FOREWORD

TOYOTA MOTOR CORPORATION

This manual (Volume 1) contains preparation, specifications and diagnostics procedures for the COROLLA.

Applicable models: ZZE120, 121, 123 series
CDE 120 series

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For repair procedures for the engine, chassis and body, electrical service procedures,
refer to VOLUME 2 (Pub. No. RM925E2).

The manual is divided into 5 sections with a thumb index for each section at the edge of the pages. Please note that the publications below have also been prepared as relevant service manuals for the components and systems in these vehicles.

Manual Name	Pub. No.
• 2ZZ-GE Engine Repair Manual	RM929E
• 3ZZ-FE, 4ZZ-FE Engine Repair Manual	RM928E
• 1 CD-FTV Engine Repair Manual	RM927E
• C51, C52 Manual Transaxle Repair Manual	RM826E
• C64 Manual Transaxle Repair Manual	RM930E
• C150 Manual Transaxle Repair Manual	RM827E
• E355, E356 Manual Transaxle Repair Manual	RM867E
• A245E, A246E Automatic Transaxle Repair Manual	RM847E
• COROLLA Electrical Wiring Diagram	EWD480E
• COROLLA New Car Features	NCF218E

All information in this manual is based on the latest product information at the time of publication. However, specifications and procedures are subject to change without notice.

CAUTION

This manual does not include all the necessary items about repair and service. This manual is made for the purpose of the use for the persons who have special techniques and certifications. In the cases that non-specialized or uncertified technicians perform repair or service only using this manual or without proper equipment or tool, that may cause severe injury to you or other people around and also cause damage to your customer's vehicle.

In order to prevent dangerous operation and damages to your customer's vehicle, be sure to follow the instruction shown below.

- Must read this manual thoroughly. It is especially important to have a good understanding of all the contents written in the PRECAUTION of "IN" section.
- The service method written in this manual is very effective to perform repair and service. When performing the operations following the procedures using this manual, be sure to use tools specified and recommended. If using non-specified or recommended tools and service method, be sure to confirm safety of the technicians and any possibility of causing personal injury or damage to the customer's vehicle before starting the operation.
- If part replacement is necessary, must replace the part with the same part number or equivalent part. Do not replace it with inferior quality.
- It is important to note that this manual contains various "Cautions" and "Notices" that must be carefully observed in order to reduce the risk of personal injury during service or repair, or the possibility that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that these "Cautions" and "Notices" are not exhaustive, because it is important to warn of all the possible hazardous consequences that might result from failure to follow these instructions.

FOREWORD

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CDE120 series

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For preparation, specifications and diagnostics service procedures,
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ENGINE, CHASSIS & BODY & ELECTRICAL RM925E

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HOW TO USE THIS MANUAL

010B2-02

GENERAL INFORMATION

1. GENERAL DESCRIPTION

(a) This manual is made in accordance with SAE J2008.

(b) Generally repair operations can be separated in the following 3 main processes:
1. Diagnosis
2. Removing and Installing, Replacing, Disassembling, Installing and Checking, Adjusting
3. Final Inspection

(c) This manual explains the 1st process of "Diagnosis" (placed in the "Diagnostics" section), the 2nd process of "Removing and Installing, Replacing, Disassembling, Installing and Checking, Adjusting", but the 3rd process of "Final Inspection" is omitted.

(d) The following essential operations are not written in this manual, however these operations must be done in the practical situation.
(1) Operation with a jack or lift
(2) Cleaning of a removed part when necessary
(3) Visual check

2. INDEX

(a) An alphabetical INDEX is provided as a section on the end of the book to guide you to the item to be repaired.

3. PREPARATION

(a) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the repairing condition. Be sure to use SST and SSM when they are required and follow the working procedure properly. A list of SST and SSM is in the Preparation section of this manual.

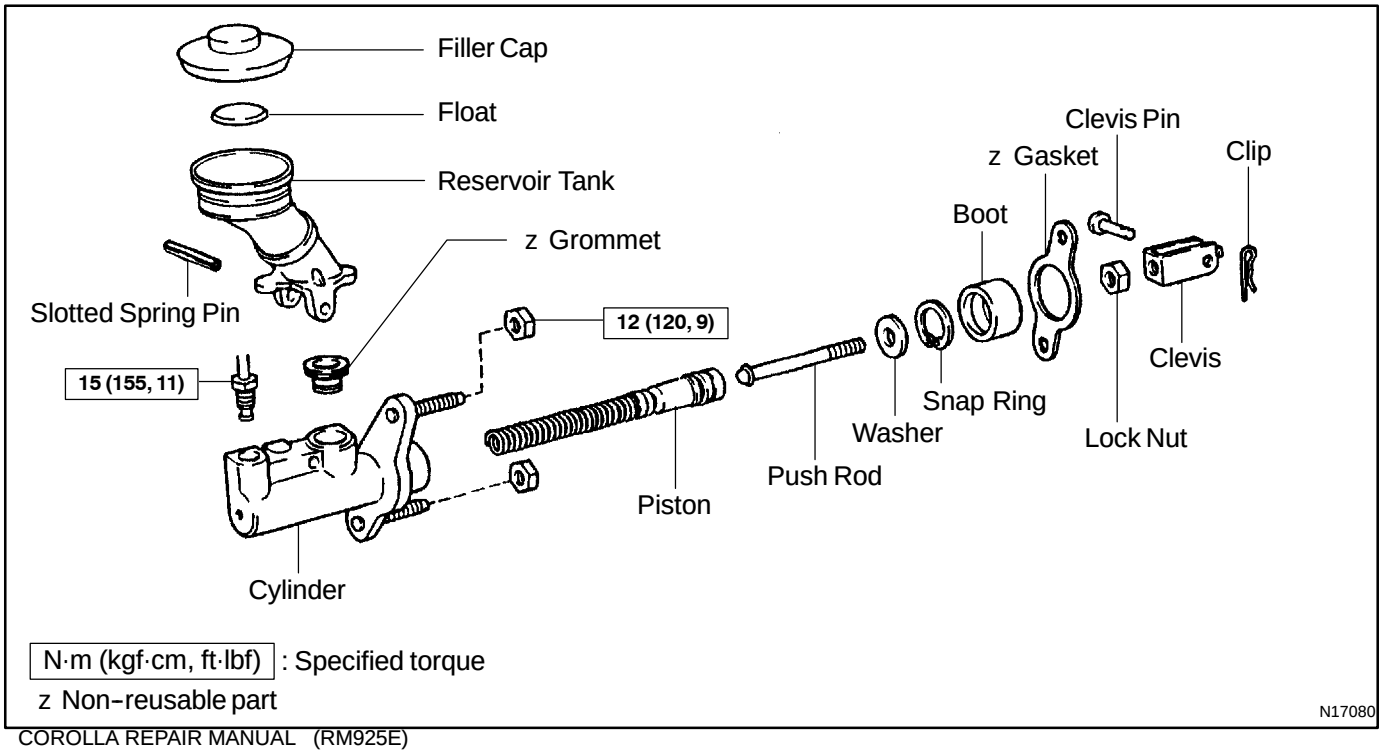
4. REPAIR PROCEDURES

(a) Component drawing is placed as the section or title when necessary.

(b) Illustrations are placed as "disassembled parts drawing" so that it enables you to understand the fitting condition of the components.

(c) Non-reusable parts, grease applied parts, precoated parts and tightening torque are specified in the components drawing.

Example:



(d) Tightening torque, oil applying position, and non-reusable parts are described as important points in the procedure.

NOTICE:

There are cases where such information can only be indicated by an illustration. In that case, all the information such as torque, oil, etc. are described in the illustration.

(e) Installing procedure of operation items is performed in the reverse order of the removing, and only the important points are described.

(f) Only items with points are described in the procedure, and the operational portion and content are placed using an illustration. In the explanations, details of the operational method, standard value and notice are placed.

(g) There may be a case where the illustrations of similar models are used. In that case the details may be different from the actual vehicle.

(h) The procedures are presented in a step-by-step format:

(1) The illustration shows what to do and where to do it.

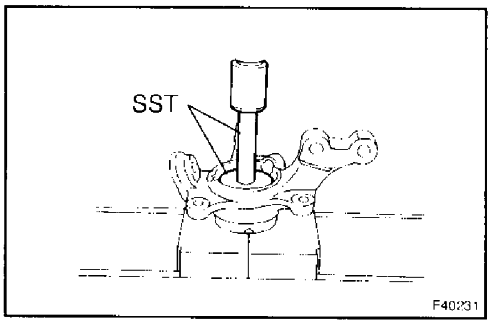
(2) The task heading tells what to do.

(3) The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example:

Illustration:

what to do and where



Task heading: what to do

14. INSTALL FRONT AXLE HUB LH BEARING

(a) Using SST and a press, install a new bearing to the steering knuckle. ← *Detailed test: how to perform task*

SST 09950-60020 (09951-00720), 09950-70010 (09951-07100)

Set part No

Component part No.

D26745

HINT:

This format provides an experienced technician with a FAST TRACK to the necessary information. The task heading can be read at a glance when necessary, and the text below provides detailed information. Important specifications and warnings always stand out in bold type.

5. SERVICE SPECIFICATIONS

(a) Specifications are presented in bold type throughout the manual. You never have to leave the procedure to look up your specifications. The specifications are also found in the Service Specifications section for a quick reference.

6. TERMS DEFINITION

CAUTION	Indicate the possibility of injury to you or other people.
NOTICE	Indicate the possibility of damage to the components being repaired.
HINT	Provide additional information to help you perform the repair efficiently.

7. SI UNIT

(a) The UNITS given in this manual are primarily expressed according to the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.

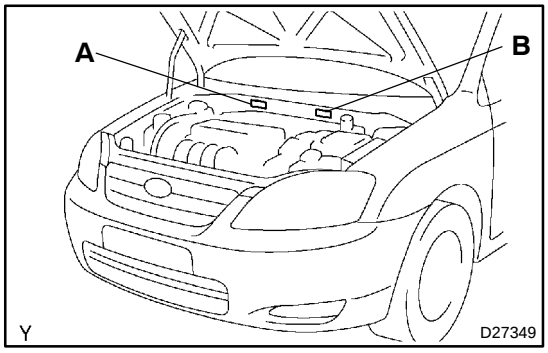
Example:

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

IDENTIFICATION INFORMATION

VEHICLE IDENTIFICATION AND SERIAL NUMBERS

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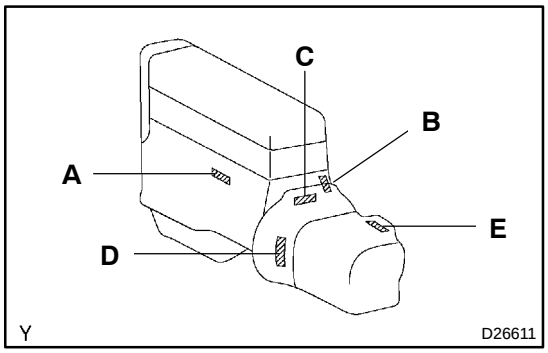


1. VEHICLE IDENTIFICATION NUMBER

(a) The vehicle identification number is stamped on the vehicle identification number plate and manufacturer's plate, as shown in the illustration.

A: Vehicle Identification Number Plate

B: Manufacturer's Plate



2. ENGINE SERIAL NUMBER AND TRANSAXLE SERIAL NUMBER

(a) The engine serial number is stamped on the cylinder block of the engine, and the transaxle serial number is stamped on the housing, as shown in the illustration.

A: 1CD-FTV

B: 2ZZ-GE, 3ZZ-FE, 4ZZ-FE

C: C50, C64, C150

D: E351

E: A246E

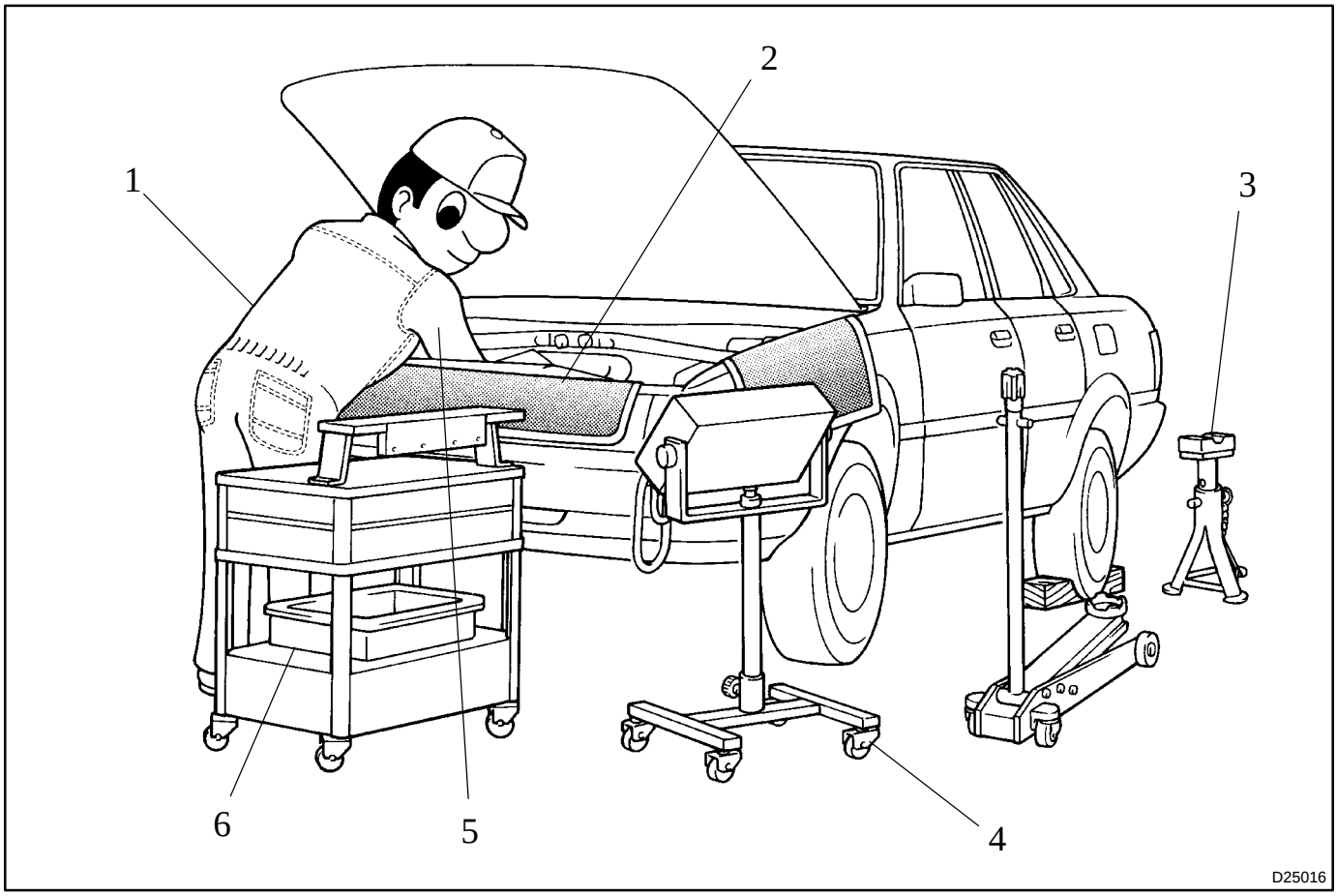
REPAIR INSTRUCTION

PRECAUTION

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1. BASIC REPAIR HINT

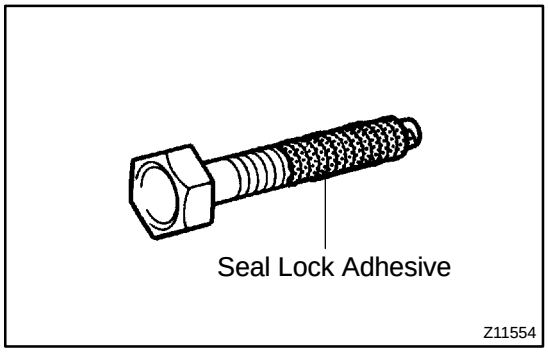
(a) HINTS ON OPERATIONS



1	Looks	S Always wear a clean uniform. S Hat and safety shoes must be worn.
2	Vehicle protection	S Set a grill cover, fender cover, seat cover and floor mat before starting the operation.
3	Safe operation	S In case of working with more than 2 persons, be sure to check safety of one another. S When working with the engine running, pay attention to the ventilation of the workshop. S In case of operating on high-temperature parts, rotating, moving and vibrating parts, pay attention not to burn or injure yourself. S When jacking up the vehicle, be sure to support the specified location with a safety stand. S When lifting up the vehicle, apply a safety equipment.
4	Preparation of tools and measuring gauge	S Before starting operation, prepare a tool stand, SST, gauge, oil, shop rag and parts for replacement.
5	Removal and Installation, Disassembly and Assembly operations	S Diagnose with a thorough understanding of the trouble phenomenon and perform effective operations. S Before removing the parts, check the assembly condition, deformation and damage condition. S When the structure is complicated, take a note or put matchmarks that will not affect its function. S Clean and wash the removed parts if necessary, and assemble them after a thorough check.
6	Removed parts	S Place the removed parts in the correct order to avoid mixing up or making them dirty. S As for non-reusable parts such as gasket, O-ring, and self lock nut, change them to new ones following the instruction of this manual. S Sort out the parts for replacement in a box and show them to the customer.

(b) JACKING UP AND SUPPORTING VEHICLE

(1) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations (See page 01-17).



(c) PRECOATED PARTS

(1) Precoated parts are bolts, nuts, etc. that are coated with a seal lock adhesive at the factory.

(2) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.

(3) When reusing precoated parts, clean off the old adhesive and dry it with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.

NOTICE:

Perform the torque checking with the lower limit value of the torque tolerance.

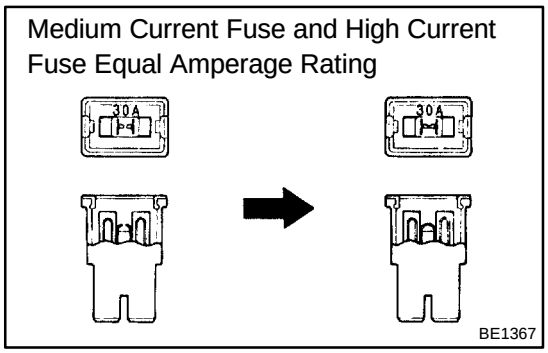
(4) Depending on the seal lock agent to apply, there may be a case where it is necessary to leave it for a specified time until it hardens.

(d) GASKETS

(1) When necessary, use a sealer on gaskets to prevent leaks.

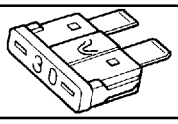
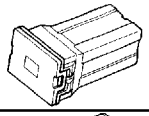
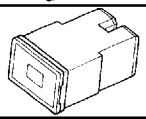
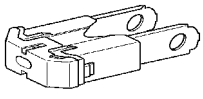
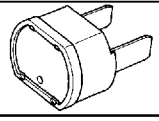
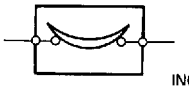
(e) BOLTS, NUTS AND SCREWS

(1) Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.



(f) FUSES

(1) When replacing fuses, be sure that a new fuse has the correct amperage rating. DO NOT exceed the rating nor use one with a lower rating.

Illustration	Symbol	Part Name	Abbreviation
 BE5594	 IN0365	FUSE	FUSE
 BE5595	 IN0366	MEDIUM CURRENT FUSE	M-FUSE
 BE5596	 IN0367	HIGH CURRENT FUSE	H-FUSE
 D25628	 IN0367	FUSIBLE LINK	FL
 BE5598	 IN0368	CIRCUIT BREAKER	CB

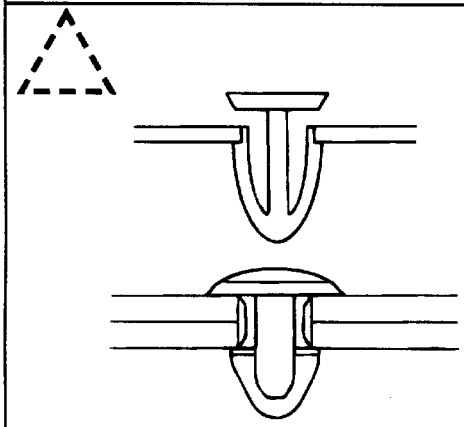
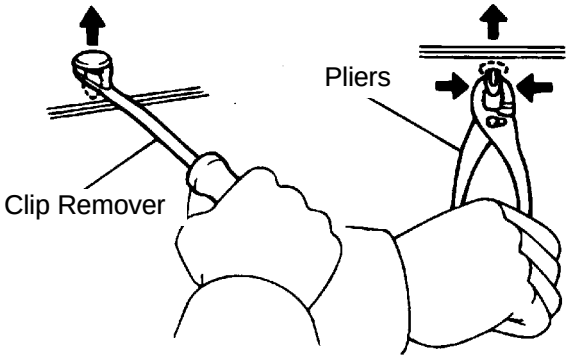
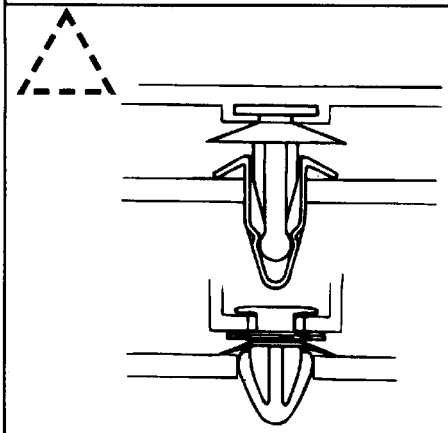
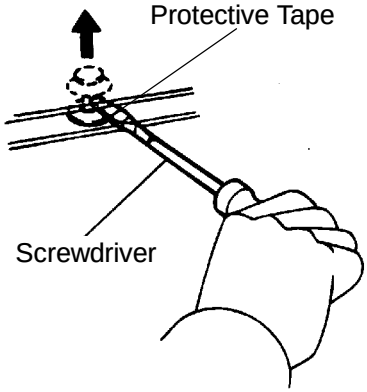
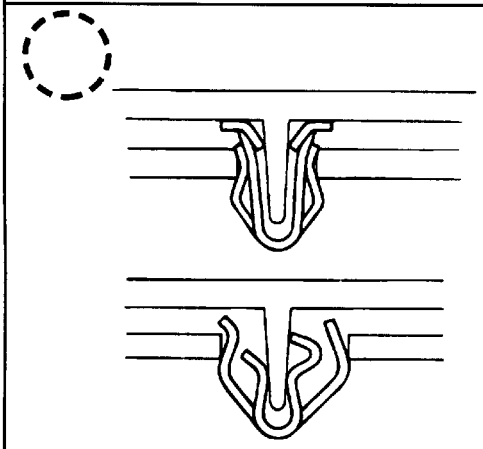
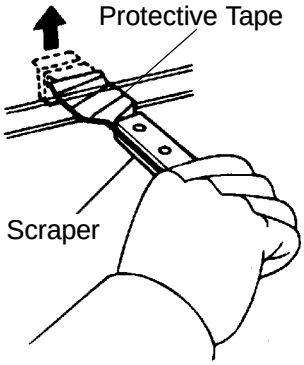
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(g) CLIPS

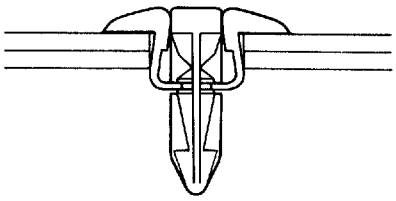
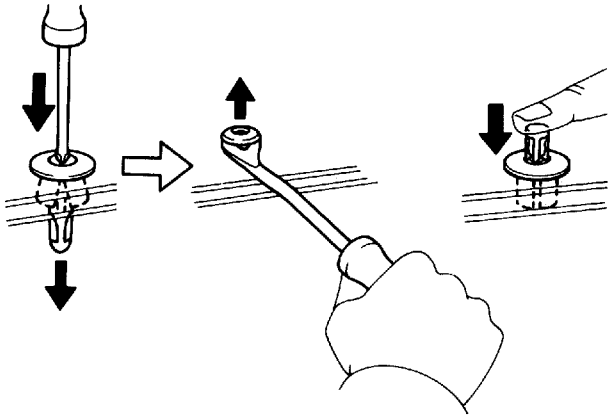
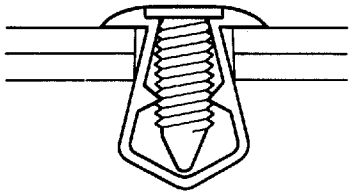
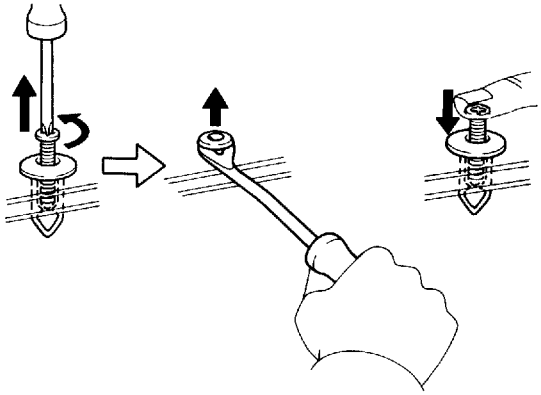
(1) The removal methods of typical clips used in body parts are shown in the table below.

HINT:

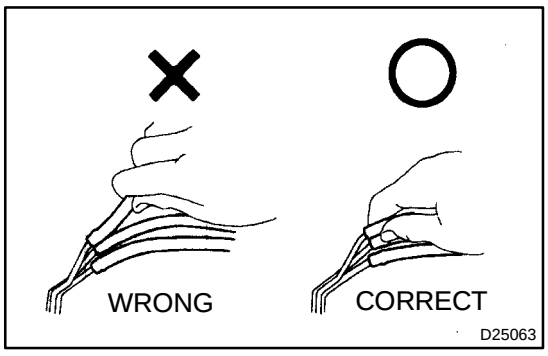
If the clip is damaged during the operation, always replace it with a new clip.

Shape (Example)	Removal/Installation
	
	
	

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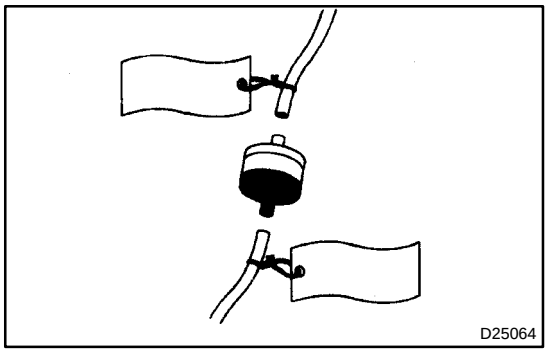
Shape (Example)	Removal/Installation
	Removal Installation 
	Removal Installation 

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(h) REMOVAL AND INSTALLATION OF VACUUM HOSES

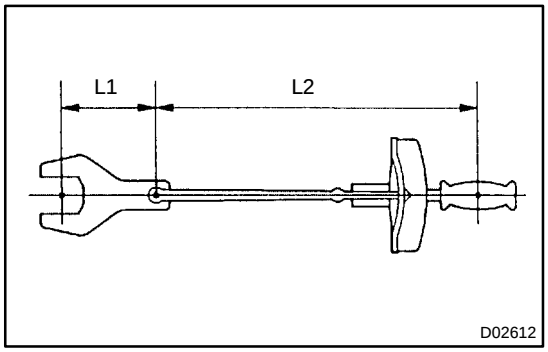
(1) To disconnect vacuum hoses, pull them by holding the end, not the middle of the hose.

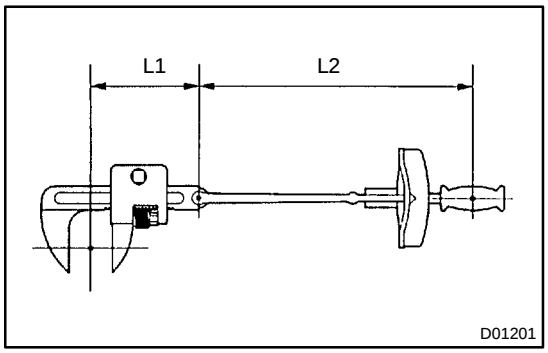


(2) When disconnecting vacuum hoses, use tags to identify where they should be reconnected.

(3) After completing the job, make a double check whether the vacuum hoses are properly connected. A label under the hood shows the proper layout.

(4) When using a vacuum gauge, never force the hose onto a connector that is too large. Use a step-down adapter for adjustment. Once the hose has been stretched, it may leak air.





(i) TORQUE WHEN USING TORQUE WRENCH WITH EXTENSION TOOL

(1) In case of tightening with a torque wrench which has an extended length by combining the torque wrench with SST or tool, tightening until the reading on the torque wrench reaches the specified torque value actually is excessive torque.

(2) In this manual, only the specified torque is described. In case of using SST or an extension tool, calculate the reading of the torque wrench by the formula.

(3) Formula T'=T x L2/(L1 + L2)

T'	Reading of torque wrench {N·m (kgf·cm, ft·lbf)}
T	Torque {N·m (kgf·cm, ft·lbf)}
L1	Length of SST or tool (cm)
L2	Length of torque wrench (cm)

2. FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER

HINT:

The vehicle is equipped with an SRS (Supplemental Restraint System), such as the horn button assembly, instrument panel passenger airbag assembly, front seat airbag assembly, center airbag sensor assembly, front airbag sensor, side airbag sensor and seat belt pretensioner.

Failure to carry out the service operations in the correct sequence could cause the supplemental restraint system to unexpectedly deploy during servicing. It may possibly lead to a serious accident.

Furthermore, if a mistake is made in servicing the supplemental restraint system, it is possible the SRS may fail to operate when required. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedure described in this manual.

(a) GENERAL NOTICE

(1) Malfunction symptoms of the supplemental restraint system are difficult to confirm, so the diagnostic trouble codes become the most important source of information when troubleshooting. When troubleshooting the supplemental restraint system, always inspect the diagnostic trouble codes before disconnecting the battery (See page 05-942).

(2) Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

(The supplemental restraint system is equipped with a back-up power source, so if work is started within 90 seconds after disconnecting the negative (-) terminal cable from the battery, the SRS may deploy.)

When the negative (-) terminal cable is disconnected from the battery, memory of the clock and audio systems will be cancelled. So before starting work, make a record of the memorized contents in each memory system. Then, when work is finished, reset the clock and audio systems as before. To avoid erasing the memory in each memory system, never use a back-up power supply from another battery.

(3) Even in case of a minor collision where the SRS does not deploy, the horn button assembly, instrument panel passenger airbag assembly, front seat airbag assembly and seat belt pretensioner should be should be inspected (See pages 60–14, 60–27, 60–32 and 61–4 or 61–12).

(4) Never use SRS relating parts from another vehicle. When replacing parts, replace them with new parts.

(5) Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.

(6) Never disassemble and repair the airbag sensor assembly, horn button assembly, instrument panel passenger airbag assembly, front seat airbag assembly or seat belt pretensioner.

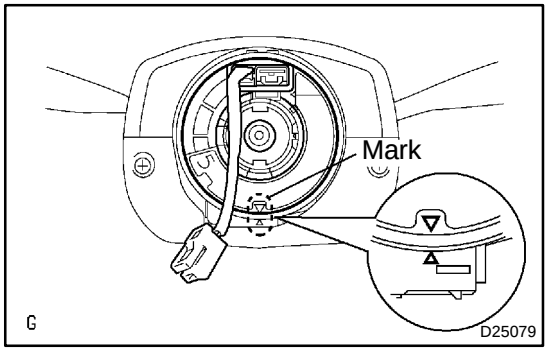
(7) If the airbag sensor assembly, side airbag sensor assembly, horn button assembly, instrument panel passenger airbag assembly, front seat airbag assembly, seat belt pretensioner have been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace them with new ones.

(8) Do not directly expose the airbag sensor assembly, horn button assembly, instrument panel passenger airbag assembly, front seat airbag assembly or seat belt pretensioner to hot air or flames.

(9) Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting an electrical circuit.

(10) Information labels are attached to the SRS components. Follow the instructions on the notices.

(11) After work on the supplemental restraint system is completed, check the SRS warning light (See page 05–942).



(b) SPIRAL CABLE (in Combination Switch)

(1) The steering wheel must be fitted correctly to the steering column with the spiral cable at the neutral position, otherwise cable disconnection and other troubles may occur. Refer to 60–22 on this manual concerning the correct installation of steering wheel.

(c) HORN BUTTON ASSEMBLY (with Airbag)

(1) When removing the horn button assembly or handling a new horn button, it should be placed with the pad top surface facing upward.
Placing it with the pad surface facing downward may lead to a serious accident if the airbag accidently inflates. Also, do not place horn button on top of one another.

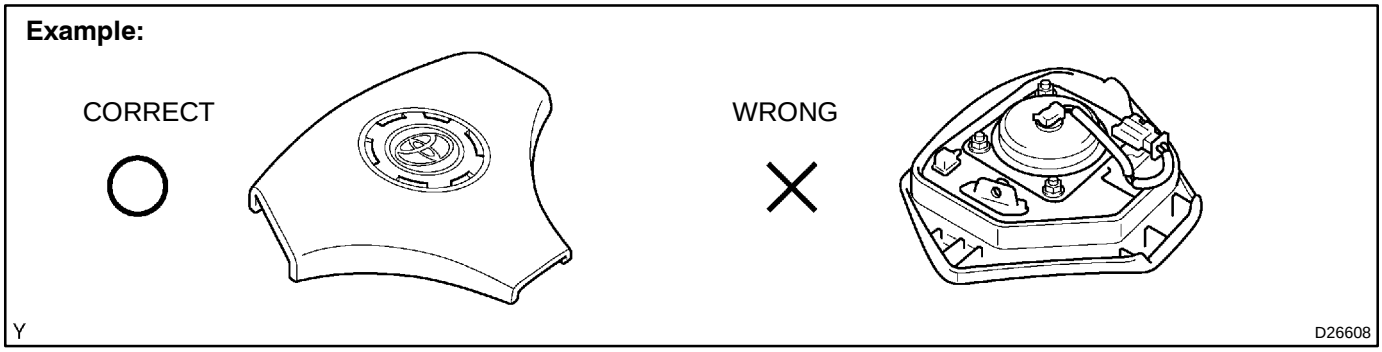
(2) Never measure the resistance of the airbag squib (This may cause the airbag to inflate, which is very dangerous.).

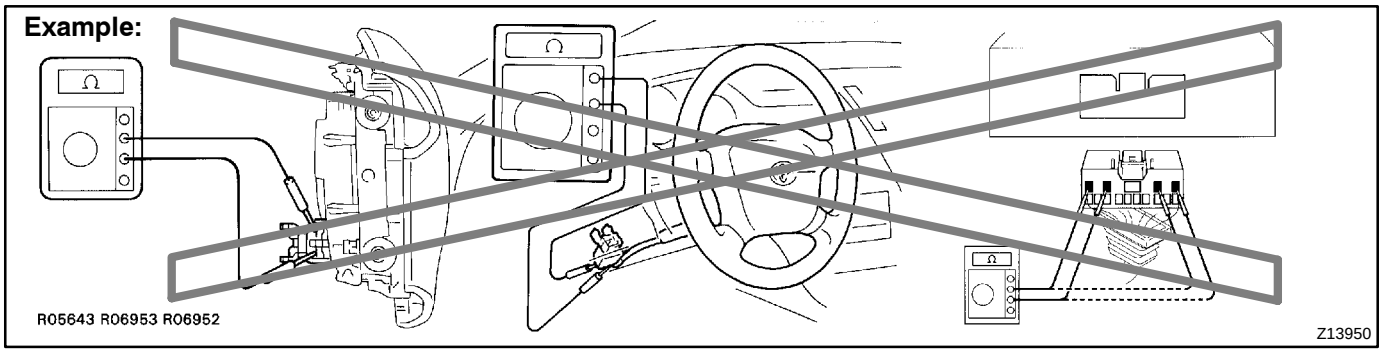
(3) Grease should not be applied to the horn button assembly and the pad should not be cleaned with detergents of any kinds.

(4) Store the horn button assembly where the ambient temperature remains below 93˚C (200˚F), without high humidity and away from electrical noise.

(5) When using electric welding, first disconnect the airbag connector (2 yellow pins) under the steering column near the combination switch connector before starting work.

(6) When disposing the vehicle or the horn button assembly alone, the airbag should be inflated using an SST before disposal (See page 60–14).
Perform the operation in a safe place away from electrical noise.





(d) INSTRUMENT PANEL PASSENGER AIRBAG ASSEMBLY

(1) Always store a removed or new instrument panel passenger airbag assembly with the airbag inflating direction facing upward.
Placing the airbag assembly with the airbag inflation direction facing downward could cause a serious accident if the airbag inflates.

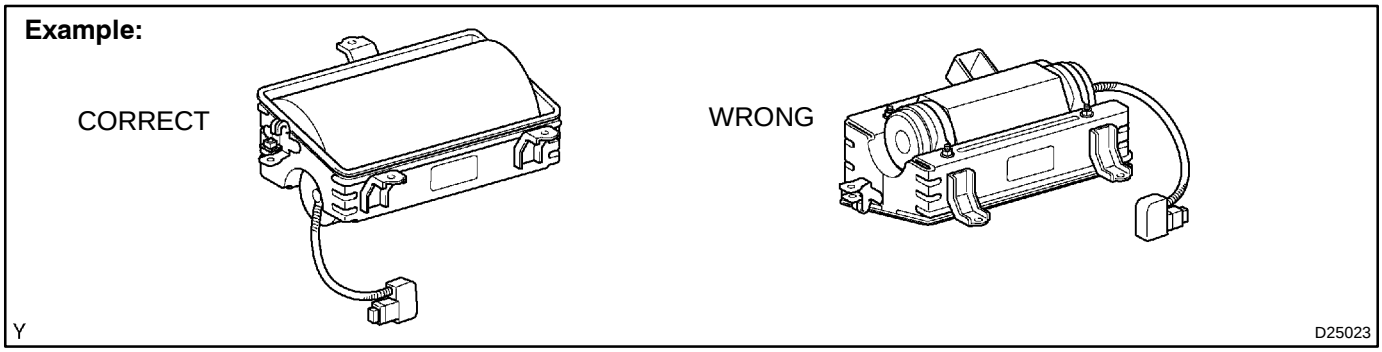
(2) Never measure the resistance of the airbag squib (This may cause the airbag to inflate, which is very dangerous.).

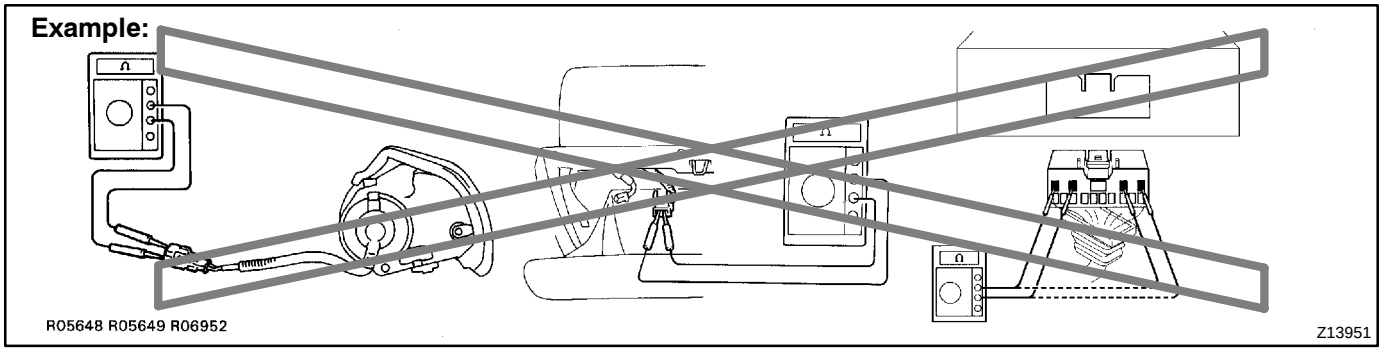
(3) Grease should not be applied to the instrument panel passenger airbag assembly and the airbag door should not be cleaned with detergents of any kind.

(4) Store the airbag assembly where the ambient temperature remains below 93°C (200°F), without high humidity and away from electrical noise.

(5) When using electric welding, first disconnect the airbag connector (2 yellow pins) installed on the assembly before starting work.

(6) When disposing of a vehicle or the airbag assembly alone, the airbag should be inflated using an SST before disposal (See page 60–27).
Perform the operation in a safe place away from electrical noise.





(e) FRONT SEAT AIRBAG ASSEMBLY

(1) Always store a removed or new front seat airbag assembly with the airbag inflating direction facing upward.
Placing the airbag assembly with the airbag inflation direction facing downward could cause a serious accident if the airbag inflates.

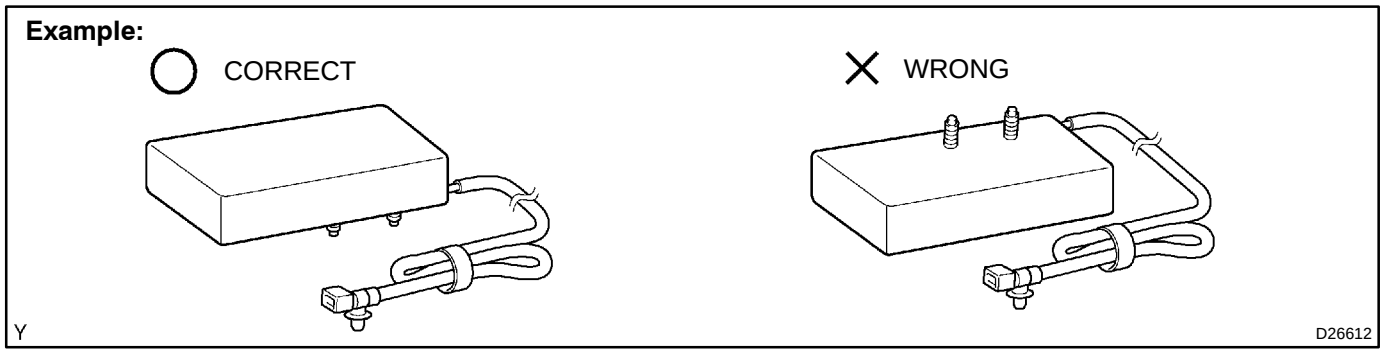
(2) Never measure the resistance of the airbag squib (This may cause the airbag to inflate, which is very dangerous.).

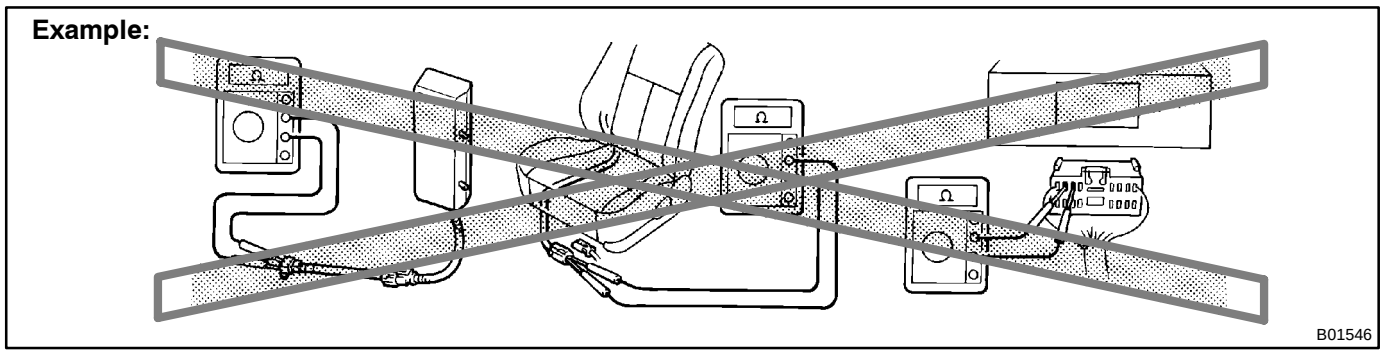
(3) Grease should not be applied to the front seat airbag assembly and the airbag door should not be cleaned with detergents of any kind.

(4) Store the airbag assembly where the ambient temperature remains below 93˚C (200˚F), without high humidity and away from electrical noise.

(5) When using electric welding, first disconnect the airbag connector (2 yellow pins) installed on the assembly before starting work.

(6) When disposing of a vehicle or the side airbag assembly alone, the airbag should be inflated using an SST before disposal (See page 60-32).
Perform the operation in a safe place away from electrical noise.





(f) SEAT BELT PRETENSIONER

(1) Never measure the resistance of the seat belt pretensioner (This may cause the seat belt pretensioner to activate, which is very dangerous.).

(2) Never disassemble the seat belt pretensioner.

(3) Never install the seat belt pretensioner in another vehicle.

(4) Store the seat belt pretensioner where the ambient temperature remains below 80˚C (176˚F) without high humidity and away from electrical noise.

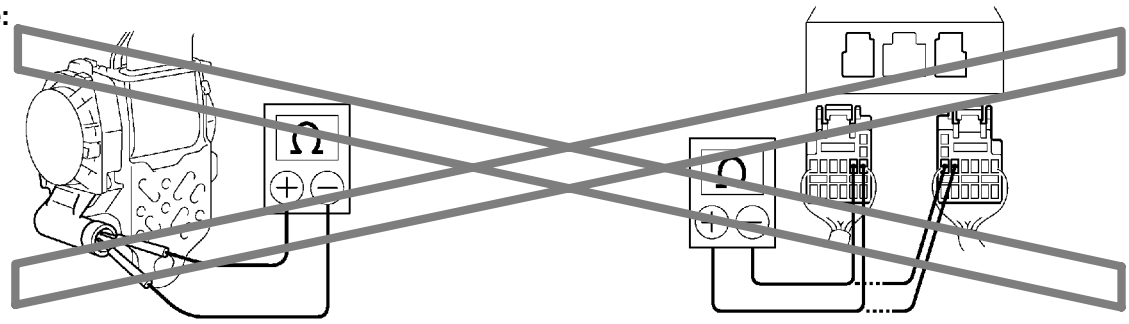
(5) When using electric welding, first disconnect the connector (2 yellow pins) before starting work.

(6) When disposing of a vehicle or the seat belt pretensioner alone, the seat belt pretensioner should be activated before disposal (See page 61-4 or 61-12). Perform the operation in a safe place away from electrical noise.

(7) The seat belt pretensioner is hot after activation, so let it cool down sufficiently before disposal. Never apply water to cool down the seat belt pretensioner.

(8) Oil or water should not be put on the front seat outer belt and the front seat outer belt should be cleaned with the appropriate detergents.

Example:



Y D26613

(g) AIRBAG SENSOR ASSEMBLY

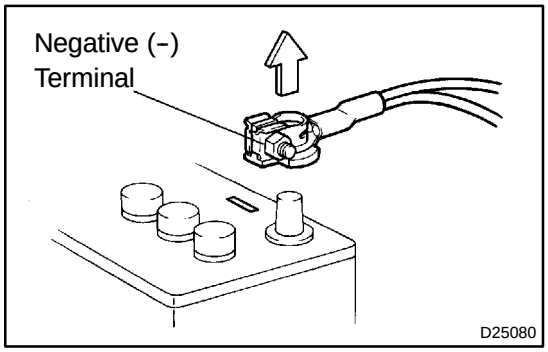
(1) Never reuse the airbag sensor assembly involved in a collision where the SRS has deployed.

(2) The connectors to the airbag sensor assembly should be connected or disconnected with the sensor mounted on the floor. If the connectors are connected or disconnected while the airbag sensor assembly is not mounted to the floor, it could cause an undesired ignition of the supplemental restraint system.

(3) Work must be started after 90 seconds from the time the ignition switch is turned to the ”LOCK” position and the negative (-) terminal cable is disconnected from the battery, even if only loosening the set bolts of the airbag sensor assembly.

(h) WIRE HARNESS AND CONNECTOR

(1) The SRS wire harness is integrated with the instrument panel wire harness assembly. All connectors in the system are a standard yellow color. If the SRS wire harness becomes disconnected or the connector becomes broken due to an accident, etc., repair or replace it.



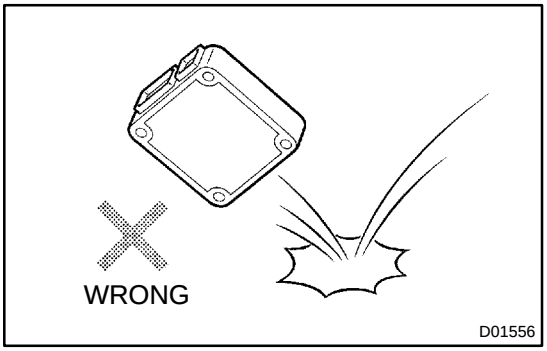
3. ELECTRONIC CONTROL

(a) REMOVAL AND INSTALLATION OF BATTERY TERMINAL

(1) Before performing electrical work, disconnect the battery negative (–) terminal cable beforehand so as to prevent burnt–out damage by short.

(2) When disconnecting and installing the terminal cable, turn the ignition switch and lighting switch OFF, and loosen the terminal nut completely. perform these operations without twisting or prying the terminal.

(3) When the battery terminal is removed, all the memories of the clock, radio, DTCs, etc. will be erased. So before removing it, check them and note them down.



(b) HANDLING OF ELECTRONIC PARTS

(1) Do not open the cover or case of the ECU unless absolutely necessary. (If the IC terminals are touched, the IC may be destroyed by static electricity.)

(2) To disconnect electrical connectors, pull the connector itself, not the wires.

(3) Be careful not to drop electrical components, such as sensors or relays. If they are dropped on a hard floor, they should be replaced and not reused.

(4) When cleaning the engine with steam, protect the electronic components, air filter and emission–related components from water.

(5) Never use an impact wrench to remove or install temperature switches or temperature sensors.

(6) When checking the continuity at the wire connector, insert the tester probe carefully to prevent terminals from bending.

4. REMOVAL AND INSTALLATION OF FUEL CONTROL PARTS

(a) PLACE FOR REMOVING AND INSTALLING FUEL SYSTEM PARTS

(1) Work in a place with good air ventilation and without anything flammable such as welder, grinder, drill, electric motor or stove in the surroundings.

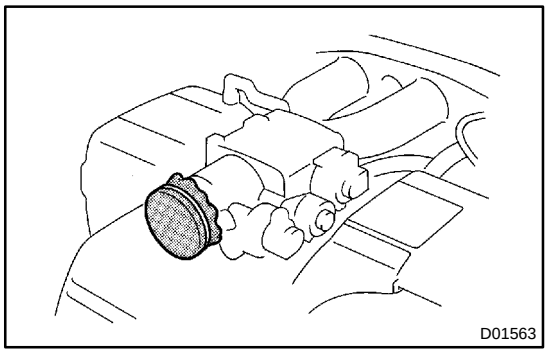
(2) Never work in a place such as a pit or nearby a pit as there is a possibility that vaporized fuel is filled in those places.

(b) REMOVING AND INSTALLING OF FUEL SYSTEM PARTS

(1) Prepare a fire extinguisher before starting the operation.

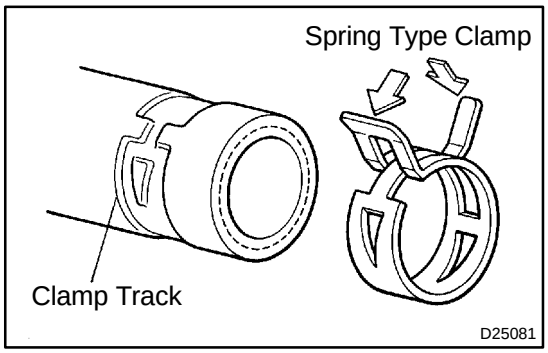
(2) For prevention of static electricity, install a ground on the fuel changer, vehicle and fuel tank, and do not spray much water so as to prevent slipping.

(3) Never use any electric equipment like an electric motor or a working light as they may cause a spark or high temperature.
(4) Never use an iron hammer as it may cause a spark.
(5) Dispose the shop rag separately from any fuel deposit.



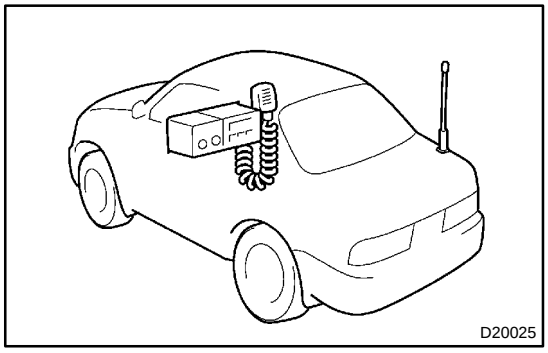
5. REMOVAL AND INSTALLATION OF ENGINE INTAKE PARTS

(a) If any metal tip is mixed in the inlet pass, this may give a bad effect to the engine and turbocharger.
(b) When removing and installing the inlet system parts, close the opening of the removed inlet system parts and the engine with a clean waste cloth or gummed tape.
(c) When installing the inlet system parts, check that there is no mixing of a metal tip.



6. HANDLING OF HOSE CLAMPS

(a) Before removing the hose, check the depth of the inserting portion and the clamp position to restore it surely.
(b) Change a deformed or dented clamp for a new one.
(c) In case of reusing the hose, install the clamp on the hose where it has a clamp track.
(d) For a spring type clamp, adjust it by adding force to the arrow mark direction after the installation.



7. FOR VEHICLES EQUIPPED WITH MOBILE COMMUNICATION SYSTEM

(a) Install an antenna as far as possible away from the ECU and sensors of the vehicle's electronic systems.
(b) Install an antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle's electronic systems. For details of the ECU and sensors locations, refer to the section on the applicable component.
(c) Prevent the antenna feeder from getting entangled with the other wirings and keep the antenna feeder separate from the other wirings as much as possible.
(d) Check that the antenna and feeder is correctly adjusted.
(e) Do not install any powerful mobile communication system.

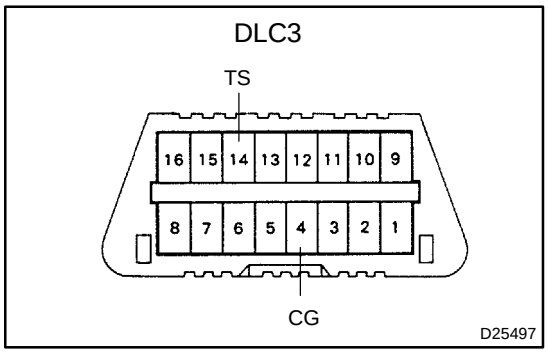
8. FOR VEHICLES EQUIPPED WITH TRACTION CONTROL (TRC) SYSTEM

(a) NOTICES WHEN USING 2–WHEEL DRUM TESTER

(1) When using a 2–wheel drum tester such as a speedometer tester, a combination tester of speedometer and brake, chassis dynamometer or else, always turn the TRC system off via the TRC OFF switch before measurement.

NOTICE:

TRC system OFF condition can be confirmed by the indication, ”TRC OFF”, of the warning light in the combination meter.



9. FOR VEHICLES EQUIPPED WITH VEHICLE SKID CONTROL (VSC) SYSTEM

(a) NOTICES WHEN USING DRUM TESTER

(1) When using a drum tester, be sure to start the engine with the ignition OFF, and connect SST to the terminals TS and CG of the DLC3 before measurement in order to prohibit the VSC operation.

SST 09843–18040

NOTICE:

- **Confirm that the VSC warning light blinks.**
- **VSC system will be reset when the engine is restarted.**
- **Fasten the vehicle with lock chains.**

(b) NOTICES OF RELATED OPERATIONS TO VSC

(1) Do not carry out unnecessary installation and removal, because it might disorder the adjustment of related parts to VSC.

(2) Be sure to carry out the preparation for operation and the confirmation of operation completion, in accordance with the instruction of the text, when the related operations to VSC are performed.

10. FOR VEHICLES EQUIPPED WITH CATALYTIC CONVERTER

CAUTION:

If large amount of unburned fuel flows into the converter, it may cause overheating and a fire hazard. To prevent this, observe the following precautions.

(a) Use only diesel fuel for 1CD–FTV engine and unleaded fuel for other engines.

(b) Avoid prolonged idling.
Avoid running the engine at idle speed for more than 20 minutes.

(c) Avoid a spark jump test.

(1) Perform a spark jump test only when absolutely necessary. Perform this test as rapidly as possible.

(2) While testing, never race the engine.

(d) Avoid a prolonged engine compression measurement.
Engine compression measurements must be done as rapidly as possible.

(e) Do not run the engine when fuel tank is nearly empty.
This may cause the engine to misfire and create an extra load on the converter.

010B5-02

VEHICLE LIFT AND SUPPORT LOCATIONS

1. NOTICE ABOUT VEHICLE CONDITION WHEN JACKING UP

(a) As a rule, the vehicle must be in an unloaded when jacking up. Never jack up or lift up the vehicle loaded with heavy weight.

(b) When removing any parts of heavy weight like the engine and transmission, the center of gravity of the vehicle moves. Place a balance weight so as to keep it from rolling, or hold the jacking support location using the mission jack.

2. NOTICE FOR USING 4 POST LIFT

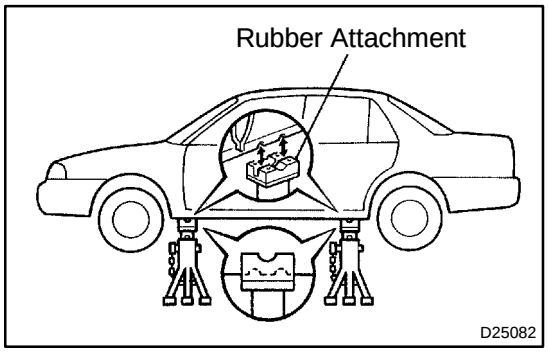
(a) Follow the instruction manual for a safety operation.

(b) Do not damage tires or wheels with a free wheel beam.

(c) Using a wheel stopper, fix the vehicle.

3. NOTICE FOR USING JACK AND SAFETY STAND

(a) Work in a flat place using a wheel stopper at all times.



(b) Use a safety stand with a rubber attachment, as shown in the illustration.

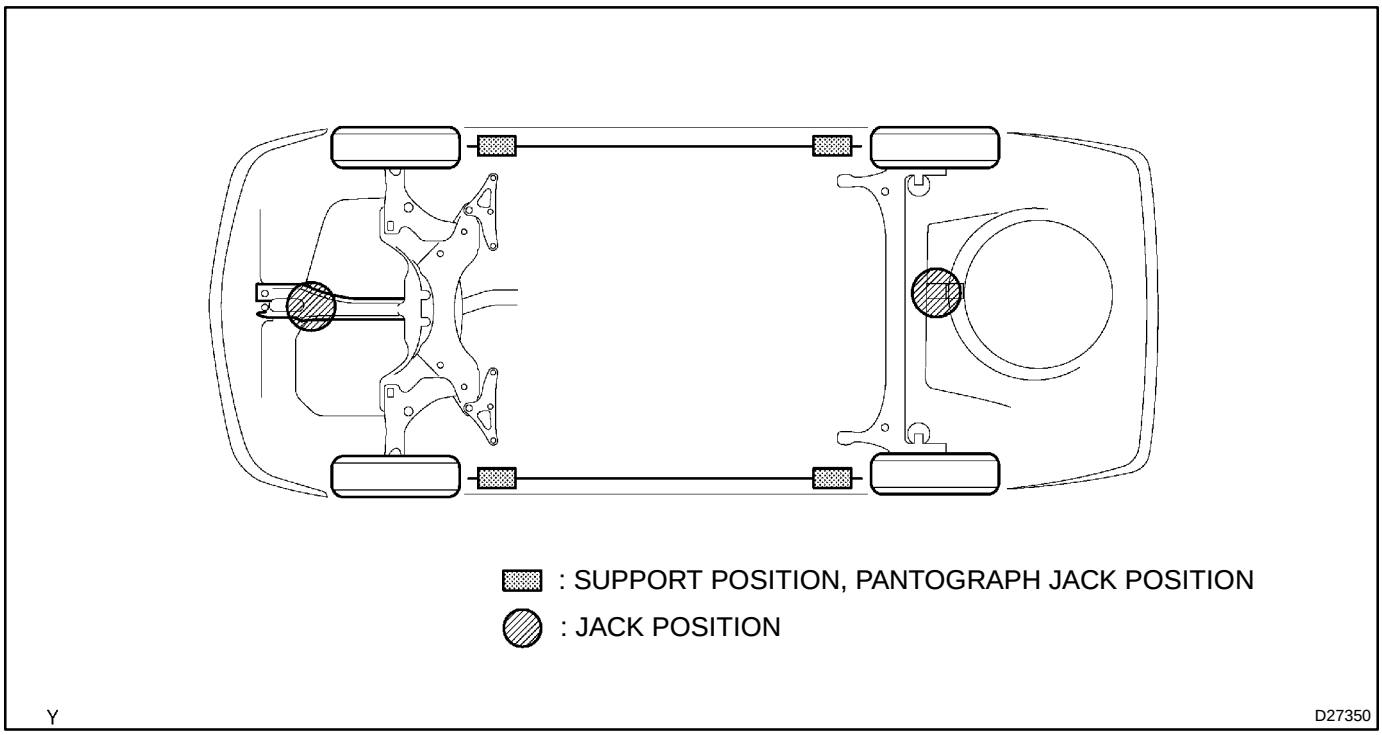
(c) Support the specified location with a jack and safety stand accurately.

(d) When jacking up the front wheels, release the parking brake and place wheel stoppers only behind the rear wheels. When jacking up the rear wheels, place wheel stoppers only in front of the front wheels.

(e) Do not work or leave the vehicle supported only by a jack. Be sure to support the vehicle with the safety stand.

(f) When jacking up only the front wheels or only the rear wheels, place wheel stoppers to both sides of the wheels.

(g) When jacking down the vehicle with its front wheels jacked up, release the parking brake and place wheels stoppers only in front of the rear wheels. When jacking down the vehicle with its rear wheels jacked up, place wheel stoppers only behind the front wheels.



4. NOTICE FOR USING SWING ARM TYPE LIFT

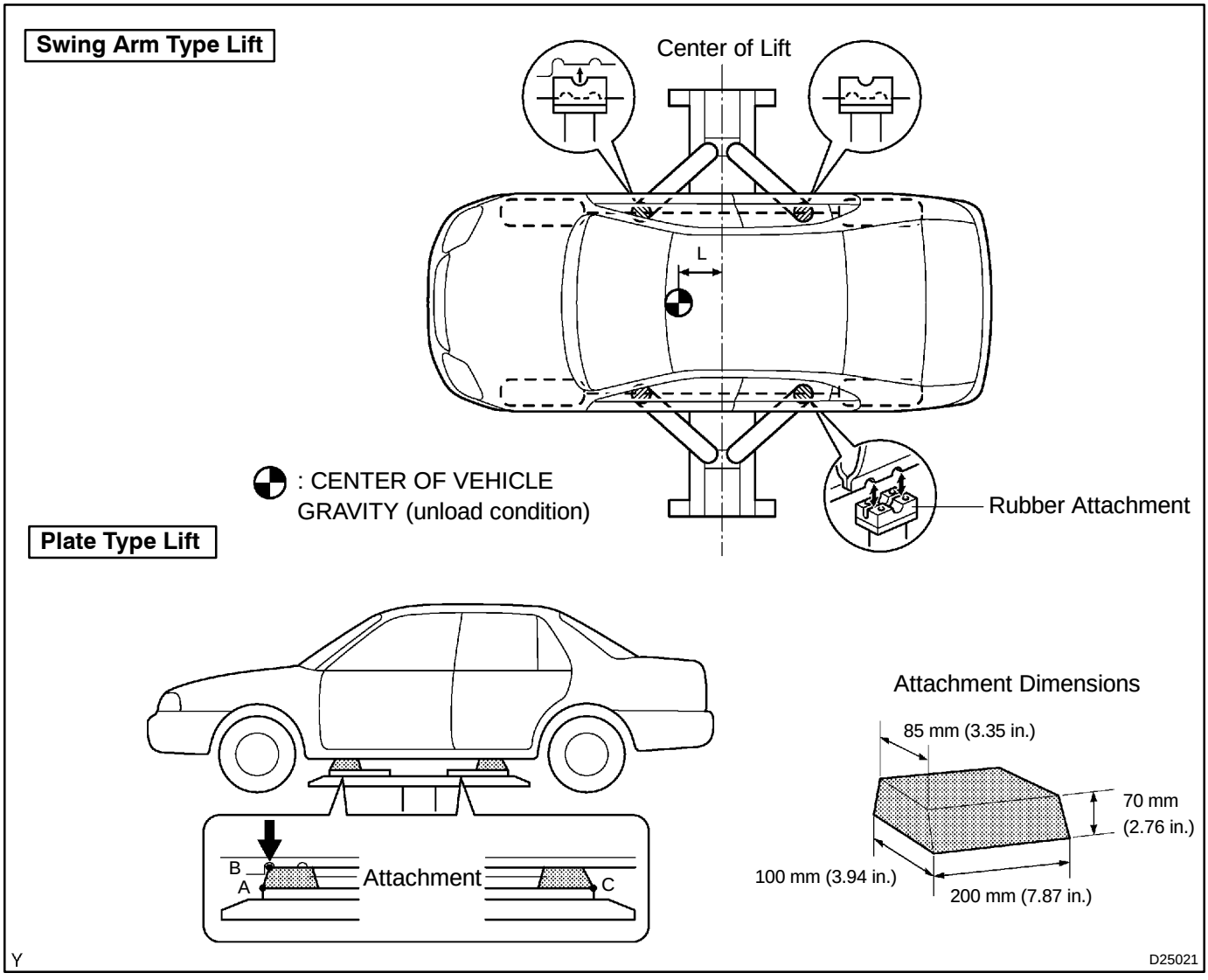
(a) Follow the instruction manual of the lift for a safety operation.
(b) Use a cradle with a rubber attachment, as shown in the illustration.
(c) Set in the vehicle so as to make its center of gravity as closer as the center of the lift. (”L” becomes short.)
(d) Make the vehicle horizontal by adjusting the height of the cradle, and match the groove of the cradle and the safety stand support location accurately.
(e) Be sure to lock the swing arm during the operation.
(f) Lift the vehicle up until the tires float and shake the vehicle to make sure that the vehicle is stable.

5. NOTICE FOR USING PLATE TYPE LIFT

(a) Follow the instruction manual of the lift for a safety operation.
(b) Use a plate lift attachment.
(c) Be sure to set the vehicle to the specified position.

Right and left set position	ⅤPlace the vehicle over the center of the lift.
Front and rear set position	ⅤAlign the cushion gum ends of the plate with the attachment lower ends (A and C). ⅤAlign the attachment upper end (B) with the rocker flange front side notch.

(d) Lift the vehicle up until the tires float a bit and shake the vehicle to make sure that the vehicle is stable.



HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

010B6-02

GENERAL INFORMATION

A large number of ECU controlled systems are used in the vehicle. In general, the ECU controlled system is considered to be a very intricate system requiring a high level of technical knowledge and expert skill to troubleshoot. The fact is, however, that if you proceed to inspect the circuits one by one, troubleshooting of these systems is not complex. If you have adequate understanding of the system and a basic knowledge of electricity, accurate diagnosis and necessary repair can be performed to locate and fix the problem. This manual is designed through emphasis of the above standpoint to help service technicians perform an accurate and effective troubleshooting, and is compiled for the following major ECU controlled systems: The troubleshooting procedure and how to make use of it are described on the following pages.

System	Page
1. EFI System (2ZZ-GE)	05-1
2. EFI System (3ZZ-FE)	05-154
3. EFI System (4ZZ-FE)	05-314
4. ECD System (1CD-FTV)	05-418
5. ABS with EBD System (TMC made)	05-558
6. ABS with EBD System (TMUK made)	05-611
7. ABS with EBD & BA & TRC & VSC System (TMUK made)	05-662
8. Electronic Controlled Automatic Transaxle [ECT]	05-757
9. Electronic Motor Power Steering System	05-809
10.Air Conditioning System	05-860
11.Supplemental Restraint System	05-939
12.Audio System	05-1072
13.Navigation System	05-1131
14.Navigation System (Turn by Turn Type)	05-1212
15.Power Window Control System (TMC made)	05-1243
16.Combination Meter	05-1286
17.Power Door Lock Control System	05-1314
18.Wireless Door Lock Control System	05-1352
19.Engine Immobiliser System	05-1374
20.Theft Deterrent System (TMUK made)	05-1409

FOR USING HAND-HELD TESTER

HINT:

- Before using the tester, the tester's operator manual should be read thoroughly.
- If the tester cannot communicate with ECU controlled systems when you have connected the cable of the tester to the DLC3, turn the ignition switch ON and operatate the tester to check whether there is a problem on the vehicle side or tester side.
  - (1) If the communication is normal when the tester is connected to another vehicle, inspect the diagnosis data link line (Bus⊕line) or ECU power circuit of the vehicle.
  - (2) If the communication is still impossible when the tester is connected to another vehicle, the problem is probably in the tester itself, so perform the Self Test procedures outline in the Tester Operator's Manual.

010B7-02

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

Carry out troubleshooting in accordance with the procedure on the following page. Here, only the basic procedure is shown. Details are provided in the Diagnostics section, showing the most effective methods for each circuit. Confirm the troubleshooting procedures first for the relevant circuit before beginning the troubleshooting of that circuit.

1	Vehicle brought to workshop

2	Customer problem analysis

(a) Ask the customer about the conditions and the environment when the problem occurred.

3	Symptom confirmation and DTC (and freeze frame data) check

(a) Check the battery positive voltage.
Voltage: 10 - 14 V (Engine stopped)
(b) Visually check the wire harness, connectors and fuses for open and short, etc.
(c) Warm up the engine to the normal operating temperature.
(d) Confirm the problem symptoms and conditions, and check the DTCs according to the applicable chart.

OK → **Go to step 5**

NG

4	DTC chart

(a) Check the results obtained in step 3, then confirm the inspection procedure for the system or the part which should be checked using the DTC chart.

→ **Go to step 6**

5	Problem symptoms chart

(a) Check the results obtained in step 3, then confirm the inspection procedure for the system or the part which should be checked using the problem symptoms table.

6	Circuit inspection or parts inspection

(a) Confirm the circuit for the system or the part which should be checked using the problem symptoms table or the results obtained in step 4.

7	Repair

(a) Repair the affected system or part in accordance with the instructions in step 6.

8	Confirmation test

(a) After completing repairs, confirm that the problem has been solved.
(If the problem dose not reoccur, perform a confirmation test under the same conditions and in the same environment as when it occurred for the first time.)

END

CUSTOMER PROBLEM ANALYSIS

HINT:

- In troubleshooting, the problem symptoms must be confirmed accurately and all preconceptions must be cleared in order to give an accurate judgment. To ascertain what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions when it occurred.
- The following 5 items are important points in the problem analysis. Past problems which are thought to be unrelated and the repair history, etc. may also help in some cases, so as much information as possible should be gathered and its relationship with the problem symptoms should be correctly ascertained for a reference in troubleshooting. A customer problem analysis table is provided in Diagnostics section for each system for your use.

Important Points in the Customer Problem Analysis

- What ----- Vehicle model, system name
- When ----- Date, time, occurrence frequency
- Where ----- Road conditions
- Under what conditions? ----- Running conditions, driving conditions, weather conditions
- How did it happen? ----- Problem symptoms

(Sample) Supplemental restraint system check sheet.

CUSTOMER PROBLEM ANALYSIS CHECK

Supplemental Restraint System Check Sheet

Inspector's Name

Customer's Name		**Registration No.**	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

Date Problem First Occurred	/ /
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Other
Temperature	Approx.

Vehicle Operation	☐ Starting ☐ Idling ☐ Driving [☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ Other]

SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE

HINT:

- The diagnostic system in COROLLA has various functions. The first function is the Diagnostic Trouble Code (DTC) Check in which a malfunction in the signal circuits to the ECU is stored in code form in the ECU memory. Another function is the Input Signal Check which checks if the signals from various switches are sent to the ECU correctly. By using these check functions, possible areas of the problem can be narrowed down quickly and troubleshooting can be performed effectively. Diagnostic functions are incorporated in the following systems in COROLLA.

System	Diagnostic Trouble Code Check	Input Signal Check (Sensor Check)	Diagnostic Test Mode (Active Test)
EFI System (2ZZ-GE)	(with Check Mode)		
EFI System (3ZZ-FE/4ZZ-FE)	(with Check Mode)		
ECD System (1CD-FTV)	(with Check Mode)		
ABS with EBD System			
ABS with EBD & BA & TRC & VSC System			
Electronic Controlled Automatic Transaxle [ECT]	(with Check Mode)		
Electronic Motor Power Steering System			
Air Conditioning System			
Supplemental Restraint System			
Engine Immobiliser System			

- In the DTC check, it is very important to determine whether the problem indicated by the DTC is still occurring or has occurred in the past but returned to normal at present. In addition, it must be checked in the problem symptom check whether the malfunction indicated by the DTC is directly related to the problem symptom or not. For this reason, the DTC should be checked before and after the symptom confirmation to determine the current conditions. If this is not done, it may, depending on the case, result in unnecessary troubleshooting for normally operating systems, making it more difficult to detect the problem area, or trying to repair irrelevant areas. Therefore always follow the procedure in the correct order and perform the DTC check.
- A flow chart showing how to proceed with the troubleshooting using the diagnostic trouble code (DTC) check is shown below. This flow chart shows how to utilize the DTC check effectively, then by carefully checking the results, indicates how to proceed either to the DTC troubleshooting or to the troubleshooting of problem symptoms table.

1	**DTC check**

2	**Making a note and clear the DTCs**

3	**Symptom confirmation**

	Problem symptoms exist
	No problem symptoms exist
a	**Go to step 5**

b

4	Simulation test using the symptom simulation methods

5	DTC check

	DTC displayed
	Normal code displayed

a → Troubleshooting of problem indicated by DTC

b

6	Symptom confirmation

	No problem symptoms exist
	Problem symptoms exist

If a DTC was displayed in the initial DTC check, it indicates that a trouble may have occurred in a wire harness or connector in that circuit in the past, therefore check the wire harness and connectors (See page 01-30).

a → System normal

b

Troubleshooting of each problem symptom

The problem is still occurring in a place other than diagnostic circuit (The DTC displayed first is either for a past problem or it is a secondary problem).

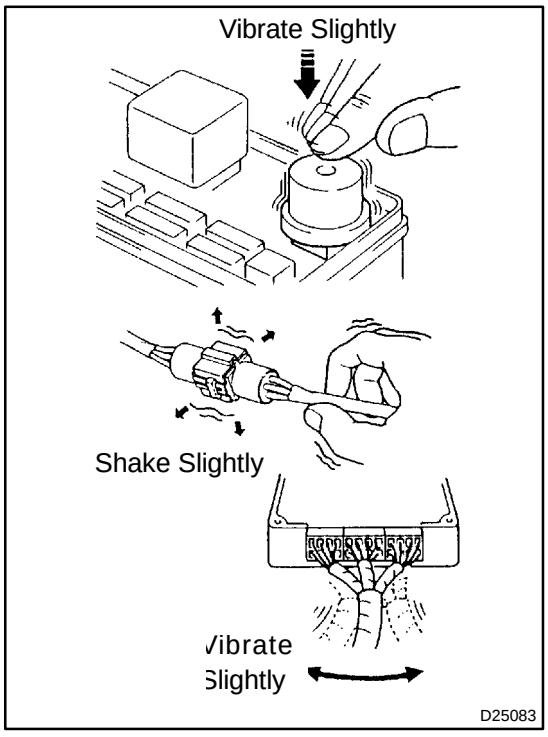
SYMPTOM SIMULATION

HINT:

The most difficult case in troubleshooting is when no problem symptoms occurs. In such cases, a thorough customer problem analysis must be carried out, then simulate the same or similar conditions and environment in which the problem occurred in the customer's vehicle. No matter how much experience a technician has, or how skilled he may be, if he proceeds to troubleshoot without confirming the problem symptoms, he will tend to overlook something important in the repair operation and make a wrong guess somewhere, which will only lead to a standstill. For example, for a problem which only occurs when the engine is cold, or for a problem which occurs due to vibration caused by the road during driving, etc., the problem can never be determined with the engine hot condition or the vehicle at a standstill. Since vibration, heat or water penetration (moisture) is a likely cause for the problem which is difficult to reproduce, the symptom simulation tests introduced here are effective measures to a point that the external causes are applied to the vehicle in a stationary condition.

Important points in the symptom simulation test:

In the symptom simulation test, the problem symptoms should be confirmed, and the problem area or parts must also be found out. To do so, narrow down the possible problem circuits according to the symptoms before starting this test and have a hand−held tester connected beforehand. After that, carry out the symptom simulation test, judging whether the circuit being tested is defective or normal and also confirming the problem symptoms at the same time. Refer to the problem symptoms table of each system to narrow down the possible causes of the symptom.



1. VIBRATION METHOD: When vibration seems to be the major cause.

(a) PART AND SENSOR

(1) Apply slight vibration with a finger to the part of the sensor considered to be the problem cause and check that the malfunction occurs.

HINT:

Applying strong vibration to relays may result in open relays.

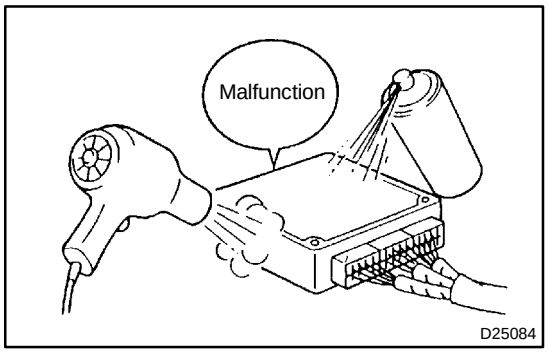
(b) CONNECTORS

(1) Slightly shake the connector vertically and horizontally.

(c) WIRE HARNESS

(1) Slightly shake the wire harness vertically and horizontally.

The connector joint and fulcrum of the vibration are the major areas to be checked thoroughly.

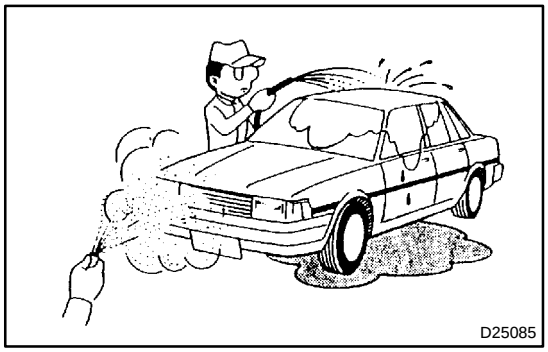


2. HEAT METHOD: When the problem seems to occur when the suspect area is heated.

(a) Heat the component that is the possible cause of the malfunction with a hair dryer or similar object. Check if the malfunction occurs.

NOTICE:

- **Do not heat to more than 60_C (140_F). (Temperature is limited so as not to damage the components.)**
- **Do not apply heat directly to the parts in the ECU.**



3. WATER SPRINKLING METHOD: When the malfunction seems to occur on a rainy day or in a high-humidity condition.

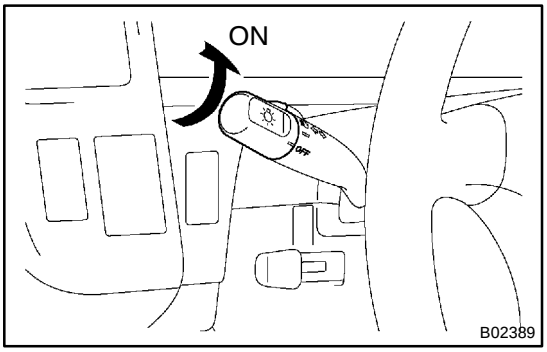
(a) Sprinkle water onto the vehicle and check if the malfunction occurs.

NOTICE:

- **Never sprinkle water directly onto the engine compartment, but indirectly change the temperature and humidity by applying water spray onto the radiator front surface.**
- **Never apply water directly onto the electronic components.**

HINT:

If a vehicle is subject to water leakage, the leaked water may contaminate the ECU. When testing a vehicle with a water leakage problem, special caution must be taken.



4. OTHERS: When the malfunction seems to occur when electrical load is excessive.

(a) Turn on all electrical loads including the heater blower, headlights, rear window defogger, etc. and check if the malfunction occurs.

DIAGNOSTIC TROUBLE CODE CHART

The inspection procedure is shown in the table below. This table permits an efficient and accurate trouble-shooting using the diagnostic trouble codes displayed in the diagnostic trouble code check. Proceed with troubleshooting in accordance with the inspection procedure given in the diagnostic chart corresponding to the diagnostic trouble codes displayed. The Supplemental Restraint System diagnostic trouble code chart is shown below as an example.

D DTC No.
Indicates the diagnostic trouble code.

D Page or Instructions
Indicates the page where the inspection procedure for each circuit is to be found, or gives instructions for checking and repairs.

D Trouble Area
Indicates the suspect area of the problem.

D Detection Item
Indicates the system of the problem or contents of the problem.

DIAGNOSTIC TROUBLE CODE CHART

If a malfunction code is displayed during the DTC check, check the circuit for that code listed in the table below (Proceed to the page given for that circuit).

DTC No. (See page)	Detection Item	Trouble Area	SRS Warming Light
B0100/13 (05-119)	D Short in D squib circuit	D Steering wheel pad (squib) D Spiral cable D Airbag sensor assembly D Wire harness	ON
B0101/14 (05-124)	D Open in D squib circuit	D Steering wheel pad (squib) D Spiral cable D Airbag sensor assembly D Wire harness	ON
B0102/11 (05-128)	D Short in D squib circuit (to ground)	D Steering wheel pad (squib) D Spiral cable D Airbag sensor assembly D Wire harness	ON
B0103/12 (05-132)	D Short in D squib circuit (to B+)	D Steering wheel pad (squib) D Spiral cable D Airbag sensor assembly D Wire harness	ON
B0105/53 (05-136)	D Short in P squib circuit	D Front Passenger airbag assembly (squib) D Airbag sensor assembly D Wire harness	ON
B0106/54	D Open in P squib circuit	D Front Passenger airbag assembly (squib) D Airbag sensor assembly D Wire harness	
	circuit (to Ground)	D Front Passenger airbag assembly (squib) D Airbag sensor assembly D Wire harness	

PROBLEM SYMPTOMS TABLE

The suspected circuits or parts for each problem symptom are shown in the table below. Use this table to troubleshoot the problem when a "Normal" code is displayed in the diagnostic trouble code check but the problem is still occurring. Numbers in the table indicate the inspection order in which the circuits or parts should be checked.

HINT:

When the problem is not detected by the diagnostic system even though the problem symptom is present, it is considered that the problem is occurring outside the detection range of the diagnostic system, or that the problem is occurring in a system other than the diagnostic system.

D Page
Indicates the page where the flow chart for each circuit is located.

D Circuit Inspection, Inspection Order
Indicates the circuit which needs to be checked for each problem symptom. Check in the order indicated by the numbers.

Problem Symptom

D Circuit or Part Name
Indicates the circuit or part which needs to be checked.

PROBLEM SYMPTOMS TABLE

Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspected Area	See page
1. With the ignition switch in ACC or ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed. 2. SRS warning light is always lit up even when ignition switch is in the LOCK position	1. SRS warning light circuit (Always lights up when ignition switch is in LOCK position.)	05-180
1. With the ignition switch in the ACC or ON position, the SRS warning light does not light up.	1. SRS warning light circuit (Dose not light up when ignition switch is turned to ACC or ON.)	05-183
1. DTC is not displayed. 2. SRS warning light is always lit up at the time of DTC check procedure. 3. DTC is displayed without Tc and CG terminal connection.	1. Tc terminal circuit	05-187

CIRCUIT INSPECTION

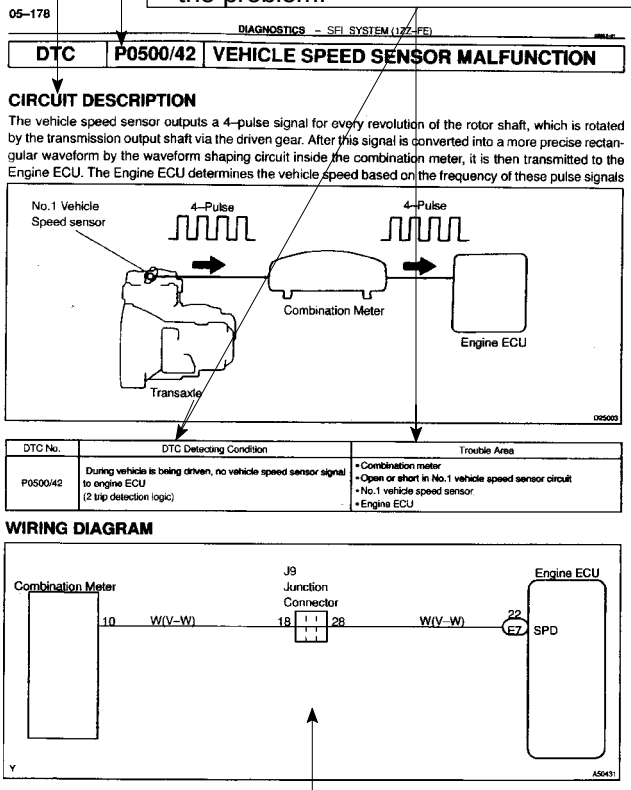
How to read and use each page is shown below.

D Circuit Description
The major role and operation, etc. of the circuit and its component parts are explained.

D Diagnostic Trouble Code No. and Detection Item

D Indicates the diagnostic trouble code, diagnostic trouble code set parameter and suspect area of the problem.

D Inspection Procedure
Use the inspection procedure to determine if the circuit is normal or abnormal, and if it is abnormal, use it to determine whether the problem is located in the sensors, actuators, wire harness or ECU.



05–178

DIAGNOSTICS – SFI SYSTEM (1ZZ–FE)

DTC P0500/42 VEHICLE SPEED SENSOR MALFUNCTION

CIRCUIT DESCRIPTION

The vehicle speed sensor outputs a 4–pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the Engine ECU. The Engine ECU determines the vehicle speed based on the frequency of these pulse signals

DTC No.	DTC Detecting Condition	Trouble Area
P0500/42	During vehicle is being driven, no vehicle speed sensor signal to engine ECU (2 trip detection logic)	• Combination meter • Open or short in No.1 vehicle speed sensor circuit • No.1 vehicle speed sensor • Engine ECU

WIRING DIAGRAM

D Wiring Diagram
This shows a wiring diagram of the circuit.
Use this diagram together with ELECTRICAL WIRING DIAGRAM to thoroughly understand the circuit.
Wire colors are indicated by an alphabetical code.
B = Black, L = Blue, R = Red, BR = Brown,
LG = Light Green, V = Violet, G = Green,
O = Orange, W = White, GR = Gray, P = Pink,
Y = Yellow, SB = Sky Blue
The first letter indicates the basic wire color and the second letter indicates the color of the stripe.

05–179

DIAGNOSTICS – SFI SYSTEM (1ZZ–FE)

INSPECTION PROCEDURE

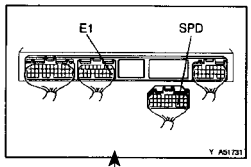
1 READ VALUE OF VEHICLE SPEED VALUE(SPEEDOMETER OPERATION)

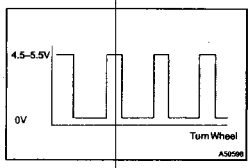
(a) Select data monitor on the hand–held tester.
(b) Perform a test drive of the vehicle.
(c) Read the vehicle speed on the hand–held tester.
RESULT: The same as the speed displayed on the speed meter.

NG → **REPLACE COMBINATION METER ASSY**

OK

2 INSPECT ECU





(a) Check the output waveform.
HINT:
Using the oscilloscope function of hand–held tester, it is possible to check the function between the engine ECU and the knock control sensor. The waveform shown in the illustration is an example without noise and chattering.
(1) Connect the hand–held tester between the terminals SPD of the engine ECU E7 connector and E1 of the engine ECU E8 connector.
(2) Select the oscilloscope function on the hand–held tester. (Refer to the hand–held tester's instruction book for operating instructions.)
RESULT: Voltage is intermittently generated

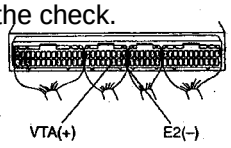
ITEM	CONTENTS
TERMINAL	SPD⇔E1
EQUIPMENT SET	5V/DIV, 20ms/DIV
CONDITION	Running at 20 km/h

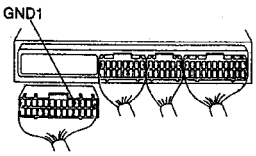
HINT:
• The multitude gets shorter as the engine speed becomes faster.

OK → **CHECK AND REPLACE ECU**

NG

D Indicates the condition of the connector of ECU during the check.





Connector being checked is connected.
Connections of tester are indicated by (+), (–) after terminals name.

Connector being checked is disconnected.
On inspection with body ground side is not specified.

D25842

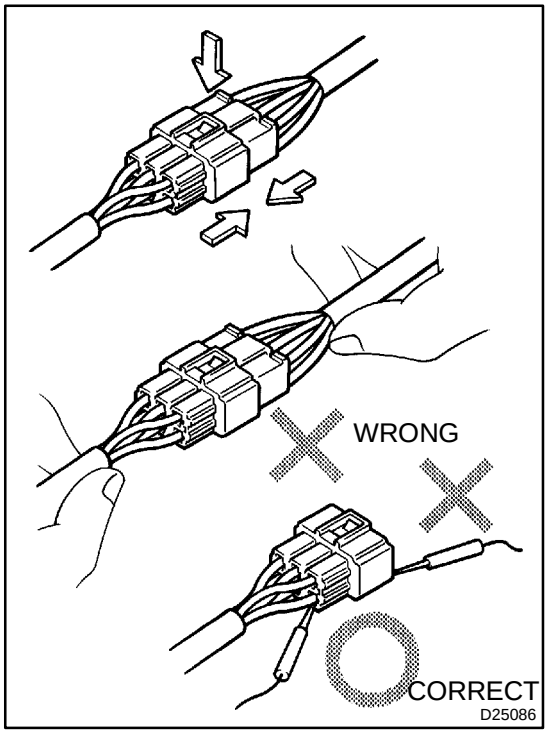
010B8-02

ELECTRONIC CIRCUIT INSPECTION PROCEDURE

1. BASIC INSPECTION

(a) RESISTANCE MEASURING CONDITION OF ELECTRONIC PARTS

(1) Unless stated, all resistance is measured at an ambient temperature of 20_C (68_F). Because the resistance may be outside the specifications if measured at high temperatures immediately after the vehicle has been running, measurements should be made when the engine has cooled down.



(b) HANDLING OF CONNECTOR

(1) When removing the connector with a lock, press the connector toward the engagement and remove the lock by making the lock claw movable easily.

(2) When removing the connector, do not hold the harness, but hold the connector.

(3) Before connecting the connector, check that there are no deformation, damage and missing of the terminals.

(4) Connection of the connector with a lock should be securely done until it makes a click sound.

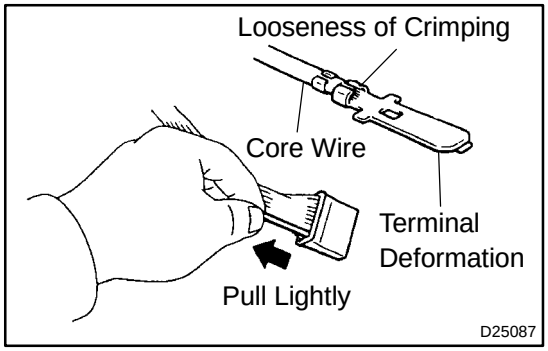
(5) In case of checking the connector with a Toyota electrical tester, perform it at the back side (harness side) of the connector using a mini test lead.

NOTICE:

- **Water proof connector cannot be checked from its back side, check by connecting the sub-harness.**
- **Do not damage the terminals by moving the inserted tester needle.**

(c) CONNECTOR CHECKING POINTS

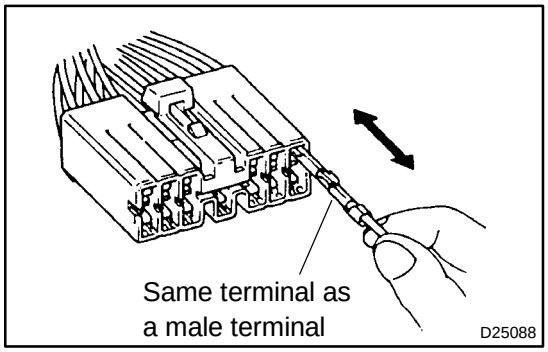
(1) Checking when the connector is connected:
By holding the connector, check the inserted condition and locking efficiency (engaged condition).



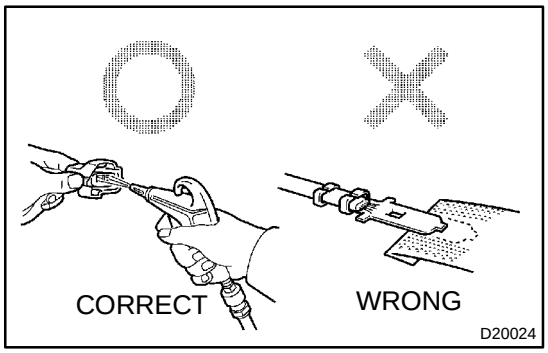
(2) Checking when the connector is removed:
Check by pulling the wire harness lightly (missing terminal, terminal crimping condition, core wire break).
Check visually if there is any rust, metal tip, water and bend of terminal (rust, mixing of foreign object, terminal deformation).

NOTICE:

When testing a gold-plated female terminal, always use a gold-plated male terminal.



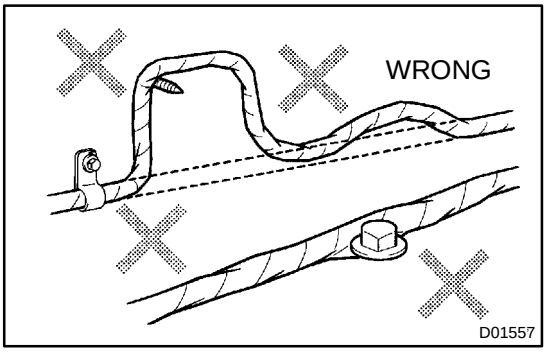
(3) Checking of the contact pressure of the terminal: Prepare the same terminal as a male terminal. By inserting it to a female terminal, check the engaged condition and sliding load.



(d) REPAIR METHOD OF CONNECTOR TERMINAL

(1) In case there is any soil at the contact point, clean the contact point using an air gun or waste cloth. At this time, never polish the contact point using a sand paper as the platings may come off.

(2) In case of abnormal contact pressure, replace the female terminal. At this time, if a male terminal is gold-plated (gold color), use gold-plated female terminals and if it is silver-plated (silver color), use silver-plated female terminals.



(e) HANDLING OF WIRE HARNESS

(1) In case of removing the wire harness, check the wiring and clamping condition before proceeding the work so that it is restore correctly.

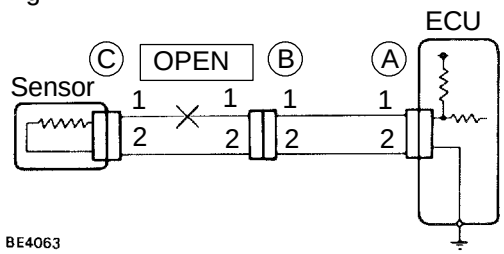
(2) Never twist, pull or slack off the wire harness more than necessary.

(3) Never make the wire harness come into contact with a high-temperature part, rotating, moving, vibrating or acute-angled part (edge of the panel, tip of the screw, etc.).

(4) When installing parts, never sandwich the wire harness between them.

(5) Never cut or break the cover of the wire harness. If it is cut or broken, replace it or securely repair it with a vinyl tape.

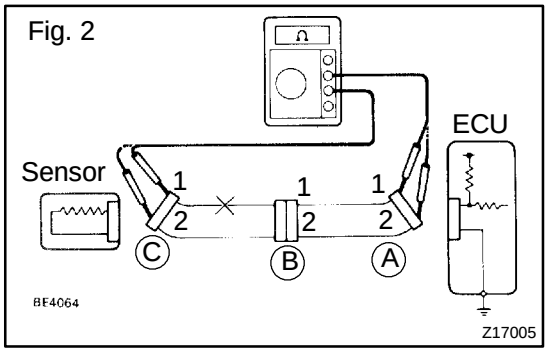
Fig. 1



2. CHECK OPEN CIRCUIT

(a) For the open circuit in the wire harness in Fig. 1, perform "(b) Check the continuity" or "(c) Check the voltage" to locate the section.

Fig. 2



(b) Check the continuity.

(1) Disconnect connectors "A" and "C" and measure the resistance between them.

Resistance: 1 Ω or less

HINT:

Measure the resistance while lightly shaking the wire harness vertically and horizontally.

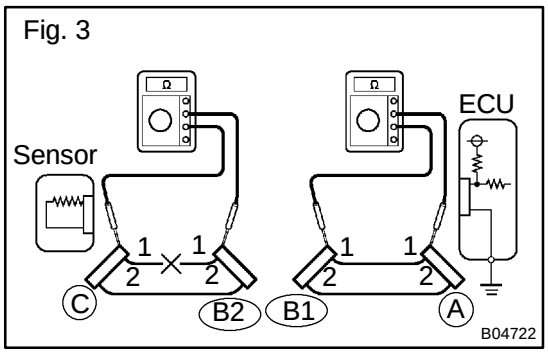
In the case of Fig. 2:

Between terminal 1 of connector "A" and terminal 1 of connector "C" → No continuity (open)

Between terminal 2 of connector "A" and terminal 2 of connector "C" → Continuity

Therefore, it is found out that there is an open circuit between terminal 1 of connector "A" and terminal 1 of connector "C".

Fig. 3



(2) Disconnect connector "B" and measure the resistance between the connectors.

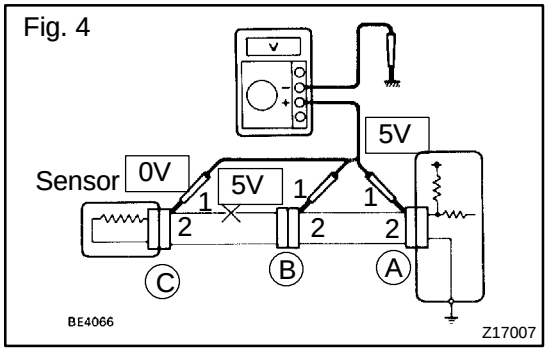
In the case of Fig. 3:

Between terminal 1 of connector "A" and terminal 1 of connector "B1" → Continuity

Between terminal 1 of connector "B2" and terminal 1 of connector "C" → No continuity (open)

Therefore, it is found out that there is an open circuit between terminal 1 of connector "B2" and terminal 1 of connector "C".

Fig. 4



(c) Check the voltage.

(1) In a circuit in which voltage is applied (to the ECU connector terminal), an open circuit can be checked by conducting a voltage check.

As shown in Fig. 4, with each connector still connected, measure the voltage between the body ground and terminal 1 of connector "A" at the ECU 5V output terminal, terminal 1 of connector "B", and terminal 1 of connector "C", in that order.

(2) If the results are:

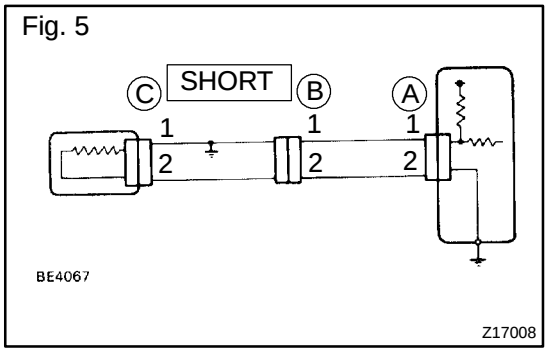
5 V: Between Terminal 1 of connector "A" and Body Ground

5 V: Between Terminal 1 of connector "B" and Body Ground

0 V: Between Terminal 1 of connector "C" and Body Ground

Then it is found out that there is an open circuit in the wire harness between terminal 1 of "B" and terminal 1 of "C".

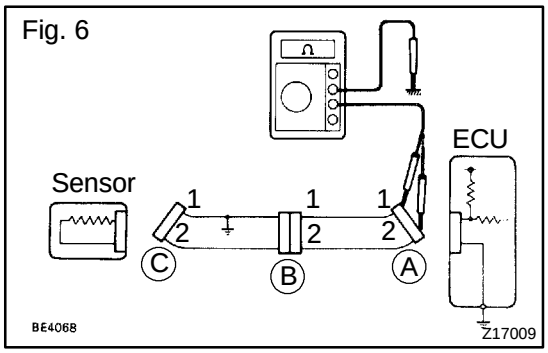
Fig. 5



3. CHECK SHORT CIRCUIT

(a) If the wire harness is ground shorted as in Fig. 5, locate the section by conducting a "continuity check with ground".

Fig. 6



(b) Check the continuity with ground.

(1) Disconnect connectors "A" and "C" and measure the resistance between terminal 1 and 2 connector "A" and body ground.

Resistance: 1 MΩ or higher

HINT:

Measure the resistance while lightly shaking the wire harness vertically and horizontally.

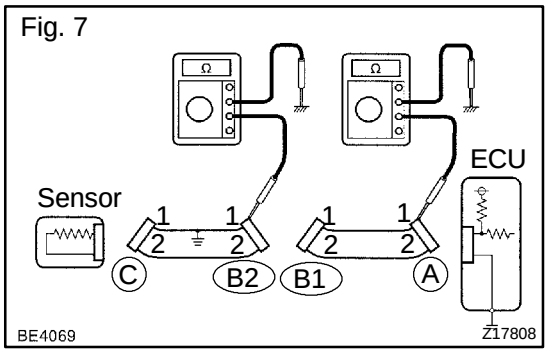
In the case of Fig. 6:

Between terminal 1 of connector "A" and body ground → Continuity (short)

Between terminal 2 of connector "A" and body ground → No continuity

Therefore, it is found out that there is a short circuit between terminal 1 of connector "A" and terminal 1 of connector "C".

Fig. 7



(2) Disconnect connector "B" and measure the resistance between terminal 1 of connector "A" and body ground, and terminal 1 of connector "B2" and body ground.

In the case of Fig. 7:

Between terminal 1 of connector "A" and body ground → No continuity

Between terminal 1 of connector "B2" and body ground → Continuity (short)

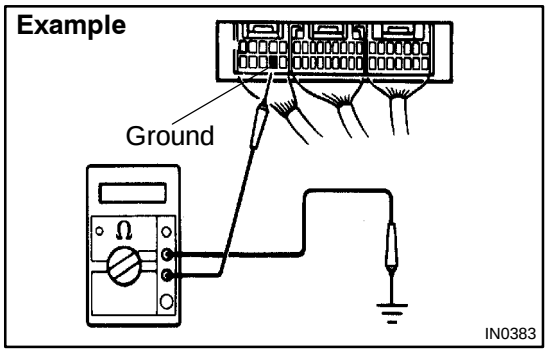
Therefore, it is found out that there is a short circuit between terminal 1 of connector "B2" and terminal 1 of connector "C".

4. CHECK AND REPLACE ECU

NOTICE:

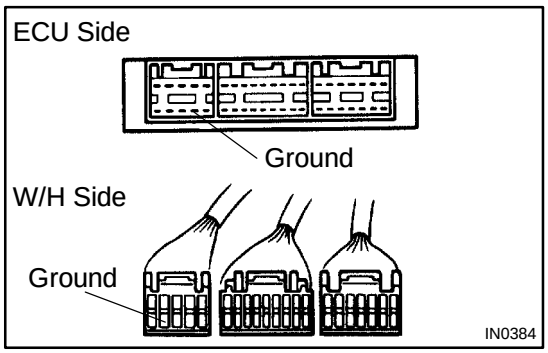
- **Start an inspection of the connector from the backside of the connector in the wire harness side with the connector connected to the ECU.**
- **When a measuring condition is not specified, perform the inspection with the engine stopped and also the ignition switched ON.**

(a) First check the ECU ground circuit. If it is faulty, repair it. If it is normal, the ECU could be faulty, so replace the ECU with a normal functioning one and check that the symptoms appear.



(1) Measure the resistance between the ECU ground terminal and the body ground.

Resistance: 1 Ω or less



(2) Disconnect the ECU connector, check the ground terminals on the ECU side and the wire harness side for bend and check the contact pressure.

TERMS

ABBREVIATIONS USED IN THIS MANUAL

010B9-03

Abbreviations	Meaning
ABS	Anti-Lock Brake System
AC	Alternating Current
ACC	Accessory
ACIS	Acoustic Control Induction System
ACSD	Automatic Cold Start Device
A.D.D.	Automatic Disconnecting Differential
A/F	Air-Fuel Ratio
AHC	Active Height Control Suspension
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Amplifier
ANT	Antenna
APPROX.	Approximately
ASSY	Assembly
A/T, ATM	Automatic Transmission (Transaxle)
ATF	Automatic Transmission Fluid
AUTO	Automatic
AUX	Auxiliary
AVG	Average
AVS	Adaptive Variable Suspension
B+	Battery Voltage
BA	Brake Assist
BACS	Boost Altitude Compensation System
BAT	Battery
BDC	Bottom Dead Center
B/L	Bi-Level
B/S	Bore-Stroke Ratio
BTDC	Before Top Dead Center
BVSV	Bimetallic Vacuum Switching Valve
Calif.	California
CB	Circuit Breaker
CCo	Catalytic Converter For Oxidation
CD	Compact Disc
CF	Cornering Force
CG	Center Of Gravity
CH	Channel
COMB.	Combination
CPE	Coupe
CPS	Combustion Pressure Sensor
CPU	Central Processing Unit
CRS	Child Restraint System
CTR	Center
C/V	Check Valve
CV	Control Valve
CW	Curb Weight
DC	Direct Current
DEF	Defogger
DFL	Deflector

Abbreviations	Meaning
DIFF.	Differential
DIFF. LOCK	Differential Lock
D/INJ	Direct Injection
DLC	Data Link Connector
DLI	Distributorless Ignition
DOHC	Double Overhead Cam
DP	Dash Pot
DS	Dead Soak
DSP	Digital Signal Processor
DTC	Diagnostic Trouble Code
DVD	Digital Versatible Disc
EBD	Electric Brake force Distribution
ECAM	Engine Control And Measurement System
ECD	Electronic Controlled Diesel
ECDY	Eddy Current Dynamometer
ECU	Electronic Control Unit
ED	Electro-Deposited Coating
EDU	Electronic Driving Unit
EDIC	Electric Diesel Injection Control
EFI	Electronic Fuel Injection
E/G	Engine
EGR	Exhaust Gas Recirculation
EGR-VM	EGR-Vacuum Modulator
ELR	Emergency Locking Retractor
EMPS	Electric Motor Power Steering
ENG	Engine
ESA	Electronic Spark Advance
ETCS-i	Electronic Throttle Control System-intelligent
EVAP	Evaporative Emission Control
EVP	Evaporator
E-VRV	Electric Vacuum Regulating Valve
EX, EXH	Exhaust
FE	Fuel Economy
FF	Front-Engine Front-Wheel-Drive
F/G	Fuel Gauge
FIPG	Formed In Place Gasket
FL	Fusible Link
F/P	Fuel Pump
FPU	Fuel Pressure Up
Fr	Front
FR	Front-Engine Rear-Wheel-Drive
F/W	Flywheel
FW/D	Flywheel Damper
FWD	Front-Wheel-Drive
GAS	Gasoline
GND	Ground
GPS	Global Positioning System
HAC	High Altitude Compensator
H/B	Hatchback
H-FUSE	High Current Fuse
HI	High

Abbreviations	Meaning
HID	High Intensity Discharge (Head Lamp)
HPU	Hydrraulic Power Unit
HSG	Housing
HT	Hard Top
HWS	Heated Windshield System
IAC	Idel Air Control
IC	Integrated Circuit
IDI	Indirect Diesel Injection
IFS	Independent Front Suspension
IG	Ignition
IIA	Integrated Ignition Assembly
IN	Intake (Manifold, Valve)
INT	Intermittent
I/P	Instrument Panel
IRS	Independent Rear Suspension
ISC	Idle Speed Control
J/B	Junction Block
J/C	Junction Connector
KD	Kick-Down
LAN	Local Area Network
LB	Liftback
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	Left-Hand
LHD	Left-Hand Drive
L/H/W	Length, Height, Width
LLC	Long-Life Coolant
LNG	Liquified Natural Gas
LO	Low
LPG	Liquified Petroleum Gas
LSD	Limited Slip Differential
LSP & PV	Load Sensing Proportioning And Bypass Valve
LSPV	Load Sensing Proportioning Valve
MAP	Manifold Absolute Pressure
MAX.	Maximum
M-FUSE	Mediam Current Fuse
MIC	Microphone
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MG1	Motor Generator No.1
MG2	Motor Generator No.2
MP	Multipurpose
MPI	Multipoint Electronic Injection
MPX	Multiplex Communication System
M/T, MTM	Manual Transmission
MT	Mount
MTG	Mounting
N	Neutral
NA	Natural Aspiration
No.	Number
O/D	Overdrive

Abbreviations	Meaning
OEM	Original Equipment Manufacturing
OHC	Overhead Camshaft
OHV	Overhead Valve
OPT	Option
ORVR	On-board Refilling Vapor Recovery
O/S	Oversize
P & BV	Proportioning And Bypass Valve
PCS	Power Control System
PCV	Positive Crankcase Ventilation
PKB	Parking Brake
PPS	Progressive Power Steering
PS	Power Steering
PTO	Power Take-Off
P/W	Power Window
R & P	Rack And Pinion
RAM	Random Access Memory
R/B	Relay Block
RBS	Recirculating Ball Type Steering
R/F	Reinforcement
RFS	Rigid Front Suspension
RH	Right-Hand
RHD	Right-Hand Drive
RLY	Relay
ROM	Read Only Memory
Rr	Rear
RR	Rear-Engine Rear-Wheel-Drive
RRS	Rigid Front Suspension
RWD	Rear-Wheel-Drive
SDN	Sedan
SEN	Sensor
SICS	Starting Injection Control System
SOC	State Of Charge
SOHC	Single Overhead Camshaft
SPEC	Specification
SPI	Single Point Injection
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
STJ	Cold-Start Fuel Injection
SW	Switch
SYS	System
T/A	Transaxle
TACH	Tachometer
TBI	Throttle Body Electronic Fuel Injection
TC	Turbocharger
TCCS	TOYOTA Computer-Controlled System
TCV	Timing Control Valve
TDC	Top Dead Center
TEMP.	Temperature
TEMS	TOYOTA Electronic Modulated Suspension

Abbreviations	Meaning
TFT	Toyota Free-Tronic
TIS	Total Information System For Vehicle Development
T/M	Transmission
TMC	TOYOTA Motor Corporation
TMMK	TOYOTA Motor Manufacturing Kentucky, Inc.
TRC	Traction Control System
TURBO	Turbocharge
TWC	Three-Way Catalyst
U/D	Underdrive
U/S	Undersize
VCV	Vacuum Control Valve
VENT	Ventilator
VIN	Vehicle Identification Number
VPS	Variable Power Steering
VSC	Vehicle Stability Control
VSV	Vacuum Switching Valve
VTV	Vacuum Transmitting Valve
VVT-i	Variable Valve Timing-intelligent
w/	With
WGN	Wagon
W/H	Wire Harness
w/o	Without
WU-TWC	Warm Up Three-way Catalytic Converter
WU-OC	Warm Up Oxidation Catalytic Converter
1st	First
2nd	Second
2WD	Two Wheel Drive Vehicle (4 x 2)
3rd	Third
4th	Fourth
4WD	Four Wheel Drive Vehicle (4 x 4)
4WS	Four Wheel Steering System
5th	Fifth

010BA-04

GLOSSARY OF SAE AND TOYOTA TERMS

This glossary lists all SAE-J1930 terms and abbreviations used in this manual in compliance with SAE recommendations, as well as their TOYOTA equivalents.

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )--ABBREVIATIONS
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner, A/CL
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	-
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	HAC
CAC	Charge Air Cooler	Intercooler
CARB	Carburettor	Carburettor
CFI	Continuous Fuel Injection	-
CKP	Crankshaft Position	Crank Angle
CL	Closed Loop	Closed Loop
CMP	Camshaft Position	Cam Angle
CPP	Clutch Pedal Position	-
CTOX	Continuous Trap Oxidizer	-
CTP	Closed Throttle Position	LL ON, Idle ON
DFI	Direct Fuel Injection (Diesel)	Direct Injection (DI)
DI	Distributor Ignition	-
DLC1 DLC2 DLC3	Data Link Connector 1 Data Link Connector 2 Data Link Connector 3	1: Check Connector 2: Total Diagnosis Comunication Link (TDCL) 3: OBD II Diagnostic Connector
DTC	Diagnostic Trouble Code	Diagnostic Code
DTM	Diagnostic Test Mode	-
ECL	Engine Control Level	-
ECM	Engine Control Module	Engine ECU (Electronic Control Unit)
ECT	Engine Coolant Temperature	Coolant Temperature, Water Temperature (THW)
EEPROM	Electrically Erasable Programmable Read Only Memory	Electrically Erasable Programmable Read Only Memory (EEPROM), Erasable Programmable Read Only Memory (EPROM)
EFE	Early Fuel Evaporation	Cold Mixture Heater (CMH), Heat Control Valve (HCV)
EGR	Exhaust Gas Recirculation	Exhaust Gas Recirculation (EGR)
EI	Electronic Ignition	TOYOTA Distributorless Ignition (TDI)
EM	Engine Modification	Engine Modification (EM)
EPROM	Erasable Programmable Read Only Memory	Programmable Read Only Memory (PROM)
EVAP	Evaporative Emission	Evaporative Emission Control (EVAP)
FC	Fan Control	-
FEEPROM	Flash Electrically Erasable Programmable Read Only Memory	-
FEPROM	Flash Erasable Programmable Read Only Memory	-
FF	Flexible Fuel	-
FP	Fuel Pump	Fuel Pump
GEN	Generator	Alternator
GND	Ground	Ground (GND)

HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (HO_2S)
IAC	Idle Air Control	Idle Speed Control (ISC)
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	-
IFI	Indirect Fuel Injection	Indirect Injection (IDL)
IFS	Inertia Fuel-Shutoff	-
ISC	Idle Speed Control	-
KS	Knock Sensor	Knock Sensor
MAF	Mass Air Flow	Air Flow Meter
MAP	Manifold Absolute Pressure	Manifold Pressure Intake Vacuum
MC	Mixture Control	Electric Bleed Air Control Valve (EBCV) Mixture Control Valve (MCV) Electric Air Control Valve (EACV)
MDP	Manifold Differential Pressure	-
MFI	Multiport Fuel Injection	Electronic Fuel Injection (EFI)
MIL	Malfunction Indicator Lamp	Check Engine Lamp
MST	Manifold Surface Temperature	-
MVZ	Manifold Vacuum Zone	-
NVRAM	Non-Volatile Random Access Memory	-
O2S	Oxygen Sensor	Oxygen Sensor, O_2 Sensor (O_2S)
OBD	On-Board Diagnostic	On-Board Diagnostic System (OBD)
OC	Oxidation Catalytic Converter	Oxidation Catalyst Convert (OC), CCo
OP	Open Loop	Open Loop
PAIR	Pulsed Secondary Air Injection	Air Suction (AS)
PCM	Powertrain Control Module	-
PNP	Park/Neutral Position	-
PROM	Programmable Read Only Memory	-
PSP	Power Steering Pressure	-
PTOX	Periodic Trap Oxidizer	Diesel Particulate Filter (DPF) Diesel Particulate Trap (DPT)
RAM	Random Access Memory	Random Access Memory (RAM)
RM	Relay Module	-
ROM	Read Only Memory	Read Only Memory (ROM)
RPM	Engine Speed	Engine Speed
SC	Supercharger	Supercharger
SCB	Supercharger Bypass	E-ABV
SFI	Sequential Multiport Fuel Injection	Electronic Fuel Injection (EFI), Sequential Injection
SPL	Smoke Puff Limiter	-
SRI	Service Reminder Indicator	-
SRT	System Readiness Test	-
ST	Scan Tool	-
TB	Throttle Body	Throttle Body
TBI	Throttle Body Fuel Injection	Single Point Injection Central Fuel Injection (Ci)
TC	Turbocharger	Turbocharger
TCC	Torque Converter Clutch	Torque Converter

TCM	Transmission Control Module	Transmission ECU, ECT ECU
TP	Throttle Position	Throttle Position
TR	Transmission Range	-
TVV	Thermal Vacuum Valve	Bimetallic Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)
TWC	Three-Way Catalytic Converter	Three-Way Catalytic (TWC) Manifold Converter CC_{RO}
TWC+OC	Three-Way + Oxidation Catalytic Converter	CC_R + CCo
VAF	Volume Air Flow	Air Flow Meter
VR	Voltage Regulator	Voltage Regulator
VSS	Vehicle Speed Sensor	Vehicle Speed Sensor
WOT	Wide Open Throttle	Full Throttle
WU-OC	Warm Up Oxidation Catalytic Converter	-
WU-TWC	Warm Up Three-Way Catalytic Converter	-
3GR	Third Gear	-
4GR	Fourth Gear	-

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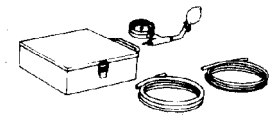
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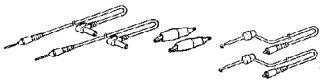
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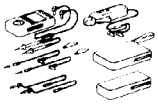
0217N-01

SST

	09816-30010	Oil Pressure Switch Socket	EFI SYSTEM(2ZZ-GE)
	09843-18040	Diagnosis Check Wire No.2	AIR CONDITIONING SYSTEM ELECTRONIC MOTOR POWER STEERING SYSTEM SUPPLEMENTAL RESTRAINT SYSTEM ECD SYSTEM(1CD-FTV) EFI SYSTEM(2ZZ-GE) EFI SYSTEM(4ZZ-FE)
	09992-00242	Turbocharger Pressure Gauge	ECD SYSTEM(1CD-FTV)

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	SUPPLEMENTAL RESTRAINT SYSTEM ELECTRONIC CONTROLLED AUTOMATIC TRANSAXLE[ECT] ECD SYSTEM(1CD-FTV) EFI SYSTEM(2ZZ-GE) EFI SYSTEM(3ZZ-FE) EFI SYSTEM(4ZZ-FE)
	(09083-00150)	Test Lead Set	AIR CONDITIONING SYSTEM ELECTRONIC MOTOR POWER STEERING SYSTEM SUPPLEMENTAL RESTRAINT SYSTEM ELECTRONIC CONTROLLED AUTOMATIC TRANSAXLE[ECT] AUDIO SYSTEM NAVIGATION SYSTEM COMBINATION METER POWER DOOR LOCK CONTROL SYSTEM WIRELESS DOOR LOCK CONTROL SYSTEM ENGINE IMMOBILISER SYSTEM EFI SYSTEM(2ZZ-GE) EFI SYSTEM(3ZZ-FE) EFI SYSTEM(4ZZ-FE) ABS WITH EBD SYSTEM(TMC MADE) POWER WINDOW CONTROL SYSTEM(TMC MADE) ABS WITH EBD SYSTEM(TMUK MADE) ABS WITH EBD & BA & TRC & VSC SYSTEM(TMUK MADE)

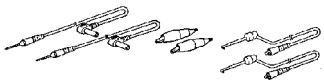
	09082-00050	TOYOTA Electrical Tester Set	ELECTRONIC CONTROLLED AUTOMATIC TRANSAXLE[ECT]

ENGINE CONTROL SYSTEM

0216H-01

PREPARATION

Recomended Tools

	09082-00040 TOYOTA Electrical Tester	EFI SYSTEM(2ZZ-GE) EFI SYSTEM(3ZZ-FE/4ZZ-FE) ECD SYSTEM(1CD-FTV)
	(09083-00150) Test Lead Set	EFI SYSTEM(2ZZ-GE) EFI SYSTEM(3ZZ-FE/4ZZ-FE) ECD SYSTEM(1CD-FTV)

Equipment

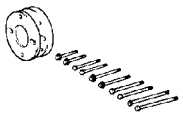
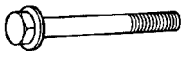
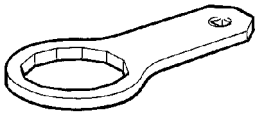
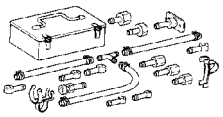
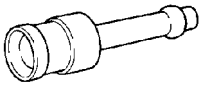
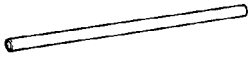
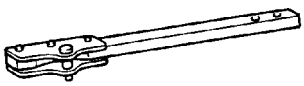
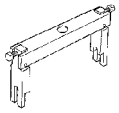
Voltmeter	
Ohmmeter	
Service wire harness	
Heater	
Thermometer	
Torque wrench	
Radiator cap tester	

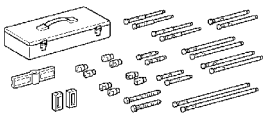
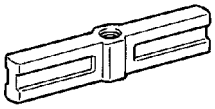
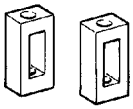
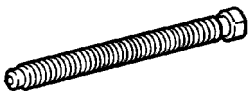
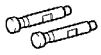
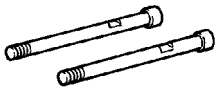
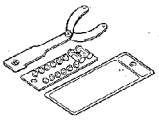
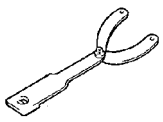
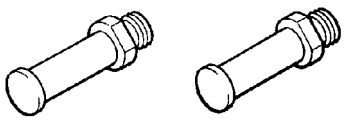
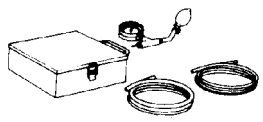
FUEL

PREPARATION

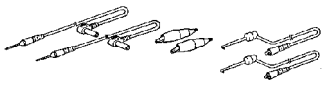
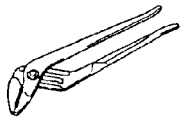
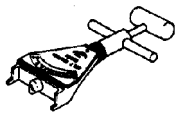
0216I-01

SST

	09023-12700	Union Nut Wrench 17mm	INJECTOR ASSY(1CD-FTV) INJECTION PUMP ASSY(1CD-FTV) COMMON RAIL ASSY(1CD-FTV)
	09023-12900	Union Nut Wrench 19mm	INJECTOR ASSY(1CD-FTV) INJECTION PUMP ASSY(1CD-FTV) COMMON RAIL ASSY(1CD-FTV)
	09213-54015	Crankshaft Pulley Holding Tool	INJECTION PUMP ASSY(1CD-FTV)
	(91651-60855)	Bolt	INJECTION PUMP ASSY(1CD-FTV)
	09228-64030	Fuel Filter Wrench	FUEL FILTER ASSY(1CD-FTV)
	09268-21010	Fuel Hose Puller	FUEL INJECTOR ASSY(2ZZ-GE) FUEL INJECTOR ASSY (3ZZ-FE/4ZZ-FE)
	09268-41047	Injection Measuring Tool Set	FUEL SYSTEM(GASOLINE (HATCH BACK)) FUEL SYSTEM(GASOLINE (SEDAN/STATION WAGON))
	(09268-41110)	Adaptor	FUEL SYSTEM(GASOLINE (HATCH BACK)) FUEL SYSTEM(GASOLINE (SEDAN/STATION WAGON))
	(09268-41300)	Clamp	FUEL SYSTEM (GASOLINE(HATCH BACK)) FUEL SYSTEM(GASOLINE (SEDAN/STATION WAGON))
	(95336-08070)	Hose	FUEL SYSTEM (GASOLINE(HATCH BACK)) FUEL SYSTEM(GASOLINE (SEDAN/STATION WAGON))
	09330-00021	Companion Flange Holding Tool	INJECTION PUMP ASSY(1CD-FTV)
	09808-14010	Fuel Sender Gauge Tool Assy	FUEL PUMP ASSY (GASOLINE(HATCH BACK)) FUEL TANK ASSY (GASOLINE(HATCH BACK)) FUEL TANK ASSY (DIESEL(HATCH BACK))

	09842-30055	Wire "G" EFI Inspection	FUEL SYSTEM (GASOLINE(HATCH BACK)) FUEL SYSTEM(GASOLINE (SEDAN/STATION WAGON))
	09842-30080	Wire "H" EFI Inspection	FUEL SYSTEM (GASOLINE(HATCH BACK))
	09950-50013	Puller C Set	INJECTION PUMP ASSY(1CD-FTV)
	(09951-05010)	Hanger 150	INJECTION PUMP ASSY(1CD-FTV)
	(09952-05010)	Slide Arm	INJECTION PUMP ASSY(1CD-FTV)
	(09953-05010)	Center Bolt 100	INJECTION PUMP ASSY(1CD-FTV)
	(09953-05020)	Center Bolt 150	INJECTION PUMP ASSY(1CD-FTV)
	(09954-05021)	Claw No.2	INJECTION PUMP ASSY(1CD-FTV)
	(09954-05030)	Claw No.3	INJECTION PUMP ASSY(1CD-FTV)
	09960-10010	Variable Pin Wrench Set	INJECTION PUMP ASSY(1CD-FTV)
	(09962-01000)	Variable Pin Wrench Arm Assy	INJECTION PUMP ASSY(1CD-FTV)
	(09963-01000)	Pin 10	INJECTION PUMP ASSY(1CD-FTV)
	09992-00242	Turbocharger Pressure Gauge	INJECTOR ASSY(1CD-FTV)

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	FUEL SYSTEM(1CD-FTV) FUEL SYSTEM (GASOLINE(HATCH BACK)) FUEL SYSTEM(GASOLINE (SEDAN/STATION WAGON))
	(09083-00150)	Test Lead Set	FUEL SYSTEM (GASOLINE(HATCH BACK)) FUEL SYSTEM(GASOLINE (SEDAN/STATION WAGON))
	09130-00150	Water Pump Pliers	FUEL FILTER ASSY(1CD-FTV)
	09216-00021	Belt Tension Gauge	INJECTION PUMP ASSY(1CD-FTV)

SSM

	08826-00080	Seal Packing Black or equivalent (FIPG)	INJECTOR ASSY(1CD-FTV)
	08850-00065	Butyl Tape Set	FUEL PUMP ASSY (GASOLINE(HATCH BACK)) FUEL TANK ASSY (GASOLINE(HATCH BACK)) FUEL PUMP ASSY(GASOLINE (SEDAN/STATION WAGON)) FUEL TANK ASSY(GASOLINE (SEDAN/STATION WAGON)) FUEL TANK ASSY (DIESEL(HATCH BACK))

Equipment

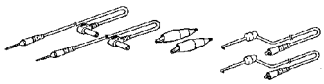
Service wire harness	
Ohmmeter	
Torque wrench	
Vernier calipers	
Vacuum gauge	
Wooden block	
Radiator cap tester	
Stopwatch	
Measuring flask	

EMISSION CONTROL

PREPARATION

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Recomended Tools

	09082-00040	TOYOTA Electrical Tester	EMISSION CONTROL SYSTEM (2ZZ-GE) EMISSION CONTROL SYSTEM (3ZZ-FE/4ZZ-FE)
	(09083-00150)	Test Lead Set	EMISSION CONTROL SYSTEM (2ZZ-GE) EMISSION CONTROL SYSTEM (3ZZ-FE/4ZZ-FE)

Equipment

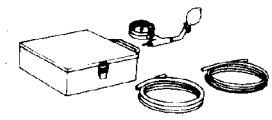
Service wire harness	
Ohmmeter	
Hand-held vacuum pump	
Vacuum gauge	

INTAKE

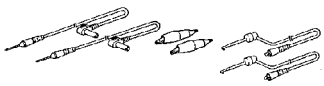
PREPARATION

0216K-01

SST

	09992-00242	Turbocharger Pressure Gauge	TURBO CHARGER SYSTEM (1CD-FTV)

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	TURBO CHARGER SYSTEM (1CD-FTV)
	(09083-00150)	Test Lead Set	TURBO CHARGER SYSTEM (1CD-FTV)

Equipment

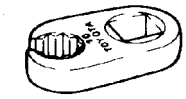
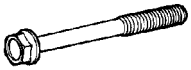
Vacuum gauge	
Voltmeter	
Ohmmeter	
Service wire harness	
Torque wrench	
Slide calipers	

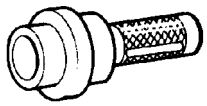
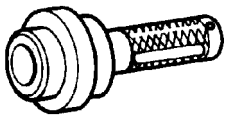
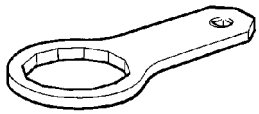
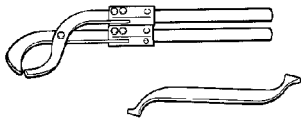
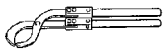
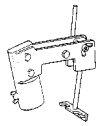
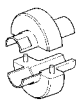
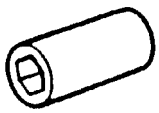
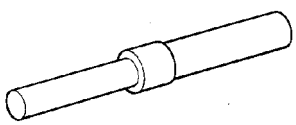
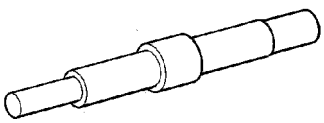
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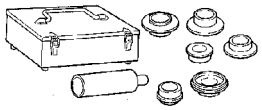
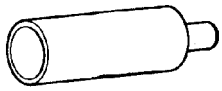
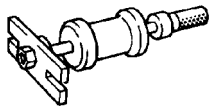
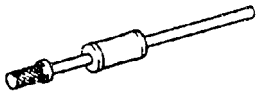
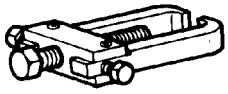
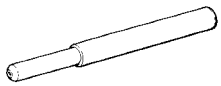
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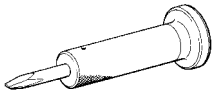
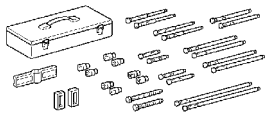
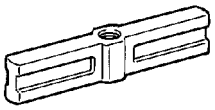
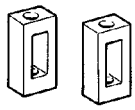
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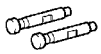
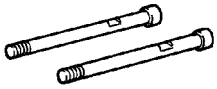
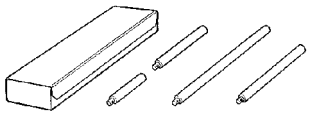
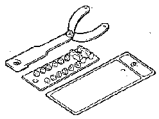
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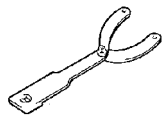
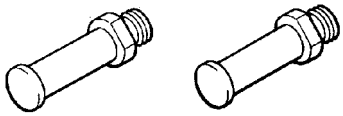
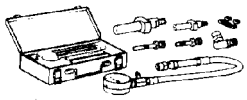
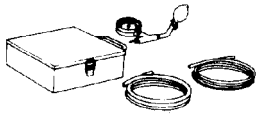
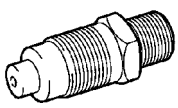
	09023-00100	Union Nut Wrench 10 mm	PARTIAL ENGINE ASSY(1CD-FTV)
	09023-12700	Union Nut Wrench 17mm	VALVE CLEARANCE(1CD-FTV) PARTIAL ENGINE ASSY(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09023-12900	Union Nut Wrench 19mm	VALVE CLEARANCE(1CD-FTV) PARTIAL ENGINE ASSY(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV)
	09213-70010	Crankshaft Pulley Holding Tool	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV)
	(09213-70020)	Bolt	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV)
	09213-70011	Crankshaft Pully Holding Tool	PARTIAL ENGINE ASSY(2ZZ-GE) CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) ENGINE REAR OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)
	09223-15020	Oil Seal & Bearing Replacer	ENGINE REAR OIL SEAL(2ZZ-GE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09223-15030	Oil Seal & Bearing Replacer	ENGINE REAR OIL SEAL(1CD-FTV) ENGINE REAR OIL SEAL(2ZZ-GE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)

	09223-22010	Crankshaft Front Oil Seal Replacer	CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) CHAIN SUB-ASSY(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE) TIMING GEAR COVER OIL SEAL(3ZZ-FE/4ZZ-FE)
	09223-46011	Crankshaft Front Oil Seal Replacer	CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV)
	09228-64030	Fuel Filter Wrench	PARTIAL ENGINE ASSY(1CD-FTV)
	09248-55050	Valve Clearance Adjust Tool Set	VALVE CLEARANCE(1CD-FTV)
	(09248-05510)	Valve Lifter Press	VALVE CLEARANCE(1CD-FTV)
	(09248-05520)	Valve Lifter Stopper	VALVE CLEARANCE(1CD-FTV)
	09248-77010	Valve Clearance Adjusting Compressor Set	VALVE CLEARANCE(2ZZ-GE)
	(09248-07010)	Valve Clearance Adjusting Compressor	VALVE CLEARANCE(2ZZ-GE)
	09268-21010	Fuel Hose Puller	CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE)
	09268-46021	Nozzle Holder Retaining Nut Wrench	PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)
	09301-00210	Clutch Guide Tool	PARTIAL ENGINE ASSY(1CD-FTV) PARTIAL ENGINE ASSY(2ZZ-GE) ENGINE REAR OIL SEAL(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09301-00220	Clutch Guide Tool	ENGINE REAR OIL SEAL(1CD-FTV)

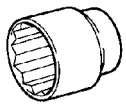
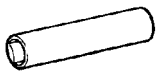
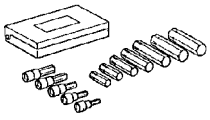
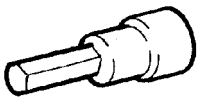
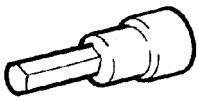
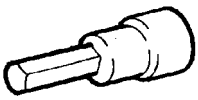
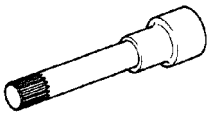
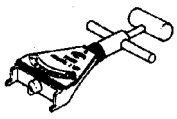
	09316-60011	Transmission & Transfer Bearing Replacer	CRANKSHAFT SEAL(1CD-FTV)
	(09316-00011)	Replacer Pipe	CRANKSHAFT SEAL(1CD-FTV)
	09330-00021	Companion Flange Holding Tool	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV) PARTIAL ENGINE ASSY(2ZZ-GE) CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) ENGINE REAR OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)
	09520-01010	Drive Shaft Remover Attachment	ENGINE REAR OIL SEAL(1CD-FTV) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09520-24010	Differential Side Gear Shaft Puller	ENGINE REAR OIL SEAL(1CD-FTV) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	(09520-32040)	Shocker Set	ENGINE REAR OIL SEAL(1CD-FTV) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09628-62011	Boll Joint Puller	PARTIAL ENGINE ASSY(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV) PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09670-00010	Front Crossmember Guide Tool	PARTIAL ENGINE ASSY(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)
	09816-30010	Oil Pressure Switch Socket	PARTIAL ENGINE ASSY(2ZZ-GE)
	09817-33190	Sensor Socket Wrench	PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)

	09843-18030	Tacho-pulse Pickup Wire No.2	ENGINE ASSEMBLY(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) ENGINE ASSEMBLY(3ZZ-FE/4ZZ-FE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE)
	09843-18040	Diagnosis Check Wire No.2	ENGINE ASSEMBLY(1CD-FTV) ENGINE ASSEMBLY(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) ENGINE ASSEMBLY(3ZZ-FE/4ZZ-FE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE)
	09930-00010	Drive Shaft Nut Chisel	PARTIAL ENGINE ASSY(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV) PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09950-50013	Puller C Set	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE)
	(09951-05010)	Hanger 150	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE)
	(09952-05010)	Slide Arm	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE)
	(09953-05010)	Center Bolt 100	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV)

	(09953-05020)	Center Bolt 150	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE)
	(09954-05021)	Claw No.2	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE)
	(09954-05030)	Claw No.3	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV)
	(09957-04010)	Attachment	CHAIN SUB-ASSY(2ZZ-GE) TIMING GEAR COVER OIL SEAL(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE)
	09950-70010	Handle Set	ENGINE REAR OIL SEAL(1CD-FTV) ENGINE REAR OIL SEAL(2ZZ-GE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	(09951-07100)	Handle 100	ENGINE REAR OIL SEAL(1CD-FTV) ENGINE REAR OIL SEAL(2ZZ-GE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09960-10010	Variable Pin Wrench Set	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) CHAIN SUB-ASSY(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE) TIMING GEAR COVER OIL SEAL(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)

	(09962-01000)	Variable Pin Wrench Arm Assy	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) CHAIN SUB-ASSY(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE) TIMING GEAR COVER OIL SEAL(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	(09963-00600)	Pin 6	CHAIN SUB-ASSY(2ZZ-GE)
	(09963-01000)	Pin 10	PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) CHAIN SUB-ASSY(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE) TIMING GEAR COVER OIL SEAL(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09992-00025	Cylinder Compression Check Gauge Set	ENGINE ASSEMBLY(1CD-FTV)
	(09992-00121)	No. 4 Attachment	ENGINE ASSEMBLY(1CD-FTV)
	(09992-00211)	Gauge Assy	ENGINE ASSEMBLY(1CD-FTV)
	09992-00242	Turbocharger Pressure Gauge	VALVE CLEARANCE(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV)
	09992-00500	Compression Gauge Attachment	ENGINE ASSEMBLY(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) ENGINE ASSEMBLY(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE)

Recomended Tools

	09011-12301	Socket Wrench 30 mm	PARTIAL ENGINE ASSY(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV) PARTIAL ENGINE ASSY(2ZZ-GE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09017-38120	Deep Socket Wrench 12 mm	PARTIAL ENGINE ASSY(1CD-FTV)
	09040-00011	Hexagon Wrench Set	PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	(09043-20050)	Socket Hexagon Wrench 5	PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)
	(09043-20050)	Socket Hexagon Wrench 5	PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)
	(09043-20100)	Socket Hexagon Wrench 10	PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE) ENGINE REAR OIL SEAL(3ZZ-FE/4ZZ-FE)
	09043-50100	Bi-hexagon Wrench 10 mm	CYLINDER HEAD GASKET(2ZZ-GE)
	(09203-00010)	Thickness Gauge	CAMSHAFT(2ZZ-GE)
	09216-00021	Belt Tension Gauge	ENGINE ASSEMBLY(1CD-FTV) DRIVE BELT(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV)

SSM

	08826-00080 Seal Packing Black or equivalent (FIPG)	VALVE CLEARANCE(1CD-FTV) PARTIAL ENGINE ASSY(1CD-FTV) TIMING BELT(1CD-FTV) CAMSHAFT(1CD-FTV) CYLINDER HEAD GASKET(1CD-FTV) CRANKSHAFT SEAL(1CD-FTV) CHAIN SUB-ASSY(2ZZ-GE) CAMSHAFT(2ZZ-GE) CYLINDER HEAD GASKET(2ZZ-GE) VALVE CLEARANCE(3ZZ-FE/4ZZ-FE) CHAIN SUB-ASSY(3ZZ-FE/4ZZ-FE) CAMSHAFT(3ZZ-FE/4ZZ-FE) CYLINDER HEAD GASKET(3ZZ-FE/4ZZ-FE)
	08826-00100 "Seal Packing 1282B," THREE BOND 1282B or equivalent (FIPG)	CYLINDER HEAD GASKET(2ZZ-GE)
	08833-00070 "Adhesive 1324," THREE BOND 1324 or equivalent	PARTIAL ENGINE ASSY(1CD-FTV) ENGINE REAR OIL SEAL(1CD-FTV) PARTIAL ENGINE ASSY(2ZZ-GE) PARTIAL ENGINE ASSY(3ZZ-FE/4ZZ-FE)

Equipment

Hexagon wrench (6 mm)	
Feeler gauge	
CO/HC meter	
Dial indicator	
Dial indicator or dial indicator with magnetic base	
Feeler gauge	
Micrometer	
Radiator cap tester	
Straight edge	
Techometer	
Torque wrench	
Vernier calipers	
Dial indicator with magnetic base	
Tire pressure gauge	
Alignment tester	
Toe-in gauge	
Engine sling device	
Slide calipers	
Sandpaper (#400)	
Wooden block	
Chain block	
Angle gauge	
Universal engine lifter	

EXHAUST

PREPARATION

0216L-01

Equipment

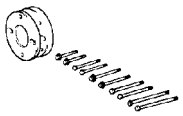
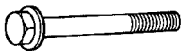
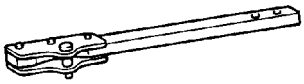
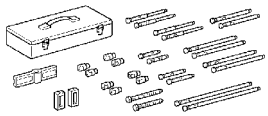
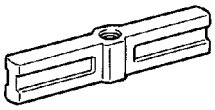
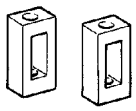
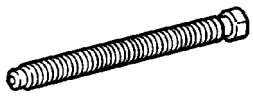
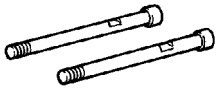
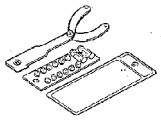
Torque wrench	
Vernier calipers	

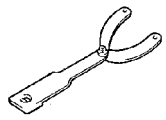
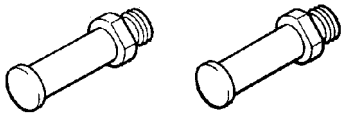
COOLING

PREPARATION

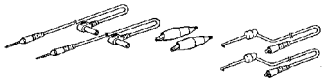
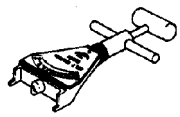
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SST

	09023-12700	Union Nut Wrench 17mm	WATER PUMP ASSY(1CD-FTV)
	09023-12900	Union Nut Wrench 19mm	WATER PUMP ASSY(1CD-FTV)
	09213-54015	Crankshaft Pulley Holding Tool	WATER PUMP ASSY(1CD-FTV)
	(91651-60855)	Bolt	WATER PUMP ASSY(1CD-FTV)
	09330-00021	Companion Flange Holding Tool	WATER PUMP ASSY(1CD-FTV)
	09950-50013	Puller C Set	WATER PUMP ASSY(1CD-FTV)
	(09951-05010)	Hanger 150	WATER PUMP ASSY(1CD-FTV)
	(09952-05010)	Slide Arm	WATER PUMP ASSY(1CD-FTV)
	(09953-05010)	Center Bolt 100	WATER PUMP ASSY(1CD-FTV)
	(09953-05020)	Center Bolt 150	WATER PUMP ASSY(1CD-FTV)
	(09954-05030)	Claw No.3	WATER PUMP ASSY(1CD-FTV)
	09960-10010	Variable Pin Wrench Set	WATER PUMP ASSY(1CD-FTV) WATER PUMP ASSY(2ZZ-GE)

	(09962-01000)	Variable Pin Wrench Arm Assy	WATER PUMP ASSY(2ZZ-GE) WATER PUMP ASSY(1CD-FTV)
	(09963-00600)	Pin 6	WATER PUMP ASSY(2ZZ-GE)
	(09963-01000)	Pin 10	WATER PUMP ASSY(1CD-FTV)

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	COOLING FAN SYSTEM(2ZZ-GE) COOLING FAN SYSTEM (3ZZ-FE/4ZZ-FE)
	(09083-00150)	Test Lead Set	COOLING FAN SYSTEM(2ZZ-GE) COOLING FAN SYSTEM (3ZZ-FE/4ZZ-FE)
	09216-00021	Belt Tension Gauge	WATER PUMP ASSY(1CD-FTV)

SSM

	08826-00080	Seal Packing Black or equivalent (FIPG)	WATER PUMP ASSY(1CD-FTV)

Equipment

Hexagon wrench (8 mm)	
Ohmmeter	
Radiator cap tester	
Thermometer	
Torque wrench	
Slide calipers	
Wooden block	
Heater	

Coolant (2ZZ-GE/3ZZ-FE/4ZZ-FE)

Item		Capacity	Classification
Engine coolant	2ZZ-GE	6.7 liters (7.1 US qts, 5.9 Imp. qts)	TOYOTA long life coolant
Engine coolant	3ZZ-FE/4ZZFE	6.5 liters (6.9 US qts, 5.7 Imp. qts)	TOYOTA long life coolant

Coolant (1CD-FTV)

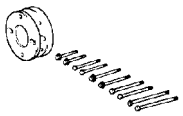
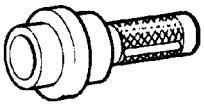
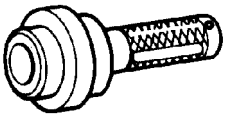
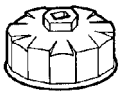
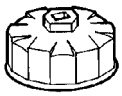
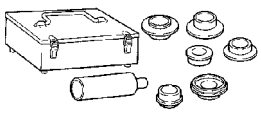
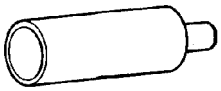
Item	Capacity	Classification
Engine coolant (w/ heater)	7.6 liters (8.0 US qts, 6.7 Imp. qts)	TOYOTA long life coolant
Engine coolant (w/o heater)	7.4 liters (7.8 US qts, 6.5 Imp. qts)	TOYOTA long life coolant

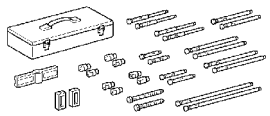
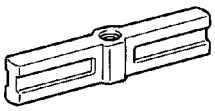
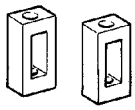
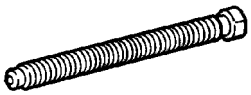
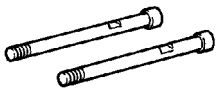
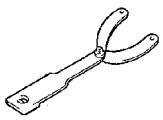
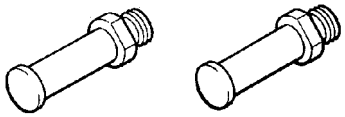
LUBRICATION

PREPARATION

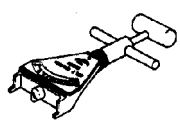
0216N-01

SST

	09032-00100	Oil Pan Seal Cutter	OIL PUMP ASSY(1CD-FTV)
	09213-54015	Crankshaft Pulley Holding Tool	OIL PUMP ASSY(1CD-FTV)
	(91651-60855)	Bolt	OIL PUMP ASSY(1CD-FTV)
	09213-70011	Crankshaft Pully Holding Tool	OIL PUMP ASSY(2ZZ-GE)
	09223-22010	Crankshaft Front Oil Seal Replacer	OIL PUMP ASSY(2ZZ-GE) OIL PUMP ASSY(3ZZ-FE/4ZZ-FE)
	09223-46011	Crankshaft Front Oil Seal Replacer	OIL PUMP ASSY(1CD-FTV)
	09228-06501	Oil Filter Wrench	OIL COOLER ASSY(2ZZ-GE) OIL FILTER SUB-ASSY(2ZZ-GE) OIL FILTER SUB-ASSY (3ZZ-FE/4ZZ-FE)
	09228-10002	Oil Filter Wrench	OIL FILTER SUB-ASSY(1CD-FTV)
	09316-60011	Transmission & Transfer Bearing Replacer	OIL PUMP ASSY(1CD-FTV)
	(09316-00011)	Replacer Pipe	OIL PUMP ASSY(1CD-FTV)
	(09316-00021)	Replacer "A"	OIL PUMP ASSY(1CD-FTV)
	09330-00021	Companion Flange Holding Tool	OIL PUMP ASSY(1CD-FTV) OIL PUMP ASSY(2ZZ-GE)

	09950-50013	Puller C Set	OIL PUMP ASSY(1CD-FTV) OIL PUMP ASSY(2ZZ-GE)
	(09951-05010)	Hanger 150	OIL PUMP ASSY(1CD-FTV) OIL PUMP ASSY(2ZZ-GE)
	(09952-05010)	Slide Arm	OIL PUMP ASSY(1CD-FTV) OIL PUMP ASSY(2ZZ-GE)
	(09953-05010)	Center Bolt 100	OIL PUMP ASSY(1CD-FTV)
	(09953-05020)	Center Bolt 150	OIL PUMP ASSY(1CD-FTV) OIL PUMP ASSY(2ZZ-GE)
	(09954-05021)	Claw No.2	OIL PUMP ASSY(1CD-FTV) OIL PUMP ASSY(2ZZ-GE)
	(09954-05030)	Claw No.3	OIL PUMP ASSY(1CD-FTV)
	(09957-04010)	Attachment	OIL PUMP ASSY(2ZZ-GE)
	09960-10010	Variable Pin Wrench Set	OIL PUMP ASSY(2ZZ-GE) OIL PUMP ASSY(3ZZ-FE/4ZZ-FE)
	(09962-01000)	Variable Pin Wrench Arm Assy	OIL PUMP ASSY(2ZZ-GE) OIL PUMP ASSY(3ZZ-FE/4ZZ-FE)
	(09963-00600)	Pin 6	OIL PUMP ASSY(2ZZ-GE)
	(09963-01000)	Pin 10	OIL PUMP ASSY(3ZZ-FE/4ZZ-FE)

Recomended Tools

	09216-00021	Belt Tension Gauge	OIL PUMP ASSY(1CD-FTV)

SSM

	08826-00080	Seal Packing Black or equivalent (FIPG)	OIL PUMP ASSY(1CD-FTV) OIL PUMP ASSY(2ZZ-GE) OIL PUMP ASSY(3ZZ-FE/4ZZ-FE)

Equipment

Radiator cap tester	
Slide calipers	
Wooden block	
Service Wire Harness	
Ammeter(A)	
Torque wrench	

Lubricant (2ZZ-GE/3ZZ-FE/4ZZ-FE)

Item		Capacity	Classification
Oil grade		-	API grade "SJ" Energy-Conserving, "SL" Energy-Conserving or ILSAC multigrade engine oil
Drain and refill	2ZZ-GE w/ oil filter change w/o oil filter change	 4.4 liters (4.7 US qts, 3.9 lmp. qts) 4.2 liters (4.4 US qts, 3.7 lmp. qts)	-
Drain and refill	3ZZ-FE/4ZZ-FE w/ oil filter change w/o oil filter change	 3.7 liters (3.9 US qts, 3.3 lmp. qts) 3.5 liters (3.7 US qts, 3.1 lmp. qts)	-
Dry fill	2ZZ-GE	5.15 liters (5.4 US qts, 4.5 lmp. qts)	-
Dry fill	3ZZ-FE/4ZZ-FE	4.2 liters (4.4 US qts,3.7 lmp. qts)	-

Lubricant (1CD-FTV)

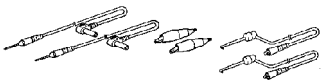
Item		Capacity	Classification
Oil grade		-	API grade CF-4 or CF
Drain and refill	w/ oil filter change w/o oil filter change	5.9 liters (6.2 US qts, 5.2 lmp. qts) 5.3 liters (5.6 US qts, 4.7 lmp. qts)	-
Dry fill		6.7 liters (7.1 US qts, 5.9 lmp. qts)	-

IGNITION

PREPARATION

0216O-01

Recomended Tools

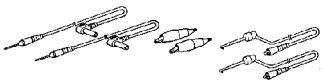
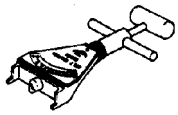
	09082-00040	TOYOTA Electrical Tester	IGNITION SYSTEM(2ZZ-GE) IGNITION SYSTEM (3ZZ-FE/4ZZ-FE)
	(09083-00150)	Test Lead Set	IGNITION SYSTEM(2ZZ-GE) IGNITION SYSTEM (3ZZ-FE/4ZZ-FE)

STARTING & CHARGING

0216P-01

PREPARATION

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	STARTING SYSTEM(2ZZ-GE) STARTING SYSTEM (3ZZ-FE/4ZZ-FE)
	(09083-00150)	Test Lead Set	STARTING SYSTEM(2ZZ-GE) STARTING SYSTEM (3ZZ-FE/4ZZ-FE)
	09216-00021	Belt Tension Gauge	GENERATOR ASSY(1CD-FTV)

Equipment

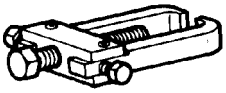
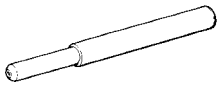
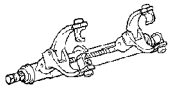
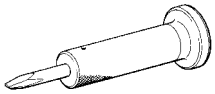
Service Wire Harness	
Ammeter	
Ohmmeter	
Radiator cap tester	
Torque wrench	
Slide calipers	

FRONT SUSPENSION

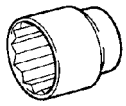
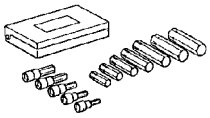
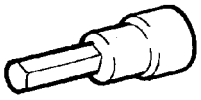
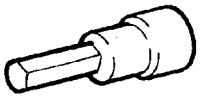
PREPARATION

02172-01

SST

	09628-62011	Boll Joint Puller	LOWER BALL JOINT ASSY FRONT LH STABILIZER BAR FRONT
	09670-00010	Front Crossmember Guide Tool	STABILIZER BAR FRONT
	09727-30021	Coil Spring Compressor	FRONT SHOCK ABSORBER WITH COIL SPRING
	09729-22031	Front Spring Upper Seat Holder	FRONT SHOCK ABSORBER WITH COIL SPRING
	09930-00010	Drive Shaft Nut Chisel	LOWER BALL JOINT ASSY FRONT LH

Recomended Tools

	09011-12301	Socket Wrench 30 mm	LOWER BALL JOINT ASSY FRONT LH
	09040-00011	Hexagon Wrench Set	FRONT SHOCK ABSORBER WITH COIL SPRING STABILIZER BAR FRONT
	(09043-20050)	Socket Hexagon Wrench 5	FRONT SHOCK ABSORBER WITH COIL SPRING STABILIZER BAR FRONT
	(09043-20060)	Socket Hexagon Wrench 6	FRONT SHOCK ABSORBER WITH COIL SPRING STABILIZER BAR FRONT

Equipment

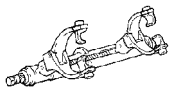
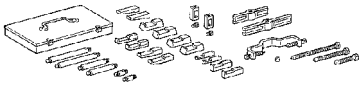
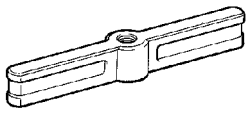
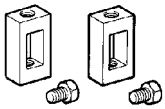
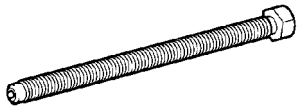
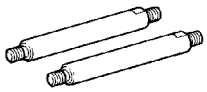
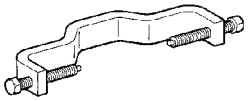
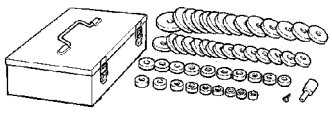
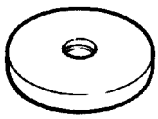
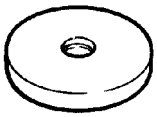
Torque wrench	
Dial indicator with magnetic base	
Tire pressure gauge	
Alignment tester	
Toe-in gauge	
Angle gauge	
Camber-caster-kingpin gauge	
Plastic hammer	
Drill	
Engine sliding device	

REAR SUSPENSION

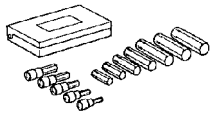
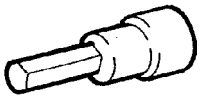
PREPARATION

02173-01

SST

	09710-04101	Base	REAR AXLE BEAM ASSY
	09727-30021	Coil Spring Compressor	REAR SHOCK ABSORBER WITH COIL SPRING
	09950-40011	Puller B Set	REAR AXLE BEAM ASSY
	(09951-04020)	Hanger 200	REAR AXLE BEAM ASSY
	(09952-04010)	Slide Arm	REAR AXLE BEAM ASSY
	(09953-04030)	Center Bolt 200	REAR AXLE BEAM ASSY
	(09954-04020)	Arm 100	REAR AXLE BEAM ASSY
	(09957-04010)	Attachment	REAR AXLE BEAM ASSY
	(09958-04011)	Holder	REAR AXLE BEAM ASSY
	09950-60010	Replacer Set	REAR AXLE BEAM ASSY
	(09951-00620)	Replacer 62	REAR AXLE BEAM ASSY
	(09951-00630)	Replacer 63	REAR AXLE BEAM ASSY

Recomended Tools

	09040-00011	Hexagon Wrench Set	REAR SHOCK ABSORBER WITH COIL SPRING
	(09043-20060)	Socket Hexagon Wrench 6	REAR SHOCK ABSORBER WITH COIL SPRING

Equipment

Torque wrench	
Dial indicator with magnetic base	
Wheel balancer	
Tire pressure gauge	
Alignment tester	
Toe-in gauge	
Camber-caster-kingpin gauge	
Drill	

TIRE & WHEEL

PREPARATION

02174-01

Equipment

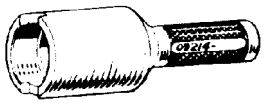
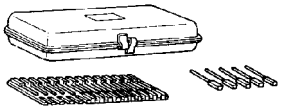
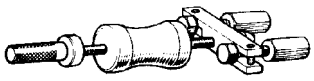
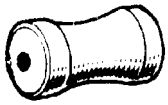
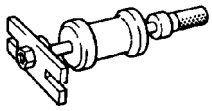
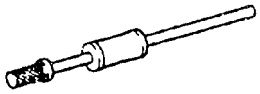
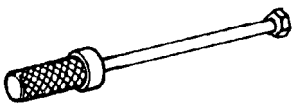
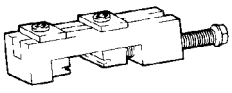
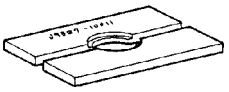
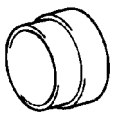
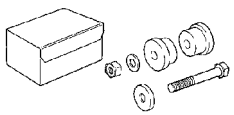
Tire pressure gauge	
Dial indicator with magnetic base	
Wheel balancer	

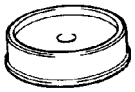
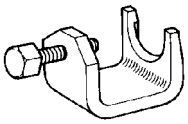
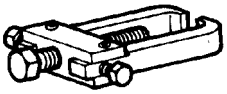
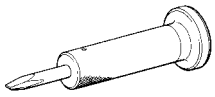
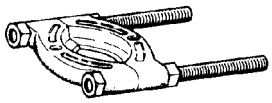
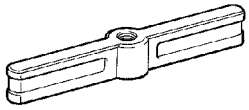
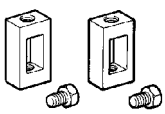
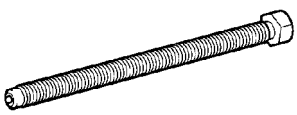
DRIVE SHAFT / PROPELLER SHAFT

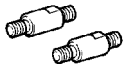
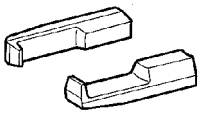
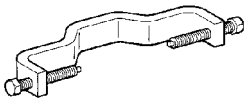
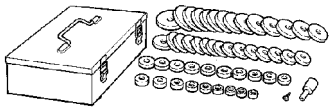
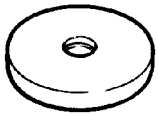
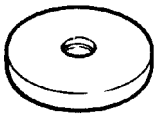
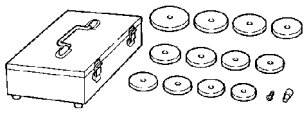
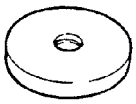
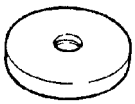
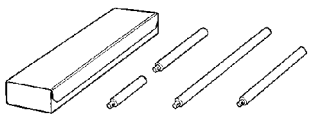
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PREPARATION

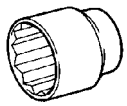
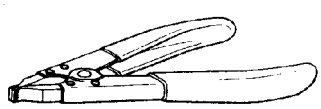
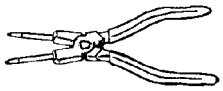
SST

	09214-76011	Crankshaft Pulley Replacer	REAR AXLE HUB & BEARING ASSY LH
	09240-00020	Wire Gauge Set	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09520-00031	Rear Axle Shaft Puller	FRONT AXLE HUB SUB-ASSY LH REAR AXLE HUB & BEARING ASSY LH
	(09520-00040)	Shocker	REAR AXLE HUB & BEARING ASSY LH
	09520-01010	Drive Shaft Remover Attachment	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09520-24010	Differential Side Gear Shaft Puller	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	(09520-32040)	Shocker Set	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09521-00020	Drive Shaft Boot Clamping Tool	REAR AXLE HUB & BEARING ASSY LH
	09521-24010	Rear Axle Shaft Puller	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09527-10011	Rear Axle Shaft Bearing Remover	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09527-17011	Rear Axle Shaft Bearing Remover	FRONT AXLE HUB SUB-ASSY LH
	09608-16042	Front Hub Bearing Adjusting Tool	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)

	(09608-02021)	Bolt & Nut	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	(09608-02041)	Retainer	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09608-32010	Steering Knuckle Oil Seal Replacer	FRONT AXLE HUB SUB-ASSY LH
	09628-10011	Ball Joint Puller	REAR AXLE LH HUB BOLT FRONT AXLE LH HUB BOLT
	09628-62011	Boll Joint Puller	FRONT AXLE HUB SUB-ASSY LH FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09710-04081	Base	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV)
	09726-40010	Lower Control Shaft Bearing Replacer	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV)
	09930-00010	Drive Shaft Nut Chisel	FRONT AXLE HUB SUB-ASSY LH FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09950-00020	Bearing Remover	REAR AXLE HUB & BEARING ASSY LH FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09950-40011	Puller B Set	FRONT AXLE HUB SUB-ASSY LH
	(09951-04020)	Hanger 200	FRONT AXLE HUB SUB-ASSY LH
	(09952-04010)	Slide Arm	FRONT AXLE HUB SUB-ASSY LH
	(09953-04030)	Center Bolt 200	FRONT AXLE HUB SUB-ASSY LH

	(09954-04010) Arm 25	FRONT AXLE HUB SUB-ASSY LH
	(09955-04061) Claw No.6	FRONT AXLE HUB SUB-ASSY LH
	(09957-04010) Attachment	FRONT AXLE HUB SUB-ASSY LH
	(09958-04010) Holder (J)	FRONT AXLE HUB SUB-ASSY LH
	09950-60010 Replacer Set	FRONT AXLE HUB SUB-ASSY LH
	(09951-00370) Replacer 37	FRONT AXLE HUB SUB-ASSY LH
	(09951-00600) Replacer 60	FRONT AXLE HUB SUB-ASSY LH
	(09951-00640) Replacer 64	FRONT AXLE HUB SUB-ASSY LH
	09950-60020 Replacer Set No.2	FRONT AXLE HUB SUB-ASSY LH FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV)
	(09951-00710) Replacer 71	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV)
	(09951-00720) Replacer 72	FRONT AXLE HUB SUB-ASSY LH
	09950-70010 Handle Set	FRONT AXLE HUB SUB-ASSY LH FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV)
	(09951-07100) Handle 100	FRONT AXLE HUB SUB-ASSY LH FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV)

Recomended Tools

	09011-12301	Socket Wrench 30 mm	FRONT AXLE HUB SUB-ASSY LH FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV)
	09905-00012	Snap Ring No.1 Expander	FRONT DRIVE SHAFT(2ZZ-GE/1CD-FTV) FRONT DRIVE SHAFT(3ZZ-FE/4ZZ-FE)
	09905-00013	Snap Ring Pliers	FRONT AXLE HUB SUB-ASSY LH

Equipment

Torque wrench	
Dial indicator with magnetic base	
Alingment tester	
Toe-in gauge	
Tire pressure gauge	
Angle gauge	

Lubricant

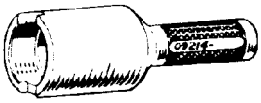
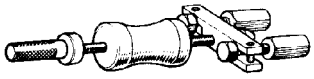
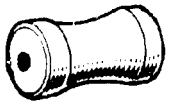
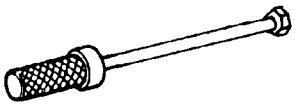
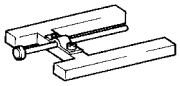
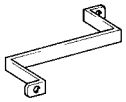
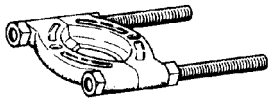
Item		Capacity
Front drive shaft		
3ZZ-FE/4ZZ-FE	Outboard joint grease (Hatch back)	85 - 105 g (3.00 - 3.70 oz.)
	Inboard joint grease (Sedan/Wagon)	180 - 190 g (6.35 - 6.70 oz.)
	Inboard joint grease (Hatch back)	126 - 136 g (4.44 - 4.80 oz.)
2ZZ-GE/1CD-FTV	Outboard joint grease (Sedan/Wagon)	190 - 200 g (6.70 - 7.05 oz.)
	Outboard joint grease (Hatch back)	152 - 162 g (5.36 - 5.71 oz.)
	Inboard joint grease (Sedan/Wagon)	185 - 195 g (6.52 - 6.88 oz.)
	Inboard joint grease (Hatch back, 2ZZ-GE)	160 - 180 g (5.64 - 6.35 oz.)
	Inboard joint grease (Hatch back, 1CD-FTV)	170 - 190 g (6.00 - 6.70 oz.)

BRAKE

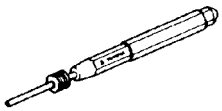
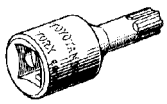
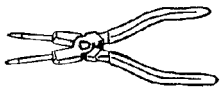
PREPARATION

02178-01

SST

	09023-00100	Union Nut Wrench 10 mm	BRAKE FLUID BRAKE MASTER CYLINDER SUB-ASSY BRAKE BOOSTER ASSY(LHD) BRAKE BOOSTER ASSY(RHD) FRONT BRAKE(TMC MADE) BRAKE ACTUATOR ASSY(TMC MADE) REAR DISC BRAKE(TMC MADE) FRONT BRAKE(TMUK MADE) BRAKE ACTUATOR ASSY(TMUK MADE) REAR DISC BRAKE(TMUK MADE)
	09023-38400	Union Nut Wrench 14mm	BRAKE FLUID BRAKE MASTER CYLINDER SUB-ASSY BRAKE BOOSTER ASSY(LHD) BRAKE BOOSTER ASSY(RHD) FRONT BRAKE(TMUK MADE) BRAKE ACTUATOR ASSY(TMUK MADE) REAR DISC BRAKE(TMUK MADE)
	09214-76011	Crankshaft Pulley Replacer	SKID CONTROL SENSOR
	09520-00031	Rear Axle Shaft Puller	SKID CONTROL SENSOR
	(09520-00040)	Shocker	SKID CONTROL SENSOR
	09521-00020	Drive Shaft Boot Clamping Tool	SKID CONTROL SENSOR
	09737-00012	Brake Booster Push Rod Gauge	BRAKE MASTER CYLINDER SUB-ASSY
	09737-00020	Brake Booster Push Rod Wrench	BRAKE MASTER CYLINDER SUB-ASSY
	09950-00020	Bearing Remover	SKID CONTROL SENSOR

Recomended Tools

	09031-00030	Pin Punch	VACUUM PUMP ASSY(1CD-FTV)
	09042-00010	Torx Socket T30	STEERING SENSOR(w/ VSC)
	09905-00013	Snap Ring Pliers	BRAKE MASTER CYLINDER SUB-ASSY

Equipment

Vernier calipers	
Slide calipers	
Dial indicator	
Micrometer	
Torque wrench	
Vacuum gauge	
V-Block	

Lubricant

Item	Capacity	Classification
Brake fluid	-	SAE J1703 or FMVSS No. 116 DOT3

PARKING BRAKE

02179-01

PREPARATION

SST

	09718-00010 Shoe Hold Down Spring Driver	PARKING BRAKE ASSY(TMC MADE) PARKING BRAKE CABLE ASSY NO.3(TMC MADE)

Equipment

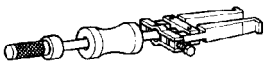
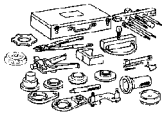
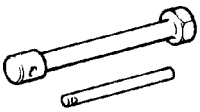
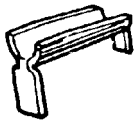
Torque wrench	
Brake drum gauge	
Ruler	

AUTOMATIC TRANSMISSION / TRANS

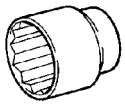
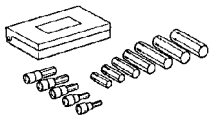
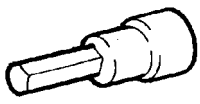
PREPARATION

0216D-01

SST

	09023-12700	Union Nut Wrench 17mm	AUTOMATIC TRANSAXLE ASSY(ATM)
	09308-00010	Oil Seal Puller	FRONT DIFFERENTIAL OIL SEAL(ATM)
	09350-32014	TOYOTA Automatic Transmission Tool Set	AUTOMATIC TRANSAXLE ASSY(ATM) FRONT DIFFERENTIAL OIL SEAL(ATM) TORQUE CONVERTER CLUTCH AND DRIVE PLATE(ATM)
	(09351-32010)	One-way Clutch Test Tool	AUTOMATIC TRANSAXLE ASSY(ATM) TORQUE CONVERTER CLUTCH AND DRIVE PLATE(ATM)
	(09351-32020)	Stator Stopper	AUTOMATIC TRANSAXLE ASSY(ATM) TORQUE CONVERTER CLUTCH AND DRIVE PLATE(ATM)
	(09351-32111)	Side Bearing Race Replacer	FRONT DIFFERENTIAL OIL SEAL(ATM)
	(09351-32130)	Handle	FRONT DIFFERENTIAL OIL SEAL(ATM)
	(09351-32150)	Oil Seal Replacer	FRONT DIFFERENTIAL OIL SEAL(ATM)

Recomended Tools

	09011-12301	Socket Wrench 30 mm	AUTOMATIC TRANSAXLE ASSY(ATM)
	09040-00011	Hexagon Wrench Set	AUTOMATIC TRANSAXLE ASSY
	(09043-20100)	Socket Hexagon Wrench 10	FRONT DIFFERENTIAL OIL SEAL(ATM)

	09082-00040 TOYOTA Electrical Tester	SHIFT LOCK CONTROL SWITCH(ATM)

Equipment

Straight edge	Torque converter clutch
Vernier calipers	Torque converter clutch
Dial indicator or dial indicator with magnetic base	Drive plate
Torque wrench	
Engine sling device	Automatic transaxle assy
Slide calipers	Automatic transaxle assy,Front differential oil seal
Chain block	Automatic transaxle assy

Lubricant

Item	Capacity	Classification
Automatic transaxle fluid Dry fill Drain and refill	 7.3 liters (7.72 US qts, 6.42 lmp.qts) 3.0 liters (3.2 US qts, 2.6 lmp.qts)	 ATF Type T-IV

SSM (Special Service Materials)

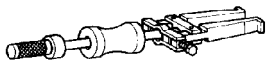
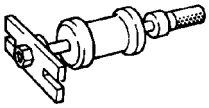
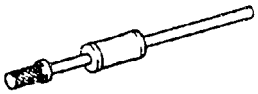
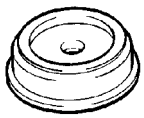
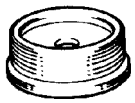
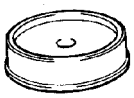
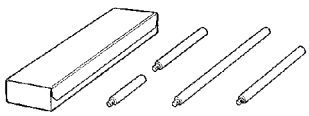
08833-00070 "Adhesive 1324," THREE BOND 1324 or equivalent	

MANUAL TRANSMISSION/TRANSAXLE

PREPARATION

0217C-01

SST

	09308-00010	Oil Seal Puller	FRONT DIFFERENTIAL OIL SEAL(C50/C64/C150) FRONT DIFFERENTIAL OIL SEAL(E351)
	09520-01010	Drive Shaft Remover Attachment	MANUAL TRANSAXLE ASSY(C50/C64/C150) FRONT DIFFERENTIAL OIL SEAL(C50/C64/C150) MANUAL TRANSAXLE ASSY(E351) FRONT DIFFERENTIAL OIL SEAL(E351)
	09520-24010	Differential Side Gear Shaft Puller	MANUAL TRANSAXLE ASSY(C50/C64/C150) FRONT DIFFERENTIAL OIL SEAL(C50/C64/C150) MANUAL TRANSAXLE ASSY(E351) FRONT DIFFERENTIAL OIL SEAL(E351)
	(09520-32040)	Shocker Set	MANUAL TRANSAXLE ASSY(C50/C64/C150) FRONT DIFFERENTIAL OIL SEAL(C50/C64/C150) MANUAL TRANSAXLE ASSY(E351) FRONT DIFFERENTIAL OIL SEAL(E351)
	09554-14010	Differential Oil Seal Replacer	FRONT DIFFERENTIAL OIL SEAL(C50/C64/C150)
	09608-10010	Steering Knuckle Oil Seal Replacer	FRONT DIFFERENTIAL OIL SEAL(E351)
	09608-32010	Steering Knuckle Oil Seal Replacer	FRONT DIFFERENTIAL OIL SEAL(E351)
	09950-70010	Handle Set	FRONT DIFFERENTIAL OIL SEAL(C50/C64/C150) FRONT DIFFERENTIAL OIL SEAL(E351)
	(09951-07200)	Handle 200	FRONT DIFFERENTIAL OIL SEAL(C50/C64/C150) FRONT DIFFERENTIAL OIL SEAL(E351)

Equipment

Torque wrench	

Lubricant

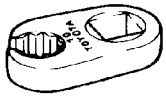
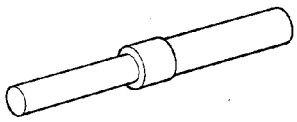
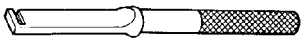
Item	Capacity	Classification
C50, C150 Manual transaxle oil (w/ Differential oil)	1.9 liters (2.0 US qts, 1.7 Imp. qts)	API GL-4 or GL-5 SAE 75W-90
C64 Manual transaxle oil (w/ Differential oil)	2.3 liters (2.4 US qts, 2.0 Imp. qts)	API GL-4 or GL-5 SAE 75W-90
E351 Manual transaxle oil (w/ Differential oil)	2.5 liters (2.6 US qts, 2.2 Imp. qts)	API GL-4 or GL-5 SAE 75W-90

CLUTCH

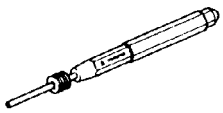
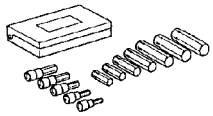
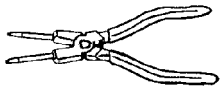
PREPARATION

0217F-01

SST

	09023-00100	Union Nut Wrench 10 mm	CLUTCH ACCUMULATOR ASSY(1CD-FTV) CLUTCH RELEASE CYLINDER ASSY(MTM) CLUTCH MASTER CYLINDER ASSY(MTM)
	09301-00210	Clutch Guide Tool	CLUTCH UNIT(MTM)
	09333-00013	Universal Joint Bearing Remover & Replacer	CLUTCH UNIT(MTM)

Recomended Tools

	09031-00030	Pin Punch	CLUTCH MASTER CYLINDER ASSY(MTM)
	09040-00011	Hexagon Wrench Set	CLUTCH PEDAL SUB-ASSY(MTM) CLUTCH MASTER CYLINDER ASSY(MTM)
	09905-00013	Snap Ring Pliers	CLUTCH MASTER CYLINDER ASSY(MTM)

Equipment

Vernier calipers	
Dial indicator with magnetic base	
Torque wrench	

Lubricant

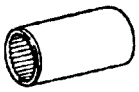
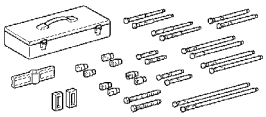
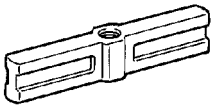
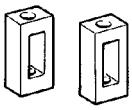
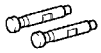
Item	Capacity	Classification
Brake fluid	-	SAE J1703 or FMVSS No. 116 DOT3

STEERING COLUMN

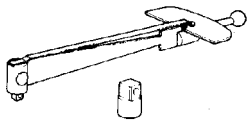
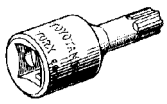
0217A-01

PREPARATION

SST

	09616-00011	Steering Worm Bearing Adjusting Socket	STEERING COLUMN ASSY
	09950-50013	Puller C Set	STEERING COLUMN ASSY
	(09951-05010)	Hanger 150	STEERING COLUMN ASSY
	(09952-05010)	Slide Arm	STEERING COLUMN ASSY
	(09953-05020)	Center Bolt 150	STEERING COLUMN ASSY
	(09954-05021)	Claw No.2	STEERING COLUMN ASSY

Recomended Tools

	09025-00010	Torque Wrench (30 kgf-cm)	STEERING COLUMN ASSY
	09042-00010	Torx Socket T30	STEERING COLUMN ASSY

Equipment

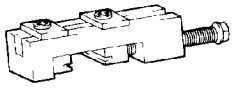
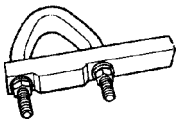
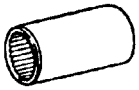
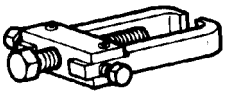
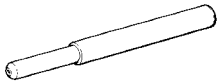
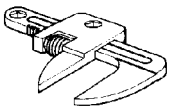
Torque wrench	

POWER STEERING

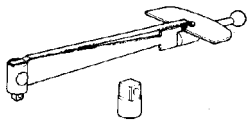
PREPARATION

0217B-01

SST

	09521-24010	Rear Axle Shaft Puller	GEAR ASSY, STEERING
	09612-00012	Rack & Pinion Steering Rack Housing Stand	GEAR ASSY, STEERING
	09616-00011	Steering Worm Bearing Adjusting Socket	GEAR ASSY, STEERING
	09628-62011	Boll Joint Puller	GEAR ASSY, STEERING
	09670-00010	Front Crossmember Guide Tool	GEAR ASSY, STEERING
	09922-10010	Variable Open Wrench	GEAR ASSY, STEERING

Recomended Tools

	09025-00010	Torque Wrench (30 kgf-cm)	GEAR ASSY, STEERING

Equipment

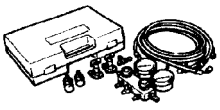
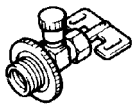
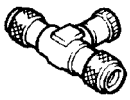
	09090-04020	Engine Sling Device	GEAR ASSY, STEERING

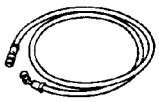
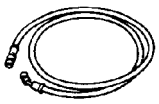
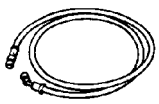
HEATER & AIR CONDITIONER

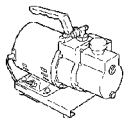
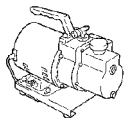
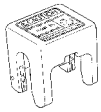
PREPARATION

0216G-01

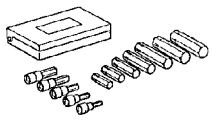
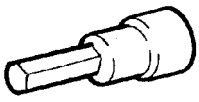
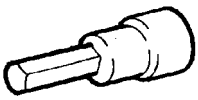
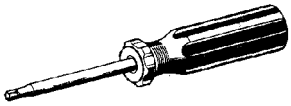
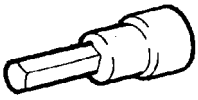
SST

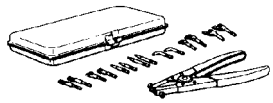
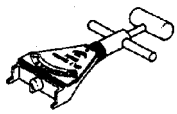
	07110-58060	Air Conditioner Service Tool Set	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(07117-58060)	Refrigerant Drain Service Valve	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(07117-58070)	T-Joint	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(07117-58080)	Quick Disconnect Adapter	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)

	(07117-58090) Quick Disconnect Adapter	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(07117-78050) Refrigerant Charging Gauge	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(07117-88060) Refrigerant Charging Hose	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(07117-88070) Refrigerant Charging Hose	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(07117-88080) Refrigerant Charging Hose	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)

	07117-48130	Vacuum Pump (220 V)	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	07117-48140	Vacuum Pump (240 V)	REFRIGERANT AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	09870-00015	A/C Quick Joint Puller No.1	AIR CONDITIONING RADIATOR ASSY
	09870-00025	A/C Quick Joint Puller No.2	AIR CONDITIONING RADIATOR ASSY

Recomended Tools

	09040-00011	Hexagon Wrench Set	AIR CONDITIONING RADIATOR ASSY COOLER CONDENSER ASSY
	(09043-20050)	Socket Hexagon Wrench 5	AIR CONDITIONING RADIATOR ASSY
	(09043-20100)	Socket Hexagon Wrench 10	COOLER CONDENSER ASSY
	09041-00010	Torx Driver T20	COOLER CONDENSER ASSY
	(09043-20100)	Socket Hexagon Wrench 10	COOLER CONDENSER ASSY

	09904-00010	Expander Set	COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	(09904-00050)	No. 4 Claw	COOLER COMPRESSOR ASSY(1CD-FTV) COOLER COMPRESSOR ASSY(2ZZ-GE) COOLER COMPRESSOR ASSY(3ZZ-FE) COOLER COMPRESSOR ASSY(4ZZ-FE)
	09216-00021	Belt Tension Gauge	V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
	09082-00040	TOYOTA Electrical Tester	

Equipment

Voltmeter	
Anmeter	
Ohmmeter	
Vinyl tape	
Hexagon wrench 10 mm (0.39 in.)	
Hexagon wrench 14 mm (0.55 in.)	
Hexagon wrench 5 mm (0.20 in.)	
Hexagon wrench 4 mm (0.16 in.)	
Vise pliers	
Gas leak detector	
Belt tension gauge	
Dial indicator	
Torque wrench	

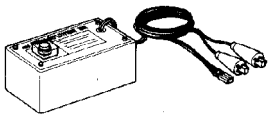
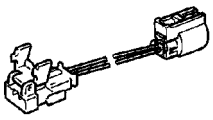
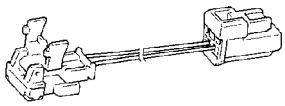
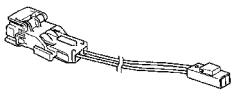
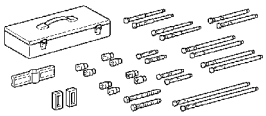
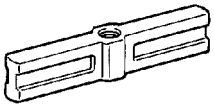
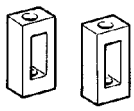
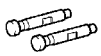
Lubricant

Item	Capacity	Classification
Compressor oil	-	ND-OIL 8 or equivalent

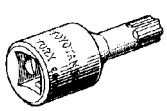
SUPPLEMENTAL RESTRAINT SYSTEM

PREPARATION

0217E-02

	09082-00700	SRS Airbag Deployment Tool	HORN BUTTON ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY FRONT SEAT AIRBAG ASSY RH
	09082-00750	Airbag Deployment Wire Sub-harness No.3	FRONT SEAT AIRBAG ASSY RH
	09082-00760	Airbag Deployment Wire Sub-harness No.4	HORN BUTTON ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY
	09082-00801	Airbag Deployment Wire Sub-Harness No. 8	HORN BUTTON ASSY
	(09082-10801)	Wire A	HORN BUTTON ASSY
	(09082-20801)	Wire B	HORN BUTTON ASSY
	09950-50013	Puller C Set	SPIRAL CABLE SUB-ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY
	(09951-05010)	Hanger 150	SPIRAL CABLE SUB-ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY
	(09952-05010)	Slide Arm	SPIRAL CABLE SUB-ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY
	(09953-05020)	Center Bolt 150	SPIRAL CABLE SUB-ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY
	(09954-05021)	Claw No.2	SPIRAL CABLE SUB-ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY

Recomended Tools

	09042-00010	Torx Socket T30	SPIRAL CABLE SUB-ASSY HORN BUTTON ASSY INSTR PNL PASS L/DOOR AIR BAG ASSY

Equipment

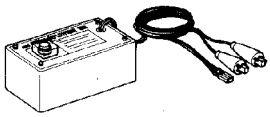
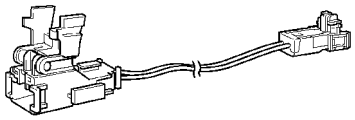
Torque wrench	
Bolt Length: 35.0 mm (1.387 in.) Pitch: 1.0 mm (0.039 in.) Diam.: 6.0 mm (0.236 in.)	Airbag disposal
Tire Width: 185 mm (7.28 in.) Inner diam.: 360 mm (14.17 in.)	Airbag disposal
Tire with disc wheel Width: 185 mm (7.28 in.) Inner diam.: 360 mm (14.17 in.)	Airbag disposal
Vinyl bag	Airbag disposal

SEAT BELT

PREPARATION

0216E-01

SST

	09082-00700	SRS Airbag Deployment Tool	FRONT SEAT BELT(HATCHBACK) FRONT SEAT BELT (SEDAN/STATION WAGON)
	09082-00770	Airbag Deployment Wire Sub-harness No.5	FRONT SEAT BELT(HATCHBACK) FRONT SEAT BELT (SEDAN/STATION WAGON)

Recomended Tools

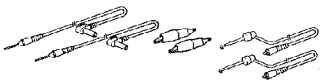
	99999-70027	Torque wrench	FRONT SEAT BELT(HATCHBACK) FRONT SEAT BELT (SEDAN/STATION WAGON)

LIGHTING

PREPARATION

0217G-01

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	LIGHTING SYSTEM
	(09083-00150)	Test Lead Set	LIGHTING SYSTEM

Equipment

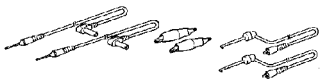
Torque wrench	
Volt meter	

WIPER & WASHER

0217H-01

PREPARATION

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	WIPER AND WASHER SYSTEM
	(09083-00150)	Test Lead Set	WIPER AND WASHER SYSTEM

Equipment

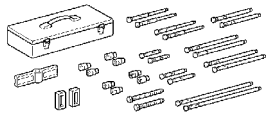
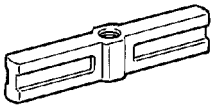
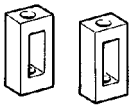
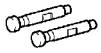
Torque wrench	

AUDIO & VISUAL SYSTEM

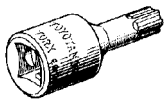
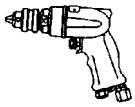
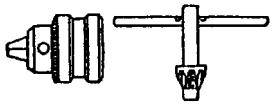
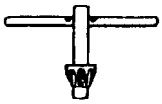
PREPARATION

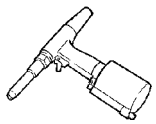
02170-01

SST

	09950-50013	Puller C Set	ANTENNA CORD SUB-ASSY W/HOLDER ANTENNA ASSY
	(09951-05010)	Hanger 150	ANTENNA CORD SUB-ASSY W/HOLDER ANTENNA ASSY
	(09952-05010)	Slide Arm	ANTENNA CORD SUB-ASSY W/HOLDER ANTENNA ASSY
	(09953-05020)	Center Bolt 150	ANTENNA CORD SUB-ASSY W/HOLDER ANTENNA ASSY
	(09954-05021)	Claw No.2	ANTENNA CORD SUB-ASSY W/HOLDER ANTENNA ASSY

Recomended Tools

	09042-00010	Torx Socket T30	ANTENNA CORD SUB-ASSY W/HOLDER ANTENNA ASSY
	09050-00032	Air Drill	FRONT NO.1 SPEAKER ASSY REAR SPEAKER ASSY(3-DOOR HATCHBACK) REAR SPEAKER ASSY(5-DOOR HATCHBACK) REAR SPEAKER ASSY(SEDAN/STATION WAGON)
	(09050-00210)	Chuck Set	FRONT NO.1 SPEAKER ASSY REAR SPEAKER ASSY(3-DOOR HATCHBACK) REAR SPEAKER ASSY(5-DOOR HATCHBACK) REAR SPEAKER ASSY(SEDAN/STATION WAGON)
	(09050-00220)	Handle	FRONT NO.1 SPEAKER ASSY REAR SPEAKER ASSY(3-DOOR HATCHBACK) REAR SPEAKER ASSY(5-DOOR HATCHBACK) REAR SPEAKER ASSY(SEDAN/STATION WAGON)

	09050-20010	Air Riveter	FRONT NO.1 SPEAKER ASSY REAR SPEAKER ASSY(3-DOOR HATCHBACK) REAR SPEAKER ASSY(5-DOOR HATCHBACK) REAR SPEAKER ASSY(SEDAN/STATION WAGON)
	(09050-02010)	Dust Cap	FRONT NO.1 SPEAKER ASSY REAR SPEAKER ASSY(3-DOOR HATCHBACK) REAR SPEAKER ASSY(5-DOOR HATCHBACK) REAR SPEAKER ASSY(SEDAN/STATION WAGON)
	(09050-02020)	Nose Piece No.1	FRONT NO.1 SPEAKER ASSY REAR SPEAKER ASSY(3-DOOR HATCHBACK) REAR SPEAKER ASSY(5-DOOR HATCHBACK) REAR SPEAKER ASSY(SEDAN/STATION WAGON)
	09060-60350	Revet Cutter	FRONT NO.1 SPEAKER ASSY REAR SPEAKER ASSY(3-DOOR HATCHBACK) REAR SPEAKER ASSY(5-DOOR HATCHBACK) REAR SPEAKER ASSY(SEDAN/STATION WAGON)
	09070-20010	Moulding Remover	AMPLIFIER ANTENNA ASSY ANTENNA CORD SUB-ASSY W/HOLDER ANTENNA ASSY

Equipment

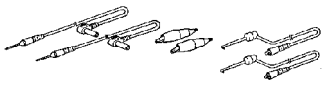
Torque wrench	

WINDSHIELD/WINDOWGLASS/MIRROR

0216Z-01

PREPARATION

Recomended Tools

	09070-20010	Moulding Remover	WINDSHIELD GLASS
	(09083-00150)	Test Lead Set	POWER WINDOW CONTROL SYSTEM(TMC MADE) POWER WINDOW CONTROL SYSTEM(TMUK MADE)

Equipment

Adhesive	
Hand riveter	
Torque wrench	
Knife	
Sealer gun	
Tape	To avoid surface damage.
Piano wire	Windshield
Plastic sheet	To avoid surface damage.
Wooden block or similar object	For tying both piano wire ends

SSM

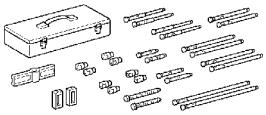
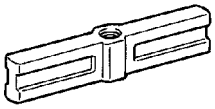
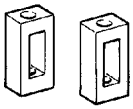
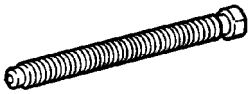
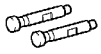
	08833-00030	Three cement black or equivalent	WINDSHIELD GLASS QUARTER WINDOW GLASS LH(3-DOOR HATCHBACK) BACK DOOR GLASS(HATCHBACK) BACK WINDOW GLASS(SEDAN) BACK DOOR GLASS(STATION WAGON) QUARTER WINDOW ASSY LH(STATION WAGON)
	08850-00801	Windshield Glass Adhesive Set or equivalent	WINDSHIELD GLASS QUARTER WINDOW GLASS LH(3-DOOR HATCHBACK) BACK DOOR GLASS(HATCHBACK) BACK WINDOW GLASS(SEDAN) BACK DOOR GLASS(STATION WAGON) QUARTER WINDOW ASSY LH(STATION WAGON)

INSTRUMENT PANEL/METER

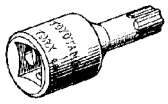
0216B-01

PREPARATION

SST

	09843-18020	Diagnosis Check Wire	
	09950-50013	Puller C Set	INSTRUMENT PANEL SUB-ASSY LOWER(HATCHBACK)
	(09951-05010)	Hanger 150	INSTRUMENT PANEL SUB-ASSY LOWER(HATCHBACK)
	(09952-05010)	Slide Arm	INSTRUMENT PANEL SUB-ASSY LOWER(HATCHBACK)
	(09953-05020)	Center Bolt 150	INSTRUMENT PANEL SUB-ASSY LOWER(HATCHBACK)
	(09954-05021)	Claw No.2	INSTRUMENT PANEL SUB-ASSY LOWER(HATCHBACK)

Recomended Tools

	09042-00010	Torx Socket T30	INSTRUMENT PANEL SUB-ASSY LOWER(HATCHBACK) INSTRUMENT PANEL SUB-ASSY LOWER(SEDAN/STATION WAGON)
	09070-20010	Moulding Remover	INSTRUMENT PANEL SUB-ASSY LOWER(HATCHBACK) INSTRUMENT PANEL SUB-ASSY LOWER(SEDAN/STATION WAGON)

Equipment

Voltmeter	
Ohmmeter	
Torque wrench	
Adhesive Tape	

SEAT

PREPARATION

0216C-01

Equipment

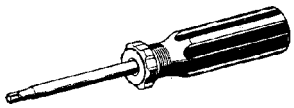
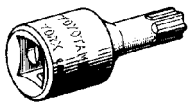
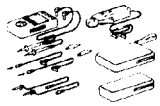
Hog ring pliers	
Hog ring	
Torque wrench	
Tape	To avoid surface damage
Ohmmeter	

SLIDING ROOF/CONVERTIBLE

0217O-01

PREPARATION

Recomended Tools

	09041-00020	Torx Driver T25	SLIDING ROOF HOUSING SUB-ASSY(TMUK MADE)
	09042-00030	Torx Socket T20	SLIDING ROOF HOUSING SUB-ASSY(TMUK MADE)
	09082-00040	TOYOTA Electrical Tester	SLIDING ROOF SYSTEM(TMUK MADE)
	09082-00050	TOYOTA Electrical Tester Set	SLIDING ROOF SYSTEM(TMUK MADE)

Equipment

Hand riveter	
Drill	
Torque wrench	

ENGINE HOOD/DOOR

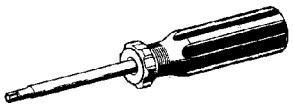
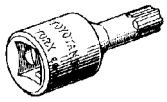
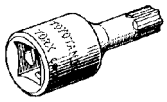
PREPARATION

0216U-01

SST

	09804-24010	Luggage Compartment Door Torsion Bar Tool	LUGGAGE DOOR HINGE TORSION BAR RH(SEDAN)
	09812-00010	Door Hinge Set Bolt Wrench	FRONT DOOR(HATCHBACK) FRONT DOOR(SEDAN/STATION WAGON)

Recomended Tools

	09041-00020	Torx Driver T25	FRONT DOOR(SEDAN/STATION WAGON) REAR DOOR(SEDAN/STATION WAGON)
	09042-00010	Torx Socket T30	FRONT DOOR(3-DOOR HATCHBACK) REAR DOOR(5-DOOR HATCHBACK) FRONT DOOR(5-DOOR HATCHBACK) FRONT DOOR(SEDAN/STATION WAGON) REAR DOOR(SEDAN/STATION WAGON)
	09042-00020	Torx Socket T40	REAR DOOR FRONT DOOR(HATCHBACK) FRONT DOOR(SEDAN/STATION WAGON)
	09070-20010	Moulding Remover	FRONT DOOR(3-DOOR HATCHBACK) REAR DOOR(5-DOOR HATCHBACK) FRONT DOOR(5-DOOR HATCHBACK) FRONT DOOR(SEDAN/STATION WAGON) REAR DOOR(SEDAN/STATION WAGON)

Equipment

Clip remover	
Tape	To avoid surface damage
Torque wrench	

EXTERIOR/INTERIOR TRIM

02171-01

PREPARATION

Recomended Tools

	09070-20010 Moulding Remover	FRONT DOOR BELT MOULDING ASSY LH REAR DOOR BELT MOULDING ASSY LH ROOF DRIP SIDE FINISH MOULDING CENTER LH(SEDAN) ROOF DRIP SIDE FINISH MOULDING CENTER LH(STATION WAGON) ROOF DRIP SIDE FINISH MOULDING CENTER LH(HATCHBACK) ROOF HEADLINING ASSY(SEDAN) ROOF HEADLINING ASSY(STATION WAGON) ROOF HEADLINING ASSY(3-DOOR HATCHBACK) ROOF HEADLINING ASSY(5-DOOR HATCHBACK)

Equipment

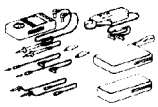
Adhesive tape	To avoid surface damage.
Torque wrench	
Clip remover	
Cleaner	
Heat light	Moulding
Piano wire	Moulding
Tape	To avoid surface damage.
Wooden block or similar object	For tying both piano wire ends

VEHICLE CONTROL SYSTEM

0217D-01

PREPARATION

Recomended Tools

	09082-00040	TOYOTA Electrical Tester	IGNITION SWITCH(TMC MADE) IGNITION SWITCH(TMUK MADE)
	09082-00050	TOYOTA Electrical Tester Set	IGNITION SWITCH(TMC MADE) IGNITION SWITCH(TMUK MADE)

SERVICE SPECIFICATIONS

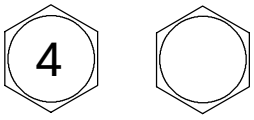
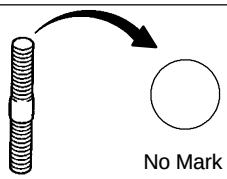
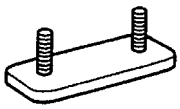
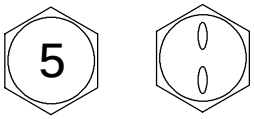
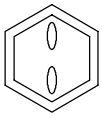
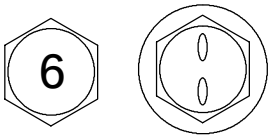
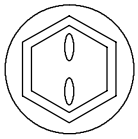
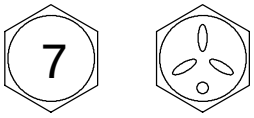
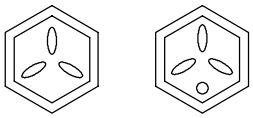
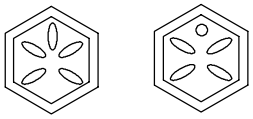
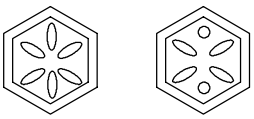
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STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

03096-02

Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
 No Mark	 No Mark	 No Mark		4T
				5T
 w/ Washer	 w/ Washer			6T
				7T
				8T
				9T
				10T
				11T

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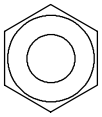
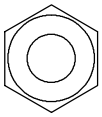
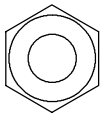
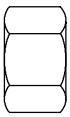
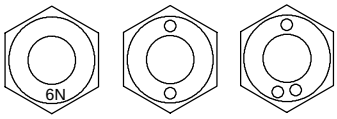
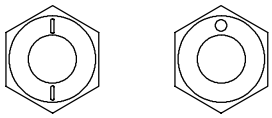
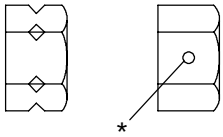
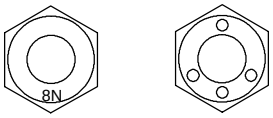
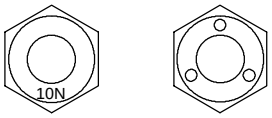
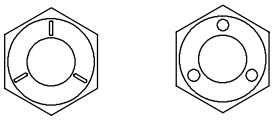
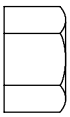
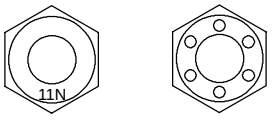
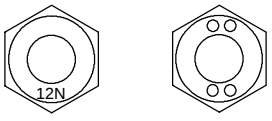
03097-02

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N·m	kgf·cm	ft·lbf	N·m	kgf·cm	ft·lbf
4T	6	1	5	55	48 in.·lbf	6	60	52 in.·lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	-	-	-
5T	6	1	6.5	65	56 in.·lbf	7.5	75	65 in.·lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	-	-	-
6T	6	1	8	80	69 in.·lbf	9	90	78 in.·lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	-	-	-
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	-	-	-
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

03098-02

HOW TO DETERMINE NUT STRENGTH

Nut Type			Class
Present Standard Hexagon Nut	Old Standard Hexagon Nut		
	Cold Forging Nut	Cutting Processed Nut	
 No Mark			4N
 No Mark (w/ Washer)	 No Mark (w/ Washer)	 No Mark	5N (4T)
 6N			6N
		 *	7N (5T)
 8N			8N
 10N		 No Mark	10N (7T)
 11N			11N
 12N			12N

*: Nut with 1 or more marks on one side surface of the nut.

B06432

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

ENGINE CONTROL SYSTEM

030LV-01

SERVICE DATA

2ZZ-GE/3ZZ-FE/4ZZ-FE:

Throttle idle speed control valve assy		
Movement	Ignition switch ON	Half open → fully close → fully open → half open
Intake air flow meter sub-assy		
Resistance	THA - E2	
	at -20_C (-4_F)	13.6 - 18.4 kΩ
	at 20_C (68_F)	2.21 - 2.69 kΩ
	at 60_C (140_F)	0.49 - 0.67 kΩ
Camshaft timing oil control valve assy		
Resistance	at 20_C (68_F)	6.9 - 7.9 Ω
E.F.I Throttle position sensor		
Resistance	VC - E2	2.5 - 6.0 kΩ
E.F.I. Engine coolant temperature sensor		
Resistance	Approx. 20_C (68_F)	2.32 - 2.59 kΩ
	Approx. 80_C (176_F)	0.310 - 0.326 kΩ
Knock control sensor		
Resistance	(2ZZ-GE)	No continuity
	(3ZZ-FE/4ZZ-FE) Approx. 20_C (68_F)	120 - 280 kΩ

1CD-FTV:

Intake air flow meter sub-assy		
Resistance	THA - E2	
	at -20_C (-4_F)	12.5 - 16.9 kΩ
	at 20_C (68_F)	2.19 - 2.67 kΩ
	at 60_C (140_F)	0.50 - 0.68 kΩ
Intake shutter assy		
Resistance	at 20_C (68_F)	
	2 - 1, 3	18 - 22 Ω
	5 - 4, 6	18 - 22 Ω
Accelerator pedal assy		
Resistance	VPA1 - EP1	5.0 kΩ or less
	VPA2 - EP2	5.0 kΩ or less
	VCP1 - EP1	1.5 - 6.0 kΩ
	VCP2 - EP2	1.5 - 6.0 kΩ
Diesel turbo inlet air temperature sensor		
Resistance	Approx. 20_C (68_F)	2.21 - 2.65 kΩ
Crank position sensor		
Resistance	at cold	1630 - 2740 Ω
	at hot	2065 - 3225 Ω
Crank position sensor		
Resistance	at cold	1630 - 2740 Ω
	at hot	2065 - 3225 Ω
Diesel engine engine coolant temperature sensor		
Resistance	Approx. 20_C (68_F)	2.32 - 2.59 kΩ
	Approx. 80_C (176_F)	0.310 - 0.326 kΩ

030LW-01

TORQUE SPECIFICATION

2ZZ-GE/3ZZ-FE/4ZZ-FE:

Part Tightened	N·m	kgf·cm	ft·lbf
Throttle body idle speed control valve assy x Throttle body assy	3.7	38	33 in.·lbf
E.F.I. Throttle position sensor x Throttle body assy	2.0	20	18 in.·lbf
Throttle body assy x Intake manifold 3ZZ-FE/4ZZ-FE	30	306	22
Throttle body assy x Intake manifold 2ZZ-GE	22	224	16
Cylinder head cover No. 2 x Cylinder head cover sub-assy	7.0	71	62 in.·lbf

1CD-FTV:

Part Tightened	N·m	kgf·cm	ft·lbf
Intake shutter assy x Intake air connector	21	214	16
Engine cover No. 1 x Cylinder head cover sub-assy	8.0	82	71 in.·lbf
Engine cover No. 1 x Intake manifold	8.0	82	71 in.·lbf
Air tube No. 2 x Transmission (w/ Intercooler)	25	255	18
Air tube No. 1 x Air tube No. 2 (w/ Intercooler)	25	255	18
Air tube No. 2 x Transmission (w/o Intercooler)	25	255	18

FUEL

SERVICE DATA

030LX-01

2ZZ-GE/3ZZ-FE/4ZZ-FE:

Fuel pressure Standard pressure	 HATCH BACK SEDAN/STAITION WAGON	 301 – 347 kPa (3.1 – 3.5 kgf·cm^2, 44 – 50 psi) 304 – 347 kPa (3.1 – 3.5 kgf·cm^2, 44 – 50 psi)
Fuel pressure Standard pressure		 304 – 343 kPa (3.1 – 3.5 kgf·cm^2, 44 – 50 psi)
Fuel injector assy Resistance	 at 20_C (68_F)	 13.4 – 14.2 Ω
Fuel injector assy (2ZZ-GE) Injection volume		 77 – 93 cm^3 (4.7 – 5.7 cu in.) per 15 seconds
Fuel injector assy (3ZZ-FE/4ZZ-FE) Injection volume		 39 – 53 cm^3 (2.4 – 3.2 cu in.) per 15 seconds
Fuel injector assy (2ZZ-GE) 	 Difference between each injector	 16 cm^3 (1.0 cu in.) or less
Fuel injector assy (3ZZ-FE/4ZZ-FE) 	 Difference between each injector	 14 cm^3 (0.9 cu in.) or less
Fuel injector assy (2ZZ-GE) Fuel drop		 1 drop or less per 12 minutes
Fuel injector assy (3ZZ-FE/4ZZ-FE) Fuel drop		 1 drop or less per 5 minutes
Fuel pump assy Resistance	 at 20_C (68_F)	 0.2 – 3.0 Ω

1CD-FTV:

Injection pump assy Resistance	 at 20_C (68_F)	 1.5 – 1.7 Ω
Injector assy Resistance	 at 20_C (68_F)	 2.6 – 2.8 Ω
Fuel heater assy Resistance	 at 20_C (68_F)	 0.5 – 2.0 Ω
Fuel temperature sensor Resistance	 Approx. 20_C (68_F) Approx. 80_C (176_F)	 2.21 – 2.69 Ω 0.287 – 0.349 Ω
Common rail assy Resistance	 2 – 3 1 – 2	 3 kΩ or less 16.4 kΩ or less

030LY-01

TORQUE SPECIFICATION

2ZZ-GE/3ZZ-FE/4ZZ-FE:

Part Tightened		N·m	kgf·cm	ft·lbf
Fuel delivery pipe sub-assy x Cylinder head sub-assy	2ZZ-GE	29	296	21
Fuel delivery pipe sub-assy x Cylinder head sub-assy	3ZZ-FE/4ZZ-FE	19	194	14
Fuel delivery pipe sub-assy (Clamp side) x Cylinder head sub-assy		9.0	92	80 in.·lbf
Fuel pipe clamp x Cylinder head sub-assy	2ZZ-GE	9.0	92	80 in.·lbf
Cylinder head cover No. 2 x Cylinder head cover sub-assy		7.0	71	62 in.·lbf
Child restraint seat anchor x Body		31	316	23
Seat belt anchor x Body		42	420	30
Rear seat cushion assy x Rear seat back hinge		31	316	23
Fuel tank vent tube set plate x Fuel tank assy	SEDAN/STATION WAGON	8.0	80	70 in.·lbf
Fuel tank band sub-assy x Body		40	408	30
Parking brake cable assy x Body		5.4	55	48 in.·lbf
Fuel tank protector No. 1 x Body		5.4	55	48 in.·lbf
Fuel tank protector No. 1 x Fuel tank band sub-assy No. 1		5.4	55	48 in.·lbf
Exhaust pipe assy front x Exhaust manifold		43	440	32
Exhaust pipe assy front x Tail pipe assy		43	440	32
Floor panel brace front x Body		30	302	22

1CD-FTV:

Part Tightened		N·m	kgf·cm	ft·lbf
Nozzle holder camp x Cylinder head sub-assy		27	270	20
Nozzle leakage pipe assy x Injector assy	Hollow screw	18	184	13
	Union bolt	22	224	16
Overflow screw x Plug		9.8	100	7
Nozzle leakage pipe No. 2 x Cylinder head sub-assy		21	214	16
Injection pipe sub-assy No. 1 - No. 4 x Injector assy				
	For use with SST	31	316	23
		34	347	25
Injection pipe sub-assy No. 1 - No. 4 x Common rail assy				
	For use with SST	37	377	27
		41	418	30
Injection pipe clamp No. 2 x Intake manifold		5.0	51	44 in.·lbf
Fuel inlet pipe sub-assy x Common rail assy				
	For use with SST	37	377	27
		41	418	30
Fuel inlet pipe sub-assy x Injection pump assy				
	For use with SST	31	316	23
		34	347	25
Fuel inlet pipe sub-assy x Intake manifold		7.4	75	65 in.·lbf
Air cleaner case x Body		7.0	71	62 in.·lbf
Air cleaner case x Transverse engine engine mounting bracket		7.0	71	62 in.·lbf
Engine cover No. 1 x Cylinder head cover sub-assy		8.0	82	71 in.·lbf
Engine cover No. 1 x Intake manifold		8.0	82	71 in.·lbf
Vacuum reservoir sub-assy x Cowl top panel outer		8.3	85	73 in.·lbf
Fuel pipe No. 2 x Injection pump assy		25	255	18
Injection pump assy x Oil pump assy		21	214	16
Injection pump stay No. 1 x Cylinder block sub-assy		21	214	15
Injection pump stay No. 1 x Injection pump assy		21	214	15
Injection pump drive pulley x Injection pump assy		103	1,050	76
Common rail assy x Cylinder block sub-assy		43	440	32
Water outlet x Cylinder head sub-assy		21	214	15
Transverse engine engine mounting bracket x Water pump assy		64	650	47

03-8

SERVICE SPECIFICATIONS - FUEL

Part Tightened	N·m	kgf·cm	ft·lbf
Transverse engine engine mounting bracket x Cylinder block sub-assy	37	377	27
Idler pulley sub-assy x V-ribbed belt tensioner assy	40	408	30
Engine mounting insulator sub-assy x Body	52	530	38
Engine mounting insulator sub-assy x Transverse engine engine mounting bracket	52	530	38
Injector driver x Body	5.0	51	44 in.·lbf
Battery clamp sub-assy x Body	5.0	51	44 in.·lbf
Front wheel RH x Front axle hub sub-assy RH	103	1,050	76
Fuel filter assy x Fuel filter support	18	178	13
Child restraint seat anchor x Body	31	316	23
Seat belt anchor x Body	42	420	30
Rear seat cushion assy x Rear seat back hinge	31	316	23
Fuel tank vent tube set plate x Fuel tank assy SEDAN/STATION WAGON	8.0	80	70 in.·lbf
Fuel tank band sub-assy x Body	40	408	30
Parking brake cable assy x Body	5.4	55	48 in.·lbf
Fuel tank protector No. 1 x Body	5.4	55	48 in.·lbf
Fuel tank protector No. 1 x Fuel tank band sub-assy No. 1	5.4	55	48 in.·lbf
Exhaust pipe assy front x Exhaust manifold	43	440	32
Exhaust pipe assy front x Tail pipe assy	43	440	32
Floor panel brace front x Body	30	302	22

EMISSION CONTROL

030LZ-01

SERVICE DATA

2ZZ-GE/3ZZ-FE/4ZZ-FE:

Oxyzen sensor		
Resistance	HT - +B	11 - 16 Ω
Vacuum switching valve		
Resistance	at 20_C (68_F)	30 - 34 Ω
Operation	air flows port E to port F	Air flows from the port F
Vacuum switching valve assy	2ZZ-GE	
Resistance	at 20_C (68_F)	37 - 44 Ω

1CD-FTV:

Electric EGR control valve assy		
Resistance	at 20_C (68_F)	11 - 13 Ω
Vacuum switching valve assy No. 1		
Resistance	at 20_C (68_F)	33 - 39 Ω

030M0-01

TORQUE SPECIFICATION

2ZZ-GE:

Part Tightened		N·m	kgf·cm	ft·lbf
Air switching valve x Air switching valve bracket		8.0	82	71
Air switching valve x Engine mounting bracket RH		21	209	15
Cylinder head cover No. 2 x Cylinder head cover		7.0	71	62
Air pump assy x Body	Nut	7.0	71	62
	Bolt	7.0	71	62

INTAKE

030M1-01

SERVICE DATA

1CD-FTV:

Turbocharging pressure		
Standard pressure		
	w/ Inter cooler	59 - 79 kPa (0.60 - 0.80 kgf/cm^2, 8.5 - 11.4 psi)
	w/o Inter cooler	40 - 70 kPa (0.41 - 0.71 kgf/cm^2, 5.8 - 10.2 psi)
Turbo pressure sensor		
Voltage	VC - E2	4.5 - 5.5 V
Voltage drop	apply vacuum 13.3 kPa (100 mmHg, 3.94 in.Hg)	0.1 - 0.3 V
	apply vacuum 26.7 kPa (200 mmHg, 7.87 in.Hg)	0.3 - 0.5 V
	apply vacuum 40.0 kPa (300 mmHg, 11.81 in.Hg)	0.5 - 0.7 V
	apply vacuum 57.3 kPa (400 mmHg, 15.75 in.Hg)	0. 7- 0.9 V
	apply vacuum 66.7 kPa (500 mmHg, 19.96 in.Hg)	0. 9- 1.0 V
Voltage up	applied vacuum 19.6 kPa (0.20 kgf/cm2, 2.84 psi)	0.1 - 0.4 V
	applied vacuum 39.2 kPa (0.40 kgf/cm2, 5.69psi)	0.4 - 0.7 V
	applied vacuum 58.8 kPa (0.60 kgf/cm2, 8.53psi)	0.7 - 1.0 V
	applied vacuum 78.5 kPa (0.80 kgf/cm2, 11.4psi)	1.0 - 1.3 V
	applied vacuum 98.0 kPa (1.00 kgf/cm2, 14.2psi)	1.3 - 1.6 V
Vacuum switching valve assy		
Resistance	at 20_C (68_F)	37 - 44 Ω

030M2-01

TORQUE SPECIFICATION

1CD-FTV:

Part Tightened		N·m	kgf·cm	ft·lbf
Turbocharger sub-assy x Exhaust manifold		53	541	39
Turbo oil outlet pipe x Turbocharger sub-assy		13	133	10
Turbo oil outlet pipe x Cylinder head sub-assy		8.8	90	78 in.·lbf
Turbo oil inlet pipe x Turbocharger sub-assy		36	367	27
Turbo oil inlet pipe x Cylinder block sub-assy		36	367	27
Turbo oil inlet pipe x Vacuum pump oil pipe		8.8	90	78 in.·lbf
Manifold converter sub-assy x Turbocharger sub-assy		25	255	18
Manifold stay x Manifold converter sub-assy		61	622	45
Manifold stay x Cylinder block sub-assy		61	622	45
Turbocharger stay x Cylinder head sub-assy	1st	15	153	11
	2nd	56	571	41
Turbocharger stay x Manifold converter sub-assy		56	571	41
Exhaust manifold heat insulator No. 2 x Turbocharger sub-assy		12	122	9
Turbo insulator No. 1 x Manifold converter sub-assy		20	204	15
Turbo insulator No. 1 x Turbocharger sub-assy	Bolt	20	204	15
	Nut	18	184	13
Turbo insulator No. 2 x Manifold converter sub-assy		20	204	15
Floor panel brace front x Body		30	302	22
Fuel filter assy x Fuel filter support		18	178	13
Air tube No. 1 x Intake air connector	w/ Inter cooler	25	255	18
	w/ Inter cooler	18	184	13
Air cleaner case x Body		7.0	71	62 in.·lbf
Air cleaner case x Engine mounting insulator LH		7.0	71	62 in.·lbf
Engine cover No. 1 x Cylinder head cover sub-assy		8.0	82	71 in.·lbf
Engine cover No. 1 x Intake manifold		8.0	82	71 in.·lbf
Vacuum reservoir sub-assy x Cowl top panel outer		8.3	85	73 in.·lbf

ENGINE MECHANICAL

SERVICE DATA

03000-06

2ZZ-GE:

Ignition timing		8 - 12_BTDC
Idle speed		750 - 850 rpm
Compression		
Compression pressure		1,400 kPa (14.3kgf/cm^2 203 psi)
Minimum pressure		1,000 kPa (10.2 kgf/cm^2 145 psi)
Difference between each cylinder		110 kPa (1.1kgf/cm^2 16 psi)
Cylinder head set bolt		
Length	Standard	146.0 - 148.2 mm (5.780 - 5.835 in.)
	Maximum	148.5 mm (5.846 in.)
Valve clearance (cold)	Intake	0.08 - 0.18 mm (0.003 - 0.007 in.)
	Exhaust	0.22 - 0.32 mm (0.009 - 0.013in.)

3ZZ-FE/4ZZ-FE:

Ignition timing		
	w/ Terminals TC and CG of DLC3 connected	8 - 12_BTDC
	w/ Terminals TC and CG of DLC3 disconnected	3 - 13_BTDC (3ZZ-FE) -6 - 9_BTDC (4ZZ-FE)
Idle speed		600 - 700 rpm (M/T) 650 - 750 rpm (A/T)
Compression		
Compression pressure		1,300 kPa (13.3kgf/cm^2 189 psi)
Minimum pressure		1,000 kPa (10.2 kgf/cm^2 145 psi)
Difference between each cylinder		100 kPa (1.0kgf/cm^2 14 psi)
Cylinder head set bolt		
Length	Standard	156.0 - 159.0 mm (6.142 - 6.260 in.)
	Maximum	159.5 mm (6.280 in.)
Valve clearance (cold)	Intake	0.15 - 0.25 mm (0.006 - 0.010 in.)
	Exhaust	0.25 - 0.35 mm (0.010 - 0.014in.)

1CD-FTV:

New drive belt deflection	Pressing force: 98 N (10 kgf, 22 lbf)	
	For vane pump (w/ compressor)	9.5 - 11.5 mm (0.37 - 0.45 in.)
	For vane pump (w/o compressor)	10 - 11 mm (0.39 - 0.43 in.)
Used drive belt deflection	Pressing force: 98 N (10 kgf, 22 lbf)	
	For vane pump (w/ compressor)	12.5 - 15.5 mm (0.49 - 0.61 in.)
	For vane pump (w/o compressor)	15 - 18 mm (0.59 - 0.71 in.)
New drive belt tension		
	For vane pump (w/ compressor)	519 - 755 N (53 - 77 kgf, 117 - 170 lbf)
	For vane pump (w/o compressor)	647 - 843 N (66 - 86 kgf, 145 - 190 lbf)
Used drive belt tension		
	For vane pump (w/ compressor)	196 - 392 N (20 - 40 kgf, 44 - 88 lbf)
	For vane pump (w/o compressor)	323 - 519 N (33 - 53 kgf, 73 - 117 lbf)
Idle speed		700 - 800 rpm.
Maximum speed		5,100 - 5,250 rpm.
Compression pressure		
	at 250 rpm.	2,746 kPa (28.0 kgf/cm2, 398 psi) or more
	Minimum	2,256 kPa (23.0 kgf/cm2, 327 psi) or more
Difference between each cylinder		490 kPa (5.0 kgf/cm2, 71 psi) or less

SERVICE SPECIFICATIONS – ENGINE MECHANICAL

Valve clearance		
Intake	(cold)	0.20 – 0.30 mm (0.008 – 0.012 in.)
Exhaust		0.35 – 0.45 mm (0.014 – 0.018 in.)
Adjusting shim thickness	Mark 2.500	2.500 mm (0.0984 in.)
	Mark 2.550	2.550 mm (0.1004 in.)
	Mark 2.600	2.600 mm (0.1024 in.)
	Mark 2.650	2.650 mm (0.1043 in.)
	Mark 2.700	2.700 mm (0.1063 in.)
	Mark 2.750	2.750 mm (0.1083 in.)
	Mark 2.800	2.800 mm (0.1102 in.)
	Mark 2.850	2.850 mm (0.1122 in.)
	Mark 2.900	2.900 mm (0.1142 in.)
	Mark 2.950	2.950 mm (0.1161 in.)
	Mark 3.000	3.000 mm (0.1181 in.)
	Mark 3.050	3.050 mm (0.1201 in.)
	Mark 3.100	3.100 mm (0.1220 in.)
	Mark 3.150	3.150 mm (0.1240 in.)
	Mark 3.200	3.200 mm (0.1260 in.)
	Mark 3.250	3.250 mm (0.1280 in.)
	Mark 3.300	3.300 mm (0.1299 in.)
Cylinder head set bolt		
Outside diameter	Standard	10.75 – 11.00 mm (0.4232 – 0.4331 in.)
	Minimum	10.40 mm (0.4904 in.)

0300P-06

TORQUE SPECIFICATION

2ZZ-GE:

Part Tightened		N·m	kgf·cm	ft·lbf
Camshaft bearing cap No.1 x Cylinder head		19	189	14
Camshaft x Camshaft timing gear		54	551	40
Chain tensioner x Cylinder block		9.0	92	80 in·lbf
Cylinder head cover x Cylinder head		10	102	89 in·lbf
V-ribbed belt tensioner x Cylinder block	Nut	29	296	21
	Bolt	100	1,020	74
Engine hanger x Engine		38	385	28
Water temperature sensor x Cylinder head		20	208	15
Knock control sensor x Cylinder block		44	449	32
Crank position sensor x Timing chain cover		9.0	92	80 in.·lbf
Engine oil pressure switch x Cylinder block		15	153	11
Water by-pass pipe No.1 x Cylinder block		10	102	7
Ignition coil assy x Cylinder head cover		9.0	92	80 in.·lbf
Fuel delivery pipe sub assy x Cylinder head		29	296	21
Fuel delivery pipe clamp x Cylinder head		9.0	92	80 in.·lbf
Exhaust manifold x Cylinder head (See page14-19)	Bolt A	50	510	37
	Bolt B	21	214	16
Exhaust manifold insulator x Exhaust manifold		20	204	15
Intake manifold x Cylinder head (See page14-19)	Bolt A	34	347	25
	Bolt B	46	469	34
Surge tank stay No.1		24	245	18
Flywheel x Crankshaft				
	1st	49	500	36
	2nd	Turn90_	Turn90_	Turn90_
Clutch cover x Flywheel		19	195	14
Starter assy x engine (See page14-19)	Bolt	37	377	27
	Wiring	9.8	100	7
Engine mounting insulator FR x Engine mounting bracket		52	530	38
Engine mounting insulator RR x Engine mounting bracket		87	887	64
Vane pump assembly x Engine		37	377	27
Engine mounting insulator LH x Engine mounting bracket		80	816	59
Engine mounting insulator RH x Engine		52	530	38
Crossmember x Body (See page14-19)		39	398	29
Center member x Body (See page14-19)		133	1,357	98
Suspension nember brace x Crossmember (See page14-19)		133	1,357	98
Suspension nember brace x Body (See page14-19)		80	816	59
Front suspension arm x Lower ball joint		142	1,448	105
Front axle hub nut x Front drive shaft		216	2,200	159
Front stabilizer link x Front stabilizer link		44	449	33
Tie rod end x Steering knuckle		49	500	36
Clutch release cylinder x Manual transaxle (See page14-19)				
	Release cylinder	12	120	9
	Clamp bolt A	25	255	18
	Clamp bolt B	5.0	51	44 in.·lbf
Battery carrier x Body		13	131	9
Generator x Engine (See page14-19)	6 M	25	255	18
	8 M	58	591	43
Floor panel brace x Body		30	302	22
Chain vibration damper x Cylinder block		21	214	16
Chain tensioner slipper x Cylinder block		21	214	16

03-16

SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Part Tightened		N·m	kgf·cm	ft·lbf
Timing chain cover x Cylinder block (See page14-35)	6 M 8 M	11 21	112 214	8 16
Chain tensioner x Timing chain cover		9.0	92	80 in.·lbf
Crankshaft pulley x Crankshaft		118	1,204	87
Engine mounting bracket x Timing chain cover		52	530	38
Water pump x Timing chain cover		9.0	92	80 in.·lbf
Cylinder head x Cylinder block	1st 2nd	49 Turn 90_	500 Turn 90_	36 Turn 90_

3ZZ-FE/4ZZ-FE:

Part Tightened		N·m	kgf·cm	ft·lbf
Cylinder head cover No. 2 x Cylinder head cover sub-assy		7.0	71	62 in.·lbf
Camshaft bearing cap No. 3 x Cylinder head sub-assy		13	133	10
Camshaft bearing cap No. 1 x Cylinder head sub-assy		23	235	17
Camshaft timing gear or sprocket x Camshaft No. 2		54	551	40
Chain tensioner assy No. 1 x Timing chain or belt cover sub-assy		9.0	92	80 in.·lbf
V-ribbed belt tensioner assy x Cylinder block sub-assy		69	704	51
V-ribbed belt tensioner assy x Cylinder head sub-assy		29	296	21
Engine mounting insulator RH x Body		52	530	38
Engine mounting insulator RH x Transverse engine engine mounting bracket		52	530	38
Cylinder head cover sub-assy x Cylinder head sub-assy	w/o washer w/ washer	11 9.0	112 92	8 80 in.·lbf
Cylinder head cover sub-assy x Timing chain or belt cover sub-assy		11	112	8
Engine wire x Cylinder head cover sub-assy		9.0	92	80 in.·lbf
Ignition coil assy x Cylinder head cover sub-assy		9.0	92	80 in.·lbf
Engine hanger x Cylinder head cover sub-assy		38	387	28
E.F.I. Engine coolant temperature sensor x Cylinder head sub-assy		20	204	15
Exhaust manifold x Cylinder head sub-assy		37	377	27
Exhaust manifold heat insulator No. 1 x Exhaust manifold		18	184	13
Manifold stay x Exhaust manifold		49	500	36
Manifold stay x Cylinder block sub-assy		49	500	36
Transverse engine engine mounting bracket x Timing chain or belt cover sub-assy		47	479	35
Knock control sensor x Cylinder block sub-assy		20	204	15
Crank position sensor No. 1 x Cylinder head sub-assy		9.0	92	80 in.·lbf
Engine oil pressure switch assy x Cylinder block sub-assy		15	153	11
Water inlet x Cylinder block sub-assy		11	112	8
Water by-pass pipe No. 1 x Cylinder block sub-assy		9.0	92	80 in.·lbf
Water by-pass pipe No. 1 x Cylinder head sub-assy		9.0	92	80 in.·lbf
Oil level gage guide x Water by-pass pipe No. 1		13	133	10
Intake manifold x Cylinder head sub-assy		30	306	22
Flywheel sub-assy x Crankshaft	1st 2nd	49 Turn 90_	500 Turn 90_	36 Turn 90_
Drive plate & ring gear sub-assy x Crankshaft		88	897	65
Transverse engine engine mounting bracket front x Transverse engine engine mounting insulator front		52	530	38
Transverse engine engine mounting bracket rear x Transverse engine engine mounting insulator rear		87	887	64
V-ribbed idler assy No. 1 x Cylinder block sub-assy		39	400	29
Transverse engine engine mounting bracket LH x Transverse engine engine mounting insulator LH		80	816	59
Transverse engine engine mounting bracket RH x Transverse engine engine mounting insulator RH		52	530	38

SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Part Tightened		N·m	kgf·cm	ft·lbf
Front suspension crossmember sub-assy x Body (TMC MADE)	Front Rear	113 157	1,152 1,601	83 116
Front suspension crossmember sub-assy x Body (TMUK MADE)		133	1,356	98
Front suspension member brace x Front suspension crossmember sub-assy (TMUK MADE)		133	1,356	98
Front suspension member brace x Body (TMUK MADE)		80	816	59
Engine mounting member sub-assy center x Body		39	398	29
Floor panel brace front x Body		30	306	22
Air cleaner case x Body		7.0	71	62 in.·lbf
Air cleaner case x Transverse engine engine mounting bracket LH		7.0	71	62 in.·lbf
Battery carrier x Body		13	133	10
Battery clamp sub-assy x Body		5.0	51	44 in.·lbf
Battery clamp sub-assy x Battery clamp bolt		30 - 4.0	31 - 41	27 - 35 in.·lbf
Radiator support upper x Body		19	194	14
Front wheel RH & LH x Front axle hub sub-assy RH & LH		103	1,050	76
Chain tensioner slipper x Cylinder block sub-assy		19	194	14
Timing chain or belt cover sub-assy x Cylinder head sub-assy		13	133	10
Timing chain or belt cover sub-assy x Cylinder block sub-assy	M6 M8	13 19	133 194	10 14
Water pump assy x Cylinder block sub-assy		11	112	8
Water pump assy x Timing chain or belt cover sub-assy		9.0	92	80 in.·lbf
Crankshaft pulley x Crankshaft		138	1,407	102
Cylinder head sub-assy x Cylinder block sub-assy	1st 2nd	49 Turn 90_	500 Turn 90_	36 Turn 90_
Camshaft timing oil control valve assy x Cylinder head sub-assy		9.0	92	80 in.·lbf
Chain vibration damper No. 1 x Cylinder head sub-assy		9.0	92	80 in.·lbf
Chain vibration damper No. 1 x Cylinder block sub-assy		9.0	92	80 in.·lbf

1CD-FTV:

Part Tightened		N·m	kgf·cm	ft·lbf
Idle pulley set nut		39	398	29
Engine cover Sub-assy x Clinder head cover		8.0	82	71 in.·lbf
Front wheel		103	1,050	76
Drain plug (Manual trnsaxle)		49	500	36
Engine hanger No.1 x Cylinder head		37	378	27
Engine hanger No.2 x Cylinder head		37	378	27
Diesel engine engine coolant temperture sensor x Cylinder head		20	204	15
Crank position sensor x Cylinder block		7.5	76	66 in.·lbf
Crank position sensor x Cylinder head		8.8	90	78 in.·lbf
Oil cooler pipe x Cylinder block		56	571	41
Compressor mounting bracket x Cylinder block		31	320	23
Injection pump x Water pump		21	214	15
Injection pump stay x Clinder block, Injection pump		21	214	15
Oil level gage guide x Injection pump stay		18	184	13
Timing belt No.3 cover x Cylinder head		7.4	75	65 in.·lbf
Intake manifold x Cylinder head		21	214	15
Wiring harness clamp bracket x Intake manifold		3.9 - 6.9	40 - 70	35 - 61 in.·lbf
Idle w/ bracket pulley assy x Cylinder head	Bolt A Bolt B	72 39	735 398	53 29
Common rail assy x Cylinder block		43	439	32
Injection pipe, Fuel inlet pipe x Common rail	For use with SST	37 41	377 418	27 30

03-18

SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Part Tightened		N·m	kgf·cm	ft·lbf
Injection pipe x Injector	For use with SST	31 34	316 347	23 25
Injection pipe clamp x Intake manifold		5.0	51	44 in.·lbf
Fuel inlet pipe x Common rail	For use with SST	37 41	377 418	27 30
Fuel inlet pipe x injection pump	For use with SST	31 34	316 347	23 25
Fuel inlet pipe clamp x Intake manifold		7.4	75	65 in.·lbf
Nozzle leakage pipe No.2 x Cylinder head		21	214	15
Vacuum pump x Cylinder head		21	214	15
EGR valve assy x Cylinder head		18	185	13
Intake air connector with diesel throttle body x intake manifold		21	214	15
Water inlet x Cylinder block		8.8	90	78 in.·lbf
Water outlet Sub-assy x Cylinder head		21	214	15
Exhaust manifold x Cylinder head		47	475	34
Oil filter bracket x No.1 oil pan		34	347	25
V-ribbed belt tensioner assy x Oil pump		31	316	23
Generater bracket No.1 x Cylinder block		37	380	27
Idler pulley Sub-assy x Drive belt tensioner		40	408	30
Transverse engine engine mounting bracket x Engine mounting insulator RR		64	653	47
Transverse engine engine mounting bracket x Engine mounting insulator FR		64	653	47
Drive shaft bearing bracket x Cylinder block		64	653	47
Rear end plate x Cylinder block		8.4	86	74 in.·lbf
Frywheel x Cranksfaft		88	898	65
Engine mounting member sub-assy center x Body		39	398	29
Front suspension crossmember sub-assy x Rear engine mounting bracket		87	887	64
Front suspension crossmember sub-assy x Front engine mounting bracket		52	530	38
Front suspension crossmember sub-assy x Body (TMC MADE)	Front Rear	113 157	1,152 1,601	83 116
Front suspension crossmember sub-assy x Body (TMUK MADE)		133	1,356	98
Front suspension member brace x Front suspension crossmember sub-assy (TMUK MADE)		133	1,356	98
Front suspension member brace x Body (TMUK MADE)		80	816	59
Engine mounting insulator RH x Body		52	530	38
Engine mounting bracket LH x Engine mounting insulator LH		80	816	59
Floor panel brace front x Body		30	306	22
Injector driver x Engine mounting insulator RH		5.0	51	44 in.·lbf
Air tube No.2 x Manual transaxle		25	255	19
Air cleaner assy x Body x Engine mounting bracket LH		7.0	71	62 in.·lbf
Engine cover No.1 x Cylinder head cover		8.0	82	71 in.·lbf
Belt tensioner x Cylinder block		21	210	15
Timing chain cover plate x Cylinder block		9.0	92	80 in.·lbf
Transverse engine engine mounting bracket x Cylinder block	For 14 mm head bolt For 17 mm head bolt	37 64	375 650	27 47
Idler pulley set bolt		40	408	30
Crankshaft pulley x Cranksfaft		180	1,800	130
Engine mounting bracket No.2 RH x Transverse engine engine mounting bracket		52	530	38
Camshaft bearing cap x Cylinder head		20	204	15
Camshaft oil seal retainer x Cylinder head		8.8	90	78 in.·lbf
Camshaft timing pulley x Camshaft		88	900	65
Cylinder head cover x Cylinder head		13	133	9.6

SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Part Tightened	N·m	kgf·cm	ft·lbf
Cylinder head x Cylinder block	45	460	33
Drain plug (oil pan)	25	250	8
Rear end plate x Cylinder block	8.4	86	74 in.·lbf
Flywheel Sub-assy x Cranksfaft	88	900	65

EXHAUST

SERVICE DATA

030M3-01

2ZZ-GE/3ZZ-FE/4ZZ-FE:

Compression spring Free length	Exhaust pipe assy front x Exhaust manifold	44mm (1.7322 in)
Compression spring Free length	Exhaust pipe assy front x Tail pipe assy	40mm (1.5748 in)

1CD-FTV

Compression spring Free length	Exhaust pipe assy front x Exhaust manifold	44mm (1.7322 in)
Compression spring Free length	Exhaust pipe assy front x Tail pipe assy	40mm (1.5748 in)

030M4-01

TORQUE SPECIFICATION

2ZZ-GE/3ZZ-FE/4ZZ-FE:

Part Tightened	N·m	kgf·cm	ft·lbf
Exhaust pipe assy front x Exhaust manifold	43	440	32
Exhaust pipe assy front x Tail pipe assy	43	440	32
Floor panel brace front x Body	30	302	22
Oxygen sensor x Exhaust pipe assy front	44	450	33

1CD-FTV

Part Tightened	N·m	kgf·cm	ft·lbf
Exhaust pipe assy front x Exhaust manifold	43	440	32
Exhaust pipe assy front x Tail pipe assy	43	440	32
Floor panel brace front x Body	30	302	22

COOLING

030M5-01

SERVICE DATA

2ZZ-GE/3ZZ-FE/4ZZ-FE

Thermostat	2ZZ-GE	
Valve opening temperature		80 - 84_C (176 - 183_F)
Valve lift	at 90_C (194_F)	10 mm (0.39 in.) or more
Thermostat	3ZZ-FE/4ZZ-FE	
Valve opening temperature		74 - 78.5_C (152 - 173_F)
Valve lift	at 95_C (203_F)	10 mm (0.39 in.) or more
Radiator cap sub-assy		
Standard opening pressure		74 - 103 kPa (0.75 - 1.05 kgf/cm2, 10.7 - 14.9 psi)
Minimum opening pressure		59 kPa (0.6 kgf/cm2, 8.5 psi)
Cooling fan		
Standard amperage	at 20_C (68_F)	8 - 12 A
Cooling fan		
Resistarce	at 20_C (68_F)	1.17 - 1.43 Ω

1CD-FTV

Thermostat		
Valve opening temperature		80 - 84_C (176 - 183_F)
Valve lift	at 95_C (203_F)	8.5 mm (0.33 in.) or more
Radiator cap sub-assy		
Standard opening pressure		93 - 122 kPa (0.95 - 1.25 kgf/cm2, 13.4 - 17.6 psi)
Minimum opening pressure		78 kPa (0.8 kgf/cm2, 11.4 psi)
Cooling fan		
Standard amperage	at 20_C (68_F)	13.2 A
Cooling fan		
Resistarce	at 20_C (68_F)	1.17 - 1.43 Ω

030M6-01

TORQUE SPECIFICATION

2ZZ-GE/3ZZ-FE/4ZZ-FE

Part Tightened		N·m	kgf·cm	ft·lbf
Water pump x Cylinder block	2ZZ-GE	9.0	92	80 in.lbf
Water pump x Cylinder block	3ZZ-FE/4ZZ-FE			
	Bolt A	9.0	92	8.0 in.lbf
	Bolt B	11	113	8
Generator assy	12 mm head	25	250	18
Generator assy	14 mm head	58	519	43
Generator bracket x Generator assy	2ZZ-GE	29	296	21
Generator bracket x Intake air surge tank	2ZZ-GE	29	296	21
Cylinder head cover No. 2 x Cylinder head cover		7.0	71	62 in.lbf

1CD-FTV

Part Tightened	N·m	kgf·cm	ft·lbf
Drain plug	13	133	10
Water pump x Cylinder block	31	320	23
Water pump x Injection pump	21	214	15
Injection pump drive pulley x Injection pump	103	1,050	76
Timing belt idler Sub-assy No.1 x Cylinder block	35	357	26
Water inlet x Cylinder block	9.0	90	78 in.·lbf

LUBRICATION

SERVICE DATA

030M7-01

2ZZ-GE/3ZZ-FE/4ZZ-FE

Oil pressure	2ZZ-GE	
	at idle speed	39 kPa (0.4 kgf·cm^2, 5.7 psi) or more
	at 3,000 rpm	294 -539 kPa (3.0 - 5.5 kgf·cm^2, 43 - 78 psi) or more
Oil pressure	3ZZ-FE/4ZZ-FE	
	at idle speed	29 kPa (0.3 kgf·cm^2, 4.3 psi) or more
	at 3,000 rpm	294 -539 kPa (3.0 - 5.5 kgf·cm^2, 43 - 78 psi) or more

1CD-FTV

Oil pressure	at idle speed	29 kPa (0.3 kgf·cm^2, 4.3 psi) or more
	at 4,500 rpm	245 - 588 kPa (2.5 - 6.0 kgf·cm^2, 36 - 85 psi)

030M8-01

TORQUE SPECIFICATION

2ZZ-GE/3ZZ-FE/4ZZ-FE

Part Tightened	N·m	kgf·cm	ft·lbf
Oil pressure switch x Cylinder head	13	130	9
Oil pan drain plug x Oil pan	37	378	27
Oil pump x Cylinder block	9.0	92	80 in.·lbf

1CD-FTV

Part Tightened		N·m	kgf·cm	ft·lbf
Oil pressure switch x Oil filter bracket		15	152	11
Oil pump x Cylinder block		31	320	23
Oil pump insulator x Oil pump		7.5	76	66 in.·lbf
Crank position sensor x Oil pump		8.8	90	78 in.·lbf
Oil pan Sub-assy x Cylinder block	10 mm head bolt and nut	11	112	8
	12 mm head bolt	21	214	15
Oil pan insulator x Oil pan		7.5	76	66 in.·lbf
Oil strainer Sub-assy x Oil pan	bolt	21	209	15
	nut	13	135	10
Oil pan Sub-assy No.2 x No.1 oil pan		12	119	9
Engine oil level sensor x Oil pan Sub-assy No.2		5.4	55	48 in.·lbf
Oil level gage guide x Injection pump stay		18	184	13
Timing belt idler Sub-assy No. 1 x Drive belte tensioner		21	214	16
Timing belt idler Sub-assy No. 2 x Drive belte tensioner		47	499	35
Front wheel RH		103	1,050	76
Oil cooler assy x Cylinder block		45	454	33

IGNITION

SERVICE DATA

030M9-01

2ZZ-GE/3ZZ-FE/4ZZ-FE

Spark plug	2ZZ-GE	
Recommended spark plug	DENSO made	SK20R11
	NGK made	IFR6A11
Electrode gap	DENSO made	1.1mm (0.043 in.)
	NGK made	1.1mm (0.043 in.)
Spark plug	3ZZ-FE	
Recommended spark plug	DENSO made	K16R-U11
	NGK made	BKR5EYA-11
Electrode gap	DENSO made	1.1mm (0.043 in.)
	NGK made	1.1mm (0.043 in.)
Spark plug	4ZZ-FE	
Recommended spark plug	DENSO made	K16R-U11
	BOSCH made	FR8KCU
Electrode gap	DENSO made	1.1mm (0.043 in.)
	BOSCH made	1.0mm (0.039 in.)
Cam position sensor	2ZZ-GE	
Resistance	at cold	835-1400Ω
	at hot	1060-1645Ω
Cam position sensor No. 1	3ZZ-FE	
Resistance	at cold	835-1400Ω
	at hot	1060-1645Ω
Crank position sensor	2ZZ-GE	
Resistance	at cold	1630-2740Ω
	at hot	2065-3225Ω
Crank position sensor	3ZZ-FE	
Resistance	at cold	1630-2740Ω
	at hot	2065-3225Ω

030MA-01

TORQUE SPECIFICATION

2ZZ-GE/3ZZ-FE/4ZZ-FE

Part Tightened		N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head				
	2ZZ-GE	18	178	13
	3ZZ-FE/4ZZ-FE	25	225	18
Ignition coil x Cylinder head cover				
	2ZZ-GE	8.5	87	76 in.·lbf
	3ZZ-FE/4ZZ-FE	9.0	92	80 in.·lbf

STARTING & CHARGING

030MB-01

SERVICE DATA

2ZZ-GE/3ZZ-FE/4ZZ-FE

Starter assy		
Specified current	DENSO MADE	90 A or less at 11.5 V
	BOSCH MADE	160 A or less at 10.5 V
Alternater	DENSO MADE	
Rated output		12V 70A, 12V 80A
standerd amperage	Idle to 2000 rpm	10A or less
standerd voltage	Idle to 2000 rpm	12.9 - 14.9V
Alternater	BOSCH MADE	
Rated output		12V 80A
standerd amperage	Idle to 2000 rpm	5A or less
standerd voltage	Idle to 2000 rpm	13.2 - 14.6V
Battery		
Voltage	at 20_C (68_F)	12.5 - 12.9 V
Specific gravity	at 20_C (68_F)	1.25 - 1.29

1CD-FTV

Starter assy		
Specified current	DENSO MADE	
	1.4kw	90 A or less at 11.5 V
	2.2kw	120 A or less at 11.5 V
	BOSCH MADE	160 A or less at 11.5 V
Alternater		
Rated output		12V 90A, 12V 130A
standerd amperage	5000 rpm	10A or less
	5000 rpm	13.2 - 14.0V
Battery		
Voltage	at 20_C (68_F)	12.5 - 12.9 V
Specific gravity	at 20_C (68_F)	1.25 - 1.29
Glow plugs		
Resistance	at 20_C (68_F)	Approx. 0.72 Ω

030MC-01

TORQUE SPECIFICATION

2ZZ-GE/3ZZ-FE/4ZZ-FE

Part Tightened		N·m	kgf·cm	ft·lbf
Lead wire x Terminal C of starter		9.8	100	7.2
Starter x Transaxle	Bolt	37	378	28
	Terminal 30	9.8	100	7
Generator assy x Engine	M12	25	250	18
	M14	54	550	39

1CD-FTV

Part Tightened		N·m	kgf·cm	ft·lbf
Lead wire x Terminal C of starter	DENSO MADE			
	1.4kw	5.9	60	52 in.·lbf
	2.2kw	5.9	60	52 in.·lbf
	BOSCH MADE	8.0	82	71 in.·lbf
Starter x Transaxle	Bolt	37	378	28
	Terminal 30	13	130	9
Generator assy x Engine	M8	21	214	15
	M10	52	530	38
	Alternator wire	9.8	100	7
Glow plug assy x Cylinder head		12	125	9
Engine cover Sub-assy x Clinder head cover		8.0	82	70 in.·lbf

FRONT SUSPENSION

SERVICE DATA

030MS-01

Front wheel alignmwnt	Vehicle height Tire size: 175/70R14 Engine type: 4ZZ-FE (Normal package) (Rough road package) 	 Front: A *1 - B *2 Rear: D *4 - C *3 Front: A *1 - B *2 Rear: D *4 - C *3	 88 mm (4.36 in.) 44 mm (1.73 in.) 69 mm (2.72 in.) 26 mm (1.02 in.)
	Vehicle height Tire size: 195/60R15 Engine type: 3ZZ-FE, 4ZZ-FE (Normal package) (Rough road package) 	 Front: A *1 - B *2 Rear: D *4 - C *3 Front: A *1 - B *2 Rear: D *4 - C *3	 87 mm (3.43 in.) 44 mm (1.73 in.) 68 mm (2.68 in.) 25 mm (0.98 in.)
	Vehicle height Tire size: 195/60R15 Engine type: 1CD-FTV 	 Front: A *1 - B *2 Rear: D *4 - C *3	 90 mm (3.54 in.) 45 mm (1.77 in.)
	Vehicle height Tire size: 195/55R16 Engine type: 2ZZ-GE 	 Front: A *1 - B *2 Rear: D *4 - C *3	 85 mm (3.35 in.) 41 mm (1.61 in.)
	Toe-in (total) 	 Rack end length difference	6' ± 12' (0.1_ ± 0.2_, 1 ± 2 mm, 0.04 ± 0.08 in.) 1.5 mm (0.059 in.) or less
	Wheel angle Tire size: 175/70R14 Engine type: 4ZZ-FE (Normal package) (Rough road package) 	 Inside wheel Outside wheel: Reference Inside wheel Outside wheel: Reference	 38°44' ± 2° (38.73° ± 2°) 32°50' (32.83°) 39°05' ± 2° (39.08° ± 2°) 33°10' (33.17°)
	Wheel angle Tire size: 195/60R15 Engine type: 3ZZ-FE, 4ZZ-FE (Normal package) (Rough road package) 	 Inside wheel Outside wheel: Reference Inside wheel Outside wheel: Reference	 38°45' ± 2° (38.75° ± 2°) 32°50' (32.83°) 39°06' ± 2° (39.10° ± 2°) 33°11' (33.18°)
	Wheel angle Tire size: 195/60R15 Engine type: 1CD-FTV 	 Inside wheel Outside wheel: Reference	 38°41' ± 2° (38.68° ± 2°) 32°47' (32.78°)
	Wheel angle Tire size: 195/55R16 Engine type: 2ZZ-GE 	 Inside wheel Outside wheel: Reference	 38°45' ± 2° (38.75° ± 2°) 32°50' (32.83°)
	Camber Tire size: 175/70R14 Engine type: 4ZZ-FE 	 Normal package Rough road package Right-left error	 -0°30' ± 45' (-0.50° ± 0.75°) -0°16' ± 45' (-0.27° ± 0.75°) 45' (0.75°) or less

Front wheel alignmwnt	Camber Tire size: 195/60R15 Engine type: 3ZZ-FE, 4ZZ-FE Normal package Rough road package Right-left error	 -0°31' ± 45' (-0.52° ± 0.75°) -0°17' ± 45' (-0.28° ± 0.75°) 45' (0.75°) or less
	Camber Tire size: 195/60R15 Engine type: 1CD-FTV Right-left error	 -0°33' ± 45' (-0.55° ± 0.75°) 45' (0.75°) or less
	Camber Tire size: 195/55R16 Engine type: 2ZZ-GE Right-left error	 -0°31' ± 45' (-0.52° ± 0.75°) 45' (0.75°) or less
	Caster Tire size: 175/70R14 Engine type: 4ZZ-FE Normal package Rough road package Right-left error	 2°51' ± 45' (2.85° ± 0.75°) 2°40' ± 45' (2.67° ± 0.75°) 45' (0.75°) or less
	Caster Tire size: 195/60R15 Engine type: 3ZZ-FE, 4ZZ-FE Normal package Rough road package Right-left error	 2°53' ± 45' (2.88° ± 0.75°) 2°41' ± 45' (2.68° ± 0.75°) 45' (0.75°) or less
	Caster Tire size: 195/60R15 Engine type: 1CD-FTV Right-left error	 2°46' ± 45' (2.77° ± 0.75°) 45' (0.75°) or less
	Caster Tire size: 195/55R16 Engine type: 2ZZ-GE Right-left error	 2°52' ± 45' (2.87° ± 0.75°) 45' (0.75°) or less
	Steering axis inclination Tire size: 175/70R14 Engine type: 4ZZ-FE Normal package Rough road package Right-left error	 11°19' (11.32°) 10°50' (10.83°) 45' (0.75°) or less
	Steering axis inclination Tire size: 195/60R15 Engine type: 3ZZ-FE, 4ZZ-FE Normal package Rough road package Right-left error	 11°19' (11.32°) 10°50' (10.83°) 45' (0.75°) or less
	Steering axis inclination Tire size: 195/60R15 Engine type: 1CD-FTV Right-left error	 11°23' (11.38°) 45' (0.75°) or less

SERVICE SPECIFICATIONS – FRONT SUSPENSION

Front wheel alignmwnt	Steering axis inclination Tire size: 195/55R16 Engine type: 2ZZ–GE	11˚19' (11.32˚)
	Right–left error	45' (0.75˚) or less
Front suspension	Lower ball joint turning torque	1.0 – 5.0 N·m (10 – 51 kgf·cm, 8.7 – 44 in.·lbf)
	Stabilizer bar link ball joint turning torque	0.05 – 2.0 N·m (0.5 – 20 kgf·cm, 0.4 – 17.7 in.·lbf)

***1: Ground clearance of front wheel center**
***2: Ground clearance of lower suspension arm front bolt center**
***3: Ground clearance of axle beam set bolt center**
***4: Ground clearance of rear wheel center**

030MT-01

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Tie rod end lock nut		74	755	55
Steering knuckle x Shock absorber		153	1,560	113
Hub nut		103	1,050	76
Suspension support x Piston rod		47	479	34
Suspension support x Body		39	398	29
Speed sensor wire harness bracket set bolt	TMUK made:	19	192	14
	TMC made:	29	296	21
Stabilizer bracket No.1 x Suspension cross member		19	194	14
Stabilizer bar link set nut	TMUK made:	44	449	33
	TMC made:	74	755	55
Lower suspension arm x Lower ball joint		142	1,448	105
Lower ball joint x Steering knuckle		103	1,050	76
Lower suspension arm x Suspension cross member		137	1,397	101

REAR SUSPENSION

SERVICE DATA

030MY–01

Rear wheel alignmwnt	Toe–in (total)	
	Normal package:	0_13’ ± 15’ (0.22_ ± 0.25_, 2.2 ± 2.5 mm, 0.09 ± 0.1 in.)
	Rough road package:	0_06’ ± 15’ (0.1_ ± 0.25_, 1.0 ± 2.5 mm, 0.04 ± 0.1 in.)
	Rack end length difference	1.5 mm (0.059 in.) or less
	Camber	
	Normal package:	–1˚28’ ± 30’ (–1.47˚ ± 0.5˚)
	Rough road package:	–1˚26’ ± 30’ (–1.43˚ ± 0.5˚)
	Right–left error	45’ (0.75˚) or less

030MZ-01

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Piston rod set nut		56	571	41
Shock absorber x Body		80	816	59
Hub nut		103	1,050	76
Shock absorber x Rear axle beam		80	816	59
Stabilizer bar x Rear axle beam	TMUK made:	185	1,886	136
	TMC made:	149	1,519	110
Rear axle hub set bolt		56	571	41
Parking brake cabke bracket set bolt		5.4	55	48 in.·lbf
Skid control sensor wire harness bracket set bolt		5.0	51	44 in.·lbf
Rear axle beam x Body		85	867	62

TIRE & WHEEL

SERVICE DATA

030N4-01

Cold tire inflation pressure	w/o rear seat For driving at 160 km/h (100 mph) or over		
	Engine type (Body type)	Tire size	Front, Rear kPa (kgf/cm^2, psi)
	4ZZ-FE	175/70R14 84H	270 (2.7, 39) *1,*2
		195/60R15 88V	260 (2.6, 37) *1,*2
	3ZZ-FE	195/60R15 88V	270 (2.7, 39) *1,*2
	1CD-FTV (W/G)	195/60R15 88V	270 (2.7, 39) *1,*2
	1CD-FTV (H/B)	195/60R15 88V	290 (2.9, 42) *1,*2
	w/o rear seat For driving under 160 km/h (100 mph)		
	Engine type (Body type)	Tire size	Front, Rear kPa (kgf/cm^2, psi)
	4ZZ-FE	175/70R14 84H	230 (2.3, 33) *1,*2
		195/60R15 88V	220 (2.2, 32) *1,*2
	3ZZ-FE	195/60R15 88V	220 (2.2, 32) *1,*2
	1CD-FTV	195/60R15 88V	240 (2.4, 35) *1,*2
	w/ rear seat For driving at 160 km/h (100 mph) or over		
	Engine type (Body type)	Tire size	Front, Rear kPa (kgf/cm^2, psi)
	4ZZ-FE	175/70R14 84H	260 (2.6, 37) *1 270 (2.7, 39) *2
		195/60R15 88V	260 (2.6, 37) *1,*2
	3ZZ-FE	195/60R15 88V	270 (2.7, 39) *1,*2
		195/60R15 88H	270 (2.7, 39) *1,*2
	2ZZ-GE	195/55R16 87V	280 (2.8, 41) *1 290 (2.9, 42) *2
	1CD-FTV (S/D, W/G)	195/60R15 88V	270 (2.7, 39) *1,*2
	1CD-FTV (H/B)	195/60R15 88V	290 (2.9, 42) *1,*2
	w/ rear seat For driving under 160 km/h (100 mph)		
	Engine type (Body type)	Tire size	Front, Rear kPa (kgf/cm^2, psi)
	4ZZ-FE	175/70R14 84H	220 (2.2, 32) *1 230 (2.3, 33) *2
		195/60R15 88V	220 (2.2, 32) *1,*2
	3ZZ-FE	195/60R15 88V	220 (2.2, 32) *1,*2
		195/60R15 88H	220 (2.2, 32) *1,*2
	2ZZ-GE	195/55R16 87V	220 (2.2, 32) *1 230 (2.3, 33) *2
	1CD-FTV	195/60R15 88V	240 (2.4, 35) *1,*2
Tire runout	1.4 mm (0.055 in.) or less		
Imbalance after adjustment	8.0 g (0.018 lb) or less		

***1: Standard inflation for all loads including full rated loads**

***2: Inflation for heavy loads, e.g. trailer towing**

DRIVE SHAFT / PROPELLER SHAFT / AXLE

030N5-01

SERVICE DATA

Front axle hub bearing	Backlash	Maximum: 0.05 mm (0.0020 in.)
Front axle hub bearing	Deviation	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub bearing	Backlash	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub bearing	Deviation	Maximum: 0.07 mm (0.0028 in.)

030N6-01

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Front wheel set bolt		103	1,050	76
Rear wheel set bolt		103	1,050	76
Tie rod end x Steering knuckle		49	500	36
Stabilizer bar link set nut	TMUK made:	44	449	33
	TMC made:	74	755	55
Speed sensor x Steering knuckle		8.0	82	71 in.·lbf
Axle hub x Front drive shaft		216	2,200	159
Automatic transaxle fluid drain plug		17.2	175	13
Manual transaxle oil drain plug		49	500	36
Steering knuckle x Suspension lower arm		142	1,448	105
Front drive shaft bearing case set bolt (2ZZ-GE/1CD-FTV)		64	650	47
Front disc brake caliper assy set bolt		107	1,090	79
Rear disc brake caliper assy set bolt		47	479	35
Flexible hose and speed sensor wire harness x Shock absorber		29	296	21
Front axle nut		216	2,200	159
Lower ball joint x Steering knuckle		103	1,050	76
Front axle x Shock absorber		153	1,560	113
Rear axle hub & bearing assy set bolt		56	571	41

BRAKE

SERVICE DATA

030MU-01

Brake pedal height (from asphalt sheet)	LHD:	
	M/T	134.9 - 144.9 mm (5.311 - 5.703 in.)
	A/T	134.3 - 144.3 mm (5.287 - 5.681 in.)
	RHD:	
	M/T	131.6 - 141.6 mm (5.181 - 5.575 in.)
	A/T	131.1 - 141.1 mm (5.161 - 5.555 in.)
Brake Pedal free play		1 - 6 mm (0.04 - 0.24 in.)
Stop light switch clearance		0.5 - 2.4 mm (0.020 - 0.094 in.)
Pedal reserve distance from asphalt sheet at 490 N (50 kgf, 110.2 lbf)		More than 60 mm (2.36 in.)
Brake booster push rod to piston clearance (w/ SST)	TMC Made:	0 mm (0 in.)
Front brake pad thickness (TMC Made:)		
3ZZ-FE/4ZZ-FE Engine type:	Standard	11.0 mm (0.433 in.)
	Minimum	1.0 mm (0.039 in.)
1CD-FTV Engine type:	Standard	11.5 mm (0.453 in.)
	Minimum	1.0 mm (0.039 in.)
Front brake pad thickness (TMUK Made:)	Standard	11.5 mm (0.453 in.)
	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness	Standard	25.0 mm (0.984 in.)
	Minimum	23.0 mm (0.906 in.)
Front brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake pad thickness (TMC Made:)	Standard	10.0 mm (0.394 in.)
	Minimum	1.0 mm (0.039 in.)
Rear brake pad thickness (TMUK Made:)	Standard	9.5 mm (0.347 in.)
	Minimum	1.0 mm (0.039 in.)
Rear disc brake thickness	Standard	9.0 mm (0.354 in.)
	Minimum	8.0 mm (0.315 in.)
Rear brake disc runout	Maximum	0.15 mm (0.0059 in.)

030MV-01

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Bleeder plug		8.3	84	73 in.·lbf
Brake booster clevis lock nut	TMC Made:	26	265	19
	TMUK Made:	19	194	14
Brake master cylinder x Piston stopper bolt	TMC Made:	10	100	7
Brake master cylinder x Reservoir	TMC Made:	1.8	18	16 in.·lbf
	TMUK Made:	13	132	10
Brake master cylinder x Brake booster	TMC Made:	12.7	129	9
	TMUK Made:	25	255	18
Brake line union nut	10 mm	15.2	155	11
	14 mm	29	296	21
Charcoal canister bracket x Body		5.4	55	48 in.·lbf
Vacuum hose x Body		5.4	55	48 in.·lbf
Brake booster x Body		12.7	130	9
Engine mount x Engine mount bracket		52	530	39
Engine mount bracket x Body		52	530	39
Rear engine mount bracket		87	887	64
Front engine mount bracket		52	530	39
Brake tube clamp x body		5.4	55	48 in.·lbf
Vacuum pump x Engine		21	214	15
Vacuum pump union nut		13.7	140	10
Vacuum pump check valve x End cover		74	214	54
Vacuum pump end cover x Casing		7.8	80	69 in.·lbf
Wheel nut		103	1,050	76
Front brake cylinder mounting x Steering knuckle		107	1,090	79
Front brake cylinder x Front brake cylinder mounting	TMC Made:	34	350	25
	TMUK Made	27	275	20
Front disc brake caliper x Flexible hose		30	310	22
Rear disc brake caliper installation bolt	TMC Made:	47	475	34
Rear disc brake cylinder mounting x Steering knuckle	TMUK Made:	46.6	475	34
Rear disc brake cylinder x Rear disc brake cylinder mounting	TMUK Made:	27	275	20
Rear disc brake caliper x Flexible hose		30	310	22
Brake actuator x Brake actuator bracket	TMC Made:	4.7	48	42 in.·lbf
Brake actuator x Brake actuator bracket	TMUK Made:			
	w/ ABS:	11.3	115	14
	w/ VSC:	4.7	48	42 in.·lbf
Brake actuator bracket x Body		19	195	14
Front speed sensor x Steering knuckle		8.0	82	71 in.·lbf
Front speed sensor wire harness clamp x shock absorber	TMC Made:	29	296	21
	TMUK Made:	18.8	192	14
Front speed sensor wire harness clamp x Body		8.0	82	71 in.·lbf
Yawrate sensor bracket set bolt		21	214	15
Yawrate sensor x Yawrate sensor bracket		5.5	56	49 in.·lbf
Yawrate sensor x Body		21	214	15

PARKING BRAKE

SERVICE DATA

030MW-01

Parking brake lever travel at 196 N (20 kgf, 44.1 lbf):		6 - 9 clicks
Rear brake disc inside diameter (TMC Made:)	Standard Maximum	173 mm (6.81 in.) 174 mm (6.85 in.)
Rear brake disc inside diameter (TMUK Made:)	Standard Maximum	172 mm (6.77 in.) 173 mm (6.81 in.)
Parking brake shoe lining thickness (TMC Made:)	Standard Maximum	3.5 mm (0.138 in.) 1.0 mm (0.039 in.)
Parking brake shoe lining thickness (TMUK Made:)	Standard Maximum	3.1 mm (0.122 in.) 1.0 mm (0.039 in.)

030MX-01

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Wheel nut	103	1,050	76
Parking brake lock nut	5.0	55	44 in.·lbf
Parking brake lever sub-assy x Body	12.5	130	9
Front floor heat insulator No.2 x Body	5.5	55	48 in.·lbf
Front floor heat insulator No.1 x Body	5.5	55	48 in.·lbf
Exhaust pipe installation bolt	43	440	32
Front floor panel brace x Body	29.6	302	21
Parking brake cable assy No.3 x Body	5.4	55	48 in.·lbf
Fuel tank protector No.1 x Body	5.5	55	48 in.·lbf
Parking brake cable assy No.3 x Backing plate (TMC made)	7.8	80	69 in.·lbf

AUTOMATIC TRANSMISSION / TRANSAXLE

SERVICE DATA

030A9-03

A246E (RHD)		
Line pressure (Wheel locked)		
	Engine idling	
	D range	382 - 422 kPa (3.9 - 4.3 kgf·cm^2, 55 - 61 psi)
	R range	647 - 760 kPa (6.6 - 7.8 kgf·cm^2, 94 - 111 psi)
	AT stall (Throttle valve fully opened)	
	D range	728 - 859 kPa (7.42 - 8.76 kgf·cm^2, 106 - 125 psi)
	R range	1,511 - 1,755 kPa (15.4 - 17.9 kgf·cm^2, 219 - 254 psi)
Engine stall revolution	D and R range	2,450 ± 150 rpm
Time lag	N → D range	Less than 1.2 seconds
	N → R range	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N range	650 ± 50 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter clutch runout	Max.	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	5.3 ± 0.5 mm (0.209 ± 0.020 in.)
	RH side	2.0 ± 0.5 mm (0.079 ± 0.020 in.)
Shift schedule		
D range		
(Throttle valve fully opened)	1 → 2	49 - 58 km/h (30 - 36 mph)
	2 → 3	94 - 106 km/h (58 - 66 mph)
	3 → 4	139 - 157 km/h (86 - 98 mph)
	4 → 3	133 - 151 km/h (83 - 94 mph)
	3 → 2	85 - 96 km/h (53 - 60 mph)
	2 → 1	39 - 47 km/h (24 - 29 mph)
(Throttle valve fully closed)	3 → 4	30 - 37 km/h (19 - 23 mph)
	4 → 3	14 - 20 km/h (7 - 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	49 - 58 km/h (30 - 36 mph)
	3 → 2	91 - 102 km/h (57 - 63 mph)
	2 → 1	39 - 47 km/h (24 - 29 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 - 51 km/h (27 - 32 mph)
Lock-up point	Throttle valve opening 5 %	
O/D gear	Lock-up ON	60 - 69 km/h (37 - 43 mph)
	Lock-up OFF	55 - 63 km/h (34 - 39 mph)
3rd gear	Lock-up ON	60 - 69 km/h (37 - 43 mph)
	Lock-up OFF	55 - 63 km/h (34 - 39 mph)
A246E (LHD)		
Line pressure (Wheel locked)		
	Engine idling	
	D range	382 - 422 kPa (3.9 - 4.3 kgf·cm^2, 55 - 61 psi)
	R range	647 - 760 kPa (6.6 - 7.8 kgf·cm^2, 94 - 111 psi)
	AT stall (Throttle valve fully opened)	
	D range	728 - 859 kPa (7.42 - 8.76 kgf·cm^2, 106 - 125 psi)
	R range	1,511 - 1,755 kPa (15.4 - 17.9 kgf·cm^2, 219 - 254 psi)
Engine stall revolution	D and R range	2,450 ± 150 rpm
Time lag	N → D range	Less than 1.2 seconds
	N → R range	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N range	650 ± 50 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter clutch runout	Max.	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	5.3 ± 0.5 mm (0.209 ± 0.020 in.)
	RH side	2.0 ± 0.5 mm (0.079 ± 0.020 in.)

Shift schedule		
D range		
(Throttle valve fully opened)	1 → 2	49 - 58 km/h (30 - 36 mph)
	2 → 3	94 - 106 km/h (58 - 66 mph)
	3 → 4	139 - 157 km/h (86 - 98 mph)
	4 → 3	111 - 127 km/h (69 - 79 mph)
	3 → 2	70 - 79 km/h (43 - 49 mph)
	2 → 1	26 - 32 km/h (16 - 20 mph)
(Throttle valve fully closed)	3 → 4	30 - 37 km/h (19 - 23 mph)
	4 → 3	14 - 20 km/h (9 - 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	49 - 58 km/h (30 - 36 mph)
	3 → 2	91 - 102 km/h (57 - 63 mph)
	2 → 1	26 - 32 km/h (16 - 20 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 - 51 km/h (27 - 32 mph)
Shift schedule(When kick down switch turns ON)		
D range		
(Throttle valve fully opened)	1 → 2	49 - 58 km/h (30 - 36 mph)
	2 → 3	94 - 106 km/h (58 - 66 mph)
	3 → 4	139 - 157 km/h (86 - 98 mph)
	4 → 3	133 - 151 km/h (83 - 94 mph)
	3 → 2	85 - 96 km/h (53 - 60 mph)
	2 → 1	39 - 47 km/h (24 - 29 mph)
2 range		
(Throttle valve fully opened)	1 → 2	49 - 58 km/h (30 - 36 mph)
	3 → 2	91 - 102 km/h (57 - 63 mph)
	2 → 1	39 - 47 km/h (24 - 29 mph)
Lock-up point	Throttle valve opening 5 %	
O/D gear	Lock-up ON	60 - 69 km/h (37 - 43 mph)
	Lock-up OFF	55 - 63 km/h (34 - 39 mph)
3rd gear	Lock-up ON	60 - 69 km/h (37 - 43 mph)
	Lock-up OFF	55 - 63 km/h (34 - 39 mph)

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Park/neutral position switch x Transaxle	Bolt	5.5	56	49 in.·lbf
	Nut	5.5	56	49 in.·lbf
Control shaft lever x Park/neutral position switch		12.5	127	9
Battery carrier x Body		13	132	10
Engine hanger x Engine		38	387	28
Drain plug x Oil pan		17.2	175	13
Transaxle x Engine	Bolt A:	64	650	47
	Bolt B:	46	470	34
	Bolt C:	23	230	17
Torque converter clutch x Drive plate		28	285	20
Engine mounting bracket RR x Transaxle		64	652	47
Engine mounting bracket FR x Transaxle		64	652	47
Center member x Body	Bolt A:	39	398	29
	Bolt B:	52	530	38
Engine mounting insulator RR x Engine mounting bracket RR		87	887	64
Engine mounting insulator RR x Suspension member		52	530	38
Engine mounting insulator FR x Engine mounting bracket FR		52	530	38
Engine mounting bracket LH x Transaxle		52	530	38
Engine mounting insulator LH x Body	Bolt A:	52	530	38
	Nut B:	80	815	59
Starter x Transaxle		39	400	29
Starter wire x Starter		9.8	100	87 in.·lbf
Transmission case protector x Transaxle		23	230	17
Oil filler tube x Transaxle		5.5	56	49 in.·lbf
Oil cooler tube clamp x Oil filler tube		5.5	56	49 in.·lbf
Oil cooler outlet tube x Transaxle		34.5	350	25
Oil cooler inlet tube x Transaxle		34.5	350	25
Wire harness clamp bracket x Transaxle		13	132	10
Wire harness x Transaxle	Bolt A:	13	132	10
	Bolt B:	10	102	7
Control cable bracket x Transaxle		12	122	9
Control cable support x Transaxle		12	122	9
Air cleaner assy x Body		7.0	71	62 in.·lbf
Cylinder head cover No. 2 x Engine		7.0	71	62 in.·lbf
Transmission wire x Transaxle		5.4	55	48
Solenoid valve x Valve body	Bolt A:	11	110	8
	Bolt B:	11	110	8
	Bolt C:	6.5	66	58 in.·lbf
Valve body x Transaxle		10	100	7
Manual detent spring x Valve body		10	100	7
Oil strainer x Valve body		10	100	7
Oil pan x Transaxle		5.3	55	48 in.·lbf
Floor shift assy x Body		12	122	9
Control cable x Control shaft lever		12	122	9
Control cable x Body	Bolt	5.0	50	43 in.·lbf
	Nut	12	122	9

MANUAL TRANSMISSION / TRANSAXLE

SERVICE DATA

030NC-01

C50, C150	
Transmission case oil seal drive in depth	2.4 ± 0.3 mm (0.094 ± 0.012 in.)
Transaxle case oil seal drive in depth	1.9 ± 0.3 mm (0.075 ± 0.012 in.)
C64	
Transmission case oil seal drive in drive in depth	9.9 ± 0.3 mm (0.390 ± 0.012 in.)
Transaxle case oil seal drive in depth	1.9 ± 0.3 mm (0.075 ± 0.012 in.)
E351	
Transmission case oil seal drive in depth	3.5 ± 0.5 mm (0.138 ± 0.020 in.)
Transaxle case cover oil seal drive in depth	0 ± 0.5 mm (0 ± 0.020 in.)

030ND-01

TORQUE SPECIFICATION

FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY (HATCHBACK)			
Part Tightened	N·m	kgf·cm	ft·lbf
Floor shift transmission control cable assy x Body	5.0	51	44 in.·lbf
Front floor heat insulator No.1 x Body	5.5	56	49 in.·lbf
Airbag sensor assy center x Body	17.5	178	13
FLOOR SHIFT CABLE TRANSMISSION CONTROL SHIFT (SEDAN/ STATION WAGON)			
Part Tightened	N·m	kgf·cm	ft·lbf
Shift cable grommet retainer No.1 x Body	5.0	51	44 in.·lbf
Clamp x Body	5.0	51	44 in.·lbf
Front floor heat insulator No.1 x Body	5.5	56	49 in.·lbf
Airbag sensor assy center x Body	17.5	178	13
FLOOR SHIFT CABLE TRANSMISSION CONTROL SELECT (SEDAN/ STATION WAGON)			
Part Tightened	N·m	kgf·cm	ft·lbf
Shift cable grommet retainer No.1 x Body	5.0	51	44 in.·lbf
Clamp x Body	5.0	51	44 in.·lbf
Front floor heat insulator No.1 x Body	5.5	56	49 in.·lbf
Airbag sensor assy center x Body	17.5	178	13
FLOOR SHIFT SHIFT LEVER ASSY			
Part Tightened	N·m	kgf·cm	ft·lbf
Floor shift shift lever assy x Body	12	120	9
C50/ C64/ C150			
Part Tightened	N·m	kgf·cm	ft·lbf
Filler and drain plugs	39.2	400	29
Engine hanger set bolt 4ZZ-FE, 3ZZ-FE:	30	306	22
Engine hanger set bolt 2ZZ-GE:	38	387	28
Engine mounting bracket RR x Transaxle	64	653	47
Engine mounting bracket RR x Engine mounting insulator RR	87	888	64
Engine mounting bracket FR x Transaxle	64	653	47
Engine mounting bracket FR x Engine mounting insulator FR	52	530	38
Manual transaxle assy x Engine Bolt A:	64	650	47
Manual transaxle assy x Engine Bolt B:	47	480	35
Manual transaxle assy x Engine Bolt C:	23	230	17
Transverse engine engine mounting bracket LH x Transaxle	52	530	38
Engine mounting bracket LH x Engine mounting insulator LH Bolt A:	52	530	38
Engine mounting bracket LH x Engine mounting insulator LH Nut B:	80	816	59
Starter assy x Manual transaxle assy	37	378	27
Starter wire set nut	12.8	131	9
Clutch release cylinder assy x Transaxle Bolt A:	25	250	19
Clutch release cylinder assy x Transaxle Bolt B:	11.8	120	9
Clutch release cylinder assy x Transaxle Bolt C:	5.0	21	44 in.·lbf
Manual transaxle assy x Wire harness clmap Bolt A:	25.5	260	19
Manual transaxle assy x Wire harness clmap Bolt B:	12.8	131	9
Manual transaxle assy x Ground cable	13	133	10
Battery carrier x Body	13	133	10
Battery clamp sub-assy x Body Bolt:	5.0	51	44 in.·lbf
Battery clamp sub-assy x Body Nut:	3.5	36	31 in.·lbf
Air cleaner assy x Body	7.0	71	62 in.·lbf
Cylinder head cover No.2 x Engine	7.0	71	62 in.·lbf
Hood set bolt	13	133	10
E351			
Part Tightened	N·m	kgf·cm	ft·lbf
Filler and drain plugs	49	500	36

SERVICE SPECIFICATIONS - MANUAL TRANSMISSION / TRANSAXLE

Part Tightened		N·m	kgf·cm	ft·lbf
Engine hanger x Engine		36.8	375	27
Transmission case protector x Transaxle		18	185	13
Engine mounting bracket RR x Transaxle		64	653	47
Engine mounting bracket RR x Engine mounting insulator RR		87	888	64
Engine mounting bracket FR x Transaxle		64	653	47
Engine mounting bracket FR x Engine mounting insulator FR		52	530	38
Manual transaxle assy x Engine	Bolt A:	64	650	47
	Bolt B:	46	470	34
	Bolt C:	40	409	30
	Bolt D:	19.5	199	14
	Bolt E:	8.0	82	71in.·lbf
Transverse engine engine mounting bracket LH x Transaxle		52	530	38
Engine mounting bracket LH x Engine mounting insulator LH	Bolt A:	52	530	38
	Nut B:	80	816	59
Accumulator to flexible hose tube x Transaxle	Bolt A:	11.8	120	9
	Bolt B:	5.0	51	44 in.·lbf
	Bolt C:	9.0	92	80 in.·lbf
Manual transaxle assy x Ground cable		12.8	131	9
Air tube No.2 (w/ intercooler) x Transaxle		25	255	18
Starter assy x Transaxle		37	378	27
Starter wire set nut		12.8	131	9
Air intake connector assy (w/o intercooler) x Transaxle	Bolt A:	21	214	15
	Bolt B:	25	255	18
Air tube No.1 x Pressure control assembly		18	184	13
Air tube No.1 x Engine	w/o Intercooler:	18	184	13
	w/ Intercooler:	25	255	18
Battery clamp sub-assy x Body	Bolt:	5.0	51	44 in.·lbf
	Nut:	3.5	36	31 in.·lbf
Air cleaner assy x Body		7.0	71	62 in.·lbf
Engine cover sub-assy No.1 x Engine		8.0	82	71 in.·lbf
Hood set bolt		13	133	10

CLUTCH

SERVICE DATA

030L1-02

Pedal height from asphalt sheet LHD steering position type		
	1CD-FTV engine type w/ intercooler	139.5 - 149.5 mm (5.492 - 5.886 in.)
	Others	135.5 - 145.5 mm (5.334 - 5.728 in.)
Pedal height from asphalt sheet RHD steering position type		
	1CD-FTV engine type w/ intercooler	146.0 - 156.0 mm (5.748 - 6.142 in.)
	Others	142.0 - 152.0 mm (5.590 - 5.984 in.)
Clutch pedal free play		5.0 - 15.0 mm (0.197 - 0591 in.)
Clutch pedal push rod play at pedal top		1.0 - 5.0 mm (0.039 - 0.197 in.)
Slotted spring pin protrusion		1.5 - 3.5 mm (0.059 - 0.138 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Clutch disc rivet head depth	Maximum	0.3 mm (0.012 in.)
Clutch disc assy runout	Minimum	0.8 mm (0.031 in.)
Diaphragm spring finger wear	Maximum depth:	0.5 mm (0.020 in.)
	Maximum width:	6.0 mm (0.236 in.)
Flywheel sub-assy runout	Maximum	0.1 mm (0.004 in.)
Diaphragm spring finger wear	Maximum depth	0.5 mm (0.020 in.)

030L2-02

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Clutch pedal sub-assy x Clutch pedal support	36.8	375	27
Clutch pedal support x Body	19.1	195	14
Clutch master cylinder push rod clevis lock nut	11.8	120	9
Clutch master cylinder x Flexible hose tube	15.2	155	11
Clutch master cylinder x Body	11.8	120	9
Clutch release cylinder bleeder plug	8.4	85	74 in.·lbf
Clutch release cylinder x Transaxle housing	11.8	120	9
Clutch release cylinder x Flexible hose tube bracket 2ZZ-GE/3ZZ-FE/4ZZ-FE engine type	5	51	4
Clutch release cylinder x Flexible hose tube	15.2	155	11
Clutch release cylinder x Clutch accumulator assy 1CD-FTV engine type	11.8	120	9
Clutch accumulator assy x Flexible hose tube 1CD-FTV engine type	15.2	155	11
Clutch cover assy x Flywheel sub-assy	19.1	195	14
Release fork support x Transaxle assy 2ZZ-GE/3ZZ-FE/4ZZ-FE engine type 1CD-FTV engine type	 36.8 39.3	 375 401	 27 29

STEERING COLUMN

SERVICE DATA

030N0-01

STEERING SYSTEM		
Steering wheel freeplay	Maximum	30 mm (1.18 in.)
STEERING COLUMN ASSY		
Steering column assy rotating torque	(1 turn for 2 sec.)	0.4 - 1.1 N·m (4 - 11 kgf·cm, 3.5 - 9.5 in.·lbf)

030N1-01

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
RHD steering position type: Steering sliding yoke sub-assy x Main shaft	35	360	26
LHD steering position type: Steering intermediate shaft assy No. 2 x Main shaft	35	360	26
Steering column assy set bolt	21	210	15
RHD steering position type: Steering intermediate shaft assy No. 2 x Steering intermediate shaft	35	360	26
LHD steering position type: Steering sliding yoke sub-assy x Steering intermediate shaft	35	360	26
RHD steering position type, M/T: Protector x Column assy	18	185	13
Steering wheel set nut	50	510	37
Steering wheel pad set screw (Torx screw)	8.8	90	78 in.·lbf

POWER STEERING

SERVICE DATA

030N2-01

POWER STEERING SYSTEM		
Steering effort at idle speed	Reference	5.5 N·m (56 kgf·cm, 49 in.·lbf)
STEERING GEAR ASSY		
Tie rod end turning torque		0.49 – 3.43 N·m (5.0 – 35 kgf·cm, 4.34 – 30.38 in.·lbf)
Total preload	Turning	0.60 – 1.30 N·m (6 – 13 kgf·cm, 5.31 – 11.51 in.·lbf)

030N3-01

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
STEERING GEAR ASSY				
Rack end x Steering rack		62 (83)	630 (845)	46 (61)
Tie rod end set nut		74	755	55
Steering gear assy set bolt	TMC Made	45	460	33
	TMUK Made	49	500	36
Steering intermediate shaft x Steering gear		35	360	26
Front suspension crossmember x Body	Bolt A	157	1,600	116
	Bolt B	113	1,152	83
Front suspension crossmember x Engine mounting insulator RR		52	530	38
Center member x Body		39	400	29
Center member x Engine mounting insulator FR		52	530	38
Front suspension lower arm No. 1 x Steering knuckle		142	1,450	105
Stabilizer link set nut	TMC Made	74	755	55
	TMUK Made	44	450	33
Tie rod end set nut		49	500	36
Front wheel set nut		103	1,050	76
Steering intermediate shaft assy No. 2 x Sliding yoke		35	360	26
Steering intermediate shaft assy No. 2 x Steering intermediate shaft		35	360	26
Steering wheel set nut		50	510	37

( ): For use without SST

HEATER & AIR CONDITIONER

SERVICE DATA

030LT-01

Refrigerant charge volume	Standard:	490 ± 30 g (17.28 ± 1.06 oz.)
V (cooler compressor to crankshaft pulley) belt No. 1 tension	New belt: Used belt:	11 - 13 mm (0.43 - 0.51 in.) 13.5 - 16.5 mm (0.53 - 0.64 in.)
Magnetic clutch clearance	(4ZZ-FE)	0.20 - 0.45 mm (0.008 - 0.018 in.)
Magnetic clutch clearance	(3ZZ-FE)	0.20 - 0.45 mm (0.008 - 0.018 in.)
Magnetic clutch clearance	(2ZZ-GE)	0.20 - 0.45 mm (0.008 - 0.018 in.)
Magnetic clutch clearance	(1CD-FTV)	0.20 - 0.45 mm (0.008 - 0.018 in.)

030LU-01

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (1CD-FTV)			
Idle pulley (Tighten) Nut: A	2.5	25	21 in.·lbf
Idle pulley Nut: A	39	390	29
AIR CONDITIONING RADIATOR ASSY			
Air conditioning tube assy x Cooler evaporator sub-assy No. 1	3.5	35	30 in.·lbf
Air conditioner unit assy x Body	9.8	100	87 in.·lbf
ECM x Blower assy	3.0	30	26 in.·lbf
BLOWER ASSY (SEDAN / STATION WAGON)			
Blower assy x Body Bolt:	9.8	100	87 in.·lbf
ECM x Blower assy	3.0	30	26 in.·lbf
BLOWER ASSY (HATCH BACK)			
Blower assy x Body Bolt:	9.8	100	87 in.·lbf
ECM x Blower assy	3.0	30	26 in.·lbf
COOLER COMPRESSOR ASSY (4ZZ-FE)			
Magnet clutch hub x Cooler compressor assy	13	134	9.7
Compressor and magnetic clutch x Engine	29	295	21
Cooler refrigerant discharge hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
Cooler refrigerant suction hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
COOLER COMPRESSOR ASSY (3ZZ-FE)			
Magnet clutch hub x Cooler compressor assy	13	134	9.7
Compressor and magnetic clutch x Engine	29	295	21
Cooler refrigerant discharge hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
Cooler refrigerant suction hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
COOLER COMPRESSOR ASSY (2ZZ-GE)			
Magnet clutch hub x Cooler compressor assy	13	134	9.7
Compressor and magnetic clutch x Engine	29	295	21
Cooler refrigerant discharge hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
Cooler refrigerant suction hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
COOLER COMPRESSOR ASSY (1CD-FTV)			
Magnet clutch hub x Cooler compressor assy	13	134	9.7
Compressor and magnetic clutch x Engine	29	295	21
Cooler refrigerant discharge hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
Cooler refrigerant suction hose No.1 x Compressor and magnetic clutch	9.8	100	87 in.·lbf
COOLER CONDENSER ASSY			
Cap x Cooler condenser assy (SEDAN / STATION WAGON)	12	125	9
Cap x Cooler condenser assy (HATCH BACK)	2.9	29	25 in.·lbf
Cooler condenser assy x Body	9.8	100	87 in.·lbf
Cooler refrigerant discharge hose No. 1 x Cooler condenser assy	5.4	55	48 in.·lbf
Cooler refrigerant liquid pipe A x Cooler condenser assy	5.4	55	48 in.·lbf
Cooler refrigerant suction pipe B x Cooler condenser assy (RHD1 CD - FTV)	5.4	55	48 in.·lbf
HEATER ASSY			
Heater & accessory assy x Bracket Bolt:	4.5	45	39 in.·lbf
Heater & accessory assy x Body	7.5	76	66 in.·lbf

SUPPLEMENTAL RESTRAINT SYSTEM

TORQUE SPECIFICATION

030HH-02

Part Tightened		N·m	kgf·cm	ft·lbf
Horn button assy x Steering wheel assy		8.8	90	78 in.·lbf
Steering wheel assy x Steering column assy		50	510	37
Instr pnl pass l/door airbag assy x Instrument panel reinforcement		20	200	14
Airbag sensor front LH x Body	TMC Made:	17.5	178	13
Airbag sensor front LH x Body	TMUK Made:	8.0	82	71 in.·lbf
Airbag front RH sensor x Body		8.0	82	71 in.·lbf
Airbag front sensor set bolt		17.5	178	13
Side airbag sensor assy RH x Body		8.0	82	71 in.·lbf

SEAT BELT

TORQUE SPECIFICATION

030LS-01

Part Tightened	N·m	kgf·cm	ft·lbf
FRONT SEAT BELT (SEDAN/STATION WAGON)			
Shoulder belt anchor adjuster x Body	42	428	31
Front seat outer belt (Upper part of retractor) x Body	4.9	50	43 in.·lbf
Front seat outer belt (Lower part of retractor) x Body	42	428	31
Front seat outer belt shoulder anchor x Body	42	428	31
Front seat outer belt floor anchor x Body	42	428	31
Front seat inner belt x Front seat	42	428	31
FRONT SEAT BELT (HATCHBACK)			
Shoulder belt anchor adjuster x Body	42	428	31
Front seat outer belt (Upper part of retractor) x Body	4.9	50	43 in.·lbf
Front seat outer belt (Lower part of retractor) x Body	42	428	31
Front seat outer belt shoulder anchor x Body	42	428	31
Front seat inner belt x Front seat	42	428	31
Front seat outer belt floor anchor x Body (5-door hatchback)	42	428	31
Front seat belt bar outer x Body (3-door hatchback)	42	428	31
Rear seat belt inner x Body (3-door hatchback)	42	428	31
REAR SEAT BELT (SEDAN)			
Child seat anchor bracket x Body	31	316	23
Rear seat inner with center belt LH x Body	42	428	31
Rear seat inner with center belt RH x Body	42	428	31
Rear seat belt outer center x Body	42	428	31
Rear seat belt outer (Retractor side) x Body	42	428	31
Rear seat belt outer (Floor anchor side) x Body	42	428	31
REAR SEAT BELT (STATION WAGON)			
Child seat anchor bracket x Body	31	316	23
Rear seat inner with center belt LH x Body	42	428	31
Rear seat inner with center belt RH x Body	42	428	31
Rear seat belt outer center x Body	42	428	31
Belt outer anchor bracket x Body	42	428	31
Rear seat belt outer (Retractor side) x Belt outer anchor bracket	42	428	31
Rear seat belt outer (Floor anchor side) x Body	42	428	31
REAR SEAT BELT (HATCHBACK)			
Child seat anchor bracket x Body	31	316	23
Rear seat inner with center belt LH x Body	42	428	31
Rear seat inner with center belt RH x Body	42	428	31
Rear seat belt outer center x Rear seat	42	428	31
Belt outer anchor bracket x Body	42	428	31
Rear seat belt outer (Retractor side) x Belt outer anchor bracket	42	428	31
Rear seat belt outer (Floor anchor side) x Body	42	428	31

WIPER & WASHER

TORQUE SPECIFICATION

030NG-01

Part Tightened	N·m	kgf·cm	ft·lbf
WINDSHIELD WIPER MOTOR ASSY			
Wiper motor x Wiper link (SEDAN / STATION WAGON)	5.4	56	49 in.·lbf
Wiper motor x Wiper link (HATCHBACK)	7.5	76	66 in.·lbf
Wiper link x Body	5.5	56	49 in.·lbf
Wiper arm x Wiper link	20.5	209	15
Wiper arm x Wiper link	20.5	209	15
REAR WIPER MOTOR ASSY (STATION WAGON)			
Rear wiper motor x Body	5.5	56	49 in.·lbf
Rear wiper motor x Rear wiper arm	5.5	56	49 in.·lbf
REAR WIPER MOTOR ASSY (HATCHBACK)			
Rear wiper motor x Body	5.5	56	49 in.·lbf
Rear wiper motor x Rear wiper arm	5.5	56	49 in.·lbf

AUDIO & VISUAL SYSTEM

TORQUE SPECIFICATION

030MP-01

Part Tightened	N·m	kgf·cm	ft·lbf
Amplifier antenna assy x Antenna nut	4.5	46	40 in.·lbf

INSTRUMENT PANEL/METER

030LN-01

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Instrument panel reinforce × Air bag	SEDAN/ STATION WAGON	20	204	15
Instrument panel reinforce × Air bag	HATCHBACK	20	204	15

SEAT

TORQUE SPECIFICATION

030LO-01

Part Tightened	N·m	kgf·cm	ft·lbf
FRONT SEAT			
Seatback assembly x Seat adjuster (SEDAN STATION WAGON)	43	440	32
Seatback assembly x Seat adjuster (HATCH BACK)	25	255	18
Seat assembly x Body	37	375	27
REAR SEAT			
Seat back hinge x Seatback (SEDAN WITH SEPARATE TYPE)	18	185	13
Seat back hinge x Seatback (HATCH BACK)	18	185	13
Rear seat back lock assembly x Seat back frame (SEDAN WITH SEPARATE TYPE)	30	306	22
Rear seat back lock assembly x Seat back frame (HATCH BACK)	30	306	22
Reclining adjuster x Seat back frame (STATION WAGON)	43	440	32
Child restraint seat anchor bracket x Reclining adjuster (STATION WAGON)	21	210	15
Rear seat back assembly x Body (STATION WAGON)	42	420	31

SLIDING ROOF/CONVERTIBLE

SERVICE DATA

030NJ-01

Sliding roof	Difference in level between sliding roof weatherstrip and roof panel	
	Except corners of rear side:	-1.5 - 1.5 mm (-0.059 - 0.059 in.)
	Corner of rear side:	-1.0 - 1.5 mm (-0.039 - 0.059 in.)

030NK-01

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Sliding roof rail x Body	5.5	56	49 in.·lbf
Sliding roof rail bracket x Body	5.0	51	44 in.·lbf
Sliding roof rail x Drive gear	4.0	41	35 in.·lbf

ENGINE HOOD/DOOR

TORQUE SPECIFICATION

030MH-01

Part Tightened	N·m	kgf·cm	ft·lbf
HOOD	-	-	-
Hood x Hood hinge	13	130	10
FRONT DOOR	-	-	-
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lock striker x Body	23	235	17
REAR DOOR	-	-	-
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lock striker x Body	23	235	17
BACK DOOR	—	—	—
Back door × Hinge	19.5	199	14
Door lock striker × Body	11.5	117	8.5
BACK DOOR STAY	—	—	—
Back door	22.0	224	16

EXTERIOR/INTERIOR TRIM

TORQUE SPECIFICATION

030MO-01

Part Tightened	N·m	kgf·cm	ft·lbf
Front bumper reinfocement × Body (SDN / WGN)	13.0	133	9
Front bumper reinfocement × Body (H/B)	13.0	133	9
Rear bumper reinfocement No.1 × Body (WGN)	13.0	133	9
Rear bumper reinfocement No.1 × Body (H/B)	13.0	133	9

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EFI SYSTEM (2ZZ-GE)

HOW TO PROCEED WITH TROUBLESHOOTING

0504C-03

When using hand-held tester, troubleshoot in accordance with the procedure shown below.

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS (See page 05-5)

3	CONNECT HAND-HELD TESTER TO DLC3

HINT:
If the display indicates a communication fault in the tool, inspect the DLC3.

4	CHECK DTC AND FREEZE FRAME DATA (See page 05-6)

HINT:
Record or print DTC and freeze frame data.

5	CLEAR DTC AND FREEZE FRAME DATA (See page 05-6)

6	VISUAL INSPECTION

7	SETTING CHECK (TEST) MODE DIAGNOSIS (See page 05-6)

8	PROBLEM SYMPTOM CONFIRMATION

HINT:
If the engine does not start, perform step 10 and 12.

A	Malfunction does not occur
B	Malfunction occurs

B → GO TO STEP 10

A

9	SYMPTOM SIMULATION (See page 05-21)

10	DTC CHECK (See page 05-6)

A	Normal code
B	Malfunction code

B → AFTER CHECKING MALFUNCTION CODE, GO TO STEP 13

A

11	BASIC INSPECTION (See page 05-6)

A	Wrong parts not confirmed
B	Wrong parts confirmed

B → GO TO STEP 16

A

12	PROBLEM SYMPTOM TABLE (See page 05-21)

A	Wrong circuit confirmed
B	Wrong parts confirmed

B → GO TO STEP 16

A

13	CHECK ECM POWER SOURCE CIRCUIT (See page 05-149)

14	CIRCUIT INSPECTION

A	Malfunction not confirmed
B	Malfunction confirmed

B → GO TO STEP 16

A

15	CHECK FOR INTERMITTENT PROBLEM (See page 05-6)

16	IDENTIFICATION OF PROBLEM

17	ADJUSTMENT, REPAIR

18	CONFIRMATION TEST

END

When not using hand-held tester, troubleshoot in accordance with the procedure shown below.

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS

3	CHECK AND CLEAR DTC

4	PROBLEM SYMPTOM CONFIRMATION

A	Malfunction does not occur
B	Malfunction occurs

B → GO TO STEP 6

A

5	SYMPTOM CONFIRMATION

6	DTC CHECK

A	Normal code
B	Malfunction code

B → AFTER CHECKING MALFUNCTION CODE, GO TO STEP 9

A

7 BASIC INSPECTION

A	Wrong parts not confirmed
B	Wrong parts confirmed

B → GO TO STEP 9

A

8 PROBLEM SYMPTOM TABLE

A	Wrong circuit confirmed
B	Wrong parts confirmed

B → GO TO STEP 11

A

9 CIRCUIT INSPECTION

A	Malfunction not confirmed
B	Malfunction confirmed

B → GO TO STEP 11

A

10 CHECK FOR INTERMITTENT PROBLEM

11 IDENTIFICATION OF PROBLEM

12 ADJUSTMENT,REPAIR

13 CONFIRMATION TEST

END

0504B-03

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE CONTROL SYSTEM Check Sheet

Inspector's Name _____

Customer's Name		Model and Model Year	
Driver's Name		Frame No.	
Data Vehicle Brought in		Engine Model	
License No.		Odometer Reading	km miles

Problem Symptoms	☐ Engine does not Start	☐ Engine does not crank ☐ No initial combustion ☐ No complete combustion
	☐ Difficult to Start	☐ Engine cranks slowly ☐ Other _____
	☐ Poor Idling	☐ Incorrect first idle ☐ Idling rpm is abnormal ☐ High (rpm) ☐ Low (rpm) ☐ Rough idling ☐ Other _____
	☐ Poor Drivability	☐ Hesitation ☐ Back fire ☐ Muffler explosion (after-fire) ☐ Surging ☐ Knocking ☐ Other _____
	☐ Engine Stall	☐ Soon after starting ☐ After accelerator pedal depressed ☐ After accelerator pedal released ☐ During A/C operation ☐ Shifting from N to D ☐ Other _____
	☐ Others	

Datas Problem Occurred		
Problem Frequency		☐ Constant ☐ Sometimes (times per day/month) ☐ Once only ☐ Other _____
Condition When Problem Occurs	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Other _____
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (approx. ____°F/____°C)
	Place	☐ Highway ☐ Suburbs ☐ Inner City ☐ Uphill ☐ Downhill ☐ Rough road ☐ Other _____
	Engine Temp.	☐ Cold ☐ Warming up ☐ After Warming up ☐ Any temp. ☐ Other _____
	Engine Operation	☐ Starting ☐ Just after starting (min.) ☐ Idling ☐ Racing ☐ Driving ☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ A/C switch ON/OFF ☐ Other _____

Condition of check engine warning light (CHK ENG)		☐ Remains on ☐ Sometimes light up ☐ Does not light up
DTC Inspection	Normal mode (Precheck)	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )
	Check Mode	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )

0573E-01

PRE-CHECK

1. DIAGNOSIS SYSTEM

(a) Priorities for troubleshooting:

If troubleshooting priorities for multiple DTCs are given in the applicable DTC chart, these should be followed.

If no instructions are given troubleshoot DTCs according to the following priorities.

(1) DTCs other than fuel trim malfunction (DTCs P0171) and misfire (DTCs P0300 – P0304).

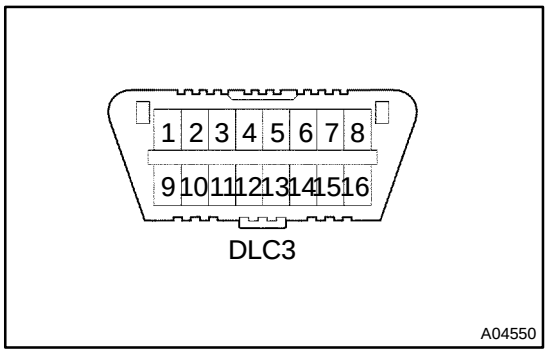
(b) Description for M-OBD (Except European spec.).

- When troubleshooting Multiplex OBD (M-OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the hand-held tester to the vehicle, and read off various data output from the vehicle's ECM.
- The vehicle's on-board computer lights up the check engine warning light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to the check engine warning light lighting up when a malfunction is detected, the applicable Diagnosis Trouble Code (DTC) are recorded in the ECM memory (See page 05-14).If the malfunction has been repaired, the check engine warning light goes off automatically but the DTCs remain recorded in the ECM memory.
- To check the DTCs, connect the hand-held tester to Data Link Connector 3 (DLC3) on the vehicle. or read the number of blinks of the check engine warning light when TC and CG terminals on the DLC3 are connected. The hand-held tester also enables you to erase the DTCs and activate the several actuators and check freezed frame data and various forms of engine data. (For operating instructions, see the hand-held tester instruction book.)
- The diagnosis system operates in normal mode during normal vehicle use. It also has a check (test) mode for technician to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic to prevent erroneous detection and ensure thorough malfunction detection. By switching the ECM to check (test) mode using hand-held tester when troubleshooting, the technician can cause the check engine warning (CHK ENG) to light up for a malfunction that is only detected once or momentarily. (Hand-held tester only)

(See step 3.)

- * 2 trip detection logic:
  When a logic malfunction is fist detected, the malfunction is temporalily stored in the ECM memory. If the same malfunction is detected again during the second drive test, this second detection cases the check engine warning (CHK ENG) to light up.
  The 2 trip repeats the same mode for 2 times. (However, the IG switch must be turned OFF between the 1st trip and 2nd trip)
- Freeze frame data:
  Freeze frame data records the engine condition when malfunction is detected.
  Because freeze frame data records the engine conditions (fuel system, calculator load, water temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

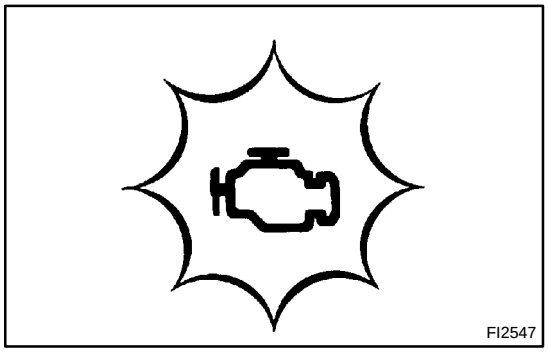
(c) Check the DLC3.
The vehicle's ECM uses the ISO 14230(M–OBD) communication protocol. The terminal arrangement of DLC3 complies with ISO 15031–03 and matches the ISO 14230 format.



Terminal No.	Connection / Voltage or Residence	Condition
7	Bus + Line / Pulse generation+	During transmission
4	Chassis Ground / ↔ Body Ground 1 Ω or less	Always
16	Battery Positive / ↔ Body Ground 9 – 14 V	Always

HINT:
If the display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of the OBD scan tool or hand–held tester to DLC3, turned the ignition switch ON and operated the hand–held tester, there is a problem on the vehicle side or tool side.

- If communication is normal when the tool is connected to another vehicle, inspect DLC3 on the original vehicle.
- If communication is still not possible is when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Debarment listed in the tool,s instruction manual.


FI2547

2. INSPECT DIAGNOSIS (Normal Mode)

(a) Check the check engine warning light.

(1) The check engine warning (CHK ENG) comes on when the ignition switch is turned ON and the engine is not running.

HINT:

If the check engine warning (CHK ENG) does not light up, troubleshoot the combination meter.

(2) When the engine is started, the check engine warning light should go off. If the lamp remains on, the diagnosis system has detected a malfunction or abnormality in the system.

(b) Check the DTC, using hand-held tester.

NOTICE:

Hand-held tester only:

When the diagnosis system is switched from normal mode to check (test) mode, it erases all DTCs and freezed frame data recorded in normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

(1) Prepare the hand-held tester.

(2) Connect the hand-held tester to DLC3.

(3) Turn the ignition switch ON and switch the hand-held tester main switch ON.

(4) Use the hand-held tester to check the DTCs and freezed frame data; note them down. (For operating instructions, see the hand-held tester's instruction book.)

(5) See page 05-14 to confirm the details of the DTCs.

NOTICE:

- **When simulating symptoms without a hand-held tester to check the DTCs, use normal mode. For codes on the DTCs, chart subject to "2 trip detection logic", turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again. When the problem has been simulated twice, the check engine warning light lights up and the DTCs, are recorded in the ECM.**
- **Check the 1st trip DTC using Mode7 for ISO 15031. (Continuous Test Results of Euro-OBD function in hand-held tester)**

3. INSPECT DIAGNOSIS (Check (Test) Mode)

HINT:

Hand-held tester only:

Compared to the normal mode, the check mode has an increased sensitivity to detect malfunctions.

Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

(a) Check the DTC.

(1) Initial conditions

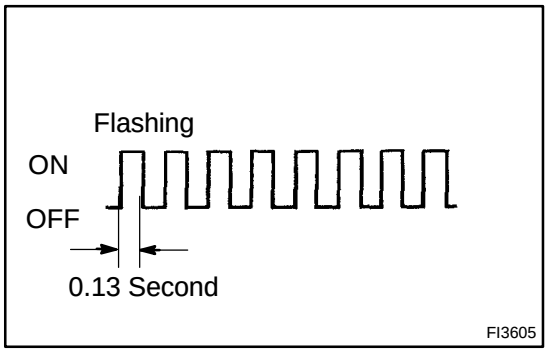
- Battery positive voltage 11V or more.
- Throttle valve fully closed.
- Transmission in "P" or "N" position.
- Air conditioning switched OFF.

(2) Turn ignition switch OFF.

(3) Prepare the hand-held tester.

(4) Connect the hand-held tester to DLC3 on the at the lower left of the instrument panel.

(5) Turn the ignition switch ON and switch the push the hand-held tester ON.



(6) Switch the hand-held tester normal mode to check (test) mode. (Check that the check engine warning light (CHK ENG) flashes.)

(7) Start the engine. (The check engine warning (CHK ENG) light goes out after the engine start.)

(8) Simulate the conditions of the malfunction described by the customer.

NOTICE:

Leave the ignition switch ON until you have checked the DTC, etc.

(9) After simulating the malfunction conditions, use the hand-held tester diagnosis selector to check the DTCs and freezed frame data, etc.

HINT:

Be careful not to turn the ignition switch OFF. When turning the ignition switch OFF, the diagnosis system converts from check (test) mode to normal mode. All DTCs, etc. are erased at this condition.

(10) After checking the DTCs, inspect the applicable circuit.

(b) Clear the DTC.

The following actions will erase the DTCs and freezed frame data.

- Operating the hand-held tester to erase the codes. (See the hand-held tester's instruction book for operating instructions.)
- Disconnecting the battery terminals or EFI fuse.

NOTICE:

If the hand-held tester switches the ECM from normal mode to check mode or vice-versa, or if the ignition switch is turned from ON to ACC or OFF during check mode, the DTCs and freezed frame data will be erased.

4. FAIL-SAFE CHART

If any of the following codes is recorded, the ECM enters fail-safe mode.

DTC No.	Fail-Safe Operation	Fail-Safe Deactivation Conditions
P0100	Ignition timing is fixed at 5˚ BTDC	Returned to normal condition
P0110	Intake air temperature is fixed at 20˚C (68˚F)	Returned to normal condition
P0115	Water temperature is fixed at 80˚C (176˚F)	Returned to normal condition
P0120	VTA is fixed at 0˚	The following condition must be repeated at least 2 times consecutively when closed throttle position switch is OFF: VTA ≧ 0.1 V and ≦ 0.95 V
P0135 P0141	The heater circuit in which an abnormality is detected is turned off	Ignition switch OFF
P0325	Max. timing retardation	Ignition switch OFF
P1300 P1305 P1310 P1315	Fuel cut	Returned to normal condition
P1656	It cut electrically the circuit in which an abnormality is detected	Returned to normal condition

5. CHECK FOR INTERMITTENT PROBLEMS

HINT:

Hand-held tester only:

By putting the vehicle's ECM in the check (test) mode, 1 trip detection logic is possible instead of 2 trip detection logic and sensitivity to detect open circuits is increased. This makes it easier to detect intermittent problems.

(a) Clear the DTCs (See step 2).
(b) Set the check (Test) mode (See step 3).
(c) Perform a simulation test (See page 01-30).
(d) Check the connector and terminal (See page 01-30).
(e) Handle the connector (See page 01-30).

6. ENGINE OPERATING CONDITION

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value from those listed here. So do not decide whether a part is faulty or not solely according to the "Normal Condition" here.

Hand-held tester display	Measurement Item	Normal Condition*1
FUEL SYS #1	Fuel System Bank 1 OPEN: Air-fuel ratio feedback stopped CLOSED: Air-fuel ratio feedback operating	Idling after warming up: CLOSED
CALC LOAD	Calculator Load: Current intake air volume as a proportion of max. intake air volume	Idling: 27.5 - 46.4 % Racing without load (2,500r/min): 19.7 - 40.5 %
COOLANT TEMP./WATER TEMP.	Water Temp. Sensor Value	After warming up: 80 - 95˚C (176 - 203˚F)
SHORT FT #1	Short-term Fuel Trim Bank 1	0 ± 20%
LONG FT #1	Long-term Fuel Trim Bank 1	0 ± 20%
ENGINE SPD	Engine Speed	Idling: 750 - 850 r/min.
VEHICLE SPD	Vehicle Speed	Vehicle Stopped: 0 km/h (0 mph)
IGN ADVANCE	Ignition Advance: Ignition Timing of Cylinder No. 1	Idling: BTDC 8 - 12˚
INTAKE AIR	Intake Air Temp. Sensor Value	Equivalent to Ambient Temp.

THROTTLE POS	Voltage Output of Throttle Position Sensor Calculated as a percentage: 0 V → 0%, 5 V → 100%	Throttle Fully Closed: 8 – 20 % Throttle Fully Open: 64 – 96 %
O2S B1, S1	Voltage Output of Oxygen Sensor Bank 1, Sensor 1	Idling: 0.1 – 0.9 V
O2S B1, S2	Voltage Output of Oxygen Sensor Bank 1 Sensor 2	Driving 50 km/h (31 mph): 0.1 – 0.9 V
O2FT B1, S1	Oxygen Sensor Fuel Trim Bank 1, Sensor 1 (Same as SHORT FT #1)	0 ± 20 %
MIL ON RUN DIST	Distance since activation of check engine warning light	When there is no DTC: 0 km (0 mile)
INJECTOR	Fuel injection time for cylinder No.1	Idling: 1.92 – 3.37 ms
STARTER SIG	Starter Signal	Cranking: ON
CTP SW	Closed Throttle Position Switch Signal	Throttle Fully Closed: ON
A/C SIG	A/C Switch Signal	A/C ON: ON
STOP LIGHT SW	Stop Light Switch Signal	Stop light switch ON: ON
FC IDL	Fuel Cut Idle: Fuel cut when throttle valve fully closed, during deceleration	Fuel cut operating: ON
FC TAU	Fuel Cut TAU: Fuel cut during very light load	Fuel cut operating: ON
CYL#1, CYL#2, CYL#3, CYL#4	Abnormal revolution variation for each cylinder	0 %
A/C CUT SIG	A/C Cut Signal	A/C S/W OFF: ON
FUEL PUMP	Fuel Pump Signal	Idling: ON
EVAP (PURGE) VSV	EVAP VSV Signal	VSV operating: ON
TOTAL FT B1	Total Fuel Trim Bank 1: Average value for fuel trim system of bank 1	Idling: 0.5 – 1.4
O2 LR B1 S1	Oxygen Sensor Lean Rich Bank 1 Sensor 1: Response time for oxygen sensor output to switch from lean to rich	Idling after warming up: 0 – 1,000 msec.
O2 RL B1 S1	Oxygen Sensor Rich Lean Bank 1 Sensor 1: Response time for oxygen sensor output to switch from rich to lean	Idling after warming up: 0 – 1,000 msec.

*1: If no conditions are specifically stated for "Idling",the A/C switch is OFF and all accessory switches are OFF.

BASIC INSPECTION

When the malfunction code is not confirmed in the DTC check, troubleshooting should be carried out in order for all possible circuits considered as causes of the problems. In many cases, by carrying out the basic engine check shown in the following flow chart, the location causing the problem can be found quickly and efficiently. Therefore, using of this check is essential for the engine troubleshooting.

1	CHECK BATTERY POSITIVE VOLTAGE (Ignition OFF)

OK	NG
11 V above	11 V below

NG → CHARGE OR REPLACE BATTERY

OK

2	CHECK IF ENGINE IS CRANKED

NG → PROCEED TO PROBLEM TABLE (See page 05-21)

OK

3	CHECK IF ENGINE STARTS

NG → GO TO STEP 7

OK

4	CHECK AIR FILER

(a) Check that the air filter is not excessively dirty or oily.

NG → CLEAN OR REPLACE

OK

5	CHECK IDLE SPEED (See page 14-1)

NG → PROCEED TO PROBLEM SYMPTOM TABLE (See page 05-21)

OK

6	CHECK IGNITION TIMING (See page 18-1)

NG → PROCEED TO PAGE 18-1 AND CONTINUE TO TROUBLESHOOT

OK

7	CHECK FUEL PRESSURE (See page 11-5)

NG → PROCEED TO PAGE 11-5 AND CONTINUE TO TROUBLESHOOT

OK

8	CHECK FOR SPARK (See page 18-1)

NG → PROCEED TO PAGE 18-1 AND CONTINUE TO TROUBLESHOOT

OK

PROCEED TO PROBLEM SYMPTOMS TABLE (See page 05-21)

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DIAGNOSTIC TROUBLE CODE CHART

HINT:

Parameters listed in the chart may not be exactly the same as your reading due to the type of instrument or other factors.

If a malfunction code is displayed during the DTC check in the check mode, check the circuit for the codes listed in the table below. For details of each code, turn to the page referred to under the "See page" for the respective "DTC No." in the DTC chart.

DTC No. (See page)	Detection Item	Trouble Area	*1 CHK ENG (MIL)	Memory
P0100 (05-23)	Air Flow Meter Circuit Malfunction	S Open or short in air flow meter circuit S Air flow meter S ECM	f	f
P0101 (05-30)	Air Flow Meter Circuit Range/Performance Problem	S ECM	f	f
P0110 (05-31)	Intake Air Temp. Circuit Malfunction	S Open or short in intake air temp. sensor circuit S Intake air temp. sensor (built into air flow meter) S ECM	f	f
P0115 (05-35)	Water Temp. Circuit Malfunction	S Open or short in water temp. sensor circuit S Water temp. sensor S ECM	f	f
P0116 (05-39)	Water Temp. Circuit Range/Performance Problem	S Water temp. sensor S Cooling system S Thermostat	f	f
P0120 (05-40)	Throttle Position Sensor Circuit Malfunction	S Open or short in throttle position sensor circuit S Throttle position sensor S ECM	f	f
P0121 (05-47)	Throttle Position Sensor Circuit Range/Performance Problem	S Throttle position sensor	f	f
P0125 (05-48)	Insufficient Water Temp. for Closed Loop Fuel Control	S Open or short in heated oxygen sensor (bank 1 sensor 1) circuit S Oxygen sensor (bank 1 sensor 1) S Air induction system S Fuel pressure S Injector S Gas leakage on exhaust system S ECM	f	f
P0130*2 (05-53)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector	f	f
P0133*2 (05-59)	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector S ECM	f	f
P0135 (05-63)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 1)	S Open or short in heater circuit of oxygen sensor S Oxygen sensor heater S ECM	f	f
P0136*2 (05-53)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 2)	S Open or short in oxygen sensor circuit S Oxygen sensor	f	f

P0141 (05-63)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)	S Open or short in heater circuit of oxygen sensor S Oxygen sensor heater S ECM	f	f
P0171*2 (05-66)	System too Lean (A/F Lean Malfunction, Bank 1)	S Air induction system S Injector blockage S Air flow meter S Water temp. sensor S Fuel pressure S Open or short in heated oxygen sensor (bank 1 sensor 1) circuit S Oxygen sensor (bank 1 sensor 1) S ECM	f	f
P0172*2 (05-66)	System too Rich (A/F Rich Malfunction, Bank 1)	S Injector leak, blockage S Air flow meter S Water temp. sensor S Ignition system S Fuel pressure S Open or short in heated oxygen sensor (bank 1 sensor 1) circuit S Gas leakage on exhaust system S Oxygen sensor (bank 1 sensor 1) S ECM	f	f
P0300*2 (05-71)	Random/Multiple Cylinder Misfire Detected	S Open or short in engine wire S Connector connection S Vacuum hose connection S Ignition system S Injector S Fuel pressure S Air flow meter S Water temp. sensor S Compression pressure S Valve clearance S Valve timing S ECM	f	f
P0301*2 (05-71)	Cylinder 1 Misfire Detected			
P0302*2 (05-71)	Cylinder 2 Misfire Detected			
P0303*2 (05-71)	Cylinder 3 Misfire Detected			
P0304*2 (05-71)	Cylinder 4 Misfire Detected			
P0325 (05-76)	Knock Sensor 1 Circuit Malfunction (Bank 1)	S Open or short in knock sensor circuit S Knock sensor (looseness) S ECM	f	f
P0335 (05-79)	Crankshaft Position Sensor Circuit Malfunction (NE Signal)	S Open or short in crankshaft position sensor circuit S Crankshaft position sensor S Crank angle sensor plate S ECM	f	f
P0340 (05-82)	Camshaft Position Sensor Circuit Malfunction (G Signal)	S Open or short in camshaft position sensor circuit S Camshaft position sensor S Intake camshaft S ECM	f	f
P0410*2 (05-84)	Air Injection System Malfunction	S Gas leak on air injection system S Air pump S Air switching valve S Air pump relay S VSV for air switching valve S ECM	f	f
P0411*2 (05-92)	ASV Open-Fixed Malfunction	S Air switching valve S VSV for air switching valve S ECM	f	f

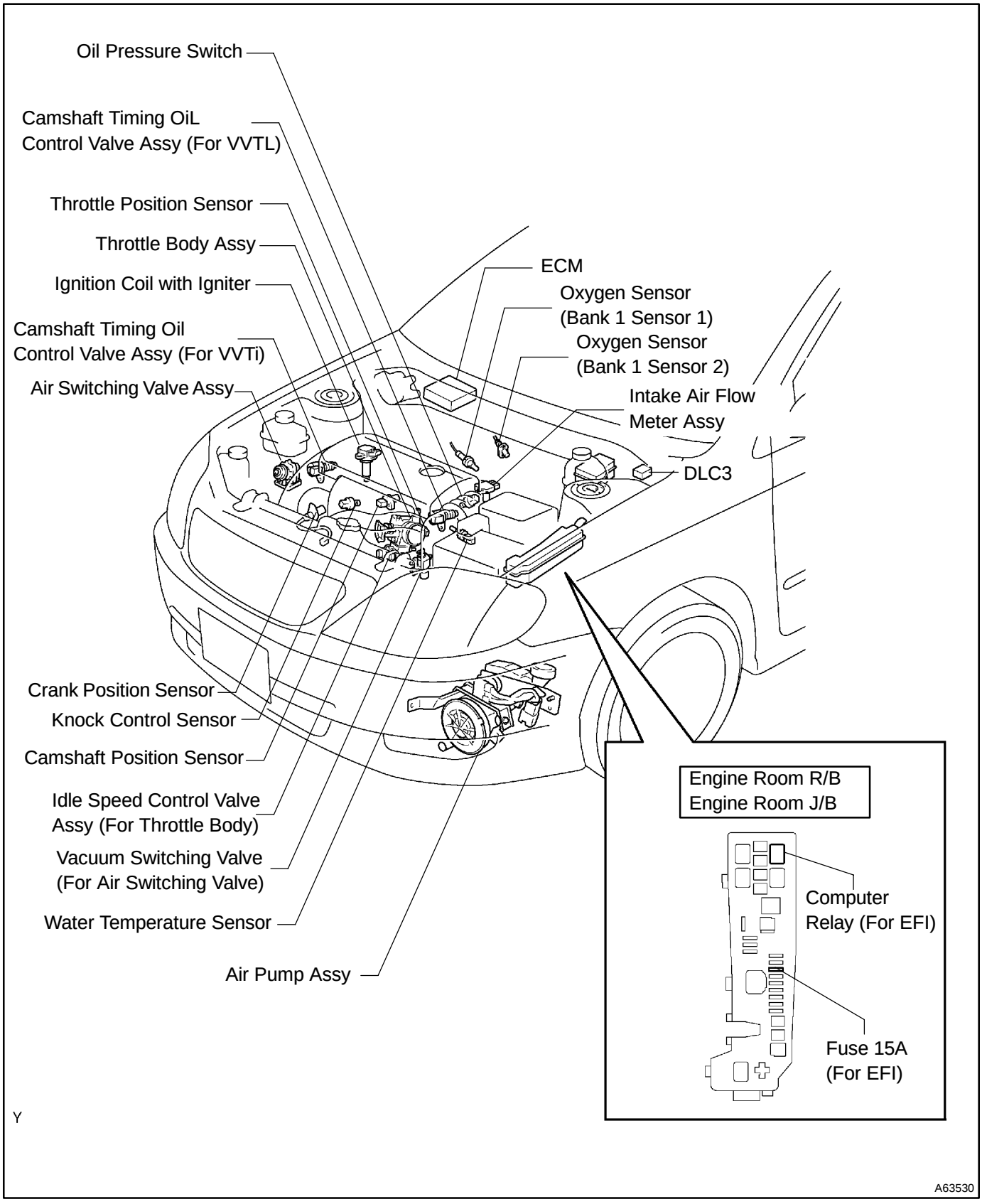
P0420*2 (05-95)	Catalyst System Efficiency Below Threshold (Bank 1)	S Gas leakage on exhaust system S Oxygen sensor S Three-way catalytic converter	f	f
P0443 (05-98)	Evaporative Emission Control System Purge Control Vent Control Malfunction	S Open or short in VSV circuit for EVAP S VSV for EVAP S ECM	f	f
P0500 (05-101)	Vehicle Speed Sensor Malfunction	S Combination meter S Open or short in vehicle speed sensor circuit S Vehicle speed sensor S ECM	f	f
P0505 (05-104)	Idle Control System Malfunction	S Open or short in ISC valve circuit S ISC valve is stick or closed S A/C switch circuit S Air induction system S ECM	f	f
P1205*2 (05-109)	Air Pump On-Fixed Malfunction	S Air pump S Air pump relay S ECM	f	f
P1300 (05-112)	Igniter Circuit Malfunction (No. 1)	S Ignition system S Open or short in IGF or IGT1 circuit from No. 1 ignition coil with igniter to ECM S No. 1 ignition coil with igniter S ECM	f	f
P1305 (05-112)	Igniter Circuit Malfunction (No. 2)	S Ignition system S Open or short in IGF or IGT2 circuit from No. 2 ignition coil with igniter to ECM S No. 2 ignition coil with igniter S ECM	f	f
P1310 (05-112)	Igniter Circuit Malfunction (No. 3)	S Ignition system S Open or short in IGF or IGT3 circuit from No. 3 ignition coil with igniter to ECM S No. 3 ignition coil with igniter S ECM	f	f
P1315 (05-112)	Igniter Circuit Malfunction (No. 4)	S Ignition system S Open or short in IGF or IGT4 circuit from No. 4 ignition coil with igniter to ECM S No. 4 ignition coil with igniter S ECM	f	f
P1335 (05-118)	Crankshaft Position Sensor Circuit Malfunction (During engine running)	S Open or short in crankshaft position sensor circuit S Crankshaft position sensor S Crank angle sensor plate S ECM	-	f
P1346 (05-119)	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 1)	S Mechanical system (Jumping teeth of timing chain, chain stretched) S ECM	f	f
P1349 (05-120)	VVT System Malfunction (Bank 1)	S Valve timing S OCV S VVT controller assembly S ECM	f *2	f
P1600 (05-126)	Engine ECU BATT Malfunction	S Open in back up power source circuit S ECM	f	f
P1656 (05-129)	OCV Circuit Malfunction (Bank 1)	S Open or short in OCV circuit S OCV S ECM	f	f

P1690*2 (05-132)	OCV Circuit Malfunction (for VVTL)	• Open or short in OCV circuit • OCV for VVTL • ECM	f	f
P1692*2 (05-136)	OCV Open Malfunction (for VVTL)	• Open or short in OCV circuit • OCV for VVTL • ECM	f	f
P1693*2 (05-136)	OCV Close Malfunction (for VVTL)	• Open or short in OCV circuit • OCV for VVTL • ECM	f	f

*1: f ... CHK ENG (MIL) lights up. - ... CHK ENG (MIL) does not light up.
*2: Only for Euro OBD vehicle.

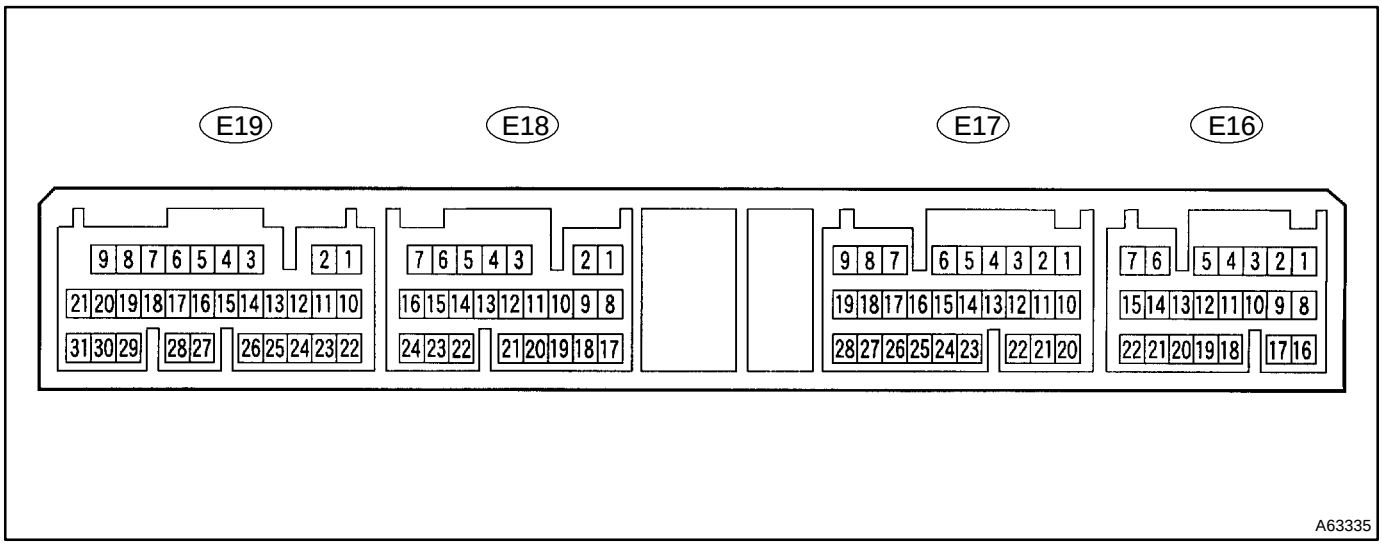
05047-03

LOCATION



05048-03

TERMINALS OF ECM



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
BATT (E16 - 1) - E1 (E18 - 17)	R-W ↔ BR	Always	8 - 14
FC (E16 - 3) - E1 (E18 - 17)	SB (G-R) ↔ BR	IG switch ON	8 - 14
FC (E16 - 3) - E1 (E18 - 17)	SB (G-R) ↔ BR	Idling	Below 1.5
IGSW (E16 - 8) - E1 (E18 - 17)	SB (B-O) ↔ BR	IG switch ON	8 - 14
W (E16 - 15) - E1 (E18 - 17)	W (R-Y) ↔ BR	Idling	8 - 14
W (E16 - 15) - E1 (E18 - 17)	W (R-Y) ↔ BR	IG switch ON	Below 3.5
+B (E16 - 16) - E1 (E18 - 17)	B ↔ BR	IG switch ON	8 - 14
STP (E17 - 6) - E1 (E18 - 17)	SB (G-W) ↔ BR	IG switch ON, brake pedal depressed	8 - 14
STP (E17 - 6) - E1 (E18 - 17)	SB (G-W) ↔ BR	IG switch ON, brake pedal released	Below 1.5
F/PS (E17 - 8) - E1 (E18 - 17)	SB (Y) ↔ BR	IG switch ON	Pulse generation
STA (E17 - 11) - E1 (E18 - 17)	SB (B-R) ↔ BR	Cranking	5.5 or more
HT1B (E17 - 16) - E03 (E18 - 8)	P-L ↔ W-B	Idling	Below 3.0
HT1B (E17 - 16) - E03 (E18 - 8)	P-L ↔ W-B	IG switch ON	9 - 14
EMPS (E17 - 14) - E1 (E18 - 17)	L-R ↔ BR	IG switch ON	8 - 14
MREL (E17 - 21) - E1 (E18 - 17)	B-W ↔ BR	IG switch ON	8 - 14
SPD (E17 - 22) - E1 (E18 - 17)	W (V-W) ↔ BR	IG switch ON, rotate driving wheel slowly	Pulse generation
OX1B (E17 - 25) - E2 (E18 - 18)	W ↔ BR	Maintain engine speed at 2,500 rpm for 2 min. after warning up	Pulse generation (See page 05-95)
TACH (E17 - 27) - E1 (E18 - 17)	W (B) ↔ BR	Idling	Pulse generation
VC (E18 - 2) - E2 (E18 - 18)	Y ↔ BR	IG switch ON	4.5 - 5.5
HT1A (E18 - 3) - E2 (E18 - 18)	P ↔ BR	Idling	Below 3.0
HT1A (E18 - 3) - E2 (E18 - 18)	P ↔ BR	IG switch ON	9 - 14
EVP1 (E18 - 4) - E01 (E19 - 21)	L-B ↔ W-B	IG switch ON	8 - 14
OVL+ (E18 - 7) - OVL- (E18 - 6)	B ↔ L-Y	Engine speed at 6,000 rpm or more	9 - 14
VG (E18 - 11) - EVG (E18 - 1)	G ↔ L-W	Idling, A/C switch OFF	1.1 - 1.5

OX1A (E18 - 12) - E2 (E18 - 18)	R ↔ BR	Maintain engine speed at 2,500 rpm for 2 min. after warning up	Pulse generation (See page 05-95)
THW (E18 - 14) - E2 (E18 - 18)	W ↔ BR	Idling, Engine coolant temp. at 80 °C (176 °F)	0.2 - 1.0
G2 (E18 - 15) - NE- (E18 - 24)	B ↔ W	Idling	Pulse generation (See page 05-79)
NE+ (E18 - 16) - NE- (E18 - 24)	B ↔ W	Idling	Pulse generation (See page 05-79)
THA (E18 - 22) - E2 (E18 - 18)	Y-B ↔ BR	Idling, intake air temp. 20 °C (68 °F)	0.5 - 3.4
VTA (E18 - 23) - E2 (E18 - 18)	LG ↔ BR	IG switch ON, throttle valve fully closed	0.3 - 1.0
VTA (E18 - 23) - E2 (E18 - 18)	LG ↔ BR	IG switch ON, throttle valve fully open	3.2 - 4.9
#10 (E19 - 1) - E01 (E19 - 21)	Y ↔ W-B	IG switch ON	8 - 14
#20 (E19 - 2) - E01 (E19 - 21)	B ↔ W-B	IG switch ON	8 - 14
#30 (E19 - 3) - E01 (E19 - 21)	W ↔ W-B	IG switch ON	8 - 14
#40 (E19 - 4) - E01 (E19 - 21)	L ↔ W-B	IG switch ON	8 - 14
IGT1 (E19 - 10) - E1 (E18 - 17)	R-L ↔ BR	Idling	Pulse generation (See page 05-112)
IGT2 (E19 - 11) - E1 (E18 - 17)	Y-G ↔ BR	Idling	Pulse generation (See page 05-112)
IGT3 (E19 - 12) - E1 (E18 - 17)	GR ↔ BR	Idling	Pulse generation (See page 05-112)
IGT4 (E19 - 13) - E1 (E18 - 17)	W ↔ BR	Idling	Pulse generation (See page 05-112)
RSO (E19 - 18) - E01 (E19 - 21)	B-L ↔ W-B	IG switch ON	9 - 14
OCV + (E19 - 24) - OCV - (E19 - 23)	Y ↔ B-Y	IG switch ON	Pulse generation (See page 05-120)
IGF (E19 - 25) - E1 (E18 - 17)	L-Y ↔ BR	IG switch ON	4.5 - 5.5
IGF (E19 - 25) - E1 (E18 - 17)	L-Y ↔ BR	Idling	Pulse generation (See page 05-112)
KNK1 (E19 - 27) - E1 (E18 - 17)	B ↔ BR	Idling	Pulse generation (See page 05-76)

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PROBLEM SYMPTOMS TABLE

When the malfunction code is not confirmed in the diagnostic trouble code check and the problem still can not be confirmed in the basic inspection, proceed to this problem symptoms tables and troubleshoot according to the numbered order given below.

Symptom	Suspect Area	See page
Engine does not crank (Does not start)	1. Starter and starter relay	19-1
No initial combustion (Does not start)	1. ECM power source circuit 2. Ignition coil (w/ Igniter) circuit 3. Fuel pump control circuit 4. Injector	05-149 05-112 05-144 05-71
No complete combustion (Does not start)	1. Fuel pump control circuit 2. Ignition coil (w/ Igniter) circuit 3. Injector	05-144 05-112 05-71
Engine cranks normally (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Ignition coil (w/ Igniter) 5. Spark plug 6. Compression 7. Injector	05-140 05-101 05-144 05-112 18-3 14-1 05-71
Cold engine (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Injector 5. Ignition coil (w/ Igniter) 6. Spark plug	05-140 05-101 05-144 05-71 05-112 18-3
Hot engine (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Injector 5. Ignition coil (w/ Igniter) 6. Spark plug	05-140 05-101 05-144 05-71 05-112 18-3
Incorrect first idle (Poor idling)	1. ISC valve circuit	05-101
High engine idle speed (Poor idling)	1. ISC valve circuit 2. ECM power source circuit	05-101 05-149
Low engine idle speed (Poor idling)	1. ISC valve circuit 2. Fuel pump control circuit 3. Injector	05-101 05-144 05-71
Rough idling (Poor idling)	1. ISC valve circuit 2. Injector 3. Ignition coil (w/ Igniter) circuit 4. Compression 5. Fuel pump control circuit	05-101 05-71 05-112 14-1 05-144
Hunting (Poor idling)	1. ISC valve circuit 2. ECU power source circuit 3. Fuel pump control circuit	05-101 05-149 05-144
Hesitation/Poor acceleration (Poor drivability)	1. Injector 2. Fuel pump control circuit 3. Ignition coil (w/ Igniter) circuit	05-71 05-144 05-112
Muffler explosion, after fire (Poor drivability)	1. Ignition coil (w/ Igniter) 2. Spark plug 3. Injector	05-112 18-3 05-71
Surging (Poor drivability)	1. Fuel pump control circuit 2. Spark plug 3. Injector	05-144 18-3 05-71

Engine stall (Soon after starting)	1. Fuel pump control circuit 2. ISC valve circuit	05-144 05-101
Engine stall (After accelerator pedal released)	1. Injector 2. ISC valve circuit 3. ECM	05-71 05-101 01-30

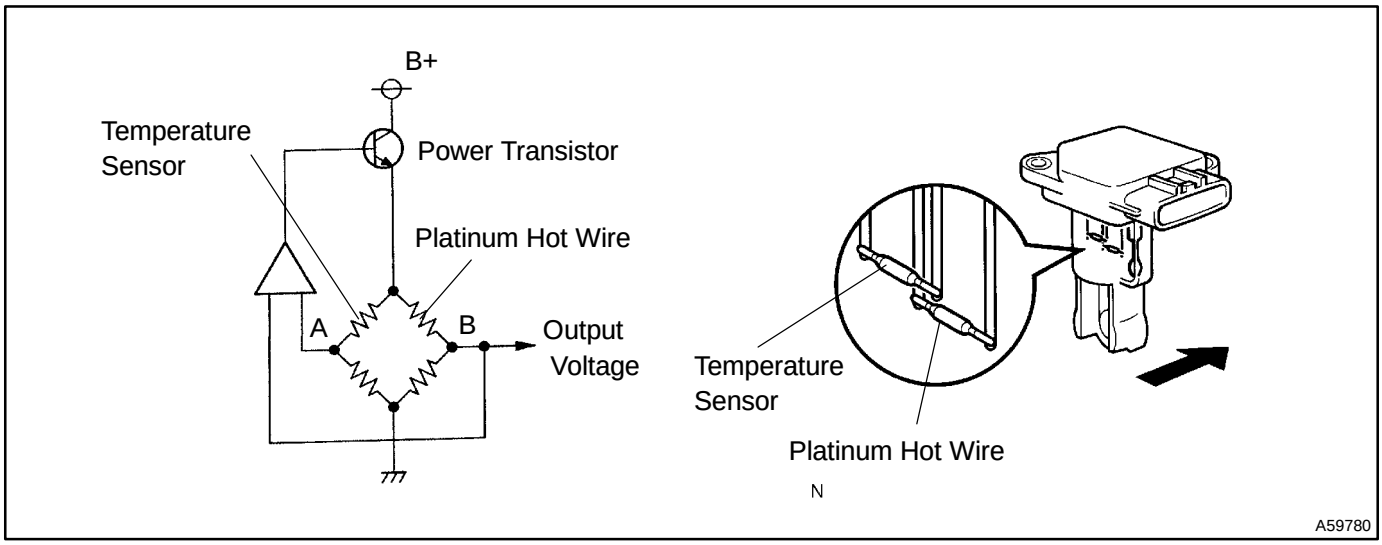
DTC P0100 MASS AIR FLOW CIRCUIT MALFANCTION

CIRCUIT DESCRIPTION

The air flow meter uses a platinum hot wire. The hot wire air flow meter consists of a platinum hot wire, temperature sensor and a control circuit installed in a plastic housing. The hot wire air flow meter works on the principle that the hot wire and temperature sensor located in the intake air bypass of the housing detect any changes in the intake air temperature.

The hot wire is maintained at the set temperature by controlling the current flow through the hot wire. This current flow is then measured as the output voltage of the air flow meter.

The circuit is constructed so that the platinum hot wire and temperature sensor provide a bridge circuit, with the power transistor controlled so that the potential of A and B remains equal to maintain the set temperature.



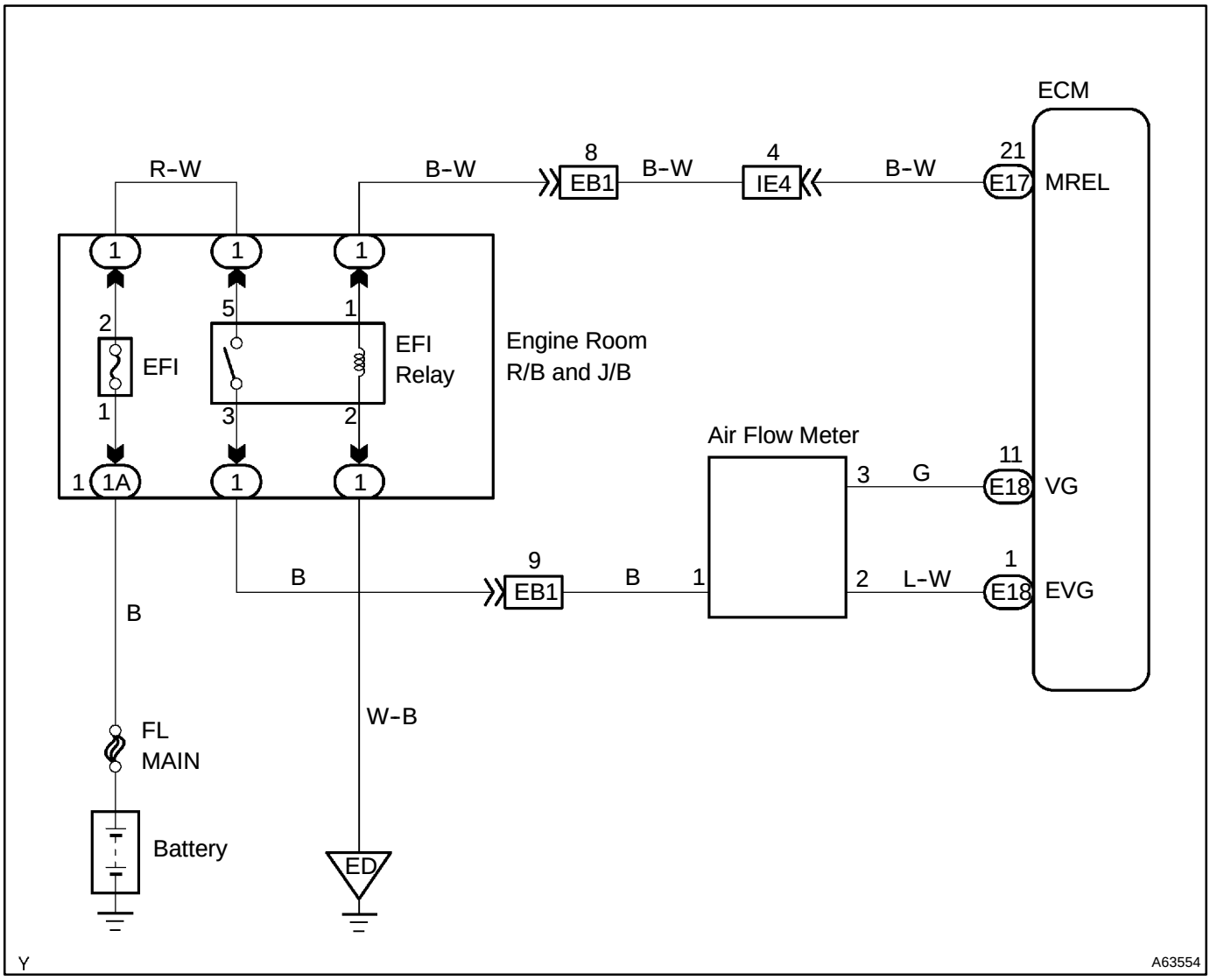
DTC No	DTC Detecting Condition	Trouble Area
P0100	Open or short in air flow meter circuit with more than 3 sec. engine speed less than 4,000 rpm	S Open or short in air flow meter circuit S Air flow meter S ECM

HINT:

After confirming DTC P0100, use the hand-held tester to confirm the air flow ratio from CURRENT DATA.

Air Flow Value (gm/sec.)	Malfunction
Approx. 0.0	S Air flow meter power source circuit open S VG circuit open or short
160.0 or more	S EVG circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1 READ VALUE OF HAND-HELD TESTER(MASS AIR FLOW RATE)

(a) Read air flow rate on the hand-held tester.

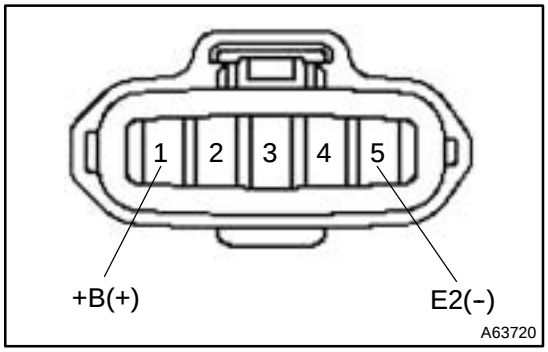
Result:

	A	B
Air flow rate (gm/sec.)	0.0	160.0 or more

B → Go to step 6

A

2 INSPECT INTAKE AIR FLOW METER SUB-ASSY(POWER SOUCE VOLTAGE)

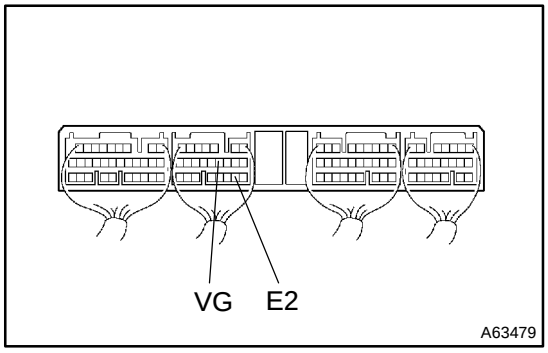


(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between the terminals +B and E2 of the air flow meter connector.
Voltage: 9 - 14 V

NG → Go to step 5

OK

3 INSPECT ECM



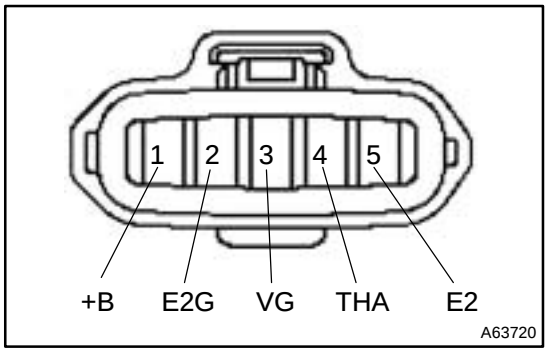
(a) Start the engine.
(b) Measure voltage between the terminals VG and E2 of the ECM connector while the engine is idling.
Voltage: 0.5 - 3.0 V

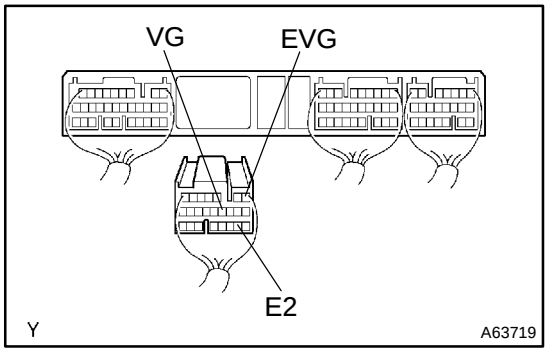
HINT:
The shift position should be A/C switch should be turned OFF.

NG → CHECK AND REPLACE ECM

OK

4	CHECK HARNESS AND CONNECTOR(ECM-INTAKE AIR FLOW METER)





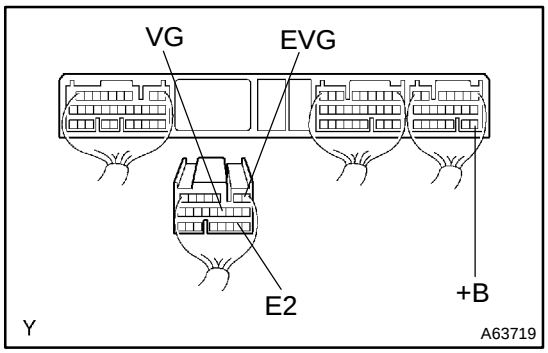
(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminals VG of the air flow meter harness connector and VG of the ECM connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2G of the air flow meter connector and EVG of the ECM connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals VG and EVG of the ECM connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals EVG and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

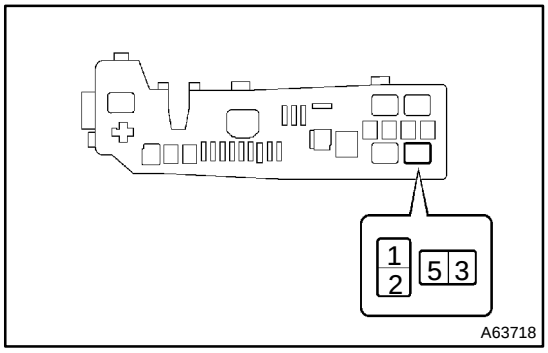
REPLACE INTAKE AIR FLOW METER SUB-ASSY

5	CHECK HARNESS AND CONNECTOR(EFI RELAY-INTAKE AIR FLOW METER)



(a) Disconnect the battery negative (-) terminal.
(b) DIsconnect the ECM E18 connector.
(c) Check continuity between the terminals +B of the ECM connector and 3 of the EFI relay installation relay block.
Resistance: 1 Ω or less

(d) Check continuity between the terminals EVG of the air flow meter connector and EVG of the ECM connector.
Resistance: 1 Ω or less

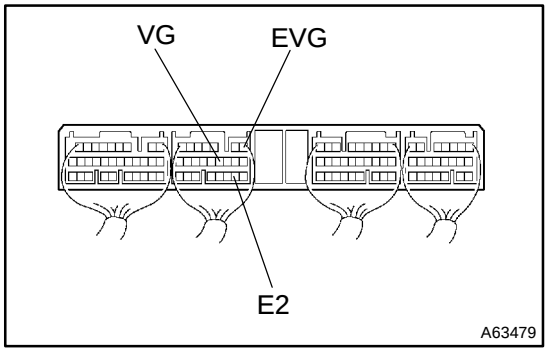


NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR ECM POWER SOURCE CIRCUIT

6	INSPECT ECM

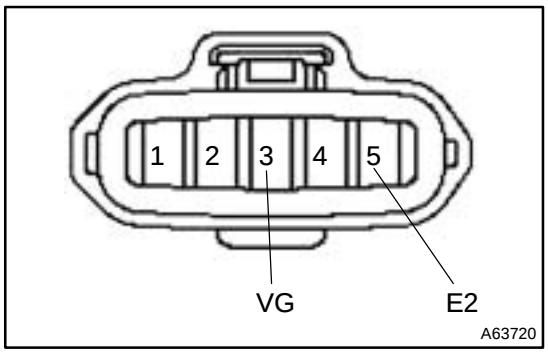


(a) Check continuity between the terminals EVG and E2 of the ECM connector.
Resistance: 1 Ω or less

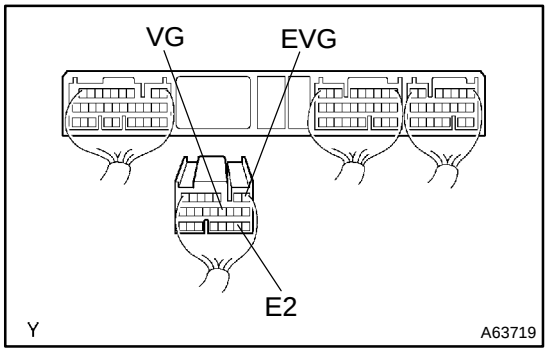
NG → **CHECK AND REPLACE ECM**

OK

7	CHECK HARNESS AND CONNECTOR(ECM-AIR FLOW METER)



(a) Check for open between the terminals VG of the air flow meter connector and VG of the ECM connector.
Resistance: 1 Ω or less
(b) Check for open between the terminals E2 of the air flow meter harness connector and E2 of the ECM connector.
Resistance: 1 Ω or less
(c) Disconnect the ECM E18 connector.
(d) Check for short between the terminals VG and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check for short between the terminals EVG and E2 of the ECM connector.
Resistance: 1 MΩ or more



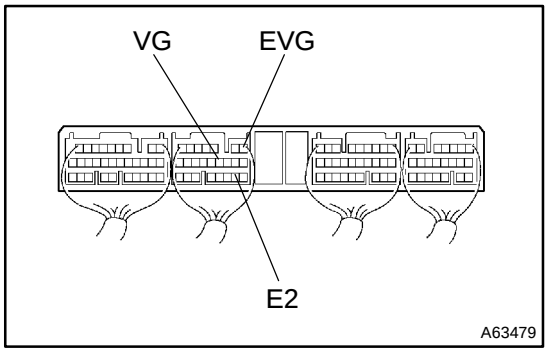
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

1	INSPECT ECM



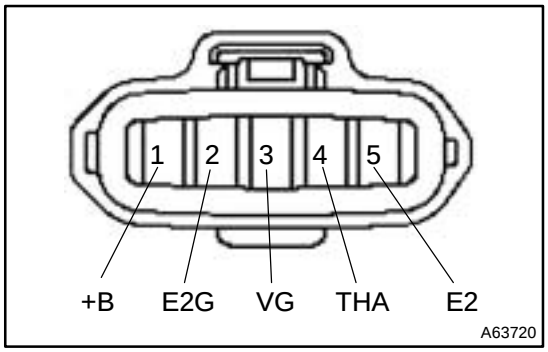
(a) Start the engine.
(b) Measure voltage between the terminals VG and E2 of the ECM connector while the engine is idling.
Voltage: 0.5 - 3.0 V

HINT:
The A/C switch should be turned off.

NG → **CHECK AND REPLACE ECM**

OK

2	INSPECT INTAKE AIR FLOW METER SUB-ASSY(POWER SOURCE VOLTAGE)

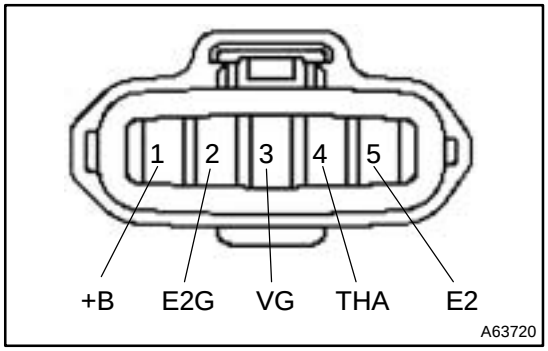


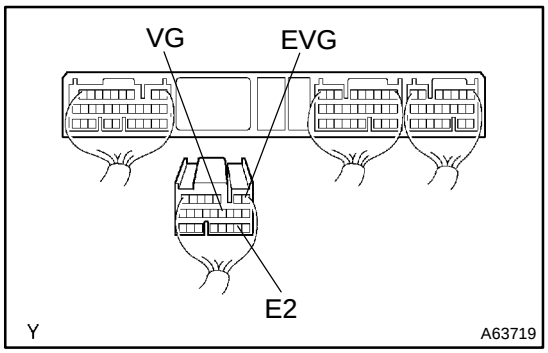
(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between the terminals VG and E2 of the air flow meter connector.
Voltage: 9 - 14 V

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-INTAKE AIR FLOW METER)





(a) Check for open between the terminals VG of the air flow meter connector and VG of the ECM connector.
Resistance: 1 Ω or less
(b) Check for open between the terminals E2 of the air flow meter connector and E2 of the ECM connector.
Resistance: 1 Ω or less
(c) Disconnect the ECM E18 connector.
(d) Check for short between the terminals VG and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check for short between the terminals EVG and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE INTAKE AIR FLOW METER SUB-ASSY

DTC	P0101	MASS AIR FLOW CIRCUIT RANGE/PERFORMANCE PROBLEM

CIRCUIT DESCRIPTION

Refer to DTC P0100 on page 05-23.

DTC No.	DTC Detecting Condition	Trouble Area
P0101	After engine is warmed up, conditions (a) and (b) continue with more than 10 sec. engine speed 900 rpm or less: (2 trip detection logic) (a) Throyyle valve fully closed (b) Atr flow meter out put > 2.2 V	S Air flow meter
	Conditions (a) and (b) continue with more than 10 sec. engine speed 1,500 rpm or more: (2 trip detection logic) (a) VTA ≧ 0.63 V (b) Air flow meter output < 1.06 V	

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0101)

SST 09843-18040

Result:

	A	B
RESULT	Only P0101 is output.	P0101 and other codes are output.

B → REPLACE INTAKE AIR FLOW METER SUB-ASSY

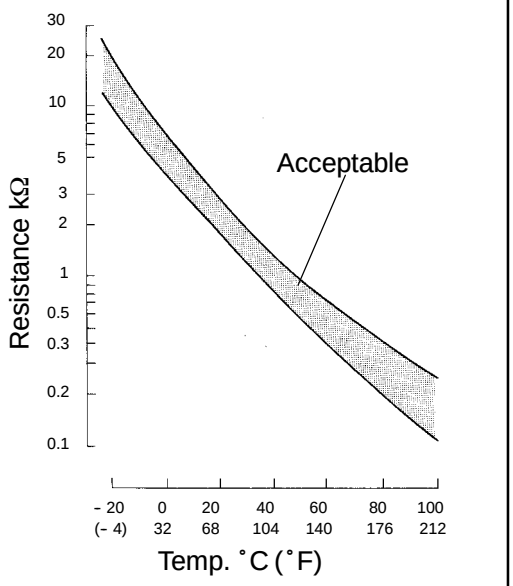
A

GO TO RELEVANT DTC CHART

DTC P0110 INTAKE AIR TEMP. CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

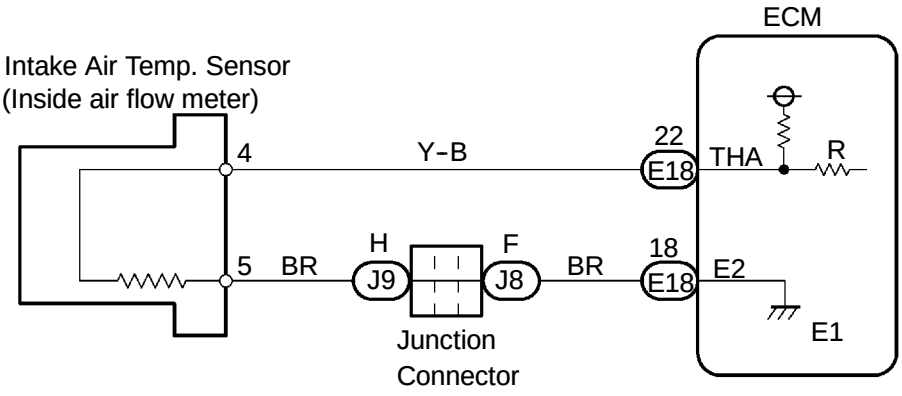
(fig. 1)



The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See fig. 1).
The intake air temp. sensor is connected to the ECM (See below). The 5 V power source voltage in the ECM is applied to the intake air temp. sensor from the terminal THA (THAR) via resistor R.
That is, the resistor R and the intake air temp. sensor are connected in series. When the resistance value of the intake air temp. sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA (THAR) also changes. Based on this signal, the ECM increases the fuel injection volume to improve driveability during cold engine operation.

DTC No.	DTC Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit	S Open or short in intake air temp. sensor circuit S Intake air temp. sensor (inside air flow meter) S ECM

WIRING DIAGRAM



Y

A63555

INSPECTION PROCEDURE

HINT:

- If DTCs P0110, P0115, P0116, P120 and P0121 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	READ VALUE OF HAND-HELD TESTER(INTAKE AIR TEMPERATURE)

(a) Read temperature value on the hand-held tester.
Temperature: The same as actual intake air temperature

Result:

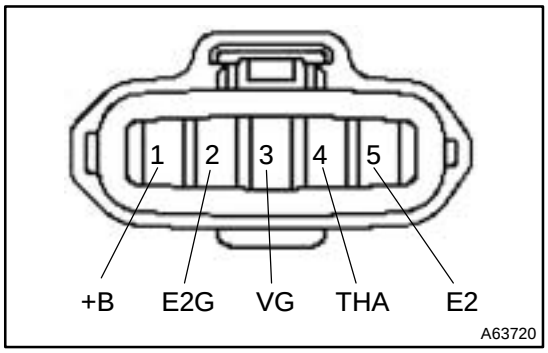
A	B	C
-40°C (-40°F)	140°C (284°F) or more	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-21)**

A

2	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN HARNESS)

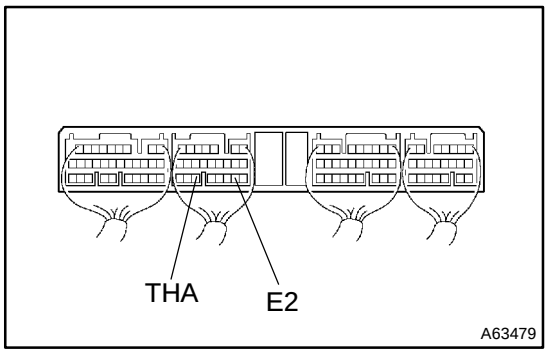


(a) Connect the terminal THA with E2.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPLACE INTAKE AIR FLOW METER SUB-ASSY**

NG

3	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN ECM)



(a) Connect the terminals THA with E2 of the ECM connector.

HINT:

Before checking, do a visual check and connector connection and terminal inspection of the ECM.

(b) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

NG	CHECK AND REPLACE ECM

OK

READ VALUE OF HARNESS AND CONNECTOR

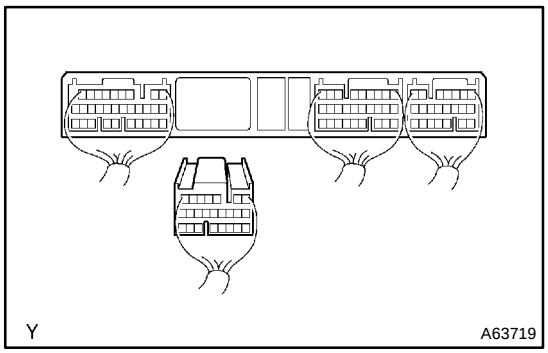
4	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN HARNESS)

(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: -40_C(-40_F)

OK	REPLACE INTAKE AIR FLOW METER SUB-ASSY

NG

5	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN ECM)



(a) Disconnect the the ECU E18 connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: -40°C (-40°F)

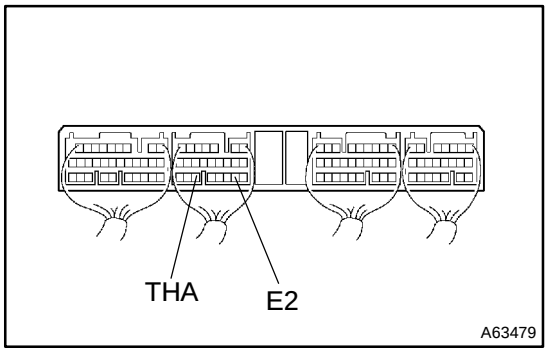
OK	REPAIR OR REPLACE HARNESS AND CONNECTOR

NG

CHECK AND REPLACE ECM

When not using hand-held tester:

1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between terminals THA and E2 of ECM connector.

Voltage:

Intake air temp. ˚C (˚F)	Voltage V
20 (68)	0.5 - 3.4
60 (140)	0.2 - 1.0

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-21)**

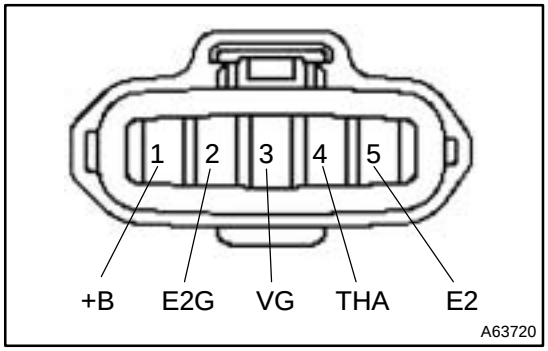
NG

2	CHECK INTAKE AIR FLOW METER SUB-ASSY (See page 10-2)

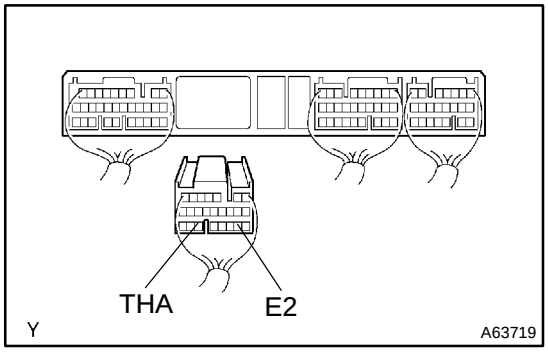
NG → **REPLACE INTAKE AIR FLOW METER SUB-ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-INTAKE AIR TEMPERATURE SENSOR)



(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals THA of the air flow meter connector and THA of the ECM connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals THA and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

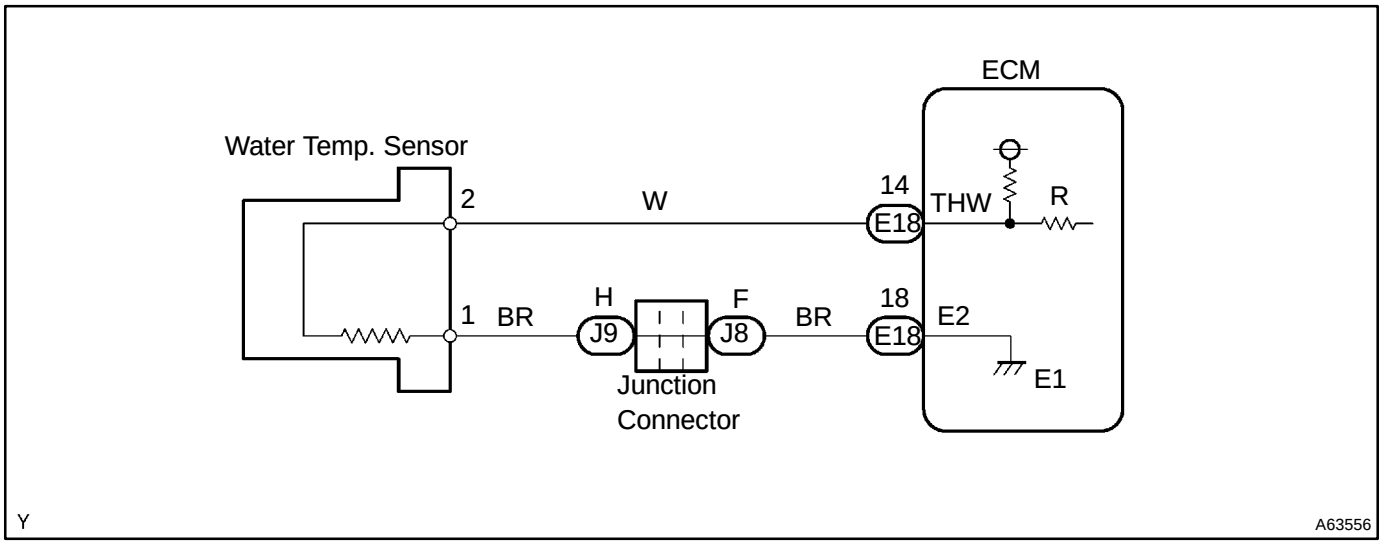
DTC	P0115	ENGINE COOLANT TEMP. CIRCUIT MALFANCTION

CIRCUIT DESCRIPTION

A thermistor built into the water temp. sensor changes the resistance value according to the water temperature.
The structure of the sensor and connection to the ECM is the same as the ones of the air temperature sensor.

DTC No.	DTC Detecting Condition	Trouble Area
P0115	Open or short in water temp. sensor circuit	S Open or short in water temp. sensor circuit S Water temp. sensor S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- S If DTC P0110 (Intake Air Temp. Circuit Malfunction), P0115 (Water Temp. Circuit Malfunction), P0120 (Throttle/Pedal Position Sensor/Switch "A" Malfunction), are output simultaneously, E1, E2 etc. (Sensor Ground system) may be open.
- S Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	READ VALUE OF HAND-HELD TESTER(WATER TEMPERATURE)

(a) Read temperature value on the hand-held tester.
Temperature: Same as actual water temperature

Result:

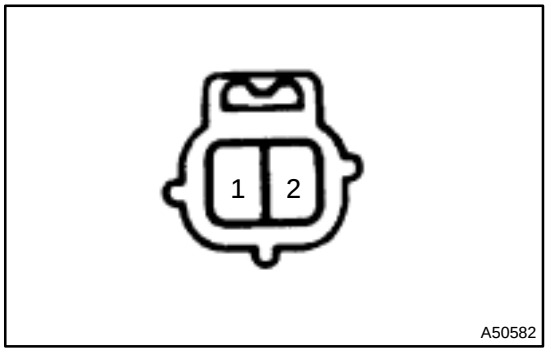
A	B	C
-40_C (-40_F)	140_C (284_F)	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-6)**

A

2	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN HARNESS)

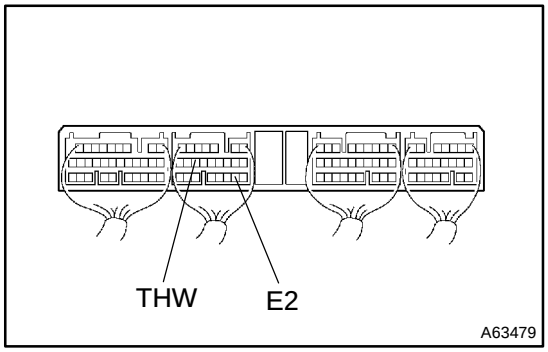


(a) Disconnect the water temperature sensor connector.
(b) Connect the terminals 1 with 2 of the water temperature sensor connector.
(c) Turn the ignition switch ON.
(d) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR**

NG

3	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN ECM)



(a) Connect the terminals THW with E2 of the ECM connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

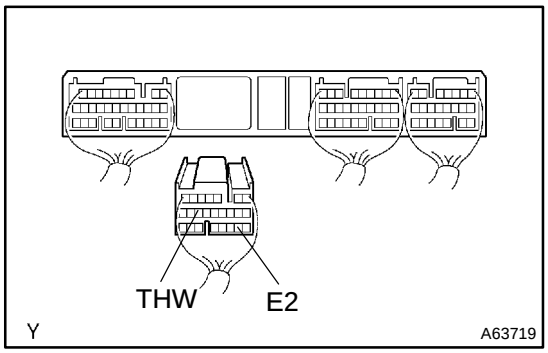
4	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN HARNESS)

(a) Disconnect the water temp. sensor connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: -40°C (-40°F)

OK → **REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR**

NG

5	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN ECM)



(a) Disconnect the ECM E18 connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: -40°C (-40°F)

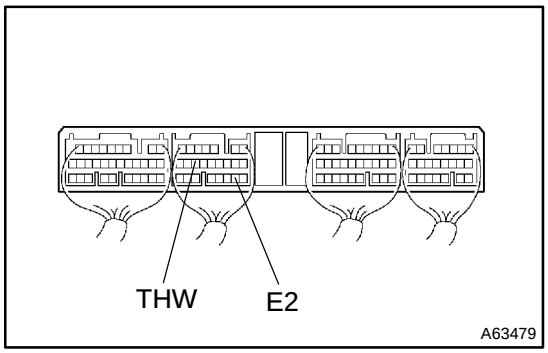
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

When not using hand-held tester:

1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals THW and E2 of the ECM connector.

Voltage:

Water temp. ˚C (˚F)	Voltage V
20 (68)	0.5 - 3.4
60 (140)	0.2 - 1.0

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-6)**

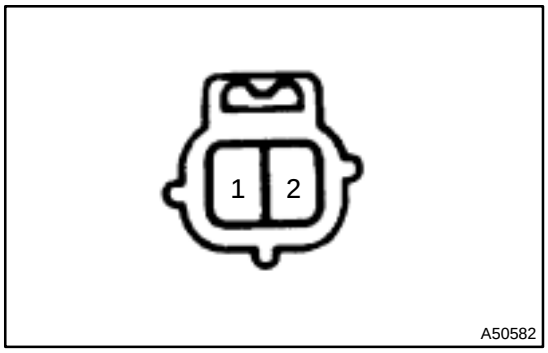
NG

2	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

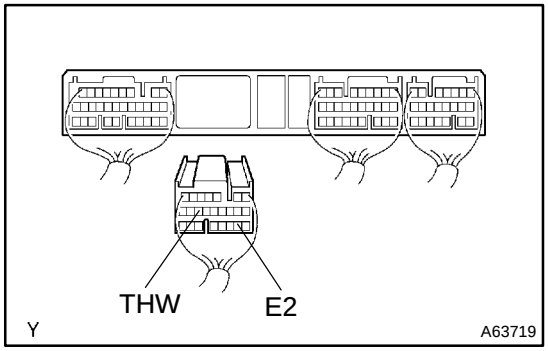
NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

3	CHECK HARNESS AND CONNECTOR(ECM-WATER TEMPERATURE SENSOR)



(a) Disconnect the water temperature sensor connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals 2 of the air flow meter connector and THW of the ECM connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals THW and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

DTC	P0116	ENGINE COOLANT TEMP.CIRCUIT RANGE/PERFORMANCE PROBLEM

CIRCUIT DESCRIPTION

Refer to DTC P0115 on page 05-35.

DTC No.	DTC Detecting Condition	Trouble Area
P0116	When engine starts, water temp. is -7°C (20°F) or less. And, 20 min. or more after engine starts, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)	S Cooling system S Engine coolant temp. sensor S Thermostat
	When engine starts, water temp. is between -7°C (20°F) and 10°C (50°F) And, 5 min. or more after engine starts, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)	

INSPECTION PROCEDURE

HINT:

- If DTCs P0110, P0115, P0116, P0120 and P0121 are output simultaneously, engine coolant temperature sensor circuit may be open. Perform the troubleshooting of DTC P0115 first.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1 READ OUTPUT DTC(BESIDES P0116)

SST 09843-18040

Result:

	A	B
RESULT	Only P0116 is output.	P0116 and other codes are output.

B → **GO TO RELEVANT DTC CHART**

A

2 INSPECT FAN AND GENERATOR V BELT

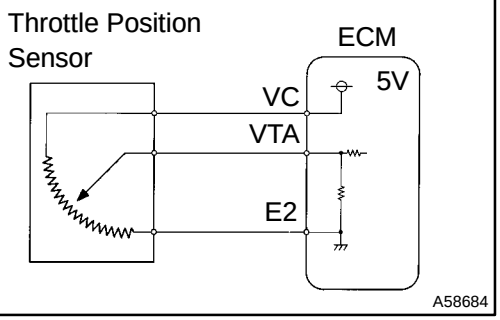
NG → **REPLACE FAN AND GENERATOR V BELT**

OK

REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

DTC	P0120	THROTTLE/PEDAL POSITION SENSOR/SWITCH"A"CIRCUIT MALTANCION

CIRCUIT DESCRIPTION



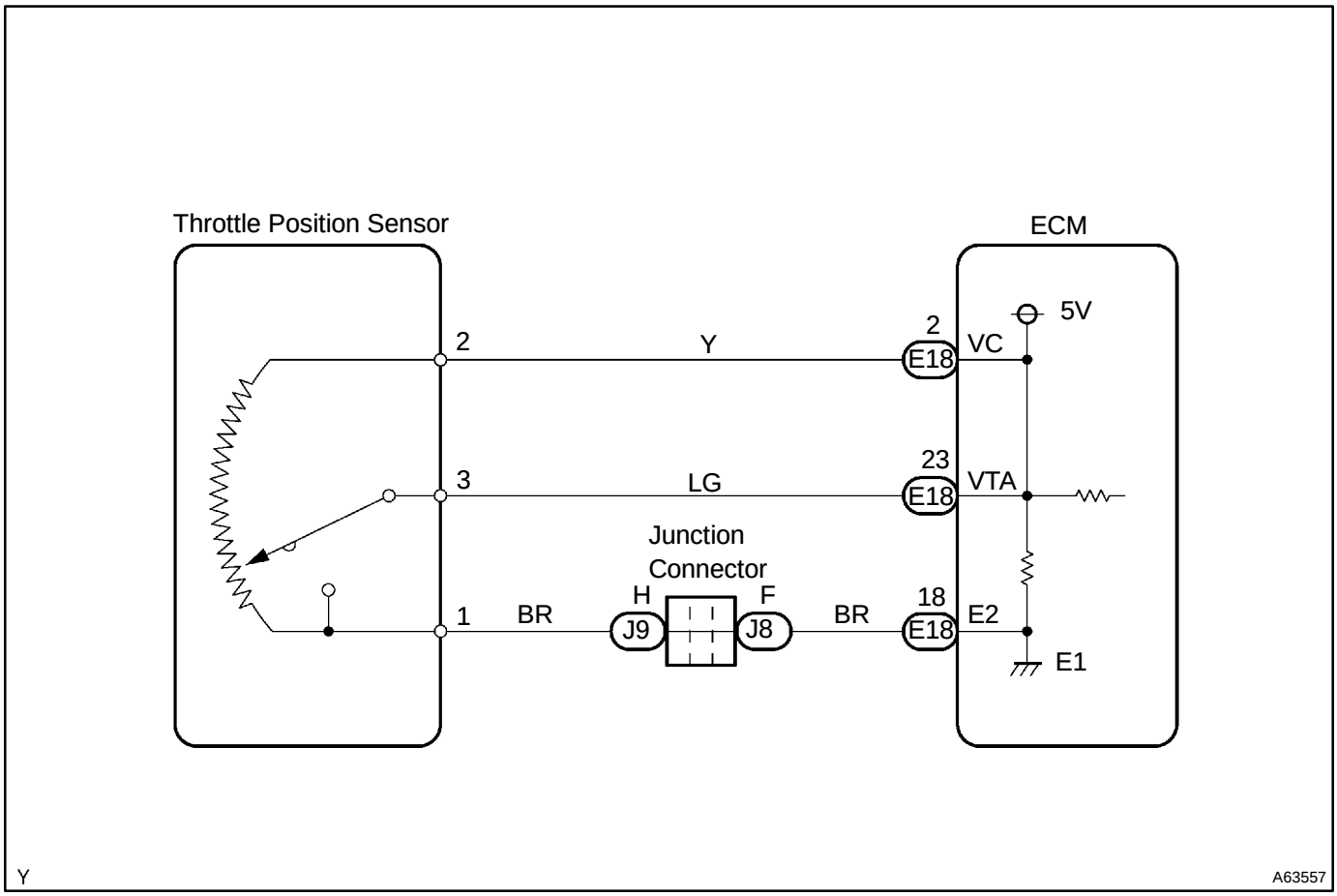
The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle.
When the throttle valve is fully closed, a voltage of approximately 0.7 V is applied to terminal VTA of the ECM. The voltage applied to the terminals VTA of the ECM increases in proportion to the opening angle of the throttle valve and becomes approximately 3.5 - 5.0 V when the throttle valve is fully opened. The ECM judges the vehicle driving conditions from these signals input from terminal VTA, uses them as one of the conditions for deciding the air-fuel ratio correction, power increase correction and fuel-cut control etc.

DTC No.	DTC Detecting Condition	Trouble Area
P0120	Condition (1) or (2) continues with more than 5 sec.: 1. VTA < 0.1 V 2. VTA > 4.9 V	S Open or short in throttle position sensor S Throttle position senor S ECM

HINT:
After confirming DTC P0120, use the hand-held tester to confirm the throttle valve opening percentage.

Throttle valve opening position expressed as percentage		Trouble Area
Throttle valve fully closed	Throttle valve fully open	
0 %	0 %	VC circuit open VTA circuit open or short
Approx. 100 %	Approx. 100 %	E2 circuit open

WIRING DIAGRAM



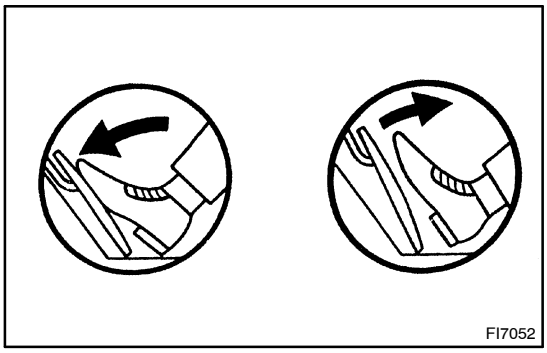
INSPECTION PROCEDURE

HINT:

- Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.
- If DTC P0110 (Intake Air Temp. Circuit Malfunction), P0115 (Water Temp. Circuit Malfunction), P0120 (Throttle/Pedal Position Sensor/Switch "A" Malfunction), are output simultaneously, E1, E2 (Sensor Ground system) may be open.

When using hand–held tester:

1	READ VALUE OF HAND–HELD TESTER(THROTTLE VALVE OPENING PERCENTAGE)



(a) Read the throttle valve opening percentage.

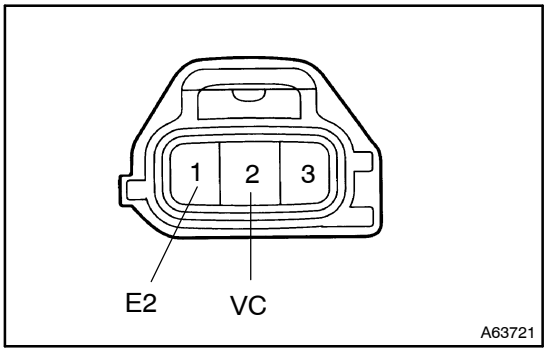
Result:

Throttle valve	Throttle valve opening position expressed as percentage
Fully open	Approx. 75 %
Fully closed	Approx. 10 %

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05–21)**

NG

2	CHECK HARNESS AND CONNECTOR(CHECK VOLTAGE)

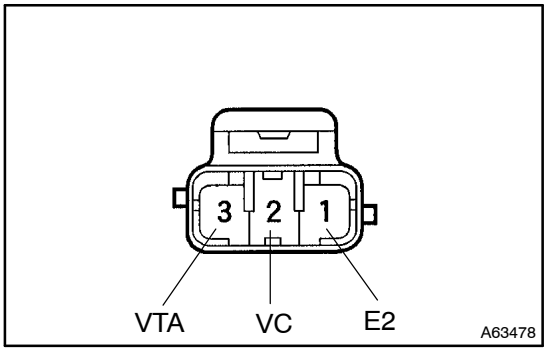


(a) Disconnect the throttle position sensor connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals VC and E2 of the throttle position sensor connector.
Voltage: 4.5 – 5.5 V

NG → **Go to step 6**

OK

3	INSPECT E.F.I. THROTTLE POSITION SENSOR



(a) Disconnect the throttle position sensor connector.
(b) Measure resistance between the terminals VC and E2 of the throttle position sensor.
(c) Measure resistance between the terminals VTA and E2 of the throttle position sensor.

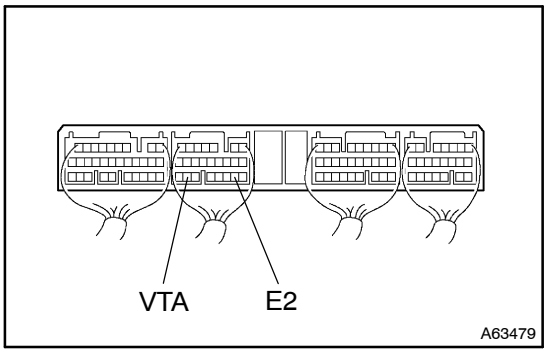
Resistance:

Terminals	Throttle valve	Resistance kΩ
2 (VC) – 1 (E2)	—	2.5 – 5.9
3 (VTA) – 1 (E2)	Fully closed	0.2 – 5.7
3 (VTA) – 1 (E2)	Fully open	2.0 – 10.2

NG → REPLACE E.F.I. THROTTLE POSITION SENSOR

OK

4 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals VTA and E2 of the ECM connector.

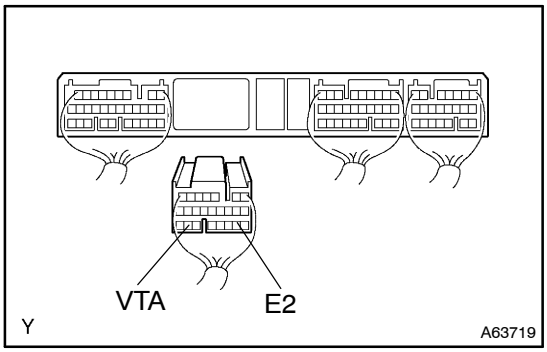
Voltage:

Throttle valve	Voltage V
Fully closed	0.3 – 1.0
Fully open	2.7 – 5.2

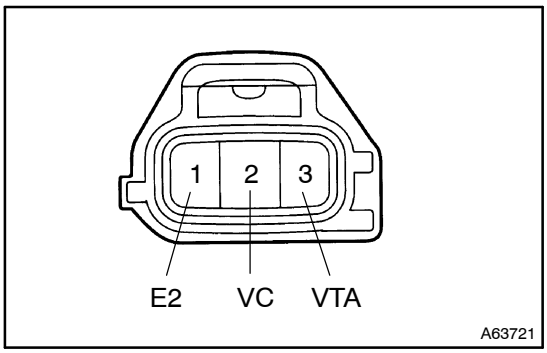
OK → CHECK AND REPLACE ECM

NG

5 CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminals VTA of the ECM connector and VTA of the throttle position sensor connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals VTA and E2 of the ECM connector.
Resistance: 1 MΩ or more

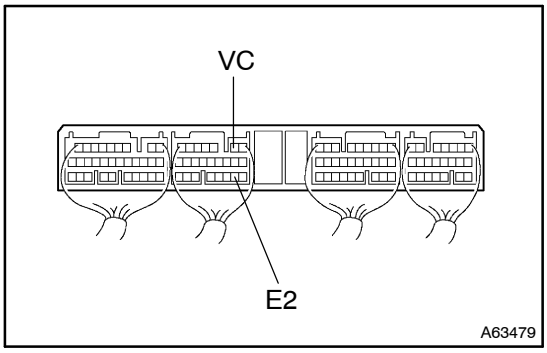


NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

6	INSPECT ECM(CHECK VOLTAGE)

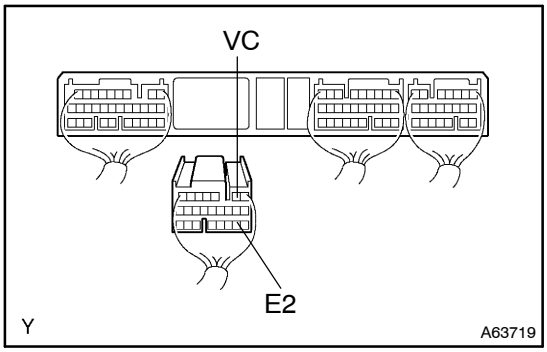


(a) Turn the ignition switch ON.
(b) Measure voltage between terminals VC and E2 of ECM connector.
Voltage: 4.5 – 5.5 V

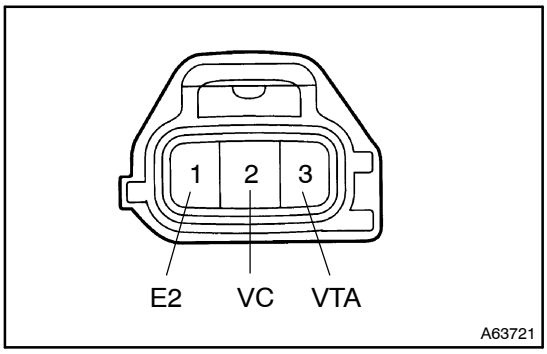
OK → **CHECK AND REPLACE ECM**

NG

7	CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminals VC of the ECM connector and VC of the throttle position sensor connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals VC and E2 of the ECM connector.
Resistance: 1 MΩ or more



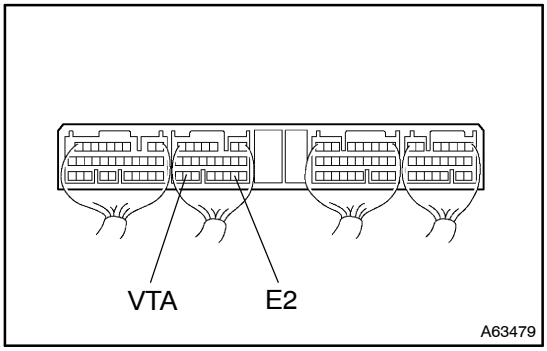
OK → **CHECK AND REPLACE ECM**

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

When not using hand–held tester:

1 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals VTA and E2 of the ECM connector.

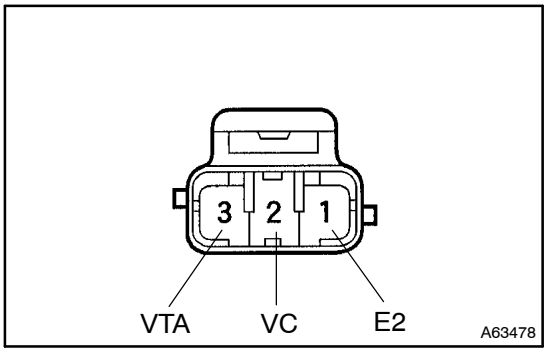
Voltage:

Throttle valve	Voltage V
Fully closed	0.3 – 1.0
Fully open	2.7 – 5.2

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2 CHECK E.F.I. THROTTLE POSITION SENSOR



(a) Disconnect the throttle position sensor connector.
(b) Measure resistance between the terminals VC and E2 of the throttle position sensor.
(c) Measure resistance between the terminals VTA and E2 of the throttle position sensor.

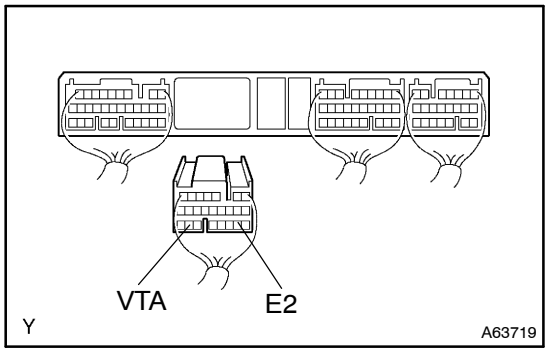
Resistance:

Terminals	Throttle valve	Resistance kΩ
2 (VC) – 1 (E2)	–	2.5 – 5.9
3 (VTA) – 1 (E2)	Fully closed	0.2 – 5.7
3 (VTA) – 1 (E2)	Fully open	2.0 – 10.2

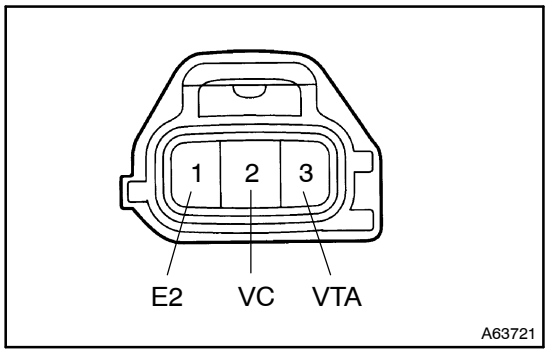
NG → **REPLACE E.F.I. THROTTLE POSITION SENSOR**

OK

3	CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminals VTA of the ECM connector and VTA of the throttle position sensor connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals VTA and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	P0121	THROTTLE/PEDAL POSITION SENSOR/SWITCH"A"CIRCUIT RANGE/PERFFORMANCE PROBLEM

CIRCUIT DESCRIPTION

Refer to DTC P0120 on page 05-40.

DTC No.	DTC Detecting Condition	Trouble Area
P0121	After vehicle speed has been exceeded 30 km/h (19 mph) even once, output value of throttle position sensor is out of applicable range for vehicle speed is more than 0 km/h (0 mph). (2 trip detection logic)	S Throttle position sensor

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	ARE THERE ANY DTC BEING OUTPUT(BESIDES P0121)

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Result:

	A	B
RESULT	Only P0121 is output.	P0121 and other codes are output.

B → GO TO RELEVANT DTC CHART

A

REPLACE E.F.I. THROTTLE POSITION SENSOR

DTC	P0125	INSUFFICIENT COOLANT TEMP. FOR CLOSE LOOP FUEL CONTROL

CIRCUIT DESCRIPTION

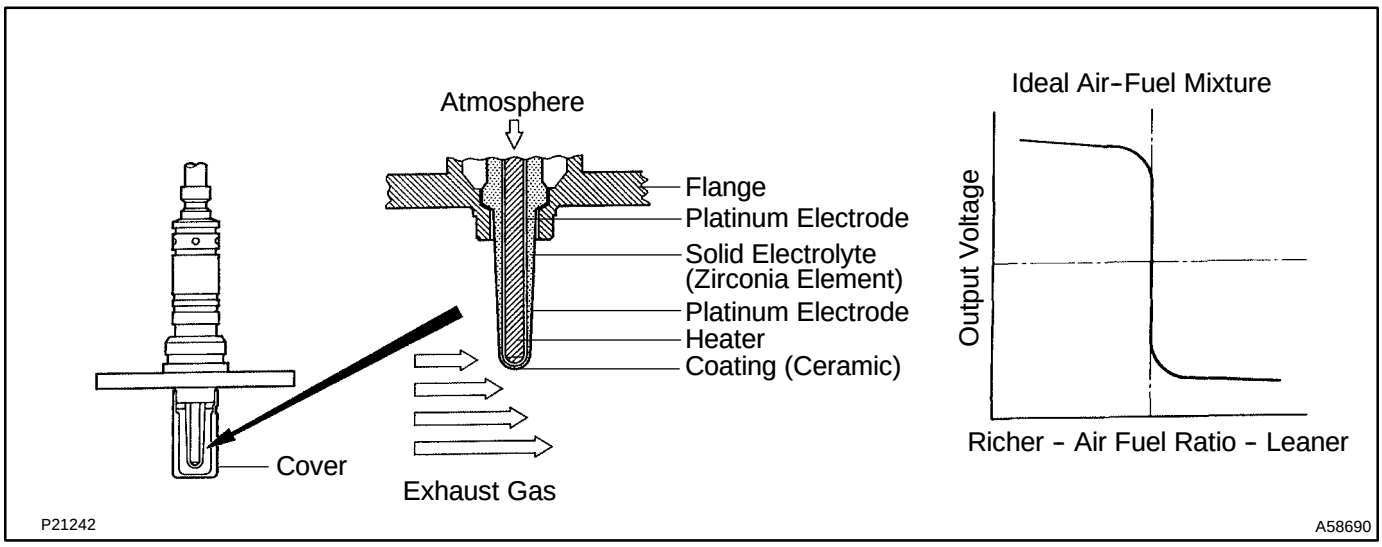
To obtain a high purification rate of the CO, HC and NOx components of the exhaust gas, a three-way catalytic converter is used. For the most efficient use of the three-way catalytic converter, the air-fuel ratio must be precisely controlled so that it is always close to the stoichiometric air-fuel ratio.

The oxygen sensor has the characteristic that it provides output voltage* being approximately proportional to the existing air-fuel ratio. The oxygen sensor output voltage* is used to provide feedback for the ECM to control the air-fuel ratio.

By the oxygen sensor output, the ECM can determine the deviation amount from the stoichiometric air-fuel ratio and control the proper injection time immediately. If the oxygen sensor is out of order, ECM is unable to perform the accurate air-fuel ratio control.

The oxygen sensor is equipped with a heater which heats the zirconia element. The heater is controlled by the ECM. When the intake air volume is low (the temperature of the exhaust gas is low), the current flows to the heater to heat the sensor for the accurate oxygen concentration detection.

*: The voltage value changes at the inside of the ECM only.

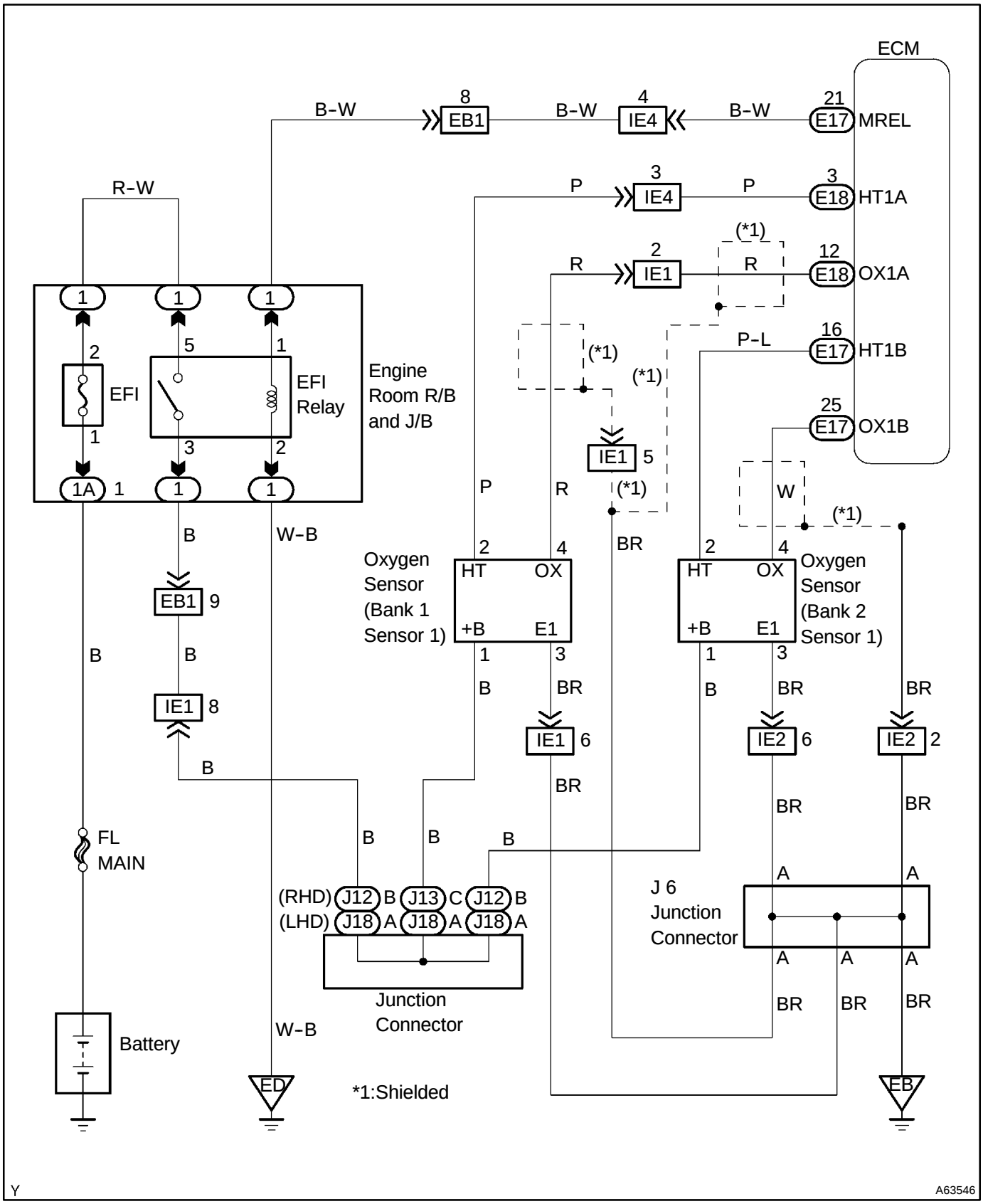


DTC No	DTC Detecting Condition	Trouble Area
P0125	After engine is warmed up, A/F sensor output* does not change when conditions (a), (b), (c) and (d) continue for at least 1.5 min: *: Output value changes at inside of the ECM only (c) Engine speed: 1,500 rpm or more (d) Vehicle speed: 40 - 100 km/h (25 - 62 mph) (e) Throttle valve is not fully closed (f) 140 sec. or more after starting engine	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector S Gas leak on exhaust system S ECM

HINT:

After confirming DTC P0125, use the hand-held tester to confirm output voltage of the oxygen sensor from the CURRENT DATA.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	READ OUTPUT DTC(BESIDES P0125)

Result:

	A	B
RESULT	Only P0125 is output.	P0125 and other codes are output.

HINT:
If any other cord besides P0125 are output, perform the troubleshoot on that DTC before.

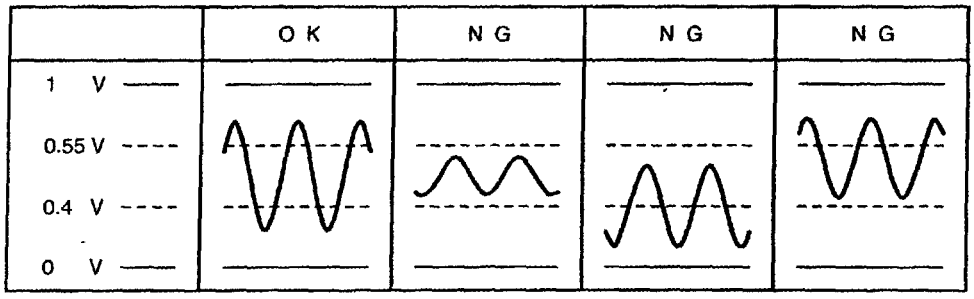
B → GO TO RELEVANT DTC CHART

A

2	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OF OXGEN SENSOR)

(a) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.
(b) Use the hand-held tester to read the output voltage of the oxygen sensor during idling.

Oxgen sensor otput voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table)



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OK → Go to step 9

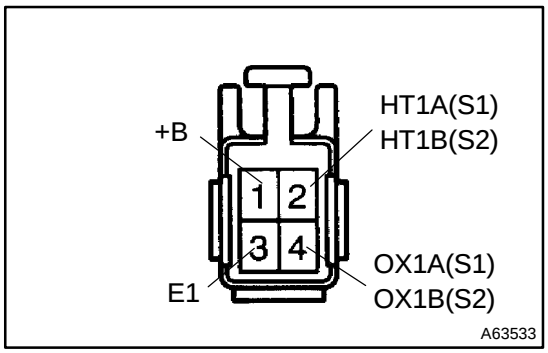
NG

3	CHECK WIRE HARNESS OR CONNECTOR(ECM-OXYGEN SENSOR)

NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

4	INSPECT OXYGEN SENSOR(OXYGEN SENSOR HEATER RESISTANCE)



(a) Disconnect the oxygen sensor connector.
(b) Measure resistance between the terminals HT and +B of the air fuel ratio sensor.
Resistance: 11 - 16 Ω (20_C)

NG → **REPLACE OXYGEN SENSOR**

OK

5	CHECK AIR INDUCTION SYSTEM

NG → **REPAIR OR REPLACE AIR INDUCTION SYSTEM**

OK

6	CHECK FUEL PRESSURE

NG → **REPAIR OR REPLACE FUEL SYSTEM**

OK

7	INSPECT FUEL INJECTOR ASSY

NG → **REPLACE FUEL INJECTOR ASSY**

OK

8	CHECK EXHAUST GAS LEAK

NG → **REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT**

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN

GO

10	READ OUTPUT DTC(BESIDES P0125)

Result:

	A	B
RESULT	P0125 is not output.	P0125 is output.

B → CHECK FOR INTERMITTENT PROBLEMS

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

NO → CHECK AND REPLACE ECM

YES

DTC IS CAUSED RUNNING OUT OF FUEL

When not using hand-held tester:

1	READ OUTPUT DTC(BESIDES P0125)

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Result:

	A	B
RESULT	P0125 is not output.	P0125 is output.

B → GO TO RELEVANT DTC CHART

A

REPLACE OXYGEN SENSOR

DTC	P0130	OXYGEN SENSOR CIRCUIT MALFUNCTION(BANK1 SENSOR1)

DTC	P0136	HEATED OXYGEN SENSOR CIRCUIT MALFUNCTION(BANK1 SENSOR2)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page 05–48.

DTC No	DTC Detecting Condition	Trouble Area
P0130 P0136	Voltage output of oxygen sensor remains at 0.4 V or more, or 0.55 V or less, during idling after engine is warmed up (2 trip detection logic)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector S ECM

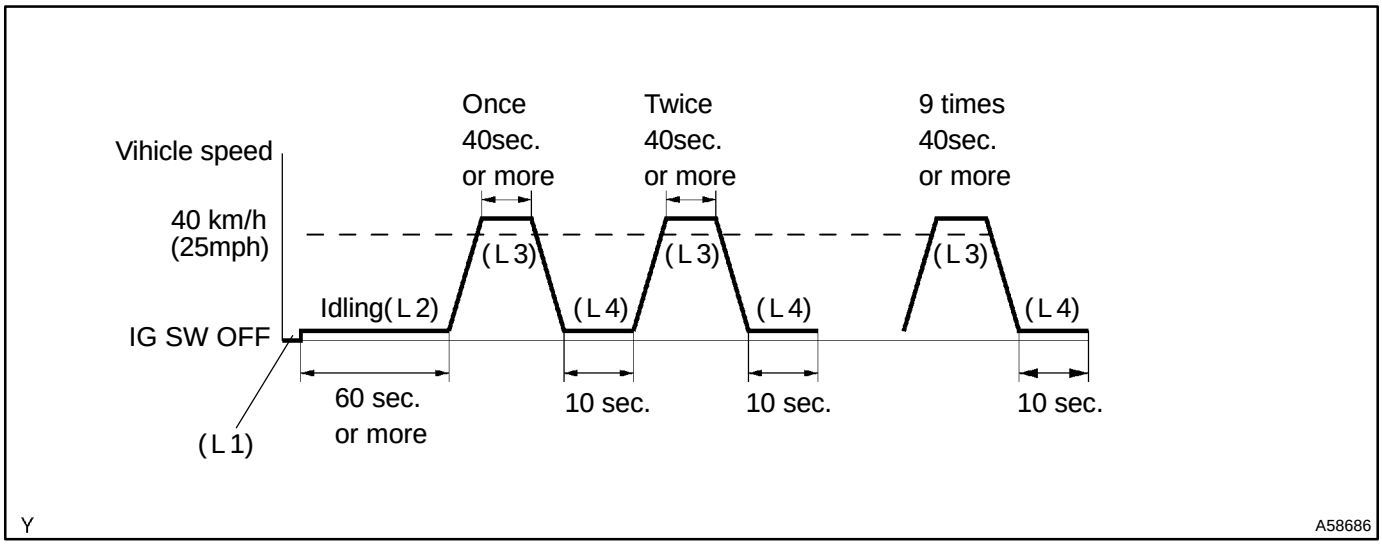
HINT:

- S Sensor 1 refers to the sensor closer to the engine body.
- S The oxygen sensor’s output voltage and the short–term fuel trim value can be read using the hand–held tester.

WIRING DIAGRAM

Refer to DTC P0125 on page 05–48.

CONFIRMATION DRIVING PATTERN



1. **Connect the hand-held tester to the DLC3. (L1)**
2. **Switch the hand-held tester from the normal mode to the check (test) mode (See page 05-6). (L1)**
3. **Start the engine and let the engine idle for 60 seconds or more. (L2)**
4. **Drive the vehicle at 40 km/h (25 mph) and more for 40 seconds or more. (L3)**
5. **Let the engine idle for 10 seconds or more. (L4)**
6. **Preform steps (L3) to (L4) 9 times. (L5)**

HINT:

If a malfunction exists, the MIL will light up on the multi information display during step (L5).

NOTICE:

If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.

If you do not have a hand-held tester, turn the ignition switch OFF after performing steps from (L2) to (L5), then perform steps from (L2) to (L5) again.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0130 OR P0136) (See page 05-6)

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Result:

	A	B
RESULT	P0130 and/or P0136 are output.	P0130 and/or P0136 other codes are output.

B → GO TO RELEVANT DTC CHART (See page 05-14)

A

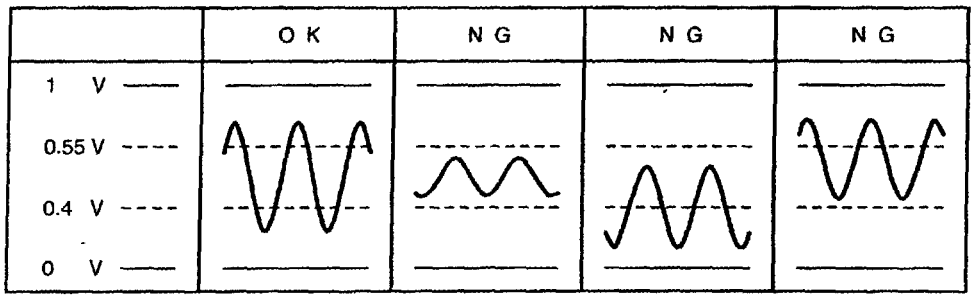
2	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OXYGEN SENSOR)

(a) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.

(b) Use the hand-held tester to read the output voltage of the oxygen sensor during idling.

Oxgen sensor otput voltage:

Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table)

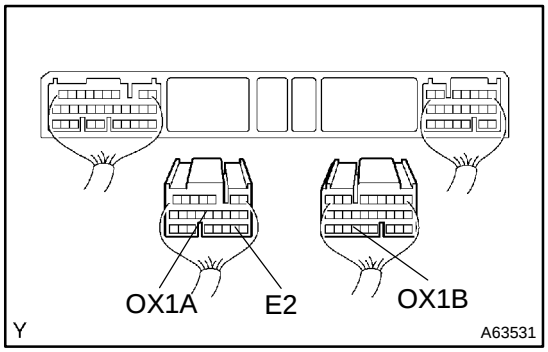


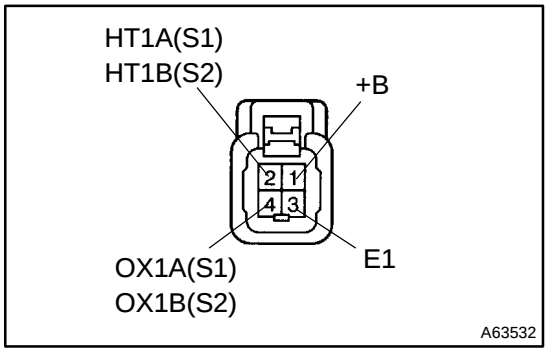
P18349

OK → Go to step 9

NG

3	CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR)





(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E17 and E18 connector.
(c) Check continuity between the terminals OX1A of the ECM connector and OX1A of the oxygen sensor connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OX1A and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check coutinuity between the terminals OX1B of the ECM connector and OX1B of the oxygen sensor connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OX1B and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	CHECK WHETHER MISFIRE IS OCCURRED OR NOT BY MONITORING DTC AND DATA LIST (See page 18-1)

NG → **CHECK FOR SPARK AND IGNITION (See page 18-3)**

OK

5	CHECK AIR INDUCTION SYSTEM (See page 10-1)

NG → **REPAIR OR REPLACE AIR INDUCTION SYSTEM**

OK

6	CHECK FUEL PRESSURE (See page 11-5)

NG → **REPAIR OR REPLACE FUEL SYSTEM (See page 11-7)**

OK

7	CHECK FUEL INJECTOR ASSY (See page 11-7)

NG → REPLACE FUEL INJECTOR ASSY (See page 11-20)

OK

8	CHECK EXHAUST GAS LEAK

(a) Clear the DTC.
(b) Warm up the oxygen sensor by a driving test to check the system.
HINT:
Refer to CONFIRMATION DRIVING PATTERN.

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN

(a) Clear the DTC.
(b) Warm up the oxygen sensor by a driving test to check the system.
HINT:
Refer to CONFIRMATION DRIVING PATTERN.

GO

10	READ OUTPUT DTC (BESIDS P0130 OR P0136) (See page 05-6)

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Result:

	A	B
RESULT	P0130 and/or P0136 are output again.	P0130 and/or P0136 other codes are not output again.

B → CHECK AND REPLACE ECM

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

(a) Confirm if the vehicle ran out of fuel or not in the past.

HINT:

There is no problem, if DTC P0130 and P0136 is not output after the CONFIRMATION DRIVING PATTERN. This means that the ECM records DTC P0130 and P0136 because of the running out of fuel in the past.

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC IS CAUSED RUNNING OUT OF FUEL

DTC	P0133	HEATED OXYGEN SENSOR SLOW RESPOMSE (BANK1 SENSOR1)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page 05-48.

DTC No	DTC Detecting Condition	Trouble Area
P0133	Response time for oxygen sensor's voltage output to change from rich to lean, or from lean to rich, is 0.8 sec. or more during idling after engine is warmed up (2 trip detection logic)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector S ECM

HINT:

- S Bank 1 refers to bank that includes cylinder No. 1.
- S Sensor 1 refers to the sensor closer to the engine body.
- S The oxygen sensor's output voltage and the short−term fuel trim value can be read using the hand−held tester.

WIRING DIAGRAM

Refer to DTC P0125 on page 05-48.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0133) (See Page 05-6)

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Result:

	A	B
RESULT	P0133 is output.	P0133 and other codes are output.

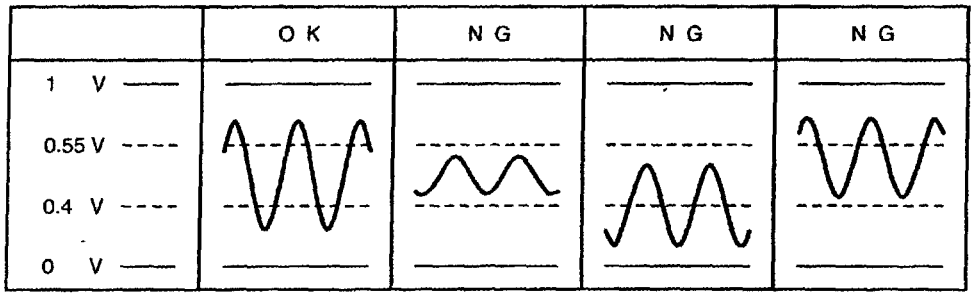
B → GO TO RELEVANT DTC CHART

A

2	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OXYGEN SENSOR)

(a) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.
(b) Use the hand-held tester to read the output voltage of the oxygen sensor during idling.

Oxgen sensor otput voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table)

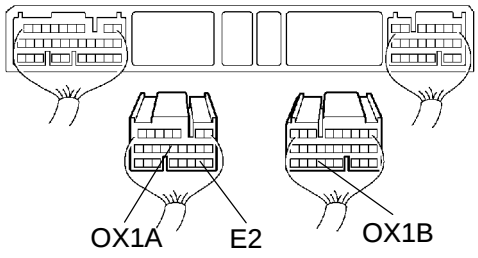


P18349

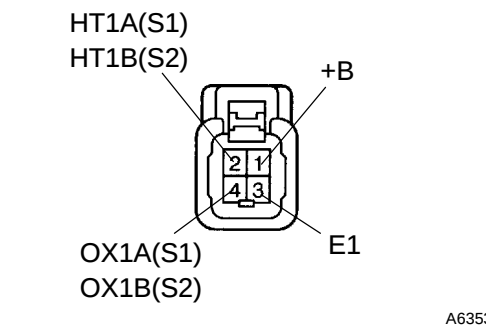
OK → Go to step 9

NG

3	CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR)



(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E17 and E18 connector.
(c) Check continuity between the terminals OX1A of the ECM connector and OX1A of the oxygen sensor connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OX1A and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check coutinuity between the terminals OX1B of the ECM connector and OX1B of the oxygen sensor connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OX1B and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4	CHECK WHETHER MISFIRE IS OCCURRED OR NOT BY MONITORING DTC AND DATA LIST (See page 18-1)

NG → CHECK FOR SPARK AND IGNITION

OK

5	CHECK AIR INDUCTION SYSTEM (See page 10-1)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

6	CHECK FUEL PRESSURE (See page 11-5)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

7	CHECK FUEL INJECTOR ASSY (See page 11-7)

NG → REPLACE FUEL INJECTOR ASSY (See Page 11-20)

OK

8	CHECK EXHAUST GAS LEAK

(a) Clear the DTC.
(b) Warm up the oxygen sensor by a driving test to check the system.
HINT:
Refer to CONFIRMATION DRIVING PATTERN.

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN

(a) Clear the DTC.
(b) Warm up the oxygen sensor by a driving test to check the system.
HINT:
Refer to CONFIRMATION DRIVING PATTERN.

GO

10	READ OUTPUT DTC (BESIDS P0133) (See Page 05-6)

SST 09843-18040

Result:

	A	B
RESULT	P0133 is not output again.	P0133 is not output again.

B → CHECK AND REPLACE ECM

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

(a) Confirm if the vehicle ran out of fuel or not in the past.

HINT:

There is no problem, if DTC P0133 is not output after the CONFIRMATION DRIVING PATTERN. This means that the ECM records DTC P0133 because of the running out of fuel in the past.

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC IS CAUSED RUNNING OUT OF FUEL

DTC	P0135	HEATED OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION(BANK1 SENSOR1)

DTC	P0141	HEATED OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION(BANK1 SENSOR2)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page 05-48.

DTC No	DTC Detecting Condition	Trouble Area
P0135 P0141	When heater operates, heater current exceeds 2 A (2 trip detection logic)	S Open or short in heater circuit of heated oxygen sensor S Heated oxygen sensor heater S ECM
	Heater current of 0.2 A or less when heater operates (2 trip detection logic)	

HINT:

- S Bank 1 refers to the bank that includes cylinder No. 1.
- S Sensor 2 refers to the sensor being farther from the engine body.

WIRING DIAGRAM

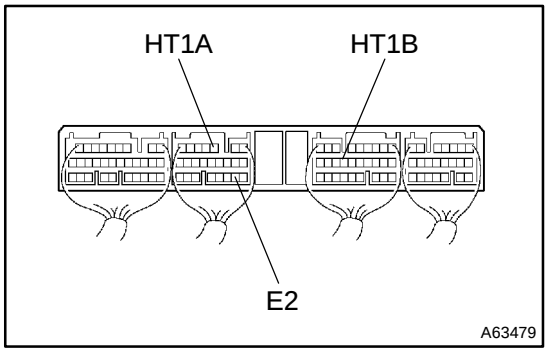
Refer to DTC P0125 on page 05-48.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.

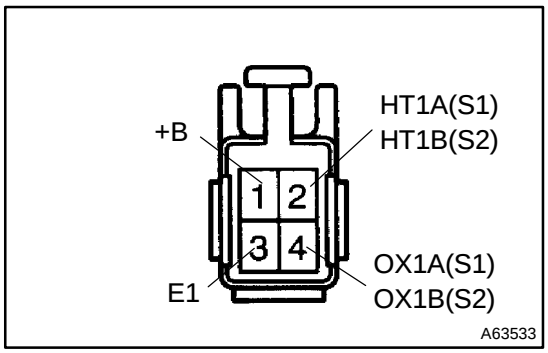
(b) Measure voltage between the terminals HT1A and E2 of the ECM connector.
Voltage: 9 - 14 V

(c) Measure voltage between the terminals HT1B and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → **CHECK AND REPLACE ECM**

NG

2	CHECK OXYGEN SENSOR(OXYGEN SENSOR HEATER)

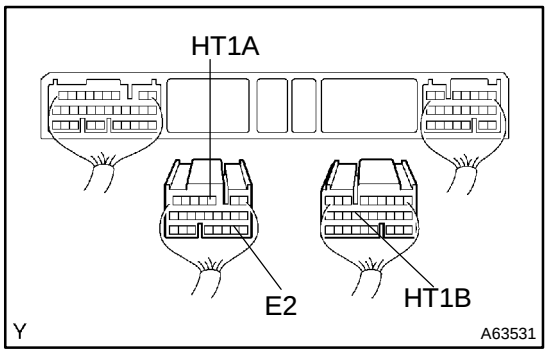


(a) Disconnect the oxygen sensor connector.
(b) Measure resistance between the terminals HT1A and +B of the oxygen sensor.
Resistance: 11 - 16 Ω (20_C)
(c) Measure resistance between the terminal HT1B and +B of the oxygen sensor.
Resistance: 11 - 16 Ω (20_C)

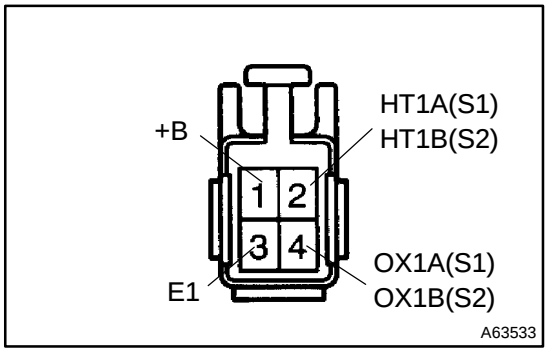
NG → **REPLACE OXYGEN SENSOR**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR)



(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E17 and E18 connector.
(c) Check continuity between the terminals HT1A of the oxygen sensor and HT1A of the ECM connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals HT1A and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals HT1B of the oxygen sensor and HT1B of the ECM connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals HT1B and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

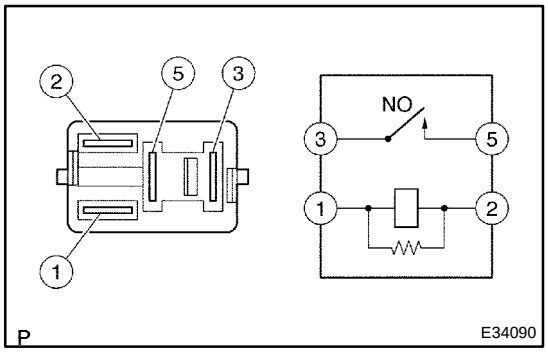
OK

4	CHECK CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-149)

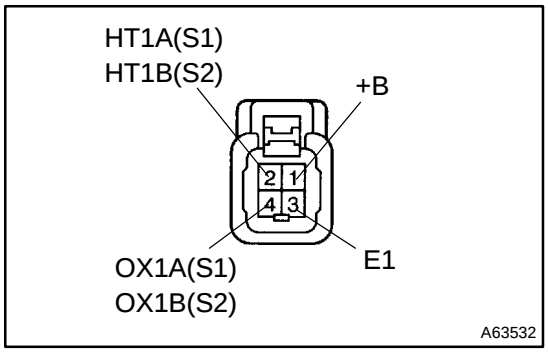
NG → **REPAIR OR REPLACE CHECK FOR ECM POWER SOURCE CIRCUIT**

OK

5	CHECK HARNESS AND CONNECTOR(E.F.I.CIRCUIT OPENING RELAY-OXYGEN SENSOR)



(a) Disconnect the battery negative (–) terminal.
(b) Disconnect the oxygen sensor connector.
(c) Check continuity between the terminals 5 of the E.F.I. circuit opening relay side connector and +B of the oxygen sensor connector.
Resistance: 1 Ω or less



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	P0171	SYSTEM TOO LEAN(FUEL TRIM)(BANK1)

DTC	P0172	SYSTEM TOO RICH(FUEL TRIM)(BANK1)

CIRCUIT DESCRIPTION

Fuel trim refers to the feedback compensation value compared against the basic injection time. Fuel trim includes short-term fuel trim and long-term fuel trim.

Short-term fuel trim is the short-term fuel compensation used to maintain the air-fuel ratio at its ideal theoretical value. The signal from the heated oxygen sensor indicates whether the air-fuel ratio is RICH or LEAN compared to the ideal theoretical value, triggering a reduction in fuel volume if the air-fuel ratio is rich, and an increase in fuel volume if it is lean.

Long-term fuel trim is overall fuel compensation carried out long-term to compensate for continual deviation of the short-term fuel trim form the central value due to individual engine differences, wear over time and changes in the usage environment.

If both the short-term fuel trim and long-term fuel trim are LEAN or RICH beyond a certain value, it is detected as a malfunction and the check engine warning (CHK ENG) lights up.

DTC No.	DTC Detecting Condition	Troble Area
P0171	Oxygen sensor voltage is 0.45 V or less (lean) for 90 sec. under conditions (a), (b) and (c): (2 trip detection logic) (a) Water temp.: 70°C (158°F) or more (b) Engine speed: 1,500 rpm or more (c) Vehicle speed: 100 km/h (62 mph) or less	• Air intake (hose loose) • Fuel line pressure • Open or short in oxygen sensor circuit • Oxygen sensor malfunction • Air flow meter • Water temp. sensor • Gas leakage on exhaust system
P0172	Oxygen sensor voltage is 0.45 V or less (lean) for 90 sec. under conditions (a), (b) and (c): (2 trip detection logic) (a) Water temp.: 70°C (158°F) or more (b) Engine speed: 1,500 rpm or more (c) Vehicle speed: 100 km/h (62 mph) or less	• Air intake (hose loose) • Fuel line pressure • Open or short in oxygen sensor circuit • Oxygen sensor malfunction • Air flow meter • Water temp. sensor • Gas leakage on exhaust system

HINT:

If the total of the short-term fuel trim value and long-term fuel trim value is within ± 25 %, the system is functioning normally.

WIRING DIAGRAM

Refer to DTC P0125 on page 05-48.

INSPECTION PROCEDURE

HINT:

Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	CHECK AIR INDUCTION SYSTEM (See page 10-1)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM (See page 10-1)

OK

2	CHECK FUEL INJECTOR ASSY (See page 11-7)

NG → REPLACE FUEL INJECTOR ASSY (See page 11-20)

OK

3	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

NG → REPAIR OR REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

4	CHECK FOR SPARK AND IGNITION (See page 18-1)

NG → REPAIR OR REPLACE IGNITION SYSTEM (See page 18-3)

OK

5	CHECK FUEL PRESSURE (See page 11-5)

NG → REPAIR OR REPLACE FUEL SYSTEM (See page 11-7)

OK

6	CHECK EXHAUST GAS LEAKAGE POINT

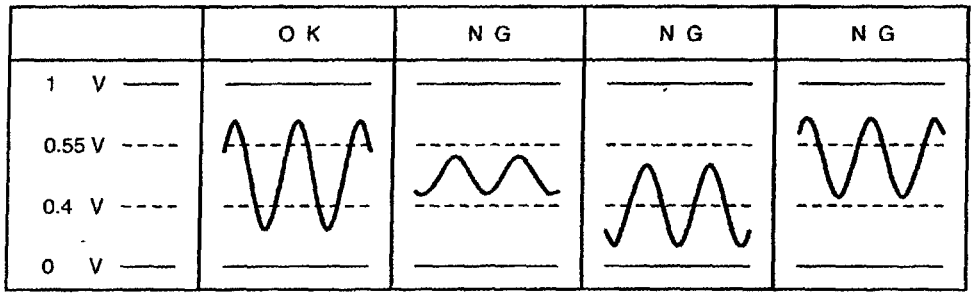
NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

7	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OF OXYGEN SENSOR)

(a) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.
(b) Use the hand-held tester to read the output voltage of the oxygen sensor during idling.

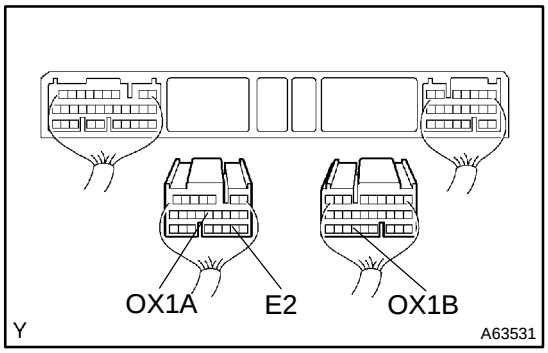
Oxgen sensor otput voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table)

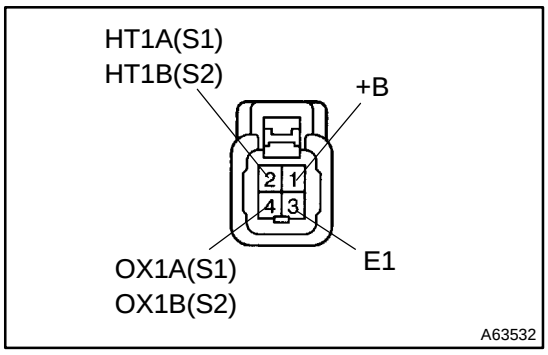


OK	Go to step 9

NG

8	CHECK HARNESS AND CONNECTOR(ENGINE ECM-OXYGEN SENSOR)





(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E17 and E18 connector.
(c) Check continuity between the terminals OX1A of the ECM connector and OX1A of the oxygen sensor connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OX1A and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check coutinuity between the terminals OX1B of the ECM connector and OX1B of the oxygen sensor connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OX1B and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE OXYGEN SENSOR

9 PERFORM CONFIRMATION DRIVING PATTERN

GO

10 READ OUTPUT DTC(BESIDES P0171 OR P0172) **(See Page 05-6)**

Result:

	A	B
RESULT	P0171 and P0172 are not output.	P0171 and P0172 are output again.

B → **CHECK AND REPLACE ECM**

A

11 CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

NO → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-21)**

YES

DTC IS CAUSED RUNNING OUT OF FUEL

When not using hand-held tester:

1	CHECK AIR INDUCTION SYSTEM (See page 10-1)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM (See page 10-1)

OK

2	CHECK FUEL PRESSURE (See page 11-5)

NG → REPAIR OR REPLACE FUEL SYSTEM (See page 11-7)

OK

3	CHECK FUEL INJECTOR ASSY (See page 11-7)

NG → REPLACE FUEL INJECTOR ASSY (See page 11-20)

OK

4	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-2)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

5	CHECK FOR SPARK AND IGNITION (See page 18-1)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

6	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD OXYGEN SENSOR INSTALLED (See page 18-1)

NO → CHECK AND REPLACE ECM

YES

REPLACE OXYGEN SENSOR

DTC	P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

DTC	P0301	CYLINDER 1 MISFIRE DETECTED

DTC	P0302	CYLINDER 2 MISFIRE DETECTED

DTC	P0303	CYLINDER 3 MISFIRE DETECTED

DTC	P0304	CYLINDER 4 MISFIRE DETECTED

CIRCUIT DESCRIPTION

Misfire: The ECM uses the crankshaft position sensor and camshaft position sensor to monitor changes in the crankshaft rotation of each cylinder.

The ECM counts the number of times from the engine speed change rate, indicating that misfire has occurred. And when the misfire rate equals to or exceeds the count, indicating that the engine condition has deteriorated, the MIL lights up.

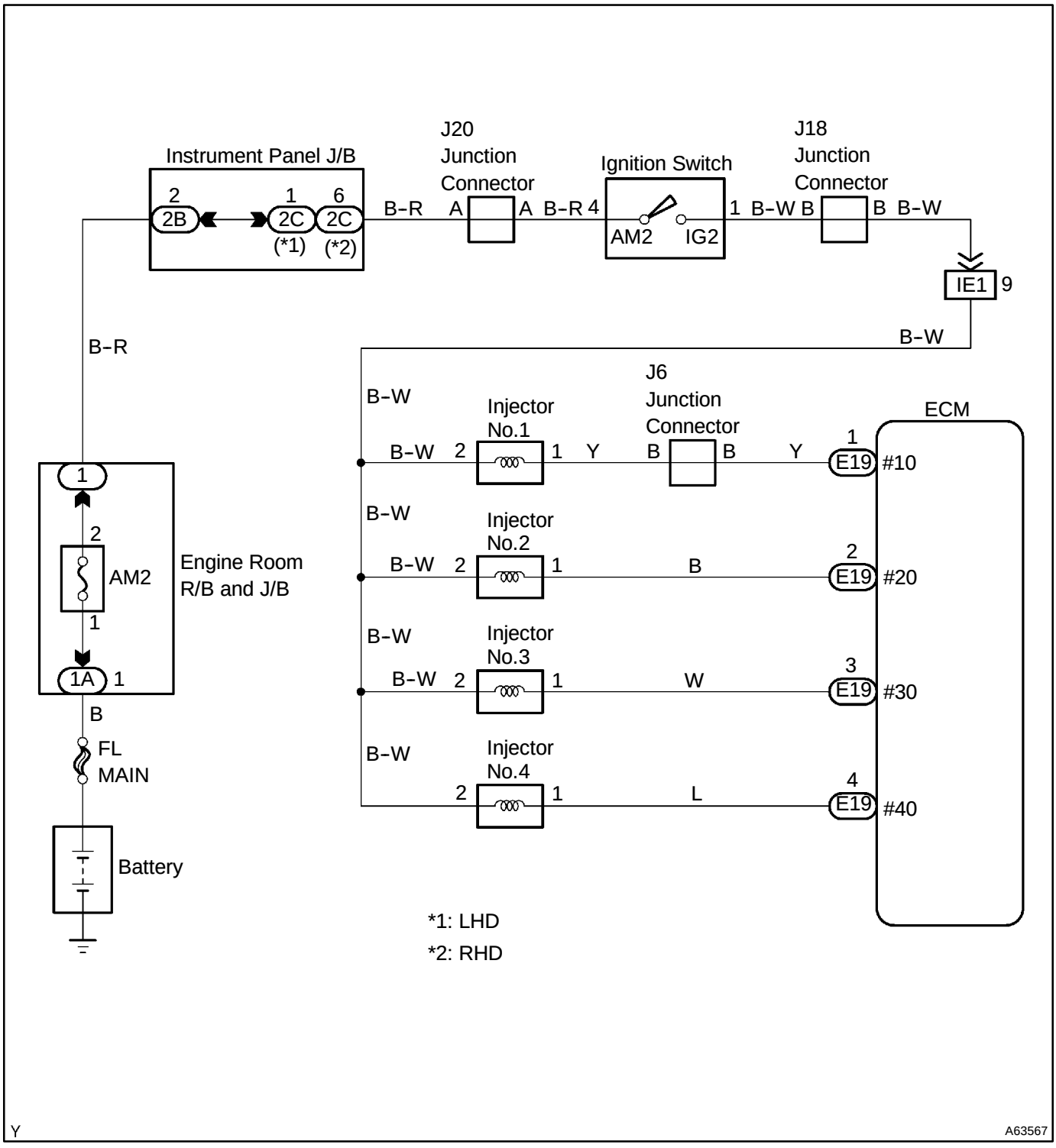
If the misfire rate is high enough and the driving conditions causes the catalyst to overheat, the MIL blinks when the misfire occurs.

DTC No.	DTC Detecting Condition	Trouble Area
P0300	Misfire of random cylinders is detected during any particular 200 or 1,000 revolutions	S Open or short in engine wire S Connector connection S Vacuum hose connection S Ignition system S Injector S Fuel pressure S Air flow meter S Water temp. sensor S Compression pressure S Valve clearance S Valve timing S ECM
P0301 P0302 P0303 P0304	For any particular 200 revolutions of engine, misfire is detected which can cause catalyst to overheat (This causes MIL to blink)	
	For any particular 1,000 revolutions of engine, misfire is detected which causes a deterioration in emissions (2 trip detection logic)	

HINT:

When the 2 or more codes for a misfiring cylinder are recorded repeatedly but no random misfire code is recorded, it is indicated that the misfires were detected and recorded at different times.

WIRING DIAGRAM



CONFIRMATION DRIVING PATTERN

(a) Connect the hand-held tester to the DLC3.
(b) Record the DTC and freeze frame data.
(c) Use the hand-held tester to set to the check mode (See page 05-6).
(d) Drive the vehicle several times with the engine speed, load and its surrounding range shown with ENGINE SPD, CALC LOAD in the freeze frame data or MISFIRE RPM, MISFIRE LOAD in the data list. If you have no hand-held tester, turn the ignition switch OFF after the symptom is simulated once. Then repeat the simulation process again.

HINT:
In order to memorize the DTC of the misfire, it is necessary to drive around MISFIRE RPM, MISFIRE LOAD in the following data list.

Engine Speed	Time
Idling	5 minutes and 45 seconds or more
1000 rpm	4 minutes or more
2000 rpm	2 minutes and 30 seconds or more
3000 rpm	1 minute and 30 seconds or more

(e) Check whether there is misfire or not by monitoring the DTC and the freeze frame data, and then, record them.
(f) Turn the ignition switch OFF and wait at least 5 seconds.

INSPECTION PROCEDURE

HINT:
- If the other DTCs besides misfire are memorized simultaneously, first perform the troubleshooting for them.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.
- If the misfire is not occured when the vehicle is brought to the workshop, it can be confirmed by reproducing the condition of the freeze frame data. After finishing the repair, confirm that there is no misfire (See the confirmation driving pattern).
- When either of SHORT FT #1, LONG FT #1, SHORT FT #2 or LONG FT #2 in the freeze frame data is over the range of ±20%, there is a possibility that the air-fuel ratio is inclining either to "RICH" (-20% or less) or "LEAN" (+20% or more).
- When COOLANT TEMP in the freeze frame data is less than 80˚C (176˚F), there is a possibility of misfire only during warming up.
- In case that the misfire cannot be reproduced, this may be because of the driving with the shortage of fuel, the use of improper fuel, a stain of ignition plug and etc.

1	CHECK WIRE HERNESS, CONNECTOR AND VACUUM HOSE IN ENGINE ROOM

(a) Check the connection conditions of the wire harness and connector.
(b) Check the disconnection, piping and break in the vacuum hose.

NG → REPAIR OR REPLACE, THEM CONFIRM THAT THERE IS NO MISFIRE

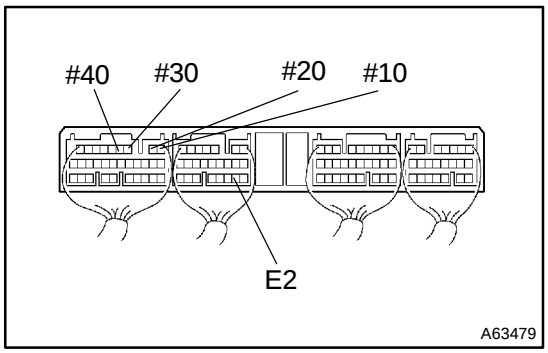
OK

2	INSPECT SPARK PLUG

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

3	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between applicable terminal and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → Go to step 5

NG

4	INSPECT FUEL INJECTOR ASSY (See page 11-7)

NG → REPLACE FUEL INJECTOR ASSY

OK

CHECK WIRE HARNESS OR CONNECTOR

5	CHECK FUEL PRESSURE (See page 11-5)

NG → REPAIR OR REPLACE FUEL PUMP, FUEL PIPE LINE AND FILTER

OK

6	INSPECT FUEL INJECTOR ASSY (See page 11-7)

NG → REPLACE FUEL INJECTOR ASSY

OK

7	INSPECT INTAKE AIR FLOW METER SUB-ASSY

NG → REPAIR OR REPLACE INTAKE AIR FLOW METER SUB-ASSY

OK

8	INSPECT E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See Page 10-2)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

CHECK COMPRESSION PRESSURE, VALVE CLEARANCE AND VAIVE TIMING

DTC	P0325	KNOCK SENSOR1 CIRCUIT MALFANCTION (BANK1)

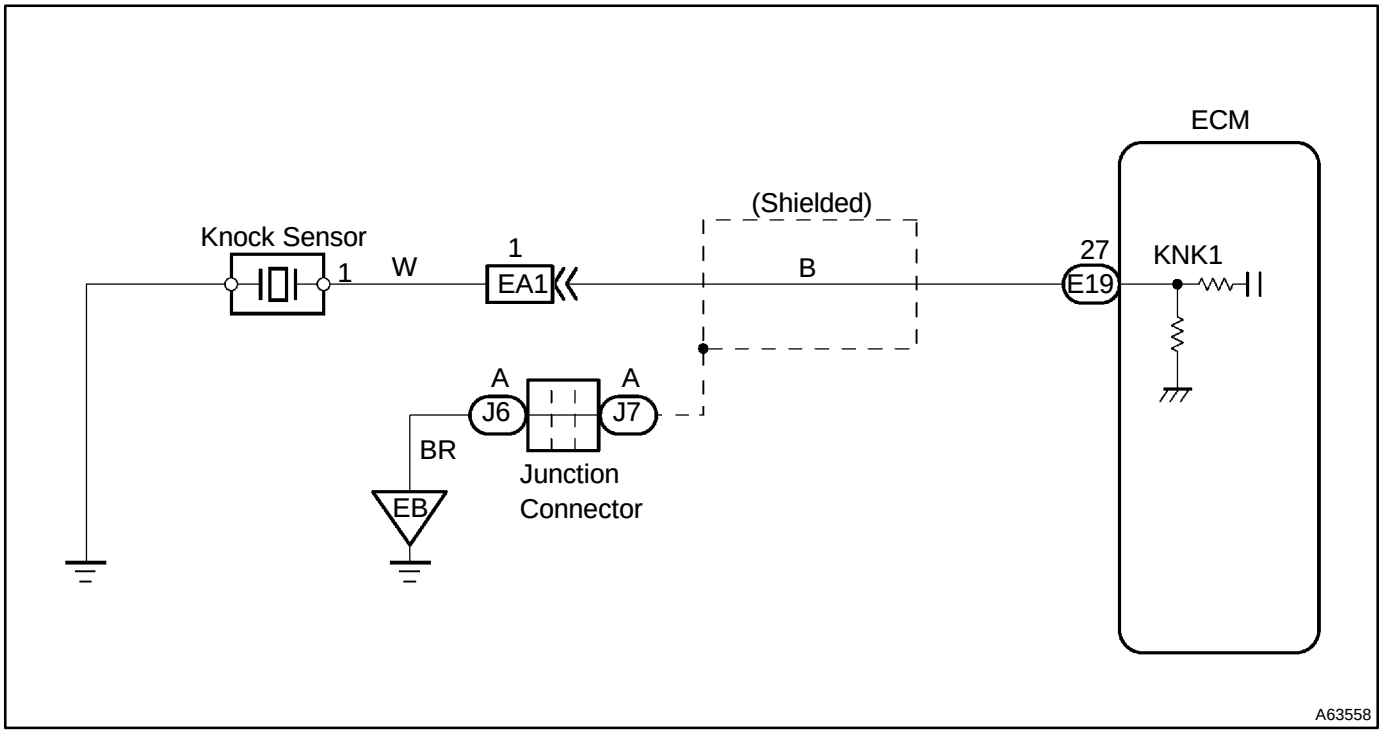
CIRCUIT DESCRIPTION

The knock sensor is fitted to the cylinder block to detect the engine knocking. This sensor contains a piezo-electric element which generates a voltage when it becomes deformed. This occurs when the cylinder block vibrates due to knocking. If the engine knocking occurs, the ignition timing is delayed to suppress it.

DTC No.	DTC Detecting Condition	Trouble Area
P0325	No knock sensor signal to ECM with engine speed, 2,000 rpm or more	S Open or short in knock sensor circuit S Knock sensor (looseness) S ECM

HINT:
If the ECM detects above diagnosis conditions, it operates the fail safe function in which the corrective retard angle value is set to the maximum value.

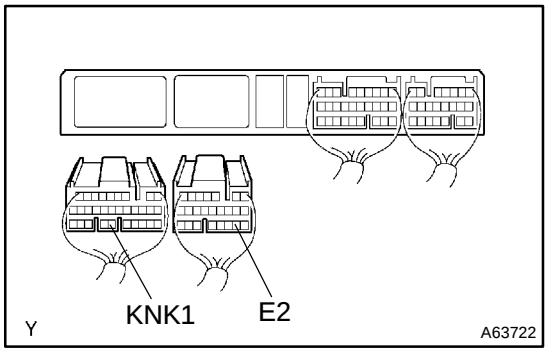
WIRING DIAGRAM

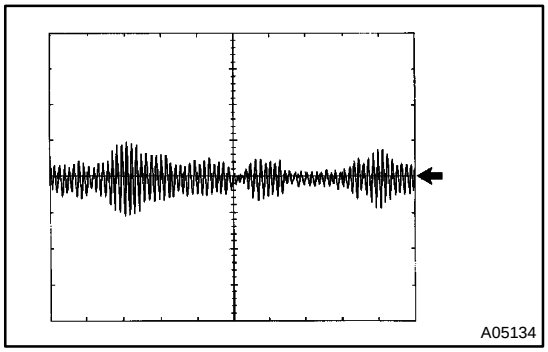


INSPECTION PROCEDURE

HINT:
Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	CHECK HARNESS AND CONNECTOR





(a) Check for short on the wire harness between the ECM and the knock control sensor.
(1) Disconnect the ECM E18 and E19 connector.
(2) Check for short between the terminals KNK1 of ECM connector and E2 of ECM connector.
Resistance: 1 MΩ or more

(b) Reference:
Inspection using the oscilloscope.
(1) With the engine racing at 4,000 rpm, check the waveform between terminal KNK1 of the ECM connector and the body ground.

HINT:
The correct waveforms are as shown in the left.
(2) Spread the time on the horizontal axis, and confirm that period of the wave is 80 μ seconds (Normal mode vibration frequency of knock sensor:12.5 kHz).

HINT:
If normal mode vibration frequency is not 7.6 kHz, the sensor is out of order.

OK	Go to step 3

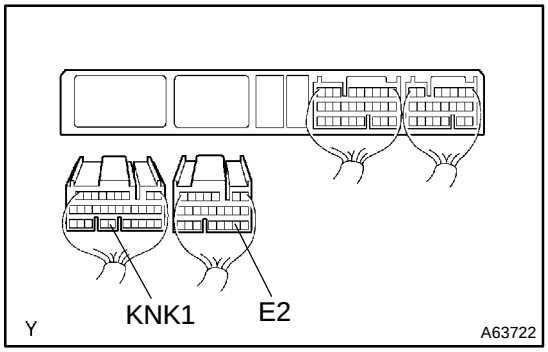
NG

2	INSPECT KNOCK CONTROL SENSOR (See page 10-2)

NG	REPLACE KNOCK CONTROL SENSOR

OK

3	CHECK HARNESS AND CONNECTOR(ECM-KNOCK CONTROL SENSOR)



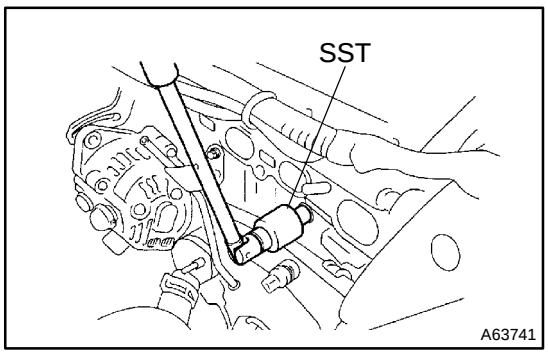
(a) Disconnect the knock control sensor connector.
(b) Disconnect the ECM E18 and E19 connector.
(c) Check continuity between the terminals KNK1 of the ECM connector and KNK1 of the knock control sensor.
Resistance: 1 Ω or less
(d) Check for short between the terminals KNK1 and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD KNOCK SENSOR IS INSTALLED

SST 09816-30010



(a) Change the knock sensor to a new one
  (1) Remove the knock control sensor.
  (2) Install the knock control sensor.
  Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)
(b) Perform the driving test.
(c) Read DTC.

Result:

	A	B
RESULT	P0325 is output	P0325 is not output

B → REPLACE KNOCK CONTROL SENSOR

A

CHECK AND REPLACE ECM

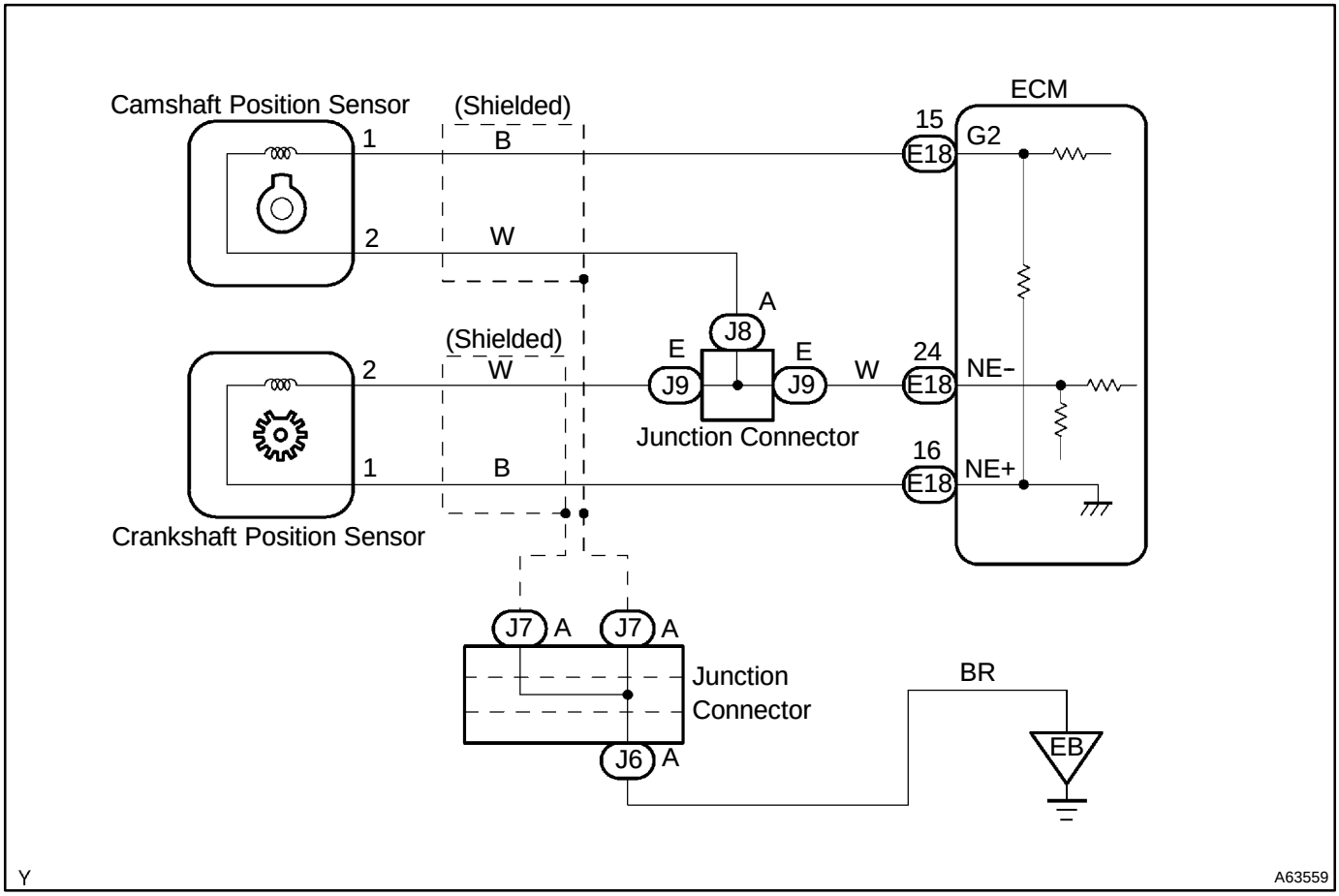
DTC	P0335	CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Crankshaft position sensor (NE signal) consists of a magnet, iron core and pick up coil.
The NE signal plate (crank angle sensor plate) has 34 teeth and is mounted on the crankshaft. The NE signal sensor generates 34 signals at every engine revolution. The engine ECM detects the crankshaft angle and the engine speed based on the NE signal, and the cylinder detection and the VVT palce based on the combination of the G and NE signal.

DTC No.	DTC Detecting Condition	Trouble Area
P0335	No crankshaft position sensor signal to ECM during cranking (2 trip detection logic)	S Open or short in crankshaft position sensor circuit S Crankshaft position sensor S Crank angle sensor plate S ECM
	No crankshaft position sensor signal to ECM with engine speed 600 rpm or more (2 trip detection logic)	

WIRING DIAGRAM

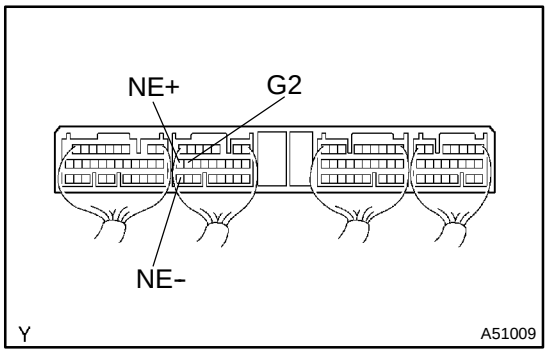


INSPECTION PROCEDURE

HINT:

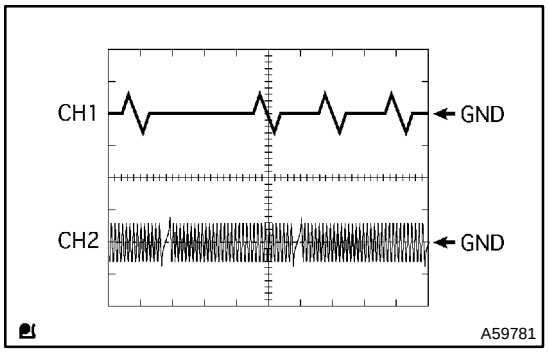
- Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.
- Perform troubleshooting of DTC P0335 first. If no trouble is found, troubleshoot the following mechanical system.

1	INSPECT CRANKSHAFT POSITION SENSOR



(a) Check the crankshaft position sensor for resistance.
(See page 18-3)
Resistance:
1630 - 2740 Ω (Cold)
2065 - 3225 Ω (Hot)

HINT:
"Cold" and "Hot" above express the temperature of the part itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C. (122_F) to 100_C (212_F)



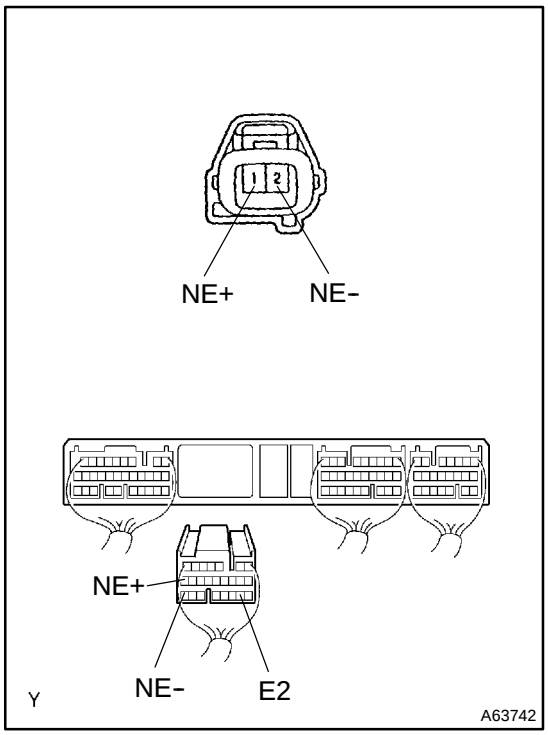
(b) Reference:
Inspection using the oscilloscope.
(1) During cranking or idling, check the waveform between terminals G2 and NE-, and NE+ and NE- of the ECM connector.

HINT:
The correct waveforms are as shown in the left.

NG → **REPLACE CRANKSHAFT POSITION SENSOR**

OK

2	CHECK HARNESS AND CONNECTOR(ECM-CRANKSHAFT POSITION SENSOR)



(a) Disconnect the crank position sensor connector.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminals NE+ of the crank position sensor connector and NE+ of the ECM connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals NE+ and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals NE- of the crank position sensor connector and NE- of the ECM connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals NE- and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	INSPECT SENSOR ATTACHMENT PART

(a) Check the crank position sensor installation.

NG → **REPAIR OR REPLACE SENSOR ATTACHMENT PART**

OK

4	INSPECT CRANKSHAFT POSITION SENSOR PLATE NO.1(TEETH OF SIGNAL PLATE)

(a) Remove the crank angle sensor plate.
(b) Check the teeth of the signal plate.

NG → **REPAIR OR REPLACE CRANKSHAFT POSITION SENSOR PLATE NO.1**

OK

CHECK AND REPLACE ECM

DTC	P0340	CAMSHAFT POSITON SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Camshaft position sensor (G signal) consists of a magnet, iron core and pickup coil.
The G signal rotor has 3 teeth on the outside and is mounted on the intake camshaft.
When the camshafts rotate, the protrusion on the signal plate and the air gap on the pickup coil changes, causing fluctuations in the magnetic field and generating an electromotive force in the pickup coil.
The NE signal plate (crank angle sensor plate) has 34 teeth and is installed in the crankshaft. The NE signal sensor generates 34 signals at every engine revolution. The engine ECM detects the crankshaft angle and the engine speed based on the NE signal, and the cylinder detection and the VVT palce based on the combination of the G and NE signal.

DTC No.	DTC Detecting Condition	Trouble Area
P0340	No camshaft position sensor signal to ECM during cranking (2 trip detection logic)	S Open or short in camshaft position sensor circuit S Camshaft position sensor S Intake camshaft S ECM
	No camshaft position sensor signal to ECM with engine speed 600 rpm or more	

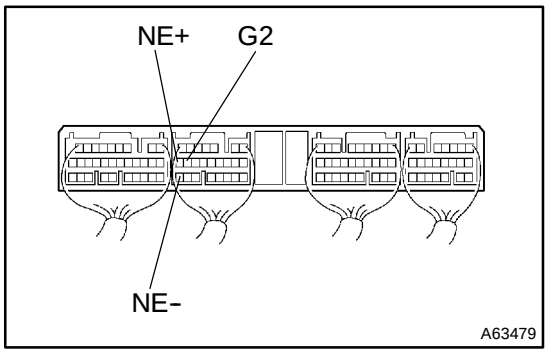
WIRING DIAGRAM

Refer to DTC P0335 on page 05-79.

INSPECTION PROCEDURE

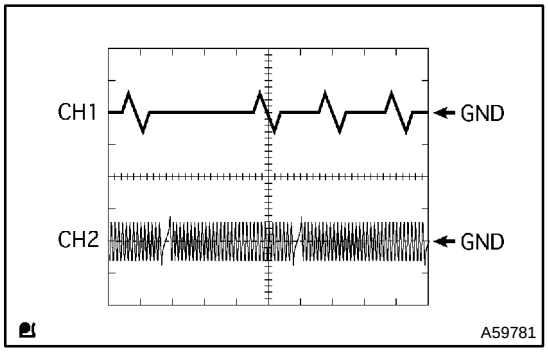
HINT:
Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	INSPECT CAM POSITION SENSOR(CHECK RESISTANCE)



(a) Check the camshaft position sensor for resistance.
(See page 18-3)
Resistance:
835 - 1400 Ω (Cold)
1060 - 1645 Ω (Hot)

HINT:
"Cold" and "Hot" above express the temperature of the part itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C (122_F) to 100_C (212_F)



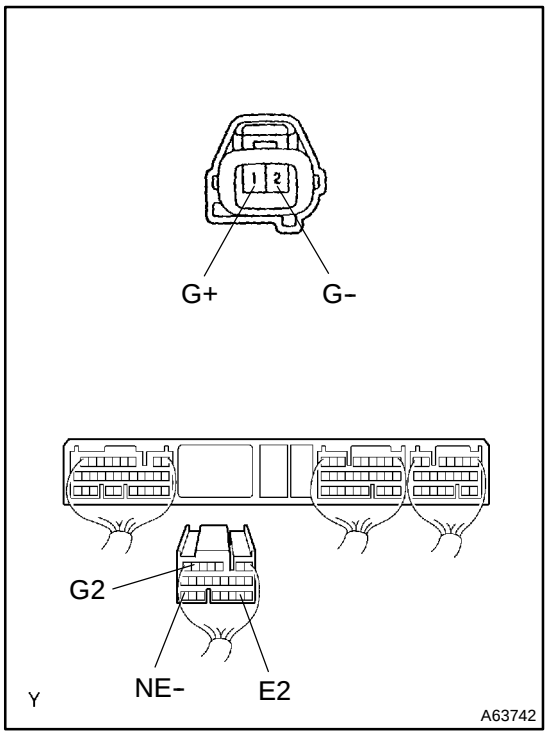
(b) Reference:
Inspection using the oscilloscope.
(1) During cranking or idling, check the waveform between terminals G2 and NE-, and NE+ and NE- of the ECM connector.

HINT:
The correct waveforms are as shown in the left.

NG → **REPLACE CAM POSITION SENSOR**

OK

2	CHECK HARNESS AND CONNECTOR(ECM-CAMSHAFT POSITION SENSOR)



(a) Disconnect the cam position sensor connector.
(b) Disconnect the ECU E18 connector.
(c) Check continuity between the terminals G+ of the camshaft position sensor connector and G2 of the the ECM connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals G+ of the camshaft position sensor connector and E2 of the the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals G- of the camshaft position sensor connector and the NE- of the the ECM connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals NE- and E2 of the the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK ↓

3	INSPECT SENSOR INSTLLATION

NG → **TIGHTEN SENSOR**

OK ↓

4	INSPECT CAMSHAFT (See Page 14-49)

NG → **REPAIR OR REPLACE CAMSHAFT**

OK ↓

CHECK AND REPLACE ECM

DTC	P0410	AIR INJECTION SYSTEM MALFUNCTION

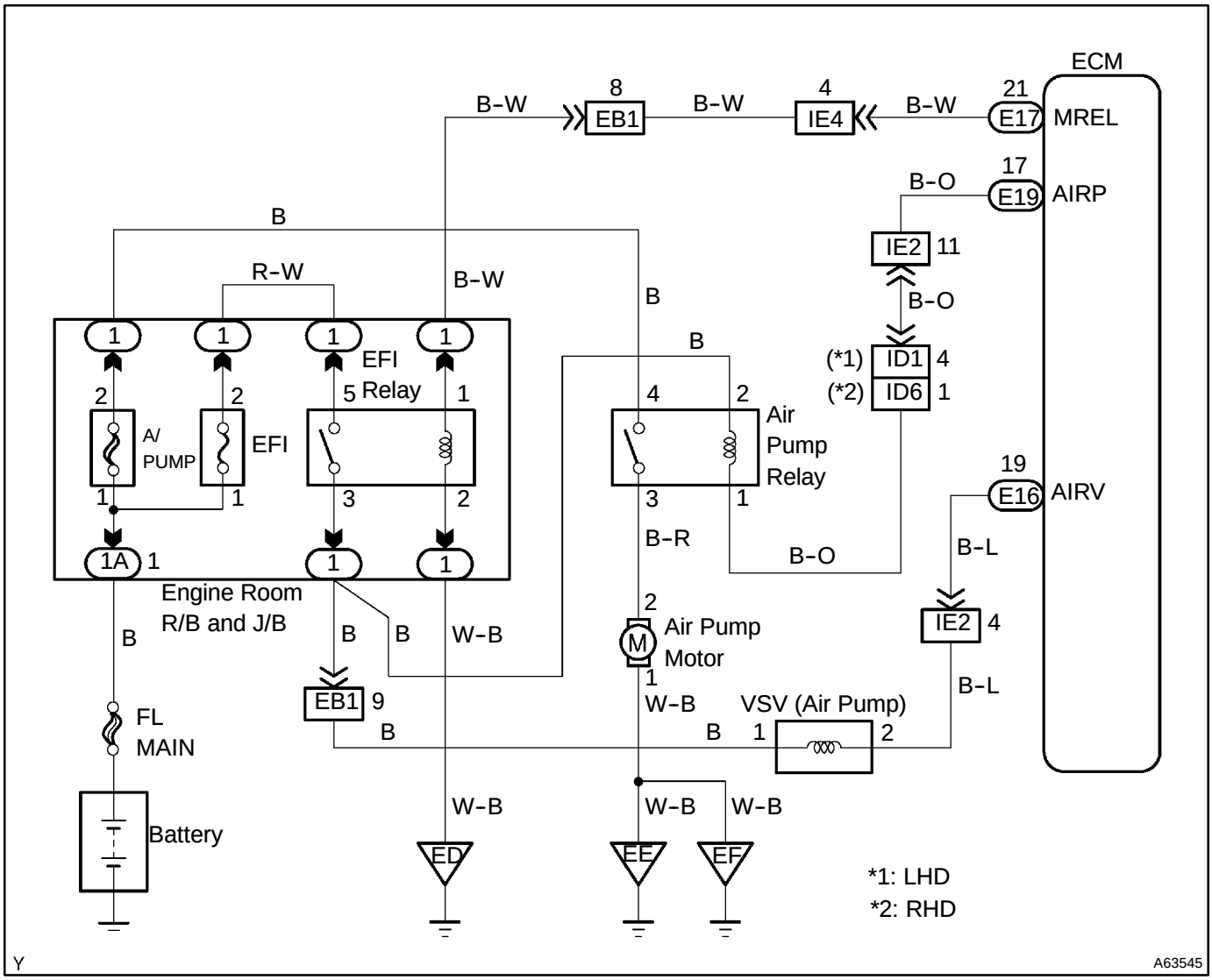
CIRCUIT DESCRIPTION

In the air injection system, air is pumped to the exhaust manifold by the electric air pump in the specified time. Because of this, the catalyst will be warmed up quickly when the engine is cold. This pumped air flows to the exhaust port of each cylinder via the air switching valve. And the air switching valve is controlled to open and close by the VSV.

During the operation of the air injection system, the exhaust A/F shifts to the lean side, because the pumped air flows to the exhaust system. Using this characteristics of the air injection system, the system is judged whether it is malfunctioning or not. And the judgement depends on the feedback condition of the air-fuel ratio and signals from the O2 sensor while the system is operating and also when the pump and the air switching valve is driven forcibly.

DTC No.	DTC Detecting Condition	Trouble Area
P0410	During the operation of the air injection system, after the starting of the engine when engine is cold. (2 trip detection logic)	S Gas leak on air injection system S Air pump S Air switching valve S Air pump relay S VSV for air switching valve S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using a hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	**PERFORM ACTIVE TEST BY HAND-HELD TESTER(CHECK OPERATION OF THE AIR PUMP)**

(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch to ON and push the hand-held tester main switch ON.
(c) Select the item "SECOND AIR VSV" in the ACTIVE TEST and operate the air pump.
OK:
ON: Oparated the air pump for 5 seconds.

HINT:
This ACTIVE TEST can be operated only for 5 seconds at a time.

NOTICE:
While performing the test during the engine is satrting, it may cause damage to the catalyser. Therefore, be sure to preform the test with the ignition ON.

NG → **Go to step 6**

OK

2	**CHECK LEAK ON AIR INJECTION SYSTEM**

NG → **REPAIR OR REPLACE**

OK

3	**INSPECT AIR SWITCHING VALVE ASSY** (See page 12-4)

NG → **REPLACE AIR SWITCHING VALVE ASSY**

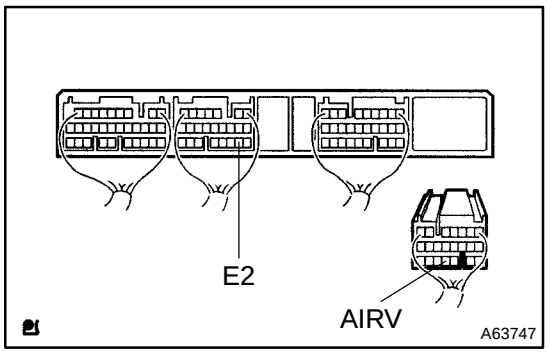
OK

4	**INSPECT VACUUM SWITCHING VALVE ASSY(for AIR SWITCHING VALVE)** (See page 12-4)

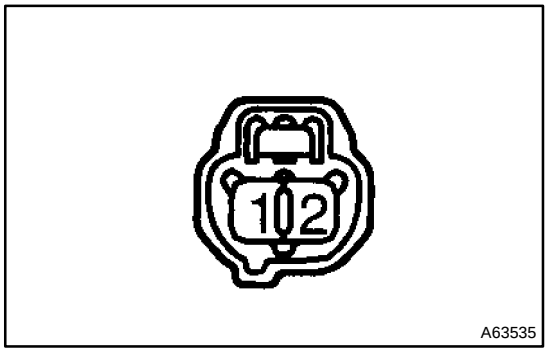
NG → **REPLACE VACUUM SWITCHING VALVE ASSY**

OK

5	CHECK HARNESS AND CONNECTOR(VSV - ECM)



(a) Disconnect the VSV for air switching valve connector.
(b) Disconnect the ECM E16 connector.
(c) Check continuity between the terminals AIRV of the ECM connector and 2 of the VSV for air switching valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals AIRV and E2 of the ECM connector
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK ↓

CHECK AND REPLACE ECM

6	INSPECT AIR PUMP ASSY(See page 12-1)

NG → **REPLACE AIR PUMP ASSY**

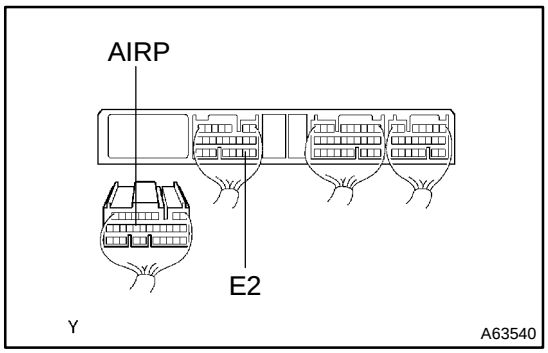
OK ↓

7	INSPECT RELAY(AIR PUMP RERAY)(See page 12-1)

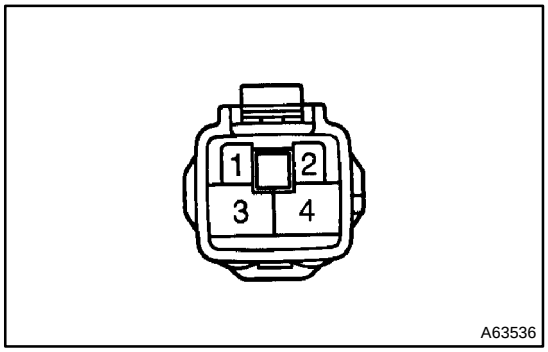
NG → **REPLACE RELAY**

OK ↓

8	CHECK HARNESS AND CONNECTOR(AIR PUMP RELAY - ECM)



(a) Disconnect the ECM E19 connector.
(b) Disconnect air pump relay connector.
(c) Check continuity between the terminals AIRP of the ECM connector and 1 of the air pump relay connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals AIRP and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

9	CHECK AIR INDUCTION SYSTEM(See page 10-1)

NG → **REPAIR OR REPLACE AIR INDUCTION SYSTEM (See page 10-1)**

OK

10	CHECK FUEL PRESSURE (See page 11-5)

NG → **REPAIR OR REPLACE FUEL SYSTEM (See page 11-7)**

OK

11	CHECK FUEL INJECTOR ASSY (See page 11-7)

NG → **REPLACE FUEL INJECTOR ASSY (See page 11-20)**

OK

12	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-2)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

13	CHECK FOR SPARK AND IGNITION (See page 18-1)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

14	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD OXYGEN SENSOR INSTALLED (See page 18-1)

NG → REPLACE OXYGEN SENSOR

OK

REPAIR OR REPLACE ECM

When not using hand-held tester:

1	INSPECT AIR PUMP ASSY (See page 12-1)

NG → REPLACE AIR PUMP ASSY

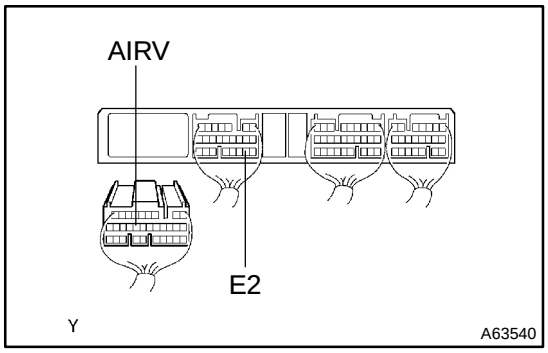
OK

2	INSPECT RELAY(AIR PUMP RELAY) (See page 12-4)

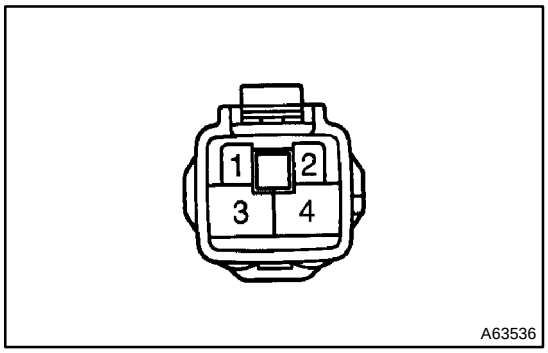
NG → REPLACE RELAY

OK

3	CHECK HARNESS AND CONNECTOR(AIR PUMP RELAY - ECM)



(a) Disconnect the ECM E16 connector.
(b) Disconnect air pump relay connector.
(c) Check continuity between the terminals AIPR of the ECM connector and 1 of the glow plug relay connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals AIPR and E2 of the ECM connector
Resistance: 1 MΩ or more



NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4	CHECK LEAK ON AIR INJECTION SYSTEM

NG → REPAIR OR REPLACE

OK

5	INSPECT AIR SWITCHING VALVE ASSY (See page 12-4)

NG → REPLACE AIR SWITCHING VALVE ASSY

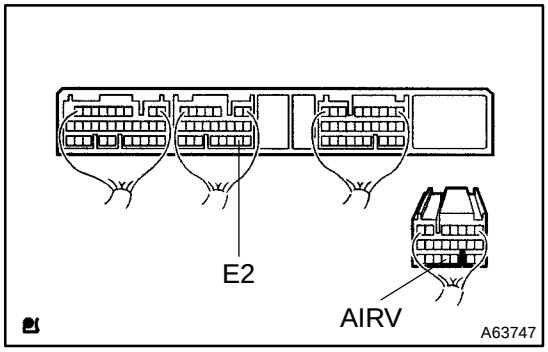
OK

6	INSPECT VACUUM SWITCHING VALVE ASSY (See page 12-4)

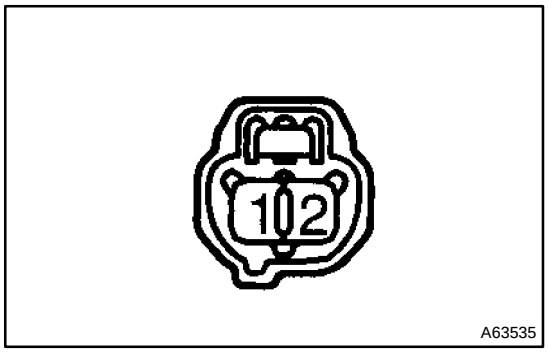
NG → REPLACE VACUUM SWITCHING VALVE ASSY

OK

7	CHECK HARNESS AND CONNECTOR(VSV - ECM)



(a) Disconnect the VSV for air switching valve connector.
(b) Disconnect the ECM E16 connector.
(c) Check continuity between the terminals AIRV of the ECM connector and 2 of the VSV for air switching valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals AIRV and E2 of the ECM connector
Resistance: 1 MΩ or more



NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

8	CHECK AIR INDUCTION SYSTEM (See page 10-1)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

	CHECK FUEL PRESSURE (See page 11-5)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

10	CHECK FUEL INJECTOR ASSY (See page 11-5)

NG → REPLACE FUEL INJECTOR ASSY (See page 11-7)

OK

11	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-2)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

12	CHECK FOR SPARK AND IGNITION (See page 18-1)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

13	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD OXYGEN SENSOR INSTALLED (See page 18-1)

NG → REPLACE OXYGEN SENSOR

OK

REPAIR OR REPLACE ECM

DTC	P0411	ASV OPEN-FIXED MALFUNCTION

CIRCUIT DESCRIPTION

Refer to DTC P0410 on page 05-84

DTC No.	DTC Detecting Condition	Trouble Area
P0411	End of the operation of the air injection system, after the engine is warmed up. (2 trip detection logic)	·Air switching valve ·VSV for air switching valve ·ECM

WIRING DIAGRAM

Refer to DTC P0410 on page 05-84

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	INSPECT AIR SWITCHING VALVE ASSY (See page12-4)

NG → REPLACE AIR SWITCHING VALVE ASSY

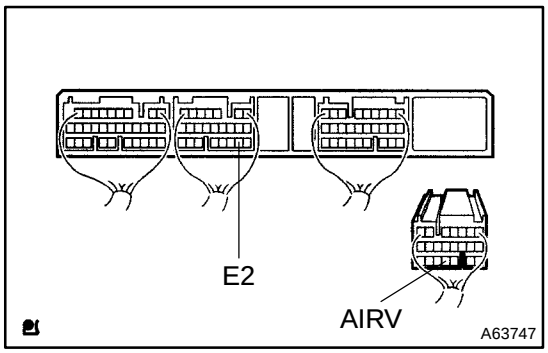
OK

2	INSPECT VACUUM SWITCHING VALVE ASSY (See page12-4)

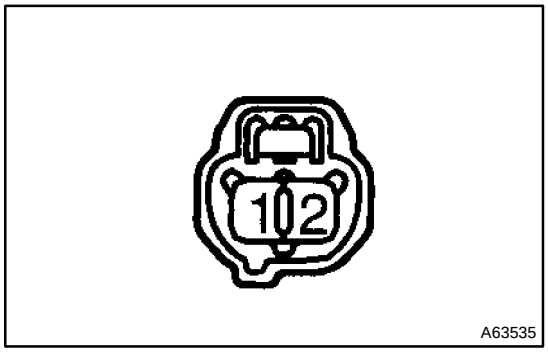
NG → REPLACE VACUUM SWITCHING VALVE ASSY

OK

3	CHECK HARNESS AND CONNECTOR(VSV - ECM)



(a) Disconnect the VSV for air switching valve connector.
(b) Disconnect the ECM E16 connector.
(c) Check continuity between the terminals AIRV of the ECM connector and 2 of the VSV for air switching valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals AIRV and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	CHECK AIR INDUCTION SYSTEM (See page 10-1)

NG → **REPAIR OR REPLACE AIR INDUCTION SYSTEM (See page 10-1)**

OK

5	CHECK FUEL PRESSURE (See page 11-7)

NG → **REPAIR OR REPLACE FUEL SYSTEM (See page 11-20)**

OK

6	CHECK FUEL INJECTOR ASSY (See page 11-7)

NG → **REPLACE FUEL INJECTOR ASSY (See page 11-20)**

OK

7	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-2)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

8	CHECK FOR SPARK AND IGNITION (See page 18-1)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

9	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD OXYGEN SENSOR INSTALLED (See page 18-1)

NG → REPLACE SENSOR, OXYGEN

OK

CHECK AND REPLACE ECM

DTC	P0420	CATALYST SYSTEM EFFCIENCY BELOW THRESHOLD(BANK1)

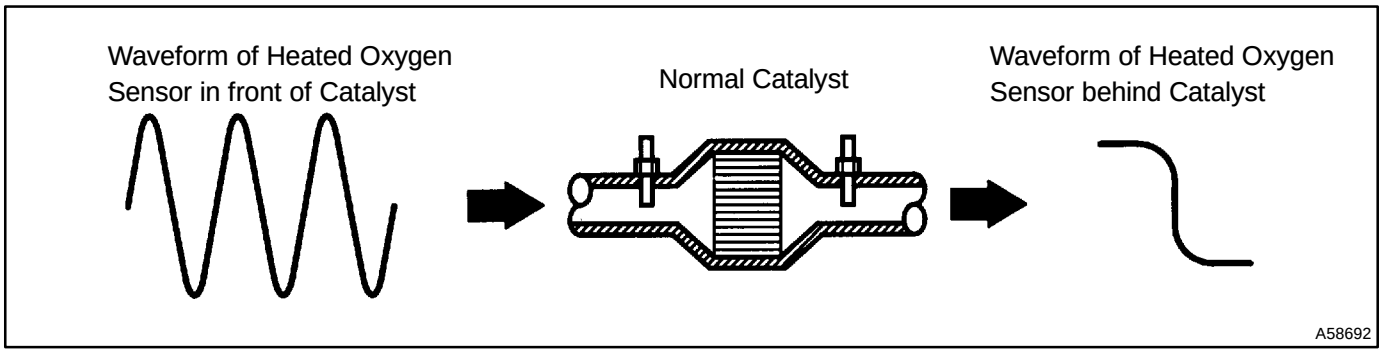
CIRCUIT DESCRIPTION

The ECM compares the waveform of the heated oxygen sensor located in front of the catalyst with the waveform of the heated oxygen sensor located behind the catalyst to determine whether or not the catalyst performance has deteriorated.

Air-fuel ratio feedback compensation keeps the waveform of the heated oxygen sensor in front of the catalyst repeatedly changing back and forth, from rich to lean.

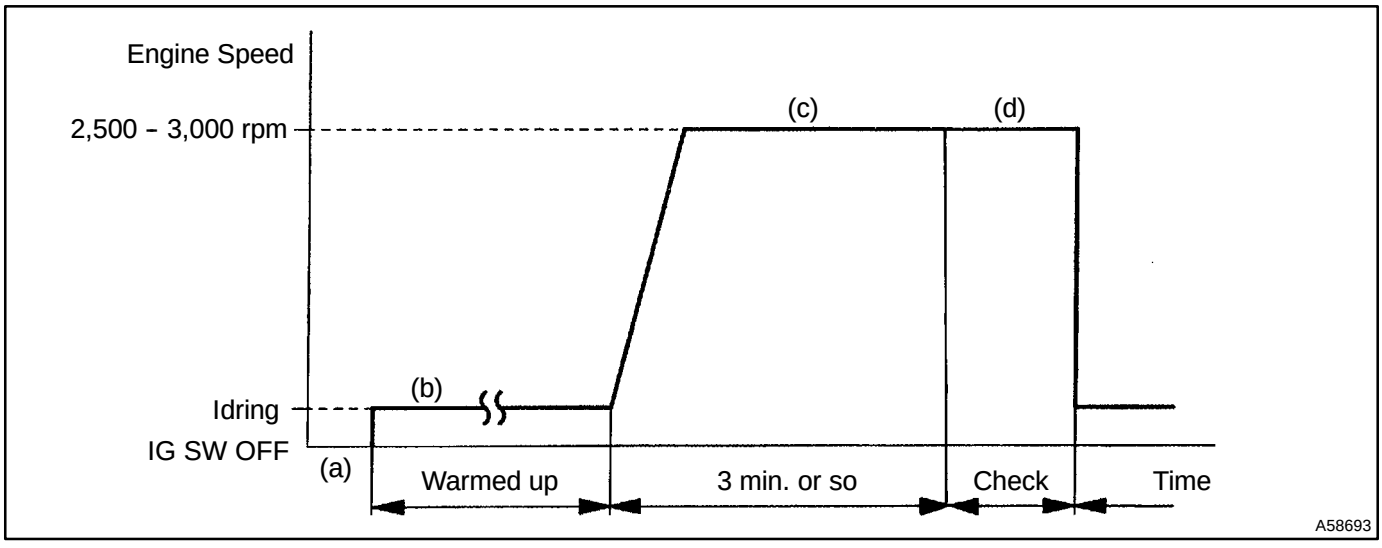
If the catalyst is functioning normally, the waveform of the heated oxygen sensor behind the catalyst switches back and forth between rich and lean much more slowly than the waveform of the heated oxygen sensor in front of the catalyst.

But when both waveforms change at a similar rate, it is indicated that the catalyst performance has deteriorated.

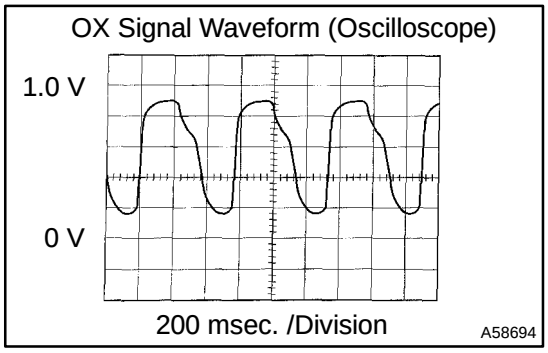


DTC No.	DTC Detecting Condition	Trouble Area
P0420	After engine and catalyst are warmed up, and while vehicle is driven within set vehicle and engine speed range, waveforms of oxygen sensors have same amplitude (2 trip detection logic)	S Gas leakage on exhaust system S Oxygen sensor S Heated oxygen sensor S Three-way catalytic converter

CONFIRMATION DRIVING PATTERN



(a) Connect the hand-held tester to the DLC3, or connect the probe of the oscilloscope between terminals OX1A, OX1B and E2 of the ECM connector.
(b) Start the engine and warm it up with all the accessories switched OFF until the water temperature is stable.
(c) Race the engine at 2,500 - 3,000 rpm for about 3 min.
(d) After confirming that the waveforms of the heated oxygen sensor (bank 1 sensor 1(OX1A)) which oscillates around 0.5 V during feedback to the ECM, check the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX1B)).



HINT:
- If there is a malfunction in the system, the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX1B)) is almost the same as that of the heated oxygen sensor (bank 1 sensor 1 (OX1A)) on the left.
- There are some cases that, the MIL may either light up or not light up even though a malfunction exists.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0420, P0430)

(a) Read the DTCs with the hand-held tester.
SST 09843-18040
Result:

	A	B
RESULT	P0420, P0430 are output	P0420, P0430 and other codes are output

B → GO TO RELEVANT DTC CHART

A

2	CHECK EXHAUST GAS LEAK

NG → REPAIR OR REPLACE

OK

3	CHECK OXYGEN SENSOR(BANK 1 SENSOR 1) (See Page 10-2)

NG → REPAIR OR REPLACE OXYGEN SENSOR

OK

4	CHECK OXYGEN SENSOR(BANK 1 SENSOR 2) (See Page 10-2)

NG → REPAIR OR REPLACE OXYGEN SENSOR

OK

REPLACE MANIFOLD CONVERTER SUB-ASSY

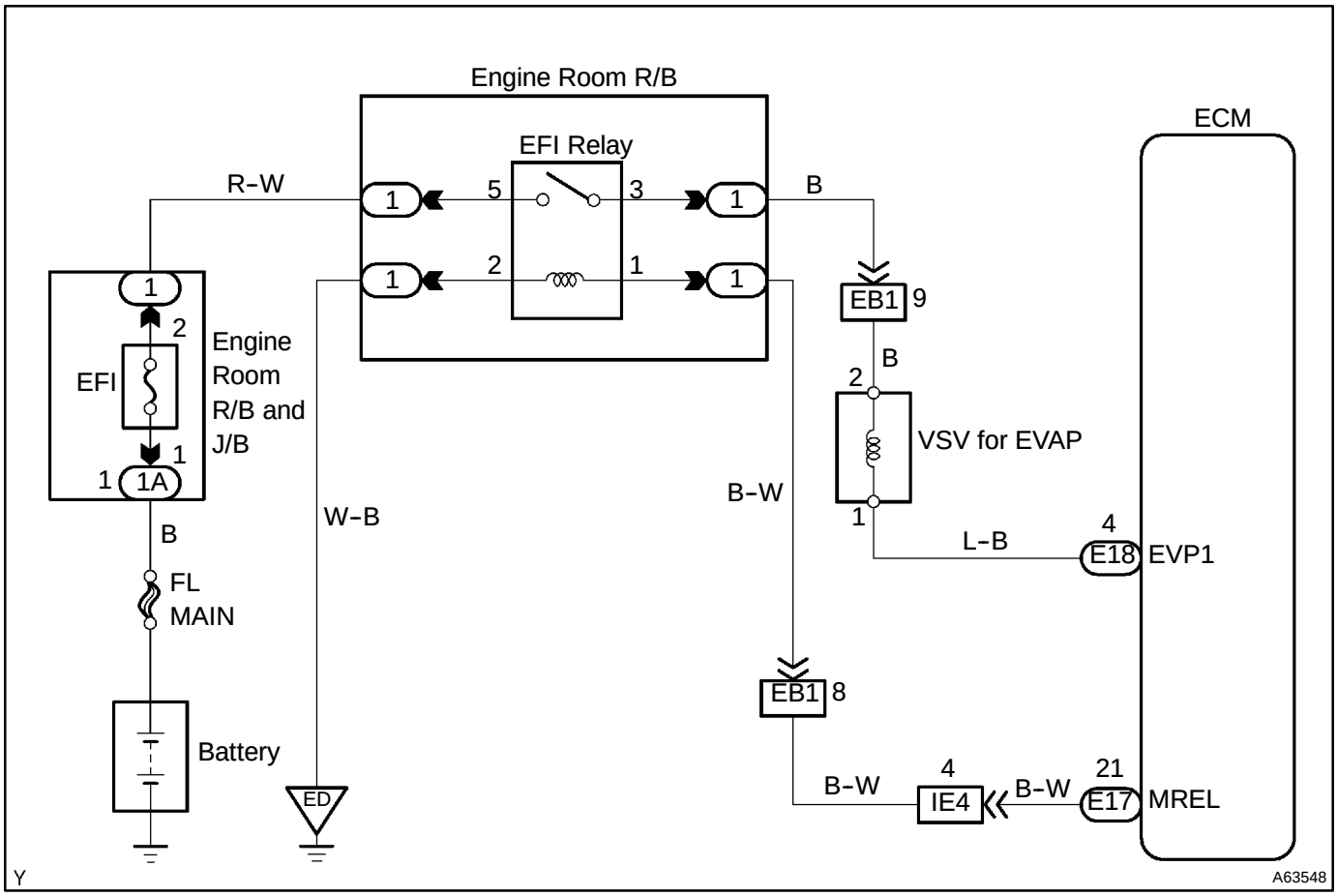
DTC	P0443	EVAPORATIVE EMISSOION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

To reduce HC emissions, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.
The ECM changes the duty signal to the VSV for the EVAP so that the intake quantity of HC emissions is appropriate for the driving conditions (engine load, engine speed, vehicle speed, etc.) after the engine is warmed up.

DTC No.	DTC Detecting Condition	Trouble Area
P0443	Proper response to ECM command does not occur	S Open of short in VSV circuit for EVAP S VSV for EVAP S ECM

WIRING DIAGRAM



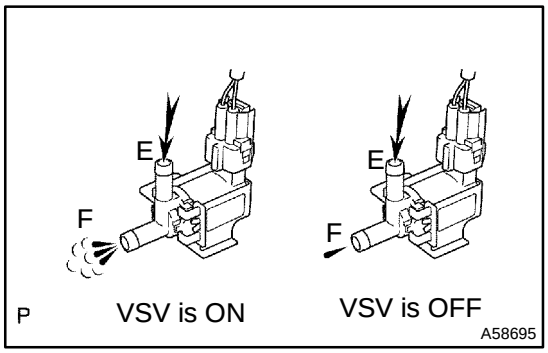
INSPECTION PROCEDURE

HINT:

Read freeze frame data using a hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(VSV FOR EVAP)



(a) Select the ACTIVE TEST mode on the hand-held tester.
(b) Disconnect the vacuum hose from the VSV for the EVAP.
(c) Start the engine.
(d) When the VSV for the EVAP is operated by the hand-held tester, apply the disconnected hose to your finger to check the suction.

Result:

VSV is ON: Disconnected hose sucks.
VSV is OFF: Disconnected hose does not suck.

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2	CHECK OPERATION OF VSV(FOR EVAP) (See Page 10-2)

NG → **REPLACE VACUUM SWITCHING VALVE ASSY NO.1**

OK

3	CHECK WIRE HARNESS OR CONNECTOR(ECM-EFI RELAY) (See Page 05-149)

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

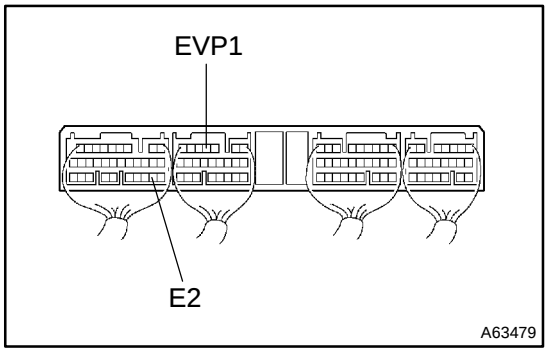
When not using hand-held tester:

1	CHECK OPERATION OF VSV(FOR EVAP) (See Page 10-2)

NG → REPLACE VACUUM SWITCHING VALVE ASSY NO.1

OK

2	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals EVP1 of the ECM connector and E2 of the ECM connector.
Voltage: 9 - 14 V

NG → CHECK WIRE HARNESS OR CONNECTOR

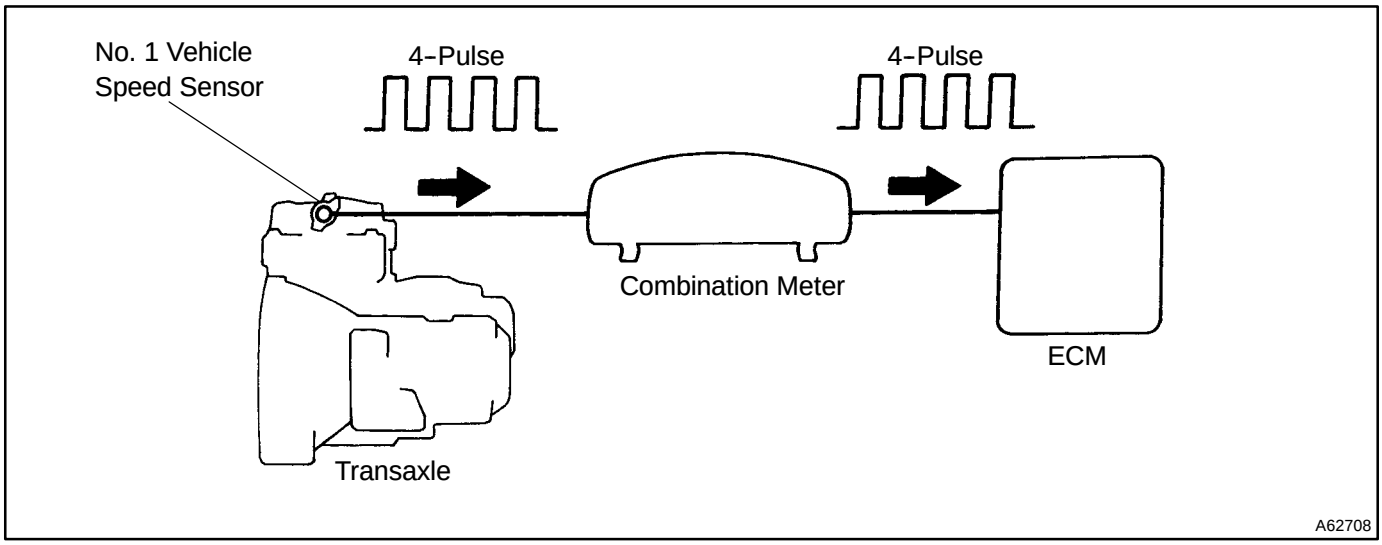
OK

CHECK AND REPLACE ECM

DTC	P0500	VEHICLE SPEED SENSOR MALFUNCTION

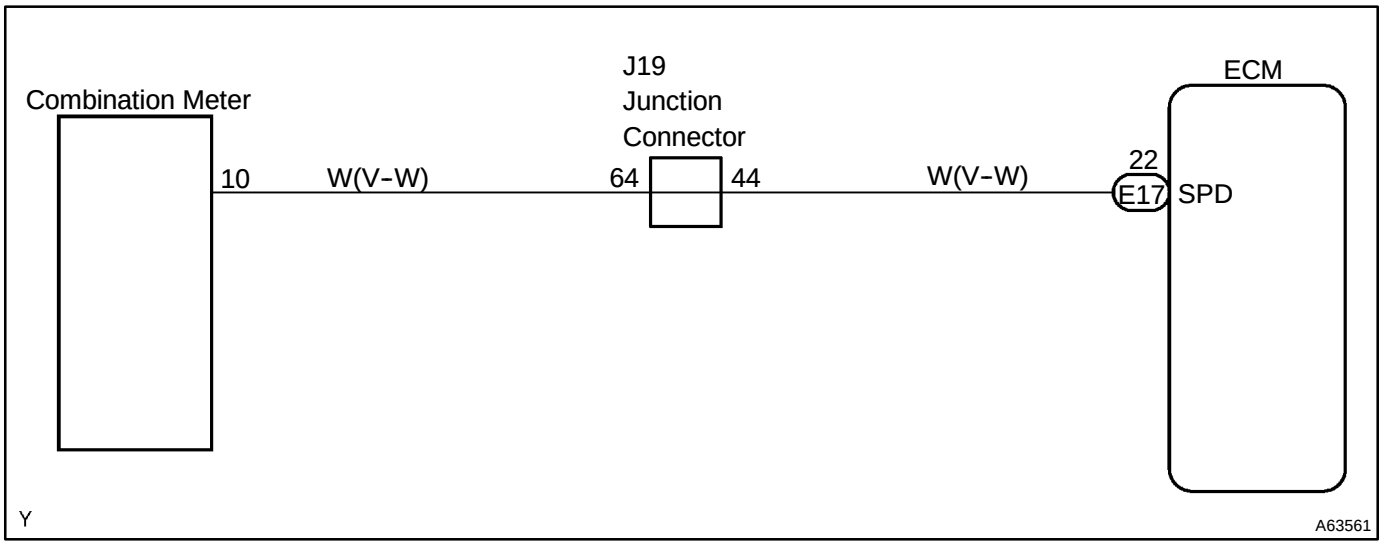
CIRCUIT DESCRIPTION

The vehicle speed sensor outputs a 4-pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the ECM. The ECM determines the vehicle speed based on the frequency of these pulse signals.



DTC No.	DTC Detecting Condition	Trouble Area
P0500	During vehicle is being driven, no vehicle speed sensor signal to ECM (2 trip detection logic)	S Combination meter S Open or short in No.1 vehicle speed sensor circuit S No.1 vehicle speed sensor S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

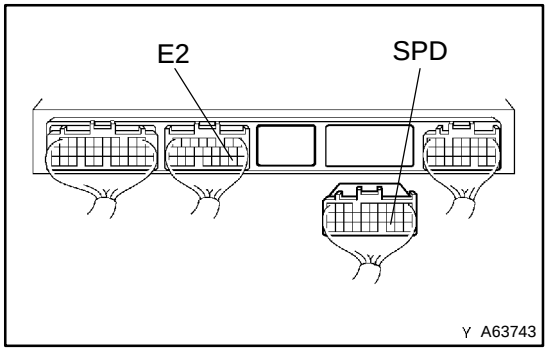
1	CHECK OPERATION OF SPEEDOMETER(SPEEDOMETER OPERATION)

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.
HINT:
The vehicle speed sensor is operating normally if the speedometer display is normal.

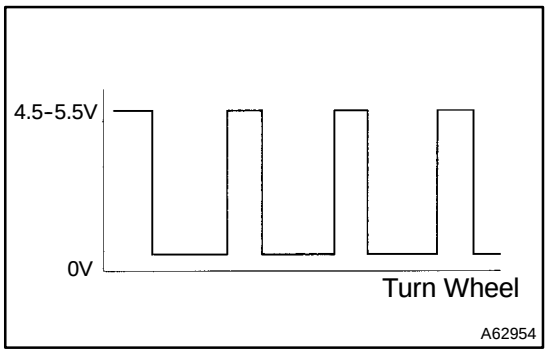
NG → CHECK SPEEDOMETER CIRCUIT

OK

2	INSPECT ECM(CHECK VOLTAGE)



(a) Shift the lever to the neutral position.
(b) Jack up the vehicle.
(c) Turn the ignition switch ON.
(d) Measure the voltage between terminal SPD of the ECM connector and E2 of the ECM connector with turning the wheel slowly.
Voltage: Generated intermittently



NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

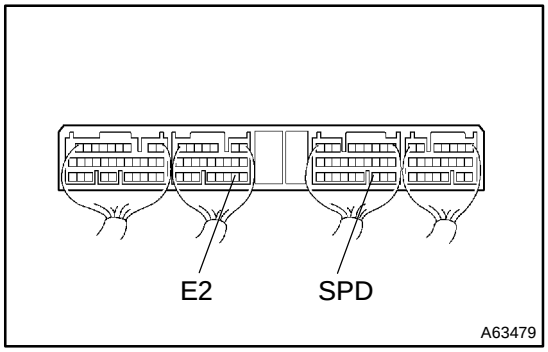
1	CHECK OPERATION OF SPEEDOMETER(SPEEDMETER OPERATION)

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.
HINT:
The vehicle speed sensor is operating normally if the speedmeter display is normal.

NG → CHECK SPEEDOMETER CIRCUIT

OK

2	INSPECT ECM

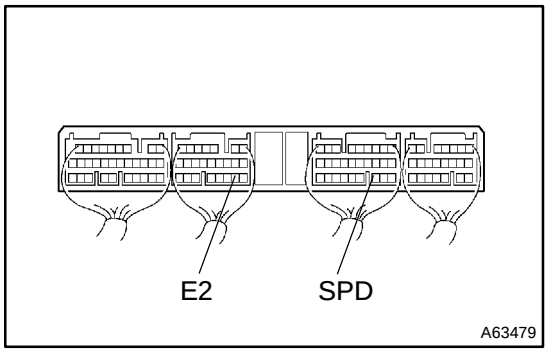


(a) Check continuity between the terminals SPD and E2 of the ECM connector.
Resistance: No continuity

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals SPD and E2 of the ECM connector.
Voltage: 0 - 5 V

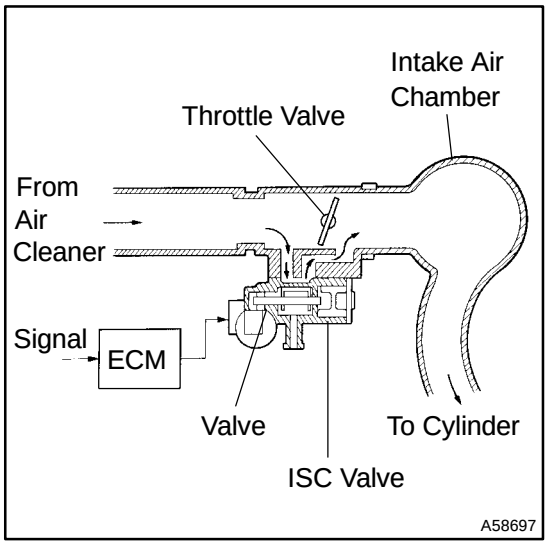
NG → CHECK AND REPLACE ECM

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

DTC P0505 IDLE CONTROL SYSTEM MALFUNCTION

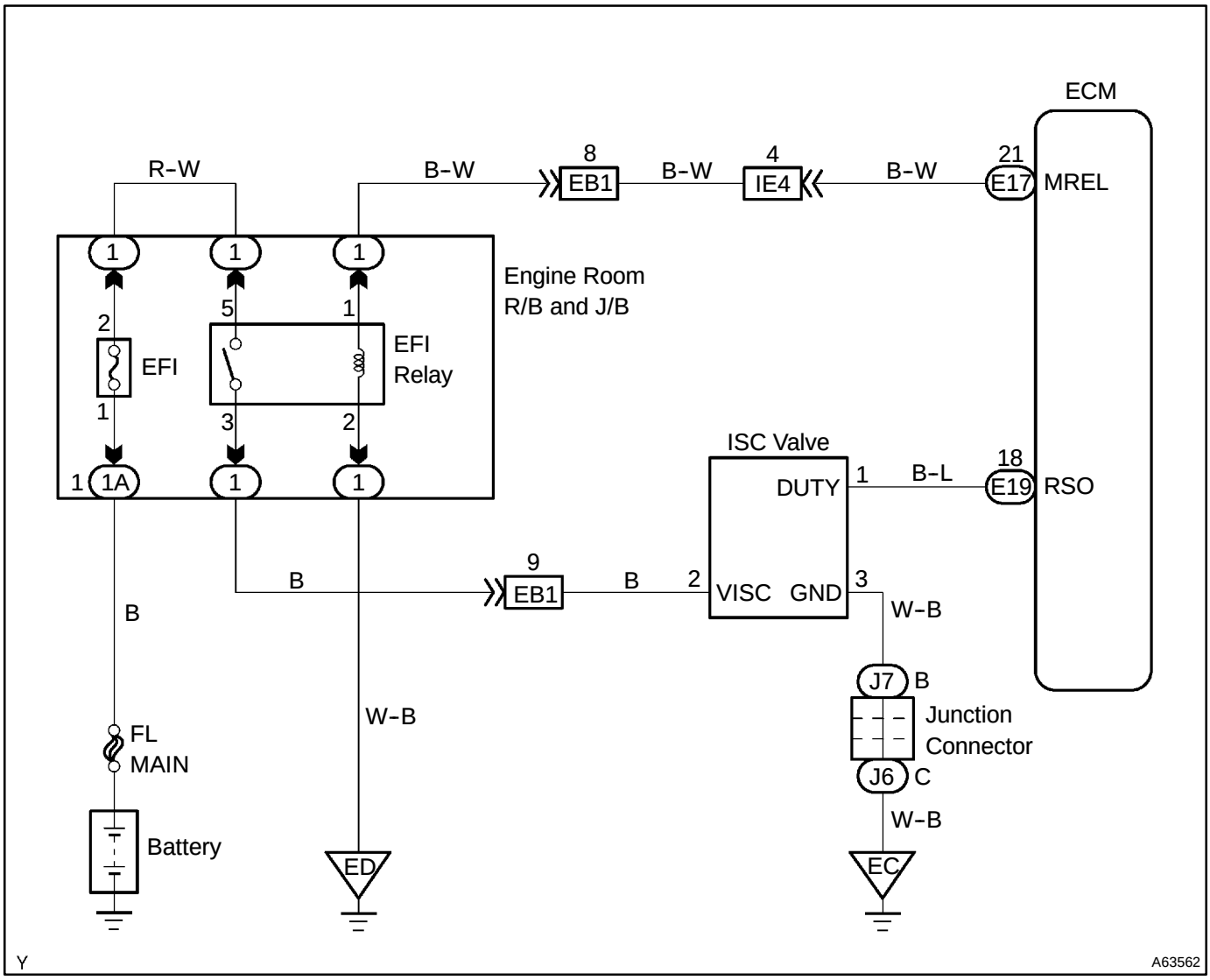
CIRCUIT DESCRIPTION



The rotary solenoid type ISC valve is located under the throttle body and intake air bypassing the throttle valve is directed to the ISC valve through the passage.
In this way the intake air volume bypassing the throttle valve is regulated, controlling the engine speed.
The ECM operates the ISC valve only to perform idle-up and provide feedback for the target idling speed.

DTC No.	DTC Detecting Condition	Trouble Area
P0505	Idle speed continues to be apart greatly from target speed	S Open or short in ISC valve circuit S ISC valve is stuck or closed S Open or short in A/C switch circuit S Air induction system S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand–held tester:

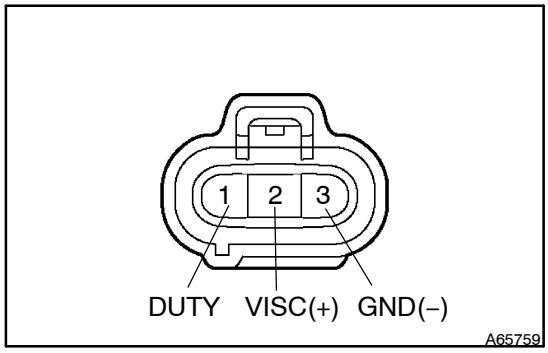
1	PERFORM ACTIVE TEST BY HAND–HELD TESTER(CHECK OPERATION OF THE ISC VALVE)

(a) Warm up the engine to the normal operating temperature.
(b) Switch off all the accessories.
(c) Switch off the A/C.
(d) Shift the lever into the neutral position.
(e) Connect the hand–held tester to the DLC3 on the vehicle.
(f) Check the difference of the engine speed in less than 5 seconds and more than 5 seconds.
Difference of engine speed: More than 100 rpm.

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2	CHECK HARNESS AND CONNECTOR

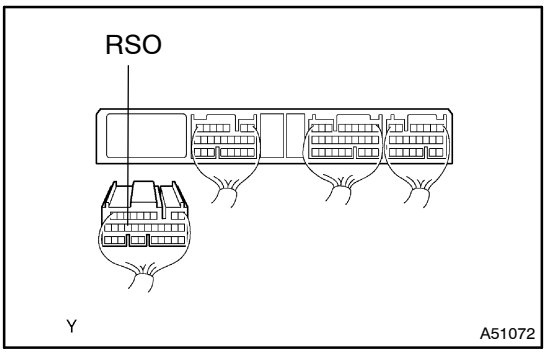


(a) Disconnect the ISC valve connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals VISC and GND of the ISC valve connector.

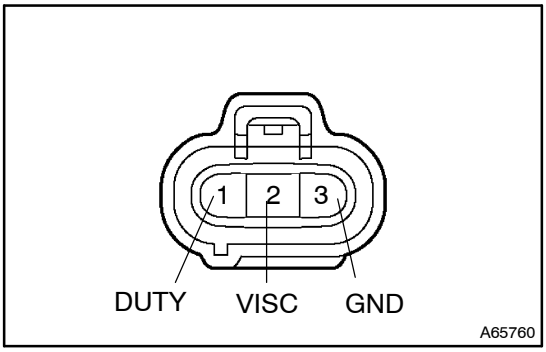
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

3	CHECK HARNESS AND CONNECTOR(RSO CIRCUIT)



(a) Disconnect the ECM E19 connector.
(b) Check continuity between the terminals RSO of the ECM connector and VISC of the ISC valve connector.
Resistance: 1 Ω or less
(c) Check for short between the terminals RSO of the ECM connector and E01 of the ISC valve connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	INSPECT THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY (See page 10–1)

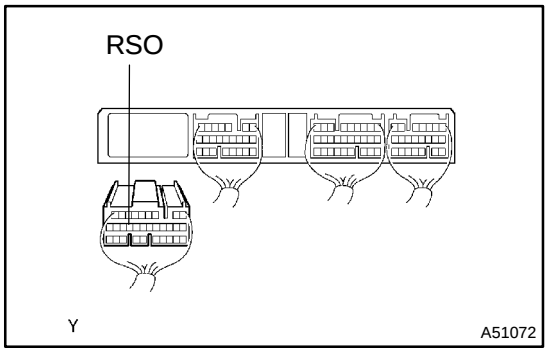
NG → **REPLACE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

1	INSPECT ECM(CHECK VOLTAGE)



(a) Disconnect the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals RSO and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → **Go to step 3**

NG

2	CHECK THROTTLE BODY IDLE SPEED CONTROL VALVE ASSY (See page 10-1)

NG → **REPLACE THROTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

3	CHECK THROTTLE BODY IDLE SPEED CONTROL VALVE ASSY (See page 10-1)

NG → **REPAIR OR REPLACE THROTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

4	CHECK BLOCKAGE OF ISC VALVE AND PASSAGE TO BYPASS THROTTLE VALVE

NG → **REPAIR OR REPLACE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

CHECK AND REPLACE ECM

DTC	P1205	AIR PUMP ON-FIXED MALFUNCTION

CIRCUIT DESCRIPTION

Refer to DTC P0410 on page 05-84

DTC No.	DTC Detecting Condition	Trouble Area
P1205	End of the operation of the air injection system, after the engine is warmed up.(1 trip detection logic)	S Air pump S Air pump relay S ECM

WIRING DIAGRAM

Refer to DTC P0410 on page 05-84

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	INSPECT AIR PUMP ASSY (See page12-1)

NG → REPLACE AIR PUMP ASSY

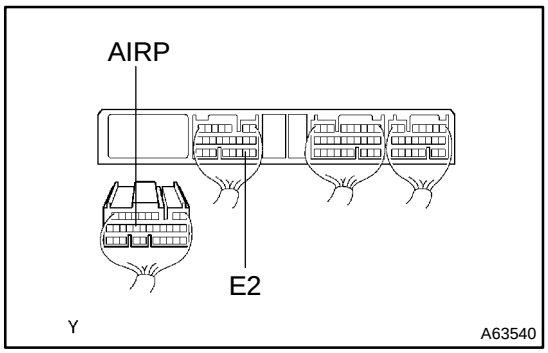
OK

2	INSPECT RELAY(AIR PUMP RELAY) (See page12-1)

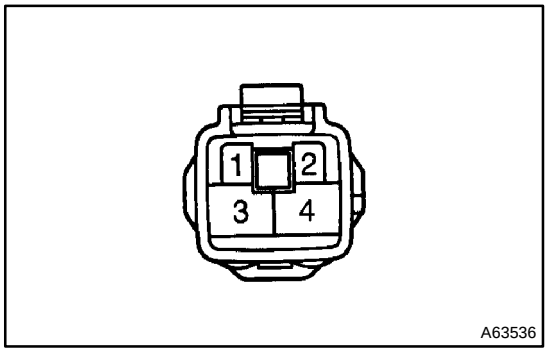
NG → REPLACE RELAY

OK

3	CHECK HARNESS AND CONNECTOR(AIR PUMP RELAY - ECM)



(a) Disconnect the ECM E19 connector.
(b) Disconnect air pump relay connector.
(c) Check continuity between the terminals AIRP of the ECM connector and 1 of the air pump relay connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals AIRP and E2 of the ECM connector
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK →

4	CHECK AIR INDUCTION SYSTEM (See page 10-1)

NG → **REPAIR OR REPLACE AIR INDUCTION SYSTEM (See page 10-1)**

OK →

5	CHECK CHECK FUEL PRESSURE (See page 11-5)

NG → **REPAIR OR REPLACE FUEL SYSTEM (See page 11-7)**

OK →

6	CHECK FUEL INJECTOR ASSY (See page 11-7)

NG → **REPLACE FUEL INJECTOR ASSY (See page 11-20)**

OK →

7	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-2)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

8	CHECK FOR SPARK AND IGNITION (See page 18-1)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

9	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD OXYGEN SENSOR INSTALLED (See page 18-1)

NG → REPLACE OXYGEN SENSOR

OK

REPAIR OR REPLACE ECM

DTC	P1300	IGNITER CIRCUIT MALFUNCTION(NO.1)

DTC	P1305	IGNITER CIRCUIT MALFUNCTION(NO.2)

DTC	P1310	IGNITER CIRCUIT MALFUNCTION(NO.3)

DTC	P1315	IGNITER CIRCUIT MALFUNCTION(No.4)

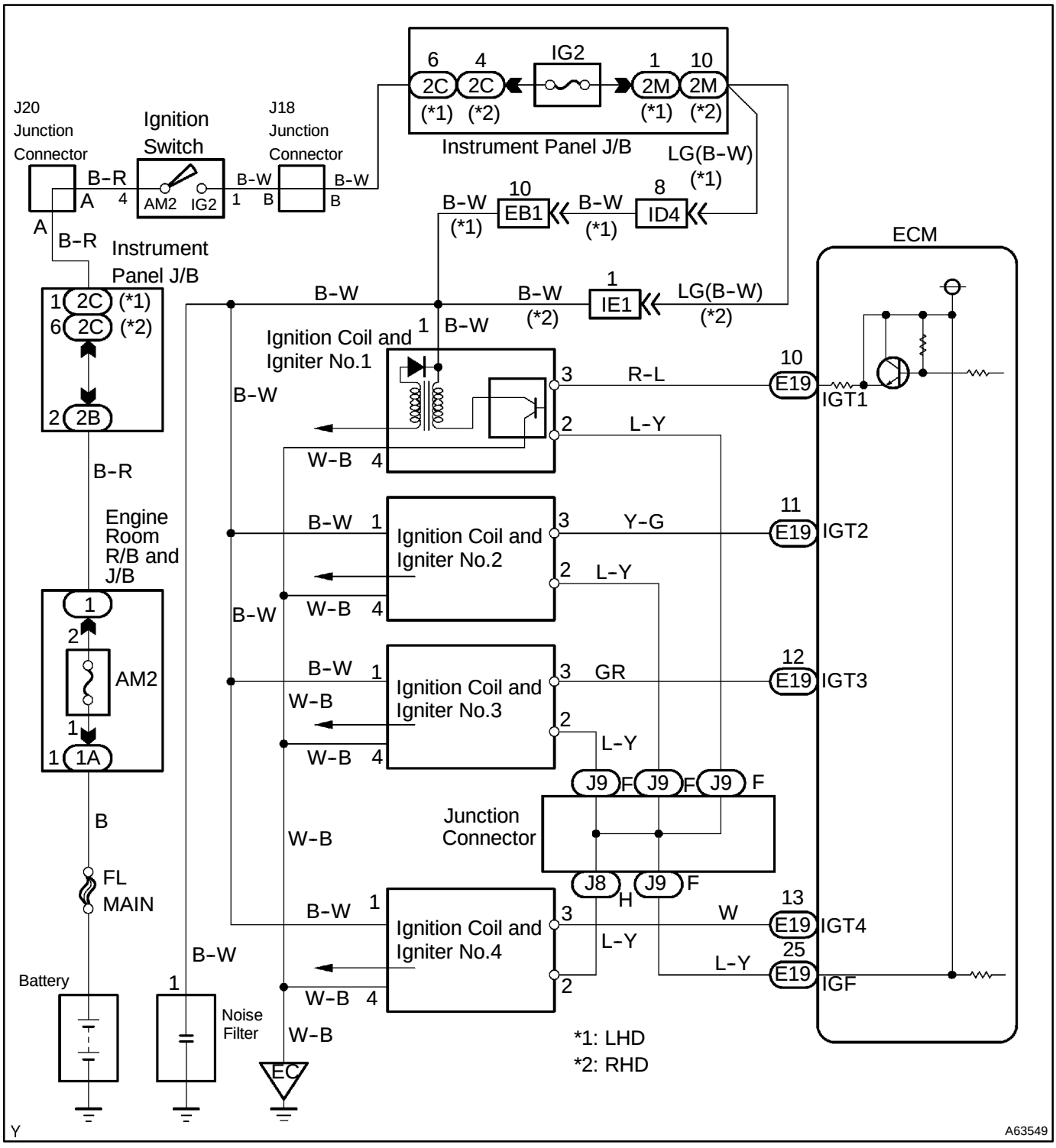
CIRCUIT DESCRIPTION

A Direct Ignition System (DIS) has been adopted. The DIS improves the ignition timing accuracy, reduces the high-voltage loss, and enhances overall reliability of the ignition system by eliminating the distributor. The DIS is a 1-cylinder ignition system which ignites one cylinder with one ignition coil. In the 1-cylinder ignition system, the spark plug is connected to the end of the secondary winding. High voltage generated in the secondary winding is applied directly to the spark plug. The spark of the spark plug passes through from the center electrode to the ground electrode.

The ECM determines ignition timing and outputs the ignition signals (IGT) of each cylinder. Based on IGT signals, the power transistors cut off the current to the primary coil in the ignition coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail-safe measurement to the ECM.

DTC No.	DTC Detecting Condition	Trouble Area
P1300 P1305 P1310 P1315	No IGF signal to ECM while engine is running	S Ignition system S Open or short in IGF and IGT circuit from ignition coil with igniter S Ignition coil with igniter S ECM

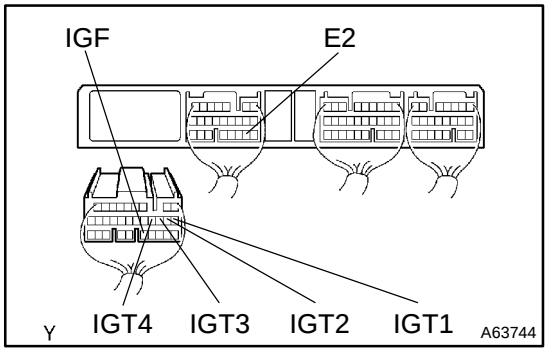
WIRING DIAGRAM

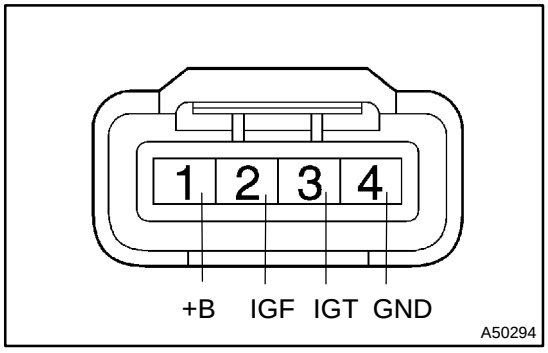


INSPECTION PROCEDURE

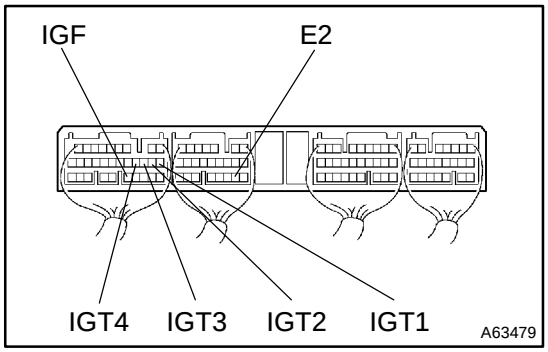
HINT:

- If DTC P1300 is displayed, check No.1 ignition coil with igniter circuit.
- If DTC P1305 is displayed, check No.2 ignition coil with igniter circuit.
- If DTC P1310 is displayed, check No.3 ignition coil with igniter circuit.
- If DTC P1315 is displayed, check No.4 ignition coil with igniter circuit.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when t





3	INSPECT ECM(CHECK VOLTAGE)



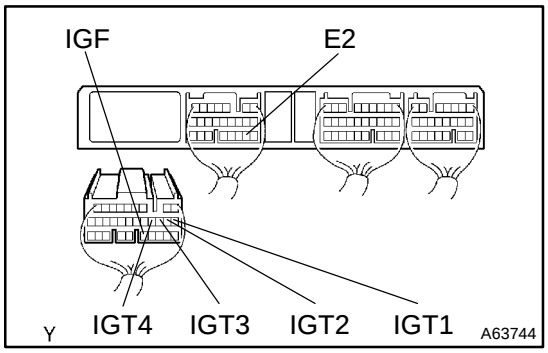
(a) Disconnect the ignition coil connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between the terminals IGF of the ECM connector and E2 of the ECM connector.
Voltage: 4.5 - 5.5 V

OK → **REPLACE IGNITION COIL ASSY**

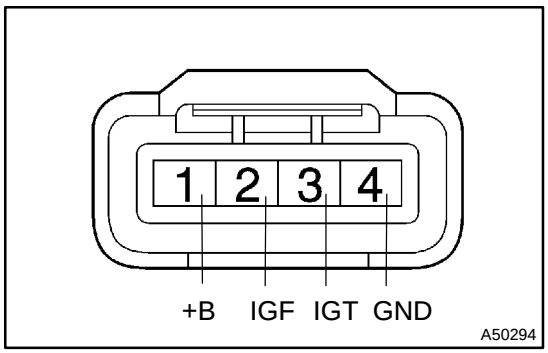
NG

CHECK AND REPLACE ECM

4	CHECK HARNESS AND CONNECTOR(ECM-IGNITION COIL)



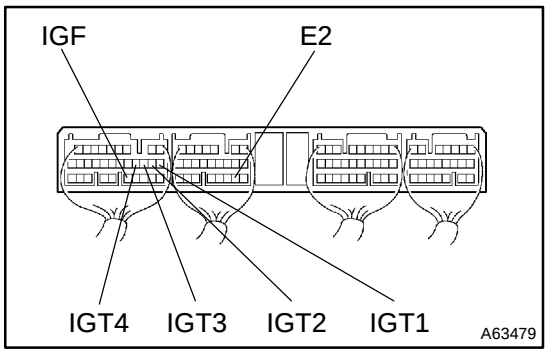
(a) Disconnect the ignition coil connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals IGT1 of the ECM connector and IGT of the ignition coil connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals IGT1 of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more.

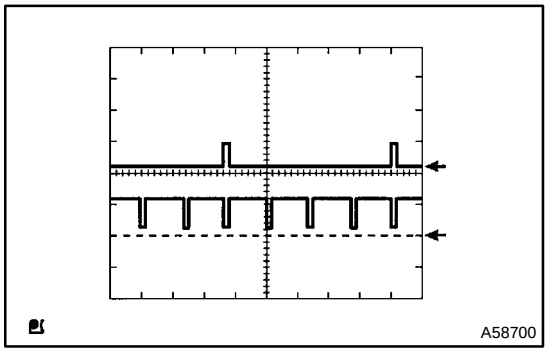


NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5 INSPECT ECM(CHECK VOLTAGE)





(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals IGT1 – IGT4 of the ECM connector and E2 of the ECM connector when the engine is cranked.
Voltage: More than 0.1 V and less than 4.5 V

HINT:
During cranking or idling, check the waveform between terminals IGT1 – IGT4 and E2 of the ECM connector.

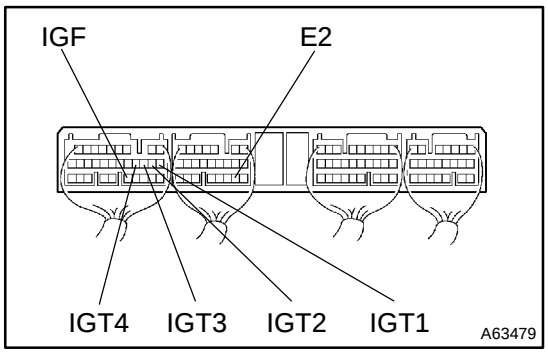
Item	Contents
Terminal	CH1: IGT1, IGT2, IGT3, IGT4 - E2 CH2: IGF - E2
Equipment Set	5 V/DIV, 20 ms/DIV
Condition	While the engine is cranking or idling

HINT:
Correct waveform appears as shown, with rectangle waves.

NG → **CHECK AND REPLACE ECM**

OK

6 INSPECT ECM(CHECK VOLTAGE)

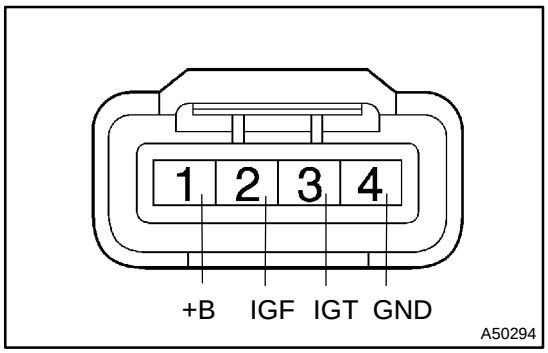


(a) Disconnect the ignition coil with the igniter connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminals IGT1 – IGT4 of the ECM connector and E2 of the ECM connector when the engine is cranked.
Voltage: More than 0.1 V and less than 4.5 V

NG → **CHECK AND REPLACE ECM**

OK

7	CHECK IGNITION COIL ASSY(POWER SOURCE)

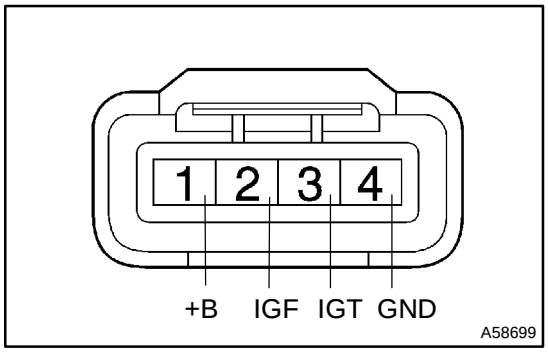


(a) Disconnect the ignition coil with the igniter connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals +B and GND of the ignition coil with the igniter connector.
Voltage: 9 - 14 V

OK → **REPAIR OR REPLACE POWER SOURCE**

NG

8	CHECK HARNESS AND CONNECTOR(IGNITION SWITCH-IGNITION COIL)



(a) Disconnect the ignition coil with igniter connector.
(b) Disconnect the ignition switch connector.
(c) Check for open between the terminals +B of the ignition coil with igniter connector and IG2 of the ignition switch.
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE IGNITION COIL ASSY

DTC	P1335	CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION(DURING ENGINE RUNNING)

CIRCUIT DESCRIPTION

Refer to DTC P0335 on page 05-79.

DTC No.	DTC Detecting Condition	Trouble Area
P1335	If conditions (a) through (c) are met: (a) NE ≧ 1,000 rpm (b) NE signal is not detected for over 50 msec. (c) Not during cranking	S Open or short in crankshaft position sensor circuit S Crankshaft position sensor S Crank angle sensor plate S ECM

WIRING DIAGRAM

Refer to DTC P0335 on page 05-79.

INSPECTION PROCEDURE

Refer to DTC P0335 on page 05-79.

DTC	P1346	VVT SENSOR/CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PLOBLEM(BANK1)

CIRCUIT DESCRIPTION

Refer to DTC P0335 on page 05-79.

DTC No.	Detection Item	Trouble Area
P1346	Deviation in crankshaft position sensor signal and VVT sensor signal (2 trip detection logic)	$ Mechanical system malfunction (Skipping teeth of timing chain, chain stretched) $ ECM

WIRING DIAGRAM

Refer to DTC P0335 on page 05-79.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK VALVE TIMING (See page 14-35)

NG → ADJUST VALVE TIMING

OK

CHECK AND REPLACE ECM

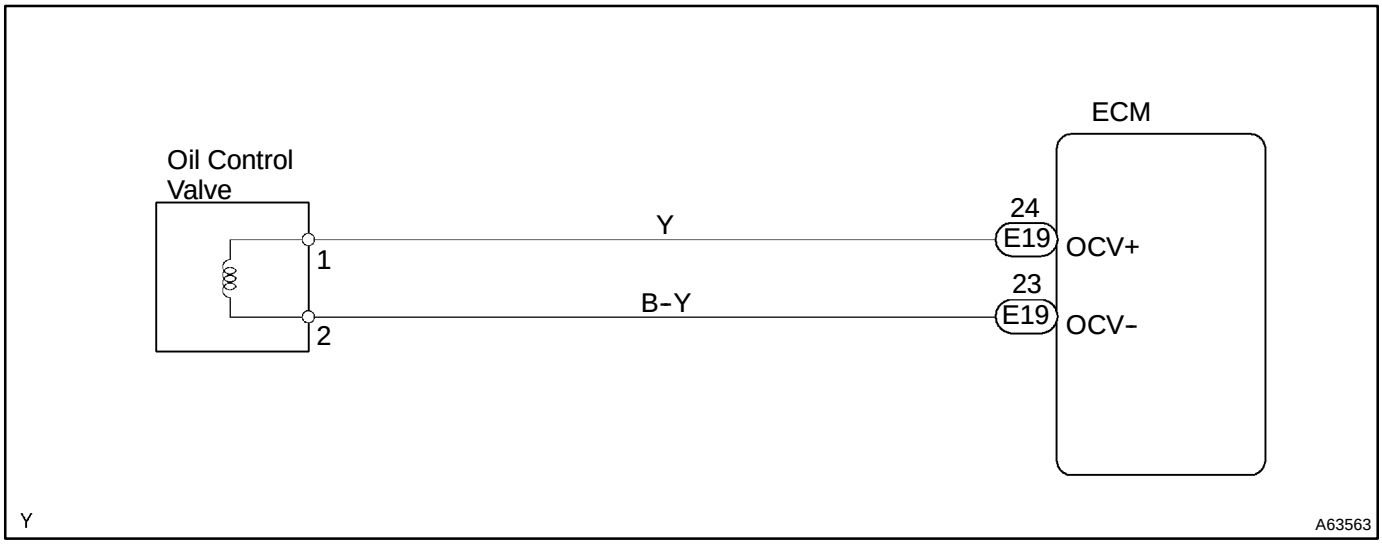
DTC	P1349	VVT SYSTEM MALFUNCTION(BANK1)

CIRCUIT DESCRIPTION

VVT system controls the intake valve timing to proper timing in response to driving condition.
ECM controls OCV (Oil Control Valve) to make the intake valve timing properly, and, oil pressure controlled with OCV is supplied to the VVT controller, and then, VVT controller changes relative position between the camshaft and the crankshaft.

DTC No.	DTC Detecting Condition	Trouble Area
P1349	Condition (a) or (b) continues for after the engine is warmed up and engine speed at 400 - 4,000 rpm: (a) Valve timing does not change from of current valve timing (b) Current valve timing is fixed	S Valve timing S Oil control valve S VVT controller assembly S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC P1349 is displayed, check VVT system circuit.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	CHECK VALVE TIMING (See page 14-35)

NG → ADJUST VALVE TIMING

OK

2	PERFORM ACTIVE TEST BY HAND-HELD TESTER(OPERATION OF OCV)

(a) Start the engine and warm it up.
(b) Connect the hand-held tester and select VVT on the ACTIVE TEST menu.
(c) Check the engine speed when operating the OCV by the hand-held tester.
OCV is OFF: Normal engine speed
OCV is ON: Rough idle or engine stall

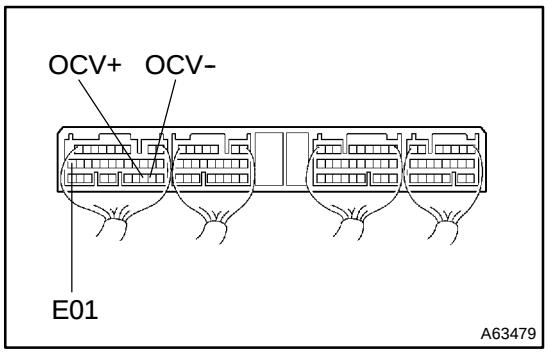
HINT:

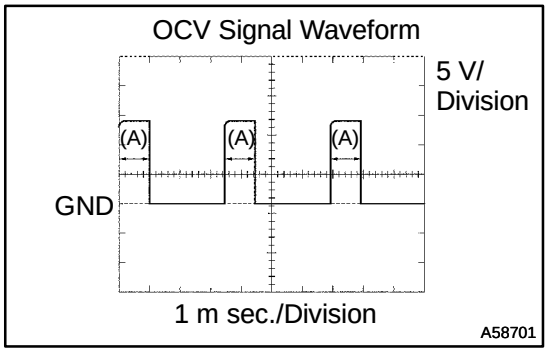
*: DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

OK → VVT SYSTEM OK

NG

3	INSPECT ECM(CHECK VOLTAGE)





(a) Turn the ignition switch ON.
(b) Check the waveform between terminals OCV+ and OCV- of the ECM connector.

HINT:
- The correct waveform is as shown in the left.
- The waveform frequency (A) becomes longer as the engine speed becomes higher.
- DTC P1349/59 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

NG → CHECK AND REPLACE ECM

OK

4	INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14-49)

NG → REPLACE VVT CONTROLLER ASSEMBLY,AND THEN GO TO NEXT STEP

OK

5	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 10-2)

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY,AND THEN GO TO NEXT STEP

OK

6	CHECK BLOCKAGE(OCV AND OIL HOLE)

NG → REPAIR OR REPLACE

OK

7	PERFORM SIMULATION TEST(CHECK DTC)

(a) Clear the DTC (See page 05-6).
(b) Perform the simulation test.
(c) Check whether or not DTC P1349 is stored (See page 05-6).
Result:

	A	B
RESULT	P1349 is output.	P1349 is not output.

HINT:
DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

B → VVT SYSTEM OK

A

CHECK AND REPLACE ECM

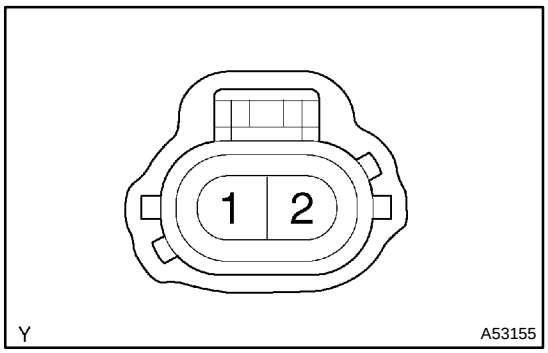
When not using hand held tester:

1	CHECK VALVE TIMING (See page 14-35)

NG → ADJUST VALVE TIMING

OK

2	CHECK OPERATION OF OCV



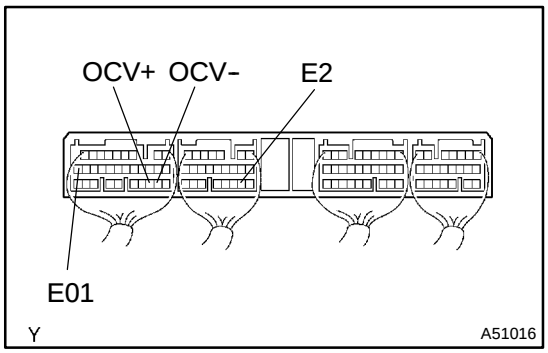
(a) Start the engine.
(b) Check the engine speed when disconnecting the OCV connector.
(c) Check the engine speed when applying battery positive voltage to the terminals of the OCV.
Result:

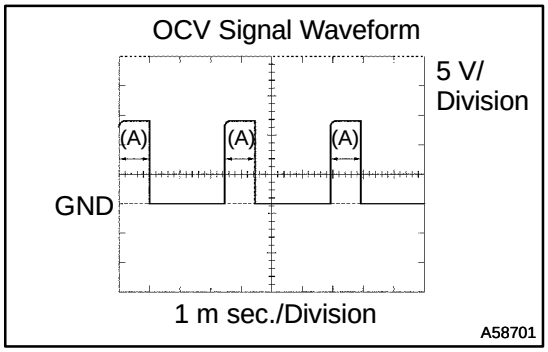
Result	Check (b)	Check (c)
A	Normal engine speed	Rough idle or engine stall
B	Except 1	

B → Go to step 4

A

3	INSPECT ECM(CHECK VOLTAGE)





(a) Turn the ignition switch ON.
(b) Check the waveform between terminals OCV+ and OCV- of the ECM connector.

HINT:
- The correct waveform is as shown in the left.
- The waveform frequency (A) becomes longer as the engine speed becomes higher.
- DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

OK → VVT SYSTEM OK

NG

CHECK AND REPLACE ECM

4	INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14-49)

NG → REPLACE VVT CONTROLLER ASSEMBLY,AND THEN GO TO NEXT STEP

OK

5	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY,AND THEN GO TO NEXT STEP

OK

6	CHECK BLOCKAGE(OCV AND OIL HOLE)

NG → REPAIR OR REPLACE

OK

7	PERFORM SIMULATION TEST(DTC CHECK)

SST 09843-18040

(a) Clear the DTC (See page 05-6).

(b) Perform the simulation test.

(c) Check whether or not DTC P1349 is stored (See page 05-6).

Result:

	A	B
RESULT	P1349 is output.	P1349 is not output.

HINT:

DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

B → **VVT SYSTEM OK**

A

CHECK AND REPLACE ECM

DTC	P1600	BACK-UP POWER SOURCE CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

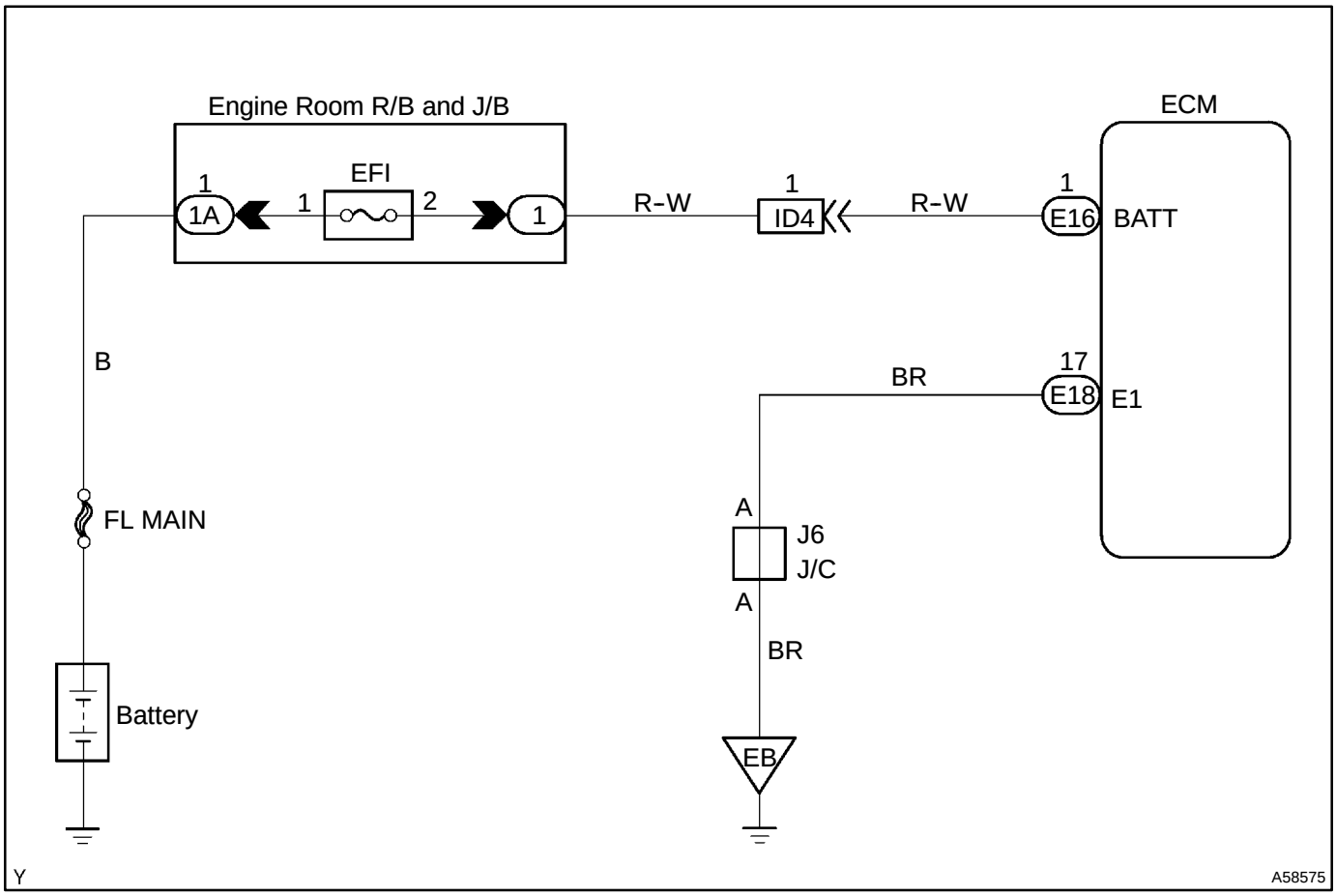
Battery positive voltage is applied to terminal BATT of the ECM even when the ignition switch is OFF for use by the DTC memory and air-fuel ratio adaptive control value memory, etc.

DTC No.	DTC Detecting Condition	Trouble Area
P1600	Open in back up power source circuit	S Open in back up power source circuit S ECM

HINT:

If DTC P1600 is displayed, the ECM does not store another DTC.

WIRING DIAGRAM

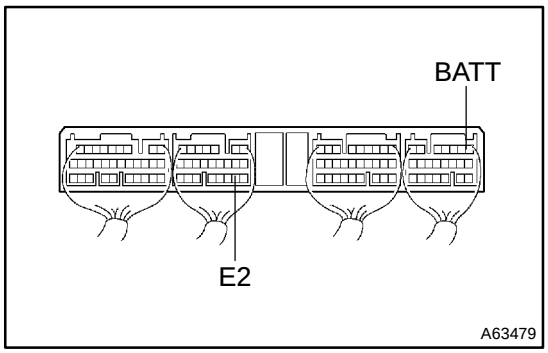


INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	INSPECT ECM(CHECK VOLTAGE)

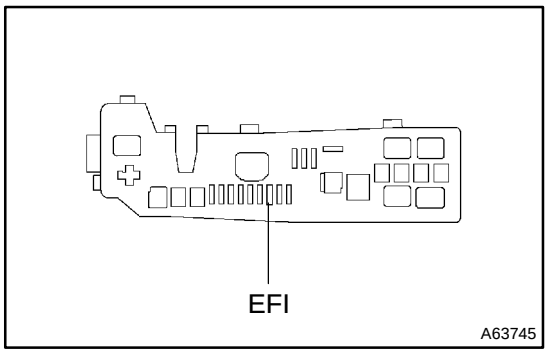


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal BATT of the ECM E16 connector and E2 of the ECM E18 connector.
Voltage: 9 - 14 V

OK → **CHECK AND REPLACE ECM**

NG

2	CHECK FUSE(EFI FUSE)

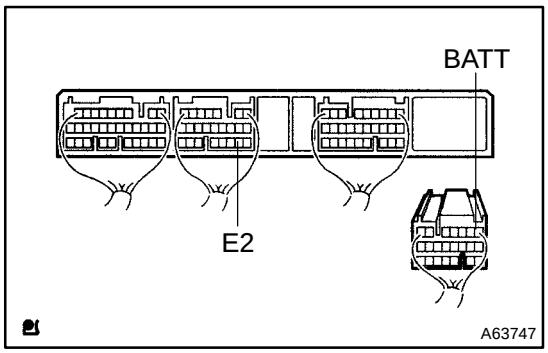


(a) Remove the EFI fuse from the engine room R/B.
(b) Check the continuity of the EFI fuse.
Result: Continuity

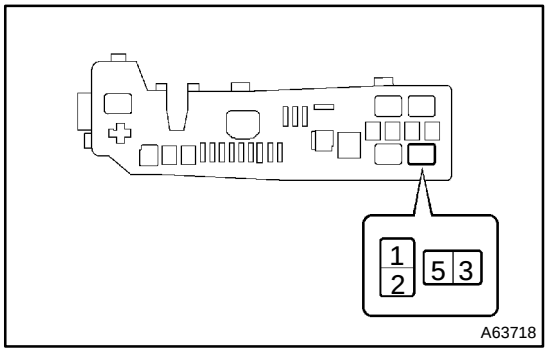
NG → **CHECK FOR SHORT IN ALL HERNESS AND COMPONENTS CONNECTED EFI FUSE**

OK

3	CHECK WIRE HARNESS OR CONNECTOR(EFI RELAY-ECM)



(a) Disconnect the ECM E16 connector.
(b) Remove the EFI relay.
(c) Check continuity between the terminals BATT of the ECM connector and 3 of the EFI relay installation relay block.
Resistance: 1 Ω or less
(d) Check for short between the terminals BATT of the ECM E5 connector and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	P1656	OCV CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Refer to DTC P1349 (VVT System Malfunction) on page 05-120.

DTC No.	DTC Detecting Condition	Trouble Area
P1656	Open or short in oil control valve circuit	S Open or short in oil control valve circuit S Oil control valve S ECM

WIRING DIAGRAM

Refer to DTC P1349 on page 05-120.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction

When using hand-held tester:

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(OCV OPERATION)

(a) Start the engine and warm it up.
(b) Connect the hand-held tester and select the VVT on the ACTIVE TEST menu.
(c) Check the engine speed when operating the OCV by using the hand-held tester.
Result:
VVT system is OFF (OCV is OFF): Normal engine speed
VVT system is ON (OCV is ON): Rough idle or engine stalled

OK → CHECK FOR INTERMITTENT PROBLEMS

NG

2	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 10-2)

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY

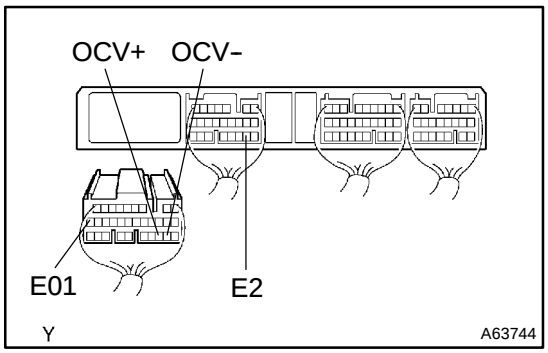
OK

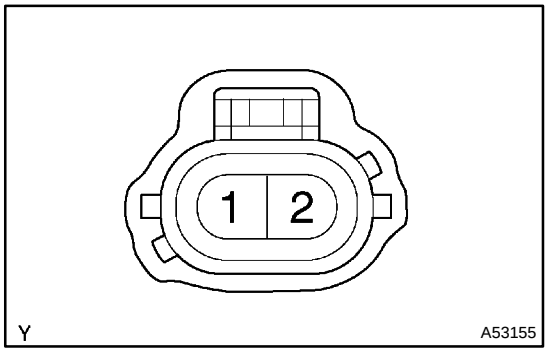
3	INSPECT ECM(CHECK VOLTAGE) (See page 05-120)

NG → CHECK AND REPLACE ECM

OK

4	CHECK WIRE HARNESS OR CONNECTOR(ECM-OCV)





(a) Disconnect the ECM E19 connector.
(b) Disconnect the camshaft timing control valve connector.
(c) Check continuity between the terminals OCV+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OCV+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OCV- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OCV- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

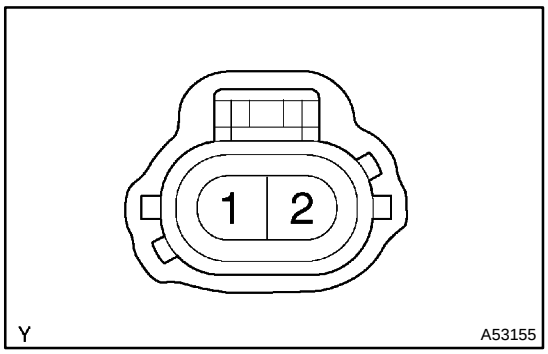
NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK FOR INTERMITTENT PROBLEMS

When not using hand-held tester:

1	CHECK OPERATION OF OCV



(a) Start the engine and warm it up.
(b) Apply battery positive voltage to the terminals of the OCV.
(c) Check the engine speed.
Result: Rough idle or engine stalled

NG → **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY**

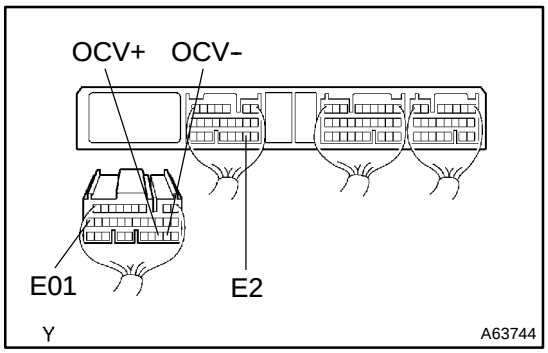
OK

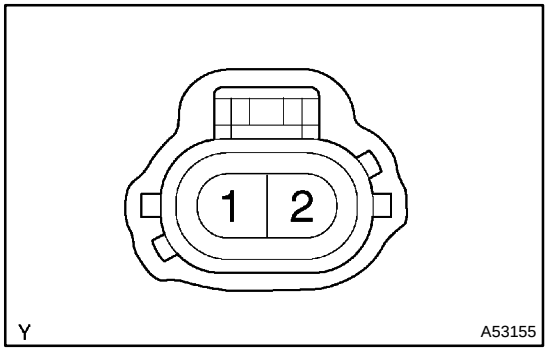
2	INSPECT ECM(CHECK VOLTAGE)(See Page 05-120)

NG → CHECK AND REPLACE ECM

OK

3	CHECK HARNESS AND CONNECTOR(ECM-OCV)





(a) Disconnect the ECM E19 connector.
(b) Disconnect the camshaft timing control valve connector.
(c) Check continuity between the terminals OCV+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OCV+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OCV- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OCV- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK FOR INTERMITTENT PROBLEMS

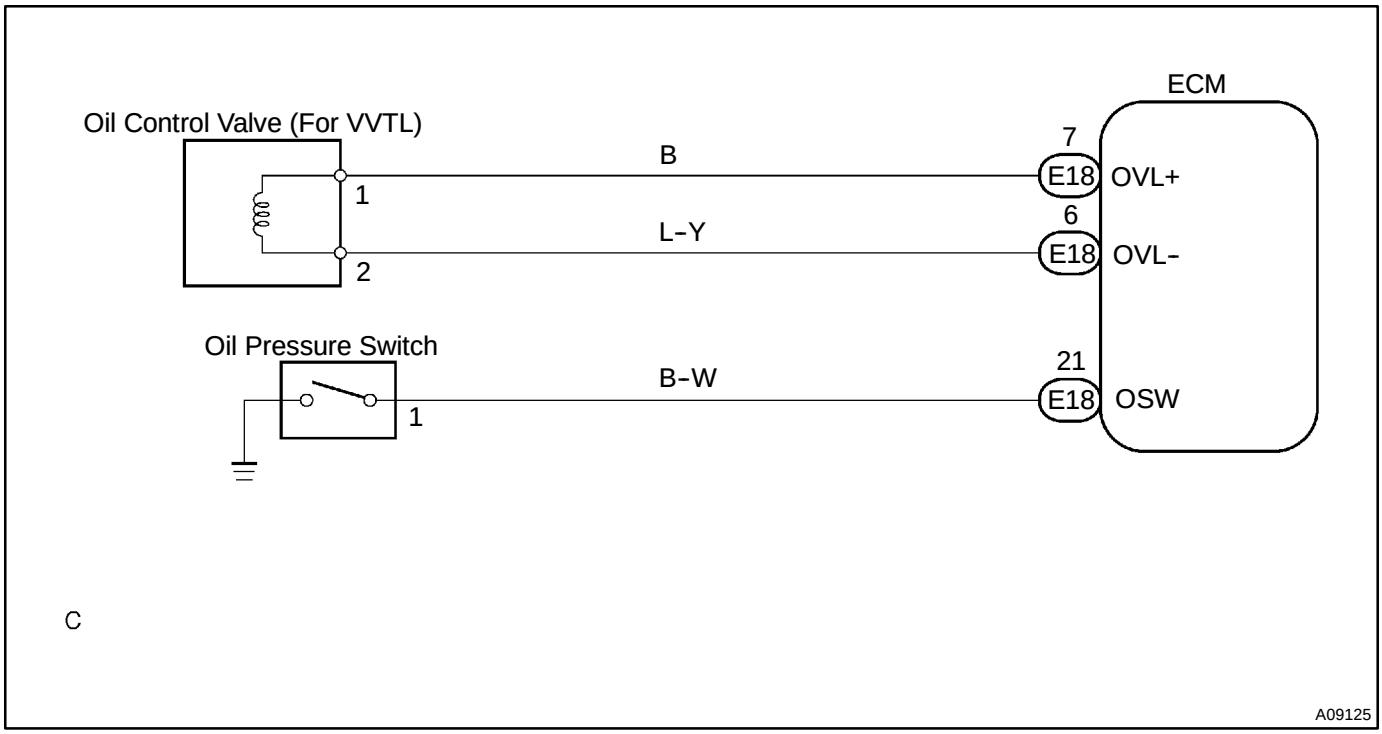
DTC	P1690	OCV FOR VVTL CIRCUIT MULFUNCTION

CIRCUIT DESCRIPTION

When the engine speed reaches 6,000 rpm, the VVTL system switches the locker arm from low speed to high speed. The ECM control the OCV to apply hydraulic pressure to the piston in the locker arm and switch the locker arm by locking the slipper for high speed.

DTC No.	DTC Detecting Condition	Trouble Area
P1690	Open or short in oil control valve (for VVTL) circuit	S Open or short in oil control valve (for VVTL) circuit S Oil control valve (for VVTL) S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	**PERFORM ACTIVE TEST BY CAMSHAFT TIMING OIL CONTROL VALVE ASSY(for VVTL)**

(a) Start the engine and warmed it up.
(b) Connect the hand-held tester and select VVTL from ACTIVE TEST menu.
(c) Maintain engine speed at 1,500 - 2,500 rpm.
(d) Check the engine speed when operate the OCV for VVTL by the hand-held tester.
Result:
VVTL system is OFF (OCV is OFF): Normal engine speed
VVTL system is ON (OCV is ON): Rough engine speed or engine stalled

OK → **CHECK FOR INTERMITTENT PROBLEMS**

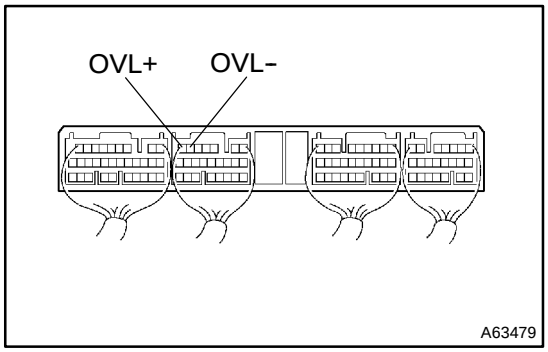
NG

2	**INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY(for VVTL)** **(See page 10-2)**

NG → **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY**

OK

3	**CHECK ECM(OVL+ - OVL-)**

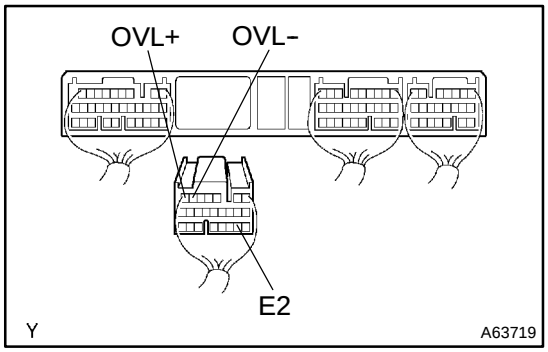


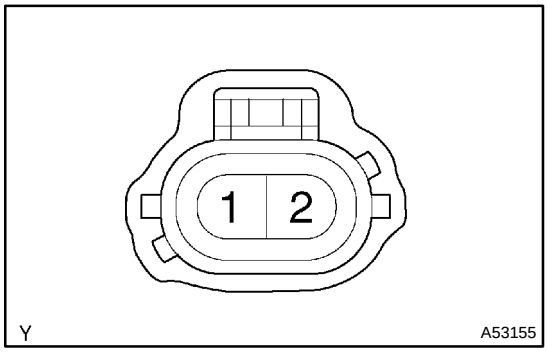
(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals OVL+ and OVL- of the ECM connector.
Voltage: 9 - 14 V

NG → **CHECK AND REPLACE ECM**

OK

4	CHECK HARNESS AND CONNECTOR(ECM - OCV for VVTL)





(a) Disconnect the ECM E18 connector.
(b) Disconnect the camshaft timing control valve connector.
(c) Check continuity between the terminals OVL+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OVL+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OVL- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OVL- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **CHECK AND REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR INTERMITTENT PROBLEMS

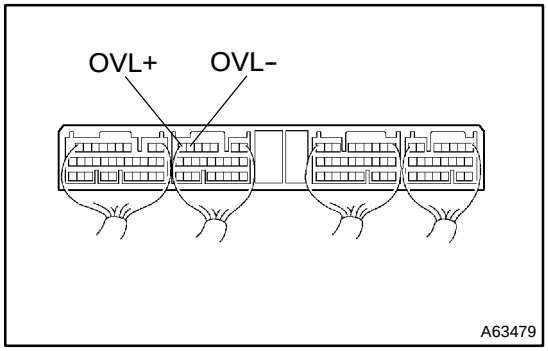
When not using hand-held tester:

1	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY(for VVTL) (See page 10-2)

NG → **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY**

OK

2	CHECK ECM(OVL+ - OVL-)

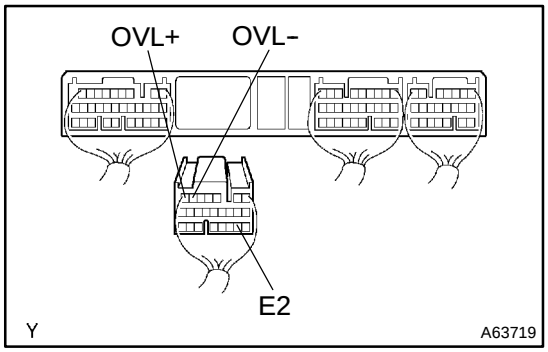


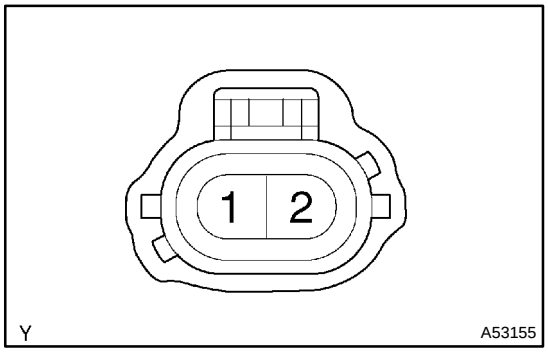
(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals OVL+ and OVL- of the ECM connector.
Voltage: 9 - 14 V

NG → **CHECK AND REPLACE ECM**

OK

3	CHECK HARNESS AND CONNECTOR(ECM - OCV for VVTL)





(a) Disconnect the ECM E18 connector.
(b) Disconnect the camshaft timing control valve connector.
(c) Check continuity between the terminals OVL+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OVL+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OVL- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OVL- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **CHECK AND REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR INTERMITTENT PROBLEMS

DTC	P1692	OCV FOR VVTL OPEN MALFUNCTION(BANK 1)

DTC	P1693	OCV FOR VVTL CLOSE MALFUNCTION(BANK 1)

CIRCUIT DESCRIPTION

Refer to DTC P1690 (OCV for VVTL Circuit Malfunction) on page 05-132.

DTC No.	DTC Detecting Condition	Trouble Area
P1692	In the condition that the engine speed is 6,000 rpm or less and the oil pressure switch on for 5 sec. or more	S Open or short in oil control valve circuit S Oil control valve (for VVTL) S Oil pressure switch for VVTL S ECM
P1693	In the condition that the water temperature is 60_C or more, the engine speed is 6,000 rpm or more, and the oil pressure switch OFF for 1 sec. or more	

WIRING DIAGRAM

Refer to DTC P1690 (OCV for VVTL Circuit Malfunction) on page 05-132.

When using hand-held tester:

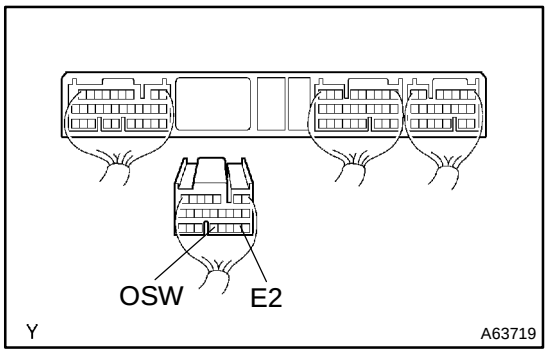
1	PERFORM ACTIVE TEST BY OIL PRESSURE SWITCH ASSY(for VVTL)

(a) Start the engine and warmed it up.
(b) Connect the hand-held tester and select VVTL from ACTIVE TEST menu.
(c) Disconnect the oil pressure switch for VVTL connector.
(d) Maintain engine speed at 6,500 rpm.
(e) Measure continuity between the oil pressure switch and body ground when operate the OCV by the hand-held tester.
Result:
VVTL system is OFF (OCV is OFF): No continuity
VVTL system is ON (OCV is ON): Continuity

NG → **REPLACE OIL PRESSURE SWITCH ASSY**

OK

2	CHECK HARNESS AND CONNECTOR(OIL PRESSURE SWITCH for VVTL - ECM)

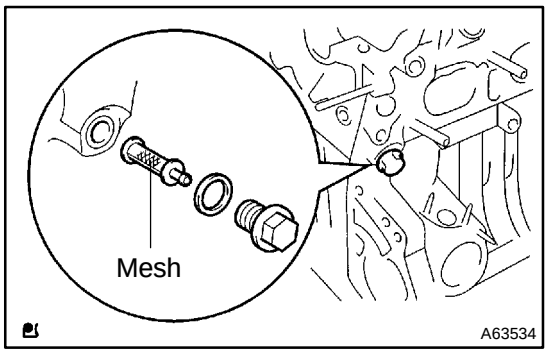


(a) Disconnect the oil pressure switch connector.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminals OSW of the ECM connector and oil pressure switch connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OSW and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 CHECK OIL CONTROL VALVE FILTER

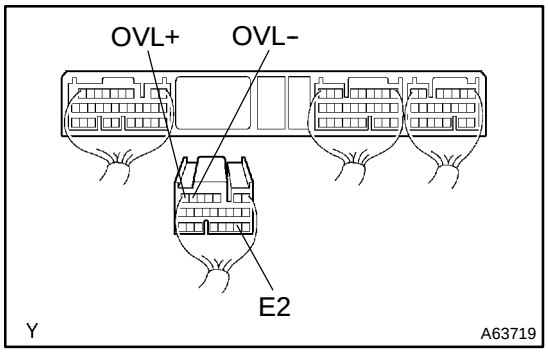


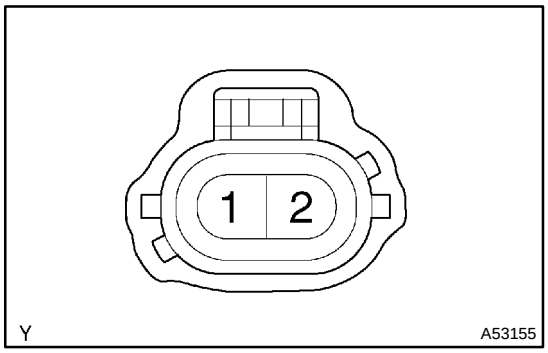
(a) Remove the generator. (See page 19-8)
(b) Remove the oil control valve filter.
(c) Check the oil control valve filter.
  (1) Confirm that the filter is clear.
(d) Place a new gasket on the bolt and install the filter.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

NG → **REPLACE OIL CONTROL VALVE FILTER**

OK

4 CHECK HARNESS AND CONNECTOR(OCV for VVTL - ECM)





(a) Disconnect the ECM E18 connector.
(b) Disconnect the camshaft timing control valve connector.
(c) Check continuity between the terminals OVL+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OVL+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OVL- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OVL- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

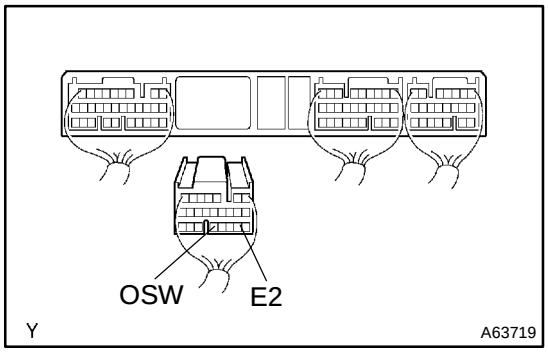
1	CHECK OIL PRESSURE SWITCH ASSY(for VVTL)

(a) Disconnect the oil pressure switch for VVTL connector.
(b) Ignition switch OFF.
(c) Measure continuity between the oil pressure switch and body ground.
Resistance: No continuity

NG → **REPLACE OIL PRESSURE SWITCH ASSY**

OK

2	CHECK HARNESS AND CONNECTOR(OIL PRESSURE SWITCH for VVTL - ECM)

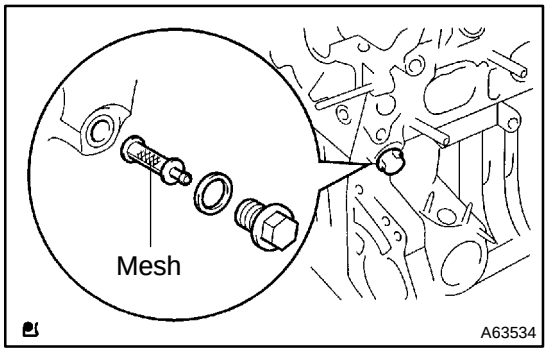


(a) Disconnect the oil pressure switch connector.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminals OSW of the ECM connector and oil pressure switch connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OSW and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	CHECK OIL CONTROL VALVE FILTER

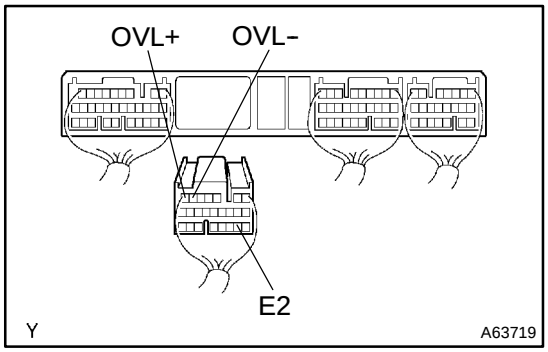


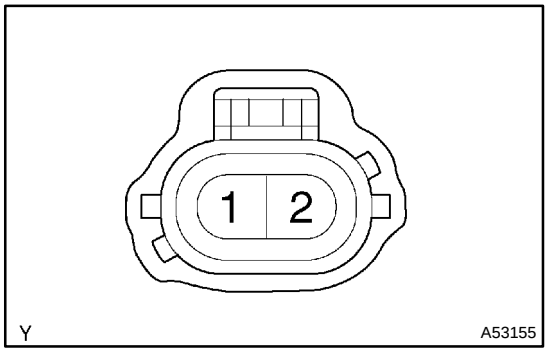
(a) Remove the generator. (See page 19-8)
(b) Remove the oil control valve filter.
(c) Check the oil control valve filter.
(1) Confirm that the filter is clear.
(d) Place a new gasket on the bolt and install the filter.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

NG → **REPLACE OIL CONTROL VALVE FILTER**

OK

4	CHECK HARNESS AND CONNECTOR(OCV for VVTL - ECM)





(a) Disconnect the ECM E18 connector.
(b) Disconnect the camshaft timing control valve connector.
(c) Check continuity between the terminals OVL+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OVL+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OVL- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OVL- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

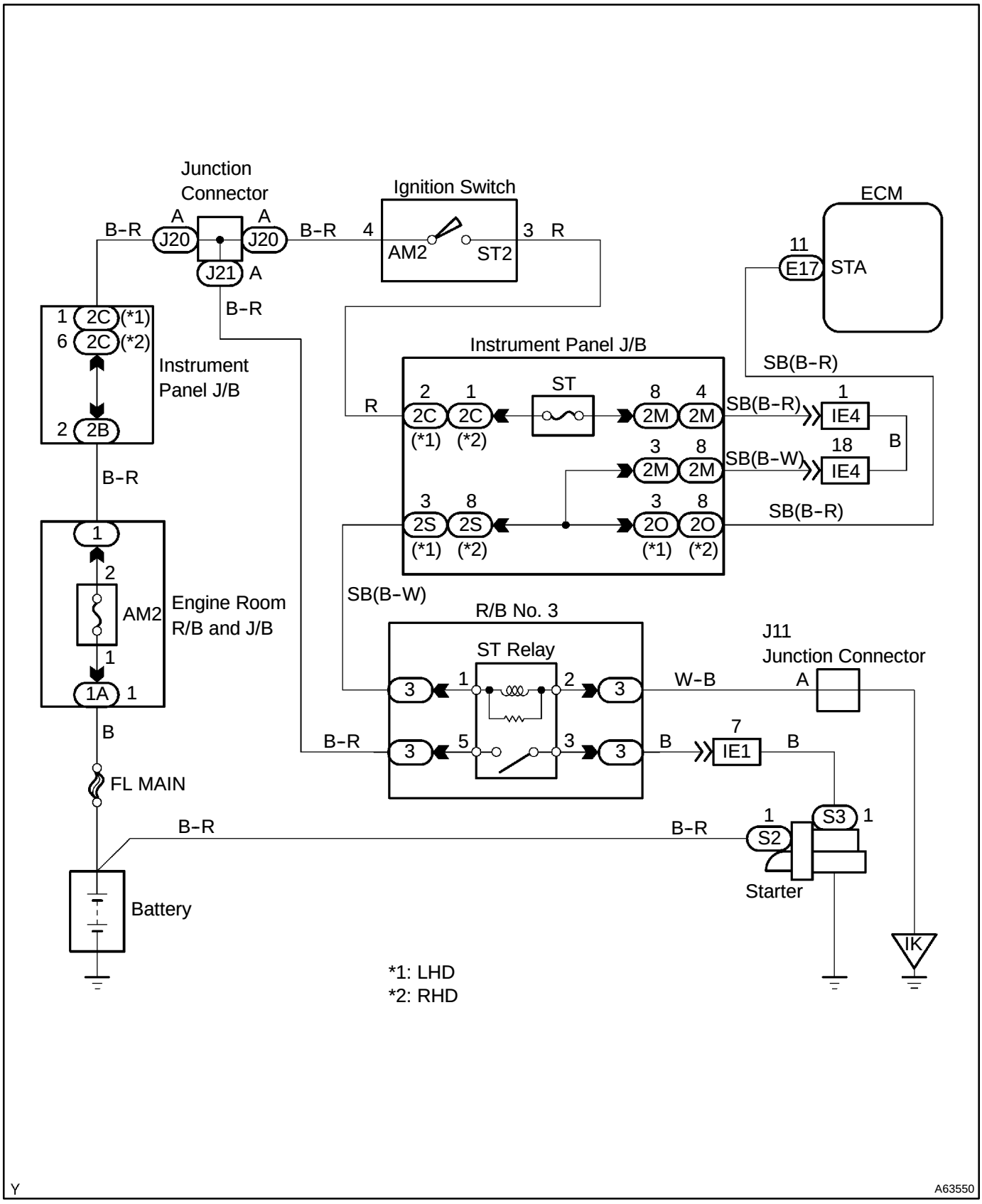
CHECK AND REPLACE ECM

STARTER SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

When the engine is cranked, the intake air flow is slow, so fuel vaporization is poor. A rich mixture is therefore necessary in order to achieve good startability. While the engine is being cranked, the battery voltage is applied to terminal STA of the ECM. The starter signal is mainly used to increase the fuel injection volume for the starting injection control and after-start injection control.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

This diagnostic chart is based on the premise that the engine is cranked normally. If the engine is not cranked, proceed to the problem symptoms table on page .

When using hand-held tester:

1 READ VALUE OF HAND-HELD TESTER(STARTER SIGNAL)

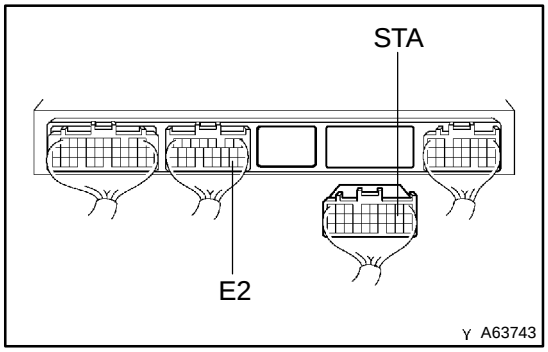
(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand-held tester main switch ON.
(c) Read the STA signal on the hand-held tester while the starter is operating.
Result:

Ignition Switch Position	ON	START
STA Signal	OFF	ON

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

NG

2 CHECK WIRE HARNESS OR CONNECTOR(ECM-STARTER RELAY)



(a) Disconnect the ECM E17 connector.
(b) Remove the starter relay.
(c) Check continuity between the terminals STA of the ECM connector and 1 of the starter relay connector side.
Resistance: 1 Ω or less
(d) Check for short between the terminals STA of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

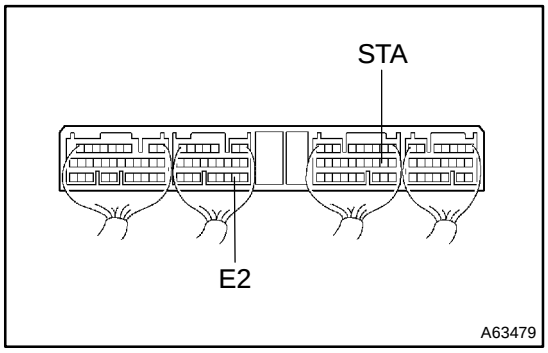
NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

1	INSPECT ECM(CHECK VOLTAGE)

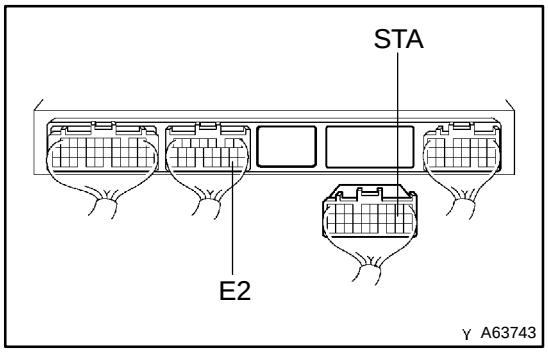


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal STA of the ECM connector and E2 of the ECM connector, during the engine cranking.
Voltage: 6 V or more

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

NG

2	CHECK WIRE HARNESS OR CONNECTOR(ECM-STARTER RELAY)



(a) Disconnect the ECM E17 connector.
(b) Remove the starter relay.
(c) Check continuity between the terminals STA of the ECM connector and 1 of the starter relay connector side.
Resistance: 1 Ω or less
(d) Check for short between the terminals STA of the ECM connector and E2 of the ECM connector.

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

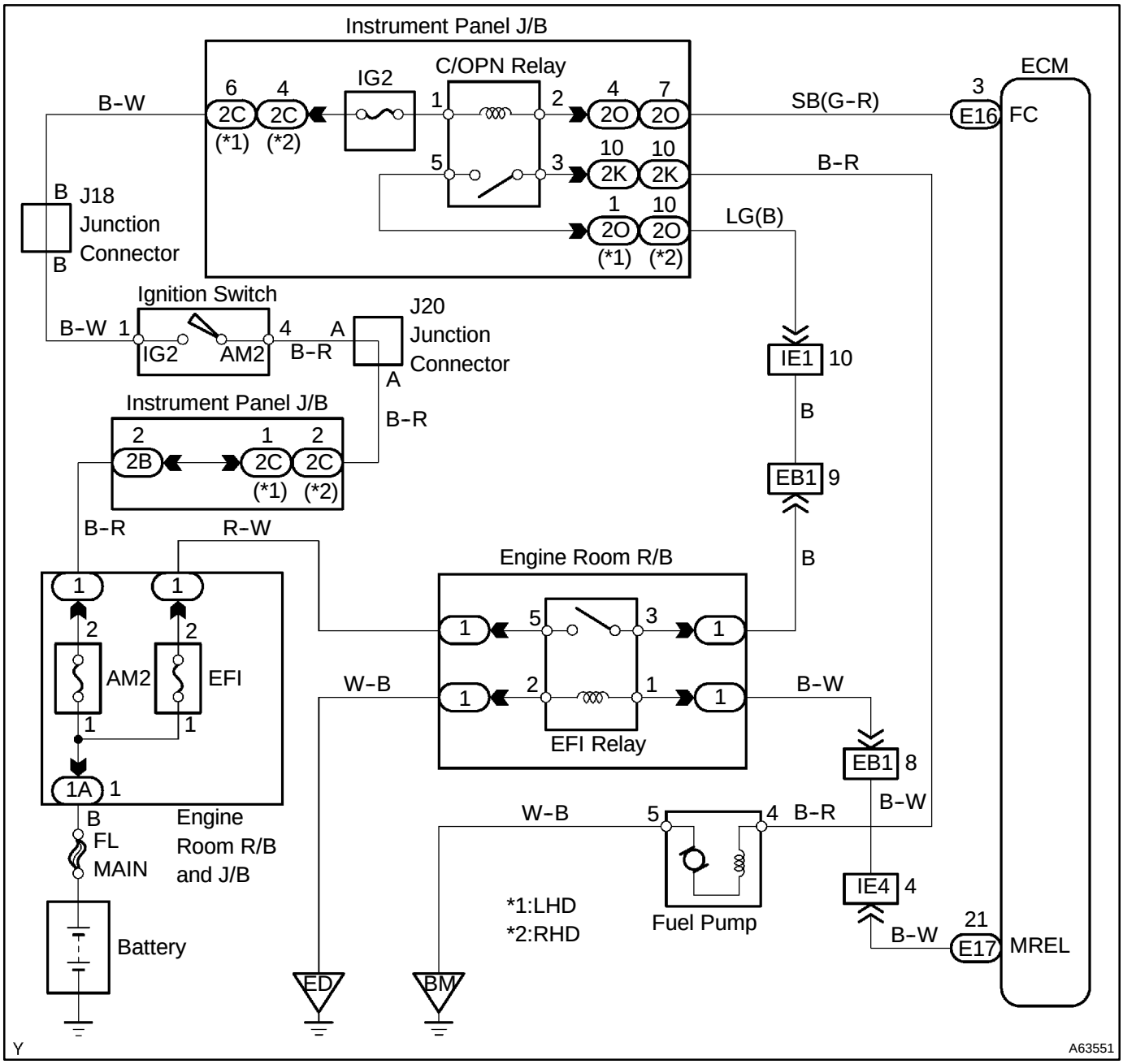
CHECK AND REPLACE ECM

FUEL PUMP CONTROL CIRCUIT

CIRCUIT DESCRIPTION

In the diagram below, when the engine is cranked, current flows from terminal ST of the ignition switch to the starter relay coil and also current flows to terminal STA of ECM (STA signal).
When the STA signal and NE signal are input to the ECM, Tr is turned ON, current flows to the coil of the circuit opening relay, the relay switches on, power is supplied to the fuel pump and the fuel pump operates.
While the NE signal is generated (engine running), the ECM keeps Tr ON (circuit opening relay ON) and the fuel pump also keeps operating.

WIRING DIAGRAM



INSPECTION PROCEDURE

When using hand-held tester:

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(OPERATION OF CIRCUIT OPENING RELAY)

(a) Select the active test mode on the hand-held tester.
(b) Turn the ignition switch ON, and perform the active test at the engine stop.
Result: The circuit opening relay operates.

OK → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE

NG

2	CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-149)

NG → REPAIR OR REPLACE

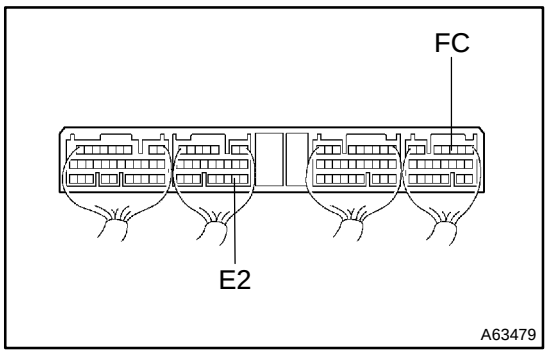
OK

3	INSPECT E.F.I. CIRCUIT OPENING RELAY ASSY(CHECK VOLTAGE BETWEEN THE TERMINALS FC OF THE ENGINE ECU E6 CONNECTOR AND E1 OF THE ENGINE ECU E8 CONNECTOR.) (See page 10-2)

NG → REPLACE E.F.I. CIRCUIT OPENING RELAY ASSY

OK

4	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal FC and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → Go to step 6

NG

5	CHECK WIRE HARNESS OR CONNECTOR(EFI MAIN RELAY-CIRCUIT OPENING RELAY, CIRCUIT OPENING RELAY-ECM) (See page 05-149)

NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK ↓

CHECK AND REPLACE ECM

6	INSPECT FUEL PUMP (See page 11-7)

NG → REPLACE FUEL PUMP

OK ↓

7	CHECK WIRE HARNESS OR CONNECTOR(CHECK FOR OPEN)

(a) Check for open in harness and connector between circuit opening relay and fuel pump, and fuel pump and body ground.

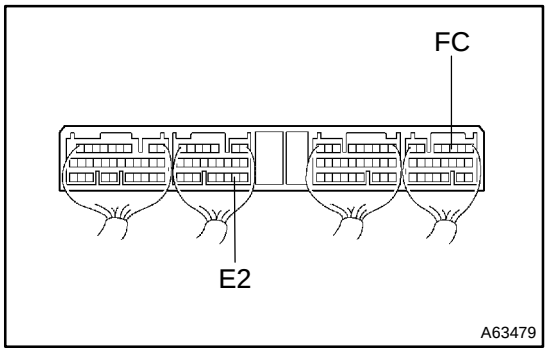
NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK ↓

CHECK AND REPLACE ECM

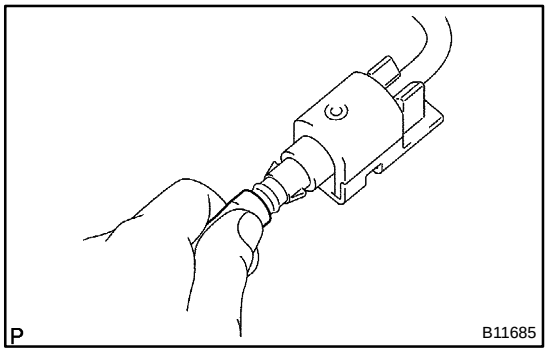
When not using hand-held tester:

1	CHECK OPERATION OF FUEL PUMP



(a) Turn the ignition switch ON.
(b) Connect between terminal FC of the ECM connector and E2 of the ECM connector.
(c) Check for fuel pressure in the fuel inlet hose when it is pinched off.
Result: There is pressure in fuel inlet hose.

HINT:
At this time, you will hear the fuel return flowing noise.



OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

NG

2	CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-149)

NG → **REPAIR OR REPLACE**

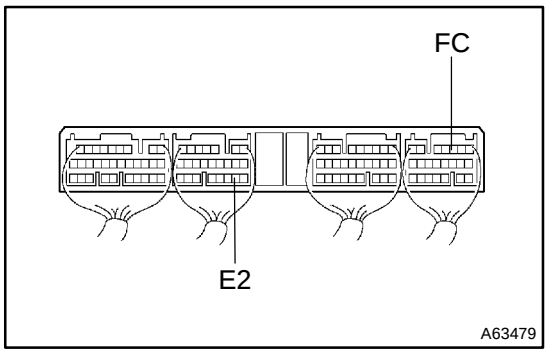
OK

3	INSPECT E.F.I. CIRCUIT OPENING RELAY ASSY (See page 10-2)

NG → **REPLACE E.F.I. CIRCUIT OPENING RELAY ASSY**

OK

4	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal FC of the ECM connector and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → **Go to step 6**

NG

5	CHECK WIRE HARNESS OR CONNECTOR(EFI MAIN RELAY-CIRCUIT OPENING RELAY, CIRCUIT OPENING RELAY ECM)

OK → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

NG

CHECK AND REPLACE ECM

6	INSPECT FUEL PUMP (See page 11-7)

NG → **REPLACE FUEL PUMP**

7	CHECK WIRE HARNESS OR CONNECTOR(OPEN BETWEEN TERMINAL 3 OF CIRCUIT OPENING RELAY AND TERMINAL)

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

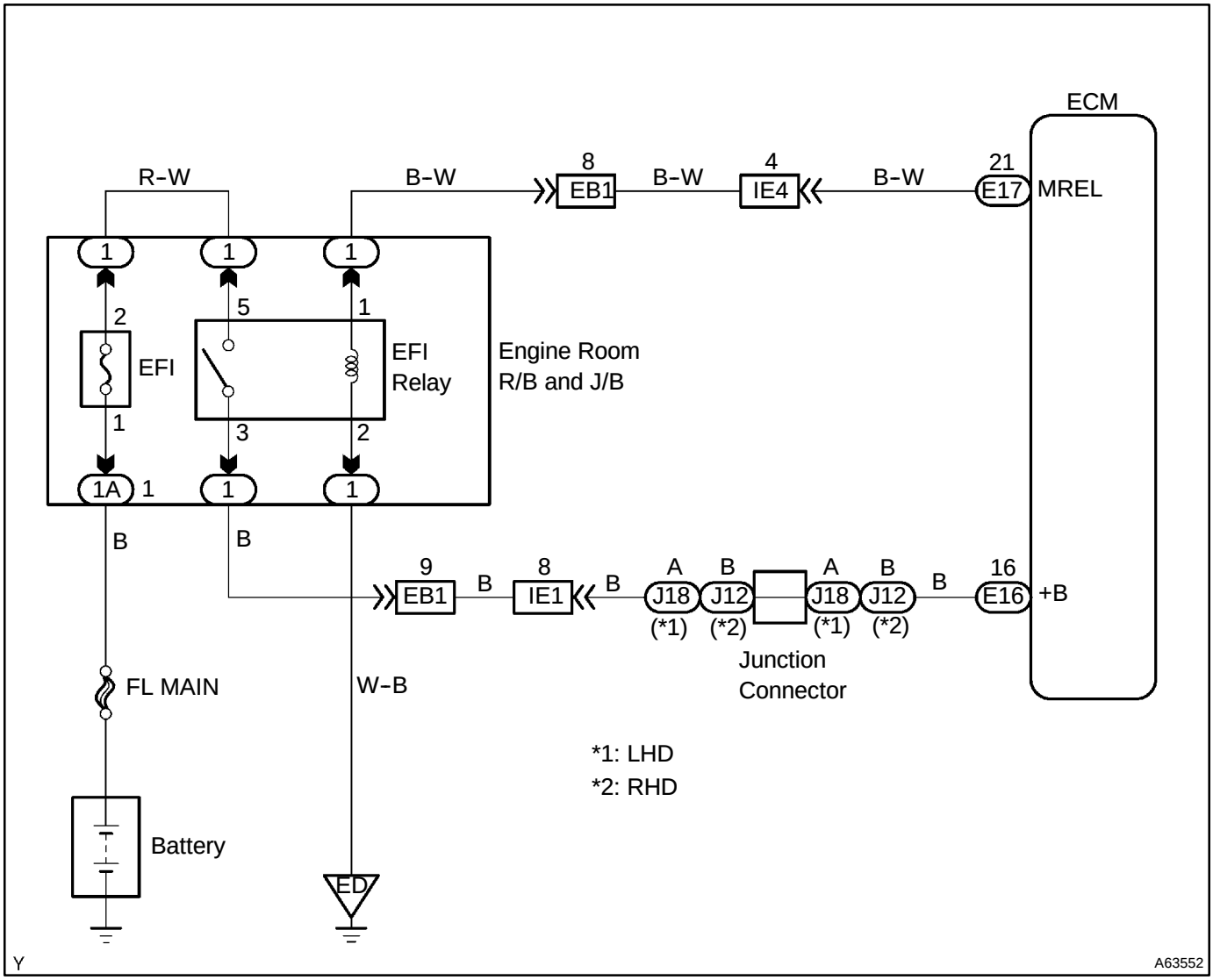
CHECK AND REPLACE ECM

ECM POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

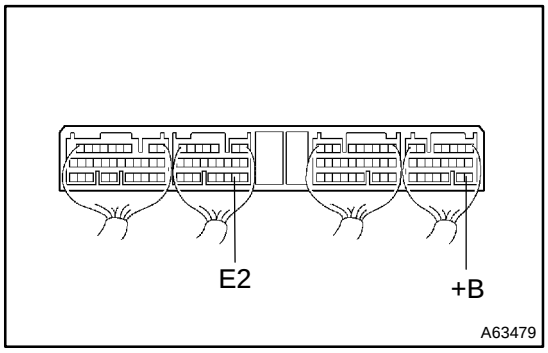
When the ignition switch is turned ON, battery positive voltage is applied to the coil which closes the contacts of the EFI main relay (Marking: EFI) and supplies power to the terminal +B of the ECM.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT ECM

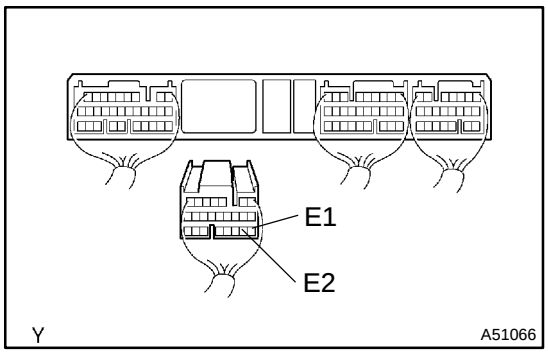


(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals +B of the ECM connector and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → **CHECK AND REPLACE ECM**

NG

2 CHECK HARNESS AND CONNECTOR(ECM GROUND)(See page 01-30)

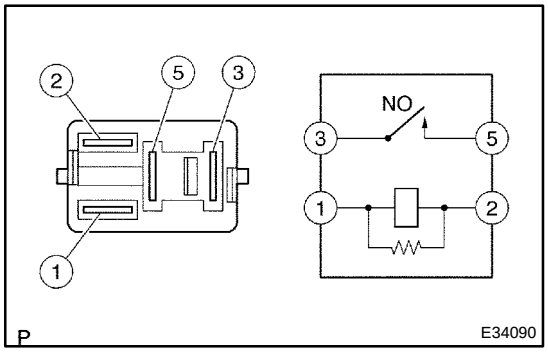


(a) Disconnect the battery negative (-) terminal.
(b) Disconnect the ECM E18 connector.
(c) Check continuity between the terminal E1 of ECM connector and body ground.
Resistance: 1 Ω or less
(d) Check continuity between the terminal E2 of the ECM connector and body ground.
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 CHECK E.F.I. CIRCUIT OPENING RELAY ASSY



(a) Check continuity between the terminals shown below.
Resistance:

TERMINAL NO.	RESISTANCE
1 - 2	1 Ω or less
3 - 5	1 MΩ or more

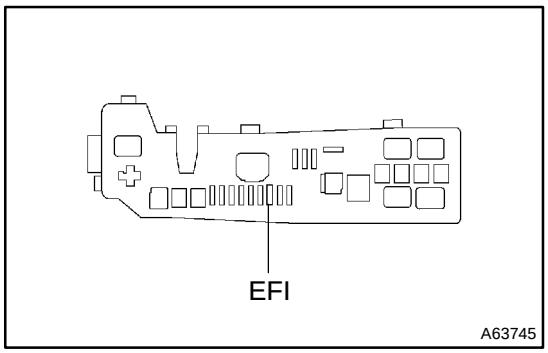
(b) Check continuity between the terminals 3 and 5 of the connector when the battery voltage is applied to the terminals between 1 and 2.
Resistance:

TERMINAL NO.	RESISTANCE
3 - 5	1 Ω or less

NG → **REPLACE E.F.I. CIRCUIT OPENING RELAY ASSY**

OK

4	CHECK FUSE(EFI FUSE)

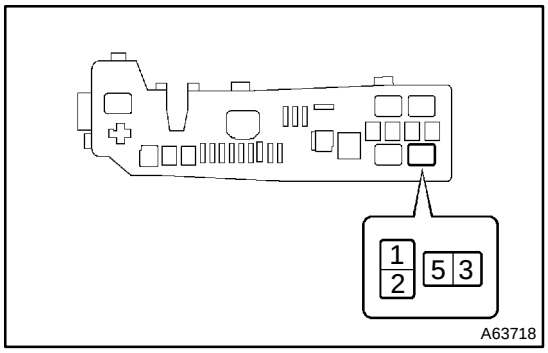


(a) Check continuity of EFI fuse.
Resistance: 1 Ω or less

NG → **REPLACE FUSE**

OK

5	CHECK RELAY OPERATION(EFI RELAY)

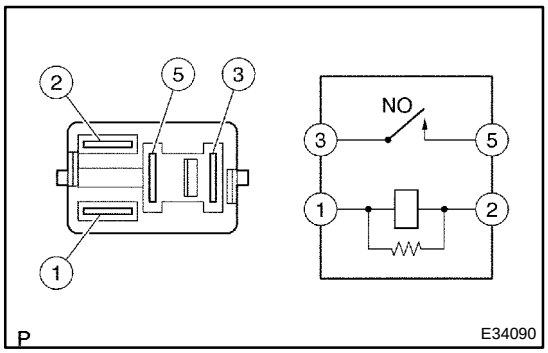


(a) Confirm that the EFI relay operates normally when turning the ignition switch ON.
Result:
EFI relay operation sound is heard successively when turning the ignition switch ON.

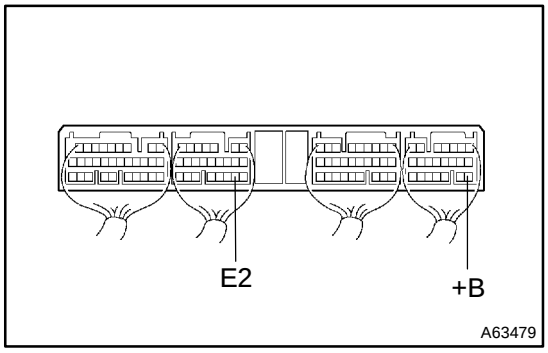
NG → **Go to step 8**

OK

6	CHECK HARNESS AND CONNECTOR(ECM-EFI RELAY)



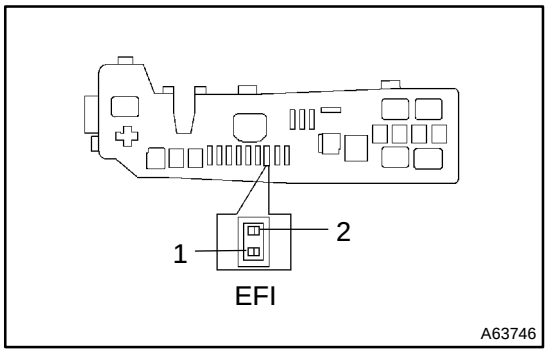
(a) Disconnect the battery negative (-) terminal.
(b) Remove the EFI relay.
(c) Check continuity between the terminals 1 of the EFI relay in the engine room R/B and +B of the ECM E16 connector.
Resistance: 1 Ω or less
(d) Check continuity between the terminals 1 of the EFI relay in the engine room R/B and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

7	CHECK HARNESS AND CONNECTOR(EFI FUSE-BATTERY)



(a) Disconnect the battery negative (-) connector.
(b) Remove the EFI fuse.
(c) Check continuity between the terminals 1 of the EFI fuse holder in the engine room R/B and negative (-) of the battery.

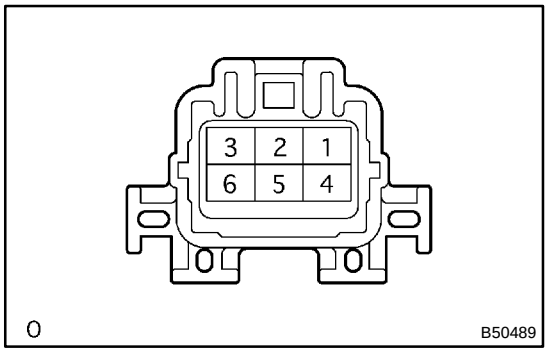
NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM

8 INSPECT IGNITION OR STARTER SWITCH ASSY



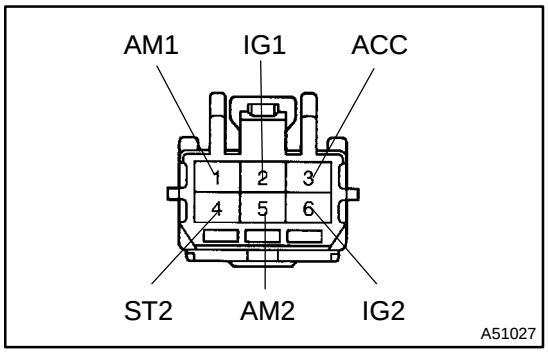
(a) Check continuity between the connector terminals shown in the chart below.

Switch	Terminal No.	Resisitance
LOCK	All Terminals	1MΩ or more
ACC	1-3	1Ω or less
ON	1-2-3 5-6	1Ω or less
START	4-5-6 1-2	1Ω or less

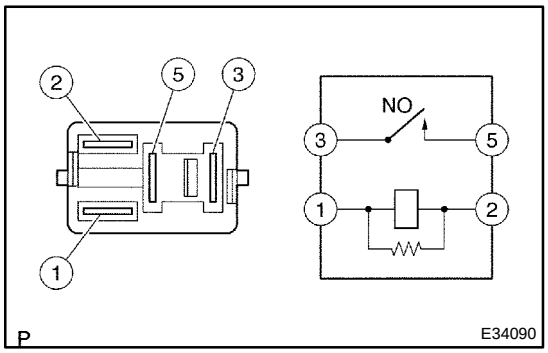
NG → **REPLACE IGNITION OR STARTER SWITCH ASSY**

OK

9 CHECK HARNESS AND CONNECTOR(IGNITION SWITCH-EFI CIRCUIT OPENING RELAY)



(a) Disconnect the battery negative (-) terminal.
(b) Remove the EFI circuit opening relay.
(c) Disconnect the ignition switch connector.
(d) Check continuity between the terminals IG2 of the ignition switch connector and 5 of the EFI circuit opening relay in the R/B.
Resistance: 1 Ω or less
(e) Check for short between the terminal IG2 of the ignition switch and body ground.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM

EFI SYSTEM (3ZZ-FE)

HOW TO PROCEED WITH TROUBLESHOOTING

0504C-05

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS (See page 05-157)

3	CONNECT THE HAND-HELD TESTER TO DLC 3

HINT:
If the display indicates a communication fault in the tool, inspect DLC3.

4	CHECK DTC AND FREEZE FRAME DATA (See page 05-158)

HINT:
Record or print DTC and freezed frame data.

5	CLEAR DTC AND FREEZE FRAME DATA (See page 05-158)

6	VISUAL INSPECTION

7	SETTING THE CHECK (TEST) MODE DIAGNOSIS (See page 05-158)

8	PROBLEM SYMPTOM CONFIRMATION

HINT:
If the engine does not start, perform step 10 and 12 first.

A	Malfunction does not occur
B	Malfunction occurs

B → GO TO STEP 10

A

9	SYMPTOM SIMULATION

10	DTC CHECK (See page 05-168)

A	Normal code
B	Malfunction code

B → AFTER CHECKING MALFUNCTION CODE, GO TO STEP 14

A

11	BASIC INSPECTION (See page 05-158)

A	Not confirm wrong parts
B	Confirm wrong parts

B → GO TO STEP 16

A

12	PROBLEM SYMPTOM TABLE (See page 05-177)

A	Confirm wrong circuit
B	Confirm wrong Parts

B → GO TO STEP 16

A

13	CHECK ECM POWER SOURCE CIRCUIT (See page 05-308)

14	CIRCUIT INSPECTION

A	Not confirm malfunction
B	Confirm malfunction

B → GO TO STEP 16

A

15	CHECK FOR INTERMITTENT PROBLEM (See page 05-158)

16	IDENTIFICATION OF PROBLEM

17	ADJUSTMENT, REPAIR

18	CONFIRMATION TEST

END

0504B-05

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE CONTROL SYSTEM Check Sheet

Inspector's Name _____

Customer's Name		Model and Model Year	
Driver's Name		Frame No.	
Data Vehicle Brought in		Engine Model	
License No.		Odometer Reading	km / miles

Problem Symptoms	☐ Engine does not Start	☐ Engine does not crank ☐ No initial combustion ☐ No complete combustion
	☐ Difficult to Start	☐ Engine cranks slowly ☐ Other _____
	☐ Poor Idling	☐ Incorrect first idle ☐ Idling rpm is abnormal ☐ High (rpm) ☐ Low (rpm) ☐ Rough idling ☐ Other _____
	☐ Poor Drivability	☐ Hesitation ☐ Back fire ☐ Muffler explosion (after-fire) ☐ Surging ☐ Knocking ☐ Other _____
	☐ Engine Stall	☐ Soon after starting ☐ After accelerator pedal depressed ☐ After accelerator pedal released ☐ During A/C operation ☐ Shifting from N to D ☐ Other _____
	☐ Others	

Datas Problem Occurred		
Problem Frequency		☐ Constant ☐ Sometimes (times per day/month) ☐ Once only ☐ Other _____
Condition When Problem Occurs	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Other _____
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (approx. ____°F/____°C)
	Place	☐ Highway ☐ Suburbs ☐ Inner City ☐ Uphill ☐ Downhill ☐ Rough road ☐ Other _____
	Engine Temp.	☐ Cold ☐ Warming up ☐ After Warming up ☐ Any temp. ☐ Other _____
	Engine Operation	☐ Starting ☐ Just after starting (min.) ☐ Idling ☐ Racing ☐ Driving ☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ A/C switch ON/OFF ☐ Other _____

Condition of check engine warning light (CHK ENG)		☐ Remains on ☐ Sometimes light up ☐ Does not light up
DTC Inspection	Normal mode (Precheck)	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )
	Check Mode	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )

0575B–01

PRE–CHECK

1. DIAGNOSIS SYSTEM

(a) Description for Euro–OBD

- When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect the vehicle to the OBD scan tool complying with ISO 15031–4 or hand–held tester, and read off various data output from the vehicle's ECM.
- Euro–OBD regulations require that the vehicle's on–board computer lights up the Check Engine Warning Light (Malfunction Indicator Lamp)/CHK ENG (MIL) on the instrument panel when the computer detects a malfunction in the emission control system/components or in the powertrain control components which affect vehicle emissions, or a malfunction in the computer. In addition to CHK ENG (MIL) lighting up when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) prescribed by ISO15031–6 are recorded in the ECM memory (See page 05–168).

If the malfunction code is not detected in 3 consecutive trips, CHK ENG (MIL) goes off automatically but the DTCs remain recorded in the ECM memory.

- To check the DTCs, connect the OBD scan tool or hand–held tester to the Data Link Connector 3 (DLC3) on the vehicle. The OBD scan tool or hand–held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data (For operating instructions, see the OBD scan tool's instruction book.).
- DTCs include ISO controlled codes and manufacturer controlled codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer controlled codes can be set freely by the manufacturer within the prescribed limits
  (See DTC chart on page 05–168).
- The diagnosis system operates in normal mode during normal vehicle use. It also has a check mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the ECM to check mode when troubleshooting, the technician can cause the CHK ENG (MIL) to light up for a malfunction that is only detected once or momentarily (Hand–held tester only) (See step 2).

- *2 trip detection logic:
  When a malfunction is first detected, the malfunction code is temporarily stored in the ECM memory (1st trip). If the same malfunction is detected again during the second drive test, this second detection causes the CHK ENG (MIL) to light up (2nd trip) (However, the ignition switch must be turned OFF between the 1st trip and the 2nd trip.).
- Freeze frame data:
  Freeze frame data records the engine condition when a misfire (DTCs P0300 – P0304) or fuel trim malfunction (DTCs P0171) or other malfunction (first malfunction only), is detected.
  Because freeze frame data records the engine conditions (fuel system, calculated load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected. When troubleshooting, it is useful to determine whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

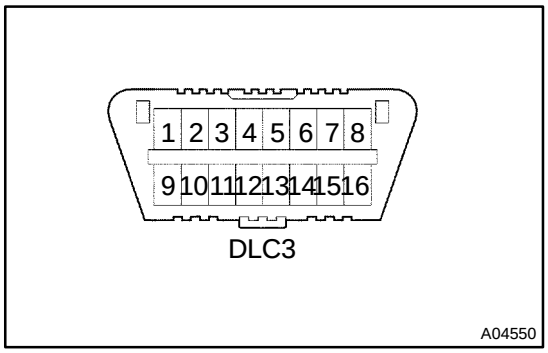
Priorities for troubleshooting. If troubleshooting priorities for multiple DTCs are given in the applicable DTC chart, these should be followed.
If no instructions are given, troubleshoot DTCs according to the following priorities.

(1) DTCs other than fuel trim malfunction (DTCs P0171) and misfire (DTCs P0300 – P0304).
(2) Fuel trim malfunction (DTCs P0171).
(3) Misfire (DTCs P0300 – P0304).

(b) Description for M–OBD

- When troubleshoot Multiplex OBD (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the vehicle to the hand–held tester, and read off various data output from the vehicle's ECM.
- The vehicle's on–board computer indicates the check engine light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to an indication of the CHK ENG when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) are recorded in the ECM memory (See page 05–168). When the malfunction does not reoccur, the CHK ENG is indicated until the ignition switch is turned off, and then the CHK ENG is not indicated when the ignition switch is turned on but the DTCs remain recorded in the ECU memory.

- To check the DTCs, connect the hand–held tester to Data Link Connector 3 (DLC3) on the vehicle or read the DTC which is indicated on the multi information display when TC and CG terminals on the DLC3 are connected. The hand–held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data. (For operating instructions, see the instruction book.)
- The diagnosis system operates in the normal mode during normal vehicle use. It also has a check (test) mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the ECM to the check (test) mode using hand–held tester when troubleshooting, the technician can cause the CHK ENG on the light up for a malfunction that is only detected once or momentarily (Hand–held tester only) (See step 2).
- * 2 trip detection logic
  When a logic malfunction is fist detected, the malfunction is temporally stored in the ECM memory. If the same malfunction is detected again during the second drive test, this second detection cases the CHK ENG to light up.
  The 2 trip repeats the same mode for 2 times (However, the ignition switch must be turned OFF between the 1st trip and 2nd trip).
- Freeze frame data:
  Freeze frame data records the engine condition when malfunction is detected.
  Because freeze frame data records the engine conditions (fuel system, calculator load, water temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

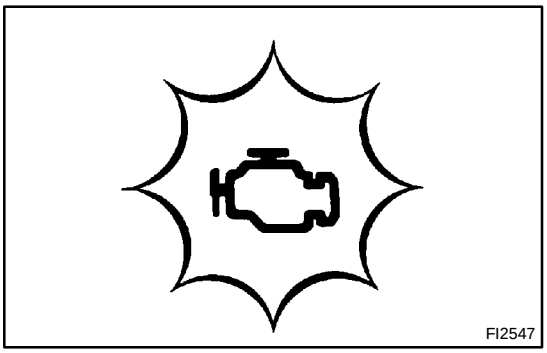


(c) Check the DLC3.
The vehicle's engine ECU uses the ISO 14230(M–OBD) communication protocol. The terminal arrangement of DLC3 complies with ISO 15031–03 and matches the ISO 14230 format.

Terminal No.	Connection / Voltage or Residence	Condition
7	Bus + Line / Pulse generation+	During transmission
4	Chassis Ground ↔ Body Ground / 1 Ω or less	Always
16	Battery Positive ↔ Body Ground / 9 - 14 V	Always

HINT:
If the display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of the OBD scan tool or hand-held tester to DLC3, turned the ignition switch ON and operated the hand-held tester, there is a problem on the vehicle side or tool side.

- If communication is normal when the tool is connected to another vehicle, inspect DLC3 on the original vehicle.
- If communication is still not possible is when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Debarment listed in the tool,s instruction manual.


FI2547

2. INSPECT DIAGNOSIS (Normal Mode)

(a) Check the check engine warning light.

(1) The check engine warning (CHK ENG) comes on when the ignition switch is turned ON and the engine is not running.

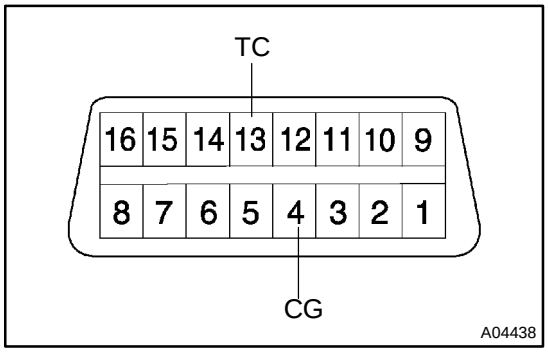
HINT:
If the check engine warning (CHK ENG) does not light up, troubleshoot the combination meter.

(2) When the engine is started, the check engine warning light should go off. If the lamp remains on, the diagnosis system has detected a malfunction or abnormality in the system.

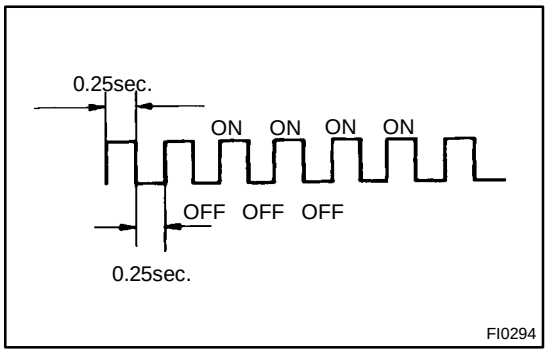
(b) Check the DTC, using hand-held tester.

NOTICE:
Hand-held tester only:
When the diagnosis system is switched from normal mode to check (test) mode, it erases all DTCs and freezed frame data recorded in normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

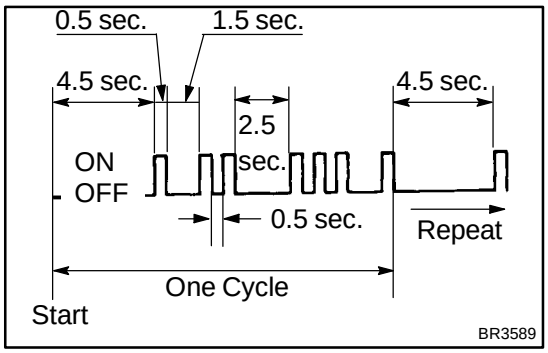
(1) Prepare the hand-held tester.
(2) Connect the hand-held tester to DLC3.
(3) Turn the ignition switch ON and switch the hand-held tester main switch ON.
(4) Use the hand-held tester to check the DTCs and freezed frame data; note them down. (For operating instructions, see the hand-held tester's instruction book.)
(5) See page 05-168 to confirm the details of the DTCs.



(c) If you have no hand-held tester, perform the following step (1) to (6).
(1) Turn the ignition switch ON.
(2) Using SST, connect between terminals 13 (TC) and 4 (CG) of DLC3.
SST 09843 - 18040



(3) Read the DTC from the check engine warning light (CHK ENG).



(4) As an example, the blinking patterns for codes, normal, 12 and 31 are as shown on the illustration.
(5) Check the details of the malfunction using the DTC chart on page 05-168.
(6) After completing the check, disconnect terminals 13 (TC) and 4 (CG) and turn off the display.

HINT:
In the event of 2 or more malfunction cords, indication will begin from the smaller numbered cord and continue in order to the larger.

NOTICE:

- **When simulating symptoms without a hand-held tester to check the DTCs, use normal mode. For codes on the DTCs, chart subject to "2 trip detection logic", turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again. When the problem has been simulated twice, the check engine warning light lights up and the DTCs, are recorded in the engine ECU.**
- **Check the 1st trip DTC using Mode7 for ISO 15031. (Continuous Test Results of Euro-OBD function in hand-held tester)**

3. INSPECT DIAGNOSIS (Check (Test) Mode)

HINT:
Hand-held tester only:
Compared to the normal mode, the check mode has an increased sensitivity to detect malfunctions.
Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

(a) Check the DTC.

(1) Initial conditions

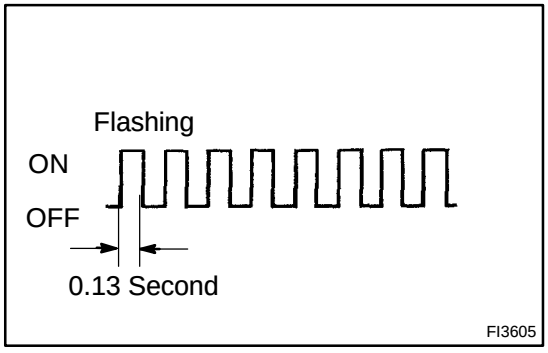
- Battery positive voltage 11V or more.
- Throttle valve fully closed.
- Transmission in "P" or "N" position.
- Air conditioning switched OFF.

(2) Turn ignition switch OFF.

(3) Prepare the hand-held tester.

(4) Connect the hand-held tester to DLC3 on the at the lower left of the instrument panel.

(5) Turn the ignition switch ON and switch the push the hand-held tester ON.



(6) Switch the hand-held tester normal mode to check (test) mode. (Check that the check engine warning light (CHK ENG) flashes.)

(7) Start the engine. (The check engine warning (CHK ENG) light goes out after the engine start.)

(8) Simulate the conditions of the malfunction described by the customer.

NOTICE:

Leave the ignition switch ON until you have checked the DTC, etc.

(9) After simulating the malfunction conditions, use the hand-held tester diagnosis selector to check the DTCs and freezed frame data, etc.

HINT:

Be careful not to turn the ignition switch OFF. When turning the ignition switch OFF, the diagnosis system converts from check (test) mode to normal mode. All DTCs, etc. are erased at this condition.

(10) After checking the DTCs, inspect the applicable circuit.

(b) Clear the DTC.

The following actions will erase the DTCs and freezed frame data.

- Operating the hand-held tester to erase the codes. (See the hand-held tester's instruction book for operating instructions.)
- Disconnecting the battery terminals or EFI fuse.

NOTICE:

If the hand-held tester switches the engine ECU from normal mode to check mode or vice-versa, or if the ignition switch is turned from ON to ACC or OFF during check mode, the DTCs and freezed frame data will be erased.

4. FAIL-SAFE CHART

If any of the following codes is recorded, the engine ECU enters fail-safe mode.

DTC No.	Fail-Safe Operation	Fail-Safe Deactivation Conditions
P0100	Ignition timing fixed at 5° BTDC	Returned to nomal condition
P0110	Intake air temp. is fixed at 20°C (68°F)	Returned to normal condition
P0115	Water temp. is fixed at 80°C(176°F)	Returned to normal condition
P0120	VTA is fixed at 0°	The following condition must be repeated at least 2 times consecutively When closed throttle position switch is OFF: YTA ≧ 0.1 V and ≦ 0.95 V
P0135 P0141	The heater circuit in which an abnormality is detected is turned off	IG switch OFF
P0325	Max. timing retardation	IG switch OFF
P1300 P1305 P1310 P1315	Fuel cut	Returned to normal condition
P1656	It cut electorically the circuit in which an abnomality is detected	Returned to normal condition

5. CHECK FOR INTERMITTENT PROBLEMS

HAND-HELD TESTER only:

By putting the vehicle's engine ECU in check (test) mode, 1 trip detection logic is possible instead of 2 trip detection logic and sensitivity to detect open circuits is increased. This makes it easier to detect intermittent problems.

(a) Clear the DTC. (See step 3.)
(b) Set the check (test) mode (See step 3.)
(c) Perform a simulation test. (See page 01-20)
(d) Check the connector and terminal. (See page 01-30)
(e) Handle the connector. (See page 01-30)

6. ENGINE OPERATING CONDITION

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value from those listed here. So do not decide whether a part is faulty or not solely according to the "Normal Condition" here.

Hand-held tester display	Measurement Item	Normal Condition*1
FUEL SYS #1	Fuel System Bank 1 OPEN: Air-fuel ratio feedback stopped CLOSED: Air-fuel ratio feedback operating	Idling after warming up: CLOSED
CALC LOAD	Calculator Load: Current intake air volume as a proportion of max. intake air volume	Idling: 27.5 - 46.4 % Racing without load (2,500rpm): 19.7 - 40.5 %
COOLANT TEMP./WATER TEMP.	Water Temp. Sensor Value	After warming up: 80 - 95°C (176 - 203°F)
SHORT FT #1	Short-term Fuel Trim Bank 1	0 ± 20%
LONG FT #1	Long-term Fuel Trim Bank 1	0 ± 20%
ENGINE SPD	Engine Speed	Idling: 600 - 700 rpm(M/T) 650 - 750 rpm(A/T, N position)
VEHICLE SPD	Vehicle Speed	Vehicle Stopped: 0 km/h (0 mph)
IGN ADVANCE	Ignition Advance: Ignition Timing of Cylinder No. 1	Idling: BTDC 2 – 13°
INTAKE AIR	Intake Air Temp. Sensor Value	Equivalent to Ambient Temp.
THROTTLE POS	Voltage Output of Throttle Position Sensor Calculated as a percentage: 0 V → 0%, 5 V → 100%	Throttle Fully Closed: 8 - 20 % Throttle Fully Open: 64 - 96 %
O2S B1, S1	Voltage Output of Oxygen Sensor Bank 1, Sensor 1	Idling: 0.1 - 0.9 V
O2S B1, S2	Voltage Output of Oxygen Sensor Bank 1 Sensor 2	Driving 50 km/h (31 mph): 0.1 - 0.9 V
O2FT B1, S1	Oxygen Sensor Fuel Trim Bank 1, Sensor 1 (Same as SHORT FT #1)	0 ± 20 %
MIL ON RUN DIST	Distance since activation of check engine warning light	When there is no DTC: 0 km (0 mph)
INJECTOR	Fuel injection time for cylinder No.1	Idling: 1.92 - 3.37 ms
MISFIRE RPM	Engine RPM for first misfire range	Misfire 0: 0 rpm
MISFIRE LOAD	Engine LOAD for first misfire range	Misfire 0: 0 g/r
STARTER SIG	Starter Signal	Cranking: ON
A/C SIG	A/C Switch Signal	A/C ON: ON
PNP SW/NSW *2	Neutral start switch signal	P or N position: ON
ELECTRCL LOAD SIG	Electrical Load Signal	Defogger switch ON: ON
CTP SW	Closed Throttle Position Switch Signal	Throttle Fully Closed: ON
STOP LIGHT SW	Stop Light Switch Signal	Stop light switch ON: ON
PS OIL PRESS SW	Power Steering Oli Pressure Switch Signal	Turn steering wheel: ON
FC IDL	Fuel Cut Idle: Fuel cut when throttle valve fully closed, during deceleration	Fuel cut operating: ON
FC TAU	Fuel Cut TAU: Fuel cut during very light load	Fuel cut operating: ON
CYL#1, CYL#2, CYL#3, CYL#4	Abnormal revolution variation for each cylinder	0 %
IGNITION	Total number of ignition for every 1,000 revolutions	0 - 300
INTAKE CTRL VSV	Intake Air Control Valve VSV Signal	VSV operating: ON
A/C CUT SIG	A/C Cut Signal	A/C S/W OFF: ON
FUEL PUMP	Fuel Pump Signal	Idling: ON
EVAP (PURGE) VSV	EVAP VSV Signal	VSV operating: ON
TOTAL FT B1	Total Fuel Trim Bank 1: Average value for fuel trim system of bank 1	Idling: 0.5 - 1.4

O2 LR B1 S1	Oxygen Sensor Lean Rich Bank 1 Sensor 1: Response time for oxygen sensor output to switch from lean to rich	Idling after warming up: 0 - 1,000 msec.
O2 RL B1 S1	Oxygen Sensor Rich Lean Bank 1 Sensor 1: Response time for oxygen sensor output to switch from rich to lean	Idling after warming up: 0 - 1,000 msec.

*1: If no conditions are specifically stated for "Idling", it means the shift lever is at N or P position, the A/C switch is OFF and all accessory switches are OFF.
*2: A/T only

BASIC INSPECTION

When the malfunction code is not confirmed in the DTC check, troubleshooting should be carried out in the order for all possible circuits to be considered as the causes of the problems. In many cases, by carrying out the basic engine check shown in the following flow chart, the location causing the problem can be found quickly and efficiently. Therefore, use of this check is essential in engine troubleshooting.

1 CHECK BATTERY VOLTAGE

NOTICE:
Carry out this check in engine stoppage condition.

REFERENCE:

	OK	NG
VOLTAGE	11V OR MORE	LESS THAN 11V

NG → **CHARGE OR REPLACE BATTERY**

OK

2 CHECK IF ENGINE IS CRANKED

NG → **PROCEED TO PROBLEM SYMPTOM TABLE** **(See page 05-177)**

OK

3 CHECK IF ENGINE STARTS

NG → **GO TO STEP 7**

OK

4	CHECK AIR FILER

(a) Visually check that the air filter is not excessively dirty or oily.

HINT:

If necessary, clean the filter with compressed air. First blow from inside thoroughly, then blow from outside of filter.

NG → REPAIR OR REPLACE

OK

5	CHECK IDLE SPEED (See page 14-82)

NG → PROCEED TO PROBLEM SYMPTOM TABLE (See page 05-177)

OK

6	CHECK IGNITION TIMING (See page 18-5)

NG → PROCEED TO PAGE 18-5 AND CONTINUE TO TROUBLESHOOT

OK

7	CHECK FUEL PRESSURE (See page 11-5)

NG → PROCEED TO PAGE 11-5 AND CONTINUE TO TROUBLESHOOT

OK

8	CHECK FOR SPARK (See page 18-5)

NG → PROCEED TO PAGE 18-5 AND CONTINUE TO TROUBLESHOOT

OK

PROCEED TO PROBLEM SYMPTOMS TABLE (See page 05-177)

05046-05

DIAGNOSTIC TROUBLE CODE CHART

HINT:

Parameters listed in the chart may not be exactly the same as your reading due to the type of instrument or other factors.

If a malfunction code is displayed during the DTC check in the check mode, check the circuit for the codes listed in the table below. For details of each code, turn to the page referred to under the "See page" for the respective "DTC No." in the DTC chart.

DTC No. (See page)	Detection Item	Trouble Area	*1 CHK ENG (MIL)	Memory
P0100 (05-179)	Air Flow Meter Circuit Malfunction	S Open or short in air flow meter circuit S Air flow meter S ECM	f	f
P0101 (05-188)	Air Flow Meter Circuit Range/Performance Problem	S ECM	f	f
P0110 (05-189)	Intake Air Temp. Circuit Malfunction	S Open or short in intake air temp. sensor circuit S Intake air temp. sensor (built into air flow meter) S ECM	f	f
P0115 (05-195)	Water Temp. Circuit Malfunction	S Open or short in water temp. sensor circuit S Water temp. sensor S ECM	f	f
P0116 (05-201)	Water Temp. Circuit Range/Performance Problem	S Water temp. sensor S Cooling system S Thermostat	f	f
P0120 (05-202)	Throttle Position Sensor Circuit Malfunction	S Open or short in throttle position sensor circuit S Throttle position sensor S ECM	f	f
P0121 (05-210)	Throttle Position Sensor Circuit Range/Performance Problem	S Throttle position sensor	f	f
P0125 (05-211)	Insufficient Water Temp. for Closed Loop Fuel Control	S Open or short in A/F sensor (bank 1, 2 sensor 1) circuit S A/F sensor (bank 1, 2 sensor 1) S Air induction system S Fuel pressure S Injector S Gas leakage on exhaust system S ECM	f	f
P0130*2 (05-216)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector	f	f
P0133*2 (05-222)	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector S ECM	f	f
P0135 (05-225)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 1)	S Open or short in heater circuit of oxygen sensor S Oxygen sensor heater S ECM	f	f
P0136*2 (05-216)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 2)	S Open or short in oxygen sensor circuit S Oxygen sensor	f	f

P0141 (05-225)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)	S Open or short in heater circuit of oxygen sensor S Oxygen sensor heater S ECM	f	f
P0171*2 (05-229)	System too Lean (A/F Lean Malfunction, Bank 1)	S Air induction system S Injector blockage S Air flow meter S Water temp. sensor S Fuel pressure S Open or short in oxygen sensor (bank 1 sensor 1) circuit S Oxygen sensor (bank 1 sensor 1) S ECM	f	f
P0172*2 (05-229)	System too Rich (A/F Rich Malfunction, Bank 1)	S Injector leak, blockage S Air flow meter S Water temp. sensor S Ignition system S Fuel pressure S Open or short in oxygen sensor (bank 1 sensor 1) circuit S Gas leakage on exhaust system S Oxygen sensor (bank 1 sensor 1) S ECM	f	f
P0300*2 (05-233)	Random/Multiple Cylinder Misfire Detected	S Open or short in engine wire S Connector connection S Vacuum hose connection S Ignition system S Injector S Fuel pressure S Air flow meter S Water temp. sensor S Compression pressure S Valve clearance S Valve timing S ECM	f	f
P0301*2 (05-233)	Cylinder 1 Misfire Detected			
P0302*2 (05-233)	Cylinder 2 Misfire Detected			
P0303*2 (05-233)	Cylinder 3 Misfire Detected			
P0304*2 (05-233)	Cylinder 4 Misfire Detected			
P0325 (05-238)	Knock Sensor 1 Circuit Malfunction (Bank 1)	S Open or short in knock sensor circuit S Knock sensor (looseness) S ECM	f	f
P0335 (05-242)	Crankshaft Position Sensor Circuit Malfunction (NE Signal)	S Open or short in crankshaft position sensor circuit S Crankshaft position sensor S Crank angle sensor plate S ECM	f	f
P0340 (05-246)	Camshaft Position Sensor Circuit Malfunction (G Signal)	S Open or short in camshaft position sensor circuit S Camshaft position sensor S Intake camshaft S ECM	f	f
P0420*2 (05-249)	Catalyst System Efficiency Below Threshold (Bank 1)	S Gas leakage on exhaust system S Oxygen sensor S Three-way catalytic converter	f	f
P0443 (05-252)	Evaporative Emission Control System Purge Control Vent Control Malfunction	S Open or short in VSV circuit for EVAP S VSV for EVAP S ECM	f	f
P0500 (05-255)	Vehicle Speed Sensor Malfunction	S Combination meter S Open or short in vehicle speed sensor circuit S Vehicle speed sensor S ECM	-	f

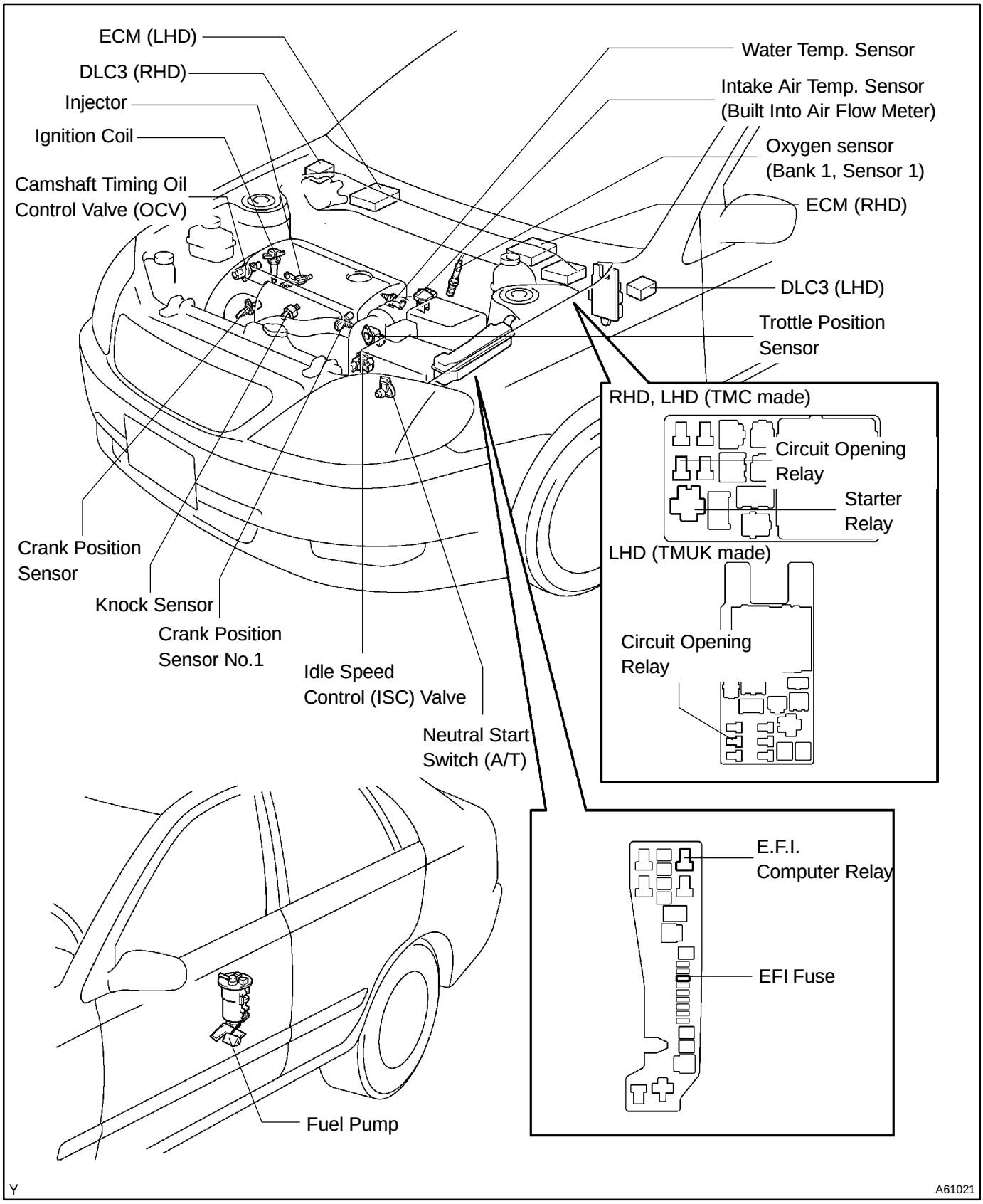
P0505 (05–259)	Idle Control System Malfunction	S Open or short in ISC valve circuit S ISC valve is stick or closed S A/C switch circuit S Air induction system S ECM	f	f
P1300 (05–264)	Igniter Circuit Malfunction (No. 1)	S Ignition system S Open or short in IGF or IGT1 circuit from No. 1 ignition coil with igniter to ECM S No. 1 ignition coil with igniter S ECM	f	f
P1305 (05–264)	Igniter Circuit Malfunction (No. 2)	S Ignition system S Open or short in IGF or IGT2 circuit from No. 2 ignition coil with igniter to ECM S No. 2 ignition coil with igniter S ECM	f	f
P1310 (05–264)	Igniter Circuit Malfunction (No. 3)	S Ignition system S Open or short in IGF or IGT3 circuit from No. 3 ignition coil with igniter to ECM S No. 3 ignition coil with igniter S ECM	f	f
P1315 (05–264)	Igniter Circuit Malfunction (No. 4)	S Ignition system S Open or short in IGF or IGT4 circuit from No. 4 ignition coil with igniter to ECM S No. 4 ignition coil with igniter S ECM	f	f
P1335 (05–272)	Crankshaft Position Sensor Circuit Malfunction (During engine running)	S Open or short in crankshaft position sensor circuit S Crankshaft position sensor S Crank angle sensor plate S ECM	–	f
P1346 (05–273)	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 1)	S Mechanical system (Jumping teeth of timing chain, chain stretched) S ECM	f	f
P1349 (05–274)	VVT System Malfunction (Bank 1)	S Valve timing S OCV S VVT controller assembly S ECM	f *2	f
P1520*3 (05–280)	Stop Light Switch Signal Circuit	S Open or short in stop light switch signal circuit S Stop light switch S ECM	f	f
P1600 (05–286)	Engine ECU BATT Malfunction	S Open in back up power source circuit S ECM	f	f
P1656 (05–289)	OCV Circuit Malfunction (Bank 1)	S Open or short in OCV circuit S OCV S ECM	f	f
P1780*3 (05–293)	Neutral Start Switch Malfunction	S Short in neutral start switch circuit S Neutral start switch S ECM	f	f
B2795	Unmatch Key Code	S Key S Unregistered key inserted before?	–	f
B2796	No Communication in Immobiliser system	S Immobiliser system	–	f
B2797	Communication Malfunction No.1	S Immobiliser system	–	f
B2798	Communication Malfunction No.1	S Immobiliser system	–	f

*1: f ... CHK ENG (MIL) lights up. – ... CHK ENG (MIL) does not light up.

*2: Only for Euro OBD vehicle.
*3: Only for A/T models.

05047-05

LOCATION

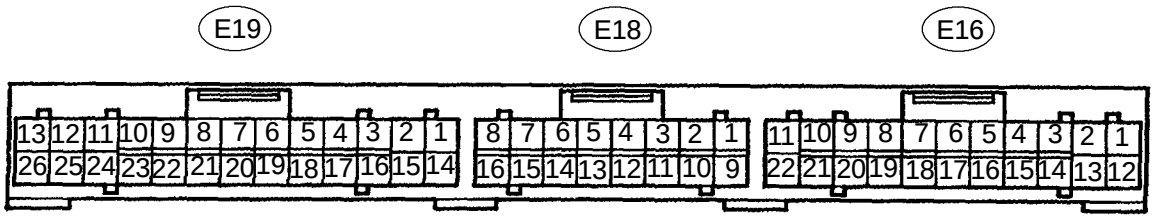


05767-01

TERMINALS OF ECU

M/T:

ECM Terminals



A64537

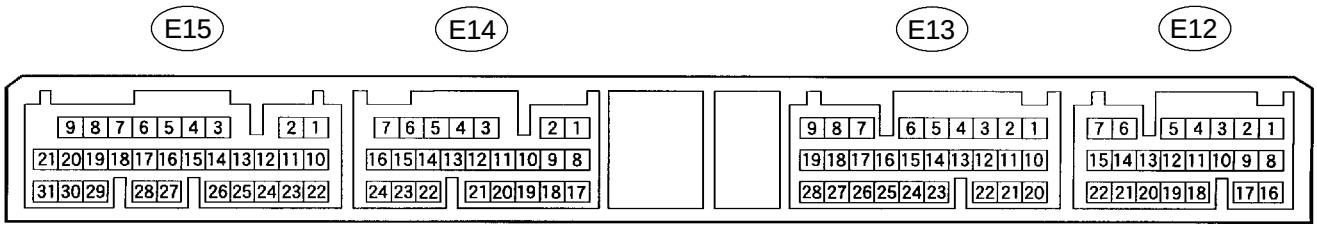
Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
BATT (E16 - 1) - E1 (E19 - 14)	R-W ↔ BR	Always	9 - 14
IGSW (E16 - 15) - E1 (E19 - 14)	B-O ↔ BR	IG switch ON	9 - 14
+B (E16 - 12) - E1 (E19 - 14)	B ↔ BR	IG switch ON	9 - 14
VC (E18 - 1) - E2 (E18 - 9)	Y ↔ BR*1 P-L ↔ BR*2	IG switch ON	4.5 - 5.5
VTA (E18 - 11) - E2 (E18 - 9)	LG ↔ BR	IG switch ON, throttle valve fully closed	0.4 - 1.0
VTA (E18 - 11) - E2 (E18 - 9)	LG ↔ BR	IG switch ON, throttle valve fully open	3.2 - 4.8
THA (E18 - 3) - E2 (E18 - 9)	Y-B ↔ BR	Idling, intake air temp. 20 ˚C (68 ˚F)	0.5 - 3.4
THW (E18 - 4) - E2 (E18 - 9)	W ↔ BR*1 W-L ↔ BR*2	Idling, Engine coolant temp. at 80 ˚C (176 ˚F)	0.2 - 1.0
STA (E16 - 11) - E1 (E19 - 14)	B-R ↔ BR	Cranking	6.0 or more
#10 (E19 - 12) - E01 (E19 - 13)	Y ↔ W-B	IG switch ON	9 - 14
#10 (E19 - 12) - E01 (E19 - 13)	Y ↔ W-B	Idring	Pulse generation
#20 (E19 - 11) - E01 (E19 - 13)	B ↔ W-B	IG switch ON	9 - 14
#20 (E19 - 11) - E01 (E19 - 13)	B ↔ W-B	Idring	Pulse generation
#30 (E19 - 25) - E01 (E19 - 13)	W ↔ W-B	IG switch ON	9 - 14
#30 (E19 - 25) - E01 (E19 - 13)	W ↔ W-B	Idring	Pulse generation
#40 (E19 - 24) - E01 (E19 - 13)	L ↔ W-B	IG switch ON	9 - 14
#40 (E19 - 24) - E01 (E19 - 13)	L ↔ W-B	Idring	Pulse generation
IGT1 (E19 - 20) - E1 (E19 - 14)	R-L ↔ BR	Idling	Pulse generation (See page 05-264)
IGT2 (E19 - 21) - E1 (E19 - 14)	Y-G ↔ BR	Idling	Pulse generation (See page 05-264)
IGT3 (E19 - 22) - E1 (E19 - 14)	GR ↔ BR	Idling	Pulse generation (See page 05-264)

IGT4 (E19 - 23) - E1 (E19 - 14)	W ↔ BR	Idling	Pulse generation (See page 05-264)
IGF (E19 - 3) - E1 (E19 - 14)	L-Y ↔ BR	IG switch ON	4.5 - 5.5
IGF (E19 - 3) - E1 (E19 - 14)	L-Y ↔ BR	Idling	Pulse generation (See page 05-264)
G2 (E18 - 12) - NE- (E18 - 13)	B ↔ W	Idling	Pulse generation (See page 05-246)
NE+ (E18 - 5) - NE- (E18 - 13)	B ↔ W	Idling	Pulse generation (See page 05-242)
MREL (E16 - 16) - E1 (E19 - 14)	B-W ↔ BR	IG switch ON	9 - 14
FC (E16 - 14) - E1 (E19 - 14)	G-R ↔ BR	IG switch ON	9 - 14
STP (E16 - 4) - E1 (E19 - 14)	G-W ↔ BR	IG switch ON, brake pedal depressed	7.5 - 14
STP (E16 - 4) - E1 (E19 - 14)	G-W ↔ BR	IG switch ON, brake pedal released	Below 1.5
OX (E18 - 6) - E1 (E19 - 14)	B ↔ BR*1 R ↔ BR*2	Maintain engine speed at 2,500 rpm for 1 min.and 30 seconds after warning up	Pulse generation
OX2 (E18 - 14) - E1 (E19 - 14)	W ↔ BR	Maintain engine speed at 2,500 rpm for 3 min. after warning up	Pulse generation
HT (E18 - 16) - E1 (E19 - 14)	P ↔ BR	Idling	Below 3.0
HT (E18 - 16) - E1 (E19 - 14)	P ↔ BR	IG switch ON	9 - 14
HT2 (E18 - 15) - E1 (E19 - 14)	P-L ↔ BR	Idling	Below 3.0
HT2 (E18 - 15) - E1 (E19 - 14)	P-L ↔ BR	IG switch ON	9 - 14
KNK1 (E19 - 18) - EKNK (E18 - 7)	B ↔ W*1 W ↔ B*2	Maintain engine speed at 4,000 rpm after warning up	Pulse generation (See page 05-238)
TC (E16 - 6) - E1 (E19 - 14)	P-B ↔ BR	IG switch ON	9 - 14
W (E16 - 5) - E1 (E19 - 14)	R-Y ↔ BR	Idling	9 - 14
W (E16 - 5) - E1 (E19 - 14)	R-Y ↔ BR	IG switch ON	Below 3.5
OCV + (E19 - 2) - OCV - (E19 - 1)	Y ↔ B-Y	IG switch ON	Pulse generation (See page 05-274)
ACT (E16 - 21) - E1 (E19 - 14)	R-L ↔ BR	A/C switch ON	9 - 14
ACT (E16 - 21) - E1 (E19 - 14)	R-L ↔ BR	A/C switch OFF	Below 2.0
EVP1 (E19 - 7) - E1 (E19 - 14)	L-B ↔ BR	IG switch ON	9 - 14
RSO (E19 - 15) - E1 (E19 - 14)	B-L ↔ BR	IG switch ON	9 - 14

*1: Sedan, Wagon
*2: Hatch back

A/T:

ECM Terminals



A63335

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
BATT (E12 - 1) - E1 (E14 - 17)	R-W ↔ BR	Always	9 - 14
IGSW (E12 - 8) - E1 (E14 - 17)	B-O ↔ BR	IG switch ON	9 - 14
+B (E12 - 16) - E1 (E14 - 17)	B ↔ BR	IG switch ON	9 - 14
VC (E14 - 2) - E2 (E14 - 18)	Y ↔ BR*1 P-L ↔ BR*2	IG switch ON	4.5 - 5.5
VTA (E14 - 23) - E2 (E14 - 18)	LG ↔ BR	IG switch ON, throttle valve fully closed	0.4 - 1.0
VTA (E14 - 23) - E2 (E14 - 18)	LG ↔ BR	IG switch ON, throttle valve fully open	3.2 - 4.8
THA (E14 - 22) - E2 (E14 - 18)	Y-B ↔ BR	Idling, intake air temp. 20 °C (68 °F)	0.5 - 3.4
THW (E14 - 14) - E2 (E14 - 18)	W ↔ BR*1 W-L ↔ BR*2	Idling, Engine coolant temp. at 80 °C (176 °F)	0.2 - 1.0
STA (E13 - 11) - E1 (E14 - 17)	B-R ↔ BR	Cranking	6.0 or more
#10 (E15 - 1) - E01 (E15 - 21)	Y ↔ W-B	IG switch ON	9 - 14
#10 (E15 - 1) - E01 (E15 - 21)	Y ↔ W-B	Idring	Pulse generation
#20 (E15 - 2) - E01 (E15 - 21)	B ↔ W-B	IG switch ON	9 - 14
#20 (E15 - 2) - E01 (E15 - 21)	B ↔ W-B	Idring	Pulse generation
#30 (E15 - 3) - E01 (E15 - 21)	W ↔ W-B	IG switch ON	9 - 14
#30 (E15 - 3) - E01 (E15 - 21)	W ↔ W-B	Idring	Pulse generation
#40 (E15 - 4) - E01 (E15 - 21)	L ↔ W-B	IG switch ON	9 - 14
#40 (E15 - 4) - E01 (E15 - 21)	L ↔ W-B	Idring	Pulse generation
IGT1 (E15 - 10) - E1 (E14 - 17)	R-L ↔ BR	Idling	Pulse generation (See page 05-264)
IGT2 (E15 - 11) - E1 (E14 - 17)	Y-G ↔ BR	Idling	Pulse generation (See page 05-264)
IGT3 (E15 - 12) - E1 (E14 - 17)	GR ↔ BR	Idling	Pulse generation (See page 05-264)
IGT4 (E15 - 13) - E1 (E14 - 17)	W ↔ BR	Idling	Pulse generation (See page 05-264)
IGF (E15 - 25) - E1 (E14 - 17)	L-Y ↔ BR	IG switch ON	4.5 - 5.5
IGF (E15 - 25) - E1 (E14 - 17)	L-Y ↔ BR	Idling	Pulse generation (See page 05-264)
G2 (E14 - 15) - NE- (E14 - 24)	B ↔ W	Idling	Pulse generation (See page 05-246)
NE+ (E14 - 16) - NE- (E14 - 24)	B ↔ W	Idling	Pulse generation (See page 05-242)

MREL (E13 - 21) - E1 (E14 - 17)	B-W ↔ BR	IG switch ON	9 - 14
FC (E12 - 3) - E1 (E14 - 17)	G-R ↔ BR	IG switch ON	9 - 14
STP (E13 - 6) - E1 (E14 - 17)	G-W ↔ BR	IG switch ON, brake pedal depressed	7.5 - 14
STP (E13 - 6) - E1 (E14 - 17)	G-W ↔ BR	IG switch ON, brake pedal released	Below 1.5
OX (E14 - 12) - E1 (E14 - 17)	B ↔ BR*1 R ↔ BR*2	Maintain engine speed at 2,500 rpm for 1 min.and 30 seconds after warning up	Pulse generation
OX2 (E13 - 25) - E1 (E14 - 17)	W ↔ BR	Maintain engine speed at 2,500 rpm for 3 min. after warning up	Pulse generation
HT (E14 - 3) - E1 (E14 - 17)	P ↔ BR	Idling	Below 3.0
HT (E14 - 3) - E1 (E14 - 17)	P ↔ BR	IG switch ON	9 - 14
HT2 (E13 - 16) - E1 (E14 - 17)	P-L ↔ BR	Idling	Below 3.0
HT2 (E13 - 16) - E1 (E14 - 17)	P-L ↔ BR	IG switch ON	9 - 14
KNK1 (E15 - 27) - EKNK (E15 - 26)	B ↔ W*1 W ↔ B*2	Maintain engine speed at 4,000 rpm after warning up	Pulse generation (See page 05-238)
TC (E13 - 5) - E1 (E14 - 17)	P-B ↔ BR	IG switch ON	9 - 14
W (E12 - 15) - E1 (E14 - 17)	R-Y ↔ BR	Idling	9 - 14
W (E12 - 15) - E1 (E14 - 17)	R-Y ↔ BR	IG switch ON	Below 3.5
OCV + (E15 - 24) - OCV - (E15 - 23)	Y ↔ B-Y	IG switch ON	Pulse generation (See page 05-274)
SIL (E12 - 11) - E1 (E14 - 17)	L-R ↔ BR	IG switch ON	9 - 14
AC (E12 - 18) - E1 (E14 - 17)	Y-R ↔ BR	A/C switch ON	9 - 14
ACT (E12 - 21) - E1 (E14 - 17)	R-L ↔ BR	A/C switch ON	9 - 14
ACT (E12 - 21) - E1 (E14 - 17)	R-L ↔ BR	A/C switch OFF	Below 2.0
EVP1 (E14 - 4) - E1 (E14 - 17)	L-B ↔ BR	IG switch ON	9 - 14
RSO (E15 - 18) - E1 (E14 - 17)	B-L ↔ BR	IG switch ON	9 - 14

*1: Sedan, Wagon
*2: Hatch back

05049-05

PROBLEM SYMPTOMS TABLE

When the malfunction code is not confirmed in the diagnostic trouble code check and the problem still can not be confirmed in the basic inspection, proceed to this problem symptoms tables and troubleshoot according to the numbered order given below.

Symptom	Suspect Area	See page
Engine does not crank (Does not start)	1. Starter and starter relay 2. Neutral start switch circuit L	19-11 40-6
No initial combustion (Does not start)	1. ECM power source circuit 2. Ignition coil (w/ Igniter) circuit 3. Fuel pump control circuit 4. Injector	05-308 05-264 05-300 05-233
No complete combustion (Does not start)	1. Fuel pump control circuit 2. Ignition coil (w/ Igniter) circuit 3. Injector	05-300 05-264 05-233
Engine cranks normally (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Ignition coil (w/ Igniter) 5. Spark plug 6. Compression 7. Injector	05-294 05-259 05-300 05-264 18-7 14-82 05-233
Cold engine (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Injector 5. Ignition coil (w/ Igniter) 6. Spark plug	05-294 05-259 05-300 05-233 05-264 18-7
Hot engine (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Injector 5. Ignition coil (w/ Igniter) 6. Spark plug	05-294 05-259 05-300 05-233 05-264 18-7
Incorrect first idle (Poor idling)	1. ISC valve circuit	05-259
High engine idle speed (Poor idling)	1. ISC valve circuit 2. ECM power source circuit 3. Neutral start switch circuit L 4. Back up power source circuit	05-259 05-308 40-6 05-306
Low engine idle speed (Poor idling)	1. ISC valve circuit 2. Neutral start switch circuit L 3. Fuel pump control circuit 4. Injector 5. Back up power source circuit	05-259 40-6 05-300 05-233 05-306
Rough idling (Poor idling)	1. ISC valve circuit 2. Injector 3. Ignition coil (w/ Igniter) circuit 4. Compression 5. Fuel pump control circuit 6. Back up power source circuit	05-259 05-233 05-264 14-82 05-300 05-306
Hunting (Poor idling)	1. ISC valve circuit 2. ECU power source circuit 3. Fuel pump control circuit	05-259 05-306 05-300
Hesitation/Poor acceleration (Poor drivability)	1. Injector 2. Fuel pump control circuit 3. Ignition coil (w/ Igniter) circuit 4. A/T faulty L	05-233 05-300 05-264 05-776

Muffler explosion, after fire (Poor drivability)	1. Ignition coil (w/ Igniter) 2. Spark plug 3. Injector	05-264 18-7 05-233
Surging (Poor drivability)	1. Fuel pump control circuit 2. Spark plug 3. Injector	05-300 18-7 05-233
Engine stall (Soon after starting)	1. Fuel pump control circuit 2. ISC valve circuit	05-300 05-259
Engine stall (After accelerator pedal released)	1. Injector 2. ISC valve circuit 3. ECM	05-233 05-259 01-30
Engine stall (When shifting N to D)	1. Neutral start switch circuit L 2. ISC valve circuit	40-6 05-259

L A/T only

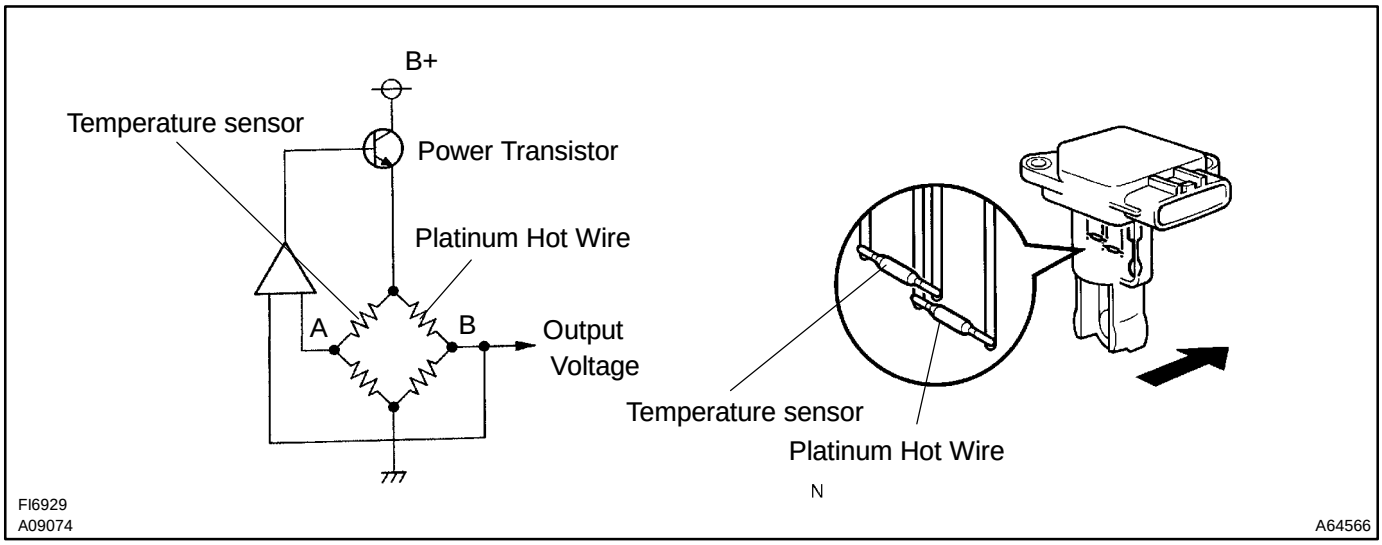
DTC	P0100	MASS AIR FLOW CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

The air flow meter uses a platinum hot wire. The hot wire air flow meter consists of a platinum hot wire, temperature sensor and a control circuit installed in a plastic housing. The hot wire air flow meter works on the principle that the hot wire and temperature sensor located in the intake air bypass of the housing detect any changes in the intake air temperature.

The hot wire is maintained at the set temperature by controlling the current flow through the hot wire. This current flow is then measured as the output voltage of the air flow meter.

The circuit is constructed so that the platinum hot wire and temperature sensor provide a bridge circuit, with the power transistor controlled so that the potential of A and B remains equal to maintain the set temperature.



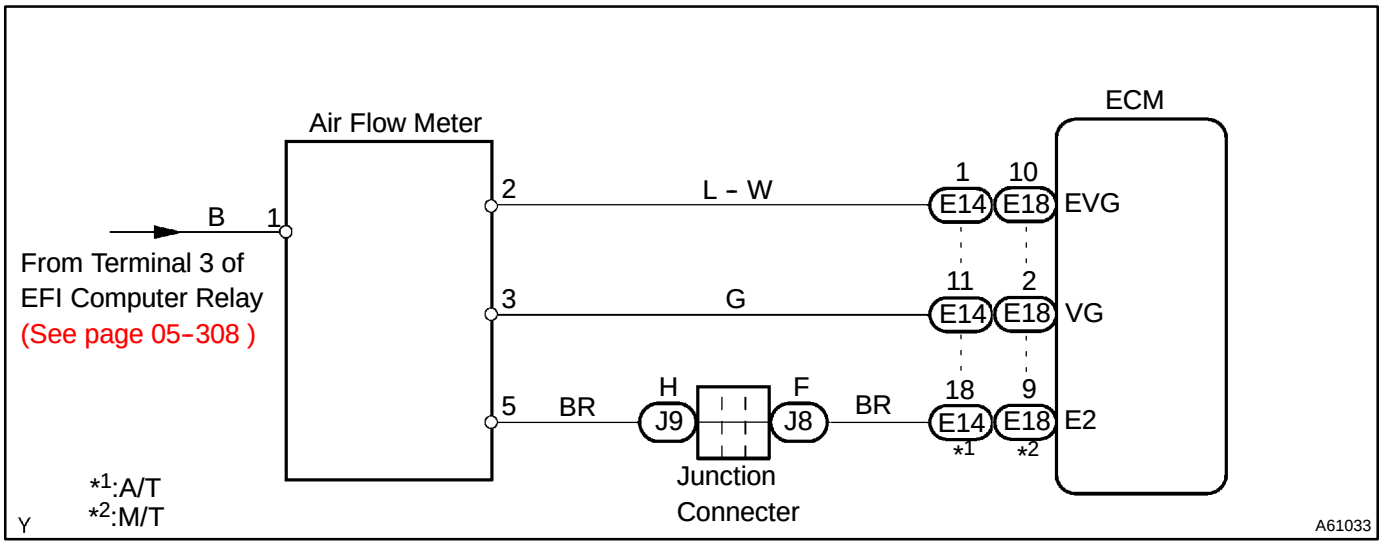
DTC No	DTC Detecting Condition	Trouble Area
P0100	Open or short in air flow meter circuit with more than 3 sec. engine speed less than 4,000 rpm	S Open or short in air flow meter circuit S Air flow meter S ECM

HINT:

After confirming DTC P0100, use the hand-held tester to confirm the air flow ratio from CURRENT DATA.

Air Flow Value (gm/sec.)	Malfunction
Approx. 0.0	S Air flow meter power source circuit open S VG circuit open or short
271.0 or more	S EVG circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester

1	READ VALUE OF HAND-HELD TESTER(MASS AIR FLOW RATE)

(a) Read air flow rate on the hand-held tester.

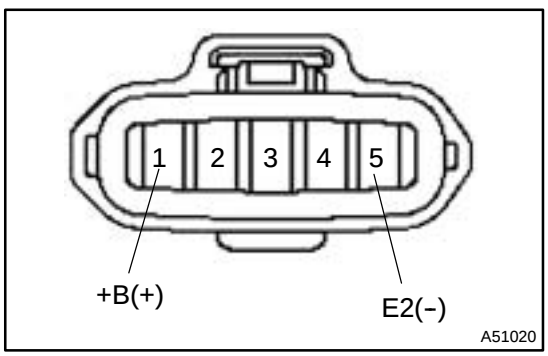
Result:

	A	B
Air flow rate (gm/sec.)	0.0	271.0 or more

B → Go to step 6

A

2	INSPECT INTAKE AIR FLOW METER SUB-ASSY(POWER SOUCE VOLTAGE)

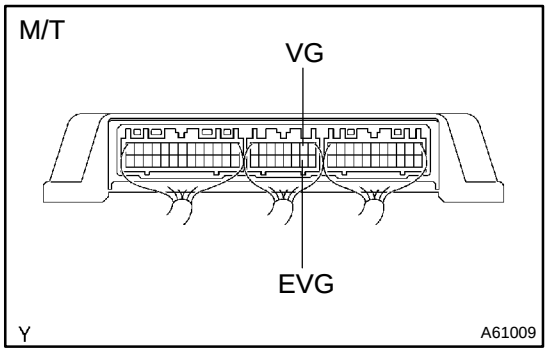


(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between the terminals +B and E2 of the air flow meter connector.
Voltage: 9 - 14 V

NG → Go to step 5

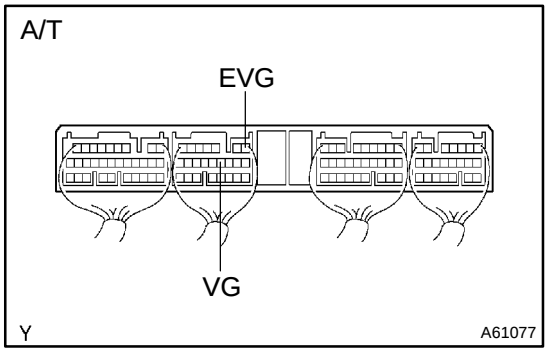
OK

3	INSPECT ECM



(a) Start the engine.
(b) Measure voltage between the terminals VG and EVG of the engine ECM connector while the engine is idling.
Voltage: 0.5 - 3.0 V

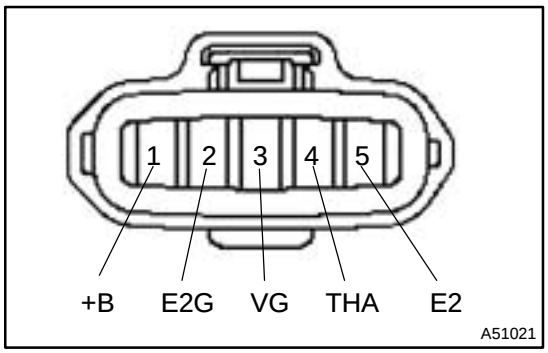
HINT:
The shift position should be P or N and A/C switch should be turned OFF.



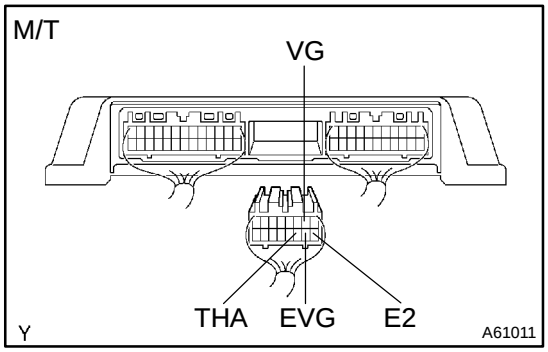
NG → **CHECK AND REPLACE ECM**

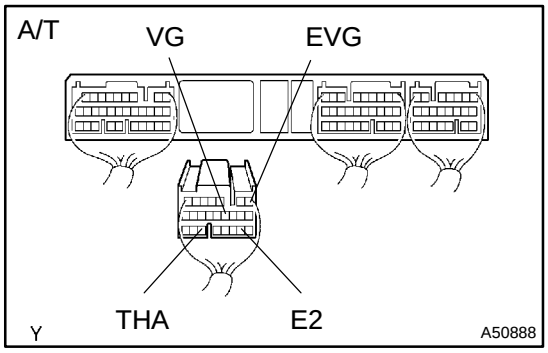
OK

4	CHECK HARNESS AND CONNECTOR(ECM-INTAKE AIR FLOW METER)



(a) Disconnect the air flow meter connector.
(b) Disconnect the engine ECM E18 connector. (M/T)
(c) Disconnect the engine ECM E14 connector. (A/T)
(d) Check continuity between the terminals VG of the air flow meter harness connector and VG of the ECM connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2G of the air flow meter connector and EVG of the ECM connector.
Resistence: 1 Ω or less
(f) Check for short between the terminals VG and EVG of the ECM connector.
Resistance: 1M Ω or more
(g) Check for short between the terminals EVG and E2 of the ECM connector.
Resistance: 1M Ω or more



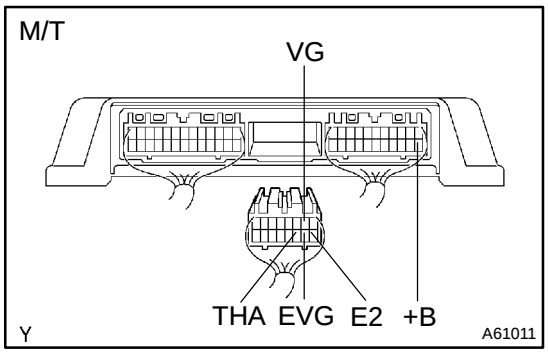


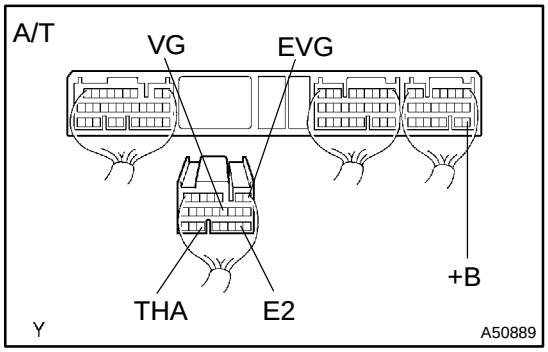
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

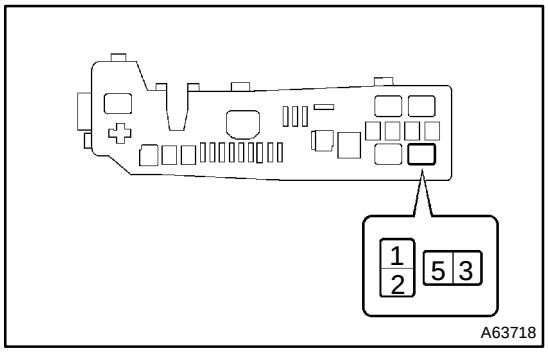
OK

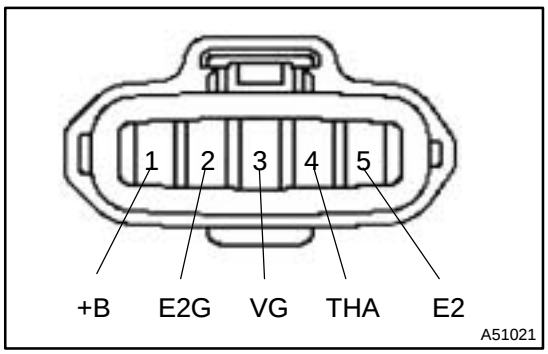
REPLACE INTAKE AIR FLOW METER SUB-ASSY

5 CHECK HARNESS AND CONNECTOR(EFI RELAY-INTAKE AIR FLOW METER)









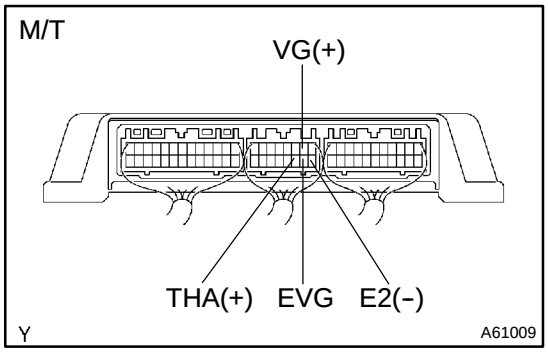
(a) Disconnect the battery negative (-) terminal.
(b) Disconnect the air flow meter connector.
(c) Remove the E.F.I. computer relay.
(d) Disconnect the engine ECM E18 connector. (M/T)
(e) Disconnect the engine ECM E14 connector. (A/T)
(f) Check continuity between the terminals +B of the engine ECM connector and 3 of the E.F.I. computer relay installation relay block.
Resistance: 1Ω or less
(g) Check continuity between the terminals EVG of the air flow meter connector and EVG of the engine ECM connector.
Resistance: 1Ω or less

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

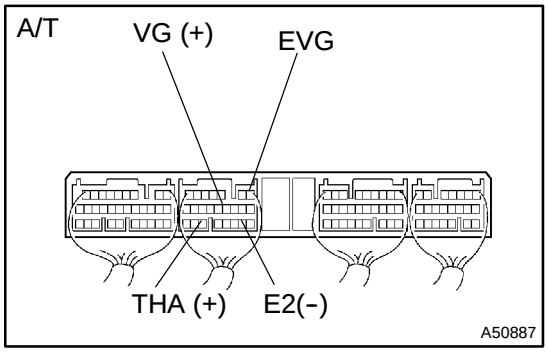
OK

CHECK FOR ECM POWER SOURCE CIRCUIT

6	INSPECT ECM



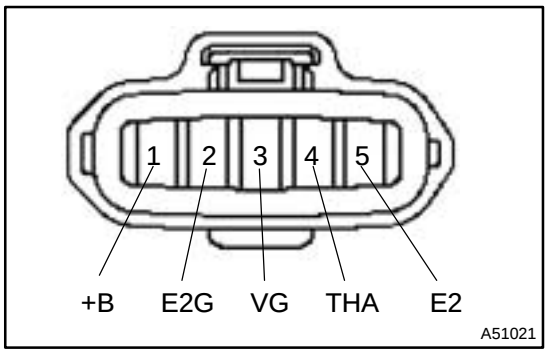
(a) Check continuity between the terminals EVG and E2 of the ECM connector.
Resistance: 1 Ω or less



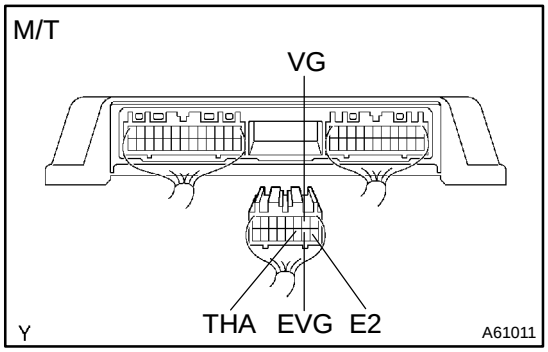
NG → **CHECK AND REPLACE ECM**

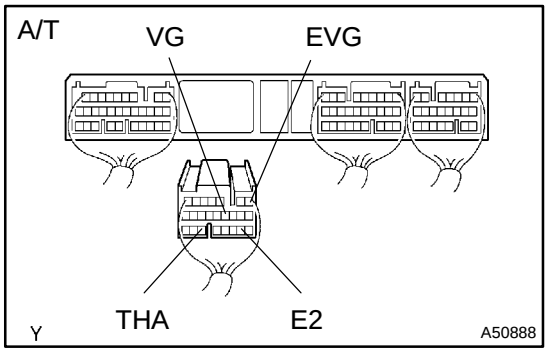
OK

7	CHECK HARNESS AND CONNECTOR(ECM-AIR FLOW METER)



(a) Disconnect the air flow meter connector.
(b) Disconnect the engine ECM E18 connector. (M/T)
(c) Disconnect the engine ECM E14 connector. (A/T)
(d) Check for open between the terminals VG of the air flow meter connector and VG of the ECM connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2 of the air flow meter connector and E2 of the ECM connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals VG and E2 of the ECM connector.
Resistance: 1M Ω or more





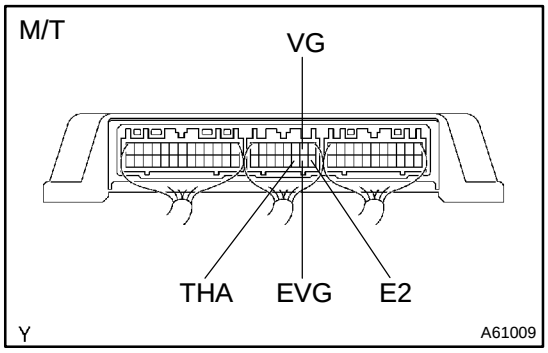
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

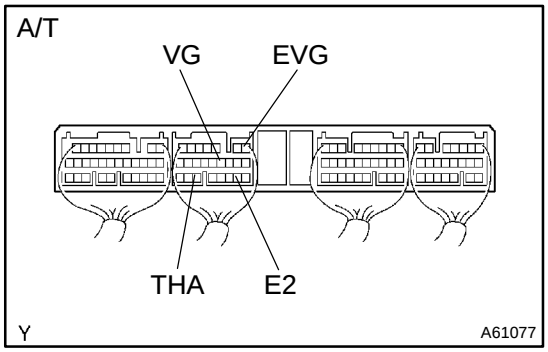
When not using hand-held tester

1	INSPECT ECM



(a) Start the engine.
(b) Measure voltage between the terminals VG and EVG of the engine ECM connector while the engine is idling.
Voltage: 0.5 - 3.0 V

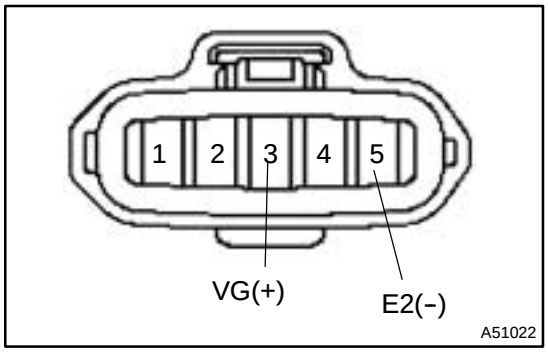
HINT:
The shift position should be P or N and A/C switch should be turned off.



NG → **CHECK AND REPLACE ECM**

OK

2	INSPECT INTAKE AIR FLOW METER SUB-ASSY(POWER SOURCE VOLTAGE)

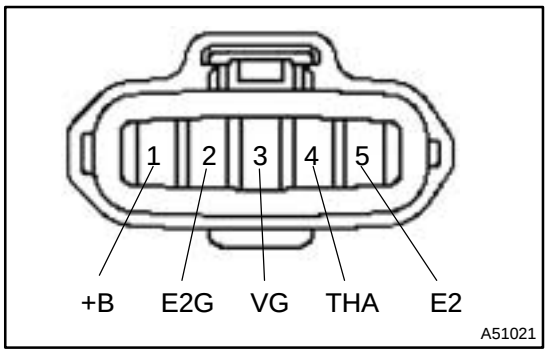


(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between the terminals VG and E2 of the air flow meter connector.
Voltage: 9 - 14 V

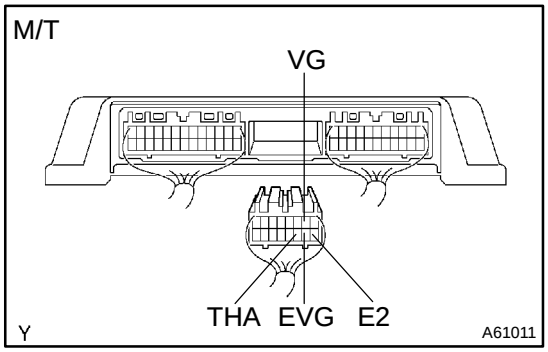
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

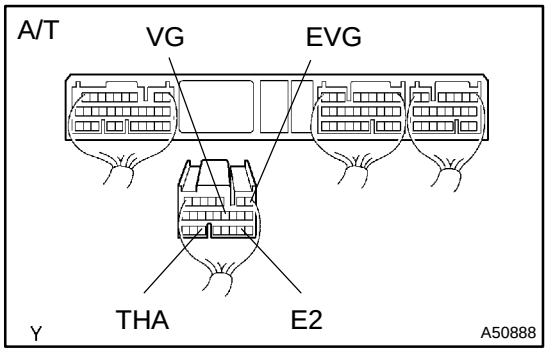
OK

3	CHECK HARNESS AND CONNECTOR(ECM-INTAKE AIR FLOW METER)



(a) Disconnect the air flow meter connector.
(b) Disconnect the engine ECM E18 connector. (M/T)
(c) Disconnect the engine ECM E14 connector. (A/T)
(d) Check for open between the terminals VG of the air flow meter connector and VG of the ECM connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2 of the air flow meter connector and E2 of the ECM connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals VG and E2 of the ECM connector.
Resistance: 1M Ω or more
(g) Check for short between the terminals EVG and E2 of the ECM connector.
Resistance: 1M Ω or more





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE INTAKE AIR FLOW METER SUB-ASSY

DTC	P0101	MASS AIR FLOW CIRCUIT RANGE/PERFORMANCE PROBLEM

CIRCUIT DESCRIPTION

Refer to DTC P0100 on page 05-179.

DTC No.	DTC Detecting Condition	Trouble Area
P0101	After engine is warmed up, conditions (a) and (b) continue with more than 10 sec. engine speed 900 rpm or less: (2 trip detection logic) (a) Throyyle valve fully closed (b) Atr flow meter out put > 2.2 V	S Air flow meter
	Conditions (a) and (b) continue with more than 10 sec. engine speed 1,500 rpm or more: (2 trip detection logic) (a) VTA ≧ 0.63 V (b) Air flow meter output < 1.06 V	

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0101)

Result:

	A	B
RESULT	Only P0101 is output.	P0101 and other codes are output.

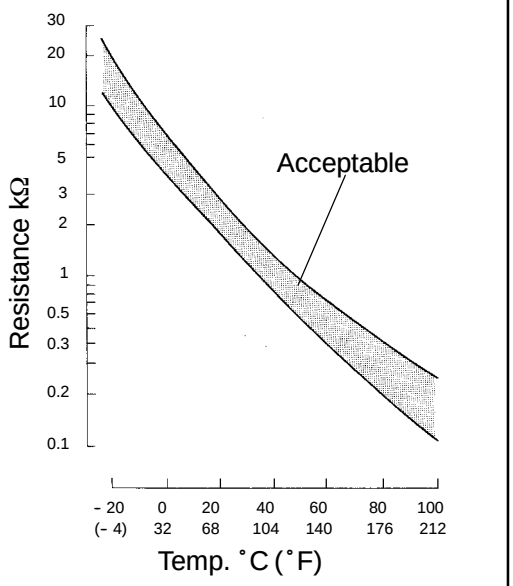
B → REPLACE INTAKE AIR FLOW METER SUB-ASSY

A → GO TO RELEVANT DTC CHART

DTC P0110 INTAKE AIR TEMP. CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

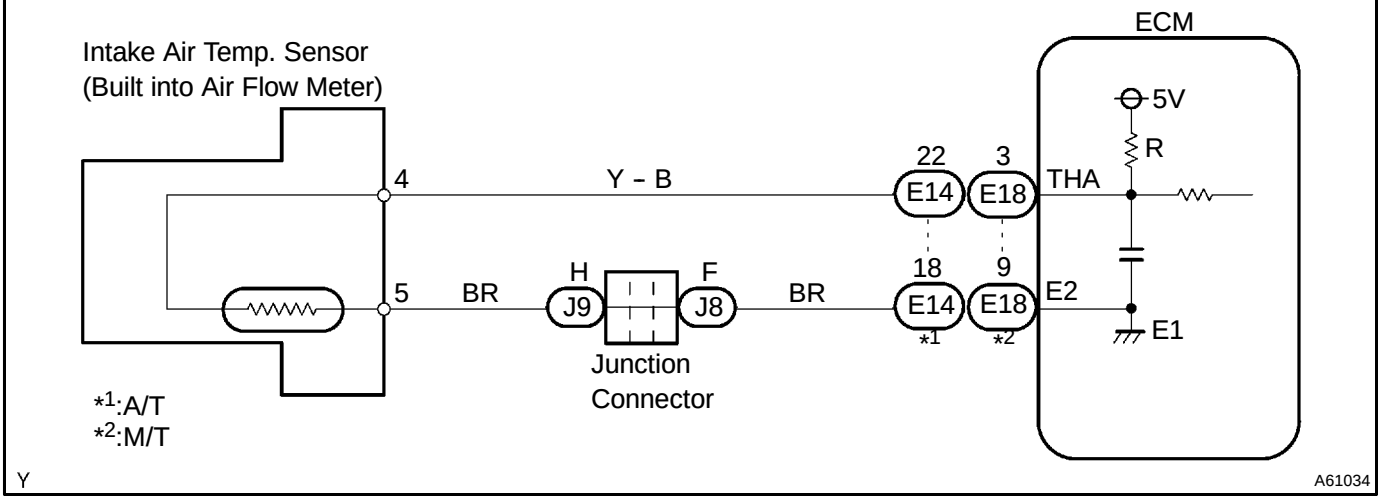
(fig. 1)



The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See fig. 1).
The intake air temp. sensor is connected to the ECM (See below). The 5 V power source voltage in the ECM is applied to the intake air temp. sensor from the terminal THA (THAR) via resistor R.
That is, the resistor R and the intake air temp. sensor are connected in series. When the resistance value of the intake air temp. sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA (THAR) also changes. Based on this signal, the ECM increases the fuel injection volume to improve driveability during cold engine operation.

DTC No.	DTC Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit	S Open or short in intake air temp. sensor circuit S Intake air temp. sensor (inside air flow meter) S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs P0110, P0115, P0116, P120 and P0121 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester

1	READ VALUE OF HAND-HELD TESTER(INTAKE AIR TEMPERATURE)

(a) Read temperature value on the hand-held tester.
Temperature: The same as actual intake air temperature

Result:

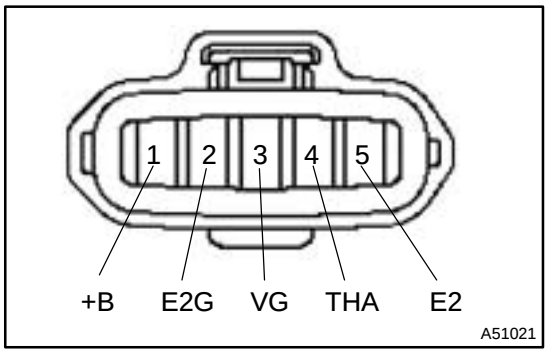
A	B	C
-40°C (-40°F)	140°C (284°F) or more	OK

B → Go to step 4

C → CHECK FOR INTERMITTENT PROBLEMS

A

2	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN HARNESS)

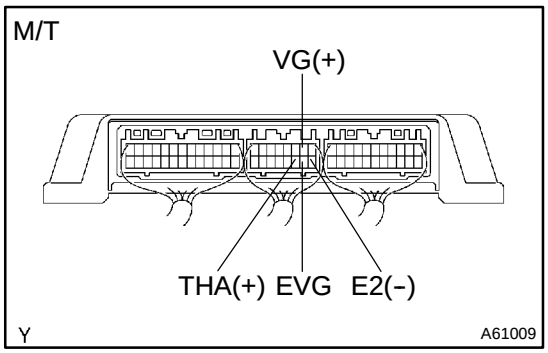


(a) Connect the terminal THA with E2.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → REPLACE INTAKE AIR FLOW METER SUB-ASSY

NG

3	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN ECM)

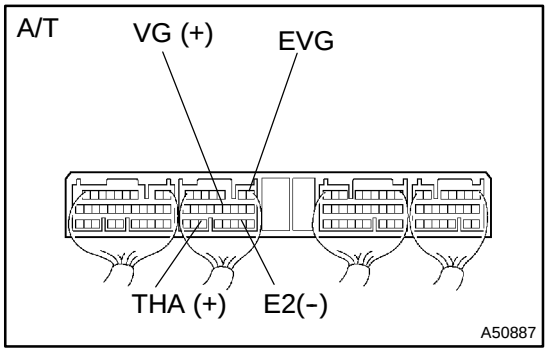


(a) Connect the terminals THA with E2 of the ECM connector.

HINT:

Before checking, do a visual check and connector connection and terminal inspection of the ECM.

(b) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more



NG → CHECK AND REPLACE ECM

OK

READ VALUE OF HARNESS AND CONNECTOR

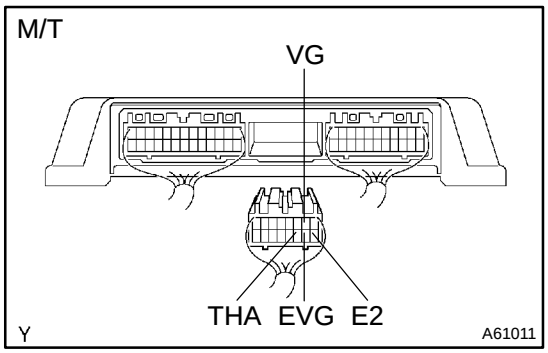
4	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN HARNESS)

(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: -40_C(-40_F)

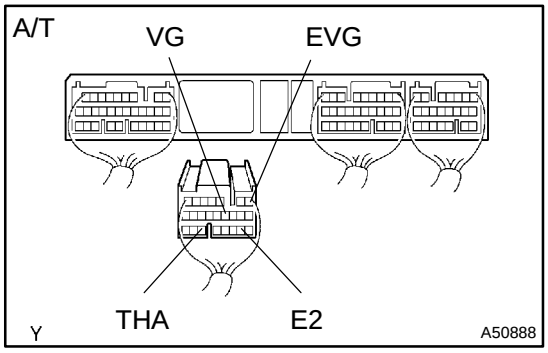
OK → REPLACE INTAKE AIR FLOW METER SUB-ASSY

NG

5	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN ECM)



(a) Disconnect the ECM E18 connector. (M/T)
(b) Disconnect the ECM E14 connector. (A/T)
(c) Turn the ignition switch ON.
(d) Read temperature value on the hand-held tester.
Temperature: -40°C (-40°F)



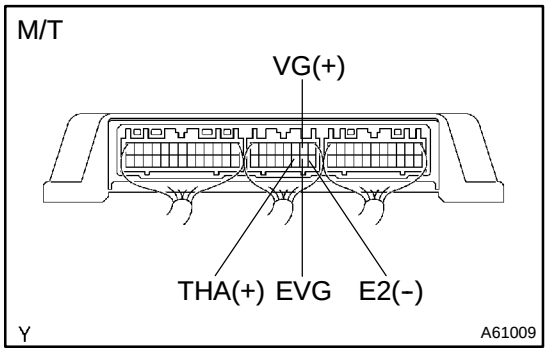
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

When not using hand-held tester

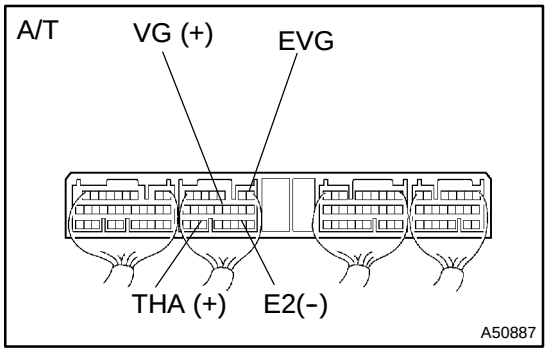
1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between terminals THA and E2 of ECM connector.

Voltage:

Intake air temp. ˚C (˚F)	Voltage
20 (68)	0.5 - 3.4 V
60 (140)	0.2 - 1.0 V



OK → CHECK FOR INTERMITTENT PROBLEMS

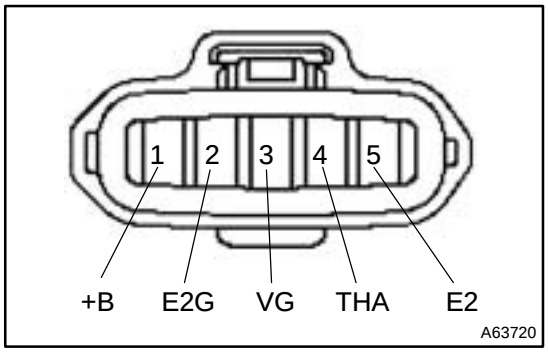
NG

2	CHECK INTAKE AIR FLOW METER SUB-ASSY (See page 10-8)

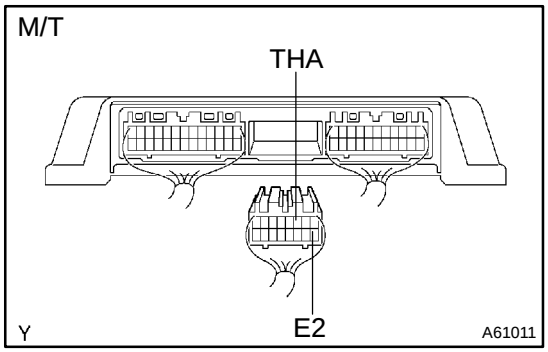
NG → REPLACE INTAKE AIR FLOW METER SUB-ASSY

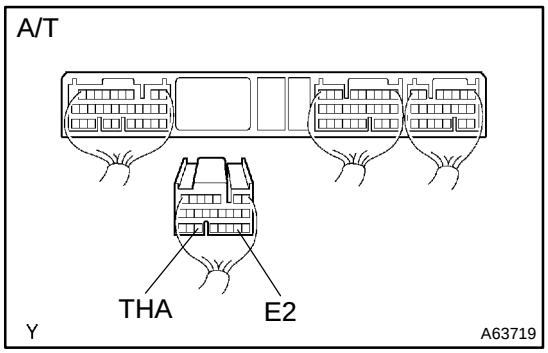
OK

3	CHECK HARNESS AND CONNECTOR(ECM-INTAKE AIR TEMPERATURE SENSOR)



(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E14 connector. (A/T)
(d) Check for open between the terminals THA of the air flow meter connector and THA of the ECM connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals THA and E2 of the ECM connector.
Resistance: 1 MΩ or more





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

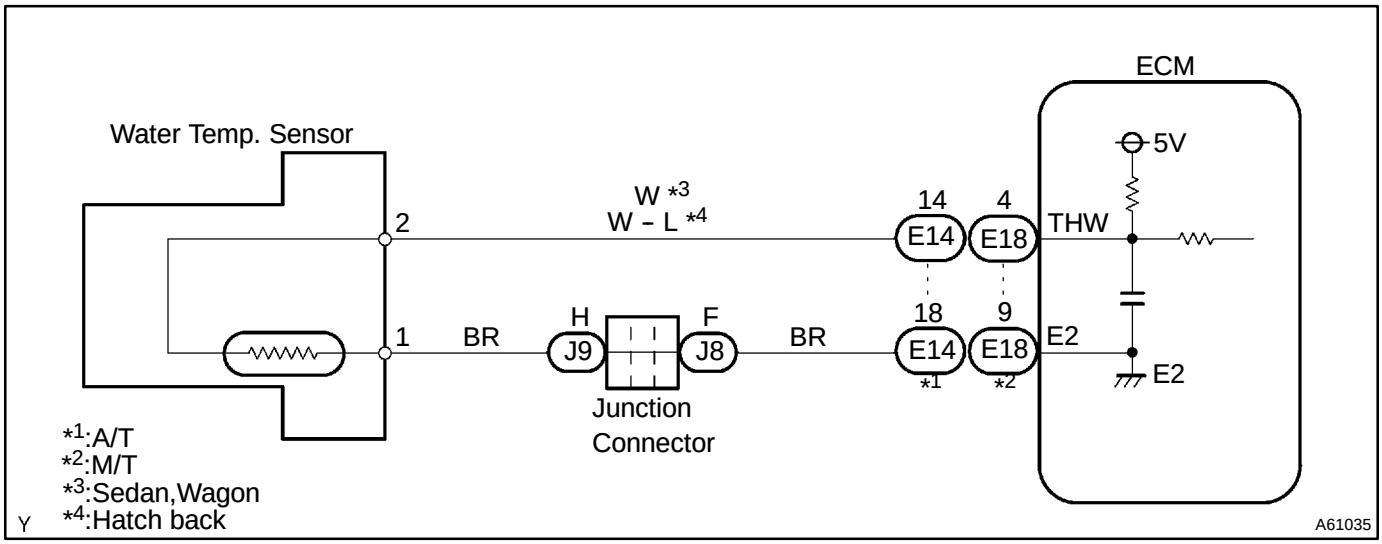
DTC	P0115	ENGINE COOLANT TEMP. CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

A thermistor built into the water temp. sensor changes the resistance value according to the water temperature.
The structure of the sensor and connection to the ECM is the same as the ones of the air temperature sensor.

DTC No.	DTC Detecting Condition	Trouble Area
P0115	Open or short in water temp. sensor circuit	S Open or short in water temp. sensor circuit S Water temp. sensor S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC P0110 (Intake Air Temp. Circuit Malfunction), P0115 (Water Temp. Circuit Malfunction), P0120 (Throttle/Pedal Position Sensor/Switch "A" Malfunction), P0550 (Power Steering Pressure Sensor Circuit Malfunction) are output simultaneously, E1, E2 etc. (Sensor Ground system) may be open.
- Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester

1	READ VALUE OF HAND-HELD TESTER(WATER TEMPERATURE)

(a) Read temperature value on the hand-held tester.
TEMPERATURE: Same as actual water temperature

Result:

A	B	C
-40_C (-40_F)	140_C (284_F)	OK

B → Go to step 4

C → CHECK FOR INTERMITTENT PROBLEMS

A

2	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN HARNESS)



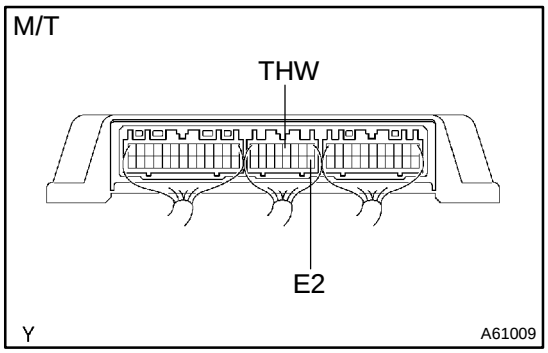
A50582

(a) Disconnect the water temperature sensor connector.
(b) Connect the terminals 1 with 2 of the water temperature sensor connector.
(c) Turn the ignition switch ON.
(d) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

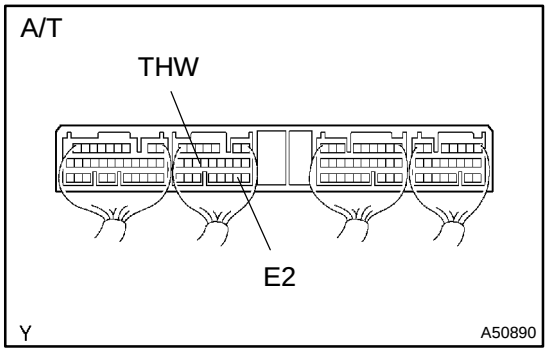
OK → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

NG

3	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN ECM)



(a) Connect the terminals THW with E2 of the ECM connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more



OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

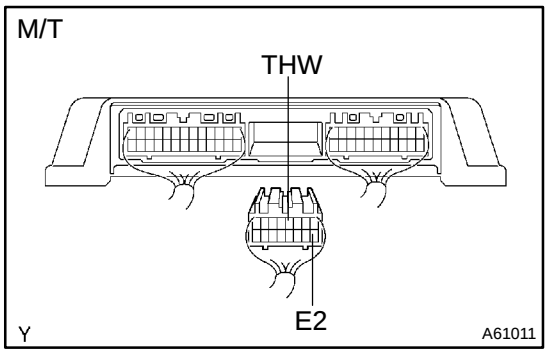
4	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN HARNESS)

(a) Disconnect the water temp. sensor connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Tempeture: -40°C (-40°F)

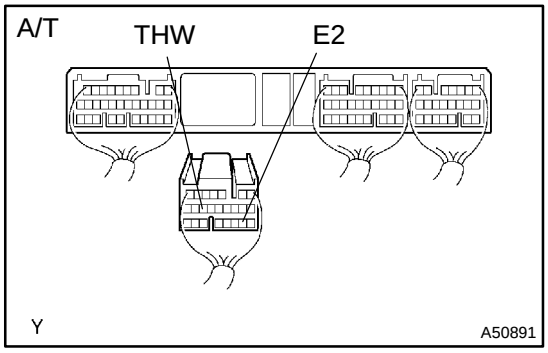
OK → **REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR**

NG

5	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN ECM)



(a) Disconnect the ECM E18 connector. (M/T)
(b) Disconnect the ECM E14 connector. (A/T)
(c) Turn the ignition switch ON.
(d) Read temperature value on the hand-held tester.
Temperature: -40°C (-40°F)



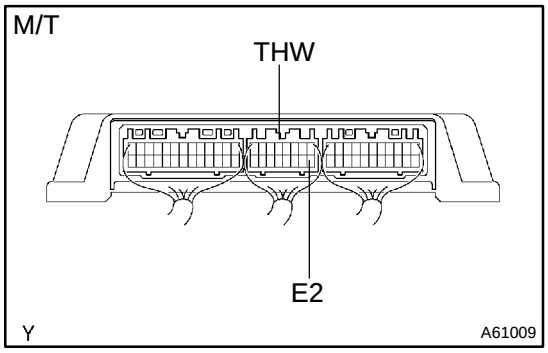
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

When not using hand-held tester

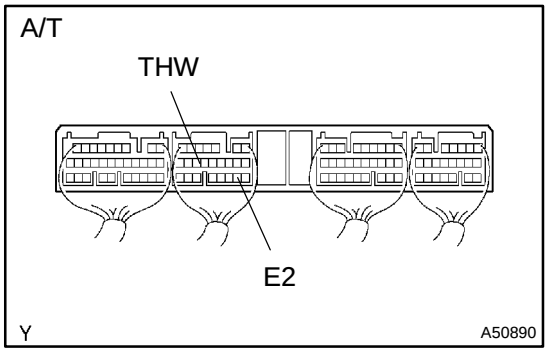
1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals THA and E2 of the ECM connector.

Voltage:

Water temp. ˚C (˚F)	Voltage
20 (68)	0.5 - 3.4 V
60 (140)	0.2 - 1.0 V



OK → CHECK FOR INTERMITTENT PROBLEMS

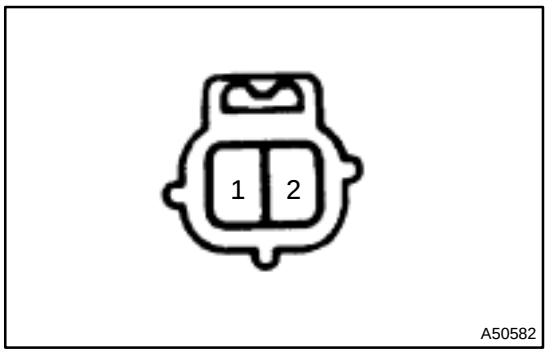
NG

2	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See Page 10-8)

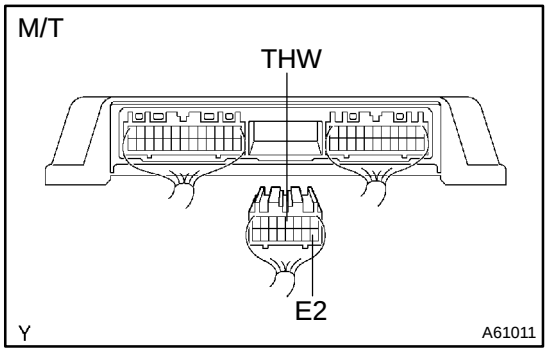
NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

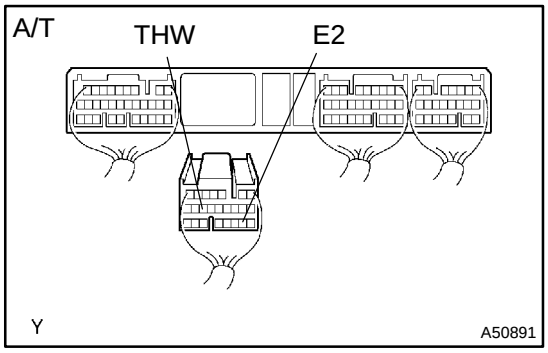
OK

3 CHECK HARNESS AND CONNECTOR(ECM-WATER TEMPERATURE SENSOR)



(a) Disconnect the water temperature sensor connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E14 connector. (A/T)
(d) Check for open between the terminals 2 of the air flow meter connector and THW of the ECM connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals THW and E2 of the ECM connector.
Resistance: 1 MΩ or more





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	P0116	ENGINE COOLANT TEMP.CIRCUIT RANGE/PERFORMANCE PROBLEM

CIRCUIT DESCRIPTION

Refer to DTC P0115 on page 05-195

DTC No.	DTC Detecting Condition	Trouble Area
P0116	When engine starts, water temp. is -7°C (20°F) or less. And, 20 min. or more after engine starts, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)	S Cooling system S Engine coolant temp. sensor S Thermostat

INSPECTION PROCEDURE

HINT:

- If DTCs P0110, P0115, P0116, P0120 and P0121 are output simultaneously, engine coolant temperature sensor circuit may be open. Perform the troubleshooting of DTC P0115 first.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1 READ OUTPUT DTC(BESIDES P0116)

Result:

	A	B
RESULT	Only P0116 is output.	P0116 and other codes are output.

B → GO TO RELEVANT DTC CHART

A

2 INSPECT THERMOSTAT

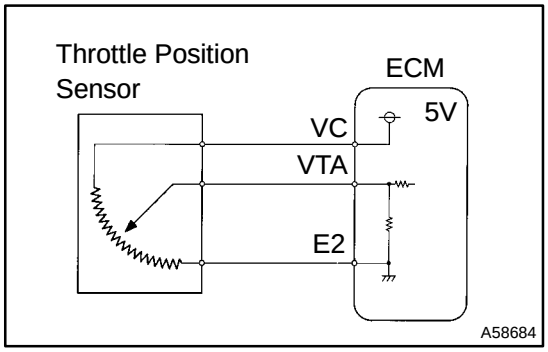
NG → REPLACE THERMOSTAT

OK

REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

DTC	P0120	THROTTLE/PEDAL POSITION SENSOR/SWITCH"A"CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION



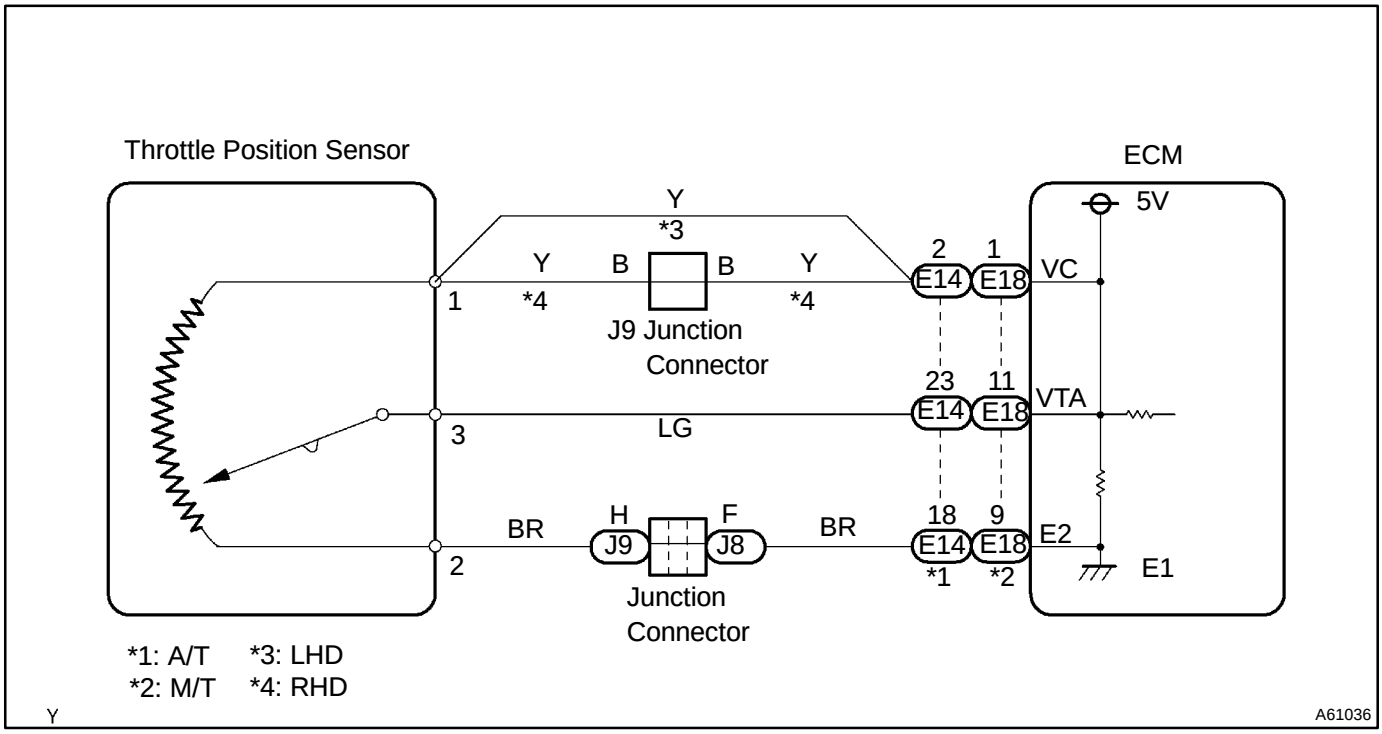
The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle.
When the throttle valve is fully closed, a voltage of approximately 0.7 V is applied to terminal VTA of the ECM. The voltage applied to the terminals VTA of the ECM increases in proportion to the opening angle of the throttle valve and becomes approximately 3.5 – 5.0 V when the throttle valve is fully opened. The ECM judges the vehicle driving conditions from these signals input from terminal VTA, uses them as one of the conditions for deciding the air–fuel ratio correction, power increase correction and fuel–cut control etc.

DTC No.	DTC Detecting Condition	Trouble Area
P0120	Condition (1) or (2) continues with more than 5 sec.: 1. VTA < 0.1 V 2. VTA > 4.9 V	• Open or short in throttle position sensor • Throttle position senor • ECM

HINT:
After confirming DTC P0120, use the hand–held tester to confirm the throttle valve opening percentage.

Throttle valve opening position expressed as percentage		Trouble Area
Throttle valve fully closed	Throttle valve fully open	
0 %	0 %	VC circuit open VTA circuit open or short
Approx. 100 %	Approx. 100 %	E2 circuit open

WIRING DIAGRAM



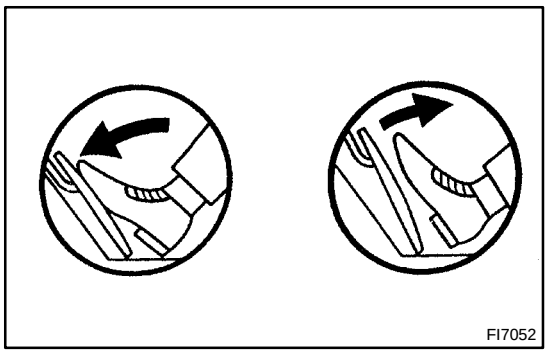
INSPECTION PROCEDURE

HINT:

- Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.
- If DTC P0110 (Intake Air Temp. Circuit Malfunction), P0115 (Water Temp. Circuit Malfunction), P0120 (Throttle/Pedal Position Sensor/Switch "A" Malfunction), P0550 (Power Steering Pressure Sensor Circuit Malfunction) are output simultaneously, E1, E2 (Sensor Ground system) may be open.

When using hand-held tester

1	READ VALUE OF HAND-HELD TESTER(THROTTLE VALVE OPENING PERCENTAGE)



(a) Read the throttle valve opening percentage.

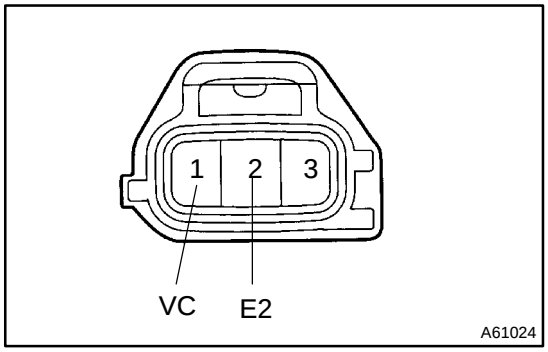
Result:

Throttle valve	Throttle valve opening position expressed as percentage
Fully open	Approx. 75 %
Fully closed	Approx. 10 %

OK → CHECK FOR INTERMITTENT PROBLEMS

NG

2	CHECK HARNESS AND CONNECTOR(CHECK VOLTAGE)

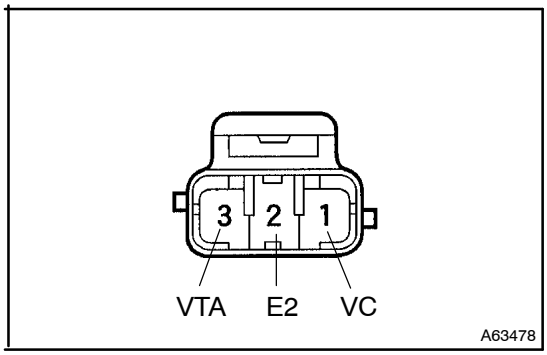


(a) Disconnect the throttle position sensor connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals VC and E2 of the throttle position sensor connector.
Voltage: 4.5-5.5V

NG → Go to step 6

OK

3 INSPECT E.F.I. THROTTLE POSITION SENSOR



(a) Disconnect the throttle position sensor connector.
(b) Measure resistance between the terminals VC and E2 of the throttle position sensor.
(c) Measure resistance between the terminals VTA and E2 of the throttle position sensor.

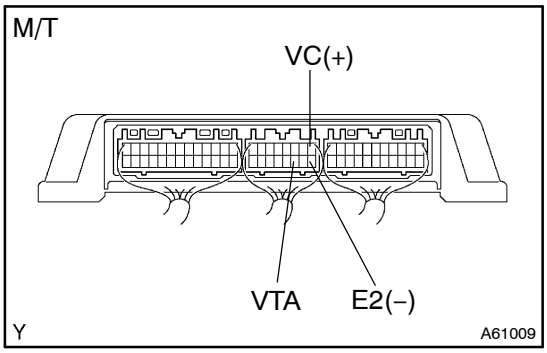
Resistance:

Terminals	Throttle valve	Resistance kΩ
1 (VC) – 2 (E2)	—	2.5 – 5.9
3 (VTA) – 2 (E2)	Fully closed	0.2 – 5.7
3 (VTA) – 2 (E2)	Fully open	2.0 – 10.2

NG → **REPLACE E.F.I. THROTTLE POSITION SENSOR**

OK

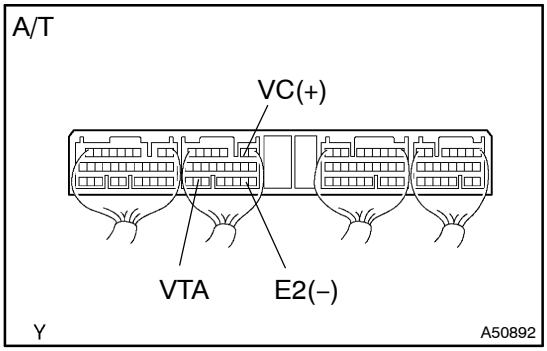
4 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals VTA and E2 of the ECM connector.

Voltage:

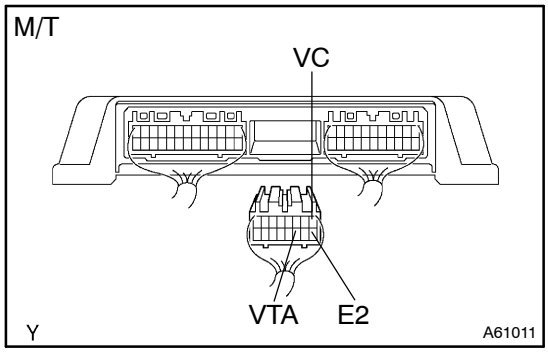
Throttle valve	Voltage V
Fully closed	0.3 – 1.0
Fully open	2.7 – 5.2



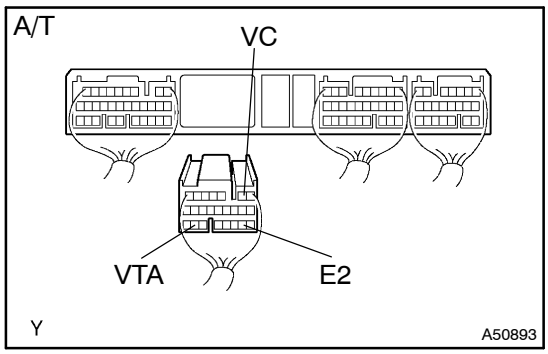
OK → **CHECK AND REPLACE ECM**

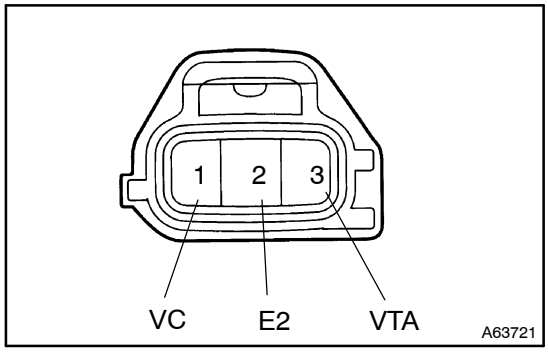
NG

5	CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E14 connector. (A/T)
(d) Check continuity between the terminals VTA of the ECM connector and VTA of the throttle position sensor connector.
Resistance:1Ω or less
(e) Check for short between the terminals VTA and E2 of the ECM connector.
Resistance: 1MΩ or more



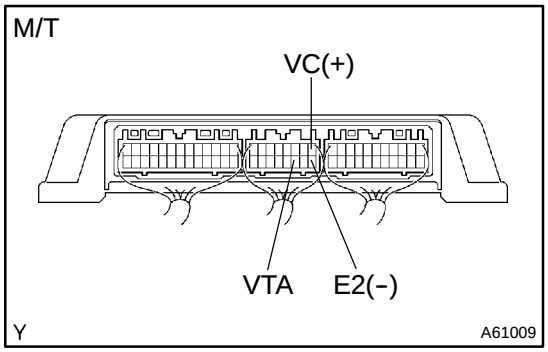


NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

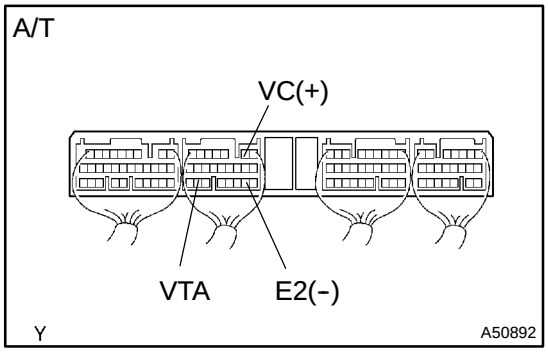
OK

CHECK AND REPLACE ECM

6	INSPECT ECM(CHECK VOLTAGE)



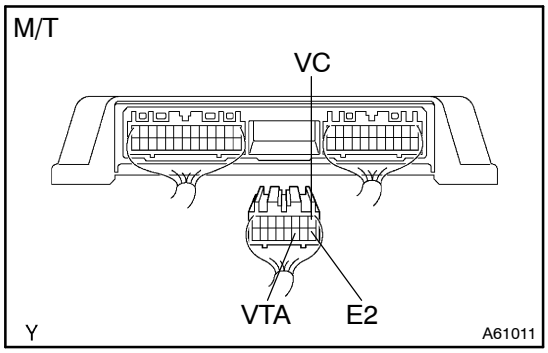
(a) Turn the ignition switch ON.
(b) Measure voltage between terminals VC and E2 of ECM connector.
Voltage: 4.5-5.5V



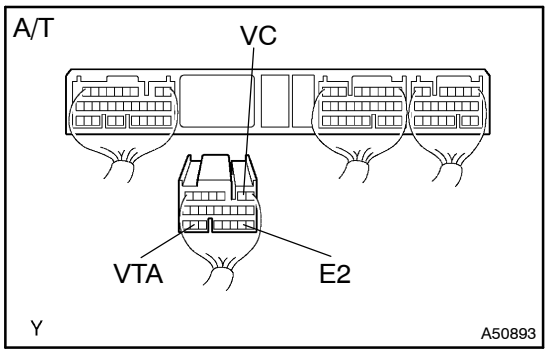
OK → **CHECK AND REPLACE ECM**

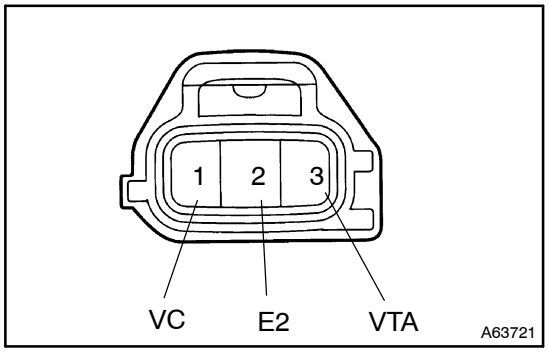
NG

7	CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E14 connector. (A/T)
(d) Check continuity between the terminals VC of the ECM connector and VC of the throttle position sensor connector.
Resistance: 1Ω or less
(e) Check for short between the terminals VC and E2 of the ECM connector.
Resistance: 1MΩ or more





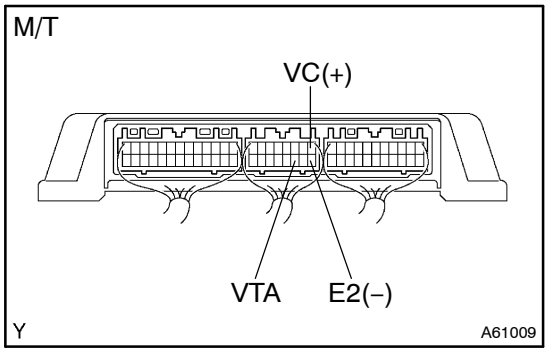
OK → CHECK AND REPLACE ECM

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

When not using hand–held tester

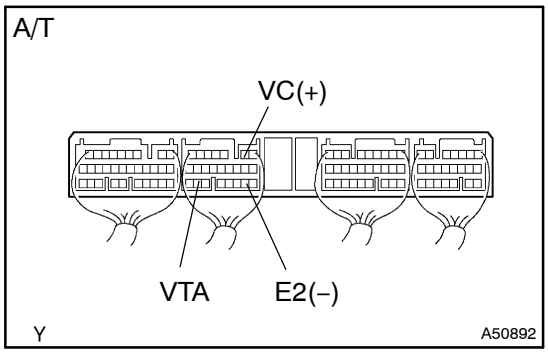
1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals VTA and E2 of the ECM connector.

Voltage:

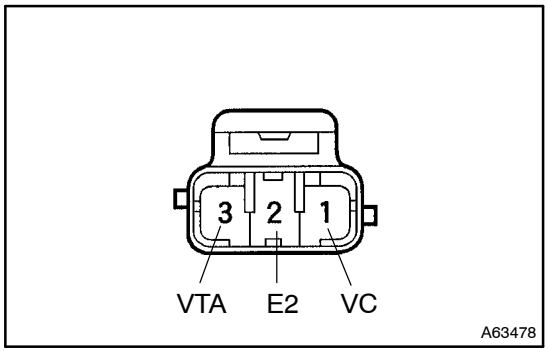
Throttle valve	Voltage V
Fully closed	0.3 – 1.0
Fully open	2.7 – 5.2



OK → CHECK FOR INTERMITTENT PROBLEMS

NG

2	CHECK E.F.I. THROTTLE POSITION SENSOR



(a) Disconnect the throttle position sensor connector.
(b) Measure resistance between the terminals VC and E2 of the throttle position sensor.
(c) Measure resistance between the terminals VTA and E2 of the throttle position sensor.

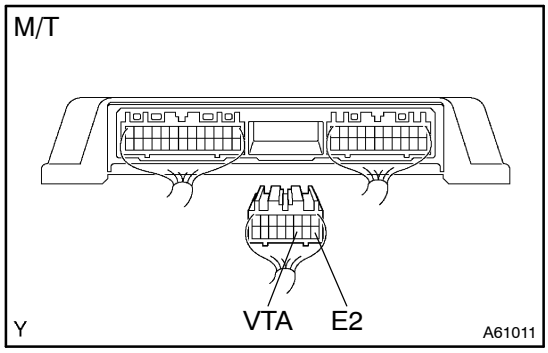
Resistance:

Terminals	Throttle valve	Resistance kΩ
1 (VC) – 2 (E2)	–	2.5 – 5.9
3 (VTA) – 2 (E2)	Fully closed	0.2 – 5.7
3 (VTA) – 2 (E2)	Fully open	2.0 – 10.2

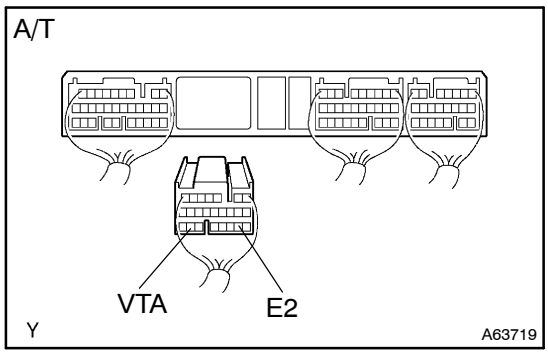
NG → REPLACE E.F.I. THROTTLE POSITION SENSOR

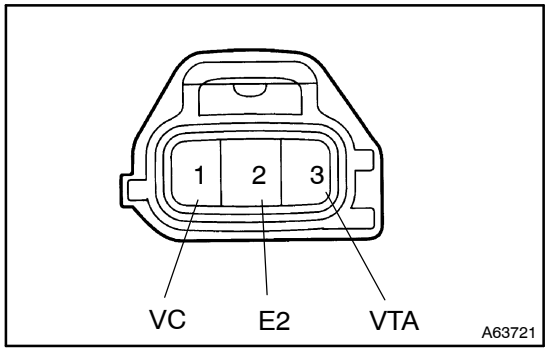
OK

3	CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E14 connector. (A/T)
(d) Check continuity between the terminals VTA of the ECM connector and VTA of the throttle position sensor connector.
Resistance: 1Ω or less
(e) Check for short between the terminals VTA and E2 of the ECM connector.
Resistance: 1MΩ or more





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	P0121	THROTTLE/PEDAL POSITION SENSOR/SWITCH"A"CIRCUIT RANGE/PERFORMANCE PROBLEM

CIRCUIT DESCRIPTION

Refer to DTC P0120 on page 05-202

DTC No.	DTC Detecting Condition	Trouble Area
P0121	After vehicle speed has been exceeded 30 km/h (19 mph) even once, output value of throttle position sensor is out of applicable range for vehicle speed is more than 0 km/h (0 mph). (2 trip detection logic)	S Throttle position sensor

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	ARE THERE ANY DTC BEING OUTPUT(BESIDES P0121)

Result:

	A	B
RESULT	Only P0121 is output.	P0121 and other codes are output.

B → GO TO RELEVANT DTC CHART

A

REPLACE E.F.I. THROTTLE POSITION SENSOR

DTC	P0125	INSUFFICIENT COOLANT TEMP. FOR CLOSE LOOP FUEL CONTROL

CIRCUIT DESCRIPTION

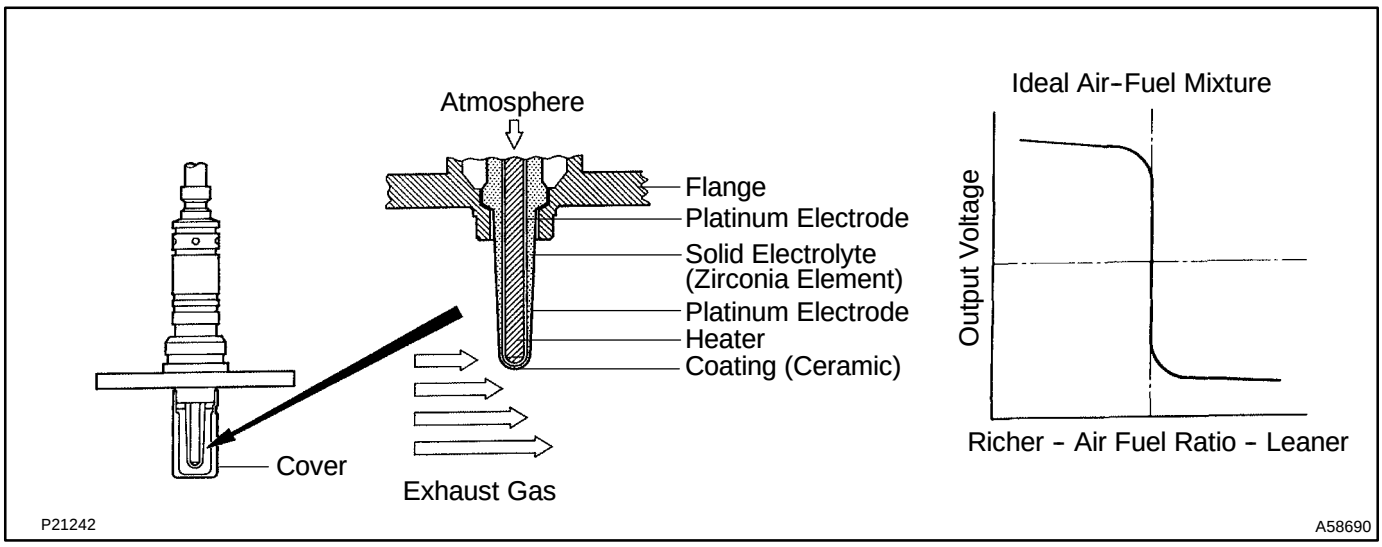
To obtain a high purification rate of the CO, HC and NOx components of the exhaust gas, a three-way catalytic converter is used. For the most efficient use of the three-way catalytic converter, the air-fuel ratio must be precisely controlled so that it is always close to the stoichiometric air-fuel ratio.

The oxygen sensor (bank1, sensor1) has the characteristic that it provides output voltage* being approximately proportional to the existing air-fuel ratio. The oxygen sensor output voltage* is used to provide feedback for the ECM to control the air-fuel ratio.

By the oxygen sensor output, the ECM can determine the deviation amount from the stoichiometric air-fuel ratio and control the proper injection time immediately. If the oxygen sensor is out of order, ECM is unable to perform the accurate air-fuel ratio control.

The oxygen sensor is equipped with a heater which heats the zirconia element. The heater is controlled by the ECM. When the intake air volume is low (the temperature of the exhaust gas is low), the current flows to the heater to heat the sensor for the accurate oxygen concentration detection.

*: The voltage value changes at the inside of the ECM only.

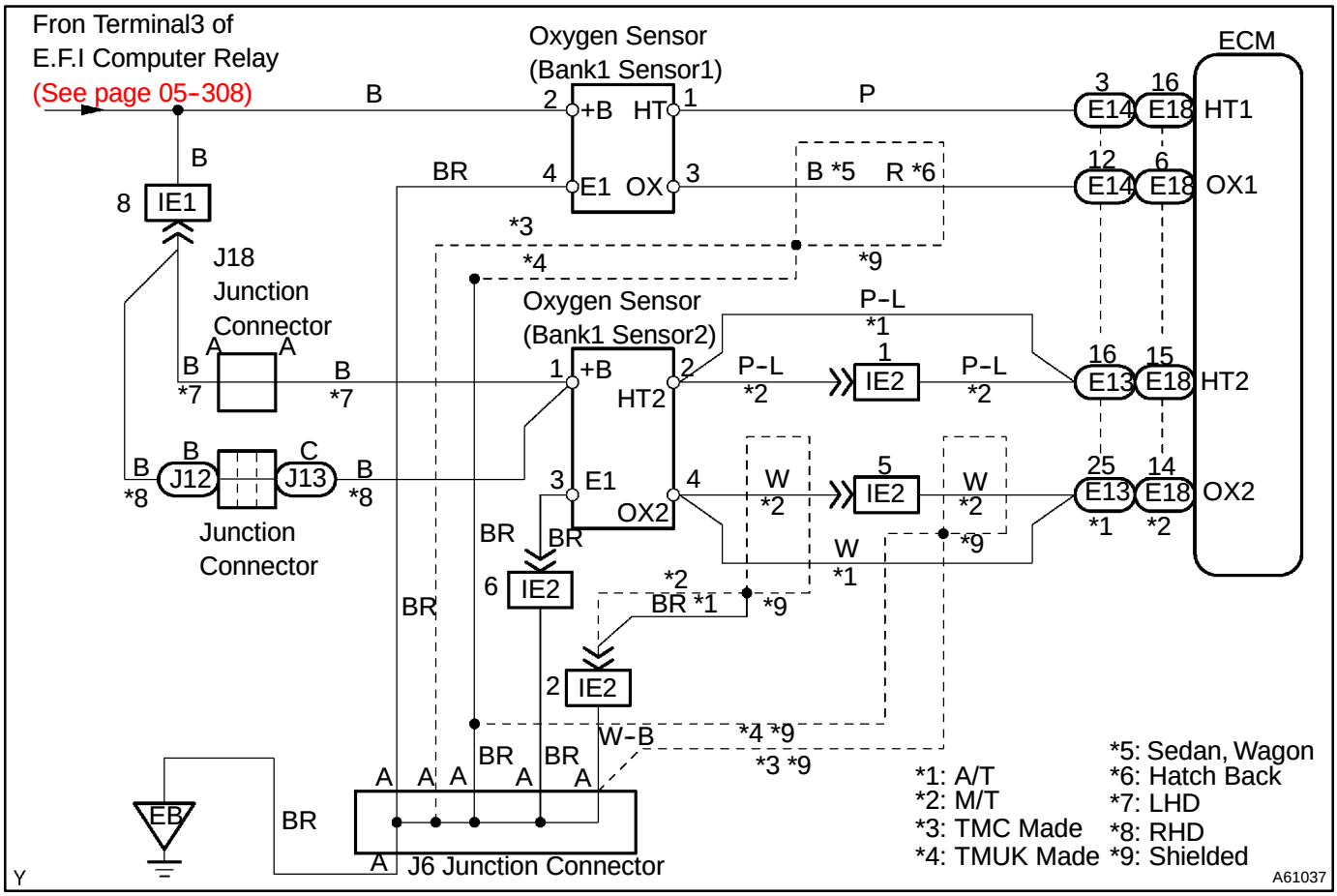


DTC No	DTC Detecting Condition	Trouble Area
P0125	After engine is warmed up, oxygen sensor output* does not change when conditions (a), (b), (c) and (d) continue for at least 1.5 min: *: Output value changes at inside of the ECM only (c) Engine speed: 1,500 rpm or more (d) Vehicle speed: 40 - 100 km/h (25 - 62 mph) (e) Throttle valve is not fully closed (f) 140 sec. or more after starting engine	$ Open or short in oxygen sensor (bank 1 sensor 1) circuit $ Oxygen sensor (bank 1 sensor 1) $ Air induction system $ Fuel pressure $ Injector $ Gas leak on exhaust system $ ECM

HINT:

After confirming DTC P0125, use the hand-held tester to confirm output voltage of the oxygen sensor (bank 1, sensor 1) from the CURRENT DATA.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	READ OUTPUT DTC(BESIDES P0125)

Result:

	A	B
RESULT	Only P0125 is output.	P0125 and other codes are output.

HINT:

If any other cord besides P0125 are output, perform the troubleshoot on that DTC before.

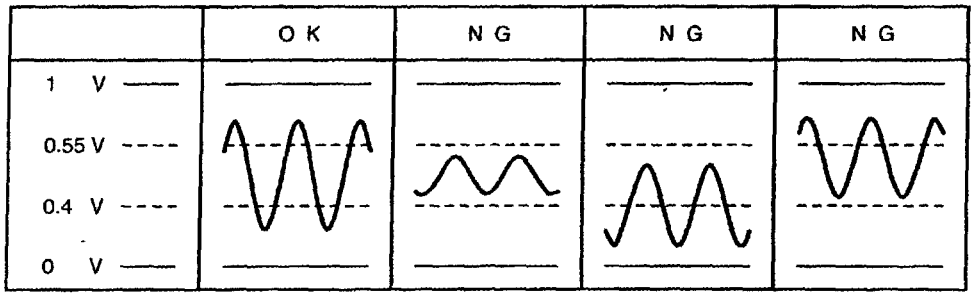
B → GO TO RELEVANT DTC CHART

A

2	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OF OXYGEN SENSOR)

(a) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.
(b) Use the hand-held tester to read the output voltage of the oxygen sensor during idling.

Oxgen sensor otput voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table)



OK → Go to step 9

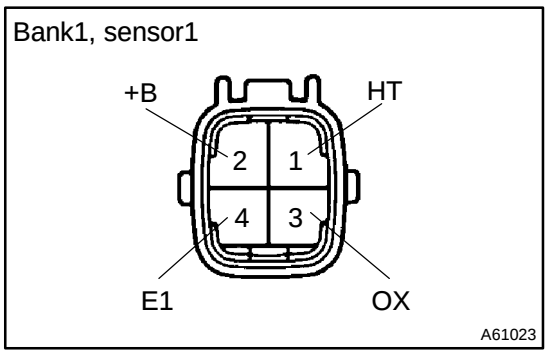
NG

3	CHECK WIRE HARNESS OR CONNECTOR(ECM-OXYGEN SENSOR)

NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

4	INSPECT OXYGEN SENSOR(OXYGEN SENSOR HEATER RESISTANCE)



(a) Disconnect the oxygen sensor connector.
(b) Measure resistance between the terminals HT and +B of the oxygen sensor.
Resistance: 5-9Ω (20_C)

NG → REPLACE OXYGEN SENSOR

OK

5	CHECK AIR INDUCTION SYSTEM (See page 10-7)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

6	CHECK FUEL PRESSURE (See page 11-5, 11-15)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

7	INSPECT FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

8	CHECK EXHAUST GAS LEAK

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN

GO

10	READ OUTPUT DTC(BESIDES P0125)

Result:

	A	B
RESULT	P0125 is not output.	P0125 is output.

B → CHECK FOR INTERMITTENT PROBLEMS

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

NO → CHECK AND REPLACE ECM

YES

DTC IS CAUSED RUNNING OUT OF FUEL

When not using hand-held tester:

1	READ OUTPUT DTC(BESIDES P0125)

Result:

	A	B
RESULT	P0125 is not output.	P0125 is output.

B → GO TO RELEVANT DTC CHART

A

REPLACE OXYGEN SENSOR

DTC	P0130	HEATED OXYGEN SENSOR CIRCUIT MALFUNCTION(BANK1 SENSOR1)

DTC	P0136	HEATED OXYGEN SENSOR CIRCUIT MALFUNCTION(BANK1 SENSOR2)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page 05-211.

DTC No	DTC Detecting Condition	Trouble Area
P0130 P0136	Voltage output of oxygen sensor remains at 0.4 V or more, or 0.55 V or less, during idling after engine is warmed up (2 trip detection logic)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector S ECM

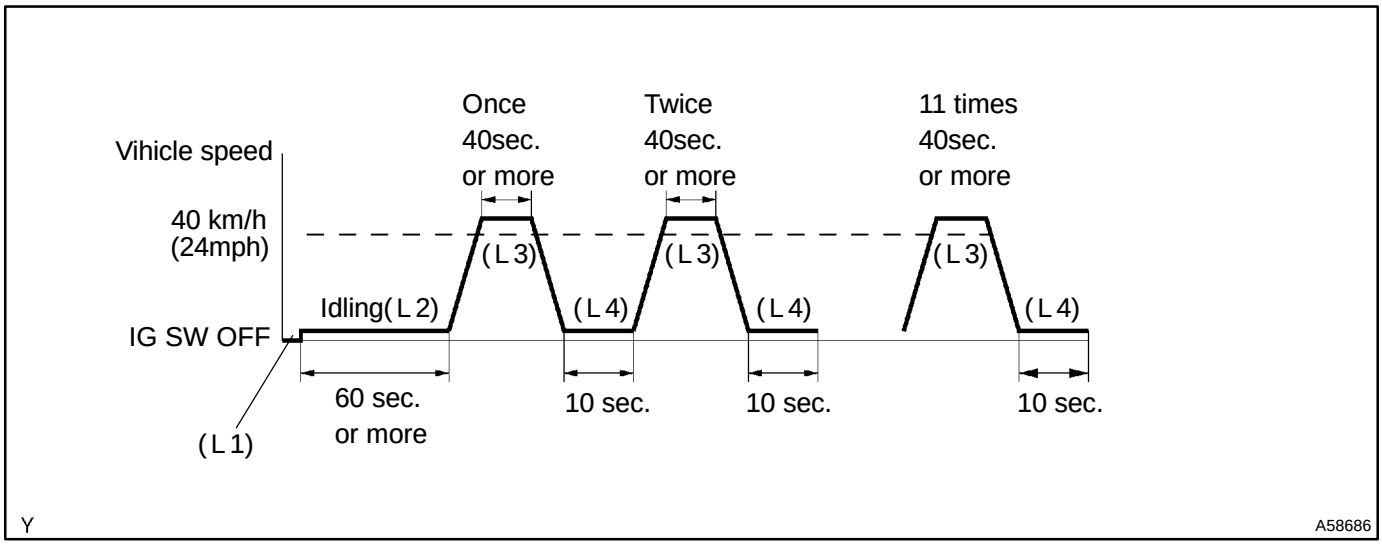
HINT:

- S Bank 1 refers to bank that includes cylinder No. 1.
- S Sensor 1 refers to the sensor closer to the engine body.
- S The oxygen sensor's output voltage and the short-term fuel trim value can be read using the hand-held tester.

WIRING DIAGRAM

Refer to DTC P0125 on page 05-211.

CONFIRMATION DRIVING PATTERN



1. **Connect the hand-held tester to the DLC3. (L1)**
2. **Switch the hand-held tester from the normal mode to the check (test) mode (See page 05-158). (L1)**
3. **Start the engine and let the engine idle for 60 seconds or more. (L2)**
4. **Drive the vehicle at 30 km/h (28 mph) or more for 40 seconds or more. (L3)**
5. **Let the engine idle for 10 seconds or more. (L4)**
6. **Preform steps (L3) to (L4) 9 times. (L5)**

HINT:
If a malfunction exists, the MIL will light up on the multi information display during step (L5).
NOTICE:
If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.
If you do not have a hand-held tester, turn the ignition switch OFF after performing steps from (L2) to (L5), then perform steps from (L2) to (L5) again.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**READ OUTPUT DTC(BESIDES P0130 OR P0136)**

Result:

	A	B
RESULT	P0130 and/or P0136 are output.	P0130 and/or P0136 other codes are output.

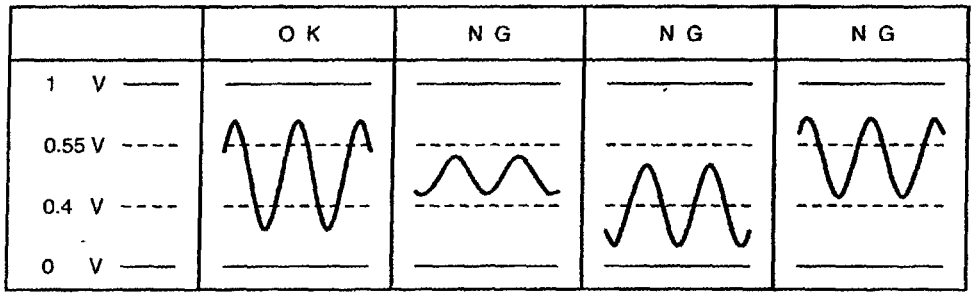
B → **GO TO RELEVANT DTC CHART**

A

2	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OXYGEN SENSOR)

(a) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.
(b) Use the hand-held tester to read the output voltage of the oxygen sensor during idling.

Oxgen sensor otput voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table)

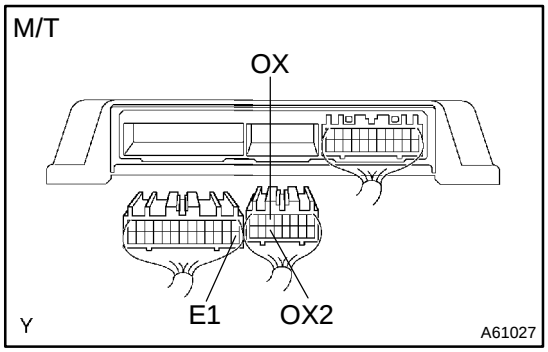


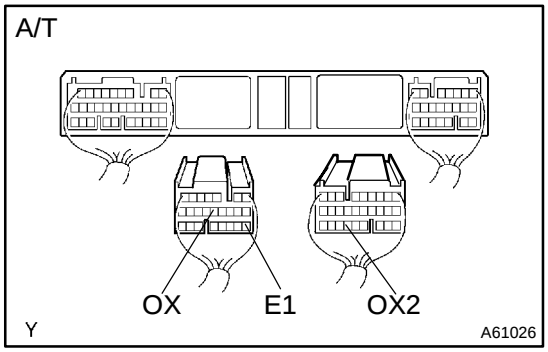
P18349

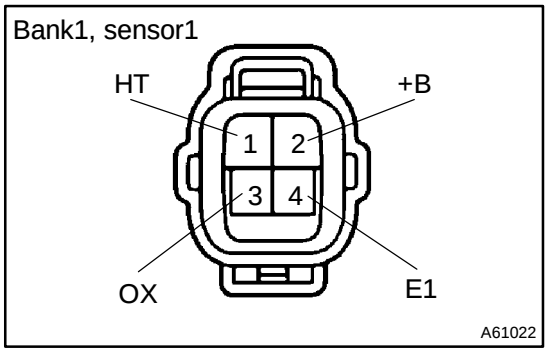
OK → **Go to step 3**

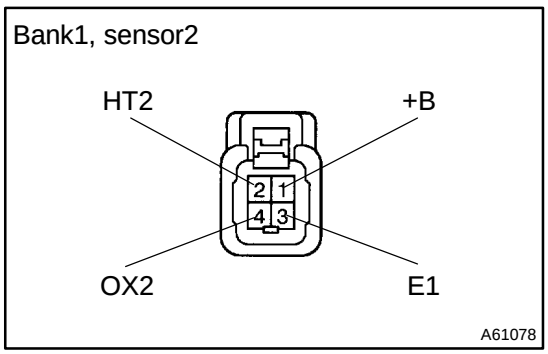
NG

3 CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR)









(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E18 and E19 connector. (M/T)
(c) Disconnect the ECM E14 and E13 connector. (A/T)
(d) Check continuity between the terminals OX of the ECM connector and OX of the oxygen sensor (Bank1, sensor1)connector.
Resistance: 1Ω or less
(e) Check continuity between the terminals OX2 of the ECM connector and OX2 of the oxygen sensor (Bank1, sensor2)connector.
Resistance: 1Ω or less
(f) Check for short between the terminals OX and E1 of the ECM connector.
Resistance: 1MΩ or more
(g) Check for short between the terminals OX2 and E1 of the ECM connector.
Resistance: 1MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	CHECK WHETHER MISFIRE IS OCCURRED OR NOT BY MONITORING DTC AND DATA LIST

NG → CHECK FOR SPARK AND IGNITION

OK

5	CHECK AIR INDUCTION SYSTEM (See page 10-7)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

6	CHECK FUEL PRESSURE (See page 11-5, 11-15)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

7	CHECK FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

8	CHECK EXHAUST GAS LEAK

(a) Clear the DTC.
(b) Warm up the oxygen sensor by a driving test to check the system.
HINT:
Refer to CONFIRMATION DRIVING PATTERN.

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN

(a) Clear the DTC.
(b) Warm up the oxygen sensor by a driving test to check the system.
HINT:
Refer to CONFIRMATION DRIVING PATTERN.

GO

10	READ OUTPUT DTC(BESIDS P0130 OR P0136)

Result:

	A	B
RESULT	P0130 and/or P0136 are output again.	P0130 and/or P0136 other codes are not output again.

B → CHECK AND REPLACE ECM

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

(a) Confirm if the vehicle ran out of fuel or not in the past.

HINT:

There is no problem, if DTC P0130 and P0136 is not output after the CONFIRMATION DRIVING PATTERN. This means that the ECM records DTC P0130 and P0136 because of the running out of fuel in the past.

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC IS CAUSED RUNNING OUT OF FUEL

DTC	P0133	HEATED OXYGEN SENSOR SLOW RESPONSE (BANK1 SENSOR1)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page 05-211.

DTC No	DTC Detecting Condition	Trouble Area
P0133	Response time for oxygen sensor's voltage output to change from rich to lean, or from lean to rich, is 1.0 sec. or more during idling after engine is warmed up (2 trip detection logic)	S Open or short in oxygen sensor circuit S Oxygen sensor S Air induction system S Fuel pressure S Injector S ECM

HINT:

- S Bank 1 refers to bank that includes cylinder No. 1.
- S Sensor 1 refers to the sensor closer to the engine body.
- S The oxygen sensor's output voltage and the short-term fuel trim value can be read using the hand-held tester.

WIRING DIAGRAM

Refer to DTC P0125 on page 05-211.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0133)

Result:

	A	B
RESULT	P0133 is output.	P0133 and other codes are output.

B → GO TO RELEVANT DTC CHART

A

2	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OXYGEN SENSOR) (See page 05-216)

OK → Go to step 9

NG

3	CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR) (See page 05-216)

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4	CHECK WHETHER MISFIRE IS OCCURRED OR NOT BY MONITORING DTC AND DATA LIST (See page 05-158)

NG → CHECK FOR SPARK AND IGNITION

OK

5	CHECK AIR INDUCTION SYSTEM (See page 10-7)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

6	CHECK FUEL PRESSURE (See page 11-5, 11-15)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

7	CHECK FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

8	CHECK EXHAUST GAS LEAK

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN (See page 05-216)

GO

10	READ OUTPUT DTC(BESIDS P0133)

Result:

	A	B
RESULT	P0133 is not output again.	P0133 is not output again.

B → CHECK AND REPLACE ECM

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

(a) Confirm if the vehicle ran out of fuel or not in the past.

HINT:

There is no problem, if DTC P0133 is not output after the CONFIRMATION DRIVING PATTERN. This means that the ECM records DTC P0133 because of the running out of fuel in the past.

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC IS CAUSED RUNNING OUT OF FUEL

DTC	P0135	HEATED OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION(BANK1 SENSOR1)

DTC	P0141	HEATED OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION(BANK1 SENSOR2)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page 05-211.

DTC No	DTC Detecting Condition	Trouble Area
P0135 P0141	When heater operates, heater current exceeds 2 A (2 trip detection logic)	S Open or short in heater circuit of heated oxygen sensor S Heated oxygen sensor heater S ECM
	Heater current of 0.2 A or less when heater operates (2 trip detection logic)	

HINT:

- S Bank 1 refers to the bank that includes cylinder No. 1.
- S Sensor 2 refers to the sensor being farther from the engine body.

WIRING DIAGRAM

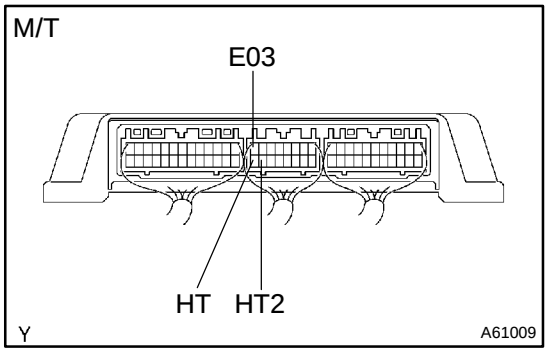
Refer to DTC P0125 on page 05-211.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

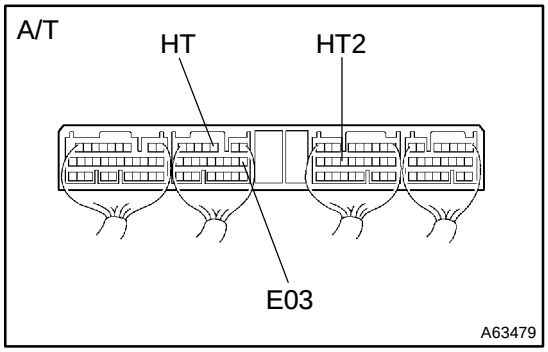
1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.

(b) Measure voltage between the terminals HT and E03 of the ECM connector.
Voltage: 9 - 14 V

(c) Measure voltage between the terminals HT2 and E03 of the ECM connector.
Voltage: 9 - 14 V

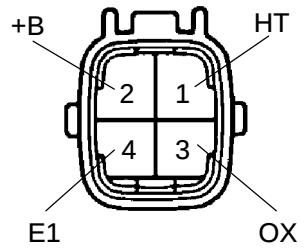


OK → **CHECK AND REPLACE ECM**

NG

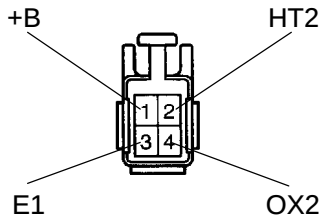
2	CHECK OXYGEN SENSOR(OXYGEN SENSOR HEATER)

Bank1, sensor1



A61023

Bank1, sensor2



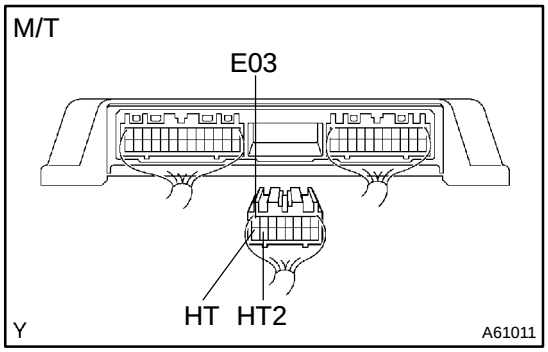
A61079

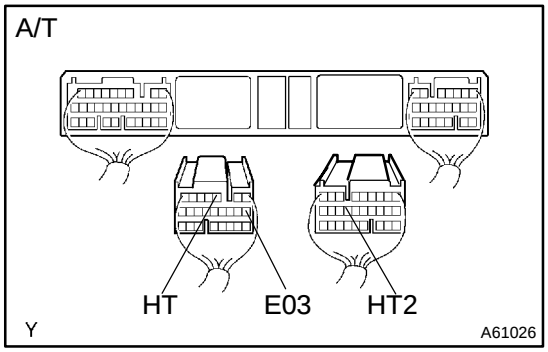
(a) Disconnect the oxygen sensor connector.
(b) Measure resistance between the terminals HT and +B of the oxygen sensor. (bank1, sensor1)
Resistance: 5 - 9Ω (20_C)
(c) Measure resistance between the terminals HT2 and +B of the oxygen sensor. (bank1, sensor2)
Resistance: 5 - 9Ω (20_C)

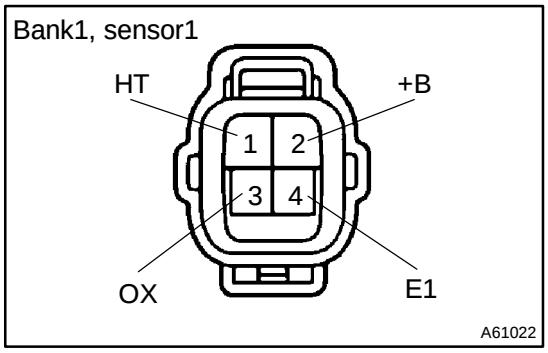
NG → **REPLACE OXYGEN SENSOR**

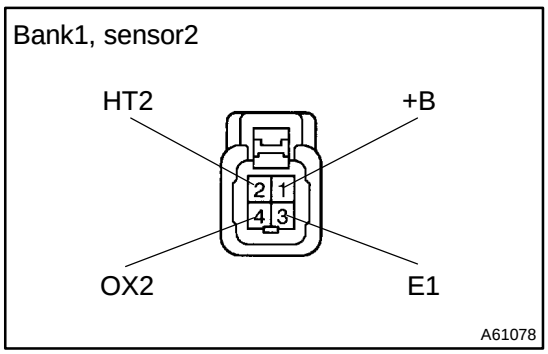
OK

3	CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR)









(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E13 and E14 connector. (A/T)
(d) Check continuity between the terminals HT of the ECM connector and HT of the oxygen sensor (Bank1, sensor1)connector.
Resistance: 1Ω or less
(e) Check continuity between the terminals HT2 of the ECM connector and HT2 of the oxygen sensor (Bank1, sensor2)connector.
Resistance: 1Ω or less
(f) Check for short between the terminals HT and E03 of the ECM connector.
Resistance: 1MΩ or more
(g) Check for short between the terminals HT2 and E03 of the ECM connector.
Resistance: 1MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

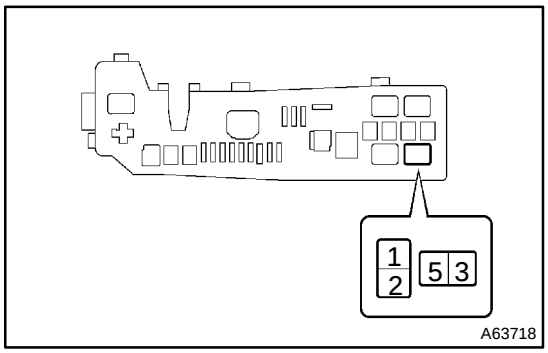
OK

4	CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-308)

NG → REPAIR OR REPLACE CHECK FOR ECM POWER SOURCE CIRCUIT

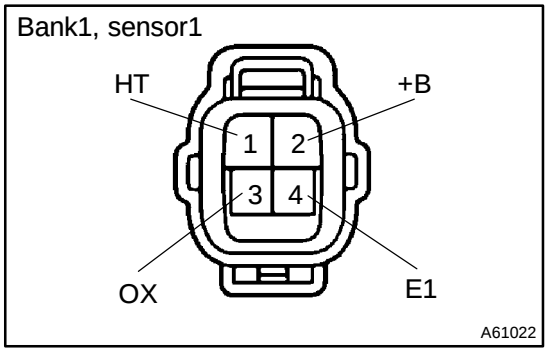
OK

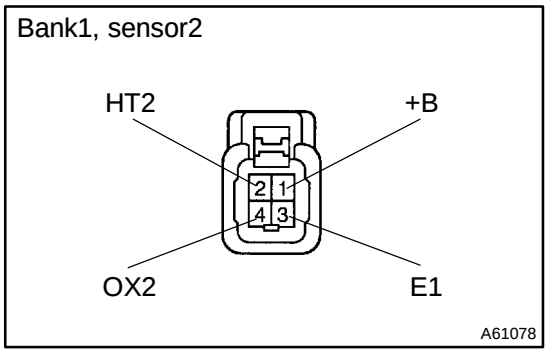
5	CHECK HARNESS AND CONNECTOR(E.F.I. COMPUTER RELAY-OXYGEN SENSOR)



(a) Disconnect the battery negative (-) terminal.
(b) Disconnect the E.F.I. computer relay.
(c) Disconnect the oxygen sensor connector.
(d) Check continuity between the terminals 5 of the E.F.I. computer relay side connector and +B of the oxygen sensor connector.
Resistance: 1Ω or less

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.





NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

DTC	P0171	SYSTEM TOO LEAN(FUEL TRIM)(BANK1)

DTC	P0172	SYSTEM TOO RICH(FUEL TRIM)(BANK1)

CIRCUIT DESCRIPTION

Fuel trim refers to the feedback compensation value compared against the basic injection time. Fuel trim includes short-term fuel trim and long-term fuel trim.

Short-term fuel trim is the short-term fuel compensation used to maintain the air-fuel ratio at its ideal theoretical value. The signal from the heated oxygen sensor indicates whether the air-fuel ratio is RICH or LEAN compared to the ideal theoretical value, triggering a reduction in fuel volume if the air-fuel ratio is rich, and an increase in fuel volume if it is lean.

Long-term fuel trim is overall fuel compensation carried out long-term to compensate for continual deviation of the short-term fuel trim form the central value due to individual engine differences, wear over time and changes in the usage environment.

If both the short-term fuel trim and long-term fuel trim are LEAN or RICH beyond a certain value, it is detected as a malfunction and the check engine warning (CHK ENG) lights up.

DTC No.	DTC Detecting Condition	
P0171	Oxygen sensor voltage is 0.45 V or less (lean) for 90 sec. under conditions (a), (b) and (c): (2 trip detection logic) (a) Water temp.: 70°C (158°F) or more (b) Engine speed: 1,500 rpm or more (c) Vehicle speed: 100 km/h (62 mph) or less	• Air intake (hose loose) • Fuel line pressure • Open or short in oxygen sensor circuit • Oxygen sensor malfunction • Air flow meter • Water temp. sensor • Gas leakage on exhaust system
P0172	Oxygen sensor voltage is 0.45 V or less (lean) for 90 sec. under conditions (a), (b) and (c): (2 trip detection logic) (a) Water temp.: 70°C (158°F) or more (b) Engine speed: 1,500 rpm or more (c) Vehicle speed: 100 km/h (62 mph) or less	• Air intake (hose loose) • Fuel line pressure • Open or short in oxygen sensor circuit • Oxygen sensor malfunction • Air flow meter • Water temp. sensor • Gas leakage on exhaust system

HINT:

If the total of the short-term fuel trim value and long-term fuel trim value is within ± 25 %, the system is functioning normally.

WIRING DIAGRAM

Refer to DTC P0125 on page 05-211.

INSPECTION PROCEDURE

HINT:

Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand-held tester

1	CHECK AIR INDUCTION SYSTEM (See page 10-7)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

2	CHECK FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

3	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-8)

NG → REPAIR OR REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

4	CHECK FOR SPARK AND IGNITION (See page 18-5)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

5	CHECK FUEL PRESSURE (See page 11-5)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

6	CHECK EXHAUST GAS LEAKAGE POINT

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

7	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OF OXYGEN SENSOR) (See page 05-216)

OK → Go to step 9

NG

8	CHECK HARNESS AND CONNECTOR(ENGINE ECU-OXYGEN SENSOR) (See page 05-216)

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN (See page 05-216)

GO

10	READ OUTPUT DTC(BESIDES P0171 OR P0172)

Result:

	A	B
RESULT	P0171 and P0172 are not output.	P0171 and P0172 are output again.

B → CHECK AND REPLACE ECU

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC P0171 IS CAUSED BY RUNNING OUT OF FUEL

When not using hand-held tester

1	CHECK AIR INDUCTION SYSTEM (See page 10-7)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

2	CHECK FUEL PRESSURE (See page 11-5, 11-15)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

3	CHECK FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

4	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-8)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

5	CHECK FOR SPARK AND IGNITION (See page 18-5)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

6	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD OXYGEN SENSOR INSTALLED

NO → CHECK AND REPLACE ECM

YES

REPLACE OXYGEN SENSOR

DTC	P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

DTC	P0301	CYLINDER 1 MISFIRE DETECTED

DTC	P0302	CYLINDER 2 MISFIRE DETECTED

DTC	P0303	CYLINDER 3 MISFIRE DETECTED

DTC	P0304	CYLINDER 4 MISFIRE DETECTED

CIRCUIT DESCRIPTION

Misfire: The ECM uses the crankshaft position sensor and camshaft position sensor to monitor changes in the crankshaft rotation of each cylinder.

The ECM counts the number of times from the engine speed change rate, indicating that misfire has occurred. And when the misfire rate equals to or exceeds the count, indicating that the engine condition has deteriorated, the MIL lights up.

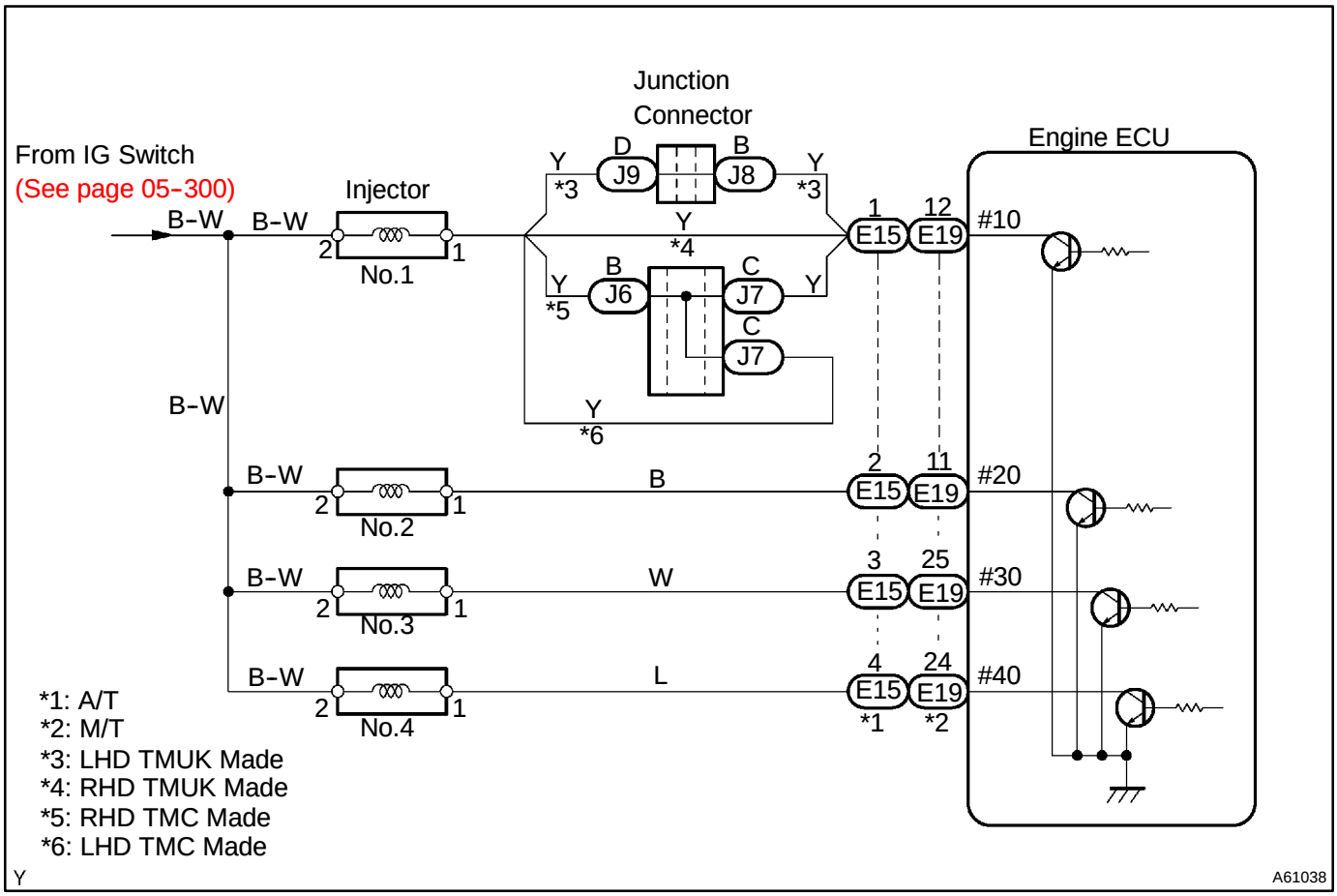
If the misfire rate is high enough and the driving conditions causes the catalyst to overheat, the MIL blinks when the misfire occurs.

DTC No.	DTC Detecting Condition	Trouble Area
P0300	Misfire of random cylinders is detected during any particular 200 or 1,000 revolutions	S Open or short in engine wire S Connector connection S Vacuum hose connection S Ignition system S Injector S Fuel pressure S Air flow meter S Water temp. sensor S Compression pressure S Valve clearance S Valve timing S ECM
P0301 P0302 P0303 P0304	For any particular 200 revolutions of engine, misfire is detected which can cause catalyst to overheat (This causes MIL to blink)	
	For any particular 1,000 revolutions of engine, misfire is detected which causes a deterioration in emissions (2 trip detection logic)	

HINT:

When the 2 or more codes for a misfiring cylinder are recorded repeatedly but no random misfire code is recorded, it is indicated that the misfires were detected and recorded at different times.

WIRING DIAGRAM



CONFIRMATION DRIVING PATTERN

(a) Connect the hand-held tester to the DLC3.
(b) Record the DTC and freeze frame data.
(c) Use the hand-held tester to set to the check mode (See page 05-158).
(d) Drive the vehicle several times with the engine speed, load and its surrounding range shown with ENGINE SPD, CALC LOAD in the freeze frame data or MISFIRE RPM, MISFIRE LOAD in the data list. If you have no hand-held tester, turn the ignition switch OFF after the symptom is simulated once. Then repeat the simulation process again.

HINT:
In order to memorize the DTC of the misfire, it is necessary to drive around MISFIRE RPM, MISFIRE LOAD in the following data list.

Engine Speed	Time
Idling	5 minutes and 45 seconds or more
1000 rpm	4 minutes or more
2000 rpm	2 minutes and 30 seconds or more
3000 rpm	1 minute and 30 seconds or more

(e) Check whether there is misfire or not by monitoring the DTC and the freeze frame data, and then, record them.
(f) Turn the ignition switch OFF and wait at least 5 seconds.

INSPECTION PROCEDURE

HINT:

- If the other DTCs besides misfire are memorized simultaneously, first perform the troubleshooting for them.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.
- If the misfire is not occured when the vehicle is brought to the workshop, it can be confirmed by reproducing the condition of the freeze frame data. After finishing the repair, confirm that there is no misfire (See the confirmation driving pattern).
- When either of SHORT FT #1, LONG FT #1, SHORT FT #2 or LONG FT #2 in the freeze frame data is over the range of ±20%, there is a possibility that the air-fuel ratio is inclining either to "RICH" (-20% or less) or "LEAN" (+20% or more).
- When COOLANT TEMP in the freeze frame data is less than 80˚C (176˚F), there is a possibility of misfire only during warming up.
- In case that the misfire cannot be reproduced, this may be because of the driving with the shortage of fuel, the use of improper fuel, a stain of ignition plug and etc.

1	CHECK WIRE HERNESS, CONNECTOR AND VACUUM HOSE IN ENGINE ROOM

(a) Check the connection conditions of the wire harness and connector.
(b) Check the disconnection, piping and break in the vacuum hose.

NG → REPAIR OR REPLACE, THEM CONFIRM THAT THERE IS NO MISFIRE

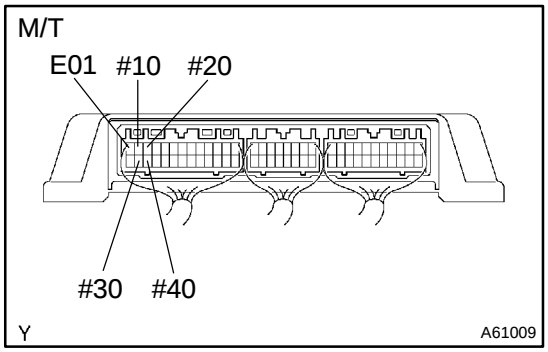
OK

2	INSPECT SPARK PLUG

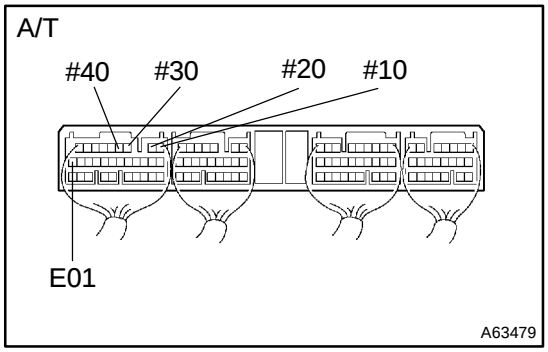
NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

3	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between applicable terminal and E01 of the ECM connector.
Voltage: 9 - 14 V



OK → Go to step 5

NG

4	INSPECT FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

CHECK WIRE HARNESS OR CONNECTOR

5	CHECK FUEL PRESSURE (See page 11-5, 11-15)

NG → REPAIR OR REPLACE FUEL PUMP, FUEL PIPE LINE AND FILTER

OK

6	INSPECT FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

7	INSPECT INTAKE AIR FLOW METER SUB-ASSY

NG → REPAIR OR REPLACE INTAKE AIR FLOW METER SUB-ASSY

OK

8	INSPECT E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-8)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

CHECK COMPRESSION PRESSURE, VALVE CLEARANCE AND VAIVE TIMING

DTC	P0325	KNOCK SENSOR1 CIRCUIT MALFUNCTION (BANK1)

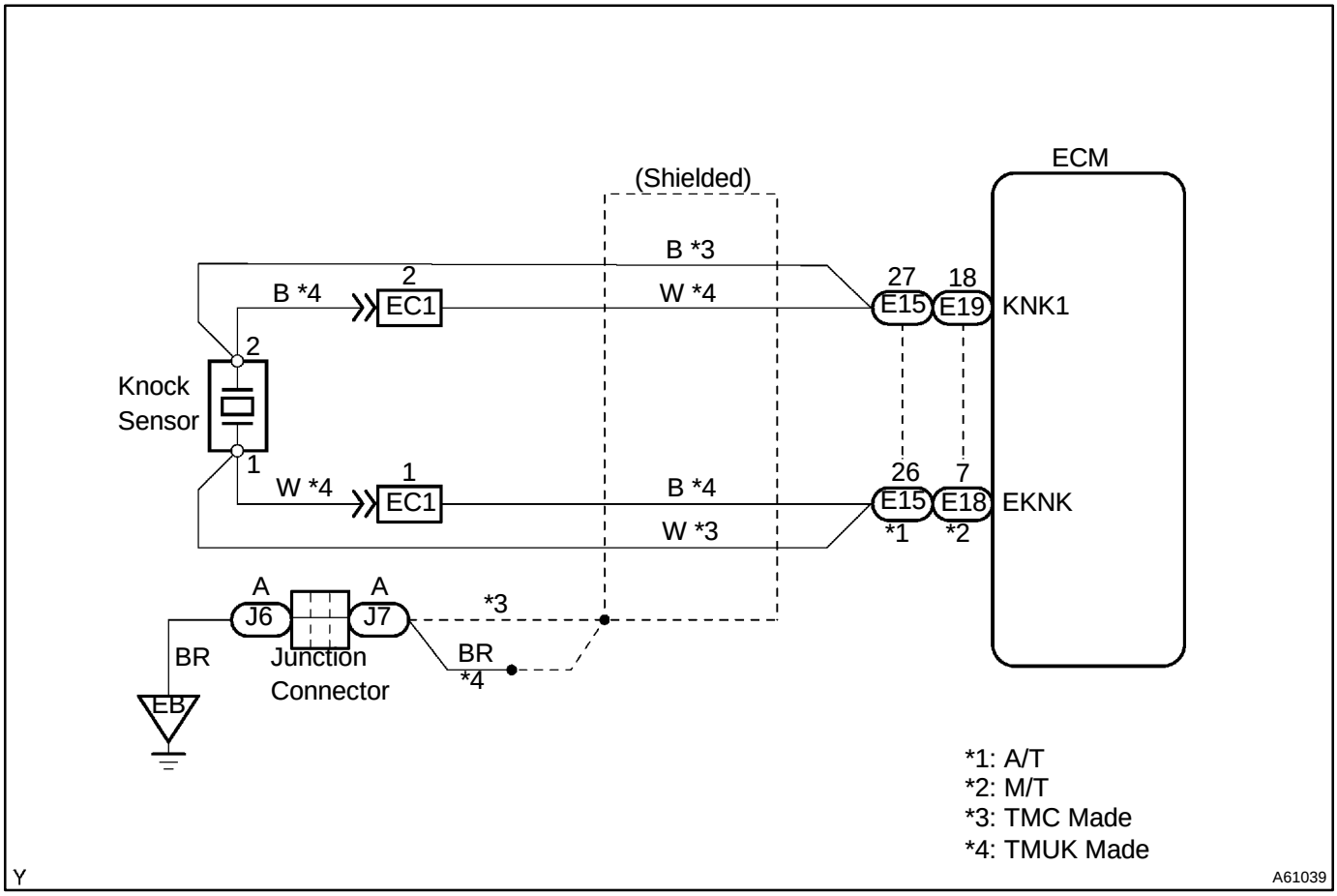
CIRCUIT DESCRIPTION

The knock sensor is fitted to the cylinder block to detect the engine knocking. This sensor contains a piezo-electric element which generates a voltage when it becomes deformed. This occurs when the cylinder block vibrates due to knocking. If the engine knocking occurs, the ignition timing is delayed to suppress it.

DTC No.	DTC Detecting Condition	Trouble Area
P0325	No knock sensor signal to ECM with engine speed, 2,000 rpm or more	ŠOpen or short in knock sensor circuit ŠKnock sensor (looseness) ŠECM

HINT:
If the ECM detects above diagnosis conditions, it operates the fail safe function in which the corrective retard angle value is set to the maximum value.

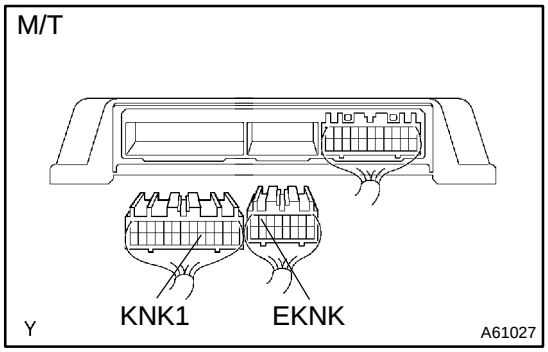
WIRING DIAGRAM

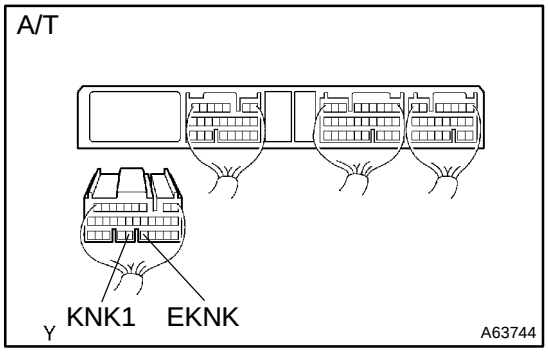


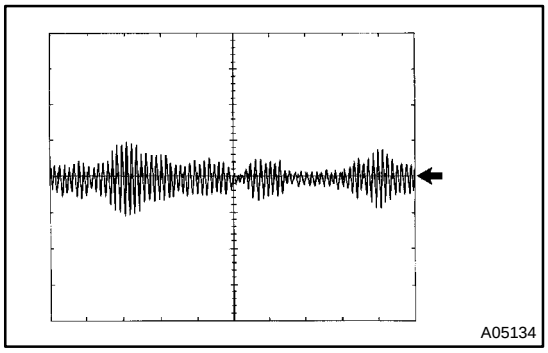
INSPECTION PROCEDURE

HINT:
Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	CHECK HARNESS AND CONNECTOR







(a) Check for short on the wire harness between the ECM and the knock control sensor.
  (1) Disconnect the ECM E18 and E19 connector. (M/T)
  (2) Disconnect the ECM E15 connector. (A/T)
  (3) Check for short between the terminals KNK1 of ECM connector and EKNK of ECM connector.

Resistance: 1 MΩ or more

(b) Reference:
Inspection using the oscilloscope.
  (1) With the engine racing at 4,000 rpm, check the waveform between terminal KNK1 of the ECM connector and the body ground.

HINT:
The correct waveforms are as shown in the left.
  (2) Spread the time on the horizontal axis, and confirm that period of the wave is 80 μ seconds (Normal mode vibration frequency of knock sensor:11.7 kHz).

HINT:
If normal mode vibration frequency is not 7.6 kHz, the sensor is out of order.

OK → **Go to step 3**

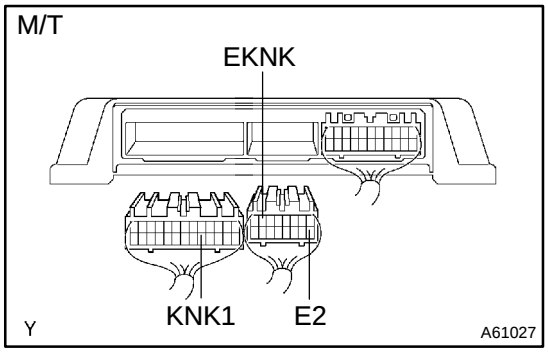
NG

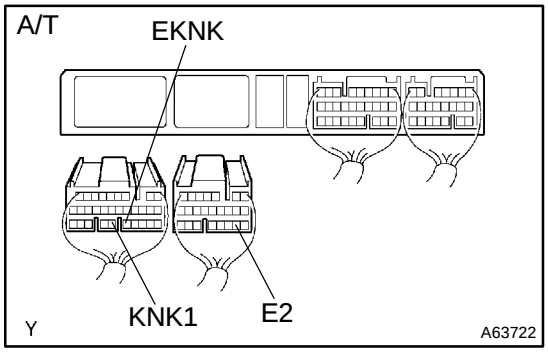
2	INSPECT KNOCK CONTROL SENSOR (See page 10-8)

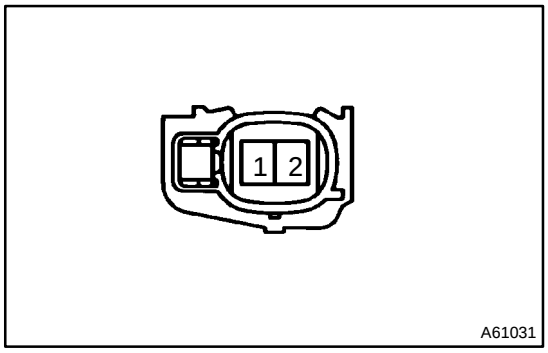
NG → **REPLACE KNOCK CONTROL SENSOR**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-KNOCK CONTROL SENSOR)







(a) Disconnect the knock control sensor connector.
(b) Disconnect the ECM E18 and E19 connector. (M/T)
(c) Disconnect the ECM E14 and E15 connector. (A/T)
(d) Check continuity between the terminals KNK1 of the ECM connector and 2 of the knock control sensor.
Resistance: 1Ω or less
(e) Check continuity between the terminals EKNK of the ECM connector and 1 of the knock control sensor.
Resistance: 1Ω or less
(f) Check for short between the terminals KNK1 and E2 of the ECM connector.
Resistance: 1MΩ or more
(g) Check for short between the terminals EKNK and E2 of the ECM connector.
Resistance: 1MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD KNOCK SENSOR IS INSTALLED

(a) Change the knock sensor to a new one
  (1) Remove the knock control sensor.
  (2) Install the knock control sensor.
(b) Perform the driving test.
(c) Read DTC.
  Result:

	A	B
RESULT	P0325 is output	P0325 is not output

B → REPLACE KNOCK CONTROL SENSOR

A

CHECK AND REPLACE ECM

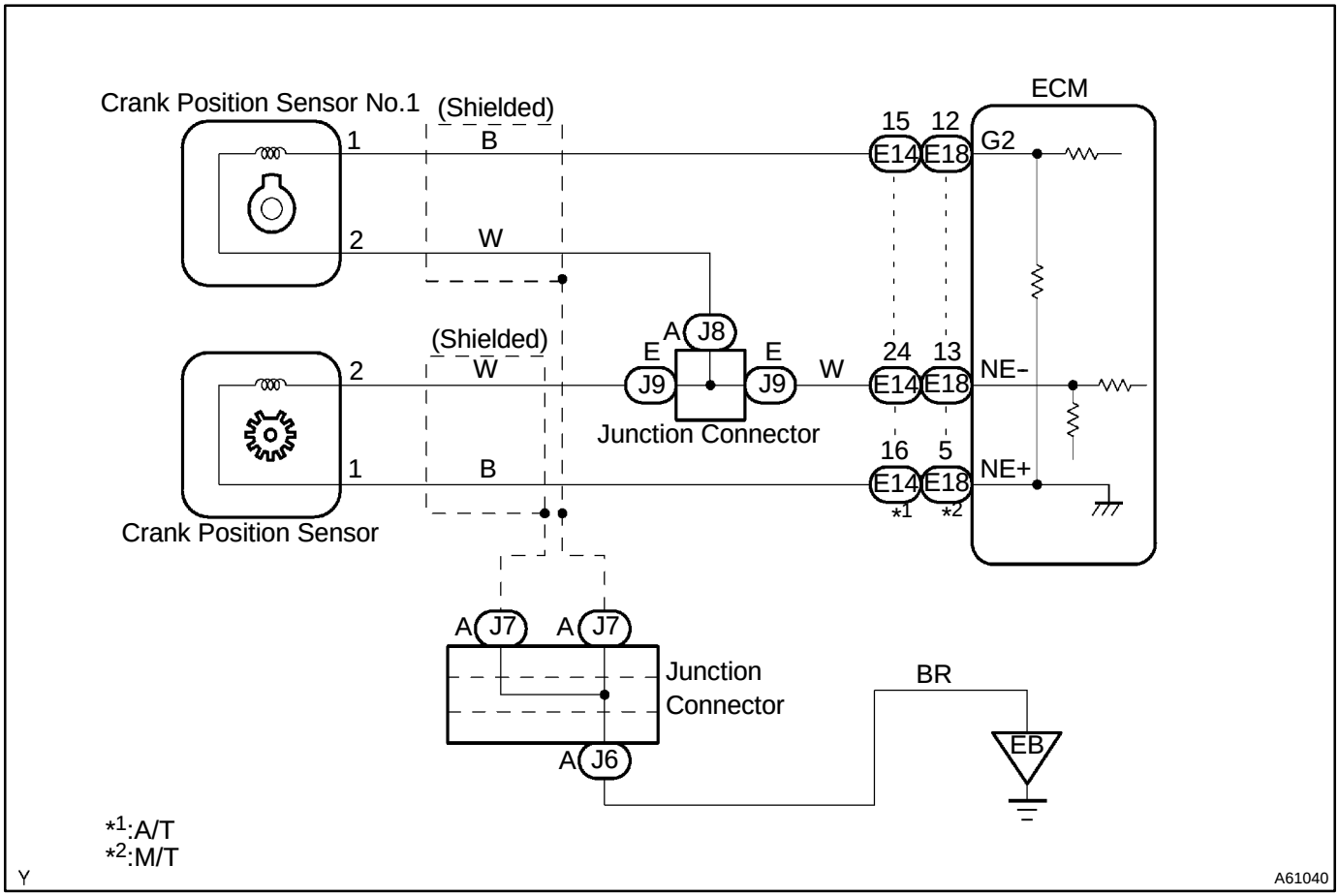
DTC	P0335	CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Crank position sensor (NE signal) consists of a magnet, iron core and pick up coil.
The NE signal plate (crank angle sensor plate) has 34 teeth and is mounted on the crankshaft. The NE signal sensor generates 34 signals at every engine revolution. The ECM detects the crankshaft angle based on the G signal, the actual crankshaft angle and the engine speed by the NE signal.

DTC No.	DTC Detecting Condition	Trouble Area
P0335	No crank position sensor signal to ECM during cranking (2 trip detection logic)	S Open or short in crank position sensor circuit S Crank position sensor S Crank angle sensor plate S ECM
	No crank position sensor signal to ECM with engine speed 600 rpm or more (2 trip detection logic)	

WIRING DIAGRAM

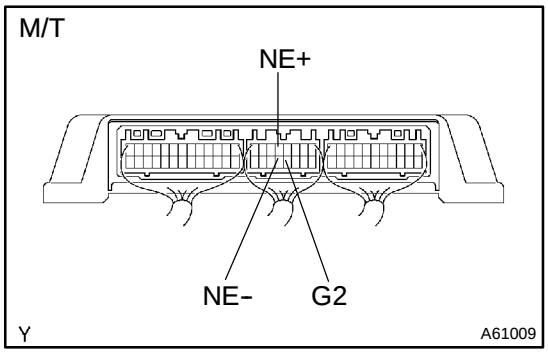


INSPECTION PROCEDURE

HINT:

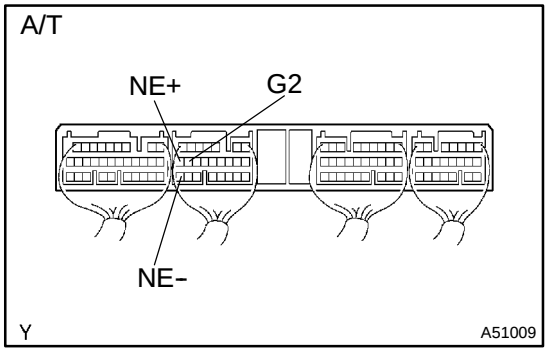
- Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.
- Perform troubleshooting of DTC P0335 first. If no trouble is found, troubleshoot the following mechanical system.

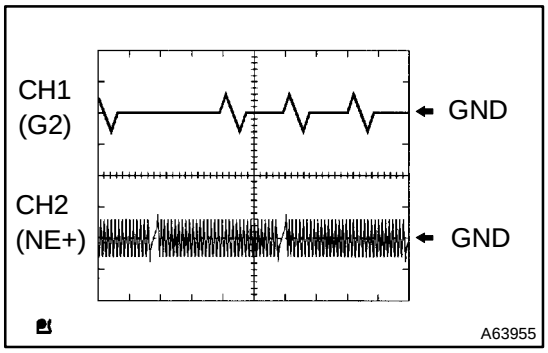
1	INSPECT CRANK POSITION SENSOR



(a) Check the crank position sensor for resistance.
(See page 18-7)
Resistance:
1630 - 2740 Ω (Cold)
2065 - 3225 Ω (Hot)

HINT:
"Cold" and "Hot" above express the temperature of the part itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C. (122_F) to 100_C (212_F)





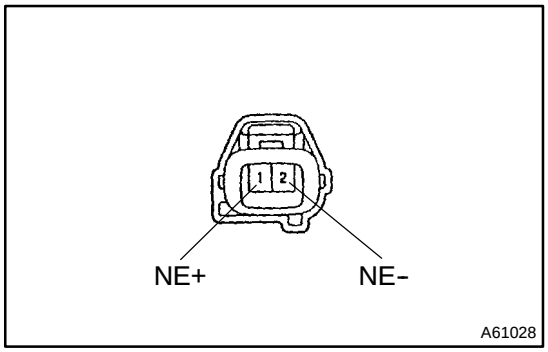
(b) Reference:
Inspection using the oscilloscope.
(1) During cranking or idling, check the waveform between terminals G2 and NE-, NE+ and NE- of the ECM connector.

HINT:
The correct waveforms are as shown in the left.

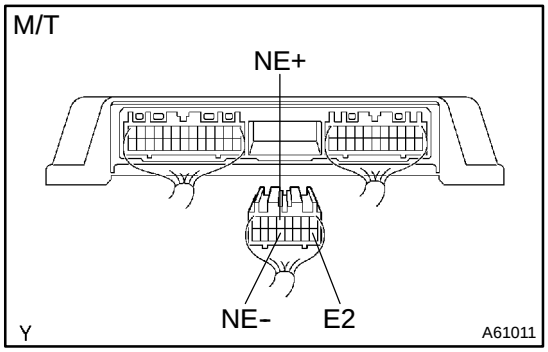
NG → **REPLACE CRANK POSITION SENSOR**

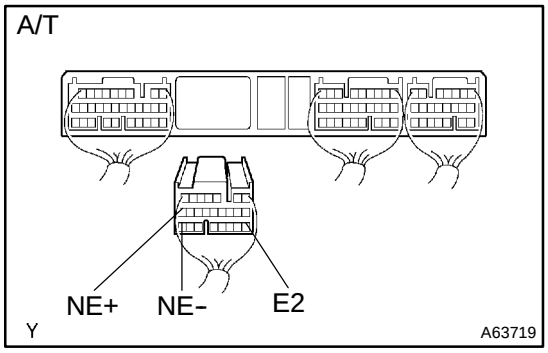
OK

2 CHECK HARNESS AND CONNECTOR(ECM-CRANKSHAFT POSITION SENSOR)



(a) Disconnect the crank position sensor connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E14 connector. (A/T)
(d) Check continuity between the terminals NE+ of the crank position sensor connector and NE+ of the ECM connector.
Resistance: 1Ω or less
(e) Check for short between the terminals NE+ and E2 of the ECM connector.
Resistance: 1MΩ or more
(f) Check continuity between the terminals NE- of the crank position sensor connector and NE- of the ECM connector.
Resistance: 1Ω or less
(g) Check for short between the terminals NE- and E2 of the ECM connector.
Resistance: 1MΩ or more





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 INSPECT SENSOR ATTACHMENT PART

(a) Check the crank position sensor installation .

NG → **REPAIR OR REPLACE SENSOR ATTACHMENT PART**

OK

4	INSPECT CRANKSHAFT POSITION SENSOR PLATE NO.1(TEETH OF SIGNAL PLATE)

(a) Remove the crank angle sensor plate.
(b) Check the teeth of the signal plate.

NG → REPAIR OR REPLACE CRANKSHAFT POSITION SENSOR PLATE NO.1

OK

CHECK AND REPLACE ECM

DTC	P0340	CAMSHAFT POSITON SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Crank position sensor No.1.(G signal) consists of a magnet, iron core and pickup coil.
The G signal rotor has 3 teeth on the outside and is mounted on the intake camshaft.
When the camshafts rotate, the protrusion on the signal plate and the air gap on the pickup coil changes, causing fluctuations in the magnetic field and generating an electromotive force in the pickup coil.
The NE signal plate (crank angle sensor plate) has 34 teeth and is installed in the crankshaft. The NE signal sensor generates 34 signals at every engine revolution. The ECM detects the crankshaft angle based on the G signals, the actual crankshaft angle and the engine speed by the NE signals.

DTC No.	DTC Detecting Condition	Trouble Area
P0340	No crank position sensor No.1 signal to ECM during cranking (2 trip detection logic)	S Open or short in crank position sensor circuit No.1 S Crank position sensor No.1 S Intake camshaft S ECM
	No crankt position sensor No.1 signal to ECM with engine speed 600 rpm or more	

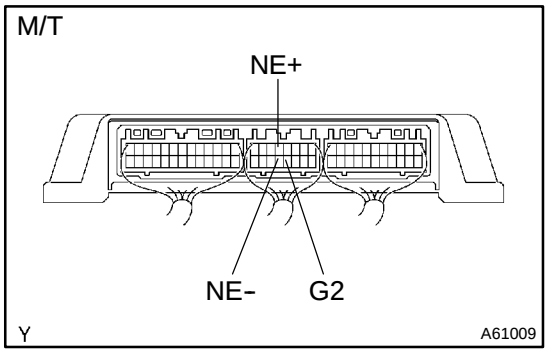
WIRING DIAGRAM

Refer to DTC P0335 on page 05-242.

INSPECTION PROCEDURE

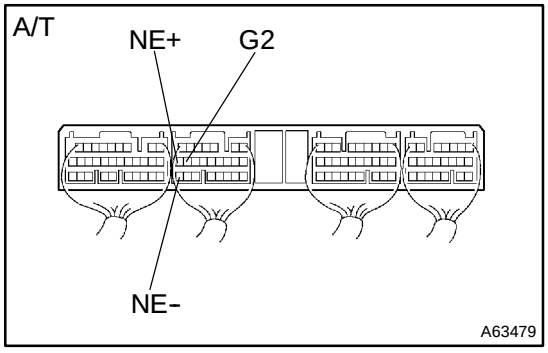
HINT:
Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

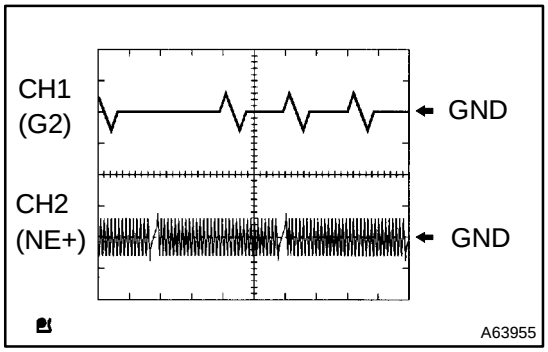
1	INSPECT CRANK POSITION SENSOR NO.1(CHECK RESISTANCE)



(a) Check the crank position sensor No.1 for resistance.
(See page 18-7)
Resistance:
1630 - 2740Ω (Cold)
2065 - 3225Ω (Hot)

HINT:
"Cold" and "Hot" above express the temperature of the part itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C (122_F) to 100_C (212_F)





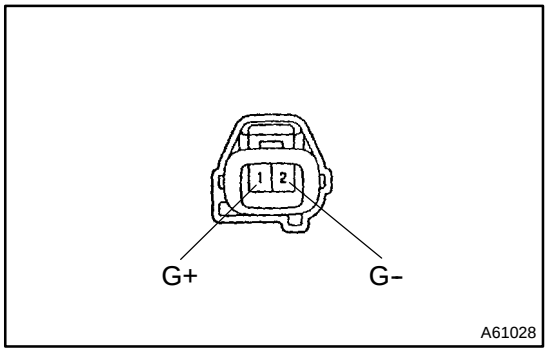
(b) Reference:
Inspection using the oscilloscope.
(1) During cranking or idling, check the waveform between terminals G2 and NE-, NE+ and NE- of the ECM connector.

HINT:
The correct waveforms are as shown in the left.

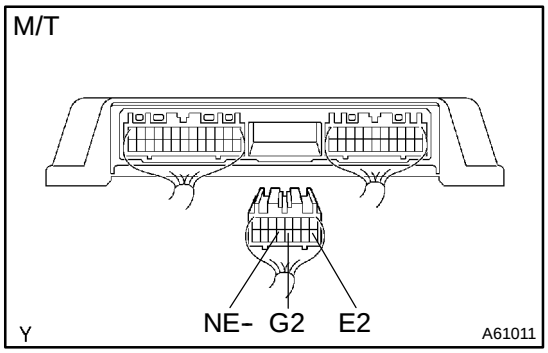
NG → **REPLACE CRANK POSITION SENSOR NO.1**

OK

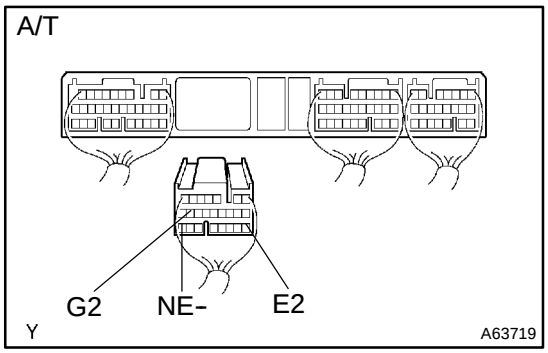
2 CHECK HARNESS AND CONNECTOR(ECM-CAMSHAFT POSITION SENSOR)



(a) Disconnect the crank position sensor No.1 connector.
(b) Disconnect the ECM E18 connector. (M/T)
(c) Disconnect the ECM E14 connector. (A/T)
(d) Check continuity between the terminals G+ of the crank position sensor No.1 connector and G2 of the the ECM connector.
Resistance: 1Ω or less
(e) Check for short between the terminals G2 and E2 of the the ECM connector.
Resistance: 1MΩ or more



(f) Check continuity between the terminals G- of the crank position sensor No.1 connector and the NE- of the the ECM connector.
Resistance: 1Ω or less
(g) Check for short between the terminals NE- and E2 of the the ECM connector.
Resistance: 1MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	INSPECT SENSOR INSTLLATION

NG → TIGHTEN SENSOR

OK

4	INSPECT CAMSHAFT

NG → REPAIR OR REPLACE CAMSHAFT

OK

CHECK AND REPLACE ECM

DTC	P0420	CATALYST SYSTEM EFFCIENCY BELOW THRESHOLD(BANK1)

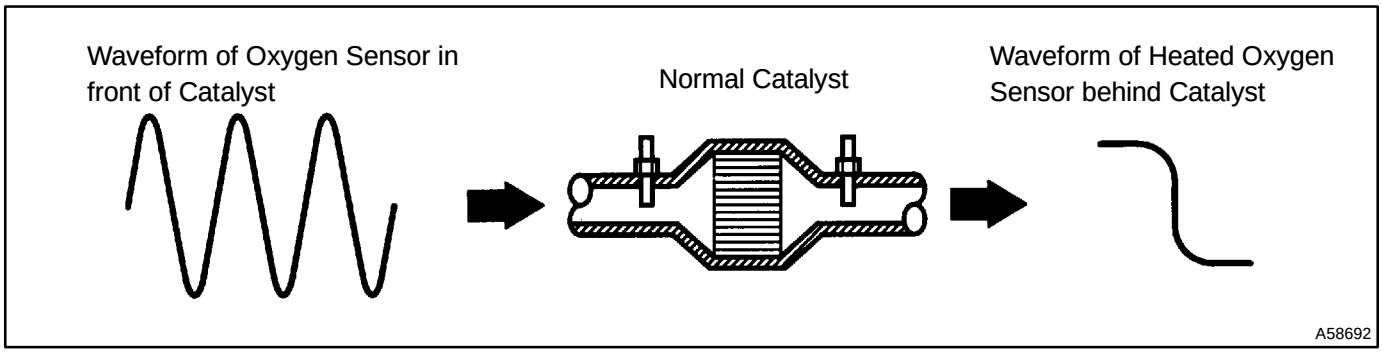
CIRCUIT DESCRIPTION

The ECM compares the waveform of the oxygen sensor located in front of the catalyst with the waveform of the heated oxygen sensor located behind the catalyst to determine whether or not the catalyst performance has deteriorated.

Air-fuel ratio feedback compensation keeps the waveform of the oxygen sensor in front of the catalyst repeatedly changing back and forth, from rich to lean.

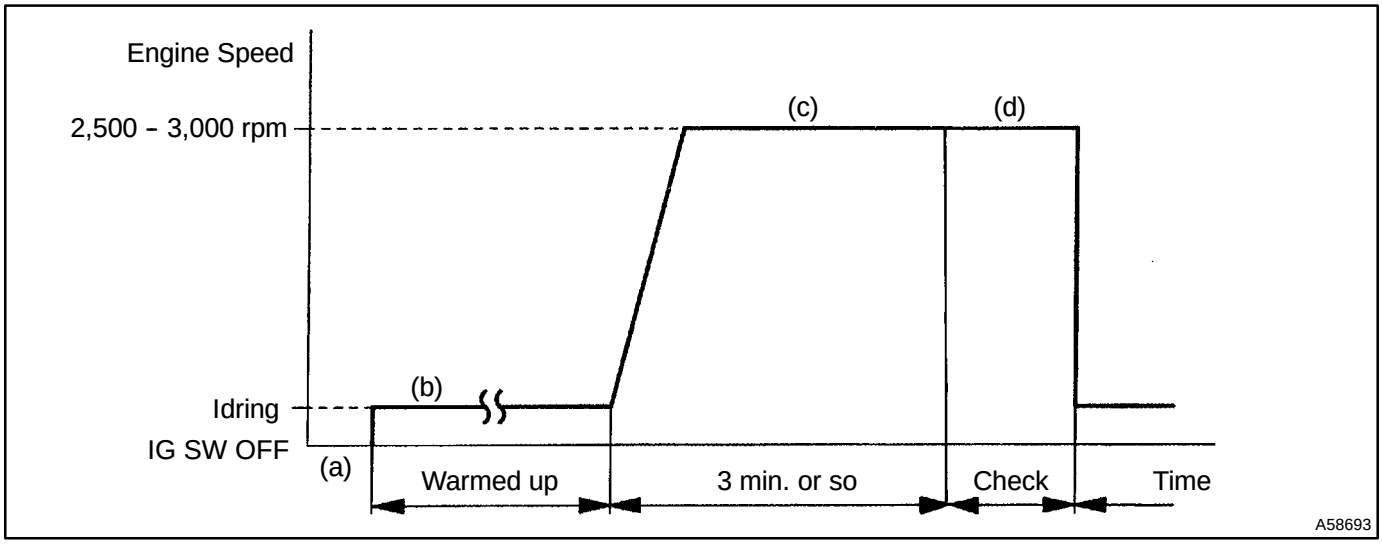
If the catalyst is functioning normally, the waveform of the heated oxygen sensor behind the catalyst switches back and forth between rich and lean much more slowly than the waveform of the oxygen sensor in front of the catalyst.

But when both waveforms change at a similar rate, it is indicated that the catalyst performance has deteriorated.

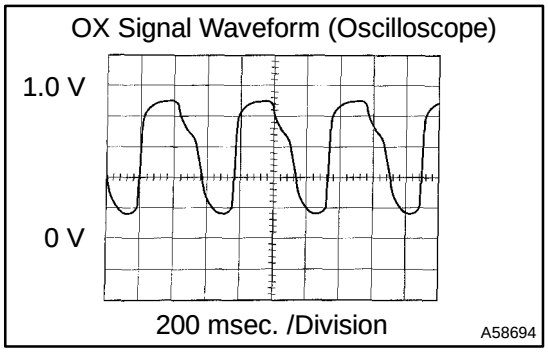


DTC No.	DTC Detecting Condition	Trouble Area
P0420	After engine and catalyst are warmed up, and while vehicle is driven within set vehicle and engine speed range, waveforms of oxygen sensors have same amplitude (2 trip detection logic)	S Gas leakage on exhaust system S Heated oxygen sensor S Three-way catalytic converter

CONFIRMATION DRIVING PATTERN



(a) Connect the hand-held tester to the DLC3, or connect the probe of the oscilloscope between terminals HAF1A, HAF2A, OX1B, OX2B and E1 of the ECM connector.
(b) Start the engine and warm it up with all the accessories switched OFF until the water temperature is stable.
(c) Race the engine at 2,500 - 3,000 rpm for about 3 min.
(d) After confirming that the waveforms of the oxygen sensor (bank 1 sensor 1 (AF1A, AF2A)) which oscillates around 0.5 V during feedback to the ECM, check the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX1B, OX2B)).



HINT:
- If there is a malfunction in the system, the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX1B)) is almost the same as that of the oxygen sensor (bank 1, 2 sensor 1 (AF1A, AF2A)) on the left.
- There are some cases that, the MIL may either light up or not light up even though a malfunction exists.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0420)

(a) Read the DTCs with the hand-held tester.
Result:

	A	B
RESULT	P0420 are output	P0420 and other codes are output

B → GO TO RELEVANT DTC CHART

A

2	CHECK EXHAUST GAS LEAK

NG → REPAIR OR REPLACE

OK

3	CHECK OXYGEN SENSOR(BANK 1 SENSOR 1) (See page 12-11)

NG → REPAIR OR REPLACE OXYGEN SENSOR

OK

4	CHECK OXYGEN SENSOR(BANK 1 SENSOR 2) (See page 12-11)

NG → REPAIR OR REPLACE OXYGEN SENSOR

OK

REPLACE THREE-WAY CATALYTIC CONVERTER

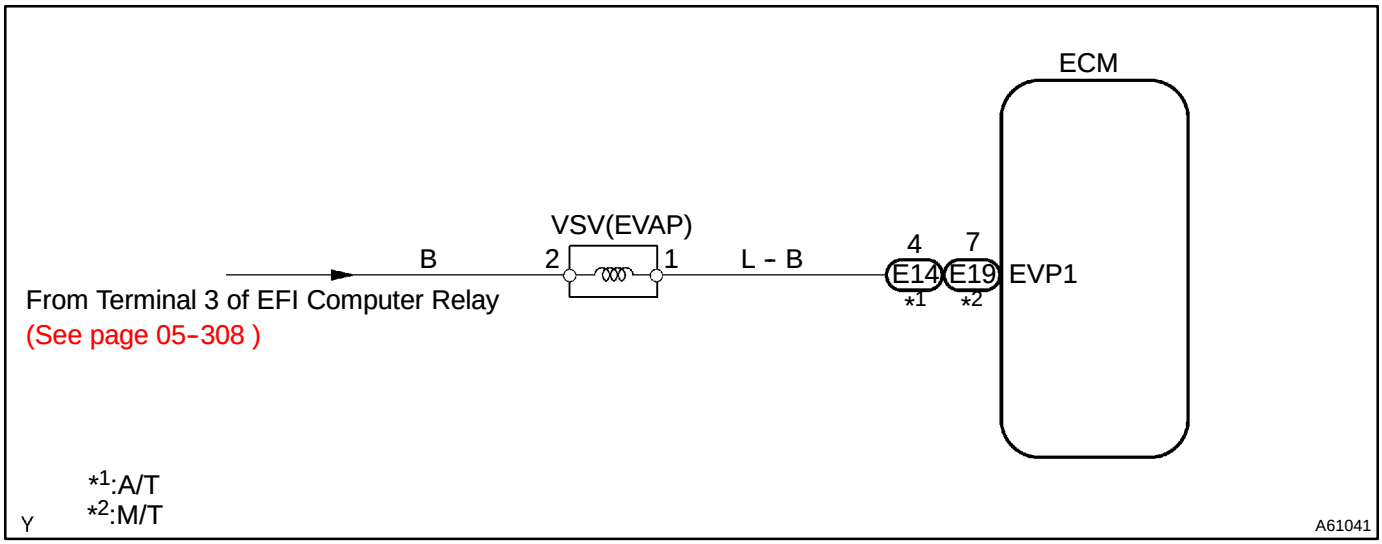
DTC	P0443	EVAPORATIVE EMISSOION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

To reduce HC emissions, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.
The ECM changes the duty signal to the VSV for the EVAP so that the intake quantity of HC emissions is appropriate for the driving conditions (engine load, engine speed, vehicle speed, etc.) after the engine is warmed up.

DTC No.	DTC Detecting Condition	Trouble Area
P0443	Proper response to ECM command does not occur	S Open of short in VSV circuit for EVAP S VSV for EVAP S ECM

WIRING DIAGRAM

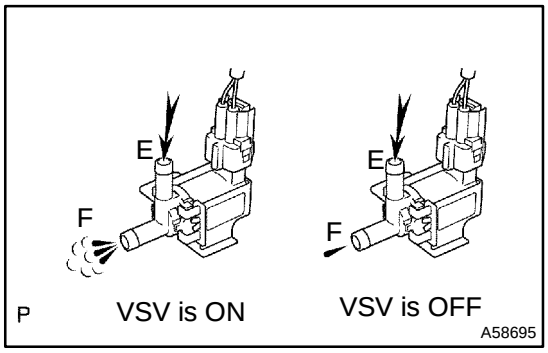


INSPECTION PROCEDURE

HINT:
Read freeze frame data using a hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(VSV FOR EVAP)



(a) Select the ACTIVE TEST mode on the hand-held tester.
(b) Disconnect the vacuum hose from the VSV for the EVAP.
(c) Start the engine.
(d) When the VSV for the EVAP is operated by the hand-held tester, apply the disconnected hose to your finger to check the suction.

Result:
VSV is ON: Disconnected hose sucks.
VSV is OFF: Disconnected hose does not suck.

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2	CHECK OPERATION OF VSV(FOR EVAP) (See page 12-11)

NG → **REPLACE VACUUM SWITCHING VALVE NO.1**

OK

3	CHECK WIRE HARNESS OR CONNECTOR(ECM-EFI RELAY) (See page 05-308)

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

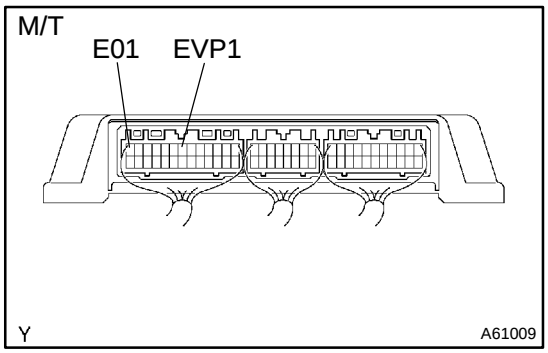
When not using hand-held tester:

1	CHECK OPERATION OF VSV(FOR EVAP) (See page 12-11)

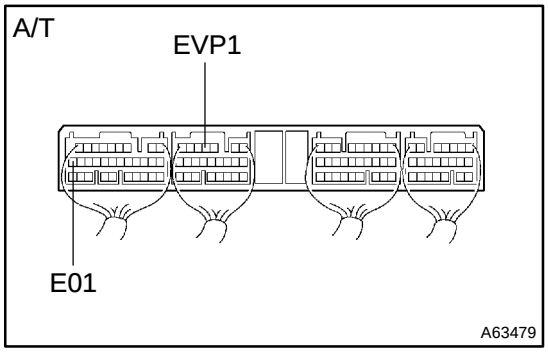
NG → **REPLACE VACUUM SWITCHING VALVE NO.1**

OK

2	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals EVP1 of the ECM connector and E01 of the ECM connector.
Voltage: 9 - 14 V



NG → **CHECK WIRE HARNESS OR CONNECTOR**

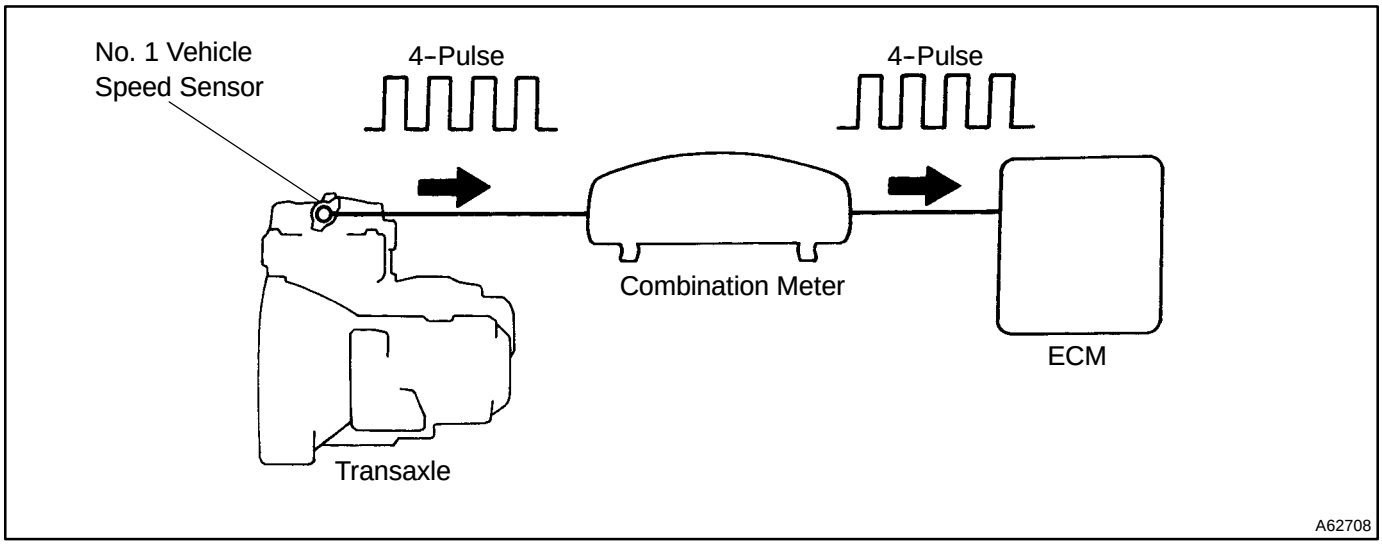
OK →

CHECK AND REPLACE ECM

DTC	P0500	VEHICLE SPEED SENSOR MALFUNCTION

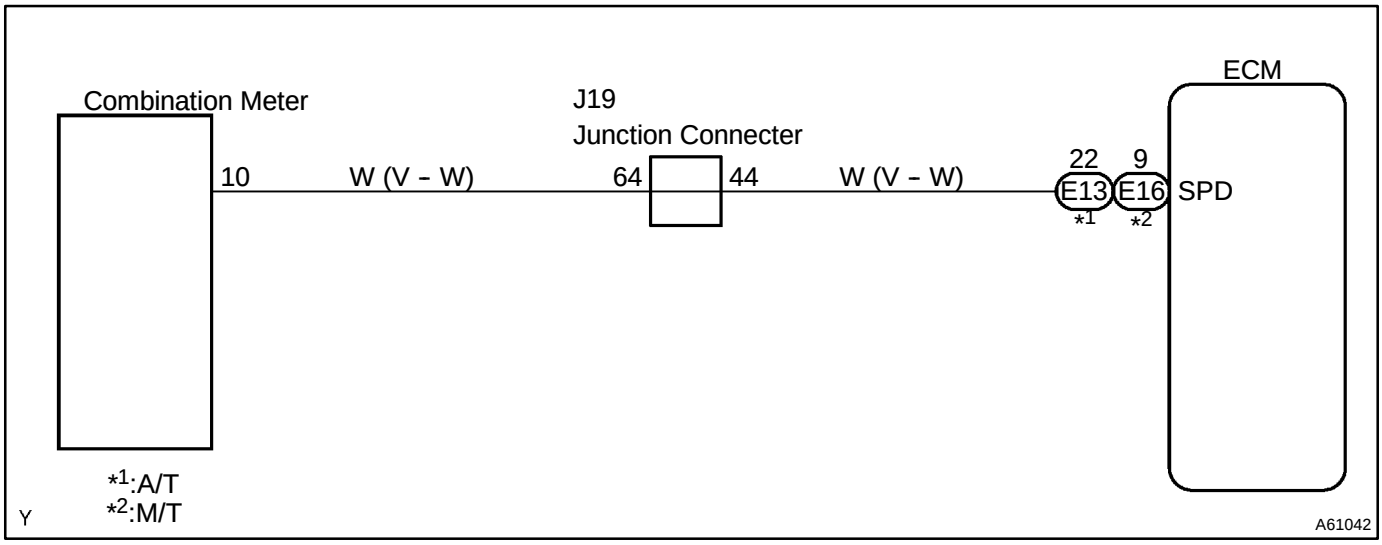
CIRCUIT DESCRIPTION

The vehicle speed sensor outputs a 4-pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the ECM. The ECM determines the vehicle speed based on the frequency of these pulse signals.



DTC No.	DTC Detecting Condition	Trouble Area
P0500	During vehicle is being driven, no vehicle speed sensor signal to ECM (2 trip detection logic)	·Combination meter ·Open or short in No.1 vehicle speed sensor circuit ·No.1 vehicle speed sensor ·ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

HINT:Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester:

1	CHECK OPERATION OF SPEEDOMETER(SPEEDOMETER OPERATION)

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.

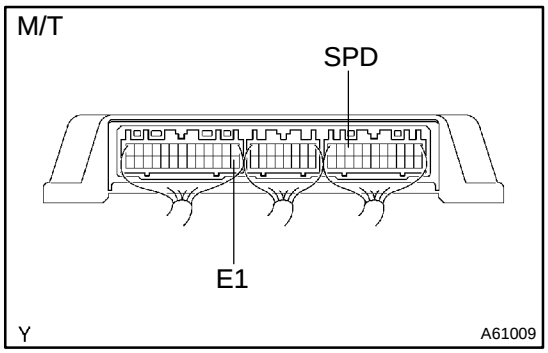
HINT:

The vehicle speed sensor is operating normally if the speedometer display is normal.

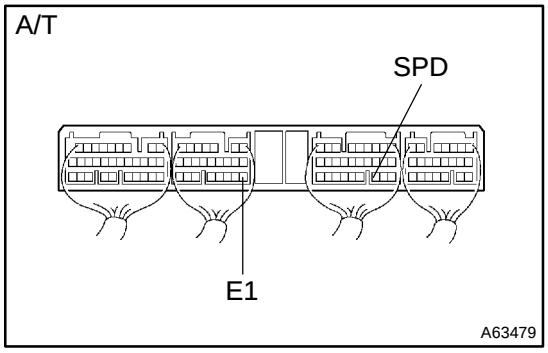
NG → CHECK SPEEDOMETER CIRCUIT

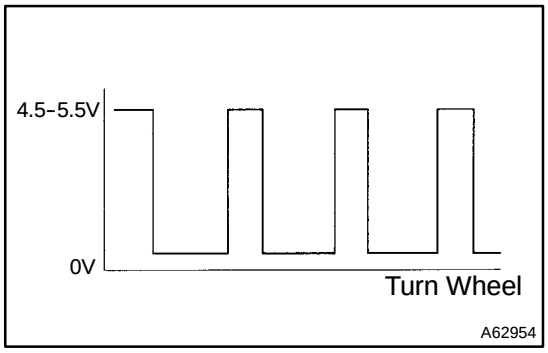
OK

2	INSPECT ECM(CHECK VOLTAGE)



(a) Shift the lever to the neutral position.
(b) Jack up the vehicle.
(c) Turn the ignition switch ON.
(d) Measure the voltage between terminal SPD of the ECM connector and E1 of the ECM connector with turning the wheel slowly.
Voltage: Generated intermittently





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

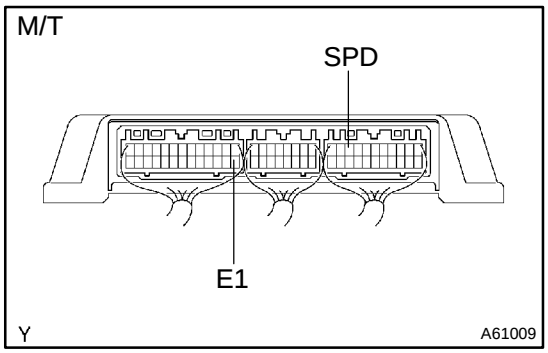
1	CHECK OPERATION OF SPEEDOMETER(SPEEDMETER OPERATION)

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.
HINT:
The vehicle speed sensor is operating normally if the speedmeter display is normal.

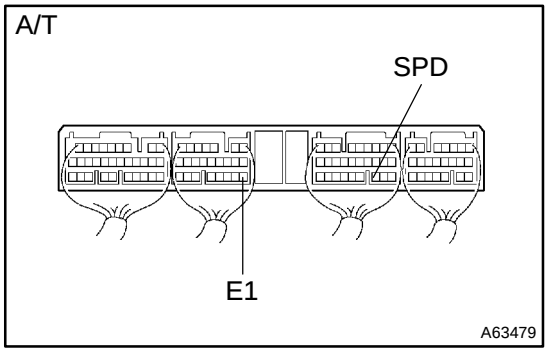
NG → **CHECK SPEEDOMETER CIRCUIT**

OK

2 INSPECT ECM



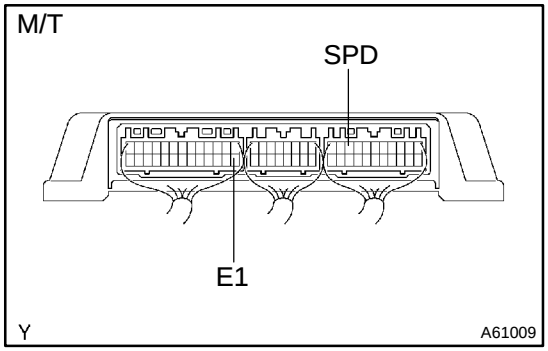
(a) Check continuity between the terminals SPD and E1 of the ECM connector.
Resistance: No continuity



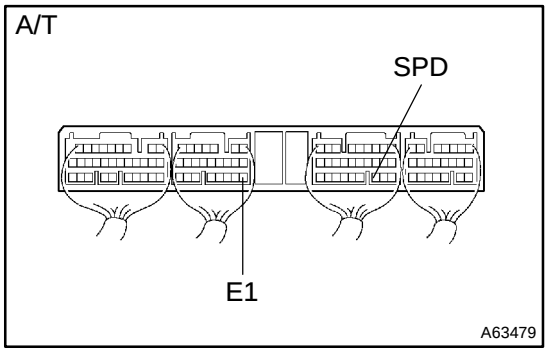
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals SPD of the ECM E6 connector and E1 of the ECM connector.
Voltage: 0 - 5 V



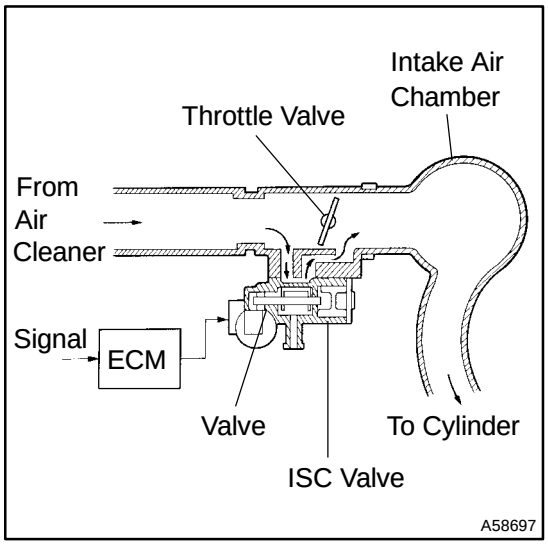
NG → **CHECK AND REPLACE ECM**

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

DTC P0505 IDLE CONTROL SYSTEM MALFUNCTION

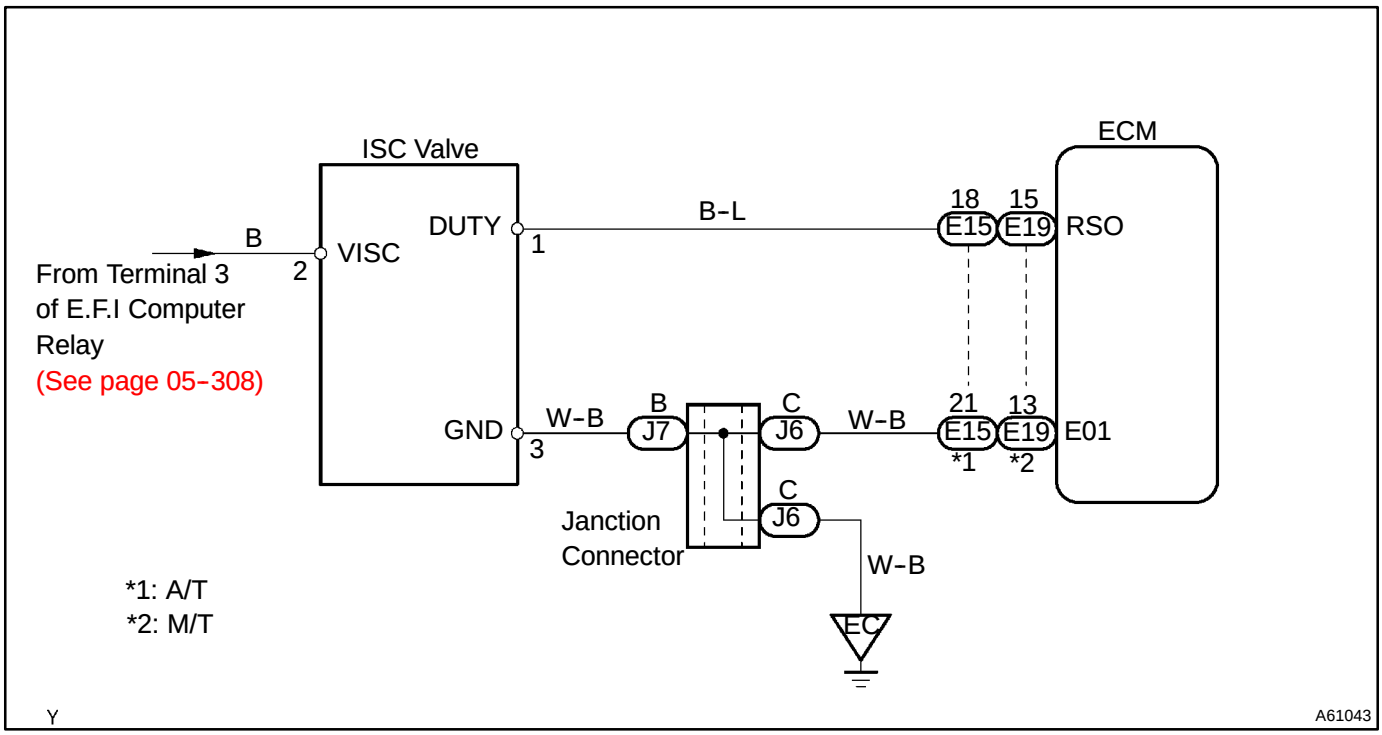
CIRCUIT DESCRIPTION



The rotary solenoid type ISC valve is located under the throttle body and intake air bypassing the throttle valve is directed to the ISC valve through the passage.
In this way the intake air volume bypassing the throttle valve is regulated, controlling the engine speed.
The ECM operates the ISC valve only to perform idle-up and provide feedback for the target idling speed.

DTC No.	DTC Detecting Condition	Trouble Area
P0505	Idle speed continues to be apart greatly from target speed	S Open or short in ISC valve circuit S ISC valve is stuck or closed S Open or short in A/C switch circuit S Air induction system S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freed frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand–held tester

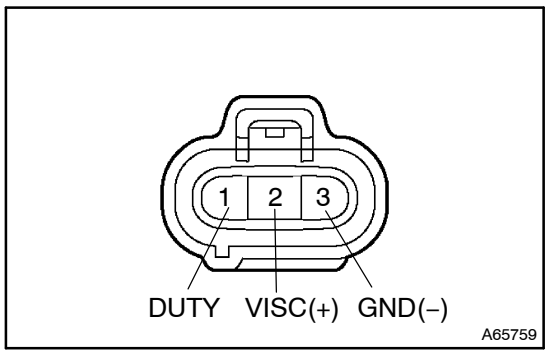
1	**PERFORM ACTIVE TEST BY HAND–HELD TESTER(CHECK OPERATION OF THE ISC VALVE)**

(a) Warm up the engine to the normal operating temperature.
(b) Switch off all the accessories.
(c) Switch off the A/C.
(d) Shift the lever into the neutral position.
(e) Connect the hand–held tester to the DLC3 on the vehicle.
(f) Check the difference of the engine speed in less than 5 seconds and more than 5 seconds.
Difference of engine speed: More than 100 rpm.

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2	**CHECK HARNESS AND CONNECTOR**

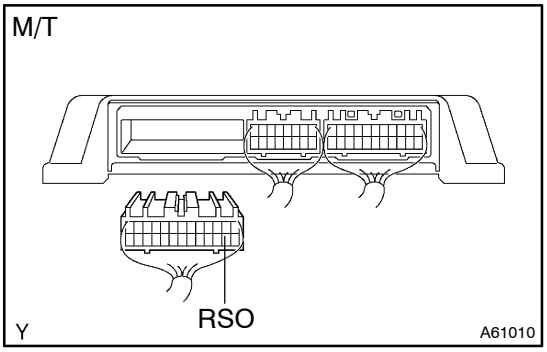


(a) Disconnect the ISC valve connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals VISC and GND of the ISC valve connector.
Voltage: 9 – 14 V

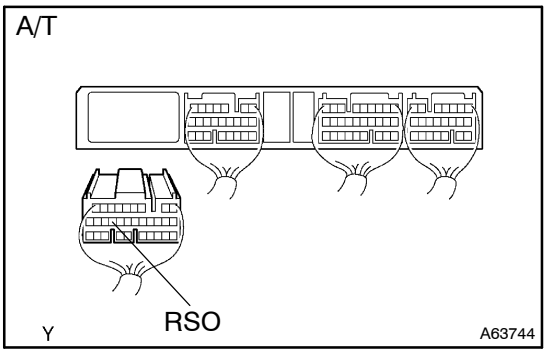
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

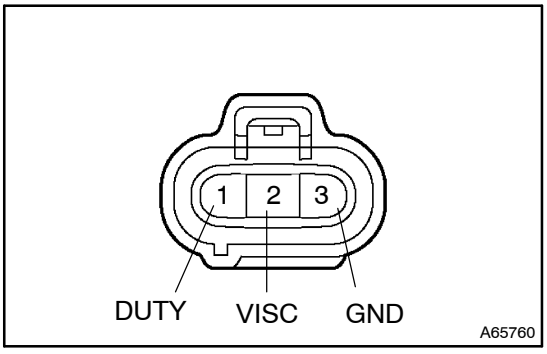
NG

3	CHECK HARNESS AND CONNECTOR(RSD CIRCUIT)



(a) Disconnect the ECM E19connector. (M/T)
(b) Disconnect the ECM E15connector. (A/T)
(c) Disconnect the ISC valve connector.
(d) Check continuity between the terminals RSO of the ECM connector and VISC of the ISC valve connector.
Resistance: 1Ω or less
(e) Check for short between the terminals RSO of the ECM connector and GND of the ISC valve connector.
Resistance: 1MΩ or more





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	INSPECT THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY (See page 10–8)

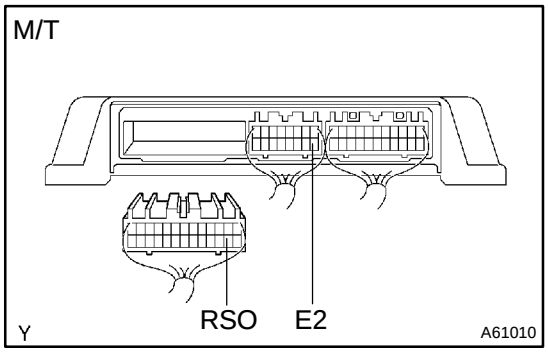
NG → **REPLACE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

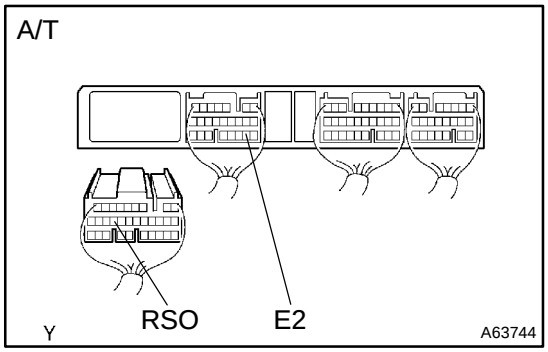
CHECK AND REPLACE ECM

When not using hand-held tester

1	INSPECT ECM(CHECK VOLTAGE)



(a) Disconnect the ECM E19connector. (M/T)
(b) Disconnect the ECM E15connector. (A/T)
(c) Turn the ignition switch ON.
(d) Measure voltage between terminals RSO and E2 of the ECM connector.
Voltage: 9 - 14 V



OK → **Go to step 3**

NG

2	CHECK THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

NG → **REPLACE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

3	CHECK THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

NG → **REPAIR OR REPLACE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

4	CHECK BLOCKAGE OF ISC VALVE AND PASSAGE TO BYPASS THROTTLE VALVE

NG → REPAIR OR REPLACE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

OK

CHECK AND REPLACE ECM

DTC	P1300	IGNITER CIRCUIT MALFUNCTION(NO.1)

DTC	P1305	IGNITER CIRCUIT MALFUNCTION(NO.2)

DTC	P1310	IGNITER CIRCUIT MALFUNCTION(NO.3)

DTC	P1315	IGNITER CIRCUIT MALFUNCTION(No.4)

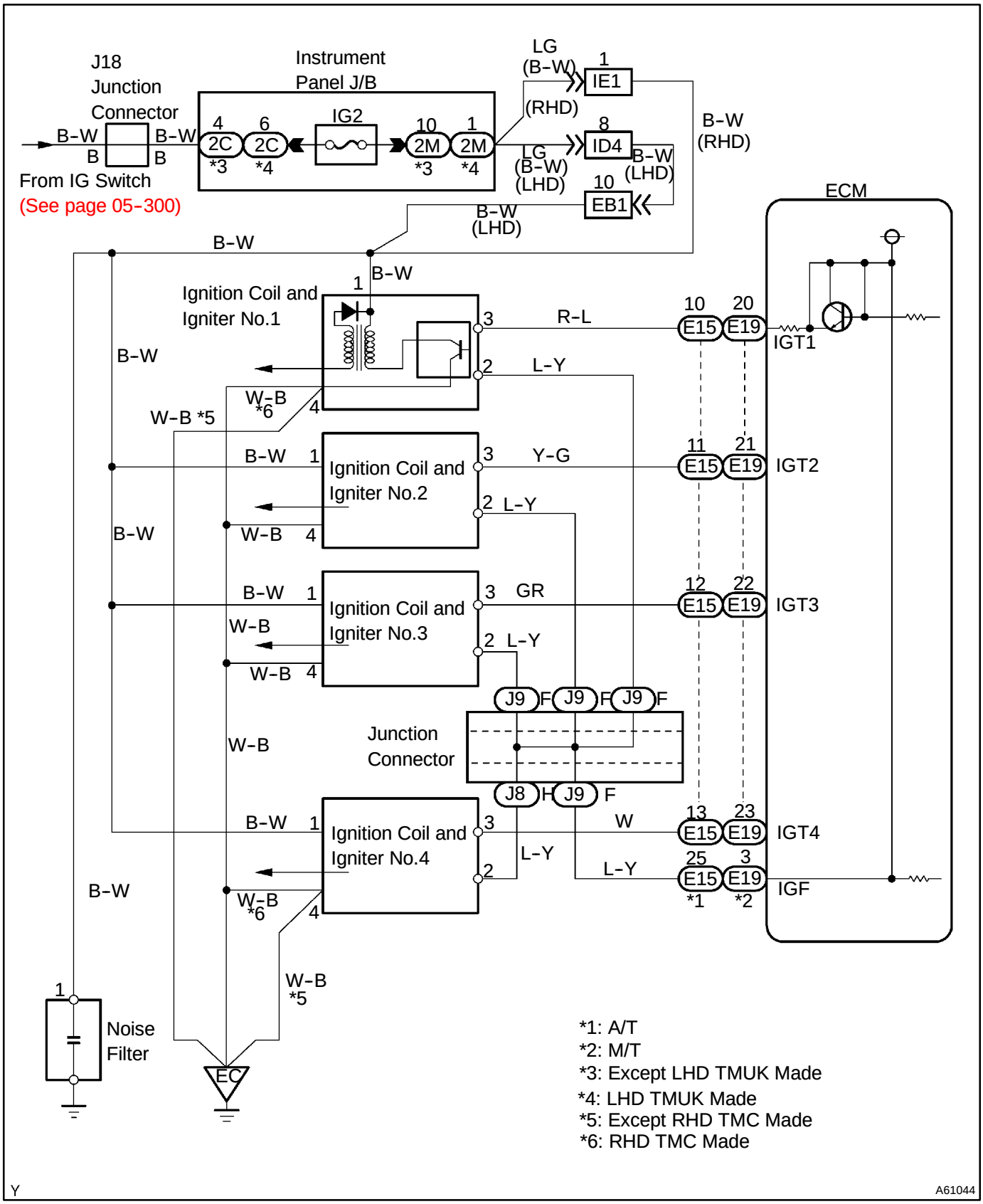
CIRCUIT DESCRIPTION

A Direct Ignition System (DIS) has been adopted. The DIS improves the ignition timing accuracy, reduces the high-voltage loss, and enhances overall reliability of the ignition system by eliminating the distributor. The DIS is a 1-cylinder ignition system which ignites one cylinder with one ignition coil. In the 1-cylinder ignition system, the spark plug is connected to the end of the secondary winding. High voltage generated in the secondary winding is applied directly to the spark plug. The spark of the spark plug passes through from the center electrode to the ground electrode.

The ECM determines ignition timing and outputs the ignition signals (IGT) of each cylinder. Based on IGT signals, the power transistors cut off the current to the primary coil in the ignition coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail-safe measurement to the ECM.

DTC No.	DTC Detecting Condition	Trouble Area
P1300 P1305 P1310 P1315	No IGF signal to ECM while engine is running	S Ignition system S Open or short in IGF and IGT circuit from ignition coil with igniter S ignition coil with igniter S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

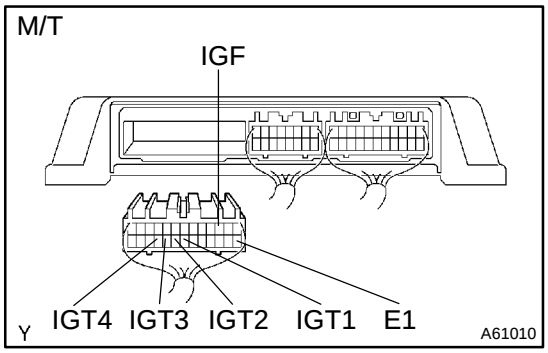
- If DTC P1300 is displayed, check No.1 ignition coil with igniter circuit.
- If DTC P1305 is displayed, check No.2 ignition coil with igniter circuit.
- If DTC P1310 is displayed, check No.3 ignition coil with igniter circuit.
- If DTC P1315 is displayed, check No.4 ignition coil with igniter circuit.
- Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction

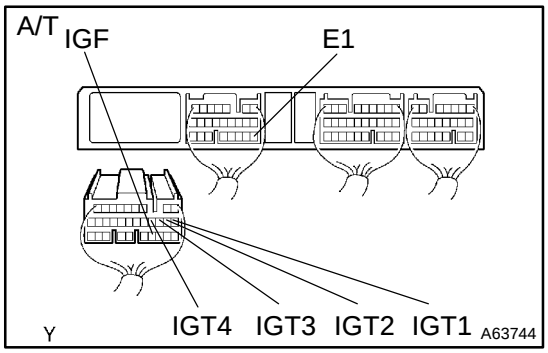
1	CHECK SPARK PLUG AND SPARK (See page 18-5)

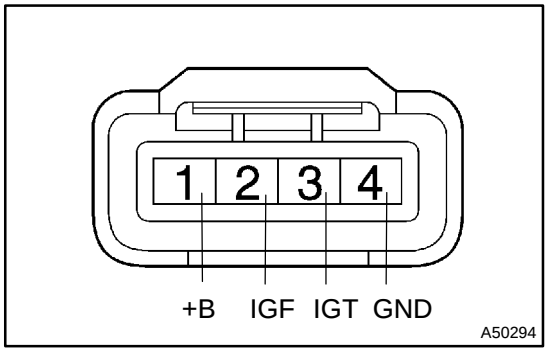
NG → Go to step 4

OK

2	CHECK HARNESS AND CONNECTOR(ECM-IGNITION COIL)







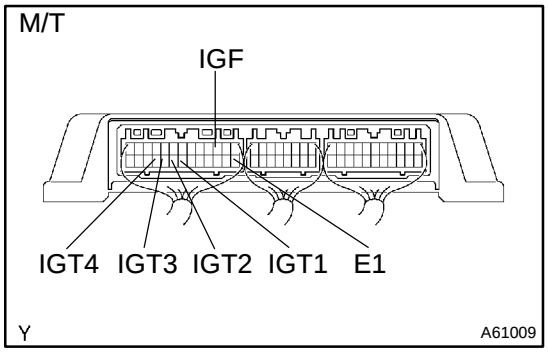
(a) Disconnect the ignition coil connector.
(b) Disconnect the ECM E19 connector. (M/T)
(c) Disconnect the ECM E15 connector. (A/T)
(d) Check for open between the terminals IGF of the ECM connector and IGF of the ignition coil connector.
Resistance: 1Ω or less
(e) Check for short between the terminals IGF of the ECM connector and E1 of the ECM connector.
Resistance: 1MΩ or less.

HINT:
The procedure below is for NO.1 cylinder. If a malfunction is found on the other cylinders, check the circuit for the cylinder with referring to this procedure.

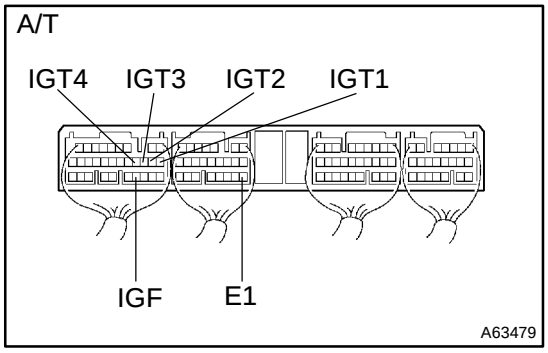
NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3	INSPECT ECM(CHECK VOLTAGE)



(a) Disconnect the ignition coil connector.
(b) Turn the ignition switch ON
(c) Measure voltage between the terminals IGF of the ECM connector and E1 ECM connector.
Voltage: 4.5 - 5.5 V

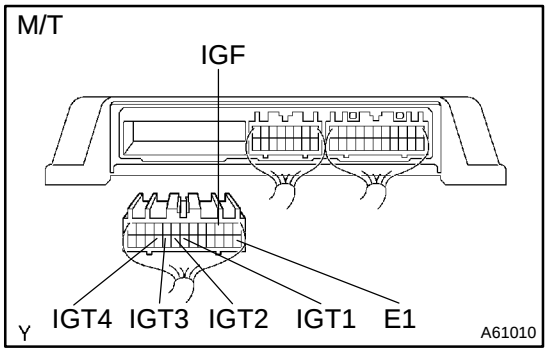


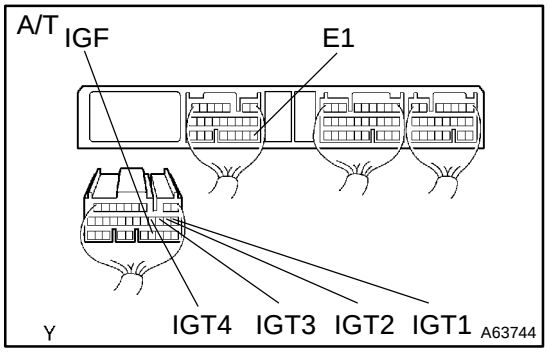
OK → **REPLACE IGNITION COIL ASSY**

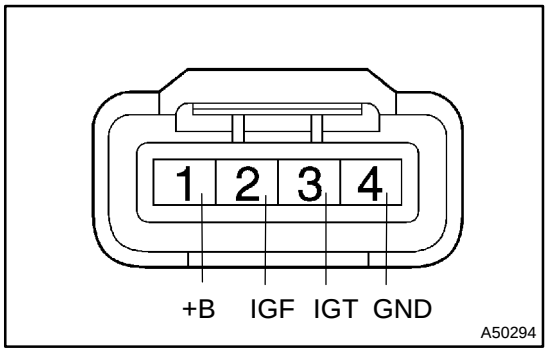
NG

CHECK AND REPLACE ECM

4	CHECK HARNESS AND CONNECTOR(ECM-IGNITION COIL)







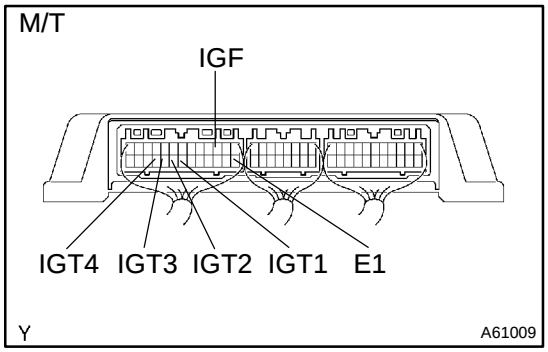
(a) Disconnect the ignition coil connector.
(b) Disconnect the ECM E19 connector. (M/T)
(c) Disconnect the ECM E15 connector. (A/T)
(d) Check for open between the terminals IGT1 of the ECM connector and IGT of the ignition coil connector.
Resistance: 1Ω or less
(e) Check for short between the terminals IGT1 of the ECM connector and E1 of the ECM connector.
Resistance: 1MΩ or more.

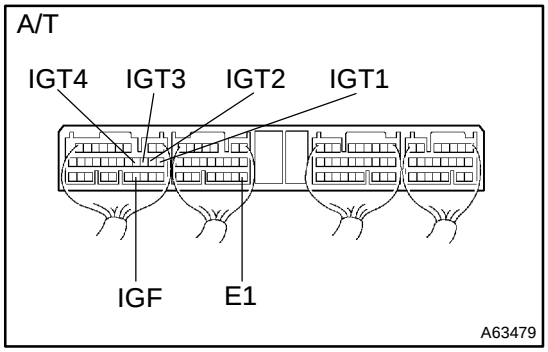
HINT:
The procedure below is for NO.1 cylinder. If a malfunction is found on the other cylinders, check the circuit for the cylinder with referring to this procedure.

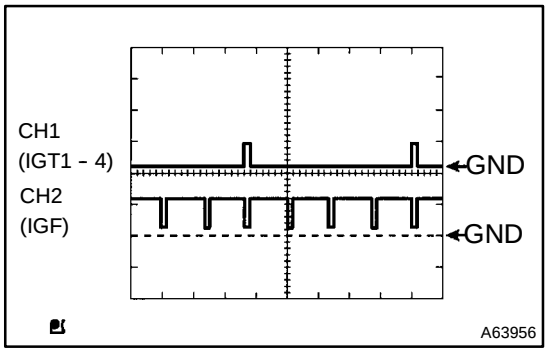
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5 INSPECT ECM(CHECK VOLTAGE)







(a) Turn the ignition switch ON.

(b) Measure the voltage between terminals IGT1 - IGT4 of the ECM connector and E1 of the ECM connector when the engine is cranked.

Voltage: More than 0.1 V and less than 4.5 V

HINT:

During cranking or idling, check the waveform between terminals IGT1 - IGT4 and E1 of the ECM connector.

Item	Contents
Terminal	CH1: IGT1, IGT2, IGT3, IGT4 - E1 CH2: IGF - E1
Equipment Set	2V/DIV, 20ms/DIV
Condition	While the engine is cranking or idling

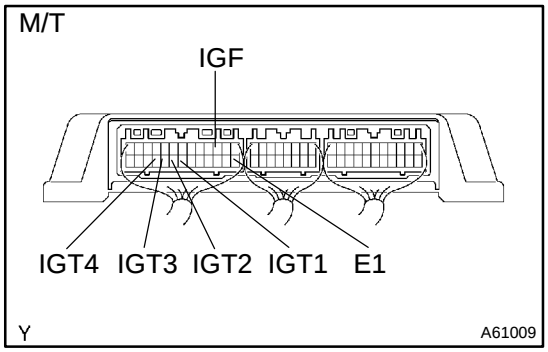
HINT:

Correct waveform appears as shown, with rectangle waves.

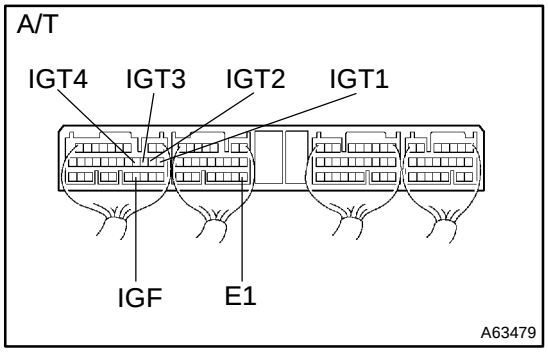
OK

NG → **CHECK AND REPLACE ECM**

6 INSPECT ECM(CHECK VOLTAGE)



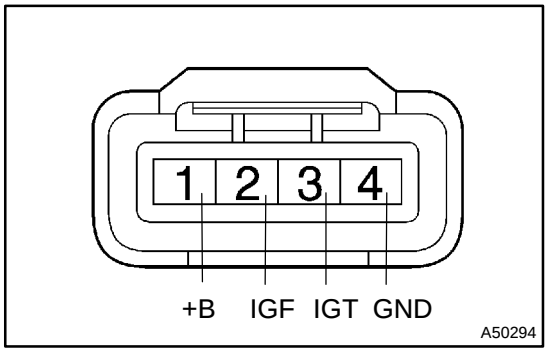
(a) Disconnect the ignition coil with the igniter connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminals IGT1 – IGT4 of the ECM connector and E1 of the ECM connector when the engine is cranked.
Voltage: More than 0.1 V and less than 4.5 V



NG → **CHECK AND REPLACE ECM**

OK

7 CHECK IGNITION COIL ASSY(POWER SOURCE)

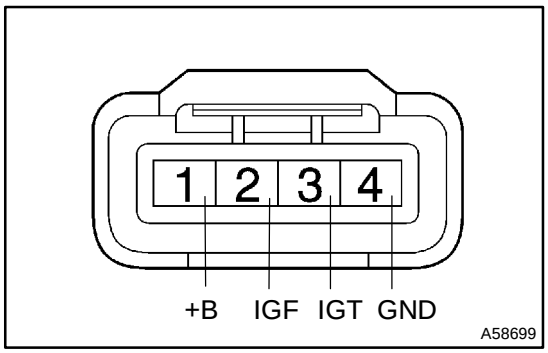


(a) Disconnect the ignition coil with the igniter connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals+B and GND of the ignition coil with the igniter connector.
Voltage: 9 - 14 V

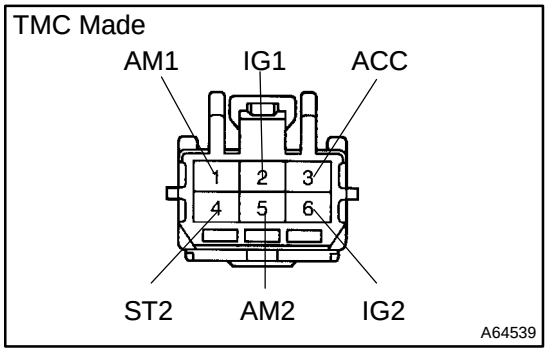
OK → **REPAIR OR REPLACE POWER SOURCE**

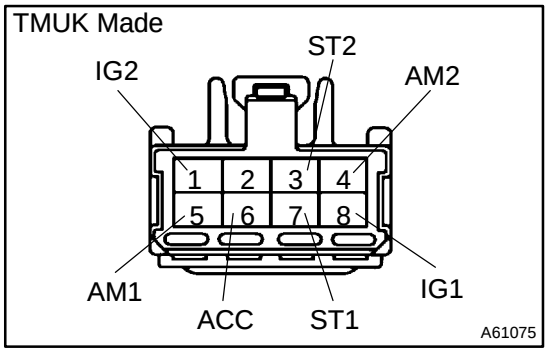
NG

8	CHECK HARNESS AND CONNECTOR(IGNITION SWITCH-IGNITION COIL)



(a) Disconnect the ignition coil with igniter connector.
(b) Disconnect the ignition switch connector.
(c) Check for open between the terminals +B of the ignition coil with igniter connector and IG2 of the ignition switch connector.
Resistance: 1 Ω or less





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK →

REPLACE IGNITION COIL ASSY

DTC	P1335	CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION(DURING ENGINE RUNNING)

CIRCUIT DESCRIPTION

Refer to DTC P0335 on page 05-242.

DTC No.	DTC Detecting Condition	Trouble Area
P1335	If conditions (a) through (c) are met: (a) NE ≧ 1,000 rpm (b) NE signal is not detected for over 50 msec. (c) Not during cranking	S Open or short in crank position sensor circuit S Crank position sensor S Crank angle sensor plate S ECM

WIRING DIAGRAM

Refer to DTC P0335 on page 05-242.

INSPECTION PROCEDURE

Refer to DTC P0335 on page 05-242.

DTC	P1346	VVT SENSOR/CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PLOBLEM(BANK1)

CIRCUIT DESCRIPTION

Refer to DTC P0335 on page 05-242.

DTC No.	Detection Item	Trouble Area
P1346	Deviation in crank position sensor No.1 signal and VVT sensor signal (2 trip detection logic)	$ Mechanical system malfunction (Skipping teeth of timing chain, chain stretched) $ ECM

WIRING DIAGRAM

Refer to DTC P0335 on page 05-242.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK VALVE TIMING (See page 14-123)

NG → ADJUST VALVE TIMING

OK

CHECK AND REPLACE ECM

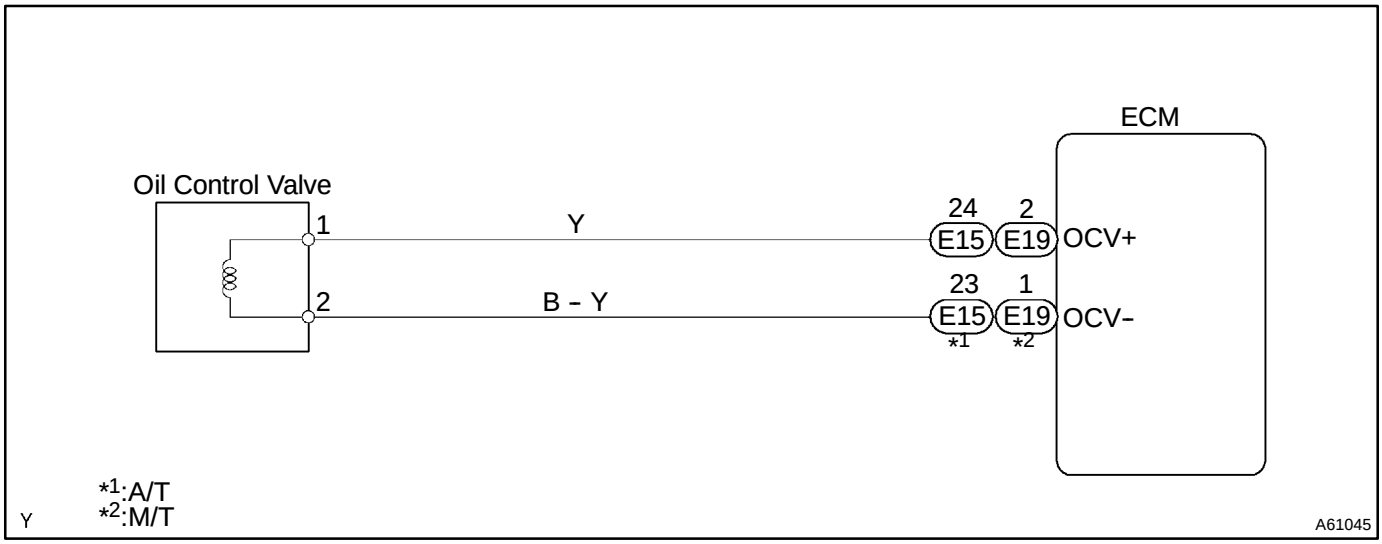
DTC	P1349	VVT SYSTEM MALFUNCTION(BANK1)

CIRCUIT DESCRIPTION

VVT system controls the intake valve timing to proper timing in response to driving condition.
ECM controls OCV (Oil Control Valve) to make the intake valve timing properly, and, oil pressure controlled with OCV is supplied to the VVT controller, and then, VVT controller changes relative position between the camshaft and the crankshaft.

DTC No.	DTC Detecting Condition	Trouble Area
1349	Condition (a) or (b) continues for after the engine is warmed up and engine speed at 400 ~ 4,000 rpm: (a) Valve timing does not change from of current valve timing (b) Current valve timing is fixed	S Valve timing S Oil control valve S VVT controller assembly S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC P1349 is displayed, check VVT system circuit.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand-held tester

1	CHECK VALVE TIMING (See page 14-123)

NG → ADJUST VALVE TIMING

OK

2	PERFORM ACTIVE TEST BY HAND-HELD TESTER(OPERATION OF OCV)

(a) Start the engine and warm it up.
(b) Connect the hand-held tester and select VVT on the ACTIVE TEST menu.
(c) Check the engine speed when operating the OCV by the hand-held tester.
OCV is OFF: Normal engine speed
OCV is ON: Rough idle or engine stall

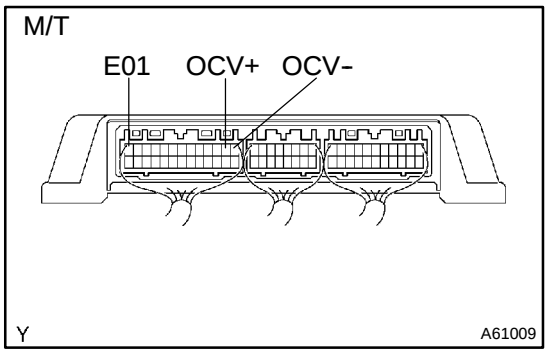
HINT:

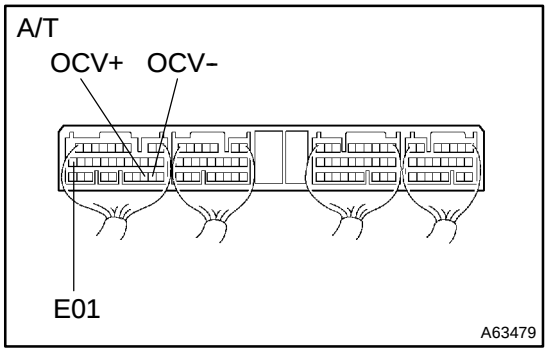
*: DTC P1349/59 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

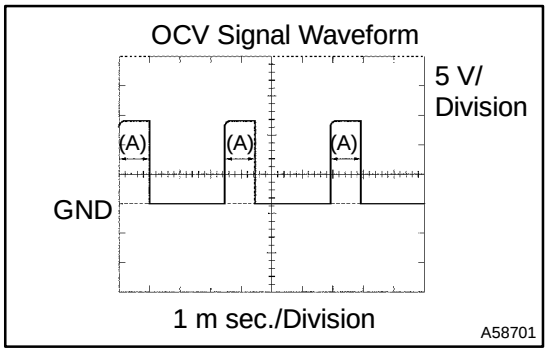
OK → VVT SYSTEM OK

NG

3	INSPECT ECM(CHECK VOLTAGE)







(a) Turn the ignition switch ON.
(b) Check the waveform between terminals OCV+ and OCV- of the ECM connector.

HINT:

- The correct waveform is as shown in the left.
- The waveform frequency (A) becomes longer as the engine speed becomes higher.
- DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

NG → **CHECK AND REPLACE ECM**

OK

4	INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14-136)

NG → **REPLACE VVT CONTROLLER ASSEMBLY,AND THEN GO TO NEXT STEP**

OK

5	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 10-8)

NG → **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY,AND THEN GO TO NEXT STEP**

OK

6	CHECK BLOCKAGE(OCV AND OIL HOLE)

NG → REPAIR OR REPLACE

OK

7	PERFORM SIMULATION TEST(CHECK DTC)

(a) Clear the DTC (See page 05-158).
(b) Perform the simulation test.
(c) Check whether or not DTC P1349 is stored (See page 05-158).

Result:

	A	B
RESULT	P1349 is output.	P1349 is not output.

HINT:
DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

B → VVT SYSTEM OK

A

CHECK AND REPLACE ECM

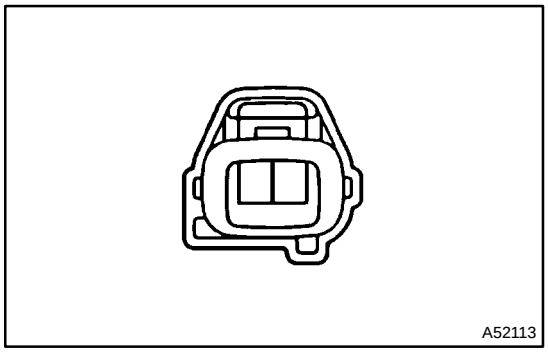
When not using hand held tester

1	CHECK VALVE TIMING (See page 14-123)

NG → ADJUST VALVE TIMING

OK

2	CHECK OPERATION OF OCV



(a) Start the engine.
(b) Check the engine speed when disconnecting the OCV connector.
(c) Check the engine speed when applying battery positive voltage to the terminals of the OCV.

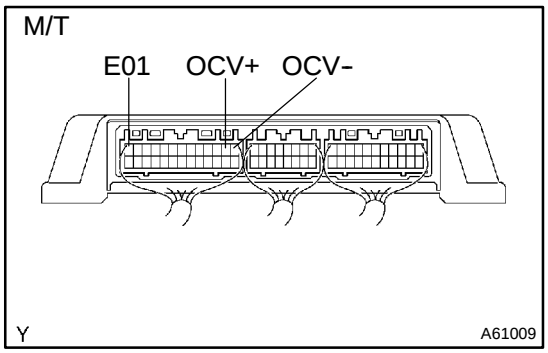
Result:

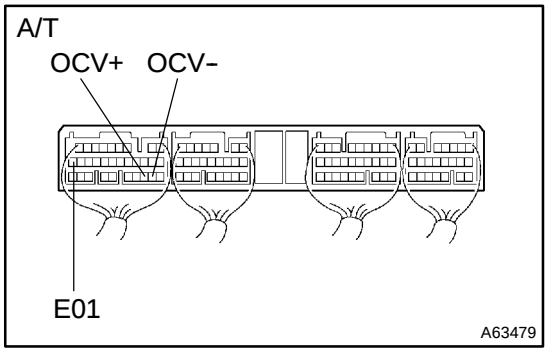
Result	Check (b)	Check (c)
A	Normal engine speed	Rough idle or engine stall
B	Except 1	

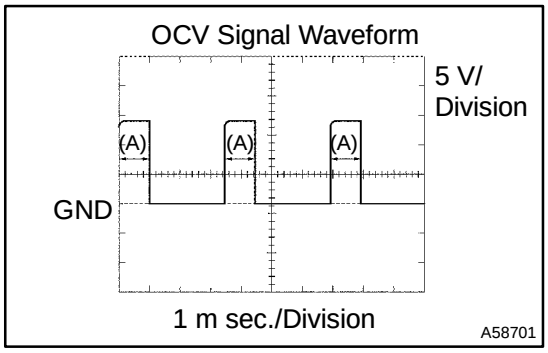
B → Go to step 4

A

3	INSPECT ECM(CHECK VOLTAGE)







(a) Turn the ignition switch ON.
(b) Check the waveform between terminals OCV+ and OCV- of the ECM connector.

HINT:
- The correct waveform is as shown in the left.
- The waveform frequency (A) becomes longer as the engine speed becomes higher.
- DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

OK → VVT SYSTEM OK

NG

CHECK AND REPLACE ECM

4	INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14-136)

NG → REPLACE VVT CONTROLLER ASSEMBLY,AND THEN GO TO NEXT STEP

OK

5	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 10-8)

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY,AND THEN GO TO NEXT STEP

OK

6	CHECK BLOCKAGE(OCV AND OIL HOLE)

NG → REPAIR OR REPLACE

OK

7	PERFORM SIMULATION TEST(DTC CHECK)

(a) Clear the DTC (See page 05-158).
(b) Perform the simulation test.
(c) Check whether or not DTC P1349 is stored (See page 05-158).

Result:

	A	B
RESULT	1349 is output.	1349 is not output.

HINT:
DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

B → VVT SYSTEM OK

A

CHECK AND REPLACE ECM

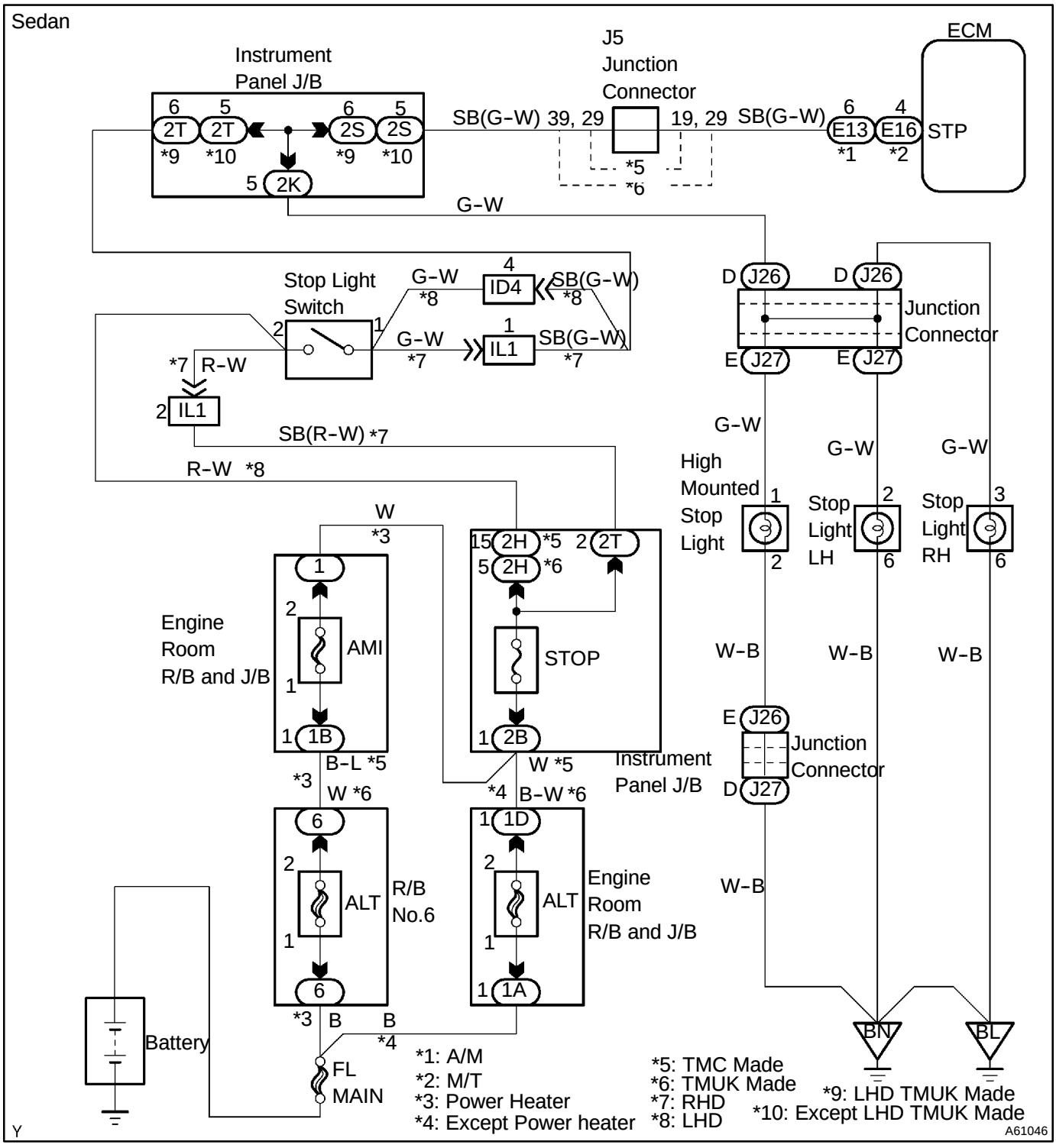
DTC	P1520	STOP LIGHT SWITCH MALFUNCTION

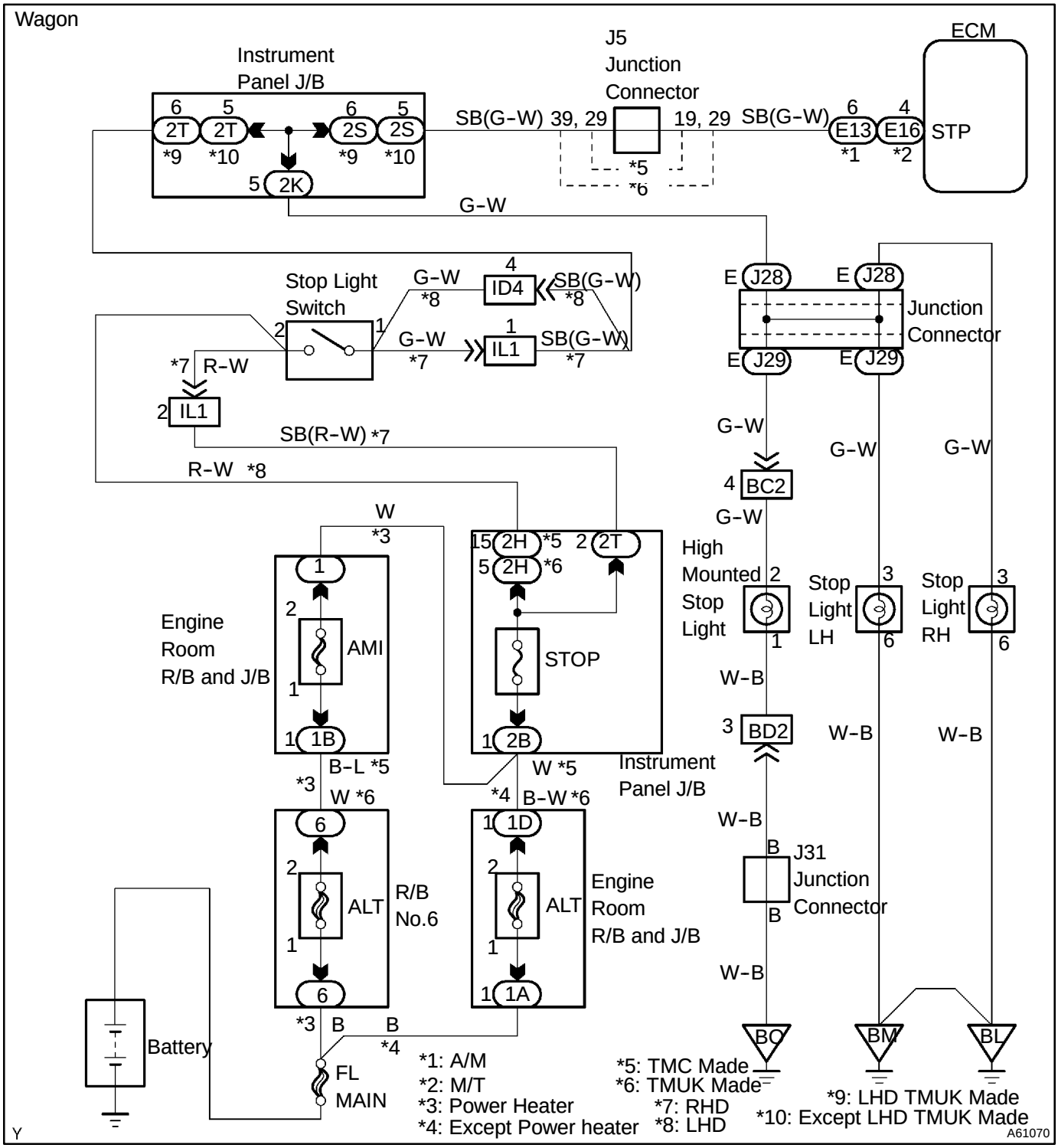
CIRCUIT DESCRIPTION

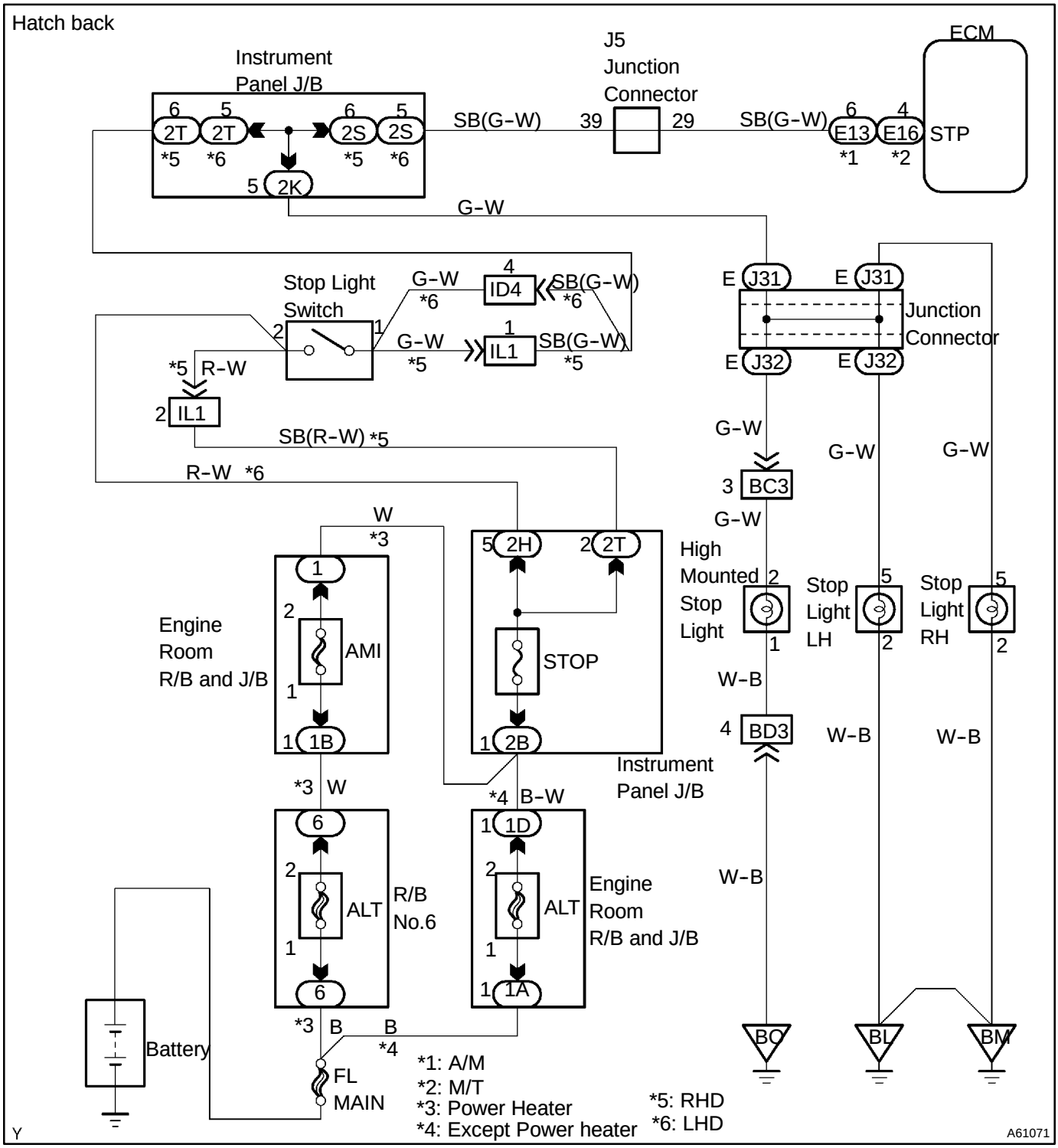
This signal is used to detect that the brakes have been applied. The STP signal voltage is the same as the one supplied to the stop lights.
The STP signal is used mainly to control the fuel cut-off engine speed (The fuel cut-off engine speed is reduced slightly when the vehicle is braking.).

DTC No.	DTC Detecting Condition	Trouble Area
P1520	Stop light switch does not turn off when repeating driving at 30 km or more and 10 time or more after depressing brake (2 trip detection logic)	S Short in stop light switch signal circuit S Stop light switch S ECM

WIRING DIAGRAM




Wagon
Instrument Panel J/B
J5 Junction Connector
ECM
STP
SB(G-W) 39, 29
19, 29 SB(G-W)
G-W
Stop Light Switch
SB(G-W)
R-W
SB(R-W) *7
R-W *8
Junction Connector
High Mounted Stop Light
Stop Light LH
Stop Light RH
Engine Room R/B and J/B
AMI
STOP
B-L *5
W *6
W-B
Instrument Panel J/B
J31 Junction Connector
Engine Room R/B and J/B
R/B No.6
ALT
Battery
FL MAIN
*1: A/M
*2: M/T
*3: Power Heater
*4: Except Power heater
*5: TMC Made
*6: TMUK Made
*7: RHD
*8: LHD
*9: LHD TMUK Made
*10: Except LHD TMUK Made
A61070


Hatch back
Instrument Panel J/B
J5 Junction Connector
ECM
STP
SB(G-W)
G-W
Stop Light Switch
R-W
SB(R-W) *5
R-W *6
Junction Connector
High Mounted Stop Light
Stop Light LH
Stop Light RH
W-B
Engine Room R/B and J/B
AMI
STOP
ALT
R/B No.6
Battery
FL MAIN
*1: A/M
*2: M/T
*3: Power Heater
*4: Except Power heater
*5: RHD
*6: LHD
A61071

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK OPERATION OF STOP LIGHT

(a) Check if the stop lights go on and off normally when the brake pedal is operated and released.

NG → REPAIR OR REPLACE STOP LIGHT SWITCH CIRCUIT

OK

2	READ VALUE OF HAND-HELD TESTER

(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand-held tester main switch ON.
(c) Read the STP signal on the hand-held tester.

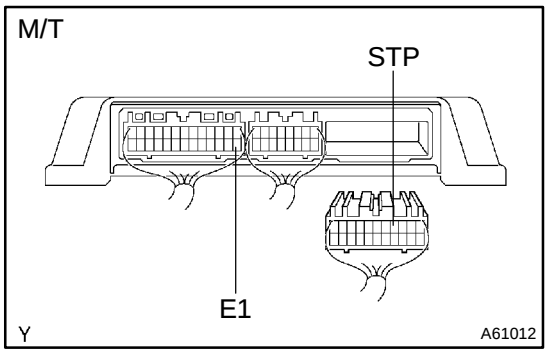
Result:

Brake Pedal	STP Signal
Depressed	ON
Released	OFF

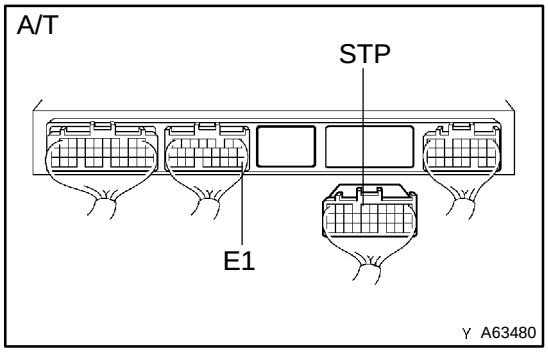
OK → CHECK FOR INTERMITTENT PROBLEMS

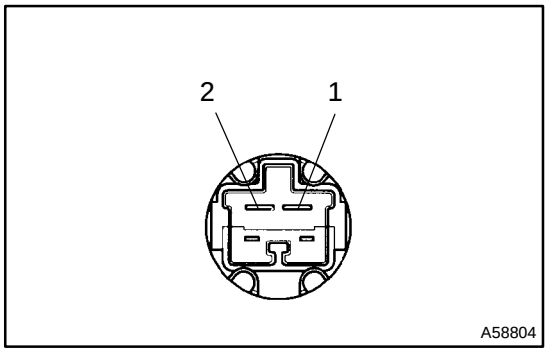
NG

3 CHECK WIRE HARNESS OR CONNECTOR(ECM-STOP LIGHT SWITCH)



(a) Disconnect the ECM E16 connector. (M/T)
(b) Disconnect the ECM E13 connector. (A/T)
(c) Disconnect the stop light connector.
(d) Check for open between the terminals STP of the ECM connector and 1 of the stop light connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals STP of the ECM connector and E1 of the ECM connector.
Resistance: 1 MΩ or more





NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	P1600	BACK-UP POWER SOURCE CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

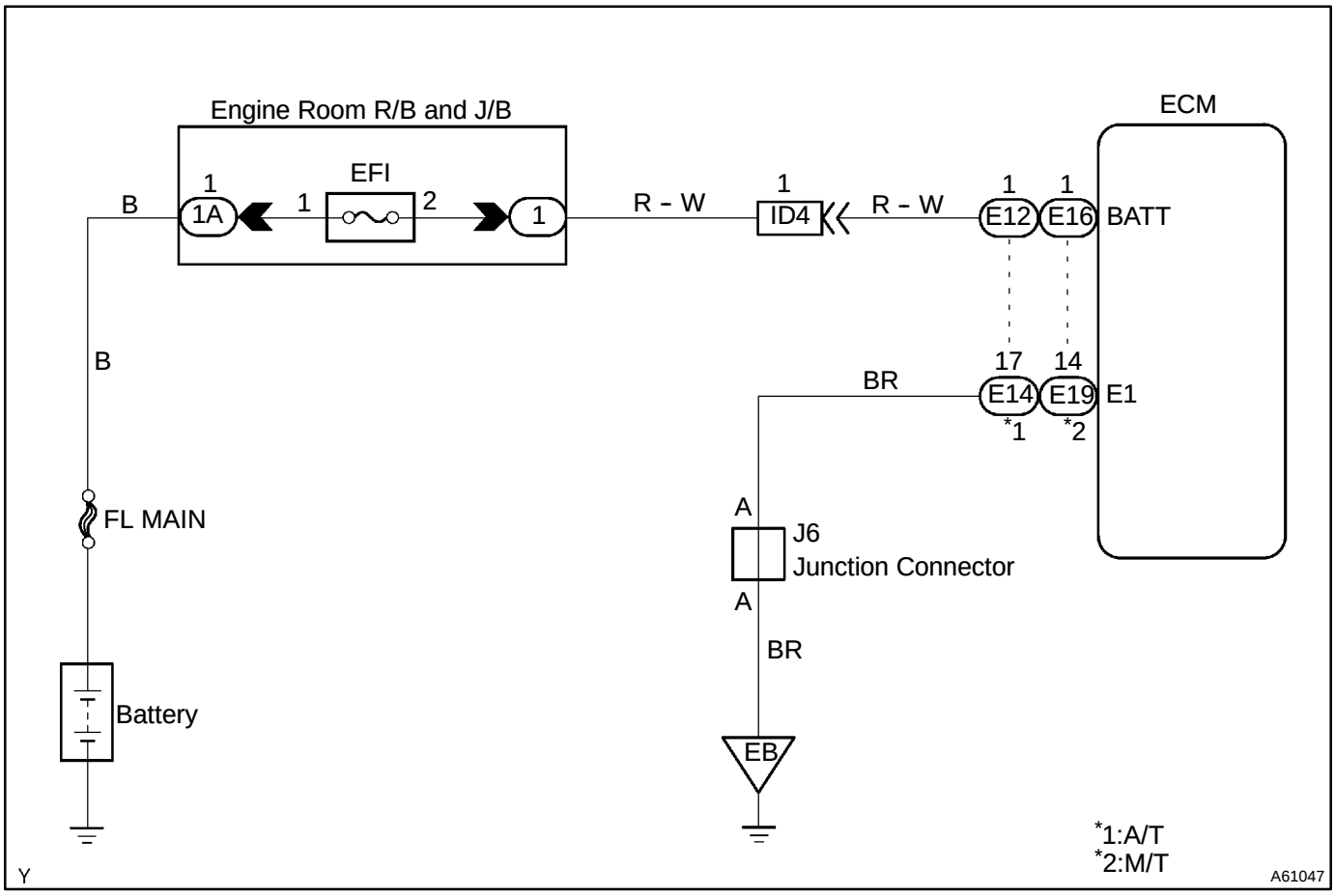
Battery positive voltage is applied to terminal BATT of the ECM even when the ignition switch is OFF for use by the DTC memory and air-fuel ratio adaptive control value memory, etc.

DTC No.	DTC Detecting Condition	Trouble Area
P1600	Open in back up power source circuit	• Open in back up power source circuit • ECM

HINT:

If DTC P1600/96 is displayed, the ECM does not store another DTC.

WIRING DIAGRAM

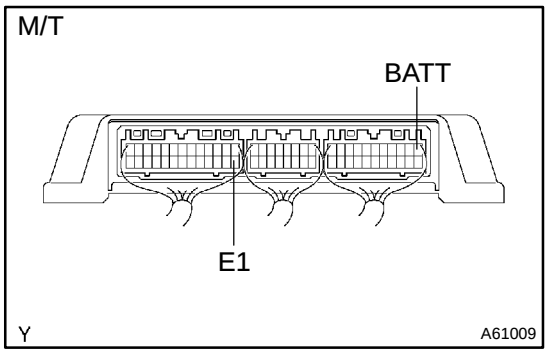


INSPECTION PROCEDURE

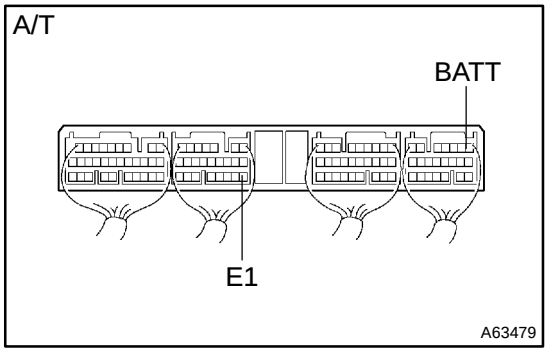
HINT:

Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	INSPECT ECM(CHECK VOLTAGE)



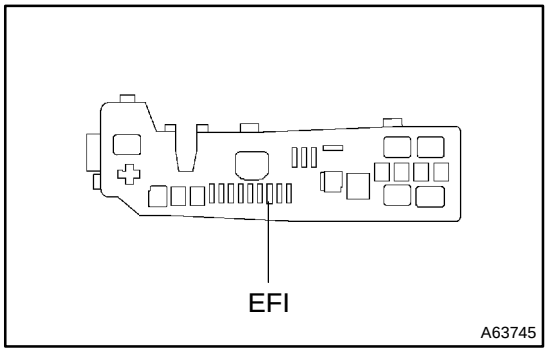
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal BATT of the ECM connector and E1 of the ECM connector.
Voltage: 9 - 14 V



OK → **CHECK AND REPLACE ECM**

NG

2	CHECK FUSE(EFI FUSE)

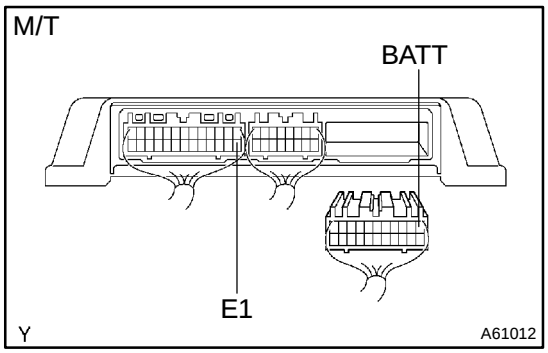


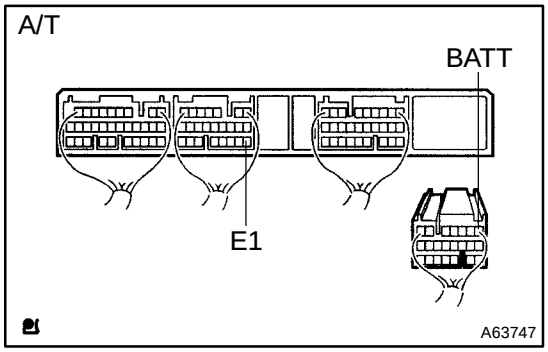
(a) Remove the EFI fuse from the engine room R/B.
(b) Check the continuity of the EFI fuse.
Resistance: 1 Ω or less

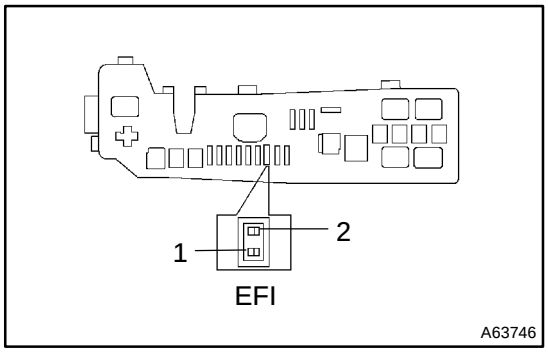
NG → **CHECK FOR SHORT IN ALL HERNESS AND COMPONENTS CONNECTED EFI FUSE**

OK

3 CHECK WIRE HARNESS OR CONNECTOR(EFI FUSE-ECM)







(a) Disconnect the battery negative (-) terminal.
(b) Disconnect the ECM E16 connector.(M/T)
(c) Disconnect the ECM E12 connector.(A/T)
(d) Remove the EFI fuse.
(e) Check continuity between the terminals BATT of the ECM connector and 2 of the EFI fuse holder in the engine R/B.
Resistance: 1 Ω or less
(f) Check for short between the terminals BATT and E1 of the ECM connector.
Resistance: 1 MΩ or more

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	P1656	OCV CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Refer to DTC P1349 on page 05-274.

DTC No.	DTC Detecting Condition	Trouble Area
P1656	Open or short in oil control valve circuit	S Open or short in oil control valve circuit S Oil control valve S ECM

WIRING DIAGRAM

Refer to DTC P1349 on page 05-274.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction

When using hand-held tester

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(OCV OPERATION)

(a) Start the engine and warm it up.
(b) Connect the hand-held tester and select the VVT on the ACTIVE TEST menu.
(c) Check the engine speed when operating the OCV by using the hand-held tester.
Result:
VVT system is OFF (OCV is OFF): Normal engine speed
VVT system is ON (OCV is ON): Rough idle or engine stalled

OK → CHECK FOR INTERMITTENT PROBLEMS

NG

2	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 10-8)

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY

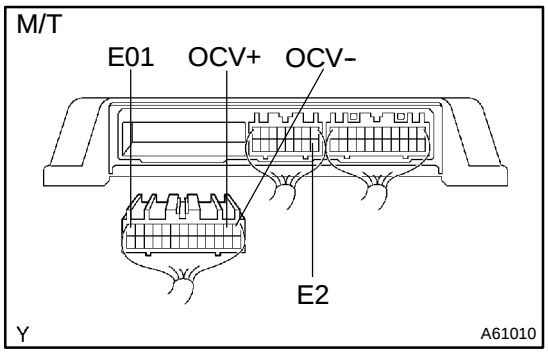
OK

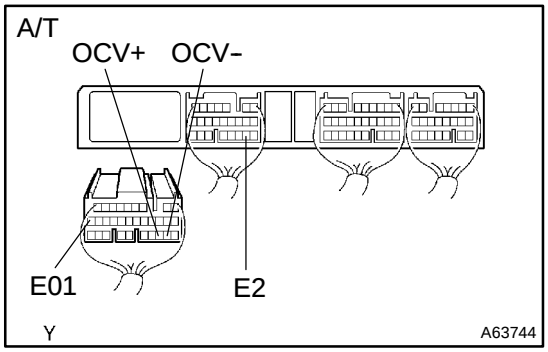
3	INSPECT ECM(CHECK VOLTAGE) (See page 05-173)

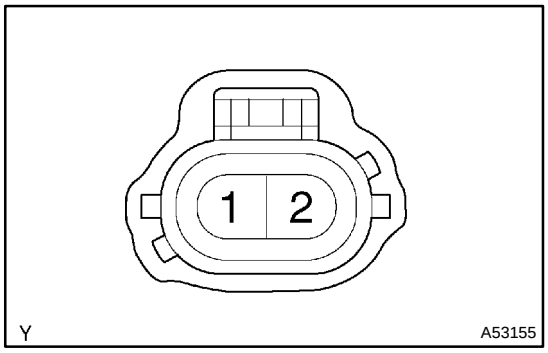
NG → CHECK AND REPLACE ECM

OK

4	CHECK WIRE HARNESS OR CONNECTOR(ECM-OCV)







(a) Disconnect the ECM E19 connector. (M/T)
(b) Disconnect the ECM E15 connector. (A/T)
(c) Disconnect the camshaft timing control valve connector.
(d) Check continuity between the terminals OCV+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals OCV+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(f) Check continuity between the terminals OCV- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(g) Check for short between the terminals OCV- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

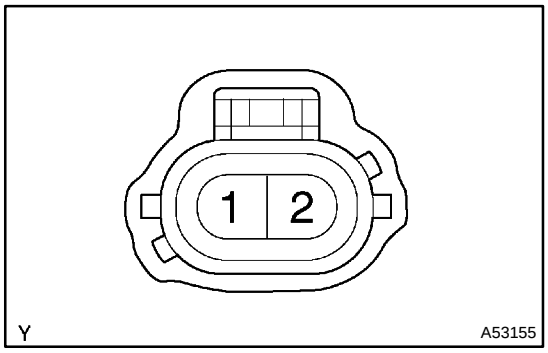
NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK FOR INTERMITTENT PROBLEMS

When not using hand-held tester

1	CHECK OPERATION OF OCV



(a) Start the engine and warm it up.
(b) Disconnect the OCV connector.
(c) Apply battery positive voltage to the terminals of the OCV.
(d) Check the engine speed.
Result: Rough idle or engine stalled

NG → **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY**

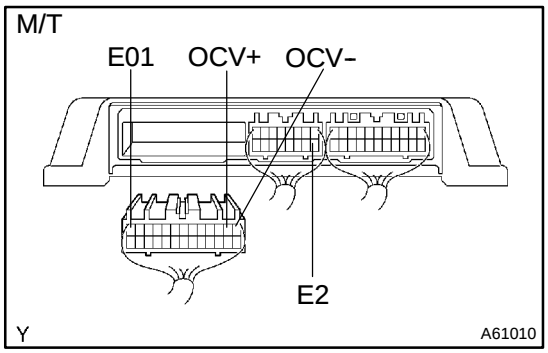
OK

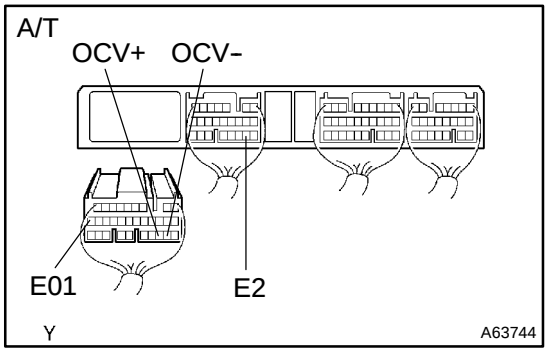
2	INSPECT ECM(CHECK VOLTAGE)

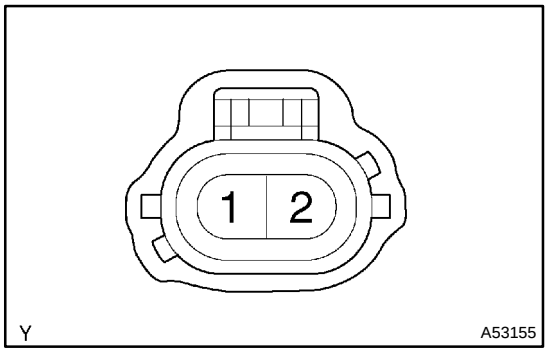
NG → **CHECK AND REPLACE ECM**

OK

3 CHECK HARNESS AND CONNECTOR(ECM-OCV)







(a) Disconnect the ECM E19 connector. (M/T)
(b) Disconnect the ECM E15 connector. (A/T)
(c) Disconnect the camshaft timing control valve connector.
(d) Check continuity between the terminals OCV+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals OCV+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(f) Check continuity between the terminals OCV- of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(g) Check for short between the terminals OCV- of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR INTERMITTENT PROBLEMS

DTC	P1780	PARK/NEUTRAL POSITION SWITCH MALFUNCTION

CIRCUIT DESCRIPTION

The neutral start switch goes on when the shift lever is in the N or P shift position. When it goes on, terminal NSW of the ECM is grounded to the body ground via the starter relay, thus the terminal NSW voltage becomes 0V. When the shift lever is in the D, 2, L or R position, the park/neutral position switch goes off, so the voltage of the ECM. Terminal NSW becomes battery voltage and the voltage of the ECM internal power source. If the shift lever is moved from the N position to the D position, this signal is used for air-fuel ratio correction and for idle speed control (estimated control), etc.

DTC No.	DTC Detecting Condition	Trouble Area
P1780	2 or more switches are ON simultaneously for N, 2, L and R positions (2 trip detection logic)When driving under conditions (a) and (b) for 30 seconds or more neutral start switch is ON (N position): (2 trip detection logic) (a) Vehicle speed: 70 km/h (44 mph) or more (b) Engine speed: 1,500 - 2,500 rpm	S Short in neutral start switch circuit S Neutral start switch S ECM

HINT:
After confirming DTC P1780, use the hand-held tester to confirm the neutral start switch signal from the CURRENT DATA.

WIRING DIAGRAM

Refer to 05-799.

INSPECTION PROCEDURE

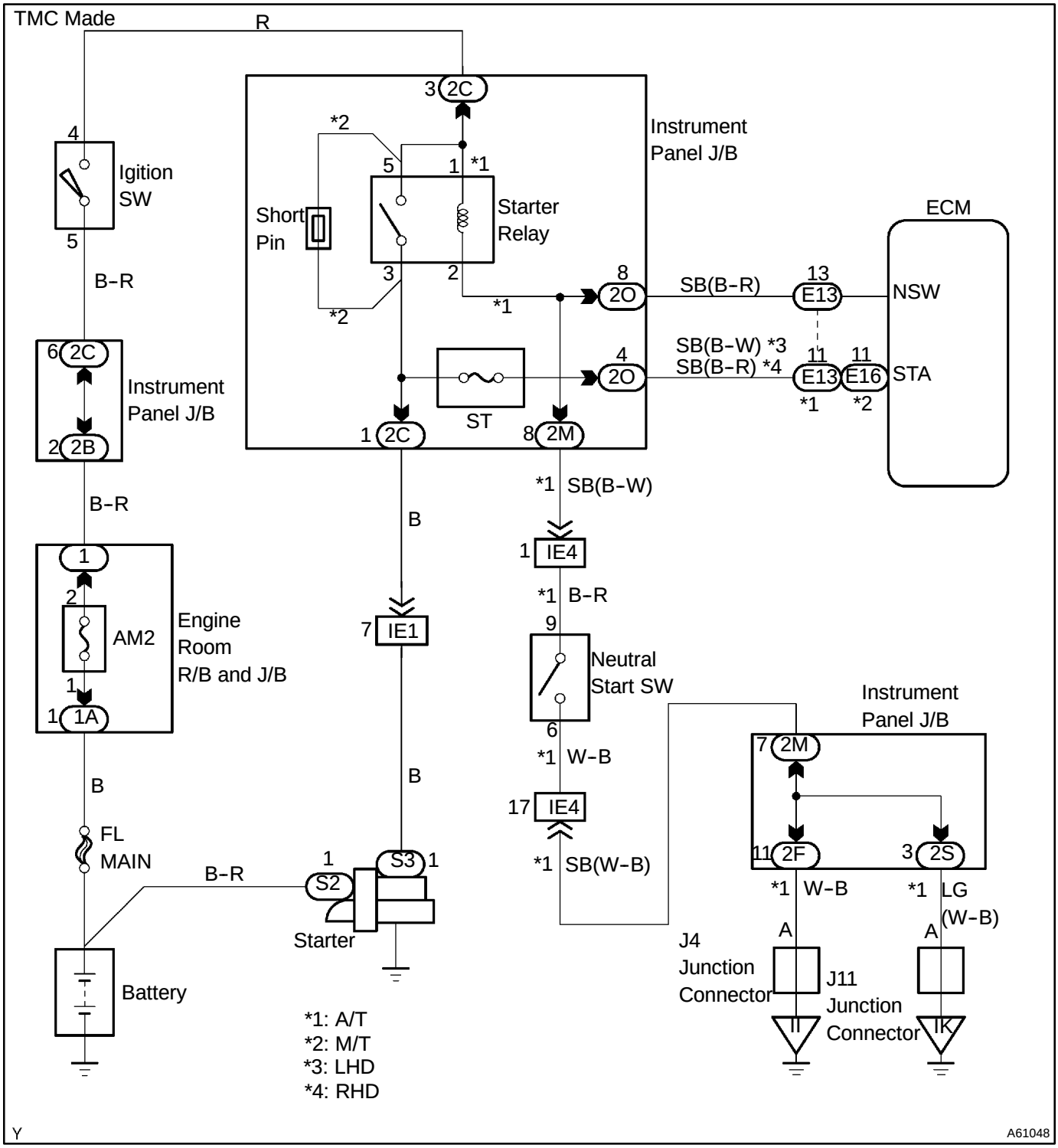
Refer to 05-799.

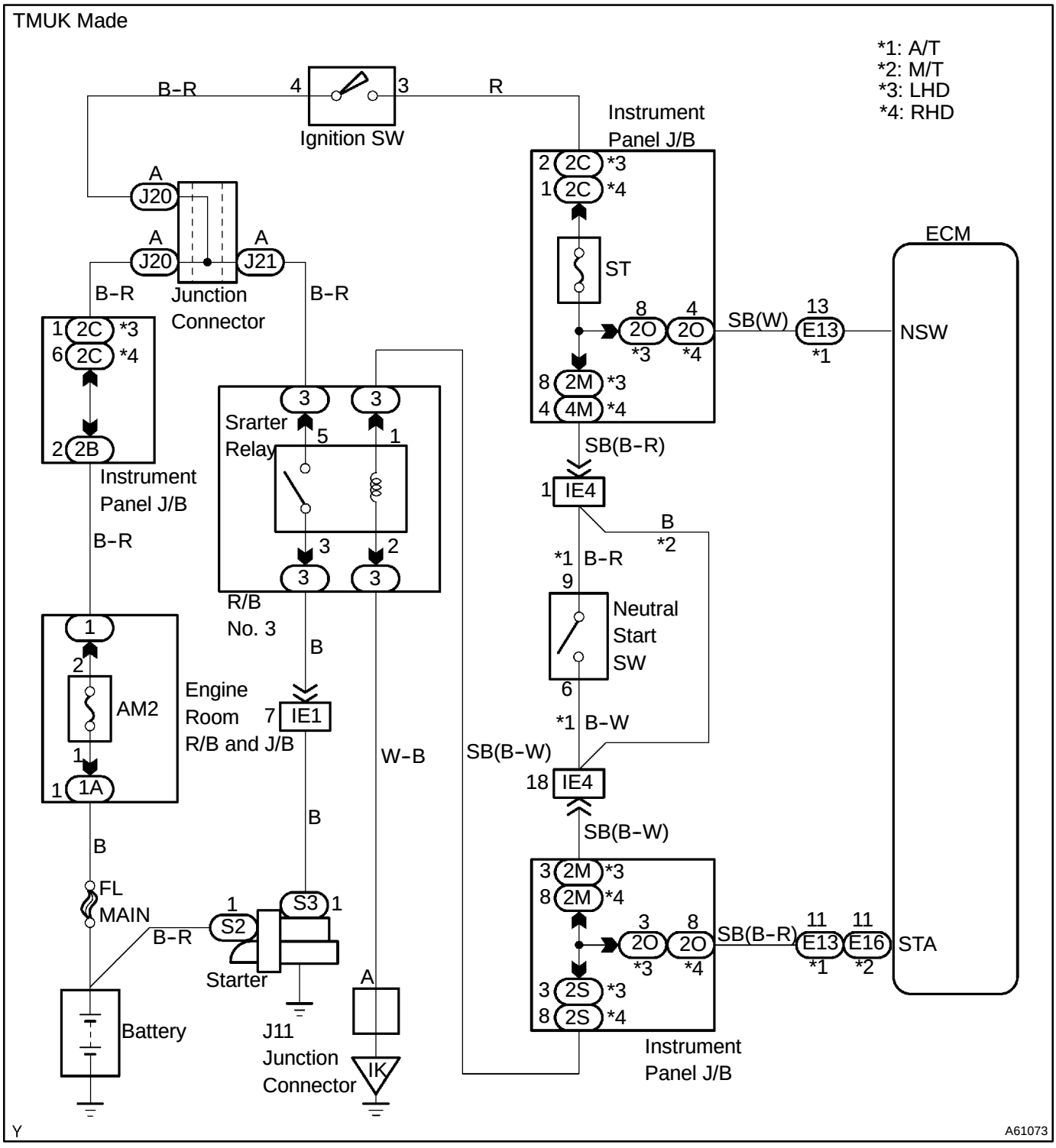
STARTER SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

When the engine is cranked, the intake air flow is slow, so fuel vaporization is poor. A rich mixture is therefore necessary in order to achieve good startability. While the engine is being cranked, the battery voltage is applied to terminal STA of the ECM. The starter signal is mainly used to increase the fuel injection volume for the starting injection control and after-start injection control.

WIRING DIAGRAM




TMUK Made
*1: A/T
*2: M/T
*3: LHD
*4: RHD
Ignition SW
Instrument Panel J/B
ECM
ST
NSW
STA
SB(W)
SB(B-R)
SB(B-W)
B-R
B-W
W-B
B
Junction Connector
Srarter Relay
R/B No. 3
Engine Room R/B and J/B
AM2
FL MAIN
Battery
Starter
J11 Junction Connector
Neutral Start SW
Instrument Panel J/B
A61073

INSPECTION PROCEDURE

HINT:

This diagnostic chart is based on the premise that the engine is cranked normally. If the engine is not cranked, proceed to the problem symptoms table on page 05-177.

When using hand-held tester:

1	READ VALUE OF HAND-HELD TESTER(STARTER SIGNAL)

(a) Connect the hand-held tester to the DLC3.

(b) Turn the ignition switch ON and push the hand-held tester main switch ON.

(c) Read the STA signal on the hand-held tester while the starter is operating.

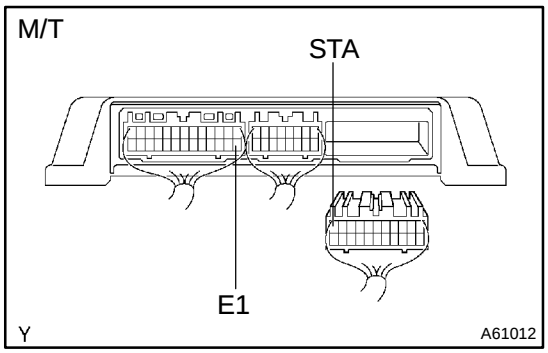
Result:

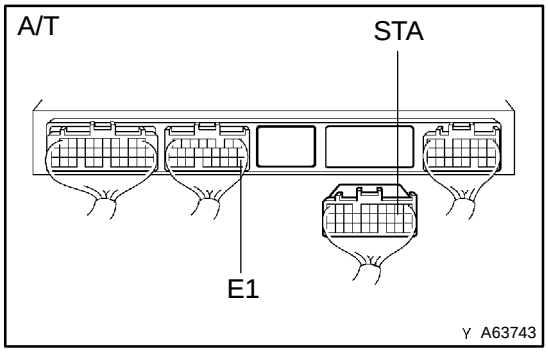
Ignition Switch Position	ON	START
STA Signal	OFF	ON

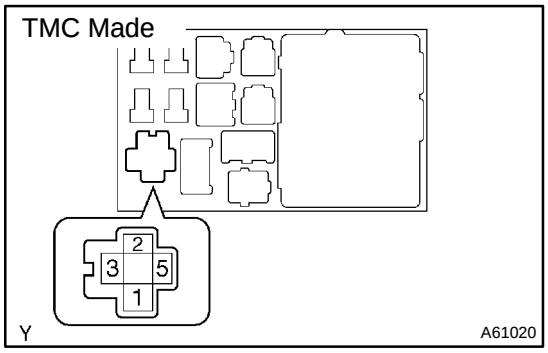
OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

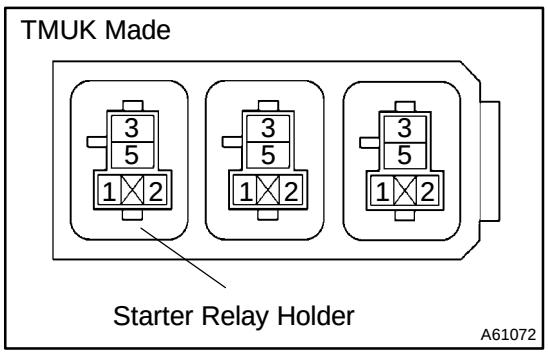
NG

2 CHECK WIRE HARNESS OR CONNECTOR(ECM-STARTER RELAY)









(a) Disconnect the ECM E16 connector. (M/T)
(b) Disconnect the ECM E13 connector. (A/T)
(c) Remove the starter relay.
(d) Check continuity between the terminals STA of the ECM connector and 1 of the starter relay connector side.
Resistance: 1 Ω or less
(e) Check for short between the terminals STA of the ECM connector and E1 of the ECM connector.
Resistance: 1 MΩ or more

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

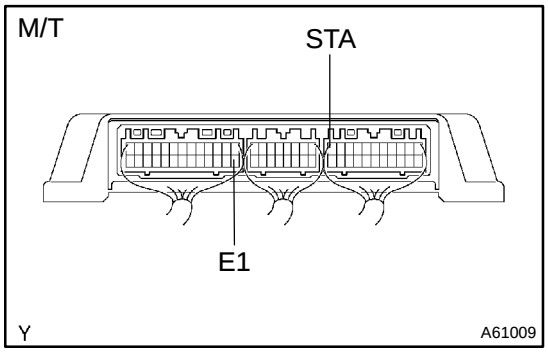
NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

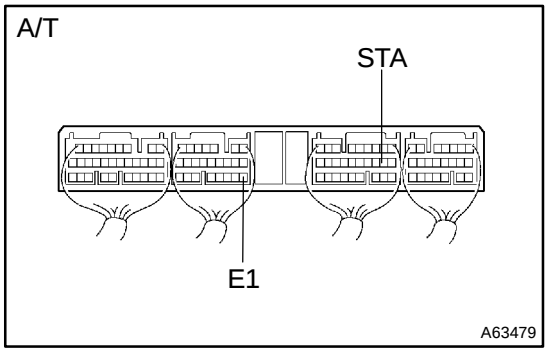
CHECK AND REPLACE ECM

When not using hand-held tester:

1	INSPECT ECM(CHECK VOLTAGE)



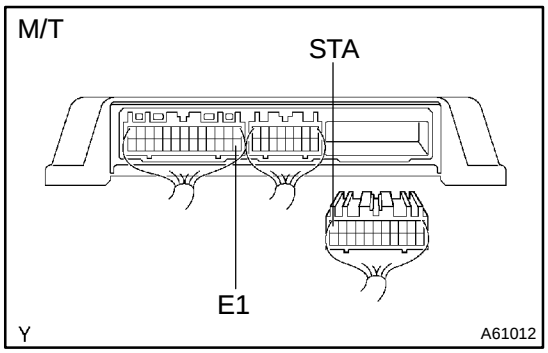
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal STA of the ECM connector and E1 of the ECM connector, during the engine cranking.
Voltage: 6 V or more

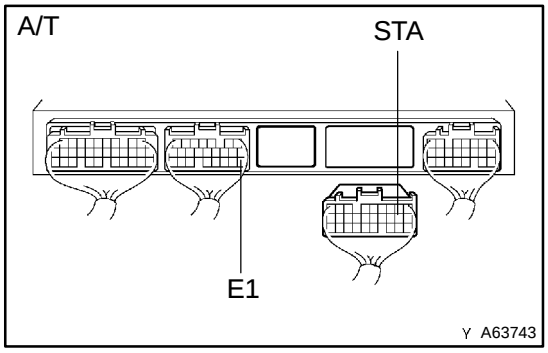


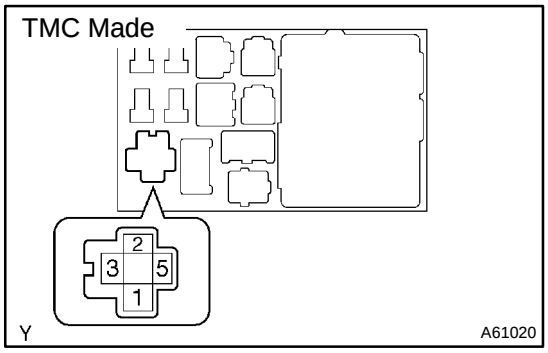
OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

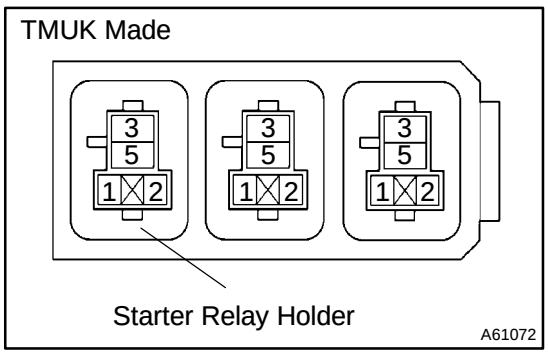
NG

2 CHECK WIRE HARNESS OR CONNECTOR(ECM-STARTER RELAY)









(a) Disconnect the ECM E16 connector. (M/T)
(b) Disconnect the ECM E13 connector. (A/T)
(c) Remove the starter relay.
(d) Check continuity between the terminals STA of the ECM connector and 1 of the starter relay connector side.
Resistance: 1 Ω or less
(e) Check for short between the terminals STA of the ECM connector and E1 of the ECM connector.
Resistance: 1 MΩ or more

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

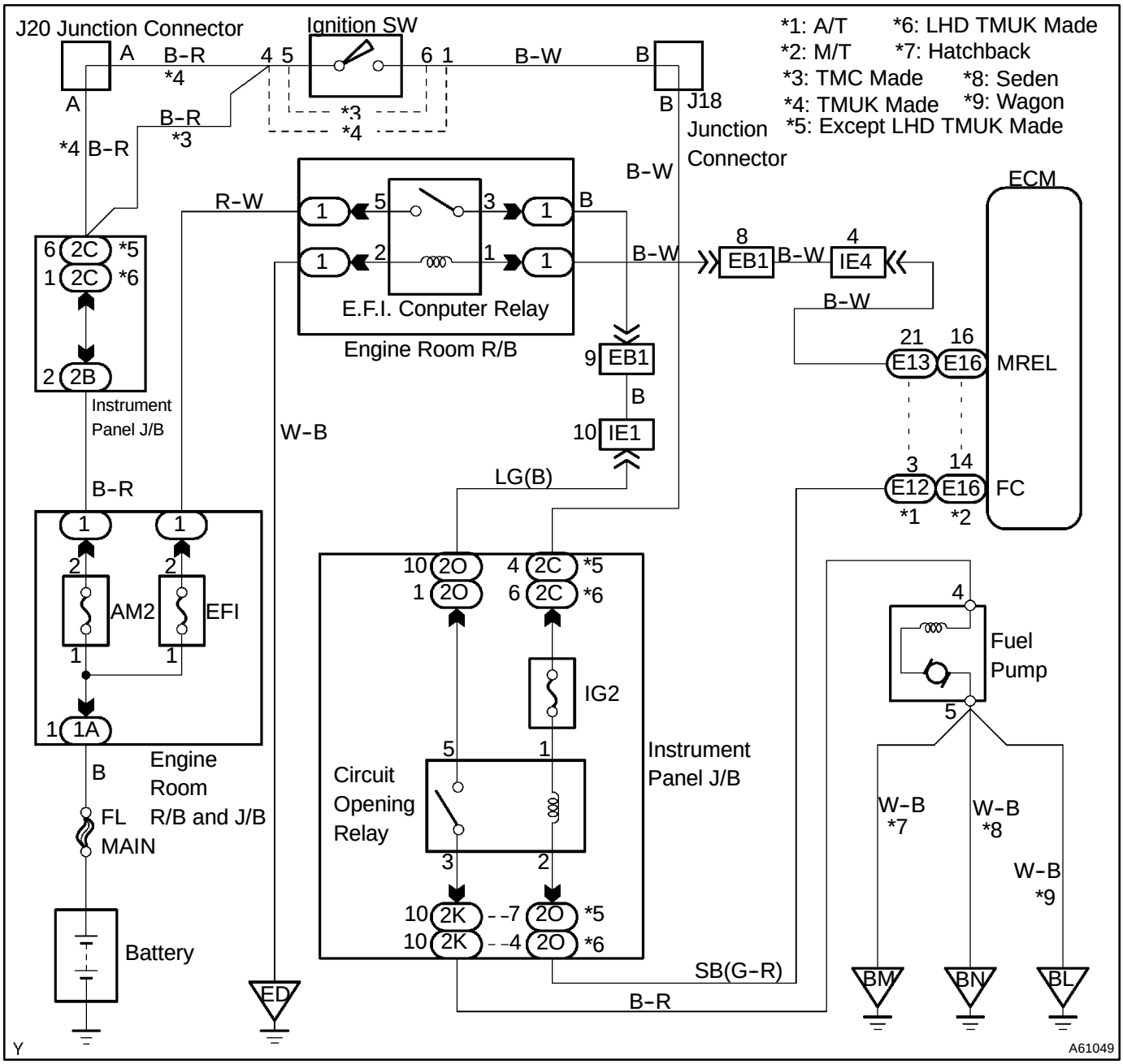
CHECK AND REPLACE ECM

FUEL PUMP CONTROL CIRCUIT

CIRCUIT DESCRIPTION

In the diagram below, when the engine is cranked, current flows from terminal ST of the ignition switch to the starter relay coil and also current flows to terminal STA of ECM (STA signal).
When the STA signal and NE signal are input to the ECM, Tr is turned ON, current flows to the coil of the circuit opening relay, the relay switches on, power is supplied to the fuel pump and the fuel pump operates.
While the NE signal is generated (engine running), the ECM keeps Tr ON (circuit opening relay ON) and the fuel pump also keeps operating.

WIRING DIAGRAM



INSPECTION PROCEDURE

When using hand-held tester:

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(OPERATION OF CIRCUIT OPENING RELAY)

(a) Select the active test mode on the hand-held tester.
(b) Turn the ignition switch ON, and perform the active test at the engine stop.
Result: The circuit opening relay operates.

OK → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE

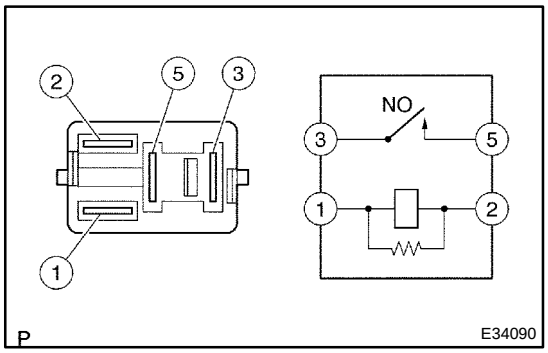
NG

2	CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-308)

NG → REPAIR OR REPLACE

OK

3	INSPECT E.F.I. CIRCUIT OPENING RELAY ASSY



(a) Check continuity between the terminals shown below.
Resistance:

TERMINAL NO.	RESISTANCE
1 - 2	1 Ω or less
3 - 5	1 ΩM or more

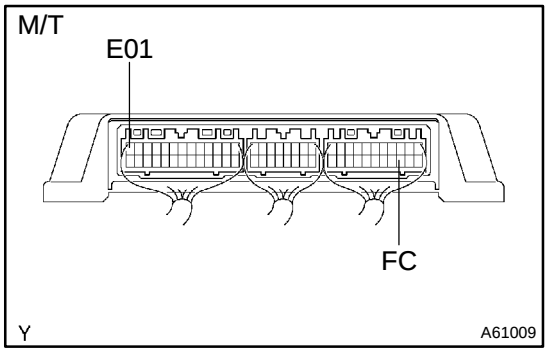
(b) Check continuity between the terminals 3 and 5 of the connector when the battery voltage is applied to the terminals between 1 and 2.
Resistance:

TERMINAL NO.	RESISTANCE
3 - 5	1 Ω or less

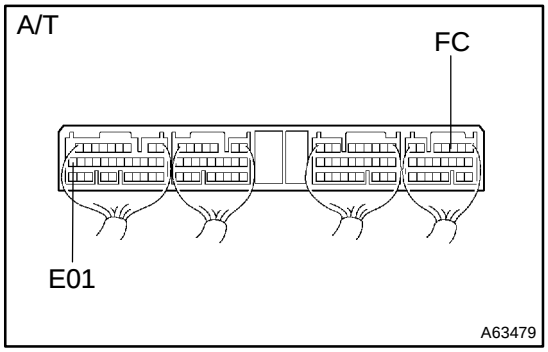
NG → REPLACE E.F.I. CIRCUIT OPENING RELAY ASSY

OK

4	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal FC and E01 of the ECM connector.
Voltage: 9 - 14 V



OK → **Go to step 6**

NG

5	CHECK WIRE HARNESS OR CONNECTOR(EFI MAIN RELAY-CIRCUIT OPENING RELAY, CIRCUIT OPENING RELAY-ECM)

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

6	INSPECT FUEL PUMP (See page 11-5)

NG → **REPLACE FUEL PUMP**

OK

7	CHECK WIRE HARNESS OR CONNECTOR(CHECK FOR OPEN)

(a) Check for open in harness and connector between circuit opening relay and fuel pump, and fuel pump and body ground.

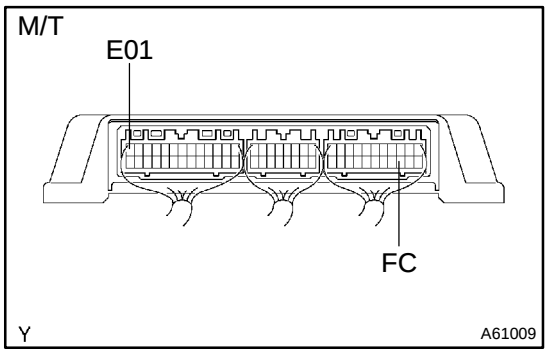
NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM

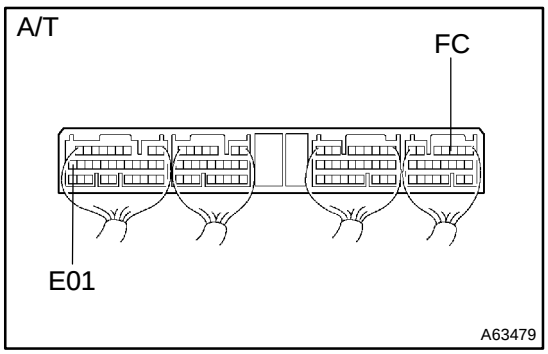
When not using hand-held tester:

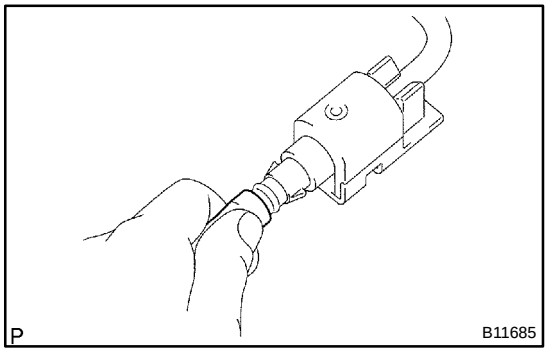
1	CHECK OPERATION OF FUEL PUMP



(a) Turn the ignition switch ON.
(b) Connect between terminal FC of the ECM connector and E01 of the ECM connector.
(c) Check for fuel pressure in the fuel inlet hose when it is pinched off.
Result: There is pressure in fuel inlet hose.

HINT:
At this time, you will hear the fuel return flowing noise.





OK → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE

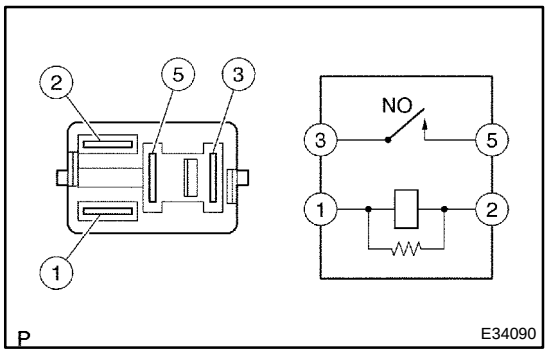
NG

2	CHECK FOR ECU POWER SOURCE CIRCUIT (See page 05-308)

NG → REPAIR OR REPLACE

OK

3	INSPECT E.F.I. CIRCUIT OPENING RELAY ASSY



(a) Check continuity between the terminals shown below.
Resistance:

TERMINAL NO.	RESISTANCE
1 - 2	1 Ω or less
3 - 5	1 ΩM or more

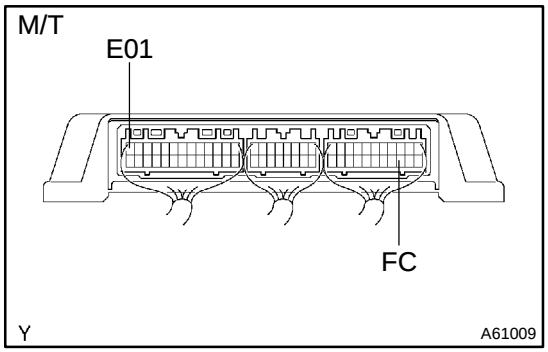
(b) Check continuity between the terminals 3 and 5 of the connector when the battery voltage is applied to the terminals between 1 and 2.
Resistance:

TERMINAL NO.	RESISTANCE
3 - 5	1 Ω or less

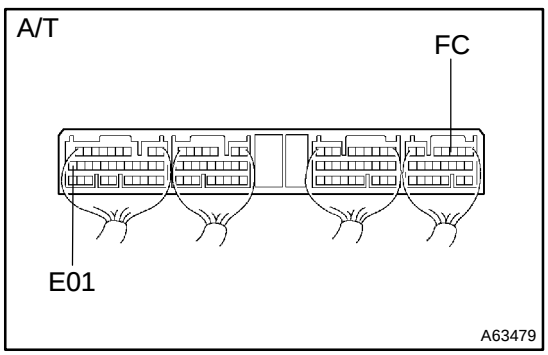
NG → REPLACE E.F.I. CIRCUIT OPENING RELAY ASSY

OK

4	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal FC of the ECM connector and E01 of the ECM connector.
Voltage: 9 - 14 V



OK → Go to step 6

NG

5	CHECK WIRE HARNESS OR CONNECTOR(EFI MAIN RELAY-CIRCUIT OPENING RELAY, CIRCUIT OPENING RELAY-ECM)

OK → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

NG

CHECK AND REPLACE ECM

6	INSPECT FUEL PUMP (See page 11-5

NG → REPLACE FUEL PUMP

OK

7	CHECK WIRE HARNESS OR CONNECTOR(OPEN BETWEEN TERMINAL 3 OF CIRCUIT OENING RELAY AND TERMINAL)

NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

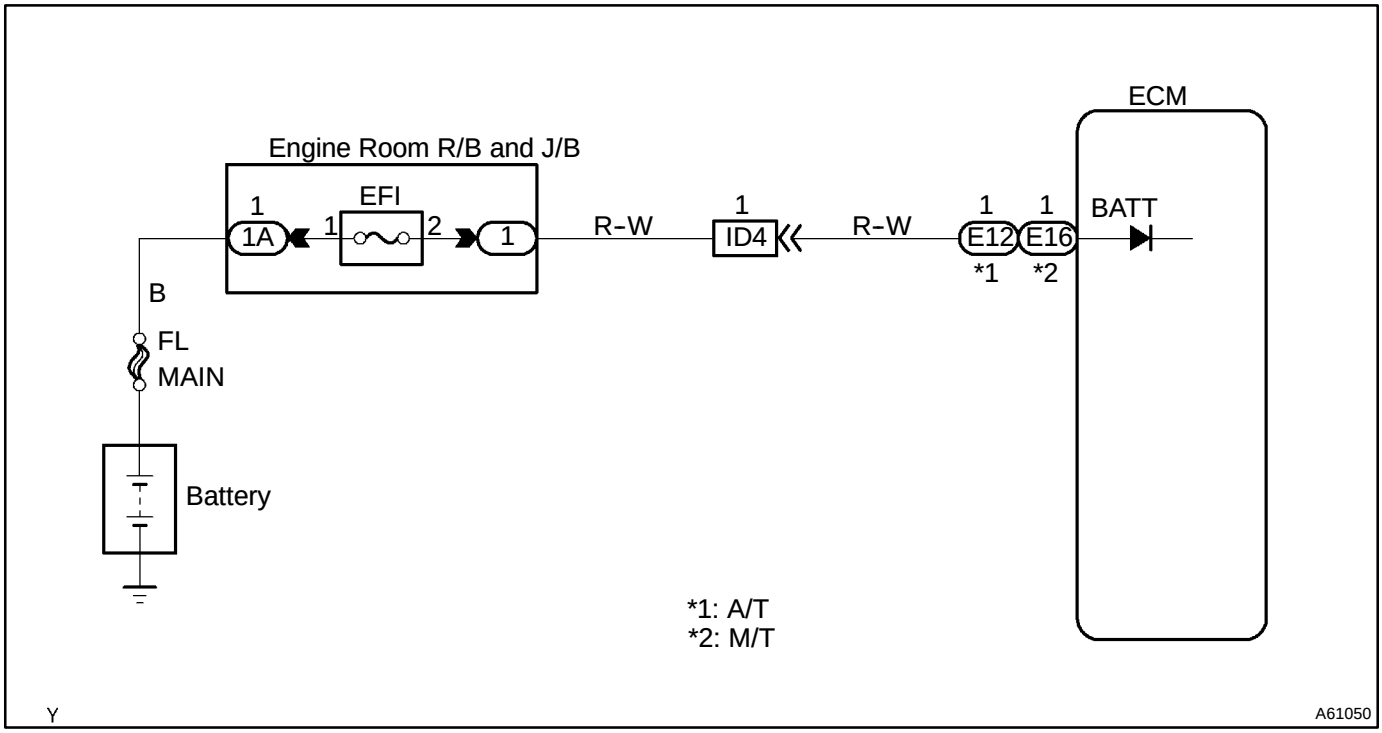
CHECK AND REPLACE ECM

ECM BACK-UP POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

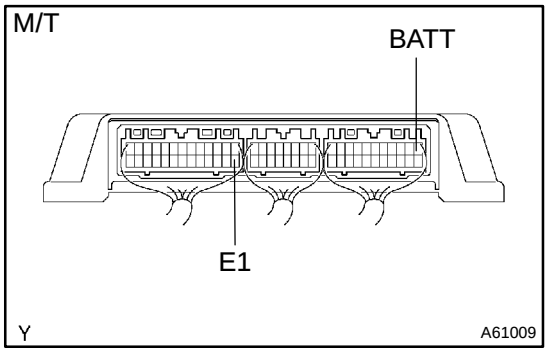
Battery positive voltage is supplied to terminal BATT of the ECM even when the ignition switch is OFF for use by the DTC memory and air-fuel ratio adaptive control value memory,etc.

WIRING DIAGRAM

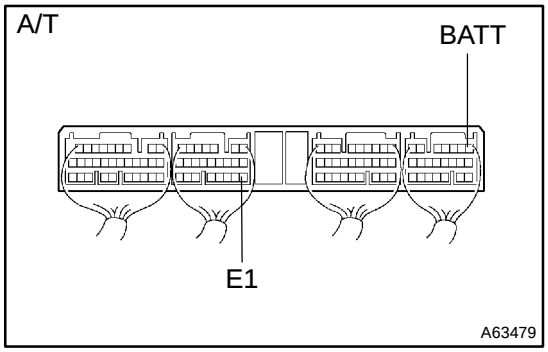


INSPECTION PROCEDURE

1	INSPECT ECM



(a) Measure voltage between the terminals BATT of the ECM connector and E1 of the ECM connector.
Voltage: 9 - 14 V



OK → **SYSTEM OK**

NG

2	CHECK FUSE(EFI FUSE) (See page 05-308)

NG → **REPLACE FUSE**

OK

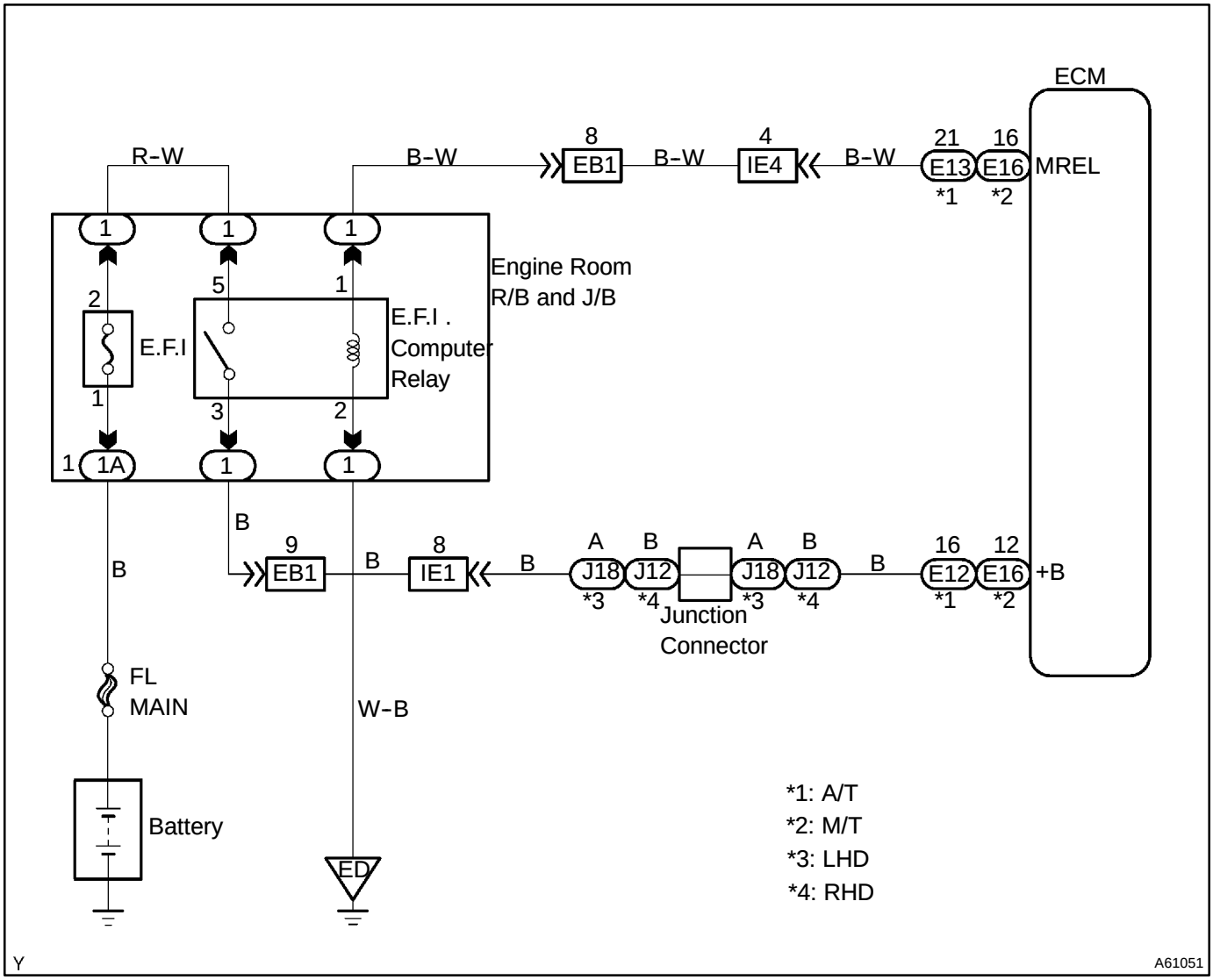
CHECK AND REPLACE ENGINE ECU POWER SOURCE CIRCUIT

ECM POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

When the ignition switch is turned ON, battery positive voltage is applied to the coil which closes the contacts of the EFI computer relay (Marking: EFI) and supplies power to the terminal +B of the ECM.

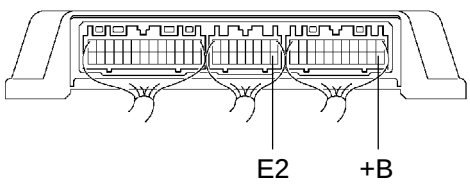
WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT ECM

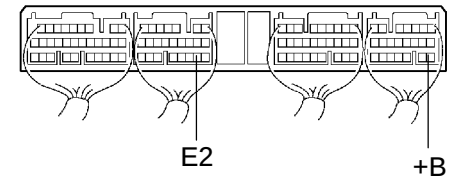
M/T



Y A61009

(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals +B of the ECM connector and E2 of the ECM connector.
Voltage: 9-14 V

A/T



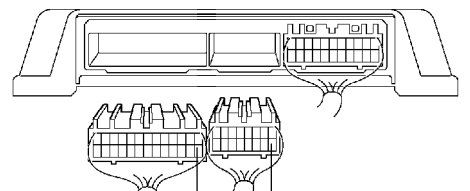
A63479

OK → **CHECK AND REPLACE ECM**

NG

2	CHECK HARNESS AND CONNECTOR(ECM GROUND)

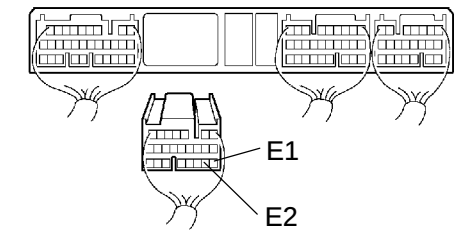
M/T



Y A61027

(a) Disconnect the battery negative terminal.
(b) Disconnect the ECM E18 and E19 connector.(M/T)
(c) Disconnect the ECM E14 connector.(A/T)
(d) Check continuity between the terminal E1 of the ECM connector and body ground.
Resistance: 1Ω or less
(e) Check continuity between the terminal E2 of the ECM connector and body ground.
Resistance: 1Ω or less

A/T

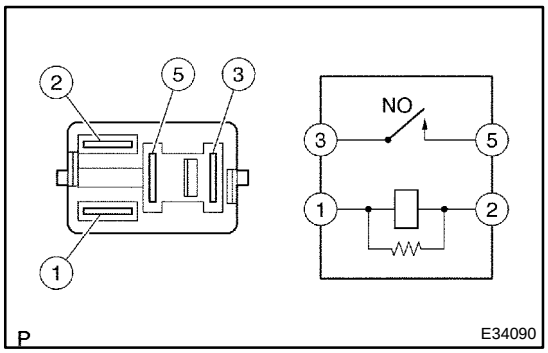


Y A51066

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 CHECK E.F.I ECU RELAY



(a) Check continuity between the terminals shown below.
Resistance:

TERMINAL NO.	RESISTANCE
1 - 2	1 Ω or less
3 - 5	1 ΩM or more

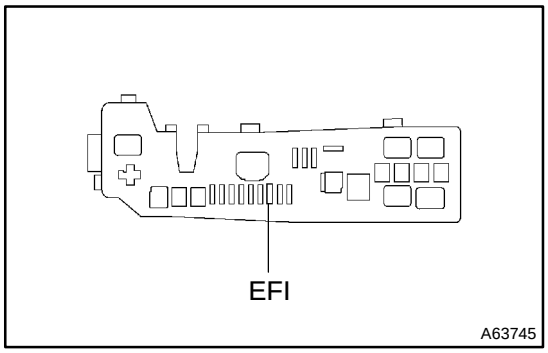
(b) Check continuity between the terminals 3 and 5 of the connector when the battery voltage is applied to the terminals between 1 and 2.
Resistance:

TERMINAL NO.	RESISTANCE
3 - 5	1 Ω or less

NG → **REPLACE E.F.I ECU RELAY**

OK

4 CHECK FUSE(E.F.I.FUSE)

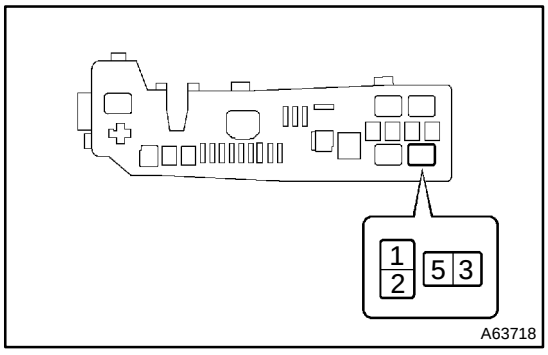


(a) Check continuity of E.F.I. fuse.
Resistance: 1Ω or less

NG → **REPLACE FUSE**

OK

5 CHECK RELAY OPERATION(E.F.I. COMPUTER RELAY)

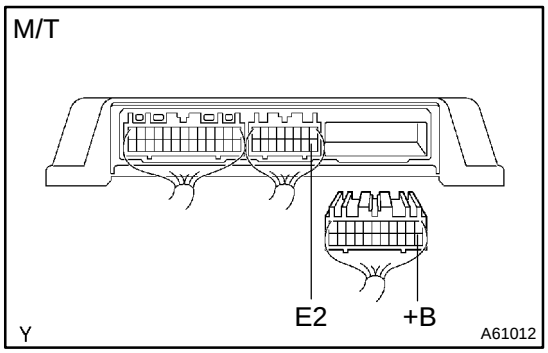


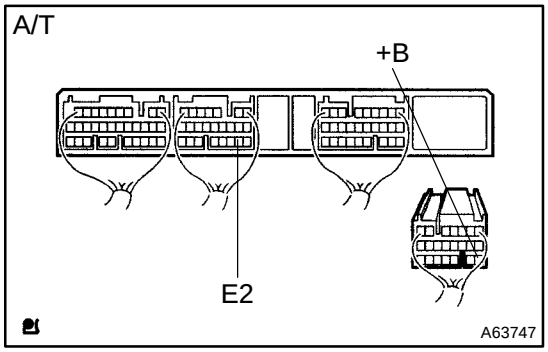
(a) Confirm that the E.F.I relay operates normally when turning the ignition switch ON.
Result:
E.F.I. relay operation sound is heard successively when turning the ignition switch ON.

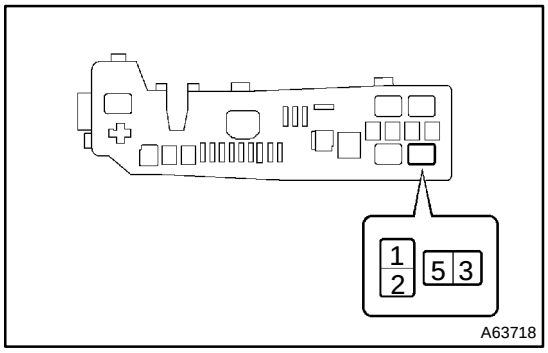
NG → **Go to step 9**

OK

6	CHECK HARNESS AND CONNECTOR(ECM-E.F.I. COMPUTER RELAY)





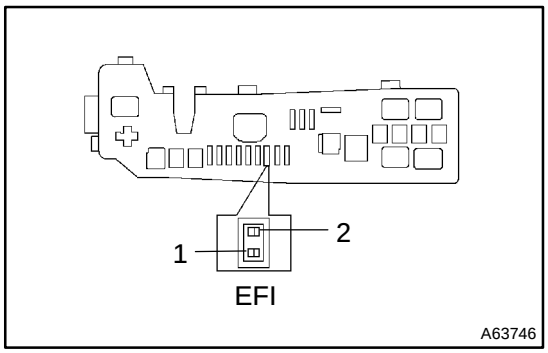


(a) Disconnect the battery negative (-) terminal.
(b) Remove the E.F.I. computer relay.
(c) Disconnect the ECM E16 connector.(M/T)
(d) Disconnect the ECM E12 connector.(A/T)
(e) Check continuity between the terminals 1 of the EFI computer relay in the engine room R/B and +B of the ECM connecter.
Resistance: 1 Ω or less
(f) Check continuity between the terminals 1 of the EFI computer relay in the engine room R/B and E2 of the ECM connecter.
Resistance: 1M Ω or more

OK

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

7 CHECK HARNESS AND CONNECTOR(E.F.I.FUSE-BATTERY)



(a) Disconnect the battery negative (-) terminal.
(b) Remove the EFI fuse.
(c) Check continuity between the terminals 1 of the EFI fuse holder in the engine room R/B and negative (-) of the battery.
Resistance: 1 Ω or less

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

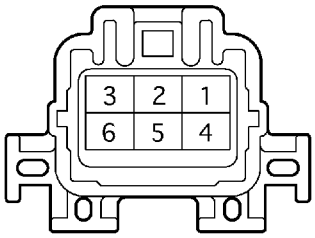
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM

8 INSPECT IGNITION OR STARTER SWITCH ASSY

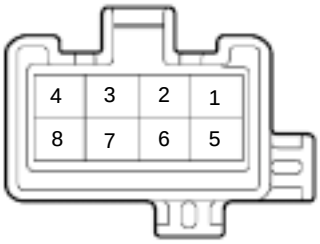
TMC Made



(a) Check continuity between the connector terminals shown in the chart below.
TMC Made:

Switch	Terminal No.	Resistance
LOCK	All Terminals	1MΩ or more
ACC	1-3	1Ω or less
ON	1-2-3 5-6	1Ω or less
START	4-5-6 1-2	1Ω or less

TMUK Made



TMUK Made:

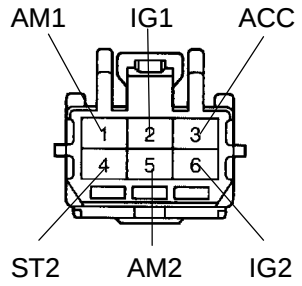
Switch	Terminal No.	Resistance
LOCK	All Terminals	1MΩ or more
ACC	5-6	1Ω or less
ON	5-6-8 1-4	1Ω or less
START	5-6-7-8 1-3-4	1Ω or less

NG → **REPLACE IGNITION OR STARTER SWITCH ASSY**

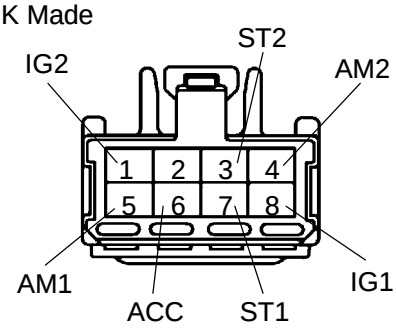
OK

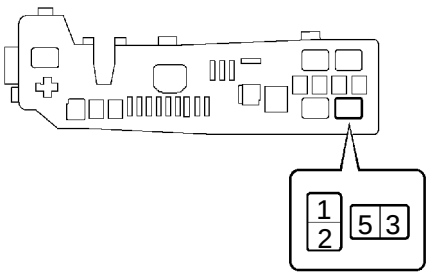
9	CHECK HARNESS AND CONNECTOR(IGNITION SWITCH-E.F.I. COMPUTER RELAY)

TMC Made



TMUK Made





(a) Disconnect the battery negative (-) terminal.
(b) Remove the EFI computer relay.
(c) Disconnect the ignition switch connector.
(d) Check continuity between the terminals IG2 of the ignition switch connector and 5 of the EFI circuit opening relay in the R/B.
Resistance: 1Ω or less
(e) Check for short between the terminal IG2 of the ignition switch and body ground.
Resistance: 1MΩ or more

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM

EFI SYSTEM (4ZZ-FE)

HOW TO PROCEED WITH TROUBLESHOOTING

0504C-04

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS (See page 05-317)

3	CONNECT THE HAND-HELD TESTER TO DLC 3

HINT:
If the display indicates a communication fault in the tool, inspect DLC3.

4	CHECK DTC AND FREEZE FRAME DATA (See page 05-318)

HINT:
Record or print DTC and freezed frame data.

5	CLEAR DTC AND FREEZE FRAME DATA (See page 05-318)

6	VISUAL INSPECTION

7	SETTING THE CHECK (TEST) MODE DIAGNOSIS (See page 05-318)

8	PROBLEM SYMPTOM CONFIRMATION

HINT:
If the engine does not start, perform step 10 and 12 first.

A	Malfunction does not occur
B	Malfunction occurs

B	GO TO STEP 10

A

9	SYMPTOM SIMULATION

10	DTC CHECK (See page 05-327)

A	Normal code
B	Malfunction code

B → AFTER CHECKING MALFUNCTION CODE, GO TO STEP 14

A

11	BASIC INSPECTION (See page 05-318)

A	Not confirm wrong parts
B	Confirm wrong parts

B → GO TO STEP 16

A

12	PROBLEM SYMPTOM TABLE (See page 05-335)

A	Confirm wrong circuit
B	Confirm wrong Parts

B → GO TO STEP 16

A

13	CHECK ECM POWER SOURCE CIRCUIT (See page 05-412)

14	CIRCUIT INSPECTION

A	Not confirm malfunction
B	Confirm malfunction

B → GO TO STEP 16

A

15	CHECK FOR INTERMITTENT PROBLEM (See page 05-318)

16	IDENTIFICATION OF PROBLEM

17	ADJUSTMENT, REPAIR

18	CONFIRMATION TEST

END

0504B-04

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE CONTROL SYSTEM Check Sheet

Inspector's Name _____

Customer's Name		Model and Model Year	
Driver's Name		Frame No.	
Data Vehicle Brought in		Engine Model	
License No.		Odometer Reading	km / miles

Problem Symptoms	☐ Engine does not Start	☐ Engine does not crank ☐ No initial combustion ☐ No complete combustion
	☐ Difficult to Start	☐ Engine cranks slowly ☐ Other _____
	☐ Poor Idling	☐ Incorrect first idle ☐ Idling rpm is abnormal ☐ High (rpm) ☐ Low (rpm) ☐ Rough idling ☐ Other _____
	☐ Poor Drivability	☐ Hesitation ☐ Back fire ☐ Muffler explosion (after-fire) ☐ Surging ☐ Knocking ☐ Other _____
	☐ Engine Stall	☐ Soon after starting ☐ After accelerator pedal depressed ☐ After accelerator pedal released ☐ During A/C operation ☐ Shifting from N to D ☐ Other _____
	☐ Others	

Datas Problem Occurred		
Problem Frequency		☐ Constant ☐ Sometimes (times per day/month) ☐ Once only ☐ Other _____
Condition When Problem Occurs	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Other _____
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (approx. ____°F/____°C)
	Place	☐ Highway ☐ Suburbs ☐ Inner City ☐ Uphill ☐ Downhill ☐ Rough road ☐ Other _____
	Engine Temp.	☐ Cold ☐ Warming up ☐ After Warming up ☐ Any temp. ☐ Other _____
	Engine Operation	☐ Starting ☐ Just after starting (min.) ☐ Idling ☐ Racing ☐ Driving ☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ A/C switch ON/OFF ☐ Other _____

Condition of check engine warning light (CHK ENG)		☐ Remains on ☐ Sometimes light up ☐ Does not light up
DTC Inspection	Normal mode (Precheck)	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )
	Check Mode	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )

05743-01

PRE-CHECK

1. DIAGNOSIS SYSTEM

(a) Description for Euro-OBD

- When troubleshooting Euro-OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect the vehicle to the OBD scan tool complying with ISO 15031-4 or hand-held tester, and read off various data output from the vehicle's ECM.
- Euro-OBD regulations require that the vehicle's on-board computer lights up the Check Engine Warning Light (Malfunction Indicator Lamp)/CHK ENG (MIL) on the instrument panel when the computer detects a malfunction in the emission control system/components or in the powertrain control components which affect vehicle emissions, or a malfunction in the computer. In addition to CHK ENG (MIL) lighting up when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) prescribed by ISO15031-6 are recorded in the ECM memory (See page 05-327).

If the malfunction code is not detected in 3 consecutive trips, CHK ENG (MIL) goes off automatically but the DTCs remain recorded in the ECM memory.

- To check the DTCs, connect the OBD scan tool or hand-held tester to the Data Link Connector 3 (DLC3) on the vehicle. The OBD scan tool or hand-held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data (For operating instructions, see the OBD scan tool's instruction book.).
- DTCs include ISO controlled codes and manufacturer controlled codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer controlled codes can be set freely by the manufacturer within the prescribed limits
  (See DTC chart on page 05-327).
- The diagnosis system operates in normal mode during normal vehicle use. It also has a check mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the ECM to check mode when troubleshooting, the technician can cause the CHK ENG (MIL) to light up for a malfunction that is only detected once or momentarily (Hand-held tester only) (See step 2).

- *2 trip detection logic:
  When a malfunction is first detected, the malfunction code is temporarily stored in the ECM memory (1st trip). If the same malfunction is detected again during the second drive test, this second detection causes the CHK ENG (MIL) to light up (2nd trip) (However, the ignition switch must be turned OFF between the 1st trip and the 2nd trip.).
- Freeze frame data:
  Freeze frame data records the engine condition when a misfire (DTCs P0300 – P0304) or fuel trim malfunction (DTCs P0170) or other malfunction (first malfunction only), is detected.
  Because freeze frame data records the engine conditions (fuel system, calculated load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected. When troubleshooting, it is useful to determine whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

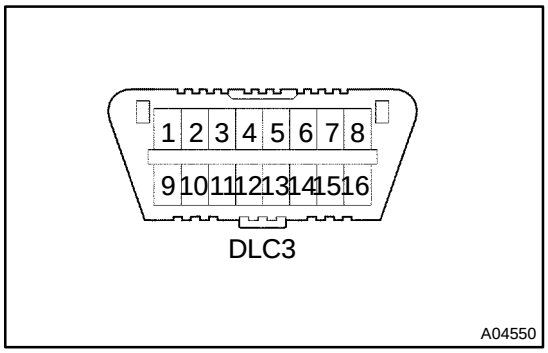
Priorities for troubleshooting. If troubleshooting priorities for multiple DTCs are given in the applicable DTC chart, these should be followed.
If no instructions are given, troubleshoot DTCs according to the following priorities.

(1) DTCs other than fuel trim malfunction (DTCs P0170) and misfire (DTCs P0300 – P0304).
(2) Fuel trim malfunction (DTCs P0170).
(3) Misfire (DTCs P0300 – P0304).

(b) Description for M–OBD

- When troubleshoot Multiplex OBD (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the vehicle to the hand–held tester, and read off various data output from the vehicle's ECM.
- The vehicle's on–board computer indicates the check engine light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to an indication of the CHK ENG when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) are recorded in the ECM memory (See page 05–327). When the malfunction does not reoccur, the CHK ENG is indicated until the ignition switch is turned off, and then the CHK ENG is not indicated when the ignition switch is turned on but the DTCs remain recorded in the ECU memory.

- To check the DTCs, connect the hand–held tester to Data Link Connector 3 (DLC3) on the vehicle or read the DTC which is indicated on the multi information display when TC and CG terminals on the DLC3 are connected. The hand–held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data. (For operating instructions, see the instruction book.)
- The diagnosis system operates in the normal mode during normal vehicle use. It also has a check (test) mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the ECM to the check (test) mode using hand–held tester when troubleshooting, the technician can cause the CHK ENG on the light up for a malfunction that is only detected once or momentarily (Hand–held tester only) (See step 2).
- * 2 trip detection logic
  When a logic malfunction is fist detected, the malfunction is temporally stored in the ECM memory. If the same malfunction is detected again during the second drive test, this second detection cases the CHK ENG to light up.
  The 2 trip repeats the same mode for 2 times (However, the ignition switch must be turned OFF between the 1st trip and 2nd trip).
- Freeze frame data:
  Freeze frame data records the engine condition when malfunction is detected.
  Because freeze frame data records the engine conditions (fuel system, calculator load, water temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

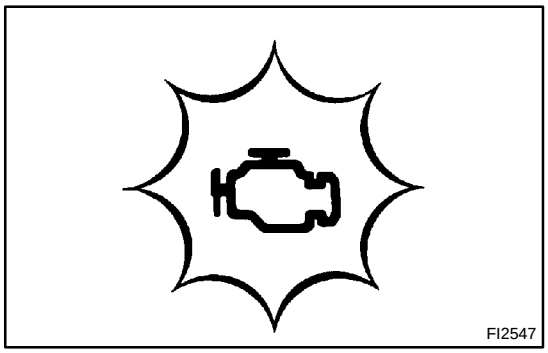


(c) Check the DLC3.
The vehicle's engine ECU uses the ISO 14230(M–OBD) communication protocol. The terminal arrangement of DLC3 complies with ISO 15031–03 and matches the ISO 14230 format.

Terminal No.	Connection / Voltage or Residence	Condition
7	Bus + Line / Pulse generation+	During transmission
4	Chassis Ground ↔ Body Ground / 1 Ω or less	Always
16	Battery Positive ↔ Body Ground / 9 - 14 V	Always

HINT:
If the display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of the OBD scan tool or hand-held tester to DLC3, turned the ignition switch ON and operated the hand-held tester, there is a problem on the vehicle side or tool side.

- If communication is normal when the tool is connected to another vehicle, inspect DLC3 on the original vehicle.
- If communication is still not possible is when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Debarment listed in the tool,s instruction manual.


FI2547

2. INSPECT DIAGNOSIS (Normal Mode)

(a) Check the check engine warning light.

(1) The check engine warning (CHK ENG) comes on when the ignition switch is turned ON and the engine is not running.

HINT:
If the check engine warning (CHK ENG) does not light up, troubleshoot the combination meter.

(2) When the engine is started, the check engine warning light should go off. If the lamp remains on, the diagnosis system has detected a malfunction or abnormality in the system.

(b) Check the DTC, using hand-held tester.

NOTICE:
When the diagnosis system is switched from normal mode to check (test) mode, it erases all DTCs and freezed frame data recorded in normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

(1) Prepare the hand-held tester.
(2) Connect the hand-held tester to DLC3.
(3) Turn the ignition switch ON and switch the hand-held tester main switch ON.
(4) Use the hand-held tester to check the DTCs and freezed frame data; note them down. (For operating instructions, see the hand-held tester's instruction book.)
(5) See page 05-327 to confirm the details of the DTCs.

NOTICE:

- **When simulating symptoms without a hand-held tester to check the DTCs, use normal mode. For codes on the DTCs, chart subject to "2 trip detection logic", turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again. When the problem has been simulated twice, the check engine warning light lights up and the DTCs, are recorded in the engine ECU.**
- **Check the 1st trip DTC using Mode7 for ISO 15031. (Continuous Test Results of Euro-OBD function in hand-held tester)**

3. INSPECT DIAGNOSIS (Check (Test) Mode)

HINT:

Hand-held tester only:

Compared to the normal mode, the check mode has an increased sensitivity to detect malfunctions.

Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

(a) Check the DTC.

(1) Initial conditions

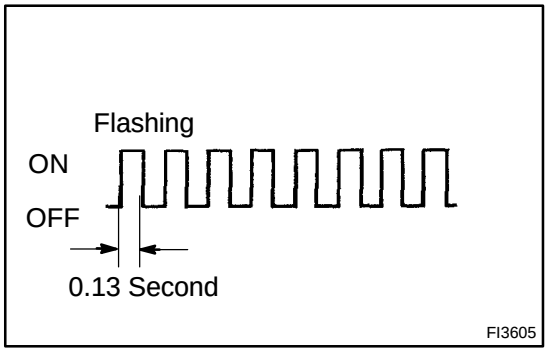
- Battery positive voltage 11V or more.
- Throttle valve fully closed.
- Transmission in "P" or "N" position.
- Air conditioning switched OFF.

(2) Turn ignition switch OFF.

(3) Prepare the hand-held tester.

(4) Connect the hand-held tester to DLC3 on the at the lower left of the instrument panel.

(5) Turn the ignition switch ON and switch the push the hand-held tester ON.



(6) Switch the hand-held tester normal mode to check (test) mode. (Check that the check engine warning light (CHK ENG) flashes.)

(7) Start the engine. (The check engine warning (CHK ENG) light goes out after the engine start.)

(8) Simulate the conditions of the malfunction described by the customer.

NOTICE:

Leave the ignition switch ON until you have checked the DTC, etc.

(9) After simulating the malfunction conditions, use the hand-held tester diagnosis selector to check the DTCs and freezed frame data, etc.

HINT:
Be careful not to turn the ignition switch OFF. When turning the ignition switch OFF, the diagnosis system converts from check (test) mode to normal mode. All DTCs, etc. are erased at this condition.

(10) After checking the DTCs, inspect the applicable circuit.

(b) Clear the DTC.
The following actions will erase the DTCs and freezed frame data.

- Operating the hand-held tester to erase the codes. (See the hand-held tester's instruction book for operating instructions.)
- Disconnecting the battery terminals or EFI fuse.

NOTICE:
If the hand-held tester switches the engine ECU from normal mode to check mode or vice-versa, or if the ignition switch is turned from ON to ACC or OFF during check mode, the DTCs and freezed frame data will be erased.

4. FAIL-SAFE CHART

If any of the following codes is recorded, the engine ECU enters fail-safe mode.

DTC No.	Fail-Safe Operation	Fail-Safe Deactivation Conditions
P0102 P0103	Ignition timing fixed at 5˚ BTDC	Returned to normal condition
P0112 P0113	Intake air temp. is fixed at 20˚C (68˚F)	Returned to normal condition
P0116 P0117 P0118	Water temp. is fixed at 80˚C(176˚F)	Returned to normal condition
P0122 P0123	VTA is fixed at 0˚	The following condition must be repeated at least 2 times consecutively When closed throttle position switch is ON: VTA ≧ 0.1 V and ≦ 0.95 V
P0135 P0141	The heater circuit in which an abnormality is detected is turned off	IG switch OFF
P0135	Max. timing retardation	IG switch OFF

5. CHECK FOR INTERMITTENT PROBLEMS

HAND-HELD TESTER only:
By putting the vehicle's engine ECU in check (test) mode, 1 trip detection logic is possible instead of 2 trip detection logic and sensitivity to detect open circuits is increased. This makes it easier to detect intermittent problems.

(a) Clear the DTC. (See step 3.)
(b) Set the check (test) mode (See step 3.)
(c) Perform a simulation test. (See page 01-20)
(d) Check the connector and terminal. (See page 01-30)
(e) Handle the connector. (See page 01-30)

6. ENGINE OPERATING CONDITION

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value from those listed here. So do not decide whether a part is faulty or not solely according to the "Normal Condition" here.

Hand-held tester display	Measurement Item	Normal Condition*1
FUEL SYS #1	Fuel System Bank 1 OPEN: Air-fuel ratio feedback stopped CLOSED: Air-fuel ratio feedback operating	Idling after warming up: CLOSED
CALC LOAD	Calculator Load: Current intake air volume as a proportion of max. intake air volume	Idling: 27.5 - 46.4 % Racing without load (2,500rpm): 19.7 - 40.5 %
COOLANT TEMP./WATER TEMP.	Water Temp. Sensor Value	After warming up: 80 - 95°C (176 - 203°F)
SHORT FT #1	Short-term Fuel Trim Bank 1	0 ± 20%
LONG FT #1	Long-term Fuel Trim Bank 1	0 ± 20%
ENGINE SPD	Engine Speed	Idling: 600 - 700 rpm
VEHICLE SPD	Vehicle Speed	Vehicle Stopped: 0 km/h (0 mph)
IGN ADVANCE	Ignition Advance: Ignition Timing of Cylinder No. 1	Idling: BTDC 3 – 13°
INTAKE AIR	Intake Air Temp. Sensor Value	Equivalent to Ambient Temp.
THROTTLE POS	Voltage Output of Throttle Position Sensor Calculated as a percentage: 0 V → 0%, 5 V → 100%	Throttle Fully Closed: 8 - 20 % Throttle Fully Open: 64 - 96 %
O2S B1, S1	Voltage Output of Oxygen Sensor Bank 1, Sensor 1	Idling: 0.1 - 0.9 V
O2S B1, S2	Voltage Output of Oxygen Sensor Bank 1 Sensor 2	Driving 50 km/h (31 mph): 0.1 - 0.9 V
O2FT B1, S1	Oxygen Sensor Fuel Trim Bank 1, Sensor 1 (Same as SHORT FT #1)	0 ± 20 %
MIL ON RUN DIST	Distance since activation of check engine warning light	When there is no DTC: 0 km (0 mph)
INJECTOR	Fuel injection time for cylinder No.1	Idling: 1.92 - 3.37 ms
MISFIRE RPM	Engine RPM for first misfire range	Misfire 0: 0 rpm
MISFIRE LOAD	Engine LOAD for first misfire range	Misfire 0: 0 g/r
STARTER SIG	Starter Signal	Cranking: ON
A/C SIG	A/C Switch Signal	A/C ON: ON
PNP SW/NSW *2	Neutral start switch signal	P or N position: ON
ELECTRCL LOAD SIG	Electrical Load Signal	Defogger switch ON: ON
CTP SW	Closed Throttle Position Switch Signal	Throttle Fully Closed: ON
STOP LIGHT SW	Stop Light Switch Signal	Stop light switch ON: ON
PS OIL PRESS SW	Power Steering Oli Pressure Switch Signal	Turn steering wheel: ON
FC IDL	Fuel Cut Idle: Fuel cut when throttle valve fully closed, during deceleration	Fuel cut operating: ON
FC TAU	Fuel Cut TAU: Fuel cut during very light load	Fuel cut operating: ON
CYL#1, CYL#2, CYL#3, CYL#4	Abnormal revolution variation for each cylinder	0 %
IGNITION	Total number of ignition for every 1,000 revolutions	0 - 300
INTAKE CTRL VSV	Intake Air Control Valve VSV Signal	VSV operating: ON
A/C CUT SIG	A/C Cut Signal	A/C S/W OFF: ON
FUEL PUMP	Fuel Pump Signal	Idling: ON
EVAP (PURGE) VSV	EVAP VSV Signal	VSV operating: ON
TOTAL FT B1	Total Fuel Trim Bank 1: Average value for fuel trim system of bank 1	Idling: 0.5 - 1.4

O2 LR B1 S1	Oxygen Sensor Lean Rich Bank 1 Sensor 1: Response time for oxygen sensor output to switch from lean to rich	Idling after warming up: 0 - 1,000 msec.
O2 RL B1 S1	Oxygen Sensor Rich Lean Bank 1 Sensor 1: Response time for oxygen sensor output to switch from rich to lean	Idling after warming up: 0 - 1,000 msec.

*1: If no conditions are specifically stated for "Idling", it means the shift lever is at N or P position, the A/C switch is OFF and all accessory switches are OFF.
*2: A/T only

BASIC INSPECTION

When the malfunction code is not confirmed in the DTC check, troubleshooting should be carried out in the order for all possible circuits to be considered as the causes of the problems. In many cases, by carrying out the basic engine check shown in the following flow chart, the location causing the problem can be found quickly and efficiently. Therefore, use of this check is essential in engine troubleshooting.

1 CHECK BATTERY VOLTAGE

NOTICE:
Carry out this check in engine stoppage condition.

REFERENCE:

	OK	NG
VOLTAGE	11V OR MORE	LESS THAN 11V

NG → **CHARGE OR REPLACE BATTERY**

OK

2 CHECK IF ENGINE IS CRANKED

NG → **PROCEED TO PROBLEM TABLE** **(See page 05-335)**

OK

3 CHECK IF ENGINE STARTS

NG → **GO TO STEP 7**

OK

4	CHECK AIR FILER

(a) Visually check that the air filter is not excessively dirty or oily.

HINT:

If necessary, clean the filter with compressed air. First blow from inside thoroughly, then blow from outside of filter.

NG → REPAIR OR REPLACE

OK

5	CHECK IDLE SPEED (See page 14-82)

NG → PROCEED TO PROBLEM SYMPTOM TABLE (See page 05-177)

OK

6	CHECK IGNITION TIMING (See page 18-5)

NG → PROCEED TO PAGE 18-5 AND CONTINUE TO TROUBLESHOOT

OK

7	CHECK FUEL PRESSURE (See page 11-5)

NG → PROCEED TO PAGE 11-5 AND CONTINUE TO TROUBLESHOOT

OK

8	CHECK FOR SPARK (See page 18-5)

NG → PROCEED TO PAGE 18-5 AND CONTINUE TO TROUBLESHOOT

OK

PROCEED TO PROBLEM SYMPTOMS TABLE (See page 05-177)

05046-04

DIAGNOSTIC TROUBLE CODE CHART

HINT:

Parameters listed in the chart may not be exactly the same as your reading due to the type of instrument or other factors.

If a malfunction code is displayed during the DTC check in the check mode, check the circuit for the codes listed in the table below. For details of each code, turn to the page referred to under the "See page" for the respective "DTC No." in the DTC chart.

DTC No. (See page)	Detection Item	Trouble Area	*1 CHK ENG (MIL)	Memory
P0102 (05-337)	Air Flow Meter Circuit Low Input	• Open or short in air flow meter circuit • Air flow meter • ECM	○	○
P0103 (05-337)	Air Flow Meter Circuit High Input	• Open or short in air flow meter circuit • Air flow meter • ECM	○	○
P0112 (05-342)	Intake Air Temperature Circuit Low Input	• Open or short in intake air teperature sensor circuit • Intake air teperature sensor (built into air flow meter) • ECM	○	○
P0113 (05-342)	Intake Air Temperature Circuit High Input	• Open or short in intake air teperature sensor circuit • Intake air teperature sensor (built into air flow meter) • ECM	○	○
P0117 (05-345)	Engine Coolant Temperature Sensor Circuit Low Input	• Open or short in engine coolant teperature sensor circuit • Engine coolant temperature sensor • ECM	○	○
P0118 (05-345)	Engine Coolant Temperature Sensor Circuit High Input	• Open or short in engine coolant teperature sensor circuit • Engine coolant temperature sensor • ECM	○	○
P0122 (05-349)	Throttle Position Sensor Circuit Low Input	• Open or short in throttle position sensor circuit • Throttle position sensor • ECM	○	○
P0123 (05-349)	Throttle Position Sensor Circuit High Input	• Open or short in throttle position sensor circuit • Throttle position sensor • ECM	○	○
P0125 (05-353-1)	Insufficient Coolant Temperature For Closed Loop Fuel Control	• Engine coolant temperature sensor • Thermostat	○	○
P0130 (05-354)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 1) • Oxygen sensor (Bank 1 Sensor 1) • Air induction system • Fuel pressure • Injector • ECM	○	○
P0132 (05-354)	Oxygen Sensor Circuit High Voltage(Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 1) • Oxygen sensor (Bank 1 Sensor 1) • Air induction system • Fuel pressure • Injector • ECM	○	○

P0133 (05–354)	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 1) • Oxygen sensor (Bank 1 Sensor 1) • Air induction system • Fuel pressure • Injector • ECM	○	○
P0134 (05–354)	Oxygen Sensor Circuit No Activity (Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 1) • Oxygen sensor (Bank 1 Sensor 1) • Air induction system • Fuel pressure • Injector • ECM	○	○
P0135 (05–365)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 1)	• Open or short in oxygen sensor heater circuit (Bank 1 Sensor 1) • Oxygen sensor heater (Bank 1 Sensor 1) • ECM	○	○
P0136 (05–354)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 2)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 2) • Oxygen sensor (Bank 1 Sensor 2) • Air induction system • Fuel pressure • Injector • ECM	○	○
P0138 (05–354)	Oxygen Sensor Circuit High Voltage(Bank 1 Sensor 2)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 2) • Oxygen sensor (Bank 1 Sensor 2) • Air induction system • Fuel pressure • Injector • ECM	○	○
P0139 (05–354)	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 2)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 2) • Oxygen sensor (Bank 1 Sensor 2) • Air induction system • Fuel pressure • Injector • ECM	○	○
P0140 (05–354)	Heated Oxygen Sensor Circuit No Activity (Bank 1 Sensor 2)	• Open or short in oxygen sensor circuit (Bank 1 Sensor 2) • Oxygen sensor (Bank 1 Sensor 2) • Air induction system • Fuel pressure • Injector • ECM	○	○
P0141 (05–365)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)	• Open or short in oxygen sensor heater circuit (Bank 1 Sensor 2) • Oxygen sensor heater (Bank 1 Sensor 2) • ECM	○	○
P0170 (05–369)	System Too Lean (Fuel Trim) (Bank 1)	• Air induction system • Injector blockage • Air flow meter • Oxygen sensor (bank 1 sensor 1) • Engine coolant temperature sensor • Fuel pressure • Gas leakage on exhaust system • ECM	○	○

P0172 (05–369)	System Too Rich (Fuel Trim) (Bank 1)	• Air induction system • Injector blockage • Air flow meter • Oxygen sensor (bank 1 sensor 1) • Engine coolant temperature sensor • Fuel pressure • Gas leakage on exhaust system • ECM	○	○
P0261 (05–372)	Cylinder 1 Injector Circuit Low	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0262 (05–372)	Cylinder 1 Injector Circuit High	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0264 (05–372)	Cylinder 2 Injector Circuit Low	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0265 (05–372)	Cylinder 2 Injector Circuit High	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0267 (05–372)	Cylinder 3 Injector Circuit Low	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0268 (05–372)	Cylinder 3 Injector Circuit High	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0270 (05–372)	Cylinder 4 Injector Circuit Low	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0271 (05–372)	Cylinder 4 Injector Circuit High	• Open or short in injector circuit • Open in injector power source circuit • Injector • ECM	○	○
P0300 (05–375)	Random/Multiple Cylinder Misfire Detected	• Open or short in engine wire • Connector connection • Vacuum hose connection • Ignition system • Injector • Fuel pressure • Air flow meter • Engine coolant temperature sensor • Compression pressure • Valve clearance • Valve timing • ECM	○*2	○
P0301 (05–375)	Cylinder 1 Misfire Detected			
P0302 (05–375)	Cylinder 2 Misfire Detected			
P0303 (05–375)	Cylinder 3 Misfire Detected			
P0304 (05–375)	Cylinder 4 Misfire Detected			
P0327 (05–379)	Knock Sensor 1 Circuit Low Input	• Open or short in knock sensor circuit • Knock sensor (looseness) • ECM	○	○

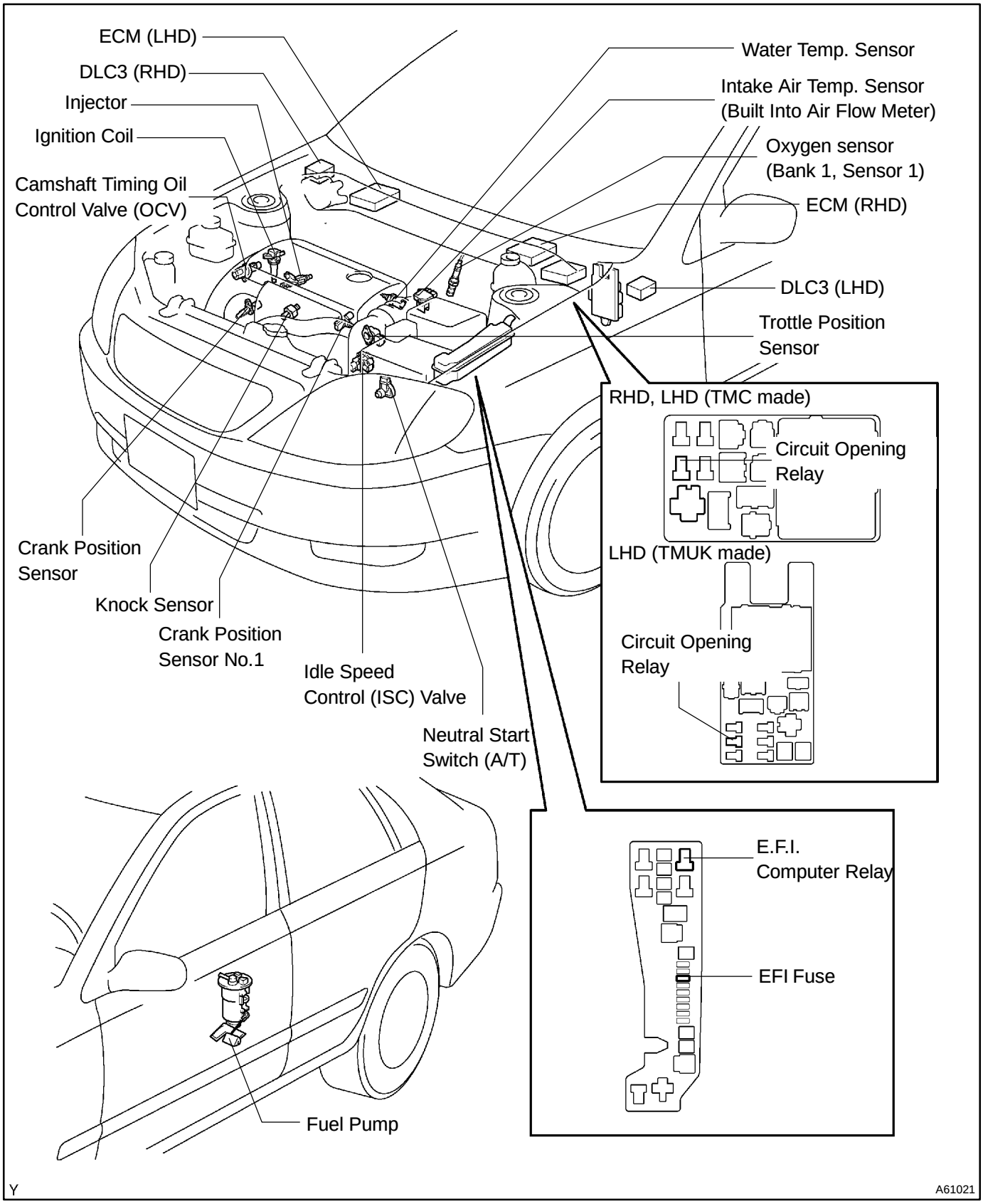
P0335 (05-381)	Crankshaft Position Sensor Circuit Malfunction	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crank angle sensor plate • ECM	○	○
P0336 (05-384)	Crankshaft Position Sensor Circuit Range/Performance	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crank angle sensor plate • ECM	○	○
P0340 (05-384-1)	Camshaft Position Sensor "A" Circuit	• Camshaft position sensor • Intake camshaft • ECM	○	○
P0341 (05-384-1)	Camshaft Position Sensor "A" Circuit Range/Performance	• Camshaft position sensor • Intake camshaft • ECM	○	○
P0342 (05-385)	Camshaft Position Sensor Circuit Low Input	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • ECM	○	○
P0343 (05-385)	Camshaft Position Sensor Circuit High Input	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • ECM	○	○
P0420 (05-388)	Catalyst System Efficiency Below Threshold	• Gas leakage on exhaust system • Oxygen sensor • Three-way catalytic converter	○	○
P0443 (05-391)	Evaporative Emission Control System Purge Control Vent Control Malfunction	• Open or short in VSV circuit for EVAP • VSV for EVAP • ECM	○	○
P0501 (05-393)	Vehicle Speed Sensor Range/ Performance	• Combination meter • Open or short in vehicle speed sensor circuit • Vehicle speed sensor • ECM	○	○
P0505 (05-395)	Idle Control System Malfunction	• Open or short in ISC valve circuit • ISC valve is stick or closed • A/C switch circuit • Air induction system • ECM	○	○
P0561 (05-398)	System Voltage Unstable	• Open in back up power source circuit • ECM	○	○
P0562 (05-400)	System Voltage Low	• Open in back up power source circuit • Tired battery • Electrical over work • Alternator • ECM	○	○
P0563 (05-400)	System Voltage High	• Open in back up power source circuit • Tired battery • Electrical over work • Alternator • ECM	○	○
P0601 (05-401-1)	Internal Control Module Memory Check Sum Error	• ECM	○	○

P1340 (05-402)	Camshaft Position Sensor Circuit Range/Performance	• Mechanical system malfunction • Valve timing (Timing chain position deviates or timing chain is stretching) • Camshaft timing gear assy • Camshaft timing oil control valve (OCV)	○	○
P1345 (05-402)	VVT System Stick Detected	• Camshaft timing gear assy • Camshaft timing oil control valve (OCV)	○	○
P1346 (05-403)	Camshaft Timing Oil Control Valve Circuit Malfunction	• Open or short in camshaft timing oil control valve (OCV) circuit • Camshaft timing oil control valve (OCV) • ECM	○	○
P1605 (05-404)	Knock Control CPU Malfunction	• ECM	○	○

*1: ○ ... CHK ENG (check engine warning light) lights up.
*2: When catalyst-damage-misfire (a lot of misfires) occurs, the CHK ENG blinks.

05047-04

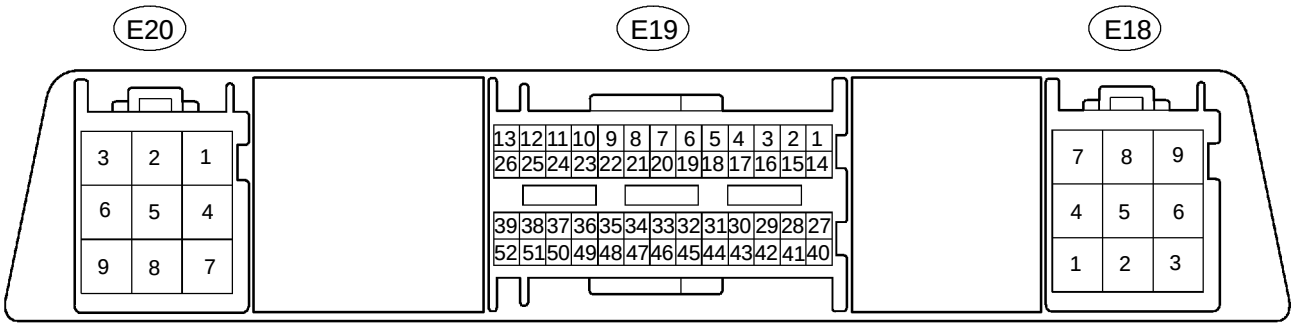
LOCATION



05048-04

TERMINALS OF ECU

ECM Terminals



Y

A63912

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
BATT (E20 - 1) - E1 (E20 - 7)	R-W ↔ W-B	Always	9 - 14
IGSW (E19 - 39) - E1 (E20 - 7)	B-W ↔ W-B	IG switch ON	9 - 14
+B (E20 - 4) - E1 (E20 - 7)	B ↔ W-B	IG switch ON	9 - 14
VC (E19 - 52) - E2 (E19 - 20)	Y ↔ BR*1 P-L ↔ Y*2	IG switch ON	4.5 - 5.5
VTA (E19 - 21) - E2 (E19 - 20)	LG ↔ BR*1 LG ↔ Y*2	IG switch ON, throttle valve fully closed	0.4 - 1.0
VTA (E19 - 21) - E2 (E19 - 20)	LG ↔ BR*1 LG ↔ Y*2	IG switch ON, throttle valve fully open	3.2 - 4.8
THA (E19 - 7) - E2 (E19 - 20)	Y-B ↔ BR*1 Y-B ↔ Y*2	Idling, intake air temp. 20 ˚C (68 ˚F)	0.5 - 3.4
THW (E19 - 8) - E2 (E19 - 20)	W ↔ BR*1 W ↔ Y*2	Idling, Engine coolant temp. at 80 ˚C (176 ˚F)	0.2 - 1.0
#1 (E20 - 9) - E01 (E18 - 1)	Y ↔ W-B	IG switch ON	9 - 14
#2 (E20 - 6) - E01 (E18 - 1)	B ↔ W-B*1 B-R ↔ W-B*2	IG switch ON	9 - 14
#3 (E20 - 8) - E01 (E18 - 1)	W ↔ W-B	IG switch ON	9 - 14
#4 (E20 - 5) - E01 (E18 - 1)	L ↔ W-B	IG switch ON	9 - 14
IGT1 (E18 - 6) - E1 (E20 - 7)	R-L ↔ W-B	Idling	9 - 14
IGT2 (E18 - 8) - E1 (E20 - 7)	Y-G ↔ W-B	Idling	9 - 14
IGT3 (E18 - 5) - E1 (E20 - 7)	GR ↔ W-B	Idling	9 - 14
IGT4 (E18 - 9) - E1 (E20 - 7)	W ↔ W-B	Idling	9 - 14
MREL (E19 - 49) - E1 (E20 - 7)	B-W ↔ W-B	IG switch ON	9 - 14
FC (E19 - 47) - E1 (E20 - 7)	G-R ↔ W-B	IG switch ON	9 - 14
STP (E19 - 3) - E1 (E20 - 7)	G-W ↔ W-B	IG switch ON, brake pedal depressed	9 - 14
STP (E19 - 3) - E1 (E20 - 7)	G-W ↔ W-B	IG switch ON, brake pedal released	Below 1.5
OX (E19 - 11) - E1 (E20 - 7)	R ↔ W-B*1 B ↔ W-B*2	IG switch ON	9 - 14
OX2 (E19 - 12) - E1 (E20 - 7)	W ↔ W-B*1 R ↔ W-B*2	IG switch ON	9 - 14
HT (E20 - 3) - E1 (E20- 7)	P ↔ W-B	IG switch ON	9 - 14
HT2 (E20 - 2) - E1 (E20 - 7)	P-L ↔ W-B*1 P ↔ W-B*2	IG switch ON	9 - 14

TC (E19 - 10) - E1 (E20 - 7)	P-B ↔ W-B	IG switch ON	9 - 14
W (E19 - 48) - E1 (E20 - 7)	R-Y ↔ W-B	IG switch ON	Below 3.0
OCV + (E18 - 4) - OCV - (E18 - 3)	Y ↔ B-Y	IG switch ON	Pulse generation

*1: Sedan, Wagon
*2:Hatch back

05049-04

PROBLEM SYMPTOMS TABLE

When the malfunction code is not confirmed in the diagnostic trouble code check and the problem still can not be confirmed in the basic inspection, proceed to this problem symptoms tables and troubleshoot according to the numbered order given below.

Symptom	Suspect Area	See page
Engine does not crank (Does not start)	1. Starter and starter relay 2. Neutral start switch circuit L	19-11 40-6
No initial combustion (Does not start)	1. ECM power source circuit 2. Ignition coil (w/ Igniter) circuit 3. Fuel pump control circuit 4. Injector	05-412 05-375 05-408 05-375
No complete combustion (Does not start)	1. Fuel pump control circuit 2. Ignition coil (w/ Igniter) circuit 3. Injector	05-408 05-375 05-375
Engine cranks normally (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Ignition coil (w/ Igniter) 5. Spark plug 6. Compression 7. Injector	05-405 05-395 05-408 18-7 18-7 14-82 05-375
Cold engine (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Injector 5. Ignition coil (w/ Igniter) 6. Spark plug	05-405 05-395 05-408 05-375 18-7 18-7
Hot engine (Difficult to start)	1. Starter signal circuit 2. ISC valve circuit 3. Fuel pump control circuit 4. Injector 5. Ignition coil (w/ Igniter) 6. Spark plug	05-405 05-395 05-408 05-375 18-7 18-7
Incorrect first idle (Poor idling)	1. ISC valve circuit	05-395
High engine idle speed (Poor idling)	1. ISC valve circuit 2. ECM power source circuit 3. Neutral start switch circuit L 4. Back up power source circuit	05-395 05-412 40-6 05-411
Low engine idle speed (Poor idling)	1. ISC valve circuit 2. Neutral start switch circuit L 3. Fuel pump control circuit 4. Injector 5. Back up power source circuit	05-395 40-6 05-408 05-375 05-411
Rough idling (Poor idling)	1. ISC valve circuit 2. Injector 3. Ignition coil (w/ Igniter) circuit 4. Compression 5. Fuel pump control circuit 6. Back up power source circuit	05-395 05-375 18-7 14-82 05-408 05-411
Hunting (Poor idling)	1. ISC valve circuit 2. ECU power source circuit 3. Fuel pump control circuit	05-395 05-412 05-408
Hesitation/Poor acceleration (Poor drivability)	1. Injector 2. Fuel pump control circuit 3. Ignition coil (w/ Igniter) circuit 4. A/T faulty L	05-375 05-408 18-7 05-776

Muffler explosion, after fire (Poor drivability)	1. Ignition coil (w/ Igniter) 2. Spark plug 3. Injector	18-7 18-7 05-375
Surging (Poor drivability)	1. Fuel pump control circuit 2. Spark plug 3. Injector	05-408 18-7 05-375
Engine stall (Soon after starting)	1. Fuel pump control circuit 2. ISC valve circuit	05-408 05-395
Engine stall (After accelerator pedal released)	1. Injector 2. ISC valve circuit 3. ECM	05-375 05-395 01-30
Engine stall (When shifting N to D)	1. Neutral start switch circuit L 2. ISC valve circuit	40-6 05-395

L A/T only

DTC	P0102	AIR FLOW METER CIRCUIT LOW INPUT

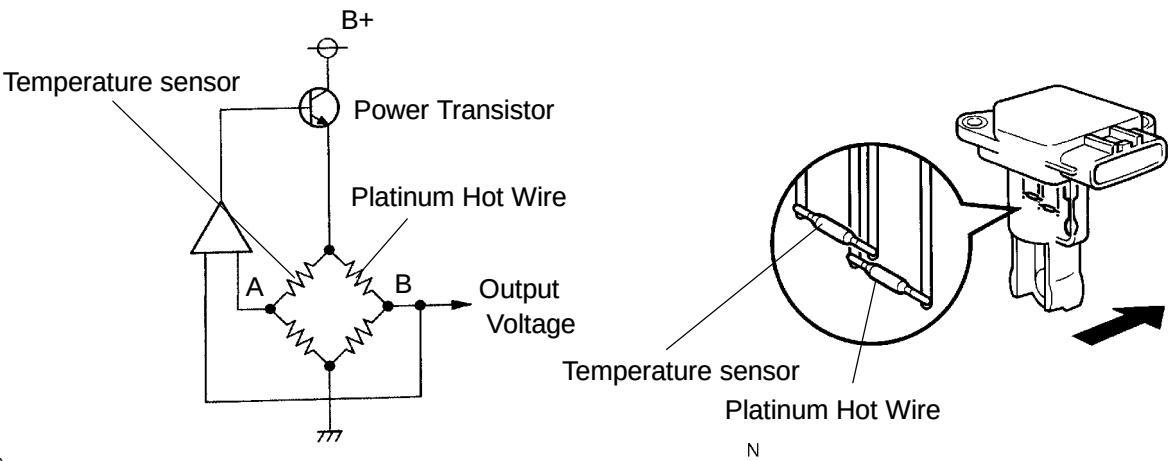
DTC	P0103	AIR FLOW METER CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

The air flow meter uses a platinum hot wire. The hot wire air flow meter consists of a platinum hot wire, temperature sensor and a control circuit installed in a plastic housing. The hot wire air flow meter works on the principle that the hot wire and temperature sensor located in the intake air bypass of the housing detect any changes in the intake air temperature.

The hot wire is maintained at the set temperature by controlling the current flow through the hot wire. This current flow is then measured as the output voltage of the air flow meter.

The circuit is constructed so that the platinum hot wire and temperature sensor provide a bridge circuit, with the power transistor controlled so that the potential of A and B remains equal to maintain the set temperature.



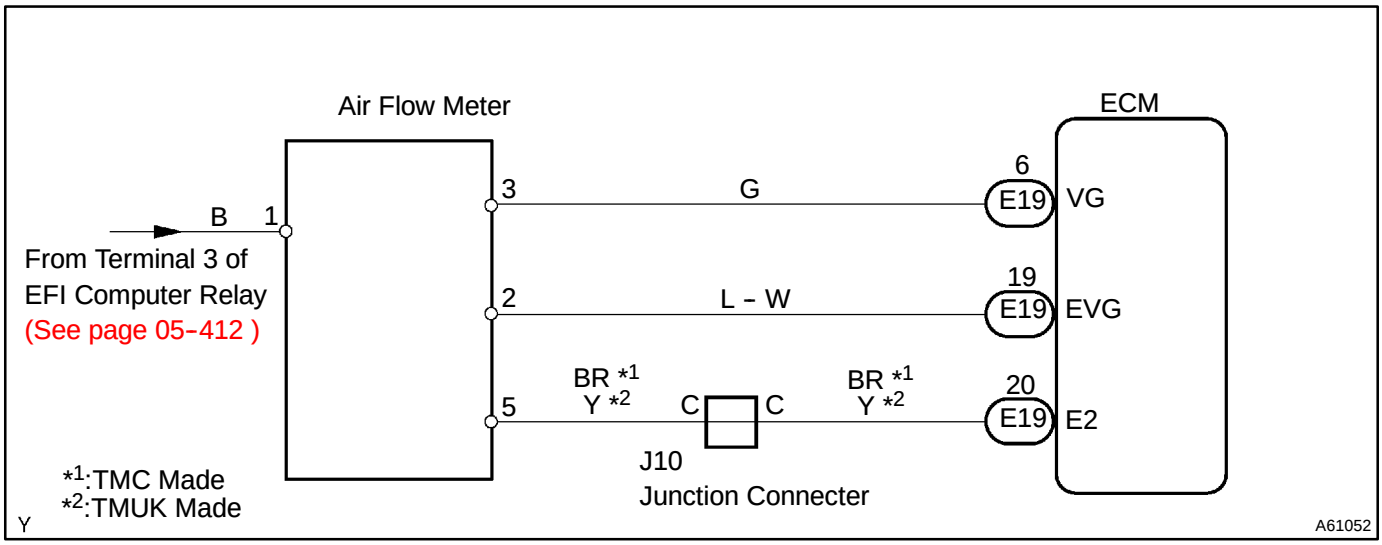
DTC No	DTC Detecting Condition	Trouble Area
P0102 P0103	Open or short in air flow meter circuit with more than 3 sec. engine speed less than 4,000 rpm	S Open or short in air flow meter circuit S Air flow meter S Engine ECU

HINT:

After confirming DTC P0102,P103 use the hand-held tester to confirm the air flow ratio from CURRENT DATA.

Air Flow Value (gm/sec.)	Malfunction
Approx. 0.0	S Air flow meter power source circuit open S VG circuit open or short
271.0 or more	S EVG circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	READ VALUE OF HAND-HELD TESTER(MASS AIR FLOW RATE)

(a) Read air flow rate on the hand-held tester.

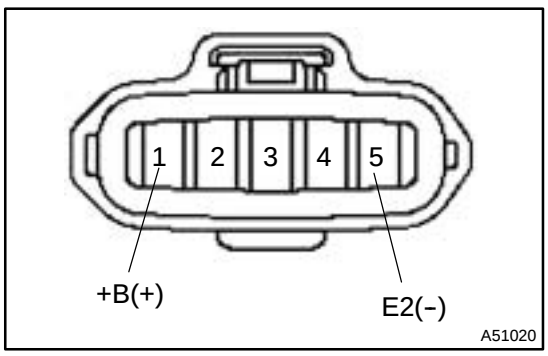
Result:

	A	B
Air flow rate (gm/sec.)	0.0	271.0 or more

B → **Go to step 6**

A

2	INSPECT INTAKE AIR FLOW METER SUB-ASSY(POWER SOUCE VOLTAGE)

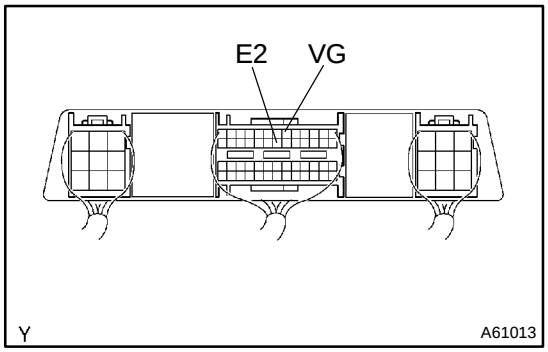


(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between the terminals +B and E2 of the air flow meter connector.
VOLTAGE: 9 - 14 V

NG → **Go to step 5**

OK

3 INSPECT ECM



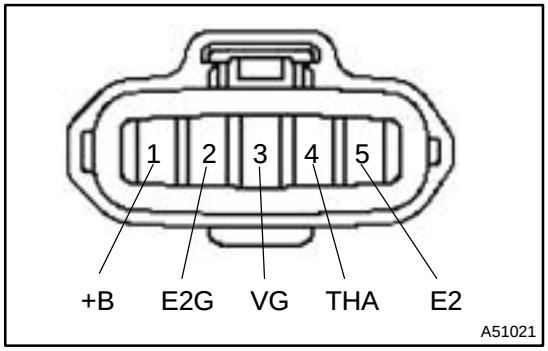
(a) Start the engine.
(b) Measure voltage between the terminals VG and E2 of the engine ECM connector while the engine is idling.
Voltage: 0.5 - 3.0 V

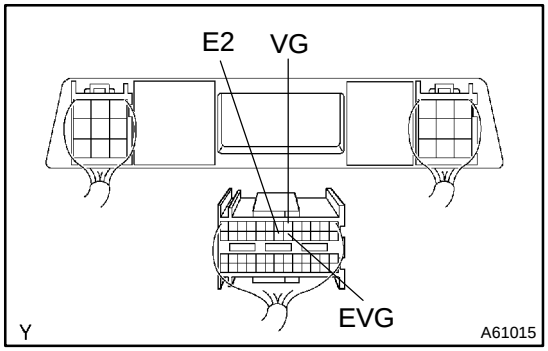
HINT:
The shift position should be P or N and A/C switch should be turned OFF.

NG → **CHECK AND REPLACE ECM**

OK

4 CHECK HARNESS AND CONNECTOR(ECM-INTAKE AIR FLOW METER)





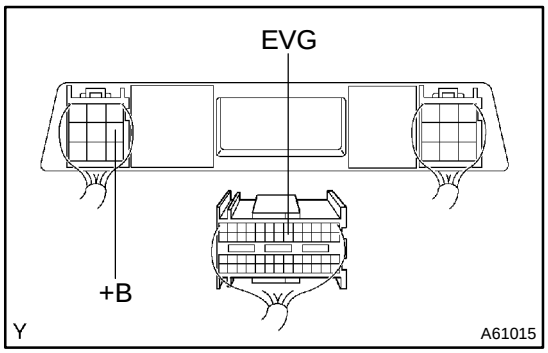
(a) Disconnect the air flow meter connector.
(b) Disconnect the engine ECM E19 connector.
(c) Check continuity between the terminals VG of the air flow meter harness connector and VG of the ECM connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2G of the air flow meter connector and EVG of the ECM connector.
Resistence: 1 Ω or less
(e) Check for short between the terminals VG and EVG of the ECM connector.
Resistance: 1M Ω or more
(f) Check for short between the terminals EVG and E2 of the ECM connector.
Resistance: 1M Ω or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

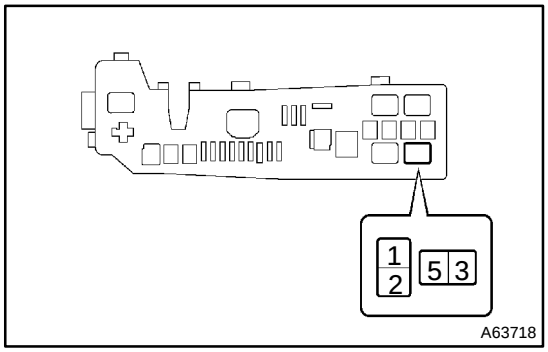
OK

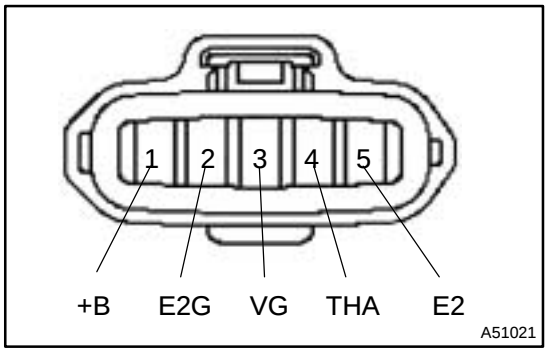
REPLACE INTAKE AIR FLOW METER SUB-ASSY

5 CHECK HARNESS AND CONNECTOR(EFI RELAY-INTAKE AIR FLOW METER)



(a) Disconnect the battery negative (-) terminal.
(b) DIsconnect the engine ECM E19 connector.
(c) Disconnect the air flow meter connector.
(d) Remove the E.F.I. computer relay.
(e) Check continuity between the terminals +B of the engine ECM connector and 3 of the E.F.I. computer relay installation relay block.
Resistance: 1Ω or less
(f) Check continuity between the terminals EVG of the air flow meter connector and EVG of the engine ECM connector.
Resistance: 1Ω or less



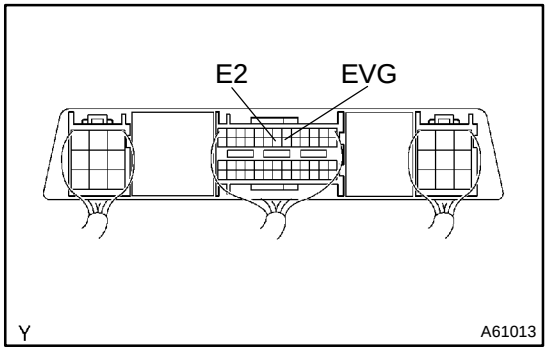


NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR ECM POWER SOURCE CIRCUIT

6 INSPECT ECM

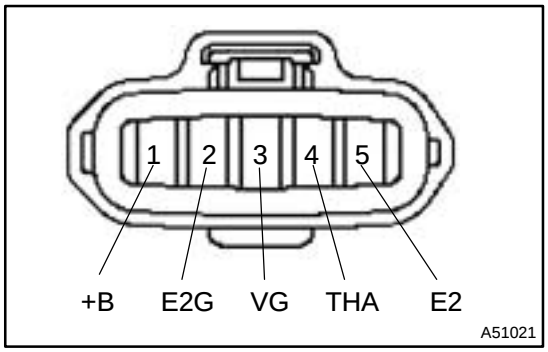


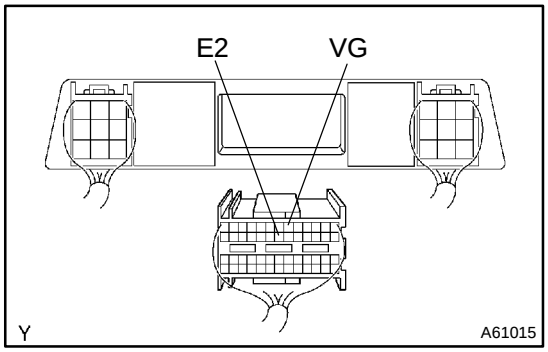
(a) Check continuity between the terminals EVG and E2 of the ECM connector.
Resistance: 1 Ω or less

NG → **CHECK AND REPLACE ECM**

OK

7	CHECK HARNESS AND CONNECTOR(ECM-AIR FLOW METER)





(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VG of the air flow meter connector and VG of the ECM connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2 of the air flow meter connector and E2 of the ECM connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals VG and E2 of the ECM connector.
Resistance: 1M Ω or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

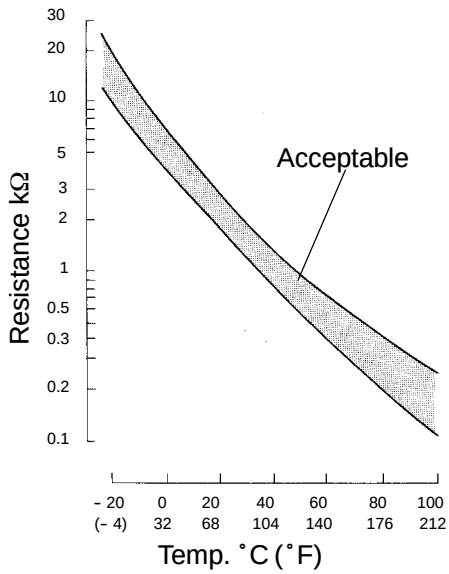
CHECK AND REPLACE ECM

DTC	P0112	INTAKE AIR TEMP. CIRCUIT LOW INPUT

DTC	P0113	INTAKE AIR TEMP. CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

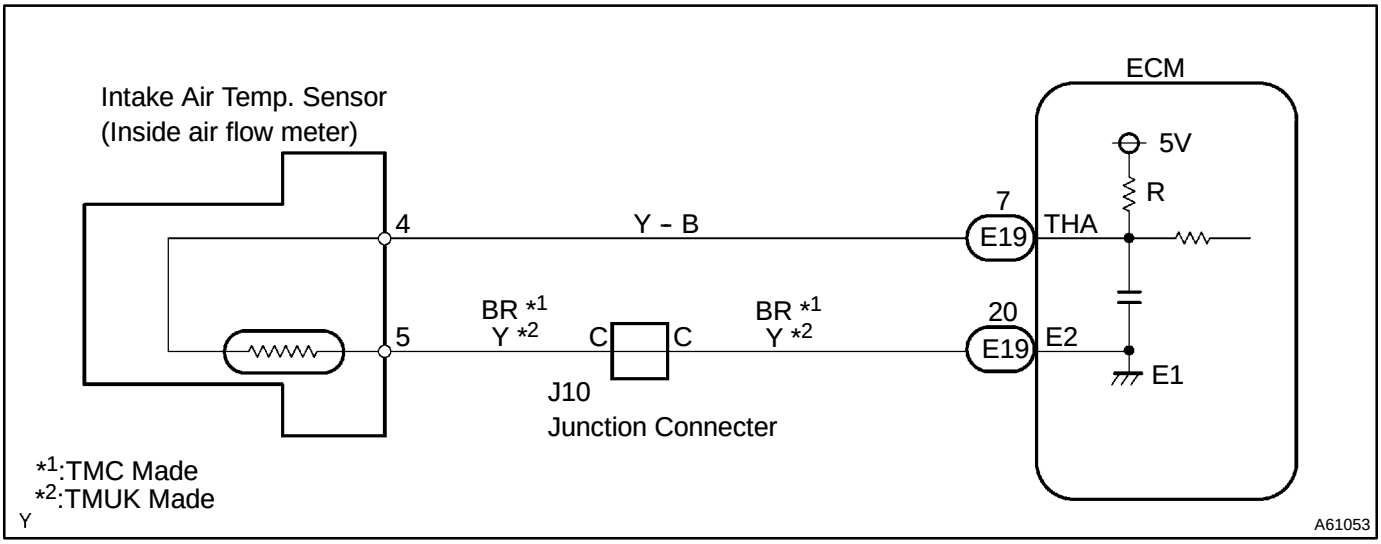
(fig. 1)



The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See fig. 1).
The intake air temp. sensor is connected to the ECM (See below). The 5 V power source voltage in the ECM is applied to the intake air temp. sensor from the terminal THA (THAR) via resistor R.
That is, the resistor R and the intake air temp. sensor are connected in series. When the resistance value of the intake air temp. sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA (THAR) also changes. Based on this signal, the ECM increases the fuel injection volume to improve driveability during cold engine operation.

DTC No.	DTC Detecting Condition	Trouble Area
P0112 P0113	Open or short in intake air temp. sensor circuit	S Open or short in intake air temp. sensor circuit S Intake air temp. sensor (inside air flow meter) S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs P0112, P01132, P0116, P117, P118, P0122 and P0123 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	READ VALUE OF HAND-HELD TESTER(INTAKE AIR TEMPERATURE)

(a) Read temperature value on the hand-held tester.
Temperature: The same as actual intake air temperature

Result:

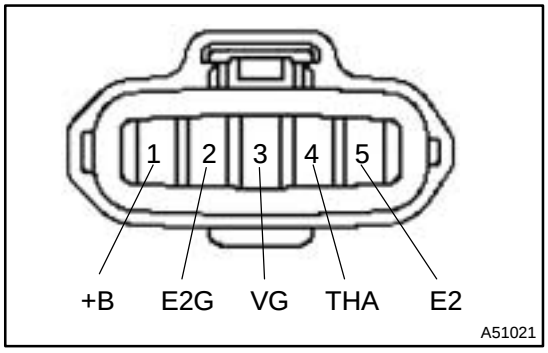
A	B	C
-40°C (-40°F)	140°C (284°F) or more	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS**

A

2	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN HARNESS)

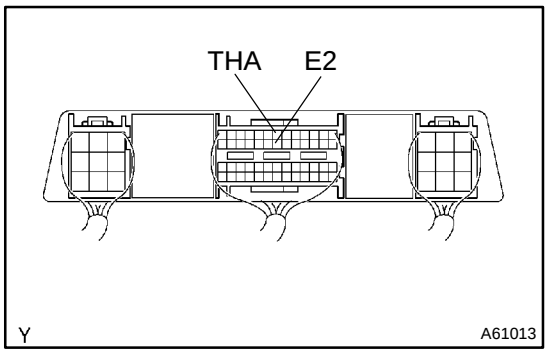


(a) Connect the terminal THA with E2.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPLACE INTAKE AIR FLOW METER SUB-ASSY**

NG

3	READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN ECM)



(a) Connect the terminals THA with E2 of the ECM connector.

HINT:

Before checking, do a visual check and connector connection and terminal inspection of the ECM.

(b) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

NG	CHECK AND REPLACE ECM

OK

READ VALUE OF HARNESS AND CONNECTOR

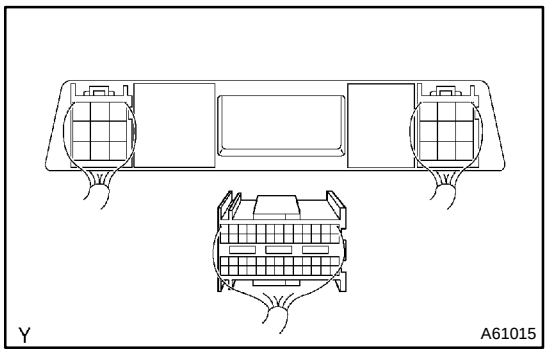
4	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN HARNESS)

(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: -40_C(-40_F)

OK	REPLACE INTAKE AIR FLOW METER SUB-ASSY

NG

5	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN ECM)



(a) Disconnect the the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand-held tester.
Temperature: -40°C (-40°F)

OK	REPAIR OR REPLACE HARNESS AND CONNECTOR

NG

CHECK AND REPLACE ECM

DTC	P0117	ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT

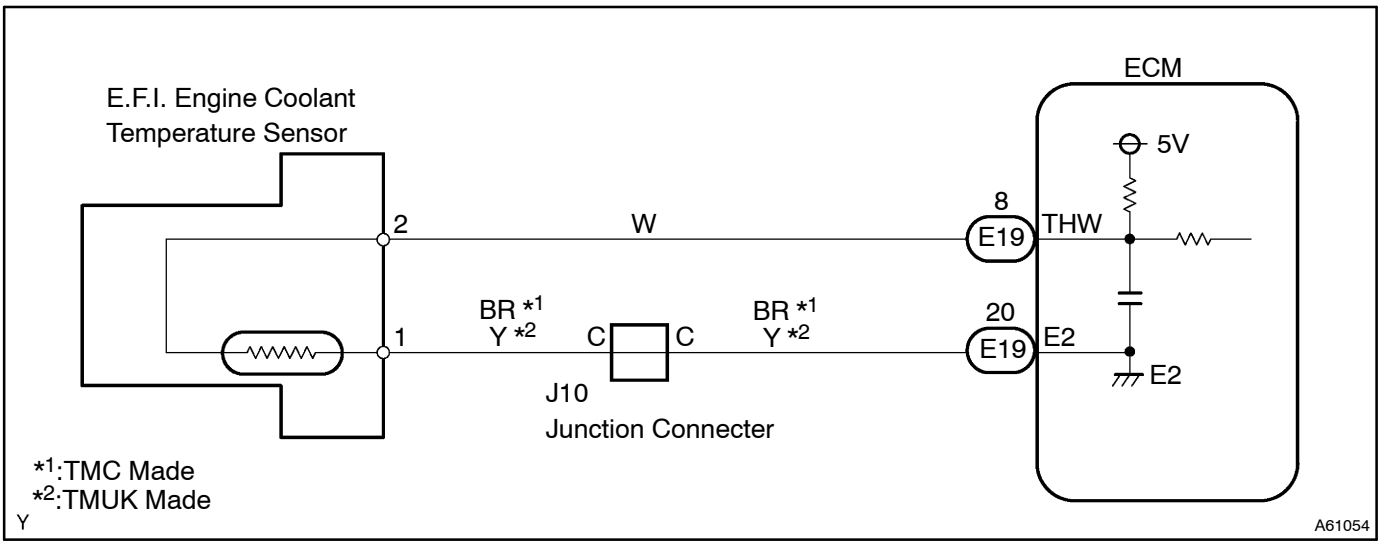
DTC	P0118	ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

A thermistor built into the engine coolant temperature sensor changes the resistance value according to the engine coolant temperature.
The structure of the sensor and connection to the ECM is the same as the ones of the air temperature sensor.

DTC No.	DTC Detecting Condition	Trouble Area
P0117	Open in engine coolant temperature sensor circuit (3 trip detection logic)	• Open or short in engine coolant temperature sensor circuit • Engine coolant temperature sensor • ECM
P0118	Short in engine coolant temperature sensor sircuit (3 trip detection logic)	

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1 READ VALUE OF HAND-HELD TESTER (ENGINE COOLANT TEMPERATURE)

(a) Read the engine coolant temperature on the hand-held tester.
TEMPERATURE: Same as actual engine coolant temperature

Result:

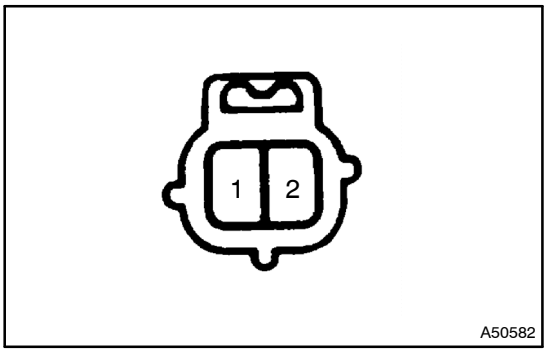
A	B	C
-40°C (-40°F)	140°C (284°F)	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS**

A

2 READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN HARNESS)

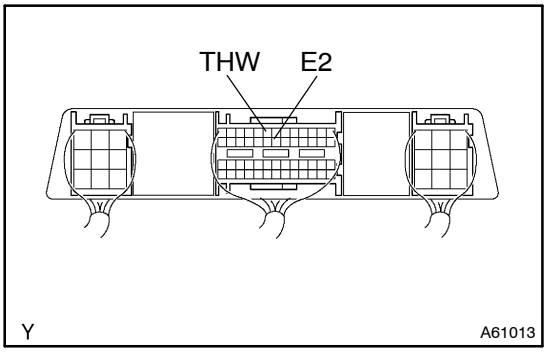


(a) Disconnect the engine coolant temperature sensor connector.
(b) Connect the terminals 1 with 2 of the engine coolant temperature sensor connector.
(c) Turn the ignition switch ON.
(d) Read the engine coolant temperature on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR**

NG

3 READ VALUE OF HAND-HELD TESTER(CHECK FOR OPEN IN ECM)



(a) Connect the terminals THW with E2 of the ECM connector.
(b) Turn the ignition switch ON.
(c) Read the engine coolant temperature on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

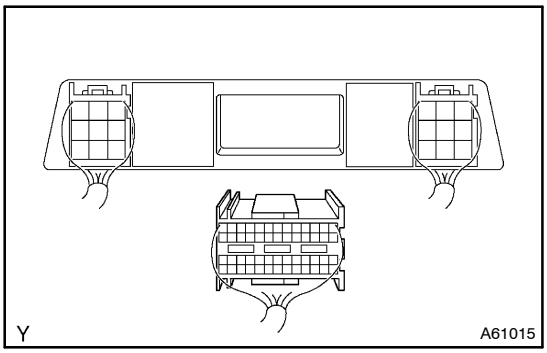
4	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN HARNESS)

(a) Disconnect the engine coolant temperature sensor connector.
(b) Turn the ignition switch ON.
(c) Read the engine coolant temperature on the hand-held tester.
Tempeture: -40°C (-40°F)

OK → **REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR**

NG

5	READ VALUE OF HAND-HELD TESTER(CHECK FOR SHORT IN ECM)



(a) Disconnect the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Read the engine coolant temperature on the hand-held tester.
Temperature: -40°C (-40°F)

OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

DTC	P0116	ENGINE COOLANT TEMP.CIRCUIT RANGE/PERFORMANCE PROBLEM

CIRCUIT DESCRIPTION

Refer to DTC P0115, P0117 and P0118 on page 05-345

DTC No.	DTC Detecting Condition	Trouble Area
P0116	When engine starts, water temp. is -7°C (20°F) or less. And, 20 min. or more after engine starts, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)	S Cooling system S Engine coolant temp. sensor S Thermostat S ECM
	When engine starts, water temp. is between -7°C (20°F) and 10°C (50°F) And, 5 min. or more after engine starts, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)	

WIRING DIAGRAM

Refer to DTC P0115, P0117 and P0118 on page 05-345

INSPECTION PROCEDURE

HINT:

- If DTCs P0110, P0115, P0116, P0117, P0118, P0122 and P0123 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1 READ OUTPUT DTC(BESIDES P0116)

SST 09843-18040

Result:

	A	B
RESULT	Only P0116 is output.	P0116 and other codes are output.

B → GO TO RELEVANT DTC CHART

A

2 INSPECT THERMOSTAT

NG → REPLACE THERMOSTAT

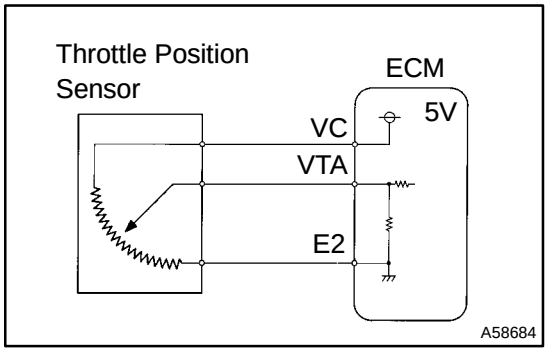
OK

REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

DTC	P0122	THROTTLE POSITION SENSOR CIRCUIT LOW INPUT

DTC	P0123	THROTTLE POSITION SENSOR CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION



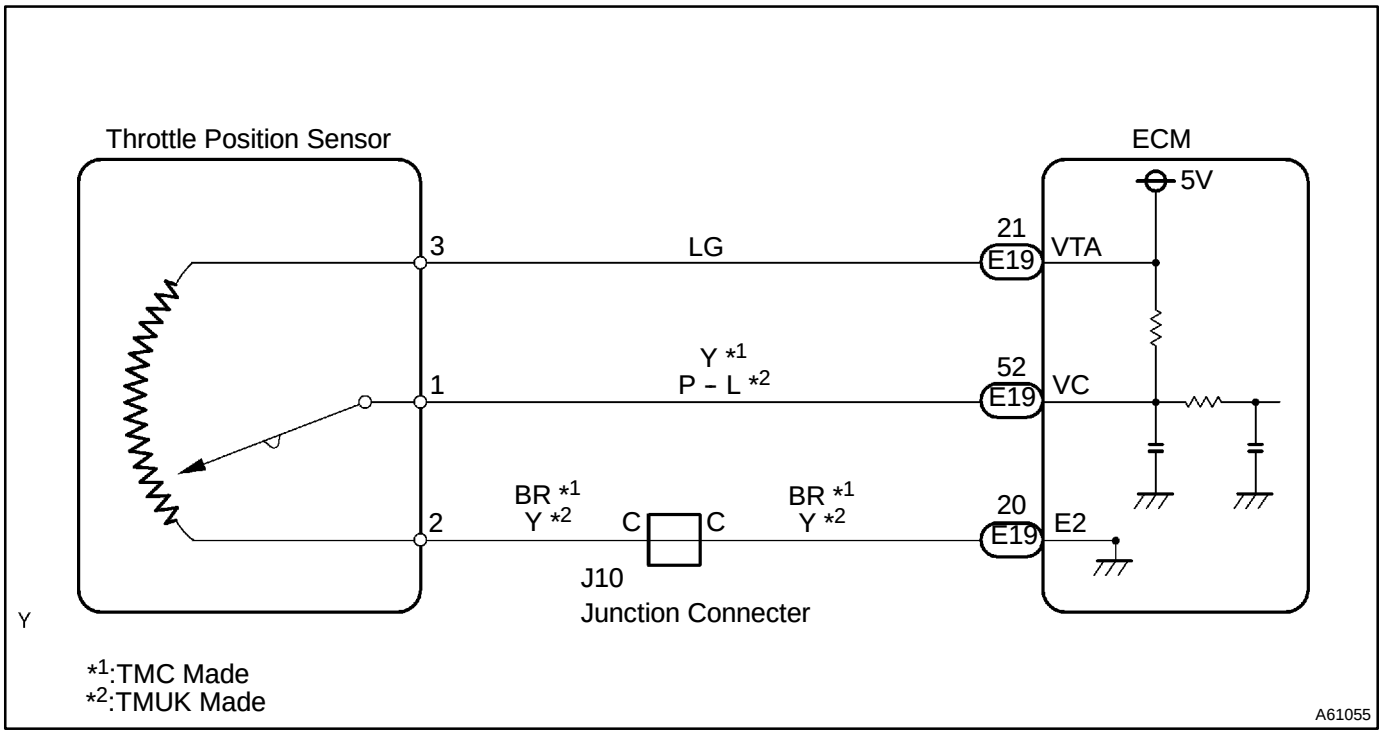
The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle.
When the throttle valve is fully closed, a voltage of approximately 0.7 V is applied to terminal VTA of the ECM. The voltage applied to the terminals VTA of the ECM increases in proportion to the opening angle of the throttle valve and becomes approximately 3.5 – 5.0 V when the throttle valve is fully opened. The ECM judges the vehicle driving conditions from these signals input from terminal VTA, uses them as one of the conditions for deciding the air–fuel ratio correction, power increase correction and fuel–cut control etc.

DTC No.	DTC Detecting Condition	Trouble Area
P0122 P0123	Condition (1) or (2) continues with more than 5 sec.: 1. VTA < 0.1 V 2. VTA > 4.9 V	S Open or short in throttle position sensor S Throttle position senor S ECM

HINT:
After confirming DTC P0122,P0123 use the hand–held tester to confirm the throttle valve opening percentage and closed throttle position switch condition.

Throttle valve opening position expressed as percentage		Trouble Area
Throttle valve fully closed	Throttle valve fully open	
0 %	0 %	VC circuit open VTA circuit open or short
Approx. 100 %	Approx. 100 %	E2 circuit open

WIRING DIAGRAM

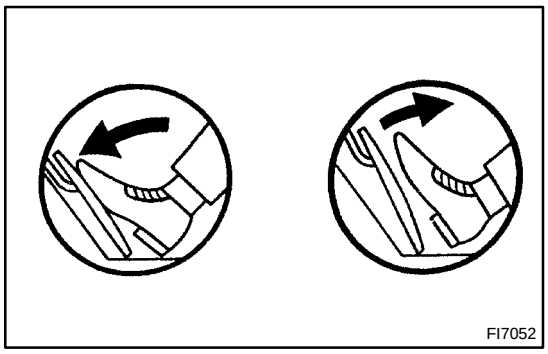


INSPECTION PROCEDURE

HINT:

- If DTCs P0110, P0115, P0116, P0117, P0118, P0122 and P0123 are output simultaneously, E2 (sensor ground) may be open.
- Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	**READ VALUE OF HAND-HELD TESTER(THROTTLE VALVE OPENING PERCENTAGE)**



(a) Read the throttle valve opening percentage.

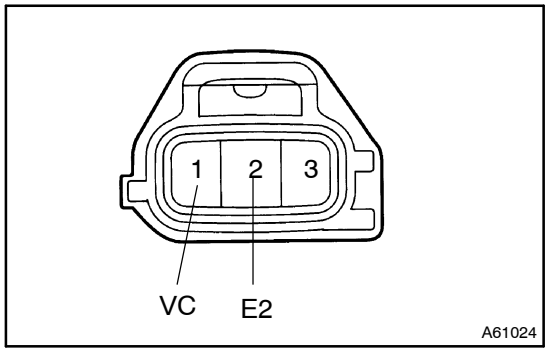
Result:

Throttle valve	Throttle valve opening position expressed as percentage
Fully open	Approx. 75 %
Fully closed	Approx. 10 %

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2 CHECK HARNESS AND CONNECTOR(CHECK VOLTAGE)

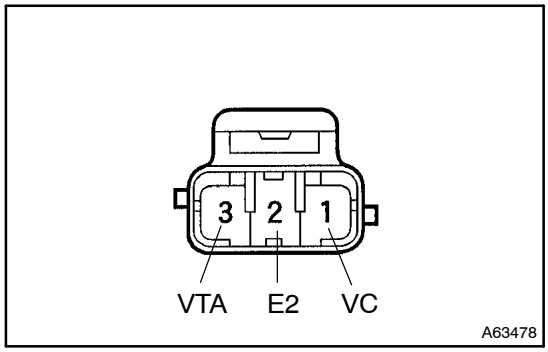


(a) Disconnect the throttle position sensor connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals VC and E2 of the throttle position sensor connector.
Voltage: 4.5–5.5V

NG → **Go to step 6**

OK

3 INSPECT E.F.I. THROTTLE POSITION SENSOR



(a) Disconnect the throttle position sensor connector.
(b) Measure resistance between the terminals VC and E2 of the throttle position sensor.
(c) Measure resistance between the terminals VTA and E2 of the throttle position sensor.

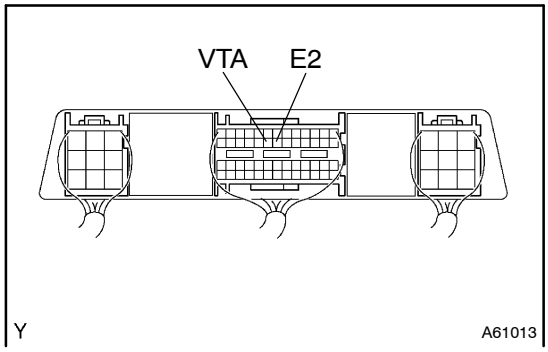
Resistance:

Terminals	Throttle valve	Resistance kΩ
1 (VC) – 2 (E2)	—	2.5 – 5.9
3 (VTA) – 2 (E2)	Fully closed	0.2 – 5.7
3 (VTA) – 2 (E2)	Fully open	2.0 – 10.2

NG → **REPLACE E.F.I. THROTTLE POSITION SENSOR**

OK

4 INSPECT ECM(CHECK VOLTAGE)

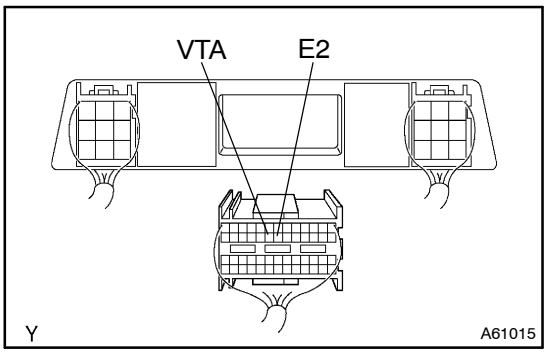


(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals VTA and E2 of the ECM connector.

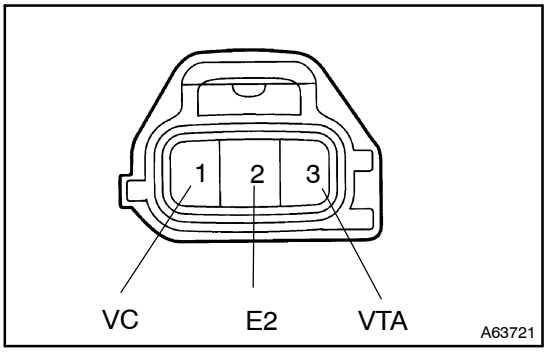
Voltage:

Throttle valve	Voltage V
Fully closed	0.3 – 1.0

5 CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check continuity between the terminals VTA of the ECM connector and VTA of the throttle position sensor connector.
Resistance:1Ω or less
(d) Check for short between the terminals VTA and E2 of the ECM connector.
Resistance: 1MΩ or more

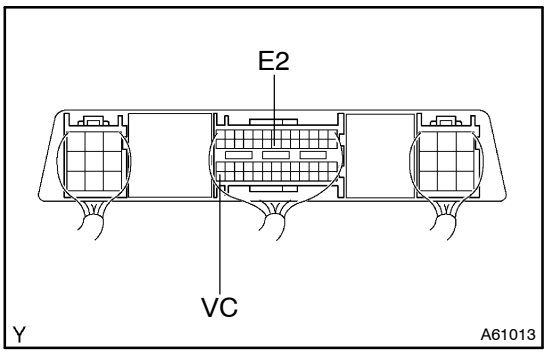


NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

6 INSPECT ECM(CHECK VOLTAGE)

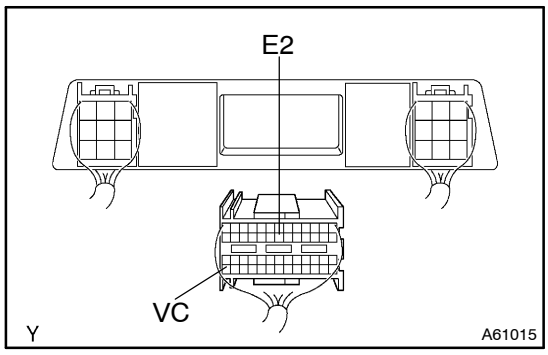


(a) Turn the ignition switch ON.
(b) Measure voltage between terminals VC and E2 of ECM connector.
Voltage: 4.5–5.5V

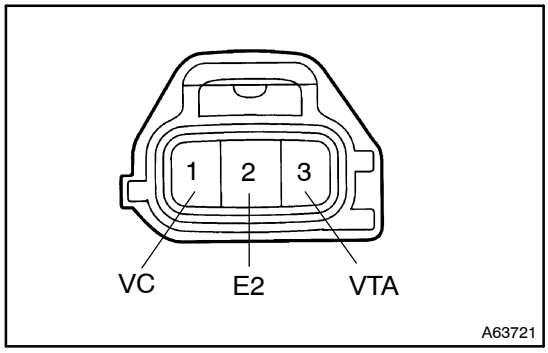
OK → **CHECK AND REPLACE ECM**

NG

7	CHECK HARNESS AND CONNECTOR(ECM–THROTTLE POSITION SENSOR)



(a) Disconnect the throttle position sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check continuity between the terminals VC of the ECM connector and VC of the throttle position sensor connector.
Resistance: 1Ω or less
(d) Check for short between the terminals VC and E2 of the ECM connector.
Resistance: 1MΩ or more



OK → **CHECK AND REPLACE ECM**

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

DTC	P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

CIRCUIT DESCRIPTION

Refer to DTC P0117 and P0118 on page 05–345.

DTC No.	DTC Detecting Condition	Trouble Area
P0125	Engine coolant temperature did not reach to engine coolant temerature for Closed Loop (3 trip detection logic)	• Engine coolant temperature sensor • Thermostat

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand–held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, this is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1 READ OUTPUT DTC (BESIDES P0125)

Result:

	A	B
RESULT	P0125 is output.	P0125 other codes are output.

B → **GO TO RELEVANT DTC CHART (See page 05–327)**

A

2 INSPECT THERMOSTAT (See page 16–16)

NG → **REPLACE THERMOSTAT**

OK

REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

DTC	P0130	OXYGEN SENSOR CIRCUIT MALFUNCTION (BANK 1 SENSOR 1)
DTC	P0132	OXYGEN SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1)
DTC	P0133	OXYGEN SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1)
DTC	P0134	OXYGEN SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1)
DTC	P0136	OXYGEN SENSOR CIRCUIT MALFUNCTION (BANK 1 SENSOR 2)
DTC	P0138	OXYGEN SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2)
DTC	P0139	OXYGEN SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2)
DTC	P0140	HEATED OXYGEN SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 2)

CIRCUIT DESCRIPTION

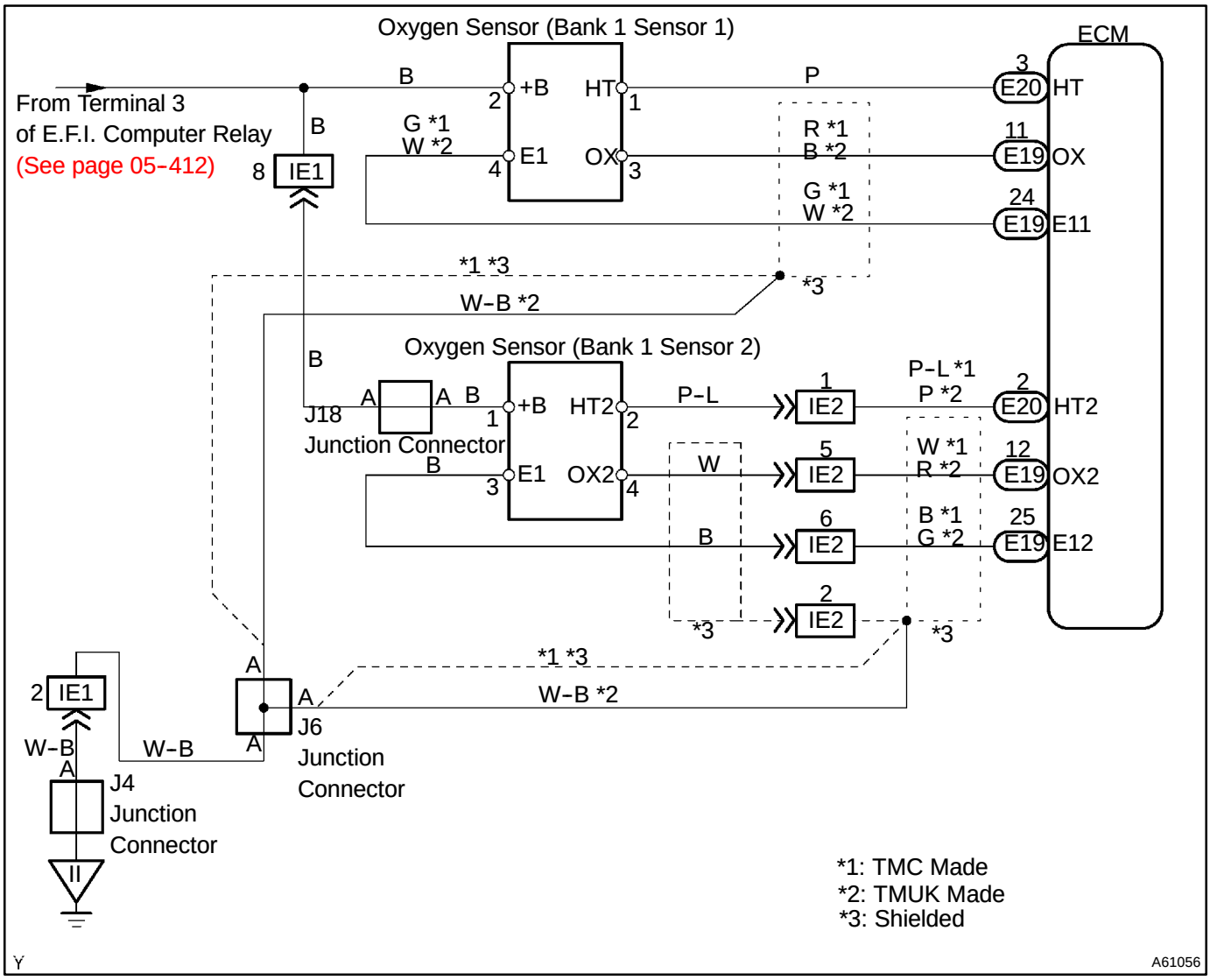
In order to obtain a high purification rate for the CO, HC and NOx components of the exhaust gas, a three–way catalytic converter is used. However, for the most efficient use of the three–way catalytic converter, the air–fuel ratio must be precisely controlled so that it is always close to the stoichiometric air–fuel ratio.
The oxygen sensor (bank 1 sensor 1) has a characteristic that its output voltage changes suddenly in the vicinity of the stoichiometric air–fuel ratio. This characteristic is used to detect the oxygen concentration in the exhaust gas and to provide the engine ECU with feedback to control of the air–fuel ratio.
When the air–fuel ratio becomes LEAN, the oxygen concentration in the exhaust gas increases and the oxygen sensor informs the engine ECU of the LEAN condition (small electromotive force: < 0.45 V).
When the air–fuel ratio is RICHER than the stoichiometric air–fuel ratio, the oxygen concentration in the exhaust gas is reduced and the oxygen sensor informs the engine ECU of the RICH condition (large electromotive force: > 0.45 V). The engine ECU judges by the electromotive force from the oxygen sensor whether the air–fuel ratio is RICH or LEAN and controls the injection timing accordingly. However, if a malfunction of the oxygen sensor causes output of abnormal electromotive force, the engine ECU is unable to perform accurate air–fuel ratio control. The oxygen sensors include a heater which heats the zirconia element. The heater is controlled by the engine ECU. When the intake air volume is low (the temperature of the exhaust gas is low), current flows to the heater to heat the sensor for accurate oxygen concentration detection.

DTC No	DTC Detecting Condition	Trouble Area
P0130 P0132 P0134	The following condition is met while vehicle running (3 trip detection logic): • Signal of oxygen sensor (bank 1 sensor 1) remained	• Open or short in oxygen sensor (bank 1 sensor 1) circuit • Oxygen sensor (bank 1 sensor 1) • Air induction system • Fuel pressure • Injector • ECM
P0133	Either of the following condition is met while vehicle running (3 trip detection logic): • Frequency of oxygen sensor (bank 1 sensor 1) failed • Signal of oxygen sensor offset	
P0136 P0138 P0140	The following condition is met while vehicle running (3 trip detection logic): • Signal of oxygen sensor (bank 1 sensor 2) remained	• Open or short in oxygen sensor (bank 1 sensor 2) circuit • Oxygen sensor (bank 1 sensor 2) • Air induction system • Fuel pressure • Injector • ECM
P0139	Signal of oxygen sensor (bank 1 sensor 2) was not switching between Lean and Rich (3 trip detection logic)	

HINT:

- Bank 1 refers to bank that includes cylinder No. 1.
- Sensor 1 refers to the sensor closer to the engine body.
- Sensor 2 refers to the sensor farther away from the engine body.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTC

(a) Note output DTC.
(b) Connect the hand-held tester to the DLC3.
(c) Clear the DTSs.
(d) Drive the vehicle with the following conditions.
  (1) Allow the engine to idle for two minutes.
  (2) Warm-up the engine until the engine coolant temperature reaches 75°C (167 °F)
  (3) Drive the vehicle by 48 km/h (30 mph) or more for 40 seconds or more.
  (4) Stop the vehicle and allow the engine to idle for 20 seconds.
  (5) Repeat step (3) and (4) at least eight times in one driving cycle.
(e) Check the pending DTCs.
  Result:

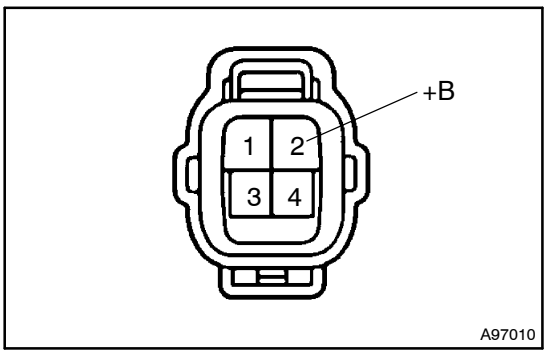
Output DTC	Proceed to
P0130, P0132, P0133 or P0134	A
P0136, P0138, P0139 or P0140	B
Others	C

B → Go to step 11

C → GO TO RELEVANT DTC CHART (See page 05-327)

A

2	CHECK HARNESS AND CONNECTOR(POWER SOURCE OF OXYGEN SENSOR BANK1 SENSOR1)

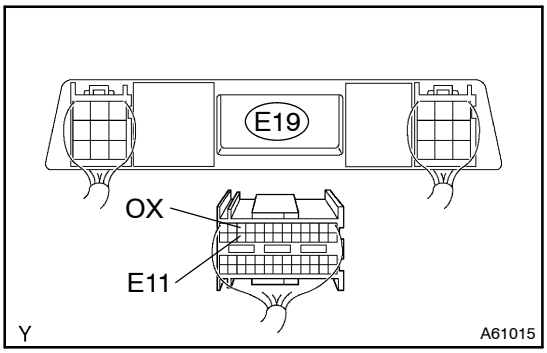


(a) Turn the ignition switch OFF.
(b) Disconnect the oxygen sensor connector.
(c) Turn the ignition switch ON.
(d) Measure the voltage of the connector between terminal +B and body ground.
  Standard: Battery voltage

NG → REPAIR OR REPLACE POWER SOURCE CIRCUIT

OK

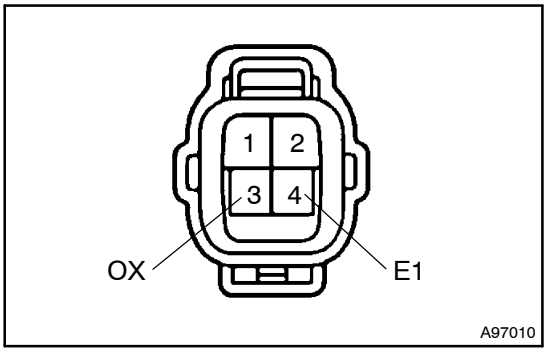
3	CHECK HARNESS AND CONNECTOR(ECM – OXYGEN SENSOR BANK1 SENSOR1)



(a) Turn the ignition switch OFF.
(b) Disconnect the E19 ECM connector.
(c) Measure the resistance of the ECM connector and oxygen sensor connector.

Standard:

Tester Connection	Specified Condition
OX (E19–11) – OX (3)	10 Ω or less
E11 (E19–24) – E1 (4)	10 Ω or less
OX (E19–11) – Body ground	10 kΩ or more
E11 (E19–24) – body ground	10 kΩ or more



NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4	CHECK EXHAUST GAS LEAK

Result: There is no exhaust gas leak.

NG → REPAIR EXHAUST SYSTEM

OK

5	CHECK PCV HOSE

Result: The PCV hose is connected securely.

NG → REPAIR OR REPLACE PCV HOSE

OK

6	CHECK AIR INDUCTION SYSTEM

(a) Check the vacuum hoses and intake air pipes are connected securely.
(b) Check the air cleaner condition.

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

7	CHECK FUEL PRESSURE (See page 11-5, 11-15)

NG → REPAIR FUEL SYSTEM

OK

8	CHECK FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

9	REPLACE OXYGEN SENSOR(BANK1 SENSOR1)

NEXT

10	CHECK DTC (REFER TO STEP1)

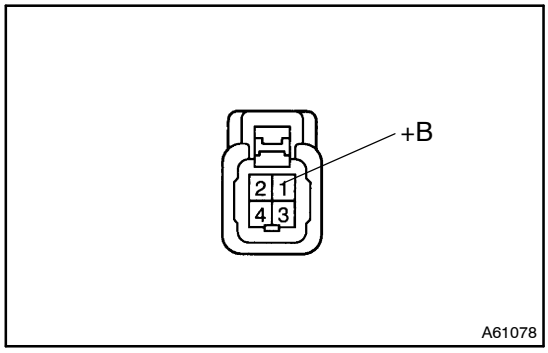
Result: No DTC is output.

NG → REPLACE ECM

OK

END

11	CHECK HARNESS AND CONNECTOR(POWER SOURCEOF OXYGEN SENSOR BANK1 SENSOR2)

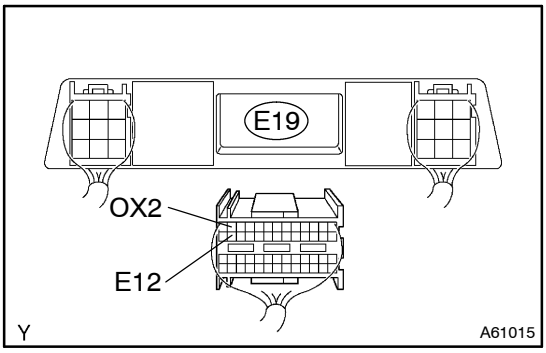


(a) Turn the ignition switch OFF.
(b) Disconnect the oxygen sensor connector.
(c) Turn the ignition switch ON.
(d) Measure the voltage of the connector between terminal +B and body ground.
Standard: Battery voltage

NG → REPAIR OR REPLACE POWER SOURCE CIRCUIT

OK

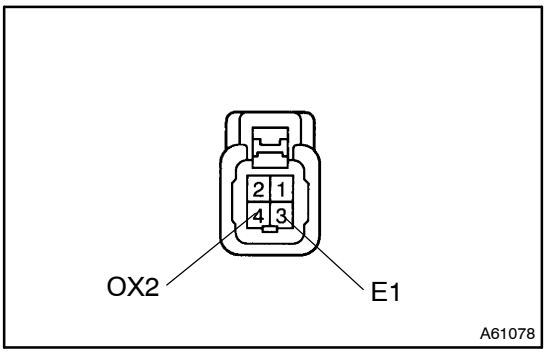
12	CHECK HARNESS AND CONNECTOR(ECM – OXYGEN SENSOR BANK1 SENSOR2)



(a) Turn the ignition switch OFF.
(b) Disconnect the E19 ECM connector.
(c) Measure the resistance of the ECM connector and oxygen sensor connector.

Standard:

Tester Connection	Specified Condition
OX2 (E19–12) – OX2 (4)	10 Ω or less
E12 (E19–25) – E1 (3)	10 Ω or less
OX2 (E19–12) – Body ground	10 kΩ or more
E12 (E19–25) – body ground	10 kΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

13	REPLACE OXYGEN SENSOR(BANK1 SENSOR2)

NEXT

14	CHECK DTC (REFER TO STEP1)

Result: No DTC is output.

NG → **REPLACE ECM**

OK

END

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

(a) Confirm if the vehicle ran out of fuel or not in the past.

HINT:

There is no problem, if DTC P0130, P0131, P0132, P0133, P0136, P0137, P0138, P0139 is not output after the CONFIRMATION DRIVING PATTERN. This means that the ECM records DTC P0130, P0131, P0132, P0133, P0136, P0137, P0138, P0139 because of the running out of fuel in the past.

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC IS CAUSED RUNNING OUT OF FUEL

DTC	P0134	HEATED OXYGEN SENSOR CIRCIT NO ACTIVITY DETECTED (BANK1 SENSOR1)

DTC	P0140	HEATED OXYGEN SENSOR CIRCIT NO ACTIVITY DETECTED (BANK1 SENSOR2)

CIRCUIT DESCRIPTION

Refer to DTC P0130 on page 05-354.

DTC No	DTC Detecting Condition	Trouble Area
P0134 P0140	Response time for oxygen sensor's voltage output to change from rich to lean, or from lean to rich, is 1.0 sec. or more during idling after engine is warmed up (2 trip detection logic)	S Open or short in oxygen sensor circuit S Oxygen sensor S ECM

HINT:

- S Bank 1 refers to bank that includes cylinder No. 1.
- S Sensor 1 refers to the sensor closer to the engine body.
- S Sensor 2 refers to the sensor farther away from the engine body.

WIRING DIAGRAM

Refer to DTC P0130 on page 05-354.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. when troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0134,P0140)

Result:

	A	B
RESULT	P0134, P0140 is output.	P0134, P0140 and other codes are output.

B → GO TO RELEVANT DTC CHART

A

2	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OXYGEN SENSOR) (See page 05-354)

OK → Go to step 9

NG

3	CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR) (See page 05-354)

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4	CHECK WHETHER MISFIRE IS OCCURRED OR NOT BY MONITORING DTC AND DATA LIST (See page 05-318)

NG → CHECK FOR SPARK AND IGNITION

OK

5	CHECK AIR INDUCTION SYSTEM (See page 10-7)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

6	CHECK FUEL PRESSURE (See page 11-5, 11-15)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

7	CHECK FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

8	CHECK EXHAUST GAS LEAK

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN (See page 05-354)

GO

10	READ OUTPUT DTC(BESIDS P0134,P0140)

Result:

	A	B
RESULT	P0134, P0140 is output.	P0134, P0140 and other codes are output.

B → CHECK AND REPLACE ECM

A

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

(a) Confirm if the vehicle ran out of fuel or not in the past.

HINT:

There is no problem, if DTC P0134, P0140 is not output after the CONFIRMATION DRIVING PATTERN. This means that the ECM records DTC P0134, P0140 because of the running out of fuel in the past.

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC IS CAUSED RUNNING OUT OF FUEL

DTC	P0135	HEATED OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION(BANK1 SENSOR1)

DTC	P0141	HEATED OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION(BANK1 SENSOR2)

CIRCUIT DESCRIPTION

Refer to DTC P0130 on page 05-354.

DTC No	DTC Detecting Condition	Trouble Area
P0135 P0141	When heater operates, heater current exceeds 2 A (2 trip detection logic)	S Open or short in heater circuit of heated oxygen sensor S Heated oxygen sensor heater S ECM
	Heater current of 0.2 A or less when heater operates (2 trip detection logic)	

HINT:

- S Sensor 1 refers to the sensor closer to the engine body.
- S Sensor 2 refers to the sensor farther away from the engine body.

WIRING DIAGRAM

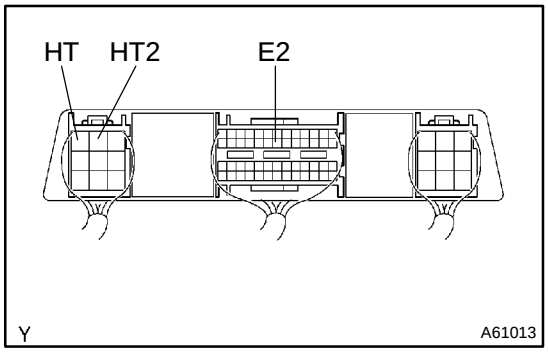
Refer to DTC P0130 on page 05-354.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.

(b) Measure voltage between the terminals HT and E2 of the ECM connector.
Voltage: 9 - 14 V

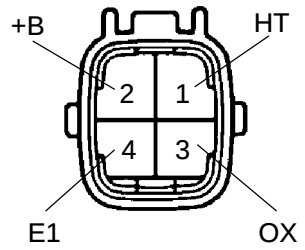
(c) Measure voltage between the terminals HT2 and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → **CHECK AND REPLACE ECM**

NG

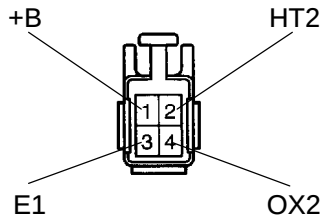
2	CHECK OXYGEN SENSOR(OXYGEN SENSOR HEATER)

Bank1, sensor1



A61023

Bank1, sensor2



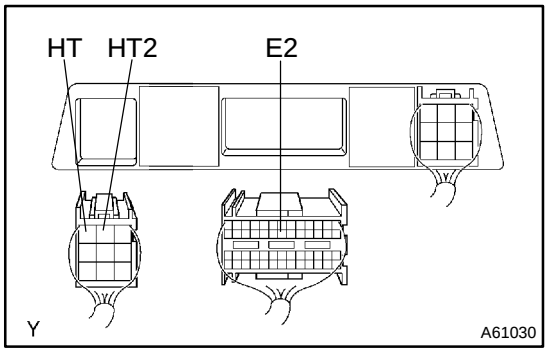
A61079

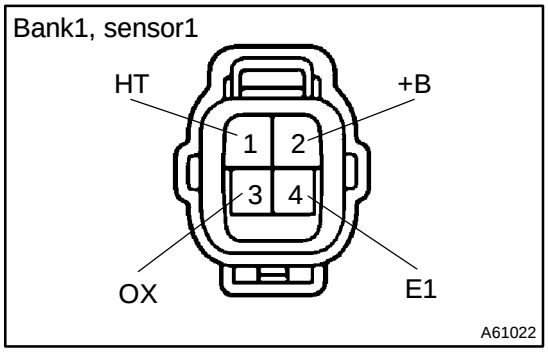
(a) Disconnect the oxygen sensor connector.
(b) Measure resistance between the terminals HT and +B of the oxygen sensor. (bank1, sensor1)
Resistance: 11 - 16Ω (20_C)
(c) Measure resistance between the terminals HT2 and +B of the oxygen sensor. (bank1, sensor2)
Resistance: 11 - 16Ω (20_C)

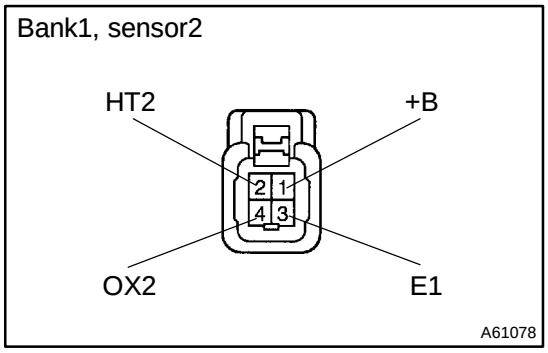
NG → **REPLACE OXYGEN SENSOR**

OK

3 CHECK HARNESS AND CONNECTOR(ECM-OXYGEN SENSOR)







(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E19 and E20 connector.
(c) Check continuity between the terminals HT of the oxygen sensor (Bank 1, sensor 1) and HT of the ECM connector.
Resistance: 1Ω or less
(d) Check continuity between the terminals HT2 of the oxygen sensor (Bank 1, sensor 2) and HT2 of the ECM connector.
Resistance: 1Ω or less
(e) Check for short between the terminals HT and E2 of the ECM connector.
Resistance: 1MΩ or more
(f) Check for short between the terminals HT2 and E2 of the ECM connector.
Resistance: 1MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

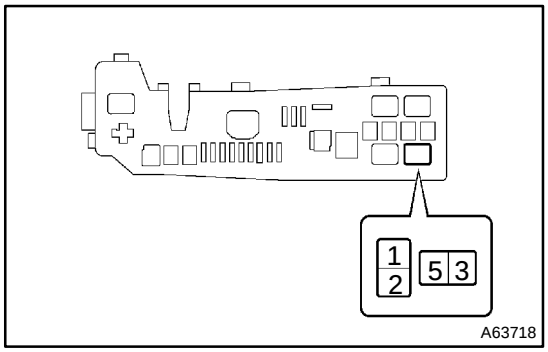
OK

4 CHECK CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-412)

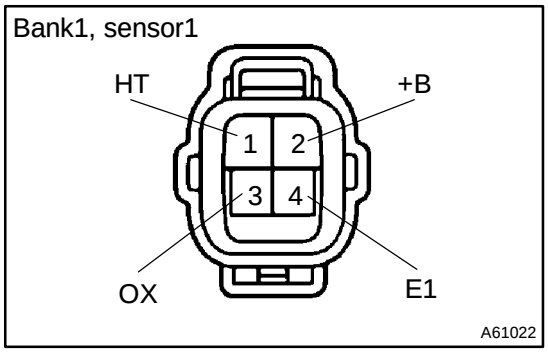
NG → **REPAIR OR REPLACE CHECK FOR ECM POWER SOURCE CIRCUIT**

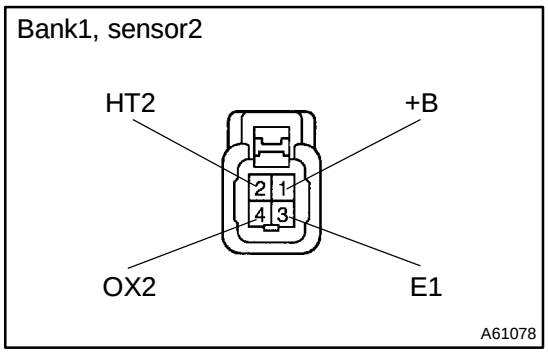
OK

5	CHECK HARNESS AND CONNECTOR(E.F.I. COMPUTER RELAY-OXYGEN SENSOR)



(a) Disconnect the battery negative (-) terminal.
(b) Remove the E.F.I. computer relay.
(c) Disconnect the oxygen sensor connector.
(d) Check continuity between the terminals 5 of the E.F.I. circuit opening relay side connector and +B of the oxygen sensor connector.
Resistance: 1Ω or less





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK →

CHECK AND REPLACE ECM

DTC	P0171	SYSTEM TOO LEAN (FUEL TRIM)

DTC	P0172	SYSTEM TOO RICH (FUEL TRIM)

CIRCUIT DESCRIPTION

Fuel trim refers to the feedback compensation value compared against the basic injection time. Fuel trim includes short–term fuel trim and long–term fuel trim.

Short–term fuel trim is the short–term fuel compensation used to maintain the air–fuel ratio at its ideal theoretical value. The signal from the heated oxygen sensor indicates whether the air–fuel ratio is RICH or LEAN compared to the ideal theoretical value, triggering a reduction in fuel volume if the air–fuel ratio is rich, and an increase in fuel volume if it is lean.

Long–term fuel trim is overall fuel compensation carried out long–term to compensate for continual deviation of the short–term fuel trim form the central value due to individual engine differences, wear over time and changes in the usage environment.

If both the short–term fuel trim and long–term fuel trim are LEAN or RICH beyond a certain value, it is detected as a malfunction and the check engine warning light (CHK ENG) is illuminated.

DTC No.	DTC Detecting Condition	Trouble Area
P0171	When air–fuel ratio feedback is stable after warming up engine, fuel trim is considerably in error on LEAN side (2 trip detection logic)	• Air induction system • Fuel pressure • Air flow meter • Injector blockage • Oxygen sensor (bank 1 sensor 1) • Gas leakage on exhaust system • Engine coolant temperature sensor • ECM
P0172	When air–fuel ratio feedback is stable after warming up engine, fuel trim is considerably in error on RICH side (2 trip detection logic)	

INSPECTION PROCEDURE

HINT:

- The oxygen sensor voltage and the fuel–trim can be read using the hand–held tester.
- Read freed frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	CHECK AIR INDUCTION SYSTEM (See page 10–7)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

2	CHECK FUEL INJECTOR ASSY (See page 11–7, 11–17)

NG → REPLACE FUEL INJECTOR ASSY

OK

3	CHECK E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-8)

NG → REPAIR OR REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

4	CHECK FOR SPARK AND IGNITION (See page 18-5)

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

5	CHECK FUEL PRESSURE (See page 11-5)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

6	CHECK EXHAUST GAS LEAKAGE POINT

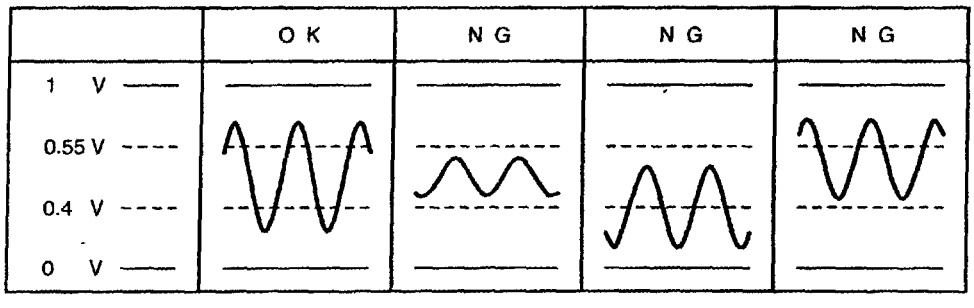
NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

7	READ VALUE OF HAND-HELD TESTER(OUTPUT VOLTAGE OF OXYGEN SENSOR)

(a) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.
(b) Use the hand-held tester to read the output voltage of the oxygen sensor during idling.

Oxgen sensor otput voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table)

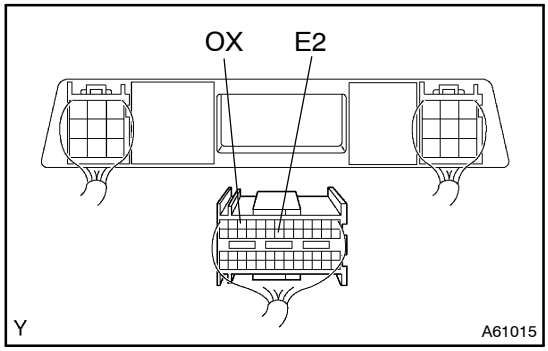


P18349

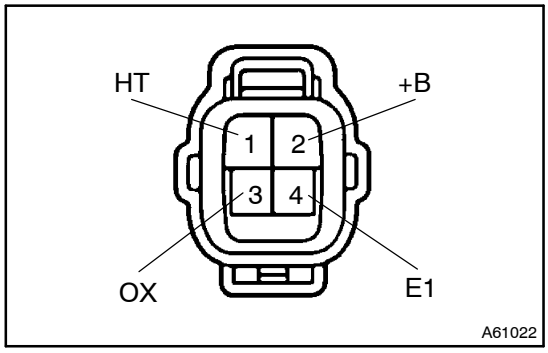
OK → Go to step 9

NG

8	CHECK HARNESS AND CONNECTOR(ENGINE ECU-OXYGEN SENSOR)



(a) Disconnect the oxygen sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check continuity between the terminals OX of the ECM connector and OX of the oxygen sensor connector.
Resistance: 1Ω or less
(d) Check continuity between the terminals E1 of the ECM connector and the E1 of the oxygen sensor connector.
Resistance: 1Ω or less
(e) Check for short between the terminals OX and E2 of the ECM connector.
Resistance: 1MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE OXYGEN SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN

GO

10	READ OUTPUT DTC(BESIDES P0171 AND P0172)

Result:

	A	B
RESULT	P0171, P0172 are not output.	P0171, P0172 are output again.

B → **CHECK AND REPLACE ECU**

A

11	CONFIRM VEHICLE RAN OUT OF FUEL IN PAST

NO → **CHECK FOR INTERMITTENT PROBLEMS**

YES

DTC P0171 OR P0172 IS CAUSED BY RUNNING OF FUEL

DTC	P0261	CYLINDER 1 INJECTOR CIRCUIT LOW

DTC	P0262	CYLINDER 1 INJECTOR CIRCUIT HIGH

DTC	P0264	CYLINDER 2 INJECTOR CIRCUIT LOW

DTC	P0265	CYLINDER 2 INJECTOR CIRCUIT HIGH

DTC	P0267	CYLINDER 3 INJECTOR CIRCUIT LOW

DTC	P0268	CYLINDER 3 INJECTOR CIRCUIT HIGH

DTC	P0270	CYLINDER 4 INJECTOR CIRCUIT LOW

DTC	P0271	CYLINDER 4 INJECTOR CIRCUIT HIGH

CIRCUIT DESCRIPTION

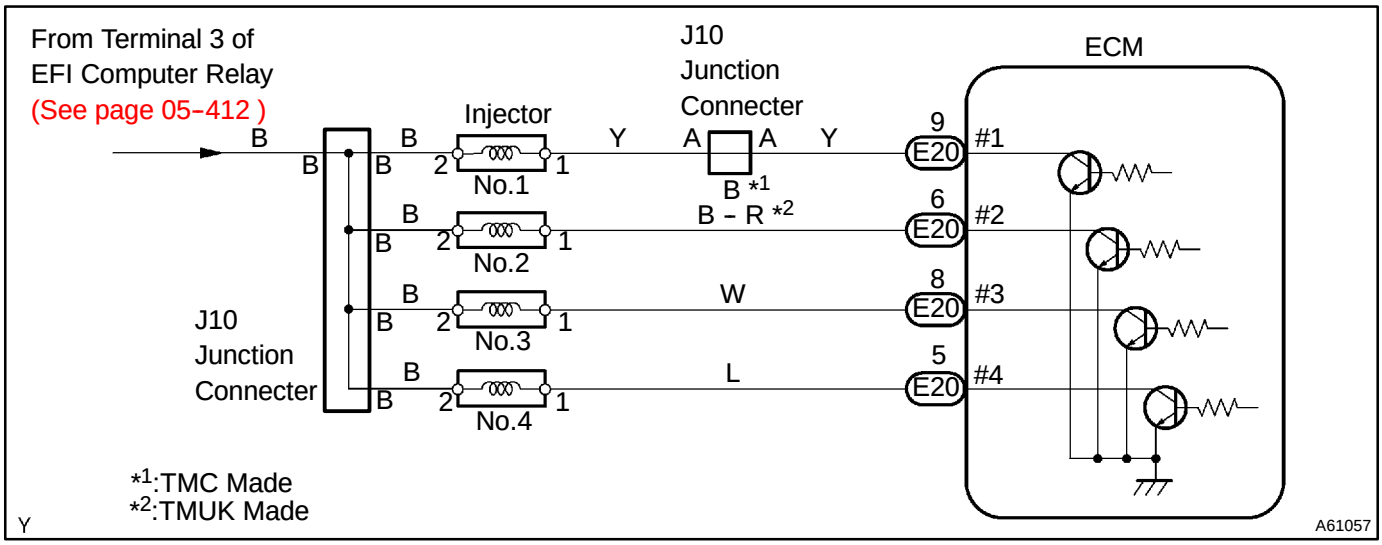
The injectors are situated in the intake manifold.
They inject fuel into the cylinders based on the signals from the engine ECU.

DTC No.	DTC Detecting Condition	Trouble Area
P0261 P0264 P0267 P0270	Open or short in injector circuit	S Open or short in injector circuit S Open in injector power source circuit S Injector S ECM
P0262 P0265 P0258 P0271	Short in back up power source circuit	S Open or short in injector circuit S Open in injector power source circuit S Injector S ECM

HINT:

- If DTC P0261 or P0262 is displayed, check No.1 injector circuit.
- If DTC P0264 or P0265 is displayed, check No.1 injector circuit.
- If DTC P0267 or P0268 is displayed, check No.1 injector circuit.
- If DTC P0270 or P0271 is displayed, check No.1 injector circuit.

WIRING DIAGRAM

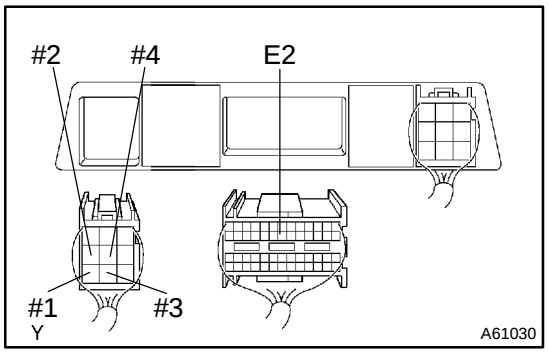


INSPECTION PROCEDURE

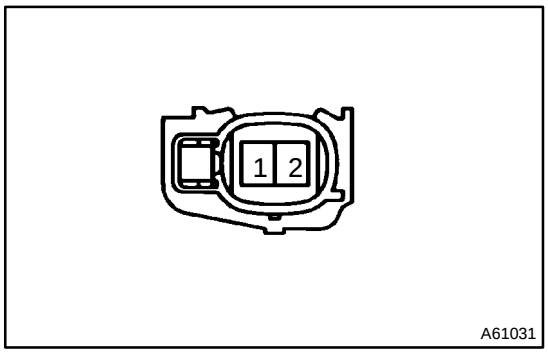
HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK HARNESS AND CONNECTOR(ECM - INJECTOR)



(a) Disconnect the injector connector.
(b) Disconnect the ECM E19 and E20 connector.
(c) Check continuity between applicable terminal of the ECM connector and 1 of the injector connector.
Resistance: 1 Ω or less
(d) Check for short between applicable terminal and E2 of the ECM connector.
Resistance: 1M Ω or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

2	CHECK FUEL INJECTOR ASSY (See page 11-7, 11-17)

NG → REPAIR OR REPLACE FUEL INJECTOR ASSY

OK

CHECK AND REPLACE ECM

DTC	P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

DTC	P0301	CYLINDER 1 MISFIRE DETECTED

DTC	P0302	CYLINDER 2 MISFIRE DETECTED

DTC	P0303	CYLINDER 3 MISFIRE DETECTED

DTC	P0304	CYLINDER 4 MISFIRE DETECTED

CIRCUIT DESCRIPTION

Misfire: The ECM uses the crankshaft position sensor and camshaft position sensor to monitor changes in the crankshaft rotation of each cylinder.

The ECM counts the number of times from the engine speed change rate, indicating that misfire has occurred. And when the misfire rate equals to or exceeds the count, indicating that the engine condition has deteriorated, the MIL lights up.

If the misfire rate is high enough and the driving conditions causes the catalyst to overheat, the MIL blinks when the misfire occurs.

DTC No.	DTC Detecting Condition	Trouble Area
P0300	Misfire of random cylinders is detected during any particular 200 or 1,000 revolutions	S Open or short in engine wire S Connector connection S Vacuum hose connection S Ignition system S Injector S Fuel pressure S Mass air flow meter S Engine coolant temp. sensor S Compression pressure S Valve clearance S Valve timing S ECM
P0301 P0302 P0303 P0304	For any particular 200 revolutions of engine, misfire is detected which can cause catalyst to overheat (This causes MIL to blink)	
	For any particular 1,000 revolutions of engine, misfire is detected which causes a deterioration in emissions (2 trip detection logic)	

HINT:

When the 2 or more codes for a misfiring cylinder are recorded repeatedly but no random misfire code is recorded, it is indicated that the misfires were detected and recorded at different times.

WIRING DIAGRAM

Refer to DTC P0261 on page 05-372

(a) Connect the hand-held tester to the DLC3.
(b) Record the DTC and freeze frame data.
(c) Use the hand-held tester to set to the check mode (See page 05-318).
(d) Drive the vehicle several times with the engine speed, load and its surrounding range shown with ENGINE SPD, CALC LOAD in the freeze frame data or MISFIRE RPM, MISFIRE LOAD in the data list. If you have no hand-held tester, turn the ignition switch OFF after the symptom is simulated once. Then repeat the simulation process again.

HINT:
In order to memorize the DTC of the misfire, it is necessary to drive around MISFIRE RPM, MISFIRE LOAD in the following data list.

Engine Speed	Time
Idling	5 minutes and 45 seconds or more
1000 rpm	4 minutes or more
2000 rpm	2 minutes and 30 seconds or more
3000 rpm	1 minute and 30 seconds or more

(e) Check whether there is misfire or not by monitoring the DTC and the freeze frame data, and then, record them.
(f) Turn the ignition switch OFF and wait at least 5 seconds.

INSPECTION PROCEDURE

HINT:
- If the other DTCs besides misfire are memorized simultaneously, first perform the troubleshooting for them.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.
- If the misfire is not occured when the vehicle is brought to the workshop, it can be confirmed by reproducing the condition of the freeze frame data. After finishing the repair, confirm that there is no misfire (See the confirmation driving pattern).
- When either of SHORT FT #1, LONG FT #1, SHORT FT #2 or LONG FT #2 in the freeze frame data is over the range of ±20%, there is a possibility that the air-fuel ratio is inclining either to "RICH" (-20% or less) or "LEAN" (+20% or more).
- When COOLANT TEMP in the freeze frame data is less than 80˚C (176˚F), there is a possibility of misfire only during warming up.
- In case that the misfire cannot be reproduced, this may be because of the driving with the shortage of fuel, the use of improper fuel, a stain of ignition plug and etc.

1	CHECK WIRE HERNESS, CONNECTOR AND VACUUM HOSE IN ENGINE ROOM

(a) Check the connection conditions of the wire harness and connector.
(b) Check the disconnection, piping and break in the vacuum hose.

NG → REPAIR OR REPLACE, THEM CONFIRM THAT THERE IS NO MISFIRE

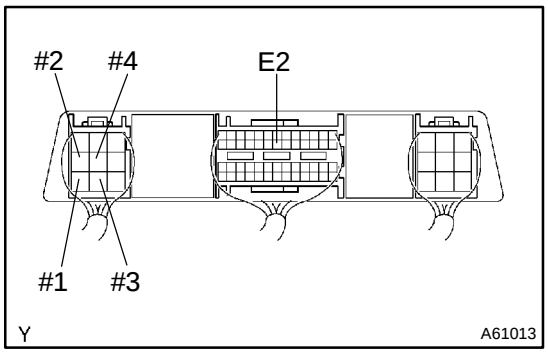
OK

2	INSPECT SPARK PLUG

NG → REPAIR OR REPLACE IGNITION SYSTEM

OK

3	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between applicable terminal and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → Go to step 5

NG

4	INSPECT FUEL INJECTOR ASSY (See page 11-7,11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

CHECK WIRE HARNESS OR CONNECTOR

5	CHECK FUEL PRESSURE (See page 11-5,11-15)

NG → REPAIR OR REPLACE FUEL PUMP, FUEL PIPE LINE AND FILTER

OK

6	INSPECT FUEL INJECTOR ASSY (See page 11-7,11-17)

NG → REPLACE FUEL INJECTOR ASSY

OK

7	INSPECT INTAKE AIR FLOW METER SUB-ASSY (See page 10-8)

NG → REPAIR OR REPLACE INTAKE AIR FLOW METER SUB-ASSY

OK

8	INSPECT E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-8)

NG → REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

CHECK COMPRESSION PRESSURE, VALVE CLEARANCE AND VAIVE TIMING

DTC	P0327	KNOCK SENSOR 1 CIRCUIT LOW INPUT

CIRCUIT DESCRIPTION

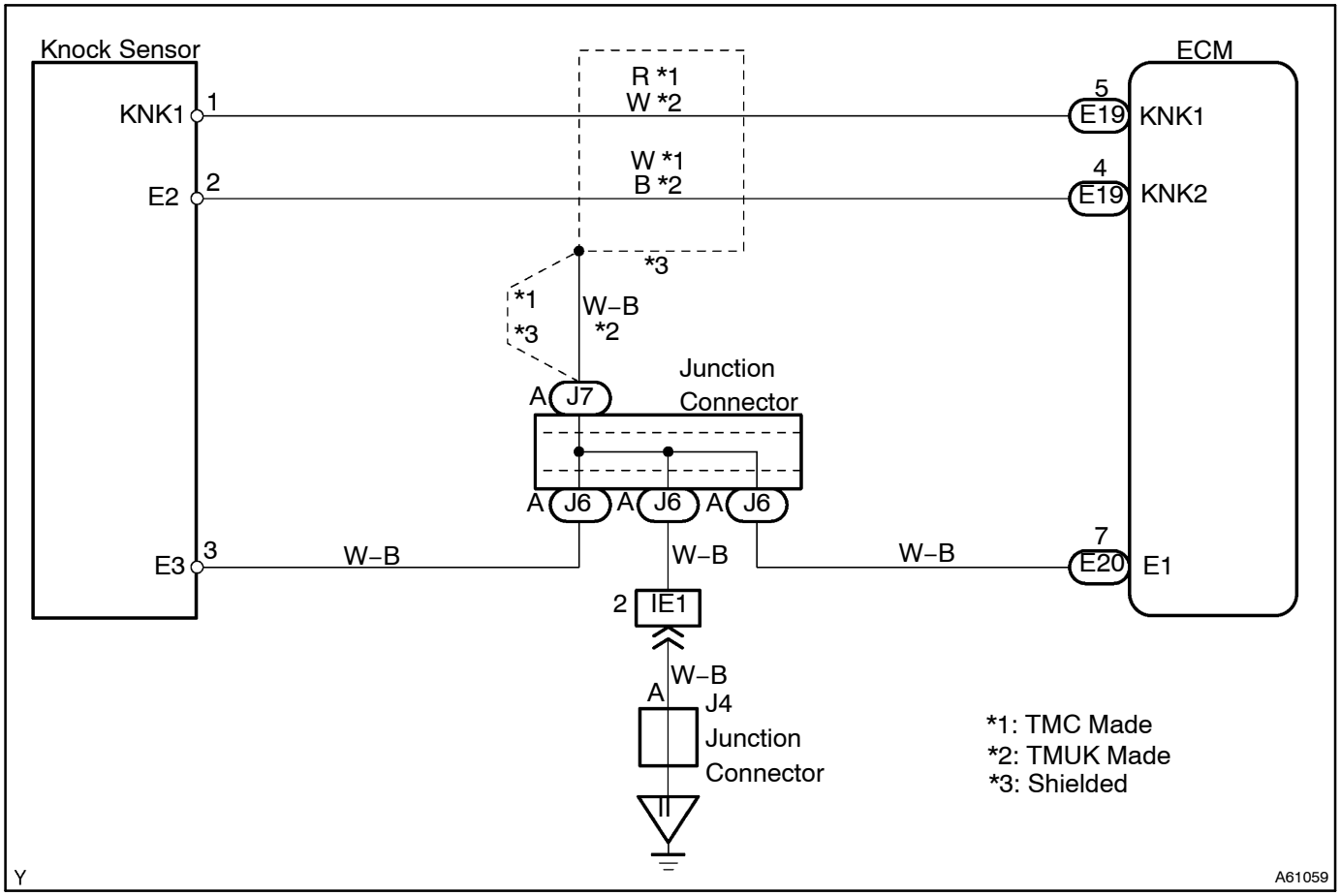
The knock sensor is fitted to the cylinder block to detect the engine knocking. This sensor contains a piezo-electric element which generates a voltage when it becomes deformed. This occurs when the cylinder block vibrates due to knocking. If the engine knocking occurs, the ignition timing is retarded to suppress it.

DTC No.	DTC Detecting Condition	Trouble Area
P0327	Open or short in Knock Sensor circuit (3 trip detection logic)	• Open or short in knock sensor circuit • Knock sensor (looseness) • ECM

HINT:

If the ECM detects above diagnosis conditions, it operates the fail safe function in which the corrective retard angle value is set to the maximum value.

WIRING DIAGRAM

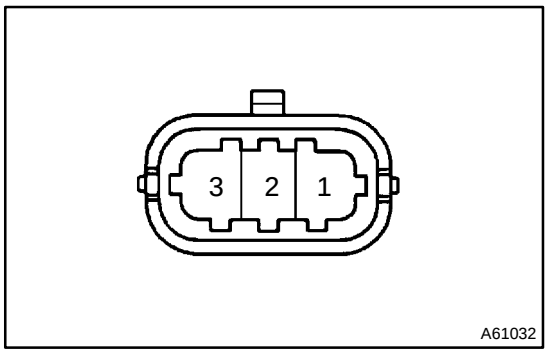


INSPECTION PROCEDURE

HINT:

Read freed frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	INSPECT KNOCK CONTROL SENSOR

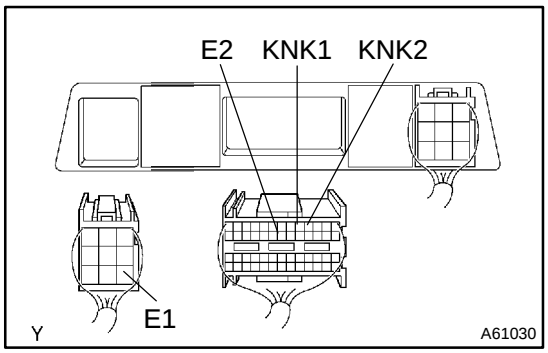


(a) Measure the resistance between terminals 1 and 2 of the knock contorl sensor.
Resistance: 1MΩ or more

NG → **REPLACE KNOCK CONTROL SENSOR**

OK

2	CHECK HARNESS AND CONNECTOR(ECM-KNOCK CONTROL SENSOR)



(a) Disconnect the knock control sensor connector.
(b) Disconnect the ECM E19 and E20 connector.
(c) Check continuity between the terminals KNK1 of the ECM connector and 1 of the knock control sensor.
Resistance: 1Ω or less
(d) Check continuity between the terminals KNK2 of the ECM connector and 2 of the knock control sensor.
Resistance: 1Ω or less
(e) Check continuity between the terminals E1 of the ECM connector and 3 of the knock control sensor.
Resistance: 1Ω or less
(f) Check for short between the terminals KNK1 and E2 of the ECM connector.
Resistance: 1MΩ or more
(g) Check for short between the terminals KNK2 and E2 of the ECM connector.
Resistance: 1MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD KNOCK SENSOR IS INSTALLED

OK → **REPLACE KNOCK CONTROL SENSOR**

NG

CHECK AND REPLACE ECM

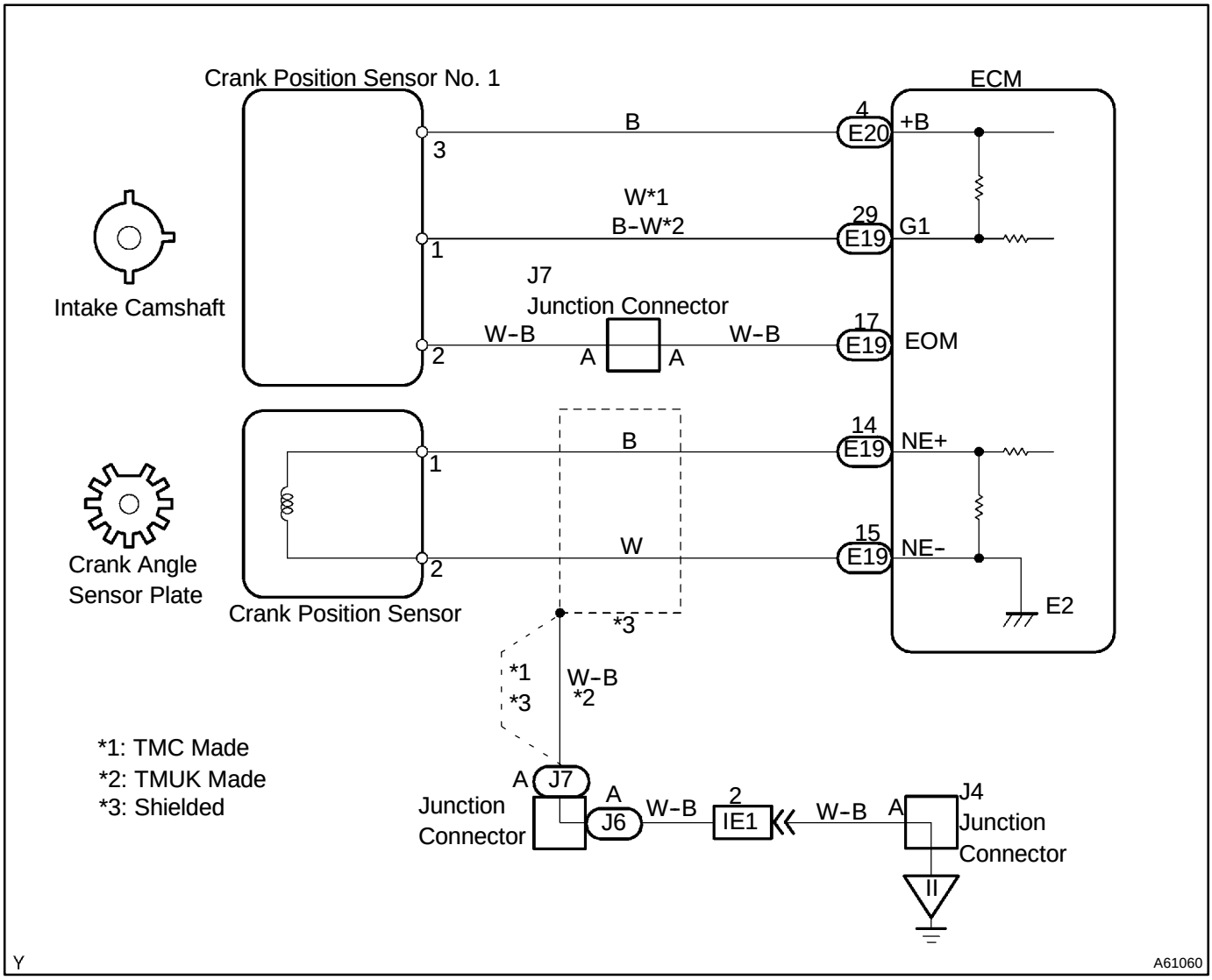
DTC	P0335	CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Crankt position sensor (NE signal) consists of a magnet, iron core and pick up coil.
The NE signal plate (crank angle sensor plate) has 34 teeth and is mounted on the crankshaft. The NE signal sensor generates 34 signals at every engine revolution. The ECM detects the crankshaft angle based on the G signal, the actual crankshaft angle and the engine speed by the NE signal.

DTC No.	DTC Detecting Condition	Trouble Area
P0335	No crank position sensor signal to ECM during cranking (2 trip detection logic)	S Open or short in crank position sensor circuit S Crank position sensor S Crank angle sensor plate S ECM
	No crank position sensor signal to ECM with engine speed 600 rpm or more (2 trip detection logic)	

WIRING DIAGRAM



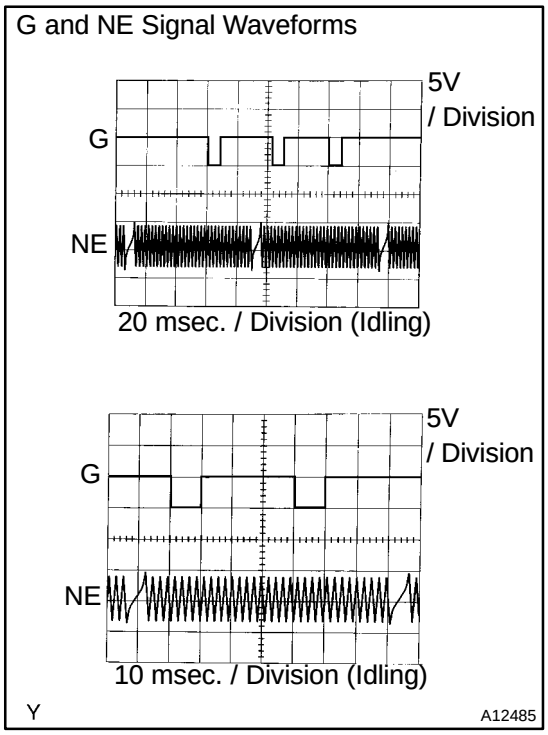
Y A61060

INSPECTION PROCEDURE

HINT:

- Read freed frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.
- Perform troubleshooting of DTC P0335/12 first. If no trouble is found, troubleshoot the following mechanical system.

1	INSPECT CRANK POSITION SENSOR

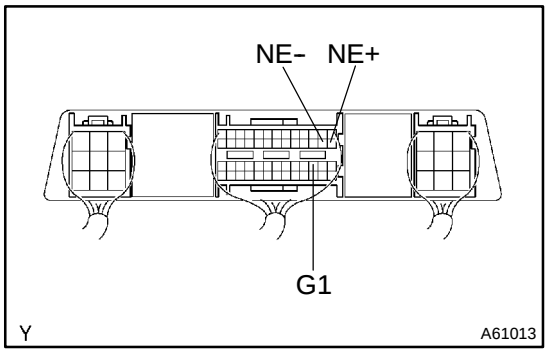


(a) Check the crank position sensor for resistance.
(See page 18–7)
Resistance:
1630 – 2740 Ω (Cold)
2065 – 3225 Ω (Hot)

HINT:
”Cold” and ”Hot” above express the temperature of the part itself. ”Cold” is from –10_C (14_F) to 50_C (122_F) and ”Hot” is from 50_C. (122_F) to 100_C (212_F)

(b) Reference:
Inspection using the oscilloscope.
(1) During cranking or idling, check the waveform between terminals G1 and NE–, and NE+ and NE– of the ECM connector.

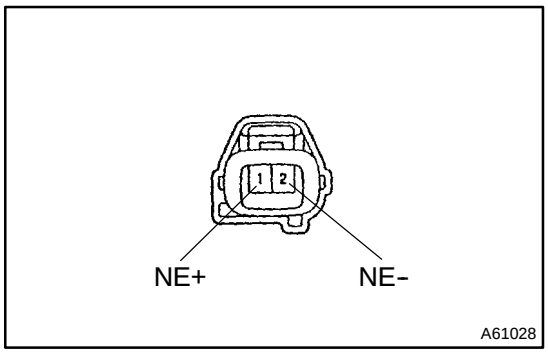
HINT:
The correct waveforms are as shown in the left.

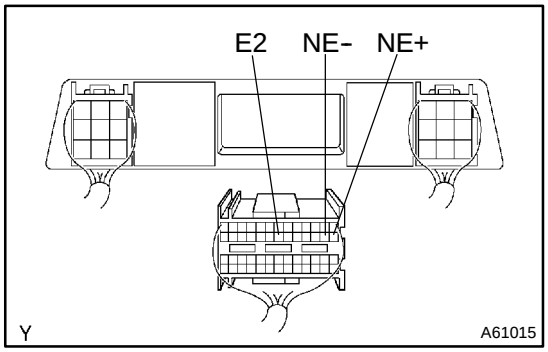


OK

NG → **REPLACE CRANK POSITION SENSOR**

2	CHECK HARNESS AND CONNECTOR(ECM-CRANKSHAFT POSITION SENSOR)





(a) Disconnect the crank position sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check continuity between the terminals NE+ of the crank position sensor connector and NE+ of the ECM connector.
Resistance: 1Ω or less
(d) Check for short between the terminals NE+ and E2 of the ECM connector.
Resistance: 1MΩ or more
(e) Check continuity between the terminals NE- of the crank position sensor connector and NE- of the ECM connector.
Resistance: 1Ω or less
(f) Check for short between the terminals NE- and E2 of the ECM connector.
Resistance: 1MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	INSPECT SENSOR ATTACHMENT PART

(a) Check the crank position sensor installation .

NG → **REPAIR OR REPLACE SENSOR ATTACHMENT PART**

OK

4	INSPECT CRANKSHAFT POSITION SENSOR PLATE NO.1(TEETH OF SIGNAL PLATE)

(a) Remove the crank angle sensor plate.
(b) Check the teeth of the signal plate.

NG → **REPAIR OR REPLACE CRANKSHAFT POSITION SENSOR PLATE NO.1**

OK

CHECK AND REPLACE ECM

DTC	P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

CIRCUIT DESCRIPTION

Refer to DTC P0335 on page 05-381.

DTC No	DTC Detecting Condition	Trouble Area
P0336	No crank position sensor signal to ECM during cranking (2trip detection logic)	S Open or short in crank position sensor circuit S Crank position sensor S Crank angle sensor plate S ECM
	No crank position sensor signal to ECM with engine speed 600 rpm or more (2trip detection logic)	

WIRING DIAGRAM

Refer to DTC P0335 on page 05-381.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. when troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

DTC	P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT

DTC	P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

CIRCUIT DESCRIPTION

Refer to DTC P0335 on page 05–381.

DTC No.	DTC Detecting Condition	Trouble Area
P0340	Camshaft position deviated from crankshaft position (3 trip detection logic).	• Mechanical system malfunction (skipping teeth of timing chain, chain stretched) • Valve timing
P0341	Camshaft signal is not accurate (3 trip detection logic).	• Intake camshaft

WIRING DIAGRAM

Refer to DTC P0335 on page 05–381.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand–held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, this is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK VALVE TIMING (See page 14–123)

NG → ADJUST VALVE TIMING (See page 14–123)

OK

2	CHECK INTAKE CAMSHAFT (TEETH FOR CAMSHAFT POSITION SENSOR)

NG → REPLACE INTAKE CAMSHAFT

OK

CHECK FOR INTERMITTENT PROBLEMS (See page 05–318)

DTC	P0342	CAMSHAFT POSITION SENSOR CIRCUIT LOW INPUT

DTC	P0343	CAMSHAFT POSITION SENSOR CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

Crank position sensor No.1 (G signal) consists of a magnet, iron core and pickup coil.
The G signal rotor has 3 teeth on the outside and is mounted on the intake camshaft.
When the camshafts rotate, the magnetic firld on hall element inside of the sensor is changed by changing the air gap between the signal plate and the sensor.
That cause hall effects, and that hall effects cause electromotive force.
The circuit inside of the sensor catch tne electromotive force and process it as on/off signal.
The NE signal plate (crank angle sensor plate) has 34 teeth and is installed in the crankshaft. The NE signal sensor generates 34 signals at every engine revolution. The ECM detects the crankshaft angle based on the G signals, the actual crankshaft angle and the engine speed by the NE signals.

DTC No.	DTC Detecting Condition	Trouble Area
P0342 P0343	No crank position sensor No.1 signal to ECM during cranking (2 trip detection logic)	S Open or short in crank position sensor circuit No.1 S Crank position sensor No.1 S Intake camshaft S ECM
	No crank position sensor No.1 signal to ECM with engine speed 600 rpm or more	

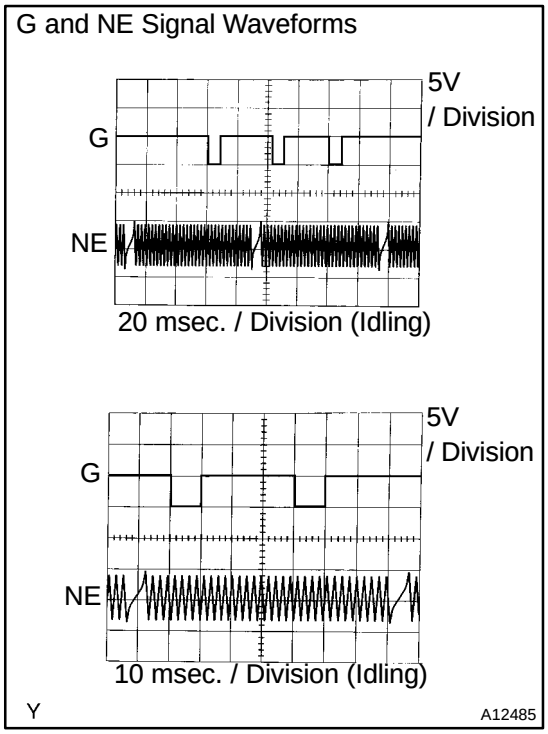
WIRING DIAGRAM

Refer to DTC P0335 on page 05-381.

INSPECTION PROCEDURE

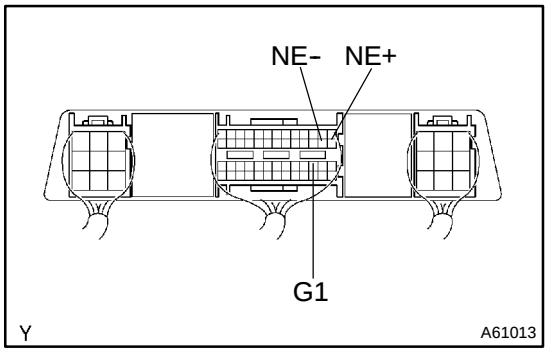
HINT:
Read freed frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	INSPECT CRANK POSITION SENSOR NO.1(CHECK RESISTANCE)



(a) Reference:
Inspection using the oscilloscope.
(1) During cranking or idling, check the waveform between terminals G1 and NE−, NE+ and NE− of the ECM connector.

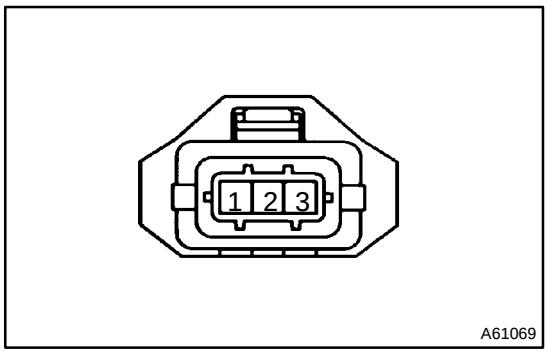
HINT:
The correct waveforms are as shown in the left.

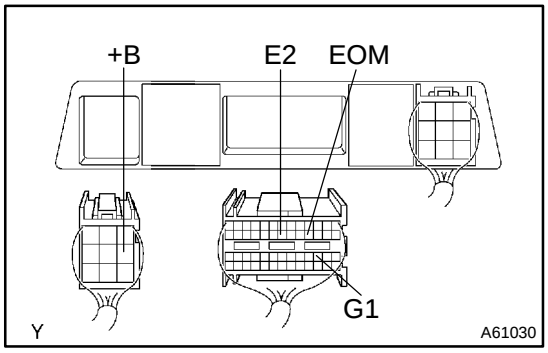


NG → REPLACE CRANK POSITION SENSOR NO.1

OK

2	CHECK HARNESS AND CONNECTOR(ECM-CRANK POSITION SENSOR No.1)





(a) Disconnect the crank position sensor No.1 connector.
(b) Disconnect the ECU E19 and E20 connector.
(c) Check continuity between the terminals 1 of the crank position sensor No.1 connector and G1 of the the ECM connector.
Resistance: 1Ω or less
(d) Check for short between the terminals G1 and E2 of the the ECM connector.
Resistance: 1MΩ or more
(e) Check continuity between the terminals 2 of the crank position sensor No.1 connector and EOM of the the ECM connector.
Resistance: 1Ω or less
(f) Check for short between the terminals EOM and E2 of the the ECM connector.
Resistance: 1MΩ or more
(g) Check continuity between the terminals 3 of the crank position sensor No.1 connector and +B of the the ECM connector.
Resistance: 1Ω or less
(h) Check for short between the terminals +B and E2 of the the ECM connector.
Resistance: 1MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	INSPECT SENSOR INSTLLATION

NG → **TIGHTEN SENSOR**

OK

4	INSPECT CAMSHAFT

NG → **REPAIR OR REPLACE CAMSHAFT**

OK

CHECK AND REPLACE ECM

DTC	P0420	CATALYST SYSTEM EFFCIENCY BELOW THRESHOLD(BANK1)

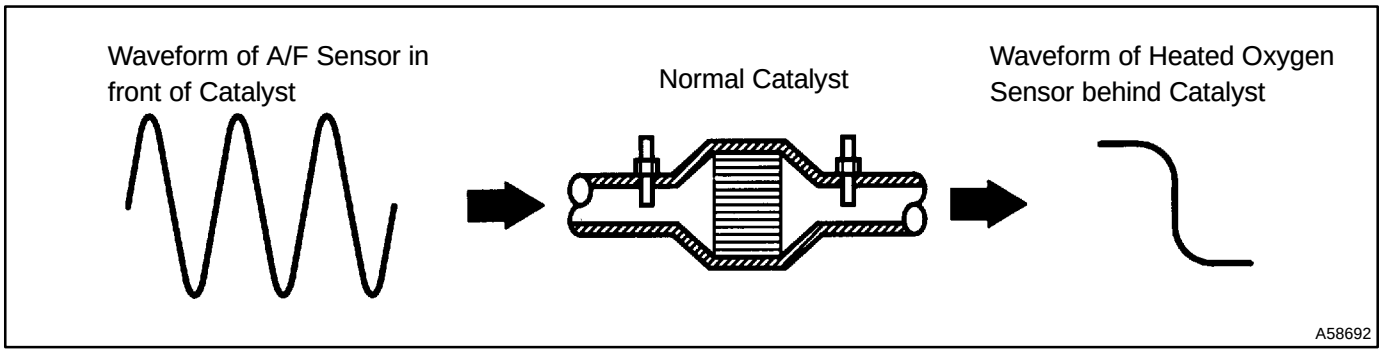
CIRCUIT DESCRIPTION

The ECM compares the waveform of the oxygen sensor located in front of the catalyst with the waveform of the heated oxygen sensor located behind the catalyst to determine whether or not the catalyst performance has deteriorated.

Air-fuel ratio feedback compensation keeps the waveform of the oxygen sensor in front of the catalyst repeatedly changing back and forth, from rich to lean.

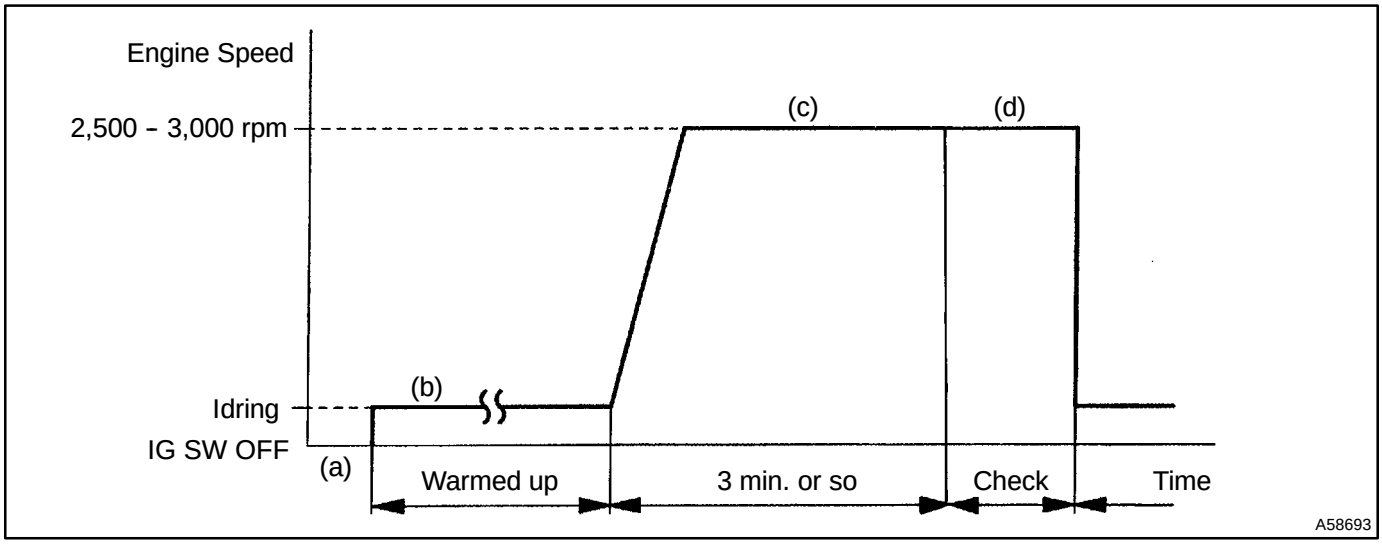
If the catalyst is functioning normally, the waveform of the heated oxygen sensor behind the catalyst switches back and forth between rich and lean much more slowly than the waveform of the oxygen sensor in front of the catalyst.

But when both waveforms change at a similar rate, it is indicated that the catalyst performance has deteriorated.

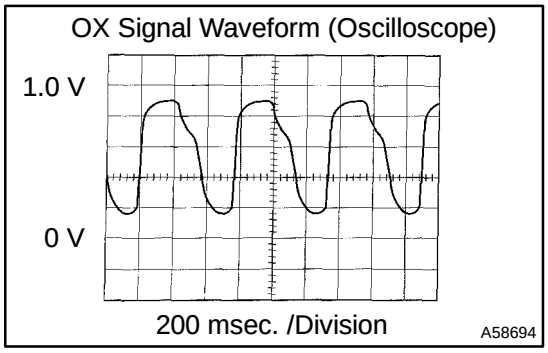


DTC No.	DTC Detecting Condition	Trouble Area
P0420	After engine and catalyst are warmed up, and while vehicle is driven within set vehicle and engine speed range, waveforms of oxygen sensors have same amplitude (2 trip detection logic)	S Gas leakage on exhaust system S Heated oxygen sensor S Three-way catalytic converter

CONFIRMATION DRIVING PATTERN



(a) Connect the hand-held tester to the DLC3, or connect the probe of the oscilloscope between terminals HAF1A, HAF2A, OX1B, OX2B and E1 of the ECM connector.
(b) Start the engine and warm it up with all the accessories switched OFF until the water temperature is stable.
(c) Race the engine at 2,500 - 3,000 rpm for about 3 min.
(d) After confirming that the waveforms of the oxygen sensor (bank 1 sensor 1 (AF1A, AF2A)) which oscillates around 0.5 V during feedback to the ECM, check the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX1B, OX2B)).



HINT:
- If there is a malfunction in the system, the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX1B)) is almost the same as that of the oxygen sensor (bank 1 sensor 1 (AF1A, AF2A)) on the left.
- There are some cases that, the MIL may either light up or not light up even though a malfunction exists.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	READ OUTPUT DTC(BESIDES P0420)

SST 09843-18040

(a) Read the DTCs with the hand-held tester.
Result:

	A	B
RESULT	P0420 are output	P0420 and other codes are output

B → GO TO RELEVANT DTC CHART

A

2	CHECK EXHAUST GAS LEAK

NG → REPAIR OR REPLACE

OK

3	CHECK OXYGEN SENSOR(BANK 1 SENSOR 1) (See page 12-11)

NG → REPAIR OR REPLACE OXYGEN SENSOR

OK

4	CHECK OXYGEN SENSOR(BANK 1 SENSOR 2) (See page 12-11)

NG → REPAIR OR REPLACE OXYGEN SENSOR

OK

REPLACE THREE-WAY CATALYTIC CONVERTER

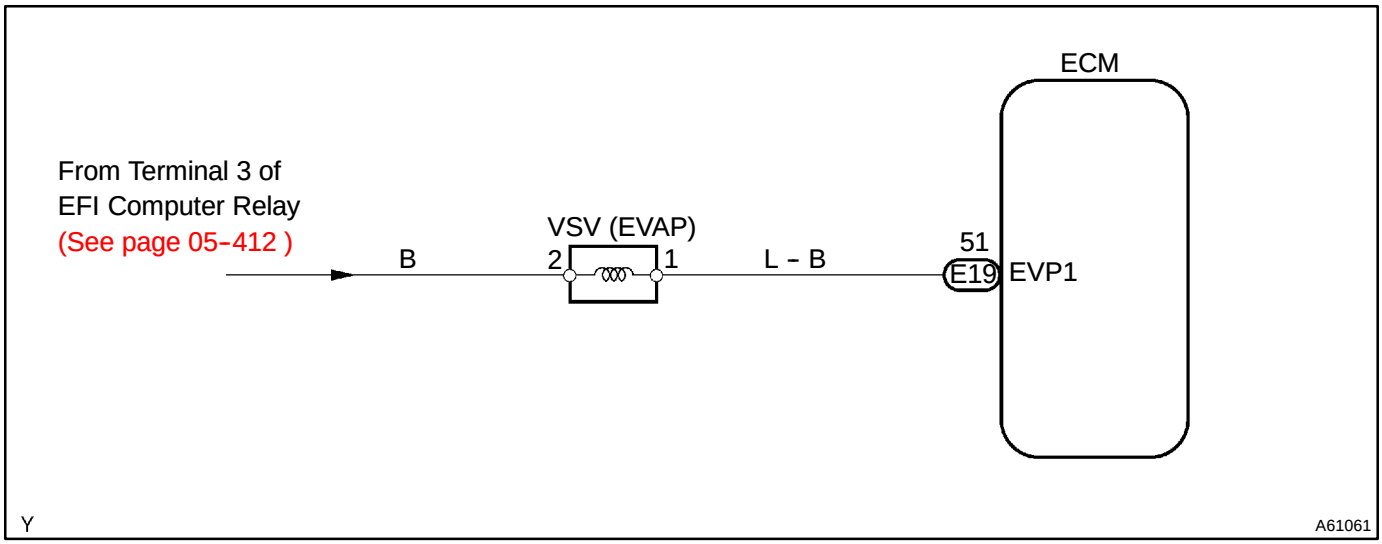
DTC	P0443	EVAPORATIVE EMISSOION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

To reduce HC emissions, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.
The ECM changes the duty signal to the VSV for the EVAP so that the intake quantity of HC emissions is appropriate for the driving conditions (engine load, engine speed, vehicle speed, etc.) after the engine is warmed up.

DTC No.	DTC Detecting Condition	Trouble Area
P0443	Proper response to ECM command does not occur	S Open of short in VSV circuit for EVAP S VSV for EVAP S ECM

WIRING DIAGRAM

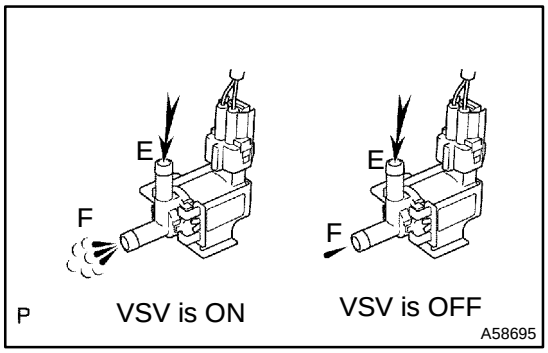


INSPECTION PROCEDURE

HINT:

Read freeze frame data using a hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(VSV FOR EVAP)



(a) Select the ACTIVE TEST mode on the hand-held tester.
(b) Disconnect the vacuum hose from the VSV for the EVAP.
(c) Start the engine.
(d) When the VSV for the EVAP is operated by the hand-held tester, apply the disconnected hose to your finger to check the suction.

Result:

VSV is ON: Disconnected hose sucks.
VSV is OFF: Disconnected hose does not suck.

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2	CHECK OPERATION OF VSV(FOR EVAP) (See page 12-11)

NG → **REPLACE VACUUM SWITCHING VALVE NO.1**

OK

3	CHECK WIRE HARNESS OR CONNECTOR(ECM-EFI RELAY) (See page 05-412)

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

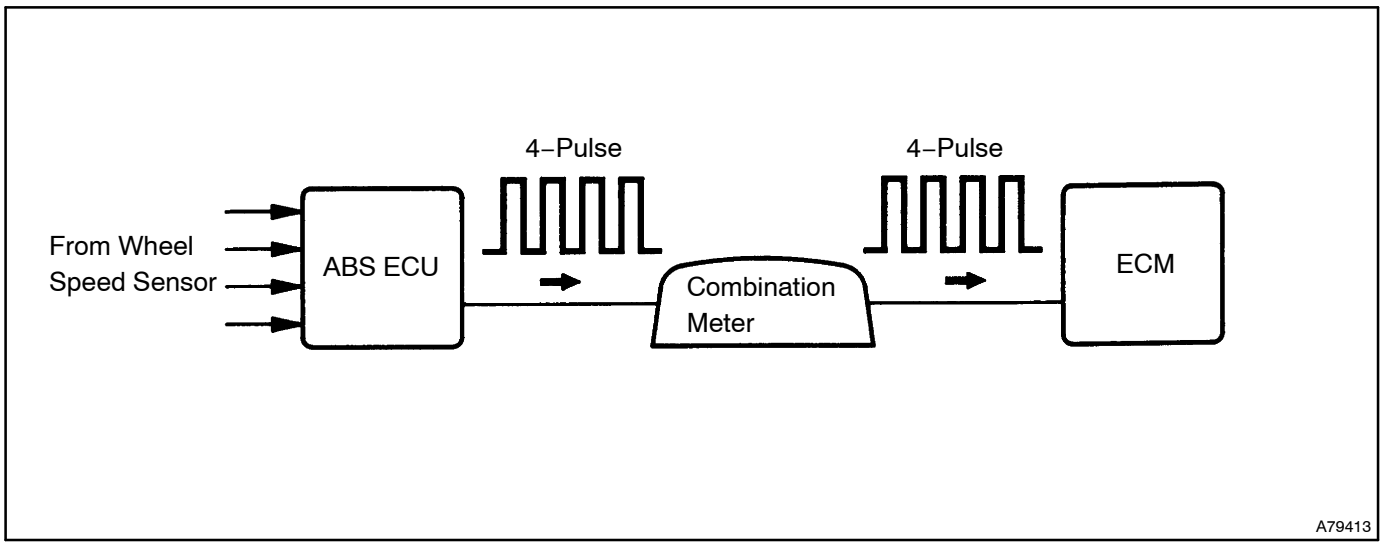
OK

CHECK AND REPLACE ECM

DTC	P0501	VEHICLE SPEED SENSOR RANGE/PERFORMANCE

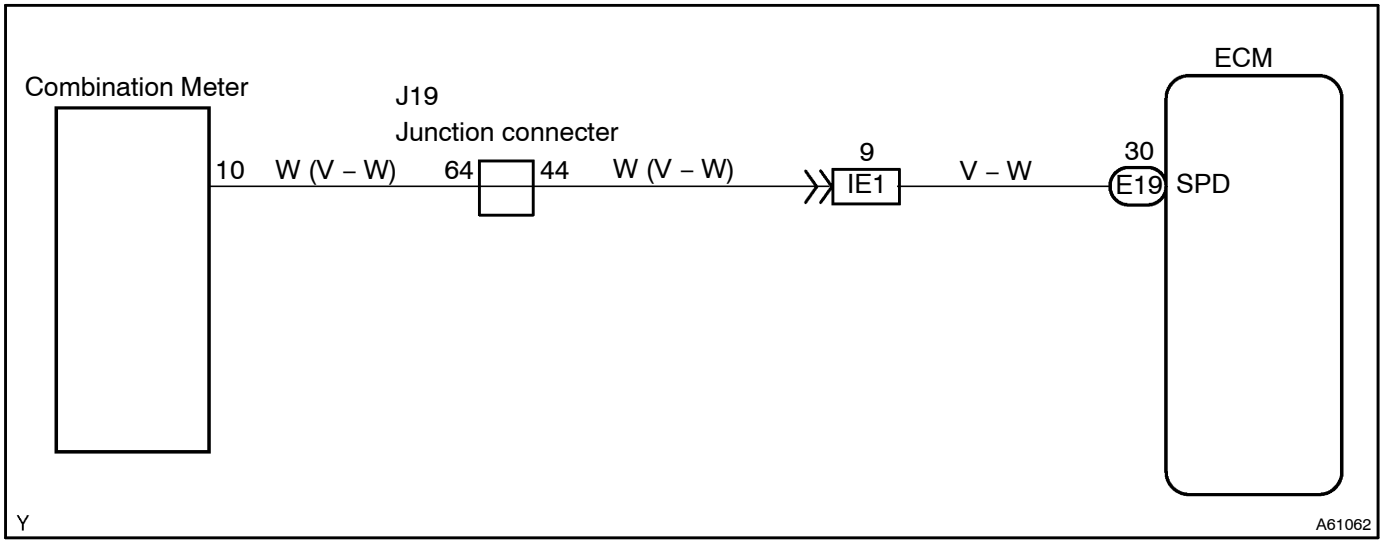
CIRCUIT DESCRIPTION

The vehicle equipped with ABS detects a vehicle speed using the stability control ECU and wheel speed sensor. This sensor monitors a wheel rotation speed and sends the signal to the ECU.
The stability control ECU converts these wheel speed signals into a 4−pulse signal and outputs it to the ECM via the combination meter.



DTC No.	DTC Detecting Condition	Trouble Area
P0501	During vehicle is being driven, no vehicle speed sensor signal to ECM (3 trip detection logic)	• Combination meter • Open or short in No.1 vehicle speed sensor circuit • No.1 vehicle speed sensor • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

HINT:Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK OPERATION OF SPEEDOMETER(SPEEDOMETER OPERATION)

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.

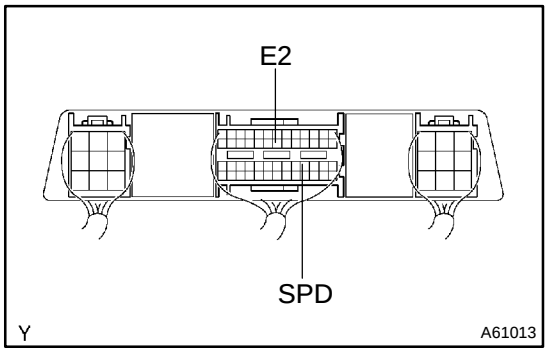
HINT:

The vehicle speed sensor is operating normally if the speedometer display is normal.

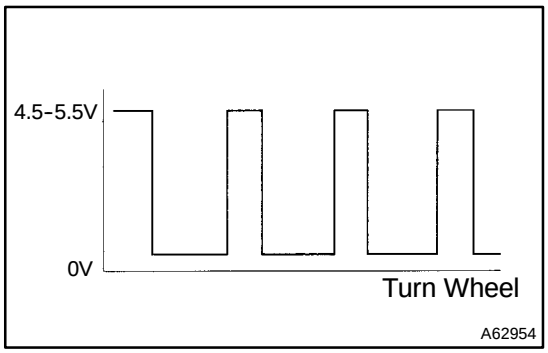
NG → CHECK SPEEDOMETER CIRCUIT

OK

2	INSPECT ECM(CHECK VOLTAGE)



(a) Shift the lever to the neutral position.
(b) Jack up the vehicle.
(c) Turn the ignition switch ON.
(d) Measure the voltage between terminal SPD of the ECM connector and E2 of the ECM connector with turning the wheel slowly.
Voltage: Generated intermittently



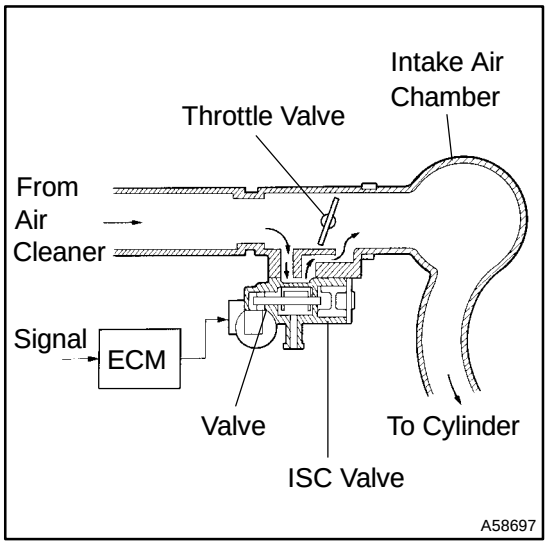
NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

DTC P0505 IDLE CONTROL SYSTEM MALFUNCTION

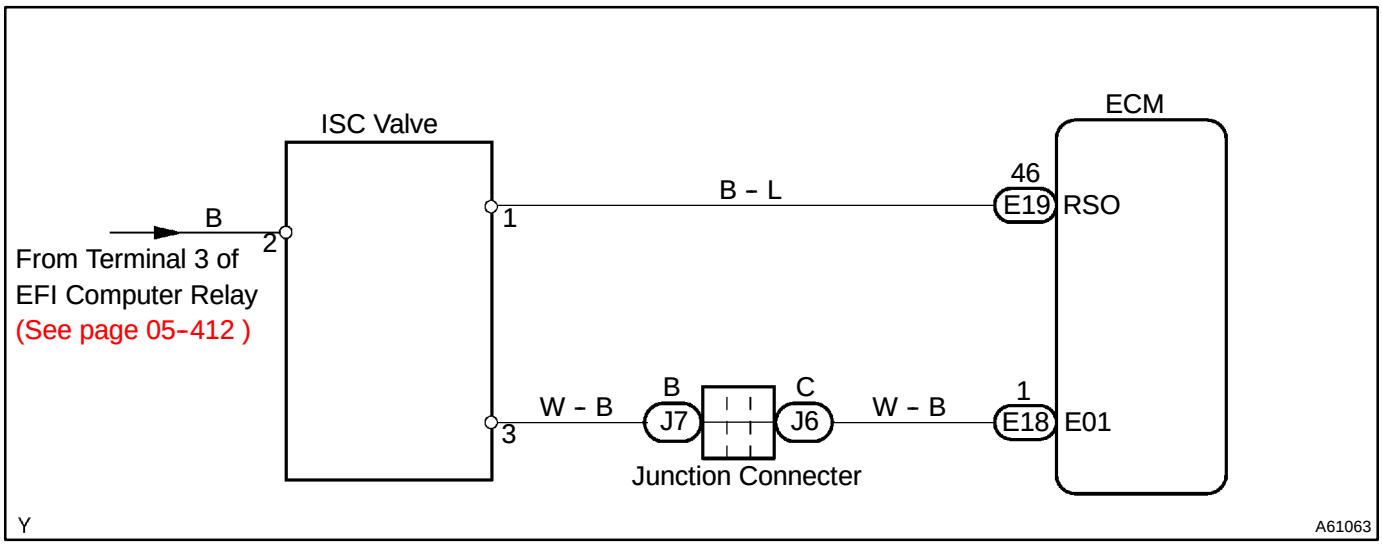
CIRCUIT DESCRIPTION



The rotary solenoid type ISC valve is located under the throttle body and intake air bypassing the throttle valve is directed to the ISC valve through the passage.
In this way the intake air volume bypassing the throttle valve is regulated, controlling the engine speed.
The ECM operates the ISC valve only to perform idle-up and provide feedback for the target idling speed.

DTC No.	DTC Detecting Condition	Trouble Area
P0505	Idle speed continues to be apart greatly from target speed	S Open or short in ISC valve circuit S ISC valve is stuck or closed S Open or short in A/C switch circuit S Air induction system S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freed frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

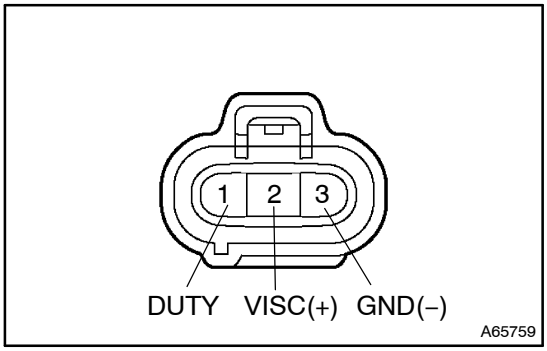
1	PERFORM ACTIVE TEST BY HAND–HELD TESTER(CHECK OPERATION OF THE ISC VALVE)

(a) Warm up the engine to the normal operating temperature.
(b) Switch off all the accessories.
(c) Switch off the A/C.
(d) Shift the lever into the neutral position.
(e) Connect the hand–held tester to the DLC3 on the vehicle.
(f) Check the difference of the engine speed in less than 5 seconds and more than 5 seconds.
Difference of engine speed: More than 100 rpm.

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2	CHECK HARNESS AND CONNECTOR

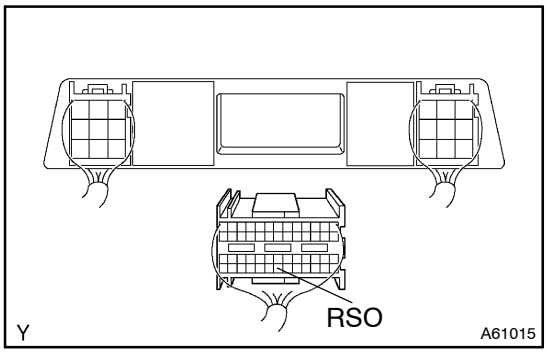


(a) Disconnect the ISC valve connector.
(b) Turn the ignition switch ON.
(c) Measure voltage between terminals VISC and GND of the ISC valve connector.
Voltage: 9 – 14 V

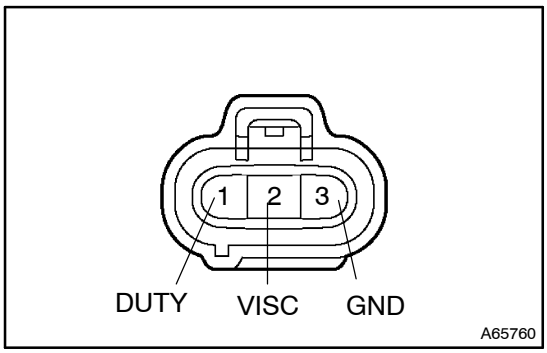
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

3	CHECK HARNESS AND CONNECTOR(RSD CIRCUIT)



(a) Disconnect the ECM E19 connector.
(b) Disconnect the ISC valve conector.
(c) Check continuity between the terminals RSO of the ECM connector and VISC of the ISC valve connector.
Resistance: 1Ω or less
(d) Check for short between the terminals RSO of the ECM connector and E01 of the ISC valve connector.
Resistance: 1MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	INSPECT THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY (See page 10–8)

NG → **REPLACE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY**

OK

CHECK AND REPLACE ECM

DTC	P0561	SYSTEM VOLTAGE UNSTABLE

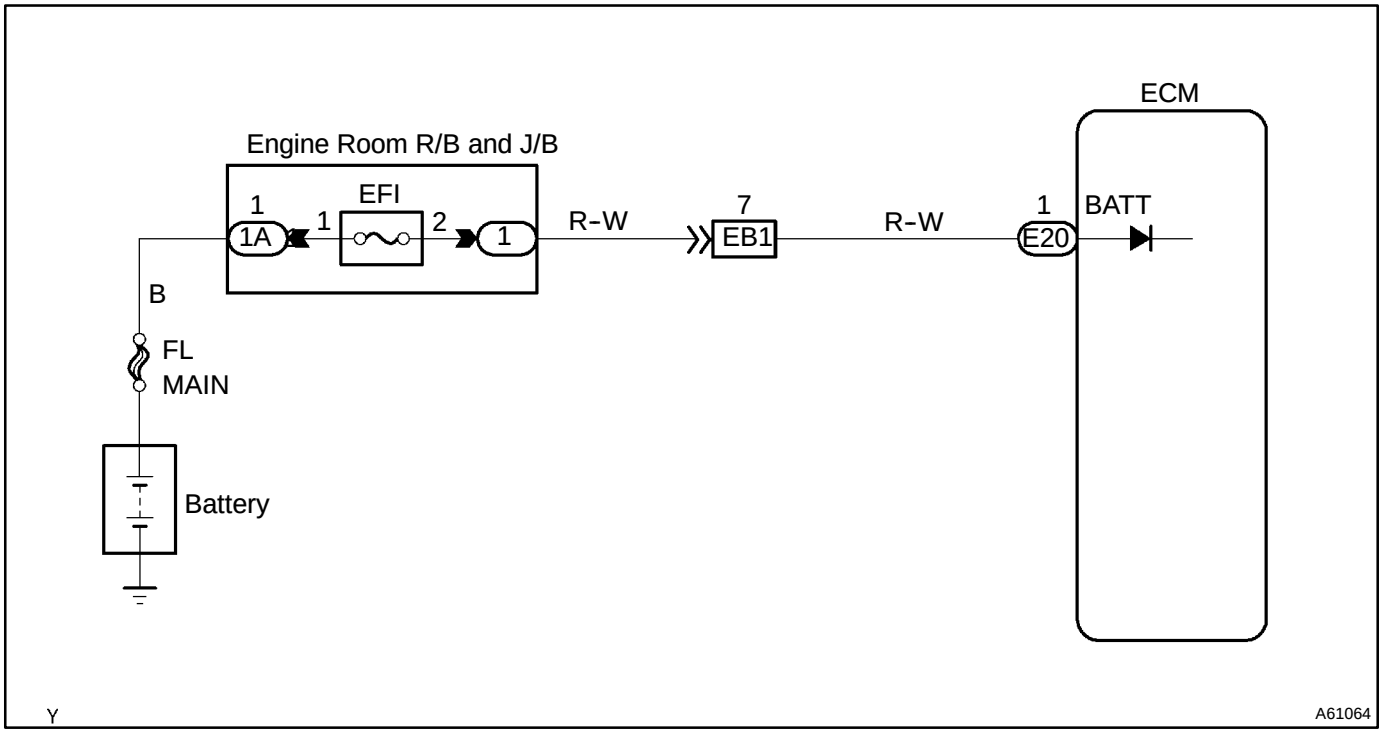
CIRCUIT DESCRIPTION

Battery positive voltage is supplied to terminal BATT of the ECM even when the ignition switch is OFF for use by the DTC memory and air-fuel ratio adaptive control valve memory, etc.

DTC No.	DTC Detecting Condition	Trouble Area
P0561	Open or short in back up power source circuit	$ Open in back up power source circuit $ ECM

HINT:
If DTC P0561 appear,the ECM dose not store another DTC.

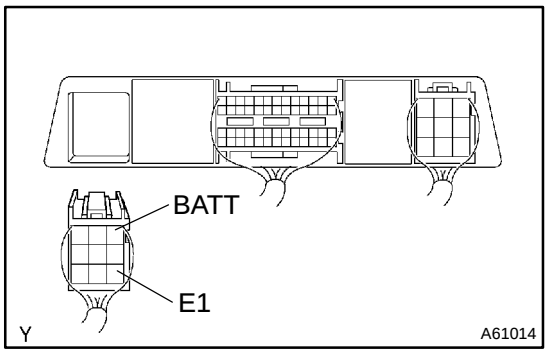
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK HARNESS AND CONNECTOR(BATTERY-ECM)



(a) Disconnect the battery negative (-) terminal.
(b) Disconnect the ECM E20 connector.
(c) Check continuity between the terminal BATT of the ECM connector and negative (-) of the battery.
Resistance: 1 Ω or less
(d) Check for short between the terminal BATT and E1 of the ECM connector.
Resistance: 1M Ω or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

2	CHECK FUSE(EFI) (See page 05-412)

NG → **CHECK FOR SHORT IN ALL HERNESS AND COMPONENTS CONNECTED EFI FUSE**

OK

CHECK AND REPLACE ECM

DTC	P0562	SYSTEM VOLTAGE LOW

DTC	P0563	SYSTEM VOLTAGE HIGH

CIRCUIT DESCRIPTION

Battery positive voltage is supplied to terminal BATT of the ECM even when the ignition switch is OFF for use by the DTC memory and air-fuel ratio adaptive control valve memory, etc.

DTC No.	DTC Detecting Condition	Trouble Area
P0562 P0563	Open or short in back up power source circuit	S Open in back up power source circuit S Tired battery S Electrical overwork S Altrenator S 24V battery S ECM

HINT:

- S If DTC P0561 appear,the ECM dose not store another DTC.
- S If DTC P0562 appear,the voltage of ECM is 6V or less.
- S If DTC P0563 appear,the voltage of ECM is 16V or more.

WIRING DIAGRAM

Refer to DTC P0561 on page 05-398.

INSPECTION PROCEDURE

HINT:

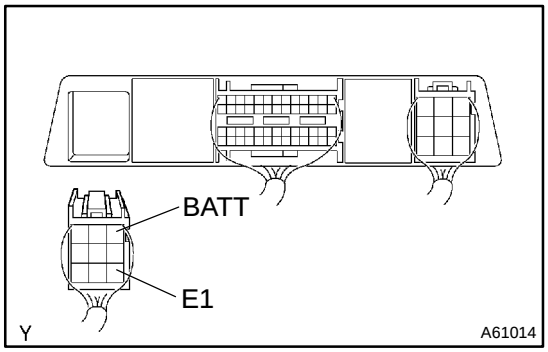
Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

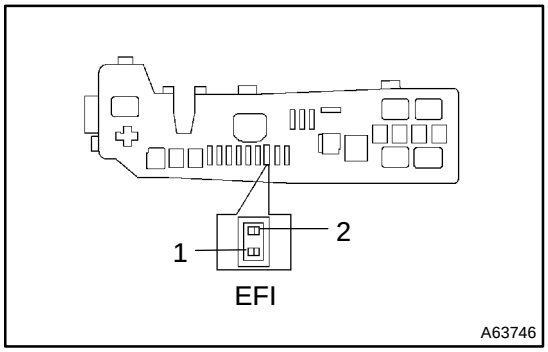
1	CHECK FUSE(EFI) (See page 05-412)

NG → CHECK FOR SHORT IN ALL HERNESS AND COMPONENTS CONNECTED EFI FUSE

OK

2	CHECK HARNESS AND CONNECTOR(ECM-EFI FUSE,EFI FUSE-BATTERY)





(a) Disconnect the battery negative (-) terminal.
(b) Disconnect the ECM E20 connector.
(c) Remove the EFI fuse.
(d) Check continuity between the terminals BATT of the ECM connector and 2 of the EFI fuse holder in the engine room R/B.
Resistance: 1 Ω or less
(e) Check for short between the terminals BATT and E1 of the ECM connector.
Resistance: 1M Ω or more
(f) Check continuity between the terminals 1 of the EFI fuse holder in the engine room R/B and negative (-) of the battery.
Resistance: 1 Ω or less

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	CHECK GENERATOR ASSY (See page 19-17)

NG → **REPAIR OR REPLACE**

OK

4	CHECK BATTERY(VOLTAGE) (See page 05-318)

NG → **REPLACE BATTERY**

OK

CHECK AND REPLACE ECM

DTC	P0601	INTERNAL CONTROL MODULE MEMORY CHECK SUM ERROR

CIRCUIT DESCRIPTION

The ECM memory status is diagnosed by internal ”mirroring” of the main CPU and the sub CPU to detect Random Access Memory (RAM) errors. The two CPUs also perform continuous mutual monitoring.

DTC No.	DTC Detecting Condition	Trouble Area
P0601	ECM Malfunction (3 trip detection logic)	• ECM

INSPECTION PROCEDURE

REPLACE ECM

DTC	P1345	VVT SENSOR/CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION (BANK 1)

CIRCUIT DESCRIPTION

Refer to DTC P0342, P0343 on page 05-385.

DTC No	DTC Detecting Condition	Trouble Area
P1345	No crank position sensor No.1 signal to ECM (2trip detection logic)	S Open or short in crank position sensor No.1 circuit S Crank position sensor No.1 S Intake camshaft S ECM

WIRING DIAGRAM

Refer to DTC P0335 on page 05-381.

INSPECTION PROCEDURE

Refer to DTC P0342, P0343 on page 05-385.

HINT:

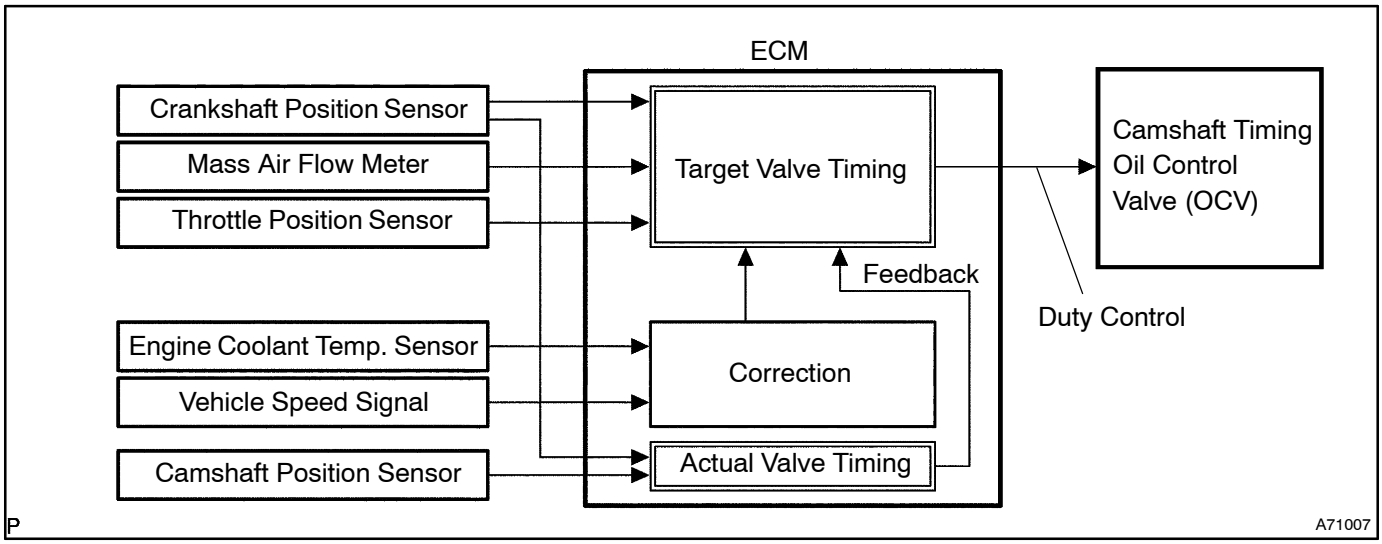
- If DTC P1345 is displayed, check the crank position sensor No.1
- Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. when troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

DTC	P1340	CAMSHAFT POSITION SENSOR RANGE/ PERFORMANCE

DTC	P1345	VVT SYSTEM STICK DETECTED

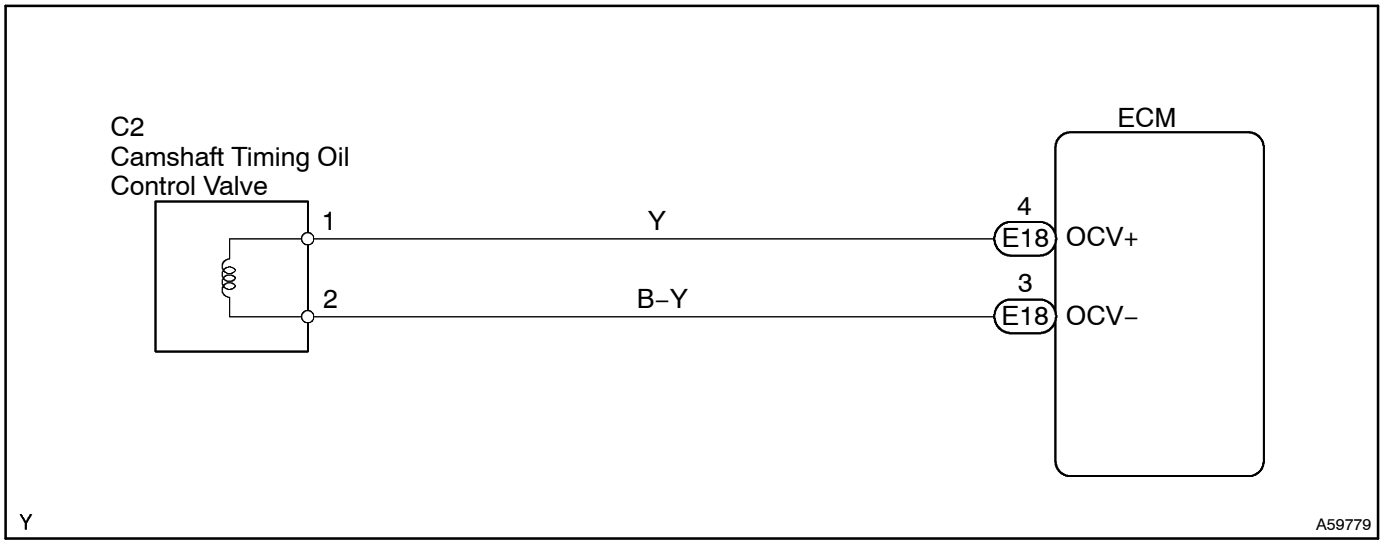
CIRCUIT DESCRIPTION

The Variable Valve Timing (VVT) system includes the ECM, the Oil Control Valve (OCV) and the VVT controller. The ECM sends a target "duty–cycle" control signal to the OCV. This control signal, applied to the OCV, regulates the oil pressure supplied to the VVT controller. Camshaft timing control is performed based on engine operation conditions such as intake air volume, throttle position and engine coolant temperature.
The ECM controls the OCV based on the signals output from several sensors. The VVT controller regulates the intake camshaft angle using oil pressure through the OCV. As result, the relative position between the camshaft and the crankshaft is optimized, and the engine torque improves, fuel economy improves, and exhaust emissions decrease. The ECM detects the actual valve timing using signals from the camshaft position sensor and the crankshaft position sensor. The ECM performs feedback control and verifies target valve timing.



DTC No.	DTC Detection Condition	Trouble Area
P1340	• Camshaft position deviated from specified position (3 trip detection logic). • Camshaft position remained at advenced position (3 trip detection logic).	• Mechanical system malfunction • Valve timing (Timing chain position deviates or timing chain is stretching) • Camshaft timing gear assy • Camshaft timing oil control valve (OCV)
P1345	Camshaft position deviated from commanded camshaft position (camshaft timing gear malfunction) (1 trip detection logic).	• Camshaft timing gear assy • Camshaft timing oil control valve (OCV)

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand–held tester. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

1	CHECK VALVE TIMING (See page 14–123)

OK: The matchmarks of crankshaft pulley and camshaft pulley are aligning.

NG → ADJUST VALVE TIMING (See page 14–123)

OK

2	READ OUTPUT DTC(CHECK IF DTC OUTPUT RECURS)

(a) Clear the DTC.
(b) Start and warm up the engine.
(c) Drive the vehicle for 10 minutes or more.
(d) Read output DTC.
OK: No DTC output.

OK → VVT SYSTEM OK*

HINT:
*: DTCs P1340 or P1345 is output when a foreign object in engine oil is caught in some part of the system. These codes will stay registered even if the system returns to normal after a short time. These foreign objects are then captured by the oil filter, thus eliminating the source of the problem.

NG

3	CHECK OIL CONTROL VALVE FILTER

OK: The filter is not clogged.

NG → REPLACE OIL CONTROL VALVE FILTER

OK

4	CHECK CAMSHAFT TIMING OIL CONTROL VALVE ASSY(OCV) (See page 10–8)

OK: OCV has no contamination and mores smoothly.

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY (OCV)

OK

REPLACE CAMSHAFT TIMING GEAR ASSY

DTC	P1346	CAMSHAFT TIMING OIL CONTROL VALVE CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Refer to DTC P1340 on page 05-402.

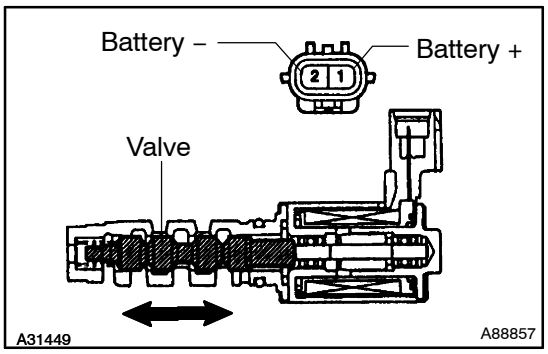
DTC No.	Detection Item	Trouble Area
P1346	Camshaft timing oil control valve (OCV) circuit was open/short circuit (3 trip detection logic).	• Open or short in camshaft timing oil control valve (OCV) circuit • Camshaft timing oil control valve (OCV) • ECM

WIRING DIAGRAM

Refer to DTC P1340 on page 05-402.

INSPECTION PROCEDURE

1	CHECK CAMSHAFT TIMING OIL CONTROL VALVE ASSY (OCV)



(a) Turn the ignition switch OFF.
(b) Remove the OCV.
(c) Apply the battery voltage to the OCV.
(d) Check that the OCV moves smoothly.

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY (OCV)

OK

2	CHECK HARNESS AND CONNECTOR (ECM – OCV)

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE ECM

DTC P1605 KNOCK CONTROL CPU MALFUNCTION

CIRCUIT DESCRIPTION

DTC No.	Detection Item	Trouble Area
P1605	Knock control IC malfunction (3 trip detection logic)	• ECM

INSPECTION PROCEDURE

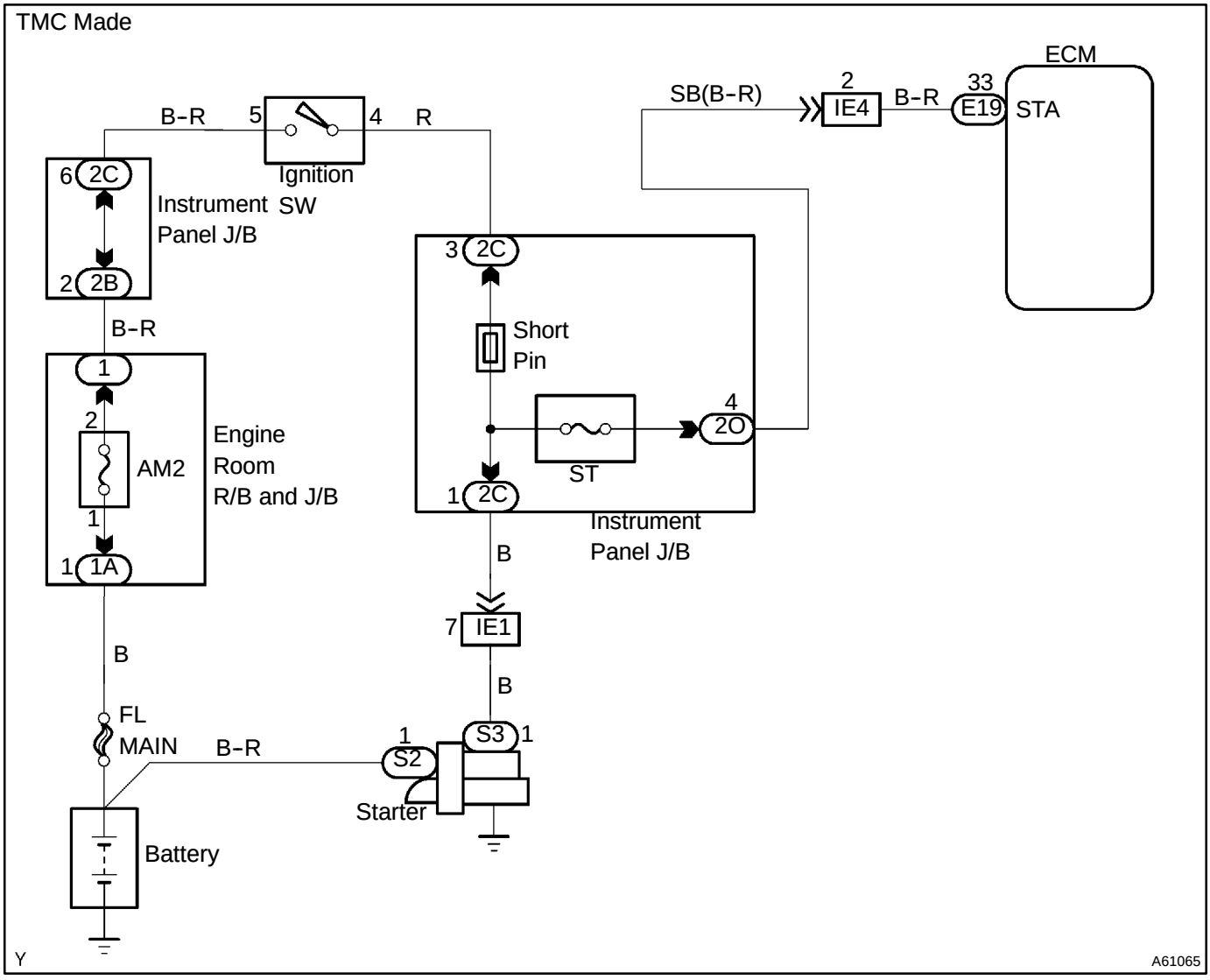
REPLACE ECM

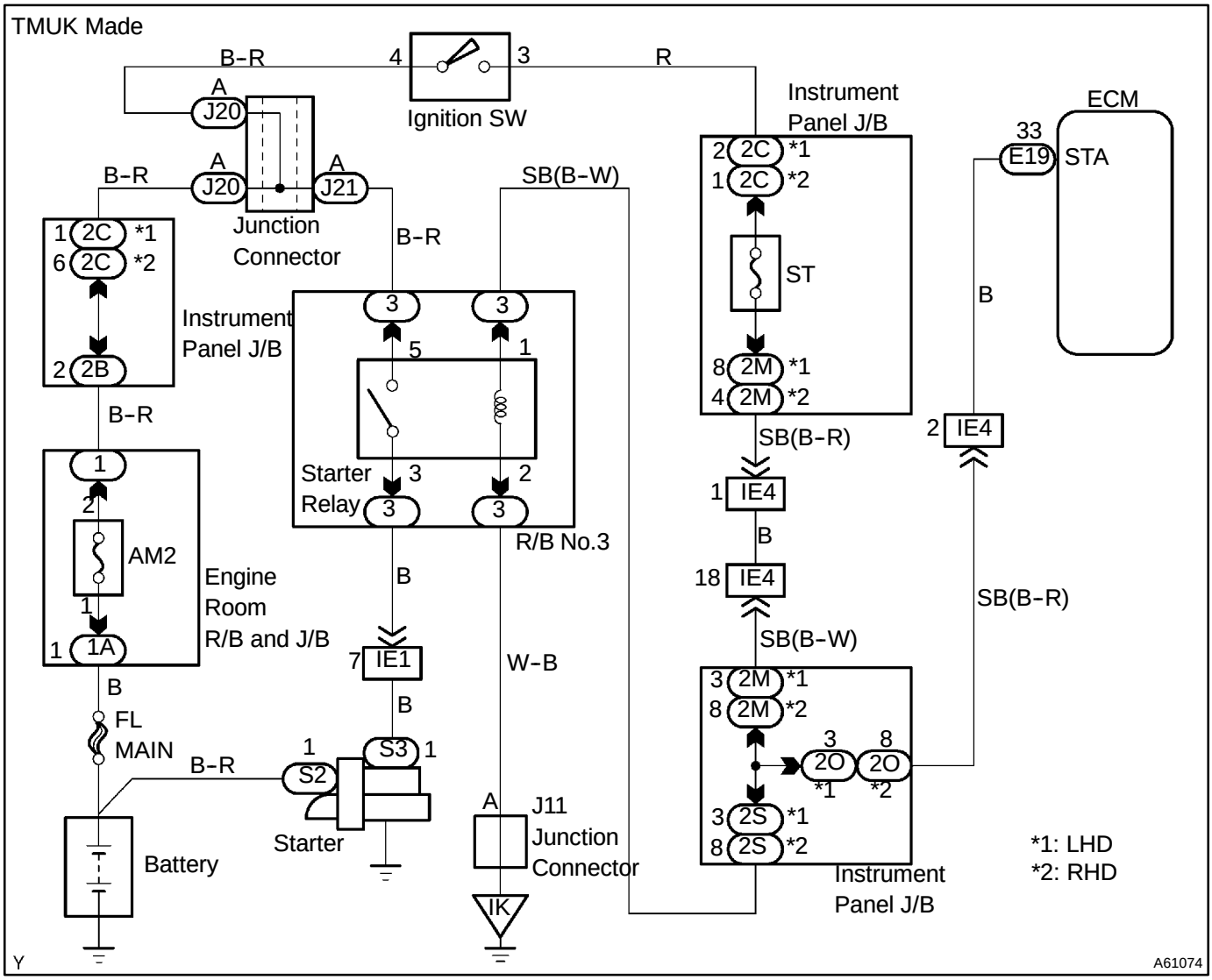
STARTER SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

When the engine is cranked, the intake air flow is slow, so fuel vaporization is poor. A rich mixture is therefore necessary in order to achieve good startability. While the engine is being cranked, the battery voltage is applied to terminal STA of the ECM. The starter signal is mainly used to increase the fuel injection volume for the starting injection control and after-start injection control.

WIRING DIAGRAM





INSPECTION PROCEDURE

HINT:

This diagnostic chart is based on the premise that the engine is being cranked under normal conditions. If the engine does not crank, proceed to the problem symptoms table on page 05-335

1	READ VALUE OF HAND-HELD TESTER(STARTER SIGNAL)

(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand-held tester main switch ON.
(c) Read the STA signal on the hand-held tester while the starter is operating.

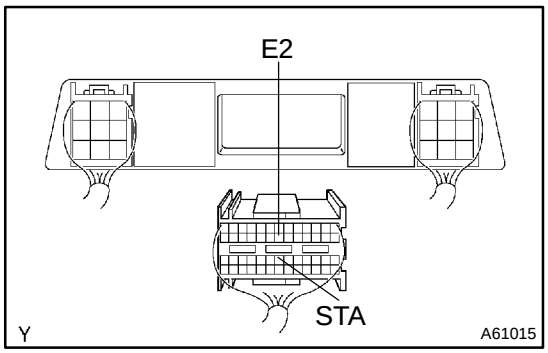
Result:

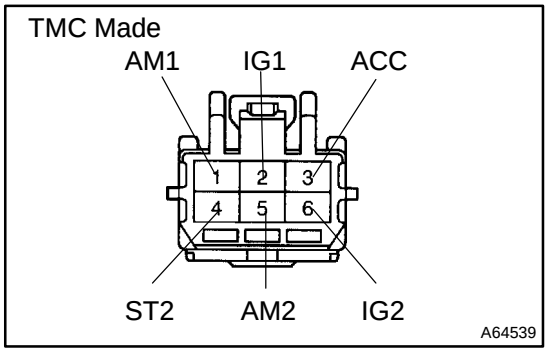
Ignition Switch Position	ON	START
STA Signal	OFF	ON

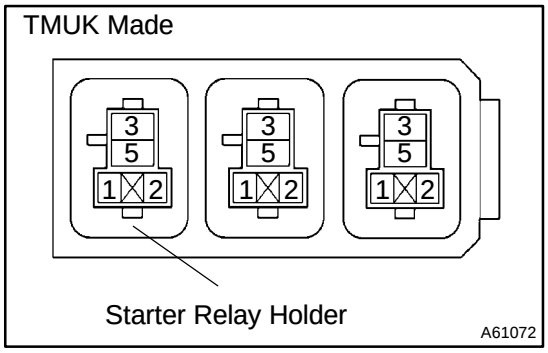
OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

NG

2 CHECK WIRE HARNESS OR CONNECTOR(ECM-STARTER RELAY)







(a) Disconnect the ECM E19 connector.
(b) Disconnect the ignition switch connector. (TMC made)
(c) Remove the starter relay. (TMUK made)
(d) Check continuity between the terminals STA of the ECM connector and 4 of the ignition switch connector. (TMC made)
Resistance: 1 Ω or less
(e) Check continuity between the terminals STA of the ECM connector and 1 of the starter relay connector side. (TMUK made)
Resistance: 1 Ω or less
(f) Check for short between the terminals STA of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

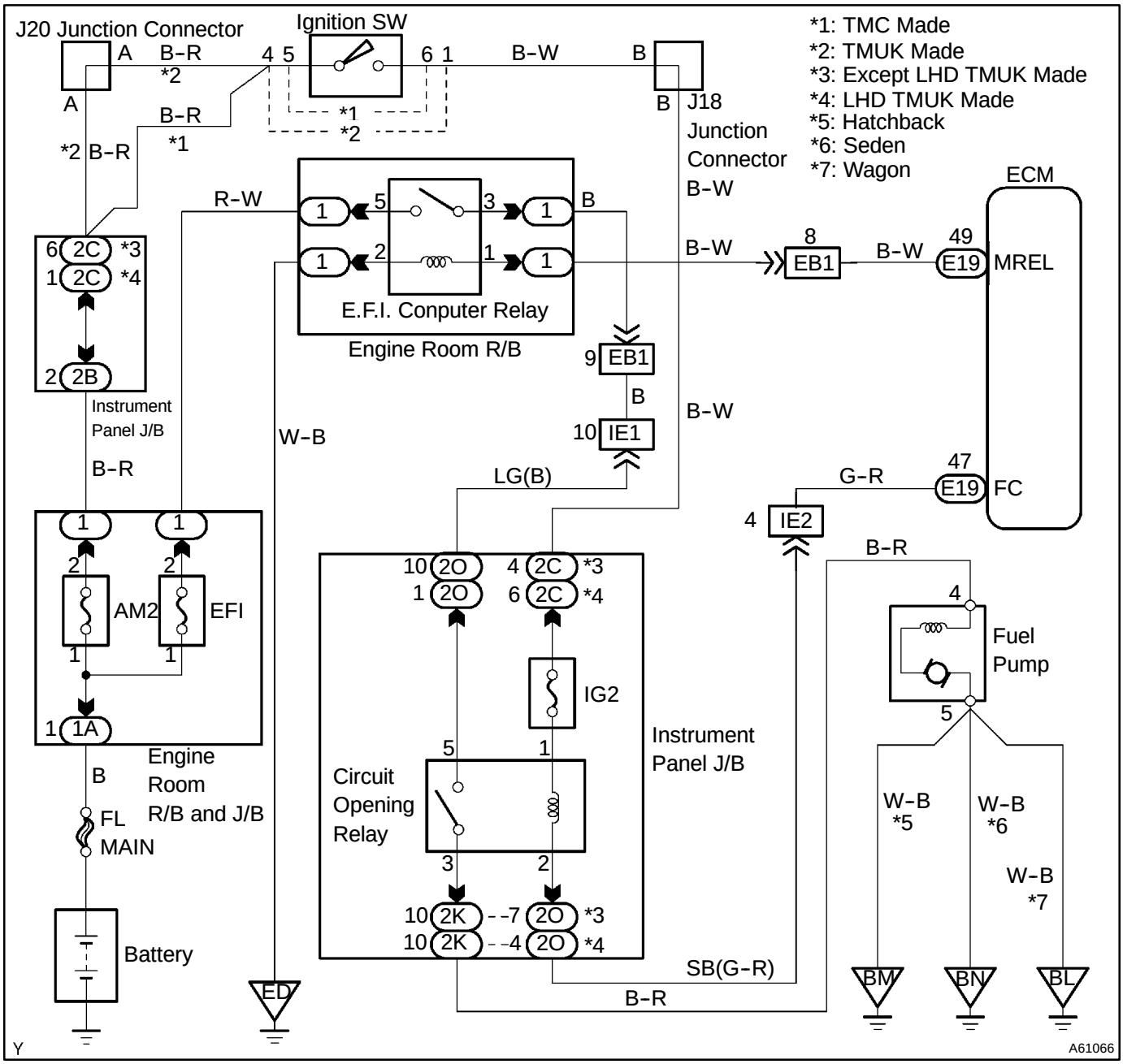
CHECK AND REPLACE COMPUTER, ENGINE CONTROL

FUEL PUMP CONTROL CIRCUIT

CIRCUIT DESCRIPTION

In the diagram below, when the engine is cranked, current flows from terminal ST of the ignition switch to the starter relay coil and also current flows to terminal STA of ECM (STA signal).
When the STA signal and NE signal are input to the ECM, Tr is turned ON, current flows to the coil of the circuit opening relay, the relay switches on, power is supplied to the fuel pump and the fuel pump operates.
While the NE signal is generated (engine running), the ECM keeps Tr ON (circuit opening relay ON) and the fuel pump also keeps operating.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(OPERATION OF CIRCUIT OPENING RELAY)

(a) Select the active test mode on the hand-held tester.
(b) Turn the ignition switch ON, and perform the active test at the engine stop.
Result: The circuit opening relay operates.

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

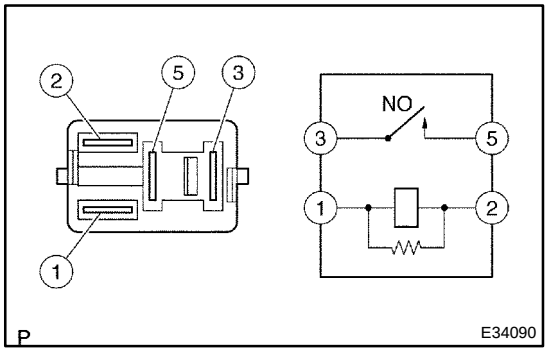
NG

2	CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-412)

NG → **REPAIR OR REPLACE**

OK

3	INSPECT E.F.I. CIRCUIT OPENING RELAY ASSY



(a) Check continuity between the terminals shown below.
Resistance:

TERMINAL NO.	RESISTANCE
1 - 2	1 Ω or less
3 - 5	1 ΩM or more

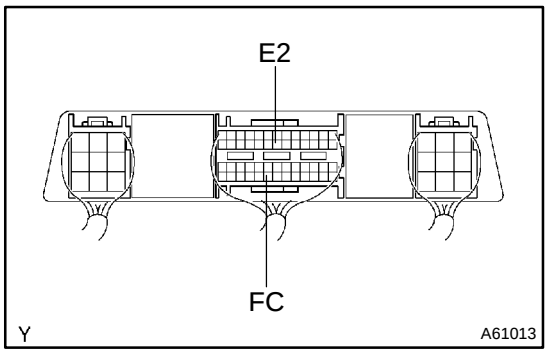
(b) Check continuity between the terminals 3 and 5 of the connector when the battery voltage is applied to the terminals between 1 and 2.
Resistance:

TERMINAL NO.	RESISTANCE
3 - 5	1 Ω or less

NG → **REPLACE E.F.I. CIRCUIT OPENING RELAY ASSY**

OK

4	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal FC and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → Go to step 6

NG

5	CHECK WIRE HARNESS OR CONNECTOR(EFI MAIN RELAY-CIRCUIT OPENING RELAY, CIRCUIT OPENING RELAY-ECM)

NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM

6	INSPECT FUEL PUMP (See page 11-10,11-17)

NG → REPLACE FUEL PUMP

OK

7	CHECK WIRE HARNESS OR CONNECTOR(CHECK FOR OPEN)

(a) Check for open in harness and connector between circuit opening relay and fuel pump, and fuel pump and body ground.

NG → REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM

ECM BACK-UP POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

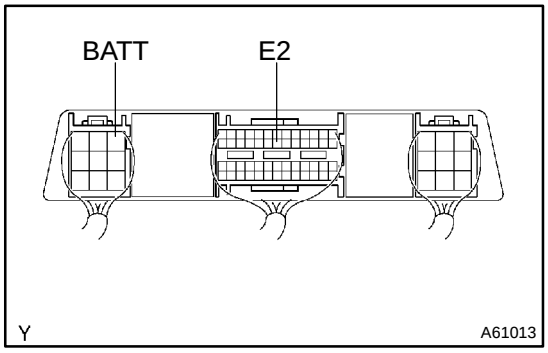
Battery positive voltage is supplied to terminal BATT of the ECM even when the ignition switch is OFF for use by the DTC memory and air-fuel ratio adaptive control value memory,etc.

WIRING DIAGRAM

Refer to DTC P0561 on page 05-398.

INSPECTION PROCEDURE

1	INSPECT ECM



(a) Measure voltage between the terminals BATT of the ECM connector and E2 of the ECM connector.
Voltage: 9 - 14 V

OK → **SYSTEM OK**

NG

2	CHECK FUSE(EFI FUSE) (See page 05-412)

NG → **REPLACE FUSE**

OK

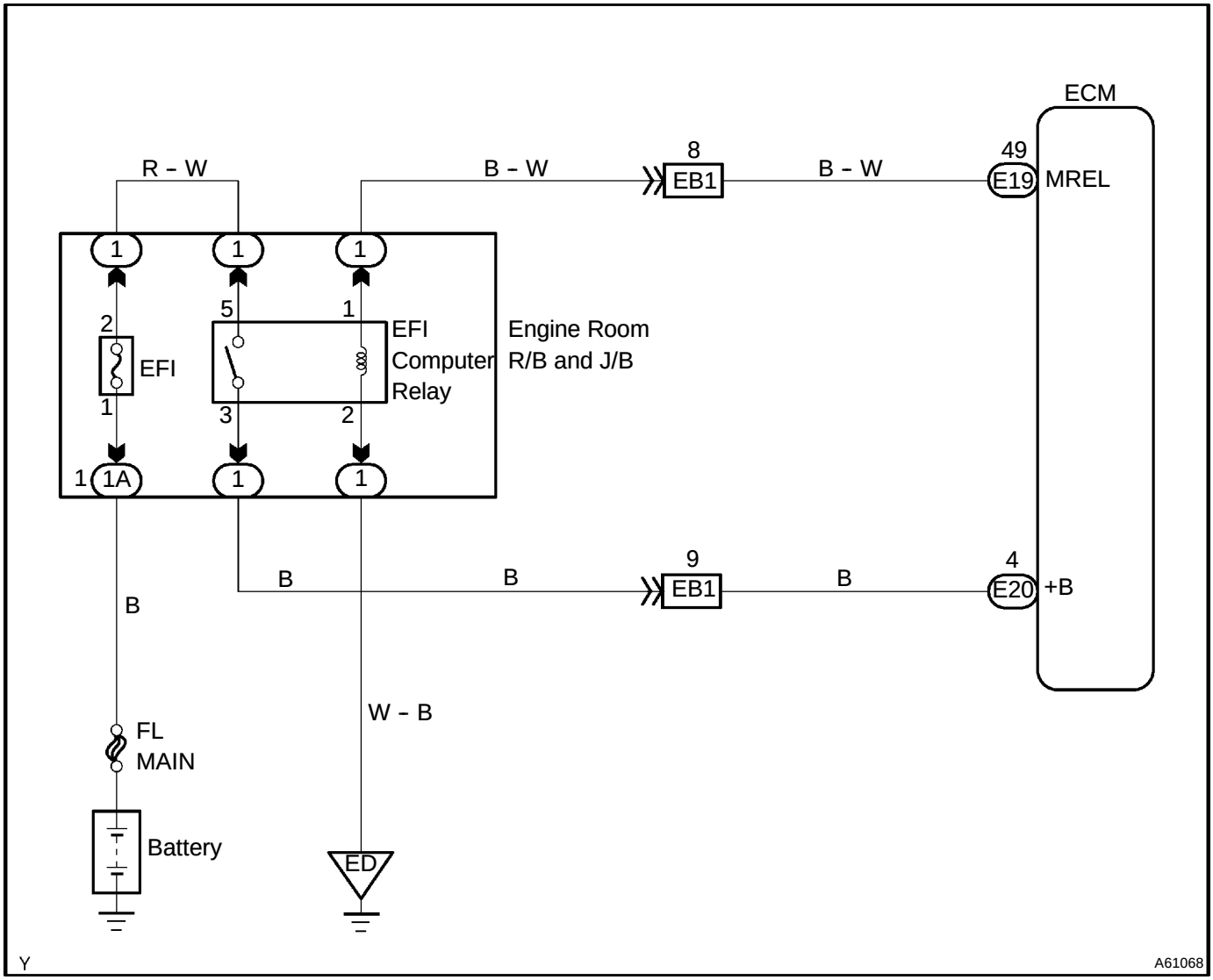
CHECK AND REPLACE ENGINE ECU POWER SOURCE CIRCUIT

ECM POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

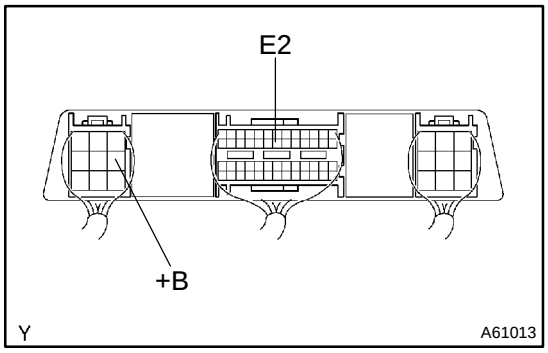
When the ignition switch is turned ON, battery positive voltage is applied to the coil which closes the contacts of the E.F.I. computer relay (Marking: EFI) and supplies power to the terminal +B of the ECM.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT ECM

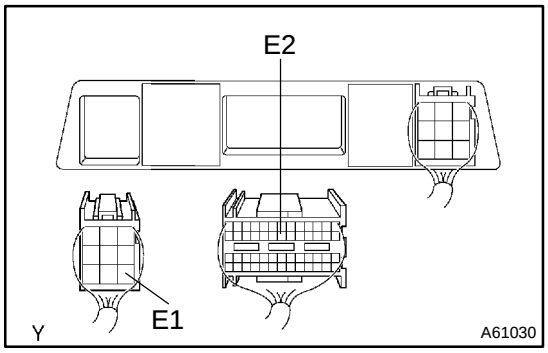


(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals +B of the ECM connector and E2 of the ECM connector.
Voltage: 9-14 V

OK → **CHECK AND REPLACE ECM**

NG

2 CHECK HARNESS AND CONNECTOR(ECM GROUND)

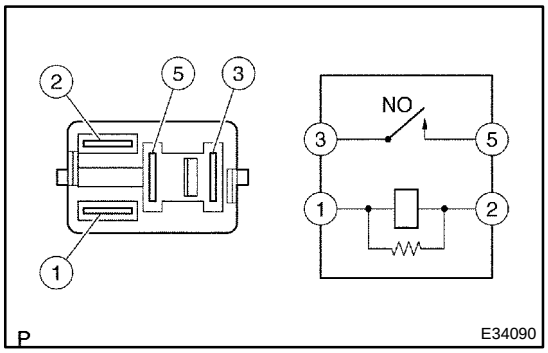


(a) Disconnect the battery negative terminal.
(b) Disconnect the ECM E19 and E20 connector.
(c) Check continuity between the terminal E1 of the ECM connector and body ground.
Resistance: 1Ω or less
(d) Check continuity between the terminal E2 of the ECM connector and body ground.
Resistance: 1Ω or less

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 CHECK E.F.I ECU RELAY



(a) Check continuity between the terminals shown below.
Resistance:

TERMINAL NO.	RESISTANCE
1 - 2	1 Ω or less
3 - 5	1 ΩM or more

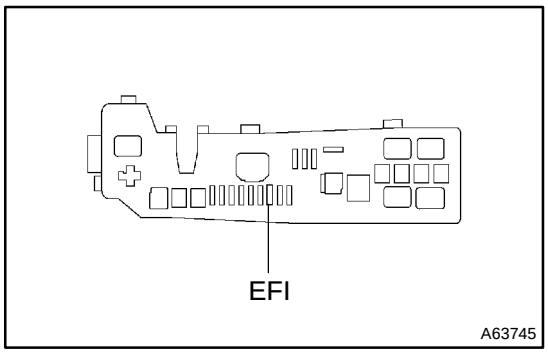
(b) Check continuity between the terminals 3 and 5 of the connector when the battery voltage is applied to the terminals between 1 and 2.
Resistance:

TERMINAL NO.	RESISTANCE
3 - 5	1 Ω or less

NG → **REPLACE E.F.I ECU RELAY**

OK

4	CHECK FUSE(E.F.I.FUSE)

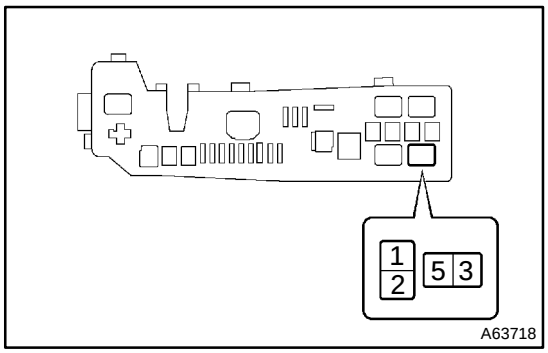


(a) Check continuity of E.F.I. fuse.
Resistance: 1Ω or less

NG → **REPLACE FUSE**

OK

5	CHECK RELAY OPERATION(E.F.I. COMPUTER RELAY)

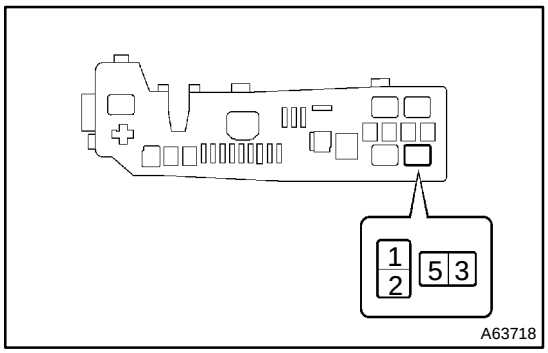


(a) Confirm that the E.F.I relay operates normally when turning the ignition switch ON.
Result:
E.F.I. relay operation sound is heard successively when turning the ignition switch ON.

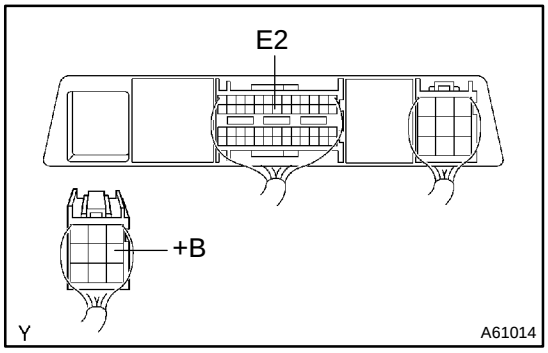
NG → **Go to step 9**

OK

6 CHECK HARNESS AND CONNECTOR(ECM-E.F.I. COMPUTER RELAY)



(a) Disconnect the battery negative (-) terminal.
(b) Disconnect the ECM E20 connector.
(c) Remove the E.F.I. computer relay.
(d) Check continuity between the terminals 1 of the EFI computer relay in the engine room R/B and +B of the ECM E6 connector.
Resistance: 1Ω or less
(e) Check continuity between the terminals 1 of the EFI computer relay in the engine room R/B and E1 of the ECU connector.
Resistance: 1MΩ or more

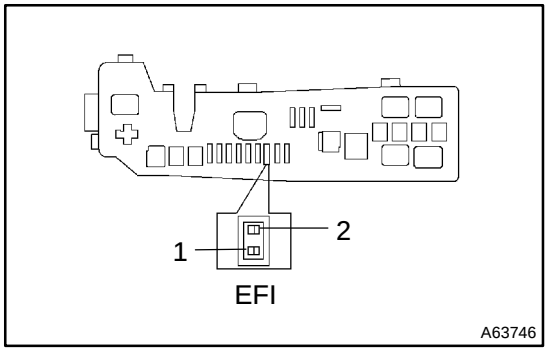


NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

7 CHECK HARNESS AND CONNECTOR(E.F.I.FUSE-BATTERY)



(a) Disconnect the battery negative (-) terminal.
(b) Remove the EFI fuse.
(c) Check continuity between the terminals 1 of the EFI fuse holder in the engine room R/B and negative (-) of the battery.
Resistance: 1Ω or less

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

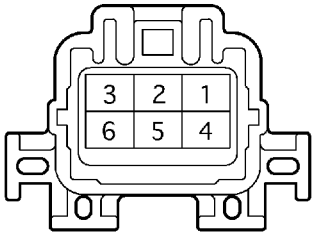
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM

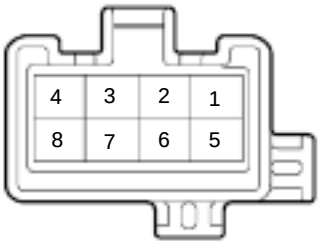
8	INSPECT IGNITION OR STARTER SWITCH ASSY

TMC Made



B50489

TMUK Made



A64540

(a) Check continuity between the connector terminals shown in the chart below.

TMC Made:

Switch	Terminal No.	Resistance
LOCK	All Terminals	1MΩ or more
ACC	1-3	1Ω or less
ON	1-2-3 5-6	1Ω or less
START	4-5-6 1-2	1Ω or less

TMUK Made:

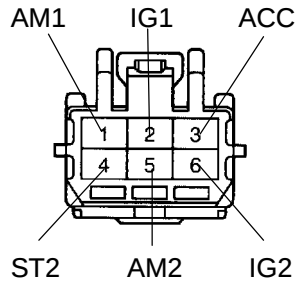
Switch	Terminal No.	Resistance
LOCK	All Terminals	1MΩ or more
ACC	5-6	1Ω or less
ON	5-6-8 1-4	1Ω or less
START	5-6-7-8 1-3-4	1Ω or less

NG → **REPLACE IGNITION OR STARTER SWITCH ASSY**

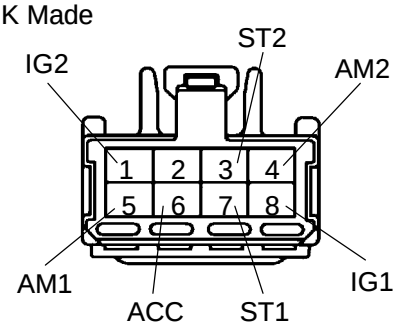
OK

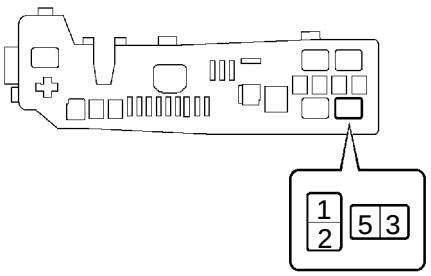
9	CHECK HARNESS AND CONNECTOR(IGNITION SWITCH-E.F.I. COMPUTER RELAY)

TMC Made



TMUK Made





(a) Disconnect the battery negative (-) terminal.
(b) Remove the EFI computer relay.
(c) Disconnect the ignition switch connector.
(d) Check continuity between the terminals IG2 of the ignition switch connector and 5 of the EFI circuit opening relay in the R/B.
Resistance: 1Ω or less
(e) Check for short between the terminal IG2 of the ignition switch and body ground.
Resistance: 1MΩ or more

NOTICE:
Do not insert the tester leads hard in the procedure (c), or the holder may be damaged.

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM

ECD SYSTEM (1CD-FTV)

HOW TO PROCEED WITH TROUBLESHOOTING

054S2-04

When using hand - held tester, troubleshoot in accordance with the procedure shown below

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS (See page 05-423)

3	CONNECT THE HAND-HELD TESTER TO DLC3

HINT:
If the display indicates a communication fault in the tool, inspect DLC3.

4	CHECK DTC AND FREEZED FRAME DATA (See page 05-424)

HINT:
Record or print DTC and Freezed Frame Data, if needed.

5	CLEAR DTC AND FREEZED FRAME DATA (See page 05-424)

6	VISUAL INSPECTION

7	SETTING THE CHECK (TEST) MODE DIAGNOSIS (See page 05-424)

8	PROBLEM SYMPTOM CONFIRMATION

HINT:
If the engine does not start, perform step 10 and 12 first.

A	Malfunction does not occur
B	Malfunction occurs

B	GO TO STEP 10

A

9	SYMPTOM SIMULATION

10	DTC CHECK (See page 05-424)

A	No code
B	Malfunction code

B → AFTER CHECKING MALFUNCTION CODE, GO TO STEP 13

A

11	BASIC INSPECTION (See page 05-424)

A	Not confirm wrong parts
B	Confirm wrong parts

B → GO TO STEP 16

A

12	PROBLEM SYMPTOM TABLE (See page 05-438)

A	Confirm wrong circuit
B	Confirm wrong Parts

B → GO TO STEP 16

A

13	CHECK ECM POWER SOURCE CIRCUIT (See page 05-522)

14	CIRCUIT INSPECTION

A	Not confirm malfunction
B	Confirm malfunction

B → GO TO STEP 16

A

15	CHECK FOR INTERMITTENT PROBLEM (See page 05-424)

16	IDENTIFICATION OF PROBLEM

17	ADJUSTMENT, REPAIR

18	CONFIRMATION TEST

END

When not using hand-held tester, troubleshoot in accordance with the procedure shown below.

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS (See page 05-423)

3	CHECK AND CLEAR DTC (See page 05-424)

4	PROBLEM SYMPTOM CONFIRMATION

A	Malfunction does not occur
B	Malfunction occurs

B → GO TO STEP 6

A

5	SYMPTOM CONFIRMATION

6	DTC CHECK (See page 05-424)

A	Normal code
B	Malfunction code

B → AFTER CHECKING MALFUNCTION CODE, GO TO STEP 9

A

7	BASIC INSPECTION (See page 05-424)

A	Not confirm wrong parts
B	Confirm wrong parts

B → GO TO STEP 9

A

8	PROBLEM SYMPTOM TABLE (See page 05-438)

A	Confirm wrong circuit
B	Confirm wrong Parts

B → GO TO STEP 12

A

9	CHECK ECM POWER SOURCE CIRCUIT (See page 05-522)

10	CIRCUIT INSPECTION

A	Not confirm malfunction
B	Confirm malfunction

B → GO TO STEP 12

A

11	CHECK FOR INTERMITTENT PROBLEM (See page 05-424)

12	IDENTIFICATION OF PROBLEM

13	ADJUSTMENT, REPAIR

14	CONFIRMATION TEST

END

054S3-04

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE CONTROL SYSTEM Check Sheet

Inspector's Name _____

Customer's Name		Model and Model Year	
Driver's Name		Frame No.	
Data Vehicle Brought in		Engine Model	
License No.		Odometer Reading	km / miles

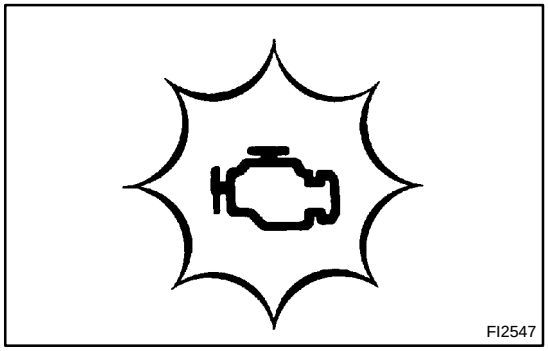
Problem Symptoms	☐ Engine does not Start	☐ Engine does not crank ☐ No initial combustion ☐ No complete combustion
	☐ Difficult to Start	☐ Engine cranks slowly ☐ Other _____
	☐ Poor Idling	☐ Incorrect first idle ☐ Idling rpm is abnormal ☐ High (rpm) ☐ Low (rpm) ☐ Rough idling ☐ Other _____
	☐ Poor Drivability	☐ Hesitation ☐ Back fire ☐ Muffler explosion (after-fire) ☐ Surging ☐ Knocking ☐ Other _____
	☐ Engine Stall	☐ Soon after starting ☐ After accelerator pedal depressed ☐ After accelerator pedal released ☐ During A/C operation ☐ Shifting from N to D ☐ Other _____
	☐ Others	

Datas Problem Occurred		
Problem Frequency		☐ Constant ☐ Sometimes (times per day/month) ☐ Once only ☐ Other _____
Condition When Problem Occurs	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Other _____
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (approx. ____°F/____°C)
	Place	☐ Highway ☐ Suburbs ☐ Inner City ☐ Uphill ☐ Downhill ☐ Rough road ☐ Other _____
	Engine Temp.	☐ Cold ☐ Warming up ☐ After Warming up ☐ Any temp. ☐ Other _____
	Engine Operation	☐ Starting ☐ Just after starting (min.) ☐ Idling ☐ Racing ☐ Driving ☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ A/C switch ON/OFF ☐ Other _____

Condition of check engine warning light (CHK ENG)		☐ Remains on ☐ Sometimes light up ☐ Does not light up
DTC Inspection	Normal mode (Precheck)	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )
	Check Mode	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )

054S4–04

PRE–CHECK



1. DIAGNOSIS SYSTEM

(a) Description

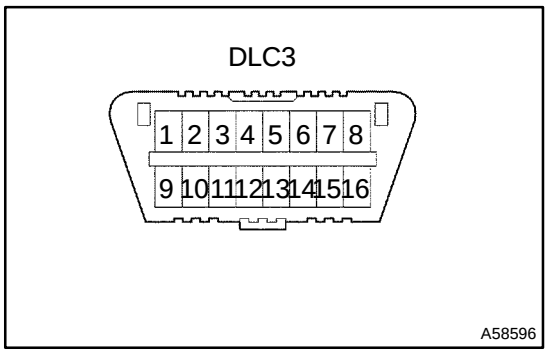
- When troubleshooting Multiplex OBD (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the vehicle to the hand–held tester, and read off various data output form the vehicle's ECM.
- The vehicle's on–board computer lights up the check engine warning light on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to the check engine warning light lighting up when a malfunction is detected, the applicable diagnostic trouble codes are recorded in the ECM memory. (See page 05–432)

If the malfunction has been repaired, the check engine warning light goes off automatically but the diagnostic trouble codes remain recorded in the ECM memory.

- To check the diagnostic trouble codes, connect the hand–held tester to Data Link Connector 3 (DLC3) on the vehicle or read the number of blinks of the check engine warning light when TC and CG terminals on the DLC3 are connected. The hand–held tester also enables you to erase the diagnostic trouble codes and activate the several actuators and check freeze frame data and various forms of engine data. (For operating instructions, see the hand–held tester instruction book.)
- The diagnosis system operates in normal mode during normal vehicle use. It also has a check (test) mode for technicians to simulate malfunction symptoms and troubleshoot. Some diagnostic trouble codes use 2 trip detection logic* to prevent erroneous detection and ensure thorough malfunction detection. By switching the ECM to check (test) mode using hand–held tester when troubleshooting, the technician can cause the check engine warning light to light up for a malfunction that is only detected once or momentarily. (hand–held tester only) (See page 05–432)

- *2 trip detection logic:
  When a logic malfunction is first detected, the malfunction is temporarily stored in the ECM memory. If the same malfunction is detected again during the second drive test, this second detection causes the check engine warning light to light up. The 2 trip repeats the same mode a 2nd time. (However, the ignition switch must be turned OFF between the 1st trip and 2nd trip).
- Freeze frame data:
  Freeze frame data records the engine condition when malfunction is detected. Because freeze frame data records the engine conditions (fuel system, calculator load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

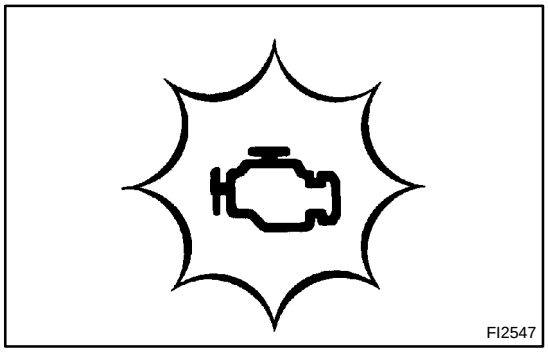
(b) Check the DLC3.
The vehicle's ECM uses ISO 14230 for communication. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 14230 format.



Terminal No.	Connection/Voltage or Resistance	Condition
7	Bus + Line/Pulse generation	During transmission
4	Chassis Ground - Body Ground/1 Ω or less	Always
16	Battery Positive - Body Ground/9 - 14 V	Always

HINT:
If your display shows UNABLE TO CONNECT TO VEHICLE when you have connected the cable of the hand-held tester to the DLC3, turned the ignition switch ON and operated the hand-held tester, there is a problem on the vehicle side or tool side.

- If communication is normal when the tool is connected to anther vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Department listed in the tool's instruction manual.


FI2547

2. Normal Mode: INSPECT DIAGNOSIS

(a) Check the check engine warning light.

(1) The check engine warning light comes on when the ignition switch is turned ON and the engine is not running.

HINT:
If the check engine warning light does not light up, troubleshoot the combination meter.

(2) When the engine is started, the check engine warning light should go off. If the lamp remains on, the diagnosis system has detected a malfunction or abnormality in the system.

(b) Check the DTC using hand-held tester.

NOTICE:
When the diagnosis system is switched from the normal mode to the check (test) mode, it erases all DTCs and freezed frame data recorded in the normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

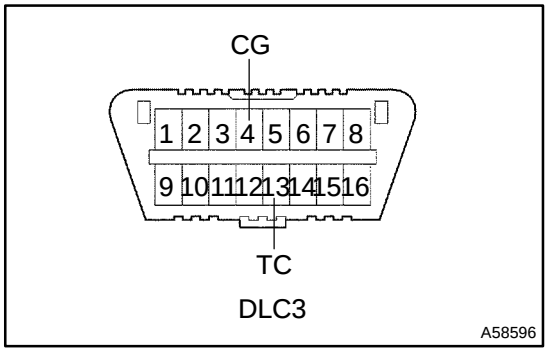
(1) Prepare the hand-held tester.

(2) Connect the hand-held tester to the DLC3.

(3) Turn the ignition switch ON and switch the hand-held tester main switch ON.

(4) Use the hand-held tester to check the DTCs and freezed frame data, note them down. (For operating instructions, see the hand-held tester's instruction book.)

(5) Confirm the details of the DTCs.



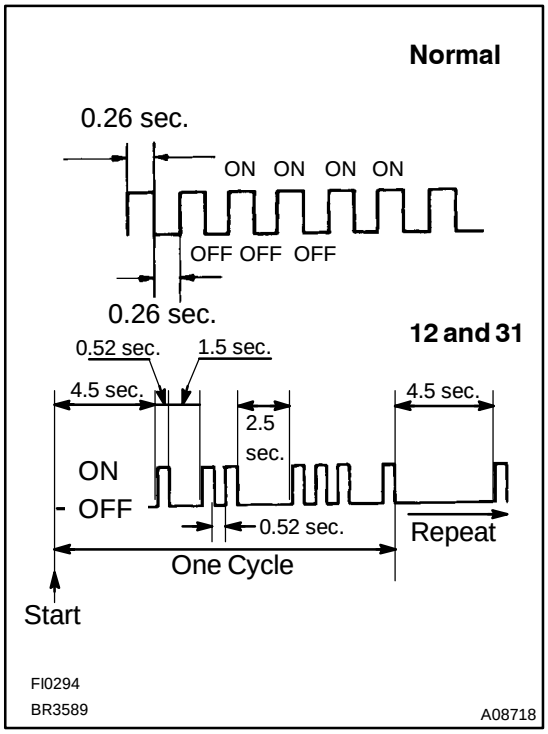
A58596

(c) Check the DTC not using hand-held tester.

(1) Turn the ignition switch ON.

(2) Using SST, connect between terminals 13 (TC) and 4 (CG) of the DLC3.

SST 09843-18040



(3) Read the DTC from the check engine warning light. As an example, the blinking patterns for codes; normal, 12 and 31 are as shown in the illustration.

HINT:
If a DTC is not output, check the diagnostic connector (DLC3) circuit (See page 05-543).

(4) Check the details of the malfunction using the DTC chart (See page 05-432).

(5) After completing the check, disconnect terminals 3 (TC) and 4 (CG) and turn off the display.

HINT:
In the event of 2 or more malfunction codes, the indication will begin from the smaller numbered code to the larger in order.

NOTICE:
When simulating symptoms without a hand-held tester to check the DTCs, use the normal mode. For code on the DTCs chart subject to "2 trip detection logic", turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again. When the problem has been simulated twice, the check engine warning light lights up and the DTCs are recorded in the ECM.

3. Check (Test) Mode: INSPECT DIAGNOSIS

HINT:
Hand-held tester only:
Compared to the normal mode, the check mode has an increased sensitivity to detect malfunctions.
Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

(a) Check the DTC.

(1) Initial conditions.
- Battery positive voltage 11 V or more
- Throttle valve fully closed
- Transmission in neutral position
- A/C switched OFF.

(2) Turn the ignition switch OFF.

(3) Prepare the hand-held tester.

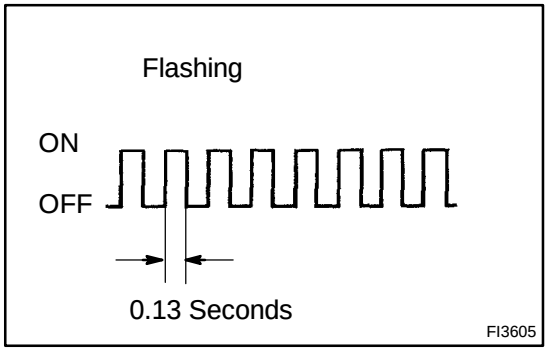
(4) Connect the hand-held tester to the DLC3.

(5) Turn the ignition switch ON and push the hand-held tester main switch ON.

(6) Switch the hand-held tester from the normal mode to the check (test) mode. (Check that the check engine warning light flashes.)

(7) Start the engine. (The check engine warning light goes out after the engine start.)

(8) Simulate the conditions of the malfunction described by the customer.



NOTICE:
Leave the ignition switch ON until you have checked the DTCs, etc.

(9) After simulating the malfunction conditions, use the hand-held tester diagnosis selector to check the DTCs and freezed frame data, etc.

HINT:
Take care not to turn the ignition switch OFF. Turning the ignition switch OFF switches the diagnosis system from the check (test) mode to the normal mode, so all diagnostic codes, etc. are erased.

(10) After checking the DTCs, inspect the applicable circuit.

(b) Clear the DTC.

The following actions will erase the DTCs and freezed frame data.

- Operating the hand-held tester to erase the codes. (See the hand-held tester's instruction book for operating instructions.)
- Disconnecting the battery terminals or ECD fuse.

NOTICE:
If the hand-held tester switches the ECM from the normal mode to the check (test) mode or vice-versa, or if the ignition switch is turned from ON to ACC or LOCK during the check (test) mode, the DTCs and freezed frame data will be erased.

4. FAIL-SAFE CHART

If any of the following codes is recorded, the ECM enters fail-safe mode.

DTC No.	Fail-Safe Operation	Fail-Safe Deactivation Conditions
12	Out put limit	Return to normal condition
15	Out put limit	+B OFF
19 (1)	Out put limit	+B OFF
22	Engine coolant temp. is fixed at 107°C (224.6°F)	Return to normal condition
24	Intake air temp. is fixed at 150°C (302°F)	Return to normal condition
32	Compensation value is set at fixed value	Return to normal condition
35	Turbo pressure is set at fixed value	Return to normal condition
39	Fuel temp. is fixed at 40°C (104.0°F)	Return to normal condition
42	Vehicle speed is fixed at 0 km/h (0 mph)	Vehicle speed > 0 km/h (0 mph)
49	Out put limit	+B OFF
78 (1)	Fuel cut	+B OFF
78 (3)	Out put limit	+B OFF
97	Fuel cut	IG OFF→ON or Starter ON
	Out put limit	

5. CHECK FOR INTERMITTENT PROBLEMS

HINT:

Hand-held tester only:

By putting the vehicle's ECM in the check (test) mode, 1 trip detection logic is possible instead of 2 trip detection logic and sensitivity to detect open circuits is increased. This makes it easier to detect intermittent problems.

(a) Clear the DTC (See step 3.)

(b) Set the check (test) mode (See step 3.)

(c) Perform a simulation test (See page 01-20)

(d) Check the connector and terminal (See page 01-30)

(e) Handle the connector (See page 01-30)

6. REFERENCE VALUE OF ECM DATA

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its values differ from those listed here. So do not decide whether a part is faulty or not solely according to the "Normal Condition" here.

HINT:

The ECM data can be monitored by hand-held tester.

(a) Connect the hand-held tester to the DLC3.

(b) Monitor ECM data by following the prompts on the tester screen. Please refer to the hand-held tester operator's manual for further detail.

Item	Inspection Condition	Reference Value
INJECTION VOLUME	Engine at idling*	3 - 10 mm^3/st
INJECTION VOLUME	Engine racing at 2,000 rpm*	3 - 10 mm^3/st
INJECTION VOLUME	Engine racing at 3,000 rpm*	5 - 12 mm^3/st
INJECTION TIMING	Engine at idling*	-1 - 5°CA
INJECTION TIMING	Engine racing at 2,000 rpm*	-3 - 1°CA
INJECTION TIMING	Engine racing at 3,000 rpm*	1 - 5°CA
ENGINE SPD	RPM kept stable (Comparison with tachometer)	No great changes
PIM	Engine at idling*	85 - 110 kPa
PIM	Engine racing at 2,000 rpm*	80 - 110 kPa
PIM	Engine racing at 3,000 rpm*	90 - 130 kPa
ACCEL POSITION	Accelerator pedal fully closed	0 %
ACCEL POSITION	Accelerator pedal fully opened	100 %
IDL SIG	Accelerator pedal full closed	ON
STARTER SIG	During cranking	ON
AFM	Air Flow Rate Through Air Flow Meter at idling	6 - 13 g/s
COMN RAIL PRESS	Engine at idling*	25 - 45 Mpa
M - INJ/PILOT ON	Engine at idling*	600 - 1200 μs
M - INJ/PILOT OFF	Engine at idling*	0 μs
PILOT - INJ	Engine at idling*	400 - 700 μs
PUMP VCM ANGLE	Engine at idling*	70 - 90°CA

HINT:

*: All accessories and A/C are switched OFF.

BASIC INSPECTION

When the malfunction code is not confirmed in the DTC check, troubleshooting should be carried out in order for all possible circuits to be considered as the cases of the problems.
In many cases, by carrying out the basic engine check shown in the following flow chart, the location causing the problem can be found quickly and efficiently. Therefore, use of this check is essential in engine trouble-shooting.

1	CHECK BATTERY VOLTAGE

NOTICE:
Carry out this check under the engine stoppage condition.

	OK	NG
Voltage	11 V or more	Less than 11 V

NG → **CHARGE OR REPLACE BATTERY**

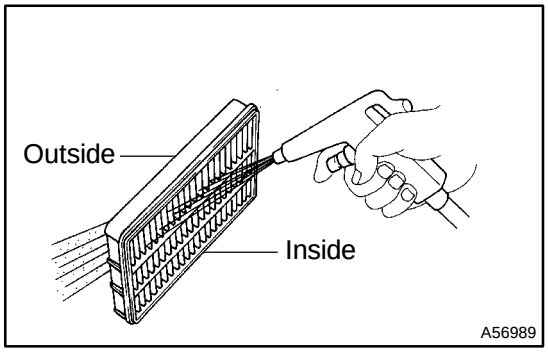
OK

2	CHECK IF ENGINE IS CRANKED

NG → **PROCEED TO PROBLEM TABLE**
ON PAGE 05-438

OK

3	CHECK AIR FILTER



(a) Visually check that the air filter is not excessively dirty or oily.

HINT:
Visually check that the air filter is not

NOTICE:
If necessary, clean the filter with compressed air. First blow from inside thoroughly, the blow from outside of filter.

NG → **REPAIR OR REPLACE**

OK

4	CHECK FUEL QUALITY

(a) Check that use only diesel fuel.
(b) Check that the fuel does not contain any impurity.

NG → **REPLACE FUEL**

OK

5	CHECK ENGINE OIL (See page 17-10)

NG → ADD OR REPLACE

OK

6	CHECK COOLANT (See page 16-33)

NG → REPLACE COOLANT

OK

7	CHECK DIAGNOSTIC CONNECTOR (DLC3) CIRCUIT (See page 05-543)

NG → REPAIR OR REPLACE

OK

8	CHECK PCV SYSTEM (See page 12-13)

NG → REPAIR OR REPLACE

OK

PROCEED TO PROBLEM SYMPTOMS TABLE ON PAGE 05-438

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DIAGNOSTIC TROUBLE CODE CHART

HINT:

Parameters listed in the chart may not be exactly the same as your readings due to the type of instrument or other factors.

If a malfunction code is displayed during the DTC check in the check (test) mode, check the circuit for the codes listed in the table below. For details of each code, turn to the page referred to under the "See page " for the respective "DTC No." in the DTC chart.

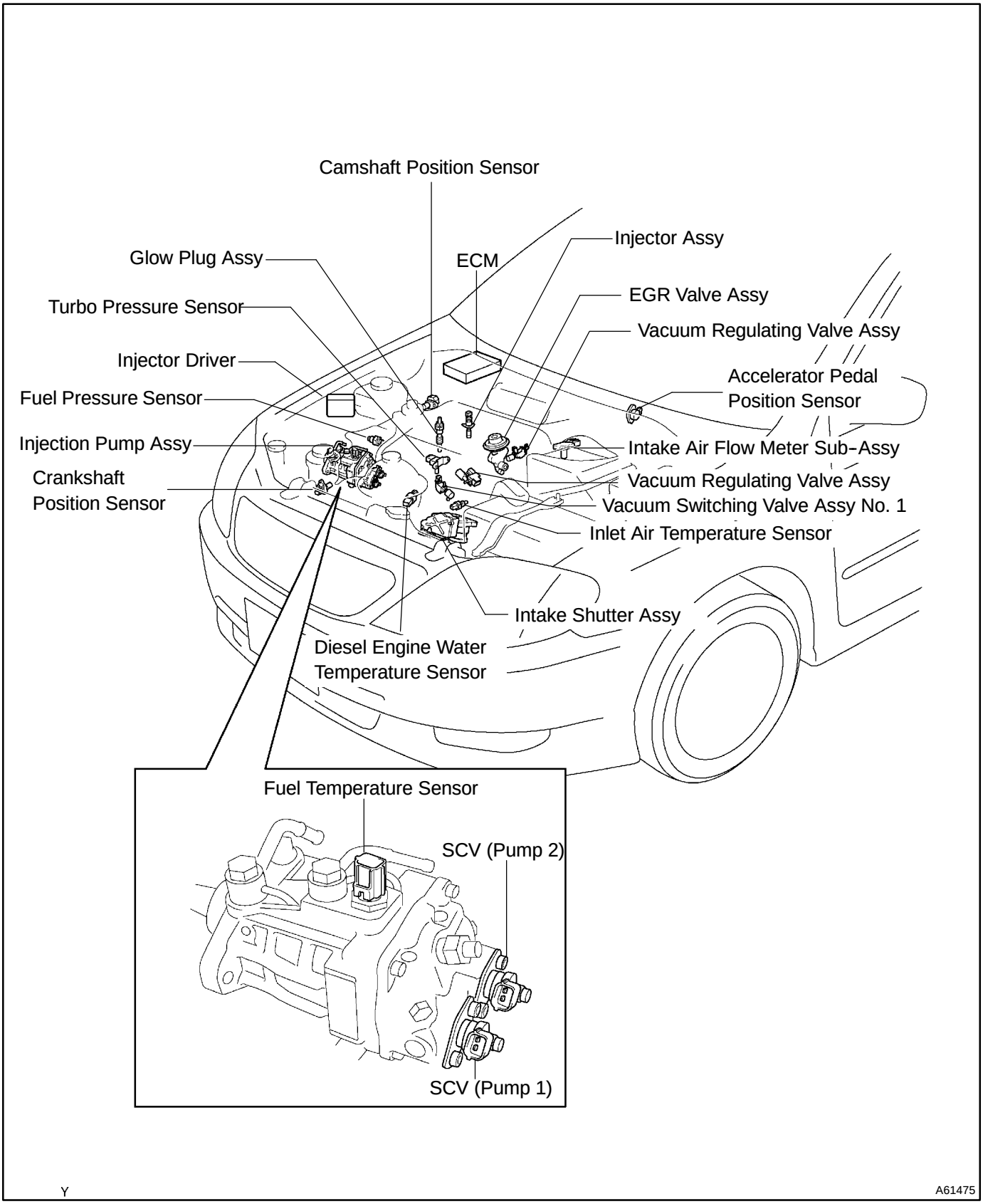
DTC No. (See Page)	Detection Item	Trouble Area	* CHE ENG	Memory
12 (05-441)	Engine Speed Sensor Circuit Malfunction (TDC or G1 Circuit)	S Open or short in camshaft position sensor circuit S Camshaft position sensor S Camshaft timing pulley S ECM	f	f
13 (05-444)	Engine Speed Sensor Circuit Malfunction (NE Circuit)	S Open or short in crankshaft position sensor circuit S Crankshaft Position sensor S Crankshaft timing pulley S ECM	f	f
15 (05-446)	Throttle control Motor Circuit Malfunction	S Open or short throttle control motor circuit S Throttle control motor S Throttle valve S ECM	f	f
17 (05-449)	IC Circuit malfunction	S ECM	f	f
19 (1) (05-450)	Accelerator Pedal Position Sensor Circuit Malfunction (Open/ Short)	S Open or short in accelerator pedal position sensor circuit S Accelerator pedal position sensor S ECM	f	f
19 (2) (05-458)	Accelerator Pedal Position Sensor Circuit Malfunction (Range)	S Open or short in accelerator pedal position sensor circuit S Accelerator pedal position sensor S ECM	f	f
22 (05-461)	Water Temp. sensor Circuit Malfunction	S Open or short in water temp. sensor circuit S Water temp. sensor S ECM	f	f
24 (1) (05-466)	Intake Air Temp. Sensor circuit Malfunction	S Open or short in intake air temp. sensor circuit S Intake air temp. sensor S ECM	-	f
24 (2) (05-471)	Atmospheric Temp. Sensor Circuit Malfunction	S Open or short in atmospheric temp. sensor circuit S Atmospheric air temp. sensor (built into air flow meter) S ECM	-	f
31 (05-475)	Air Flow Circuit Malfunction	S Open or short in air flow meter circuit S Air flow meter S ECM	f	f
32 (05-482)	Injector Correction Resistance Malfunction	S Open or short in injector correction resistance circuit S Injector correction resistance S ECM	-	f
35 (05-483)	Turbo Pressure Sensor Circuit Malfunction	S Open or short in turbo pressure sensor circuit S Turbo pressure sensor S Open or short in VSV turbo pressure sensor circuit S VSV for turbo pressure sensor S Vacuum hose disconnected or blocked S ECM	f	f
39 (05-492)	Fuel Temp. Sensor Circuit Malfunction	S Open or short in fuel temp. sensor circuit S Fuel pressure sensor S ECM	f	f
42 (05-497)	Vehicle Speed Sensor Signal Circuit Malfunction	S Open or short in vehicle speed sensor circuit S Vehicle speed sensor S Combination meter S ECM	-	f

49 (05-500)	Pressure Sensor Circuit Malfunction	S Open or short in fuel pressure sensor circuit for common rail S Fuel pressure sensor for common rail S ECM	f	f
51 (05-502)	Stop Light Switch Circuit Malfunction	S Open or short in stop light switch signal circuit S Stop light switch S ECM	-	f
78 (1) (05-506)	Fuel Pump Circuit Malfunction (Fuel Leakage)	S Open or short in EDU circuit S EDU S Open or short in injector circuit S Injector S Open or short in common rail pressure sensor circuit S Common rail pressure sensor S Fuel line between supply pump and common rail S Fuel line between common rail and injector S Pressure Limiter S ECM	f	f
78 (2) (05-511)	Fuel Pump. Circuit Malfunction (Open Circuit)	S Open or short in SCV circuit S SCV S Supply pump S ECM	f	f
78 (3) (05-511)	Fuel Pump Circuit Malfunction (Over Force Feed)	S Open or short in SCV circuit S SCV S Supply pump S ECM	f	f
97 (05-516)	EDU Circuit Malfunction	S Open or short in EDU circuit S EDU S Open or short in SCV circuit S SCV S Injector S ECM	f	f
99 *	Engine Immobilizer System Malfunction	S Open or short in engine immobilizer system circuit S Transponder key amplifier S Transponder key computer S Transponder key coil S ECM	-	f

1: Check engine warning light does not light up.
f Check engine warning light lights up.
2: See Page 05-1374 Engine Immobilizer Section

054S6-04

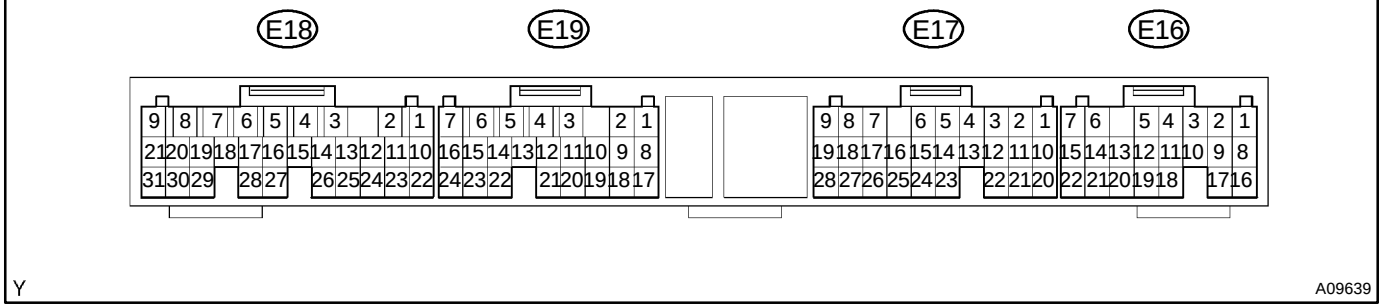
LOCATION



054T8-04

TERMINALS OF ECM

ECM Terminals



Symbols (Terminal No.)	Wiring Color	Condition	STD Voltage (V)
BATT (E16-2) - E1 (E18-22)	R-W - BR	Always	9 - 14
+B (E16-1) - E1 (E18-22)	LG(B) - BR *1 B - BR *2	IG switch ON	9 - 14
VC (E19-21) - E2 (E19-20)	Y - BR	IG switch ON	4.5 - 5.5
VCC (E17-8) - E2C (E17-27)	B - R *3 B - Y *4	IG switch ON	4.5 - 5.5
VA (E17-19) - E2C (E17-27)	G - R *3 G - Y *4	Accelerator pedal fully closed	0.6 - 1.3
VA (E17-19) - E2C (E17-27)	G - R *3 G - Y *4	Accelerator pedal fully opened	2.8 - 4.5
VAS (E17-28) - E2C (E17-27)	W - R *3 W - Y *4	Accelerator pedal fully closed	1.4 - 2.1
VAS (E17-28) - E2C (E17-27)	W - R *3 W - Y *4	Accelerator pedal fully opened	3.6 - 5.0
PCR (E19-2) - E2 (E19-20)	G-W - BR	IG switch ON	1.0 - 4.0
THAF (E19-13) - E2 (E19-20)	Y-R - BR *5 L - O - BR *6	Atmospheric temp	0.5 - 3.8
PIM (E19-16) - E2 (E19-20)	LG-R - BR	Apply vacuum 40 kPa (300 mmHg, 11.8 in.Hg)	1.0 - 1.8
PIM (E19-16) - E2 (E19-20)	LG-R - BR	Apply vacuum 135 kPa (1,000 mmHg, 39.4 in.Hg)	2.3 - 3.2
THA (E19-22) - E2 (E19-20)	L - BR *5 Y - B - BR *6	Idling, air intake temp. 0°C (32°F) to 60°C (140°F)	0.2 - 3.8
THW (E19-14) - E2 (E19-20)	W - BR	Idling, engine coolant temp. 60°C (140°F) to 120°C (248°F)	0.1 - 1.5
THF (E19-24) - E2 (E19-20)	Y-R - BR	IG switch ON (at engine cold)	0.5 - 3.8
VG (E19-19) - EVG (E19-11)	G - L-W *5 G - L *6	Idling, A/C switch OFF	0.5 - 3.0
IGSW (E16-9) - E1 (E18-22)	SB(B-O) - BR	IG switch ON	9 - 14
STA (E17-6) - E1 (E18-22)	SB(B-W) - BR *3 SB(B-R) - BR *4	Cranking	6.0 or more
NE+ (E18-17) - NE- (E18-28)	B - W	Idling	Pulse generation (See page 05-444)
G1+ (E18-16) - G- (E18-27)	B - W *5 R - G *6	Idling	Pulse generation (See page 05-441)
SP1 (E17-22) - E1 (E18-22)	W(V-W) - BR	IG switch ON, Rotate driving wheel slowly	Pulse generation (See page 05-497)
PA (E19-17) - E01 (E18-21)	B-R - W-B	VSV for atmospheric pressure leaning OFF	9 - 14
PA (E19-17) - E01 (E18-21)	B-R - W-B	VSV for atmospheric pressure leaning ON	0 - 3
STP (E17-23) - E2 (E19 - 20)	SB(G-W) - BR	IG switch ON, Brake pedal depressed	7.5 - 14

STP (E17-23) - E2 (E19 - 20)	SB(G-W) - BR	IG switch ON, Brake pedal released	Below 1.5
ST1- (E17-26) - E2 (E19 - 20)	G-R - BR	IG switch ON, Brake pedal depressed	Below 1.5
ST1- (E17-26) - E2 (E19 - 20)	G-R - BR	IG switch ON, Brake pedal released	7.5 - 14
#1 (E18-4) - E01 (E18-21)	L - W-B	Idling	Pulse generation (See page 05-516)
#2 (E18-14) - E01 (E18-21)	L-W - W-B *5 L-O - W-B *6	Idling	Pulse generation (See page 05-516)
#3 (E18-3) - E01 (E18-21)	L-R - W-B	Idling	Pulse generation (See page 05-516)
#4 (E18-15) - E01 (E18-21)	L-B - W-B	Idling	Pulse generation (See page 05-516)
INJF (E18-18) - E01 (E18-21)	R-Y - W-B *5 Y-G - W-B *6	Idling	Pulse generation (See page 05-516)
MREL (E16-7) - E01 (E18-21)	B-W - W-B	IG switch ON	9 - 14
AC1 (E17-24) - E1 (E18-22)	Y-B - BR *7 Y-R - BR *8	A/C switch ON (at idling)	0 - 1.5
AC1 (E17-24) - E1 (E18-22)	Y-B - BR *7 Y-R - BR *8	A/C switch OFF	9 - 14
TACH (E17-10) - E1 (E18-22)	W(B) - BR	Idling	9 - 14
SREL (E16-16) - E01 (E18-21)	G-R - W-B	IG switch ON	9 - 14
W (E16-12) - E01 (E18-21)	W(R-Y) - W-B	Check engine warning light lights up	0 - 3
W (E16-12) - E01 (E18-21)	W(R-Y) - W-B	Except check engine warning light lights up	9 - 14
GIND (E16-3) - E01 (E18-21)	W(R) - W-B	Glow indicator light lights up	0 - 3
GIND (E16-3) - E01 (E18-21)	W(R) - W-B	Except glow indicator light lights up	9 - 14
ACT (E17-13) - E1 (E18-22)	R-L - BR	IG switch ON	9 - 14
ACT (E17-13) - E1 (E18-22)	R-L - BR	At A/C cut controlled (Driving below 30 km/h, accelerator pedal fully opened for 5 sec.)	0 - 3
THWO (E16-6) - E1 (E18-22)	W(Y-R) - BR	IG switch ON	Pulse generation (See page 05-538)
LU+A (E18-20) - E01 (E18-21)	W-R - W-B	IG switch ON	Pulse generation (See page 05-446)
LU-A (E18-30) - E01 (E18-21)	W-L - W-B	IG switch ON	Pulse generation (See page 05-446)
LU+B (E18-19) - E01 (E18-21)	L-R - W-B *5 R-W - W-B *6	IG switch ON	Pulse generation (See page 05-446)
LU-B (E18-29) - E01 (E18-21)	L-Y - W-B	IG switch ON	Pulse generation (See page 05-446)
TC (E16-18) - E1 (E18-22)	W(P-B) - BR	IG switch ON	9 - 14
SIL (E16-19) - E1 (E18-22)	W(L-R) - BR	Connect hand-held tester to DLC3	Pulse generation
IMI (E16-14) - E1 (E18-22)	LG-R - BR	Idling	Pulse generation
IMO (E16-21) - E1 (E18-22)	LG-B - BR	A few sec. after engine staring	Pulse generation
RINJ1 (E18 - 13) - E1 (E18-22)	R-L - BR *5 LG - BR *6	Idling	0.5 - 4.5
RINJ2 (E18 - 12) - E1 (E18-22)	L-R - BR *5 R-B - BR *6	Idling	0.5 - 4.5
RINJ3 (E18 - 11) - E1 (E18-22)	R - BR *5 P - BR *6	Idling	0.5 - 4.5

RINJ4 (E18 - 10) - E1 (E18-22)	L - BR	Idling	0.5 - 4.5
PCV1 (E18-9) - E01 (E18-21)	G-R - W-B	Idling	Pulse generation (See page 05-506)
PCV2 (E18-8) - E01 (E18-21)	Y-R - W-B	Idling	Pulse generation (See page 05-506)
MHSW (E17-25) - E1 (E18-22)	B - BR	Heater idle up switch ON	2.5 or less
MHSW (E17-25) - E1 (E18-22)	B - BR	Heater idle up switch OFF	10.5 or less
EGR (E18-5) - E01 (E18-21)	L-W - W-B	IG switch ON EGR ON	9 - 14 Pulse generation (See page 05-528)
EGRC (E18-1) - E01 (E18-21)	L-B - W-B	IG switch ON Maintain engine speed at 1500 r/min after warming up	0 - 3 9 - 14

*1: LHD
*2: RHD
*3: LHD TMC Made
*4: Except LHD TMC Made
*5: TMC Made
*6: TMUK Made
*7: TMC Made Automatic A/C
*8: Except TMC Made Automatic A/C

054S7-04

PROBLEM SYMPTOMS TABLE

When the malfunction code is not confirmed the DTC check and the problem still can not be confirmed in the basic inspection, then proceed to this step and perform troubleshooting according to the numbered order given in the table below.

Symptom	Suspect Area	See page
Does not crank (Difficult to start)	3. Starter	19-21
	4. Starter relay	19-21
	5. Water temp. sensor	10-15
Cold engine (Difficult to start)	1. STA signal circuit	05-549
	2. Injector	11-60
	3. Fuel filter	11-85
	4. Compression	10-15
	5. EC	10-15
	6. Supply pump	11-74
	7. Fuel pressure sensor	10-15
	8. Diesel throttle	10-15
	9. Glow plug system	10-15
Hot engine (Difficult to start)	1. STA signal circuit	05-549
	2. Injector	11-60
	3. Fuel filter	11-85
	4. Compression	10-15
	5. EC	10-15
	6. Supply pump	11-74
	7. Fuel pressure sensor	10-15
	8. Diesel throttle	10-15
Soon after starting (Engine stall)	1. Fuel filter	11-85
	2. Injector	11-60
	3. EC power source circuit	05-522
	4. EC	10-15
	5. Supply pump	11-74
	6. Fuel pressure sensor	10-15
	7. Diesel throttle	10-15
Others (Engine stall)	1. EC power source circuit	05-522
	2. Injector	11-60
	3. EC	10-15
	4. Supply pump	11-74
	5. Fuel pressure sensor	10-15
	6. Diesel throttle	10-15
Incorrect first idle (Poor idling)	1. Fuel filter	11-85
	2. Injector	11-60
	3. EC	10-15
	4. Supply pump	11-74
	5. Fuel pressure sensor	10-15
High engine idle speed (Poor idling)	1. A/C signal circuit	05-535
	2. Injector	11-60
	3. STA signal circuit	05-549
	4. EC	10-15
	5. Supply pump	11-74
	6. Fuel pressure sensor	10-15

Lower engine idle speed (Poor idling)	1. A/C signal circuit 2. Injector 3. EGR control circuit 4. Compression 5. Valve clearance 6. Fuel line (Air beed) 7. EC 8. Supply pump 9. Fuel pressure sensor 10. Diesel throttle	05-535 11-60 05-528 10-15 14-173 — 10-15 11-74 10-15 10-15
Rough idling (Poor idling)	1. Injector 2. Fuel line (Air beed) 3. EGR control circuit 4. Compression 5. Valve clearance 6. EC 7. Supply pump 8. Fuel pressure sensor 9. Diesel throttle	11-60 — 05-528 10-15 14-173 10-15 11-74 10-15 10-15
Hunting at hot engine (Poor idling)	1. Injector 2. EC power source circuit 3. Compression 4. Fuel line (Air beed) 5. Valve clearance 6. EC 7. Supply pump 8. Fuel pressure sensor 9. Diesel throttle	11-60 05-522 10-15 — 14-173 10-15 11-74 10-15 10-15
Hunting at cold engine (Poor idling)	1. Injector 2. EC power source circuit 3. Compression 4. Fuel line (Air beed) 5. Valve clearance 6. EC 7. Supply pump 8. Fuel pressure sensor 9. Diesel throttle	11-60 05-522 10-15 — 14-173 10-15 11-74 10-15 10-15
Hesitation/ Poor acceleration (Poor driveability)	1. Injector 2. Fuel filter 3. EGR control circuit 4. Compression 5. EC 6. Supply pump 7. Fuel pressure sensor 8. Diesel throttle	11-60 11-85 05-528 10-15 10-15 11-74 10-15 10-15
Knocking (Poor driveability)	1. Injector 2. EGR control circuit 3. EC 4. Supply pump 5. Fuel pressure sensor	11-60 05-528 10-15 11-74 10-15
Black smoke (Poor driveability)	1. Injector 2. EGR control circuit 3. EC 4. Supply pump 5. Fuel pressure sensor 6. Diesel throttle	11-60 05-528 10-15 11-74 10-15 10-15

White smoke (Poor driveability)	1. EGR control circuit 2. Injector 3. Fuel filter 4. EC 5. Supply pump 6. Fuel pressure sensor 7. Diesel throttle	05-528 11-60 11-85 10-15 11-74 10-15 10-15
Surging/ Hunting (Poor driveability)	1. Injector 2. EC 3. Supply pump 4. Fuel pressure sensor	11-60 10-15 11-74 10-15

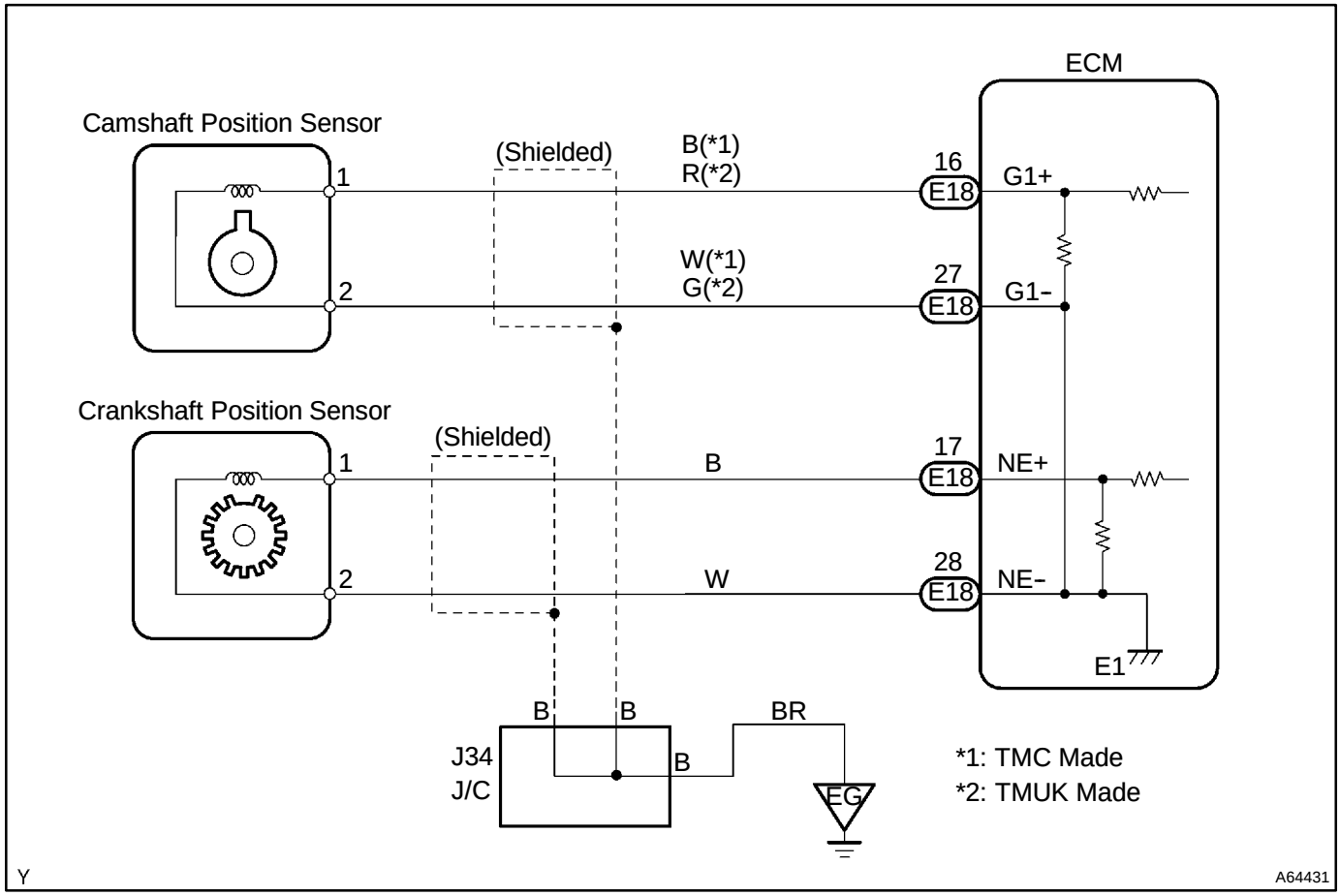
DTC	12	ENGINE SPEED SENSOR CIRCUIT MALFUNCTION(TDC OR G1 CIRCUIT)

CIRCUIT DESCRIPTION

Camshaft position sensor (G signal) consists of a magnet, iron core and pickup coil.
The G signal plate has one tooth on its outer circumference and is installed the camshaft timing pulley. When the camshafts rotate, the protrusion on the signal plate and the air gap on the pickup coil change, causing fluctuations in the magnetic field and generating an electromotive force in the pickup coil.
The NE signal plate has 34 teeth and is mounted on the crankshaft timing pulley. The NE signal sensor generates 34 signals at every engine revolution. The ECM detects the standard crankshaft angle based on the G signal and the actual crankshaft angle and the engine speed by the NE signal.

DTC No.	DTC Detection Condition	Trouble Area
12	No camshaft position sensor signal to ECM during cranking	$ Open or short in camshaft position sensor circuit $ Camshaft position sensor $ Camshaft timing pulley $ ECM
	No camshaft position sensor signal to ECM with engine speed 650 rpm or more	

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- Perform troubleshooting of DTC 12 first. If no trouble is found, troubleshoot the following mechanical system.
- Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

1	INSPECT CRANK POSITION SENSOR

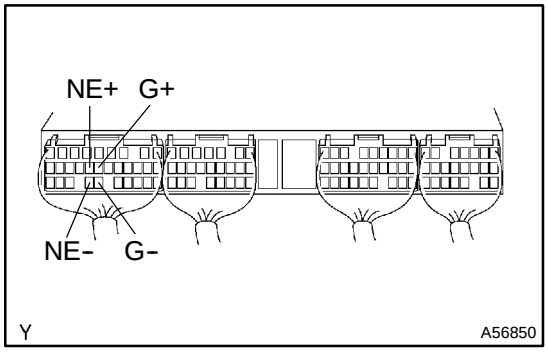
(a) Check the camshaft position sensor for resistance. (See page 10-15)

Resistance:
1630 - 2740 Ω (COLD)
2065 - 3225 Ω (HOT)

HINT:
"Cold" and "Hot" above express the temperature of the part itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C (122_F) to 100_C (212_F)

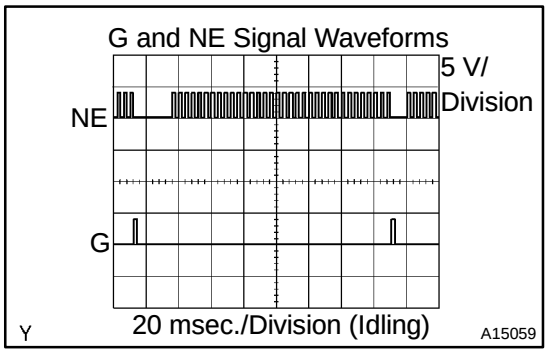
(b) Reference

(1) Check the output wave form.



Item	Contents
Terminal	G+ ⇔ G- NE+ ⇔ NE-
Equipment set	5 V/DIV, 20 ms/DIV
Condition	During idling

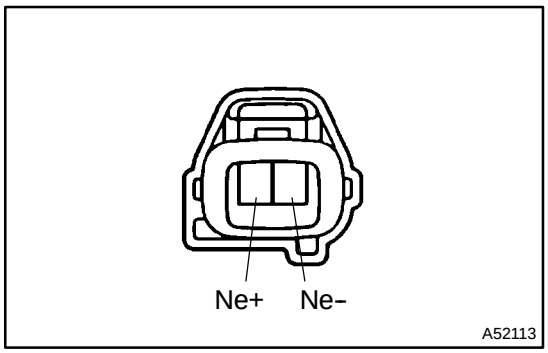
HINT:
The correct waveforms are as shown.

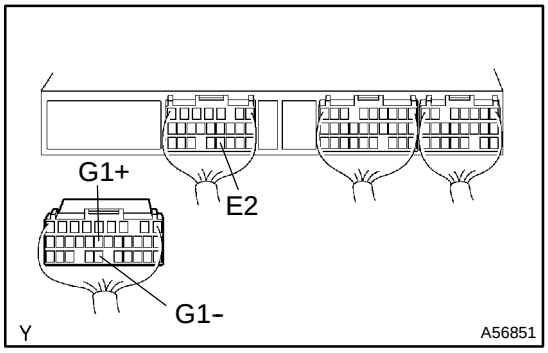


NG → **REPLACE CRANK POSITION SENSOR**

OK

2 CHECK HARNESS AND CONNECTOR(ECM-CAMSHAFT POSITION SENSOR)





(a) Disconnect the camshaft position sensor connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals G1+ of the ECM E18 connector and Ne+ of the camshaft position sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals G1- of the ECM E18 connector and Ne- of the camshaft position sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals G1+ and G1- of the ECM E18 connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals G1+, G1- of the ECM E18 connector and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 INSPECT SENSOR INSTALLATION

(a) Check the camshaft position sensor installation.

NG → **TIGHTEN SENSOR**

OK

4 INSPECT CAMSHAFT TIMING PULLEY(SIGNAL PLATE TEETH)

(a) Remove the timing belt No. 2 cover. (See Page 14-213)
(b) Check the camshaft timing pulley teeth.

NG → **REPLACE CAMSHAFT TIMING PULLEY**

OK

CHECK AND REPLACE ECM

DTC	13	ENGINE SPEED SENSOR CIRCUIT MALFUNCTION(NE CIRCUIT)

CIRCUIT DESCRIPTION

Crankshaft position sensor (NE signal) consists of a magnet, iron core and pickup coil.
The NE signal plate has 34 teeth and is installed the crankshaft timing pulley. The NE signal sensor generates 34 signals of every engine revolution. The ECM detects the standard crankshaft angle based on the G signal, and the actual crankshaft angle and the engine speed by the NE signal.

DTC No.	DTC Detection Condition	Trouble Area
13	No crankshaft position sensor signal to ECM for 0.5 sec. or more at 650 rpm or more	S Open or short in crankshaft position sensor circuit S Crankshaft position sensor S Crankshaft timing pulley S ECM
	No crankshaft position sensor signal to ECM for 2.0 sec. or more during cranking	

WIRING DIAGRAM

Refer to DTC12 on page 05-441.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

1	INSPECT CRANK POSITION SENSOR

(a) Check the crankshaft position sensor for resistance.
Resistance:
1,630 - 2,740 Ω (COLD)
2,065 - 3,225 Ω (HOT)

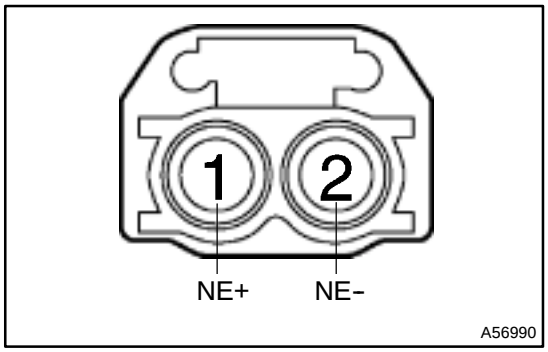
HINT:
"Cold" and "Hot" above express the temperature of the part itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C (122_F) to 100_C (212_F).

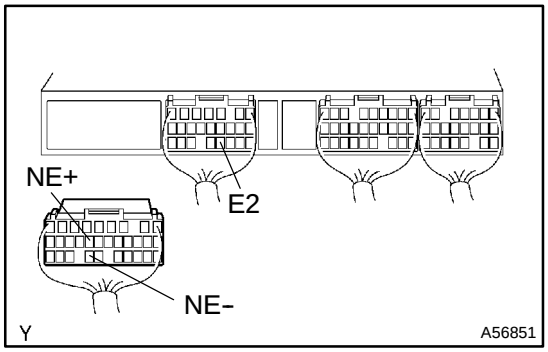
(b) Reference
(1) Refer to DTC12 on page 05-441

NG → **REPLACE CRANK POSITION SENSOR**

OK

2	CHECK HARNESS AND CONNECTOR(ECM-CRANKSHAFT POSITION SENSOR)





(a) Disconnect the crankshaft position sensor connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals NE+ of the ECM E18 connector and NE+ of the crankshaft position sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals NE- of the ECM E18 connector and NE- of the crankshaft position sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals NE+ and NE- of the ECM E18 connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals NE+, NE- of the ECM E18 connector and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	INSPECT SENSOR INSTALLATION

(a) Check the crankshaft position sensor installation.

NG → **TIGHTEN SENSOR**

OK

4	INSPECT CRANKSHAFT TIMING PULLEY(SIGNAL PLATE TEETH)

(a) Remove the timing belt No. 1 cover. (See page 14-213)
(b) Check the teeth of the signal plate.

NG → **REPLACE CRANKSHAFT TIMING PULLEY**

OK

CHECK AND REPLACE ECM

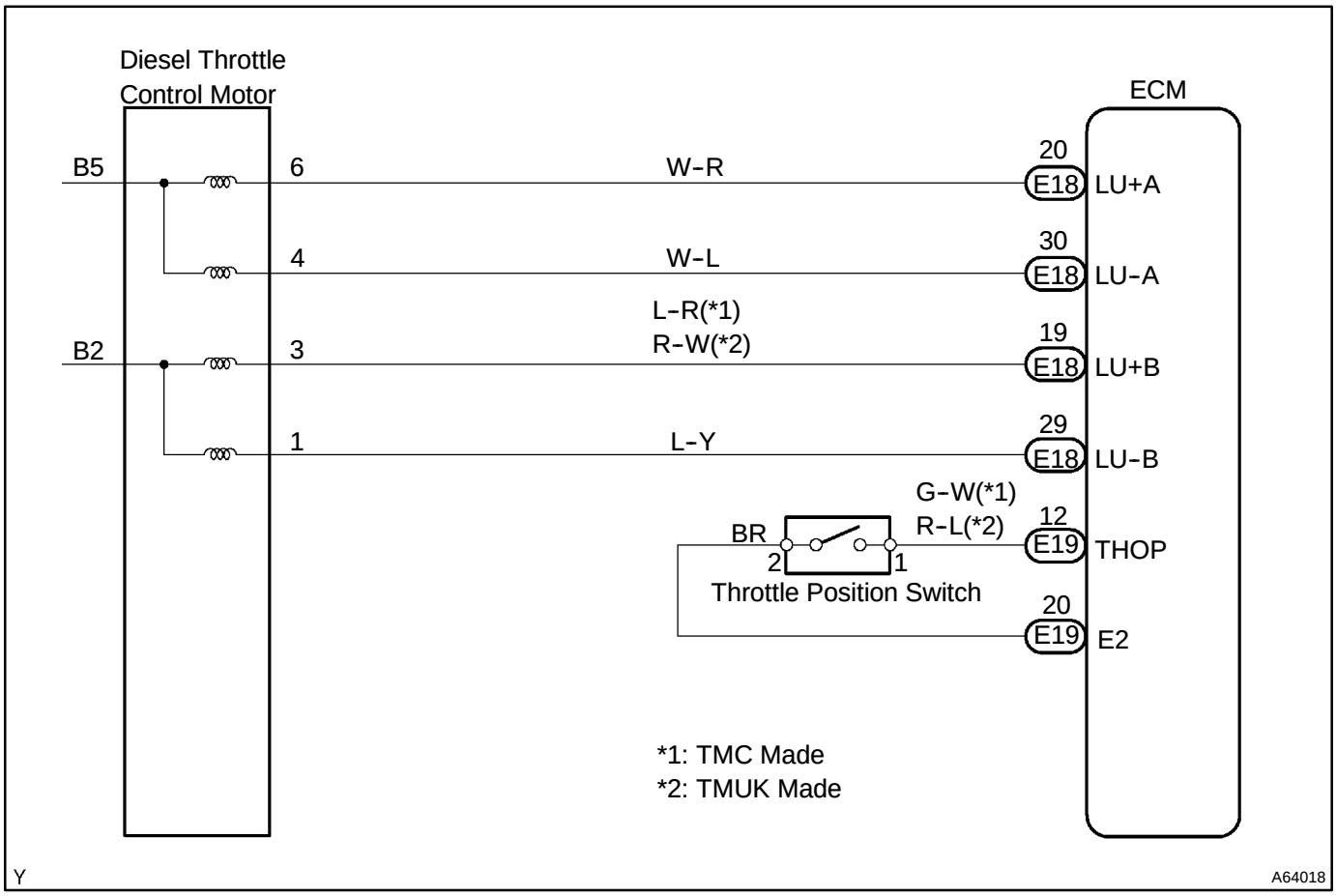
DTC	15	THROTTLE CONTROL MOTOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The fully opening of the throttle valve is detected by the throttle fully open position switch which is mounted on the throttle body.
If this DTC is stored, the ECM shuts down the power for the throttle control motor.

DTC No.	DTC Detection Condition	Trouble Area
15	Open or short in throttle control motor circuit	S Open or short in throttle control motor circuit S Throttle control motor S Throttle valve S Throttle drive gear S Diesel throttle body S ECM
	Open or short in throttle full switch circuit	

WIRING DIAGRAM

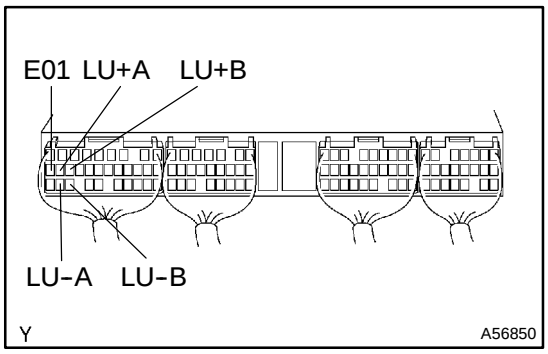


INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester, as freeze frame records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

1	INSPECT ECM(THROTTLE CONTOROL MOTOR CIRCUIT)

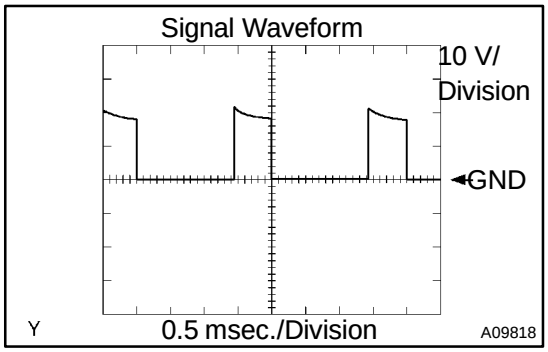


(a) Check the output waveform.

Item	Contents
Terminal	LU+A, LU-A, LU+B ,LU-B ⇔ E01
Equipment set	10 V/DIV, 0.5 ms/DIV
Condition	During engine racing

HINT:

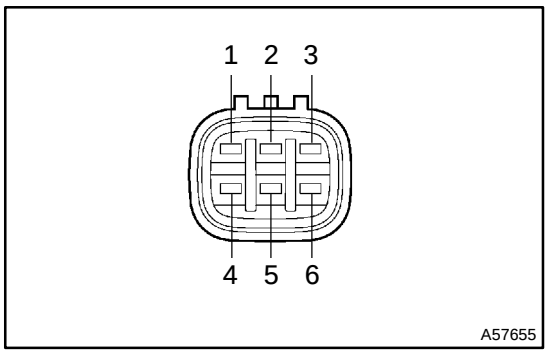
The correct waveforms are as shown.



OK → CHECK AND REPLACE ECM

NG

2	INSPECT INTAKE SHUTTER ASSY(CHECK RESISTANCE OF THROTTLE CONTOROL MOTOR)



(a) Disconnect the throttle control motor connector.

(b) Measure the resistance between terminals 1, 3 and 2 of the throttle control motor.

Resistance:

18 - 22 Ω at 20°C (68°F)

(c) Measure the resistance between terminals 4, 6 and 5 of the throttle control motor.

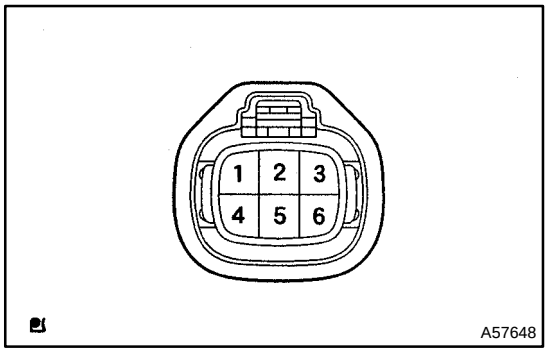
Resistance:

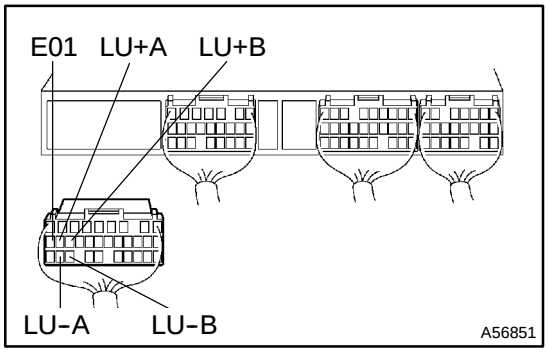
18 - 22 Ω at 20°C (68°F)

NG → REPLACE INTAKE SHUTTER ASSY

OK

3	CHECK HARNESS AND CONNECTOR(THROTTLE CONTOROL MOTOR-ECM)





(a) Disconnect the throttle control motor connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals LU+A of the ECM E18 connector and 6 of the throttle control motor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals LU-A of the ECM E18 connector and 4 of the throttle control motor harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals LU+B of the ECM E18 connector and 3 of the throttle control motor harness side connector.
Resistance: 1 Ω or less
(f) Check for open between the terminals LU-B of the ECM E18 connector and 1 of the throttle control motor harness side connector.
Resistance: 1 Ω or less
(g) Check for short between the terminals LU+A, LU-A, LU+B, LU-B and E01 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

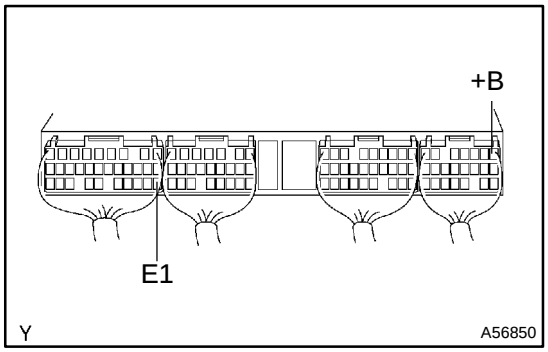
OK

CHECK AND REPLACE ECM

DTC	17	IC CIRCUIT MALFUNCTION

INSPECTION PROCEDURE

1	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals +B and E1 of the ECM connector.
Voltage: 9 - 14 V

OK → **CHECK AND REPLACE ECM**

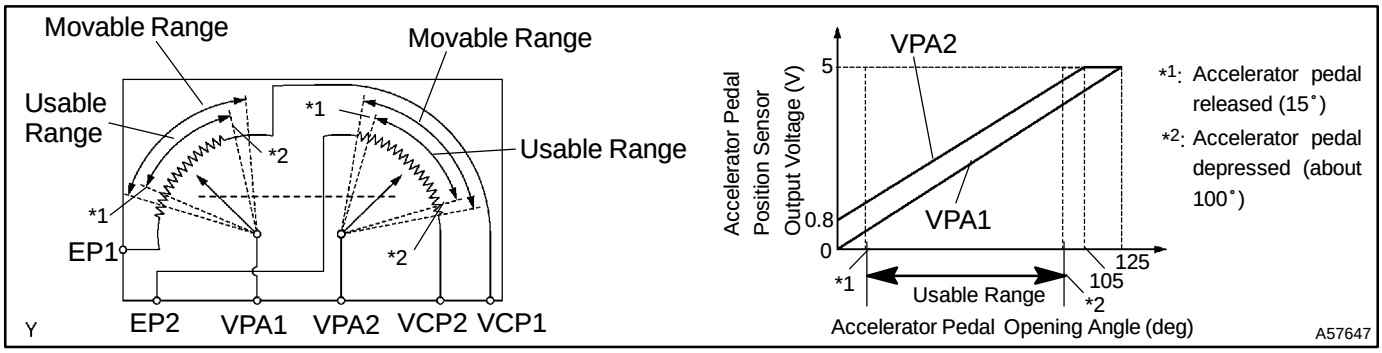
NG

CHECK FOR ECM POWER SOURCE CIRCUIT **(See page 05-522)**

DTC	19(1)	ACCELERATOR PEDAL POSITION SENSOR CIRCUIT MALFUNCTION(OPEN/SHORT)

CIRCUIT DESCRIPTION

Accelerator pedal position sensor is mounted on the accelerator pedal bracket and it have the 2 sensors to detects the accelerator position and a malfunction of the accelerator position's own.
The accelerator pedal position sensor is the voltage applied to the terminals VA and VAS of the ECM changes between 0 V and 5 V in proportion to the opening angle of the accelerator pedal.
The ECM judges the current opening angle of the accelerator pedal from these signals input from terminals VA and VAS and the ECM controls the throttle motor based on these signals.
If this DTC is stored, the ECM shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

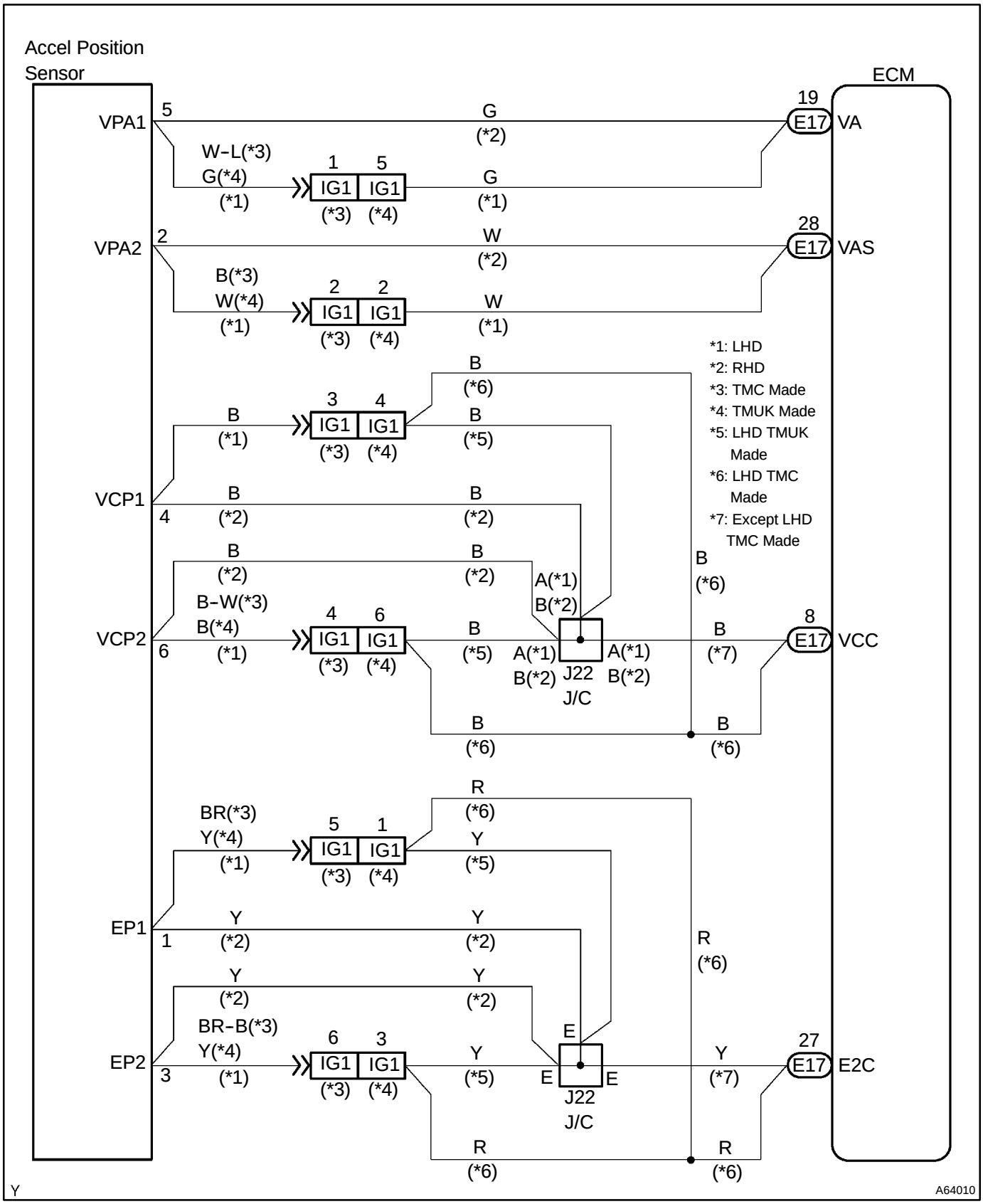


DTC No.	DTC Detecting Condition	Trouble Area
19(1)	Condition (a), (b), (c) or (d) continues for 2.0 seconds: (a) VPA1 ≦ 0.2 V and VPA2 ≦ 0.5 V (b) VPA1 ≧ 4.8 V (c) When 3.45 V ≧ VPA1 ≧ 0.2 V, and VPA2 ≧ 4.8 V (d) VPA1-VPA2 ≦ 0.02 V	S Open or short in accelerator pedal position sensor circuit S Accelerator pedal position sensor S ECM
	Condition (a) continues for 0.5 seconds: (a) VPA1 ≦ 0.2 V or VPA2 ≦ 0.5 V	

HINT:
After confirming DTC 19 (1), use the hand-held tester to confirm the accelerator pedal opening percentage and accelerator pedal close position switch condition.

Accelerator pedal opening position expressed as percentage		Trouble area
Accelerator pedal fully closed	Accelerator pedal fully open	
0 %	0 %	S VCC circuit open S VA, VAS circuit open or short
Approx. 100 %	Approx. 100 %	S E2C circuit open

WIRING DIAGRAM

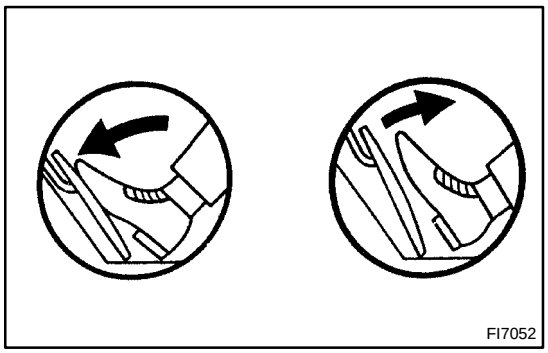


INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

When using Hand-held Tester:

1	READ VALUE OF HAND-HELD TESTER(ACCELERATOR PEDAL OPENING PERCENTAGE)



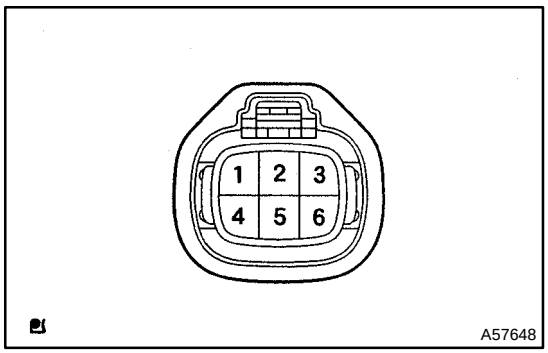
(a) Read the accelerator pedal opening percentage.
Result:

Accelerator pedal	Accelerator pedal opening position expressed as percentage
Fully depressed	Approx. 75 %
Fully released	Approx. 16 %

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-429)**

NG

2	CHECK HARNESS AND CONNECTOR

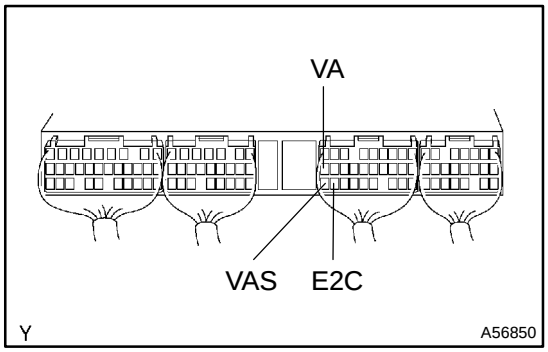


(a) Disconnect the accelerator pedal position sensor connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminal 1, 4, and 3, 6 of the wire harness side connector.
Voltage: 4.5 - 5.5 V

NG → **Go to step 5**

OK

3 INSPECT ECM



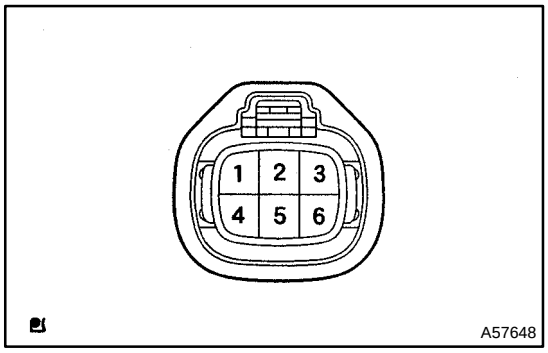
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VA and E2C, VAS and E2C of the ECM connector.
Voltage:

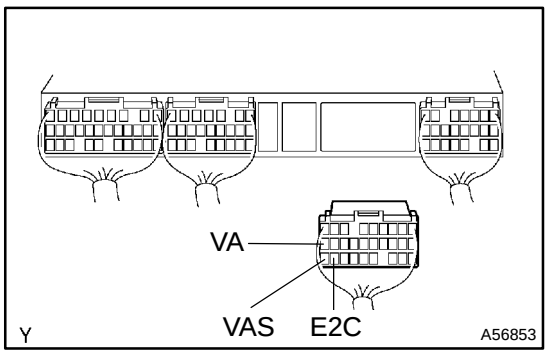
Accelerator pedal	Voltage
Fully closed	VA: 0.5 - 1.1 V VAS: 0.9 - 2.3 V
Fully open	VA: 3.0 - 4.6 V VAS: 3.4 - 5.0 V

OK → **CHECK AND REPLACE ECM**

NG

4 CHECK HARNESS AND CONNECTOR(ECM-ACCELERATOR PEDAL POSITION SENSOR)





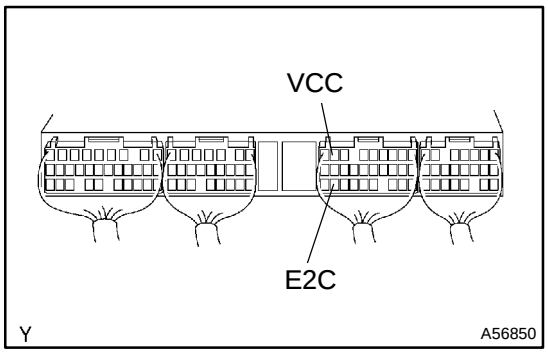
(a) Disconnect the accelerator pedal position sensor connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals VA of the ECM E17 connector and 5 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals VAS of the ECM E17 connector and 2 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals VA and VAS of the ECM E17 connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals VA and E2C,VAS and E2C of the ECM E17 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ACCELERATOR PEDAL ASSY

5	INSPECT ECM

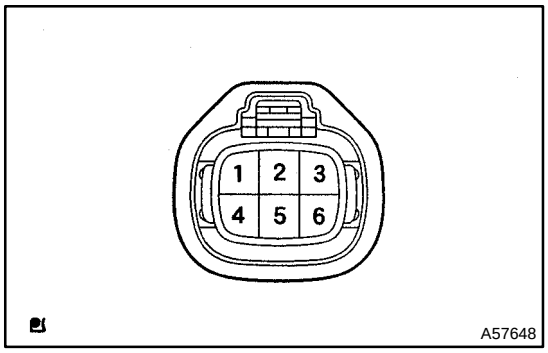


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VCC and E2C of the ECM connector.
Voltage: 4.5 - 5.5 V

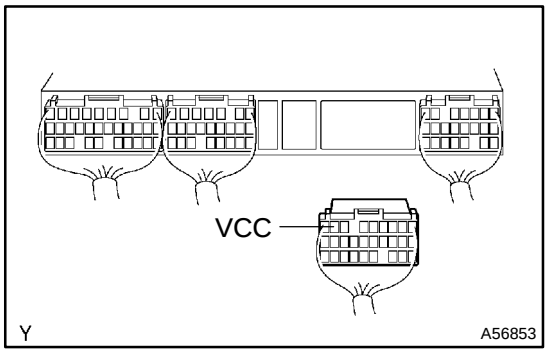
NG → **CHECK AND REPLACE ECM**

OK

6	CHECK HARNESS AND CONNECTOR(ECM-ACCELERATOR PEDAL POSITION SENSOR)



(a) Disconnect the accelerator pedal position sensor connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals VCC of the ECM E17 connector and 4 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less



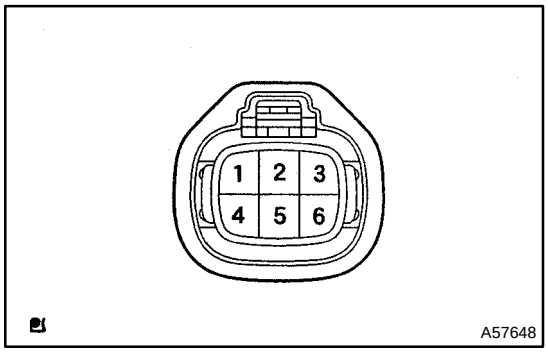
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

1	CHECK HARNESS AND CONNECTOR

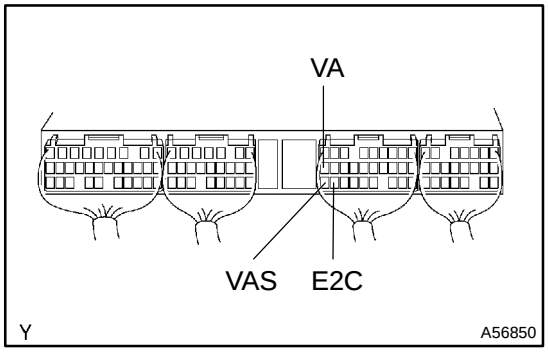


(a) Disconnect the accelerator pedal position sensor connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminal 1, 4 and 3, 6 of the wire harness side connector.
Voltage: 4.5 - 5.5 V

NG → **Go to step 4**

OK

2	INSPECT ECM



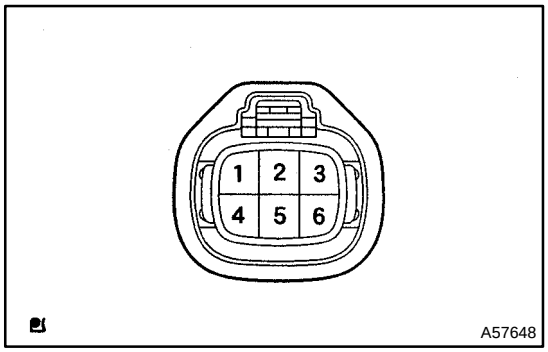
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VA and E2C, VAS and E2C of the ECM connector.
Result:

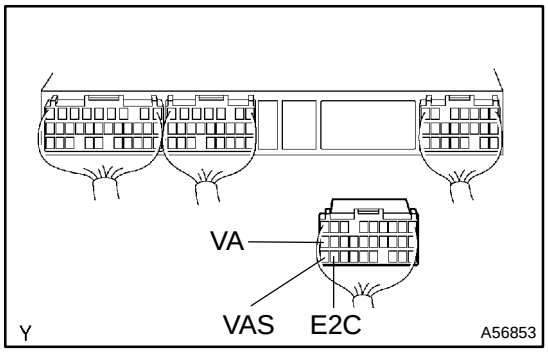
Accelerator pedal	Voltage
Fully closed	VA: 0.5 - 1.1 V VAS: 0.9 - 2.3 V
Fully open	VA: 3.0 - 4.6 V VAS: 3.4 - 5.0 V

OK → **CHECK AND REPLACE ECM**

NG

3	CHECK HARNESS AND CONNECTOR(ECM-ACCELERATOR PEDAL POSITION SENSOR)





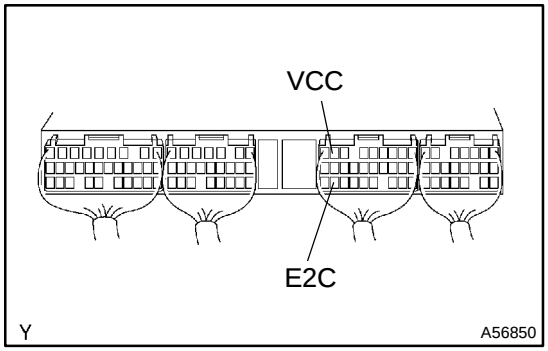
(a) Disconnect the accelerator pedal position sensor connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals VA of the ECM E17 connector and 5 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals VAS of the ECM E17 connector and 2 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals VA and VAS of the ECM E17 connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals VA and E2C,VAS and E2C of the ECM E17 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ACCELERATOR PEDAL ASSY

4	INSPECT ECM

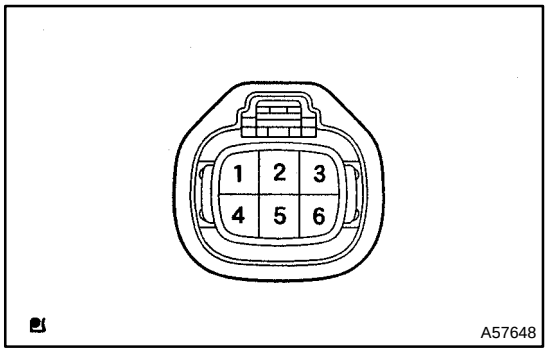


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VCC and E2C of the ECM connector.
Voltage: 4.5 - 5.5 V

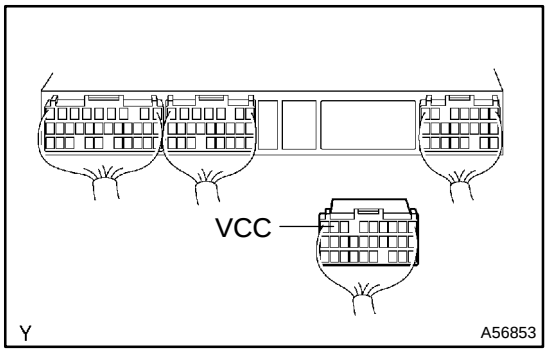
NG → **CHECK AND REPLACE ECM**

OK

5	CHECK HARNESS AND CONNECTOR(ECM-ACCELERATOR PEDAL POSITION SENSOR)



(a) Disconnect the accelerator pedal position sensor connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals VCC of the ECM E17 connector and 4 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	19(2)	ACCELERATOR PEDAL POSITION SENSOR CIRCUIT MALFUNCTION(IDLE SWITCH/RANGE)

CIRCUIT DESCRIPTION

Refer to DTC 19 (1) on page 05-450.

DTC No.	DTC Detecting Condition	Trouble Area
19 (2)	Withe the ECM sensor completed learning and when the electric potential difference of No. 1 and No. 2 sensors has become more than 1.2 V or less than 0.4 V.	S Open or short in accelerator pedal position sensor circuit S Accelerator pedal position sensor S ECM
	Either one of the followings continues more than 2.0 seconds. (b) When the electrical potential difference of No. 1 and No. 2 sensors is beside the specified value. (c) VPA2 ≧ 4.9 V (d) Accelerator idling criterion voltage of No. 1 and No. 2 in less than 0.04 V.	

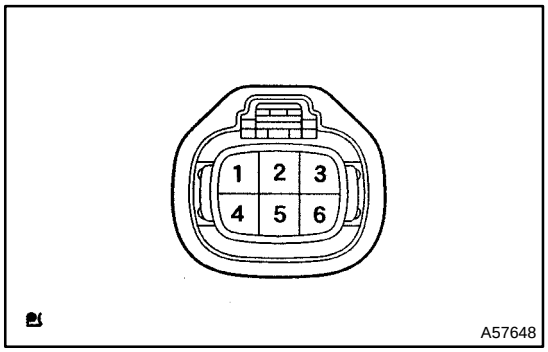
WIRING DIAGRAM

Refer to DTC 19 (1) on page 05-450.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK HARNESS AND CONNECTOR

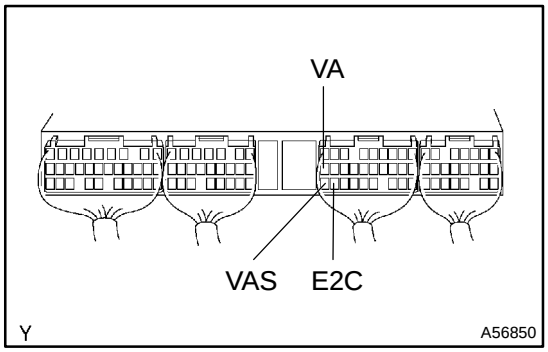


(a) Disconnect the accelerator pedal position sensor connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminal 1, 4 and 3, 6 of the wire harness side connector.
Voltage: 4.5 - 5.5 V

NG → **Go to step 4**

OK

2	INSPECT ECM



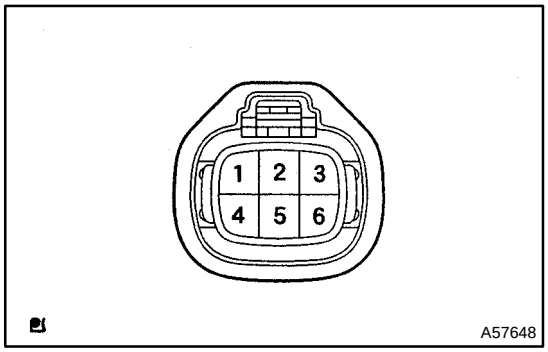
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VA and E2C, VAS and E2C of the ECM connector.
Voltage:

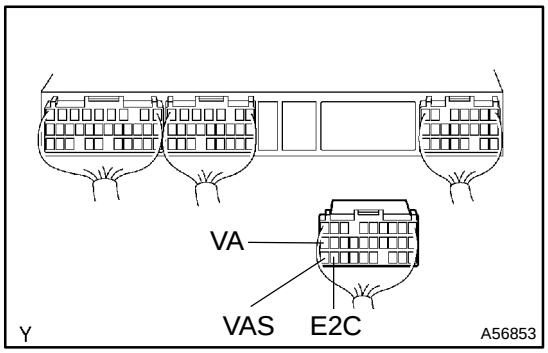
Accelerator pedal	Voltage
Fully closed	VA: 0.5 - 1.1 V VAS: 0.9 - 2.3 V
Fully open	VA: 3.0 - 4.6 V VAS: 3.4 - 5.0 V

NG → **CHECK AND REPLACE ECM**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-ACCELERATOR PEDAL POSITION SENSOR)





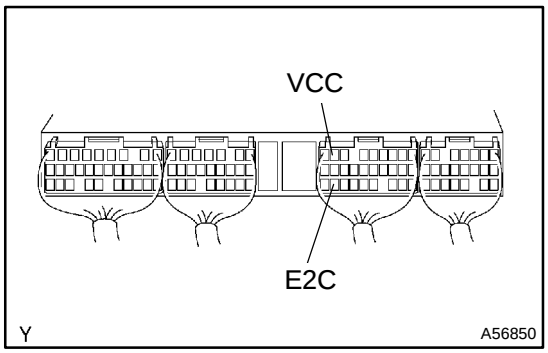
(a) Disconnect the accelerator pedal position sensor connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals VA of the ECM E17 connector and 5 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals VAS of the ECM E17 connector and 2 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals VA and VAS of the ECM E17 connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals VA and E2C,VAS and E2C of the ECM E17 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ACCELERATOR PEDAL ASSY

4	INSPECT ECM

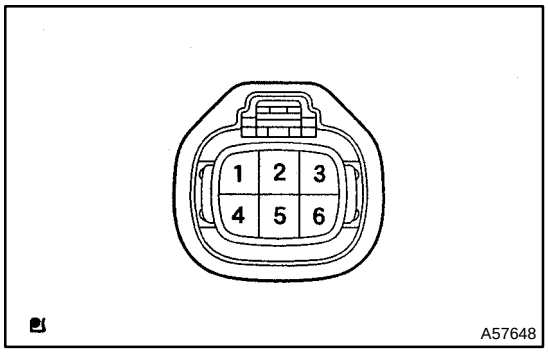


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VCC and E2C of the ECM connector.
Voltage: 4.5 - 5.5 V

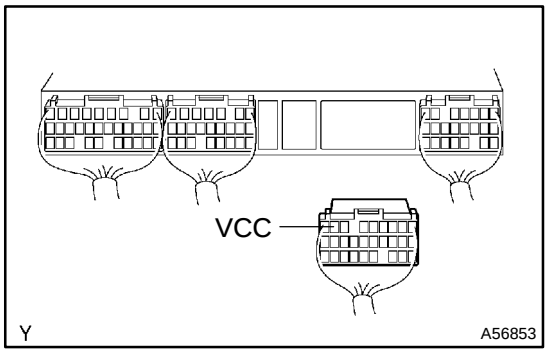
NG → **CHECK AND REPLACE ECM**

OK

5	CHECK HARNESS AND CONNECTOR(ECM-ACCELERATOR PEDAL POSITION SENSOR)



(a) Disconnect the accelerator pedal position sensor connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals VCC of the ECM E17 connector and 4 of the accelerator pedal position sensor harness side connector.
Resistance: 1 Ω or less



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

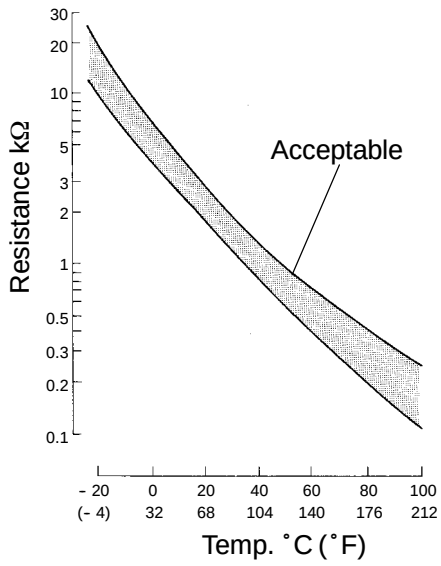
OK

CHECK AND REPLACE ECM

DTC	22	WATER TEMP.SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

(Fig. 1)



The water temperature sensor senses the coolant temperature. A thermistor built into the sensor changes the resistance value according to the coolant temperature. The lower the coolant temperature, the greater the thermistor resistance value, and the higher the coolant temperature, the lower the thermistor resistance value (See Fig. 1).

The water temperature sensor is connected to the ECM (See below). The 5 V power source voltage in the ECM is applied to the water temperature sensor from the terminal THW via a resistor R. That is, resistor R and the water temperature sensor are connected in series. When the resistance value of the water temperature sensor changes in accordance with changes in the coolant temperature, the potential at the terminal THW also changes. Based on this signal, the ECM increases the fuel injection volume to improve drivability during cold engine operation.

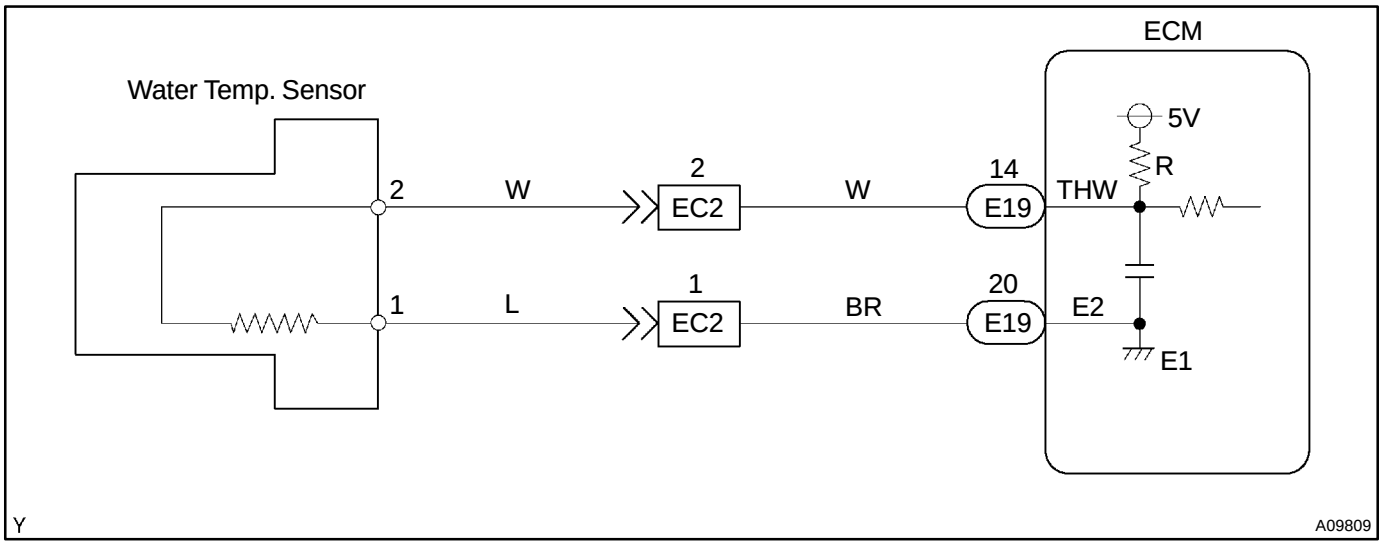
DTC No.	DTC Detection Condition	Trouble Area
22	Open or short in water temp. sensor circuit for 0.5 sec. or more	S Open or short in water temp. sensor circuit S Water temp. sensor S ECM

HINT:

After confirming DTC 22, use the hand-held tester to confirm the water temperature from the CURRENT DATA.

Temperature displayed	Malfunction
- 40˚C (- 40˚F)	Open circuit
140˚C (284˚F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs 22, 24 and 39 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using Hand-Held tester:

1	READ VALUE OF HAND-HELD TESTER(WATER TEMP.)

(a) Connect the hand-held tester to the DLC3.
(b) Read temperature value on the hand-held tester.
Temperature: The same as actual water temperature

Result:

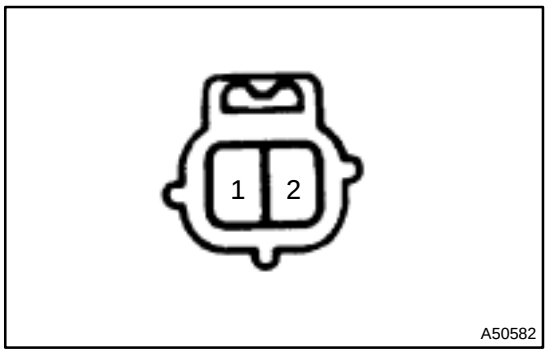
A	B	C
- 40_C (- 40_F)	140_C (284_F)	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-424)**

A

2	CHECK HARNESS AND CONNECTOR(CHECK FOR OPEN)

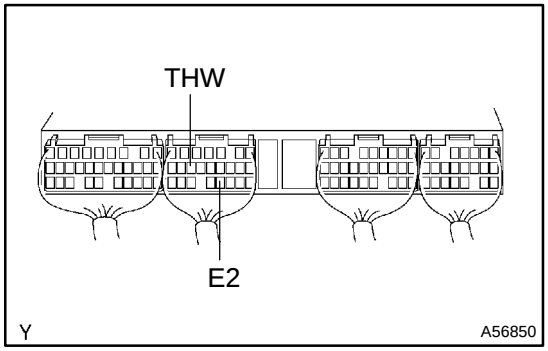


(a) Disconnect the water temperature sensor connector.
(b) Connect the terminals 1 with 2 of the water temperature sensor harness side connector.
(c) Turn the ignition switch ON.
(d) Read temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK	REPLACE DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR

NG

3	INSPECT ECM(CHECK FOR OPEN)



(a) Connect between terminals THW and E2 of the ECM connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: 140˚C (284˚F) or more

OK	REPAIR OR REPLACE HARNESS AND CONNECTOR

NG

CHECK AND REPLACE ECM

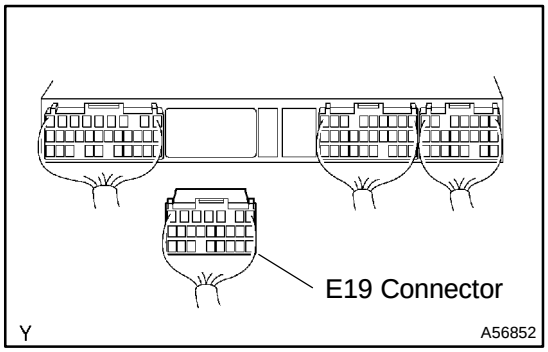
4	CHECK HARNESS AND CONNECTOR(CHECK FOR SHORT)

(a) Disconnect the water temperature sensor connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40˚C (- 40˚F)

OK	REPLACE DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR

NG

5	INSPECT ECM(CHECK FOR SHORT)



(a) Disconnect the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40˚C (- 40˚F)

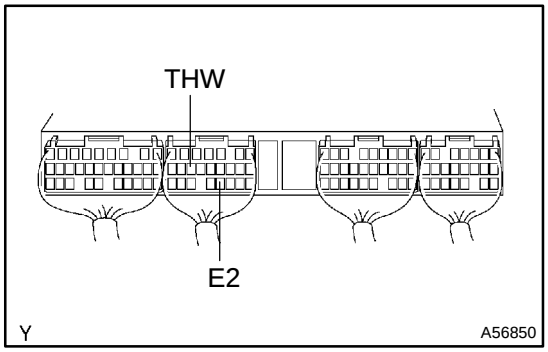
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

When not using Hand-Held tester:

1	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals THW and E2 of the ECM connector.
Voltage:

Water Temperature	Voltage
20˚C (68˚F) (Engine is cool)	0.2 - 3.8 V
80˚C (176˚F) (Engine is hot)	0.1 - 1.5 V

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-424)**

NG

2	CHECK DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR

(a) Disconnect the water temp. sensor connector.
(b) Measure resistance between the water temp. sensor terminals.
Resistance:
Within acceptable zone on the chart below

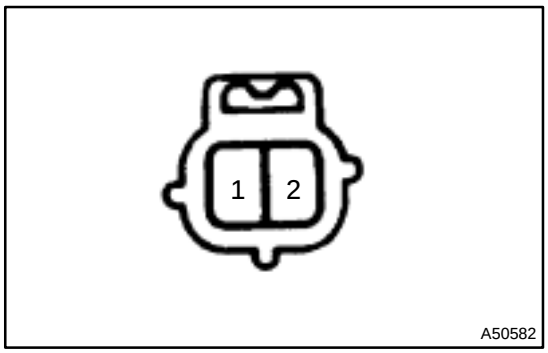
Water temp. ˚C (˚F)	Resistance
20 (68)	2 - 3 kΩ
80 (176)	0.2 - 0.4 kΩ

NOTICE:
When checking the water temperature sensor directly in the water, be careful not to allow water to come into the sensor. After the checking, wipe out the sensor.

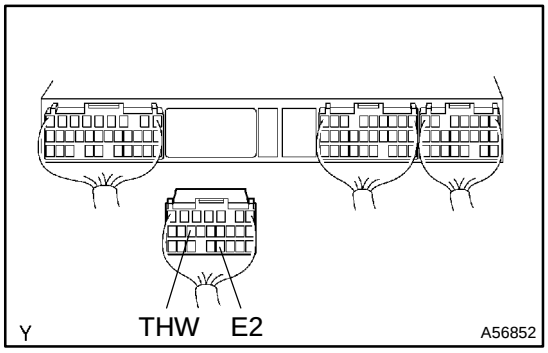
NG → **REPLACE DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-WATER TEMP.SENSOR)



(a) Disconnect the water temp. sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals THW of the ECM E19 connector and 2 of the water temp. sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2 of the ECM E19 connector and 1 of the water temp. sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals THW and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

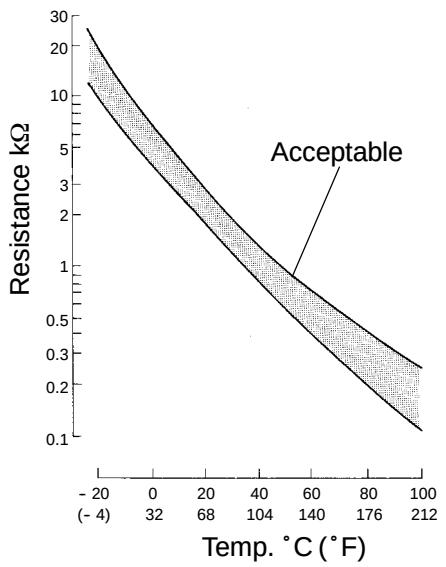
OK

CHECK AND REPLACE ECM

DTC	24(1)	INTAKE AIR TEMP.SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

(Fig. 1)



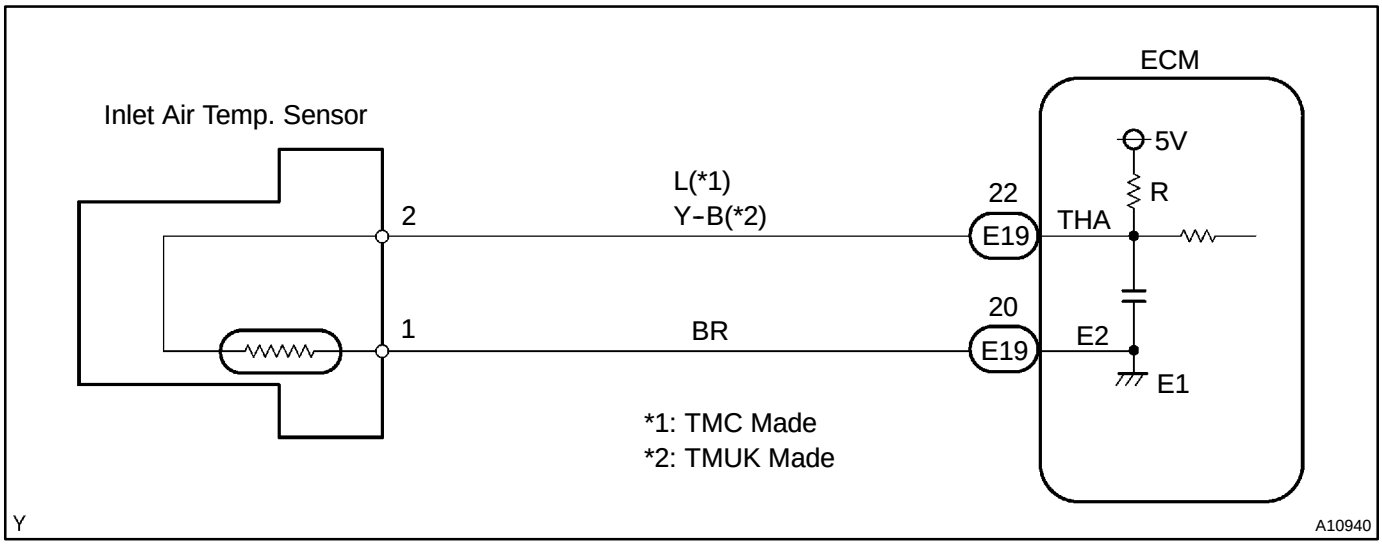
The inlet air temperature sensor is built into the intake manifold and senses the inlet air temperature. A thermistor built in the sensor changes the resistance value according to the inlet air temperature. The lower the inlet air temperature, the greater the thermistor resistance value, and the higher the inlet air temperature, the lower the thermistor resistance value (See Fig. 1).
The inlet air temperature sensor is connected to the ECM. The 5 V power source voltage in the ECM is applied to the inlet air temperature sensor from terminal THA via a resistor R. That is the resistor R and the inlet air temperature sensor are connected in series. When the resistance value of the inlet air temperature sensor changes. Based on this signal, the ECM increases the fuel injection volume to improve drivability during cold engine operation.

DTC No.	DTC Detection Condition	Trouble Area
24 (1)	Open or short in inlet air temp. sensor circuit for 0.5 sec. or more	S Open or short in inlet air temp. sensor circuit S Inlet air temp. sensor S ECM

HINT:
After confirming DTC 24, use the hand-held tester to confirm the inlet air temperature from the CURRENT DATA.

Temperature displayed	Malfunction
- 40°C (- 40°F)	Open circuit
140°C (284°F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC 22, 24, 35 and 39, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using Hand-Held tester:

1	READ VALUE OF HAND-HELD TESTER(INTAKE AIR TEMP)

(a) Read temperature value on the hand-held tester.
Temperature: The same as actual inlet air temperature

Result:

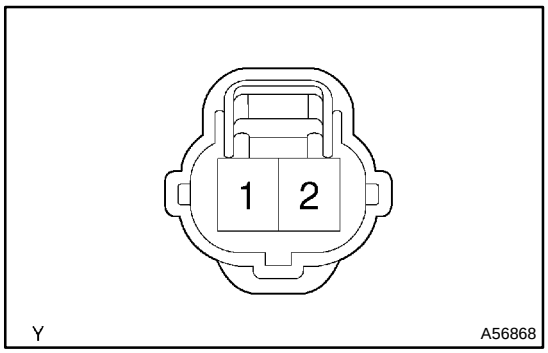
A	B	C
- 40°C (- 40°F)	140°C (284°F) or more	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS**
(See page 05-424)

A

2	CHECK HARNESS AND CONNECTOR(CHECK FOR OPEN)

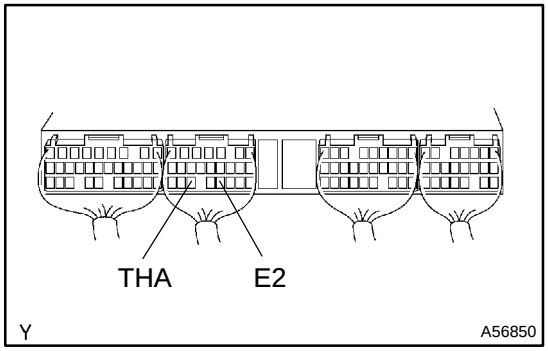


(a) Disconnect the inlet air temperature sensor connector.
(b) Connect the terminals 1 with 2 of the inlet air temperature sensor harness side connector.
(c) Turn the ignition switch ON.
(d) Read the temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK	REPLACE DIESEL TURBO INLET AIR TENPERATURE SENSOR

NG

3	INSPECT ECM(CHECK FOR OPEN)



(a) Connect between terminals THA and E2 of the ECM connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK	REPAIR OR REPLACE HARNESS AND CONNECTOR

NG

CHECK AND REPLACE ECM

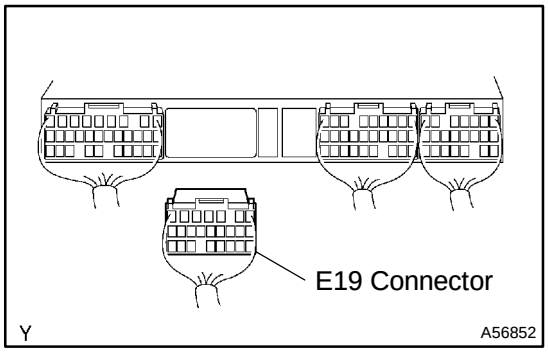
4	CHECK HARNESS AND CONNECTOR(CHECK FOR SHORT)

(a) Disconnect the inlet air temperature sensor connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40°C (- 40°F)

OK	REPLACE DIESEL TURBO INLET AIR TENPERATURE SENSOR

NG

5	INSPECT ECM(CHECK FOR SHORT)



(a) Disconnect the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40°C (- 40°F)

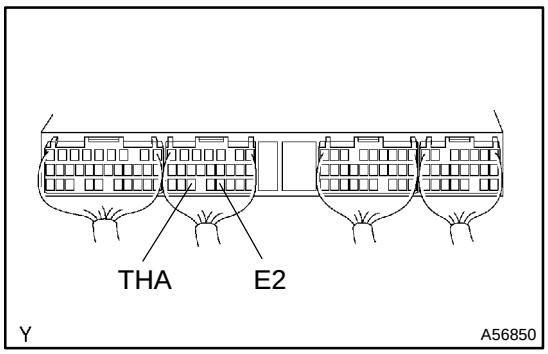
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

When not using Hand-held Tester:

1	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals THA and E2 of the ECU connector.
Voltage:

Intake Air Temp. ˚C (˚F)	Voltage
20 (68) (Engine is cool)	0.2 - 3.8 V
80 (176) (Engine is hot)	0.1 - 1.5 V

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-424)**

NG

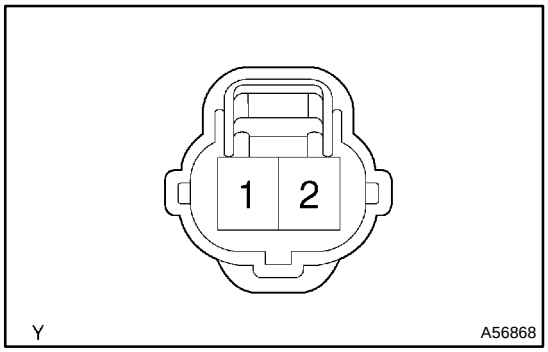
2	INSPECT DIESEL TURBO INLET AIR TENPERATURE SENSOR

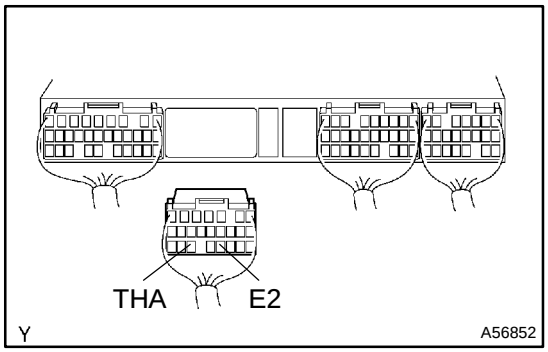
(a) Disconnect the inlet air temperature sensor connector.
(b) Measure resistance between the inlet air temperature sensor terminals.
Resistance: 2 - 3 kΩ at 20_C (68_F)

NG → **REPLACE DIESEL TURBO INLET AIR TENPERATURE SENSOR**

OK

3	CHECK AND REPLACE HARNESS AND CONNECTOR(ECM-INLET AIR TEMP.SENSOR)





(a) Disconnect the inlet air temperature sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals THA of the ECM E19 connector and 2 of the inlet air temperature sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2 of the ECM E19 connector and 1 of the inlet air temperature sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals THA and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

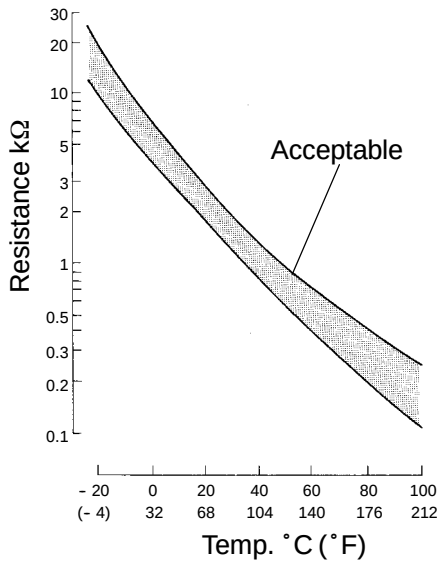
OK

CHECK AND REPLACE ECM

DTC	24(2)	ATMOSPHERIC TEMP.SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

(Fig. 1)



The atmospheric temperature sensor is built into the air flow meter and senses the atmospheric temperature. A thermistor built in the sensor changes the resistance value according to the atmospheric temperature. The lower the atmospheric temperature, the greater the thermistor resistance value, and the higher the atmospheric temperature, the lower the thermistor resistance value (See Fig. 1).

The atmospheric temperature sensor is connected to the ECM. The 5 V power source voltage in the ECM is applied to the atmospheric temperature sensor from terminal THAF via a resistor R. That is resistor R and the atmospheric temperature sensor are connected in series. When the resistance value of the atmospheric temperature sensor changes. Based on this signal, the ECM increases the fuel injection volume to improve drivability during cold engine operation.

DTC No.	DTC Detection Condition	Trouble Area
24	Open or short in atmospheric temp. sensor circuit for 0.5 sec. or more	S Open or short in atmospheric temp. sensor circuit S Atmospheric temp. sensor (built into air flow meter) S ECM

HINT:

After confirming DTC 24, use the hand-held tester to confirm the atmospheric temperature from the CURRENT DATA.

Temperature Displayed	Malfunction
- 40˚C (- 40˚F)	Open circuit
140˚C (284˚F) or more	Short circuit

WIRING DIAGRAM

Refer to DTC 31 on page 05-475.

INSPECTION PROCEDURE

HINT:

- If DTC 22, 24, 35 and 39 displays, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using hand-held tester:

1	READ VALUE OF HAND-HELD TESTER(ATMOSPHERIC TEMP.)

(a) Read temperature value on the hand-held tester.
Temperature: The same as actual atmospheric air temperature

Result:

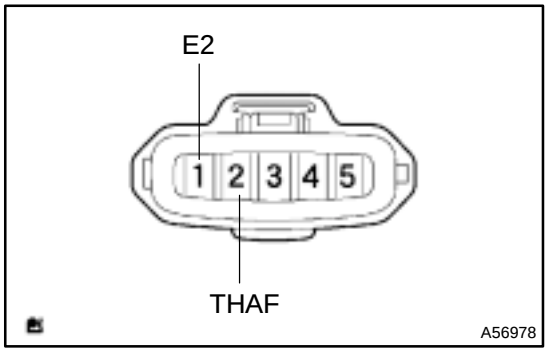
A	B	C
- 40°C (- 40°F)	140°C (284°F) or more	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-424)**

A

2	CHECK HARNESS AND CONNECTOR(CHECK FOR OPEN)

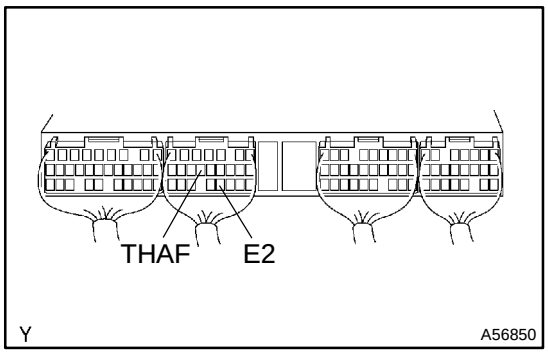


(a) Disconnect the air flow meter connector.
(b) Connect the terminals E2 with THAF of atmospheric temperature sensor harness side connector.
(c) Turn the ignition switch ON.
(d) Read the temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPLACE INTAKE AIR FLOW METER SUB-ASSY**

NG

3	INSPECT ECM(CHECK FOR OPEN)



(a) Connect between terminals THAF and E2 of the ECM connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: 140°C (284°F) or more

OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

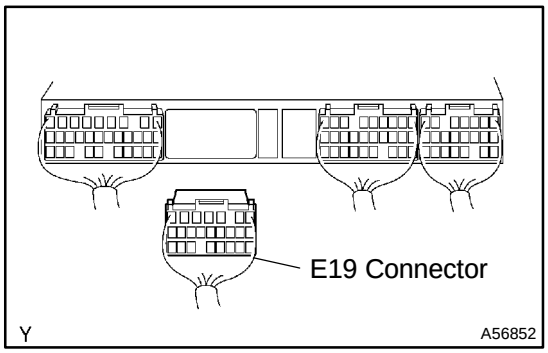
4	CHECK HARNESS AND CONNECTOR(CHECK FOR SHORT)

(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40°C (- 40°F)

OK → **REPLACE INTAKE AIR FLOW METER SUB-ASSY**

NG

5	INSPECT ECM(CHECK FOR SHORT)



(a) Disconnect the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40°C (- 40°F)

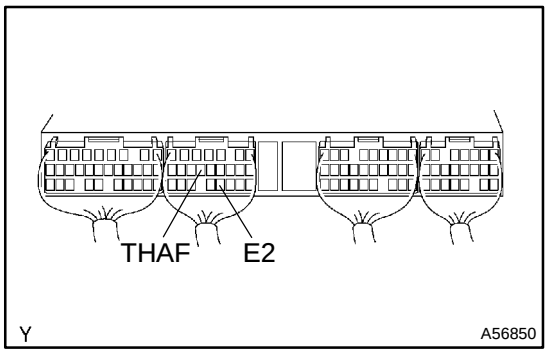
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

When not using Hand-held Tester:

1	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals THAF and E2 of the ECM connector.
Voltage:

Atmospheric Temperature	Voltage
20°C (68°F) (Engine is cool)	0.2 - 3.8 V
80°C (176°F) (Engine is hot)	0.1 - 1.5 V

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-424)**

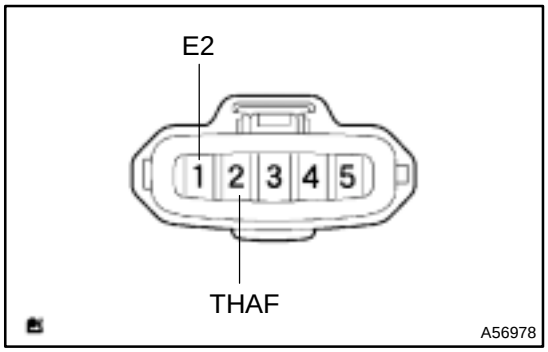
NG

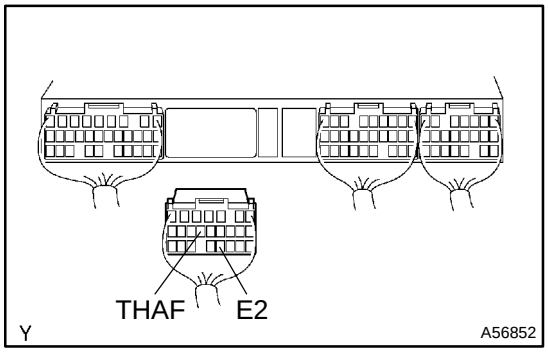
2	INSPECT INTAKE AIR FLOW METER SUB-ASSY (See page 10-15)

NG → **REPLACE INTAKE AIR FLOW METER SUB-ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-ATMOSPHERIC TEMP.SENSOR)





(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals THAF of the ECM E19 connector and THAF of the air flow meter harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2 of the ECM E19 connector and E2 of the air flow meter harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals THAF and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

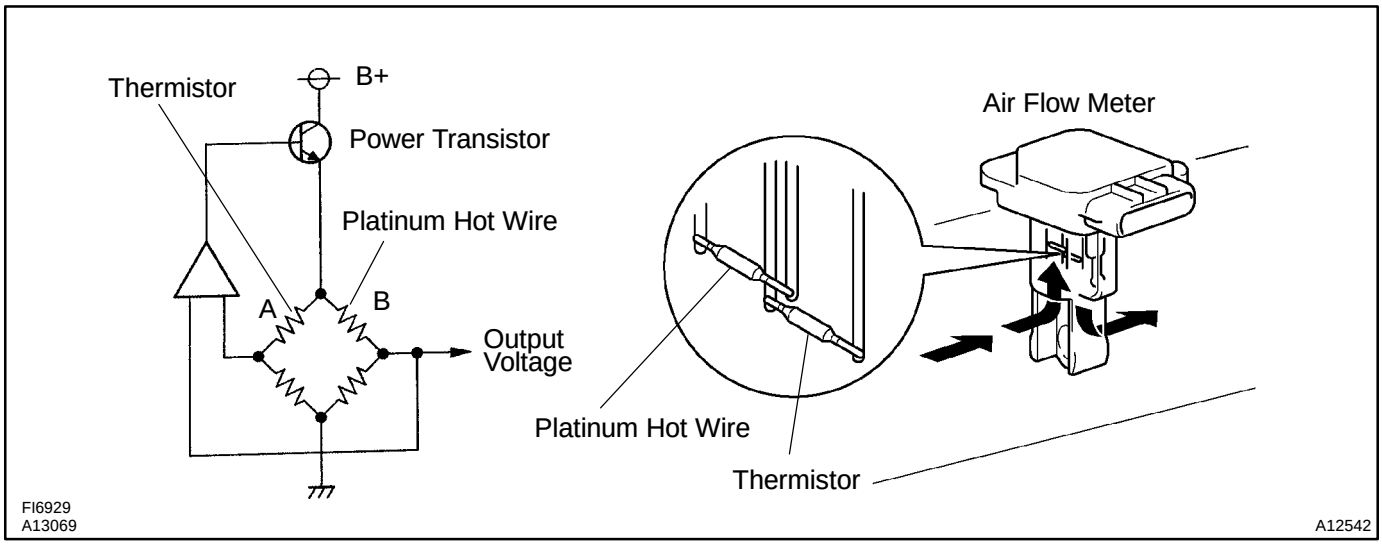
DTC	31	AIR FLOW CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

The air flow meter uses a platinum hot wire. The hot wire air flow meter consists of a platinum hot wire, thermistor and a control circuit installed in a plastic housing. The hot wire air flow meter works on the principle that the hot wire and thermistor located in the intake air bypass of the housing detect any changes in the intake air temperature.

The hot wire is maintained at the set temperature by controlling the current flow through the hot wire. This current flow is then measured as the output voltage of the air flow meter.

The circuit is constructed so that the platinum hot wire and thermistor provide a bridge circuit with the power transistor controlled so that the potential of A and B remains equal to maintain the set temperature.



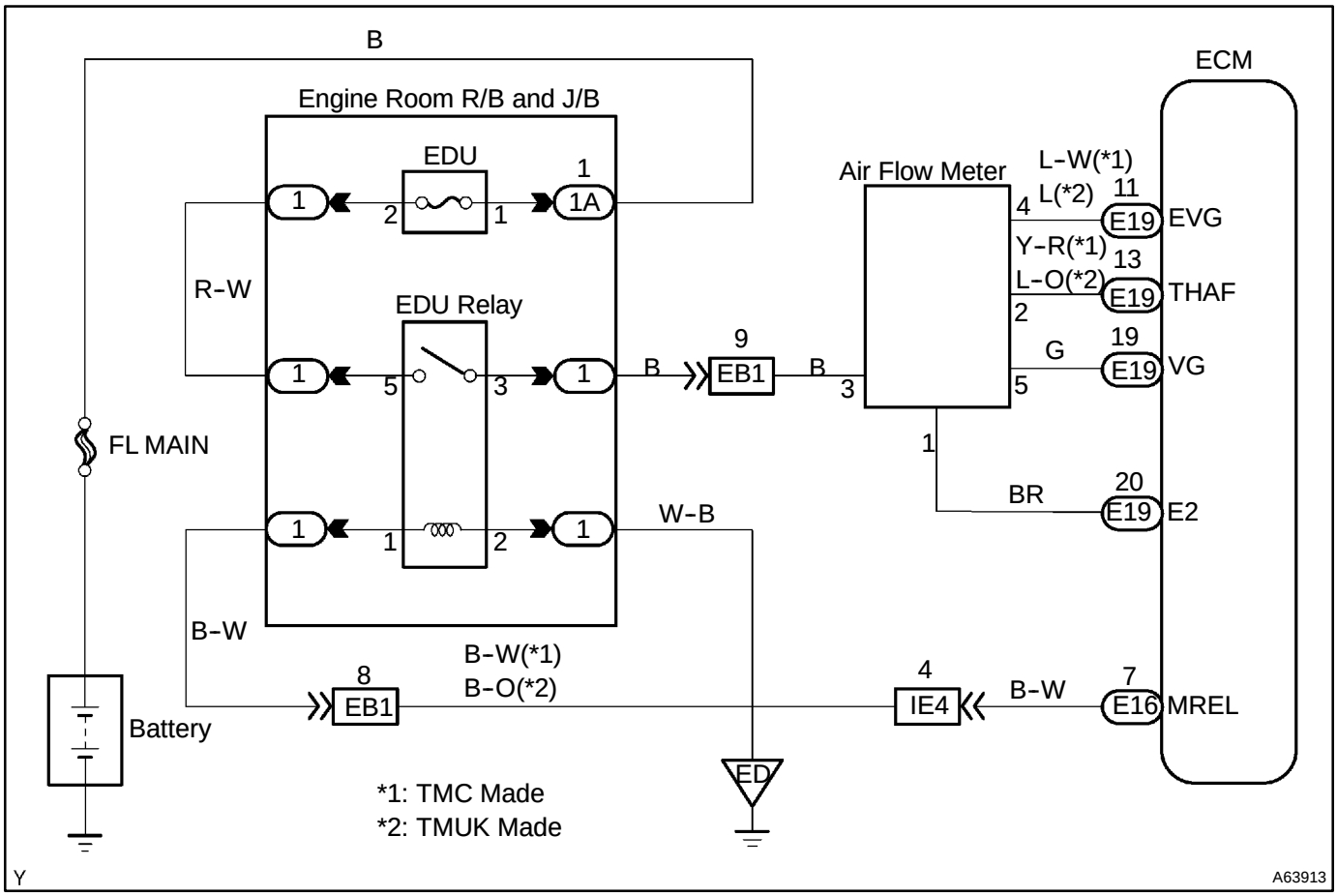
DTC No.	DTC Detection Condition	Trouble Area
31	Open or short in air flow meter circuit with more than 3 sec.	S Open or short in air flow meter circuit S Air flow meter S ECM

HINT:

After confirming DTC 31, use the hand-held tester to confirm the air flow ratio from the CURRENT DATA.

Air Flow Value (gm/sec.)	Malfunction
Approx. 0.0	S Air flow meter power source circuit open S VG circuit open or short
174.0 or more	S EVG circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using hand-held tester

1	READ VALUE OF HAND-HELD TESTER(MASS AIR FLOW RATE)

(a) Read the air flow rate on the hand-held tester.

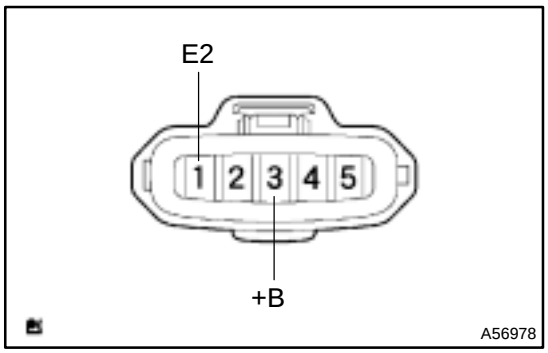
Result:

	A	B
Air Flow Rate (g/s)	0.0	174.0 or more

B → Go to step 6

A

2	INSPECT INTAKE AIR FLOW METER SUB-ASSY(POWER SOURCE VOLTAGE)

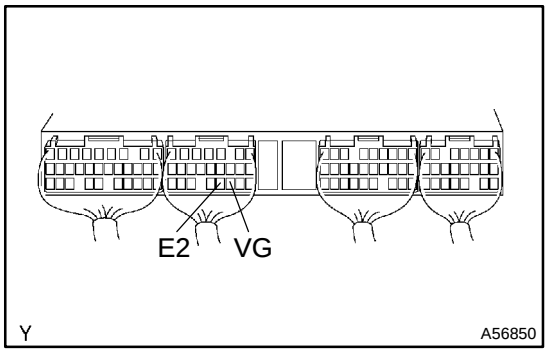


(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminal +B and E2 of the air flow meter harness side connector.
Voltage: 9 - 14 V

NG → **Go to step 5**

OK

3	INSPECT ECM



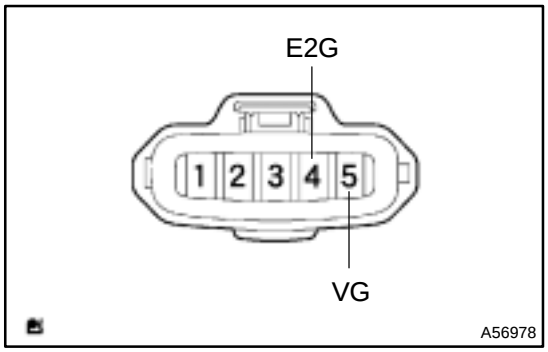
(a) Start the engine.
(b) Measure the voltage between terminal VG and E2 of the ECM connector while the engine is idling.
Voltage: 0.5 - 3.0 V

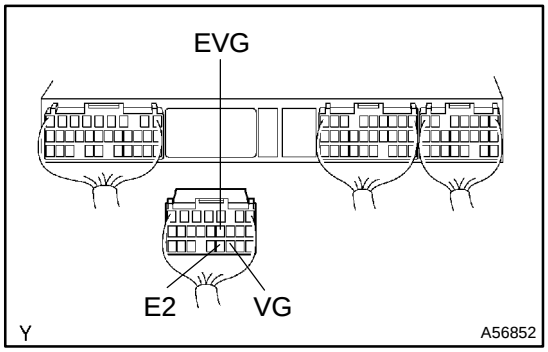
HINT:
The shift position should be P or N, and A/C switch should be turned OFF.

OK → **CHECK AND REPLACE ECM**

NG

4	CHECK HARNESS AND CONNECTOR(AIR FLOW METER-ECM)





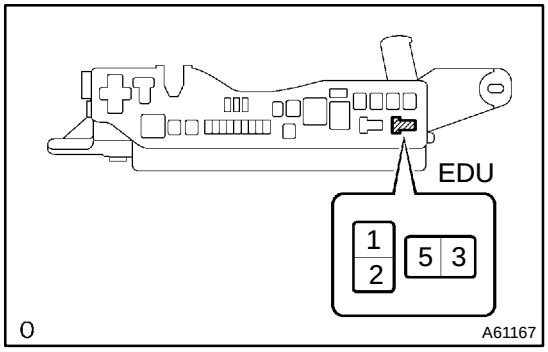
(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VG of the ECM E19 connector and VG of the air flow meter harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals EVG of the ECM E19 connector and E2G of the air flow meter harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals VG and EGV of the ECM E19 connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals VG and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

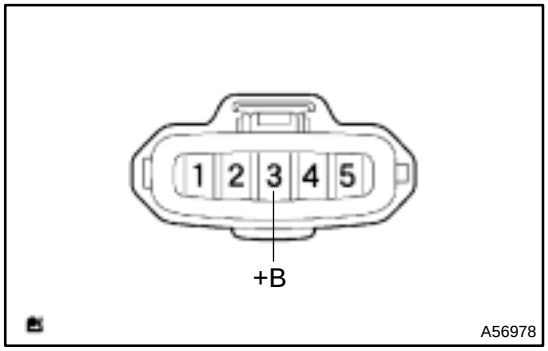
OK

REPLACE INTAKE AIR FLOW METER SUB-ASSY

5	CHECK HARNESS AND CONNECTOR(AIR FLOW METER +B CIRCUIT)



(a) Remove the EDU relay from the engine room R/B.
(b) Disconnect the air flow meter connector.
(c) Check for open between the terminals +B of the air flow meter connector and 3 of the EDU relay.
Resistance: 1 Ω or less

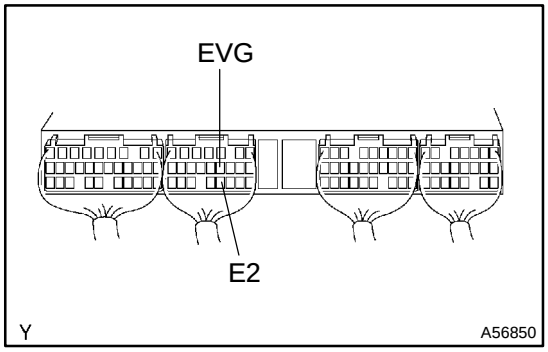


NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR ECM POWER SOURCE CIRCUIT

6 INSPECT ECM

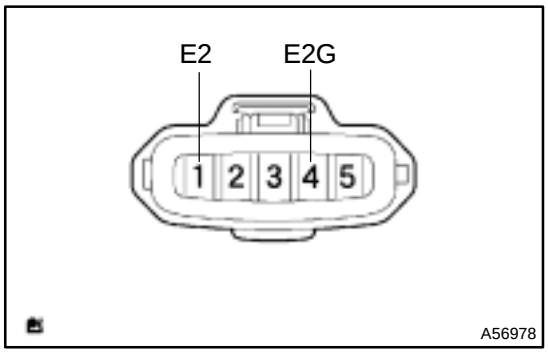


(a) Check for open between the terminals EVG and E2 of the ECM connector.
Resistance: 1 Ω or less

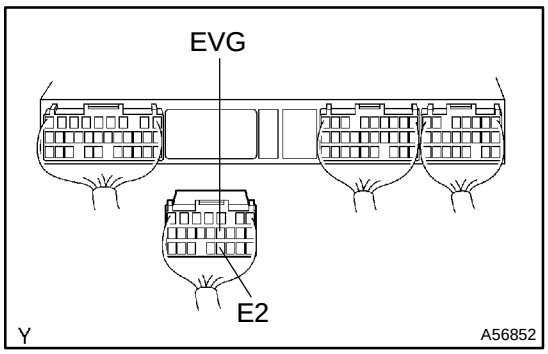
NG → **CHECK AND REPLACE ECM**

OK

7 CHECK HARNESS AND CONNECTOR(AIR FLOW METER-ECM)



(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals EVG of the ECM E19 connector and E2G of the air flow meter harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2 of the ECM E19 connector and E2 of the air flow meter harness side connector.
Resistance: 1 Ω or less



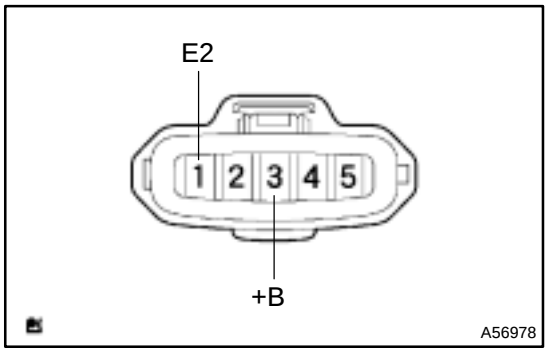
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE INTAKE AIR FLOW METER SUB-ASSY

When not using Hand-held Tester

1	INSPECT INTAKE AIR FLOW METER SUB-ASSY(POWER SOURCE VOLTAGE)

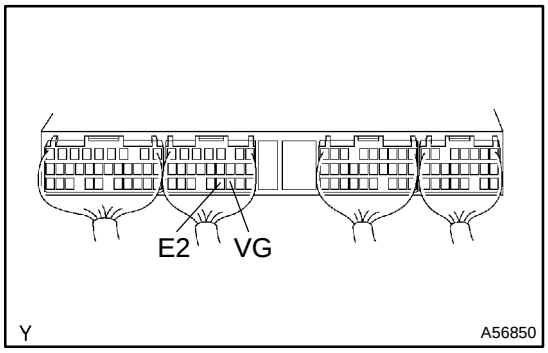


(a) Disconnect the air flow meter connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminal +B and E2 of the air flow meter harness side connector.
Voltage: 9 - 14 V

NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

2	INSPECT ECM



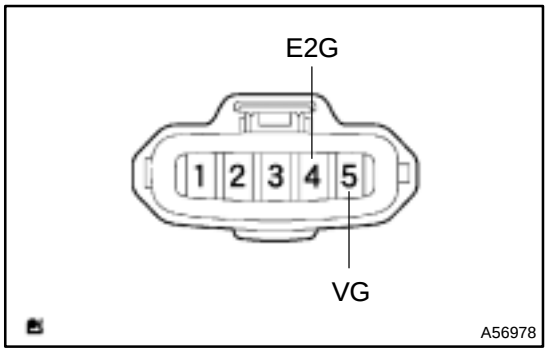
(a) Start the engine.
(b) Measure the voltage between terminal VG and E2 of the ECM connector while the engine is idling.
Voltage: 0.5 - 3.0 V

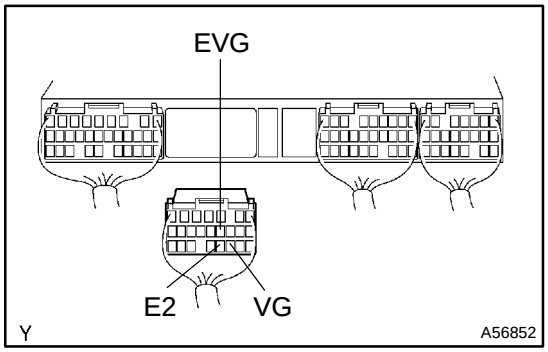
HINT:
The shift position should be P or N and A/C switch should be turned OFF.

NG	CHECK AND REPLACE ECM

OK

3	CHECK HARNESS AND CONNECTOR(AIR FLOW METER-ECM)





(a) Disconnect the air flow meter connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VG of the ECM E19 connector and VG of the air flow meter harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals EVG of the ECM E19 connector and E2G of the air flow meter harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals VG and EVG of the ECM E19 connector.
Resistance: 1 MΩ or more
(f) Check for short between the terminals VG and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE INTAKE AIR FLOW METER SUB-ASSY

DTC	32	INJECTOR CORRECTION RESISTANCE MALFUNCTION

CIRCUIT DESCRIPTION

The correction system is correcting a few vary between each injectors.

DTC No.	DTC Detection Condition	Trouble Area
32	Open or short in circuit	S Injector correction resistance circuit S Injector correction resistance (built into injector) S ECM

WIRING DIAGRAM

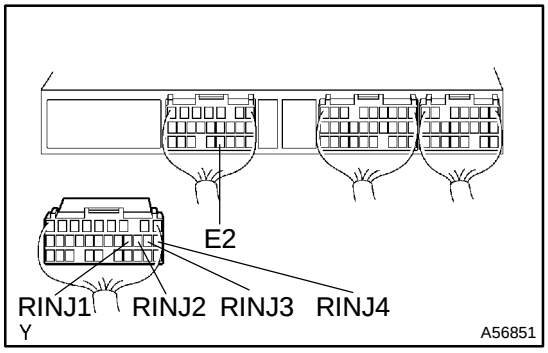
Refer to DTC 97 on page 05-516

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

1 INSPECT ECM(CHECK INJECTOR CORRECTION RESISTANCE)

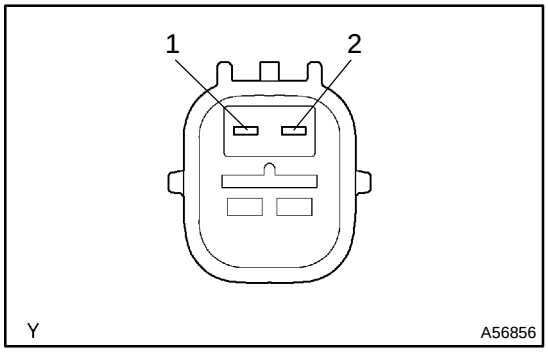


(a) Turn the ignition switch OFF.
(b) Disconnect the ECM E18 connector.
(c) Measure the resistance between terminal RINJ1, RINJ2, RINJ3, RINJ4 and E2 of the ECM connector.
Resistance: 30 - 9600 Ω

OK → **CHECK AND REPLACE ECM**

NG

2 INSPECT INJECTOR ASSY(CHECK RESISTANCE)



(a) Disconnect the 4 injector connector.
(b) Measure the resistance between terminals 1and 2 of the injector terminal.
Resistance: 30 - 9530 Ω at 20˚C (68_F)

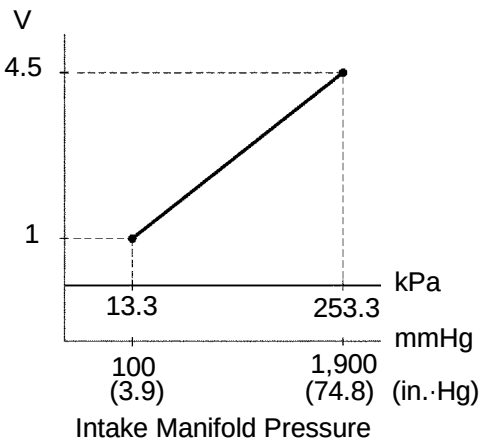
NG → **REPLACE INJECTOR ASSY**

OK

REPAIR HARNESS AND CONNECTOR

DTC	35	TURBO PRESSURE SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION



The turbo pressure sensor is connected to the intake manifold. The ECM detects the intake manifold pressure as a voltage by the sensor. The ECM uses the intake manifold pressure signal for correction of injection volume control and injection timing control.

The VSV for turbo pressure sensor switches the atmosphere applied to the turbo pressure sensor to the intake manifold pressure. The turbo pressure sensor monitors both the atmospheric pressure and intake manifold pressure and transmits the output voltage to the ECM, and the ECM uses this atmospheric pressure value for correcting the injection volume.

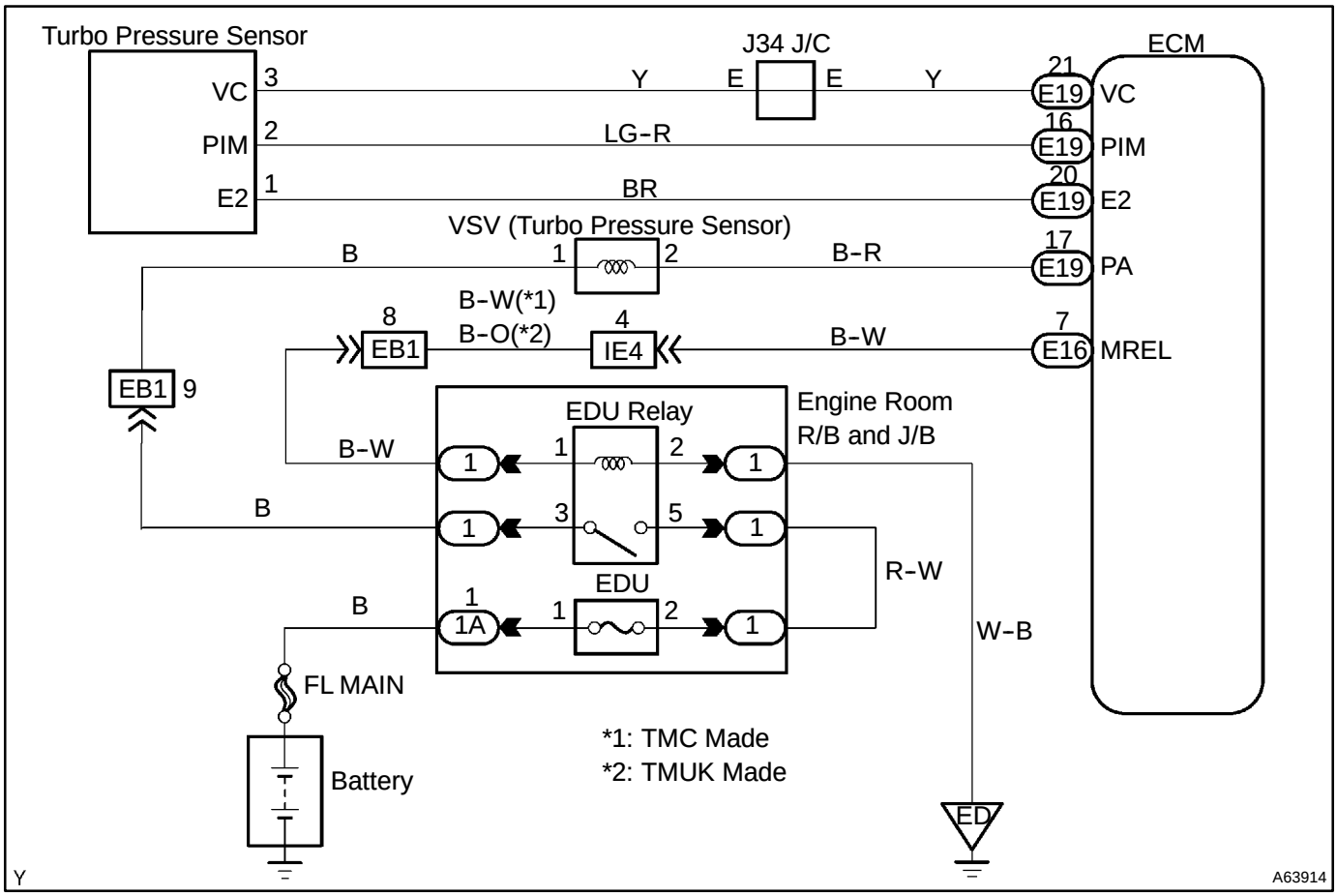
DTC No.	DTC Detection Condition	Trouble Area
35	Open or short in turbo pressure sensor circuit for 2 sec. or more	S Open or short in turbo pressure sensor circuit S Turbo pressure sensor S Open or short in VSV for turbo pressure sensor circuit S VSV for turbo pressure sensor S Vacuum hose disconnected or blocked S ECM

HINT:

After confirming DTC 35, use the hand-held tester to confirm the intake manifold pressure from the CURRENT DATA.

Intake Manifold Pressure (kPa)	Malfunction
Approx. 0	S PIM circuit short
130 or more	S VC circuit open or short S PIM circuit open S E2 circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC 22, 24, 35 and 39 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using Hand-held Tester:

1	READ VALUE OF HAND-HELD TESTER(INTAKE MANIFOLD PRESSURE)

(a) Read the value of intake manifold pressure on the hand-held tester.
Pressure: The same as atmospheric pressure.

OK → **Go to step 6**

NG

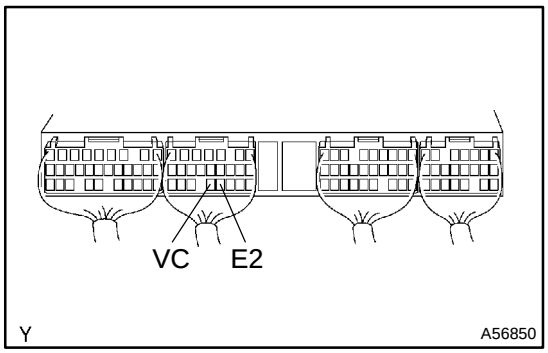
2	INSPECT DIESEL TURBO TURBO PRESSURE SENSOR (See page 13-3)

SST 09992-00242

NG → **REPLACE DIESEL TURBO TURBO PRESSURE SENSOR**

OK

3	INSPECT ECM

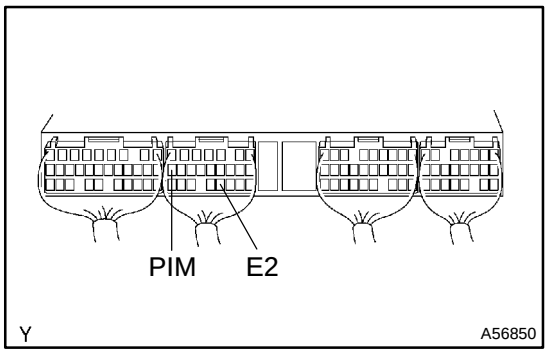


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VC and E2 of the ECM connector.
Voltage: 4.5 - 5.5 V

NG → **CHECK AND REPLACE ECM**

OK

4	INSPECT ECM

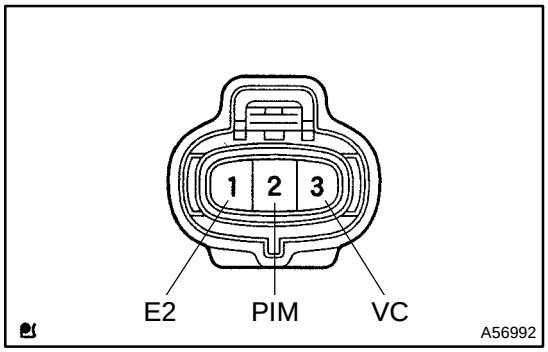


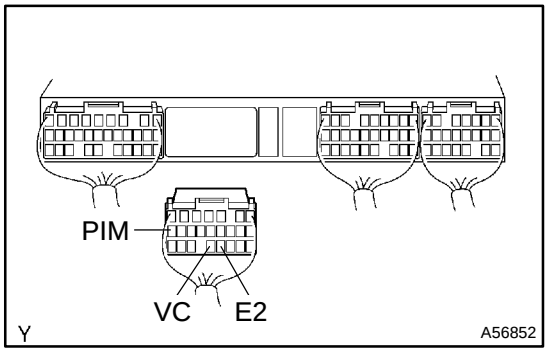
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals PIM and E2 of the ECM connector.
Voltage: 1.7 - 2.9 V

OK → **CHECK AND REPLACE ECM**

NG

5	CHECK HARNESS AND CONNECTOR(ECM-TURBO PRESSURE SENSOR)





(a) Disconnect the turbo pressure sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VC of the ECM E19 connector and VC of the turbo pressure sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PIM of the ECM E19 connector and PIM of the turbo pressure sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2 of the ECM E19 connector and E2 of the turbo pressure sensor harness side connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals VC and PIM of the ECM E19 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals VC, PIM and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

6	CHECK THE CONNECTION OF VACUUM HOSE(TURBO PRESSURE SENSOR-VSV FOR TURBO PRESSURE SENSOR,AND VSV FOR TURBO PRESSURE SENSOR-INTAKE MANIFOLD)

NG → **REPAIR OR REPLACE VACUUM HOSE**

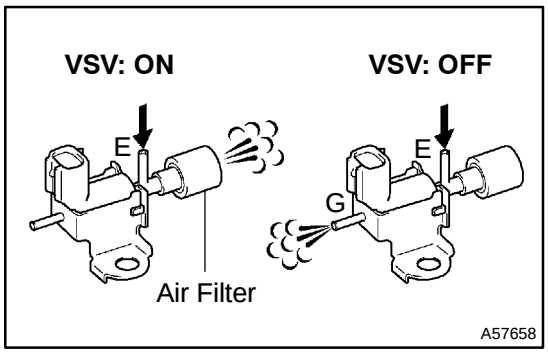
OK

7	INSPECT VACUUM SWITCHING VALVE ASSY NO.1 (See page 13-3)

NG → **REPLACE VACUUM SWITCHING VALVE ASSY NO.1**

OK

8	CHECK OPERATION OF VSV(PURGE FLOW)

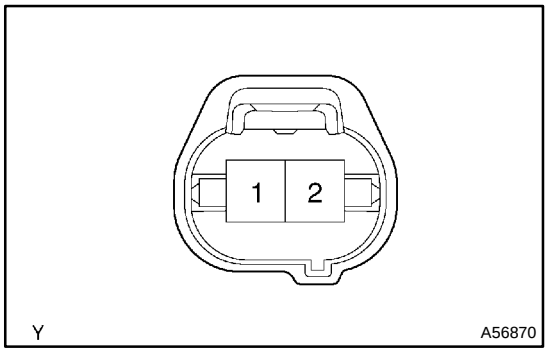


(a) Disconnect the vacuum hoses from the VSV.
(b) Turn the ignition switch ON.
(c) Check the operation of the VSV when it is operated by the hand-held tester.
VSV is ON:
Air from port E flows out through the air filter.
VSV is OFF:
Air from port E flows out through port G.

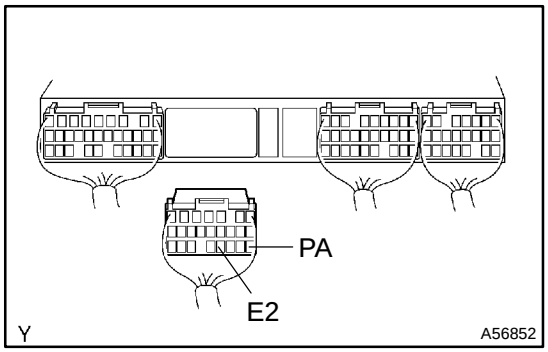
OK	CHECK AND REPLACE ECM

NG

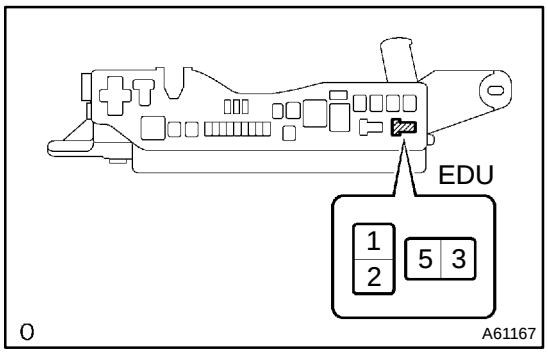
9	CHECK HARNESS AND CONNECTOR(ECM-VSV FOR TURBO PRESSURE SENSOR,AND VSV FOR TURBO PRESSURE)



(a) Disconnect the VSV connector.
(b) Disconnect the ECM E19 connector.
(c) Remove the EFI relay.
(d) Check for open between the terminals PA of the ECM E19 connector and 2 of the VSV harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals 1 of the VSV harness side connector and 3 of the EDU relay in the engine room R/B connector.
Resistance: 1 Ω or less



(f) Check for short between the terminals PA and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals 1 of the VSV and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more



NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE VACUUM SWITCHING VALVE ASSY NO.1

When not using Hand-held Tester:

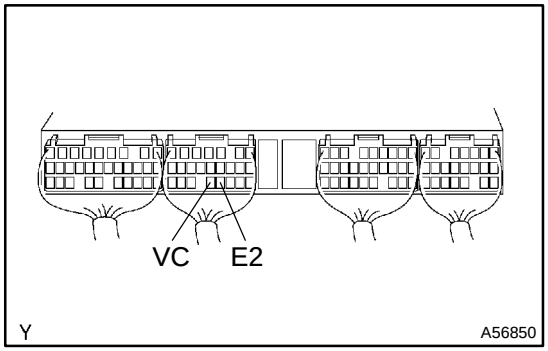
1	INSPECT DIESEL TURBO TURBO PRESSURE SENSOR (See page 13-3)

SST 09992-00242

NG → REPLACE DIESEL TURBO TURBO PRESSURE SENSOR

OK

2	INSPECT ECM

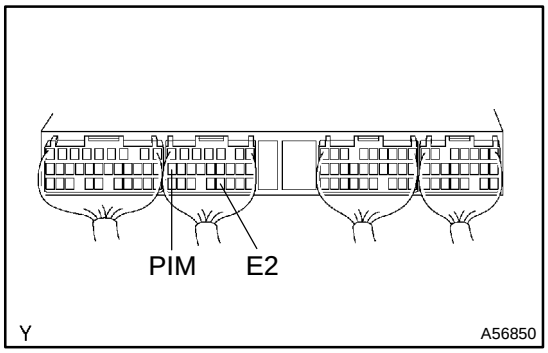


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals VC and E2 of the ECM connector.
Voltage: 4.5 - 5.5 V

NG → CHECK AND REPLACE ECM

OK

3	INSPECT ECM

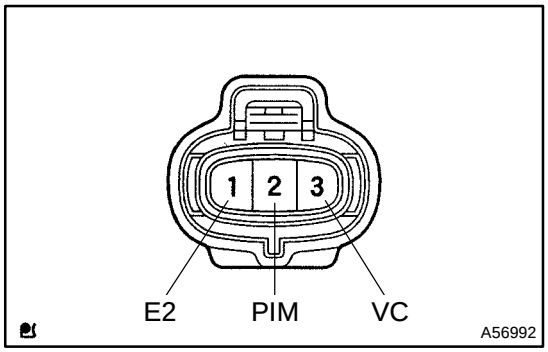


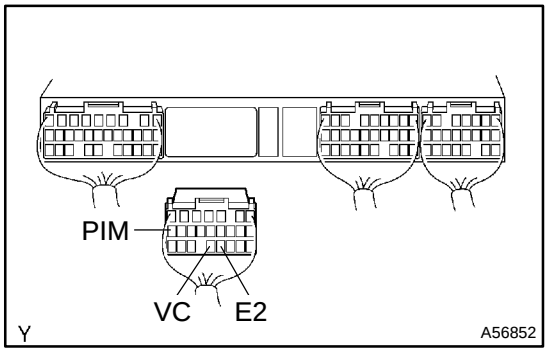
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals PIM and E2 of the ECM connector.
Voltage: 1.7 - 2.9 V

OK → CHECK AND REPLACE ECM

NG

4	CHECK HARNESS AND CONNECTOR(ECM-TURBO PRESSURE SENSOR)





(a) Disconnect the turbo pressure sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VC of the ECM E19 connector and VC of the turbo pressure sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PIM of the ECM E19 connector and PIM of the turbo pressure sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2 of the ECM E19 connector and E2 of the air turbo pressure sensor harness side connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals VC and PIM of the ECM E19 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals VC, PIM and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

5	CHECK THE CONNECTION OF VACUUM HOSE(TURBO PRESSURE SENSOR-VSV FOR TURBO PRESSURE SENSOR,AND VSV FOR TURBO PRESSURE SENSOR INTAKE MANIFOLD)

NG	REPAIR OR REPLACE VACUUM HOSE

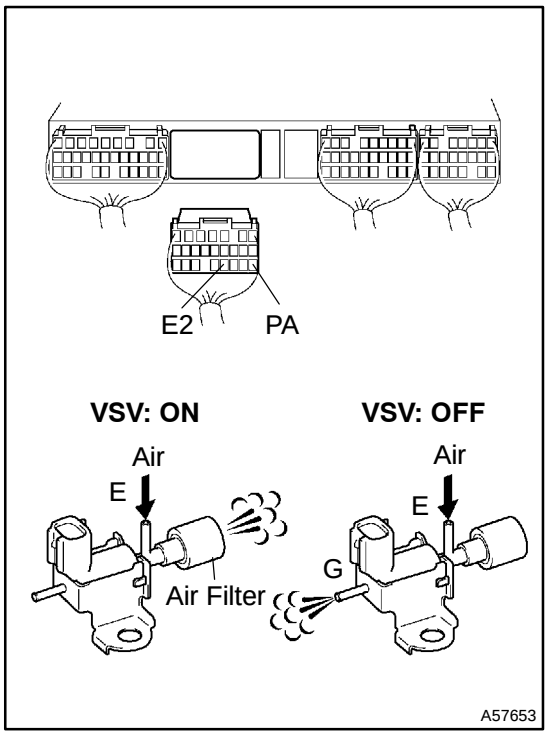
OK

6	INSPECT VACUUM SWITCHING VALVE ASSY NO.1 (See Page 13-5)

NG	REPLACE VACUUM SWITCHING VALVE ASSY NO.1

OK

7	CHECK OPERATION OF VSV(PURGE FLOW)



(a) Disconnect the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Check the VSV function.
(1) Connect between terminal PA and E2 of the ECM connector. (VSV is ON)

VSV is ON:
Air from port E flows out through the air filter.

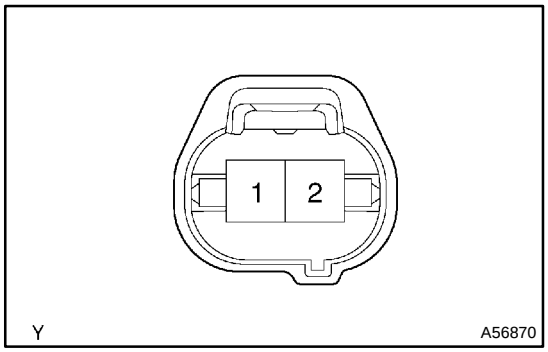
(2) Disconnect between terminal PA and E2 of the ECM connector. (VSV is OFF)

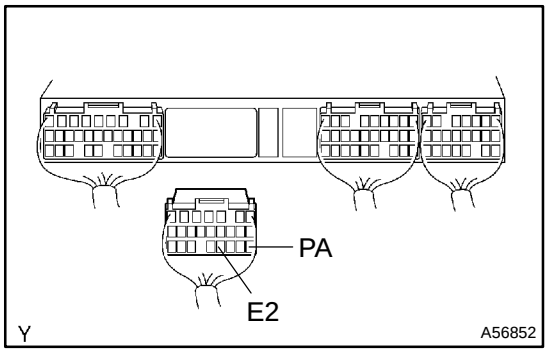
VSV is OFF:
Air from port E flows out through port G.

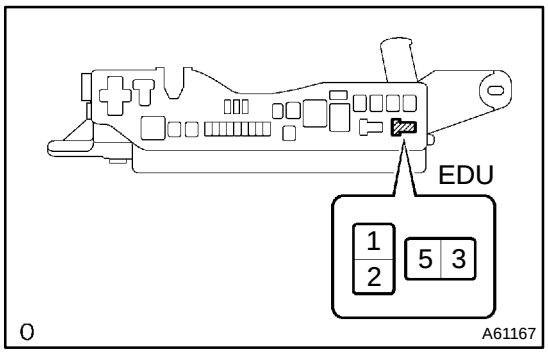
OK → **CHECK AND REPLACE ECM**

NG

8	CHECK HARNESS AND CONNECTOR(ECM-VSV FOR TURBO PRESSURE SENSOR,AND FOR TURBO PRESSURE SEN)







(a) Disconnect the VSV connector.
(b) Disconnect the ECM E19 connector.
(c) Remove the EDU relay.
(d) Check for open between the terminals PA of the ECM E19 connector and 2 of the VSV harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals 1 of the VSV harness side connector and 3 of the EDU relay in the engine room R/B connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals PA and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals 1 of the VSV and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

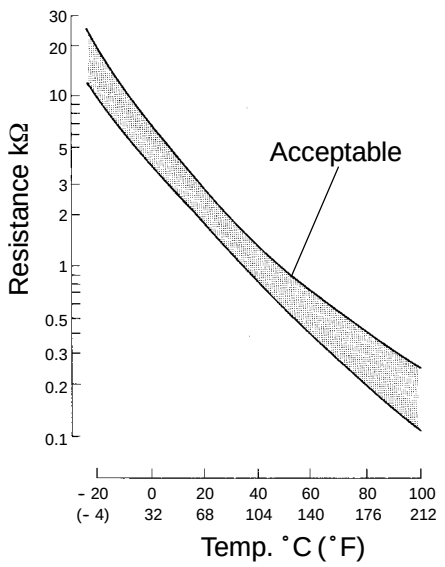
OK

REPLACE VACUUM SWITCHING VALVE ASSY NO.1

DTC	39	FUEL TEMP.SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

(Fig. 1)



The fuel temperature sensor senses the fuel temperature. A thermistor built into the sensor changes the resistance value according to the fuel temperature. The lower the fuel temperature, the greater the thermistor resistance value, and the higher the fuel temperature, the lower the thermistor resistance value (See Fig. 1).

The fuel temperature sensor is connected to the ECM (See below). The 5 V power source voltage in the ECM is applied to the fuel temperature sensor from terminal THF via a resistor R. That is, resistor R and the fuel temperature sensor are connected in series. When the resistance value of the fuel temperature sensor changes in accordance with changes in the fuel temperature, the potential at terminal THF also changes. Based on this signal, the ECM. Based on this signal, the ECM performs the pressure control compensation of the supply pump and error detection compensation of the highly pressurized fuel system.

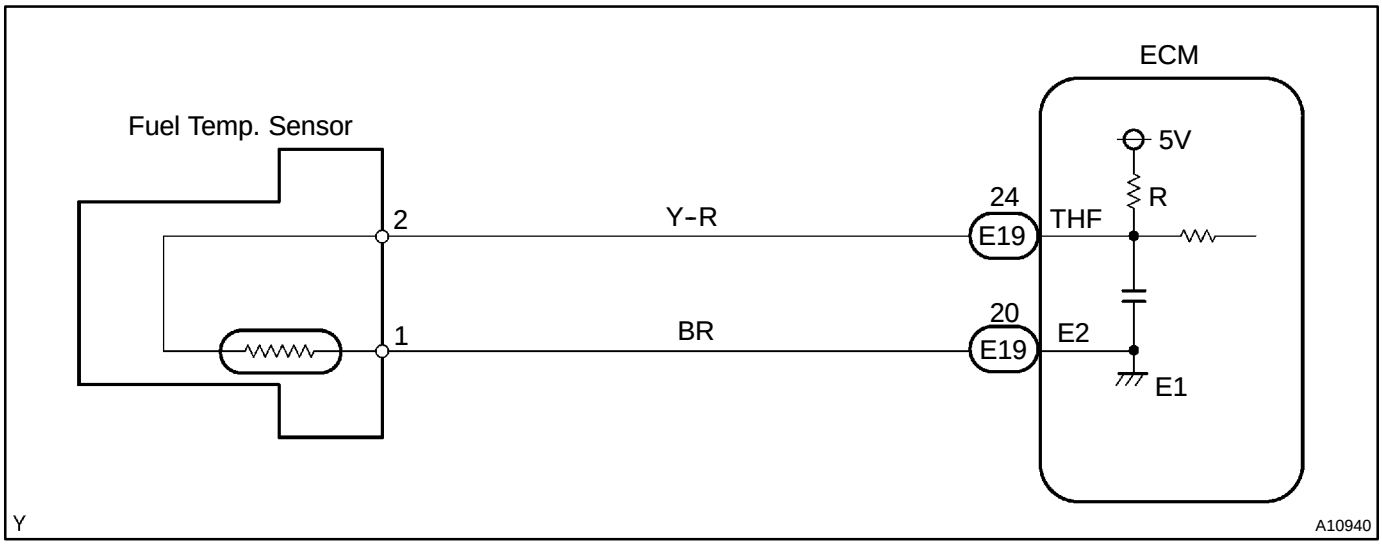
DTC No.	DTC Detection Condition	Trouble Area
39	Open or short in fuel temp. sensor circuit for 0.5 sec. or more	ŠOpen or short in fuel temp. sensor circuit ŠFuel temp. sensor ŠECM

HINT:

After confirming DTC 39, use the hand-held tester to confirm the fuel temperature from the CURRENT DATA.

Temperature displayed	Malfunction
- 40˚C (- 40˚F)	Open circuit
140˚C (284˚F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC 22, 24, 35 and 39 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using Hand-held Tester:

1	READ VALUE OF HAND-HELD TESTER (FUEL TEMP.)

(a) Read the temperature value on the hand-held tester.
Temperature: The same as actual fuel temperature.

Result:

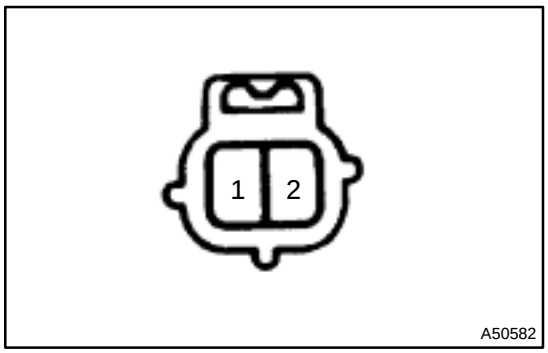
A	B	C
- 40_C(- 40_F)	140_C(284_F) or more	OK

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS**
(See page 05-424)

A

2	CHECK HARNESS AND CONNECTOR(CHECK FOR OPEN)

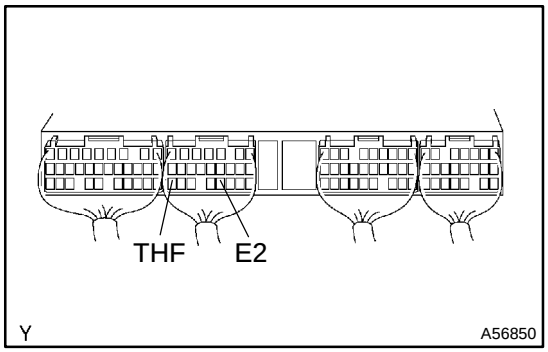


(a) Disconnect the fuel temperature sensor connector.
(b) Connect the sensor terminals 1 with 2 of water temperature sensor harness side connector.
(c) Turn the ignition switch ON.
(d) Read the temperature value on the hand-held tester.
Temperature: 140˚C (284˚F) or more

OK → **REPLACE INJECTION PUMP ASSY**

NG

3	INSPECT ECM(CHECK FOR OPEN)



(a) Connect between terminals THF and E2 of the ECM connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: 140˚C (284˚F) or more

OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

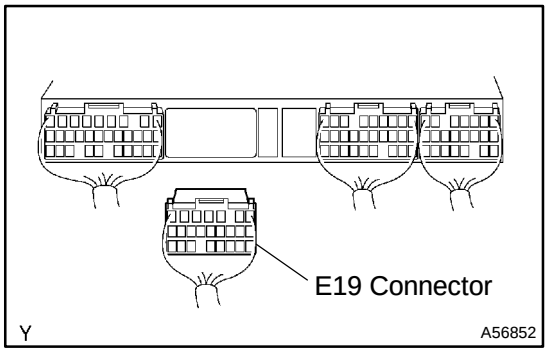
4	CHECK HARNESS AND CONNECTOR(CHECK FOR SHORT)

(a) Disconnect the fuel temperature sensor connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40˚C (- 40˚F)

OK → **REPLACE FUEL TEMPERATURE SENSOR**

NG

5	INSPECT ECM(CHECK FOR SHORT)



(a) Disconnect the ECM E19 connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand-held tester.
Temperature: - 40˚C (- 40˚F)

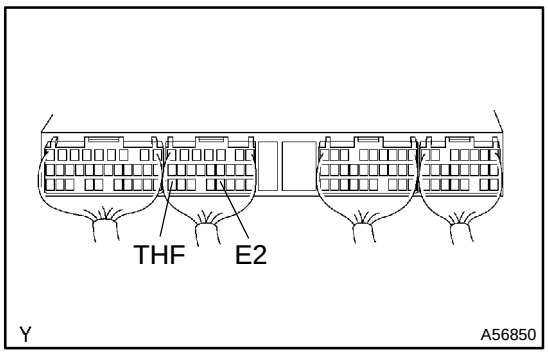
OK → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CHECK AND REPLACE ECM

When not using Hand-held Tester:

1	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals THF and E2 of the ECM connecter.
Voltage:

Fuel Temp. ˚C (˚F)	Voltage
20 (68) (Engine is cool)	0.2 - 3.8 V
80 (176) (Engine is hot)	0.1 - 1.5 V

OK → **CHECK FOR INTERMITTENT PROBLEMS** **(See page 05-429)**

NG

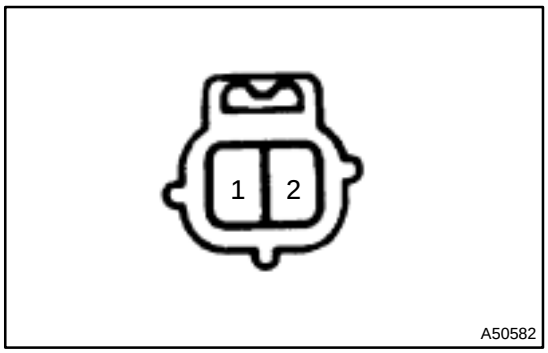
2	INSPECT INJECTION PUMP ASSY

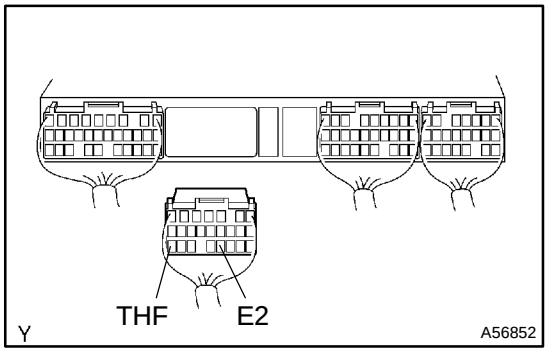
(a) Inspect the fuel temperature sensor.
(1) Disconnect the fuel temperature sensor connector.
(2) Measure the resistance between the fuel temperature sensor terminals.
Resistance: 0.5 - 3.0 Ω at 40_C (104_F)

NG → **REPLACE INJECTION PUMP ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(ECM-FUEL TEMP.SENSOR)





(a) Disconnect the fuel temperature sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals THF of the ECM E19 connector and 2 of the fuel temperature sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals E2 of the ECM E19 connector and 1 of the fuel temperature sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals THF and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

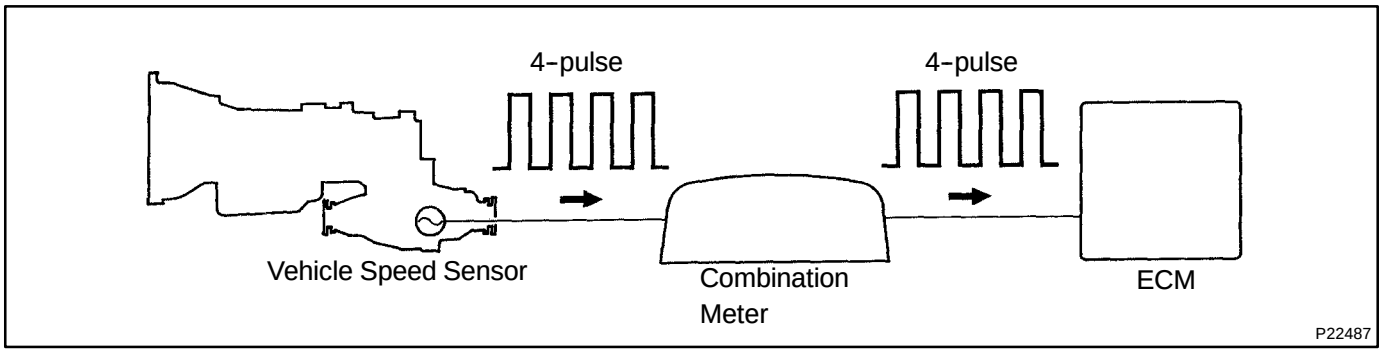
OK

CHECK AND REPLACE ECM

DTC	42	VEHICLE SPEED SENSOR SIGNAL CIRCUIT MALFUNCTION

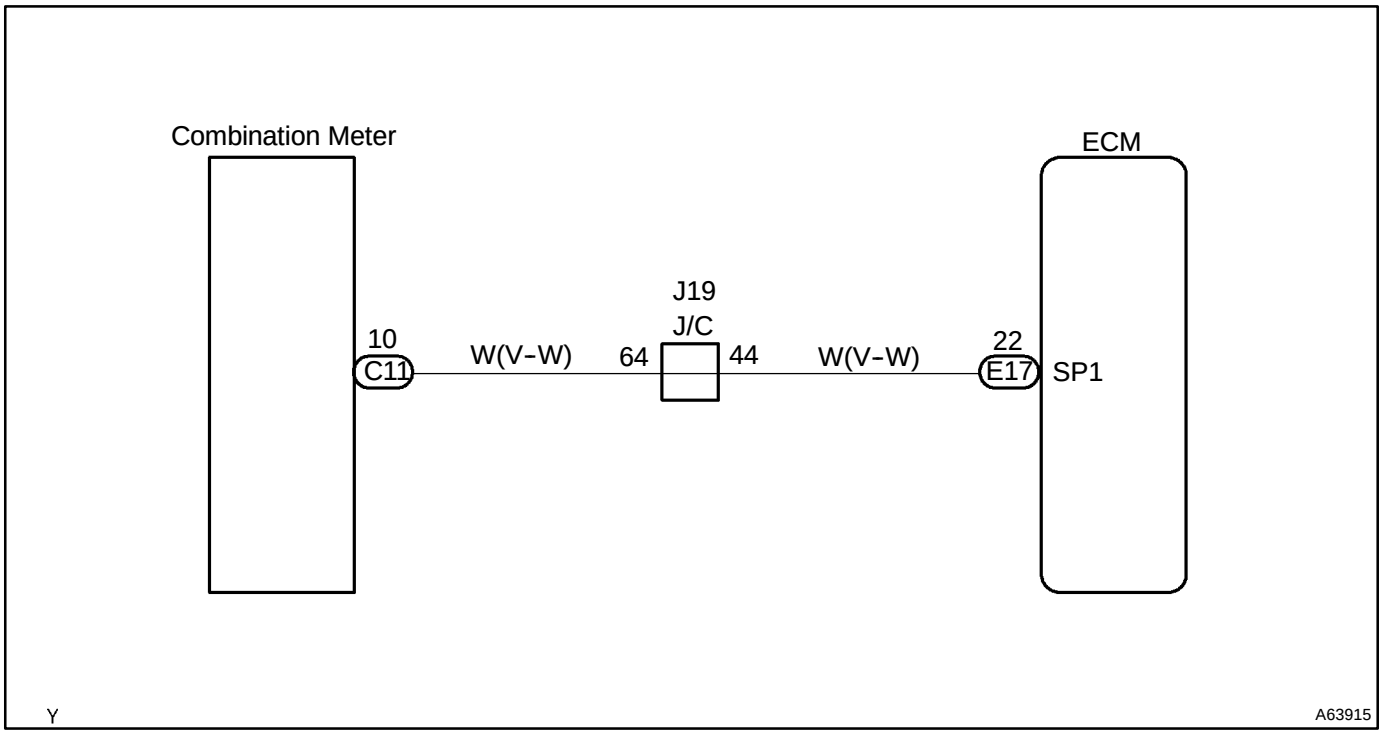
CIRCUIT DESCRIPTION

The vehicle speed sensor outputs a 4-pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the ECM. The ECM determines the vehicle speed based on the frequency of these pulse signals.



DTC No.	DTC Detection Condition	Trouble Area
42	All conditions below are detected continuously for 8 sec. or more: (a) Vehicle speed signal: 0 km/h (0 mph) (b) Engine speed: 2,000 - 4,000 rpm (c) Engine coolant temp.: 60°C (176°F) or more (d) Accelerator pedal opening angle : 29 % or more	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

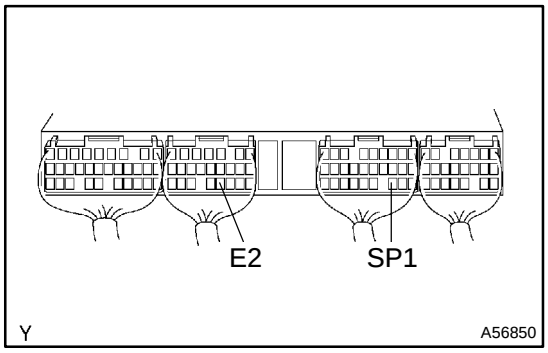
1	CHECK OPERATION OF SPEED METER

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.
HINT:
The vehicle speed sensor is operating normally if the speedometer display is normal.

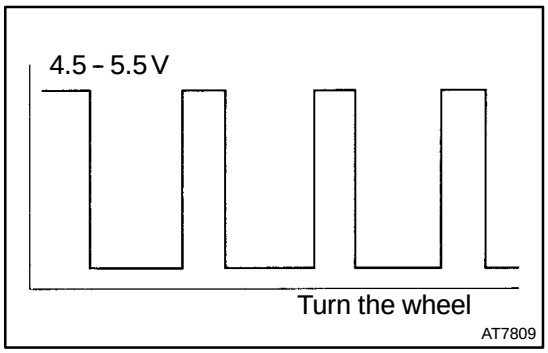
NG → CHECK SPEED METER CIRCUIT

OK

2	INSPECT ECM



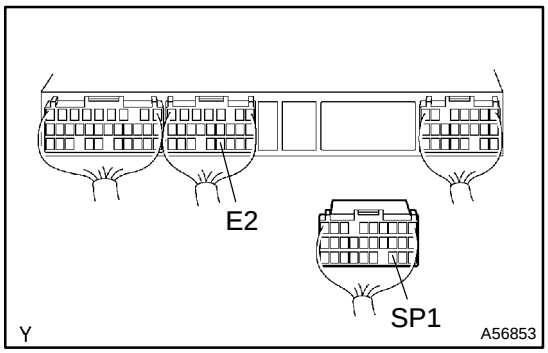
(a) Shift the shift lever to the neutral.
(b) Jack up one of the front wheels.
(c) Turn the ignition switch ON.
(d) Measure the voltage between terminal SP1 and E2 of the ECM connector when the wheel is turned slowly.
Result: Voltage is generated intermittently.



OK → CHECK AND REPLACE ECM

NG

3	CHECK HARNESS AND CONNECTOR(COMBINATION METER-ECM)



(a) Disconnect the combination meter C8 connector. (See page 71-32)

(b) Disconnect the ECM E17 connector.

(c) Check for open between the terminals SP1 of the ECM E17 connector and C8 of the combination meter connector. (Terminal arrangement on 05-1295)
Resistance: 1 Ω or less

(d) Check for short between the terminals SP1 of the ECM E19 connector and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

OK → **CHECK AND REPLACE ECM**

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

DTC	49	FUEL PRESSURE SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

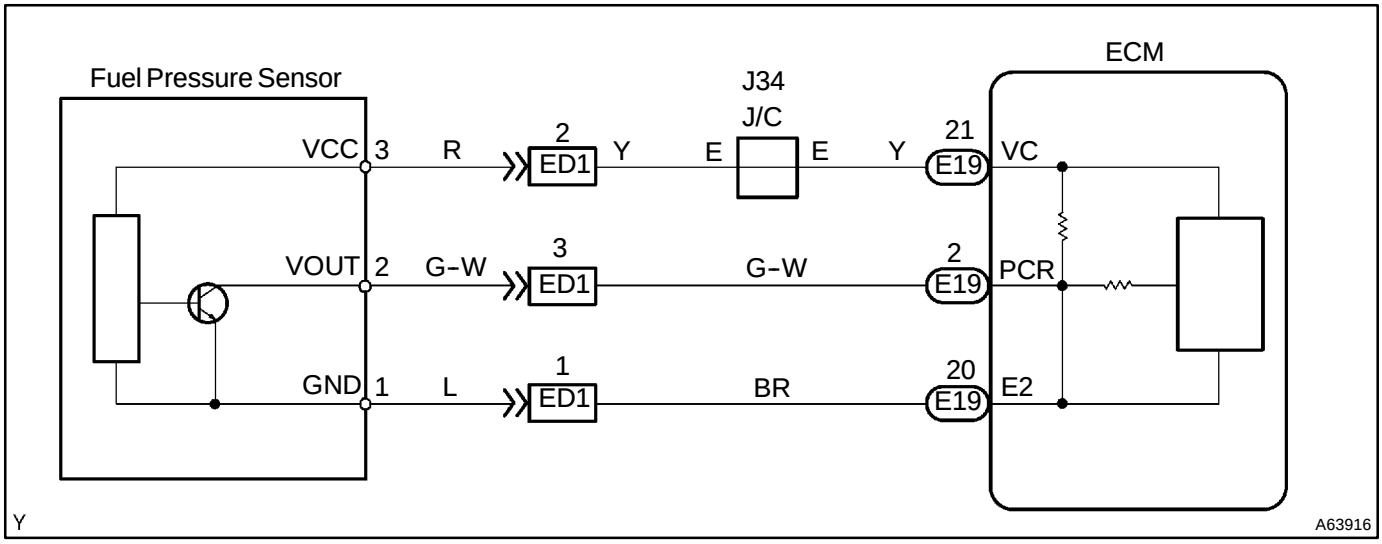
Fuel pressure sensor installed on a Common Rail detects the fuel pressure and controls to feed back the pump discharge in order to keep the target pressure (20 – 135 Mpa) set by the engine control computer.

DTC No.	DTC Detection Condition	Trouble Area
P49	Open or short in fuel pressure sensor circuit for common rail	S Open or short in fuel pressure sensor circuit for common rail S Fuel pressure sensor for common rail S ECM

HINT:

After confirming DTC 49, use the hand-held tester to confirm the fuel rail pressure from the CURRENT DATA.

WIRING DIAGRAM

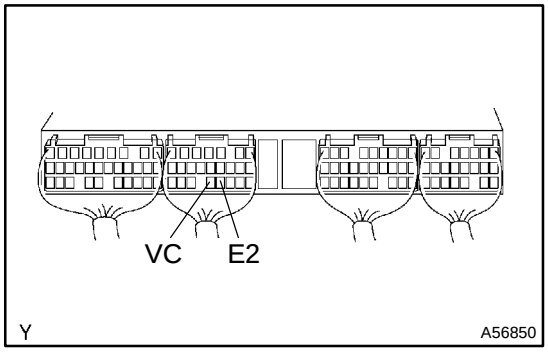


INSPECTION PROCEDURE

HINT:

- S If DTC 22, 24, 39 and 49 are output simultaneously, E2 (sensor ground) may be open.
- S Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

1	INSPECT ECM



(a) Turn the ignition switch ON.

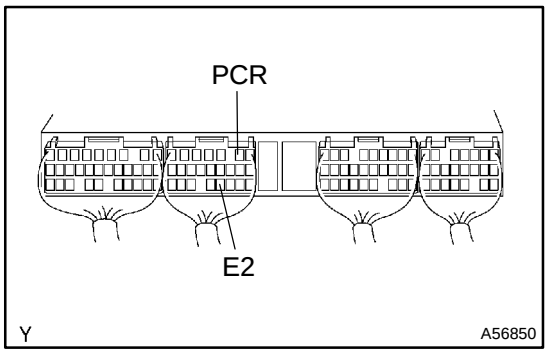
(b) Measure the voltage between terminals VC and E2 of the ECM connector.

Voltage: 4.5 - 5.5 V

NG → **CHECK AND REPLACE ECM**

OK

2	INSPECT ECM

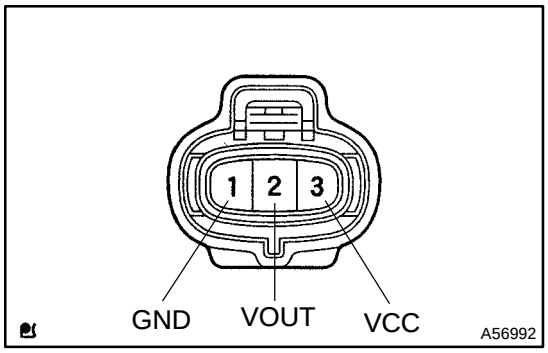


(a) Start the engine.
(b) Measure the voltage between terminals PCR and E2 of the ECM connector.
Voltage: 4.6 V at 20°C (68°F)

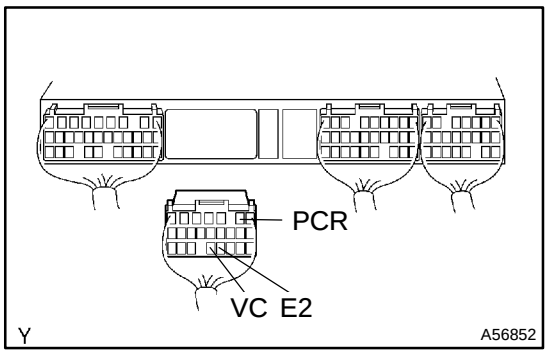
OK → **CHECK AND REPLACE ECM**

NG

3	CHECK HARNESS AND CONNECTOR(COMMON RAIL FUEL PRESSURE SENSOR-ECM)



(a) Disconnect the fuel pressure sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VC of the ECM E19 connector and 3 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PCR of the ECM E19 connector and 2 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2 of the ECM E19 connector and 1 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less



(f) Check for short between the terminals VC and PCR of the ECM E19 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals VC, PCR and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE COMMON RAIL ASSY

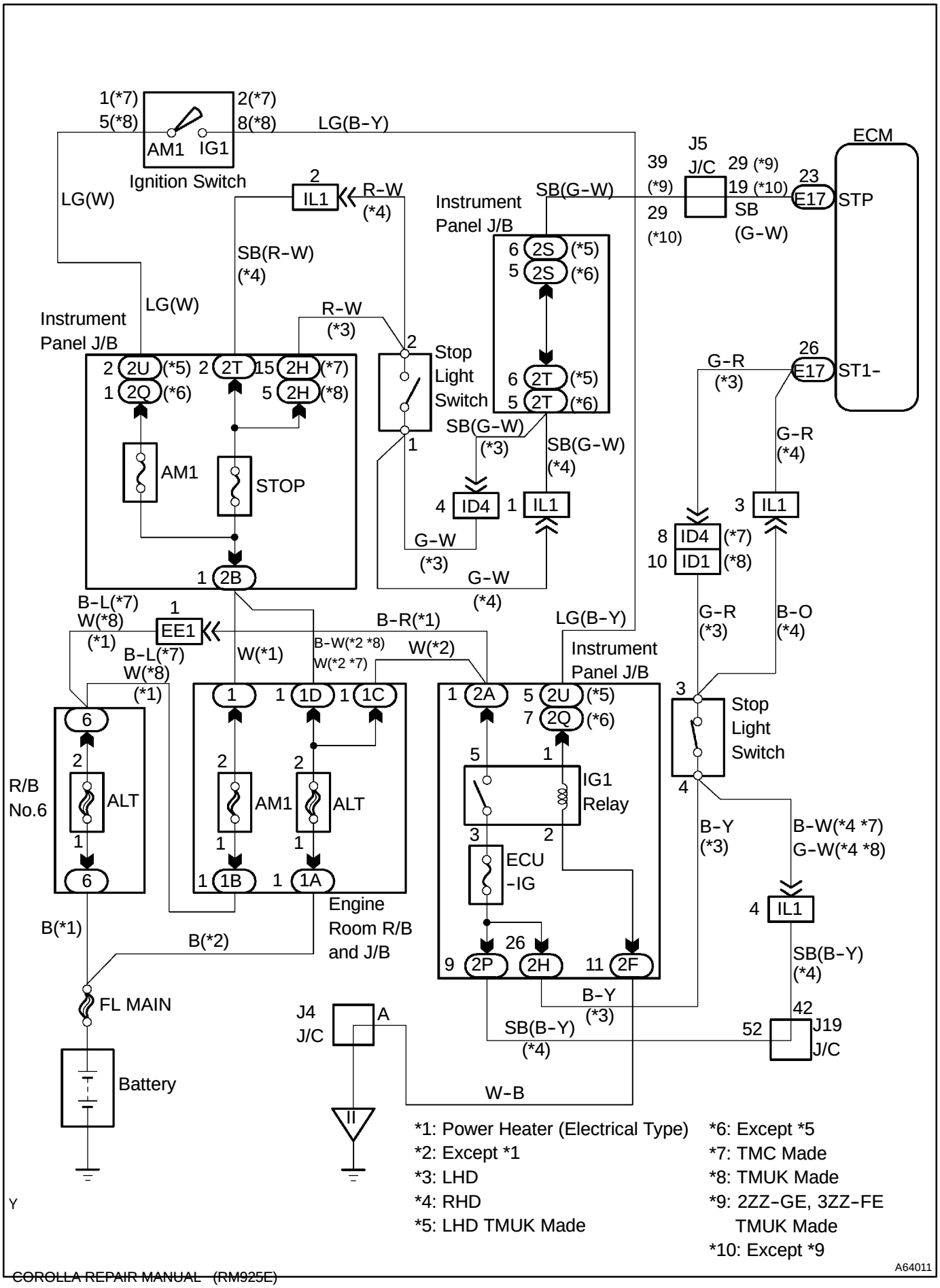
DTC	51	STOP LIGHT SWITCH CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

In this system, the signal of the stoplight switch is used for the judgement to detect abnormality in the acceleration system.
The stoplight switch has a duplex system (STP and ST1-) .
That is to memorize the abnormality when the signals at the time of depressing and nondepressing the brake pedal are detected simultaneously.

DTC No.	DTC Detection Condition	Trouble Area
51	When STP (without depressing the brake pedal) and ST1- (with the brake pedal depressed) signals continue for longer than 0.5 seconds with the ignition switch ON	S Open or short in stop light switch signal circuit S Stop light switch S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand-held tester,as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

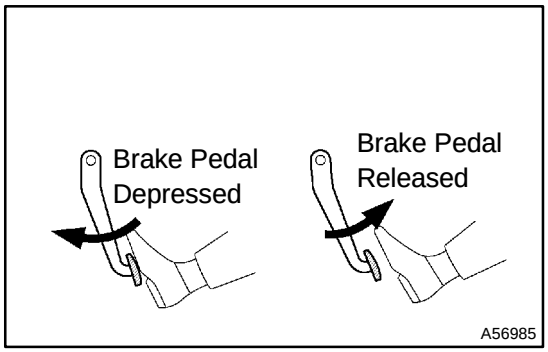
1	CHECK OPERATION OF STOP LIGHT

(a) Check if the stop lights go on and off normally when the brake pedal is depressed and released.

NG → REPAIR STOP LIGHT SWITCH CIRCUIT

OK

2	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Check the voltage between terminal STP and E1 of the ECM connector.

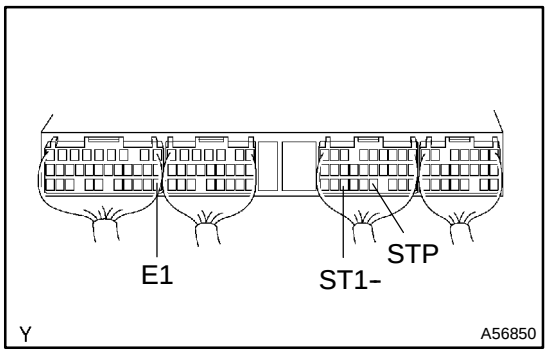
Voltage:

Brake Pedal	Voltage
Depressed	7.5 - 14 V
Released	Below 1.5 V

(c) Check the voltage between terminal ST1- and E1 of the ECM connector.

Voltage:

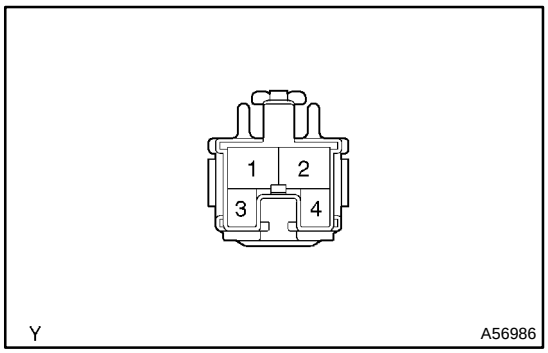
Brake Pedal	Voltage
Depressed	Below 1.5 V
Released	7.5 - 14 V

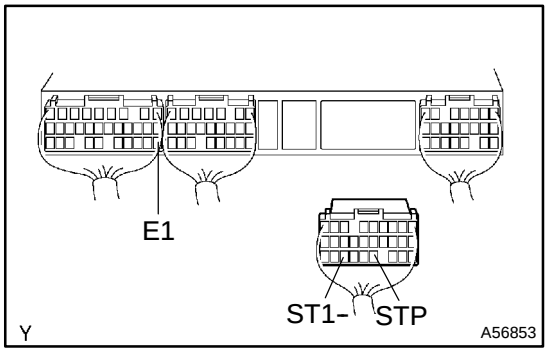


OK → CHECK FOR INTERMITTENT PROBLEMS (See page 05-429)

NG

3	CHECK HARNESS AND CONNECTOR(ECM-STOP LIGHT SWITCH)





(a) Disconnect the stop light switch connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals STP of the ECM E17 connector and 1 of the stop light switch harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals ST1- of the ECM E17 connector and 4 of the stop light switch harness side connector.
Resistance: 1 Ω or less
(e) Check for short between the terminals STP, ST1- and E1 of the ECM E17 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

DTC	78(1)	FUEL PUMP CIRCUIT MALFUNCTION(FUEL LEAKAGE)

CIRCUIT DESCRIPTION

Refer to DTC 49 on page 05-500.
Refer to DTC 97 on page 05-516.

DTC No.	DTC Detection condition	Trouble Area
78 (1)	Pressure change of common rail is abnormal against injection quantify and supply quantify of supply pump	S Open or short in EDU circuit S EDU S Open or short in injector circuit S Injector S Open or short in common rail pressure sensor circuit S Common rail pressure sensor S Fuel line between supply pump and common rail S Fuel line between common rail and injector S Pressure limiter S ECM

WIRING DIAGRAM

Refer to DTC 49 on page 05-500.
Refer to DTC 97 on page 05-516.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using Hand-Held tester:

1	READ OUTPUT DTC

Result:

	A	B
Result	39, 49, 78 (2), 78 (3) or 97 are not output	39, 49, 78 (2), 78 (3) or 97 are output

B → GO TO RELEVANT DTC CHART (See page 05-432)

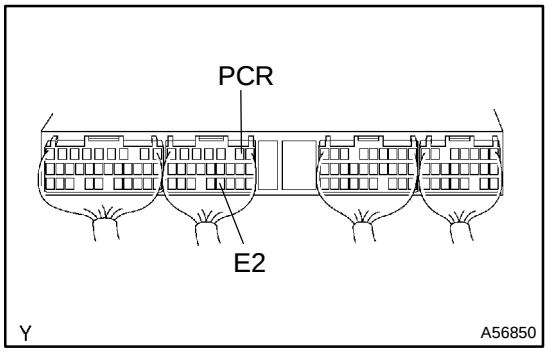
A

2	CHECK FUEL LEAKAGE(ENGINE ROOM)

NG → REPAIR OR REPLACE

OK

3	INSPECT ECM

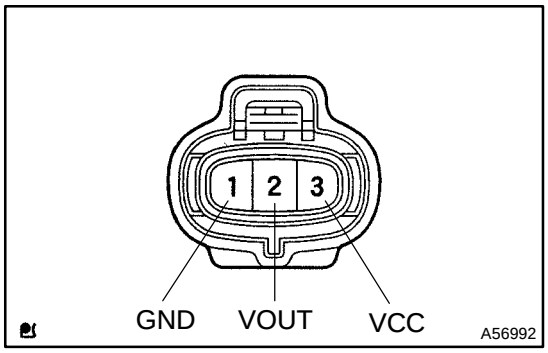


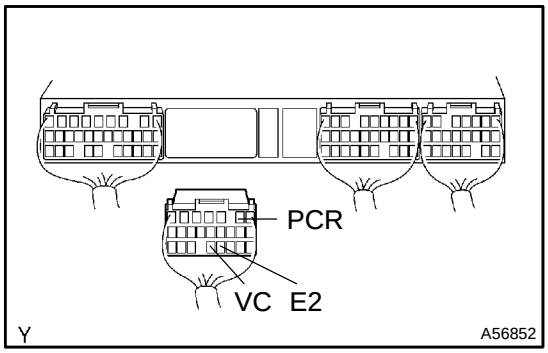
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals PCR and E2 of the ECM E18 connector.
Voltage: Approx. 1 V at 20˚C (68˚F)

OK	Go to step 5

NG

4	CHECK HARNESS AND CONNECTOR(COMMON RAIL FUEL PRESSURE SENSOR-ECM)





(a) Disconnect the fuel pressure sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VC of the ECM E19 connector and 3 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PCR of the ECM E19 connector and 2 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2 of the ECM E19 connector and 1 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals VC and PCR of the ECM E19 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals VC, PCR and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE COMMON RAIL ASSY

5	READ VALUE OF HAND-HELD TESTER(COMRENSATION OF INJECTION QUANTIFY BETWEEN CYLINDERS)

(a) Turn the ignition switch ON.
(b) Read the compensation of the injection quantify between the cylinders on the hand-held tester.
Result:
STD - 3 - 3 mm^3/st
Maximum - 5 - 5 mm^3/st

NG → REPLACE INJECTOR ASSY

OK

6	CHECK FUEL(MIXED WITH ENGINE OIL)

NG → REPLACE INJECTOR ASSY

OK

7	CHECK EXHAUST GAS(WHEN YOU START ENGINE,WHITE SMOKE)

NG → REPLACE INJECTOR ASSY

OK

8	INSPECT INJECTOR ASSY (See page 05-482)

NG → REPLACE INJECTOR ASSY

OK

REPLACE COMMON RAIL ASSY

When not using Hand-held Tester:

1	READ OUTPUT DTC

SST 09843-18040

Result:

	A	B
Result	39, 49, 78 (2), 78 (3) or 97 are not output	39, 49, 78 (2), 78 (3) or 97 are output

B → GO TO RELEVANT DTC CHART (See page 05-432)

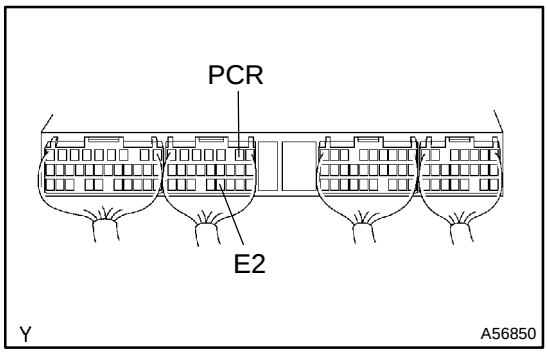
A

2	CHECK FUEL LEAKAGE(ENGINE ROOM)

NG → REPAIR OR REPLACE

OK

3	INSPECT ECM

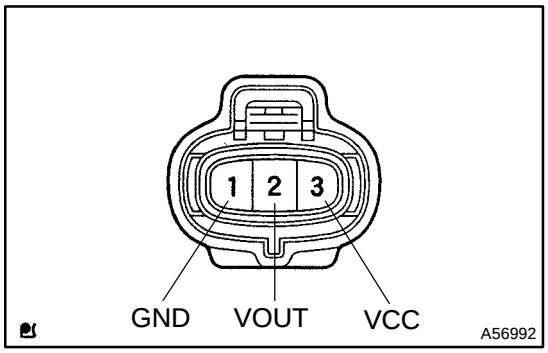


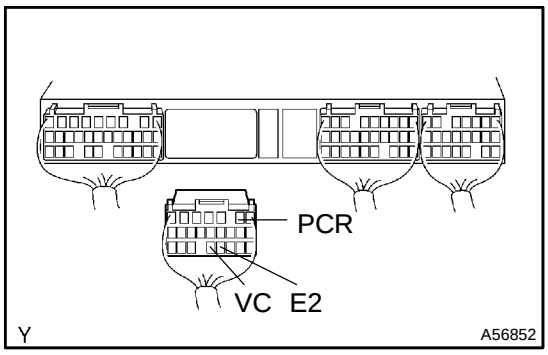
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals PCR and E2 of the ECM E19 connector.
Voltage: Approx. 1 V at 20˚C (68˚F)

OK → Go to step 5

NG

4	CHECK HARNESS AND CONNECTOR(COMMON RAIL FUEL PRESSURE SENSOR-ECM)





(a) Disconnect the fuel pressure sensor connector.
(b) Disconnect the ECM E19 connector.
(c) Check for open between the terminals VC of the ECM E19 connector and 3 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PCR of the ECM E19 connector and 2 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals E2 of the ECM E19 connector and 1 of the fuel pressure sensor harness side connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals VC and PCR of the ECM E19 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals VC, PCR and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE COMMON RAIL ASSY

5	CHECK FUEL(MIXED WITH ENGINE OIL)

NG → REPLACE INJECTOR ASSY

OK

6	CHECK EXHAUST GAS(WHEN YOU START ENGINE,WHITE SMOKE)

NG → REPLACE INJECTOR ASSY

OK

GO TO DTC CHART (See page 05-511)

DTC	78(2)	FUEL PUMP CIRCUIT MALFUNCTION(OPEN CIRCUIT)

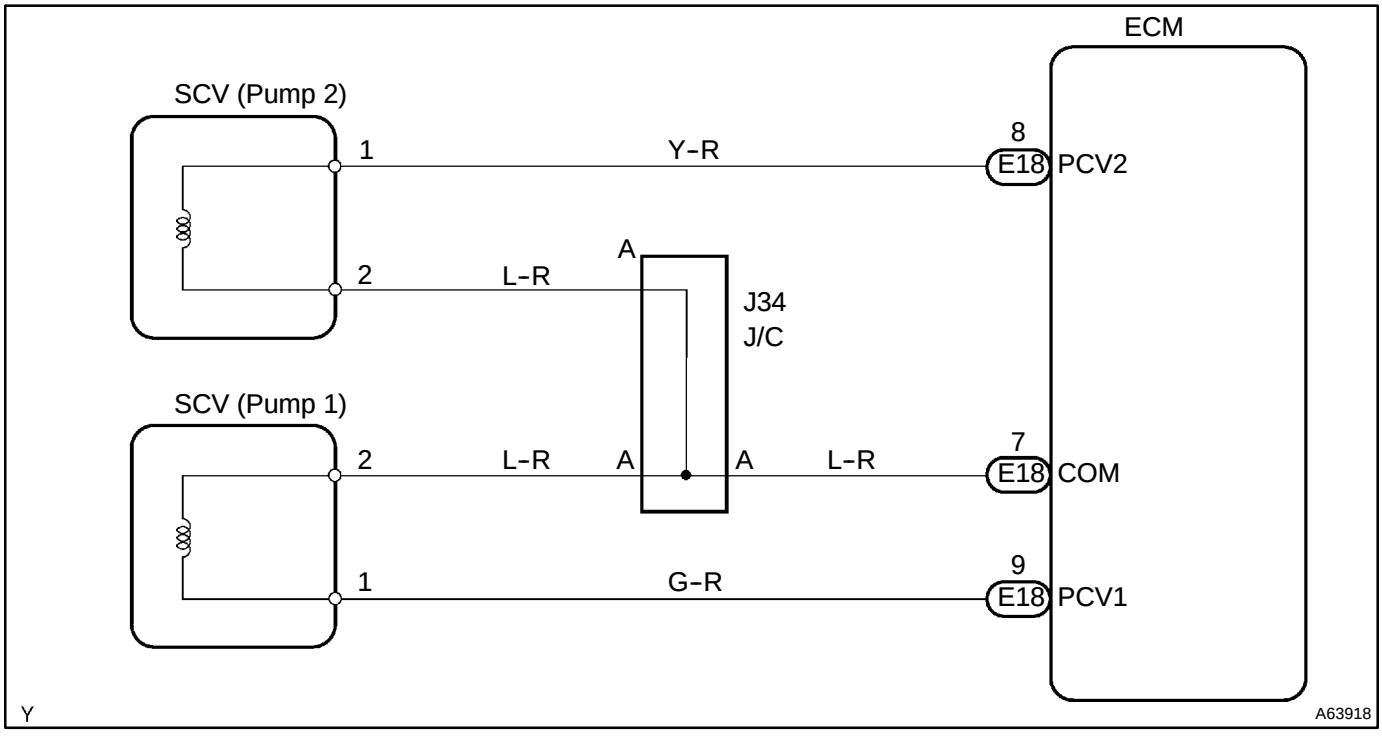
DTC	78(3)	FUEL PUMP CIRCUIT MALFUNCTION(OVER FORCE FEED)

CIRCUIT DESCRIPTION

Supply pump is a tandem type and has two circuits of the fuel suction and force feed processes that achieve both high pressure force feed of fuel and reduction of driving torque.
In the suction process, it control SCV (Suction Control Valve) which suctions fuel by a plunger.

DTC No.	DTC Detection condition	Trouble Area
78 (2) 78 (3)	Pressure change of common rail against supply quantify of supply pump is abnormal	$ Open or short in SCV circuit $ SCV $ Supply pump $ ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using Hand-held Tester:

1	READ OUTPUT DTC

Result:

	A	B
Result	39, 49, or 97 are not output	39, 49 or 97 are output

B → GO TO RELEVANT DTC CHART (See page 05-432)

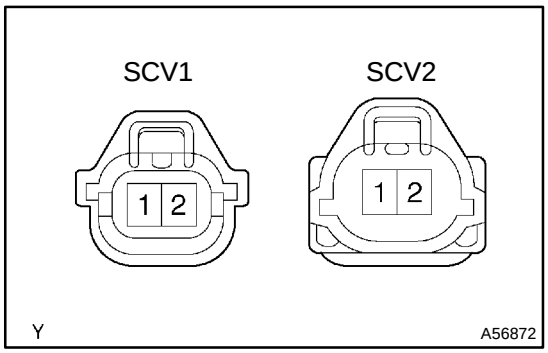
A

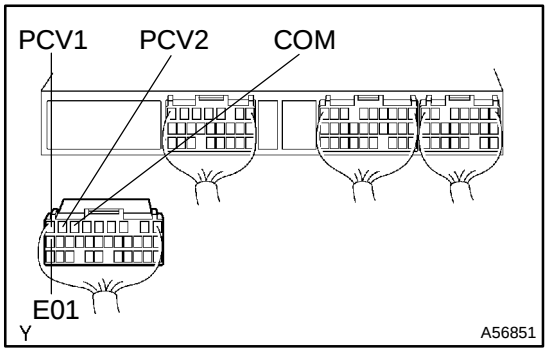
2	INSPECT INJECTION PUMP ASSY(CHECK SCV1 AND SCV2) (See page 11-60)

NG → REPLACE INJECTION PUMP ASSY

OK

3	CHECK HARNESS AND CONNECTOR(SCV-ECM)



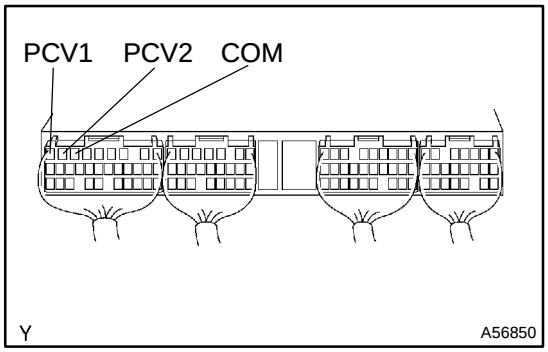


(a) Disconnect the SCV1 and SCV2 connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals PCV1 of the ECM E18 connector and 1 of the SCV1 harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PCV2 of the ECM E18 connector and 1 of the SCV2 harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals COM of the ECM E18 connector and 2 of the SCV1 and SCV2 harness side connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals PCV1, PCV2 and COM of the ECM E18 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals PCV1, PCV2, COM and E01 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → REPLACE HARNESS AND CONNECTOR

OK

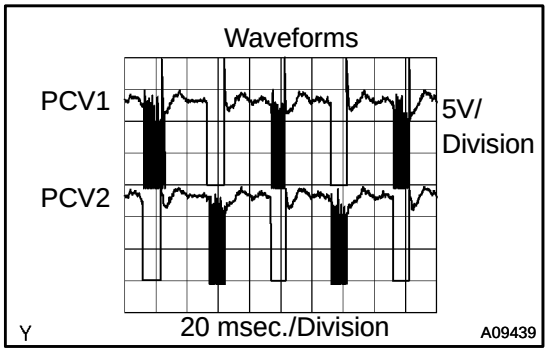
4	INSPECT ECM



(a) Check the output waveform.

Item	Contents
Terminal	CH1: PCV1 ⇔ COM CH2: PCV2 ⇔ COM
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or idling

HINT:
The correct waveforms are as shown.



NG → CHECK AND REPLACE ECM

OK →

REPLACE INJECTION PUMP ASSY

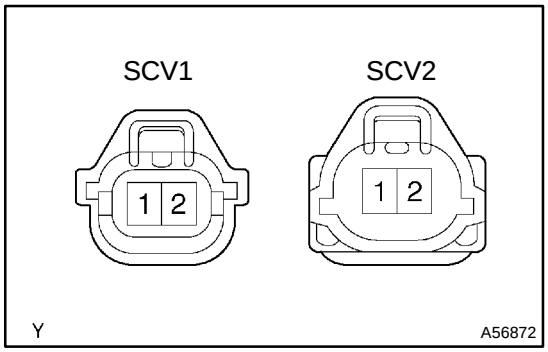
When not using Hand-held Tester:

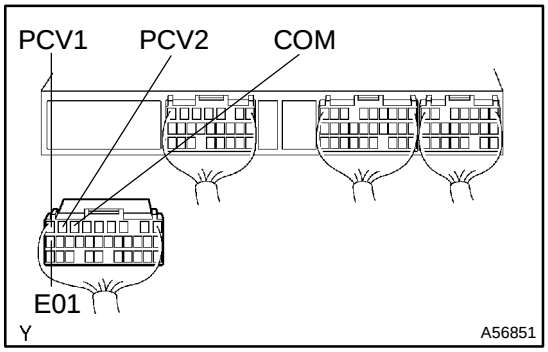
1	INSPECT INJECTION PUMP ASSY(CHECK SCV1 AND SCV2) (See page 11-60)

NG → REPLACE INJECTION PUMP ASSY

OK →

2	CHECK HARNESS AND CONNECTOR(SCV-ECM)



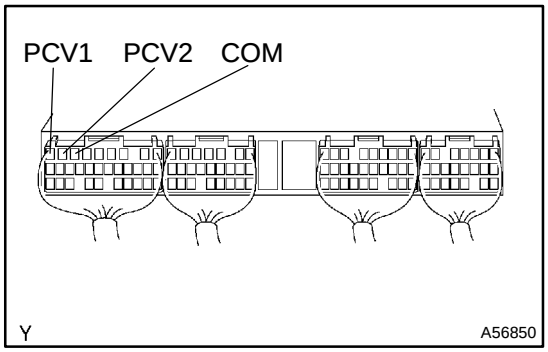


(a) Disconnect the SCV1 and SCV2 connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals PCV1 of the ECM E18 connector and 1 of the SCV1 harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PCV2 of the ECM E18 connector and 1 of the SCV2 harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals COM of the ECM E18 connector and 2 of the SCV1 and SCV2 harness side connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals PCV1, PCV2 and COM of the ECM E18 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals PCV1, PCV2, COM and E01 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

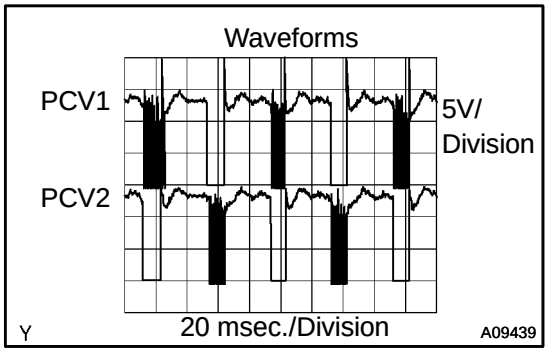
3	INSPECT ECM



(a) Check the output waveform.

Item	Contents
Terminal	CH1: PCV1 ⇔ COM CH2: PCV2 ⇔ COM
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or idling

HINT:
The correct waveforms are as shown.



NG → CHECK AND REPLACE ECM

OK

4	CHECK ENGINE START

YES → REPLACE INJECTION PUMP ASSY

NO

5	INSPECT INJECTOR ASSY (See page 05-482)

NG → REPLACE INJECTOR ASSY

OK

REPLACE COMMON RAIL ASSY

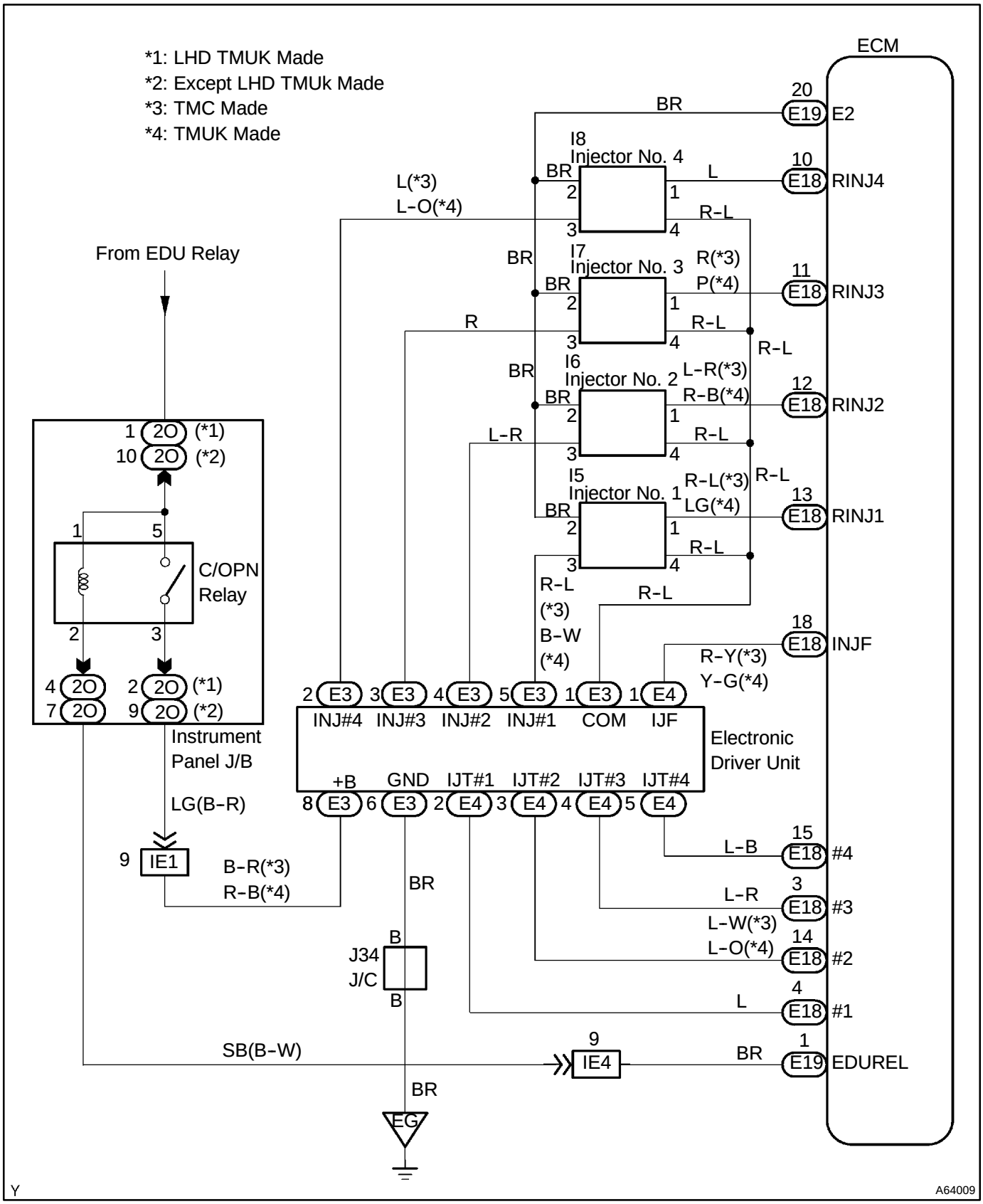
DTC	97	EDU CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

The ECM has been adopted to drive the injector at high speeds. The EDU has realized high-speed driving under high fuel pressure conditions through the use of a DC/DC converter that provides a high-voltage, quick-charging system.
The ECM constantly monitors the EDU and stops the engine in case an abnormal condition is detected.

DTC No.	DTC Detection condition	Trouble Area
97	Open or short in EDU circuit	S Open or short in EDU circuit S EDU S Open or short in SCV circuit S SCV S Injector S ECM

WIRING DIAGRAM

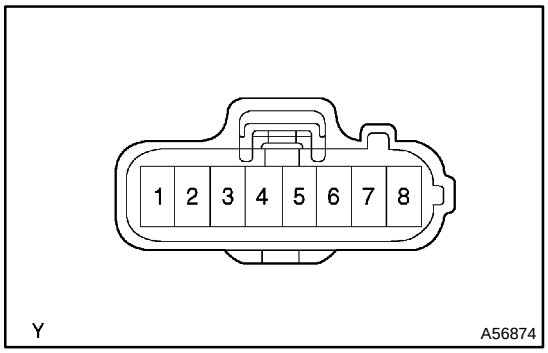


INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ration was lean or rich, etc. at the time of the malfunction.

1	CHECK HARNESS AND CONNECTOR(EDU PPOWER SOURCE)

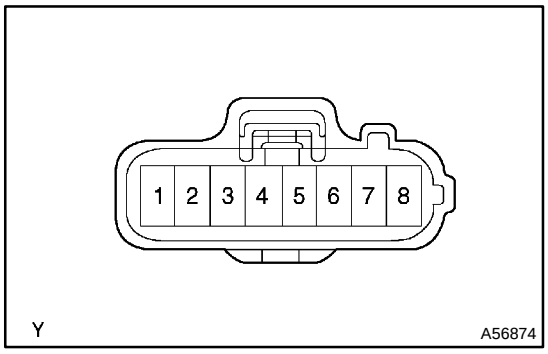


(a) Disconnect the EDU E3 connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminals 6 and 8 of the wire harness side connector.
Voltage: 9 - 14 V

NG → **CHECK EDU POWER SOUCE CIRCUIT**

OK

2	CHECK HARNESS AND CONNECTOR(FOR EDU CONNECTOR)



(a) Disconnect the EDU E3 connector.
(b) Turn the ignition switch ON.
(c) Measure the resistance between terminals 1 and 2 - 5 of the wire harness side connector.
Resistance: 2.5 - 3.1 Ω at 20°C (68°F)

OK → **Go to step 4**

NG

3	INSPECT INJECTOR ASSY (See page 05-482)

NG → **REPLACE INJECTOR ASSY**

OK

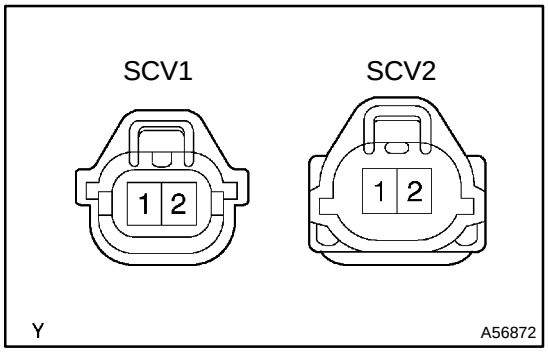
REPAIR OR REPLACE HARNESS AND CONNECTOR

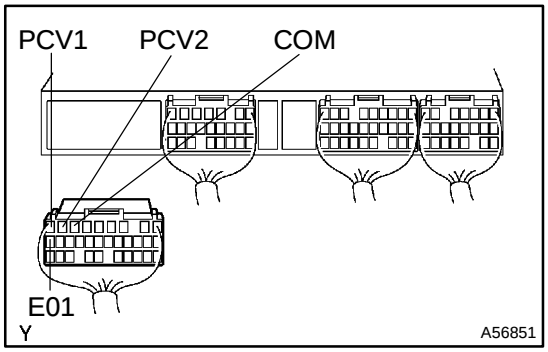
4	INSPECT INJECTION PUMP ASSY(CHECK SCV1 AND SCV2) (See page 11-60)

NG → **REPLACE INJECTION PUMP ASSY**

OK

5 CHECK HARNESS AND CONNECTOR(SCV1 AND SCV2-ECM)



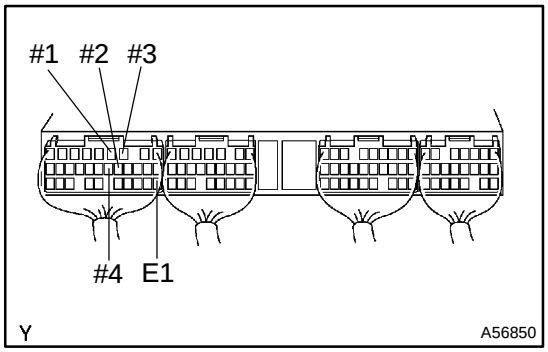


(a) Disconnect the SCV1 and SCV2 connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals PCV1 of the ECM E18 connector and 1 of the SCV1 harness side connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals PCV2 of the ECM E18 connector and 1 of the SCV2 harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals COM of the ECM E18 connector and 2 of the SCV1 and SCV2 harness side connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals PCV1, PCV2 and COM of the ECM E18 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals PCV1, PCV2, COM and E01 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

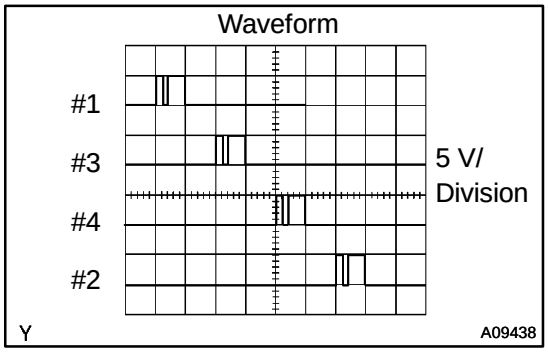
6 INSPECT ECM



(a) Check the output waveform.

Item	Contents
Terminal	#1 - #4 ⇔ E1
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or idling

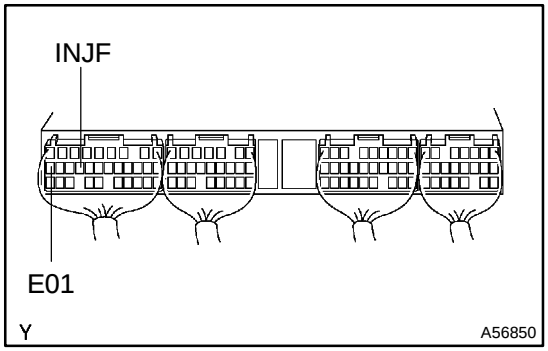
HINT:
The correct waveforms are as shown.



NG → CHECK AND REPLACE ECM

OK

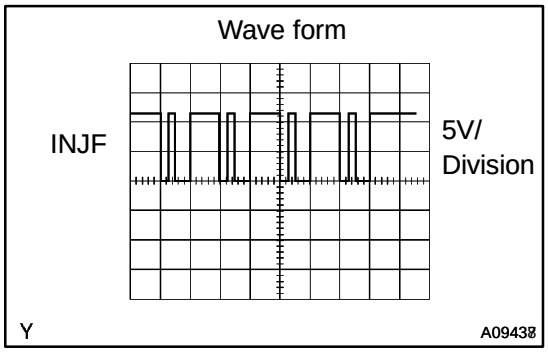
7 INSPECT ECM



(a) Check the output waveform.

Item	Contents
Terminal	INJF ⇔ E01
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or idling

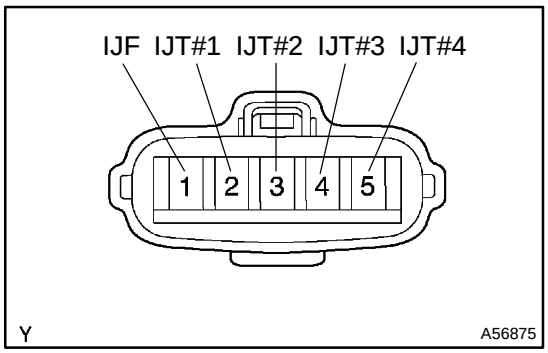
HINT:
The correct waveforms are as shown.

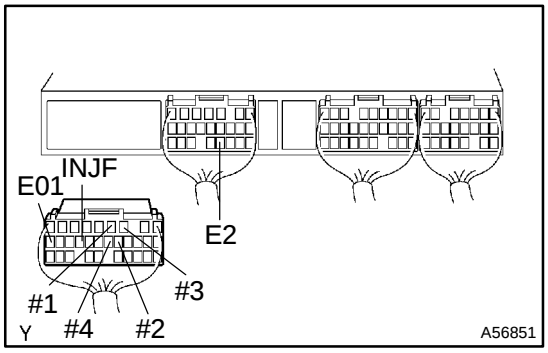


NG → CHECK AND REPLACE ECM

OK

8	CHECK HARNESS AND CONNECTOR(EDU-ECM)





(a) Disconnect the EDU E4 connector.
(b) Disconnect the ECM E18 connector.
(c) Check for open between the terminals #1 of the ECM E18 connector and IJT#1 of the EDU harness side E4 connector.
Resistance: 1 Ω or less
(d) Check for open between the terminals #2 of the ECM E18 connector and IJT#2 of the EDU harness side E4 connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals #3 of the ECM E18 connector and IJT#3 of the EDU harness side E4 connector.
Resistance: 1 Ω or less
(f) Check for open between the terminals #4 of the ECM E18 connector and IJT#4 of the EDU harness side E4 connector.
Resistance: 1 Ω or less
(g) Check for open between the terminals INJF of the ECM E18 connector and IJF of the EDU harness side E4 connector.
Resistance: 1 Ω or less
(h) Check for short between the terminals #1, #2, #3 and #4 of the ECM E18 connector.
Resistance: 1 MΩ or more
(i) Check for short between the terminals #1, #2, #3, #4 of the ECM E18 connector and E2 of the ECM E19 connector.
Resistance: 1 MΩ or more
(j) Check for short between the terminals INJF of the ECM E19 connector and E01 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

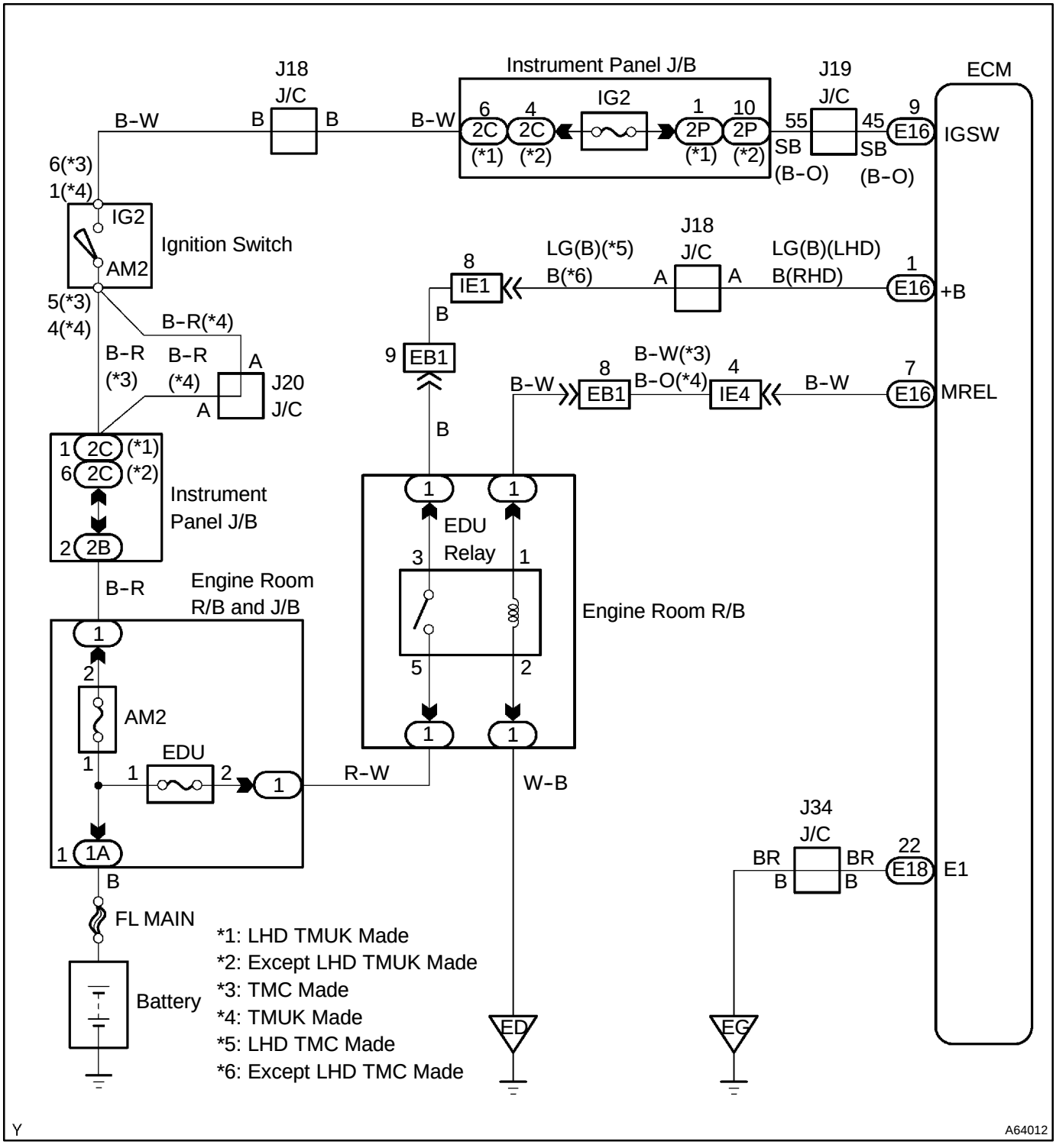
REPLACE INJECTOR DRIVER

ECM POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

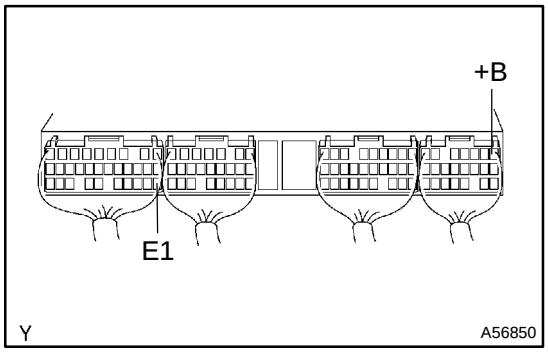
When the ignition switch is turned ON, battery positive voltage is applied to the coil, closing the contacts of the ECD main relay (Marking: EFI) and supplying power to the terminal +B of the ECM.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT ECM

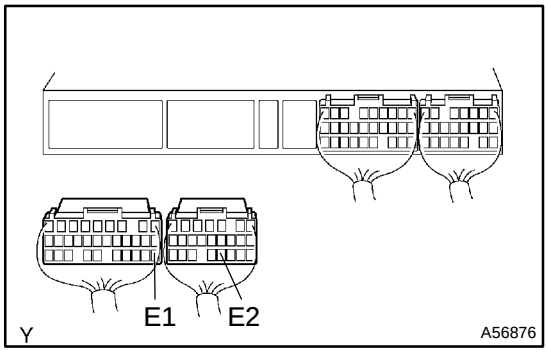


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals +B and E1 of the ECM connector.
Voltage: 9 - 14 V

OK	**PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE** **(See page 05-438)**

NG

2 CHECK HARNESS AND CONNECTOR(ECM GROUND)

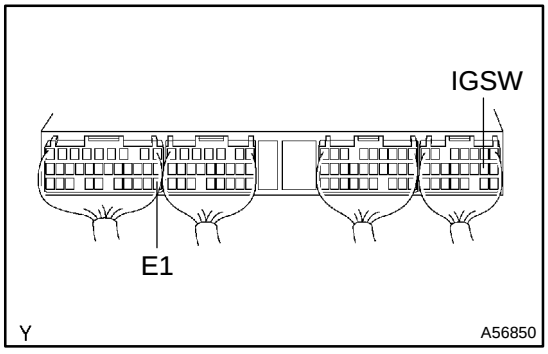


(a) Disconnect the ECM E19 and E18 connector.
(b) Check for open between the terminals E1 and E2 of the ECM connector and body ground.
Resistance: 1 Ω or less

NG	**REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 INSPECT ECM

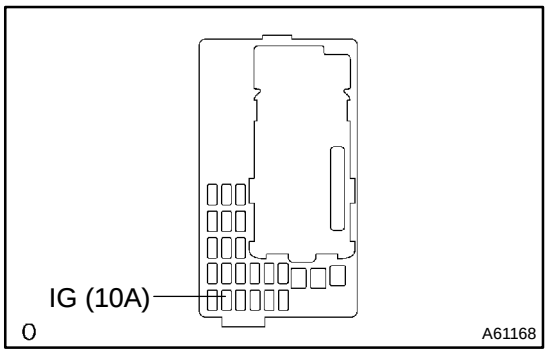


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals IGSW and E1 of the ECM connector.
Voltage: 9 - 14 V

OK	**Go to step 7**

NG

4 CHECK FUSE(IGN FUSE)

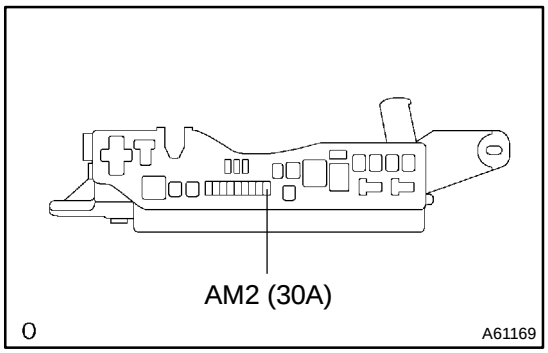


(a) Remove the IGN fuse from the instrument panel J/B.
(b) Check the continuity of the IGN fuse.
Resistance: 1 Ω or less

NG → **CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED IGN FUSE**

OK

5 CHECK FUSE(AM2 FUSE)

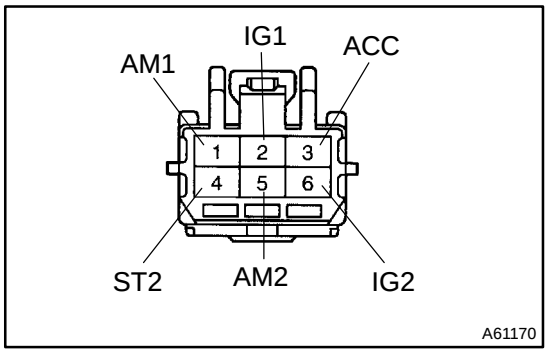


(a) Remove the AM2 fuse from the engine room R/B.
(b) Check the continuity of the AM2 fuse.
Resistance: 1 Ω or less

NG → **CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED AM2 FUSE**

OK

6 INSPECT IGNITION OR STARTER SWITCH ASSY



(a) Check continuity between the connector terminals shown in the chart below.

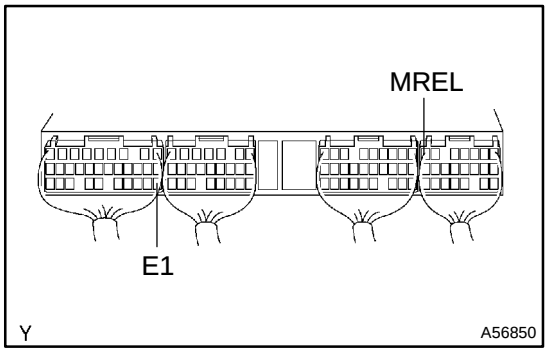
Switch	Terminal No.	Resistance
LOCK	All Terminal to Terminal	1 MΩ or more
ACC	1 ⇔ 3	1 Ω or less
ON	1 ⇔ 2 ⇔ 3 5 ⇔ 6	1 Ω or less
START	1 ⇔ 2 4 ⇔ 5 ⇔ 6	1 Ω or less

NG → **REPLACE IGNITION OR STARTER SWITCH ASSY**

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

7 INSPECT ECM

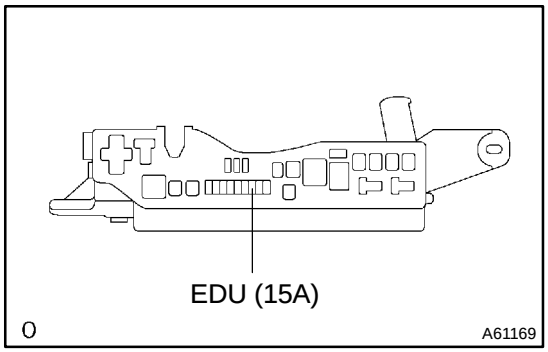


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals MREL and E1 of the ECM connector.
Voltage: 9 - 14 V

NG → **CHECK AND REPLACE ECM**

OK

8 CHECK FUSE(EDU FUSE)

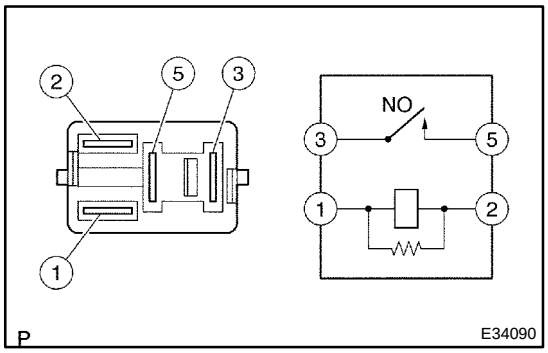


(a) Remove the EDU fuse from the engine room R/B.
(b) Check the continuity of the EDU fuse.
Resistance: 1 Ω or less

NG → **CHECK FOR SHORT IN ALL HERNESS AND COMPONENTS CONNECTED EFI FUSE**

OK

9 INSPECT E.F.I ECU RELAY(EDU RELAY)



(a) Remove the EDU relay from the engine room R/B.
(b) Check continuity between the terminals shown below.
Resistance:

Terminal No.	Resistance
1 - 2	1 Ω or less
3 - 5	1 MΩ or more

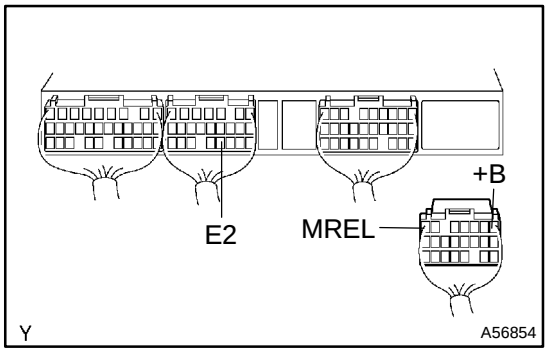
(c) Check continuity between the terminals 3 and 5 of the connector when the battery voltage is applied to the terminals between 1 and 2.
Resistance:

Terminal No.	Resistance
3 - 5	1 Ω or less

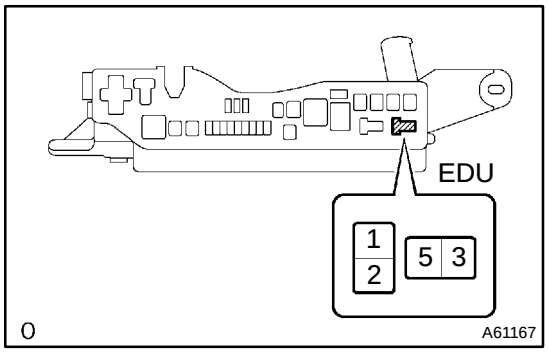
NG → **REPLACE E.F.I ECU RELAY**

OK

10	CHECK HARNESS AND CONNECTOR(TERMINAL MREL-BODY GROUND AND TERMINAL +B-EFI RELAY)



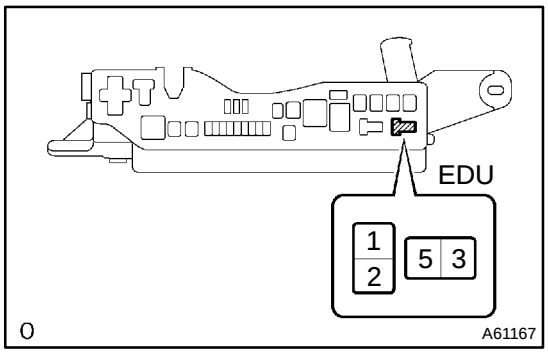
(a) Disconnect the ECM E16 connector.
(b) Check for open between the terminals MREL of ECM E16 connector and body ground.
Resistance: 1 Ω or less
(c) Remove the EDU relay.
(d) Check for short between the terminals MREL and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check for open between terminals +B of ECM E16 connector and 3 of the EDU relay.
Resistance: 1 Ω or less



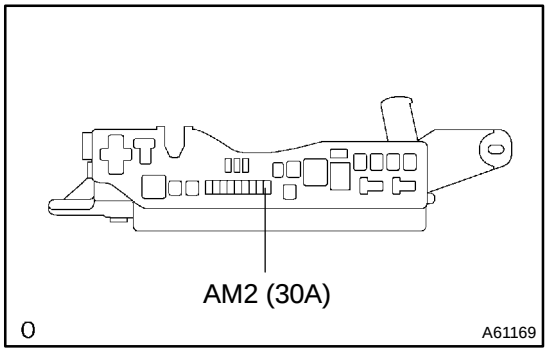
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

11	CHECK HARNESS AND CONNECTOR(EFI FUSE-BATTERY AND EFI FUSE-EFI RELAY)



(a) Remove the EDU relay from the engine room R/B.
(b) Remove the AM2 fuse from the engine room R/B.
(c) Check for open between terminals 2 of the AM2 fuse and 5 of the EDU relay.
Resistance: 1 Ω or less
(d) Check for open between terminals 1 of the AM2 fuse and positive (+) of the battery
Resistance: 1 Ω or less



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ENGINE ROOM RELAY BLOCK

EGR CONTROL CIRCUIT

CIRCUIT DESCRIPTION

The EGR system recirculates exhaust gas, which is controlled to the proper quantity to suit the driving conditions into the intake air mixture to slow down combustion, reduce the combustion temperature and reduce NOx emissions.

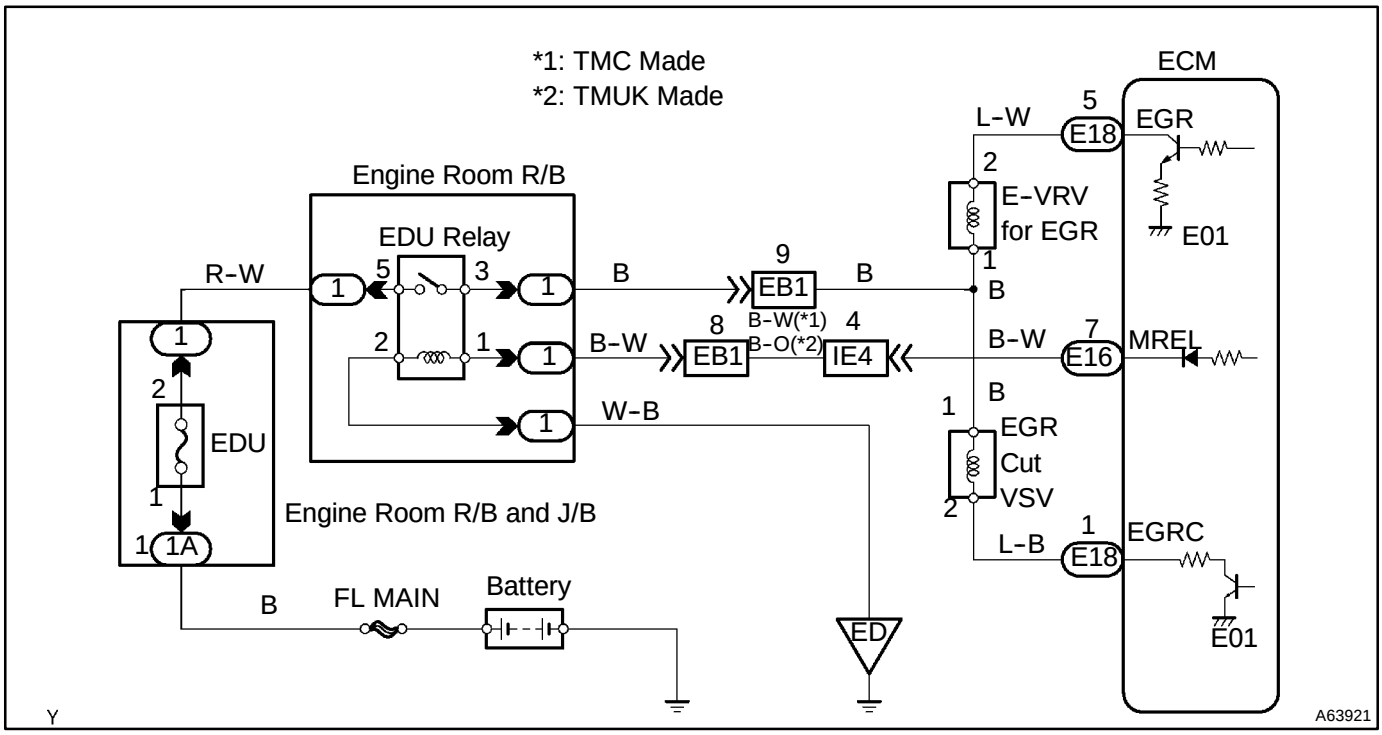
The lift amount of EGR valve is controlled by the vacuum which is regulated by the E-VRV operated by the engine ECU.

If even one of the following conditions is fulfilled, the VSV is turned ON by a signal from the ECU. This results in atmospheric air acting on the EGR valve, closing the EGR valve and shutting off the exhaust gas (EGR cut-off).

Under the following conditions, EGR is cut to maintain driveability.

- Before the engine is warmed up
- Engine speed over 4,000 r/min

WIRING DIAGRAM



INSPECTION PROCEDURE

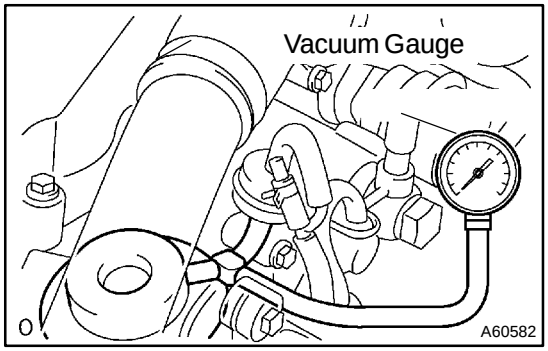
When using Hand-held Tester:

1	CHECK THE CONNECTION OF VACUUM HOSE

NG → REPAIR OR REPLACE VACUUM HOSE

OK

2	CHECK VACUUM HOSE(EGR VALVE-VSV FOR EGR AT 1,500 R/MIN)



(a) Using a 3-way connector, connect a vacuum gauge to the hose between the VSV and EGR valve.
(b) Warm up the engine to above 80˚C (176˚F).
(c) Check the vacuum at 1,500 rpm.

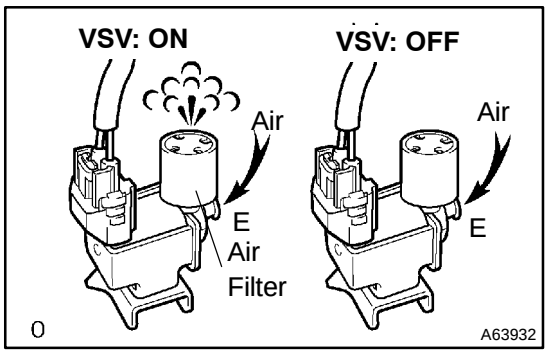
Type	Vacuum
A	0 kPa (0 mmHg, 0 in. Hg)
B	0 kPa (0 mmHg, in. Hg) - 28 kPa (210 mmHg, 8.3 in. Hg)
C	Above 28 kPa (210 mmHg, 8.3 in. Hg)

A → Go to step 7

C → Go to step 10

B

3	CHECK OPERATION OF VSV



(a) Disconnect the vacuum hose from the VSV for the EGR.
(b) Connect the hand-held tester to the DLC3.
(c) Turn the ignition switch ON and push the hand-held tester main switch ON.
(d) Select the ACTIVE TEST mode on the hand-held tester.
(e) Check the operation of VSV for EGR when it is operated by the hand-held tester.
VSV is ON:
Air from port E flows out through air filter.
VSV is OFF:
Air does not flow from port E to air filter.

OK → CHECK AND REPLACE VACUUM HOSE

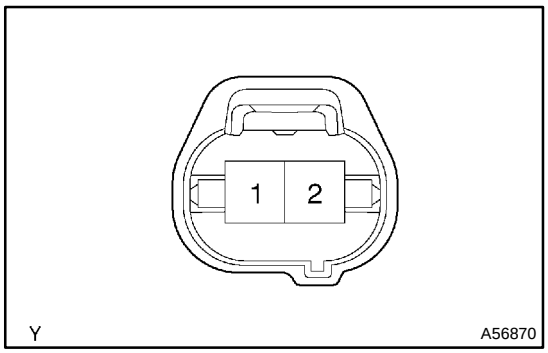
NG

4	CHECK VACUUM SWITCHING VALVE ASSY NO.1 (See page 10-15)

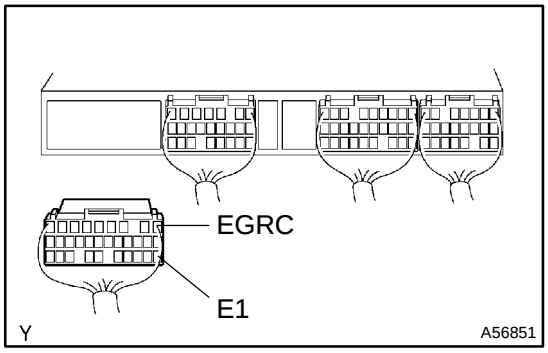
NG → REPLACE VACUUM SWITCHING VALVE ASSY NO.1

OK

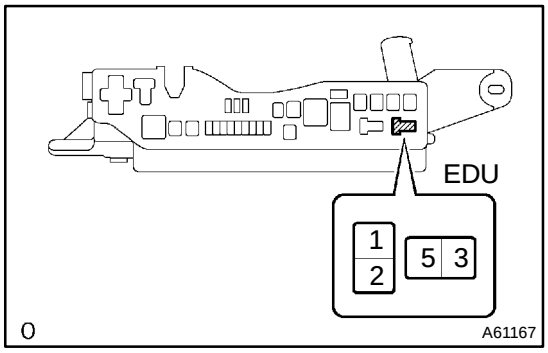
5	CHECK HARNESS AND CONNECTOR(VSV FOR EGR-ECM)



(a) Disconnect the VSV connector.
(b) Disconnect the ECM E18 connector.
(c) Remove the EDU relay.
(d) Check for open between the terminals EGRC of the ECM E18 connector and 2 of the VSV harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals 1 of the VSV harness side connector and 1 of the EDU relay in the engine room R/B connector.
Resistance: 1 Ω or less



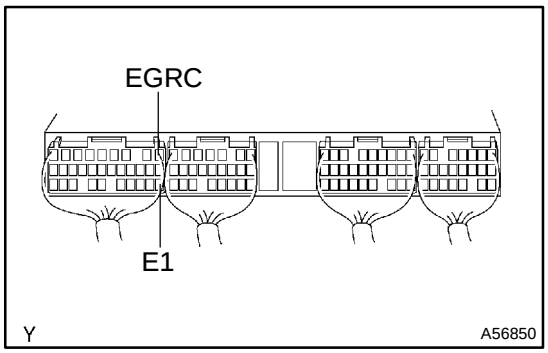
(f) Check for short between the terminals EGRC and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals E1 of the ECM E18 connector and 1 of the VSV harness side connector.
Resistance: 1 MΩ or more



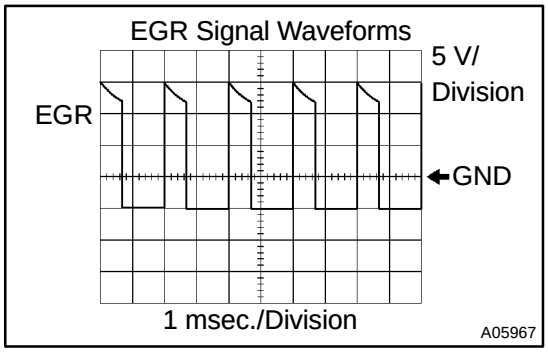
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

6 INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals EGRC and E1 of the ECM E19 connector.
Voltage: 9 - 14 V



(c) Check the output waveform.

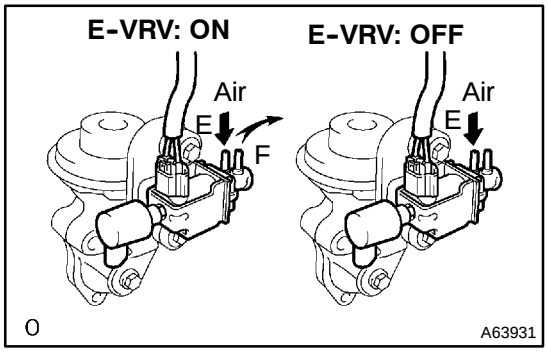
Item	contents
Terminal	EGRC⇔E1
Equipment set	5 V/DIV, 1 ms/DIV
Condition	During EGR system ON (engine speed 1500 rpm)

HINT:
The correct waveforms are as shown.

NG → **Go to step 8**

OK

7 CHECK OPERATION OF E-VRV



(a) Disconnect the vacuum hoses from the E-VRV.
(b) Connect the hand-held tester to the DLC3.
(c) Turn the ignition switch ON and the push hand-held tester main switch ON.
(d) Select the ACTIVE TEST mode on the hand-held tester.
(e) Check the operation of the E-VRV when it is operated by the hand-held tester.
E-VRV ON:
Air from port E flows out through port F.
E-VRV OFF:
Air from port E flows out through air filter.

OK → **Go to step 10**

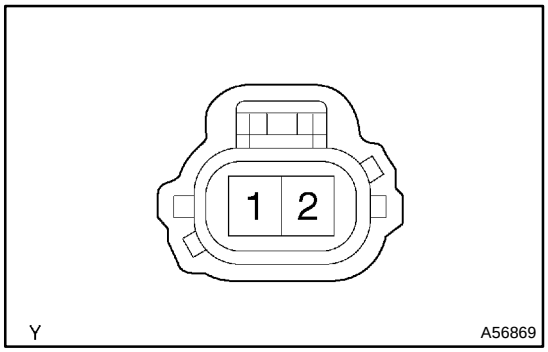
NG

8 CHECK E-VRV (See page 10-15)

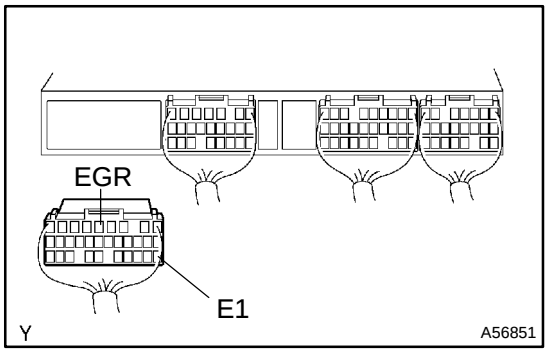
NG → **REPLACE E-VRV**

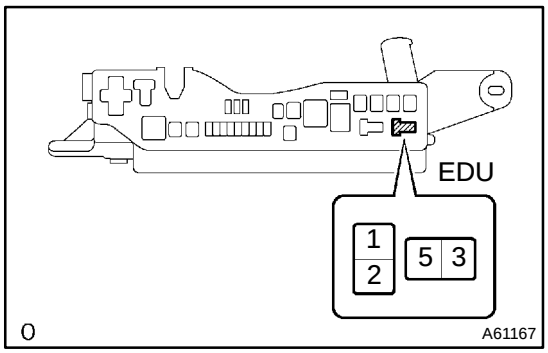
OK

9	CHECK HARNESS AND CONNECTOR(E-VRV-ECM,AND E-VRV-EFI MAIN RELAY)



(a) Disconnect the E-VRV connector.
(b) Disconnect the ECM E18 connector.
(c) Remove the EDU relay.
(d) Check for open between the terminals EGR of the ECM E18 connector and 2 of the E-VRV harness side connector.
Resistance: 1 Ω or less
(e) Check for open between the terminals 1 of the E-VRV harness side connector and 3 of the EDU relay in the engine room R/B connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals EGR and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more
(g) Check for short between the terminals 1 of the E-VRV and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more





NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

10	CHECK EGR VALVE ASSY (See page 10-15)

NG → **REPLACE EGR VALVE ASSY**

OK

CHECK AND REPLACE ECM

When not using Hand-held Tester:

1	CHECK THE CONNECTION OF VACUUM HOSE

NG → REPAIR OR REPLACE VACUUM HOSE

OK

2	CHECK VACUUM HOSE(EGR VALVE-VSV FOR EGR AT 1,500 R/MIN) (See page 05-528, step 2)

A → Go to step 6

C → Go to step 7

B

3	CHECK VACUUM SWITCHING VALVE ASSY NO.1 (See page 10-15)

NG → REPLACE VACUUM SWITCHING VALVE ASSY NO.1

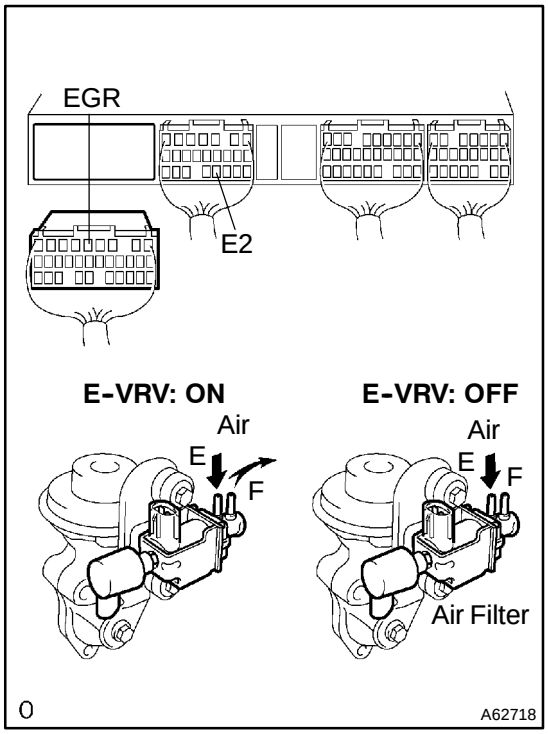
OK

4	CHECK HARNESS AND CONNECTOR(VSV FOR EGR-ECM) (See page 05-528, step 5)

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

5	CHECK OPERATION OF E-VRV



(a) Disconnect the ECM E18 connector.
(b) Turn the ignition switch ON.
(c) Check the E-VRV operation.
(1) Connect the terminals between EGR and E2 of the ECM connector. (ON)

E-VRV ON:
Air from port E flows out through port F

(2) Disconnect the terminals between EGR and E2 of the ECM connector. (OFF)

E-VRV OFF:
Air from port E flows out through air filter

OK	Go to step 7

NG

6	CHECK E-VRV (See page 10-15)

NG	REPLACE E-VRV

OK

7	CHECK HARNESS AND CONNECTOR(E-VRV-ECM,AND E-VRV-EFI MAINRELAY) (See page 05-528, step 9)

NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

8	CHECK EGR VALVE ASSY (See page 10-15)

NG	REPLACE EGR VALVE ASSY

OK

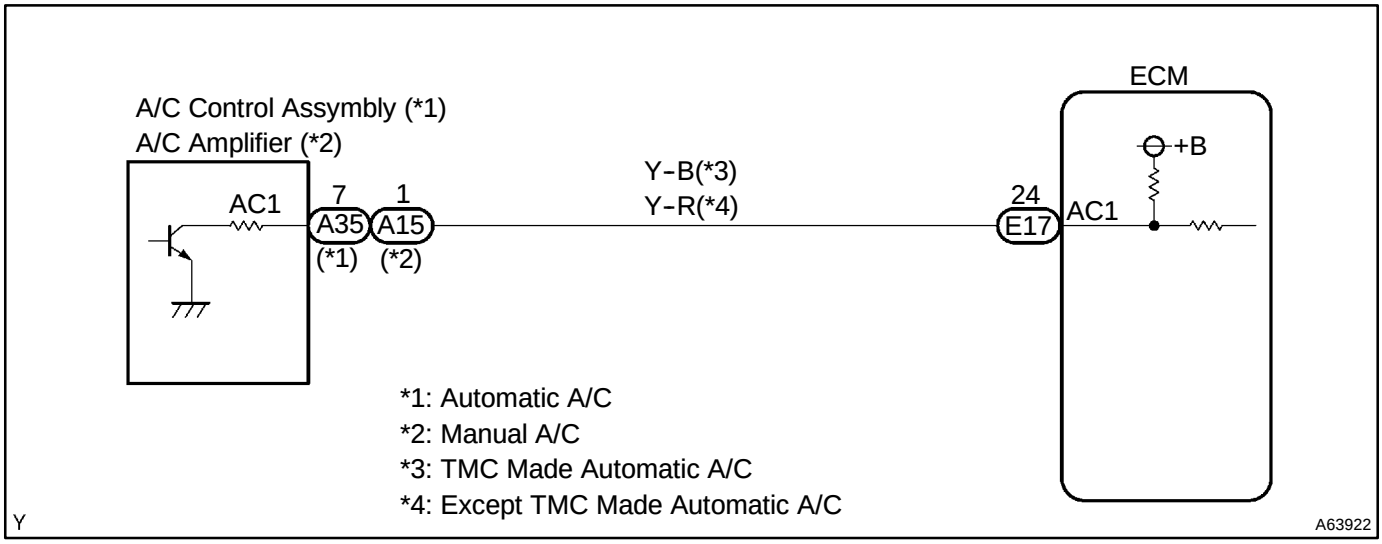
CHECK AND REPLACE ECM

A/C SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

When the A/C compressor is ON, the A/C amplifier sends the A/C signal to the ECM, then ECM increases the fuel injection volume to improve driveability during engine idling.

WIRING DIAGRAM



INSPECTION PROCEDURE

When using Hand-held Tester:

1	READ VALUE OF HAND-HELD TESTER(CHECK A/C SIGNAL)

(a) Read the A/C signal on the hand-held tester while the A/C compressor is ON.

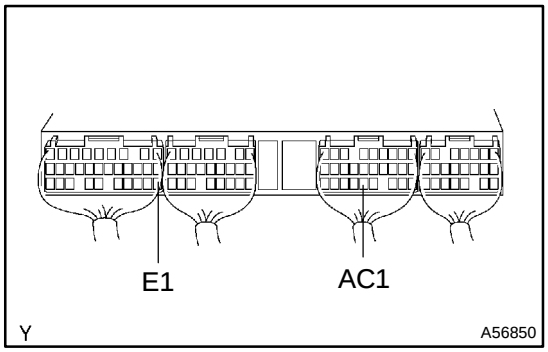
Result:

A/C Switch Condition	OFF	ON
A/C Signal	OFF	ON

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE** **(See page 05-438)**

NG

2 INSPECT ECM



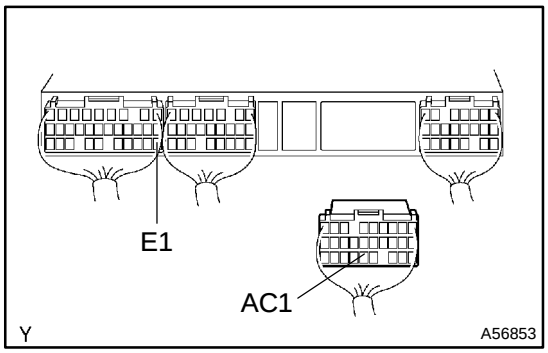
(a) Start the engine.
(b) Measure the voltage between terminals AC1 and E1 of the ECM connector. When the A/C switch is turned to ON and OFF.
Voltage:

A/C Switch Condition	Voltage
ON	Below 1.5 V
OFF	9 - 14 V

OK → **CHECK AND REPLACE ECM**

NG

3 CHECK HARNESS AND CONNECTOR(ECM-A/C AMPLIFIER)



(a) Disconnect the A/C amplifier A12 connector.
(See page 55-115)
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals AC1 of the ECM E17 connector and A12 of the A/C amplifier harness side connector. (Terminal arrangement on 55-4)
Resistance: 1 Ω or less
(d) Check for short between the terminals AC1 of the ECM E17 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more

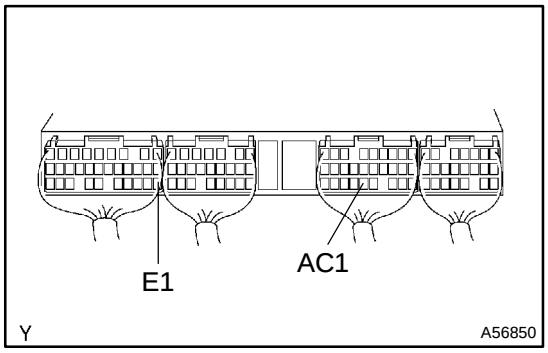
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE COOLER STABILIZER AMPLIFIER ASSY

When not using Hand-held Tester:

1	INSPECT ECM



(a) Start the engine.
(b) Measure the voltage between terminals AC1 and E1 of the ECM connector. When the A/C switch is turned to ON and OFF.

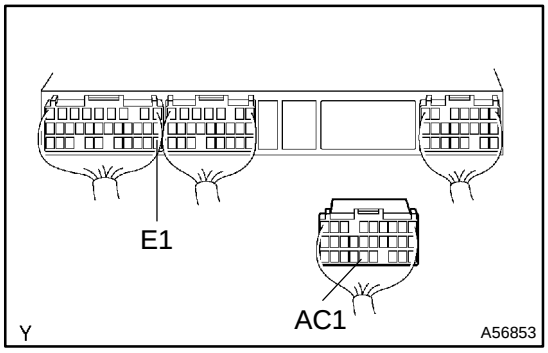
Voltage:

A/C Switch Condition	Voltage
ON	Below 1.5 V
OFF	9 - 14 V

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE** **(See page 05-438)**

NG

2	CHECK AND REPLACE HARNESS AND CONNECTOR(ECM-A/C AMPLIFIER)



(a) Disconnect the A/C amplifier A12 connector. (See page 55-115)
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals AC1 of the ECM E17 connector and A12 of the A/C amplifier harness side connector. (Terminal arrangement on 55-4)
Resistance: 1 Ω or less
(d) Check for short between the terminals AC1 of the ECM E17 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

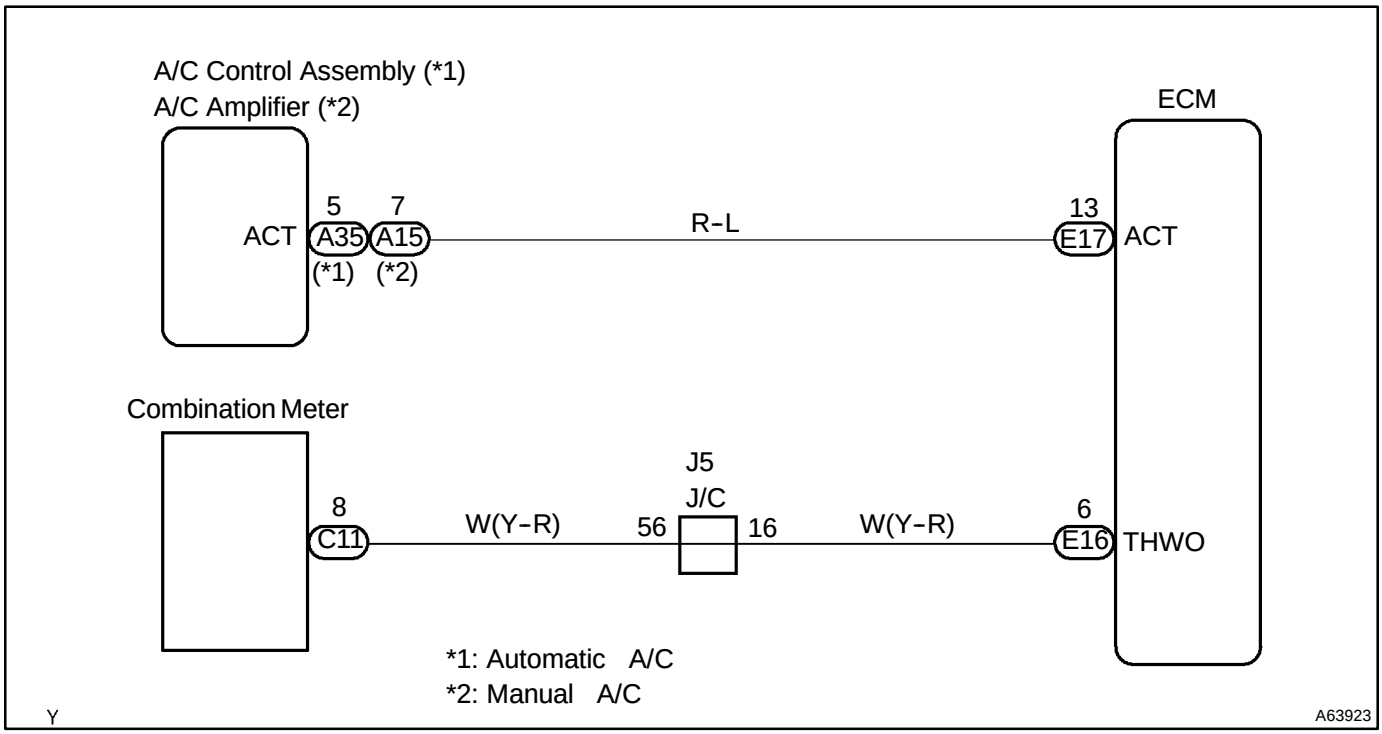
CHECK AND REPLACE COOLER STABILIZER AMPLIFIER ASSY

A/C CUT CONTROL CIRCUIT

CIRCUIT DESCRIPTION

This circuit cuts air conditioning operation during vehicle acceleration in order to increase acceleration performance. During acceleration with the vehicle speed at 30 km/h (19 mph) or less and accelerator pedal opening angle at 45˚ or more, the A/C magnetic switch is turned OFF for several seconds.
The air conditioning is also controlled by the ECM out putting the engine coolant temperature to A/C amplifier.

WIRING DIAGRAM



INSPECTION PROCEDURE

When using Hand-held Tester:

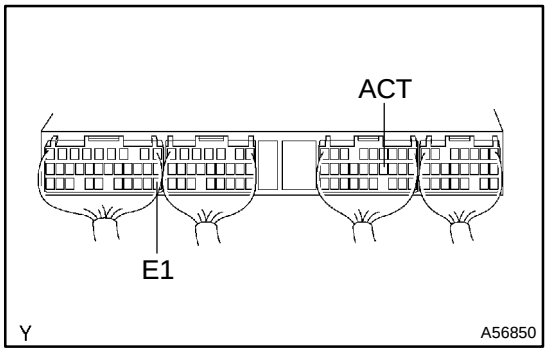
1	HAND-HELD TESTER(CHECK OPERATION A/C CUT CONTOROL)

(a) Start the engine and air conditioning switch ON.
HINT:
A/C magnetic clutch is turned ON.
(b) Select the ACTIVE TEST mode on the hand-held tester.
(c) Check operation of A/C magnetic clutch cut when air conditioning cut control is operated by the hand-held tester.
Result: A/C magnet clutch is turned OFF.

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE** **(See page 05-438)**

NG

2 INSPECT ECM



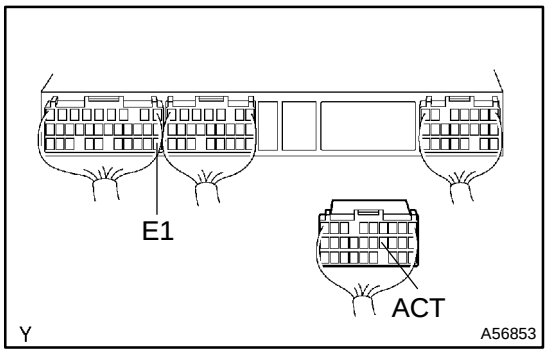
(a) Start the engine.
(b) Measure voltage between terminals ACT and E1 of ECM connector when A/C switch is turned to ON and OFF.
Voltage:

A/C switch condition	Voltage
Engine at idling	9 - 14 V
IG ON Engine stop	0 - 3 V

OK → **CHECK AND REPLACE COOLER STABILIZER AMPLIFIER ASSY**

NG

3 CHECK HARNESS AND CONNECTOR(ECM-A/C AMPLIFIER)

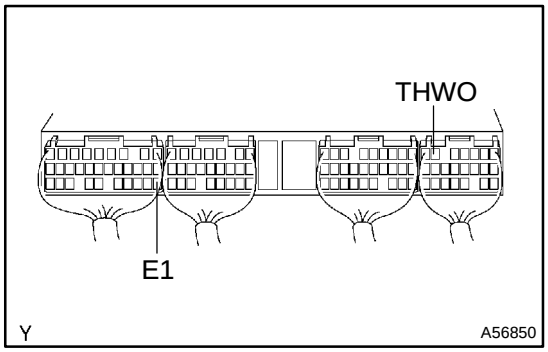


(a) Disconnect the A/C amplifier A12 connector.
(See page 55-115)
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals ACT of the ECM E17 connector and A12 of the A/C amplifier harness side connector. (Terminal arrangement on 55-4)
Resistance: 1 Ω or less
(d) Check for short between the terminals ACT of the ECM E17 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4 INSPECT ECM

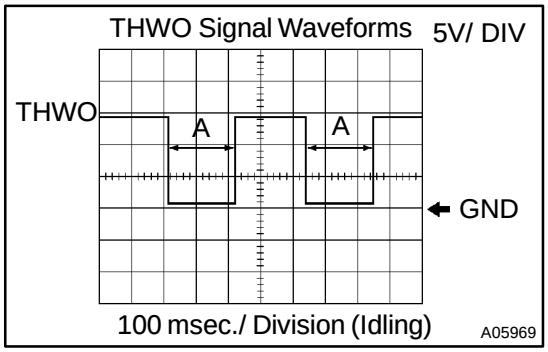


(a) Turn the ignition switch ON.
(b) Measure voltage between terminals THWO and E1 of ECM connector.
Result: Voltage is generated intermittently.

HINT:
During idling, check waveform between terminals THWO and E2 of ECM using oscilloscope.

Water temp.	30˚C or less	Approx. 75˚C	90˚C or more
A	16.4 msec.	200.7 msec.	262 - 410 msec.

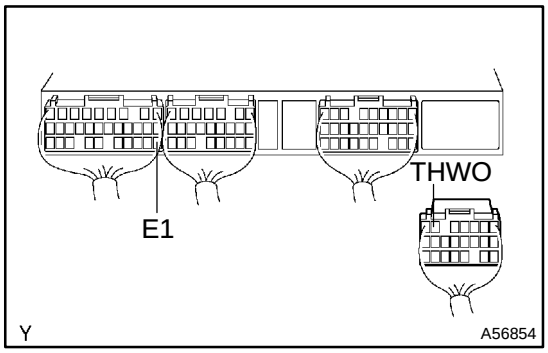
The correct waveform is as shown.



OK → CHECK AND REPLACE COOLER STABILIZER AMPLIFIER ASSY

NG

5 CHECK HARNESS AND CONNECTOR(ECM-COMBINATION METER)



(a) Disconnect the combination meter C8 connector. (See page 71-32)
(b) Disconnect the ECM E16 connector.
(c) Check for open between the terminals THWO of the ECM E16 connector and C8 of the combination meter harness side connector. (Terminal arrangement on 05-1295)
Resistance: 1 Ω or less
(d) Check for short between the terminals THWO of the ECM E16 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more

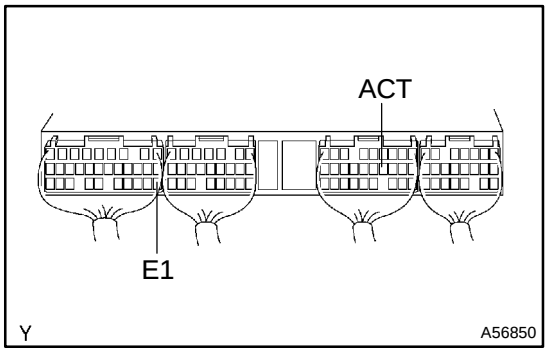
NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

When not using Hand-held Tester:

1	INSPECT ECM



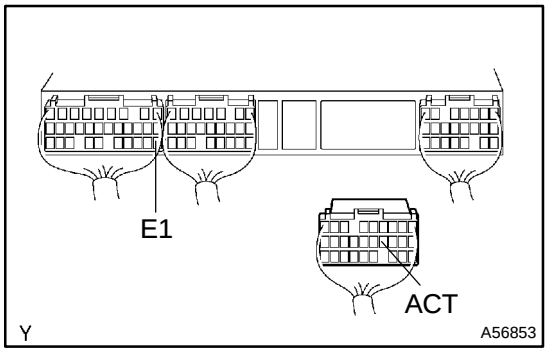
(a) Start the engine.
(b) Measure voltage between terminals ACT and E1 of ECM connector when A/C switch is turned to ON and OFF.
Voltage:

A/C switch condition	Voltage
Engine at idling	9 - 14 V
IG ON Engine stop	0 - 3 V

OK → **CHECK AND REPLACE COOLER STABILIZER AMPLIFIER ASSY**

NG

2	CHECK HARNESS AND CONNECTOR(ECM-A/C AMPLIFIER)

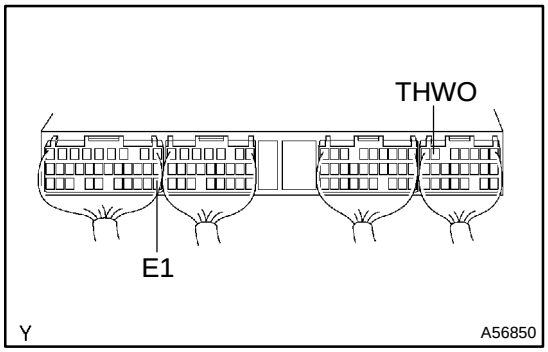


(a) Disconnect the A/C amplifier A12 connector.
(See page 55-115)
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals ACT of the ECM E17 connector and A12 of the A/C amplifier harness side connector. (Terminal arrangement on 55-4)
Resistance: 1 Ω or less
(d) Check for short between the terminals ACT of the ECM E17 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 INSPECT ECM

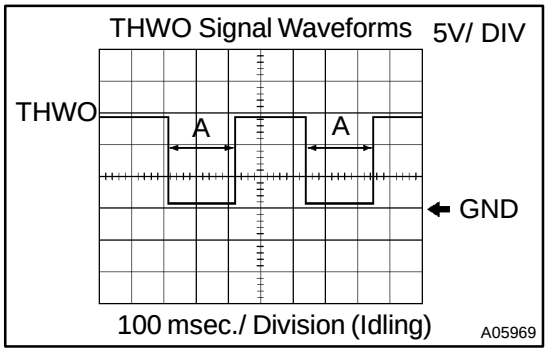


(a) Turn the ignition switch ON.
(b) Measure voltage between terminal THWO and E1 of ECM connector.
Result: Voltage is generated intermittently.

HINT:
During idling, check waveform between terminals THWO and E2 of ECM using oscilloscope.

Water temp.	30˚C or less	Approx. 75˚C	90˚C or more
A	16.4 msec.	200.7 msec.	262 - 410 msec.

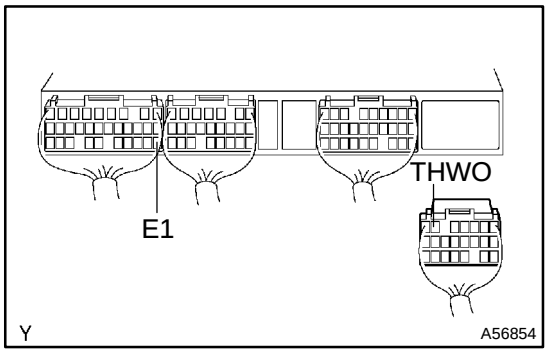
The correct waveform is as shown.



OK → **CHECK AND REPLACE COOLER STABILIZER AMPLIFIER ASSY**

NG

4 CHECK HARNESS AND CONNECTOR(ECM-COMBINATIPN METER)



(a) Disconnect the combination meter C8 connector. (See page 71-32)
(b) Disconnect the ECM E16 connector.
(c) Check for open between the terminals THWO of the ECM E16 connector and C8 of the combination meter harness side connector. (Terminal arrangement on 05-1295)
Resistance: 1 Ω or less
(d) Check for short between the terminals THWO of the ECM E16 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

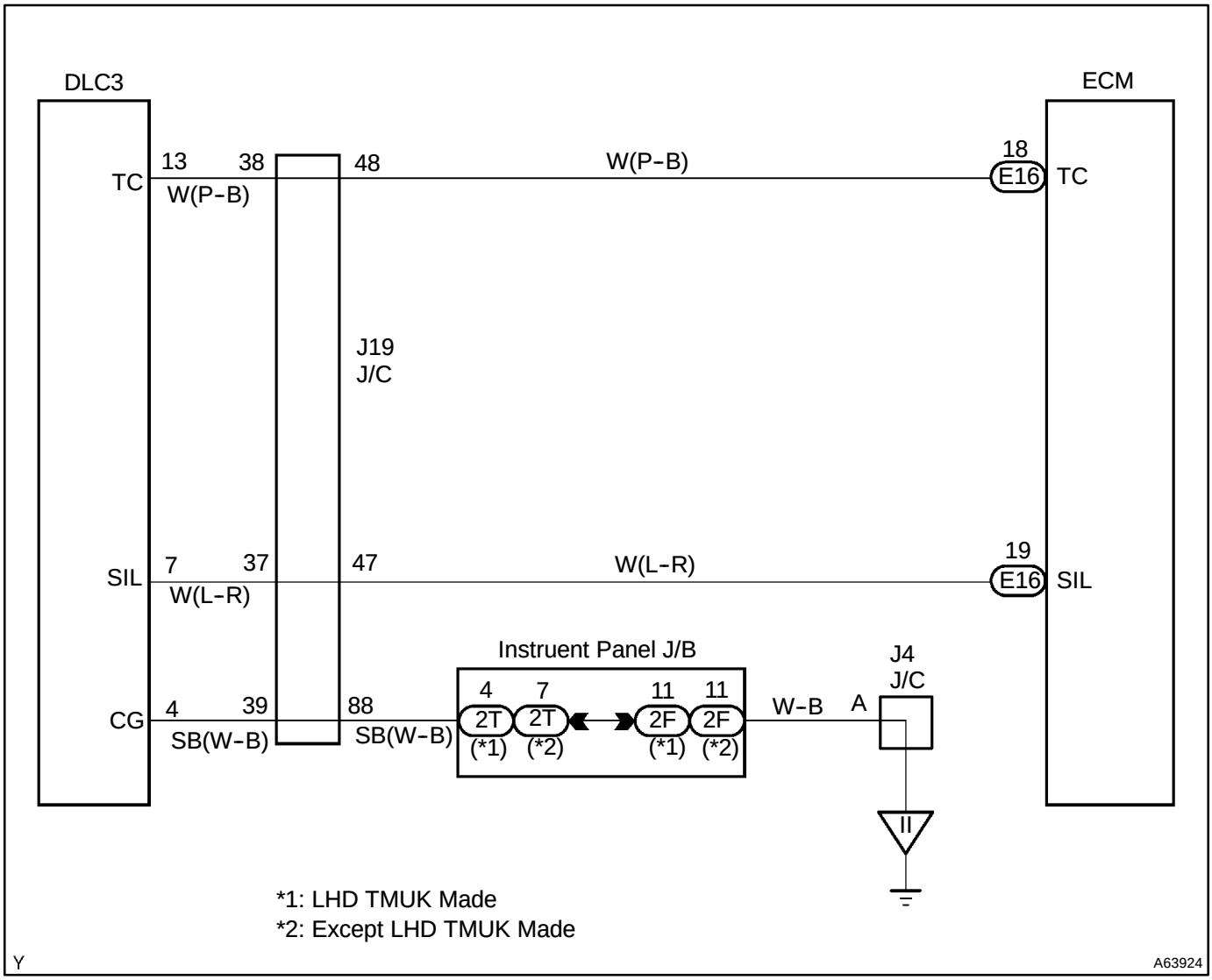
CHECK AND REPLACE ECM

DIAGNOSIS CIRCUIT

CIRCUIT DESCRIPTION

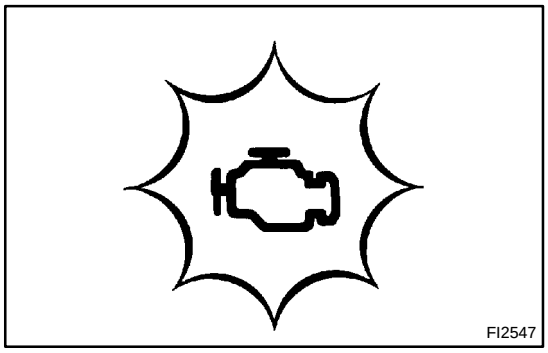
Terminals TC and CG are located in the DLC3.
The DLC3 is located under the finish lower panel. When terminals TC and CG are connected, DTC in normal mode or test mode can be read from the check engine warning light in the combination meter.
Also, terminal SIL is located in the DLC3. This terminal is used by the M-OBD communication with hand-held tester.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK CHK ENG(MIL)



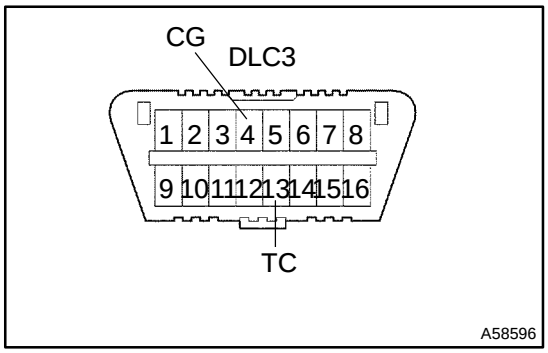
(a) Turn the ignition switch ON.
(b) Using SST, connect terminals TC and CG of the DLC3.
SST 09843-18040
(c) Check the CHK ENG (MIL) condition.
Result:
CHK ENG (MIL): Blinking

HINT:
If this inspection OK and there is no hand-held tester, do not need to do the following steps and this circuit is OK. Proceed to next circuit inspection shown on problem symptom table (See page 05-438).

OK → **Go to step 8**

NG

2	CHECK HARNESS AND CONNECTOR(TERMINAL OF DLC3)

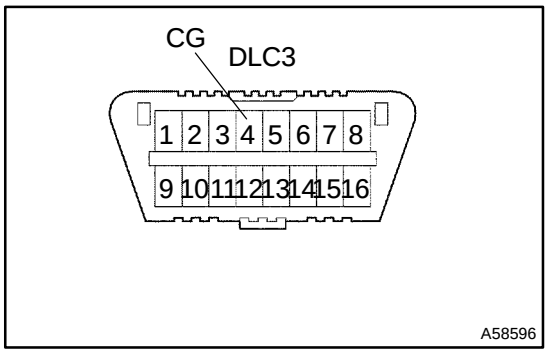


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals TC and CG of the DLC3.
Voltage: 9 - 14 V

OK → **Go to step 5**

NG

3	CHECK HARNESS AND CONNECTOR(TERMINAL OF DLC3)

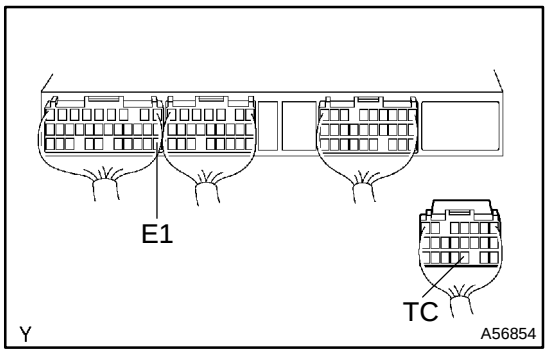


(a) Check continuity terminal CG of DLC3 and body ground.
Resistance: 1 Ω or less

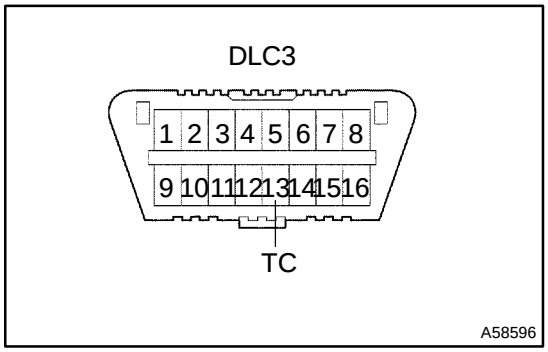
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	CHECK HARNESS AND CONNECTOR(ECM-DLC3)



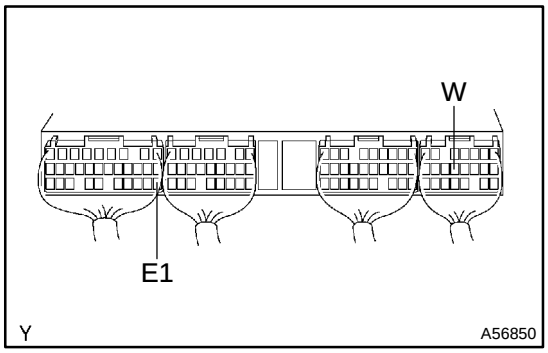
(a) Disconnect the ECM E16 connector.
(b) Check for open between the terminals TC of the ECM E16 connector and TC of the DLC3.
Resistance: 1 Ω or less
(c) Check for short between the terminals TC of the ECM E16 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal W and E1 of the ECM connector.
Voltage: 9 - 14 V

OK → **CHECK AND REPLACE ECM**

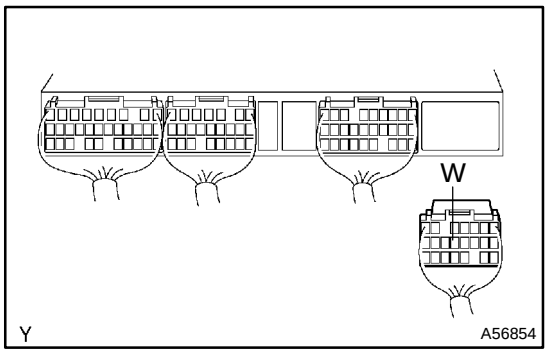
NG

6	CHECK BULB(ENGINE WARNING LIGHT)

NG → **REPLACE BULB**

OK

7	CHECK HARNESS AND CONNECTOR(ECM-COMBINATION METER)



(a) Disconnect the combination meter C8 connector. (See page 71-32)
(b) Disconnect the ECM E16 connector.
(c) Check for open between the terminals W of the ECM E16 connector and C8 of the combination meter harness side connector. (Terminal arrangement on 05-1295)
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

8	READ OUTPUT DTC OF HAND-HELD TESTER(INCLUDING NORMAL DTC)

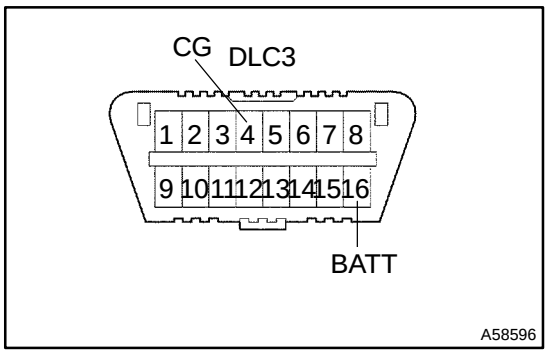
Result:

	A	B
Result	DTC code is output	DTC code is not output

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE (See page 05-438)**

A

9	CHECK HARNESS AND CONNECTOR(TERMINAL OF DLC3)

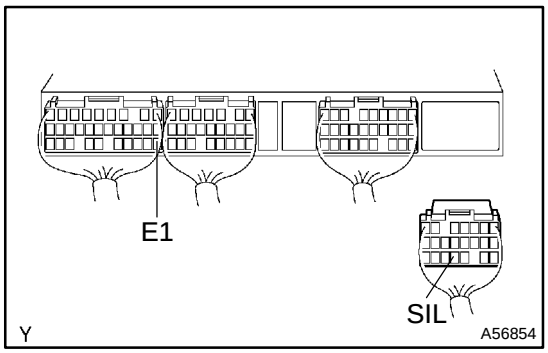


(a) Measure the voltage between terminal BATT and CG of the DLC3.
Voltage: 9 - 14 V

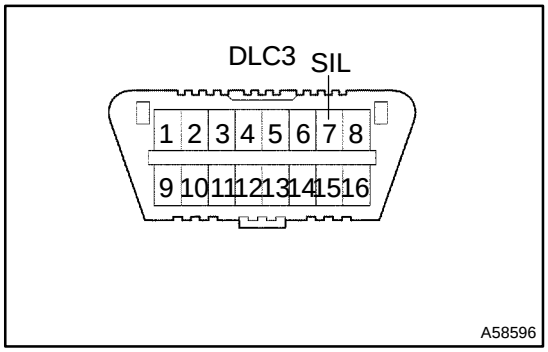
NG → **Go to step 11**

OK

10	CHECK HARNESS AND CONNECTOR(ECM-DLC3)



(a) Disconnect the ECM E16 connector.
(b) Check for open between the terminals SIL of the ECM E16 connector and SIL of the DLC3.
Resistance: 1 Ω or less
(c) Check for short between the terminals SIL of the ECM E16 connector and E1 of the ECM E18 connector.
Resistance: 1 MΩ or more

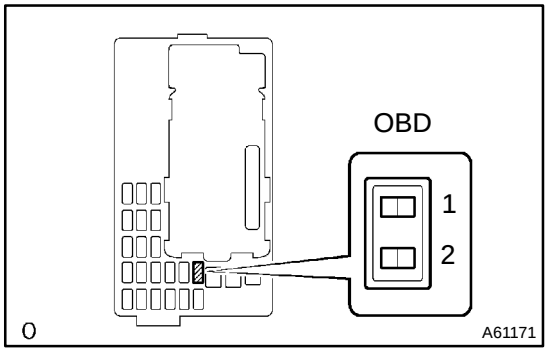


NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

11	CHECK FUSE(OBD FUSE)

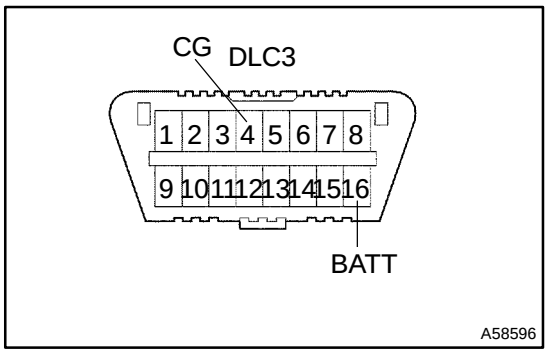


(a) Remove the OBD fuse from the instrument panel J/B.
(b) Check the continuity of the OBD fuse.
Resistance: 1 Ω or less

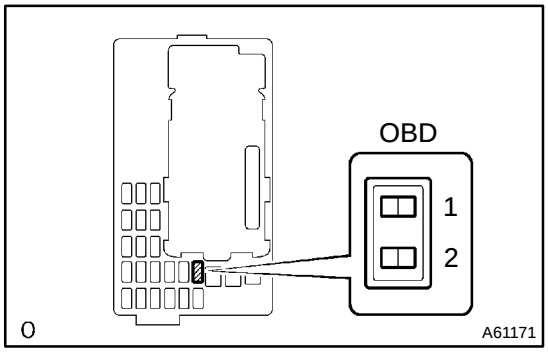
NG → **REPLACE FUSE**

OK

12	CHECK HARNESS AND CONNECTOR(DLC3-ENGINE ROOM R/B)



(a) Remove the OBD fuse from the instrument panel J/B.
(b) Check for open between the terminals BATT of the DLC3 and 2 of the OBD fuse.
Resistance: 1 Ω or less
(c) Check for short between the terminals BATT and CG of the DLC3.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

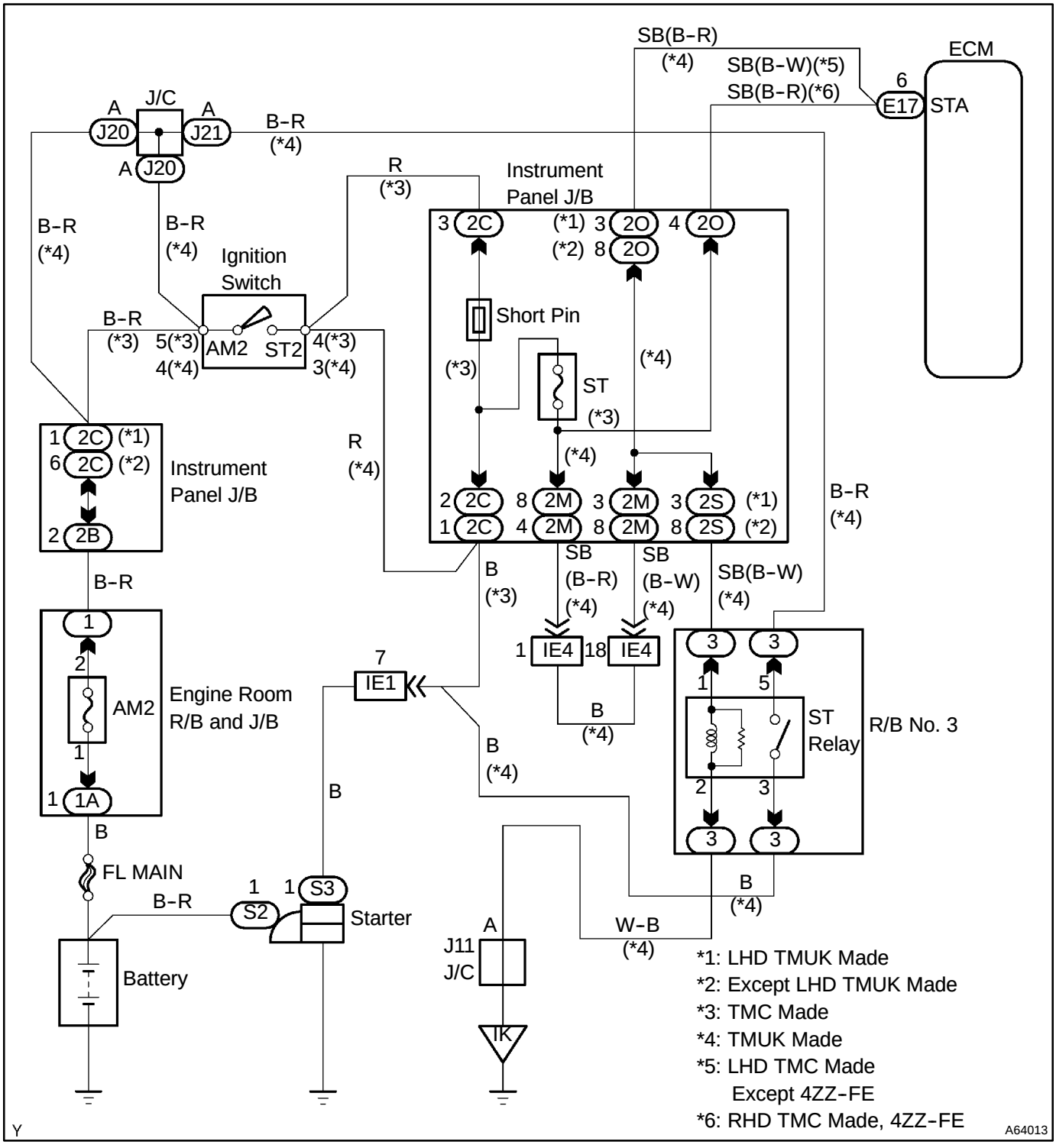
REPAIR OR REPLACE POWER SOURCE CIRCUIT

STARTER SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

When the engine is being cranked, the intake air flow is slow, so fuel vaporization is poor. A rich mixture is therefore necessary in order to achieve good start ability. While the engine is being cranked, the battery positive voltage is applied to terminal STA of the ECM. The starter signal is mainly used to increase the fuel injection volume for the starting injection control and after-start injection control.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
This diagnostic chart is based on the premise that the engine is being cranked under normal conditions. If the engine does not crank, proceed to the problem symptoms table on page 05-438.

When using Hand-held Tester:

1	READ VALUE OF HAND-HELD TESTER(STA SIGNAL)

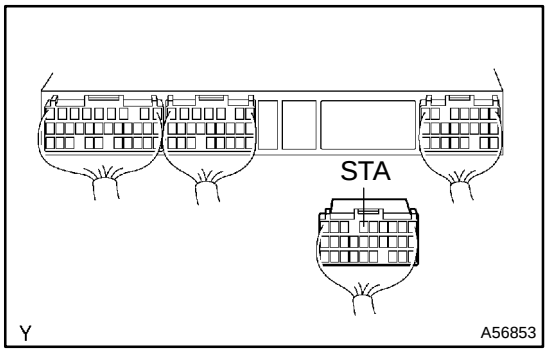
(a) Read the STA signal on the hand-held tester while the starter operates.
Result:

Ignition Switch Position	ON	STA
STA Signal	OFF	ON

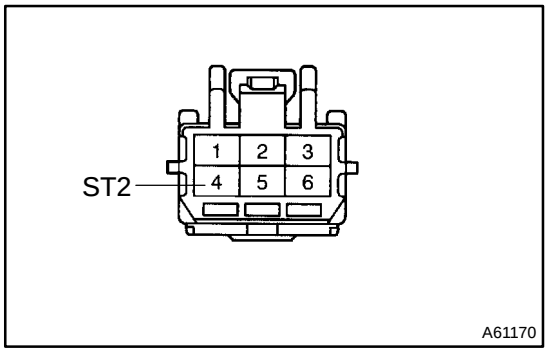
OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE** **(See page 05-438)**

NG

2	CHECK HARNESS AND CONNECTOR(ECM-IGNITION SWITCH)



(a) Disconnect the ignition switch connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals STA of the ECM E17 connector and ST2 of the ignition switch harness side connector.
Resistance: 1Ω or less



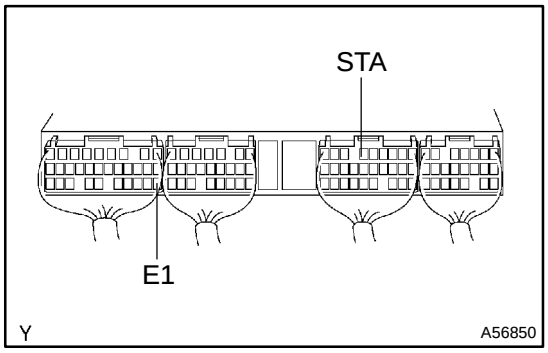
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

When not using Hand-held Tester:

1	INSPECT ECM

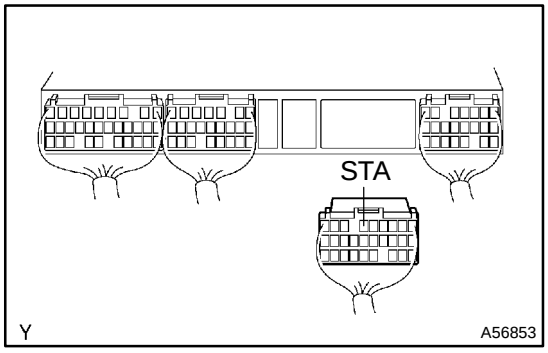


(a) Turn the ignition switch ON.
(b) Measure the voltage between terminal STA and E1 of the ECM connector during cranking.
Voltage: 6.0 V or more

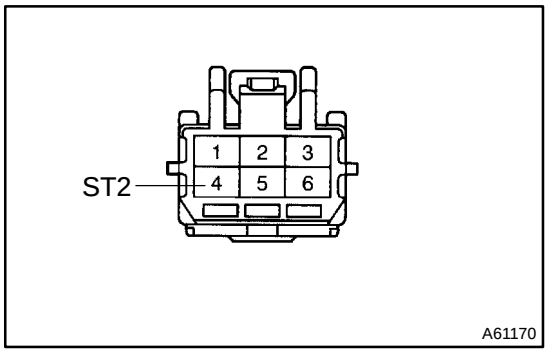
OK	PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE (See page 05-438)

NG

2	CHECK HARNESS AND CONNECTOR(ECM-IGNITION SWITCH)



(a) Disconnect the ignition switch connector.
(b) Disconnect the ECM E17 connector.
(c) Check for open between the terminals STA of the ECM E17 connector and ST2 of the ignition switch harness side connector.
Result: 1Ω or less



NG	REPAIR OR REPLACE HARNESS AND CONNECTOR

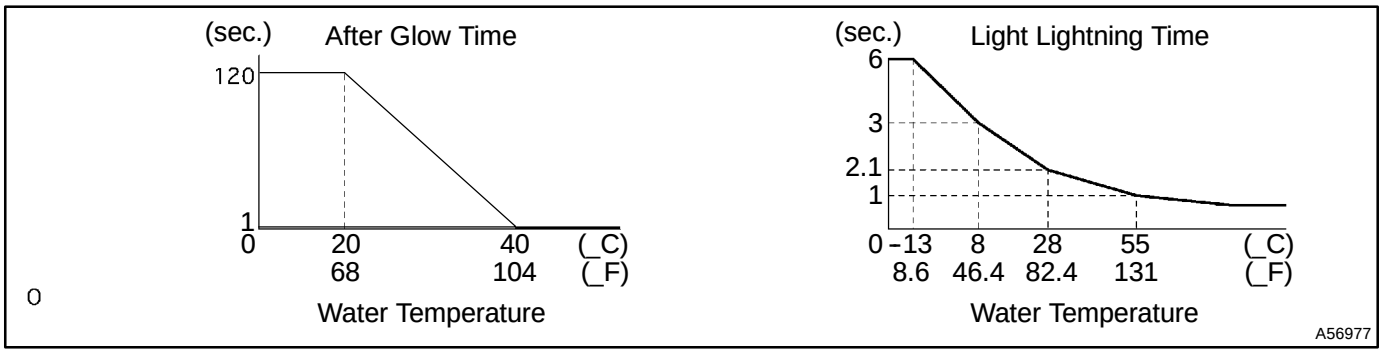
OK

CHECK AND REPLACE ECM

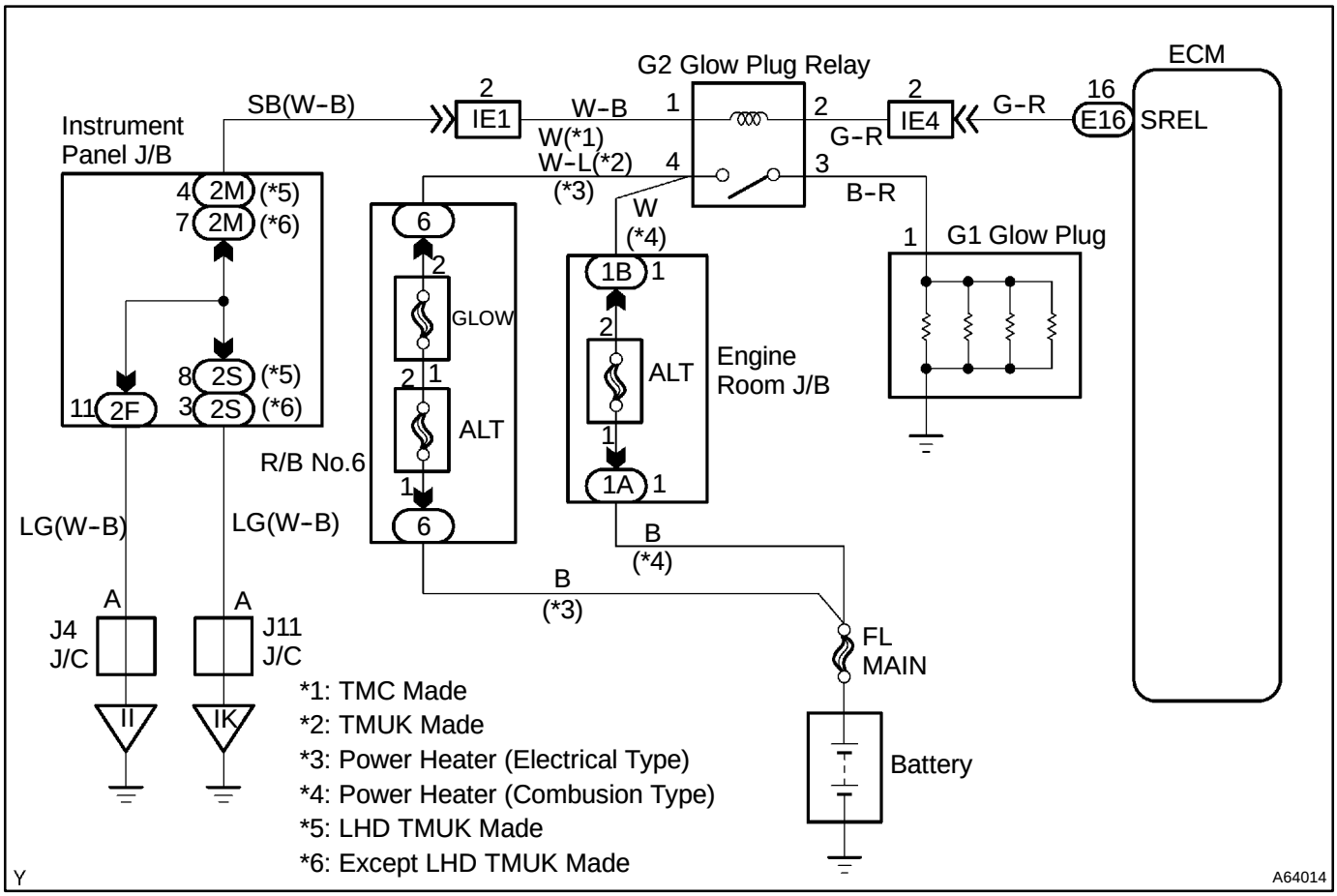
PRE-HEATING CONTROL CIRCUIT

CIRCUIT DESCRIPTION

When the ignition switch turns ON, the ECM calculates the glow indicator lighting time/heating corresponding to the coolant temperature at that time and turns ON the glow indicator light/glow plug relay.
As the caramics is used for a glow plug material, the current control is not performed.



WIRING DIAGRAM



INSPECTION PROCEDURE

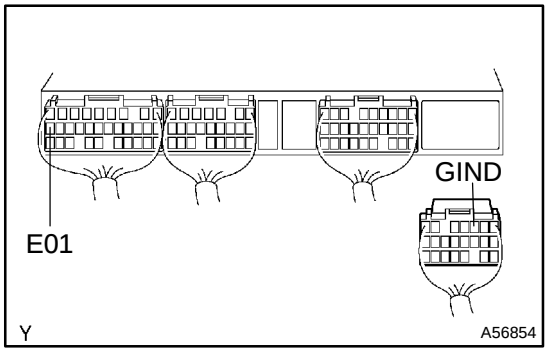
1	CHECK GLOW INDICATOR LIGHT

(a) Turn the ignition switch ON.
(b) Does the glow indicator light up?
(c) The glow indicator lights up for 0.5 sec. or more.

OK → **Go to step 6**

NG

2	INSPECT ECM

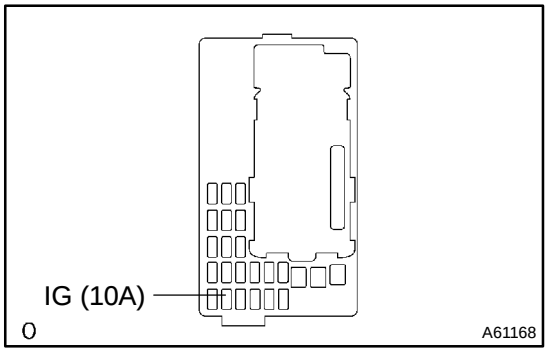


(a) Disconnect the ECM E16 connector.
(b) Turn ignition switch ON.
(c) Measure the voltage between terminal GIND and E01 of the ECM connector.
Voltage: 9 - 4 V

OK → **CHECK AND REPLACE ECM**

NG

3	CHECK FUSE(IGN FUSE)



(a) Remove the IGN fuse from the instrument panel J/B.
(b) Check the continuity of the IGN fuse.
Resistance: 1 Ω or less

NG → **CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED IGN FUSE**

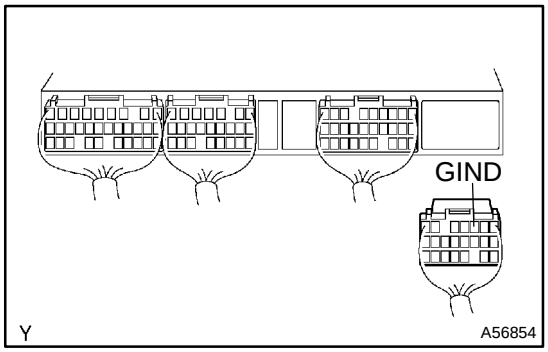
OK

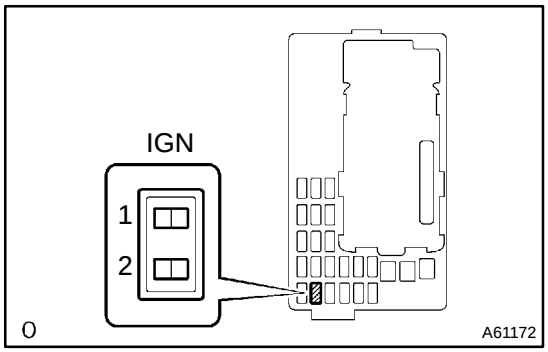
4	CHECK GLOW INDICATOR LIGHT(LIGHT BULB)

NG → **REPLACE BULB**

OK

5	CHECK HARNESS AND CONNECTOR(ECM-COMBINATION METER,AND COMBINATION METER-ING FUSE)





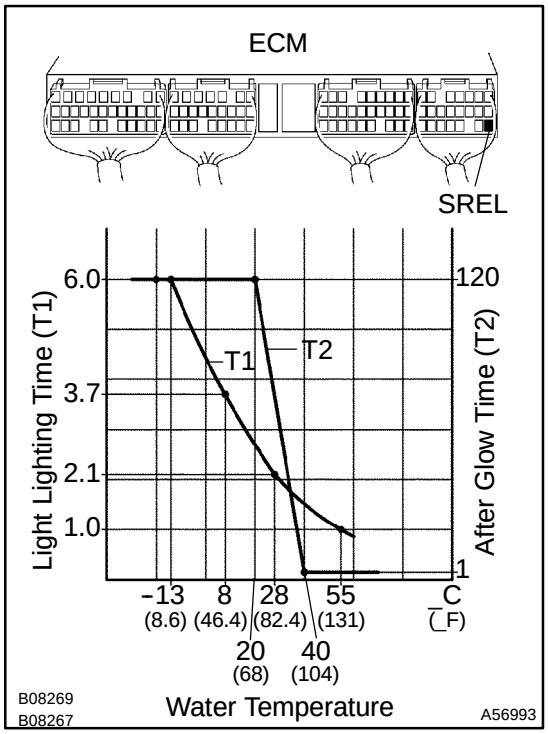
(a) Disconnect the combination meter C8 connector (See page 71-32).
(b) Disconnect the ECM E16 connector.
(c) Remove the IGN fuse from the instrument panel J/B.
(d) Check for open between the terminals GIND of the ECM E16 connector and C8 of the combination meter connector. (Terminal arrangement on 05-1295)
Resistance: 1 Ω or less
(e) Check for open between the terminals 2 of the IGN fuse terminal and C8 of the combination meter connector. Terminal arrangement on 05-1295)
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

6	CHECK GLOW INDICATOR LIGHT(LIGHTING TIME)



(a) Inspect lighting time of glow indicator light.
(1) Turn the ignition switch ON, and measure the lighting time.
LIGHT LIGHTING TIME (T1): Refer to the chart graph

(b) Inspect after glow time.
(1) Turn the ignition switch to START, after the engine starts, measure the time when the battery voltage is applied to terminal SREL of the ECM.
AFTER GLOW TIME (T2): Refer to the chart graph

NG → **CHECK AND REPLACE ECM**

OK

7	READ OUTPUT DTC (See page 05-424)

SST 09843-18040

Result:

	A	B
RESULT	Other DTC is not output	Other DTC is output

B → **GO TO RELEVANT DTC CHART**

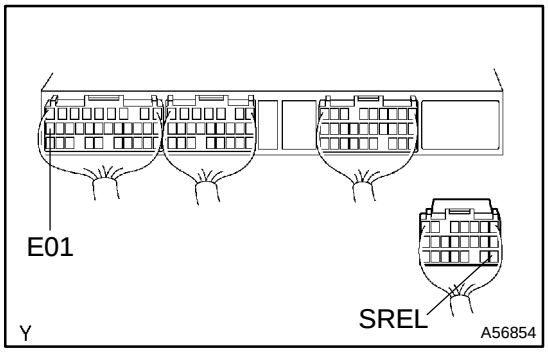
A

8	CHECK GLOW PLUG RELAY ASSY (See page 19-32)

NG → **REPLACE GLOW PLUG ASSY**

OK

9	INSPECT ECM

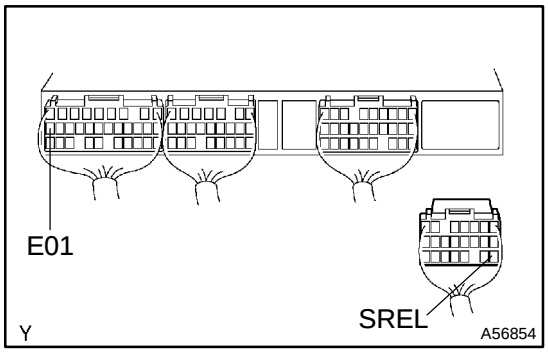


(a) Disconnect the ECM E16 connector.
(b) Turn the ignition switch START.
(c) Measure the voltage between terminal SREL and E01 of the ECM connector at cranking.
Voltage: 9 - 14 V

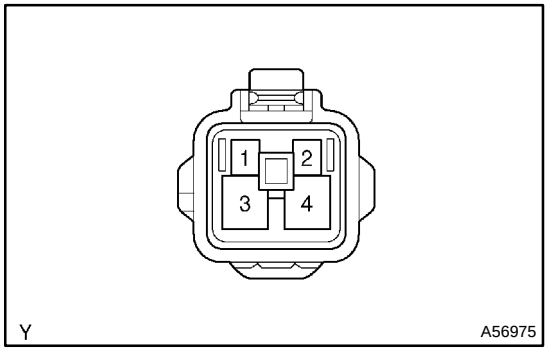
NG → **CHECK AND REPLACE ECM**

OK

10	CHECK HARNESS AND CONNECTOR(ECM-GLOW PLUG RELAY,AND GLOW PLUG RELAY-BODY GROUND)



(a) Disconnect the glow plug relay connector.
(b) Disconnect the ECM E16 connector.
(c) Check for open between the terminals SREL of the ECM E16 connector and 2 of the glow plug relay harness side connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals SREL of the ECM E16 connector and E01 of the ECM E18 connector.
Resistance: 1 MΩ or less
(e) Check for open between the terminal 1 of the glow plug relay harness side connector and body ground.
Resistance: 1 Ω or less



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

11	INSPECT GLOW PLUG ASSY (See page 19-32)

NG → **REPLACE GLOW PLUG ASSY**

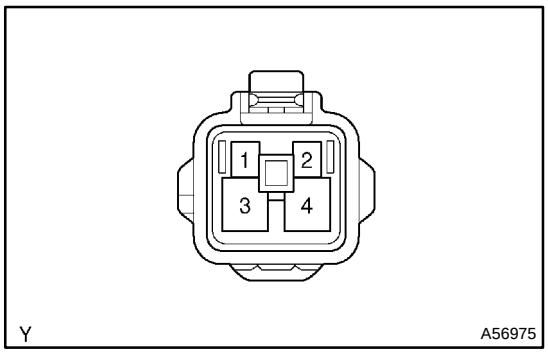
OK

12	INSPECT GLOW PLUG ASSY(INSTALLATION)

NG → TIGHTEN GLOW PLUG

OK

13	CHECK HARNESS AND CONNECTOR(GLOW PLUG RERAY-GLOW PLUG)



(a) Disconnect the glow plug relay connector.
(b) Remove the harness side terminal of the glow plug connector.
(c) Check for open between the terminals 3 of the glow plug relay harness side connector and harness side terminal of the glow plug connector.
Resistance: 1 Ω or less

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE
(See page 05-438)

ABS WITH EBD SYSTEM (TMC MADE)

HOW TO PROCEED WITH TROUBLESHOOTING

050YD-06

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-560)

3	Check and Clear DTCs and Freeze Frame Data (See page 05-561)

4	Problem Symptom Confirmation

- Symptom does not occur: Go to step 5
- Symptom occurs: Go to step 6

5	Symptom Simulation (See page 01-20)

6	DTC Check (See page 05-561)

- There is no output: Go to step 7
- There is output: Go to step 8

7	Problem Symptoms Table (See page 05-571)

- Check for fluid leakage and Go to step 10

8	DTC Chart (See page 05-567)

9	Circuit Inspection (See page 05-572 - 05-609)

HINT:
When 2 or more DTC's are recorded, and the problem is not identified, perform circuit inspection of the other DTC's.

10	**Identification of Problem**

11	**Repair**

12	**Comfirmation Test**

End

HINT:
Step 3, 6, 9, 12:
Diagnostic steps permitting the use of the hand-held tester.
Fail safe function:
When a failure occurs in the ABS system, the ABS warning light is lit and the ABS operation is prohibited. In addition to this, when the failure which disables the EBD operation occurs, the brake warning light is lit as well and the EBD operation is prohibited.

050X4-06

CUSTOMER PROBLEM ANALYSIS CHECK

ABS Check Sheet

Inspector's Name :

Customer's Name		**Registration No.**	
		Registration Date	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

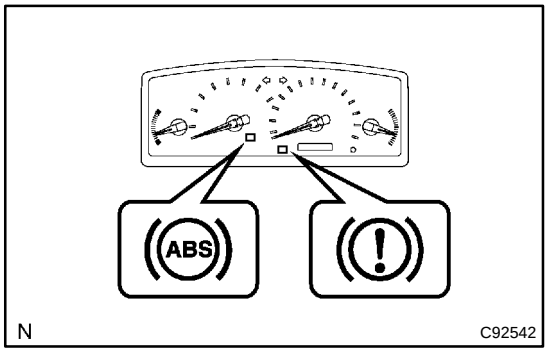
Date Problem First Occurred	/ /
Frequency the Problem Occurs	☐ Continuously ☐ Intermittently (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate efficiently.	
	ABS Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up
	Brake Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

Freeze Frame Data	STOP LIGHT SW	☐ ON ☐ OFF
	SYSTEM	☐ NO SYS ☐ ABS ☐ FAIL SF
	#IG ON	
	VEHICLE SPD	MPH km/h

056SR-02



PRE-CHECK

1. DIAGNOSIS SYSTEM

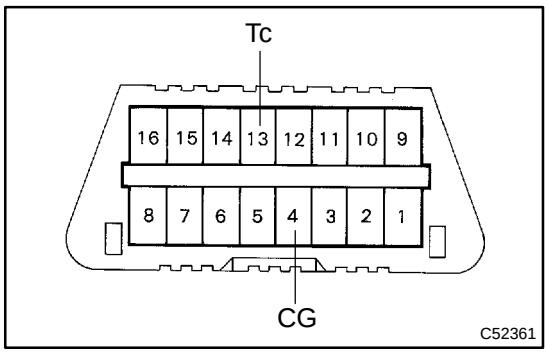
(a) Release the parking brake lever.

(b) Check the warning lights.

When the ignition switch is turned ON, check that the ABS warning light and brake warning light goes on for 3 sec.

HINT:

- When the parking brake is applied or the level of the brake fluid is low, the brake warning light is lit.
- If the indicator check result is not normal, proceed to troubleshooting for the ABS warning light circuit (See page 05-596 or 05-600) or brake warning light circuit (See page 05-603).



(c) In case of not using hand-held tester:

Check the DTC.

(1) Using SST, it connects terminal Tc and CG of DLC3.

SST 09843-18040

(2) Turn the ignition switch to ON.

(3) Read the DTC from the ABS warning light on the combination meter.

HINT:

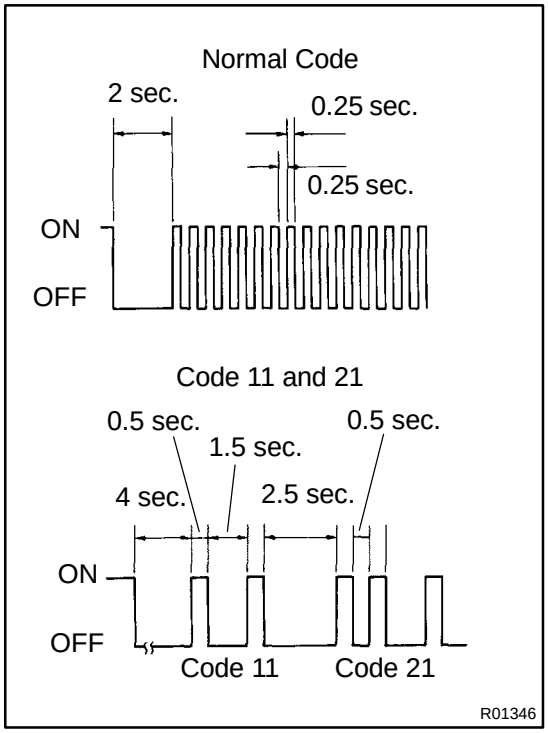
- If not code appears, inspect the diagnostic circuit or ABS warning light circuit (See page 05-607 or 05-600).
- As an example, the blinking patterns for normal code and codes 11 and 21 are shown on the left.

(4) Codes are explained in the code table on page 05-567.

If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC will be displayed 1st.

(5) After completing the check, remove the SST from the DLC3.

SST 09843-18040



(d) In case of using hand-held tester:

Check the DTC.

(1) Read the DTC by following the prompts on the tester screen.

HINT:

Please refer to the hand-held tester operator's manual for further details.

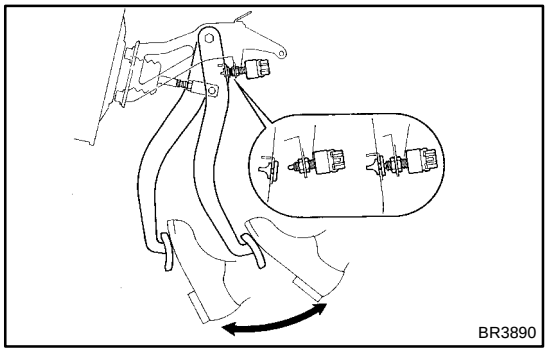
(e) In case of not using hand-held tester:

Clear DTC.

(1) Using SST, it connects the terminal Tc and CG of the DLC3.

SST 09843-18040

(2) Turn the ignition switch to ON.



(3) Clear DTC stored in ECU by depressing the brake pedal 8 or more times whitin 5 sec.
(4) Check that the ABS warning light shows the normal code.
(5) Remove the SST from the DLC3.
SST 09843-18040

HINT:
Disconnect the battey cable during repairs will not erase the DTC in the ECU.

(f) In case of using hand-held tester:
Clear the DTC.
(1) Turn the ignition switch to ON.
(2) Operate the hand-held tester to erase the codes.

HINT:
Please refer to the hand-held tester operator's manual for further details.

2. DATA LIST

HINT:
According to the DATA LIST displayed by the Hand-held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. Reading the DATA LIST as a first step of troubleshooting is one of the method to shorten the labor time.

(a) Connect the Hand-held tester to the DLC3.
(b) Turn the ignition switch to ON.
(c) According to the display on tester, read the "DATA LIST".

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
ABS MOT RELAY	ABS motor relay / ON or OFF		
SOL RELAY	Solenoid relay / ON or OFF		
STOP LIGHT SW	Stop light switch / ON or OFF	ON : Brake pedal depressed OFF : Brake pedal released	
PKB SW	Parking brake switch / ON or OFF	ON : Parking brake applied OFF : Parking brake released	
ABS OPERT FR	ABS operation (FR) / BEFORE or OPERATE	BEFORE : No ABS operation (FR) OPERATE : During ABS operation (FR)	
ABS OPERT FL	ABS operation (FL) / BEFORE or OPERATE	BEFORE : No ABS operation (FL) OPERATE : During ABS operation (FL)	
ABS OPERT RR	ABS operation (RR) / BEFORE or OPERATE	BEFORE : No ABS operation (RR) OPERATE : During ABS operation (RR)	Speed indicated on speedometer
ABS OPERT RL	ABS operation (RL) / BEFORE or OPERATE	BEFORE : No ABS operation (RL) OPERATE : During ABS operation (RL)	Speed indicated on speedometer

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
WHEEL SPD FR	Wheel speed sensor (FR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD FL	Wheel speed sensor (FL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD RR	Wheel speed sensor (RR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	
WHEEL SPD RL	Wheel speed sensor (RL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	
IG VOLTAGE	ECU power supply voltage / NORMAL or TOO LOW	NORMAL : 9.5 V or over TOO LOW : Below 9.5 V	
SFRR	ABS solenoid (SFRR) ON / OFF		
SFRH	ABS solenoid (SFRH) ON / OFF		
SFLR	ABS solenoid (SFLR) ON / OFF		
SFLH	ABS solenoid (SFLH) ON / OFF		
SRRR (SRR)	ABS solenoid (SRRR (SRR)) ON / OFF		
SRRH (SRH)	ABS solenoid (SRRH (SRH)) ON / OFF		
SRLR	ABS solenoid (SRLR) ON / OFF		
SRLH	ABS solenoid (SRLH) ON / OFF		
AIR BLD SUPPORT	Air bleed support / SUPPORT or NOT SUP	Supported	
TEST MODE	Test mode / NORMAL or TEST	NORMAL : Normal mode TEST : During test mode	
#CODES	Number of DTC recorded / min.: 0, max.: 255	Min.: 0, max.: 19	

3. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the Hand-held tester allows the relay, actuator and so on to operate without parts removal. Performing the ACTIVE TEST as a first step of troubleshooting is one of the methods to shorten the labor time.

It is possible to display the DATA LIST during the ACTIVE TEST.

(a) Connect the Hand-held tester to the DLC3.

(b) Turn the ignition switch to ON.

(c) According to the display on tester, perform the "ACTIVE TEST".

Item	Vehicle Condition / Test Details	Diagnostic Note
SFRR	Turns ABS solenoid (SFRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRH	Turns ABS solenoid (SFRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLR	Turns ABS solenoid (SFLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLH	Turns ABS solenoid (SFLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRR	Turns ABS solenoid (SRRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRH	Turns ABS solenoid (SRRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLR	Turns ABS solenoid (SRLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLH	Turns ABS solenoid (SRLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRR & SFRH	Turns ABS solenoid SFRR & SFRH ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLR & SFLH	Turns ABS solenoid SFLR & SFLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SRH & SRR	Turns ABS solenoid SRH & SRR ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLR & SRLH	Turns ABS solenoid SRLR & SRLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRH & SFLH	Turns ABS solenoid SFRH & SFLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SOL RELAY	Turns ABS solenoid relay ON / OFF	Operation of solenoid (clicking sound) can be heard
ABS MOT RELAY	Turns ABS motor relay ON / OFF	Operation of motor can be heard
ABS WARN LIGHT	Turns ABS warning light ON / OFF	Observe combination meter
BRAKE WRN LIGHT	Turns BRAKE warning light ON / OFF	Observe combination meter

4. FREEZE FRAME DATA

(a) The vehicle (sensor) status memorized during ABS operation or at the time of error code detection can be displayed using the hand-held tester.

(b) Only one record of freeze frame data is stored and the freeze frame data generated during ABS operation are constantly updated. Also, the number of the ignition switch's "ON" after the freeze frame data is stored can be memorized up to 31 and it can be displayed.

HINT:

If the ignition switch "ON" operation exceeds 31 times, "31" appears on the display.

(c) If the diagnosis code abnormality occurs, the freeze frame data at the occurrence of the abnormality is stored but the ABS actuation data is deleted.

Hand-held tester display	Measurement Item	Reference Value*
VEHICLE SPD	Vehicle speed	Speed indication of a meter
STOP LIGHT SW	Stop light switch signal	Stop light switch ON: ON, OFF: OFF
# IG ON	Numbers of operations of ignition switch ON after memorizing freeze frame data	0 - 31
SYSTEM	Operate system	ABS operate: ABS

*: If no conditions are specifically stated for "Idling", it means the shift lever is at N or P position, the A/C switch is OFF and all accessory switches are OFF.

5. SPEED SENSOR SIGNAL CHECK

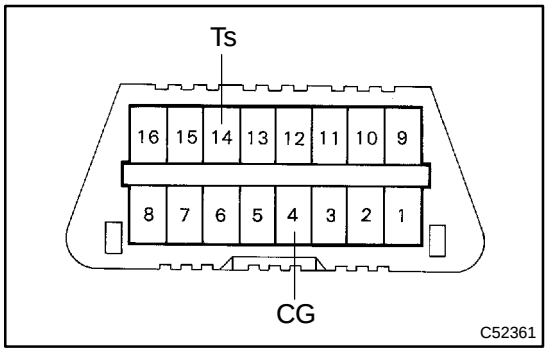
HINT:

If the ignition switch is turned from ON to ACC or LOCK during test mode, DTC will be erased.

(a) In case of not using hand-held tester:

Check the speed sensor signal.

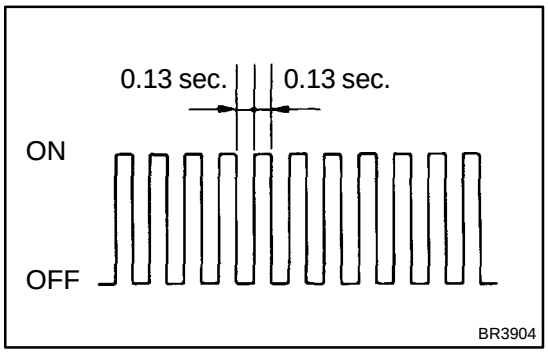
(1) Turn the ignition switch to ON.



(2) Using SST, it connects the terminal Ts and CG of DLC3.

SST 09843-18040

(3) Start the engine.



(4) Check that the ABS warning light blinks.

HINT:

If the ABS warning light does not blink, inspect the ABS warning light circuit and Ts circuit (See page 05-600 and 05-609).

(5) Drive the vehicle straight forward at the speed of 45 km/h (28 mph) or over for several seconds and check that the ABS warning light comes off.

HINT:

The sensor check may not be completed if the wheels spin or the steering wheels steered during check.

(6) Stop the vehicle.

(7) Using SST, it connects the terminal Tc and CG of the DLC3.

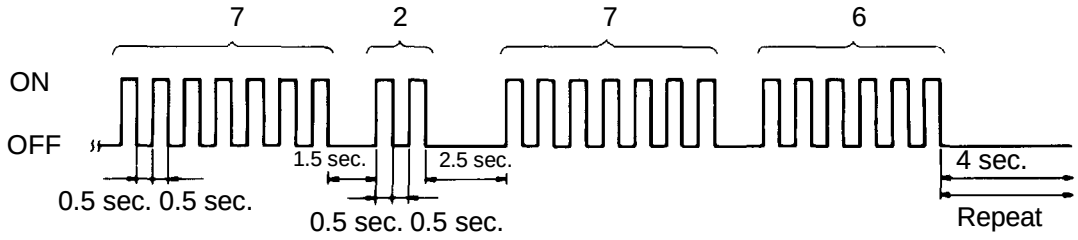
SST 09843-18040

(8) Read the number of blinks of the ABS warning light.

HINT:

- See the list of DTC shown on the 05–567.
- If every sensor is normal, a normal code is output (A cycle of 0.25 sec. ON and 0.25 sec. OFF is repeated).
- If 2 or more malfunctions are indicated at the same time, the lowest numbered code will be displayed.

Malfunction Code (Example Code 72, 76)



BR3893

(9) After performing the check, turn the ignition switch to OFF, and remove the SST from the DLC3.

SST 09843–18040

(b) In case of using hand–held tester:

Check the speed sensor signal.

(1) Do step (3) to (6) on the previous page.

(2) Read the DTC by following the prompts on the tes ter screen.

HINT:

Please refer to the hand–held tester operator's manual for fur ther details.

050XB-06

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

When removing the part, turn the ignition switch to OFF.

HINT:

- Using SST 09843-18040, it connect the terminal Tc and CG of DLC3.
- If any abnormality is not found when inspecting parts, inspect the ECU and ground points for poor contact.
- If a malfunction code is displayed during the DTC check, check the circuit listed that code. For details of each code, turn to the page referred to under the "See page" for respective "DTC No." in the DTC chart.
- When 2 or more DTC's are recorded, and the problem is not identified, perform circuit inspection of the other DTC's.

DTC No. (See Page)	Detection Item	Trouble Area
C0200/31 (05-572)	Right front wheel speed sensor signal malfunction	• Right front speed sensor • Right front speed sensor circuit • Right front speed sensor rotor
C0205/32 (05-572)	Left front wheel speed sensor signal malfunction	• Left front speed sensor • Left front speed sensor circuit • Left front speed sensor rotor
C0210/33 (05-576)	Right rear wheel speed sensor signal malfunction	• Right rear speed sensor • Right rear speed sensor circuit • Right rear speed sensor rotor
C0215/34 (05-576)	Left rear wheel speed sensor signal malfunction	• Left rear speed sensor • Left rear speed sensor circuit • Left rear speed sensor rotor
C0226/21 (05-580)	Open or short circuit in ABS actuator solenoid (SFR) circuit	• Brake actuator • SFRR or SFRH circuit
C0236/22 (05-580)	Open or short circuit in ABS actuator solenoid (SFL) circuit	• Brake actuator • SFLR or SFLH circuit
C0246/23 (05-580)	Open or short circuit in ABS actuator solenoid (SRR) circuit	• Brake actuator • SRRR or SRRH circuit
C0256/24 (05-580)	Open or short circuit in ABS actuator solenoid (SRL) circuit	• Brake actuator • SRLR or SRLH circuit
C0273/13 (05-582)	Open circuit in ABS motor relay circuit	• ABS motor relay • ABS motor relay circuit
C0274/14 (05-582)	Short circuit in ABS motor relay circuit	
C0278/11 (05-585)	Open circuit in ABS solenoid relay circuit	• ABS solenoid relay • ABS solenoid relay circuit
C0279/12 (05-585)	Short circuit in ABS solenoid relay circuit	
C1235/35 (05-572)	Foreign matter is attached on the tip of right front sensor	• Right front speed sensor • Right front speed sensor rotor
C1236/36 (05-572)	Foreign matter is attached on the tip of left front sensor	• Left front speed sensor • Left front speed sensor rotor
C1238/38 (05-576)	Foreign matter is attached on the tip of right rear sensor	• Right rear speed sensor • Right rear speed sensor rotor
C1239/39 (05-576)	Foreign matter is attached on the tip of left rear sensor	• Left rear speed sensor • Left rear speed sensor rotor
C1241/41 (05-588)	Low battery voltage or abnormally high battery voltage	• Battery • Charging system • Power source circuit
C1249/49 (05-591)	Open circuit in stop light switch circuit	• Stop light switch • Stop light switch circuit

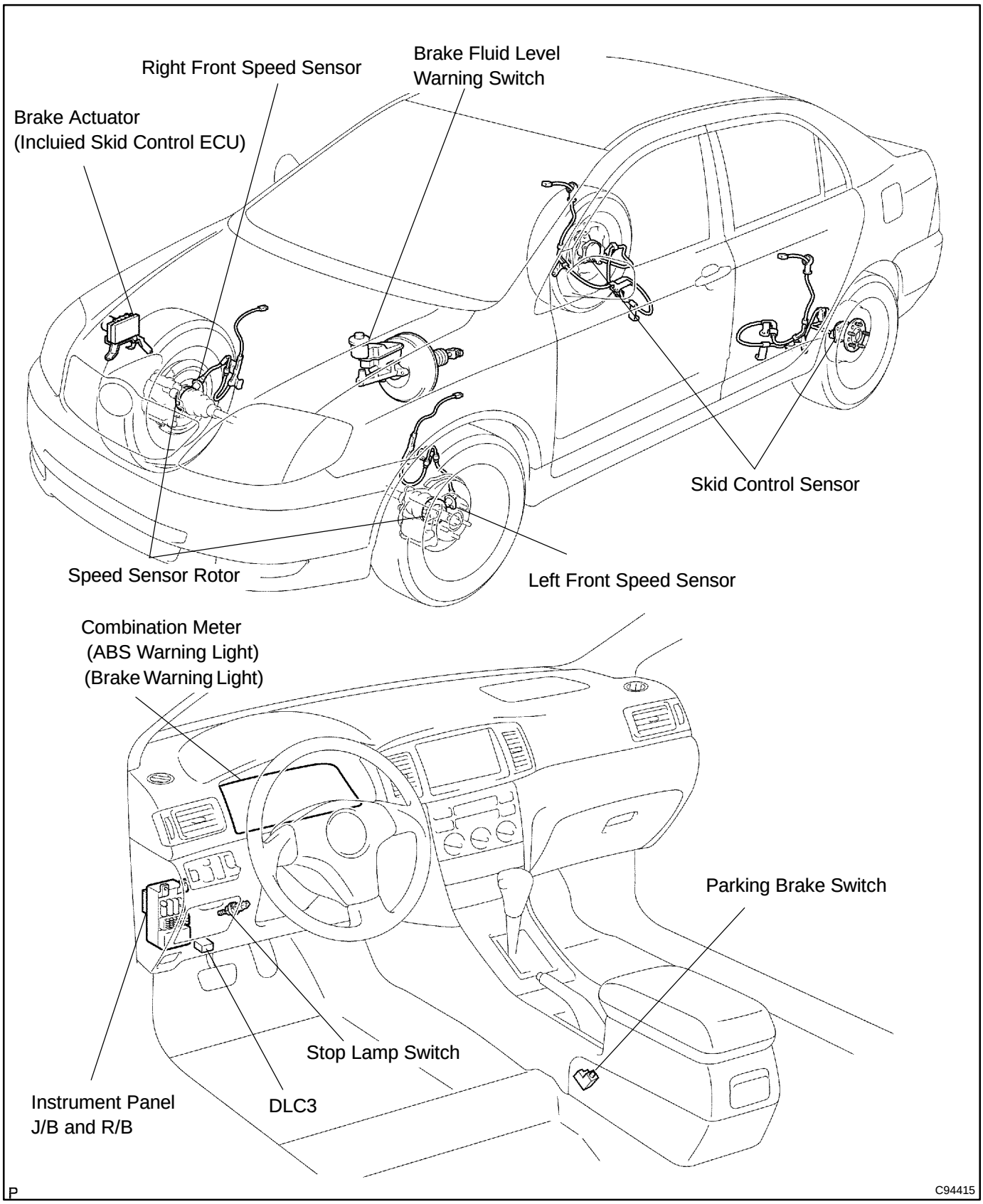
C1251/51 (05-594)	Pump motor is locked Open circuit in pump motor circuit	S ABS pump motor
Always ON (05-596)	Malfunction in skid control ECU	S Battery S Charging system S Power source circuit S Skid control ECU

DTC of speed sensor check function:

Code No.	Diagnosis	Trouble Area
C1271/71	Low output voltage of right front speed sensor	S Right front speed sensor S Sensor installation S Sensor rotor
C1272/72	Low output voltage of left front speed sensor	S Left front speed sensor S Sensor installation S Sensor rotor
C1273/73	Low output voltage of right rear speed sensor	S Right rear speed sensor S Sensor installation S Sensor rotor
C1274/74	Low output voltage of left rear speed sensor	S Left rear speed sensor S Sensor installation S Sensor rotor
C1275/75	Abnormal change in output voltage of right front speed sensor	Right front speed sensor rotor
C1276/76	Abnormal change in output voltage of left front speed sensor	Left front speed sensor rotor
C1277/77	Abnormal change in output voltage of right rear speed sensor	Right rear speed sensor rotor
C1278/78	Abnormal change in output voltage of left rear speed sensor	Left rear speed sensor rotor

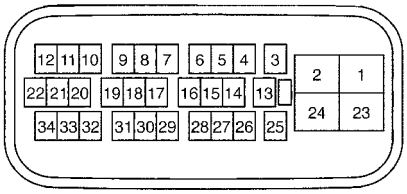
050XD-05

LOCATION



050XF-06

TERMINALS OF ECU



F07812

Symbols (Terminal No.)	Wiring Color	Condition	STD Voltage (V)
+BS (1) - GND (2, 24)	L ⇔ W-B	Always	10 - 14
FL+ (9) - FL- (10)	R ⇔ G	IG switch ON, slowly turn left front wheel	AC generation
RL+ (11) - RL- (12)	B ⇔ Y	IG switch ON, slowly turn left rear wheel	AC generation
BRL (4) - GND (2, 24)	R-W ⇔ W-B	IG switch ON, brake warning light ON	8 - 14
D/G (14) - GND (2, 24)	L-R ⇔ W-B	IG switch ON	10 - 14
Ts (15) - GND (2,24)	GR-G ⇔ W-B	IG switch ON	10 - 14
Tc (16) - GND (2, 24)	P-B ⇔ W-B	IG switch ON	10 - 14
STP (18) - GND (2, 24)	G-W ⇔ W-B	Stop light switch ON	8 - 14
+BM (23) - GND (2, 24)	L ⇔ W-B	Always	10 - 14
IG1 (25) - GND (2, 24)	B-Y ⇔ W-B	IG switch ON	10 - 14
WA (26) - GND (2, 24)	W-R ⇔ W-B	IG switch ON, ABS warning light ON	8 - 14
FR+ (31) - FR- (32)	B ⇔ W	IG switch ON, slowly turn right front wheel	AC generation
RR+ (33) - RR- (34)	R ⇔ W	IG switch ON, slowly turn right rear wheel	AC generation
SP1 (27) - GND (2, 24)	V-W ↔ W-B	Vehicle driving at about 20 km/h (12 mph)	AC generation
PKB (30) - GND (2, 24)	R-Y ↔ W-B	IG switch ON, parking brake switch ON	Below 1.5
		IG switch ON, parking brake switch OFF	10 - 14

050XH-06

PROBLEM SYMPTOMS TABLE

If a normal code is displayed during the DTC check but the problem still occurs, check the circuits for each problem symptom in the order given in the table below and proceed to the relevant troubleshooting page.

NOTICE:

When replacing Skid Control ECU, sensor or etc., turn the ignition switch to OFF.

Symptom	Suspect Area	See page
ABS does not operate	When the followings 1. to 4. are all normal and the problem is still occurring, replace the skid control ECU. 1. Check the DTC reconfirming that the normal code is output. 2. IG power source circuit 3. Speed sensor circuit 4. Check the brake actuator with a hand-held tester. If abnormal, check the hydraulic circuit for leakage.	 05-561 05-588 05-572 05-576 32-79
ABS does not operate efficiently	When the following 1. to 4. are all normal and the problem is still occurring, replace the skid control ECU. 1. Check the DTC reconfirming that the normal code is output. 2. Speed sensor circuit 3. Stop light switch circuit 4. Check the brake actuator with a hand-held tester. If abnormal, check the hydraulic circuit for leakage.	 05-561 05-572 05-576 05-591 32-79
ABS warning light abnormality	1. ABS warning light circuit 2. Skid control ECU	05-596 05-600 -
DTC check cannot be done	When the following 1. and 2. are all normal and the problem is still occurring, replace the skid control ECU. 1. ABS warning light circuit 2. Tc terminal circuit	 05-596 05-600 05-607
Speed sensor signal check cannot be done	1. Ts terminal circuit 2. Skid control ECU	05-609 -

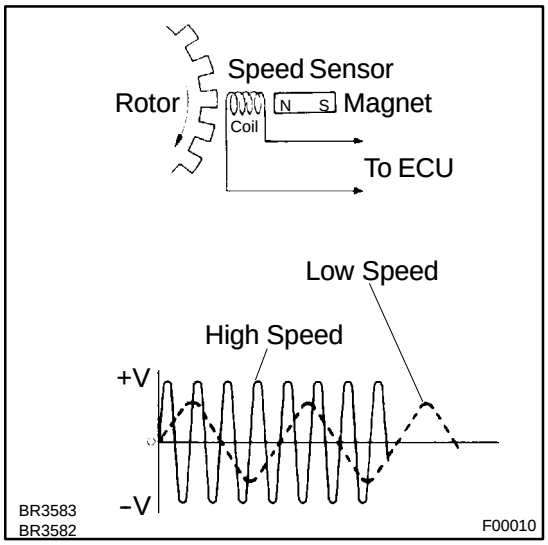
DTC	C0200/31	RIGHT FRONT SPEED SENSOR CIRCUIT

DTC	C0205/32	LEFT FRONT SPEED SENSOR CIRCUIT

DTC	C1235/35	FOREIGN MATTER IS ATTACHED ON TIP OF RIGHT FRONT SENSOR

DTC	C1236/36	FOREIGN MATTER IS ATTACHED ON TIP OF LEFT FRONT SENSOR

CIRCUIT DESCRIPTION

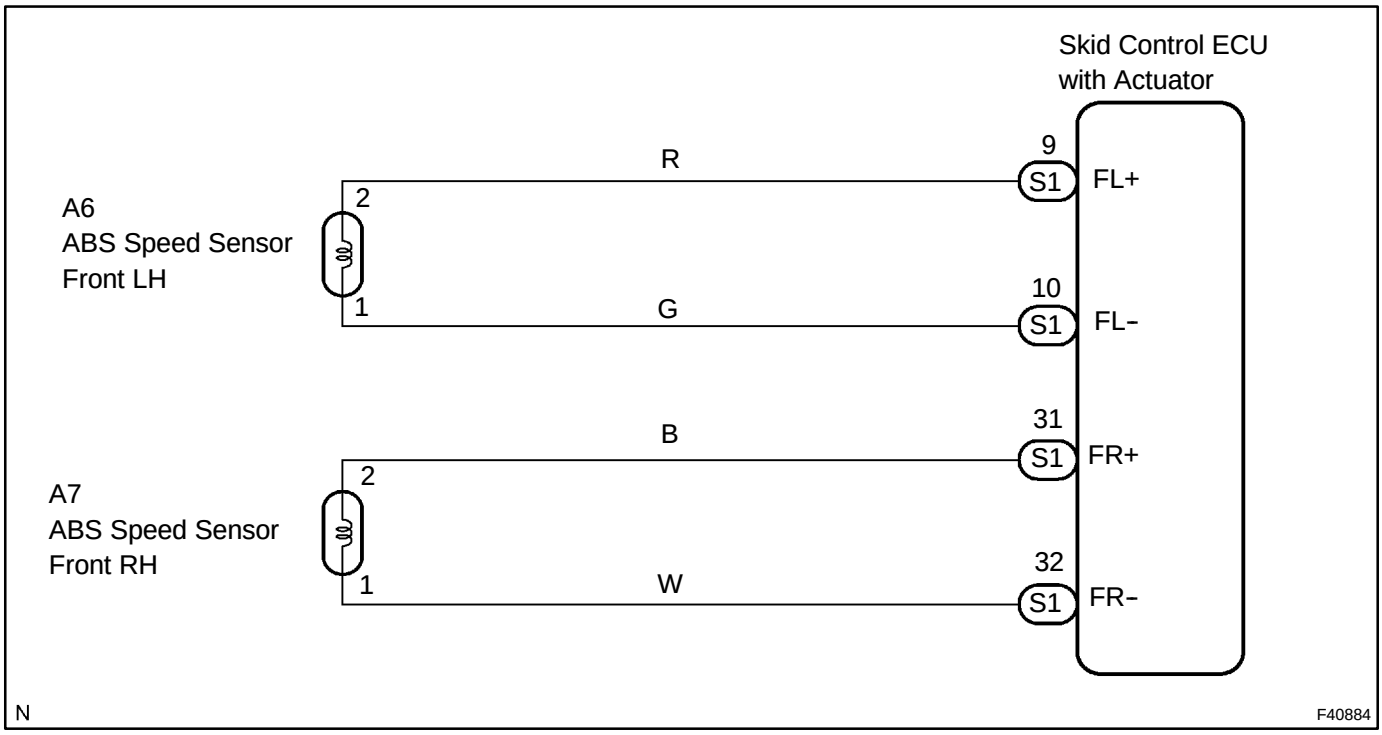


The speed sensor detects wheel speed and transmits the appropriate signals to the ECU. These signals are used for control of the ABS control system. Each of the front and rear rotors has 48 serrations.
When the rotors rotate, the magnetic field generated by the permanent magnet in the speed sensor induces an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200/31 C0205/32	Detection of any of conditions 1. through 3.: 1. At vehicle speed of 10 km/h (6 mph) or more, pulses are not input for 15 sec. 2. Momentary interruption of the speed sensor signal occurs at least 7 times in the time between switching the ignition switch ON and switching it OFF. 3. The condition that the speed sensor signal circuit is open continues for 0.5 sec. or more.	S Right front and left front speed sensor S Each speed sensor circuit S Speed sensor rotor
C1235/35 C1236/36	At the vehicle speed of 20 km/h (12 mph) or more, the condition that noise is included in the speed sensor signal continues for 5 sec. or more.	S Right front and left front speed sensor S Speed sensor rotor

HINT:
DTC No. C0200/31 and C1235/35 is the right front speed sensor.
DTC No. C0205/32 and C1236/36 is the left front speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF HAND-HELD TESTER(FRONT SPEED SENSOR)

(a) Select the DATALIST mode on the hand-held tester.

(b) Check that there is no difference between the speed value output from the speed sensor displayed by the hand-held tester and the speed value displayed by the speedometer when driving the vehicle.

OK:

There is almost no difference in the displayed speed value.

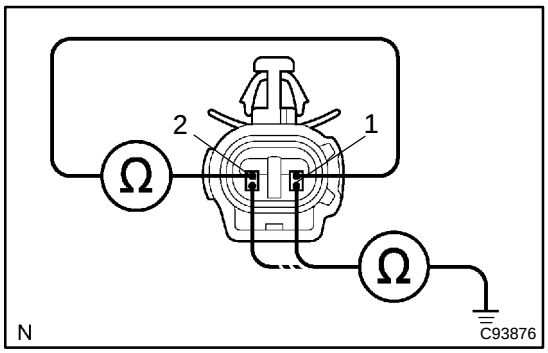
HINT:

There is tolerance of ±10 % in the speedometer indication.

OK → **Go to step 5**

NG

2 INSPECT FRONT SPEED SENSOR



(a) Remove the fender liner.
(b) Disconnect the speed sensor connector.
(c) Measure resistance between terminals 1 and 2 of the speed sensor connector.
OK:
Resistance: 1.4 - 1.8 kΩ at 20_C (68_F)
(d) Measure resistance between each of terminals 1 and 2 of speed sensor connector and body ground.
OK:
Resistance: 1 MΩ or higher

NG → **REPLACE SPEED SENSOR FRONT RH**

NG → **REPLACE SPEED SENSOR FRONT LH**

NOTICE:
Check the speed sensor signal last **(See page 05-561).**

OK

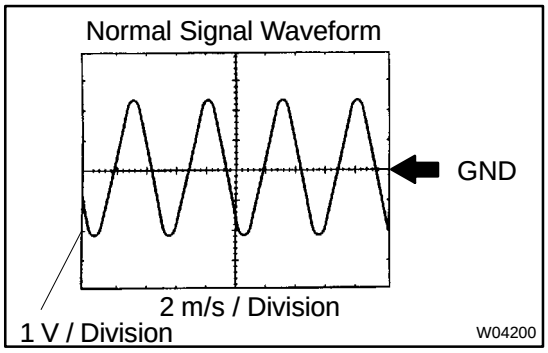
3 CHECK HARNESS AND CONNECTOR(FRONT SPEED SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each front speed sensor and skid control ECU (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



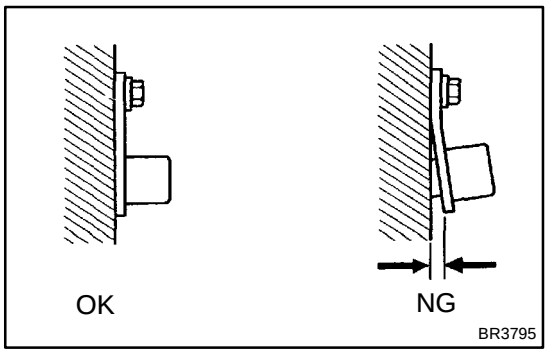
(REFERENCE) INSPECTION USING OSCILLOSCOPE
(a) Connect the oscilloscope to the terminal FR+ - FR- and FL+ - FL- of the skid control ECU.
(b) Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

HINT:
- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter deposited on it.

OK → **CHECK AND REPLACE BRAKE ACTUATOR ASSY** **(See page 01-30)**

NG

5 INSPECT FRONT SPEED SENSOR INSTALLATION



(a) Check the speed sensor installation.
OK:
The installation bolt is tightened properly and there is no clearance between the sensor and front steering knuckle.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

NG → **REPLACE SPEED SENSOR FRONT RH**

NG → **REPLACE SPEED SENSOR FRONT LH**

NOTICE:
Check the speed sensor signal last (See page 05-561).

OK

6 INSPECT SPEED SENSOR TIP

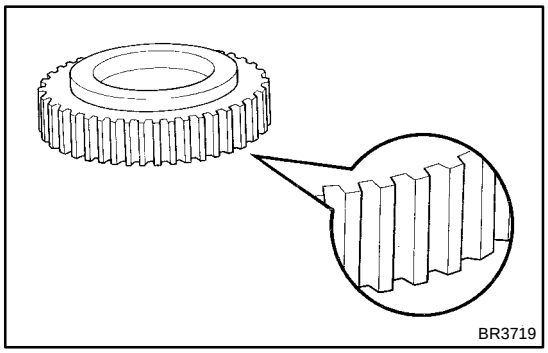
(a) Remove the front speed sensor (See page 32-91).
(b) Check the sensor tip.
OK:
No scratches or foreign objects on the sensor tip.

NG → **CLEAN OR REPAIR SPEED SENSOR**

NOTICE:
Check the speed sensor signal last (See page 05-561).

OK

7 INSPECT SPEED SENSOR ROTOR



(a) Remove the front speed sensor rotor (See page 30-6 or 30-18).
(b) Check the sensor rotor serrations.
OK:
No scratches, missing teeth or foreign objects.

HINT:
If foreign matter is attached, remove it and after reassembling, check the output waveform.

NG → **CLEAN OR REPAIR SPEED SENSOR ROTOR**

NOTICE:
Check the speed sensor signal last (See page 05-561).

OK

CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

DTC	C0210/33	RIGHT REAR SPEED SENSOR CIRCUIT

DTC	C0215/34	LEFT REAR SPEED SENSOR CIRCUIT

DTC	C1238/38	FOREIGN MATTER IS ATTACHED ON TIP OF RIGHT REAR SENSOR

DTC	C1239/39	FOREIGN MATTER IS ATTACHED ON TIP OF LEFT REAR SENSOR

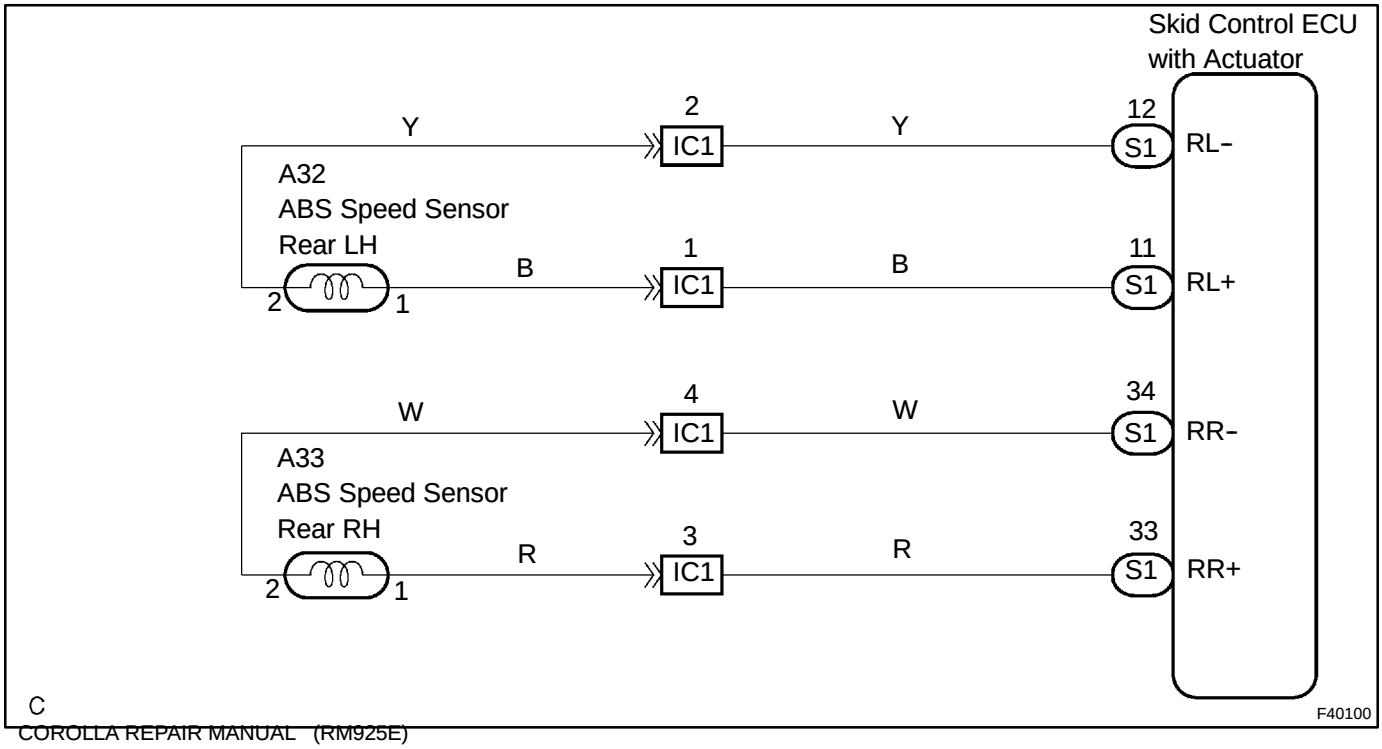
CIRCUIT DESCRIPTION

Refer to DTC C0200/31, C0205/32, C1235/35, C1236/36 on page 05-572.

DTC No.	DTC Detecting Condition	Trouble Area
C0210/33 C0215/34	Detection of any of conditions 1. through 3.: 1. At vehicle speed of 10 km/h (6 mph) or more, pulses are not input for 15 sec. 2. Momentary interruption of the speed sensor signal occurs at least 7 times in the time between switching the ignition switch ON and switching it OFF. 3. The condition that the speed sensor signal circuit is open continues for 0.5 sec. or more.	$ Right rear and left rear speed sensor $ Each speed sensor circuit $ Speed sensor rotor
C1238/38 C1239/39	At the vehicle speed of 20 km/h (12 mph) or more, the condition that noise is included in the speed sensor signal continues for 5 sec. or more.	$ Right rear and left rear speed sensor $ Speed sensor rotor

HINT:
DTC No. C0210/33, C1238/38 is for the right rear speed sensor.
DTC No. C0215/34, C1239/39 is for the left rear speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF HAND-HELD TESTER(SKID CONTROL SENSOR)

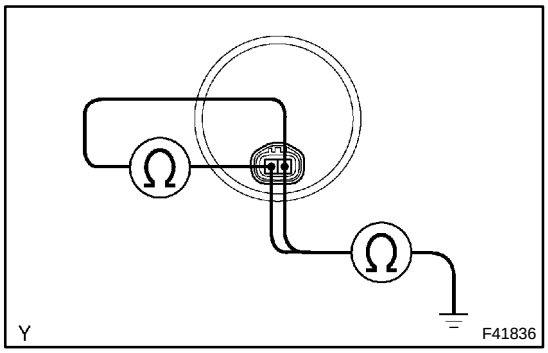
(a) Check that there is no difference between the speed value output from the speed sensor displayed by the hand-held tester and the speed value displayed by the speedometer when driving the vehicle.
OK:
There is almost no difference in the displayed speed value.

HINT:
There is tolerance of ± 10 % in the speedometer indication.

OK	Go to step 5

NG

2	INSPECT SKID CONTROL SENSOR



(a) Disconnect the skid control sensor connector.
(b) Measure resistance between terminals 1 and 2 of the skid control sensor connector.
OK:
Resistance: 2.2 kΩ or less
(c) Measure resistance between each of terminals 1 and 2 of skid control sensor connector and body ground.
OK:
Resistance: 1 MΩ or higher

NG	REPLACE SKID CONTROL SENSOR

NOTICE:
Check the speed sensor signal last (See page 05-561).

OK

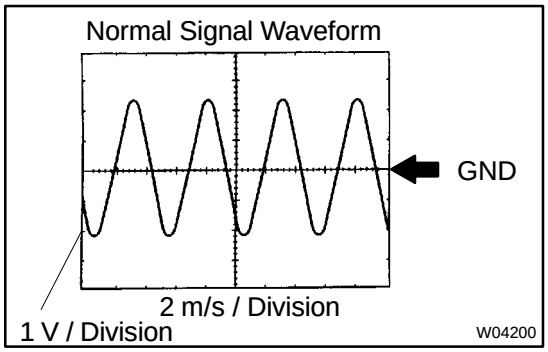
3	CHECK HARNESS AND CONNECTOR(SKID CONTROL SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each skid control sensor and skid control ECU (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4 INSPECT SENSOR AND SENSOR ROTOR SERRATIONS



(REFERENCE) INSPECTION USING OSCILLOSCOPE

(a) Connect the oscilloscope to the terminals RR+ - RR- and RL+ - RL- of the skid control ECU.

(b) Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

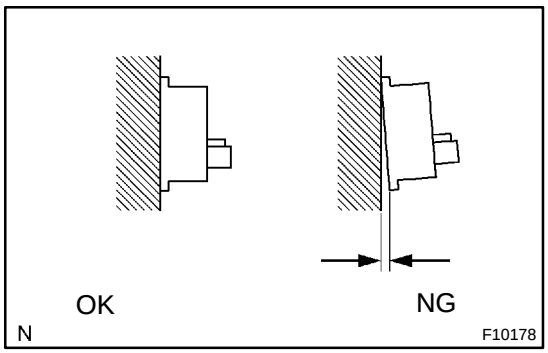
HINT:

- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter deposited on it.

OK	CHECK AND REPLACE BRAKE ACTUATOR ASSY(See page 01-30)

NG

5 INSPECT SENSOR INSTLLATION



(a) Check the sensor installation.

OK:

There is no clearance between the sensor and rear axle carrier.

NG	REPLACE SKID CONTROL SENSOR

NOTICE:

Check the speed sensor signal last (See page 05-561).

OK

6 INSPECT SKID CONTROL SENSOR TIP

(a) Remove the skid control sensor (See page 32-94).

(b) Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.

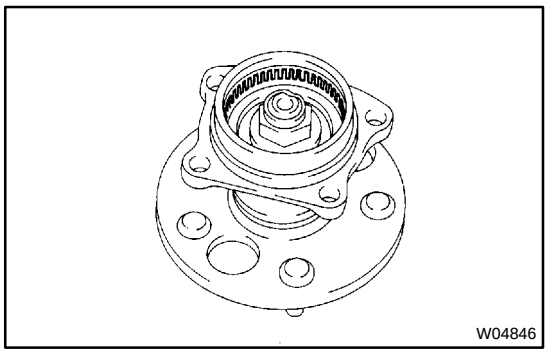
NG	CLEAN OR REPAIR SKID CONTORL SENSOR

NOTICE:

Check the speed sensor signal last (See page 05-561).

OK

7	INSPECT SENSOR ROTOR



(a) Check the sensor rotor serrations.
OK:
No scratches, missing teeth or foreign objects.

NG → **REPLACE REAR AXLE HUB & BEARING ASSY LH**

NG → **REPLACE REAR AXLE HUB & BEARING ASSY RH**

NOTICE:
Check the speed sensor signal last (See page 05-561).

OK →

CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

NOTICE:
Do not reuse skid control sensor.

DTC	C0226/21	SFR SOLENOID CIRCUIT

DTC	C0236/22	SFL SOLENOID CIRCUIT

DTC	C0246/23	SRR SOLENOID CIRCUIT

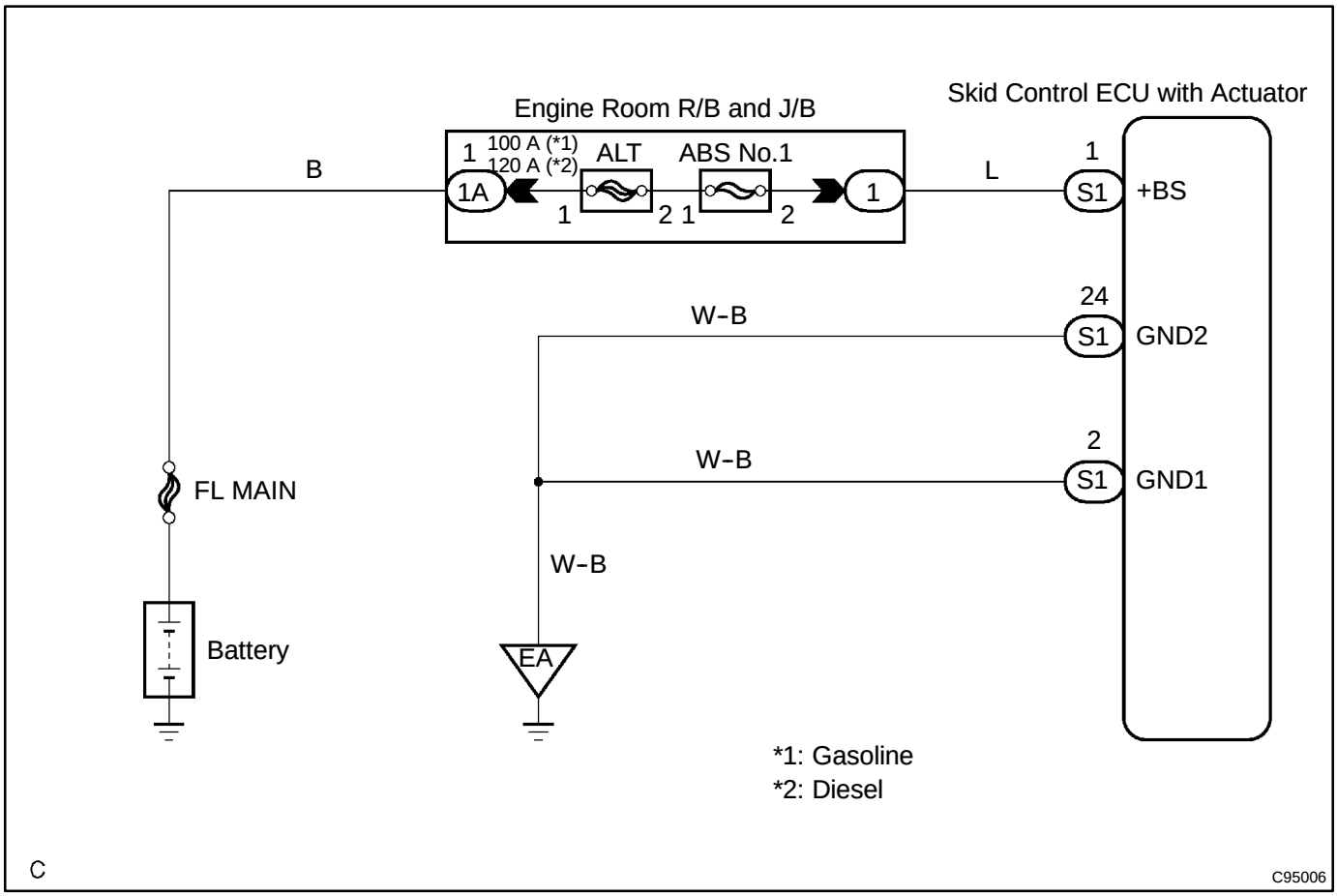
DTC	C0256/24	SRL SOLENOID CIRCUIT

CIRCUIT DESCRIPTION

This solenoid goes on when signals are received from the ECU and controls the pressure acting on the wheel cylinders thus controlling the braking force.

DTC No.	DTC Detecting Condition	Trouble Area
C0226/21 C0236/22 C0246/23 C0256/24	Detection of any condition in 1. and 2.: 1. With IG1 terminal voltage at 10V – 16V, solenoid circuit is open or short circuit for 0.05 sec. or longer. 2. With IG1 terminal voltage at 10V – 16V, during ABS control solenoid relay contact is OFF for 0.05 sec. or longer.	S Each solenoid circuit S Brake actuator

WIRING DIAGRAM



INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check if the other DTCs are recorded (See page 05-561).

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

REPLACE BRAKE ACTUATOR ASSY

DTC	C0273/13	OPEN CIRCUIT IN ABS MOTOR RELAY CIRCUIT

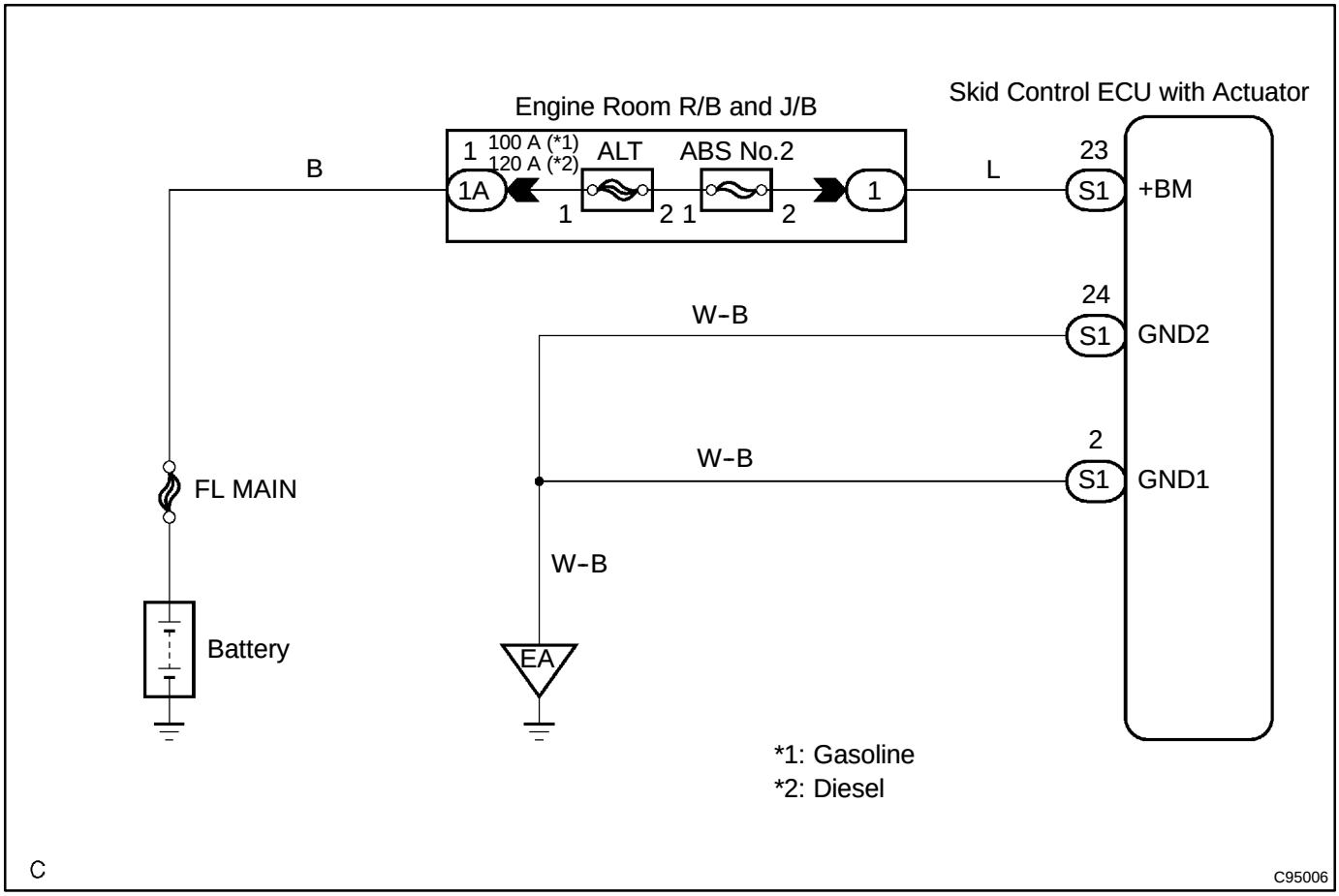
DTC	C0274/14	B+ SHORT CIRCUIT IN ABS MOTOR RELAY CIRCUIT

CIRCUIT DESCRIPTION

The ABS motor relay supplies power to the ABS pump motor. While the ABS is activated, the ECU switches the motor relay ON and operates the ABS pump motor.

DTC No.	DTC Detecting Condition	Trouble Area
C0273/13	With IG1 voltage 10V or below during initial check or ABS control, pump motor relay is turned ON, and relay contact is not ON for 0.2 sec. or longer.	$ ABS motor relay $ ABS motor relay circuit
C0274/14	When pump motor relay is turned OFF, relay contact is ON for 3 sec. or longer.	

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(ABS MOTOR RELAY)

(a) Check the operation sound of the ABS motor individually when operaing it with the hand-held tester.

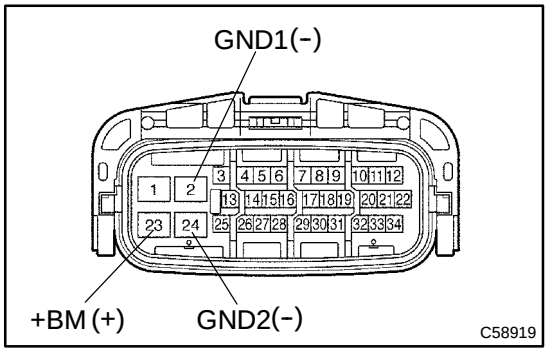
OK:

The operation sound of the ABS motor should be heard.

OK → **CHECK AND REPLACE BRAKE ACTUATOR ASSY** **(See page 01-30)**

NG

2	INSPECT SKID CONTROL ECU CONNECTOR(+BM TERMINAL VOLTAGE)



(a) Disconnect the skid control ECU connector.

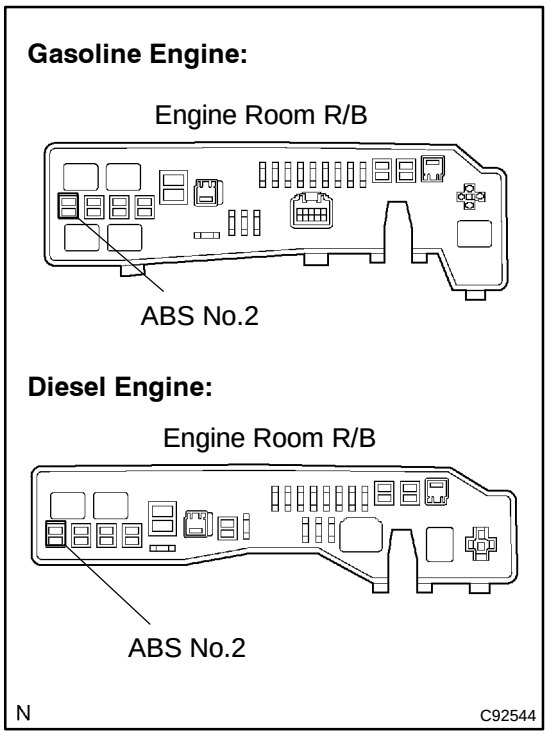
(b) Measure the voltage between terminals +BM (S1-23) and GND (S1-2, 24) of skid control ECU harness side connector.

Voltage: 10 - 14 V

OK → **CHECK AND REPLACE BRAKE ACTUATOR ASSY** **(See page 01-30)**

NG

3 INSPECT FUSE(ABS No.2 FUSE)

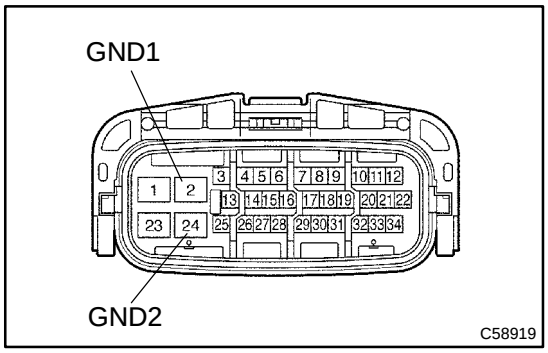


(a) Remove ABS No.2 fuse from the engine room R/B.
(b) Check continuity of ABS No.2 fuse.
OK:
Continuity

NG → **REPLACE INSPECT FOR SHORT CIRCUIT IN ALL HARNESSES AND COMPONENTS CONNECTED TO ABS NO.2 FUSE**

OK

4 INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-2, 24) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR(+BM CIRCUIT) **(See page 01-30)**

DTC	C0278/11	OPEN CIRCUIT IN ABS SOLENOID RELAY CIRCUIT

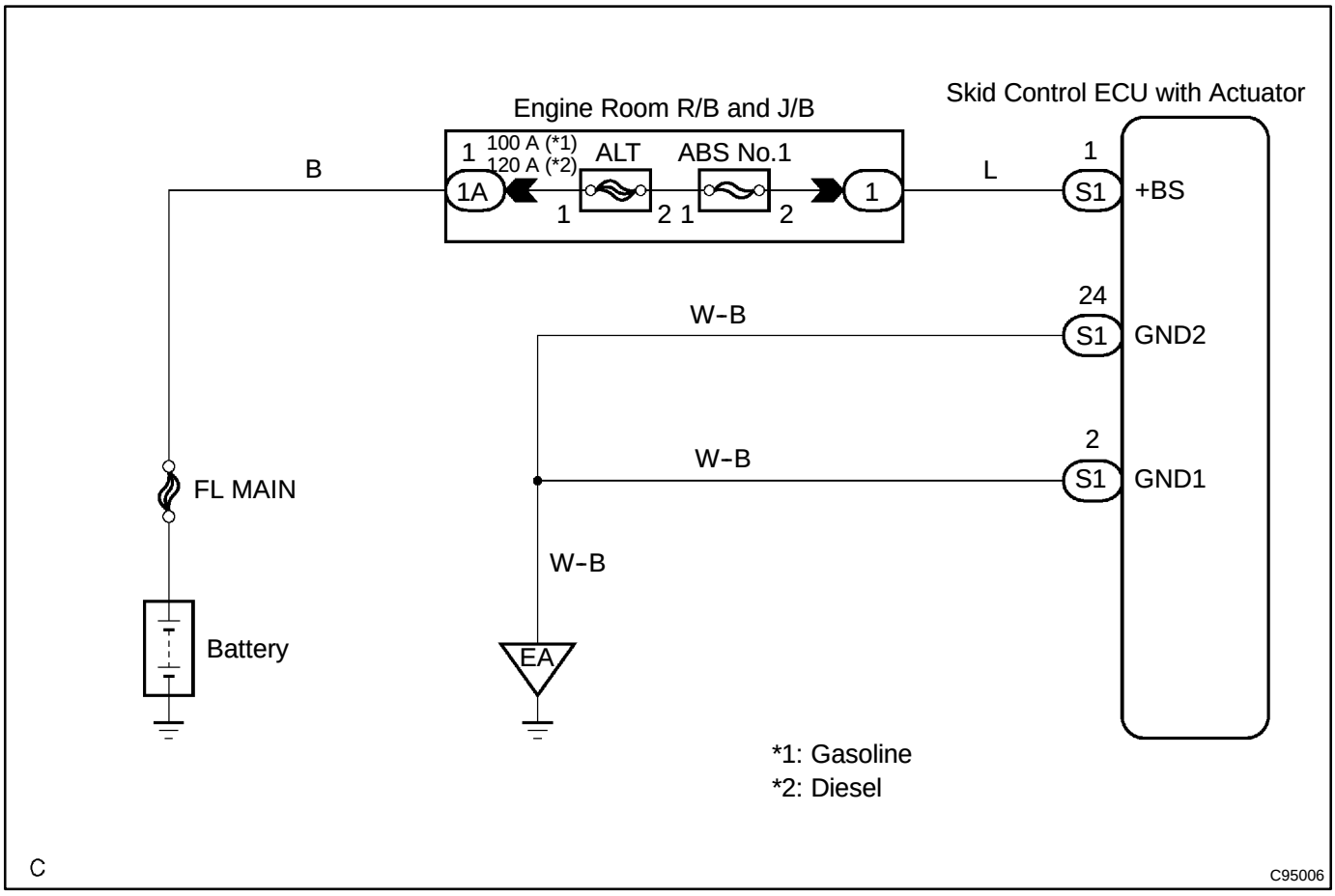
DTC	C0279/12	SHORT CIRCUIT IN ABS SOLENOID RELAY CIRCUIT

CIRCUIT DESCRIPTION

This relay supplies power to each ABS solenoid. After the ignition switch is turned ON, if the initial check is OK, the relay goes on.

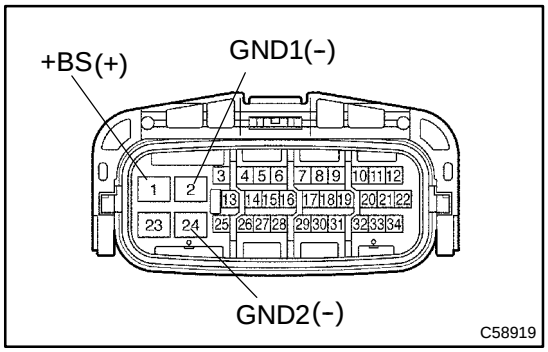
DTC No.	DTC Detecting Condition	Trouble Area
C0278/11	When solenoid relay is turned ON, relay contact is OFF for 0.2 sec. or longer.	$ ABS solenoid relay $ ABS solenoid relay circuit
C0279/12	Immediately after IG1 is turned ON, when solenoid relay is turned OFF, relay contact is ON for 0.2 sec. or longer.	

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT SKID CONTROL ECU CONNECTOR(+BS TERMINAL VOLTAGE)



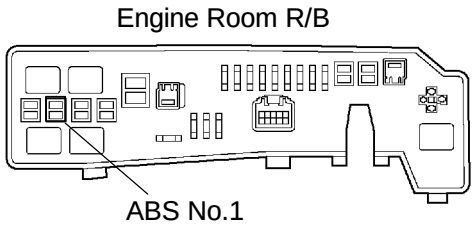
(a) Disconnect the skid control ECU connector.
(b) Measure the voltage between terminals +BS (S1-1) and GND (S1-2, 24) of skid control ECU harness side connector.
Voltage: 10 - 14 V

OK → **CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)**

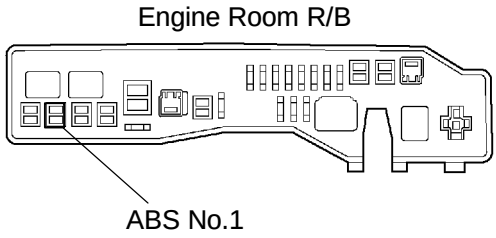
NG

2 INSPECT FUSE(ABS No.1 FUSE)

Gasoline Engine:



Diesel Engine:



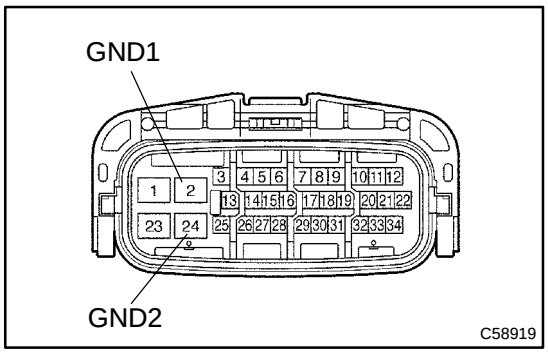
N
C92544

(a) Remove ABS No.1 fuse from the engine room R/B.
(b) Check continuity of ABS No.1 fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESSES AND COMPONENTS CONNECTED TO ABS NO.1 FUSE**

OK

3	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-2, 24) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE HARNESS AND CONNECTOR(+BM CIRCUIT) **(See page 01-30)**

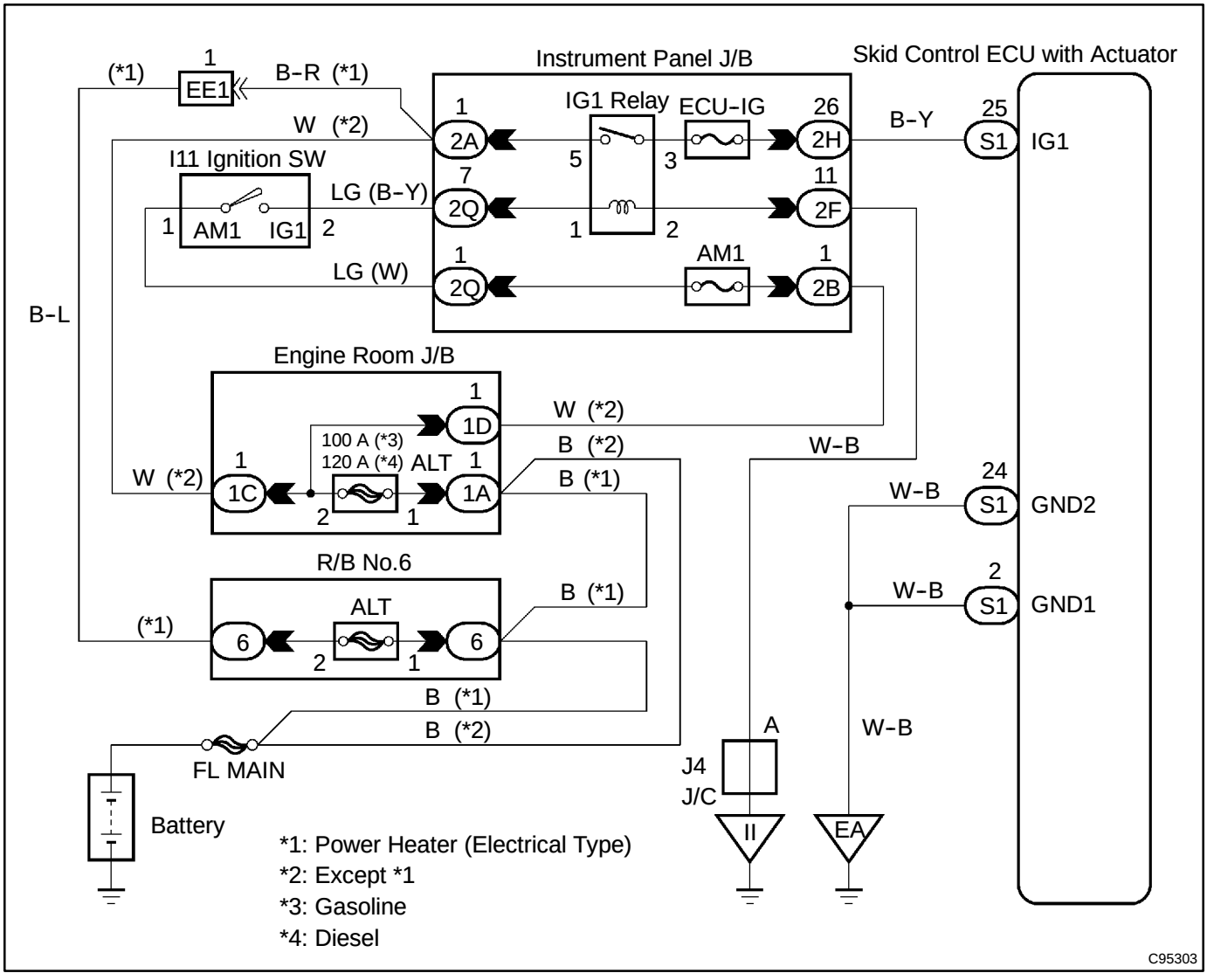
DTC	C1241/41	LOW BATTERY POSITIVE VOLTOAGE OR ABNORMALLY HIGH BATTERY POSITIVE VOLTAGE

CIRCUIT DESCRIPTION

This is the power source of the ECU, hence the actuators.

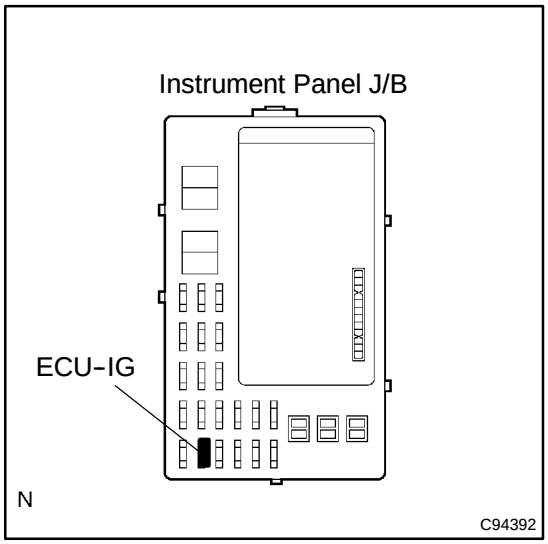
DTC No.	DTC Detecting Condition	Trouble Area
C1241/41	Detection of any of conditions 1. through 3. : 1. With vehicle speed at 3 km/h or more, IG1 terminal voltage is 10V or below for 10 sec. or longer. 2. With IG1 terminal voltage at 10V or below, solenoid relay open, pump motor relay open, solenoid fault detecting condition are established 3. Voltage of ECU terminal IG1 remains at more than 17V continues for 1.2 sec. or more.	S Battery S Charging system S Power source circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT FUSE(ECU-IG FUSE)



(a) Remove ECU-IG fuse from the instrument panel J/B.
(b) Check continuity of ECU-IG fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESS AND COMPONENTS CONNECTED TO ECU-IG FUSE**

OK

2	INSPECT BATTERY

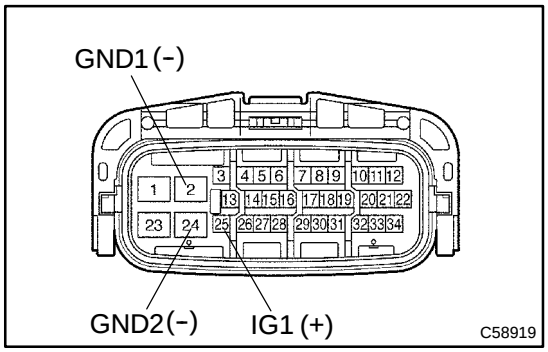
OK:
Voltage: 10 - 14 V

NG → **INSPECT CHARGING SYSTEM**

OK

3	INSPECT SKID CONTROL ECU CONNECTOR(IG1 TERMINAL VOLTAGE)

IN CASE OF USING HAND-HELD TESTER:
(a) Check the voltage condition output from the ECU displayed on the hand-held tester.
OK:
"Normal" is displayed.

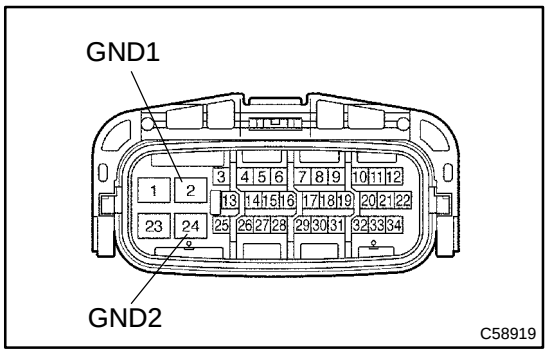


IN CASE OF NOT USING HAND-HELD TESTER:
(a) Disconnect the skid control ECU connector.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals IG1 (S1-25) and GND (S1-2, 24) of skid control ECU harness side connector.
OK:
oltage: 10 - 14 V

OK → **CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)**

NG

4	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-2, 24) of skid control ECU harness side connector and body ground.
OK:
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

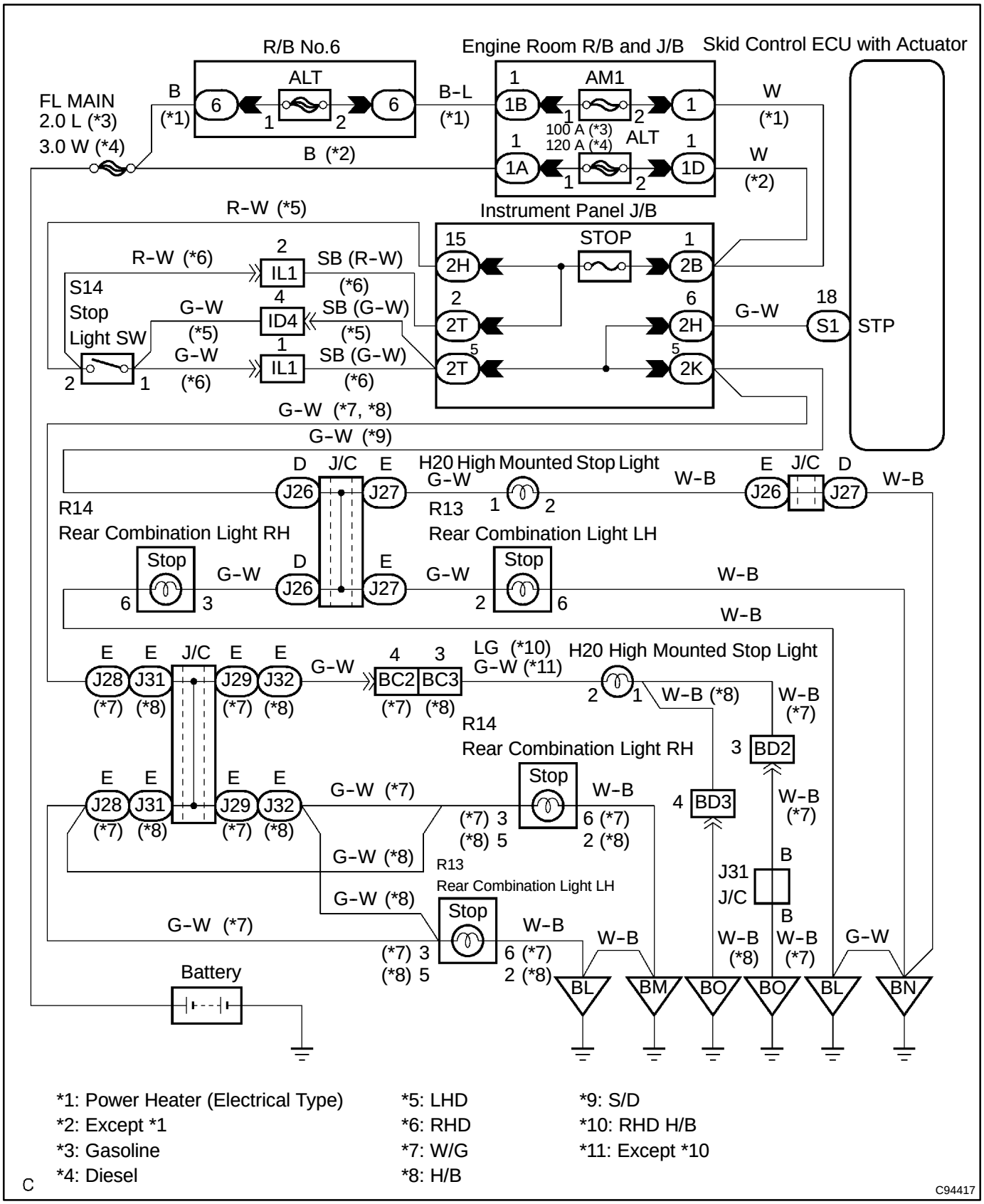
CHECK AND REPAIR HARNESS AND CONNECTOR(IG CIRCUIT) **(See page 01-30)**

DTC	C1249/49	OPEN CIRCUIT IN STOP LIGHT SWITCH CIRCUIT

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1249/49	With IG1 terminal voltage at 10V - 16V, ABS not controlling stop light switch circuit is open for 1.0 sec. or longer.	S Stop light switch S Stop light switch circuit

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: LHD
*6: RHD
*7: W/G
*8: H/B
*9: S/D
*10: RHD H/B
*11: Except *10

C94417

INSPECTION PROCEDURE

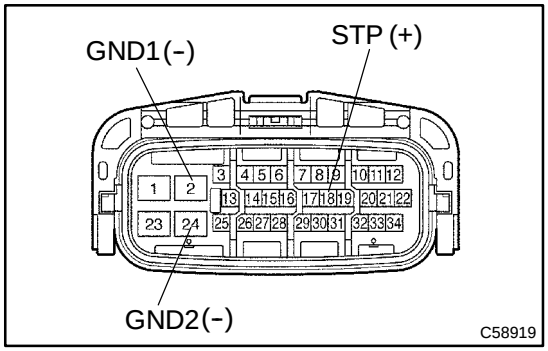
1	INSPECT STOP LAMP SWITCH ASSY

(a) Check that the stop light lights up when brake pedal is depressed and turns OFF when the brake pedal is released.

NG → Go to step 4

OK

2	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(STP TERMINAL)



(a) Disconnect skid control ECU connector.
(b) Measure voltage between terminal STP (S1-18) and GND (S1-2, 24) of skid control ECU harness side connector when the brake pedal is depressed.
Voltage: 10 - 14 V

OK → CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

NG

3	CHECK HARNESS AND CONNECTOR(STOP LIGHT SWITCH - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between stop light switch and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE (See page 05-571)

4	CHECK HARNESS AND CONNECTOR(STOP LIGHT CIRCUIT)

(a) Check for open and short circuit in harness and connector of the stop light circuit (See page 01-30).

OK → REPLACE STOP LAMP SWITCH ASSY

NG

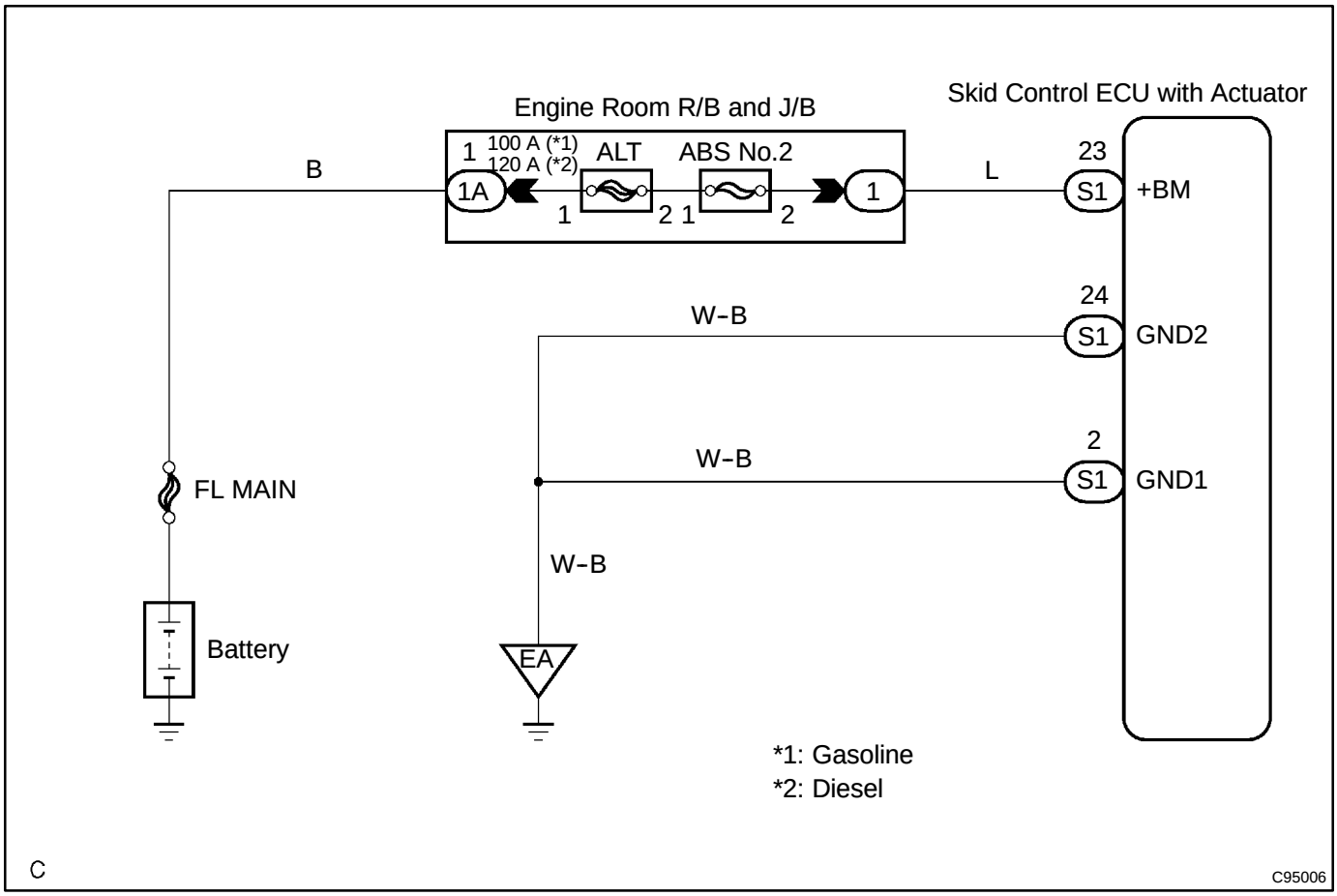
REPAIR OR REPLACE HARNESS OR CONNECTOR

DTC	C1251/51	PUMP MOTOR IS LOCKED/OPEN CIRCUIT IN PUMP MOTOR GROUND

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1251/51	ABS actuator pump motor is not operating normally during initial check.	ABS pump motor

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using hand-held tester.

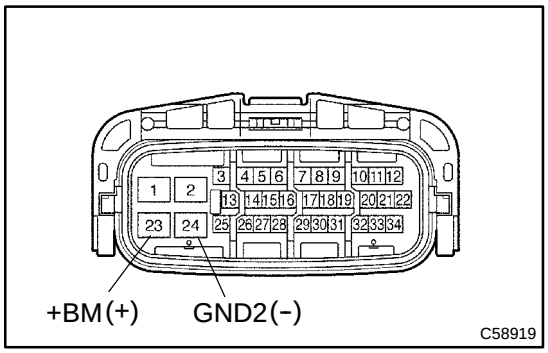
1	INSPECT BRAKE ACTUATOR ASSY

(a) Select the DATALIST mode on the hand-held tester.
(b) Check the operation sound of the ABS pump motor when operating it with the hand-held tester.
OK:
The operation sound of the ABS pump motor should be heard.

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**
(See page 05-571)

NG

2	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(+BM TERMINAL VOLTAGE)



(a) Disconnect the skid control ECU connector.
(b) Measure the voltage between terminal +BM (S1-23) and GND (S1-2, 24) of skid control ECU harness side connector.
OK:
The operation sound of the ABS pump motor should be heard.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE BRAKE ACTUATOR ASSY

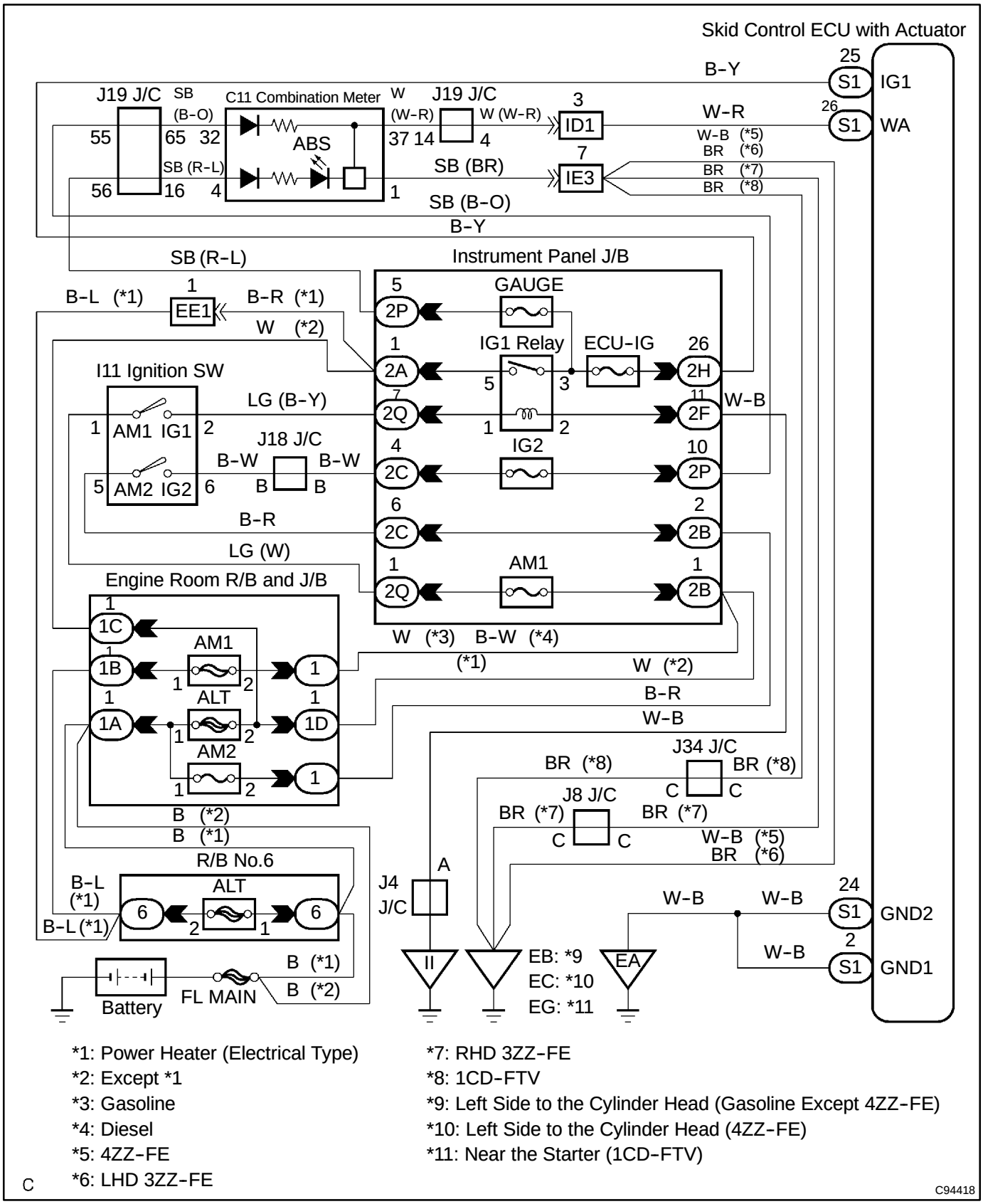
DTC	AlwaysON	MALFUNCTION IN ABS ECU

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
Always ON	Either of the following 1. or 2. is detected: 1. The ECU connectors are OFF from the ECU. 2. There is a malfunction in the ECU internal circuit.	$ Battery $ Charging system $ Power source circuit $ Skid control ECU

HINT:
There is a case that hand-held tester cannot be used when ECU is abnormal.

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: 4ZZ-FE
*6: LHD 3ZZ-FE
*7: RHD 3ZZ-FE
*8: 1CD-FTV
*9: Left Side to the Cylinder Head (Gasoline Except 4ZZ-FE)
*10: Left Side to the Cylinder Head (4ZZ-FE)
*11: Near the Starter (1CD-FTV)

C

C94418

INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check the DTC (See page 05-561).

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

2	INSPECT SKID CONTROL ECU CONNECTOR SECURELY CONNECTED

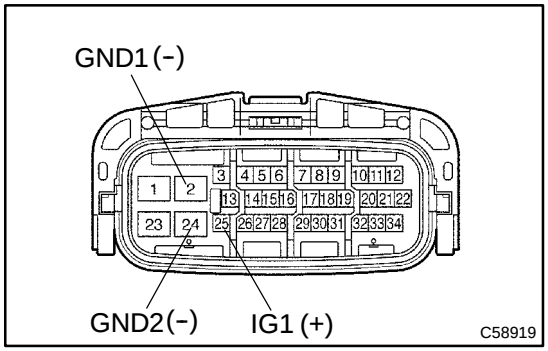
NO → CONNECT CONNECTOR TO ECU

YES

3	INSPECT SKID CONTROL ECU CONNECTOR(IG1 TERMINAL VOLTAGE)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.
OK:
"Normal" is displayed.



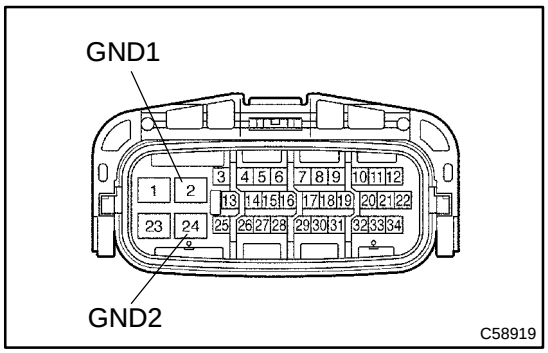
IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control ECU connector.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals IG1 (S1-25) and GND (S1-2, 24) of skid control ECU harness side connector.
Voltage: 10 - 14 V

OK → Go to step 5

NG

4	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



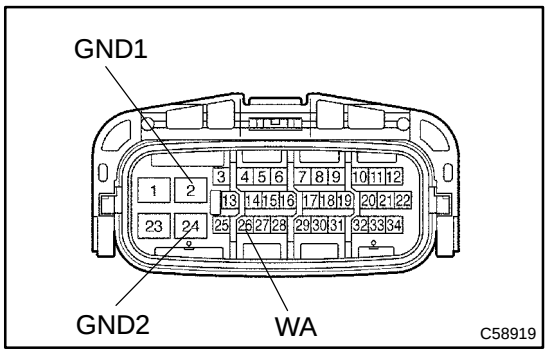
(a) Measure resistance between terminal GND (S1-2, 24) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR(IG CIRCUIT)

5	INSPECT COMBINATION METER(ABS WARNING LIGHT)



(a) Disconnect the skid control ECU connector.
(b) Using service wire, connect terminals WA (S1-26) and GND (S1-2, 24) of skid control ECU harness side connector.
(c) Turn the ignition switch to ON.
OK:
ABS warning light goes off.

NG → **REPAIR OR REPLACE COMBINATION METER**

OK

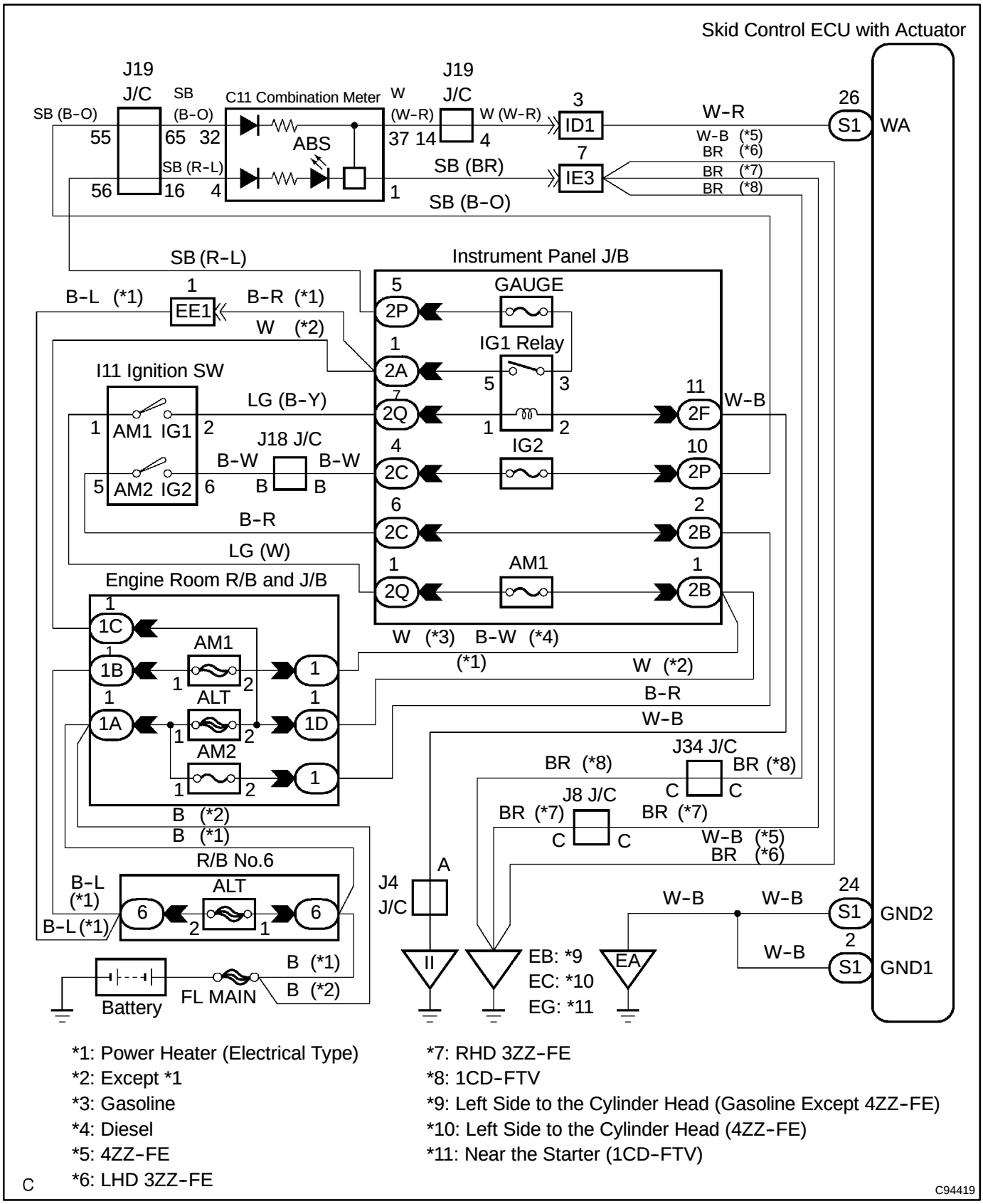
CHECK AND REPLACE BRAKE ACTUATOR ASSY **(See page 01-30)**

ABS WARNING LIGHT CIRCUIT(DOES NOT LIGHT UP)

CIRCUIT DESCRIPTION

If the ECU detect trouble, it will prohibit ABS control, turn on ABS warning light, and store the DTC.
Connect terminals Tc and CG of the DLC3 to make the ABS warning light blink and output the DTC.

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: 4ZZ-FE
*6: LHD 3ZZ-FE
*7: RHD 3ZZ-FE
*8: 1CD-FTV
*9: Left Side to the Cylinder Head (Gasoline Except 4ZZ-FE)
*10: Left Side to the Cylinder Head (4ZZ-FE)
*11: Near the Starter (1CD-FTV)

C

C94419

INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(ABS WARNING LIGHT)

(a) Check that "ON" and "OFF" of the ABS warning light can be shown on the combination meter by the hand-held tester.

OK → CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

NG

2	INSPECT COMBINATION METER ASSY(ABS WARNING LIGHT) (See page 71-1)

(a) Disconnect the connector from the skid control ECU.
(b) Turn the ignition switch to ON.
(c) Check the ABS warning light.
OK:
ABS warning light goes ON

NG → REPAIR OR REPLACE COMBINATION METER ASSY

OK

3	CHECK HARNESS AND CONNECTOR(WA CIRCUIT)

(a) Check for short circuit in harness and connector of the between terminal WA of skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

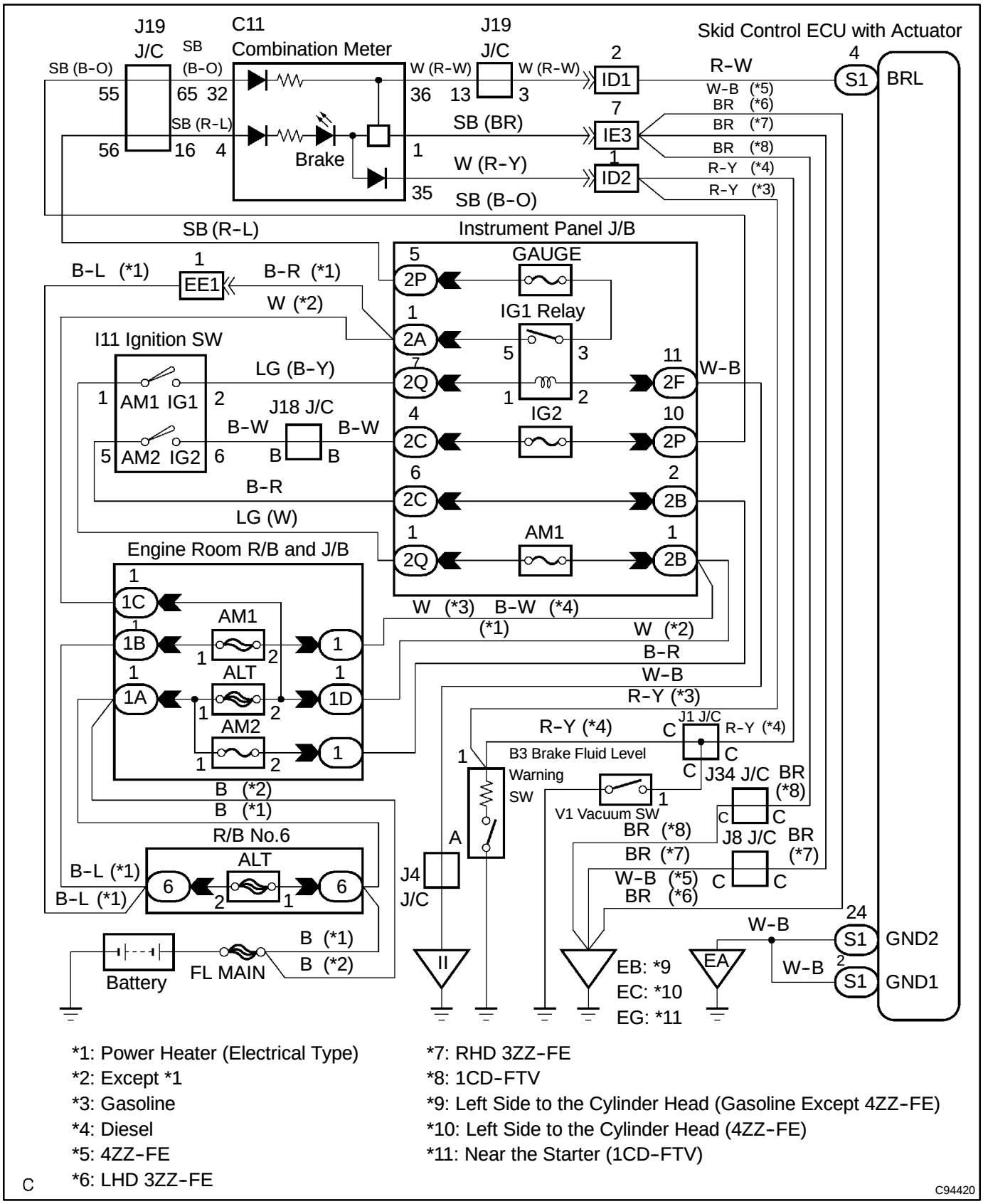
CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

BRAKE WARNING LIGHT CIRCUIT

CIRCUIT DESCRIPTION

If the ECU detects trouble, it lights the brake warning light at the same time of prohibiting ABS control. At this time, the ECU records a DTC in memory.
Connect terminals Tc and CG of the DLC3 to make the brake warning light blink and output the DTC.

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: 4ZZ-FE
*6: LHD 3ZZ-FE
*7: RHD 3ZZ-FE
*8: 1CD-FTV
*9: Left Side to the Cylinder Head (Gasoline Except 4ZZ-FE)
*10: Left Side to the Cylinder Head (4ZZ-FE)
*11: Near the Starter (1CD-FTV)

C94420

INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check the DTC (See page 05-561).
OK:
Normal code

NG → **REPAIR CIRCUIT INDICATED BY OUTPUT CODE**

OK

2	INSPECT PARKING BRAKE SWITCH CIRCUIT

(a) Check for open and short circuit in parking brake switch circuit (See page 01-30).

NG → **REPAIR OR REPLACE PARKING BRAKE SWITCH CIRCUIT**

OK

3	INSPECT BRAKE FLUID LEVEL WARNING SWITCH CIRCUIT

(a) Check the brake fluid level in reservoir.
(b) Check for open and shot circuit in brake fluid level warning switch circuit (See page 71-1).

OK:

A	Diesel Engine
B	Gasoline Engine

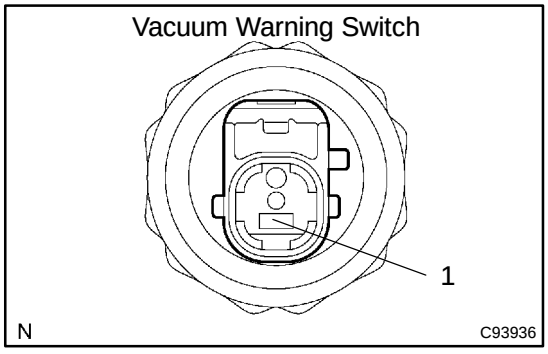
A → **Go to step 4**

B → **Go to step 6**

NG

REPAIR OR REPLACE BRAKE FLUID LEVEL WARNING SWITCH CIRCUIT

4	INSPECT VACUUM WARNING SWITCH ASSY



(a) Disconnect the vacuum warning switch connector from the vacuum tank.
(b) Check continuity terminal 1 of the vacuum warning switch and body ground.
OK:

Vacuum Tank	Condition
Fill vacuum	Open
No vacuum	Continuity

NG → **REPAIR VACUUM WARNING SWITCH ASSY**

OK

5	INSPECT VACUUM WARNING SWITCH CIRCUIT

(a) Check for open and short circuit in harness and connector between vacuum warning switch and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

6	INSPECT COMBINATION METER ASSEMBLY(BRAKE WARNING LIGHT CIRCUIT)

(a) Check for open and short circuit in combination meter (See page 01-30).

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

7	CHECK HARNESS AND CONNECTOR(BRAKE ACTUATOR - COMBINATION METER)

(a) Check for open and short circuit in harness and connector between brake actuator and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

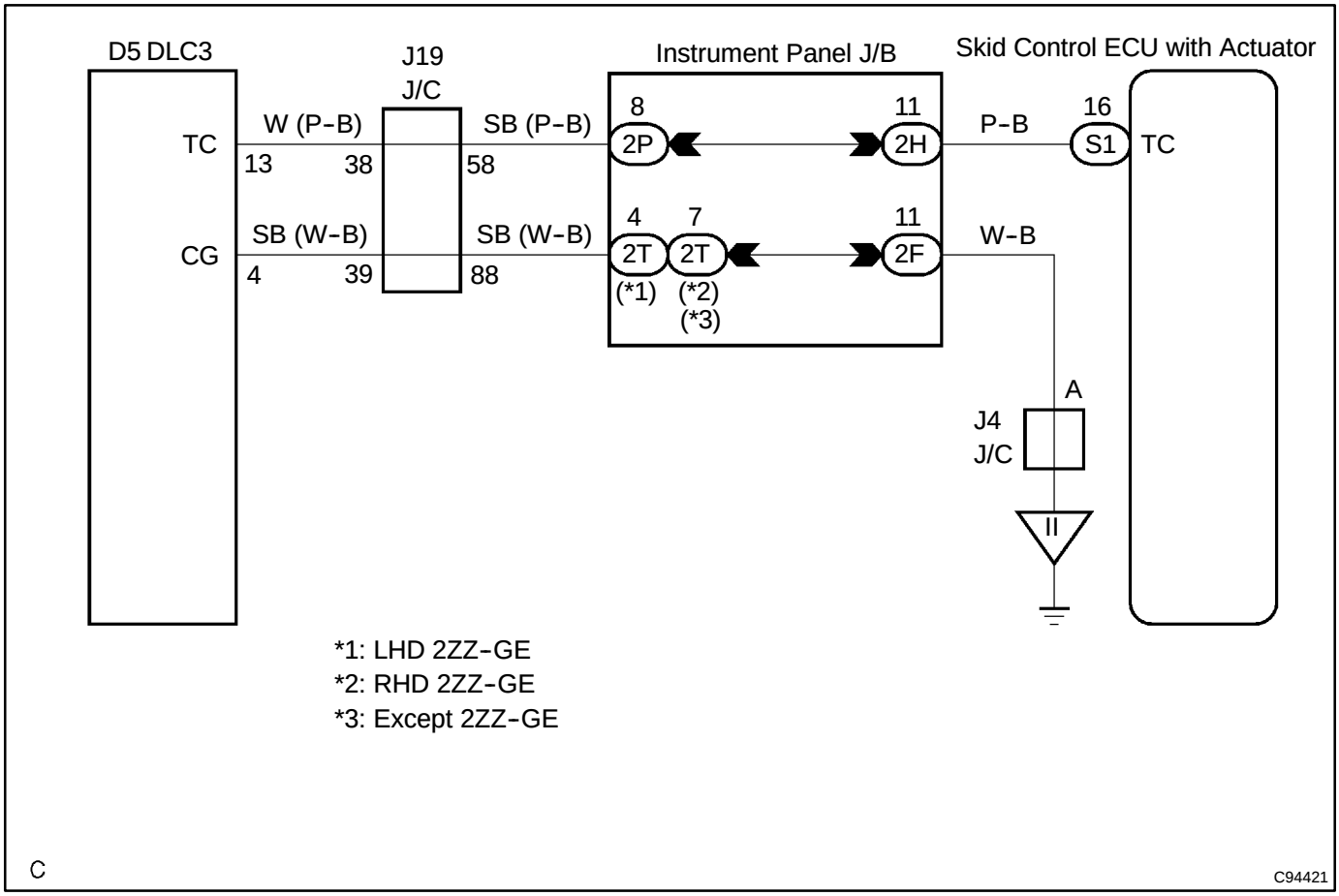
CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

TC TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

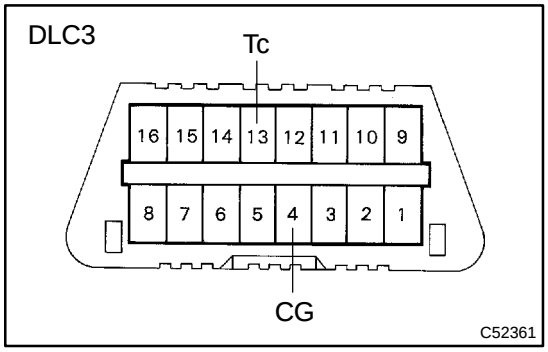
Connecting terminals Tc and CG of the DLC3 causes the ECU to display the DTC by flashing the ABS warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT DLC3 TERMINAL VOLTAGE(Tc TERMINAL)



(a) Turn the ignition switch to ON.
(b) Measure voltage between terminals Tc and CG of DLC3.
OK:
Voltage: 10 - 14 V

OK	Go to step 3

NG

2	CHECK HARNESS AND CONNECTOR(DLC3 - BODY GROUND)

(a) Check for open and short circuit in harness and connector between terminal CG of the DLC3 and body ground (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - DLC3)

(a) Check for open and short circuit in harness and connector between terminal Tc of the skid control ECU and DLC3 (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

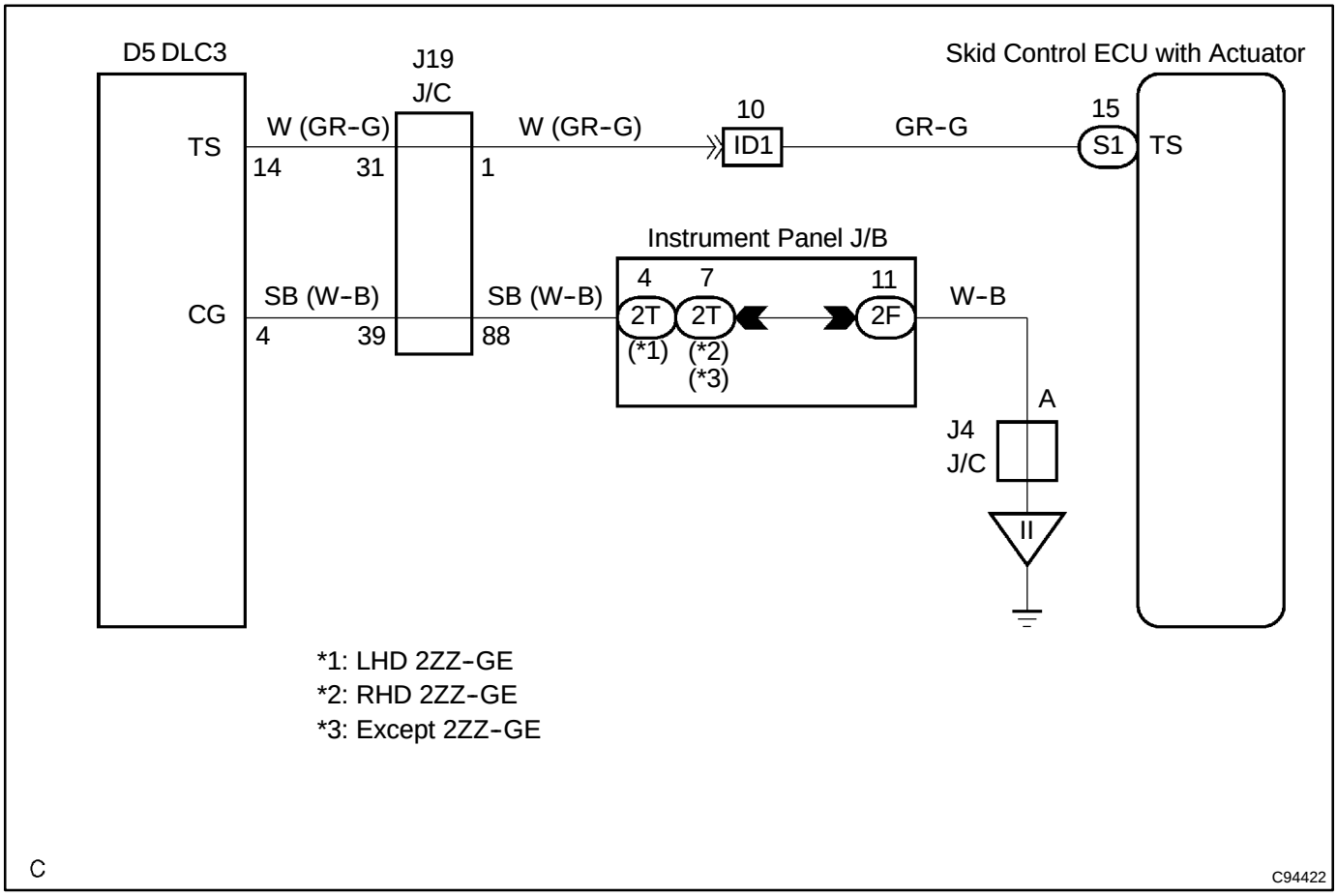
CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

Ts Terminal Circuit

CIRCUIT DESCRIPTION

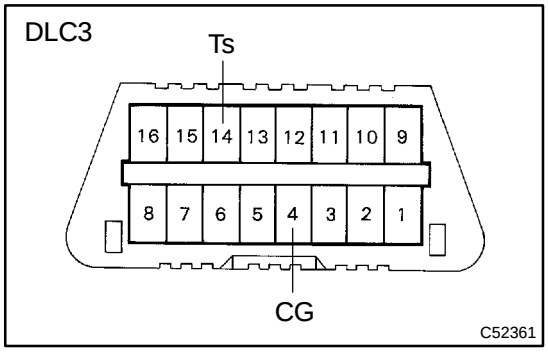
The sensor check circuit detects abnormalities in the speed sensor signal which cannot be detected with the DTC check.
Connecting terminals Ts and CG of the DLC3 starts the check.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT DLC3 TERMINAL VOLTAGE(Ts TERMINAL)



(a) Turn the ignition switch to ON.
(b) Measure voltage between terminals Ts and CG of DLC3.
OK:
Voltage: 10 - 14 V

OK → **Go to step 3**

NG

COROLLA REPAIR MANUAL (RM925E)

2	CHECK HARNESS AND CONNECTOR(DLC3 - BODY GROUND)

(a) Check for open and short circuit in harness and connector between terminal CG of the DLC3 and body ground (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - DLC3)

(a) Check for open and short circuit in harness and connector between terminal Ts of the DLC3 and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE BRAKE ACTUATOR ASSY (See page 01-30)

ABS WITH EBD SYSTEM (TMUK MADE)

HOW TO PROCEED WITH TROUBLESHOOTING

050YD-07

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-613)

3	Check and Clear DTCs and Freeze Frame Data (See page 05-614)

4	Problem Symptom Confirmation

- Symptom does not occur: Go to step 5
- Symptom occurs: Go to step 6

5	Symptom Simulation (See page 01-20)

6	DTC Check (See page 05-614)

- There is no output: Go to step 7
- There is output: Go to step 8

7	Problem Symptoms Table (See page 05-623)

- Check for fluid leakage and Go to step 10

8	DTC Chart (See page 05-619)

9	Circuit Inspection (See page 05-624 - 05-660)

HINT:
When 2 or more DTC's are recorded, and the problem is not identified, perform circuit inspection of the other DTC's.

10	**Identification of Problem**

11	**Repair**

12	**Comfirmation Test**

End

HINT:
Step 3, 6, 9, 12:
Diagnostic steps permitting the use of the hand-held tester.
Fail safe function:
When a failure occurs in the ABS system, the ABS warning light is lit and the ABS operation is prohibited. In addition to this, when the failure which disables the EBD operation occurs, the brake warning light is lit as well and the EBD operation is prohibited.

050X4-07

CUSTOMER PROBLEM ANALYSIS CHECK

ABS Check Sheet

Inspector's Name :

Customer's Name		**Registration No.**	
		Registration Date	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

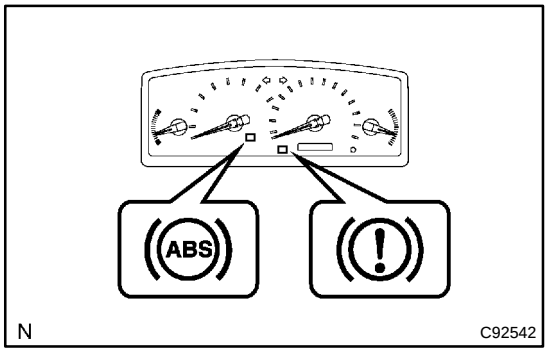
Date Problem First Occurred	/ /
Frequency the Problem Occurs	☐ Continuously ☐ Intermittently (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate efficiently.	
	ABS Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up
	Brake Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

Freeze Frame Data	STOP LIGHT SW	☐ ON ☐ OFF
	SYSTEM	☐ NO SYS ☐ ABS ☐ FAIL SF
	#IG ON	
	VEHICLE SPD	km/h MPH

0577T-01



PRE-CHECK

1. DIAGNOSIS SYSTEM

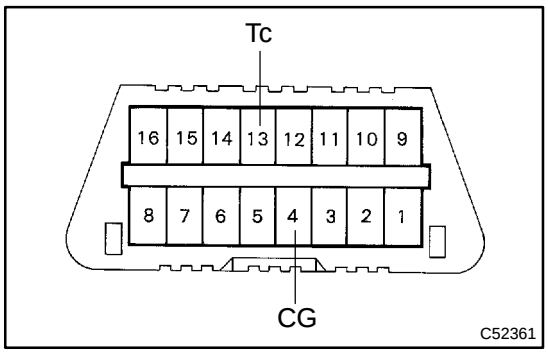
(a) Release the parking brake lever.

(b) Check the warning lights.

When the ignition switch is turned ON, check that the ABS warning light and brake warning light goes on for 3 sec.

HINT:

- When the parking brake is applied or the level of the brake fluid is low, the brake warning light is lit.
- If the indicator check result is not normal, proceed to troubleshooting for the ABS warning light circuit (See page 05-649 or 05-653) or brake warning light circuit (See page 05-656).



(c) In case of not using hand-held tester:

Check the DTC.

(1) Using SST, it connects terminal Tc and CG of DLC3.

SST 09843-18040

(2) Turn the ignition switch to ON.

(3) Read the DTC from the ABS warning light on the combination meter.

HINT:

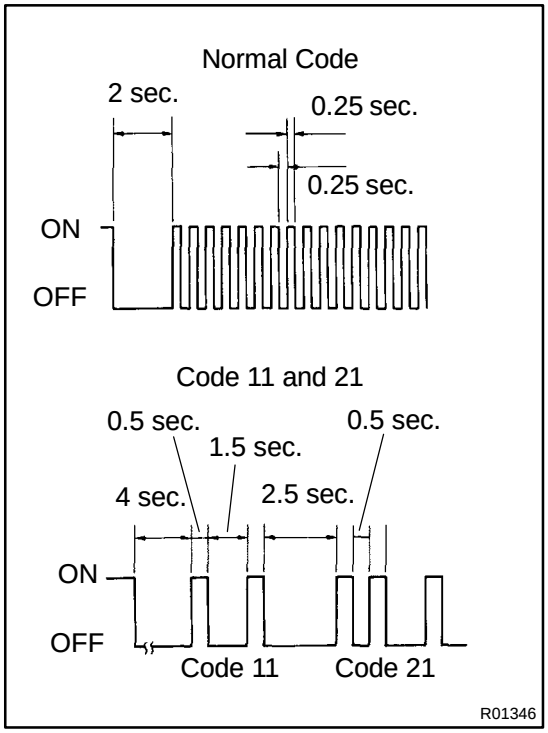
- If not code appears, inspect the diagnostic circuit or ABS warning light circuit (See page 05-660 or 05-653).
- As an example, the blinking patterns for normal code and codes 11 and 21 are shown on the left.

(4) Codes are explained in the code table on page 05-619.

If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC will be displayed 1st.

(5) After completing the check, remove the SST from the DLC3.

SST 09843-18040



(d) In case of using hand-held tester:

Check the DTC.

(1) Read the DTC by following the prompts on the tester screen.

HINT:

Please refer to the hand-held tester operator's manual for further details.

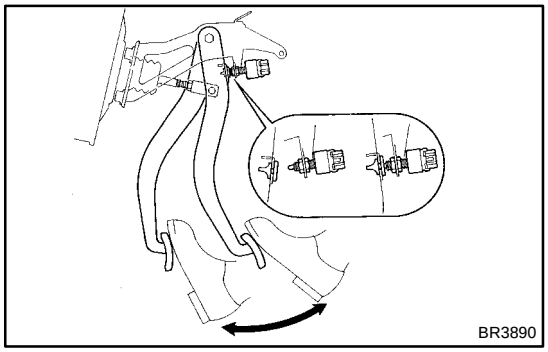
(e) In case of not using hand-held tester:

Clear DTC.

(1) Using SST, it connects the terminal Tc and CG of the DLC3.

SST 09843-18040

(2) Turn the ignition switch to ON.



(3) Clear DTC stored in ECU by depressing the brake pedal 8 or more times within 5 sec.
(4) Check that the ABS warning light shows the normal code.
(5) Remove the SST from the DLC3.
SST 09843-18040

HINT:
Disconnecting the battery cable during repairs will not erase the DTC in the ECU.

(f) In case of using hand-held tester:
Clear the DTC.
(1) Turn the ignition switch to ON.
(2) Operate the hand-held tester to erase the codes.

HINT:
Please refer to the hand-held tester operator's manual for further details.

2. DATA LIST

HINT:
According to the DATA LIST displayed by the Hand-held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. Reading the DATA LIST as a first step of troubleshooting is one of the methods to shorten the labor time.

(a) Connect the Hand-held tester to the DLC3.
(b) Turn the ignition switch to ON.
(c) According to the display on tester, read the "DATA LIST".

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
ABS MOT RELAY	ABS motor relay / ON or OFF		
SOL RELAY	Solenoid relay / ON or OFF		
STOP LIGHT SW	Stop light switch / ON or OFF	ON : Brake pedal depressed OFF : Brake pedal released	
PKB SW	Parking brake switch / ON or OFF	ON : Parking brake applied OFF : Parking brake released	
ABS OPERT FR	ABS operation (FR) / BEFORE or OPERATE	BEFORE : No ABS operation (FR) OPERATE : During ABS operation (FR)	
ABS OPERT FL	ABS operation (FL) / BEFORE or OPERATE	BEFORE : No ABS operation (FL) OPERATE : During ABS operation (FL)	
ABS OPERT RR	ABS operation (RR) / BEFORE or OPERATE	BEFORE : No ABS operation (RR) OPERATE : During ABS operation (RR)	Speed indicated on speedometer
ABS OPERT RL	ABS operation (RL) / BEFORE or OPERATE	BEFORE : No ABS operation (RL) OPERATE : During ABS operation (RL)	Speed indicated on speedometer

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
WHEEL SPD FR	Wheel speed sensor (FR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD FL	Wheel speed sensor (FL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD RR	Wheel speed sensor (RR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	
WHEEL SPD RL	Wheel speed sensor (RL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	
IG VOLTAGE	ECU power supply voltage / NORMAL or TOO LOW	NORMAL : 9.5 V or over TOO LOW : Below 9.5 V	
SFRR	ABS solenoid (SFRR) ON / OFF		
SFRH	ABS solenoid (SFRH) ON / OFF		
SFLR	ABS solenoid (SFLR) ON / OFF		
SFLH	ABS solenoid (SFLH) ON / OFF		
SRRR (SRR)	ABS solenoid (SRRR (SRR)) ON / OFF		
SRRH (SRH)	ABS solenoid (SRRH (SRH)) ON / OFF		
SRLR	ABS solenoid (SRLR) ON / OFF		
SRLH	ABS solenoid (SRLH) ON / OFF		
AIR BLD SUPPORT	Air bleed support / SUPPORT or NOT SUP	Supported	
TEST MODE	Test mode / NORMAL or TEST	NORMAL : Normal mode TEST : During test mode	
#CODES	Number of DTC recorded / min.: 0, max.: 255	Min.: 0, max.: 19	

3. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the Hand-held tester allows the relay, actuator and so on to operate without parts removal. Performing the ACTIVE TEST as a first step of troubleshooting is one of the methods to shorten the labor time.

It is possible to display the DATA LIST during the ACTIVE TEST.

(a) Connect the Hand-held tester to the DLC3.

(b) Turn the ignition switch to ON.

(c) According to the display on tester, perform the "ACTIVE TEST".

Item	Vehicle Condition / Test Details	Diagnostic Note
SFRR	Turns ABS solenoid (SFRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRH	Turns ABS solenoid (SFRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLR	Turns ABS solenoid (SFLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLH	Turns ABS solenoid (SFLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRR	Turns ABS solenoid (SRRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRH	Turns ABS solenoid (SRRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLR	Turns ABS solenoid (SRLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLH	Turns ABS solenoid (SRLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRR & SFRH	Turns ABS solenoid SFRR & SFRH ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLR & SFLH	Turns ABS solenoid SFLR & SFLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRR & SRRH	Turns ABS solenoid SRRR & SRRH ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLR & SRLH	Turns ABS solenoid SRLR & SRLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRH & SFLH	Turns ABS solenoid SFRH & SFLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SOL RELAY	Turns ABS solenoid relay ON / OFF	Operation of solenoid (clicking sound) can be heard
ABS MOT RELAY	Turns ABS motor relay ON / OFF	Operation of motor can be heard
ABS WARN LIGHT	Turns ABS warning light ON / OFF	Observe combination meter
BRAKE WRN LIGHT	Turns BRAKE warning light ON / OFF	Observe combination meter

4. FREEZE FRAME DATA

(a) The vehicle (sensor) status memorized during ABS operation or at the time of error code detection can be displayed using the hand-held tester.

(b) Only one record of freeze frame data is stored and the freeze frame data generated during ABS operation are constantly updated. Also, the number of the ignition switch's "ON" after the freeze frame data is stored can be memorized up to 31 and it can be displayed.

HINT:

If the ignition switch "ON" operation exceeds 31 times, "31" appears on the display.

(c) If the diagnosis code malfunction occurs, the freeze frame data at the occurrence of the abnormality is stored but the ABS actuation data is not stored.

Hand-held tester display	Measurement Item	Reference Value*
VEHICLE SPD	Vehicle speed	Speed indication of a meter
STOP LIGHT SW	Stop light switch signal	Stop light switch ON: ON, OFF: OFF
# IG ON	Numbers of operations of ignition switch ON after memorizing freeze frame data	0 - 31
SYSTEM	Operate system	ABS operate: ABS

*: If no conditions are specifically stated for "Idling", it means the shift lever is at N or P position, the A/C switch is OFF and all accessory switches are OFF.

5. SPEED SENSOR SIGNAL CHECK

HINT:

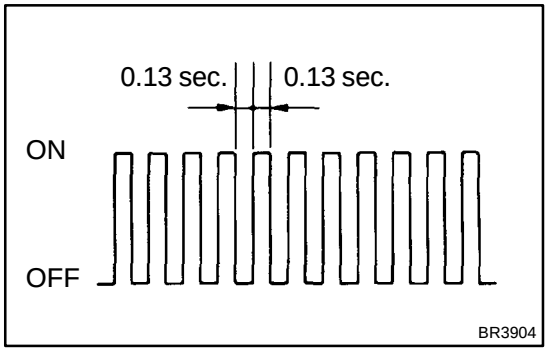
- If the ignition switch is turned from ON to ACC or LOCK during test mode, DTC of sensor check function will be erased.
- During test mode, ECU records all DTC of sensor check function. By preforming sensor signal check, the codes are erased if normality is confirmed. The codes left over are the codes where abnormality was found.

(a) Check the sensor signal.

(1) Start the engine.

(2) Connect the hand-held tester to the DLC3.

(3) Select the TEST MODE.



(4) Check that the ABS warning light blinks.

HINT:

If the ABS warning light does not blink, inspect the ABS warning light circuit (See page 05-653).

(5) Drive the vehicle straight forward.

HINT:

- Drive the vehicle faster than 45 km/h (28 mph) for several sec.
- There is a case that the sensor check is not completed if the vehicle has its wheels spun or its steering wheel steered during this check.

(6) Stop the vehicle.

(7) Using SST, connect the terminals Tc and CG of the DLC3.

(b) Read the DTC, from the hand-held tester screen.

HINT:

- See the list of DTC shown on the 05-619.
- Please refer to the hand-held tester operator's manual for further details.

050XB-07

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

When removing the part, turn the ignition switch to OFF.

HINT:

- Using SST 09843-18040, it connect the terminal Tc and CG of DLC3.
- If any abnormality is not found when inspecting parts, inspect the ECU and ground points for poor contact.
- If a malfunction code is displayed during the DTC check, check the circuit listed that code. For details of each code, turn to the page referred to under the "See page" for respective "DTC No." in the DTC chart.
- When 2 or more DTC's are recorded, and the problem is not identified, perform circuit inspection of the other DTC's.

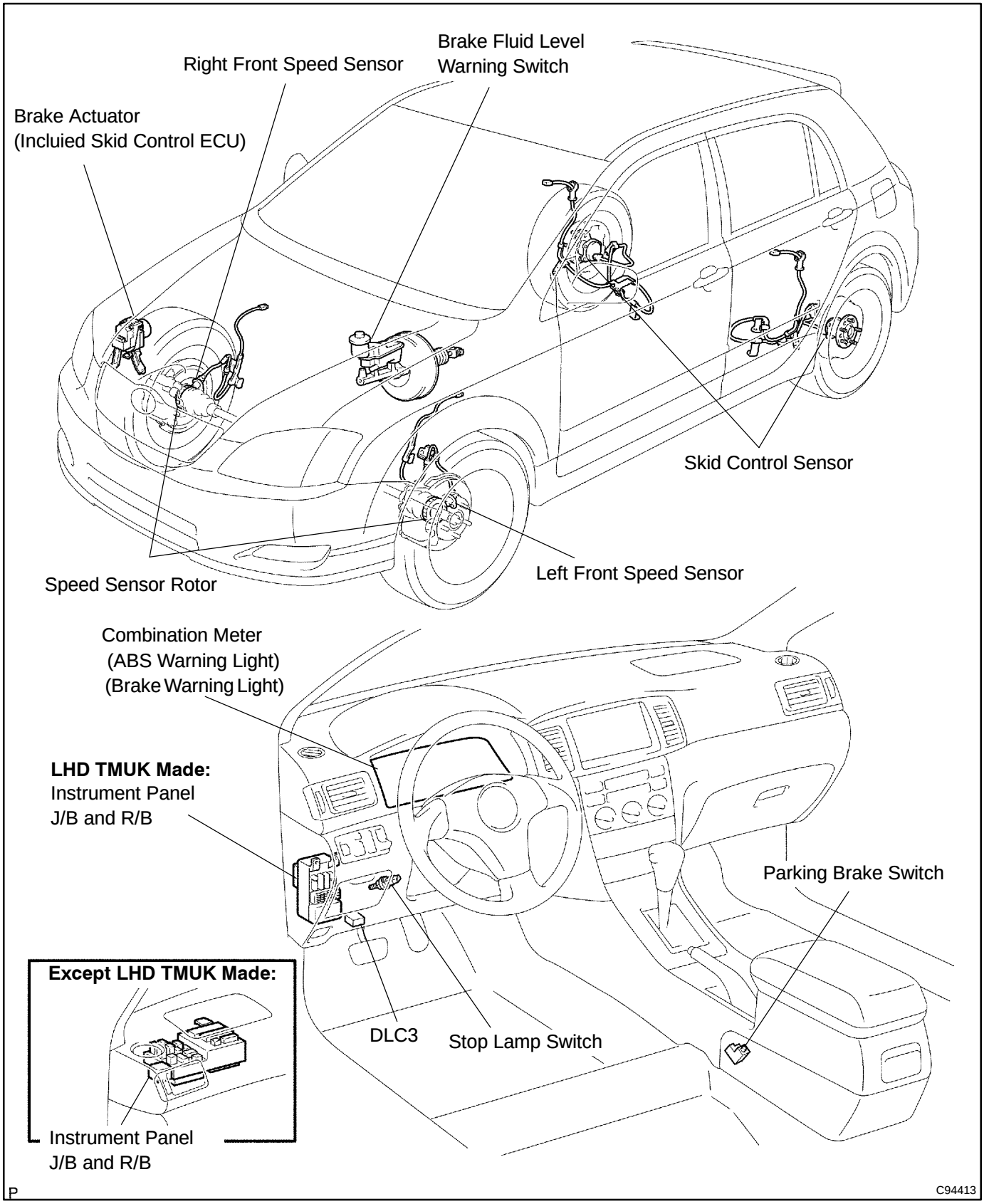
DTC No. (See Page)	Detection Item	Trouble Area
C0200/31 (05-624)	Right front wheel speed sensor signal malfunction	• Right front speed sensor • Right front speed sensor rotor
C0205/32 (05-624)	Left front wheel speed sensor signal malfunction	• Left front speed sensor • Left front speed sensor rotor
C0210/33 (05-628)	Right rear wheel speed sensor signal malfunction	• Right rear speed sensor • Right rear speed sensor rotor
C0215/34 (05-628)	Left rear wheel speed sensor signal malfunction	• Left rear speed sensor • Left rear speed sensor rotor
C0226/21 (05-632)	Open or short circuit in ABS actuator solenoid (SFR) circuit	• SFRR or SFRH circuit
C0236/22 (05-632)	Open or short circuit in ABS actuator solenoid (SFL) circuit	• SFLR or SFLH circuit
C0246/23 (05-632)	Open or short circuit in ABS actuator solenoid (SRR) circuit	• SRRR or SRRH circuit
C0256/24 (05-632)	Open or short circuit in ABS actuator solenoid (SRL) circuit	• SRLR or SRLH circuit
C0273/13 (05-634)	Open or short circuit in ABS motor relay circuit	• ABS motor relay • ABS motor relay circuit
C0278/11 (05-637)	Open or short circuit in ABS solenoid relay circuit	• ABS solenoid relay • ABS solenoid relay circuit
C1237/37 (05-640)	Speed sensor rotor is wrong number of teeth on one of the 4 wheels	• Speed sensor • Speed sensor circuit
C1241/41 (05-641)	Low battery voltage or abnormally high battery voltage	• Battery • Charging system • Power source circuit
C1249/58 (05-644)	Open circuit in stop light switch circuit	• Stop light switch • Stop light switch circuit
C1300/62 (05-647)	Malfunction in skid control ECU	• Battery • Skid control ECU
C1330/35 (05-624)	Open circuit in right front speed sensor	• Right front speed sensor • Right front speed sensor circuit
C1331/36 (05-624)	Open circuit in left front speed sensor	• Left front speed sensor • Left front speed sensor circuit
C1332/38 (05-628)	Open circuit in right rear speed sensor	• Right rear speed sensor • Right rear speed sensor circuit
C1333/39 (05-628)	Open circuit in right rear speed sensor	• Left rear speed sensor • Left rear speed sensor circuit
Always ON (05-649)	Malfunction in ABS ECU	• Battery • Charging system • Power source circuit • Skid control ECU

DTC of speed sensor check function:

Code No.	Diagnosis	Trouble Area
C1271/71	Low output voltage of right front speed sensor	• Right front speed sensor • Sensor installation • Sensor rotor
C1272/72	Low output voltage of left front speed sensor	• Left front speed sensor • Sensor installation • Sensor rotor
C1273/73	Low output voltage of right rear speed sensor	• Right rear speed sensor • Sensor installation • Sensor rotor
C1274/74	Low output voltage of left rear speed sensor	• Left rear speed sensor • Sensor installation • Sensor rotor
C1275/75	Abnormal change in output voltage of right front speed sensor	Right front speed sensor rotor
C1276/76	Abnormal change in output voltage of left front speed sensor	Left front speed sensor rotor
C1277/77	Abnormal change in output voltage of right rear speed sensor	Right rear speed sensor rotor
C1278/78	Abnormal change in output voltage of left rear speed sensor	Left rear speed sensor rotor

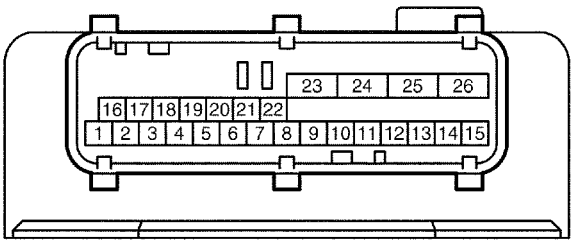
050XD-06

LOCATION



050XF-07

TERMINALS OF ECU



P C94402

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
IG1 (1) - GND (23, 26)	B-Y ↔ W-B	IG switch ON	10 - 14
STP (2) - GND (23, 26)	G-W ↔ W-B	Stop light switch ON	5 - 14
		Stop light switch OFF	Below 1.0
PKB (3) - GND (23, 26)	R-Y ↔ W-B	IG switch ON, parking brake switch ON	Below 2.0
		IG switch ON, parking brake switch OFF	10 - 14
Tc (4) - GND (23, 26)	P-B ↔ W-B	IG switch ON	5.7 - 8.1
D/G (5) - GND (23, 26)	L-R ↔ W-B	IG switch ON, ABS warning light OFF	5.7 - 8.1
SP1 (6) - GND (23, 26)	P ↔ W-B	Vehicle drive at about 20 km/h (12mph)	AC generation
RL+ (7) - RL- (8)	B ↔ Y	IG switch ON Slowly turn left rear wheel	AC generation
FL+ (9) - FL- (10)	R ↔ G	IG switch ON Slowly turn left front wheel	AC generation
FR+ (11) - FR- (12)	B ↔ W	IG switch ON Slowly turn right front wheel	Below 1.0
RR+ (14) - RR- (15)	R ↔ W	IG switch ON Slowly turn right rear wheel	AC generation
EBDW (21) - GND (23, 26)	R-W ↔ W-B	IG switch ON, BRAKE warning light ON	7 - 10
		IG switch ON, BRAKE warning light OFF	Below 2.0
WA (22) - GND (23, 26)	W-R ↔ W-B	IG switch ON, ABS warning light ON	7 - 10
		IG switch ON, ABS warning light OFF	Below 2.0
B1 (24) - GND (23, 26)	L ↔ W-B	Always	10 - 14
+B (25) - GND (23, 26)	L ↔ W-B	Always	10 - 14

050XH-07

PROBLEM SYMPTOMS TABLE

If a normal code is displayed during the DTC check but the problem still occurs, check the circuits for each problem symptom in the order given in the table below and proceed to the relevant troubleshooting page.

NOTICE:

When replacing Skid Control ECU, sensor or etc., turn the ignition switch to OFF.

Symptom	Suspect Area	See page
ABS does not operate	When the followings 1. to 4. are all normal and the problem is still occurring, replace the skid control ECU. 1. Check the DTC reconfirming that the normal code is output. 2. IG power source circuit 3. Speed sensor circuit 4. Check the brake actuator with a hand-held tester. If abnormal, check the hydraulic circuit for leakage.	 05-614 05-641 05-624 05-628 32-84
ABS does not operate efficiently	When the following 1. to 4. are all normal and the problem is still occurring, replace the skid control ECU. 1. Check the DTC reconfirming that the normal code is output. 2. Speed sensor circuit 3. Stop light switch circuit 4. Check the brake actuator with a hand-held tester. If abnormal, check the hydraulic circuit for leakage.	 05-614 05-624 05-628 05-644 32-84
ABS warning light abnormality	1. ABS warning light circuit 2. Skid control ECU	05-653 -
DTC check cannot be done	When the following 1. and 2. are all normal and the problem is still occurring, replace the skid control ECU. 1. ABS warning light circuit 2. Tc terminal circuit	 05-653 05-660
Speed sensor signal check cannot be done	1. D/G terminal circuit 2. Skid control ECU	- -

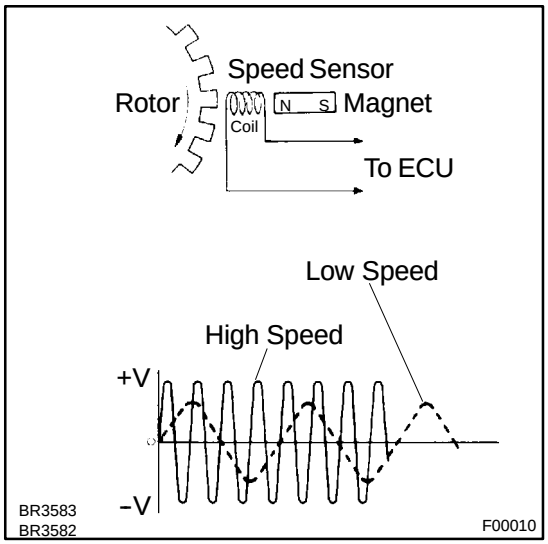
DTC	C0200/31	RIGHT FRONT SPEED SENSOR

DTC	C0205/32	LEFT FRONT SPEED SENSOR

DTC	C1330/35	RIGHT FRONT SPEED SENSOR CIRCUIT

DTC	C1331/36	LEFT FRONT SPEED SENSOR CIRCUIT

CIRCUIT DESCRIPTION

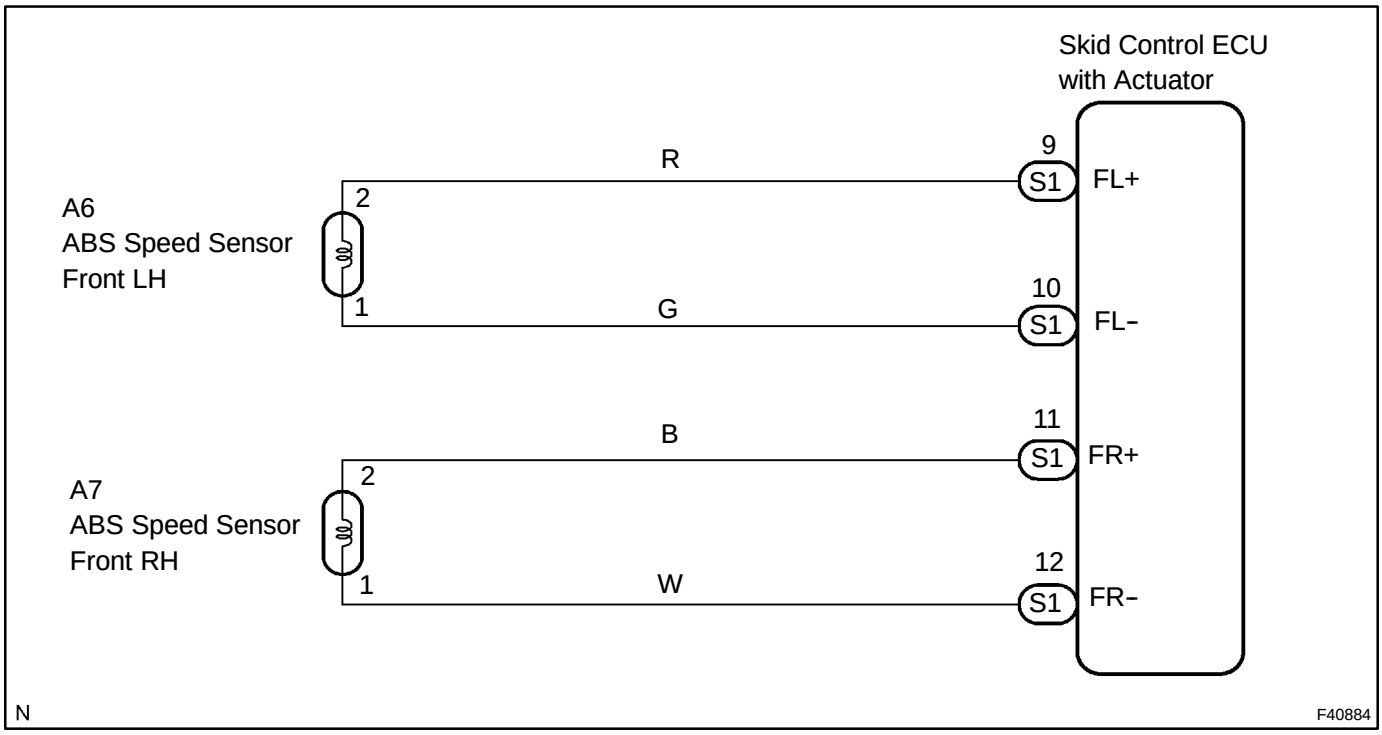


The speed sensor detects wheel speed and transmits the appropriate signals to the ECU. These signals are used for control of the ABS control system. Each of the front and rear rotors has 48 serrations.
When the rotors rotate, the magnetic field generated by the permanent magnet in the speed sensor induces an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200/31 C0205/32	When any of the following 1. to 3. is detected : 1. Vehicle speed is more than 40 km/h (25 mph), pulses are not input for 0.01 sec. 2. After the initial start or restart and when the vehicle speed has reached 12 km/h (7 mph), the wheel speed of 0 km/h (0 mph) is detected. 3. After the initial start or restart and when the vehicle speed has reached 18 km/h (11 mph), the front wheel speed of 0 km/h (0 mph) is detected.	$ Right front and left front speed sensor $ Speed sensor rotor
C1330/35 C1331/36	Detecting abnormality in the resistance value of each speed sensor.	$ Right front and left front speed sensor $ Speed sensor circuit

HINT:
DTC No. C0200/31 and C1330/35 is the right front speed sensor.
DTC No. C0205/32 and C1331/36 is the left front speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF HAND-HELD TESTER(FRONT SPEED SENSOR)

(a) Select the item "WHEEL SPEED FL (FR)" in the DATA LIST and read its value displayed on the hand-held tester.

(b) Check that there is no difference between the speed value output from the speed sensor displayed on the hand-held tester and the speed value displayed on the speedometer when driving the vehicle.

OK:

There is almost no difference in the displayed speed value.

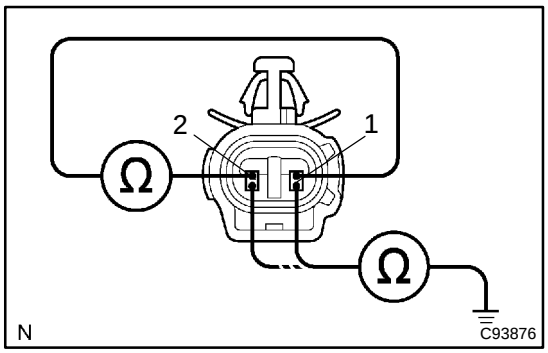
HINT:

There is tolerance of ±10 % in the speedometer indication.

OK	Go to step 5

NG

2 INSPECT FRONT SPEED SENSOR



(a) Remove the fender liner.
(b) Disconnect the speed sensor connector.
(c) Measure resistance between terminals 1 and 2 of the speed sensor connector.
OK:
Resistance: 1.4 - 1.8 kΩ at 20_C (68_F)
(d) Measure resistance between each of terminals 1 and 2 of speed sensor connector and body ground.
OK:
Resistance: 1 MΩ or higher

NG	REPLACE SPEED SENSOR FRONT RH
NG	REPLACE SPEED SENSOR FRONT LH

NOTICE:
Check the speed sensor signal last (See page 05-614).

OK

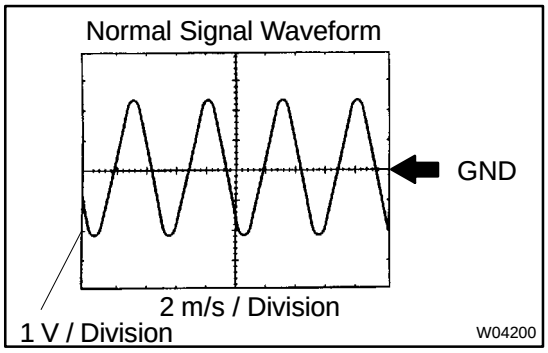
3 CHECK HARNESS AND CONNECTOR(FRONT SPEED SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each front speed sensor and skid control ECU (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



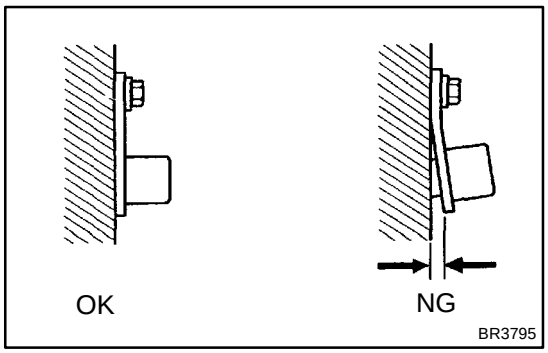
(REFERENCE) INSPECTION USING OSCILLOSCOPE
(a) Connect the oscilloscope to the terminal FR+ - FR- and FL+ - FL- of the skid control ECU.
(b) Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

HINT:
- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter deposited on it.

OK	CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

NG

5 INSPECT FRONT SPEED SENSOR INSTALLATION



(a) Check the speed sensor installation.
OK:
The installation bolt is tightened properly and there is no clearance between the sensor and front steering knuckle.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

NG → **REPLACE SPEED SENSOR FRONT RH**

NG → **REPLACE SPEED SENSOR FRONT LH**

NOTICE:
Check the speed sensor signal last (See page 05-614).

OK

6 INSPECT SPEED SENSOR TIP

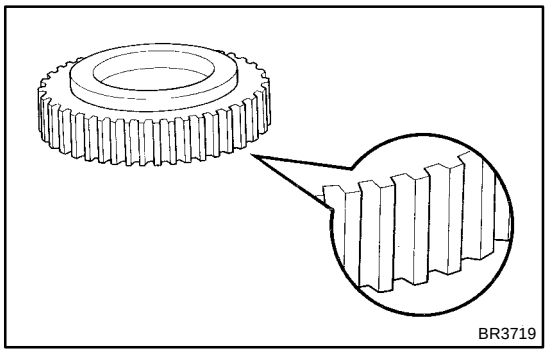
(a) Remove the front speed sensor (See page 32-91).
(b) Check the sensor tip.
OK:
No scratches or foreign objects on the sensor tip.

NG → **CLEAN OR REPAIR SPEED SENSOR**

NOTICE:
Check the speed sensor signal last (See page 05-614).

OK

7 INSPECT SPEED SENSOR ROTOR



(a) Remove the front speed sensor rotor (See page 30-6 or 30-18).
(b) Check the sensor rotor serrations.
OK:
No scratches, missing teeth or foreign objects.

HINT:
If foreign matter is attached, remove it and after reassembling, check the output waveform.

NG → **CLEAN OR REPAIR SPEED SENSOR ROTOR**

NOTICE:
Check the speed sensor signal last (See page 05-614).

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

DTC	C0210/33	RIGHT REAR SPEED SENSOR

DTC	C0215/34	LEFT REAR SPEED SENSOR

DTC	C1332/38	RIGHT REAR SPEED SENSOR CIRCUIT

DTC	C1333/39	LEFT REAR SPEED SENSOR CIRCUIT

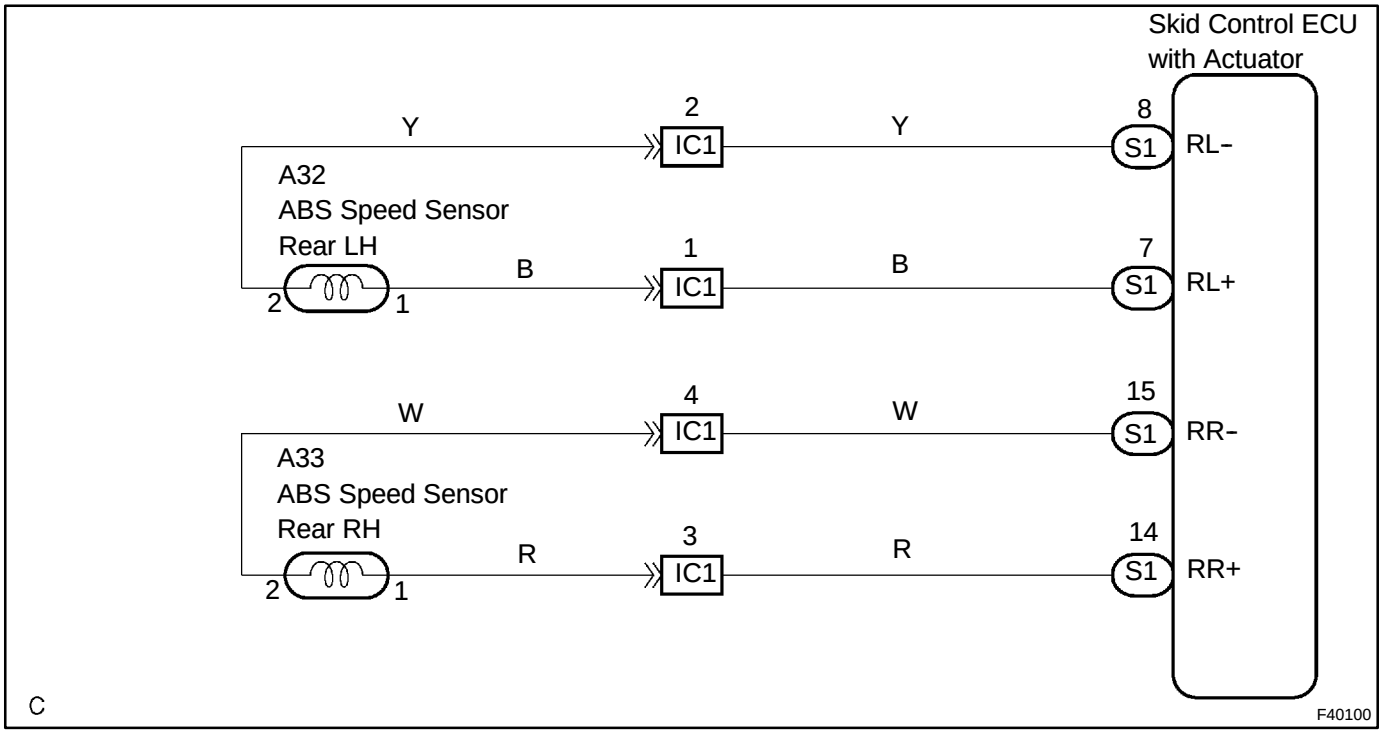
CIRCUIT DESCRIPTION

Refer to DTC C0200/31, C0205/32, C1330/35, C1331/36 on page 05-624.

DTC No.	DTC Detecting Condition	Trouble Area
C0210/33 C0215/34	When any of the following 1. to 3. is detected : 1. Vehicle speed is more than 40 km/h (25 mph), pulses are not input for 0.01 sec. 2. After the initial start or restart and when the vehicle speed has reached 12 km/h (7 mph), the wheel speed of 0 km/h (0 mph) is detected. 3. After the initial start or restart and when the vehicle speed has reached 18 km/h (11 mph), the front wheel speed of 0 km/h (0 mph) is detected.	S Right rear and left rear speed sensor S Speed sensor rotor
C1332/38 C1333/39	Detecting abnormality in the resistance value of each speed sensor.	S Right rear and left rear speed sensor S Speed sensor circuit

HINT:
DTC No. C0210/33, C1332/38 is for the right rear speed sensor.
DTC No. C0215/34, C1333/39 is for the left rear speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF HAND-HELD TESTER(SKID CONTROL SENSOR)

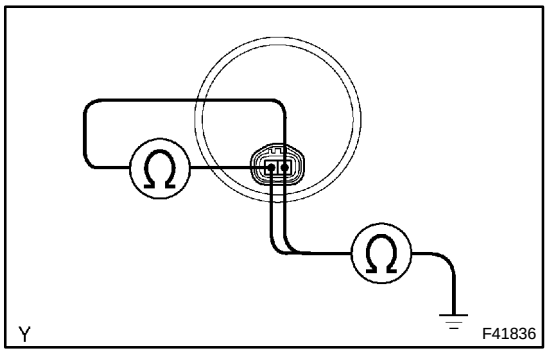
(a) Select the item "WHEEL SPEED RL (RR)" in the DATA LIST and read its value displayed on the hand-held tester.
(b) Check that there is no difference between the speed value output from the speed sensor displayed on the hand-held tester and the speed value displayed on the speedometer when driving the vehicle.
OK:
There is almost no difference in the displayed speed value.

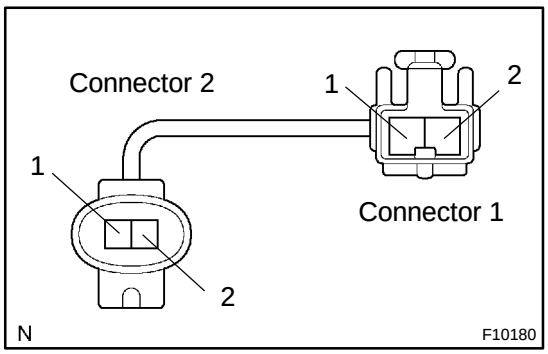
HINT:
There is tolerance of ± 10 % in the speedometer indication.

OK	Go to step 5

NG

2	INSPECT SKID CONTROL SENSOR





(a) Disconnect the skid control sensor connector.
(b) Measure resistance between terminals 1 and 2 of the skid control sensor connector.
OK:
Resistance: 2.2 kΩ or less
(c) Measure resistance between each of terminals 1 and 2 of skid control sensor connector and body ground.
OK:
Resistance: 1 MΩ or higher

Skid control Sensor Sub-Wire Harness:
(a) Remove the seat cushion and seatback.
(b) Make sure that there is no looseness at the connector lock part and connecting part of the connector.
(c) Measure resistance between terminal 1 of connector 1 and terminal 2 of connector 2.
(d) Measure resistance between terminal 2 of connector 1 and terminal 1 of connector 2.
OK: 1 Ω or lower
(e) Measure resistance between terminals 1 and 2 of speed sensor connector 1 and body ground.
OK: 10 MΩ or higher

NG	REPLACE SKID CONTROL SENSOR OR SUB-WIRE HARNESS

NOTICE:
Check the speed sensor signal last (See page 05-614).

OK

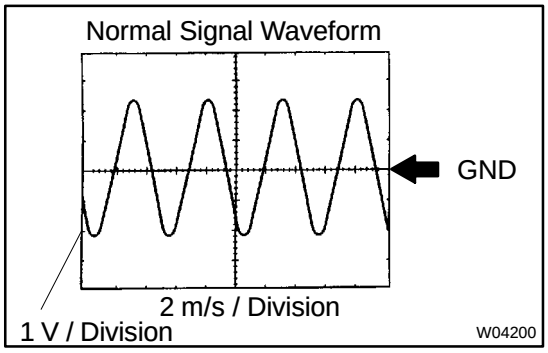
3	CHECK HARNESS AND CONNECTOR(SKID CONTROL SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each skid control sensor and skid control ECU (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	INSPECT SENSOR AND SENSOR ROTOR SERRATIONS



(REFERENCE) INSPECTION USING OSCILLOSCOPE

(a) Connect the oscilloscope to the terminals RR+ - RR- and RL+ - RL- of the skid control ECU.

(b) Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

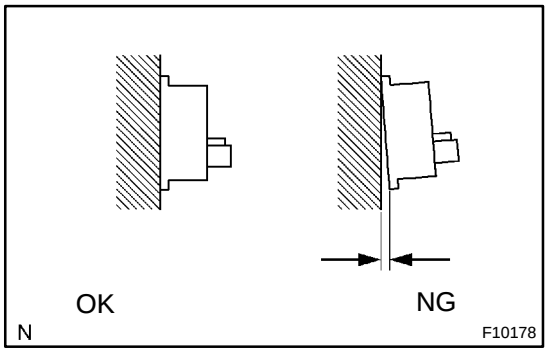
HINT:

- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter deposited on it.

OK → **CHECK AND REPLACE SKID CONTROL ECU ASSY** **(See page 01-30)**

NG

5	INSPECT SENSOR INSTLLATION



(a) Check the sensor installation.

OK:

There is no clearance between the sensor and rear axle carrier.

NG → **REPLACE SKID CONTROL SENSOR**

NOTICE:

Check the speed sensor signal last **(See page 05-614)****.**

OK

6	INSPECT SKID CONTROL SENSOR TIP

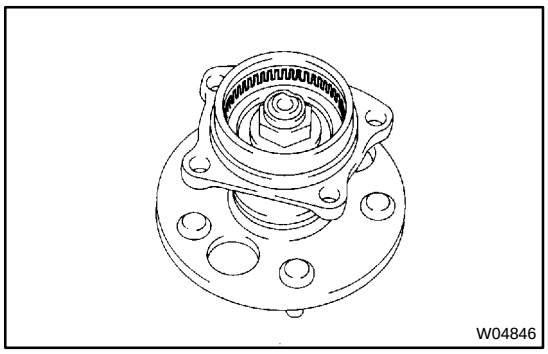
(a) Remove the skid control sensor (See page 32-94).
(b) Check the sensor tip.
OK:
No scratches or foreign objects on the sensor tip.

NG → **CLEAN OR REPAIR SKID CONTORL SENSOR**

NOTICE:
Check the speed sensor signal last (See page 05-614).

OK

7	INSPECT SENSOR ROTOR



(a) Check the sensor rotor serrations.
OK:
No scratches, missing teeth or foreign objects.

NG → **REPLACE REAR AXLE HUB & BEARING ASSY LH**

NG → **REPLACE REAR AXLE HUB & BEARING ASSY RH**

NOTICE:
Check the speed sensor signal last (See page 05-614).

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NOTICE:
Do not reuse skid control sensor.

DTC	C0226/21	SFR SOLENOID CIRCUIT

DTC	C0236/22	SFL SOLENOID CIRCUIT

DTC	C0246/23	SRR SOLENOID CIRCUIT

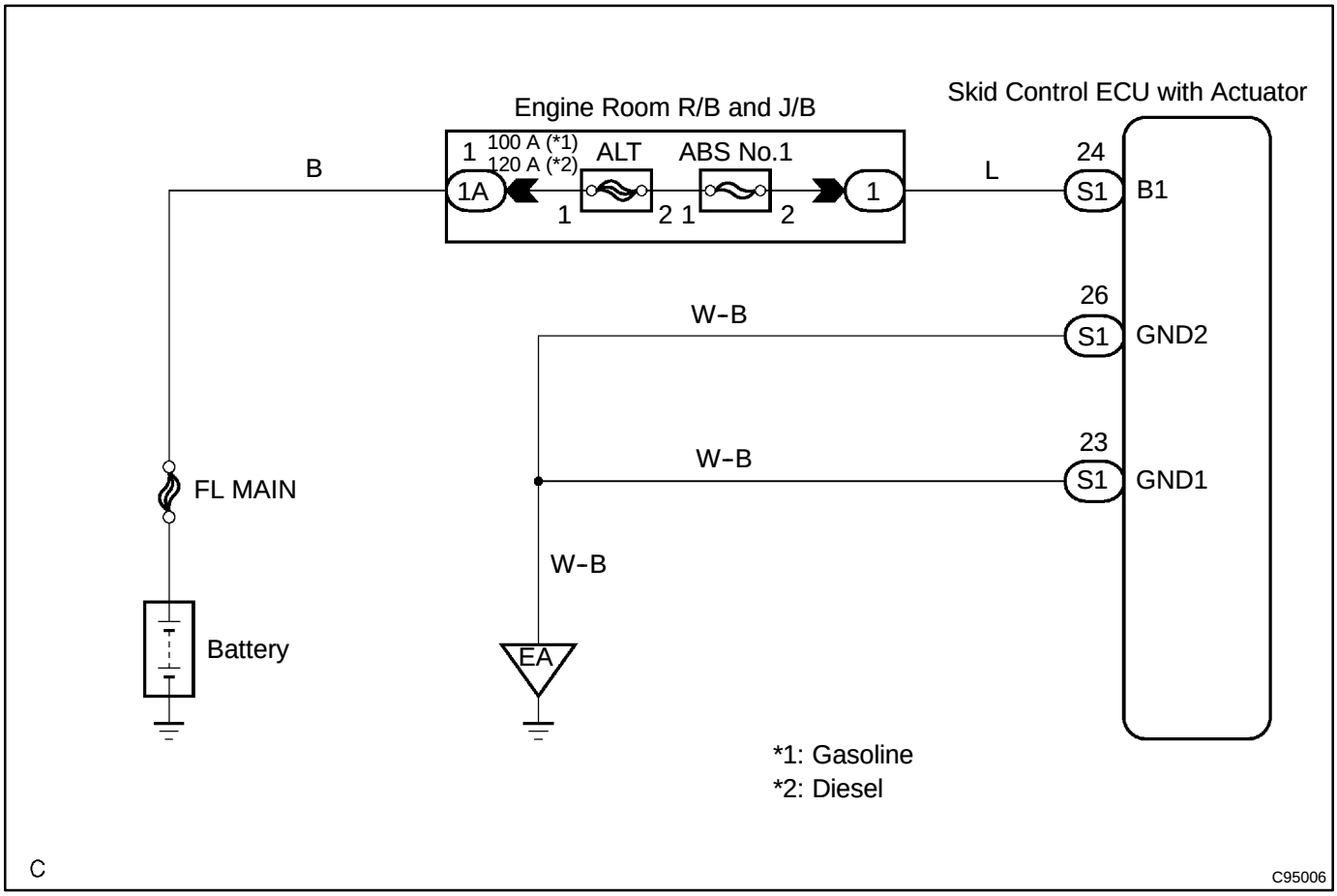
DTC	C0256/24	SRL SOLENOID CIRCUIT

CIRCUIT DESCRIPTION

This solenoid goes on when signals are received from the ECU and controls the pressure acting on the wheel cylinders thus controlling the braking force.

DTC No.	DTC Detecting Condition	Trouble Area
C0226/21 C0236/22 C0246/23 C0256/24	Solenoid valve signal does not match to the check result.	S Each solenoid circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check if the other DTCs are recorded (See page 05-614).

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

REPLACE SKID CONTROL ECU ASSY

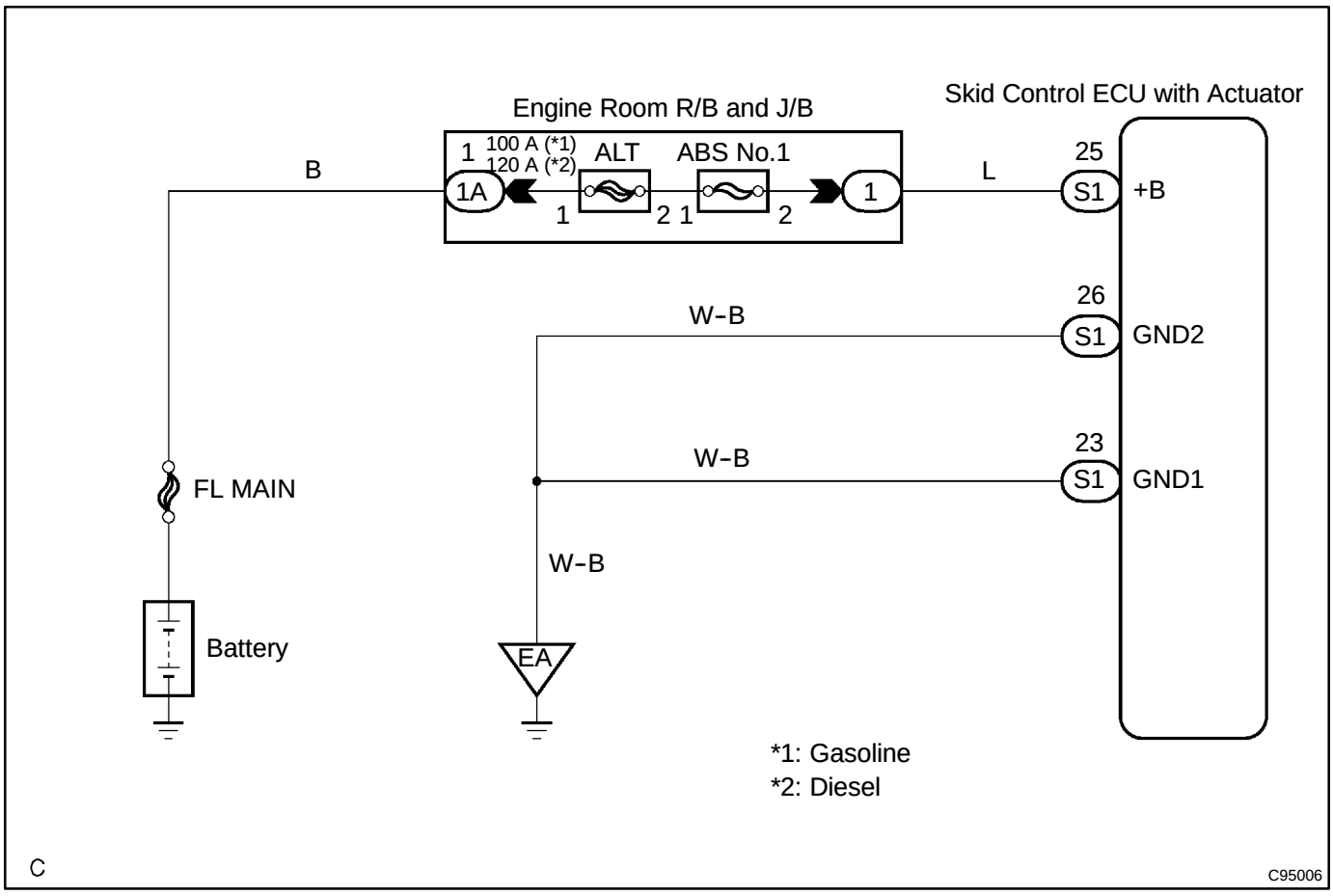
DTC	C0273/13	OPEN OR SHORT CIRCUIT IN ABS MOTOR RELAY CIRCUIT

CIRCUIT DESCRIPTION

The ABS motor relay supplies power to the ABS pump motor. While the ABS is activated, the ECU switches the motor relay ON and operates the ABS pump motor.

DTC No.	DTC Detecting Condition	Trouble Area
C0273/13	Detection of any conditions from 1 to 3: 1. After actuation of the motor relay, pump motor voltage will not be supplied within 0.4 sec. 2. When pump motor voltage is at high level, motor relay will not actuate for 2.5 sec. or more. 3. Pump motor voltage keeps low level for longer than 0.4 sec. and the pump repeats activating for 7 sec. 3 times maximum. Since the last activation, the pump motor has gone dead because of short circuit.	S ABS motor relay S ABS motor relay circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

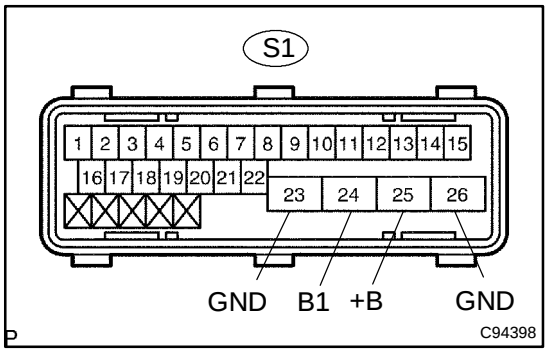
1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(ABS MOTOR RELAY)

(a) Check the operation sound of the ABS motor individually when operaing it with the hand-held tester.
OK:
The operation sound of the ABS motor should be heard.

OK → **IF THE SAME CODE IS STILL OUTPUT AFTER THE DTC IS DELETED, CHECK THE CONTACT THE CONDITION OF EACH CONNECTION.**

NG

2	INSPECT SKID CONTROL ECU CONNECTOR(+B TERMINAL VOLTAGE)

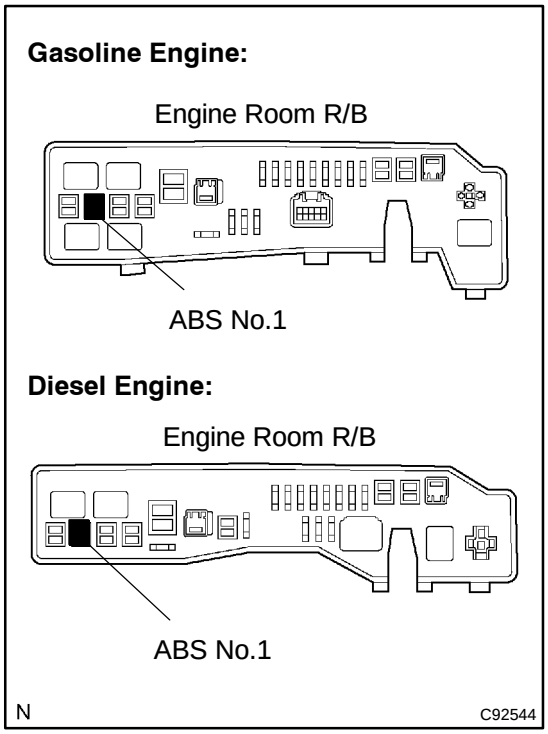


(a) Disconnect the skid control ECU connector.
(b) Measure the voltage between terminals +B (S1-25) and GND (S1-23, 26) of skid control ECU harness side connector.
Voltage: 10 - 14 V
(c) Measure the voltage between terminals B1 (S1-24) and GND (S1-23, 26) of skid control ECU harness side connector.
Voltage: 10 - 14 V

OK → **IF THE SAME CODE IS STILL OUTPUT AFTER THE DTC IS DELETED, CHECK THE CONTACT THE CONDITION OF EACH CONNECTION.**

NG

3	INSPECT FUSE(ABS No.1 FUSE)

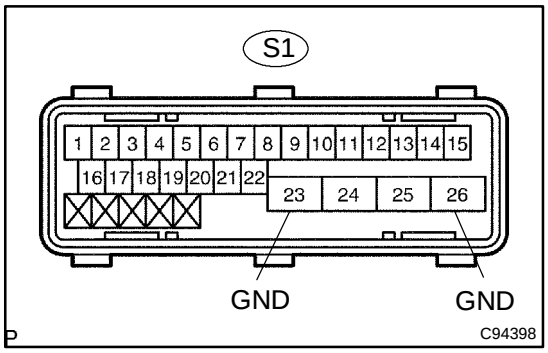


(a) Remove ABS No.1 fuse from the engine room R/B.
(b) Check continuity of ABS No.1 fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESSES AND COMPONENTS CONNECTED TO ABS NO.1 FUSE**

OK

4	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-23, 26) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE HARNESS AND CONNECTOR(+B CIRCUIT) **(See page 01-30)**

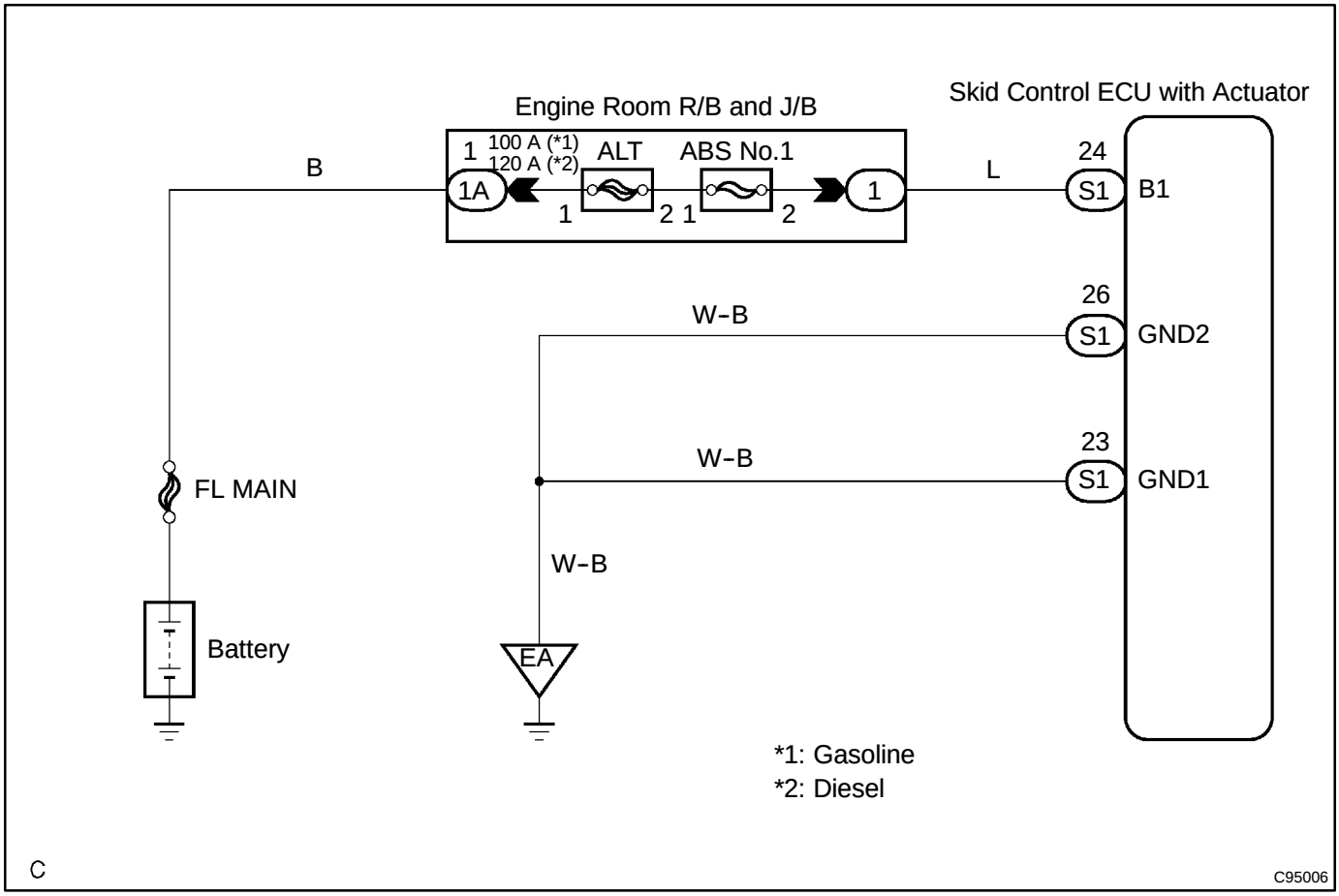
DTC	C0278/11	OPEN OR SHORT CIRCUT IN ABS SOLENOID RELAY

CIRCUIT DESCRIPTION

This relay supplies power to each ABS solenoid. After the ignition switch is turned ON, if the initial check is OK, the relay goes on.

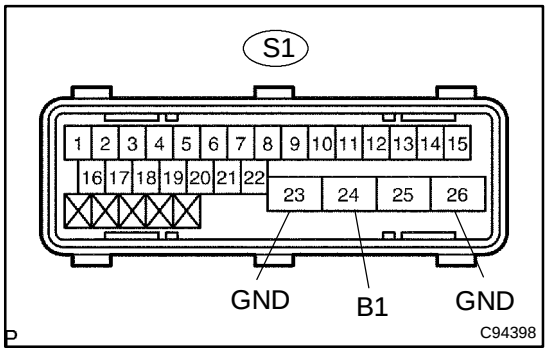
DTC No.	DTC Detecting Condition	Trouble Area
C0278/11	Detection of any conditions from 1 to 3: 1. 3 or more solenoid valves are shown faulty in response and simultaneously valve supply voltage is detected faulty. 2. Solenoid valve relay is not switched OFF. 3. Valve relay is frozen in spite of its high valve relay supply voltage.	$ ABS solenoid relay $ ABS solenoid relay circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT SKID CONTROL ECU CONNECTOR(B1 TERMINAL VOLTAGE)

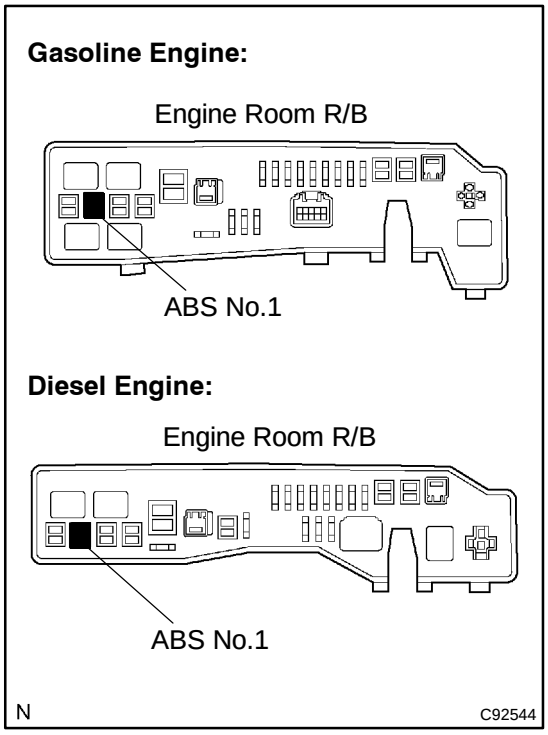


(a) Disconnect the skid control ECU connector.
(b) Measure the voltage between terminals B1 (S1-24) and GND (S1-23, 26) of skid control ECU harness side connector.
Voltage: 10 - 14 V

OK → **IF THE SAME CODE IS STILL OUTPUT AFTER THE DTC IS DELETED, CHECK THE CONTACT THE CONDITION OF EACH CONNECTION.**

NG

2	INSPECT FUSE(ABS No.1 FUSE)

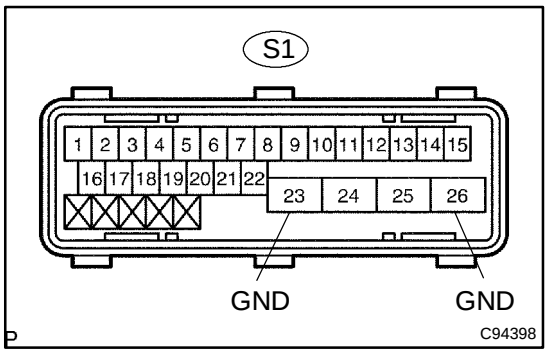


(a) Remove ABS No.1 fuse from the engine room R/B.
(b) Check continuity of ABS No.1 fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESSES AND COMPONENTS CONNECTED TO ABS NO.1 FUSE**

OK

3	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-23, 26) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR(B1 CIRCUIT) **(See page 01-30)**

DTC C1237/37 SPEED SENSOR ROTOR FAULTY

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1237/37	Detection of any of conditions from 1. through 4.: 1. When the ignition switch is ON, the speed difference between the rear right and rear left wheels is 5 km/h (3mph) or more (vehicle speed: 100 km/h (62 mph) or less). 2. When the ignition switch is ON, the slip difference between the reference wheel and any other wheels is 6 % or more (vehicle speed: 100 km/h (62 mph) or more). 3. Continuous ABS control for 60 sec. or more. 4. Interference on 1 or more wheels for 20 sec. with the brake pedal depressed, or for 5 sec. when the brake pedal is not depressed.	$ Speed sensor $ Sensor rotor

INSPECTION PROCEDURE

1 INSPECT TIRE SIZE

NG → **REPLACE TIRES SO THAT ALL 4 TIRES ARE SAME IN SIZE**

OK

2 INSPECT SPEED SENSOR ROTOR

(a) Check the speed sensor rotors (See page 30-6 or 30-18).

NG → **REPLACE SENSOR ROTOR**

OK

3 INSPECT SPEED SENSOR

(a) Check the speed sensors (See page 32-91).

NG → **REPLACE SPEED SENSOR**

OK

4 CHECK HARNESS AND CONNECTOR(SPEED SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each terminal of speed sensor and skid control ECU (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

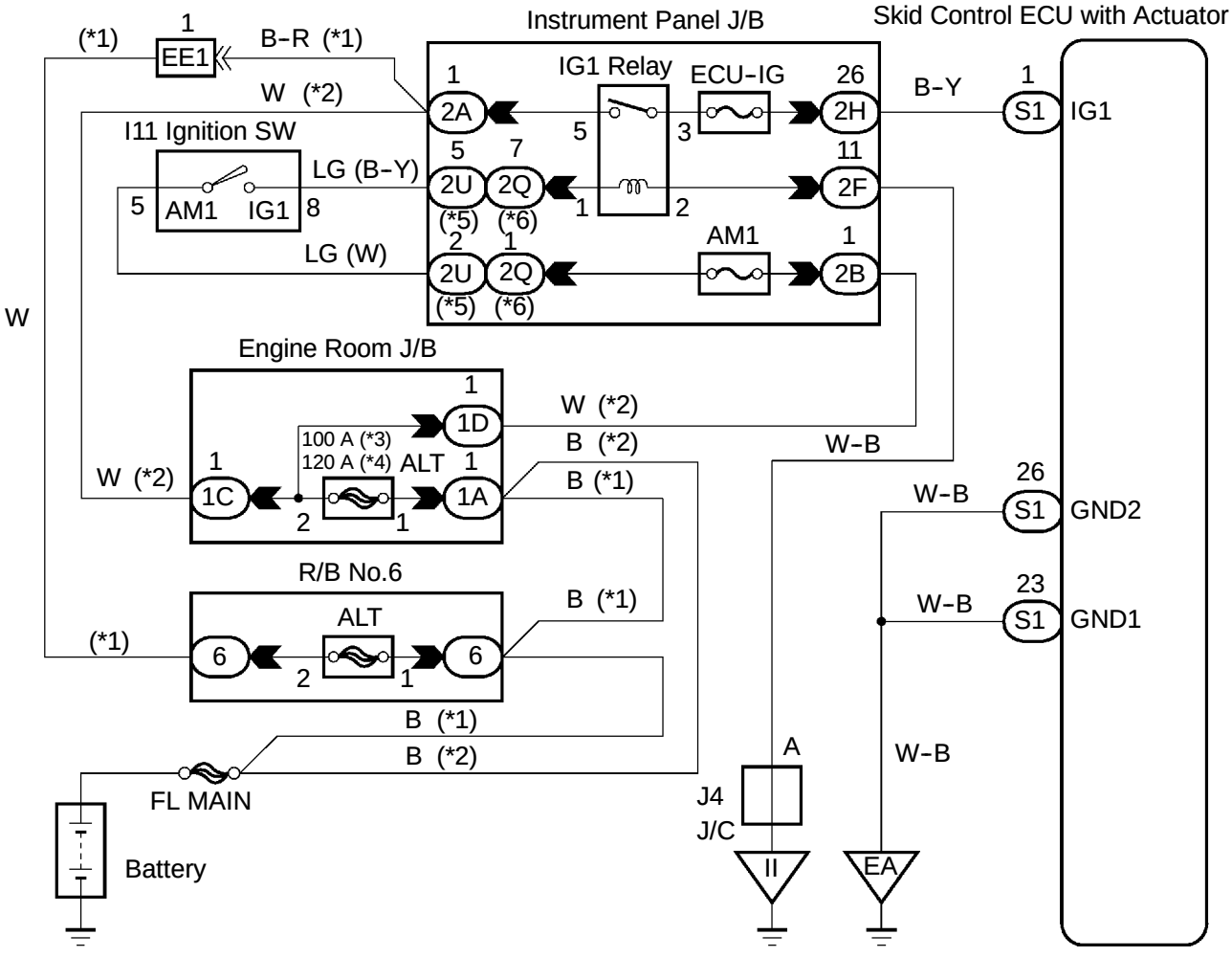
DTC	C1241/41	LOW BATTERY POSITIVE VOLTOAGE OR ABNORMALLY HIGH BATTERY POSITIVE VOLTAGE

CIRCUIT DESCRIPTION

This is the power source of the ECU, hence the actuators.

DTC No.	DTC Detecting Condition	Trouble Area
C1241/41	Vehicle speed of about 6 km/h (4 mph), low battery voltage of less than 9.4 V at the time of non-operation of ABS control or less than 8.8 V at the time of operation of ABS control, and high battery voltage of more than 17.4 V.	$ Battery $ Charging system $ Power source circuit

WIRING DIAGRAM



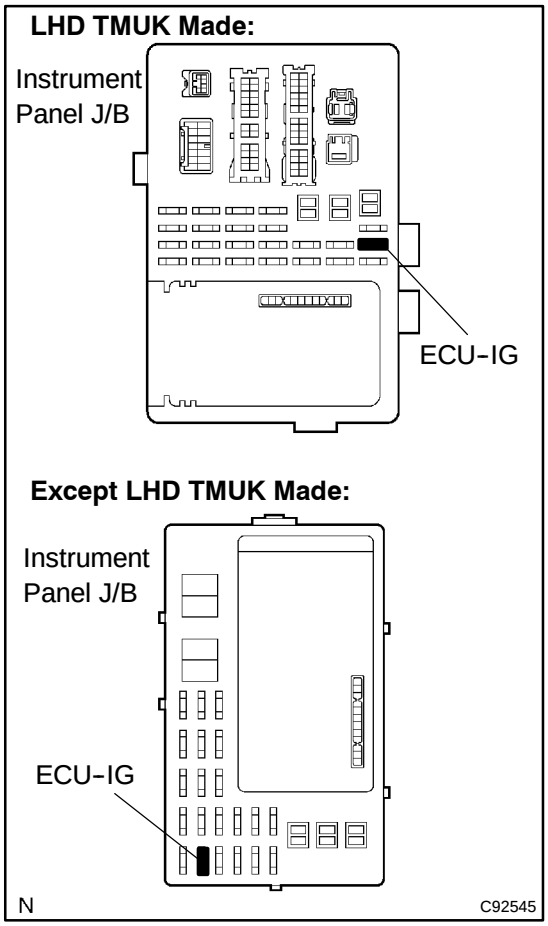
*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: LHD
*6: RHD

C

C94423

INSPECTION PROCEDURE

1	INSPECT FUSE(ECU-IG FUSE)



(a) Remove ECU-IG fuse from the instrument panel J/B.
(b) Check continuity of ECU-IG fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESS AND COMPONENTS CONNECTED TO ECU-IG FUSE**

OK

2	INSPECT BATTERY

OK:
Voltage: 10 - 14 V

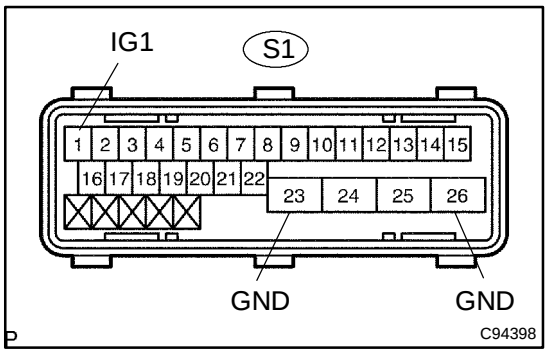
NG → **INSPECT CHARGING SYSTEM**

OK

3	INSPECT SKID CONTROL ECU CONNECTOR(IG1 TERMINAL VOLTAGE)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.
OK:
"Normal" is displayed.



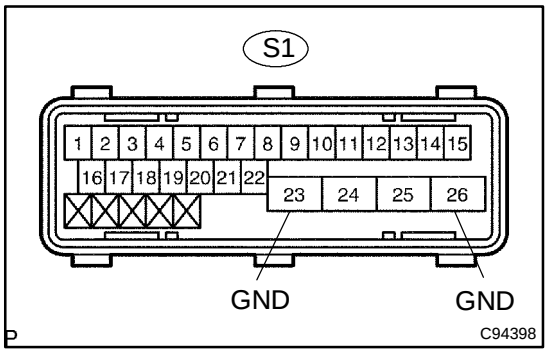
IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control ECU connector.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals IG1 (S1-1) and GND (S1-23, 26) of skid control ECU harness side connector.
OK:
oltage: 10 - 14 V

OK → **CHECK AND REPLACE SKID CONTROL ECU ASSY** **(See page 01-30)**

NG

4	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-23, 26) of skid control ECU harness side connector and body ground.
OK:
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

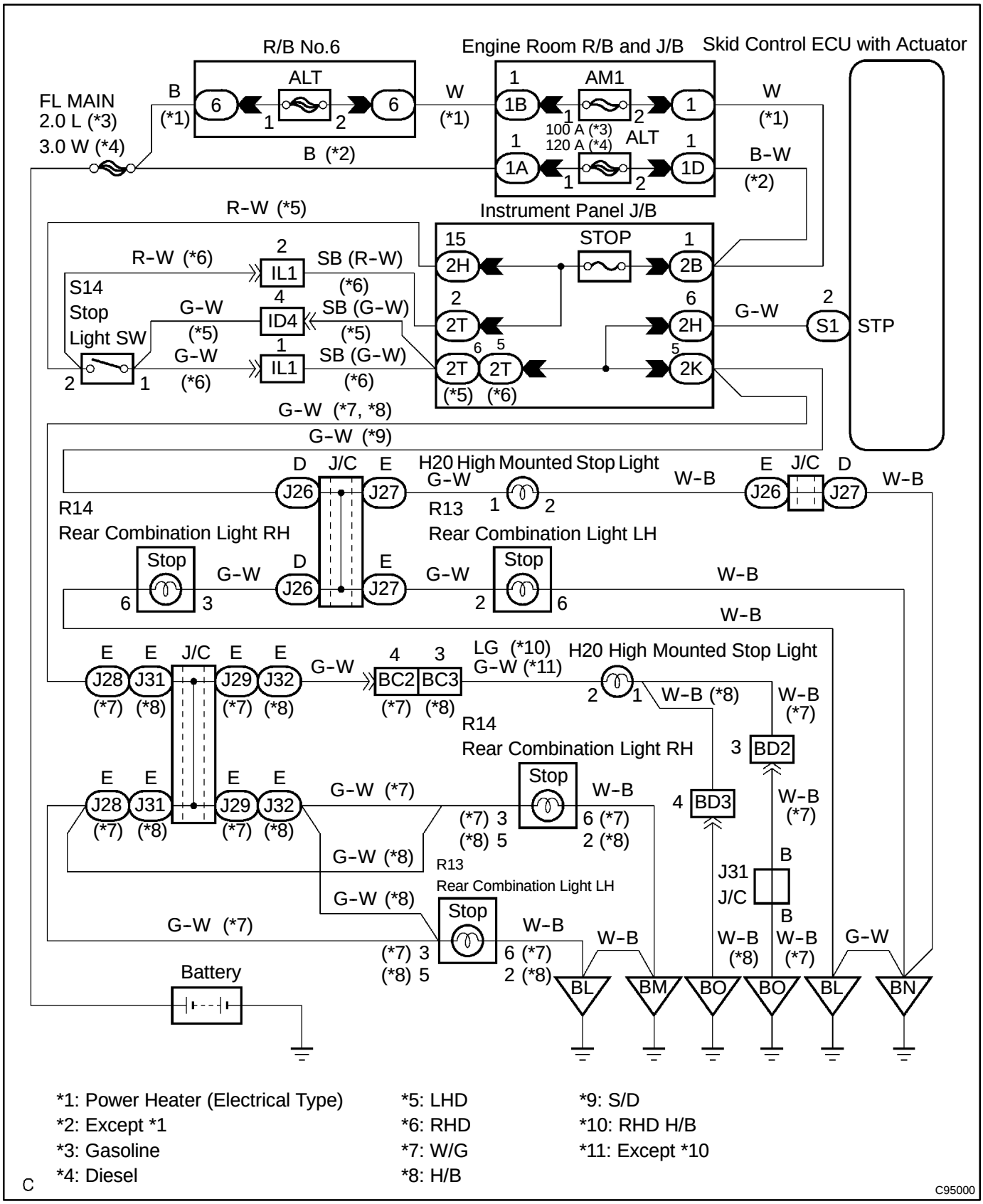
CHECK AND REPAIR HARNESS AND CONNECTOR(IG CIRCUIT) **(See page 01-30)**

DTC C1249/58 STOP LIGHT SWITCH CIRCUIT

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1249/58	Stop light switch circuit is open, and stop light switch voltage is in the level between 55 % or more and less than 75 % of the battery voltage.	S Stop light switch S Stop light switch circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

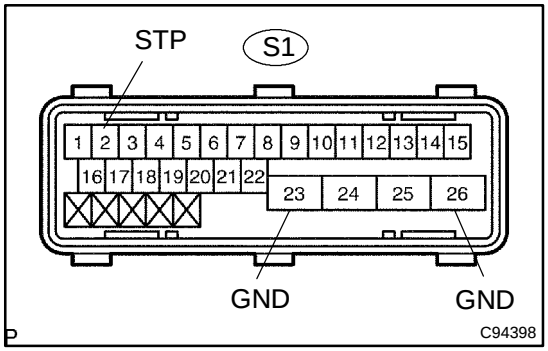
1	INSPECT STOP LAMP SWITCH ASSY

(a) Check that the stop light lights up when brake pedal is depressed and turns OFF when the brake pedal is released.

NG → Go to step 4

OK

2	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(STP TERMINAL)



(a) Disconnect skid control ECU connector.
(b) Measure voltage between terminal STP (S1-2) and GND (S1-23, 26) of skid control ECU harness side connector when the brake pedal is depressed.
Voltage: 10 - 14 V

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

NG

3	CHECK HARNESS AND CONNECTOR(STOP LIGHT SWITCH - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between stop light switch and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE (See page 05-623)

4	CHECK HARNESS AND CONNECTOR(STOP LIGHT CIRCUIT)

(a) Check for open and short circuit in harness and connector of the stop light circuit (See page 01-30).

OK → REPLACE STOP LAMP SWITCH ASSY

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

DTC C1300/62 SKID CONTROL ECU MALFUNCTION

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1300/62	Skid control ECU continuously detects the proper operation of ABS.	ECU

INSPECTION PROCEDURE

1	RECONFIRM DTC

A	DTC C1300/62
B	Except DTC C1300/62

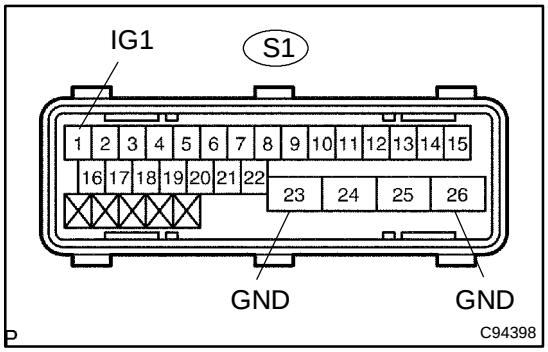
B → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

A

2	INSPECT SKID CONTROL ECU CONNECTOR(IG1 TERMINAL VOLTAGE)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.
OK:
"Normal" is displayed.



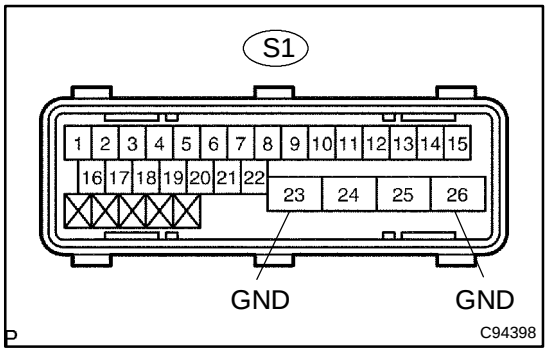
IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control ECU connector.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals IG1 (S1-1) and GND (S1-23, 26) of skid control ECU harness side connector.
OK:
oltage: 10 - 14 V

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

NG

3	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-23, 26) of skid control ECU harness side connector and body ground.
OK:
Resistance: 1 Ω or less

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR(IG1 CIRCUIT) **(See page 01-30)**

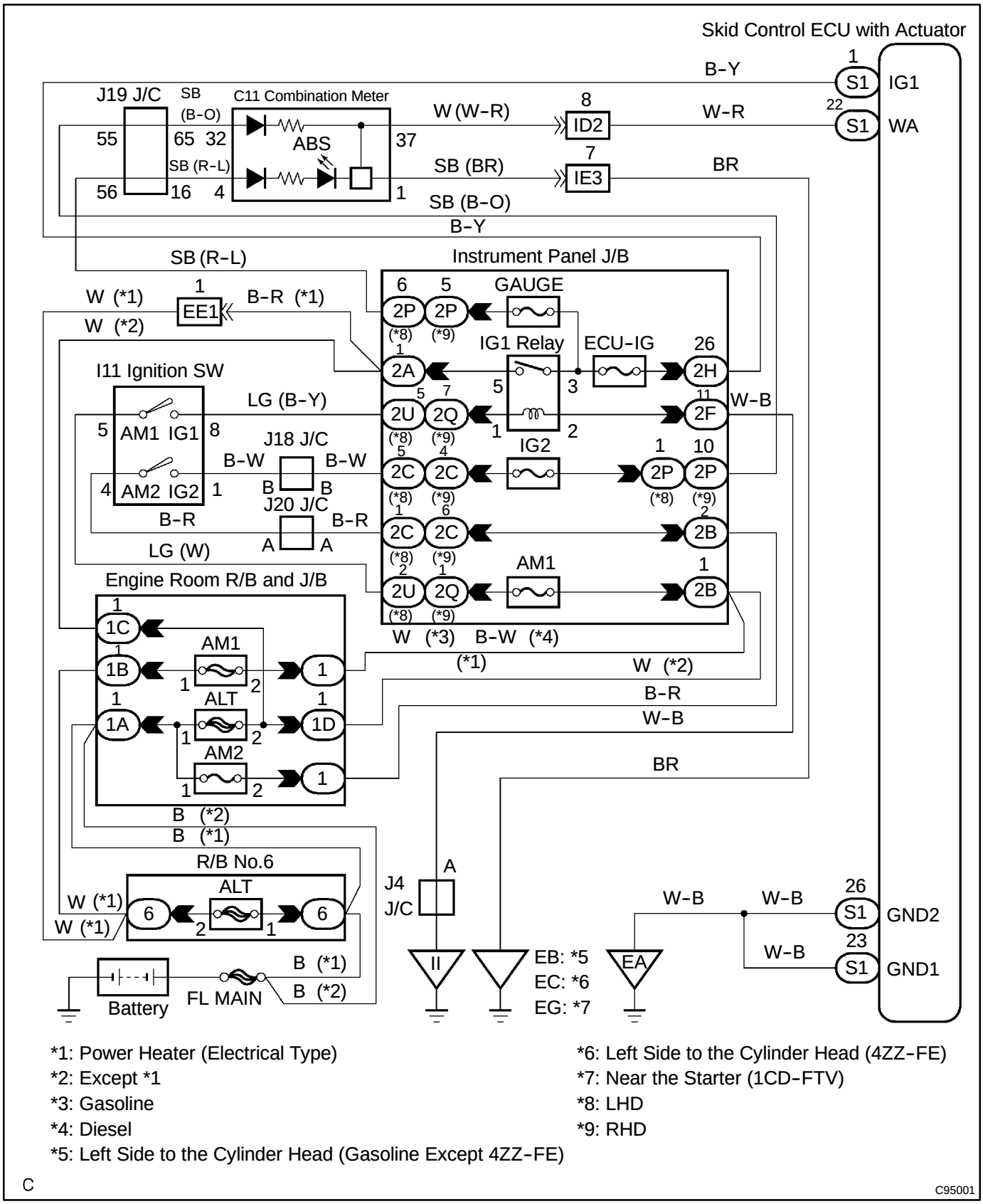
DTC	AlwaysON	MALFUNCTION IN ABS ECU

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
Always ON	Either of the following 1. or 2. is detected: 1. The ECU connectors are OFF from the ECU. 2. There is a malfunction in the ECU internal circuit.	$ Battery $ Charging system $ Power source circuit $ Skid control ECU

HINT:
There is a case that hand-held tester cannot be used when ECU is abnormal.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check the DTC (See page 05-614).

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

2	INSPECT SKID CONTROL ECU CONNECTOR SECURELY CONNECTED

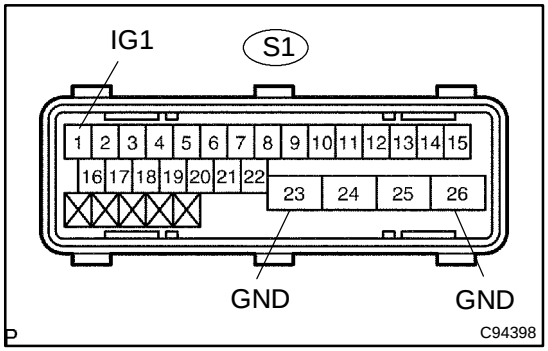
NO → CONNECT CONNECTOR TO ECU

YES

3	INSPECT SKID CONTROL ECU CONNECTOR(IG1 TERMINAL VOLTAGE)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.
OK:
"Normal" is displayed.



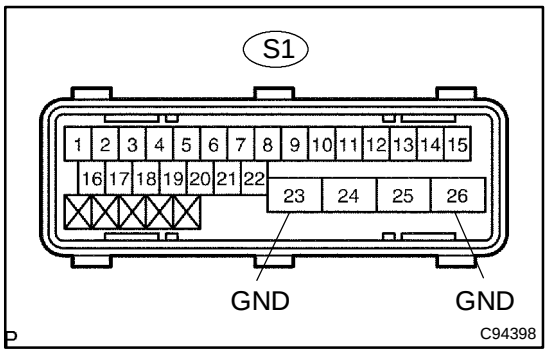
IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control ECU connector.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals IG1 (S1-1) and GND (S1-23, 26) of skid control ECU harness side connector.
Voltage: 10 - 14 V

OK → Go to step 5

NG

4 INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



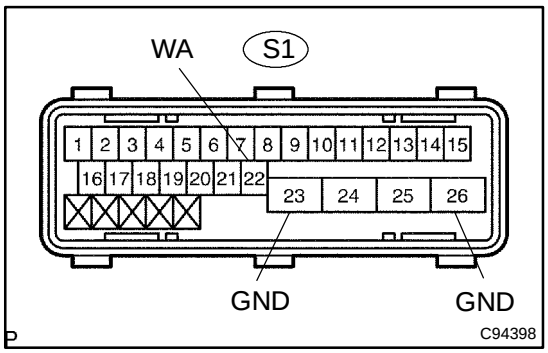
(a) Measure resistance between terminal GND (S1-23, 26) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR(IG CIRCUIT) **(See page 01-30)**

5 INSPECT COMBINATION METER(ABS WARNING LIGHT)



(a) Disconnect the skid control ECU connector.
(b) Using service wire, connect terminals WA (S1-22) and GND (S1-23, 26) of skid control ECU harness side connector.
(c) Turn the ignition switch to ON.
OK:
ABS warning light goes off.

NG → **REPAIR OR REPLACE COMBINATION METER**

OK

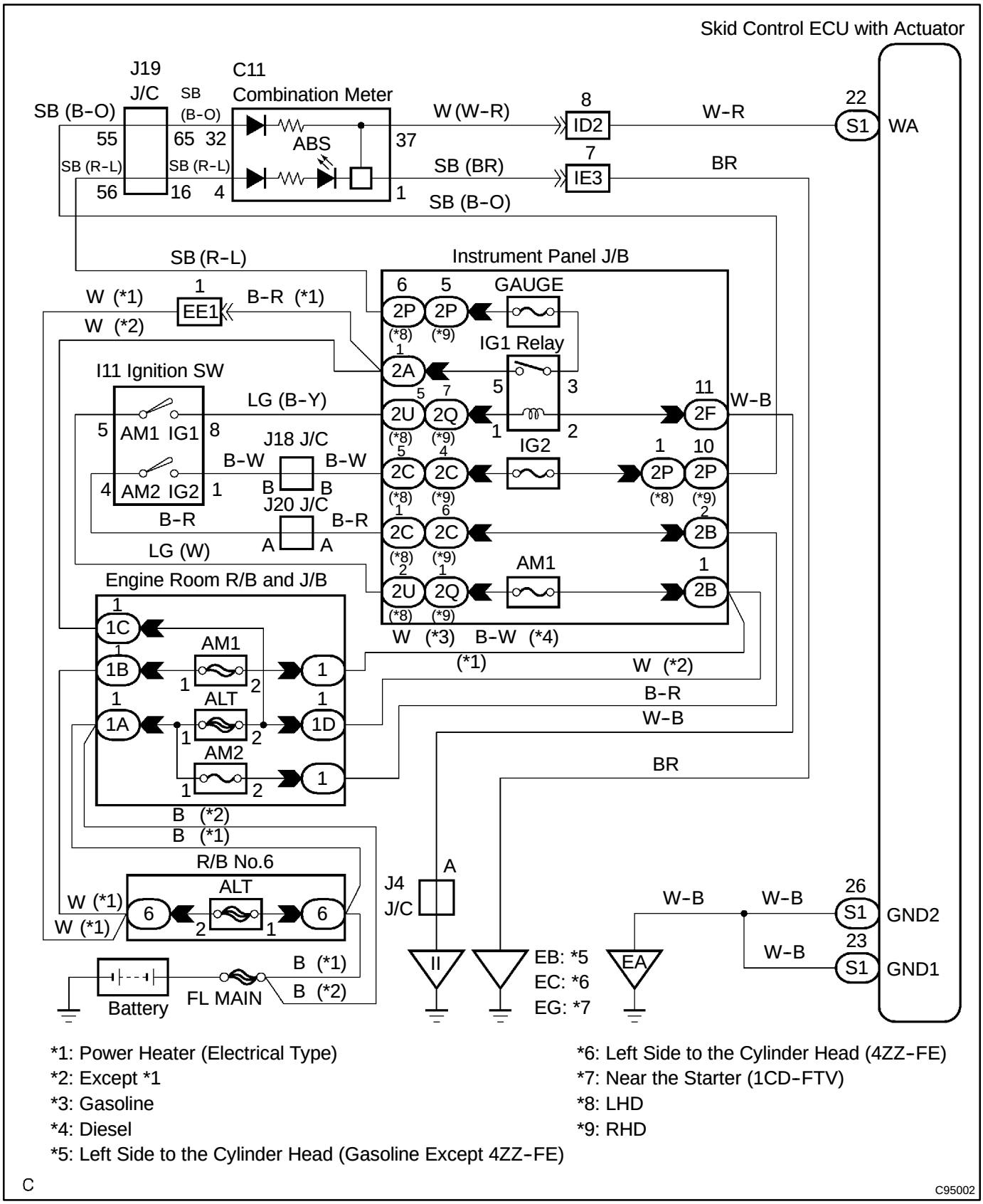
CHECK AND REPLACE SKID CONTROL ECU ASSY **(See page 01-30)**

ABS WARNING LIGHT CIRCUIT(DOES NOT LIGHT UP)

CIRCUIT DESCRIPTION

If the ECU detects trouble, it will prohibit ABS control, turn on ABS warning light, and store the DTC. Connect terminals Tc and CG of the DLC3 to make the ABS warning light blink and output the DTC.

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: Left Side to the Cylinder Head (Gasoline Except 4ZZ-FE)
*6: Left Side to the Cylinder Head (4ZZ-FE)
*7: Near the Starter (1CD-FTV)
*8: LHD
*9: RHD

C95002

INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(ABS WARNING LIGHT)

(a) Check that "ON" and "OFF" of the ABS warning light can be shown on the combination meter by the hand-held tester.

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NG

2	INSPECT COMBINATION METER ASSY(ABS WARNING LIGHT) (See page 71-1)

(a) Disconnect the connector from the skid control ECU.
(b) Turn the ignition switch to ON.
(c) Check the ABS warning light.
OK:
ABS warning light goes ON

NG → REPAIR OR REPLACE COMBINATION METER ASSY

OK

3	CHECK HARNESS AND CONNECTOR(WA CIRCUIT)

(a) Check for short circuit in harness and connector between terminal WA of skid control ECU and combination mete (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

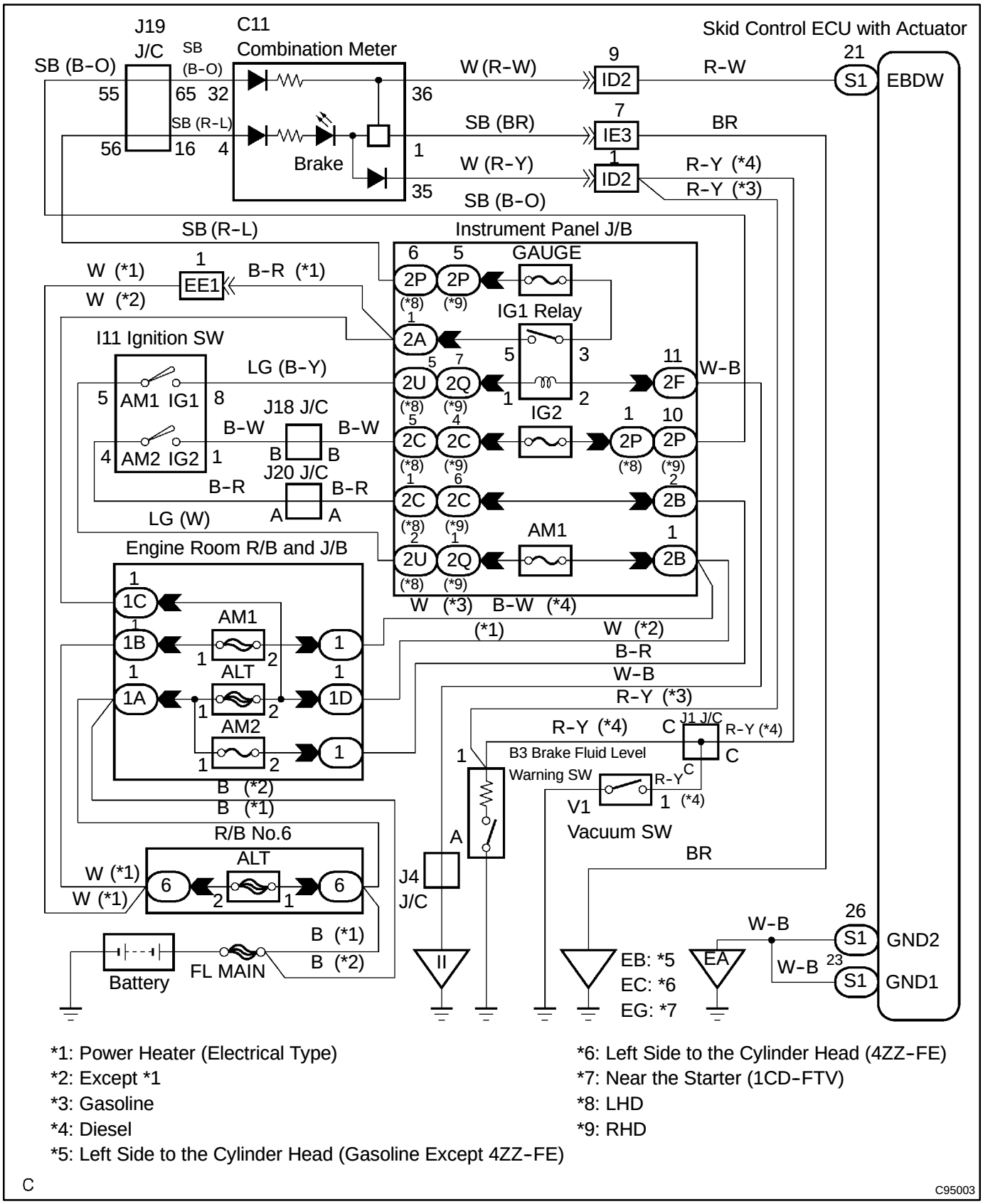
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

BRAKE WARNING LIGHT CIRCUIT

CIRCUIT DESCRIPTION

If the ECU detects trouble, it lights the brake warning light at the same time of prohibiting ABS control. At this time, the ECU records a DTC in memory.
Connect terminals Tc and CG of the DLC3 to make the brake warning light blink and output the DTC.

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: Left Side to the Cylinder Head (Gasoline Except 4ZZ-FE)
*6: Left Side to the Cylinder Head (4ZZ-FE)
*7: Near the Starter (1CD-FTV)
*8: LHD
*9: RHD

C

C95003

INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check the DTC (See page 05-614).
OK:
Normal code

NG → **REPAIR CIRCUIT INDICATED BY OUTPUT CODE**

OK ↓

2	INSPECT PARKING BRAKE SWITCH CIRCUIT

(a) Check for open and short circuit in parking brake switch circuit (See page 01-30).

NG → **REPAIR OR REPLACE PARKING BRAKE SWITCH CIRCUIT**

OK ↓

3	INSPECT BRAKE FLUID LEVEL WARNING SWITCH CIRCUIT

(a) Check the brake fluid level in reservoir.
(b) Check for open and shot circuit in brake fluid level warning switch circuit (See page 01-30).

NG → **REPAIR OR REPLACE BRAKE FLUID LEVEL WARNING SWITCH CIRCUIT**

OK ↓

4	INSPECT VACUUM WARNING SWITCH CIRCUIT

(a) Check for open and short circuit in harness and connector between vacuum warning switch and skid control ECU (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ↓

5	INSPECT COMBINATION METER ASSEMBLY(BRAKE WARNING LIGHT CIRCUIT)

(a) Check for open and short circuit in combination meter (See page 71-8).

NG → **REPAIR OR REPLACE COMBINATION METER ASSEMBLY**

OK ↓

6	CHECK HARNESS AND CONNECTOR(BRAKE ACTUATOR - COMBINATION METER)

(a) Check for open and short circuit in harness and connector between brake actuator and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

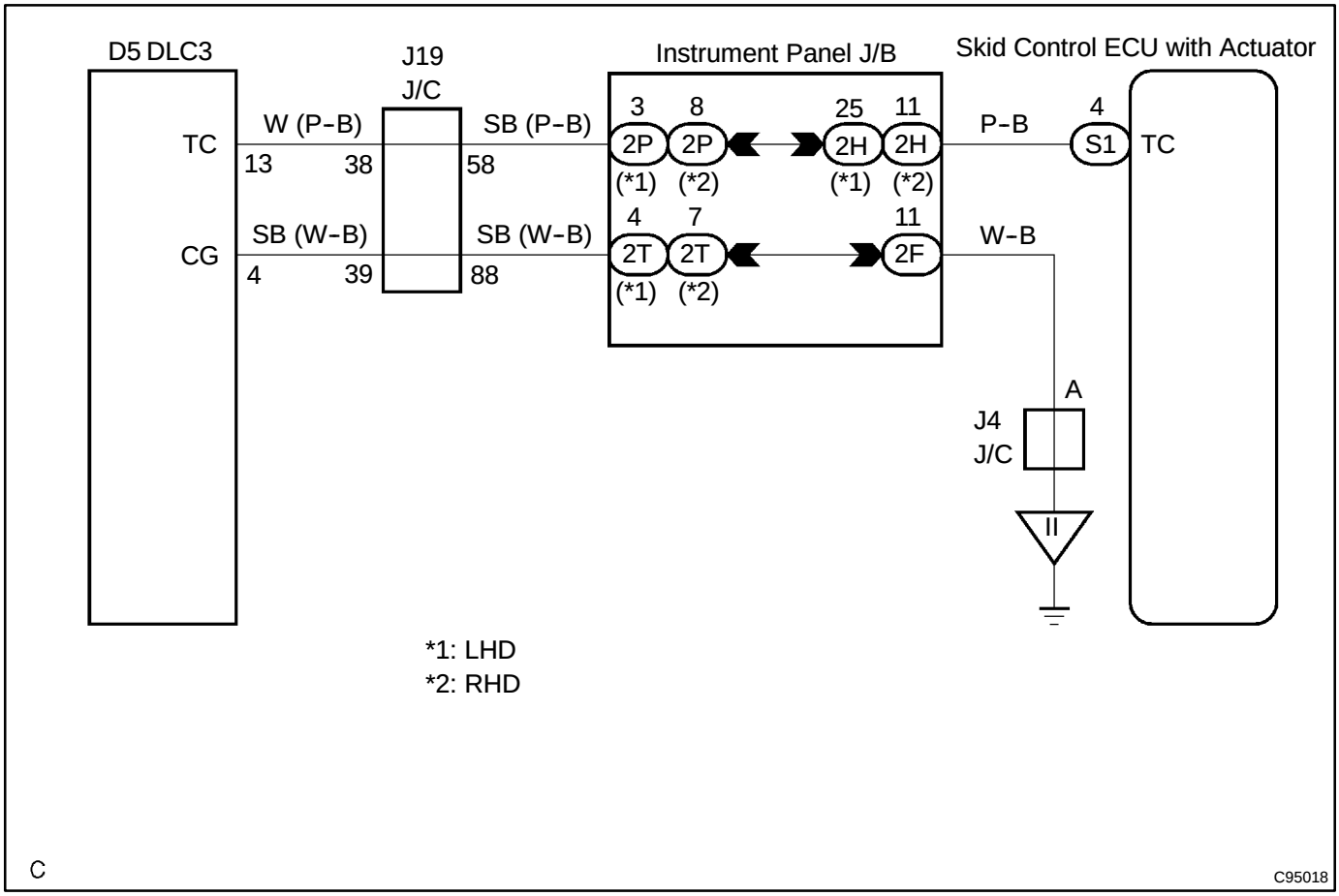
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

TC TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

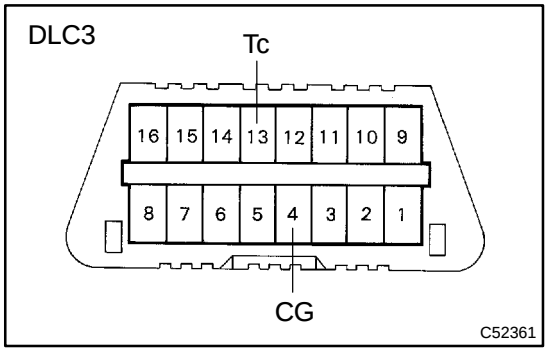
Connecting terminals Tc and CG of the DLC3 causes the ECU to display the DTC by flashing the ABS warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT DLC3 TERMINAL VOLTAGE(Tc TERMINAL)



(a) Turn the ignition switch to ON.
(b) Measure voltage between terminals Tc and CG of DLC3.
OK:
Voltage: 10 - 14 V

OK	Go to step 3

NG

2	CHECK HARNESS AND CONNECTOR(DLC3 - BODY GROUND)

(a) Check for open and short circuit in harness and connector between terminal CG of the DLC3 and body ground (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - DLC3)

(a) Check for open and short circuit in harness and connector between terminal Tc of the skid control ECU and DLC3 (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

ABS WITH EBD & BA & TRC & VSC SYSTEM (TMUK MADE)

0542N-03

HOW TO PROCEED WITH TROUBLESHOOTING

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-664)

3	Check and Clear DTCs and Freeze Frame Data (See page 05-666)

4	Problem Symptom Confirmation

- Symptom does not occur: Go to step 5
- Symptom occurs: Go to step 6

5	Symptom Simulation (See page 01-20)

6	DTC Check (See page 05-676)

- There is no output: Go to step 7
- There is output: Go to step 8

7	Problem Symptoms Table (See page 05-682)

- Check for fluid leakage and Go to step 10

8	DTC Chart (See page 05-676)

9	Circuit Inspection (See page 05-684 - 05-755)

HINT:
When 2 or more DTC's are recorded, and the problem is not identified, perform circuit inspection of the other DTC's.

10	Identification of Problem

11	Repair

12	Comfirmation Test

End

HINT:
Step 3, 6, 9, 12:
Diagnostic steps permitting the use of the hand-held tester.
Fail safe function:
When a failure occurs in the ABS & BA & TRC & VSC systems, the ABS warning light, the VSC warning light and the TRC OFF indicator light are lit and the ABS & BA & TRC & VSC operations are prohibited. In addition to this, when the failure that disables the EBD operation occurs, the brake warning light is lit as well and the EBD operation is prohibited.

0542O-03

CUSTOMER PROBLEM ANALYSIS CHECK

ABS & EBD & BA Check Sheet

Inspector's Name :

Customer's Name		**Registration No.**	
		Registration Date	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate efficiently.	
	☐ BA does not operate.	
	☐ EBD does not operate.	
	ABS Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up
	Brake Warning Light Abnormal (PKB released)	☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

Freeze Frame Data	STOP LIGHT SW	☐ ON ☐ OFF
	SYSTEM	☐ NO SYS ☐ ABS ☐ BA ☐ FAIL SF
	#IG ON	
	VEHICLE SPD	km/h MPH

TRC & VSC Check Sheet

Inspector's Name :

Customer's Name		**Registration No.**	
		Registration Date	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

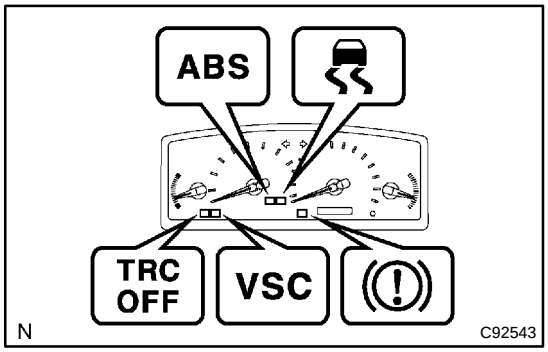
Symptoms	☐ TRAC does not operate. (Wheels spin when starting rapidly.)	
	☐ VSC does not operate. (Wheels sideslip at the time of sharp turning.)	
	TRC OFF Indicator Light Abnormal	☐ Remains ON ☐ Does not Light Up
	VSC Warning Indicator Abnormal	☐ Displays ☐ Does not Display
	SLIP Indicator Light Abnormal	☐ Remains ON ☐ Does not Light Up
	Skid Control Buzzer Abnormal	☐ Sounds ☐ Does not Sound

Check Item	**ABS Warning Light**	☐ Normal ☐ Malfunction Code (Code)
	Malfunction Indicator Light	☐ Normal ☐ Malfunction Code (Code)

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

Freeze Frame Data	VSC/TRC OFF SW	☐ ON ☐ OFF
	SYSTEM	☐ VSC/TRC
	SHIFT POSITION	☐ P,N ☐ 2 ☐ R ☐ 3 ☐ D ☐ 4 ☐ L ☐ FAIL
	STEERING ANG	deg
	YAW RAT	deg/s
	MAS CYL PRESS	V
	THROTTLE	deg
	MAS PRESS GRADE	MPa/s
	G (RIGHT&LEFT)	G
	G (BACK&FORTH)	G

0577Y-01



PRE-CHECK

1. DIAGNOSIS SYSTEM

(a) Check the warning lights.

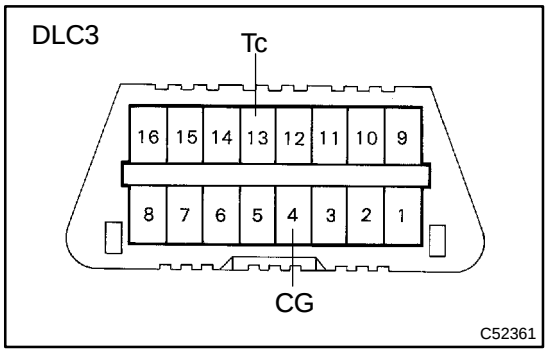
(1) Release parking brake lever.

(2) When the ignition switch is turned ON, check that the ABS warning light, Brake warning light, VSC warning light, TRC OFF indicator light and SLIP indicator light goes on for approx. 3 seconds.

HINT:

- When the parking brake is applied or brake fluid level is low, the Brake warning light is lit.
- If the ECU stores DTC, ABS warning light , VSC warning light and TRC OFF indicator light is ON.
- If the indicator check result is not normal, proceed to troubleshooting for the light circuit.

Trouble Area	See page
ABS warning light circuit	05-737
Brake warning light circuit	05-742
VSC warning light circuit	05-740
TRC OFF indicator light circuit	05-746
SLIP indicator light circuit	05-749



(b) In case of not using hand-held tester:
Check the DTC.

(1) Using SST, it connects terminal Tc and CG of DLC3.
SST 09843-18040

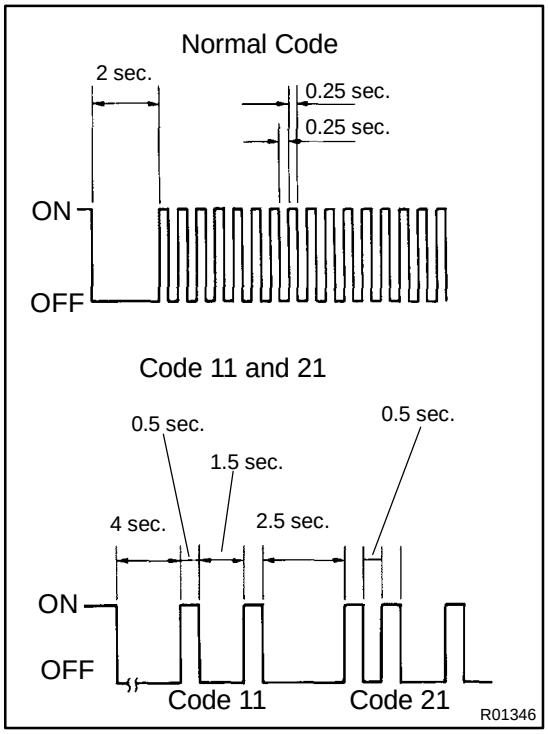
(2) Turn the ignition switch to ON.

(3) Read the DTC from the ABS warning light or VSC warning light on the combination meter.

HINT:

- If no code appears, inspect the diagnostic circuit, ABS warning light circuit or VSC warning light circuit.

Trouble Area	See page
Tc terminal circuit	05-753
ABS warning light circuit	05-737
VSC warning light circuit	05-740



S As an example, the blinking patterns for the normal code and codes 11 and 21 are shown on the left.

(4) Codes are explained in the code table on page 05-676.

(5) After completing the check, disconnect terminal Tc and CG of DLC3, and turn off the display.

If 2 or more malfunctions are detected at the same time, the lowest numbered DTC will be displayed first.

(c) In case of using the hand-held tester:

Check the DTC.

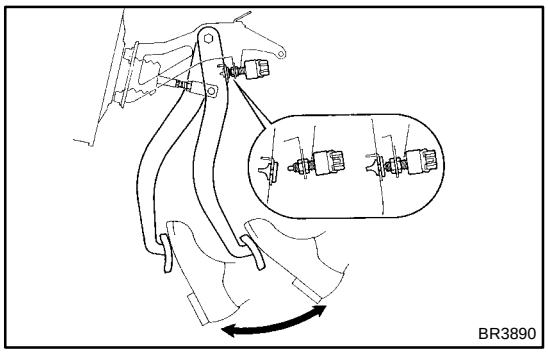
(1) Hook up the hand-held tester to the DLC3.

(2) Turn the ignition switch to ON.

(3) Read the DTC by following the prompts on the tester screen.

HINT:

Please refer to the hand-held tester operator's manual for further details.



(d) In case of not using hand-held tester:

Clear the DTC.

(1) Using SST, it connects the terminal Tc and CG of the DLC3.

SST 09843-18040

(2) Turn the ignition switch to ON.

(3) Clear DTC stored in ECU by depressing the brake pedal 8 or more times within 5 sec.

(4) Check that the ABS warning light and VSC warning light shows the normal code.

(5) Remove the SST from the DLC3.

SST 09843-18040

HINT:

Disconnecting the battery cable during repairs will not erase the DTC in the ECU.

(e) In case of using hand-held tester:

Clear the DTC.

(1) Turn the ignition switch to ON.

(2) Operate the hand-held tester to erase the codes.

HINT:

Please refer to the hand-held tester operator's manual for further details.

2. DATA LIST

HINT:

According to the DATA LIST displayed by the Hand-held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. Reading the DATA LIST as a first step of troubleshooting is one of the method to shorten the labor time.

(a) Connect the Hand-held tester to the DLC3.

(b) Turn the ignition switch to ON.

(c) According to the display on tester, read the "DATA LIST".

Item	Measurement Item / Range (Display	Normal Condition	Diagnostic Note
ABS MOT RELAY	ABS motor relay / ON or OFF		
SOL RELAY	Solenoid relay / ON or OFF		
VSC / TRC OFF SW	VSC / TRC OFF switch / ON or OFF		
IDLE SW	Main idle switch / ON or OFF	ON : Accelerator pedal released OFF : Accelerator pedal depressed	
STOP LIGHT SW	Stop light switch / ON or OFF	ON : Brake pedal depressed OFF : Brake pedal released	
PKB SW	Parking brake switch / ON or OFF	ON : Parking brake applied OFF : Parking brake released	
ABS OPERT FR	ABS operation (FR) / BEFORE or OPERATE	BEFORE : No ABS operation (FR) OPERATE : During ABS operation (FR)	
ABS OPERT FL	ABS operation (FL) / BEFORE or OPERATE	BEFORE : No ABS operation (FL) OPERATE : During ABS operation (FL)	
ABS OPERT RR	ABS operation (RR) / BEFORE or OPERATE	BEFORE : No ABS operation (RR) OPERATE : During ABS operation (RR)	
ABS OPERT RL	ABS operation (RL) / BEFORE or OPERATE	BEFORE : No ABS operation (RL) OPERATE : During ABS operation (RL)	
WHEEL SPD FR	Wheel speed sensor (FR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD FL	Wheel speed sensor (FL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD RR	Wheel speed sensor (RR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer

Item	Measurement Item / Range (Display	Normal Condition	Diagnostic Note
WHEEL SPD RL	Wheel speed sensor (RL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed	Speed indicated on speedometer
DECELERAT SENS	Deceleration sensor 1 reading / min.: −1.869 G, max.: 1.869 G	Approximately 0 ± 0.13G at still condition	Reading changes when vehicle is bounced
IG VOLTAGE	ECU power supply voltage / NORMAL or TOO LOW	NORMAL : 9.5 V or over TOO LOW : Below 9.5 V	
SFRR	ABS solenoid (SFRR) / ON or OFF		
SFRH	ABS solenoid (SFRH) / ON or OFF		
SFLR	ABS solenoid (SFLR) / ON or OFF		
SFLH	ABS solenoid (SFLH) / ON or OFF		
SRRR (SRR)	ABS solenoid (SRRR (SRR)) / ON or OFF		
SRRH (SRH)	ABS solenoid (SRRH (SRH)) / ON or OFF		
SRLR	ABS solenoid SRLR) / ON or OFF		
SRLH	ABS solenoid SRLH) / ON or OFF		
SRC1	TRC solenoid SRC1 / ON or OFF		
SRC2	TRC solenoid SRC2 / ON or OFF		
SMC1	TRC solenoid SMC1 / ON or OFF		
SMC2	TRC solenoid SMC2 / ON or OFF		
VEHICLE SPD	Maximum wheel speed sensor reading / min.: 0 km/h (0 MPH), max.: 326 km/h (202 MPH)	Actual vehicle speed	Speed indicated on speedometer
MAS CYL PRESS	Master cylinder pressure sensor 1 reading / min.: 0 V, max.: 5 V	When brake pedal is released : 0.3 – 0.9 V	Reading increases when brake pedal is depressed
TEST MODE	Test mode / NORMAL or TEST	NORMAL : Normal mode TEST : During test mode	
#CODES	Number of DTC recorded / min.: 0, max.: 255	Min.: 0, max.: 26	

3. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the Hand-held tester allows the relay, VSV, actuator and so on to operate without parts removal. Performing the ACTIVE TEST as a first step of troubleshooting is one of the method to shorten the labor time.

It is possible to display the DATA LIST during the ACTIVE TEST.

(a) Connect the Hand-held tester to the DLC3.

(b) Turn the ignition switch to ON.

(c) According to the display on tester, perform the "ACTIVE TEST".

HINT:

IG must be turned ON to proceed Active Test using a hand-held tester.

*1: For VSC equipped vehicles only

Item	Vehicle Condition / Test Details	Diagnostic Note
SFRR	Turns ABS solenoid (SFRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRH	Turns ABS solenoid (SFRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLR	Turns ABS solenoid (SFLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLH	Turns ABS solenoid (SFLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRR	Turns ABS solenoid (SRRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRH	Turns ABS solenoid (SRRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLR	Turns ABS solenoid (SRLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLH	Turns ABS solenoid (SRLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRC1	Turns TRAC solenoid SRCF (SA1) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRC2	Turns TRAC solenoid SRCF (SA2) ON / OFF	Operation of solenoid (clicking sound) can be heard
SMC1	Turns TRC solenoid SMF (BA-SOL) ON / OFF	Operation of solenoid (clicking sound) can be heard
SMC2	Turns TRC solenoid SMR ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRR & SFRH	Turns ABS solenoid SFRR & SFRH ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLR & SFLH	Turns ABS solenoid SFLR & SFLH ON / OFF	Operation of solenoid (clicking sound) can be heard

Item	Vehicle Condition / Test Details	Diagnostic Note
SRH & SRR	Turns ABS solenoid SRH & SRR ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLR & SRLH	Turns ABS solenoid SRLR & SRLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRH & SFLH	Turns ABS solenoid SFRH & SFLH ON / OFF	Operation of solenoid (clicking sound) can be heard
SRCF & SRCR	Turns ABS solenoid SRCF & SRCR ON / OFF	Operation of solenoid (clicking sound) can be heard
SRMF & SRMR	Turns ABS solenoid SRMF & SRMR ON / OFF	Operation of solenoid (clicking sound) can be heard
SOL RELAY	Turns ABS solenoid relay ON / OFF	Operation of solenoid (clicking sound) can be heard
ABS MOT RELAY	Turns ABS motor relay ON / OFF	Operation of motor can be heard
ABS WARN LIGHT	Turns ABS warning light ON / OFF	Observe combination meter
VSC WARN LIGHT	Turns VSC warning light ON / OFF	Observe combination meter
VSC / TRC OFF IND	Turns VSC / TRC OFF indicator ON / OFF	Observe combination meter
SLIP INDI LIGHT	Turns SLIP indicator light ON / OFF	Observe combination meter
BRAKE WRN LIGHT	Turns BRAKE warning light ON / OFF	Observe combination meter
VSC WARN BUZ	Turns VSC warning buzzer ON / OFF	Buzzer can be heard

4. FREEZE FRAME DATA

(a) The vehicle (sensor) status memorized during ABS and/or VSC operation or at the time of error code detection can be displayed using the hand-held tester.

(b) Only one record of freeze frame data is stored and the freeze frame data generated during ABS and/or VSC operation are constantly updated. Also, the number of the ignition switch's "ON" after the freeze frame data is stored can be memorized up to 31 and it can be displayed.

HINT:

If the ignition switch "ON" operation exceeds 31 times, "31" appears on the display.

(c) If the diagnosis code abnormality occurs, the freeze frame data at the occurrence of the abnormality is stored but the ABS actuation data is deleted.

Hand-held tester display	Measurement Item	Reference Value*
VEHICLE SPD	Vehicle speed	Speed indication of a meter
STOP LIGHT SW	Stop light switch signal	Stop light switch ON: ON, OFF: OFF
# IG ON	Numbers of operations of ignition switch ON after memorizing freeze frame data	0 - 31
MAS CYL PRESS	Master cylinder pressure sensor output voltage	Release brake pedal: 0.3 - 0.9 V Depress brake pedal: 3.2 - 4.5 V
MASS PRESS GRADE	Master cylinder pressure sensor changing gradient	-30 - 200 MPa/s
SYSTEM	Operate system	ABS operate: ABS BA operate: BA VSC (TRC) operate: VSC (TRC)
YAW RATE	Yaw rate angle sensor output value	-70 - 70
STEERING ANG	Steering sensor output value	Left turn: Increase Right turn: Drop
THROTTLE	Throttle position sensor output value	Release accelerator pedal: Approx. 0 deg Depress accelerator pedal: Approx. 90 deg
G (BACK & FORTH)	Back and forth G	-1.5 - 1.5
VSC (TRC) OFF SW	TRC OFF switch signal	TRC OFF SW ON: ON OFF: OFF
SHIFT POSITION	Shift lever position	P: P R: R N: N D: D 2: 2 L: L

*: If no conditions are specifically stated for "Idling", it means the shift lever is at N or P position, the A/C switch is OFF and all accessory switches are OFF.

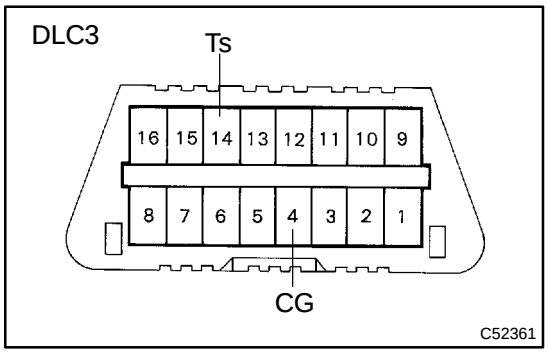
5. In case of not using hand-held tester:
ABS SENSOR SIGNAL CHECK (TEST MODE)

NOTICE:

When having replaced the steering angle sensor and/or ECU, perform zero point calibration of the steering angle sensor or system decision (When replacing the ECU) (See step 7).

HINT:

If the ignition switch is turned from ON to ACC or LOCK during test mode, DTC will be erased.



(a) Procedures for test mode:
(1) Turn the ignition switch to OFF.
(2) Using SST, it connects terminal Ts and CG of DLC3.
SST 09843-18040
(3) Check that the steering wheel is in the straight-ahead position and shift the shift lever to P range.
(4) Turn the ignition switch to ON.
(5) Check that the ABS warning light blinks.

HINT:

If the ABS warning light does not blink, inspect the ABS warning light circuit or Ts terminal circuit.

Trouble area	See Page
Ts terminal circuit	05-755
ABS warning light circuit	05-737

(b) Check the master cylinder pressure sensor.
(1) Leaving the vehicle in a stationary condition and the brake pedal in free condition for 1 sec. or more, continue to quickly depress the brake pedal with a force of 98 N (10 kgf, 22 lbf) or more for 1 sec. or more.

HINT:

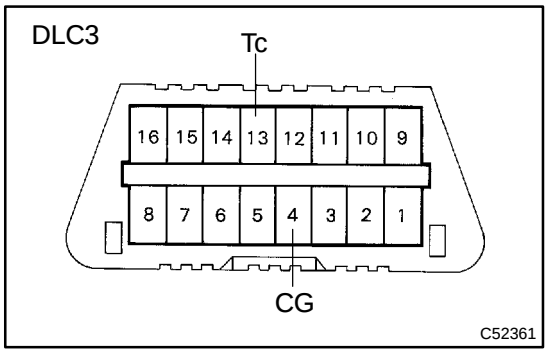
At this time, the ABS warning light goes on for 3 sec.

(c) Check the speed sensor signal.
(1) Drive the vehicle straight forward at the speed of 45 km/h (28 mph) or over for several seconds and check that the ABS warning light comes off.

HINT:

The sensor check may not be completed if the wheels spin or the steering wheels are steered during this check.

(d) Stop the vehicle.

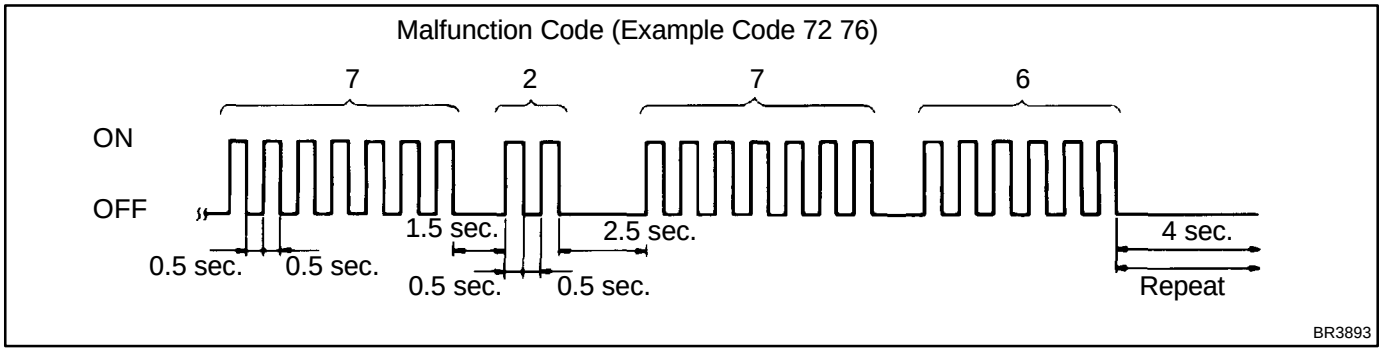


(e) Using SST, it connects terminal Tc and CG of DLC3.
SST 09843-18040
(f) Read the number of blinks of the ABS warning light.

HINT:

- See the list of DTC on page 05-676.
- If every sensors are normal, the normal code is output (A cycle of 0.25 sec. ON and 0.25 sec. OFF is repeated).

S If more than 1 malfunctions are detected at the same time, the lowest numbered code will be displayed first.



(g) After the check, disconnect the SST from terminal Ts and CG, Tc and CG of DLC3 and turn the ignition switch to OFF.
SST 09843-19040

6. In case of using hand-held tester:
ABS SENSOR SIGNAL CHECK (TEST MODE)

NOTICE:
When having replaced the steering angle sensor and/or ECU, perform zero point calibration of the steering angle sensor or system decision (When replacing the ECU) (See step 7).

HINT:
If the ignition switch is turned from ON to ACC or LOCK during test mode, DTC will be erased.

(a) Hook up the hand-held tester to the DLC3.
(b) Do step 5. - (a) - (3) and from (b) to (d) on the previous pages.
(c) Read the DTC by following the prompts on the tester screen.

HINT:
Please refer to the hand-held tester operator's manual for further details.

7. STEERING ANGLE SENSOR ZERO POINT CALIBRATION

NOTICE:
When replacing the steering angle sensor with column assembly or ECU, Engine and ECT ECU (A/T), Engine ECU (M/T) or when adjusting the front wheel alignment or steering wheel center point in accordance with the removing and installing or replacing the suspension, axle or steering parts, make sure to perform steering angle sensor zero point calibration.

(a) Using SST, connect terminals Ts and CG of DLC3.
SST 09843-18040
(b) Turn the ignition switch ON.
(c) Make sure the steering off center angle is less than ±3° when assembling of steering wheels (Smaller value is desirable).
(d) Press the TRC OFF switch and hold it.
(e) Check that the following conditions are satisfied.

HINT:
S Check engine warning light turns on.
S ABS warning light is blinking.

(f) Depress the brake pedal 3 times or more within 2 seconds.

(g) Check that the skid control buzzer sounds for 3 seconds.

HINT:

- Press and hold the TRC OFF switch until skid control buzzer sounds. When it starts sounding, turn off the switch.
- When the skid control buzzer starts sounding, turn off the TRC OFF switch.
- If the skid control buzzer sounds, the sensor calibration is in normal completion.
- If the skid control buzzer does not sound, do the sensor calibration again.
- If the skid control buzzer still will not sound, there is malfunction in the steering angle sensor, so check the DTC.

0542Q-03

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

- **When removing the part, turn the ignition switch OFF.**
- **When replacing the steering angle sensor or ECU, make sure to perform steering angle sensor zero point calibration.**

HINT:

- Using SST 09843-18040, it connect the terminal Tc and CG of DLC3.
- If any abnormality is not found when inspecting parts, inspect the ECU and ground points for poor contact.
- If a malfunction code is displayed during the DTC check, check the circuit listed that code. For details of each code, turn to the page referred to under the "See page" for respective "DTC No." in the DTC chart.
- When 2 or more DTC's are recorded, and the problem is not identified, perform circuit inspection of the other DTC's.

DTC chart of ABS system:

DTC No. (See Page)	Detection Item	Trouble Area
C0200 / 31 (05-684)	Right front wheel speed sensor signal malfunction	• Right front speed sensor • Right front speed sensor circuit • Right front speed sensor rotor
C0205 / 32 (05-684)	Left front wheel speed sensor signal malfunction	• Left front speed sensor • Left front speed sensor circuit • Left front speed sensor rotor
C0210 / 33 (05-688)	Right rear wheel speed sensor signal malfunction	• Right rear speed sensor • Right rear speed sensor circuit • Right rear speed sensor rotor
C0215 / 34 (05-688)	Left rear wheel speed sensor signal malfunction	• Left rear speed sensor • Left rear speed sensor circuit • Left rear speed sensor rotor
C0226 / 21 (05-692)	Open or short circuit in brake actuator	• Brake actuator • SFRR or SFRH circuit
C0236 / 22 (05-692)	Open or short circuit in brake actuator	• Brake actuator • SFLR or SFLH circuit
C0246 / 23 (05-692)	Open or short circuit in brake actuator	• Brake actuator • SRRR or SRRH circuit
C0256 / 24 (05-692)	Open or short circuit in brake actuator	• Brake actuator • SRLR or SRLH circuit
C0273 / 13 (05-694)	Open or short circuit in ABS motor relay circuit	• ABS motor relay • ABS motor relay circuit
C0278 / 11 (05-697)	Open or short circuit in ABS solenoid relay circuit	• ABS solenoid relay • ABS solenoid relay circuit
C1237 / 37 (05-711)	Front tires are different from rear in size.	• Tire size • Speed sensor rotor
C1241 / 41 (05-712)	Low battery positive voltage or abnormally high battery positive voltage	• Battery • Charging system • Power source circuit
C1249 / 58 (05-718)	Open circuit in stop light switch circuit	• Stop lamp switch • Stop lamp switch circuit
C1300 / 62 (05-722)	Malfunction in skid control ECU	• Battery • Skid control ECU

C1330 / 35 (05-684)	Open circuit in right front speed sensor circuit	S Right front speed sensor S Right front speed sensor circuit
C1331 / 36 (05-684)	Open circuit in left front speed sensor circuit	S Left front speed sensor S Left front speed sensor circuit
C1332 / 38 (05-688)	Open circuit in right rear speed sensor circuit	S Right rear speed sensor S Right rear speed sensor circuit
C1333 / 39 (05-688)	Open circuit in left rear speed sensor circuit	S Left rear speed sensor S Left rear speed sensor circuit
Always ON (05-729)	Malfunction in skid control ECU Open circuit in ABS warning light circuit	S Battery S Charging system S Power source circuit S Skid control ECU

DTC chart of VSC system:

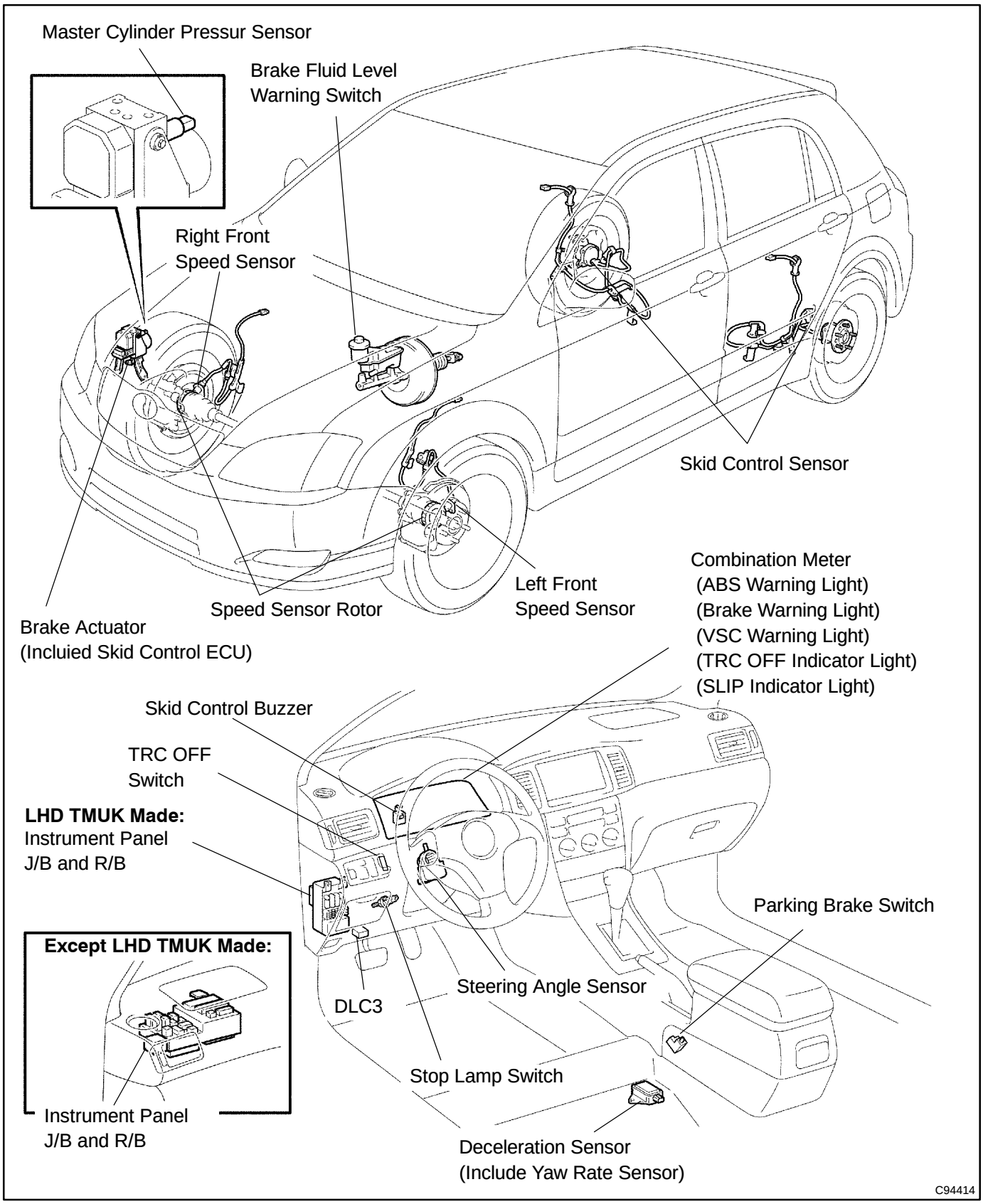
DTC No. (See Page)	Detection Item	Trouble Area
C0365 / 43 (05-699)	Malfunction in deceleration sensor (combined in yaw rate sensor)	S Deceleration sensor S Deceleration sensor circuit
C0371 / 55 (05-701)	Open or short circuit in yaw rate sensor circuit	S Yaw rate sensor S Yaw rate sensor circuit
C1202 / 44 (05-703)	Open or short circuit in NE signal circuit	S NEO circuit S ECM S Skid control ECU
C1203 / 59 (05-705)	ECM communication circuit malfunction	S TRC+ or TRC- circuit S ENG+ or ENG- circuit S ECM
C1208 / 54 (05-707)	Malfunction in steering angle sensor	S Steering angle sensor S Steering angle sensor circuit
C1225 / 25 (05-709)	Open or short circuit in brake actuator solenoid circuit (SMC1 circuit)	S Brake actuator S SMC1 circuit
C1226 / 26 (05-709)	Open or short circuit in brake actuator solenoid circuit (SMC2 circuit)	S Brake actuator S SMC2 circuit
C1227 / 27 (05-709)	Open or short circuit in brake actuator solenoid circuit (SRC1 circuit)	S Brake actuator S SRC1 circuit
C1228 / 28 (05-709)	Open or short circuit in brake actuator solenoid circuit (SRC2 circuit)	S Brake actuator S SRC2 circuit
C1246 / 53 (05-715)	Malfunction in master cylinder pressure sensor	S Master cylinder pressure sensor S Master cylinder pressure sensor circuit
C1288 / 88 (05-721)	Malfunction in ECM version	S Steering angle sensor zero point calibration
C1301 / 42 (05-724)	Malfunction in CAN communication circuit (steering angle sensor circuit, yaw rate sensor circuit)	S Steering angle sensor circuit S Yaw rate sensor circuit
C1350 / 51 (05-727)	Pump motor is locked Open circuit in pump motor ground	S Brake actuator pump motor
Always ON (05-733)	Malfunction in skid control ECU Open circuit in VSC warning light circuit	S Battery S Charging system S Power source circuit S Skid control ECU

DTC of sensor check function :

Code No.	Diagnosis	Trouble Area
C1271/71	Low output voltage of right front speed sensor	$ Right front speed sensor $ Sensor installation $ Sensor rotor
C1272/72	Low output voltage of left front speed sensor	$ Left front speed sensor $ Sensor installation $ Sensor rotor
C1273/73	Low output voltage of right rear speed sensor	$ Right rear speed sensor $ Sensor installation $ Sensor rotor
C1274/74	Low output voltage of left rear speed sensor	$ Left rear speed sensor $ Sensor installation $ Sensor rotor
C1275/75	Abnormal change in output voltage of right front speed sensor	Right front sensor rotor
C1276/76	Abnormal change in output voltage of left front speed sensor	Left front speed sensor rotor
C1277/77	Abnormal change in output voltage of right rear speed sensor	Right rear sensor rotor
C1278/78	Abnormal change in output voltage of left rear speed sensor	Left rear speed sensor rotor

056T1-02

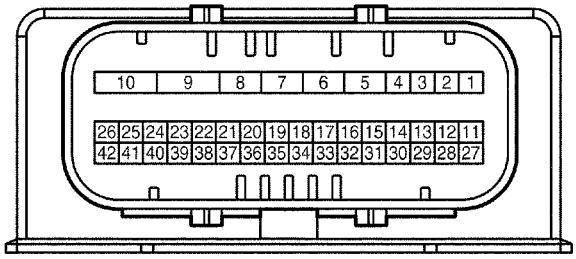
LOCATION



C94414

0542S-03

TERMINALS OF ECU



P C94401

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
WT (2) - GND (6, 10)	R-Y ⇔ W-B	IG Switch ON, TRAC OFF Light ON	Below 2.0
		IG Switch ON, TRAC OFF Light OFF	10 - 14
IND (4) - GND (6, 10)	R-G ⇔ W-B	IG Switch ON, SLIP indicator light ON	Below 2.0
		IG Switch ON, SLIP indicator light OFF	10 - 14
+BS (5) - GND (6, 10)	L ⇔ W-B	Always	10 - 14
ENG+ (8) - ENG- (7)	R ⇔ G	IG switch ON	Pulse generation
+BM (9) - GND (6, 10)	L ⇔ W-B	Always	10 - 14
PMC (11) - E2 (12)	W ⇔ R	IG switch ON, stop light switch OFF	0.3 - 0.7
SS1 (13) - SS2 (29)	L ⇔ P	Engine idling, slowly tun steering wheel	Pulse generation
IG1 (14) - GND (6, 10)	B-Y ⇔ W-B	IG switch ON	10 - 14
BZ (15) - GND (6, 10)	L-O ⇔ W-B	IG switch ON, VSC buzzer is sounded	Below 1.0 ↔ 10 - 14
		IG switch ON, VSC buzzer is not sounded	10 - 14
Tc (17) - GND (6, 10)	P-B ⇔ W-B	IG Switch ON	10 - 14
TRC+ (18) - TRC- (19)	B ⇔ W	IG switch ON	Pulse generation
EBDW (20) - GND (6, 10)	R-W ⇔ W-B	IG Switch ON, Brake warning light ON	Below 2.0
		IG Switch ON, Brake warning light OFF	10 - 14
FR+ (21) - FR- (22)	B ⇔ W	IG switch ON, slowly turn right front wheel	AC generation
RL+ (23) - RL- (40)	B ⇔ Y	IG switch ON, slowly turn left rear wheel	AC generation
D/G (26) - GND (6, 10)	L-R ⇔ W-B	IG switch ON	10 - 14
VCM (27) - GND (6, 10)	B ⇔ W-B	IG switch ON	4.5 - 5.5
Ts (28) - GND (6, 10)	GR-G ⇔ W-B	IG switch ON	10 - 14
YIGA (30) - YGND (16)	G ⇔ R	IG Switch ON	10 - 14
PKB (31) - GND (6, 10)	R-Y ⇔ W-B	IG switch ON, parking brake switch ON	Below 1.5
		IG switch ON, parking brake switch OFF	10 - 14
NEO (32) - GND (6, 10)	G-W ⇔ W-B	Engine idling	Pulse generation
VSCM (34) - GND (6, 10)	L-B ⇔ W-B	IG Switch ON, VSC warning light ON	Below 2.0
		IG Switch ON, VSC warning light OFF	10 - 14
SP1 (35) - GND (6, 10)	V-W ⇔ W-B	Vehicle drives at about 20 km/h (12 mph)	Pulse generation
WA (36) - GND (6, 10)	W-R ⇔ W-B	IG Switch ON, ABS warning light ON	Below 2.0
		IG Switch ON, ABS warning light OFF	10 - 14
STP (37) - GND (6, 10)	G-W ⇔ W-B	Stop light switch OFF	Below 1.5
		Stop light switch ON	8 - 14
RR+ (38) - RR- (39)	R ⇔ W	IG switch ON, slowly turn right rear wheel	AC generation
FL+ (41) - FL- (24)	R ⇔ G	IG switch ON, slowly turn left front wheel	AC generation

CSW (42) - GND (6, 10)	L ⇔ W-B	IG switch ON, TRC OFF switch pushed in	Below 1.5
		IG switch ON, TRC OFF switch released	8 - 14

0542T-03

PROBLEM SYMPTOMS TABLE

If a normal code is displayed during the DTC check but the problem still occurs, check the circuits for each problem symptom in the order given in the table below and proceed to the relevant troubleshooting page.

NOTICE:

When replacing skid control ECU, sensor or etc., turn the ignition switch to OFF.

Symptom	Suspect Area	See page
ABS does not operate BA does not operate EBD does not operate	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. IG power source circuit 3. Speed sensor circuit 4. Check the brake master cylinder with a ABS actuator checker or hand-held tester. If abnormal, check the hydraulic circuit for leakage.	 05-666 05-712 05-684 05-688 32-84
ABS does not operate efficiently BA does not operate efficiently EBD does not operate efficiently	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. Speed sensor circuit 3. Stop light switch circuit 4. Check the brake master cylinder with a ABS actuator checker or hand-held tester. If abnormal, check the hydraulic circuit for leakage.	 05-666 05-684 05-688 05-718 32-84
ABS warning light abnormal	1. ABS warning light circuit 2. Skid control ECU	05-737 05-729
DTC of ABS check cannot be done	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. Tc terminal circuit	 05-666 05-753
Sensor signal check cannot be done	1. Ts terminal circuit 2. Skid control ECU	05-755 05-729
TRC does not operate	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. IG power source circuit 3. Check the hydraulic circuit for leakage. 4. Speed sensor circuit	 05-666 05-712 - 05-684 05-688

Symptom	Suspect Area	See page
VSC does not operate	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. IG power source circuit 3. Check the hydraulic circuit for leakage. 4. Speed sensor circuit 5. Yaw rate sensor and deceleration sensor circuit 6. Steering angle sensor circuit	 05-666 05-712 - 05-684 05-688 05-701 05-699 05-707
SLIP indicator light abnormal	1. SLIP indicator light circuit 2. Skid control ECU	05-749 -
TRC OFF indicator abnormal	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. TRC OFF switch circuit	 05-666 05-746
DTC of VSC check cannot be done	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. Tc terminal circuit	 05-666 05-753
VSC warning light abnormal	If the symptoms still occur even after the following circuits in suspect areas are inspected and proved to be normal, replace the skid control ECU. 1. Check the DTC again and make sure that the normal code is output. 2. VSC warning circuit	 05-666 05-740

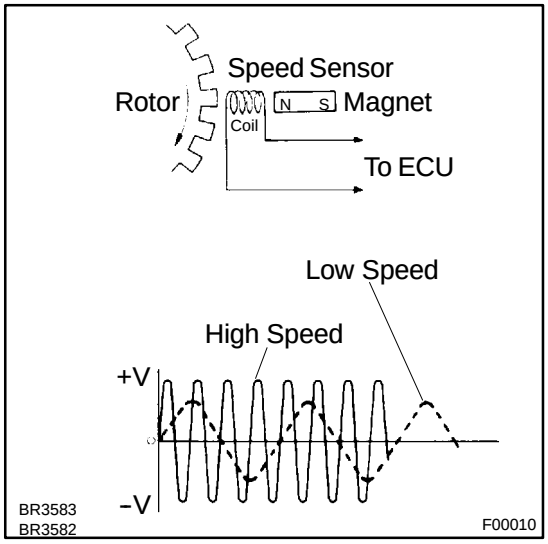
DTC	C0200/31	RIGHT FRONT SPEED SENSOR

DTC	C0205/32	LEFT FRONT SPEED SENSOR

DTC	C1330/35	RIGHT FRONT SPEED SENSOR CIRCUIT

DTC	C1331/36	LEFT FRONT SPEED SENSOR CIRCUIT

CIRCUIT DESCRIPTION

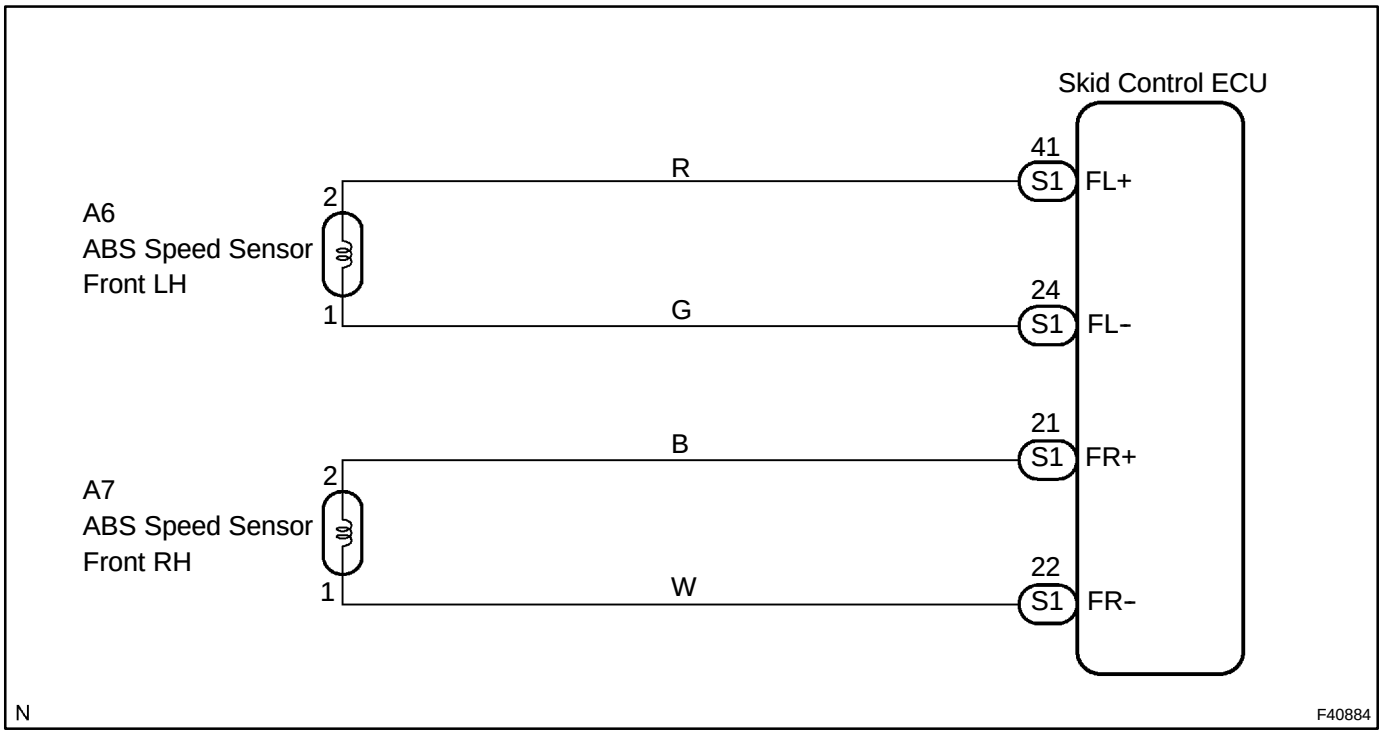


The speed sensor detects wheel speed and transmits the appropriate signals to the ECU. These signals are used for control of the ABS and VSC control systems. Each of the front and rear rotors has 48 serrations.
When the rotors rotate, the magnetic field generated by the permanent magnet in the speed sensor induces an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200/31 C0205/32	When any of the following 1. to 3. is detected : 1. Vehicle speed is more than 40 km/h (25 mph), pulses are not input for 0.01 sec. 2. After the initial start or restart and when the vehicle speed has reached 12 km/h (7 mph), the wheel speed of 0 km/h (0 mph) is detected. 3. After the initial start or restart and when the vehicle speed has reached 18 km/h (11 mph), the front wheel speed of 0 km/h (0 mph) is detected.	S Right front and left front speed sensor S Speed sensor rotor
C1330/35 C1331/36	Detecting abnormality in the resistance value of each speed sensor.	S Right front and left front speed sensor S Speed sensor circuit

HINT:
DTC No. C0200/31 and C1330/35 is the right front speed sensor.
DTC No. C0205/32 and C1331/36 is the left front speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF HAND-HELD TESTER(FRONT SPEED SENSOR)

(a) Select the item "WHEEL SPEED FL (FR)" in the DATA LIST and read its value displayed on the hand-held tester.

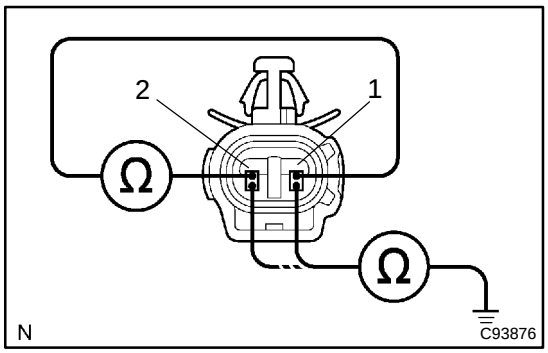
(b) Check that there is no difference between the speed value output from the speed sensor displayed on the hand-held tester and the speed value displayed on the speedometer when driving the vehicle.
OK:
There is almost no difference in the displayed speed value.

HINT:
There is tolerance of ±10 % in the speedometer indication.

OK → **Go to step 5**

NG

2 INSPECT FRONT SPEED SENSOR



(a) Remove the fender liner.
(b) Disconnect the speed sensor connector.
(c) Measure resistance between terminals 1 and 2 of the speed sensor connector.
OK:
Resistance: 1.4 - 1.8 kΩ at 20_C (68_F)
(d) Measure resistance between each of terminals 1 and 2 of speed sensor connector and body ground.
OK:
Resistance: 1 MΩ or higher

NG → **REPLACE SPEED SENSOR FRONT RH**

NG → **REPLACE SPEED SENSOR FRONT LH**

NOTICE:
Check the speed sensor signal last (See page 05-666).

OK

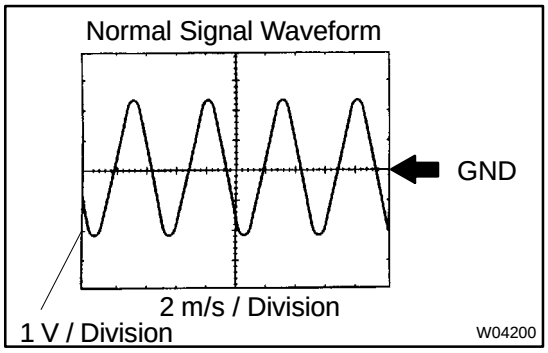
3 CHECK HARNESS AND CONNECTOR(FRONT SPEED SENSOR-SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each front speed sensor and skid control ECU connector (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



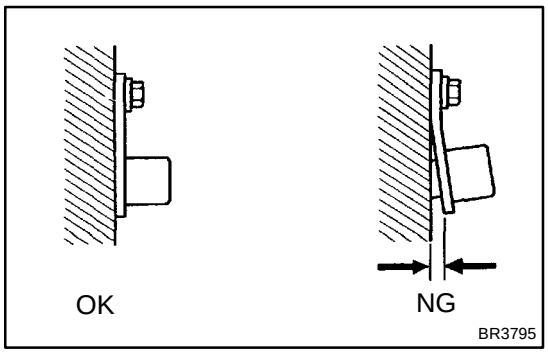
(REFERENCE) INSPECTION USING OSCILLOSCOPE
(a) Connect the oscilloscope to the terminals FR+ - FR- and FL+ - FL- of the skid control ECU.
(b) Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

HINT:
- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter deposited on it.

OK → **CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)**

NG

5	INSPECT FRONT SPEED SENSOR INSTALLATION



(a) Check the speed sensor installation.
OK:
The installation bolt is tightened properly and there is no clearance between the sensor and front steering knuckle.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

NG → **REPLACE SPEED SENSOR FRONT RH**

NG → **REPLACE SPEED SENSOR FRONT LH**

NOTICE:
Check the speed sensor signal last (See page 05-666).

OK

6	INSPECT SPEED SENSOR TIP

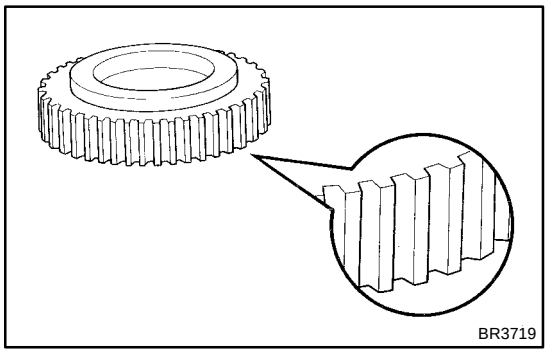
(a) Remove the front speed sensor (See page 32-91).
(b) Check the sensor tip.
OK:
No scratches or foreign objects on the sensor tip.

NG → **CLEAN OR REPAIR SPEED SENSOR**

NOTICE:
Check the speed sensor signal last (See page 05-666).

OK

7	INSPECT SPEED SENSOR ROTOR



(a) Remove the front speed sensor rotor (See page 30-6 or 30-18).
(b) Check the sensor rotor serrations.
OK:
No scratches, missing teeth or foreign objects.
HINT:
If foreign matter is attached, remove it and after reassembling, check the output waveform.

NG → **CLEAN OR REPAIR SPEED SENSOR ROTOR**

NOTICE:
Check the speed sensor signal last (See page 05-666).

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

DTC	C0210/33	RIGHT REAR SPEED SENSOR

DTC	C0215/34	LEFT REAR SPEED SENSOR

DTC	C1332/38	RIGHT REAR SPEED SENSOR CIRCUIT

DTC	C1333/39	LEFT REAR SPEED SENSOR CIRCUIT

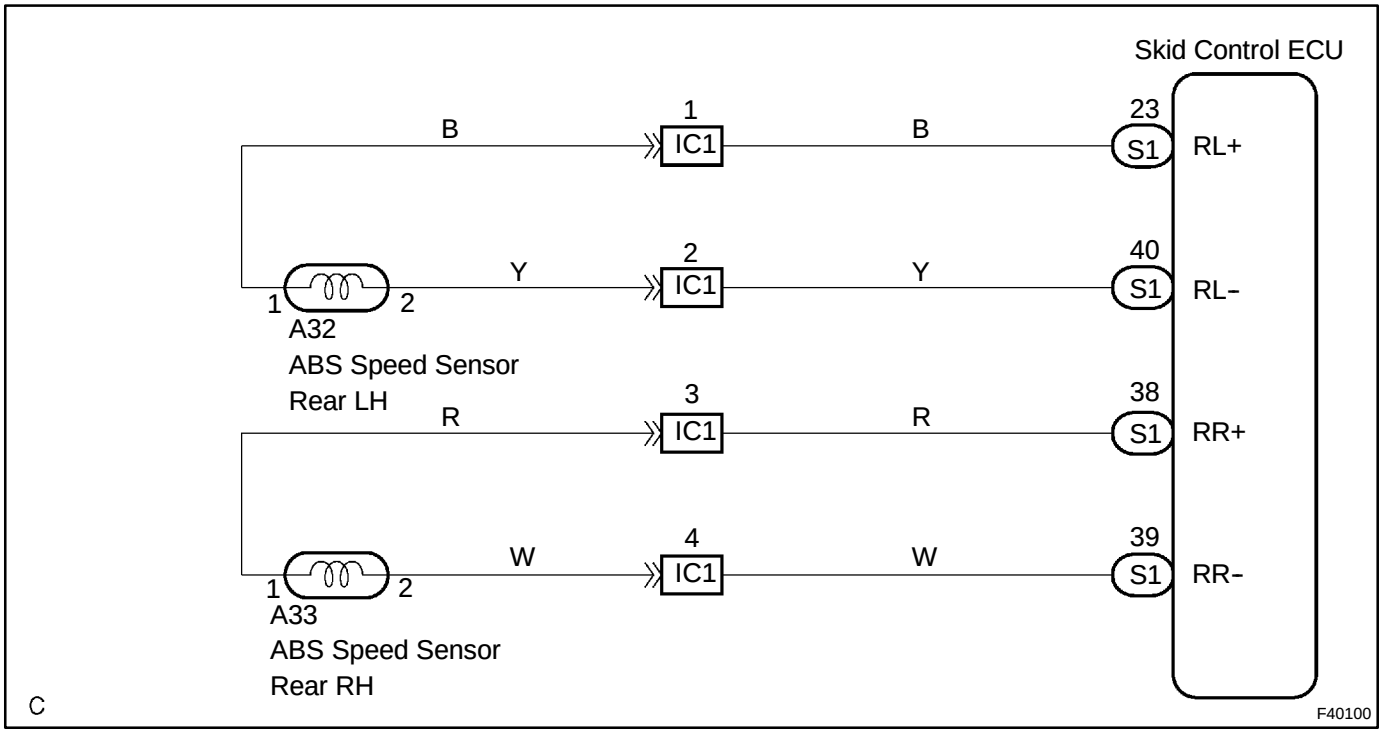
CIRCUIT DESCRIPTION

Refer to DTC C0200/31, C0205/32, C1330/35, C1331/36 on page 05-684.

DTC No.	DTC Detecting Condition	Trouble Area
C0210/33 C0215/34	When any of the following 1. to 3. is detected : 1. Vehicle speed is more than 40 km/h (25 mph), pulses are not input for 0.01 sec. 2. After the initial start or restart and when the vehicle speed has reached 12 km/h (7 mph), the wheel speed of 0 km/h (0 mph) is detected. 3. After the initial start or restart and when the vehicle speed has reached 18 km/h (11 mph), the front wheel speed of 0 km/h (0 mph) is detected.	S Right rear and left rear speed sensor S Speed sensor rotor
C1332/38 C1333/39	Detecting abnormality in the resistance value of each speed sensor.	S Right rear and left rear speed sensor S Speed sensor circuit

HINT:
DTC No. C0210/33, C1332/38 is the right rear speed sensor.
DTC No. C0215/34, C1333/39 is the left rear speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF HAND-HELD TESTER(SKID CONTROL SENSOR)

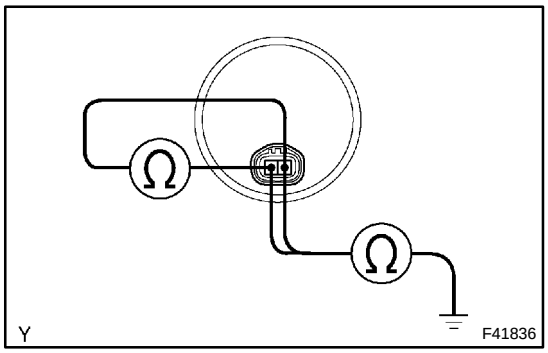
(a) Select the item "WHEEL SPEED RL (RR)" in the DATA LIST and read its value displayed on the hand-held tester.
(b) Check that there is no difference between the speed value output from the speed sensor displayed on the hand-held tester and the speed value displayed on the speedometer when driving the vehicle.
OK:
There is almost no difference in the displayed speed value.

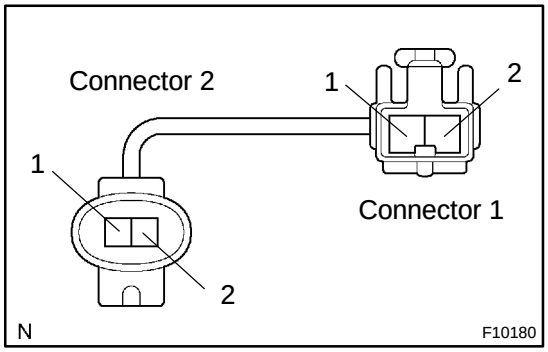
HINT:
There is tolerance of ± 10 % in the speedometer indication.

OK	Go to step 5

NG

2	INSPECT SKID CONTROL SENSOR





(a) Disconnect the skid control sensor connector.
(b) Measure resistance between terminals 1 and 2 of the speed sensor connector.
OK:
Resistance: 2.2 kΩ or less
(c) Measure resistance between each of terminals 1 and 2 of skid control sensor connector and body ground.
OK:
Resistance: 1 MΩ or higher

Skid control Sensor Sub-Wire Harness:
(a) Remove the seat cushion and seatback.
(b) Make sure that there is no looseness at the connector lock part and connecting part of the connector.
(c) Measure resistance between terminal 1 of connector 1 and terminal 2 of connector 2.
(d) Measure resistance between terminal 2 of connector 1 and terminal 1 of connector 2.
OK: 1 Ω or lower
(e) Measure resistance between terminals 1 and 2 of speed sensor connector 1 and body ground.
OK: 10 MΩ or higher

NG	REPLACE SKID CONTROL SENSOR

NOTICE:
Check the speed sensor signal last **(See page 05-666).**

OK

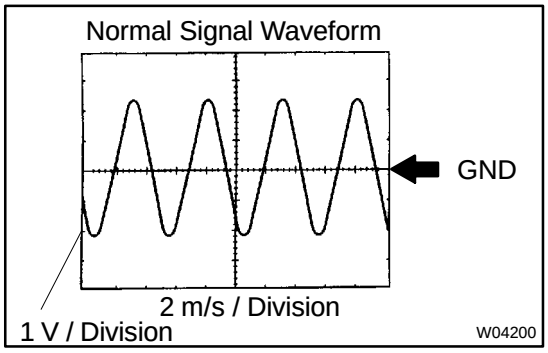
3	CHECK HARNESS AND CONNECTOR(SKID CONTROL SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each skid control sensor and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



(REFERENCE) INSPECTION USING OSCILLOSCOPE

(a) Connect the oscilloscope to the terminals RR+ - RR- and RL+ - RL- of the skid control ECU.

(b) Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

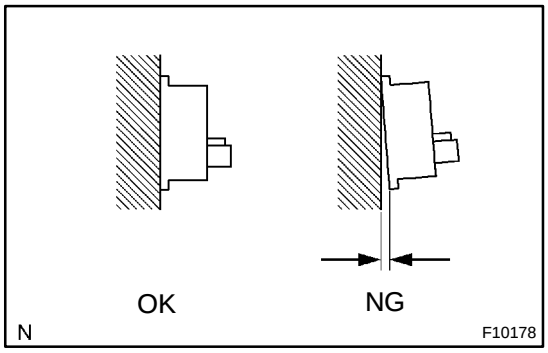
HINT:

- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter deposited on it.

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

NG

5	INSPECT SKID CONTROL SENSOR INSTALLATION



(a) Check the sensor installation.

OK:

There is no clearance between the sensor and rear axle carrier.

NG → REPLACE SKID CONTROL SENSOR

NOTICE:

Check the speed sensor signal last **(See page 05-666).**

OK

6	INSPECT SKID CONTROL SENSOR TIP

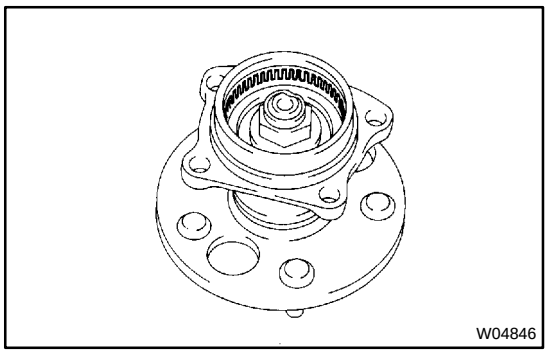
(a) Remove the skid control sensor (See page 32-94).
(b) Check the sensor tip.
OK:
No scratches or foreign objects on the senaor tip.

NG → **CLEAN OR REPAIR SKID CONTORL SENSOR**

NOTICE:
Check the speed sensor signal last (See page 05-666).

OK

7	INSPECT SENSOR ROTOR



(a) Check the sensor rotor serrations.
OK:
No scratches, missing teeth or foreign objects.

NG → **REPLACE REAR AXLE HUB & BEARING ASSY LH**

NG → **REPLACE REAR AXLE HUB & BEARING ASSY RH**

NOTICE:
Check the speed sensor signal last (See page 05-666).

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NOTICE:
Do not reuse skid control sensor.

DTC	C0226/21	SFR SOLENOID CIRCUIT

DTC	C0236/22	SFL SOLENOID CIRCUIT

DTC	C0246/23	SRR SOLENOID CIRCUIT

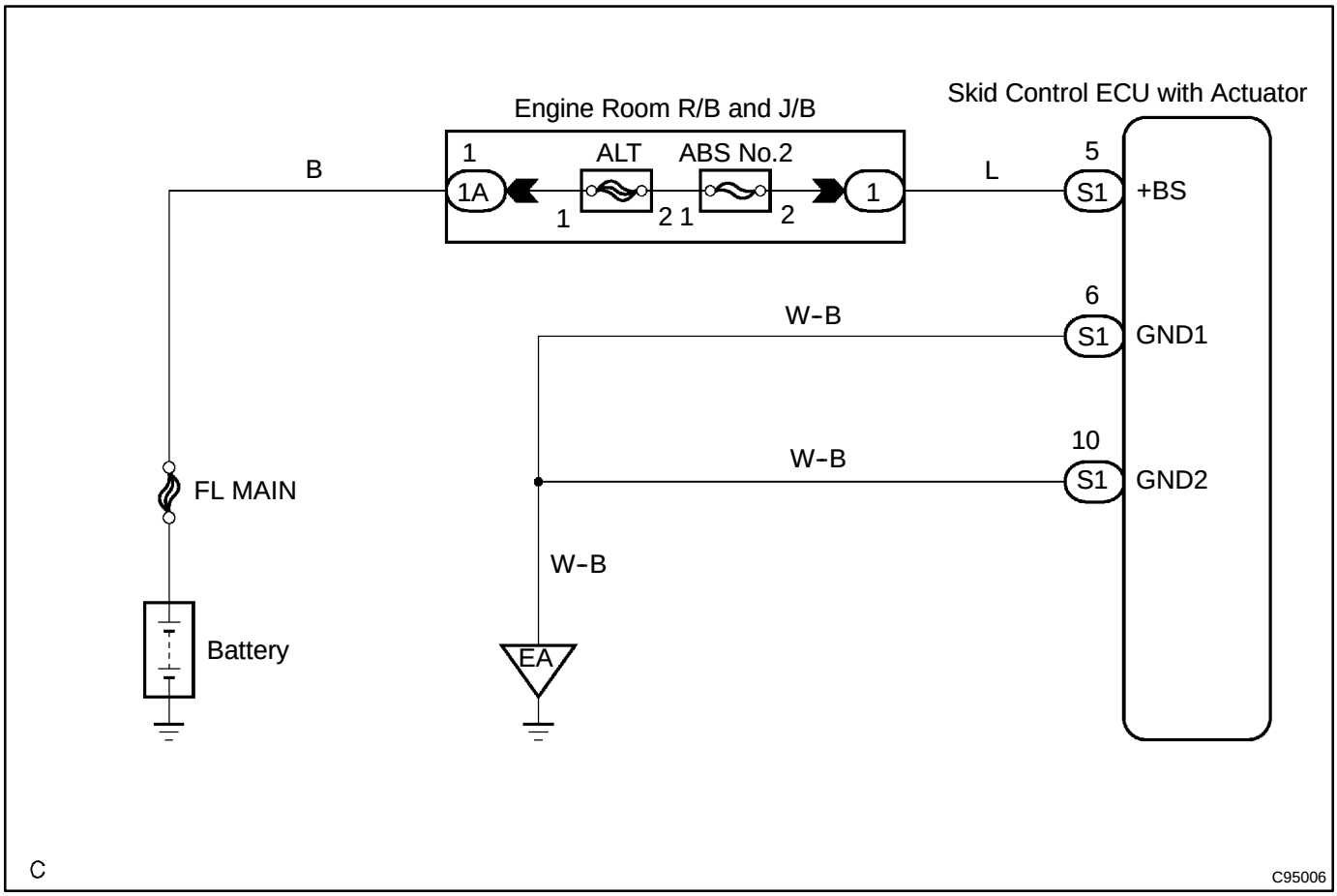
DTC	C0256/24	SRL SOLENOID CIRCUIT

CIRCUIT DESCRIPTION

The solenoid goes on when signals are received from the ECU and controls the pressure action on the wheel cylinders thus controlling the braking force.

DTC No.	DTC Detecting Condition	Trouble Area
C0226/21 C0236/22 C0246/23 C0256/24	Solenoid valve signal does not match to the check result.	S Each solenoid valve

WIRING DIAGRAM



INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check if the other DTCs are recorded (See page 05-666).

YES	REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

REPLACE BRAKE ACTUATOR ASSY

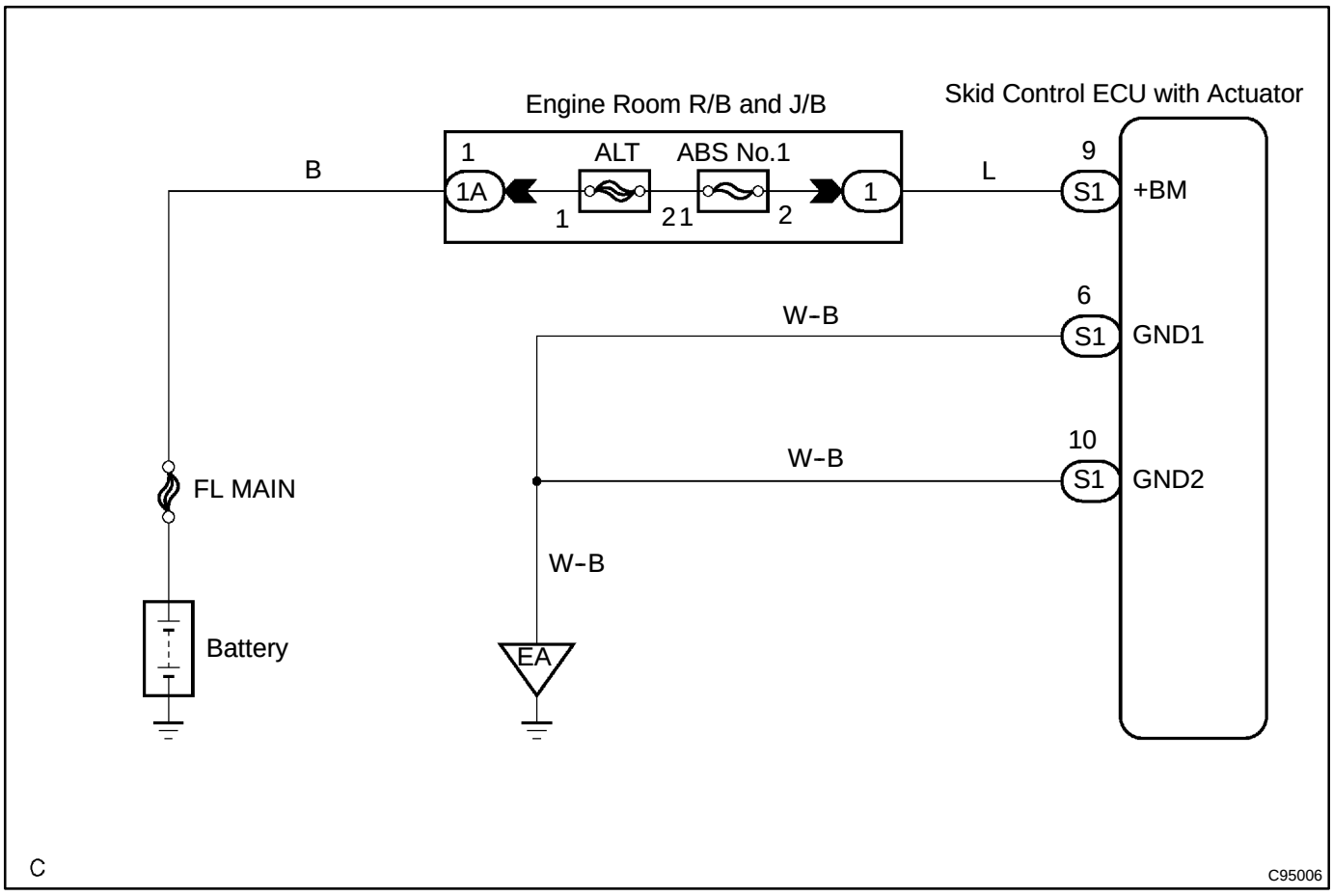
DTC	C0273/13	OPEN OR SHORT CIRCUIT IN ABS MOTOR RELAY CIRCUIT

CIRCUIT DESCRIPTION

The ABS motor relay supplies power to the ABS pump motor. While the ABS & BA & TRC & VSC are activated, the ECU switches the motor relay ON and operates the ABS pump motor.

DTC No.	DTC Detecting Condition	Trouble Area
C0273/13	Detection of any conditions from 1 to 3: 1. After actuation of the motor relay, pump motor voltage will not be supplied within 0.4 sec. 2. When pump motor voltage is at high level, motor relay will not actuate for 2.5 sec. or more. 3. Pump motor voltage keeps low level for longer than 0.4 sec. and the pump repeats activating for 7 sec. 3 times maximum. Since the last activation, the pump motor has gone dead because of short circuit.	S ABS motor relay S ABS motor relay circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

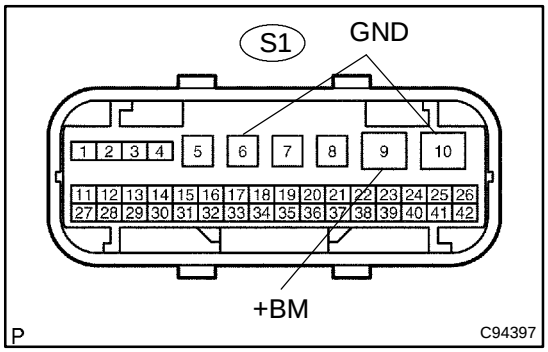
1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(ABS MOTOR RELAY)

(a) Check the operation sound of the ABS motor individually when operaing it with the hand-held tester.
OK:
The operation sound of the ABS motor should be heard.

OK → **IF THE SAME CODE IS STILL OUTPUT AFTER THE DTC IS DELETED, CHECK THE CONTACT THE CONDITION OF EACH CONNECTION.**

NG

2	INSPECT SKID CONTROL ECU CONNECTOR(+BM TERMINAL VOLTAGE)

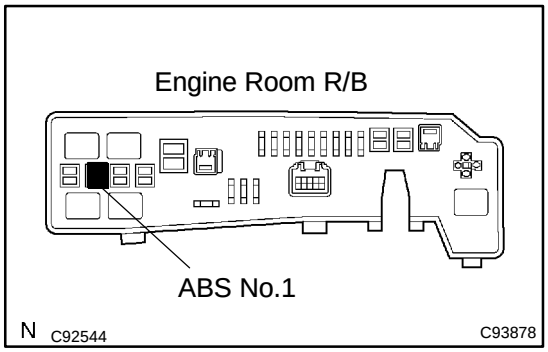


(a) Disconnect the skid control ECU connector.
(b) Measure the voltage between terminals +BM (S1-9) and GND (S1-6, 10) of skid control ECU harness side connector.
Voltage: 10 - 14 V

OK → **IF THE SAME CODE IS STILL OUTPUT AFTER THE DTC IS DELETED, CHECK THE CONTACT THE CONDITION OF EACH CONNECTION.**

NG

3	INSPECT FUSE(ABS No.1 FUSE)

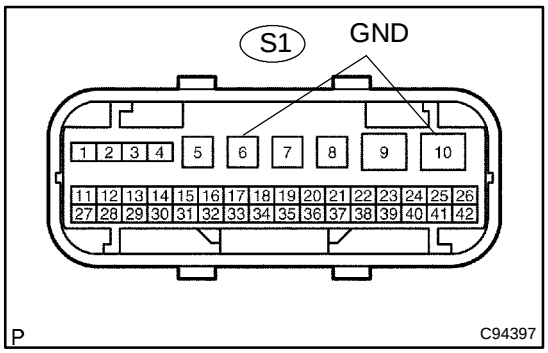


(a) Remove ABS No.1 fuse from the engine room R/B.
(b) Check continuity of ABS No.1 fuse.
OK:
Continuity

NG → **REPLACE INSPECT FOR SHORT CIRCUIT IN ALL HARNESSES AND COMPONENTS CONNECTED TO ABS NO.1 FUSE**

OK

4	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-6, 10) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR(+BM CIRCUIT) **(See page 01-30)**

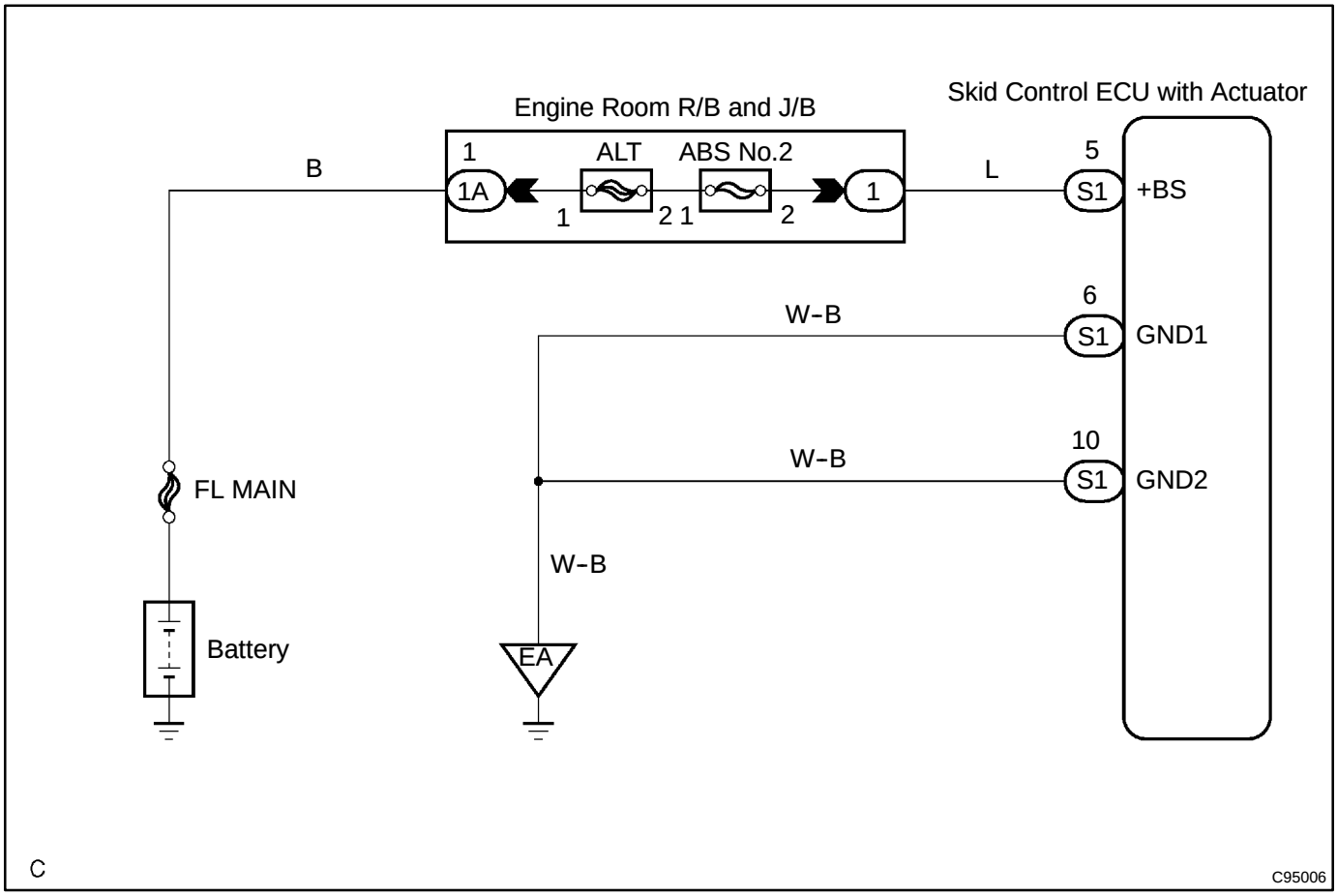
DTC	C0278/11	OPEN OR SHORT CIRCUT IN ABS SOLENOID RELAY

CIRCUIT DESCRIPTION

This relay supplies power to each ABS solenoid. After the ignition switch is turned ON, if the initial check is OK, the relay goes on.

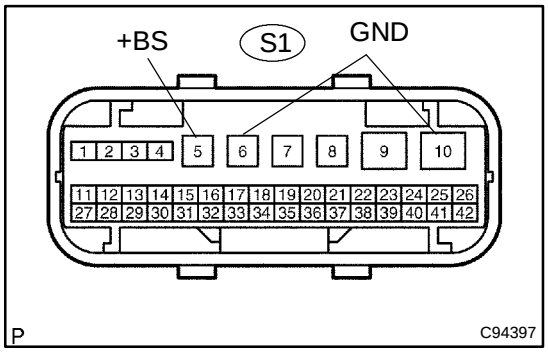
DTC No.	DTC Detecting Condition	Trouble Area
C0278/11	Detection of any conditions from 1 to 3: 1. 3 or more solenoid valves are shown faulty in response and simultaneously valve supply voltage is detected faulty. 2. Solenoid valve relay is not switched OFF. 3. Valve relay is frozen in spite of its high valve relay supply voltage.	$ ABS solenoid relay $ ABS solenoid relay circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT SKID CONTROL ECU CONNECTOR(+BS TERMINAL VOLTAGE)

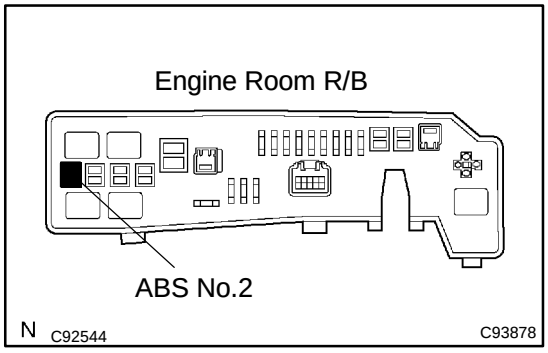


(a) Disconnect the skid control ECU connector.
(b) Measure the voltage between terminals +BS (S1-5) and GND (S1-6, 10) of skid control ECU harness side connector.
Voltage: 10 - 14 V

OK → **IF THE SAME CODE IS STILL OUTPUT AFTER THE DTC IS DELETED, CHECK THE CONTACT THE CONDITION OF EACH CONNECTION.**

NG

2 INSPECT FUSE(ABS No.2 FUSE)

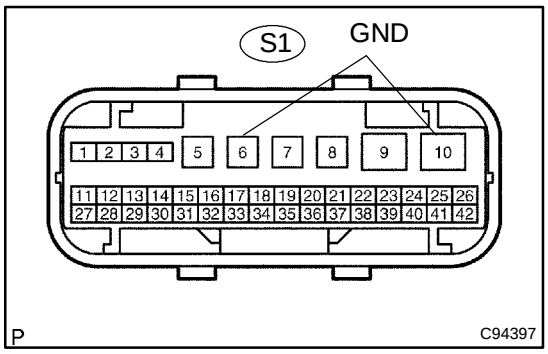


(a) Remove ABS No.2 fuse from the engine room R/B.
(b) Check continuity of ABS No.2 fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESSES AND COMPONENTS CONNECTED TO ABS NO.2 FUSE**

OK

3 INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Measure resistance between terminal GND (S1-6, 10) of skid control ECU harness side connector and body ground.
Resistance: 1 Ω or less

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE HARNESS AND CONNECTOR(+BS CIRCUIT) **(See page 01-30)**

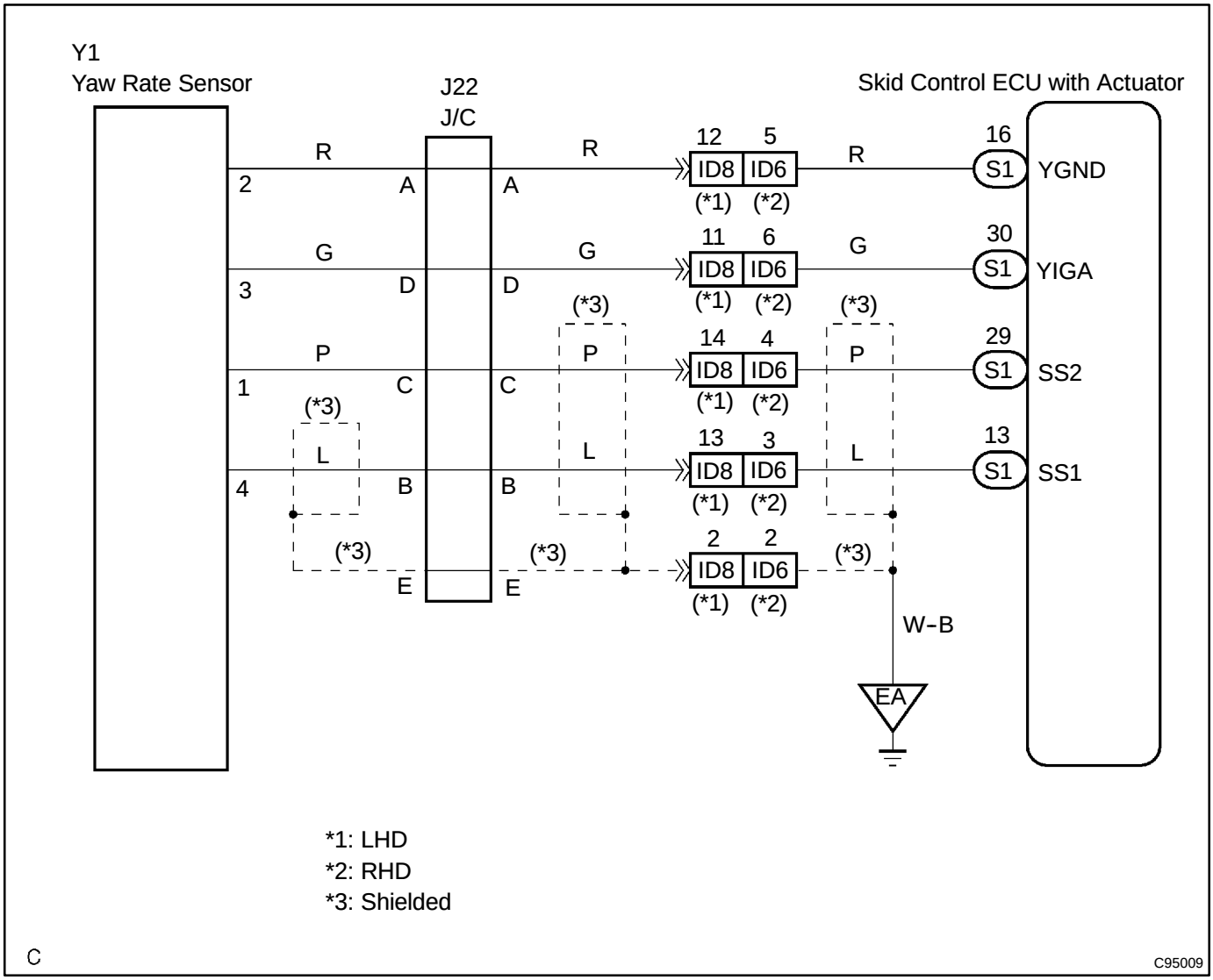
DTC C0365/43 MALFUNCTION IN DECELERATION SENSOR

CIRCUIT DESCRIPTION

Deceleration sensor is combined with yaw rate sensor.

DTC No.	DTC Detecting Condition	Trouble Area
C0365/43	Detection of any of conditions from 1. through 2.: 1. Deceleration difference between sensor signal and reference value is large. 2. Offset value of sensor signal is higher than the standard value.	S Deceleration sensor S Deceleration sensor circuit

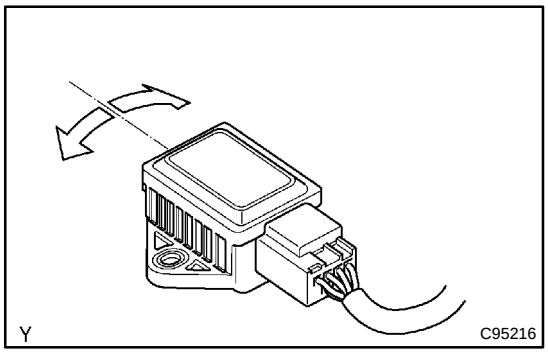
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF YAWRATE SENSOR(INCLUDE DECELERATION SENSOR)



(a) Remove the 2 bolts and deceleration sensor with connector still connected.
(b) Connect the hand-held tester to the DLC3
(c) Turn the ignition switch ON and push the hand-held tester main switch ON.
(d) Select the DATALIST mode on the hand-held tester.
(e) Check the deceleration value 0 ± 0.23 G.
(f) Check that the yaw rate value of the deceleration sensor displayed on the hand-held tester is changing: Place the yaw rate sensor vertically to the ground and turn the sensor pivoted on its center.
OK:
Deceleration value must be changing.

OK → **CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)**

NG

2	CHECK HARNESS AND CONNECTOR(YAW RATE SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each terminal SS1, SS2, YIGA and YGND of yaw rate sensor and skid control ECU (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

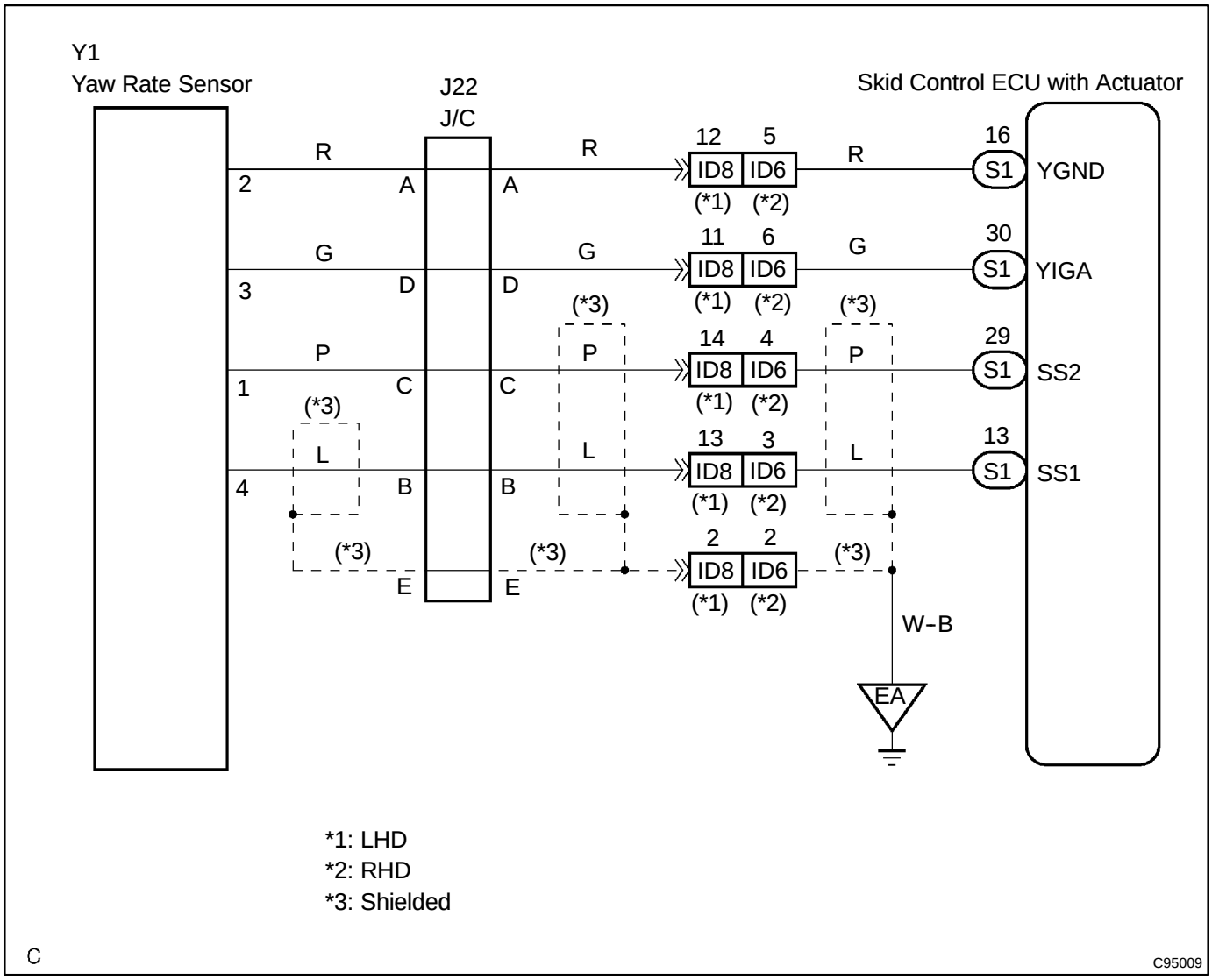
CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

DTC	C0371/55	OPEN OR SHORT CIRCUIT IN YAW RATE SENSOR CIRCUIT

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C0371/55	Detection of any of conditions from 1. through 4.: 1. The voltage of sensor signal is out of range. 2. The offset value of sensor signal is outside the plausible range. 3. Sensor signal change rapidly under normal driving. 4. Sensor is more or worse sensitivity than reference yaw rate during cornering.	S Yaw rate sensor S Yaw rate sensor circuit

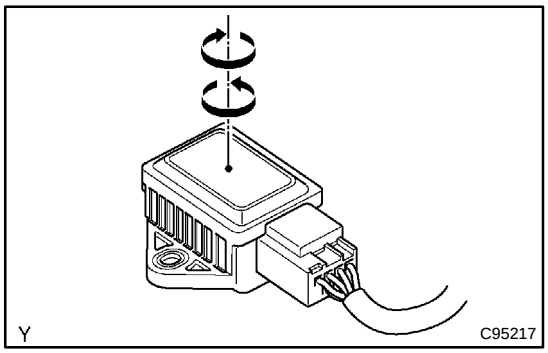
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF YAWRATE SENSOR



(a) Remove the 2 bolts and yaw rate sensor with connector still connected.
(b) Connect the hand-held tester to the DLC3.
(c) Turn the ignition switch ON and push the hand-held tester main switch ON.
(d) Select the DATALIST mode on the hand-held tester.
(e) Check the yaw rate value 0 ± 5 deg/s.
(f) Check that the yaw rate value of the yaw rate sensor displayed on the hand-held tester is changing: Place the yaw rate sensor vertically to the ground and turn the sensor pivoted on its center.
OK:
Yaw rate value must be changing.

OK	CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

NG

2	CHECK HARNESS AND CONNECTOR(YAW RATE SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each terminal SS1, SS2, YIGA and YGND of yaw rate sensor and skid control ECU (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-19)

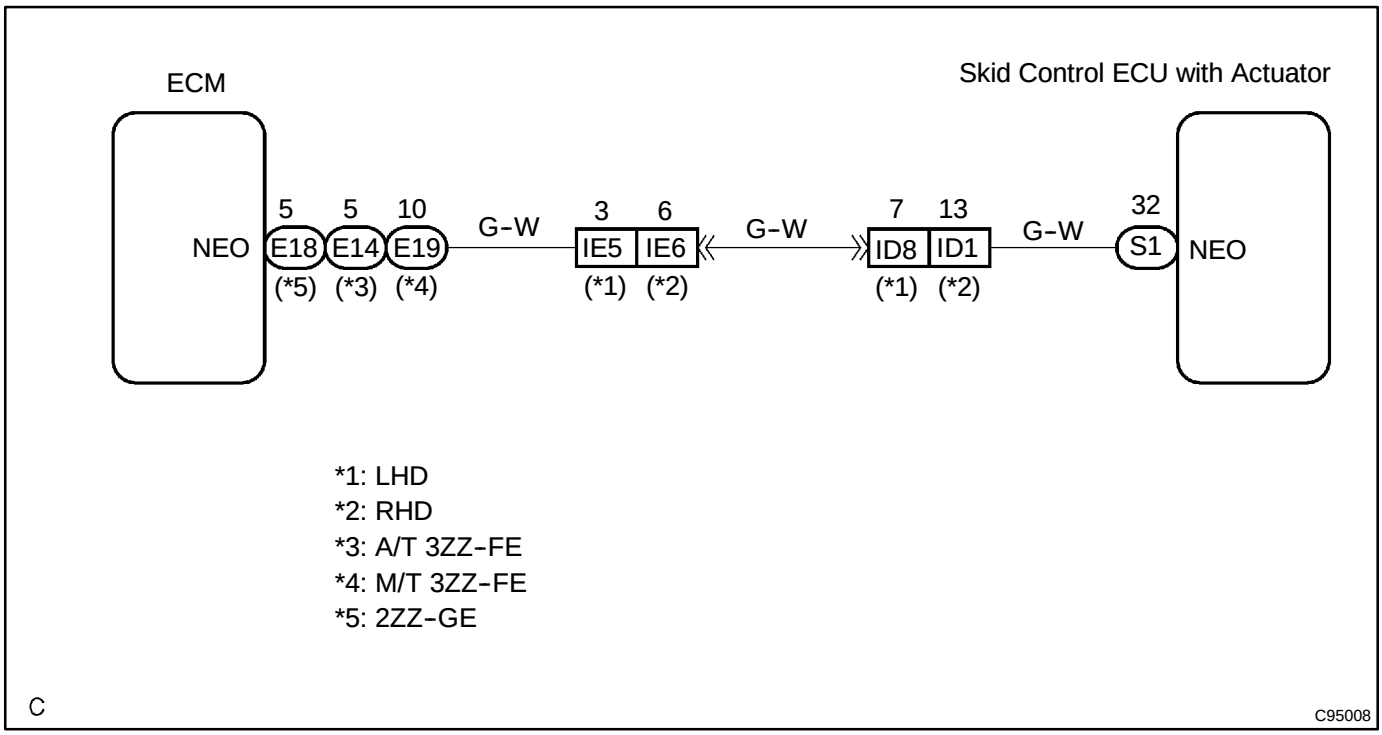
DTC C1202/44 NE SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

The skid control ECU receives engine revolution speed signals (NE signals) from the ECM.

DTC No.	DTC Detecting Condition	Trouble Area
C1202/44	At vehicle speed of 30 km/h (19 mph) or more, and when data received from the ECM is in normal condition, and open or short circuit for engine revolution signal circuit continues for 5 secs. or more.	$ NEO circuit $ ECM $ Skid control ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

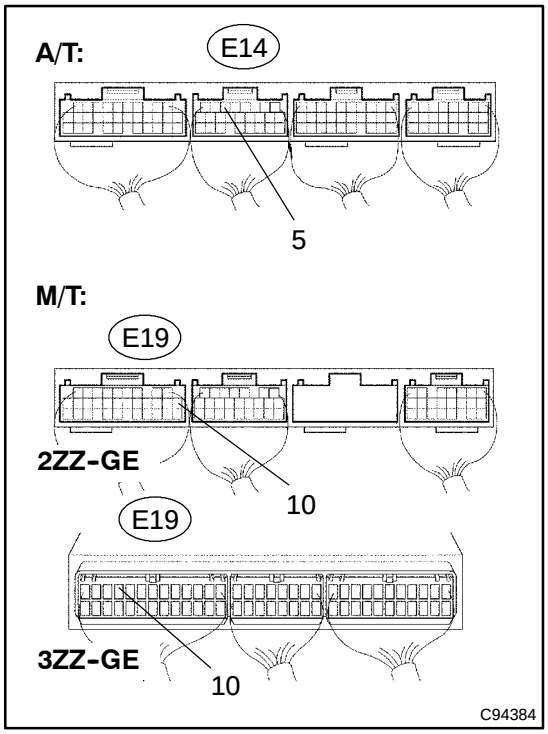
1	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - ECM)

(a) Check for open and short circuit in harness and connector between terminal NEO of skid control ECU and ECM (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

2 INSPECT ECM TERMINAL VOLTAGE(NEO TERMINAL)

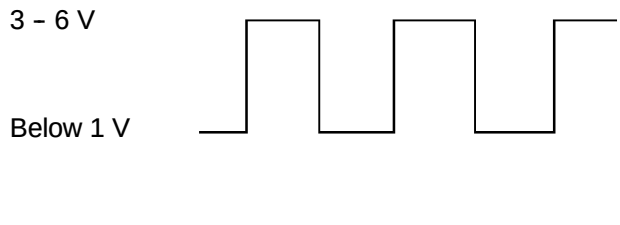


(a) Remove the ECM with connector still connected.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminal NEO (E-5 (A/T), E19-10 (M/T)) of ECM and body ground for the engine conditions below.

OK:

Engine condition	Voltage
OFF (IG ON)	3 - 6 V or below 1 V
ON (Idling)	3 - 6 V ⇔ below 1 V (Pulse)

(Reference)



NG → **CHECK AND REPLACE ECM** **(See page 01-30)**

OK →

IF THE SAME CODE IS STILL OUTPUT AFTER THE DTC IS DELETED, CHECK THE CONTACT THE CONDITION OF EACH CONNECTION.

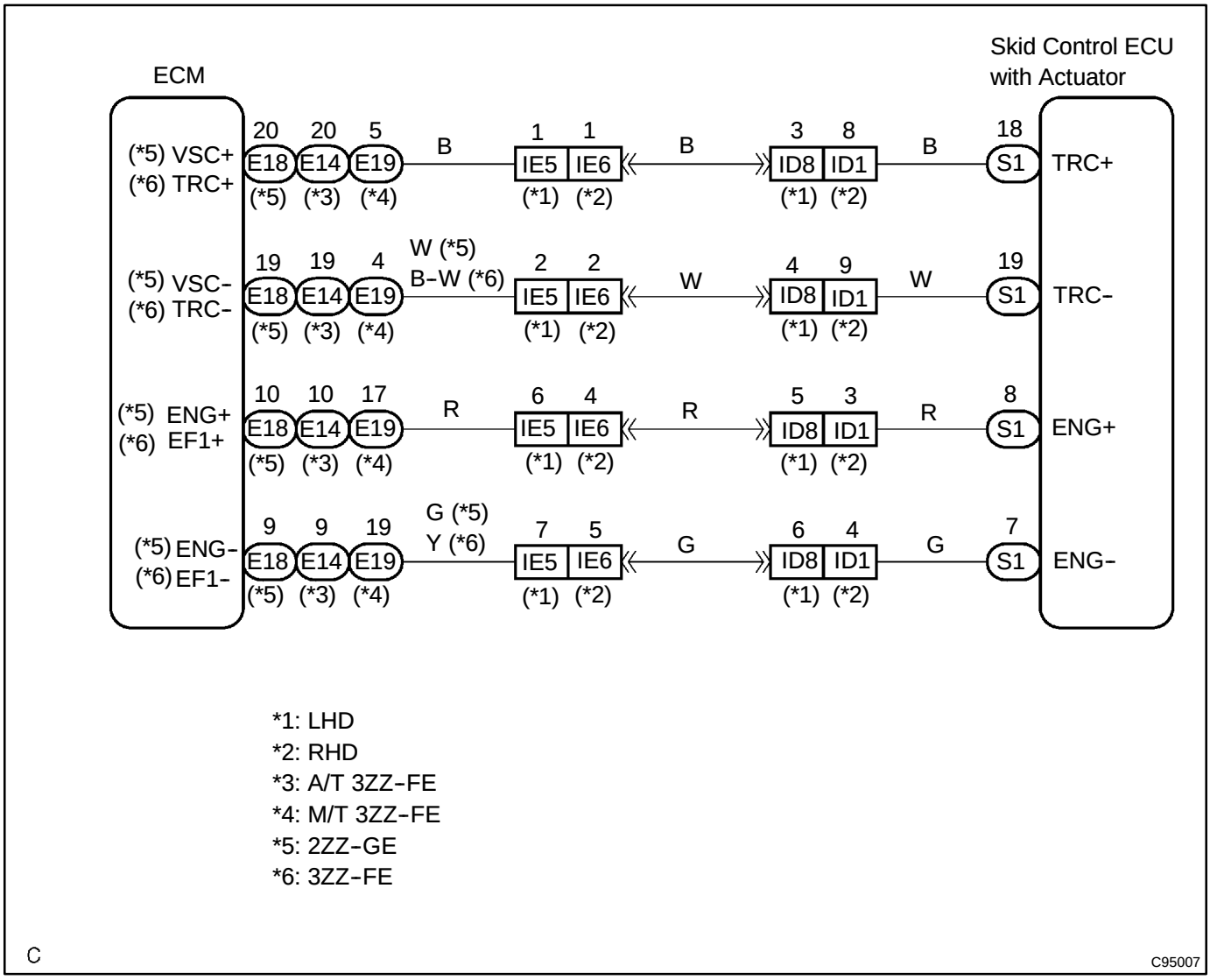
DTC	C1203/59	ECM COMMUNICATOIN CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

The circuit is used to transmit TRC & VSC control information from the skid control ECU to the ECM (TRC+, TRC-), and engine control information from the ECM to the skid control ECU (ENG+, ENG-).

DTC No.	DTC Detecting Condition	Trouble Area
C1203/59	When any of the following 1. through 3. is detected : 1. IG1 voltage is 8.5 V or more, and the condition that data can not be sent to ECM continues for 1.2 sec. or more. 2. IG1 voltage is 8.5 V or more, engine speed is 500 r.p.m or more, vehicle speed is 60 km/h (38 mph) or more, and the condition that data can not be received from ECM continues for 5 sec. or more. 3. The condition that data can not be transmitted between the skid control ECU and ECM occurs at least once within 5 sec. continues 10 consecutive times.	S TRC+ or TRC- circuit S ENG+ or ENG- circuit S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK HARNESS AND CONNECTOR(ECM - SKID CONTROL ECU)

(a) Check for open and short ciruit in harness and connector between each of terminals ENG+, ENG-, TRC+, TRC- of skid control ECU and the same one of the ECM (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

2	CHECK OPERATION OF MALFUNCTION INDICATOR

NG → CHECK AND REPLACE ECM (See page 01-30)

OK

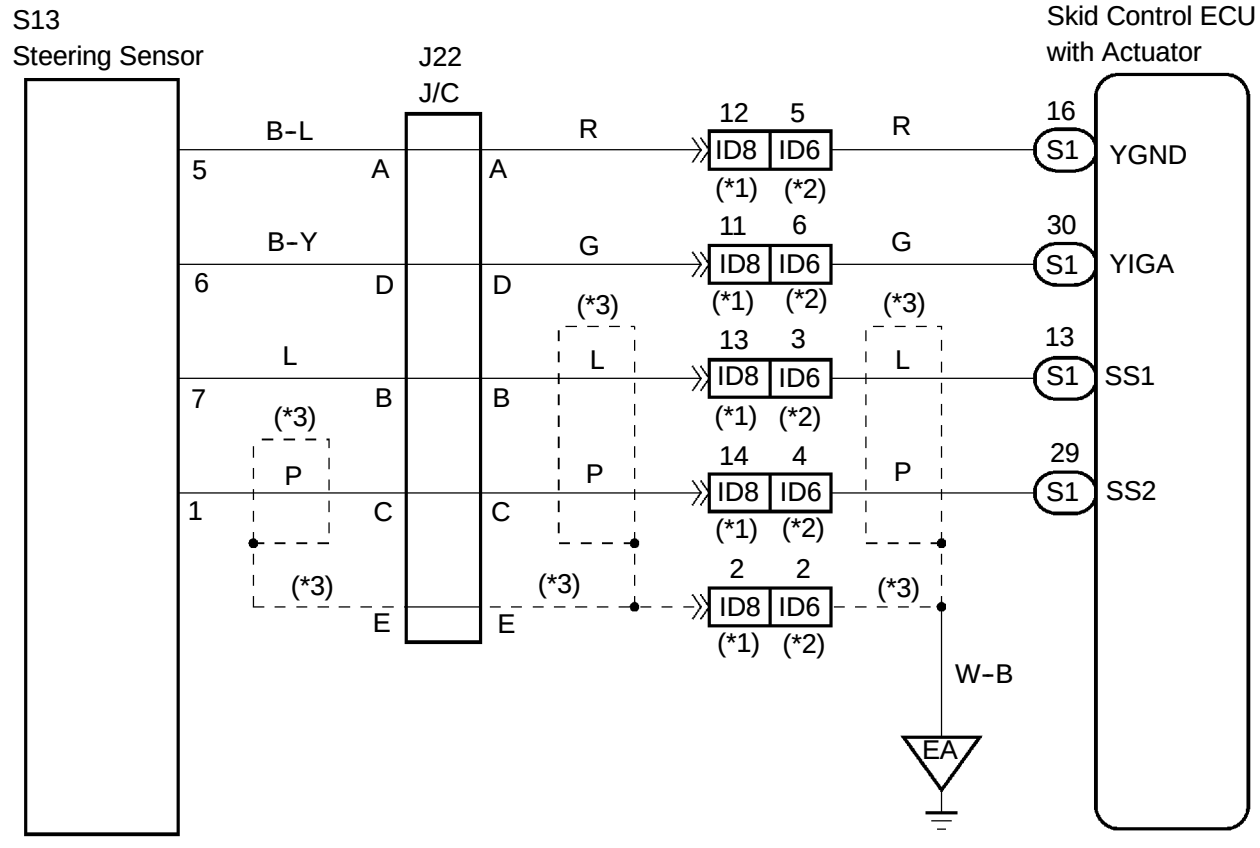
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

DTC C1208/54 MALFUNCTION IN STEERING ANGLE SENSOR CIRCUIT

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1231/31	Detection of any of conditions 1. through 7: 1. When the condition that ECU terminal IG1 voltage is 9.8 V or more, and does not receive data from steering angle sensor continues. 2. Sensor internal failure. 3. The offset value is out of range. 4. Sensor signal change higher. 5. Steering angle value difference between measured and reference is out of range. 6. Steering sensor is not centered. 7. Steering sensor signal is out of range. 8. Steering sensor is not calibration.	S Steering angle sensor S Steering angle sensor circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF STEERING SENSOR

(a) Select the DATALIST mode on the hand-held tester.
(b) Check that the steering wheel turning angle value of the steering angle position sensor displayed on the hand-held tester is changing when turning the steering wheel.
OK:
Steering wheel turning angle value must be changing.

OK → Go to step 4

NG

2	CHECK CHECK INSTALLATION CONDITION OF STEERING ANGLE SENSOR

NG → REPLACE STEERING SENSOR (See page 32-100)

OK

3	CHECK HARNESS AND CONNECTOR(STEERING SENSOR CIRCUIT - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each terminal SS1, SS2, YIGA and YGND of skid control ECU and ateering angle sensor (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CALIBRATE STEERING ANGLE SENSOR (See page 05-666)

NG → REPLACE STEERING SENSOR

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

DTC	C1225/25	SMC SOLENOID CIRCUIT

DTC	C1226/26	SPC SOLENOID CIRCUIT

DTC	C1227/27	SRC SOLENOID CIRCUIT

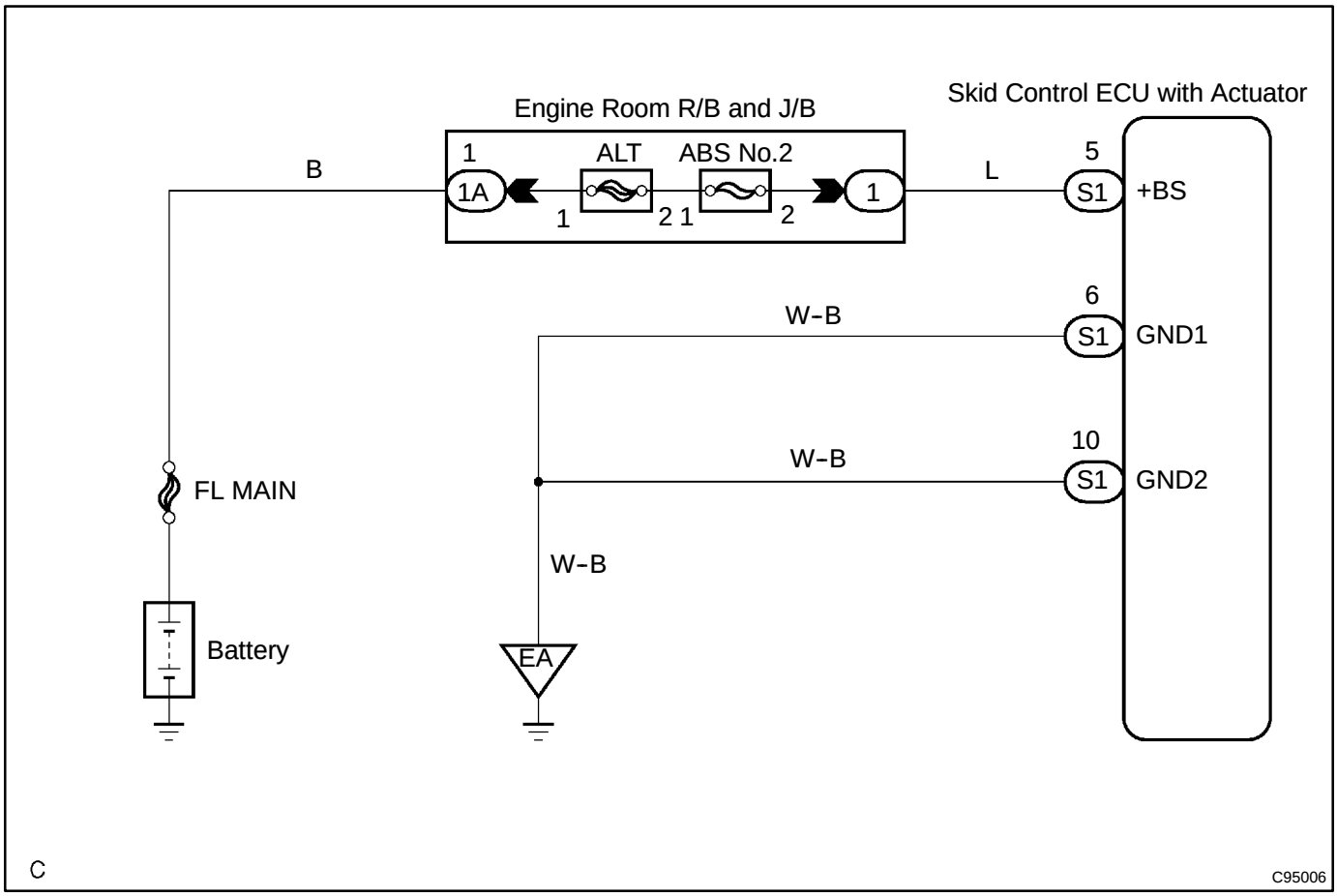
DTC	C1228/28	STR SOLENOID CIRCUIT

CIRCUIT DESCRIPTION

The solenoid goes on when signals are received from the ECU and controls the pressure action on the wheel cylinders thus controlling the braking force.

DTC No.	DTC Detecting Condition	Trouble Area
C1225/25	Open or short in SMC1 circuit.	$ Brake actuator $ SMC1 circuit
C1226/26	Open or short in SMC2 circuit.	$ Brake actuator $ SMC2 circuit
C1227/27	Open or short in SRC1 circuit.	$ Brake actuator $ SRC1 circuit
C1228/28	Open or short in SRC2 circuit.	$ Brake actuator $ SRC2 circuit

WIRING DIAGRAM



1	RECONFIRM DTC

(a) Check if the other DTCs are recorded (See page 05-666).

YES → **REPAIR CIRCUIT INDICATED BY OUTPUT CODE**

NO

REPLACE BRAKE ACTUATOR ASSY

DTC C1237/37 SPEED SENSOR ROTOR FAULTY

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1237/37	Detection of any of conditions from 1. through 4.: 1. When the ignition switch is ON, the speed difference between the rear right and rear left wheels is 5 km/h (3mph) or more (vehicle speed: 100 km/h (62 mph) or less). 2. When the ignition switch is ON, the slip difference between the reference wheel and any other wheels is 6 % or more (vehicle speed: 100 km/h (62 mph) or more). 3. Continuous ABS control for 60 sec. or more. 4. Interference on 1 or more wheels for 20 sec. with the brake pedal depressed, or for 5 sec. when the brake pedal is not depressed.	S Speed sensor S Sensor rotor

INSPECTION PROCEDURE

1 INSPECT TIRE SIZE

NG → **REPLACE TIRES SO THAT ALL 4 TIRES ARE SAME IN SIZE**

OK

2 INSPECT SPEED SENSOR ROTOR

(a) Check the speed sensor rotors (See page 30-6 or 30-18).

NG → **REPLACE SENSOR ROTOR**

OK

3 INSPECT SPEED SENSOR

(a) Check the speed sensors (See page 32-91).

NG → **REPLACE SPEED SENSOR**

OK

4 CHECK HARNESS AND CONNECTOR(SPEED SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between each terminal of speed sensor and skid control ECU (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

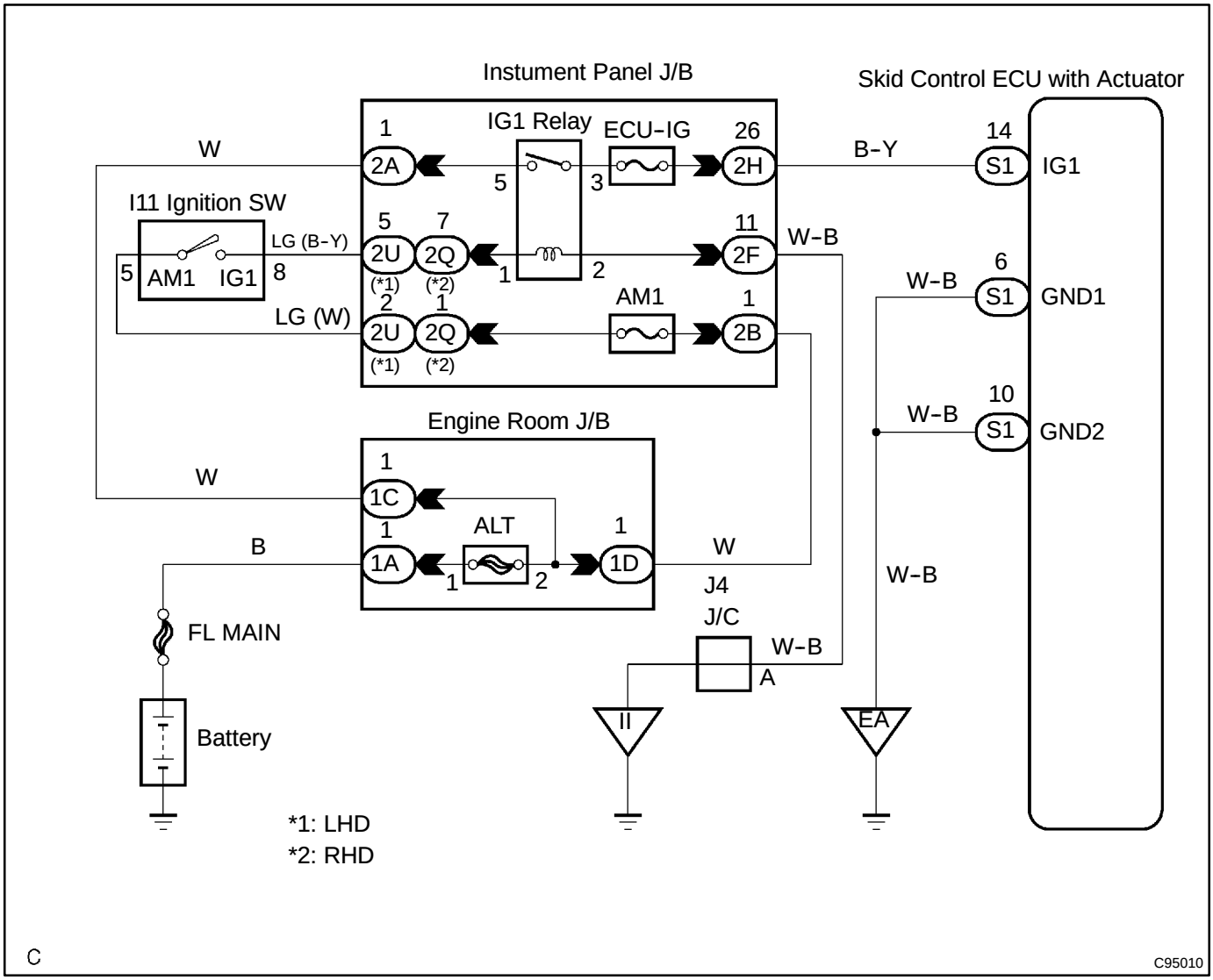
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

DTC	C1241/41	LOW BATTERY POSITIVE VOLTOAGE OR ABNORMALLY HIGH BATTERY POSITIVE VOLTAGE

CIRCUIT DESCRIPTION

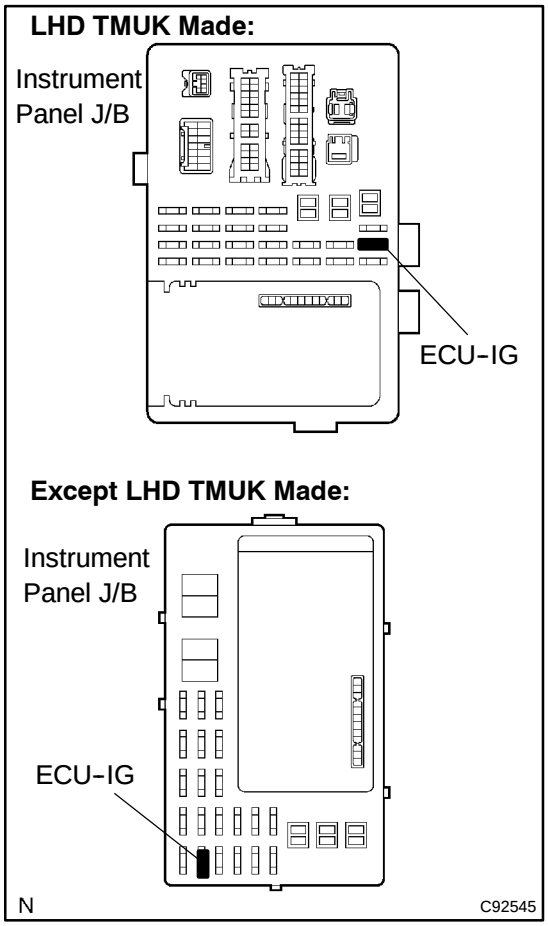
DTC No.	DTC Detecting Condition	Trouble Area
C1241/41	Vehicle speed of about 6 km/h (4 mph), low battery voltage of less than 9.4 V at the time of non-operation of ABS control or less than 8.8 V at the time of operation of ABS control, and high battery voltage of more than 17.4 V.	S Battery S IC regulator S Power source circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT FUSE(ECU-IG FUSE)



(a) Remove ECU-IG fuse from instrument panel J/B.
(b) Check continuity of ECU-IG fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESS AND COMPONENTS CONNECTED TO ECU-IG FUSE**

OK

2	INSPECT BATTERY

OK:
Voltage: 10 - 14 V

NG → **INSPECT CHARGING SYSTEM**

OK

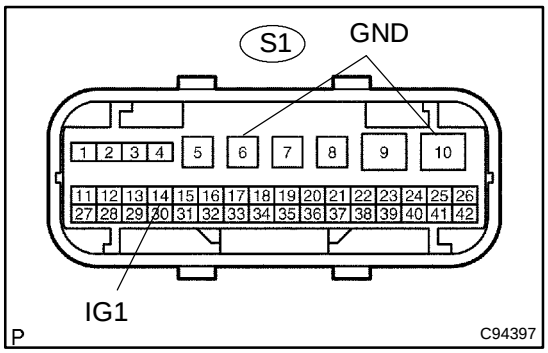
3	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(IG1 TERMINAL)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.

OK:

"Normal" is displayed.



IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control connector.

(b) Turn the ignition switch to ON.

(c) Measure voltage between terminals IG1 (S1-14) and GND (S1-6, 10) of skid control ECU harness side connector.

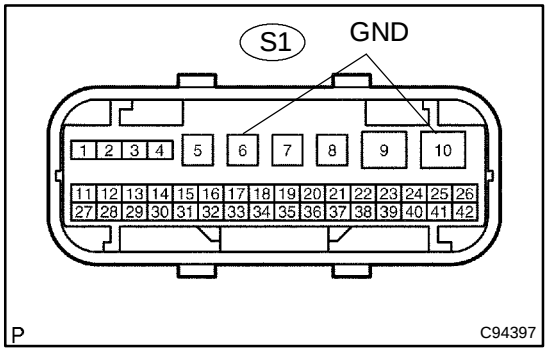
OK:

Voltage: 10 - 14 V

OK	CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NG

4	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Disconnect the skid control ECU connector.

(b) Measure resistance between terminal GND (S1-6, 10) of skid control ECU harness side connector and body ground.

OK:

Resistance: 1 Ω or less

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

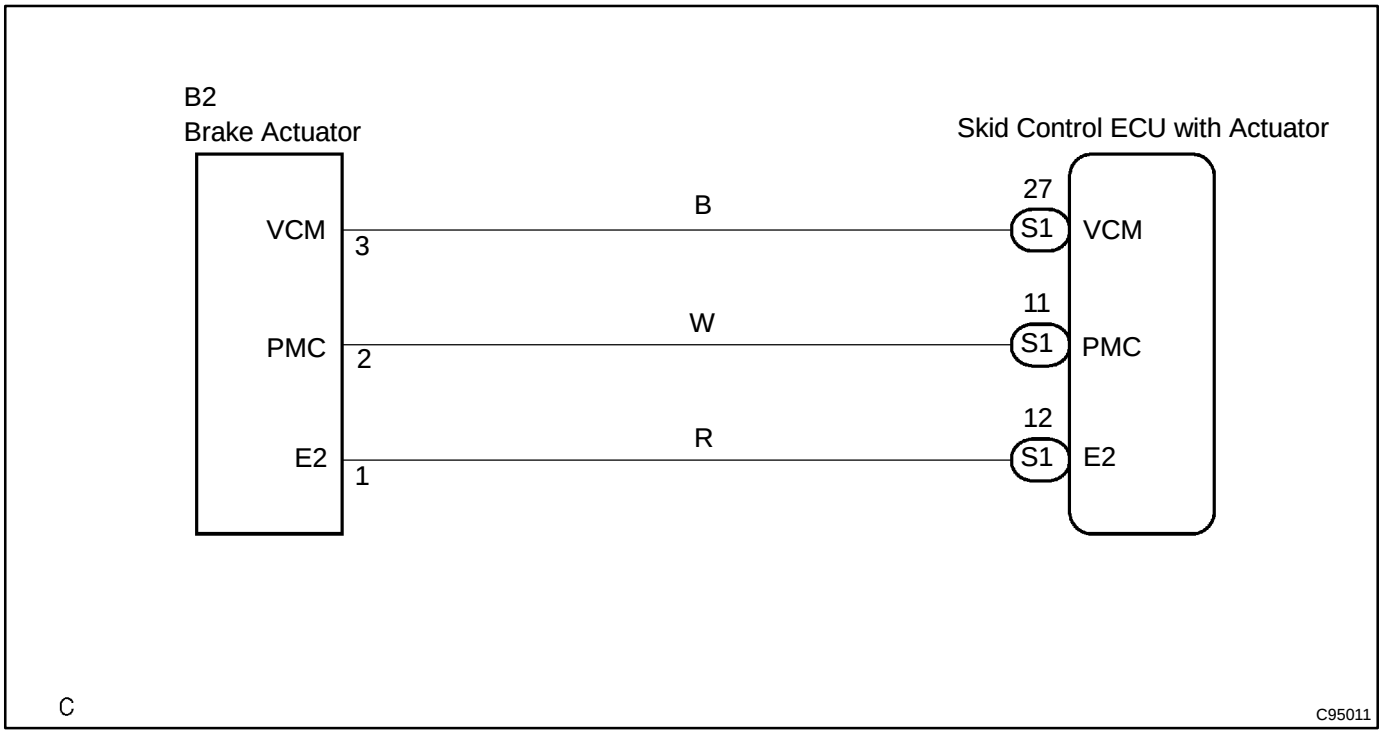
CHECK AND REPAIR HARNESS AND CONNECTOR(IG1 TERMINAL CIRCUIT) (See page 01-30)

DTC C1246/53 MALFUNCTION IN MASTER CYLINDER PRESSURE SENSOR

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1246/53	When any of the following 1. through 3. is detected: 1. The voltage of sensor signal is out of range (less than 0.25 V, more than 4.75 V). 2. The sensor supply voltage is out of range (above 5.6 V, below 4.4 V). 3. The sensor signal offset value is out of range. 4. Stop light fuse is open.	S Master cylinder pressure sensor S Master cylinder pressure sensor circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	READ VALUE OF MASTER CYLINDER PRESSURE SENSOR

(a) Select the DATALIST mode on the hand-held tester.
(b) Check that the brake fluid pressure value of the No.1 master cylinder pressure sensor and No.2 master cylinder pressure sensor displayed on the hand-held tester changes when depressing the brake pedal.
OK:
Brake fluid pressure value must be changing.

OK	Go to step 4

NG

2	INSPECT STOP LAMP SWITCH ASSY

(a) Check that the stop light lights up when brake pedal is depressed and turns OFF when the brake pedal is released.

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

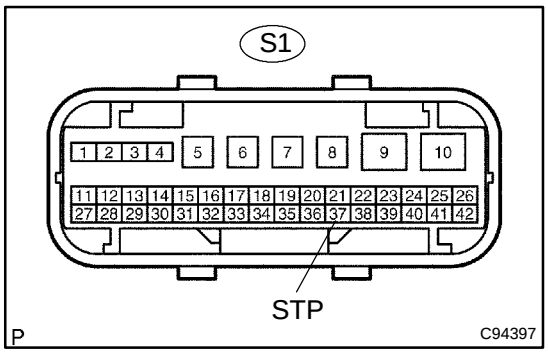
3	CHECK HARNESS AND CONNECTOR(MASTER CYLINDER PRESSUR SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between terminal of master cylinder pressur sensor and skid control ECU (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(STP TERMINAL)



(a) Disconnect the skid control ECU connector.
(b) Measure voltage between terminal STP (S1-37) of skid control ECU harness side connector and body ground when brake pedal is depressed.
OK:
Voltage: 8 - 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

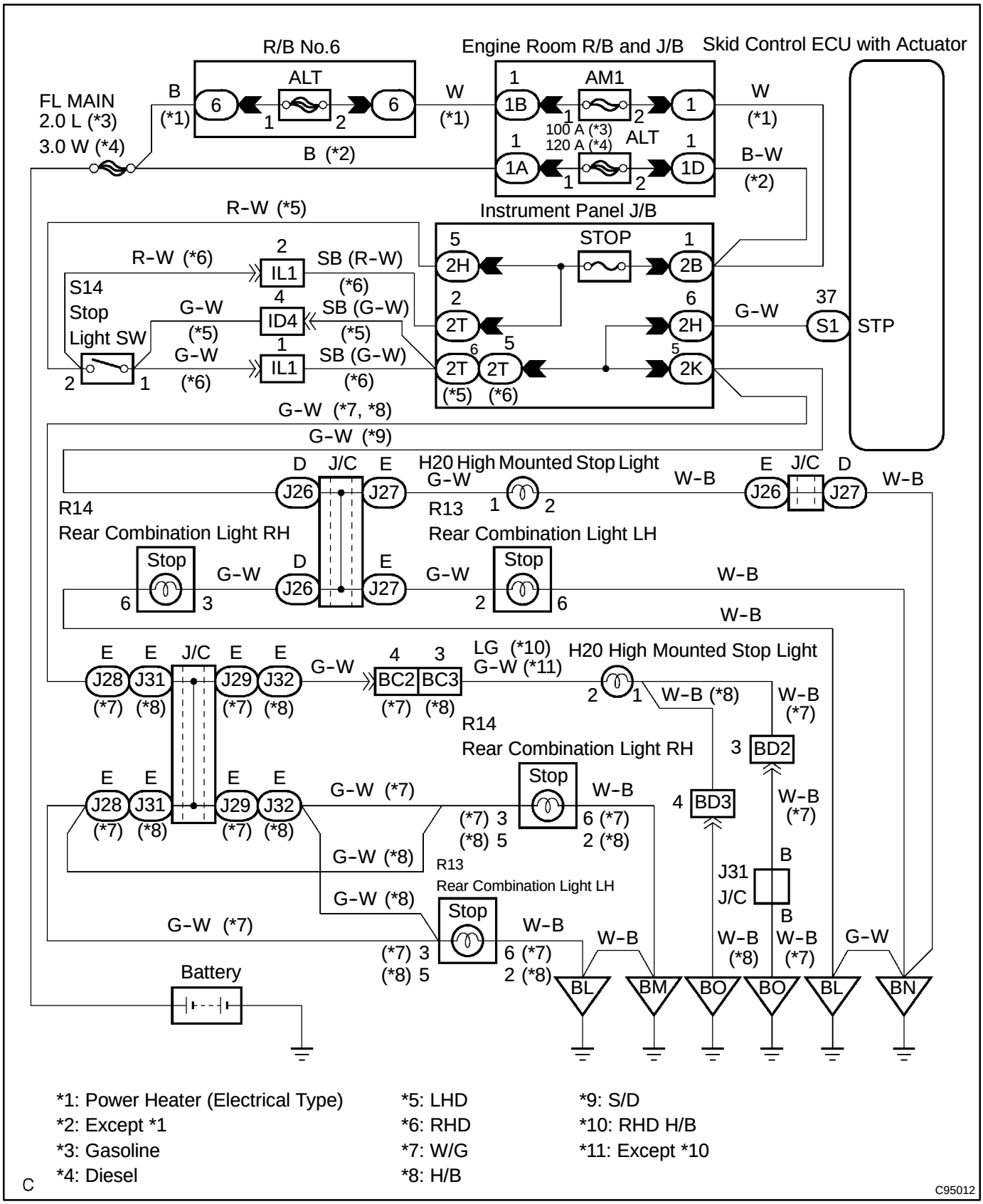
CHECK AND REPLACE SKID CONTROL ECU ASSY**(See page 01-30)**

DTC C1249/58 STOP LIGHT SWITCH CIRCUIT

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1249/58	After the ignition switch is turned ON, the condition that the STP terminal voltage of ECU is 55 % to 75 % of supplied voltage, continues for 1 sec. or more.	Stop light switch circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

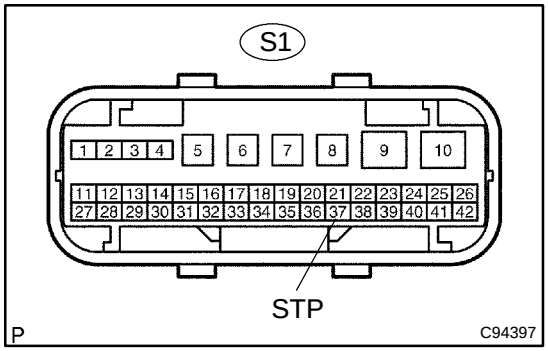
1	INSPECT STOP LAMP SWITCH ASSY

(a) Check that the stop light lights up when brake pedal is depressed and turns OFF when the brake pedal is released.

NG → Go to step 4

OK

2	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(STP TERMINAL)



(a) Disconnect the skid control ECU connector.
(b) Measure voltage between terminal STP (S1-37) of skid control ECU harness side connector and body ground when brake pedal is depressed.
OK:
Voltage: 8 - 14 V

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

NG

3	CHECK HARNESS AND CONNECTOR(STOP LIGHT SWITCH - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between stop light switch and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE

4	CHECK HARNESS AND CONNECTOR(STOP LIGHT CIRCUIT)

(a) Check for open and short circuit in harness and connector of the stop light circuit (See page 01-30).

OK → REPLACE STOP LAMP SWITCH ASSY

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

DTC	C1288/88	ECU VERSION MISS MATCHI

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1288/88	When any of the following 1. through 2. is detecte: 1. ECM does not match. 2. Steering angle sensor is not calibration.	S ECM S Steering angle sensor calibration.

INSPECTION PROCEDURE

1	PERFORM STEERING ANGLE SENSOR ZERO POINT CALIBRATION

(a) Perform the steering angle sensor zero point calibration (See page 05-666).

2	RECONFIRM DTC

(a) Check if the same DTC is stored in the memory.

NO → END

YES

3	CHECK HARNESS AND CONNECTOR(STEERING ANGLE SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between steering angle sensor and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

DTC C1300/62 SKID CONTROL ECU MALFUNCTION

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1300/62	Skid control ECU continuously detects the proper operation of ABS.	ECU

INSPECTION PROCEDURE

1	RECONFIRM DTC

A	DTC C1300/62
B	Except DTC C1300/62

B → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

A

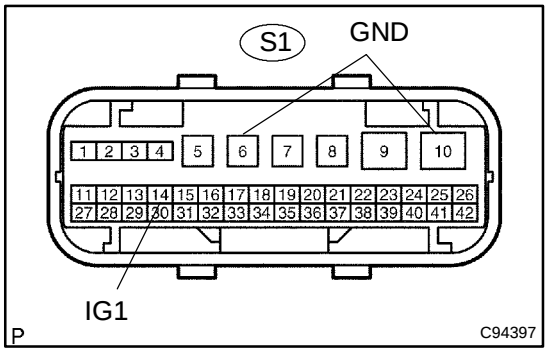
2	INSPECT SKID CONTROL ECU CONNECTOR(IG1 TERMINAL VOLTAGE)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.

OK:

"Normal" is displayed.



IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control connector.

(b) Turn the ignition switch to ON.

(c) Measure voltage between terminals IG1 (S1-14) and GND (S1-6, 10) of skid control ECU harness side connector.

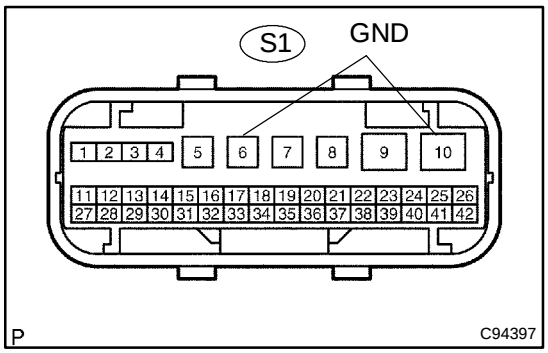
OK:

Voltage: 10 - 14 V

OK → CHECK AND REPLACE COMPUTER, SKID CONTROL

NG

3	INSPECT SKID CONTROL ECU CONNECTOR(GND TERMINAL CONTINUITY)



(a) Disconnect the skid control ECU connector.
(b) Measure resistance between terminal GND (S1-6, 10) of skid control ECU harness side connector and body ground.
OK:
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR(IG1 CIRCUIT)

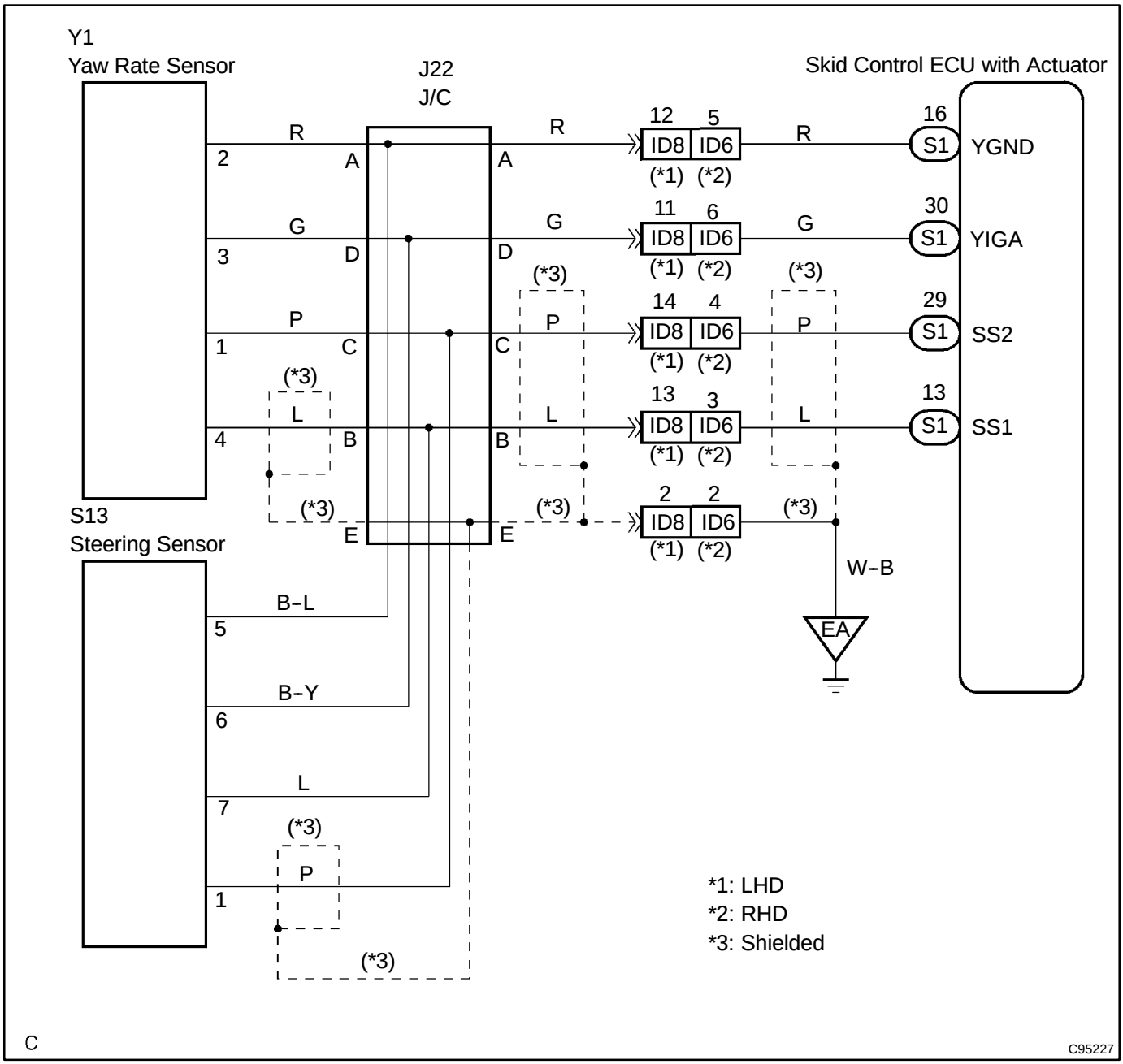
DTC	C1301/42	CAN COMMUNICATION SYSTEM MALFUNCTION

CIRCUIT DESCRIPTION

The circuit is used to send TRC & VSC control information from yaw rate sensor and steering angle sensor information to skid control CU

DTC No.	DTC Detecting Condition	Trouble Area
C1301/42	IG1 voltage is 9.5 V or more, and the condition that data from ECU can not be received continues for 1.2 sec. or more.	S Yaw rate sensor circuit S Steering angle sensor circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK HARNESS AND CONNECTOR(YAW RATE SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between yaw rate sensor and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

2	CHECK HARNESS AND CONNECTOR(STEERING ANGLE SENSOR - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between steering angle sensor and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

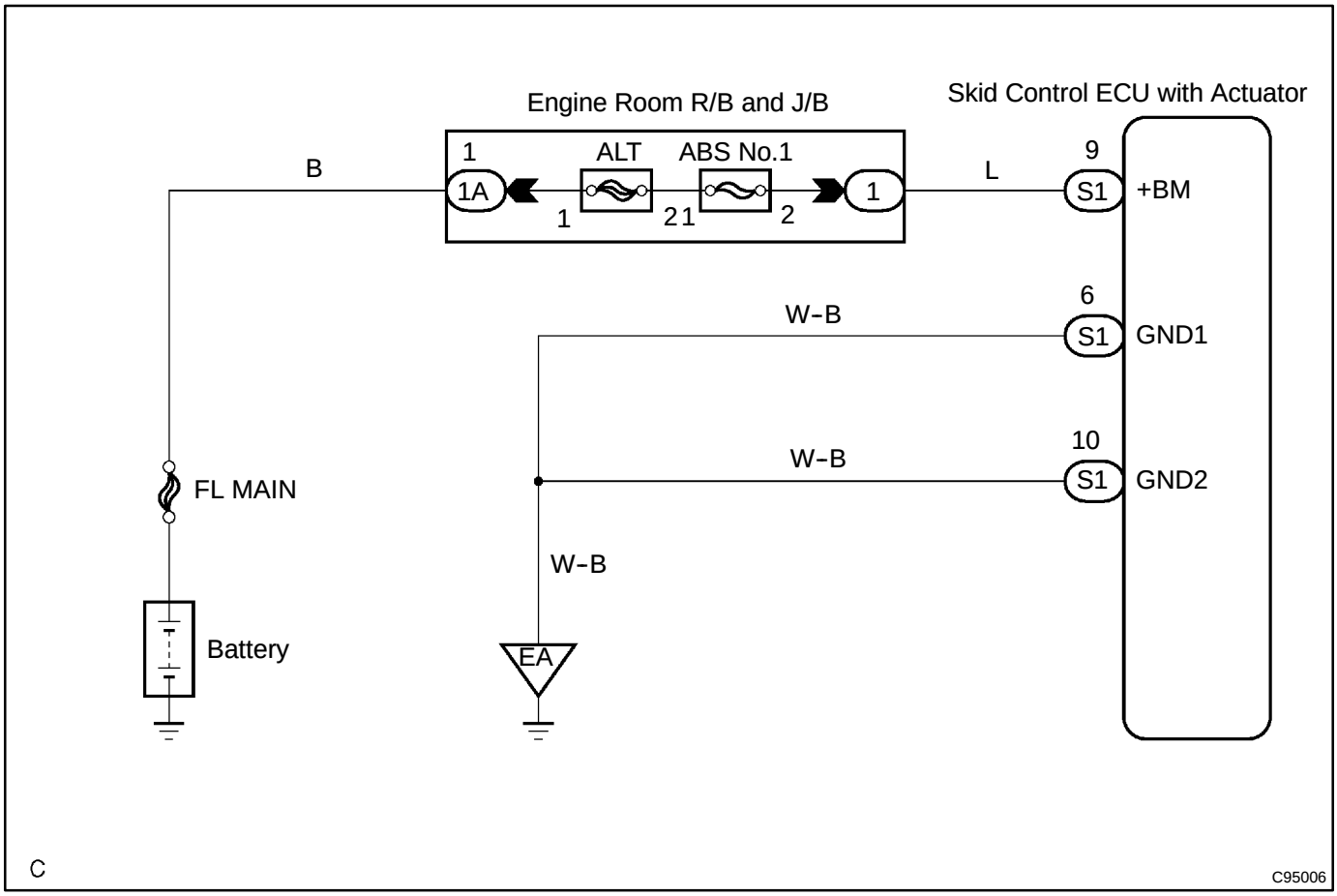
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

DTC C1350/51 PUMP MOTOR IS LOCKED/OPEN CIRCUIT IN PUMP MOTOR GROUND

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1350/51	When any of the following 1. through 3. is detected. 1. No motor voltage supply after skid control ECU of the motor relay. 2. A high level of motor voltage with no skid control ECU of the motor relay. 3. The pump motor voltage is high level for a certain time after the motor relay has elapsed.	Brake actuator pump motor

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	RECONFIRM DTC

(a) Check if the other DTCs are recorded (See page 05-666).

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

REPLACE BRAKE ACTUATOR ASSY

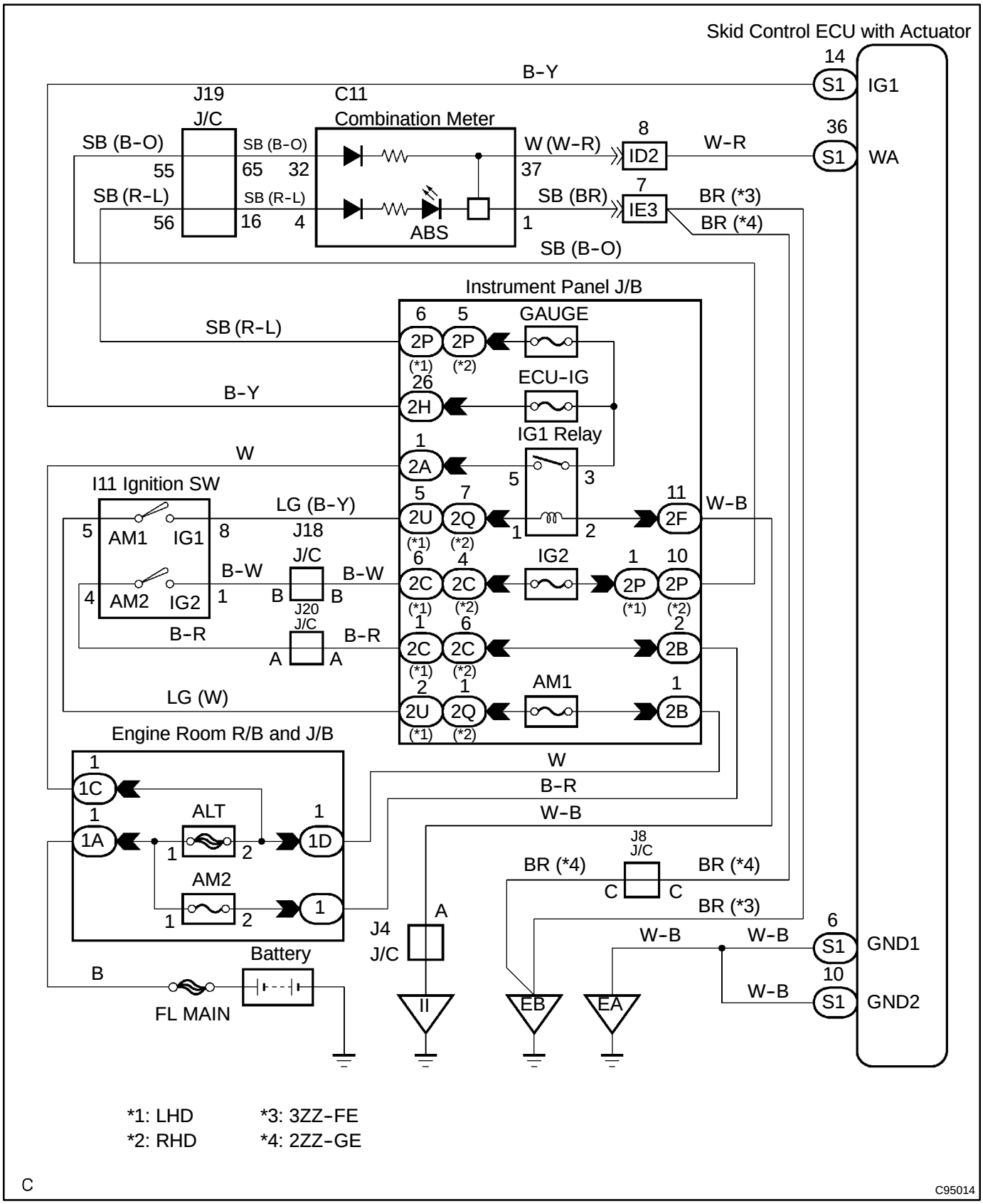
DTC	AlwaysON	MALFUNCTION IN ABS ECU

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
Always ON	Either of the following 1. or 2. is detected: 1. The ECU connectors are OFF from the ECU. 2. There is a malfunction in the ECU internal circuit.	S Battery S IC regulator S Power source circuit S Skid control ECU

HINT:
There is a case that hand-held tester cannot be used when ECU is abnormal.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTC FOR ABS

(a) Check DTC on page 05-666.

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

2	INSPECT SKID CONTROL ECU CONNECTOR SECURELY CONNECTED

NO → CONNECT CONNECTOR TO ECU

YES

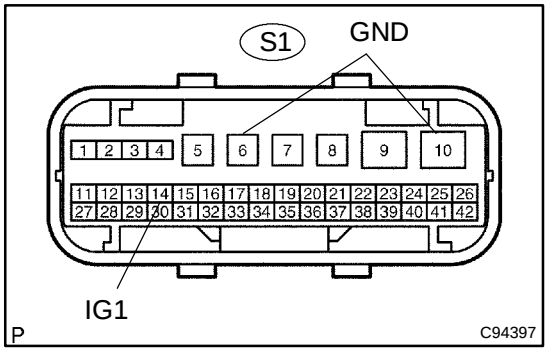
3	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(IG1 TERMINAL)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.

OK:

"Normal" is displayed.



IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control connector.

(b) Turn the ignition switch to ON.

(c) Measure voltage between terminals IG1 (S1-14) and GND (S1-6, 10) of skid control ECU harness side connector.

OK:

Voltage: 10 - 14 V

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NG

4	INSPECT BATTERY

OK:

Voltage: 10 - 14 V

NG → INSPECT CHARGING SYSTEM

OK

5	CHECK HARNESS AND CONNECTOR(DLC3 - SKID CONTROL ECU)

(a) Check for short circuit in harness and connector between terminal Tc of DLC3 and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

6	INSPECT ABS WARNING LIGHT

(a) See combination meter troubleshooting on page 71-1.

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

7	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - COMBINATION METER)

(a) Check for open and short circuit in harness and connector between skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

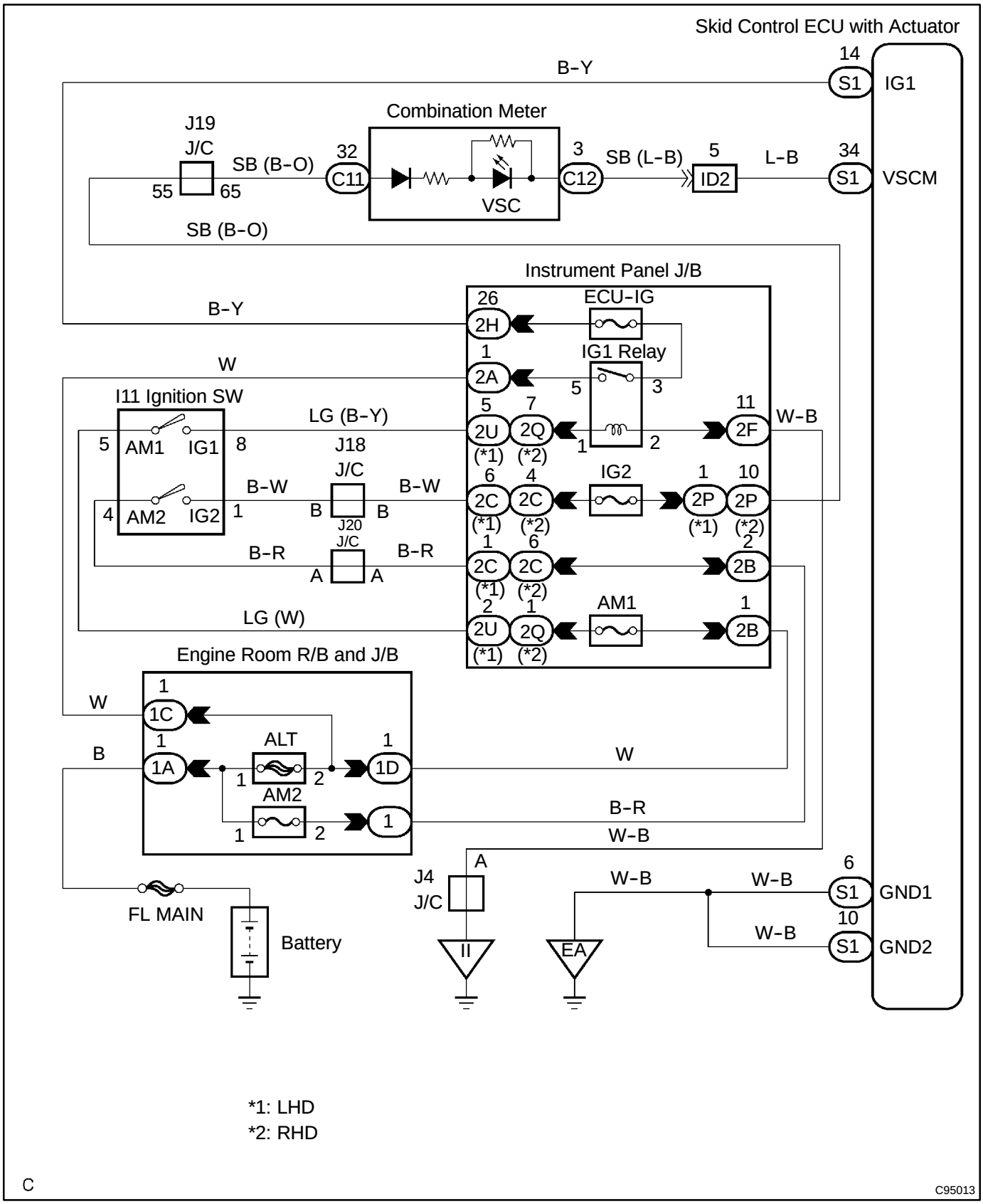
DTC	AlwaysON	MALFUNCTION IN ECU(VSC WARNING LIGHT)

CIRCUIT DESCRIPTION

If the ECU stores DTC, the VSC warning light lights on the combination meter.

DTC No.	DTC Detecting Condition	Trouble Area
Always ON	Malfunction in skid control EU	$ Battery $ IC regulator $ Power source circuit $ Skid control ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTC FOR VSC

(a) Check DTC on page 05-666.

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

2	INSPECT SKID CONTROL ECU CONNECTOR SECURELY CONNECTED

NO → CONNECT CONNECTOR TO ECU

YES

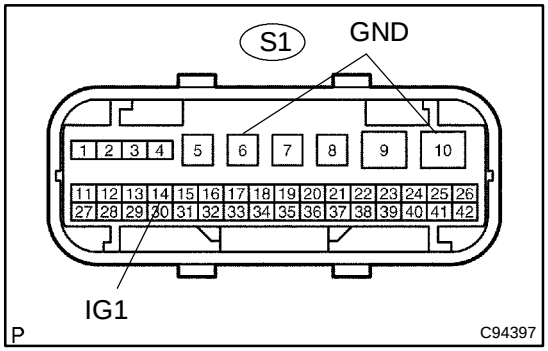
3	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(IG1 TERMINAL)

IN CASE OF USING HAND-HELD TESTER:

(a) Check the voltage condition output from the ECU displayed on the hand-held tester.

OK:

"Normal" is displayed.



IN CASE OF NOT USING HAND-HELD TESTER:

(a) Disconnect the skid control connector.

(b) Turn the ignition switch to ON.

(c) Measure voltage between terminals IG1 (S1-14) and GND (S1-6, 10) of skid control ECU harness side connector.

OK:

Voltage: 10 - 14 V

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY(See page 01-30)

NG

4	INSPECT BATTERY

OK:

Voltage: 10 - 14 V

NG → INSPECT CHARGING SYSTEM

OK

5	CHECK HARNESS AND CONNECTOR(DLC3 - SKID CONTROL ECU)

(a) Check for short circuit in harness and connector between terminal Tc of DLC3 and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

6	CHECK VSC WARNING LIGHT

(a) See combination meter troubleshooting on page 71-1.

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

7	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - COMBINATION METER)

(a) Check for open and short circuit in harness and connector between skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

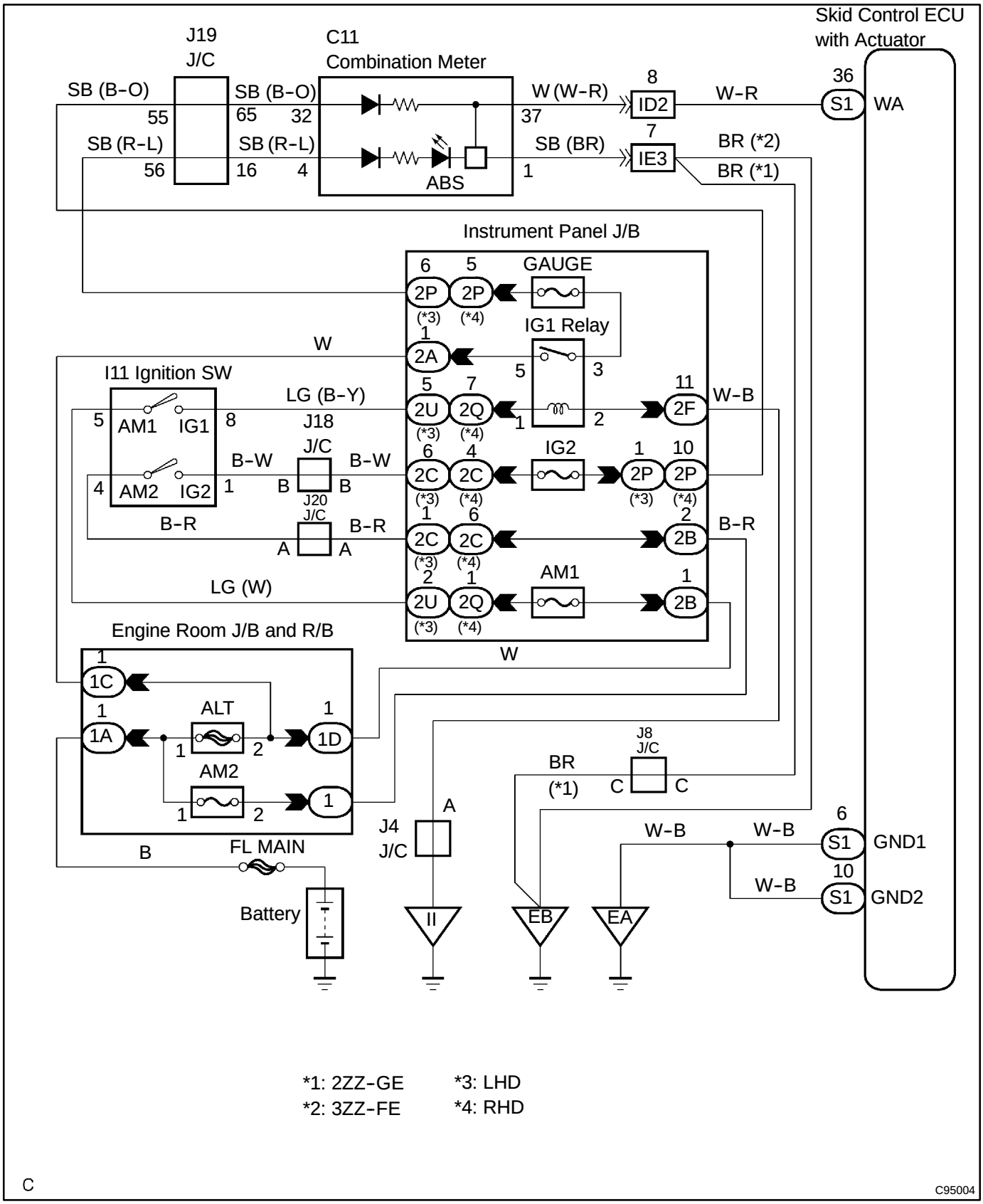
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

ABS WARNING LIGHT CIRCUIT(DOES NOT LIGHT UP)

CIRCUIT DESCRIPTION

If the ECU detects trouble, it will prohibit ABS control, turn on ABS warning light, and store the DTC. Connect terminals Tc and CG of the DLC3 to make the ABS warning light blink and output the DTC.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(ABS WARNING LIGHT)

(a) Check that "ON" and "OFF" of the ABS warning light can be shown on the combination meter on the hand-held tester.

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NG

2	INSPECT ABS WARNING LIGHT

(a) See combination meter troubleshooting on page 01-30.

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

3	CHECK HARNESS AND CONNECTOR(SKID CONTORL ECU - CMBINATION METER)

(a) Check for open and short circuit in harness and connector between skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

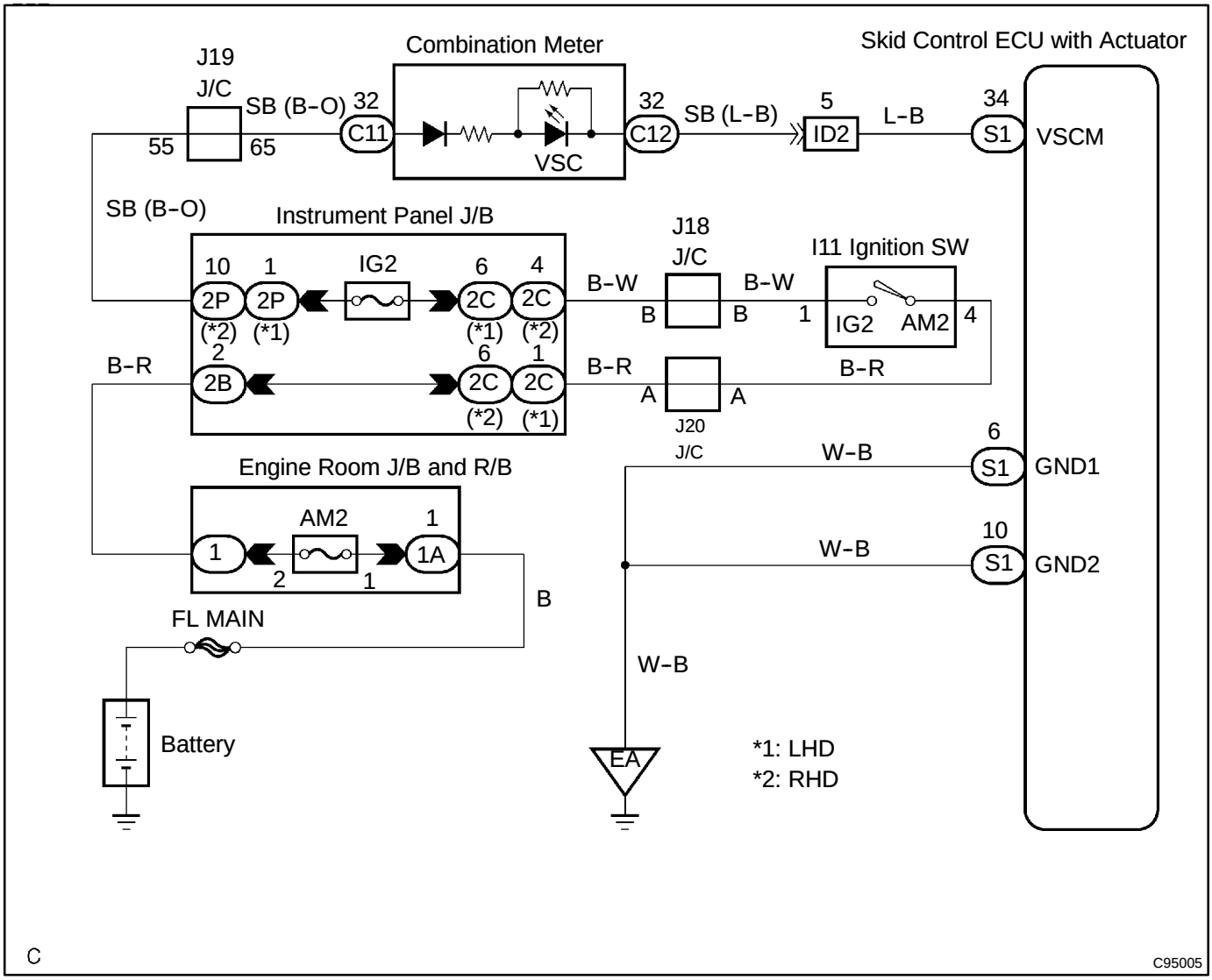
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

VSC WARNING LIGHT CIRCUIT(DOES NOT LIGHT UP)

CIRCUIT DESCRIPTION

If the ECU stores DTC, the VSC warning light lights on the combination meter.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(VSC WARNING LIGHT)

(a) Check that "ON" and "OFF" of the VSC warning light can be shown on the combination meter with the hand-held tester.

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NG

2	INSPECT VSC WARNING LIGHT

(a) See combination meter troubleshooting on page 71-1.

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

3	CHECK HARNESS AND CONNECTOR(COMBINATION METER - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

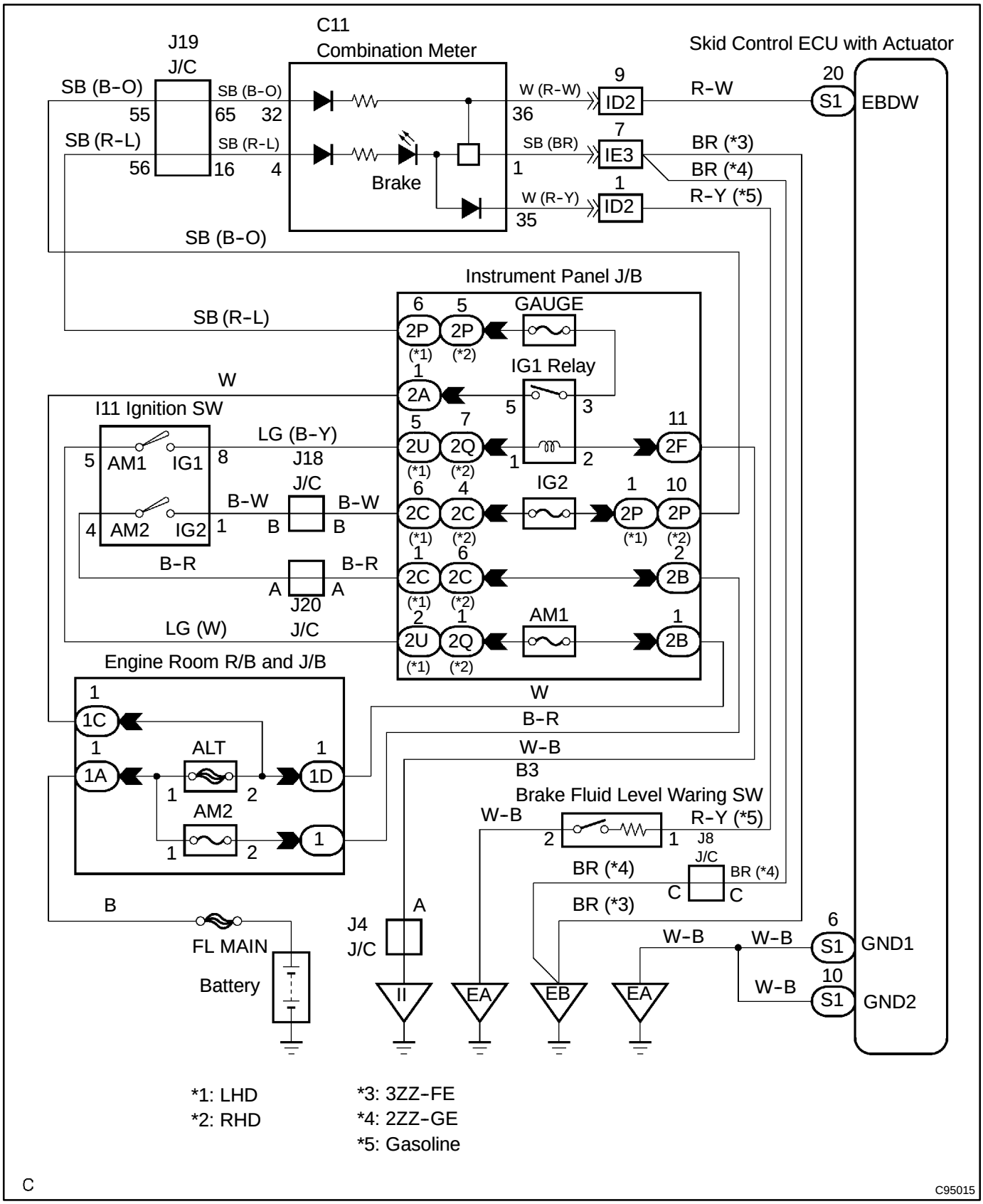
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

BRAKE WARNING LIGHT CIRCUIT

CIRCUIT DESCRIPTION

The Brake warning light is turned on when the brake fluid is insufficient, the parking brake is applied or the EBD is defective.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(BRAKE WARNING LIGHT)

(a) Check that "ON" and "OFF" of the Brake warning light can be shown on the combination meter with the hand-held tester.

OK → Go to step 4

NG

2	CHECK DTC FOR ABS

(a) Check DTC on page 05-666.

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

3	INSPECT BRAKE WARNING LIGHT

(a) See combination meter troubleshooting on page 71-1.

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

4	INSPECT PARKING BRAKE SWITCH ASSY (See page 71-1)

NG → REPLACE PARKING BRAKE SWITCH ASSY

OK

5	INSPECT BRAKE FLUID LEVEL WARNING SWITCH (See page 71-1)

NG → REPLACE BRAKE MASTER CYLINDER RESERVOIR ASSY

OK

6	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - PARKING BRAKE SWITCH)

(a) Check for open and short circuit in harness and connector between terminal PKB of skid control ECU and parking brake switch (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

7	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - BRAKE FLUID LEVEL WARNING SWITCH)

(a) Check for open and short circuit in harness and connector between terminal EBDW of skid control ECU and brake fluid level warning switch (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

8	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - COMBINATION MERTER)

(a) Check for open and short circuit in harness and connector between skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

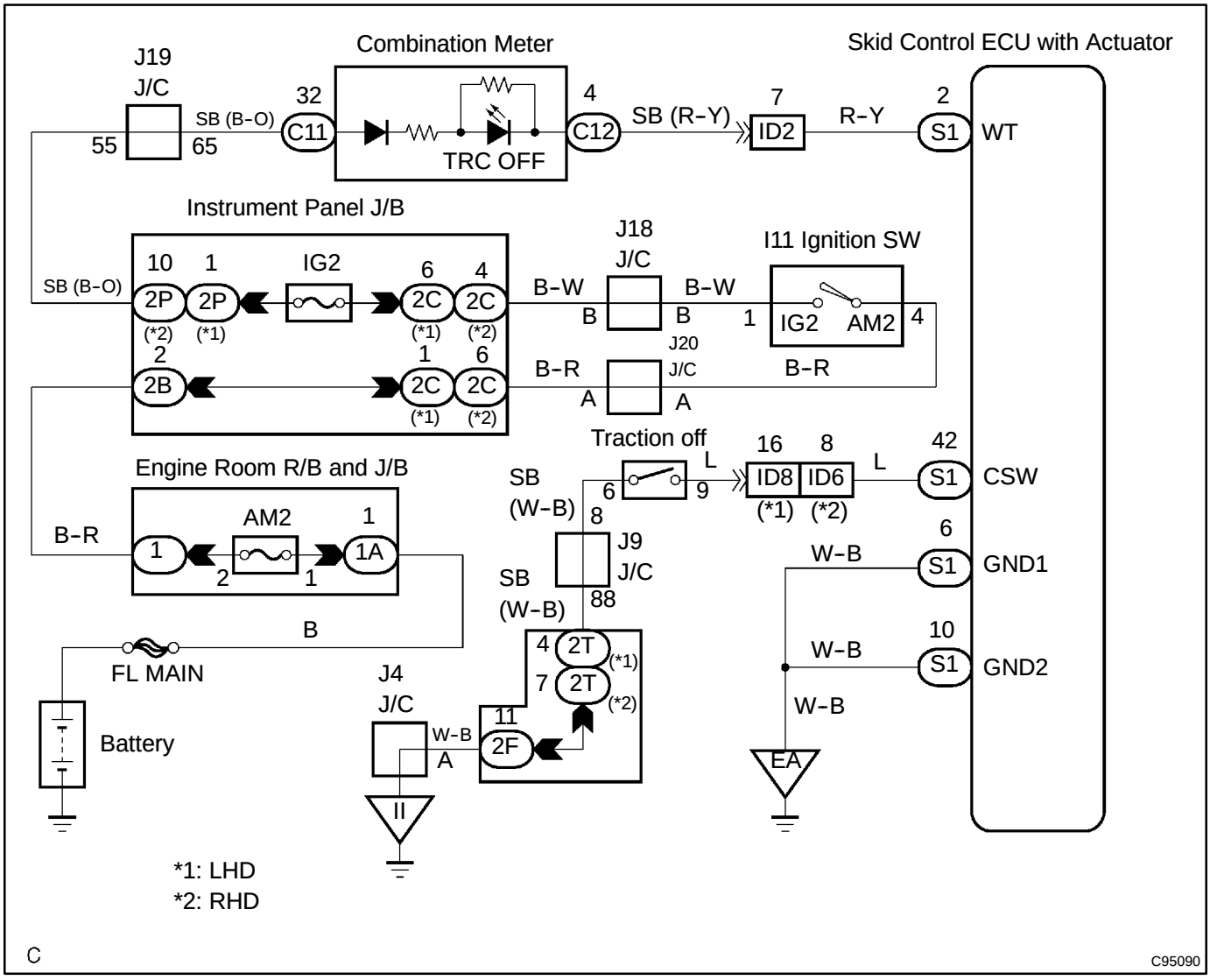
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

TRC OFF INDICATOR, TRC CUT SWITCH CIRCUIT

CIRCUIT DESCRIPTION

This is the TRC & VSC control main switch. When the TRC OFF switch is pressed, TRC & VSC control goes off and the TRC OFF indicator turn to on. Also, turn the TRC OFF indicator light to "ON" when the VSC system is at the fail safe control. Turn the ignition switch to OFF, TRC & VSC control surely comes on when the ignition switch turns to ON next time.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(TRC OFF INDICATOR LIGHT)

(a) Check that "ON" and "OFF" of the TRC OFF indicator light can be shown on the combination meter with the hand-held tester.

OK → Go to step 3

NG

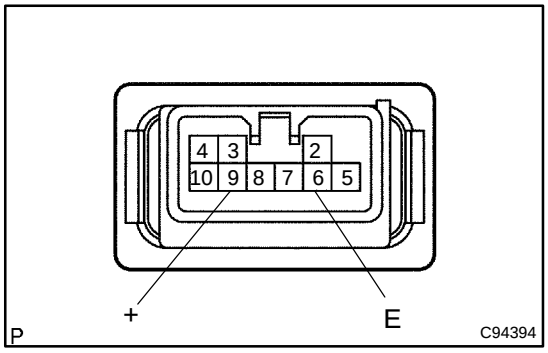
2	INSPECT TRC OFF INDICATOR LIGHT

(a) See combination meter troubleshooting on page 01-30.

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

3	INSPECT TRACTION CONTROL SWITCH



(a) Remove the TRC OFF switch.
(b) Disconnect the TRC OFF switch connector.
(c) Measure resistance between terminals + (6) and E (9) of the TRC OFF switch when the TRC OFF switch is ON and OFF.

OK:

TRC OFF switch	Resistance
Pushed in	Continuity
Released	1MΩ or higher

NG → REPLACE TRACTION CONTROL SWITCH

OK

4	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - TRC OFF SWITCH)

(a) Check for open and short circuit in harness and connector between terminal CSW of skid control ECU and TRC OFF switch (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - COMBINATION METER)

(a) Check for open and short circuit in harness and connector between skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

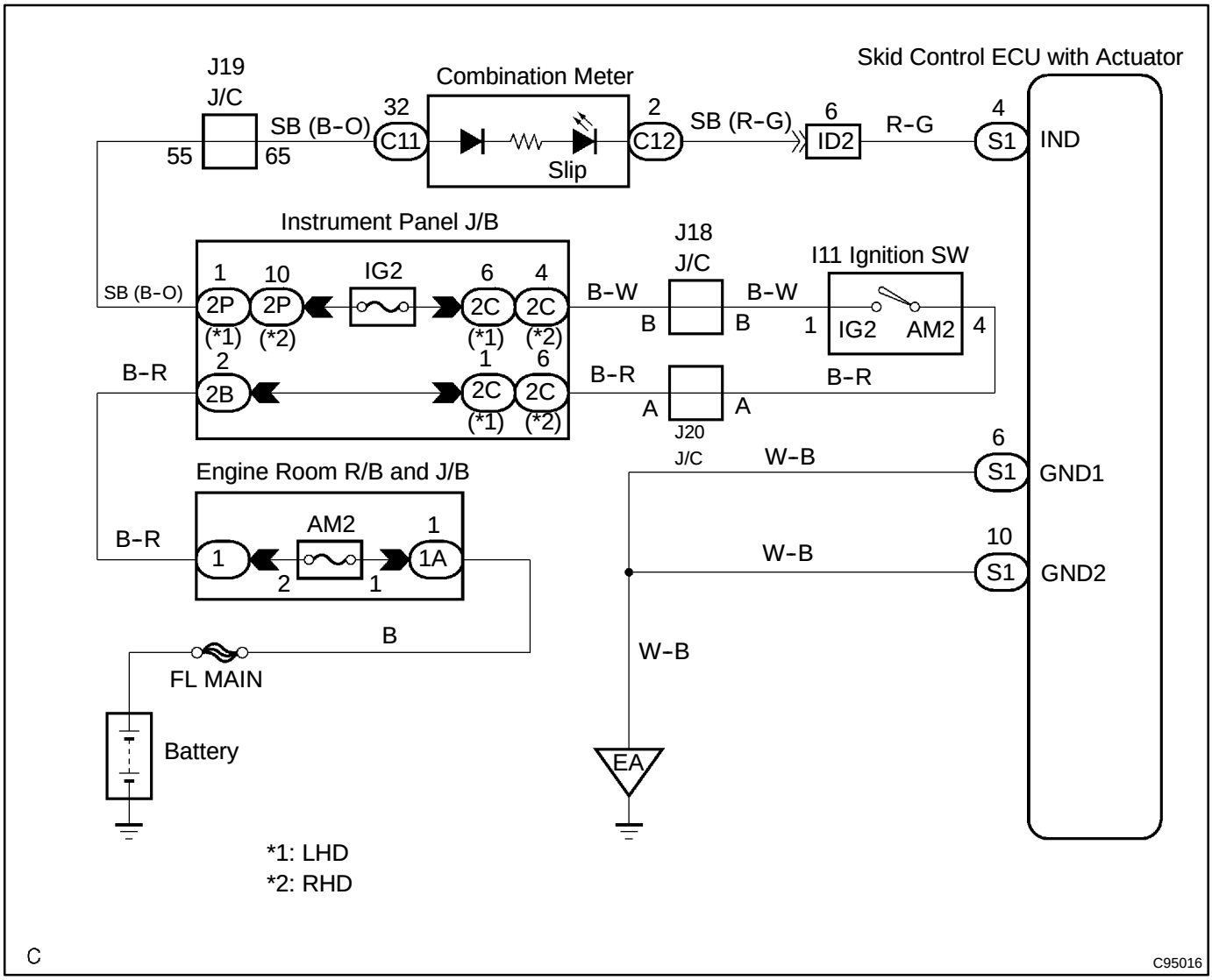
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

SLIP INDICATOR LIGHT CIRCUIT

CIRCUIT DESCRIPTION

The SLIP indicator blinks during TRC & VSC operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(SLIP INDICATOR LIGHT)

(a) Check that "ON" and "OFF" of the SLIP indicator light can be shown on the combination meter with the hand-held tester.

OK → Go to step 3

NG

2	INSPECT SLIP INDICATOR LIGHT

(a) See combination meter troubleshooting on page 71-1.

NG → REPAIR OR REPLACE COMBINATION METER ASSEMBLY

OK

3	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - COMBINATION METER)

(a) Check for open and short circuit in harness and connector between terminal IND of skid control ECU and combination meter (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

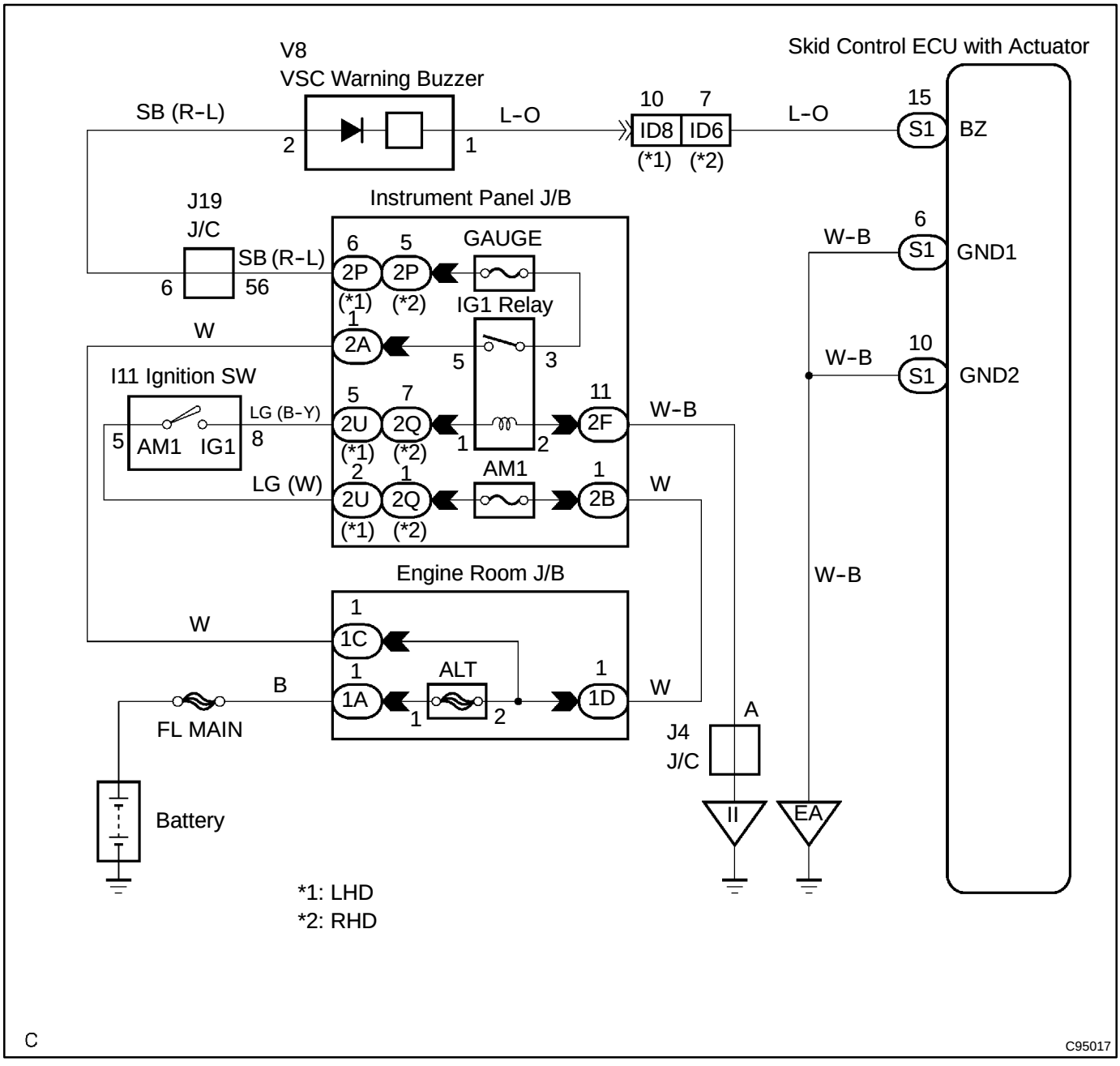
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

SKID CONTROL BUZZER CIRCUIT

CIRCUIT DESCRIPTION

The skid control buzzer sounds during VSC operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using the hand-held tester.

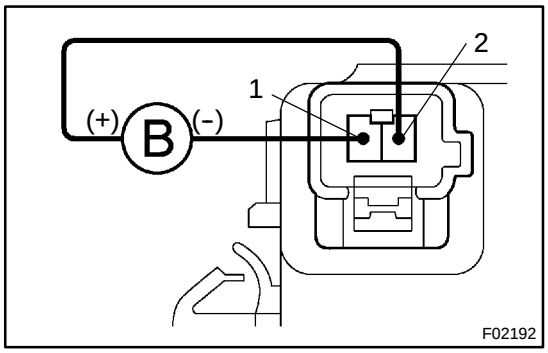
1	PERFORM ACTIVE TEST BY HAND-HELD TESTER(SKID CONTROL BUZZER)

(a) Check that skid control buzzer sounds "ON" and "OFF" with the hand-held tester.

OK → CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

NG

2	INSPECT SKID CONTROL BUZZER ASSY



(a) Disconnect the skid control buzzer connector.
(b) Apply battery positive voltage to the terminals 1 and 2 of skid control buzzer connector, check that the buzzer sounds.

NG → REPLACE SKID CONTROL BUZZER ASSY

OK

3	CHECK HARNESS AND CONNECTOR(SKID CONTROL BUZZER - SKID CONTROL ECU)

(a) Check for open and short circuit in harness and connector between terminal BZ of skid control ECU and skid control buzzer (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

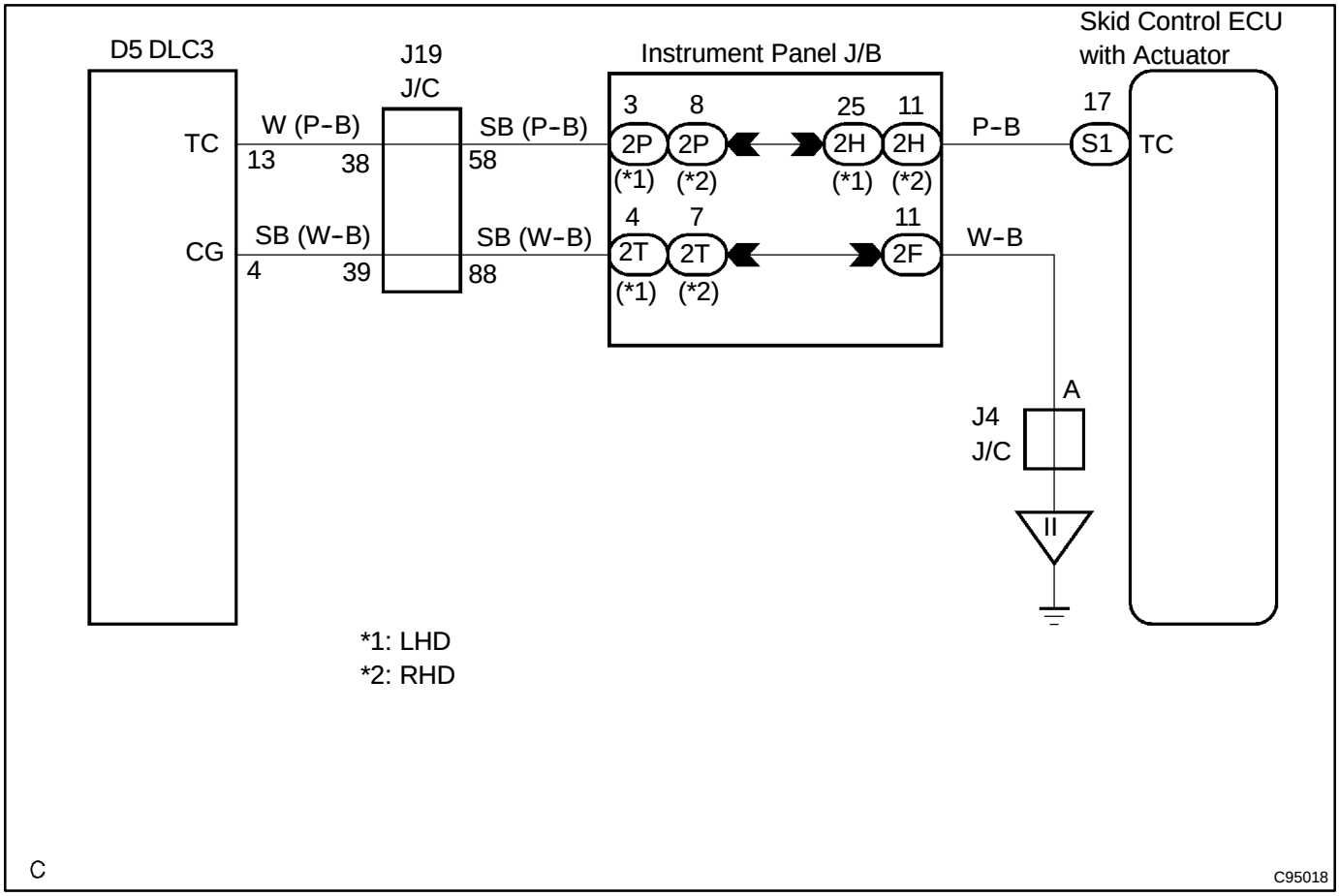
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

TC TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

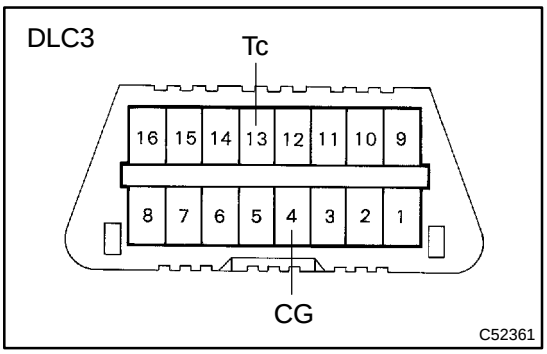
Connecting terminals Tc and CG of the DLC3 causes the ECU to display the DTC by flashing the ABS warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT DLC3 TERMINAL VOLTAGE(Tc TERMINAL)



(a) Turn the ignition switch to ON.
(b) Measure voltage between terminals Tc and CG of DLC3.
OK:
Voltage: 10 - 14 V

OK	Go to step 3

NG

2	CHECK HARNESS AND CONNECTOR(DLC3 - BODY GROUND)

(a) Check for open and short circuit in harness and connector between terminal CG of the DLC3 and body ground (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK HARNESS AND CONNECTOR(SKID CONTROL ECU - DLC3)

(a) Check for open and short circuit in harness and connector between terminal Tc of the skid control ECU and DLC3 (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

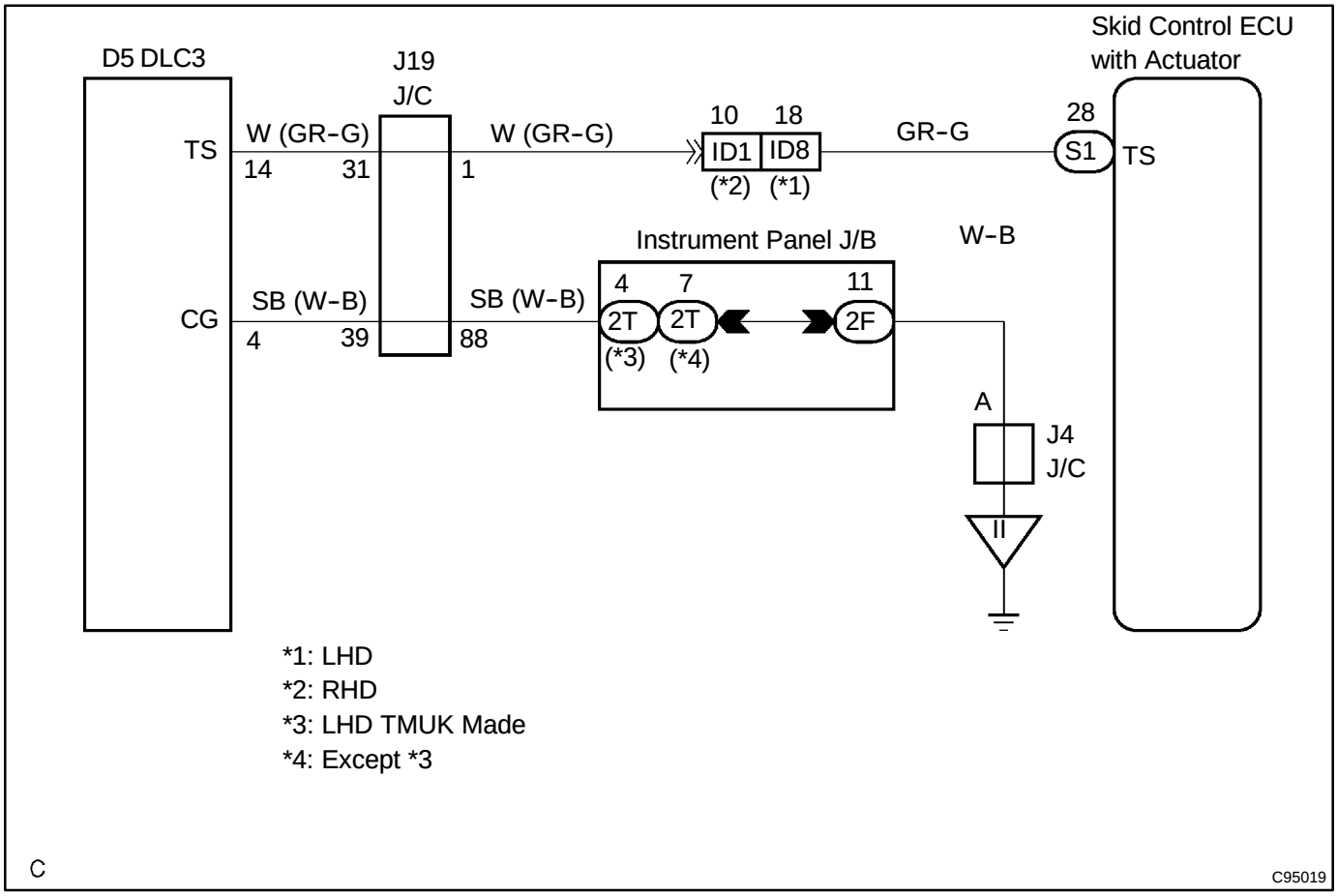
CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

TS TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

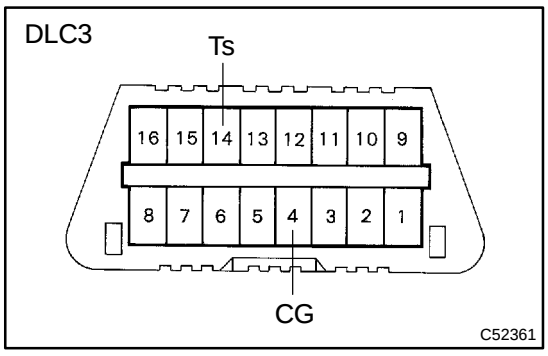
The sensor check circuit detects abnormalities in the sensor signal which cannot be detected with the DTC check.
Connecting terminals Ts and CG of the DLC3 starts the check.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT DLC3 TERMINAL VOLTAGE(Ts TERMINAL)



(a) Turn the ignition switch to ON.
(b) Measure voltage between terminals Ts and CG of DLC3.
OK:
Voltage: 10 - 14 V

OK	Go to step 3

NG
COROLLA REPAIR MANUAL (RM925E)

2	CHECK HARNESS AND CONNECTOR(DLC3 - BODY GROUND)

(a) Check for open and short circuit in harness and connector between terminal Ts of the DLC3 and skid control ECU (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK AND REPAIR HARNESS AND CONNECTOR(SKID CONTROL ECU - DLC3)

(a) Check for open and short circuit in harness and connector between terminal CG of the DLC3 and body ground (See page 01-30).

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE SKID CONTROL ECU ASSY (See page 01-30)

ELECTRONIC CONTROLLED AUTOMATIC TRANSAXLE[ECT]

HOW TO PROCEED WITH TROUBLESHOOTING

050UK-03

When using hand-held tester, troubleshoot in accordance with the procedure on the following pages.

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-762)

3	Connect the hand-held tester to DLC3

4	Check and Clear DTC and Freeze Frame Data (See page 05-763)

5	Visual Inspection

6	Setting the Check Mode Diagnosis (See page 05-763)

7	Problem Symptom Confirmation

- Symptom does not occur: Go to step 8
- Symptom occur: Go to step 17

8	Symptom Simulation (See page 01-25)

9	DTC Check (See page 05-763)

- DTC is not output: Go to step 10
- DTC is output: Go to step 18

10	Basic Inspection (See page 05-763)

NG → Go to step 19

OK

11	Mechanical System Test (See page 05-763)

NG → Go to step 16

OK

12	Manual Shifting Test (See page 05-763)

NG → Go to step 14

OK

13	Problem Symptoms Table Chapter 1 (See page 05-776)

NG → Go to step 18

OK

14	Problem Symptoms Table Chapter 2 (See page 05-776)

NG → Go to step 16

OK

15	Problem Symptoms Table Chapter 3 (See page 05-776)

NG

16	Part Inspection

→ Go to step 19

17	DTC Chart (See page 05-773)

18	Circuit Inspection (See page 05-781)

19	Identification of Problem

20	Repair

21	Confirmation Test

End

When not using hand-held tester, troubleshoot in accordance with the procedure on the following pages.

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-762)

3	Check and Clear DTCs (See page 05-763)

4	Problem Symptom Confirmation

- Symptom does not occur: Go to step 5
- Symptom occur: Go to step 6

5	Symptom Simulation (See page 01-20)

6	DTC Check (See page 05-763)

- DTC is not output: Go to step 7
- DTC is output: Go to step 14

7	Basic Inspection (See page 05-763)

NG → Go to step 16

OK

8	Mechanical System Test (See page 05-763)

NG → Go to step 13

OK

9	Manual Shifting Test (See page 05-763)

NG → Go to step 11

OK

10	Problem Symptoms Table Chapter 1 (See page 05-776)

NG → Go to step 15

OK

11	Problem Symptoms Table Chapter 2 (See page 05-776)

NG → Go to step 13

OK

12	Problem Symptoms Table Chapter 3 (See page 05-776)

NG

13	Part Inspection

→ Go to step 16

14	DTC Chart (See page 05-773)

15	Circuit Inspection (See page 05-781)

16	Identification of Problem

17	Repair

18	Confirmation Test

End

050UL-03

CUSTOMER PROBLEM ANALYSIS CHECK

Transmission Control System Check Sheet

Inspector's Name :

Customer's Name		Registration No.	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	Odometer Reading	km mile

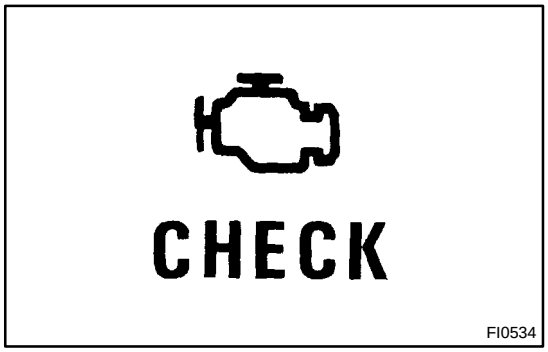
Date Problem Occurred	/ /
How Often Does Problem Occur?	j Continuous j Intermittent (times a day)

Symptoms	j Vehicle does not move (j Any range j Particular range)
	j No up-shift (j 1st → 2nd j 2nd → 3rd j 3rd → O/D)
	j No down-shift (j O/D → 3rd j 3rd → 2nd j 2nd → 1st)
	j Lock-up malfunction
	j Shift point too high or too low
	j Harsh engagement (j N → D j Lock-up j Any drive range)
	j Slip or shudder
	j No kick-down
	j Others ( )

Check Item	MIL	☐ Normal ☐ Remains ON

DTC Check	1st Time	☐ Normal code ☐ Malfunction code (DTC)
	2nd Time	☐ Normal code ☐ Malfunction code (DTC)

050UP-03



PRE-CHECK

1. DIAGNOSIS SYSTEM

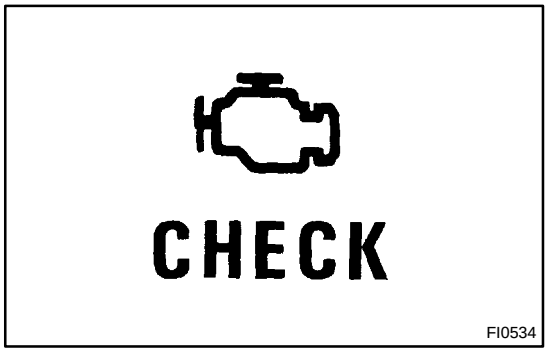
(a) Description

(1) When troubleshooting Multiplex (M-OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the hand-held tester to the vehicle, and read off various data output from the vehicle's ECM.
The vehicle's on-board computer lights up the MIL on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to the MIL lighting up when a malfunction is detected, the applicable DTCs are recorded in the ECM memory.
If the malfunction only occurs in 3-trip, the MIL goes off but the DTCs remain recorded in the ECM memory.

(2) To check the DTCs, connect a hand-held tester to DLC3 on the vehicle or read the number of blinks of the MIL when TC and CG terminals on the DLC3 are connected. The hand-held tester also enables you to erase the DTCs and activate the several actuators and check freeze frame data and various forms of engine data (For instruction book).

(3) The diagnosis system operates in normal mode during normal vehicle use, and also has a check (test) mode for technicians to simulate malfunction symptoms and perform troubleshooting. Most DTCs use 2-trip detection logic (*) to prevent erroneous detection and ensure thorough malfunction detection. By switching the ECM to check (test) mode using hand-held tester when troubleshooting, the technician can cause the MIL to light up for a malfunction that is only detected once or momentarily.

(4) *2-trip detection logic:
When a logic malfunction is first detected, the malfunction is temporarily stored in the ECM memory. If the same malfunction is detected again during the 2nd test drive, this 2nd detection causes the MIL to light up.



2. INSPECT DIAGNOSIS (NORMAL MODE)

(a) Check the MIL.

(1) The MIL comes on when the ignition switch is turned ON and the engine is not running.

HINT:

If the MIL does not light up, troubleshoot the combination meter.

(2) When the engine is started, the MIL should go off. If the light remains on, the diagnosis system has detected a malfunction or abnormality in the system.

(b) Check the DTC, Using hand-held tester.

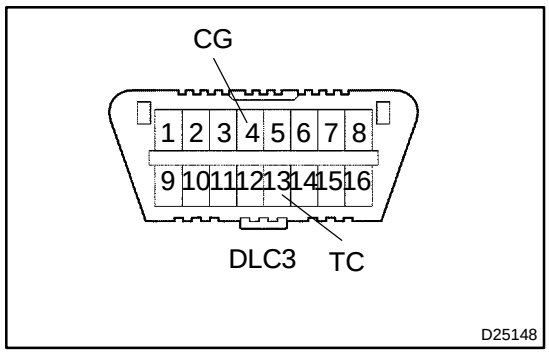
NOTICE:

Hand-held tester only:

When the diagnostic system is switched from normal mode to check (test) mode, it erases all DTCs and freeze frame data recorded in normal mode. So before switching modes, always check the DTCs and freeze frame data, and note them down.

(1) Use the hand-held tester to check the DTCs and instructions, see the hand-held tester instruction book.

(2) See page 05-773 to confirm the details of the DTCs.

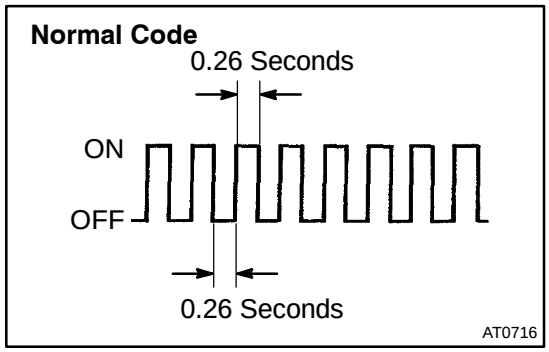


(c) Check the DTC (Not using hand-held tester).

(1) Turn the ignition switch ON, but do not start the engine.

(2) Using SST, connect terminals 13 (TC) and 4 (CG) of DLC3.

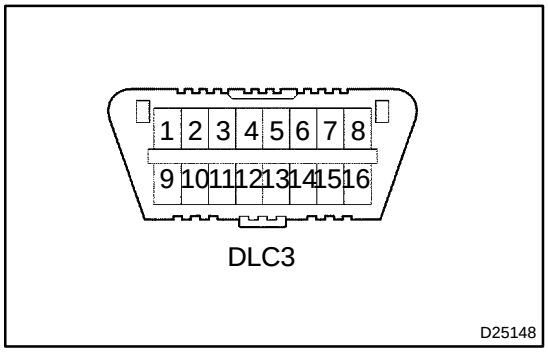
SST 09843-18040



(3) Read the DTC indicated by the number of times the MIL blinks.

HINT:

If the system is operating normally, the light will blink 2 times per second.



(d) Inspect the DLC3.

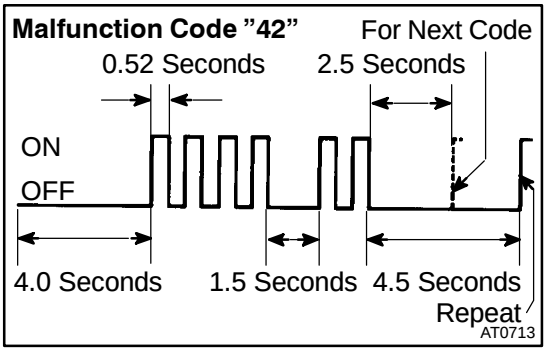
(1) The vehicle's ECM uses ISO 14230 for communication. The terminal arrangement of DLC3 complies with SAE J1962 and matches the ISO 14230 format.

Terminal No.	Connection	Voltage or Resistance	Condition
7	Bus ⊕ Line	Pulse generation	During transaxle
4	Chassis Ground	↔ Body Ground / 1 Ω or less	Always
16	Battery Positive	↔ Body Ground / 9 – 14 V	Always

HINT:

If your display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of hand-held tester to DLC3, turned the ignition switch ON and operated the hand-held tester, there is a problem on the vehicle side or tool side.

- If communication is normal when the tool is connected to another vehicle, inspect DLC3 on the original vehicle.
- If communication is still not possible when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Department listed in the tool's instruction manual.



(2) The malfunction code is indicated, as shown in the chart on the left (DTC "42" is shown as an example).

HINT:

When 2 or more malfunction codes are stored in memory, the lower-numbered code is displayed first.

3. INSPECT DIAGNOSIS (CHECK MODE)

HINT:

Hand-held tester only: Compared to the normal mode, the check mode has high sensing ability to detect malfunctions. Furthermore, the same diagnostic items which are detected in Normal mode can also be detected in Check mode.

(a) Check the DTC.

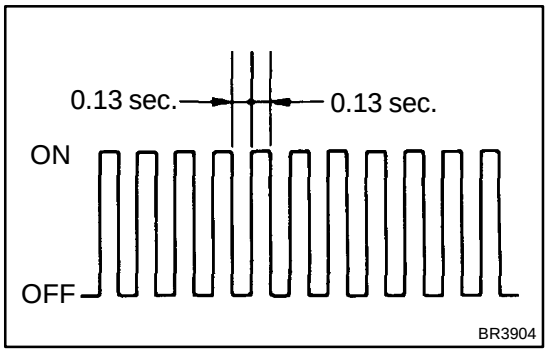
(1) Check the initial conditions.

- Battery voltage 11 V or more
- Throttle valve fully closed
- Shift lever in P range
- Air conditioning switched OFF

(2) Turn the ignition switch OFF.

(3) Prepare a hand-held tester.

(4) Connect the hand-held tester to DLC3.
(5) Turn the ignition switch ON and switch the hand-held tester ON.



(6) Switch the hand-held tester from Normal mode to Check mode (Check that the MIL flashes).
(7) Start the engine (MIL goes out after the engine starts).
(8) Simulate the conditions of the malfunction described by the customer.

NOTICE:
Leave the ignition switch ON until you have checked the DTCs, etc.

(9) After simulating the malfunction conditions, use the hand-held tester diagnosis selector to check the DTCs and freeze frame data, etc.

HINT:
Take care not to turn the ignition switch OFF, as turning it off switches the diagnosis system from Check mode to Normal mode, all DTCs etc. are erased.

(10) After checking the DTC, inspect the applicable circuit.

(b) When using hand-held tester:
Clear the DTC.
The following operation will erase the DTC and freeze frame data. Operate a hand-held tester to erase the codes.

(c) When not using hand-held tester:
Clear the DTC.
Remove the EFI fuse from engine room R/B No. 1 for 10 seconds or more.

4. PROBLEM SYMPTOM CONFIRMATION

(a) Taking into consideration the results of the customer problem analysis, try to reproduce the symptoms of the trouble. If the problem is that the transaxle does not shift up, shift down, or the shift point is too high or too low conduct the following road test referring to the automatic shift schedule and simulate the problem symptoms.

5. ROAD TEST

NOTICE:
Conduct the test at normal operating ATF temperature 50 - 80 ˚C (122 - 176 ˚F).

(a) D range test
Shift into the D range and fully depress the accelerator pedal and check the following points:
(1) Check up-shift operation.
Check to see that 1 → 2, 2 → 3 and 3 → O/D up-shift takes place, and that the shift points conform to the automatic shift schedule (See page 03-43).

HINT:
- O/D Gear Up-shift Prohibition Control (1. Water temp. is 60 ˚C (140 ˚F) or less. 2. If there is a 10 km/h (6 mph) difference between the set cruise control speed and vehicle speed.)
- O/D Gear Lock-up Prohibition Control (1. Brake pedal is depressed. 2. Water temp. is 60 ˚C (140 ˚F) or lower)

(2) Check for shift shock and slip.
Check for shock and slip at the 1 → 2, 2 → 3 and 3 → O/D up-shift.
(3) Check for abnormal noises and vibration.
Run in D range lock-up or O/D gear and check for abnormal noises and vibration.

HINT:
The check for the cause of abnormal noises and vibration must be done very thoroughly as it could also be sure to loss of balance in the differential, torque converter, etc.

(4) Check kick-down operation.
While running in the D range, 2nd, 3rd and O/D gears, check to see that the possible kick-down vehicle speed limits for 2 → 1, 3 → 2 and O/D → 3 kick-downs conform to those indicated in the automatic shift schedule (See page 03-43).
(5) Check for abnormal shock and slip at kick-down.
(6) Check the lock-up mechanism.
- Drive in D range O/D gear, at a steady speed (lock-up ON) of about 60 km/h (37 mph).
- Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

If there is a big jump in engine speed, there is no lock-up.

(b) 2 range test
Shift into the 2 range and fully depress the accelerator pedal and check the following points:
(1) Check up-shift operation.
Check to see that the 1 → 2 up-shift takes place and that the shift point conforms to the automatic shift schedule (See page 03-43).

HINT:
There is no O/D up-shift and lock-up in the 2 range.

(2) Check engine braking.
While running in the 2 range and 2nd gear, release the accelerator pedal and check the engine braking effect.
(3) Check for abnormal noises during acceleration and deceleration, and for shock at up-shift and down-shift.

(c) L range test
Shift into the L range and fully depress the accelerator pedal and check the following points:
(1) Check no up-shift.
While running in the L range, check that there is no up-shift to 2nd gear.
(2) Check engine braking.
While running in the L range, release the accelerator pedal and check the engine braking effect.
(3) Check for abnormal noises during acceleration and deceleration.

(d) R range test
Shift into the R range and fully depress the accelerator pedal and check for slipping.

CAUTION:
Before conducting this test ensure that the test area is free from people and obstruction.

(e) P range test
Stop the vehicle on a grade (more than 5˚) and after shifting into the P range, release the parking brake. Then, check to see that the parking lock pawl holds the vehicle in place.

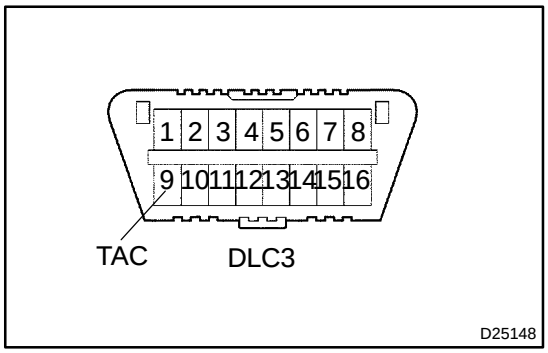
6. MECHANICAL SYSTEM TESTS

(a) Measure the stall speed.

The object of this test is to check the overall performance of the transaxle and engine by measuring the stall speeds in the D and R ranges.

NOTICE:

- **Do the test at normal operating ATF temperature 50 - 80 °C (122 - 176 °F).**
- **Do not continuously run this test for longer than 5 seconds.**
- **To ensure safety, do this test in a wide, clear level area which provides good traction.**
- **The stall test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is doing the test.**



(1) Chock the 4 wheels.

(2) Connect a hand-held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843-18030

(3) Fully apply the parking brake.

(4) Keep your left foot pressing firmly on the brake pedal.

(5) Start the engine.

(6) Shift into the D range. Press all the way down on the accelerator pedal with your right foot.

(7) Quickly read the stall speed at this time.

Stall speed: 2,450 ± 150 rpm

(8) Do the same test in the R range.

Stall speed: 2,450 ± 150 rpm

Evaluation:

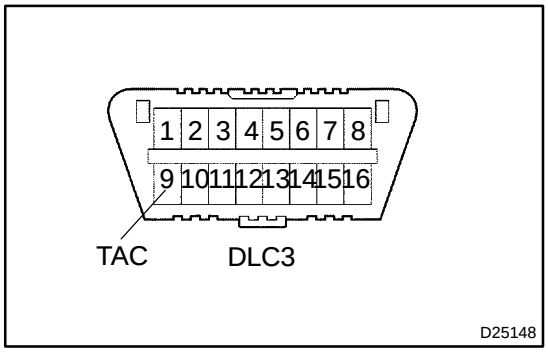
Problem	Possible cause
(a) Stall speed low in D and R ranges	• Engine output may be insufficient • Stator one-way clutch not operating properly HINT: If more than 600 rpm below the specified value, the torque converter could be faulty.
(b) Stall speed high in D range	• Line pressure too low • Forward clutch slipping • One-way clutch No.2 not operating properly • U/D one-way clutch not operating properly
(c) Stall speed high in R range	• Line pressure too low • Reverse clutch slipping • 1st and reverse brake slipping • U/D brake slipping
(d) Stall speed high in D and R ranges	• Line pressure too low • Improper fluid level • U/D one-way clutch not operating properly

(b) Measure the time lag.

(1) When the shift lever is shifted while the engine is idling, there will be a certain time lapse or lag before the shock can be felt. This is used for checking the condition of the O/D direct clutch, forward clutch, and 1st and reverse brake.

NOTICE:

- **Do the test at normal operating ATF temperature 50 - 80 °C (122 - 176 °F).**
- **Be sure to allow 1 minute interval between tests.**
- **Take 3 measurements and take the average value.**



(2) Chock the 4 wheels.

(3) Connect a hand-held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843-18030

(4) Start engine and check idle speed.

Idle speed: 650 ± 50 rpm (In N range and A/C OFF)

(5) Shift the lever from N to D range. Using a stop watch, measure the time from when the lever is shifted until the shock is felt.

Time lag: N → D less than 1.2 seconds

(6) In the same way, measure the time lag for N → R.

Time lag: N → R less than 1.5 seconds

Evaluation (If N → D or N → R time lag is longer than the specified):

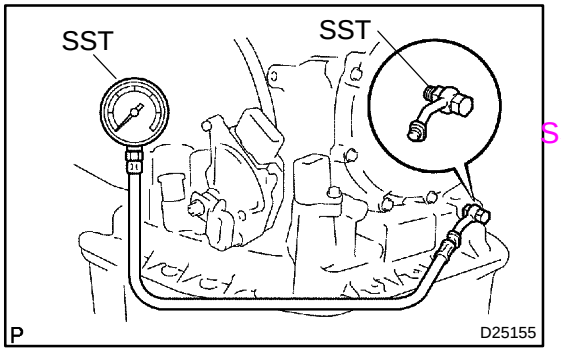
Problem	Possible cause
N → D time lag is longer	• Line pressure too low • Forward clutch worn • U/D one-way clutch not operating properly
N → R time lag is longer	• Line pressure too low • Improper fluid level • Direct clutch worn • 1st and reverse brake worn

7. HYDRAULIC TEST

(a) Measure the line pressure.

NOTICE:

- **Do the test at normal operation ATF temperature 50 - 80 °C (122 - 176 °F).**
- **The line pressure test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stopper outside the vehicle while the other is doing the test.**
- **Be careful to prevent SST's hose from interfering with the exhaust pipe.**



(1) Warm up the ATF.
(2) Remove the test plug on the rear side of the transaxle case and connect SST.

SST 09992-00095 (09992- 00231, 09992-00271)

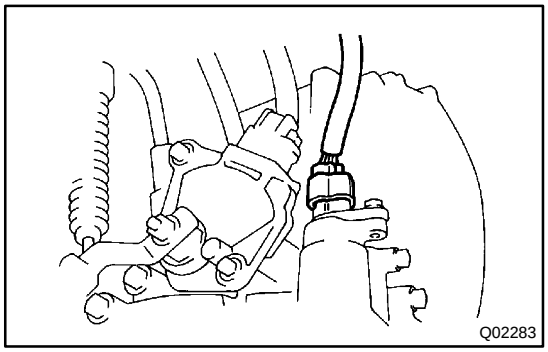
(3) Fully apply the parking brake and chock the 4 wheels.
(4) Connect a hand-held tester to DLC3.
(5) Start the engine and check idling speed.
(6) Keep your left foot pressing firmly on the brake pedal and shift into D range.
(7) Measure the line pressure when the engine is idling.
(8) Depress the accelerator pedal all the way down. Quickly read the highest line pressure when engine speed reaches stall speed.
(9) In the same way, do the test in R range.

Specified line pressure:

Condition	D range kPa (kgf/cm^2, psi)	R range kPa (kgf/cm^2, psi)
Idling	382 - 422 (3.9 - 4.3, 55 - 61)	647 - 760 (6.6 - 7.8, 94 - 111)
Stall	728 - 859 (7.42 - 8.76, 106 - 125)	1,511 - 1,755 (15.4 - 17.9, 219 - 254)

Evaluation:

Problem	Possible cause
If the measured values at all ranges are higher	• SLT solenoid valve defective • Regulator valve detective
If the measured values at all ranges are lower	• SLT solenoid valve defective • Regulator valve defective • Oil pump defective • O/D direct clutch defective
If pressure is low in the D range only	• D range circuit fluid leakage • Forward clutch defective
If pressure is low in the R range only	• R range circuit fluid leakage • Direct clutch defective • 1st and reverse brake defective



8. MANUAL SHIFTING TEST

HINT:

By this test, it can be determined whether the trouble is within the electrical circuit or is a mechanical problem in the transaxle.

(a) Disconnect the transmission wire connector.

(b) Inspect the manual driving operation.

Check that the shift and gear positions correspond to the table below.

While driving, shift through the L, 2 and D ranges.

Check that the gear change corresponds to the shift range.

Shift range	Gear position
D	O/D
2	3rd
L	1st
R	Reverse
P	Pawl Lock

HINT:

If the L, 2 and D range gear positions are difficult to distinguish, do the above read test.

If any abnormality is found in the above test, the problem is in the transaxle itself.

(c) Connect the transmission wire connector.

(d) Cancel out the DTC.

9. ENGINE OPERATING CONDITION

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value differs from those listed here. Do not depend solely on the "Normal Condition" here when deciding whether or not the part is faulty.

Hand-held tester display	Measurement Item	Normal Condition*
VEHICLE SPD	Vehicle Speed	Vehicle stopped: 0 km/h (0 mph)
ATF	ATF Condition	OK
AT FLUID TEMP	ATF Temperature Sensor Value	After stall test: 80 _C (176 _F)
SPD (NT)	Input Revolution	Idling: 650 - 750 rpm
SHIFT	Gear Position	Gear Position
STOP LIGHT SW	Stop Light Switch	Brake pedal depressed: ON Brake pedal released: OFF
NSW	Shift Range	P or N range: ON Except P or N range: OFF
REVERSE	Shift Range	R range: ON Except R range: OFF
DRIVE	Shift Range	D range: ON Except D range: OFF
2ND	Shift Range	2 range: ON Except 2 range: OFF
LOW	Shift Range	L range: No Except L range: OFF
SOLENOID (SLT)	SLT Solenoid Valve Operating Condition	Accelerator pedal fully open: ON Accelerator pedal fully closed: OFF

050VP-03

DIAGNOSTIC TROUBLE CODE CHART

If a DTC is displayed during the DTC check, check the circuit listed in the table below and proceed to the page given.

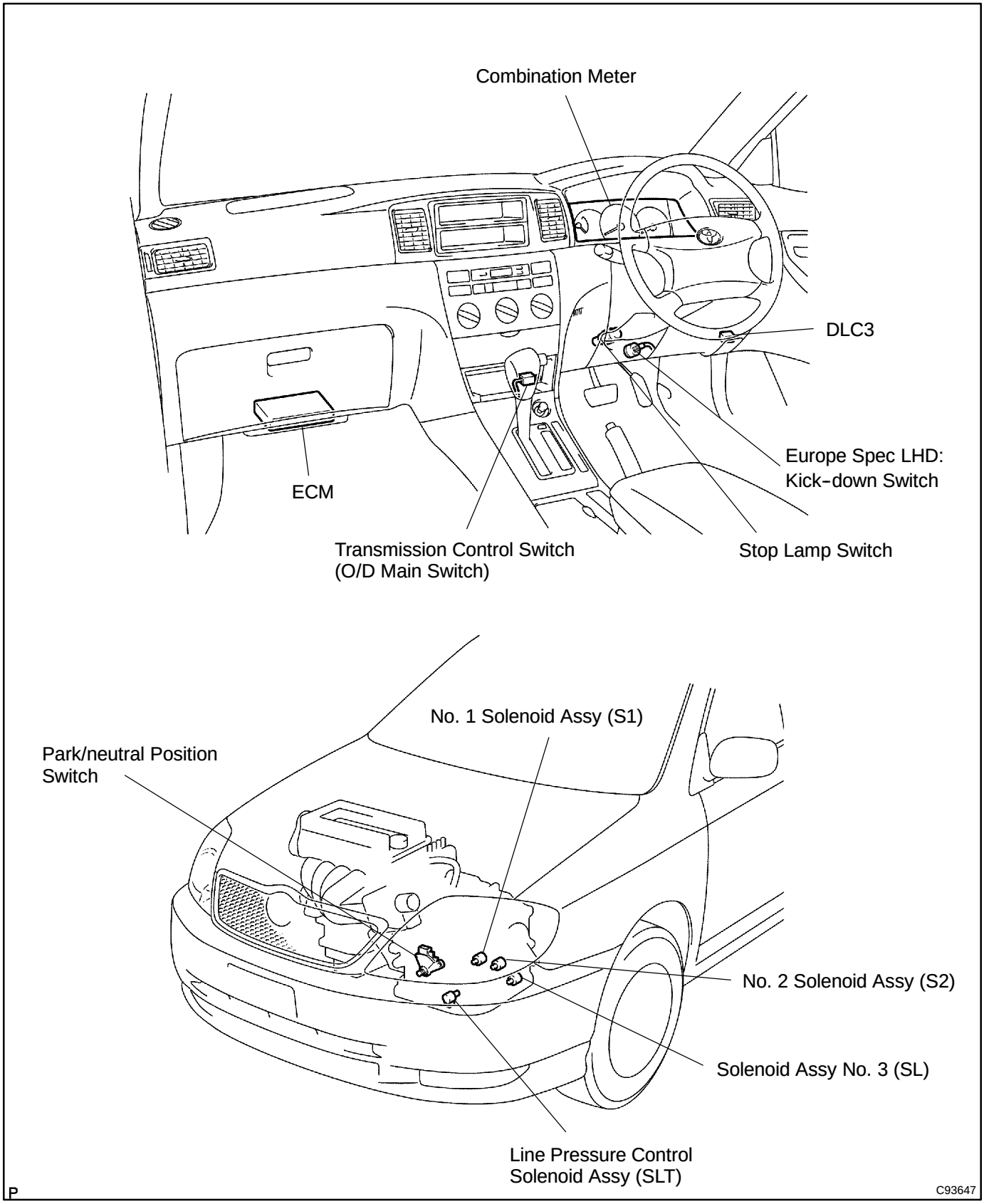
DTC No. (See Page)	Detection Item	Trouble Area	MIL*1	Memory*2
P0500/42 (05-781)	Vehicle Speed Sensor Malfunction	S Combination meter S Wire harness S ECM S Automatic transaxle (clutch, brake or gear etc.)	f	f
P0750/62 (05-783)	S1 Solenoid Valve Malfunction	S No. 1 solenoid assy (S1) S Valve body S Automatic transaxle (clutch, brake or gear etc.)	f	f
P0753/62 (05-784)	S1 Solenoid Valve Electrical Malfunction	S Transmission wire S Wire harness S No. 1 solenoid assy (S1) S ECM	f	f
P0755/63 (05-788)	S2 Solenoid Valve Malfunction	S No. 2 solenoid assy (S2) S Valve body S Automatic transaxle (clutch, brake or gear etc.)	f	f
P0758/63 (05-784)	S2 Solenoid Valve Electrical Malfunction	S Transmission wire S Wire harness S No. 2 solenoid assy (S2) S ECM	f	f
P0770/64 (05-789)	SL Solenoid Valve Malfunction	S Solenoid assy No. 3 (SL) S Valve body S Torque converter clutch S Automatic transaxle (clutch, brake or gear etc.)	f	f
P0773/64 (05-790)	SL Solenoid Valve Electrical Malfunction	S Transmission wire S Wire harness S Solenoid assy No. 3 (SL) S ECM	f	f
P1520/95 (05-793)	Stop Light Switch Malfunction	S Wire harness S Stop light switch S ECM	f	f
P1760/77 (05-795)	Linear Solenoid for Line Pressure Control Malfunction (SLT)	S Transmission wire S Wire harness S Line pressure control solenoid assy (SLT) S ECM	f	f
P1780/97 (05-799)	Park/neutral position Switch Malfunction	S Wire harness S Park/neutral position switch S ECM	f	f

HINT:

- *1: " f " mark means MIL light up. "×" mark means MIL does not light up.
- *2: " f " mark means ECM memorizes the malfunction code if the ECM detects the DTC detection condition.
- This DTC may be output when the clutch, brake and gear components etc. inside the automatic transaxle are damaged.

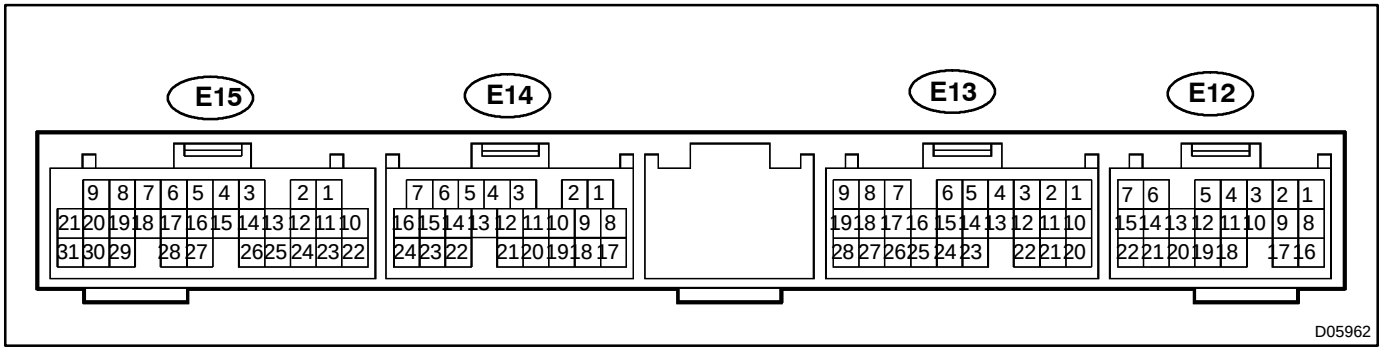
050V8-03

LOCATION



0571Y-01

TERMINALS OF ECM



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
ODMS (E12-7) ↔ E1 (E14-17)	LG ↔ BR	IG ON	10 - 14
		IG ON and press continuously O/D main switch	Below 1
R (E13-2) ↔ E1[3] (E14-17)	SB (R-B) ↔ BR	IG ON and shift lever R range	8 - 14
		IG ON and shift lever other than R range	Below 1.5
2 (E13-3) ↔ E1 (E14-17)	LG-R ↔ BR	IG ON and shift lever 2 range	8 - 14
		IG ON and shift lever other than 2 range	Below 1.5
KD*3 (E13-4) ↔ E1 (E14-17)	P-G*3 ↔ BR	IG ON and kick-down switch ON	Below 1
		IG ON and kick-down switch OFF	10 - 14
STP (E13-6) ↔ E1 (E14-17)	SB (G-W) ↔ BR	IG ON and brake pedal depressed	8 - 14
		IG ON and brake pedal released	Below 1.5
L (E13-12) ↔ E1 (E14-17)	LG-B ↔ BR	IG ON and shift lever L range	8 - 14
		IG ON and shift lever other than L range	Below 1.5
NSW (E13-13) ↔ E1 (E14-17)	SB (B-R)*1 SB (W)*2 ↔ BR	Shift lever P or N range, ignition key is START range	Below 1.5
ODLP (E13-19) ↔ E1 (E14-17)	W (LG) ↔ BR	IG ON and O/D OFF indicator light lights up	Below 3
		IG ON and O/D OFF indicator light goes off	9 - 14
SLT+ (E15-6) ↔ SLT- (E15-5)	R-W ↔ P	IG ON	8 - 14
S1 (E15-8) ↔ E1 (E14-17)	R-Y ↔ BR	IG ON	8 - 14
		1st or 2nd gear	8 - 14
		3rd or O/D gear	Below 1.5
SL (E15-9) ↔ E1 (E14-17)	L-W ↔ BR	IG ON	Below 1.5
		Vehicle driving under lock-up position	8 - 14
S2 (E15-20) ↔ E1 (E14-17)	L ↔ BR	IG ON	Below 1.5
		2nd or 3rd gear	8 - 14
		1st or O/D gear	Below 1.5
SPD (E13-22) ↔ E1 (E14-17)	W (V-W) ↔ BR	IG ON and rotate driving wheel slowly	Pulse generation

*1: TMC Made
*2: TMUK Made
*3: Europe LHD

050VA-03

PROBLEM SYMPTOMS TABLE

If a normal code is displayed during the diagnostic trouble code check but the trouble still occurs, check the circuits for each symptom in the order given in the charts on the following pages and proceed to the page given for troubleshooting.

HINT:

The Matrix Chart is divided into 3 chapters.

Chapter 1: Electronic circuit matrix chart

Chapter 2: On-vehicle repair matrix chart

Chapter 3: Off-vehicle repair matrix chart

- If the instruction "Proceed to next circuit inspection shown on matrix chart" is given in the flow chart for each circuit, proceed to the circuit with the next highest number in the table to continue the check.
- If the trouble still occurs even though there are no abnormalities in any of the other circuits, then check and replace the ECM.

Chapter 1: Electronic circuit matrix chart

Symptom	Suspect Area	See page
No up-shift (A particular gear, from 1st to 3rd gear, is not up-shifted)	ECM	01-30
No up-shift (3rd → O/D)	1. O/D main switch circuit 2. ECM	05-804 01-30
No down-shift (O/D → 3rd)	1. O/D main switch circuit 2. ECM	05-804 01-30
No down-shift (A particular gear, from 1st to 3rd gear, is not down-shifted)	ECM	01-30
No lock-up	ECM	01-30
No lock-up OFF	ECM	01-30
Shift point too high or too low	ECM	01-30
Up shift to 2nd while in L range	1. Park/neutral position switch circuit 2. ECM	05-799 01-30
Up-shift to 3rd while in 2 range	1. Park/neutral position switch circuit 2. ECM	05-799 01-30
Up-shift to O/D from 3rd while O/D main switch is OFF	1. O/D main switch circuit 2. ECM	05-804 01-30
Up-shift to O/D from 3rd while engine is cold	ECM	01-30
No kick-down	1. Kick-down switch circuit 2. ECM	05-807 01-30
Engine stalls when starting off or stopping	ECM	01-30

Chapter 2: On-vehicle repair

(L : A245E/A246E automatic transaxle repair manual Pub. No. RM847E)

Symptom	Suspect Area	See page
Does not move in any forward ranges	Off-vehicle matrix chart	-
Does not move in reverse range	Off-vehicle matrix chart	-
Does not move in any range	1. Valve body assembly (Primary regulator valve) 2. Valve body assembly (Manual valve) 3. Off-vehicle matrix chart	L L -
No-up shift (1st → 2nd)	1. Valve body assembly (1 - 2 shift valve) 2. Off-vehicle matrix chart	L -
No-up shift (2nd → 3rd)	1. Valve body assembly (2 - 3 shift valve) 2. Off-vehicle matrix chart	L -
No-up shift (3rd → O/D)	1. Valve body assembly (3 - 4 shift valve) 2. Off-vehicle matrix chart	L -
No-down shift (O/D → 3rd)	1. Valve body assembly (3 - 4 shift valve) 2. Off-vehicle matrix chart	L -
No-down shift (3rd → 2nd)	1. Valve body assembly (2 - 3 shift valve) 2. Off-vehicle matrix chart	L -
No-down shift (2nd → 1st)	1. Valve body assembly (1 - 2 shift valve) 2. Off-vehicle matrix chart	L -
Harsh engagement (N → R)	1. Valve body assembly (C_2 accumulator) 2. Off-vehicle matrix chart	L -
Harsh engagement (N → D)	1. Valve body assembly (C_1 accumulator) 2. Off-vehicle matrix chart	L -
Harsh engagement (N → L)	1. Valve body assembly (C_1 accumulator) 2. Valve body assembly (Low coast modulator valve) 3. Off-vehicle matrix chart	L L -
Harsh engagement (1st → 2nd "D" range)	1. Valve body assembly (Accumulator control valve) 2. Valve body assembly (B_2 accumulator) 3. Off-vehicle matrix chart	L L -
Harsh engagement (1st → 2nd "2" range)	1. Valve body assembly (B_2 accumulator) 2. Valve body assembly (Accumulator control valve) 3. Valve body assembly (2nd coast modulator control) 4. Off-vehicle matrix chart	L L L -
Harsh engagement (1st → 2nd → 3rd → O/D)	1. Valve body assembly (Primary regulator valve)	L
Harsh engagement (2nd → 3rd)	1. Valve body assembly (C_2 accumulator) 2. Valve body assembly (Accumulator control valve) 3. Off-vehicle matrix chart	L L -
Harsh engagement (3rd → O/D)	1. Valve body assembly (B_2 accumulator) 2. Valve body assembly (C_3 accumulator) 3. Off-vehicle matrix chart	L L -
Harsh engagement (O/D → 3rd)	1. Valve body assembly (B_4 accumulator) 2. Off-vehicle matrix chart	L -
Harsh engagement (3rd → 2nd)	1. Valve body assembly (C_2 accumulator) 2. Off-vehicle matrix chart	L -
Slip (Forward & Reverse)	1. Valve body assembly (Primary regulator valve) 2. Oil strainer 3. Off-vehicle matrix chart	L 40-22 -
Slip ("R" range, 1st, 2nd, 3rd, O/D)	Off-vehicle matrix chart	-

Symptom	Suspect Area	See page
No engine braking (1st "L" range)	1. Valve body assembly (Low coast modulator valve) 2. Off-vehicle matrix chart	L -
No engine braking (2nd "2" range)	1. Valve body assembly (2nd coast modulator valve) 2. Off-vehicle matrix chart	L -
No kick down	1. Valve body assembly (1 - 2 shift valve) 2. Valve body assembly (2 - 3 shift valve) 3. Valve body assembly (3 - 4 shift valve)	L L L
Poor acceleration	1. Valve body assembly (Primary regulator valve) 2. Off-vehicle matrix chart	L -
No lock-up	1. Valve body assembly (Lock-up relay valve) 2. Off-vehicle matrix chart	L -

Chapter 3: Off-vehicle repair
(L : A245E/A246E automatic transaxle repair manual Pub. No. RM847E)

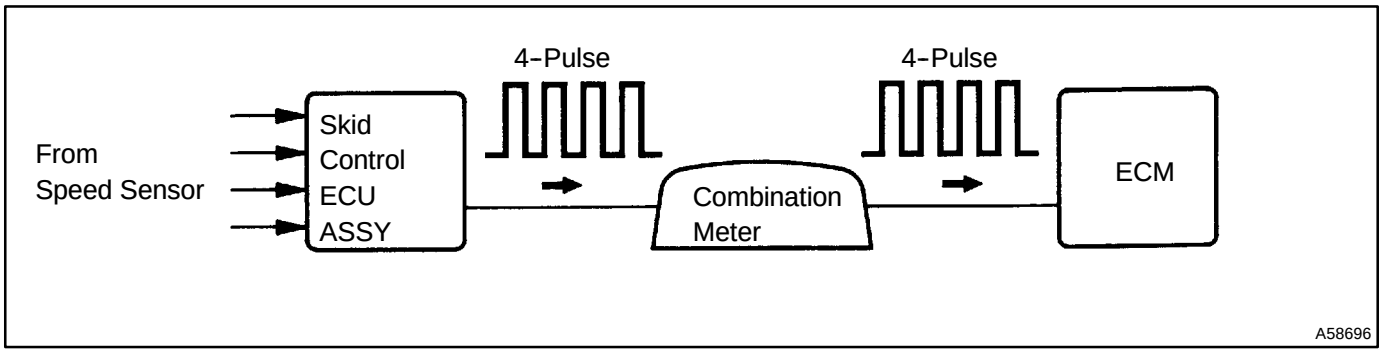
Symptom	Suspect Area	See page
Does not move in any forward ranges	Forward clutch (C_1)	L
Does not move in reverse range	1. Direct clutch (C_2) 2. 1st and reverse brake (B_3) 3. U/D brake (B_4)	L L L
Does not move in any ranges	1. Torque converter clutch 2. Oil pump 3. U/D one-way clutch (F_3) 4. Front planetary gear 5. Rear planetary gear	40-20 L L L L
No-up shift (1st → 2nd)	1. 2nd brake (B_2) 2. No.1 one-way clutch (F_1)	L L
No-up shift (2nd → 3rd)	Direct clutch (C_2)	L
No-up shift (3rd → O/D)	U/D clutch (C_3)	L
No-down shift (O/D → 3rd)	1. U/D brake (B_4) 2. U/D one-way clutch (F_3)	L L
No-down shift (3rd → 2nd)	No.1 one-way clutch (F_1)	L
No-down shift (2nd → 1st)	No.2 one-way clutch (F_2)	L
Harsh engagement (N → R)	1. Direct clutch (C_2) 2. 1st and reverse brake (B_3)	L L
Harsh engagement (N → D)	1. Forward clutch (C_1) 2. On-vehicle matrix chart	L -
Harsh engagement (N → L)	Forward clutch (C_1)	L
Harsh engagement (1st → 2nd "D" range)	1. 2nd brake (B_2) 2. No.1 one-way clutch (F_1)	L L
Harsh engagement (1st → 2nd "2" range)	1. 2nd coast brake (B_1) 2. 2nd brake (B_2) 3. No.1 one-way clutch (F_1)	L L L
Harsh engagement (2nd → 3rd)	Direct clutch (C_2)	L
Harsh engagement (3rd → O/D)	U/D clutch (C_3)	L
Harsh engagement (O/D → 3rd)	U/D brake (B_4)	L
Harsh engagement (3rd → 2nd)	Direct clutch (C_2)	L
Slip (Forward & Reverse)	1. Torque converter clutch 2. Oil pump	40-20 L
Slip ("R" range)	1. Direct clutch (C_2) 2. 1st and reverse brake (B_3)	L L
Slip (1st)	1. Forward clutch (C_1) 2. No.2 one-way clutch (F_2) 3. U/D one-way clutch (F_3)	L L L

Symptom	Suspect Area	See page
Slip (2nd)	1. Forward clutch (C_1) 2. 2nd brake (B_2) 3. No.1 one-way clutch (F_1) 4. U/D one-way clutch (F_3)	L L L L
Slip (3rd)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D one-way clutch (F_3)	L L L
Slip (O/D)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D clutch (C_3)	L L L
No engine braking (1st "L" range)	1st and reverse brake (B_3)	L
No engine braking (2nd "2" range)	2nd coast brake (B_1)	L
Poor acceleration	1. Torque converter clutch 2. Forward clutch (C_1)	40-20 L
No lock-up	Torque converter clutch	40-20
Engine stalls when starting off or stopping	Torque converter clutch	40-20

DTC P0500/42 VEHICLE SPEED SENSOR MALFUNCTION

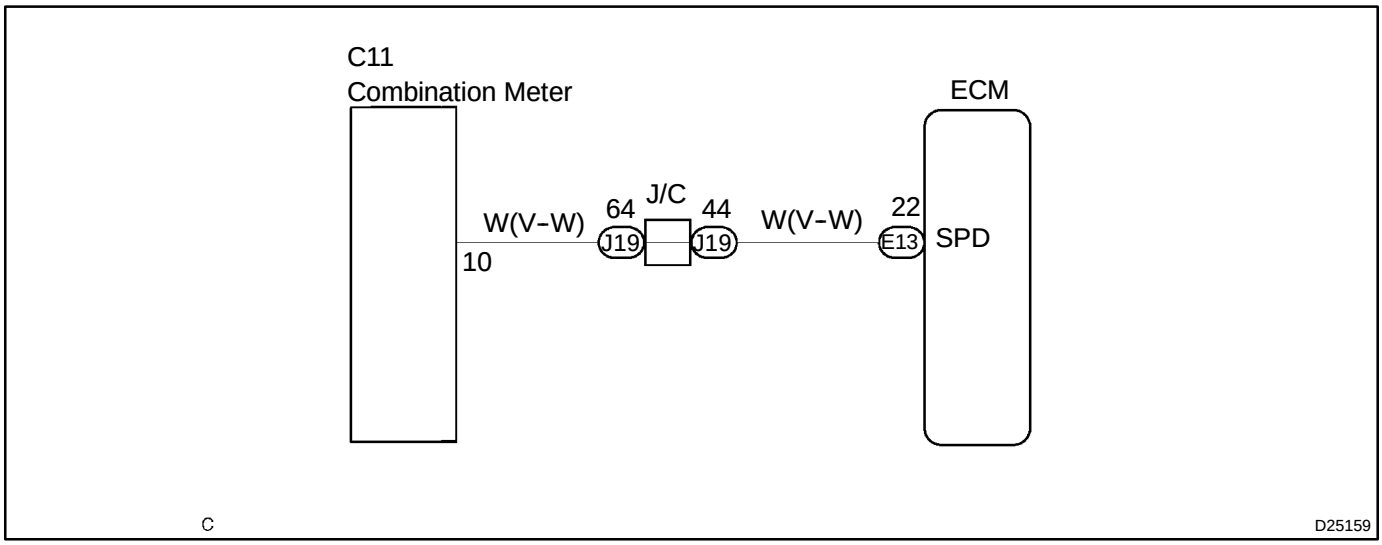
CIRCUIT DESCRIPTION

The vehicle speed sensor outputs a 4-pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the ECM. The ECM determines the vehicle speed based on the frequency of these pulse signals.



DTC No.	DTC Detecting Condition	Trouble Area
P0500/42	No vehicle speed sensor signal to ECM under following condition: (2 trip detection logic) (a) Vehicle is being driven (b) Clutch or brake slips or gear is broken (2-trip detection logic)	$ Combination meter $ Open or short in vehicle speed sensor circuit $ Vehicle speed sensor $ ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

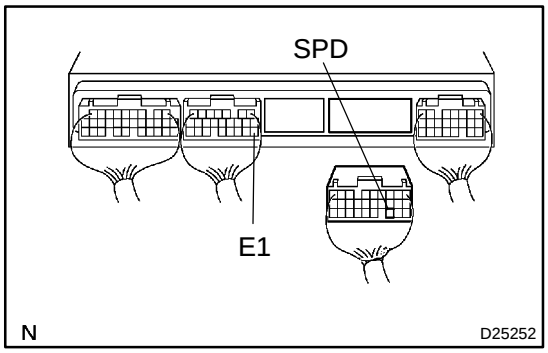
1	INSPECT COMBINATION METER ASSY

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.
HINT:
The vehicle speed sensor is operating normally if the speedometer display is normal.

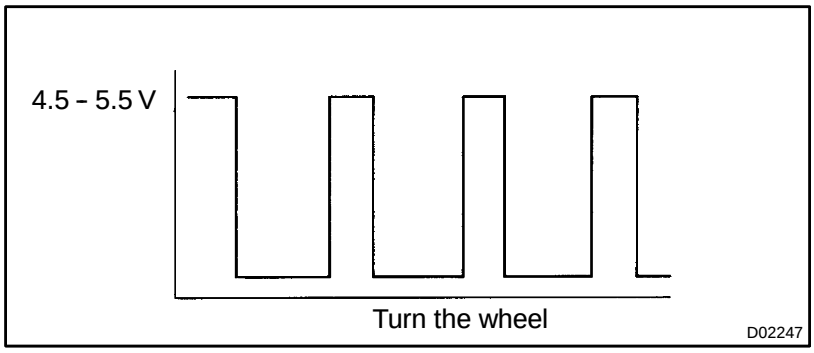
NG → CHECK COMBINATION METER ASSY

OK

2	CHECK HARNESS AND CONNECTOR(SPD - COMBINATION METER)



(a) Shift the shift lever to N range.
(b) Jack up one of the front wheels.
(c) Measure voltage between terminal SPD of ECM connector and body ground when the wheel is turned slowly.
Voltage is generated intermittently.



NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	INSPECT ECM(SPD - E1) (See page 05-775)

NG → CHECK AND REPLACE ECM (See page 01-30)

OK

CHECK AND REPLACE AUTOMATIC TRANSAXLE ASSY

DTC P0750/62 S1 SOLENOID VALVE MALFUNCTION

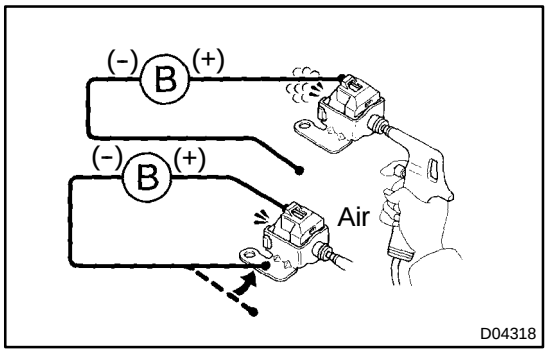
SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor and crankshaft position sensor to detect the actual gear position (1st, 2nd, 3rd or O/D gear).
Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect the mechanical trouble of the shift solenoid valves, the valve body or automatic transaxle (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0750/62	During normal driving, the gear required by the ECM does not match the actual gear (2-trip detection logic)	S No. 1 solenoid assy (S1) S Valve body S Automatic transaxle (clutch, brake or gear etc.)

INSPECTION PROCEDURE

1 INSPECT TRANSMISSION NO.1 SOLENOID ASSY(S1)



(a) Remove the S1 solenoid valve.
(b) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak the air.
OK:
Solenoid valve does not leak air.
(c) When battery voltage is supplied to the shift solenoid valve, check that the valve opens.
OK:
Solenoid valve opens.

NG → **REPLACE TRANSMISSION NO.1 SOLENOID ASSY(S1)**

OK

2 INSPECT TRANSMISSION VALVE BODY ASSY
(See chapter 2 in the problem symptoms table)

NG → **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSY(See page 40-22)**

OK

REPAIR AUTOMATIC TRANSAXLE ASSY

DTC	P0753/62	S1 SOLENOIN VALVE ELECTRICAL MALFUNCTION

DTC	P0758/63	S2 SOLENOID VALVE ELECTRICAL MALFUNCTION

CIRCUIT DESCRIPTION

Shifting from 1st to O/D is performed in combination with ON and OFF of the No. 1 and No. 2 solenoid valves controlled by ECM. If an open or short circuit occurs in either of the solenoid valves, the ECM controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

Position	NORMAL			S1 SOLENOID VALVE MALFUNCTIONING			S2 SOLENOID VALVE MALFUNCTIONING			BOTH SOLENOID MALFUNCTIONING
	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear	Gear when shift selector is manually operated
	S1	S2		S1	S2		S1	S2		
D	ON	OFF	1st	X	ON	3rd	ON	X	1st	O/D
	ON	ON	2nd	X	ON	3rd	OFF	X	O/D	O/D
	OFF	ON	3rd	X	ON	3rd	OFF	X	O/D	O/D
	OFF	OFF	O/D	X	OFF	O/D	OFF	X	O/D	O/D
2	ON	OFF	1st	X	ON	3rd	ON	X	1st	3rd
	ON	ON	2nd	X	ON	3rd	OFF	X	3rd	3rd
	OFF	ON	3rd	X	ON	3rd	OFF	X	3rd	3rd
L	ON	OFF	1st	X	OFF	1st	ON	X	1st	1st
	ON	ON	2nd	X	ON	2nd	ON	X	1st	1st

X: Malfunctions

HINT:

Check the S1 solenoid valve when DTC P0753/62 is output and check the S2 solenoid valve when DTC P0758/63 is output.

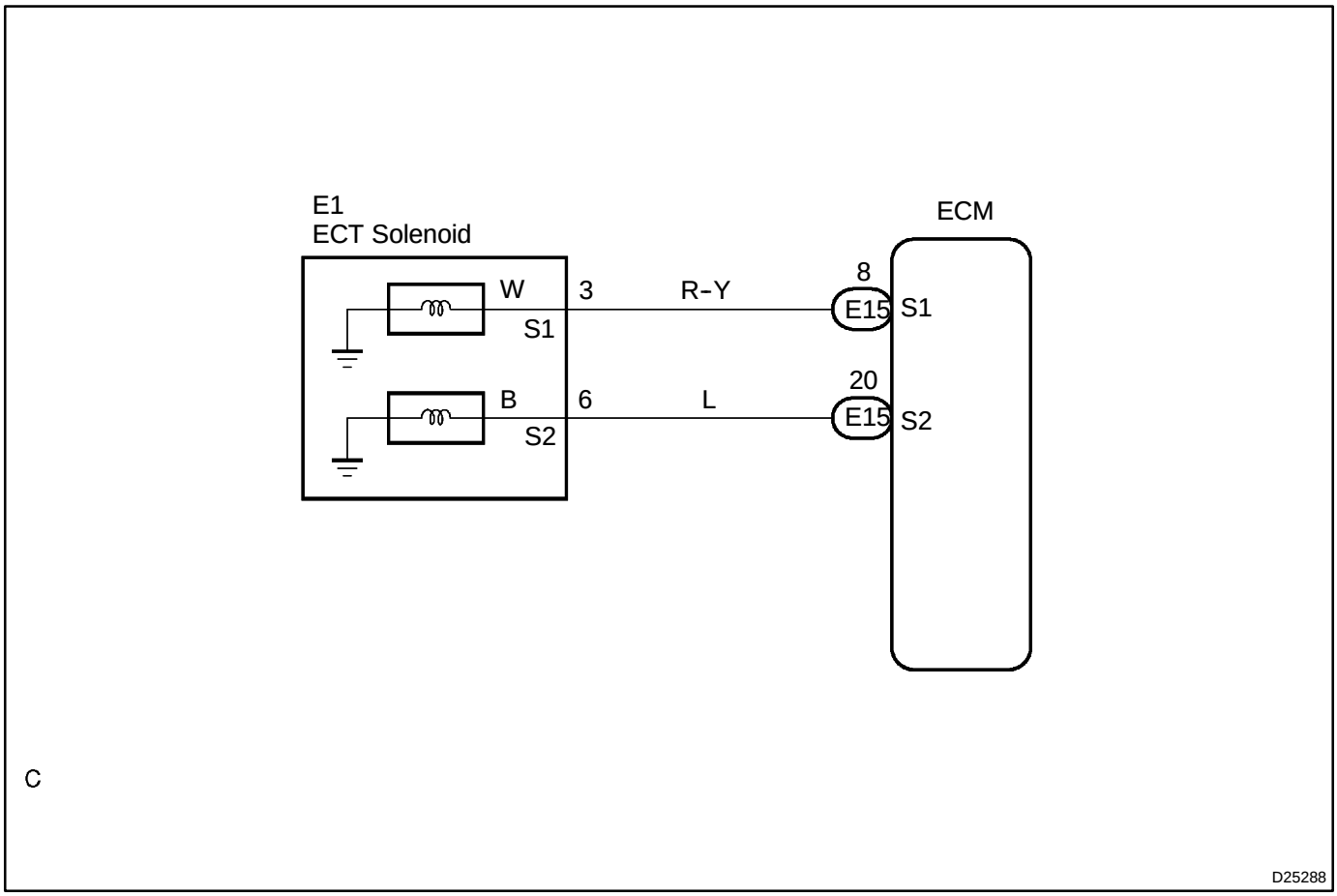
DTC No.	DTC Detecting Condition	Trouble Area
P0753/62 P0758/63	(a) Solenoid resistance is 8 Ω or less (short circuit) when the solenoid is energized. (b) Solenoid resistance is 100 kΩ or more (open circuit) when the solenoid is not energized.	$ Transmission wire $ Wire harness $ No. 1 solenoid assy (S1) $ No. 2 solenoid assy (S2) $ ECM

Fail safe function:

If either of the solenoid valve circuits develops an open or short, the ECM turns the other solenoid valve ON and OFF to shift to the gear positions shown in the table above. The ECM also turns the ST solenoid valve OFF at the same time. If both solenoids malfunction, hydraulic control cannot be performed electronically and must be done manually.

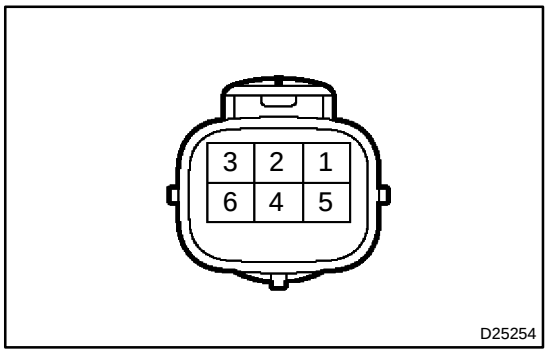
Manual shifting as shown in the above table must be done (In the case of a short circuit, the ECM stops sending current to the short circuited solenoid).

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT TRANSMISSION WIRE



(a) Disconnect the transmission wire connector from the automatic transaxle.

(b) Measure resistance between terminal 3 and body ground.

OK:

Resistance: 11 - 15 Ω at 20 _C (68 _F)

NG → **Go to step 3**

(c) Measure resistance between terminal 6 and body ground.

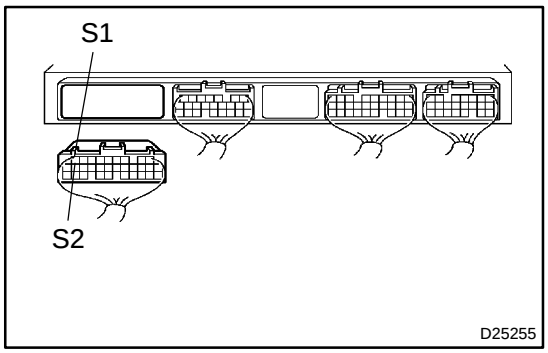
OK:

Resistance: 11 - 15 Ω at 20 _C (68 _F)

NG → **Go to step 4**

OK

2 CHECK HARNESS AND CONNECTOR(Transmission wire - ECM)



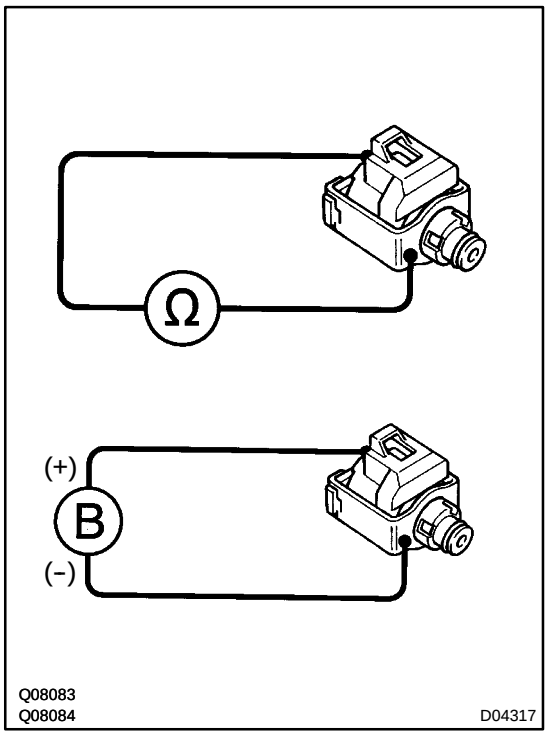
(a) Disconnect the connector from ECM.
(b) Measure the resistance between each terminal S1 of the transmission wire and the ECM, and between each terminal S2 of them.
OK:
There is no open and short circuit.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE ECM **(See page 01-30)**

3 INSPECT TRANSMISSION NO.1 SOLENOID ASSY(S1)



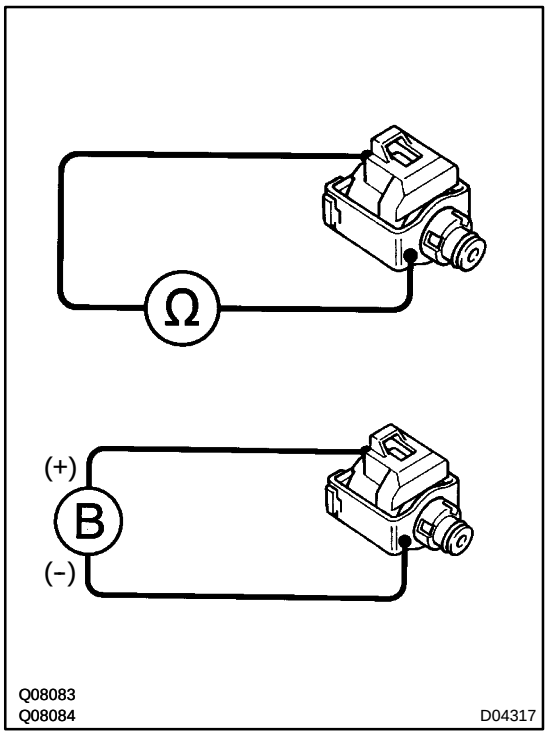
(a) Remove the S1 solenoid valve .
(b) Measure resistance between the solenoid connector and the solenoid body.
OK:
Resistance: 11 - 15 Ω at 20°C (68°F)
(c) Connector positive ⊕ lead to the terminal of solenoid connector, negative ⊖ lead to the solenoid body.
OK:
The solenoid makes an operating noise.

NG → **REPLACE TRANSMISSION NO.1 SOLENOID ASSY(S1)**

OK

REPAIR OR REPLACE TRANSMISSION WIRE **(See page 40-26)**

4	INSPECT TRANSMISSION NO.2 SOLENOID ASSY(S2)



(a) Remove the S2 solenoid valve .

(b) Measure resistance between the solenoid connector and the solenoid body.

OK:

Resistance: 11 - 15 Ω at 20˚C (68˚F)

(c) Connector positive ⊕ lead to the terminal of solenoid connector, negative ⊖ lead to the solenoid body.

OK:

The solenoid makes an operating noise.

NG → **REPLACE TRANSMISSION NO.2 SOLENOID ASSY(S2)**

OK

REPAIR OR REPLACE TRANSMISSION WIRE **(See page 40-26)**

DTC P0755/63 S2 SOLENOID VALVE MALFUNCTION

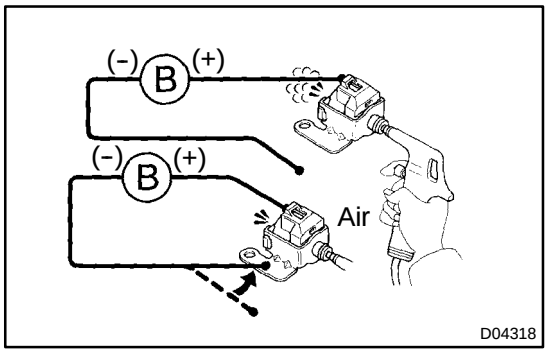
SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor and crankshaft position sensor to detect the actual gear position (1st, 2nd, 3rd or O/D gear).
Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect the mechanical trouble of the shift solenoid valves, the valve body or automatic transaxle (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0755/63	During normal driving, the gear required by the ECM does not match the actual gear (2-trip detection logic)	S No. 2 solenoid assy (S2) S Valve body S Automatic transaxle (clutch, brake or gear etc.)

INSPECTION PROCEDURE

1 INSPECT TRANSMISSION NO.2 SOLENOID ASSY(S2)



(a) Remove the S2 solenoid valve.
(b) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak the air.
OK:
Solenoid valve does not leak air.
(c) When battery voltage is supplied to the shift solenoid valve, check that the valve opens.
OK:
Solenoid valve opens.

NG → **REPLACE TRANSMISSION NO.2 SOLENOID ASSY(S2)**

OK

2 INSPECT TRANSMISSION VALVE BODY ASSY
(See chapter 2 in the problem symptoms table)

NG → **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSY (See page 40-22)**

OK

REPAIR AUTOMATIC TRANSAXLE ASSY

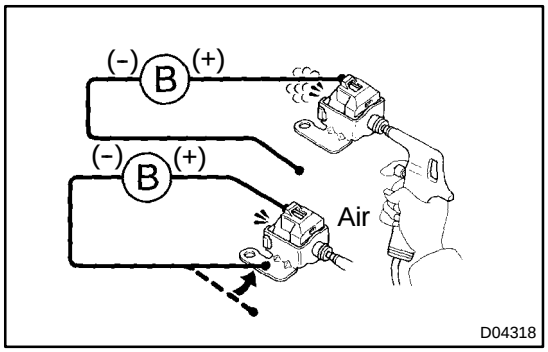
DTC P0770/64 SL SOLENOID VALVE MALFUNCTION

SYSTEM DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
P0770/64	During normal driving, the gear required by the ECM does not match the actual gear (2-trip detection logic)	S Solenoid assy No. 3 (SL) S Valve body S Torque converter clutch S Automatic transaxle (clutch, brake or gear etc.)

INSPECTION PROCEDURE

1 INSPECT TRANSMISSION SOLENOID ASSY NO.3(SL)



(a) Remove the SL solenoid valve.

(b) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak the air.

OK:

Solenoid valve does not leak air.

(c) When battery voltage is supplied to the shift solenoid valve, check that the valve opens.

OK:

Solenoid valve opens.

NG → **REPLACE TRANSMISSION SOLENOID ASSY NO.3(SL)**

OK

2 INSPECT TRANSMISSION VALVE BODY ASSY
(See chapter 2 in the problem symptoms table)

NG → **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSY (See page 40-22)**

OK

3 INSPECT TORQUE CONVERTER CLUTCH ASSY(See page 40-20)

NG → **REPLACE TORQUE CONVERTER CLUTCH ASSY**

OK

REPAIR AUTOMATIC TRANSAXLE ASSY

DTC	P0773/64	SL SOLENOID VALVE ELECTRICAL MALFUNCTION

CIRCUIT DESCRIPTION

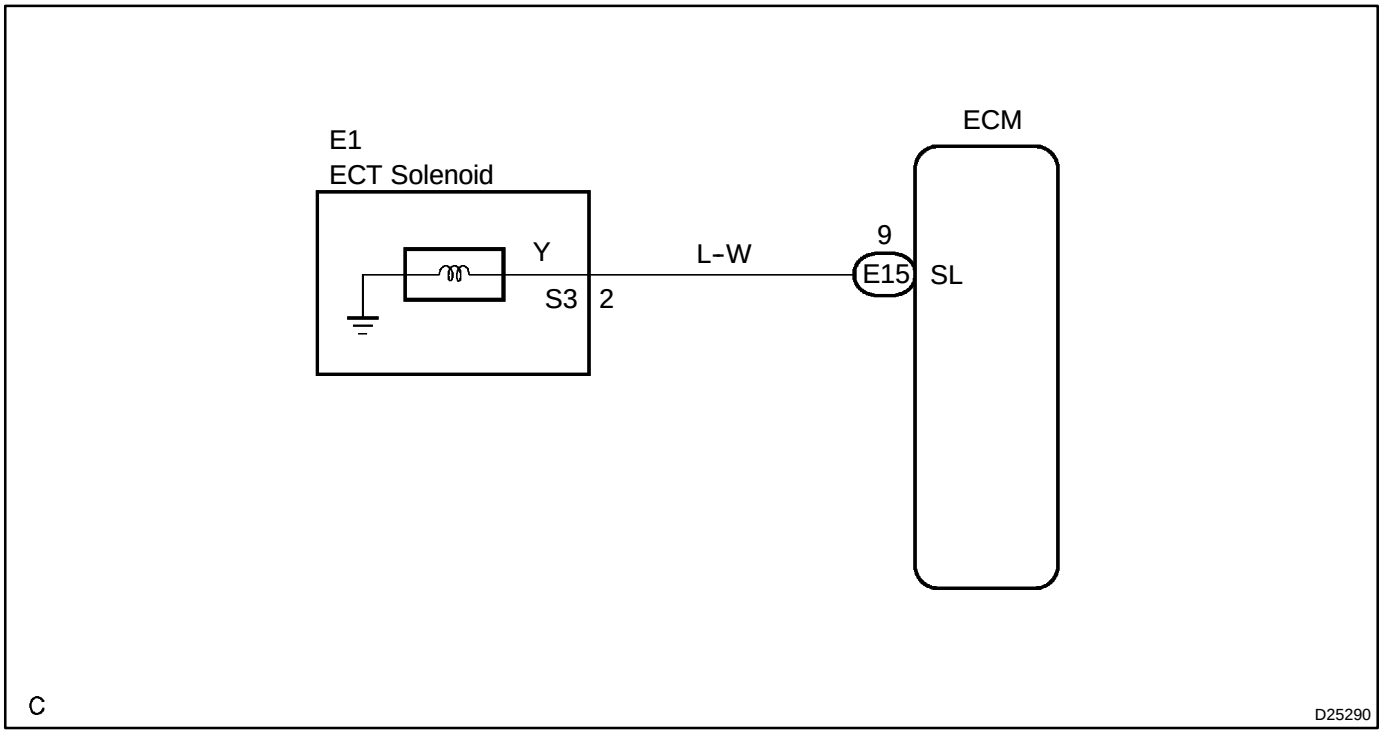
The SL solenoid valve is turned ON and OFF by signals from the ECM to control the hydraulic pressure acting on the lock-up relay valve, then the signals control operation of the lock-up clutch.

DTC No.	DTC Detecting Condition	Trouble Area
P0773/64	Either (a) or (b) is detected for 1 time. (2-trip detection logic) (a) Solenoid resistance is 8 Ω or less for short circuit when solenoid is energized. (b) Solenoid resistance is 100 kΩ or more for open circuit when solenoid is not energized.	$ Transmission wire $ Wire harness $ Solenoid assy No. 3 (SL) $ ECM

Fail safe function

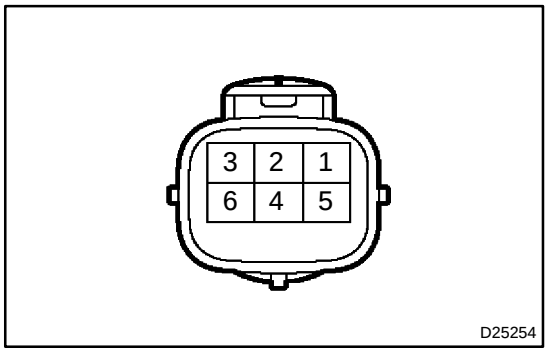
If the ECM detects a malfunction, it turns the SL solenoid valve OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT TRANSMISSION WIRE(SL)

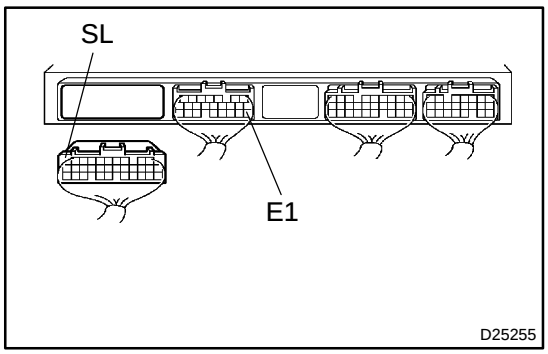


(a) Disconnect the transmission wire connector from the transaxle.
(b) Measure resistance between the terminal 2 and the body ground.
OK:
Resistance: 11 - 15 Ω at 20 _C (68 _F)

NG → **Go to step 3**

OK

2	CHECK HARNESS AND CONNECTOR(Transmission wire-ECM)



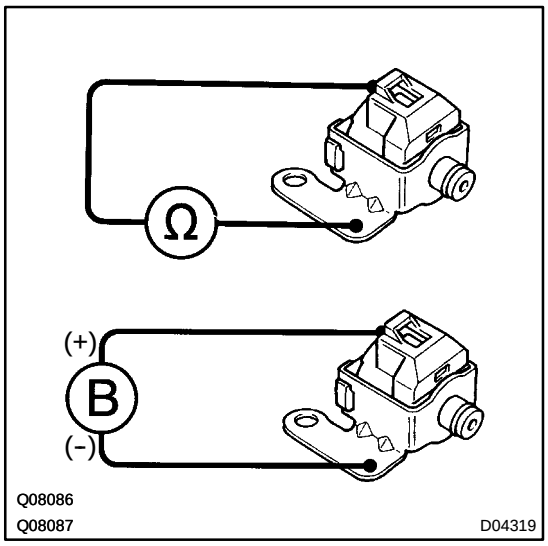
(a) Connect the transmission wire connector.
(b) Disconnect the ECM connector.
(c) Measure resistance between the terminal SL and E1.
OK:
Resistance: 11 - 15 Ω at 20 _C (68 _F)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE ECM **(See page 01-30)**

3	INSPECT TRANSMISSION SOLENOID ASSY NO.3(SL)



(a) Remove the SL solenoid valve.
(b) Measure resistance between the terminal SL of shift solenoid valve and the solenoid body.
OK:
Resistance: 11 - 15 Ω at 20 _C (68 _F)
(c) Connect positive (+) lead to the terminal of solenoid connector, negative (-) lead to the solenoid body.
OK:
The SL solenoid valve makes operation noise.

NG → **REPLACE TRANSMISSION SOLENOID ASSY NO.3(SL)**

OK

REPAIR OR REPLACE TRANSMISSION WIRE **(See page 40-26)**

DTC P1520/95 STOP LIGHT SWITCH MALFUNCTION

CIRCUIT DESCRIPTION

The purpose of this circuit is to prevent the engine from stalling while driving in lock-up condition, when brakes are suddenly applied.
When the brake pedal is depressed, this switch sends a signals to the ECM. Then the ECM cancels the operation of the lock-up clutch while braking is in progress.

DTC No.	DTC Detection Condition	Trouble Area
P1520/95	No stop light switch signal to ECM during driving (2 trip detection logic)	$ Open or short in stop light switch circuit $ Stop light switch $ ECM

WIRING DIAGRAM

See page 05-280

INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using hand-held tester.

1 READ VALUE OF HAND-HELD TESTER

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the Hand-held tester to the DLC3.
(d) Turn the ignition switch ON and push the Hand-held tester main SW ON.
(e) Select the item "STOP LIGHT SW" in the DATALIST and read its value displayed on the Hand-held tester.

NOTICE:
The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value differs from those listed here. Do not depend solely on the "Normal Condition" here when deciding whether or not the part is faulty.

Item	Measurement Item/ Display (Range)	Normal Condition	Diagnostic Note
STOP LIGHT SW	Stop light SW Status/ ON or OFF	$ Brake Pedal is depressed: ON $ Brake Pedal is released: OFF	←

OK → **CHECK AND REPLACE ECM (See page 01-30)**

NG

2 INSPECT STOP LAMP SWITCH ASSY (See page 05-591, 05-644 or 05-718)

NG → **REPLACE STOP LAMP SWITCH ASSY**

OK

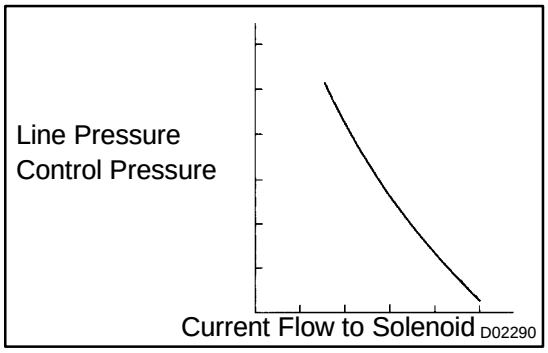
3	CHECK HARNESS AND CONNECTOR(STOP LAMP SWITCH ASSY - ECM)

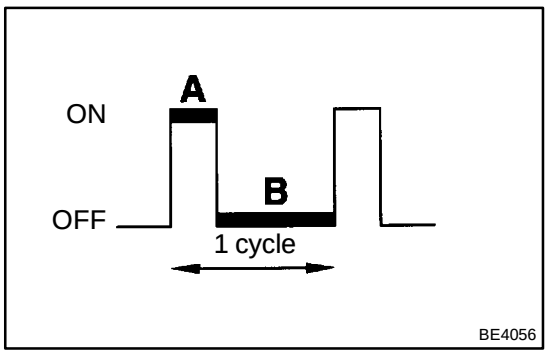
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR (See page 01-30)

OK

CHECK AND REPLACE ECM (See page 01-30)

DTC	P1760/77	LINEAR SOLENOID FOR LINE PRESSURE CONTROL MALFUNCTION(SLT)





CIRCUIT DESCRIPTION

The throttle pressure that is applied to the primary regulator valve (which modulates the line pressure) causes the solenoid valve SLT, under electronic control, to precisely and minutely modulate and generate the line pressure according the extent of the accelerator pedal depressed or the output of engine power.

This reduces the function of the line pressure and provides smooth shifting.

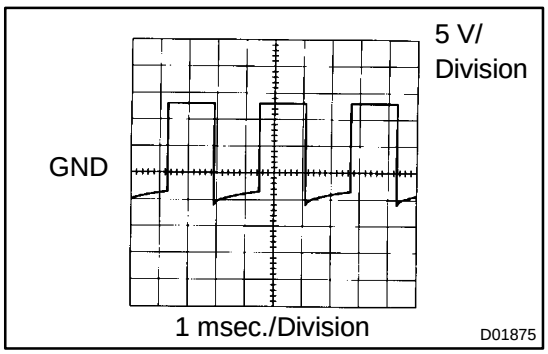
Upon receiving a signal of the throttle valve opening angle, the ECM controls the line pressure by sending a predetermined (*) duty ratio to the solenoid valve, modulating the line pressure and generating throttle pressure.

(*): Duty Ratio

The duty ratio is the ratio of the period of continuity in one cycle. For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then

Duty Ratio=A/(A+B) x 100 (%)

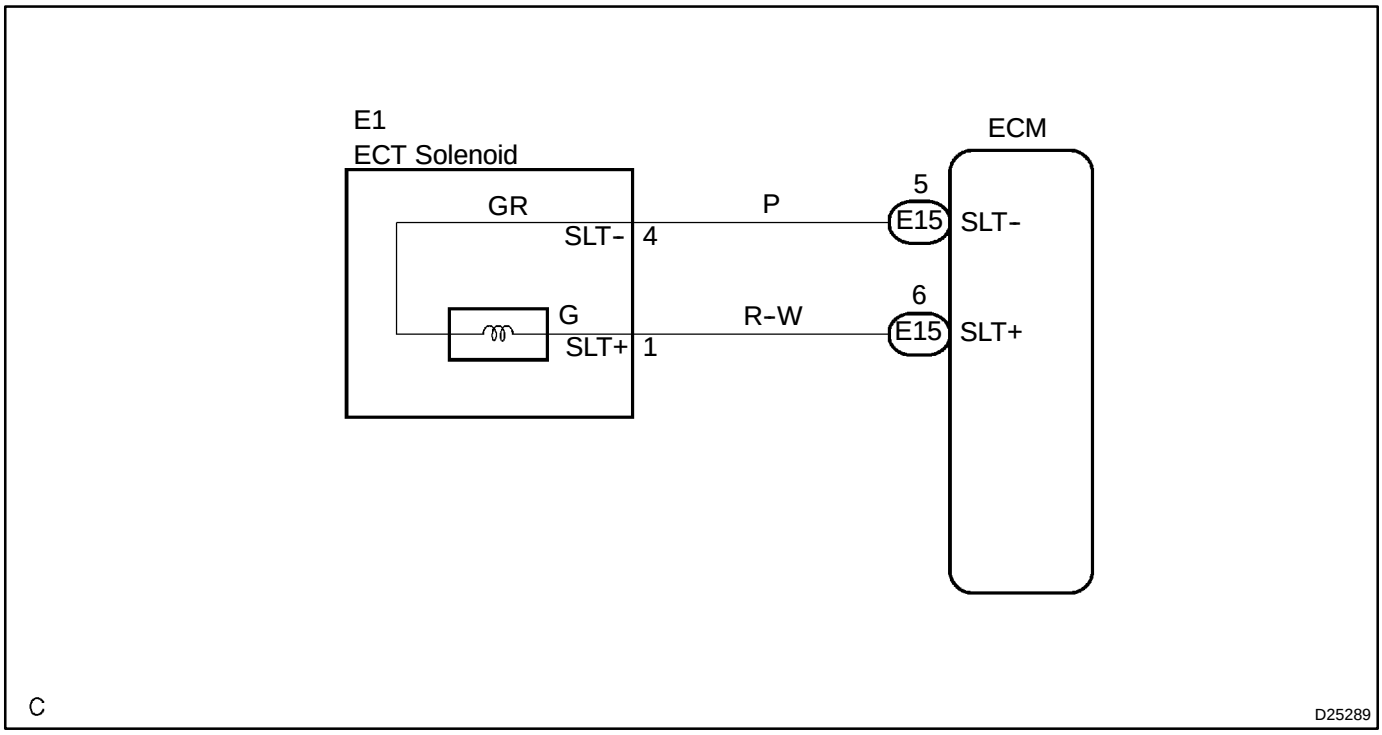
DTC No.	DTC Detection Condition	Trouble Area
P1760/77	Condition (a) or (b) below is detected 1 sec. or more: (a) SLT- terminal: 0V (b) SLT- terminal: 12V	S Open or short in line pressure control solenoid (SLT) circuit S Line pressure control solenoid assy (SLT) S ECM



Reference:

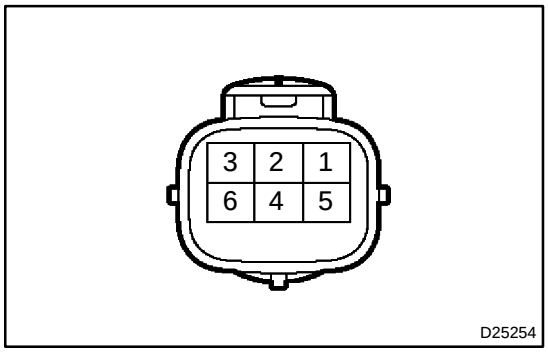
Check the waveform between terminals SLT+ and SLT- during the engine idling.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT TRANSMISSION WIRE

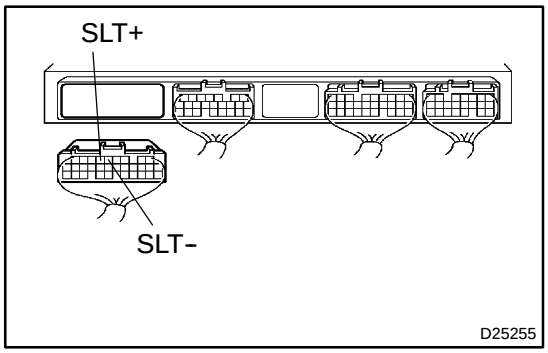


(a) Disconnect the transmission wire connector from the transaxle.
(b) Measure resistance between the terminal 1 and 2.
OK:
Resistance: 5.0 - 5.6 Ω at 20 ˚C (68˚F)

NG → **Go to step 3**

OK

2	CHECK HARNESS AND CONNECTOR(Transmission wire - ECM)



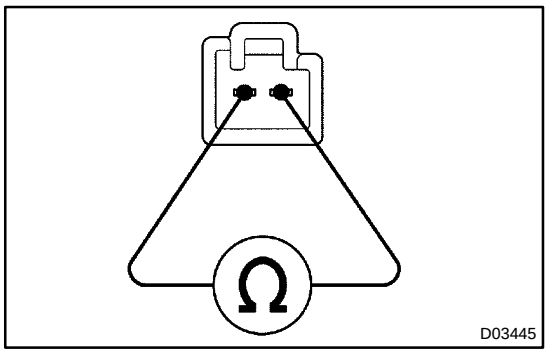
(a) Connect the transmission wire connector.
(b) Disconnect the ECM connector.
(c) Measure resistance between terminal SLT+ and SLT-.
OK:
Resistance: 5.0 - 5.6 Ω at 20 ˚C (68˚F)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR (See page 01-30)**

OK

CHECK AND REPLACE ECM (See page 01-30)

3	INSPECT LINE PRESSURE CONTROL SOLENOID ASSY(SLT)



(a) Disconnect the solenoid connector.
(b) Measure resistance between terminals 1 and 2 of solenoid connector.
OK:
Resistance: 5.0 - 5.6 Ω at 20 °C (68°F)

NG → **REPLACE LINE PRESSURE CONTROL SOLENOID ASSY(SLT)**

OK

REPAIR OR REPLACE TRANSMISSION WIRE **(See page 40-26)**

DTC	P1780/97	PARK/NEUTRAL POSITION SWITCH MALFUNCTION

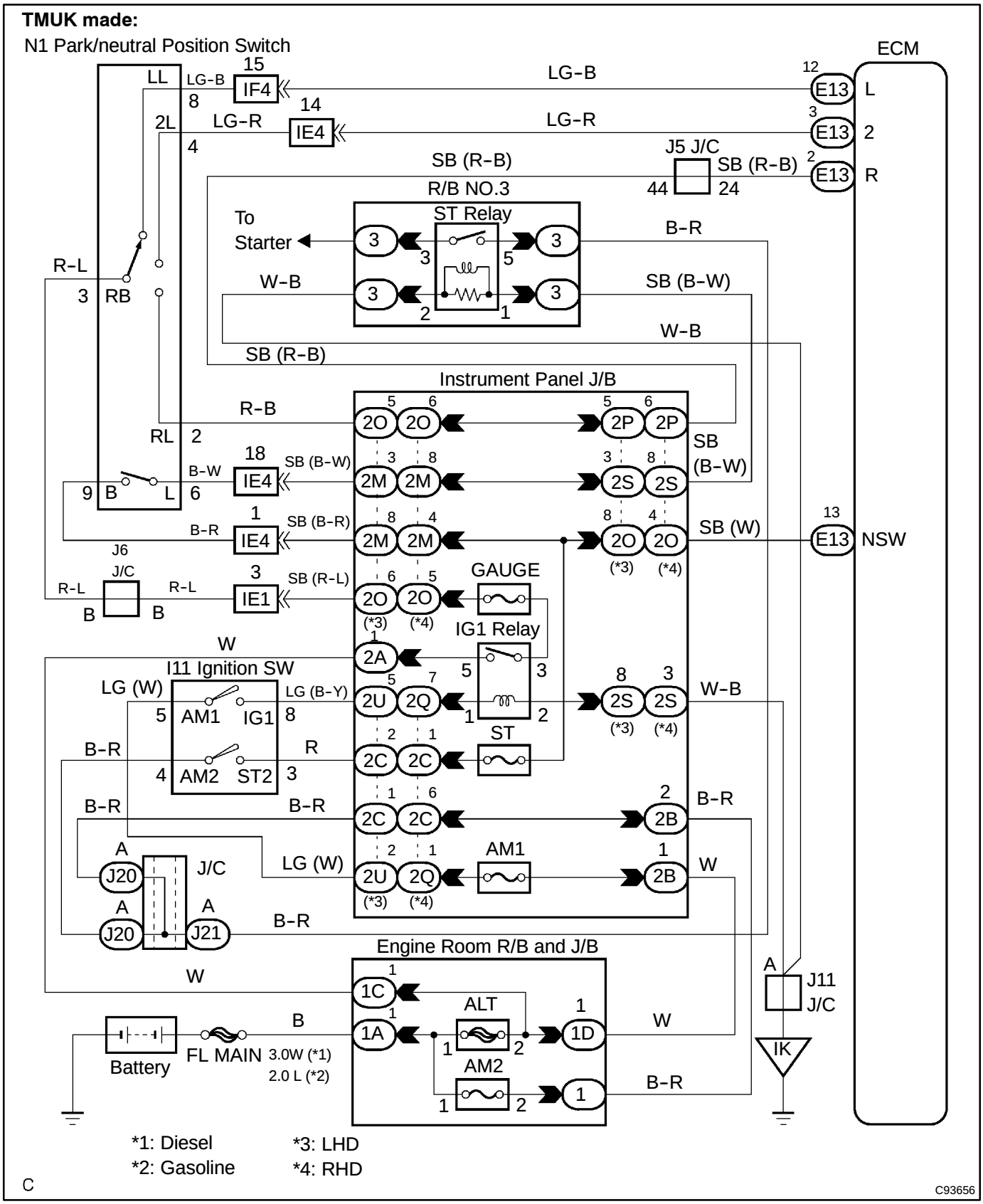
PARK/NEUTRAL POSITION SWITCH CIRCUIT

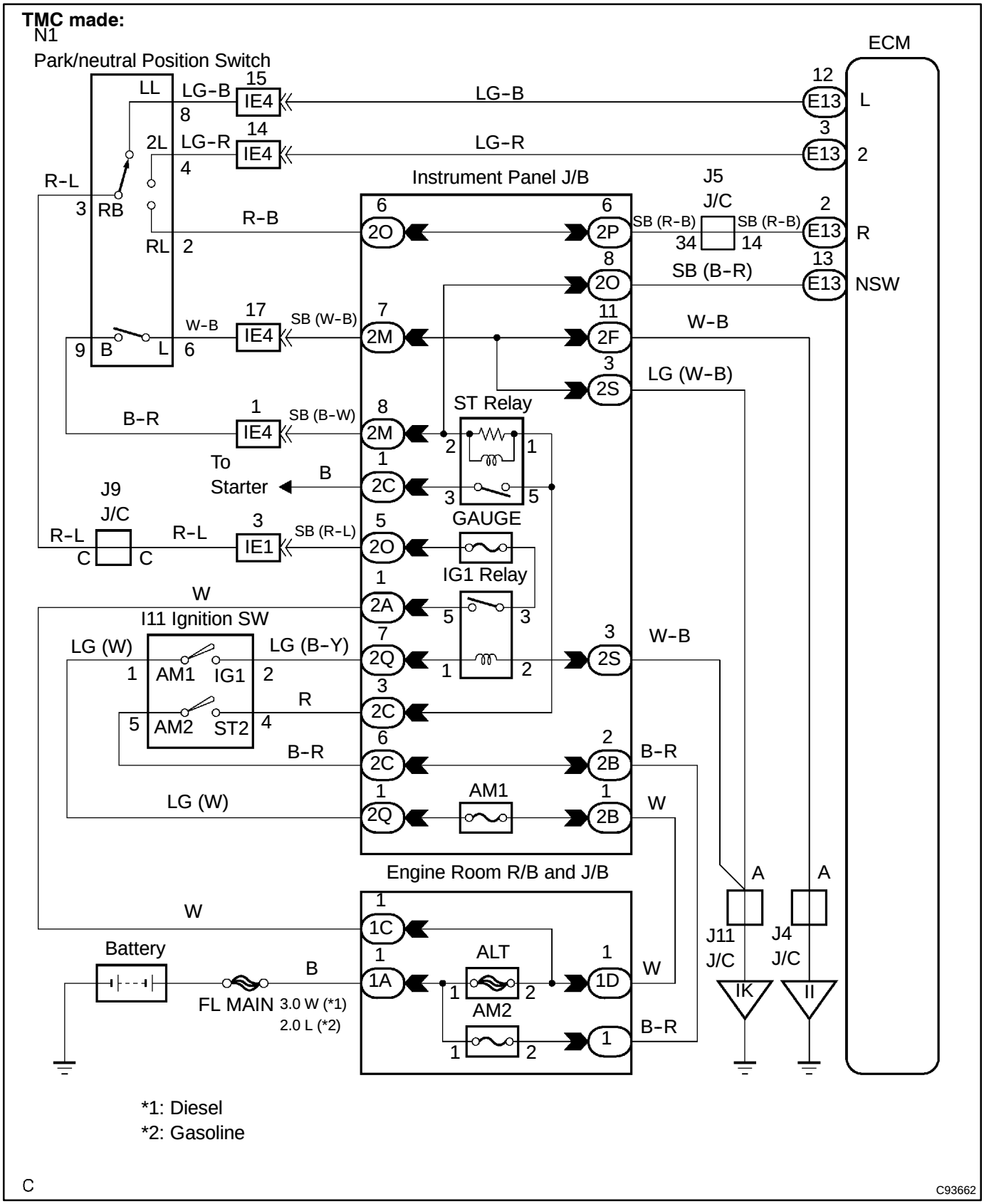
CIRCUIT DESCRIPTION

The park/neutral position switch detects the shift lever range and sends the signals to the ECM.
The ECM receives the signals (NSW, R, 2 and L) from the park/neutral position switch, when the signal is not sent to the ECM from the park/neutral position switch, the ECM judges that the shift lever is in the D range.

DTC No.	DTC Detecting Condition	Trouble Area
P1780/97	2 or more switches are ON simultaneously for "N", "R", "2" or "L" range. (2-trip detection logic)	S Wire harness S Park/neutral position switch S ECM
	When driving under the conditions (a), (b) and (c) for 30 seconds or more, the park/neutral position switch is ON (N position). (2-trip detection logic) (a) Vehicle speed: 80 km/h (50 mph) or more (b) Engine speed: 1,500 - 5,000 rpm (c) Manifold absolute pressure: 300 mmHg or more	

WIRING DIAGRAM




TMC made:
N1
Park/neutral Position Switch
ECM
Instrument Panel J/B
Engine Room R/B and J/B
J5 J/C
J9 J/C
J11 J/C
J4 J/C
ST Relay
GAUGE
IG1 Relay
I11 Ignition SW
Battery
FL MAIN
3.0 W (*1)
2.0 L (*2)
To Starter
*1: Diesel
*2: Gasoline
C
C93662

INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using hand-held tester.

1	READ VALUE OF HAND-HELD TESTER

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the Hand-held tester to the DLC3.
(d) Turn the ignition switch ON and push the Hand-held tester main SW ON.
(e) Shift the shift lever to the R, D, 2 and L ranges, select the item "REVERSE", "4TH/DRIVE","2ND" and "LOW" in the DATALIST and read its value displayed on the Hand-held tester.

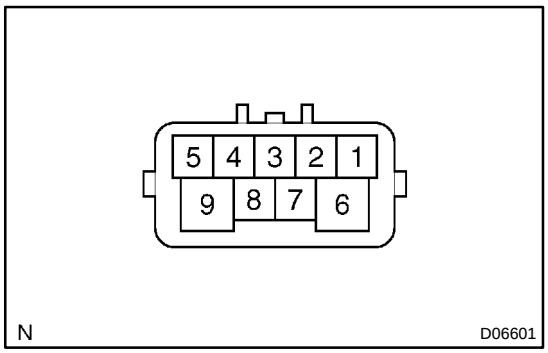
NOTICE:
The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value differs from those listed here. Do not depend solely on the "Normal Condition" here when deciding whether or not the part is faulty.

Item	Measurement Item/ Display (Range)	Normal Condition	Diagnostic Note
LOW	PNP SW Status/ ON or OFF	Shift lever range is; L: ON Except L: OFF	The shift lever range and these values are different, there are failures of the PNP switch or shift cable adjustment.
2ND	PNP SW Status/ ON or OFF	Shift lever range is; 2: ON Except 2: OFF	
REVERSE	PNP SW Status/ ON or OFF	Shift lever range is; R: ON Except R: OFF	
4TH/DRIVE	PNP SW Status/ ON or OFF	Shift lever range is; D: ON Except D: OFF	

OK → **CHECK AND REPLACE ECM** **(See page 01-30)**

NG

2 INSPECT PARK/NEUTRAL POSITION SWITCH ASSY



(a) Disconnect the park/neutral position switch connector.
(b) Check continuity between each terminal shown below when the shift lever is moved to each range.

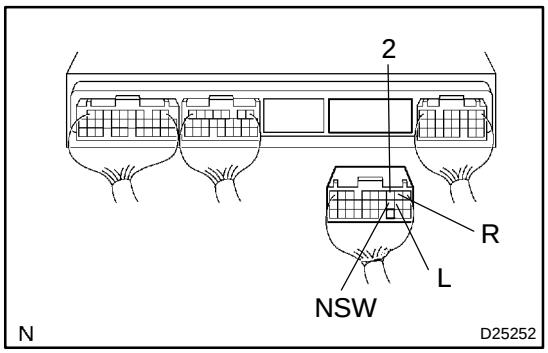
Shift Range	Terminal No. to continuity	
P	1 - 3	6 - 9
R	2 - 3	-
N	3 - 5	6 - 9
D	3 - 7	-
2	3 - 4	-
L	3 - 8	-

OK:
There is continuity.

NG → **REPLACE PARK/NEUTRAL POSITION SWITCH ASSY (See page 40-3)**

OK

3 CHECK HARNESS AND CONNECTOR(PARK/NEUTRAL POSITION SWITCH - ECM)



(a) Connect the park/neutral position switch connector.
(b) Disconnect the ECM connector.
(c) Turn the IG switch ON and measure the voltage between terminals NSW, R, 2 and L of ECM and the E1 when the shift lever is shifted to the following range.

OK:

Shift range	Terminal	Voltage (V)
Except P*1 and N*1	NSW - E1	10 - 14
R	R - E1	10 - 14
2	2 - E1	10 - 14
L	L - E1	10 - 14

*1: When the ignition key is START range

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR (See page 01-30)**

OK

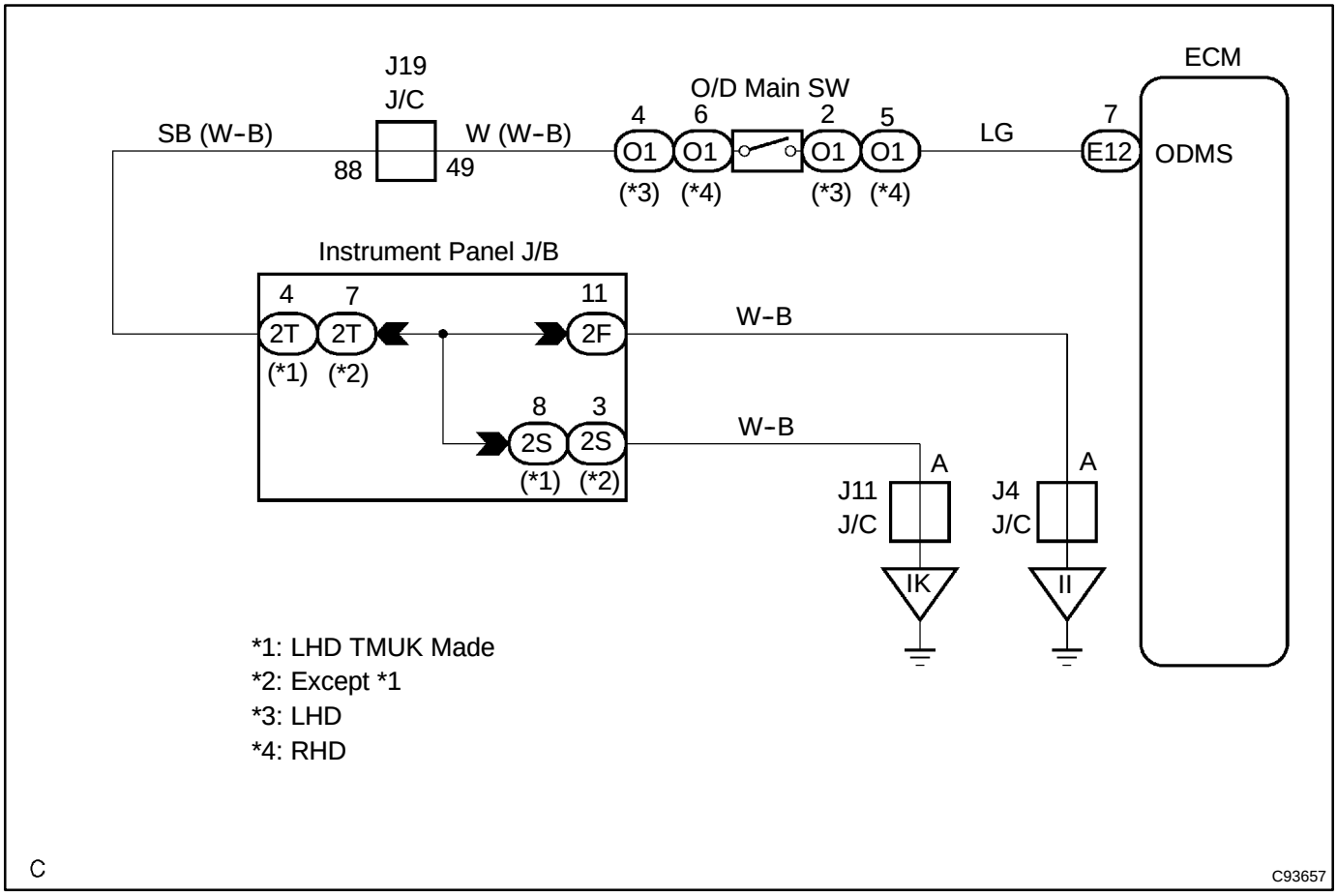
CHECK AND REPLACE ECM (See page 01-30)

O/D Main Switch Circuit

CIRCUIT DESCRIPTION

The O/D main switch is a momentary type switch. When pressing the O/D main switch, the O/D OFF indicator light lights up and the ECM prohibits shifting into O/D, and when pressing it once again, the O/D OFF indicator light goes off and the ECM allows shifting into O/D. Turning the IG switch OFF will reset the O/D OFF indicator light.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using hand-held tester.

1	READ VALUE OF HAND-HELD TESTER

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the Hand-held tester to the DLC3.
(d) Turn the ignition switch ON and push the Hand-held tester main SW ON.
(e) Select the item "OVERDRV CUT SW1" in the DATALIST and read its value displayed on the Hand-held tester.

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value differs from those listed here. Do not depend solely on the "Normal Condition" here when deciding whether or not the part is faulty.

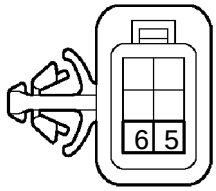
Item	Measurement Item/ Display (Range)	Normal Condition	Diagnostic Note
OVERDRV CUT SW1	O/D SW Status/ ON or OFF	$O/D SW Push: ON $O/D SW Release: OFF	←

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE** **(See page 05-776)**

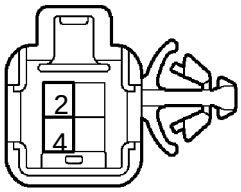
NG

2 INSPECT TRANSMISSION CONTROL SWITCH

RHD Steering Position Type:



LHD Steering Position Type:



C94321

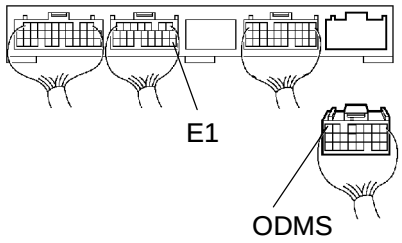
(a) Disconnect the connector of transmission control switch.
(b) RHD steering position type:
Check continuity between terminals 5 and 6 of transmission control switch.
(c) LHD steering position type:
Check continuity between terminals 2 and 4 of transmission control switch.
OK:

Transmission control switch	Specified condition
Press continuously transmissin control switch	Continuity
Release transmission control switch	No continuity

NG → **REPLACE TRANSMISSION CONTROL SWITCH**

OK

3 CHECK HARNESS AND CONNECTOR(TRANSMISSION CONTROL SWITCH - ECM)



D25241

(a) Connect the connector of transmission control switch.
(b) Disconnect the ECM connector.
(c) Check continuity between terminals ODMS and E1 of ECM.
OK:

Transmission control switch	Specified condition
Press continuously transmissin control switch	Continuity
Release transmission control switch	No continuity

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR** **(See page 01-30)**

OK

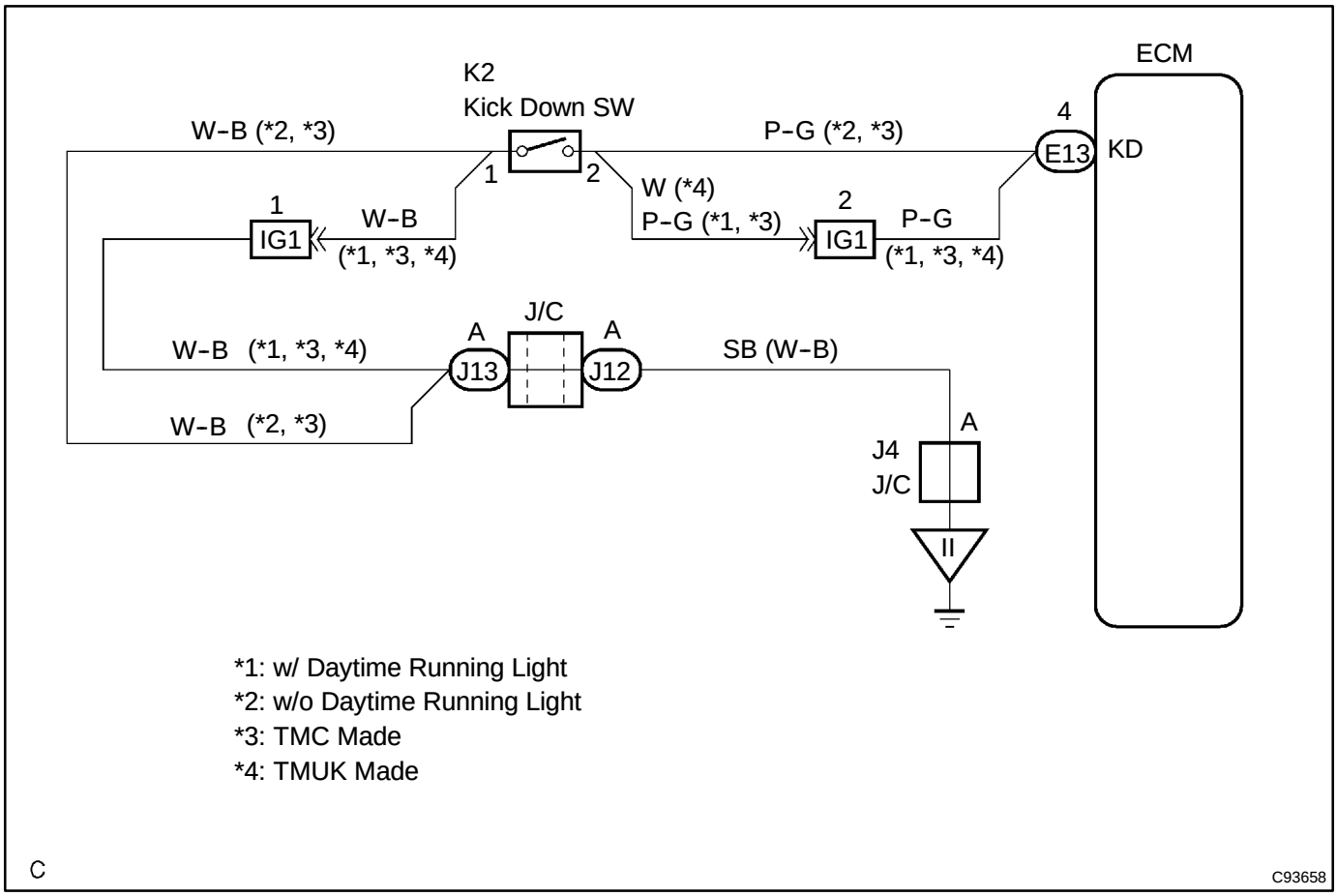
CHECK AND REPLACE ECM **(See page 01-30)**

KICK DOWN SWITCH CIRCUIT

CIRCUIT DESCRIPTION

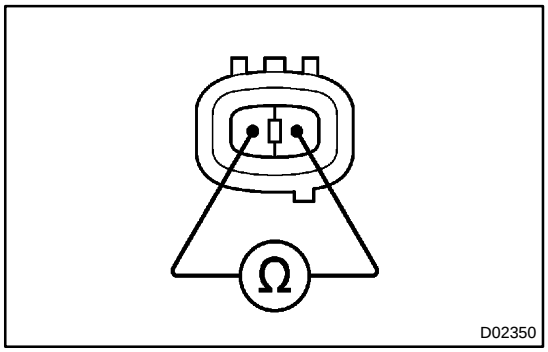
The kick-down switch is turned ON when the accelerator pedal is depressed to the full throttle and sends signals to ECM.
When the kick-down switch is turned ON, the ECM controls gear shifting according to the programmed shift diagrams.
If a short circuit develops in the kick-down switch, the ECM disregards the kick-down signals and controls shifting at the normal shift points.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT KICK DOWN SWITCH



(a) Disconnect the kick-down switch connector.
(b) Measure continuity between terminals 1 and 2 of the kick-down switch connector when kick-down switch is ON and OFF.

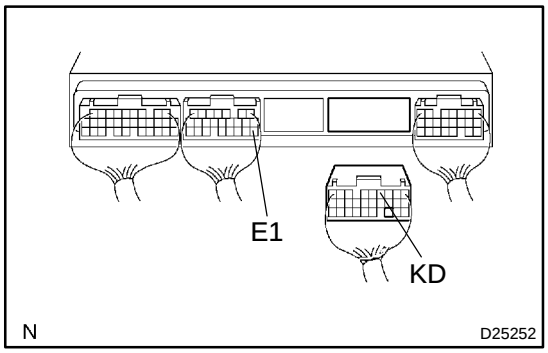
OK:

Kick-down switch	Continuity
ON	Continuity
OFF	No continuity

NG → **REPLACE KICK DOWN SWITCH**

OK

2 CHECK HARNESS AND CONNECTOR(KICK DOWN SWITCH-ECM)



(a) Connect the connector of kick-down switch connector.
(b) Disconnect the ECM connector.
(c) Check continuity between terminals KD and E1 of ECM when accelerator pedal is fully depressed or not.

OK:

Accelerator pedal	Specified condition
Fully depressed (Kick-down switch is ON)	Continuity
Released (Kick-down switch is OFF)	No continuity

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE ECM **(See page 01-30)**

ELECTRONIC MOTOR POWER STEERING SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

050Y2-03

Troubleshooting in accordance with the procedure on the following pages.

HINT:

Items inside are tittles of pages in this manual with the page number in the bottom portion. See the indicated pages for detailed explanation.

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS (See page 05-811)

3	CHECK AND CLEAR DTCS AND FREEZE FRAME DATA

(a) After the completion of the DTC and freeze frame data check, clear the DTC (See page 05-812).

4	PROBLEM SYMPTOM CONFIRMATION

- SYMPTOM DOES NOT OCCUR(Go to step 5)
- SYMPTOM OCCURS(Go to step 6)

5	SYMPTOM SIMULATION (See page 01-20)

6	DTC CHECK (See page 05-812)

- NORMAL CODE(Go to step 7)
- MALFUNCTION CODE(Go to step 8)

7	PROBLEM SYMPTOMS TABLE (See page 05-824)

8	DTC CHART(See page 05-820)

9	CIRCUIT INSPECTION (See page 05-825 to 05-858)

10	IDENTIFICATION OF PROBLEM

11	REPAIR

12	CONFIRMATION TEST

END

HINT:
Step 3, 6, 9, 12:
Diagnostic steps permitting the use of the hand-held tester.

Fail safe function
If the power steering ECU assy detects abnormality, halt, fix or lower the steering power assist so as to protect the system.
HINT:
Repeating the steering operation when stopping or driving at low speed, or leaving the steering wheel turn fully for long hours will lower the amount of power assist so as to avoid heating power steering ECU assy. In this case, not operating the steering for about 10 minutes with engine idle will lead to return the normal state.

050Y7-03

CUSTOMER PROBLEM ANALYSIS CHECK

EMPS Check Sheet

Inspector's :
Name

Customer's Name		**Registration No.**	
		Registration Year	/ /
Vehicle Model		**Frame No.**	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

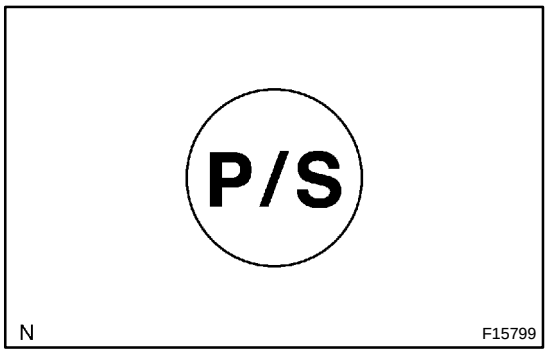
Date Problem First Occurred	/ / (Engine ☐ Cooled ☐ Warmed up)
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Steering operation is heavy.	
	☐ Steering force to the right and left differs, or steering force is uneven.	
	☐ During running, the steering force does not alter corresponding the vehicle speed.	
	☐ The steering returns unwell.	
	☐ Vibration or strange sound comes from the steering column assy.	
	☐ When a trouble happens (☐ During turning ☐ During vehicle stop ☐ Always)	
	☐ Others	
	PS Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

Freeze Frame Data
An abnormal code is output at the first time, record the freeze frame data as well (as the DTC).

PRE-CHECK



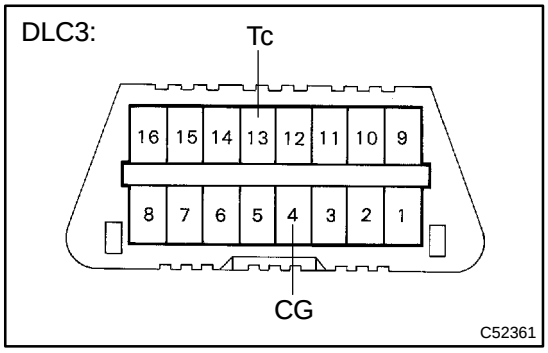
1. DIAGNOSIS SYSTEM

(a) Check the PS warning light.

(1) When the ignition switch is turned ON, check that the PS warning light goes on for 2 seconds.

HINT:

If the indicator check result is not normal, proceed to trouble-shooting for the PS warning light circuit (See page 05-853).



(b) In case of not using hand-held tester:

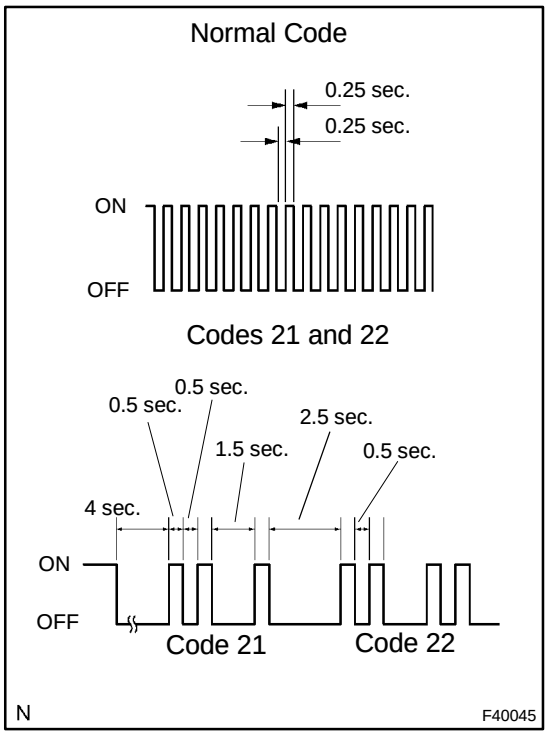
Check the DTC.

(1) Using SST, connect terminals Tc and CG of the DLC3.

SST 09843-18040

(2) Turn the ignition switch to ON.

(3) Read the DTC from the PS warning light.



HINT:

- If no code appears, inspect the Tc terminal circuit (See page 05-856) and PS warning light circuit (See page 05-853).
- As an example, the blinking patterns for normal code and codes 21 and 22 are shown on the left.

(4) Codes are explained in the DTC chart on page 05-820.

(5) After completing the check, disconnect terminals Tc and CG of the DLC3, and turn off the display.

If 2 or more malfunctions are indicated at the same time, DTC will be displayed in the ascending over.

(c) In case of using hand-held tester:

Check the DTC.

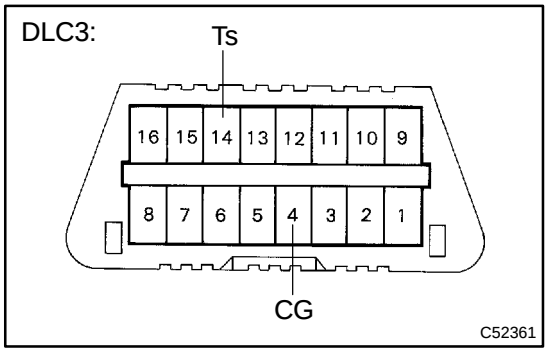
(1) Hook up the hand-held tester to the DLC3.

(2) Turn the ignition switch to ON.

(3) Read the DTC by following the prompts on the tester screen.

HINT:

Please refer to the hand-held tester operator's manual for further details.



(d) In case of not using hand-held tester:
Clear the DTC.
(1) Using SST, connect terminals Ts and CG of the DLC3.
SST 09843-18040
(2) Turn the ignition switch to ON.
(3) Disconnect and connect the terminal CG of the DLC3 4 times or more within 8 seconds, delete DTC of the power steering ECU assy.
(4) Check that the PS warning light shows the normal code.
(5) Remove the SST from the DLC3.
SST 09843-18040

(e) In case of using hand-held tester:
Clear the DTC.
(1) Hook up the hand-held tester to the DLC3.
(2) Turn the ignition switch to ON.
(3) Operate the hand-held tester to erase the codes.

HINT:
Please refer to the hand-held tester operator's manual for further details.

2. DATA LIST AND FREEZE FRAME DATA

HINT:
IG must be turned ON to observe data using a hand-held tester. The vehicle is considered to be placed on a flat level surface.

Data List (*: with freeze frame data):

TMC made:

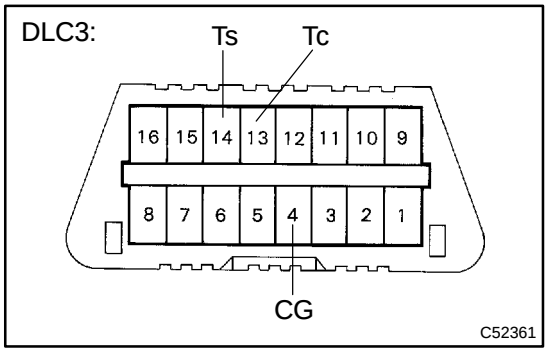
Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TRQ1 (*)	Show the output states in the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.2 - 2.8 V Steering wheel right turned: 2.2 - 4.85 V Steering wheel left turned: 0.15 - 2.8 V	-
TRQ2 (*)	Show the output states in the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.2 - 2.8 V Steering wheel right turned: 2.2 - 4.85 V Steering wheel left turned: 0.15 - 2.8 V	-
TRQ3 (*)	Show the output states in the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.2 - 2.8 V Steering wheel right turned: 2.2 - 4.85 V Steering wheel left turned: 0.15 - 2.8 V	-
SPD (*)	Show the vehicle speed on the speedometer / Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph)	Actual vehicle speed	Vehicle speed indicated on speedometer
ENGINE REV (*)	Show the engine revolution / Min.: 0 rpm Max.: 8,160 rpm	Actual engine speed	-

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
MOTOR ACTUAL (*)	Show the current flowing motor / Min.: -128 A, Max.: 127 A	0 - 65 A	-
COMMAND VALUE (*)	Show the specified current value / Min.: -128 A, Max.: 127 A	0 - 65 A	-
STR ANGL VEL (*)	Shown the steering wheel steering speed / Min.: -4,096 deg/sec. Max.: 4,064 deg/sec.	Steering wheel right turned: Negative number Steering wheel left turned: Positive number	-
THERMISTOR TEMP (*)	Show the temperature of the thermistor / Min.: -50 _C, Max.: 205 _C	-	-
PIG SUPPLY (*)	Show the power supply voltage for driving motor / Min.: 0 V, Max.: 25.5 V	8 - 16 V	While power steering operated
IG SUPPLY (*)	Show the power supply condition / Min.: 0 V, Max.: 25.5 V	Actual ECU power supply voltage: 10 - 14 V	-
TRQ1 ZERO VAL (*)	Show the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.2 - 2.8 V	-
TRQ2 ZERO VAL (*)	Show the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.2 - 2.8 V	-
TRQ3 ZERO VAL (*)	Show the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 1.9 - 3.1 V	-
MTR OVERHEAT	Record of continuous overheat preventive control / record or un-record	Un-record	-
MTR LOW POWER	Record of low motor power supply voltage / record or un-record	Un-record	-
#CODES	Number of DTC recorded / Min.: 0, Max.: 255	Min.: 0, Max.: XX	-
ASSIST MAP	Show the selected condition of the assist map / 1 or 3	1 or 3	-
TEST MODE STATUS	Test mode status / NORMAL or TEST	NORMAL: Normal mode TEST: During test mode	-

TMUK made:

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TRQ1 (*)	Show the output states in the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.3 - 2.7 V Steering wheel right turned: 2.5 - 4.7 V Steering wheel left turned: 0.3 - 2.5 V	-
TRQ2 (*)	Show the output states in the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.3 - 2.7 V Steering wheel right turned: 0.3 - 2.5 V Steering wheel left turned: 2.5 - 4.7 V	-
TRQ3 (*)	Show the output states in the torque sensor / Min.: 0 V, Max.: 5 V	Steering wheel center position: 2.3 - 2.7 V Steering wheel right turned: 2.5 - 4.7 V Steering wheel left turned: 0.3 - 2.5 V	-

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
SPD (*)	Show the vehicle speed on the speedometer / Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph)	Actual vehicle speed	Vehicle speed indicated on speedometer
ENGINE REV (*)	Show the engine revolution / Min.: 0 rpm Max.: 8,160 rpm	Actual engine speed	-
MOTOR ACTUAL (*)	Show the current flowing motor / Min.: -128 A, Max.: 127 A	0 - 60 A	-
COMMAND VALUE (*)	Show the specified current value / Min.: -128 A, Max.: 127 A	0 - 60 A	-
STR ANGL VEL (*)	Shown the steering wheel steering speed / Min.: -4,096 deg/sec. Max.: 4,096 deg/sec.	Steering wheel right turned: Negative number Steering wheel left turned: Positive number	-
THERMISTOR TEMP (*)	Show the temperature of the thermistor / Min.: -50 _C, Max.: 205 _C	-	-
PIG SUPPLY (*)	Show the power supply voltage for driving motor / Min.: 0 V, Max.: 25.5 V	8 - 16 V	While power steering operated
IG SUPPLY (*)	Show the power supply condition / Min.: 0 V, Max.: 25.5 V	ON or OFF	-
MTR OVERHEAT	Record of continuous overheat preventive control / record or un-record	Un-record	-
MTR LOW POWER	Record of low motor power supply voltage / record or un-record	Un-record	-
#CODES	Number of DTC recorded / Min.: 0, Max.: 255	Min.: 0, Max.: XX	-
ASSIST MAP	Show the selected condition of the assist map / 1, 2 or 3	1, 2 or 3	-
ECU ID	Show the identifying information of ECU / 01	01	-
TEST MODE STATUS	Test mode status / NORMAL or TEST	NORMAL: Normal mode TEST: During test mode	-



3. INPUT SIGNAL CHECK (TEST MODE)

(a) In case of not using hand-held tester:
Check the input signal.

(1) Using SST, connect terminals Ts and CG of DLC3.
SST 09843-18040

(2) Turn the ignition switch to ON.

(3) Check that the PS warning light shows the normal code.

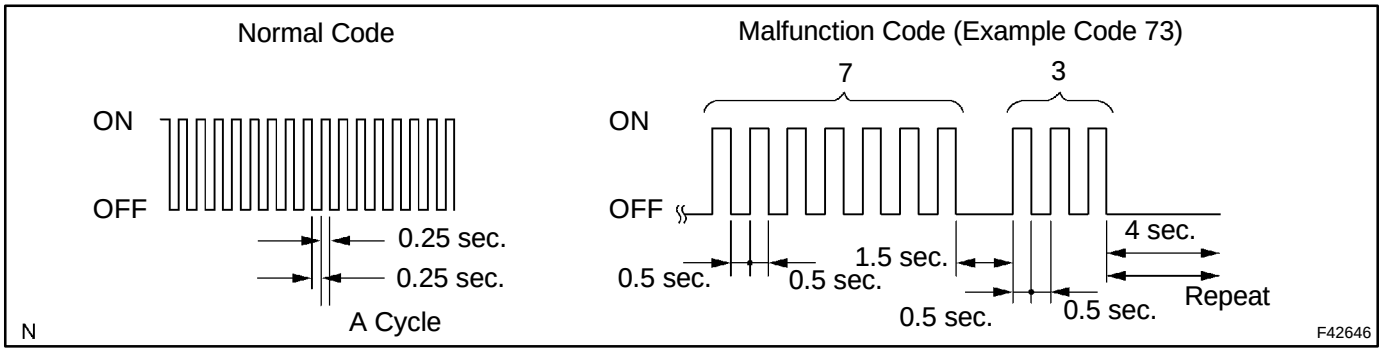
(4) Check the PS warning light goes off with driving at the vehicle speed of 10 km/h (6 mph) or over, with the engine speed being more than 300 rpm.

HINT:
If the PS warning light goes off during driving, the sensor judged to be normal.

(5) Stop the vehicle.

(6) Using SST, connect terminals Tc and CG of DLC3.
SST 09843–18040
(7) Read the number of blinks of the PS warning light.

HINT:
- See the list of DTC shown on the this page.
- Even if a sensor is normal, it output codes 71 and 73 during test mode.



(8) After doing check, disconnect the SST from the terminal Ts and CG, Tc and CG of DLC3, and turn the ignition switch to OFF.
SST 09843–18040

(b) In case of using hand–held tester:
Check the input signal.
(1) Hook up the hand–held tester to the DLC3.
(2) Check the warning light goes off with driving more than 10 km/h (6 mph) or engine speed more than 300 rpm.
(3) Read the DTC by following the prompts on the tester screen.

HINT:
- Please refer to the hand–held tester operator's manual for further details.
- See the list of DTC shown on the bottom of this page.
- Even if a sensor is normal, it outputs codes C1571/71 and C1573/73 during test mode.

DTC of input signal check function:

Code No. (See page)	Diagnosis	Trouble Area
C1571/71 (05–834)	Speed sensor signal check 1 (Test mode)	Speed sensor Speed sensor circuit Combination meter assy Skid control ECU assy Power steering ECU assy
C1573/73 (05–834)	Engine revolution signal check 1 (Test mode)	Engine revolution signal circuit ECM Power steering ECU assy

4. TMC MADE:
CALIBRATION OF TORQUE SENSOR ZERO POINT

HINT:
Perform this operation in the following cases.
- When removing and installing "tilt steering column assembly" and "steering gear assembly".
- When replacing power steering ECU assy.

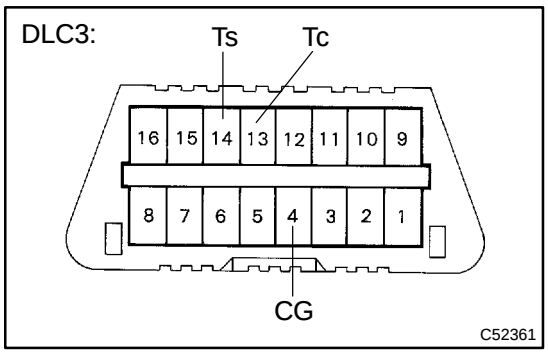
(a) Place front wheels and steering wheel facing straight ahead.

(b) In case of using hand-held tester:
Perform the torque sensor zero point initialization.

HINT:
If the power steering ECU assy is replaced, however, this operation is not necessary.

(1) Stop the vehicle.
(2) Hook up the hand-held tester to the DLC3.
(3) Select the "TRQ SENS ADJUST" mode on the hand-held tester.
(4) Select the "ZERO POINT INITIALIZE".
(5) Following the screen instructions, perform the torque sensor zero point initialization.

HINT:
Please refer to the hand-held tester operator's manual for further details.



(c) In case of not using hand-held tester:
Perform the torque sensor zero point initialization.

HINT:
If the power steering ECU assy is replaced, however, this operation is not necessary.

(1) Stop the vehicle.
(2) Using SST, connect terminals Ts and CG of DLC3.
SST 09843-18040
(3) Using SST, connect terminals Tc and CG of DLC3.
SST 09843-18040
(4) Disconnect and connect the terminal Tc of DLC3 20 times within 20 seconds.
(5) Check the DTC C1515/15.

(d) In case of using hand-held tester:
Perform the torque sensor zero point calibration.

HINT:
Don't touch the steering wheel.

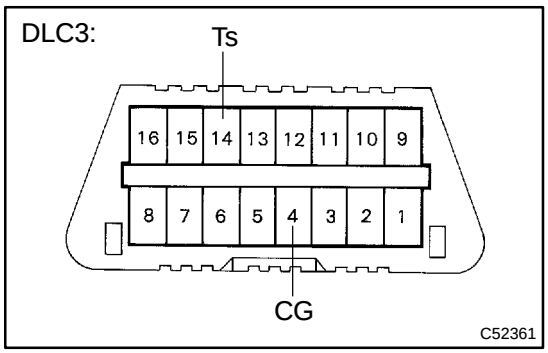
(1) Select the "TRQ SENS ADJUST" mode on the hand-held tester.
(2) Select the "ZERO POINT ADJUST".
(3) Following the screen instructions, perform the torque sensor zero point calibration.

HINT:
Please refer to the hand-held tester operator's manual for further details.

(e) In case of not using hand–held tester:
Perform the torque sensor zero point calibration.

HINT:

- Don't touch the steering wheel.
- Check that the DTC for except C1515/15 is not output.
  (1) Stop the vehicle and turn the ignition switch to OFF.
  (2) Using SST, connect terminals Ts and CG of DLC3 and ignition switch to ON.
  SST 09843–18040
  (3) Disconnect the SST.
  SST 09843–18040
  (4) Check the DTC is not output.



5. REPLACE POWER STEERING ECU ASSY

NOTICE:

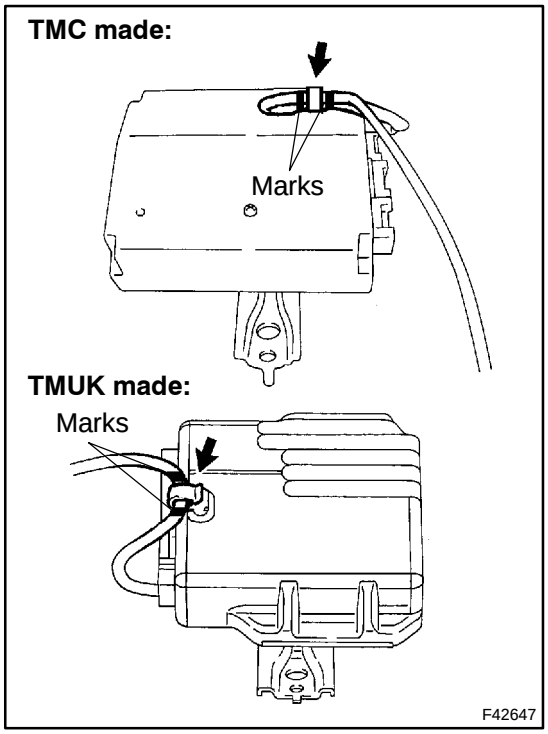
Check the procedures for removing and installing the power steering ECU assy well when replacing the power steering ECU assy. Also check the procedures for removing and installing the steering column assy well.

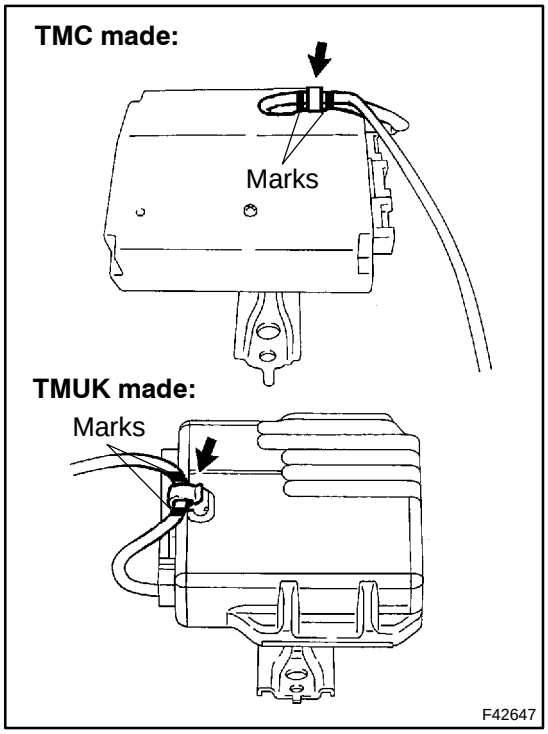
(a) Remove the power steering ECU assy
(See page 50–7).
  (1) Mark the clamp position of the harness in order to reinstall.
  (2) Disconnect the harness of the connector from the clamp of the power steering ECU assy.

NOTICE:

Do not remove the clamp from the power steering ECU assy to reuse it.

  (3) Disconnect the connector.
  (4) Remove the 2 screws and power steering ECU assy.





(b) Install the power steering ECU assy
(See page 50-7).
(1) Install the power steering ECU assy with the 2 screws.
(2) Connect the harness to clamp of power steering ECU assy.

NOTICE:

- **In case that the column assy has been replaced with a new supplied one, remove the clamp attached to the column and connect the harness to the power steering ECU assy clamp. Mark the clamp position before removing it.**
- **Hold the mark position on the harness to the clamp.**
- **In case that the power steering ECU is replaced with a new supplied one, be sure to use the appropriate power steering ECU assy to the vehicle.**

050WM-03

DIAGNOSTIC TROUBLE CODE CHART

HINT:

- Using SST 09843-18040, connect terminals Tc and CG of the DLC3.
- If a malfunction code is displayed during the DTC check, check the circuit listed for the code. For details of each code, turn to the page referred to under the "See page" for respective "DTC No." in the DTC chart.

TMC made:

DTC No. (See page)	Detection Item	Trouble Area
C1511/11 (05-825)	Torque sensor circuit malfunction	• Steering column assy • Power steering ECU assy
C1512/12 (05-825)		
C1513/13 (05-825)		
C1514/14 (05-825)	Torque sensor power source circuit malfunction	
C1515/15 (05-829)	Calibration of torque sensor zero point not performed	Because sensor zero point calibration is not preformed.
C1516/16 (05-829)	Calibration of torque sensor zero point not completed	Because sensor zero point calibration failure.
C1517/17 (05-825)	Torque sensor hold malfunction	• Steering column assy • Power steering ECU assy
C1521/21 (05-831)	Motor circuit malfunction	• Steering column assy • Power steering ECU assy
C1523/23 (05-831)		
C1524/24 (05-831)		
C1531/31 (05-833)	Power steering ECU assy malfunction	Power steering ECU assy
C1532/32 (05-833)		
C1533/33 (05-833)		
C1541/41 (05-834)	Speed sensor malfunction	• Speed sensor • Speed sensor circuit • Combination meter assy • Skid control ECU • Power steering ECU assy
C1542/42 (05-834)		
C1544/44 (05-837)	Engine revolution signal malfunction	• Engine revolution signal circuit • ECM • Power steering ECU assy
C1545/45 (05-837)		
C1551/51 (05-840)	IG power source circuit malfunction	• ECU-IG fuse • Power steering relay • IG power source circuit • Charging system • Power steering ECU assy

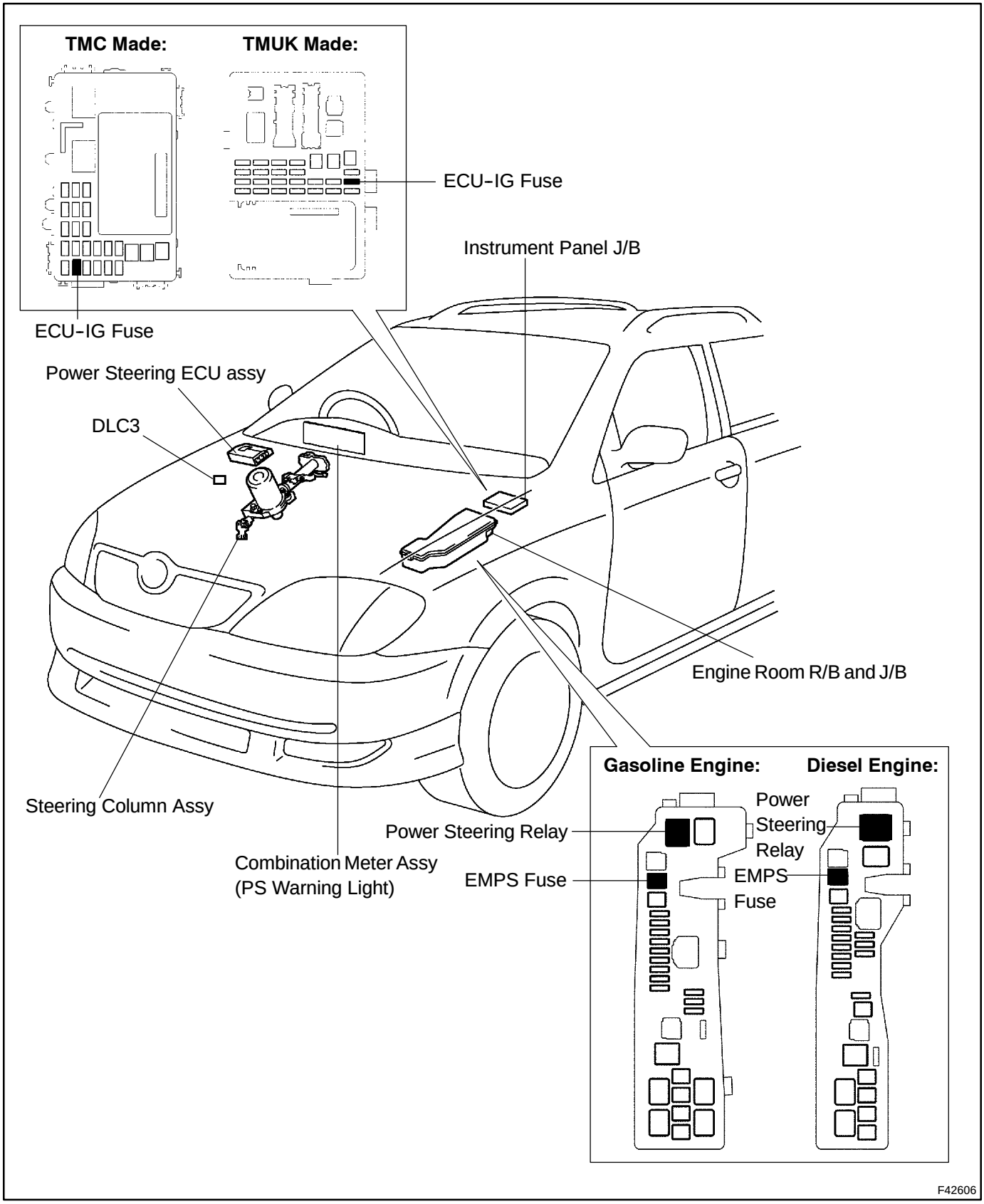
C1552/52 (05-844)	PIG power source circuit malfunction	• EMPS fuse • Power steering relay • PIG power source circuit • Power steering ECU assy
C1554/54 (05-844)	Power steering relay circuit malfunction	
C1555/55 (05-849)	EMPS motor relay circuit malfunction	Power steering ECU assy
C1581/81 (05-833)	Assist map un-written	Power steering ECU assy

TMUK made:

DTC No. (See page)	Detection Item	Trouble Area
C1511/11 (05-825)	Torque sensor circuit malfunction	• Steering column assy • Power steering ECU assy
C1512/12 (05-825)		
C1513/13 (05-825)		
C1514/14 (05-825)	Torque sensor power source circuit malfunction	
C1521/21 (05-831)	Motor circuit malfunction	• Steering column assy • Power steering ECU assy
C1523/23 (05-831)		
C1524/24 (05-831)		
C1531/31 (05-833)	Power steering ECU assy malfunction	Power steering ECU assy
C1532/32 (05-833)		
C1533/33 (05-833)		
C1541/41 (05-834)	Speed sensor malfunction	• Speed sensor • Speed sensor circuit • Combination meter assy • Skid control ECU • Power steering ECU assy
C1544/44 (05-837)	Engine revolution signal circuit malfunction	• Engine revolution signal circuit • ECM • Power steering ECU assy
C1551/51 (05-840)	IG power source circuit malfunction	• ECU-IG fuse • Power steering relay • IG power source circuit • Charging system • Power steering ECU assy
C1552/52 (05-844)	PIG power source circuit malfunction	• EMPS fuse • Power steering relay • PIG power source circuit • Power steering ECU assy
C1554/54 (05-844)	Power steering relay circuit malfunction	
C1555/55 (05-849)	EMPS motor relay circuit malfunction	Power steering ECU assy
C1581/81 (05-833)	Assist map un-written	Power steering ECU assy

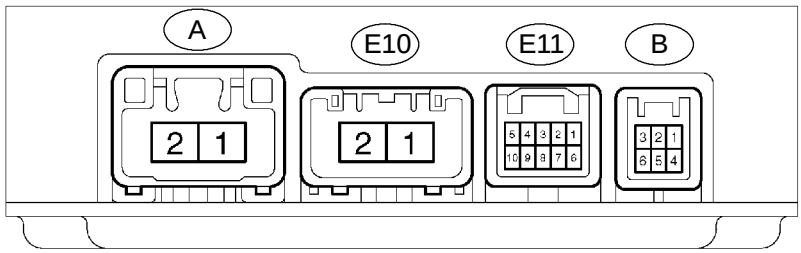
050WN-03

LOCATION



050WO-03

TERMINALS OF ECU



N F42607

Symbols (Terminal No.)	Wiring Color	Condition	STD Voltage (V)
TRQV (B-1) - PGND (E10-2)	- W-B	IG switch ON	TMC made: 7.5 - 8.5
			TMUK made: 8.5 - 9.5
TRQ2 (B-2) - PGND (E10-2)	- W-B	IG switch ON, turn the steering wheel to left and right	TMC made: 0.15 - 4.85
			TMUK made: 0.3 - 4.7
TRQG (B-3) - PGND (E10-2)	- W-B	IG switch ON	Below 1.0
TRQ1 (B-4) - PGND (E10-2)	- W-B	IG switch ON, turn the steering wheel to left and right	TMC made: 0.15 - 4.85
			TMUK made: 0.3 - 4.7
TMUK made only: TRQ1 (B-5) - PGND (E10-2)	- W-B	IG switch ON	3.1 - 3.5
M1 (A-1) - PGND (E10-2)	B - W-B	IG switch ON, turn the steering wheel to left	Below 1.0
		IG switch ON, turn the steering wheel to right	10 - 16
M2 (A-2) - PGND (E10-2)	R - W-B	IG switch ON, turn the steering wheel to left	10 - 16
		IG switch ON, turn the steering wheel to right	Below 1.0
PIG (E10-1) - PGND (E10-2)	B - W-B	IG switch ON	10 - 16
PGND (E10-2) - Body Ground	W-B - Body Ground	Always	Below 1.0
SIL (E11-1) - PGND (E10-2)	W (L-R) - W-B	IG switch ON	10 - 16
RLY (E11-2) - PGND (E10-2)	R-G - W-B	IG switch ON, after 1 sec. or more	Below 2.0
Tc (E11-3) - PGND (E10-2)	W (P-B) - W-B	IG switch ON	5 - 14
SPD (E11-4) - PGND (E10-2)	W (V-W) - W-B	IG switch ON	Pulse generation
IG (E11-5) - PGND (E10-2)	SB (B-Y) - W-B	IG switch ON	9 - 14
WL (E11-7) - PGND (E10-2)	W (R-Y) - W-B	After IG switch ON and PS warning light turns on for 2 sec., then it goes off	Below 1.0
Ts (E11-9) - PGND (E10-2)	W (GR-G) - W-B	IG switch ON	5 - 14
TACH (E11-10) - PGND (E10-2)	W (B) - W-B	IG switch ON	Pulse generation
IDUP (E11-6) - PGND (E10-2)	W (L-R) - W-B	IG switch ON	5 - 14

050WP-03

PROBLEM SYMPTOMS TABLE

If a normal code is displayed during the DTC check but the problem still occurs, check the circuits for each problem symptom in the order given in the table below and proceed to the relevant troubleshooting page.

Symptom	Suspected Area	See page
At the time of idling, steering control force is great.	Only when 1. to 6. are all normal and the problem is still occurring, replace the power steering ECU assy. 1. Check the DTC reconfirming that the normal code is output. 2. IG Power source circuit 3. ECM 4. Front tire (Worn or improperly inflated) 5. Front wheel alignment (Incorrect) 6. Steering column assy	 05-812 05-840 01-30 28-1 26-2 50-7
Even if the vehicle speed is increased, appropriate steering resistance cannot be felt.	Only when 1. to 3. are all normal and the problem is still occurring, replace the power steering ECU assy. 1. Check the DTC reconfirming that the normal code is output. 2. Combination meter assy 3. Steering column assy	 05-812 71-3 50-7
PS warning light abnormal.	1. PS warning light circuit 2. Power steering ECU assy	05-853 01-30
DTC check cannot be done.	Only when 1. and 2. are all normal and the problem is still occurring, replace the Power steering ECU assy. 1. PS warning light circuit 2. Tc terminal circuit	 05-853 05-856
Input signal check cannot be done.	1. Ts terminal circuit 2. Power steering ECU assy 3. Combination meter assy	05-858 01-30 71-3
Abnormal noise.	1. Steering column assy 2. Power steering ECU assy 3. Steering gear assy	50-7 01-30 51-6

DTC	C1511/11	Torque Sensor Circuit Malfunction

DTC	C1512/12	Torque Sensor Circuit Malfunction

DTC	C1513/13	Torque Sensor Circuit Malfunction

DTC	C1514/14	Torque Sensor Power Source Circuit Malfunction

DTC	C1517/17	Torque Sensor Hold Malfunction

CIRCUIT DESCRIPTION

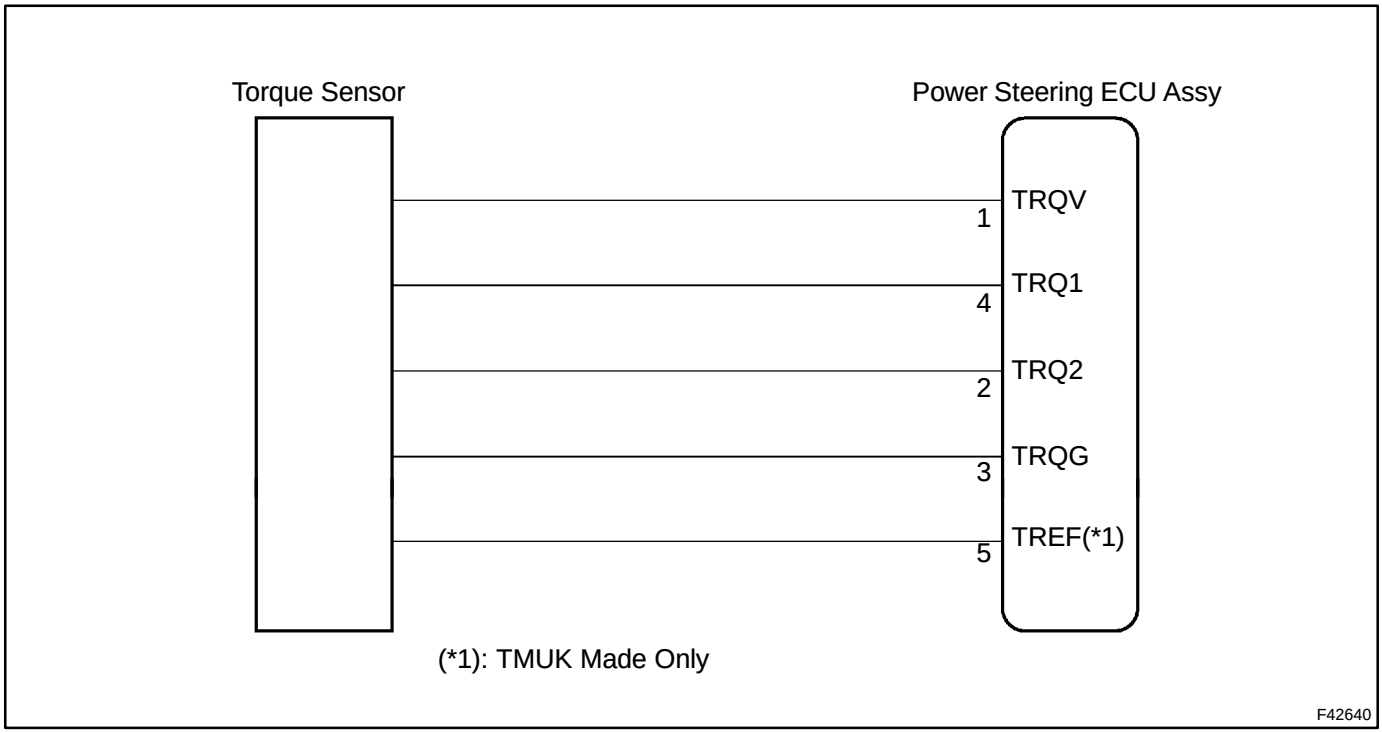
Steering torque is detected from output current of torque sensor.

DTC No.	DTC Detecting Condition	Trouble Area
C1511/11	Torque sensor circuit malfunction	• Steering column assy • Power steering ECU assy
C1512/12		
C1513/13		
C1514/14	Torque sensor power source circuit malfunction	
C1517/17	Torque sensor hold malfunction	

HINT:

DTC C1517/17 is only output by TMC made.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from the step 1 in case of using hand-held tester and start from step 2 in case of not using hand-held tester.

1	READ VALUE OF HAND-HELD TESTER

(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch to ON and push the hand-held tester main switch ON.
(c) Select the item "TRQ1" and "TRQ2" in the DATA LIST and read its value displayed on the hand-held tester.
(d) Check the values on the "TRQ1" and "TRQ2" of the data monitor with the steering wheel being in the center value position (no load).
OK:
TMC made: 2.2 - 2.8 V
TMUK made: 2.3 - 2.7 V
(e) Check the difference of the values between "TRQ1" and "TRQ2" with the steering wheel being in the center value position (no load).
OK:
Voltage: 0.3 V or less
(f) Check the values of the torque sensor on the data monitor when turning steering wheel.
(1) Turn the steering wheel to the right end from the center value position, and check the values on the "TRQ1" and "TRQ2" of the data monitor.
OK:

TMC made:

TRQ1	TRQ2
2.2 - 4.85 V	2.2 - 4.85 V

TMUK made:

TRQ1	TRQ2
2.5 - 4.7 V	0.3 - 2.5 V

(2) Turn the steering wheel to the left end from the center value position, and check the values on the "TRQ1" and "TRQ2" of the data monitor.
OK:

TMC made:

TRQ1	TRQ2
0.15 - 2.8 V	0.15 - 2.8 V

TMUK made:

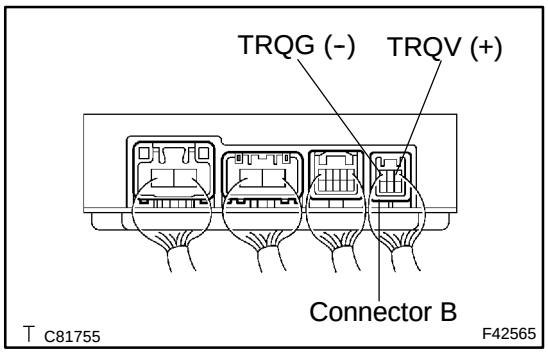
TRQ1	TRQ2
0.3 - 2.5 V	2.5 - 4.7 V

(3) Check the difference of the values between "TRQ1" and "TRQ2".
OK:
Voltage: 0.3 V or less

OK → **CHECK AND REPLACE POWER STEERING ECU ASSY** **(See page 01-30)**

NG

2	INSPECT POWER STEERING ECU ASSY



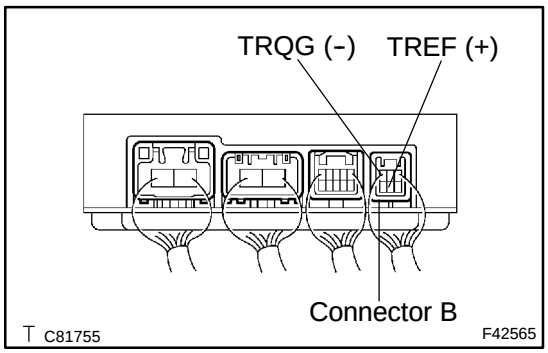
(a) Remove the power steering ECU assy with connectors still connected.

(b) Measure the voltage between terminals 1 (TRQV) and 3 (TRQG) of power steering ECU assy connector B.

OK:

TMC made: 7.5 - 8.5 V

TMUK made: 8.5 - 9.5 V



(c) TMUK made only:

Measure the voltage between terminals 5 (TREF) and 3 (TRQG) of power steering ECU assy connector B.

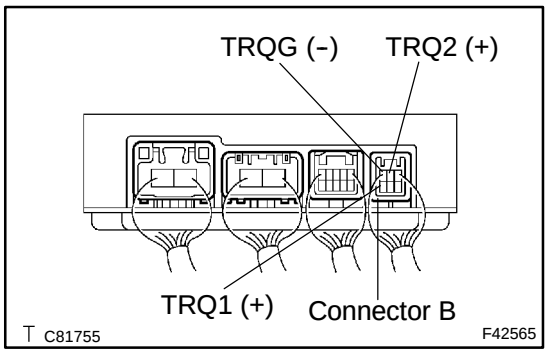
OK:

Voltage: 3.1 - 3.5 V

NG → **CHECK AND REPLACE POWER STEERING ECU ASSY** (See page 01-30)

OK

3	INSPECT STEERING COLUMN ASSY(TORQUE SENSOR)



(a) Measure the voltage between terminals 2 (TRQ2) and 3 (TRQG), 6 (TRQ1) and 3 (TRQG) of power steering ECU assy connector B.

OK:

TMC made:

Steering position	TRQ1	TRQ2
Center position	2.2 - 2.8 V	2.2 - 2.8 V
Right turned	2.2 - 4.85 V	2.2 - 4.85 V
Left turned	0.15 - 2.8 V	0.15 - 2.8 V

TMUK made:

Steering position	TRQ1	TRQ2
Center position	2.3 - 2.7 V	2.3 - 2.7 V
Right turned	2.5 - 4.7 V	0.3 - 2.5 V
Left turned	0.3 - 2.5 V	2.5 - 4.7 V

NG → **CHECK AND REPLACE STEERING COLUMN ASSY**

OK

CHECK AND REPLACE POWER STEERING ECU ASSY **(See page 01-30)**

DTC	C1515/15	Torque Sensor Zero Point Calbration Not Performed

CIRCUIT DESCRIPTION

This DTC does not indicate trouble. Perform calibration of torque sensor zero point to delete DTC.

DTC No.	DTC Detecting Condition	Trouble Area
C1515/15	When torque sensor zero point calibration not performed, this DTC is detected.	Be cause sensor zero point calibration is not performed.

HINT:
DTC 15/15/15 is only output by TMC made.

INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check the DTC (See page 05-812).
(b) Is DTC except for C1515/15 output?

YES → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

NO

2	PERFORM CALIBRATION OF TORQUE SENSOR ZERO POINT(See page 05-812)

3	RECONFIRM DTC

(a) Check the DTC (See page 05-812).
(b) Is DTC C1516/16 output?

NO → END

YES

REPAIR CIRCUIT INDICATED BY DTC C1516/16 (See page 05-830)

DTC	C1516/16	Calibration of Sensor Zero Point Not Completed

CIRCUIT DESCRIPTION

This DTC does not indicate trouble. This is detected when the torque sensor zero point calibration is not completed normally.

DTC No.	DTC Detecting Condition	Trouble Area
C1516/16	This is detected when the torque sensor zero point calibration is not completed normally.	Because sensor zero point calibration failure.

HINT:
DTC 1516/16 is only output by TMC made.

INSPECTION PROCEDURE

1	CLEAR DTC (See page 05-812)

2	PERFORM CALIBRATION OF TORQUE SENSOR ZERO POINT (See page 05-812)

3	RECONFIRM DTC

(a) Check the DTC (See page 05-812).
(A): DTC C1516/16 output after attempted 3 time or more.
(B): Normal code output.

HINT:
In case that the DTC code is output in spite of conducting the steering zero point correction, replace the steering column assy.

(A)	REPLACE STEERING COLUMN ASSY

(B)

END

DTC	C1521/21	Motor Circuit Malfunction

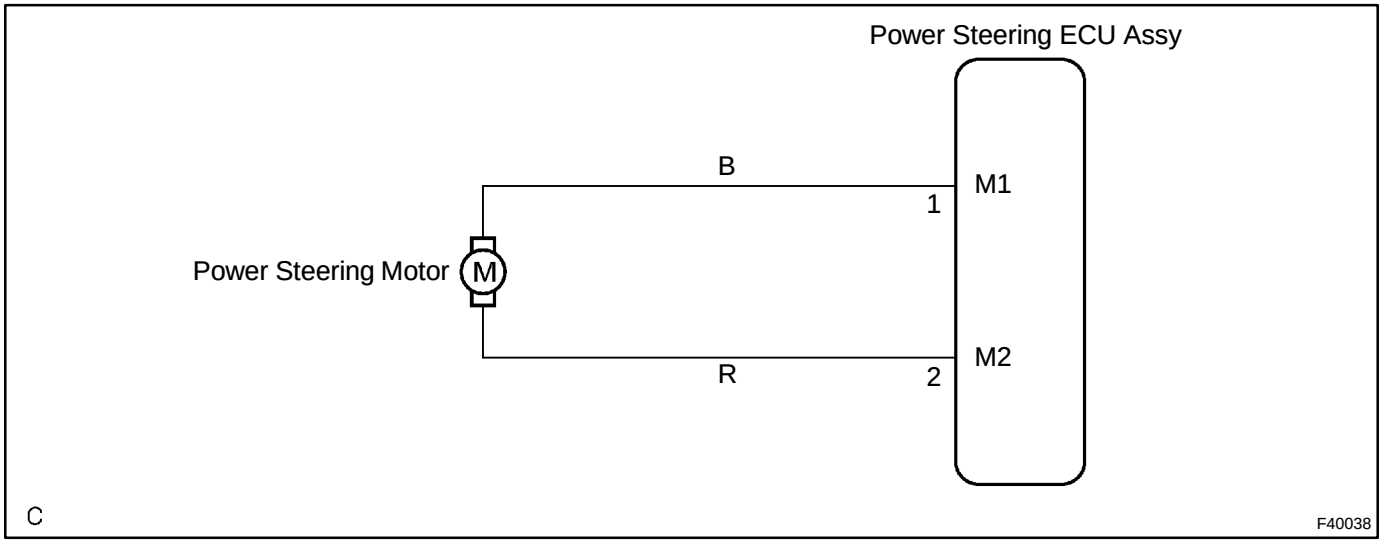
DTC	C1523/23	Motor Circuit Malfunction

DTC	C1524/24	Motor Circuit Malfunction

CIRCUIT DESCRIPTION

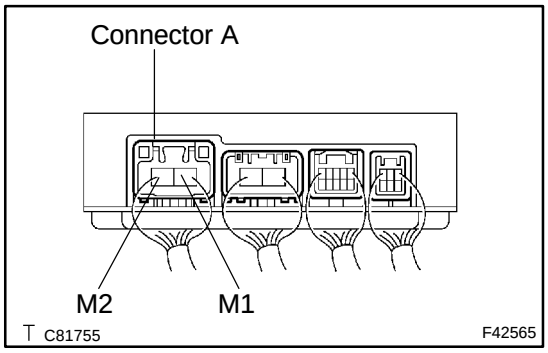
DTC No.	DTC Detecting Condition	Trouble Area
C1521/21	Short circuit of motor terminal or abnormal voltage or current in motor circuit.	S Steering column assy S Power steering ECU assy
C1523/23		
C1524/24		

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT POWER STEERING ECU ASSY

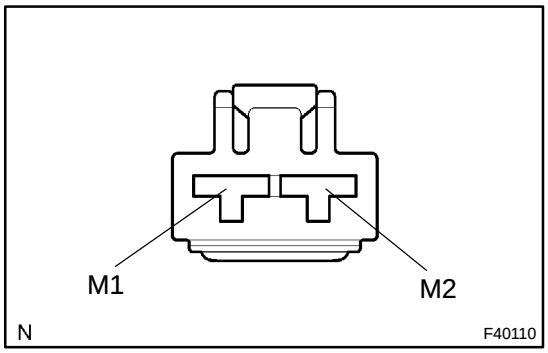


(a) Remove the power steering ECU assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Turn the steering wheel to left and right and measure the voltage between terminals 1 (M1) and 2 (M2) of power steering ECU assy connector A.
OK:
Voltage changes when steering wheel is turned.

NG → **CHECK AND REPLACE POWER STEERING ECU ASSY** **(See page 01-30)**

OK

2 INSPECT STEERING COLUMN ASSY(POWER STEERING MOTOR)



(a) Disconnect the connector from the power steering motor.
(b) Measure the resistance between terminals 1 (M1) and 2 (M2) of power steering motor connector.
OK:
Resistance: 0.07 - 1 Ω

NG → **CHECK AND REPLACE STEERING COLUMN ASSY**

OK

CHECK AND REPLACE POWER STEERING ECU ASSY **(See page 01-30)**

DTC	C1531/31	EMPS ECU Circuit Malfunction

DTC	C1532/32	EMPS ECU Circuit Malfunction

DTC	C1533/33	EMPS ECU Circuit Malfunction

DTC	C1581/81	Assist Map Un-written

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1531/31	Power steering ECU assy malfunction	Power steering ECU assy
C1532/32		
C1533/33		
C1581/81	Assist map un-written	

INSPECTION PROCEDURE

1	RECONFIRM DTC

(a) Check the DTC (See page 05-812).

(b) Is DTC except for C1531/31, C1532/32, C1533/33 and/or C1581/81 output?

NO → REPAIR CIRCUIT INDICATED BY OUTPUT CODE

YES

CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

DTC	C1541/41	Speed Sensor Malfunction

DTC	C1542/42	Speed Sensor Malfunction

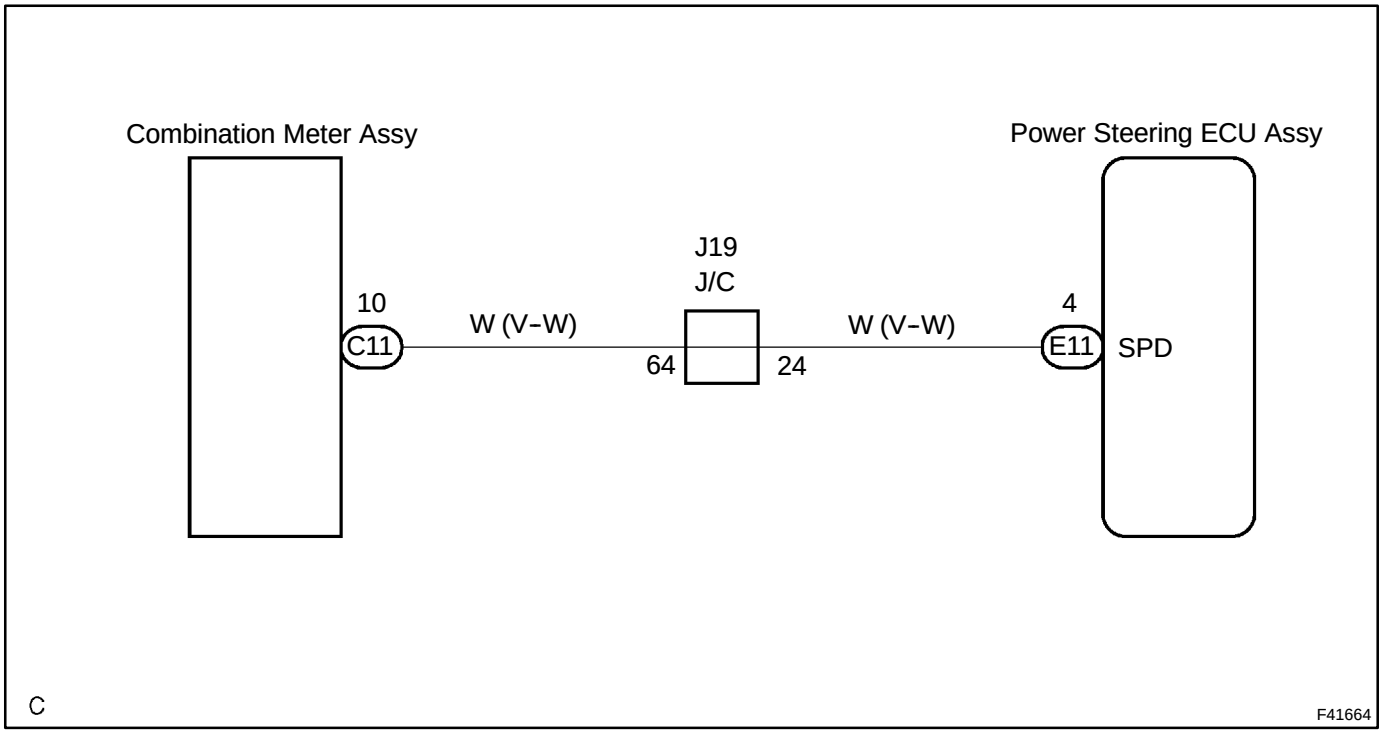
DTC	C1571/71	Speed Sensor Malfunction (Test mode)

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1541/41	Speed sensor malfunction	S Speed sensor S Speed sensor circuit S Combination meter assy S Skid control ECU assy S Power steering ECU assy
C1542/42		
C1571/71	Speed sensor malfunction (Test mode)	

HINT:
DTC C1542/ 42 is only output by TMC made.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from the step 1 in case of using hand-held tester and start from step 2 in case of not using hand-held tester.

1	READ VALUE OF HAND-HELD TESTER

(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch to ON and turn the hand-held tester main switch to ON.
(c) Select the item "SPD" in the DATA LIST and read its value displayed on the hand-held tester.
(d) Check that there is no difference between the speed value output from the speedometer displayed by the hand-held tester and the speed value displayed by the speedometer when driving the vehicle.
OK:
There is almost no difference in the displayed speed value.

HINT:
There is tolerance of ±10 % in the speedometer indication.

OK → **CHECK AND REPLACE POWER STEERING ECU ASSY** **(See page 01-30)**

NG

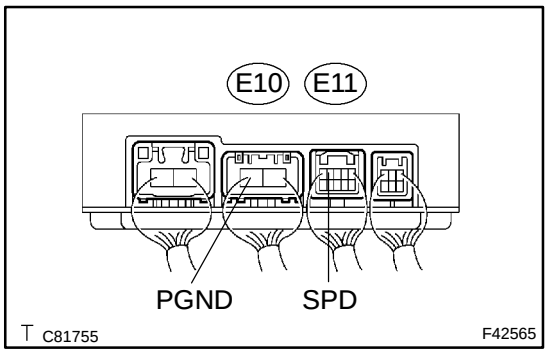
2	CHECK DIAGNOSTIC CODE OUTPUT

(a) Check that DTC for ABS output the normal code.

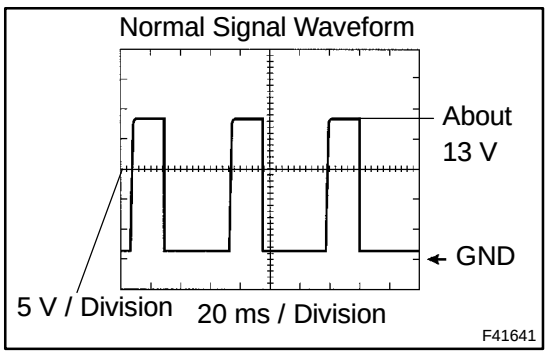
NO → **REPAIR CIRCUIT INDICATED BY OUTPUT CODE**

YES

3	INSPECT POWER STEERING ECU ASSY(SPD OUTPUT)



(a) Remove the power steering ECU assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Connect an oscilloscope to terminals E11 – 4 (SPD) and E10 – 2 (PGND) of the power steering ECU assy connector.



(d) Driving at about 10 km/h (6 mph), check the signal waveform.
OK:
Signal waveform as shown in the illustration.

HINT:
As the vehicle speed becomes higher, the waveform cycle is getting shorter.

OK	CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

NG

4	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - COMBINATION METER ASSY)

(a) Check for open and short circuit in harness and connector between power steering ECU assy and combination meter assy (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

GO TO COMBINATION METER SYSTEM (See page 05-1298)

DTC	C1544/44	Engine Revolution Signal Malfunction

DTC	C1545/45	Engine Revolution Signal Malfunction

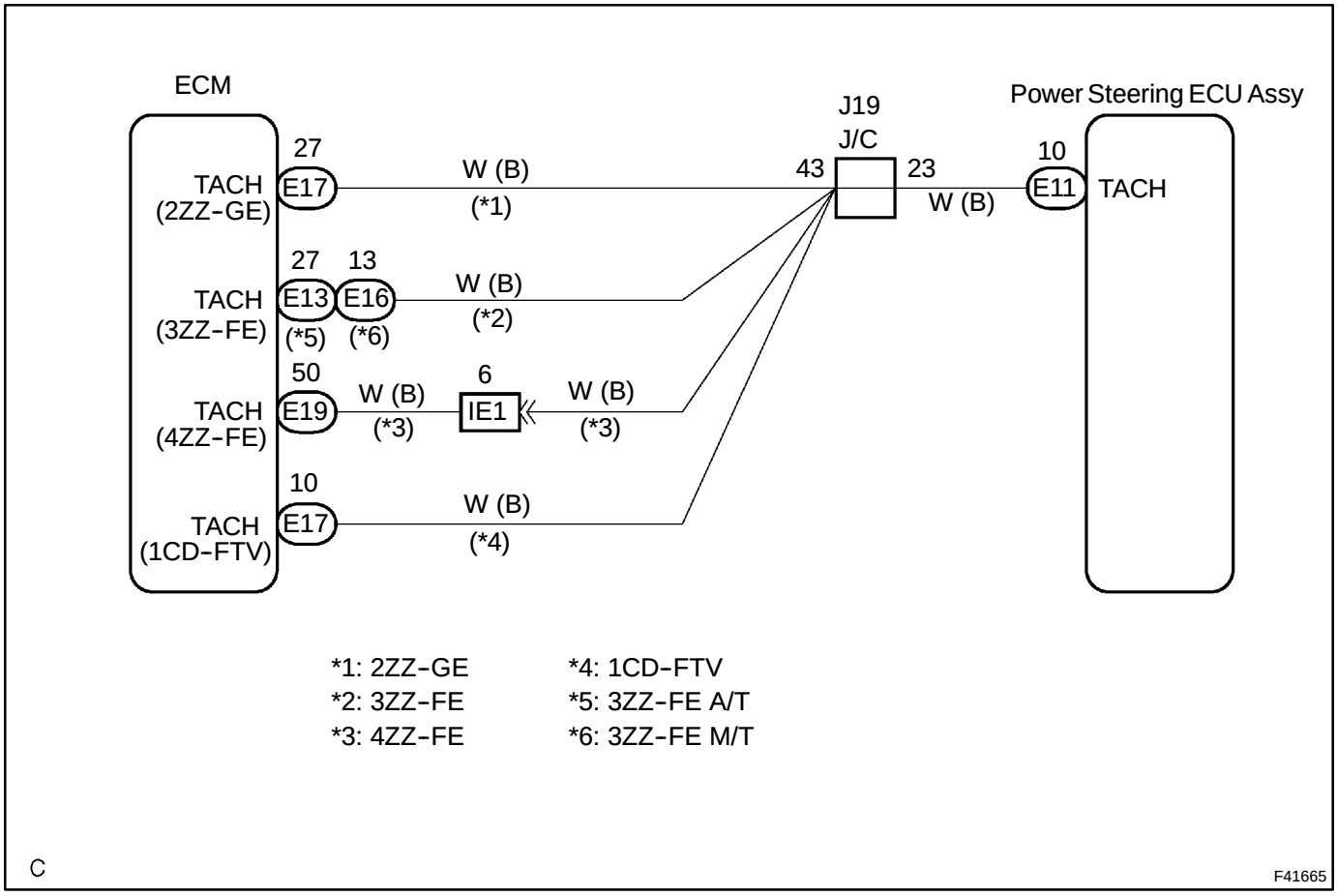
DTC	C1573/73	Engine Revolution Signal Malfunction (Test Mode)

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1544/44	Engine revolution signal malfunction	S Engine revolution signal circuit S ECM S Power steering ECU assy
C1545/45		
C1573/73	Engine revolution signal malfunction (Test mode)	

HINT:
DTC C1545/45 is only output by TMC made.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Start the inspection from the step 1 in case of using hand-held tester and start from step 2 in case of not using hand-held tester.

1	READ VALUE OF HAND-HELD TESTER

(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch to ON and turn the hand-held tester main switch to ON.
(c) Select the item "ENGINE REV" in the DATA LIST and read its value displayed on the hand-held tester.
(d) Check that there is no difference between the engine revolution value output from the tachometer displayed by the hand-held tester and the engine speed value displayed by the tachometer when engine is idle.

OK:

There is almost no difference in the displayed engine speed value.

HINT:

There is tolerance of ±10 % in the tachometer indication.

OK → **CHECK AND REPLACE POWER STEERING ECU ASSY** **(See page 01-30)**

NG

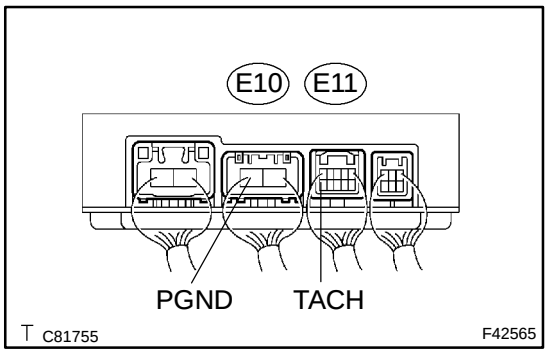
2	CHECK DIAGNOSTIC CODE OUTPUT

(a) Check that DTC for engine output the normal code.

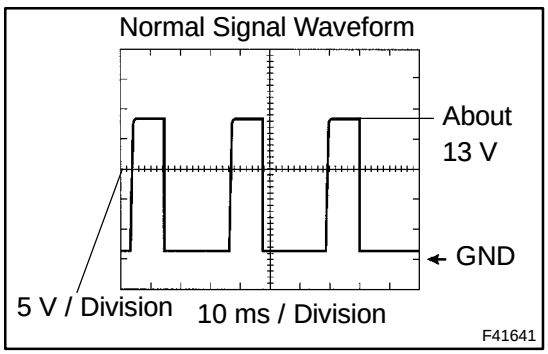
NO → **REPAIR CIRCUIT INDICATED BY OUTPUT CODE**

YES

3	INSPECT POWER STEERING ECU ASSY(TACH OUTPUT)



(a) Remove the power steering ECU assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Connect an oscilloscope to terminals E11 – 10 (TACH) and E10 – 2 (PGND) of the power steering ECU assy connector.



(d) With the engine idling, and check the signal waveform.
OK:
Signal waveform as shown in the illustration.

HINT:
As the engine revolution (more than 300 rpm) becomes higher, the waveform cycle is getting shorter.

OK	CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

NG

4	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - ECM)

(a) Check for open and short circuit in harness and connector between power steering ECU assy and ECM (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

GO TO ENGINE CONTROL SYSTEM

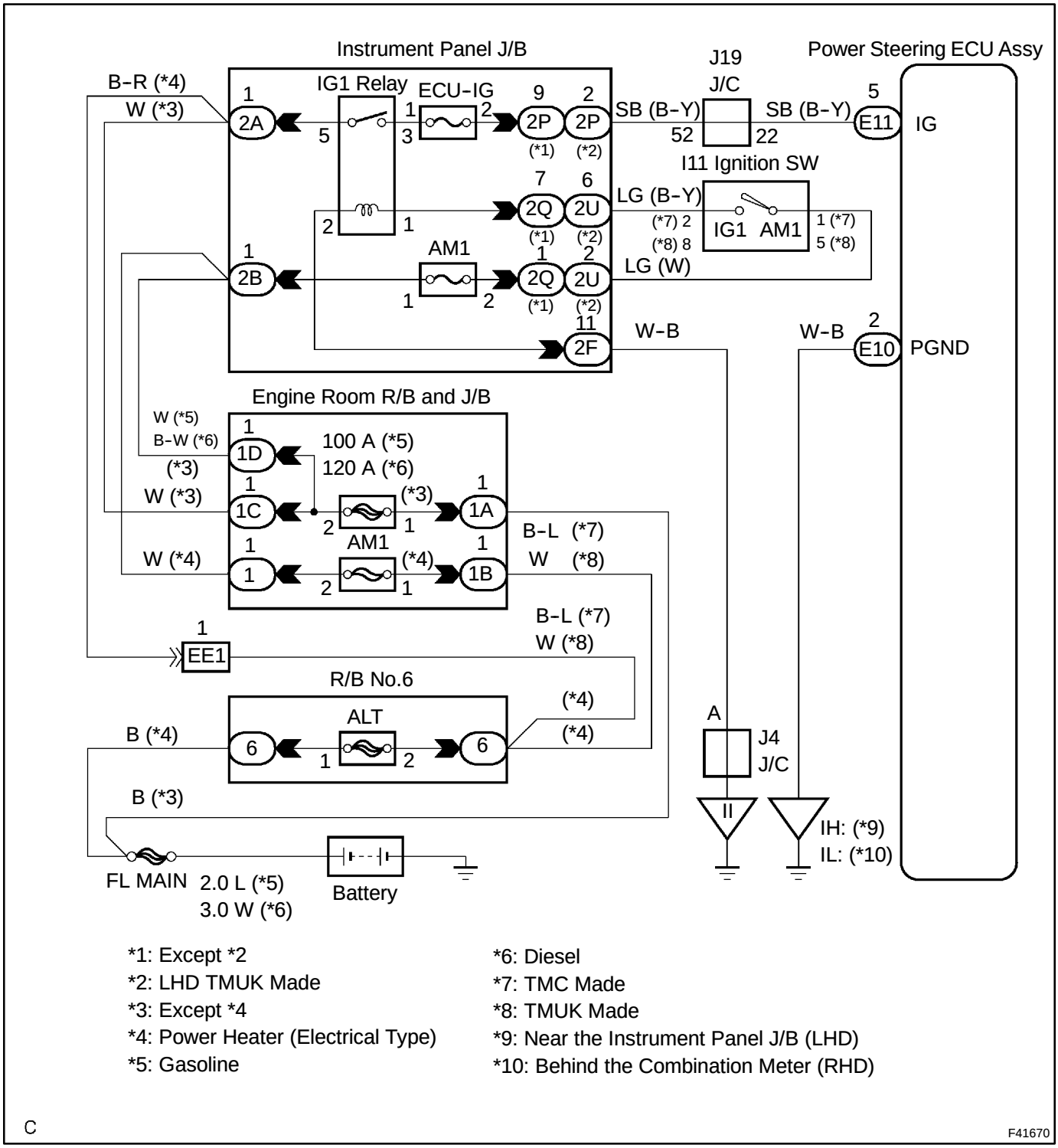
DTC C1551/51 IG Power Source Circuit Malfunction

CIRCUIT DESCRIPTION

The power steering ECU assy identifies ON or OFF status of ignition switch by this circuit.

DTC No.	DTC Detecting Condition	Trouble Area
C1551/51	The abnormal IG voltage value which is not within the specification is input to power steering ECU assy.	S ECU-IG fuse S IG power source circuit S Charging system S Power steering ECU assy

WIRING DIAGRAM



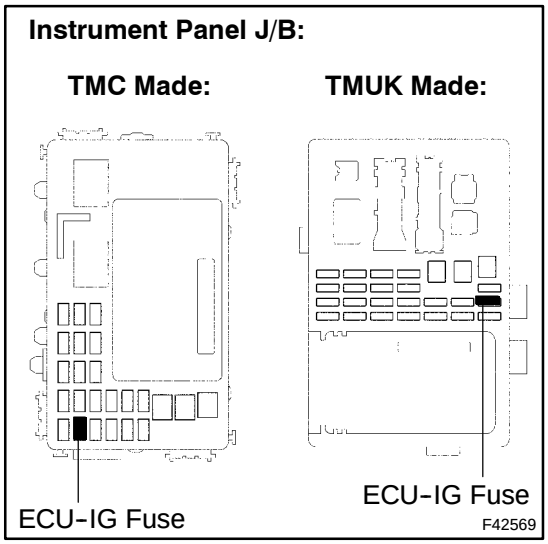
*1: Except *2
*2: LHD TMUK Made
*3: Except *4
*4: Power Heater (Electrical Type)
*5: Gasoline
*6: Diesel
*7: TMC Made
*8: TMUK Made
*9: Near the Instrument Panel J/B (LHD)
*10: Behind the Combination Meter (RHD)

C

F41670

INSPECTION PROCEDURE

1 INSPECT FUSE(ECU-IG)

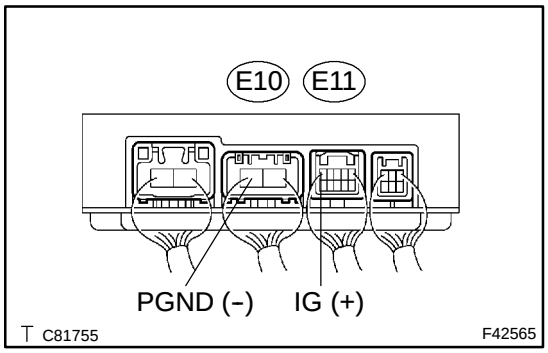


(a) Remove the ECU-IG fuse from the instrument panel J/B.
(b) Check the continuity of the ECU-IG fuse.
OK:
Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN ALL HARNESS AND COMPONENTS CONNECTED TO ECU-IG FUSE**

OK

2 INSPECT POWER STEERING ECU ASSY

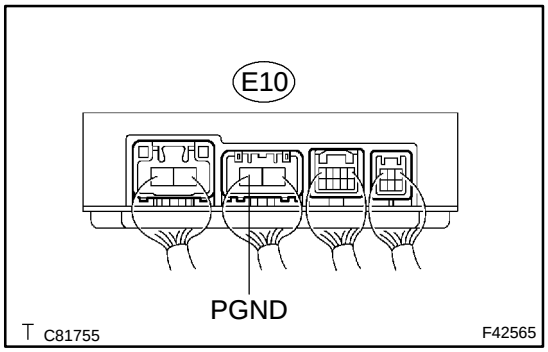


(a) Remove the power steering ECU assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Measure the voltage between terminals E11 - 5 (IG) and E10 - 2 (PGND) of power steering ECU assy connector.
OK:
Voltage: 9 - 14 V

OK → **CHECK AND REPLACE POWER STEERING ECU ASSY** **(See page 01-30)**

NG

3	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - BODY GROUND)



(a) Measure the resistance between terminals E10 - 2 (PGND) of power steering ECU assy connector and body ground.
OK:
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - INSTRUMENT PANEL J/B)

(a) Check for open and short circuit in harness and connector between power steering ECU assy and instrument panel J/B (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

DTC	C1552/52	PIG Power Source Circuit

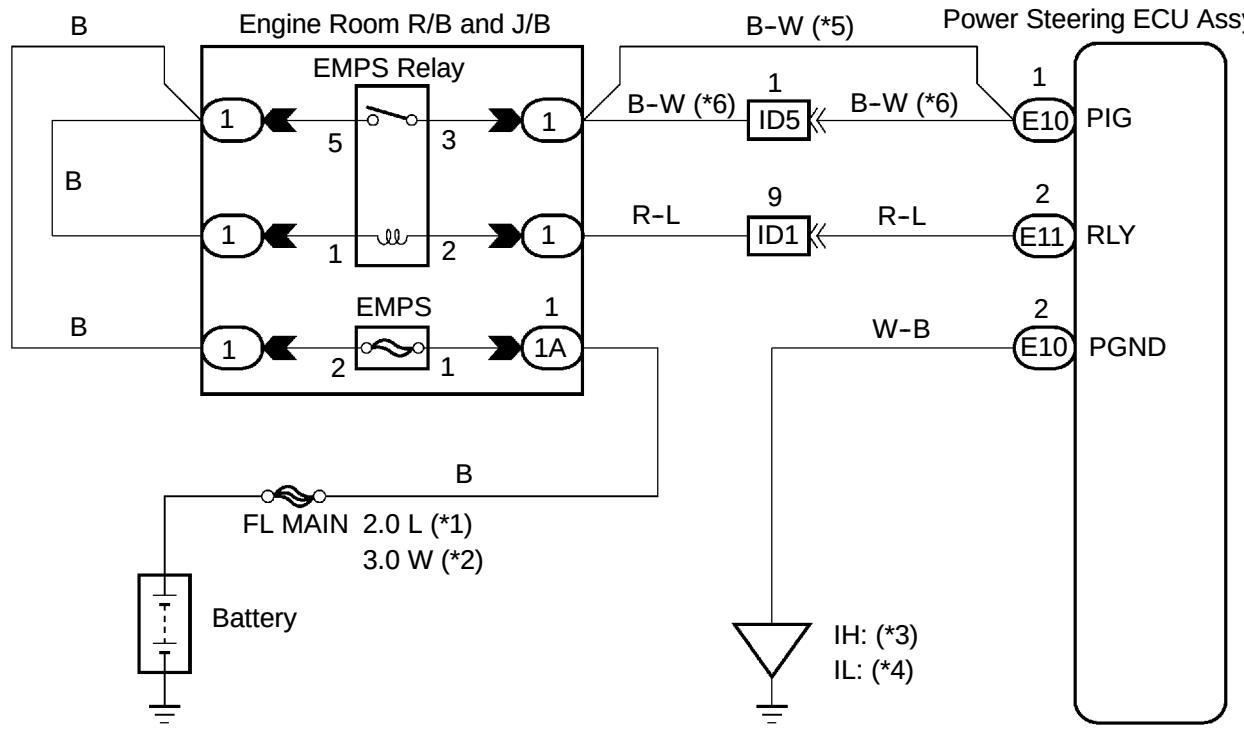
DTC	C1554/54	EMPS Relay Circuit

CIRCUIT DESCRIPTION

When turning ignition switch to ON, battery is supplied to terminal PIG of power steering ECU assy by power steering relay operation.

DTC No.	DTC Detecting Condition	Trouble Area
C1552/52	The abnormal motor power source voltage value which is not within the specification is input to power steering ECU assy.	S EMPS fuse S Power steering relay S PIG power source circuit S Power steering ECU assy
C1554/54	Open or short circuit of power steering relay circuit is detected.	

WIRING DIAGRAM



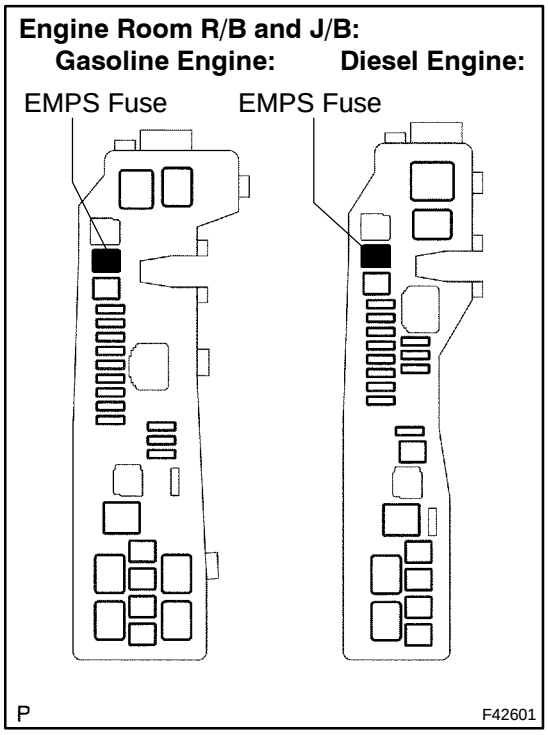
*1: Gasoline
*2: Diesel
*3: Near the Instrument Panel J/B (LHD)
*4: Behind the Combination Meter (RHD)
*5: LHD
*6: RHD

C

F41669

INSPECTION PROCEDURE

1	INSPECT FUSE(EMPS)



(a) Remove the EMPS fuse from the engine room R/B and J/B.

(b) Check the continuity of the EMPS fuse.

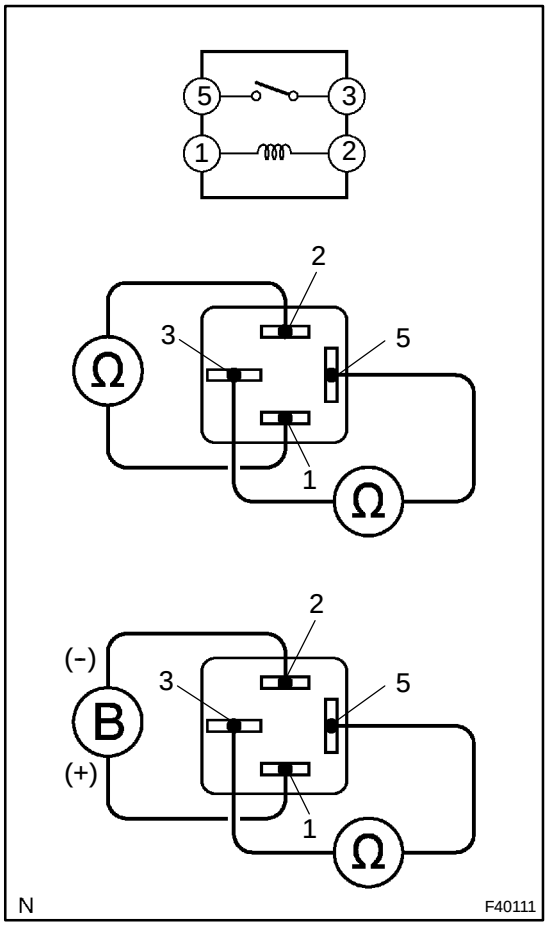
OK:

Continuity

NG → **INSPECT FOR SHORT CIRCUIT IN HARNESS AND ALL COMPONENTS CONNECTED TO EMPS FUSE**

OK

2 INSPECT POWER STEERING RELAY



(a) Remove the power steering relay from the engine room R/B and J/B.

(b) Check the continuity between each terminal of the power steering relay.

OK:

Continuity is within acceptable zone on chart.

Terminal No.	Specification
Terminals 1 and 2	Continuity (Reference value 115 ± 50 Ω)
Terminals 3 and 5	Open

(c) Apply battery voltage between terminals 1 and 2.

(d) Check the continuity between the terminals 3 and 5.

OK:

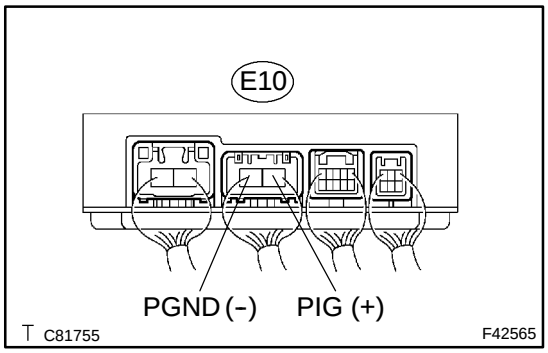
Continuity is within acceptable zone on chart.

Terminal No.	Specification
Terminals 3 and 5	Continuity

NG → **REPLACE POWER STEERING RELAY**

OK

3 INSPECT POWER STEERING ECU ASSY



(a) Remove the power steering ECU assy with connector still connected.

(b) Turn the ignition switch to ON.

(c) Measure the voltage between terminals E10 – 1 (PIG) and E10 – 2 (PGND) of power steering ECU assy connector.

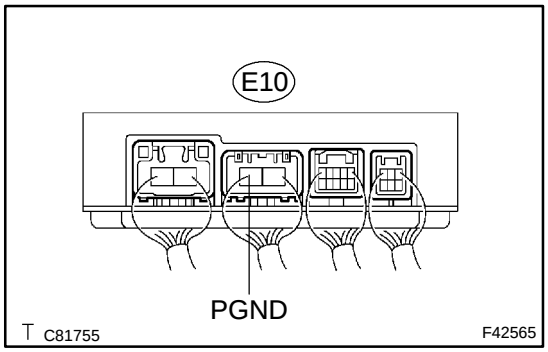
OK:

Voltage: 10 - 16 V

OK → **CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)**

NG

4	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - BODY GROUND)



(a) Measure the resistance between terminals E10 - 2 (PGND) of power steering ECU assy connector and body ground.
OK:
Resistance: 1 Ω or less

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

5	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - ENGINE ROOM R/B AND J/B)

(a) Check for open and short circuit in harness and connector between power steering ECU assy and engine room R/B and J/B (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

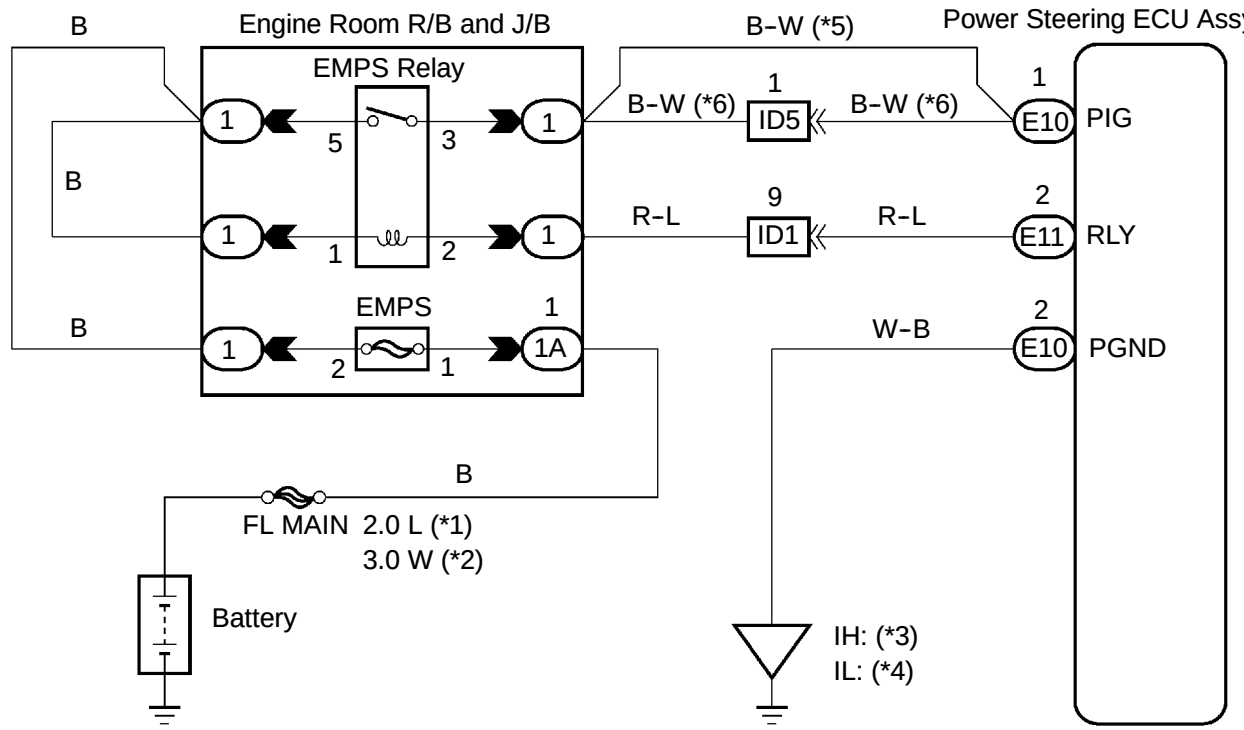
OK

CHECK AND REPLACE POWER STEERING ECU ASSY **(See page 01-30)**

DTC C1555/55 EMPS Motor Relay Circuit

DTC No.	DTC Detecting Condition	Trouble Area
C1555/55	Open or short circuit of EMPS motor relay circuit is detected.	Power steering ECU assy

WIRING DIAGRAM



*1: Gasoline
*2: Diesel
*3: Near the Instrument Panel J/B (LHD)
*4: Behind the Combination Meter (RHD)
*5: LHD
*6: RHD

C

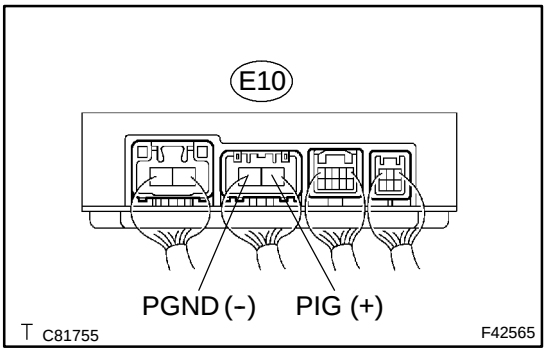
F41669

INSPECTION PROCEDURE

1	INSPECT POWER STEERING ECU ASSY

In case of using hand-held tester:

(a) Connect the hand-held tester to the DLC3.
(b) Turn the ignition switch to ON and turn the hand-held tester main switch to ON.
(c) Select the item "PIG SUPPLY" in the FREEZE FRAME DATA and read its value displayed on the hand-held tester.
(d) Check that the power supply voltage value of the drive motor displayed by the hand-held tester.
OK:
Voltage: 8 - 16 V



In case of not using hand-held tester:

(a) Remove the power steering ECU assy with connector still connected.
(b) Turn the ignition switch to ON.
(c) Measure the voltage between terminals E10 - 1 (PIG) and E10 - 2 (PGND) of power steering ECU assy connector.
OK:
Voltage: 10 - 16 V

NG → **GO TO RELEVANT DTC CHART** (See page 05-844)

OK

2	RECONFIRM DTC

(a) Check the DTC (See page 05-812).
(b) Is DTC except for C1552/52 output?

YES → **REPAIR CIRCUIT INDICATED BY OUTPUT CODE**

NO

CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

Malfunction in EMPS ECU

CIRCUIT DESCRIPTION

If the power steering ECU assy detects trouble, the PS warning lights up. At this time, the power steering ECU assy records a DTC in memory.

INSPECTION PROCEDURE

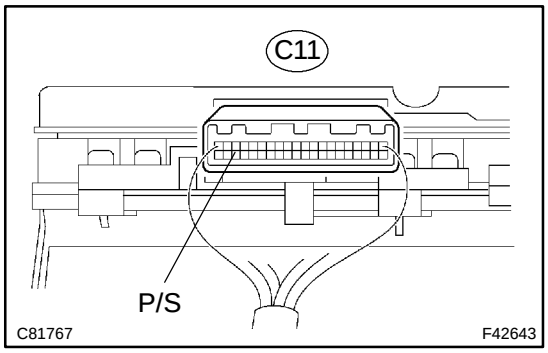
1	RECONFIRM DTC

(a) Check the DTC (See page 01-30).
(A): Malfunction code output.
(B): Normal code output.

(A) → **REPAIR CIRCUIT INDICATED BY OUTPUT CODE**

(B)

2	CHECK PS WARNING LIGHT

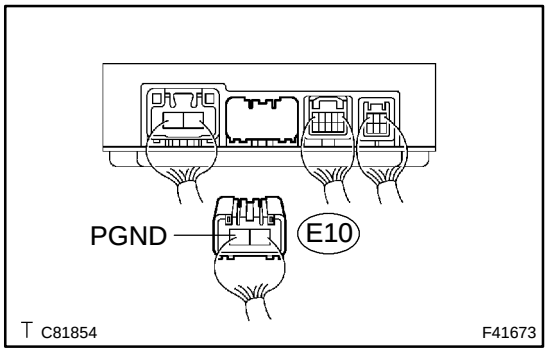


(a) Remove the combination meter assy with connectors still connected.
(b) Connect the terminal C11 - 38 (P/S) of combination meter assy connector and body ground.
OK:
The PS warning light turns off.

NG → **GO TO COMBINATION METER SYSTEM**

OK

3	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - BODY GROUND)



(a) Remove the power steering ECU assy with connectors still connected.
(b) Disconnect the power steering ECU assy E10 connector.
(c) Check the continuity between terminals E10 - 2 (PGND) of power steering ECU assy connector and body ground.
OK:
Continuity

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

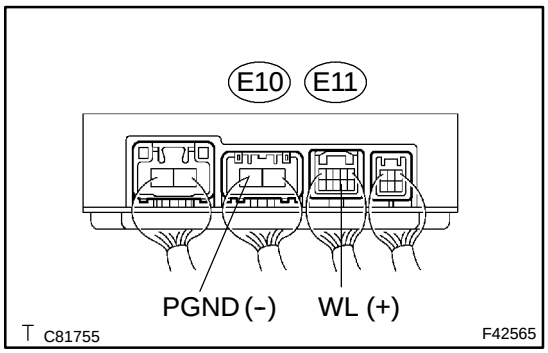
4	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - COMBINATION METER ASSY)

(a) Check for open and short circuit in harness and connector between power steering ECU assy and combination meter assy (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5	INSPECT POWER STEERING ECU ASSY



(a) Connect the power steering ECU assy E10 connector.
(b) Check the power steering ECU assy connectors securely connected.
(c) Measure the voltage between terminals E11 - 7 (WL) and E10 - 2 (PGND) of power steering ECU assy, when turning the ignition switch to ON.
OK:
For 2 seconds (it is) 9 - 14 V, then below 0.1 V.

NG	CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

OK

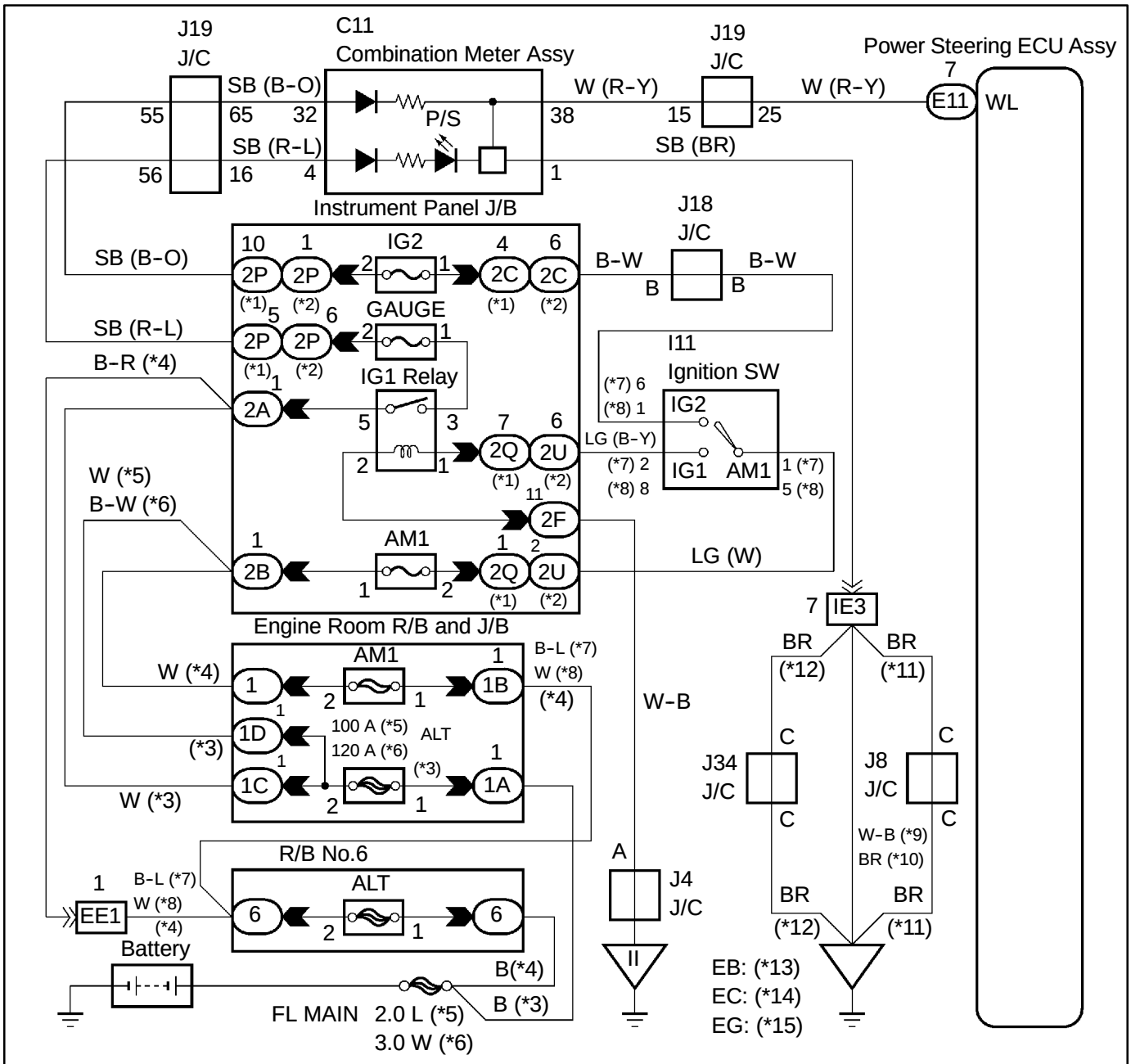
GO TO COMBINATION METER SYSTEM

EMPS Warning Light Circuit

CIRCUIT DESCRIPTION

If the power steering ECU assy detects trouble, the PS warning lights up. At this time, the power steering ECU assy records a DTC in memory.

WIRING DIAGRAM



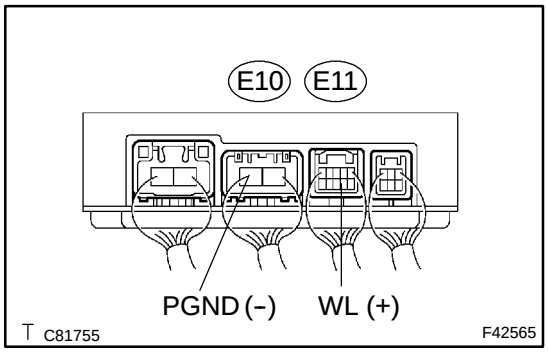
*1: Except *2
*2: LHD TMUK Made
*3: Except *4
*4: Power Heater (Electrical Type)
*5: Gasoline
*6: Diesel
*7: TMC Made
*8: TMUK Made
*9: 4ZZ-FE TMC Made
*10: LHD TMC Made 3ZZ-FE, TMUK Made Except 2ZZ-GE
*11: 2ZZ-GE, RHD TMC Made 3ZZ-FE
*12: 1CD-FTV TMC Made
*13: Left Side of the Cylinder Head (Gasoline Except 4ZZ-FE)
*14: Left Side of the Cylinder Head (4ZZ-FE)
*15: Near the Starter (1CD-FTV)

C

F41666

INSPECTION PROCEDURE

1	INSPECT POWER STEERING ECU ASSY



(a) Remove the power steering ECU assy with connectors still connected.

(b) Measure the voltage between terminals E11 - 7 (WL) and E10 - 2 (PGND) of power steering ECU assy, when turning the ignition switch to ON.

OK:

For 2 seconds (it is) 9 - 14 V, then below 0.1 V.

NG → **CHECK AND REPLACE POWER STEERING ECU ASSY** **(See page 01-30)**

OK

2	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - COMBINATION METER ASSY)

(a) Check for open and short circuit in harness and connector between power steering ECU assy and combination meter assy (See page 01-30).

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

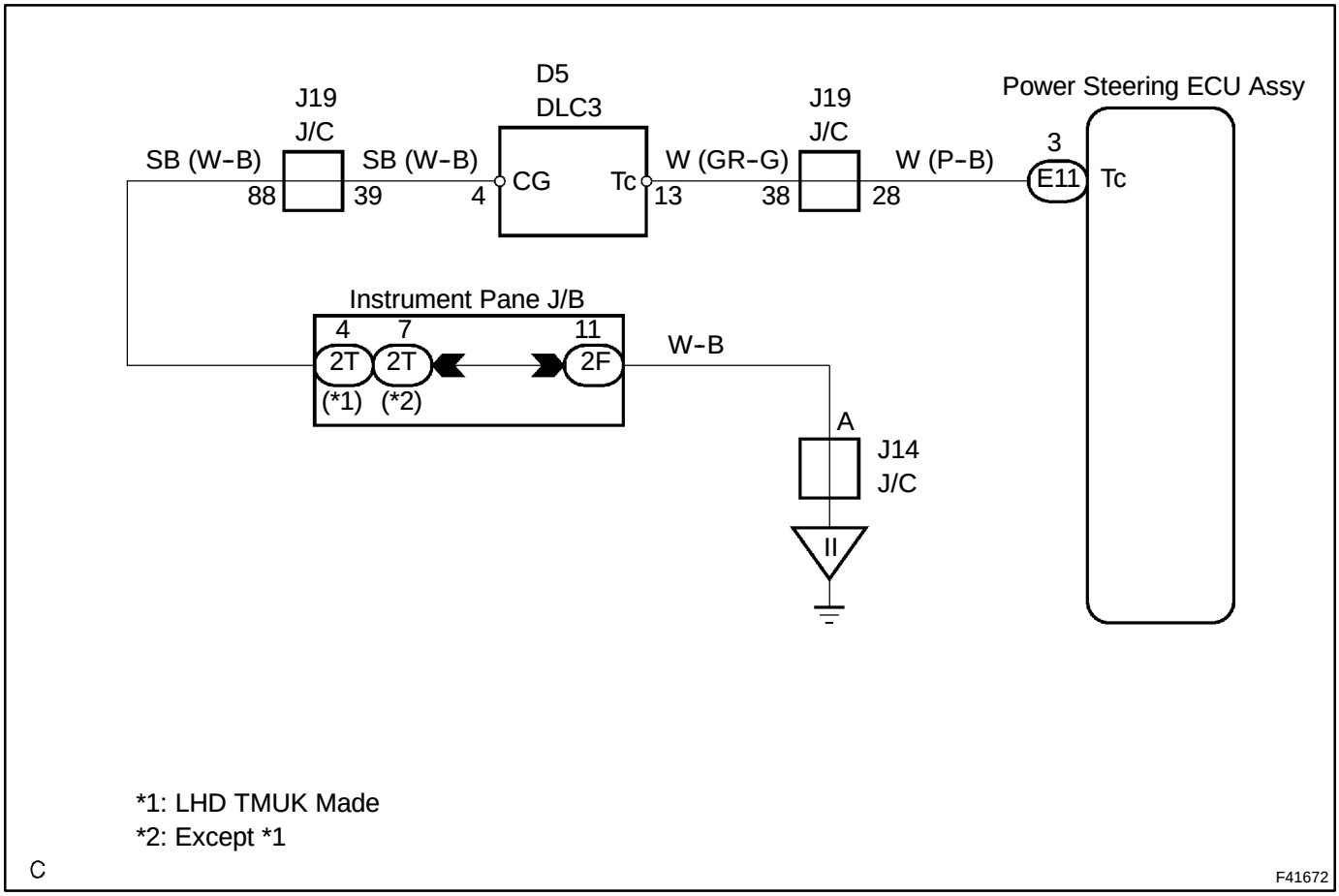
CHECK GO TO COMBINATION METER SYSTEM

TC TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

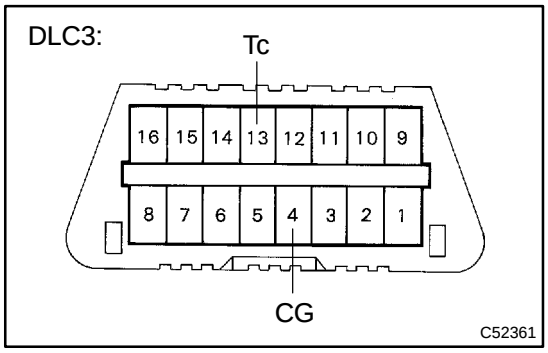
Connecting terminals Tc and CG of the DLC3 causes the power steering ECU assy to display the DTC by flashing the PS warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT DLC3 TERMINAL VOLTAGE(Tc TERMINAL)



(a) Turn the ignition switch to ON.
(b) Measure voltage between terminals Tc and CG of DLC3.
OK:
Voltage: 5 - 14 V

OK	Go to step 3

NG

2	CHECK HARNESS AND CONNECTOR(DLC3 - BODY GROUND)

(a) Check for open and short circuit in harness and connector between terminal CG of DLC3 and body ground (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK HARNESS AND CONNECTOR(DLC3 - POWER STEERING ECU ASSY)

(a) Check for open and short circuit in harness and connector between terminal Tc of DLC3 and power steering ECU assy (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

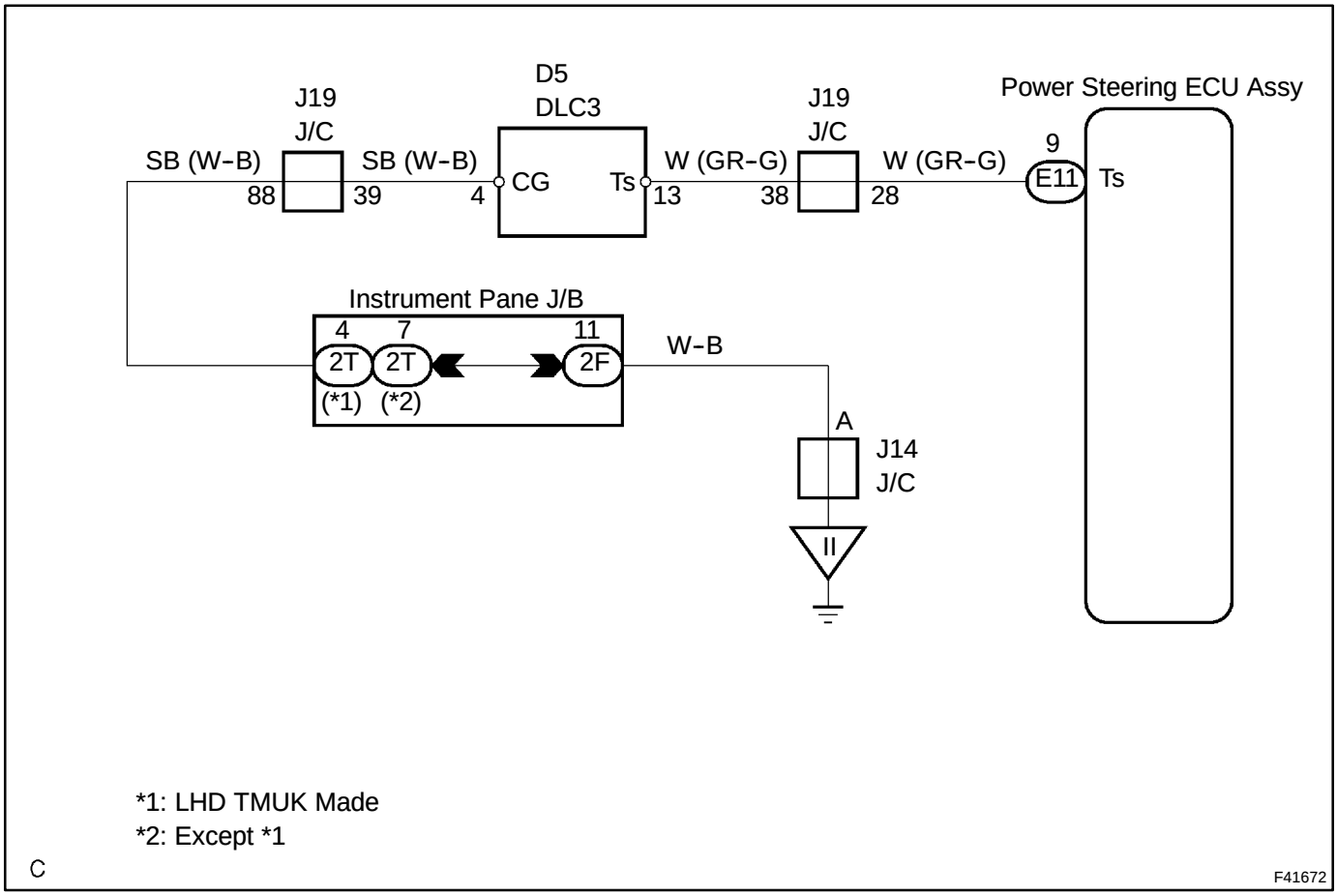
CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

TS TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

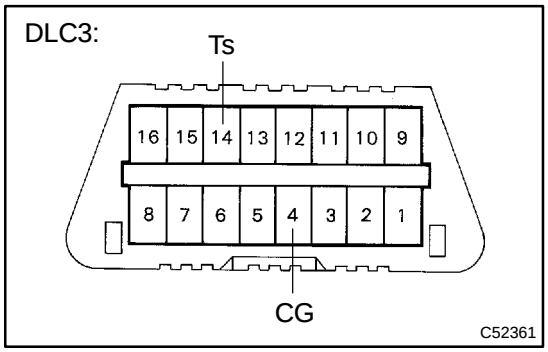
After making short circuit between terminal Ts and CG of DLC3 with the ignition switch turned OFF, the mode will change from normal mode to test mode when the ignition switch is turned ON. After the ignition switch is turned ON, there will be DTC output from Tc terminal of DLC3.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT DLC3 TERMINAL VOLTAGE(Ts TERMINAL) (Ts - CG)



(a) Turn the ignition switch to ON.
(b) Measure voltage between terminals Ts and CG of DLC3.
OK:
Voltage: 5 - 14 V

OK	Go to step 3

NG

2	CHECK HARNESS AND CONNECTOR(DLC3 - BODY GROUND)

(a) Check for open and short circuit in harness and connector between terminal CG of DLC3 and body ground (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK HARNESS AND CONNECTOR(POWER STEERING ECU ASSY - DLC3)

(a) Check for open and short circuit in harness and connector between terminal Ts of DLC3 and power steering ECU assy (See page 01-30).

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE POWER STEERING ECU ASSY (See page 01-30)

AIR CONDITIONING SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

050TG-05

1	VEHICLE BROUGHT TO WORK SHOP

2	CUSTOMER PROBLEM ANALYSIS (See page 05-862)

3	CHECK AND CLEAR DTC (See page 05-863)

4	PROBLEM SYMPTOM CONFIRMATION

→ SYMPTOM OCCUR (GO TO STEP 6)

SYMPTOM DOES NOT OCCUR (GO TO STEP 5)

5	SYMPTOM SIMULATION (See page 01-20)

6	DTC CHECK (See page 05-863)

→ MALFUNCTION CODE (GO TO STEP 7)

→ NORMAL CODE (GO TO STEP 8)

7	DTC CHART (See page 05-866)

→ GO TO STEP 10

8	PROBLEM SYMPTOMS TABLE (See page 05-872)

9	ACTUATOR CHECK (See page 05-863)

10	CIRCUIT INSPECTION (See page 05-874 - 05-932)

11	IDENTIFICATION OF PROBLEM

12	PARTS INSPECTION

13	REPAIR

14	CONFIRMATION TEST

15	END

050TH-05

CUSTOMER PROBLEM ANALYSIS CHECK

AIR CONDITIONING SYSTEM Check Sheet

Inspector's name:

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date vehicle Brought In	/ /	**Odometer Reading**	**km Miles**

Date of Problem Occurrence	/ /
How Often does Problem Occur?	j Continuous j Intermittent (times a day)
Weather	j Fine j Cloudy j Snowy j Various / Other
Outdoor Temperature	j Hot j Warm j Cool j Cold (Approx. °F °C)

Symptoms	**Air Flow Control is Faulty**	j Blower motor does not operation j Blower motor speed does not change (Always Hi, Always Med, Always Lo)
	Temperature Control is Faulty	j Cabin temperature does not go down j Cabin temperature does not rise j Response is slow
	Air Inlet Control is Faulty	j Cannot change between FRS and REC (Always Fresh or always Recirculating)
	Vent Control is Faulty	j Mode will not change j Will not enter the desired mode

DTC Check	**1st Time**	j Normal Code j Malfunction Code (Code)
	2nd Time	j Normal Code j Malfunction Code (Code)

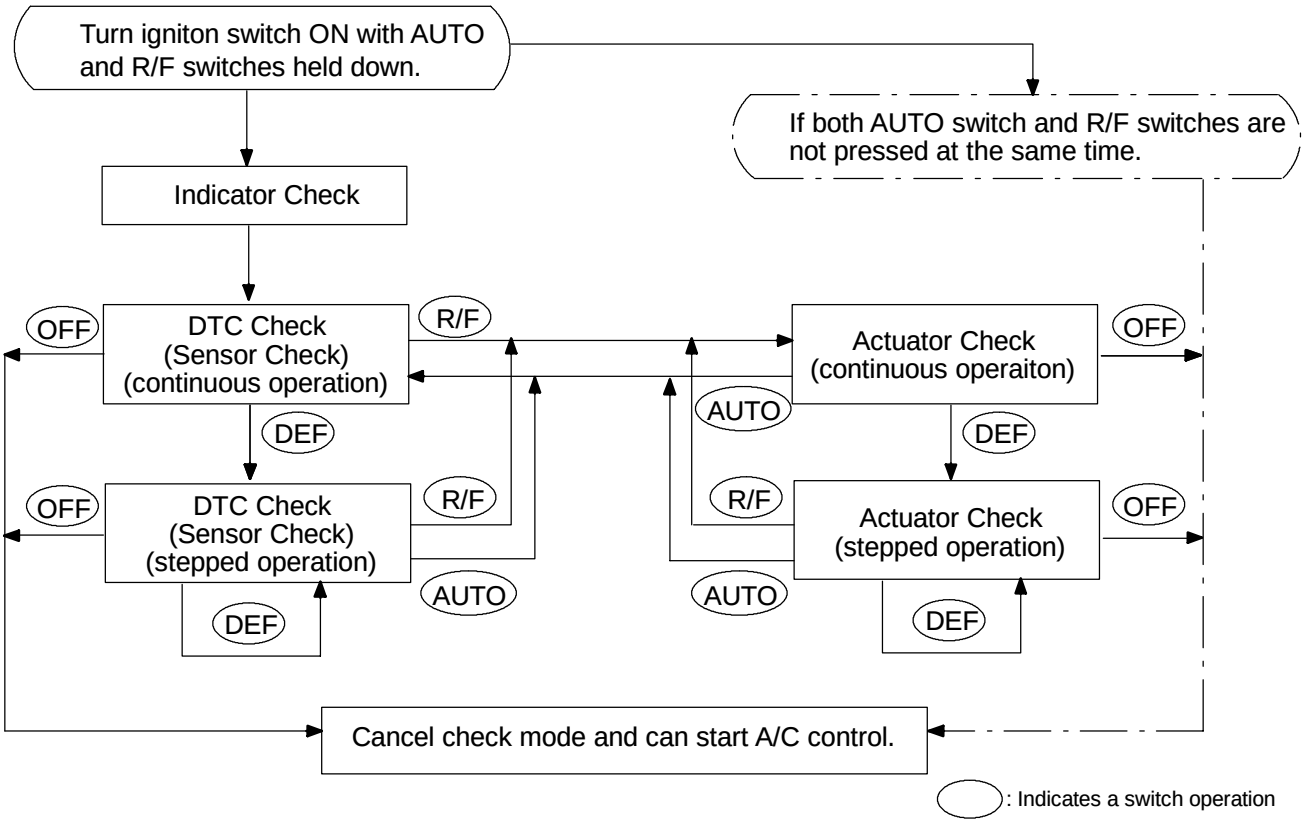
I30150

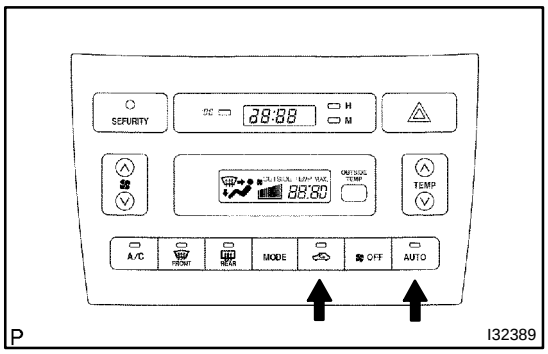
050TI-04

PRE-CHECK

1. LIST OF OPERATION METHODS

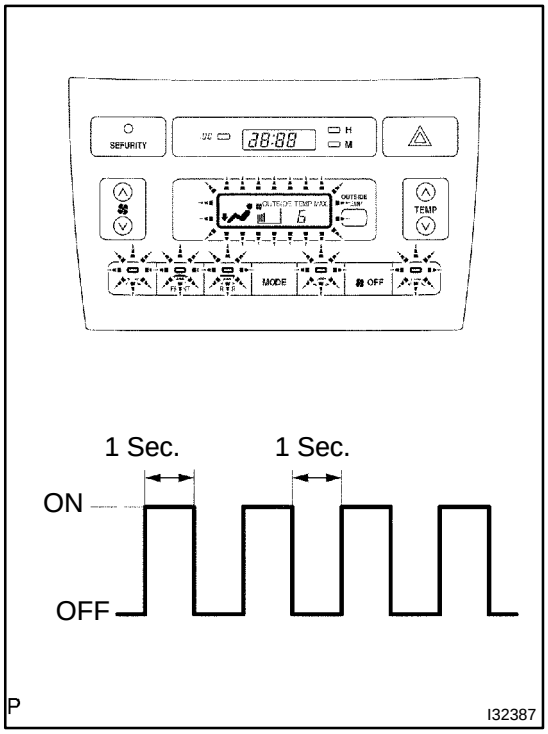
By operating each of the A/C control switches as shown the diagram below, it is possible to enter the diagnosis check mode.





2. INDICATOR CHECK

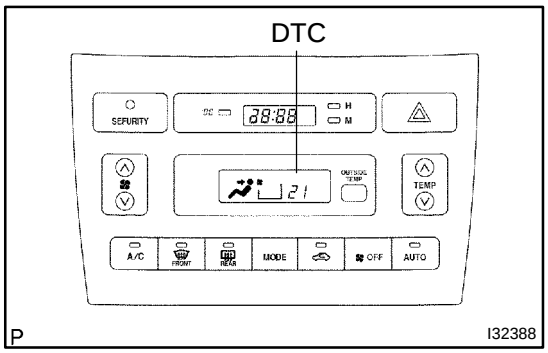
(a) Turn the ignition switch ON while pressing the A/C control AUTO switch and R/F switch simultaneously.



(b) Check that the indicators light up and go off at second intervals 4 times in succession.

HINT:

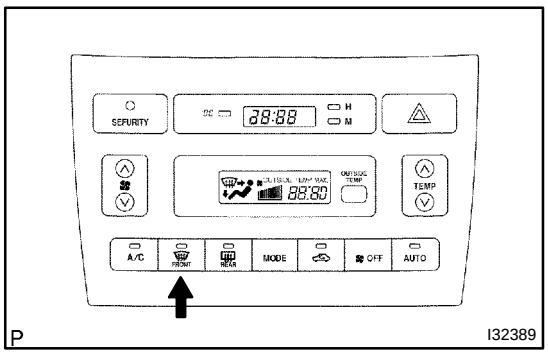
- After the indicator check is completed, the system enters the DTC begins automatically.
- Press the OFF switch when desiring to cancel the check mode.



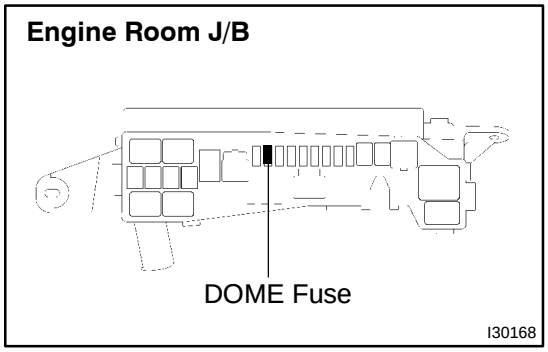
3. DTC CHECK (SENSOR CHECK)

(a) Perform an indicator check. After the indicator check is completed, the system enters the DTC check mode automatically.

(b) Read the code displayed on the panel. Refer to the list of codes on page 05-866 when reading the codes. (Trouble code are output at the temperature display.)



(c) If the slower display is desired, press the front DEF switch and change it to stepped operation. Each time the front DEF switch is pressed, the display changes by 1 step.

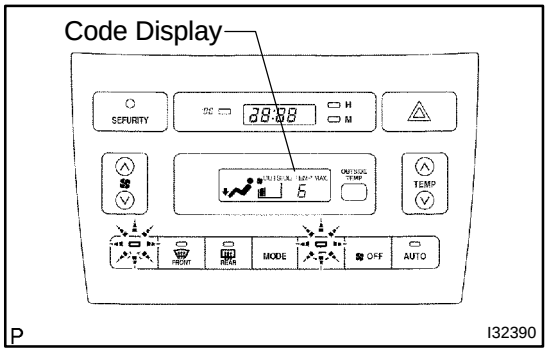


4. CLEARING DTC

(a) To clear diagnostic trouble code, there are 2 ways.

(1) During sensor check, press the "DEF" switch and "Rr. DEF" switch at the same time.

(2) Pull the DOME fuse in engine room J/B for 20 sec. or longer to clear the DTC memory.



5. ACTUATOR CHECK

(a) After entering the DTC check mode (Sensor Check Mode) press the R/F switch.

(b) Since each damper, motor and relay automatically operates at 1 sec. intervals beginning in order from 10 in the temperature display, check the temperature and air flow visually and by hand.
If the slower display is desired, press the DEF switch and change it to step operation. Each time the DEF switch is pressed, the display changes by 1 step.

HINT:

- Code are displayed in order from the smaller to the larger numbers.
- To cancel the check mode, press the OFF switch.

Step No.	Display code	Conditions				
		Blower level	Air flow vent	Air inlet damper	Magnetic clutch	Air mix damper
1	0	0	FACE	FRESH	OFF	"COOL" side (Full closed)
2	1	1	FACE	FRESH	OFF	"COOL" side (Full closed)
3	2	16	FACE	FRESH	ON	"COOL" side (Full closed)
4	3	16	FACE	FRESH	ON	"COOL" side (Full closed)
5	4	16	FACE	RECIRCULATION	ON	"COOL"/ "WARM " (50 % open)
6	5	16	B/L	RECIRCULATION	ON	"COOL"/ "WARM " (50 % open)
7	6	16	FOOT	RECIRCULATION	ON	"WARM" side (Full opened)
8	7	16	FOOT	RECIRCULATION	ON	"WARM" side (Full opened)
9	8	16	FOOT/ DEF	RECIRCULATION	ON	"WARM" side (Full opened)
10	9	31	DEF	RECIRCULATION	ON	"WARM" side (Full opened)

050TJ-05

DIAGNOSTIC TROUBLE CODE CHART

If malfunction code is displayed during the DTC check (sensor check), check the circuit listed for that code in the table below (Proceed to the page given for that circuit).

DTC No. (See Page)	Detection Item	Trouble Area	Memory*4
00	Normal	-	-
11*1 (05-874)	Room temperature sensor circuit	S Room temp. sensor S A/C amplifier assy S Harness or connector between room temp. sensor and A/C amplifier assy	f (8.5 min. or more)
12*2 (05-877)	Ambient temperature sensor circuit	S Ambient temp. sensor S Harness or connector between ambient temp. sensor and A/C amplifier assy S A/C amplifier assy	f (8.5 min. or more)
13 (05-880)	Evaporator temperature sensor circuit	S Evaporator temp. sensor S Harness or connector between evaporator temp. sensor and A/C amplifier assy S A/C amplifier assy	f (8.5 min. or more)
14 (05-884)	Water temperature sensor circuit	S Water temp. sensor S Harness or connector between water temp. sensor and ECM S Harness or connector between ECM and combination meter S Harness or connector combination meter and A/C amplifier assy S A/C amplifier assy	-
21*3 (05-886)	Solar sensor circuit (short)	S Solar sensor S Harness or connector between solar sensor and A/C amplifier assy S A/C amplifier assy	f (8.5 min. or more)
	Solar sensor circuit (open)		-
23 (05-889)	Pressure switch circuit	S Pressure switch S A/C amplifier assy S Harness or connector between pressure switch and A/C amplifier assy	-
31 (05-892)	Air mix damper position sensor circuit	S Air mix damper position sensor S A/C amplifier assy S Harness or connector between air mix damper position sensor and A/C amplifier assy	-
33 (05-896)	Air outlet damper position sensor circuit	S Air outlet damper position sensor S A/C amplifier assy S Harness or connector between air outlet damper position sensor and A/C amplifier assy	f (1 min. or more)
41 (05-900)	Air mix control servomotor	S Air mix control servomotor S Air mix damper position sensor S Harness or connector between air mix damper servomotor and A/C amplifier assy S A/C amplifier assy	f (15 sec.)
43 (05-904)	Air outlet control servomotor	S Air outlet control servomotor S Air outlet damper position sensor S Harness or connector between air inlet damper, servomotor and A/C amplifier assy S A/C amplifier assy	f (15 sec.)

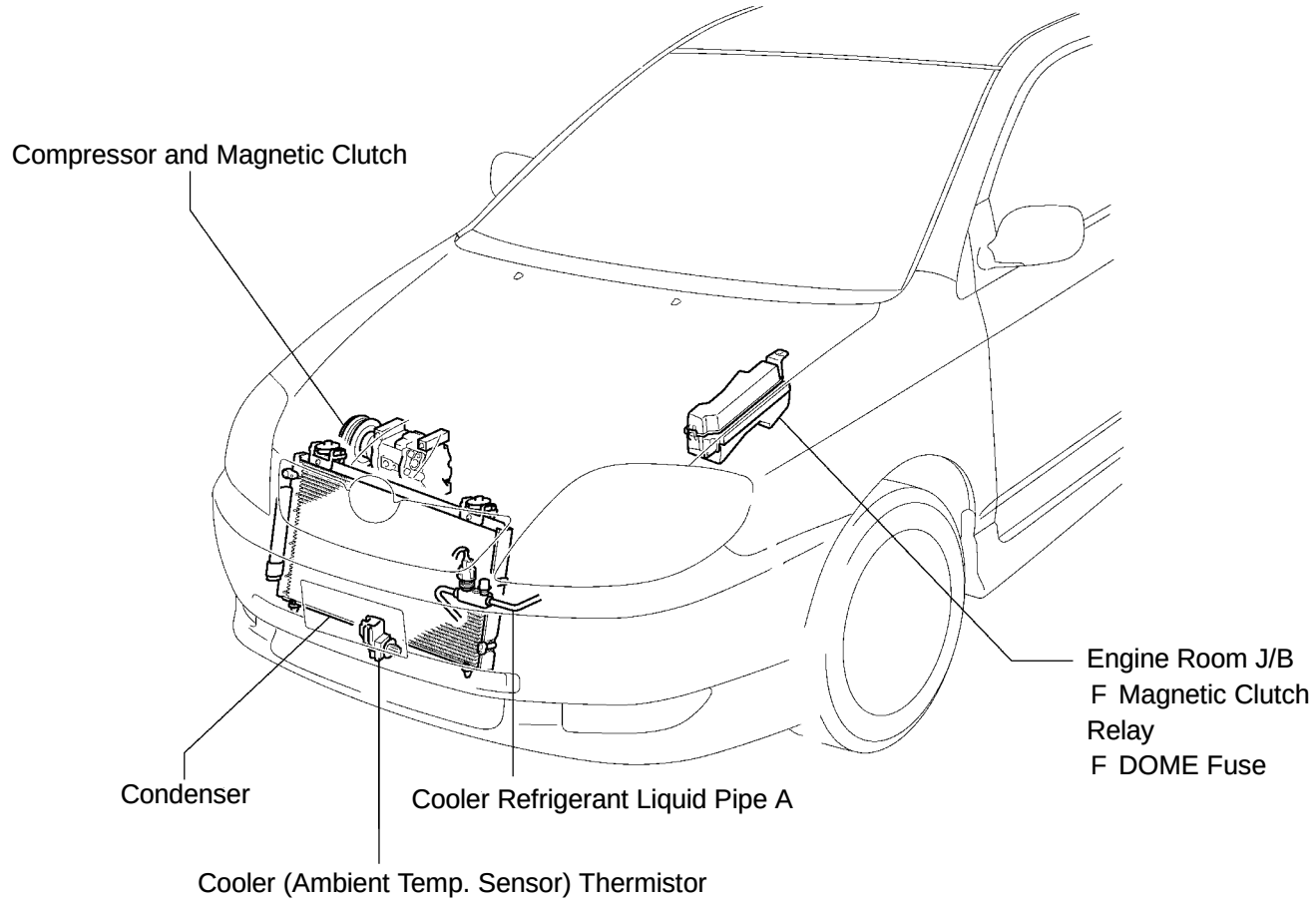
HINT:

- S *1: If the room temp. is approx. -18.6˚C (-3.7˚F) or lower, trouble code 11 may be output even though the system is normal.
- S *2: If the ambient temp. is approx. -52.9˚C (-61.4˚F) or lower, a malfunction code may be output even though the system is normal.

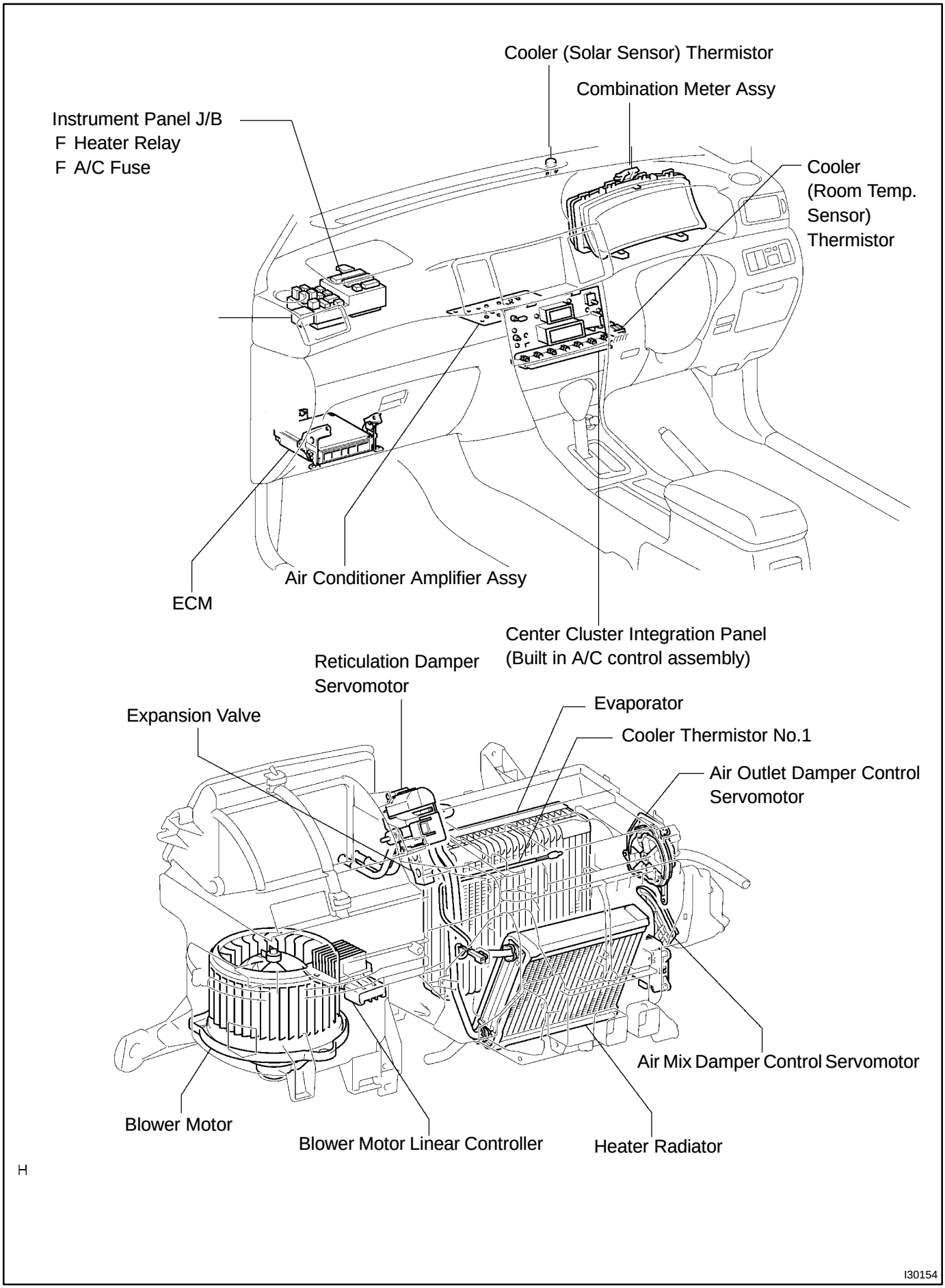
S *3: If the check is being performed in a dark place, DTC 21 (solar sensor circuit abnormal) could be displayed.

050TK-05

LOCATION

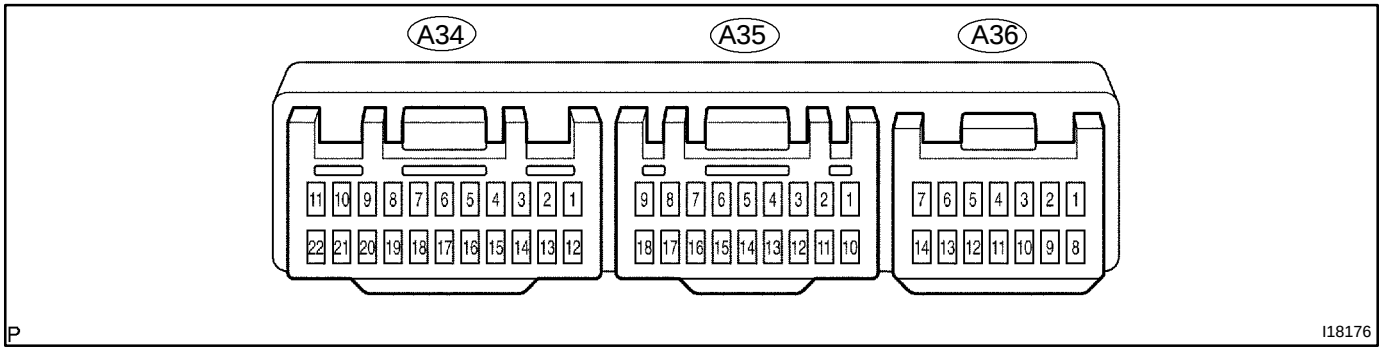


I30153


Cooler (Solar Sensor) Thermistor
Combination Meter Assy
Instrument Panel J/B
F Heater Relay
F A/C Fuse
Cooler
(Room Temp.
Sensor)
Thermistor
Air Conditioner Amplifier Assy
ECM
Center Cluster Integration Panel
(Built in A/C control assembly)
Reticulation Damper
Servomotor
Expansion Valve
Evaporator
Cooler Thermistor No.1
Air Outlet Damper Control
Servomotor
Air Mix Damper Control Servomotor
Blower Motor
Blower Motor Linear Controller
Heater Radiator
H
I30154

050TL-03

TERMINALS OF ECU



Symbols (Terminal No.)	Wiring Color	Condition	STD voltage (V)
TP ⇔ SG-TP (A34-4 ⇔ A34-2)	W-L ⇔ BR-Y	Ignition switch ON and set temperature MAX. COOL → MAX. WARM	3.5 - 4.5 V → 0.5 - 1.5 V
TPM ⇔ SG-TPM (A34-5 ⇔ A34-3)	L-O ⇔ L-Y	Ignition switch ON and set air flow FACE → DEF	3.5 - 4.5 V → 0.5 - 1.5 V
S5-TP ⇔ SG- TP (A34-6 ⇔ A34-2)	W-R ⇔ BR-Y	Ignition switch ON	4.5 - 5.5 V
S5-TPM ⇔ SG-TPM (A34-7 ⇔ A34-3)	LG ⇔ L-Y	Ignition switch ON	4.5 - 5.5 V
AMC ⇔ GND (A34-8 ⇔ A34-12)	R-W ⇔ SB(W-B)	Ignition switch ON and set temperature MAX. COOL → MAX. WARM	10 - 14 V → Below 1 V
AMH ⇔ GND (A34-9 ⇔ A34-12)	L ⇔ SB(W-B)	Ignition switch ON and set temperature: MAX. COOL → MAX. WARM	Below 1 V → 10 - 14 V
AOF ⇔ GND (A34-10 ⇔ A34-12)	Y-B ⇔ SB(W-B)	Ignition switch ON and set air flow setting FACE → DEF	10 - 14 V → Below 1 V
AOD ⇔ GND (A34-11 ⇔ A34-12)	R-B ⇔ SB(W-B)	Ignition switch ON and set air flow setting FACE → DEF	Below 1 V → 10 - 14 V
GND ⇔ Body ground (A34-12 ⇔ Body Ground)	SB(W-B) ⇔ Body ground	Constant	Continuity
BLC ⇔ GND (A34-13 ⇔ A34-12)	L-B ⇔ SB(W-B)	Ignition switch ON and operate blower motor	Pulse generation
HR ⇔ GND (A34-14 ⇔ A34-12)	L-O ⇔ SB(W-B)	Ignition switch ON and blower switch OFF → ON	10 - 14 V → Below 1 V
RDEF ⇔ GND (A34-15 ⇔ A34-12)	SB(B) ⇔ SB(W-B)	Ignition switch ON and rear defogger switch OFF → ON	10 - 14 V → Below 1 V
SEC ⇔ GND (A34-16 ⇔ A34-12)	W(W-R) ⇔ SB(W-B)	Ignition switch ON and security indicator light ON → OFF	10 - 14 V → Below 1 V
ACC ⇔ GND (A34-20 ⇔ A34-12)	SB(GR) ⇔ SB(W-B)	Ignition switch LOCK → ACC	0 V → 10 - 14 V
IG ⇔ GND (A34-21 ⇔ A34-12)	SB(R-L) ⇔ SB(W-B)	Ignition switch LOCK or ACC → ON	0 V → 10 - 14 V
+B ⇔ GND (A34-22 ⇔ A34-12)	SB(L-Y) ⇔ SB(W-B)	Constant	10 - 14 V
ACT ⇔ GND (A35-5 ⇔ A34-12)	R-L ⇔ SB(W-B)	Ignition switch START and A/C magnetic clutch is not engaged → engaged	Below 1 V → 10 - 14 V
TW ⇔ GND (A35-6 ⇔ A34-12)	W(Y-R) ⇔ SB(W-B)	Ignition switch START	Pulse generation
AC1 ⇔ GND (A35-7 ⇔ A34-12)	Y-R (*2) Y-B (*3) ⇔ SB(W-B)	Ignition switch START and A/C magnetic clutch is not engaged → engaged	10 - 14 V → Below 1 V
S5-TS ⇔ Body ground (A35-10 ⇔ Body Ground)	W(W-R) (*4) W(L-W) (*5) ⇔ Body ground	Ignition switch ON	4.5 - 5.5 V
TS ⇔ Body ground (A35-11 ⇔ Body ground)	W(L-W) (*4) W(W-R) (*5) ⇔ Body ground	Ignition switch ON and solar sensor is covered by a cloth → solar sensor subject to electric light	Below 4.0 V → 4.5 - 5.5 V

Symbols (Terminal No.)	Wiring Color	Condition	STD voltage (V)
HZD ⇔ Body ground (A34-17 ⇔ Body ground)	Y-G ⇔ Body ground	Hazard switch OFF → ON	0 V → 10 - 14 V
TAC (*1) ⇔ GND (A35-8 ⇔ A34-12)	B ⇔ SB (W-B)	Ignition switch ON and set temperature MAX. COOL → MAX. WARM	10 - 14 V → Below 1 V
TR ⇔ SG-TR (A35-12 ⇔ A35-14)	GR ⇔ BR-Y	Ignition switch ON and cabin temp.: 25_C (77_F) → 40_C (104_F)	1.8 - 2.2 V → 1.2-1.6 V
SG-TE ⇔ TE (A35-15 ⇔ A35-13)	W-L ⇔ TE	Ignition switch ON and evaporator temp.: 0_C (32_F) → 15_C (59_F)	2.0 - 2.4 V → 1.4 - 1.8 V
AIF ⇔ GND (A35-16 ⇔ A34-12)	G-Y ⇔ SB(W-B)	Ignition switch ON and air intake setting FRESH → RECIRCULATION	10 - 14 V → Below 1 V
AIR ⇔ GND (A35-17 ⇔ A34-12)	L-W ⇔ SB(W-B)	Ignition switch ON and air intake setting FRESH → RECIRCULATION	Below 1 V → 10 - 14 V
SPD ⇔ GND (A35-18 ⇔ A34-12)	W(V-W) ⇔ SB(W-B)	Ignition switch ON and turn front wheel slowly	Pulse generation
MGC ⇔ GND (A36-1 ⇔ A34-12)	Y-R ⇔ SB(W-B)	Ignition switch START and A/C magnetic clutch is not engaged → engaged	10 - 14 V → Below 1 V
CFN+ ⇔ GND (A36-2 ⇔ A34-12)	LG ⇔ SB(W-B)	Ignition switch ON and A/C magnetic clutch is not engaged → engaged	10 - 14 V → Below 1 V
CFN- ⇔ GND (A36-3 ⇔ A34-12)	LG-B ⇔ SB(W-B)	Ignition switch START and radiator fan motor speed LO → HI	10 - 14 V → Below 1 V
PRS ⇔ GND (A36-4 ⇔ A34-12)	Y-B ⇔ SB(W-B)	Ignition switch START and refrigerant pressure normally → less than 0.19 MPa (2.0 kgf/ cm^2, 28 psi) or more than 1.34 MPa (322.0 kgf/ cm^2, 455 psi)	10 - 14 V → Below 1 V
TAM ⇔ SG-TAM (A36-12 ⇔ A36-13)	W-G ⇔ BR-Y	Ignition switch ON and ambient temp.: 25_C (77_F) → 40_C (104_F)	1.4 - 1.8 V → 0.9 - 1.3 V

*1: Diesel engine
*2: Gasoline engine, Diesel engine except LHD (TMC made)
*3: Diesel engine LHD (TMC made)
*4: Gasoline engine, Diesel engine LHD (TMUK made)
*5: Diesel engine except LHD (TMUK made)

050TM-05

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See Page
Whole functions of the A/C system does not operate.	1. IG power source circuit 2. A/C amplifier assy	05-915 01-20
Air Flow Control : No blower operation	1. Heater relay circuit 2. Blower motor circuit 3. A/C amplifier assy	05-920 05-923 01-20
Air Flow Control : No blower control	1. Blower motor circuit	05-923
Air Flow Control : Insufficient air out	1. Blower motor circuit 2. A/C amplifier assy	05-923 01-20
Temperature Control : No cool air comes out	1. Volume of refrigerant 2. Drive belt tension 3. Refrigerant pressure 4. Compressor circuit 5. Pressure switch circuit 6. Air mix control servomotor circuit 7. Air mix damper position sensor circuit 8. Room temp. sensor circuit 9. Ambient temp. sensor circuit 10. Vehicle speed signal circuit 11. Condenser fan circuit 12. A/C amplifier assy	55-19 19-17 55-19 05-926 05-889 05-900 05-892 05-874 05-877 05-930 05-932 01-30
Temperature Control : No warm air comes out	1. Air mix control servomotor circuit 2. Air mix damper position sensor circuit 3. Ambient temp. sensor circuit 4. Vehicle speed signal circuit 5. Room temp. sensor circuit 6. Evaporator temp. sensor circuit 7. A/C amplifier assy 8. Heater radiator	05-900 05-892 05-877 05-930 05-874 05-880 01-30 -
Temperature Control : Output air is warmer or cooler than the set temperature or response is slow.	1. Room temp. sensor circuit 2. Ambient temp. sensor circuit 3. Vehicle speed signal circuit 4. Solar sensor circuit 5. Air mix damper position sensor circuit 6. Air mix control servomotor circuit 7. Water temp. sensor circuit 8. A/C amplifier assy	05-874 05-877 05-930 05-886 05-892 05-900 05-884 01-30
Temperature Control : No temperature control (only Max. cool or Max. warm)	1. Air mix control servomotor circuit 2. Air mix damper position sensor circuit 3. A/C amplifier assy	05-900 05-892 01-30
No air inlet control	1. Recirculation damper control servomotor circuit 2. A/C amplifier assy	05-908 01-30
No air outlet control	1. Air outlet damper position sensor circuit 2. Air outlet control servomotor circuit 3. A/C amplifier assy	05-896 05-904 01-30
Engine idle up does not occur, or is continuous	1. Compressor circuit 2. A/C amplifier assy	05-926 01-30
Set temperature value displayed does not much up with operation of temperature control switch.	1. A/C amplifier assy	01-30
Brightness does not changes when rheostat volume or light control switch it turned.	1. Illumination light system 2. A/C amplifier assy	- 01-30

Symptom	Suspect Area	See Page
Condenser fan does not operate.	1. Condenser fan circuit 2. ECM (Water temp. sensor circuit) 3. A/C amplifier assy	05-932 05-884 01-30
Unable to access the diagnosis mode.	1. A/C amplifier assy	01-30
DTC not recorded. Set mode is cleared when IG switch is turned off.	1. Back-up power source circuit 2. A/C amplifier assy	05-913 01-30

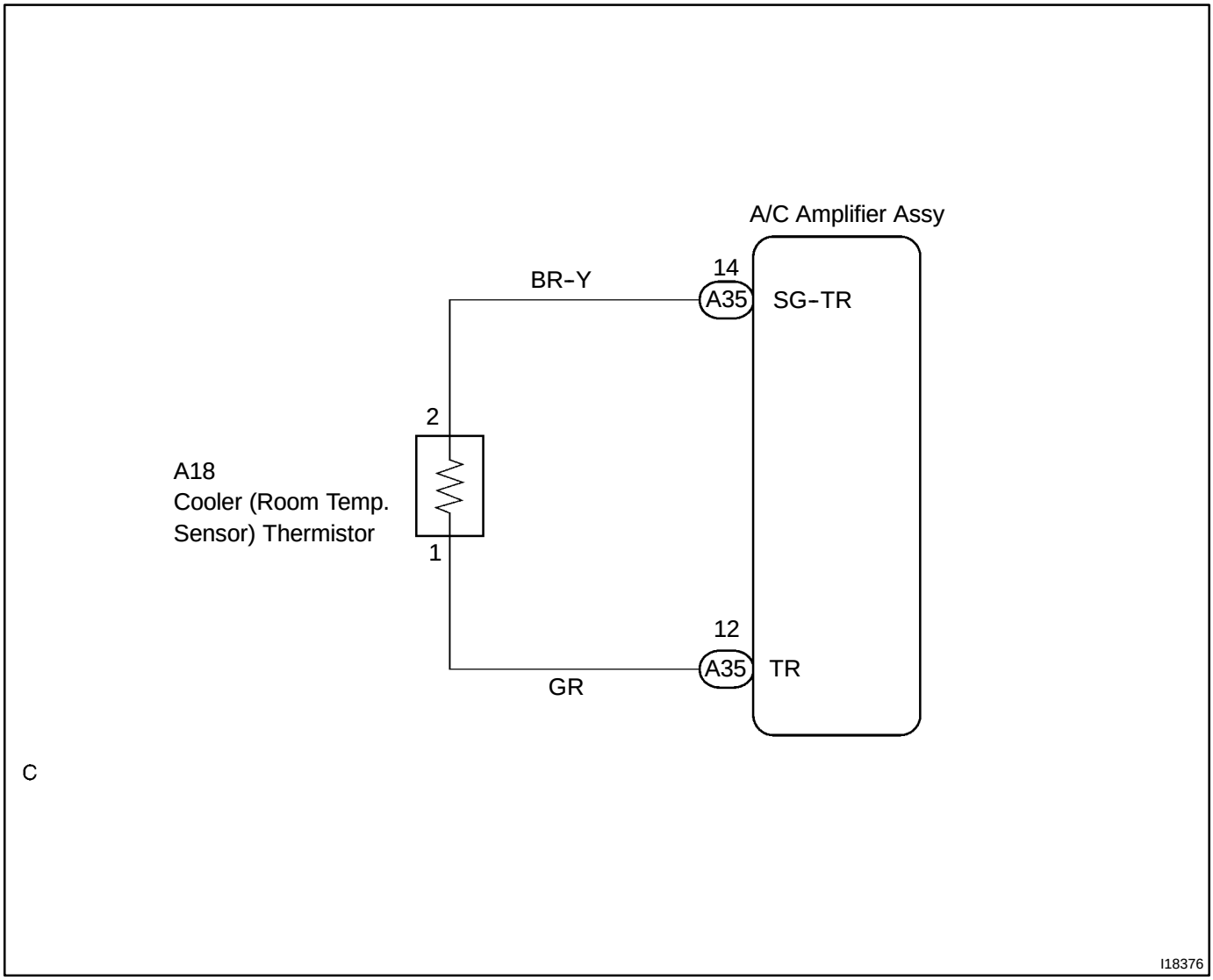
DTC	11	ROOM TEMPERATURE SENSOR CIRCUIT

CIRCUIT DESCRIPTION

This sensor detects the temperature inside the cabin and sends the appropriate signals to the A/C amplifier assy.

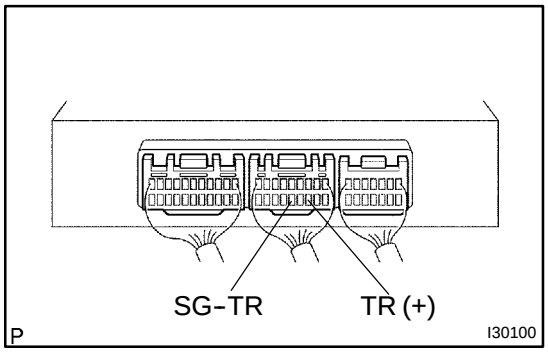
DTC No.	Detection Item	Trouble Area
11	Open or short in room temperature sensor circuit	S Cooler (Room temp. sensor) thermistor S Harness or connector between cooler (Room temp. sensor) thermistor and A/C amplifier assy S A/C amplifier assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT AIRCONDITIONER AMPLIFIER ASSY(TR, SG-TR)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals TR and SG-TR of A/C amplifier assy connector at each temperature.
Voltage:
at 25 _C (77 _F) : 1.8 - 2.2 V
at 40 _C (104 _F) : 1.2 - 1.6 V

HINT:
As the temperature increases, the voltage decreases.

Result:

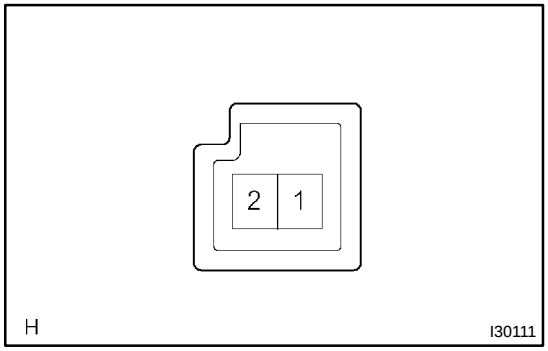
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

C → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE**

A

2	INSPECT COOLER (ROOM TEMP. SENSOR) THERMISTOR



(a) Remove the cooler (Room temp. sensor) thermistor.
(b) Measure resistance between terminals 1 and 2 of cooler (Room temp. sensor) thermistor connector at each temperature.
Resistance:
at 25 _C (77 _F): 1.65 - 1.75 kΩ
at 40 _C (104 _F): 0.55 - 0.65 kΩ

HINT:
As the temperature increases, the resistance decreases.

NG → **REPLACE COOLER (ROOM TEMP. SENSOR) THERMISTOR**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN COOLER (ROOM TEMP. SENSOR) THERMISTOR AND AIR CONDITIONER AMPLIFIER ASSY)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A →

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

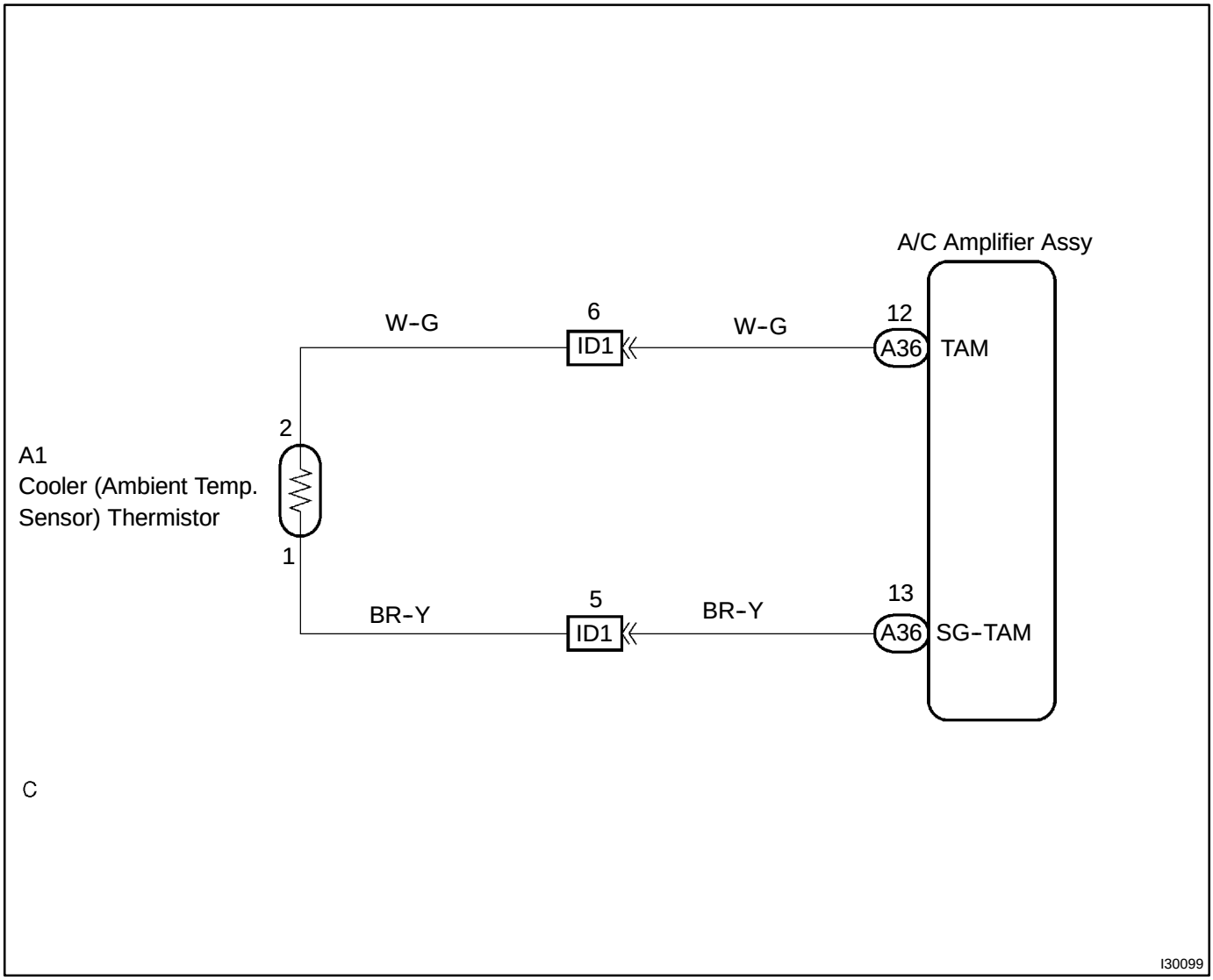
DTC	12	AMBIENT TEMPERATURE SENSOR CIRCUIT

CIRCUIT DESCRIPTION

This sensor detects the temperature outside the cabin and sends the appropriate signals to the A/C amplifier assy.

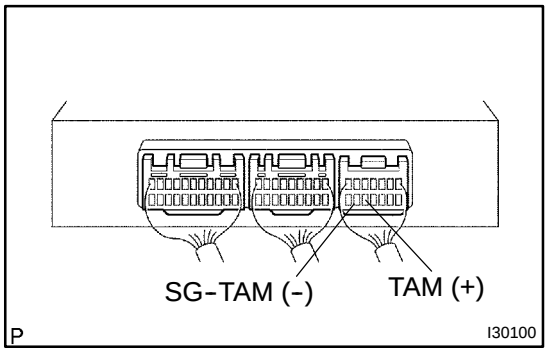
DTC No.	Detection Item	Trouble Area
12	Open or short in ambient temperature sensor circuit	$ Cooler (Ambient temp. sensor) thermistor $ Harness or connector between cooler (Ambient temp. sensor) thermistor and A/C amplifier assy $ A/C amplifier assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK AIRCONDITIONER AMPLIFIER ASSY(TAM, SG-TAM)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals TAM and SG-TAM of A/C amplifier assy connector at each temperature.
Voltage:
at 25 _C (77 _F) : 1.4 - 1.8 V
at 40 _C (104 _F) : 0.9 - 1.3 V

HINT:
As the temperature increases, the voltage decreases.

Result:

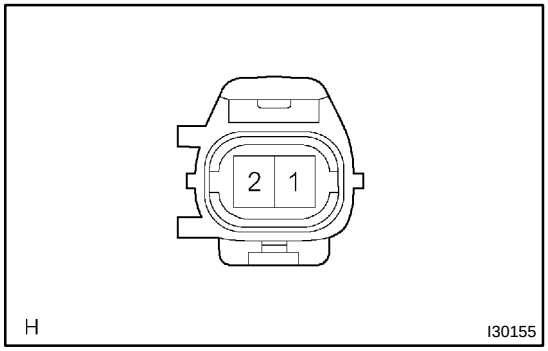
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

C → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE**

A

2	INSPECT COOLER (AMBIENT TEMP. SENSOR) THERMISTOR



(a) Remove the cooler (Ambient temp. sensor) thermistor.
(b) Measure resistance between terminals 1 and 2 of cooler (Ambient temp. sensor) thermistor connector at each temperature.
Resistance:
at 25 _C (77 _F) : 1.65 - 1.75 kΩ
at 40 _C (104 _F) : 0.55 - 0.65 kΩ

HINT:
As the temperature increases, the resistance decreases.

NG → **REPLACE COOLER (AMBIENT TEMP. SENSOR) THERMISTOR**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN COOLER (AMBINENT TEMP. SENSOR)THERMISTOR AND AIR CONDITONER AMPLFIER ASSY)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A →

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

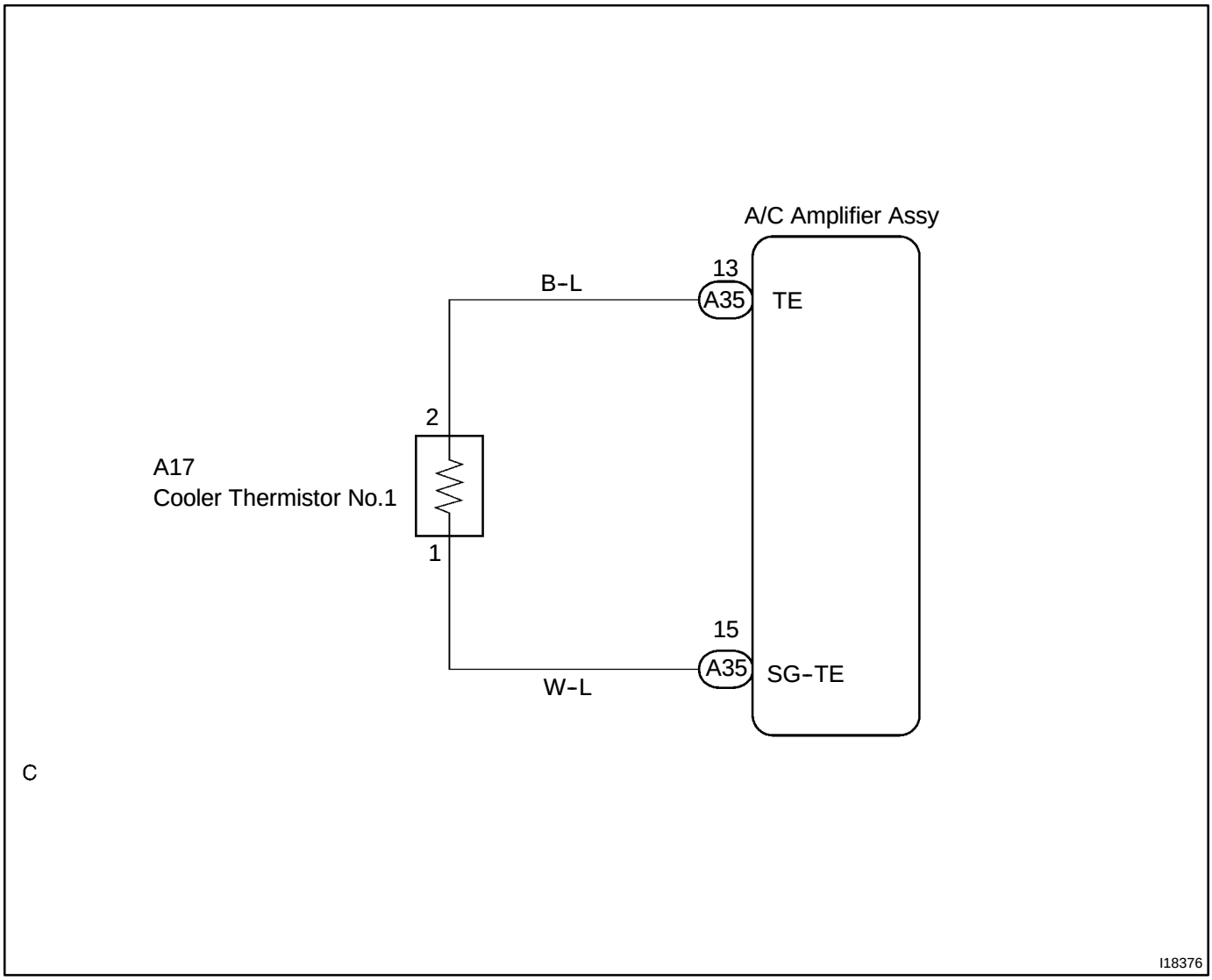
DTC	13	EVAPORATOR TEMPERATURE SENSOR CIRCUIT

CIRCUIT DESCRIPTION

This sensor detects the temperature inside the cooling unit and sends the appropriate signals to the A/C amplifier assy.

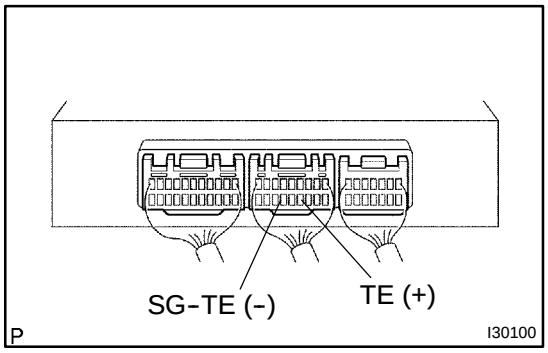
DTC No.	Detection Item	Trouble Area
13	Open or short in evaporator temperature sensor circuit.	S Cooler thermistor No.1 (Evaporator temp. sensor) S Harness or connector between cooler thermistor No.1 (Evaporator temp. sensor) and A/C amplifier assy S A/C amplifier assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT AIRCONDITIONER AMPLIFIER ASSY(TE, SG-TE)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals TE and SG-TE of A/C amplifier assy connector at each temperature.
Voltage:
at 0 °C (32 °F) : 2.0 - 2.4 V
at 15 °C (59 °F) : 1.4 - 1.8 V

Result:

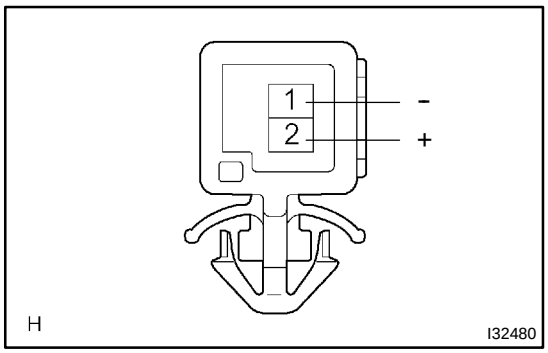
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

C → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE**

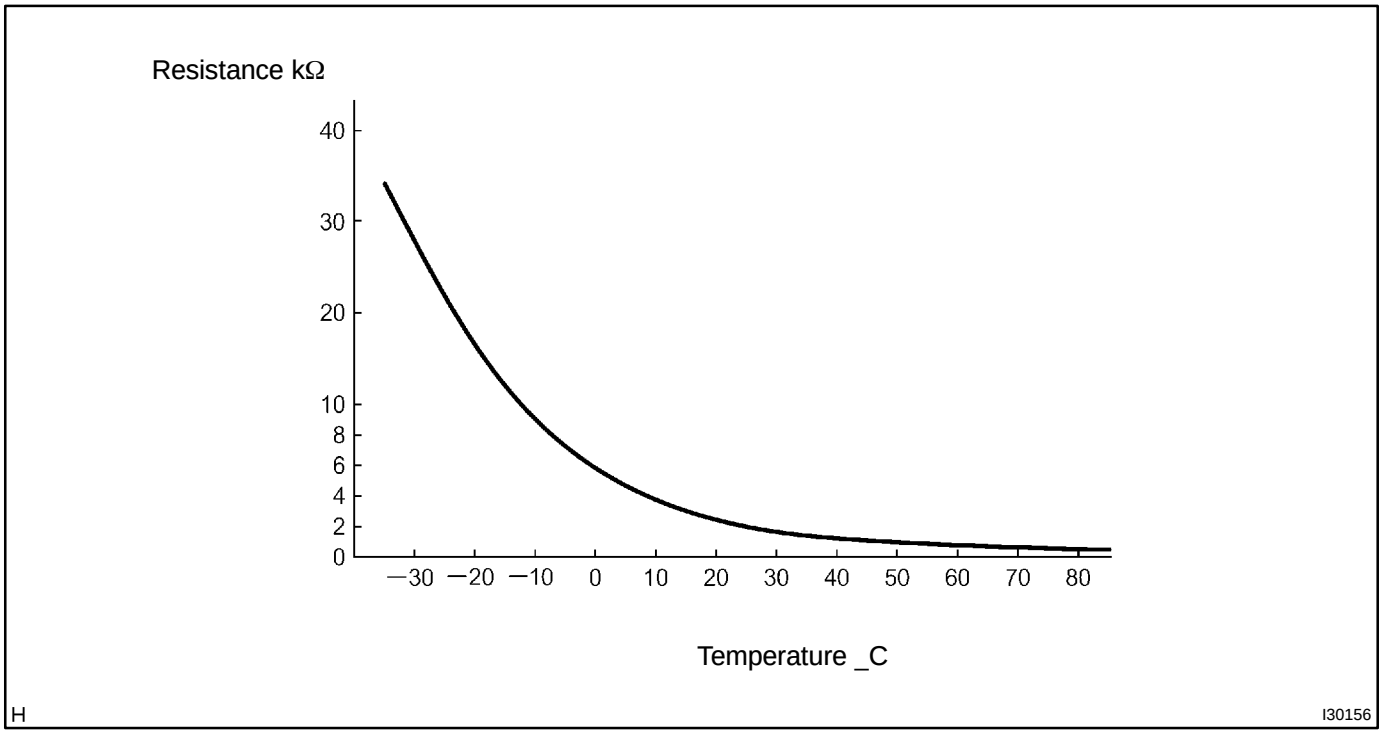
A

2	INSPECT COOLER THERMISTOR NO.1



(a) Remove the cooler thermistor No. 1.
(b) Check resistance between terminals 1 and 2 of cooler thermistor No. 1 at each temperature, as shown in the chart.

Resistance:



NG → REPLACE COOLER THERMISTOR NO.1

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN COOLER THERMISTOR NO.1 AND AIR CONDITIONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A →

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

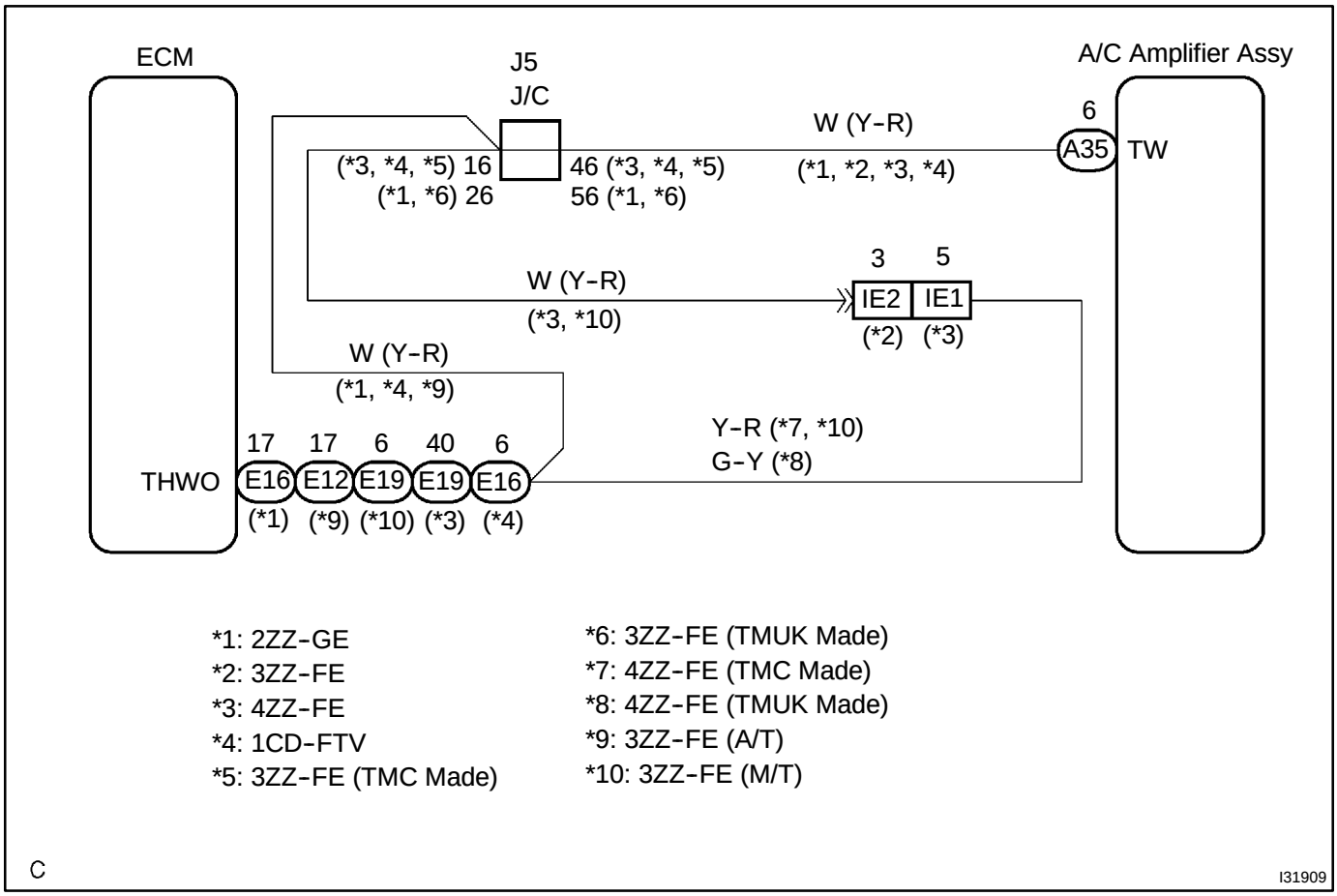
DTC	14	ENGINE COOLANT TEMPERATURE COMMUNICATION CIRCUIT

CIRCUIT DESCRIPTION

This sensor detects the temperature and sends the appropriate signals to the A/C amplifier assy. These signals are used for warm up control when engine is cold.

DTC No.	Detection Item	Trouble Area
14	Open or short in engine coolant temperature communication circuit.	$ ECM $ Harness or connector between ECM and A/C amplifier assy $ A/C amplifier assy

WIRING DIAGRAM



*1: 2ZZ-GE
*2: 3ZZ-FE
*3: 4ZZ-FE
*4: 1CD-FTV
*5: 3ZZ-FE (TMC Made)
*6: 3ZZ-FE (TMUK Made)
*7: 4ZZ-FE (TMC Made)
*8: 4ZZ-FE (TMUK Made)
*9: 3ZZ-FE (A/T)
*10: 3ZZ-FE (M/T)

INSPECTION PROCEDURE

1	DIAGNOSTIC TROUBLE CODE CHECK

(a) Check that the DTC 14 does not output.

NG → GO TO ENGINE CONTROL SYSTEM

OK

2	CHECK HARNESS AND CONNECTOR(BETWEEN ECM AND AIR CONDITONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

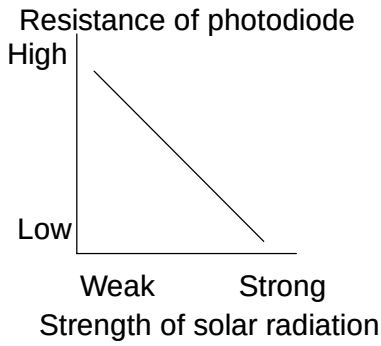
B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

DTC	21	SOLAR SENSOR CIRCUIT(PASSENGER SIDE)

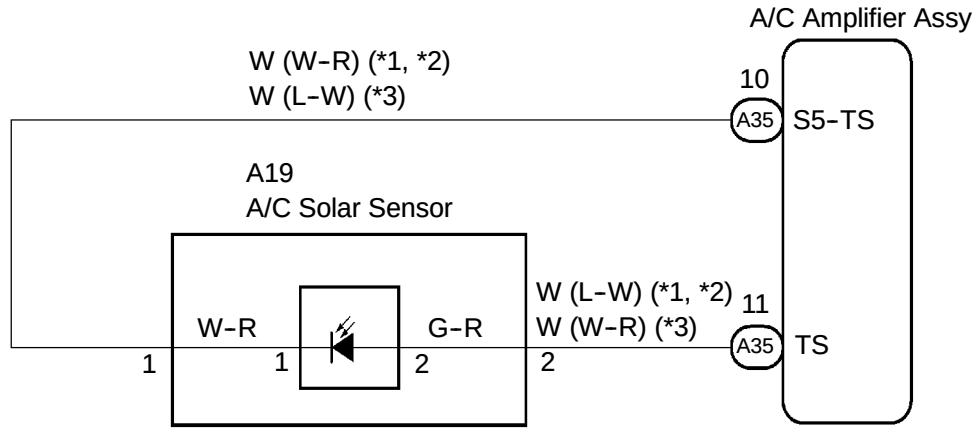
CIRCUIT DESCRIPTION



A photo diode in the solar sensor detects solar radiation and sends signals to the A/C amplifier assy.

DTC No.	Detection Item	Trouble Area
21	Open or short in solar sensor circuit. (Please note that display of DTC 21 is not abnormal when the sensor is not receiving solar radiation.)	ⅤCooler (Solar sensor) thermistor ⅤHarness or connector between cooler (Solar sensor) thermistor and A/C amplifier assy ⅤA/C amplifier assy

WIRING DIAGRAM



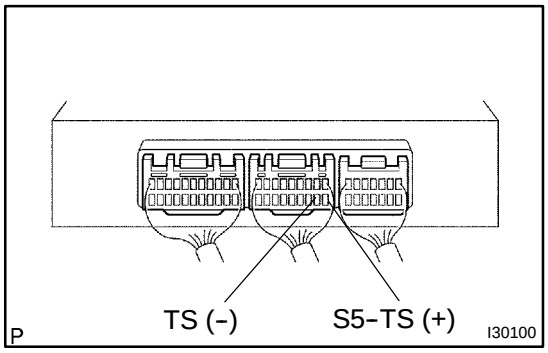
*1: Gasoline engine
*2: Diesel engine LHD (TMUK Made)
*3: Diesel engine except LHD (TMUK Made)

C

I31910

INSPECTION PROCEDURE

1	INSPECT AIRCONDITIONER AMPLIFIER ASSY(TS, S5-TS)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals S5-TS and TS of A/C amplifier assy connector when the cooler (Solar sensor) thermistor is subject to an electric light, and when the cooler (Solar sensor) thermistor is covered by a cloth
Voltage:
Sensor subject to electric light: Below 4.0 V
Sensor is covered by a cloth: 4.0 - 4.5 V

HINT:
As the inspection light is moved away from the sensor, the voltage increases.

Result:

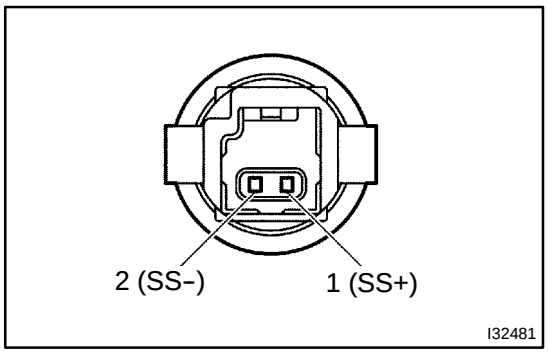
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

C → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE**

A

2	INSPECT COOLER (SOLAR SENSOR) THERMISTOR



(a) Remove the cooler (Solar sensor) thermistor.
(b) Cover the cooler (Solar sensor) thermistor with a cloth.
(c) Measure resistance between terminals 1 and 2 of cooler (Solar sensor) thermistor connector.
Resistance: ∞ Ω (No continuity)

HINT:
Connect the positive (+) lead to ohmmeter to terminal 1 and negative (-) lead to terminal 2 of the cooler (Solar sensor) thermistor.

(d) Remove the cloth from the cooler (Solar sensor) thermistor and subject the cooler (Solar sensor) thermistor to electric light.
(e) Measure resistance between terminals 1 and 2 of cooler (Solar sensor) thermistor.
Resistance: Approx. 10 kΩ (Continuity)

HINT:
Connect the positive (+) lead to ohmmeter to terminal 1and negative (-) lead to terminal 2 of the cooler (Solar sensor) thermistor.

NG → **REPLACE COOLER (SOLAR SENSOR) THERMISTOR**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN COOLER (SOLAR SENSOR) THERMISTOR AND AIR CONDITONER AMPLIFIER ASSY)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

A

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

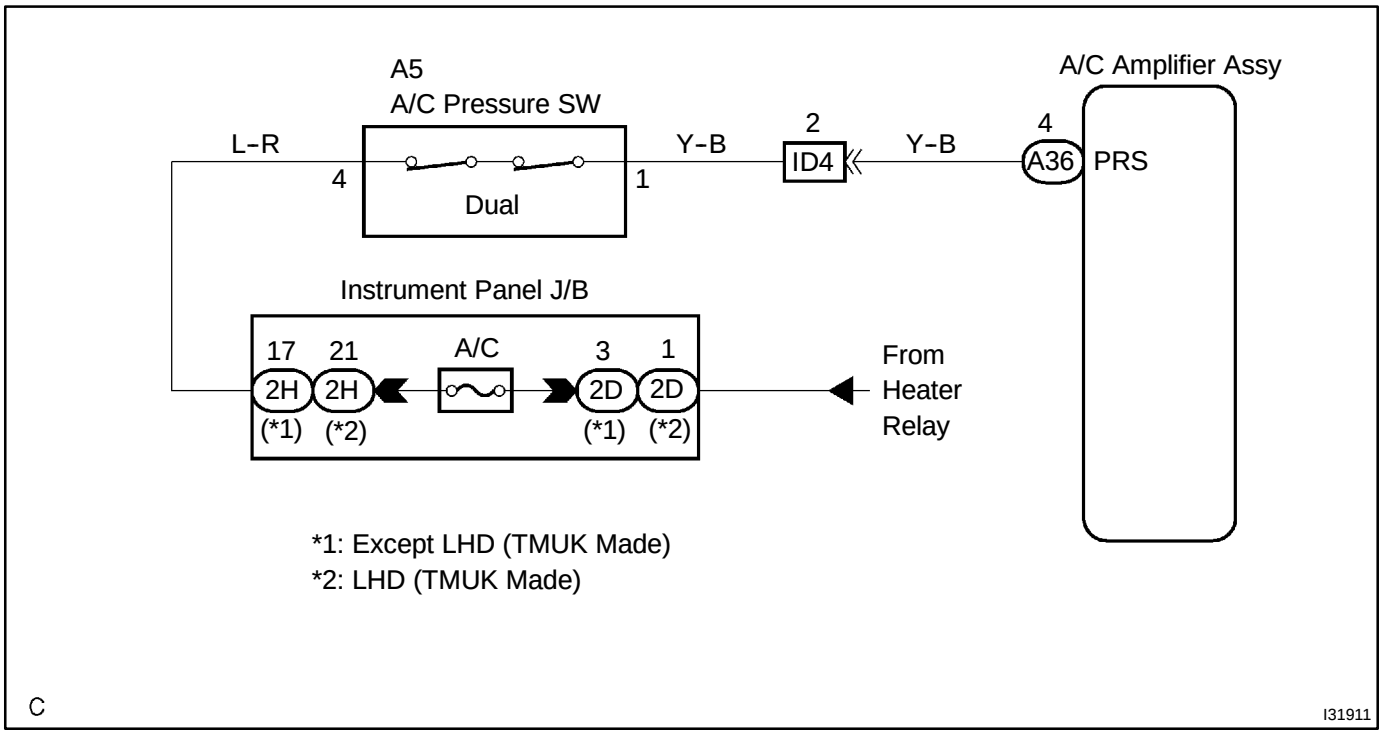
DTC 23 PRESSURE SWITCH CIRCUIT

CIRCUIT DESCRIPTION

The pressure switch sends the appropriate signals to the A/C amplifier assy when the A/C refrigerant pressure drops too low or rises too high. When the A/C amplifier assy receives these signals, it outputs signals via the A/C amplifier assy to switch OFF the compressor relay and turns the magnetic clutch OFF.

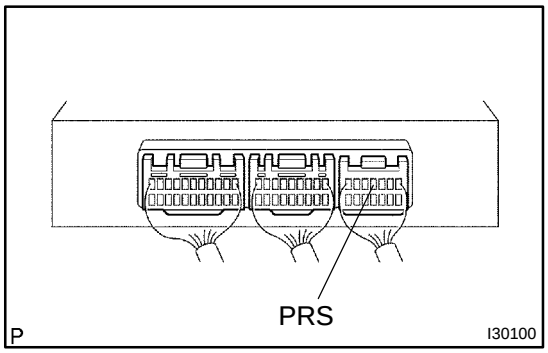
DTC No.	Detection Item	Trouble Area
23	S Open in pressure sensor circuit. S Abnormal refrigerant pressure. below 196 kPa (2.0 kg/cm^2, 28 psi) over 3,140 kPa (32.0 kgf/cm^2, 455 psi)	S Pressure switch S Harness or connector between pressure switch and A/C amplifier assy S Refrigerant pipe line S A/C amplifier assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT AIRCONDITIONER AMPLIFIER ASSY(PRS)



(a) Install the manifold gauge set.
(b) Turn the ignition switch to ON.
(c) Check voltage between terminal PRS of A/C amplifier assy connector and body ground when refrigerant pressure is changed.
(d) The voltage changes with refrigerant pressure, as shown in the diagram below.

Voltage:

Low Pressure Cut Side	Reference : High Pressure Cut Side
ON (0V) 196 kPa 225 kPa OFF (12V)	ON (0V) 2,550 kPa 3,140 kPa OFF (12V)

Result:

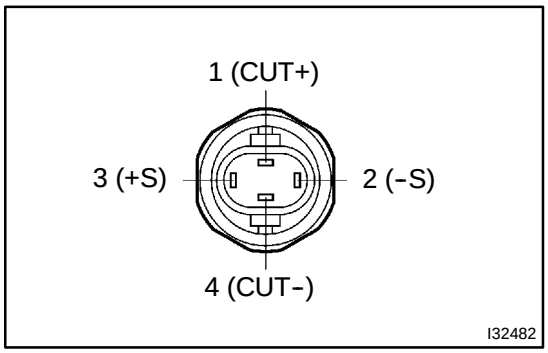
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

C → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

A

2 CHECK COOLER REFRIGERANT LIQUID PIPE A (PRESSURE SWITCH)



(a) Turn the ignition switch to ON.
(b) Check continuity between terminals 1 and 4 of cooler refrigerant liquid pipe A when refrigerant pressure is changed.
(c) The continuity changes with refrigerant pressure as shown in the diagram below.

Continuity:

Low Pressure Cut Side	Reference : High Pressure Cut Side
ON (continuity) 196 kPa 211 kPa OFF (continuity)	ON (continuity) 2,550 kPa 3,140 kPa OFF (continuity)

NG → **REPLACE COOLER REFRIGERANT LIQUID PIPE A**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN PRESSURE SWITCH AND AIR CONDITIONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

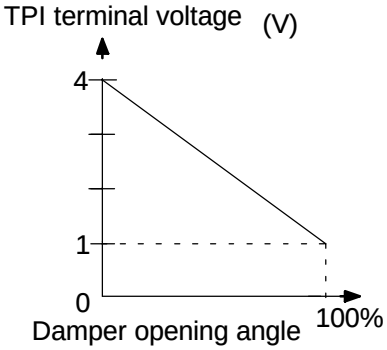
B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

DTC	31	AIR MIX DAMPER POSITION SENSOR CIRCUIT(PASSENGER SIDE)

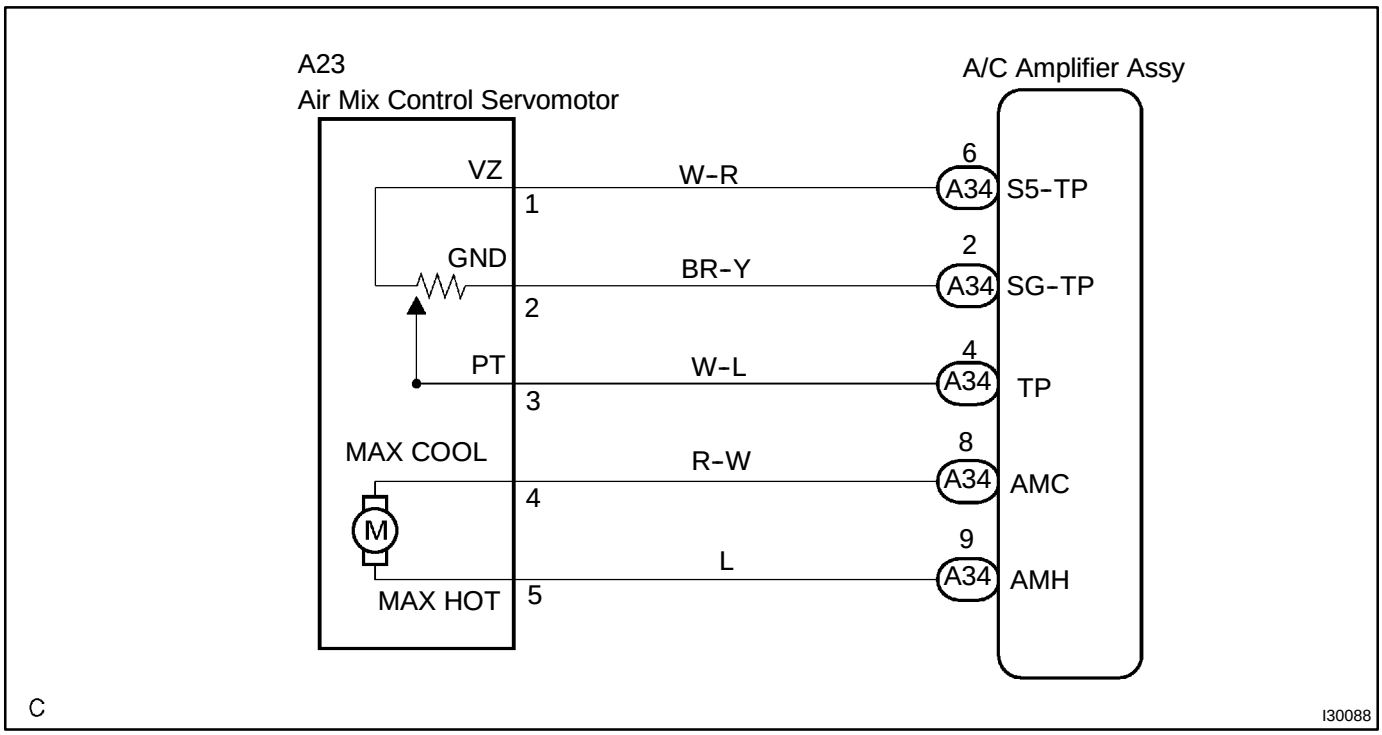
CIRCUIT DESCRIPTION



This sensor detects the position of the air mix damper and sends the appropriate signals to the A/C amplifier assy. The position sensor is built into the airmix damper servo sub-assy.

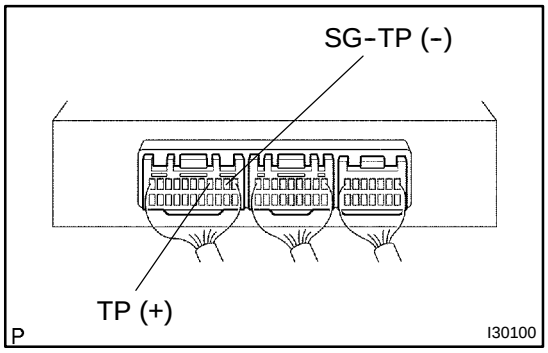
DTC No.	Detection Item	Trouble Area
31	Short to ground or power source circuit in air mix damper position sensor circuit.	ŠAirmix damper servo sub-assy ŠHarness or connector between airmix damper servo sub-assy and A/C amplifier assy ŠA/C amplifier assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT AIRCONDITIONER AMPLIFIER ASSY(TP, SG-TP)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Change the set temperature to activate the air mix damper and measure the voltage between terminals TP and SG-TP of A/C amplifier assy.
Voltage:
MAX. COOL: 3.5 - 4.5 V
MAX. WARM: 0.5 - 1.8 V

HINT:
As the set temperature increases, the voltage decreases gradually without interruption.

Result:

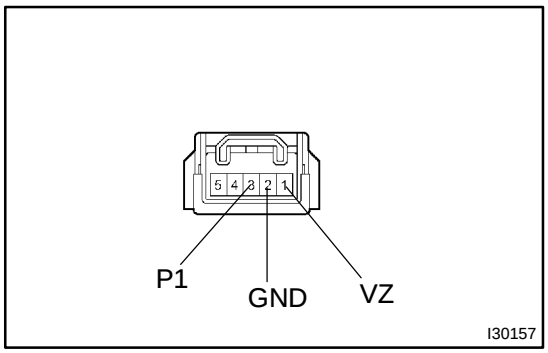
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

C → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE**

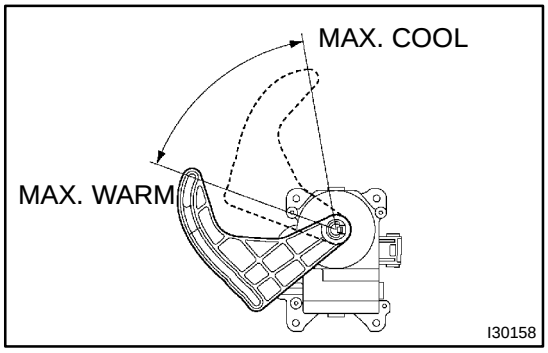
A

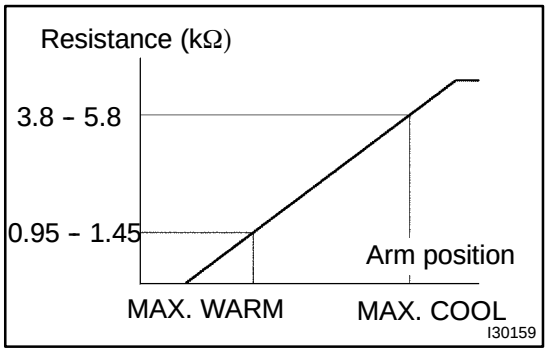
2	INSPECT AIRMIX DAMPER SERVO SUB-ASSY



(a) Remove the air mix damper servo sub-assy.
(b) Measure resistance between terminals 1 and 2 of air mix damper servo sub-assy connector.
Resistance: 4.8 - 7.2 kΩ
(c) While operating airmix damper servo sub-assy as shown in the procedure on page 05-900, measure resistance between terminals 1 and 3 of airmix damper servo sub-assy.
Resistance:
MAX. COOL: 3.8 - 5.8 kΩ
MAX. WARM: 0.95 - 1.45 kΩ

HINT:
As the airmix damper servo sub-assy moves from cool side to warm side, the resistance decreases gradually without interruption.





NG → **REPLACE AIRMIX DAMPER SERVO SUB-ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN AIR MIX DAMPER POSITION SENSOR AND AIR CONDITIONER AMPLIFIER ASSY)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

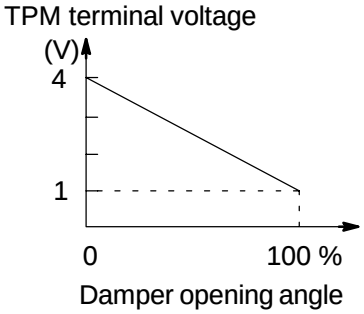
B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

DTC	33	AIR OUTLET DAMPER POSITION SENSOR CIRCUIT

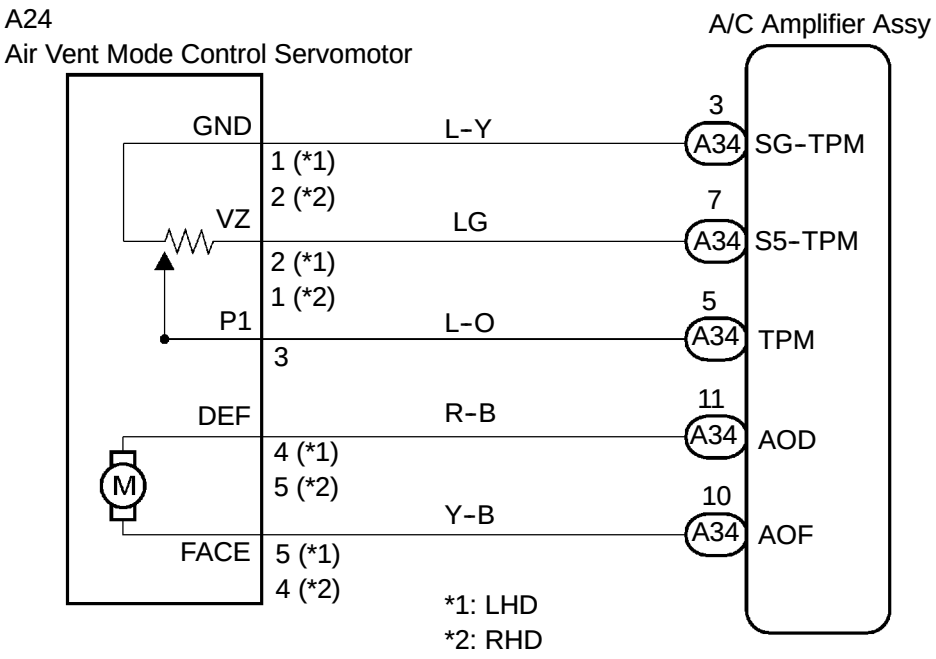
CIRCUIT DESCRIPTION



This sensor detects the position of the air outlet damper and sends the appropriate signals to the A/C amplifier assy. The position sensor is built into the mode damper servo sub-assy.

DTC No.	Detection Item	Trouble Area
33	Short to ground or power source circuit in air outlet damper position sensor circuit.	S Mode damper servo sub-assy S Harness or connector between mode damper servo sub-assy and A/C amplifier assy S A/C amplifier assy

WIRING DIAGRAM

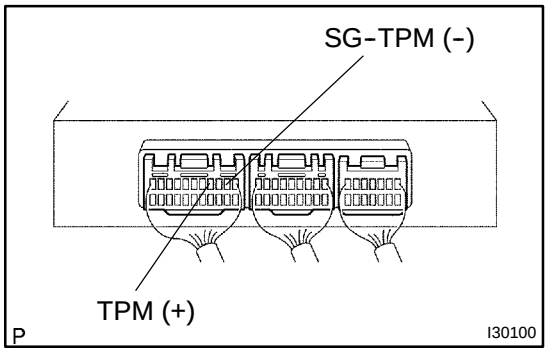


C

I30088

INSPECTION PROCEDURE

1	INSPECT AIRCONDITIONER AMPLIFIER ASSY(TPM, SG-TPM)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminals TPM and SG-TPM of A/C amplifier assy.
Voltage:
FACE: 3.5 - 4.5 V
DEF: 0.5 - 1.5 V

HINT:
As the mode damper servo sub-assy is moved from FACE side to DEF side, the voltage decreases gradually with out interruption.

Result:

A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

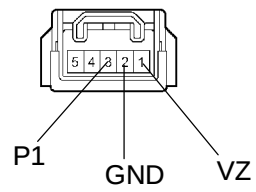
B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

C → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE**

A

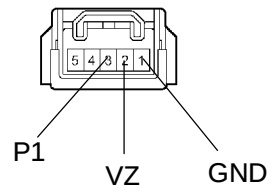
2 INSPECT MODE DAMPER SERVO SUB-ASSY

RHD:

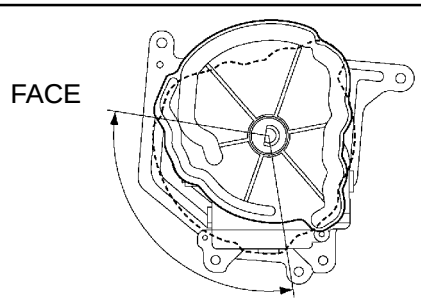


I30157

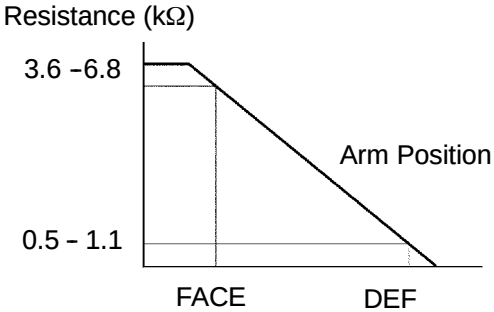
LHD:



I30157



I30160



I30161

(a) Remove the mode damper servo sub-assy.

(b) Measure resistance between terminals 1 and 2 of mode damper servo sub-assy connector.
Resistance: 4.2 - 7.8 kΩ

(c) RHD:
While operating mode damper servo sub-assy as in the procedure on page 05-904, measure resistance between terminal 1 and 3 of mode damper servo sub-assy.
Resistance:
DEF: 0.5 - 1.1 kΩ
FACE: 3.6 - 6.8 kΩ

(d) LHD:
While operating mode damper servo sub-assy as in the procedure on page 05-904, measure resistance between terminal 2 and 3 of mode damper servo sub-assy.
Resistance:
DEF: 0.5 - 1.1 kΩ
FACE: 3.6 - 6.8 kΩ

HINT:
As the mode damper servo sub-assy moved from DEF side to FACE side, the resistance decreases gradually with out interruption.

NG → **REPLACE MODE DAMPER SERVO SUB-ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN AIR OUTLET DAMPER POSITION SENSOR AND AIR CONDITIONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

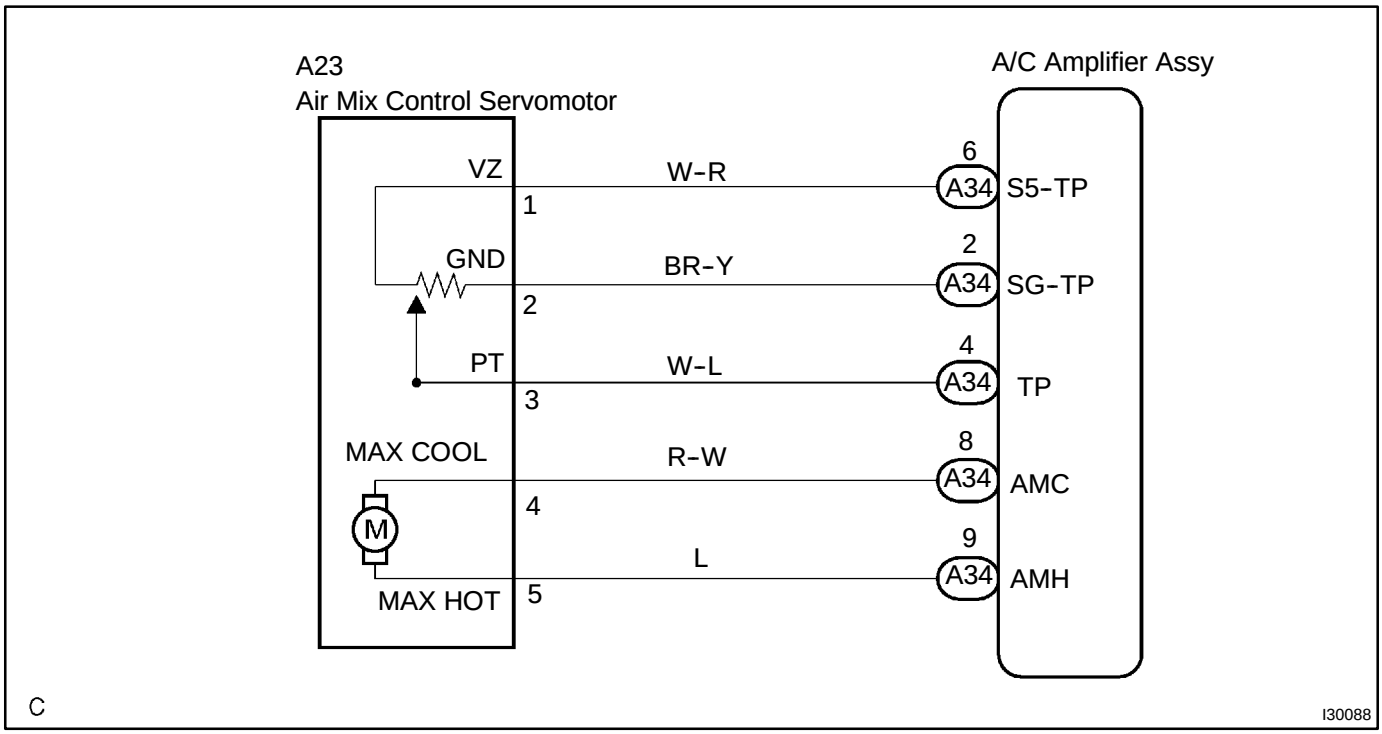
DTC	41	AIR MIX DAMPER CONTROL SERVOMOTOR CIRCUIT(PASSENGER SIDE)

CIRCUIT DESCRIPTION

This air mix servomotor is controlled by the A/C amplifier assy and moves the airmix damper servo sub-assy to the desired position.

DTC No.	Detection Item	Trouble Area
41	Air mix damper position sensor value does not change even if A/C amplifier assy operates airmix damper servo sub-assy.	S Airmix damper servo sub-assy S Harness or connector between A/C amplifier assy and airmix damper servo sub-assy S A/C amplifier assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1	PERFORM ACTUATOR CHECK

(a) Set to actuator check mode (See page 05-863).
(b) Press the DEF switch and change to step operation.
(c) Check the air flow temperature by hand.

Display Code	Air Mix Damper Operation
0	COOL side (0 % open)
1	COOL side (0 % open)
2	COOL side (0 % open)
3	COOL side (0 % open)
4	COOL/WARM (50 % open)
5	COOL/WARM (50 % open)
6	COOL/WARM (50 % open)
7	WARM side (100 % open)
8	WARM side (100 % open)
9	WARM side (100 % open)

Result:

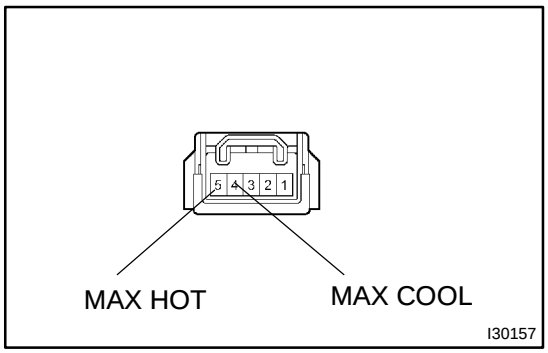
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

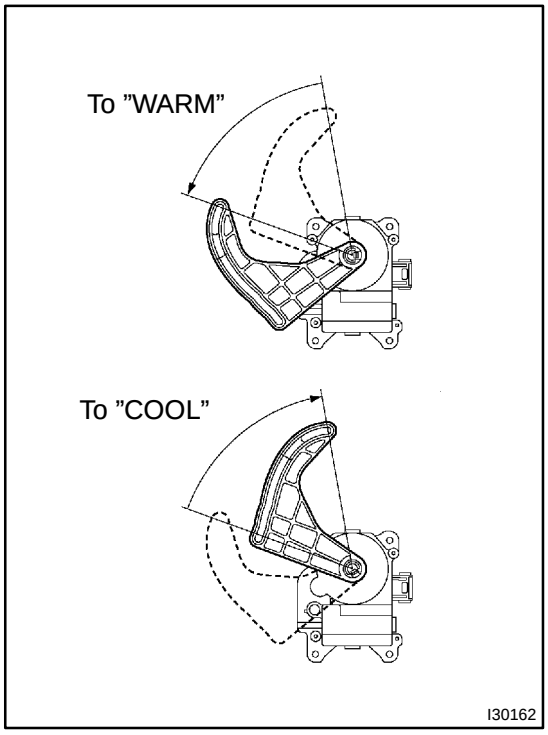
C → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE

A

2	INSPECT AIRMIX DAMPER SERVO SUB-ASSY



(a) Remove the airmix damper servo sub-assy.
(b) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "COOL" side smoothly.
(c) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turns to "WARM" side smoothly.



NG → REPLACE AIRMIX DAMPER SERVO SUB-ASSY

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN AIR MIX DAMPER CONTROL SERVOMOTOR AND AIR CONDITIONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A →

CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

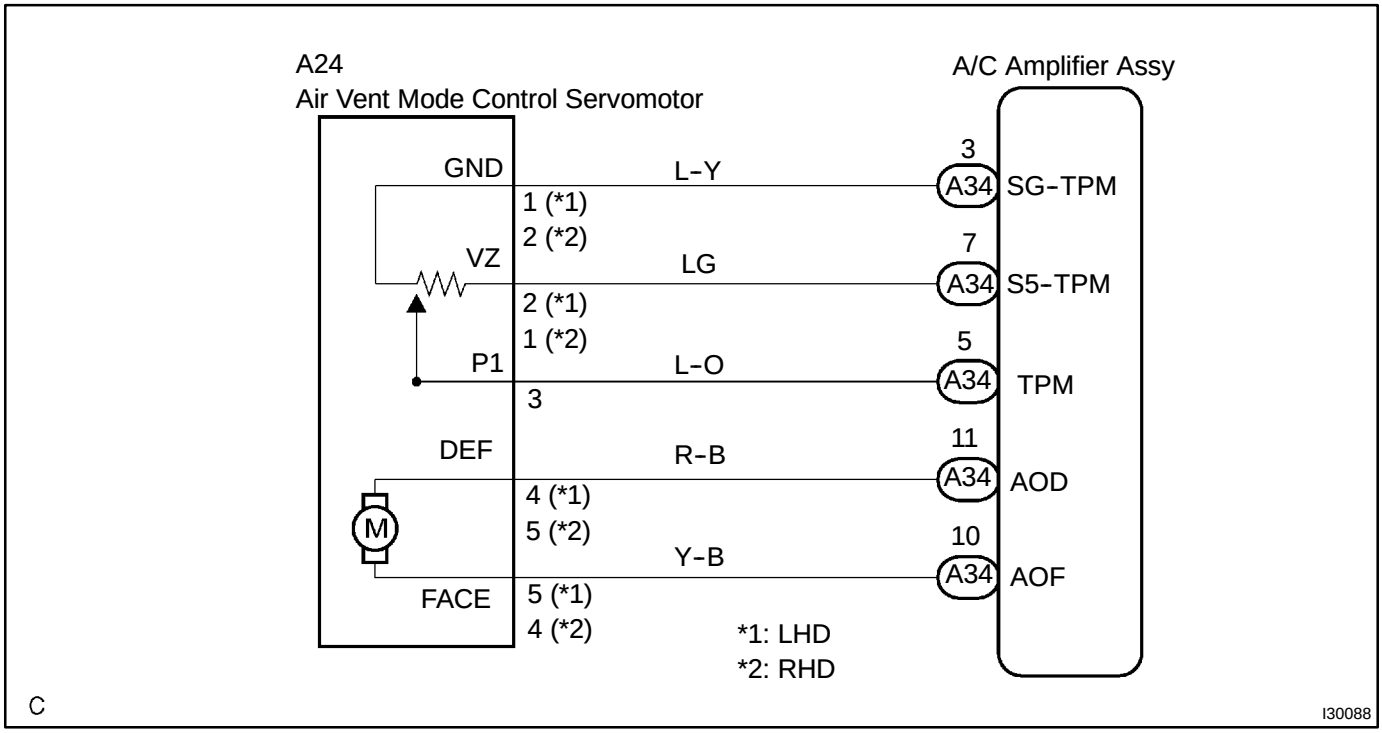
DTC	43	AIR OUTLET DAMPER CONTROL SERVOMOTOR CIRCUIT

CIRCUIT DESCRIPTION

This circuit turns the mode damper servo sub-assy and changes each mode damper position by the signals from the A/C amplifier assy. When the AUTO switch is ON, the A/C amplifier assy changes the mode automatically between (FACE), (BI-LEVEL) and (FOOT) according to the temperature setting.

DTC No.	Detection Item	Trouble Area
43	Air outlet damper position sensor value does not change even if A/C amplifier assy operated mode damper servo sub-assy.	S Mode damper servo sub-assy S Harness or connector between A/C amplifier assy and mode damper servo sub-assy S A/C amplifier assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1	PERFORM ACTUATOR CHECK

(a) Warm up engine.
(b) Set to actuator check mode (See page 05-863).
(c) Press the DEF switch and change it to step operation
(d) Press the DEF switch and check that the air flow by hand.

Display code	Air flow condition
0	FACE
1	FACE
2	FACE
3	FACE
4	FACE
5	B/L
6	FOOT
7	FOOT
8	FOOT/DEF
9	DEF

Result:

A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

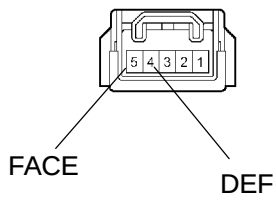
B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

C → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE

A

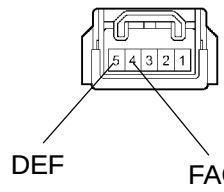
2 INSPECT MODE DAMPER SERVO SUB-ASSY

LHD:

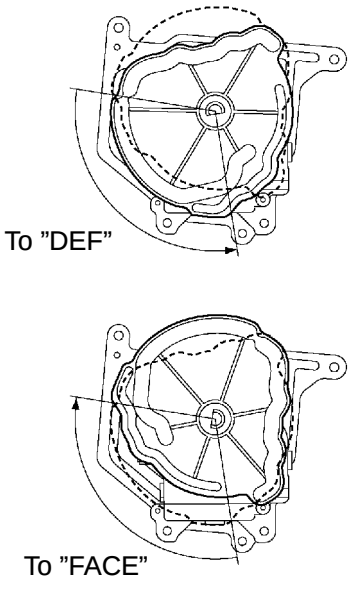


I30157

RHD:



I30157



I30116

(a) Remove the mode damper servo sub-assy.

(b) LHD:
Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "DEF" position.

(c) RHD:
Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turns to "DEF" position.

(d) LHD:
Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turn to "FACE" position.

(e) RHD:
Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "FACE" position.

NG → **REPLACE MODE DAMPER SERVO SUB-ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN AIR OUTLET DAMPER CONTROL SERVOMOTOR AND AIR CONDITIONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

A

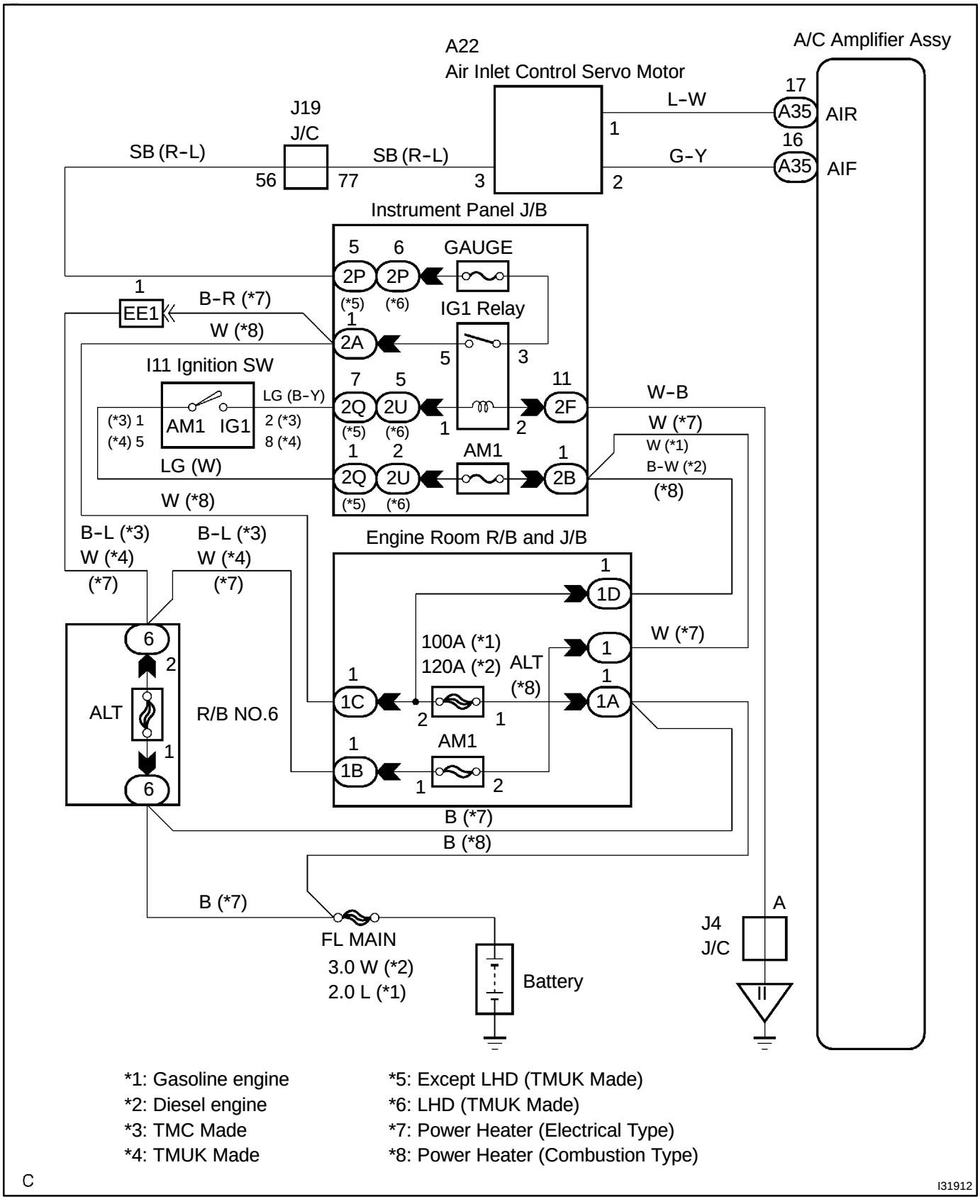
CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

RECIRCULATION DAMPER SERVOMOTOR CIRCUIT

CIRCUIT DESCRIPTION

The recirculation damper servomotor is controlled by the A/C amplifier assy and move the recirculation damper to the desired position

WIRING DIAGRAM



INSPECTION PROCEDURE

1	PERFORM ACTUATOR CHECK

(a) Remove the glove box to see and check the recirculation damper operation.
(b) Set to the actuator check mode (See page 05-863).
(c) Press the DEF switch and change it to step operation.
(d) Press the DEF switch in order and check the operation of recirculation damper.

Display code	Recirculation damper position
0	FRESH
1	FRESH
2	FRESH
3	FRESH
4	RECIRCURATION
5	RECIRCURATION
6	RECIRCURATION
7	RECIRCURATION
8	RECIRCURATION
9	RECIRCURATION

Result:

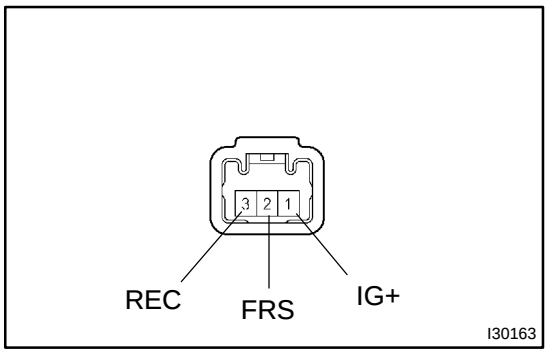
A	NG
B	OK: When checking use for DTC chart
C	OK: When checking use for problem symptoms table

B → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

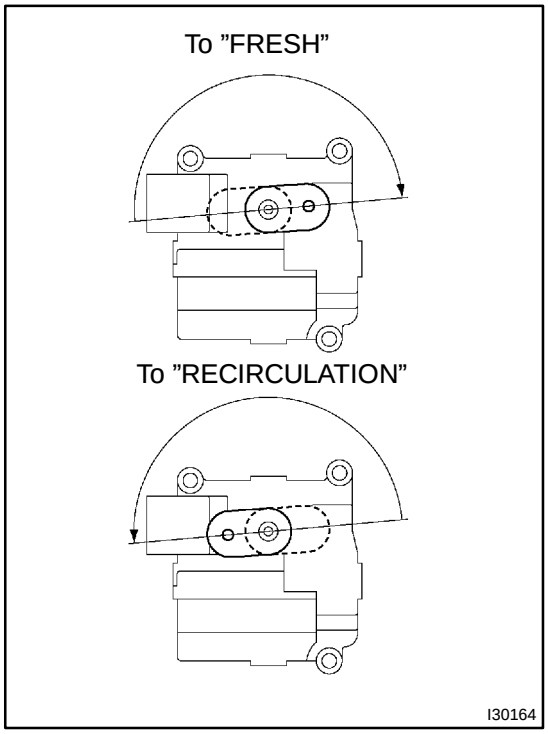
C → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE

A

2	INSPECT RECIRCULATION DAMPER SERVO SUB-ASSY



(a) Remove the recirculation damper servo sub-assy.
(b) Connect the positive (+) lead to from the battery to terminal 1 and negative (-) lead to terminal 2, then check that the lever turns to "FRESH" side smoothly.
(c) Connect the positive (+) lead to from the battery to terminal 1 and negative (-) lead to terminal 3, then check that the lever turns to "RECIRCULATION" side smoothly.



NG → REPLACE RECIRCULATION DAMPER SERVO SUB-ASSY

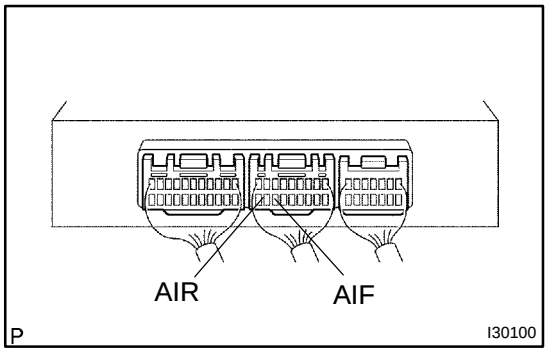
OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN RECIRCULATON DAMPER SERVOMOTOR AND BATTERY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	INSPECT AIRCONDITIONER AMPLIFIER ASSY(AIF, AIR)



(a) Remove the A/C amplifier assy with connectors still connected.

(b) Measure voltage between terminal AIF of A/C amplifier assy and body ground when recirculation switch is operated, as shown in the chart.

Voltage:

Recirculation switch	Voltage (V)
FRESH	10 - 14
RECIRCULATION	Below 1.0

(c) Measure voltage between terminal AIR of A/C amplifier assy and body ground when recirculation switch is operated, as shown in the chart.

Voltage:

Recirculation switch	Voltage (V)
FRESH	Below 1.0
RECIRCULATION	10 - 14

NG → **Go to step 5**

OK →

REPAIR OR REPLACE HARNESS OR CONNECTOR

5	CHECK THAT MALFUNCTION DISAPPEAR A KNOWN GOOD AIR CONDITIONER AMPLIFIER ASSY IS INSTALLED

(a) Check that the malfunction disappear when a known good A/C amplifier assy is installed.

Result:

A	Malfunction does not disappear
B	Malfunction disappear

B → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

A →

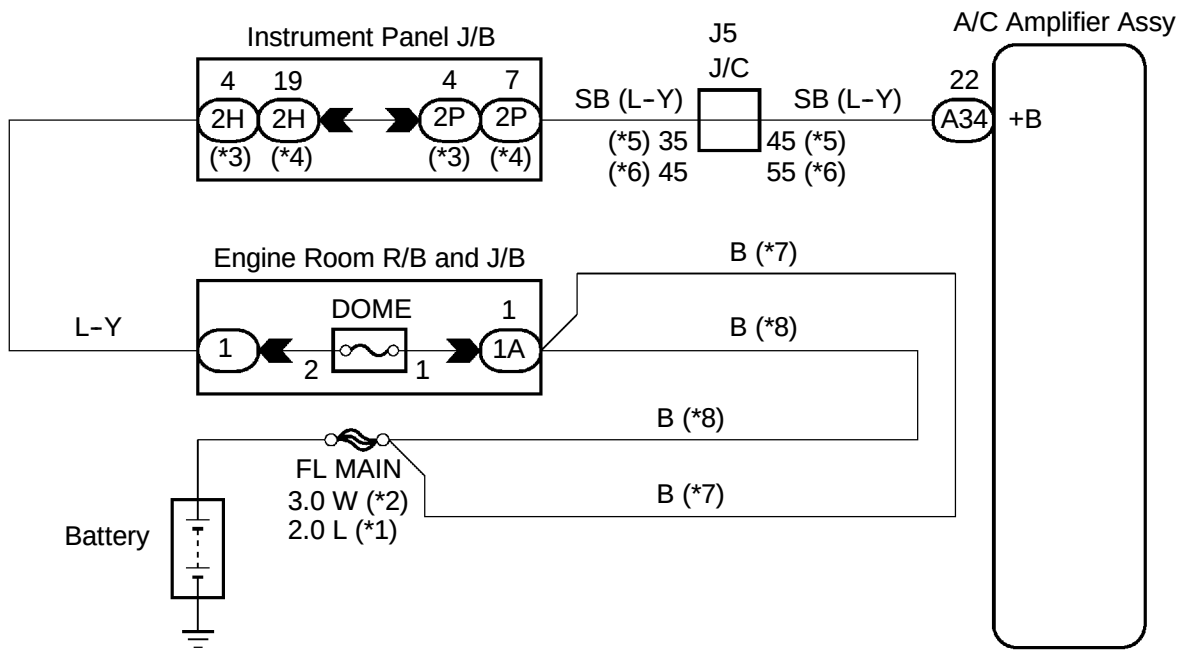
CHECK AND REPLACE CENTER CLUSTER MODULE CIRCUIT

BACK-UP POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

This is the back-up power source for the A/C amplifier assy. Power is supplied even when the ignition switch is off and is used for diagnostic trouble code memory, etc.

WIRING DIAGRAM



*1: Gasoline engine
*2: Diesel engine
*3: Except LHD (TMUK Made)
*4: LHD (TMUK Made)
*5: Except *6
*6: 2ZZ-GE engine 3ZZ-FE engine (TMUK Made)
*7: Power Heater (Electrical Type)
*8: Power Heater (Combustion Type)

C

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INSPECTION PROCEDURE

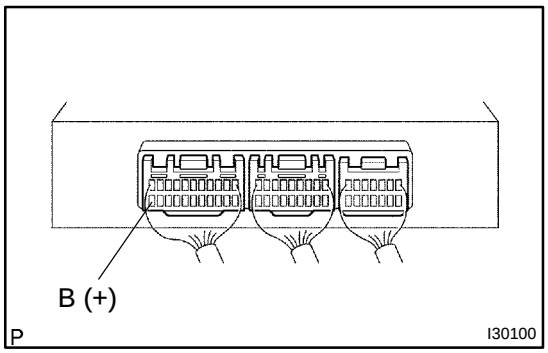
1	CHECK FUSE(DOME FUSE)

(a) Remove the DOME fuse from the engine room R/B and J/B.
(b) Check that the continuity exists of DOME fuse.

NG → REPLACE FUSE

OK

2	INSPECT AIRCONDITIONER AMPLIFIER ASSY(+B)



(a) Remove the A/C amplifier assy with connectors still connected.

(b) Measure voltage between terminals +B of A/C amplifier assy and body ground.
Voltage: 10 - 14 V

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

NG

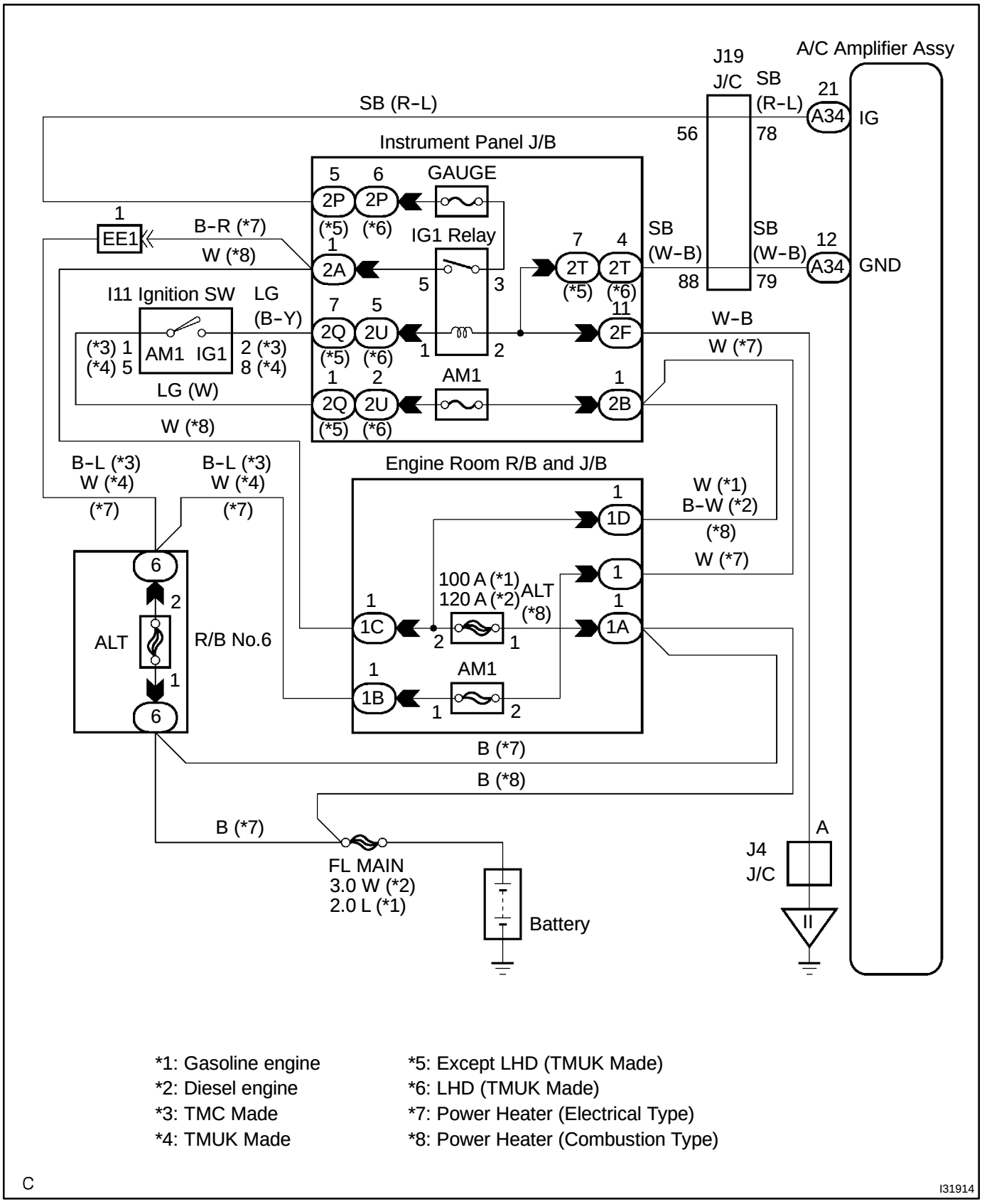
REPAIR OR REPLACE HARNESS OR CONNECTOR

IG POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

This is the power source for the A/C amplifier assy (contains the ECU) and servomotor, etc.

WIRING DIAGRAM



INSPECTION PROCEDURE

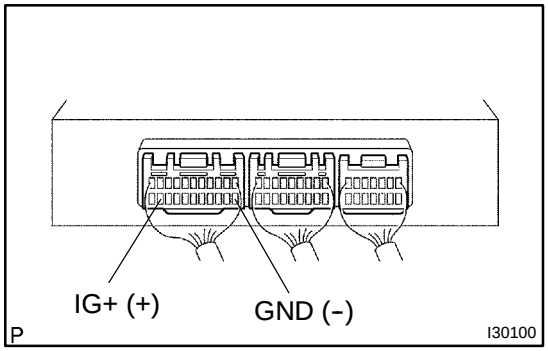
1	CHECK FUSE(GAUGE FUSE)

(a) Remove the GAUGE fuse from the engine room R/B and J/B.
(b) Check that the continuity exists of GAUGE fuse.

NG → REPLACE FUSE

OK

2	INSPECT AIRCONDITIONER AMPLIFIER ASSY(IG, GND)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Measure voltage between terminals IG+ and GND of the A/C amplifier assy.
Voltage: 10 - 14 V

OK → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE

NG

3	CHECK HARNESS AND CONNECTOR(BETWEEN AIR CONDITIONER AMPLIFIER ASSY AND BODY GROUND)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK HARNESS AND CONNECTOR(BETWEEN AIR CONDITIONER AMPLIFIER ASSY AND BATTERY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

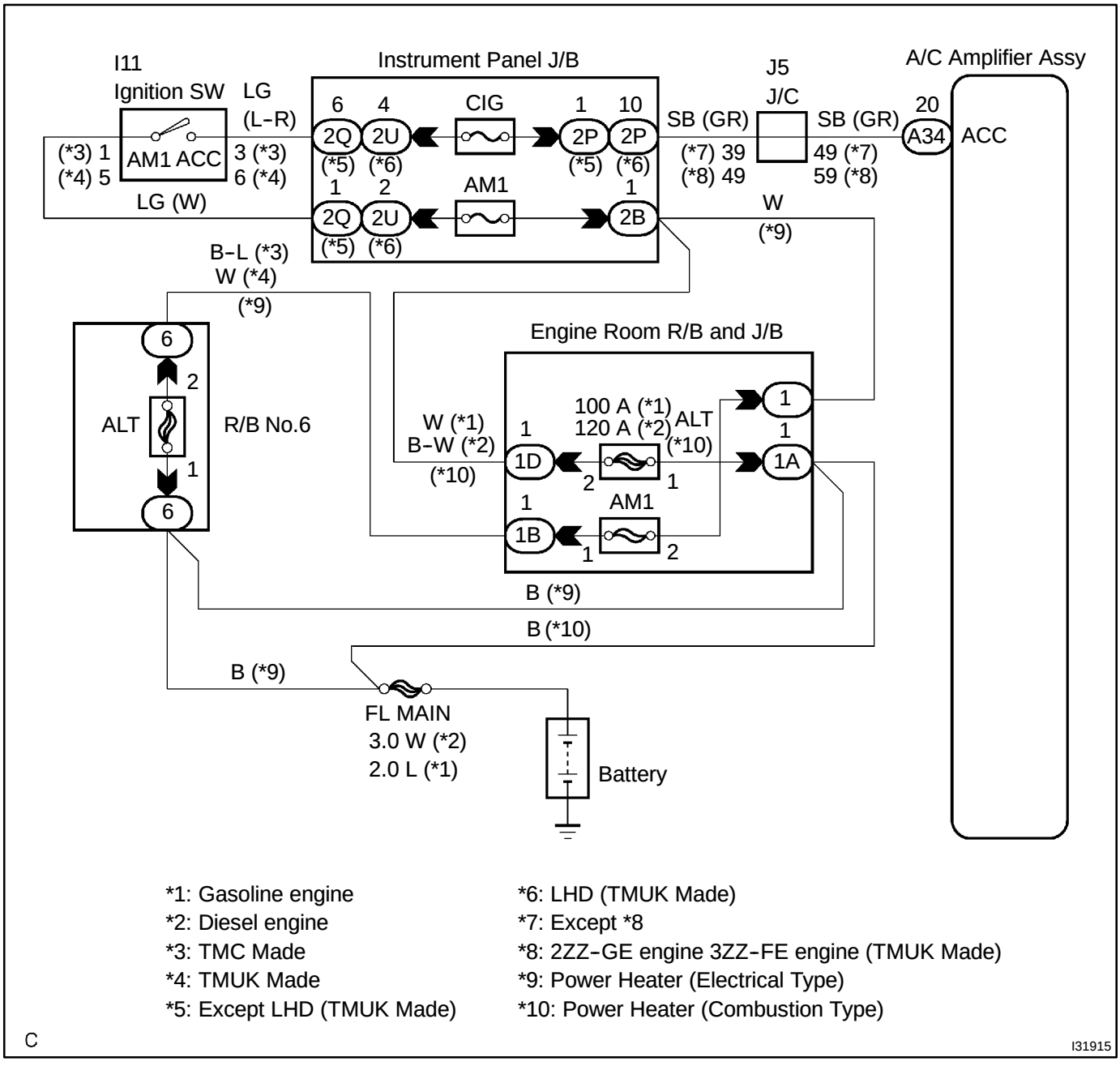
CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

ACC POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

This circuit supplies power to the A/C amplifier assy. It supplies power to the illumination for the clock.

WIRING DIAGRAM



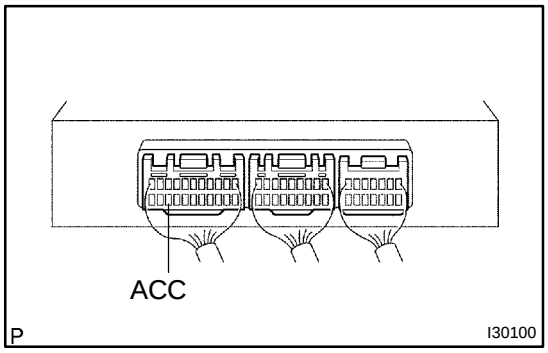
*1: Gasoline engine
*2: Diesel engine
*3: TMC Made
*4: TMUK Made
*5: Except LHD (TMUK Made)
*6: LHD (TMUK Made)
*7: Except *8
*8: 2ZZ-GE engine 3ZZ-FE engine (TMUK Made)
*9: Power Heater (Electrical Type)
*10: Power Heater (Combustion Type)

C

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INSPECTION PROCEDURE

1	INSPECT AIRCONDITIONER AMPLIFIER ASSY(ACC)



(a) Remove the A/C amplifier assy with connectors still connected.
(b) Turn the ignition switch to ACC.
(c) Measure voltage between terminals ACC of the A/C amplifier assy and body ground.
Voltage: 10 - 14 V

OK → **CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY**

NG

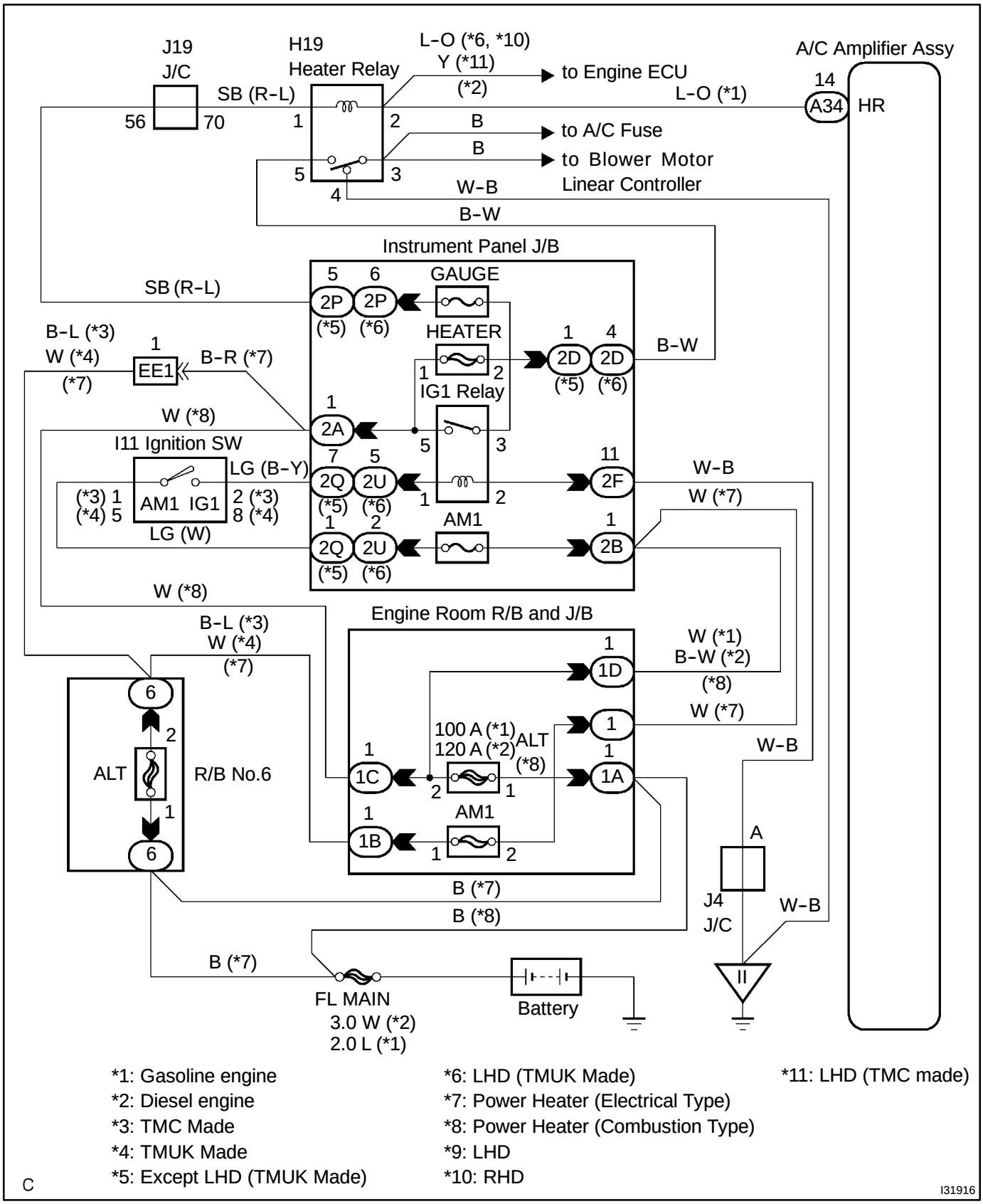
REPAIR OR REPLACE HARNESS OR CONNECTOR

HEATER RELAY CIRCUIT

CIRCUIT DESCRIPTION

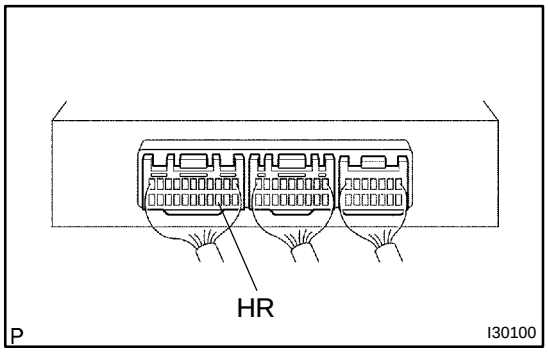
The heater relay is switched on by signals from the A/C amplifier assy. It supplies power to the blower motor.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT AIRCONDITIONER AMPLIFIER ASSY(HR)



(a) Remove the A/C amplifier assy with connectors still connected.

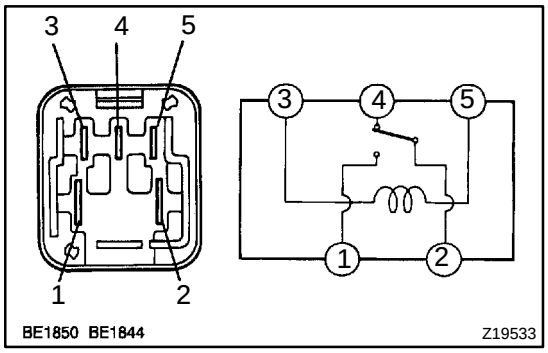
(b) Measure voltage between terminal HR of A/C amplifier assy and body ground when ignition switch is ON and OFF.

Voltage:
Ignition switch OFF: 0 V
Ignition switch ON (Blower switch ON): Below 1 V
Ignition switch ON (Blower switch OFF): 10 - 14 V

OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

NG

2 INSPECT HEATER BLOWER MOTOR RELAY ASSY



(a) Check that the continuity exists between each pair of terminals of heater blower motor relay assy, as shown in the chart.

Tester connection	Specified condition
1 - 4	No continuity
2 - 4	Continuity
3 - 5	62.5 - 90.9 Ω

(b) Apply battery voltage between terminals 3 and 5.

(c) Check continuity each pair of terminals, as shown the chart.

Tester connection	Specified condition
1 - 2	Continuity
2 - 4	No continuity

NG → **REPLACE HEATER BLOWER MOTOR RELAY ASSY**

OK

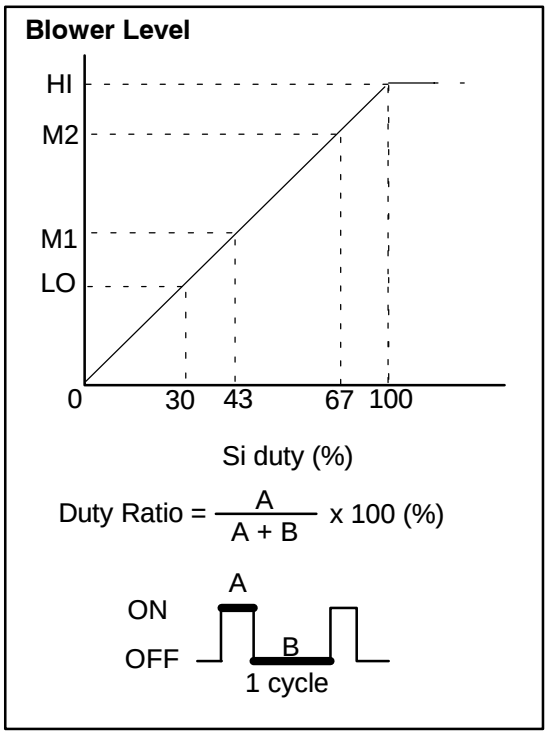
3 CHECK HARNESS AND CONNECTOR(BETWEEN HEATER RELAY AND BATTERY)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

BLOWER MOTOR CIRCUIT



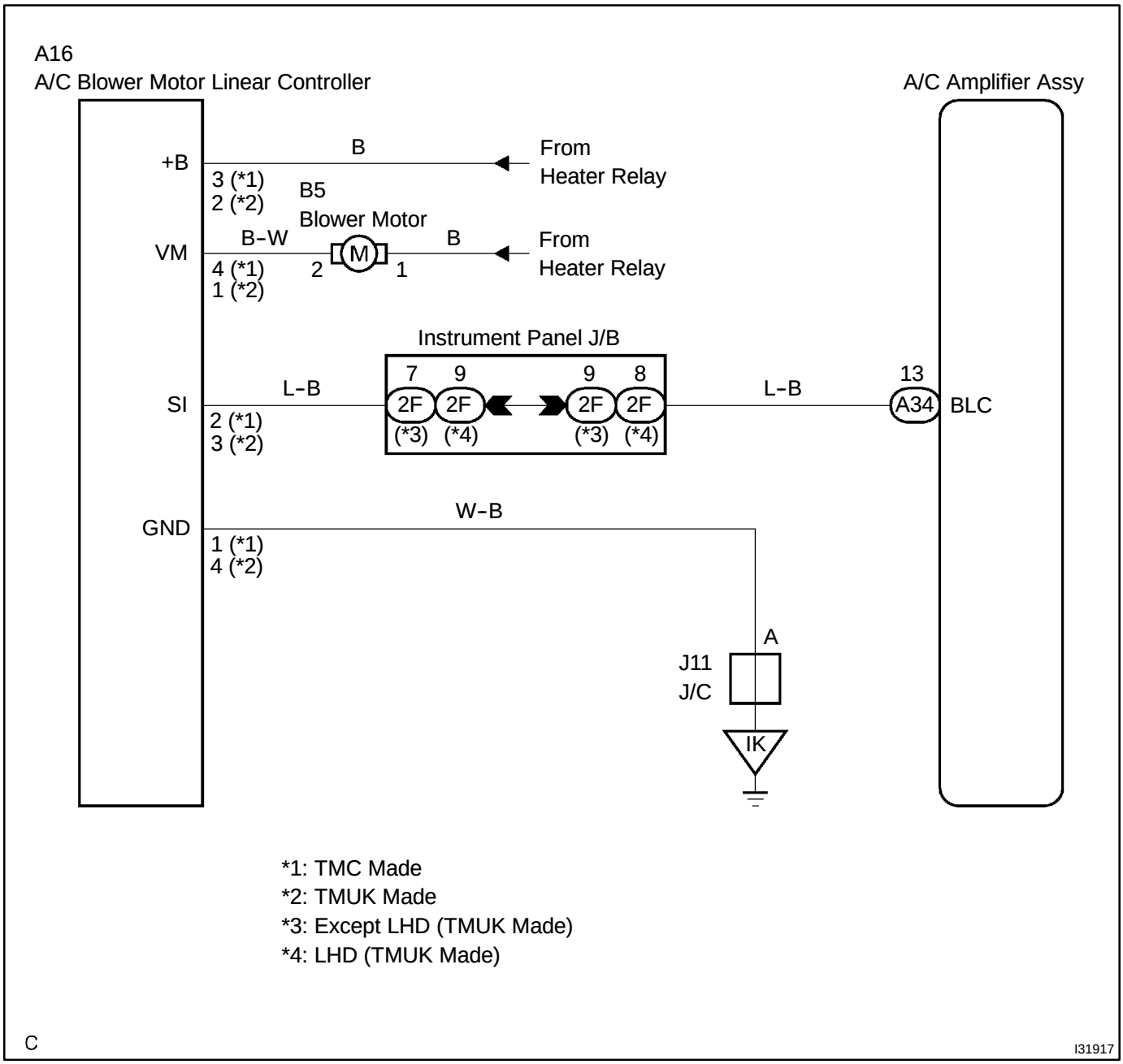
CIRCUIT DESCRIPTION

The blower motor is operated by signals from the A/C amplifier assy. Blower motor speed signals are transmitted by changes in the Duty Ratio.

Duty Ratio:

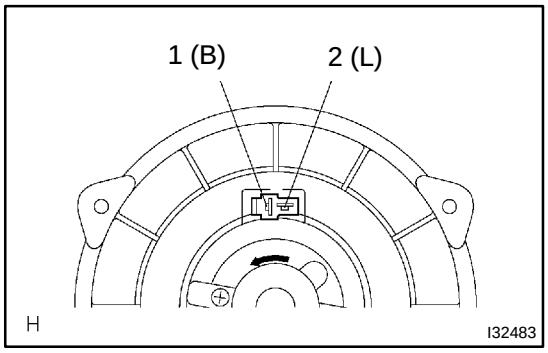
The duty ratio is the ratio of the period of continuity in one cycle. For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT BLOWER W/FAN MOTOR SUB-ASSY



(a) Remove the blower w/ fan motor sub-assy.
(b) Connect positive (+) lead to terminal 2 of blower w/ fan motor sub-assy connector, negative (-) lead to terminal 1 of the blower w/ fan motor sub-assy connector.
Standard: Blower motor operates smoothly.

NG → REPLACE BLOWER W/FAN MOTOR SUB-ASSY

OK

2	CHECK HARNESS AND CONNECTOR(BETWEEN BATTERY AND BLOWER MOTOR LINEAR CONTROLLER)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN BLOWER MOTOR LINEAR CONTROLLER AND AIR CONDITIONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

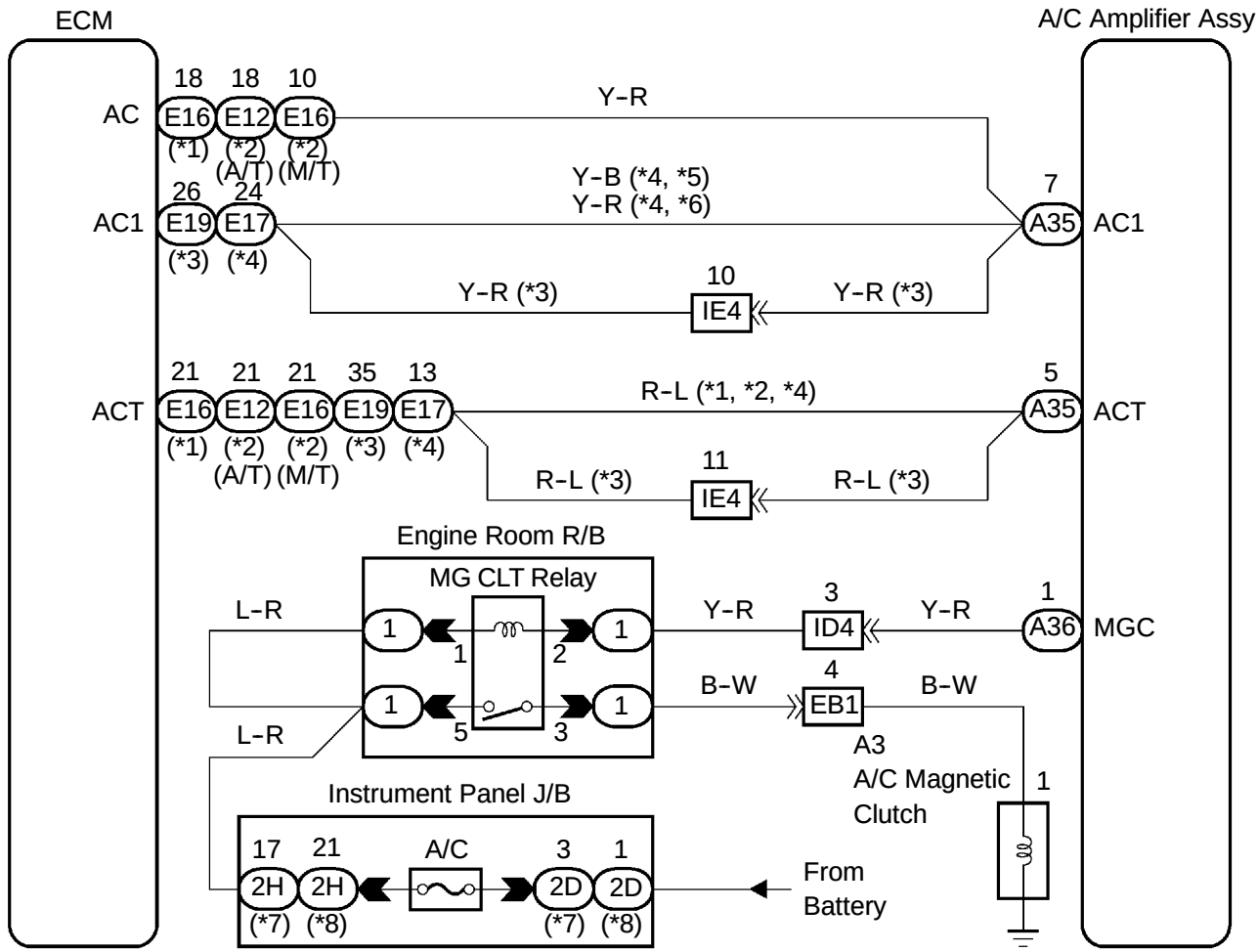
CHECK AND REPLACE BLOWER MOTOR CONTROL

COMPRESSOR CIRCUIT

CIRCUIT DESCRIPTION

The A/C amplifier assy outputs the magnetic clutch ON signal from terminal AC1 to the ECM receives this signal, it sends a signal from terminal ACT and switches the magnetic clutch relay ON, thus turning on the magnetic clutch.

WIRING DIAGRAM



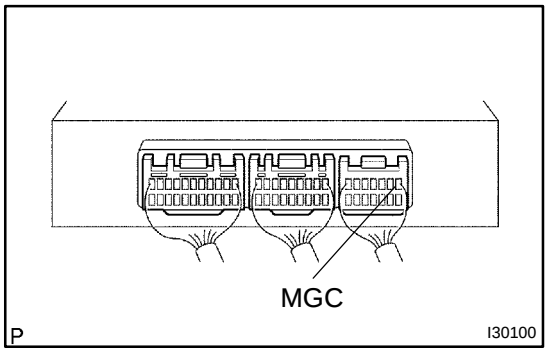
*1: 2ZZ-GE engine
*2: 3ZZ-FE engine
*3: 4ZZ-FE engine
*4: 1CD-FTV engine
*5: Diesel engine LHD (TMC Made)
*6: Diesel engine except LHD (TMC Made)
*7: Except LHD (TMUK Made)
*8: LHD (TMUK Made)

C

I31918

INSPECTION PROCEDURE

1 CHECK AIRCONDITIONER AMPLIFIER ASSY(MGC)

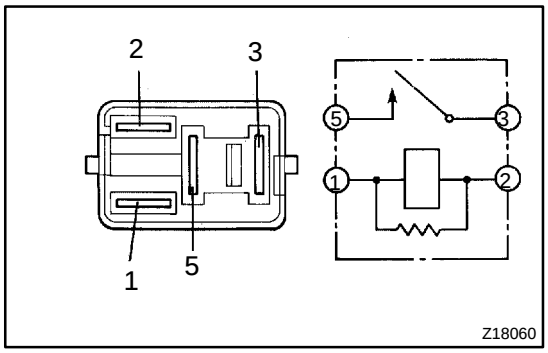


(a) Remove the A/C amplifier assy with connectors still connected.
(b) Start the engine and push AUTO switch.
(c) Check voltage between terminal MGC of A/C amplifier assy and body ground when magnetic clutch is ON and OFF by A/C switch.
Voltage:
A/C switch ON: Below 1 V
A/C switch OFF: 10 - 14 V

NG → **Go to step 5**

OK

2 INSPECT MAGNET-CLUTCH RELAY



(a) Remove the relay (magnetic clutch relay) from engine room R/B.
(b) Check continuity between each pair of terminal shown below of relay (magnetic clutch relay).
Continuity (Resistance):

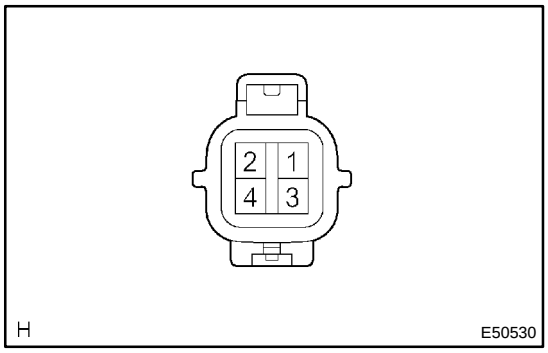
Tester connection	Specified condition
1 - 2	Continuity (62.5 - 90.9 Ω)
3 - 5	No continuity

(c) Apply battery voltage between terminals 1 and 2.
(d) Check that continuity between terminals 3 and 5.

NG → **REPLACE MAGNET-CLUTCH RELAY**

OK

3 CHECK COOLER CONDENSER ASSY



(a) Disconnect the connector from the compressor.
(b) Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to body ground, then check that the magnetic clutch is engaged.

NG → **REPLACE MAGNET CLUTCH ASSY**

OK

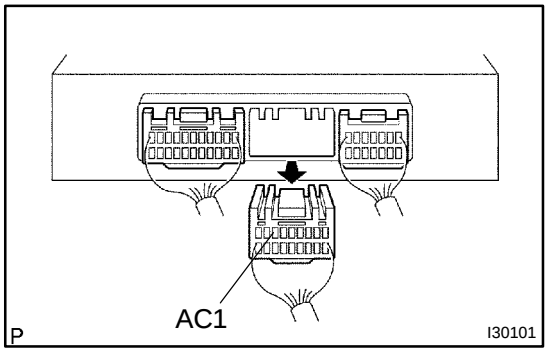
4	CHECK HARNESS AND CONNECTOR(BETWEEN MAGNETIC CLUTCH RELAY AND COMPRESSOR, COMPRESSOR AND BODY GROUND)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE

5	CHECK AIRCONDITIONER AMPLIFIER ASSY(AC1)

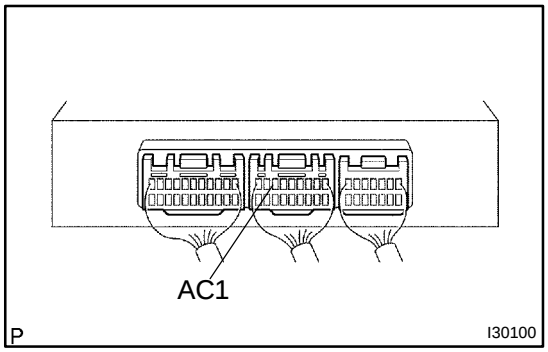


(a) Disconnect the "A35" connector of A/C amplifier assy.
(b) Turn the ignition switch to ON.
(c) Measure voltage between terminal AC1 of A/C amplifier assy connector (wire harness side) and body ground.
Voltage: 10 - 14 V

OK → CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

NG

6	CHECK AIRCONDITIONER AMPLIFIER ASSY(AC1)

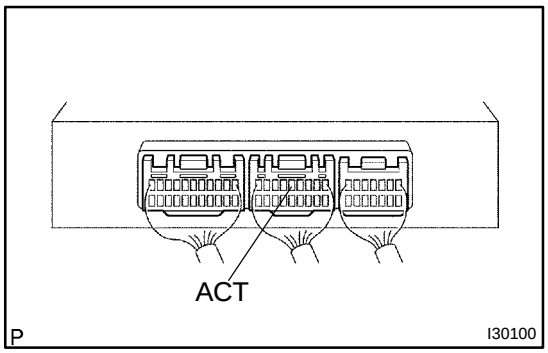


(a) Connect the "A35" connector to A/C amplifier assy.
(b) Start engine.
(c) Push AUTO switch.
(d) Measure voltage between terminal AC1 of A/C amplifier assy connector (wire harness side) and body ground.
Voltage:
Magnetic clutch is engaged: Below 1 V
Magnetic clutch is not engaged: 10 - 14 V

NG → CHECK AND REPLACE ECM

OK

7	CHECK AIRCONDITIONER AMPLIFIER ASSY(ACT)



(a) Start engine.
(b) Push AUTO switch.
(c) Measure voltage between terminal ACT of A/C amplifier assy connector (wire harness side) and body ground.
Voltage:
A/C switch ON: 10 - 14 V
A/C switch OFF: Below 1 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

8	CHECK HARNESS AND CONNECTOR(BETWEEN AIR CONDITIONER AMPLIFIER ASSY AND ECM)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

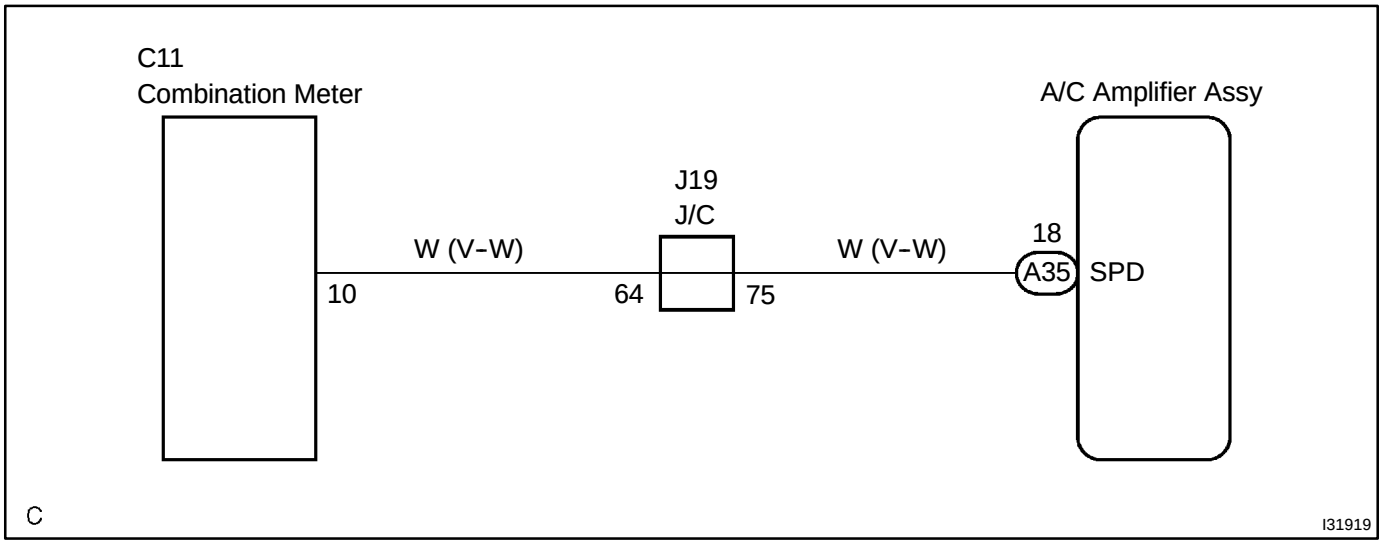
CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

VEHICLE SPEED SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

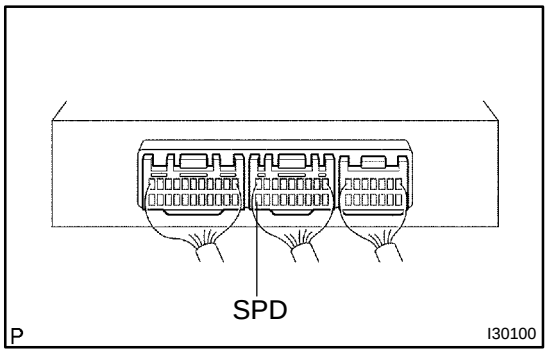
This A/C amplifier assy monitors the vehicle speed through signals sent from the speed sensor. The A/C amplifier assy uses these signals to revise the ambient temperature sensor signal.

WIRING DIAGRAM

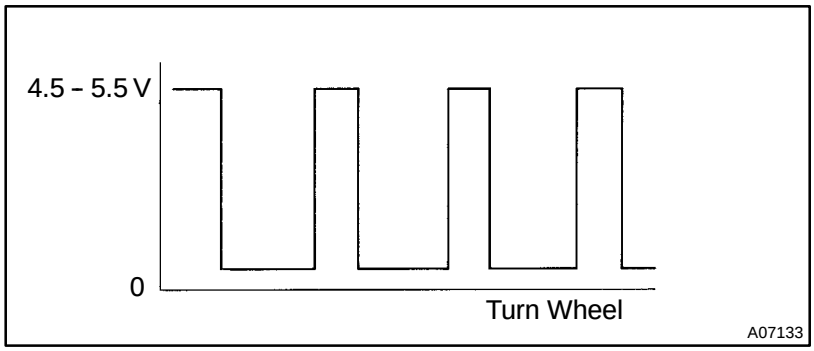


INSPECTION PROCEDURE

1	INSPECT AIRCONDITIONER AMPLIFIER ASSY(SPD)



(a) Shift the shift lever to neutral.
(b) Jack up the vehicle.
(c) Turn the ignition switch to ON.
(d) Measure voltage between terminal SPD of the A/C amplifier assy connector and body ground when the wheel is turning slowly.
Standard voltage:
Voltage is generated intermittently.



OK → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOM TABLE**

NG

2	INSPECT COMBINATION METER ASSY (See page 71-3)

NG → **GO TO COMBINATION METER SYSTEM**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR)

CONDENSER FAN CIRCUIT

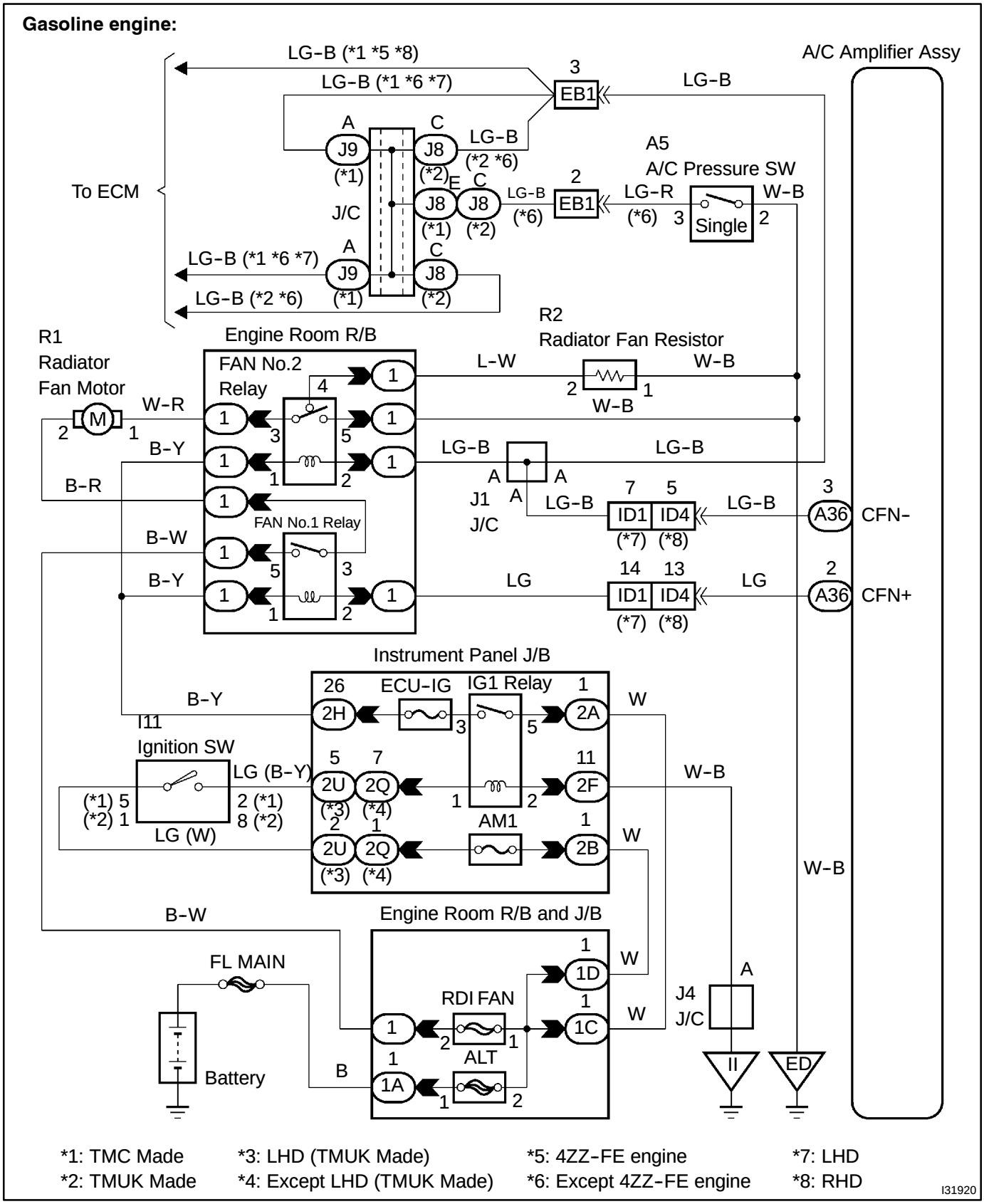
CIRCUIT DESCRIPTION

The electric fan speed is controlled as described below, in accordance with the following signals:

- ON/OFF signal of A/C switch.
- ON/OFF signal detected by the pressure switch (that cut out at medium pressure)
- ON/OFF signal detected by water temperature switch.

WIRING DIAGRAM

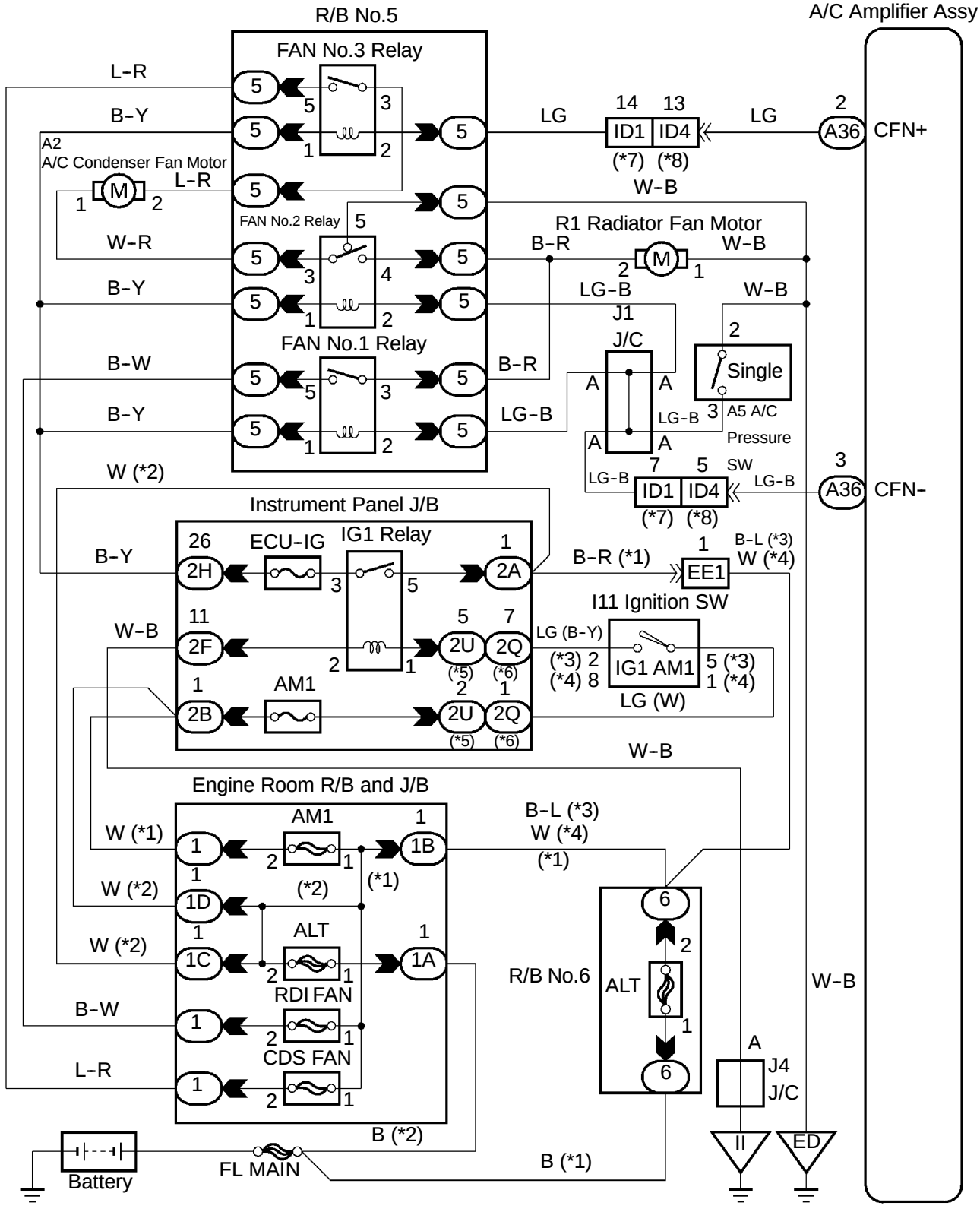
Gasoline engine:



*1: TMC Made
*2: TMUK Made
*3: LHD (TMUK Made)
*4: Except LHD (TMUK Made)
*5: 4ZZ-FE engine
*6: Except 4ZZ-FE engine
*7: LHD
*8: RHD

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Diesel engine:



*1: Power Heater (Electrical Type)
*2: Power Heater (Combustion Type)
*3: TMC Made
*4: TMUK Made
*5: LHD (TMUK Made)
*6: Except LHD (TMUK Made)
*7: LHD
*8: RHD

C

I31921

INSPECTION PROCEDURE

1 CHECK VEHICLE CONDITION

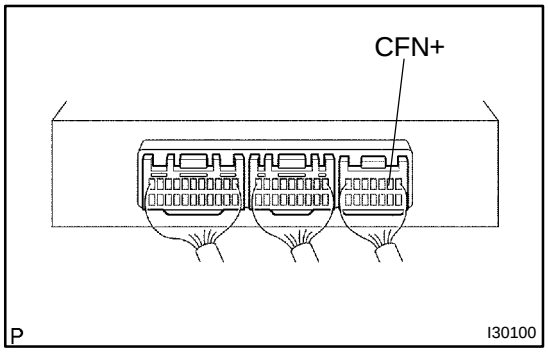
(a) Check fan operation condition, as shown in the chart.

Fan condition	Result
Fan does not operate	A
Fan speed does not change	B

B → **Go to step 8**

A

2 CHECK AIRCONDITIONER AMPLIFIER ASSY(CFN+)



(a) Remove the A/C amplifier assy with connectors still connected.

(b) Measure voltage between terminal CFN+ of A/C amplifier assy and body ground.

Voltage:

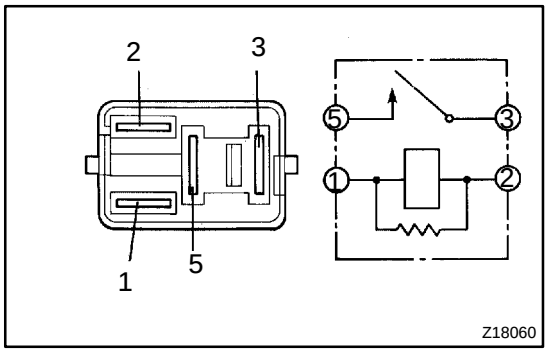
Ignition switch ON: Below 1 V

Ignition switch OFF: 10 - 14 V

OK → **Go to step 6**

NG

3 INSPECT COOLING FAN RELAY



(a) Inspect the No. 1 cooling fan relay continuity.

(1) Using an ohmmeter, check that continuity between terminals 1 and 2.

If no continuity, replace the relay.

(2) Check that no continuity between terminals 3 and 5.

(b) Inspect the No. 1 cooling fan relay operation.

(1) Apply battery voltage across terminals 1 and 2.

(2) Using an ohmmeter, check that continuity between terminals 3 and 5.

NG → **REPLACE COOLING FAN RELAY**

OK

4	INSPECT COOLING FAN MOTOR

(a) Check cooling fan motor operation (See page 16-4).

NG → REPLACE COOLING FAN MOTOR

OK

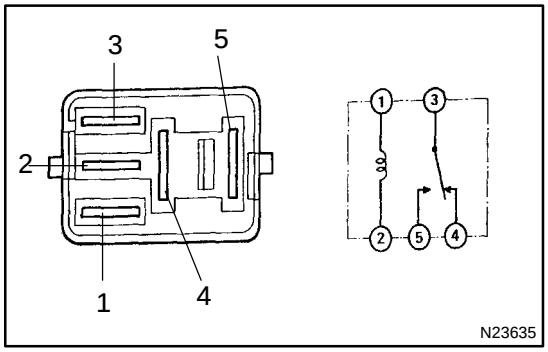
5	CHECK HARNESS AND CONNECTOR(BETWEEN FAN NO.1 RELAY AND AIR CONDITONER AMPLFIER ASSY, COOLING FAN MOTOR AND FAN NO.1 RELAY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

6	INSPECT COOLING FAN RELAY NO.2



(a) Inspect the No. 2 cooling fan relay continuity.
  (1) Using an ohmmeter, check that continuity between terminals 1 and 2.
  (2) Check that continuity between terminals 3 and 4.
  (3) Check that no continuity between terminals 3 and 5.

(b) Inspect the No. 2 cooling fan relay operation.
  (1) Apply battery voltage across terminals 1 and 2.
  (2) Using an ohmmeter, check that no continuity between terminals 3 and 4.

NG → REPLACE COOLING FAN RELAY NO.2

OK

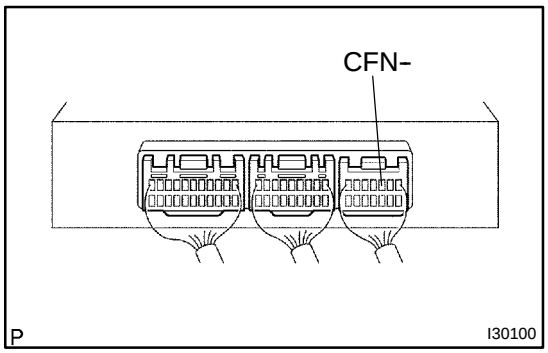
7	CHECK HARNESS AND CONNECTOR(BETWEEN FAN NO.2 RELAY AND FAN MOTOR, FAN NO.2 RELAY AND BODY GROUND)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE

8 CHECK AIRCONDITIONER AMPLIFIER ASSY(CFN-)



(a) Remove the A/C amplifier assy with connectors still connected.

(b) Measure voltage between terminal CFN+ of A/C amplifier assy and body ground when each cooling fan condition.

Voltage:

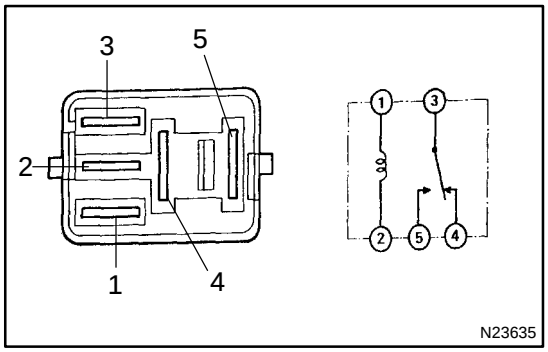
Low speed: 10 - 14 V

High speed: Below 1 V

OK	**Go to step**

NG

9 INSPECT COOLING FAN RELAY NO.2



(a) Inspect the No. 2 cooling fan relay continuity.

(1) Using an ohmmeter, check that continuity between terminals 1 and 2.

(2) Check that continuity between terminals 3 and 4.

(3) Check that no continuity between terminals 3 and 5.

(b) Inspect the No. 2 cooling fan relay operation.

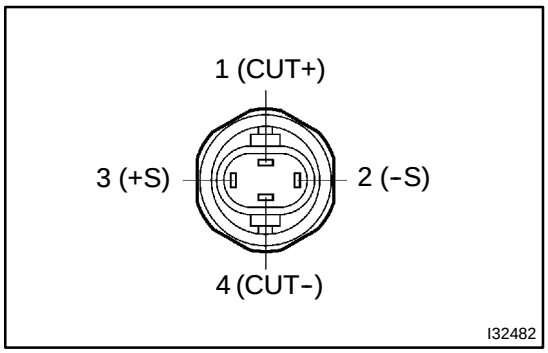
(1) Apply battery voltage across terminals 1 and 2.

(2) Using an ohmmeter, check that no continuity between terminals 3 and 4.

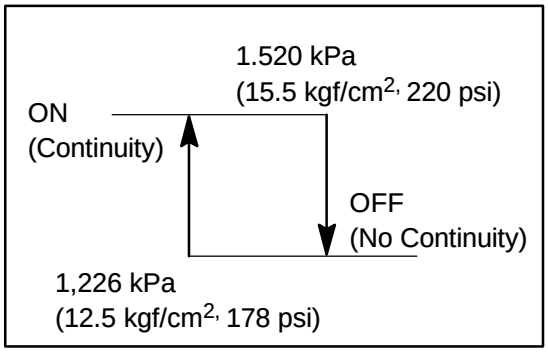
NG	**REPLACE COOLING FAN RELAY NO.2**

OK

10	INSPECT COOLER REFRIGERANT LIQUID PIPE A



(a) Install manifold gauge set.
(b) Connect the positive (+) lead from the tester to terminal 2 and negative (-) lead to terminal 3.
(c) Check that the continuity, when each refrigerant pressure, as shown in the illustration.



NG → REPLACE COOLER REFRIGERANT LIQUID PIPE A

OK

11	CHECK HARNESS AND CONNECTOR(BETWEEN PRESSURE SWITCH AND AIR CONDITIONER AMPLIFIER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE AIRCONDITIONER AMPLIFIER ASSY

12	INSPECT COOLING FAN RESISTOR

(a) Check cooling fan resistor (See page 55-7).

NG → REPLACE COOLING FAN RESISTOR

OK

13	CHECK HARNESS AND CONNECTOR(BETWEEN FAN NO.2 RELAY AND COOLING FAN RESISTOR, COOLING FAN RESISTOR AND BODY GROUND)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE

SUPPLEMENTAL RESTRAINT SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

050YF-08

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-941)

3	Warning Light Check (See page 05-942)

- Warning is light remains ON: Go to step 4
- Warning is light remains OFF: Go to step 5

4	DTC Check (Read Present DTC) (See page 05-942)

- Go to step 6

5	DTC Check (Read Past DTC) (See page 05-942)

6	DTC Chart (See page 05-942)

7	Circuit Inspection (See page 05-954 to 05-1055)

- Malfunction code is output: Go to step 8
- Normal code is output: Go to step 14

8	Identification of Problem

9	Repair

10	Clear DTC (Present and Past DTC) (See page 05-942)

11	**Warning Light Check** (See page 05-942)

→ Warning light is remains OFF: Go to step 12

→ Warning light is remains ON: Go to step 13

12	**DTC Check (Read Past DTC)** (See page 05-942)

→ DTC code is not output: Go to step 15

→ DTC code is output: Go to step 13

13	**DTC Check** (See page 05-942)

→ Go to step 6

14	**Symptom Simulation** (See page 01-20)

→ Warning is light remains OFF: Go to step 15

→ Warning is light ON: Go to step 13

15	**Confirmation Test**

→

End

HINT:
Step 3, 4, 7, 10, 12, 13:
Diagnostic steps permitting the use of the hand-held tester.

050WX-01

CUSTOMER PROBLEM ANALYSIS CHECK

Supplemental Restraint System Check Sheet	Inspector's Name

Customer's Name		Registration No.	
		Registration Year	
		Frame No.	
Date Vehicle Brought In		Odometer Reading	km Miles

Date Problem Occurred	
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Other
Temperature	Approx.

Vehicle Operation	☐ Starting ☐ Idling ☐ Driving [☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ Other]
Road Condition	
Details Of Problem	

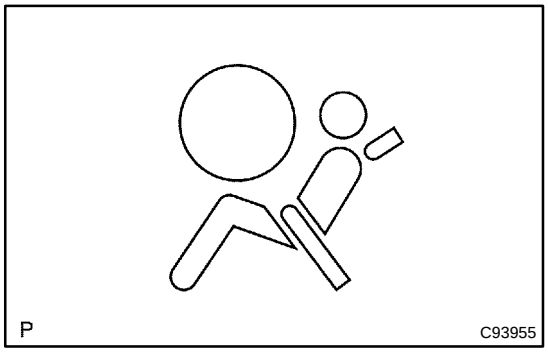
Vehicle Inspection, Repair History Prior to Occurrence of Malfunction (Including Supplemental Restraint System)	

Diagnosis System Inspection

SRS Warning Light Inspection	1st Time	☐ Remains ON ☐ Sometimes Lights Up ☐ Does Not Light Up
	2nd Time	☐ Remains ON ☐ Sometimes Lights Up ☐ Does Not Light Up
DTC Inspection	1st Time	☐ Normal Code ☐ Malfunction Code [Code.]
	2nd Time	☐ Normal Code ☐ Malfunction Code [Code.]

H40122

05728-01



PRE-CHECK

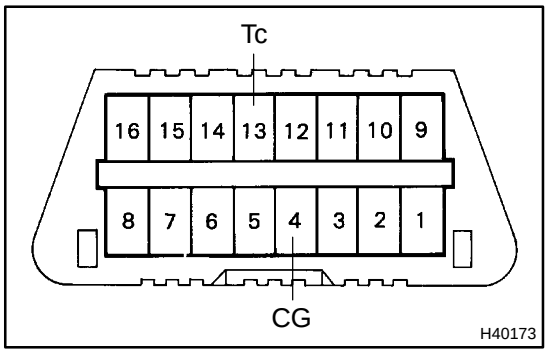
1. SRS WARNING LIGHT CHECK

(a) Turn the ignition switch to the ON position and check that the SRS warning light lights up.

(b) Check that the SRS warning light goes out after approx. 6 seconds.

HINT:

- When the ignition switch is at ON and the SRS warning light remains on or flashes, the airbag sensor assy center has detected a malfunction code.
- If, after approx. 6 second have elapsed, the SRS warning light sometimes lights up or the SRS warning light lights up even when the ignition switch is OFF, a short in the SRS warning light circuit can be considered likely. Proceed to "SRS warning light circuit malfunction" on page 05-1065 and 05-1068.



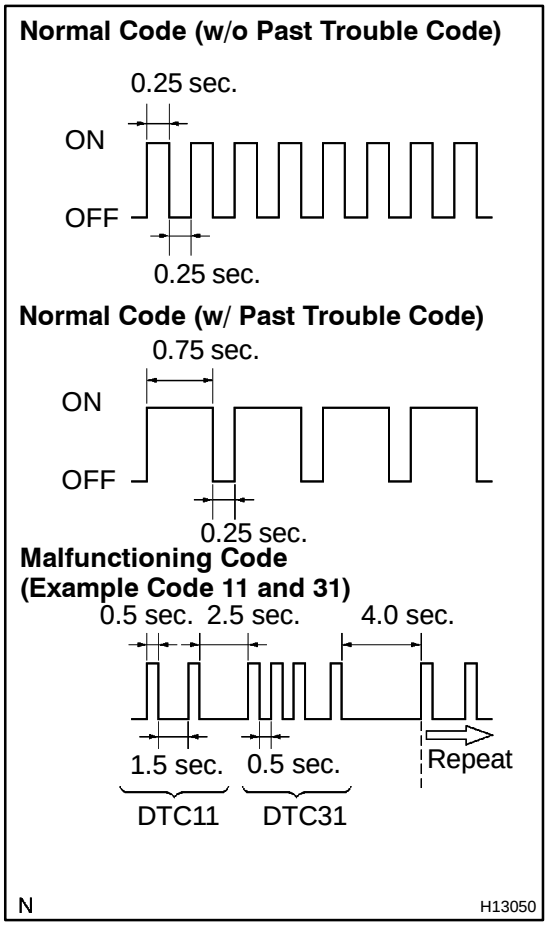
2. DTC CHECK (Using diagnosis check wire)

(a) Present troubles codes:
Output the DTC.
(1) Turn the ignition switch to the ON position and wait for approx. 60 seconds.
(2) Using SST, connect the terminals Tc and CG of the DLC3.
SST 09843-18040

NOTICE:
Pay due attention to the terminal connecting position to avoid a malfunction.

(b) Past troubles codes:
Output the DTC.
(1) Using SST, connect the terminals Tc and CG of the DLC3.
SST 09843-18040
(2) Turn the ignition switch to the ON position and wait for approx. 60 seconds.

NOTICE:
Pay due attention to the terminal connecting position to avoid a malfunction.



(c) Read the DTC.

Read the 2-digit DTC as indicated by the number of times the SRS warning light blinks. As an example, the blinking patterns, normal, 11 and 31 are shown in the illustration.

- Normal code indication (w/o past trouble code)
  The light will blink 2 times per second.
- Normal code indication (w/ past trouble code)
  When the past troubles code is stored in the airbag sensor assy center, the light blinks only ones a second.
- Malfunction code indication
  The first blinking output indicates the first digit of a 2-digit DTC. After a 1.5-second pause, the second blinking output will indicate the second digit.

If there are 2 or more codes, there will be a 2.5-second pause between each code. After all the codes have been output, there will be a 4.0-second pause and they will all be repeated.

HINT:

- In the event of a number of trouble codes, indication will start from the smallest numbered code.
- If a DTC is not output or a DTC is output without terminal connecting proceed to the Tc terminal circuit inspection on page 05-1070.

3. DTC CHECK (Using hand-held tester)

(a) Hook up the hand-held tester to the DLC3.

(b) Read the DTCs by following the prompts on the tester screen.

HINT:

Please refer to the hand-held tester operator's manual for further details.

4. DTC CLEARANCE (Not using service wire)

(a) When the ignition switch is turned OFF, the diagnostic trouble code is cleared.

HINT:

DTC might not be cleared by turning the ignition switch OFF. In this case, proceed to the next step.

5. DTC CLEARANCE (Using service wire)

(a) Using a service wire, connect terminals TC and CG of the DLC3.

(b) Disconnect terminal TC of DLC3 within 10 seconds after the DTC begins to be output, and check if the warning light lights up within 3 seconds.

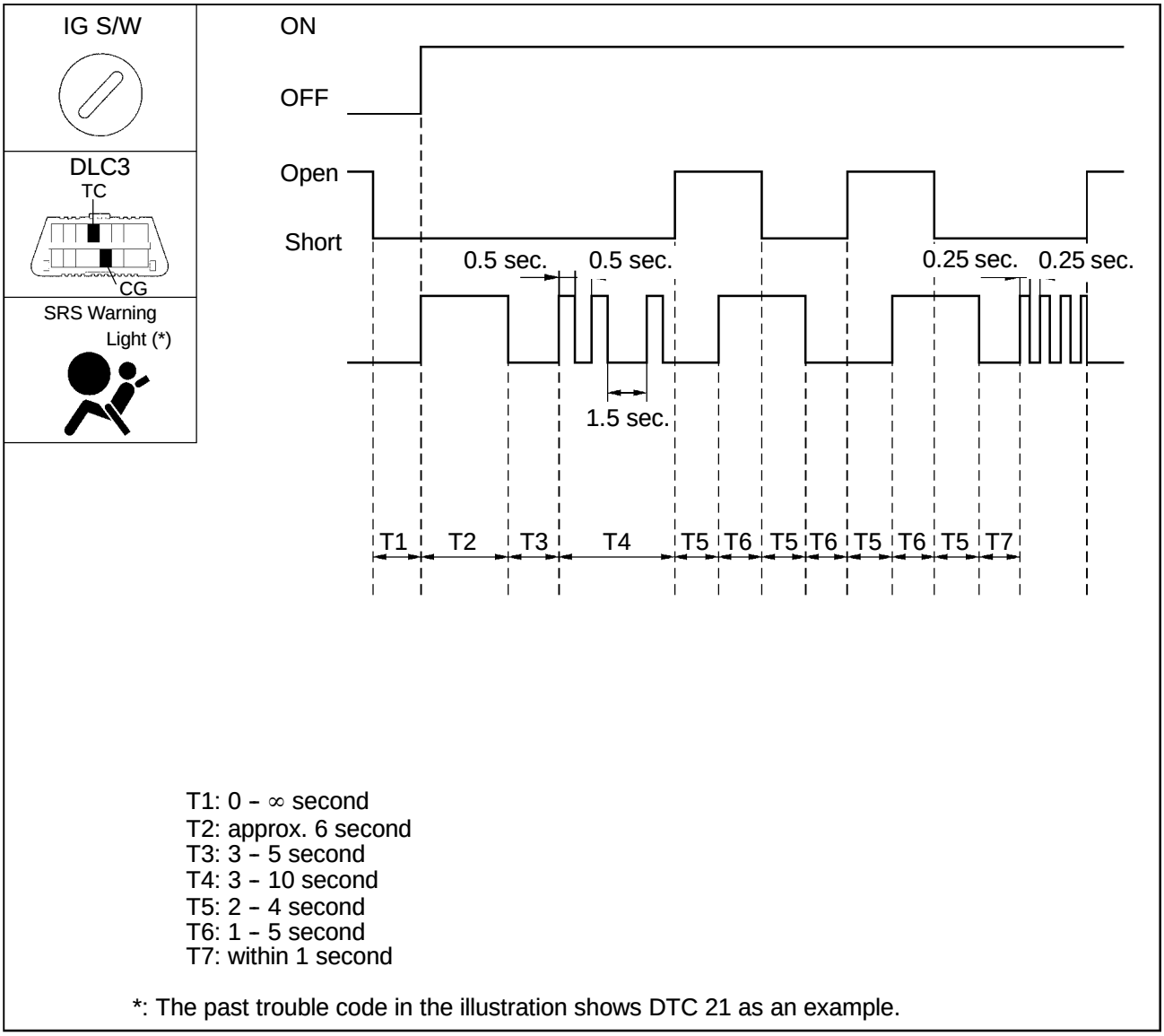
(c) Within 2.0 seconds to 4.0 seconds after the SRS warning light lights up, connect the terminals TC and CG of the DLC3.

(d) Light the SRS warning light goes off 2.0 to 4.0 seconds after connecting the terminals TC and CG of DLC3, then disconnect the terminal TC of the DLC3 2.0 to 4.0 seconds after the warning light goes off.

(e) Light the SRS warning light on again 3 seconds after disconnecting terminal TC of DLC3, then within 2.0 to 4.0 seconds after the lighting, connect terminals TC and CG of the DLC3.

(f) Check if the SRS warning light goes off 2.0 to 4.0 seconds after connecting terminals TC and CG of DLC3, and the correct code is output 1 second after the SRS warning goes off.

If DTCs are to cleared, repeat the above procedure until the codes are cleared.



T1: 0 – ∞ second
T2: approx. 6 second
T3: 3 – 5 second
T4: 3 – 10 second
T5: 2 – 4 second
T6: 1 – 5 second
T7: within 1 second

*: The past trouble code in the illustration shows DTC 21 as an example.

H41917

6. DTC CLEARANCE (Using hand-held tester)

(a) Hook up the hand-held tester to the DLC3.

(b) Clear the DTCs by following the prompts on the tester screen.

HINT:

Please refer to the hand-held tester operation's manual for further details.

7. RELEASE METHOD OF AIRBAG ACTIVATION PREVENTION MECHANISM

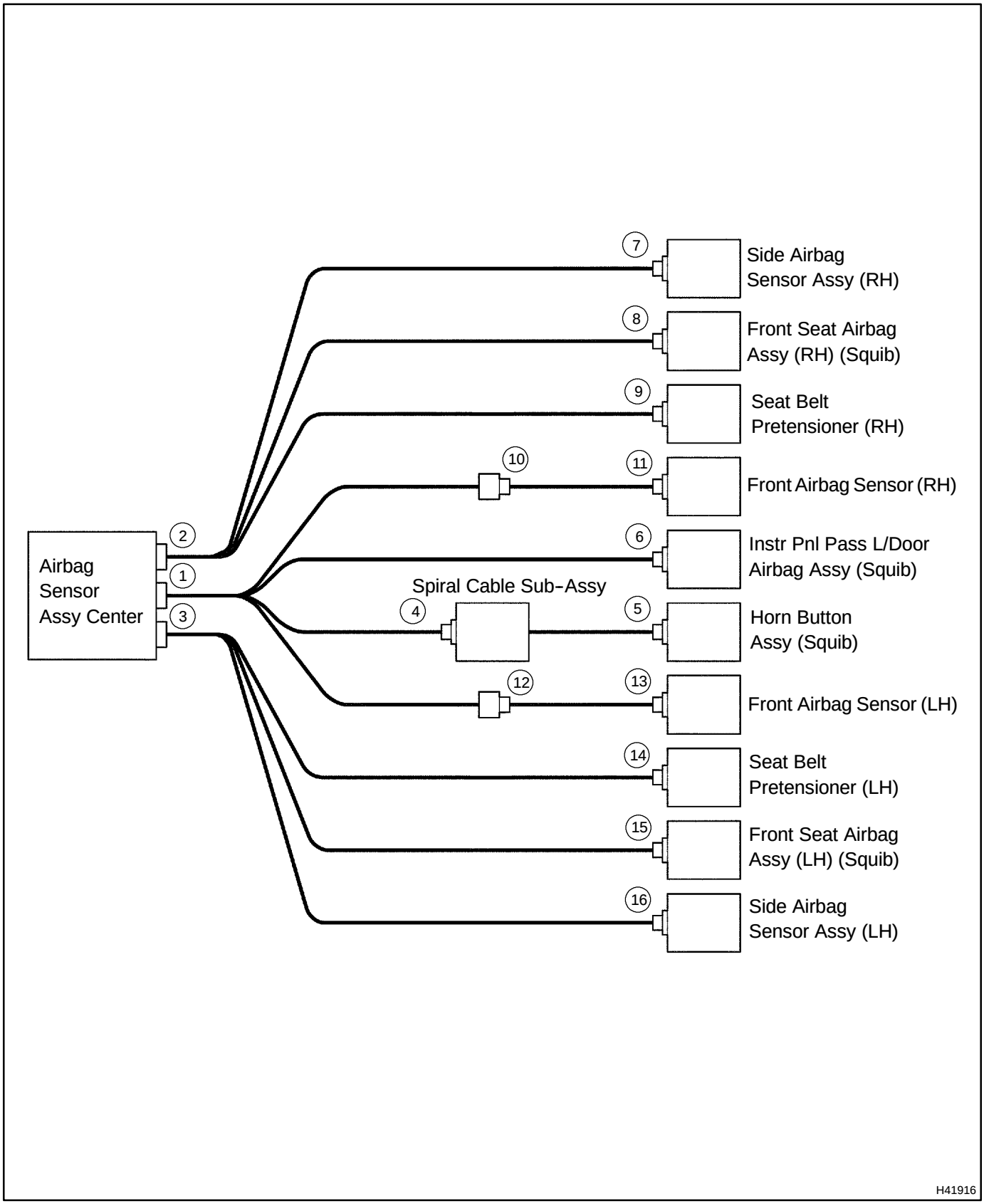
(a) An airbag activention prevention mechanism is built into the connector for the squib circuit of the SRS. When release of the airbag activation prevention mechanism is directed in the troubleshooting procedure, as shown in the illustration of the connectors on the next pages, insert paper which has the same thickness as the male terminal between the terminal and the short spring.

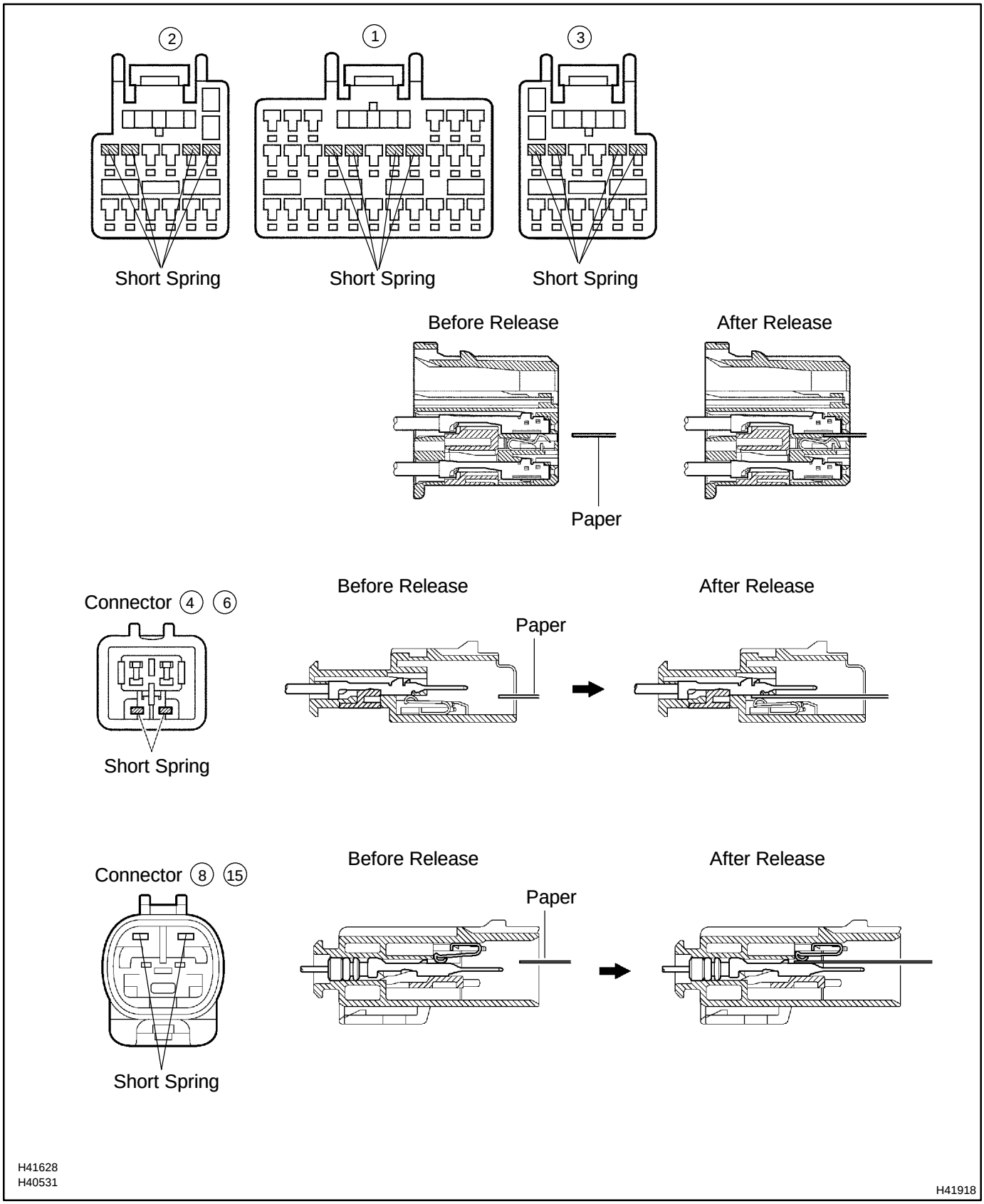
CAUTION:

Never release the airbag activation prevention mechanism on the squib connector.

NOTICE:

- **Do not release the airbag activation prevention mechanism unless specifically directed by the troubleshooting procedure.**
- **If the inserted paper is too thick the terminal and short spring may be damaged, so always use paper with the same thickness as the male terminal.**


Airbag Sensor Assy Center
2
1
3
Spiral Cable Sub-Assy
4
7
Side Airbag Sensor Assy (RH)
8
Front Seat Airbag Assy (RH) (Squib)
9
Seat Belt Pretensioner (RH)
10
11
Front Airbag Sensor (RH)
6
Instr Pnl Pass L/Door Airbag Assy (Squib)
5
Horn Button Assy (Squib)
12
13
Front Airbag Sensor (LH)
14
Seat Belt Pretensioner (LH)
15
Front Seat Airbag Assy (LH) (Squib)
16
Side Airbag Sensor Assy (LH)
H41916


2
1
3
Short Spring
Short Spring
Short Spring
Before Release
After Release
Paper
Connector 4 6
Before Release
After Release
Paper
Short Spring
Connector 8 15
Before Release
After Release
Paper
Short Spring
H41628
H40531
H41918

05729-01

DIAGNOSTIC TROUBLE CODE CHART

DTC No. (See page)	Detection Item	Trouble Area	SRS Warning Light
B0100/13 (05-954)	$ SHORT IN D SQUIB CIRCUIT	$ Horn button assy (squib) $ Spiral cable sub-assy $ Airbag sensor assy center $ Instrument panel wire	ON
B0101/14 (05-958)	$ OPEN IN D SQUIB CIRCUIT	$ Horn button assy (squib) $ Spiral cable sub-assy $ Airbag sensor assy center $ Instrument panel wire	ON
B0102/11 (05-962)	$ SHORT IN D SQUIB CIRCUIT (TO GROUND)	$ Horn button assy (squib) $ Spiral cable sub-assy $ Airbag sensor assy center $ Instrument panel wire	ON
B0103/12 (05-966)	$ SHORT IN D SQUIB CIRCUIT (TO B+)	$ Horn button assy (squib) $ Spiral cable sub-assy $ Airbag sensor assy center $ Instrument panel wire	ON
B0105/53 (05-970)	$ SHORT IN P SQUIB CIRCUIT	$ Instr pnl pass l/door airbag assy (squib) $ Airbag sensor assy center $ Instrument panel wire	ON
B0106/54 (05-973)	$ OPEN IN P SQUIB CIRCUIT	$ Instr pnl pass l/door airbag assy (squib) $ Airbag sensor assy center $ Instrument panel wire	ON
B0107/51 (05-976)	$ SHORT IN P SQUIB CIRCUIT (TO GROUND)	$ Instr pnl pass l/door airbag assy (squib) $ Airbag sensor assy center $ Instrument panel wire	ON
B0108/52 (05-979)	$ SHORT IN P SQUIB CIRCUIT (TO B+)	$ Instr pnl pass l/door airbag assy (squib) $ Airbag sensor assy center $ Instrument panel wire	ON
B0110/43 (05-982)	$ SHORT IN SIDE SQUIB (RH) CIR-CUIT	$ Front seat airbag assy RH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0111/44 (05-985)	$ OPEN IN SIDE SQUIB (RH) CIRCUIT	$ Front seat airbag assy RH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0112/41 (05-988)	$ SHORT IN SIDE SQUIB (RH) CIRCUIT (TO GROUND)	$ Front seat airbag assy RH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0113/42 (05-991)	$ SHORT IN SIDE SQUIB (RH) CIRCUIT (TO B+)	$ Front seat airbag assy RH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0115/47 (05-994)	$ SHORT IN SIDE SQUIB (LH) CIRCUIT	$ Front seat airbag assy LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0116/48 (05-997)	$ OPEN IN SIDE SQUIB (LH) CIRCUIT	$ Front seat airbag assy LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0117/45 (05-1000)	$ SHORT IN SIDE SQUIB (LH) CIRCUIT (TO GROUND)	$ Front seat airbag assy LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0118/46 (05-1003)	$ SHORT IN SIDE SQUIB (LH) CIRCUIT (TO B+)	$ Front seat airbag assy LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0130/63 (05-1006)	$ SHORT IN P/T SQUIB (RH) CIRCUIT	$ Seat belt pretensioner RH (squib) $ Airbag sensor assy center $ Wire harness	Blink

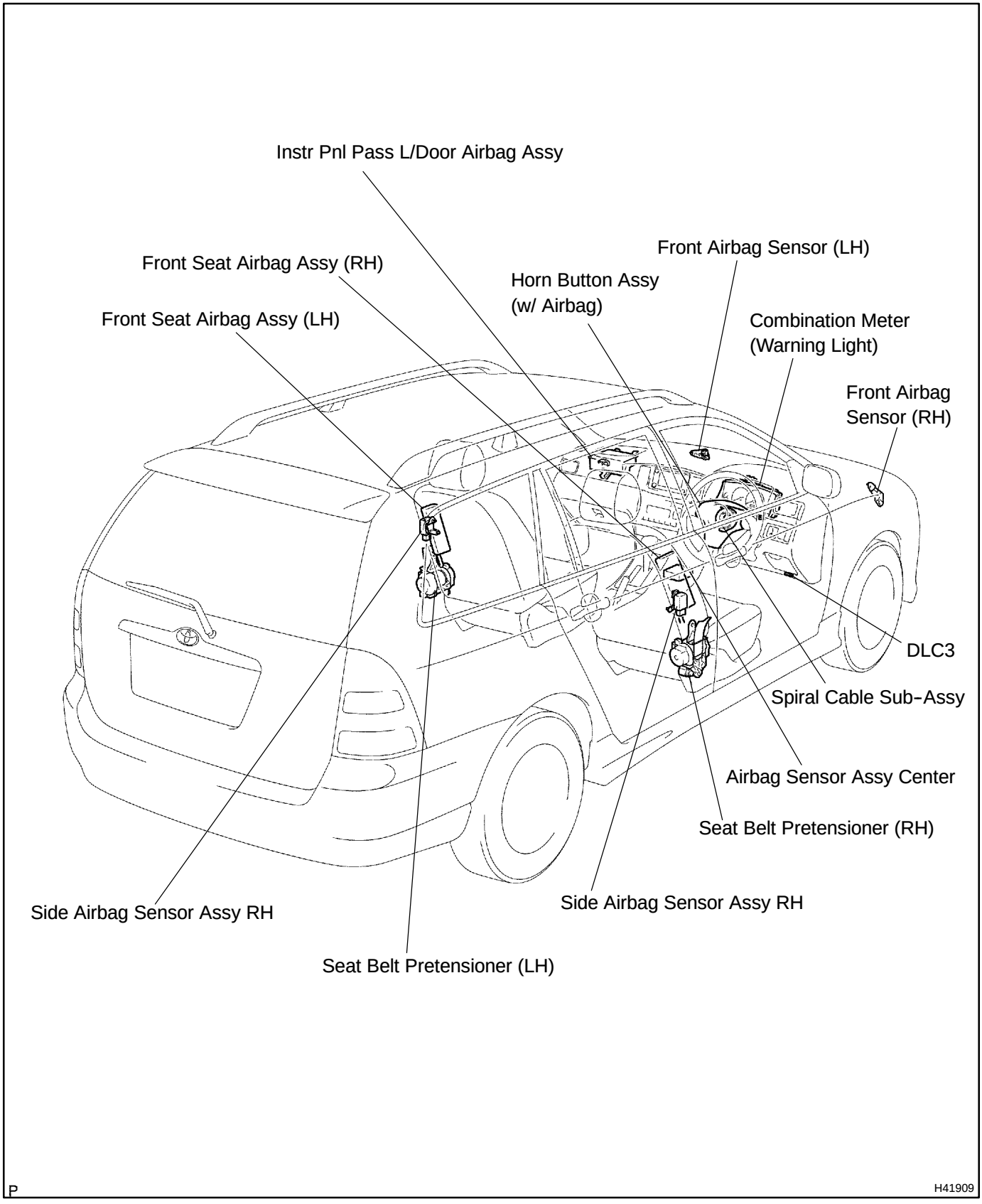
B0131/64 (05-1010)	$ OPEN IN P/T SQUIB (RH) CIRCUIT	$ Seat belt pretensioner RH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0132/61 (05-1013)	$ SHORT IN P/T SQUIB (RH) CIRCUIT (TO GROUND)	$ Seat belt pretensioner RH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0133/62 (05-1016)	$ SHORT IN P/T SQUIB (RH) CIRCUIT (TO B+)	$ Seat belt pretensioner RH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0135/73 (05-1019)	$ SHORT IN P/T SQUIB (LH) CIRCUIT	$ Seat belt pretensioner LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0136/74 (05-1023)	$ OPEN IN P/T SQUIB (LH) CIRCUIT	$ Seat belt pretensioner LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0137/71 (05-1026)	$ SHORT IN P/T SQUIB (LH) CIRCUIT (TO GROUND)	$ Seat belt pretensioner LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B0138/72 (05-1029)	$ SHORT IN P/T SQUIB (LH) CIRCUIT (TO B+)	$ Seat belt pretensioner LH (squib) $ Airbag sensor assy center $ Wire harness	Blink
B1100/31 (05-1032)	$ AIRBAG SENSOR ASSY CENTER MALFUNCTION	$ Airbag sensor assy center	ON
B1135/24 (05-1034)	$ HALF CONNECTION DETECTION MALFUNCTION	$ Airbag sensor assy center	ON
B1140/32 (05-1036)	$ SIDE AIRBAG SENSOR ASSY (RH) MALFUNCTION	$ Side Airbag sensor assy RH $ Wire harness	Blink
B1141/33 (05-1042)	$ SIDE AIRBAG SENSOR ASSY (LH) MALFUNCTION	$ Side Airbag sensor assy LH $ Wire harness	Blink
B1156/B1157 /15 (05-1048)	$ FRONT AIRBAG SENSOR (RH) MALFUNCTION	$ Airbag front RH sensor $ Airbag sensor assy center $ Engine room main wire harness $ Instrument panel wire	ON
B1158/B1159 /16 (05-1055)	$ FRONT AIRBAG SENSOR (LH) MALFUNCTION	$ Airbag sensor front LH $ Airbag sensor assy center $ Engine room main wire harness $ Instrument panel wire	ON
Normal (05-1062)	$ SYSTEM NORMAL	-	OFF
	$ VOLTAGE SOURCE DROP	$ Battery $ Airbag sensor assy center	ON

HINT:

- When the SRS warning light remains lit up and the DTC is the normal code, this means a voltage source drops.
  This malfunction is not stored in memory by the airbag sensor assy center and if the power source voltage returns to normal, the SRS warning light will automatically go out.
- When 2 or more codes are indicated, the codes will be displayed in numeral order starting from the lowest numbered code.
- If a code not listed on the chart is displayed, the airbag sensor assy center is faulty.
- In the case of any malfunction concerning any open circuit, ground short, or B+ short due to any squib, another malfunction code may not be detected. In this case, correct the malfunction currently being output, and then perform malfunction diagnosis again. Another malfunction code may then be detected.

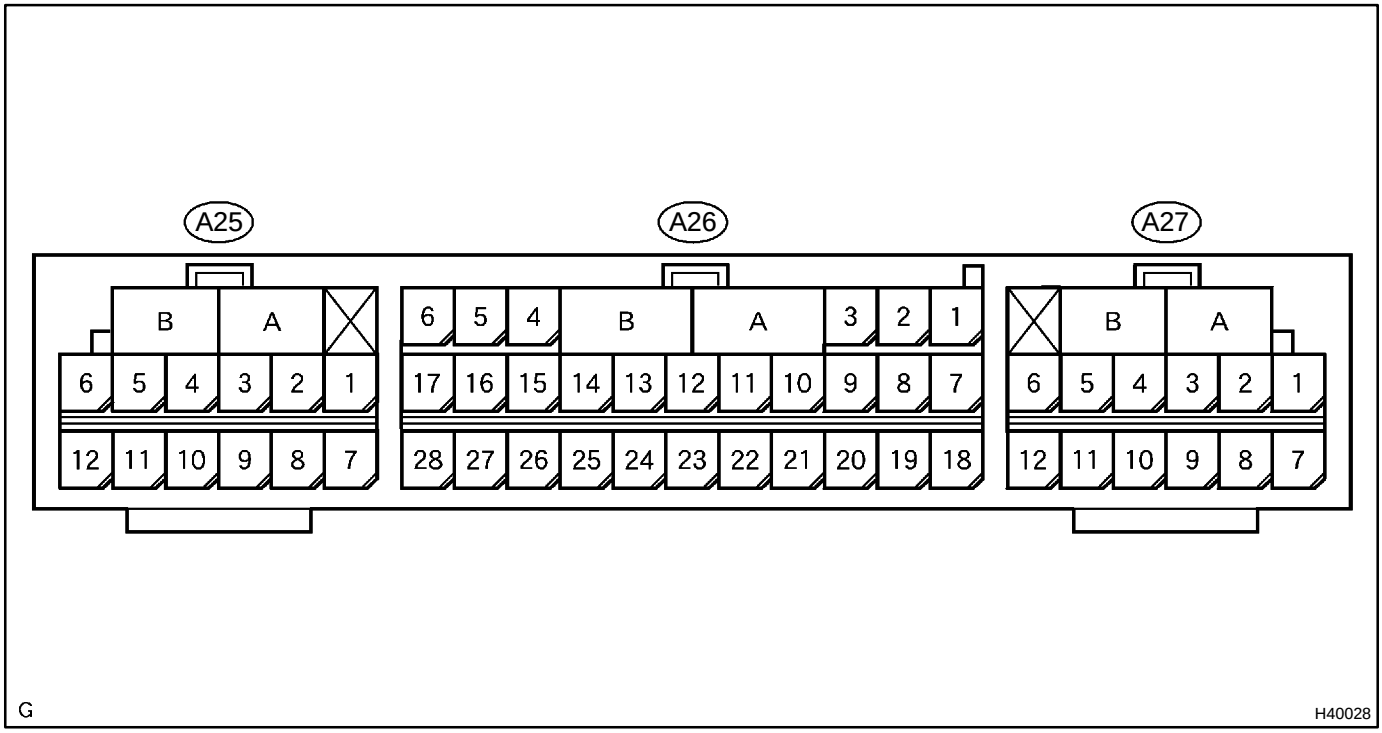
050X1-08

LOCATION



0572A-01

TERMINALS OF ECM



No.	Symbol	Terminal Name
A	-	Electrical Connector Check Mechanism
B	-	Electrical Connector Check Mechanism
A26-3	LA	SRS Warning Light
A26-5	IG2	Power Source (IG2 Fuse)
A26-9	+SR	Front Airbag Sensor (RH)
A26-10	P+	Squib (Passenger)
A26-11	P-	Squib (Passenger)
A26-12	SIL	Diagnosis
A26-13	D-	Squib (Driver)
A26-14	D+	Squib (Driver)
A26-15	+SL	Airbag Front Sensor (LH)
A26-19	Tc	Diagnosis
A26-20	-SR	Airbag Front Sensor (RH)
A26-23	GSW2	ECM
A26-26	-SL	AIrbag Front Sensor (LH)
A26-27	E1	Ground
A26-28	E2	Ground
A25-1	PL-	Squib (Seat Belt Pretensioner, LH)
A25-2	PL+	Squib (Seat Belt Pretensioner, LH)
A25-5	SFL+ *1, SFL- *2	Squib (Side, LH)
A25-6	SFL- *1, SFL+ *2	Squib (Side, LH)
A25-7	VUPL *1 *2	Side Airbag Sensor Assy (LH)
A25-9	SSL- *1, ESL *2	Side Airbag Sensor Assy (LH)
A25-10	FSL *1, SSL+ *2	Side Airbag Sensor Assy (LH)
A25-12	ESL *1, SSL- *2	Side Airbag Sensor Assy (LH)
A27-1	SFR- *1, SFR+ *2	Squib (Side, RH)
A27-2	SFR+ *1, SFR- *2	Squib (Side, RH)
A27-5	PR+	Squib (Seat Belt Pretensioner, RH)
A27-6	PR-	Squib (Seat Belt Pretensioner, RH)

No.	Symbol	Terminal Name
A27-7	ESR *1, SSR- *2	Side Airbag Sensor Assy (RH)
A27-9	FSR *1, SSR+ *2	Side Airbag Sensor Assy (RH)
A27-10	SSR- *1, ESR *2	Side Airbag Sensor Assy (RH)
A27-12	VUPR *1 *2	Side Airbag Sensor Assy (RH)

*1: TMUK Made, w/ Side Airbag
*2: TMC Made, w/ Side Airbag

050YH-08

PROBLEM SYMPTOMS TABLE

HINT:

Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
S When the ignition switch in ACC or ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed.	S SRS WARNING LIGHT CIRCUIT MALFUNCTION (ALWAYS LIGHT UP, WHEN IGNITION SWITCH IS LOCK POSITION).	05-1065
S SRS warning light is always lit up even when ignition switch is in the LOCK position.		
S With the ignition switch in ACC or ON position, the SRS warning light does not light up.	S SRS WARNING LIGHT CIRCUIT MALFUNCTION (DOES NOT LIGHT UP, WHEN IGNITION SWITCH IS TURNED TO ACC OR ON).	05-1068
S DTC is not displayed.	S TC TERMINAL CIRCUIT	05-1070
S SRS warning light is always lit up at the time of DTC check procedure.		
S DTC is displayed without Tc and CG terminal connection.		

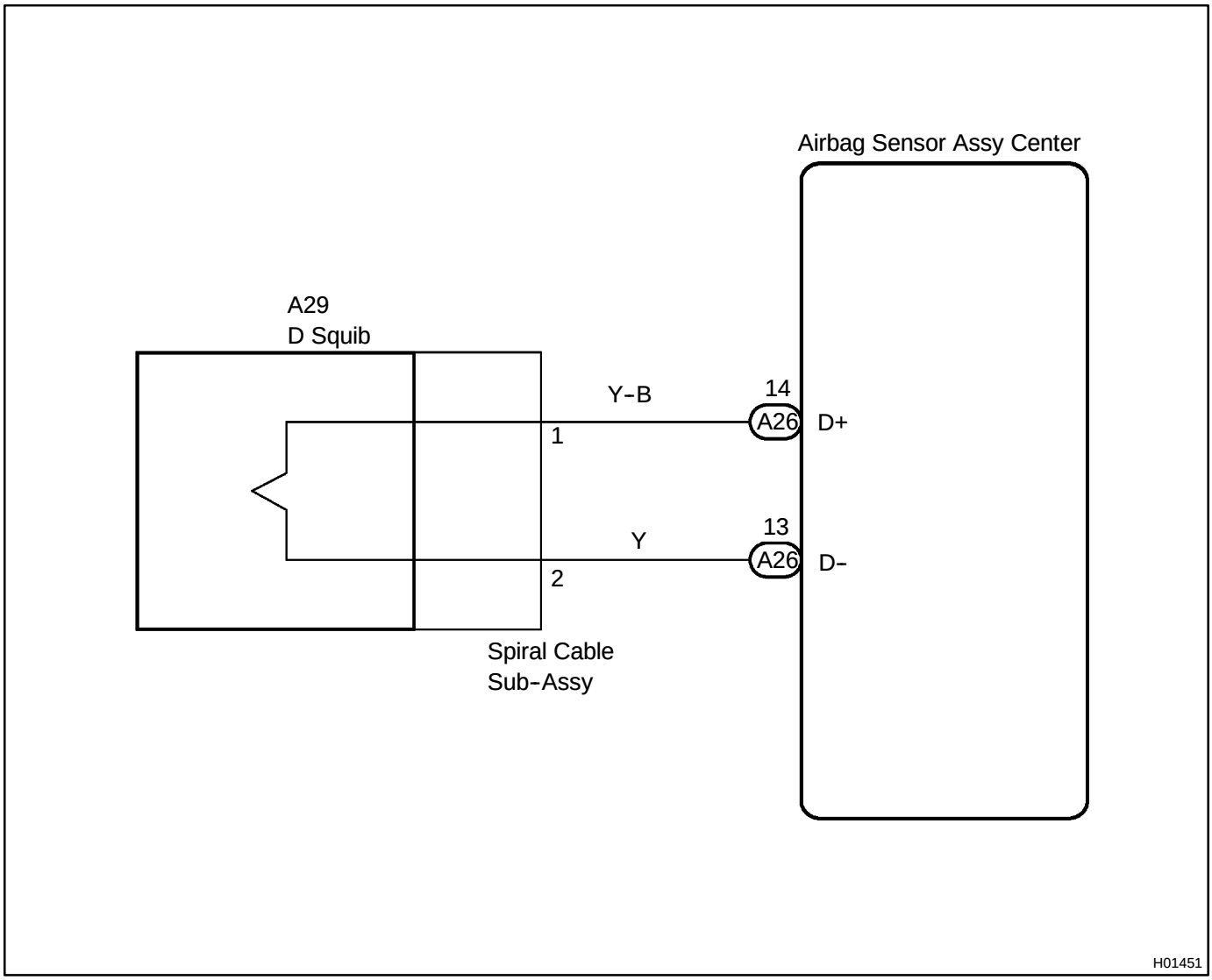
DTC	B0100/13	SHORT IN D SQUIB CIRCUIT

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assy center, spiral cable sub-assy and horn button assy. It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0100/13 is recorded when a short is detected in the D squib circuit.

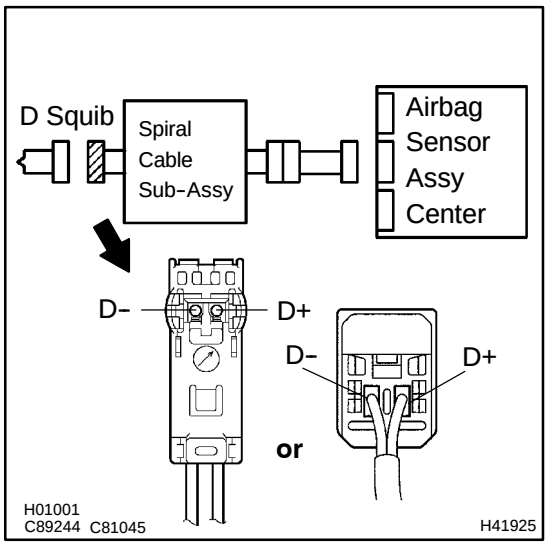
DTC No.	DTC Detecting Condition	Trouble Area
B0100/13	S Short circuit between D+ wire harness and D- wire harness of squib S D squib malfunction S Spiral cable sub-assy malfunction S Airbag sensor assy center malfunction	S Horn button assy (D squib) S Spiral cable sub-assy S Airbag sensor assy center S Instrument panel wire

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK D SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - HORN BUTTON ASSY)



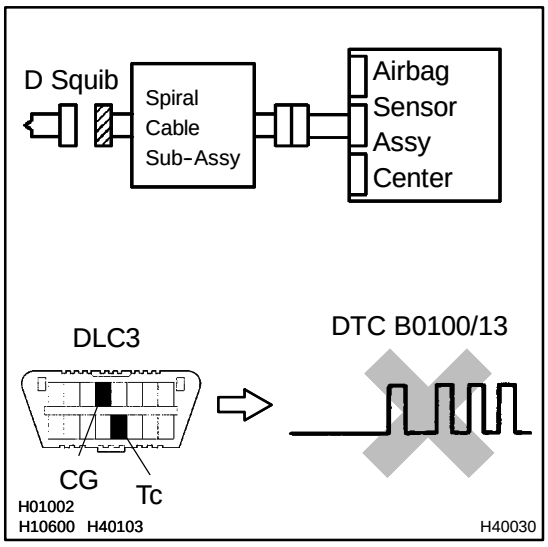
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the horn button assy.
(c) Release the airbag activation prevention mechanism of the connector (on the airbag sensor assy center side) between the airbag sensor assy center and the spiral cable sub-assy (See page 05-942).
(d) For the connector (on the spiral cable sub-assy side) between the spiral cable sub-assy and the horn button assy, measure the resistance between D+ and D-.
OK:
Resistance: 1 MΩ or Higher

NG → **Go to step 4**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(c) Turn the ignition switch to ON, and wait at least for 20 seconds.
(d) Clear the DTC stored in memory (See page 05-942).
(e) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(f) Turn the ignition switch to ON, and wait at least for 20 seconds.
(g) Check the DTC (See page 05-942).
OK:
DTC B0100/13 is not output.

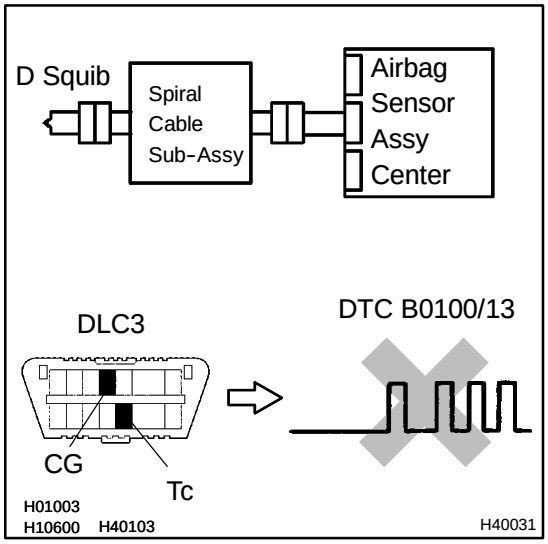
HINT:
Codes other than code B0100/13 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK D SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the horn button assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0100/13 is not output.

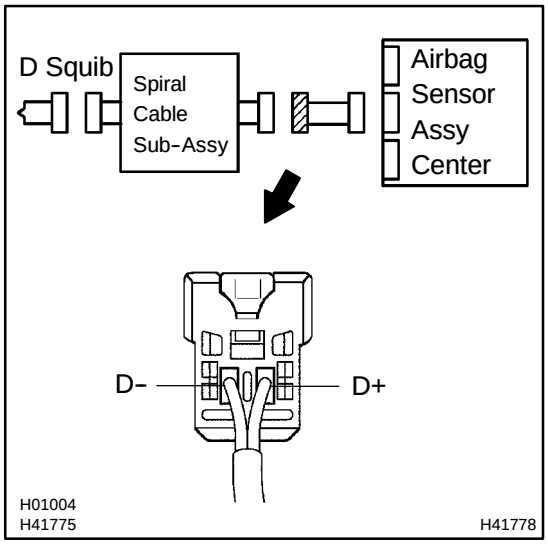
HINT:
Codes other than code B0100/13 may be output at this time, but they are not relevant to this check.

NG → **REPLACE HORN BUTTON ASSY**

OK

USE SIMULATION METHOD TO CHECK

4	CHECK INSTRUMENT PANEL WIRE(AIRBAG SENSOR ASSY CENTER - SPIRAL CABLE SUB-ASSY)

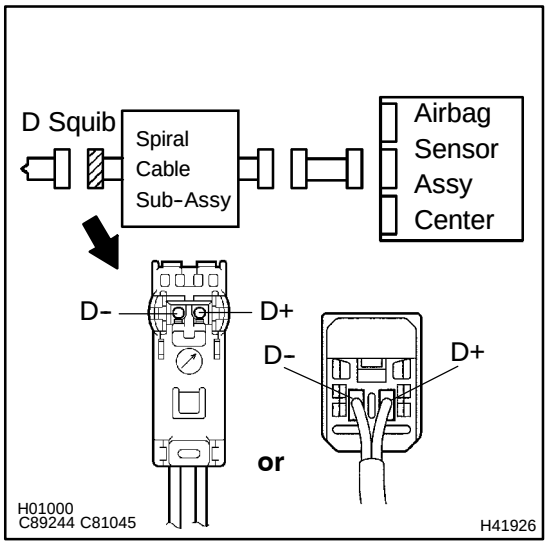


(a) Disconnect the connector of the instrument panel wire.
(b) Release the airbag activation prevention mechanism of the spiral cable sub-assy connector on the airbag sensor assy center side (See page 05-942).
(c) For the connector (on the spiral cable sub-assy side) between the airbag sensor assy center and the spiral cable sub-assy, measure the resistance between D+ and D-.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE**

OK

5	CHECK SPIRAL CABLE SUB-ASSY



(a) Release the airbag activation prevention mechanism of the connector (on the airbag sensor assy center side) between the airbag sensor assy center and the spiral cable sub-assy (See page 05-942).
(b) For the connector (on the spiral cable sub-assy side) between the horn button assy and the spiral cable sub-assy, measure the resistance between D+ and D-.
OK:
Resistance: 1 MΩ or Higher

NG → **REPLACE SPIRAL CABLE SUB-ASSY**

OK

USE SIMULATION METHOD TO CHECK

DTC B0101/14 OPEN IN D SQUIB CIRCUIT

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assy center, spiral cable sub-assy and horn button assy. It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0101/14 is recorded when an open is detected in the D squib circuit.

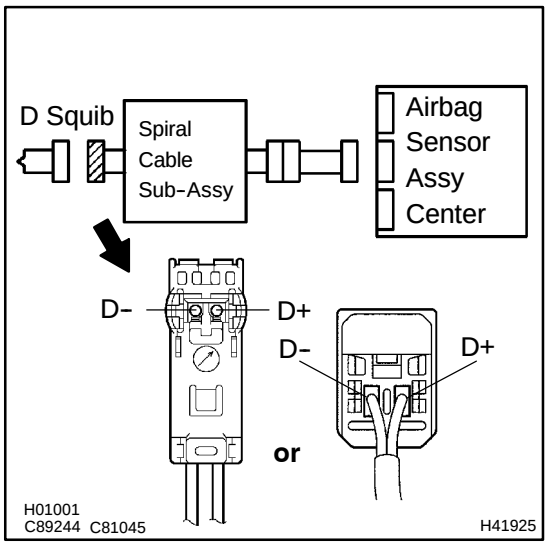
DTC No.	DTC Detecting Condition	Trouble Area
B0101/14	S Open circuit in D+ wire harness or D- wire harness of squib S D squib malfunction S Spiral cable sub-assy malfunction S Airbag sensor assy center malfunction	S Horn button assy (D squib) S Spiral cable sub-assy S Airbag sensor assy center S Instrument panel wire

WIRING DIAGRAM

See page 05-954.

INSPECTION PROCEDURE

1	CHECK D SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - HORN BUTTON ASSY)



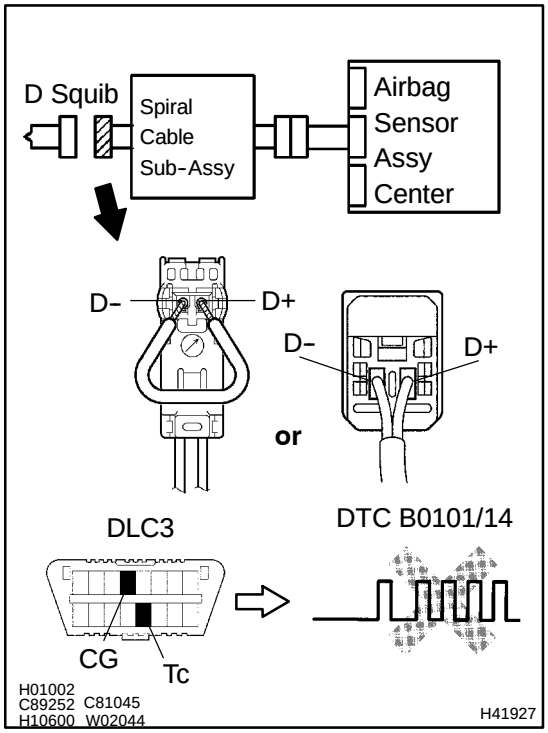
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the horn button assy.
(c) For the connector (on the spiral cable sub-assy side) between the spiral cable sub-assy and the horn button assy, measure the resistance between D+ and D-.
OK:
Resistance: Below 1 Ω

NG → **Go to step 4**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect D+ and D- of the connector (on the spiral cable sub-assy side) between the spiral cable sub-assy and the horn button assy.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).

OK:

DTC B0101/14 is not output.

HINT:

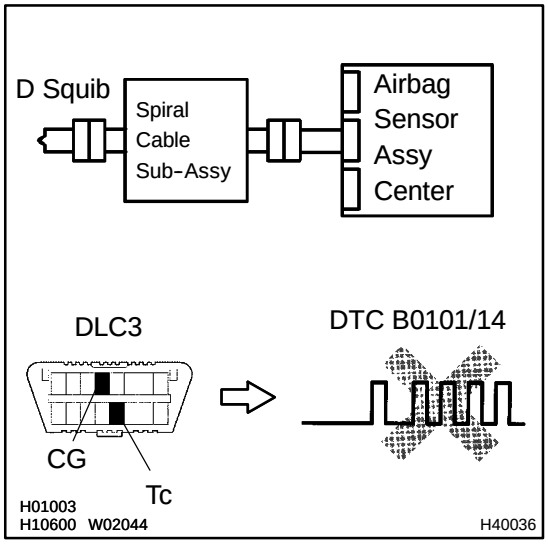
Codes other than code B0101/14 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK D SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the horn button assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0101/14 is not output.

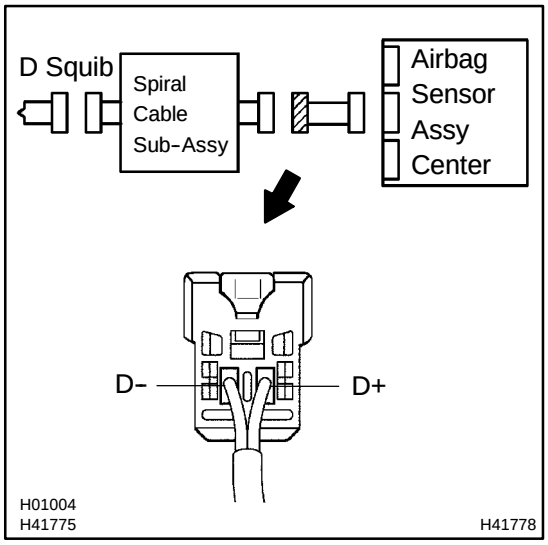
HINT:
Codes other than code B0101/14 may be output at this time, but they are not relevant to this check.

NG → **REPLACE HORN BUTTON ASSY**

OK

USE SIMULATION METHOD TO CHECK

4	CHECK INSTRUMENT PANEL WIRE(AIRBAG SENSOR ASSY CENTER - SPIRAL CABLE SUB-ASSY)

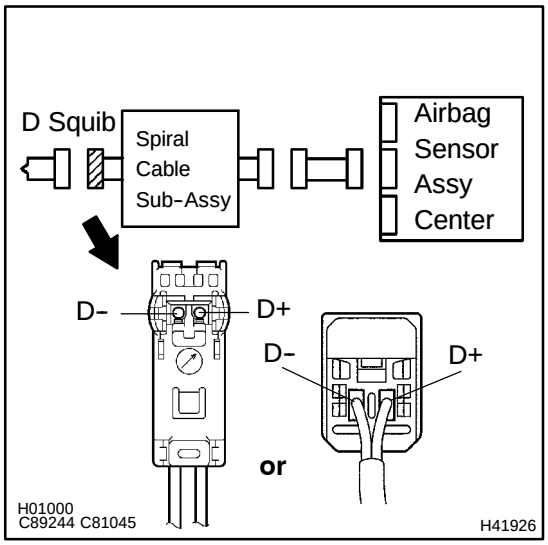


(a) Disconnect the connector of the instrument panel wire.
(b) For the connector (on the spiral cable sub-assy side) between the airbag sensor assy center and the spiral cable sub-assy, measure the resistance between D+ and D-.
OK:
Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE**

OK

5	CHECK SPIRAL CABLE SUB-ASSY



(a) For the connector (on the spiral cable sub-assy side) between the horn button assy and the spiral cable sub-assy, measure the resistance between D+ and D-.
OK:
Resistance: Below 1 Ω

NG → **REPLACE SPIRAL CABLE SUB-ASSY**

OK

USE SIMULATION METHOD TO CHECK

DTC B0102/11 SHORT IN D SQUIB CIRCUIT (TO GROUND)

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assy center, spiral cable sub-assy and horn button assy. It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0102/11 is recorded when a ground short is detected in the D squib circuit.

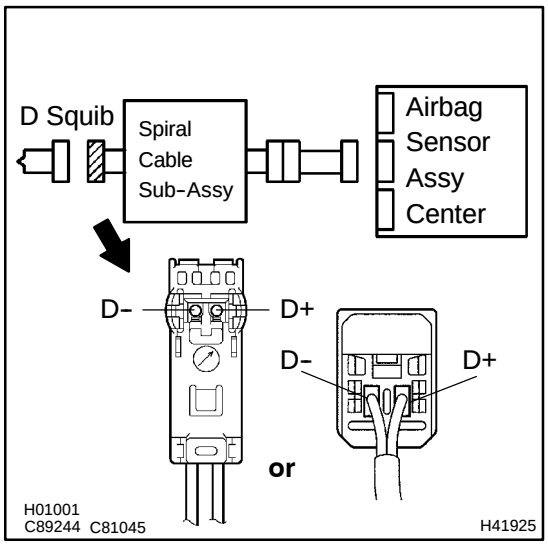
DTC No.	DTC Detecting Condition	Trouble Area
B0102/11	• Short circuit in D squib wire harness (to ground) • D squib malfunction • Spiral cable sub-assy malfunction • Airbag sensor assy center malfunction	• Horn button assy (D squib) • Spiral cable sub-assy • Airbag sensor assy center • Instrument panel wire

WIRING DIAGRAM

See page 05-954.

INSPECTION PROCEDURE

1	CHECK D SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - HORN BUTTON ASSY)



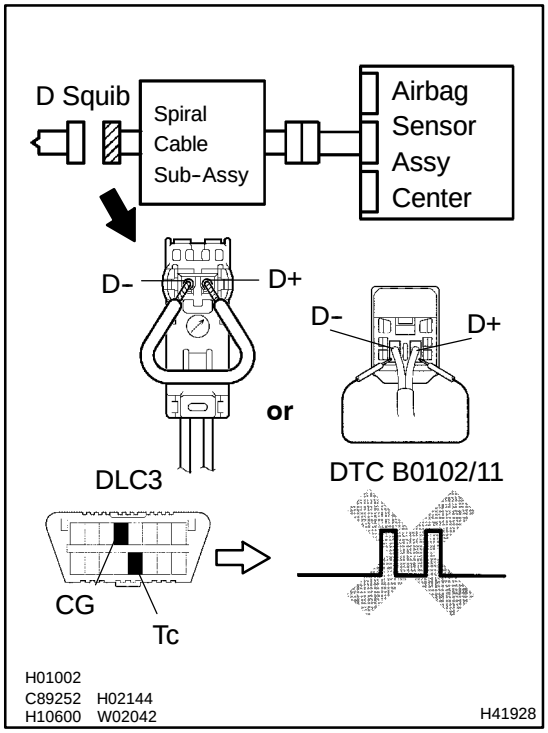
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the horn button assy.
(c) For the connector (on the spiral cable sub-assy side) between the spiral cable sub-assy and the horn button assy, measure the resistance between D+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **Go to step 5**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect D+ and D- of the connector (on the spiral cable sub-assy side) between the spiral cable sub-assy and the horn button assy.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait t least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B0102/11 is not output.

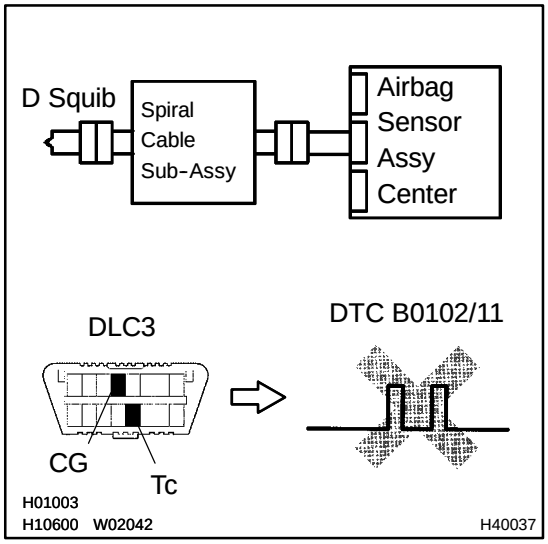
HINT:
Codes other than code B0102/11 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK D SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the horn button assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0102/11 is not output.

HINT:

Codes other than code B0102/11 may be output at this time, but they are not relevant to this check.

NG → **REPLACE HORN BUTTON ASSY**

OK

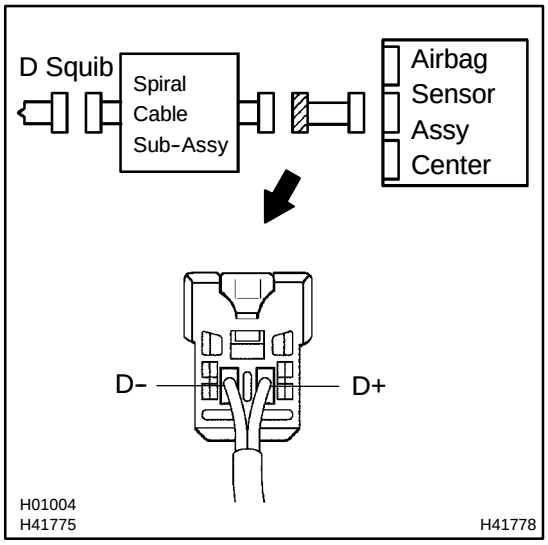
4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

5	CHECK INSTRUMENT PANEL WIRE(AIRBAG SENSOR ASSY CENTER - SPIRAL CABLE SUB-ASSY)

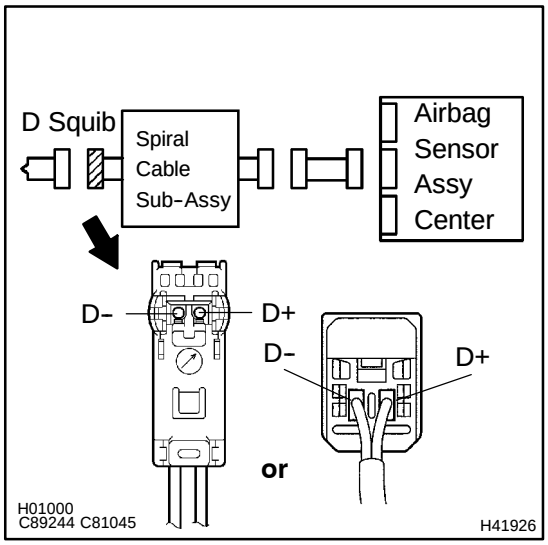


(a) Disconnect the connector of the instrument panel wire.
(b) For the connector (on the spiral cable sub-assy side) between the airbag sensor assy center and the spiral cable sub-assy, measure the resistance between D+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE**

OK

6	CHECK SPIRAL CABLE SUB-ASSY



(a) For the connector (on the spiral cable sub-assy side) between the horn button assy and the spiral cable sub-assy, measure the resistance between D+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **REPLACE SPIRAL CABLE SUB-ASSY**

OK

7	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC	B0103/12	SHORT IN D SQUIB CIRCUIT (TO B+)

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assy center, spiral cable sub-assy and horn button assy. It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0103/12 is recorded when a B+ short is detected in the D squib circuit.

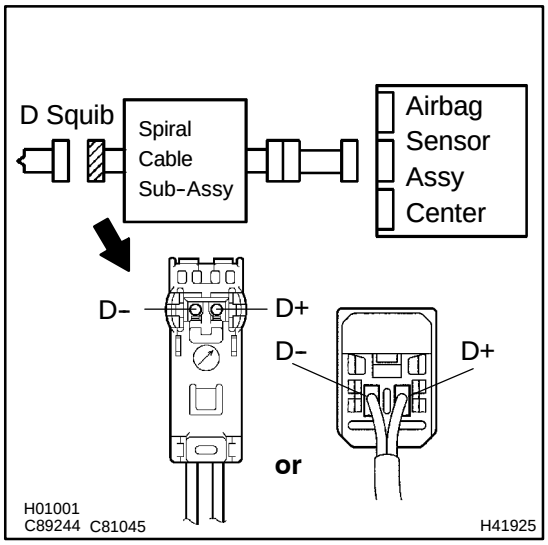
DTC No.	DTC Detecting Condition	Trouble Area
B0103/12	$ Short circuit in D squib wire harness (to B+) $ D squib malfunction $ Spiral cable sub-assy malfunction $ Airbag sensor assy center malfunction	$ Horn button assy (D squib) $ Spiral cable sub-assy $ Airbag sensor assy center $ Instrument panel wire

WIRING DIAGRAM

See page 05-954.

INSPECTION PROCEDURE

1	CHECK D SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - HORN BUTTON ASSY)



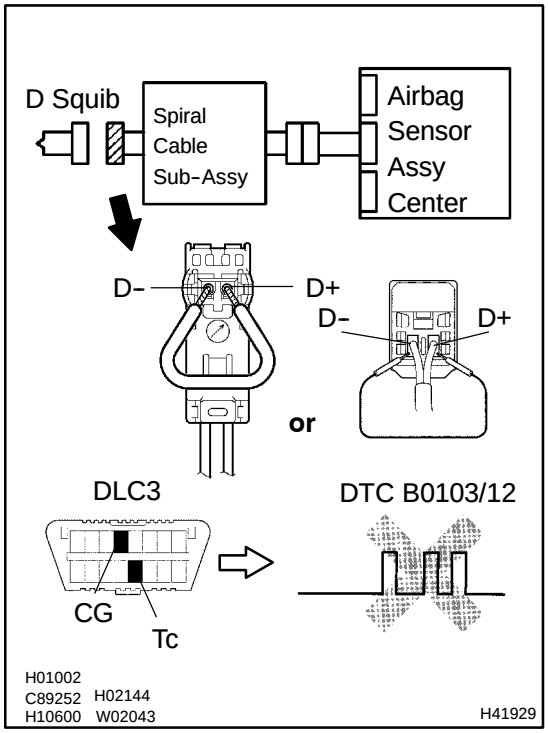
(a) Disconnect negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the horn button assy.
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) For the connector (on the spiral cable sub-assy side) between the spiral cable sub-assy and the horn button assy, measure the voltage between D+ and body ground.
OK:
Voltage: Below 1 V

NG → **Go to step 5**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the connector to the airbag sensor assy center.
(c) Using a service wire, connect D+ and D- of the connector (on the spiral cable sub-assy side) between the spiral cable sub-assy and the horn button assy.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0103/12 is not output.

HINT:

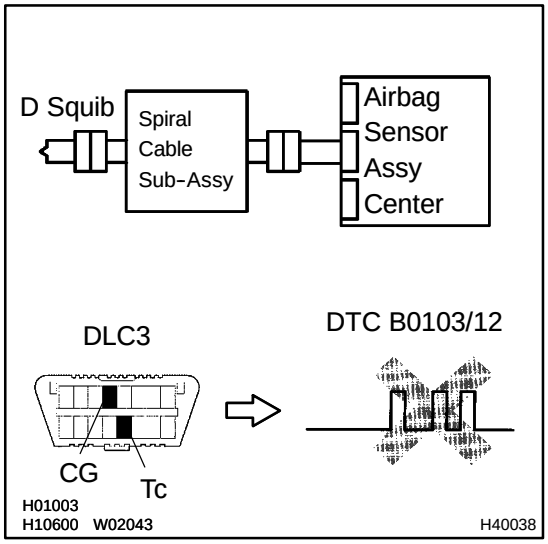
Codes other than code B0103/12 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK D SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the horn button assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0103/12 is not output.

HINT:

Codes other than code B0103/12 may be output at this time, but they are not relevant to this check.

NG → **REPLACE HORN BUTTON ASSY**

OK

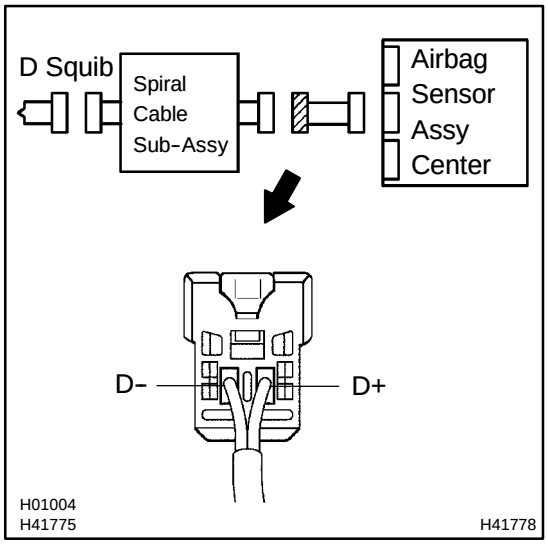
4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

5	CHECK INSTRUMENT PANEL WIRE(AIRBAG SENSOR ASSY CENTER - SPIRAL CABLE SUB-ASSY)

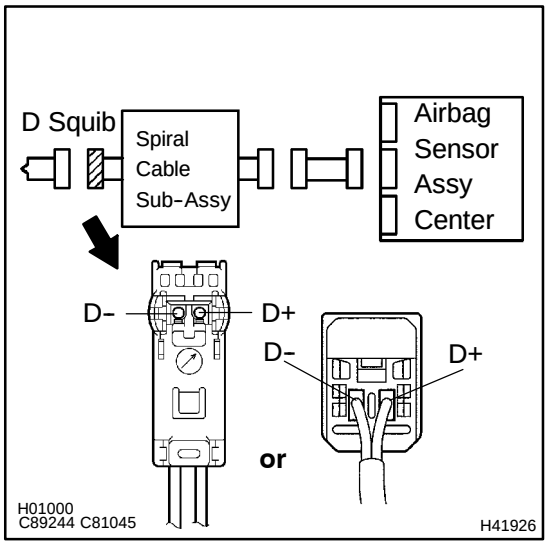


(a) Turn the ignition switch to LOCK.
(b) Disconnect the connector of the instrument panel wire.
(c) For the connector (on the spiral cable sub-assy side) between the airbag sensor assy center and the spiral cable sub-assy, measure the voltage between D+ and body ground.
OK:
Voltage: Below 1 V

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE**

OK

6	CHECK SPIRAL CABLE SUB-ASSY



(a) For the connector (on the spiral cable sub-assy side) between the horn button assy and the spiral cable sub-assy, measure the voltage between D+ and body ground.
OK:
Voltage: Below 1 V

NG → **REPLACE SPIRAL CABLE SUB-ASSY**

OK

7	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

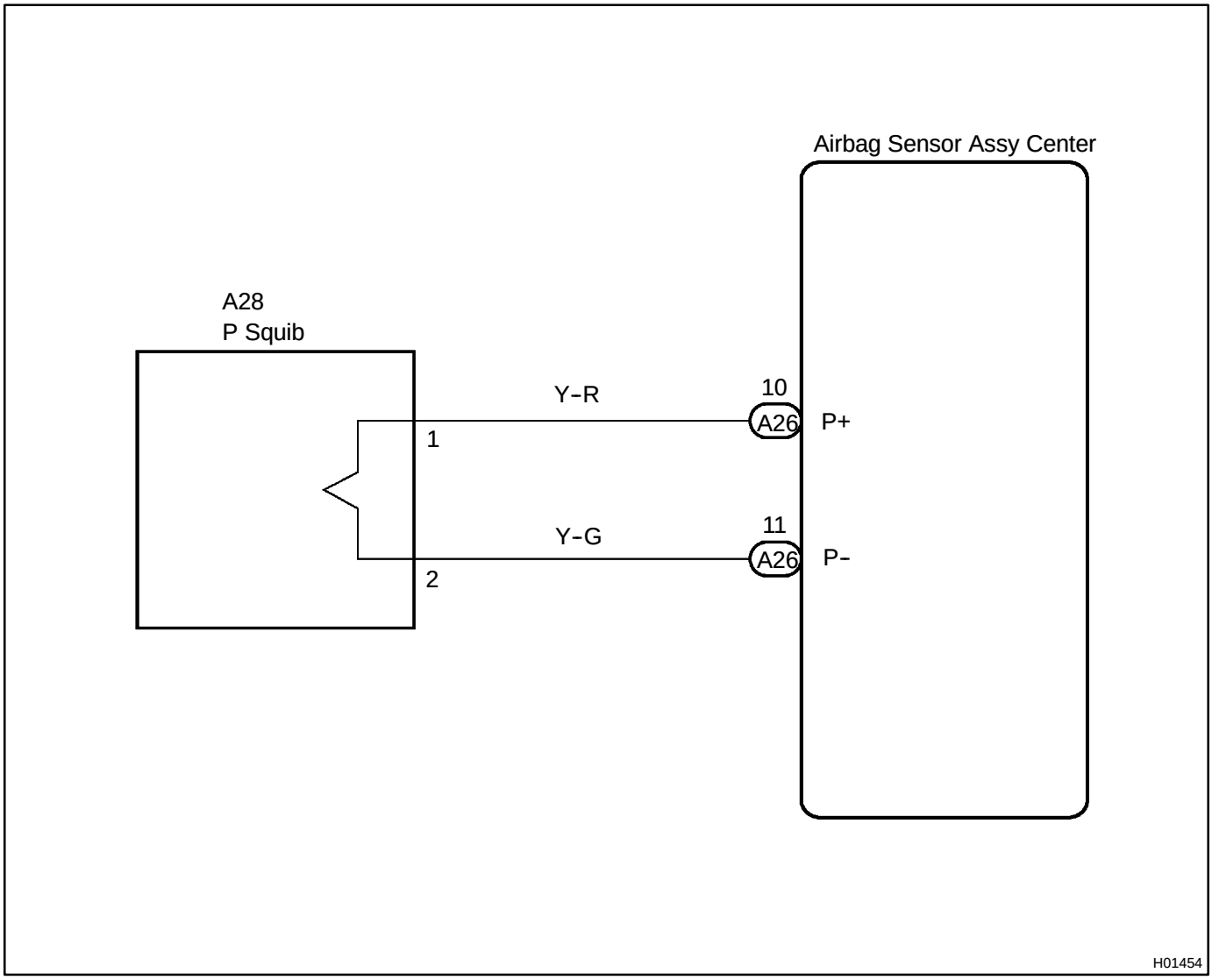
DTC	B0105/53	SHORT IN P SQUIB CIRCUIT

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assy center and instr pnl pass l/door airbag assy.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0105/53 is recorded when a short is detected in the P squib circuit.

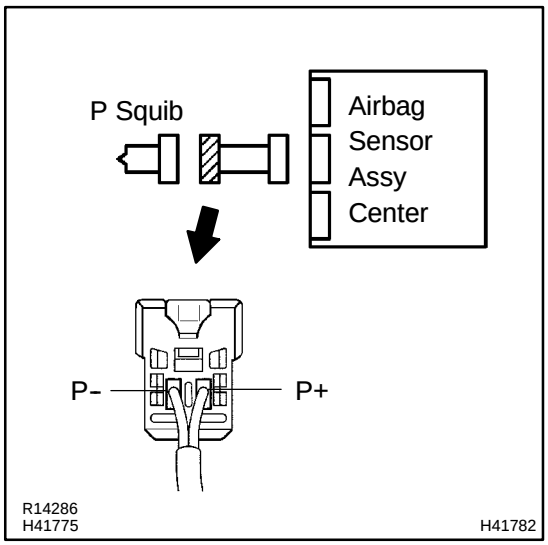
DTC No.	DTC Detecting Condition	Trouble Area
B0105/53	S Short circuit between P+ wire harness and P- wire harness of squib S P squib malfunction S Airbag sensor assy center malfunction	S Instr pnl pass l/door airbag assy (P squib) S Airbag sensor assy center S Instrument panel wire

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK P SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - INSTR PNL PASS L/DOOR AIRBAG ASSY)



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the instr pnl pass l/door airbag assy.

HINT:
Make sure that the connector is not damaged (The lock button is not disengaged, or the claw of the lock is not deformed or damaged). If the damage is found, replace the wire harness.

(c) Release the airbag activation prevention mechanism of the connector (on the airbag sensor assy center side) between the instr pnl pass l/door airbag assy and the airbag sensor assy center (See page 05-942).
(d) For the connector (on the instr pnl pass l/door airbag assy side) between the airbag sensor assy center and the instr pnl pass l/door airbag assy, measure the resistance between P+ and P-.

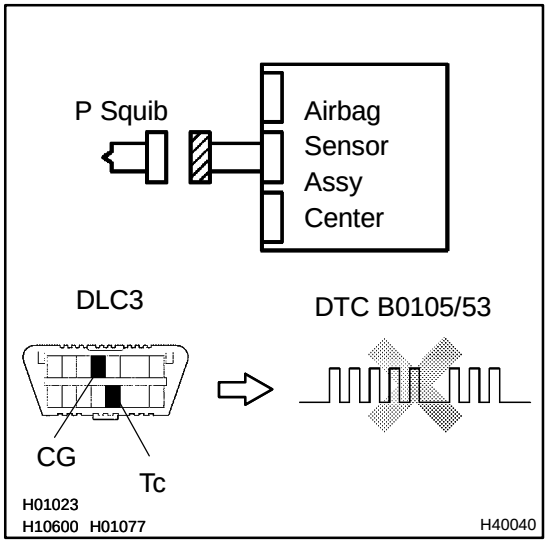
OK:
Resistance: 1 MΩ or Higher

NG	REPAIR OR REPLACE INSTRUMENT PANEL WIRE

OK

2	CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(c) Turn the ignition switch to ON, and wait at least for 20 seconds.
(d) Clear the DTC stored in memory (See page 05-942).
(e) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(f) Turn the ignition switch to ON, and wait at least for 20 seconds.
(g) Check the DTC (See page 05-942).

OK:
DTC B0105/53 is not output.

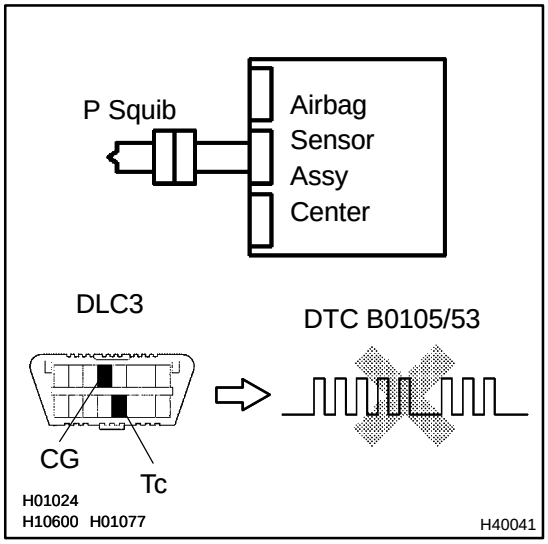
HINT:
Codes other than code B0105/53 may be output at this time, but they are not relevant to this check.

NG	REPLACE AIR BAG SENSOR ASSY CENTER

OK

3	CHECK P SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the instr pnl pass l/door airbag assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0105/53 is not output.

HINT:
Codes other than code B0105/53 may be output at this time, but they are not relevant to this check.

NG → **REPLACE INSTR PNL PASS L/DOOR AIR BAG ASSY**

OK

USE SIMULATION METHOD TO CHECK

DTC B0106/54 OPEN IN P SQUIB CIRCUIT

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assy center and instr pnl pass l/door airbag assy.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0106/54 is recorded when an open is detected in the P squib circuit.

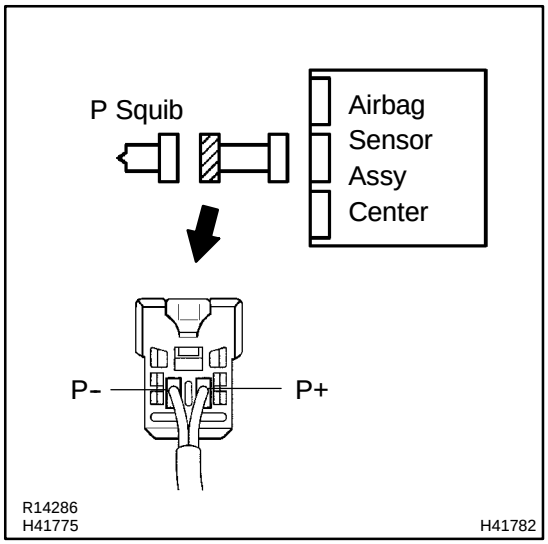
DTC No.	DTC Detecting Condition	Trouble Area
B0106/54	S Open circuit in P+ wire harness or P- wire harness of squib S P squib malfunction S Airbag sensor assy center malfunction	S Instr pnl pass l/door airbag assy (P squib) S Airbag sensor assy center S Instrument panel wire

WIRING DIAGRAM

See page 05-970.

INSPECTION PROCEDURE

1	CHECK P SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - INSTR PNL PASS L/DOOR AIRBAG ASSY)



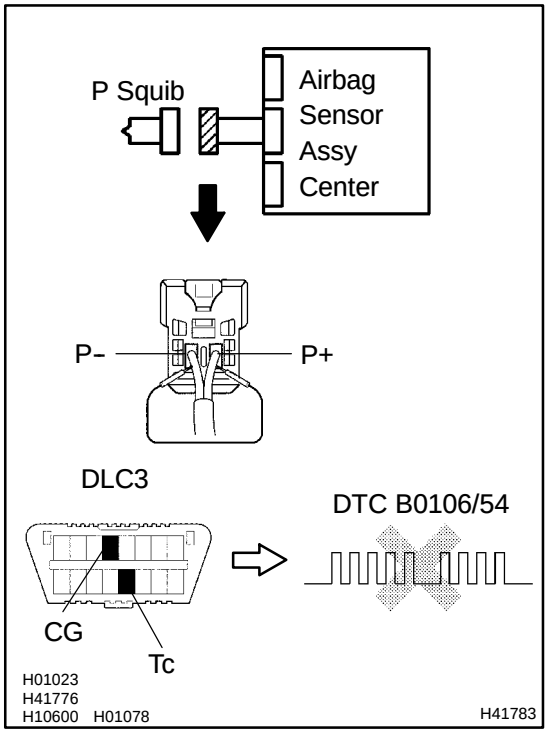
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the instr pnl pass l/door airbag assy.
(c) For the connector (on the instr pnl pass l/door airbag assy side) between the instr pnl pass l/door airbag assy and the airbag sensor assy center, measure the resistance between P+ and P-.
OK:
Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect P+ and P- of the connector (on the instr pnl pass l/door airbag assy side) between the instr pnl pass l/door airbag assy and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B0106/54 is not output.

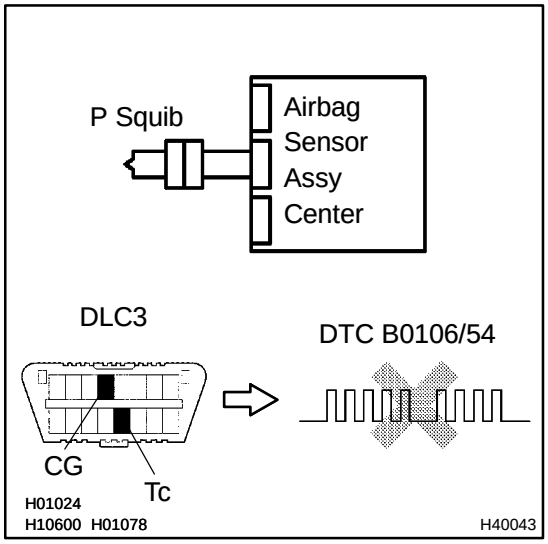
HINT:
Codes other than code B0106/54 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the instr pnl pass l/door airbag assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0106/54 is not output.

HINT:
Codes other than code B0106/54 may be output at this time, but they are not relevant to this check.

NG → **REPLACE INSTR PNL PASS L/DOOR AIR BAG ASSY**

OK

USE SIMULATION METHOD TO CHECK

DTC B0107/51 SHORT IN P SQUIB CIRCUIT (TO GROUND)

The P squib circuit consists of the airbag sensor assy center and instr pnl pass l/door airbag assy.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0107/51 is recorded when ground short is detected in the P squib circuit.

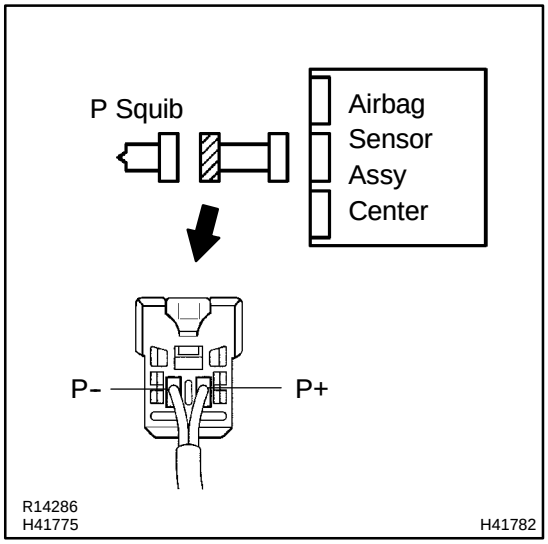
DTC No.	DTC Detecting Condition	Trouble Area
B0107/51	S Short circuit in P squib wire harness (to ground) S P squib malfunction S Airbag sensor assy center malfunction	S Instr pnl pass l/door airbag assy (P squib) S Airbag sensor assy center S Instrument panel wire

WIRING DIAGRAM

See page 05-970.

INSPECTION PROCEDURE

1	CHECK P SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - INSTR PNL PASS L/DOOR AIRBAG ASSY)



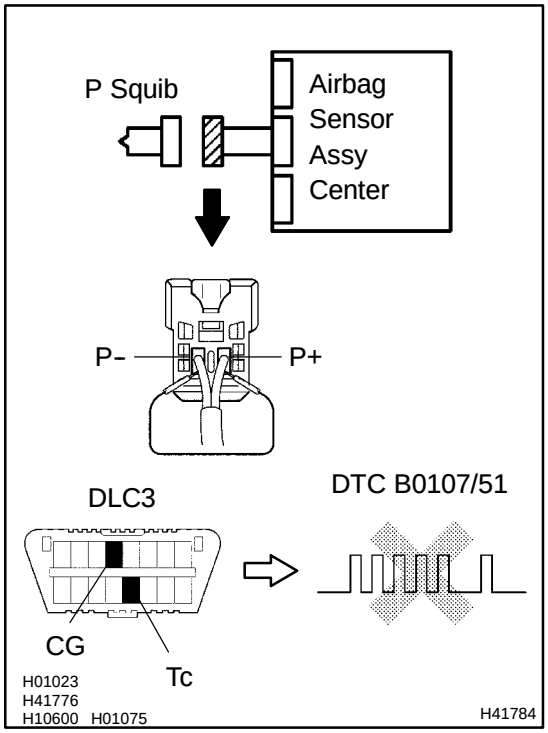
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the instr pnl pass l/door airbag assy.
(c) For the connector (on the instr pnl pass l/door airbag assy side) between the instr pnl pass l/door airbag assy and the airbag sensor assy center, measure the resistance between P+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect P+ and P- of the connector (on the instr pnl pass l/door airbag assy side) between the instr pnl pass l/door airbag assy and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).

OK:

DTC B0107/51 is not output.

HINT:

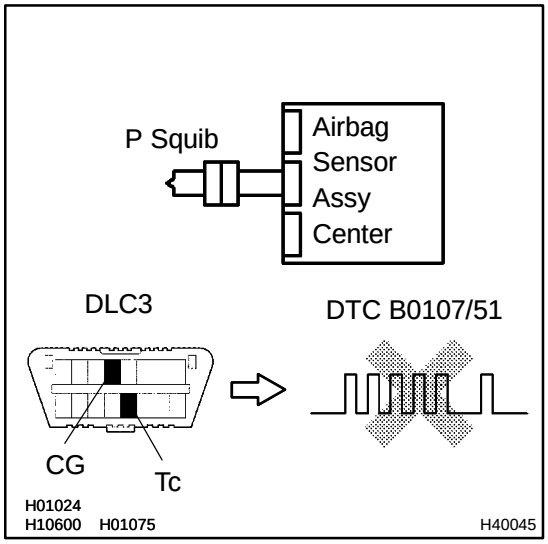
Codes other than code B0107/51 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the instr pnl pass l/door airbag assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0107/51 is not output.

HINT:
Codes other than code B0107/51 may be output at this time, but they are not relevant to this check.

NG → **REPLACE INSTR PNL PASS L/DOOR AIR BAG ASSY**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC B0108/52 SHORT IN P SQUIB CIRCUIT (TO B+)

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assy center and instr pnl pass l/door airbag assy.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0108/52 is recorded when a B+ short is detected in the P squib circuit.

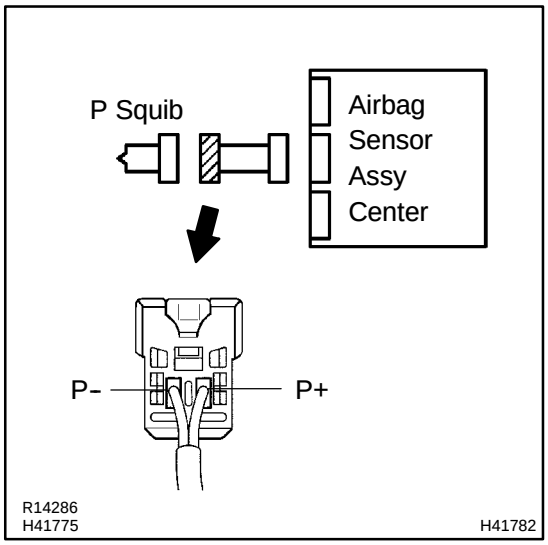
DTC No.	DTC Detecting Condition	Trouble Area
B0108/52	S Short circuit in P squib wire harness (to B+) S P squib malfunction S Airbag sensor assy center malfunction	S Instr pnl pass l/door airbag assy (P squib) S Airbag sensor assy center S Instrument panel wire

WIRING DIAGRAM

See page 05-970.

INSPECTION PROCEDURE

1	CHECK P SQUIB CIRCUIT(AIRBAG SENSOR ASSY CENTER - INSTR PNL PASS L/DOOR AIRBAG ASSY)



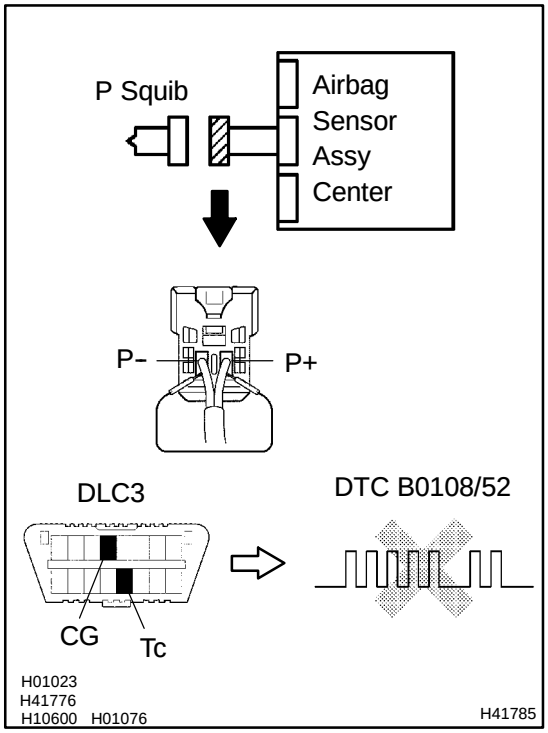
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the instr pnl pass l/door airbag assy.
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) For the connector (on the instr pnl pass l/door airbag assy side) between the instr pnl pass l/door airbag assy and the airbag sensor assy center, measure the voltage between P+ and body ground.
OK:
Voltage: Below 1 V

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the connector to the airbag sensor assy center.
(c) Using a service wire, connect P+ and P- of the connector (on the instr pnl pass l/door airbag assy side) between the instr pnl pass l/door airbag assy and the airbag sensor assy center.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0108/52 is not output.

HINT:

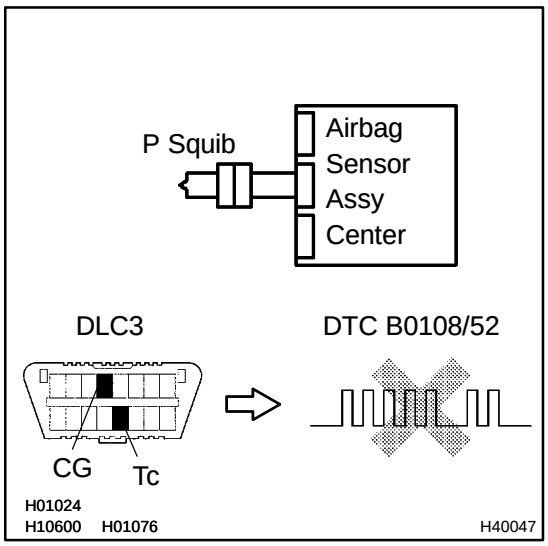
Codes other than code B0108/52 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P SQUIB

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the instr pnl pass l/door airbag assy connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0108/52 is not output.

HINT:
Codes other than code B0108/52 may be output at this time, but they are not relevant to this check.

NG → **REPLACE INSTR PNL PASS L/DOOR AIR BAG ASSY**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

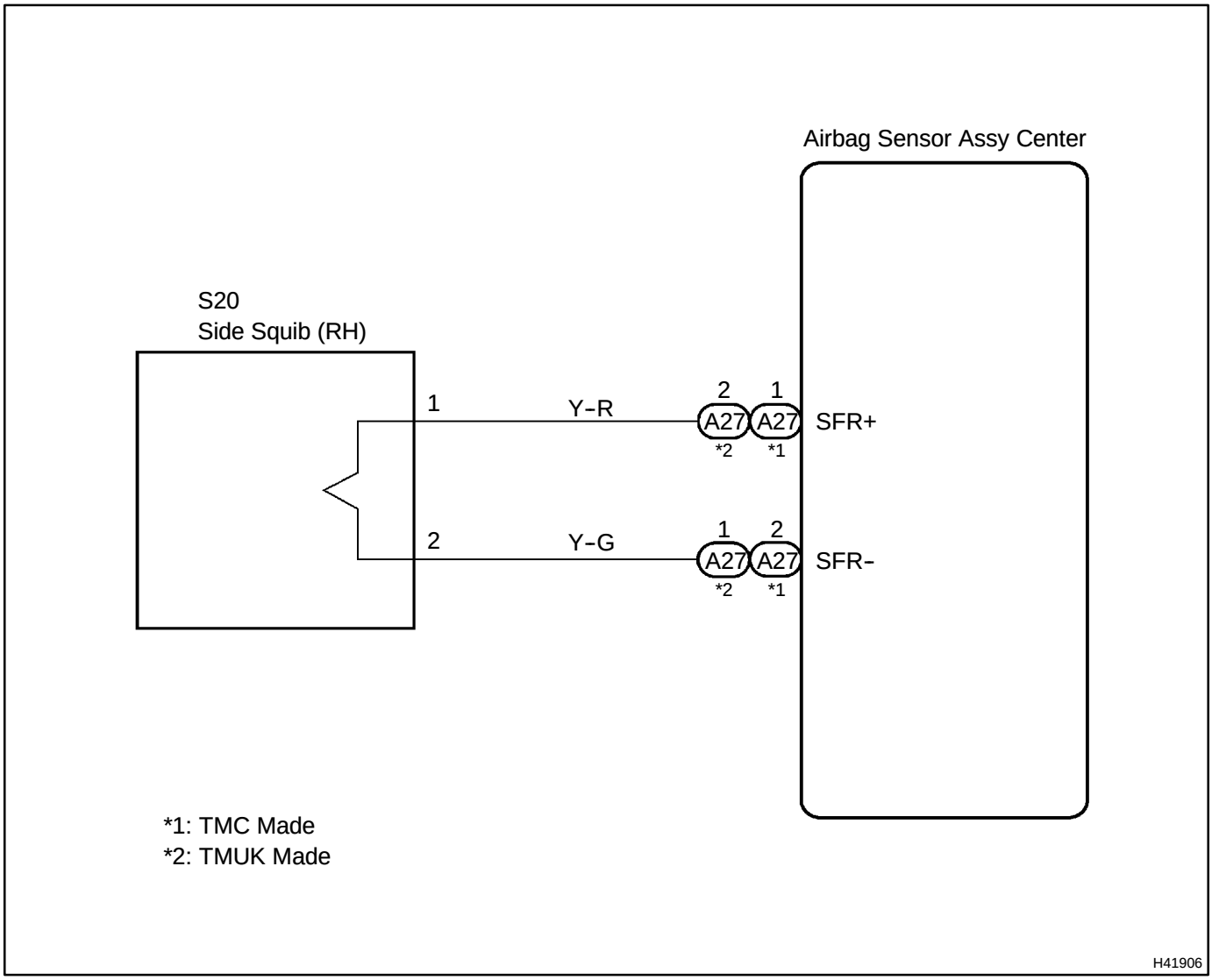
DTC	B0110/43	SHORT IN SIDE SQUIB (RH) CIRCUIT

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assy center and front seat airbag assy (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0110/43 is recorded when a short is detected in the side squib (RH) circuit.

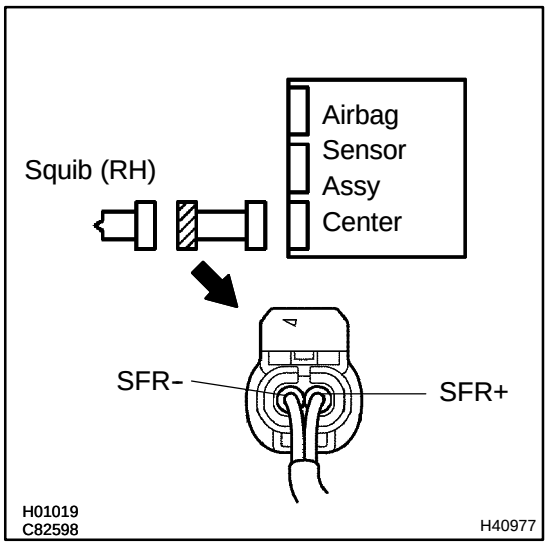
DTC No.	DTC Detecting Condition	Trouble Area
B0110/43	S Short circuit between SFR+ wire harness and SFR- wire harness of squib S Side squib (RH) malfunction S Airbag sensor assy center malfunction	S Front seat airbag assy (RH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)



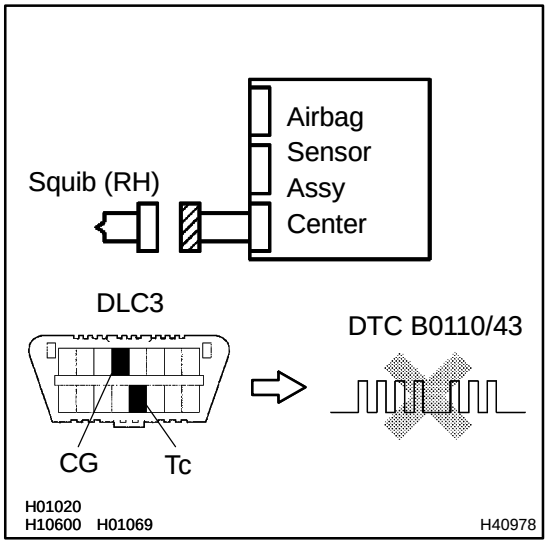
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (RH).
(c) Release the airbag activation prevention mechanism of the connector (on the airbag sensor assy center side) between the airbag sensor assy center and the front seat airbag assy (RH) (See page 05-942).
(d) For the connector (on the front seat airbag assy side) between the airbag sensor assy center and the front seat airbag assy (RH), measure the resistance between SFR+ and SFR-.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)**

OK

2	CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the the connector to the airbag sensor assy center.
(b) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(c) Turn the ignition switch to ON, and wait at least for 20 seconds.
(d) Clear the DTC stored in memory (See page 05-942).
(e) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(f) Turn the ignition switch to ON, and wait at least for 20 seconds.
(g) Check the DTC (See page 05-942).
OK:
DTC B0110/43 is not output.

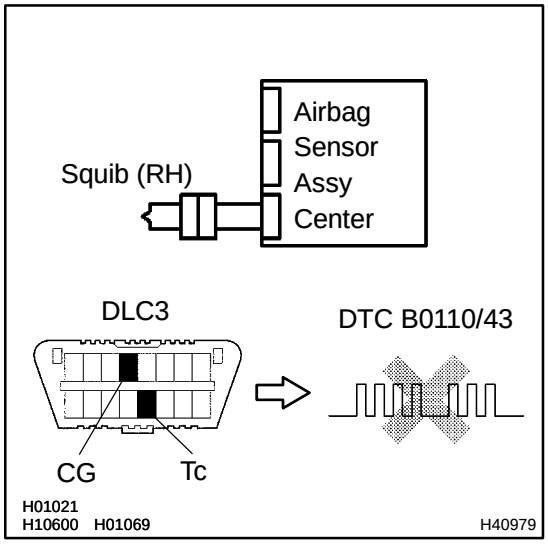
HINT:
Codes other than code B0110/43 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(RH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0110/43 is not output.

HINT:
Codes other than code B0110/43 may be output at this time, but they are not relevant to this check.

NG → **REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY**

OK →

USE SIMULATION METHOD TO CHECK

DTC B0111/44 OPEN IN SIDE SQUIB (RH) CIRCUIT

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assy center and front seat airbag assy (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0111/44 is recorded when an open is detected in the side squib (RH) circuit.

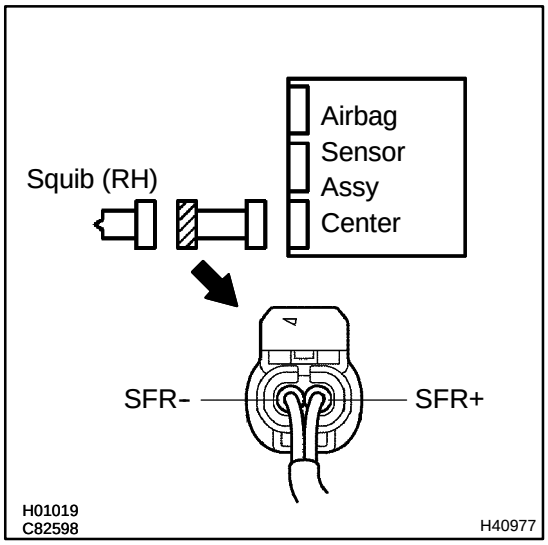
DTC No.	DTC Detecting Condition	Trouble Area
B0111/44	$ Open circuit in SFR+ wire harness or SFR- wire harness of squib $ Side squib (RH) malfunction $ Airbag sensor assy center malfunction	$ Front seat airbag assy (RH) $ Airbag sensor assy center $ Wire harness

WIRING DIAGRAM

See page 05-982.

INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)



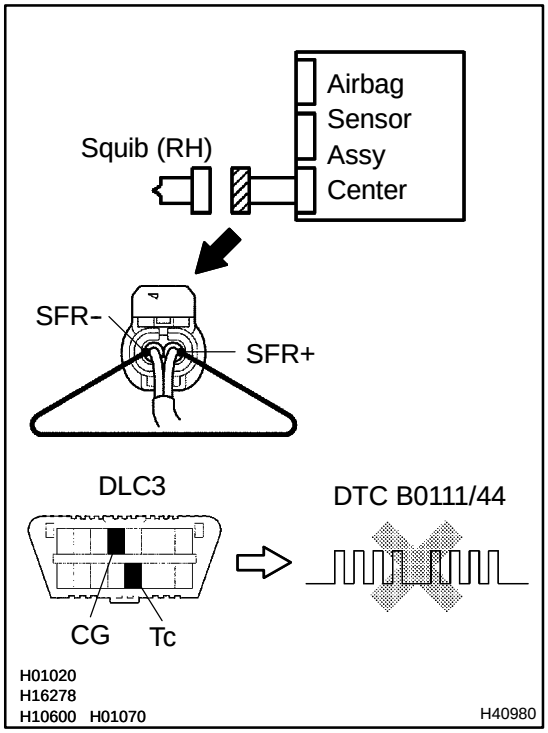
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (RH).
(c) For the connector (on the front seat airbag assy side) between the front seat airbag assy (RH) and the airbag sensor assy center, measure the resistance between SFR+ and SFR-.
OK:
Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)**

OK

2	CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect SFR+ and SFR- of the connector (on the front seat airbag assy side) between the front seat airbag assy (RH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B0111/44 is not output.

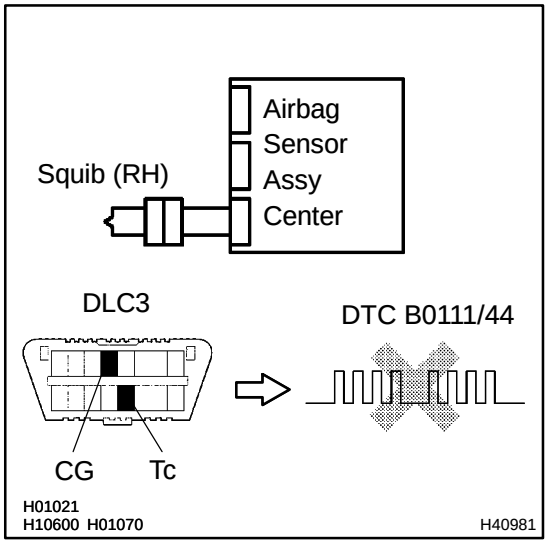
HINT:
Codes other than code B0111/44 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(RH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0111/44 is not output.

HINT:
Codes other than code B0111/44 may be output at this time, but they are not relevant to this check.

NG	REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY

OK

USE SIMULATION METHOD TO CHECK

DTC	B0112/41	SHORT IN SIDE SQUIB (RH) CIRCUIT (TO GROUND)

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assy center and front seat airbag assy (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0112/41 is recorded when ground short is detected in the side squib (RH) circuit.

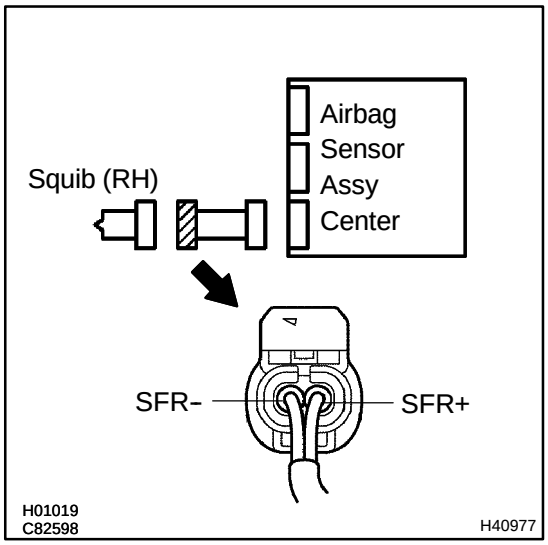
DTC No.	DTC Detecting Condition	Trouble Area
B0112/41	S Short circuit in side squib (RH) wire harness (to ground) S Side squib (RH) malfunction S Airbag sensor assy center malfunction	S Front seat airbag assy (RH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-982.

INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)



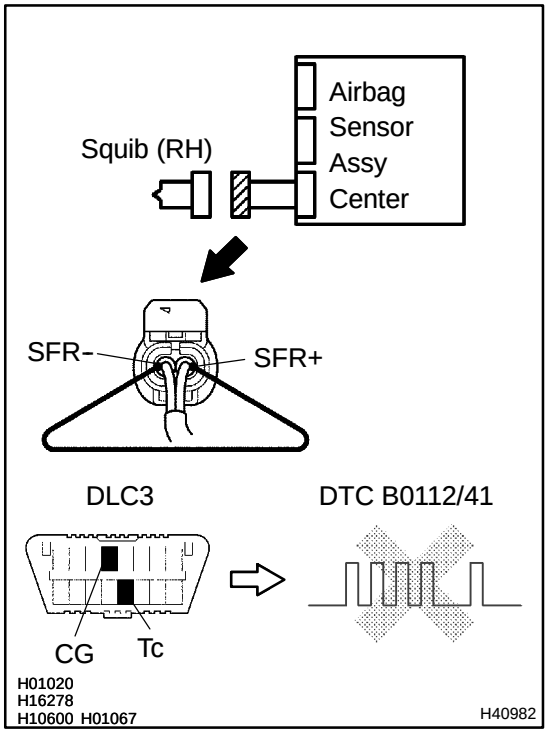
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (RH).
(c) For the connector (on the front seat airbag assy side) between the front seat airbag assy (RH) and the airbag sensor assy center, measure the resistance between SFR+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect SFR+ and SFR- of the connector (on the front seat airbag assy side) between the front seat airbag assy (RH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B0112/41 is not output.

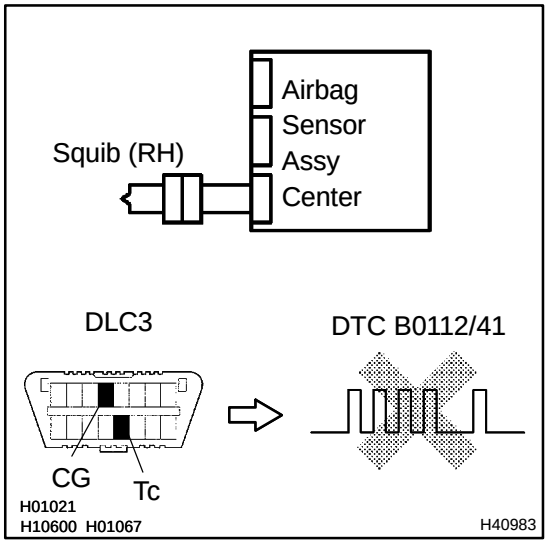
HINT:
Codes other than code B0112/41 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(RH)

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(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0112/41 is not output.

HINT:

Codes other than code B0112/41 may be output at this time, but they are not relevant to this check.

NG → **REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC	B0113/42	SHORT IN SIDE SQUIB (RH) CIRCUIT (TO B+)

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assy center and front seat airbag assy (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0113/42 is recorded when a B+ short is detected in the side squib (RH) circuit.

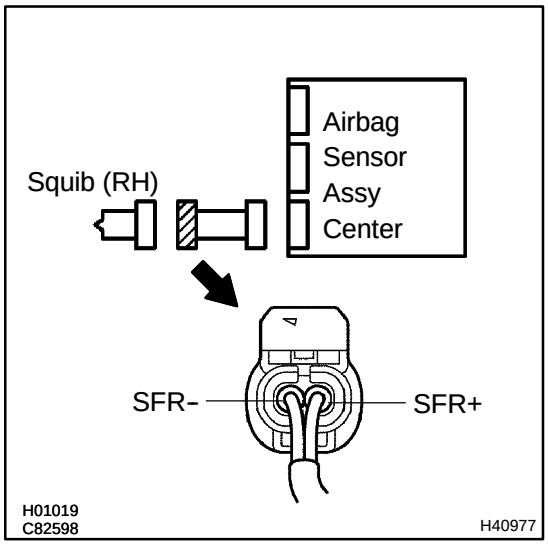
DTC No.	DTC Detecting Condition	Trouble Area
B0113/42	S Short circuit in side squib (RH) wire harness (to B+) S Side squib (RH) malfunction S Airbag sensor assy center malfunction	S Front seat airbag assy (RH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-982.

INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)



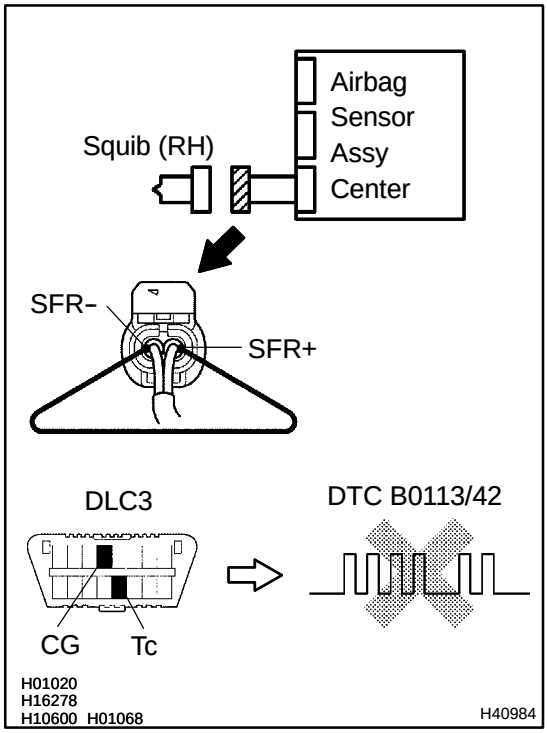
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (RH).
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) For the connector (on the front seat airbag assy side) between the front seat airbag assy (RH) and the airbag sensor assy center, measure the voltage between SFR+ and body ground.
OK:
Voltage: Below 1 V

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the connector to the airbag sensor assy center.
(c) Using a service wire, connect SFR+ and SFR- of the connector (on the front seat airbag assy side) between the front seat airbag assy (RH) and the airbag sensor assy center.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0113/42 is not output.

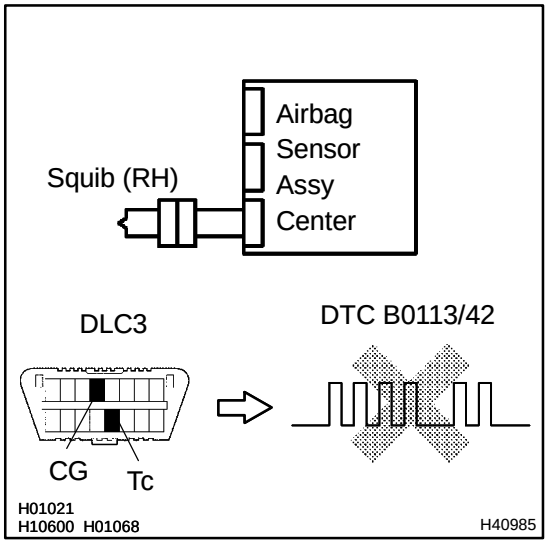
HINT:
Codes other than code B0113/42 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(RH)

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(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0113/42 is not output.

HINT:
Codes other than code B0113/42 may be output at this time, but they are not relevant to this check.

NG → **REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

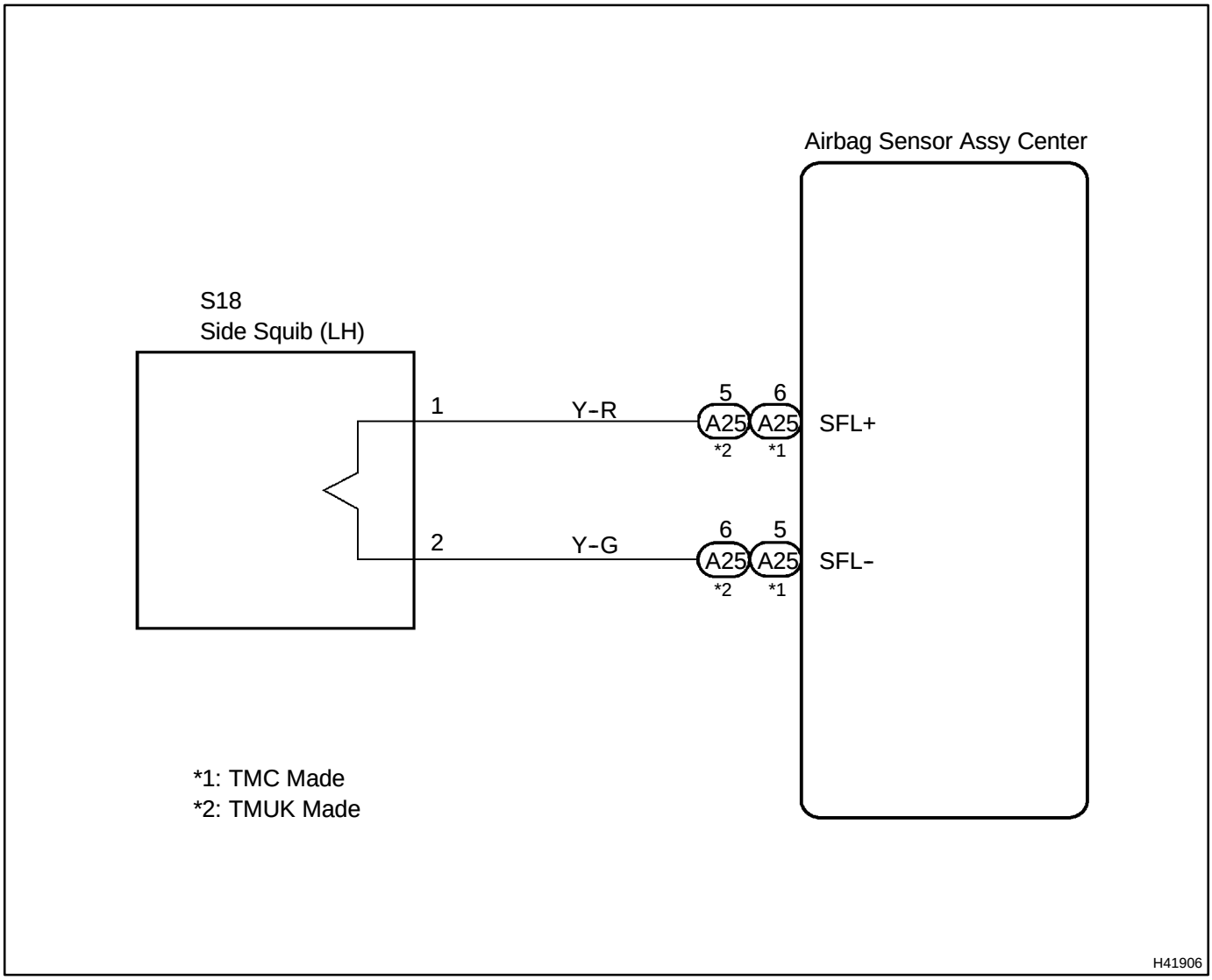
DTC	B0115/47	SHORT IN SIDE SQUIB (LH) CIRCUIT

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assy center and front seat airbag assy (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0115/47 is recorded when a short is detected in the side squib (LH) circuit.

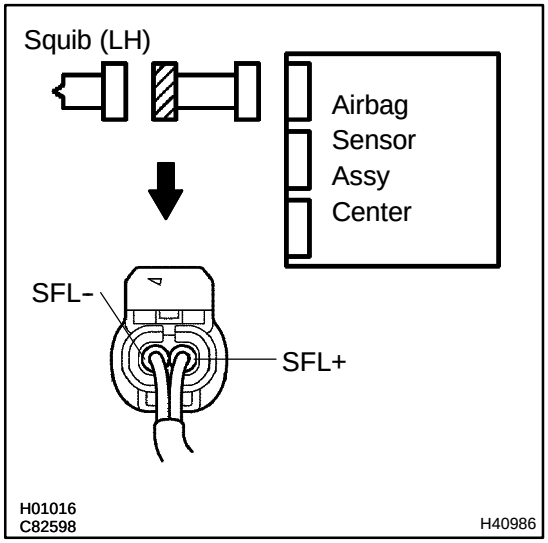
DTC No.	DTC Detecting Condition	Trouble Area
B0115/47	S Short circuit between SFL+ wire harness and SFL- wire harness of squib S Side squib (LH) malfunction S Airbag sensor assy center malfunction	S Front seat airbag assy (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)



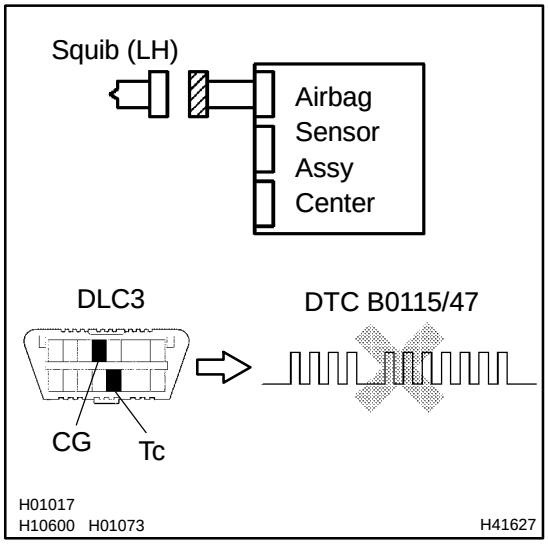
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (LH).
(c) Release the airbag activation prevention mechanism of the connector (on the airbag sensor assy center side) between the airbag sensor assy center and the front seat airbag assy (LH) (See page 05-942).
(d) For the connector (on the front seat airbag assy side) between the airbag sensor assy center and the front seat airbag assy (LH), measure the resistance between SFL+ and SFL-.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2	CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(c) Turn the ignition switch to ON, and wait at least for 20 seconds.
(d) Clear the DTC stored in memory (See page 05-942).
(e) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(f) Turn the ignition switch to ON, and wait at least for 20 seconds.
(g) Check the DTC (See page 05-942).
OK:
DTC B0115/47 is not output.

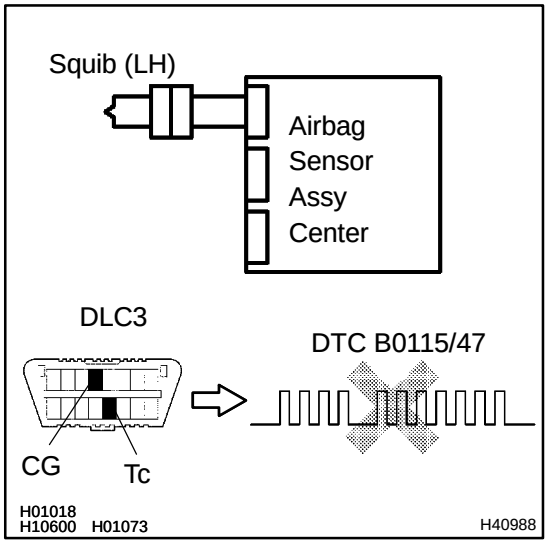
HINT:
Codes other than code B0115/47 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(LH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0115/47 is not output.

HINT:
Codes other than code B0115/47 may be output at this time, but they are not relevant to this check.

NG → **REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY**

OK →

USE SIMULATION METHOD TO CHECK

DTC B0116/48 OPEN IN SIDE SQUIB (LH) CIRCUIT

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assy center and front seat airbag assy (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0116/48 is recorded when an open is detected in the side squib (LH) circuit.

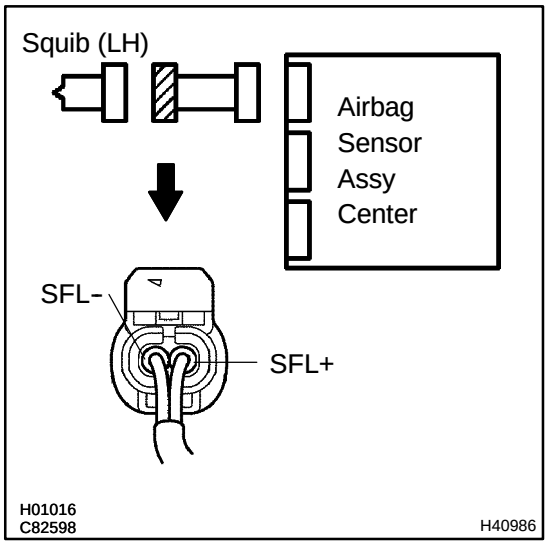
DTC No.	DTC Detecting Condition	Trouble Area
B0116/48	S Open circuit in SFL+ wire harness or SFL- wire harness of squib S Side squib (LH) malfunction S Airbag sensor assy center malfunction	S Front seat airbag assy (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-994.

INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)



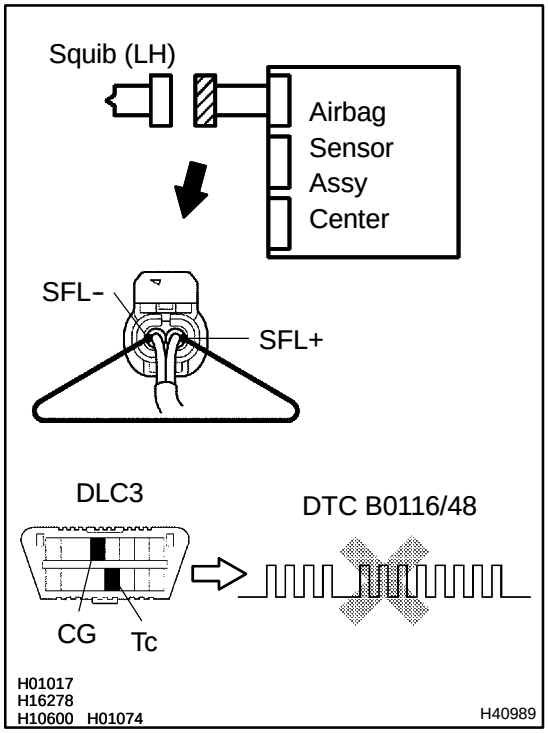
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (LH).
(c) For the connector (on the front seat airbag assy side) between the front seat airbag assy (LH) and the airbag sensor assy center, measure the resistance between SFL+ and SFL-.
OK:
Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect SFL+ and SFL- of the connector (on the front seat airbag assy side) between the front seat airbag assy (LH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B0116/48 is not output.

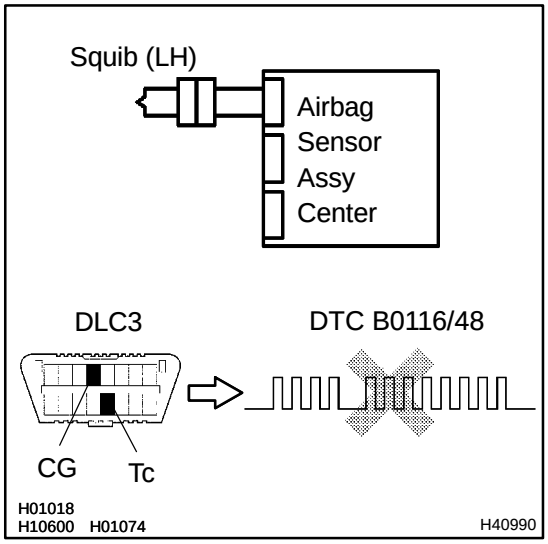
HINT:
Codes other than code B0116/48 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(LH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0116/48 is not output.

HINT:
Codes other than code B0116/48 may be output at this time, but they are not relevant to this check.

NG → **REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY**

OK →

USE SIMULATION METHOD TO CHECK

DTC	B0117/45	SHORT IN SIDE SQUIB (LH) CIRCUIT (TO GROUND)

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assy center and front seat airbag assy (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0117/45 is recorded when ground short is detected in the side squib (LH) circuit.

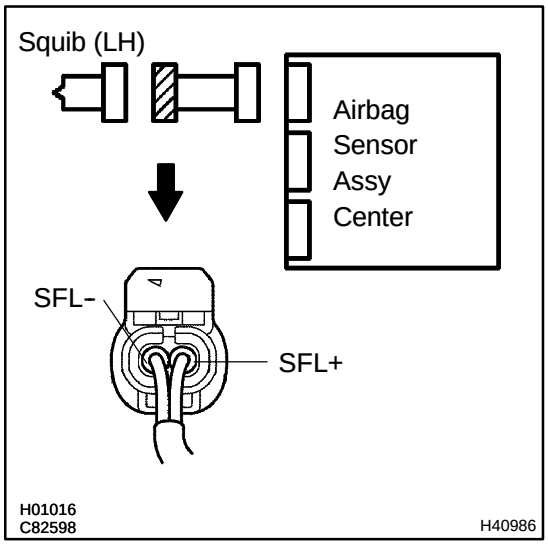
DTC No.	DTC Detecting Condition	Trouble Area
B0117/45	S Short circuit in side squib (LH) wire harness (to ground) S Side squib (LH) malfunction S Airbag sensor assy center malfunction	S Front seat airbag assy (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-994.

INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)



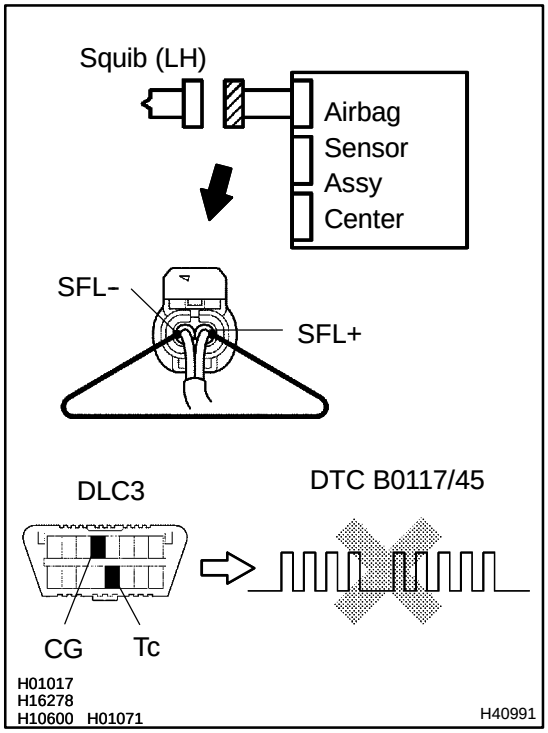
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (LH).
(c) For the connector (on the front seat airbag assy side) between the front seat airbag assy (LH) and the airbag sensor assy center, measure the resistance between SFL+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect SFL+ and SFL- of the connector (on the front seat airbag assy side) between the front seat airbag assy (LH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B0117/45 is not output.

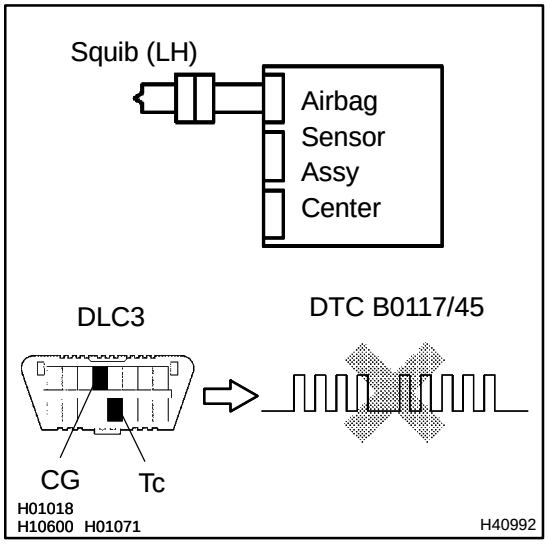
HINT:
Codes other than code B0117/45 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(LH)

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(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0117/45 is not output.

HINT:

Codes other than code B0117/45 may be output at this time, but they are not relevant to this check.

NG → **REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC	B0118/46	SHORT IN SIDE SQUIB (LH) CIRCUIT (TO B+)

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assy center and front seat airbag assy (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0118/46 is recorded when a B+ short is detected in the side squib (LH) circuit.

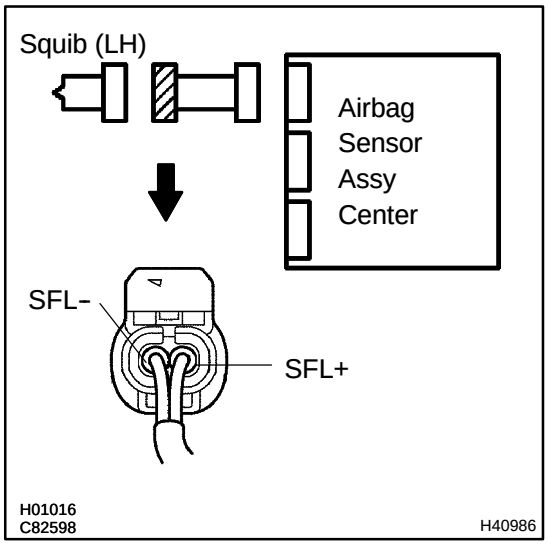
DTC No.	DTC Detecting Condition	Trouble Area
B0118/46	S Short circuit in side squib (LH) wire harness (to B+) S Side squib (LH) malfunction S Airbag sensor assy center malfunction	S Front seat airbag assy (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-994.

INSPECTION PROCEDURE

1	CHECK SIDE SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)



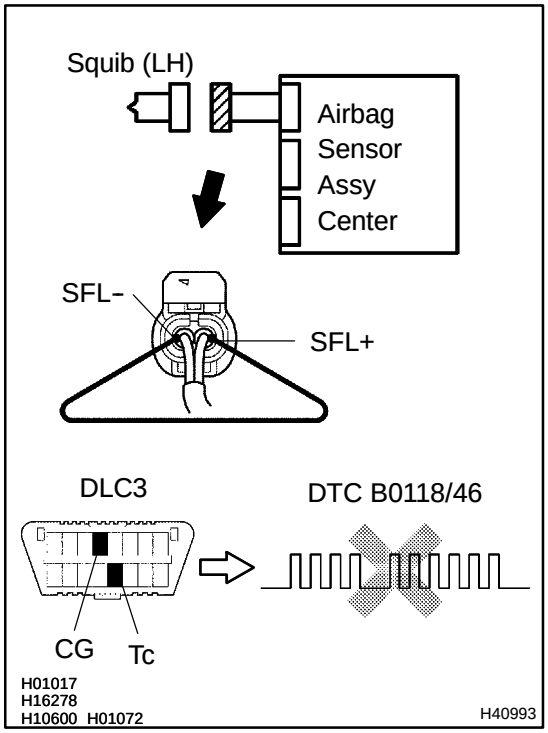
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the front seat airbag assy (LH).
(c) Connect negative (-) terminal cable to the battery, turn the ignition switch to ON.
(d) For the connector (on the front seat airbag assy side) between the front seat airbag assy (LH) and the airbag sensor assy center, measure the voltage between SFL+ and body ground.
OK:
Voltage: Below 1 V

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the connector to the airbag sensor assy center.
(c) Using a service wire, connect SFL+ and SFL- of the connector (on the front seat airbag assy side) between the front seat airbag assy (LH) and the airbag sensor assy center.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0118/46 is not output.

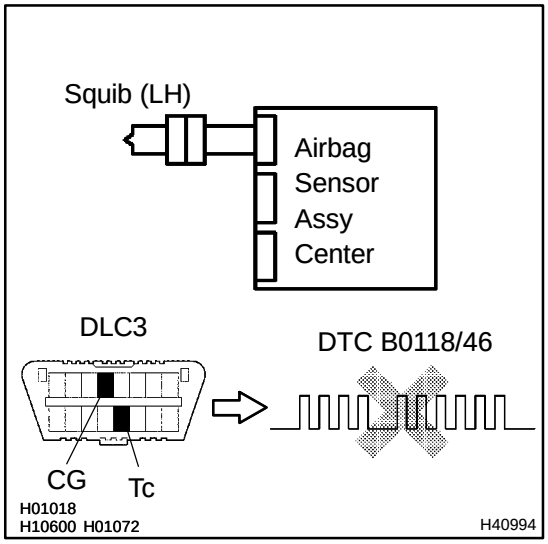
HINT:
Codes other than code B0118/46 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK SIDE SQUIB(LH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front seat airbag assy (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0118/46 is not output.

HINT:

Codes other than code B0118/46 may be output at this time, but they are not relevant to this check.

NG → **REPLACE SEPARATE TYPE FRONT SEAT BACK ASSY**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

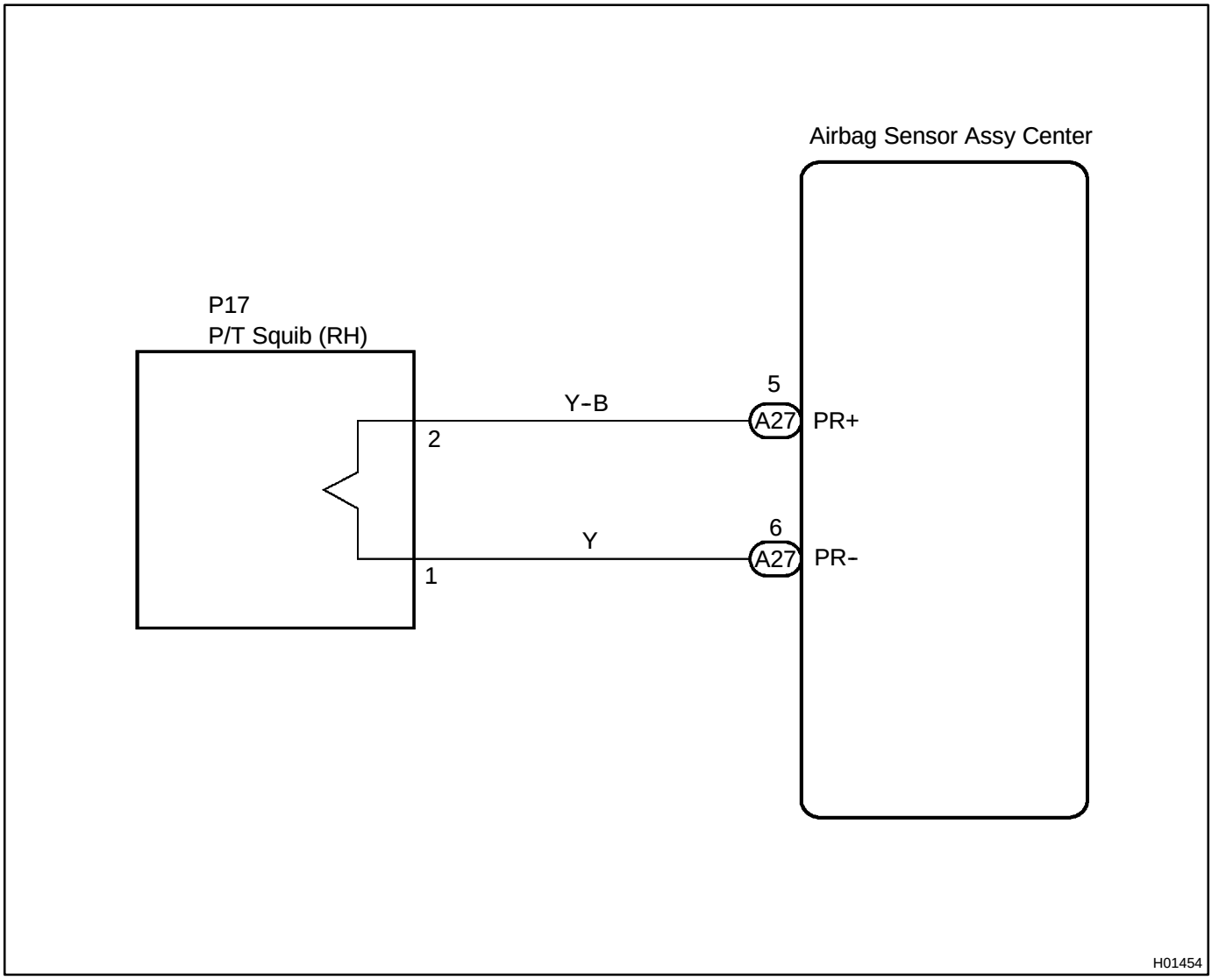
DTC	B0130/63	SHORT IN P/T SQUIB (RH) CIRCUIT

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assy center and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0130/63 is recorded when a short is detected in the P/T squib (RH) circuit.

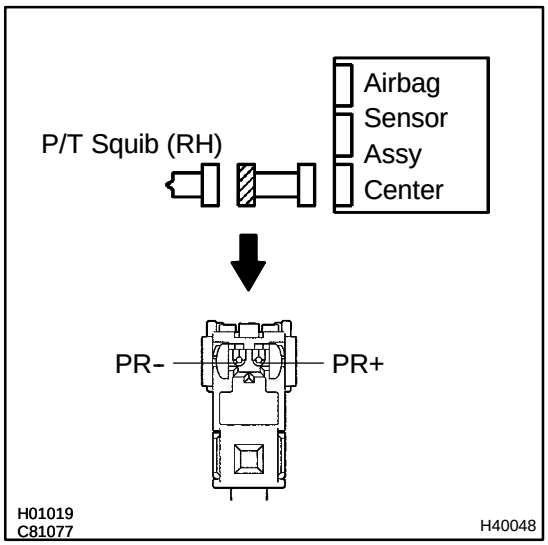
DTC No.	DTC Detecting Condition	Trouble Area
B0130/63	S Short circuit between PR+ wire harness and PR- wire harness of squib S P/T squib (RH) malfunction S Airbag sensor assy center malfunction	S Seat belt pretensioner (RH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK P/T SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY RH)



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.

(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (RH).

HINT:

Make sure that the connector is not damaged (The lock button is not disengaged, or the claw of the lock is not deformed or damaged). If the damage is found, replace the wire harness.

(c) Release the airbag activation prevention mechanism of the connector (on the airbag sensor assy center side) between the airbag sensor assy center and the seat belt pretensioner (RH) (See page 05-942).

(d) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assy center, measure the resistance between PR+ and PR-.

OK:

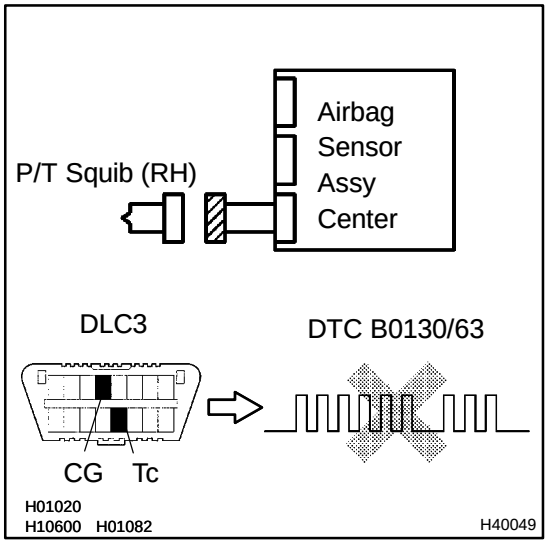
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY RH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Connect the connector to the airbag sensor assy center.
(b) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(c) Turn the ignition switch to ON, and wait at least for 20 seconds.
(d) Clear the DTC stored in memory (See page 05-942).
(e) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(f) Turn the ignition switch to ON, and wait at least for 20 seconds.
(g) Check the DTC (See page 05-942).

OK:

DTC B0130/63 is not output.

HINT:

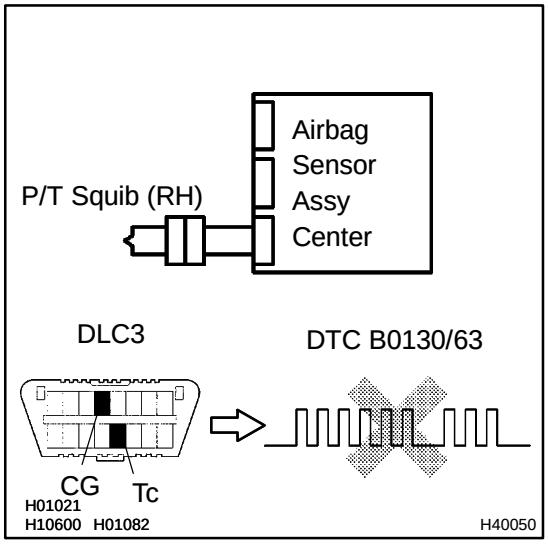
Codes other than code B0130/63 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P/T SQUIB (RH)

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(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0130/63 is not output.

HINT:

Codes other than code B0130/63 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY RH**

OK

USE SIMULATION METHOD TO CHECK

DTC	B0131/64	OPEN IN P/T (RH) CIRCUIT

CIRCUIT DESCRIPTION

The P/T squib circuit (RH) consists of the airbag sensor assy center and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0131/64 is recorded when an open is detected in the P/T squib (RH) circuit.

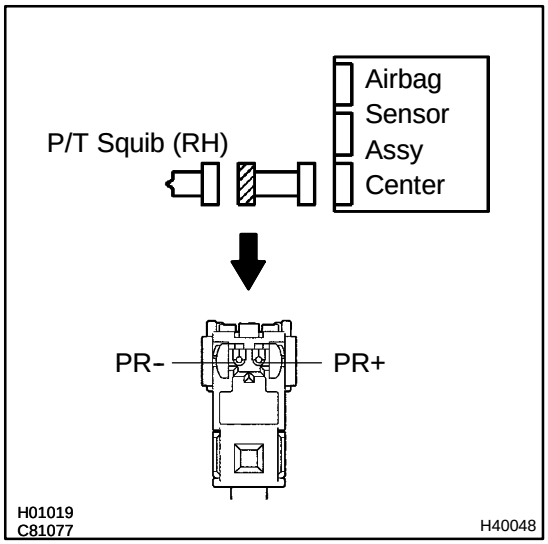
DTC No.	DTC Detecting Condition	Trouble Area
B0131/64	$ Open circuit in PR+ wire harness or PR- wire harness of squib $ P/T squib (RH) malfunction $ Airbag sensor assy center malfunction	$ Seat belt pretensioner (RH) $ Airbag sensor assy center $ Wire harness

WIRING DIAGRAM

See page 05-1006.

INSPECTION PROCEDURE

1	CHECK P/T SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY RH)



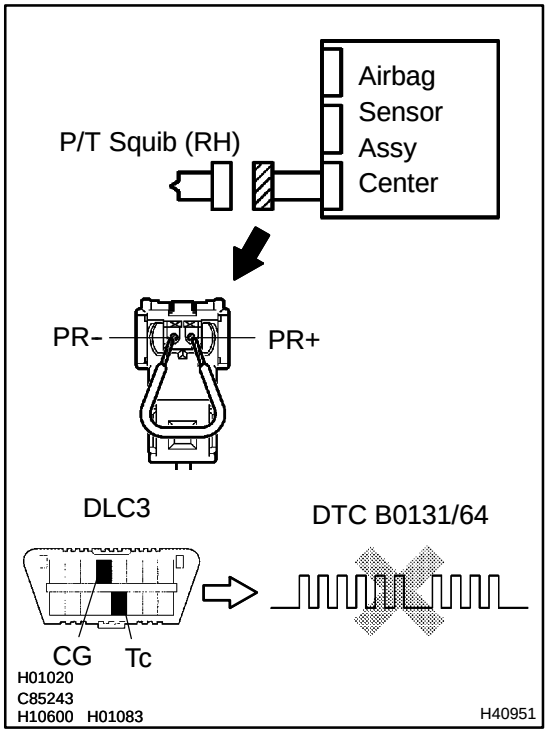
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (RH).
(c) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assy center, measure the resistance between PR+ and PR-.
OK:
Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect PR+ and PR- of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).

OK:

DTC B0131/64 is not output.

HINT:

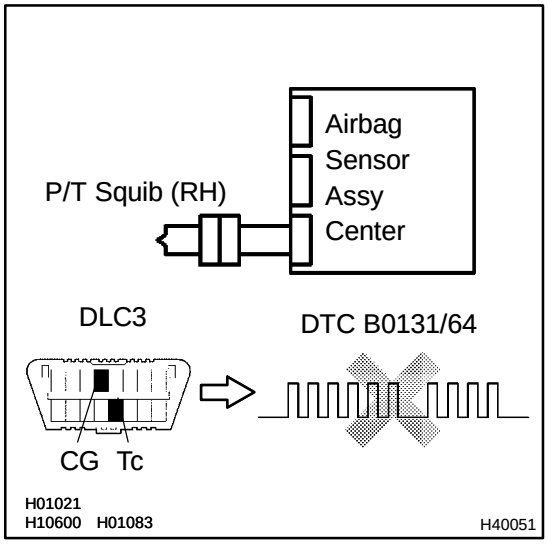
Codes other than code B0131/64 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P/T SQUIB (RH)

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(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0131/64 is not output.

HINT:
Codes other than code B0131/64 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY RH**

OK

USE SIMULATION METHOD TO CHECK

DTC	B0132/61	SHORT IN P/T SQUIB (RH) CIRCUIT (TO GROUND)

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assy center and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0132/61 is recorded when a ground short is detected in the P/T squib (RH) circuit.

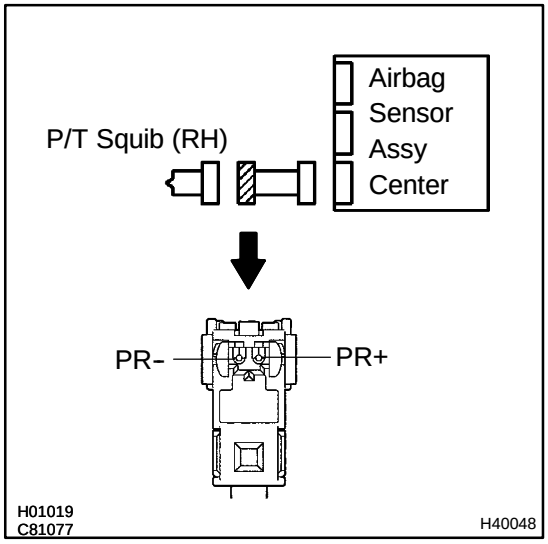
DTC No.	DTC Detecting Condition	Trouble Area
B0132/61	S Short circuit in P/T squib (RH) wire harness (to ground) S P/T squib (RH) malfunction S Airbag sensor assy center malfunction	S Seat belt pretensioner (RH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-1006.

INSPECTION PROCEDURE

1	CHECK P/T SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY RH)



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.

(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (RH).

(c) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assy center, measure the resistance between PR+ and body ground.

OK:

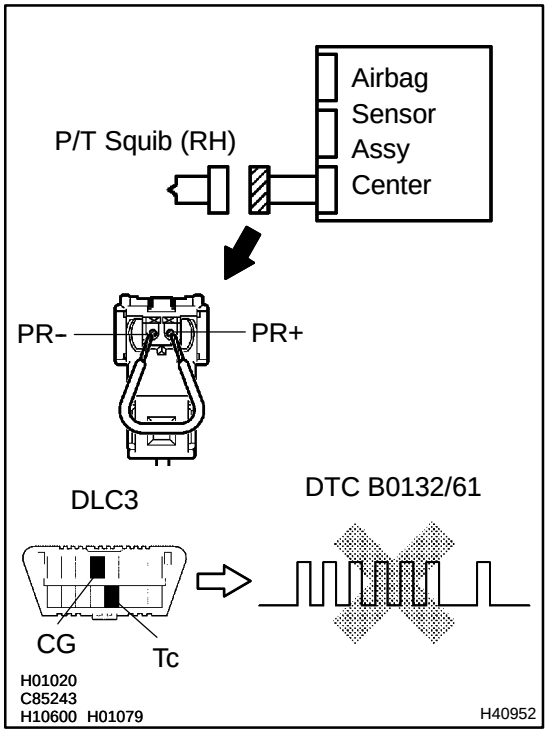
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect PR+ and PR- of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).

OK:

DTC B0132/61 is not output.

HINT:

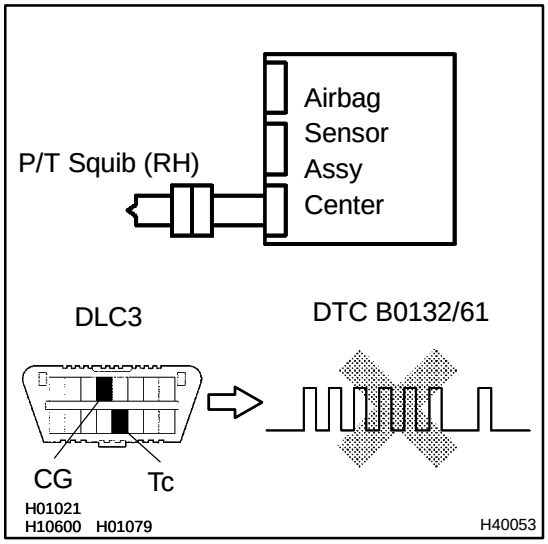
Codes other than code B0132/61 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P/T SQUIB (RH)

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(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0132/61 is not output.

HINT:
Codes other than code B0132/61 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY RH**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC	B0133/62	SHORT IN P/T SQUIB (RH) CIRCUIT (TO B+)

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assy center and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0133/62 is recorded when a B+ short is detected in the P/T squib (RH) circuit.

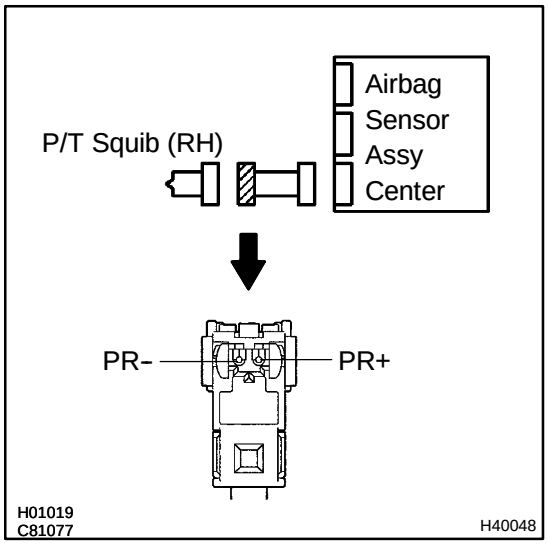
DTC No.	DTC Detecting Condition	Trouble Area
B0133/62	S Short circuit in seat belt pretensioner (RH) wire harness (to B+) S P/T squib (RH) malfunction S Airbag sensor assy center malfunction	S Seat belt pretensioner (RH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-1006.

INSPECTION PROCEDURE

1	CHECK P/T SQUIB(RH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY RH)



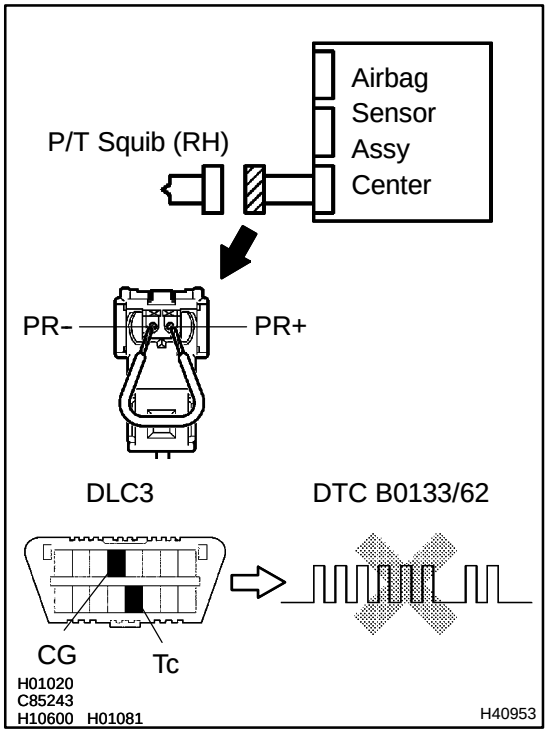
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (RH).
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assy center, measure the voltage between PR+ and body ground.
OK:
Voltage: Below 1 V

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY RH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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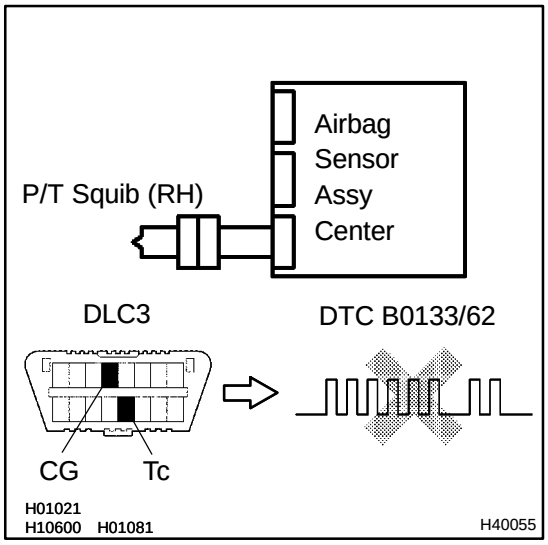
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the connector to the airbag sensor assy center.
(c) Using a service wire, connect PR+ and PR- of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assy center.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0133/62 is not output.

HINT:
Codes other than code B0133/62 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P/T SQUIB (RH)



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0133/62 is not output.

HINT:
Codes other than code B0133/62 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY RH**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

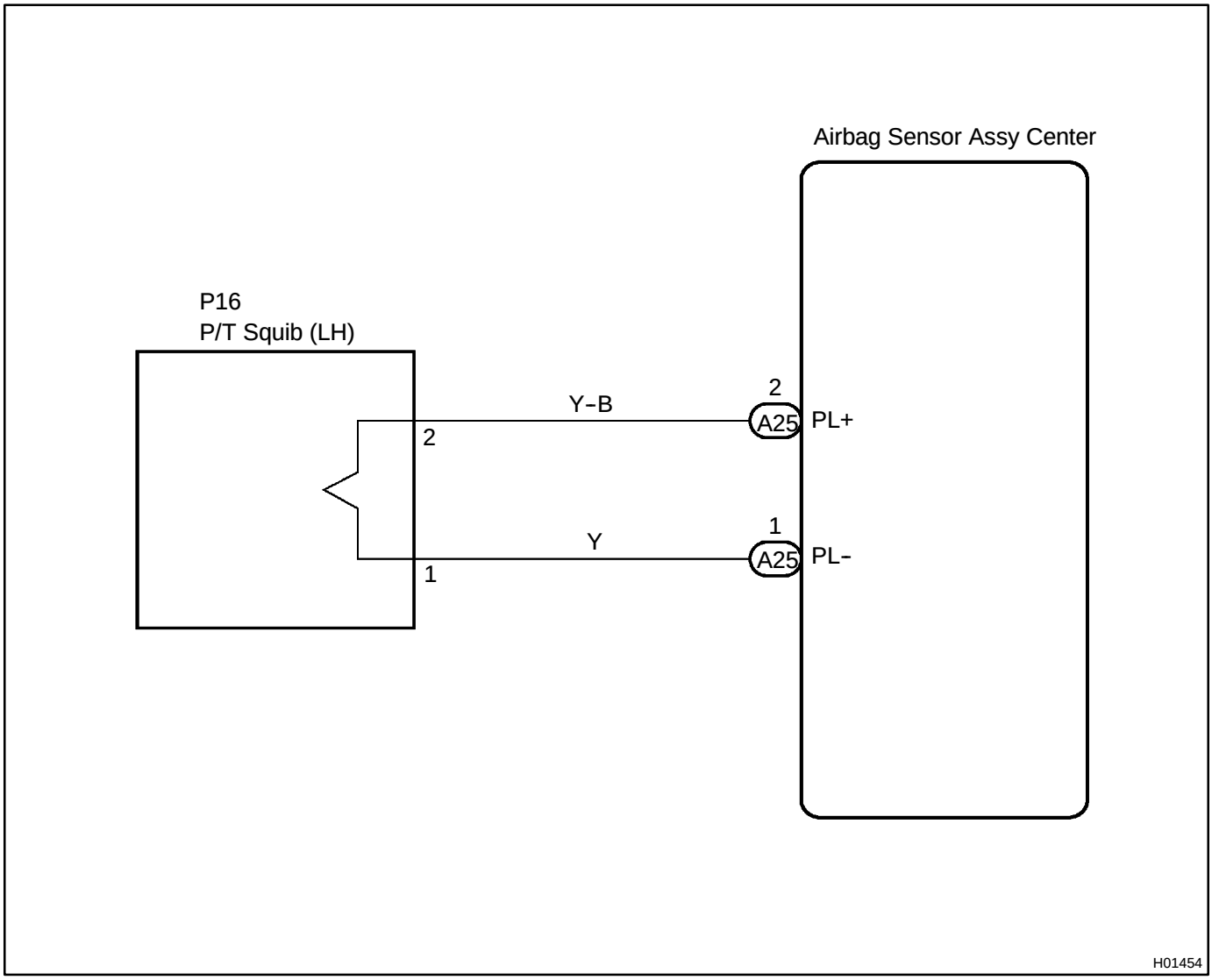
DTC	B0135/73	SHORT IN P/T SQUIB (LH) CIRCUIT

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assy center and seat belt pretensioner (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0135/73 is recorded when a short is detected in the P/T squib (LH) circuit.

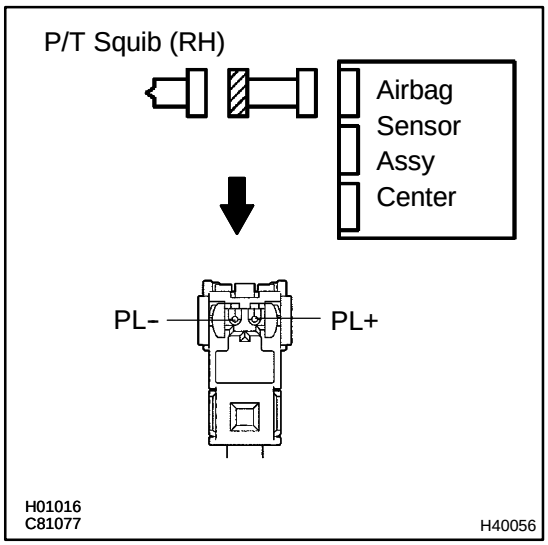
DTC No.	DTC Detecting Condition	Trouble Area
B0135/73	S Short circuit between PL+ wire harness and PL- wire harness of squib S P/T squib (LH) malfunction S Airbag sensor assy center malfunction	S Seat belt pretensioner (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**CHECK P/T SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY LH)**



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.

(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (LH).

HINT:

Make sure that the connector is not damaged (The lock button is not disengaged, or the claw of the lock is not deformed or damaged). If the damage is found, replace the wire harness.

(c) Release the airbag activation prevention mechanism of the connector (on the airbag sensor assy center side) between the airbag sensor assy center and the seat belt pretensioner (LH) (See page 05-942).

(d) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assy center, measure the resistance between PL+ and PL-.

OK:

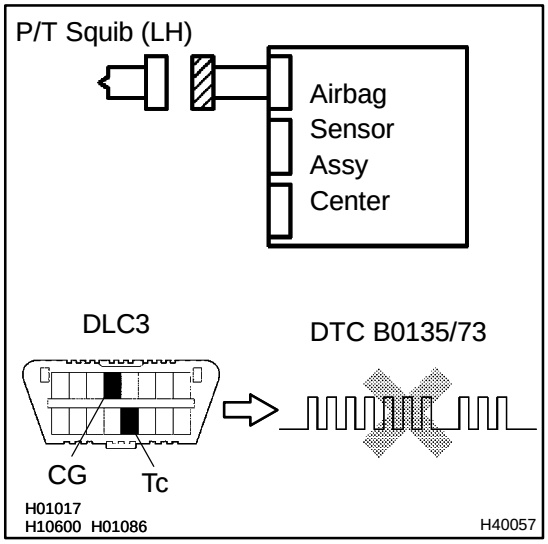
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

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(a) Connect the connector to the airbag sensor assy center.
(b) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(c) Turn the ignition switch to ON, and wait at least for 20 seconds.
(d) Clear the DTC stored in memory (See page 05-942).
(e) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(f) Turn the ignition switch to ON, and wait at least for 20 seconds.
(g) Check the DTC (See page 05-942).

OK:

DTC B0135/73 is not output.

HINT:

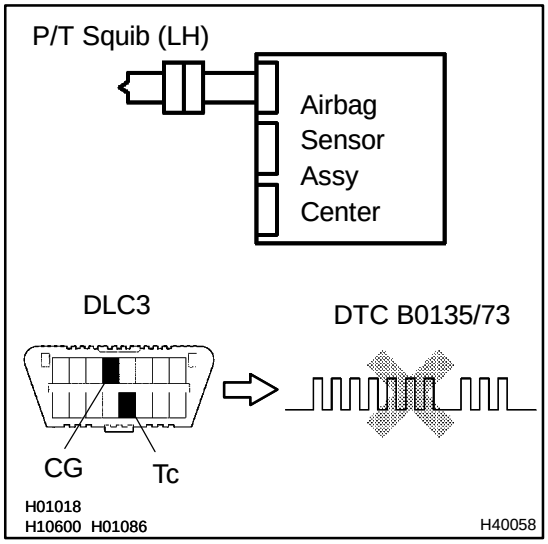
Codes other than code B0135/73 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P/T SQUIB (LH)

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(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0135/73 is not output.

HINT:

Codes other than code B0135/73 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY LH**

OK

USE SIMULATION METHOD TO CHECK

DTC B0136/74 OPEN IN P/T SQUIB (LH) CIRCUIT

CIRCUIT DESCRIPTION

The P/T squib circuit (LH) consists of the airbag sensor assy center and seat belt pretensioner (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0136/74 is recorded when an open is detected in the P/T squib (LH) circuit.

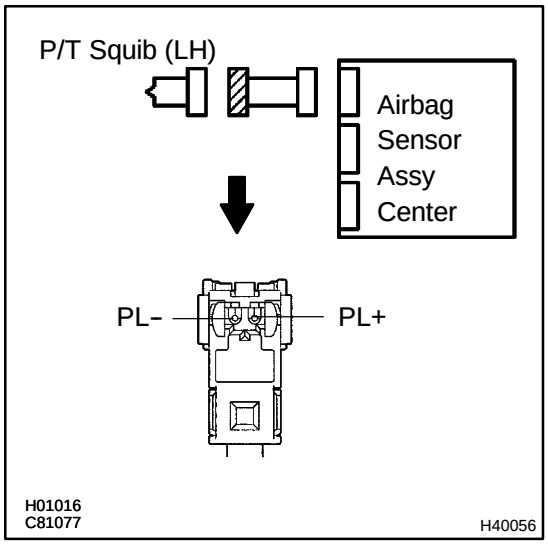
DTC No.	DTC Detecting Condition	Trouble Area
B0136/74	S Open circuit in PL+ wire harness or PL- wire harness of squib S P/T squib (LH) malfunction S Airbag sensor assy center malfunction	S Seat belt pretensioner (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-1019.

INSPECTION PROCEDURE

1	CHECK P/T SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CEMTER - FRONT SEAT OUTER BELT ASSY LH)



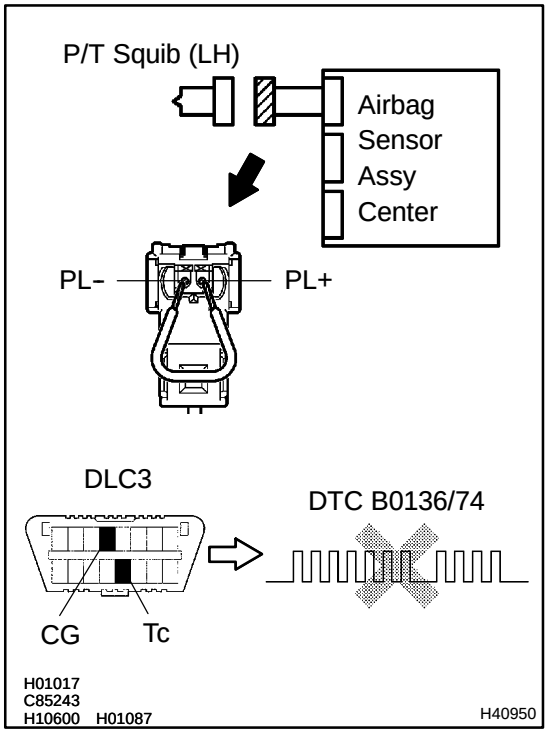
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (LH).
(c) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assy center, measure the resistance between PL+ and PL-.
OK:
Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect PL+ and PL- of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).

OK:

DTC B0136/74 is not output.

HINT:

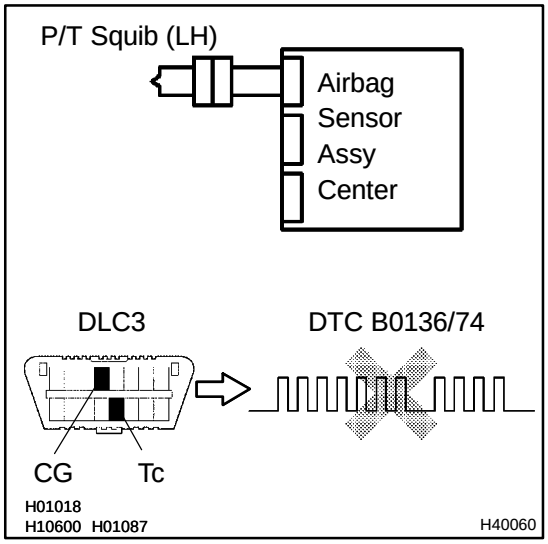
Codes other than code B0136/74 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3 CHECK P/T SQUIB (LH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0136/74 is not output.

HINT:

Codes other than code B0136/74 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY LH**

OK

USE SIMULATION METHOD TO CHECK

DTC	B0137/71	SHORT IN P/T SQUIB (LH) CIRCUIT (TO GROUND)

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assy center and seat belt pretensioner (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0137/71 is recorded when a ground short is detected in the P/T squib (LH) circuit.

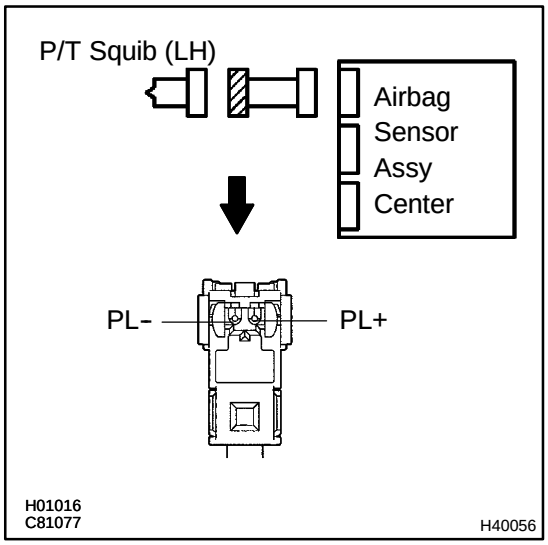
DTC No.	DTC Detecting Condition	Trouble Area
B0137/71	S Short circuit in P/T squib (LH) wire harness (to ground) S P/T squib (LH) malfunction S Airbag sensor assy center malfunction	S Seat belt pretensioner (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-1019.

INSPECTION PROCEDURE

1	CHECK P/T SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY LH)



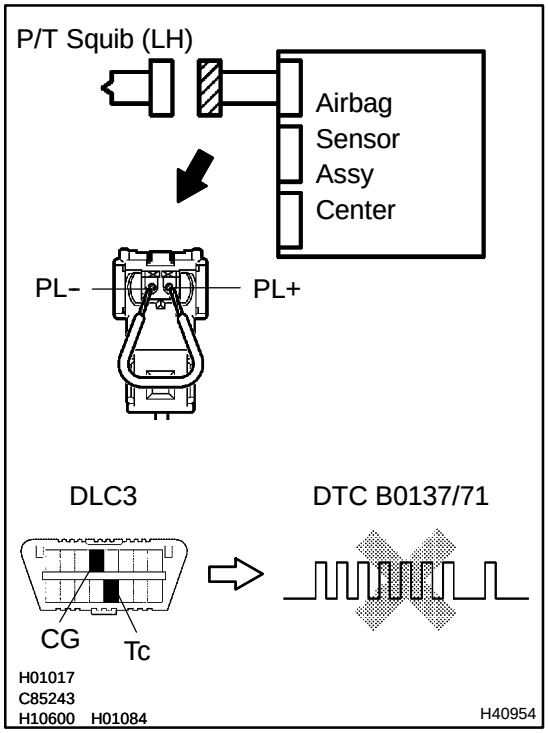
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (LH).
(c) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assy center, measure the resistance between PL+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Connect the connector to the airbag sensor assy center.
(b) Using a service wire, connect PL+ and PL- of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B0137/71 is not output.

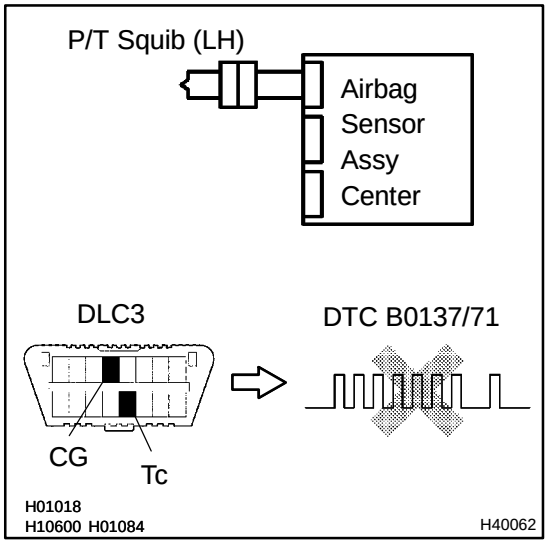
HINT:
Codes other than code B0137/71 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P/T SQUIB (LH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0137/71 is not output.

HINT:

Codes other than code B0137/71 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY LH**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC B0138/72 SHORT IN P/T SQUIB (LH) CIRCUIT (TO B+)

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assy center and seat belt pretensioner (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
DTC B0138/72 is recorded when a B+ short is detected in the P/T squib (LH) circuit.

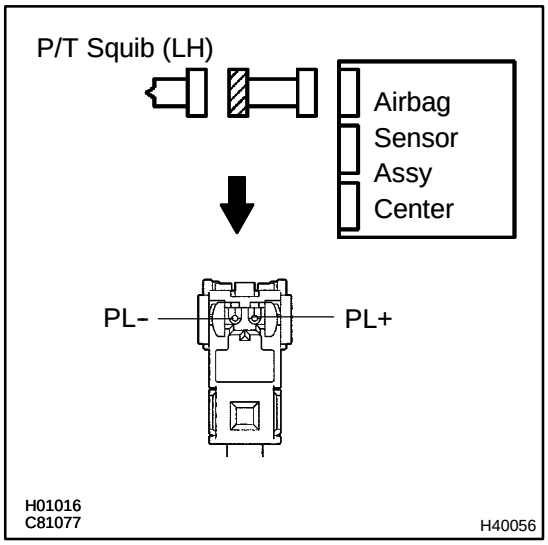
DTC No.	DTC Detecting Condition	Trouble Area
B0138/72	S Short circuit in seat belt pretensioner (LH) wire harness (to B+) S P/T squib (LH) malfunction S Airbag sensor assy center malfunction	S Seat belt pretensioner (LH) S Airbag sensor assy center S Wire harness

WIRING DIAGRAM

See page 05-1019.

INSPECTION PROCEDURE

1	CHECK P/T SQUIB(LH) CIRCUIT(AIRBAG SENSOR ASSY CENTER - FRONT SEAT OUTER BELT ASSY LH)



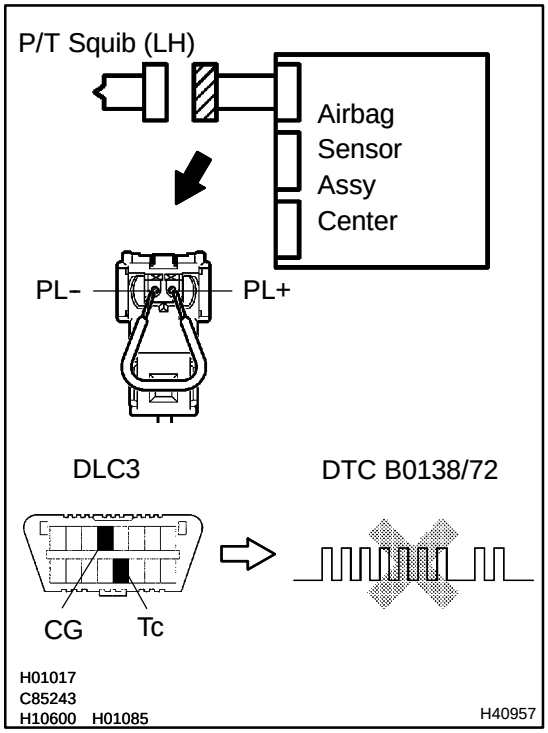
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the seat belt pretensioner (LH).
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assy center, measure the voltage between PL+ and body ground.
OK:
Voltage: Below 1 V

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - FRONT SEAT AIRBAG ASSY LH)**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Disconnect the negative (-) terminal cable from the battery and wait at least for 90 seconds.
(b) Connect the connector to the airbag sensor assy center.
(c) Using a service wire, connect PL+ and PL- of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assy center.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).

OK:

DTC B0138/72 is not output.

HINT:

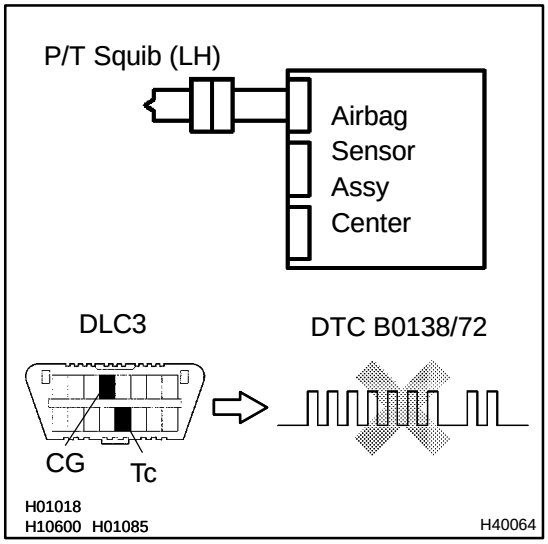
Codes other than code B0138/72 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK P/T SQUIB (LH)

SST 09843-18040



(a) Turn the ignition switch to LOCK.
(b) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Clear the DTC stored in memory (See page 05-942).
(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(h) Turn the ignition switch to ON, and wait at least for 20 seconds.
(i) Check the DTC (See page 05-942).
OK:
DTC B0138/72 is not output.

HINT:
Codes other than code B0138/72 may be output at this time, but they are not relevant to this check.

NG → **REPLACE FRONT SEAT OUTER BELT ASSY LH**

OK

4	USE SIMULATION METHOD TO CHECK

NG → **Go to step 1**

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC B1100/31 AIRBAG SENSOR ASSY MALFUNCTION

CIRCUIT DESCRIPTION

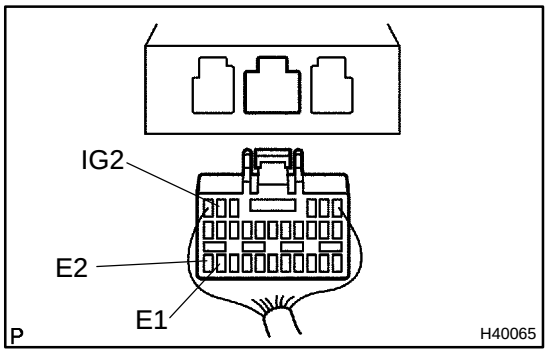
The airbag sensor assy center consists of a airbag sensor assy center, safing sensor, drive circuit, diagnosis circuit and ignition control, etc.
It receives signals from the airbag sensor, judges whether or not the SRS must be activated, and detects diagnosis system malfunction.
DTC B1100/31 is recorded when occurrence of a malfunction in the airbag sensor assy center is detected.

DTC No.	DTC Detecting Condition	Trouble Area
B1100/31	S Airbag sensor assy center malfunction	S Airbag sensor assy center

INSPECTION PROCEDURE

HINT:
When a malfunction code other than code B1100/31 is displayed at the same time, first repair the malfunction indicated by the malfunction code other than code B1100/31.

1 CHECK VOLTAGE AT IG2 OF AIRBAG SENSOR ASSY CENTER



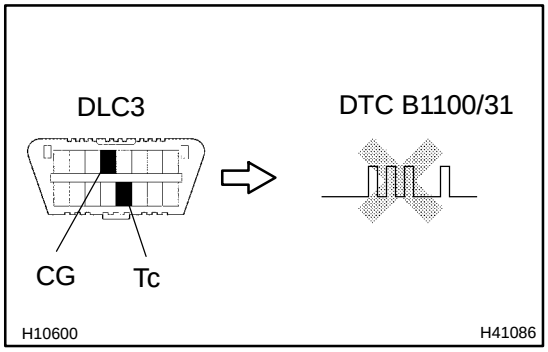
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors of all the SRS components.
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) Measure the voltage between body ground and terminal IG2 of the airbag sensor assy center connector.
Voltage: 10 - 14 V

NG → **CHECK THAT AN ABNORMALITY OCCURS ON THE BATTERY AND CHARGING SYSTEM**

OK

2 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the connectors of all the SRS components.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B1100/31 is not output.

HINT:
Codes other than code B1100/31 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

USE SIMULATION METHOD TO CHECK

DTC	B1135/24	HARF CONNECTION IN AIRBAG SENSOR ASSY CONNECTOR

CIRCUIT DESCRIPTION

The airbag sensor assy center detects partial connection of connector.
DTC B1135/24 is recorded when the airbag sensor assy center detects an open in the electrical connection check mechanism of the airbag sensor assy center connector or in the airbag sensor assy center circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1135/24	$ Malfunction of electrical connection check mechanism of airbag sensor assy center connector $ Airbag sensor assy center malfunction	$ Electrical connection check mechanism $ Airbag sensor assy center

INSPECTION PROCEDURE

1	CHECK AIRBAG SENSOR ASSY CENTER CONNECTOR

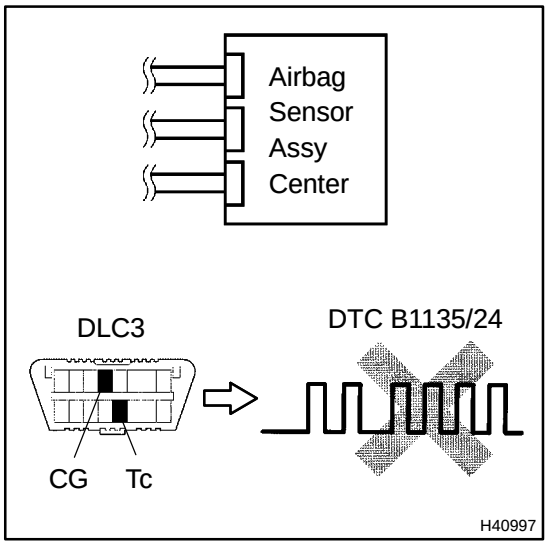
(a) Disconnect negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Check the connection of the airbag sensor assy center connectors.

NG → CONNECT CONNECTORS

OK

2	CHECK AIR BAG SENSOR ASSY CENTER

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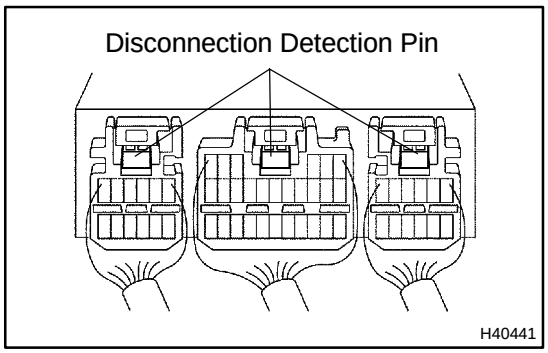
(a) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(b) Turn the ignition switch to ON, and wait at least for 60 seconds.
(c) Clear the DTC stored in memory (See page 05-942).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page 05-942).
OK:
DTC B1135/24 is not output.

HINT:
Codes other than code B1135/24 may be output at this time, but they are not relevant to this check.

OK → USE SIMULATION METHOD TO CHECK

NG

3	CHECK PERFORM A VISUAL CHECK OF THE DISCONNECTION DETECTION PIN



(a) Disconnect the negative (–) terminal cable from the battery, and wait at least for 90 seconds.

(b) With 3 connectors connected to the airbag sensor assy center, place tester leads onto any 2 of 3 disconnection detection pins and check for continuity.

OK:

Continuity

NG → **REPAIR OR REPLACE AIRBAG SENSOR ASSEMBLY CONNECTOR**

OK

REPLACE AIR BAG SENSOR ASSY CENTER

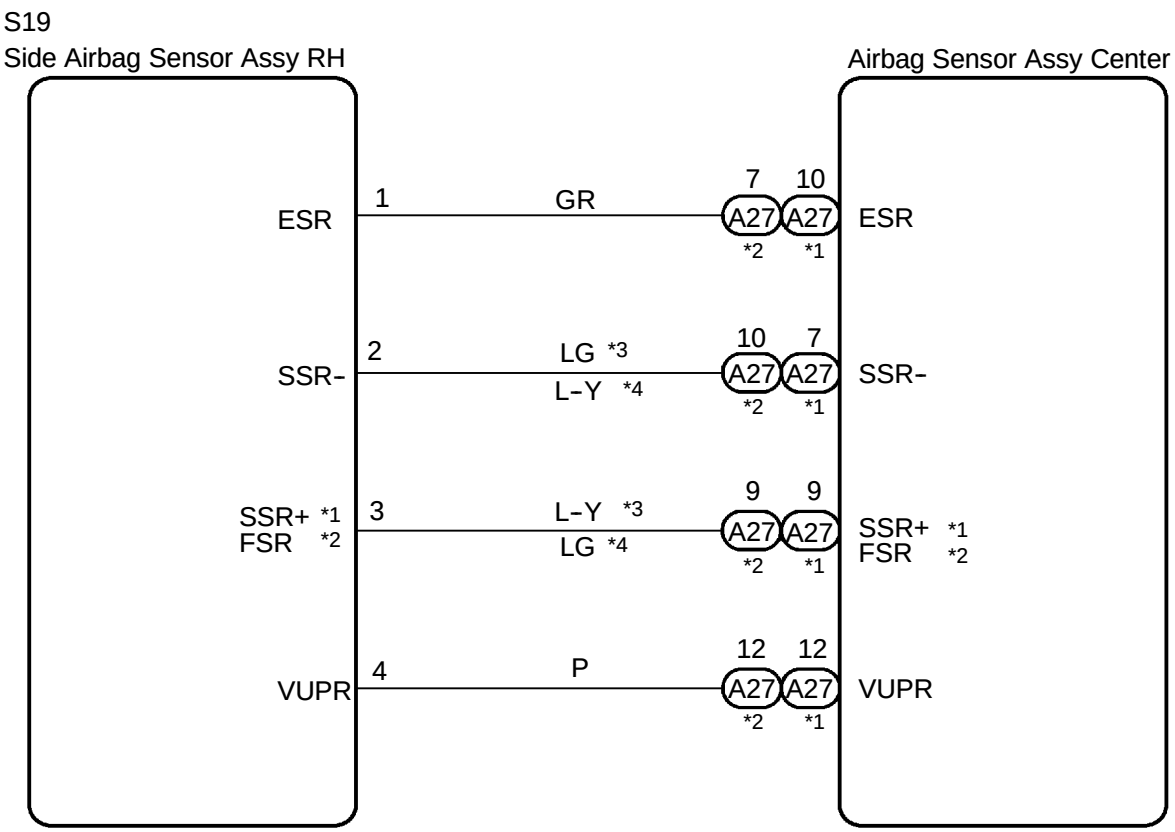
DTC	B1140/32	SIDE AIRBAG SENSOR ASSY (RH) MALFUNCTION

CIRCUIT DESCRIPTION

The side airbag sensor assy RH consists of the safing sensor, diagnosis circuit and lateral deceleration sensor, etc.
It receives signals from the lateral deceleration sensor, judges whether or not the SRS must be activated, and detects diagnosis system malfunction.
DTC B1140/32 is recorded when occurrence of a malfunction in the side airbag sensor assy RH is detected.

DTC No.	DTC Detecting Condition	Trouble Area
B1140/32	S Side airbag sensor assy RH malfunction	S Side airbag sensor assy RH S Airbag sensor assy center S Wire harness

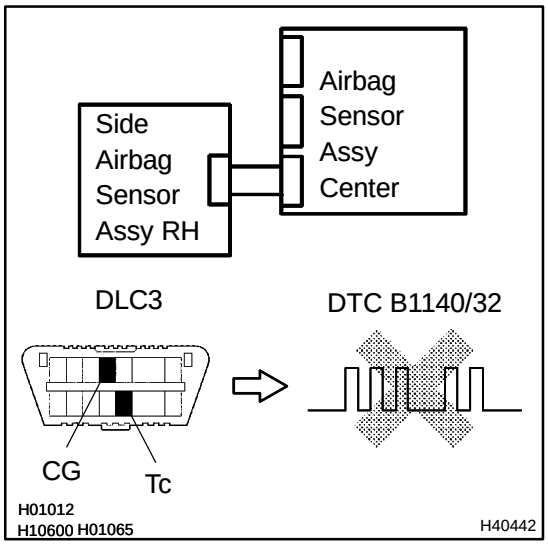
WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK SIDE AIR BAG SENSOR ASSY RH

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(a) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page 05-942).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page 05-942).
OK:
DTC B1140/32 is not output.

HINT:
Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

OK	USE SIMULATION METHOD TO CHECK

NG

2	CHECK AIRBAG SENSOR ASSY CENTER CONNECTOR

(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Check that the connector is properly connected to the airbag sensor assy center.

NG	CONNECT CONNECTORS

OK

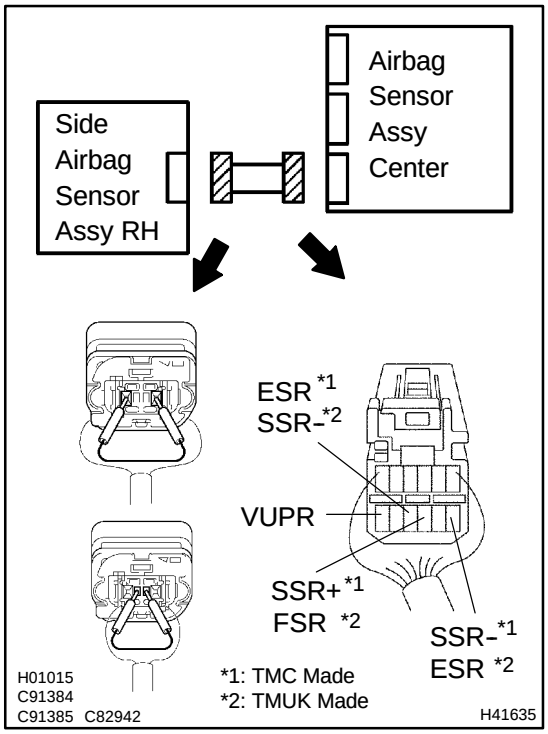
3	CHECK SIDE AIRBAG SENSOR ASSY CONNECTOR

(a) Check that the connector is properly connected to the side airbag sensor assy RH.

NG	CONNECT CONNECTORS

OK

4	CHECK SIDE AIRBAG SENSOR ASSY(RH) CIRCUIT(OPEN)(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY RH)



(a) Disconnect the connectors between the airbag sensor assy center and the side airbag sensor assy RH.

(b) TMC Made:
Using a service wire, connect the terminals of connector, between VUPR and ESR, and between SSR+ and SSR-.

(c) TMUK Made:
Using a service wire, connect the terminals of connector, between VUPR and ESR, and between FSR and SSR-.

(d) TMC Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy RH and the airbag sensor assy center, measure the resistance between VUPR and ESR, and between SSR+ and SSR-.

(e) TMUK Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy RH and the airbag sensor assy center, measure the resistance between VUPR and ESR, and between FSR and SSR-.

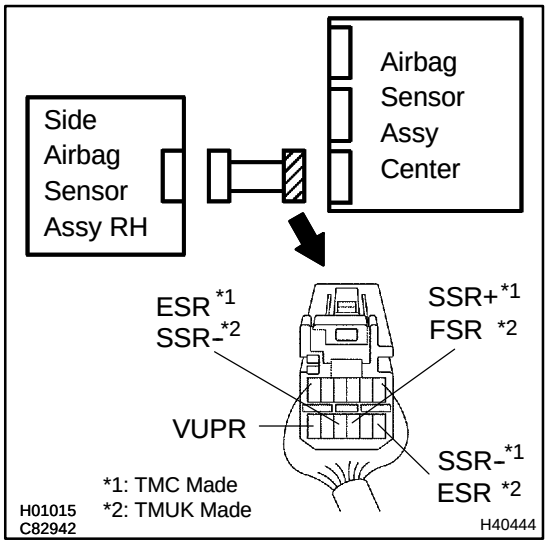
OK:

Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY RH)**

OK

5	CHECK SIDE AIRBAG SENSOR ASSY(RH) CIRCUIT(TO GROUND)(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY RH)



(a) TMC Made:
Disconnect the connection between VUPR and ESR, and between SSR+ and SSR-.

(b) TMUK Made:
Disconnect the connection between VUPR and ESR, and between FSR and SSR-.

(c) TMC Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy RH and the airbag sensor assy center, measure the resistance between each terminal of VUPR, SSR- and SSR+, and body ground.

(d) TMUK Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy RH and the airbag sensor assy center, measure the resistance between each terminal of VUPR, SSR- and FSR, and body ground.

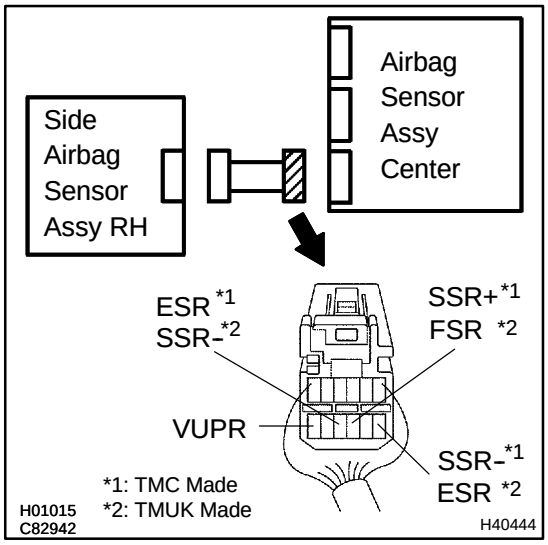
OK:

Resistance: 1MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY RH)**

OK

6	CHECK SIDE AIRBAG SENSOR ASSY(RH) CIRCUIT(TO B+)(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY RH)



(a) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.

(b) TMC Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy RH and the airbag sensor assy center, measure the voltage between each terminal of VUPR, SSR- and SSR+, and body ground.

(c) TMUK Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy RH and the airbag sensor assy center, measure the voltage between each terminal of VUPR, SSR- and FSR, and body ground.

OK:

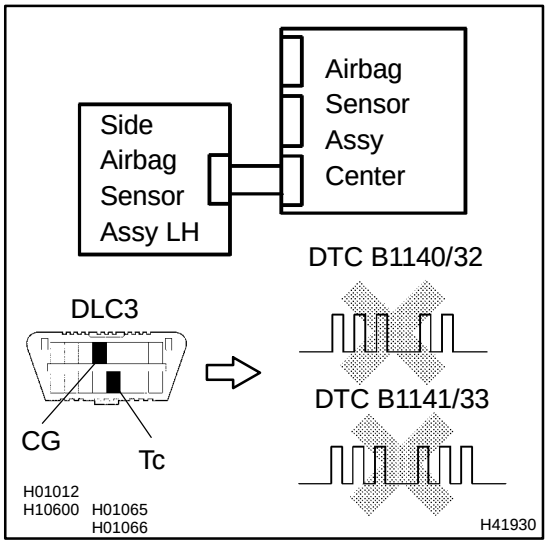
Voltage: Below 1 V

NG	REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY RH)

OK

7	CHECK SIDE AIR BAG SENSOR ASSY RH

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(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.

(b) Connect the airbag sensor assy center connector.

(c) Interchange the side airbag sensor assy RH and LH and connect the connector.

(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.

(e) Turn the ignition switch to ON, and wait at least for 20 seconds.

(f) Clear the DTC stored in memory (See page 05-942).

(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(h) Turn the ignition switch to ON, and wait at least for 20 seconds.

(i) Check the DTC (See page 05-942).

(A): DTC B1140/32 is not output.

(B): DTC B1141/33 is not output.

NG(A)	REPLACE AIR BAG SENSOR ASSY CENTER

NG(B)	REPLACE SIDE AIR BAG SENSOR ASSY RH

OK

8	USE SIMULATION METHOD TO CHECK

NG → Go to step 1

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

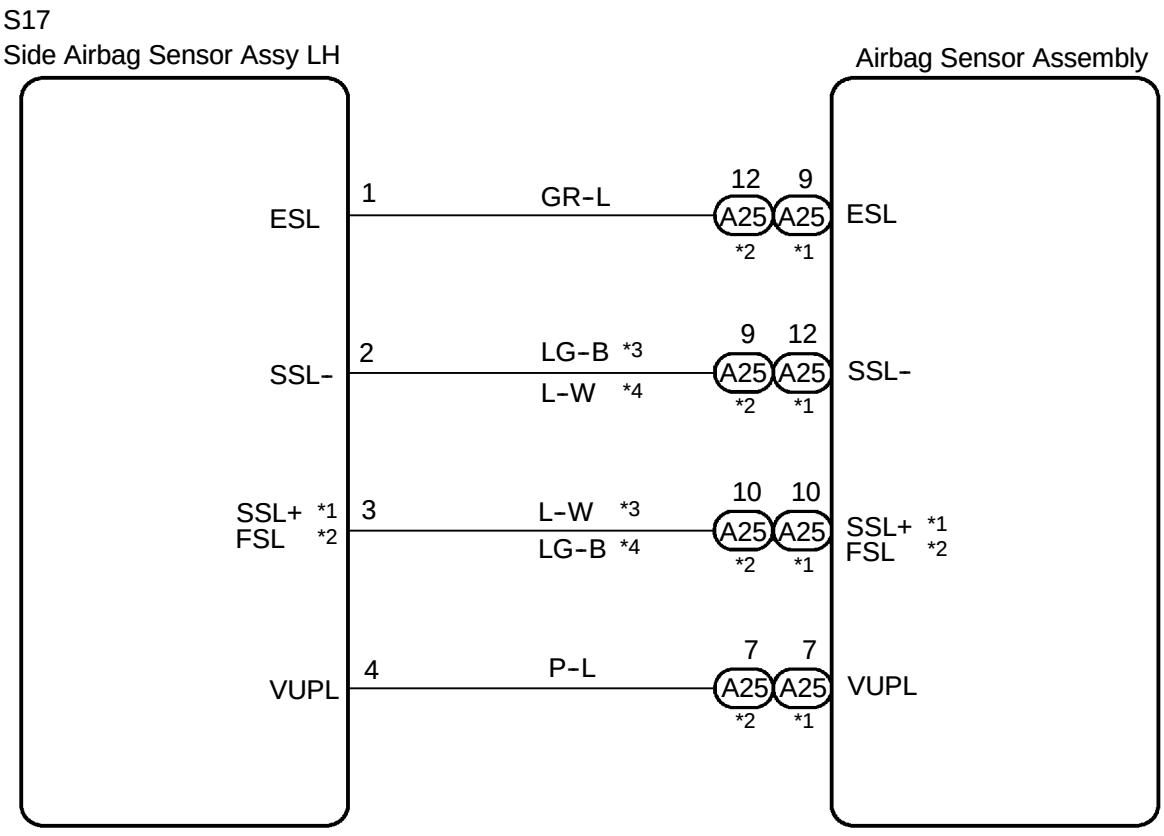
DTC	B1141/33	SIDE AIRBAG SENSOR ASSY (LH) MALFUNCTION

CIRCUIT DESCRIPTION

The side airbag sensor assy LH consists of the safing sensor, diagnosis circuit and lateral deceleration sensor, etc.
It receives signals from the lateral deceleration sensor, judges whether or not the SRS must be activated, and detects diagnosis system malfunction.
DTC B1141/33 is recorded when occurrence of a malfunction in the side airbag sensor assy LH is detected.

DTC No.	DTC Detecting Condition	Trouble Area
B1141/33	S Side airbag sensor assy LH malfunction	S Side airbag sensor assy LH S Airbag sensor assy center S Wire harness

WIRING DIAGRAM



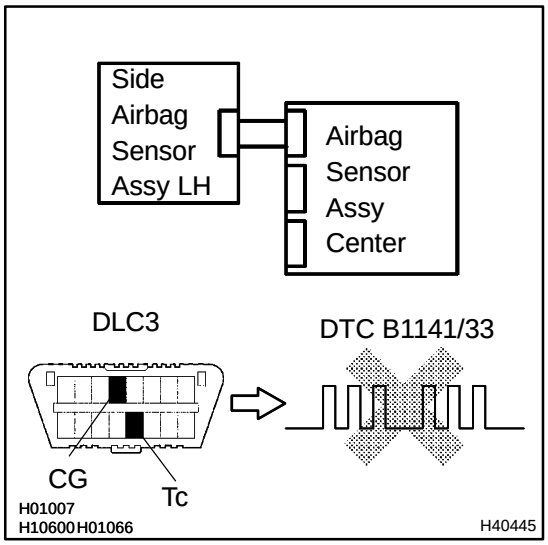
*1: TMC Made
*2: TMUK Made
*3: RHD TMC Made
*4: Except RHD TMC Made

H41907

INSPECTION PROCEDURE

1	CHECK SIDE AIR BAG SENSOR ASSY LH

SST 09843-18040



(a) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page 05-942).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page 05-942).
OK:
DTC B1141/33 is not output.

HINT:
Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

OK	USE SIMULATION METHOD TO CHECK

NG

2	CHECK AIRBAG SENSOR ASSY CENTER CONNECTOR

(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Check that the connector is properly connected to the airbag sensor assy center.

NG	CONNECT CONNECTORS

OK

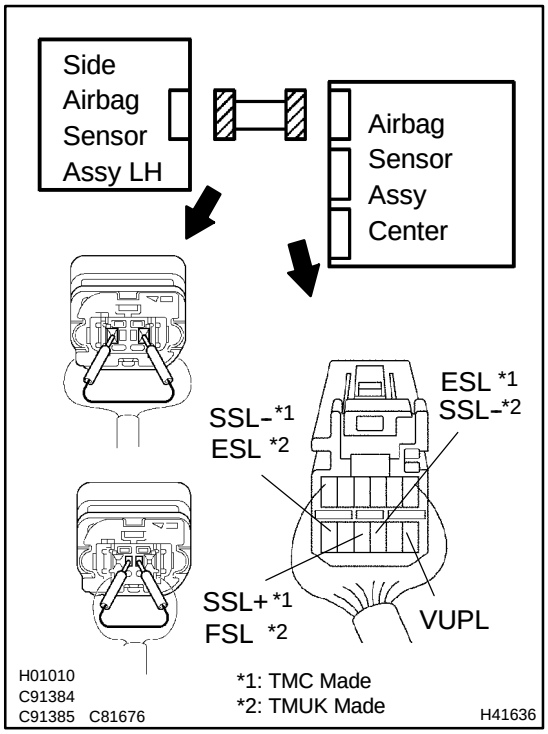
3	CHECK SIDE AIRBAG SENSOR ASSY CONNECTOR

(a) Check that the connector is properly connected to the side airbag sensor assy LH.

NG	CONNECT CONNECTORS

OK

4	CHECK SIDE AIRBAG SENSOR ASSY(LH) CIRCUIT(OPEN)(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY LH)



(a) Disconnect the connectors between the airbag sensor assy center and the side airbag sensor assy LH.

(b) TMC Made:
Using a service wire, connect the terminals of connector, between VUPL and ESL, and between SSL+ and SSL-.

(c) TMUK Made:
Using a service wire, connect the terminals of connector, between VUPL and ESL, and between FSL and SSL-.

(d) TMC Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy LH and the airbag sensor assy center, measure the resistance between VUPL and ESL, and between SSL+ and SSL-.

(e) TMUK Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy LH and the airbag sensor assy center, measure the resistance between VUPL and ESL, and between FSL and SSL-.

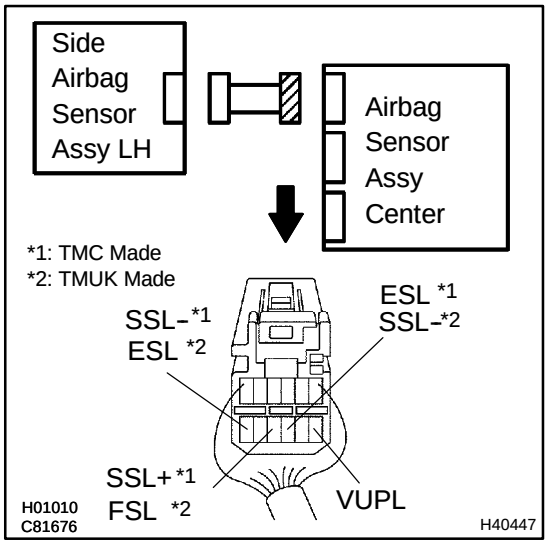
OK:

Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY LH)**

OK

5	CHECK SIDE AIRBAG SENSOR ASSY(LH) CIRCUIT(TO GROUND)(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY LH)



(a) TMC Made:
Disconnect the connection between VUPL and ESL, and between SSR+ and SSL-.

(b) TMUK Made:
Disconnect the connection between VUPL and ESL, and between FSL and SSL-.

(c) TMC Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy LH and the airbag sensor assy center, measure the resistance between each terminal of VUPL, SSL- and SSL+, and body ground.

(d) TMUK Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy LH and the airbag sensor assy center, measure the resistance between each terminal of VUPL, SSL- and FSL, and body ground.

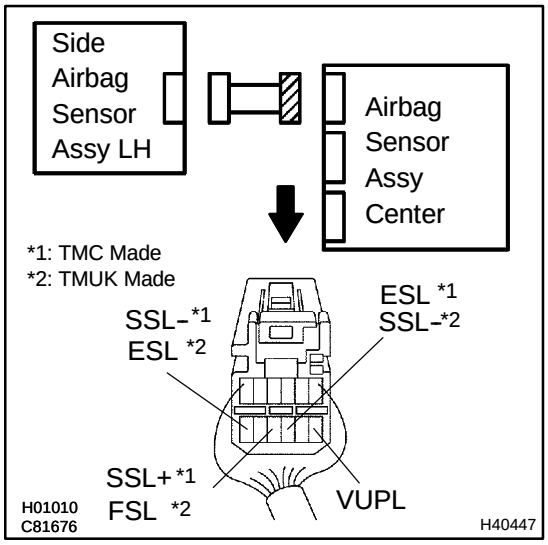
OK:

Resistance: 1MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY LH)**

OK

6	CHECK SIDE AIRBAG SENSOR ASSY(LH) CIRCUIT(TO B+)(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY LH)



(a) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.

(b) TMC Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy LH and the airbag sensor assy center, measure the voltage between each terminal of VUPL, SSL- and SSL+, and body ground.

(c) TMUK Made:
For the connector (on the airbag sensor assy center side) between the side airbag sensor assy LH and the airbag sensor assy center, measure the voltage between each terminal of VUPL, SSL- and FSL, and body ground.

OK:

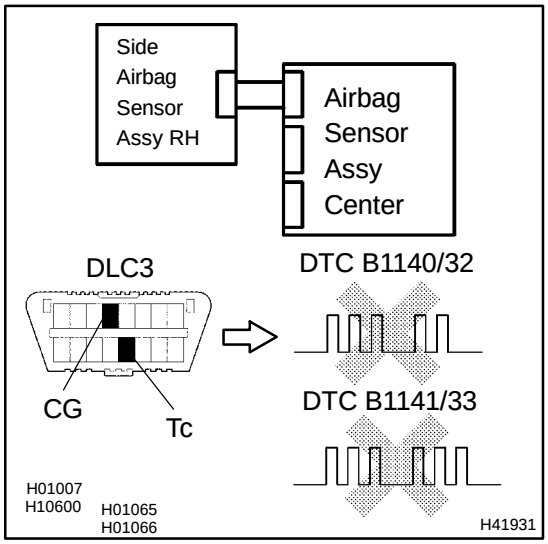
Voltage: Below 1 V

NG	REPAIR OR REPLACE WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - SIDE AIRBAG SENSOR ASSY LH)

OK

7	CHECK SIDE AIR BAG SENSOR ASSY LH

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(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.

(b) Connect the airbag sensor assy center connector.

(c) Interchange the side airbag sensor assy RH and LH and connect the connector.

(d) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.

(e) Turn the ignition switch to ON, and wait at least for 20 seconds.

(f) Clear the DTC stored in memory (See page 05-942).

(g) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(h) Turn the ignition switch to ON, and wait at least for 20 seconds.

(i) Check the DTC (See page 05-942).

(A): DTC B1140/32 is not output.

(B): DTC B1141/33 is not output.

NG(A)	REPLACE SIDE AIR BAG SENSOR ASSY LH

NG(B)	REPLACE AIR BAG SENSOR ASSY CENTER

OK

8	USE SIMULATION METHOD TO CHECK

NG → Go to step 1

OK

REPLACE ALL SRS COMPONENTS INCLUDING THE WIRE HARNESS

DTC	B1156/15	FRONT AIRBAG SENSOR (RH) MALFUNCTION

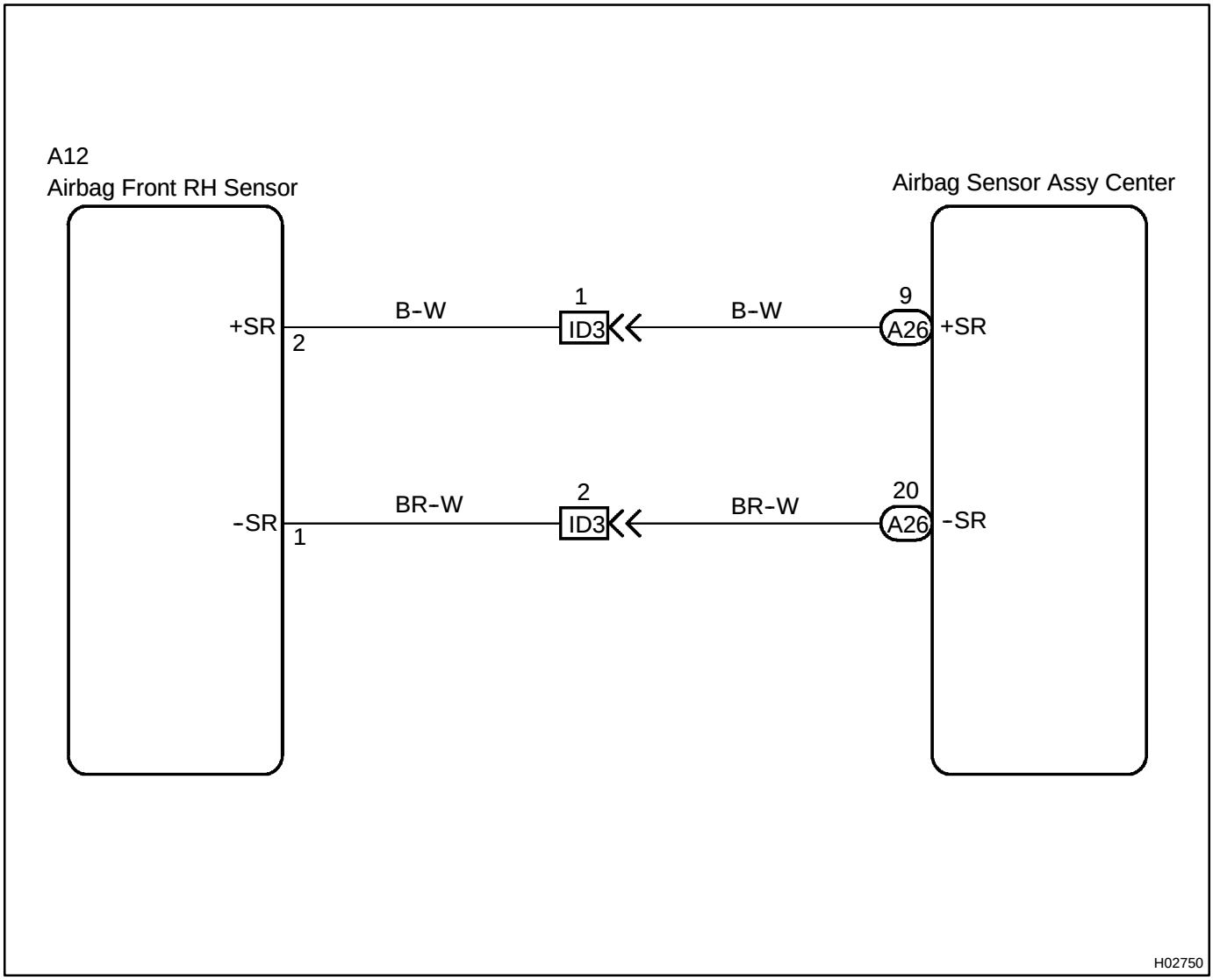
DTC	B1157/15	FRONT AIRBAG SENSOR (RH) MALFUNCTION

CIRCUIT DESCRIPTION

The airbag front RH sensor circuit consists of the airbag sensor assy center and airbag front RH sensor. DTC B1156/B1157/15 is recorded when a malfunction is detected in the airbag front RH sensor circuit.

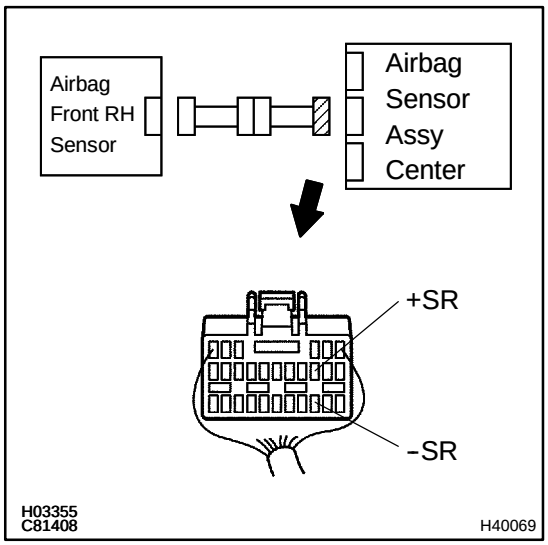
DTC No.	DTC Detecting Condition	Trouble Area
B1156/B1157/15	S Airbag front RH sensor malfunction	S Airbag front RH sensor S Airbag sensor assy center S Instrument panel wire S Engine room main wire

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK FRONT AIRBAG SENSOR (RH) CIRCUIT (TO B+)(AIRBAG SENSOR ASSY CENTER - AIRBAG FRONT RH SENSOR)



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the airbag front RH sensor.
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) For the connector (on the airbag sensor assy center side) between the airbag front RH sensor and the airbag sensor assy center, measure the voltage between body ground and each of +SR and -SR.

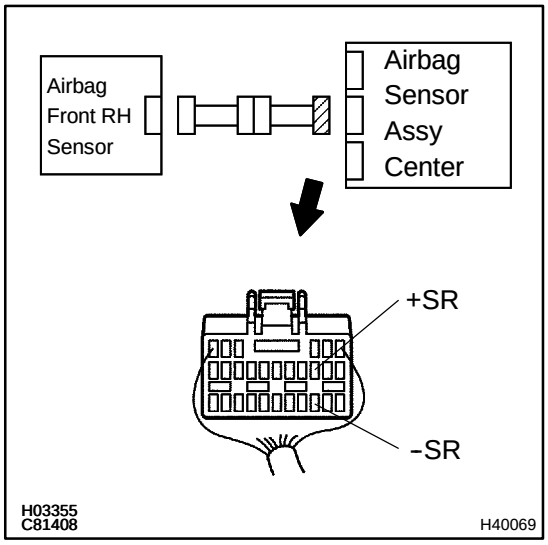
OK:

Voltage: Below 1 V

NG → Go to step 6

OK

2	CHECK FRONT AIRBAG SENSOR (RH) CIRCUIT (TO GROUND)(AIRBAG SENSOR ASSY - AIRBAG FRONT RH SENSOR)



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) For the connector (on the airbag sensor assy center side) between the airbag front RH sensor and the airbag sensor assy center, measure the resistance between body ground and each of +SR and -SR.

OK:

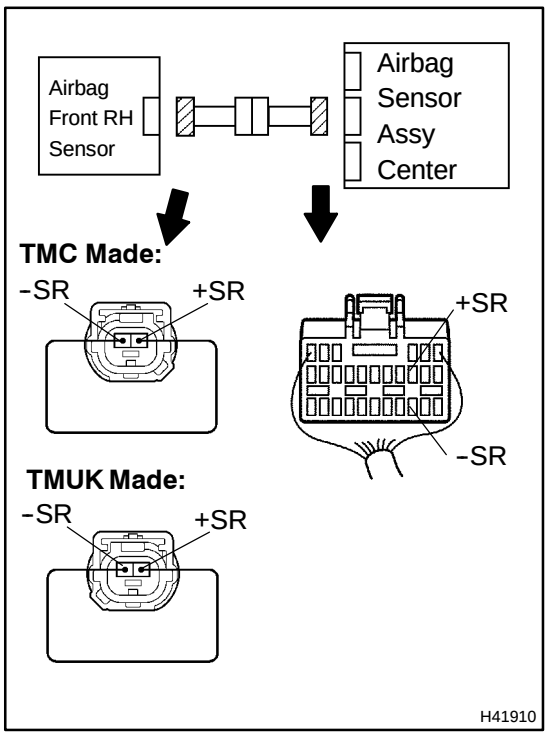
Resistance: 1 MΩ or Higher

NG → Go to step 7

OK

3	CHECK FRONT AIRBAG SENSOR (RH) CIRCUIT(OPEN)(AIRBAG SENSOR ASSY CENTER - AIRBAG FRONT RH SENSOR)

SST 09843-18040



(a) Using a service wire, connect +SR and -SR of the connector (on the airbag front RH sensor side) between the airbag sensor assy center and the airbag front RH sensor.

(b) For the connector (on the airbag sensor assy center side) between the airbag front RH sensor and the airbag sensor assy center, measure the resistance between +SR and -SR.

OK:

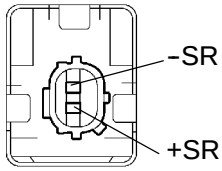
Resistance: Below 1 Ω

NG	Go to step 8

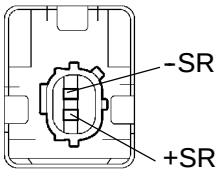
OK

4	INSPECT AIR BAG FRONT RH SENSOR

TMC Made:



TMUK Made:



H41786
H41787
H41905

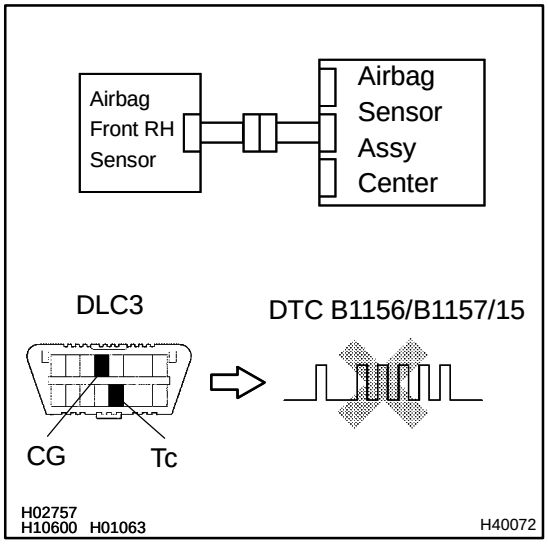
(a) For the connector of the airbag front RH sensor, measure the resistance between +SR and -SR.
OK:
Resistance: 820 Ω

NG → **REPLACE AIR BAG FRONT RH SENSOR**

OK

5 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the airbag front RH sensor connector and airbag sensor assy center connector.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).
OK:
DTC B1156/B1157/15 is not output.

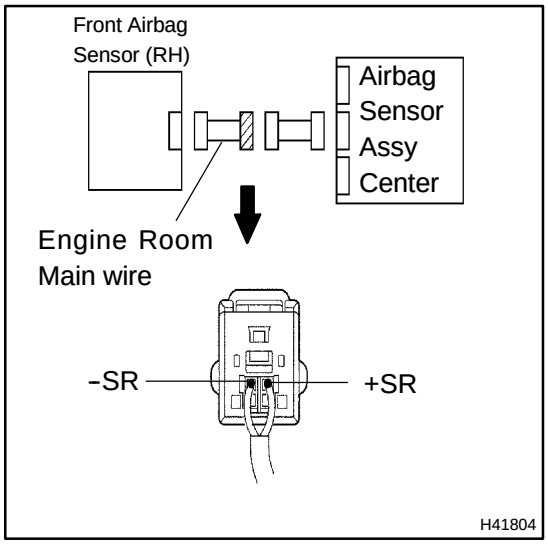
HINT:
Codes other than code B1156/B1157/15 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

USE SIMULATION METHOD TO CHECK

6	CHECK ENGINE ROOM MAIN WIRE HARNESS (TO B+)(CONNECTOR - AIRBAG FRONT RH SENSOR)



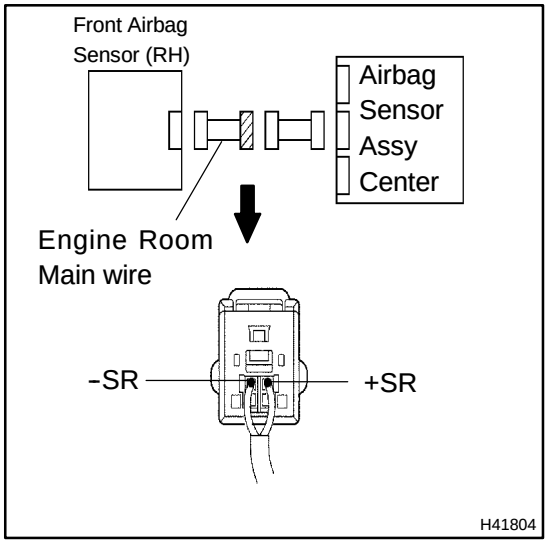
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connector between the engine room main wire and the instrument panel wire.
(c) Connect negative (-)terminal cable to the battery.
(d) Turn the ignition switch to ON, and wait at least for 60 seconds.
(e) For the connector (on the engine room main wire side) between the airbag sensor assy center and the engine room main wire, measure the voltage between body ground and each of +SR and -SR.
OK:
Voltage: Below 1 V

NG → **REPAIR OR REPLACE ENGINE ROOM MAIN WIRE**

OK

REPAIR OR REPLACE INSTRUMENT PANEL WIRE

7	CHECK ENGINE ROOM MAIN WIRE HARNESS (TO GROUND)(CONNECTOR - AIRBAG FRONT RH SENSOR)



(a) Disconnect the connector between the engine room main wire and the instrument panel wire.
(b) For the connector (on the engine room main wire side) between the airbag sensor assy center and the engine room main wire, measure the resistance between body ground and each of +SR and -SR.
OK:
Resistance: 1 MΩ or Higher

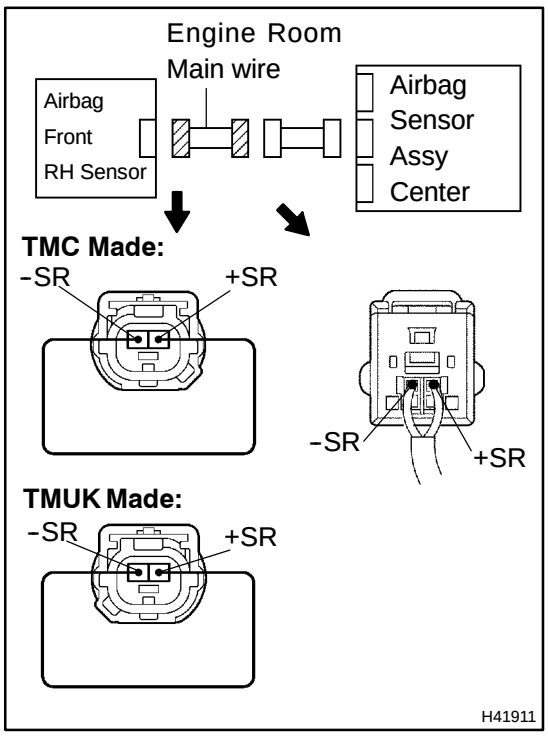
NG → **REPAIR OR REPLACE ENGINE ROOM MAIN WIRE**

OK

REPAIR OR REPLACE INSTRUMENT PANEL WIRE

8	CHECK ENGINE ROOM MAIN WIRE HARNESS(OPEN)(CONNECTOR - AIRBAG FRONT RH SENSOR)

SST 09843-18040



(a) Disconnect the connector between the engine room main wire and the instrument panel wire.

(b) Using a service wire, connect +SR and -SR of the connector (on the airbag front RH sensor side) between the engine room main wire and the airbag front RH sensor.

(c) For the connector (on the engine room main wire side) between the airbag sensor assy center and the engine room main wire, measure the resistance between the +SR and -SR.

OK:

Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE ENGINE ROOM MAIN WIRE**

OK →

REPAIR OR REPLACE INSTRUMENT PANEL WIRE

DTC	B1158/16	FRONT AIRBAG SENSOR (LH) MALFUNCTION

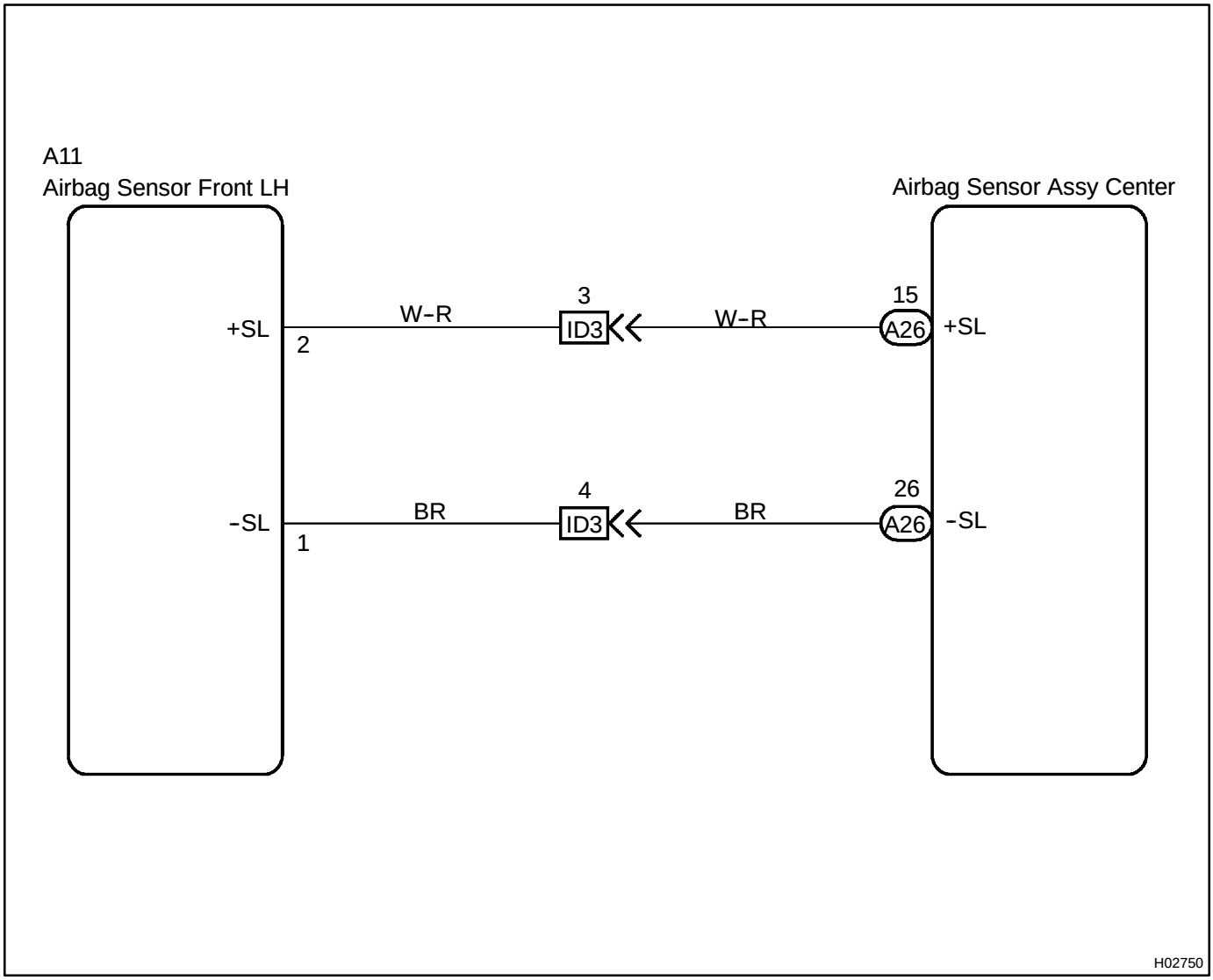
DTC	B1159/16	FRONT AIRBAG SENSOR (LH) MALFUNCTION

CIRCUIT DESCRIPTION

The airbag sensor front LH circuit consists of the airbag sensor assy center and airbag sensor front LH. DTC B1158/B1159/16 is recorded when malfunction is detected in the airbag sensor front LH circuit.

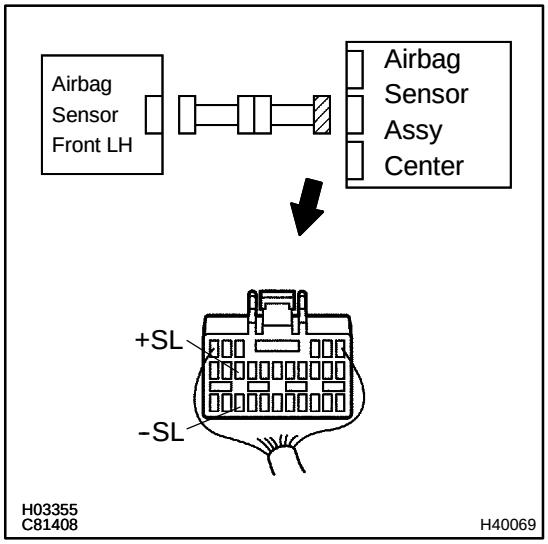
DTC No.	DTC Detecting Condition	Trouble Area
B1158/B1159/16	S Airbag sensor front LH malfunction	S Airbag sensor front LH S Airbag sensor assy center S Instrument panel wire S Engine room main wire

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK FRONT AIRBAG SENSOR (LH) CIRCUIT (TO B+)(AIRBAG SENSOR ASSY CENTER - AIRBAG SENSOR FRONT LH)

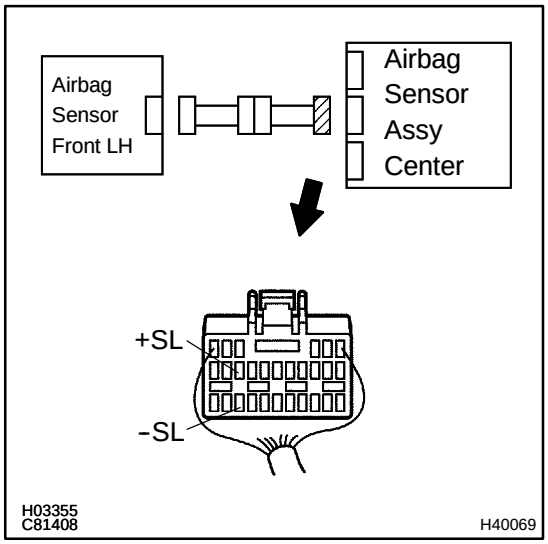


(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connectors between the airbag sensor assy center and the airbag sensor front LH.
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) For the connector (on the airbag sensor assy center side) between the airbag sensor front LH and the airbag sensor assy center, measure the voltage between body ground and each of +SL and -SL.
OK:
Voltage: Below 1 V

NG → **Go to step 6**

OK

2	CHECK FRONT AIRBAG SENSOR(LH) CIRCUIT(TO GROUND)(AIRBAG SENSOR ASSY CENTER - AIRBAG SENSOR FRONT LH)



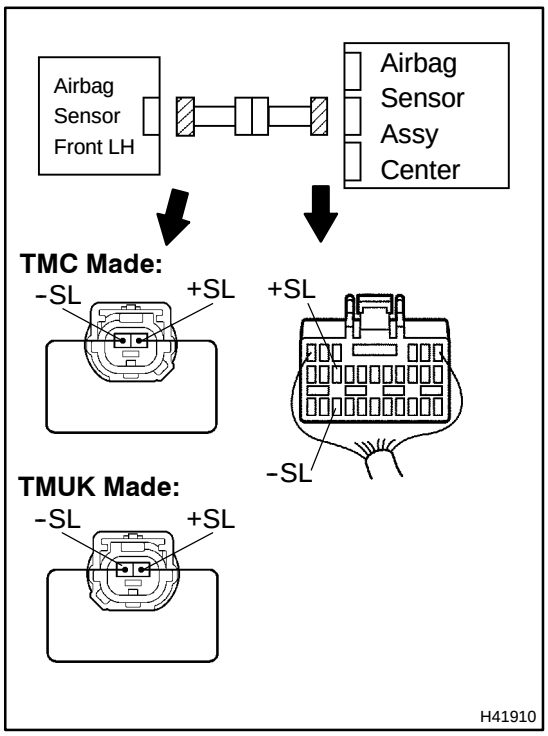
(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) For the connector (on the airbag sensor assy center side) between the airbag sensor front LH and the airbag sensor assy center, measure the resistance between body ground and each of +SL and -SL.
OK:
Resistance: 1 MΩ or Higher

NG → **Go to step 7**

OK

3	CHECK FRONT AIRBAG SENSOR (LH) CIRCUIT(OPEN)(AIRBAG SENSOR ASSY CENTER - AIRBAG SENSOR FRONT LH)

SST 09843-18040



(a) Using a service wire, connect +SL and -SL of the connector (on the airbag sensor front LH side) between the airbag sensor assy center and the airbag sensor front LH.

(b) For the connector (on the airbag sensor assy center side) between the airbag sensor front LH and the airbag sensor assy center, measure the resistance between +SL and -SL.

OK:

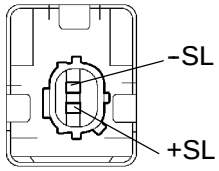
Resistance: Below 1 Ω

NG → **Go to step 8**

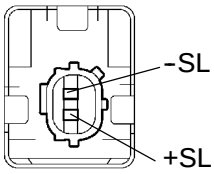
OK

4	INSPECT AIR BAG SENSOR FRONT LH

TMC Made:



TMUK Made:



H41786
H41787
H41905

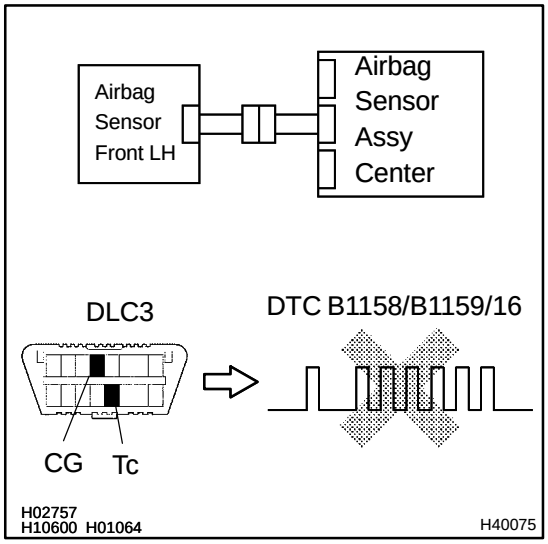
(a) For the connector of the airbag sensor front LH, measure the resistance between +SL and -SL.
OK:
Resistance: 820 Ω

NG → **REPLACE AIR BAG SENSOR FRONT LH**

OK

5 CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Connect the airbag sensor front LH connector and airbag sensor assy center connector.
(c) Connect the negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).

OK:

DTC B1158/B1159/16 is not output.

HINT:

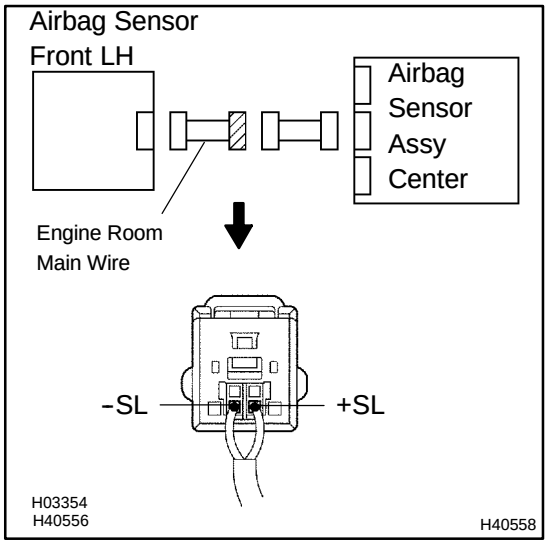
Codes other than code B1158/B1159/16 may be output at this time, but they are not relevant to this check.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

USE SIMULATION METHOD TO CHECK

6	CHECK ENGINE ROOM MAIN WIRE HARNESS (TO B+)(CONNECTOR - AIRBAG SENSOR FRONT LH)



(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connector between the engine room main wire and the instrument panel wire.
(c) Connect the negative (-) terminal to the battery.
(d) Turn the ignition switch to ON, and wait at least for 60 seconds.
(e) For the connector (on the engine room main wire side) between the airbag sensor assy center and the engine room main wire, measure the voltage between body ground and each of +SL and -SL.

OK:

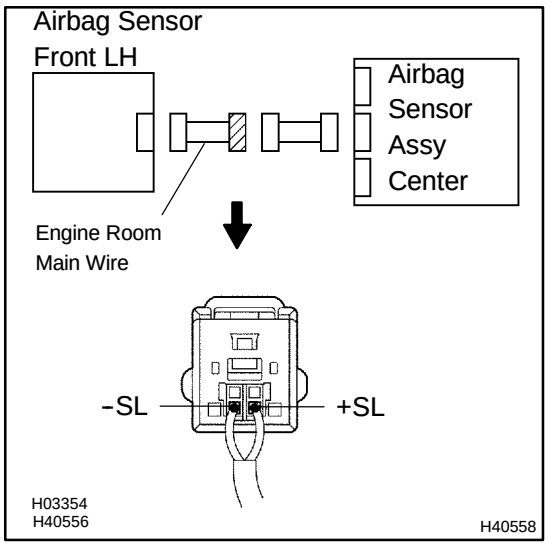
Voltage: Below 1 V

NG	REPAIR OR REPLACE ENGINE ROOM MAIN WIRE

OK

REPAIR OR REPLACE INSTRUMENT PANEL WIRE

7	CHECK ENGINE ROOM MAIN WIRE HARNESS (TO GROUND)(CONNECTOR - AIRBAG SENSOR FRONT LH)



(a) Disconnect the connector between the engine room main wire and the instrument panel wire.
(b) For the connector (on the engine room main wire side) between the airbag sensor assy center and the engine room main wire, measure the resistance between body ground and each of +SL and -SL.

OK:

Resistance: 1 MΩ or Higher

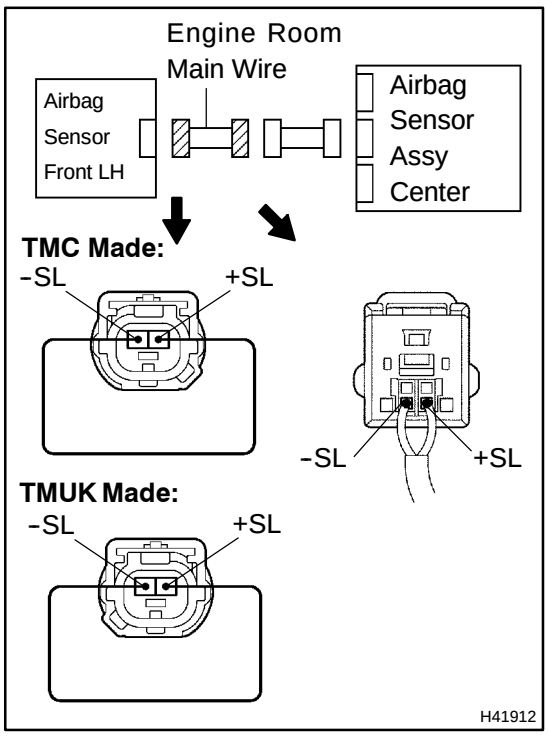
NG	REPAIR OR REPLACE ENGINE ROOM MAIN WIRE

OK

REPAIR OR REPLACE INSTRUMENT PANEL WIRE

8	CHECK ENGINE ROOM MAIN WIRE HARNESS(OPEN)(CONNECTOR - AIRBAG SENSOR FRONT LH)

SST 09843-18040



(a) Disconnect the connector between the engine room main wire and the instrument panel wire.

(b) Using a service wire, connect +SL and -SL of the connector (on the airbag sensor front LH side) between the engine room main wire harness and the airbag sensor front LH.

(c) For the connector (on the engine room main wire side) between the airbag sensor assy center and the engine room main wire, measure the resistance between +SL and -SL.

OK:

Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE ENGINE ROOM MAIN WIRE**

OK

REPAIR OR REPLACE INSTRUMENT PANEL WIRE

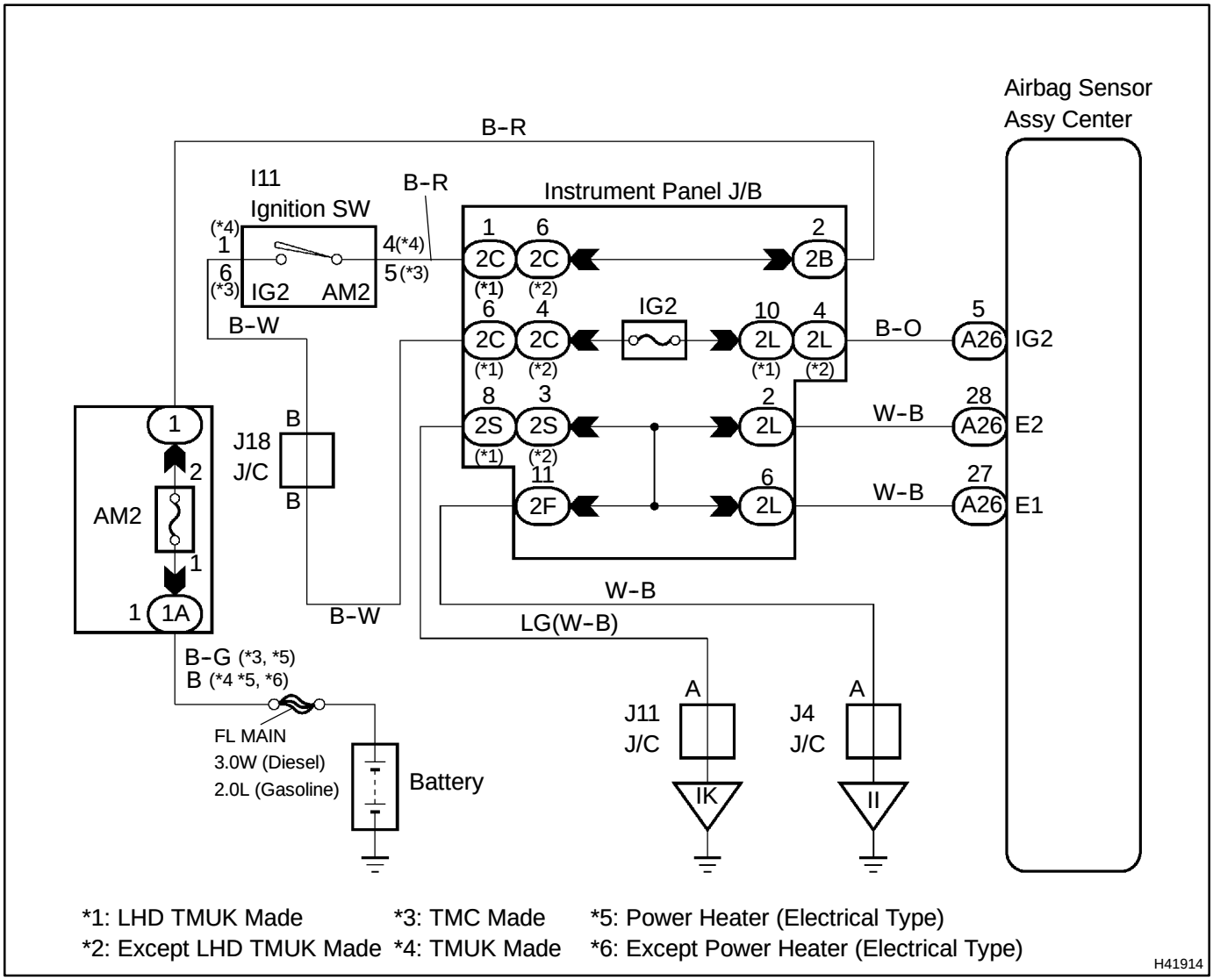
SOURCE VOLTAGE DROP

CIRCUIT DESCRIPTION

The SRS is equipped with a voltage-increase circuit (DC-DC converter) in the airbag sensor assy center in case the source voltage drops.
When the battery voltage drops, the voltage-increase circuit (DC-DC converter) functions to increase the voltage of the SRS to normal voltage.
The diagnosis system malfunction display for this circuit is different from other circuits that is when the SRS warning light remains lit up and the DTC is a normal code, source voltage drop is indicated.
Malfunction in this circuit is not recorded in the airbag sensor assy center, and the source voltage returns to normal, the SRS warning light automatically goes off.

DTC No.	Diagnosis
(Normal)	Source voltage drop

WIRING DIAGRAM



*1: LHD TMUK Made
*2: Except LHD TMUK Made
*3: TMC Made
*4: TMUK Made
*5: Power Heater (Electrical Type)
*6: Except Power Heater (Electrical Type)

H41914

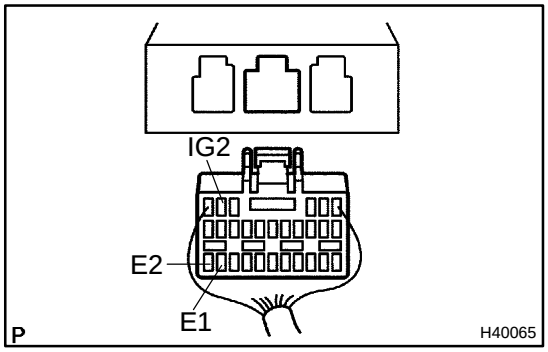
INSPECTION PROCEDURE

1	PREPARE FOR INSPECTION

(a) Disconnect negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Remove the horn button assy (See page 60-13).
(c) Disconnect the connector of the instr pnl pass l/door airbag assy (See page 60-25).
(d) Disconnect the connector of the front seat airbag assy RH and LH (See page 60-32).
(e) Disconnect the connector of the seat belt pretensioner RH and LH (See page 61-2 and 61-9).
(f) Disconnect the connectors of the airbag sensor assy center (See page 60-38).
(g) Disconnect the connector of the airbag front RH sensor and airbag sensor front LH (See page 60-40 and 60-42).
(h) Disconnect the connector of the side airbag sensor assy RH and LH (See page 60-44 and 60-46).

CAUTION:
Store the horn button assy, instr pnl pass l/door airbag assy and front seat airbag assy with the front surface facing upward.

2	CHECK SOURCE VOLTAGE



(a) Connect negative (-) terminal cable to the battery turn the ignition switch to ON, and at least for 60 seconds.
(b) Measure the voltage between body ground and IG2 on the sensor and operate electric system (defogger, wiper, headlight, heater blower, etc.).
OK:
Voltage: 10 - 14 V

NG → **REPAIR OR REPLACE HARNESS BETWEEN BATTERY AND AIRBAG SENSOR ASSY CENTER,AND CHARGING SYSTEM**

OK

3	CHECK SRS WARNING LIGHT TURN OFF

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the horn button assy connector.
(d) Connect the instr pnl pass l/door airbag assy connector.
(e) Connect the front seat airbag assy RH and LH connectors.
(f) Connect the seat belt pretensioner RH and LH connectors.
(g) Connect the airbag sensor assy center connectors.
(h) Connect the airbag front RH sensor and airbag sensor front LH connectors.
(i) Connect the side airbag sensor assy RH and LH connectors.
(j) Connect negative (-) terminal cable to the battery.
(k) Turn the ignition switch to ON, and wait at least for 60 seconds.
(l) Operate electric system (defogger, wiper, headlight, heater blower, etc.) and check that SRS warning light goes off.

OK:

SRS warning Light is not Lights up.

NG → **REPAIR OR REPLACE HARNESS BETWEEN BATTERY AND AIRBAG SENSOR ASSY CENTER,AND CHARGING SYSTEM**

OK

4	CHECK AIR BAG SENSOR ASSY CENTER

SST 09843-18040

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect negative (-) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Clear the DTC stored in memory (See page 05-942).
(f) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(g) Turn the ignition switch to ON, and wait at least for 20 seconds.
(h) Check the DTC (See page 05-942).

OK:

DTC is not output.

NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

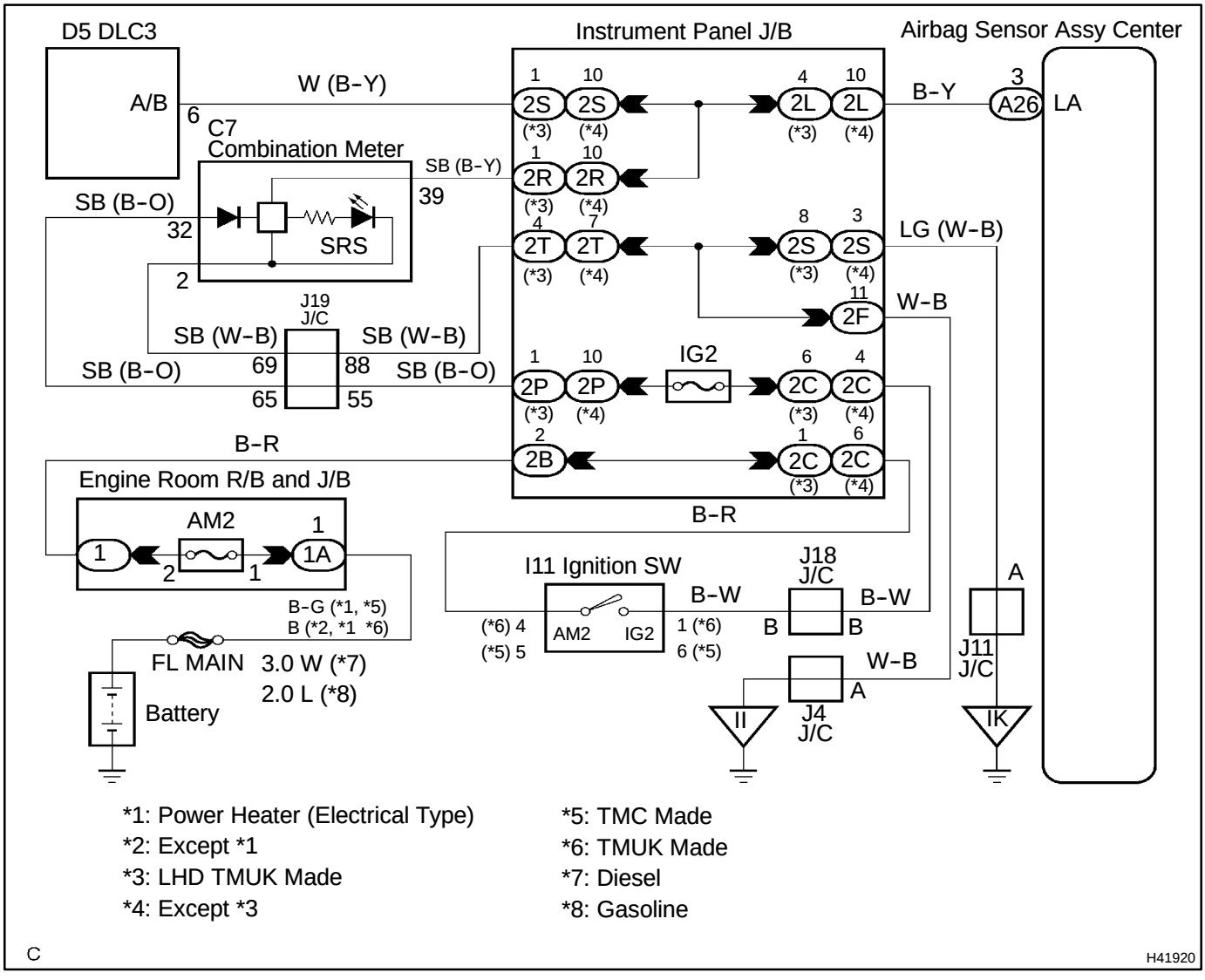
USE SIMULATION METHOD TO CHECK

SRS WARNING LIGHT CIRCUIT MALFUNCTION (ALWAYS LIGHT UP, WHEN IGNITION SWITCH IS LOCK POSITION.)

CIRCUIT DESCRIPTION

The SRS warning light is located on the combination meter.
When the SRS is normal, the SRS warning light lights up for approx. 6 seconds after the ignition switch is turned from the LOCK position to ON position, and then turns off automatically.
If there is a malfunction in the SRS, the SRS warning light lights up to inform the driver of the abnormality.
When terminals Tc and CG of the DLC3 are connected, the DTC is displayed by blinking the SRS warning light.

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: LHD TMUK Made
*4: Except *3
*5: TMC Made
*6: TMUK Made
*7: Diesel
*8: Gasoline

C
H41920

INSPECTION PROCEDURE

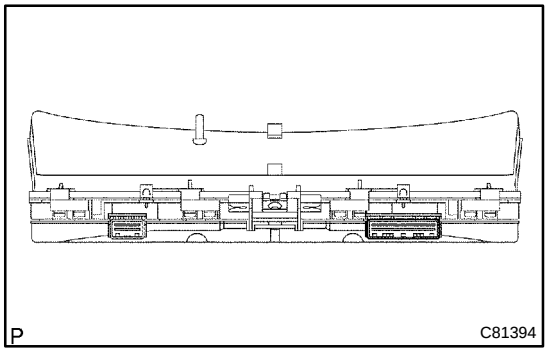
1	CHECK CONNECTOR

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(c) Disconnect the airbag sensor assembly connector.
(d) Connect negative (-) terminal cable to the battery.
(e) Check operation of SRS warning light.
OK:
The connectors are connected.

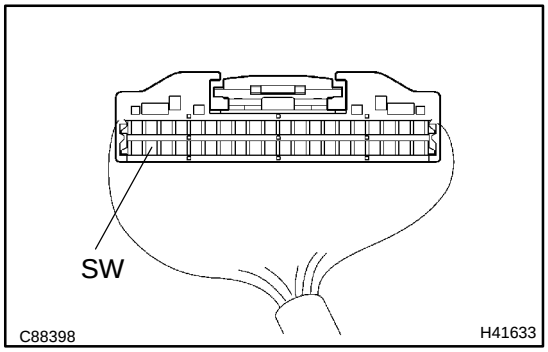
NG → **CONNECT CONNECTORS**

OK

2	CHECK COMBINATION METER ASSY



(a) Disconnect the connector from the combination meter.
(b) Connect negative (-) terminal cable to the battery, and turn the ignition switch to ON.

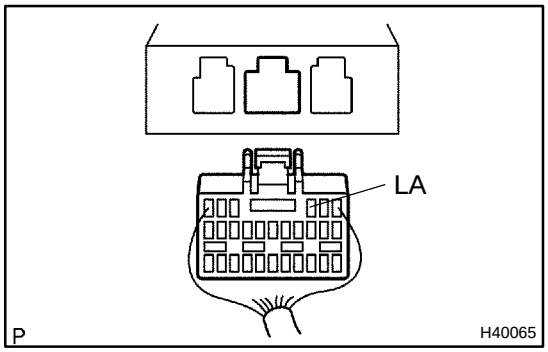


(c) Measure the resistance between SW and body ground.
OK:
Voltage: 8 V or Higher

NG → **REPAIR OR REPLACE COMBINATION METER ASSY**

OK

3	CHECK WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - COMBINATION METER ASSY)



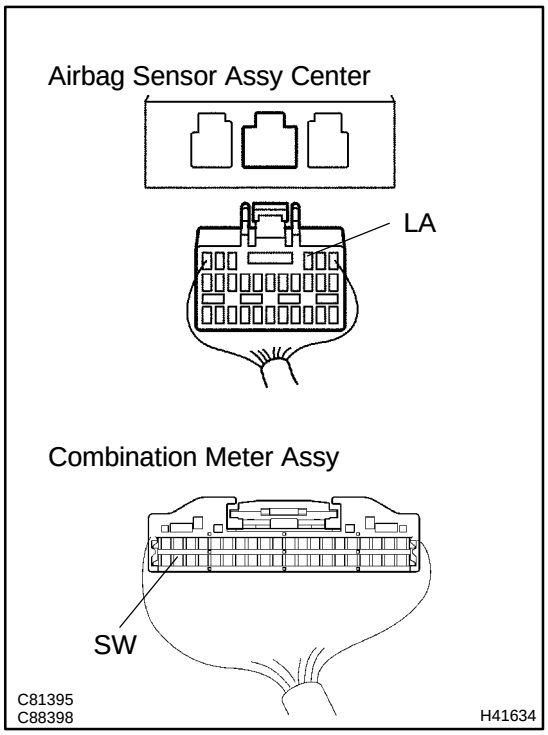
(a) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connector from the airbag sensor assembly.
(c) Measure the resistance between LA and body ground.
OK:
Resistance: 1MΩ or Higher

NG → **REPAIR OR REPLACE WIRE HERNESS (AIRBAG SENSOR ASSY CENTER - COMBINATION METER ASSY)**

OK

REPLACE AIR BAG SENSOR ASSY CENTER

4	CHECK WIRE HARNESS(AIRBAG SENSOR ASSY CENTER - COMBINATION METER ASSY)



(a) For the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the combination meter, measure the resistance between SW and LA.
OK:
Resistance: Below 1 Ω

NG → **REPAIR OR REPLACE WIRE HERNESS (AIRBAG SENSOR ASSY CENTER - COMBINATION METER ASSY)**

OK

REPLACE AIR BAG SENSOR ASSY CENTER

SRS WARNING LIGHT CIRCUIT MALFUNCTION (DOES NOT LIGHT UP, WHEN IGNITION SWITCH IS TURNED TO ACC OR ON)

CIRCUIT DESCRIPTION

The SRS warning light is located on the combination meter.
When the SRS is normal, the SRS warning light lights up for approx. 6 seconds after the ignition switch is turned from the LOCK position to ON position, and then turns off automatically.
If there is a malfunction is the SRS, the SRS warning light lights up to inform the driver of the abnormality.
When terminals Tc and CG of the DLC3 are connected, the DTC is displayed by blinking the SRS warning light.

WIRING DIAGRAM

See page 05-1065.

INSPECTION PROCEDURE

1	CHECK SOURCE VOLTAGE

(a) Measure the voltage of the battery.
OK:
Voltage: 10 - 14 V

NG → **REPAIR OR REPLACE HARNESS BETWEEN BATTERY AND AIRBAG SENSOR ASSY CENTER,AND CHARGING SYSTEM**

OK

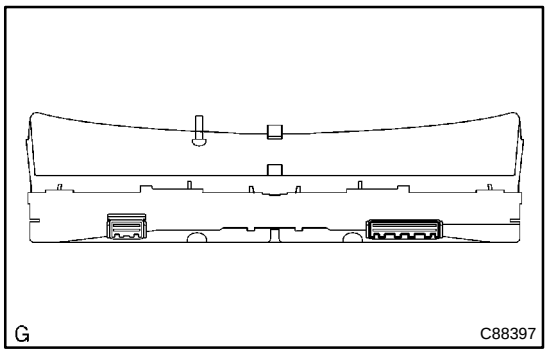
2	CHECK AIR BAG SENSOR ASSY CENTER

(a) Disconnect the negative (-) terminal cable from the battery, and wait at least for 90 seconds.
(b) Disconnect the connector from the airbag sensor assy center.
(c) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.
(d) Check SRS warning light light up in the combination meter assy.
OK:
Not SRS warning light light up.

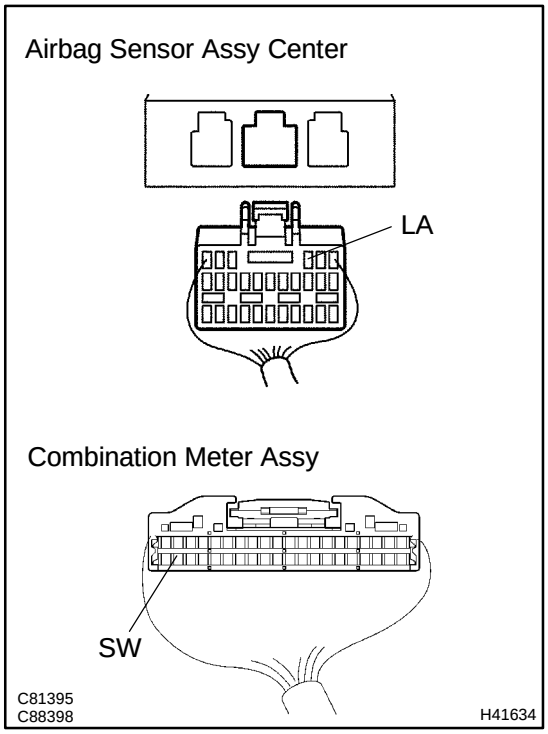
NG → **REPLACE AIR BAG SENSOR ASSY CENTER**

OK

3	CHECK WIRE HARNESS(COMBINATION METER ASSY - BATTERY)



(a) Disconnect the connector from the combination meter.



(b) Connect the negative (-) terminal cable to the battery, and turn the ignition switch to ON.

(c) For the connector (on the airbag sensor assy center side) between the airbag sensor assy center and the combination meter, measure the resistance between SW and LA.

OK:

Voltage: Below 1 V

NG → **REPAIR OR REPLACE WIRE HERNESS (COMBINATION METER-BATTERY)**

OK

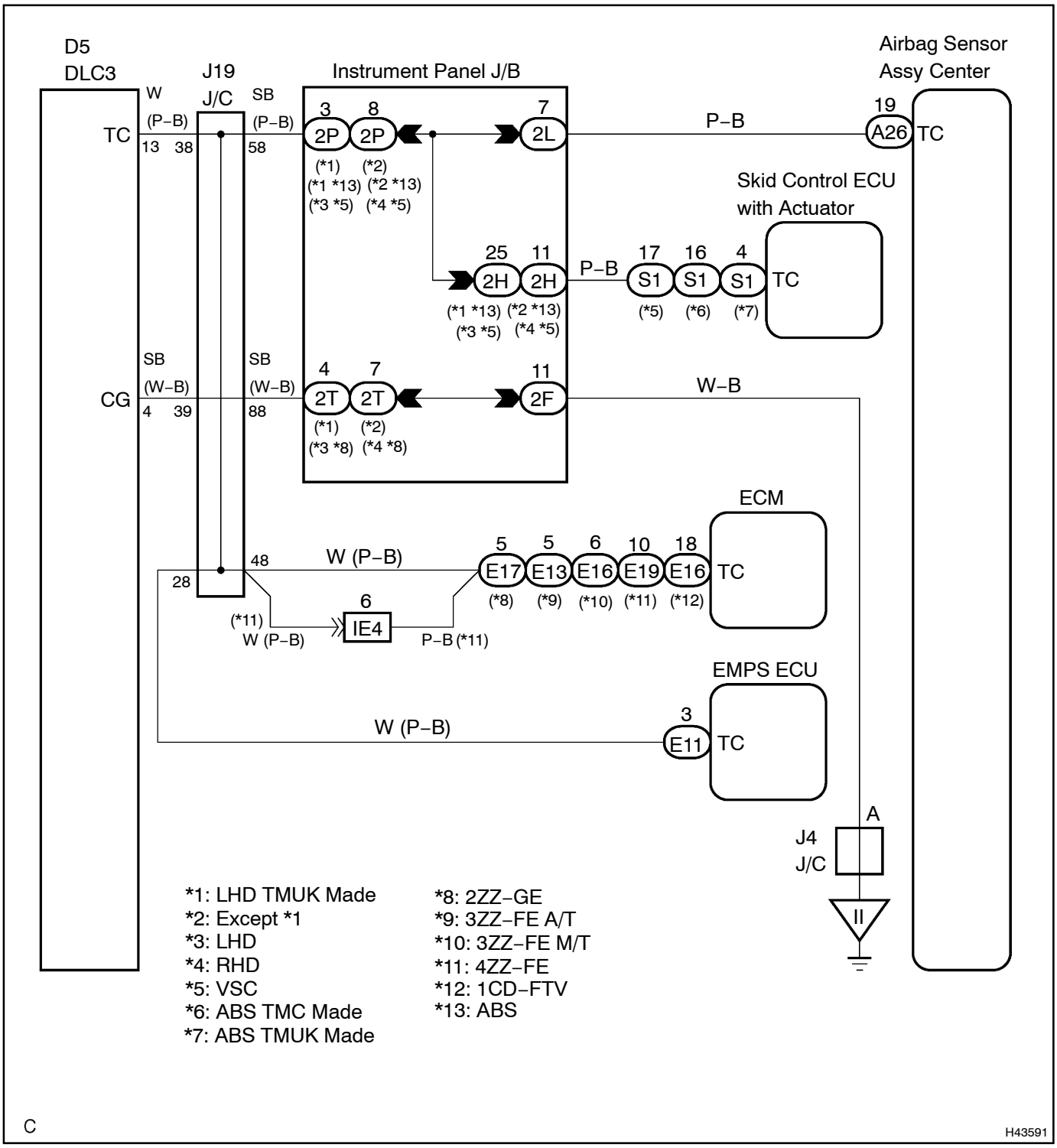
REPLACE COMBINATION METER ASSY

TC TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

DTC output mode is set by connecting terminals TC and CG of the DLC3.
The DTCs are displayed by blinking the SRS warning light.

WIRING DIAGRAM



HINT:
When each warning light stays blinking, a ground short in the wiring of terminal TC of the DLC3 or an internal ground short in each ECU is suspected.

AUDIO SYSTEM

DESCRIPTION

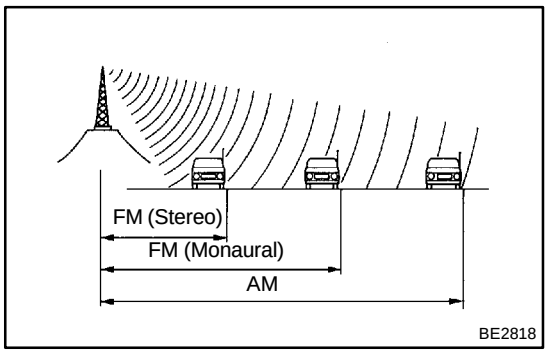
0549F-05

1. RADIO WAVE BAND

The radio wave bands used in radio broadcasting are as follows:

Frequency	30 kHz	300 kHz	3 MHz	30 MHz	300 MHz
Designation	LF	MF	HF	VHF	
Radio wave		AM ← →		FM ← →	
Modulation	Amplitude modulation			Frequency modulation	

LF: Low Frequency
MF: Medium Frequency
HF: High Frequency
VHF: Very High Frequency

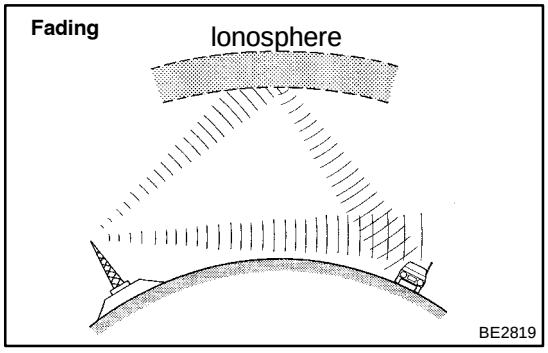


2. SERVICE AREA

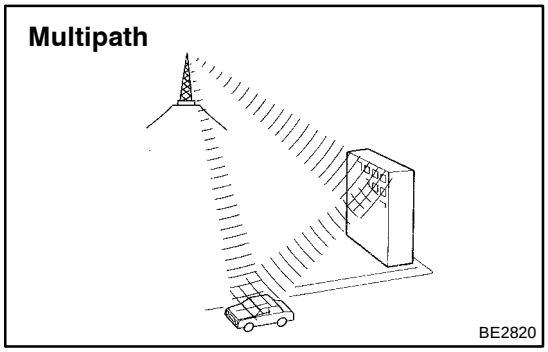
(a) There are great differences in the size of the service area for AM and FM broadcasting. Sometimes FM stereo broadcast cannot be received even through AM can be received very clearly.
Not only does FM stereo have the smallest service area, but it also picks up static and other types of interference (”noise”) easily.

3. RECEPTION PROBLEMS

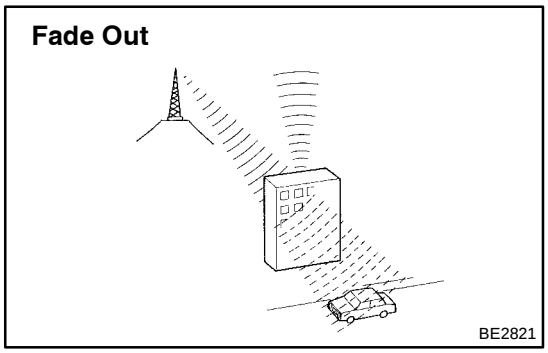
HINT:
Besides the problem of static, there are also the problems called ”fading”, ”multipath” and ”fade out”. These problems are caused not by electrical noise but by the nature of the radio waves themselves.



(a) Fading
Besides electrical interference, AM broadcasts are also susceptible to other types of interference, especially at night. This is because AM radio waves bounce off the ionosphere at night. These radio waves then interfere with the signals from the same transmitter that reach the vehicle’s antenna directly. This type of interference is called ”fading”.



(b) Multipath
Interference caused by reflection of radio waves against obstructions is called "Multipath". Multipath occurs when radio signals emitted from the broadcast transmitter antenna are reflected against tall buildings or mountains and interferes with other signals which is to be received directly.



(c) Fade Out
Because of the frequency higher than that of AM, FM radio wave tends to be reflected against obstructions such as tall buildings or mountains. For this reason, FM signals often seems to gradually disappear or fade away as the vehicle goes behind those obstructions. This phenomenon is called "fade out".

4. NOISE PROBLEMS

(a) It is very important for noise troubleshooting to understand a customer's claim clearly. Use the following table to diagnose the phenomenon.

Radio wave	Condition in which noise occurs	Probable cause
AM	Noise occurs at a specific place.	Strong possibility of foreign noise.
	Noise occurs when listening to faint broadcasting.	The same program may be broadcasted from some local stations. If the program is the same, one of those may be tuned in.
FM	Noise occurs only at night.	Strong possibility of beat from a distant broadcasting.
	Noise occurs at a specific place during driving.	Strong possibility of multipath noise and fading noise caused by changes of FM frequency.

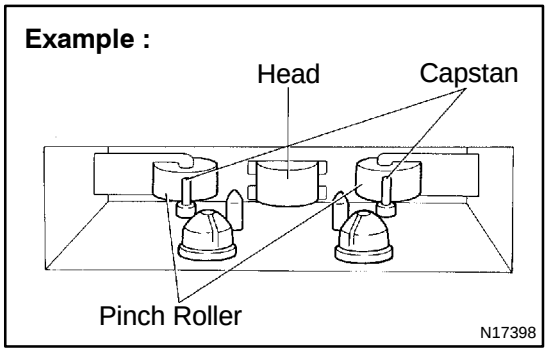
HINT:
If the condition where the noise occurs does not meet any of the above, find out the cause based on "Reception Problems". Refer to the description about Multipath and Fading mentioned previously.

5. COMPACT DISC PLAYER

(a) Compact Disc (hereafter called "CD") Players use a laser beam pick-up to read the digital signals recorded on the CD and reproduce analog signals of the music, etc. There are 4.7 in. (12 cm) and 3.2 in. (8 cm) discs available for the CD player.

HINT:
Never attempt to disassemble or oil any part of the player unit. Do not insert any object other than a disc into the magazine.

NOTICE:
CD players use an invisible laser beam which could cause hazardous radiation exposure. Be sure to operate the player correctly as instructed.

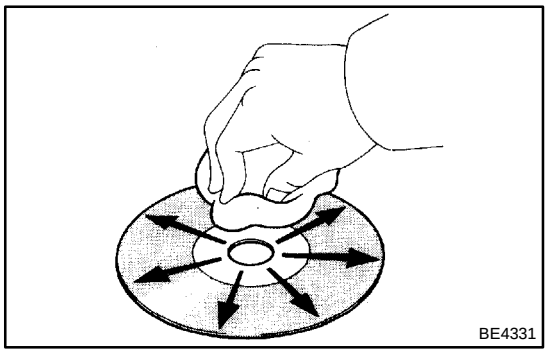


6. MAINTENANCE

Tape Player / Head Cleaning:

(a) Raise the slot cover with your finger.
Using a pencil or similar object, push in the guide.

(b) Using a cleaning pen or cotton applicator soaked in cleaner, clean the head surface, pinch rollers and capstans.



7. MAINTENANCE

CD Player / Disc Cleaning:

If the disc gets dirty, clean the disc by wiping the surface from the center to outside in the radial directions with a soft cloth.

NOTICE:

Do not use a conventional record cleaner or anti-static preservative.

8. COMMUNICATION SYSTEM

(a) Components in the audio system communicate each other though AVC-LAN. (Radio receiver with CD changer control function)

(b) The master component of AVC-LAN is the radio receiver assy with a resistance (60 - 80 Ω), which is necessary for communication.

(c) When short circuit or circuit breakdown occurs in the AVC-LAN circuit, the audio system does not operate normally due to the communication cutoff.

9. DIAGNOSIS FUNCTION

(a) The audio system has diagnosis function (The diagnosis result is displayed on the LCD of the radio receiver assy). (Radio receiver with CD changer control function)

(b) The component code (physical address), or three-digit number (in hexadecimal) is set for each component comprising AVC-LAN.

(c) The logical address, or two-digit number (in hexadecimal) is set for each function and component unit in each component.

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HOW TO PROCEED WITH TROUBLESHOOTING

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS (SEE PAGE 05-1077)

3	CHECK AND CLEAR DTC (SEE PAGE 05-1078)

4	PROBLEM SYMPTOM CONFIRMATION

→ SYMPTOM OCCURS (GO TO STEP 6)

SYMPTOM DOES NOT OCCUR (GO TO STEP 5)

5	SYMPTOM SIMULATION (SEE PAGE 01-20)

6	DTC CHECK (SEE PAGE 05-1078)

→ MALFUNCTION CODE (GO TO STEP 7)

→ NORMAL CODE (GO TO STEP 8)

7	DTC CHART (SEE PAGE 05-1084)

→ GO TO STEP 10

8	PROBLEM SYMPTOMS TABLE (SEE PAGE 05-1090)

9	CIRCUIT INSPECTION (SEE PAGE 05-1091 - 05-1130)

10	CONFIRMATION TEST

END

0549H-05

CUSTOMER PROBLEM ANALYSIS CHECK

AUDIO SYSTEM Check Sheet

Inspector's name: _____

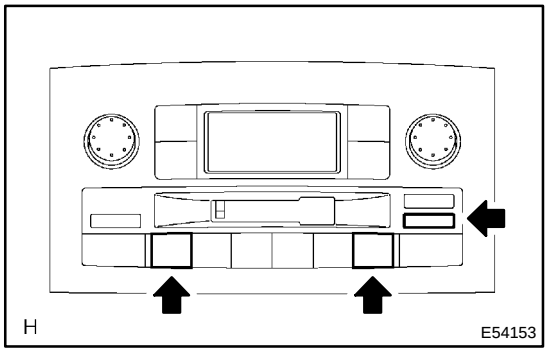
Customer's Name		**Registration No.**	
		Registration Year/Date	
		Frame No.	
Brought-in Date	/ /	**Odometer Reading**	**km Mile**

Date of First Occurrence	/ /
Frequency of Problem Occurrence	j Constant j Intermittent (Times a day)

Problem Symptom	j **Switch**
	j **Radio**
	j **CD**
	j **Noise**

DTC Check	**Parts name**	**DTC (1st time).**	**DTC (2nd time).**
	Radio receiver assy		

I30195



0549I-05

PRE-CHECK

1. DIAGNOSIS CHECK

(a) Starting Diagnosis Mode (Service Check Mode)

(1) Turn off the audio system and turn the IG switch to ACC. While pressing the preset switches "1" and "6" at the same time, press "DISC" 3 times.

(2) Reference:

- Beep sound is given 3 times and the system enters the service check mode.
- It may take about 40 sec. to complete the check.
- In the service check mode, the system check and the diagnosis memory check are performed, and the check results are displayed in ascending order of the device codes (physical address.)

Terms	Meaning
Component code (Physical address)	Three-digit code (In hexadecimal) given to each device comprising AVC-LAN. Corresponding to its function, individual symbol is provided.
Logical address	Two-digit code (In hexadecimal) given to each function and device unit in each device comprising AVC-LAN.

Code No. (physical address) List

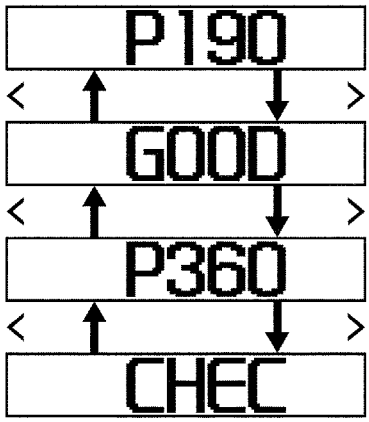
Code No. (physical address)	Equipment name
190	Radio receiver assy (Audio head unit)

(b) Finishing Diagnosis Mode

(1) Press "DISC" for 2 sec. or more, or turn the IG switch OFF.

(c) Service Check Mode Result Display (for checking the current and the past system conditions)

(1) Press the "TUNE" switch to see the check result of each device.



P---physical address
190---device code

good---"The component is normal".

P---physical address
360---component code

CHEC---"Check needed".

The illustration shows the case that the system has 2 devices with codes 190 and 360, and the device (code 360) has a trouble.
The check result is displayed in ascending order of device code. The device code is displayed first, then the check result.

P I32307

(2) Check Result Display

Display	Original Language	Meaning	Action to be taken
good	Good (normal)	No DTC is detected in both "System Check Mode" and "Diagnosis Memory Mode".	-
nCon	No connection	The system recognized the component when it was registered, but the component gives no response to the "Diagnosis Mode ON Request".	Check the power source circuit and the communication circuit of the device indicated by the device code (physical address).
ECHn	Exchange	One or more DTC for "Exchange" is detected in either "System Check Mode" or "Diagnosis Memory Mode".	Go to the detail information mode to check the trouble area referring to the DTC list.
CHEC	Check	When no DTC is detected for "Exchange", one or more DTC for "Check is detected in either "System Check Mode" or "Diagnosis Memory Mode".	Go to the detail information mode to check the trouble area referring to the DTC list.

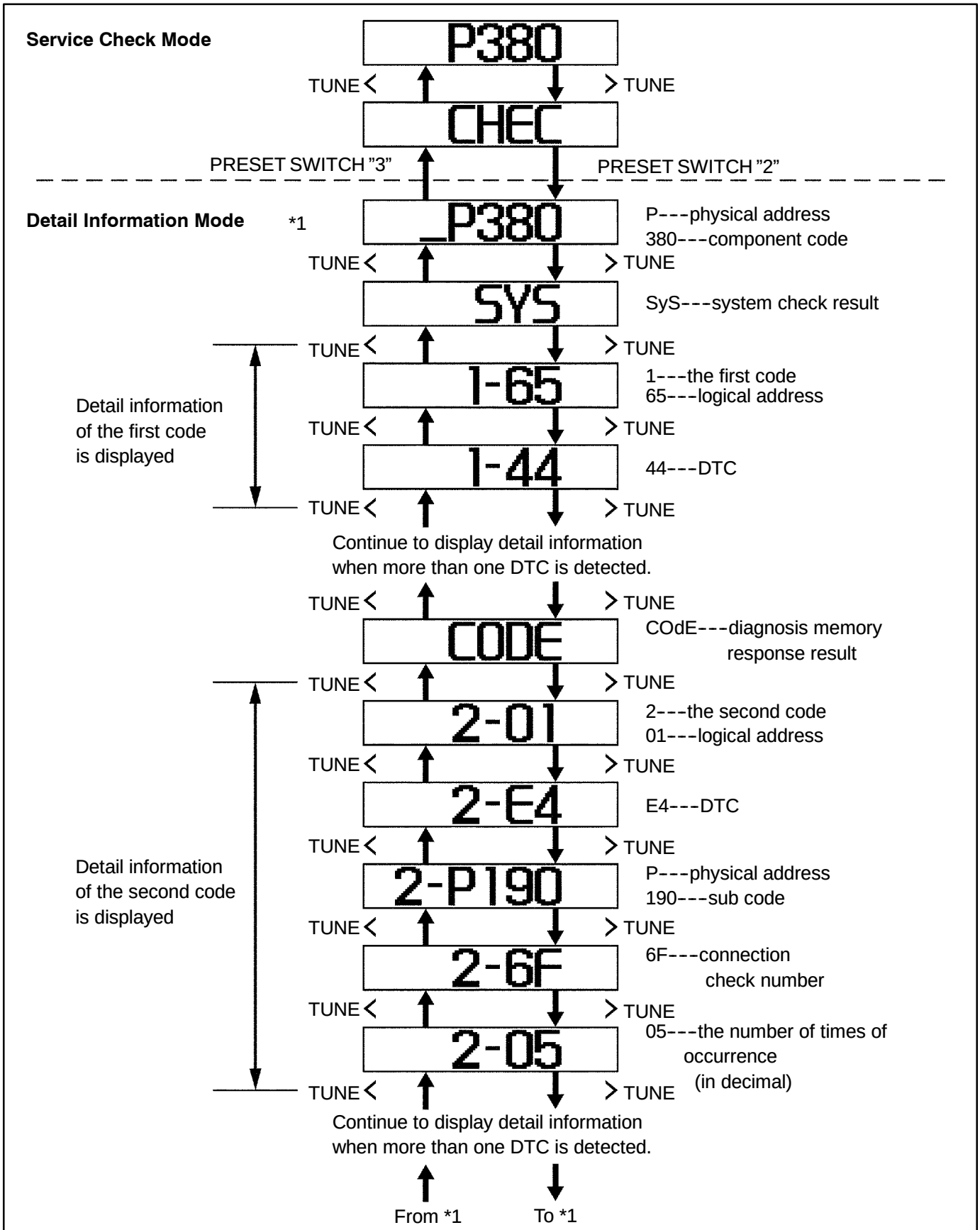
Display	Original Language	Meaning	Action to be taken
Old	Old version	Old DTC application is identified and DTC is detected in either "System Check Mode" or "Diagnosis Memory Mode".	-
nrES	No response	The device gives no response to any one of "System Check Mode ON Request", "System Check Result Request" and "Diagnosis Memory Request".	Check the power source circuit and the communication circuit of the device indicated by the device code (physical code).

(3) To perform the Service Check again, press the preset switch "1".

(d) Detail information Mode (when displaying the troubled device's DTC)

(1) With "CHEC" or "ECHn" being display, press the preset switch "2" to go to the detail information mode.

(2) Press the "TUNE" switch to display "System Check Result (SyS)" and "Diagnosis Memory Response (COdE)".



The illustration shows the case that the component with code 380 has DTC "44" and "E4" as a result of the system check and the diagnosis memory response.
The detail information mode shows the system check result first, then the diagnosis memory response result.
As for DTC that does not have any sub code, sub code is not displayed.

I32308

(3) Displayed Items in Detail Information Mode

Division Code for DTC display	Meaning	Order of detailed information displayed when the "TUNE UP" switch is pressed. (The order is reversed when the "TUNE DOWN" switch is pressed.)
SyS	System check result is displayed.	Logical address → DTC
COdE	Diagnosis memory check result is displayed.	Logical address→ DTC→ Sub code→ Connection confirmation number→ The number of times of occurrence

(4) Check the trouble area referring to the DTC list.

(5) To return to the service check mode, press the preset switch "3".

(e) Clearing Individual DTC Memory (when clearing the memory of DTC detected in the pest individually)

(1) Press the preset switch "5" for 2 sec. or more while the "ECHn" is displayed in the service check mode or during the detail information mode.

HINT:

- Beep sound is given once when the DTC memory is completely cleared.
- When DTC memory is cleared, only the component code (physical address) is displayed for the target component.
- To check DTC, press the preset switch "1" and perform the service check again.

(f) Clearance of all DTC memory (when clearing all the memory of DTC detected in the past)

(1) Start the diagnosis mode after repairing the trouble area.

(2) Press the preset switch "5" for 2 sec. or more. ("CLr" is displayed at this time.)

HINT:

- Beep sound is given once when the DTC memory is completely cleared.
- When DTC memory for all the device is cleared, only the component codes (physical address) are displayed.

(3) Press the preset switch "1" to perform the service check again, and check that no DTC is displayed for all the component codes (physical address).

2. IDENTIFICATION OF NOISE SOURCE

(a) Identify the condition under which the noise occurs, and check the noise filter on the related part.

Condition in which noise occurs	Noise Source
Depressing the acceleration pedal increases noise, and stopping the engine erases the noise immediately.	Generator
Noise occurs during the A/C or the heater operation.	Blower motor
Rapid acceleration during driving on the unpaved road or after the IG switch is turned ON makes noise.	Fuel pump
Pressing and then releasing the horn switch, and keeping pressing the horn switch makes unusual noise.	Horn
Stopping the engine erases small noise that has been heard.	Ignition
Noise occurs synchronously with the turn signal flash.	Flasher
Noise occurs during the window washer operation.	Washer
Noise occurs during the engine running, and it continues after the engine is stopped.	Engine coolant temperature sensor
Noise occurs during the wiper operation.	Wiper
Noise occurs when the brake pedal is depressed.	Stop light switch
Others.	Static electricity stored on the vehicle

(b) Reference:

- Make sure first that there is no noise from outside. Failing to do so makes the noise source detection difficult and leads to misunderstanding.
- The noise should be removed in descending order of loudness.
- Setting the radio untuned makes noise noticeable, making the recognition of the phenomenon easier.

0549J-05

DIAGNOSTIC TROUBLE CODE CHART

Terms	Meaning
Physical address	Three-digit code (shown in hexadecimal) which is given to each component comprising the AVC-LAN. Corresponding to the function, individual symbols are specified.
Logical address	Two-digit code (shown in hexadecimal) which is given to each function comprising the inner system of the AVC-LAN.

1. RADIO RECEIVER ASSY (Physical address: 190)

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It is stored when 180 sec. has passed after the power supply connector is pulled out after engine start.
- *3: It may be stored when the engine key is turned 1 min. after engine start.
- *4: It may be stored when the engine key is turned again after engine start.
- *5: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	Description	Action to be taken
22	RAM Error	Abnormal condition of RAM is detected.	Replace radio receiver assy.
D6 *1	Absence of Master	Component in which this code is recorded had been disconnected from system or master component with ignition in ACC or ON.	• Check harness for power supply system of radio receiver assy. • Check harness for communication system of radio receiver assy.
D7 *5	Connection check Error	Component in which this code is recorded had been disconnected from system or master component ignition with in ACC or ON.	• Check harness for power supply of radio receiver assy. • Check harness for communication system of radio receiver assy.
D8 *2	No Response to Connection Check	Component shown by sub code is or had been disconnected from system after engine start.	• Check harness for power supply system of component shown by sub code. • Check harness for communication system of component shown by sub code.
D9 *1	Last Mode Error	Audio or visual component operated before engine stop is or had been disconnected with ignition switch in ACC or ON.	• Check harness for power supply system of component shown by sub code. • Check harness for communication system of component shown by sub code.
DA	No Response to ON/OFF Instruction	No response is identified when changing mode (audio and visual mode change). Detected when sound and picture does not change by button operation.	• Check harness for power supply system of component shown by sub code. • Check harness for communication system of component shown by sub code. • If error occurs again, replace component shown by sub code.
DB *1	Mode Status Error	Dual alarm is detected.	• Check harness for power supply of component shown by sub code. • Check harness for communication system of component shown by sub code.
DC *3	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	If same sub code is recorded in other component, check harness for power supply and communication system of all components shown by code. (If not, delete DTC and recheck.)

DD *4	Master Reset (Momentary Interruption)	After engine is started, master component had been disconnected from system.	S Check harness for power supply system of multi-display. S Check harness for communication system of radio receiver assy. S If this error occurs frequently, replace radio receiver assy.
DE *4	Slave Reset (Momentary Interruption)	After engine is started, component shown by sub code had been disconnected from system.	S Check harness for power supply of component shown by sub code. S Check harness for communication system of component shown by sub code.
E0 *1	Registration Completion Instruction Error	"Registration Completion Instruction" command from master cannot be received.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E2	ON/OFF Instruction Parameter Error	Error occures in ON/OFF controlling command from master component.	Replace radio receiver assy
E3 *1	Registration Request Transmission	Registration Request command is output from component shown by sub code. Receiving Connection Check Instruction, Registration Request command is output from sub-master component.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

(b) Logical address: 61 (Cassette switch)

DTC	Diagnosis item	Description	Action to be taken
40	Mechanical Error of Media	Malfunction due to mechanical failure is identified. Or cassette tape is cut or entangled.	S Inspect cassette tape. S Replace radio receiver assy.
41	EJECT Error	Malfunction due to mechanical failure.	Replace radio receiver assy.
42	Tape caught in the radio receiver assy	Hub lock etc.	Inspect cassette tape.

(c) Logical address: 62 (CD player)

DTC	Diagnosis item	Description	Action to be taken
42	No Disc Readout	Disc cannot be read.	S Inspect CD. S Replace radio receiver assy.
44	CD player Error	Error is detected in CD player.	Replace radio receiver assy.
45	EJECT Error	Magazine cannot be ejected.	Replace radio receiver assy.
46	Scratched/Reversed Disc	Scratches or dirt is found on CD surface or CD is set upside down.	Inspect CD.

2. STEREO COMPONENT CONTROLLER ASSY (Physical address: 1CC)

HINT:

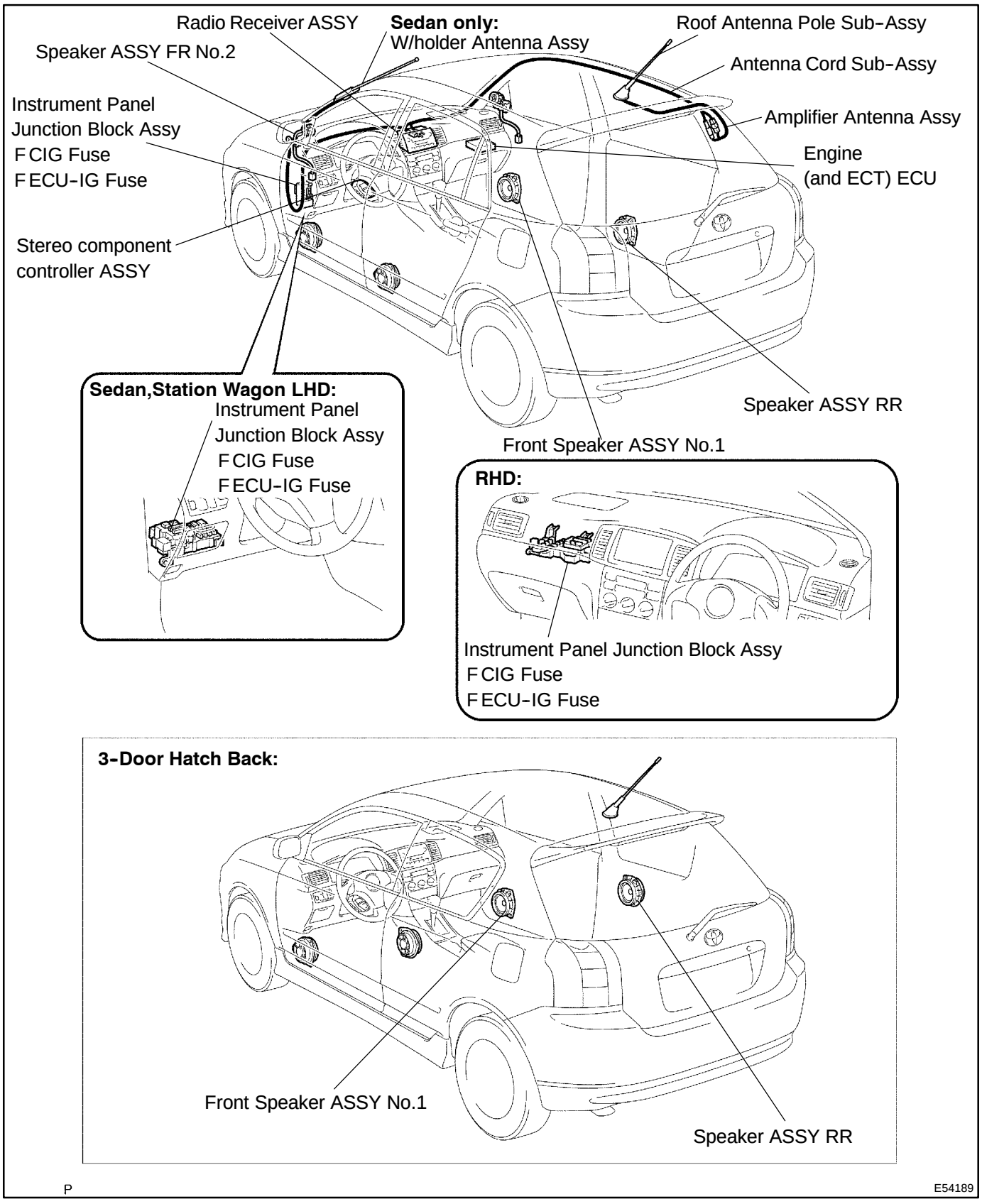
- S *1: It may be stored when the engine key is turned after engine start.
- S *2: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	Description	Action to be taken
D1 *1	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	S Check harness for power supply system of radio receiver assy. S Check harness for communication system of radio receiver assy.
D4 *2	Connection check Error	Component in which this code is recorded had been disconnected from system or master component with ignition in ACC or ON.	If same sub code is recorded in other component, check harness for power supply and communication system of all components shown by code. (If not, delete DTC and recheck.)

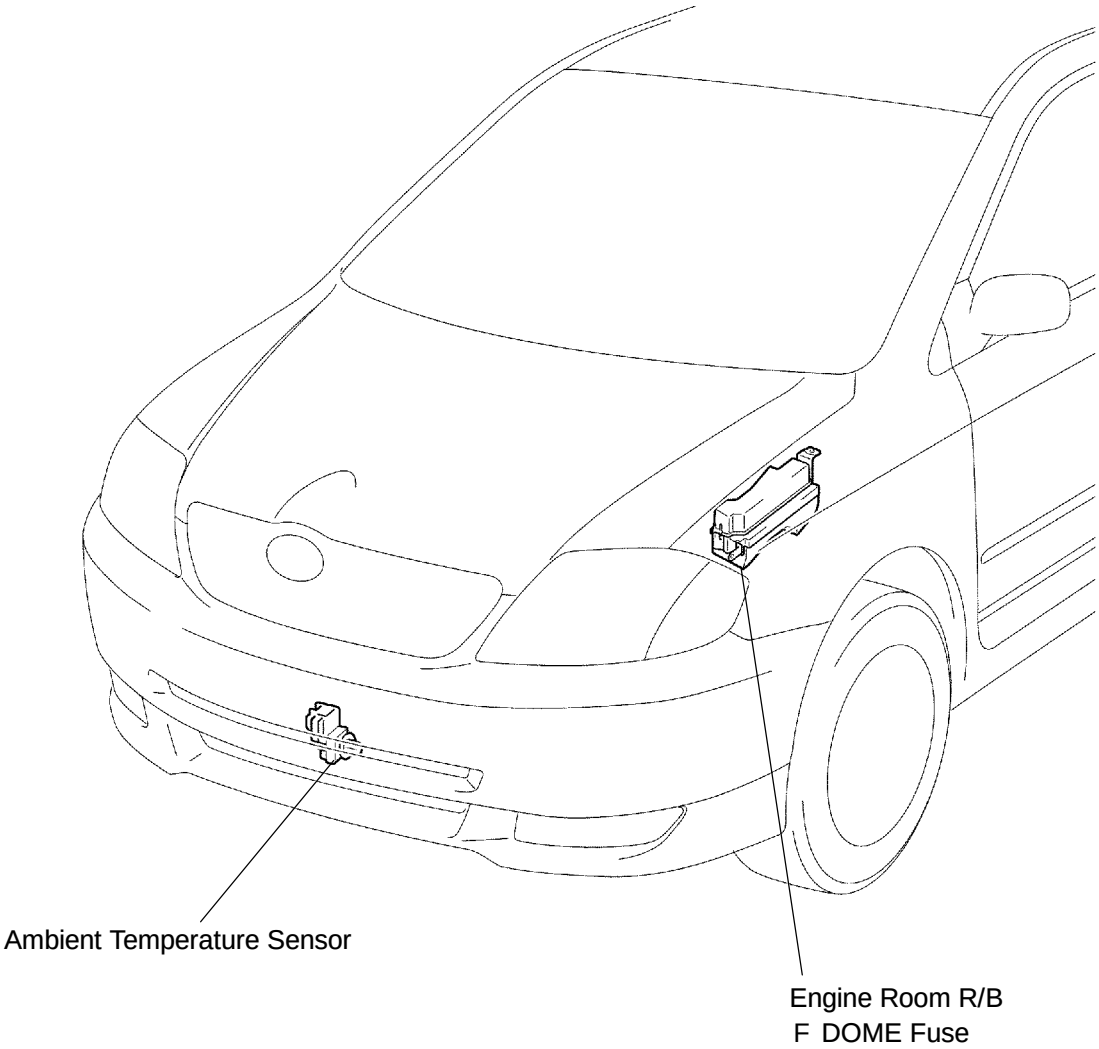
0576E-01

LOCATION



P

E54189



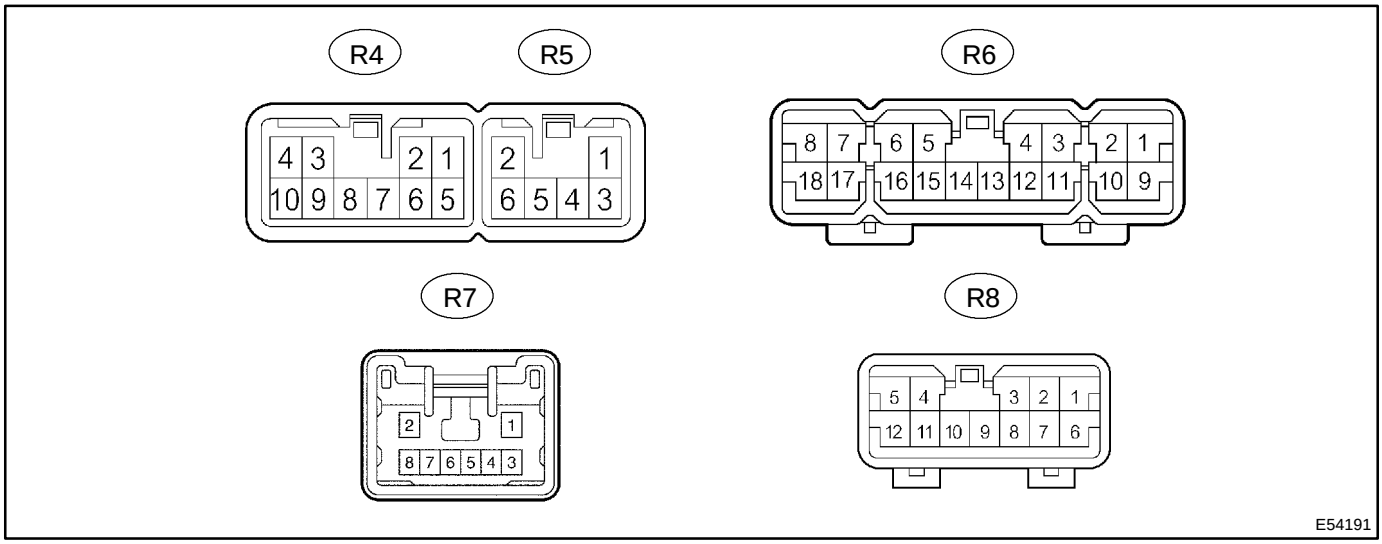
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05706-02

TERMINALS OF ECU

1. RADIO RECEIVER ASSY



Terminal No. (Symbols)	Wiring Color	Condition	STD Voltage (V)
R4-1 ⇔ R4-7 (FR+ ⇔ GND)	LG ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
R4-2 ⇔ R4-7 (FL+ ⇔ GND)	P ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
R4-3 ⇔ R4-7 (ACC ⇔ GND)	SB(GR) ⇔ BR	Ignition switch ACC	10 - 14 V
R4-4 ⇔ R4-7 (+B ⇔ GND)	L-Y ⇔ BR	Constant	10 - 14 V
R4-5 ⇔ R4-7 (FR- ⇔ GND)	L ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
R4-6 ⇔ R4-7 (FL- ⇔ GND)	V ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
R4-7 ⇔ Body ground (GND ⇔ Body ground)	BR ⇔ -	Constant	Continuity
R4-8 ⇔ R4-7 (ANT+ ⇔ GND)	B ⇔ BR	Radio is sounding	10 - 14 V
R4-10 ⇔ R4-7 (ILL+ ⇔ GND)	SB(G) ⇔ BR	Light control switch TAIL or HEAD	10 - 14 V
R5-1 ⇔ R4-7 (RR+ ⇔ GND)	R ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
R5-2 ⇔ R4-7 (RL+ ⇔ GND)	B ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
R5-3 ⇔ R4-7 (RR- ⇔ GND)	W ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
R5-6 ⇔ R4-7 (RL- ⇔ GND)	Y ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
*3 R6-1 ⇔ R6-4 (VER2 ⇔ GND)	W-B ⇔ W-B	Constant	Continuity
*3 R6-2 ⇔ R6-4 (VER1 ⇔ GND)	W-B ⇔ W-B	Constant	Continuity
*3 R6-3 ⇔ - (TX+ ⇔ -)	R ⇔ -	Service mode	-

R6-4 ⇔ Body ground (GND ⇔ Body ground)	W-B ⇔ -	Constant	Continuity
R6-7 ⇔ R6-4 (IG ⇔ GND)	SB(B-Y) ⇔ W-B	Ignition switch ON	10 - 14 V
*3 R6-10 ⇔ R6-4 (VER3 ⇔ GND)	W-B ⇔ W-B	Constant	Continuity
*3 R6-11 ⇔ - (TX- ⇔ -)	G ⇔ -	Service mode	-
*4,5 R6-12 ⇔ R6-4 (TH- ⇔ GND)	W-G ⇔ W-B	Constant	Continuity
*4,5 R6-13 ⇔ R6-4 (TH+ ⇔ GND)	BR-Y ⇔ W-B	Ignition switch ACC	4.5 - 5.5 V
*3 R6-14 ⇔ R6-4 (TAUB ⇔ GND)	B-W ⇔ W-B	Ignition switch ON	10 - 14 V
*3 R6-15 ⇔ R6-4 (TAU ⇔ GND)	Y(*1),P-L(*2) ⇔ W-B	Engine running	10 - 14 V
*3 R6-16 ⇔ R6-4 (SPD ⇔ GND)	W(V-W) ⇔ W-B	See "Vehicle signal check mode"	-
*6 R7-1 ⇔ - (BRQ ⇔ -)	Y ⇔ -	When the screen change	10 - 16 V
*6 R7-3 ⇔ R4-7 (S-GND ⇔ GND)	L ⇔ BR	Constant	Continuity
*6 R7-4 ⇔ - (HIT- ⇔ -)	G ⇔ -	Service mode	-
*6 R7-5 ⇔ - (HIT+ ⇔ -)	R ⇔ -	Service mode	-
R8-5 ⇔ R8-8 (+B ⇔ GND)	L-Y ⇔ W-B	Constant	10 - 16 V
R8-8 ⇔ Body ground (GND ⇔ Body ground)	W-B ⇔ -	Constant	Continuity
*6 R8-9 ⇔ - (TX- ⇔ -)	G ⇔ -	Service mode	-
*6 R8-10 ⇔ - (TX+ ⇔ -)	B ⇔ -	Service mode	-
R8-12 ⇔ R8-8 (ACC ⇔ GND)	GR ⇔ W-B	Ignition switch ACC	9 - 16 V

HINT:
*1:Gasoline
*2:Diesel
*3:w/ Multi Information Display w/ Navigation System
*4:w/ Multi Information Display
*5:Expept Automatic A/C
*6:w/ Navigation System

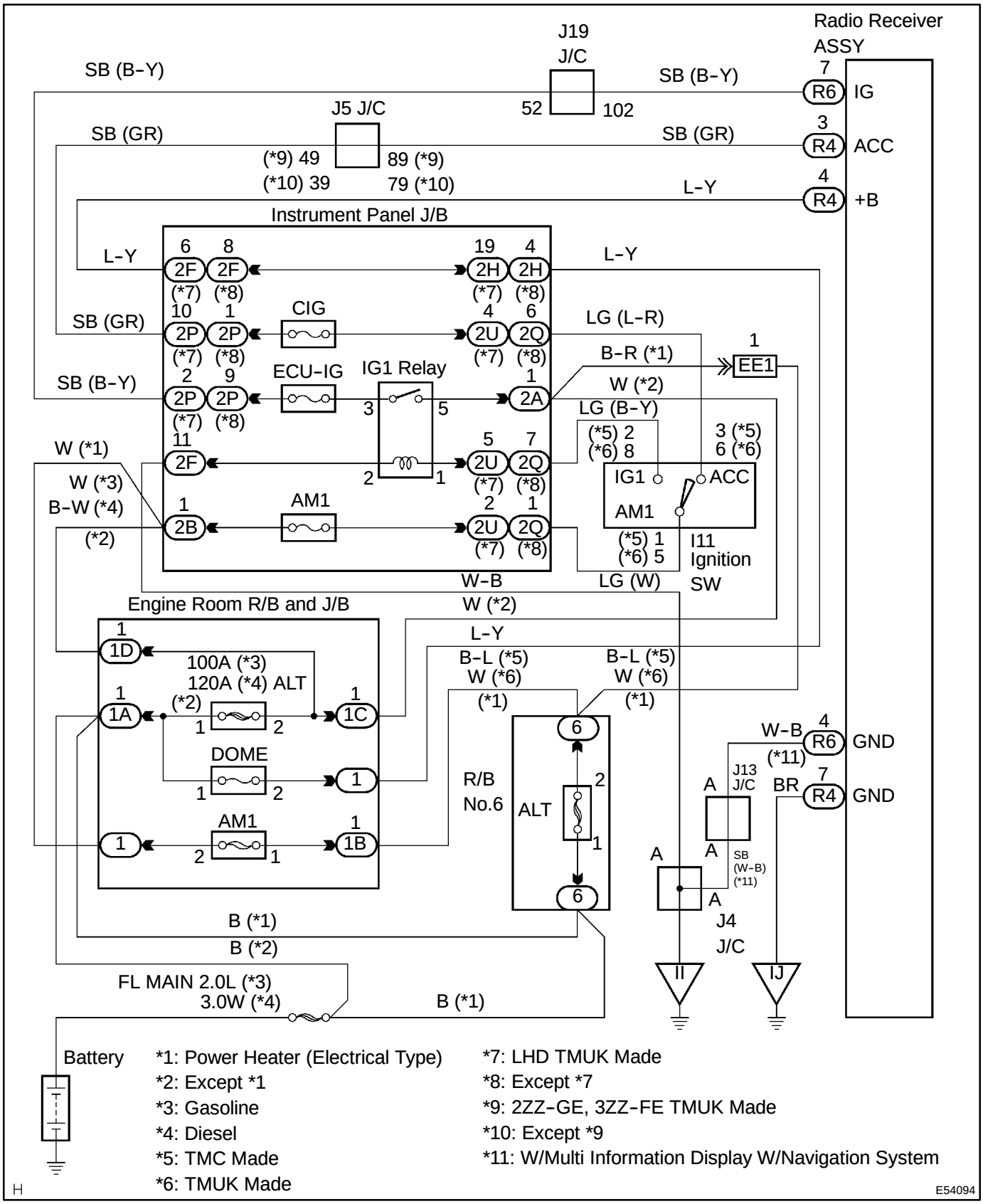
0549M-05

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Pressing power switch does not start system.	3. Radio receiver assy power source circuit 4. Radio receiver assy	05-1091
Turning on light switch does not light up night time illumination of radio receiver.	1. Radio receiver assy ILL terminal circuit 2. Radio receiver assy	05-1093
No sound is heard from speaker in all modes.	1. Speaker circuit 2. Radio receiver assy power source circuit 3. Radio receiver assy	05-1095
Sound quality is bad in all modes. (Volume is too low)	1. Speaker circuit 2. Radio receiver assy power source circuit 3. Radio receiver assy	05-1099
Radio broadcast cannot be received. (Bad reception)	1. Antenna circuit 2. Radio receiver assy	05-1103
Cassette tape cannot be inserted or played.	1. Cassette tape 2. Radio receiver assy power source circuit 3. Radio receiver assy	05-1106
Cassette tape cannot be ejected.	1. Cassette tape 2. Radio receiver assy power source circuit 3. Radio receiver assy	05-1109
Sound quality is bad only when playing tape.	1. Cassette tape 2. Radio receiver assy	05-1112
Tape is tangled due to incorrect tape speed or auto-reverse mal-function.	1. Cassette tape 2. Radio receiver assy	05-1113
CD cannot be inserted or is ejected right after insertion.	1. CD 2. Radio receiver assy power source circuit 3. Radio receiver assy	05-1114
Although system is powered, CD cannot be played.	1. CD 2. Radio receiver assy power source circuit 3. Radio receiver assy	05-1117
CD cannot be taken out.	1. CD 2. Radio receiver assy power source circuit 3. Radio receiver assy	05-1120
Sound quality is bad only when CD is played.(Volume is too low)	1. CD	05-1123
CD sound skips.	1. CD 2. Radio installation	05-1124
Do not display fuel efficiency.	1. Engine and ECT ECU 2. Radio receiver assy	05-1126
The ambient temperature does not display.	1. Ambient temperature sensor 2. Radio receiver assy	05-1128
Noise occurs.	-	05-1130

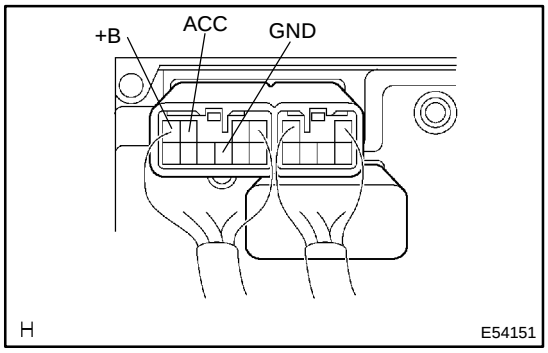
PRESSING POWER SWITCH DOES NOT START SYSTEM

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT RADIO RECEIVER ASSY(+B, ACC, GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

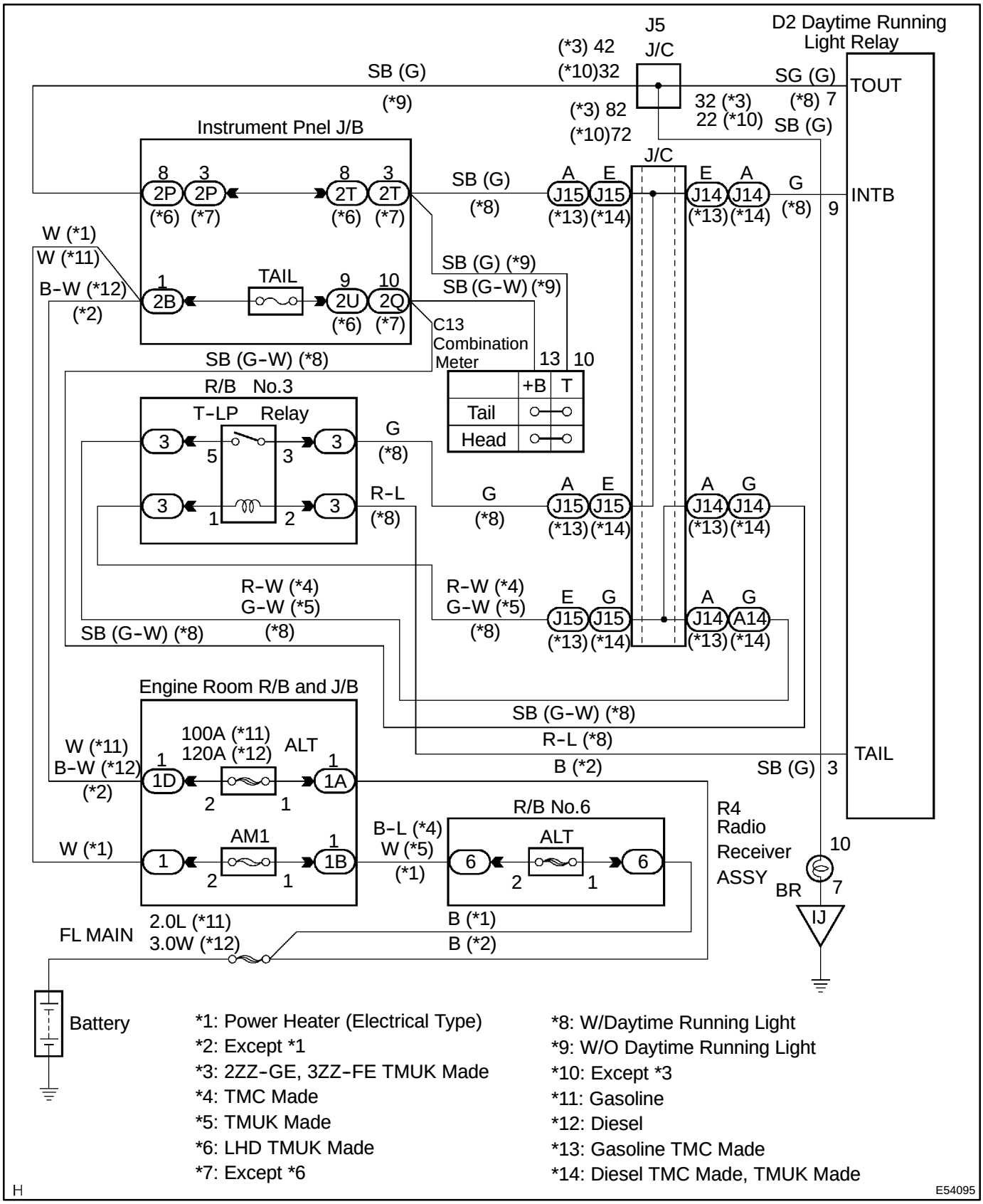
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE RADIO RECEIVER ASSY

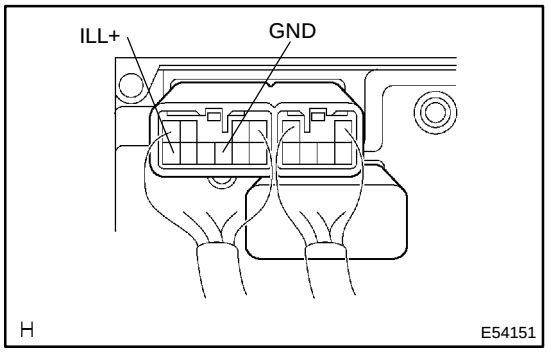
TURNING ON LIGHT SWITCH DOES NOT LIGHT UP NIGHT TIME ILLUMINATION OF RADIO RECEIVER

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT RADIO RECEIVER ASSY(ILL+)



(a) Measure voltage between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
ILL - GND	Light control switch TAIL or HEAD	10 - 14 V

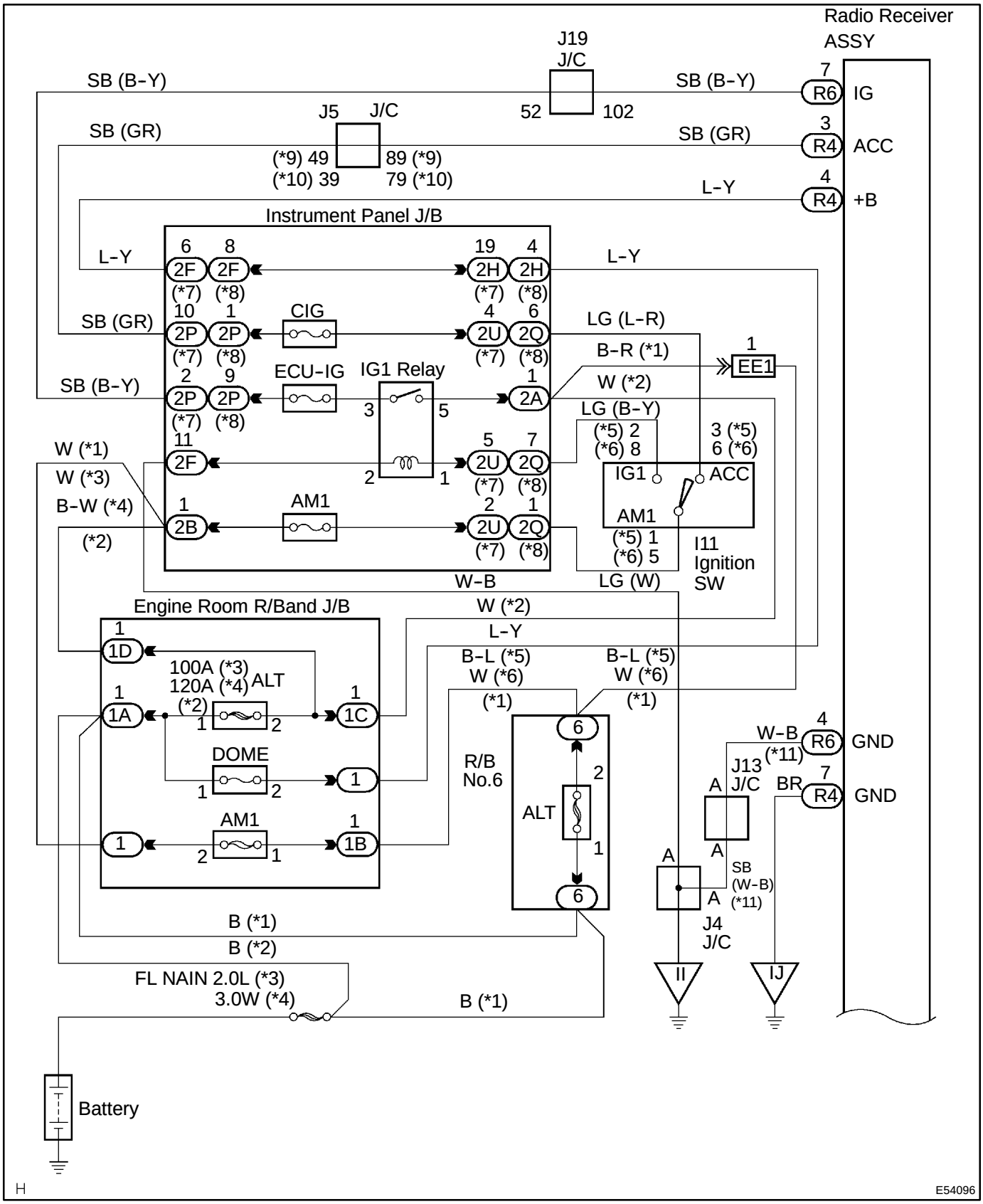
OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

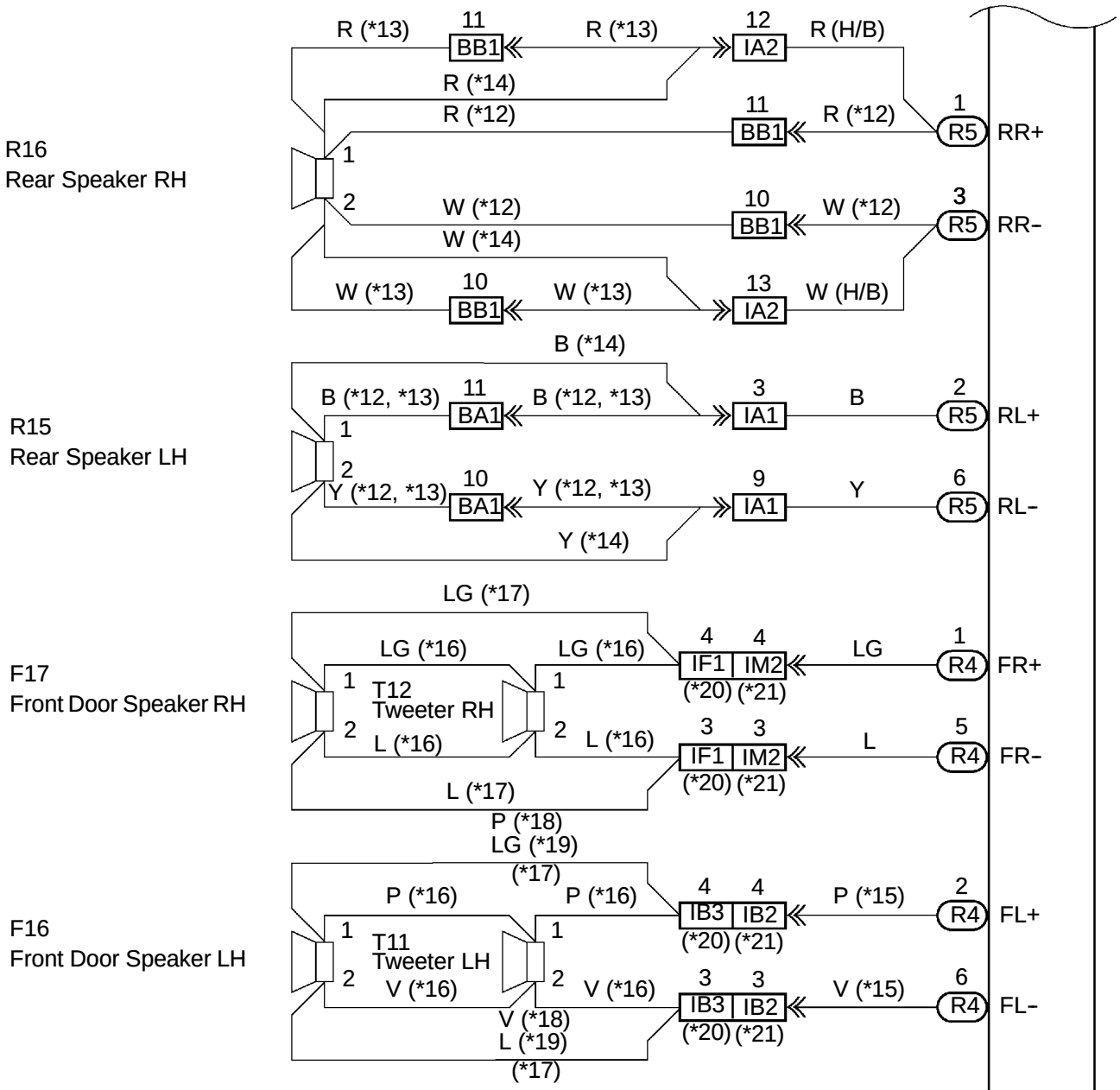
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR **(See page 01-30)**

NO SOUND IS HEARD FROM SPEAKER IN ALL MODES

WIRING DIAGRAM





*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: TMC Made
*6: TMUK Made
*7: LHD TMUK Made
*8: Except *7
*9: 2ZZ-GE, 3ZZ-FE TMUK Made
*10: Except *9
*11: W/Multi Information Display W/Navigation System
*12: W/G, S/D
*13: 5-Door H/B
*14: 3-Door H/B
*15: W/O Navigation System
*16: W/Tweeter
*17: W/O Tweeter
*18: W/Power window or W/Door Lock Control
*19: Except *18
*20: LHD
*21: RHD

E54097

INSPECTION PROCEDURE

1	CHECK LCD(LIQUID CRYSTAL DISPLAY) FOR LIGHTING

(a) LCD Illumination Check
(1) Turn the ignition switch ACC.
(2) Turn the radio receiver assembly ON.
Standard: LCD illumination of the radio receiver assembly light.

NG → **Go to step 7**

OK

2	CONTROL FADER AND ADJUST SOUND BALANCE

(a) Fader and Balance Adjustment
(1) Operate the radio receiver assembly to adjust the fader and the balance to identify the speaker that does not sound.

(A)	(B)
A specific speaker does not sound.	All speakers do not sound.

B → **CHECK AND REPLACE RADIO RECEIVER ASSY**

A

3	INSPECT FRONT NO.1 SPEAKER ASSY

(a) Preparation for Check
(1) Disconnect the connector of the speaker.
(b) Resistance Check
(1) Check the resistance between the terminals of the speaker.

NOTICE:
The speaker should not be removed for checking.
Standard value: 4 Ω

NG → **REPLACE FRONT NO.1 SPEAKER ASSY**

OK

4	INSPECT FRONT NO.2 SPEAKER ASSY

(a) Check that malfunction disappear when a known good speaker is installed.
Standard: malfunction disappear.

HINT:
Connect the all connectors of speakers.

NG → **REPLACE FRONT NO.2 SPEAKER ASSY**

OK

5	INSPECT REAR SPEAKER ASSY

(a) Preparation for Check
(1) Disconnect the connector of the speaker.
(b) Resistance Check
(1) Check the resistance between the terminals of the speaker.

NOTICE:
The speaker should not be removed for checking.

Standard value: 4 Ω

NG → **REPLACE REAR SPEAKER ASSY**

OK

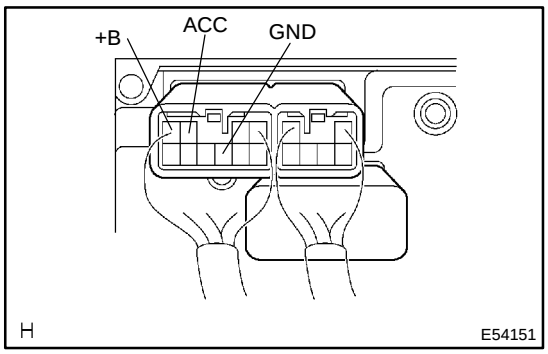
6	CHECK HARNESS AND CONNECTOR

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE RADIO RECEIVER ASSY

7	INSPECT RADIO RECEIVER ASSY(+B, ACC, GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

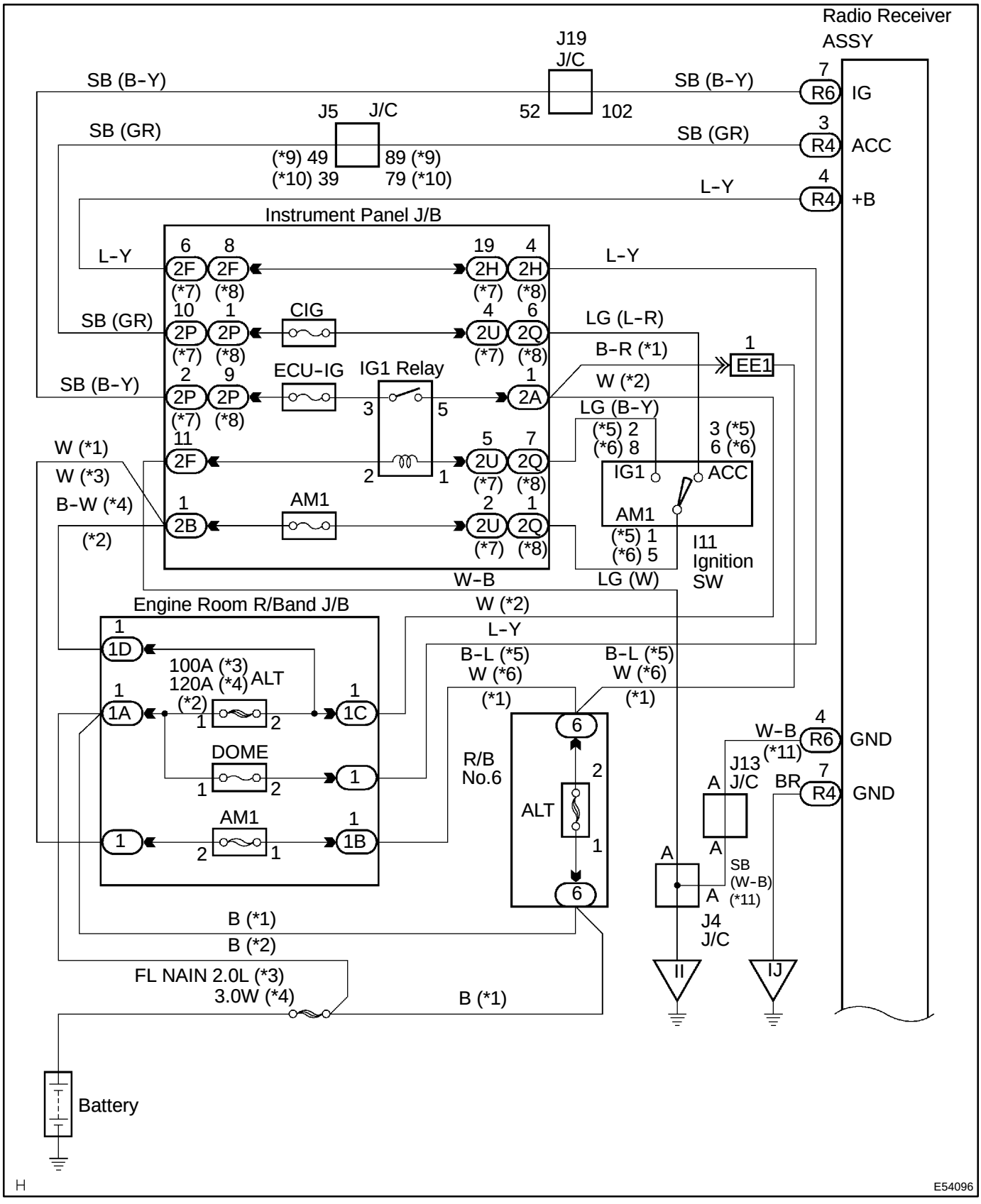
OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

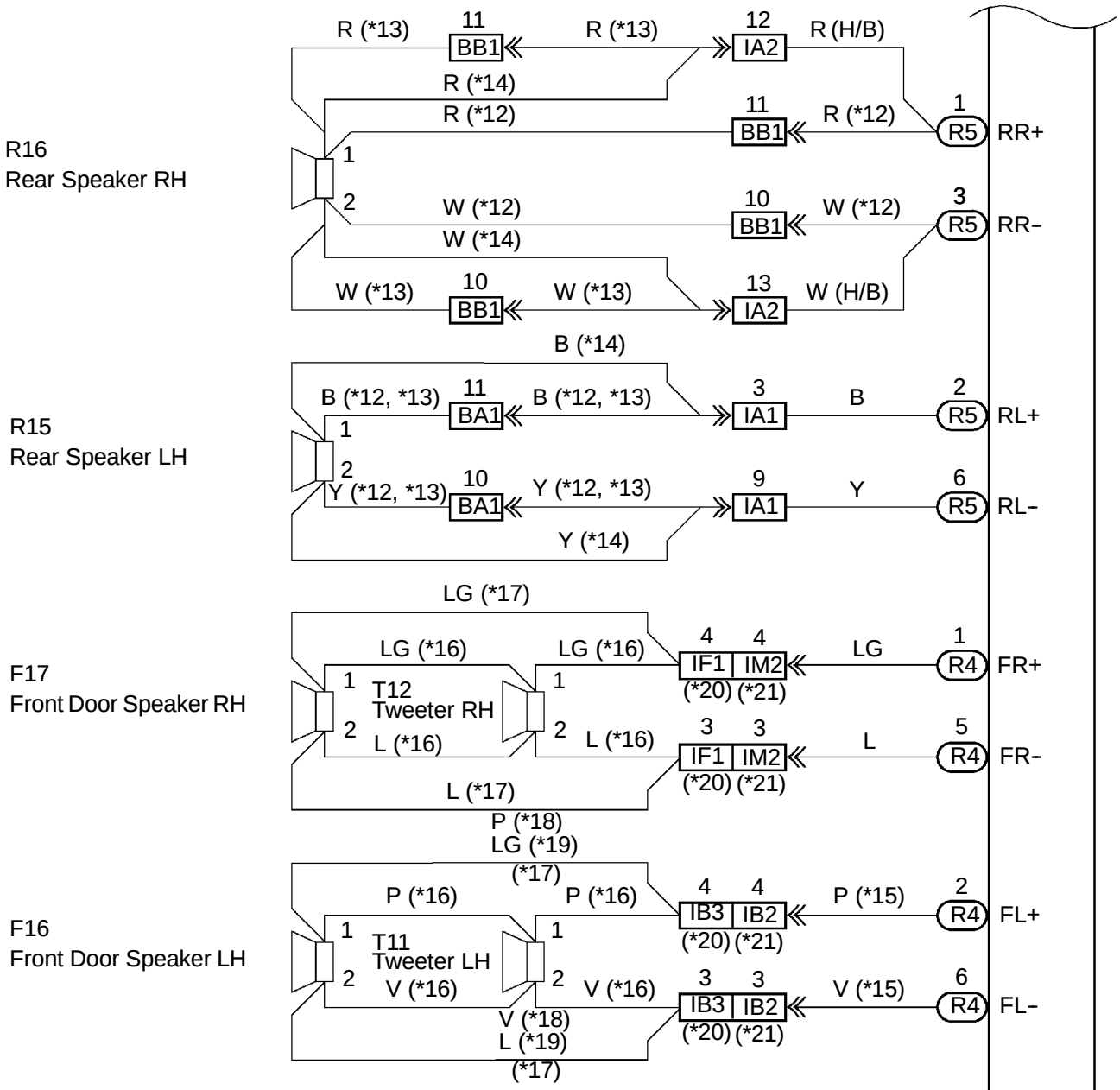
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR **(See page 01-30)**

SOUND QUALITY IS BAD IN ALL MODES(VOLUME IS TOO LOW)

WIRING DIAGRAM





*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: TMC Made
*6: TMUK Made
*7: LHD TMUK Made
*8: Except *7
*9: 2ZZ-GE, 3ZZ-FE TMUK Made
*10: Except *9
*11: W/Multi Information Display W/Navigation System
*12: W/G, S/D
*13: 5-Door H/B
*14: 3-Door H/B
*15: W/O Navigation System
*16: W/Tweeter
*17: W/O Tweeter
*18: W/Power window or W/Door Lock Control
*19: Except *18
*20: LHD
*21: RHD

E54097

INSPECTION PROCEDURE

1	ADJUST SOUND QUALITY

(a) Adjust the sound quality.
(1) Operate the radio receiver assy to adjust the sound quality.
Standard: malfunction disappear.

OK → **BAD SOUND QUALITY**

NG

2	COMPARE IT WITH ANOTHER CAR OF SAME MODEL

(a) Compare it with another vehicle of the same model.
(1) Compare with the vehicle of the same type which does not have a trouble to see if there is any difference in the condition of trouble occurrence.
Standard: No difference found.

OK → **SETTING**

NG

3	CHECK HARNESS AND CONNECTOR(RADIO RECEIVER ASSEMBLY - SPEAKER)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	INSPECT FRONT NO.1 SPEAKER ASSY

(a) Preparation for Check
(1) Disconnect the connector of the speaker.
(b) Resistance Check
(1) Check the resistance between the terminals of the speaker.

NOTICE:
The speaker should not be removed for checking.

Standard value: 4 Ω

NG → **REPLACE FRONT NO.1 SPEAKER ASSY**

OK

5 INSPECT FRONT NO.2 SPEAKER ASSY

(a) Check that malfunction disappear when a known good speaker is installed.
Standard: malfunction disappear.

HINT:
Connect the all connectors of speakers.

NG → **REPLACE FRONT NO.2 SPEAKER ASSY**

OK

6 INSPECT REAR SPEAKER ASSY

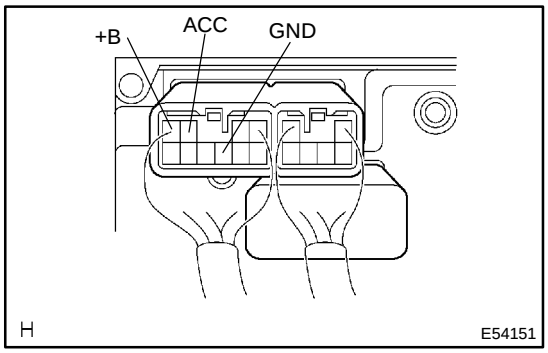
(a) Preparation for Check
(1) Disconnect the connector of the speaker.
(b) Resistance Check
(1) Check the resistance between the terminals of the speaker.

NOTICE:
The speaker should not be removed for checking.
Standard value: 4 Ω

NG → **REPLACE REAR SPEAKER ASSY**

OK

7 INSPECT RADIO RECEIVER ASSY(+B, ACC, GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.
Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.
Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR **(See page 01-30)**

RADIO BROADCAST CANNOT BE RECEIVED (BAD RECEPTION)

INSPECTION PROCEDURE

1	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search functions properly.
(1) Perform the auto-search of the radio and check that it functions normally.
Standard: The radio auto-search functions properly.

OK → CHECK AND REPLACE RADIO RECEIVER ASSY

NG

2	CHECK OPTIONAL COMPONENT

(a) Check optional component (Sun shade film, telephone antenna etc.).
(1) Check whether or not any optional component is installed, such as the sunshade film and the telephone antenna, is installed.
Standard: Optional component is installed.

OK → EFFECT FROM OPTIONAL COMPONENT

NG

3	CHECK ANTENNA FOR NOISE PRODUCTION

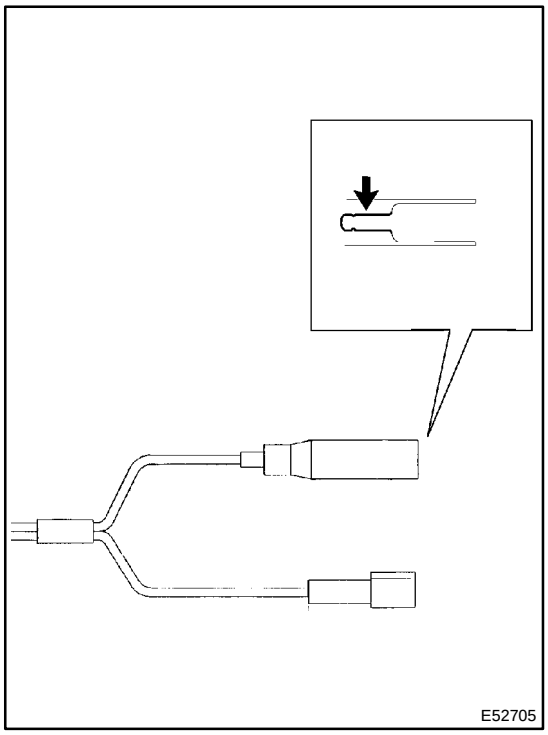
(a) Noise Check with Antenna
(1) With the ignition switch in ACC, turn on the radio and choose the AM mode.
(2) Place a tip of a screwdriver or the antenna of the antenna assembly w/ holder and check that the noise heard from the speaker.
Standard: Noise occurs.

OK → CHECK AND REPLACE RADIO RECEIVER ASSY

NG

4	CHECK ANTENNA ASSY, W/HOLDER

(a) Preparation for Check
(1) Remove the antenna plug of the amplifier antenna assy.
(b) Noise Check
(1) With the radio receiver assembly connector connected, turn the ignition switch to ACC.
(2) Turn on the radio and choose the AM mode.



(3) Place a flat-head screwdriver or a metal such as a thin wire on the antenna jack of the antenna cord sub-assy and check that the noise heard from the speaker.

Standard: Noise occurs.

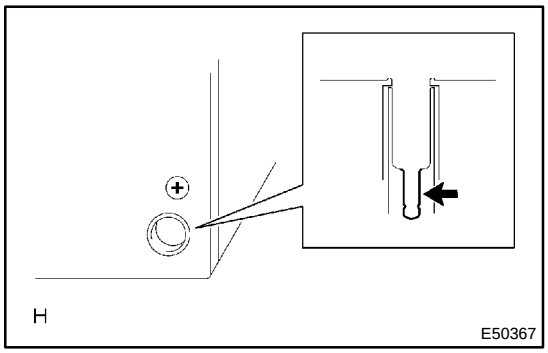
OK	REPLACE ANTENNA ASSY, W/HOLDER

NG

5	INSPECT RADIO RECEIVER ASSY(ANTENNA)

(a) Preparation for Check
  (1) Remove the antenna plug of the radio receiver assembly.

(b) Noise Check
  (1) With the radio receiver assembly connector connected, turn the ignition switch to ACC.
  (2) Turn on the radio and choose the AM mode.



  (3) Place a flat-head screwdriver or a metal such as a thin wire on the antenna jack of the radio receiver assembly and check that the noise heard from the speaker.

Standard: Noise occurs.

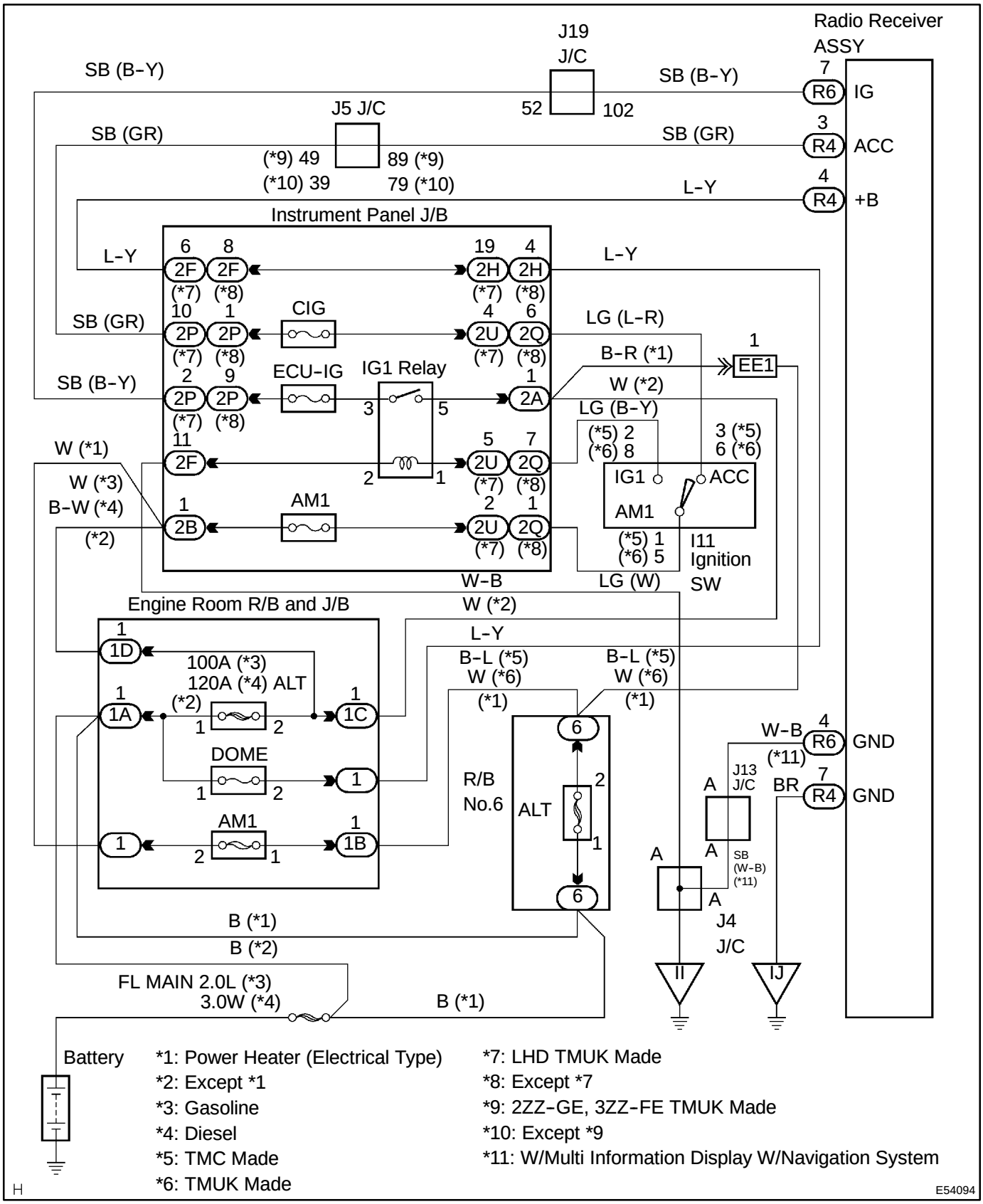
OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

CHECK AND REPLACE ANTENNA CORD SUB-ASSY

CASSETTE TAPE CANNOT BE INSERTED OR PLAYED

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK FOR ANY FOREIGN OBJECT

(a) Check for any foreign object.
(1) Check that no foreign object or defect is detected in the cassette tape player of radio receiver assembly.
Standard: No foreign object and defect detected.

NG → **REMOVE FOREIGN OBJECT**

OK

2	CHECK CASSETTE TAPE

(a) Check the cassette tape.
(1) Check that the cassette tape is a normal tape to which music or voice is recorded.
Standard: Proper cassette tape to which music or voice is recorded

NG → **CASSETTE TAPE FAULTY**

OK

3	REPLACE CASSETTE TAPE WITH ANOTHER AND RECHECK

(a) Replace the cassette tape with another and recheck.
(1) Replace the faulty cassette tape with the normal one to see if the same trouble occurs again.
Standard: The function is recovered to be normal.

OK → **CASSETTE TAPE FAULTY**

NG

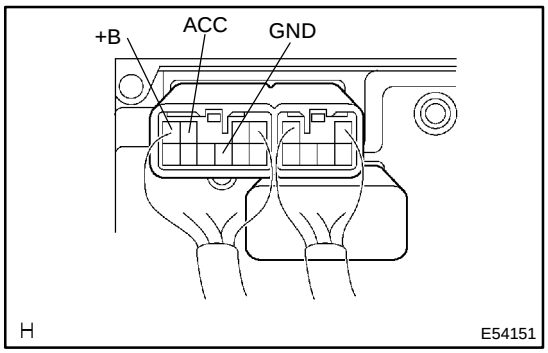
4	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search functions properly.
(1) Perform the auto-search of the radio and check that the operation is normal.
Standard: The operation returns to be normal.

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY** **(SEE PAGE 01-30)**

NG

5	INSPECT RADIO RECEIVER ASSY(+B,ACC,GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

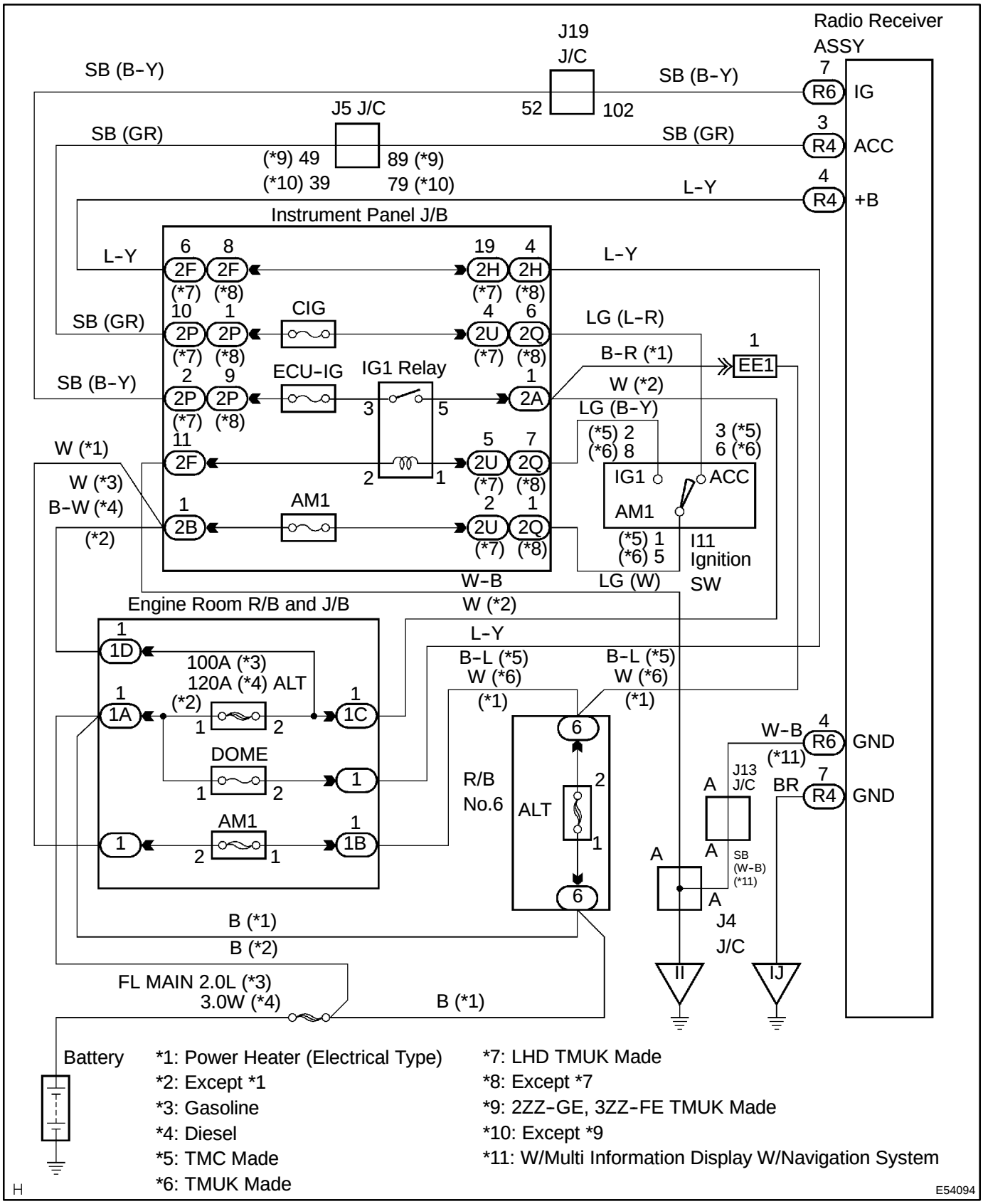
OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

CASSETTE TAPE CANNOT BE EJECTED

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search function properly.
(1) Perform the auto-research of the radio and check that the operation is normal.
Standard: malfunction disappear.

NG → **Go to step 5**

OK

2	PRESS "EJECT" AND CHECK OPERATION

(a) Press "EJECT" and check the operation.
(1) Press the cassette tape EJECT switch of the radio receiver assembly for 2 sec or more and check that the cassette tape is ejected.
Standard: The cassette tape is ejected.

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

3	CHECK CASSETTE TAPE

(a) Check the cassette tape.
(1) Check that the ejected cassette tape does not have the label peeling, cassette body deformation and others.
Standard: No fault on the cassette tape.

NG → **CASSETTE TAPE FAULTY**

OK

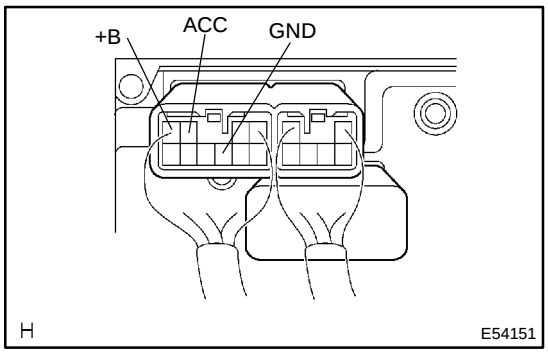
4	REPLACE CASSETTE TAPE WITH ANOTHER AND RECHECK

(a) Replace the cassette tape with another and recheck.
(1) Replace the faulty cassette tape with the normal one to see if the same trouble occurs again.
Standard: malfunction disappear.

OK → **CASSETTE TAPE FAULTY**

NG

5	INSPECT RADIO RECEIVER ASSY(+B, ACC, GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

SOUND QUALITY IS BAD ONLY WHEN PLAYING TAPE

INSPECTION PROCEDURE

1	REPLACE CASSETTE TAPE WITH ANOTHER AND RECHECK

(a) Replace the cassette tape with another and recheck.
(1) Replace the faulty cassette tape with the normal one to see if the same trouble occurs again.
Standard: malfunction disappear.

OK → CASSETTE TAPE FAULTY

NG

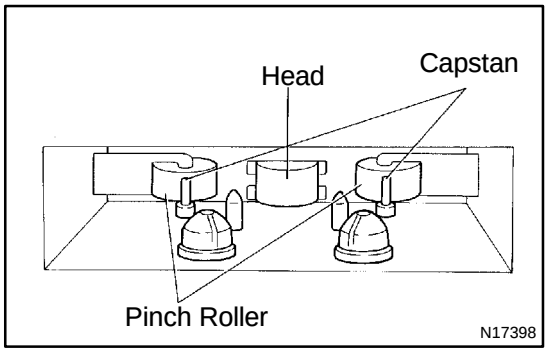
2	CHECK FOR ANY FOREIGN OBJECT

(a) Check for foreign object.
(1) Check that no foreign material and troubles are detected in the radio receiver assembly cassette tape player.

NG → REMOVE FOREIGN OBJECT

OK

3	CLEAN HEAD AND CHECK OPERATION



(a) Head cleaning
(1) Raise the cassette door with your finger. Next, using a pencil or similar object, push in the guide.
(2) Using a cleaning pen or cotton applicator soaked in cleaner, clean the head surface, pinch rollers and capstans.
(3) Check that the same trouble occurs again.

OK → HEAD DIRTY

NG

CHECK AND REPLACE RADIO RECEIVER ASSY

TAPE IS TANGLED DUE TO INCORRECT TAPE SPEED OR AUTO-REVERSE MALFUNCTION

INSPECTION PROCEDURE

1	CHECK FOR ANY FOREIGN OBJECT

(a) Check for any foreign object.
(1) Check that no foreign material and troubles are detected in the radio receiver assembly cassette tape player.
Standard: No foreign material and trouble detected.

NG → **REMOVE FOREIGN OBJECT**

OK

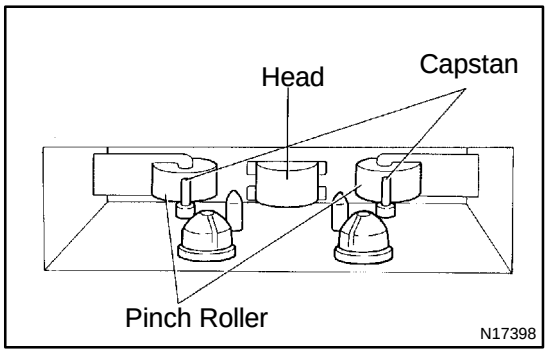
2	REPLACE CASSETTE TAPE WITH ANOTHER AND RECHECK(BELOW 90 MIN.)

(a) Replace the cassette tape with another and recheck.
(1) Replace the faulty cassette tape with the normal one (90min or less) to see if the same trouble occurs again.
Standard: malfunction disappear.

OK → **CASSETTE TAPE FAULTY**

NG

3	CLEAN HEAD AND CHECK OPERATION



(a) Head cleaning
(1) Raise the cassette door with your finger. Next, using a pencil or similar object, push in the guide.
(2) Using a cleaning pen or cotton applicator soaked in cleaner, clean the head surface, pinch rollers and capstans.
(3) Check that the same trouble occurs again.

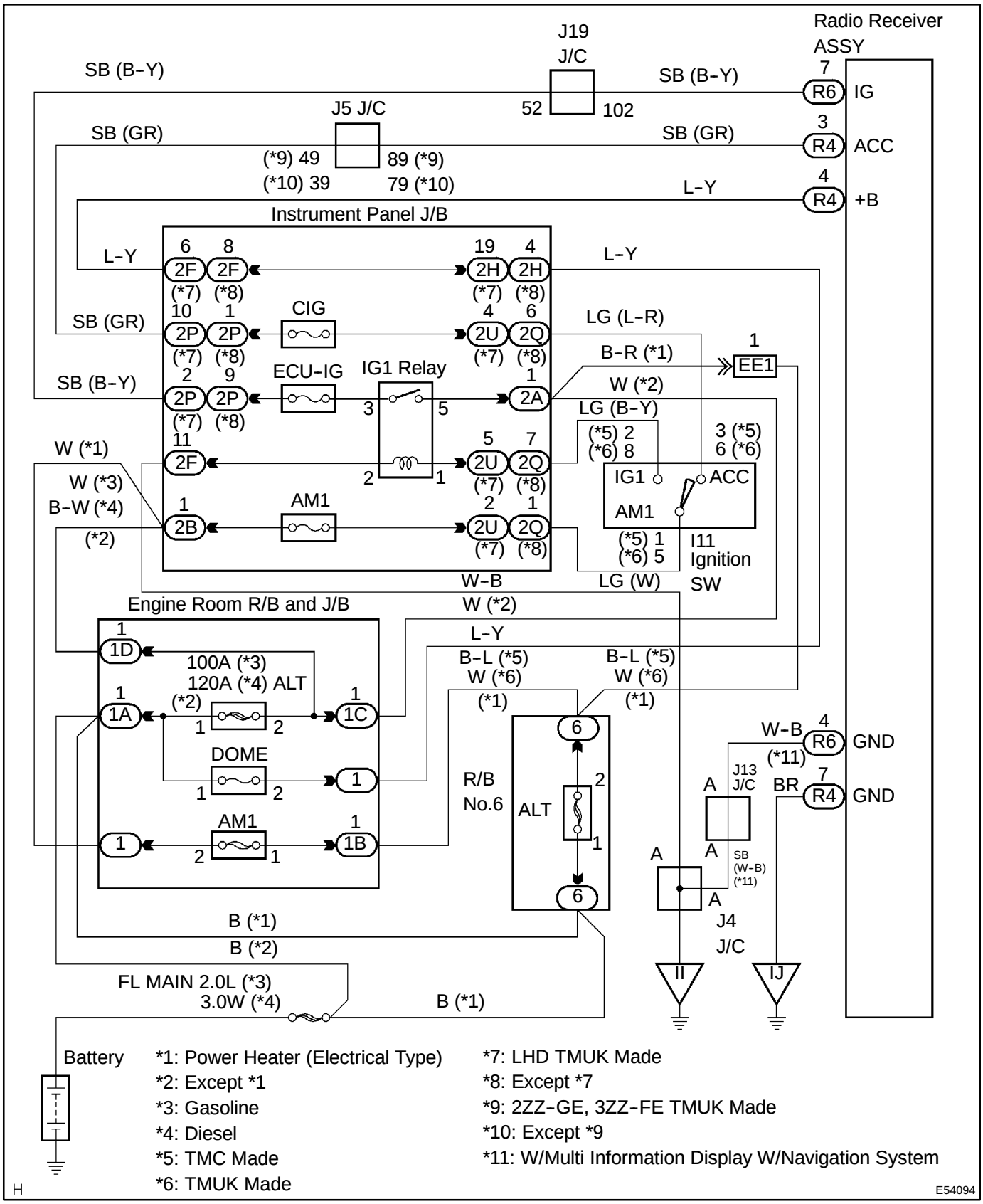
OK → **HEAD DIRTY**

NG

CHECK AND REPLACE RADIO RECEIVER ASSY

CD CANNOT BE INSERTED OR IS EJECTED RIGHT AFTER INSERTION

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK IF A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Make sure that the CD is normal audio CD, and that there is no deformation, flaw, stain, burr and other defects on the CD.
Standard: Normal audio CD.

Reference:
- Translucent or different-shaped CD cannot be played.
- CD-ROM for personal computers (with music recorded in) and recorded CD -R may not be played.
- Playing an 8-cm CD does not require an adapter.

NG → **CD FAULTY**

OK

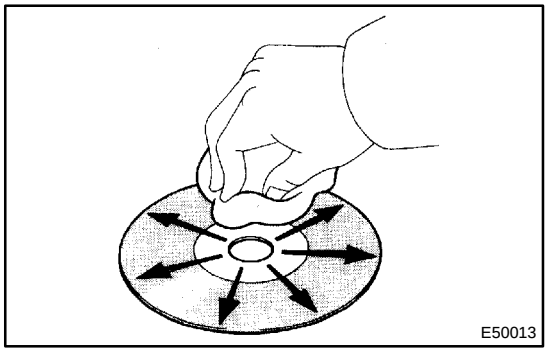
2	CHECK THAT A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Check whether or not the CD is inserted upside down.
Standard: Not upside down.

NG → **SET DISC CORRECTLY**

OK

3	DISC CLEANING



(a) Disk cleaning
(1) If the disk gets dirty, clean the disk by wiping the surface from the center to outside in the radial directions with a soft cloth.

NOTICE:
Do not use a conventional record cleaner or anti-static preservative.

OK → **DISC DIRTY**

NG

4	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with another and recheck.
(1) Replace the faulty CD with the normal one to see if the same trouble occurs again.
Standard: malfunction disappear.

OK → **CD FAULTY**

NG

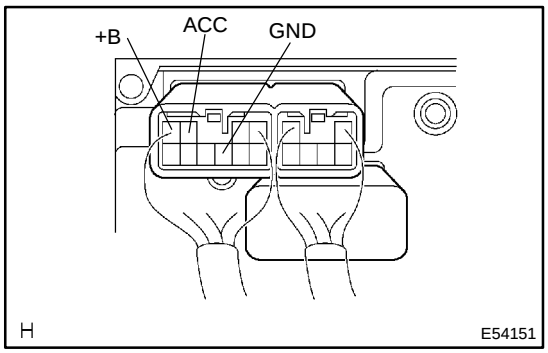
5	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search function properly.
(1) Perform the auto-research of the radio and check that the operation is normal.
Standard: malfunction disappear.

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

6	INSPECT RADIO RECEIVER ASSY(+B,ACC,GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.
Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.
Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

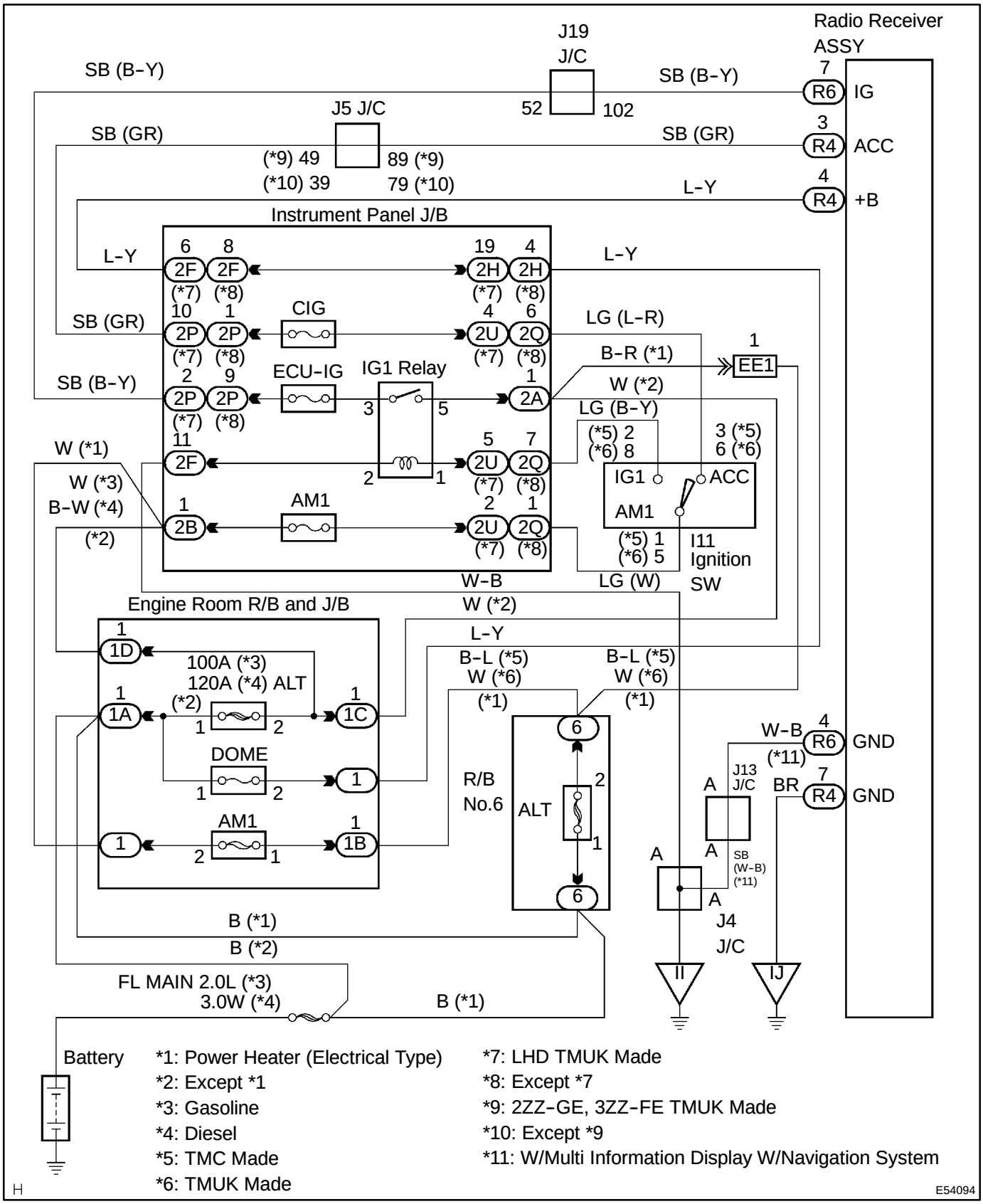
OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

ALTHOUGH SYSTEM IS POWERED,CD CANNOT BE PLAYED

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK IF A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Make sure that the CD is a normal audio CD, and that there is no deformation, flaw, stain, burr and other defects on the CD.
Standard: Normal audio CD.

Reference:
- Translucent or different-shaped CD cannot be played.
- CD-ROM for personal computers (with music recorded in) and recorded CD-R may not be played.
- Playing an 8-cm CD does not require an adapter.

NG → **CD FAULTY**

OK

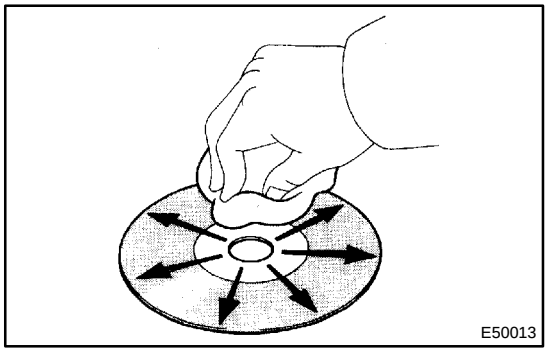
2	CHECK THAT A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Check whether or not the CD is inserted upside down.
Standard: Not upside down.

NG → **SET DISC CORRECTLY**

OK

3	DISC CLEANING



(a) Disk cleaning
(1) If the disk gets dirty, clean the disk by wiping the surface from the center to outside in the radial directions with a soft cloth.

NOTICE:
Do not use a conventional record cleaner or anti-static preservative.

OK → **DISC DIRTY**

NG

4	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with another and recheck.
(1) Replace the faulty CD with the normal one to see if the same trouble occurs again.
Standard: malfunction disappear.

OK → **CD FAULTY**

NG

5	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search function properly.
(1) Perform the auto-research of the radio and check that the operation is normal.
Standard: malfunction disappear.

NG → **Go to step 7**

OK

6	DID THE TEMPERATURE IN THE CABIN CHANGE RAPIDLY?

(a) Did the temperature in the cabin change rapidly?
(1) Check whether or not the rapid temperature change occurred in the cabin.
Standard: The rapid temperature change occurred.

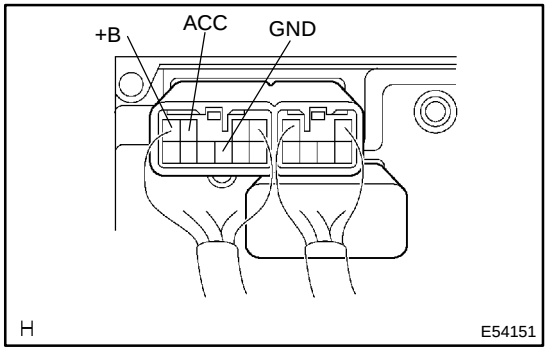
Reference:
The rapid temperature change creates condensation inside the CD player, which may disable playing CD.

OK → **CONDENSATION DUE TO TEMPERATURE CHANGE(LEAVE IT AS IT IS FOR A WHILE BEFORE USING)**

NG

CHECK AND REPLACE RADIO RECEIVER ASSY

7	INSPECT RADIO RECEIVER ASSY(+B,ACC,GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.
Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.
Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

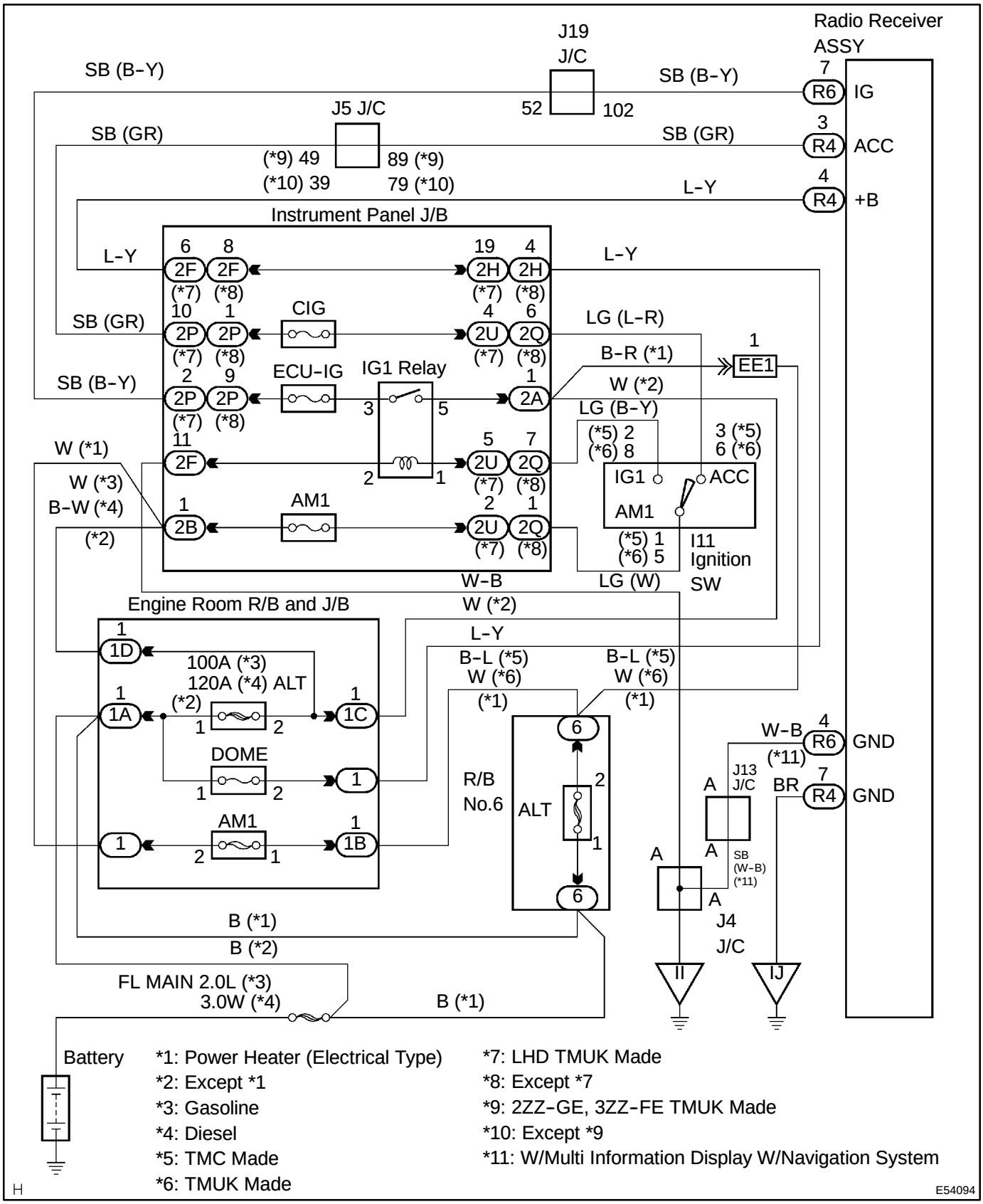
OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR **(See page 01-30)**

CD CANNOT BE TAKEN OUT

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search function properly.
(1) Perform the auto-research of the radio and check that the operation is normal.
Standard: malfunction disappear.

NG → **Go to step 5**

OK

2	PRESS "EJECT" AND CHECK OPERATION

(a) Press "EJECT"and check the operation
(1) Press the CD EJECT switch of the radio receiver assembly for 2 sec or more to see if the CD is ejected.
Standard: CD is ejected.

Reference:
If the CD is not ejected, send the vehicle for repair.
Do not try to drag it out by force.

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

3	CHECK IF A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Check that in what conditions the sound skipping occurs.
Standard: Driving on the bad road.

NG → **CD FAULTY**

OK

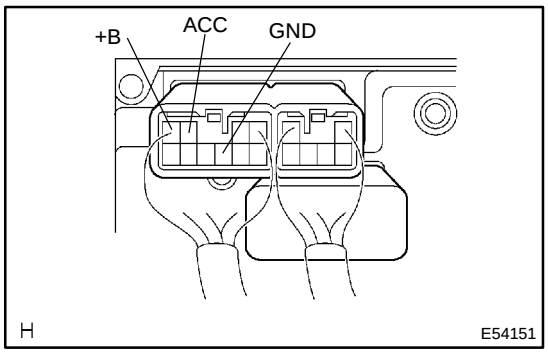
4	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with another and recheck.
(1) Check the installation condition of the radio receiver assembly.
Standard: Installed properly.

OK → **CD FAULTY**

NG

5	INSPECT RADIO RECEIVER ASSY(+B,ACC,GND)



(a) Check that the continuity exists between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
GND - Body ground	Constant	Continuity

(b) Measure voltage between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
+B - GND	Constant	10 - 14 V
ACC - GND	Ignition switch ACC or ON	10 - 14 V

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

SOUND QUALITY IS BAD ONLY WHEN CD IS PLAYED(VOLUME IS TOO LOW)

INSPECTION PROCEDURE

1	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with another and recheck.
(1) Check the installation condition of the radio receiver assembly.
Standard: malfunction disappear.

OK → **CD FAULTY**

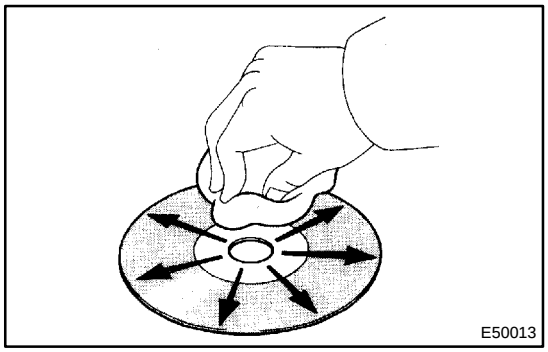
NG

CHECK AND REPLACE RADIO RECEIVER ASSY

CD SOUND SKIPS

INSPECTION PROCEDURE

1	DISC CLEANING



(a) Disk cleaning
(1) If the disk gets dirty, clean the disk by wiping the surface from the center to outside in the radial directions with a soft cloth.

NOTICE:
Do not use a conventional record cleaner or anti-static preservative.

Standard: malfunction disappear.

OK → **DISC DIRTY**

NG

2	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with another and recheck.
(1) Check the installation condition of the radio receiver assembly.
Standard: malfunction disappear.

OK → **CD FAULTY**

NG

3	CHECK WHEN THIS HAPPENS

(a) Check then this happens.
(1) Check that in what condition (place) noise occurs.
Standard: Driving on the bumpy road.

OK → **Go to step 5**

NG

4	COMPARE IT WITH ANOTHER CAR OF SAME MODEL

(a) Compare it with another vehicle of the same model.
(1) Compare with the vehicle of the same type which does not have a trouble to see if there is any difference in the condition of trouble occurrence.
Standard: No difference found.

OK → **SETTING**

NG

5	CHECK OF RADIO RECEIVER ASSEMBLY INSTALLATION

(a) Check of radio receiver assembly installation.
(1) Check the installation condition of the radio receiver assembly.
Standard: Installed properly.

NG → **INSTALL THE RADIO RECEIVER ASSEMBLY PROPERLY**

OK

6	DID THE TEMPERATURE IN THE CABIN CHANGE RAPIDLY?

(a) Did the temperature in the cabin change rapidly?
(1) Check whether or not the rapid temperature change occurred in the cabin.
Standard: The rapid temperature change occurred.

Reference:
The rapid temperature change creates condensation inside the CD player, which may disable playing CD.

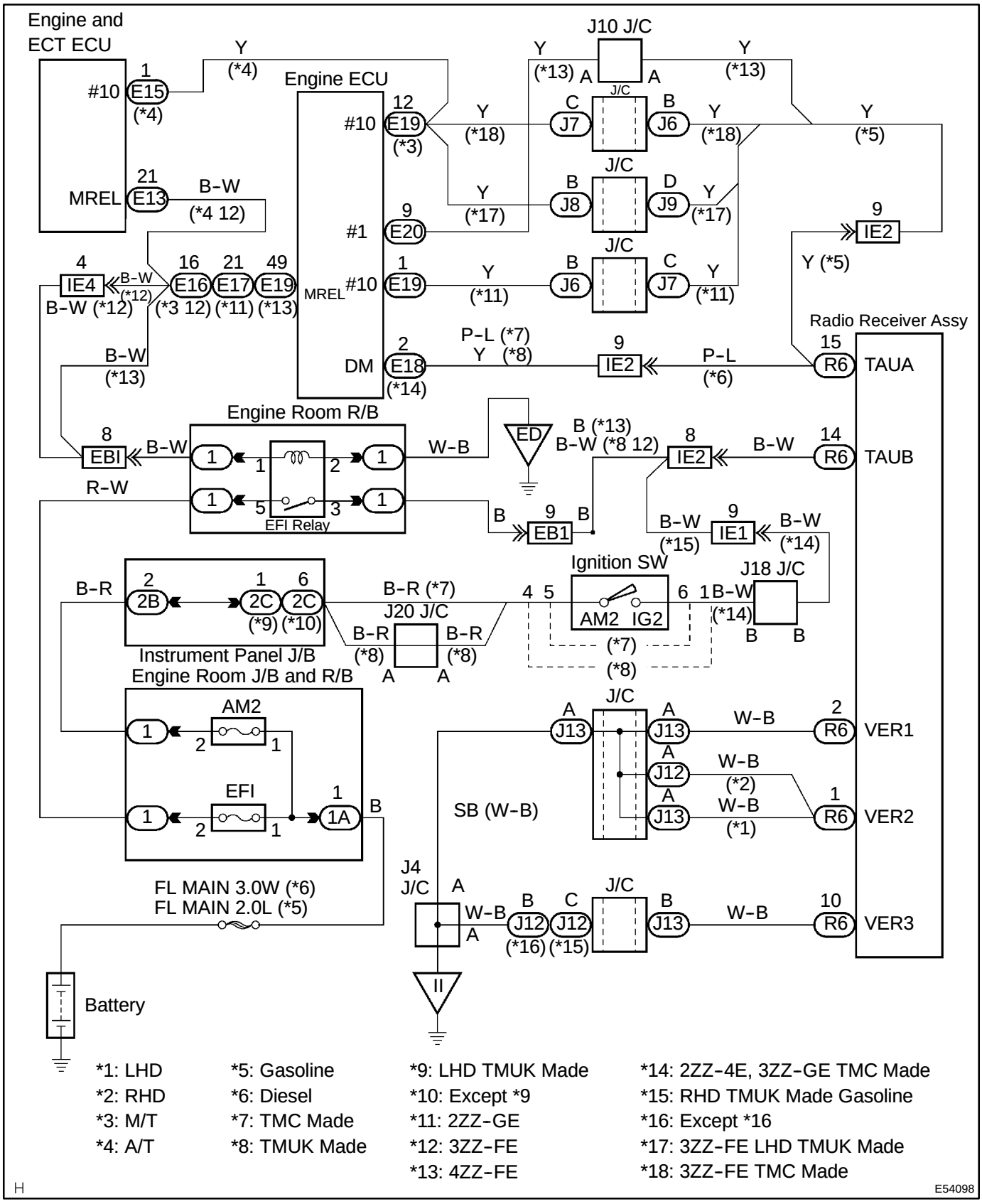
OK → **CONDENSATION DUE TO TEMPERATURE CHANGE(LEAVE IT AS IT IS FOR A WHILE BEFORE USING)**

NG

CHECK AND REPLACE RADIO RECEIVER ASSY

DO NOT DISPLAY FUEL EFFICIENCY

WIRING DIAGRAM



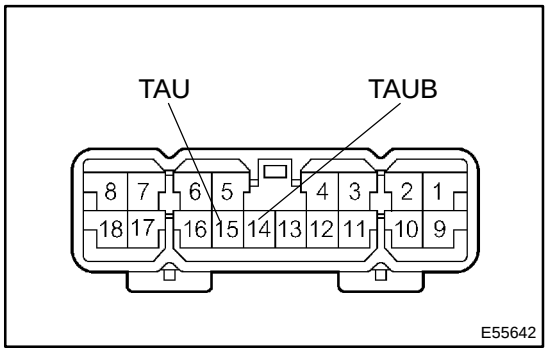
*1: LHD	*5: Gasoline	*9: LHD TMUK Made	*14: 2ZZ-4E, 3ZZ-GE TMC Made
*2: RHD	*6: Diesel	*10: Except *9	*15: RHD TMUK Made Gasoline
*3: M/T	*7: TMC Made	*11: 2ZZ-GE	*16: Except *16
*4: A/T	*8: TMUK Made	*12: 3ZZ-FE	*17: 3ZZ-FE LHD TMUK Made
		*13: 4ZZ-FE	*18: 3ZZ-FE TMC Made

H

E54098

INSPECTION PROCEDURE

1	CHECK HARNESS AND CONNECTOR(RADIO RECEIVER ASSY-ENGINE ECU)



(a) Measure voltage between terminals at each condition, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
TAUB - GND	Ignition switch ON	10 - 14 V
TAU - GND	Engine running	10 - 14 V

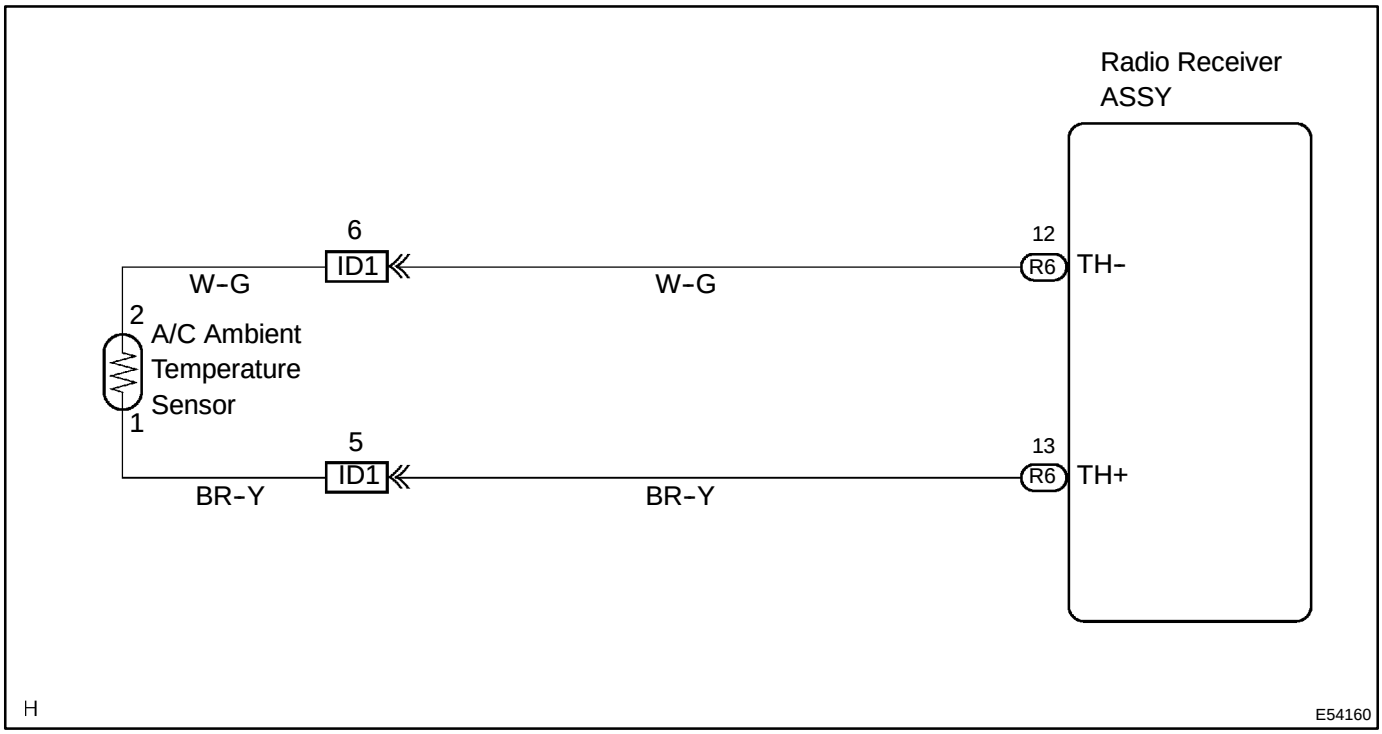
NG → **REPAIR OR REPLACE ECM** **(See page 01-30)**

OK

CHECK AND REPLACE RADIO RECEIVER ASSY

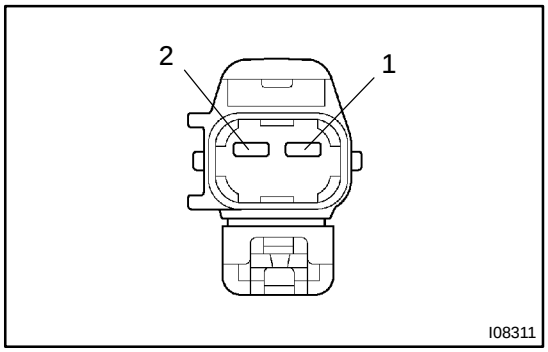
THE AMBIENT TEMPERATURE DOES NOT DISPLAY

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT OUTER AMBIENT TEMPERATURE SENSOR



(a) Remove cooler (ambient temp. sensor) thermistor.
(b) Measure resistance between terminals 1 and 2 of cooler (ambient temp. sensor) thermistor connector at each temperature.
Resistance:
at 25 _C (77 _F) : 1.62 - 1.79 kΩ
at 40 _C (104 _F) : 0.55 - 0.65 kΩ

HINT:
As the temperature increases, the resistance decreases.

NG → **REPLACE OUTER AMBIENT TEMPERATURE SENSOR**

OK

2	CHECK HARNESS AND CONNECTOR(THERMISTOR ASSY-RADIO RECEIVER ASSY)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR** **(See page 01-30)**

OK

CHECK AND REPLACE RADIO RECEIVER ASSY

NOISE OCCURS

INSPECTION PROCEDURE

1 CHECK OF SPEAKER INSTALLATION

(a) Check speaker installation condition.
(1) Check that each speaker is securely installed.
Standard: malfunction disappear.

HINT:
The radio is equipped with noise prevention system that does not work against the regular use of the radio, thereby excessively large noise cannot occur in the radio. If large noise occurs, check whether or not the earth on the antenna installation part and the proper noise-prevention equipment are all installed, and whether or not the improper wiring is held.

Condition in which noise occurs	Noise type
Depressing the acceleration pedal increases noise, and stopping the engine erases the noise immediately.	Alternator noise
Noise occurs during the A/C or the heater operation.	Blower motor noise
Rapid acceleration during the drive on the unpaved road or after the IG switch is turned ON makes noise.	Fuel pump noise
Pressing and then releasing the horn switch, and keeping pressing the horn switch makes noise.	Horn noise
Stopping the engine erases the small noise that has been heard.	Ignition noise
Noise occurs in turn with the blink of the turn signal flash.	Flasher noise
Noise occurs during the window washer operation.	Washer noise
Noise occurs during the engine running, and it continues to occur after the engine is stopped.	Water temperature sensor noise
Noise occurs during the wiper operation.	Wiper noise
Noise occurs when the brake pedal is depressed.	Stop light switch noise
Others.	Static electricity on the vehicle

HINT:
- Identify the condition under which the noise occurs, and check the noise filter on the related part.
- Make sure first that there is no noise from outside. Failing to do so makes the noise occurrence source detection impossible and leads to misunderstanding.
- The noise should be removed in descending order of loudness.

NG → INSTALL IT PROPERLY

OK

IDENTIFICATION OF NOISE SOURCE

NAVIGATION SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

0561A-02

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-1133)

3	Problem Symptom Confirmation (See page 01-30)

- Symptom does not occur (Go to step 4)
- Symptom occurs (Go to step 5)

4	Symptom Simulation (See page 01-30)

5	DTC Check (See page 05-1134)

- Normal code (Go to step 7)
- Malfunction code (Go to step 6)

6	DTC Chart (See page 05-1148)

Go to step 8

7	Problem Symptoms Table (See page 05-1156)

8	Terminal of ECU (See page 05-1153)

9	Indemnification of Problem

10	Repair or Replace

11	Confirmation Test

End

0561B-02

CUSTOMER PROBLEM ANALYSIS CHECK

NAVIGATION SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date of Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred	/ /
Frequency Problem Occurs	j Constant j Intermittent (Times a day)

Problem Symptom	**Navigation malfunction**	j Cursor movement is defective.
		j Cursor does not move.
		j GPS mark does not appear.
		j Map is not displayed.
		j Others ( )
	Display malfunction	j Screen is dark.
		j Screen is white.
		j Color is not uniform.
		j Screen is in disorder.
		j Others ( )
	Control Switch malfunction	j Can not operate with panel switches.
		j Can not operate with touch switches.
		j Others ( )

	Parts name	**1st time malfunction code.**	**2nd time malfunction code.**
DTC Check	Navigation ECU		
	Radio and Player with Display		

I32158

0561C-02

PRE-CHECK

1. USER TROUBLES UNDER NORMAL CONDITION OF THE NAVIGATION SYSTEM

(a) Voice guidance is not performed even though the system is in normal condition when:
  (1) The destination is not set up.
  (2) The vehicle is not driving on the set route. (The remaining distance is not displayed at the lower left of the map screen that tells the current position of the vehicle.)
  (3) "Guidance in Other Modes" is not set up. (In this case no voice guidance is given except on the map screen.)

(b) The vehicle icon turns around arbitrarily on the screen even when the system is in normal condition. If the ignition switch is turned to "ACC" or "ON" while the vehicle is turning around such as being on the turntable, the Navigation System memorizes the angle speed of that moment as the standard figure. To solve this problem, at the vehicle speed of 0 MPH (0 km/h), turn off the ignition switch and, then turn it to "ACC" or "ON" again, and see whether any trouble occurs again.

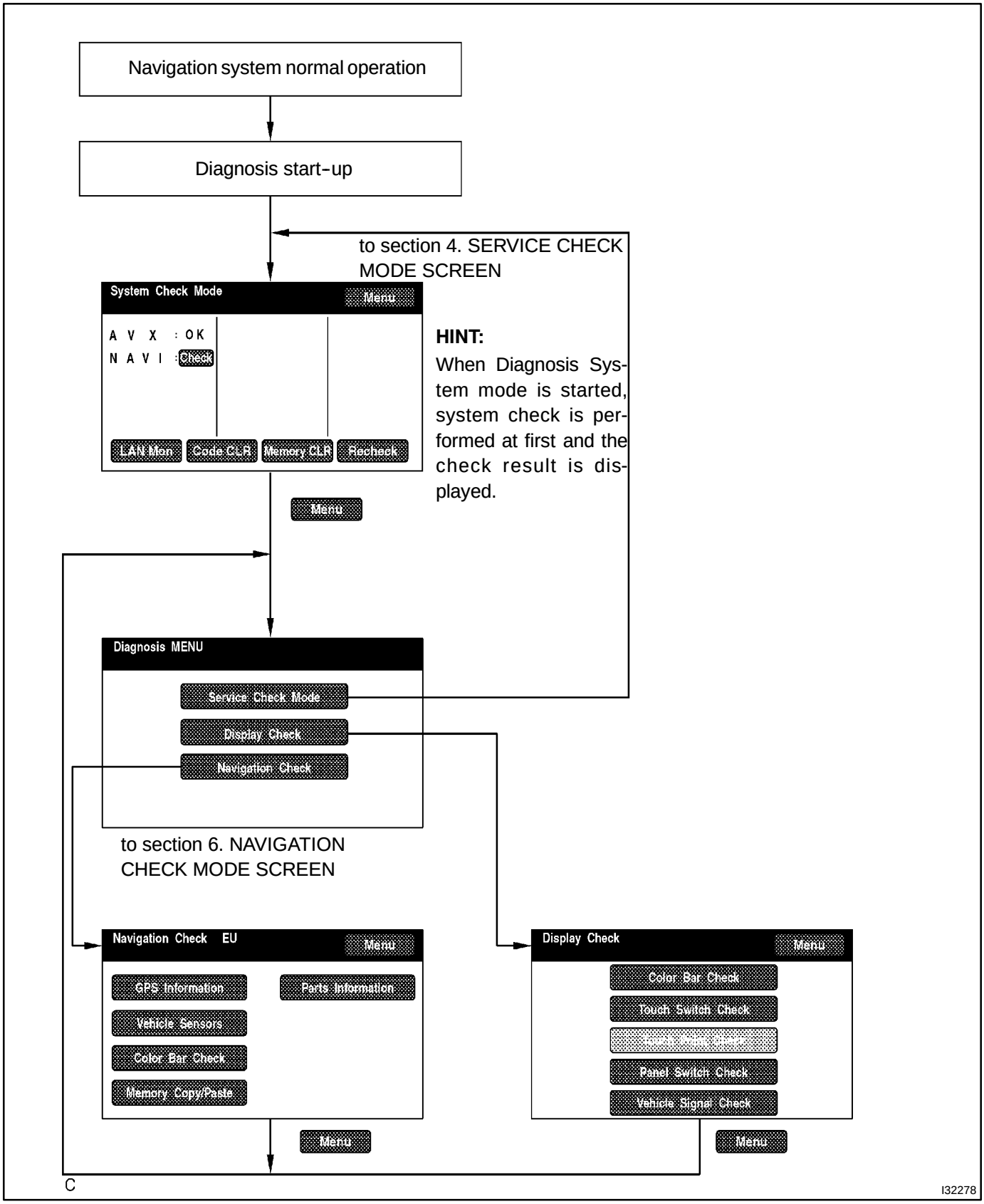
2. INSPECTION OF THE LOCATION WITH TROUBLE OCCURRENCE

(a) Examine whether the wrong display of the vehicle icon appears in a certain location or in several locations.

HINT:

It is difficult to determine the accurate vehicle position when driving on a freeway, a looped road or a road which runs in parallel with another, and immediately after going a out of the parking area. In such cases the vehicle icon can be displayed off the real position of the vehicle.

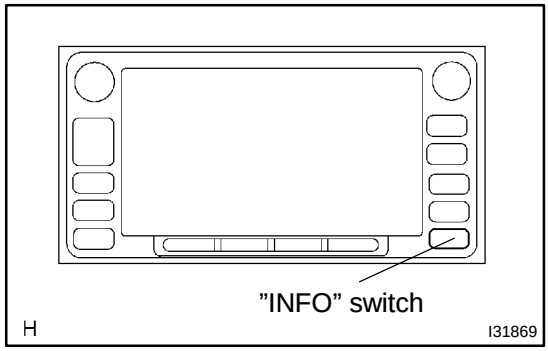
3. DIAGNOSIS SYSTEM MODE



(a) Start-up And Finishing Of The Diagnosis

HINT:

Before starting the Diagnosis System, make sure that the map appears on the screen after turning on the IG switch.
If not, some items cannot be checked.



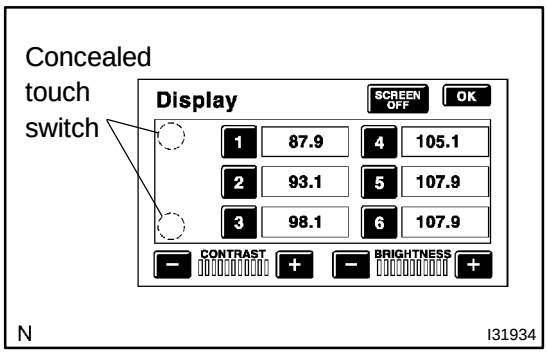
(b) Diagnosis Start-up by light control switch.

(1) Vehicle speed should be 0 km/h (0 mph).
(2) Apply the parking brake.
(3) Turn the ignition switch to ACC or ON.
(4) While pressing the "INFO" switches on the Multi Display, turn the Light Control switch from OFF → TAIL → OFF → TAIL → OFF → TAIL → OFF.

Display	Description
Service Check	By performing system check and collecting data of diagnosis memory, this mode checks the current and past condition of each connection device.
Display Check	It displays the Display Check on the screen.
Navigation Check	It displays the Navigation ECU Check on the screen.

HINT:

- When Diagnosis System starts, Service Check screen is displayed and the service check begins.
- Select MENU to display Diagnosis Check Menu.



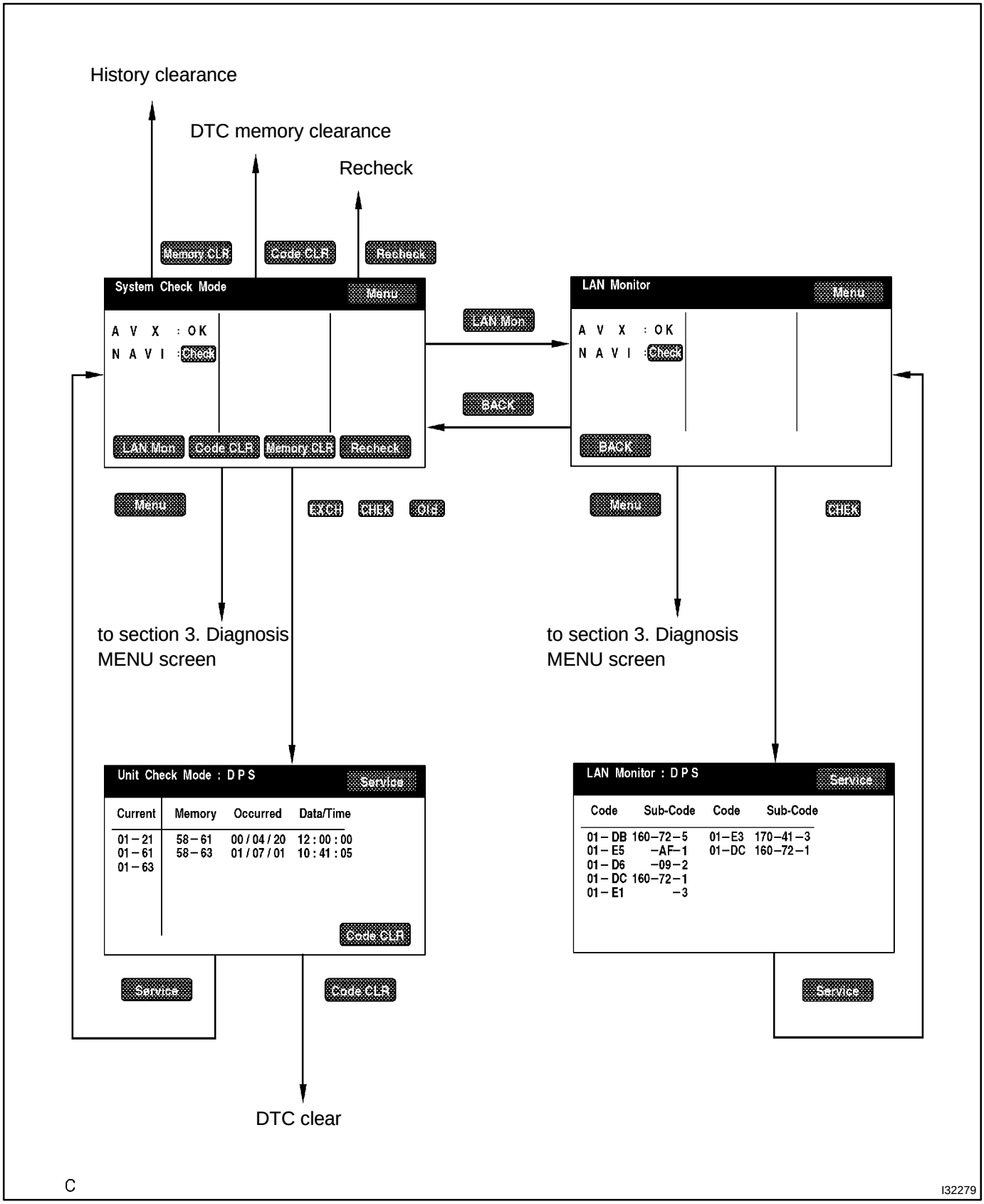
(c) Diagnosis Start-Up by touch switch.

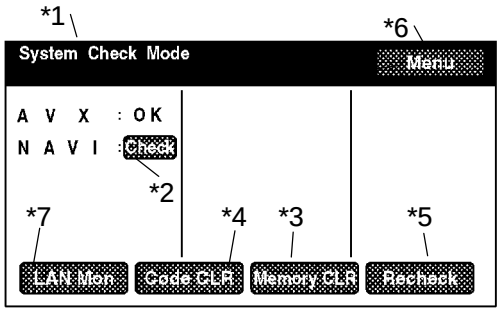
(1) Vehicle speed should be 0 km/h (0 mph).
(2) Apply the parking brake.
(3) Turn the ignition switch to ACC or ON.
(4) Activate the screen adjustment screen.
(5) Alternately touch the upper and lower bottom parts of the left end of the screen 3 times.

(d) Finishing the Diagnosis System

Turn the ignition switch off to finish the mode.

4. SERVICE CHECK MODE





I32365

(a) SERVICE CHECK MODE

(b) Service Check

(1) Start the Diagnosis System.

Display Item	Function
Components Name/*1	List of component names including optional components (15 components max.) are displayed. When the names are not identified, their physical addresses are displayed.
Check Result/*2	Check results are displayed.
Memory Clear switch/*3	Pressing this switch for 3 sec. deletes all the information about master component registration.
DTC Clear switch/*4	Pressing this switch for 3 sec. deletes diagnosis memory of all the components. It deletes Service Check results and the screen displaying the check results.
Recheck/*5	Pressing this switch performs Service Check again.
MENU/*6	Pressing this switch activates the Diagnosis Menu screen.
LAN Monitor Switch/*7	Pressing this switch activates the LAN monitor screen.

HINT:

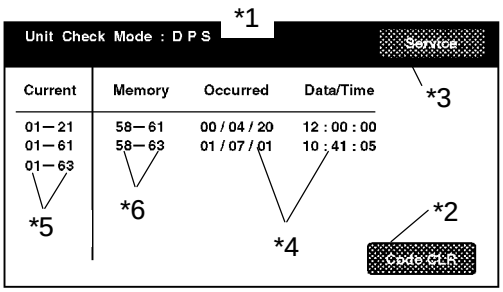
Service Check displays the check results based on the information obtained from each component's response to "System Check Execution" and "Diagnosis Memory Request", and the information of "Current DTC Notification" (the Unit Check and the LAN Check information that will be displayed on the next screens.).

(2) Read Check Result

Check Result	Meaning
OK	No DTC is identified.
EXCH	One or more DTC requesting for exchange are detected.
CHEK	One or more DTC requesting for check are detected.
NCON	No connection response to Diagnosis System start-up, whereas it has the connection response to the AVC LAN system when the power switch is turned on (when IG is turned to ACC).
Old	One or more DTC are detected because of old version.
NRES	No response to the information about the Diagnosis System, whereas it responds to the Diagnosis System start-up.
No Err	No DTC is identified.

HINT:

- After repair and check, press "Code CLR" for more than 3 sec. to delete diagnosis memory.
- After deleting diagnosis memory, press "Recheck" and make sure "OK" is displayed on the screen.



C

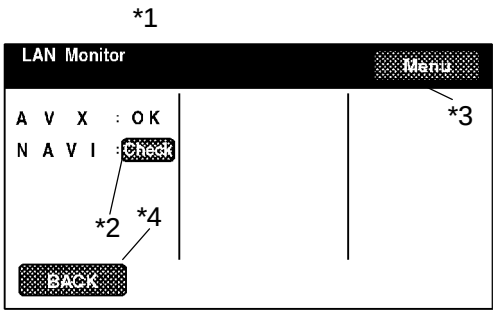
I31945

(3) "EXCH", "CHEK" and "Old" can be used as switches to activate "Unit Check Mode" for detail information. Check troubled parts of the components in these modes by referring to the DTC code list.

Display Item	Description
Components name/*1	Names of components to be checked are displayed.
DTC clear switch/*2	Pressing this switch for 3 sec. deletes DTC memory of the selected diagnosis component.
Service check mode screen switch/*3	Pressing this returns to the Service Check Mode screen.
Date/Time/*4	The date and time stamped at the time of DTC occurrence are displayed in the order of year-month-day-hour-minute-second. (If the date and time data is invalid, it is displayed as a blank.)
Current/ *5	Up to 6 DTC codes detected during the System Check are displayed.
Memory/ *6	DTC memories stored and current DTC Notification are displayed.

HINT:

- Detecting Unit DTC activates the Unit Check Mode on the screen.
- In the Unit Check Mode, DTC which is identified as "EHCK" in the Service Check, is displayed as classified into Current DTC and Past DTC.



I32366

(c) LAN Monitor

(1) Start the Diagnosis System.

Display Item	Function
Components Name/*1	List of component names including optional components (15 components max.) are displayed. When the names are not identified, their physical addresses are displayed.
Check Result/*2	Check results are displayed.
MENU/*3	Pressing this switch activates the Diagnosis Menu screen.
BACK/*4	Pressing this switch activates the System Check Mode screen.

HINT:

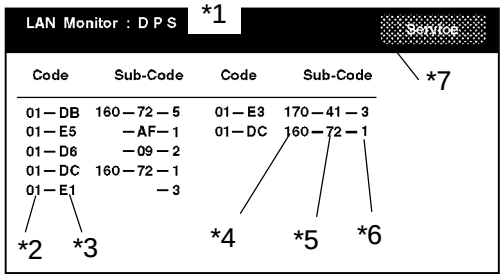
Service Check displays the check results based on the information obtained from each component's response to "System Check Execution" and "Diagnosis Memory Request", and the information of "Current DTC Notification" (the LAN Monitor that will be displayed on the next screens.).

(2) Read Check Result

Check Result	Meaning
OK	No DTC is identified.
EXCH	One or more DTC requesting for exchange are detected.
CHEK	One or more DTC requesting for check are detected.
NCON	No connection response to Diagnosis System start-up, whereas it has the connection response to the AVC LAN system when the power switch is turned on (when IG is turned to ACC).
Old	One or more DTC are detected because of old version.
NRES	No response to the information about the Diagnosis System, whereas it responds to the Diagnosis System start-up.
No Err	No DTC is identified.

HINT:

- After repair and check, press "Code CLR" for more than 3 sec. to delete diagnosis memory.
- After deleting diagnosis memory, press "Recheck" and make sure "OK" is displayed on the screen.



C I31947

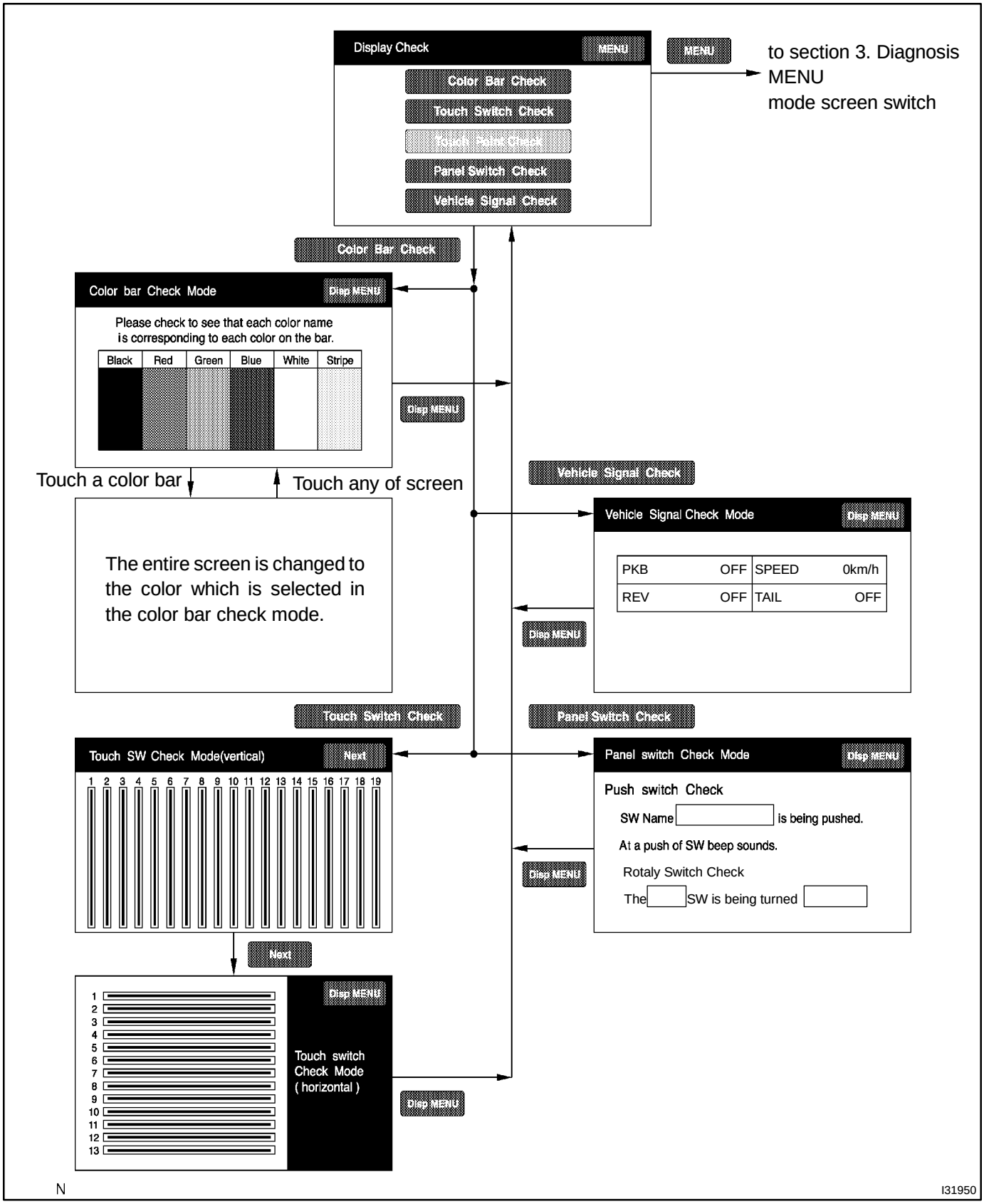
(3) "CHEK" can be used as switches to activate "LAN Monitor" for detail information. Check troubled parts of the components in these modes by referring to the DTC code list.

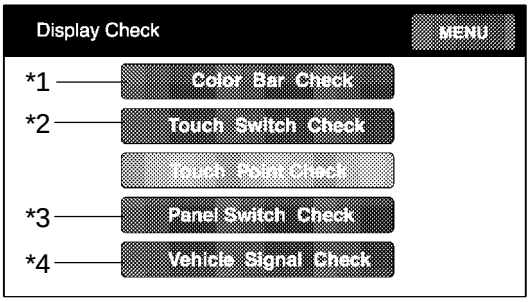
Display Item	Description
Components name/*1	Names of components to be checked are displayed.
Segment/*2	Logical address codes corresponding to DTC are displayed.
DTC/*3	DTC is displayed.
Sub-Code (address numbers of related components)/*4	Physical address codes memorized together with DTC are displayed.
Sub-code (Connection confirmation number) /*5	Connection confirmation numbers memorized together with DTC are displayed.
Sub-code (Number of occurrence) /*6	The number of occurrence of the same DTC is displayed.
Service check mode screen switch/*7	Pressing this returns to the Service Check Mode screen.

HINT:

Detecting no LAN DTC activates the LAN Check Mode on the screen.

5. DISPLAY CHECK MODE

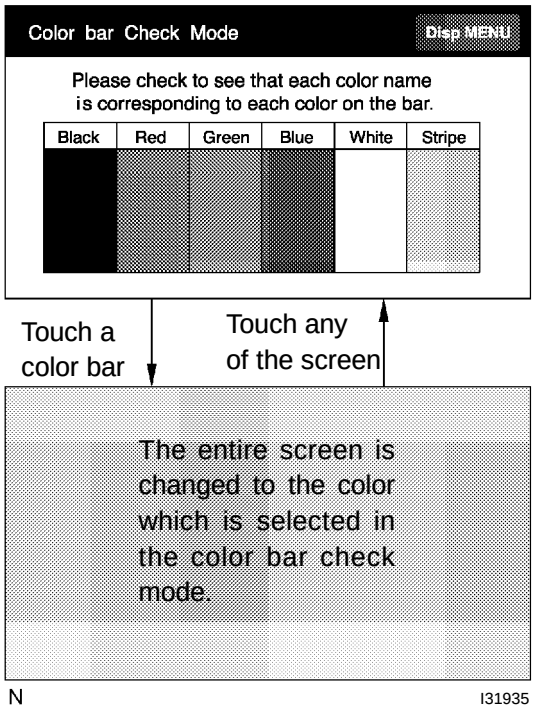




(a) DISPLAY CHECK MODE

Display	Contents
Color Bar Check/*1	Color display is checked.
Touch Switch Check/*2	Operating condition of touch switch display is checked.
Panel Switch Check/*3	Operating condition of switches on both sides of the display is checked.
Vehicle Signal Check/*4	Status of the vehicle signal which has been loaded into the display is checked.

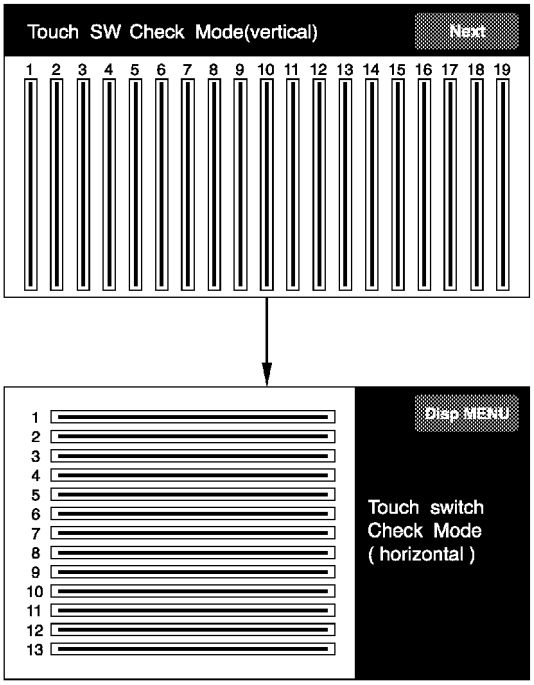
HINT:
In Display Check Mode, above checks can be performed.



(b) Display Color Bar Check
(1) Start the Diagnosis System.
(2) Select "MENU".
(3) Select "Display Check".
(4) Select "Color Bar Check".
(5) Make sure that each color name is corresponding to each color on the bar.

HINT:
Select Black, Red, Green, Blue, White and Stripe to display selected colors and stripe on the entire screen.

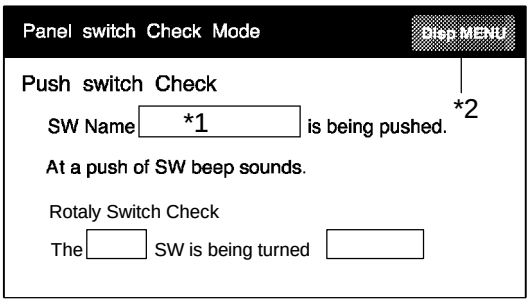
(6) Compare with the Color Bar Check in the Navigation Check and make sure that no difference is found.



N I31943

(c) Display Touch Switch Check
(1) Start the Diagnosis system.
(2) Select "MENU".
(3) Select "Display Check".
(4) Select "Touch Switch Check".
(5) Touch the screen and make sure that every line reacts to the touch.

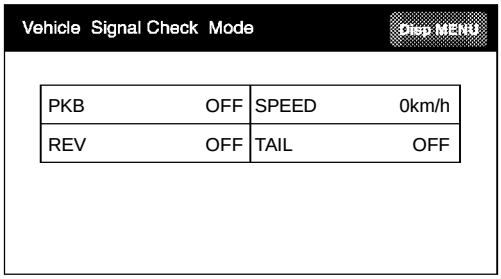
HINT:
After the Touch Switch Check for vertical lines, press "Next" to check horizontal lines.



N I31936

(d) Display Panel Switch Check
(1) Start the Diagnosis system.
(2) Select "MENU".
(3) Select "Display Check".
(4) Select "Panel Switch Check".
(5) Press each switch and make sure that it corresponds to the display on the screen.

Display Data	Description
Names of push-button switches/*1	Names of push-button switches pressed are displayed. Pressing 2 or more push-button switches is displayed as "MULTIPLE". After that if the number of push-button switches being pressed becomes 1, the name of the push-button switch being pressed is displayed.
Disp MENU	Pressing this switch activates Display Check Menu.

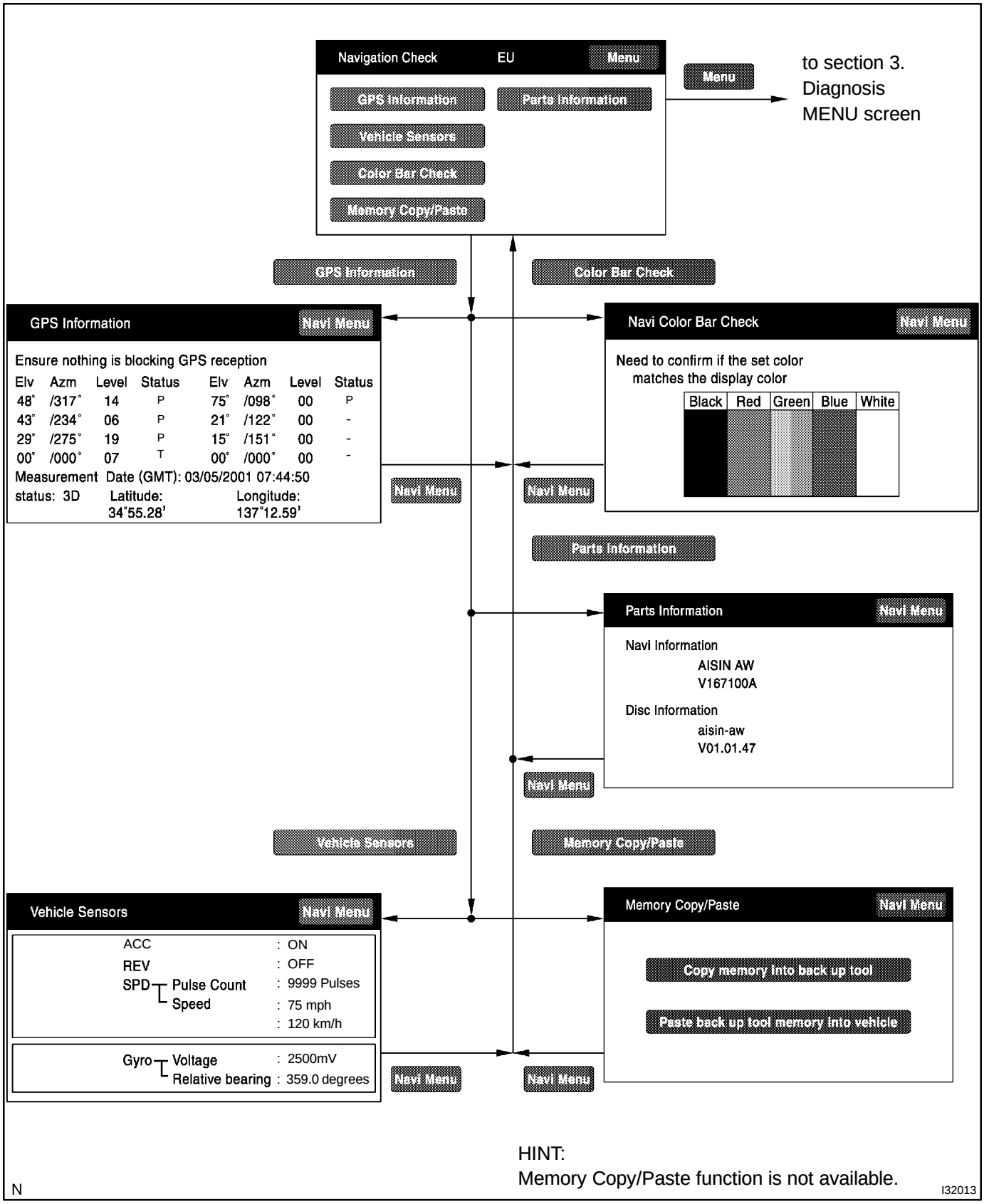


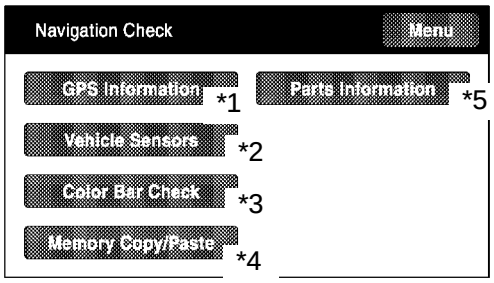
I31948

(e) Display Vehicle Signal Check
(1) Start the Diagnosis system.
(2) Select "MENU".
(3) Select "Display Check".
(4) Select "Vehicle Signal Check".
(5) Check the status of the vehicle signal (REV, PKB, SPEED, TAIL) loaded into the display.

HINT:
Vehicle signal data is updated every 1 second.

6. NAVIGATION CHECK MODE



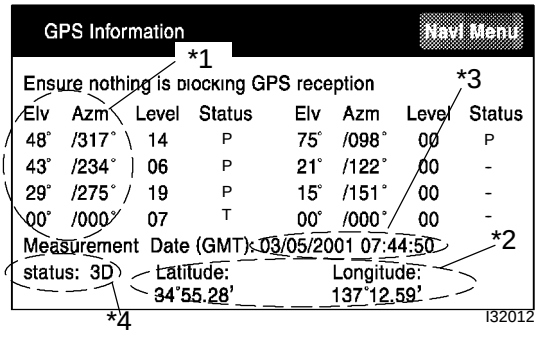


(a) NAVIGATION CHECK MODE

Display	Description
GPS Information/*1	Information related to GPS is displayed (updated every 1 second.).
Vehicle Sensors/*2	Vehicle signal information to be loaded in the Navigation ECU is displayed (updated every 1 second.).
Color Bar Check/*3	Color display of the Navigation ECU is checked. (Compare with the Color Bar Check results in the Display Check.)
Memory Copy / Paste/*4	Using hand-held tester, read and write user data such as a placement of shop, restaurant etc. stored in memory.
Parts Information/*5	Navigation program version and disc version are displayed.

HINT:

- In the Navigation Check mode, the checks mentioned above can be conducted.
- The Navigation ECU operates each Navigation Check screen.



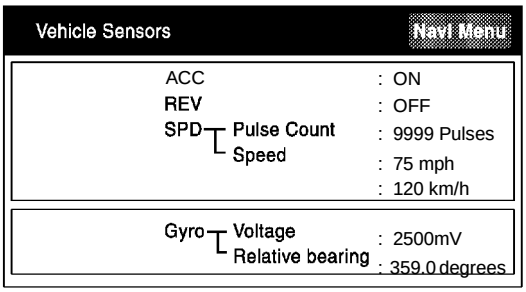
(b) GPS Information

(1) Start the Diagnosis system.
(2) Select "MENU".
(3) Select "Navigation Check".
(4) Select "GPS Information".
(5) Check the GPS-related information.

Display Data	Description
Satellite Information/*1	"Angle of elevation", "Azimuth", "Level of Signal" and "Status of Wave Reception" of the Satellite captured by the antenna are displayed (for 8 satellites max.)
Position Data/*2	The latitude and longitude of the current position are displayed in degree, minute and second.
Time Data/*3	Date and time data obtained from the GPS receiver is displayed.

Measurement Status: /*4

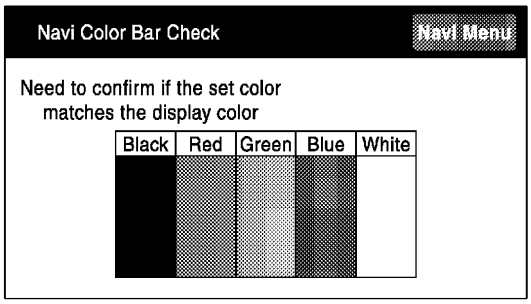
Display	Conditions
2D	Measurement on 2 dimensions
3D	Measurement on 3 dimensions
NG	GPS information cannot be used.
Error	Reception error occurs.
-	Other than the above



I32010

(c) Vehicle Sensors
(1) Start the Diagnosis system.
(2) Select "MENU".
(3) Select "Navigation Check".
(4) Select "Vehicle sensors".
(5) Check the vehicle signals (ACC, REV, SPD) and the output signal of the gyro sensor introduced into the navigation ECU.

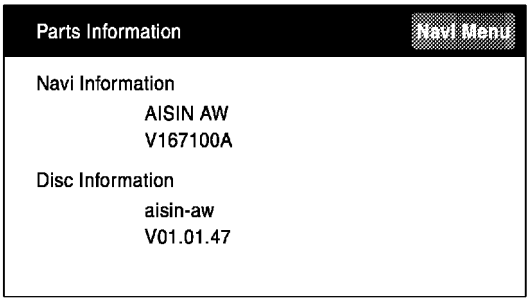
Items	Display Method
ACC signal status	Displayed as ON/OFF.
REV signal status	Displayed as ON/OFF.
SPD signal status	The cumulative value of input pulse count and the vehicle speed [km/h] [mph] are displayed. [The cumulative value of input pulse count is set to be 0 when this screen is displayed. When the vehicle starts to drive, it is counted and displayed continually.]
Output signal of the gyro sensor	Voltage [V] and relative azimuthal angle [degree] are displayed. [The position of the vehicle when this screen is displayed is set to be 0 degree in azimuth. Based on this, relative azimuthal angle is measured and displayed continually.]



N

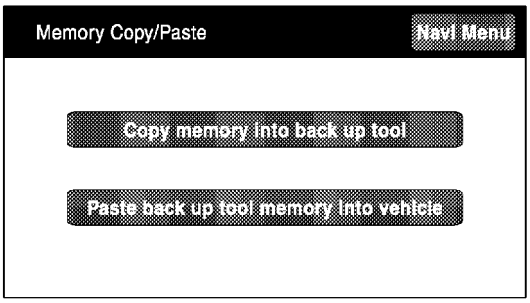
I32011

(d) Navigation Color Bar Check
(1) Start the Diagnosis system.
(2) Select "MENU".
(3) Select "Navigation Check".
(4) Select "Color Bar Check".
(5) Make sure that the set color matches the display color.
(6) Compare with the Color Bar Check in the Display Check and make sure that no difference is found.



N I30956

(e) Parts Information
(1) Start the Diagnosis system.
(2) Select ”MENU”.
(3) Select ”Navigation Check”.
(4) Select ”Parts Information”.
(5) Check the program and disc version.



N I30955

(f) Memory/ Copy/ Paste
HINT:
This function is not available.

0561D-02

DIAGNOSTIC TROUBLE CODE CHART

Terms	Meaning
Physical address	Three-digit code (shown in hexadecimal) which is given to each component comprising the AVC-LAN. Corresponding to the function, individual symbols are specified.
Logical address	Two-digit code (shown in hexadecimal) which is given to each function comprising the inner system of the AVC-LAN.

1. RADIO AND PLAYER WITH DISPLAY (Physical address: 110)

HINT:

- *1: Even if no failure is detected, this code may be stored depending on the battery condition or voltage for starting an engine.
- *2: This code is stored when 180 sec. has passed after the power supply connector is pulled out after engine start.
- *3: This code may be stored when the engine key is turned again after engine start.
- *4: This code may be stored when the engine key is turned again 1 min. after engine start.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
21	ROM Error	Abnormal condition of ROM is detected.	Replace multi-display (CRT display) display (CRT display) display.
22	RAM Error	Abnormal condition of RAM is detected.	Replace multi-display (CRT display) display (CRT display) display.
D5 *1	Registered component disconnected	Component shown by sub-code is or was disconnected from system with ignition switch in ACC or ON. Communication with component shown by sub-code is not ensured when engine is started.	- Check harness for power supply of component shown by sub-code. - Check harness for communication system of component shown by sub-code.
D8 *2	No response to connection check	Component shown by sub-code is or was disconnected from system after engine is started.	- Check harness for power supply of component shown by sub-code. - Check harness for communication system of component shown by sub-code.
D9 *1	Last Mode Error	Component operated (sound and/or image was provided) before engine stop is or was disconnected with ignition switch in ACC or ON.	- Check harness for power supply of component shown by sub-code. - Check harness for communication system of component shown by sub-code.
DA	No Response to ON/OFF Instruction	No response is identified when changing mode (audio and visual mode change). Detected when sound and picture does not change by button operation	- Check harness for power supply system of component shown by sub-code. - Check harness for communication system of component shown by sub-code. - If error occurs again, replace component shown by auxilxary code
DB *1	Mode Status Error	Dual alarm is detected.	- Check harness for power supply system of component shown by sub-code. - Check harness for communication system of component shown by sub-code.
DC *4	Transmission Error	Transmission to component shown by sub-code has been failed. (This code does not necessarily mean actual failure.)	If same sub-code is recorded in other component(s), check harness for power supply and communication system of all components shown by code.
DE *3	Slave Reset (Momentary Interruption)	After engine start, slave component has been disconnected. DB	- Check harness for power supply system of component shown by sub-code. - Check harness for communication system of component shown by sub-code.

E2	ON/OFF Instruction Parameter Error	Error is detected in ON/OFF control command from multi-display (CRT display) display	Replace multi-display (CRT display) display
E3 *1	Registration Request Transmission	S Registration Request command is output from slave component. S By reception of connection check instruction, Registration Request command is output from sub-master component.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.

(b) Logical address: 21 (Switch)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
10	Panel Switch Error	Error in panel switch input part is detected. (Error in switch control part, or internal communication error with switch control part is detected.)	S Inspect all switches on panel switch test screen in display check mode. If any of them does not function, replace A/C control assembly. S If all switches function without problem, observe them for a while.
11	Touch Switch Error	Error in touch switch sensor is detected. (Light level of LED is detected to be less than a fixed value.)	S Inspect all touch switches on touch switch test screen in display check mode. If any of lines does not react, replace multi-display (CRT display) display. S If all of vertical and horizontal lines react normally, observe them for a while.

(c) Logical address: 34 (Front passenger monitor)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
10	Error in Picture Circuit	Error in power supply system for picture circuit (abnormal voltage) is detected.	Replace multi-display (CRT display) display.
11	Back-light Error (No current)	Decline in power output from inverter circuit for back-light.	Replace multi-display (CRT display) display.
12	Back-light Error (Excess current)	Excess power output from inverter circuit for back-light.	Replace multi-display (CRT display) display.

(d) Logical address: 61 (Cassette tape player)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
40	Mechanical Error of Media	Malfunction due to mechanical failure is identified. Or cassette tape is cut or entangled.	S Inspect cassette tape. S Replace radio and player.

(e) Logical address: 62 (CD Player)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
42	No Disc Readout	Disc cannot be read.	Inspect CD. If CD is normal, replace radio and player
44	CD Error	Error is detected in CD player.	Replace radio and player.
45	EJECT Error	Disc cannot be ejected.	Replace radio and player.

47	CD High Temp.	High temperature is detected in CD changer.	Replace radio and player.
48	CD Excess Current	Excess current is applied to CD changer.	Replace radio and player.

2. NAVIGATION ECU (Physical address: 178)

HINT:

- *1: Even if no failure is detected, this code may be stored depending on the battery condition or voltage for starting the engine.
- *2: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.
- *3: This code may be stored when the engine key is turned 1 min. again after engine start.
- *4: This code may be stored when the engine key is turned again after engine start.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
D6 *1	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, multi-display (CRT display) display was disconnected.	• Check harness for power supply system of multi-display (CRT display) display. • Check harness for communication system of multi-display (CRT display) display. • Check harness for power supply system of navigation ECU. • Check harness for communication system of navigation ECU.
D7 *2	Connection Check Error	Component in which this code is recorded has been disconnected from system after engine start. Or, when this code was recorded, multi-display (CRT display) display was disconnected. D6	• Check harness for power supply system of multi-display (CRT display) display. • Check harness for communication system of multi-display (CRT display) display. • Check harness for power supply system of navigation ECU. • Check harness for communication system of navigation ECU.
DC *3	Transmission Error	Transmission to component shown by sub-code has been failed. (This code does not necessarily mean actual failure.)	If same sub-code is recorded in other component(s), check harness for power supply and communication system of all components shown by code.
DD *4	Master Reset (Momentary Interruption)	Component that is to be master has been disconnected after engine start.	• Check harness for power supply system of multi-display (CRT display) display. • Check harness for communication system of multi-display (CRT display) display. • If error occurs frequently, replace multi-display (CRT display) display.
E0 *1	Registration Completion Instruction Error	”Registration Completion Instruction” command from master cannot be received.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.
E2	ON/OFF Instruction Parameter Error	Error is detected in ON/OFF control command from multi-display (CRT display) display.	Replace multi-display (CRT display) display.
E3 *1	Registration Request Transmission	• Registration Request command is output from slave component. • Registration Request command is output from sub-master component.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.

DF *4	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment. Error occurs in communication between sub-master (audio) and master component.	S Check harness for power supply of multi-display (CRT display) display. S Check harness for communication system of multi-display (CRT display) display. S Check harness for communication system between multi-display (CRT display) display and radio and player.
E4 *1	Multiple Frame Abort	Multiple frame transmission is aborted.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

(b) Logical address: 58 (Navigation ECU)

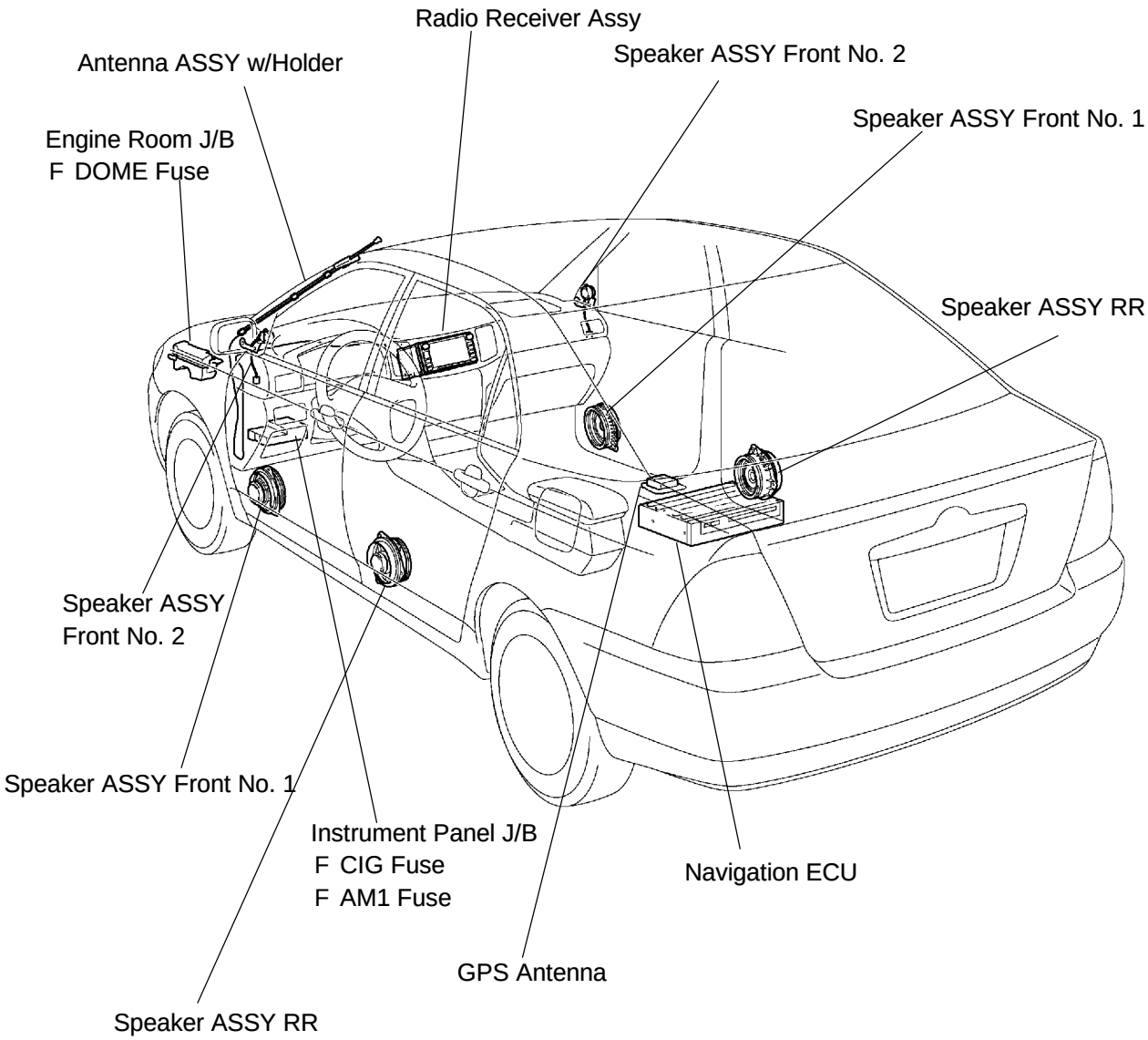
DTC	Diagnosis item	Condition	Countermeasure and inspected parts
10	Gyro Error	Error in gyro sensor is detected. (Abnormal value in voltage output from sensor is detected for more than specified time.)	Replace navigation ECU.
42	Map Disc Error	Data cannot be read for a certain time due to scratches or dirt on disc surface or insertion of wrong disc.	Inspect disc and replace if necessary. (Visually check disc surface and wipe it with soft cloth.) If disk is normal, replace navigation ECU.
43	Vehicle Signal Error	Input error of vehicle signal is detected. (When no vehicle signal has been input for a certain time.)	S Inspect wire harness. S If wire harness is normal, replace navigation ECU.

(c) Logical address: 58 (Nvigation ECU)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
11	GPS Receiver Error	Operation error of GPS receiver is detected.	At an outdoor site with a clear view, operate to display GPS data. If GPS mark is not properly displayed after 15 min. or more, replace navigation ECU.
40	GPS Antenna Error	Open condition of GPS antenna is detected. (Open circuit, connection failure of connectors, etc.)	Inspect antenna and replace if necessary.
41	Power Supply Error of GPS Antenna	Abnormal voltage of GPS antenna cable or short circuit is detected.	S Inspect GPS antenna and replace if necessary. (When no continuity is identified between connector's core and sealed part, GPS antenna is normal.) S If GPS antenna is normal, replace navigation ECU.

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LOCATION

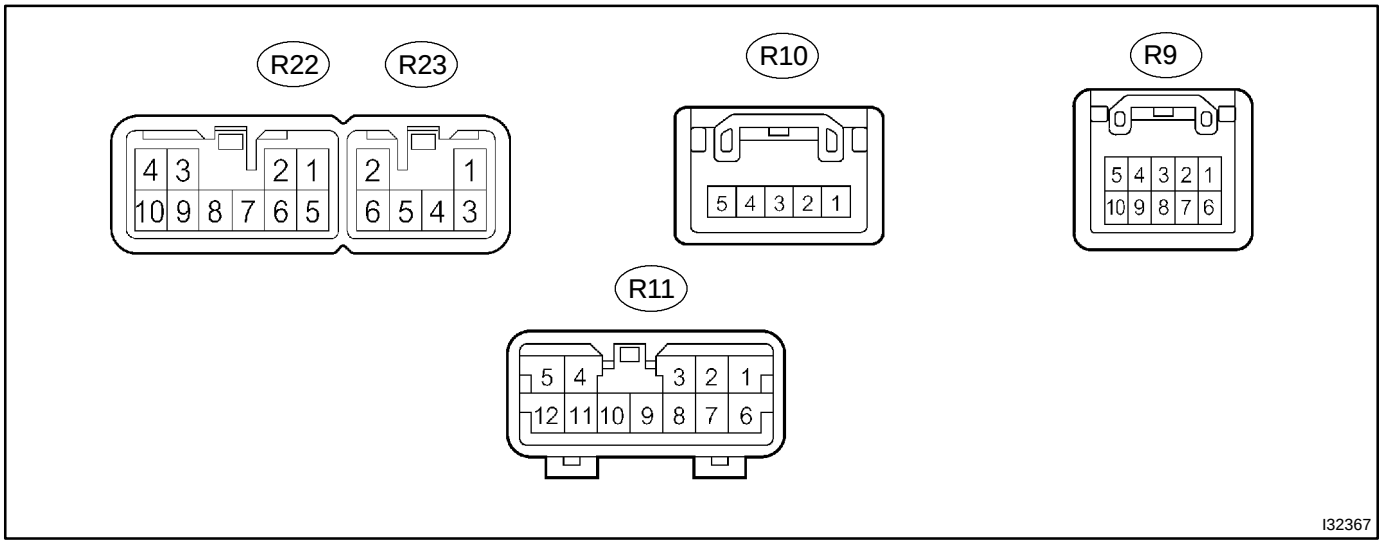


I32368

05626-02

TERMINALS OF ECU

1. RADIO AND PLAYER WITH DISPLAY



Terminal No. (Symbols)	Wiring Color	Condition	STD Voltage (V)
*2 FR+ ⇔GND(R22-1 ⇔ R22-7)	LG ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
*1 FR+ ⇔GND(R22-1 ⇔ R22-7)	P(LG) ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
*2 FL+ ⇔GND(R22-2 ⇔ R22-7)	P(P) ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
*1 FL+ ⇔GND(R22-2 ⇔ R22-7)	P ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
ACC+B ⇔GND(R22-3 ⇔ R22-7)	SB(GR) ⇔ BR	Ignition switch ACC	10 - 14 V
BU+B ⇔GND(R22-4 ⇔ R22-7)	L-Y ⇔ BR	Constant	10 - 14 V
*2 FR- ⇔GND(R22-5 ⇔ R22-7)	L ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
*1 FR- ⇔GND(R22-5 ⇔ R22-7)	P(L) ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
*2 FL- ⇔GND(R22-6 ⇔ R22-7)	P(V) ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
*1 FL- ⇔GND(R22-6 ⇔ R22-7)	V ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
GND ⇔ Body ground (R22-7 ⇔ Body ground)	BR ⇔ Body ground	Constant	Continuity
ILL+ ⇔GND (R22-10 ⇔ R22-7)	SB(G) ⇔ BR	Light control switch TAIL or HEAD	10 - 14 V
RR+ ⇔GND (R23-1 ⇔ R22-7)	R ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output

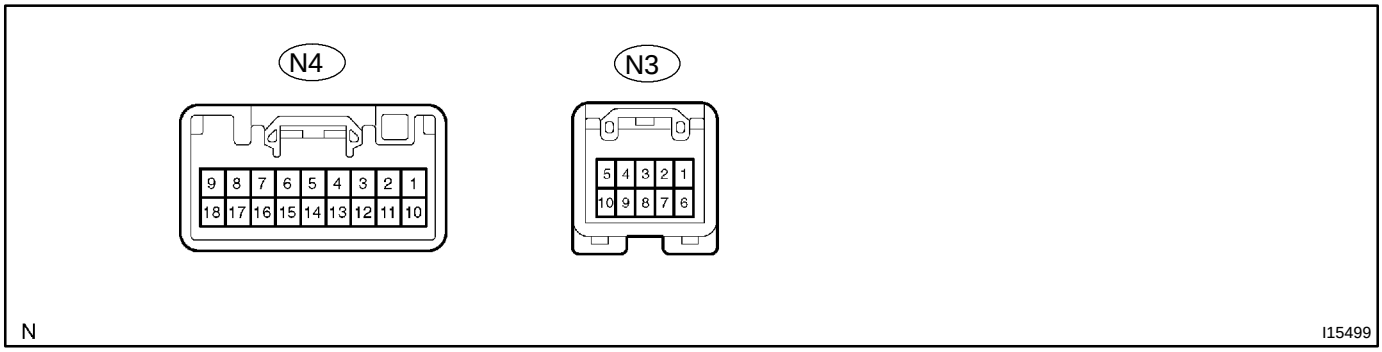
RL+ ⇔GND (R23-2 ⇔ R22-7)	B ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
RR- ⇔GND (R23-3 ⇔ R22-7)	W ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
RL- ⇔GND (R23-6 ⇔ R22-7)	Y ⇔ BR	Audio system is sounding	A waveform synchronized with sounds is output
PKB⇔ GND (R10-1 ⇔ R22-7)	R-Y ⇔ BR	See "Vehicle Signal Check Mode"	-
SPD ⇔ GND (R10-3 ⇔ R22-7)	W(V-W) ⇔ BR	See "Vehicle Signal Check Mode"	-
VR ⇔ Body ground (R9-1 ⇔ Body ground)	Y ⇔ Body ground	Ignition switch OFF	Below 1V
R ⇔ GND (R9-2 ⇔ R22-7)	R ⇔ BR	Navigation switch is switched	Pulse generation 1
B ⇔ GND (R9-3 ⇔ R22-7)	B ⇔ BR	Navigation switch is switched	Pulse generation 1
TX+ ⇔ - (R9-5 ⇔ -)	SB(B) ⇔ -	See "Service Check Mode"	-
VG ⇔ Body ground (R9-6 ⇔ Body ground)	Shielded ⇔ Body ground	Constant	Continuity
G ⇔ GND (R9-7 ⇔ R22-7)	G ⇔ BR	Navigation switch is switched	Pulse generation 1
SYNC ⇔ GND (R9-8 ⇔ R22-7)	W ⇔ BR	Navigation switch is switched	Pulse generation 2
TX- ⇔ - (R9-10 ⇔ -)	SB(W) ⇔ -	See "Service Check Mode"	-

HINT:

*1: LHD models

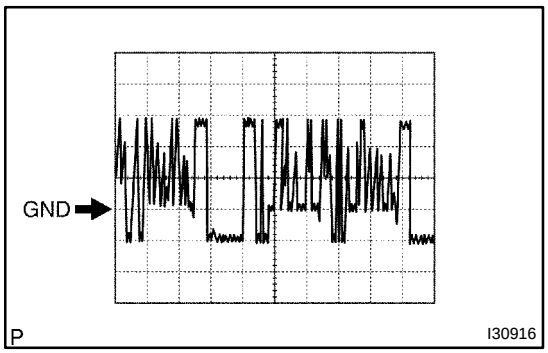
*2: RHD models

2. NAVIGATION ECU

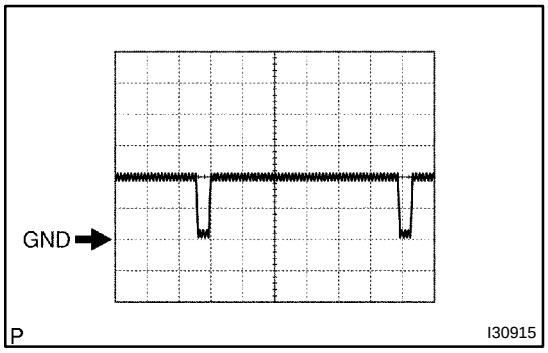


Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
AUI+ ⇔ GND (N4-1 ⇔ N4-17)	LG(RHD) P(LHD) ⇔W-B	Audio system is sounding	A waveform synchronized with sounds is output
AUO+ ⇔ GND (N4-2⇔ N4-17)	LG(RHD) P(LHD) ⇔W-B	Sound quality test	-
SPD ⇔ GND (N4-5 ⇔ N4-17)	W(V-W) ⇔ W-B	See "Vehicle Signal Check Mode"	-
+B ⇔GND (N4-9 ⇔ N4-17)	L-Y ⇔ W-B	Constant	10 - 14 V

AUI- ⇔ GND (N4-10 ⇔ N4-17)	L(RHD) V(LHD) ⇔ W-B	Audio system is sounding	A waveform synchronized with sounds is output
AUO- ⇔ GND (N4-11 ⇔ N4-17)	L(RHD) V(LHD) ⇔ W-B	Sound quality test	-
REV ⇔ - (N4-14 ⇔ -)	SB(R-B) ⇔ -	See "Vehicle Signal Check Mode"	-
GND ⇔ Body ground (N4-17 ⇔ Body ground)	W-B ⇔ Body ground	Constant	Below 1 V
ACC ⇔ GND (N4-18 ⇔ N4-17)	SB(GR) ⇔ W-B	Ignition switch OFF	Below 1 V
		Ignition switch ACC or ON	10 - 14 V
VR ⇔ VG (N3-1 ⇔ N3-6)	Y ⇔ Shielded	Ignition switch OFF	Below 1 V
R ⇔ VG (N3-2 ⇔ N3-6)	R ⇔ Shielded	Navigation map is switched	Pulse generation 1
B ⇔ VG (N3-3 ⇔ N3-6)	B ⇔ Shielded	Navigation map is switched	Pulse generation 1
TX+⇔ - (N3-5 ⇔ -)	SB(B) ⇔ -	See "Service Check Mode"	-
VG ⇔ GND (N3-6 ⇔ N4-17)	Shielded ⇔ W-B	Ignition switch OFF	Below 1 V
G ⇔ VG (N3-7 ⇔ N3-6)	G ⇔ Shielded	Navigation map is switched	Pulse generation 1
SYNC ⇔ VG (N3-8 ⇔ N3-6)	W ⇔ Shielded	Navigation display is displayed	Pulse generation 2
TX- ⇔ - (N3-10 ⇔ -)	SB(W) ⇔ -	See "Service Check Mode"	-



Oscilloscope wave 1
Terminal to be measured: R, G, B - GND
Setting for measurement: 200 mV/DIV10- μs/DIV
Condition: Navigation map is switched.



Oscilloscope wave 2
Terminal to be measured: SYNC - GND
Setting for measurement: 500 mV/DIV10- μs/DIV
Condition: Navigation display is displayed.

0561F-02

PROBLEM SYMPTOMS TABLE

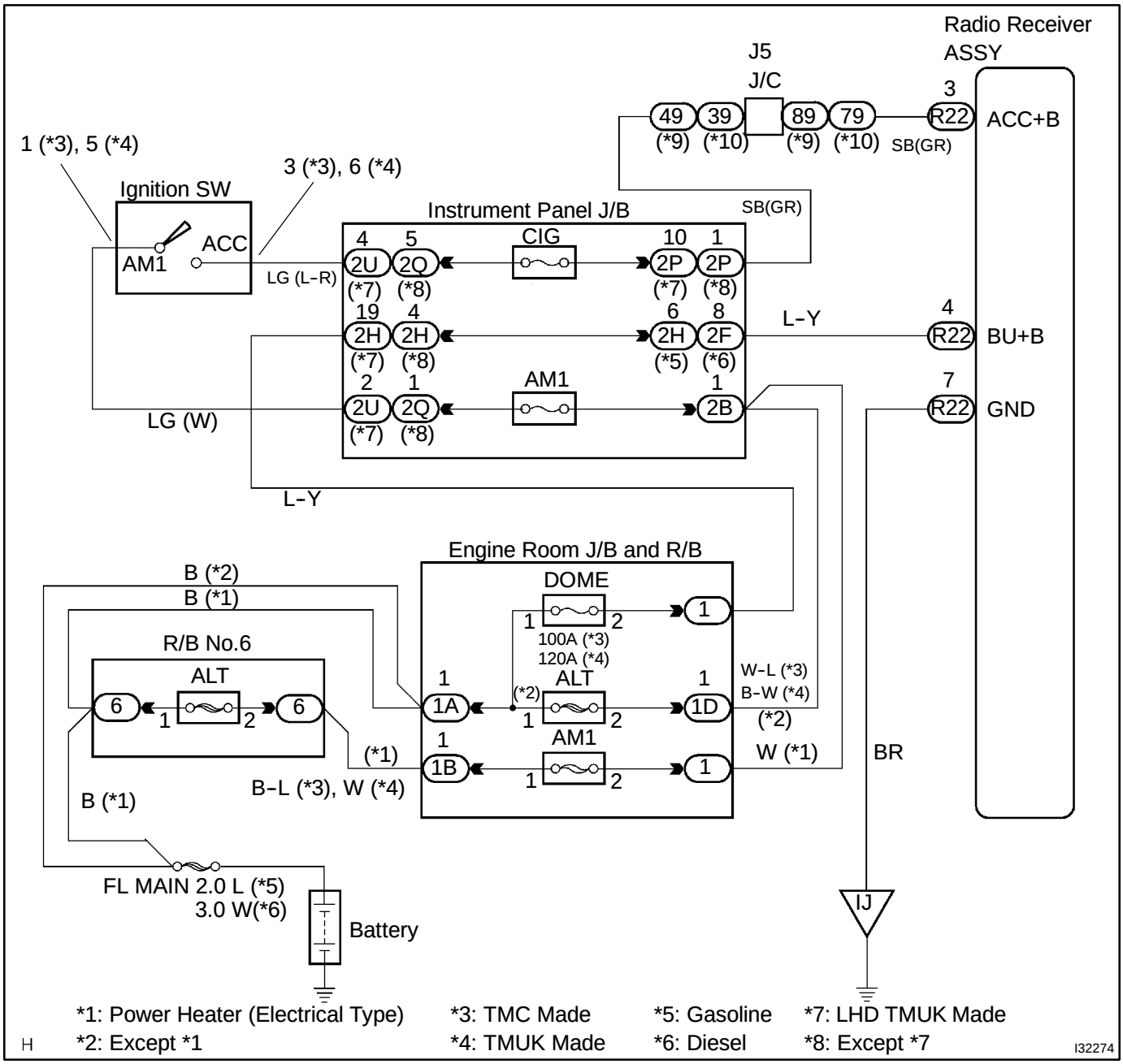
Flow chart No.	Symptom	See page
1	Even when pressing "PWR/VOL" switch or any audio switch, the screen remains black.	05-1157
2	Panel switch does not function.	05-1159
3	Although "PWR/VOL" switch is pressed, no sound is heard (Display and switch operation is normal).	05-1160
4	No navigation screen displayed when "MAP/VOICE" "MENU" or "DEST" switch pressed (Screen cannot be switched).	05-1163
5	Navigation screen not stabilized (Syncronous error).	05-1166
6	Color on navigation screen is unusual (RGB signal)	05-1169
7	Black screen appears when "MAP/VOICE", "MENU" or "DEST" switch pressed.	05-1173
8	Front speaker (Driver side) only is not heard (Radio, casette tape, CD)	05-1176
9	Map disk cannot be inserted.	05-1180
10	Map screen displayed does not appear (Disk caution screen does not change).	05-1182
11	Map is displayed in white or blue screen (Switched and vehicle position mark are displayed).	05-1183
12	Screen cannot be dimmed when light control switch is turned to "TAIL" position.	05-1184
13	Touch switch does not function (Navigation screen only)	05-1186
14	Vehicle position is deviated from correct point badly.	05-1187
15	GPS mark does not appear	05-1189
16	No voice navigation	05-1190
17	Vehicle position mark rotates without control (Map rotates without control)	05-1193
18	Driving derections opposit to moving derection of vehicle position mark	05-1196
19	CD cannot be inserted / is ejected right after insertion / cannot be played.	05-1198
20	CD cannot be ejected	05-1200
21	Cassette tape cannot be inserted or played.	05-1198
22	Cassette tape cannot be ejected	05-1200
23	CD sound skips.	05-1202
24	Noise occurs	05-1208
25	Radio broadcast cannot be received. (Bad reception)	05-1210

EXAMPLES OF MISUNDERSTANDING SYMPTOMS AS MALFUNCTIONS

Condition	Cause	Procedure to recover
Screen displays "AUDIO OFF", even when "PWR/VOL" switch is turned off.	"PWR/VOL" switch turns the audio off, but not the screen. To turn off the screen, "SCREEN OFF" switch must be pressed.	Press "DISPLAY" switch → Press "SCREEN OFF" switch on screen
The screen is too dark or too bright, when the screen is changed between navigation and audio.	The contrast set up of the screen between navigation and audio is different. The contrast needs to be set up for each of the navigation and audio screen.	*Navigation: Press "DISPLAY" and adjust by "BRIGHTNESS" switch. *AUDIO: Press "DISPLAY" and adjust by "CONTRAST" switch.
Present position is not displayed even when "NAVI" switch is pressed.	Pressing "NAVI" switch displays the previous screen. For present position, "MAP/VOICE" switch must be pressed.	Press "NAVI" switch → Press "MAP/VOICE" switch.
Even when pressing the panel switch, it doesn't function.	*Since this switch is pressure sensitive type, press the switch scurely. *The panel switch toned down does not work even if is pressed.	Press the panel switch securely, if the pressure is weak or time is insufficient, the switch does not function.

EVEN WHEN PRESSING "PWR/VOL" SWITCH OR ANY AUDIO SWITCH, THE SCREEN REMAINS BLACK

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK SCREEN MODE

(a) Check the screen mode
(1) Press "AUDIO" or "NAVI" switch to check if the screen turns on.

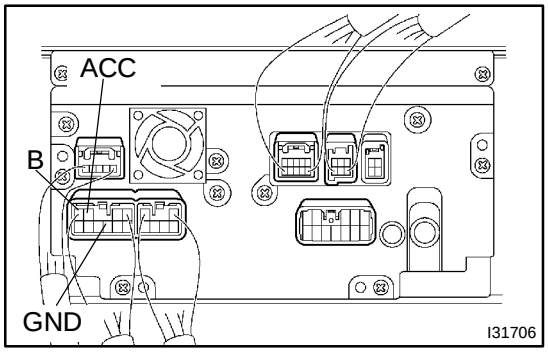
HINT:
If the mode is "SCREEN OFF" the screen remains black but the sound is heard.

A	Screen remains black.
B	Screen displays audio or navi mode.

B → **NORMAL**

A

2	INSPECT RADIO RECEIVER ASSY(B,ACC,GND)



(a) Remove the radio receiver assy with connectors with still connected.
(b) Check voltage.
(1) Measure voltage between terminals +B, ACC and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.
(1) Check that the continuity exists between terminal GND of radio receiver assy and body ground.

Standard: Continuity exists.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE RADIO RECEIVER ASSY

PANEL SWITCH DOES NOT FUNCTION

INSPECTION PROCEDURE

1	CHECK SWITCH

(a) Check the switch
(1) Check that the switch is not pressed double by the foreign objects near the radio receiver switch.
Standard: No foreign objects

NG → REMOVE FOREIGN OBJECT

OK

2	DISPLAY CHECK MODE

(a) Inspect the display
(1) Boot the diagnosis, preform ”Inspection of Display Panel switch” to check that the function is normal.
Standard: The function is normal

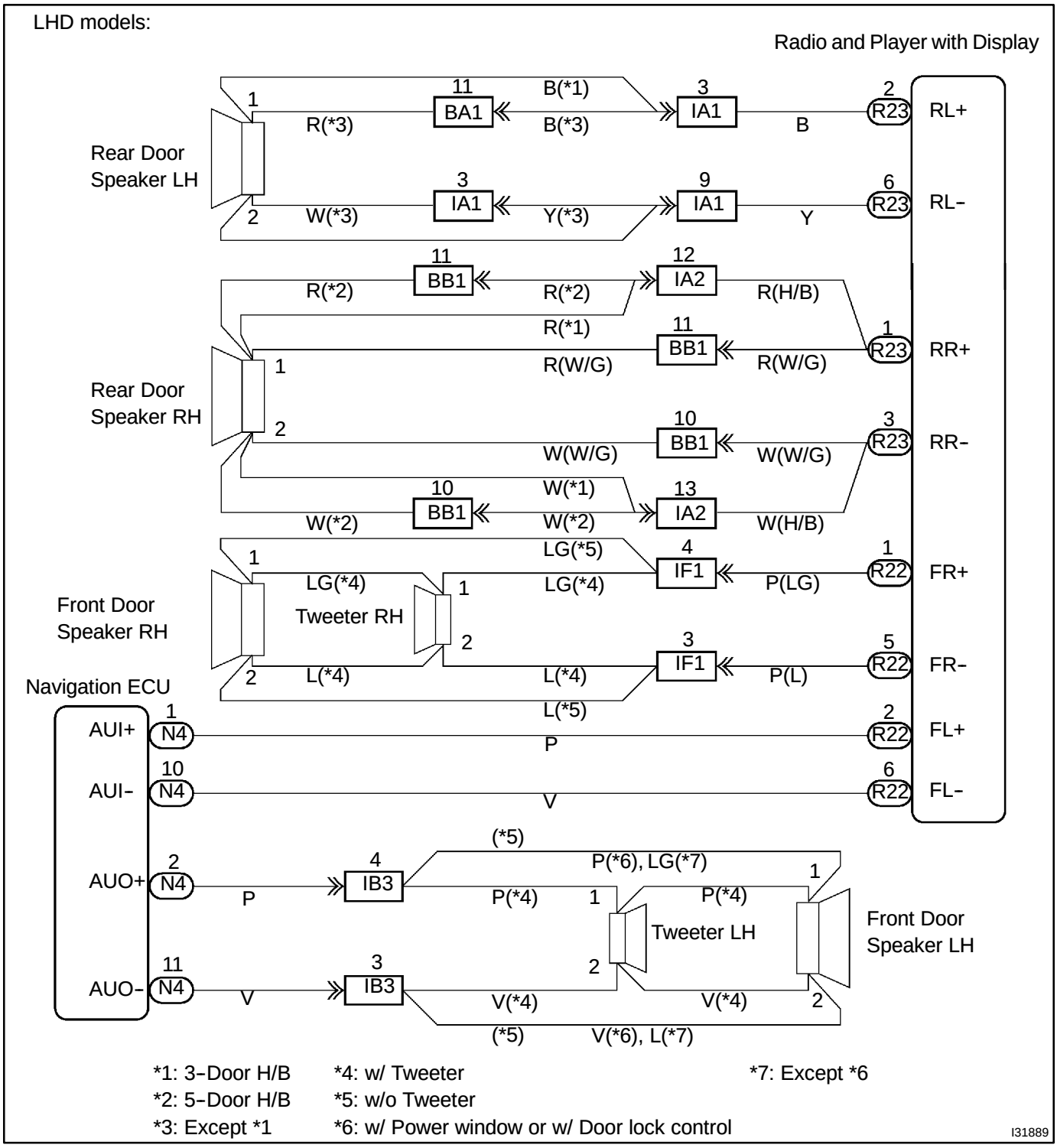
OK → NORMAL

NG

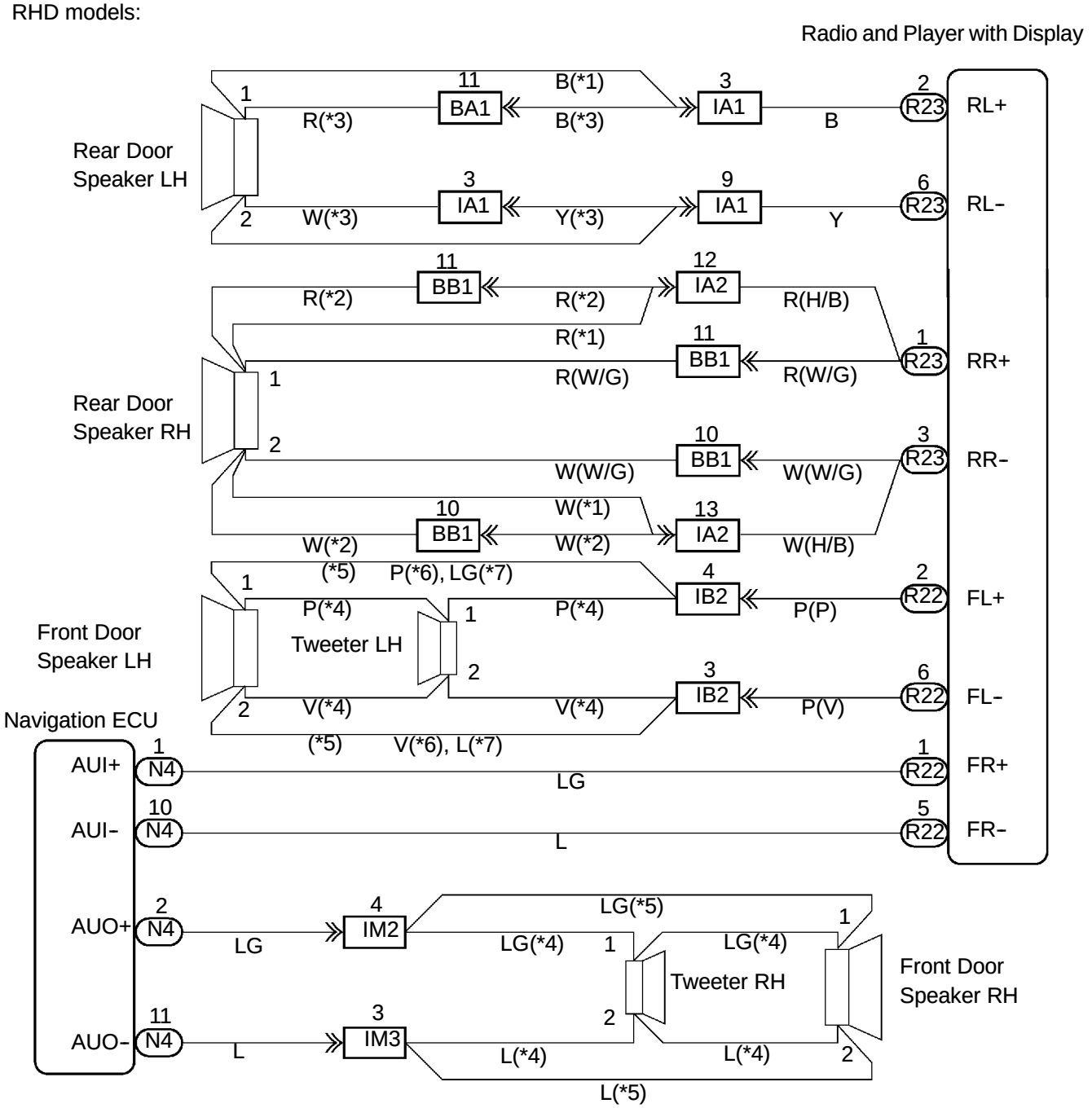
CHECK AND REPLACE RADIO RECEIVER ASSY

ALTHOUGH "PWR/VOL" SWITCH IS PRESED, NO SOUND IS HEARD (DISPLAY AND SWITCH OPERATION IS NORMAL)

WIRING DIAGRAM



RHD models:

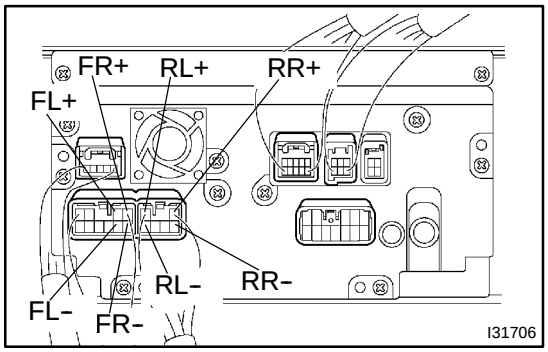


*1: 3-Door H/B
*2: 5-Door H/B
*3: Except *1
*4: w/ Tweeter
*5: w/o Tweeter
*6: w/ Power window or w/ Door lock control
*7: Except *6

I31889

INSPECTION PROCEDURE

1	INSPECT RADIO RECEIVER ASSY(FL+,FL-,FR+,FR-)



(a) Remove the radio receiver assy with connectors with still connected.

(b) Using an oscilloscope, check signal waveform between terminals FL+, FL-, FR+, FR-, RL+, RL-, RR+, RR- and GND of radio receiver assy.

Standard:

Terminal	Condition	Specified condition
FL+ ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
FL- ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
FR+ ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
FR- ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
RL+ ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
RL- ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
RR+ ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
RR- ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output

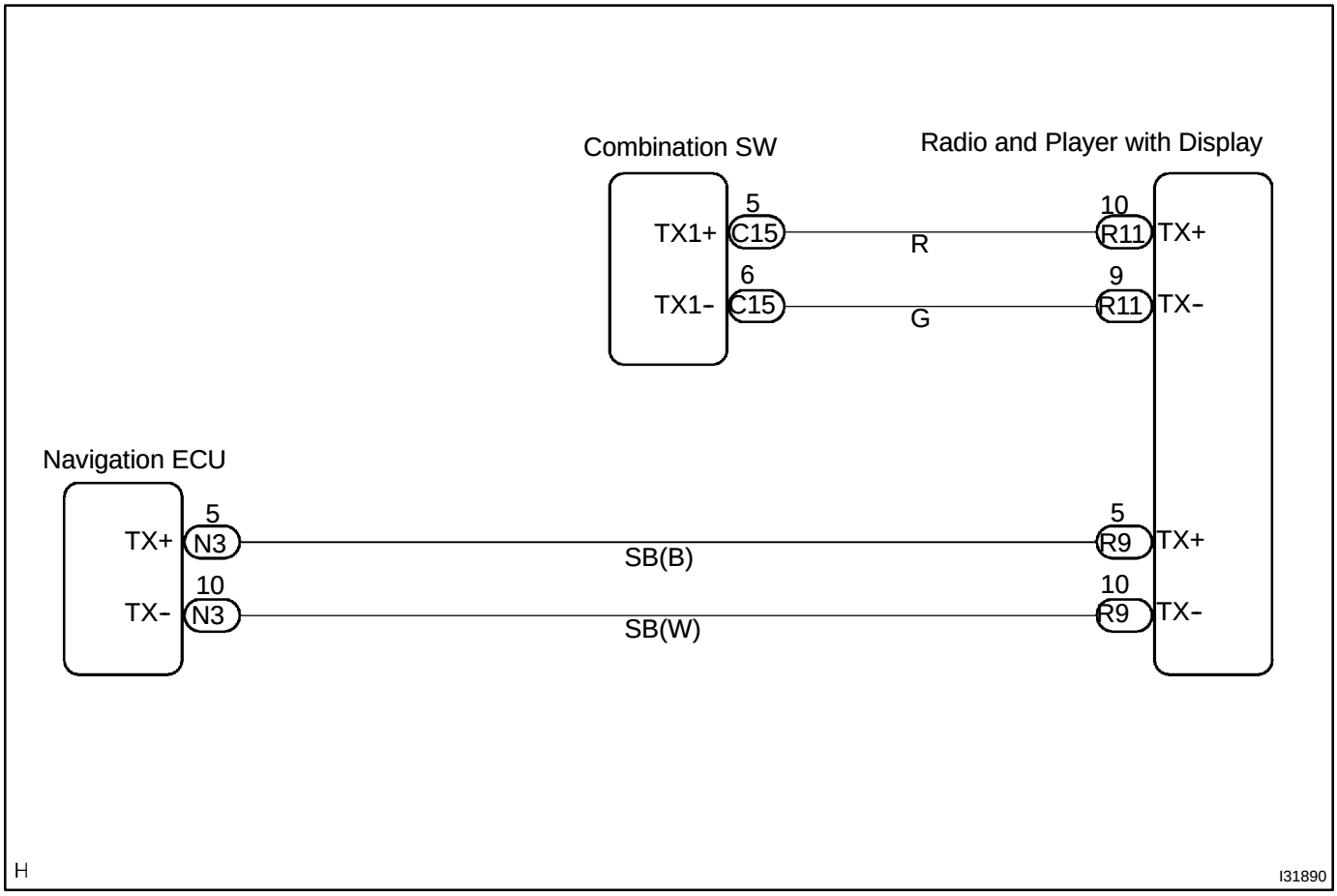
NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

CHECK AND REPLACE APPLICABLE PART(INCLUDE WIRE HARNESS)

NO NAVIGATION SCREEN DISPLAYED WHEN "MAP/VOICE", "MENU" OR "DEST" SWITCH PRESSED (SCREEN CANNOT BE SWITCHED)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	SERVICE CHECK MODE(NAVIGATION ECU)

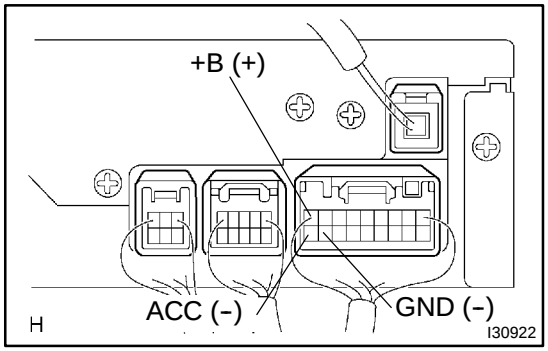
(a) Perform service check.
(1) Start up the diagnosis system and read result of navigation ECU in the service check mode.

A	"NCON" is displayed or "NAVI-ECU" is not displayed
B	"NAVI-ECU: OK" is displayed

B → **CHECK AND REPLACE RADIO RECEIVER ASSY**

A

2	INSPECT NAVIGATION ECU(+B,ACC,GND)



(a) Remove the navigation ECU with connectors with still connected.
(b) Check voltage.
(1) Measure voltage between terminals +B, ACC and GND of navigation ECU at each conditions, as shown in the chart.

Standard:

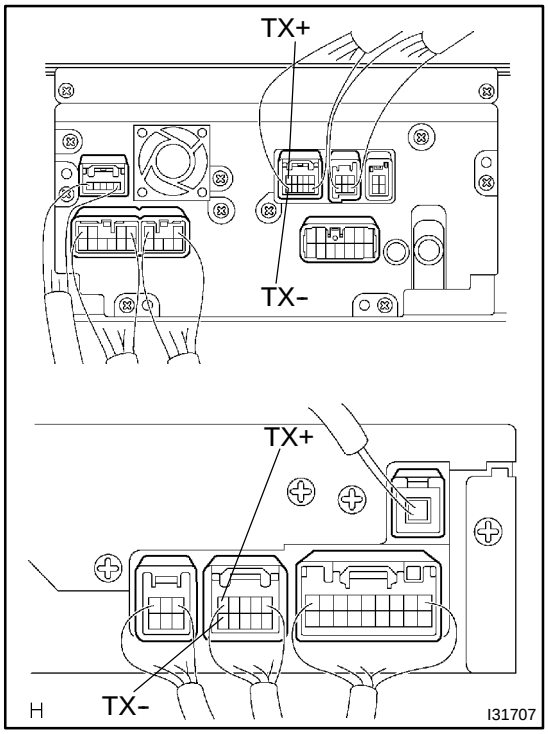
Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.
(1) Check that the continuity exists between terminal GND of navigation ECU and body ground.
Standard: Continuity exists.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

3	CHECK HARNESS AND CONNECTOR(RADIO RECEIVER ASSY-NAVIGATION ECU)



(a) Disconnect the connector from the navigation ECU.
(b) Disconnect the connector from the radio receiver assy.
(c) Check continuity.
(1) Check that the continuity between navigation ECU and radio receiver assy.

Standard:

Tester connection	Specified condition
TX+ ⇔ TX+	Continuity
TX- ⇔ TX-	Continuity
TX+ ⇔ Body ground	No continuity
TX- ⇔ Body ground	No continuity

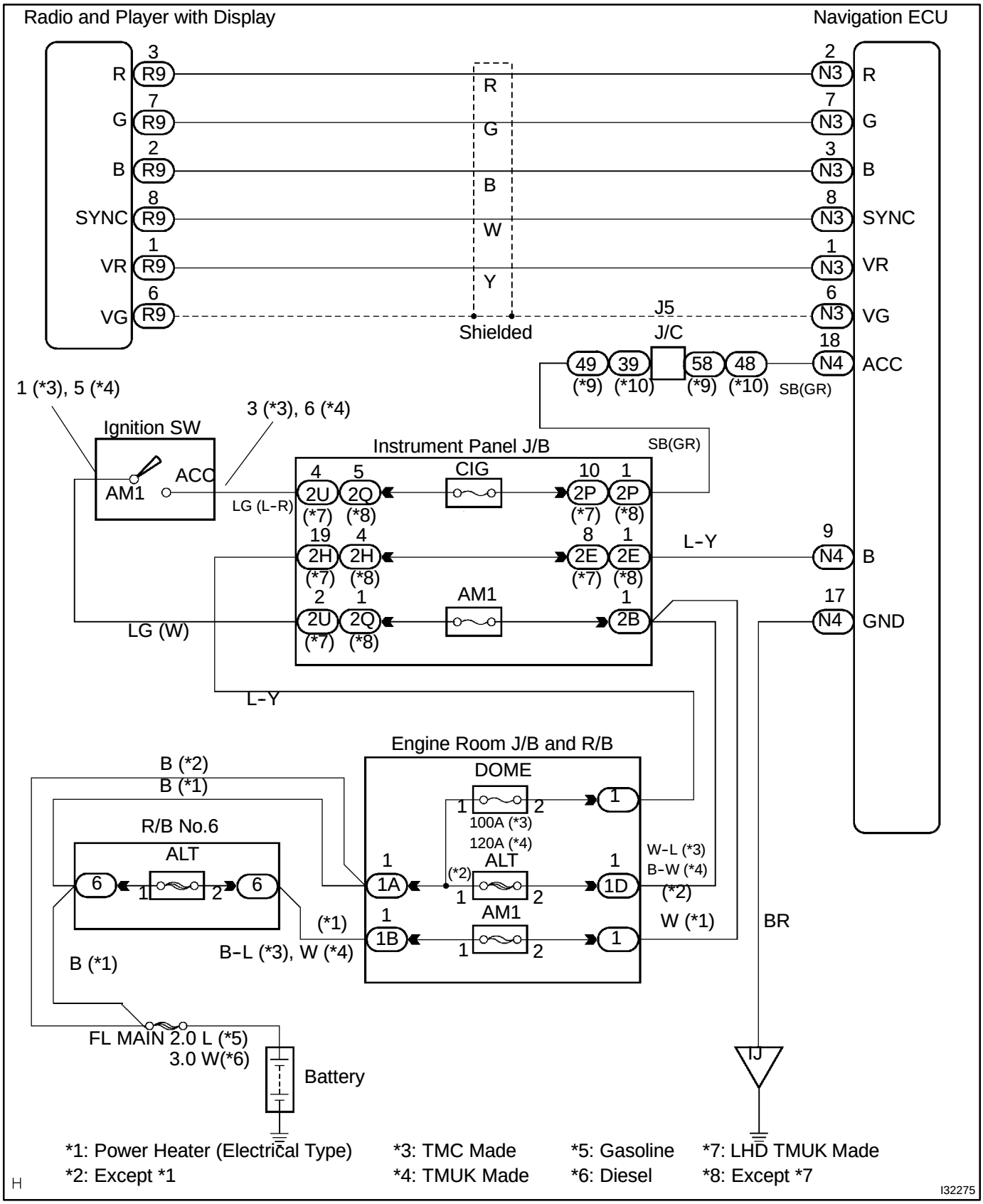
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE NAVIGATION ECU

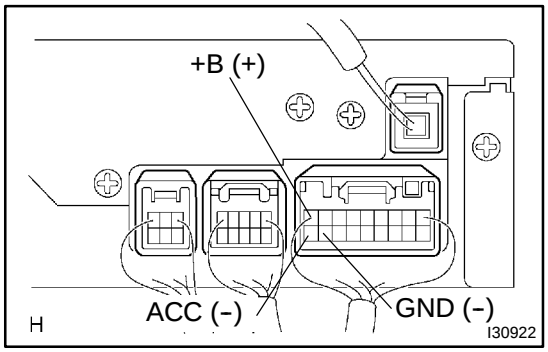
NAVIGATION SCREEN NOT STABILIZED (SYNCRONOUS ERROR)

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT NAVIGATION ECU(+B,ACC,GND)



(a) Remove the navigation ECU with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of navigation ECU at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.

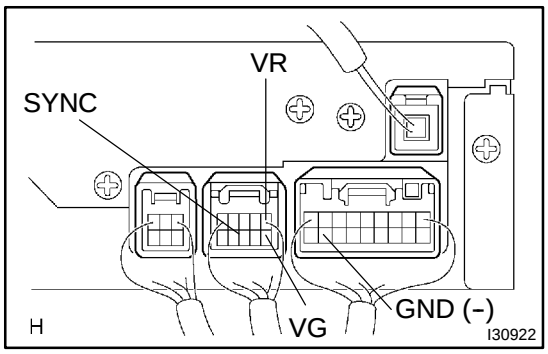
(1) Check that the continuity exists between terminal GND of navigation ECU and body ground.

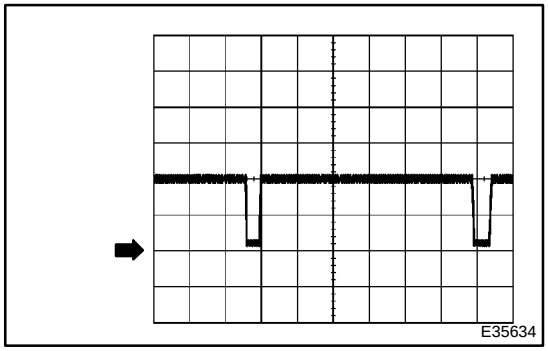
Standard: Continuity exists.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

2 INSPECT NAVIGATION ECU(SYNC,VR,VG)





(a) Check continuity.

(1) Check that the continuity exists between each terminals, as shown in the chart.

Standard:

Terminal	Condition	Specified condition
VR ⇔ Body ground	Constant	Continuity
VG ⇔ Body ground	Constant	Continuity

(b) Check signal waveform.

(1) Using an oscilloscope, check signal waveform between terminals SYNC and GND of navigation ECU.

Item	Contents
Tool setting	500 mV/ DIV, 10 μs/ DIV
Condition	Navigation display is displayed

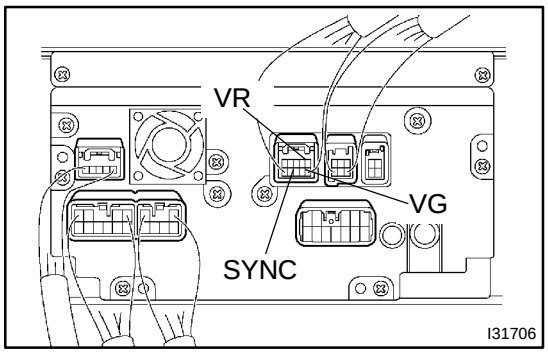
HINT:

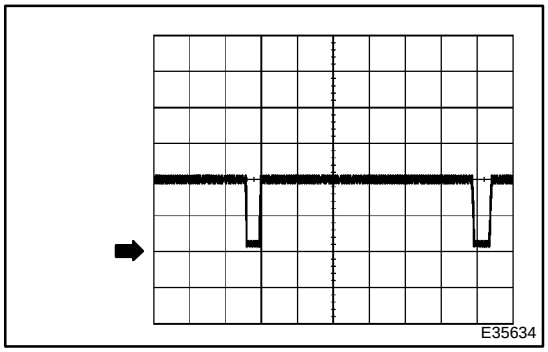
Signal wave from is shown in the chart.

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

3 INSPECT RADIO RECEIVER ASSY(SYNC,VR,VG)





(a) Check continuity.

(1) Check that the continuity exists between each terminals, as shown in the chart.

Standard:

Terminal	Condition	Specified condition
VR ⇔ Body ground	Constant	Continuity
VG ⇔ Body ground	Constant	Continuity

(b) Check signal waveform.

(1) Using an oscilloscope, check signal waveform between terminals SYNC and GND of radio receiver assy.

Item	Contents
Tool setting	500 mV/ DIV, 10 μs/ DIV
Condition	Navigation display is displayed

HINT:
Signal wave from is shown in the chart.

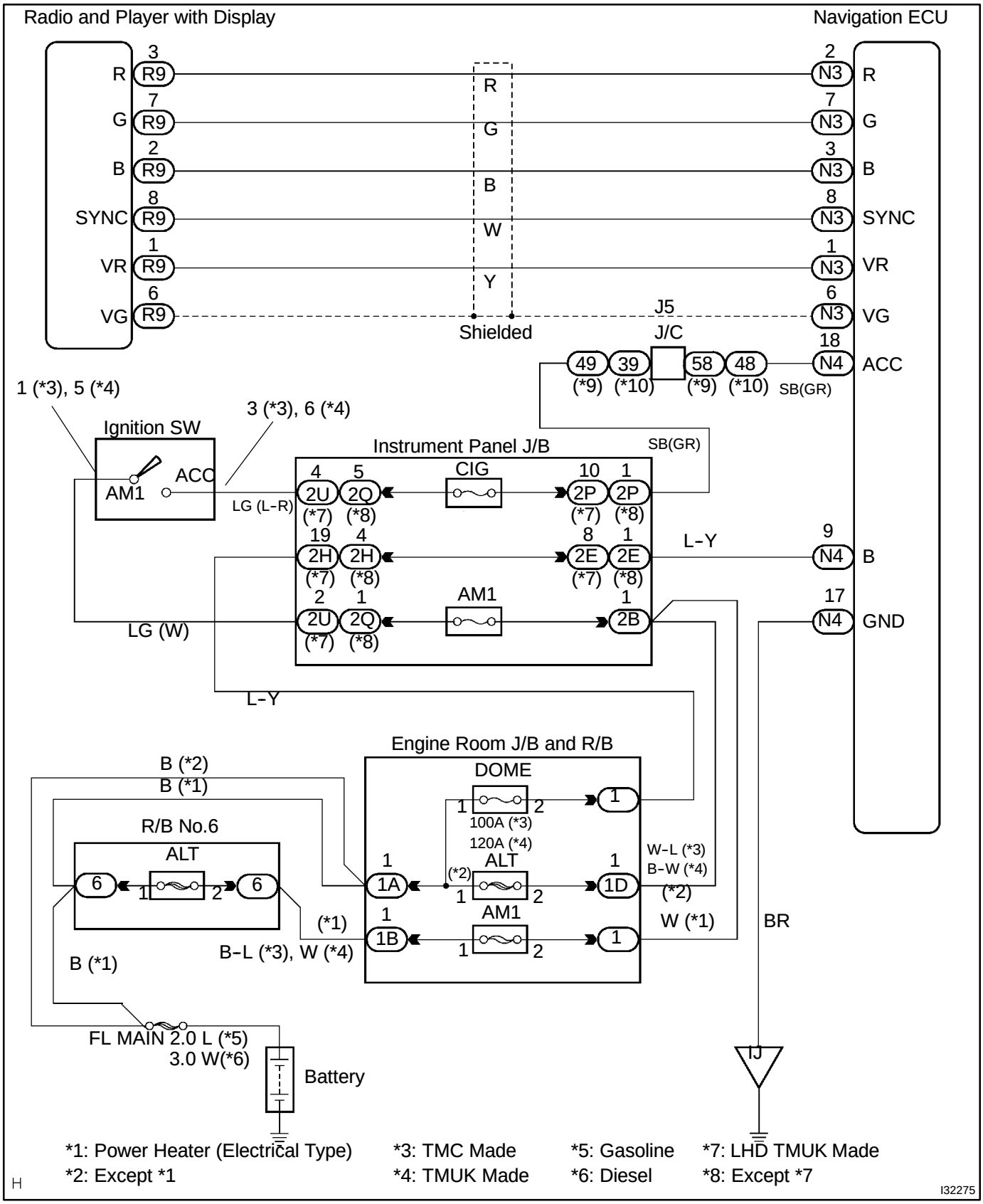
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK →

CHECK AND REPLACE RADIO RECEIVER ASSY

COLOR ON NAVIGATION SCREEN IS UNUSUAL (RGB SIGNAL ERROR)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	DISPLAY CHECK MODE(COLOR BAR CHECK)

(a) Perform dispay check mode.
(1) Start the diagnosis system and perform display color bar check of display check mode.
Standard: Color bar check is normally

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

2	NAVIGATION CHECK MODE(COLOR BAR CHECK)

(a) Perform navigation check mode.
(1) Start the diagnosis system and perform navigation color bar check of navigation check mode.
Standard: Color bar check is normally

NG → **Go to step 4**

OK

3	CHECK SETTING(NAVIGATION SETTING)

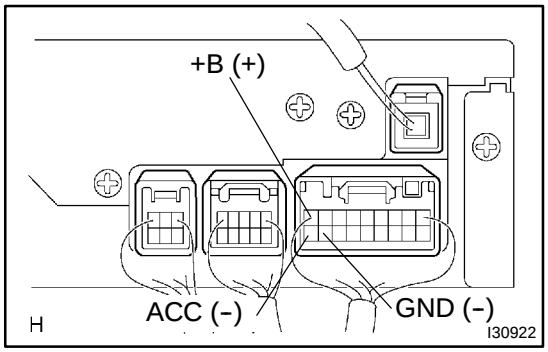
(a) Check the color settings of each daytime screen/night screen at the "Navigation setting" on the menu.
Standard: Color setting is normally

NG → **CHECK AND REPLACE NAVIGATION ECU**

OK

NORMAL

4 INSPECT NAVIGATION ECU(+B,ACC,GND)



(a) Remove the navigation ECU with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of navigation ECU at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.

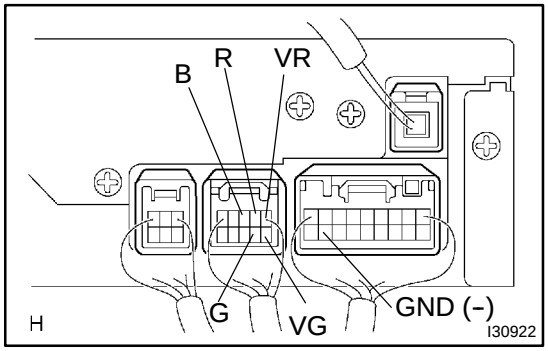
(1) Check that the continuity exists between terminal GND of navigation ECU and body ground.

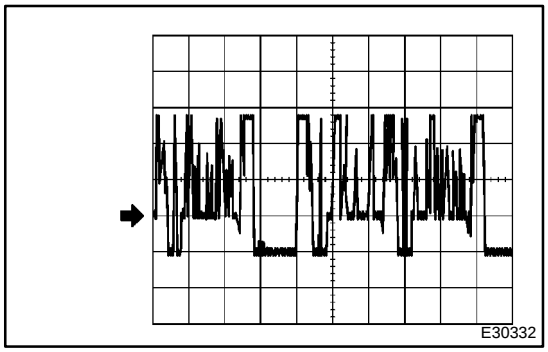
Standard: Continuity exists.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

5 INSPECT NAVIGATION ECU(R,G,B,VR,VG)





(a) Check continuity.

(1) Check that the continuity exists between each terminals, as shown in the chart.

Standard:

Terminal	Condition	Specified condition
VR ⇔ Body ground	Constant	Continuity
VG ⇔ Body ground	Constant	Continuity

(b) Check signal waveform.

(1) Using an oscilloscope, check signal waveform between terminals R, G, B and GND of navigation ECU.

Item	Contents
Tool setting	200 mV/ DIV, 10 μs/ DIV
Condition	Navigation display is displayed

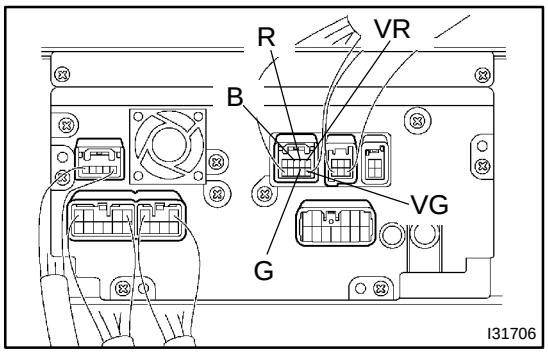
HINT:

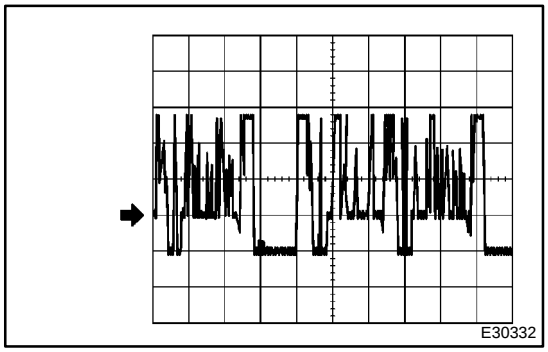
Signal wave from is shown in the chart.

NG → **CHECK AND REPLACE NAVIGATION ECU**

OK

6 INSPECT RADIO RECEIVER ASSY(R,G,B,VR,VG)





(a) Check continuity.

(1) Check that the continuity exists between each terminals, as shown in the chart.

Standard:

Terminal	Condition	Specified condition
VR ⇔ Body ground	Constant	Continuity
VG ⇔ Body ground	Constant	Continuity

(b) Check signal waveform.

(1) Using an oscilloscope, check signal waveform between terminals R, G, B and GND of radio receiver assy.

Item	Contents
Tool setting	200 mV/ DIV, 10 μs/ DIV
Condition	Navigation display is displayed

HINT:

Signal wave from is shown in the chart.

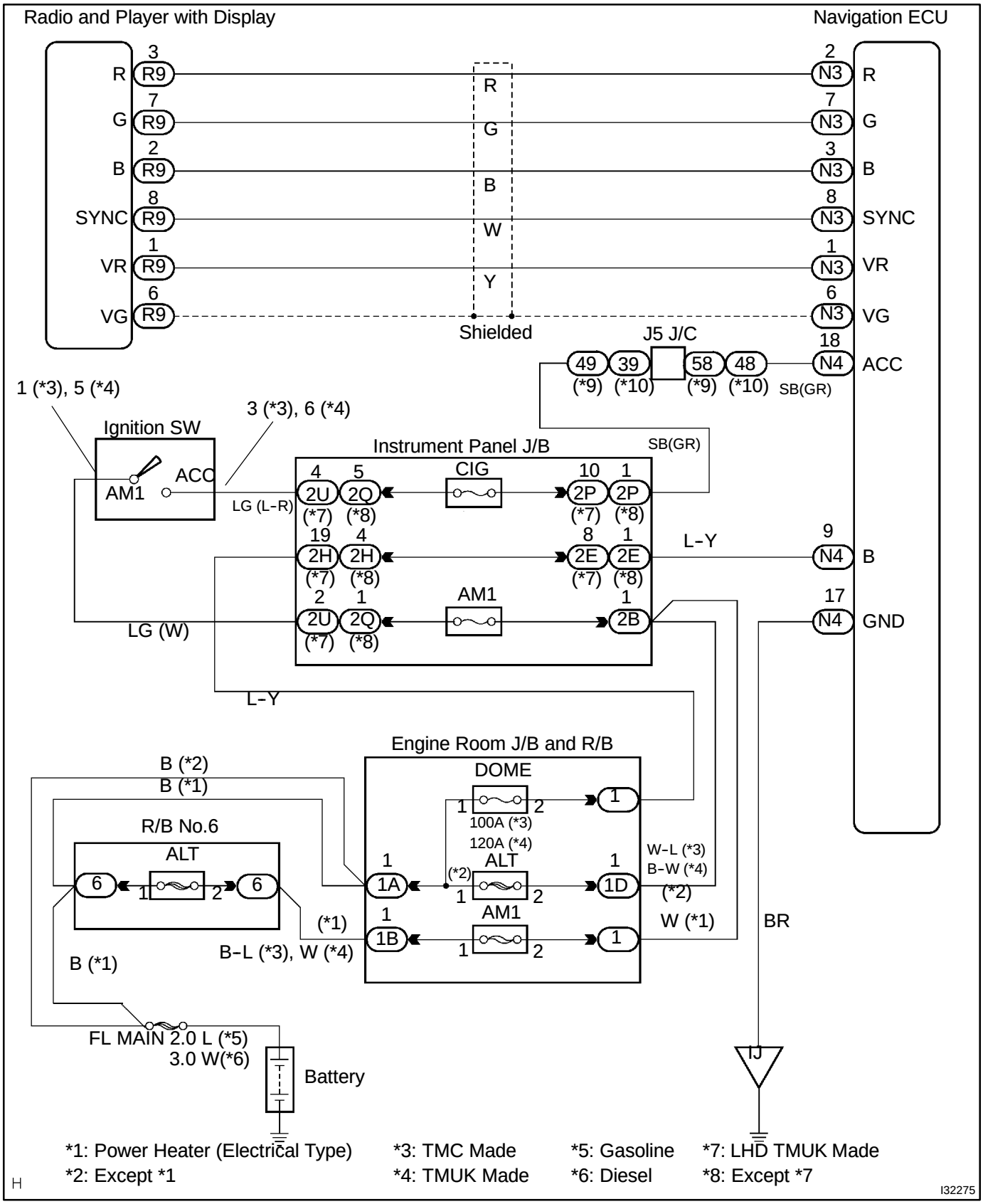
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK →

CHECK AND REPLACE RADIO RECEIVER ASSY

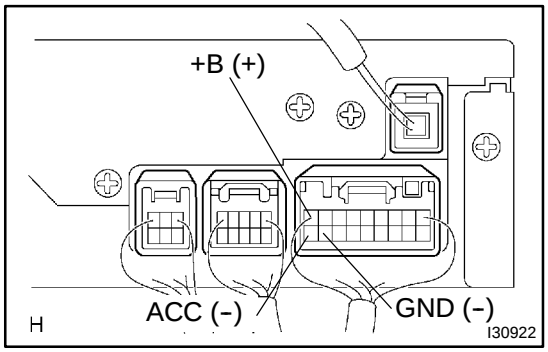
BLACK SCREEN APPEARS WHEN "MENU","MAP/VOICE"OR "DEST"SWITCH PRESSED

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT NAVIGATION ECU(+B,ACC,GND)



(a) Remove the navigation ECU with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of navigation ECU at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.

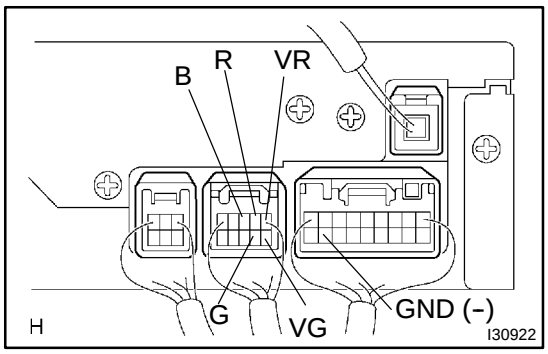
(1) Check that the continuity exists between terminal GND of navigation ECU and body ground.

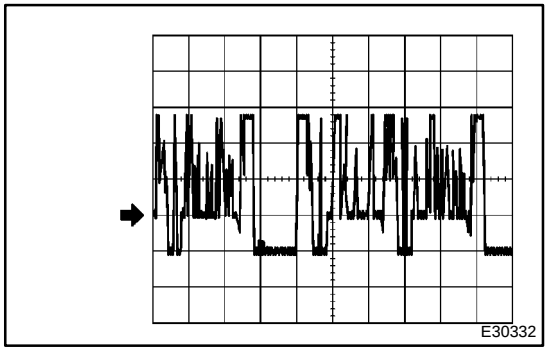
Standard: Continuity exists.

NG → **CHECK AND REPLACE HARNESS OR CONNECTOR**

OK

2 INSPECT NAVIGATION ECU(R,G,B,VR,VG)





(a) Check continuity.

(1) Check that the continuity exists between each terminals, as shown in the chart.

Standard:

Terminal	Condition	Specified condition
VR ⇔ Body ground	Constant	Continuity
VG ⇔ Body ground	Constant	Continuity

(b) Check signal waveform.

(1) Using an oscilloscope, check signal waveform between terminals R, G, B and GND of navigation ECU

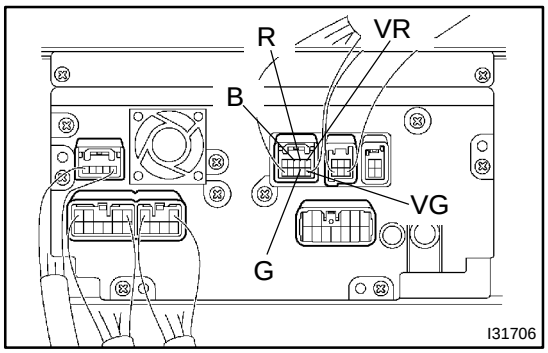
Item	Contents
Tool setting	200 mV/ DIV, 10 μs/ DIV
Condition	Navigation display is displayed

HINT:
Signal wave from is shown in the chart.

NG → **REPAIR OR REPLACE NAVIGATION ECU**

OK

3 INSPECT RADIO RECEIVER ASSY(R,G,B,VR,VG)



(a) Check continuity.

(1) Check that the continuity exists between each terminals, as shown in the chart.

Standard:

Terminal	Condition	Specified condition
VR ⇔ Body ground	Constant	Continuity
VG ⇔ Body ground	Constant	Continuity

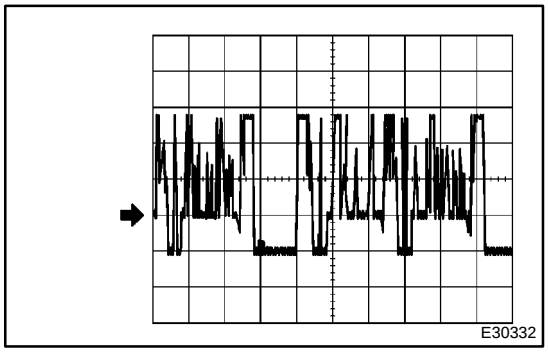
(b) Check signal waveform.

(1) Using an oscilloscope, check signal waveform between terminals R, G, B and GND of radio receiver assy.

Item	Contents
Tool setting	200 mV/ DIV, 10 μs/ DIV
Condition	Navigation display is displayed

HINT:

Signal wave from is shown in the chart.



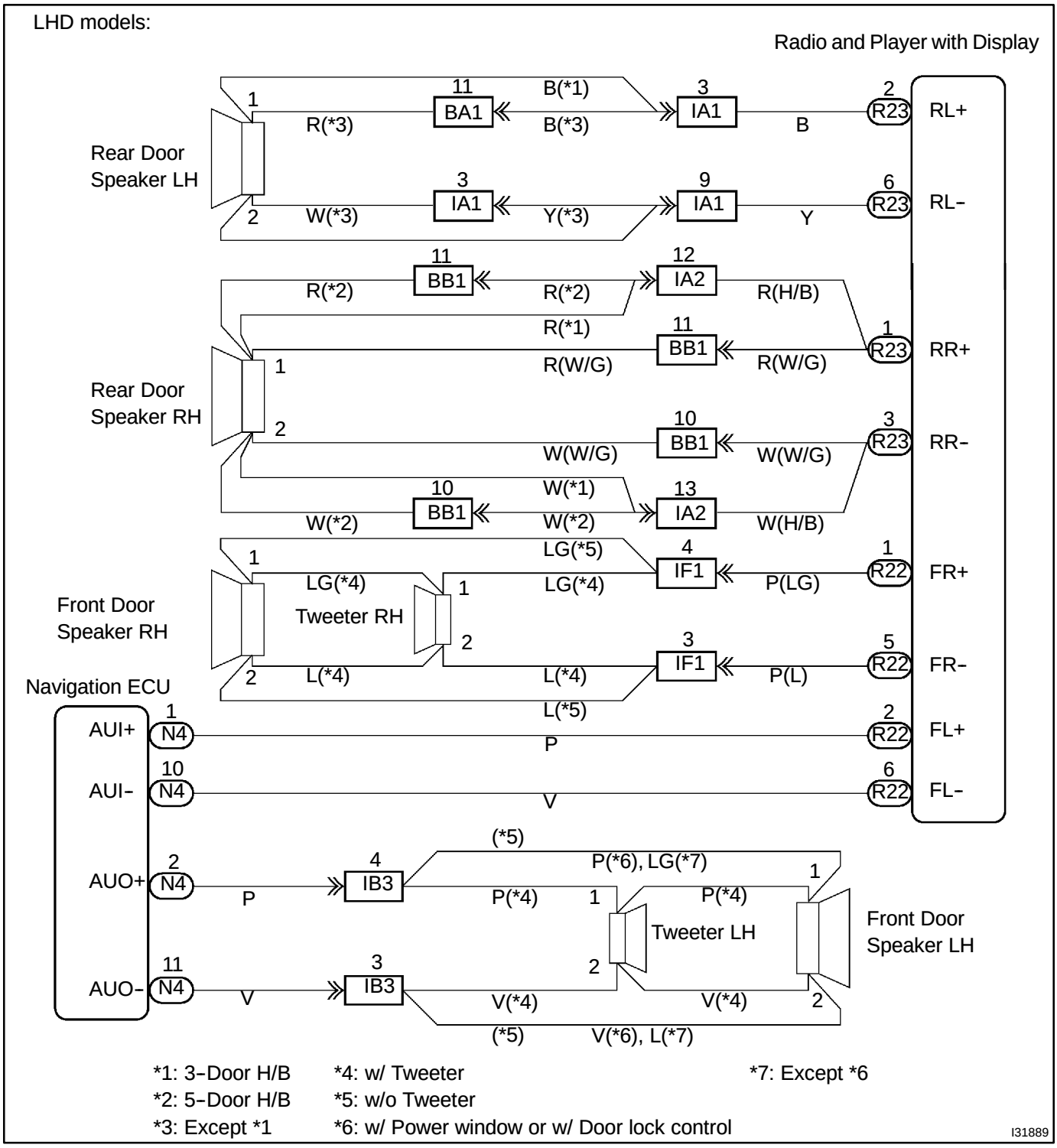
NG → **CHECK AND REPLACE HARNESS OR CONNECTOR**

OK

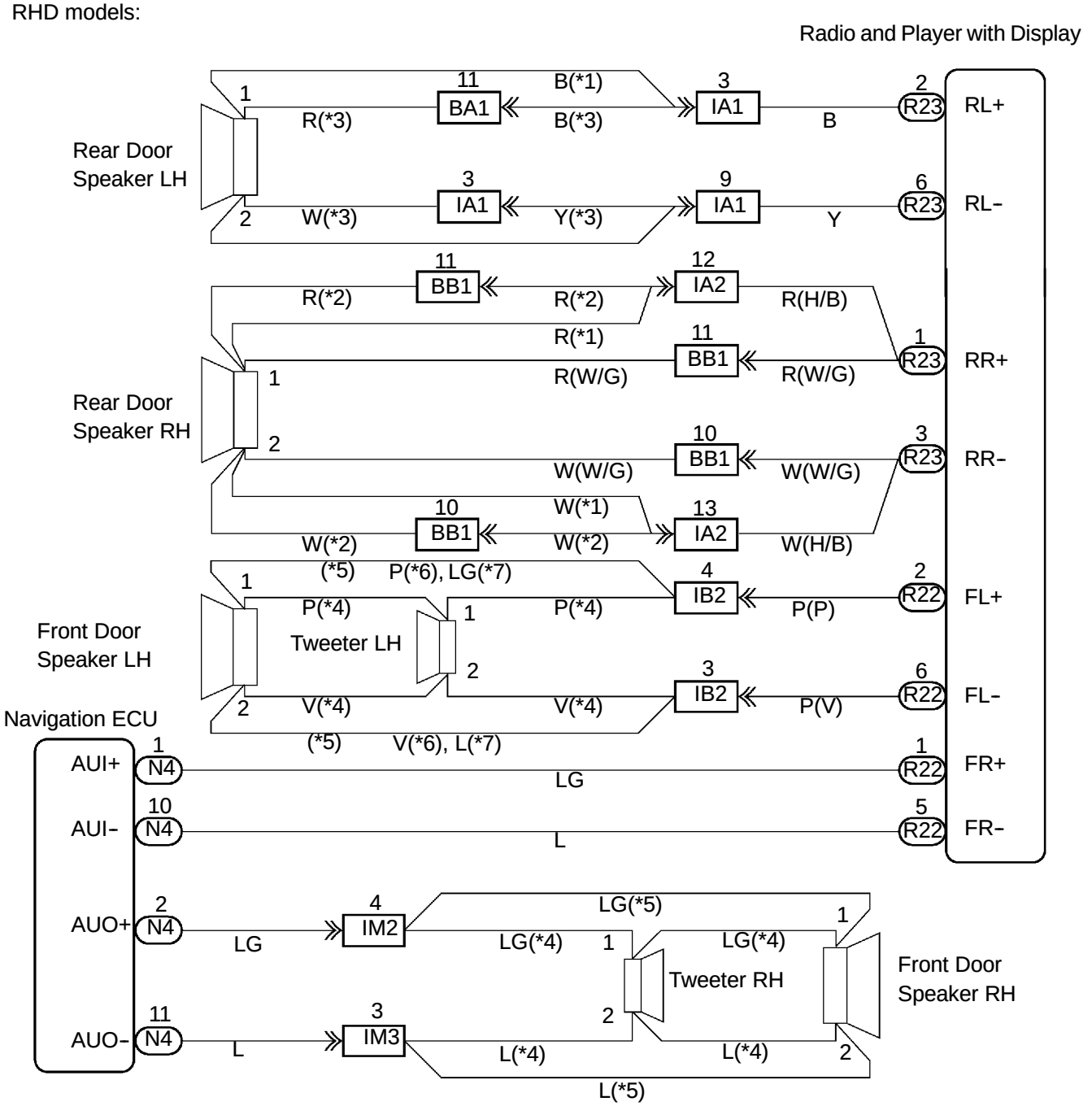
CHECK AND REPLACE RADIO RECEIVER ASSY

FRONT SPEAKER (DRIVER SIDE) ONLY IS NOT HEARD (RADIO, CASETTE TAPE, CD)

WIRING DIAGRAM



RHD models:



*1: 3-Door H/B
*2: 5-Door H/B
*3: Except *1
*4: w/ Tweeter
*5: w/o Tweeter
*6: w/ Power window or w/ Door lock control
*7: Except *6

INSPECTION PROCEDURE

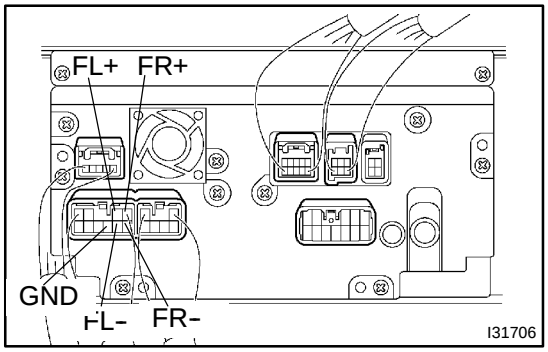
1	CHECK SETTING(THE VOLUE OF THE NAVIGATION VOICE SOUND)

(a) Check the settings.
(1) Set the volume MAX at the voice sound settings on the menu.
STANDARD: "This system will guide you in this volume"is produced.

NG → **INSPECT FRONT NO.1 SPEAKER ASSY**

OK

2	INSPECT RADIO RECEIVER ASSY(FL+,FL-,FR+,FR-)



(a) Remove the radio receiver assy with connectors with still connected.
(b) Using an oscilloscope, check signal waveform between terminals FL+, FL-, FR+, FR- and GND of radio receiver assy.

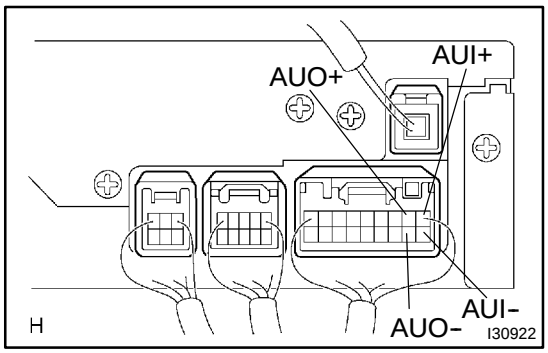
Standard:

Terminal	Condition	Specified condition
FL+ (LHD) ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
FL- (LHD) ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
FR+ (RHD) ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
FR- (RHD) ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output

NG → **REPAIR OR REPLACE RADIO RECEIVER ASSY**

OK

3	INSPECT NAVIGATION ECU(AUO+,AUO-)



(a) Check continuity.
(1) Check that the continuity exists between each terminals, as shown in the chart.

Standard:

Terminal	Condition	Specified condition
AUI+ ⇔ AUO+	Constant	Continuity
AUI- ⇔ AUO-	Constant	Continuity

NG → **REPAIR OR REPLACE NAVIGATION ECU**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

4	INSPECT FRONT NO.1 SPEAKER ASSY

(a) Check continuity.
(1) Check that the continuity exists between terminals of font No.1 speaker.
Standard: 4Ω

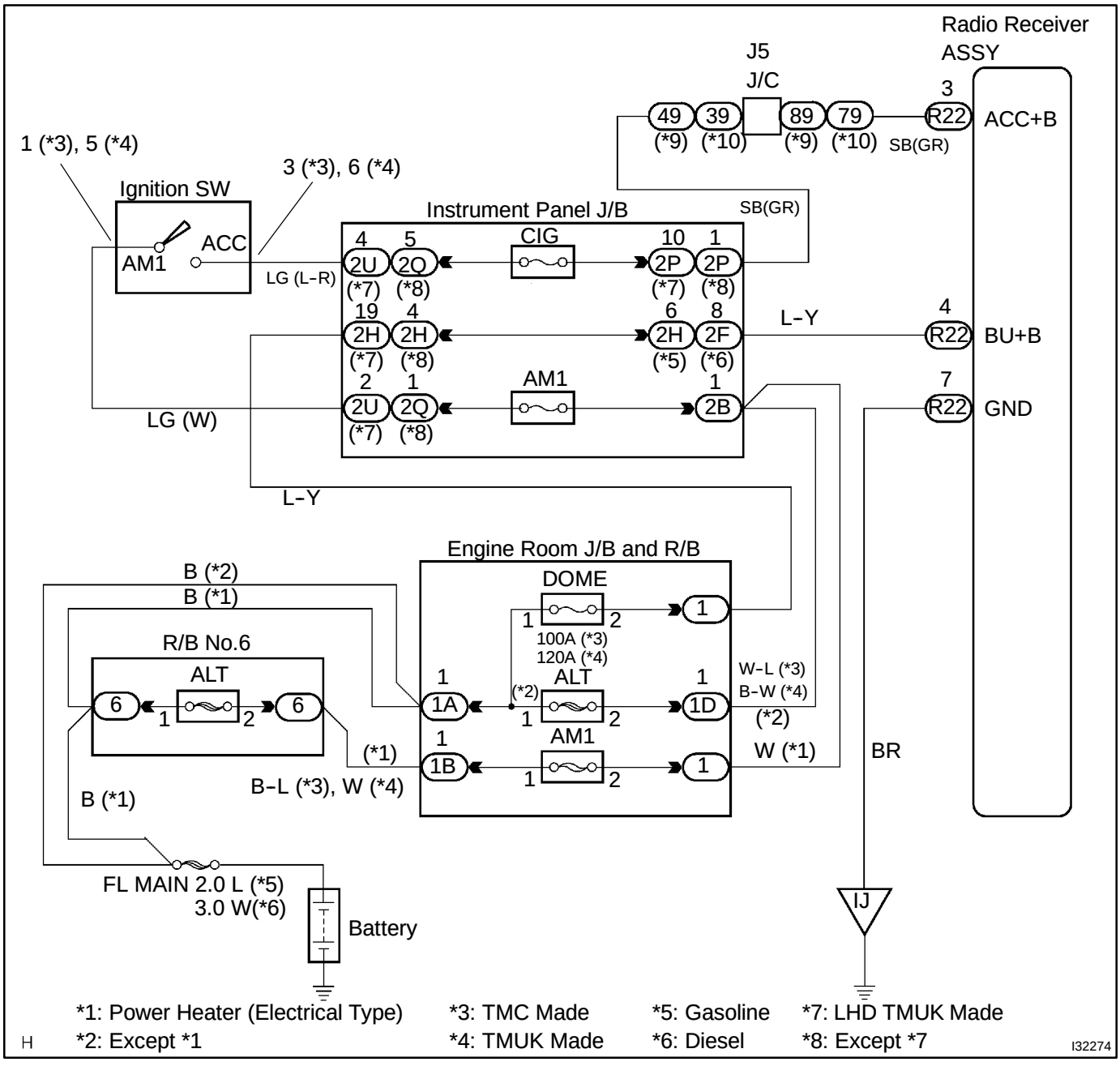
NG → **REPAIR OR REPLACE FRONT NO.1 SPEAKER ASSY**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

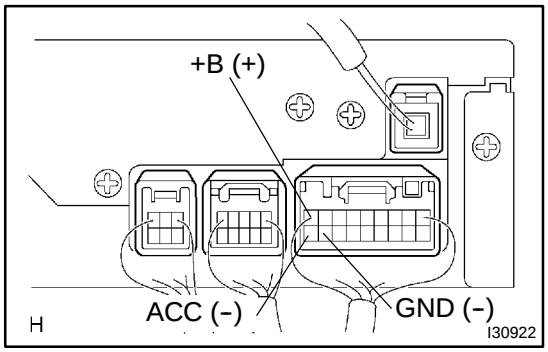
MAP DISC CANNOT BE INSERTED

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT NAVIGATION ECU(+B,ACC,GND)



(a) Remove the navigation ECU with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of navigation ECU at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.

(1) Check that the continuity exists between terminal GND of navigation ECU and body ground.

Standard: Continuity exists.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE NAVIGATION ECU

MAP SCREEN DISPLAYED DOES NOT APPEAR (DISC CAUTOIN SCREEN DOES NOT CHANGE)

INSPECTION PROCEDURE

1	TAKE APPROPRIATE MESURES ACCORDING TO CAUTION SCREEN

(a) Take appropriate measures according to caution screen.

CAUTION SCREEN

CAUTION MESSAGE	CAUSE	CORRECTIVE ACTION
Cover is open. Please close disk cover before using system.	The cover of the map disk slot is open.	Close the cover.
No disc detected. Insert map disk.	No map disk is inserted.	Insert a proper map disc.
No disc detected. Insert map disk. Check flaw or dirt on disk.	Cannot read correctly due to flaw or dirt.	Insert a correct map disc.
Disc read error. Check disc.	Something other than map disc i s inserted.	Insert a correct map disc.
Disc read error due to hight tempetature.	Pick-up part of the player is heated to a high temperature.	Stop the vehicle at a shaded cool place and turn the ignition switch OFF. When confirming that the temperature of the navigation ECU has been lowered, turn the ignition switch ON.
Disc read error. Consult dealer/sshop.	Player cannot read map disc temporarily.	Turn the IG switch from OFF to ON. (*1)

*1: If the same "CAUTION MESSAGE" is displayed again even after turning the ignition switch to ON, replace the navigation ECU.

STANDARD: Correctly functions.

OK → **NORMAL**

NG

2	REPLACE DISC PLAYER DISC

NG

CHECK AND REPLACE NAVIGATION ECU

MAP IS DISPLAYED IN WHITE OR BLUE SCREEN (SWITCHED AND VEHICLE POSITION MARK ARE DISPLAYED)

INSPECTION PROCEDURE

1	CHECK SETTING

(a) Check the settings.
(1) Check that the map display is normal when set up the scale of the map widest area.
STANDARD: Map display is normal

OK → **NORMAL**

NG

2	CHECK IT OPERATION AGAIN

(a) Clean the map disk.
(1) After wiping the map disk in the circumference direction with a soft cloth, insert it again.

OK → **NORMAL**

NG

3	REPLACE DISC PLAYER DISC

NG

CHECK AND REPLACE NAVIGATION ECU

SCREEN CANNOT BE DIMMED WHEN LIGHT CONTROL SWITCH IS TURNED TO "TAIL" POSITION

INSPECTION PROCEDURE

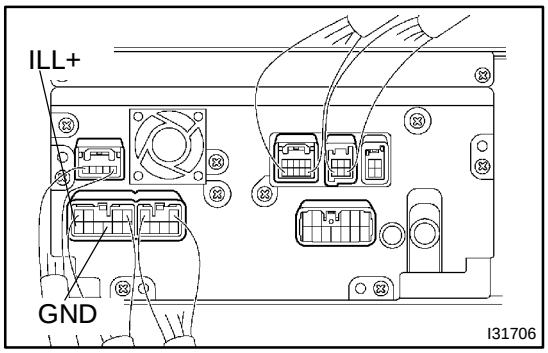
1	DISPLAY CHECK MODE

(a) Perform display check.
(1) Set up diagnosis system and read result of display vehicle check mode.
STANDARD: Input signal is normal (TAIL)

OK → **Go to step 3**

NG

2	INSPECT RADIO RECEIVER ASSY(ILL+)



(a) Check voltage.
(1) Measure voltage between terminals ILL+ and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Headlight dimmer switch position	condition
OFF	0V
TAIL or HEAD	10 - 14V

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

3	INSPECT DISPLAY

(a) Check the screen display.
(1) Check that the screen dimmed by turning the headlight dimmer switch to ON.
STANDARD: The screen dimming function is normal

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

4	CHECK SETTING

(a) Check the settings.
(1) Turn the ignition switch ON.
(2) Turn the power switch of the radio receiver assy ON to display the map.
(3) Operate the radio receiver assy, and check that ”The color of night screen is standard” is set at the navigation condition setting.

STANDARD: The setting is normal

NG → **THE SETTING IS ABNORMAL**

OK

CHECK AND REPLACE NAVIGATION ECU

TOUCH SWITCH DOES NOT FUNCTION (NAVIGATION SCREEN ONLY)

INSPECTION PROCEDURE

1	DISPLAY CHECK MODE(DISPLAY TOUCH SWITCH CHECK)

(a) Perform display touch switch check of display check mode.
(1) Start up the diagnosis system and perform display touch switch check of display check mode.
STANDARD: Touch switch is normal

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

2	CHECK SWITCH(BEEP SOUND)

(a) Check the switch(Beep sound).
(1) Press each touch switch on the navigation screen to check that the beep sounds are produced.
STANDARD: Beep sound is normal

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE NAVIGATION ECU

VEHICLE POSITION IS DEVIATED FROM CORRECT POINT BADLY

INSPECTION PROCEDURE

1	CHECK DISPLAY(GPS MARK DISPLAY)

(a) Preparation for the pre-check.
  (1) Move the vehicle in the place with a fine view to GPS mark is displayed.
(b) Check the screen display.
  (1) Turn the ignition switch ON.
  (2) Turn the power switch of the radio receiver assy ON to display the map.
  STANDARD: "GPS" mark is appeared

NG → **GO TO TROBLESHOOT FOR "GPS MARK DOES NOT APPEAR"**

OK

2	CHECK WHEN THIS HAPPENS

(a) Check the abnormal condition.
  (1) Check the point in which the trouble occurs.

STANDARD:

A	The trouble occur in the not specific area
B	The trouble occur in the specific area

HINT:
At the place difficult specify the vehicle position (a by-pass road, a high-level road, a loop road, or several-storied car park, etc.), the vehicle position may be of the point due to the wrong matching.

B → **NORMAL**

A

3	CHECK DISPLAY(AUTOMATIC CALIBRATION)

(a) Check the screen display.
  (1) Check the color of "Automatic calibration" switch at the distance correction screen.
  STANDARD: Green ("Automatic calibration" switch)

OK → **NORMAL**

NG

4	NAVIGATION CHECK MODE(VEHICLE SIGNAL CHECK)

(a) Perform vehicle signal check of navigation check mode.
(1) Start up the diagnosis system and read result of SPD signal in vehicle signal check mode.
STANDARD: Input signal is normal (SPD)

NG → **Go to step 6**

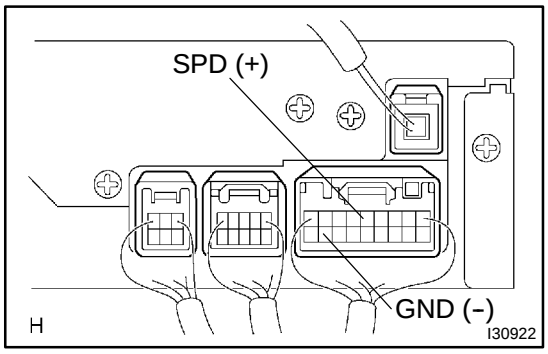
OK

5	CHECK IT OPERATION AGAIN

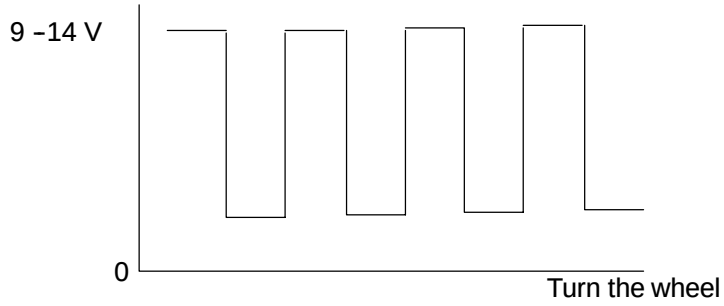
NG

CHECK AND REPLACE NAVIGATION ECU

6	INSPECT NAVIGATION ECU(SPD)



(a) Remove the navigation ECU with connectors still connected.
(b) Check voltage.
(1) Shift the shift lever to neutral.
(2) Jack up one of the front wheel.
(3) Turn ignition switch ON.
(4) Measure voltage between terminals SPD and GND of navigation ECU when the front wheel are turned slowly.
Voltage is generated intermittently.



OK → **CHECK AND REPLACE NAVIGATION ECU**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

GPS MARK DOES NOT APPEAR

INSPECTION PROCEDURE

1	CHECK MARK DISPLAY

(a) Check that the malfunction disappear when move the vehicle in the place with a fine view.
Standard: GPS mark is displayed.

HINT:
At the place surrounded by the architecture, vehicle cannot receive the GPS radio wave.

OK → NORMAL

NG

2	CHECK OPTIONAL COMPONENT

(a) Check optional component.
(1) Check that there is the optional component on the vehicle.
Standard: There is not optional component on the vehicle.
(2) Check that there is anything such as film stuck to the window or any metal object on the instrument panel.
Standard: There is not anything such as film stuck to the window or any metal object on the instrument panel.

NG → EFFECT FROM OPTIONAL COMPONENT

OK

3	CHECK NAVIGATION ANTENNA ASSY

NG → REPLACE NAVIGATION ANTENNA ASSY

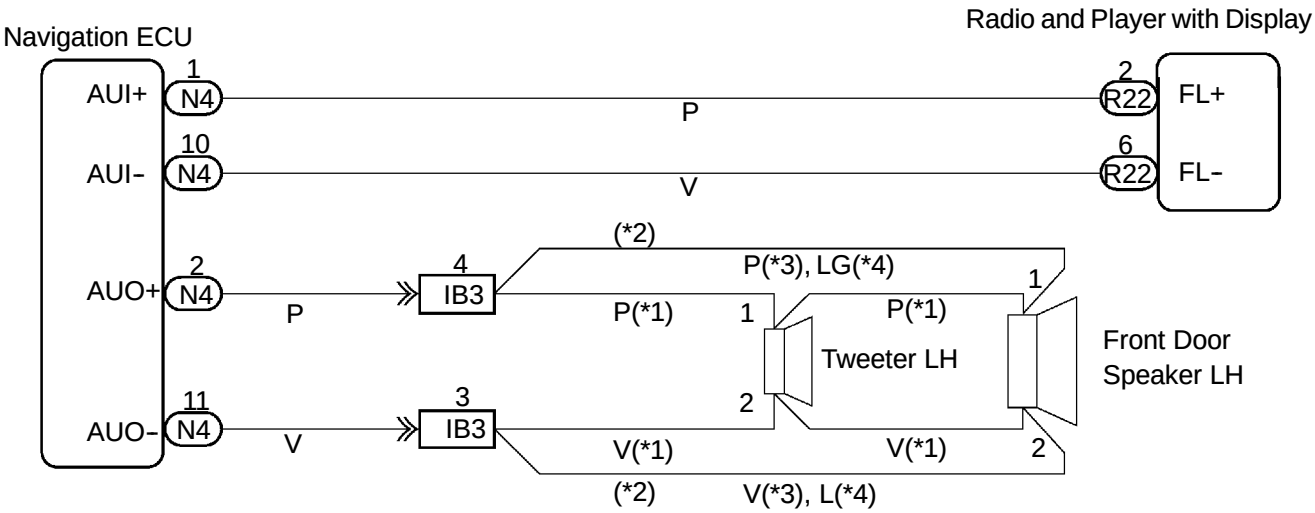
OK

CHECK AND REPLACE NAVIGATION ECU

NO VOICE NAVIGATION

WIRING DIAGRAM

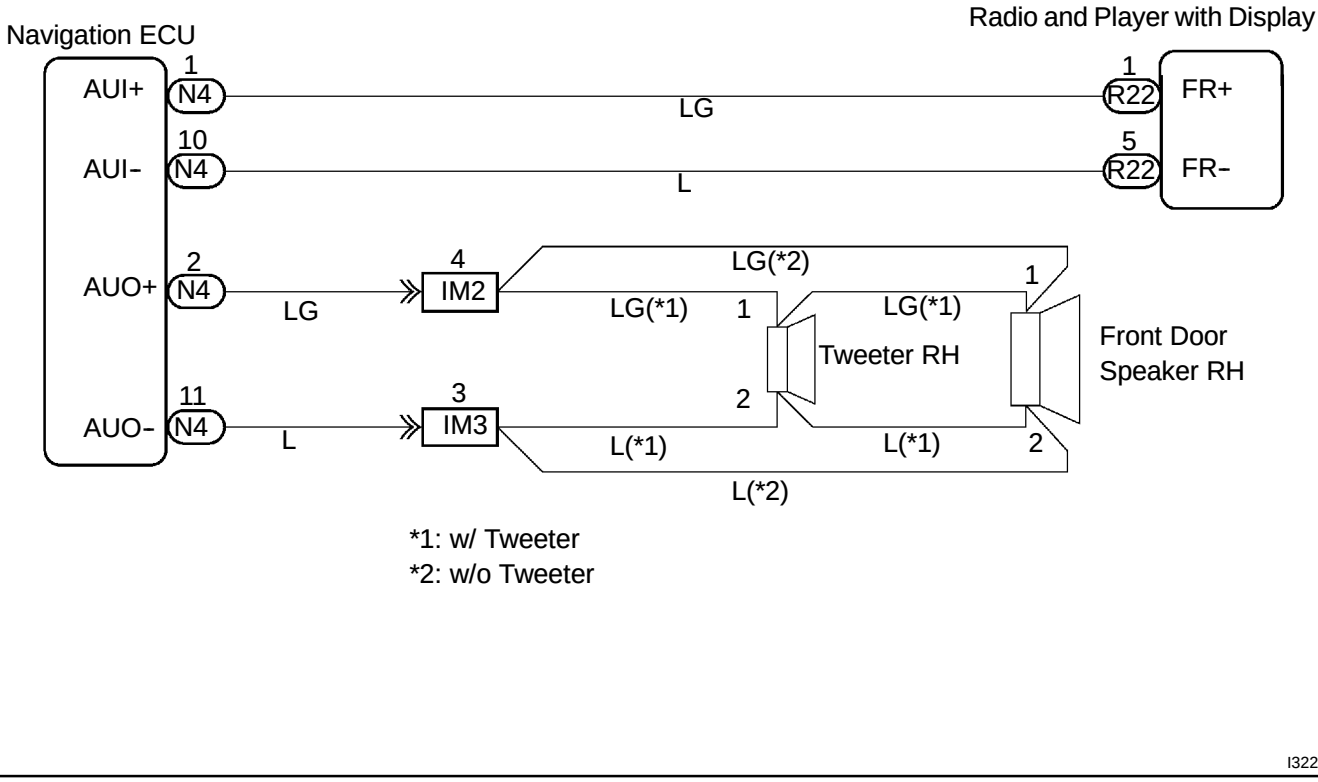
LHD models:



*1: w/ Tweeter
*2: w/o Tweeter
*3: w/ Power window or w/ Door lock control
*4: Except *3

I32276

RHD models:


Navigation ECU
Radio and Player with Display
AUI+
AUI-
AUO+
AUO-
N4
1
10
2
11
LG
L
R22
FR+
FR-
IM2
IM3
4
3
LG(*2)
LG(*1)
L(*1)
L(*2)
Tweeter RH
Front Door
Speaker RH
*1: w/ Tweeter
*2: w/o Tweeter
I32276

INSPECTION PROCEDURE

1	CHECK SETTING(THE VOLUME OF THE NAVIGATION SOUND)

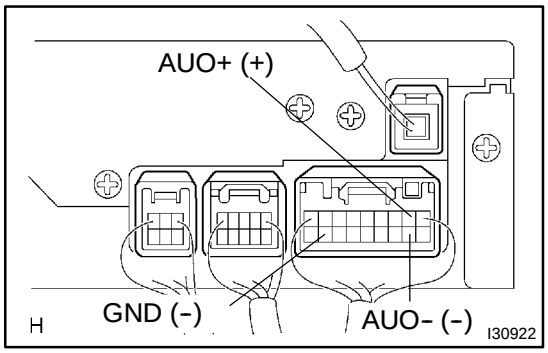
(a) Check the settings.
(1) Set the volume MAX at the voice sound settings on the menu.
STANDARD: Vocalize "This system will guide you in the volume"

HINT:
- In the following cases, no voice sound guidance is made even if the system is normal.
- When the destination is not set.
- When not running on the route (the remaining distance at the left bottom on the present point is not displayed)
- When "other modes guidance" is not set (voise sound guidance is made only on the map screen)

OK → **NORMAL**

NG

2	INSPECT NAVIGATION ECU(AUO+,AUO-)



(a) Check signal waveform.
(1) Using an oscilloscope, check signal waveform between terminals AUO+, AUO- and GND of navigation ECU.

Standard:

Terminal	Condition	Specified condition
AUO+ ⇔ GND	Audio system is sounding	A waveform synchronized with sound is output
AUO- ⇔ GND	Audio system is sounding	A waveform synchronized with sound is output

NG → **CHECK AND REPLACE NAVIGATION ECU**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

3	INSPECT FRONT NO.1 SPEAKER ASSY

(a) Check continuity.
(1) Check that the continuity exists between terminals of font No.1 speaker.
Standard: 4Ω

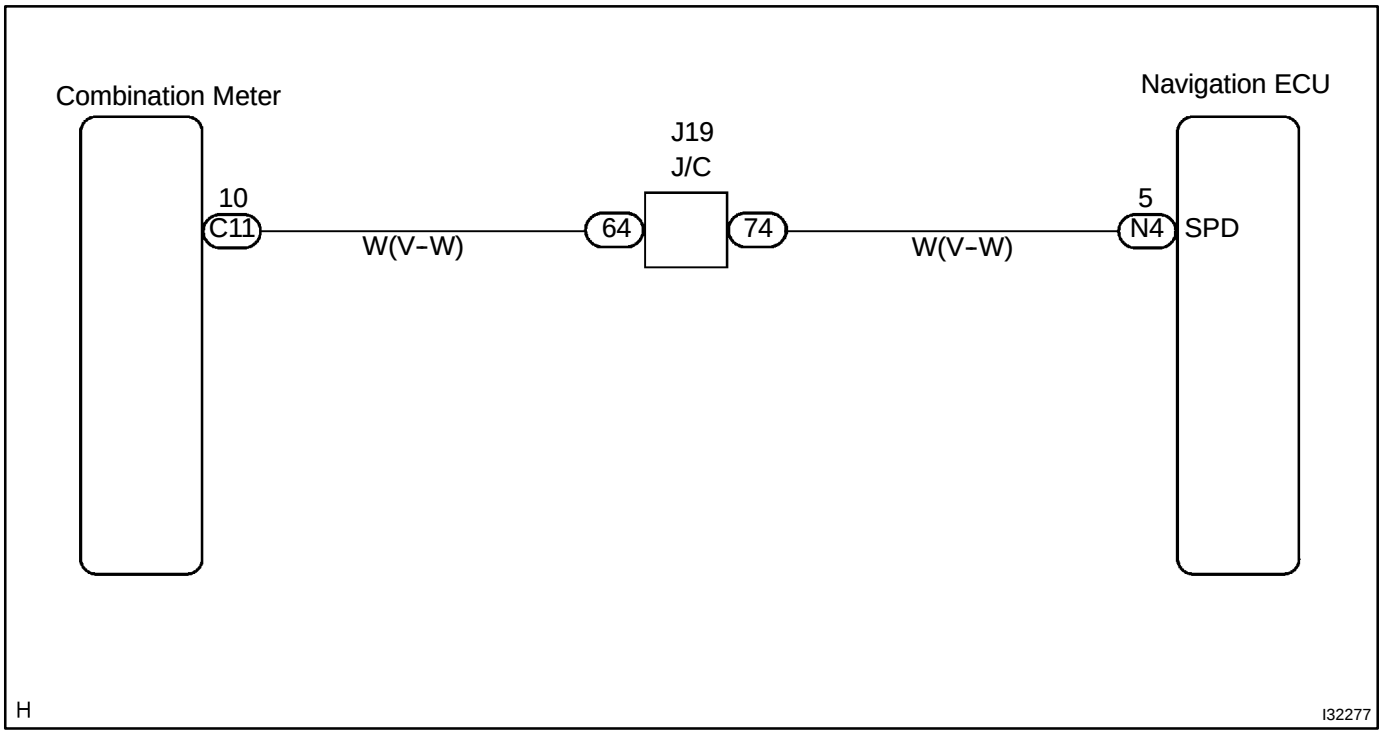
NG → **REPLACE FRONT NO.1 SPEAKER ASSY**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

VEHICLE POSITION MARK ROTATES WIHOUT CONTROL (MAP ROTATES WITHOUT CONTROL)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK IT OPERATION AGAIN

(a) Turn the ignition switch from OFF to ON, the check that the malfunction disappear.
STANDARD: Malfunction disappear

HINT:
Even if the works correctly, the following conditions may be seen, vehicle position mark turns, or the map turns unwillingly. (It is because by turning the IG switch to ACC or ON during turning, navigation system stores based on the angular speed). In that case, turn the IG switch from OFF to ACC or ON to return the correct function.

OK → **NORMAL**

NG

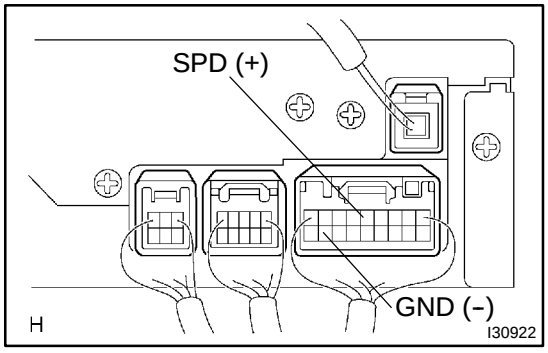
2	NAVIGATION CHECK MODE(VEHICLE SIGNAL CHECK MODE)

(a) Perform vehicle signal check of navigation check mode.
(1) Start up the diagnosis system and read of "SPD" signal in vehicle signal check mode.
STANDARD: Input signal is normal

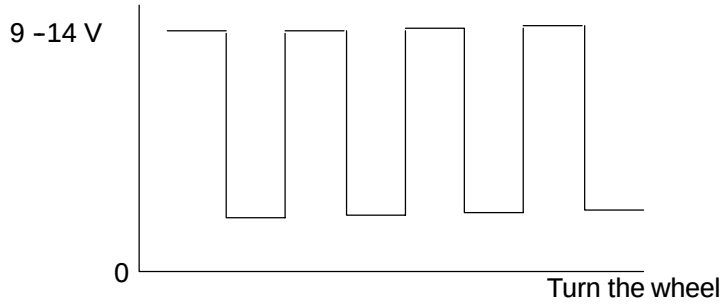
OK → **CHECK AND REPLACE NAVIGATION ECU**

NG

3	INSPECT NAVIGATION ECU(SPD)



(a) Remove the navigation ECU with connectors still connected.
(b) Check voltage.
(1) Shift the shift lever to neutral.
(2) Jack up one of the front wheel.
(3) Turn ignition switch ON.
(4) Measure voltage between terminals SPD and GND of navigation ECU when the front wheel are turned slowly.
Voltage is generated intermittently.



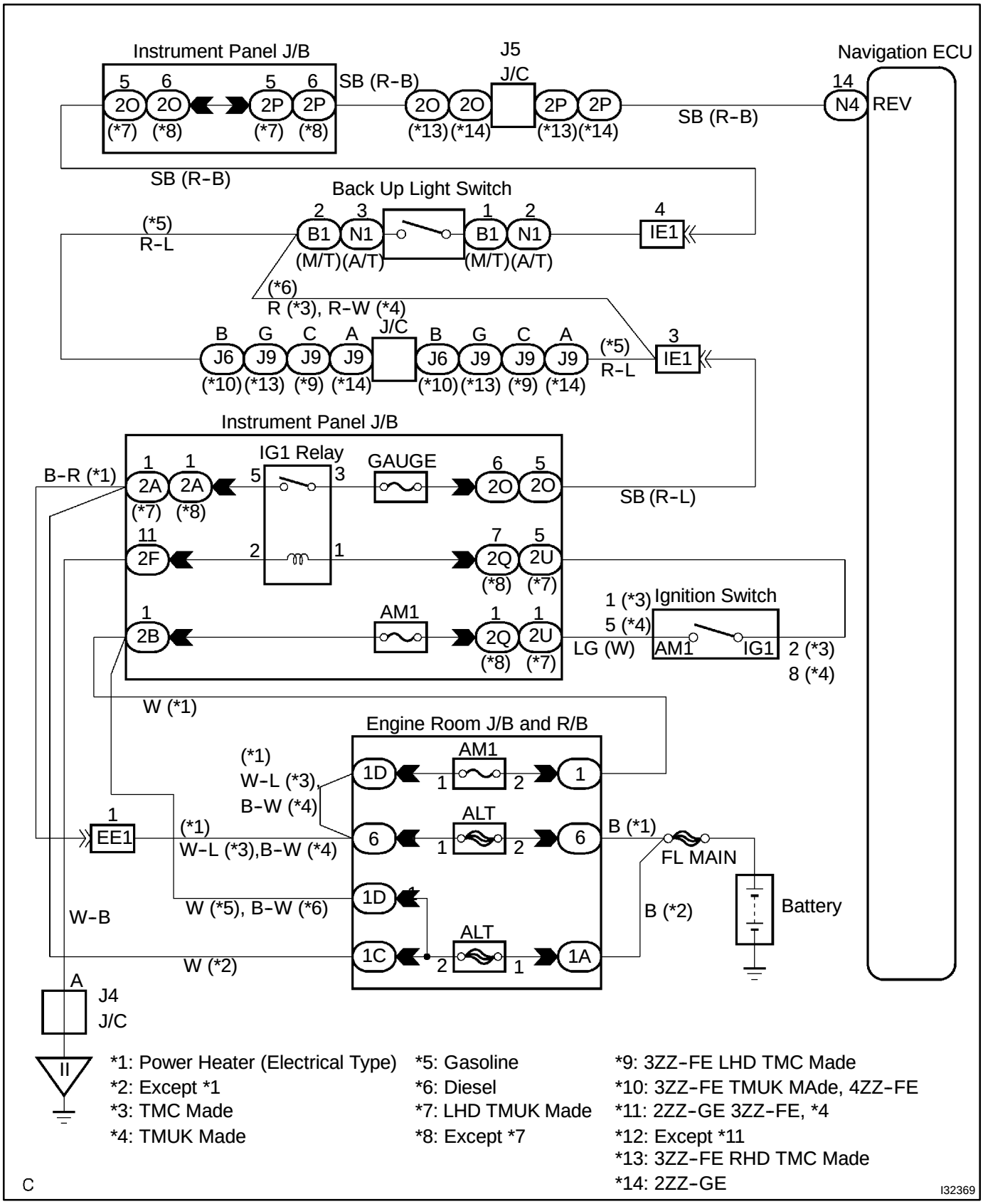
OK → **CHECK AND REPLACE NAVIGATION ECU**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

DRIVING DERECTIONS OPPOSIT TO MOVING DERECTION OF VEHICLE POSITION MARK

WIRING DIAGRAM



INSPECTION PROCEDURE

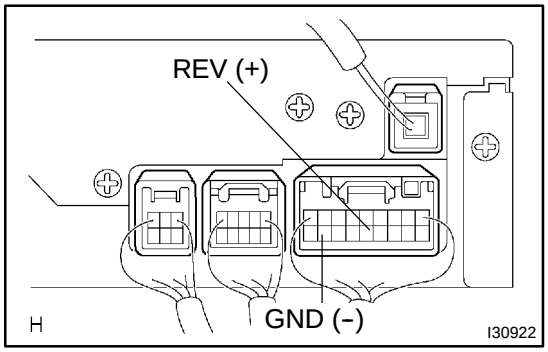
1	NAVIGATION CHECK MODE(VEHICLE SIGNAL CHECK MODE)

(a) Perform vehicle signal check of navigation check mode.
(1) Start up the diagnosis system and read result of REV signal in vehicle signal check mode.
STANDARD: Input signal is normal (REV)

OK → **CHECK AND REPLACE NAVIGATION ECU**

NG

2	INSPECT NAVIGATION ECU(REV)



(a) Remove the navigation ECU with connectors still connected.
(b) Check voltage.
(1) Measure voltage between terminal REV and GND of navigation ECU.

Voltage:

Terminal	Condition	Voltage (V)
REV ⇔ GND	Turn ignition switch ON and put gear shift in R range	10 - 14 V

OK → **CHECK AND REPLACE NAVIGATION ECU**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

CD CANNOT BE INSERTED/IS EJECTED RIGHT AFTER INSERTION/CANNOT BE PLAYED

INSPECTION PROCEDURE

1	CHECK IF A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Make sure that the CD is normal audio CD, and that there is no deformation, flaw, stain, burr and other defects on the CD.
Standard: Normal audio CD.

Reference:
- Translucent or different-shaped CD cannot be played.
- CD-ROM for personal computers (with music recorded in) and recorded CD -R may not be played.
- Playing an 8-cm CD does not require an adapter.

NG → CD FAULTY

OK

2	CHECK THAT A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Check whether or not the CD is inserted upside down.
Standard: Not upside down.

NG → SET DISC CORRECTLY

OK

3	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with another and recheck.
(1) Replace the faulty CD with the normal one to see if the same trouble occurs again.
Standard: malfunction disappear.

OK → CD FAULTY

NG

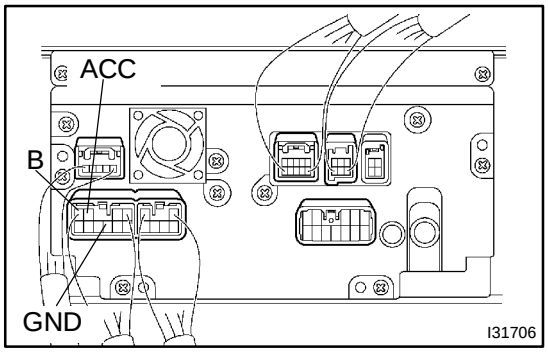
4	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search function properly.
(1) Perform the auto-research of the radio and check that the operation is normal.
Standard: malfunction disappear.

OK → REPLACE RADIO RECEIVER ASSY

NG

5 CHECK AND REPLACE RADIO RECEIVER ASSY



(a) Remove the radio receiver assy with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 – 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 – 14 V

(c) Check continuity.

(1) Check that the continuity exists between terminal GND of radio receiver assy and body ground.

Standard: Continuity exists.

OK → **REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

CD CANNOT BE EJECTED

INSPECTION PROCEDURE

1	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search function properly.
(1) Perform the auto-research of the radio and check that the operation is normal.
Standard: malfunction disappear.

NG → Go to step 5

OK

2	PRESS "EJECT" AND CHECK OPERATION

(a) Press "EJECT" and check the operation.
(1) Press the CD EJECT switch of the radio receiver assembly for 2 sec. or more to see if the CD is ejected.
Standard: CD is ejected

HINT:
- If the CD is not ejected, send the vehicle for repair.
- Do not try top draw it out by force.

NG → CHECK AND REPLACE RADIO RECEIVER ASSY

OK

3	CHECK IF A PROPER CD IS INSERTED

(a) Check that a proper CD is inserted.
(1) Make sure that the CD is a normal music CD, and that there is no deformation, flaw, stain, burr and other defects on the CD.
Standard: Normal music CD.

HINT:
- Translucent or different-shaped CD cannot be played.
- CD-ROM for personal computers (with music recorded in) and recorded CD-R may not be played.
- Playing an 8-cm CD does not require an adapter.

NG → CD FAULTY

OK

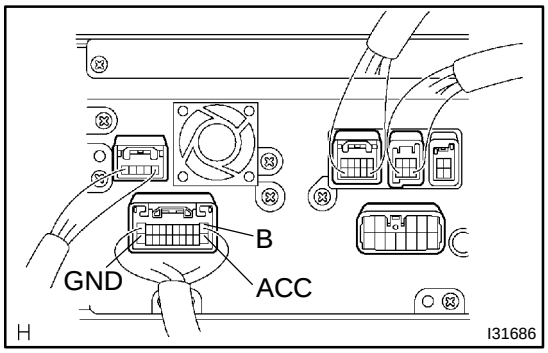
4	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with another and recheck.
(1) Replace the faulty CD with normal one to see if the same trouble occurs again.
Standard: The operation returns to be normal.

OK	CD FAULTY

NG

5	INSPECT RADIO RECEIVER ASSY



(a) Remove the radio receiver assy with connectors with still connected.
(b) Check voltage.
(1) Measure voltage between terminals +B, ACC and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 – 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 – 14 V

(c) Check continuity.
(1) Check that the continuity exists between terminal GND of radio receiver assy and body ground.
Standard: Continuity exists.

OK	CHECK AND REPLACE RADIO RECEIVER ASSY

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

CD SOUND SKIPS

INSPECTION PROCEDURE

1	REPLACE CD WITH ANOTHER AND RECHECK

(a) Replace the CD with normal one and check it the same trouble occurs again.
(1) Check the installation condition of the radio receiver assembly.
Standard: The operation returns to be normal.

OK → **CD FAULTY**

NG

2	CHECK WHEN THIS HAPPENS

(a) Check when this happens.
(1) Check that in what condition (place) sound skips.
Cause: Driving on the bumpy road.

OK → **Go to step 4**

NG

3	COMPARE IT WITH ANOTHER CAR OF SAME MODEL

(a) Compare it with another vehicle of the same model.
(1) Compare with the vehicle of the same type which does not have a trouble to see if there is any difference in the condition of trouble occurrence.
Standard: No difference found.

OK → **SETTING**

NG

4	CHECK OF RADIO RECEIVER ASSEMBLY INSTALLATION

(a) Check of the radio receiver assembly installation.
(1) Check the installation condition of the radio receiver assembly.
Standard: Installed properly.

NG → **INSTALL THE RADIO RECEIVER ASSEMBLY PROPERLY**

OK

5	DID THE TEMPERATURE IN THE CABIN CHANGE RAPIDLY?

(a) Did the temperature in the cabin change rapidly?

(1) Check whether or not rapid temperature change occurred in the cabin.

Cause: Rapid temp. change.

Reference:

Rapid temperature change my cause condensation inside the CD player, which may affect its normal operation.

OK → **CONDENSATION DUE TO TEMPERATURE CHANGE(LEAVE IT AS IT IS FOR A WHILE BEFORE USING)**

NG

CHECK AND REPLACE RADIO RECEIVER ASSY

CASSETTE TAPE CANNOT BE INSERTED OR PLAYED

INSPECTION PROCEDURE

1	CHECK FOR ANY FOREIGN OBJECT

(a) Check for any foreign object.
(1) Check that no foreign object or defect is detected in the cassette tape player of radio receiver assembly.
Standard: No foreign object and defect detected.

NG → **REMOVE FOREIGN OBJECT**

OK

2	CHECK CASSETTE TAPE

(a) Check the cassette tape.
(1) Check that the cassette tape is a normal tape to which music or voice is recorded.
Standard: Proper cassette tape to which music or voice is recorded

NG → **CASSETTE TAPE FAULTY**

OK

3	REPLACE CASSETTE TAPE WITH ANOTHER AND RECHECK

(a) Replace the cassette tape with another and recheck.
(1) Replace the faulty cassette tape with the normal one to see if the same trouble occurs again.
Standard: The function is recovered to be normal.

OK → **CASSETTE TAPE FAULTY**

NG

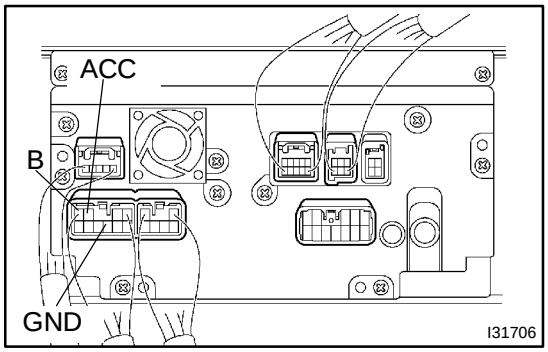
4	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search functions properly.
(1) Perform the auto-search of the radio and check that the operation is normal.
Standard: The operation returns to be normal.

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

5	INSPECT RADIO RECEIVER ASSY(B,ACC,GND)



(a) Remove the radio receiver assy with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.

(1) Check that the continuity exists between terminal GND of radio receiver assy and body ground.

Standard: Continuity exists.

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

CASSETTE TAPE CANNOT BE EJECTED

INSPECTION PROCEDURE

1	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search function properly.
(1) Perform the auto-research of the radio and check that the operation is normal.
Standard: malfunction disappear.

NG → Go to step 5

OK

2	PRESS "EJECT" AND CHECK OPERATION

(a) Press "EJECT" and check the operation.
(1) Press the cassette tape EJECT switch of the radio receiver assembly for 2 sec or more and check that the cassette tape is ejected.
Standard: The cassette tape is ejected.

NG → CHECK AND REPLACE RADIO RECEIVER ASSY

OK

3	CHECK CASSETTE TAPE

(a) Check the cassette tape.
(1) Check that the ejected cassette tape does not have the label peeling, cassette body deformation and others.
Standard: No fault on the cassette tape.

NG → CASSETTE TAPE FAULTY

OK

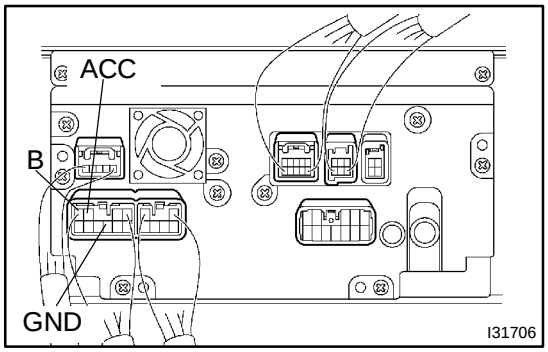
4	REPLACE CASSETTE TAPE WITH ANOTHER AND RECHECK

(a) Replace the cassette tape with another and recheck.
(1) Replace the faulty cassette tape with the normal one to see if the same trouble occurs again.
Standard: malfunction disappear.

NG → CASSETTE TAPE FAULTY

NG

5	INSPECT RADIO RECEIVER ASSY(B, ACC, GND)



(a) Remove the radio receiver assy with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.

(1) Check that the continuity exists between terminal GND of radio receiver assy and body ground.

Standard: Continuity exists.

OK → **CHECK AND REPLACE RADIO RECEIVER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

NOISE OCCURS

INSPECTION PROCEDURE

1	CHECK NOISE-INCLUDED DEVICE

(a) Identify the faulty mode where noise occurs.
(1) Operate the radio receiver assy to find out the noise source.

Standard:

A	B
Noise occurs in the radio mode only.	Noise occurs in any mode.

B → Go to step 7

A

2	CHECK WHEN THIS HAPPENS

(a) Check when this happens.
(1) Check that in what condition (place) noise occurs.

Standard:

A	B
Noise occurs at any place.	Noise occurs at a particular place.

B → WAVE DISTURBANCE

A

3	CHECK OPTIONAL COMPONENT

(a) Check optical component.

HINT:
As noise prevention is implemented to the degree which is practically allowed, excessively large noise cannot occur in the radio broadcasting.
However, in case that happens, check for grounding of the antenna-installed part, installation of all the proper noise-prevention parts, and proper wiring.

OK → EFFECT FROM OPTIONAL COMPONENT

NG

4	CHECK BY REMOVING ANTENNA PLUG

(a) Check for noise by removing the antenna plug.
(1) With the antenna plug being removed from the radio receiver assy, operate the radio receiver assy again to see if any noise occurs.
Standard: Noise occurs.

OK → CHECK AND REPLACE RADIO RECEIVER ASSY

NG

5	CHECK W/HOLDER ANTENNA ASSY

NG → INSTALLATION FAILURE

OK

6	CHECK ANTENNA TERMINAL ON BACK WINDOW GLASS BY DISINSTALLATION

(a) Disconnect the window glass antenna terminal and check for noise.
(1) While the amplifier antenna is disconnected from the back window glass antenna terminal, operate the radio receiver assy and recheck whether noise occurs or not.

A	B
No noise.	Noise occurs.

B → REPLACE W/HOLDER ANTENNA ASSY

A

GO TO DEFOGGER SYSTEM

7	CHECK OF SPEAKER INSTALLATION

(a) Check of speaker installation.
(1) Check that the ground part of the antenna is securelyinstalled to the vehicle bode.
Standard: Installed properly.

NG → INSTALL THE SPEAKER PROPERLY

OK

IDENTIFICATION OF NOISE SOURCE

RADIO BROADCAST CANNOT BE RECEIVED (BAD RECEPTION)

INSPECTION PROCEDURE

1	CHECK IF RADIO AUTO-SEARCH FUNCTIONS PROPERLY

(a) Check if the radio auto-search functions properly.
(1) Perform the auto-search of the radio and check that it functions normally.
Standard: The radio auto-search functions properly.

OK → CHECK AND REPLACE RADIO RECEIVER ASSY

NG

2	CHECK OPTIONAL COMPONENT

(a) Check optional component (Sun shade film, telephone antenna etc.).
(1) Check whether or not any optional component is installed, such as the sunshade film and the telephone antenna, is installed.
Standard: Optional component is installed.

OK → EFFECT FROM OPTIONAL COMPONENT

NG

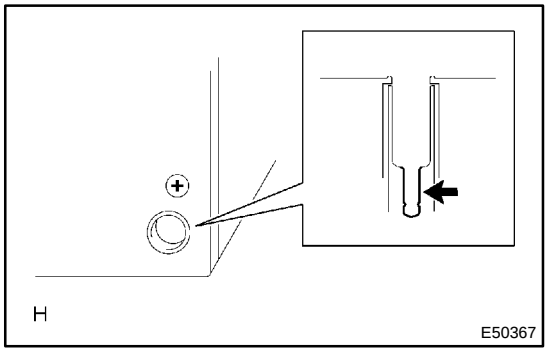
3	CHECK ANTENNA FOR NOISE PRODUCTION

(a) Noise Check with Antenna
(1) With the ignition switch in ACC, turn on the radio and choose the AM mode.
(2) Place a tip of a screwdriver or the antenna of the antenna assembly w/ holder and check that the noise heard from the speaker.
Standard: Noise occurs.

OK → CHECK AND REPLACE RADIO RECEIVER ASSY

NG

4 INSPECT RADIO RECEIVER ASSY



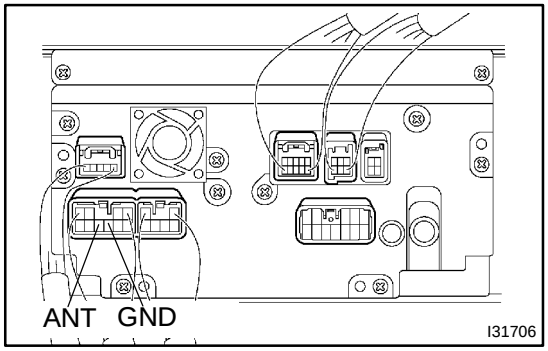
(a) Preparation for Check
  (1) Remove the antenna plug of the radio receiver assembly.
(b) Noise Check
  (1) With the radio receiver assembly connector connected, turn the ignition switch to ACC.
  (2) Turn on the radio and choose the AM mode.
  (3) Place a flat-head screwdriver or a metal such as a thin wire on the antenna jack of the radio receiver assembly and check that the noise heard from the speaker.

Standard: Noise occurs.

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

5 INSPECT RADIO RECEIVER ASSY



(a) Remove the radio receiver assy with connectors with still connected.
(b) Check voltage.
  (1) Measure voltage between terminals ANT and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (v)
ANT ⇔ GND	Constant	10 - 14 V

NG → **CHECK AND REPLACE RADIO RECEIVER ASSY**

OK

REPLACE W/HOLDER ANTENNA ASSY

NAVIGATION SYSTEM (TURN BY TURN TYPE)

HOW TO PROCEED WITH TROUBLESHOOTING

0574V-01

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05-1133)

3	Problem Symptom Confirmation (See page 01-20)

- Symptom does not occur (Go to step 4)
- Symptom occurs (Go to step 5)

4	Symptom Simulation (See page 01-20)

5	DTC Check (See page 05-1134)

- Normal code (Go to step 7)
- Malfunction code (Go to step 6)

6	DTC Chart (See page 05-1148)

Go to step 8

7	Problem Symptoms Table (See page 05-1156)

8	Terminals of ECU (See page 05-1153)

9	Indemnification of Problem

10	**Repair or Replace**

11	**Confirmation Test**

End

0574W-01

CUSTOMER PROBLEM ANALYSIS CHECK

NAVIGATION SYSTEM Check Sheet

Inspector's name : _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date of Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Constant ☐ Intermittent (Times a day)

Problem Symptom	**Navigation malfunction**	☐ Cursor movement is defective.
		☐ Cursor does not move.
		☐ Arrow mark is not displayed.
		☐ Others ( )
	Display malfunction	☐ Screen is black
		☐ Screen is white
		☐ Others ( )

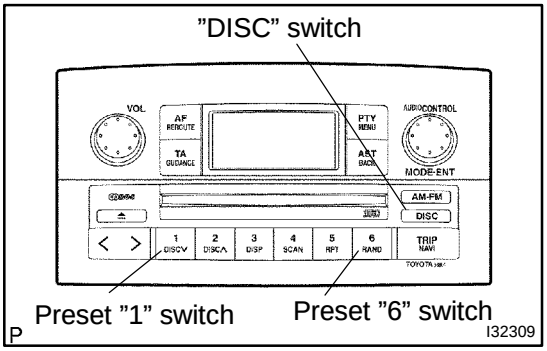
	Parts name	**1st time malfunction code.**	**2nd time malfunction code.**
DTC Check	Navigation ECU		
	Radio and Player with Display		

P

I31752

0574X-01

PRE-CHECK



1. DIAGNOSIS CHECK

(a) Starting Diagnosis Mode (Service Check Mode)

(1) Turn off the audio system and turn the IG switch to ACC. While pressing the preset switches ”1” and ”6” at the same time, press ”DISC” 3 times.

(2) Reference:

- Beep sound is given 3 times and the system enters the service check mode.
- It may take about 40 sec. to complete the check.
- In the service check mode, the system check and the diagnosis memory check are performed, and the check results are displayed in ascending order of the device codes (physical address.)

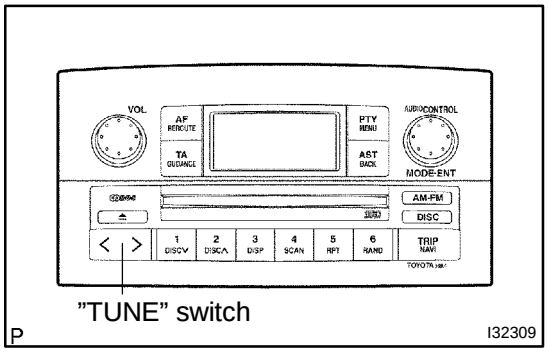
Terms	Meaning
Component code (Physical address)	Three-digit code (In hexadecimal) given to each device comprising AVC-LAN. Corresponding to its function, individual symbol is provided.
Logical address	Two-digit code (In hexadecimal) given to each function and device unit in each device comprising AVC-LAN.

Code No. (physical address) List

Code No. (physical address)	Equipment name
190	Radio receiver assy (Audio head unit)
440	Stereo component amplifier

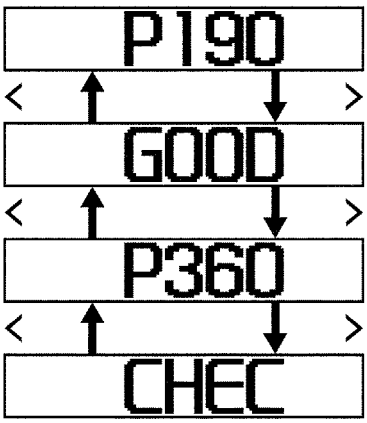
(b) Finishing Diagnosis Mode

(1) Press ”DISC” for 2 sec. or more, or turn the IG switch OFF.



(c) Service Check Mode Result Display (for checking the current and the past system conditions)

(1) Press the "TUNE" switch to see the check result of each device.



P---physical address
190---device code

GOOD---"The component is normal".

P---physical address
360---component code

CHEC---"Check needed".

P I32307

The illustration shows the case that the system has 2 devices with codes 190 and 360, and the device (code 360) has a trouble.
The check result is displayed in ascending order of device code. The device code is displayed first, then the check result.

(2) Check Result Display

Display	Original Language	Meaning	Action to be taken
GOOD	Good (normal)	No DTC is detected in both "System Check Mode" and "Diagnosis Memory Mode".	-
NCON	No connection	The system recognized the component when it was registered, but the component gives no response to the "Diagnosis Mode ON Request".	Check the power source circuit and the communication circuit of the device indicated by the device code (physical address).

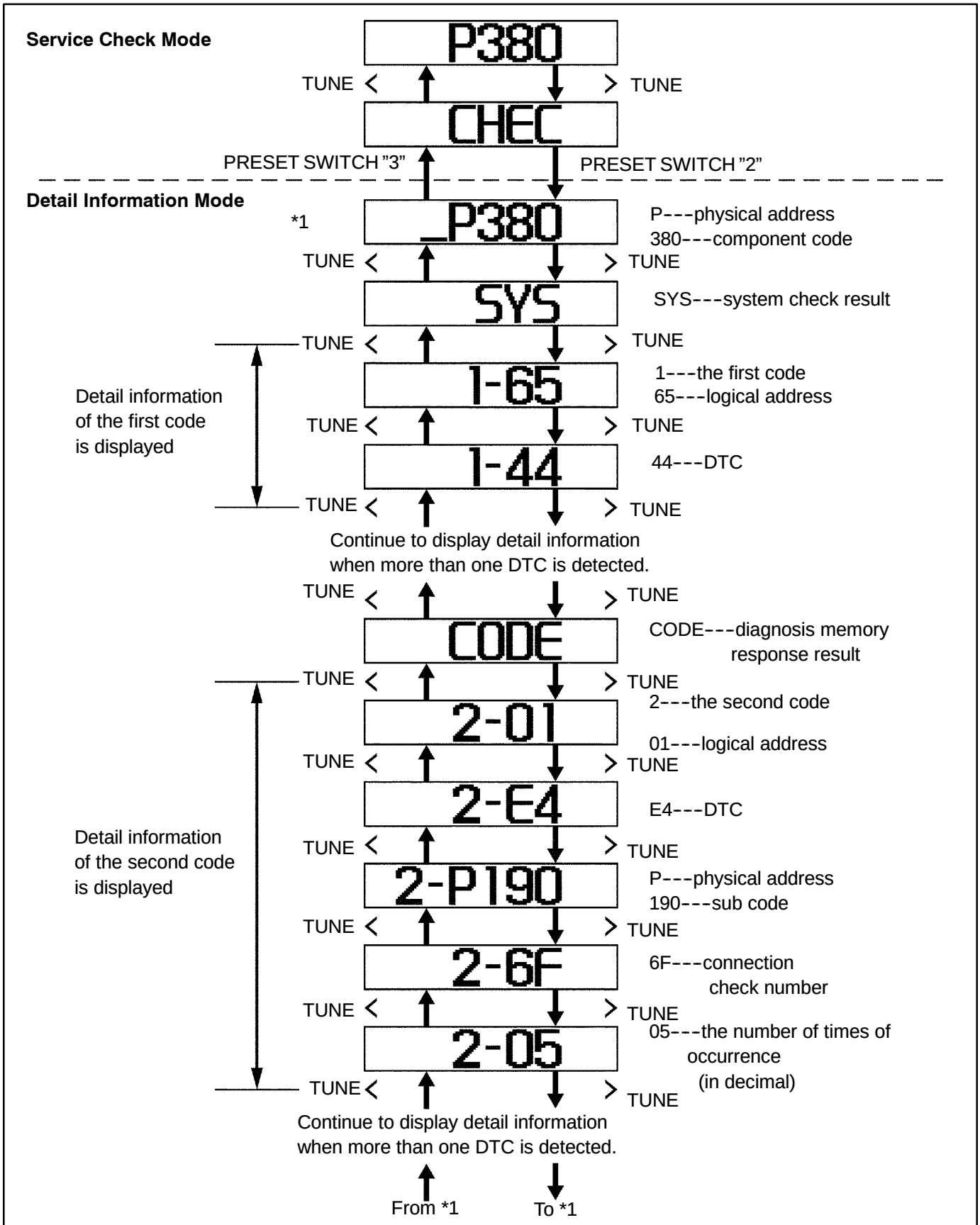
Display	Original Language	Meaning	Action to be taken
ECHN	Exchange	One or more DTC for "Exchange" is detected in either "System Check Mode" or "Diagnosis Memory Mode".	Go to the detail information mode to check the trouble area referring to the DTC list.
CHEC	Check	When no DTC is detected for "Exchange", one or more DTC for "Check is detected in either "System Check Mode" or "Diagnosis Memory Mode".	Go to the detail information mode to check the trouble area referring to the DTC list.
OLD	Old version	Old DTC application is identified and DTC is detected in either "System Check Mode" or "Diagnosis Memory Mode".	-
NRES	No response	The device gives no response to any one of "System Check Mode ON Request", "System Check Result Request" and "Diagnosis Memory Request".	Check the power source circuit and the communication circuit of the device indicated by the device code (physical code).

(3) To perform the Service Check again, press the preset switch "1".

(d) Detail information Mode (when displaying the troubled device's DTC)

(1) With "CHEC" or "ECHN" being display, press the preset switch "2" to go to the detail information mode.

(2) Press the "TUNE" switch to display "System Check Result (SyS)" and "Diagnosis Memory Response (CODE)".



The illustration shows the case that the component with code 380 has DTC "44" and "E4" as a result of the system check and the diagnosis memory response.
The detail information mode shows the system check result first, then the diagnosis memory response result.
As for DTC that does not have any sub code, sub code is not displayed.

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(3) Displayed Items in Detail Information Mode

Division Code for DTC display	Meaning	Order of detailed information displayed when the "TUNE UP" switch is pressed. (The order is reversed when the "TUNE DOWN" switch is pressed.)
SYS	System check result is displayed.	Logical address → DTC
CODE	Diagnosis memory check result is displayed.	Logical address→ DTC→ Sub code→ Connection confirmation number→ The number of times of occurrence

(4) Check the trouble area referring to the DTC list.

(5) To return to the service check mode, press the preset switch "3".

(e) Clearing Individual DTC Memory (when clearing the memory of DTC detected in the pest individually)

(1) Press the preset switch "5" for 2 sec. or more while the "ECHN" is displayed in the service check mode or during the detail information mode.

HINT:

- Beep sound is given once when the DTC memory is completely cleared.
- When DTC memory is cleared, only the component code (physical address) is displayed for the target component.
- To check DTC, press the preset switch "1" and perform the service check again.

(f) Clearance of all DTC memory (when clearing all the memory of DTC detected in the past)

(1) Start the diagnosis mode after repairing the trouble area.

(2) Press the preset switch "5" for 2 sec. or more ("CLr" is displayed at this time.).

HINT:

- Beep sound is given once when the DTC memory is completely cleared.
- When DTC memory for all the device is cleared, only the component codes (physical address) are displayed.

(3) Press the preset switch "1" to perform the service check again, and check that no DTC is displayed for all the component codes (physical address).

0574Y-01

DIAGNOSTIC TROUBLE CODE CHART

Terms	Meaning
Physical address	Three-digit code (shown in hexadecimal) which is given to each component comprising the AVC-LAN. Corresponding to the function, individual symbols are specified.
Logical address	Two-digit code (shown in hexadecimal) which is given to each function comprising the inner system of the AVC-LAN.

1. NAVIGATION ECU (Physical address: 178)

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It may be stored when the engine key is turned again after engine start.
- *3: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

(a) Logical address: 01 (Communication control)

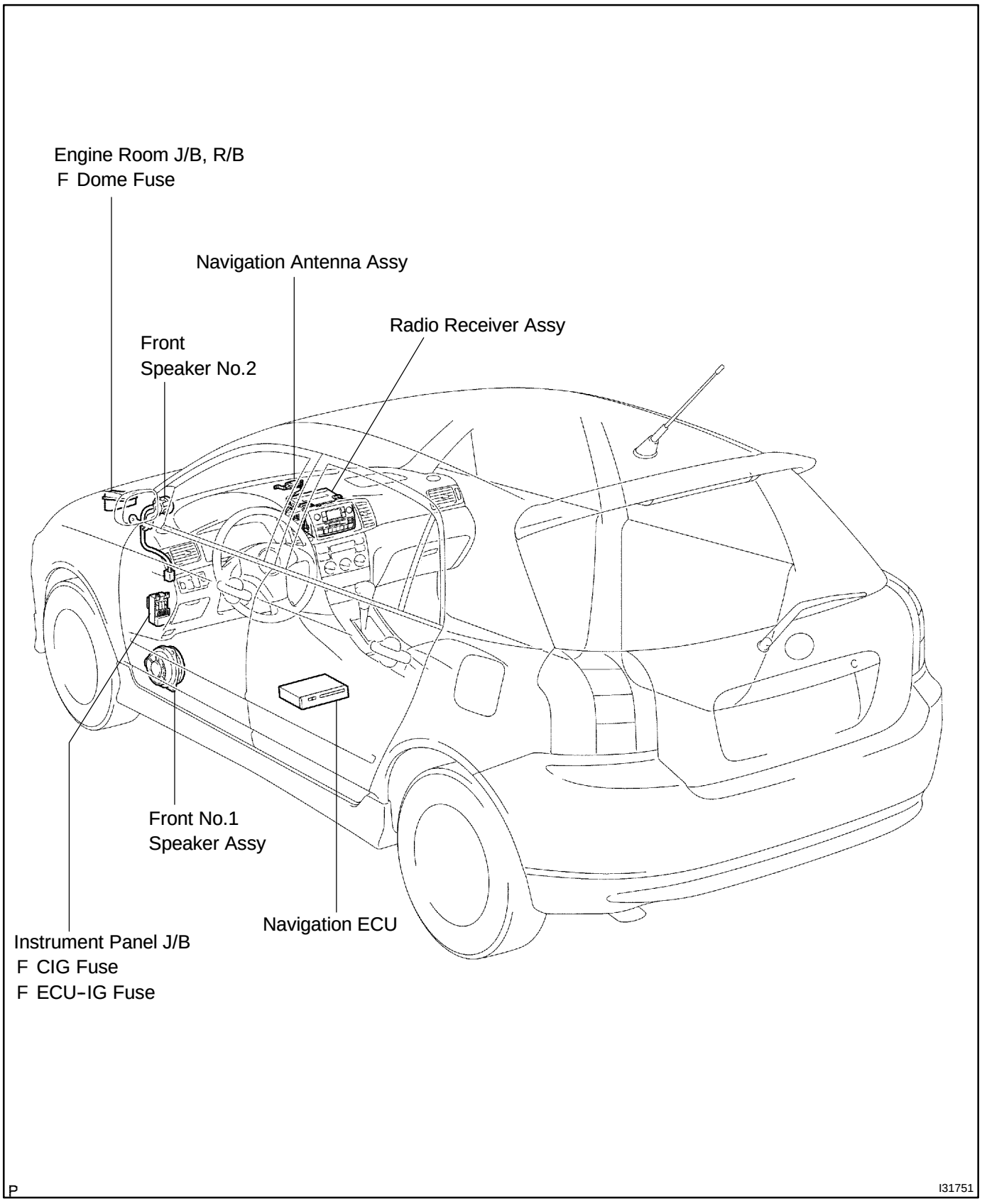
DTC	Diagnosis item (System / Diagnosis check)	Description	Action to be taken
D1 *1 *2	Transmission Error (System check - " f " Diagnosis memory - " f ")	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	If same auxiliary code is recorded in other component, check harness for power supply and communication system of all components shown by code.
D3	Periodic communication connection confirmation (System check - "X" Diagnosis memory - " f ")	When the system detects the more than 3 omissions among the connection confirmation numbers in the periodic communication.	- Replace radio receiver assy - Check wire harness
D4 *3	Periodic communication error (System check - "X" Diagnosis memory -" f ")	Connection confirmation has not come from the equipment that is communicating.	- Replace radio receiver assy - Check wire harness

(b) Logical address: 58 (Navigation ECU)

DTC	Diagnosis item	Condition	Countermeasure and inspected parts
40	Gyro Error	Error in gyro sensor is detected. (Abnormal value in voltage output from sensor is detected for more than specified time.)	Replace navigation ECU.
52 53	Map Disc Error	Data cannot be read for a certain time due to scratches or dirt on disc surface or insertion of wrong disc.	Inspect disc and replace if necessary. (Visually check disc surface and wipe it with soft cloth.)
60 61	GPS Receiver Error	Operation error of GPS receiver is detected.	At an outdoor site with a clear view, operate to display GPS data. If GPS mark is not properly displayed after 15 min. or more, replace navigation ECU.
62	GPS Antenna Error	Open condition of GPS antenna is detected. (Open circuit, connection failure of connectors, etc.)	Inspect antenna and replace if necessary.
71	Vehicle Signal Error	Input error of vehicle signal is detected. (When no vehicle signal has been input for a certain time.)	- Inspect wire harness. - If wire harness is normal, replace navigation ECU.

0574Z-01

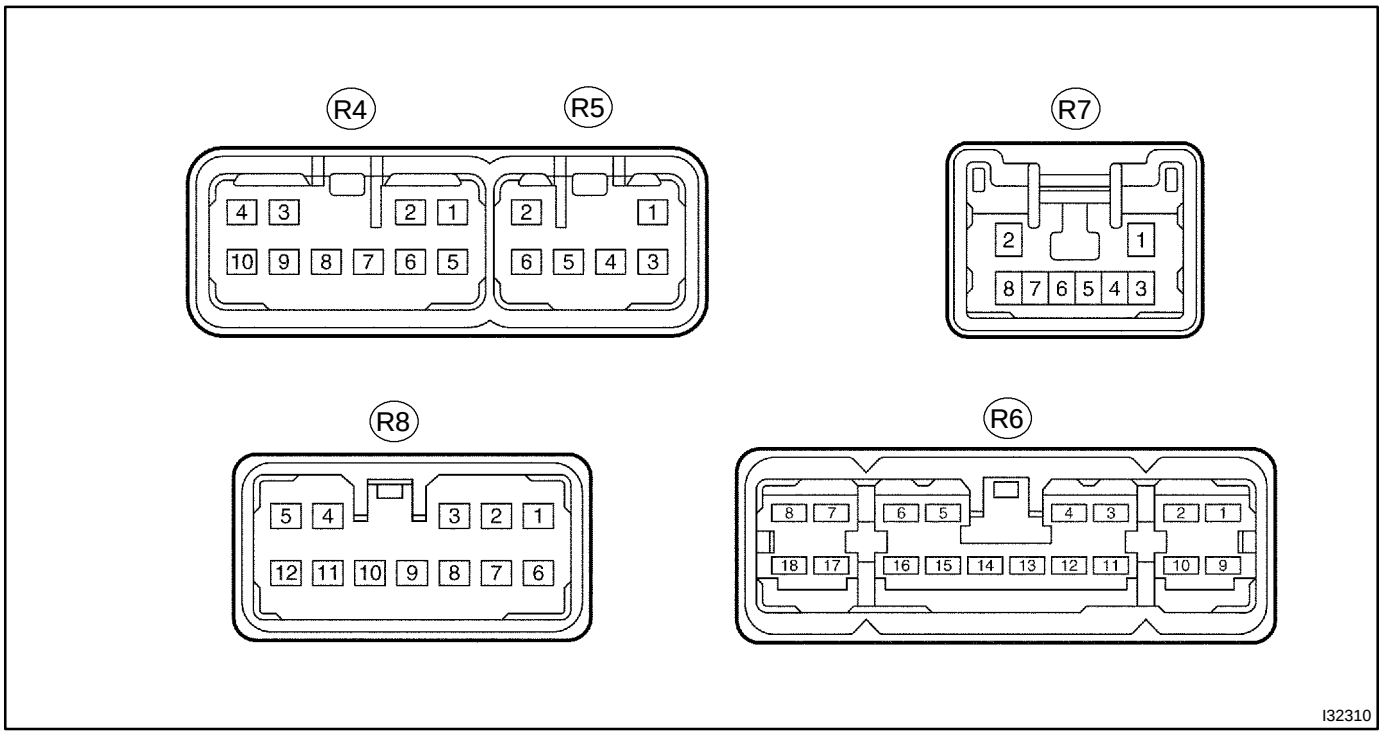
LOCATION



05750-01

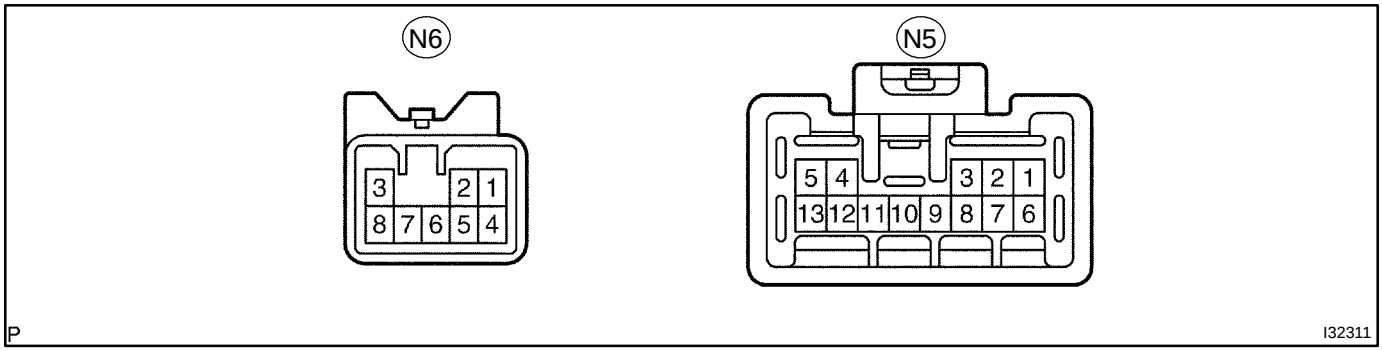
TERMINALS OF ECU

1. RADIO RECEIVER ASSY



Terminal No. (Symbols)	Wiring Color	Condition	STD Voltage (V)
R4-2 ⇔ R8-8 (FL+ ⇔ GND)	P ⇔ W-B	Audio system is sounding	5 - 7 V
R4-6 ⇔ R8-8 (FL- ⇔ GND)	V ⇔ W-B	Audio system is sounding	5 - 7 V
R7-1 ⇔ R8-8 (BRQ ⇔ GND)	Y ⇔ W-B	When the screen change	10 - 16 V
R7-3 ⇔ Body ground (S-GND ⇔ Body ground)	L ⇔ Body ground	Constant	Continuity
R7-4 (HIT-)	G	Constant	-
R7-5 (HIT+)	R	Constant	-
R8-5 ⇔ R8-8 (+B ⇔ GND)	L-Y ⇔ W-B	Constant	10 - 16 V
R8-8 ⇔ Body ground (GND ⇔ Body ground)	W-B ⇔ Body ground	Constant	Continuity
R8-9 (TX-)	W	See "Service Check Mode"	-
R8-10 (TX+)	B	See "Service Check Mode"	-
R8-12 ⇔ R8-8 (ACC ⇔ GND)	GR ⇔ W-B	Ignition switch ACC	9 - 16V

2. NAVIGATION ECU



Terminal No. (Symbols)	Wiring Color	Condition	STD Voltage (V)
R5-1 ⇔ N5-8 (AUI+ ⇔ GND)	P ⇔ W-B	Audio system is sounding	5 - 7 V
N5-2 ⇔ N5-8 (AUO+ ⇔ GND)	P ⇔ W-B	Audio system is sounding	5 - 7 V
N5-4 (REV)	SB (R-B)	When the shift gear	8 - 16 V
N5-5 ⇔ N5-8 (+B ⇔ GND)	L-Y ⇔ W-B	Constant	10 - 16 V
N5-6 ⇔ N5-8 (AUI- ⇔ GND)	V ⇔ W-B	Audio system is sounding	5 - 7 V
N5-7 ⇔ N5-8 (AUO- ⇔ GND)	V ⇔ W-B	Audio system is sounding	5 - 7 V
N5-8 ⇔ Body ground (GND ⇔ Body ground)	W-B ⇔ Body ground	Constant	Continuity
N5-12 ⇔ N5-8 (SPD ⇔ GND)	W (V-W) ⇔ W-B	Ignition switch ON Propeller shaft is rotate slowly	Repeat 9V ⇔ 1 V
N5-13 ⇔ N5-8 (ACC ⇔ GND)	GR ⇔ W-B	Ignition switch ACC	9 - 16 V
N6-3 (TX+)	B	See "Service Check Mode"	-
N6-4 ⇔ N5-8 (DBRQ ⇔ GND)	Y ⇔ W-B	When the screen change	10 - 16 V
N6-5 (DTX+)	R	Constant	-
N6-6 (DTX-)	G	Constant	-
N6-7 ⇔ Body ground (DGS ⇔ Body ground)	L⇔ Body ground	Constant	Continuity
N6-8 (TX-)	W	See "Service Check Mode"	-

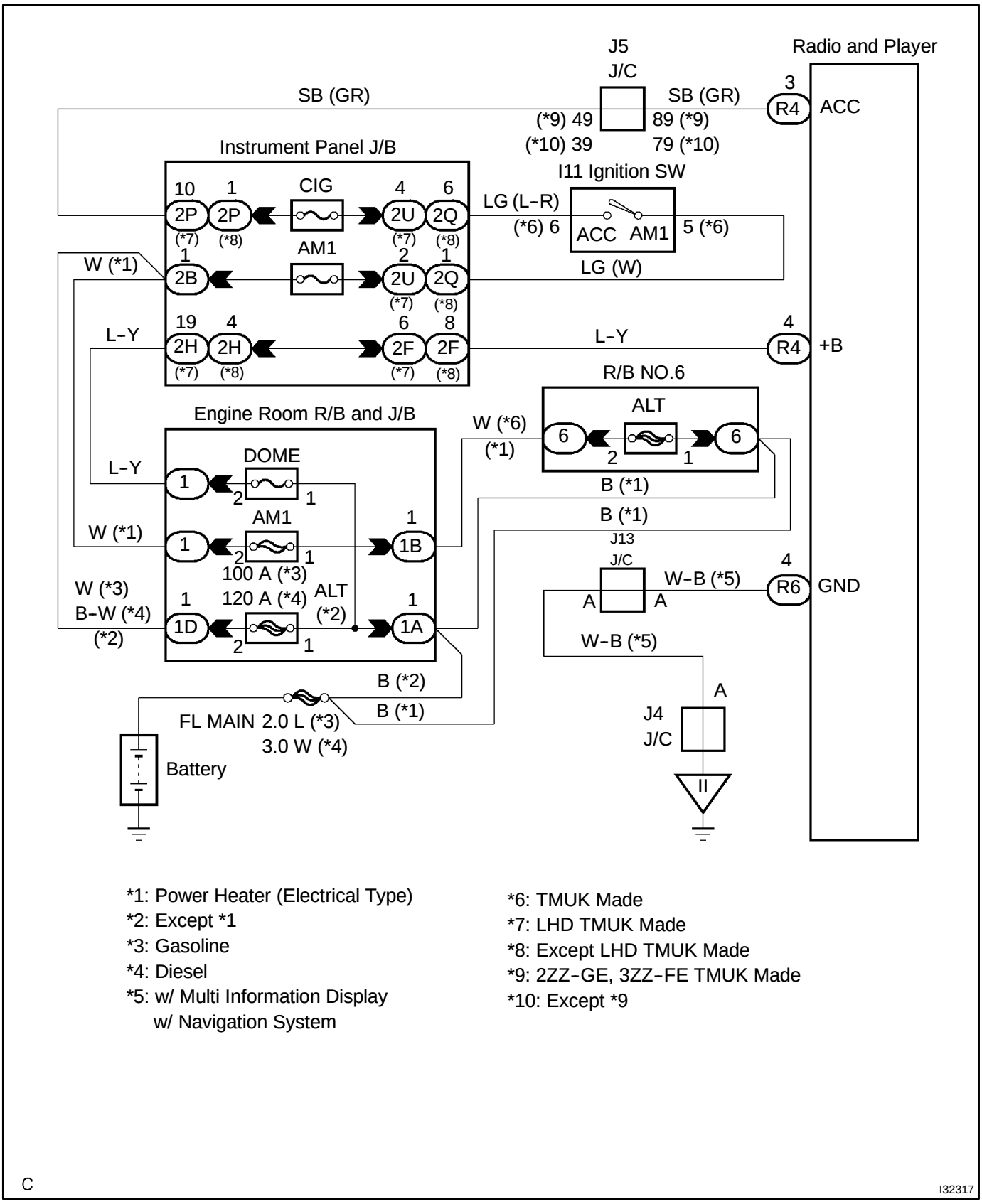
05751-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Black screen (Nothing displayed)	3. Radio receiver assy 4. Navigation ECU	05-1225 05-1225
No navigation screen displayed	1. Radio receiver assy 2. Navigation ECU 3. Wire harness or connector	05-1227 05-1227 05-1227
Different street name is displayed	1. Radio receiver assy 2. Navigation ECU	05-1230 05-1230
Memory is cleared by acc off	Navigation ECU	05-1232
No movement beyond caution display	1. Navigation DISC 2. Navigation ECU	05-1234 05-1234
Driving direction opposite to moving direction of arrow mark	1. Radio receiver assy 2. Navigation ECU 3. Wire harness or connector	05-1235 05-1235 05-1235
Only navigation voice is heard from front left speaker	1. Radio receiver assy 2. Navigation ECU 3. Wire harness or connector	05-1237 05-1237 05-1237
No sounds heard from the front left speaker	1. Radio receiver assy 2. Navigation ECU 3. Wire harness or connector	05-1239 05-1239 05-1239
Switch does not function (Only at the navigation screen)	1. Radio receiver assy 2. Navigation ECU 3. Wire harness or connector	05-1241 05-1241 05-1241

BLACK SCREEN (NOTHING DISPALYED)

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: Gasoline
*4: Diesel
*5: w/ Multi Information Display
w/ Navigation System

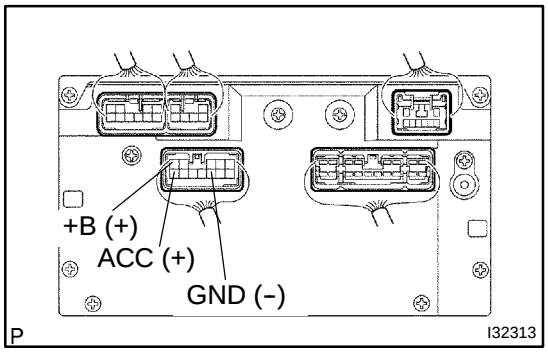
*6: TMUK Made
*7: LHD TMUK Made
*8: Except LHD TMUK Made
*9: 2ZZ-GE, 3ZZ-FE TMUK Made
*10: Except *9

C

I32317

INSPECTION PROCEDURE

1	INSPECT RECEIVER ASSY, RADIO(+B, ACC, GND)



(a) Remove the radio receiver assy with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B, ACC and GND of radio receiver assy at each conditions, as shown in the chart.

Standard::

Terminal	Condition	Voltage (V)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.

(1) Check that the continuity exists between terminal GND of radio receiver assy and body ground.

Standard: Continuity exists.

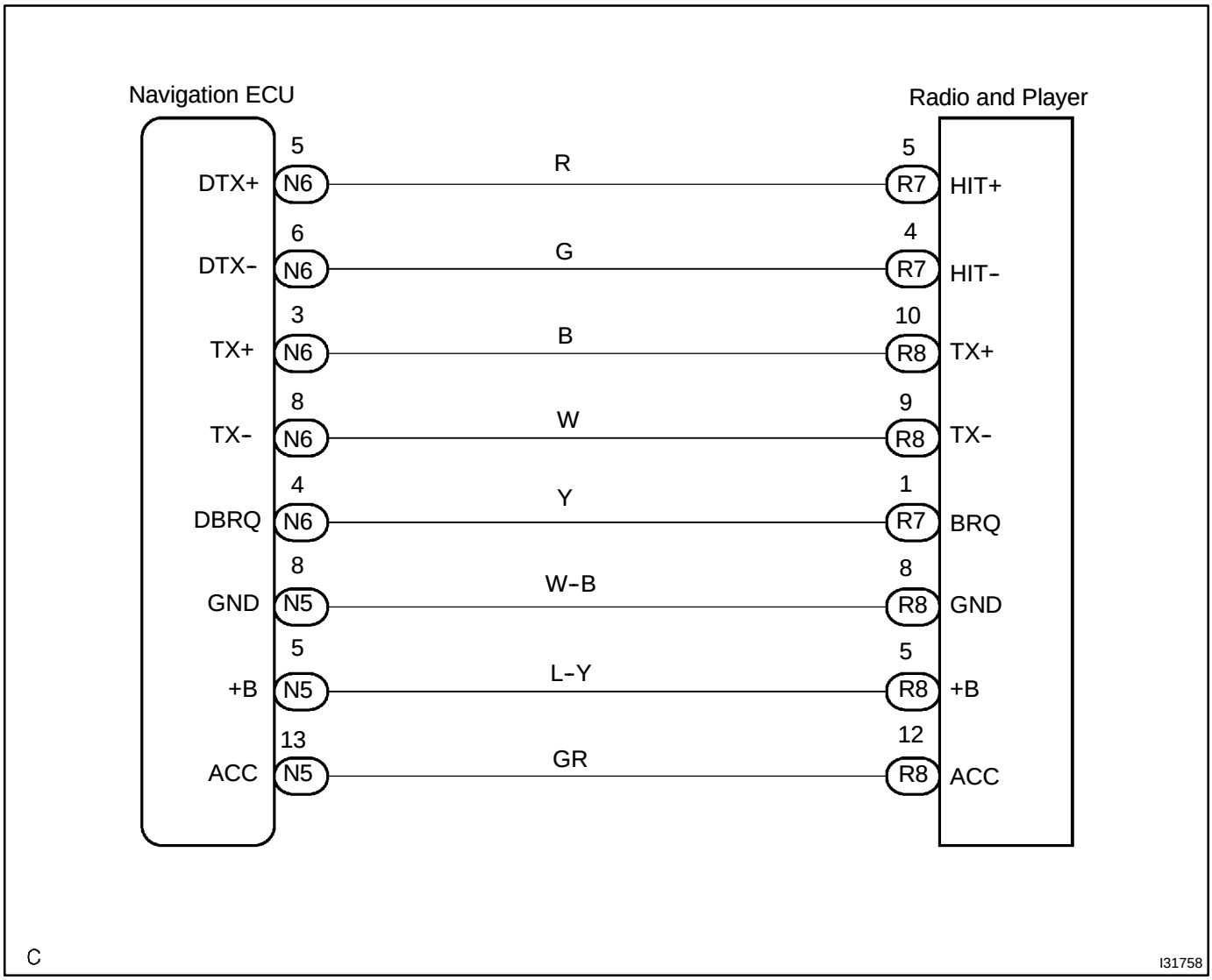
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE RECEIVER ASSY, RADIO

NO NAVIGATION SCREEN DISPLAYED

WIRING DIAGRAM



INSPECTION PROCEDURE

1	SERVICE CHECK MODE(NAVIGATION ECU)

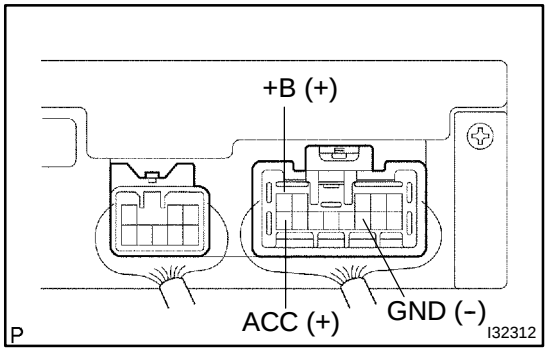
(a) Perform service check.
(1) Start up the diagnosis system and read result of navigation ECU in the service check mode.

A	"NCON" is displayed or "178" is not displayed
B	"178: GOOD" is displayed

B → **CHECK AND REPLACE RADIO RECEIVER ASSY**

A

2	INSPECT COMPUTER, NAVIGATION(+B, ACC, GND)



(a) Remove the navigation ECU with connectors with still connected.
(b) Check voltage.
(1) Measure voltage between terminals +B, ACC and GND of navigation ECU at each conditions, as shown in the chart.

Standard:

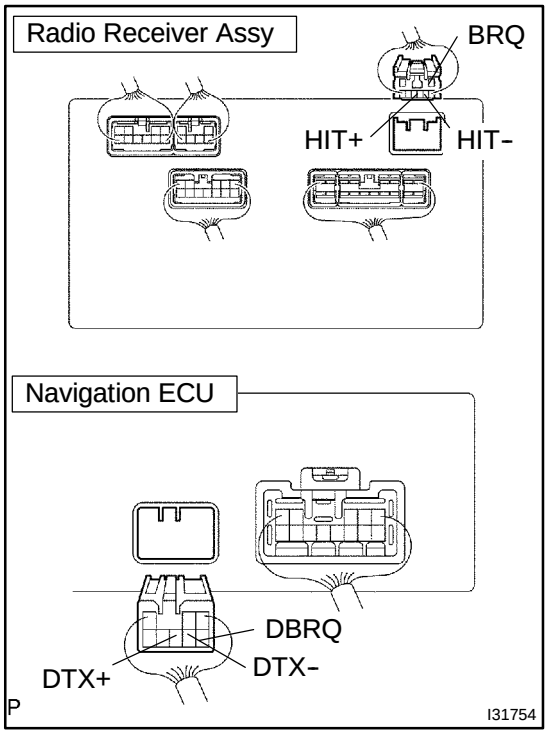
Terminal	Condition	Voltage (V)
+B ⇔ GND	Constant	10 - 14 V
ACC ⇔ GND	Turn ignition switch ACC	10 - 14 V

(c) Check continuity.
(1) Check that the continuity exists between terminal GND of navigation ECU and body ground.
Standard: Continuity exists.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

3	CHECK HARNESS AND CONNECTOR(RADIO RECEIVER ASSY-NAVIGATION ECU)



(a) Disconnect the connector from the navigation ECU.
(b) Disconnect the connector from the radio receiver assy.
(c) Check continuity.
(1) Check that the continuity between navigation ECU and radio receiver assy.

Standard:

Tester connection	Specified condition
TX+ ⇔ TX+	Continuity
TX- ⇔ TX-	Continuity
BRQ ⇔ DBRQ	Continuity
HIT+ ⇔ DTX+	Continuity
HIT- ⇔ DTX-	Continuity
TX+ ⇔ Body ground	No continuity
TX- ⇔ Body ground	No continuity
BRQ ⇔ Body ground	No continuity
HIT+ ⇔ Body ground	No continuity
HIT- ⇔ Body ground	No continuity

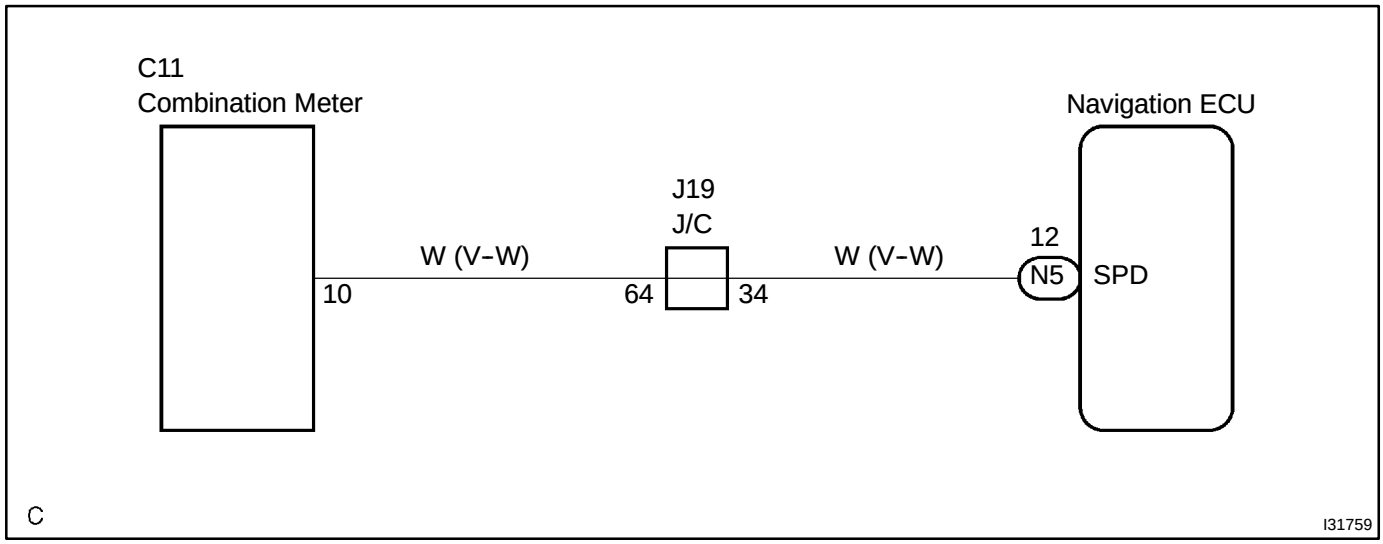
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK →

CHECK AND REPLACE COMPUTER, NAVIGATION

DIFFERENT STREET NAME IS DISPLAYED

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK WHEN THIS HAPPENS

(a) Check when this happens.

A	B
The trouble occur in the specific area or not	The trouble occur in the specific area

HINT:
If vehicle is positioned in place where it is difficult to be identified, current vehicle position may be correctly displayed.

B → **NORMAL**

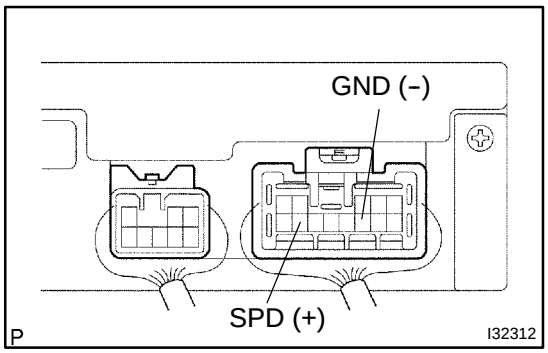
A

2	INSPECT NAVIGATION ANTENNA ASSY

NG → **REPLACE NAVIGATION ANTENNA ASSY**

OK

3	INSPECT COMPUTER, NAVIGATION(SPD, GND)



(a) Remove the navigation ECU with connectors still connected.

(b) Check voltage.

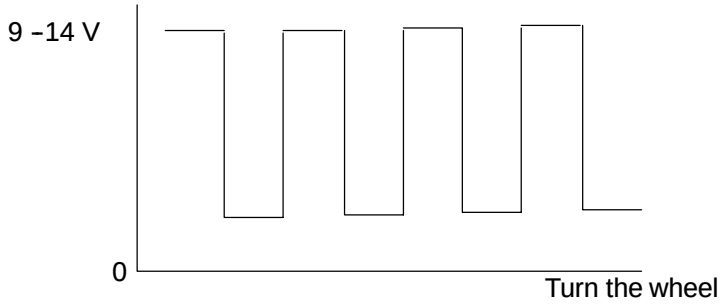
(1) Shift the shift lever to neutral.

(2) Jack up one of the rear wheel.

(3) Turn ignition switch ON.

(4) Measure voltage between terminals SPD and GND of navigation ECU when the rear wheels are turned slowly.

Voltage is generated intermittently.



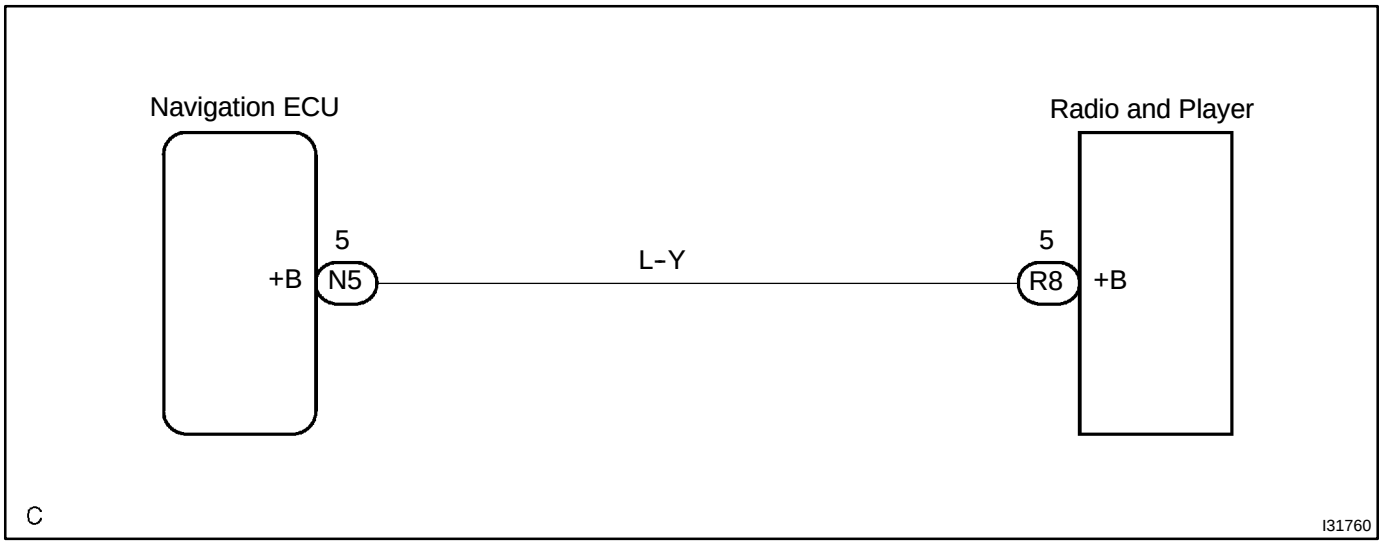
OK	CHECK AND REPLACE COMPUTER, NAVIGATION

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

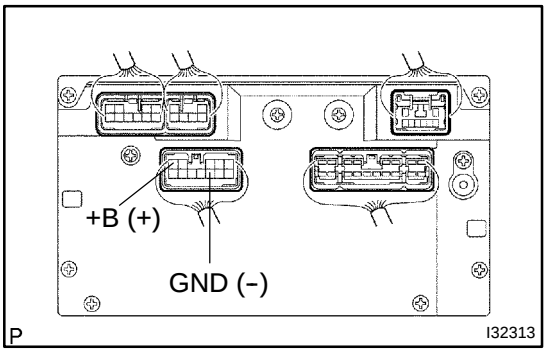
MEMORY IS CLEARED BY ACC OFF

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT RADIO RECEIVER ASSY(+B, GND)



(a) Remove the radio receiver assy with connectors with still connected.

(b) Check voltage.

(1) Measure voltage between terminals +B and GND of radio receiver assy at each conditions, as shown in the chart.

Standard:

Terminal	Condition	Voltage (V)
+B ⇔ GND	Constant	10 - 14 V

(c) Check continuity.

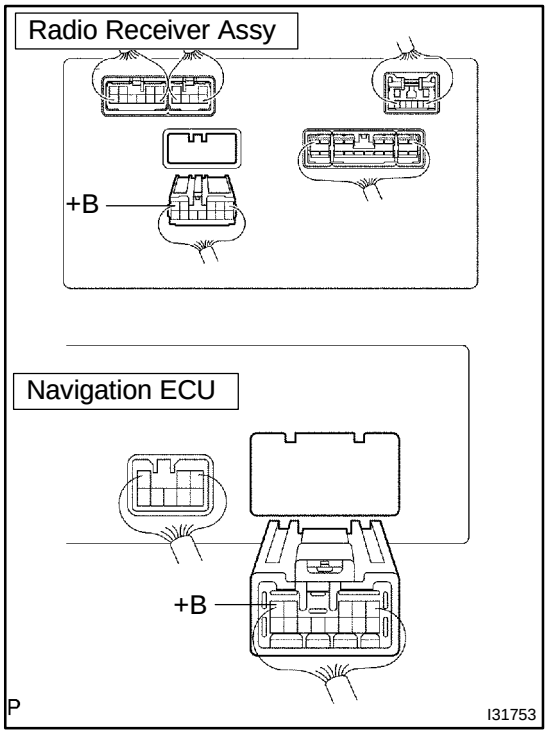
(1) Check that the continuity exists between terminal GND of radio receiver assy and body ground.

Standard: Continuity exists.

NG → **REPAIR OR REPLACE RADIO RECEIVER ASSY**

OK

2	CHECK HARNESS OR CONNECTOR(RADIO RECEIVER ASSY-NAVIGATION ECU)



(a) Disconnect the connector from the navigation ECU.
(b) Disconnect the connector from the radio receiver assy.
(c) Check continuity.
(1) Check that the continuity between navigation ECU and radio receiver assy.

Standard:

Tester connection	Specified condition
+B ⇔ +B	Continuity
+B ⇔ Body ground	No continuity

NG → **CHECK AND REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE COMPUTER, NAVIGATION

NO MOVEMENT BEYOND CAUTION DISPLAY

INSPECTION PROCEDURE

1	CHECK IT OPERATION AGAIN(CLEAN MAP DISC)

(a) Clean map disc.
(1) Wipe the disc with a cloth, insert again and turn the ignition switch ON.
Standard: Navigation system is normally.

OK → NORMAL

NG

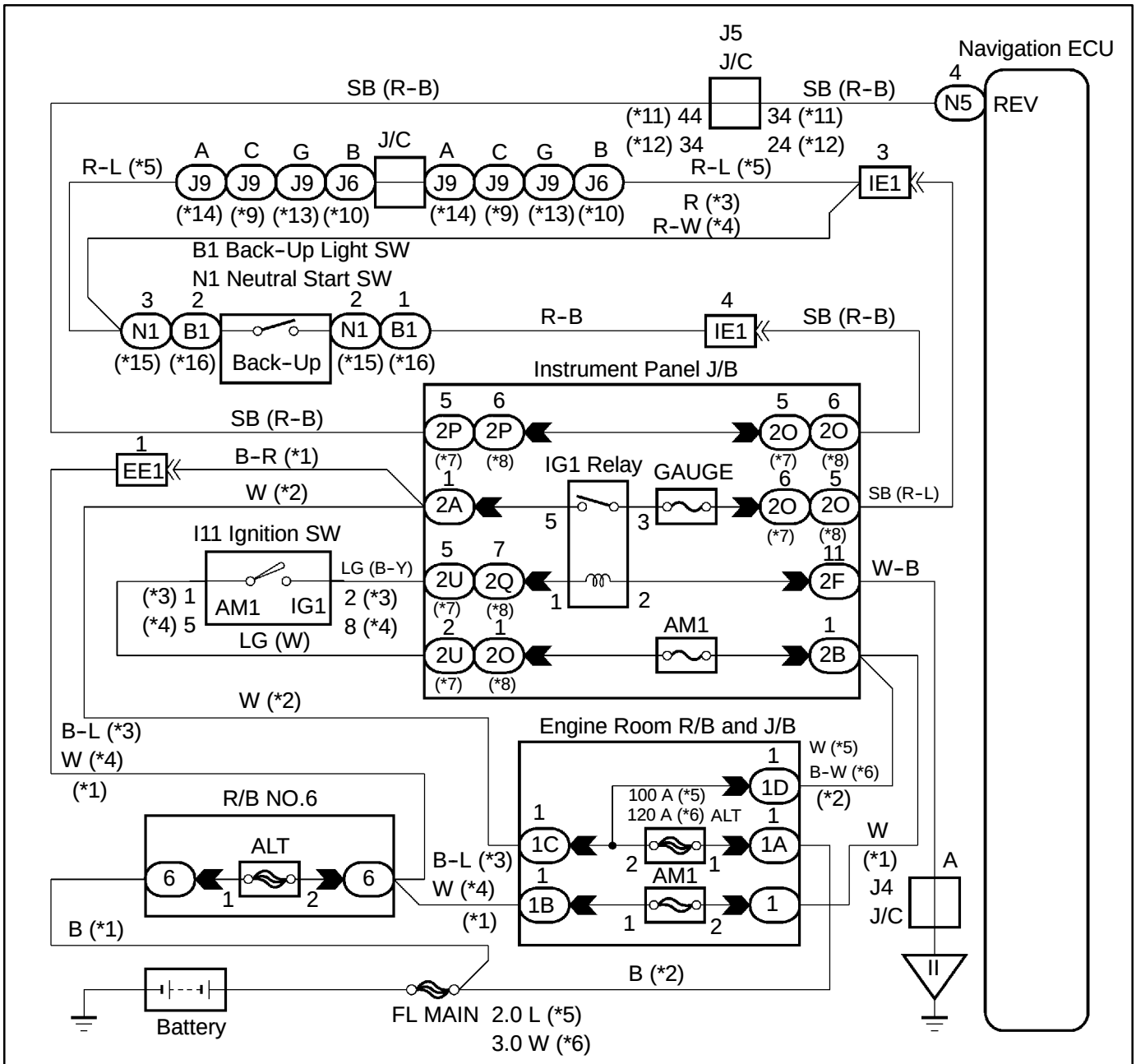
2	REPLACE DISC PLAYER DISC

NG

CHECK AND REPLACE COMPUTER, NAVIGATION

DRIVING DIRECTION OPPOSIT TO MOVING DIRECTION OF ARROW MARK

WIRING DIAGRAM



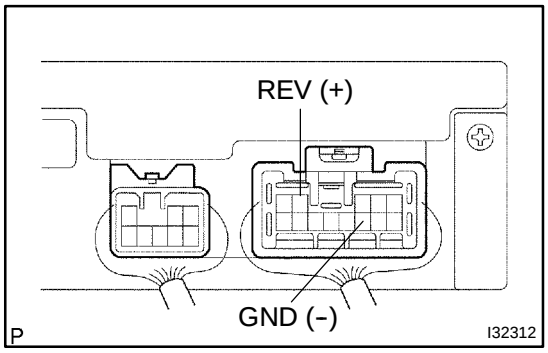
*1: Power Heater (Electrical Type)
*2: Except *1
*3: TMC Made
*4: TMUK Made
*5: Gasoline
*6: Diesel
*7: LHD TMUK Made
*8: Except *7
*9: 3ZZ-FE LHD TMC Made
*10: 3ZZ-FE TMUK Made, 4ZZ-FE
*11: 2ZZ-GE, 3ZZ-FE *4
*12: Except *11
*13: 3ZZ-FE RHD TMC Made
*14: 2ZZ-FE
*15: A/T
*16: M/T

C

I32316

INSPECTION PROCEDURE

1	INSPECT COMPUTER, NAVIGATION(REV, GND)



(a) Remove the navigation ECU with connectors still connected.

(b) Check voltage.

(1) Measure voltage between terminal REV and GND of navigation ECU.

Voltage:

Terminal	Condition	Voltage (V)
REV ⇔ GND	Turn ignition switch ON and put gear shift in R range	10 - 14 V

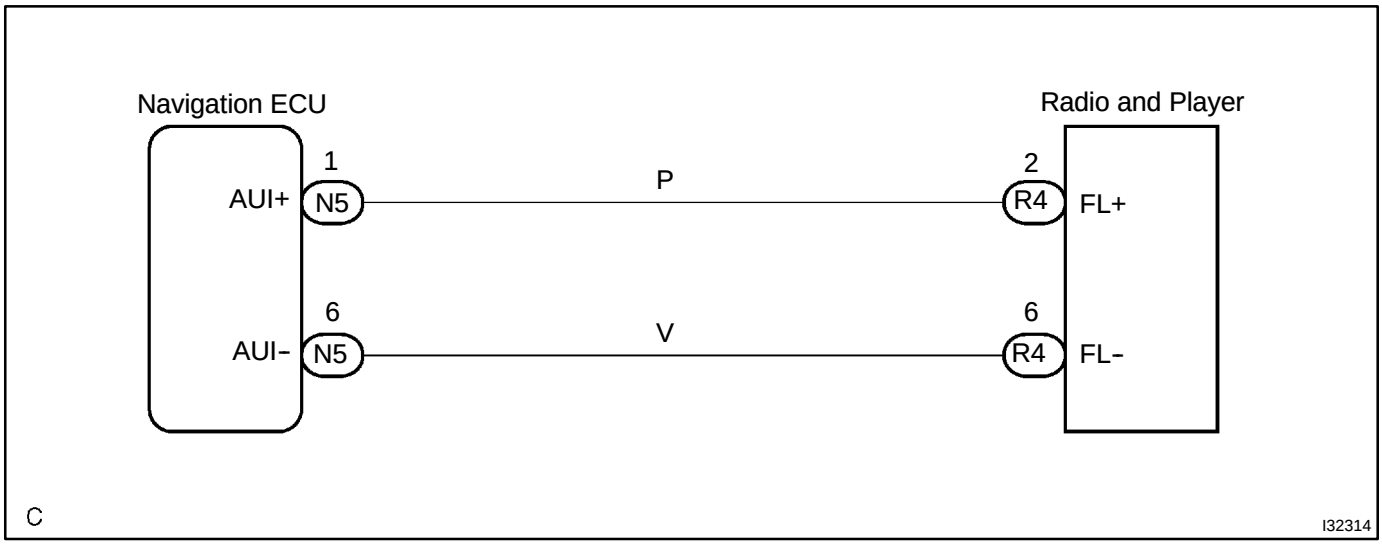
OK → **CHECK AND REPLACE COMPUTER, NAVIGATION**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

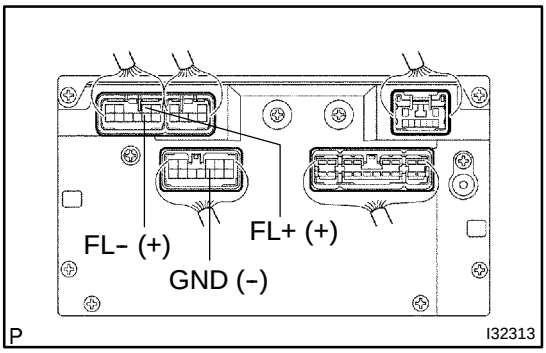
ONLY NAVIGATION VOICE IS HEARD FROM FRONT LEFT SPEAKER

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT RADIO RECEIVER ASSY(FL+, FL-, GND)



(a) Remove the radio receiver assy with connectors with still connected.

(b) Using an oscilloscope, check signal waveform between terminals FL+, FL- and GND of radio receiver assy.

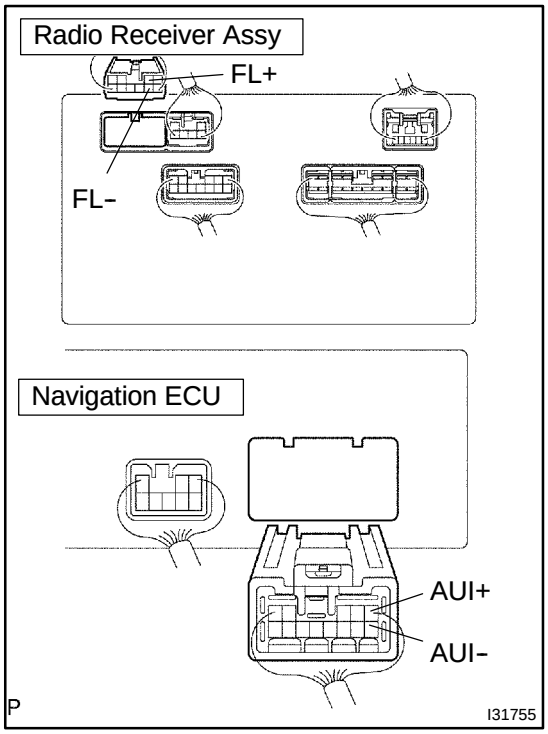
Standard:

Terminal	Condition	Specified condition
FL+ ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output
FL- ⇔ GND	While voice sound is being produced	A waveform synchronized with sound is output

NG → **REPAIR OR REPLACE RADIO RECEIVER ASSY**

OK

2 CHECK HARNESS OR CONNECTOR(RADIO RECEIVER ASSY-NAVIGATION ECU)



(a) Disconnect the connector from the navigation ECU.
(b) Disconnect the connector from the radio receiver assy.
(c) Check continuity.
  (1) Check that the continuity between navigation ECU and radio receiver assy.

Standard:

Tester connection	Specified condition
FL+ ⇔ AUI+	Continuity
FL- ⇔ AUI-	Continuity
FL+ ⇔ Body ground	No continuity
FL- ⇔ Body ground	No continuity

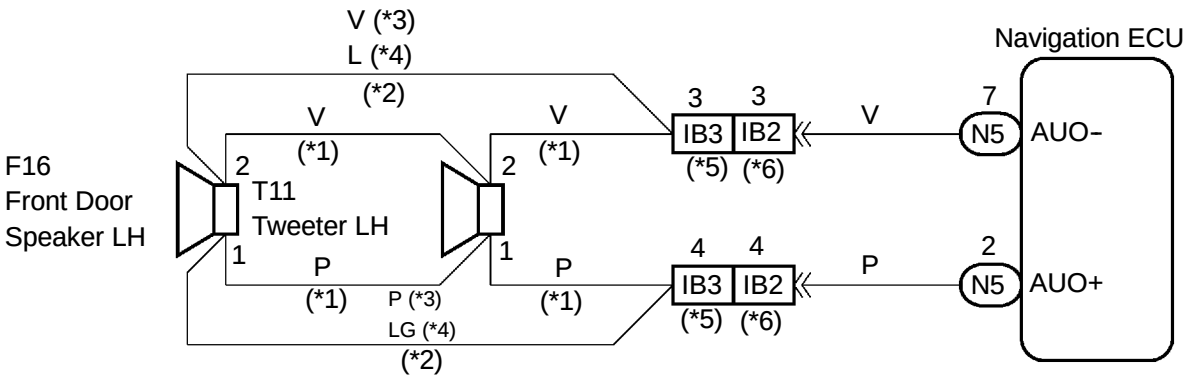
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE COMPUTER, NAVIGATION

NO SOUNDS HEARD FROM THE FRONT LEFT SPEAKER

WIRING DIAGRAM1



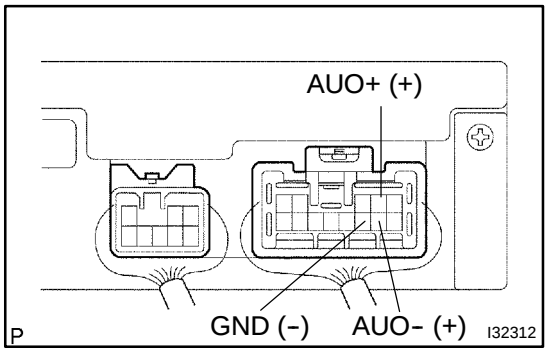
*1: w/ Tweeter
*2: w/o Tweeter
*3: w/ Power Window or w/ Door Lock Control
*4: Except w/ Power Window or w/ Door Lock Control
*5: LHD
*6: RHD

C

I32315

INSPECTION PROCEDURE

1	INSPECT COMPUTER, NAVIGATION(AUO+, AUO-, GND)



(a) Check signal waveform.
(1) Using a oscilloscope, check signal waveform between terminals AUO+, AUO- and GND of navigation ECU.

Standard:

Terminal	Condition	Specified condition
AUO+ ⇔ GND1	Audio system is sounding	A waveform synchronized with sound is output
AUO- ⇔ GND1	Audio system is sounding	A waveform synchronized with sound is output

NG → **CHECK AND REPLACE COMPUTER, NAVIGATION**

OK

2	INSPECT FRONT NO.1 SPEAKER ASSY(LEFT SIDE)

(a) Check continuity.
(1) Check that the continuity exists between terminals of font No.1 speaker.
Standard: 4 Ω

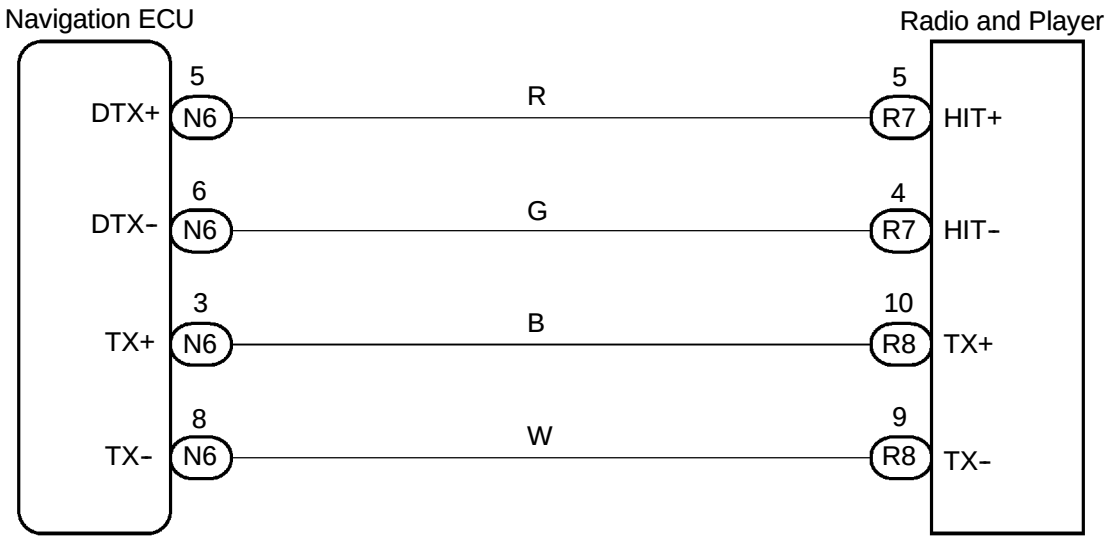
NG → **REPAIR OR REPLACE FRONT NO.1 SPEAKER ASSY**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

SWITCH DOES NOT FUNCTION (ONLY AT THE NAVIGATION SCREEN)

WIRING DIAGRAM

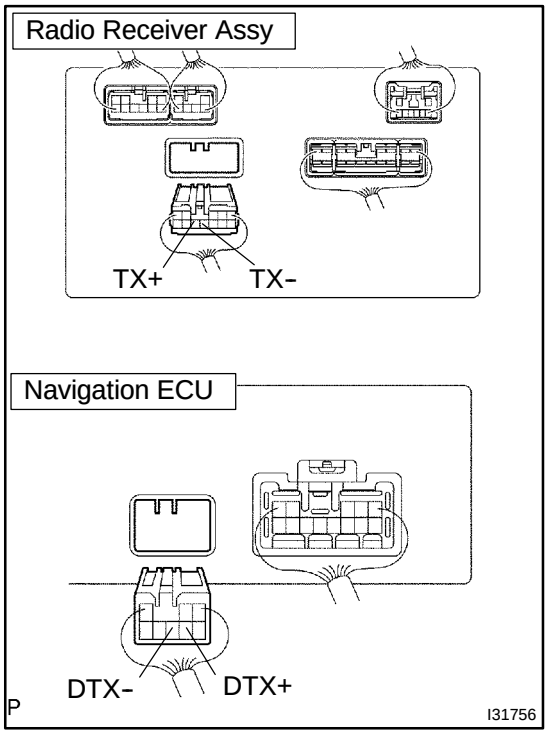


C

I31757

INSPECTION PROCEDURE

1	CHECK HARNESS OR CONNECTOR(RADIO RECEIVER ASSY-NAVIGATION ECU)



(a) Disconnect the connector from the navigation ECU.
(b) Disconnect the connector from the radio receiver assy.
(c) Check continuity.
  (1) Check that the continuity between navigation ECU and radio receiver assy.

Standard:

Tester connection	Specified condition
TX+ ⇔ TX-	Continuity
TX- ⇔ TX-	Continuity
HIT+ ⇔ DTX+	Continuity
HIT- ⇔ DTX-	Continuity
TX1+ ⇔ Body ground	No continuity
TX1- ⇔ Body ground	No continuity
HIT+ ⇔ Body ground	No continuity
HIT- ⇔ Body ground	No continuity

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE COMPUTER, NAVIGATION

POWER WINDOW CONTROL SYSTEM (TMC MADE)

HOW TO PROCEED WITH TROUBLESHOOTING

0578C-01

1	VEHICLE BROUGHT IN

2	CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK (See page 05-1244)

3	PROBLEM SYMPTOMS TABLE (See page 05-1252)

(a) Without applicable symptoms, proceed to A
(b) With applicable symptoms, proceed to B

B → GO TO STEP 5

A

4	PERFORM TROUBLESHOOTING IN THE FOLLOWING METHOD, DEPENDING ON MALFUNCTION SYMPTOM

(a) Terminals of ECU (See page 05-1252)

5	ADJUSTMENT, REPAIR OR REPLACEMENT

END

0578D-01

CUSTOMER PROBLEM ANALYSIS CHECK

POWER WINDOW CONTROL System Check Sheet

Inspector's Name _____

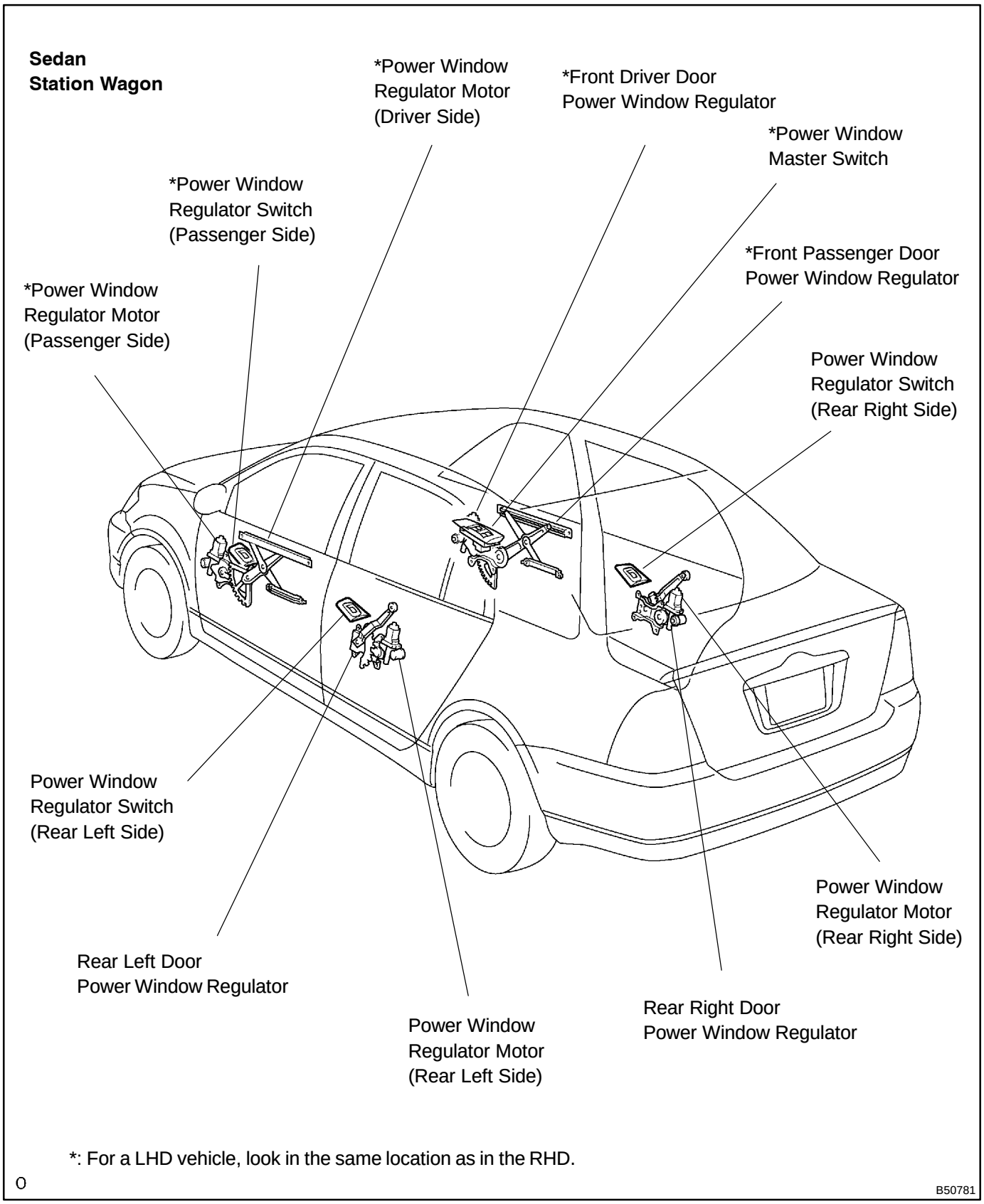
Customer's Name		Registration No.	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	Odometer Reading	km Miles

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times/per day, month) ☐ Once only
Weather Conditions When Problem Occurred	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. ˚F (˚C))
	Place	☐ Everywhere ☐ Specific Locality( )
Date Transmitter Battery Last Replaced		/ /

Problem Symptom	☐ Diagnosis code is output	
	☐ AUTO UP / AUTO DOWN do not impossible	
	☐ Operation interlocked with key is impossible	
	☐ Remote operation by the master switch is impossible in a seat	☐ Passenger door ☐ Rear left door ☐ Rear right door
	☐ Operation by a switch of each door is impossible in a door	☐ Passenger door ☐ Rear left door ☐ Rear right door
	☐ Others	
Condition when recovered normal	☐ IG ON ☐ Engine Started ☐ ( ) Switch operated	
Condition when problem occured	☐ Yes ☐ No	☐ IG OFF / ON ☐ ( ) Switch operated ☐ Others ( )

0578E-01

LOCATION



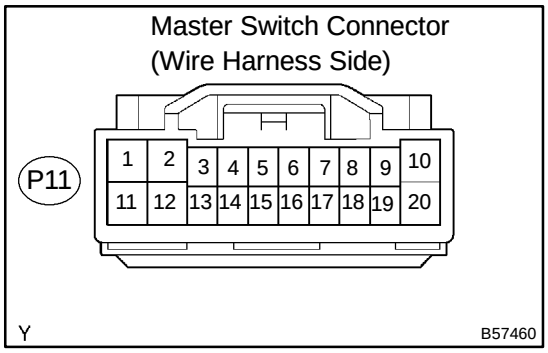
*: For a LHD vehicle, look in the same location as in the RHD.

O

B50781

0578F-01

TERMINALS OF ECU



1. POWER WINDOW REGULATOR MASTER SWITCH ASSY

(a) Inspect the regulator master switch.

(1) Disconnect the master switch connector.

(2) Inspect the voltage and continuity of each terminal of the vehicle's side connector.

Standard [LHD]:

Tester connection	Wiring color	Condition	Specified Condition
E (P11-2) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P11-10) ⇔ E (P11-2)	B-R ⇔ W-B	Constant	10 - 14 V
IG (P11-20) ⇔E (P11-2)	R-L ⇔ W-B	Ignition switch OFF → ON	0 V → 10 - 14 V
PCT (P11-6) ⇔ E (P11-2)	P ⇔ W-B	Constant	10 - 14 V
D (P11-11) ⇔ U (P11-1)	L ⇔ R	Constant	Continuity
LMT (P11-5) ⇔ SGND (P11-13)	P-L ⇔ G-Y	Driver's side door glass fully closed	No continuity
LMT (P11-5) ⇔ SGND (P11-13)	P-L ⇔ G-Y	Driver's side door glass opened by 4 mm	Continuity

Standard [RHD]:

Tester connection	Wiring color	Condition	Specified Condition
E (P11-2) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P11-10) ⇔E (P11-2)	B ⇔ W-B	Constant	10 - 14 V
IG (P11-20) ⇔ E (P11-2)	R-L ⇔ W-B	Ignition switch OFF → ON	0 V → 10 - 14 V
PCT (P11-6) ⇔ E (P11-2)	V ⇔ W-B	Constant	10 - 14 V
D (P11-11) ⇔ U (P11-1)	G ⇔ Y	Constant	Continuity
LMT (P11-5) ⇔ SGND (P11-13)	L-R ⇔ L-Y	Driver's side door glass fully closed	No continuity
LMT (P11-5) ⇔ SGND (P11-13)	L-R ⇔ L-Y	Driver's side door glass opened by 4 mm	Continuity

HINT:

If the value is not as specified, there may be a malfunction in the vehicle's side.

(3) Connect the connector, and inspect the voltage between each terminal of the connector.

Standard [LHD]:

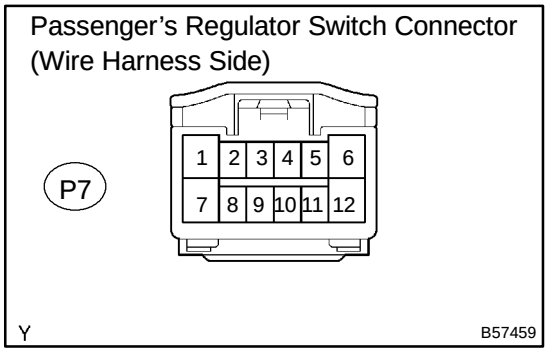
Tester connection	Wiring color	Condition	Specified Condition
U (P11-1) ⇔ E (P11-2)	R ⇔ W-B	Ignition switch ON, master switch of driver's side switch OFF → UP (manual operation)	0 V → 10 - 14 V
U (P11-1) ⇔ E (P11-2)	R ⇔ W-B	Ignition switch ON, driver's side door glass fully opened → master switch of driver's side switch UP (auto operation) → door glass fully closed	0 V → 10 - 14 V → 0 V
D (P11-11) ⇔ E (P11-2)	L ⇔ W-B	Ignition switch ON, master switch of driver's side switch OFF → DOWN (manual operation)	0 V → 10 - 14 V
D (P11-11) ⇔ E (P11-2)	L ⇔ W-B	Ignition switch ON, driver's side door glass fully closed → master switch of driver's side switch OFF → DOWN (auto operation) → door glass fully opened	0 V → 10 - 14 V → 0 V
PCT (P11-6) ⇔ E (P11-2)	P ⇔ W-B	Ignition switch ON, window lock switch LOCK → NORMAL	0 V → 10 - 14 V

Standard [RHD]:

Tester connection	Wiring color	Condition	Specified Condition
U (P11-1) ⇔ E (P11-2)	Y ⇔ W-B	Ignition switch ON, master switch of driver's side switch OFF → UP (manual operation)	0 V → 10 - 14 V
U (P11-1) ⇔ E (P11-2)	Y ⇔ W-B	Ignition switch ON, driver's side door glass fully opened → master switch driver's of side switch UP (auto operation) → door glass fully closed	0 V → 10 - 14 V → 0 V
D (P11-11) ⇔ E (P11-2)	G ⇔ W-B	Ignition switch ON, master switch of driver's side switch OFF → DOWN (manual operation)	0 V → 10 - 14 V
D (P11-11) ⇔ E (P11-2)	G ⇔ W-B	Ignition switch ON, driver's side door glass fully closed → master switch of driver's side switch OFF → DOWN (auto operation) → door glass fully opened	0 V → 10 - 14 V → 0 V
PCT (P11-6) ⇔ E (P11-2)	V ⇔ W-B	Ignition switch ON, window lock switch LOCK → NORMAL	0 V → 10 - 14 V

HINT:

If the value is not as specified, the master switch or communication line may be defective.



2. POWER WINDOW PASSENGER REGULATOR SWITCH ASSY

(a) Inspect the passenger regulator switch.

(1) Disconnect the regulator switch connector.

(2) Inspect the voltage and continuity of each terminal of the vehicle's side connector.

Standard [LHD]:

Tester connection	Wiring color	Condition	Specified Condition
E (P7-7) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P7-12) ⇔ E (P7-7)	B ⇔ W-B	Constant	10 - 14 V
D (P7-1) ⇔ U (P7-6)	G ⇔ Y	Constant	Continuity
LMT (P7-3) ⇔ SGND (P7-5)	L-R ⇔ L-Y	Passenger side door glass fully closed	No continuity
LMT (P7-3) ⇔ SGND (P7-5)	L-R ⇔ L-Y	Passenger side door glass opened by 4 mm	Continuity

Standard [RHD]:

Tester connection	Wiring color	Condition	Specified Condition
E (P7-7) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P7-12) ⇔ E (P7-7)	W-R ⇔ W-B	Constant	10 - 14 V
D (P7-1) ⇔ U (P7-6)	R ⇔ L	Constant	Continuity
LMT (P7-3) ⇔ SGND (P7-5)	G-R ⇔ G-Y	Passenger side door glass fully closed	No continuity
LMT (P7-3) ⇔ SGND (P7-5)	G-R ⇔ G-Y	Passenger side door glass opened by 4 mm	Continuity

HINT:

If the value is not as specified, there may be a malfunction in the vehicle's side.

(3) Connect the connector, and inspect the voltage between each terminal of the connector.

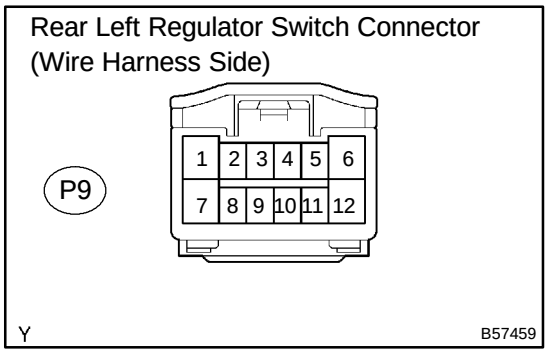
Standard [LHD]:

Tester connection	Wiring color	Condition	Specified Condition
U (P7-6) ⇔ E (P7-7)	Y ⇔ W-B	Ignition switch ON, passenger regulator switch OFF → UP (manual operation)	0 V → 10 - 14 V
U (P7-6) ⇔ E (P7-7)	Y ⇔ W-B	Ignition switch ON, passenger side door glass fully opened → passenger regulator switch UP (auto operation) → door glass fully closed	0 V → 10 - 14 V → 0 V
D (P7-1) ⇔ E (P7-7)	G ⇔ W-B	Ignition switch ON, passenger regulator switch OFF → DOWN (manual operation)	0 V → 10 - 14 V
D (P7-1) ⇔ E (P7-7)	G ⇔ W-B	Ignition switch ON, passenger side door glass fully closed → passenger regulator switch OFF → DOWN (auto operation) → door glass fully opened	0 V → 10 - 14 V → 0 V

Standard [RHD]:

Tester connection	Wiring color	Condition	Specified Condition
U (P7-6) ⇔ E (P7-7)	L ⇔ W-B	Ignition switch ON, passenger regulator switch OFF → UP (manual operation)	0 V → 10 - 14 V
U (P7-6) ⇔ E (P7-7)	L ⇔ W-B	Ignition switch ON, passenger side door glass fully opened → passenger regulator switch UP (auto operation) → door glass fully closed	0 V → 10 - 14 V → 0 V
D (P7-1) ⇔ E (P7-7)	R ⇔ W-B	Ignition switch ON, passenger regulator switch OFF → DOWN (manual operation)	0 V → 10 - 14 V
D (P7-1) ⇔ E (P7-7)	R ⇔ W-B	Ignition switch ON, passenger side door glass fully closed → passenger regulator switch OFF → DOWN (auto operation) → door glass fully opened	0 V → 10 - 14 V → 0 V

HINT:
If the value is not as specified, the passenger regulator switch or communication line may be defective.



3. w/ Rear power window:
POWER WINDOW REAR LEFT REGULATOR SWITCH ASSY

(a) Inspect the rear left regulator switch.
(1) Disconnect the regulator switch connector.
(2) Inspect the voltage and continuity of each terminal of the vehicle's side connector.

Standard:

Tester connection	Wiring color	Condition	Specified Condition
E (P9-7) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P9-12) ⇔ E (P9-7)	B ⇔ W-B	Constant	10 - 14 V
D (P9-1) ⇔ U (P9-6)	R-B ⇔ L-R	Constant	Continuity
LMT (P9-3) ⇔ SGND (P9-5)	L-R ⇔ W-R	Rear left side door glass fully closed	No continuity
LMT (P9-3) ⇔ SGND (P9-5)	L-R ⇔ W-R	Rear left side door glass opened by 4 mm	Continuity

HINT:
If the value is not as specified, there may be a malfunction in the vehicle's side.

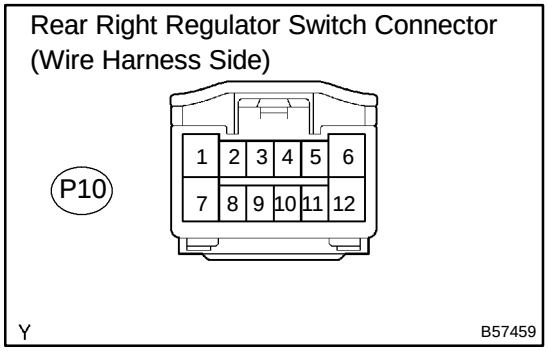
(3) Connect the connector, and inspect the voltage between each terminal of the connector.

Standard:

Tester connection	Wiring color	Condition	Specified Condition
U (P9-6) ⇔ E (P9-7)	L-R ⇔ W-B	Ignition switch ON, rear left regulator switch OFF → UP (manual operation)	0 V → 10 - 14 V
U (P9-6) ⇔ E (P9-7)	L-R ⇔ W-B	Ignition switch ON, rear left side door glass fully opened → rear left regulator switch UP (auto operation) → door glass fully closed	0 V → 10 - 14 V → 0 V
D (P9-1) ⇔ E (P9-7)	R-B ⇔ W-B	Ignition switch ON, rear left regulator switch OFF → DOWN (manual operation)	0 V → 10 - 14 V
D (P9-1) ⇔ E (P9-7)	R-B ⇔ W-B	Ignition switch ON, rear left side door glass fully closed → rear left regulator switch OFF → DOWN (auto operation) → door glass fully opened	0 V → 10 - 14 V → 0 V

HINT:

If the value is not as specified, the rear left regulator switch or communication line may be defective.



4. w/ Rear power window:

POWER WINDOW REAR RIGHT REGULATOR SWITCH ASSY

(a) Inspect the rear right regulator switch.

(1) Disconnect the regulator switch connector.

(2) Inspect the voltage and continuity of each terminal of the vehicle's side connector.

Standard:

Tester connection	Wiring color	Condition	Specified Condition
E (P10-7) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P10-12) ⇔ E (P10-7)	B ⇔ W-B	Constant	10 - 14 V
D (P10-1) ⇔ U (P10-6)	R-B ⇔ L-R	Constant	Continuity
LMT (P10-3) ⇔ SGND (P10-5)	L-R ⇔ W-R	Rear right side door glass fully closed	No continuity
LMT (P10-3) ⇔ SGND (P10-5)	L-R ⇔ W-R	Rear right side door glass opened by 4 mm	Continuity

HINT:

If the value is not as specified, there may be a malfunction in the vehicle's side.

(3) Connect the connector, and inspect the voltage between each terminal of the connector.

Standard:

Tester connection	Wiring color	Condition	Specified Condition
U (P10-6) ⇔ E (P10-7)	L-R ⇔ W-B	Ignition switch ON, rear right regulator switch OFF → UP (manual operation)	0 V → 10 - 14 V
U (P10-6) ⇔ E (P10-7)	L-R ⇔ W-B	Ignition switch ON, rear right side door glass fully opened → rear right regulator switch UP (auto operation) → door glass fully closed	0 V → 10 - 14 V → 0 V
D (P10-1) ⇔ E (P10-7)	R-B ⇔ W-B	Ignition switch ON, rear right regulator switch OFF → DOWN (manual operation)	0 V → 10 - 14 V
D (P10-1) ⇔ E (P10-7)	R-B ⇔ W-B	Ignition switch ON, rear right side door glass fully closed → rear right regulator switch OFF → DOWN (auto operation) → door glass fully opened	0 V → 10 - 14 V → 0 V

HINT:

If the value is not as specified, the rear right regulator switch or communication line may be defective.

0578G-01

PROBLEM SYMPTOMS TABLE

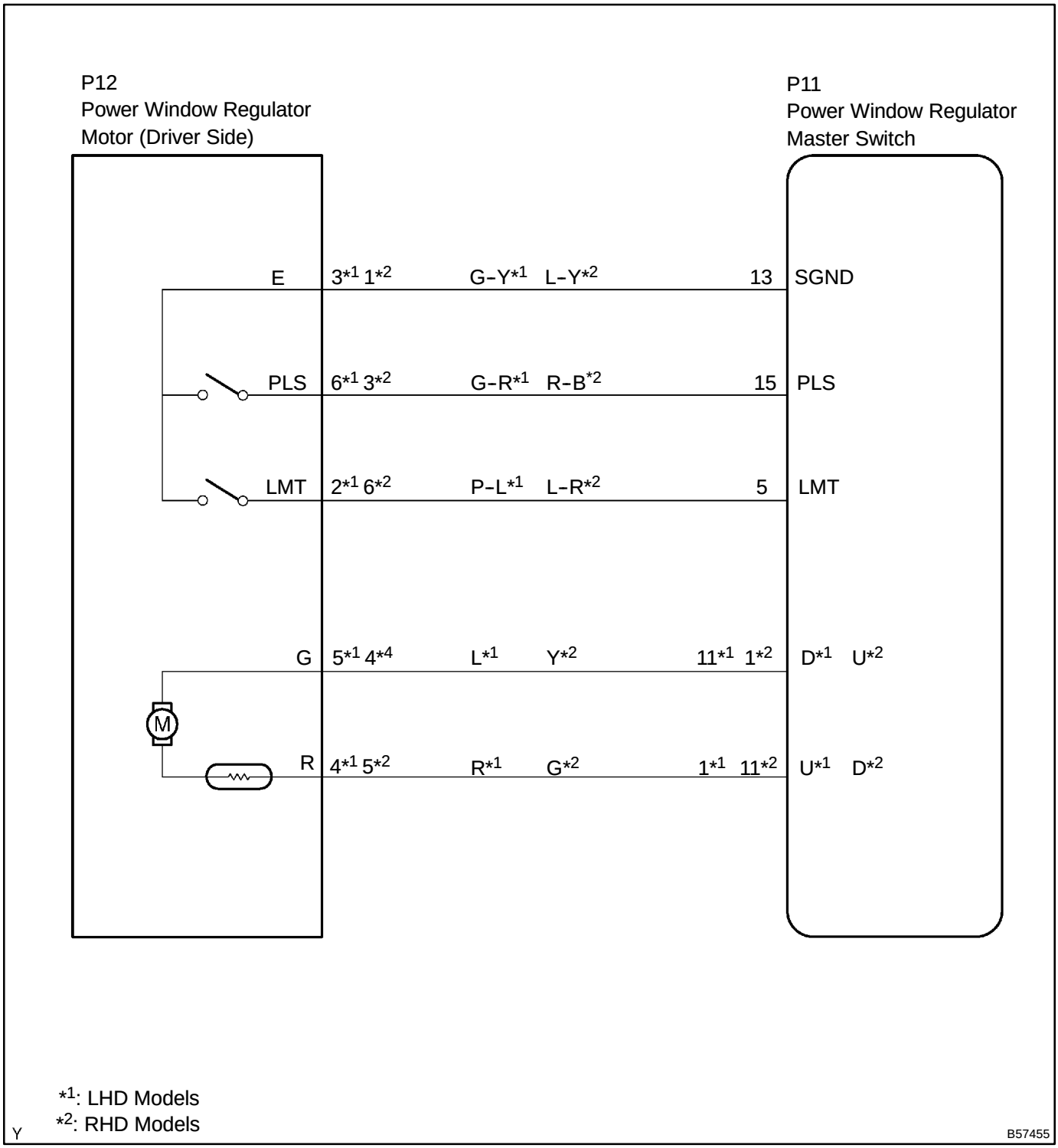
Problem symptom	Suspected area	See page
AUTO UP / AUTO DOWN operation of driver's door window is impossible(manual operation is possible)	1. Power window regulator master switch assembly 2. Power window regulator motor assembly LH	05-1246 05-1253
AUTO UP / AUTO DOWN operation of passenger's door window is impossible(manual operation is possible)	1. Power window regulator master switch assembly 2. Power window regulator motor assembly RH	05-1246 05-1257
AUTO UP / AUTO DOWN operation of rear right door window is impossible(manual operation is possible)	1. Power window regulator master switch assembly 2. Power window regulator motor assembly LH	05-1246 05-1261
AUTO UP / AUTO DOWN operation of rear left door window is impossible(manual operation is possible)	1. Power window regulator master switch assembly 2. Power window regulator motor assembly RH	05-1246 05-1261
Driver's door window goes down during AUTO UP operation	1. Power window regulator switch assembly 2. Power window regulator motor assembly LH	05-1246 05-1269
Passenger's door window goes down during AUTO UP operation	1. Power window regulator switch assembly 2. Power window regulator motor assembly RH	05-1246 05-1272
Rear right door window goes down during AUTO UP operation	1. Power window regulator switch assembly 2. Power window regulator motor assembly LH	05-1246 05-1261
Rear left door window goes down during AUTO UP operation	1. Power window regulator switch assembly 2. Power window regulator motor assembly RH	05-1246 05-1277
Driver's door window does not go down although foreign objects are caught in between	1. Power window regulator master switch assembly 2. Power window regulator motor assembly LH	05-1246 05-1279
Passenger's door window does not go down although foreign objects are caught in between	1. Power window regulator switch assembly 2. Power window regulator motor assembly RH	05-1246 05-1280
Rear right door window does not go down although foreign objects are caught in between	1. Power window regulator switch assembly 2. Power window regulator motor assembly LH	05-1246 05-1281
Rear left door window does not go down although foreign objects are caught in between	1. Power window regulator switch assembly 2. Power window regulator motor assembly RH	05-1246 05-1282
Remote operation via master switch is impossible in the other seat (operation via each door switch is possible)	1. Power window regulator master switch assembly 2. Wire harness	05-1246 -

AUTO UP / DOWN OPERATION OF DRIVER'S DOOR WINDOW IS IMPOSSIBLE (MANUAL OPERATION IS POSSIBLE)

CIRCUIT DESCRIPTION

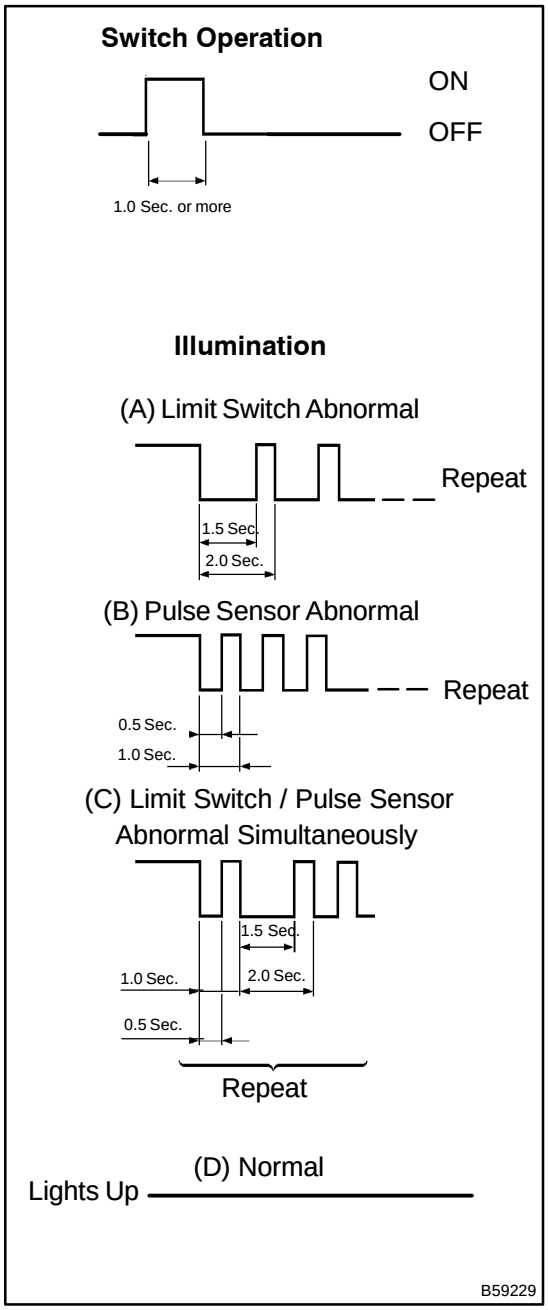
The power window regulator master switch assembly controls the driver's power window motor. If the pulse sensor and limit switch for detecting something being caught malfunction, the fail-safe function starts operating and the AUTO UP/DOWN operation will stop.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTC OUTPUT



(a) Check the diagnosis output code.

HINT:

When a malfunction has occurred in the limit switch or the pulse sensor, operate the master switch of driver's switch, and thus the code can be checked by blinking.

(1) Perform the switch operation via the master switch for the driver's door glass for 1 seconds or more.

(2) Check that the master switch's illumination lights up or blinks, as shown in the illustration.

Output code (illumination):

Illumination	Malfunction	Go to step
(A)	Limit switch abnormal	NG-A
(B)	Pulse sensor abnormal	NG-B
(C)	Limit switch and pulse sensor abnormal simultaneously	NG-A
(D)	Normal	OK

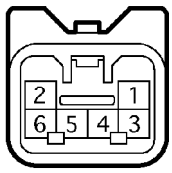
NG-A

NG-B → **Go to step 4**

OK → **REPLACE POWER WINDOW REGULATOR MASTER SWITCH ASSY**

2 CHECK LIMIT SWITCH OF POWER WINDOW REGULATOR MOTOR

Driver's Door Regulator Motor



B36953

(a) Check the power window regulator motor (driver's side).
(1) Operate the driver's door regulator motor and set the door glass anywhere except the fully closed position and also in the fully closed position.
(2) Disconnect the motor connector.
(3) Check the continuity of each terminal of the connector, as shown in the table.

Standard [LHD]:

Terminal	Glass position	Specified condition
2 ⇔ 3	Except fully closed	Continuity
	Fully closed	No continuity

Standard [RHD]:

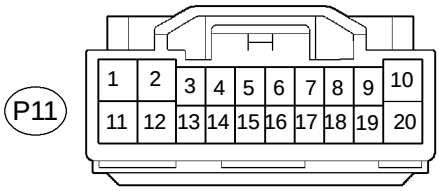
Terminal	Glass position	Specified condition
6 ⇔ 1	Except fully closed	Continuity
	Fully closed	No continuity

NG → **REPLACE DRIVER'S SIDE POWER WINDOW REGULATOR MOTOR**

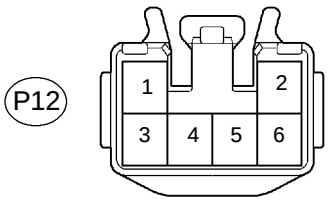
OK

3 CHECK WIRE HARNESS (MASTER SWITCH - DRIVER'S DOOR REGULATOR MOTOR)

Master Switch Connector
(Wire Harness Side)



Driver's Door Regulator Motor Connector
(Wire Harness Side)



B57460
B57754

B57810

(a) Disconnect the master switch and driver's door regulator motor connectors.
(b) Check the continuity between the terminals of the master switch (P11) and driver's door regulator motor (P12) connectors, as shown in the illustration and table.

Continuity (Check for open) [LHD]:

Terminal (Master switch ⇔ Driver's door regulator motor)	Standard
LMT (P11-5) ⇔ LMT (P12-2)	Continuity
PLS (P11-15) ⇔ PLS (P12-6)	
SGND (P11-13) ⇔ E (P12-3)	

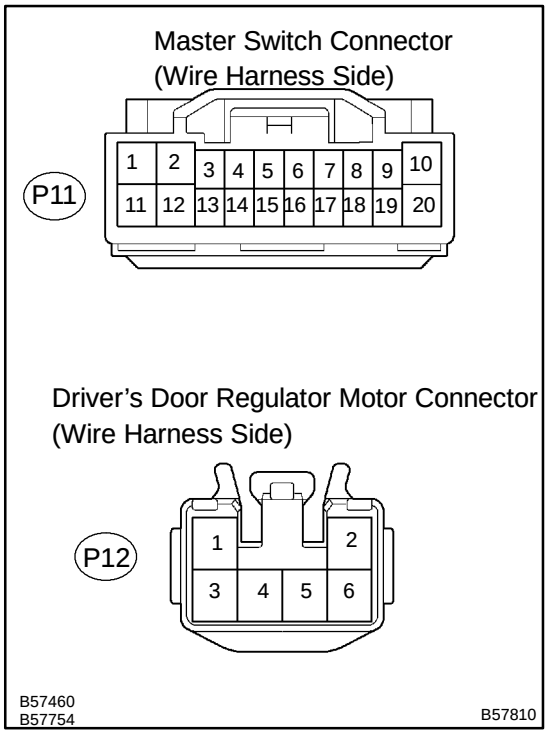
Continuity (Check for open) [RHD]:

Terminal (Master switch ⇔ Driver's door regulator motor)	Standard
LMT (P11-5) ⇔ LMT (P12-6)	Continuity
PLS (P11-15) ⇔ PLS (P12-3)	
SGND (P11-13) ⇔ E (P12-1)	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4	HARNESS AND CONNECTOR SHORT CIRCUIT INSPECTION (MASTER SWITCH OR DRIVER'S DOOR REGULATOR MOTOR - BODY)



(a) Disconnect the master switch and driver's door regulator motor connectors.

(b) Check the continuity between the terminals of the master switch (P11) connector or driver's door regulator motor (P12) connector and the body ground, as shown in the illustration and table.

Continuity (Check for short) [LHD]:

Terminal (Master switch ⇔ Driver's door regulator motor)	Standard
LMT (P11-5) or LMT (P12-2) ⇔ Body ground	No Continuity
PLS (P11-15) or PLS (P12-6) ⇔ Body ground	
SGND (P11-13) or E (P12-3) ⇔ Body ground	

Continuity (Check for short) [RHD]:

Terminal (Master switch or driver's door regulator motor ⇔ Body ground)	Standard
LMT (P11-5) or LMT (P12-6) ⇔ Body ground	No Continuity
PLS (P11-15) or PLS (P12-3) ⇔ Body ground	
SGND (P11-13) or E (P12-1) ⇔ Body ground	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5	CHECK POWER WINDOW REGULATOR MASTER SWITCH ASSY

(a) Connect the driver's door regulator motor connector.

(b) Connect the connector to the normal master switch, and check if the AUTO UP and AUTO DOWN operate.

NG → **REPLACE DRIVER'S SIDE POWER WINDOW REGULATOR MOTOR**

OK

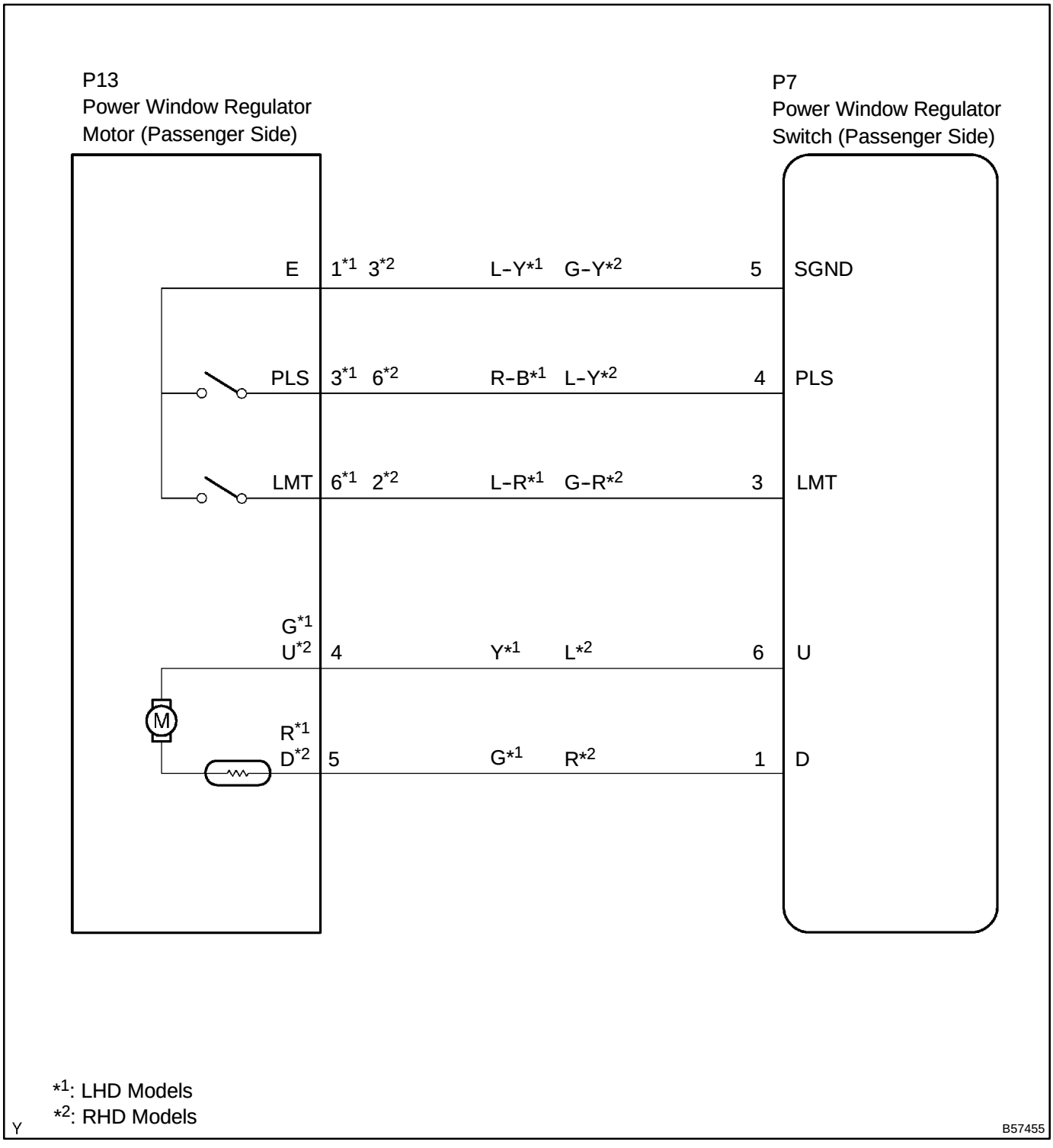
REPLACE POWER WINDOW REGULATOR MASTER SWITCH ASSY

AUTO UP / DOWN OPERATION OF PASSENGER'S DOOR WINDOW IS IMPOSSIBLE (MANUAL OPERATION IS POSSIBLE)

CIRCUIT DESCRIPTION

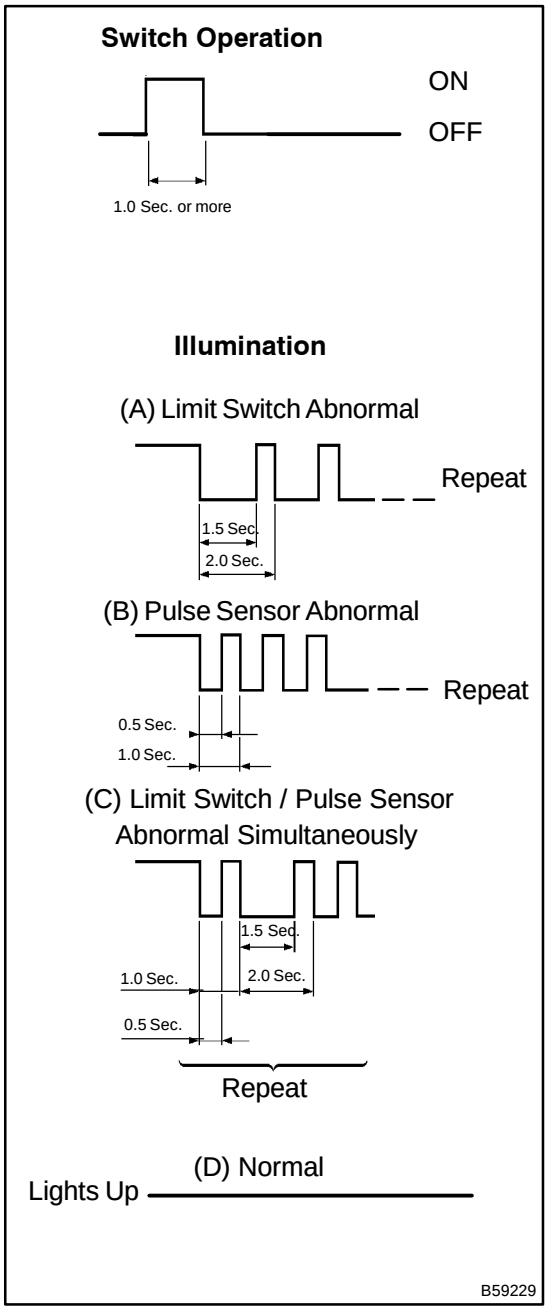
The power window passenger regulator switch assembly controls the passenger's power window motor. If the pulse sensor and limit switch for detecting something being caught malfunction, the fail-safe function starts operating and the AUTO UP/DOWN operation will stop.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTC OUTPUT



(a) Check the diagnosis output code.

HINT:

When a malfunction has occurred in the limit switch or the pulse sensor, operate the passenger regulator switch, and thus the code can be checked by blinking.

(1) Perform the switch operation via the passenger's regulator switch for 1 seconds or more.

(2) Check that the passenger's regulator switch's illumination lights up or blinks, as shown in the illustration.

Output code (illumination):

Illumination	Malfunction	Go to step
(A)	Limit switch abnormal	NG-A
(B)	Pulse sensor abnormal	NG-B
(C)	Limit switch and pulse sensor abnormal simultaneously	NG-A
(D)	Normal	OK

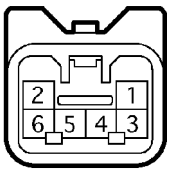
NG-B → **Go to step NO TAG**

OK → **REPLACE POWER WINDOW REGULATOR SWITCH ASSY**

NG-A

2 CHECK LIMIT SWITCH OF POWER WINDOW REGULATOR MOTOR

Passenger's Door Regulator Motor



B36953

(a) Check the power window regulator motor (passenger's side).

(1) Operate the passenger's side regulator motor and set the door glass anywhere except the fully closed position and also in the fully closed position.

(2) Disconnect the motor connector.

(3) Check the continuity of each terminal of the connector, as shown in the table.

Standard [LHD]:

Terminal	Glass position	Specified condition
6 ⇔ 1	Except fully closed	Continuity
	Fully closed	No continuity

Standard [RHD]:

Terminal	Glass position	Specified condition
3 ⇔ 5	Except fully closed	Continuity
	Fully closed	No continuity

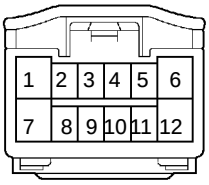
NG → **REPLACE PASSENGER'S SIDE POWER WINDOW REGULATOR MOTOR**

OK

3 CHECK WIRE HARNESS (PASSENGER'S REGULATOR SWITCH - PASSENGER'S DOOR REGULATOR MOTOR)

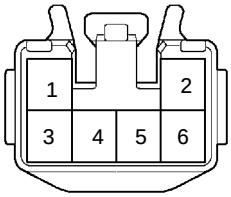
Passenger's Regulator Switch Connector (Wire Harness Side)

P7



Passenger's Door Regulator Motor Connector (Wire Harness Side)

P13



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B57811

(a) Disconnect the passenger's regulator switch and passenger's door regulator motor connectors.

(b) Check the continuity between the terminals of the passenger's regulator switch (P7) and passenger's door regulator motor (P13) connectors, as shown in the illustration and table.

Continuity (Check for open) [LHD]:

Terminal (Passenger's regulator switch ⇔ Passenger's door regulator motor)	Standard
LMT (P7-3) ⇔ LMT (P13-6)	Continuity
PLS (P7-4) ⇔ PLS (P13-3)	
SGND (P7-5) ⇔ E (P13-1)	

Continuity (Check for open) [RHD]:

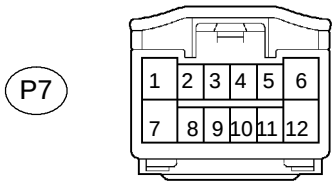
Terminal (Passenger's regulator switch ⇔ Passenger's door regulator motor)	Standard
LMT (P7-3) ⇔ LMT (P13-2)	Continuity
PLS (P7-4) ⇔ PLS (P13-6)	
SGND (P7-5) ⇔ E (P13-3)	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

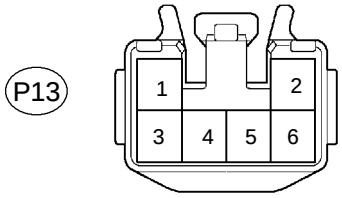
OK

4	HARNESS AND CONNECTOR SHORT CIRCUIT INSPECTION (PASSENGER'S REGULATOR SWITCH OR PASSENGER'S DOOR REGULATOR MOTOR - BODY)

Passenger's Regulator Switch Connector
(Wire Harness Side)



Passenger's Door Regulator
Motor Connector
(Wire Harness Side)



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B57811

(a) Disconnect the passenger's regulator switch and passenger's door regulator motor connectors.

(b) Check the continuity between the terminals of the passenger's regulator switch (P7) connector or passenger's door regulator motor (P13) connector and the body ground, as shown in the illustration and table.

Continuity (Check for short) [LHD]:

Terminal (Passenger's regulator switch or passenger's door regulator motor ⇔ Body ground)	Standard
LMT (P7-3) or LMT (P13-6) ⇔ Body ground	No continuity
PLS (P7-4) or PLS (P13-3) ⇔ Body ground	
SGND (P7-5) or E (P13-1) ⇔ Body ground	

Continuity (Check for short) [RHD]:

Terminal (Passenger's regulator switch or passenger's door regulator motor ⇔ Body ground)	Standard
LMT (P7-3) or LMT (P13-2) ⇔ Body ground	No continuity
PLS (P7-4) or PLS (P13-6) ⇔ Body ground	
SGND (P7-5) or E (P13-3) ⇔ Body ground	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5	CHECK POWER WINDOW REGULATOR SWITCH ASSY

(a) Connect the passenger's door regulator motor connector.

(b) Connect the connector to the normal regulator switch, and check if the AUTO UP and AUTO DOWN operate.

NG → **REPLACE PASSENGER'S SIDE POWER WINDOW REGULATOR MOTOR**

OK

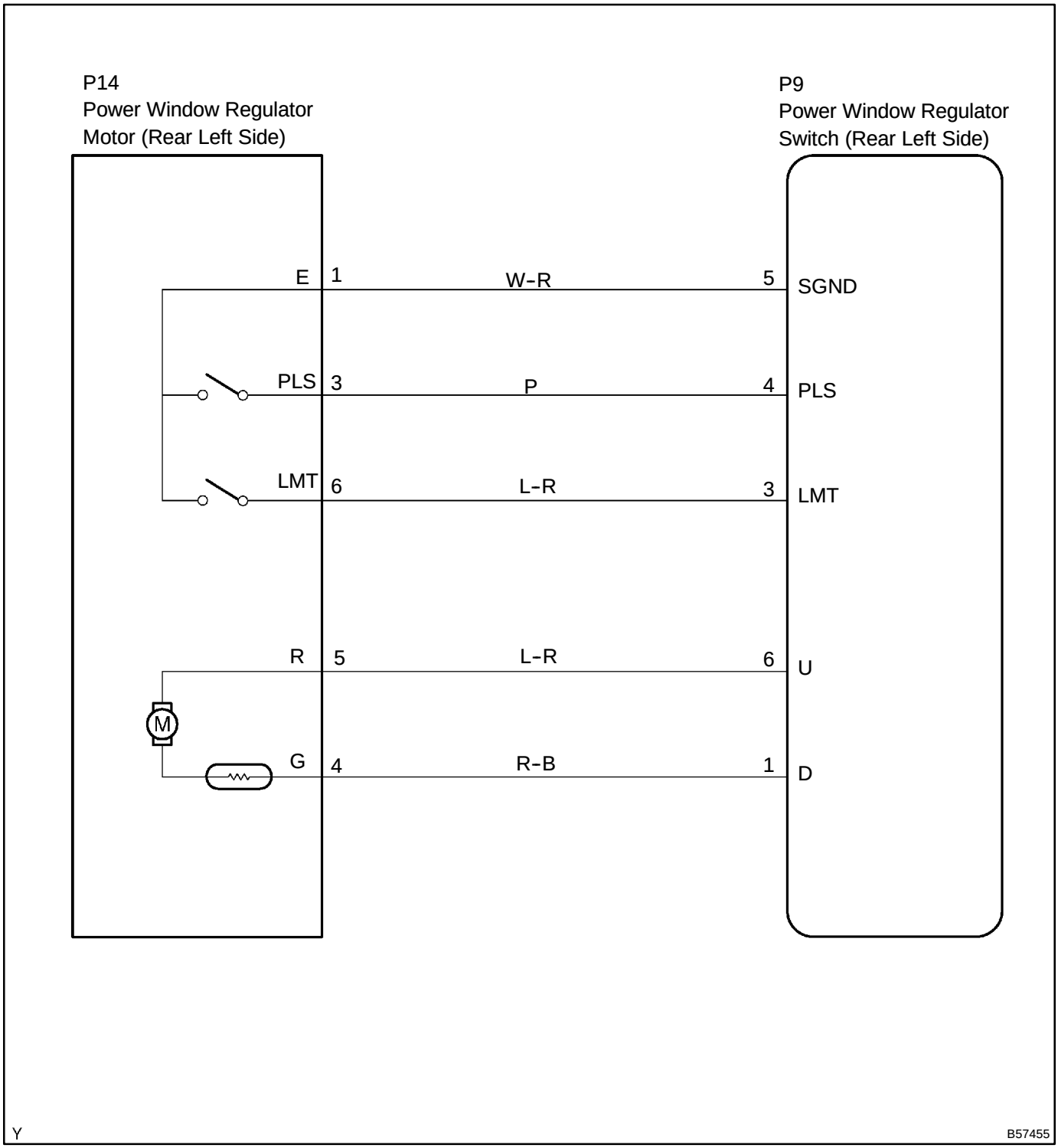
REPLACE POWER WINDOW REGULATOR SWITCH ASSY

AUTO UP /DOWN OPERATION OF REAR LEFT DOOR WINDOW IS IMPOSSIBLE (MANUAL OPERATION IS POSSIBLE)

CIRCUIT DESCRIPTION

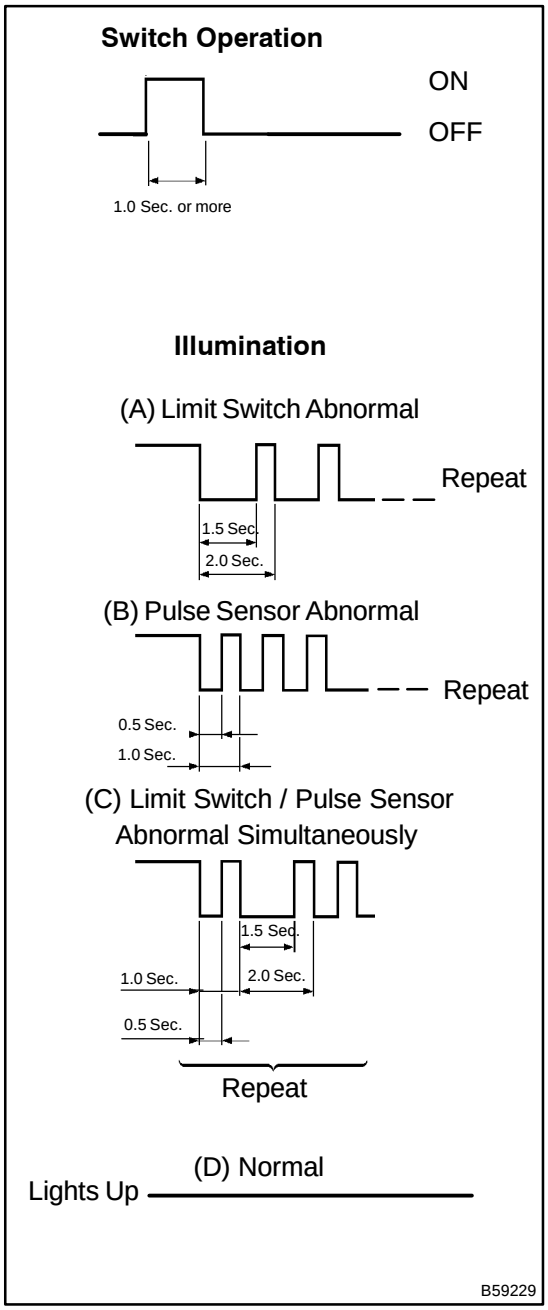
The power window rear left regulator switch assembly controls the rear left door power window motor. If the pulse sensor and limit switch for detecting something being caught malfunction, the fail-safe function starts operating and the AUTO UP/DOWN operation will stop.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTC OUTPUT



(a) Check the diagnosis output code.

HINT:

When a malfunction has occurred in the limit switch or the pulse sensor, operate the rear left regulator switch, and thus the code can be checked by blinking.

(1) Perform the switch operation via the rear left regulator switch for 1 seconds or more.

(2) Check that the rear left regulator switch's illumination lights up or blinks, as shown in the illustration.

Output code (illumination):

Illumination	Malfunction	Go to step
(A)	Limit switch abnormal	NG-A
(B)	Pulse sensor abnormal	NG-B
(C)	Limit switch and pulse sensor abnormal simultaneously	NG-A
(D)	Normal	OK

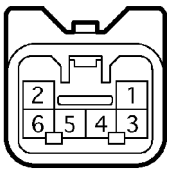
NG-B → **Go to step 4**

OK → **REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR**

NG-A

2 CHECK LIMIT SWITCH OF POWER WINDOW REGULATOR MOTOR

Rear Left Door Regulator Motor



B36953

(a) Check the power window regulator motor (rear left side).
(1) Operate the rear left door regulator motor and set the door glass anywhere except the fully closed position and also in the fully closed position.
(2) Disconnect the motor connector.
(3) Check the continuity of each terminal of the connector, as shown in the table.

Standard:

Terminal	Glass position	Specified condition
6 ⇔ 1	Except fully closed	Continuity
	Fully closed	No continuity

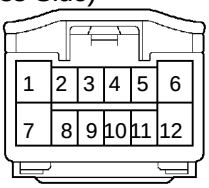
NG → **REPLACE POWER WINDOW REGULATOR MOTOR ASSY LH**

OK

3 CHECK WIRE HARNESS (REAR LEFT REGULATOR SWITCH - REAR LEFT DOOR REGULATOR MOTOR)

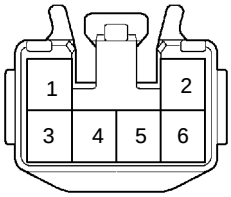
Rear Left Regulator Switch Connector (Wire Harness Side)

P9



Rear Left Door Regulator Motor Connector (Wire Harness Side)

P14



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(a) Disconnect the rear left regulator switch and rear left door regulator motor connectors.
(b) Check the continuity between the terminals of the rear left regulator switch (P9) and rear left door regulator motor (P14) connectors, as shown in the illustration and table.

Continuity (Check for open):

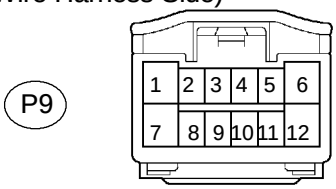
Terminal (Rear left regulator switch ⇔ Rear left door regulator motor)	Standard
LMT (P9-3) ⇔ LMT (P14-6)	Continuity
PLS (P9-4) ⇔ PLS (P14-3)	
SGND (P9-5) ⇔ E (P14-1)	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

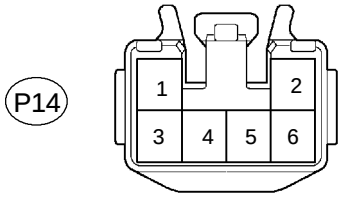
OK

4	HARNESS AND CONNECTOR SHORT CIRCUIT INSPECTION (REAR LEFT REGULATOR SWITCH OR REAR LEFT DOOR REGULATOR MOTOR - BODY)

Rear Left Regulator Switch Connector (Wire Harness Side)



Rear Left Door Regulator Motor Connector (Wire Harness Side)



B57459
B57754

B57811

(a) Disconnect the rear left regulator switch and rear left door regulator motor connectors.

(b) Check the continuity between the terminals of the rear left regulator switch (P12) connector or rear left door regulator motor (P16) connector and the body ground, as shown in the illustration and table.

Continuity (Check for short):

Terminal (Rear left regulator switch or Rear left door regulator motor ⇔ Body ground)	Standard
LMT (P9-3) or LMT (P14-6) ⇔ Body ground	No continuity
PLS (P9-4) or PLS (P14-3) ⇔ Body ground	
SGND (P9-5) or E (P14-1) ⇔ Body ground	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5	CHECK POWER WINDOW REGULATOR SWITCH ASSY REAR

(a) Connect the rear left door regulator motor connector.

(b) Connect the connector to the normal regulator switch, and check if the AUTO UP and AUTO DOWN operate.

NG → **REPLACE POWER WINDOW REGULATOR MOTOR ASSY LH**

OK

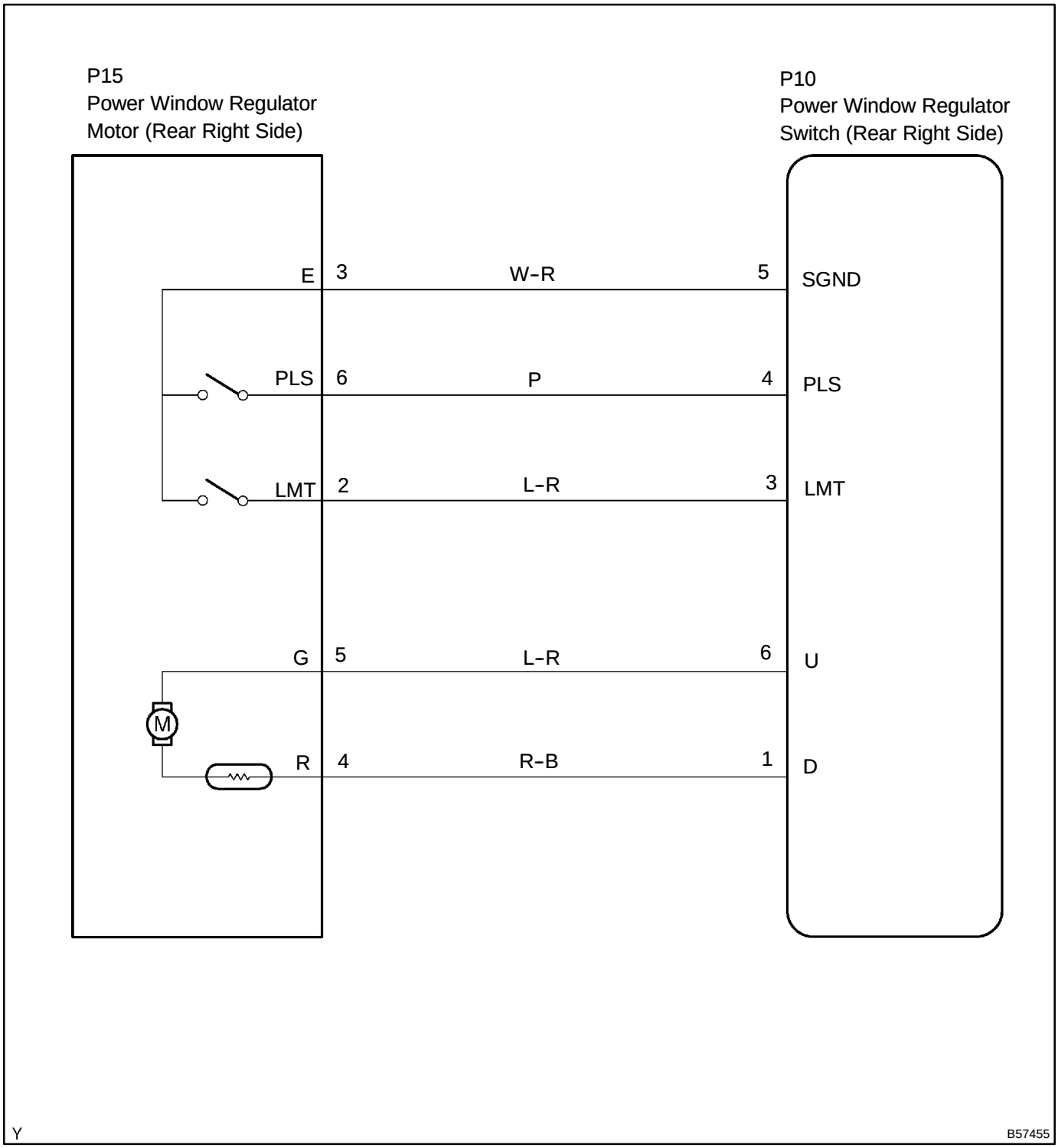
REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR

AUTO UP / DOWN OPERATION OF REAR RIGHT DOOR WINDOW IS IMPOSSIBLE (MANUAL OPERATION IS POSSIBLE)

CIRCUIT DESCRIPTION

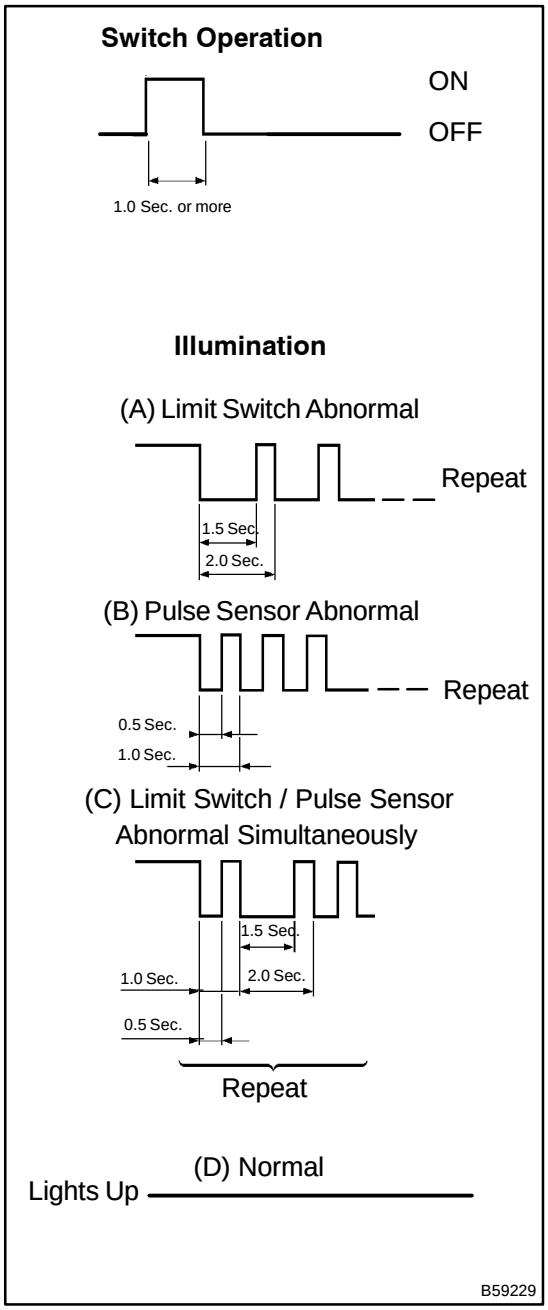
The power window rear right regulator switch assembly controls the rear right door power window motor. If the pulse sensor and limit switch for detecting something being caught malfunction, the fail-safe function starts operating and the AUTO UP/DOWN operation will stop.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTC OUTPUT



(a) Check the diagnosis output code.

HINT:

When a malfunction has occurred in the limit switch or the pulse sensor, operate the rear right regulator switch, and thus the code can be checked by blinking.

(1) Perform the switch operation via the rear right regulator switch for 1 seconds or more.

(2) Check that the rear right regulator switch's illumination lights up or blinks, as shown in the illustration.

Output code (illumination):

Illumination	Malfunction	Go to step
(A)	Limit switch abnormal	NG-A
(B)	Pulse sensor abnormal	NG-B
(C)	Limit switch and pulse sensor abnormal simultaneously	NG-A
(D)	Normal	OK

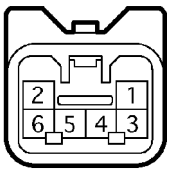
NG-B → **Go to step 4**

OK → **REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR**

NG-A

2 CHECK LIMIT SWITCH OF POWER WINDOW REGULATOR MOTOR

Rear Right Door Regulator Motor



B36953

(a) Check the power window regulator motor (rear right side).
(1) Operate the rear right door regulator motor and set the door glass anywhere except the fully closed position and also in the fully closed position.
(2) Disconnect the motor connector.
(3) Check the continuity of each terminal of the connector, as shown in the table.

Standard:

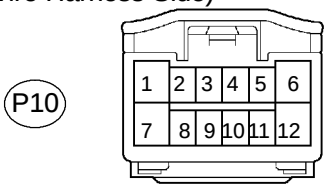
Terminal	Glass position	Specified condition
2 ⇔ 3	Except fully closed	Continuity
	Fully closed	No continuity

NG → **REPLACE POWER WINDOW REGULATOR MOTOR ASSY RH**

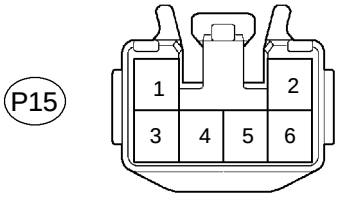
OK

3 CHECK WIRE HARNESS (REAR RIGHT REGULATOR SWITCH - REAR RIGHT DOOR REGULATOR MOTOR)

Rear Right Regulator Switch Connector (Wire Harness Side)



Rear Right Door Regulator Motor Connector (Wire Harness Side)



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B57811

(a) Disconnect the rear right regulator switch and rear right door regulator motor connectors.
(b) Check the continuity between the terminals of the rear right regulator switch (P10) and rear right door regulator motor (P15) connectors, as shown in the illustration and table.

Continuity (Check for open):

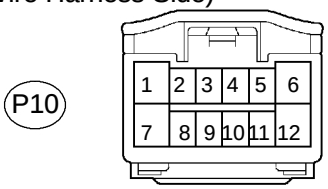
Terminal (Rear right regulator switch ⇔ Rear right door regulator motor)	Standard
LMT (P10-3) ⇔ LMT (P15-2)	Continuity
PLS (P10-4) ⇔ PLS (P15-6)	
SGND (P10-5) ⇔ E (P15-3)	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

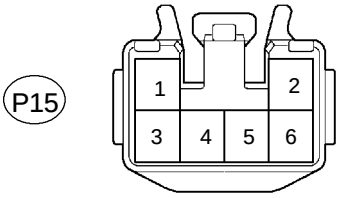
OK

4	HARNESS AND CONNECTOR SHORT CIRCUIT INSPECTION (REAR RIGHT REGULATOR SWITCH OR REAR RIGHT DOOR REGULATOR MOTOR - BODY)

Rear Right Regulator Switch Connector (Wire Harness Side)



Rear Right Door Regulator Motor Connector (Wire Harness Side)



B57459
B57754
B57811

(a) Disconnect the rear right regulator switch and rear right door regulator motor connectors.

(b) Check the continuity between the terminals of the rear right regulator switch (P13) connector or rear right door regulator motor (P17) connector and the body ground, as shown in the illustration and table.

Continuity (Check for short):

Terminal (Rear right regulator switch or rear right door regulator motor ⇔ Body ground)	Standard
LMT (P10-3) or LMT (P15-2) ⇔ Body ground	No continuity
PLS (P10-4) or PLS (P15-6) ⇔ Body ground	
SGND (P10-5) or E (P15-3) ⇔ Body ground	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5	CHECK POWER WINDOW REGULATOR SWITCH ASSY REAR

(a) Connect the rear right door regulator motor connector.

(b) Connect the connector to the normal regulator switch, and check if the AUTO UP and AUTO DOWN operate.

NG → **REPLACE POWER WINDOW REGULATOR MOTOR ASSY RH**

OK

REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR

DRIVER'S DOOR WINDOW GOES DOWN DURING AUTO UP OPERATION

CIRCUIT DESCRIPTION

The power window regulator master switch assembly controls the driver's power window. With the limit switch ON, when the pulse changes in the pulse sensor that detects the motor revolution within the operation range of the jam protection, it is recognized as something being caught and so the motor operation will be reversed. This also occurs when the limit switch OFF position and the door glass fully closed position are not in place by replacing and installing the motor. If this occurs, reset the driver's power window regulator motor (initial position setting of the limit switch).

WIRING DIAGRAM

See page 05-1253

INSPECTION PROCEDURE

1	CHECK SLIDING RESISTANCE AT REVERSING POSITION

(a) Turn the ignition switch ON.
(b) Check that nothing increases the sliding resistance of the door glass around the reverse position when operating the AUTO UP function.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

2	CHECK SLIDING RESISTANCE OF DOOR GLASS

(a) Remove the window regulator.
(b) When raising the assembled door glass by hand, the glass slides smoothly without being caught.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

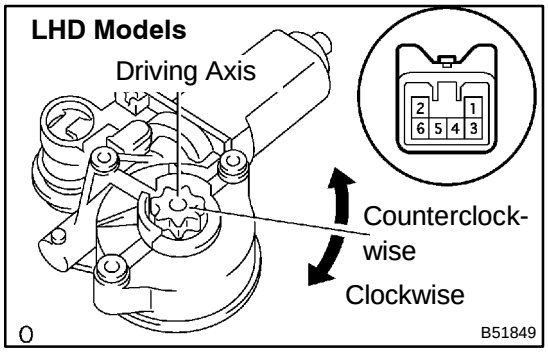
3	CHECK DRIVER'S DOOR WINDOW REGULATOR

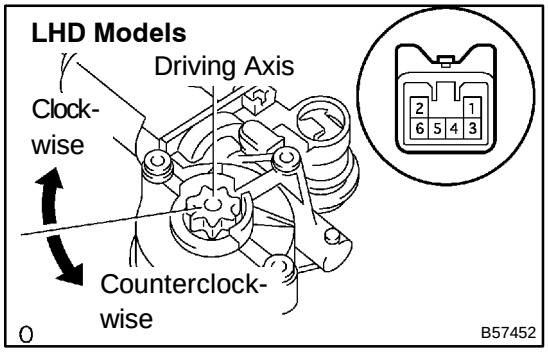
(a) Remove the power window regulator motor from the window regulator.
(b) Check the movement of the window regulator is smooth without being caught and no damage exists in the gear part when moving the window regulator by hand.

NG → REPLACE DRIVER'S DOOR WINDOW REGULATOR

OK

4 INSPECT DRIVER'S SIDE POWER WINDOW REGULATOR MOTOR





(a) Inspect the operation of the driver's side power window regulator motor assembly.

(1) Check that the motor operates smoothly when the battery voltage is applied to each terminal of the connector.

[LHD models] Standard:

Measuring condition	Operational direction
Battery positive - Terminal 4 Battery negative - Terminal 5	Clockwise rotation toward driving axis
Battery positive - Terminal 5 Battery negative - Terminal 4	Counterclockwise rotation toward driving axis

[RHD models] Standard:

Measuring condition	Operational direction
Battery positive - Terminal 5 Battery negative - Terminal 4	Clockwise toward driving axis
Battery positive - Terminal 4 Battery negative - Terminal 5	Counterclockwise toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 5.

NOTICE:

Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from 16 - 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut-off).

Standard: Approximately 4 - 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut-off, check that the door glass goes down when the power window regulator switch is turned DOWN.

NG → **REPLACE DRIVER'S SIDE POWER WINDOW REGULATOR MOTOR**

OK

5	RESET POWER WINDOW REGULATOR MOTOR (See page 75-6)

(a) Reset the driver's door regulator motor limit switch.
(b) Install the driver's door regulator motor to the vehicle.
(c) Check the driver's door glass moves smoothly.

NG → REPLACE POWER WINDOW REGULATOR MASTER SWITCH ASSY

OK

NORMAL

PASSENGER'S DOOR WINDOW GOES DOWN DURING AUTO UP OPERATION

CIRCUIT DESCRIPTION

The power window regulator master switch assembly controls the passenger's power window and also drives the passenger's power window motor. With the limit switch ON, when the pulse changes in the pulse sensor that detects the motor revolution within the operation range of the jam protection, it is recognized as something being caught and so the motor operation will be reversed. This also occurs when the limit switch OFF position and the door glass fully closed position are not in place by replacing and installing the motor. If this occurs, reset the passenger's power window regulator motor (initial position setting of the limit switch).

WIRING DIAGRAM

See page 05-1257

INSPECTION PROCEDURE

1	CHECK SLIDING RESISTANCE AT REVERSING POSITION

(a) Turn the ignition switch ON.
(b) Check that nothing increases the sliding resistance of the door glass around the reverse position when operating the AUTO UP function.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

2	CHECK SLIDING RESISTANCE OF DOOR GLASS

(a) Remove the window regulator.
(b) When raising the assembled door glass by hand, the glass slides smoothly without being caught.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

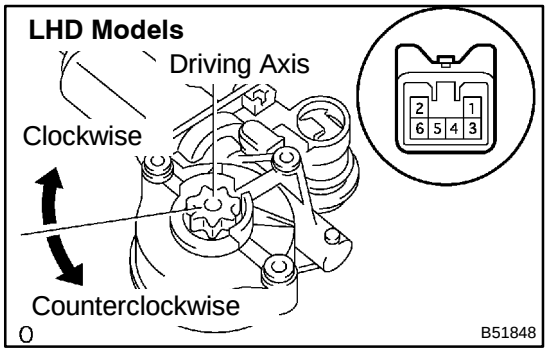
3	CHECK PASSENGER'S DOOR WINDOW REGULATOR

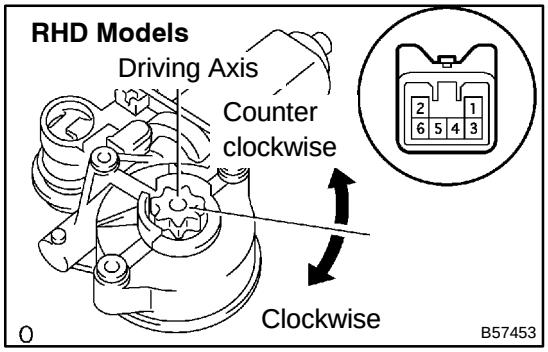
(a) Remove the power window regulator motor from the window regulator.
(b) Check the movement of the window regulator is smooth without being caught and no damage exists in the gear part when moving the window regulator by hand.

NG → REPLACE PASSENGER'S DOOR WINDOW REGULATOR

OK

4 INSPECT PASSENGER'S SIDE POWER WINDOW REGULATOR MOTOR





(a) Inspect the operation of the passenger side power window regulator motor assembly.

(1) Check that the motor operates smoothly when the battery voltage is applied to each terminal of the connector.

[LHD] Standard:

Measuring condition	Operational direction
Battery positive - Terminal 5 Battery negative - Terminal 4	Clockwise rotation toward driving axis
Battery positive - Terminal 4 Battery negative - Terminal 5	Counterclockwise rotation toward driving axis

[RHD] Standard:

Measuring condition	Operational direction
Battery positive - Terminal 4 Battery negative - Terminal 5	Clockwise toward driving axis
Battery positive - Terminal 5 Battery negative - Terminal 4	Counterclockwise toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 5.

NOTICE:

Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current is takes to change from 16 - 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut-off).

Standard: Approximately 4 - 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut-off, check that the door glass goes down when the power window regulator switch is turned DOWN.

NG → **REPLACE PASSENGER'S SIDE POWER WINDOW REGULATOR MOTOR**

OK

5	RESET POWER WINDOW REGULATOR MOTOR (See page 75-6)

(a) Reset the passenger's door regulator motor limit switch.
(b) Install the passenger's door regulator motor to the vehicle.
(c) Check the passenger's door glass moves smoothly.

NG → REPLACE POWER WINDOW REGULATOR SWITCH ASSY

OK

NORMAL

REAR LEFT DOOR WINDOW GOES DOWN DURING AUTO UP OPERATION

CIRCUIT DESCRIPTION

The power window regulator master switch assembly controls the rear left door power window and also drives the rear left door power window motor. With the limit switch ON, when the pulse changes in the pulse sensor that detects the motor revolution within the operation range of the jam protection, it is recognized as something being caught and so the motor operation will be reversed. This also occurs when the limit switch OFF position and the door glass fully closed position are not in place by replacing and installing the motor. If this occurs, reset the passenger's power window regulator motor (initial position setting of the limit switch).

WIRING DIAGRAM

See page 05-1261

INSPECTION PROCEDURE

1	CHECK SLIDING RESISTANCE AT REVERSING POSITION

(a) Turn the ignition switch ON.
(b) Check that nothing increases the sliding resistance of the door glass around the reverse position when operating the AUTO UP function.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

2	CHECK SLIDING RESISTANCE OF DOOR GLASS

(a) Remove the window regulator.
(b) When raising the assembled door glass by hand, the glass slides smoothly without being caught.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

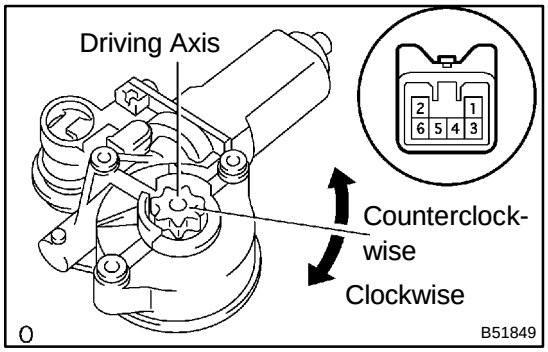
3	CHECK REAR DOOR WINDOW REGULATOR SUB-ASSY LH

(a) Remove the power window regulator motor from the window regulator.
(b) Check the movement of the window regulator is smooth without being caught and no damage exists in the gear part when moving the window regulator by hand.

NG → REPLACE REAR DOOR WINDOW REGULATOR SUB-ASSY LH

OK

4	INSPECT POWER WINDOW REGULATOR MOTOR ASSY LH



(a) Inspect the operation of the rear LH power window regulator motor assembly.

(1) Check that the motor operates smoothly when the battery voltage is applied to each terminal of the connector.

Standard:

Measuring condition	Operational direction
Battery positive - Terminal 4 Battery negative - Terminal 5	Clockwise rotation toward driving axis
Battery positive - Terminal 5 Battery negative - Terminal 4	Counterclockwise rotation toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 5.

NOTICE:

Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from 16 - 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut-off).

Standard: Approximately 4 - 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut-off, check that the door glass goes down when the power window regulator switch is turned DOWN.

NG → **REPLACE POWER WINDOW REGULATOR MOTOR ASSY LH**

OK

5	RESET POWER WINDOW REGULATOR MOTOR (See page 75-36)

(a) Reset the rear left door regulator motor limit switch.

(b) Install the rear left door regulator motor to the vehicle.

(c) Check the rear left door glass moves smoothly.

NG → **REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR**

OK

NORMAL

REAR RIGHT DOOR WINDOW GOES DOWN DURING AUTO UP OPERATION

CIRCUIT DESCRIPTION

The power window regulator master switch assembly controls the rear right door power window and also drives the rear right door power window motor. With the limit switch ON, when the pulse changes in the pulse sensor that detects the motor revolution within the operation range of the jam protection, it is recognized as something being caught and so the motor operation will be reversed. This also occurs when the limit switch OFF position and the door glass fully closed position are not in place by replacing and installing the motor. If this occurs, reset the passenger's power window regulator motor (initial position setting of the limit switch).

WIRING DIAGRAM

See page 05-1265

INSPECTION PROCEDURE

1	CHECK SLIDING RESISTANCE AT REVERSING POSITION

(a) Turn the ignition switch ON.
(b) Check that nothing increases the sliding resistance of the door glass around the reverse position when operating the AUTO UP function.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

2	CHECK SLIDING RESISTANCE OF DOOR GLASS

(a) Remove the window regulator.
(b) When raising the assembled door glass by hand, the glass slides smoothly without being caught.

NG → REPAIR OR REPLACE APPLICABLE PART

OK

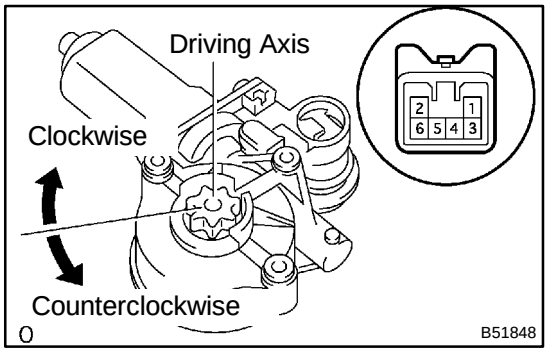
3	CHECK REAR DOOR WINDOW REGULATOR SUB-ASSY RH

(a) Remove the power window regulator motor from the window regulator.
(b) Check the movement of the window regulator is smooth without being caught and no damage exists in the gear part when moving the window regulator by hand.

NG → REPLACE REAR DOOR WINDOW REGULATOR SUB-ASSY RH

OK

4	INSPECT POWER WINDOW REGULATOR MOTOR ASSY RH



(a) Inspect the operation of the rear RH power window regulator motor assembly.

(1) Check that the motor operates smoothly when the battery voltage is applied to each terminal of the connector.

Standard:

Measuring condition	Operational direction
Battery positive - Terminal 5 Battery negative - Terminal 4	Clockwise rotation toward driving axis
Battery positive - Terminal 4 Battery negative - Terminal 5	Counterclockwise rotation toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 5.

NOTICE:

Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from 16 - 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut-off).

Standard: Approximately 4 - 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut-off, check that the door glass goes down when the power window regulator switch is turned DOWN.

NG → **REPLACE POWER WINDOW REGULATOR MOTOR ASSY RH**

OK

5	RESET POWER WINDOW REGULATOR MOTOR (See page 75-36)

(a) Reset the rear right door regulator motor limit switch.

(b) Install the rear right door regulator motor to the vehicle.

(c) Check the rear right door glass moves smoothly.

NG → **REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR**

OK

NORMAL

DRIVER'S DOOR WINDOW DOES NOT GO DOWN ALTHOUGH FOREIGN OBJECTS ARE CAUGHT IN BETWEEN

CIRCUIT DESCRIPTION

The power window regulator master switch assembly controls the driver's power window motor. The jam protection functions only within the operation range of the jam protection during the AUTO UP operation.

INSPECTION PROCEDURE

1 CHECK JAM PROTECTION FUNCTION OPERATING CONDITION

(a) Turn the ignition switch ON.
(b) The AUTO UP operation works with the ignition switch ON (One-touch operation).

NO → **NORMAL**

YES

2 CHECK POWER WINDOW REGULATOR MASTER SWITCH ASSY

(a) Check the operation.
  (1) Turn the ignition switch ON.
  (2) Check if AUTO UP and AUTO DOWN operate.

NG → **TO CHART 1** (See page 05-1253)

OK

3 CHECK JAM PROTECTION FUNCTION OPERATING RANGE

(a) Check the jam protection function does not operate within 4 mm before the fully closed position of the door glass.

OK → **NORMAL**

NG

4 RESET POWER WINDOW REGULATOR MOTOR (See page 75-12)

(a) Reset the driver's door regulator motor limit switch.
(b) Install the driver's door regulator motor to the vehicle.
(c) Check the driver's door glass moves smoothly.

OK → **NORMAL**

NG

REPLACE POWER WINDOW REGULATOR MASTER SWITCH ASSY

PASSENGER'S DOOR WINDOW DOES NOT GO DOWN ALTHOUGH FOREIGN OBJECTS ARE CAUGHT IN BETWEEN

CIRCUIT DESCRIPTION

The passenger's power window regulator switch assembly controls the passenger's power window motor. The jam protection functions only within the operation range of the jam protection during the AUTO UP operation.

INSPECTION PROCEDURE

1	CHECK JAM PROTECTION FUNCTION OPERATING CONDITION

(a) Turn the ignition switch ON.
(b) The AUTO UP operation works with the ignition switch ON (One-touch operation).

NG → NORMAL

YES

2	CHECK POWER WINDOW REGULATOR SWITCH ASSY

(a) Check the operation.
  (1) Turn the ignition switch ON.
  (2) Check if AUTO UP and AUTO DOWN operate.

NG → TO CHART 1 (See page 05-1257)

OK

3	CHECK JAM PROTECTION FUNCTION OPERATING RANGE

(a) Check the jam protection function does not operate within 4 mm before the fully closed position of the door glass.

OK → NORMAL

NG

4	RESET POWER WINDOW REGULATOR MOTOR (See page 75-12)

(a) Reset the passenger's door regulator motor limit switch.
(b) Install the passenger's door regulator motor to the vehicle.
(c) Check the passenger's door glass moves smoothly.

OK → NORMAL

NG

REPLACE POWER WINDOW REGULATOR SWITCH ASSY

REAR LEFT DOOR WINDOW DOES NOT GO DOWN ALTHOUGH FOREIGN OBJECTS ARE CAUGHT IN BETWEEN

CIRCUIT DESCRIPTION

The rear left door power window regulator switch assembly controls the rear left door power window motor. The jam protection functions only within the operation range of the jam protection during the AUTO UP operation.

INSPECTION PROCEDURE

1	CHECK JAM PROTECTION FUNCTION OPERATING CONDITION

(a) Turn the ignition switch ON.
(b) The AUTO UP operation works with the ignition switch ON (One-touch operation).

NO → NORMAL

YES

2	CHECK POWER WINDOW REGULATOR SWITCH ASSY REAR

(a) Check the operation.
  (1) Turn the ignition switch ON.
  (2) Check if AUTO UP and AUTO DOWN operate.

NG → TO CHART 1 (See page 05-1261)

OK

3	CHECK JAM PROTECTION FUNCTION OPERATING RANGE

(a) Check the jam protection function does not operate within 4 mm before the fully closed position of the door glass.

OK → NORMAL

NG

4	RESET POWER WINDOW REGULATOR MOTOR (See page 75-36)

(a) Reset the rear left door regulator motor limit switch.
(b) Install the rear left door regulator motor to the vehicle.
(c) Check the rear left door glass moves smoothly.

OK → NORMAL

NG

REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR

REAR RIGHT DOOR WINDOW DOES NOT GO DOWN ALTHOUGH FOREIGN OBJECTS ARE CAUGHT IN BETWEEN

CIRCUIT DESCRIPTION

The rear right door power window regulator switch assembly controls the rear right door power window motor. The jam protection functions only within the operation range of the jam protection during the AUTO UP operation.

INSPECTION PROCEDURE

1	CHECK JAM PROTECTION FUNCTION OPERATING CONDITION

(a) Turn the ignition switch ON.
(b) The AUTO UP operation works with the ignition switch ON (One-touch operation).

NO → NORMAL

YES

2	CHECK POWER WINDOW REGULATOR SWITCH ASSY REAR

(a) Check the operation.
  (1) Turn the ignition switch ON.
  (2) Check if AUTO UP and AUTO DOWN operate.

NG → TO CHART 1 (See page 05-1265)

OK

3	CHECK JAM PROTECTION FUNCTION OPERATING RANGE

(a) Check the jam protection function does not operate within 4 mm before the fully closed position of the door glass.

OK → NORMAL

NG

4	RESET POWER WINDOW REGULATOR MOTOR (See page 75-36)

(a) Reset the rear right door regulator motor limit switch.
(b) Install the rear right door regulator motor to the vehicle.
(c) Check the rear right door glass moves smoothly.

OK → NORMAL

NG

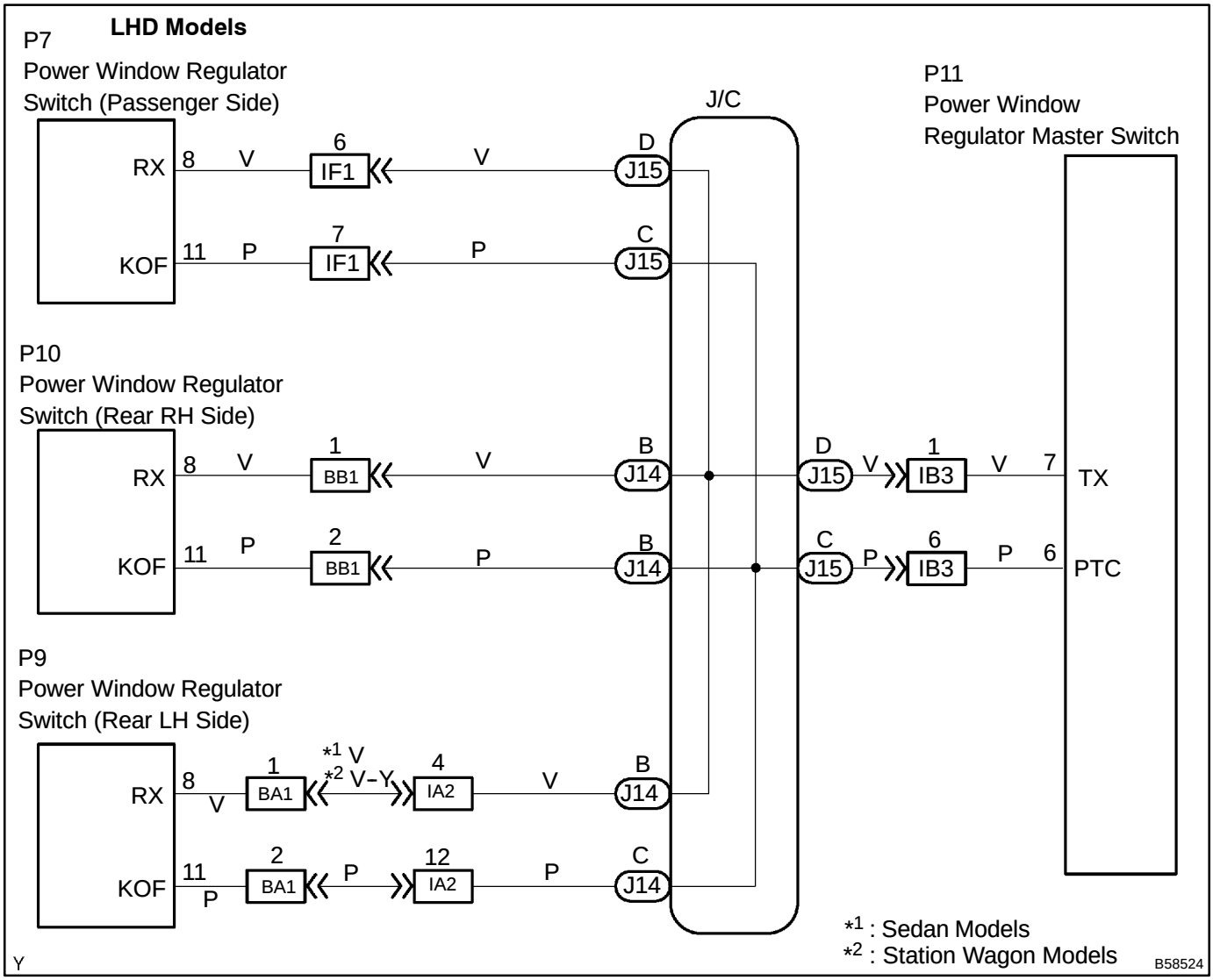
REPLACE POWER WINDOW REGULATOR SWITCH ASSY REAR

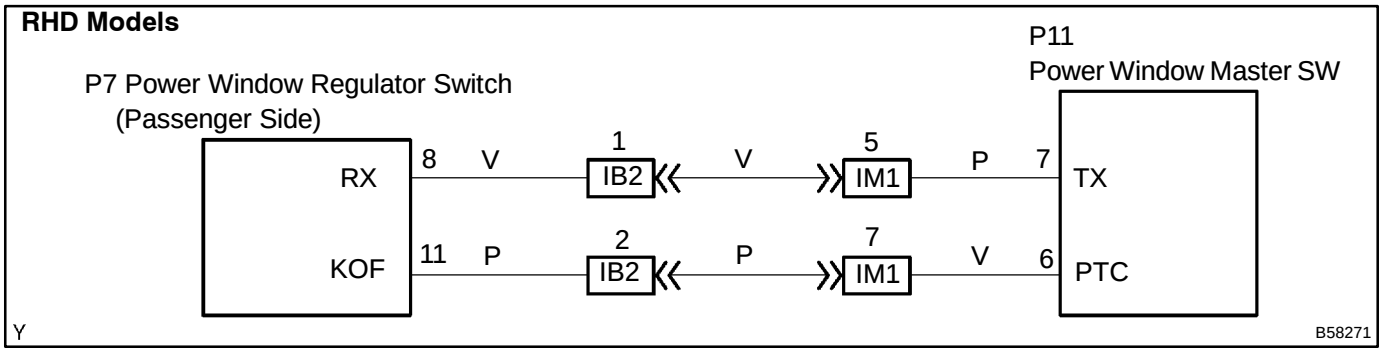
REMOTE OPERATION VIA MASTER SWITCH IS IMPOSSIBLE IN THE OTHER SEAT

CIRCUIT DESCRIPTION

With the ignition switch ON, the master switch transmits remote switch signals for other seats to each regulator switch multiply, and then the regulator switch drives the power window motor.

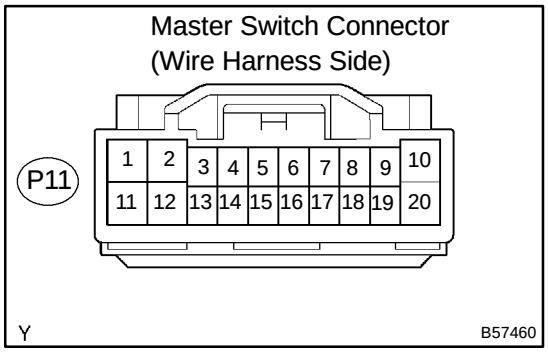
WIRING DIAGRAM





INSPECTION PROCEDURE

1	CHECK POWER WINDOW REGULATOR MASTER SWITCH ASSY



(a) Inspect the master switch.
(1) Disconnect the master switch connector.
(2) Inspect the voltage and continuity of each terminal of the vehicle's side connector.

Standard [LHD]:

Tester connection	Wiring color	Condition	Specified condition
E (P11-2) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P11-10) ⇔ E (P11-2)	B-R ⇔ W-B	Constant	10 - 14 V
IG (P11-20) ⇔ E (P11-2)	R-L ⇔ W-B	Ignition switch OFF → ON	0 V → 10 - 14 V

Standard [RHD]:

Tester connection	Wiring color	Condition	Specified condition
E (P11-2) ⇔ Body ground	W-B ⇔ -	Constant	Continuity
B (P11-10) ⇔ E (P11-2)	B ⇔ W-B	Constant	10 - 14 V
IG (P11-20) ⇔ E (D13-2)	R-L ⇔ W-B	Ignition switch OFF → ON	0 V → 10 - 14 V

HINT:
If the value is not as specified, there may be a malfunction in the vehicle's side.

(3) Connect the connector, and inspect the voltage between each terminal of the connector.

Standard [LHD]:

Tester connection	Wiring color	Condition	Specified condition
PCT (P11-6) ⇔ E (P11-2)	P ⇔ W-B	Ignition switch ON, window lock switch LOCK → NORMAL	0 V → 10 - 14 V

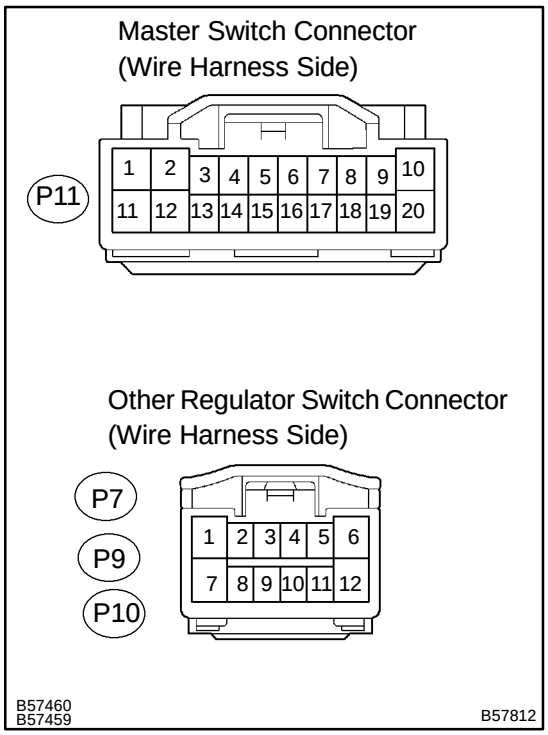
Standard [RHD]:

Tester connection	Wiring color	Condition	Specified condition
PCT (P11-6) ⇔ E (P11-2)	V ⇔ W-B	Ignition switch ON, window lock switch LOCK → NORMAL	0 V → 10 - 14 V

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

2 CHECK WIRE HARNESS (MASTER SWITCH - OTHER REGULATOR SWITCH)



(a) Disconnect the master switch and other regulator switch connectors.

(b) Check the continuity between the terminals of the master switch (P11) and other regulator switch (P7, P9 and P10) connectors, as shown in the illustration and table.

Continuity (Check for open):

Terminal (Master switch ⇔ Other regulator switch)	Standard
TX (P11-7) ⇔ RX (P7-8, P9-8 and P10-8)	Continuity

Continuity (Check for short):

Terminal (Master switch ⇔ Other regulator switch)	Standard
TX (P11-7) or RX (P7-8, P9-8 and P10-8) ⇔ Body ground	No continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE POWER WINDOW REGULATOR MASTER SWITCH ASSY

COMBINATION METER

HOW TO PROCEED WITH TROUBLESHOOTING

05651-02

1	Vehicle Brought to Workshop
2	Customer Problem Analysis (See page 05-1287)
3	Problem Symptom Confirmation (See page 05-1297)
4	Circuit Inspection (See page 05-1298 - 05-1312)
5	Repair or Replace
6	Confirmation Test
7	End

05652-02

CUSTOMER PROBLEM ANALYSIS CHECK

COMBINATION METER SYSTEM Check Sheet

Inspector's name:

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date of Vehicle Brought In	/ /	**Odometer Reading**	**km** **Mile**

Date Problem First Occurred		/ /
Frequency Problem Occurs		j Constant j Sometimes (Times per day, month) j Once only
Weather Conditions When Problem Occurred	**Weather**	j Fine j Cloudy j Rainy j Snowy j Various/Others
	Outside temperature	j Hot j Warm j Cool j Cold (Approx. °F (°C))

Problem Symptom	**Gauge**	V Malfunction in speedometer
		V Malfunction in tachometer
		V Malfunction in water temperature receiver gauge
		V Malfunction in fuel receiver gauge
	Others	V Entire combination meter does not operate
		V Operating light control rheostat does not charge light brightness
		V Key unlock warning buzzer or light auto turn off warning buzzer does not sound
		V Malfunction in clock
		V All buzzer do not sound

I30453

05653-02

PRE-CHECK

1. DATA LIST

HINT:

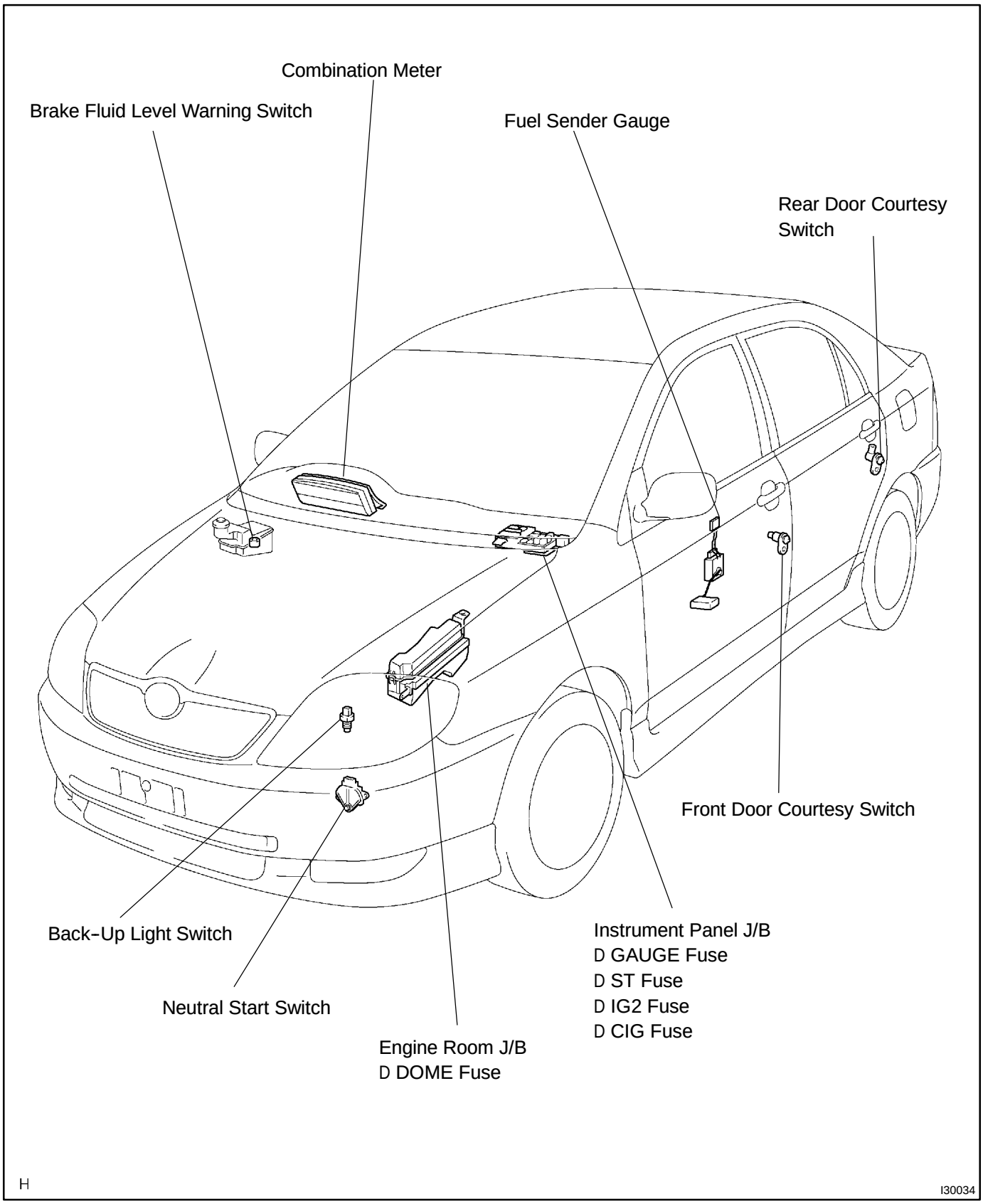
According to the DATA LIST displayed by the OBD II scan tool or Hand-held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. Reading the DATA LIST as a first step of troubleshooting is one of the method to shorten the labor time.

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the OBD II scan tool or Hand-held tester to the DLC3.
(d) Turn the ignition switch ON.
(e) According to the display on tester, read the "DATA LIST".

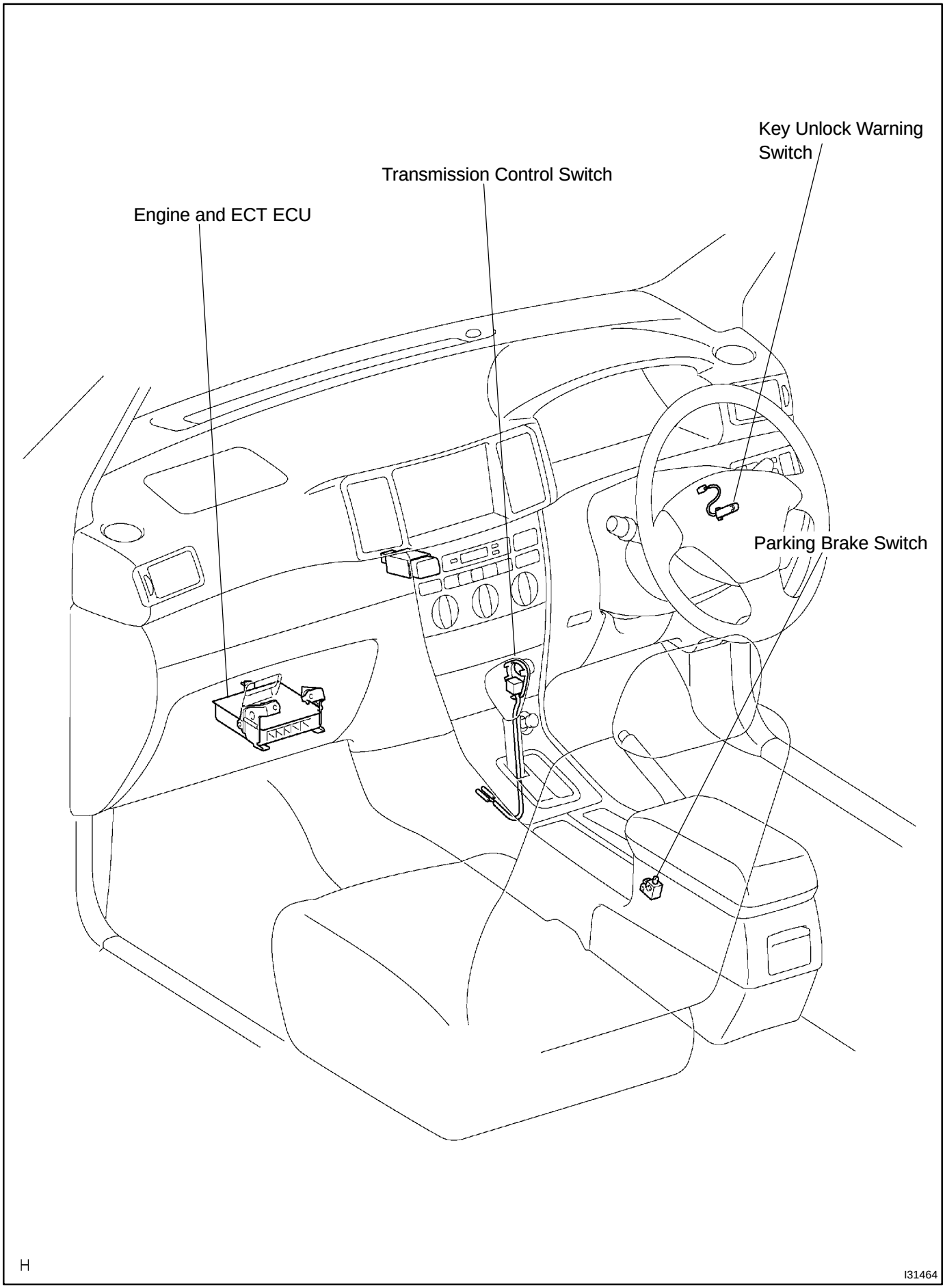
Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
ENGINE SPD	Engine Speed/ Min.: 0 rpm, Max.: 16,383 rpm	Idling: M/T 650 - 750 rpm A/T 550 - 750 rpm	-
COOLANT TEMP	Coolant temperature/ Min.: -40 _C, Max.: 140 _C	After warming up: 80 - 95˚C (176 - 203˚F)	If the value is "-40 _C" or "140 _C", sensor circuit is open or shorted.

05654-02

LOCATION

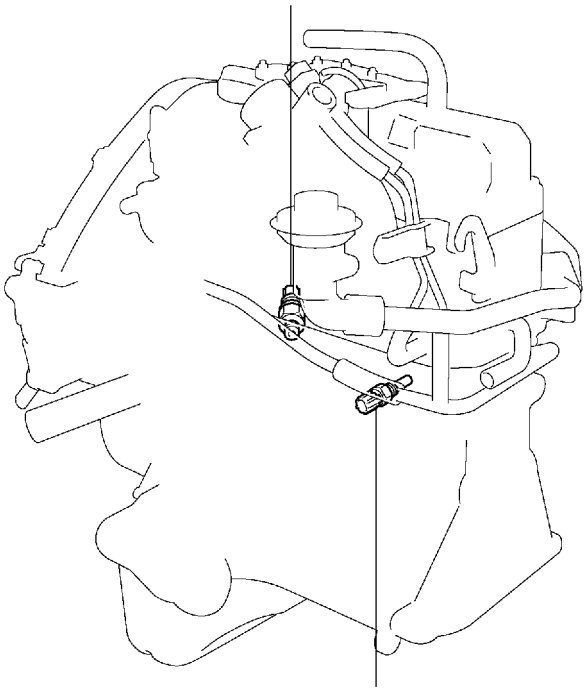


05-1290


Key Unlock Warning Switch
Transmission Control Switch
Engine and ECT ECU
Parking Brake Switch
H
I31464

1CD-FTV:

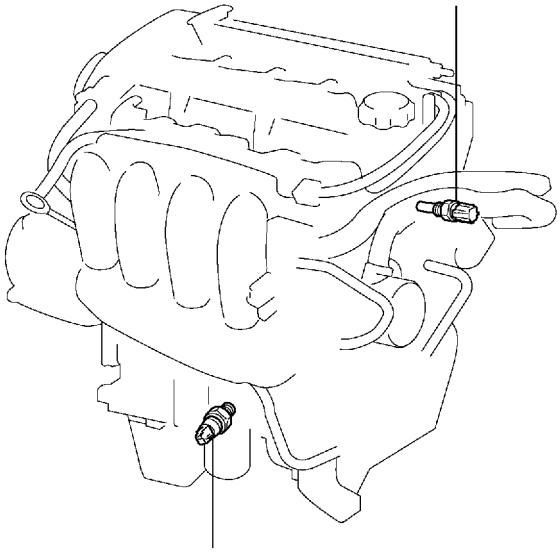
Lo Oil Pressure Warning Switch



EFI
Water Temperature Switch

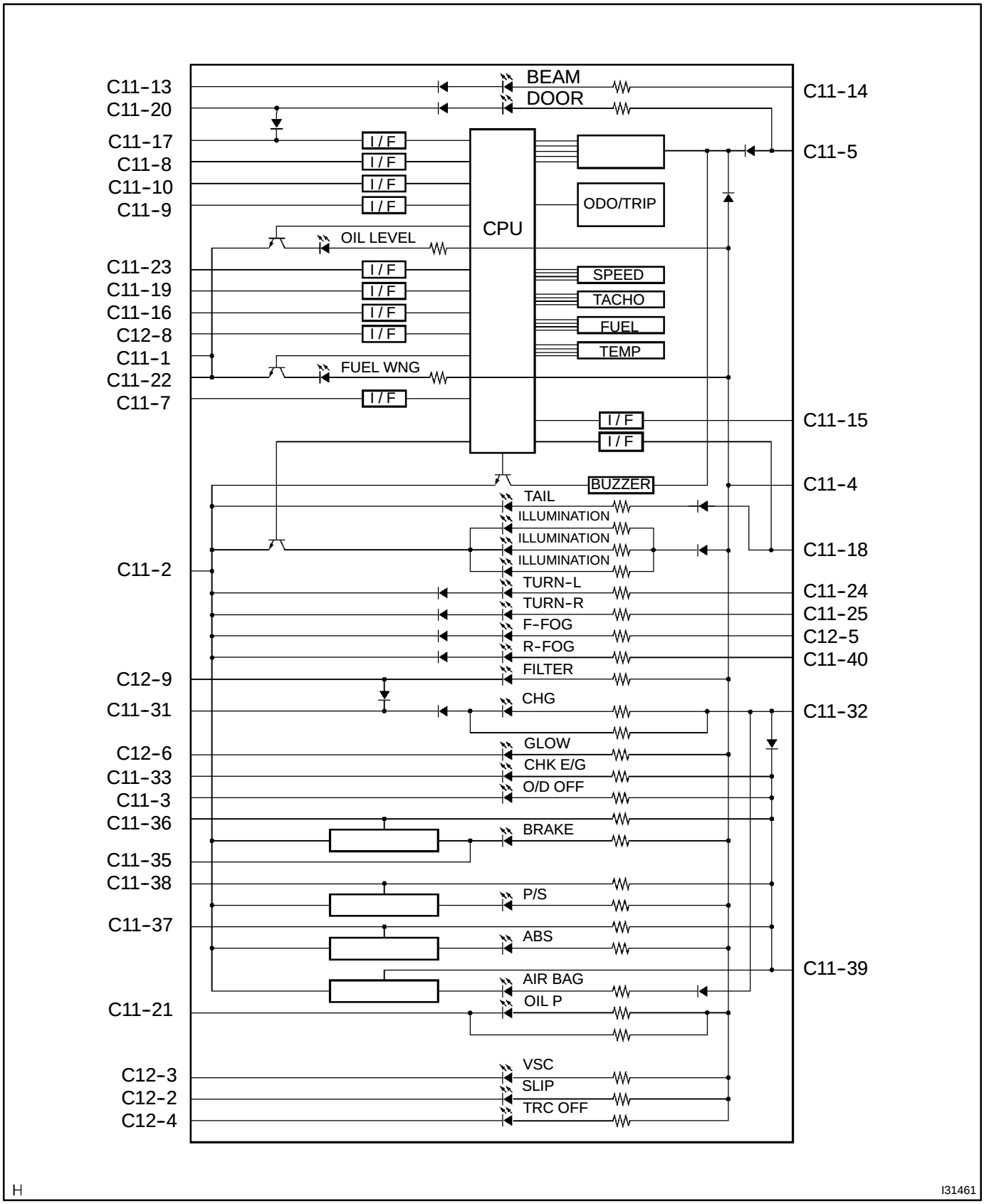
2ZZ-GE, 3ZZ-FE, 4ZZ-FE:

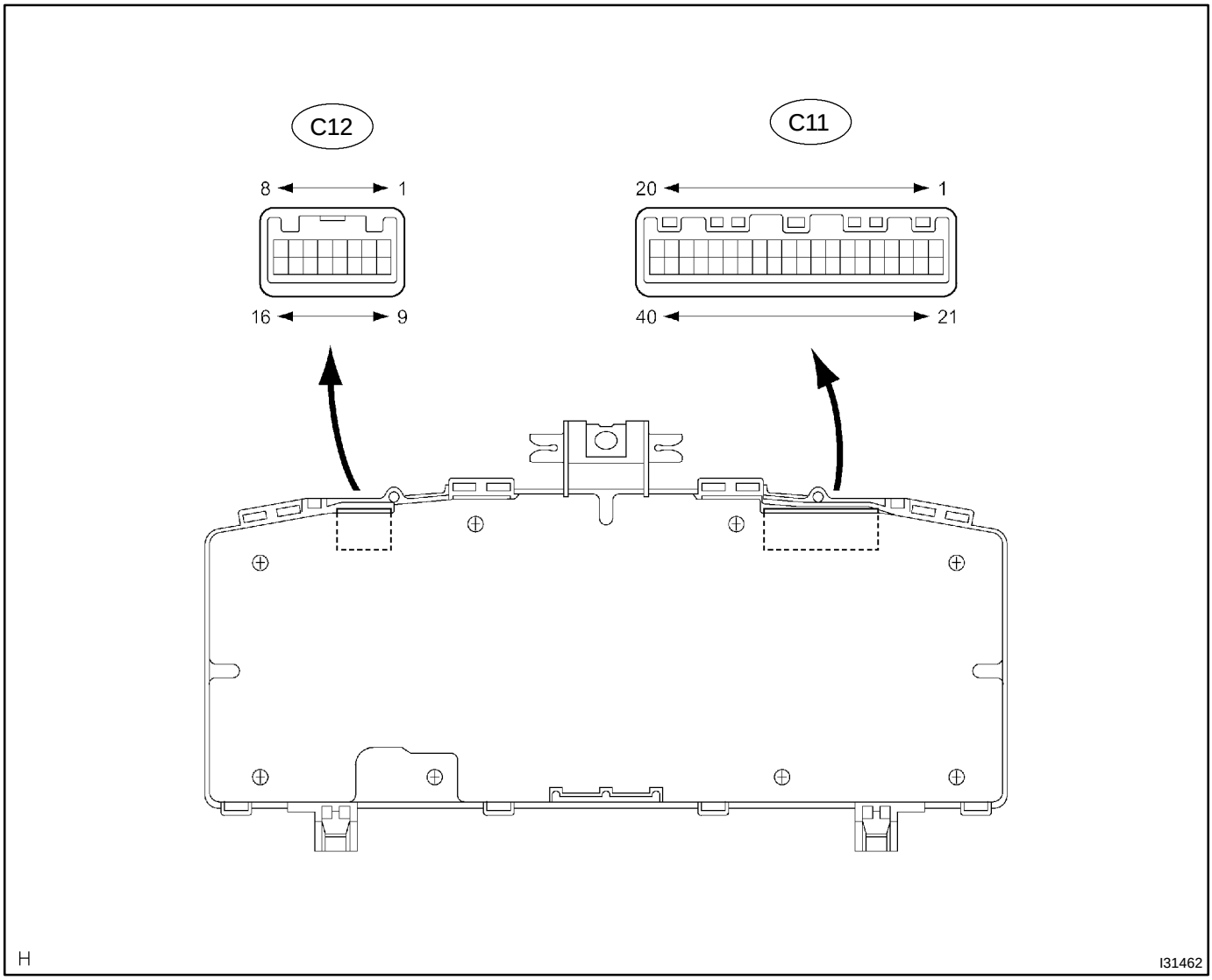
EFI
Water Temperature Switch



Lo Oil Pressure Warning Switch

I31466


C11-13
C11-20
C11-17
C11-8
C11-10
C11-9
C11-23
C11-19
C11-16
C12-8
C11-1
C11-22
C11-7
C11-2
C12-9
C11-31
C12-6
C11-33
C11-3
C11-36
C11-35
C11-38
C11-37
C11-21
C12-3
C12-2
C12-4
BEAM
DOOR
I/F
CPU
ODO/TRIP
OIL LEVEL
SPEED
TACHO
FUEL
TEMP
FUEL WNG
BUZZER
TAIL
ILLUMINATION
TURN-L
TURN-R
F-FOG
R-FOG
FILTER
CHG
GLOW
CHK E/G
O/D OFF
BRAKE
P/S
ABS
AIR BAG
OIL P
VSC
SLIP
TRC OFF
C11-14
C11-5
C11-15
C11-4
C11-18
C11-24
C11-25
C12-5
C11-40
C11-32
C11-39
H
I31461

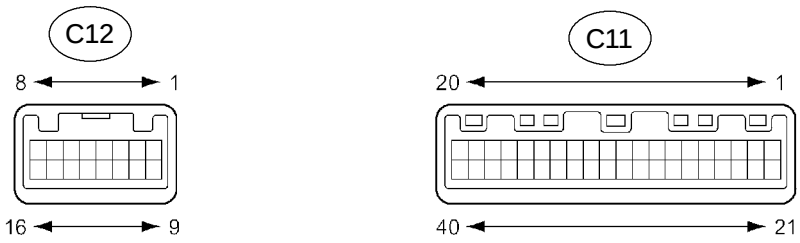

C12
C11
8
1
16
9
20
1
40
21
H
I31462

Terminal No.		Wire harness side
C11	1	Ground (Signal Ground)
	2	Ground (Power Ground)
	3	Engine ECU (M/T), Engine and ECT ECU (A/T)
	4	GAUGE Fuse
	5	DOME Fuse
	7	Fuel sender gauge
	8	Engine ECU (M/T), Engine and ECT ECU (A/T)
	9	Skid Control ECU (SI)
	10	Radio and Player, Navigation ECU, EMPS ECU, Engine ECU, Engine and ECT ECU
	13	Ground
	14	DRL Relay
	15	ST Fuse (M/T), Neutral Start Switch (A/T)
	16	Integration Relay
	17	Driver Side Courtesy Switch
	18	Light Control Switch
	19	Engine ECU (M/T), Engine and ECT ECU (A/T)
	20	Except Driver Side Courtesy Switch
	21	Engine Oil Pressure Switch
	22	Fuel sender gauge
	23	Back-up Light Switch (2ZZ-GE)
	24	Turn Signal Flasher
	25	Turn Signal Flasher
	31	Alternator
	32	IG2 Fuse
	33	Engine ECU (M/T), Engine and ECT ECU (A/T)
	35	Brake Fluid Level Warning Switch
	36	Skid Control ECU (EBD)
	37	Skid Control ECU (ABS)
	38	EMPS ECU
	39	Airbag Sensor Assembly
	40	Rear Fog Light
C12	2	Skid Control ECU (SLIP)
	3	Skid Control ECU (VSC)
	4	Skid Control ECU (TRC OFF)
	5	Front Fog Light
	6	Engine ECU (GLOW)
	8	Engine Oil Level Sensor
	9	Fuel Filter Warning Switch

05722-01

TERMINALS OF ECU

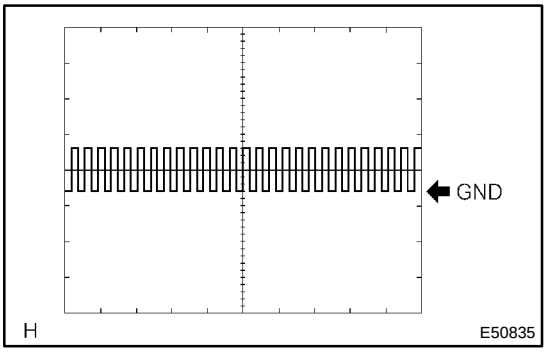
1. COMBINATION METER ASSY



I31463

Terminals No. (Symbols)	Wiring Color	Condition	STD Voltage (V)
C11-1 ↔ Body ground	SB (BR)	Constant	Continuity
C11-2 ↔ Body ground	SB (W-B)	Constant	Continuity
C11-3 ↔ Body ground	W (LG)	O/D off indicator light ON → OFF	Below1V → 10 - 14 V
C11-4 ↔ Body ground	SB (R-L)	Ignition switch OFF or ACC → ON	Below1V → 10 - 14 V
C11-5 ↔ Body ground	SB (L-Y)	Constant	10 - 14 V
C11-7 ↔ Body ground	W (Y-B)	Fuel level is full → empty	Below1V → 4 - 7 V
C11-8 ↔ Body ground	W (Y-R)	Ignition switch ON	Pulse generation (*8)
C11-9 ↔ Body ground	W (V-W)	Ignition switch ON and slowly turn drive wheel	Below 1 V ↔ 10 - 14 V
C11-10 ↔ Body ground	W (V-W)	Ignition switch ON and slowly turn drive wheel	Below 1 V ↔ 10 - 14 V
C11-13 ↔ Body ground	W (W-B) (*2) SB (R-G) (*3)	Hi beam indicator light ON → OFF	Below1V → 10 - 14 V
C11-14 ↔ Body ground	SB (R-L) (*2) SB (L-Y) (*3)	Constant	10 - 14 V
C11-15 ↔ Body ground	W (B-W)	Ignition switch OFF or ACC or ON	Below 1 V
		Engine start	10 - 14 V
C11-16 ↔ Body ground	SB (L-B)	Ignition key inserted	Below 1 V
		No ignition key inserted	10 - 14 V
C11-17 ↔ Body ground	SB (R-W)	Driver door opened → closed	Below1V → 10 - 14 V
C11-18 ↔ Body ground	SB (G) (*4)	Tail light switch OFF → ON	Below1V → 10 - 14 V
C11-19 ↔ Body ground	W (B)	Engine running	Pulse generation (*7)
C11-20 ↔ Body ground	SB (R-G)	Passenger door opened → closed	Below1V → 10 - 14 V
C11-21 ↔ Body ground	W (W)	Oil pressure warning light ON → OFF	Below1V → 10 - 14 V
C11-22 ↔ Body ground	SB (BR)	Constant	Continuity
C11-24 ↔ Body ground	W (G-B)	Left turn indicator light OFF → ON	Below1V → 10 - 14 V
C11-25 ↔ Body ground	W (G-Y)	Right turn indicator light OFF → ON	Below1V → 10 - 14 V
C11-31 ↔ Body ground	W (Y)	Discharge indicator light ON → OFF	Below1V → 10 - 14 V
C11-32 ↔ Body ground	SB (B-O)	Ignition switch OFF → ON	Below1V → 10 - 14 V
C11-33 ↔ Body ground	W (R-Y)	Malfunction indicator light ON → OFF	Below1V → 10 - 14 V
C11-35 ↔ Body ground	W (R-Y)	Ignition switch ON and brake fluid level warning light ON → OFF	Below1V → 10 - 14 V
C11-36 ↔ Body ground	W (R-W)	Brake warning light ON → OFF	4 - 8 V → Below1V
C11-37 ↔ Body ground	W (W-R)	ABS warning light ON → OFF	4 - 8 V → Below1V
C11-38 ↔ Body ground	W (R-Y)	P/S warning light ON → OFF	4 - 8 V → Below1V

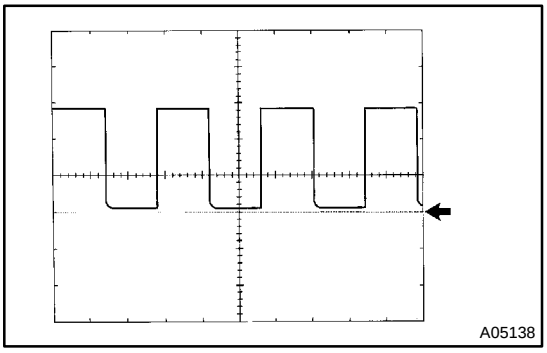
C11-39 ↔ Body ground	SB (B-Y)	A/B warning light ON → OFF	Below1V → 6 - 11 V
C11-40 ↔ Body ground	SB (R) (*5)	Rear foglight indicator light OFF → ON	Below1V → 10 - 14 V
C12-2 ↔ Body ground	SB (R-G)	SLIP indicator light ON → OFF	Below1V → 10 - 14 V
C12-3 ↔ Body ground	SB (L-B)	VSC indicator light ON → OFF	Below1V → 10 - 14 V
C12-4 ↔ Body ground	SB (R-Y)	TRCOFF indicator light ON → OFF	Below1V → 10 - 14 V
C12-5 ↔ Body ground	SB (R)	FR FOG indicator light OFF → ON	Below1V → 10 - 14 V
C12-6 ↔ Body ground (*6)	W (R)	GLOW indicator light ON → OFF	Below1V → 10 - 14 V
C12-8 ↔ Body ground (*6)	W (L)	OIL LEVEL indicator light OFF → ON	Below1V → 10 - 14 V
C12-9 ↔ Body ground (*6)	W (LG)	FILTER indicator light ON → OFF	Below1V → 10 - 14 V



(*1): Reference: Using oscilloscope:

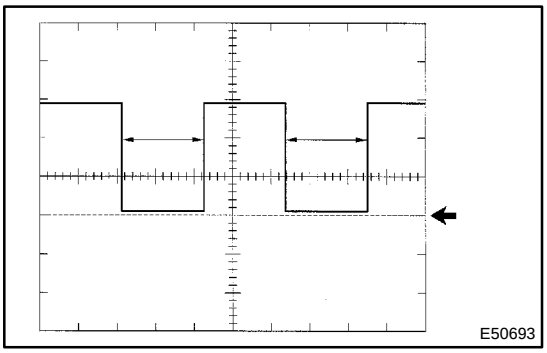
Item	Contents
Tool setting	10 V/ DIV, 20 ms/ DV
Vehicle condition	Engine idle speed

(*2): w/ Daytime running light
(*3): w/o Daytime running light
(*4): Except optitron meter
(*5): 2ZZ-GE Engine
(*6): 1CD-FTV Engine



(*7): Reference: Using oscilloscope:

Item	Contents
Tool setting	5 V/ DIV, 20 ms/ DV
Vehicle condition	Engine idle speed



(*8): Reference: Using oscilloscope:

Item	Contents
Tool setting	5 V/ DIV, 20 ms/ DV
Vehicle condition	Engine idle speed

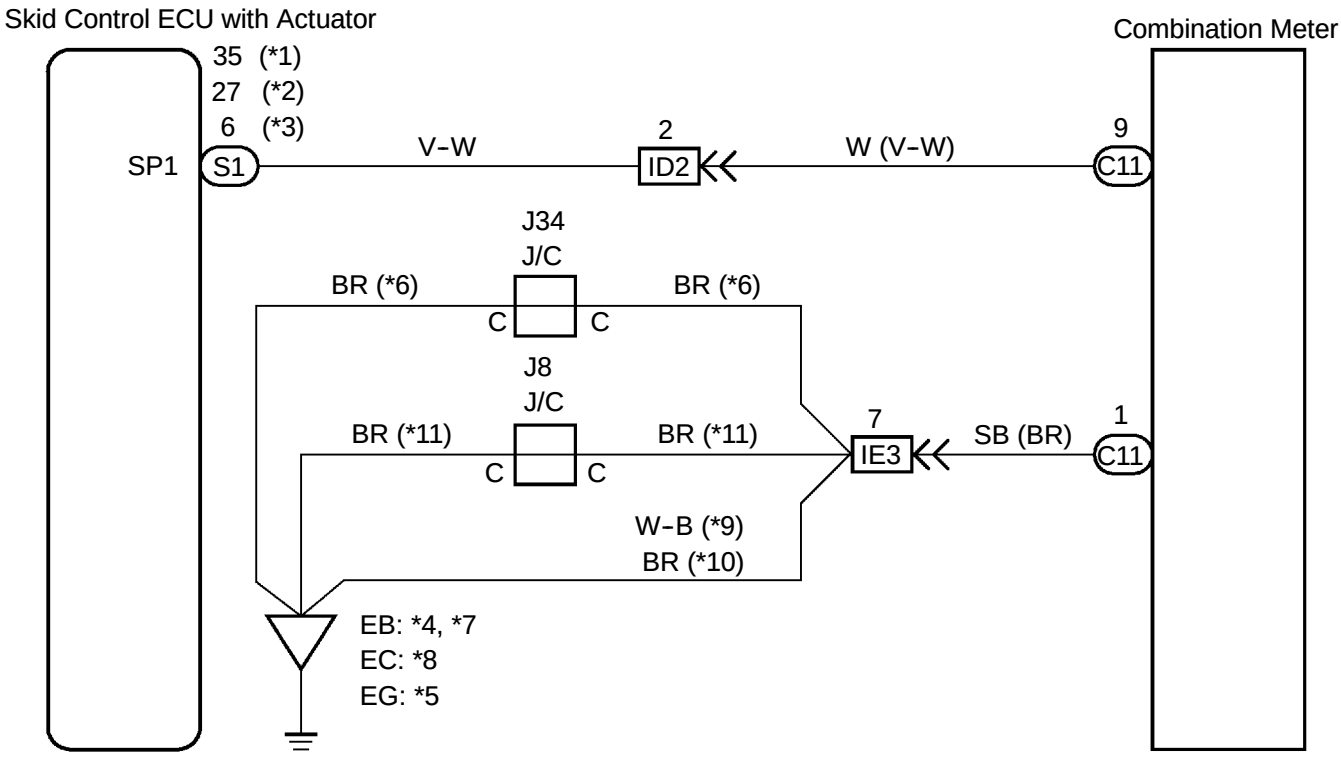
05656-02

PROBLEM SYMPTOMS TABLE

Chart No.	Symptom	See page
1	Malfunction in speedometer	05-1298
2	Malfunction in tachometer	05-1300
3	Malfunction in water temperature receiver gauge	05-1302
4	Malfunction in fuel receiver gauge	05-1304
5	Entire combination meter does not operate	05-1306
6	Key unlock warning buzzer or light auto turn off warning does not sound	05-1308
7	Reverse shift warning buzzer does not sound	05-1310
8	Malfunction in clock	05-1312

MALFUNCTION IN SPEEDOMETER

WIRING DIAGRAM

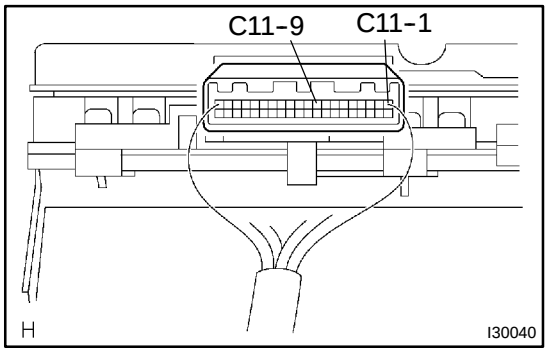


*1: TMUK Made w/ VSC
*2: TMC Made w/ ABS
*3: TMUK Made w/ ABS
*4: Gasoline
*5: Diesel
*6: 1CD-FTV
*7: Except 4ZZ-FE
*8: 4ZZ-FE
*9: 4ZZ-FE TMC Made
*10: LHD TMC Made 3ZZ-FE,
TMUK Made Except 2ZZ-GE, 1CD-FTV
*11: 2ZZ-GE, RHD TMC Made 3ZZ-FE

N
I31467

INSPECTION PROCEDURE

1	CHECK COMBINATION METER ASSY



(a) Remove the combination meter assy with connector still connected.

(b) Check voltage.

(1) Jack up either of the front wheels.

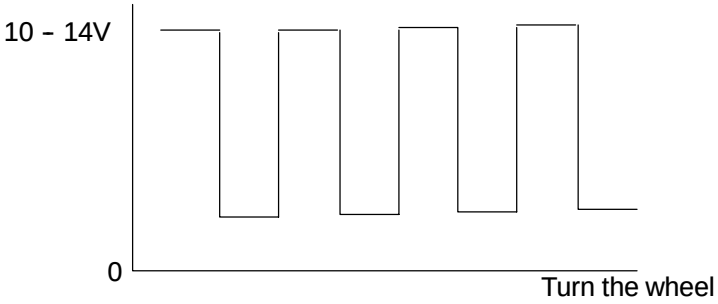
(2) Shift the shift lever to neutral.

(3) Turn the ignition switch to ON.

(4) Measure the voltage between terminals C11-9 and C11-1 of combination meter assy when front wheel is turning slowly.

Standard voltage:

Voltage is generated intermittently.



NG → **CHECK AND REPLACE COMBINATION METER ASSY**

OK

2	REPAIR OR REPLACE HARNESS AND CONNECTOR(BETWEEN COMBINATION METER AND SKID CONTROL ECU)

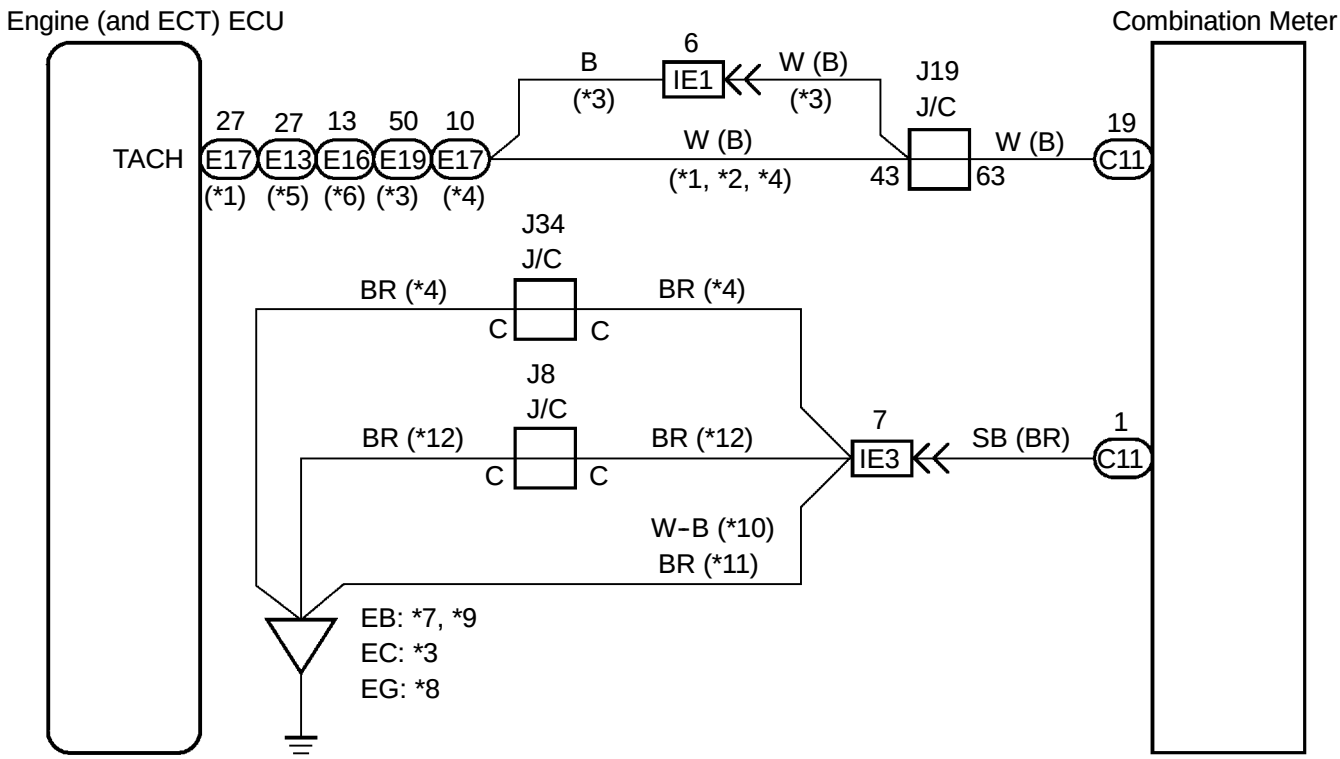
OK → **CHECK AND REPLACE VEHICLE SKID CONTROL SYSTEM**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

MALFUNCTION IN TACHOMETER

WIRING DIAGRAM



*1: 2ZZ-GE
*2: 3ZZ-FE
*3: 4ZZ-FE
*4: 1CD-FTV
*5: 3ZZ-FE (A/T)
*6: 3ZZ-FE (M/T)
*7: Gasoline
*8: Diesel
*9: Except 4ZZ-FE
*10: 4ZZ-FE TMC Made
*11: LHD TMC Made 3ZZ-FE, TMUK Made Except 2ZZ-GE, 1CD-FTV
*12: 2ZZ-GE, RHD TMC Made 3ZZ-FE

N
I31468

INSPECTION PROCEDURE

1	READ VALUE OF HAND-HELD TESTER

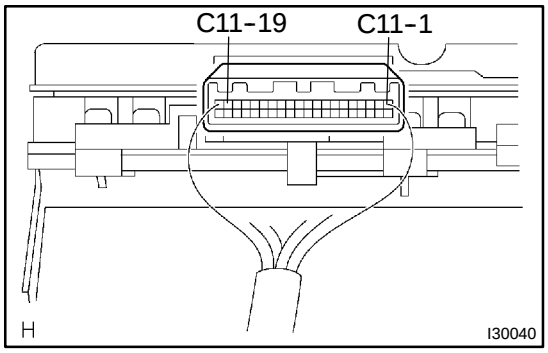
(a) Check output value of ECM.
  (1) Connect the hand-held tester to DLC3.
  (2) Turn the ignition switch to ON and push the hand-held tester main switch ON.
  (3) Select the item "ENGINE SPD" in the DATA LIST and read its value displayed on the hand-held tester.

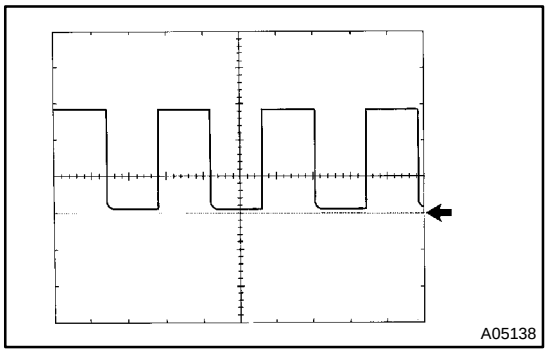
OK: There is almost no difference in the displayed engine rpm value.

NG → **GO TO ENGINE CONTROL SYSTEM**

OK

2	CHECK COMBINATION METER ASSY





(REFERENCE) INSPECTION USING OSCILLOSCOPE

(a) Check the input signal waveform.
  (1) Remove the combination meter assy with connectors still connected.
  (2) Connect the oscilloscope to the terminals C11-19 and C11-1 of combination meter assy.
  (3) Start engine.
  (4) Check the signal waveform.

Item	Contents
Tool setting	5 V/ DIV, 20 ms/ DV
Vehicle condition	Engine idle speed

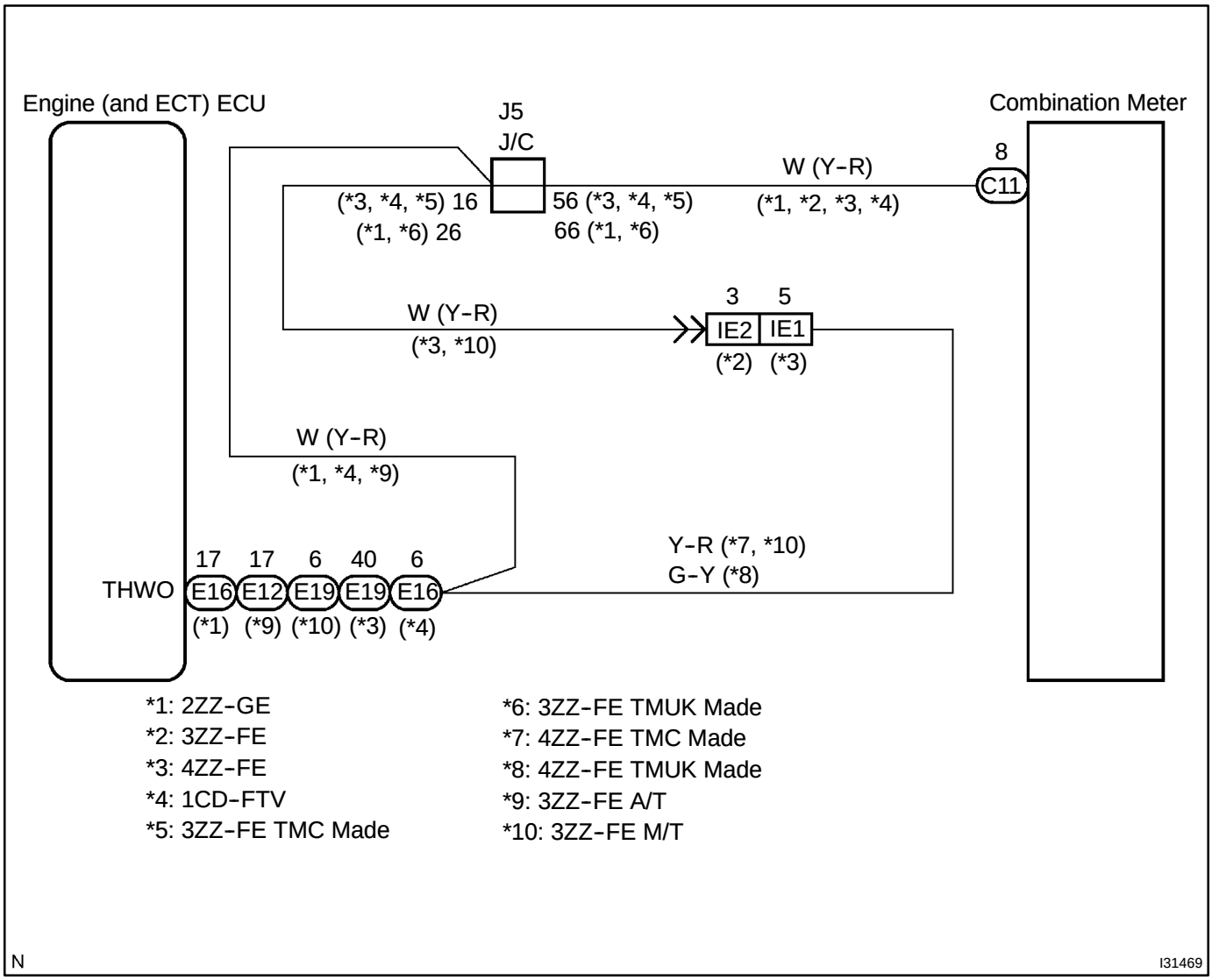
OK → **CHECK AND REPLACE COMBINATION METER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

MALFUNCTION IN WATER TEMPERATURE RECEIVER GAUGE

WIRING DIAGRAM



*1: 2ZZ-GE
*2: 3ZZ-FE
*3: 4ZZ-FE
*4: 1CD-FTV
*5: 3ZZ-FE TMC Made
*6: 3ZZ-FE TMUK Made
*7: 4ZZ-FE TMC Made
*8: 4ZZ-FE TMUK Made
*9: 3ZZ-FE A/T
*10: 3ZZ-FE M/T

INSPECTION PROCEDURE

1	READ VALUE OF HAND-HELD TESTER

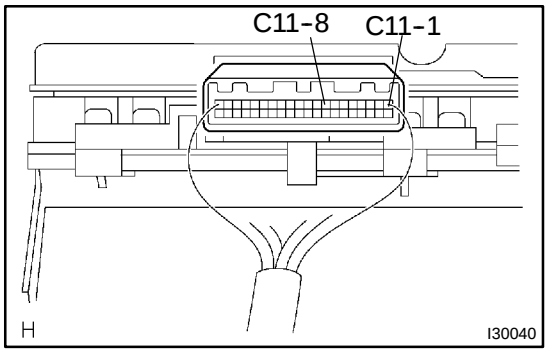
(a) Check output value of ECM.
  (1) Connect the hand-held tester to DLC3.
  (2) Turn the ignition switch to ON and push the hand-held tester main switch ON.
  (3) Select the item "COOLANT TEMP" in the DATA LIST and read its value displayed on the hand-held tester.

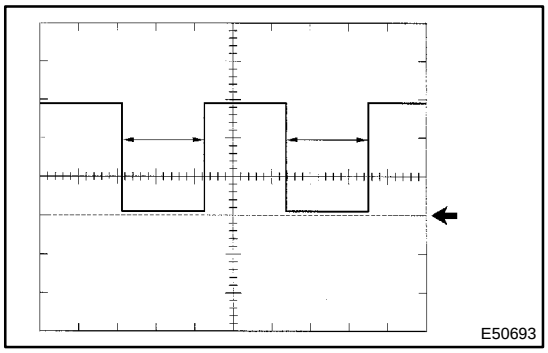
OK: Same as actual engine coolant temperature.

NG → **GO TO ENGINE CONTROL SYSTEM**

OK

2	CHECK COMBINATION METER ASSY





(REFERENCE) INSPECTION USING OSCILLOSCOPE

(a) Check the input signal waveform.
  (1) Remove the combination meter assy with connectors still connected.
  (2) Connect the oscilloscope to the terminals C11-8 and C11-1 of combination meter assy.
  (3) Start engine.
  (4) Check the signal waveform.

Item	Contents
Tool setting	5 V/ DIV, 20 ms/ DV
Vehicle condition	Engine idle speed

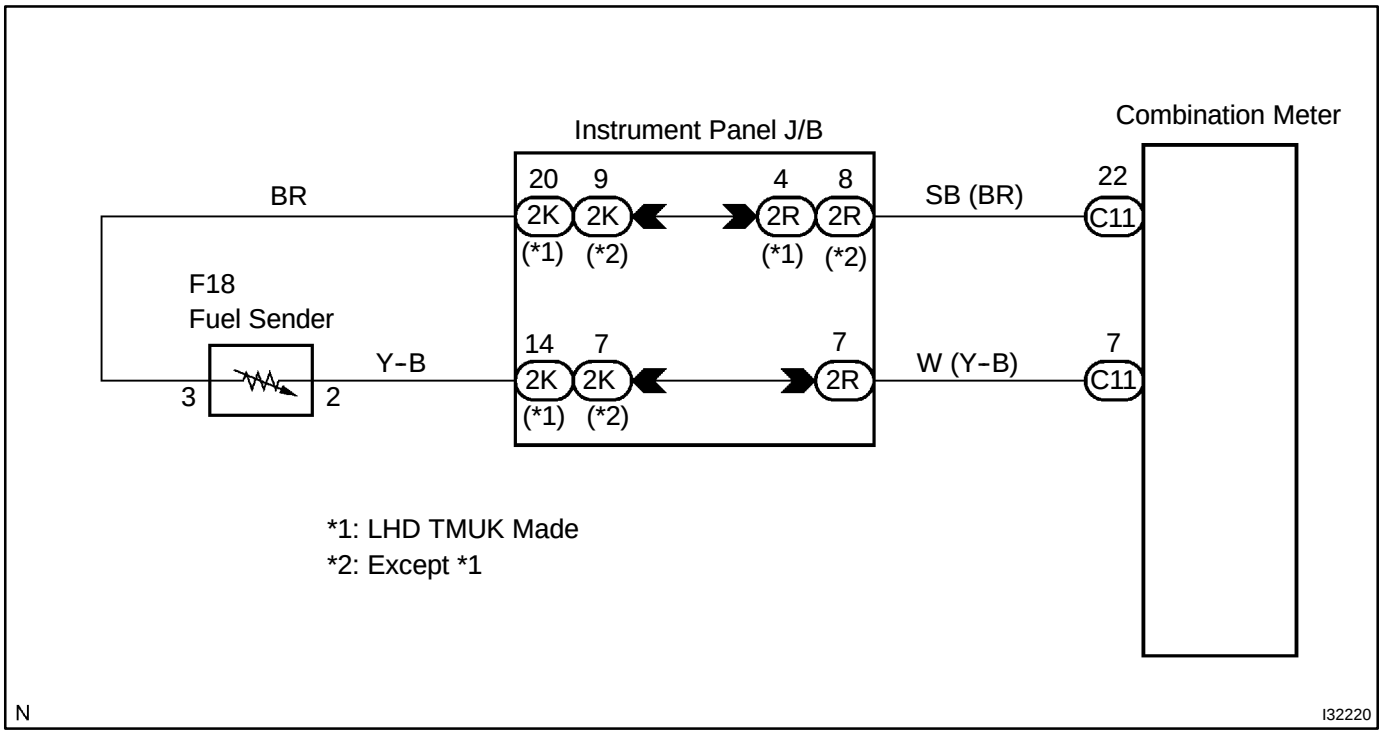
OK → **CHECK AND REPLACE COMBINATION METER ASSY**

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

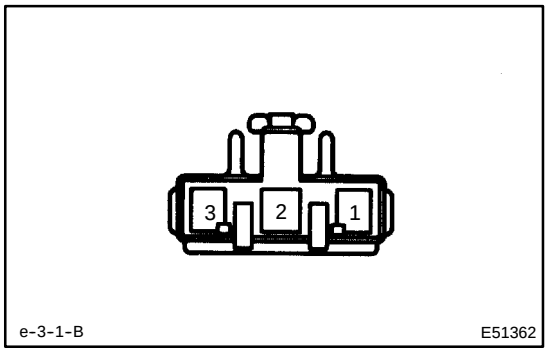
MALFUNCTION IN FUEL RECEIVER GAUGE

WIRING DIAGRAM



INSPECTION PROCEDURE

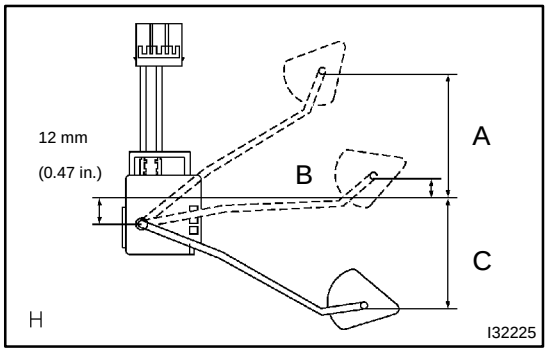
1	INSPECT FUEL SENDER GAGE ASSY



(a) Check fuel sender gauge resistance.
(1) Disconnect the connector fuel sender gauge.
(2) Check the float position between terminals 2 and 3 of the connector. Check that the resistance value changes continuity.

Standard voltage:

Float level	Float position mm (in.)	Resistance (Ω)
F (A)	64.5 (2.54) ± 3 (0.12)	15.0 ± 1
1/2 (B)	11.6 (0.46) ± 3 (0.12)	54.7 ± 3
E (C)	52.7 (2.07) ± 3 (0.12)	107.0 ± 1



NG → REPLACE FUEL SENDER GAGE ASSY

OK

2	CHECK HARNESS AND CONNECTOR(BETWEEN COMBINATION METER AND FUEL SENDER GAGE ASSY)

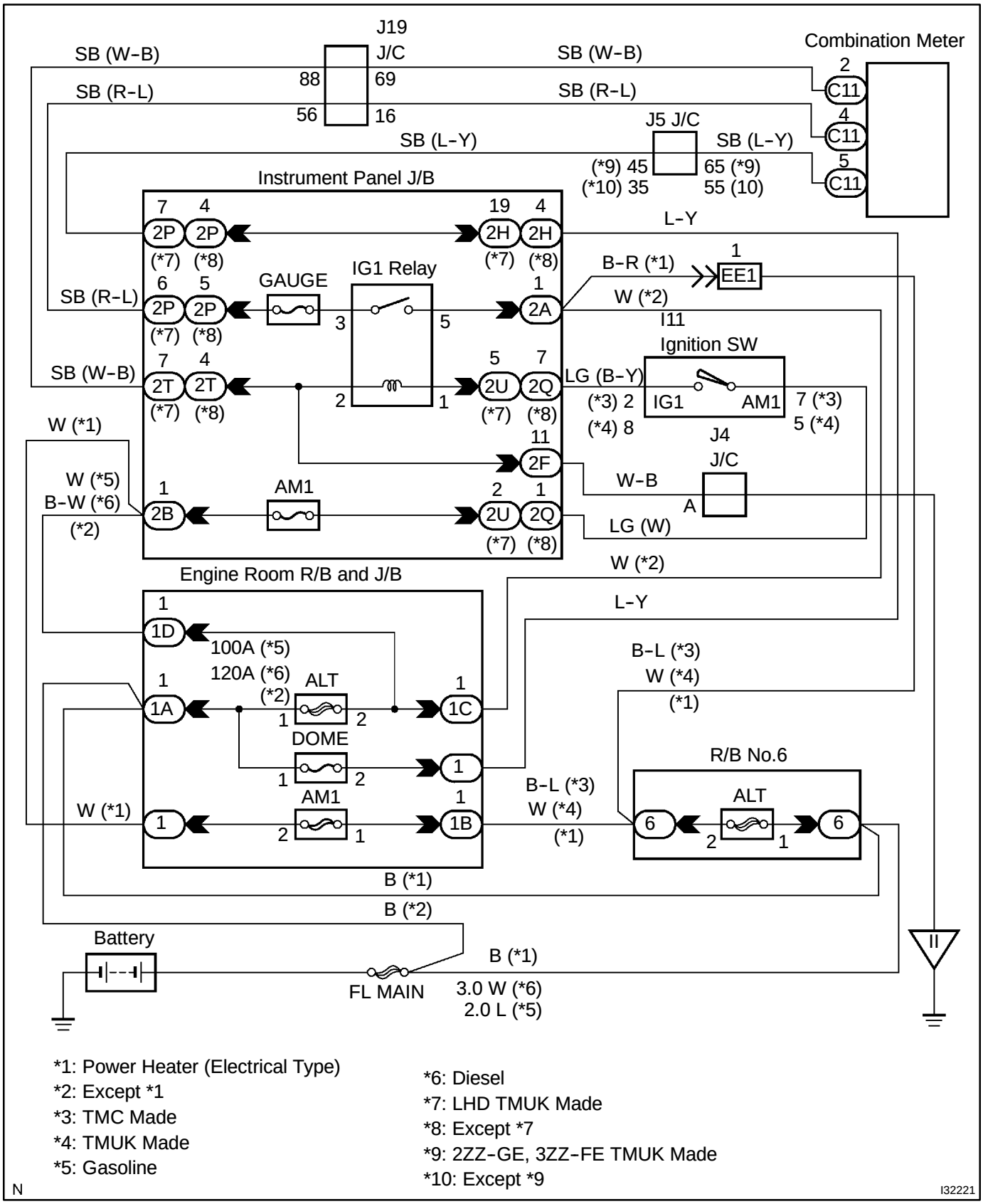
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE COMBINATION METER ASSY

ENTIRE COMBINATION METER DOES NOT OPERATE

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: TMC Made
*4: TMUK Made
*5: Gasoline
*6: Diesel
*7: LHD TMUK Made
*8: Except *7
*9: 2ZZ-GE, 3ZZ-FE TMUK Made
*10: Except *9

N
I32221

INSPECTION PROCEDURE

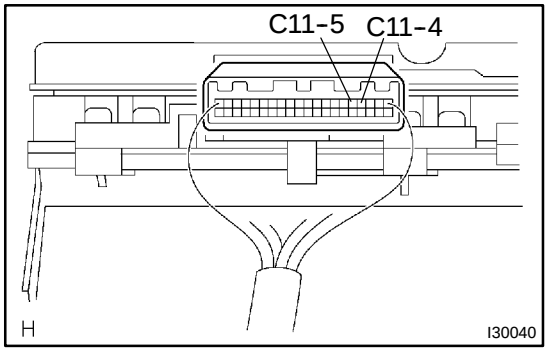
1	INSPECT FUSE(DOME,GAUGE)

(a) Check the continuity in DOME fuse.
(b) Check the continuity in GAUGE fuse.

NG → REPLACE FUSE

OK

2	CHECK COMBINATION METER ASSY(POWER SOURCE CIRCUIT)

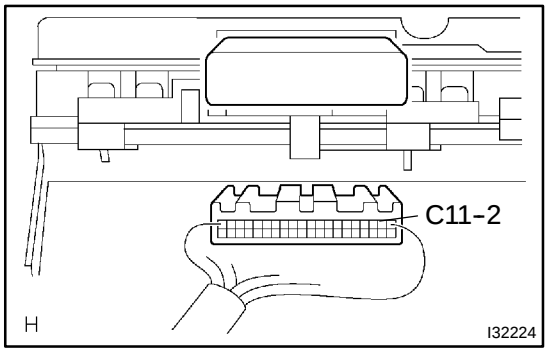


(a) Check voltage.
(1) Remove the combination meter assy with connectors still connected.
(2) Measure voltage between terminal C11-5 of combination meter assy connector and body ground.
Voltage: 10 - 14 V
(3) Turn the ignition switch to ON.
(4) Measure voltage between terminal C11-4 of combination meter assy connector and body ground.
Voltage: 10 - 14 V

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3	CHECK COMBINATION METER ASSY(GROUND CIRCUIT)



(a) Check continuity.
(1) Disconnect the "C11" connector from combination meter assy.
(2) Check continuity between terminal C11-2 of combination meter assy connector and body ground.
OK: Continuity exists

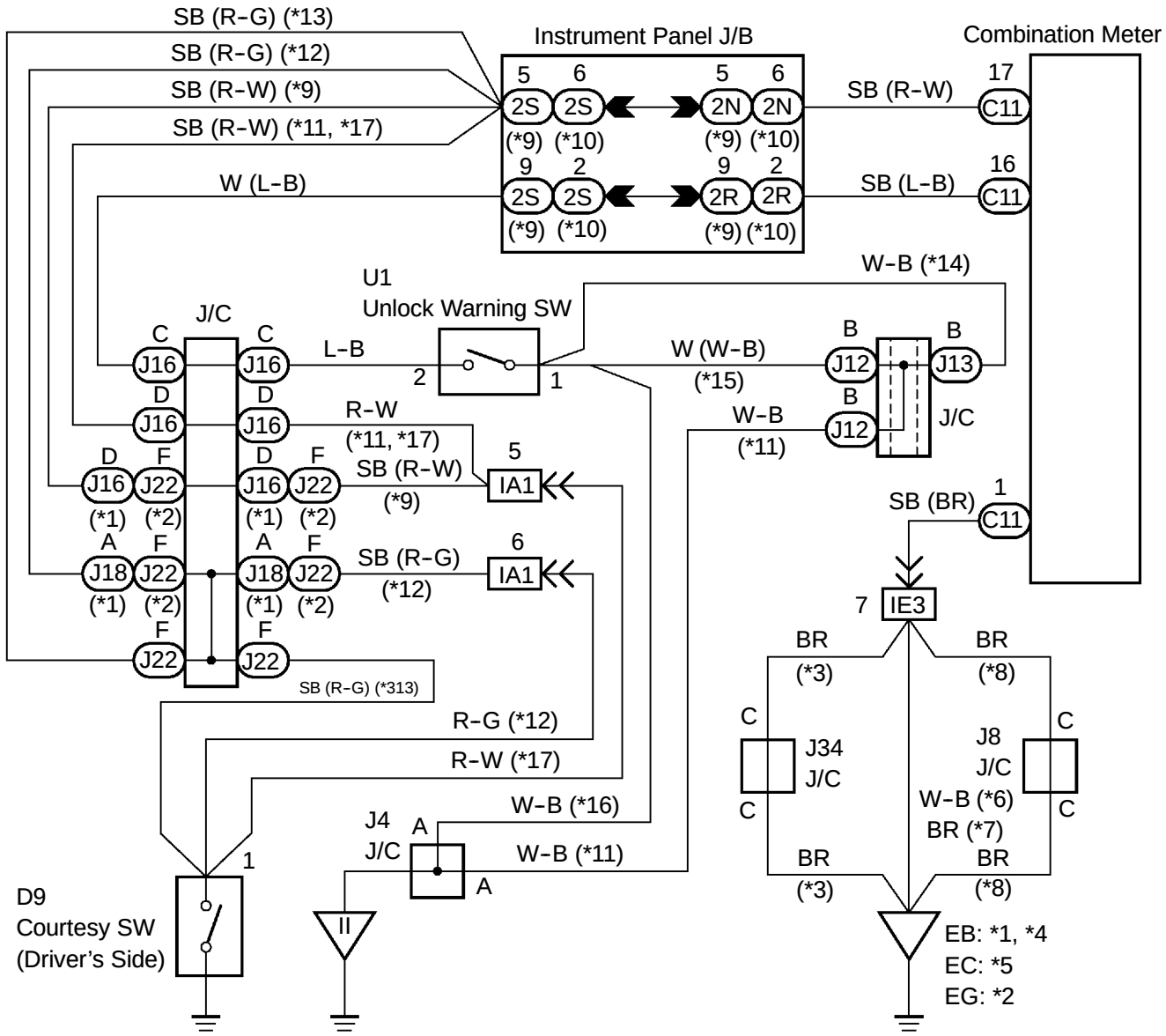
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE COMBINATION METER ASSY

"KEY UNLOCK WARNING BUZZER" OR "LIGHT AUTO TURN OFF WARNING BUZZER" DOES NOT OPERATE

WIRING DIAGRAM



*1: Gasoline
*2: Diesel
*3: 1CD-FTV
*4: Except 4ZZ-FE
*5: 4ZZ-FE
*6: 4ZZ-FE TMC Made
*7: LHD TMC Made 3ZZ-FE, TMUK Made Except 2ZZ-GE, 1CD-FTV
*8: 2ZZ-GE, RHD TMC Made 3ZZ-FE
*9: LHD TMUK Made
*10: Except *9
*11: TMC Made
*12: RHD H/B
*13: RHD W/G
*14: TMC Made Except LHD Diesel
*15: TMC Made LHD Diesel
*16: TMUK Made
*17: LHD

N
I32222

INSPECTION PROCEDURE

1	CHECK BUZZER(KEY UNLOCK WARNIG,LIGHT AUTO TURN OFF WARNING)

(a) Check that the all of the warning buzzer sound.

A	All buzzers do not sound.
B	Key unlock warning buzzer does not sound
C	Light auto turn off warning buzzer does not sound

B → **Go to step 2**

C → **Go to step 4**

A

CHECK AND REPLACE COMBINATION METER ASSY

2	INSPECT UN-LOCK WARNING SWITCH ASSY (See page 80-2, 80-4)

NG → **REPLACE UN-LOCK WARNING SWITCH ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(BETWEEN COMBINATION METER AND KEY UNLOCK WARNING SWITCH)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE COMBINATION METER ASSY

4	INSPECT FRONT DOOR COURTESY LAMP SWITCH ASSY (See page 65-8)

NG → **REPLACE FRONT DOOR COURTESY LAMP SWITCH ASSY**

OK

5	CHECK HARNESS AND CONNECTOR(BETWEEN COMBINETION METER AND DOOR COURTESY SWITCH)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

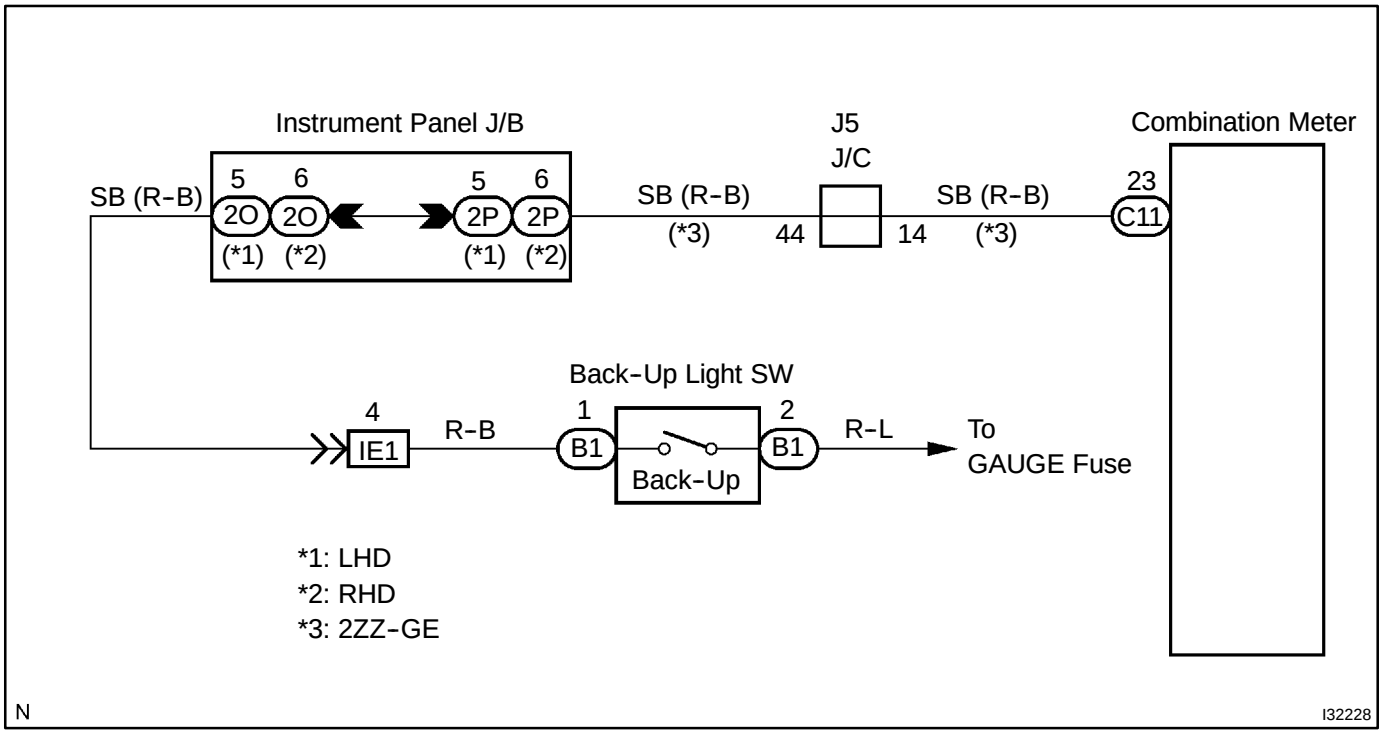
CHECK AND REPLACE COMBINATION METER ASSY

REVERSE SHIFT WARNING BUZZER DOES NOT SOUND

CIRCUIT DESCRIPTION

Confirm that the 6 M/T, then check this circuit.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK BUZZER

(a) Check that the all of the warning buzzer sound.

A	Reverse shift warning buzzer does not sound.
B	Key unlock warning buzzer or light auto turn off warning does not sound.
C	All buzzers do not sound.

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE (See page 05-1297)

C → CHECK AND REPLACE COMBINATION METER ASSY

A

2	INSPECT BACK UP LAMP SWITCH ASSY (See page 65-8)

NG → REPLACE BACK UP LAMP SWITCH ASSY

OK

3	CHECK HARNESS AND CONNECTOR

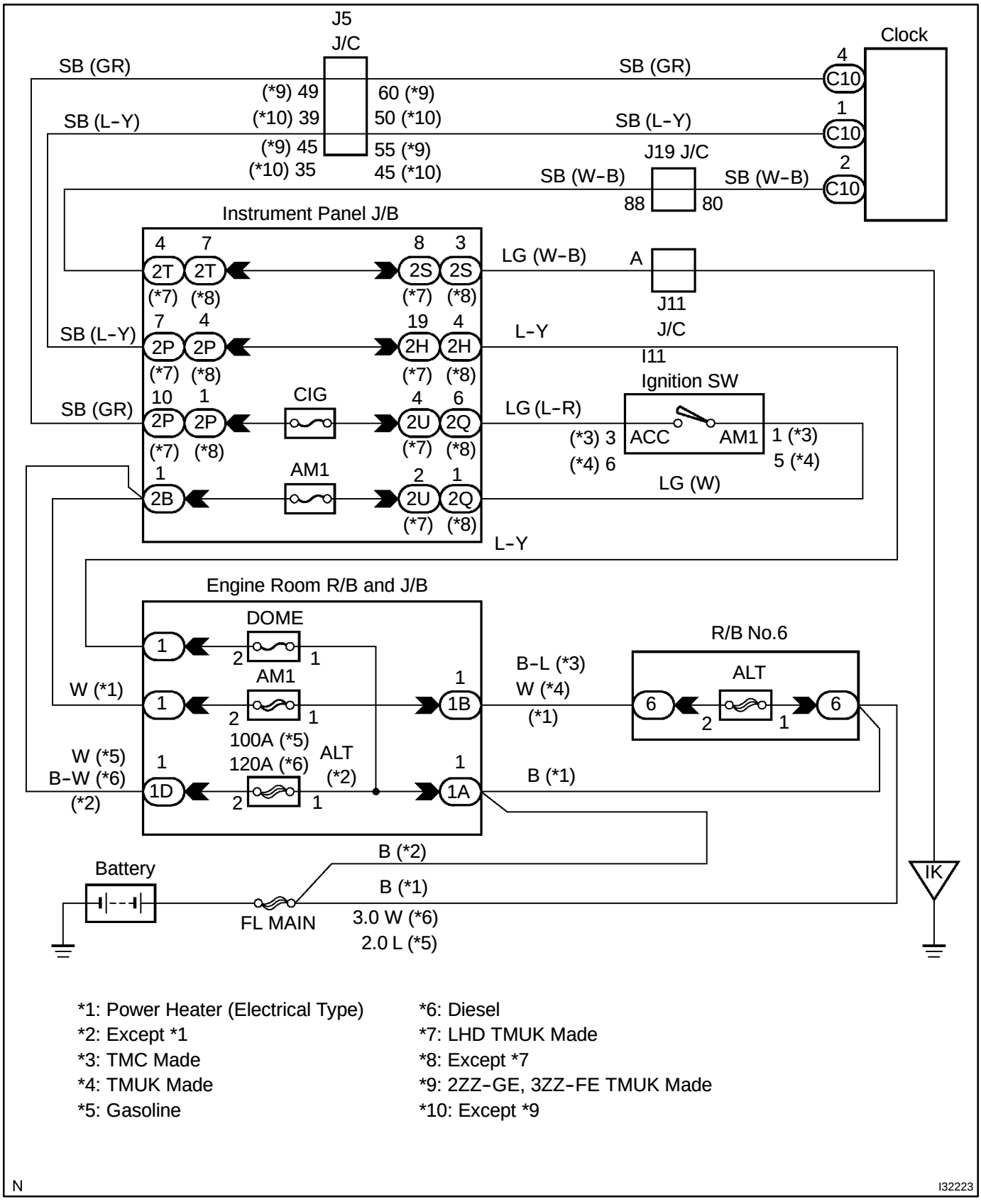
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE COMBINATION METER ASSY

MALFUNCTION IN CLOCK

WIRING DIAGRAM



*1: Power Heater (Electrical Type)
*2: Except *1
*3: TMC Made
*4: TMUK Made
*5: Gasoline
*6: Diesel
*7: LHD TMUK Made
*8: Except *7
*9: 2ZZ-GE, 3ZZ-FE TMUK Made
*10: Except *9

N
I32223

INSPECTION PROCEDURE

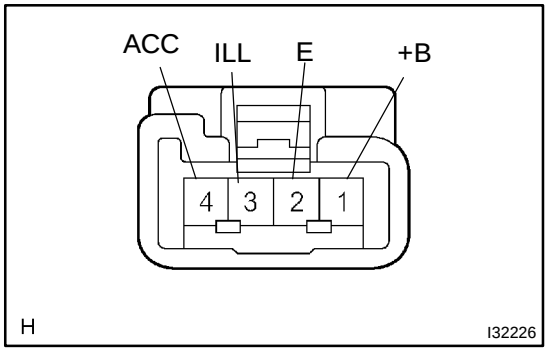
1	INSPECT FUSE(CIG,DOME)

(a) Check the continuity in CIG fuse.
(b) Check the continuity in DOME fuse.

NG → REPLACE FUSE

OK

2	CHECK HARNESS AND CONNECTOR



(a) Check voltage.
(1) Remove the clock assy with connector still connected.
(2) Measure voltage between terminal 1 (+B) of clock assy connector and body ground.
Standard voltage: 10 - 14 V
(3) Turn the ignition switch to ACC.
(4) Measure voltage between terminal 4 (ACC) of clock assy connector and body ground.
Standard voltage: 10 - 14 V

OK → REPLACE CLOCK ASSY

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

POWER DOOR LOCK CONTROL SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

0578U-01

1	VEHICLE BROUGHT IN

2	CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK (See page 05-1315)

3	SYMPTOMS TABLE (See page 05-1328)

(a) Without applicable symptoms, proceed to A
(b) With applicable symptoms, proceed to B

B → GO TO STEP 6

A

4	PERFORM TROUBLESHOOTING IN THE FOLLOWING METHOD, DEPENDING ON MALFUNCTION SYMPTOM

(a) Terminal of ECU
(b) Inspection
(c) On-vehicle inspection

5	ADJUSTMENT, REPAIR OR REPLACEMENT

END

0578V-01

CUSTOMER PROBLEM ANALYSIS CHECK

DOOR LOCK CONTROL SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

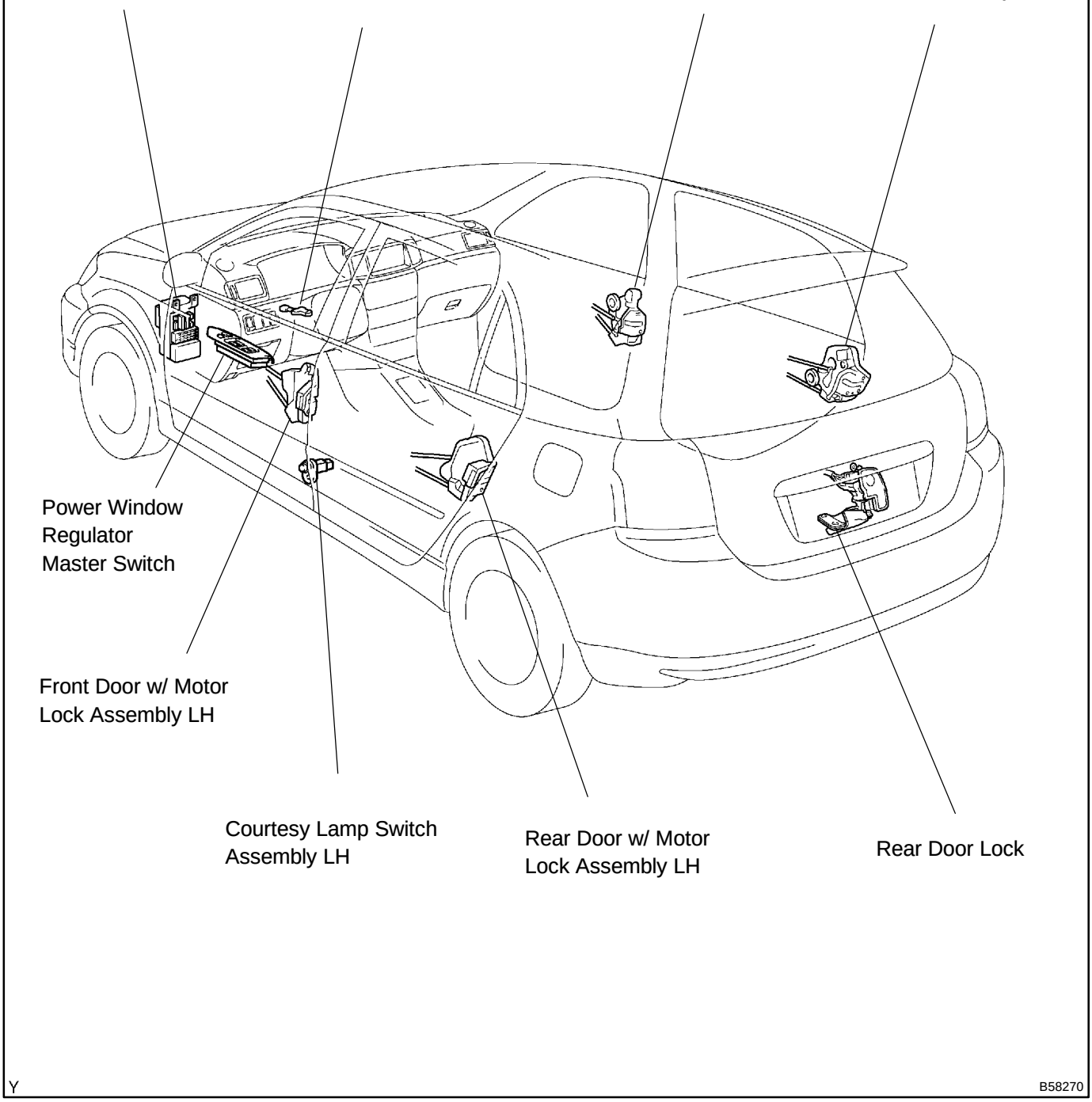
Date Problem First Occurred		/ /
Frequency Problem Occurs		j Constant j Sometimes (Times per day, month) j Once only
Weather Conditions When Problem Occurred	**Weather**	j Fine j Cloudy j Rainy j Snowy j Various/Others
	Outdoor temperature	j Hot j Warm j Cool j Cold (Approx. °F (°C))

Problem Symptom	j Malfunction in Door Lock/ Unlock Operation Using Door Lock Control Switch.	j Driver's side door lock control switch.	j Driver's side door j Passenger's side door
		j Passenger's side door key lock and unlock control switch.	j Driver's side door j Passenger's side door
	j Malfunction in Door Lock/ Unlock Operation Using Key.	j Driver's side door key lock and unlock control switch.	j Driver's side door j Passenger's side door
		j Passenger's side door key lock and unlock control switch.	j Driver's side door j Passenger's side door
		j 2-operation unlock function of driver's side door key lock and unlock switch.	
	j Malfunction in Key Confinement Prevention Function.		
	j Malfunction in Luggage Compartment Door Opener Function.		
	j Others.		

0578W-01

LOCATION

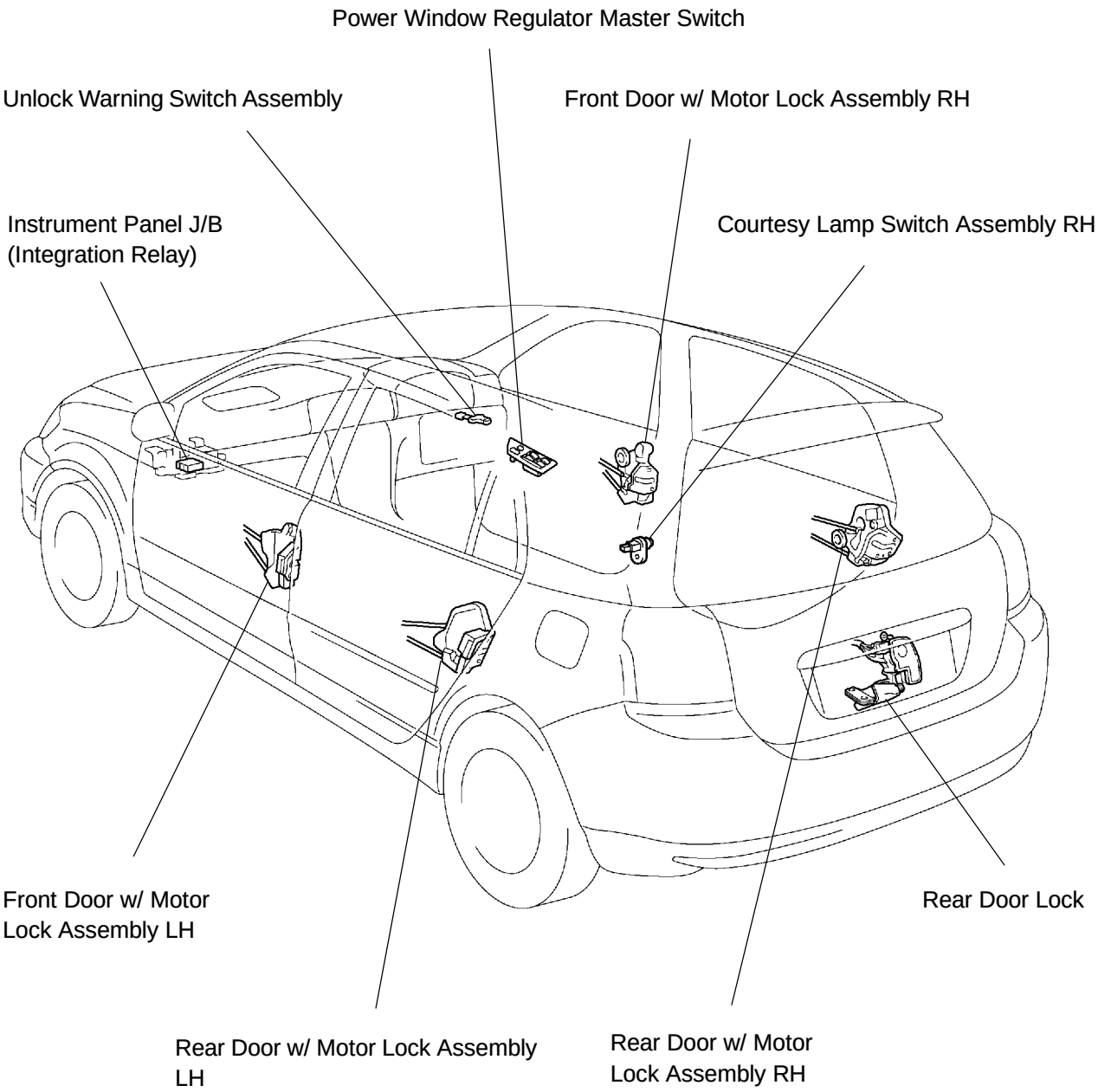
TMUK Made (LHD)



Y

B58270

TMUK Made (RHD)

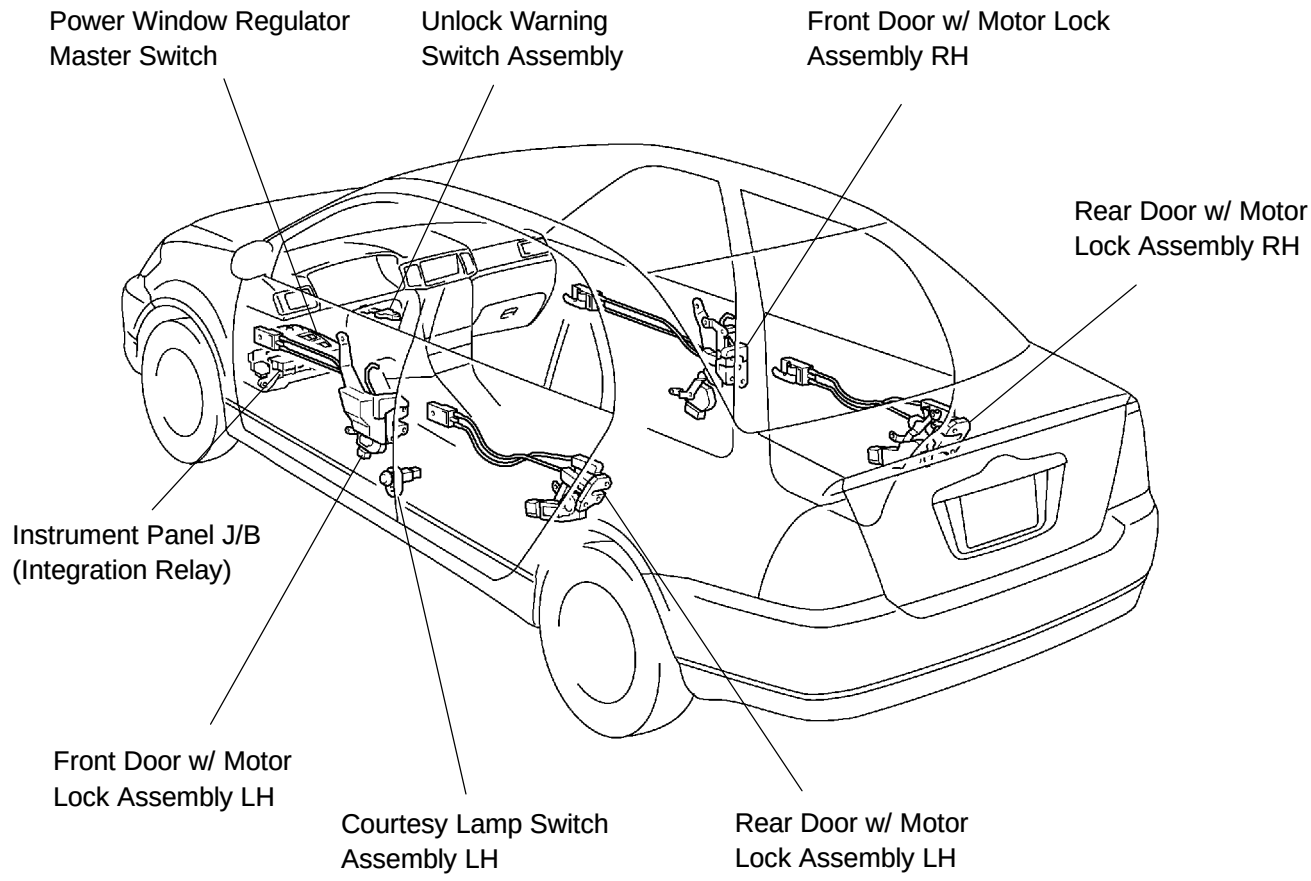


Y

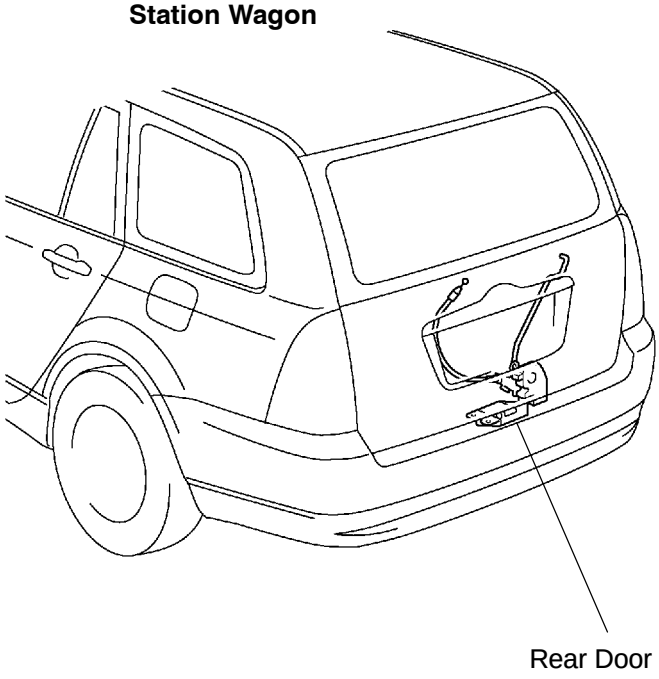
B58003

TMC Made (LHD)

Sedan

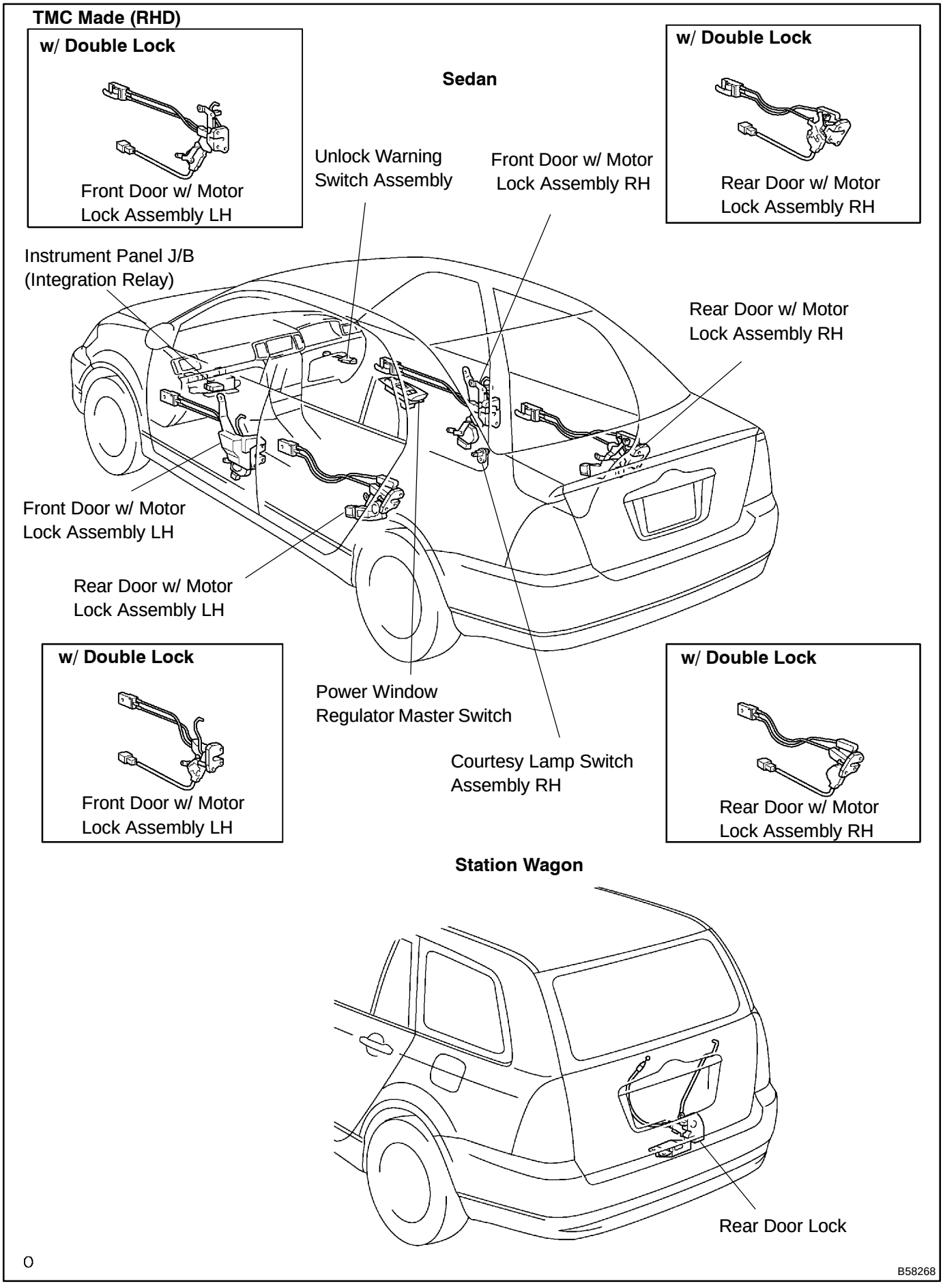


Station Wagon



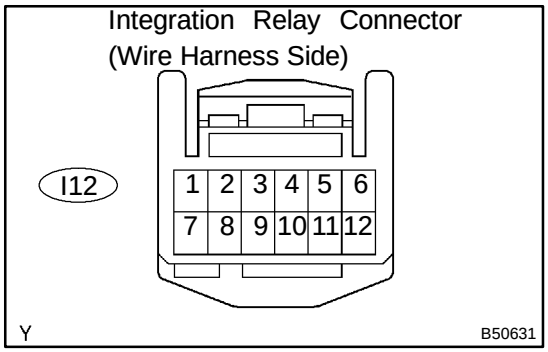
O

B58267


TMC Made (RHD)
w/ Double Lock
Front Door w/ Motor Lock Assembly LH
Sedan
w/ Double Lock
Rear Door w/ Motor Lock Assembly RH
Unlock Warning Switch Assembly
Front Door w/ Motor Lock Assembly RH
Instrument Panel J/B (Integration Relay)
Rear Door w/ Motor Lock Assembly RH
Front Door w/ Motor Lock Assembly LH
Rear Door w/ Motor Lock Assembly LH
w/ Double Lock
Front Door w/ Motor Lock Assembly LH
Power Window Regulator Master Switch
Courtesy Lamp Switch Assembly RH
w/ Double Lock
Rear Door w/ Motor Lock Assembly RH
Station Wagon
Rear Door Lock
O
B58268

0578X-01

TERMINALS OF ECU



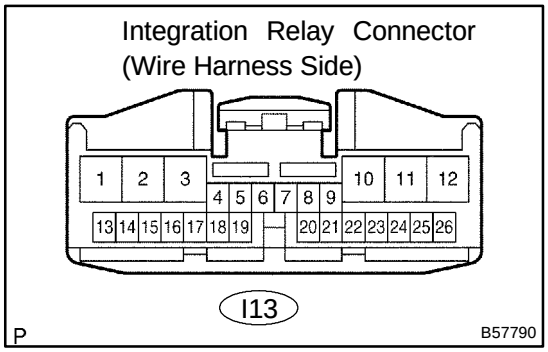
1. INSPECT INTEGRATION RELAY WITH DOOR CONTROL (w/o Double Lock)

(a) Disconnect the connector and check the continuity of each terminal of the vehicle's connector.

Standard :

Tester connection	Wiring color	Condition	Specified Condition
L1 (I12-4) ⇔ Ground	L-W ⇔ -	[w/ power window] Master switch (Manual door lock operation) OFF → LOCK	No continuity → Continuity
		[w/o power window] Door control switch (Manual operation) OFF → LOCK	
		Using the key, operate the driver's door lock cylinder OFF → LOCK	
L2 (I12-2) ⇔ Ground	G-Y ⇔ -	Using the key, operate the driver's door lock cylinder LOCK → Other position	Continuity → No continuity
UL1 (I12-3) ⇔ Ground	L-Y ⇔ -	[w/ power window] Master switch (Manual door lock operation) OFF → UNLOCK	No continuity → Continuity
		[w/o power window] Door control switch (Manual operation) OFF → UNLOCK	
		Using the key, operate the driver's door lock cylinder OFF → UNLOCK	
UL2 (I12-1) ⇔ Ground	L-R ⇔ -	Using the key, operate the driver's door lock cylinder UN- LOCK → Other position	Continuity → No continuity
LSWD (I12-5) ⇔ Ground	W ⇔ -	Driver's door lock control knob LOCK → UNLOCK	No continuity → Continuity

If the condition is not as specified, it means that the vehicle malfunctions.



2. INSPECT INTEGRATION RELAY WITH DOOR CONTROL (w/ Double Lock)

(a) Disconnect the connector and check the continuity of each terminal of the vehicle's connector.

Standard:

Tester connection	Wiring color	Condition	Specified Condition
L1 (I13-9) ⇔ Ground	L-W ⇔ -	[w/ power window] Master switch (Manual door lock operation) OFF → LOCK	No continuity → Continuity
		[w/o power window] Door control switch (Manual operation) OFF → LOCK	
		Using the key, operate the driver's door lock cylinder OFF → LOCK	
L2 (I13-7) ⇔ Ground	G-Y ⇔ -	Using the key, operate the driver's door lock cylinder LOCK → Other position	Continuity → No continuity
UL1 (I13-8) ⇔ Ground	L-Y ⇔ -	Door control switch (Manual operation) OFF → UNLOCK	No continuity → Continuity
		Using the key, operate the driver's door lock cylinder OFF → UNLOCK	
UL2 (I13-6) ⇔ Ground	L-R ⇔ -	Using the key, operate the driver's door lock cylinder UNLOCK → Other position	Continuity → No continuity
LSWD (I13-19) ⇔ Ground	W ⇔ -	Driver's door lock control knob LOCK → UNLOCK	No continuity → Continuity

If the condition is not as specified, it means that the vehicle malfunctions.

3. TMUK made models:

INSPECT INSTRUMENT PANEL J/B (INTEGRATION RELAY)

(a) Inspect the fuse.

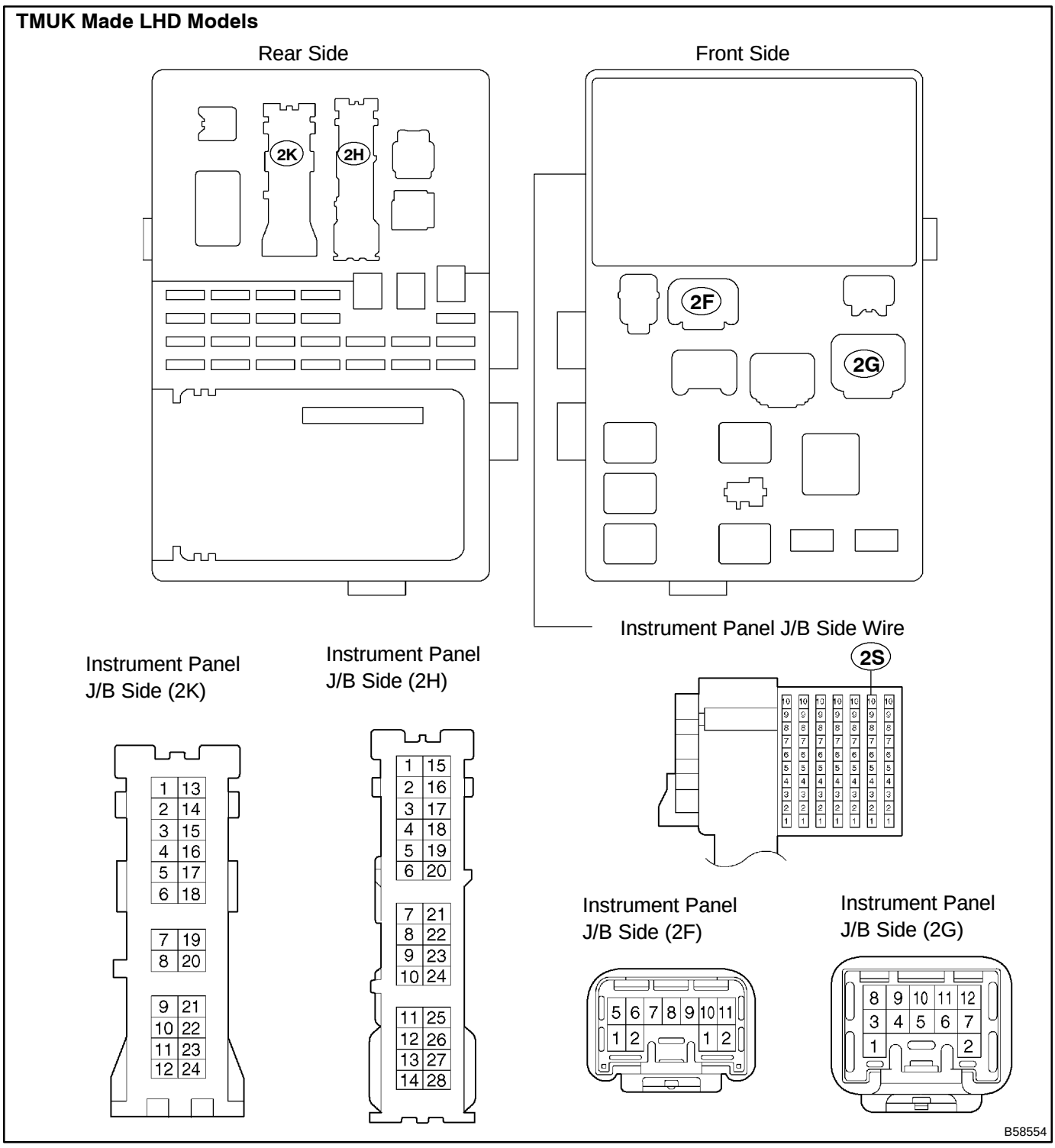
(1) Inspect DOOR fuse.

(b) Inspect the integration relay.

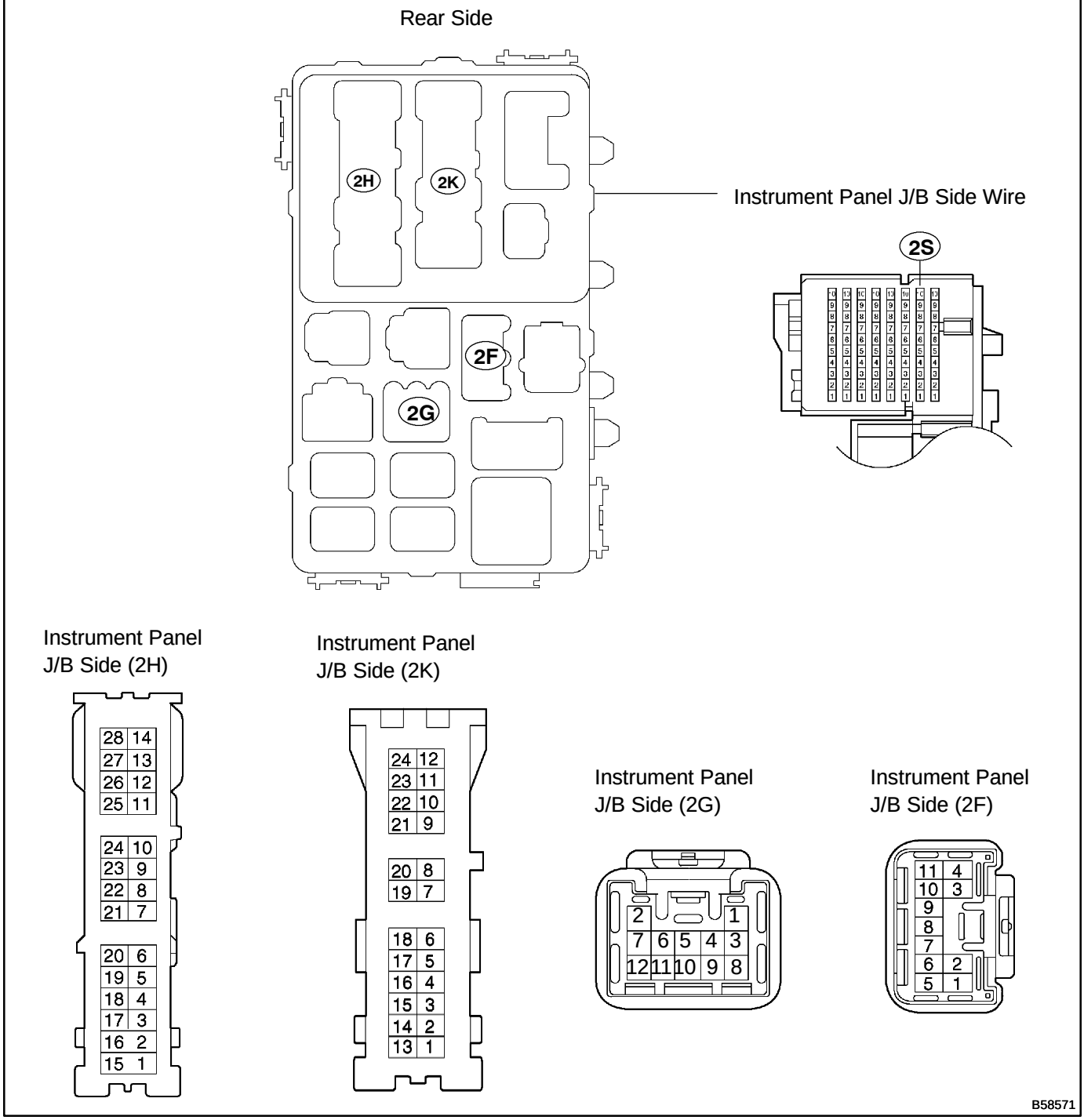
(1) Disconnect connectors 2F, 2G, 2H and 2K of the instrument panel J/B.

(2) Check the continuity of each terminal of the vehicle's connector.

TMUK Made LHD Models



TMUK Made RHD Models



Standard [TMUK made LHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-9) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	No continuity → Continuity
E (2F-11) ⇔ Ground	W-B ⇔ -	Constant	Continuity
DCTY (2S-5) ⇔ Ground	SB (R-W) ⇔ -	Driver door fully closed → Opened	No continuity → Continuity

Standard [TMUK made RHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-2) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	No continuity → Continuity
E (2F-11) ⇔ Ground	W-B ⇔ -	Constant	Continuity
DCTY (2S-6) ⇔ Ground	SB (R-G) ⇔ -	Driver door fully closed → Opened	No continuity → Continuity

If the condition is not as specified, it means that the vehicle malfunctions.

(3) Connect the connector and check the voltage of each terminal of the connector.

Standard [TMUK made LHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-9) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	10 - 14 V → 0 V
ACT+ (2G-11) ⇔ Ground	LG (L) ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-5) ⇔ Ground	LG (R) ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2G-9) ⇔ Ground	L ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-2) ⇔ Ground	R ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2K-9) ⇔ Ground	L ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2K-22) ⇔ Ground	R ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less

Standard [TMUK made RHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-2) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	10 - 14 V → 0 V
ACT+ (2G-1) ⇔ Ground	L ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-5) ⇔ Ground	R ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2G-11) ⇔ Ground	L⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-6) ⇔ Ground	R ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2K-13) ⇔ Ground	L ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2K-8) ⇔ Ground	R ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less

4. TMC made models:

INSPECT INSTRUMENT PANEL J/B (INTEGRATION RELAY)

(a) Inspect the fuse.

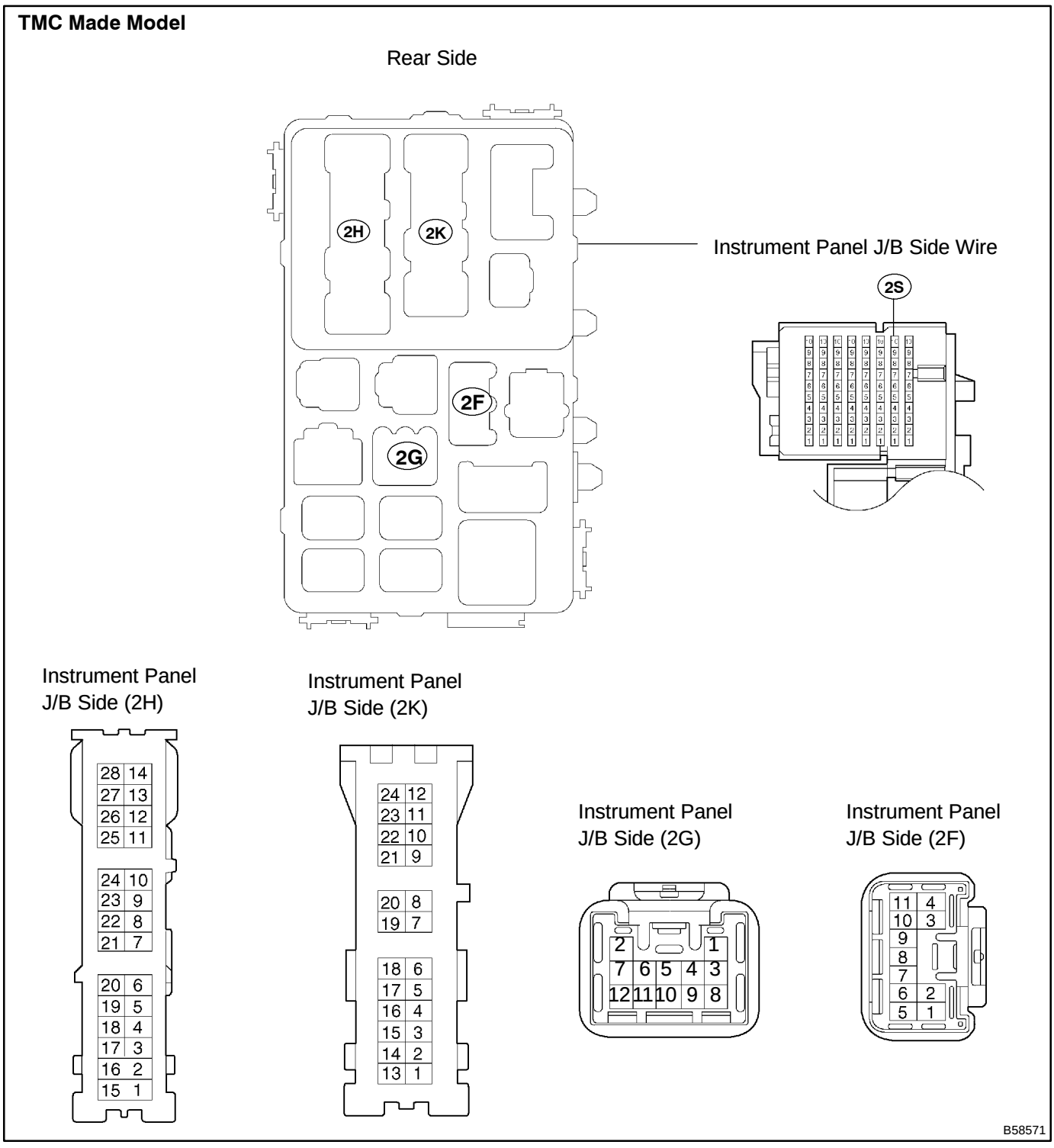
(1) Inspect DOOR fuse.

(b) Inspect the integration relay.

(1) Disconnect connectors 2H, 2G and 2K of the instrument panel J/B.

(2) Check the continuity of each terminal of the vehicle's connector.

TMC Made Model



Standard [TMC made LHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-2) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	No continuity → Continuity
E (2F-11) ⇔ Ground	W-B ⇔ -	Constant	Continuity
DCTY (2S-6) ⇔ Ground	SB (R-W) ⇔ -	Driver door fully closed → Opened	No continuity → Continuity

Standard [TMC made LHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-2) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	10 - 14 V → 0 V
ACT+ (2G-11) ⇔ Ground	LG (L) ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-6) ⇔ Ground	LG (R) ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2G-1) ⇔ Ground	LG (L)⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-5) ⇔ Ground	LG (R) ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2K-13) ⇔ Ground	L ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-8) ⇔ Ground	R ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2G-12) ⇔ Ground	LG (L) ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-7) ⇔ Ground	LG (R) ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less

If the value is not as specified, it means the integration relay or instrument panel J/B assembly malfunctions.

Standard [TMC made RHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-2) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	No continuity → Continuity
E (2F-11) ⇔ Ground	W-B ⇔ -	Constant	Continuity
DCTY (2S-6) ⇔ Ground	SB (R-G) ⇔ -	Driver door fully closed → Opened	No continuity → Continuity

If the condition is not as specified, it means that the vehicle malfunctions.

(3) Connect the connector and check the voltage of each terminal of the connector.

Standard [TMC made RHD models]:

Tester connection	Wiring color	Condition	Specified Condition
KSW (2S-2) ⇔ Ground	W (L-B) ⇔ -	No key in ignition switch lock cylinder → Yes	10 - 14 V → 0 V
ACT+ (2G-1) ⇔ Ground	LG (L) ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-5) ⇔ Ground	LG (R) ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2G-11) ⇔ Ground	LG (L)⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-6) ⇔ Ground	LG (R) ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2K-12) ⇔ Ground	LG (L) ⇔ -	Insert key in driver door lock cylinder OFF → UNLOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2G-7) ⇔ Ground	LG (R) ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT+ (2K-13) ⇔ Ground	L ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less
ACT- (2K-8) ⇔ Ground	R ⇔ -	Insert key in driver door lock cylinder OFF → LOCK	0 V → 10 - 14 V → 1 V or less

If the value is not as specified, it means the integration relay or instrument panel J/B assembly malfunctions.

0578Y-01

PROBLEM SYMPTOMS TABLE

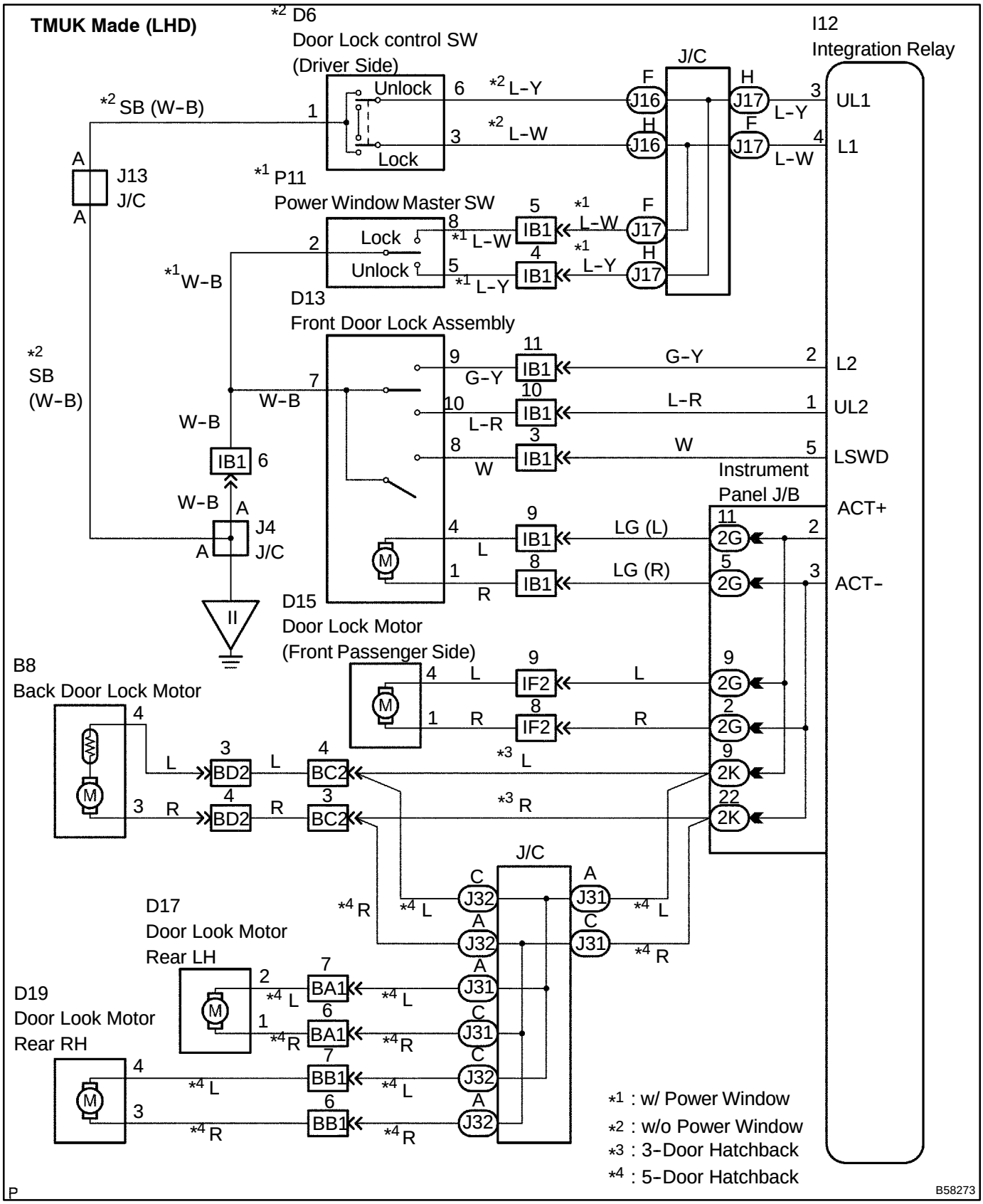
Symptom	Suspected Area	See page
All doors are not operated by the driver's door key cylinder interlocked with key	1. Front door lock assembly RH 2. Wireharness 3. Power window master switch	05-1329
Key confinement prevention function does not work properly (Manual operation and interlocked operation with key are active)	1. Unlock warning switch assembly 2. Wireharness 3. Door open warning Light (combination meter) 4. Front door courtesy lamp	05-1347

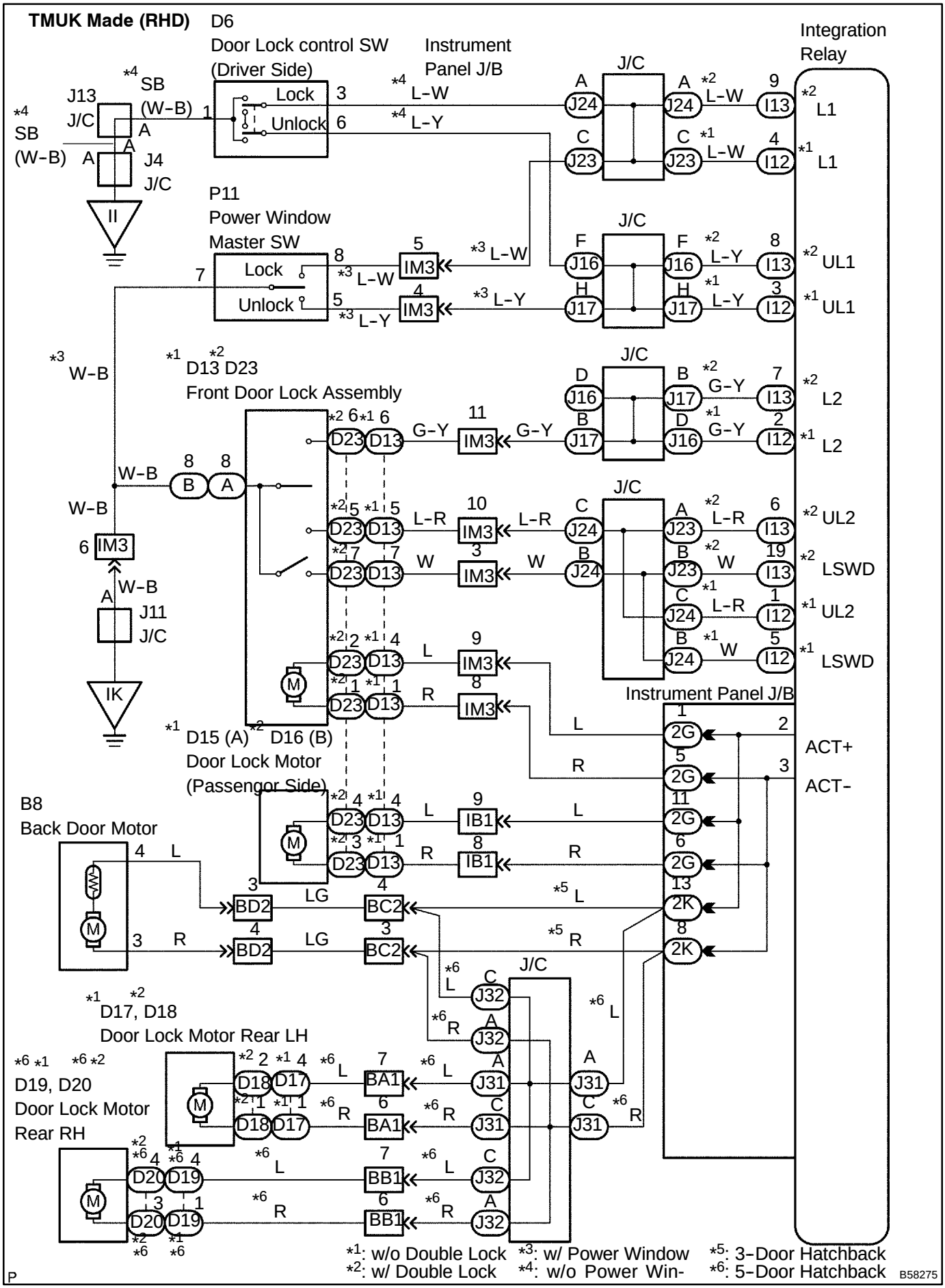
ALL DOOR LOCK AND UNLOCK DO NOT OPERATE BY THE MASTER SWITCH OR THE DRIVER'S DOOR KEY

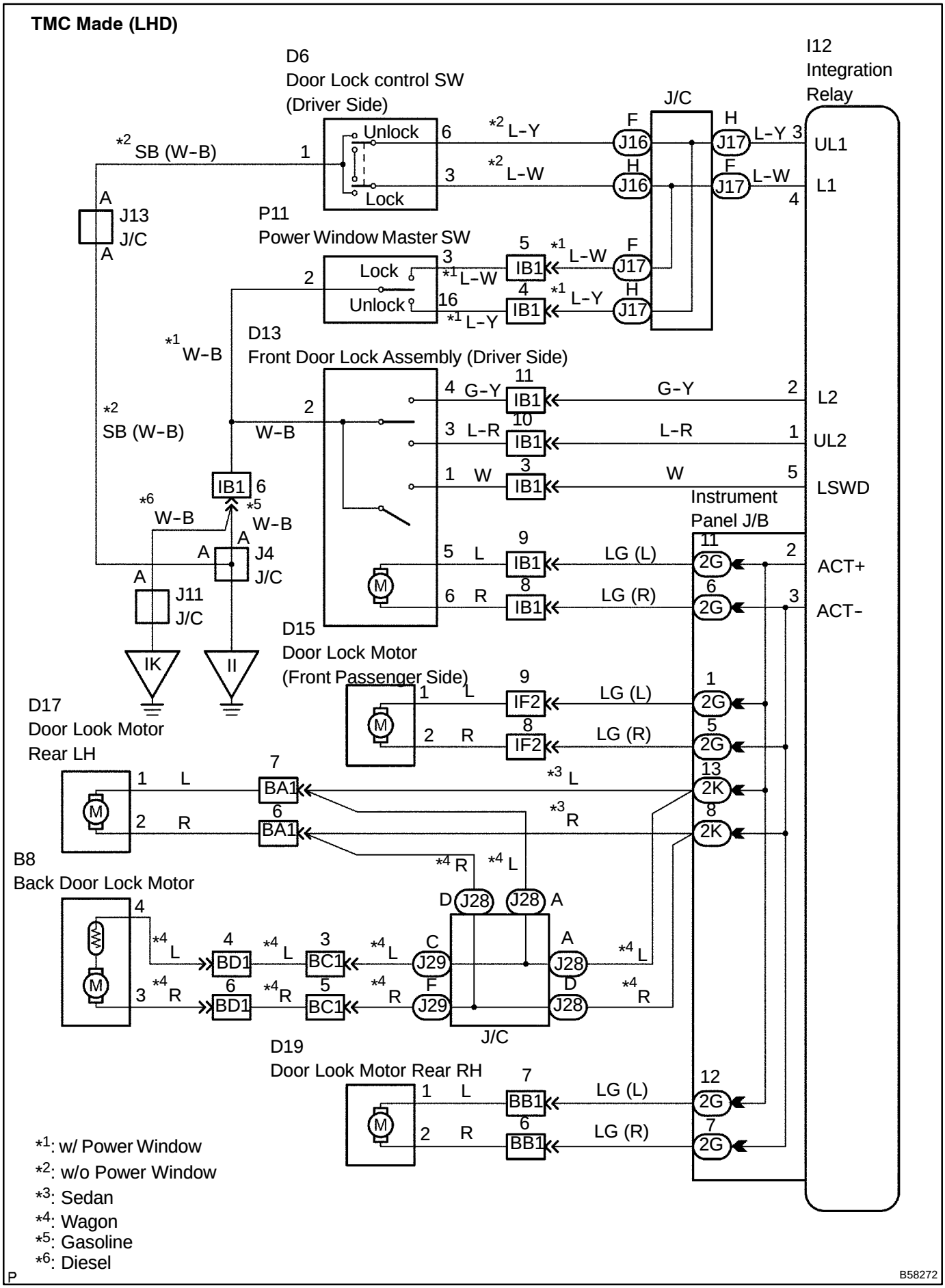
CIRCUIT DESCRIPTION

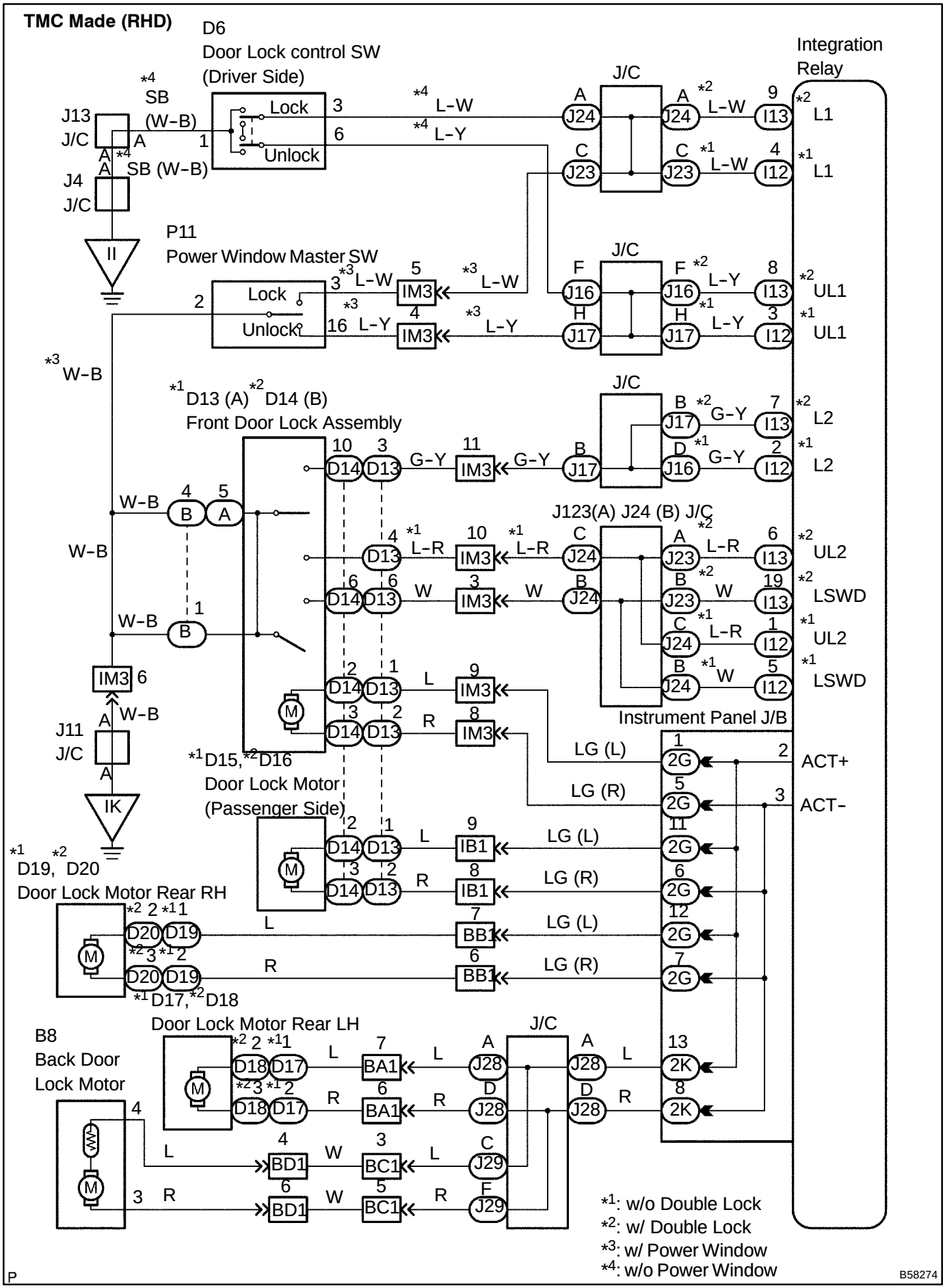
The integration relay receives a switch signal from the master switch and the driver's door key, and then drives the door lock motor.

WIRING DIAGRAM




TMUK Made (RHD)
D6
Door Lock control SW
(Driver Side)
Instrument
Panel J/B
Integration
Relay
P11
Power Window
Master SW
Lock
Unlock
D13 D23
Front Door Lock Assembly
D15 (A) D16 (B)
Door Lock Motor
(Passenger Side)
B8
Back Door Motor
D17, D18
Door Lock Motor Rear LH
D19, D20
Door Lock Motor
Rear RH
J/C
J13
J4
J11
SB
W-B
L-W
L-Y
G-Y
L-R
W
L
R
LG
L1
UL1
L2
UL2
LSWD
ACT+
ACT-
*1: w/o Double Lock
*2: w/ Double Lock
*3: w/ Power Window
*4: w/o Power Win-
*5: 3-Door Hatchback
*6: 5-Door Hatchback
B58275


TMC Made (LHD)
D6
Door Lock control SW
(Driver Side)
Unlock
Lock
*2 SB (W-B)
*2 L-Y
*2 L-W
J/C
I12
Integration
Relay
UL1
L1
P11
Power Window Master SW
Lock
Unlock
*1 L-W
*1 L-Y
J13
J/C
D13
Front Door Lock Assembly (Driver Side)
*1 W-B
*2 SB (W-B)
W-B
G-Y
L-R
W
L2
UL2
LSWD
IB1
*5 W-B
*6 W-B
J4
J/C
J11
J/C
Instrument
Panel J/B
ACT+
ACT-
IK
II
D15
Door Lock Motor
(Front Passenger Side)
LG (L)
LG (R)
IF2
D17
Door Look Motor
Rear LH
BA1
*3 L
*3 R
B8
Back Door Lock Motor
*4 R
*4 L
BD1
BC1
J29
J28
D19
Door Look Motor Rear RH
BB1
*1: w/ Power Window
*2: w/o Power Window
*3: Sedan
*4: Wagon
*5: Gasoline
*6: Diesel
P
B58272


TMC Made (RHD)
D6
Door Lock control SW
(Driver Side)
Integration
Relay
P11
Power Window Master SW
D13 (A) D14 (B)
Front Door Lock Assembly
J123(A) J24 (B) J/C
Instrument Panel J/B
D15, D16
Door Lock Motor
(Passenger Side)
D19, D20
Door Lock Motor Rear RH
D17, D18
Door Lock Motor Rear LH
B8
Back Door
Lock Motor
J/C
Lock
Unlock
ACT+
ACT-
*1: w/o Double Lock
*2: w/ Double Lock
*3: w/ Power Window
*4: w/o Power Window
B58274

INSPECTION PROCEDURE

1	CHECK DOOR LOCK

(a) When the door does not operate manually, proceed to" A ".
(b) When the door does not operate via the key, proceed to" B ".

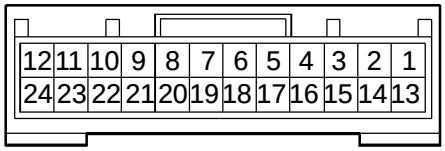
B → Go to step 4

A

2	INSPECT POWER WINDOW REGULATOR MASTER SWITCH ASSY

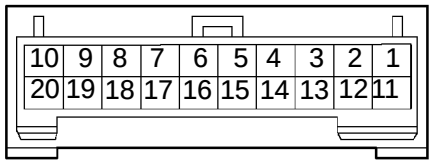
TMUK Made

Power Window Master Switch



TMC Made

Power Window Master Switch



B58278
B58006
B58555

(a) Inspect the power window regulator master switch assembly (door lock switch) continuity.

Standard [TMUK Made]:

Switch position	Tester connection	Specified condition
Lock	8 ⇔ 7	Continuity
OFF	-	No continuity
Unlock	5 ⇔ 7	Continuity

Standard [TMC Made]:

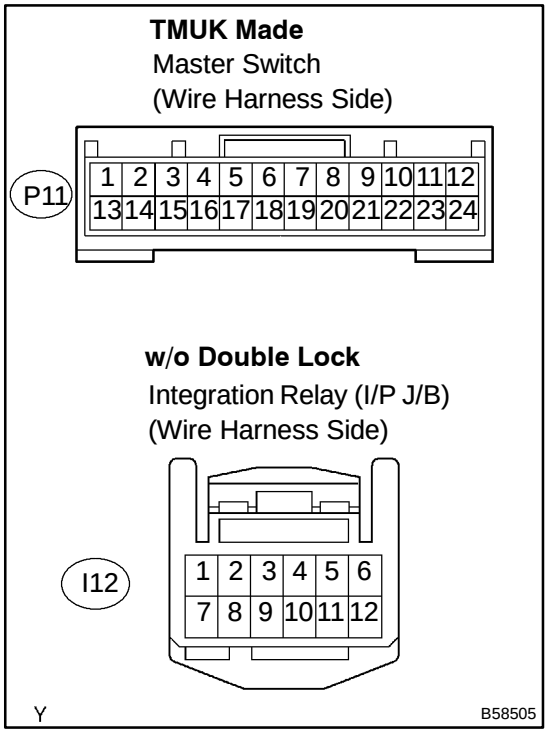
Switch position	Tester connection	Specified condition
Lock	3 ⇔ 2	Continuity
OFF	-	No continuity
Unlock	16 ⇔ 2	Continuity

If the operation is not as specified, replace the door lock assembly.

NG → REPLACE POWER WINDOW REGULATOR MASTER SWITCH ASSY

OK

3	CHECK WIRE HARNESS (POWER WINDOW MASTER SWITCH - INTEGRATION RELAY) OR (DOOR LOCK CONTROL SWITCH - INTEGRATION RELAY)

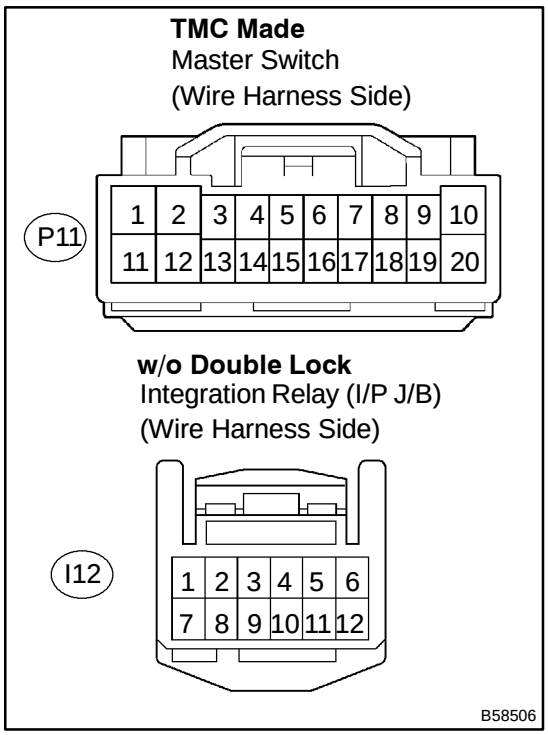


(a) w/ Power window:
Disconnect the master switch and integration relay connectors.
w/o Power window:
Disconnect the door lock control switch and integration relay connectors.

(b) Check the continuity between the terminals of the master switch (P11) or door lock control switch (D6)and integration relay (I12 or I13) connectors, as shown in the illustration and table.

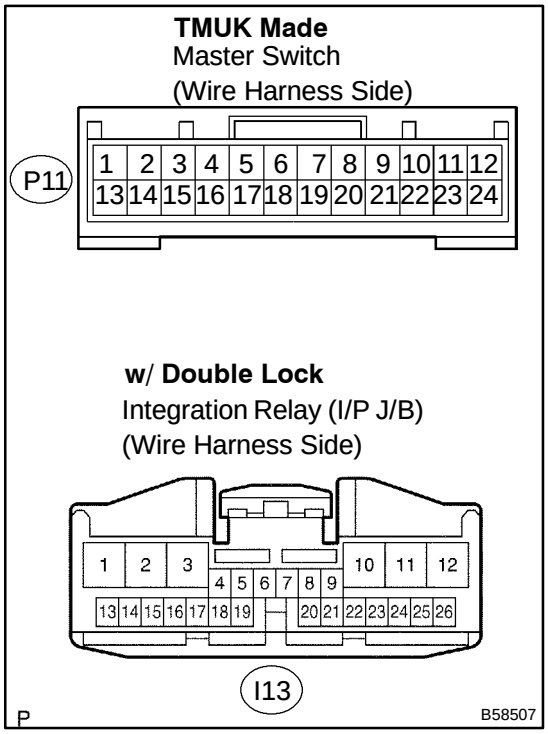
[w/ Power window] TMUK Made (w/o Double Lock)
Continuity (Check for open) :

Terminal (Master switch ⇔ Integration relay)	Standard
5 (P11-5) ⇔ UL1 (I12-3)	Continuity
8 (P11-8) ⇔ L1 (I12-4)	
7 (P11-7) ⇔ Body ground	



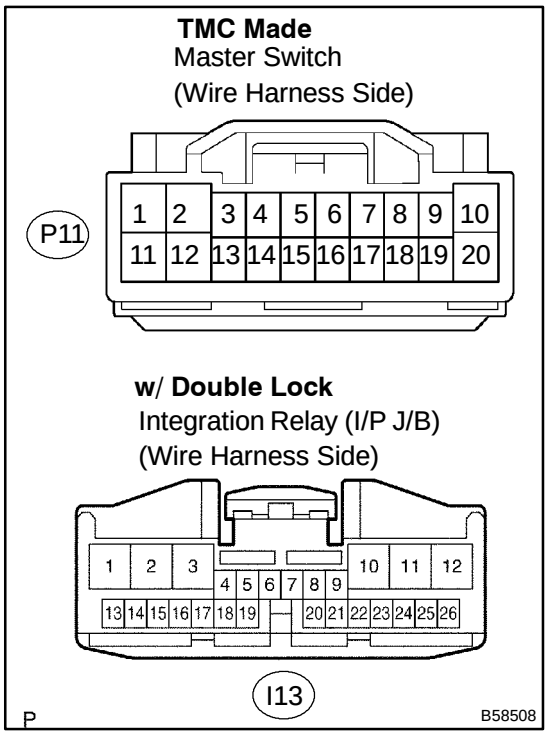
[w/ Power window] TMC Made (w/o Double Lock)
Continuity (Check for open):

Terminal (Master switch ⇔ Integration relay)	Standard
16 (P11-16) ⇔ UL1 (I12-3)	Continuity
3 (P11-3) ⇔ L1 (I12-4)	
2 (P11-2) ⇔ Body ground	



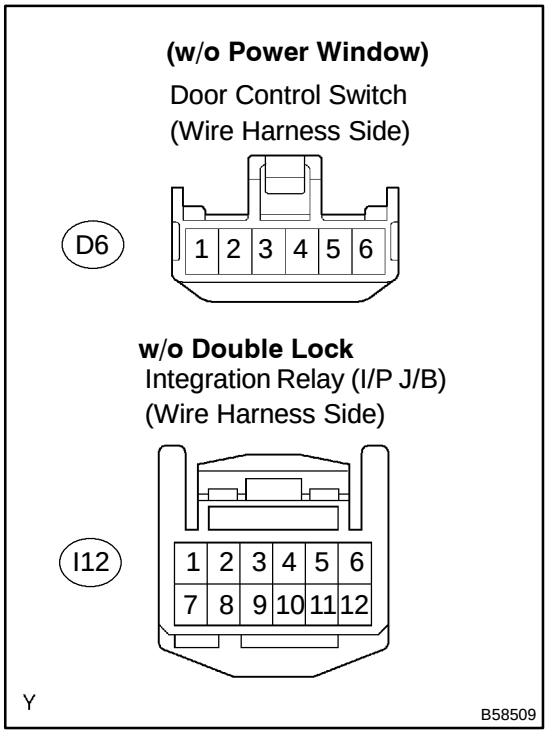
[w/ Power window] TMUK Made (w/ Double Lock)
Continuity (Check for open) :

Terminal (Master switch ⇔ Integration relay)	Standard
5 (P11-5) ⇔ UL1 (I13-8)	Continuity
8 (P11-8) ⇔ L1 (I13-9)	
7 (P11-7) ⇔ Body ground	



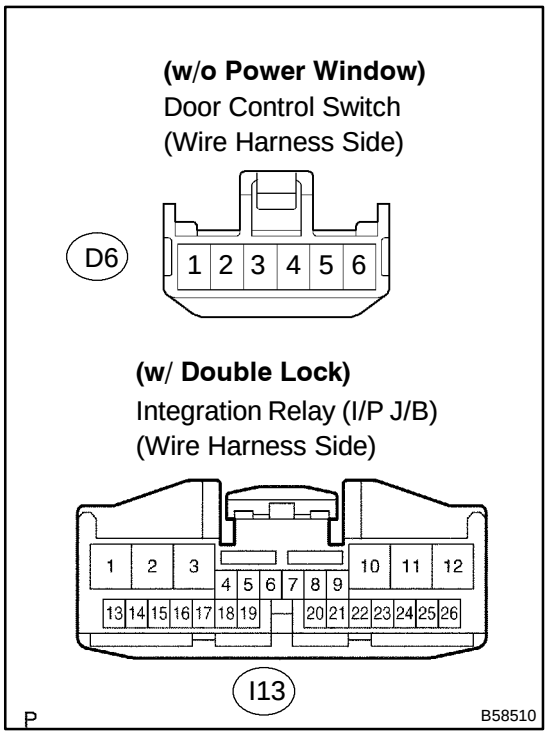
[w/ Power window] TMC Made (w/ Double Lock)
Continuity (Check for open):

Terminal (Master switch ⇔ Integration relay)	Standard
16 (P11-16) ⇔ UL1 (I13-8)	Continuity
3 (P11-3) ⇔ L1 (I13-9)	
2 (P11-2) ⇔ Body ground	



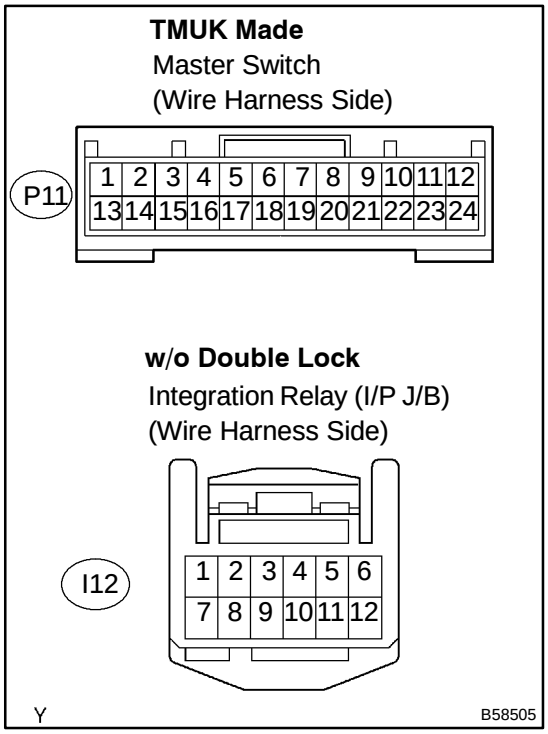
[w/o Power window] (w/o Double Lock)
Continuity (Check for open) :

Terminal (Door lock control switch ⇔ Integration relay)	Standard
6 (D6-6) ⇔ UL1 (I12-3)	Continuity
3 (D6-3) ⇔ L1 (I12-4)	
1 (D6-1) ⇔ Body ground	



[w/o Power window] (w/ Double Lock)
Continuity (Check for open) :

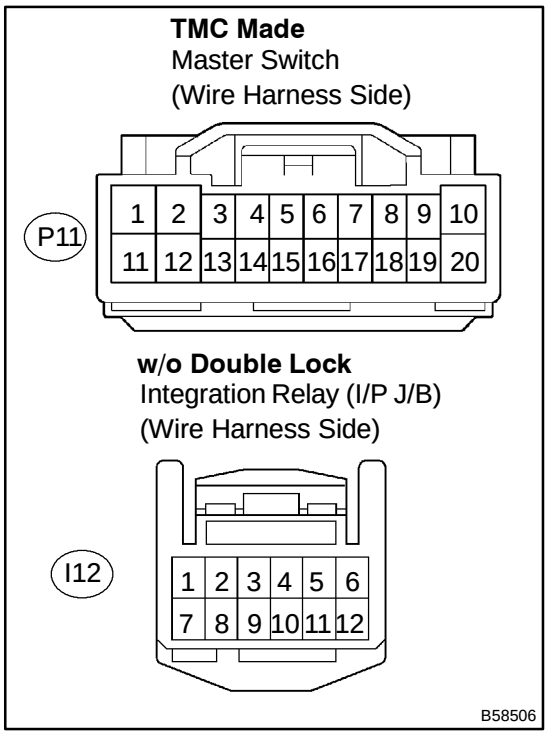
Terminal (Door lock control switch ⇔ Integration relay)	Standard
6 (D6-6) ⇔ UL1 (I13-8)	Continuity
3 (D6-3) ⇔ L1 (I13-9)	
1 (D6-1) ⇔ Body ground	



(c) Check the continuity between the terminals of the master switch (P11) connector, door lock control switch (D6) connector or integration relay (I12 or I13) connector and the body ground, as shown in the illustration and table.

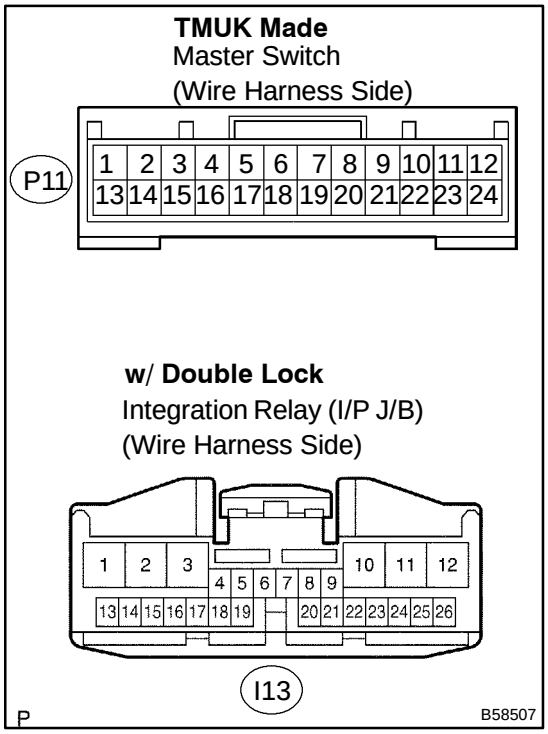
[w/ Power window] TMUK Made (w/o Double Lock)
Continuity (Check for short) :

Terminal (Master switch or Integration relay ⇔ Body ground)	Standard
5 (P11-5) or UL1 (I12-3) ⇔ Body ground	No continuity
8 (P11-8) or L1 (I12-4) ⇔ Body ground	



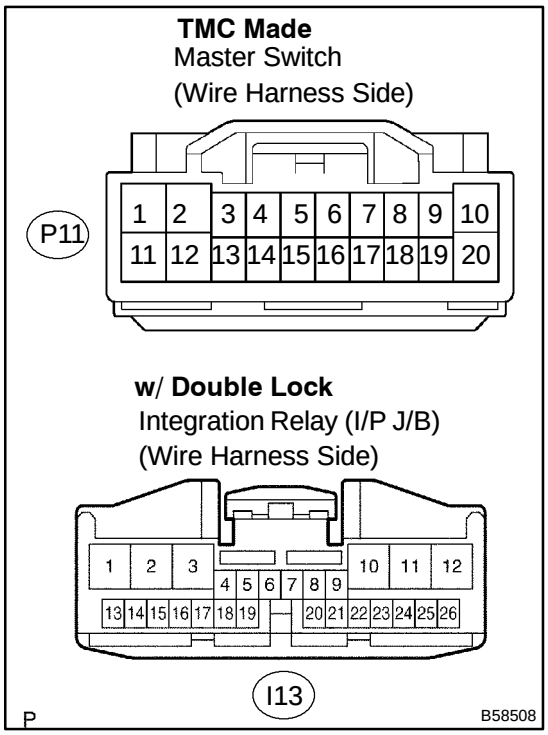
[w/ Power window] TMC Made (w/o Double Lock)
Continuity (Check for short):

Terminal (Master switch or Integration relay ⇔ Body ground)	Standard
16 (P11-16) or UL1 (I12-3) ⇔ Body ground	No continuity
3 (P11-3) or L1 (I12-4) ⇔ Body ground	



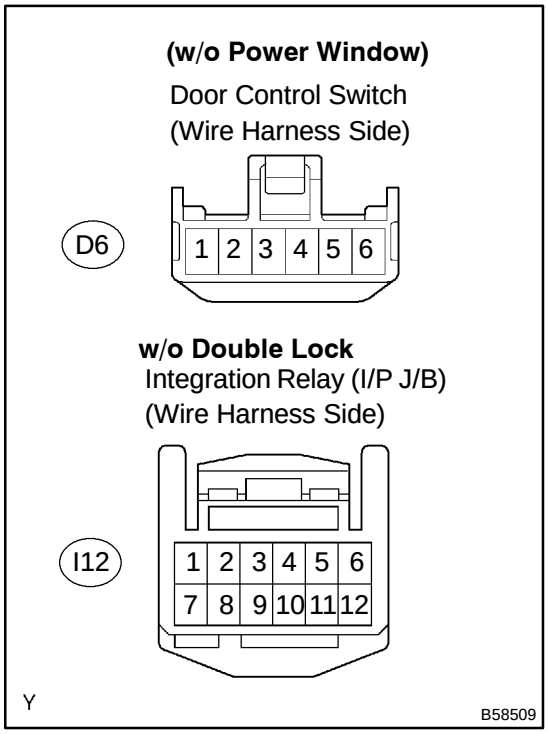
[w/ Power window] TMUK Made (w/ Double Lock)
Continuity (Check for short) :

Terminal (Master switch or Integration relay ⇔ Body ground)	Standard
5 (P11-5) or UL1 (I13-8) ⇔ Body ground	No continuity
8 (P11-8) or L1 (I13-9) ⇔ Body ground	



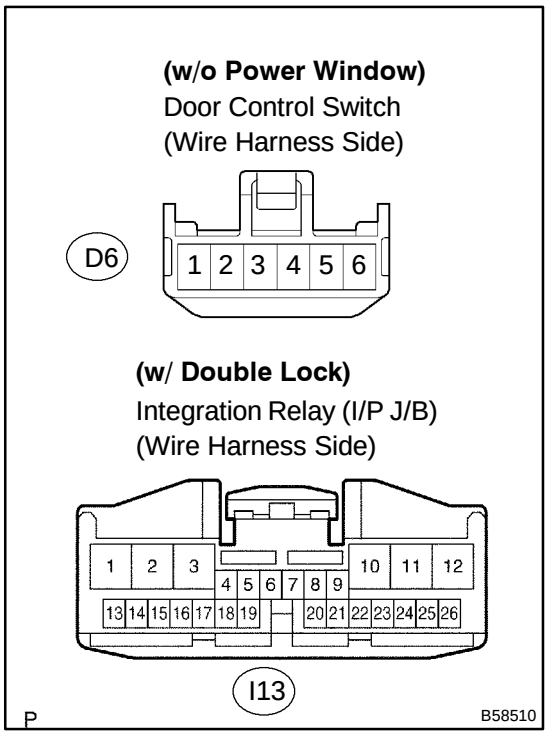
[w/ Power window] TMC Made (w/ Double Lock)
Continuity (Check for short):

Terminal (Master switch or Integration relay ⇔ Body ground)	Standard
16 (P11-16) or UL1 (I13-8) ⇔ Body ground	No continuity
3 (P11-3) or L1 (I13-9) ⇔ Body ground	



[w/o Power window] (w/o Double Lock)
Continuity (Check for short):

Terminal (Door lock control switch or Integration relay ⇔ Body ground)	Standard
6 (D6-6) or UL1 (I12-3)	Continuity
3 (D6-3) or L1 (I12-4)	



[w/o Power window] TMC Made (w/ Double Lock)
Continuity (Check for short):

Terminal (Door lock control switch or Integration relay ⇔ Body ground)	Standard
6 (D6-6) or UL1 (I13-8)	Continuity
3 (D6-3) or L1 (I13-9)	

OK → **REPLACE INTEGRATION RELAY**

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

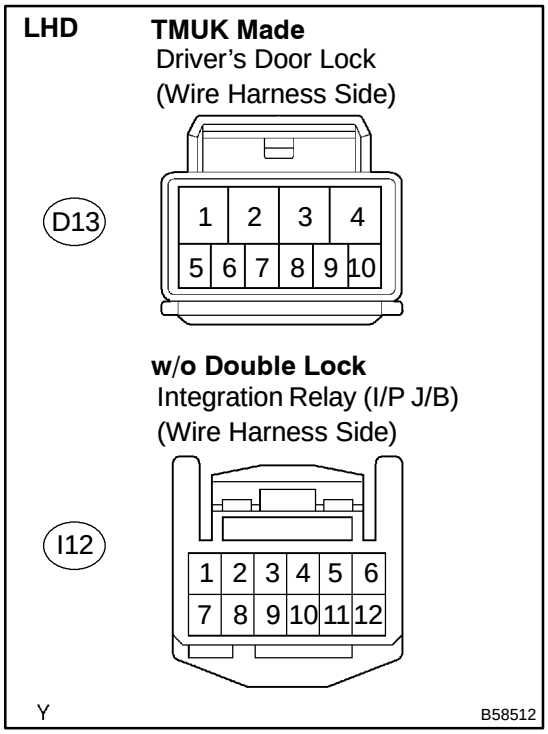
4 INSPECT DRIVER'S DOOR LOCK **(See page 73-3)**

(a) Inspect the driver's door lock key switch.
(b) Inspect the driver's door lock position switch .

NG → **REPLACE DRIVER'S DOOR LOCK**

OK

5	CHECK WIRE HARNESS (DRIVER'S DOOR LOCK - INTEGRATION RELAY)



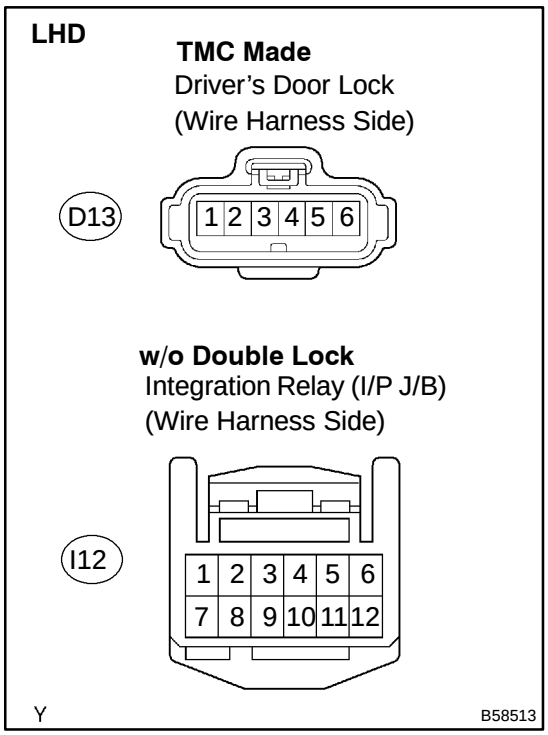
(a) Disconnect the driver door lock and integration relay connectors.

(b) Check the continuity between the terminals of the driver's door lock (D13 or D14 or D23) and integration relay (I12 or I13) connectors, as shown in the illustration and table.

[TMUK made LHD model]

Continuity (Check for open) :

Terminal (Driver's door lock ⇔ Integration relay)	Standard
4 (D13-4) ⇔ L2 (I12-2)	Continuity
3 (D13-3) ⇔ UL2 (I12-1)	
1 (D13-1) ⇔ LSWD (I12-5)	
7 (D13-7) ⇔ Body ground	

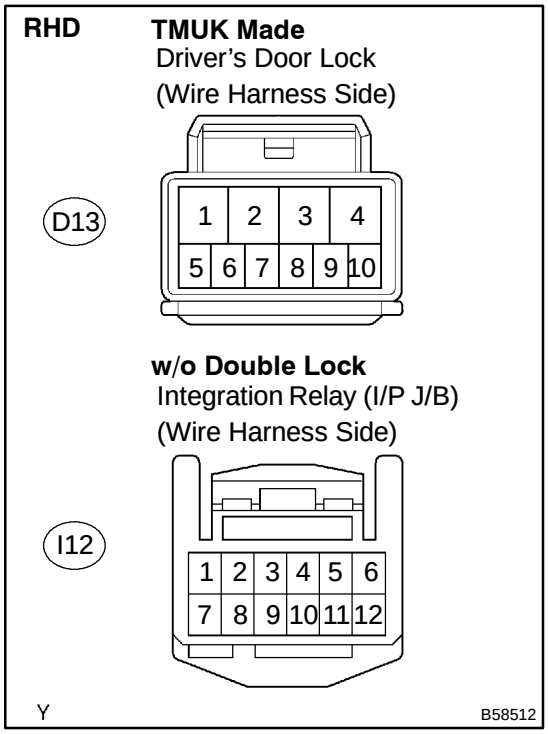


[TMC made LHD model]

Continuity (Check for open) :

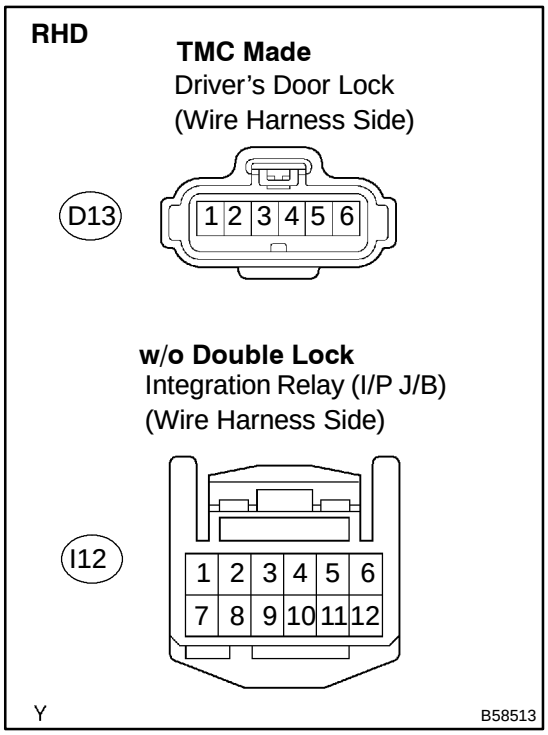
Terminal (Driver's door lock ⇔ Integration relay)	Standard
9 (D13-9) ⇔ L2 (I12-2)	Continuity
10 (D13-10) ⇔ UL2 (I12-1)	
8 (D13-8) ⇔ LSWD (I12-5)	
2 (D13-2) ⇔ Body ground	

05-1342



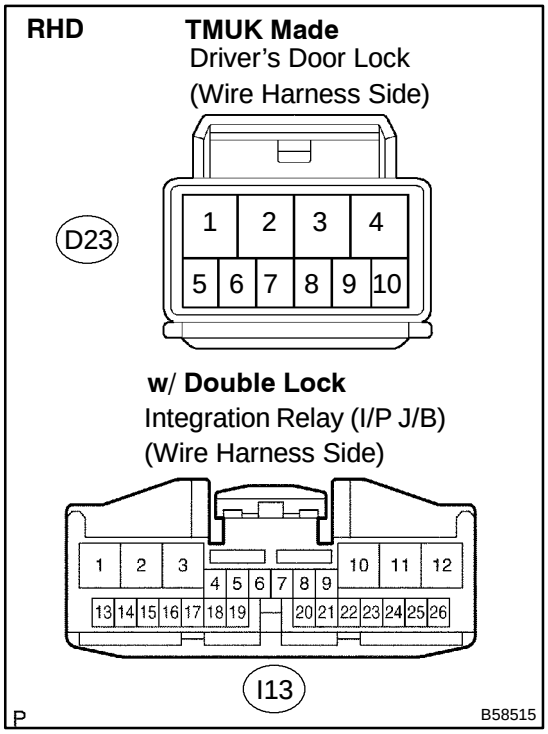
[TMUK made RHD model] (w/o Double lock)
Continuity (Check for open) :

Terminal (Driver's door lock ⇔ Integration relay)	Standard
6 (D13-6) ⇔ L2 (I12-2)	Continuity
5 (D13-5) ⇔ UL2 (I12-1)	
7 (D13-7) ⇔ LSWD (I12-5)	
8 (D13-8) ⇔ Body ground	



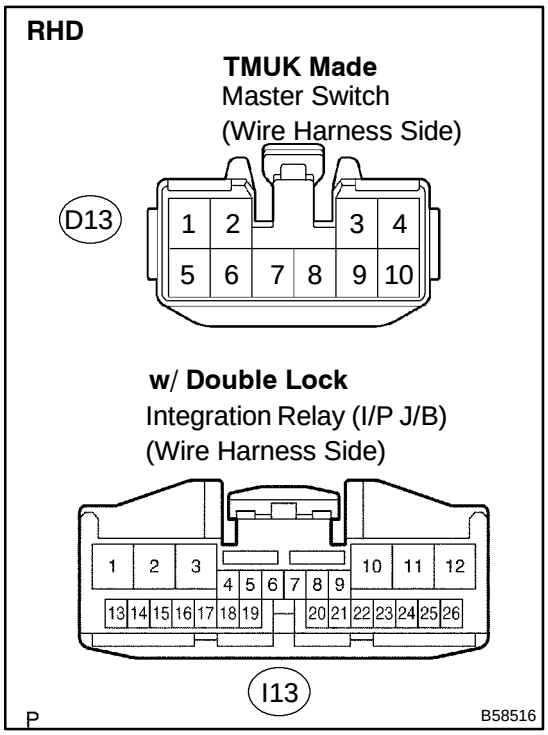
[TMC made RHD model] (w/o Double lock)
Continuity (Check for open) :

Terminal (Driver's door lock ⇔ Integration relay)	Standard
3 (D13-3) ⇔ L2 (I12-2)	Continuity
4 (D13-4) ⇔ UL2 (I12-1)	
6 (D13-6) ⇔ LSWD (I12-5)	
5 (D13-5) ⇔ Body ground	



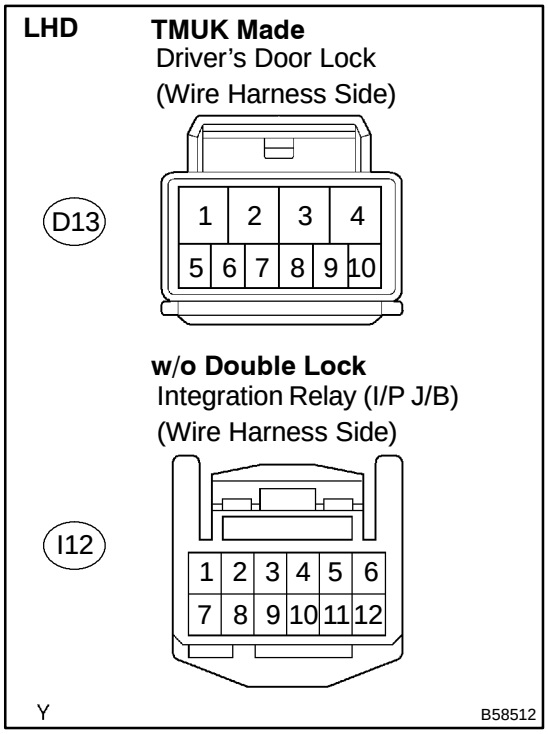
[[TMUK made RHD model] (w/ Double lock)
Continuity (Check for open) :

Terminal (Driver's door lock ⇔ Integration relay)	Standard
6 (D23-6) ⇔ L2 (I13-7)	Continuity
5 (D23-5) ⇔ UL2 (I13-6)	Continuity
7 (D23-7) ⇔ LSWD (I13-19)	Continuity
8 (D23-8) ⇔ Body ground	Continuity



[TMC made RHD model] (w/ Double lock)
Continuity (Check for open) :

Terminal (Driver's door lock ⇔ Integration relay)	Standard
10 (D14-10) ⇔ L2 (I13-7)	Continuity
6 (D14-6) ⇔ LSWD (I13-19)	
1 (D14-1) ⇔ Body ground	

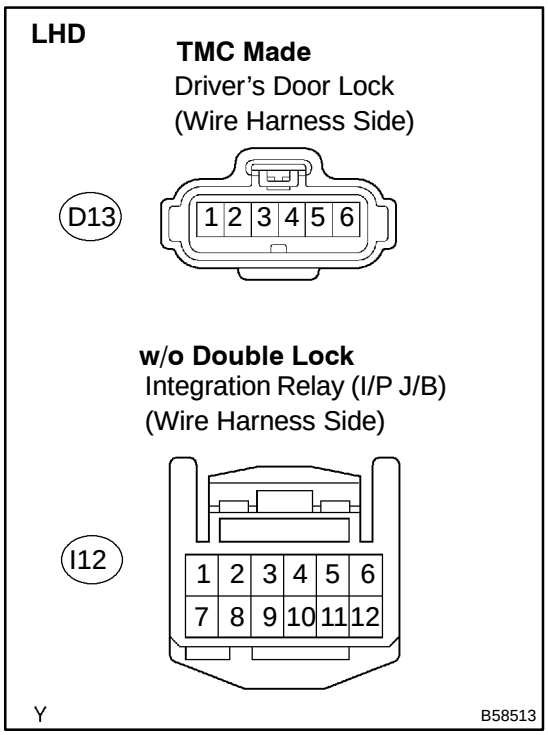


(c) Check the continuity between the terminals of the driver's door lock (D13 or D14 or D23) connector or integration relay (I12 or I13) connector and the body ground, as shown in the illustration and table.

[TMUK made LHD model]

Continuity (Check for Short) :

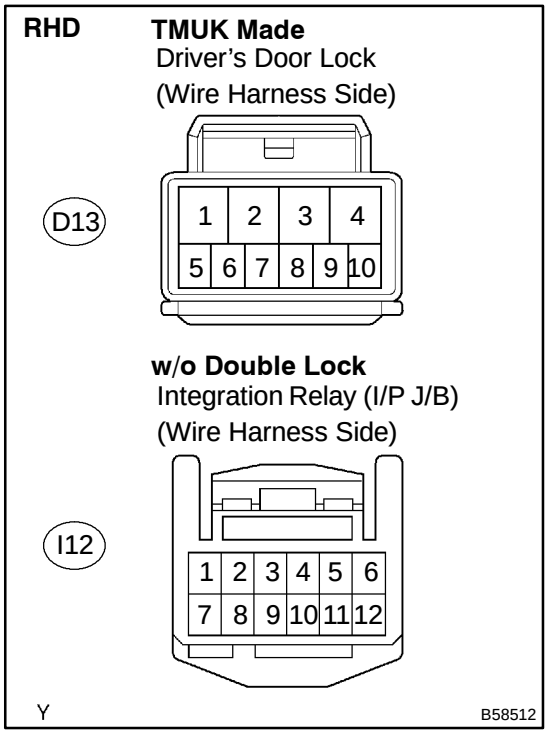
Terminal (Driver's door lock or Integration relay ⇔ Body ground)	Standard
4 (D13-4) or L2 (I12-2) ⇔ Body ground	No continuity
3 (D13-3) or UL2 (I12-1) ⇔ Body ground	
1 (D13-1) or LSWD (I12-5) ⇔ Body ground	



[TMC made LHD model]

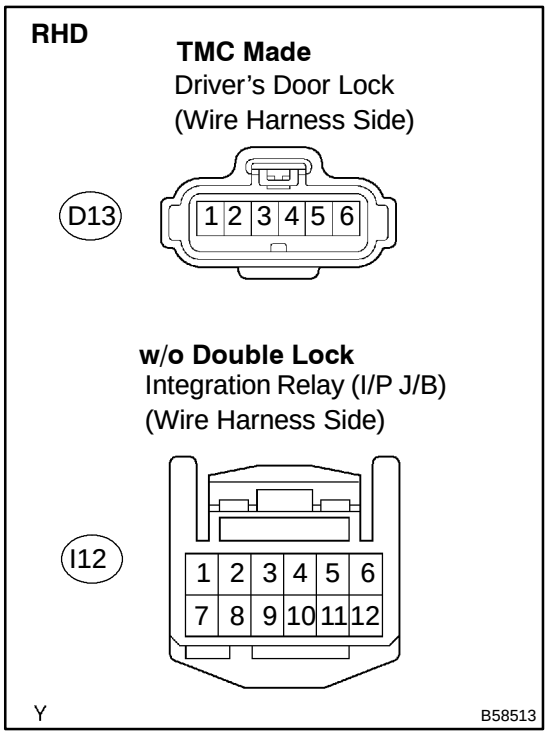
Continuity (Check for short) :

Terminal (Driver's door lock or Integration relay ⇔ Body ground)	Standard
9 (D13-9) or L2 (I12-2) ⇔ Body ground	No continuity
10 (D13-10) or UL2 (I12-1) ⇔ Body ground	
8 (D13-8) or LSWD (I12-5) ⇔ Body ground	



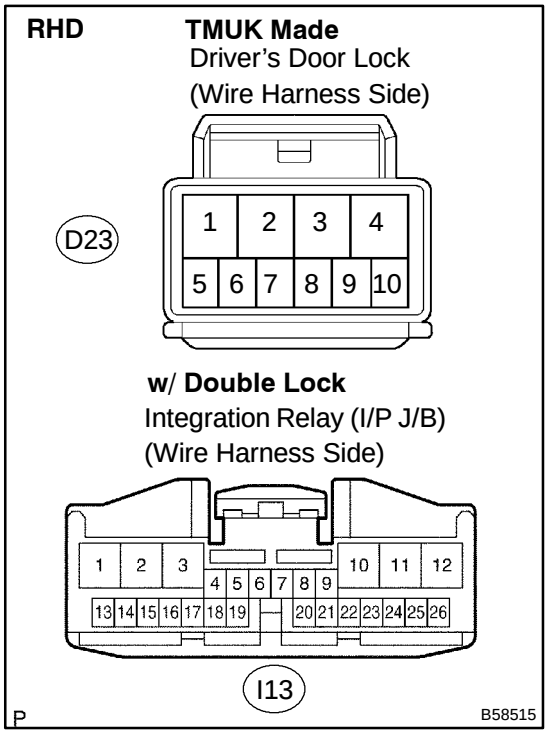
[TMUK made RHD model] (w/o Double lock)
Continuity (Check for short) :

Terminal (Driver's door lock or Integration relay ⇔ Body ground)	Standard
6 (D13-6) or L2 (I12-2) ⇔ Body ground	No continuity
5 (D13-5) or UL2 (I12-1) ⇔ Body ground	
7 (D13-7) or LSWD (I12-5) ⇔ Body ground	



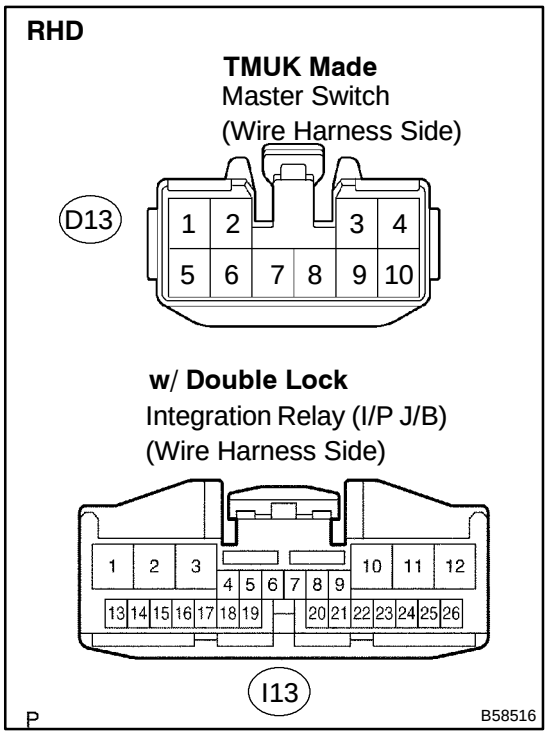
[TMC made RHD model] (w/o Double lock)
Continuity (Check for short) :

Terminal (Driver's door lock or Integration relay ⇔ Body ground)	Standard
3 (D13-3) or L2 (I12-2) ⇔ Body ground	No continuity
4 (D13-4) or UL2 (I12-1) ⇔ Body ground	
6 (D13-6) or LSWD (I12-5) ⇔ Body ground	



[TMUK made RHD model] (w/ Double lock)
Continuity (Check for short) :

Terminal (Driver's door lock or Integration relay ⇔ Body ground)	Standard
6 (D23-6) or L2 (I13-7) ⇔ Body ground	No continuity
5 (D23-5) or UL2 (I13-6) ⇔ Body ground	
7 (D23-7) or LSWD (I13-19) ⇔ Body ground	



[TMC made RHD model] (w/ Double lock)
Continuity (Check for short) :

Terminal (Driver's door lock or Integration relay ⇔ Body ground)	Standard
10 (D14-10) or L2 (I13-7) ⇔ Body ground	No continuity
6 (D14-6) or LSWD (I13-19) ⇔ Body ground	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

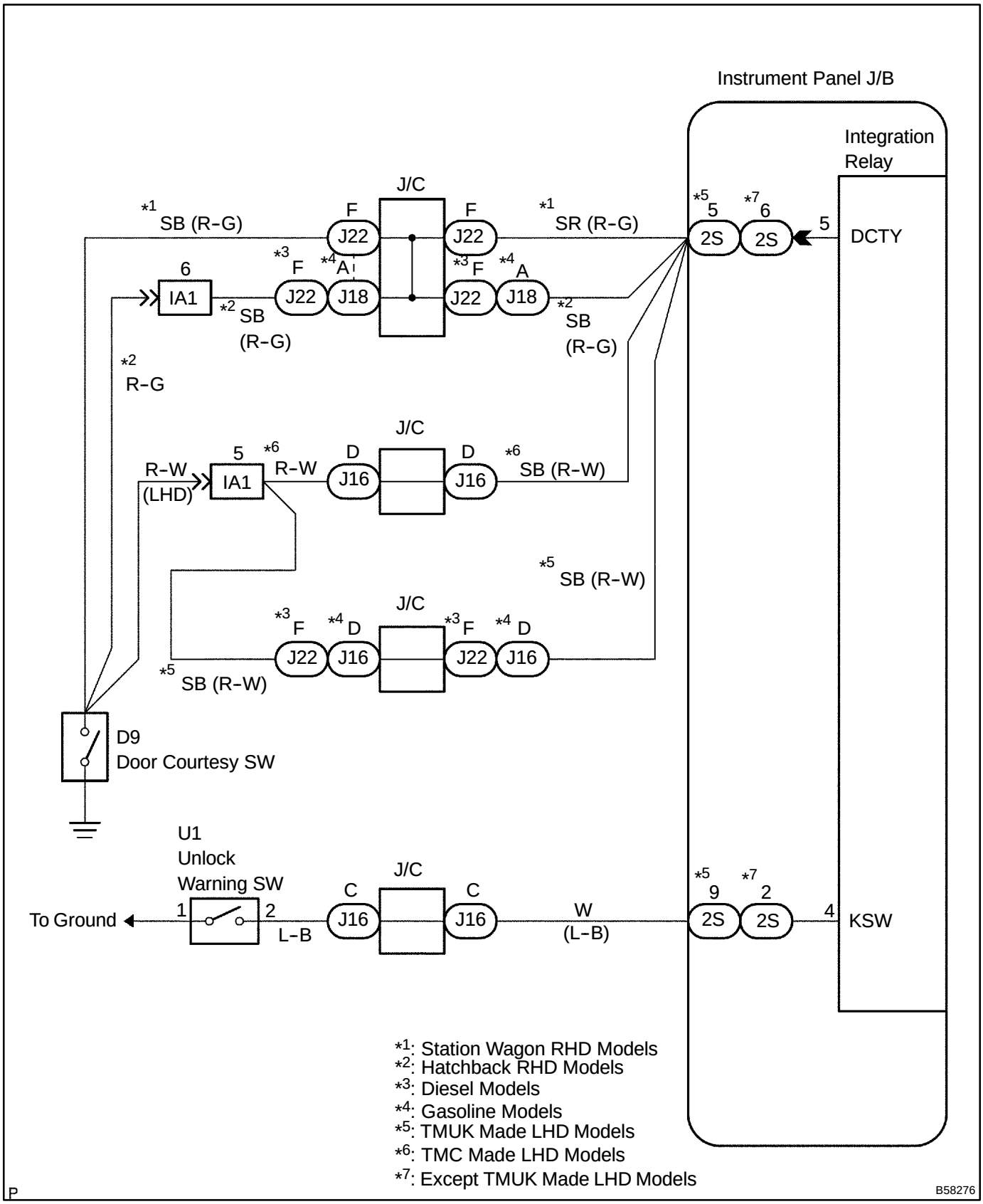
REPLACE INTEGRATION RELAY

KEY CONFINEMENT PREVENTION FUNCTION DOES NOT WORK PROPERLY (MANUAL OPERATION AND INTERLOCKED WITH KEY ARE ACTIVE)

CIRCUIT DESCRIPTION

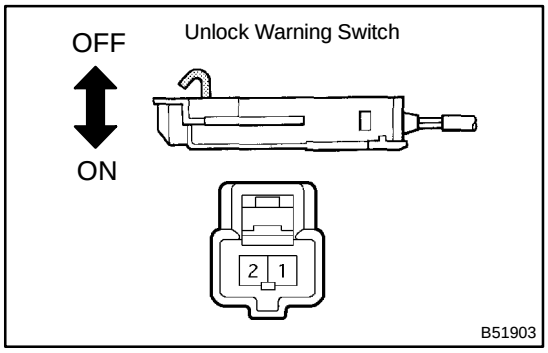
Integration relay senses, by the unlock warning switch, that the key is in the key cylinder. Because of this, the MPX body ECU will unlock all the doors immediately after locking them if a door is locked while the key is in the key cylinder.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT UN-LOCK WARNING SWITCH ASSY



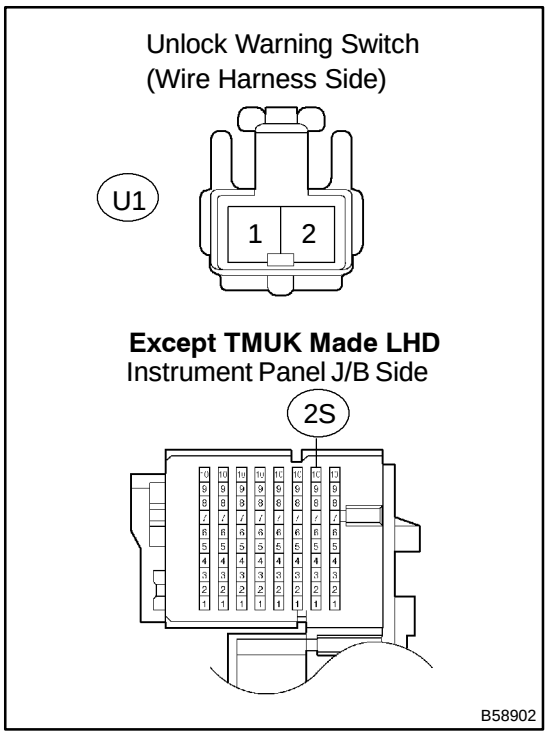
(a) Remove the key unlock warning switch.
(b) Inspect the key unlock warning switch continuity.
Continuity :

Condition	Tester connection	Specified condition
Switch OFF (Key removed)	-	No continuity
Switch ON (Key set)	1 - 2	Continuity

NG → **REPLACE UN-LOCK WARNING SWITCH ASSY**

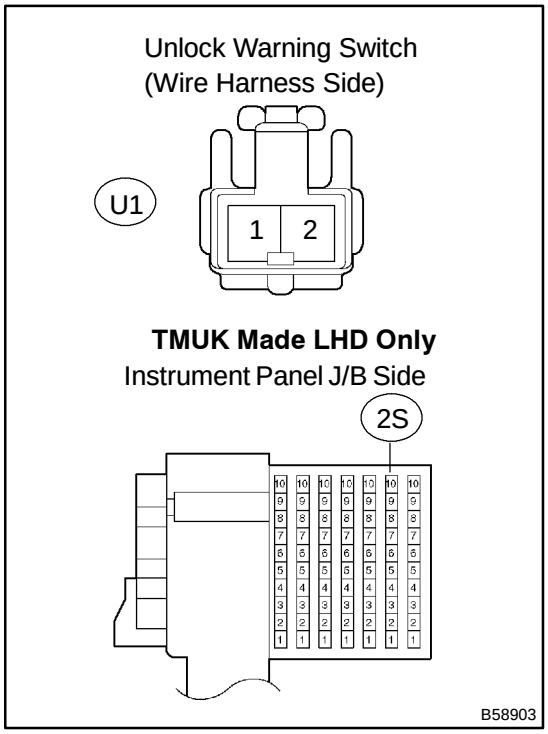
OK

2	CHECK WIRE HARNESS (UN-LOCK WARNING SWITCH ASSY - INSTRUMENT PANEL J/B)



(a) Disconnect the unlock warning switch connector.
(b) Check the continuity between the terminals of the unlock warning switch (U1) and instrument panel J/B (2S) connectors, as shown in the illustration and table.
[Except TMUK Made LHD]
Continuity (Check for open) :

Terminal (Unlock warning switch ⇔ Instrument panel J/B)	Standard
2 (U1-2) ⇔ KSW (2S-2)	Continuity
1 (U1-1) ⇔ Body ground	



[TMUK Made LHD Only]

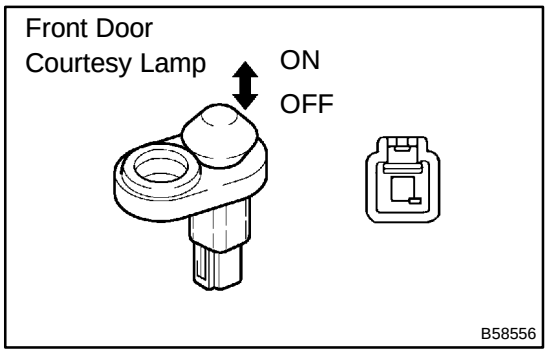
Continuity (Check for open) :

Terminal (Unlock warning switch ⇔ Instrument panel J/B)	Standard
2 (U1-2) ⇔ KSW (2S-9)	Continuity
1 (U1-1) ⇔ Body ground	

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 INSPECT FRONT DOOR COURTESY LAMP SWITCH ASSY



(a) Remove the courtesy lamp switch.

(b) Inspect the courtesy lamp switch continuity.

Continuity:

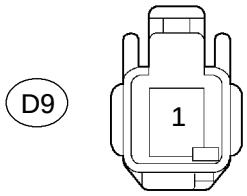
Condition	Tester connection	Specified condition
Switch OFF	1 - Ground	Continuity
Switch ON	1 - Ground	No continuity

NG → **REPLACE FRONT DOOR COURTESY LAMP SWITCH ASSY**

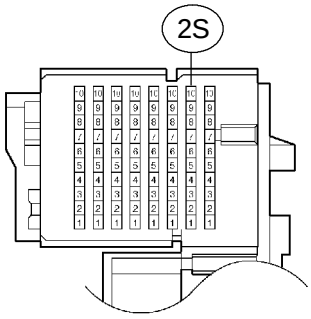
OK

4	CHECK WIRE HARNESS (COURTESY LAMP SWITCH - INSTRUMENT PANEL J/B)

Driver Side courtesy Lamp Switch (Wire Harness Side)



Except TMUK Made LHD
Instrument Panel J/B Side



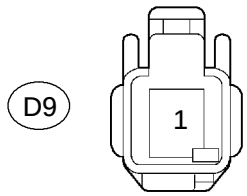
B58904

(a) Disconnect the cutesy lamp switch connector.
(b) Check the continuity between the terminals of the courtesy lamp switch (D9) and instrument panel J/B (2S) connectors, as shown in the illustration and table.

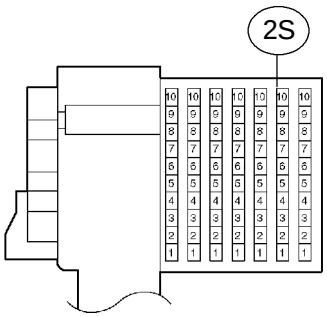
[Except TMUK made LHD model]
Continuity (Check for open) :

Terminal (Courtesy lamp switch or Instrument panel J/B ⇔ Body ground)	Standard
1 (D9-1) ⇔ DTCY (2S-6)	Continuity

Driver Side courtesy Lamp Switch (Wire Harness Side)



TMUK Made LHD Only
Instrument Panel J/B Side



B58905

[TMUK made LHD model Only]
Continuity (Check for open) :

Terminal (Courtesy lamp switch or Instrument panel J/B ⇔ Body ground)	Standard
1 (D9-1) ⇔ DTCY (2S-5)	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE INTEGRATION RELAY

WIRELESS DOOR LOCK CONTROL SYSTEM

05771-01

HOW TO PROCEED WITH TROUBLESHOOTING

1	VEHICLE BROUGHT IN

2	CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK (See page 05-1353)

3	SYMPTOMS TABLE (See page 05-1365)

(a) Without applicable symptoms, proceed to A
(b) With applicable symptoms, proceed to B

B → GO TO STEP 6

A

4	PERFORM TROUBLESHOOTING IN THE FOLLOWING METHOD, DEPENDING ON MALFUNCTION SYMPTOM

(a) Terminal of ECU
(b) Inspection
(c) On-vehicle inspection

5	ADJUSTMENT, REPAIR OR REPLACEMENT

END

05773-01

CUSTOMER PROBLEM ANALYSIS CHECK

WIRELESS DOOR LOCK CONTROL System Check Sheet

Inspector's Name _____

Customer's Name		**Registration No.**	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	**km Miles**

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times/per day, month) ☐ Once only
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. ˚F (˚C))
	Place	☐ Everywhere ☐ Specific Locality( )
Date Transmitter Battery Last Replaced		/ /

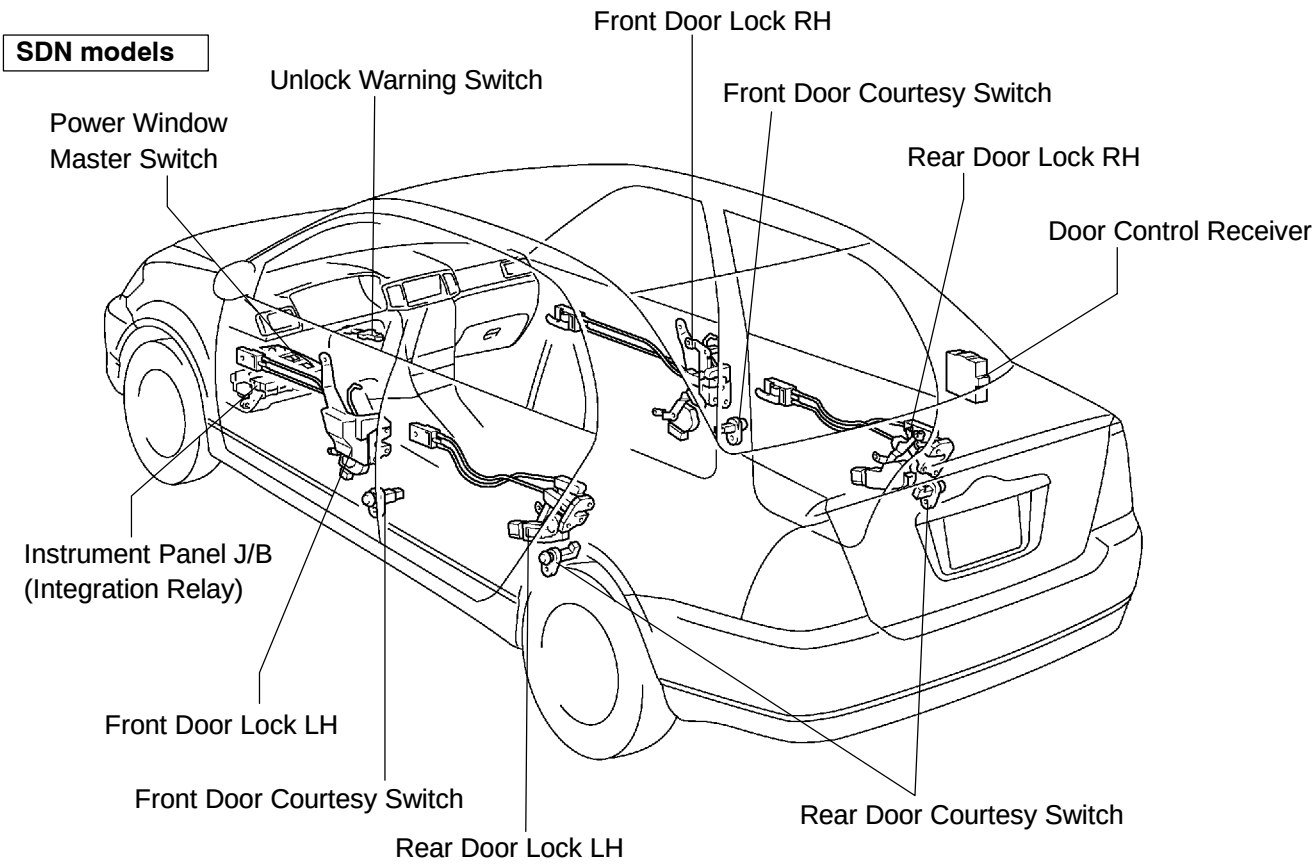
Problem Symptom	☐ Whole wireless door lock control system does impossible.	
	☐ Only door unlock operation is impossible.	
	☐ Only door lock operation is impossible.	
	☐ Only key confinement prevention function is impossible.	
	☐ Wireless door lock function operates even when each door is opened.	
	☐ Wireless door lock functions incorrectly. (Although one door is unlocked, when the transmitter switch is pressed, all doors become unlocked.)	☐ When RH door is unlocked ☐ When LH door is unlocked
	☐ Others	

05776-01

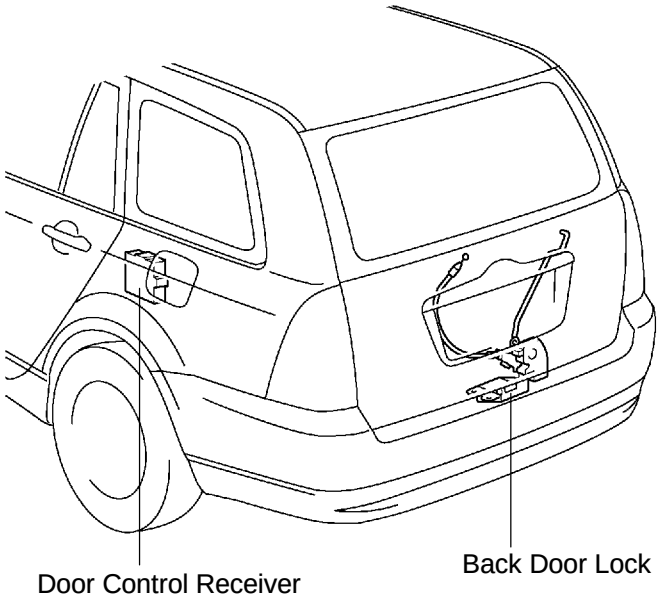
LOCATION

TMC LHD models

SDN models

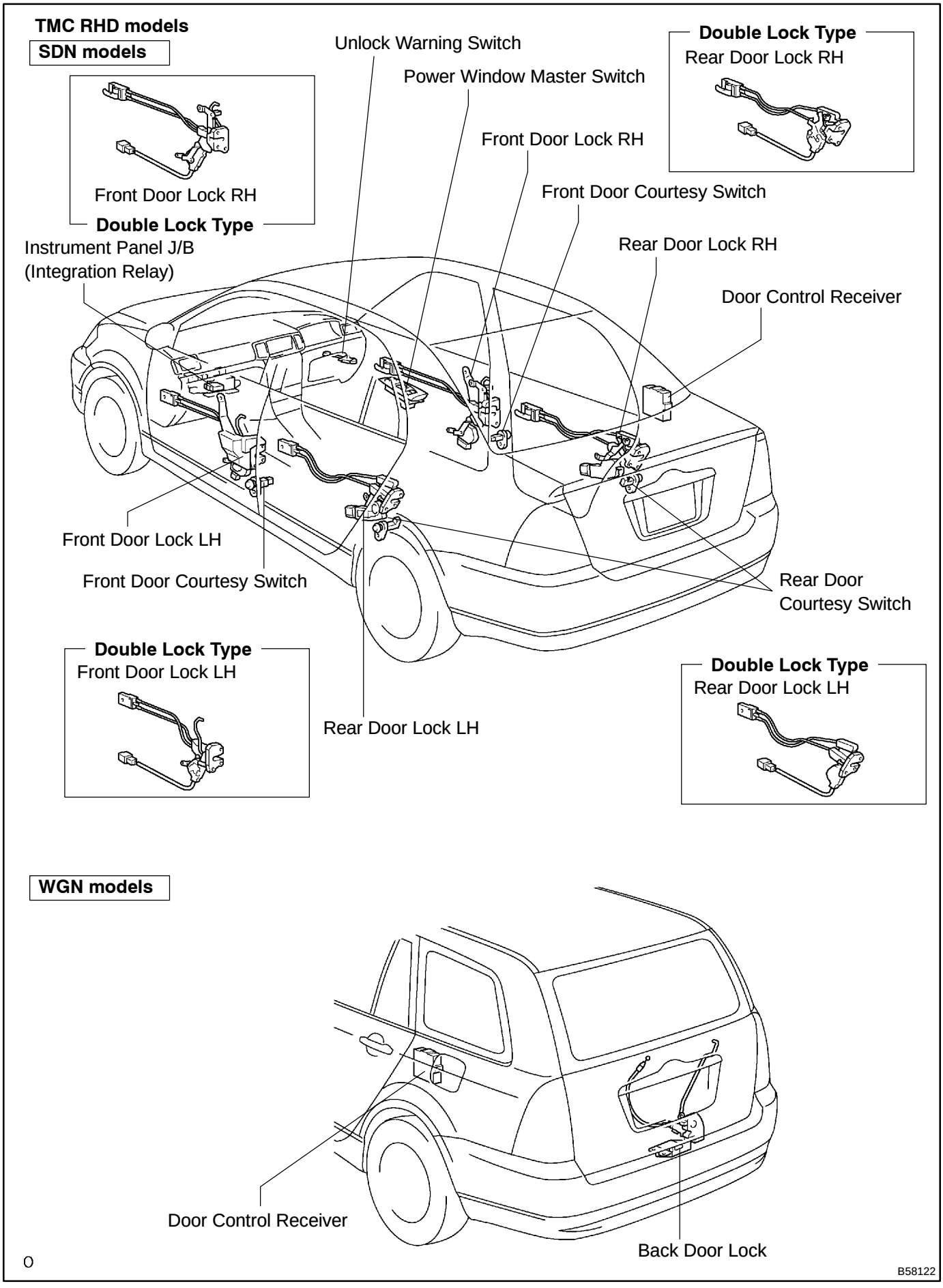


WGN models

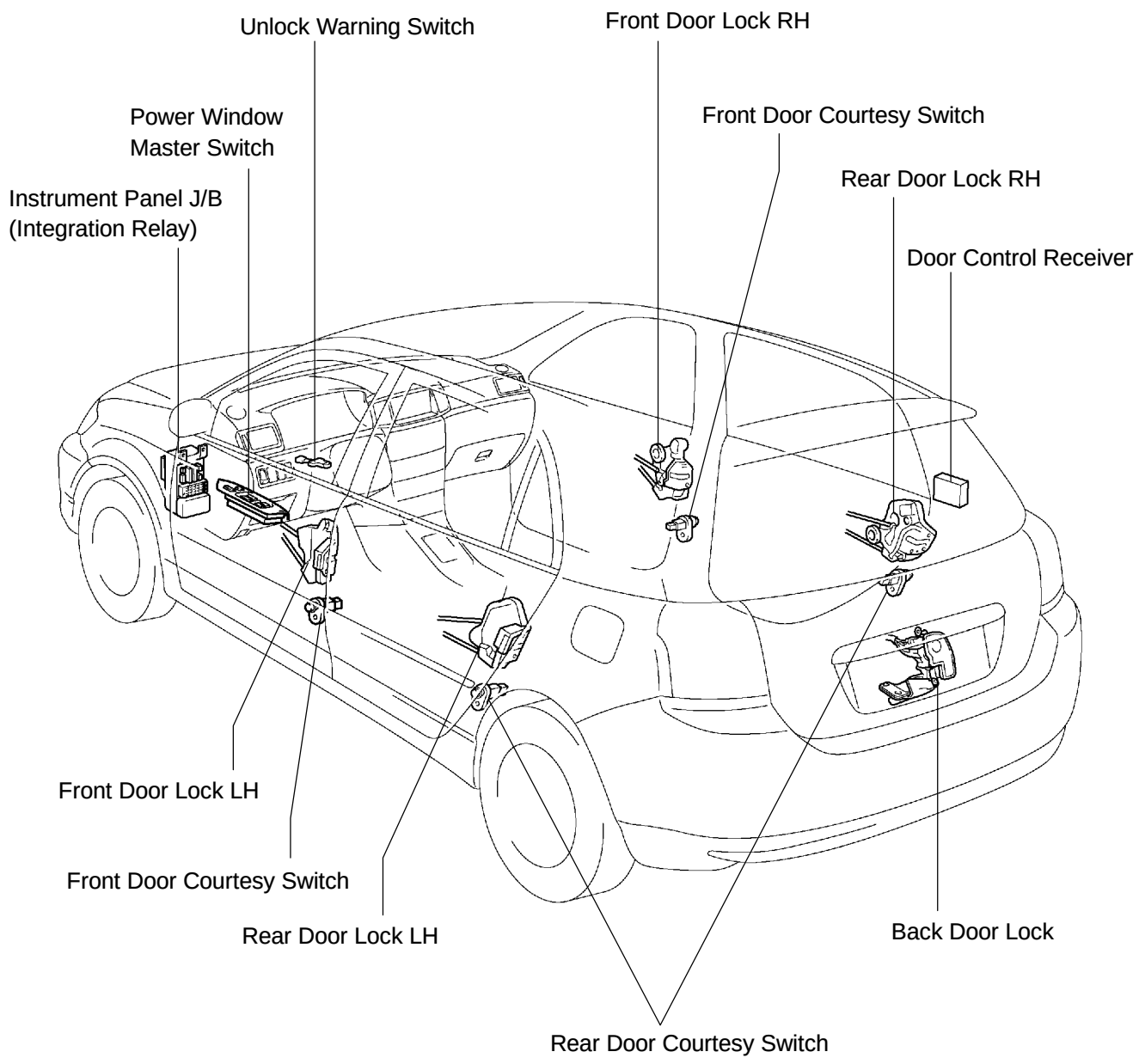


O

B58121


TMC RHD models
SDN models
Front Door Lock RH
Double Lock Type
Unlock Warning Switch
Power Window Master Switch
Front Door Lock RH
Front Door Courtesy Switch
Double Lock Type
Rear Door Lock RH
Instrument Panel J/B
(Integration Relay)
Rear Door Lock RH
Door Control Receiver
Front Door Lock LH
Front Door Courtesy Switch
Rear Door
Courtesy Switch
Double Lock Type
Front Door Lock LH
Rear Door Lock LH
Double Lock Type
Rear Door Lock LH
WGN models
Door Control Receiver
Back Door Lock
O
B58122

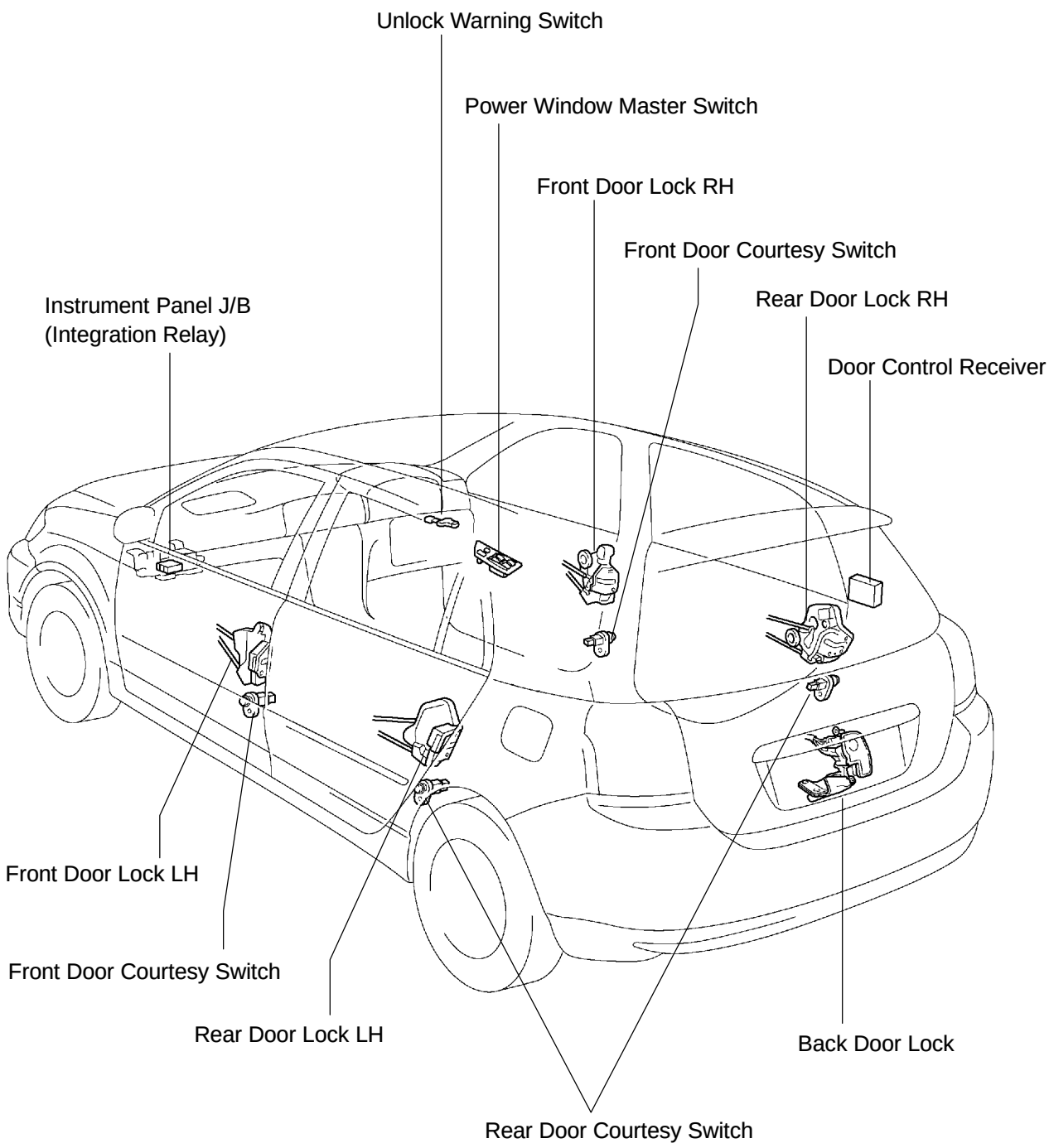
TMUK LHD models



Y

B58119

TMUK RHD models

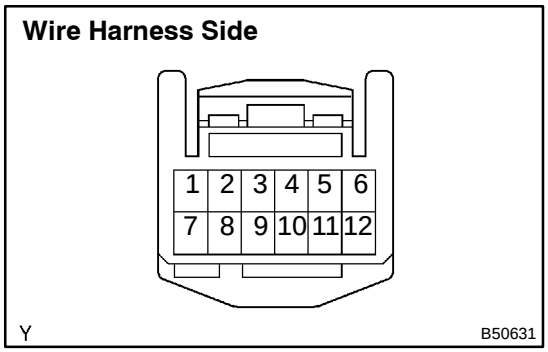


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0577A-01

TERMINALS OF ECU



1. TMC and TMUK made w/o Double Lock models: INSPECT INTEGRATION RELAY WITH DOOR CONTROL

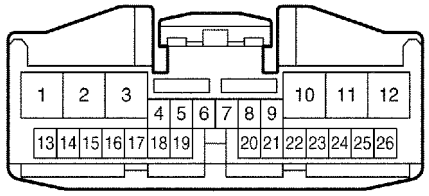
(a) Disconnect the connector and check the continuity of each terminal of the vehicle's connector.

Standard:

Tester connection	Wiring color	Condition	Specified Condition
5 (LSWD) ⇔ Body ground	W ⇔ Body ground	Driver's door lock control knob LOCK → UNLOCK	No continuity → Continuity
4 (L1) ⇔ Body ground	L-W ⇔ Body ground	Door control switch (Manual operation) OFF → LOCK	No continuity → Continuity
3 (UL1) ⇔ Body ground	L-Y ⇔ Body ground	Door control switch (Manual operation) OFF → UNLOCK	No continuity → Continuity
2 (L2) ⇔ Body ground	G-Y ⇔ Body ground	Using the key, operate the driver's door lock cylinder LOCK → Other position	Continuity → No continuity
1 (UL2) ⇔ Body ground	L-R ⇔ Body ground	Using the key, operate the driver's door lock cylinder UNLOCK → Other position	Continuity → No continuity
7 (HAZ) ⇔ Body ground	Y-G ⇔ Body ground	Transmitter LOCK or UNLOCK switch is pushed Hazard warning switch ON	0 V (Hazard no flashing) → 10 - 14 V (Hazard flashing)

If the condition is not as specified, it means that the vehicle malfunctions.

Wire Harness Side



P B57790

2. TMC and TMUK made w/ Double Lock models: INSPECT INTEGRATION RELAY WITH DOOR CONTROL

(a) Disconnect the connector and check the continuity of each terminal of the vehicle's connector.

Standard:

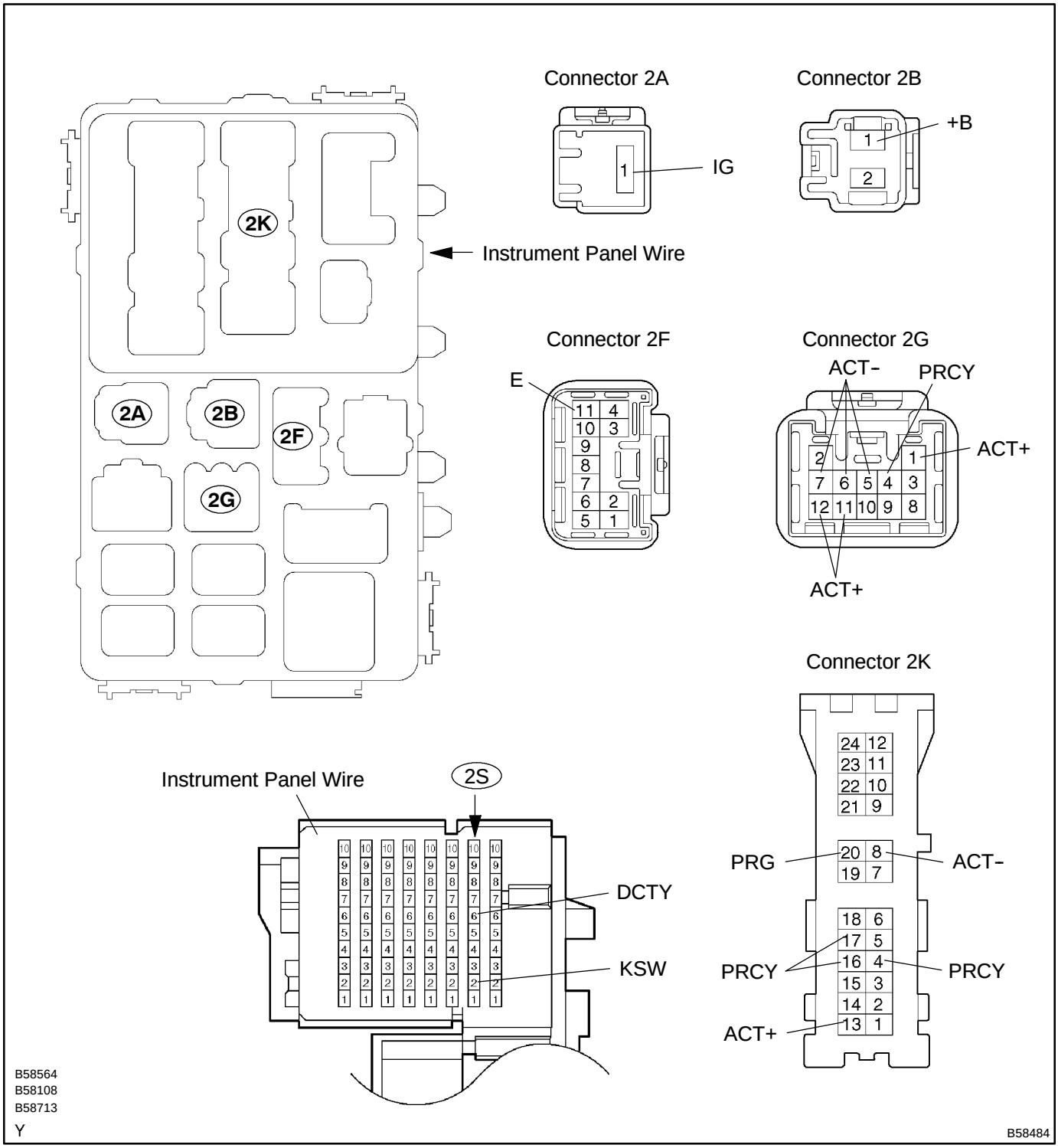
Tester connection	Wiring color	Condition	Specified Condition
19 (LSWD) ⇔ Body ground	W ⇔ Body ground	Driver's door lock control knob LOCK → UNLOCK	No continuity → Continuity
24 (DBSD) ⇔ Body ground	W-R ⇔ Body ground	Driver's door double door lock OFF → SET	No continuity → Continuity
23 (DBSP) ⇔ Body ground	W-L ⇔ Body ground	Passenger's door double door lock OFF → SET	No continuity → Continuity
22 (DBSL) ⇔ Body ground	W ⇔ Body ground	RL door double door lock OFF → SET	No continuity → Continuity
21 (DBSR) ⇔ Body ground	W-G ⇔ Body ground	RR door double door lock OFF → SET	No continuity → Continuity
9 (L1) ⇔ Body ground	L-W ⇔ Body ground	Door control switch (Manual operation) OFF → LOCK	No continuity → Continuity
8 (UL1) ⇔ Body ground	L-Y ⇔ Body ground	Door control switch (Manual operation) OFF → UNLOCK	No continuity → Continuity
7 (L2) ⇔ Body ground	G-Y ⇔ Body ground	Using the key, operate the driver's door lock cylinder LOCK → Other position	Continuity → No continuity
6 (UL2) ⇔ Body ground	L-R ⇔ Body ground	Using the key, operate the driver's door lock cylinder UNLOCK → Other position	Continuity → No continuity
2 (ACTS) ⇔ Body ground	L-W ⇔ Body ground	Double door lock OFF → SET	0 V → 10 - 14 V → 1 V or less
3 (ACTR) ⇔ Body ground	R-W ⇔ Body ground	Double door lock OFF → SET	0 V → 10 - 14 V → 1 V or less
25 (HAZ) ⇔ Body ground	Y-G ⇔ Body ground	Transmitter LOCK or UNLOCK switch is pushed Hazard warning switch ON	0 V (Hazard no flashing) → 10 - 14 V (Hazard flashing)

If the condition is not as specified, it means that the vehicle malfunctions.

3. Except TMUK LHD models:
INSPECT INSTRUMENTAL PANEL J/B (INTEGRATION RELAY)

(a) Inspect the fuse.
  (1) Inspect the DOOR 25 A and DOME 15 A fuses.

(b) Inspect the integration relay.
  (1) Disconnect the connectors 2A, 2B, 2F, 2G and 2K of the instrument panel J/B.
  (2) Check the voltage and continuity of each terminal of the vehicle's connector.



Standard:

Tester connection	Wiring color	Condition	Specified Condition
2S-6 (DCTY) ⇔ Body ground	*3 SB (R-G) ⇔ Body ground *14 SB (R-W) ⇔ Body ground	Driver door fully closed → Opened	No continuity → Continuity
2G-4 (PRCY) ⇔ Body ground	*1 R-G ⇔ Body ground *2 SB (R-G) ⇔ Body ground *3 R-W ⇔ Body ground	Passenger door fully closed → Opened	
2K-16 (PRCY) ⇔ Body ground	*4 R-W ⇔ Body ground *5 R-B ⇔ Body ground	RL door fully closed → Opened	
2K-17 (PRCY) ⇔ Body ground	*6 R-W ⇔ Body ground *7 R-L ⇔ Body ground	RR door fully closed → Opened	
2K-4 (PRCY) ⇔ Body ground	R-Y ⇔ Body ground	Back door fully closed → Opened	
2S-2 (KSW) ⇔ Body ground	W (L-B) ⇔ Body ground	No key in ignition switch lock cylinder → Key inserted	
2A-1 (IG) ⇔ Body ground	*8 B-R ⇔ Body ground *9 W ⇔ Body ground	Ignition switch OFF → ON	0 V → 10 - 14 V
2B-1 (+B) ⇔ Body ground	*8 W ⇔ Body ground *10 B-W ⇔ Body ground *11 W ⇔ Body ground	Constant	10 - 14 V
2G-11 (ACT+) ⇔ Body ground	*13 LG (L) ⇔ Body ground *12 L ⇔ Body ground	FL door lock OFF → ON	0 V → 10 - 14 V → 1 V or less
2G-6 (ACT-) ⇔ Body ground	*13 LG (R) ⇔ Body ground *12 R ⇔ Body ground		
2G-1 (ACT+) ⇔ Body ground	*13 LG (L) ⇔ Body ground *12 L ⇔ Body ground	FR door lock OFF → ON	
2G-5 (ACT-) ⇔ Body ground	*13 LG (R) ⇔ Body ground *12 R ⇔ Body ground		
2K-13 (ACT+) ⇔ Body ground	L ⇔ Body ground	S RL door lock OFF → ON (SDN models) S Back door lock OFF → ON (WGN models)	
2K-8 (ACT-) ⇔ Body ground	R ⇔ Body ground		
2G-12 (ACT+) ⇔ Body ground	LG (L) ⇔ Body ground	RR door lock OFF → ON	
2G-7 (ACT-) ⇔ Body ground	LG (R) ⇔ Body ground		
2F-11 (E) ⇔ Body ground	W-B ⇔ Body ground	Constant	Continuity

*1: LHD H/B models, *2: LHD Except H/B models, *3: RHD models, *4: RHD TMC made models,
*5: Except *4 models, *6: WGN models, *7: H/B models, *8: w/ Power Heater (Electrical type) models,
*9: Except *8 models, *10: Diesel Except *8 models, *11: Gasoline Except *8 models,
*12: RHD TMUK made models, *13: TMC made models, *14: RHD models
If the condition is not as specified, it means that the vehicle malfunctions.

(3) Connect the connector and check the voltage of each terminal of the connector.

Standard:

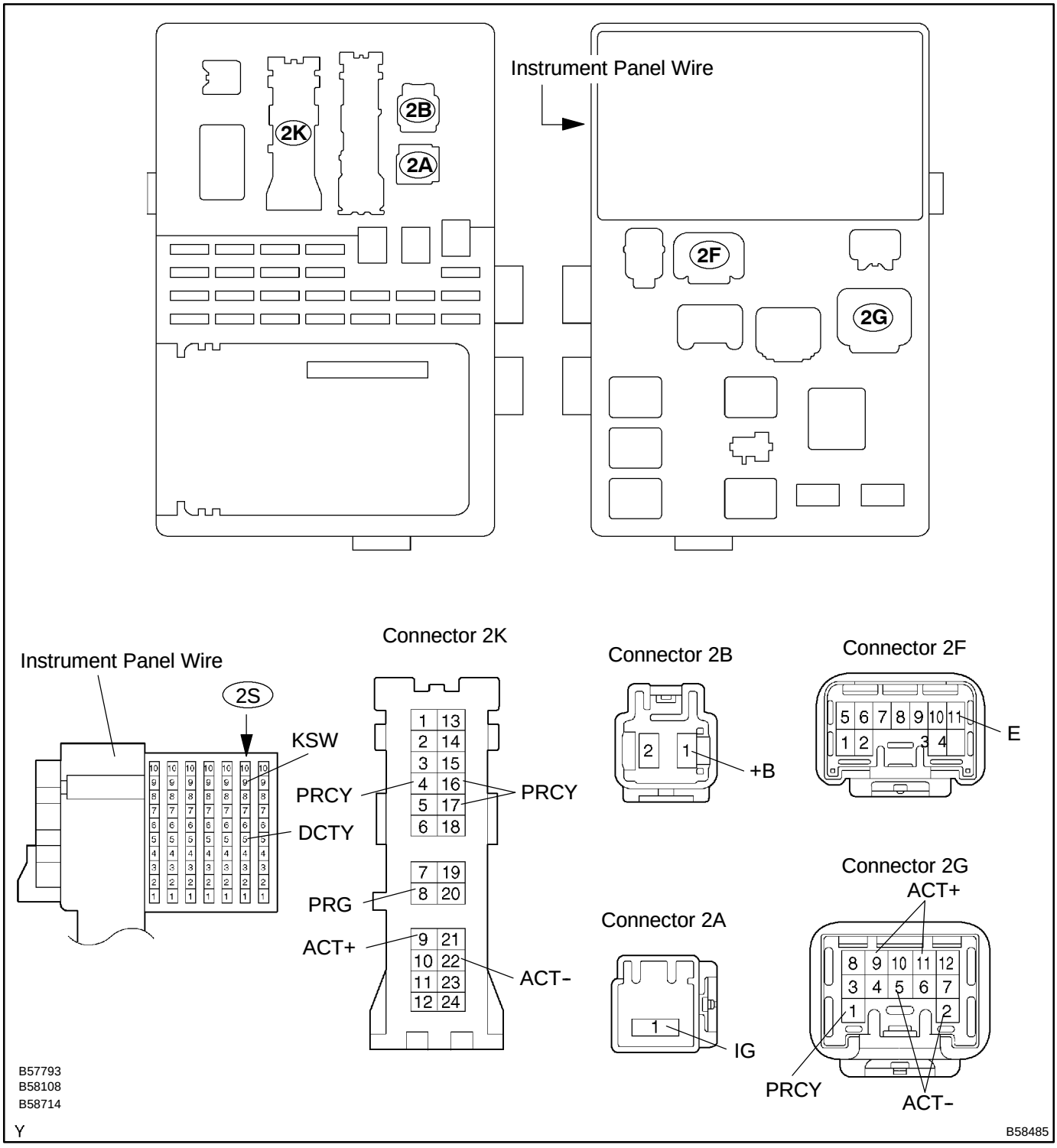
Tester connection	Wiring color	Condition	Specified Condition
2K-20 (PRG) ⇔ Body ground	G-Y ⇔ Body ground	IG switch OFF, no key in driver door lock cylinder, all door closed, and transmitter switch ON	1 V or less → 6 V → 1 V or less

If the value is not as specified, it means the instrument panel J/B assembly malfunctions.

4. TMUK LHD models:
INSPECT INSTRUMENTAL PANEL J/B (INTEGRATION RELAY)

(a) Inspect the fuse.
(1) Inspect the DOOR 25 A and DOME 15 A fuses.

(b) Inspect the integration relay.
(1) Disconnect the connectors 2A, 2B, 2F, 2G and 2K of the instrument panel J/B.
(2) Check the voltage and continuity of each terminal of the vehicle's connector.



Standard:

Tester connection	Wiring color	Condition	Specified Condition
2S-5 (DCTY) ⇔ Body ground	SB (R-W) ⇔ Body ground	Driver door fully closed → Opened	No continuity → Continuity
2G-1 (PRCY) ⇔ Body ground	R-G ⇔ Body ground	Passenger door fully closed → Opened	No continuity → Continuity
2K-16 (PRCY) ⇔ Body ground	R-B ⇔ Body ground	RL door fully closed → Opened	
2K-17 (PRCY) ⇔ Body ground	R-Y ⇔ Body ground	RR door fully closed → Opened	
2K-4 (PRCY) ⇔ Body ground	R-L ⇔ Body ground	Back door fully closed → Opened	
2S-9 (KSW) ⇔ Body ground	W (L-B) ⇔ Body ground	No key in ignition switch lock cylinder → Yes	
2A-1 (IG) ⇔ Body ground	B-R ⇔ Body ground	Ignition switch OFF → ON	0 V → 10 - 14 V
2B-1 (+B) ⇔ Body ground	W ⇔ Body ground	Constant	10 - 14 V
2G-11 (ACT+) ⇔ Body ground	LG (L) ⇔ Body ground	FL door lock OFF → ON	0 V → 10 - 14 V → 1 V or less
2G-5 (ACT-) ⇔ Body ground	LG (R) ⇔ Body ground		
2G-9 (ACT+) ⇔ Body ground	L ⇔ Body ground	FR door lock OFF → ON	
2G-2 (ACT-) ⇔ Body ground	R ⇔ Body ground		
2K-9 (ACT+) ⇔ Body ground	L ⇔ Body ground	$ RL door lock OFF → ON $ RR door lock OFF → ON $ Back door lock OFF → ON	
2K-22 (ACT-) ⇔ Body ground	R ⇔ Body ground		
2F-11 (E) ⇔ Body ground	W-B ⇔ Body ground	Constant	Continuity

If the condition is not as specified, it means that the vehicle malfunctions.

(3) Connect the connector and check the voltage of each terminal of the connector.

Standard:

Tester connection	Wiring color	Condition	Specified Condition
2K-8 (PRG) ⇔ Body ground	W-B ⇔ Body ground	IG switch OFF, no key in driver door lock cylinder, all door closed, and transmitter switch ON	1 V or less → 6 V → 1 V or less

If the value is not as specified, it means the instrument panel J/B assembly malfunctions.

0577C-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
All functions of wireless door lock control system do not operate (only wireless control function does not operate).	1. Transmitter battery	73-18 73-19
	2. Door control transmitter	73-16
	3. Door control receiver	73-16
	4. DOME fuse	68-1
	5. Integration relay	05-1358
	6. Unlock warning SW	05-1422
	7. Wire harness	-

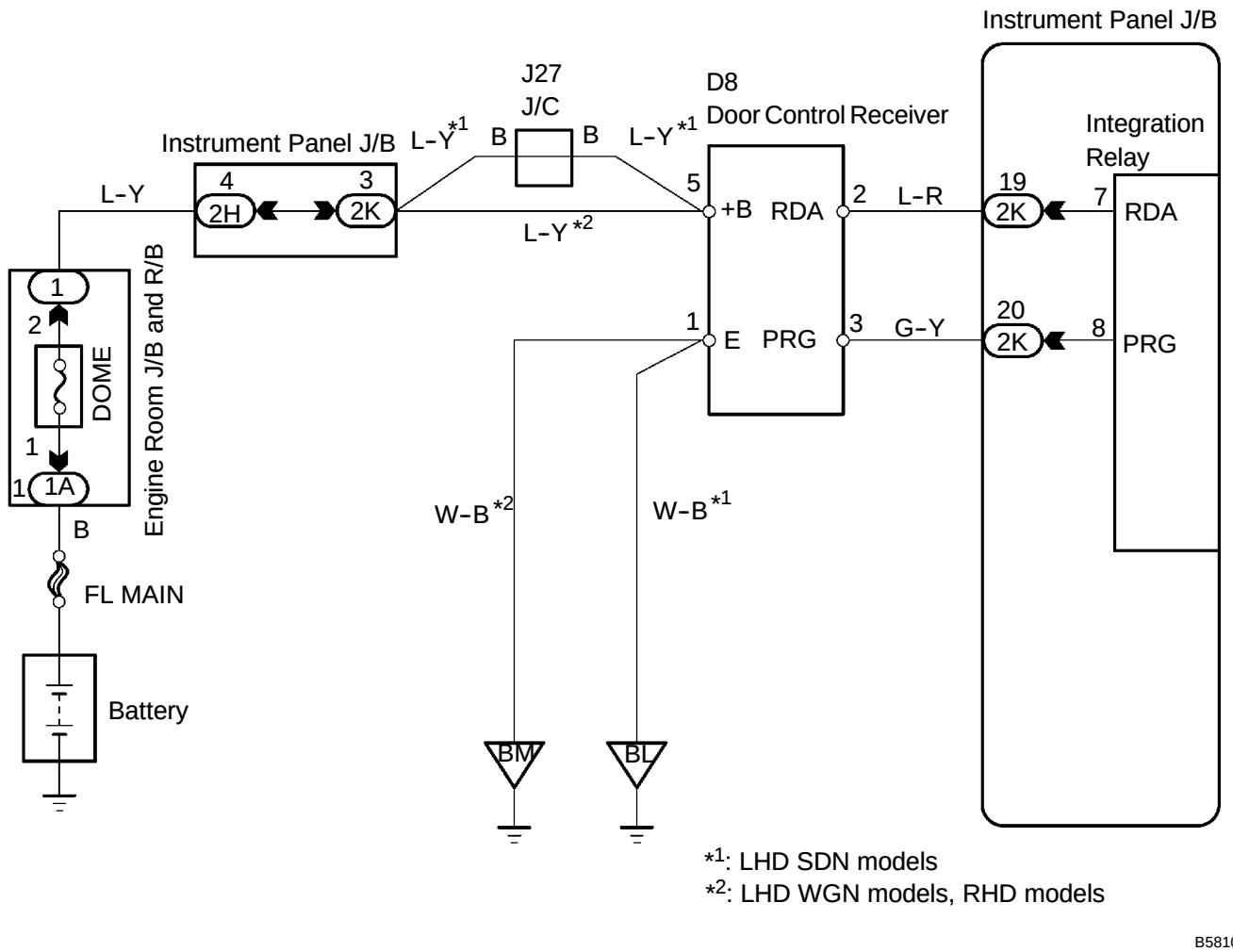
ONLY WIRELESS CONTROL FUNCTION IS INOPERATIVE (PREPARE NEW OR NORMAL TRANSMITTER OF THE SAME TYPE VEHICLE)

CIRCUIT DESCRIPTION

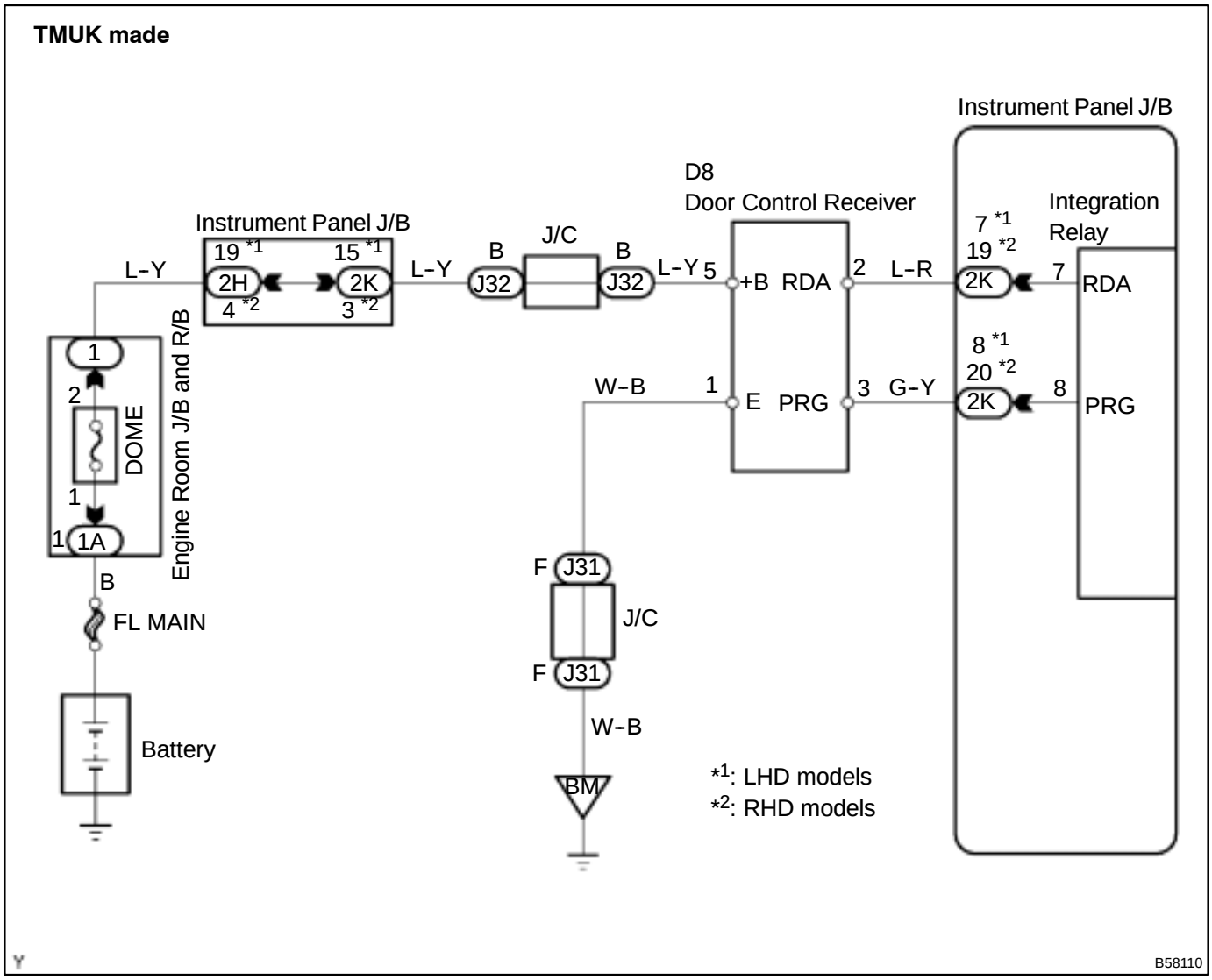
The door control receiver receives a signal from the transmitter and send it to the integration relay with door control by line. Door control receiver receives a signal from the transmitter and sends the signal to the integration relay. The integration relay sends a door LOCK/UNLOCK signal to each door lock actuator to control it.

WIRING DIAGRAM

TMC made



TMUK made


Instrument Panel J/B
D8
Door Control Receiver
Integration
Relay
Instrument Panel J/B
19 *1
15 *1
2H
2K
4 *2
3 *2
L-Y
B
J/C
B
J32
J32
L-Y
5
+B
RDA
2
L-R
7 *1
19 *2
2K
7
RDA
8 *1
20 *2
2K
8
PRG
W-B
1
E
PRG
3
G-Y
1
2
DOME
1
1
1A
Engine Room J/B and R/B
B
FL MAIN
Battery
F
J31
J/C
F
J31
W-B
BM
*1: LHD models
*2: RHD models
B58110

INSPECTION PROCEDURE

HINT:
A switch described in this text indicates the switch for sending, which is built-in the door control transmitter.

1	CHECK THE WIRELESS DOOR LOCK FUNCTIONS

OK → NORMAL

NG

2	CHECK TRANSMITTER LED LAMP ON

(a) Check the transmitter LED lights up 3 times when pressing the switch 3 times.

OK → Go to step 4

NG

3	CHECK TRANSMITTER BATTERY SIMPLY

(a) When the transmitter battery is replaced with a new or normal one, check the transmitter LED lights up 3 times when pressing the switch 3 times.

OK → REPLACE TRANSMITTER BATTERY

NG → REPLACE TRANSMITTER SUB-ASSY MODULE SET DOOR CONTROL

4	CHECK THE WIRELESS DOOR LOCK FUNCTIONS

(a) Check if the UNLOCK-LOCK operates by the standard operation.

NOTICE:
Standard operation, herein, means an operation to press the transmission switch for 1 second, directing the transmitter to the vehicle in the location that is 100 cm (39.37 in.) away from the driver's outside handle in the right direction.

NG → REPLACE TRANSMITTER SUB-ASSY MODULE SET DOOR CONTROL

OK

5	CONFIRM ROOM LAMP ON

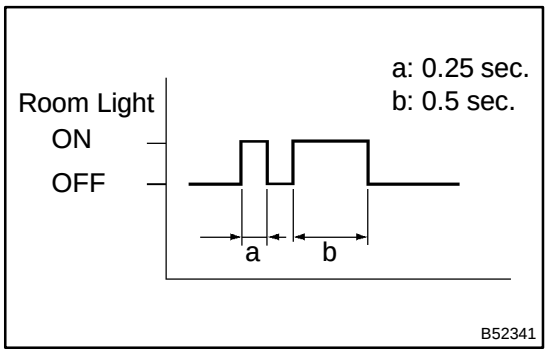
(a) Check that the room lamp comes on.

HINT:
When the light does not come on, proceed with the self-diagnostic mode after the repair of the room light.

6	ENTER INTO THE SELF DIAGNOSTIC MODE

(a) Enter into the self-diagnostic mode via an operation of the ignition switch lock cylinder.
  (1) Insert the key into the ignition switch lock cylinder under the vehicle's initial condition, and then carry out the operation of the ignition switch assembly OFF→ON→OFF once within 5 seconds after the key is pulled out.
  (2) Within 30 seconds after the ignition switch assembly is turned OFF, carry out the operation of the ignition switch assembly OFF→ON→OFF 9 times.

NOTICE:
It will enter into the normal mode if even one of the above conditions has not been met.
HINT:
- Operation of the ignition switch assembly OFF→ON will finish the self-diagnostic mode.
- Do not carry out lock/ unlock operations during the self-diagnostic mode.



(b) Check that it has entered into the self-diagnostic mode by blinks of the room light.

NG → CONFIRM INPUT METHOD OF SELF DIAGNOSTIC MODE

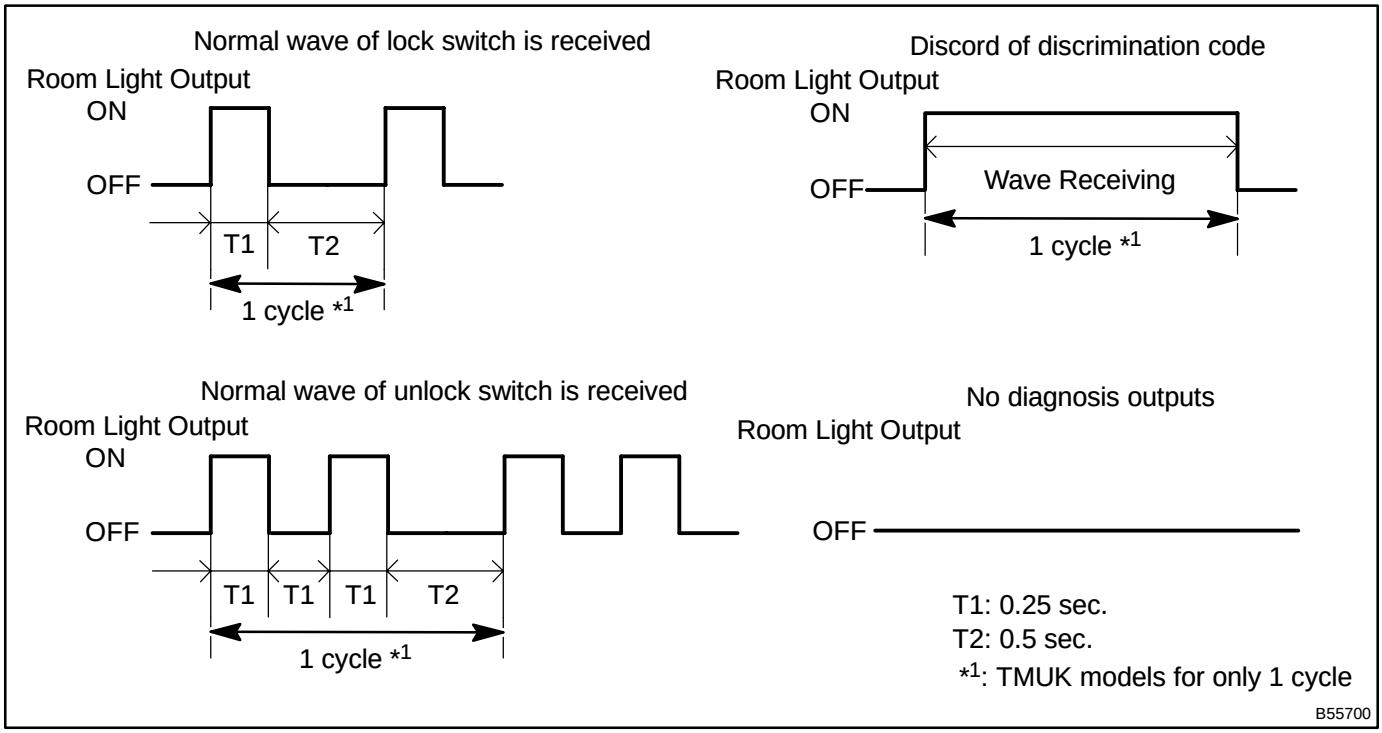
OK

7	CHECK BY SELF-DIAGNOSTIC MODE

(a) Inspect the outputs of the diagnosis when the door control transmitter switch has been kept pressing (Check of diagnosis outputs can be made by output of the room light.).

HINT:

- In case of a reception of the normal wave of the LOCK/UNLOCK switch (room light blinks) and no diagnosis outputs (room light off), go to step "A".
- In case of discord of discrimination code (room lights on), go to step "B".
- In case of no diagnosis outputs, go to step "C".



A	REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSY
C	Go to step 9

B

8	REGISTRATION OF RECOGINITION CODE

(a) Check that it is possible to enter into the rewrite mode to add mode or the discrimination code registration, and also registration is possible.

OK	NORMAL(CARRY OUT INSPECTION OF FUNCTIONS)
NG	Go to step 10

9	CHECK RESPONSE OF DOOR CONTROL RECEIVER

(a) When a new normal door control transmitter switch for the same type vehicle is kept pressing, check if a diagnosis of no correspondence in the recognition code is output,

OK → REPLACE TRANSMITTER SUB-ASSY MODULE SET DOOR CONTROL

NG → Go to step 13

10	EXCHANGE DOOR CONTROL RECEIVER WITH NORMAL ONE

OK → REPLACE DOOR CONTROL RECEIVER

NG → REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSY

11	CONFIRM INPUT METHOD OF SELF DIAGNOSTIC MODE

(a) When the input method of the self-diagnostic mode is correct, proceed to "A".
(b) When the input method of the self-diagnostic mode is incorrect, proceed to "B".

B → Go to step 6

A

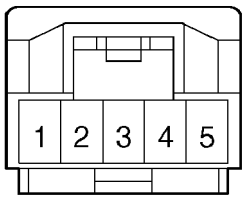
12	INSPECT UN-LOCK WARNING SWITCH ASSY

OK → REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSY

NG → REPLACE UN-LOCK WARNING SWITCH ASSY

13	CHECK DOOR CONTROL RECEIVER

Wire Harness Side



B59092

(a) Disconnect the connector from the control receiver.
(b) Check the connector on the harness side.

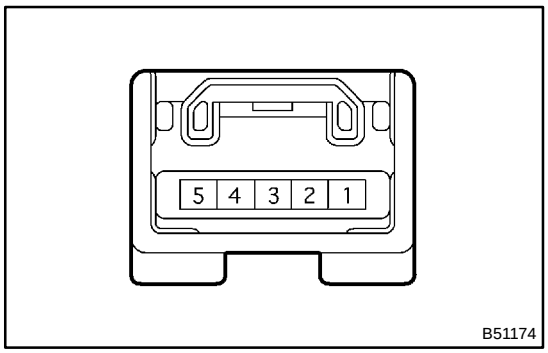
Voltage and Continuity:

Tester connection	Specified condition
5 (+B) - Body ground	10 - 14 V
1 (E) - Body ground	Continuity

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

14 CHECK DOOR CONTROL RECEIVER



(a) Reconnect the connector to the door control receiver, and check the voltage between terminal 2 and the body ground.

Voltage:

Tester connection	Condition	Specified condition
2 (RDA) - Ground	IG switch OFF, No key in ignition switch, All door closed, Each transmitter switch OFF → ON	Below 1 V → About 6 - 7 V → Below 1 V

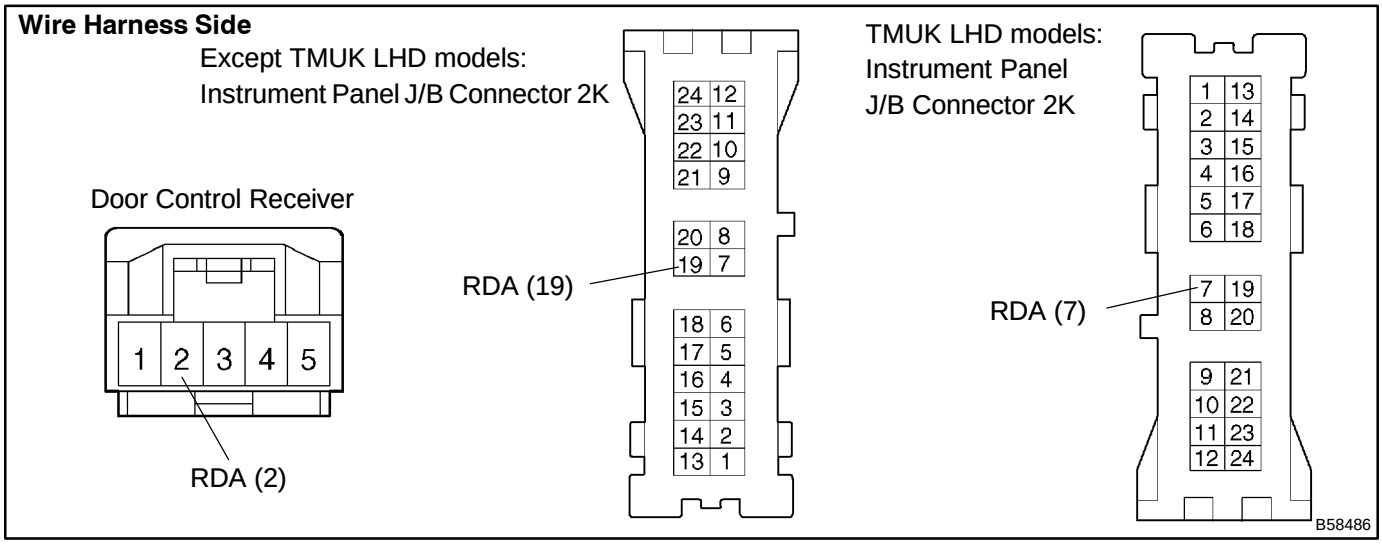
NOTICE:
Check the confirmation of the output voltage with the bar graph display.

NG → Go to step 16

OK

15 CHECK WIRE HARNESS

(a) Disconnect the instrument panel J/B connector 2K and door control receiver connector, and inspect the connector on the wire harness side.



Standard:

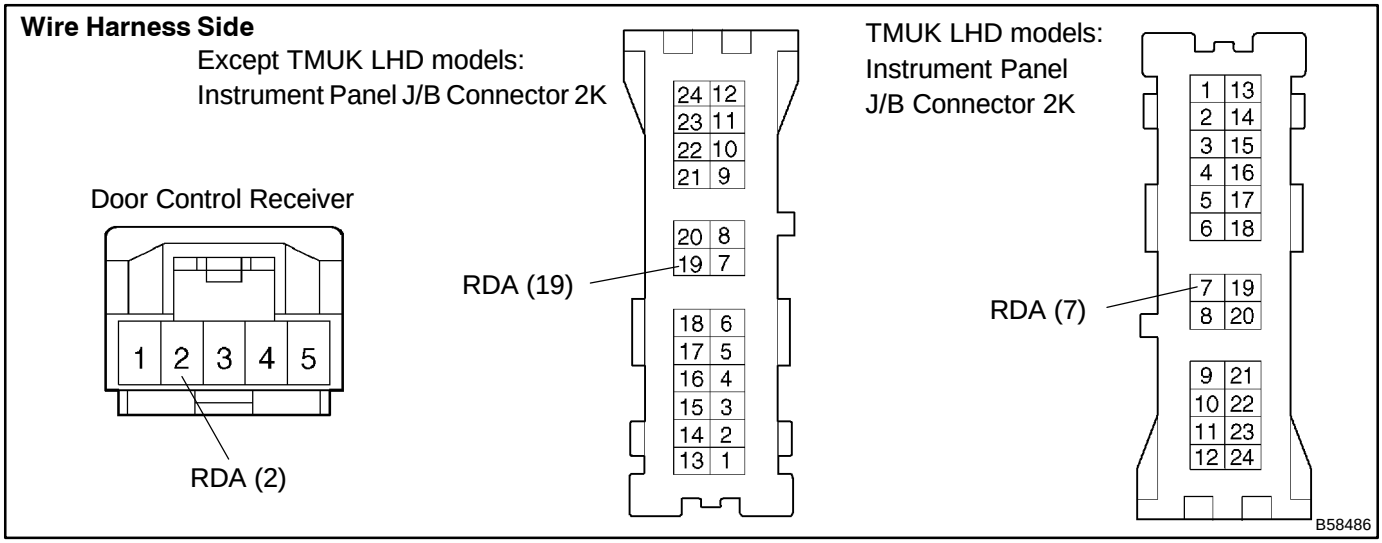
Models	Terminals (Receiver - Instrument Panel J/B)	Specified condition
Except TMUK LHD models	2 (RDA) ⇔ 2K-19 (RDA)	Continuity
TMUK LHD models	2 (RDA) ⇔ 2K-7 (RDA)	

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK → Go to step 17

16	CHECK WIRE HARNESS

(a) Disconnect the instrument panel J/B connector 2K and door control receiver connector, and inspect the connector on the wire harness side.



Standard:

Models	Terminals	Specified condition
Except TMUK LHD models	2K-19 (RDA) ⇔ Ground	No continuity
TMUK LHD models	2K-7 (RDA) ⇔ Ground	
All models	2 (Receiver) ⇔ Ground	No continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

17	EXCHANGE DOOR CONTROL RECEIVER WITH NORMAL ONE

OK → **REPLACE DOOR CONTROL RECEIVER**

NG

REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSY

ENGINE IMMOBILISER SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

05791-01

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS CHECK AND PROBLEM SYMPTOM CONFIRMATION

3	CRANK ENGINE FOR MORE THAN 10 SECONDS

4	CHECK DIAGNOSTICS TROUBLE CODE OF ECM (See page 05-1378)

(a) When any of the following codes is output, proceed to "A".
(b) When a code except the followings is output or no code is output, proceed to "B".
Code: 1-1, 1-2, 1-3, 2-1, 2-2, 3-1, 3-2, 3-3, 3-4, B2795, B2796, B2797, B2798

B	Refer to EFI or ECD system (See page 05-168, 05-333, 05-14, 05-432)

A

5	CHECK DIAGNOSTICS TROUBLE CODE (See page 05-1378)

(a) Check a DTC and note it if a code is output.
(b) Delete the DTC.
(c) Check if the DTC will be output once again, when the problem symptom is simulated based on the noted code.
(1) With an output of the code, proceed to "A".
(2) Without an output of the code, proceed to "B".

B	Normal

A

6	ACCORDING TO PROBLEM SYMPTOM, PERFORM TROUBLESHOOTING

(a) PRE-CHECK (See page 05-1377)
(1) Inspection with hand-held tester (ECU data monitor)
(2) Inspection with hand-held tester (Active test)
(b) TERMINAL OF ECU (See page 05-1380)

7	ADJUSTMENT, REPAIR OR REPLACE

END

05792-01

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE IMMOBILISER Check Sheet

Inspector's Name :

Customer's Name		**Registration No.**	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Intermittent (times a day) ☐ Only once
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. _F (_C)

Symptoms	☐ Immobiliser is not set. (Engine starts with key codes other than the registered key code.)
	☐ Engine does not start.

DTC Check	**1st Time**	☐ Normal code ☐ Malfunction code (Code)
	2nd Time	☐ Normal code ☐ Malfunction code (Code)

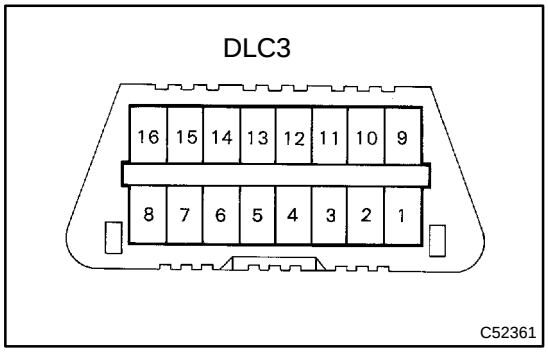
PRE-CHECK

HINT:

- Use of the hand-held tester makes it possible to select the check mode besides the normal mode. The check mode has further sensibility to detect a malfunction than the normal mode.
- The check mode is used, when the normal code is output in the normal mode although there should be a problem in each sensor's signal system.

1. PREPARATION FOR INSPECTION

(a) Check that the throttle valve is fully closed.
(b) Have the shift in the N or P range.
(c) Turn off the air conditioner.



2. DTC CHECK

(a) Connect the hand-held tester to the DLC3
(b) Following the instruction on the display to select the normal mode or check mode, check the DTC

HINT:

If no code is displayed, there may be a problem in the computer.

3. DTC DELETE

(a) Following the instruction on the display, delete the diagnosis code.

NOTICE:

If the code cannot be deleted, the operation to delete the code should be restarted after the ignition switch is once turned OFF.

4. INSPECTION WITH HAND-HELD TESTER

(a) By using hand-held tester, make a judgement of good or bad and find out a malfunctioning part by the ECU data monitor.

ECM:

Item	Inspecting condition	Standard value
Main key inserted	IG ON with main key → Pull it out from IG SW cylinder	Insert / Not insert
Sub key inserted	IG ON with sub key → Pull it out from IG SW cylinder	Insert / Not insert
Registered key in immobilizer	-	3 keys

05794-01

DIAGNOSTIC TROUBLE CODE CHART

1. Gasoline Engine:
ECM DIAGNOSTIC TROUBLE CODE CHART

DTC No. (See page)	Detection item	Trouble Area
B2795 (05-1387)	Unmatched key code	S Key
B2796, B2798 (05-1388)	No communication in immobiliser system	S Key S Transponder key amplifier with key coil S Wire harness
B2797 (05-1394)	Communication malfunction No.1	S Transponder key amplifier with key coil S Unregistered key inserted before S Wire harness S ECM

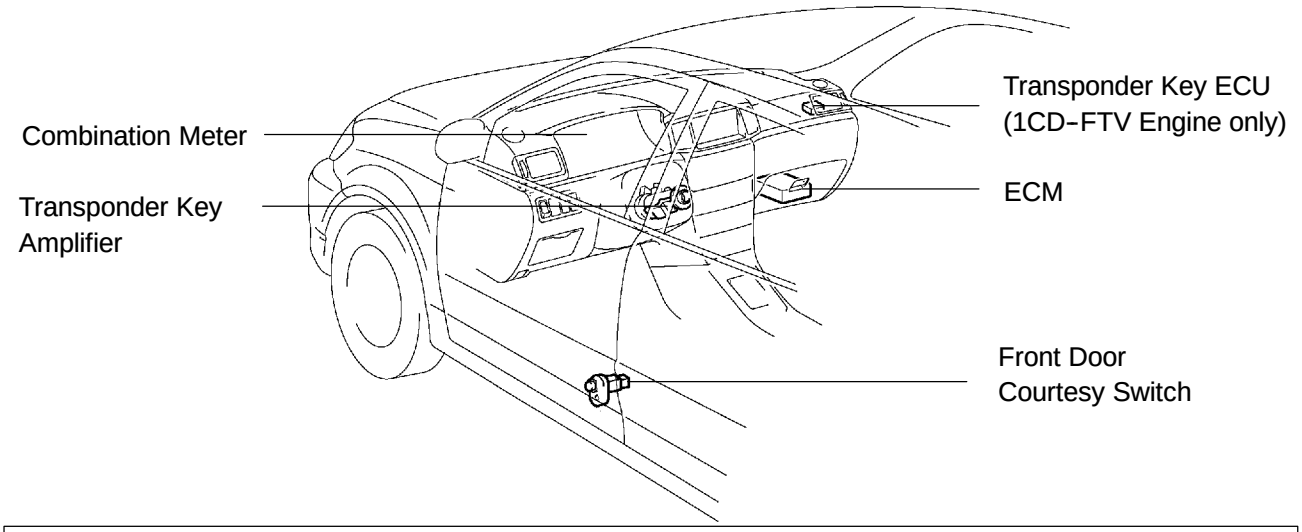
2. Diesel Engine:
TRANSPONDER KEY ECU DIAGNOSTIC TROUBLE CODE CHART

DTC No. (See page)	Detection item	Trouble Area
B2799 (05-1395)	Engine immobilizer system malfunction	S Transponder key ECU S Transponder key amplifier with key coil S ECM S Wire harness
1-1 (05-1397)	Code 1-1 is not output	S Unlock warning switch S Transponder key ECU S Wire harness
1-2 (05-1399)	Code 1-2 is not output	S Door courtesy S Wire harness
1-3 (05-1401)	Code 1-3 is not output	S Ignition switch S Transponder key ECU S Wire harness
2-1, 2-2 (05-1403)	Code 2-1, 2-2 is not output	S Key S Transponder key ECU S Transponder key amplifier with key coil S Wire harness
3-1 (05-1406)	Code 3-1 is output	S Key
3-2, 3-3 (05-1407)	Code 3-2 or 3-3 is output	S Key S Transponder key ECU S Transponder key amplifier with key coil S Wire harness
3-4	Code 3-4 is output	S Transponder key ECU has no memory space to register another key code

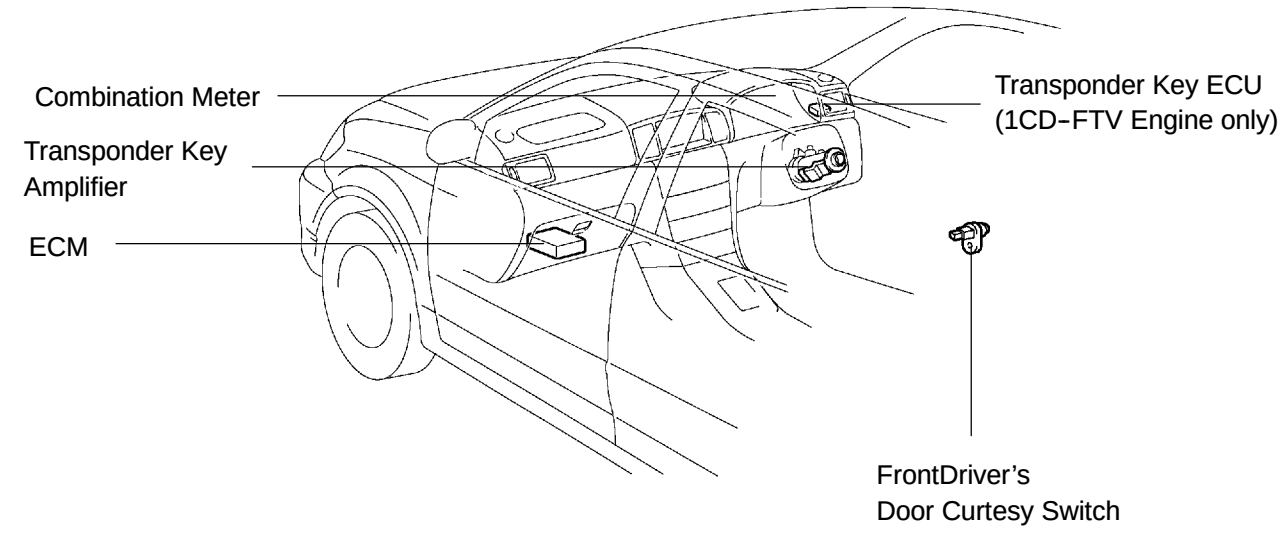
05795-01

LOCATION

LHD Models



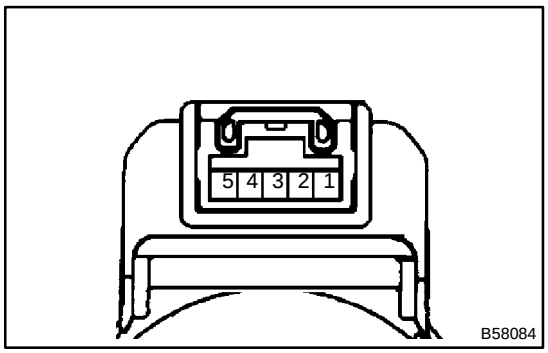
RHD Models



B58683

05796-01

TERMINALS OF ECU



1. INSPECT TRANSPONDER KEY AMPLIFIER

(a) Disconnect the transponder key amplifier connector.

(b) Check the continuity between the transponder key amplifier and body ground.

Standard:

Tester connection	Wiring color	Continuity
GND (T6-3) ⇔ Body ground	W-B *1 R *2 - Body ground	Continuity

*1: Gasoline engine models

*2: Diesel Engine models

(c) Connect the transponder key amplifier connector.

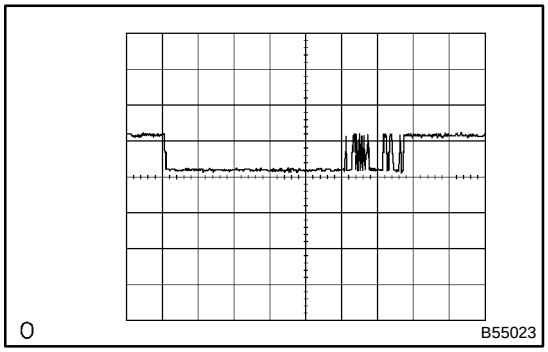
(d) Check the voltage, waveform and continuity between the transponder key amplifier terminals

Standard:

Symbols (Terminal No.)	Wiring Color	Condition	Standard
+B (T6-5) ⇔ GND (T6-3)	B ⇔ W-B*1, R*2	No key in the ignition key cylinder → With key	0 V → 10 - 14 V
CODE (T6-2) ⇔ GND (T6-3)	P ⇔ W-B*1, R*2	No key in the ignition key cylinder → With key	Waveform 1
RXCK (T6-4) ⇔ GND (T6-3)	V ⇔ W-B*1, R*2	No key in the ignition key cylinder → With key	Waveform 2
TXCT (T6-1) ⇔ GND (T6-3)	G ⇔ W-B*1, R*2	No key in the ignition key cylinder → With key	Waveform 3
GND (T6-3) ⇔ Body ground	W-B*1, R*2 ⇔ Body ground	Constant	Continuity

*1: Gasoline Engine models

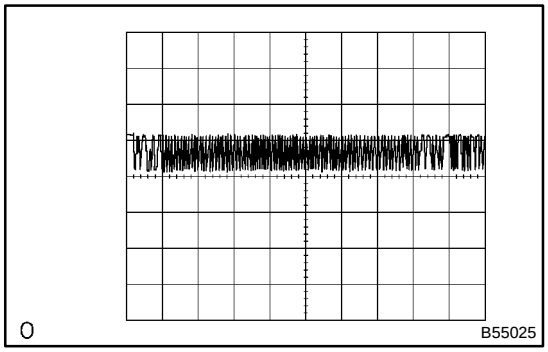
*2: Diesel Engine models



Reference: Inspection by using oscilloscope

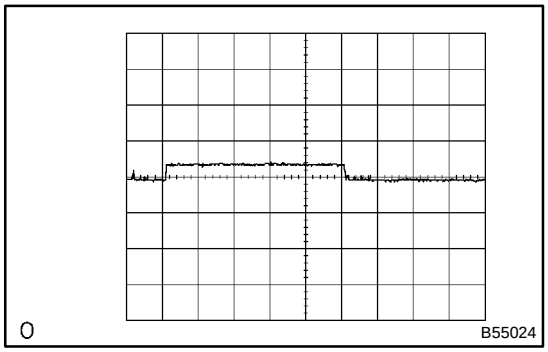
Waveform 1

Item	Condition
Terminal	CODE - GND
Tool setting	10V/DIV, 10ms/DIV
Vehicle condition	Ignition switch ON



Waveform 2

Item	Condition
Terminal	RXCX - GND
Tool setting	10V/DIV, 10ms/DIV
Vehicle condition	Ignition switch ON



Waveform 3

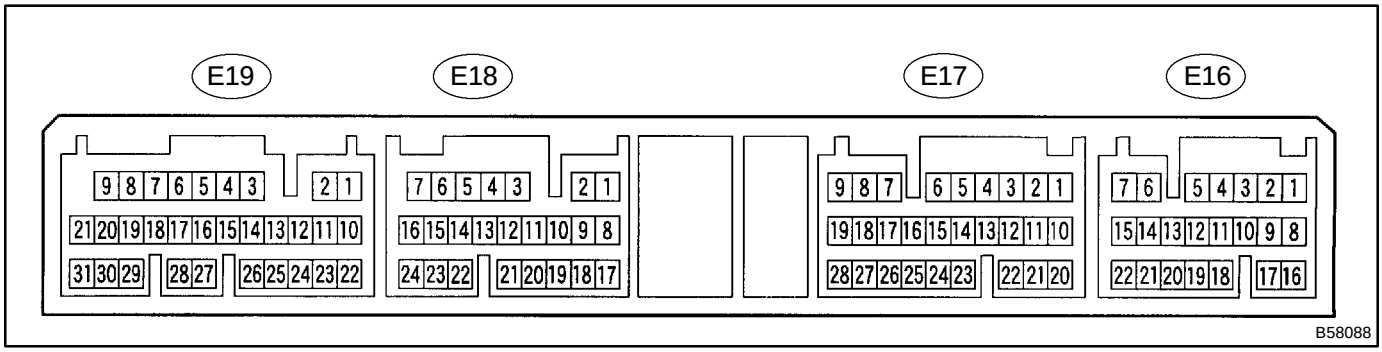
Item	Condition
Terminal	TXCK - GND
Tool setting	10V/DIV, 10ms/DIV
Vehicle condition	Ignition switch ON

2. Gasoline engine models:
INSPECT ECM

NOTICE:

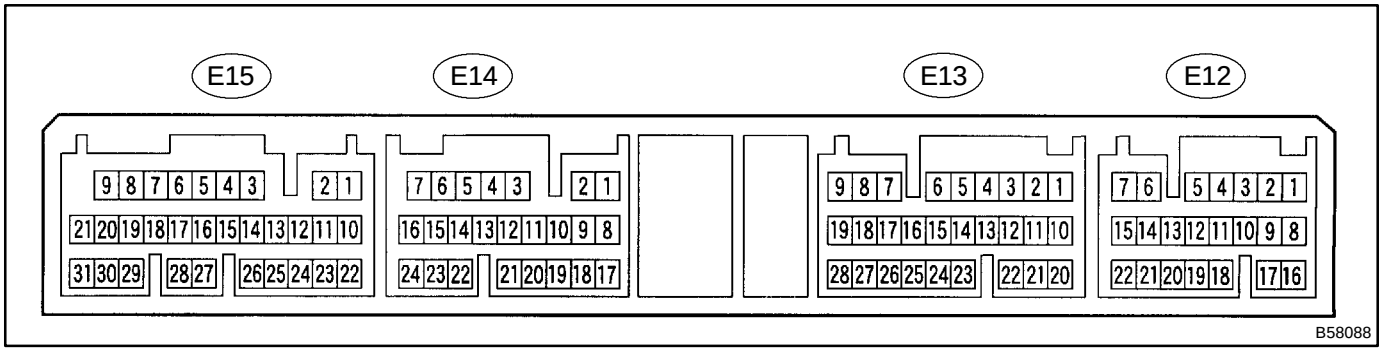
- **Inspection should be started from the backside of the ECM with the ECM connector being connected.**
- **Inspect the power source voltage and the body ground before the operation inspection.**

(a) 2ZZ-GE models:



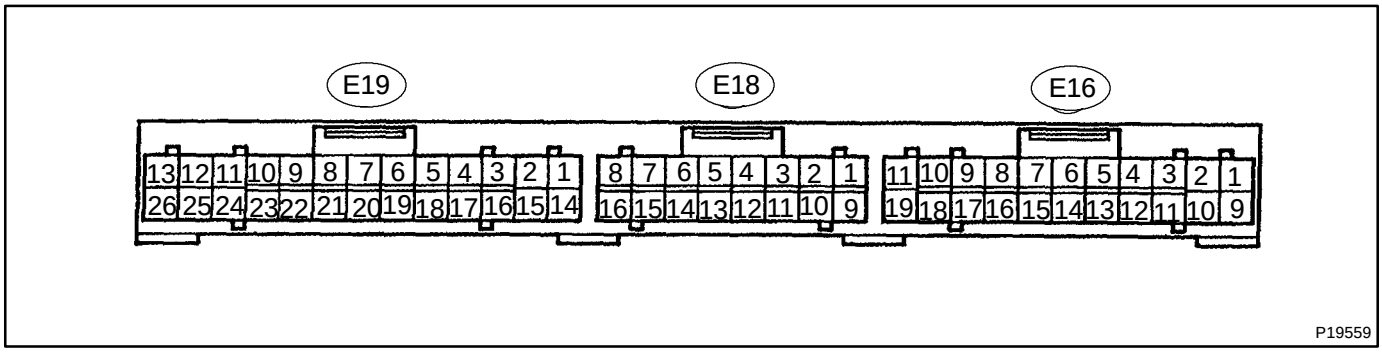
Terminal No. (Symbols)	Wiring Color	Condition	Standard
CODE (E17-7) ⇔ E1 (E18-17)	P ⇔ BR	No key in the ignition key cylinder → With key	Waveform 1
RXCK (E17-26) ⇔ E1 (E18-17)	V ⇔ BR	No key in the ignition key cylinder → With key	Waveform 2
TXCT (E17-15) ⇔ E1 (E18-17)	G ⇔ BR	No key in the ignition key cylinder → With key	Waveform 3
IMLD (E16-2) ⇔ E1 (E18-17)	W (W-R) ⇔ BR	Immobilizer system set	10 - 14 V
KSW (E17-17) ⇔ E1(E18-17)	L-B ⇔ BR	No key → With key	10 - 14 V → 0 V or less
E1 (E18-17) ⇔ Body ground	BR ⇔ Body ground	Ignition switch OFF → ON	Continuity
EOM (E16-5) ⇔ Body ground	W-B ⇔ Body ground	Constant	Continuity

(b) A/T of 3ZZ-FE models:



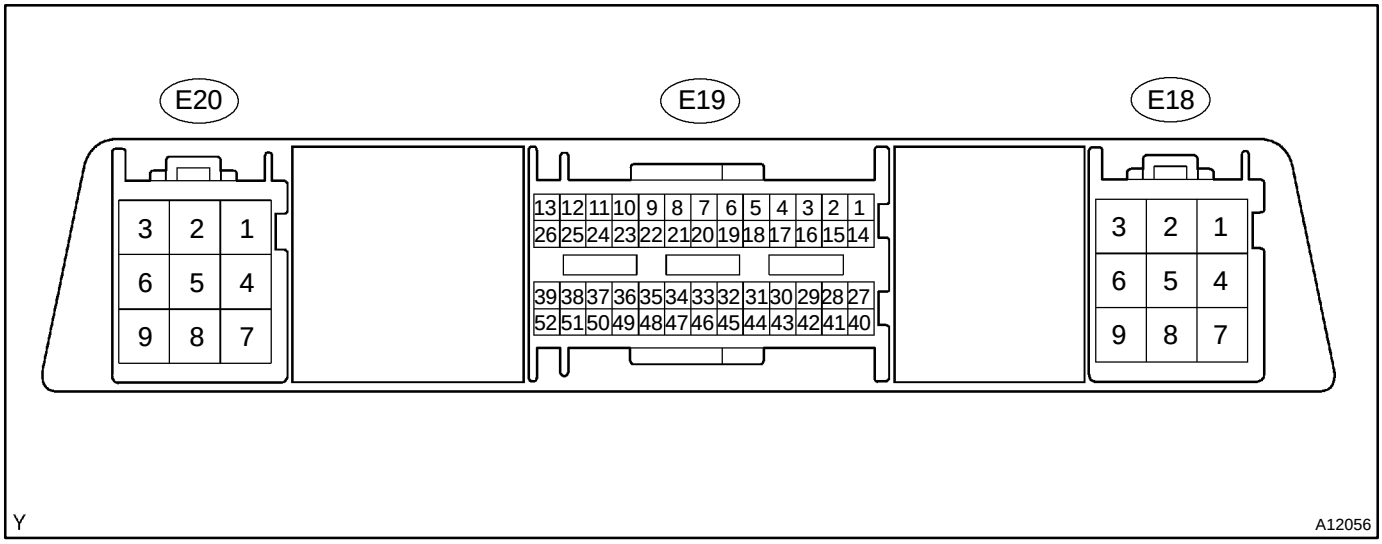
Terminal No. (Symbols)	Wiring Color	Condition	Standard
CODE (E13-7) ⇔ E1 (E14-17)	P ⇔ BR	No key in the ignition key cylinder → With key	Waveform 1
RXCK (E13-26) ⇔ E1 (E14-17)	V ⇔ BR	No key in the ignition key cylinder → With key	Waveform 2
TXCT (E13-15) ⇔ E1 (E14-17)	G ⇔ BR	No key in the ignition key cylinder → With key	Waveform 3
IMLD (E12-2) ⇔ E1 (E14-17)	W (W-R) ⇔ BR	Immobilizer system set	10 - 14 V
KSW (E13-17) ⇔ E1 (E14-17)	L-B ⇔ BR	No key → With key	10 - 14 V → 0 V or less
E1 (E14-17) ⇔ Body ground	BR ⇔ Body ground	Ignition switch OFF → ON	Continuity
EOM (E12-5) ⇔ Body ground	W-B ⇔ Body ground	Constant	Continuity

(c) M/T of 3ZZ-FE models:

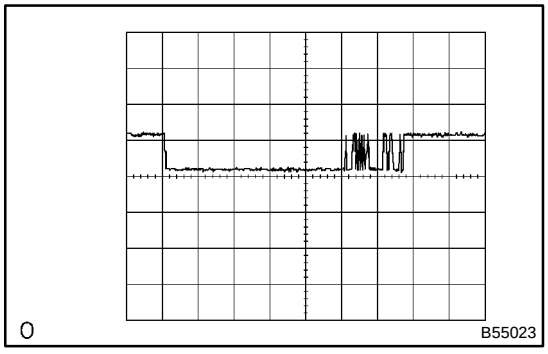


Terminal No. (Symbols)	Wiring Color	Condition	Standard
CODE (E16-16) ⇔ E1 (E19-14)	P ⇔ BR	No key in the ignition key cylinder → With key	Waveform 1
RXCK (E16-17) ⇔ E1 (E19-14)	V ⇔ BR	No key in the ignition key cylinder → With key	Waveform 2
TXCT (E16-15) ⇔ E1 (E19-14)	G ⇔ BR	No key in the ignition key cylinder → With key	Waveform 3
IMLD (E16-7) ⇔ E1 (E19-14)	W (W-R) ⇔ BR	Immobilizer system set	10 - 14 V
KSW (E16-8) ⇔ E1 (E19-14)	L-B ⇔ BR	No key → With key	10 - 14 V → 0 V or less
E1 (E19-14) ⇔ Body ground	BR ⇔ Body ground	Ignition switch OFF → ON	Continuity

(d) 4ZZ-FE models:



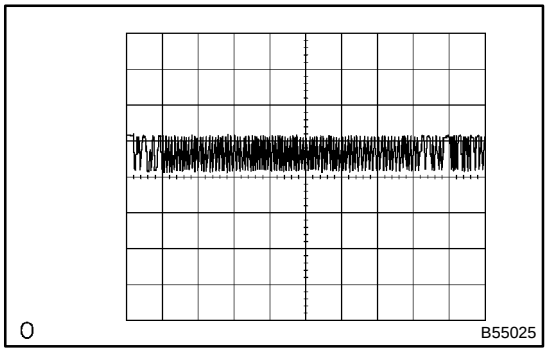
Terminal No. (Symbols)	Wiring Color	Condition	Standard
CODE (E19-2) ⇔ E1 (E20-7)	P ⇔ W-B	No key in the ignition key cylinder → With key	Waveform 1
RXCK (E19-16) ⇔ E1 (E20-7)	V ⇔ W-B	No key in the ignition key cylinder → With key	Waveform 2
TXCT (E19-18) ⇔ E1 (E20-7)	G ⇔ W-B	No key in the ignition key cylinder → With key	Waveform 3
IMLD (E19-37) ⇔ E1 (E20-7)	W-R ⇔ W-B	Immobilizer system set	10 - 14 V
KSW (E19-38) ⇔ E1 (E20-7)	L-B ⇔ W-B	No key → With key	10 - 14 V → 0 V or less
E1 (E20-7) ⇔ Body ground	W-B ⇔ Body ground	Ignition switch OFF → ON	Continuity
EOM (E19-17) ⇔ Body ground	W-B ⇔ Body ground	Constant	Continuity



Reference: Inspection by using oscilloscope

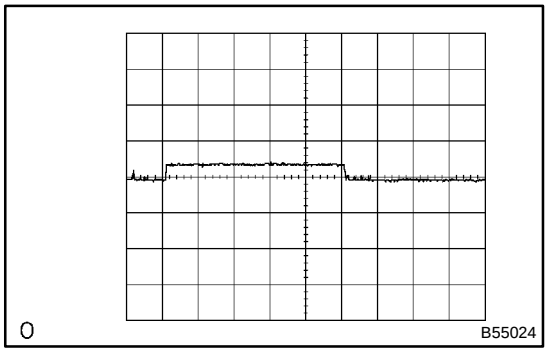
Waveform 1

Item	Condition
Terminal	CODE - GND
Tool setting	10V/DIV, 10ms/DIV
Vehicle condition	Ignition switch ON



Waveform 2

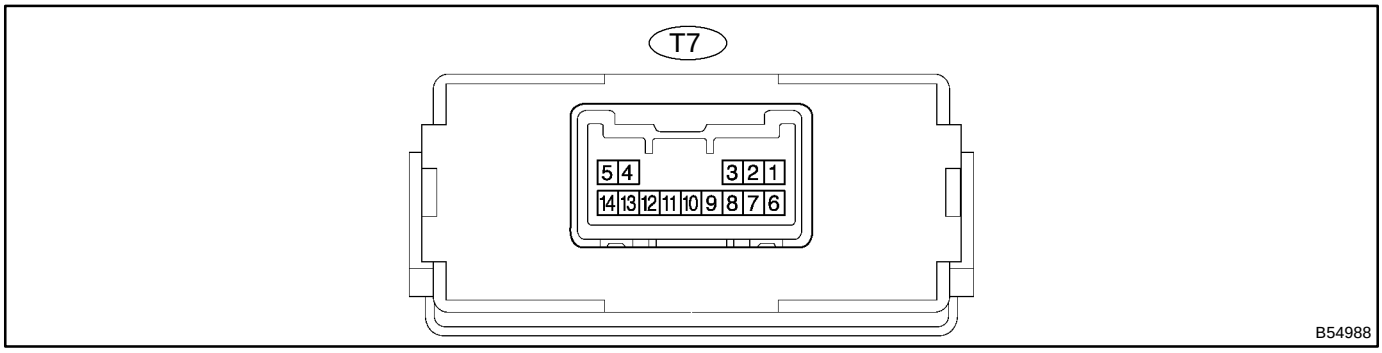
Item	Condition
Terminal	RXCX - GND
Tool setting	10V/DIV, 10ms/DIV
Vehicle condition	Ignition switch ON



Waveform 3

Item	Condition
Terminal	TXCK - GND
Tool setting	10V/DIV, 10ms/DIV
Vehicle condition	Ignition switch ON

3. Diesel engine models:
INSPECT TRANSPONDER KEY ECU



(a) Disconnect the transponder key ECU connector.

Standard:

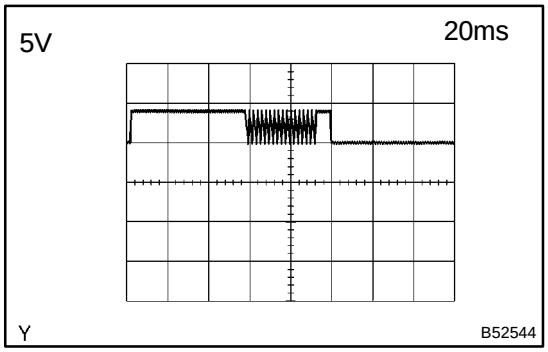
Symbols (Terminal No.)	Wiring Color	Condition	Standard
GND (T7-14) ⇔ Body ground	W-B ⇔ Body ground	Constant	Continuity
+B (T7-1) ⇔ GND (T7-14)	SB(R-G) ⇔ W-B	Constant	10 - 14 V
IG (T7-2) ⇔ GND (T7-14)	B-W*1, SB(B-W)*2 ⇔ W-B	IG switch OFF → ON	0 V → 10 - 14 V
KSW (T7-9) ⇔ GND (T7-14)	L-B ⇔ W-B	No key in the ignition key cylinder → With key	No continuity → Continuity

*1: LHD models
*2: RHD models

(b) Connect the transponder key ECU connector.

Standard:

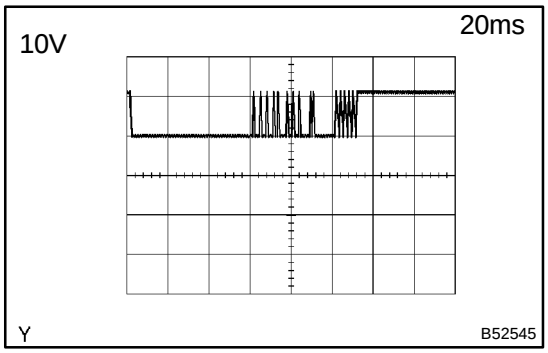
Symbols (Terminal No.)	Wiring Color	Condition	Standard)
KSW (T7-9) ⇔ GND (T7-14)	L-B ⇔ W-B	No key in the ignition key cylinder → With key	10 - 14 V → 0 V
VC12 (T7-6) ⇔ GND (T7-14)	B ⇔ W-B	IG switch OFF → ON	0 V → 10 - 14 V
TXCT (T7-13) ⇔ GND (T7-14)	G ⇔ W-B	IG switch OFF → ON	Waveform 1
CODE (T7-4) ⇔ GND (T7-14)	P ⇔ W-B	IG switch OFF → ON	Waveform 2
RXCX (T7-5) ⇔ GND (T7-14)	V ⇔ W-B	IG switch OFF → ON	Waveform 3
EFIO (T7-11) ⇔ GND (T7-14)	LG-R ⇔ W-B	IG switch OFF → ON	Waveform 4
EFII (T7-10) ⇔ GND (T7-14)	LG-B ⇔ W-B	IG switch OFF → ON	Waveform 5



Reference: Inspection by using oscilloscope

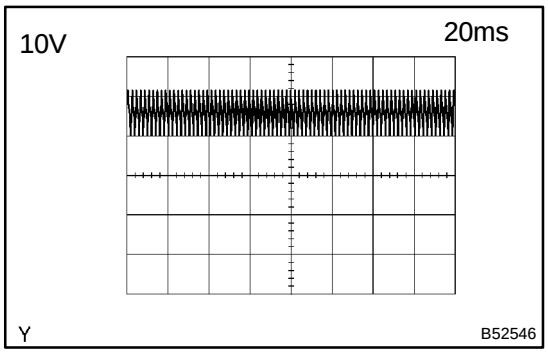
Waveform 1

Item	Condition
Terminal	TXCT - GND
Tool setting	5V/DIV, 20ms/DIV
Vehicle condition	Ignition switch ON



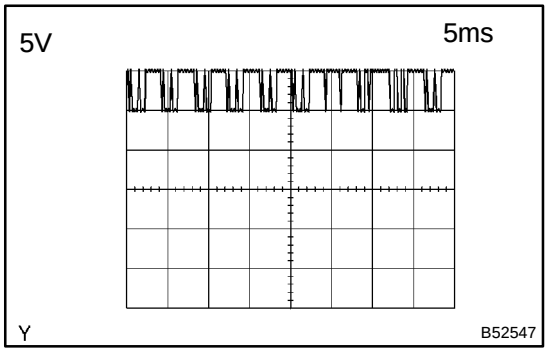
Waveform 2

Item	Condition
Terminal	CODE - GND
Tool setting	10V/DIV, 20ms/DIV
Vehicle condition	Ignition switch ON



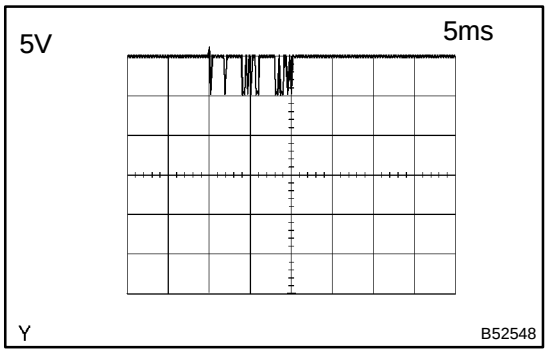
Waveform 3

Item	Condition
Terminal	RXCK - GND
Tool setting	10V/DIV, 20ms/DIV
Vehicle condition	Ignition switch ON



Waveform 4

Item	Condition
Terminal	EFIO - GND
Tool setting	5V/DIV, 5ms/DIV
Vehicle condition	Ignition switch ON



Waveform 5

Item	Condition
Terminal	EFII - GND
Tool setting	5V/DIV, 5ms/DIV
Vehicle condition	Constant

05797-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Engine does not start	1. Key	05-1406 05-1407 05-1387 05-1388
	2. Transponder key amplifier	05-1388 05-1394 05-1397
	3. Transponder key ECU (1CD-FTV Engine only)	05-1401 05-1403 05-1407
	4. ECM	05-1403 05-1394

DTC B2795/99 UNMATCHED KEY CODE

CIRCUIT DESCRIPTION

This DTC is output when an unregistered key is inserted.

DTC No.	DTC Detecting Condition	Trouble Area
B2795	Key with different ID code inserted in ignition switch	Key

INSPECTION PROCEDURE

1	CHECK DTC CODE

(a) Insert the key again after the DTC is cleared.
(b) Check whether the engine starts, after a reregistration of the key that does not start the engine has been done.

OK → NO PROBLEM (BECAUSE OF KEY REREGISTRATION)

NG

REPLACE KEY THAT DOES NOT START ENGINE

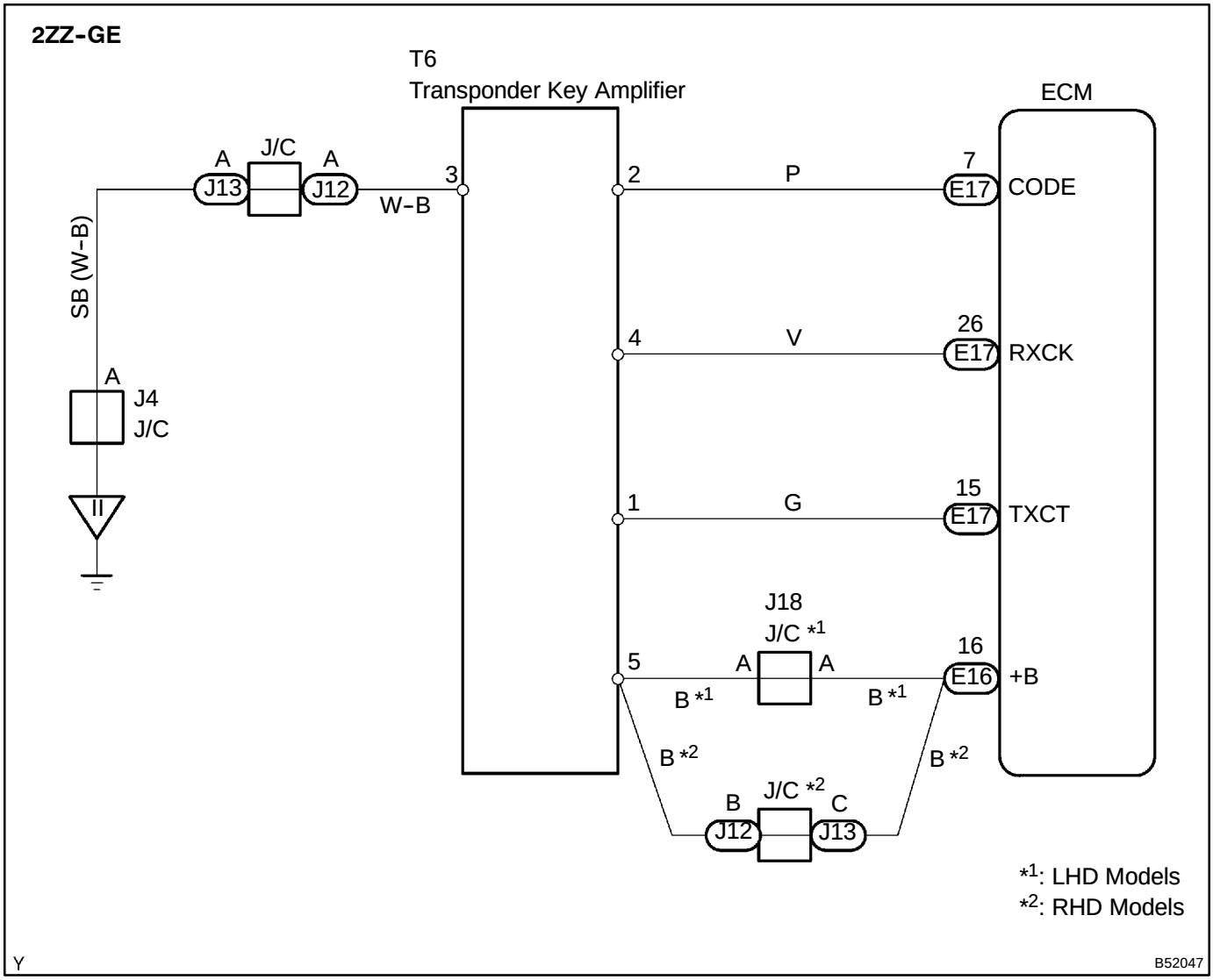
DTC	B2796/99	NO COMMUNICATION IN IMMOBILISER SYSTEM

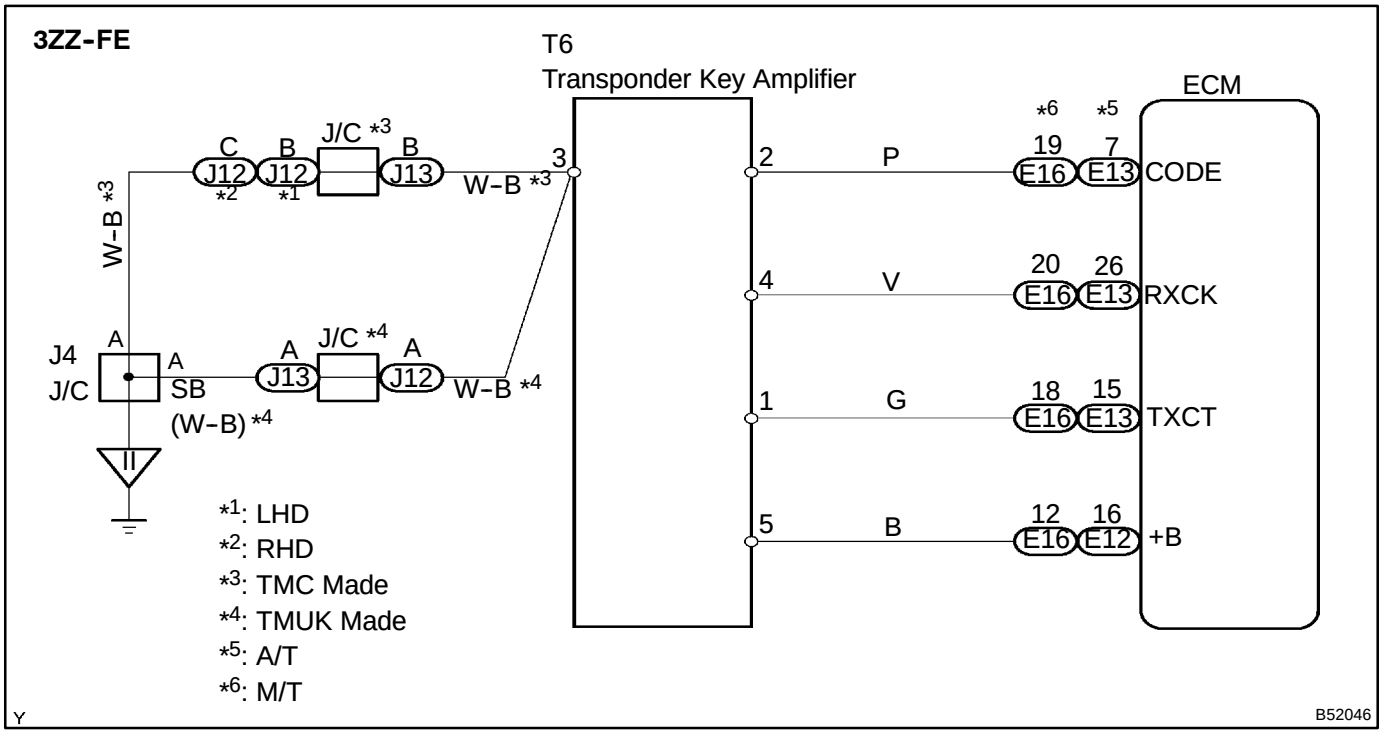
DTC	B2798/99	COMMUNICATION MALFUNCTION NO.2

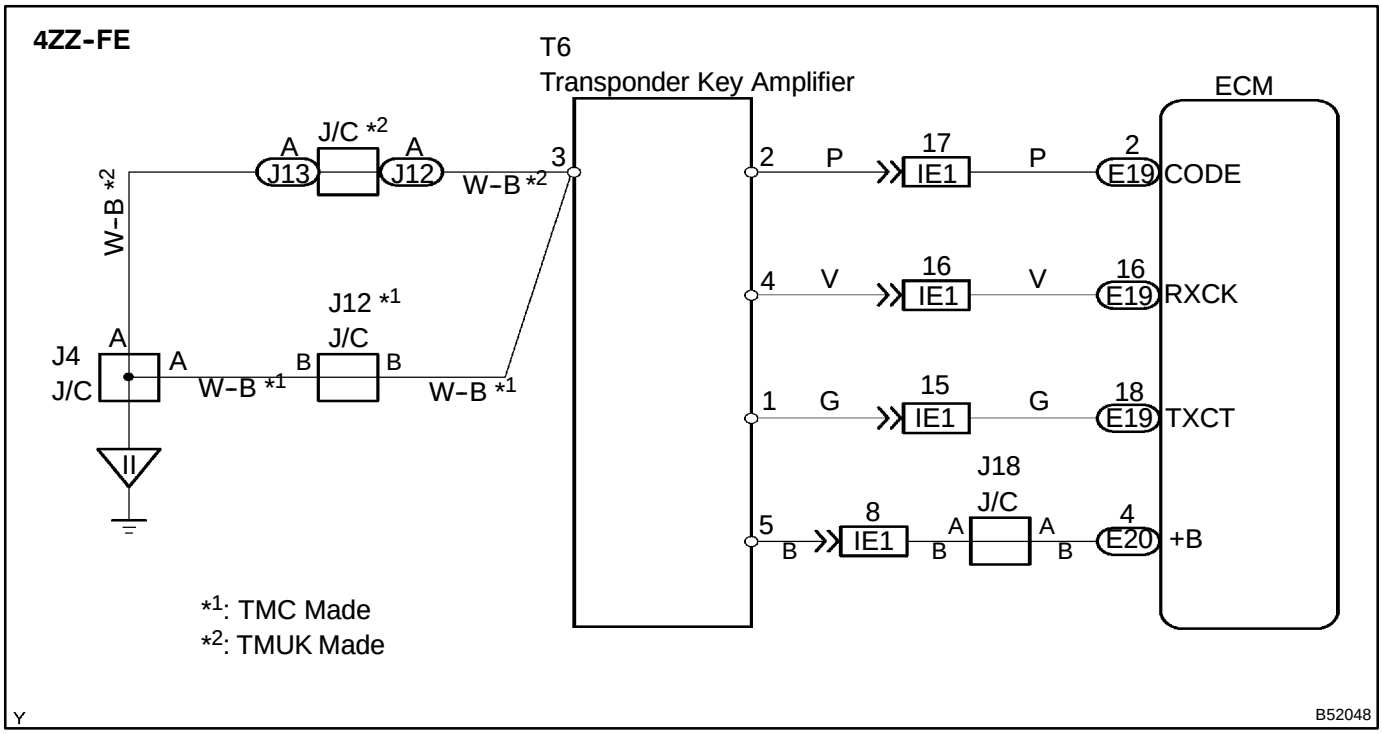
CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
B2796/99	No communication	S Key S Transponder key amplifier with key coil S Wire harness
B2798/99	Communication error	S Key S Transponder key amplifier with key coil S Wire harness

WIRING DIAGRAM




3ZZ-FE
T6
Transponder Key Amplifier
ECM
J/C *3
C
B
B
J12
J12
J13
*2
*1
W-B *3
3
W-B *3
J4
J/C
A
A
SB
(W-B) *4
A
J/C *4
A
J13
J12
W-B *4
2
P
19
7
E16
E13
CODE
4
V
20
26
E16
E13
RXCK
1
G
18
15
E16
E13
TXCT
5
B
12
16
E16
E12
+B
*6
*5
*1: LHD
*2: RHD
*3: TMC Made
*4: TMUK Made
*5: A/T
*6: M/T
Y
B52046


4ZZ-FE
T6
Transponder Key Amplifier
ECM
J/C *2
A
A
J13
J12
W-B *2
3
W-B *2
J12 *1
J/C
J4
J/C
A
A
W-B *1
B
B
W-B *1
2
P
17
IE1
P
2
E19
CODE
4
V
16
IE1
V
16
E19
RXCK
1
G
15
IE1
G
18
E19
TXCT
J18
J/C
5
B
8
IE1
A
B
A
B
4
E20
+B
*1: TMC Made
*2: TMUK Made
Y
B52048

INSPECTION PROCEDURE

1	READ VALUE OF HAND-HELD TESTER

(a) Using the hand-held tester, read value of ECM.
ECM:

Item	Inspecting condition	Standard value
Main key inserted	IG ON with main key → Pull it out from IG SW cylinder	Insert / Not insert
Sub key inserted	IG ON with sub key → Pull it out from IG SW cylinder	Insert / Not insert

OK → **MALFUNCTION OCCURS IN ENGINE INCLUDING ECM**

NG

2	CHECK WHETHER ENGINE STARTS WITH OTHER KEYS

(a) Check whether the engine starts with the other keys for the vehicle.

NG → **Go to step 4**

OK

3	REREGISTER OR REPLAE KEY THAT DOES NOT START ENGINE

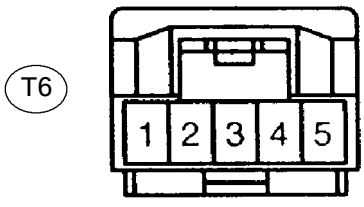
(a) Check whether the engine starts, after the reregistration of the key that does not start the engine has been done.

A → **END**

B → **TRANSPONDER CHIP OF A SPECIFIC KEY IS DETECTIVE AND REPLACE KEY**

4	CHECK TRANSPONDER KEY AMPLIFIER (+B)

Wire Harness Side



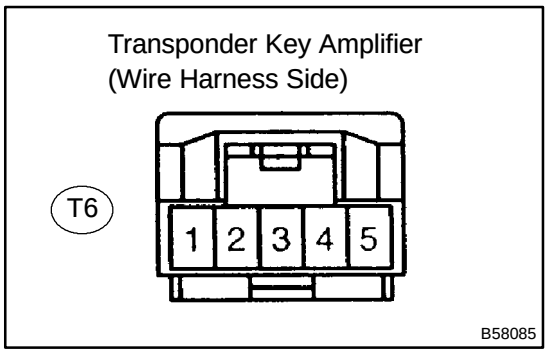
(a) Check the continuity between terminal of the transponder key coil connector.
Standard:

Terminals	Specified condition
+B (T6-5) ⇔ Body ground	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5 CHECK TRANSPONDER KEY AMPLIFIER (GND)



(a) Check the continuity between terminal of the transponder key coil connector.

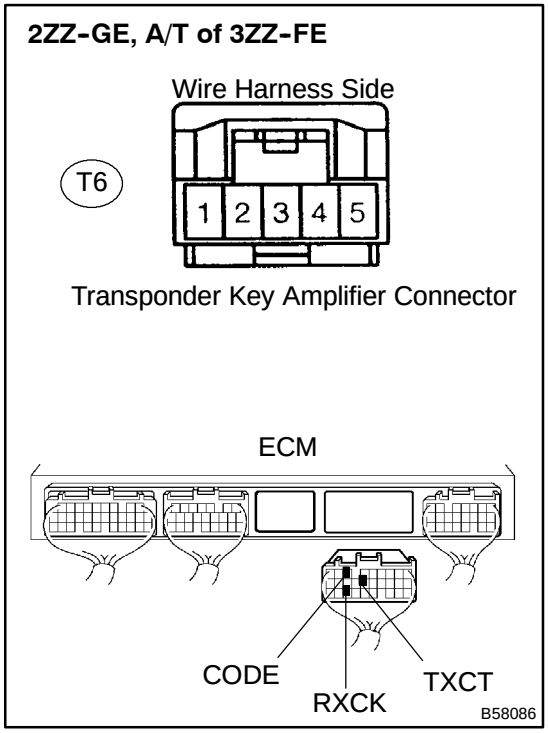
Standard:

Terminals	Specified condition
GND (T6-3) ⇔ Body ground	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

6 CHECK WIRE HARNESS (TRANSPONDER KEY AMPLIFIER ⇔ ECM)



(a) 2ZZ-GE models:

(1) Disconnect the transponder key amplifier and E17 ECM connectors.

(2) Check the continuity between each terminal of the transponder key amplifier vehicle's side connector and the ECM vehicle's side connector.

Standard (Check for short):

Terminals (ECM ⇔ Amplifier)	Specified condition
CODE (E17-7) ⇔ CODE (T6-2)	Continuity
RXCK (E17-26) ⇔ RXCK (T6-4)	Continuity
TXCT (E17-15) ⇔ TXCT (T6-1)	Continuity

Standard (Check for open):

Terminals (ECM or Amplifier ⇔ Body ground)	Specified condition
CODE (E17-7) or CODE (T6-2) ⇔ Body ground	No continuity
RXCK (E17-26) or RXCK(T6-4) ⇔ Body ground	No continuity
TXCT (E17-15) or TXCT (T6-1) ⇔ Body ground	No continuity

(b) A/T of 3ZZ-FE models:

(1) Disconnect the transponder key amplifier and E13 ECM connectors.

(2) Check the continuity between each terminal of the transponder key amplifier vehicle's side connector and the ECM vehicle's side connector.

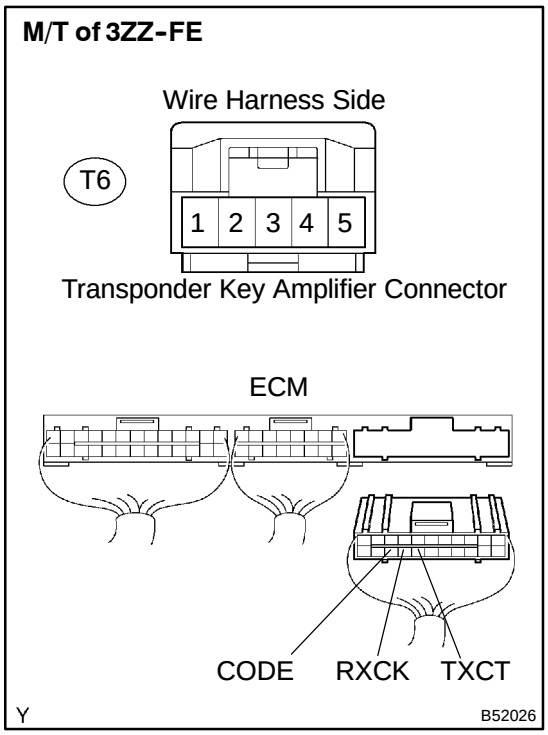
Standard (Check for short):

Terminals (ECM ⇔ Amplifier)	Specified condition
CODE (E13-7) ⇔ CODE (T6-2)	Continuity
RXCK (E13-26) ⇔ RXCK (T6-4)	Continuity
TXCT (E13-15) ⇔ TXCT (T6-1)	Continuity

Standard (Check for open):

Terminals (ECM or Amplifier ⇔ Body ground)	Specified condition
CODE (E13-7) or CODE (T6-2) ⇔ Body ground	No continuity
RXCK (E13-26) or RXCK (T6-4) ⇔ Body ground	No continuity
TXCT (E13-15) or TXCT (T6-1) ⇔ Body ground	No continuity

M/T of 3ZZ-FE



(c) M/T of 3ZZ-FE models:

(1) Disconnect the transponder key amplifier and E16 ECM connectors.

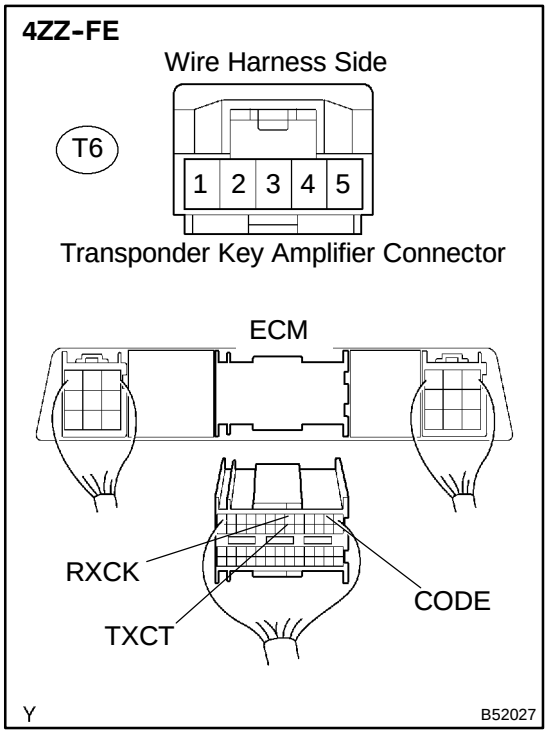
(2) Check the continuity between each terminal of the transponder key amplifier vehicle's side connector and the ECM vehicle's side connector.

Standard (Check for short):

Terminals (ECM ⇔ Amplifier)	Specified condition
CODE (E16-16) ⇔ CODE (T6-2)	Continuity
RXCK (E16-17) ⇔ RXCK (T6-4)	Continuity
TXCT (E16-15) ⇔ TXCT (T6-1)	Continuity

Standard (Check for open):

Terminals (ECM or Amplifier⇔ Body ground)	Specified condition
CODE (E16-16) or CODE (T6-2) ⇔ Body ground	No continuity
RXCK (E16-17) or RXCK (T6-4) ⇔ Body ground	No continuity
TXCT (E16-15) or TXCT (T6-1) ⇔ Body ground	No continuity



(d) 4ZZ-FE models:

(1) Disconnect the transponder key amplifier and E19 ECM connectors.

(2) Check the continuity between each terminal of the transponder key amplifier vehicle's side connector and the ECM vehicle's side connector.

Standard (Check for short):

Terminals (ECM ⇔ Amplifier)	Specified condition
CODE (E19-2) ⇔ CODE (T6-2)	Continuity
RXCK (E19-6) ⇔ RXCK (T6-4)	Continuity
TXCT (E19-18) ⇔ TXCT (T6-1)	Continuity

Standard (Check for open):

Terminals (ECM or Amplifier ⇔ Body ground)	Specified condition
CODE (E19-2) or CODE (T6-2) ⇔ Body ground	No continuity
RXCK (E19-6) or RXCK (T6-4) ⇔ Body ground	No continuity
TXCT (E19-18) or TXCT (T6-1) ⇔ Body ground	No continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

7 CHECK TRANSPONDER KEY AMPLIFIER

(a) Replace the transponder key amplifier.

(b) Check that the engine starts.

OK → **TRANSPONDER KEY AMPLIFIER IS BROKEN**

NG

CHECK AND REPLACE ECM **(See page 01-30)**

DTC	B2797/99	COMMUNICATION MALFUNCTION NO.1

CIRCUIT DESCRIPTION

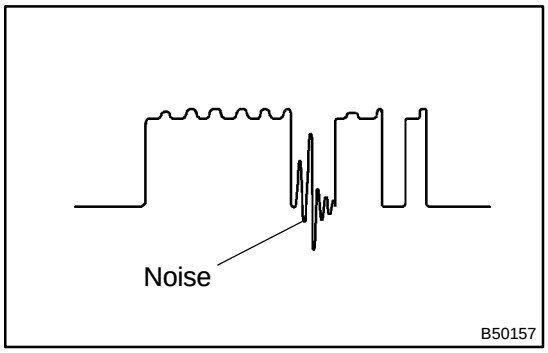
This code is detected when an error occurs in normal communication.
(Example: Some noise is included in communication line.)

DTC No.	DTC Detection Condition	Trouble Area
B2797/99	Communication error	$ Transponder key amplifier with key coil $ Unregistered key inserted before $ Wire harness $ ECM

WIRING DIAGRAM

Refer to DTC B2796/99 on page 05-1388.

1 CHECK ECM



(a) Insert the master key already registered in the key cylinder.
(1) Using an oscilloscope or hand-held tester, check that noise is included in the CODE terminal of the ECM.

Standard: No noise is detected.

NG → **FIND CAUSE OF NOISE AND REMOVE IT**

OK

2 CHECK OPERATION OF TRANSPONDER KEY AMPLIFIER

(a) Does it operate normally after replacement of transponder key amplifier?

OK → **NORMAL (TRANSPONDER KEY AMPLIFIER DETECTIVE)**

NG

CHECK AND REPLACE ECM **(See page 01-30)**

DTC	B2799/99	ENGINE IMOBILISER SYSTEM MALFUNCTION

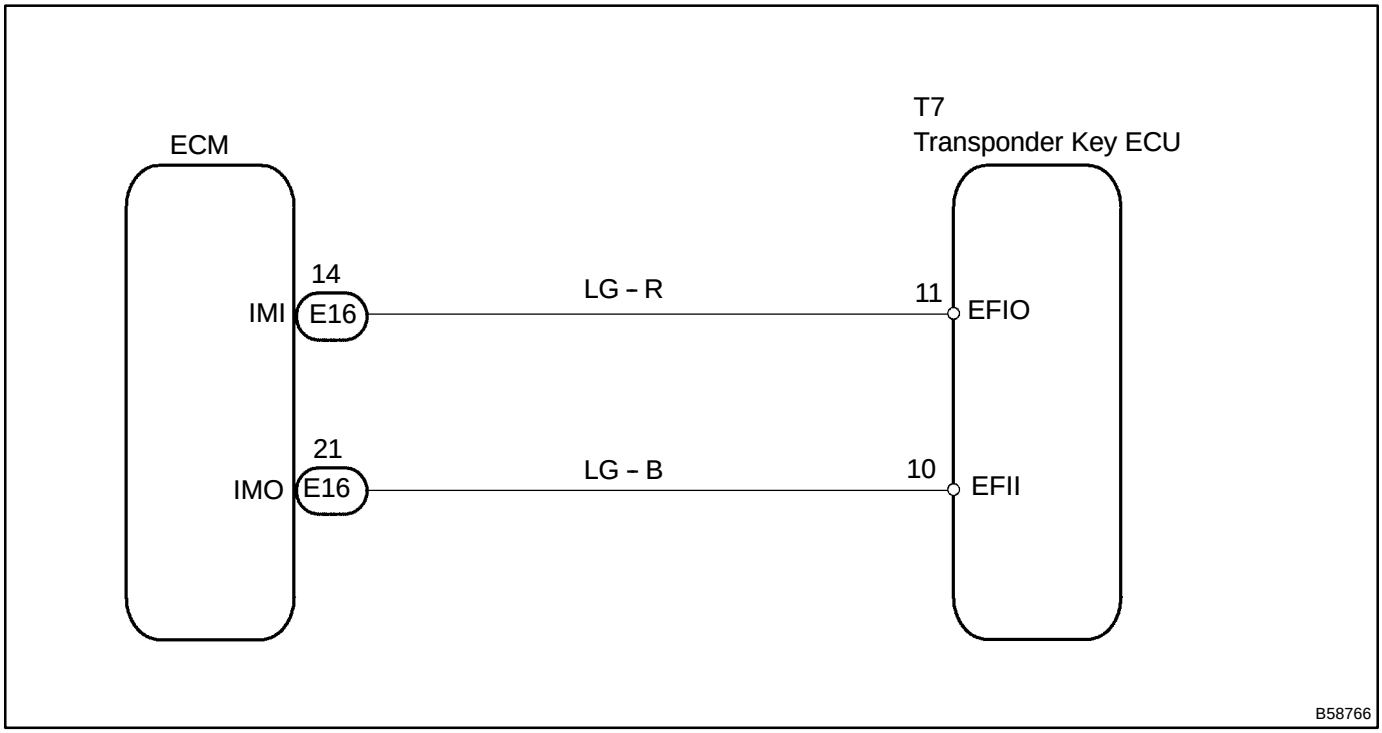
NOTICE:
This DTC is only for the 1CD-FTV engine models.

CIRCUIT DESCRIPTION

This DTC is output, when a DTC is output from the transponder key ECU, or when there is an open or short circuit in the wire harness between the transponder key ECU and the ECM.

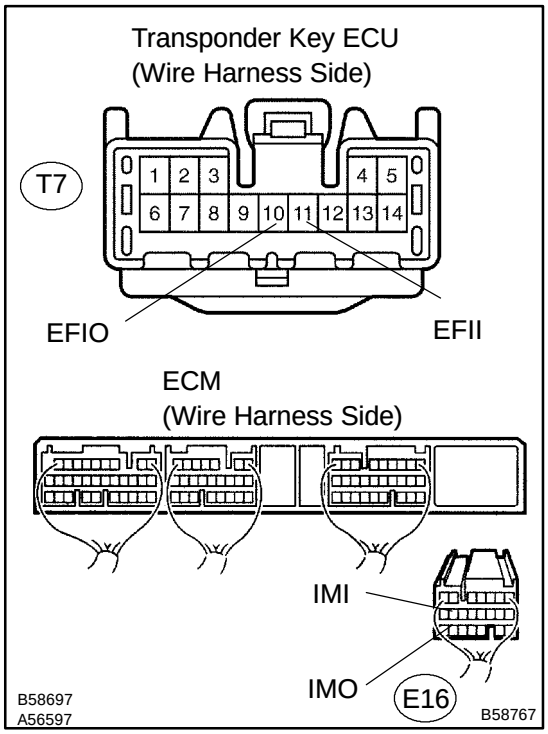
DTC No.	DTC Detecting Condition	Trouble Area
B2799	S Error in communication between ECM and transponder key ECU, and in communication line. S Communication ID is different in communication with Transponder key ECU.	S Wire harness S Transponder key ECU S ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK WIRE HARNESS (TRANSPONDER KEY ECU ⇔ ECM)



(a) Disconnect the transponder key ECU connector and ECM connector E16, and check the continuity between each terminal on the wire harness side.

Continuity:

Terminals (Transponder ECU ⇔ ECM)	Specified condition
EFIO (T7-11) ⇔ IMI (E16-14)	Continuity
EFII (T7-10) ⇔ IMO (E16-21)	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

2	CHECK OPERATION OF TRANSPONDER KEY ECU

(a) After exchanging the transponder key ECU, check that the engine starts.

NG → **NORMAL**

OK

REPLACE ECM

CODE 1-1 IS NOT OUTPUT

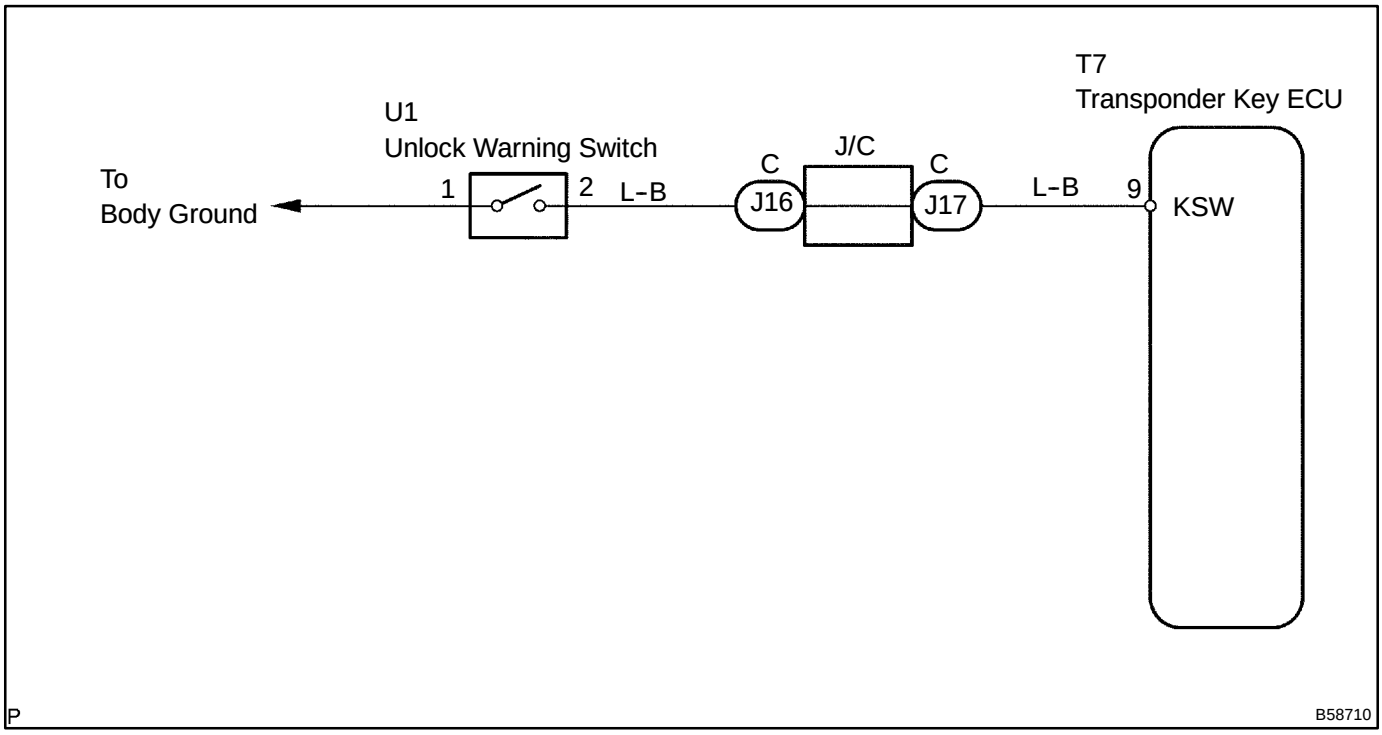
NOTICE:
This DTC is only for the 1CD-FTV engine models.

CIRCUIT DESCRIPTION

The transponder key ECU outputs DTC11 when the key unlock warning switch is ON (key is inserted).
HINT:
DTC11 is a normal code.

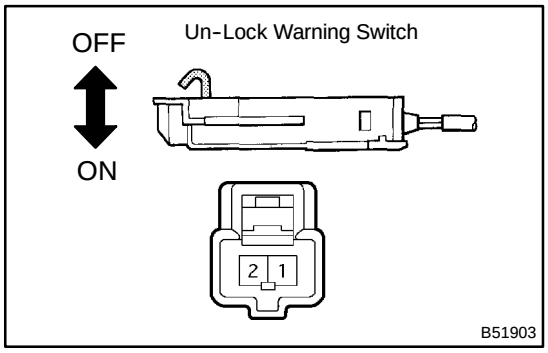
DTC No.	DTC detecting condition	Trouble area
11	Code 1-1 is not output	S Unlock warning switch S Transponder key ECU S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK UN-LOCK WARNING SWITCH ASSY



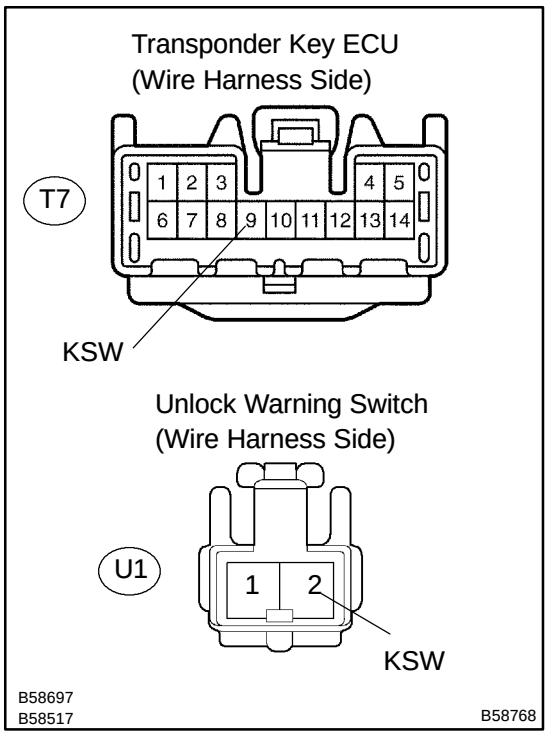
(a) Remove the key unlock warning switch.
(b) Inspect the key unlock warning switch continuity.
Continuity:

Condition	Tester connection	Specified condition
Switch OFF (Key removed)	-	No continuity
Switch ON (Key set)	1 - 2	Continuity

NG → **REPLACE UN-LOCK WARNING SWITCH ASSY**

OK

2	CHECK WIRE HARNESS (TRANSPONDER KEY ECU ⇔ UN-LOCK WARNING SWITCH)



(a) Disconnect the transponder key ECU connector and unlock warning switch connector, and check the continuity between each terminal on the wire harness side.
Continuity:

Terminals (Unlock SW ⇔ ECU)	Specified condition
KSW (U1-2) ⇔ KSW (T7-9)	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE TRANSPONDER KEY ECU ASSY

CODE 1-2 IS NOT OUTPUT

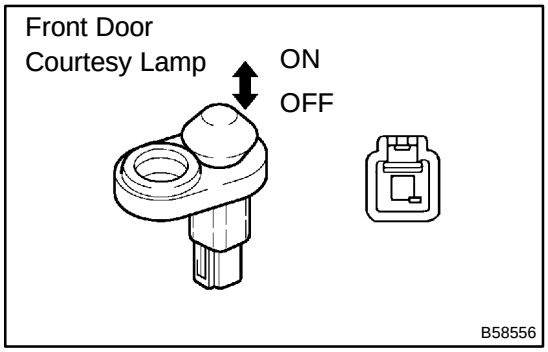
NOTICE:
This DTC is only for the 1CD-FTV engine models.

CIRCUIT DESCRIPTION

This DTC will be output when the front driver's door is open.
HINT:
DTC12 are normal code.

DTC No.	DTC detecting condition	Trouble area
12	Code 1-2 is not output	S Front door courtesy switch S Transponder key ECU S Wire harness

1	INSPECT FRONT DOOR COURTESY LAMP SWITCH ASSY



(a) Remove curtesy lamp switch.
(b) Inspect the curtesy lamp switch continuity.
Continuity:

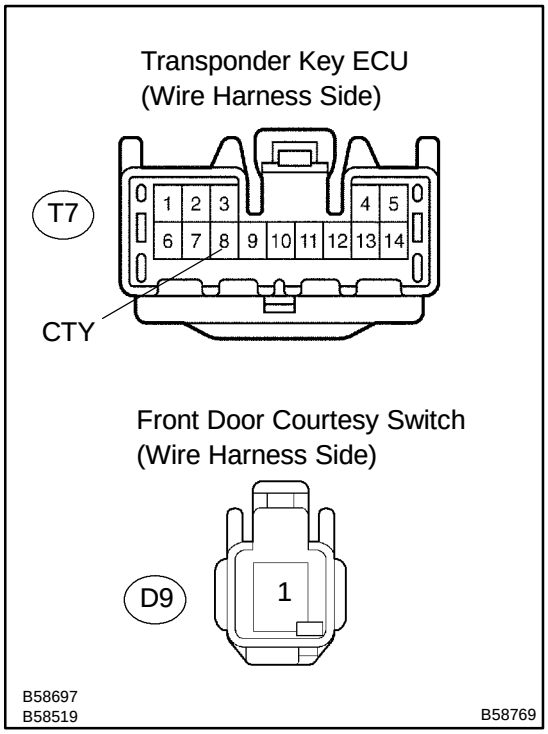
Condition	Tester connection	Specified condition
Switch OFF	1 - Ground	Continuity
Switch ON	1 - Ground	No continuity

0579D-01

NG → **REPLACE FRONT DOOR COURTESY LAMP SWITCH ASSY**

OK →

2	CHECK WIRE HARNESS (TRANSPONDER KEY ECU ⇔ FRONT DOOR COURTESY SWITCH)



(a) Disconnect the transponder key ECU connector and front door courtesy switch connector, and check the continuity between each terminal on the wire harness side.

Continuity:

Terminals (Transponder ECU ⇔ Front door courtesy switch)	Specified condition
CTY (T7-8) ⇔ 1 (D9-1)	Continuity

OK → **REPLACE FRONT DOOR COURTESY LAMP SWITCH ASSY**

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

CODE 1-3 IS NOT OUTPUT

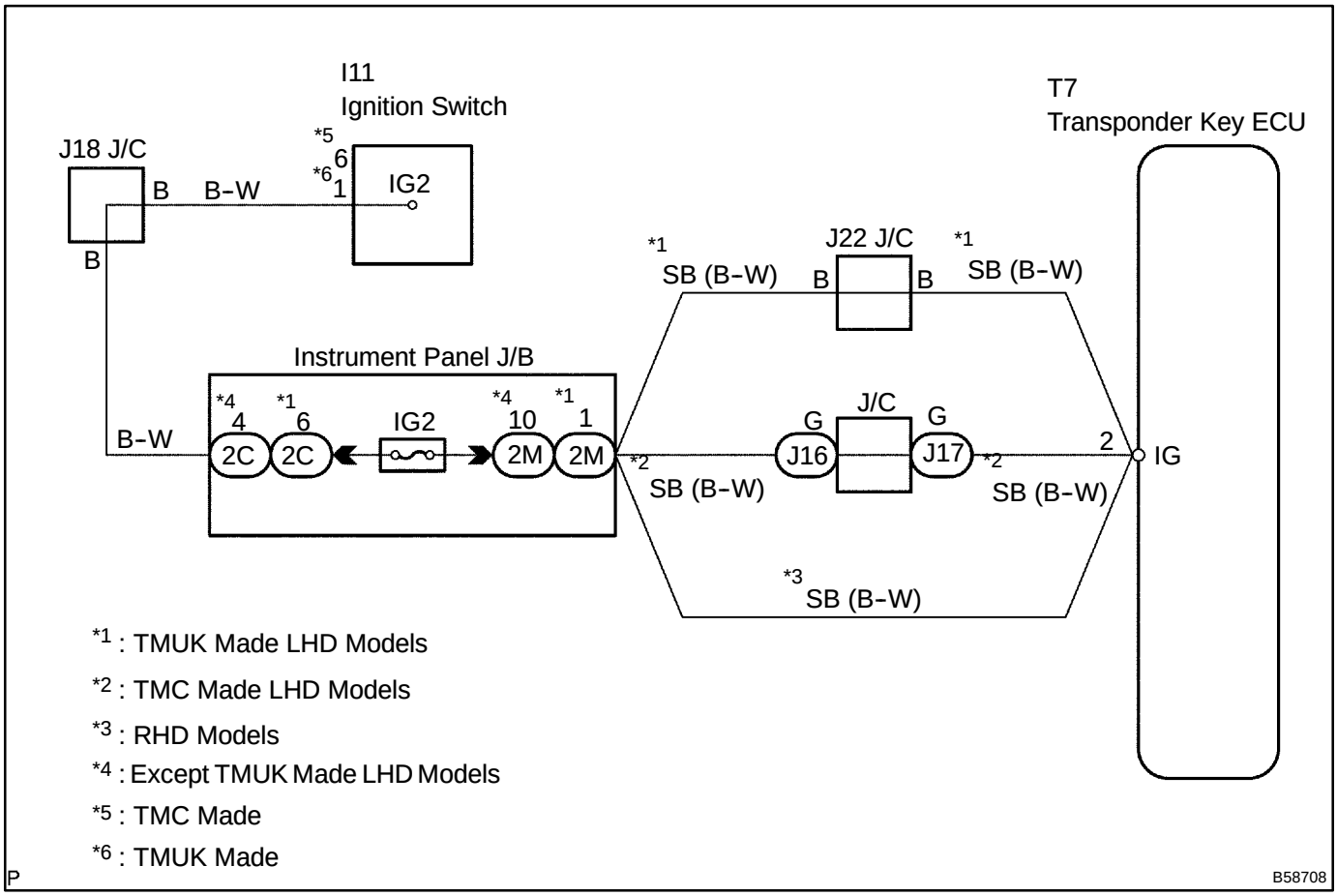
NOTICE:
This DTC is only for the 1CD-FTV engine models.

CIRCUIT DESCRIPTION

The transponder key ECU outputs DTC13 when the ignition switch is ON.
HINT:
DTC13 is a normal code.

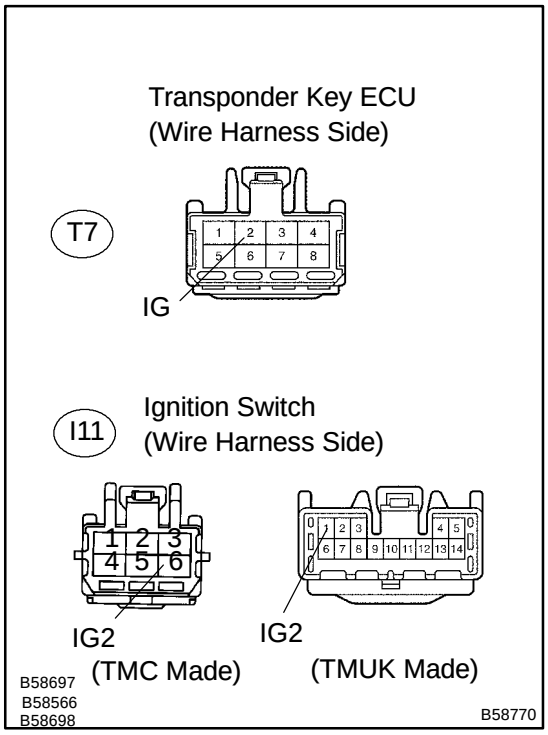
DTC No.	DTC detecting condition	Trouble area
13	Code 1-3 is not output	S Ignition switch S Transponder key ECU S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK WIRE HARNESS (TRANSPONDER KEY ECU ⇔ IGNITION SWITCH)



(a) Disconnect the transponder key ECU connector and ignition switch connector, and check the continuity between each terminal on the wire harness side.

Continuity (TMC Made):

Terminals (IG SW ⇔ ECU)	Specified condition
IG2 (I11-6) ⇔ IG (T7-2)	Continuity

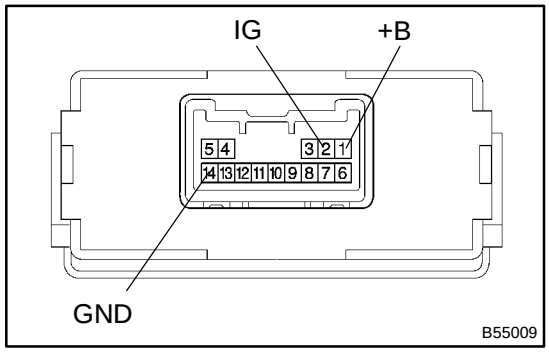
Continuity (TMC Made):

Terminals (IG SW ⇔ ECU)	Specified condition
IG2 (I11-1) ⇔ IG (T7-2)	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

2 CHECK TRANSPONDER KEY ECU ASSY



(a) Check the transponder key ECU.

Voltage and Continuity:

Tester connection	Specified condition
1 (+B) ⇔ Body ground	10 - 14 V
2 (IG) ⇔ Body ground	10 - 14 V (IG ON)
14 (GND) ⇔ Body ground	Continuity

NG → **CHECK AND REPLACE TRANSPONDER KEY ECU ASSY** **(See page 01-30)**

OK

REPLACE IGNITION OR STARTER SWITCH ASSY

CODE 2-1 AND 2-2 ARE NOT OUTPUT

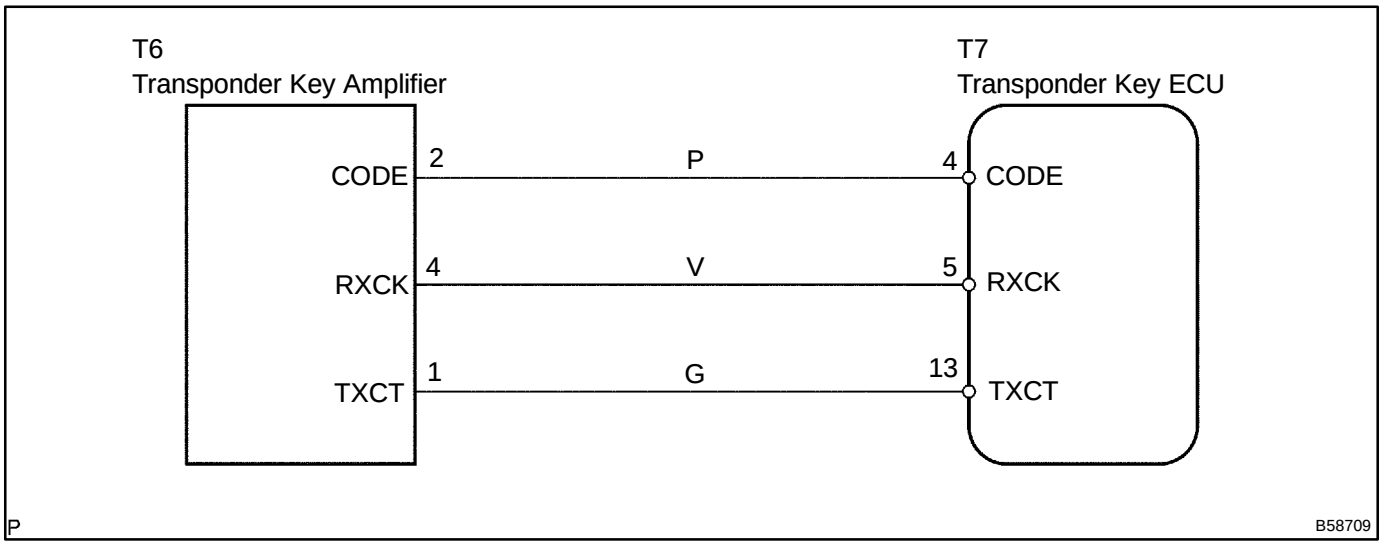
NOTICE:
This DTC is only for the 1CD-FTV engine models.

CIRCUIT DESCRIPTION

The transponder key ECU outputs DTC21 while identification of the master key makes the immobilizer system unset, and also outputs DTC22 while identification of the sub key makes it unset.
HINT:
DTC21 and 22 are normal code.

DTC No.	DTC detecting condition	Trouble area
2-1, 2-2	Code 2-1 and 2-2 are not output	S Key S Transponder key ECU S Transponder key amplifier with key coil S ECM S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	BASIC INSPECTION

(a) Check whether the engine can start with a sub-key for other vehicle of the same type.

NG → Go to step 3

OK

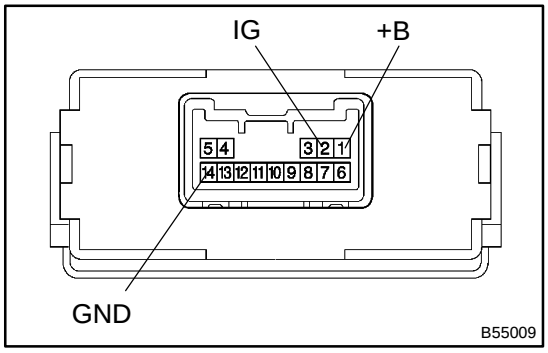
2	KEY REGISTRATION

(a) Register the key which the engine cannot start with.

OK > NORMAL

NG > REPLACE KEY

3	CHECK TRANSPONDER KEY AMPLIFIER



(a) Check the transponder key ECU.

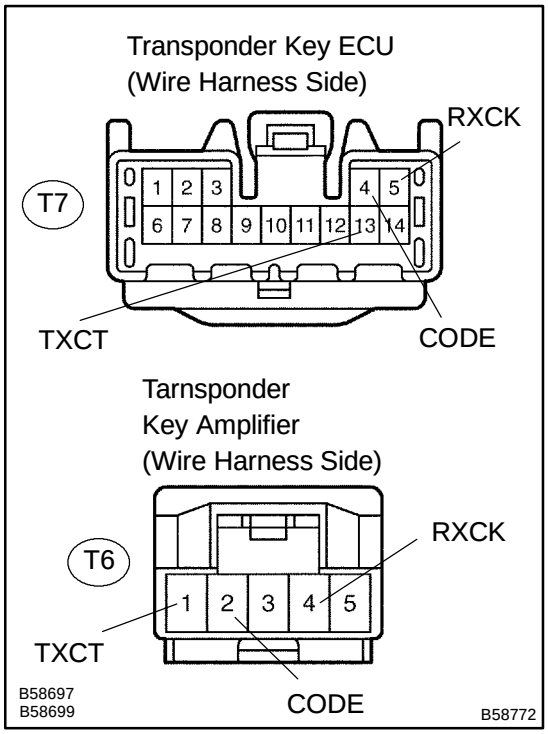
Voltage and Continuity:

Tester connection	Specified condition
1 (+B) ⇔ Body ground	10 - 14 V
2 (IG) ⇔ Body ground	10 - 14 V (IG ON)
14 (GND) ⇔ Body ground	Continuity

NG > REPLACE TRANSPONDER KEY AMPLIFIER

OK

4	CHECK WIRE HARNESS (TRANSPONDER KEY ECU ⇔ TRANSPONDER KEY AMPLIFIER)



(a) Disconnect the transponder key ECU connector and ECM transponder key amplifier connector, and check the continuity between each terminal on the wire harness side.

Continuity (TMC Made):

Terminals (Transponder ECU ⇔ Transponder key amplifier)	Specified condition
4 (CODE) ⇔ 2 (CODE)	Continuity
5 (RXCK) ⇔ 4 (RXCK)	Continuity
13 (TXCT) ⇔ 1 (TKCT)	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE TRANSPONDER KEY ECU ASSY

CODE 3-1 IS OUTPUT

NOTICE:
This DTC is only for the 1CD-FTV engine models.

CIRCUIT DESCRIPTION

The transponder key ECU outputs DTC31 when a wrong or registered key code is identified.
HINT:
DTC31 is an abnormal code.

DTC No.	DTC detecting condition	Trouble area
31	Code 3-1 is output	S Key

INSPECTION PROCEDURE

1	ERASE DTC

(a) Delete the DTC.

2	KEY REGISTRATION

(a) Register the key that does not start the engine.

OK → NORMAL

NG

REPLACE KEY

CODE 3-2 AND 3-3 ARE OUTPUT

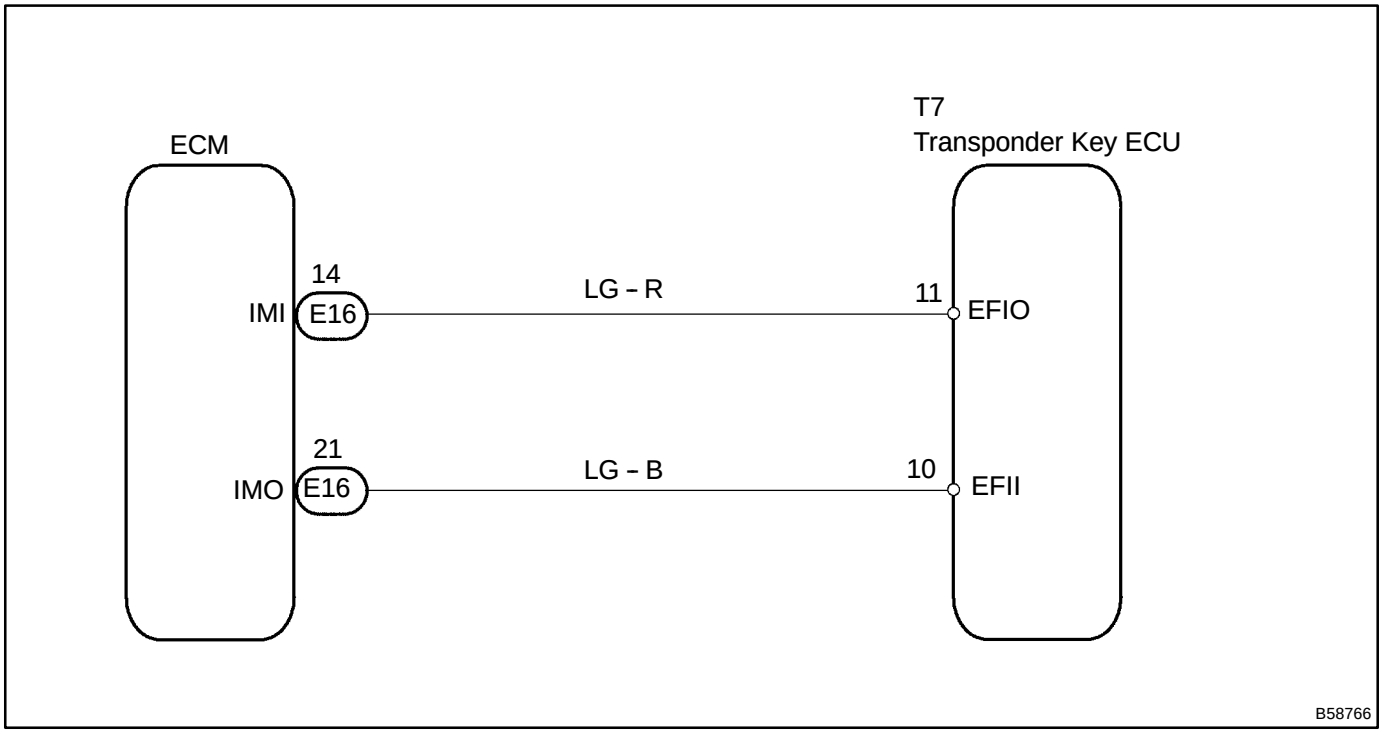
NOTICE:
This DTC is only for the 1CD-FTV engine models.

CIRCUIT DESCRIPTION

The transponder key ECU outputs DTC32 when a key without a key code is inserted, and also outputs DTC33 when a key code cannot be identified.
HINT:
DTC32 and 33 are abnormal code.

DTC No.	DTC detecting condition	Trouble area
32, 33	Code 3-2 and 3-3 are output	S Key S Transponder key ECU S Transponder key amplifier with key coil S Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK KEY

(a) Check whether the engine can be started with a spare key of the same vehicle.

YES → REPLACE KEY

NO

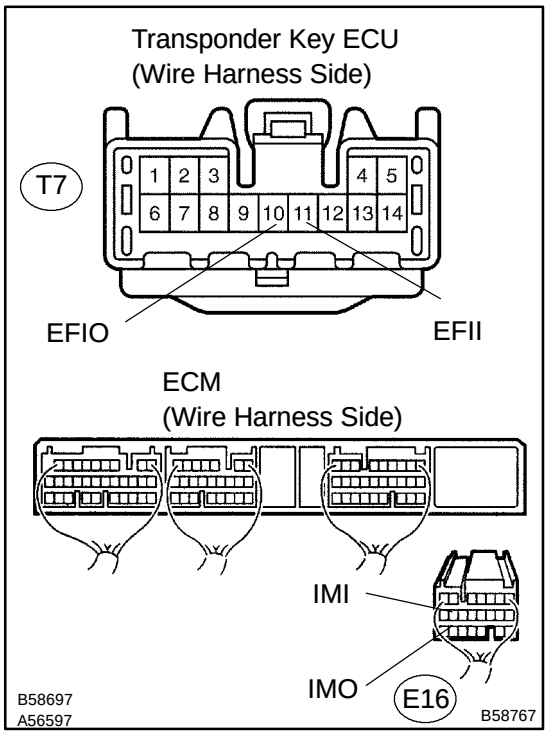
2	EXCHANGE TRANSPONDER KEY AMPLIFIER WITH NORMAL ONE

(a) DTC No. 3-2:
  (1) When the engine start. proceed to "A".
  (2) When the engine does not starts, proceed to "B".
(b) DTC No. 3-3:
  (1) Proceed to "A".

A → **REPLACE TRANSPONDER KEY AMPLIFIER**

B

3	CHECK WIRE HARNESS (TRANSPONDER KEY ECU ⇔ ECM)



(a) Disconnect the transponder key ECU connector and ECM connector E16, and check the continuity between each terminal on the wire harness side.
Continuity:

Terminals (Transponder ECU ⇔ ECM)	Specified condition
EFIO (T7-11) ⇔ IMI (E16-14)	Continuity
EFII (T7-10) ⇔ IMO (E16-21)	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM **(See page 05-435)**

THEFT DETERRENT SYSTEM (TMUK MADE)

0577E-01

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshooting in accordance with the procedure on the following pages

1	VEHICLE BROUGHT TO WORKSHOP

2	CUSTOMER PROBLEM ANALYSIS AND PROBLEM SYMPTOM CONFIRMATION (See page 05-1410 and 05-1414)

A	Symptom does not occur
B	Symptom occurs

B → GO TO STEP 4

A

3	SYMPTOM SIMULATION

4	PROBLEM SYMPTOM TABLE (See page 05-1414)

5	CIRCUIT INSPECTION AND PART INSPECTION (See page 05-1414)

6	IDENTIFICATION OF PROBLEM

7	REPAIR

8	CONFIRMATION TEST

END

0577F-01

CUSTOMER PROBLEM ANALYSIS CHECK

THEFT DETERRENT SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km** **Mile**

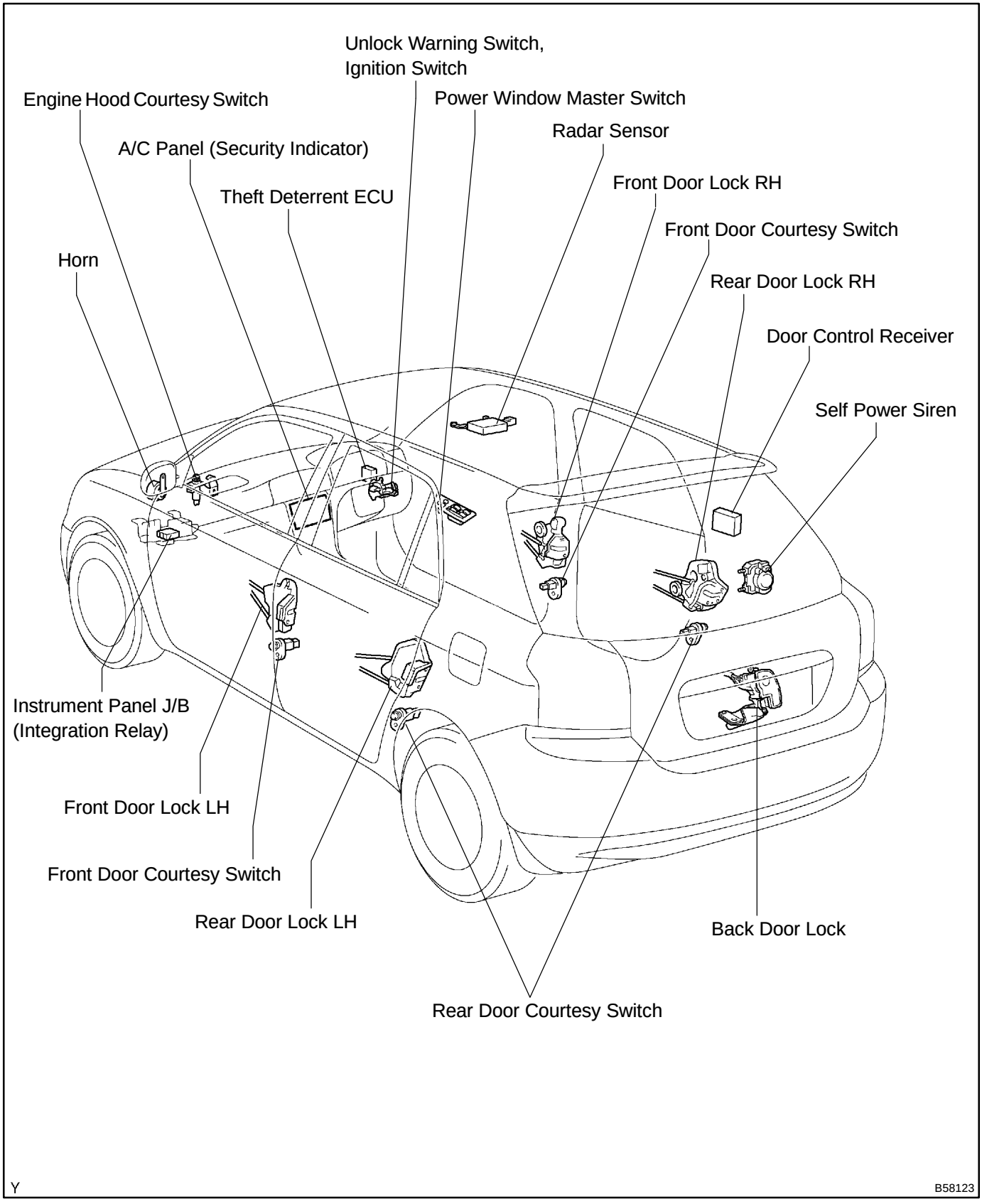
Date Problem First Occurred		/ /
Frequency Problem Occurs		j Constant j Sometimes (Times per day, month) j Once only
Weather Conditions When Problem Occurred	**Weather**	j Fine j Cloudy j Rainy j Snowy j Various/Others
	Outdoor temperature	j Hot j Warm j Cool j Cold (Approx. °F (°C))

Problem Symptom

j Theft deterrent system cannot be set.		
j Indicator light does not flash when the theft deterrent system is set. (It stays on or does not light at all.)		
j Theft deterrent system does not operate.	j When unlocked using the door lock knob. j When the engine hood is opened.	Malfunction j Horn only j Self power siren only j Hazard lights only j Room lights only j Starter cut only j Door lock operation only
j System cannot be canceled, once set.	j When door is unlocked using key or wireless door lock control system. j When the key is inserted in the ignition key cylinder and turned to ACC or ON position. (However, only when the system has never operated) j When the luggage compartment door is opened with the key.	
j System cannot be canceled during warning operation.	j When door is unlocked using key or wireless door lock control system. j When the key is inserted in the ignition key cylinder and turned to ACC or ON position.	
j Warning operation starts when the system is set and the door or luggage compartment door is opened with the key.		
j Others.		

0577G-01

LOCATION



0577H-01

TERMINALS OF ECU

1. INSPECT THEFT DETERRENT ECU

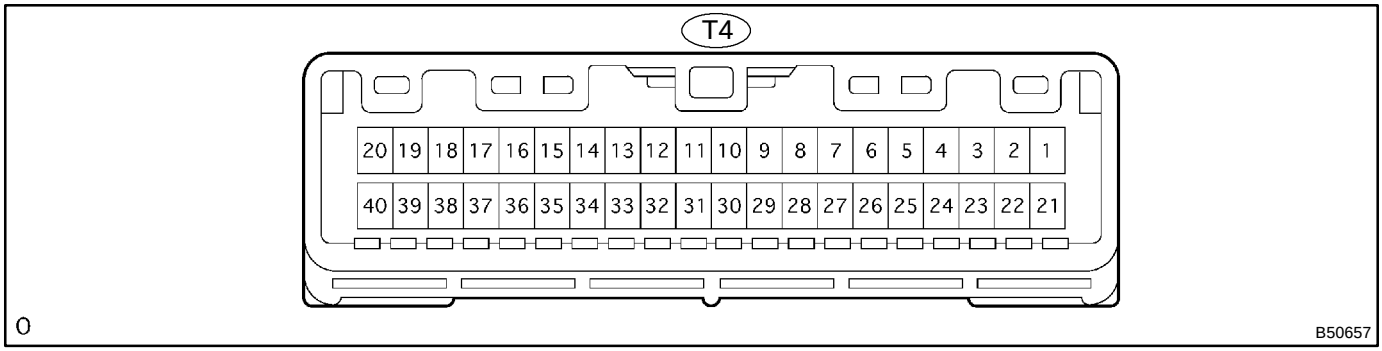
(a) Inspect the fuse.

(1) Inspect the ECU-B 10 A and DOME 15 A fuses.

(b) Check the theft deterrent ECU.

(1) Disconnect the ECU connector.

(2) Check the voltage and continuity of each terminal of the vehicle's side connectors.



Standard:

Tester connection	Wiring Color	Condition	Specified Condition
E (T4 - 29) ⇔ Body ground	W-B ⇔ Body ground	Constant	Continuity
+B1 (T4 - 2) ⇔ E (T4 - 29)	SB (L-Y) ⇔ W-B	Constant	10 - 14 V
+B2 (T4 - 3) ⇔ E (T4 - 29)	SB (R-G) ⇔ W-B	Constant	10 - 14 V
CTY (T4 - 20) ⇔ E (T4 - 29)	SB (Y-B) ⇔ W-B	S Passenger door fully closed → Opened S RR door fully closed → Opened S RL door fully closed → Opened	No continuity → Continuity
DSWH (T4 - 40) ⇔ E (T4 - 29)	SB (R-G) ⇔ W-B	Driver door fully closed → Opened	No continuity → Continuity
DSWH (T4 - 34) ⇔ E (T4 - 29)	V-Y ⇔ W-B	Engine hood fully opened → Closed	No continuity → Continuity
REV (T4 - 23) ⇔ E (T4 - 29)	*1 W (LG) ⇔ W-B *2 B ⇔ W-B	Engine started	Engine revolution pulse
KSW (T4 - 12) ⇔ E (T4 - 29)	L-B ⇔ W-B	No key in ignition switch lock cylinder → Key inserted	0 V → 10 - 14 V
L2 (T4 - 16) ⇔ E (T4 - 29)	G-Y ⇔ W-B	Driver door lock UNLOCK → LOCK	0 V → 10 - 14 V → 1 V or less
UL3 (T4 - 17) ⇔ E (T4 - 29)	L-R⇔ W-B	Driver door lock LOCK → UNLOCK	0 V → 10 - 14 V → 1 V or less
IRSG (T4 - 28) ⇔ E (T4 - 29)	W (R) ⇔ W-B	Driver door lock LOCK → UNLOCK	Integration relay pulse
IG (T4 - 10) ⇔ E (T4 - 29)	SB (B-Y) ⇔ W-B	Ignition switch OFF → ON	0 V → 10 - 14 V
LSWD (T4 - 37) ⇔ E (T4 - 29)	W ⇔ W-B	Driver door lock UNLOCK → LOCK	0 V → 10 - 14 V
LSWP (T4 - 38) ⇔ E (T4 - 29)	LG ⇔ W-B	Passenger door lock UNLOCK → LOCK	0 V → 10 - 14 V
IOUT (T4 - 26) ⇔ E (T4 - 29)	L-B ⇔ W-B	Arming mode → Alarming mode	0 V → 10 - 14 V

*1: Gasoline models, *2: Diesel models

If the value is not as specified, the vehicle's side may be defective.

(3) Connect the ECU connector.

Standard:

Tester connection	Wiring Color	Condition	Specified Condition
DMLP (T4 - 9) ⇔ E (T4 - 29)	R-Y ⇔ W-B	Arming mode → Alarming mode	0 V → 10 - 14 V
HAZD (T4 - 8) ⇔ E (T4 - 29)	Y-G ⇔ W-B	Arming mode → Alarming mode	0 V → 10 - 14 V
IND (T4 - 25) ⇔ E (T4 - 29)	W (W-R) ⇔ W-B	Security indicator light lights up. (It lights up only for 30 sec.)	10 - 14 V
S+B (T4 - 24) ⇔ E (T4 - 29)	P-L ⇔ W-B	Constant	10 - 14 V
HORN (T4 - 5) ⇔ E (T4 - 29)	G-R ⇔ W-B	Arming mode → Alarming mode	0 V → 10 - 14 V
CTLS (T4 - 27) ⇔ E (T4 - 29)	L-O ⇔ W-B	Self power siren is sounding. (Theft deterrent system is in alarming mode)	5 V

If the value is not as specified, the vehicle's side may be defective.

05771-01

PROBLEM SYMPTOMS TABLE

Proceed to the reference page shown in the matrix chart below for each malfunction symptom and trouble-shoot each circuit.

HINT:

Troubleshooting of the theft deterrent system is based on the premise that the door lock control system is operating normally. Accordingly, before troubleshooting the theft deterrent system, first make certain that the door lock control system is operating normally.

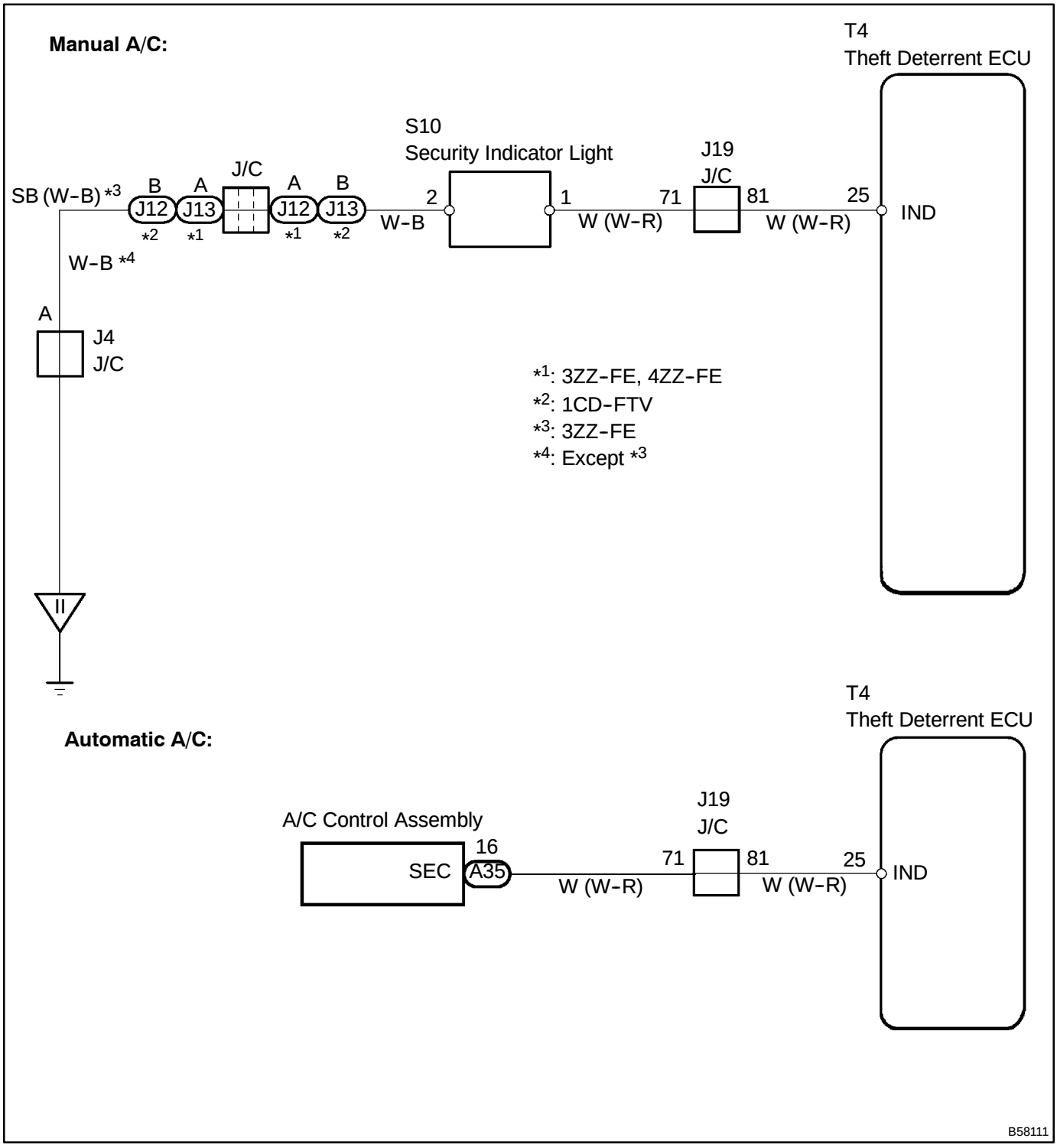
Symptom	Suspected Area	See page
Indicator light circuit	1. Indicator light 2. Theft warning ECU 3. WIre harness	05-1415
ECU power source circuit	1. ECU-B fuse 2. Theft warning ECU 3. WIre harness	05-1417
Ignition switch circuit	1. Ignition switch 2. ECU-B fuse 3. IG1 relay 4. Theft warning ECU 5. WIre harness	05-1419
Key unlock warning switch circuit	1. Key unlock warning switch 2. Theft warning ECU 3. WIre harness	05-1422
Engine hood courtesy switch circuit	1. Theft warning courtesy switch (Hood courtesy switch) 2. Theft warning ECU 3. WIre harness	05-1424
Hazard warning light circuit	1. Turn signal flasher assy 2. Theft warning ECU 3. WIre harness	05-1428
Room light circuit	1. Room lamp assy No. 1 (Room light) 2. Theft warning ECU 3. WIre harness	05-1426
Horn circuit	1. Low pitched horn assy 2. Theft warning ECU 3. WIre harness	05-1430
Self power siren circuit	1. Theft warning siren (Self power siren) 2. Theft warning ECU 3. WIre harness	05-1432
Radar sensor circuit	1. Theft warning radar sensor (Radar sensor) 2. Theft warning ECU 3. WIre harness	05-1435

INDICATOR LIGHT CIRCUIT

CIRCUIT DESCRIPTION

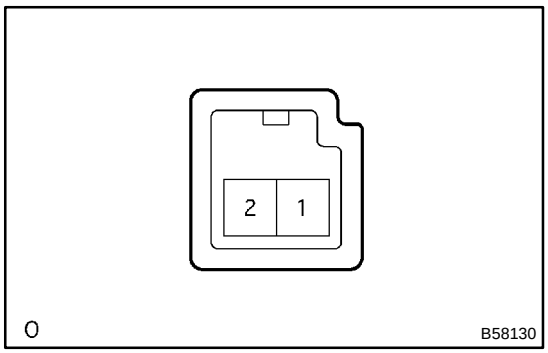
When the theft deterrent system is preparing to be set, this circuit lights up the indicator light. When the system has been set, it continually turns the indicator light on for 0.2 seconds and turns it off for 1.8 seconds, thus blinking the indicator light blinks.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK THEFT WARNING INDICATOR LAMP ASSY



(a) Manual A/C models:
Apply battery positive voltage between the positive (+) lead to terminal 2 and the negative (-) lead to terminal 1 of the security indicator lamp.
Standard: Security indicator light comes on

(b) Automatic A/C models:
Inspect the indicator lamp (A/C panel)
(See page 05-870).
Standard: Security indicator light comes on

NG → **REPLACE THEFT WARNING INDICATOR LAMP ASSY**

OK

2 CHECK WIRE HARNESS

(a) Manual A/C:
Check the continuity between terminal IND (T4-25) of the theft deterrent ECU connector and terminal 1 of the security indicator light connector.
Standard: Continuity

(b) Automatic A/C:
Check the continuity between terminal IND (T4-25) of the theft deterrent ECU connector and terminal A35-16 of the A/C control assembly connector.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 CHECK WIRE HARNESS

(a) Manual AC/ only:
Check the continuity between terminal 2 of the security indicator light connector and the body ground.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

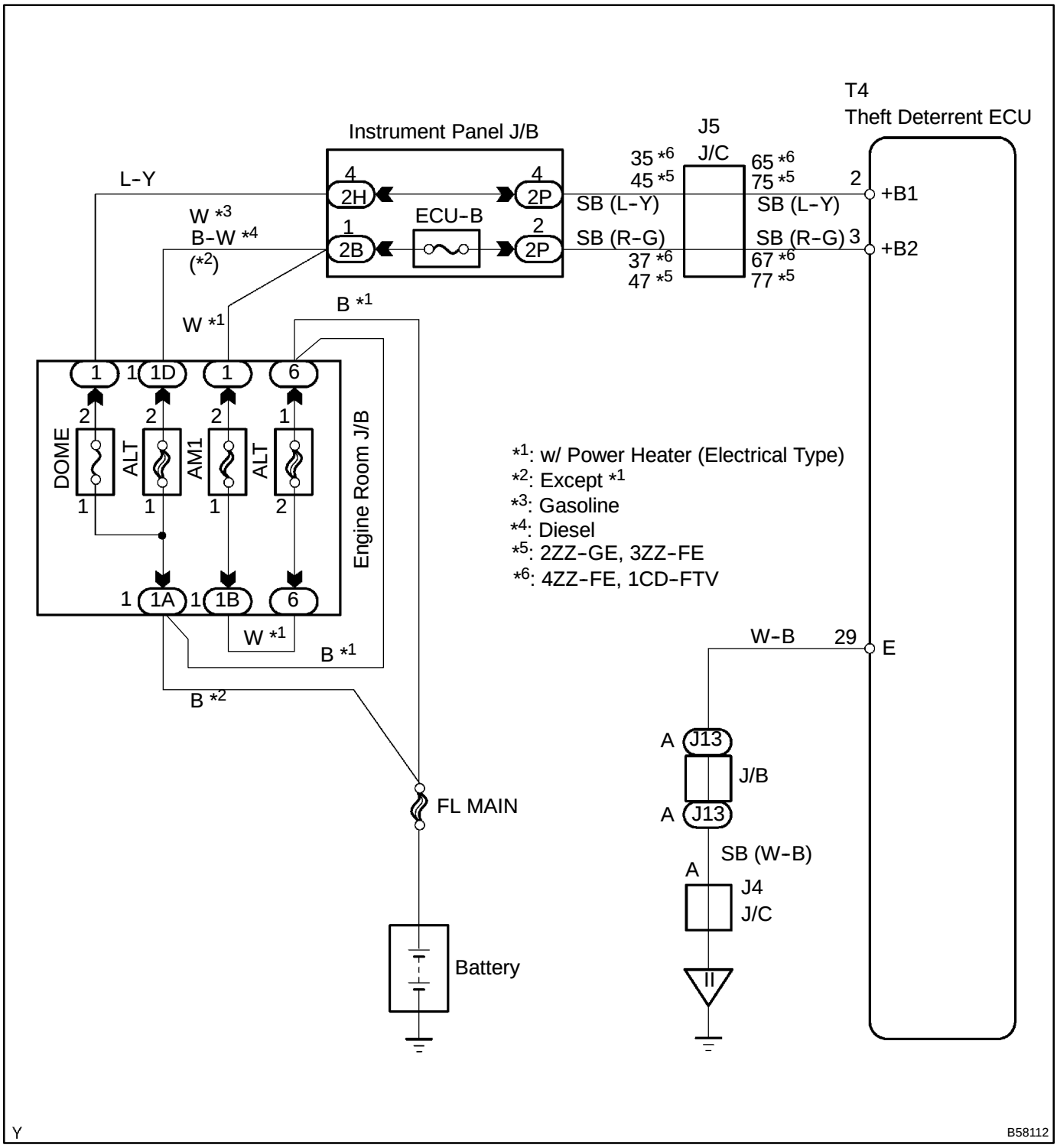
CHECK AND REPLACE THEFT WARNING ECU ASSY

ECU POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

This circuit provides power to operate the theft deterrent ECU.

WIRING DIAGRAM



INSPECTION PROCEDURE

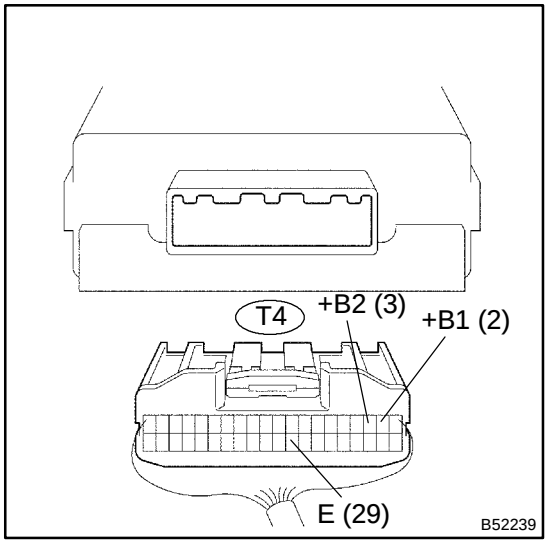
1 CHECK FUSE

(a) Remove the ECU-B fuse from the I/P J/B.
(b) Check the continuity of the fuse.

NG → **REPLACE FUSE**

OK

2 INSPECT THEFT WARNING ECU ASSY



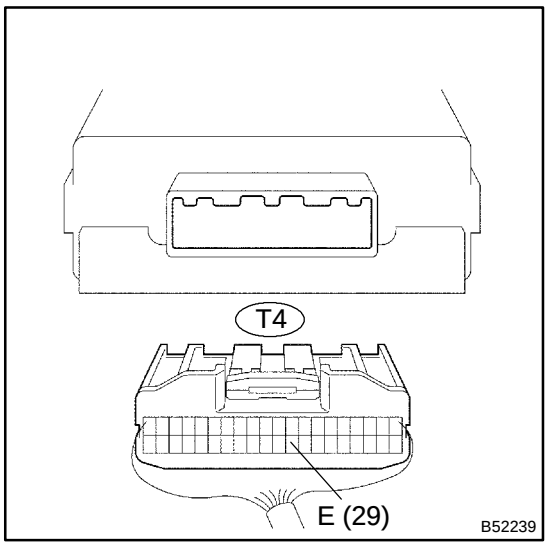
(a) Disconnect the ECU connector.
(b) Measure the voltage between terminals of the ECU connector.

Measuring condition	Specified condition
T4-2 ⇔ T4-29 (+B1 ⇔ E)	10 - 14 V
T4-3 ⇔ T4-29 (+B2 ⇔ E)	10 - 14 V

NG → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE**

OK

3 CHECK WIRE HARNESS



(a) Disconnect the ECU connector.
(b) Check the connector on the harness side.

Continuity:

Tester connection	Specified condition
E (29) - Body ground	No continuity

Voltage:

Tester connection	Specified condition
E (29) - Body ground	0 V

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

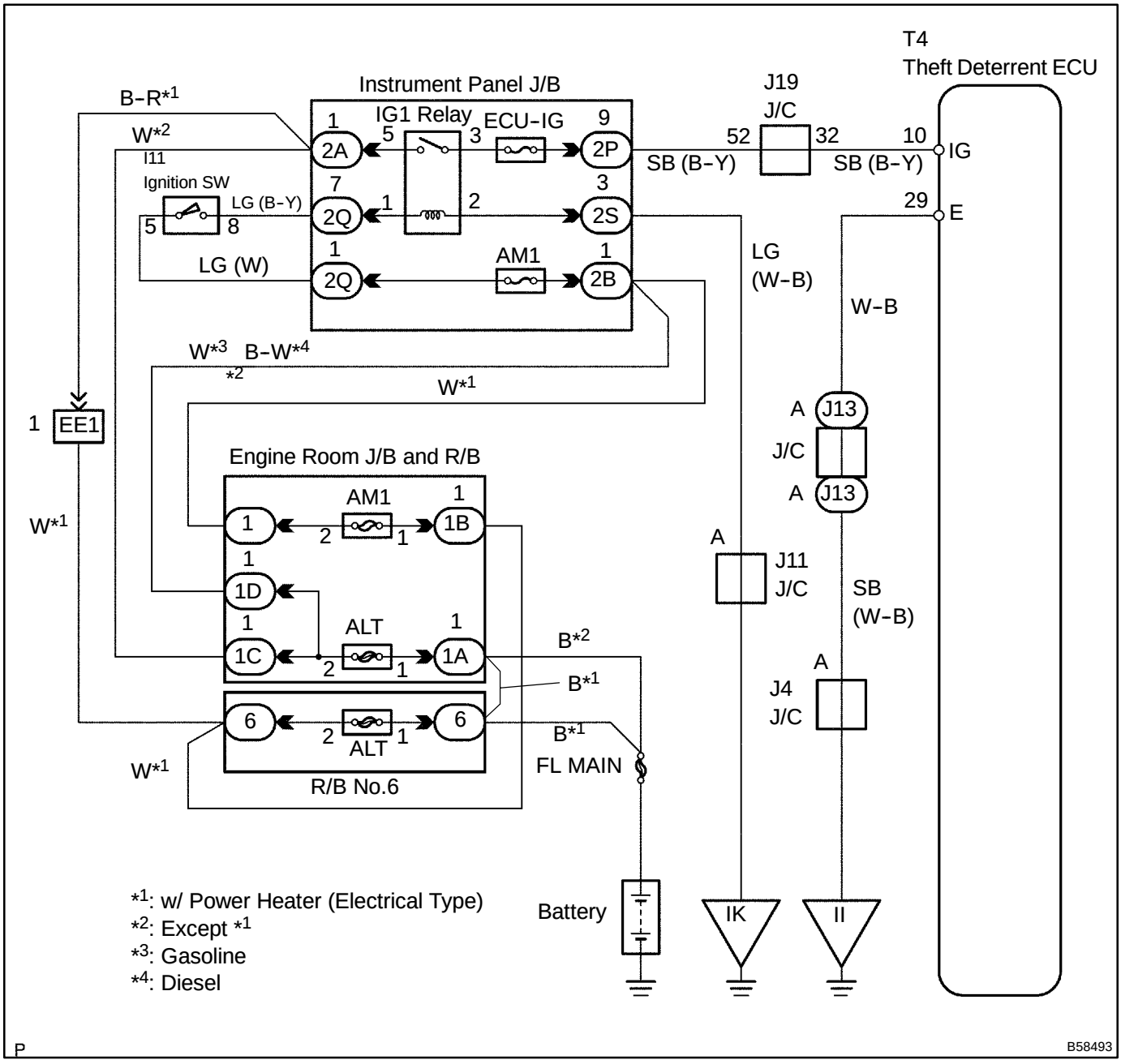
REPAIR OR REPLACE THEFT WARNING ECU ASSY

IGNITION SWITCH CIRCUIT

CIRCUIT DESCRIPTION

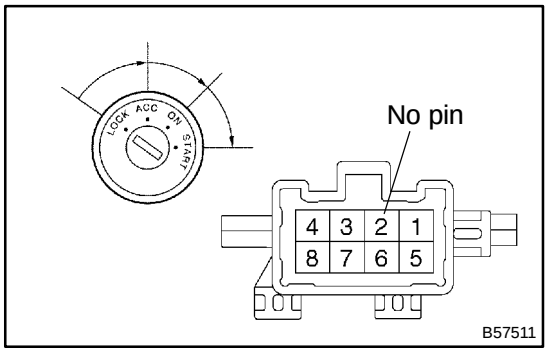
If the ignition switch is turned to the ON position, battery positive voltage is applied to the switches, such as terminals IG of the ECU. Furthermore, power supplied from the terminals IG of the ECU is used as power for the door courtesy switch and position switch.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK IGNITION OR STARTER SWITCH ASSY



(a) Check the ignition switch.

Standard:

Switch position	Tester connection	Specified condition
LOCK	-	No continuity
ACC	5 ⇔ 6	Continuity
ON	1 ⇔ 4 5 ⇔ 6 ⇔ 8	Continuity
START	1 ⇔ 3 ⇔ 4 5 ⇔ 7 ⇔ 8	Continuity

NG → **REPLACE IGNITION OR STARTER SWITCH ASSY**

OK

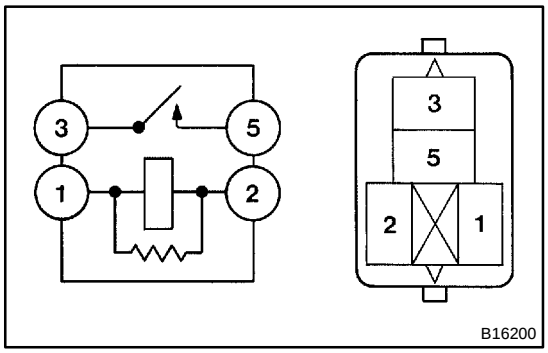
2 CHECK FUSE

(a) Remove the ECU-B fuse from the I/P J/B.
(b) Check the continuity of the fuse.

NG → **REPLACE FUSE**

OK

3 CHECK RELAY



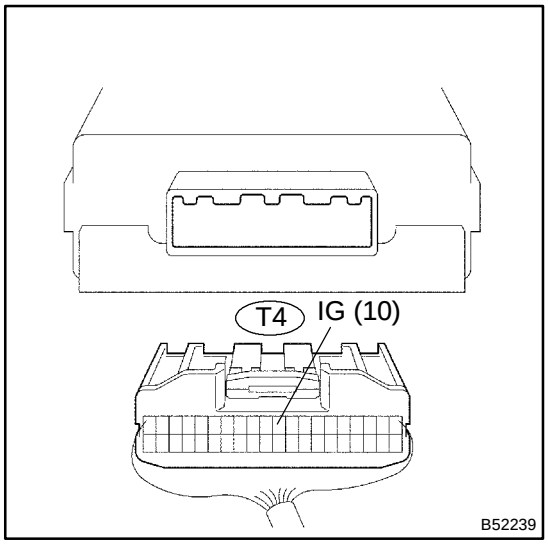
(a) Inspect the IG1 relay (marking: IG1) continuity.

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

NG → **REPLACE RELAY**

OK

4	CHECK THEFT WARNING ECU ASSY



(a) Disconnect the ECU connector.
(b) Measure the voltage between the terminals of the ECU connector.

Measuring condition	Specified condition
T4-10 ⇔ Ground (IG ⇔ Ground)	10 - 14 V

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

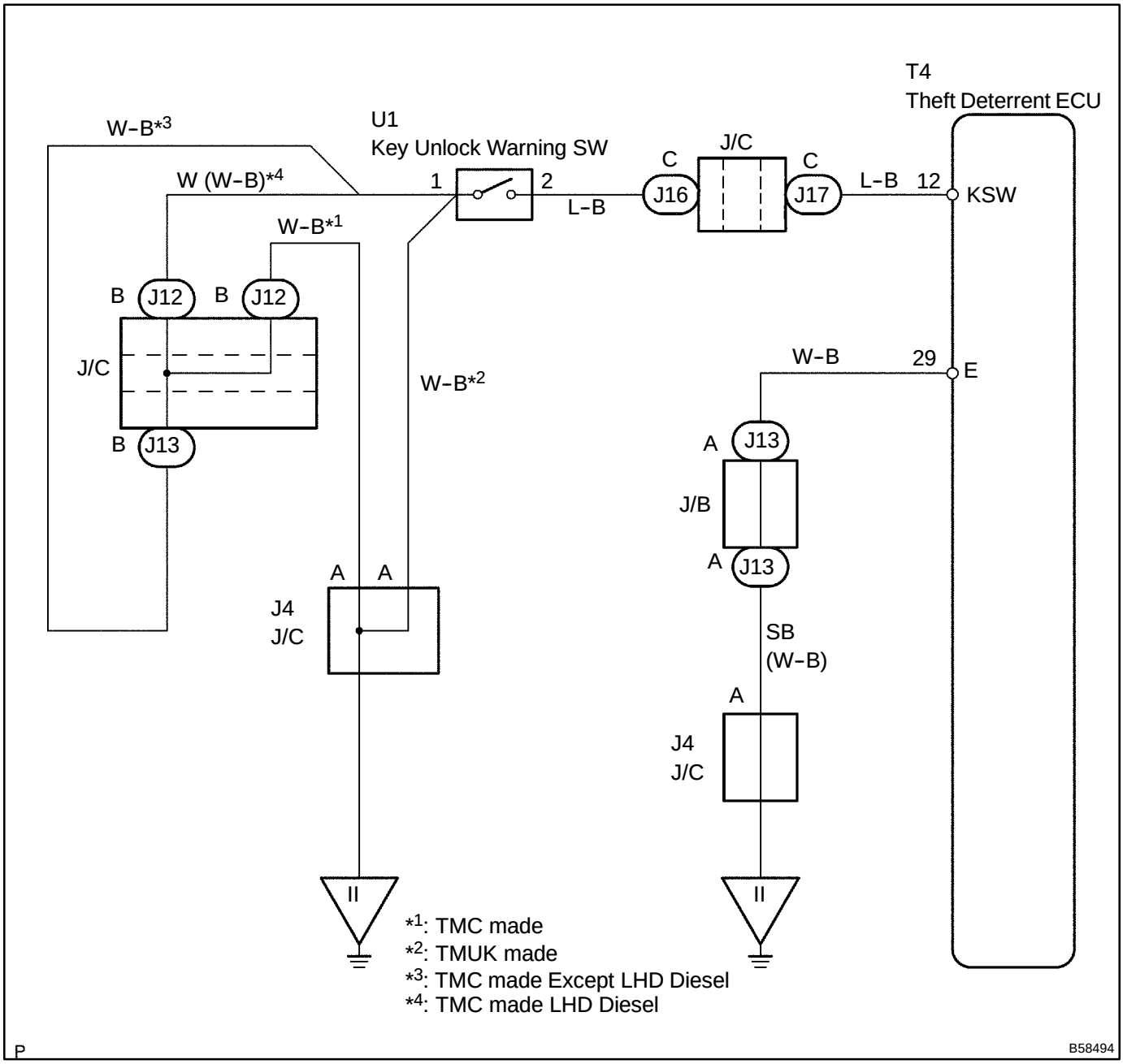
REPAIR OR REPLACE THEFT WARNING ECU ASSY

KEY UNLOCK WARNING SWITCH CIRCUIT

CIRCUIT DESCRIPTION

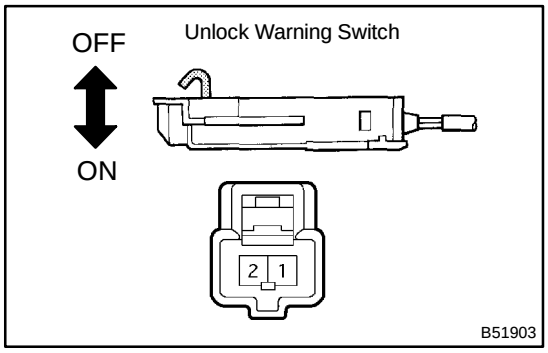
The key unlock warning switch comes on when the ignition key is inserted in the key cylinder and goes off when the ignition key is removed.
The ECU operates the key confinement prevention function while the key unlock warning switch is on.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK UN-LOCK WARNING SWITCH ASSY



(a) Disconnect the key unlock warning switch connector.
(b) Check the continuity between terminals 1 and 2 of the key unlock warning switch connector, when the key is inserted into the key cylinder or removed.

Switch position	Tester connection	Specified condition
ON (Key inserted)	1 - 2	Continuity
OFF (Key removed)	-	No continuity

NG → REPLACE UN-LOCK WARNING SWITCH ASSY

OK

2	CHECK WIRE HARNESS

(a) Check the continuity between terminal KSW (T4-12) of the theft deterrent ECU connector and terminal 2 of the unlock warning switch connector.
Standard: Continuity

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3	CHECK WIRE HARNESS

(a) Check the continuity between terminal 1 of the key unlock warning switch connector and the body ground.
Standard: Continuity

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

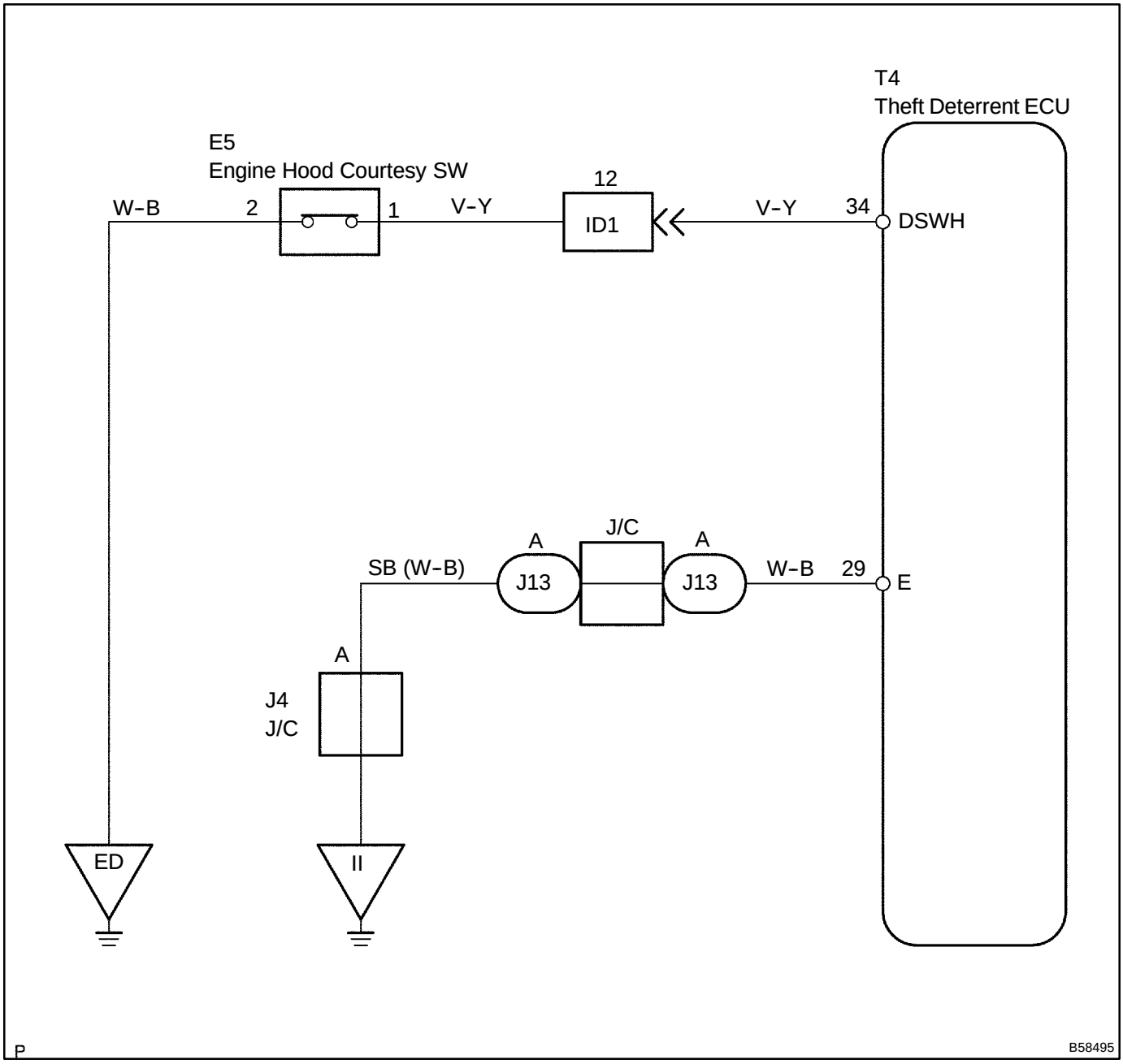
REPAIR OR REPLACE THEFT WARNING ECU ASSY

ENGINE HOOD COURTESY SWITCH CIRCUIT

CIRCUIT DESCRIPTION

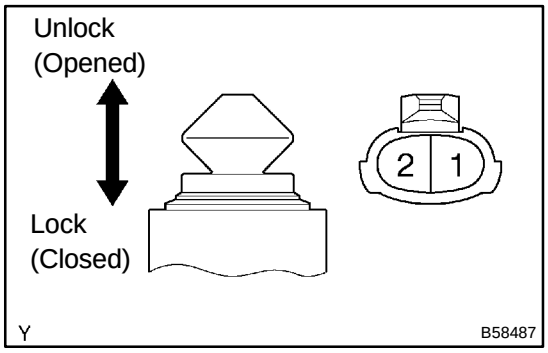
The engine hood courtesy switch is built into the engine hood lock assembly, and comes on when the engine hood is opened and goes off when the engine hood is closed.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK THEFT WARNING COURTESY SWITCH



(a) Disconnect the engine hood courtesy switch connector.
(b) Check the continuity between terminals 1 and 2 of the switch connector.

Switch position	Tester connection	Specified condition
Unlock (Opened)	1 - 2	Continuity
Lock (Closed)	1 - 2	No continuity

NG → **REPAIR OR REPLACE THEFT WARNING COURTESY SWITCH**

OK

2	CHECK WIRE HARNESS

(a) Check the continuity between terminal DSWH (T4-34) of the theft deterrent ECU connector and terminal 1 of the engine hood courtesy switch connector.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	CHECK WIRE HARNESS

(a) Check the continuity between terminal 2 of the engine hood courtesy switch connector and the body ground.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

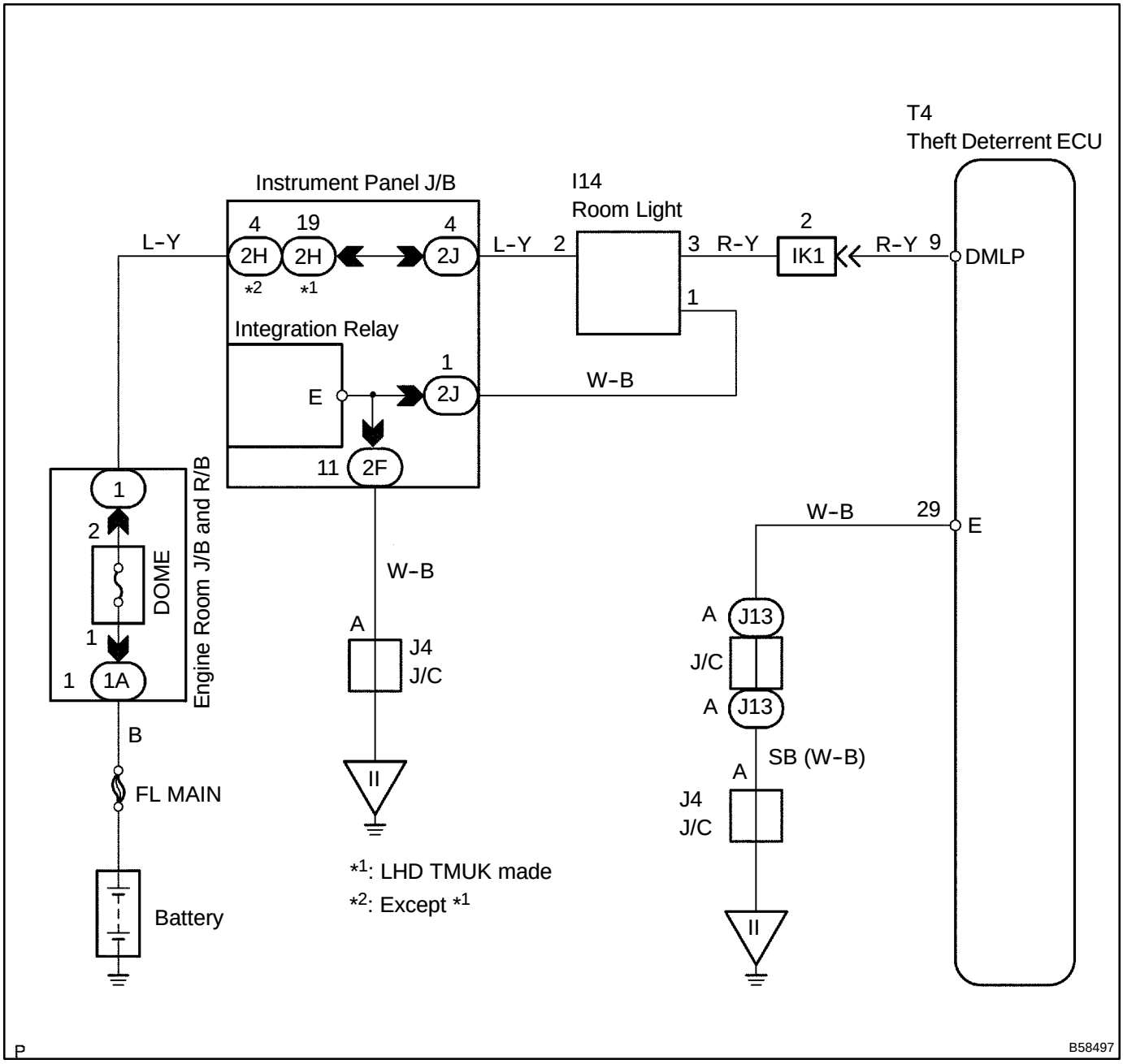
REPLACE THEFT WARNING ECU ASSY

ROOM LIGHT CIRCUIT

CIRCUIT DESCRIPTION

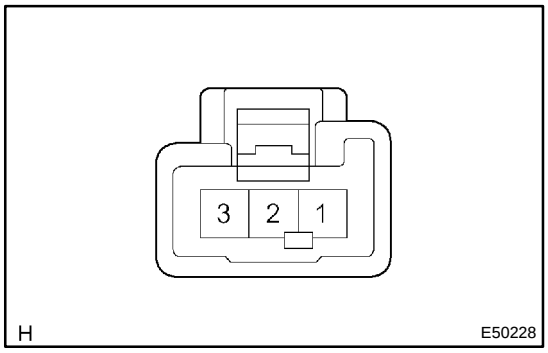
When the theft deterrent system is transferred from the arming state to the alarming state, the theft deterrent ECU lights the room light by sending a controlling room light signal to the turn signal flasher relay.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK ROOM LAMP ASSY NO.1



(a) Check the room light continuity.
(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
OFF	-	No continuity
DOOR	2 - 3	Continuity
ON	1 - 2	Continuity

NG → **REPAIR OR REPLACE ROOM LAMP ASSY NO.1**

OK

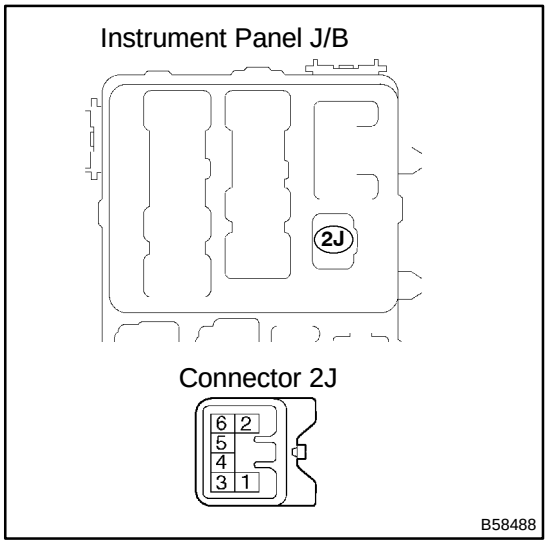
2 CHECK WIRE HARNESS

(a) Check the continuity between terminal DMLP (T4-9) of the theft deterrent ECU connector and terminal 3 of the room light connector.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 CHECK WIRE HARNESS



(a) Check the continuity between terminal 2J-4 of the instrument panel J/B 2J connector and terminal 2 of the room light connector.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

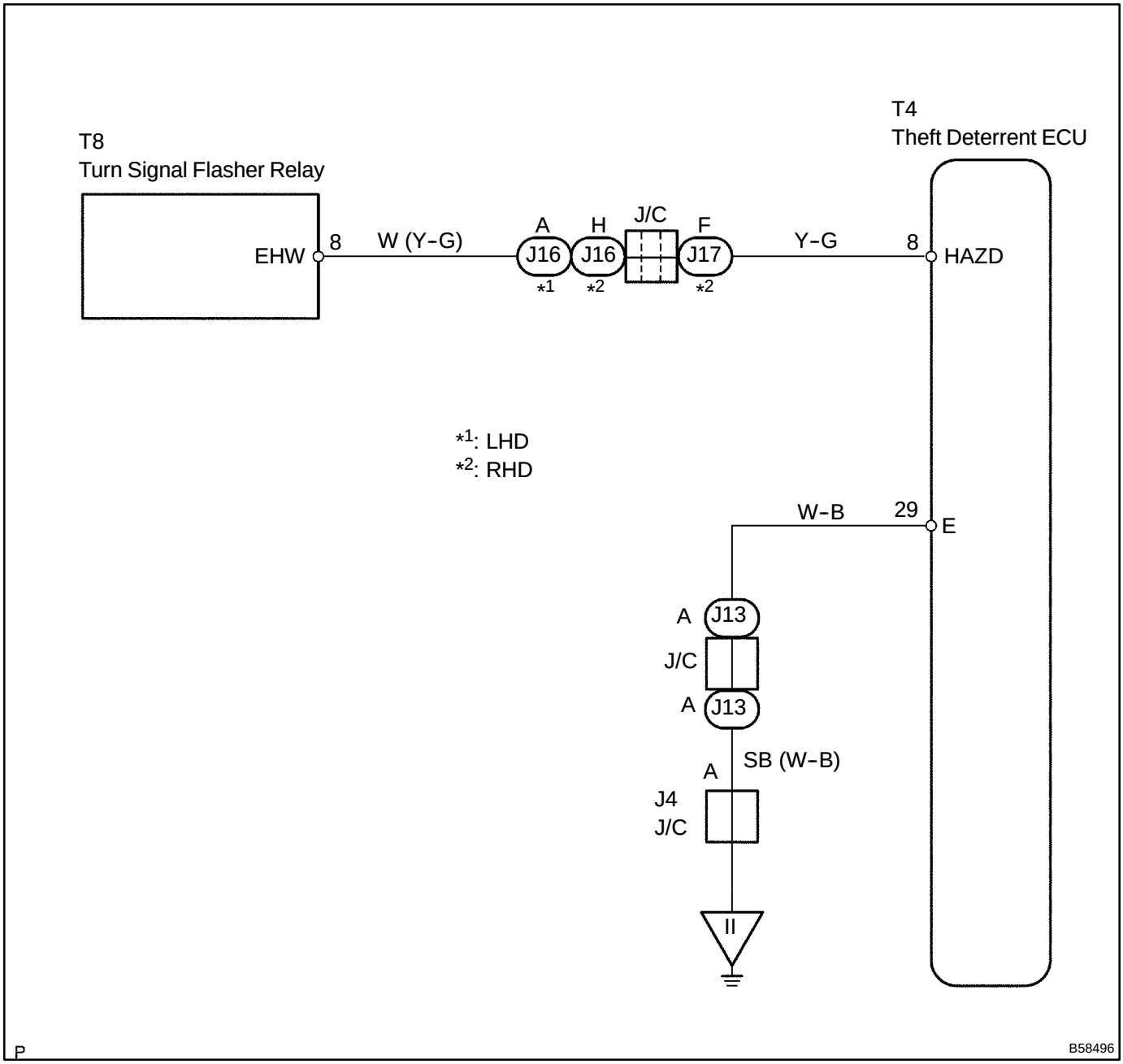
REPLACE THEFT WARNING ECU ASSY

HAZARD WARNING LIGHT CIRCUIT

CIRCUIT DESCRIPTION

When the theft deterrent system is transferred from the arming state to the alarming state, the theft deterrent ECU flashes the hazard light by sending a controlling hazard signal to the turn signal flasher relay.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK TURN SIGNAL FLASHER ASSY

(a) Check the turn signal flasher relay (See page 65-5).

NG → REPAIR OR REPLACE TURN SIGNAL FLASHER ASSY

OK

2	CHECK WIRE HARNESS

(a) Check the continuity between terminal HAZD (T4-8) of the theft deterrent ECU connector and terminal EHW (T8-8) of the turn signal flasher relay connector.
Standard: Continuity

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

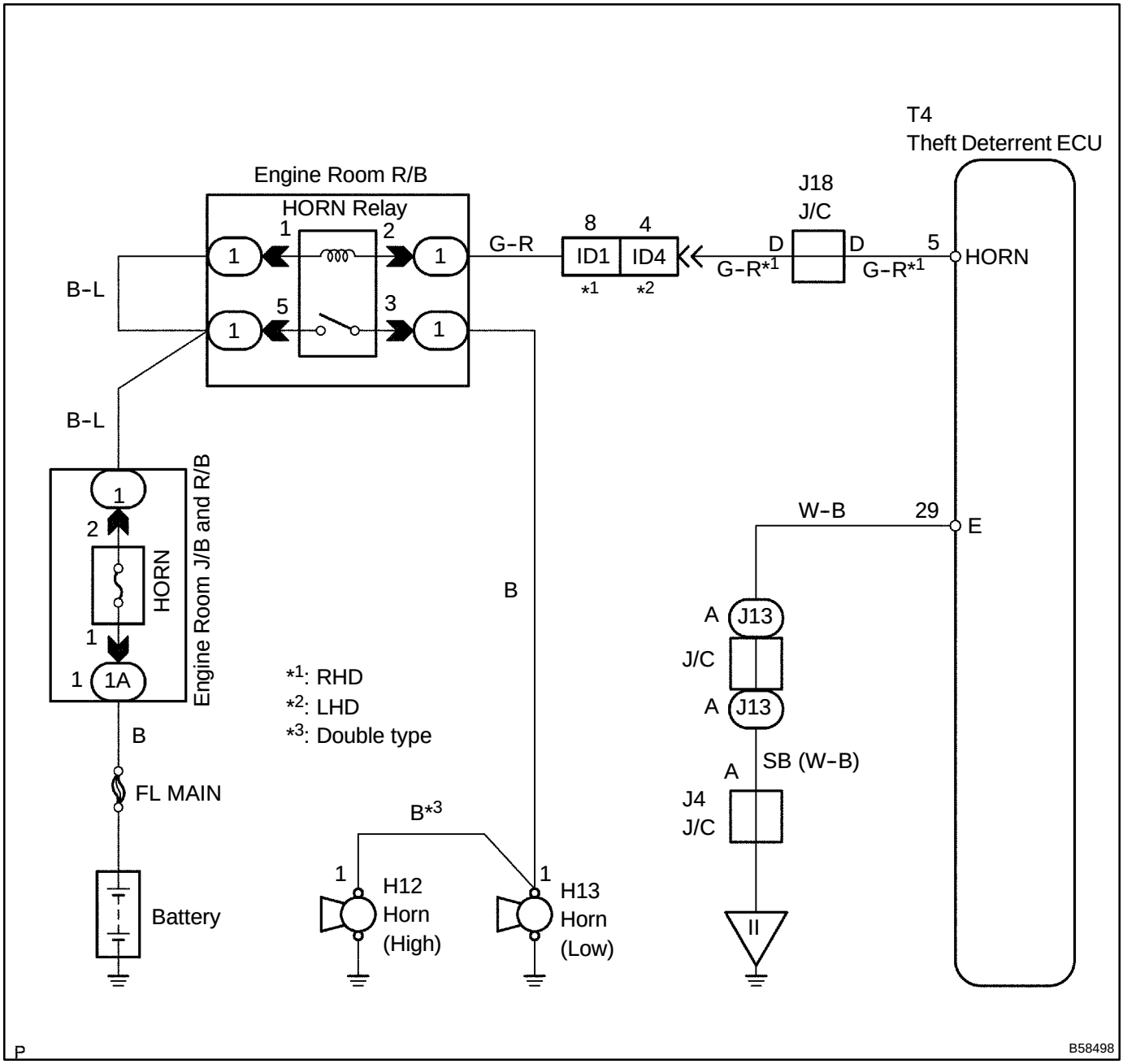
REPLACE THEFT WARNING ECU ASSY

HORN CIRCUIT

CIRCUIT DESCRIPTION

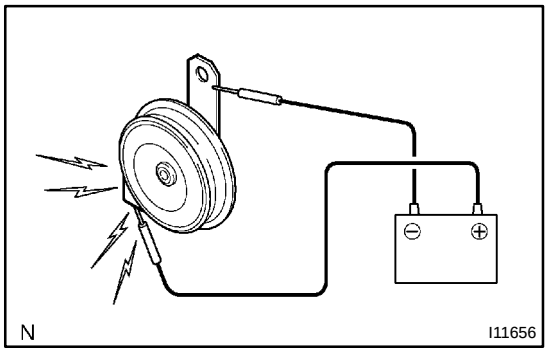
When the theft deterrent system is transferred from the arming state to the alarming state, the theft deterrent ECU switches on the HORN relay so that it sounds the horns. The horn sounds in 0.4 seconds interval.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK LOW PITCHED HORN ASSY

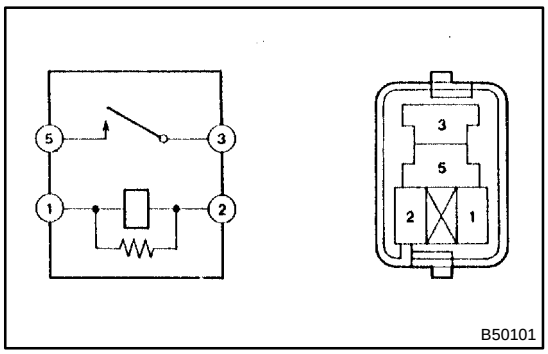


(a) Connect the positive (+) lead from the battery to the terminal and negative (–) lead to the horn body and check that the horn blows.

NG → **REPAIR OR REPLACE LOW PITCHED HORN ASSY**

OK

2 CHECK HORN RELAY ASSY



(a) Check the horn relay (Marking: HORN) continuity.

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

NG → **REPLACE HORN RELAY ASSY**

OK

3 CHECK WIRE HARNESS

(a) Check the continuity between terminal HORN (T4-5) of the theft deterrent ECU connector and terminal 1 of the horn connector. Then, the horn relay turns on.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPAIR OR REPLACE THEFT WARNING ECU ASSY

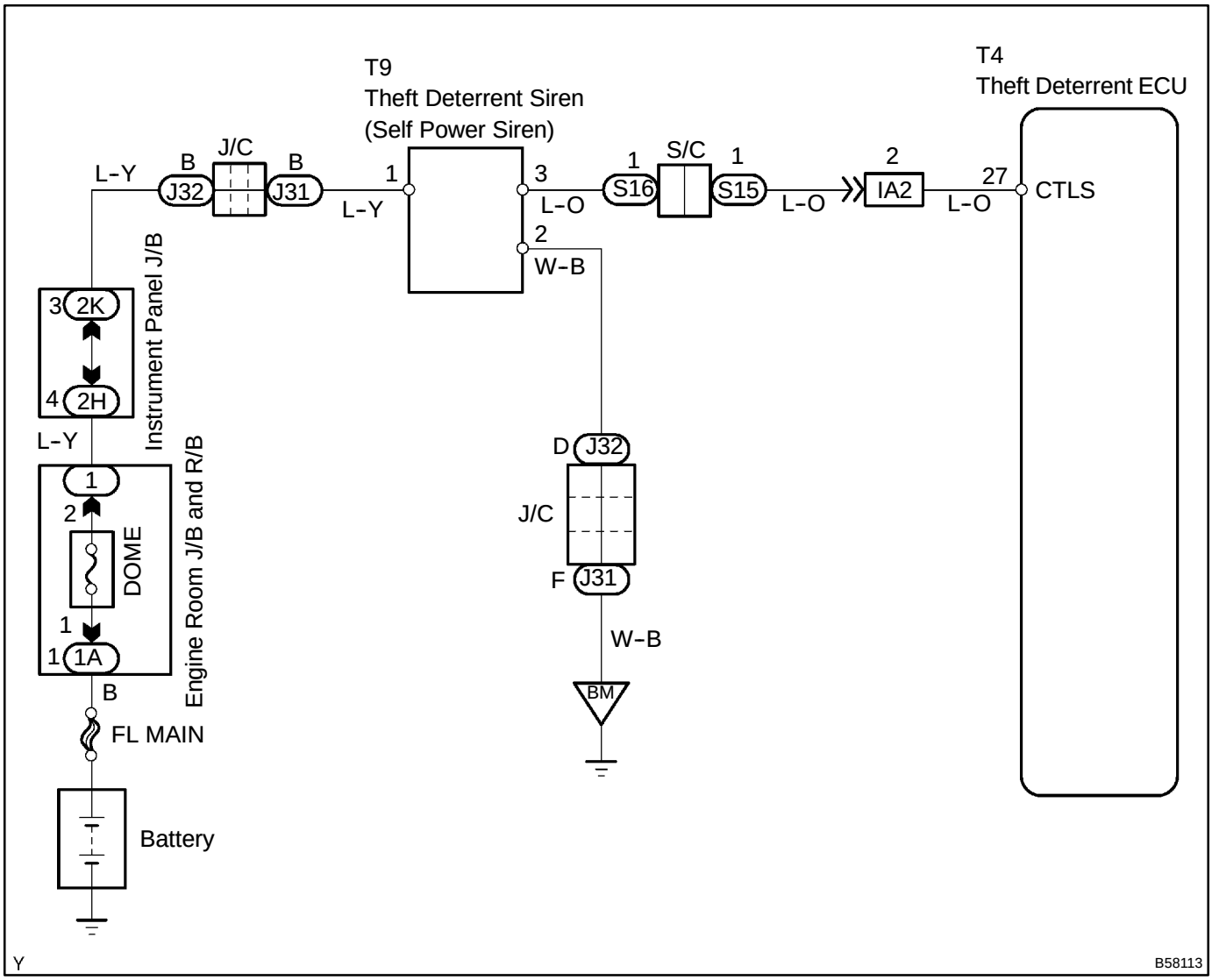
SELF POWER SIREN CIRCUIT

CIRCUIT DESCRIPTION

The self power siren has an internal battery. If any of the vehicle's battery or communication line is opened, the self power siren detects it by itself and sounds. Although the self power siren sounds by receiving a signal from the theft deterrent ECU usually, the self power siren can sound by its internal battery in case that the vehicle's battery is opened.

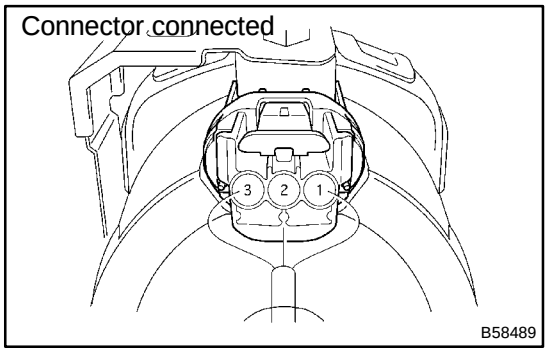
The theft deterrent ECU sends an arming signal to the self power siren while transferring to the armed state, and it also sends a disarming signal to the siren while transferring to the disarmed state. Besides, the theft deterrent ECU can sound the self power siren by sending an alarming signal in the alarm sounding state.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK THEFT WARNING SIREN ASSY

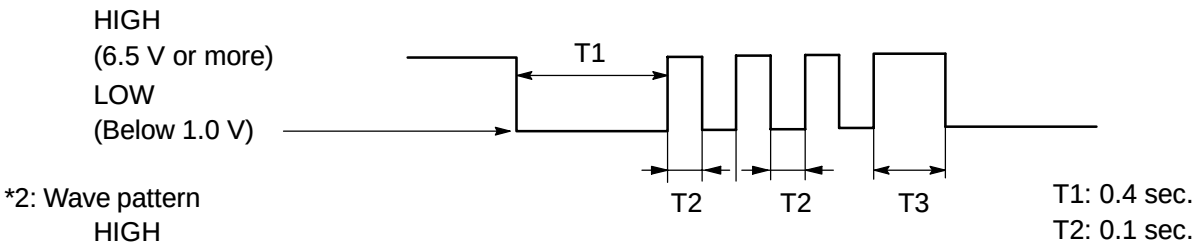


(a) Check the self power siren.

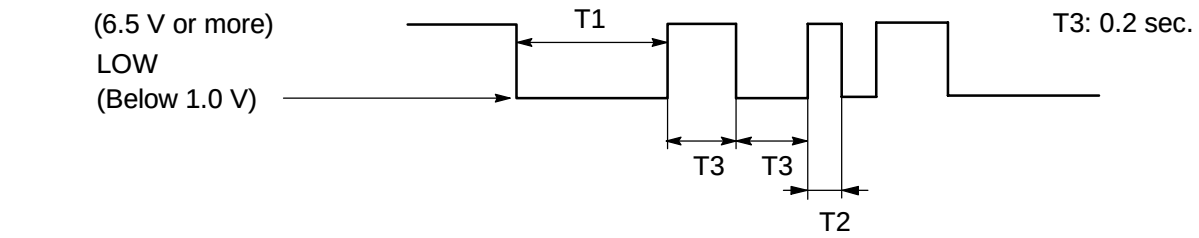
Standard:

Tester connection	Condition	Specified condition
1 - Ground	Constant	Battery voltage
2 - Ground	Constant	No voltage
3 - Ground	When transferred from armed or arming preparation state to disarmed state.	Using an oscilloscope *1
	When transferred from the arming preparation state to armed state.	Using an oscilloscope *2
	Normal condition	Approx. 1.4 V

*1: Wave pattern



*2: Wave pattern



T1: 0.4 sec.
T2: 0.1 sec.
T3: 0.2 sec.

NG → **REPAIR OR REPLACE THEFT WARNING SIREN ASSY**

OK

2 CHECK WIRE HARNESS

(a) Check the continuity between terminal CTLS (T4-27) of the theft deterrent ECU connector and terminal 3 of the self power siren connector.

Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3	CHECK WIRE HARNESS

(a) Check the continuity between terminal 2 of the self power siren connector and the body ground.
Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

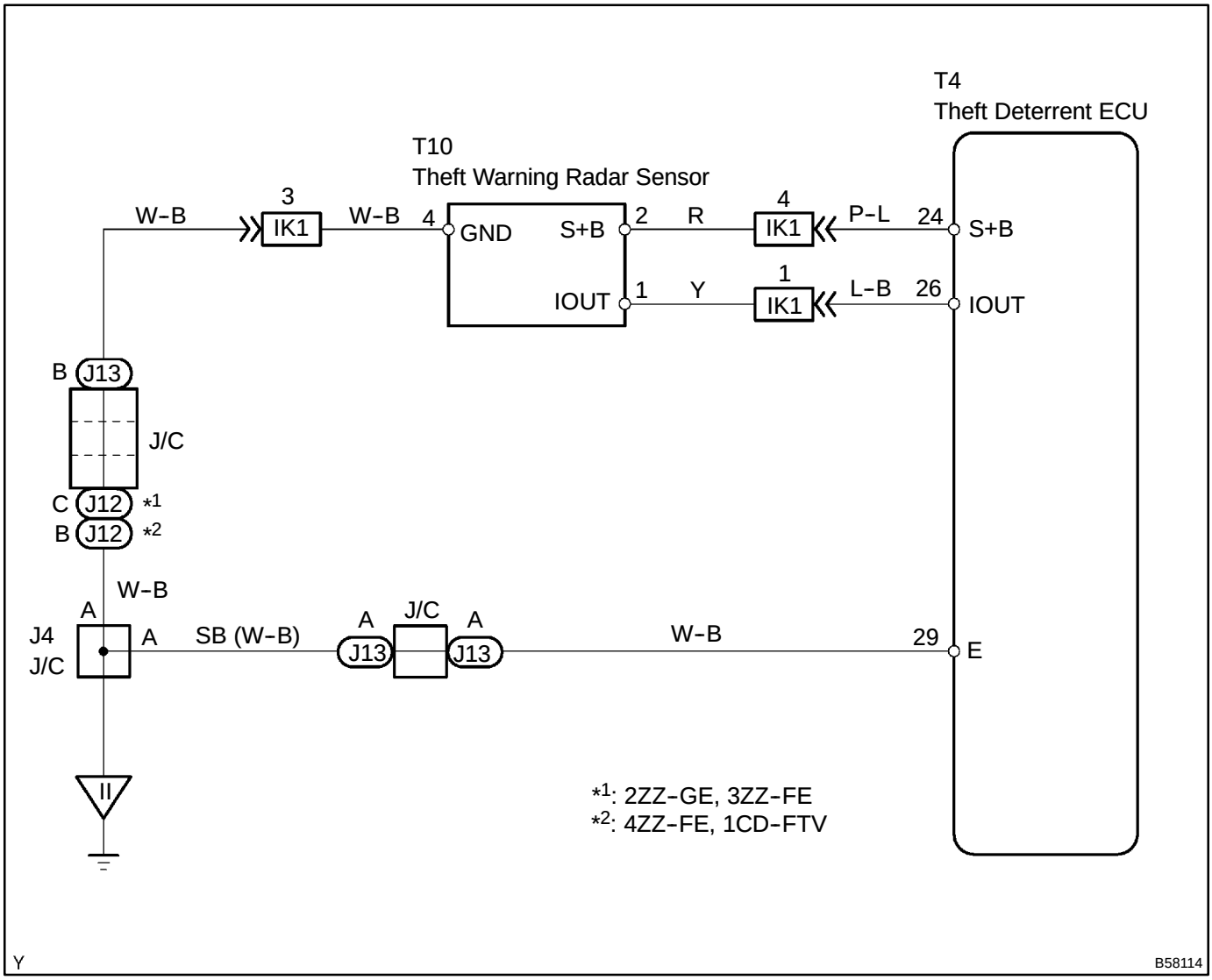
REPAIR OR REPLACE THEFT WARNING ECU ASSY

RADAR SENSOR CIRCUIT

CIRCUIT DESCRIPTION

A radio transmitter is integrated into the dome light.
This creates a spherical electric field inside the vehicle that detects intrusion using the Doppler effect caused by movement of an object in the vehicle, and outputs a warning trigger signal to the theft deterrent ECU.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK THEFT WARNING RADAR SENSOR

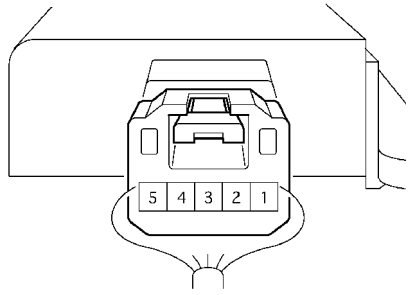
(a) Set the system with a window open, and after 30 seconds insert your hand through the window and shake it near the sensor to check if the alarm is triggered.

OK → **NO PROBLEM**

NG

2	CHECK THEFT WARNING RADAR SENSOR

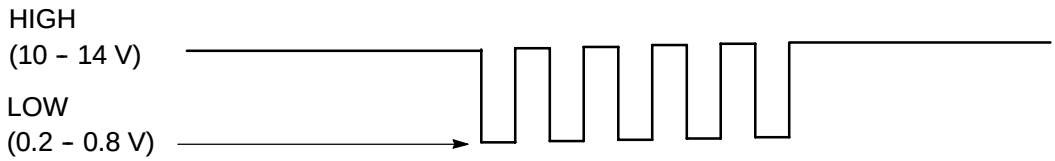
Connector connected



(a) Check the radar sensor.

Tester connection	Condition	Specified condition
2 - Ground	Arming preparation state or armed state.	Battery voltage
	Disarmed state.	Below 1 V
1 - Ground	When the sensor does not detect any movement.	10 - 12 V
	When the sensor detects movement when in arming preparation or armed state.	Using an oscilloscope *1
4 - Ground	Constant	Continuity

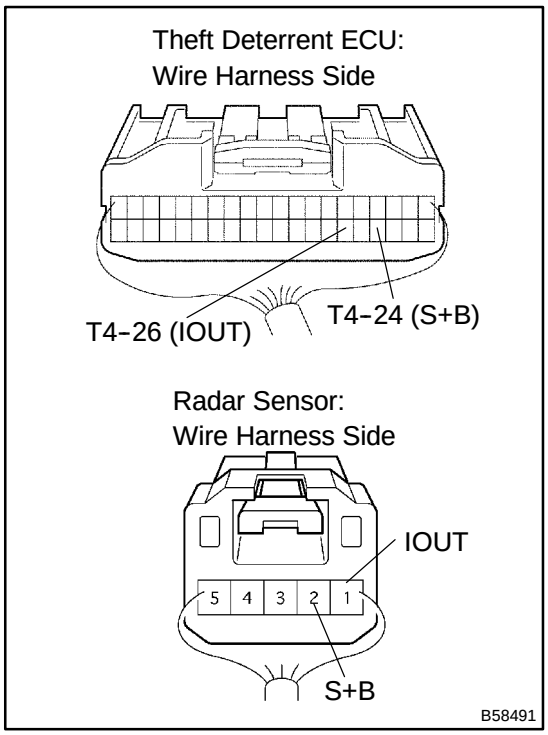
*1: Wave pattern



NG → **REPLACE THEFT WARNING RADAR SENSOR**

OK

3 CHECK WIRE HARNESS



(a) Disconnect the connector from the theft deterrent ECU and radar sensor.

(b) Check the connector on the harness side.

Continuity:

Tester connection (Theft deterrent ECU ⇔ Radar sensor)	Specified condition
T4-24 (S+B) ⇔ T10-2 (S+B)	Continuity
T4-26 (IOUT) ⇔ T10-1 (IOUT)	Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

4 CHECK WIRE HARNESS

(a) Check the continuity between terminal T10-4 (GND) of the radar sensor connector and the body ground.

Standard: Continuity

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE THEFT WARNING ECU ASSY

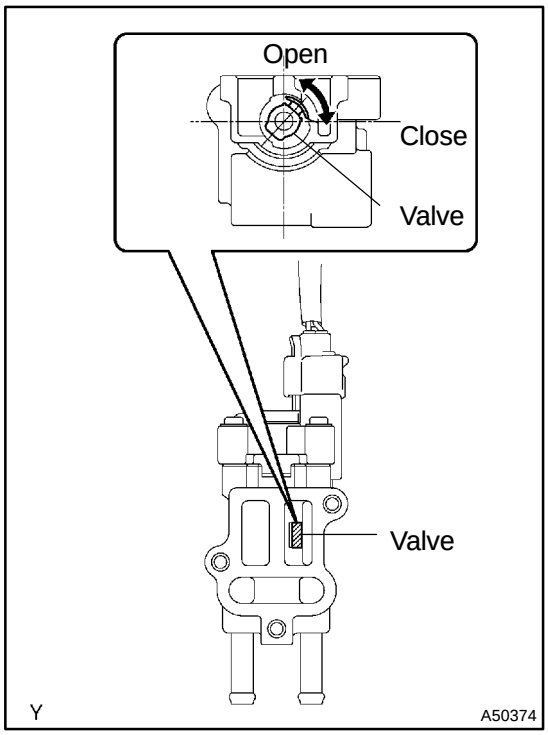
ENGINE CONTROL SYSTEM

EFI SYSTEM (2ZZ-GE) 10-1
ON-VEHICLE INSPECTION 10-1
INSPECTION 10-2/4
THROTTLE BODY ASSY (2ZZ-GE) 10-5
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and Disassembly & Reassembly 10-6
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EFI SYSTEM (2ZZ-GE)

ON-VEHICLE INSPECTION

1007E-01



1. INSPECTION THROTTLE BODY IDLE SPEED CONTROL VALVE ASSY

NOTICE:

- **It is impossible to check the resister value and the operation of ISCV by itself, because the ISCV has an IC circuit inside it, which transforms the duty signal from the ECU to the derive signal.**
- **After checking, erase the DTC.**
- **Clear the DTC after inspection.**

HINT:

When the ISCV system has malfunctions except for its adherence, DTC P0505 is detected.

(a) Operation inspection.

(1) Connect the ISC connector to the ISC valve.

(2) Check the ISC valve movement when the ignition switch is turned ON.

Movement:

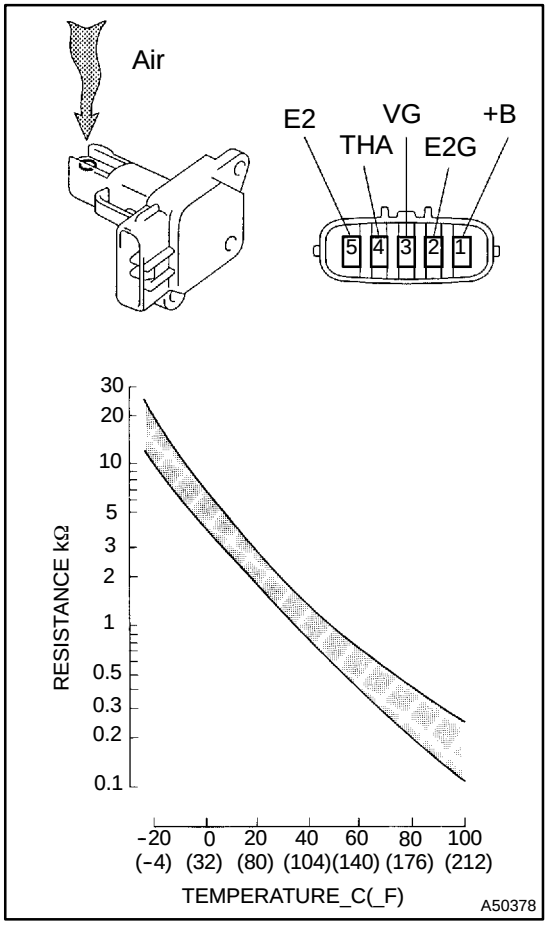
Half open → fully close → fully open → half open

HINT:

ISC valve moves within 0.5 second.

1007F-01

INSPECTION



1. INTAKE AIR FLOW METER SUB-ASSY

(a) Output voltage inspection.
  (1) Apply battery voltage across terminals 1 (+B) and 2 (E2G).
  (2) Using a voltmeter, connect the positive (+) tester probe to terminal VG, and negative (-) tester probe to terminal E2G.
  (3) Blow air into the MAF meter, and check that the voltage fluctuates.

(b) Resistance inspection.
  (1) Using an ohmmeter, measure the resistance between terminals 4 (THA) and 5 (E2).

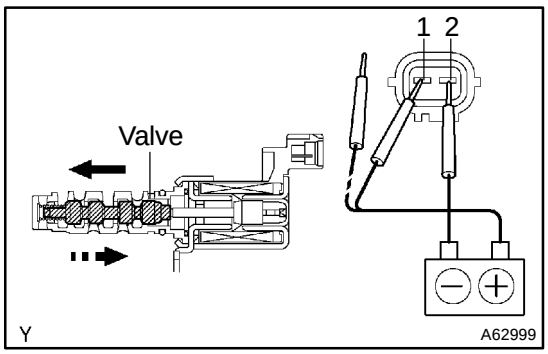
Resistance:

Terminals	Resistance	Temperature
THA - E2	13.6 - 18.4 kΩ	-20 _C (-4 _F)
THA - E2	2.21 - 2.69 kΩ	20 _C (68 _F)
THA - E2	0.49 - 0.67 kΩ	60 _C (140 _F)

2. CAMSHAFT TIMING OIL CONTROL VALVE ASSY

(a) Resistance inspection.
  (1) Using an ohmmeter, measure the resistance between the terminals.

Resistance: 6.9 - 7.9 Ω at 20 _C (68 _F)



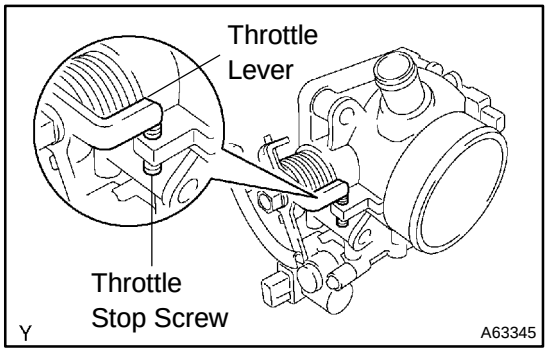
(b) Movement inspection.
  (1) Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2, and check the movement of the valve.

NOTICE:

Confirm the valve does not adhere.

HINT:

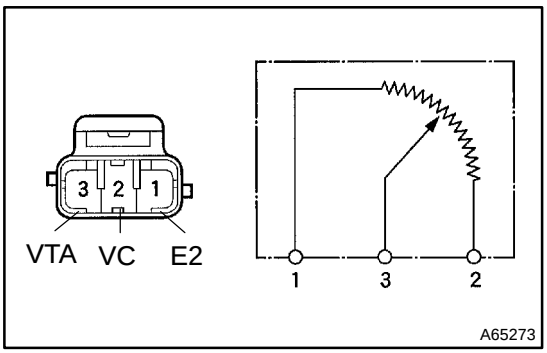
Bad returning of the valve by entrance of foreign objects causes subtle pressure leak to the advanced direction. Then, DTC can be detected.



3. THROTTLE BODY ASSY

(a) Check throttle body.
  (1) Check that throttle valve shaft is not rickety.
  (2) Check that each port is not stopped up.
  (3) Check that throttle valve opens and closes smoothly.
  (4) Check that there is no clearance between the throttle stop screw and throttle lever at the throttle closed position.

NOTICE:
Do not adjust the throttle stop screw.

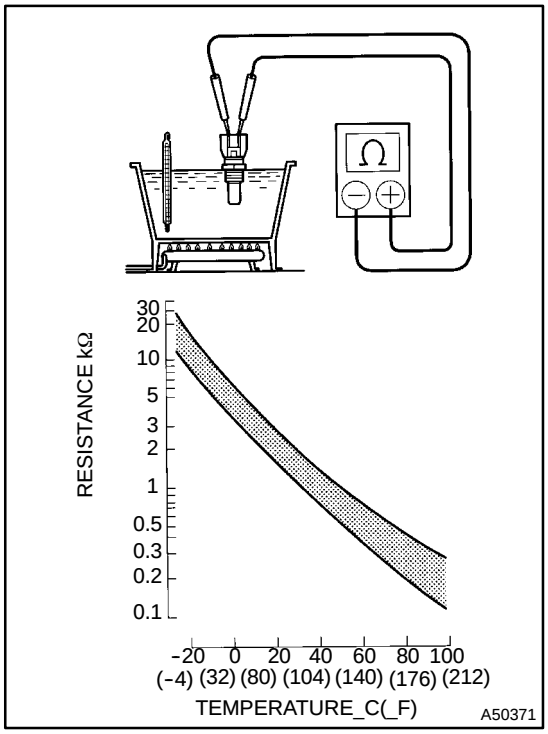


4. E.F.I. THROTTLE POSITION SENSOR

(a) Resistance inspection.
  (1) Disconnect the throttle position sensor connector.
  (2) Using an ohmmeter, measure the resistance between terminals VC and E2.
  Resistance: 2.5 - 6.0 kΩ
  (3) Check the change of resistance between terminals VTA and E2.
  Change of resistance:
  The resistance value increases in proportion to the throttle lever opening value.

HINT:

Throttle valve	Resistance
Fully open	0.2 - 5.7 kΩ
Fully close	2.0 - 10.2 kΩ



5. E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Resistance inspection.

(1) Using an ohmmeter, measure the resistance between each terminal.

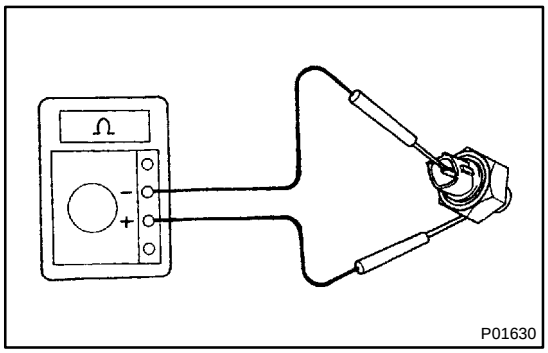
Resistance:

Approx. 20_C (68_F) 2.32 - 2.59 kΩ

Approx. 80_C (176_F) 0.310 - 0.326 kΩ

NOTICE:

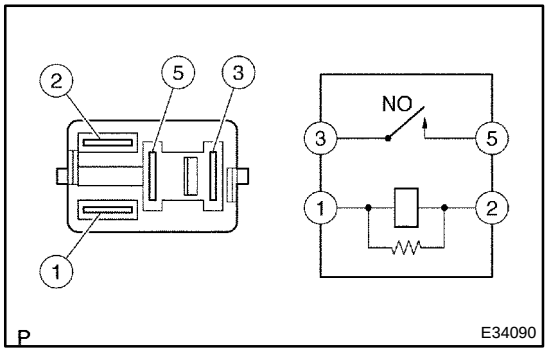
In case of checking the water temperature sensor in the water, be careful not to allow water to go into the terminals, and after checking, wipe out the sensor.



6. KNOCK CONTROL SENSOR

(a) Continuity inspection.

(1) Using an ohmmeter, check that no continuity exists between the terminal and body.



7. E.F.I. CIRCUIT OPENING RELAY ASSY

(a) Continuity inspection.

(1) Using an ohmmeter, check that continuity exists between each terminal.

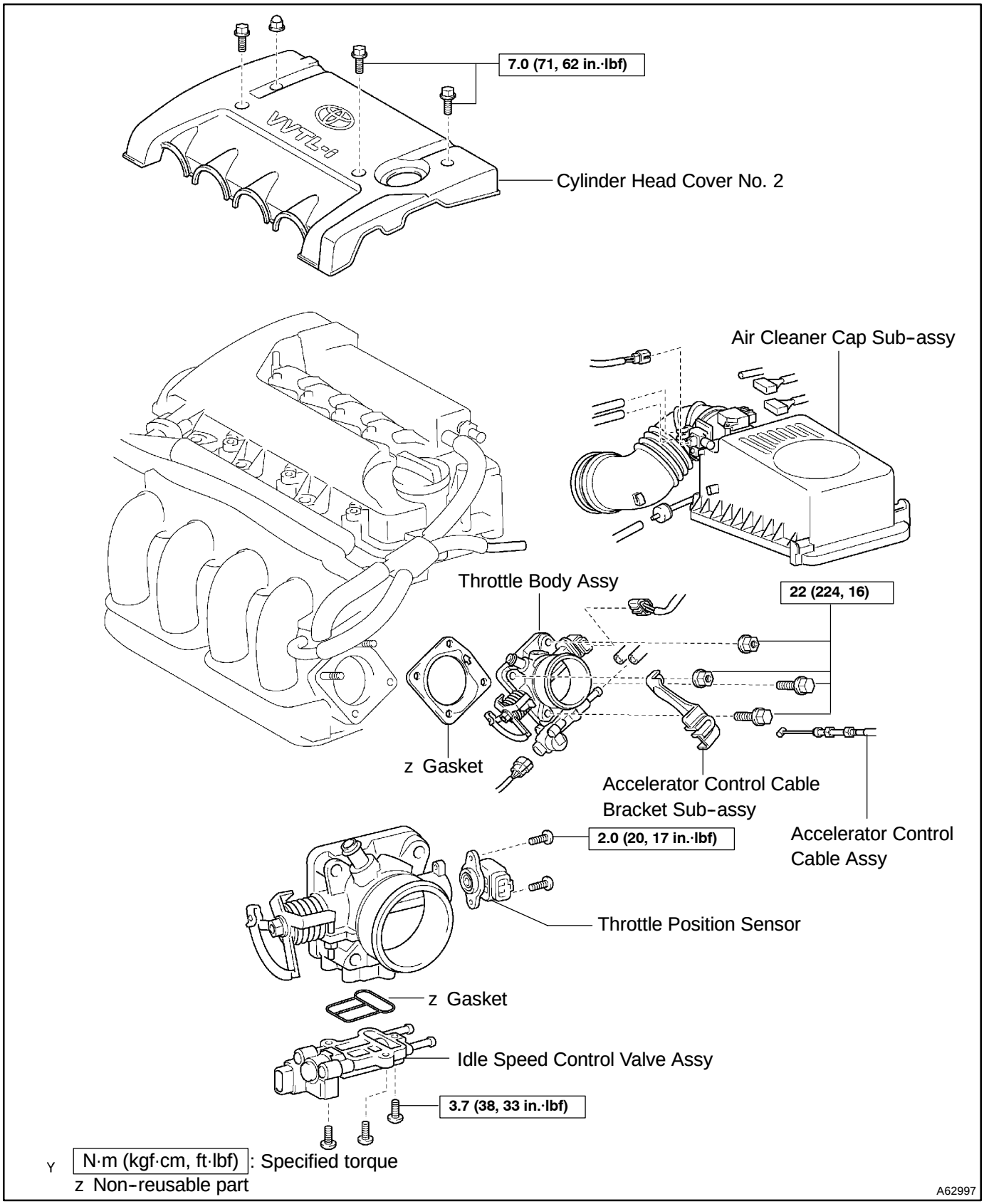
Between terminals	Specified condition
1 - 2	Continuity
3 - 5	No continuity

(2) Using an ohmmeter, check that continuity exists between terminals 3 and 5 when the battery voltage is applied across terminals 1 and 2.

THROTTLE BODY ASSY (2ZZ-GE)

COMPONENTS

1007I-01



1007J-01

Removal & Installation and Disassembly & Reassembly

1. REMOVE ENGINE UNDER COVER LH

2. DRAIN COOLANT **(See page 16-6)**

3. REMOVE AIR CLEANER CAP SUB-ASSY

4. REMOVE CYLINDER HEAD COVER NO.2

5. SEPARATE ACCELERATOR CONTROL CABLE ASSY

6. REMOVE THROTTLE BODY ASSY

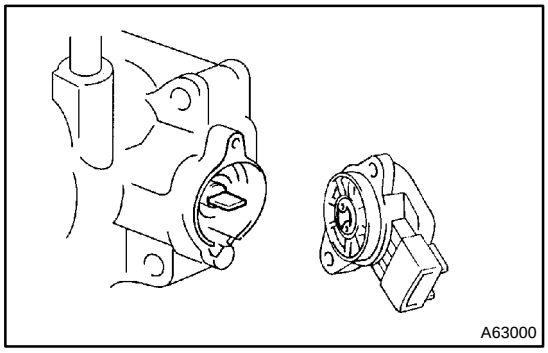
(a) Disconnect the throttle position sensor connector and idle speed control valve connector.
(b) Disconnect the ventilation hose.
(c) Remove the 2 bolts and accelerator control cable bracket.
(d) Disconnect the 2 water bypass hose.
(e) Remove the 2 bolts, 2 nuts and throttle body from the intake manifold.

7. REMOVE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

(a) Remove the 3 screws and idle speed control valve.

8. REMOVE E.F.I. THROTTLE POSITION SENSOR

(a) Remove the 2 screws and throttle position sensor.



9. INSTALL E.F.I. THROTTLE POSITION SENSOR

(a) Confirm the throttle valve is fully closed.
(b) Revolve the sensor 30 – 90_ in the left direction to the throttle valve fully closed position, and insert the sensor to the throttle body.
(c) Revolve the sensor 30 – 90_ in the right direction and install it 2 screws.

10. INSTALL THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

(a) Install the idle speed control valve with a new gasket.

11. INSTALL THROTTLE BODY ASSY

(a) Install a new gasket to the intake manifold.
(b) Install the throttle body with the 2 bolts and nut.
Torque: 22 N·m (224 kgf·cm, 16 ft·lbf)

12. INSTALL CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

13. ADD COOLANT **(See page 16-6)**

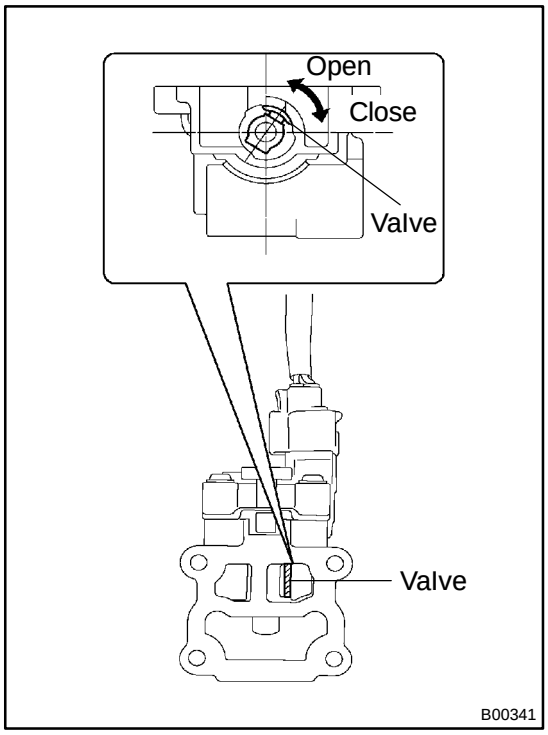
14. INSPECT CHECK ENGINE COOLANT LEAK **(See page 16-1)**

15. WARMING UP

EFI SYSTEM (3ZZ-FE/4ZZ-FE)

ON-VEHICLE INSPECTION

1007G-01



1. INSPECTION THROTTLE BODY IDLE SPEED CONTROL VALVE ASSY

NOTICE:

- **It is impossible to check the resister value and the operation of ISCV by itself, because the ISCV has an IC circuit inside it, which transforms the duty signal from the ECU to the derive signal.**
- **After checking, erase the DTC.**
- **Clear the DTC after inspection.**

HINT:

When the ISCV system has malfunctions except for its adherence, DTC P0505 is detected.

(a) Operation inspection.

(1) Connect the ISC connector to the ISC valve.

(2) Check the ISC valve movement when the ignition switch is turned ON.

Movement:

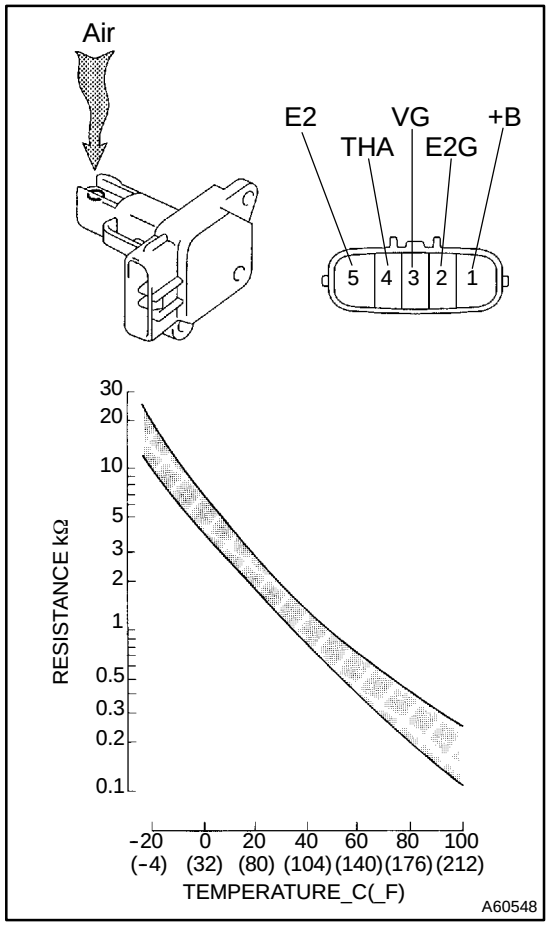
Half open → fully close → fully open → half open

HINT:

ISC valve moves within 0.5 second.

1007H-01

INSPECTION



1. INTAKE AIR FLOW METER SUB-ASSY

(a) Output voltage inspection.
  (1) Apply battery voltage across terminals 1 (+B) and 2 (E2G).
  (2) Using a voltmeter, connect the positive (+) tester probe to terminal 3 (VG), and negative (-) tester probe to terminal 2 (E2G).
  (3) Blow air into the MAF meter, and check that the voltage fluctuates.

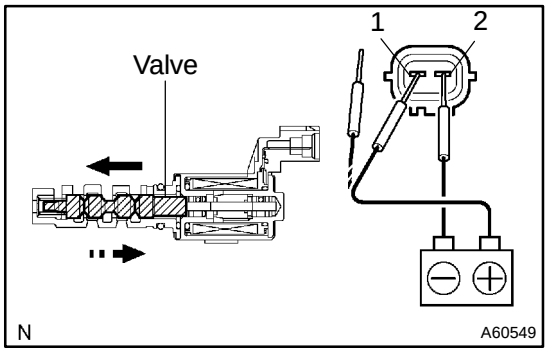
(b) Resistance inspection.
  (1) Using an ohmmeter, measure the resistance between terminals 4 (THA) and 5 (E2).

Resistance:
Approx. -20 _C (-4 _F) 13.6 - 18.4 kΩ
Approx. 20 _C (68 _F) 2.21 - 2.69 kΩ
Approx. 60 _C (140 _F) 0.49 - 0.67 kΩ

2. CAMSHAFT TIMING OIL CONTROL VALVE ASSY

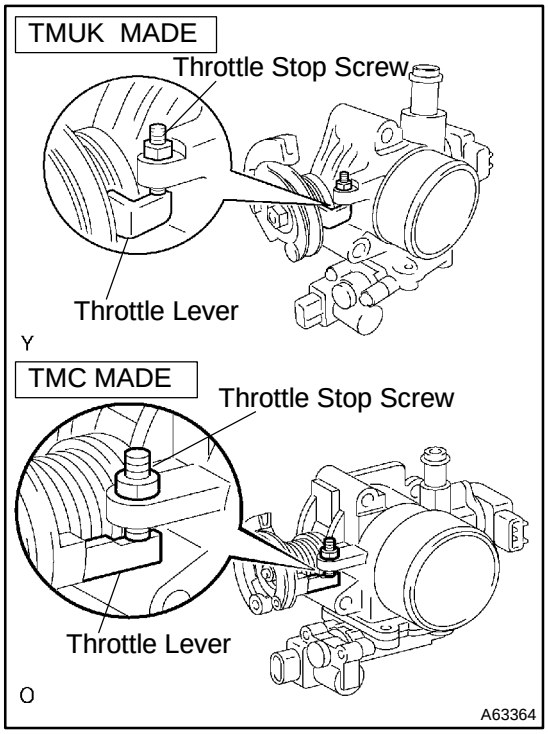
(a) Resistance inspection.
  (1) Using an ohmmeter, measure the resistance between terminals.

Resistance: 6.9 - 7.9 Ω at 20 _C (68 _F)



(b) Movement inspection.
  (1) Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2, and check the movement of the valve.

NOTICE:
Confirm the valve does not adhere.
HINT:
Bad returning of the valve by entrance of foreign objects causes subtle pressure leak to the advanced direction. Then, DTC can be detected.



3. THROTTLE BODY ASSY

(a) Check throttle body.
  (1) Check that throttle valve shaft is not rickety.
  (2) Check that each port is not stopped up.
  (3) Check that throttle valve opens and closes smoothly.
  (4) Check that there is no clearance between the throttle stop screw and throttle lever at the throttle closed position.

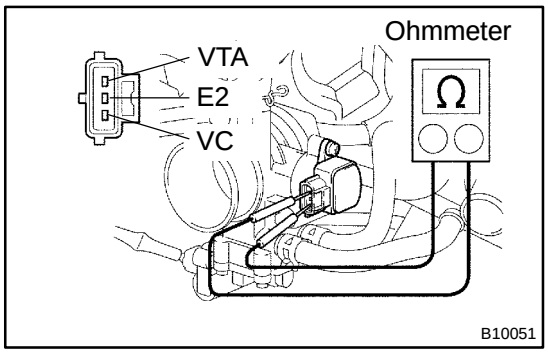
NOTICE:
Do not adjust the throttle stop screw.

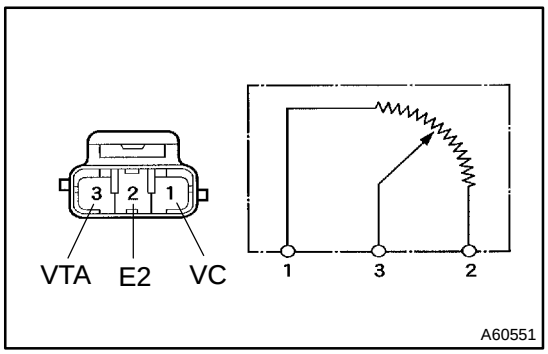
(b) Check throttle position sensor (TMUK Made).

(c) Using an ohmmeter, measure the resistance between each terminal.

Resistance:

Clearance between lever and stop screw	Between terminals	Resistance
0 mm (0 in.)	VTA - E2	0.2 - 5.7 kΩ
Throttle valve fully open	VTA - E2	2.0 - 10.2 kΩ
-	VC - E2	02.5 - 5.9 kΩ



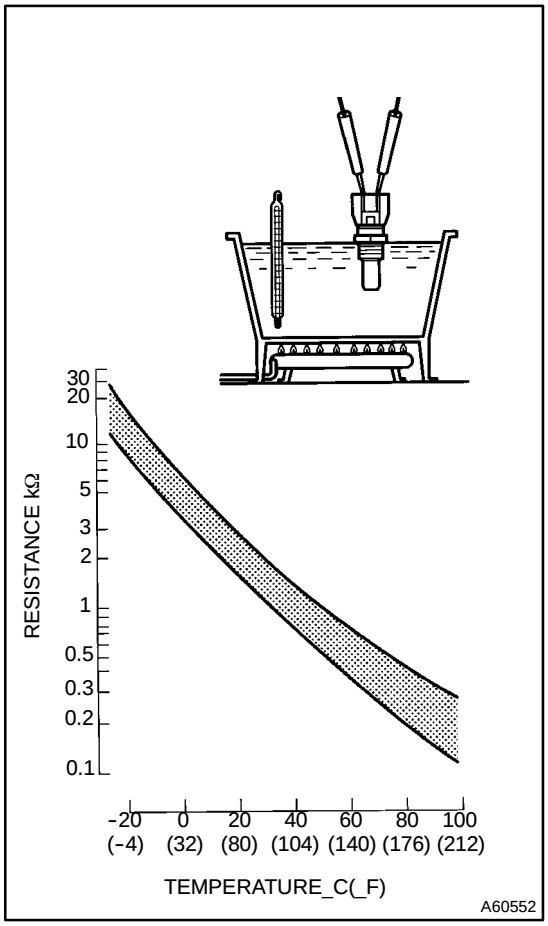


4. E.F.I. THROTTLE POSITION SENSOR(TMC MADE)

(a) Resistance inspection.
  (1) Disconnect the throttle position sensor connector.
  (2) Using an ohmmeter, measure the resistance between terminals 1 (VC) and 2 (E2).
  Resistance: 2.5 - 6.0 kΩ
  (3) Check the change of resistance between terminals 3 (VTA) and 2 (E2).
  Change of resistance:
  The resistance value increases in proportion to the throttle lever opening value.

HINT:

Throttle valve	Resistance
Fully open	0.2 - 5.7 kΩ
Fully close	2.0 - 10.2 kΩ



5. E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Resistance inspection.

(1) Using an ohmmeter, measure the resistance between terminals.

Resistance:

Approx. 20 _C (68 _F) 2.32 - 2.59 kΩ

Approx. 80 _C (176 _F) 0.310 - 0.326 kΩ

NOTICE:

In case of checking the water temperature sensor in the water, be careful not to allow water to go into the terminals, and after checking, wipe out the sensor.

6. KNOCK CONTROL SENSOR

(a) Resistance inspection (DENSO Made).

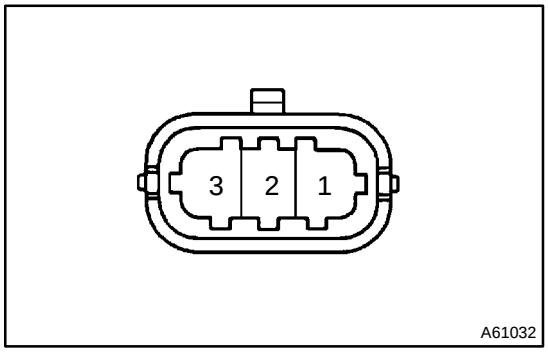
(1) Using an ohmmeter, measure the resistance between terminals.

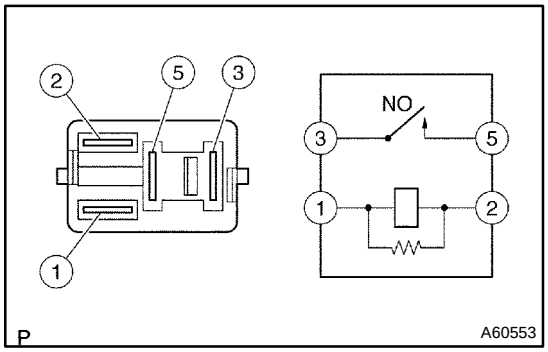
Resistance: 120 - 280 kΩ

(b) Resistance inspection: (BOSCH Made).

(1) Using an ohmmeter, measure the resistance between terminals 1 and 2.

Resistance: 1 MΩ or more





7. E.F.I. CIRCUIT OPENING RELAY ASSY

(a) Continuity inspection.

(1) Using an ohmmeter, check that there is continuity between each terminal.

Specified condition:

Between terminals	Specified condition
1 - 2	Continuity
3 - 5	No continuity

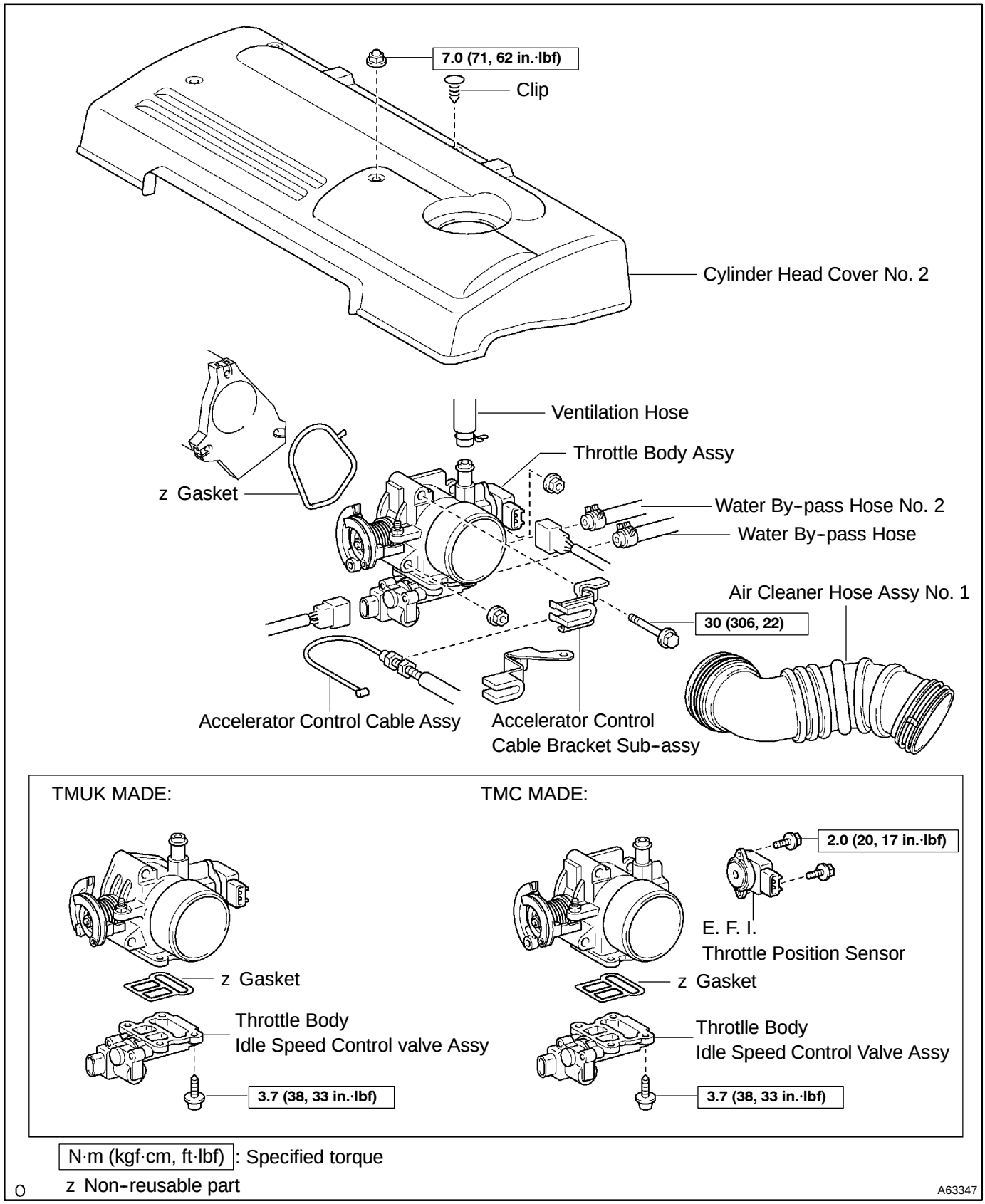
(2) Using an ohmmeter, check that there is continuity between terminals 3 and 5 when the battery voltage is applied across terminals 1 and 2.

Specified condition: Continuity

THROTTLE BODY ASSY (3ZZ-FE/4ZZ-FE)

COMPONENTS

1007K-01



N·m (kgf·cm, ft·lbf): Specified torque

z Non-reusable part

A63347

1007L-01

Removal & Installation and Disassembly & Reassembly

1. REMOVE ENGINE UNDER COVER LH

2. DRAIN COOLANT **(See page 16-20)**

3. REMOVE CYLINDER HEAD COVER NO.2

(a) Remove the 2 nuts, 2 clips and cylinder head cover.

4. REMOVE AIR CLEANER HOSE NO.1

(a) Loosen the 2 air cleaner hose clamp bolts, and remove the air cleaner hose.

5. SEPARATE ACCELERATOR CONTROL CABLE ASSY

(a) Loosen the nut, and accelerator control cable.

6. DISCONNECT VENTILATION HOSE

(a) Disconnect the ventilation hose from throttle body.

7. DISCONNECT WATER BY-PASS HOSE

(a) Disconnect the water by-pass hose from throttle body.

8. DISCONNECT WATER BY-PASS HOSE NO.2

(a) Disconnect the water by-pass hose from throttle body.

9. REMOVE THROTTLE BODY ASSY

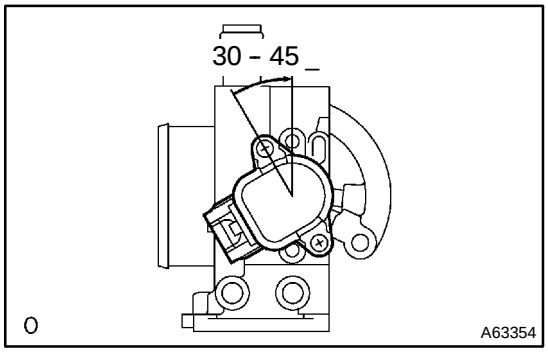
(a) Disconnect the 2 connectors.
(b) Remove the bolt, 2 nuts, accelerator control cable bracket, throttle body and gasket.

10. REMOVE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

(a) Remove the 4 screws, idle speed control valve and gasket.

11. REMOVE E.F.I. THROTTLE POSITION SENSOR(TMC MADE)

(a) Remove the 2 screws and E.F.I. throttle position sensor.



12. INSTALL E.F.I. THROTTLE POSITION SENSOR (TMC MADE)

(a) Confirm the throttle valve is fully closed.
(b) Revolve the E.F.I. throttle position sensor 30 – 45_ in the left direction to the throttle valve fully closed position, and insert the E.F.I. throttle position sensor to the throttle body.
(c) Revolve the E.F.I. throttle position sensor 30 – 45_ in the right direction, and install it with 2 screws.
Torque: 2.0 N·m (20 kgf·cm, 17 in.·lbf)

13. INSTALL THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

(a) Install a new gasket to the idle speed control valve.
(b) Install the idle speed control valve with the 3 screws.
Torque: 3.7 N·m (38 kgf·cm, 33 ft·lbf)

14. INSTALL THROTTLE BODY ASSY

(a) Install a new gasket to the intake manifold.
(b) Install the throttle body and accelerator control cable bracket with the bolt and 2 nuts.
Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

15. INSTALL CYLINDER HEAD COVER NO.2

(a) Install the cylinder head cover with the 2 nuts and clips.
Torque: 7 N·m (71 kgf·cm, 62 in.·lbf)

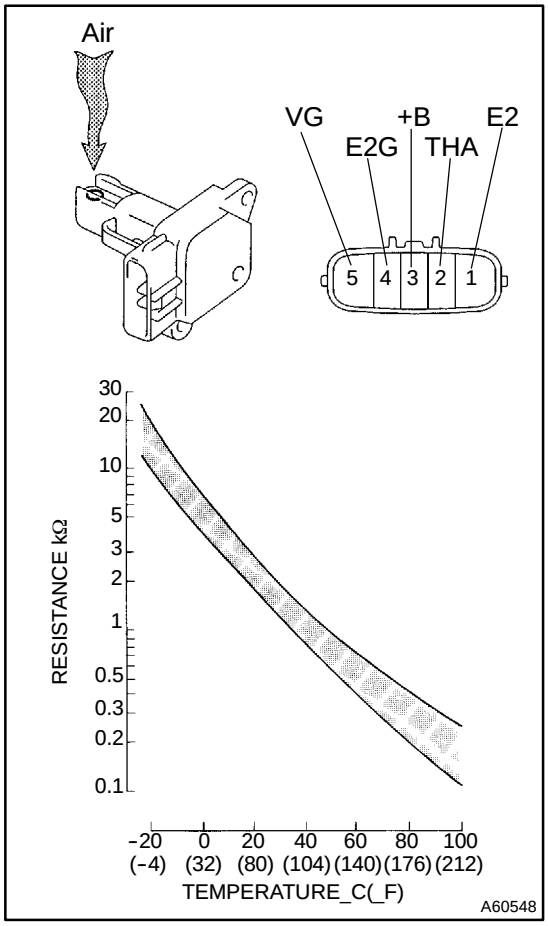
16. ADD COOLANT **(See page 16-20)**

17. CHECK ENGINE COOLANT LEAK **(See page 16-15)**

ECD SYSTEM (1CD-FTV)

INSPECTION

1007M-01



1. INTAKE AIR FLOW METER SUB-ASSY

(a) Output voltage inspection.

(1) Apply battery voltage across terminals 3 (+B) and 4 (E2G).

(2) Using a voltmeter, connect the positive (+) tester prove to terminal 5 (VG), and negative (−) tester prove to terminal 4 (E2G).

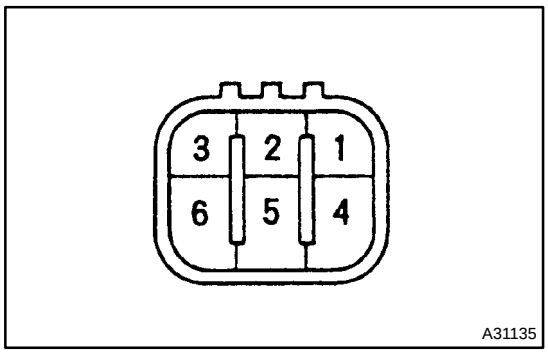
(3) Blow air into the intake air flow meter, and check that the voltage fluctuates.

(b) Resistance inspection.

(1) Using an ohmmeter, measure the resistance between terminals 2 (THA) and 1 (E2).

Resistance:

Approx. -20_C (-4_F) 12.5 - 16.9 kΩ
Approx. 20_C (68_F) 2.19 - 2.67 kΩ
Approx. 60_C (140_F) 0.50 - 0.68 kΩ



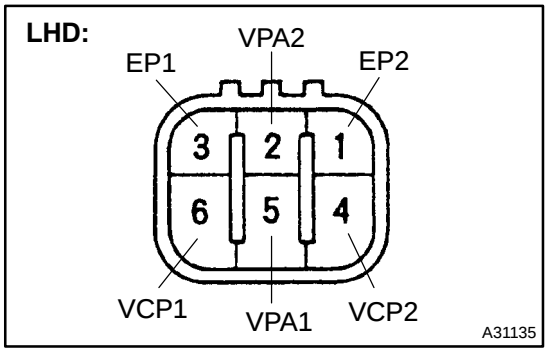
2. INTAKE SHUTTER ASSY

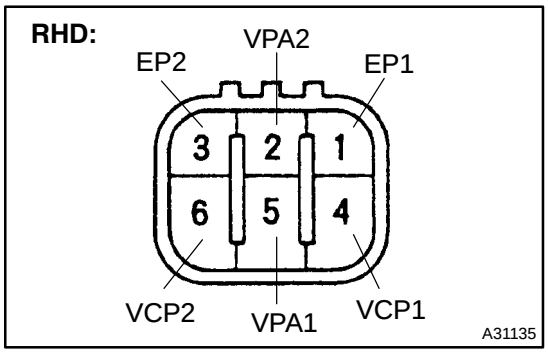
(a) Resistance inspection. (Throttle control motor)

(1) Using an ohmmeter, measure the resistance between each terminals.

Resistance:

Terminals	Temperature	Resistance
2 - 1, 3	at 20_C (68_F)	18 - 22 kΩ
5 - 4, 6	at 20_C (68_F)	18 - 22 kΩ





3. ACCELERATOR PEDAL ROD ASSY

(a) Resistance inspection. (Accele position sensor)

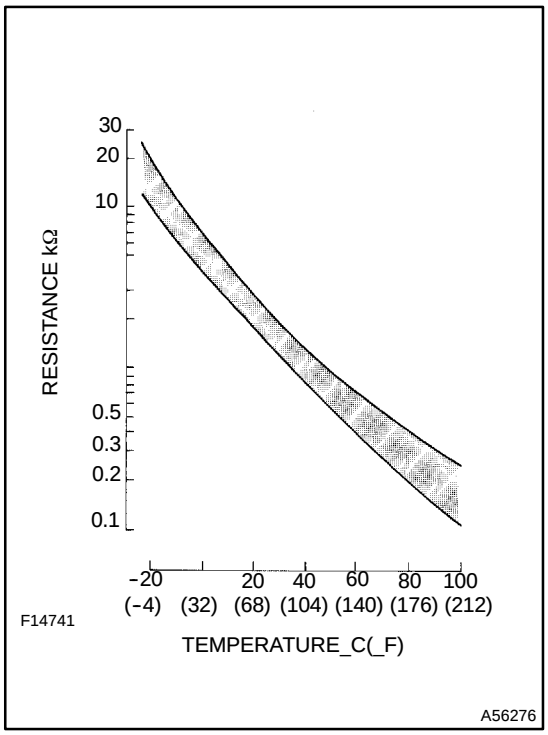
(1) Using an ohmmeter, measure the resistance between each terminals.

Resistance (LHD):

Between terminal	Resistance
5 (VPA1) - 3 (EP1)	5.0 kΩ or less
2 (VPA2) - 1 (EP2)	5.0 kΩ or less
6 (VCP1) - 3 (EP1)	1.5 - 6.0 kΩ
4 (VCP2) - 1 (EP2)	1.5 - 6.0 kΩ

Resistance (RHD):

Between terminal	Resistance
5 (VPA1) - 1 (EP1)	5.0 kΩ or less
2 (VPA2) - 3 (EP2)	5.0 kΩ or less
4 (VCP1) - 1 (EP1)	1.5 - 6.0 kΩ
6 (VCP2) - 3 (EP2)	1.5 - 6.0 kΩ



4. DIESEL TURBO INLET AIR TENPERATURE SENSOR

(a) Resistance inspection.

(1) Using an ohmmeter, measure the resistance between terminals.

Resistance: Approx. 20_C (68_F) 2.21 - 2.65 kΩ

5. CRANK POSITION SENSOR

(a) Resistance inspection.

(1) Using an ohmmeter, measure the resistance between terminals.

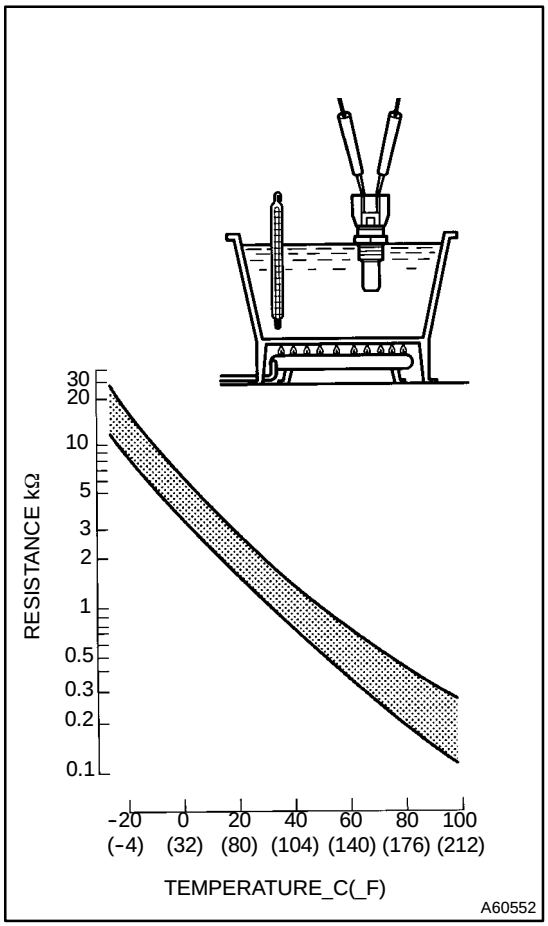
Resistance:
at cold 1,630 - 2,740 kΩ
at hot 2,065 - 3,225 kΩ

NOTICE:
"Cold" and "Hot" in the following sentence express the temperature of the sensor itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C (122_F) to 100_C (212_F)

6. CRANK POSITION SENSOR

(a) Resistance inspection.
(1) Using an ohmmeter, measure the resistance between terminals.
Resistance:
at cold 1,630 - 2,740 kΩ
at hot 2,065 - 3,225 kΩ

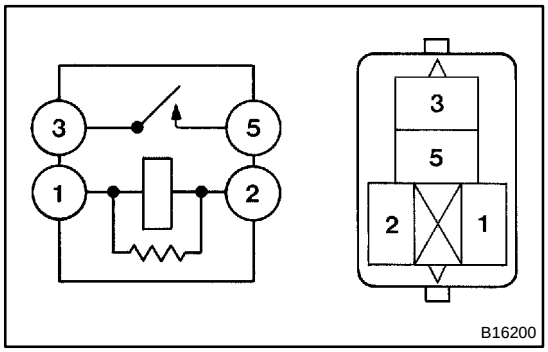
NOTICE:
"Cold" and "Hot" in the following sentence express the temperature of the sensor itself. "Cold" is from -10_C (14_F) to 50_C (122_F) and "Hot" is from 50_C (122_F) to 100_C (212_F)



7. DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR

(a) Resistance inspection.
(1) Using an ohmmeter, measure the resistance between terminals.
Resistance:
Approx. 20_C (68_F) 2.32 - 2.59 kΩ
Approx. 80_C (176_F) 0.310 - 0.326 kΩ

NOTICE:
In case of checking the water temperature sensor in the water, be careful not to allow water top go into the terminals, and after checking, wipe out the sensor.



8. INJECTOR DRIVER RELAY

(a) Continuity inspection.
(1) Using an ohmmeter, check that there is continuity between each terminal.
Specified condition:

Between terminal	Specified condition
1 - 2	Continuity
3 - 5	No continuity

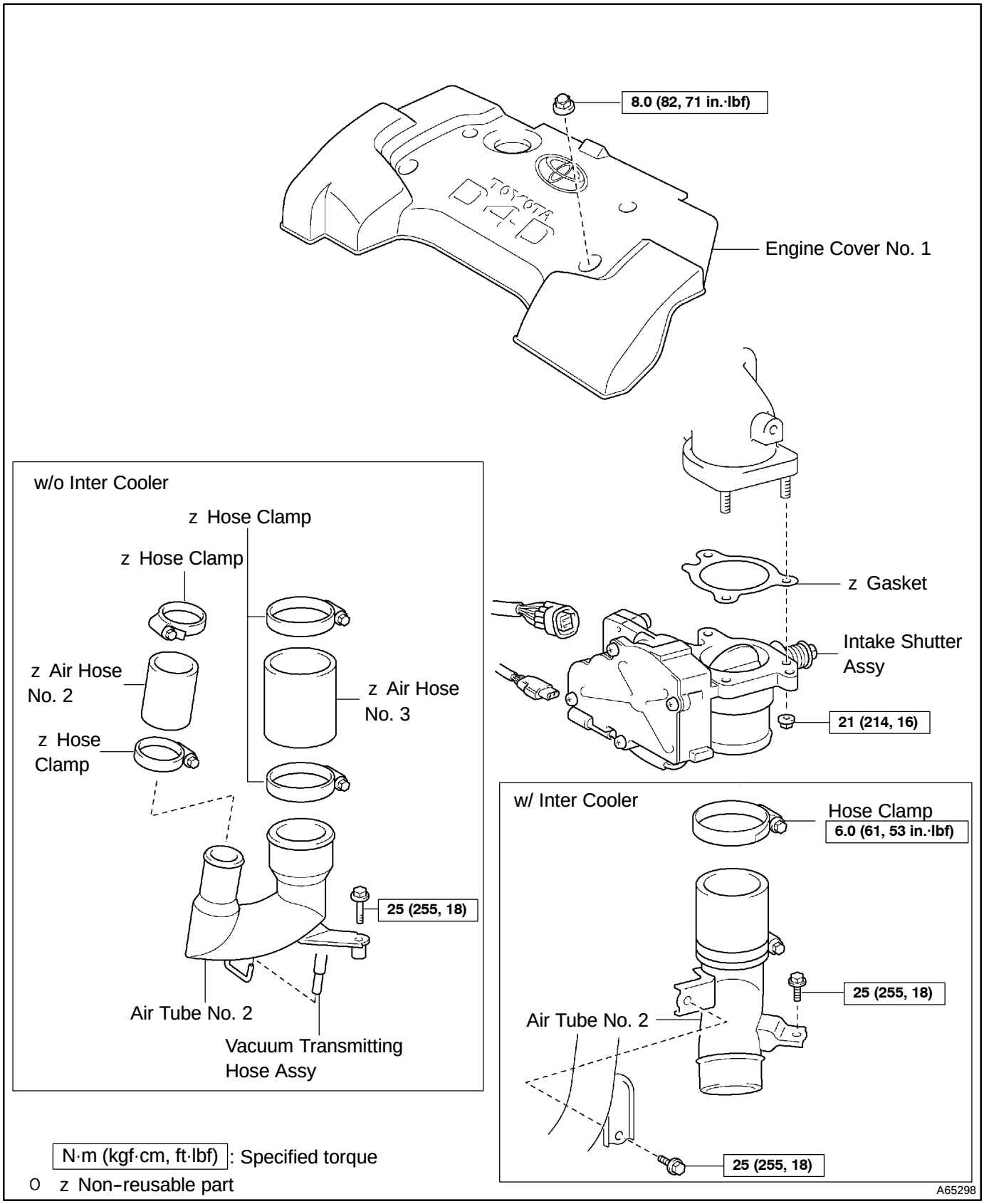
(2) Using an ohmmeter, check that there is continuity between terminals 3 and 5 when the battery voltage is applied across terminals 1 and 2.

Specified condition: Continuity

INTAKE SHUTTER ASSY (1CD-FTV)

COMPONENTS

1007N-01



1007O-01

Removal & Installation and Disassembly & Reassembly

1. REMOVE BATTERY

2. REMOVE ENGINE COVER SUB-ASSY NO.1

(a) Remove the 5 nuts and engine cover.

3. REMOVE AIR HOSE NO.4(W/ INTER COOLER)

(a) Loosen the 2 hose clamps.
(b) Remove the 2 bolts from the air tube No. 2.
(c) Remove the air hose No. 4.

4. DISCONNECT VACUUM TRANSMITTING HOSE ASSY(W/O INTER COOLER)

(a) Disconnect the vacuum transmitting hose from the air tube.

5. REMOVE AIR TUBE NO.2(W/O INTER COOLER)

(a) Loosen the 2 hose clamps.
(b) Remove the bolt and air tube.

6. REMOVE INTAKE SHUTTER ASSY

(a) Disconnect the 2 connectors.
(b) Remove the 3 nuts, intake shutter and gasket.

7. INSTALL INTAKE SHUTTER ASSY

(a) Install a new gasket and the intake shutter with the 3 nuts.
Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

8. INSTALL AIR HOSE NO.4(W/ INTER COOLER)

(a) Install the air hose No. 4 to the air tube No. 2.
(b) Install the air tube No. 2 with the 2 bolt.
(c) Install 2 hose clamps.
Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)

9. INSTALL AIR TUBE NO.2(W/O INTER COOLER)
(See Page 14-190)
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

10. INSTALL ENGINE COVER SUB-ASSY NO.1

(a) Install the engine cover with the 5 nuts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

11. INSTALL BATTERY
Torque:
Bolt 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Nut 3.0 - 4.0 N·m (31 - 41 kgf·cm, 27 - 35 in.·lbf)

FUEL

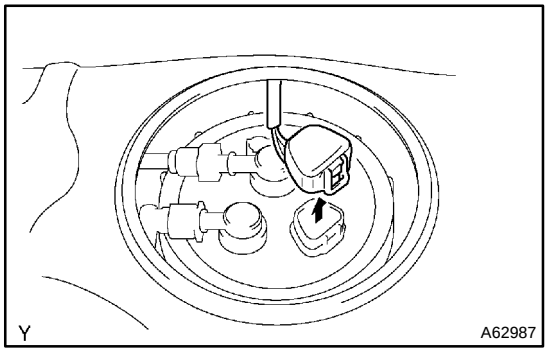
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FUEL SYSTEM (GASOLINE(HATCH BACK))

110CE-01

PRECAUTION

1. **BEFORE WORKING ON FUEL SYSTEM, DISCONNECT NEGATIVE (-) TERMINAL CABLE FROM BATTERY**
2. **DO NOT SMOKE OR WORK NEAR AN OPEN FLAME WHEN WORKING ON FUEL SYSTEM**
3. **KEEP GASOLINE AWAY FROM RUBBER OR LEATHER PARTS**

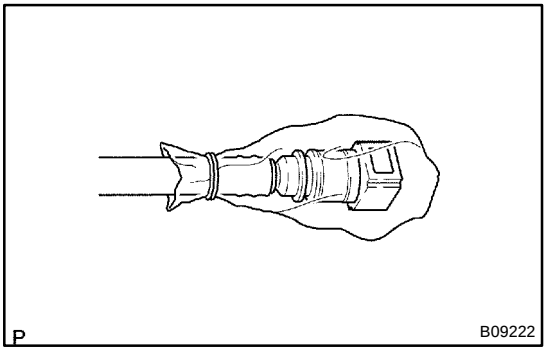


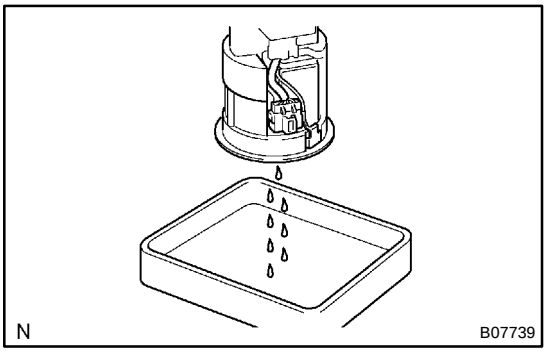
4. **WORK FOR PREVENT GASOLINE FROM SPILLING OUT**

(a) Disconnect the fuel pump connector.
(b) Start the engine. After the engine has stopped on its own, turn the ignition switch to lock.
(c) Disconnect negative (–) terminal cable from battery.
(d) Connect the fuel pump connector.

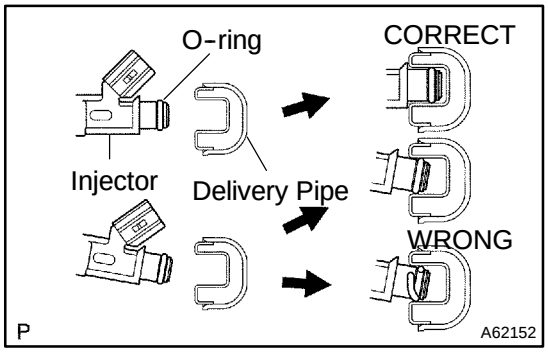
5. **FUEL SYSTEM**

(a) When disconnecting the high fuel pressure line, a large amount of gasoline will spill out, so observe these procedures.
(1) Work for prevent gasoline from spilling out.
(2) Disconnect the fuel tube.
(3) Drain the fuel remained inside the fuel tube.
(4) Protect the disconnected fuel tube from damage and foreign material by covering it with a plastic bag.

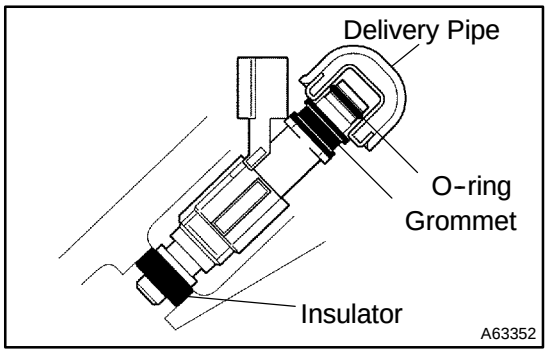




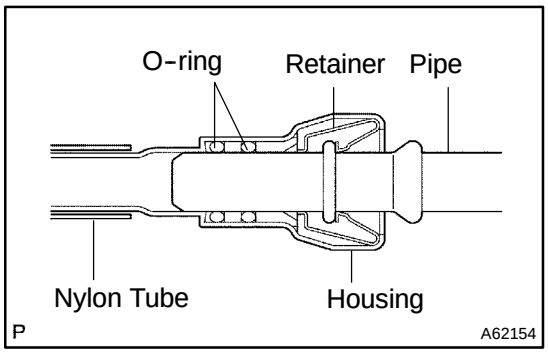
(5) Put a container under the connection.



(b) Observe these precautions when removing and installing the injector.
(1) Never reuse the O-ring.
(2) When placing a new O-ring on the injector, take care not to damage it in any way.
(3) Coat a new O-ring with spindle oil or gasoline before installing. Never use engine, gear or brake oil.



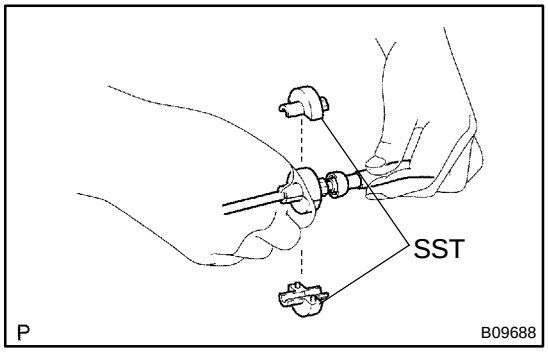
(c) Install the injector to the delivery pipe and cylinder head, as shown in the illustration. Before installing the injector, be sure to apply spindle oil or gasoline on the place where the delivery pipe touches O-ring of the injector.



(d) Observe these precautions when disconnecting the fuel delivery pipe.

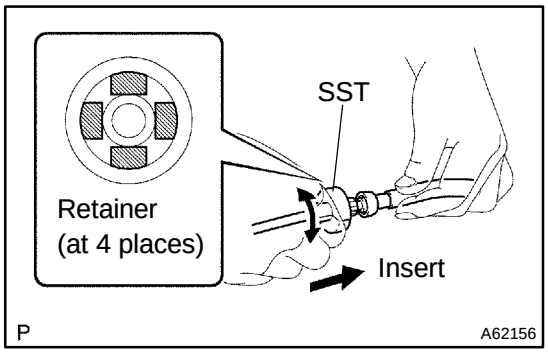
HINT:
The structure of the metallic connector is shown as left.

(1) Remove the fuel pipe clamp.

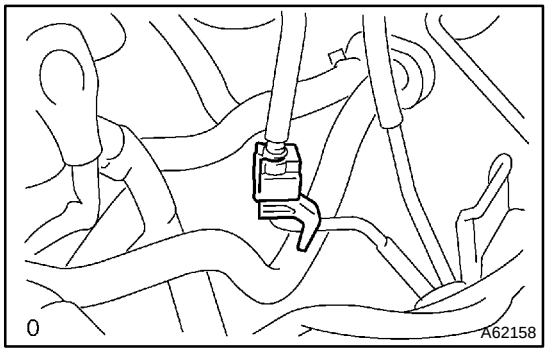


(2) Get the metallic connector of the fuel tube assembly, pull it out towards the rear and hold it as it is.
(3) Assemble SST to the connection as shown.

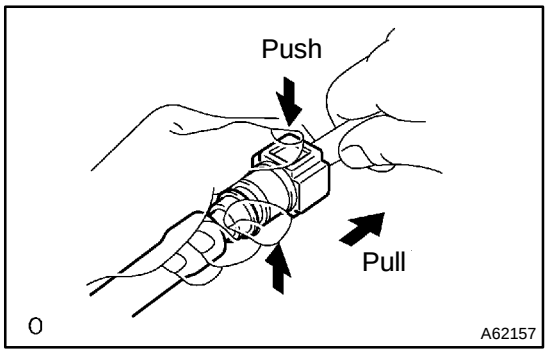
SST 09628-21010



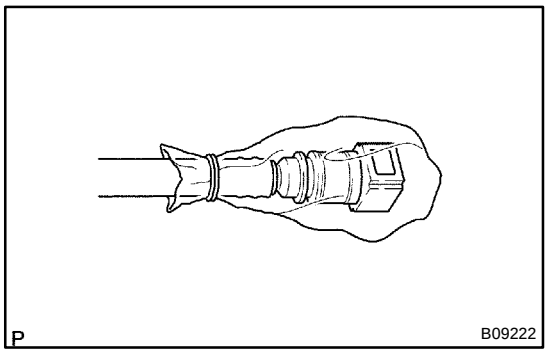
(4) Turn SST, align the retainers inside the connector with SST chamfered parts and insert SST into the connector.
(5) Slide SST and the connector together towards the fuel tube assembly.



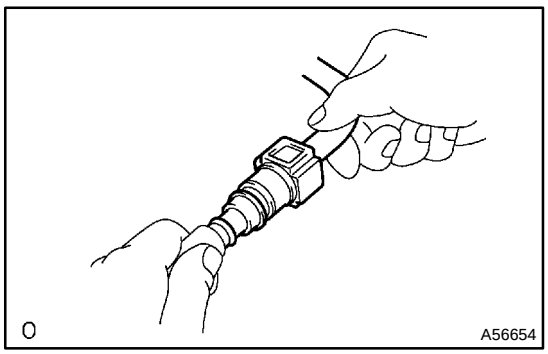
(e) Observe these precautions when disconnecting the fuel tube connector (quick type).
(1) Remove the fuel pipe clamp.
(2) Check if there is any dirt like mud on the pipe and around the connector before disconnecting them and clean the dirt away.



(3) Be sure to disconnect with hands.
(4) When the connector and the pipe are stuck, pinch the retainer between the hands, push and pull the connector to free to disconnect and pull it out. Do not use any tool at this time.
(5) Inspect if there is any dirt or the likes on the seal surface of the disconnected pipe and clean it away.



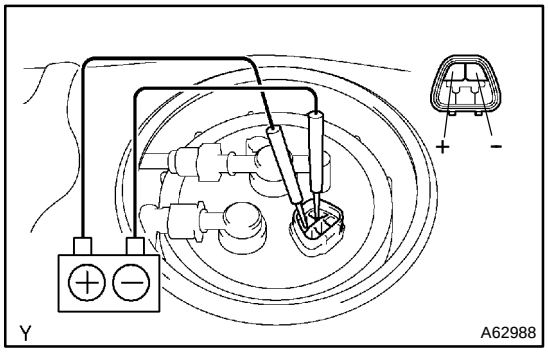
(6) Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.



(f) Observe these precautions when connecting the fuel tube connector (quick type).
(1) Match the axis of the connector with axis of the pipe, and push in the connector until retainer makes a "click" sound. In case that the connections is tight, apply little amount of new engine oil on the tip of the pipe.
(2) After having finished the connection, check if the pipe and the connector are securely connected by pulling them.

6. CHECK FUEL LEAK

(a) Check that there are no fuel leaks after doing maintenance anywhere on the fuel system.
(1) Connect the hand-held tester to the DLC3.
(2) Turn the ignition switch ON and hand-held tester main switch ON.
(3) Select the active test mode on the hand-held tester.
(4) Please refer to the hand-held tester operator's manual for further details.



(5) If you have no hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector.
(6) Check that there are no leaks from any part of the fuel system.
(7) Turn the ignition switch to LOCK.
(8) Disconnect the hand-held tester from the DLC3.

ON-VEHICLE INSPECTION

1. CHECK FUEL PUMP OPERATION

(a) Connect the hand-held tester to the DLC3.

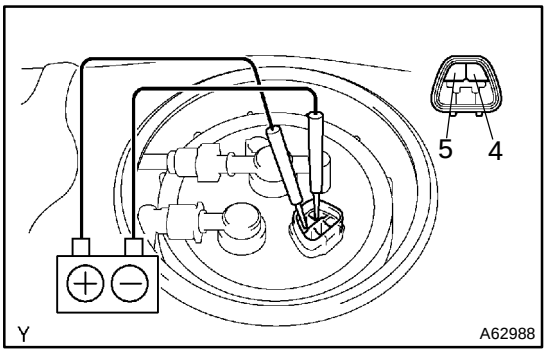
(b) Turn the ignition switch ON and hand-held tester main switch ON.

NOTICE:

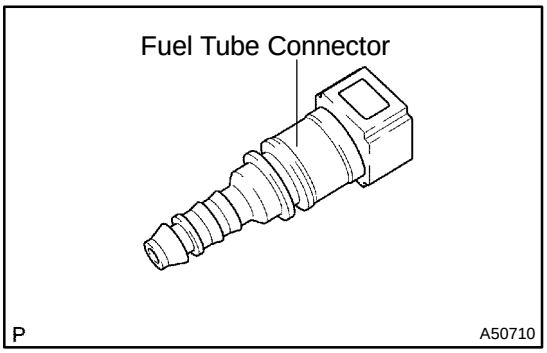
Do not start the engine.

(c) Select the active test mode on the hand-held tester.

(d) Please refer to the hand-held tester operator's manual for further details.



(e) If you have no hand-held tester, connect the positive (+) lead form the battery to terminal 5 of the connecter, and the negative (-) lead to terminal 4.



2. CHECK FUEL PRESSURE

(a) Prepare for inspection.

(1) Purchase the new fuel tube and take out the fuel tube connector from its pipe.

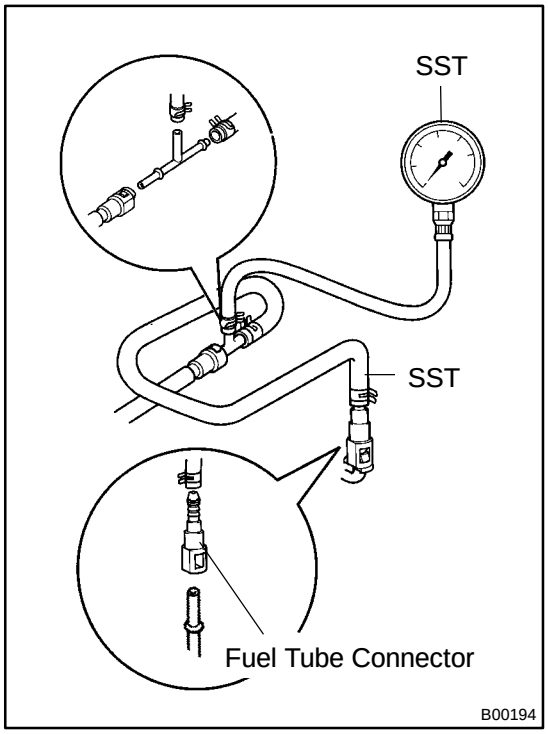
HINT:

Part No.: 23271 - 88601

(b) Work for prevent gasoline from spilling out.

(c) Disconnect the fuel tube clamp from the fuel tube connector.

(d) Disconnect the fuel tube (fuel tube connector) from the fuel pipe.



(e) Install SST (pressure gauge) as shown in the illustration by using SST and fuel tube connector.
SST 09268-41047 (95336-08070), 09268-45014 (09268-41250) 90467-13001,

(f) Wipe off any splattered gasoline.

(g) Start the engine.

(h) Measure the fuel pressure at idle.
Fuel pressure:
304 - 347 kPa (3.1 - 3.5 kgf·cm^2, 44 - 50 psi)

(i) Stop the engine.

(j) Check that the fuel pressure remains as specified for 5 minutes after the engine has stopped.
Fuel pressure:
147 kPa (1.5 kgf·cm^2, 21 psi) or more

If pressure is not as specified, check the fuel pump, pressure regulator and/or injectors.

(k) After checking fuel pressure, disconnect the negative (-) terminal cable from the battery and carefully, remove the SST and fuel tube connector to prevent gasoline from the splashing.

(l) Reconnect the fuel tube (fuel tube connector).

(m) Install the fuel tube clamp to the fuel tube connector.

(n) Check fuel leak.

INSPECTION

1. FUEL INJECTOR ASSY (2ZZ-GE ENGINE TYPE)

(a) Inspect injector resistance

SST 09268-41047 (09268-41110, 09268-41300, 95336-08070), 09842-30080

(1) Using an ohmmeter,measure the resistance between the terminals.

Resistance: 13.4 - 14.2 Ω at 20_C (68_F)

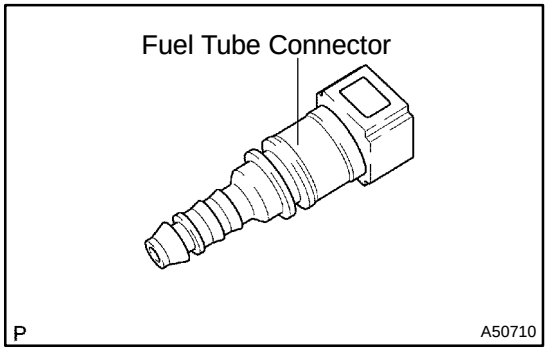
HINT:

If the resistance is not as specified,replace the injector.

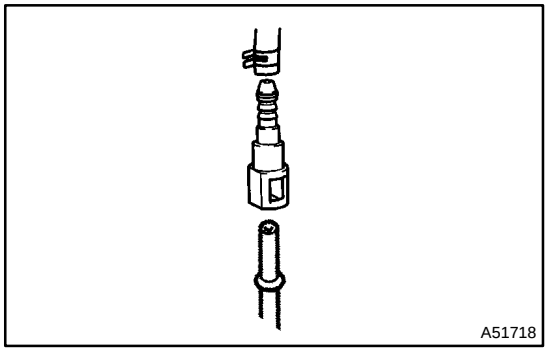
(b) Inspect injector inspection

CAUTION:

Keep injector clear of sparks during the test.



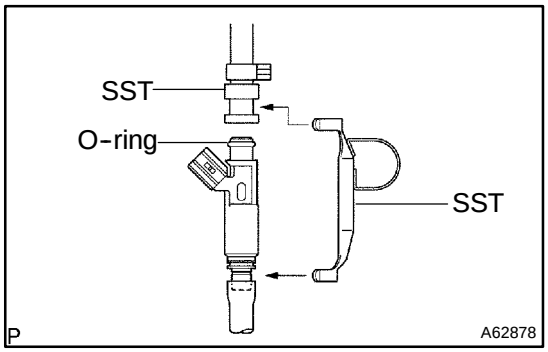
(1) Purchase the new fuel tube and take out the fuel tube connector (Part No. 23271-88601) from its pipe.



(2) Connect SST and fuel tube connector to the fuel pipe.

CAUTION:

Perform connecting operations of the fuel tube connector (quick type) after observing the precautions.



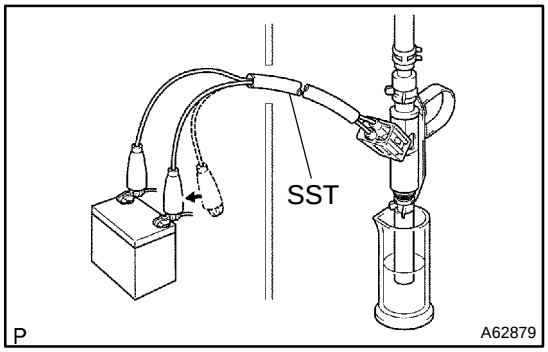
(3) Install the O-ring to the injector.

(4) Connect SST (union and hose) to the injector, and hold the injector to prevent gasoline from splashing out.

(5) Put the injector into a graduated cylinder.

HINT:

Install a suitable vinyl tube onto the injector to prevent gasoline from splashing out.



(6) Connect SST to the connector of injector.

(7) Connect SST to the battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector 2 or 3 time.

SST 09842-30080

Volume: 77 - 93 cm^3 (4.7 - 5.7 cu in.) per 15 sec.

Difference between each injector:

16 cm^3 (1.0 cu in.) or less.

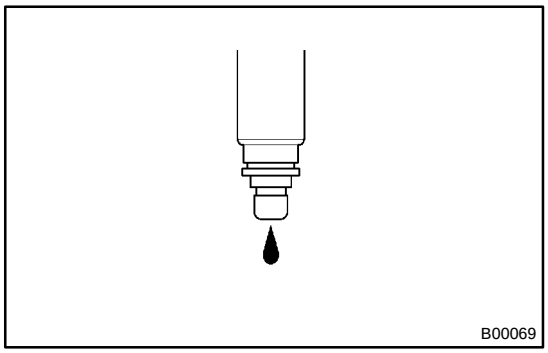
HINT:

If the injection volume is not as specified,replace the injector.

(c) Inspect leakage

(1) In the condition above, disconnect the test probes of SST from the battery and check the fuel leakage from the injector.

Fuel drop: 1 drop or less per 12 minutes



2. FUEL INJECTOR ASSY (3ZZ-FE/4ZZ-FE ENGINE TYPE)

SST 09268-41047 (09268-41110, 09268-41100, 95336-08070), 09842-30055

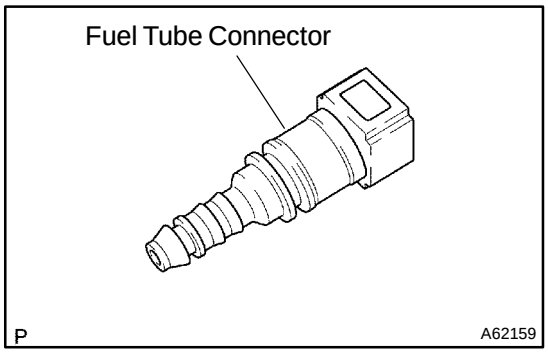
(a) Inspect injector resistance.

(1) Using an ohmmeter,measure the resistance between the terminals.

Resistance: 13.4 - 14.2 Ω at 20_C (68_F)

HINT:

If the resistance is not as specified, replace the injector.

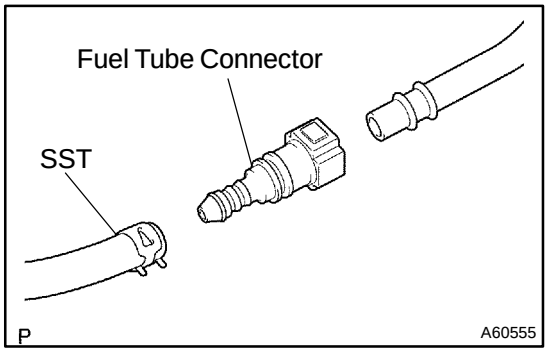


(b) Inspect injector inspection

CAUTION:

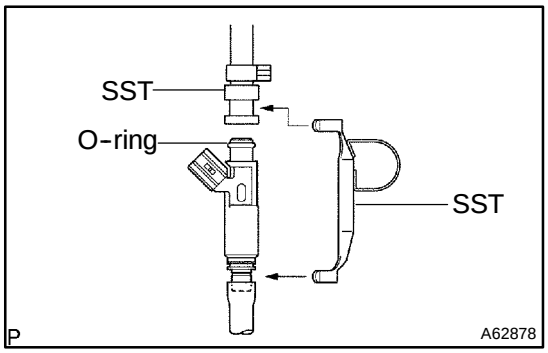
Keep injector clear of sparks during the test.

(1) Purchase the new fuel tube and take out the fuel tube connector (Part No. 23901 - 22140) from its pipe.



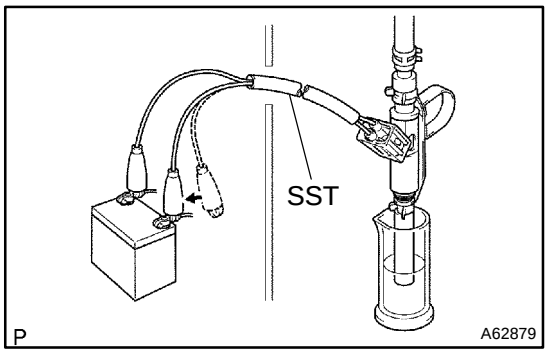
(2) Connect SST and fuel tube connector to the fuel pipe.

CAUTION:
Perform connecting operations of the fuel tube connector (quick type) after observing the precautions.



(3) Install the O-ring to the injector.
(4) Connect SST (union and hose) to the injector, and hold the injector to prevent gasoline from splashing out.
(5) Put the injector into a graduated cylinder.

HINT:
Install a suitable vinyl tube onto the injector to prevent gasoline from splashing out.



(6) Connect SST to the connector of injector.
(7) Connect SST to the battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector 2 or 3 time.

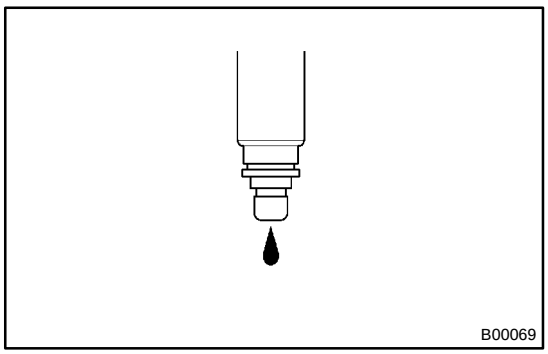
Injection volume:
39 - 53 cm^3 (2.4 - 3.2 cu in.) per 15 seconds
Difference between each injector:
14 cm^3 (0.9 cu in.) or less

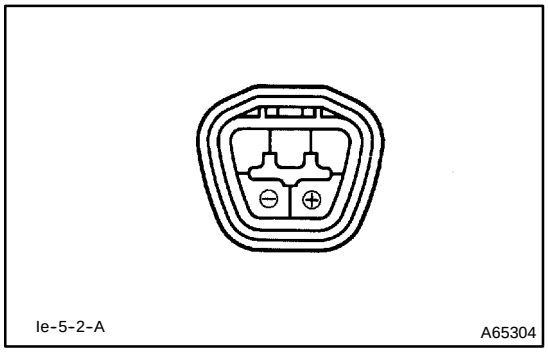
HINT:
If the injection volume is not as specified, replace the injector.

(c) Inspect leakage

(1) In the condition above, disconnect the test probes of SST from the battery and check the fuel leakage from the injector.

Fuel drop: 1 drop or less per 5 minutes





3. FUEL PUMP

(a) Insect fuel pump resistance.
  (1) Using an ohmmeter, measure the resistance between terminals 4 and 5.

Resistance: 0.2 - 3.0 Ω at 20_C (68_F)

(b) Inspect fuel pump operation
  (1) Apply battery voltage to both terminals. Check that the pump operates.

NOTICE:

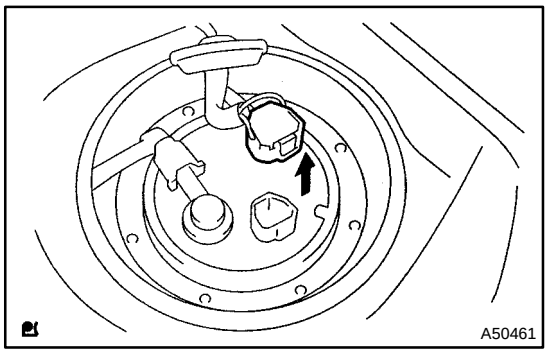
- **These tests must be done quickly (within 10 seconds) to prevent the coil from burning out.**
- **Keep fuel pump as far away from the battery as possible.**
- **Always do the switching at the battery side.**

FUEL SYSTEM (GASOLINE(SEDAN/STATION WAGON))

110CM-01

PRECAUTION

1. **BEFORE WORKING ON FUEL SYSTEM, DISCONNECT NEGATIVE (-) TERMINAL CABLE FROM BATTERY**
2. **DO NOT SMOKE OR WORK NEAR AN OPEN FLAME WHEN WORKING ON FUEL SYSTEM**
3. **KEEP GASOLINE AWAY FROM RUBBER OR LEATHER PARTS**



4. **WORK FOR PREVENT GASOLINE FROM SPILLING OUT**

(a) Disconnect the fuel pump connector.

(b) Start the engine. After the engine has stopped on its own, turn the ignition switch to lock.

(c) Disconnect negative (–) terminal cable from battery.

(d) Connect the fuel pump connector.

5. **FUEL SYSTEM**

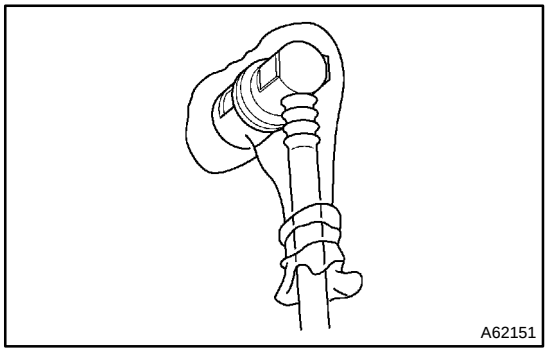
(a) When disconnecting the high fuel pressure line, a large amount of gasoline will spill out, so observe these procedures.

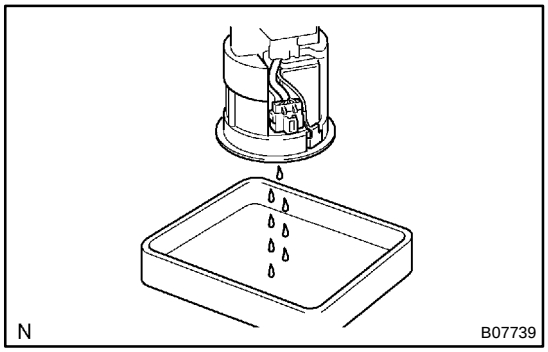
(1) Work for prevent gasoline from spilling out.

(2) Disconnect the fuel tube.

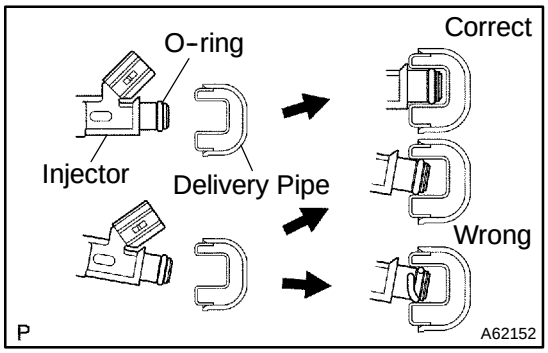
(3) Drain the fuel remained inside the fuel tube.

(4) Protect the disconnected fuel tube from damage and foreign material by covering it with a plastic bag.

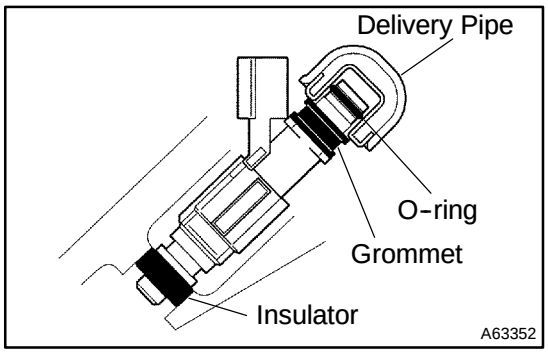




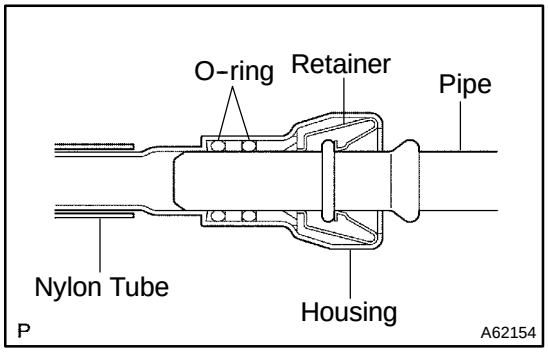
(5) Put a container under the connection.



(b) Observe these precautions when removing and installing the injector.
(1) Never reuse the O-ring.
(2) When placing a new O-ring on the injector, take care not to damage it in any way.
(3) Coat a new O-ring with spindle oil or gasoline before installing. Never use engine, gear or brake oil.



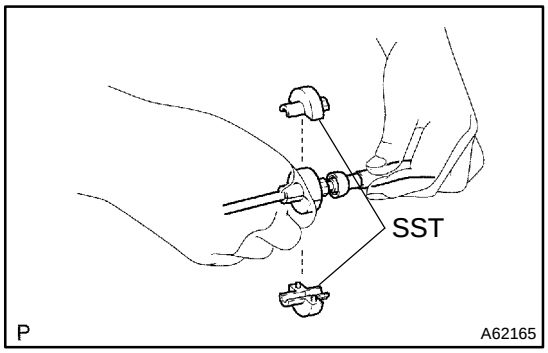
(c) Install the injector to the delivery pipe and cylinder head, as shown in the illustration. Before installing the injector, be sure to apply spindle oil or gasoline on the place where the delivery pipe touches O-ring of the injector.



(d) Observe these precautions when disconnecting the fuel delivery pipe.

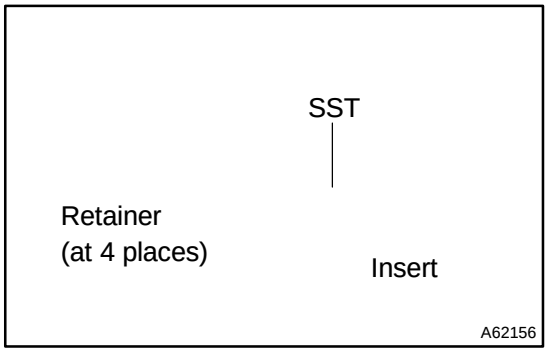
HINT:
The structure of the metallic connector is shown as left.

(1) Remove the fuel pipe clamp.
(2) Get the metallic connector of the fuel tube assembly, pull it out towards the rear and hold it as it is.

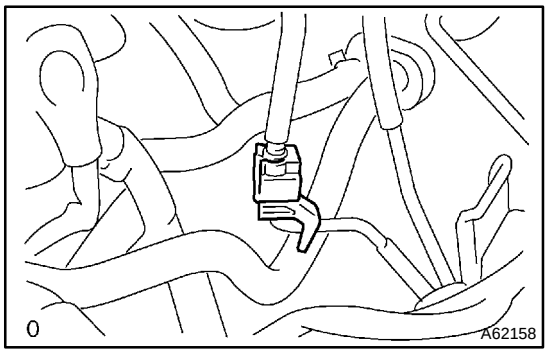


(3) Assemble SST to the connection as shown.

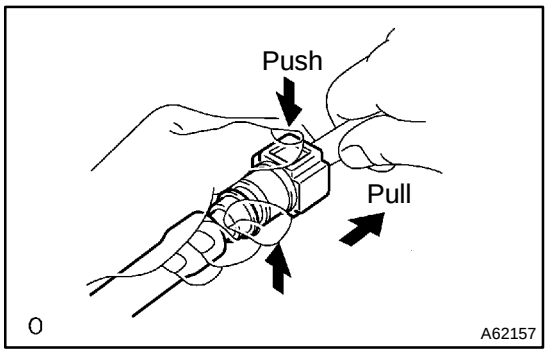
SST 09628-21010



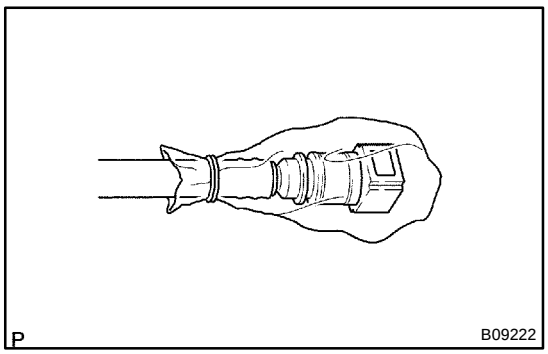
(4) Turn SST, align the retainers inside the connector with SST chamfered parts and insert SST into the connector.
(5) Slide SST and the connector together towards the fuel tube assembly.



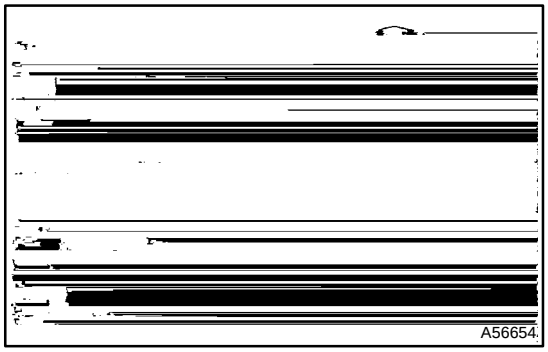
(e) Observe these precautions when disconnecting the fuel tube connector (quick type).
(1) Remove the fuel pipe clamp.
(2) Check if there is any dirt like mud on the pipe and around the connector before disconnecting them and clean the dirt away.



(3) Be sure to disconnect with hands.
(4) When the connector and the pipe are stuck, pinch the retainer between the hands, push and pull the connector to free to disconnect and pull it out. Do not use any tool at this time.
(5) Inspect if there is any dirt or the likes on the seal surface of the disconnected pipe and clean it away.



(6) Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.



(f) Observe these precautions when connecting the fuel tube connector (quick type).
(1) Match the axis of the connector with axis of the pipe, and push in the connector until retainer makes a ”click” sound. In case that the connections is tight, apply little amount of new engine oil on the tip of the pipe.
(2) After having finished the connection, check if the pipe and the connector are securely connected by pulling them.

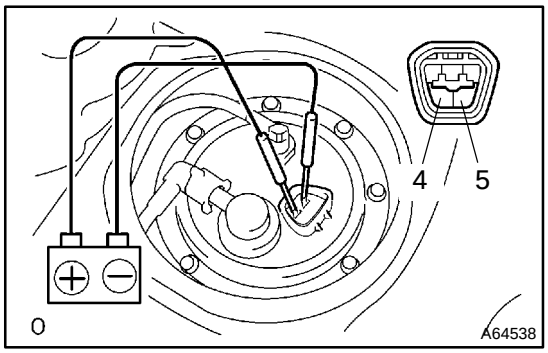
6. CHECK FUEL LEAK

(a) Check that there are no fuel leaks after doing maintenance anywhere on the fuel system.

(1) Connect the hand-held tester to the DLC3.

(2) Turn the ignition switch ON and hand-held tester main switch ON.

(3) Select the active test mode on the hand-held tester.



(4) Please refer to the hand-held tester operator's manual for further details.

(5) If you have no hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector.

(6) Check that there are no leaks from any part of the fuel system.

(7) Turn the ignition switch to LOCK.

(8) Disconnect the hand-held tester from the DLC3.

1100G-04

ON-VEHICLE INSPECTION

1. CHECK FUEL PUMP OPERATION

(a) Connect the hand-held tester to the DLC3.

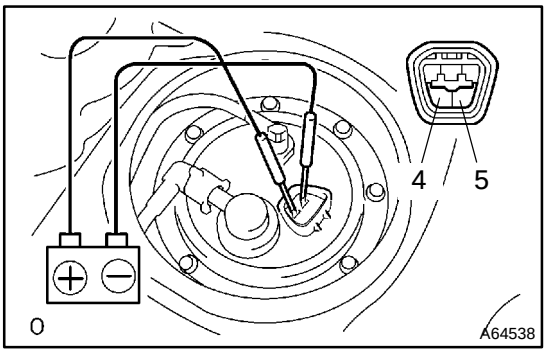
(b) Turn the ignition switch ON and hand-held tester main switch ON.

NOTICE:

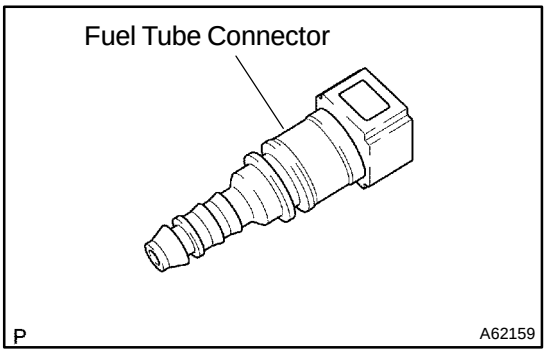
Do not start the engine.

(c) Select the active test mode on the hand-held tester.

(d) Please refer to the hand-held tester operator's manual for further details.



(e) If you have no hand-held tester, connect the positive (+) lead form the battery to terminal 4 of the connecter, and the negative (-) lead to terminal 5.



2. CHECK FUEL PRESSURE

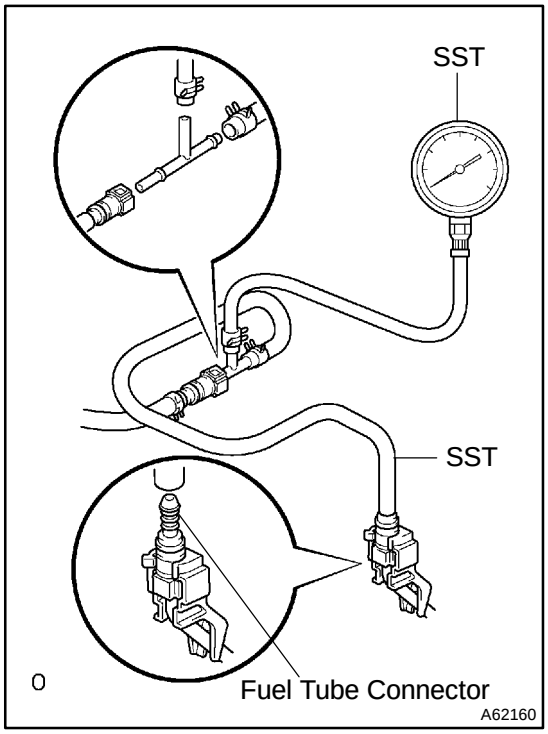
(a) Prepare for inspection.

(1) Purchase the new fuel tube and take out the fuel tube connector (Part No. 23901-22140) from its pipe.

(b) Work for prevent gasoline from spilling out.

(c) Disconnect the fuel tube clamp from the fuel tube connector.

(d) Disconnect the fuel tube (fuel tube connector) from the fuel pipe.



(e) Install SST (pressure gauge) as shown in the illustration by using SST and fuel tube connector.
SST 09268-41047 95336-08070), 09268-45014 (09268-41250) (90467-13001,

(f) Wipe off any splattered gasoline.

(g) Start the engine.

(h) Measure the fuel pressure at idle.
Fuel pressure:
304 - 343 kPa (3.1 - 3.5 kgf·cm^2, 44 - 50 psi)

(i) Stop the engine.

(j) Check that the fuel pressure remains as specified for 5 minutes after the engine has stopped.
Fuel pressure:
147 kPa (1.5 kgf·cm^2, 21 psi) or more

If pressure is not as specified, check the fuel pump, pressure regulator and/or injectors.

(k) After checking fuel pressure, disconnect the negative (-) terminal cable from the battery and carefully, remove the SST and fuel tube connector to prevent gasoline from the splashing.

(l) Reconnect the fuel tube (fuel tube connector).

(m) Install the fuel tube clamp to the fuel tube connector.

(n) Check fuel leak.

1100H-06

INSPECTION

1. FUEL INJECTOR ASSY

SST 09268-41047 (09268-41110, 09268-41100, 95336-08070), 09842-30055

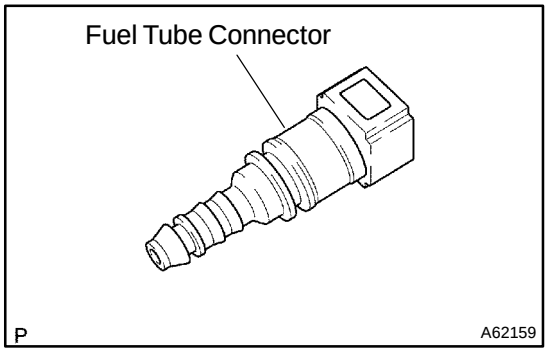
(a) Inspect injector resistance.

(1) Using an ohmmeter,measure the resistance between the terminals.

Resistance: 1.3 - 14.2 Ω at 20_C (68_F)

HINT:

If the resistance is not as specified, replace the injector.

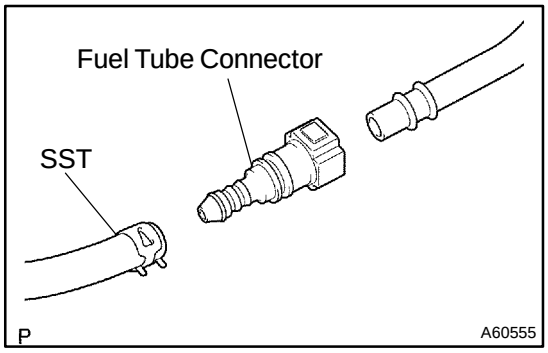


(b) Inspect injector inspection

CAUTION:

Keep injector clear of sparks during the test.

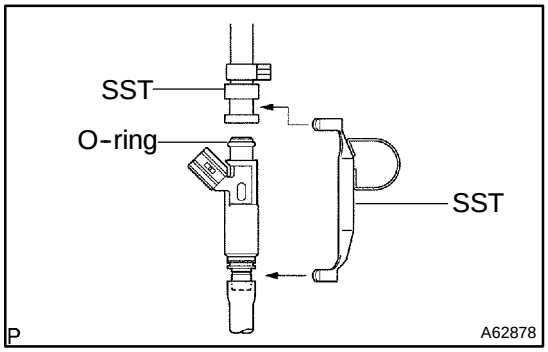
(1) Purchase the new fuel tube and take out the fuel tube connector (Part No. 23901 - 22140) from its pipe.



(2) Connect SST and fuel tube connector to the fuel pipe.

CAUTION:

Perform connecting operations of the fuel tube connector (quick type) after observing the precautions.



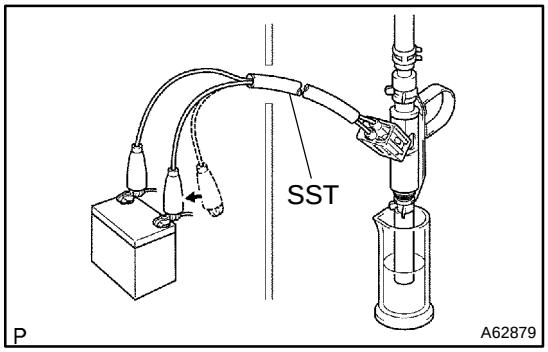
(3) Install the O-ring to the injector.

(4) Connect SST (union and hose) to the injector, and hold the injector to prevent gasoline from splashing out.

(5) Put the injector into a graduated cylinder.

HINT:

Install a suitable vinyl tube onto the injector to prevent gasoline from splashing out.



(6) Connect SST to the connector of injector.

(7) Connect SST to the battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector 2 or 3 time.

Injection volume:

39 - 53 cm^3 (2.4 - 3.2 cu in.) per 15 seconds

Difference between each injector:

14 cm^3 (0.9 cu in.) or less

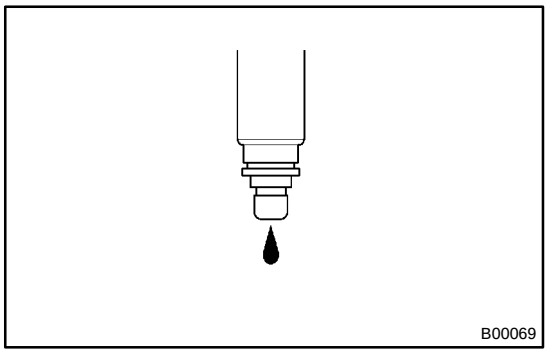
HINT:

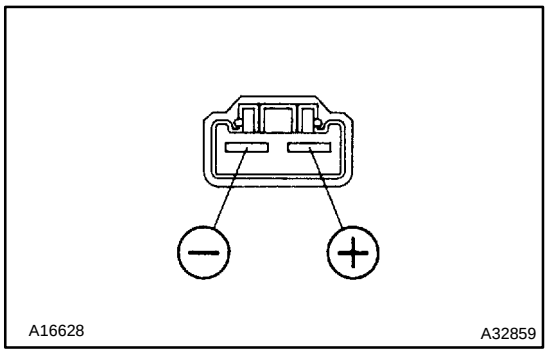
If the injection volume is not as specified, replace the injector.

(c) Inspect leakage

(1) In the condition above, disconnect the test probes of SST from the battery and check the fuel leakage from the injector.

Fuel drop: 1 drop or less per 5 minutes





2. FUEL PUMP ASSY

(a) Insect fuel pump resistance.

(1) Using an ohmmeter, measure the resistance between terminals.

Resistance: 0.2 - 3.0 Ω at 20_C (68_F)

(b) Inspect fuel pump operation

(1) Apply battery voltage to both terminals. Check that the pump operates.

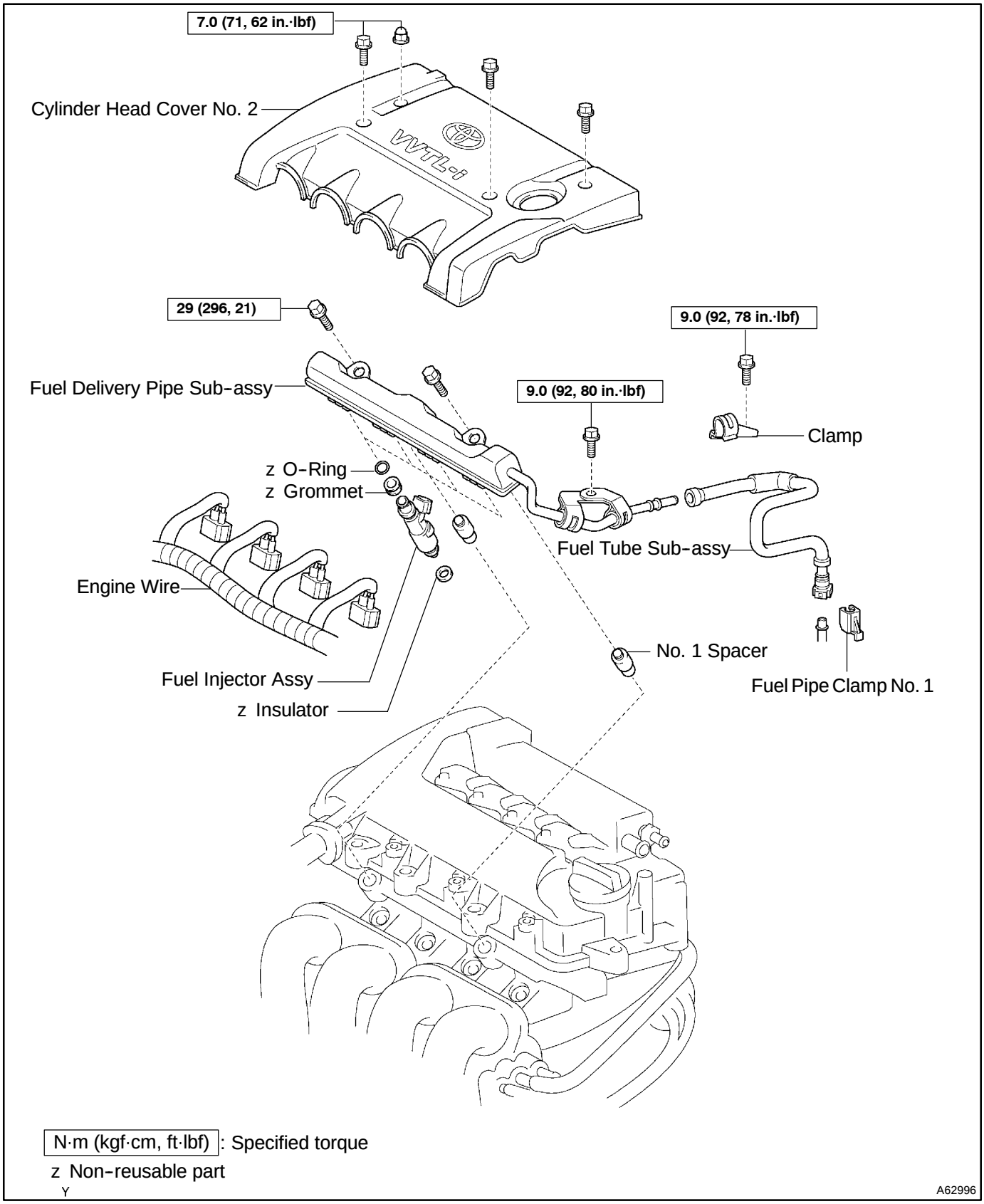
NOTICE:

- **These tests must be done quickly (within 10 seconds) to prevent the coil from burning out.**
- **Keep fuel pump as far away from the battery as possible.**
- **Always do the switching at the battery side.**

FUEL INJECTOR ASSY (2ZZ-GE)

COMPONENTS

110CG-01



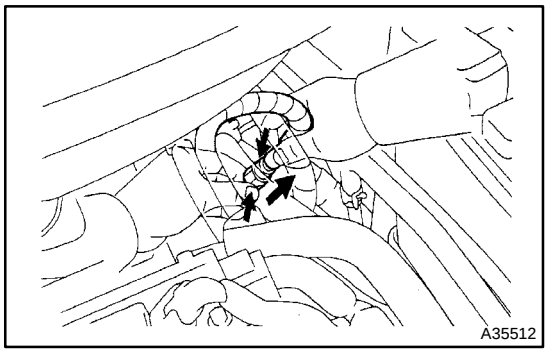
REPLACEMENT

1. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT **(See page 11-1)**

2. REMOVE CYLINDER HEAD COVER NO.2

3. DISCONNECT ENGINE WIRE

(a) Disconnect the fuel injector connector.



4. SEPARATE FUEL TUBE SUB-ASSY

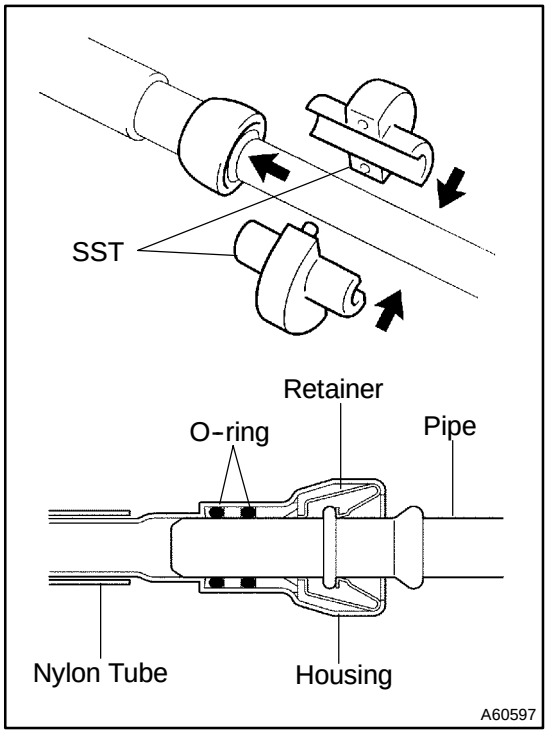
(a) Remove the EFI fuel pipe clamp.
(b) Pull the fuel pipe off the fuel tube.

NOTICE:

- **Check if there is any dirt mud on the pipe and around the connector before disconnecting them and clean the dirt away.**
- **Be sure to disconnect with hands.**
- **When the connector and the pipe are stuck, pinch the retainer between the hands, push and pull the connector to free to disconnect and pull it out. Do not use any tool at this tlme.**
- **Inspect if there is any dirt or the like on the seal surface of the disconnected pipe and clean it away.**
- **Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.**

5. REMOVE FUEL DELIVERY PIPE SUB-ASSY

(a) Remove the bolt and fuel pipe clamp.
(b) Remove the 3 bolts and delivery pipe with injector.



6. REMOVE FUEL TUBE SUB-ASSY

(a) Using the SST, Remove the fuel tube.

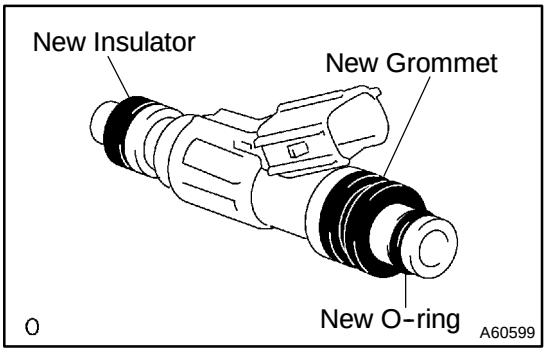
SST 09268-21010

NOTICE:

- **Check if there is any dirt mud on the pipe and around the connector before disconnecting them and clean the dirt away.**
- **Do not bent, fold and rotate the nylon tube.**
- **When the connector and the pipe are stuck, push and pull the connector to free to disconnect and pull it out.**
- **Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.**

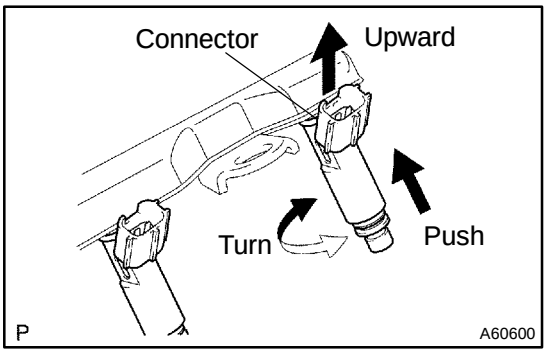
7. REMOVE FUEL INJECTOR ASSY

(a) Pull out the 4 injectors from the delivery pipe.



8. INSTALL FUEL INJECTOR ASSY

(a) Install the new insulator and grommet to each injector.
(b) Apply a light coat of gasoline to the new O-ring and install it to each injector.



(c) Apply a light coat of gasoline on the place where the fuel delivery pipe touches on O-ring.
(d) While turning the injector clockwise and counterclockwise, push it to the fuel delivery pipe.

NOTICE:

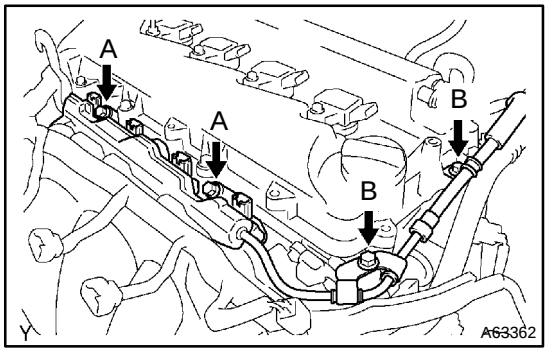
- **Be careful not twist the O-ring.**
- **After installing injectors,Check that they turns smoothly If an injector doesn't, reinstall it with a new O-ring.**

9. INSTALL FUEL TUBE SUB-ASSY

(a) Connect the fuel hose to the delivery pipe.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After having finished the connection, check if the pipe and the connector are securely connected by pulling them.**



10. INSTALL FUEL DELIVERY PIPE SUB-ASSY

(a) Install the spacer to the cylinder head.

(b) Install the fuel delivery pipe with the fuel injector and the fuel pipe clamp.

Torque:
Bolt A 29N·m (296kgf·cm, 21 ft·lbf)
Bolt B 9.0N·m (92kgf·cm, 80 in.·lbf)

11. CONNECT FUEL TUBE SUB-ASSY

(a) Connect the fuel to main tube.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After having finished the connection, check if the pipe and the connector are securely connected by pulling them.**

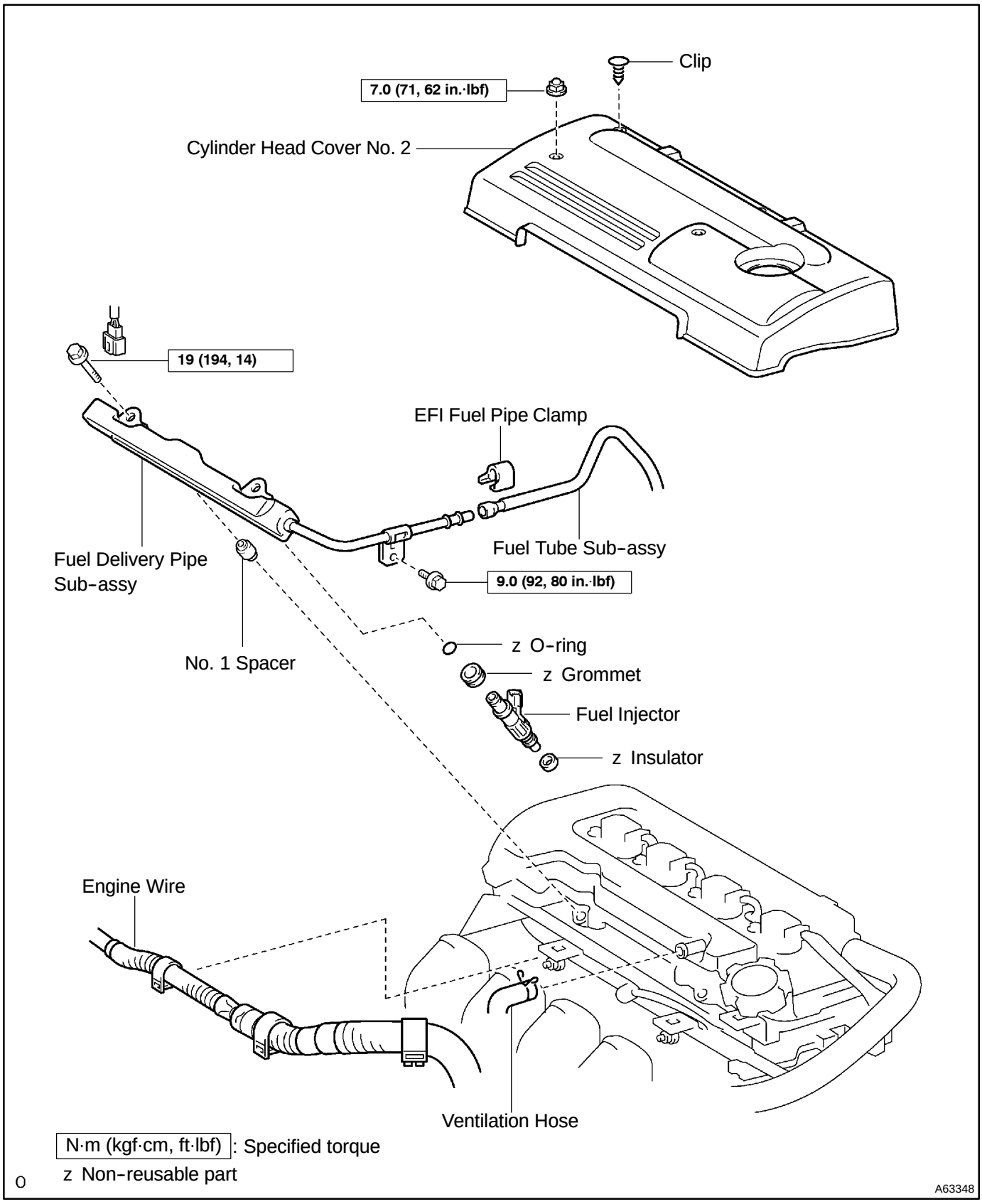
(b) Install the EFI fuel pipe clamp.

12. INSPECT FUEL PUMP OPERATION AND CHECK FOR FUEL LEAKS (See page 11-1)

FUEL INJECTOR ASSY (3ZZ-FE/4ZZ-FE)

COMPONENTS

110CN-01



REPLACEMENT

1. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT **(See page 11-1)**

2. REMOVE CYLINDER HEAD COVER NO.2

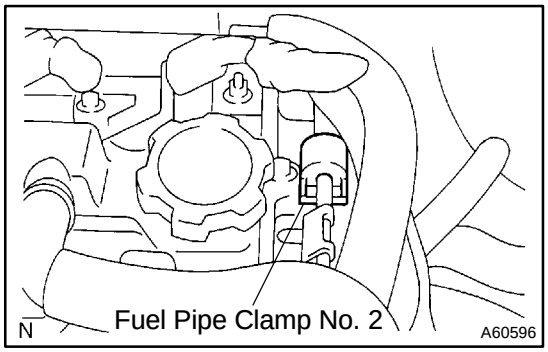
(a) Remove the 2 nuts, 2 clips and cylinder head cover.

3. DISCONNECT VENTILATION HOSE

(a) Disconnect the ventilation hose from the cylinder head cover.

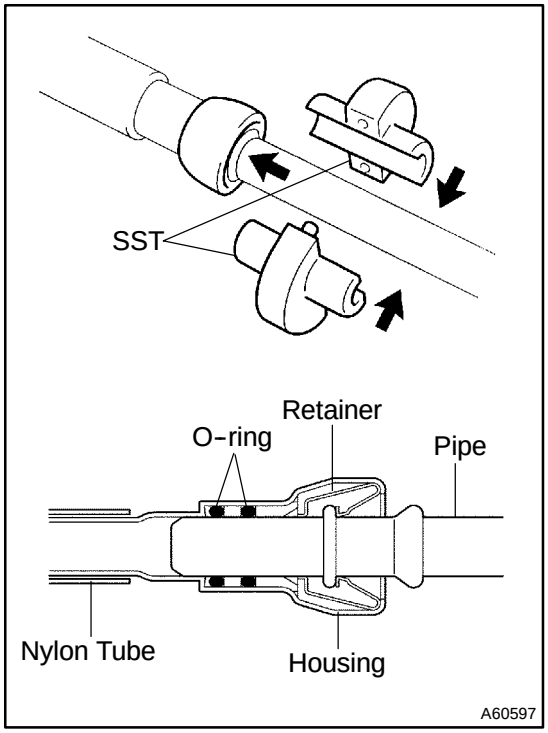
4. DISCONNECT ENGINE WIRE

(a) Remove the 3 wire harness clamps from the clamp brackets.



5. REMOVE EFI FUEL PIPE CLAMP

(a) Remove the fuel pipe clamp No. 2.



6. DISCONNECT FUEL TUBE SUB-ASSY

(a) Using the SST, separate the fuel tube.

SST 09268-21010

NOTICE:

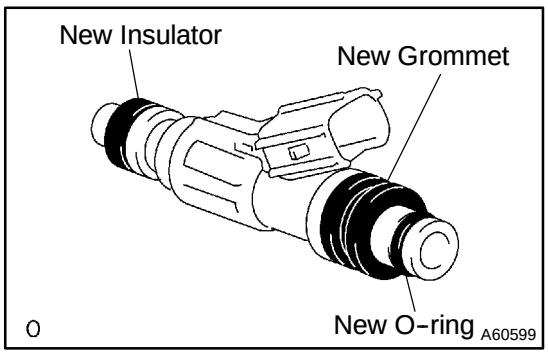
- **Check if there is any dirt mud on the pipe and around the connector before disconnecting them and clean the dirt away.**
- **Do not bent, fold and rotate the nylon tube.**
- **When the connector and the pipe are stuck, push and pull the connector to free to disconnect and pull it out.**
- **Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.**

7. REMOVE FUEL DELIVERY PIPE SUB-ASSY

(a) Remove the 3 bolts and fuel delivery pipe with injector.

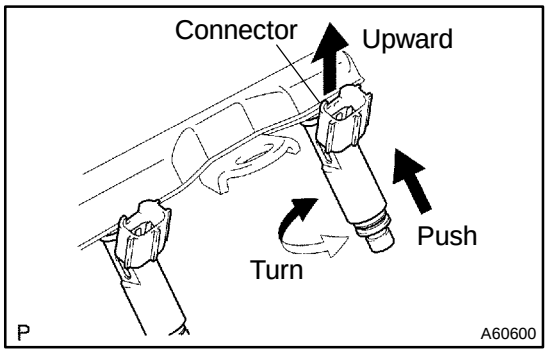
8. REMOVE FUEL INJECTOR ASSY

(a) Pull out the 4 fuel injectors from the fuel delivery pipe.



9. INSTALL FUEL INJECTOR ASSY

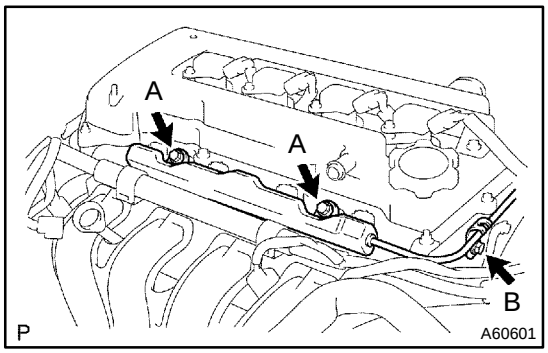
(a) Install the new insulator and grommet to each injector.
(b) Apply a light coat of gasoline to the new O-ring and install it to each injector.



(c) Apply a light coat of gasoline on the place where the fuel delivery pipe touches on O-ring.
(d) While turning the injector clockwise and counterclockwise, push it to the fuel delivery pipe.

NOTICE:

- **Be careful not twist the O-ring.**
- **After installing the fuel injectors,Check that they turns smoothly. If a fuel injector does not, reinstall it with a new O-ring.**



10. INSTALL FUEL DELIVERY PIPE SUB-ASSY

(a) Install the 2 spacers to the cylinder head.
(b) Install the fuel delivery pipe with the fuel injector.
Torque:
Bolt A 19 N·m (194kgf·cm, 14 ft·lbf)
Bolt B 9 N·m (92 kgf·cm, 80 in.·lbf)

NOTICE:

- **Be careful not drop the fuel injectors when installing the fuel delivery pipe.**
- **Check that the fuel injectors rotate smoothly after installing the fuel delivery pipe.**

11. INSTALL CYLINDER HEAD COVER NO.2

(a) Install the cylinder head cover with the 2 nuts and 2 clips.
Torque: 7 N·m (71kgf·cm, 62 in.·lbf)

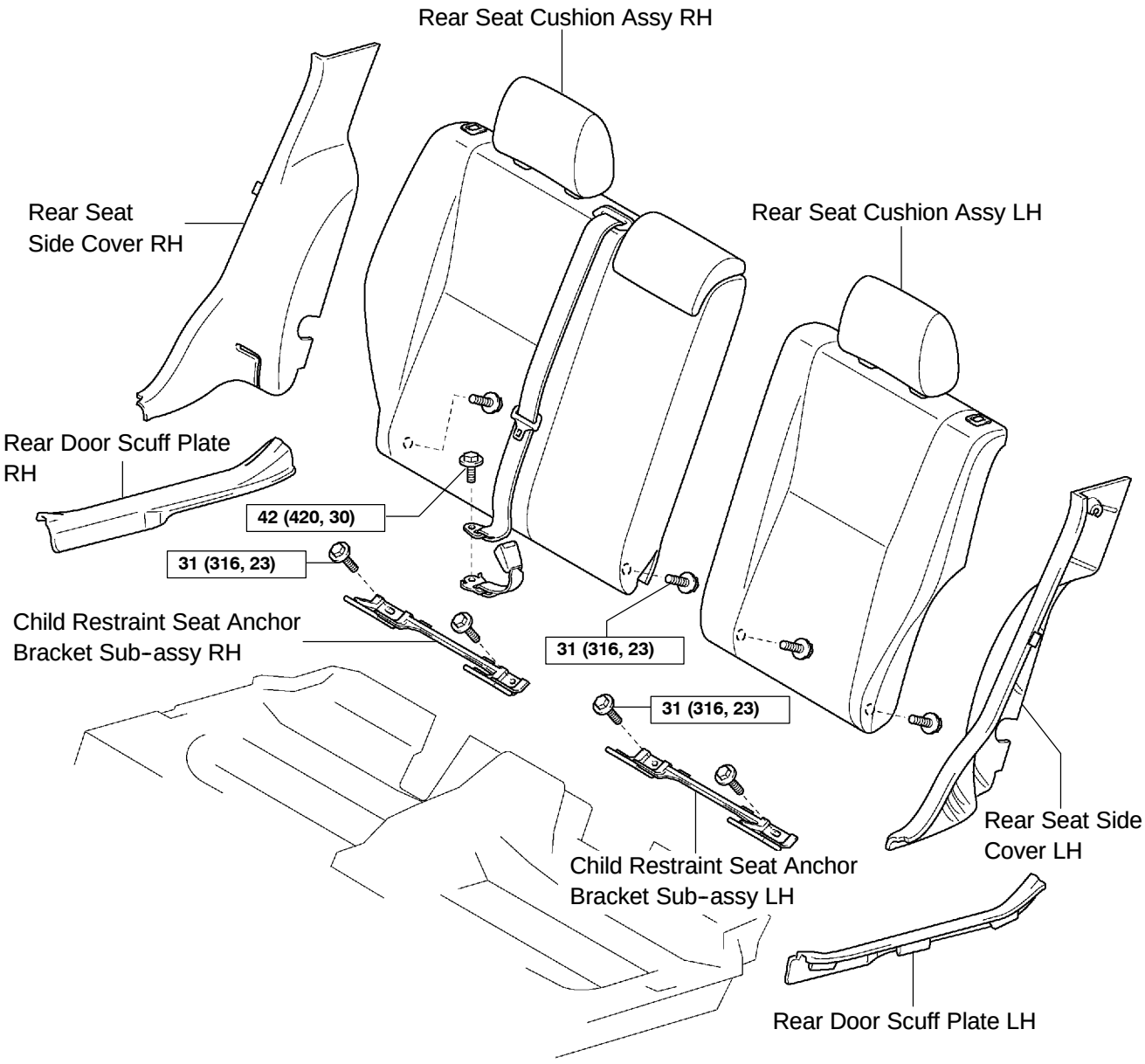
12. CHECK FUEL LEAK (See page 11-3)

FUEL PUMP ASSY (GASOLINE(HATCH BACK))

COMPONENTS

110CI-01

5 Door Hatch Back:

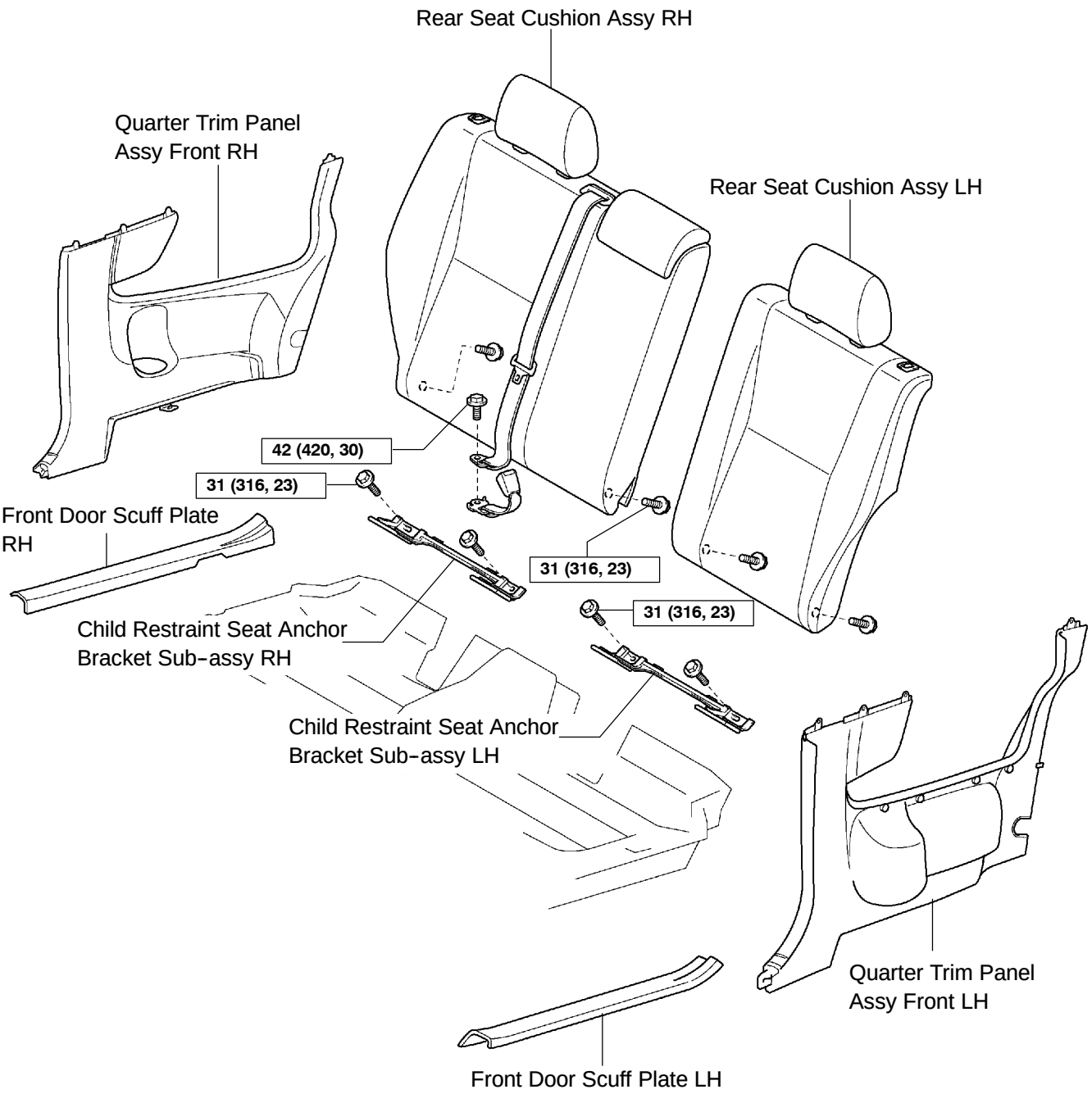


N·m (kgf·cm, ft·lbf) : Specified torque

Y

A63003

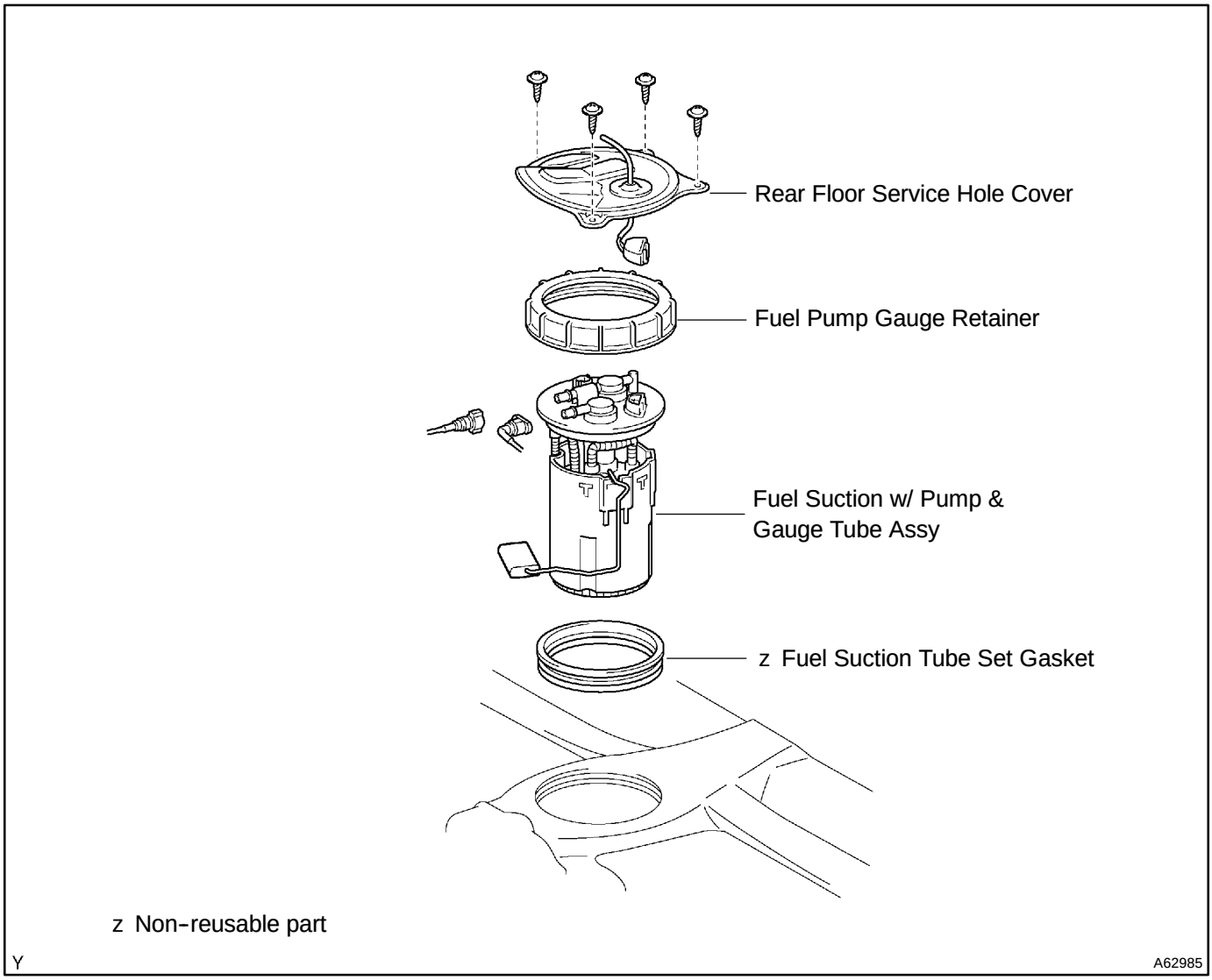
3 Door Hatch Back:



Y

N·m (kgf·cm, ft·lbf): Specified torque

A63349


Rear Floor Service Hole Cover
Fuel Pump Gauge Retainer
Fuel Suction w/ Pump &
Gauge Tube Assy
z Fuel Suction Tube Set Gasket
z Non-reusable part
Y
A62985

REPLACEMENT

1. **REMOVE REAR SEAT BACK ASSY LH**

(a) Remove the 2 bolts and the rear seat back assy LH.

2. **REMOVE REAR SEAT BACK ASSY RH**

(a) Remove the 3 bolts, 2 seat belt anchor plates and the rear seat back assy RH.

3. **REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH**

(a) Remove the 2 bolts and child restraint seat anchor bracket sub-assy LH.

4. **REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH**

(a) Remove the 2 bolts and child restraint seat anchor bracket sub-assy RH.

5. **REMOVE FRONT DOOR SCUFF PLATE LH (3 DOOR HATCH BACK BODY TYPE)**
(See page 76-48)

6. **REMOVE FRONT DOOR SCUFF PLATE RH (3 DOOR HATCH BACK BODY TYPE)**
(See page 76-48)

7. **REMOVE QUARTER TRIM PANEL ASSY FRONT LH (3 DOOR HATCH BACK BODY TYPE)**
(See page 76-49)

8. **REMOVE QUARTER TRIM PANEL ASSY FRONT RH (3 DOOR HATCH BACK BODY TYPE)**
(See page 76-49)

9. **REMOVE REAR DOOR SCUFF PLATE LH (5 DOOR HATCH BACK BODY TYPE)**
(See page 76-56)

10. **REMOVE REAR DOOR SCUFF PLATE RH (5 DOOR HATCH BACK BODY TYPE)**
(See page 76-56)

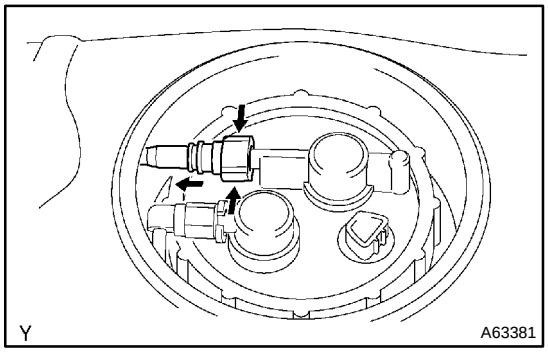
11. **REMOVE REAR SEAT SIDE COVER LH (5 DOOR HATCH BACK BODY TYPE)**
(See page 76-58)

12. **REMOVE REAR SEAT SIDE COVER RH (5 DOOR HATCH BACK BODY TYPE)**
(See page 76-58)

13. **REMOVE FLOOR CARPET ASSY FRONT**

14. **REMOVE REAR FLOOR SERVICE HOLE COVER**

15. **WORK FOR PREVENTING GASOLINE FROM SPILLING OUT** **(See page 11-1)**

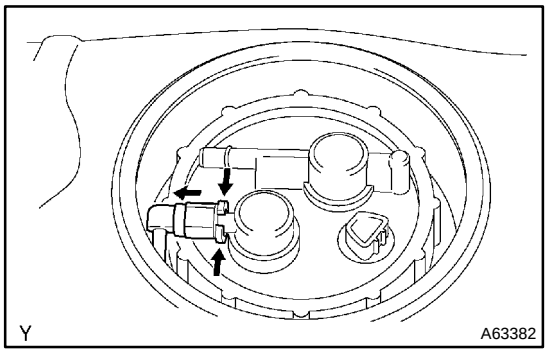


16. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Pinch the tube connector then pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**

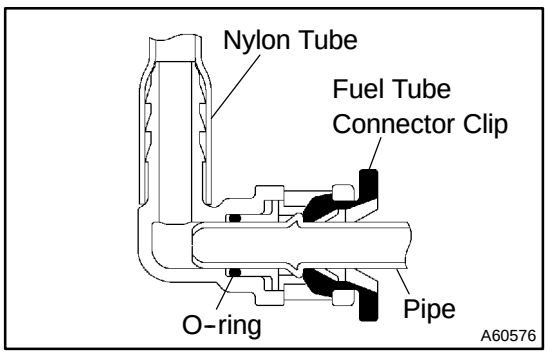


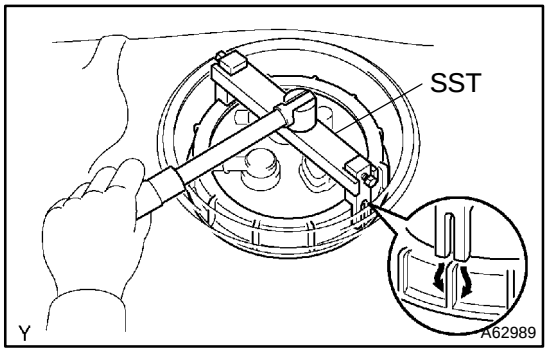
17. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the tube connector then pull out the fuel evaporation tube sub-assy No. 2.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**



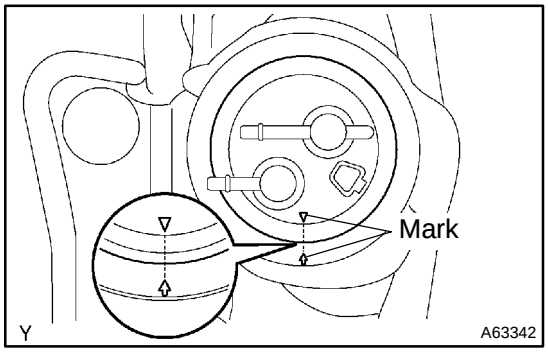


18. REMOVE FUEL SUCTION W/PUMP & GAGE TUBE ASSY

(a) Using SST, loosen the retainer.
SST 09808-14010
(b) Remove the retainer.
(c) Pull out the fuel pump assembly.

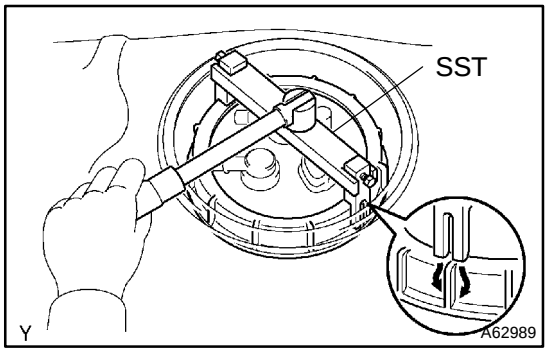
CAUTION:
Be careful that the arm of the sender gauge should not bent.

(d) Remove the gasket from the pump assembly.

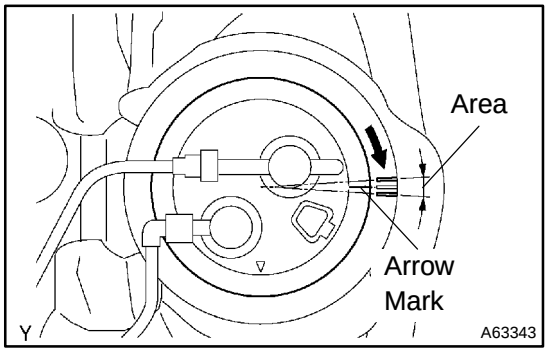


19. INSTALL FUEL SUCTION W/PUMP & GAGE TUBE ASSY

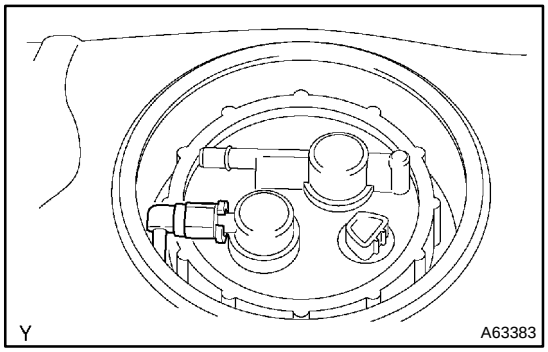
(a) Align the arrow nark of the fuel pump flange and fuel tank.
(b) Temporarily install the retainer.

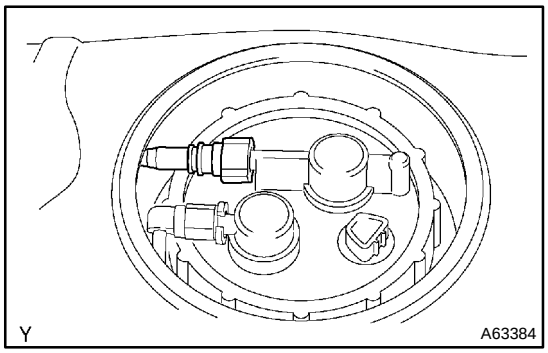


(c) Using SST, tighten the retainer until the arrow mark on the retainer is within the lines on the fuel tank.
SST 09808-14010



(d) Check that the arrow mark of the fuel pump retainer and fuel tank are aligned.





20. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

21. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

22. INSPECT CHECK FUEL LEAK **(See Page 11-3)**

23. INSTALL REAR FLOOR SERVICE HOLE COVER

(a) Using butyl tape, install the rear floor service hole cover.

24. INSTALL FLOOR CARPET ASSY FRONT

25. INSTALL REAR SEAT SIDE COVER RH (5 DOOR HATCH BACK BODY TYPE)

26. INSTALL REAR SEAT SIDE COVER LH (5 DOOR HATCH BACK BODY TYPE)

27. INSTALL REAR DOOR SCUFF PLATE RH (5 DOOR HATCH BACK BODY TYPE)

28. INSTALL REAR DOOR SCUFF PLATE LH (5 DOOR HATCH BACK BODY TYPE)

29. INSTALL QUARTER TRIM PANEL ASSY FRONT RH (3 DOOR HATCH BACK BODY TYPE)

30. INSTALL QUARTER TRIM PANEL ASSY FRONT LH (3 DOOR HATCH BACK BODY TYPE)

31. INSTALL FRONT DOOR SCUFF PLATE RH (3 DOOR HATCH BACK BODY TYPE)

32. INSTALL FRONT DOOR SCUFF PLATE LH (3 DOOR HATCH BACK BODY TYPE)

33. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)

34. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH

Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)

35. INSTALL REAR SEAT BACK ASSY RH

Torque:

Seat cushion assy 31 N·m (316 kgf·cm, 23 ft·lbf)

Seat belt anchor 42 N·m (420 kgf·cm, 30 ft·lbf)

36. INSTALL REAR SEAT BACK ASSY LH

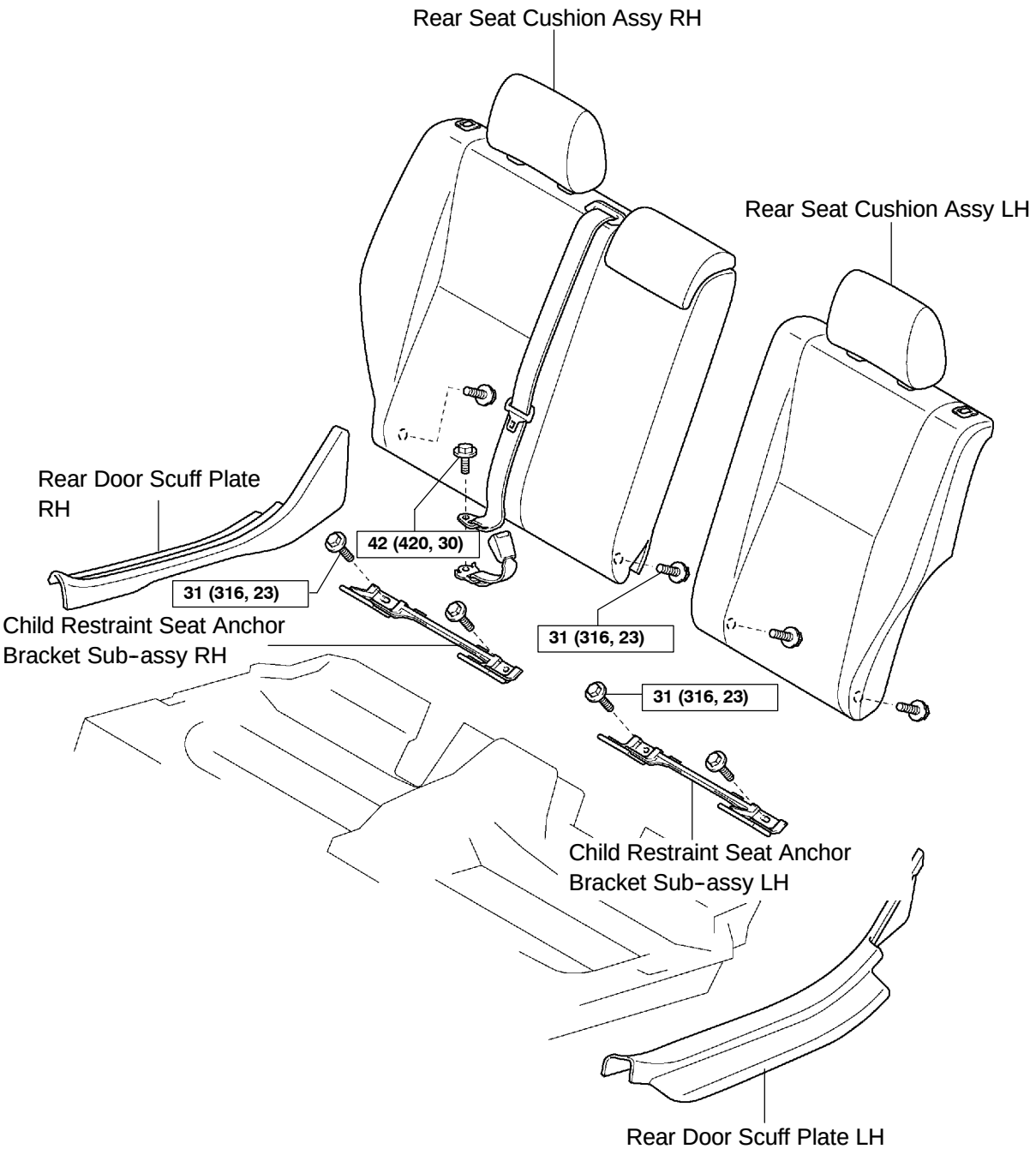
Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)

FUEL PUMP ASSY (GASOLINE(SEDAN/STATION WAGON))

COMPONENTS

110CP-01

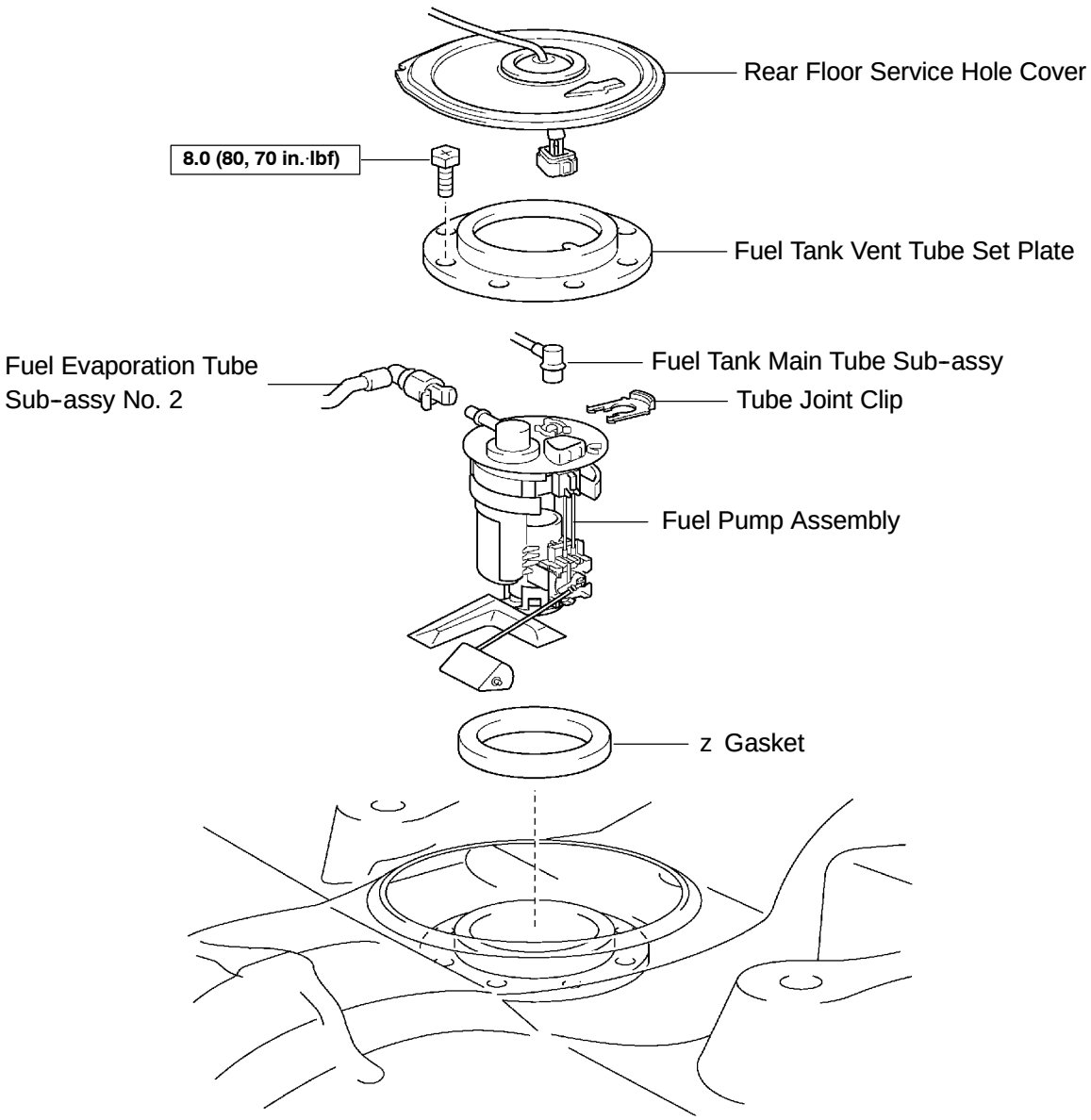
Station Wagon:



N·m (kgf·cm, ft·lbf): Specified torque

Y

A63350

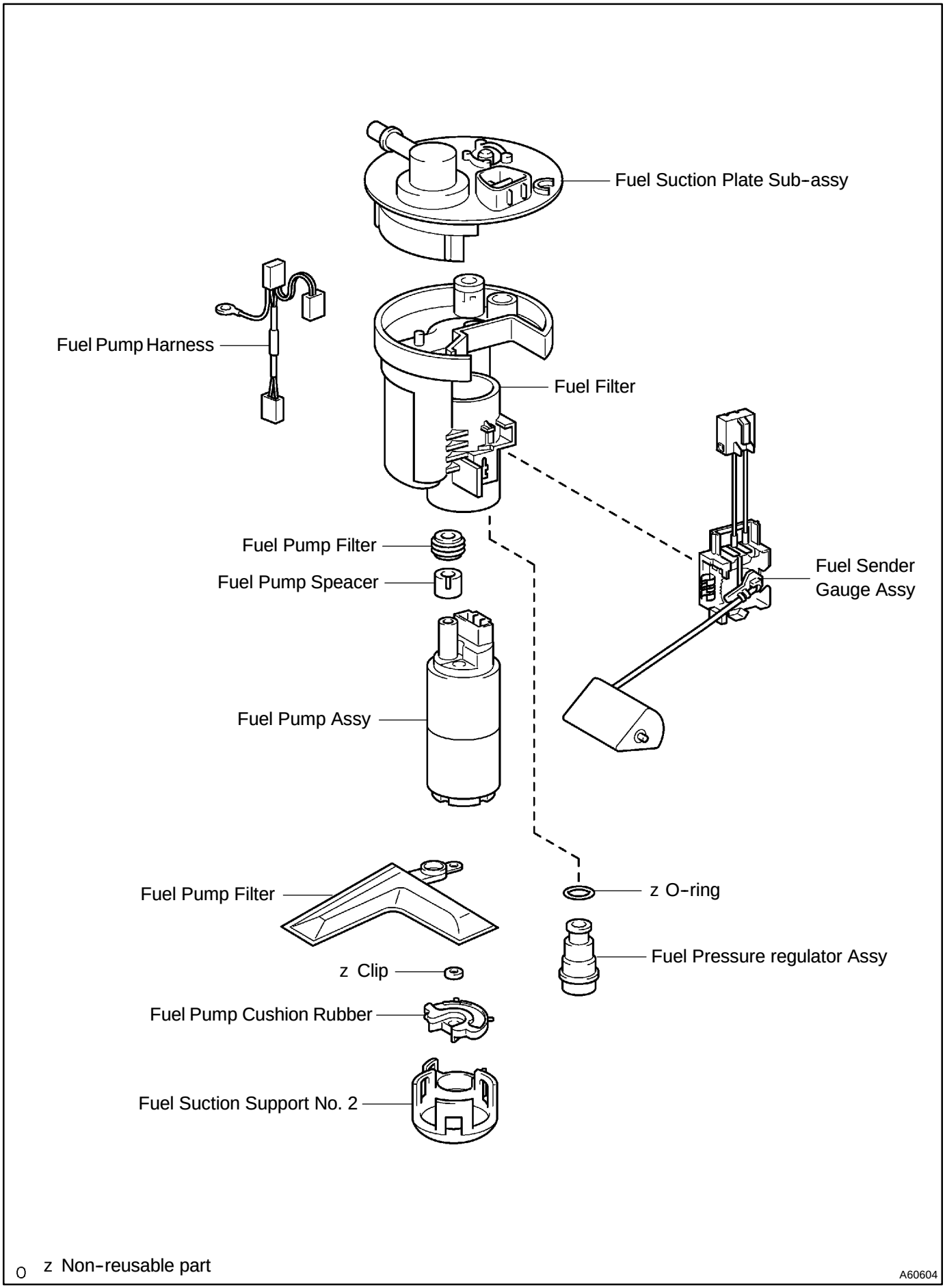


O

N·m (kgf·cm, in.·lbff): Specified torque

z Non-reusable part

A63351


Fuel Suction Plate Sub-assy
Fuel Pump Harness
Fuel Filter
Fuel Pump Filter
Fuel Pump Speacer
Fuel Sender Gauge Assy
Fuel Pump Assy
Fuel Pump Filter
z O-ring
Fuel Pressure regulator Assy
z Clip
Fuel Pump Cushion Rubber
Fuel Suction Support No. 2
o z Non-reusable part
A60604

110CQ-01

Removal & Installation and Disassembly & Reassembly

1. REMOVE REAR SEAT CUSHION ASSEMBLY(SEDAN BODY TYPE)

2. REMOVE REAR SEAT BACK ASSY LH(WAGON BODY TYPE)

(a) Remove the 2 bolts and the rear seat back assy LH.

3. REMOVE REAR SEAT BACK ASSY RH(WAGON BODY TYPE)

(a) Remove the 3 bolts, 2 seat belt anchor plates and the rear seat back assy RH.

4. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH

(a) Remove the 2 bolts and child restraint seat anchor bracket sub-assy LH.

5. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

(a) Remove the 2 bolts and child restraint seat anchor bracket sub-assy RH.

6. REMOVE REAR DOOR SCUFF PLATE LH(WAGON BODY TYPE)

(See page 76-40)

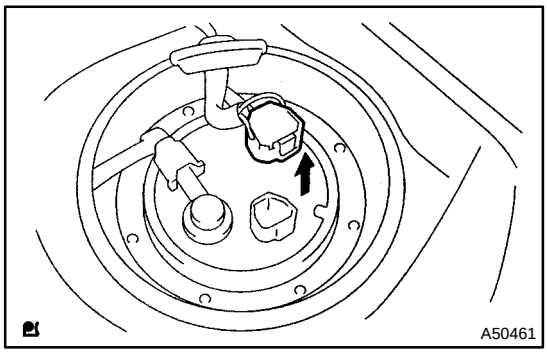
7. REMOVE REAR DOOR SCUFF PLATE RH(WAGON BODY TYPE)

(See page 76-40)

8. REMOVE FLOOR CARPET ASSY FRONT

(a) Using a clip remover, remove the clip and front floor carpet.

9. REMOVE REAR FLOOR SERVICE HOLE COVER

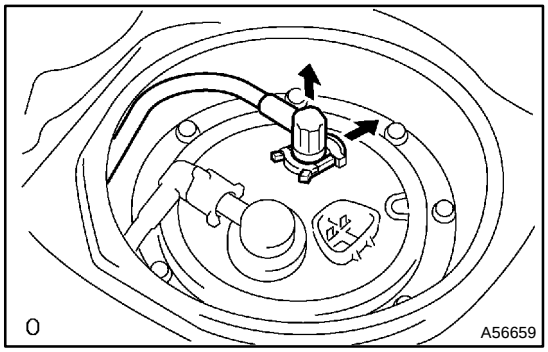


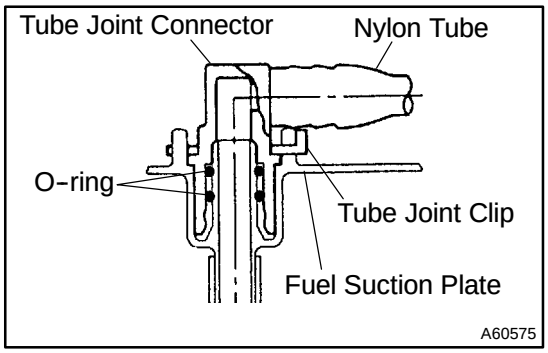
10. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT

(a) Disconnect the fuel pump connector.

(b) Start the engine.

(c) After the engine has stopped on the its own, turn the ignition switch to lock.



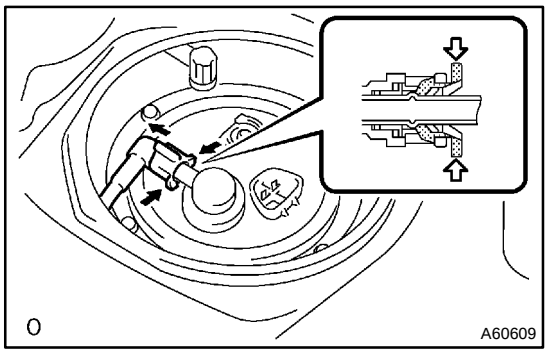


11. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Remove the tube joint clip, and pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**

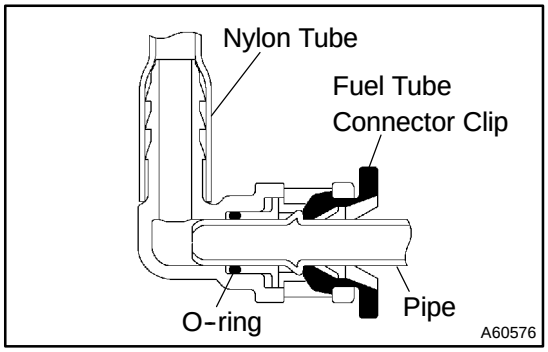


12. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the tube connector then pull out the fuel evaporation tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When connector and the pipe are stuck, pinch the tube between fingers, and turn it carefully to free and then disconnect the tube.**



13. REMOVE FUEL TANK VENT TUBE SET PLATE

(a) Remove the 8 bolts and fuel tank vent tube set plate.

14. REMOVE FUEL PUMP ASSEMBLY

(a) Pull out the fuel pump assembly.

NOTICE:

- **Do not damage the fuel pump filter.**
- **Be careful that the arm of the sender gauge should not bent.**

(b) Remove the gasket from the pump assembly.

15. REMOVE FUEL SUCTION SUPPORT NO.2

(a) Using a screwdriver, disconnect the 4 snap claws from the claw holes, and remove the fuel suction support.

NOTICE:
Be careful not to damage the fuel suction support.

16. REMOVE FUEL PUMP CUSHION RUBBER

17. REMOVE FUEL SUCTION PLATE SUB-ASSY

(a) Disconnect the 2 connectors.
(b) Using 2 screwdrivers, disconnect the 4 snap claws from the claw holes, and remove the fuel suction plate.

NOTICE:
Be careful not to damage the fuel suction plate.

18. REMOVE FUEL PUMP HARNESS

19. REMOVE FUEL SENDER GAGE ASSY

(a) Unlock the fuel sender gage, and move it downward to remove.

20. REMOVE FUEL PRESSURE REGULATOR ASSY

(a) Pull out the fuel pressure regulator from the filter.

21. REMOVE FUEL PUMP

(a) Pull out the fuel pump from the filter.

22. REMOVE FUEL PUMP FILTER

(a) Using a small screwdriver, pry out the clip.
(b) Pull out the fuel pump filter from the fuel pump.

23. REMOVE FUEL PUMP SPACER

24. REMOVE FUEL PUMP FILTER SEAL

25. INSTALL FUEL PUMP FILTER

(a) Install the fuel pump filter with a new clip.

26. INSTALL FUEL PUMP

(a) Apply gasoline to the fuel pump filter seal.
(b) Install the fuel pump to the filter.

27. INSTALL FUEL PRESSURE REGULATOR ASSY

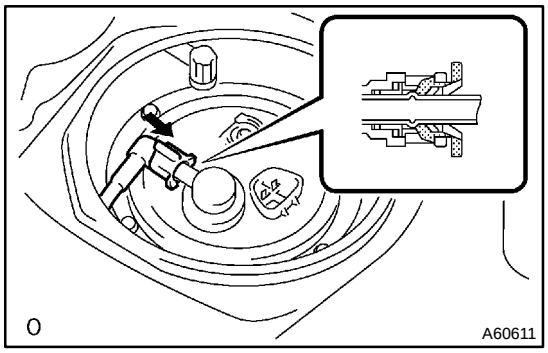
(a) Apply gasoline to a new O-ring, and install it to the fuel pressure regulator.
(b) Install the fuel pressure regulator to the filter.

28. INSTALL FUEL PUMP ASSEMBLY

(a) Install a new gasket to the fuel pump assembly.
(b) Install the fuel pump assembly to the fuel tank.

29. INSTALL FUEL TANK VENT TUBE SET PLATE

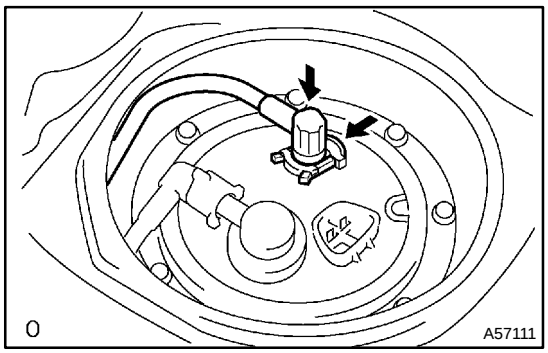
(a) Install the fuel tank vent tube set plate with the 8 bolts.
Torque: 8 N·m (80 kgf·cm, 70 in.·lbf)



30. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:
- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**



31. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Connect the fuel tank main tube with the tube joint clip.

NOTICE:
- **Check that there is no scratch or foreign objects on the connecting parts.**
- **Check that the connector is inserted fully and securely.**
- **Check that the clip of the tube joint is on the collar of the connector.**
- **After installing the tube joint clip, check that the connector is not pulled off.**

32. CHECK FUEL LEAK **(See page 11-14)**

33. INSTALL REAR FLOOR SERVICE HOLE COVER

(a) Using butyl tape, install the rear floor service hole cover.

34. INSTALL FLOOR CARPET ASSY FRONT

35. INSTALL REAR DOOR SCUFF PLATE RH(WAGON BODY TYPE)

36. INSTALL REAR DOOR SCUFF PLATE LH(WAGON BODY TYPE)

37. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)

38. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH

Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)

39. INSTALL REAR SEAT BACK ASSY RH(WAGON BODY TYPE)
Torque:
Seat cushion assy 31 N·m (316 kgf·cm, 23 ft·lbf)
Seat belt anchor 42 N·m (420 kgf·cm, 30 ft·lbf)

40. INSTALL REAR SEAT BACK ASSY LH(WAGON BODY TYPE)
Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)

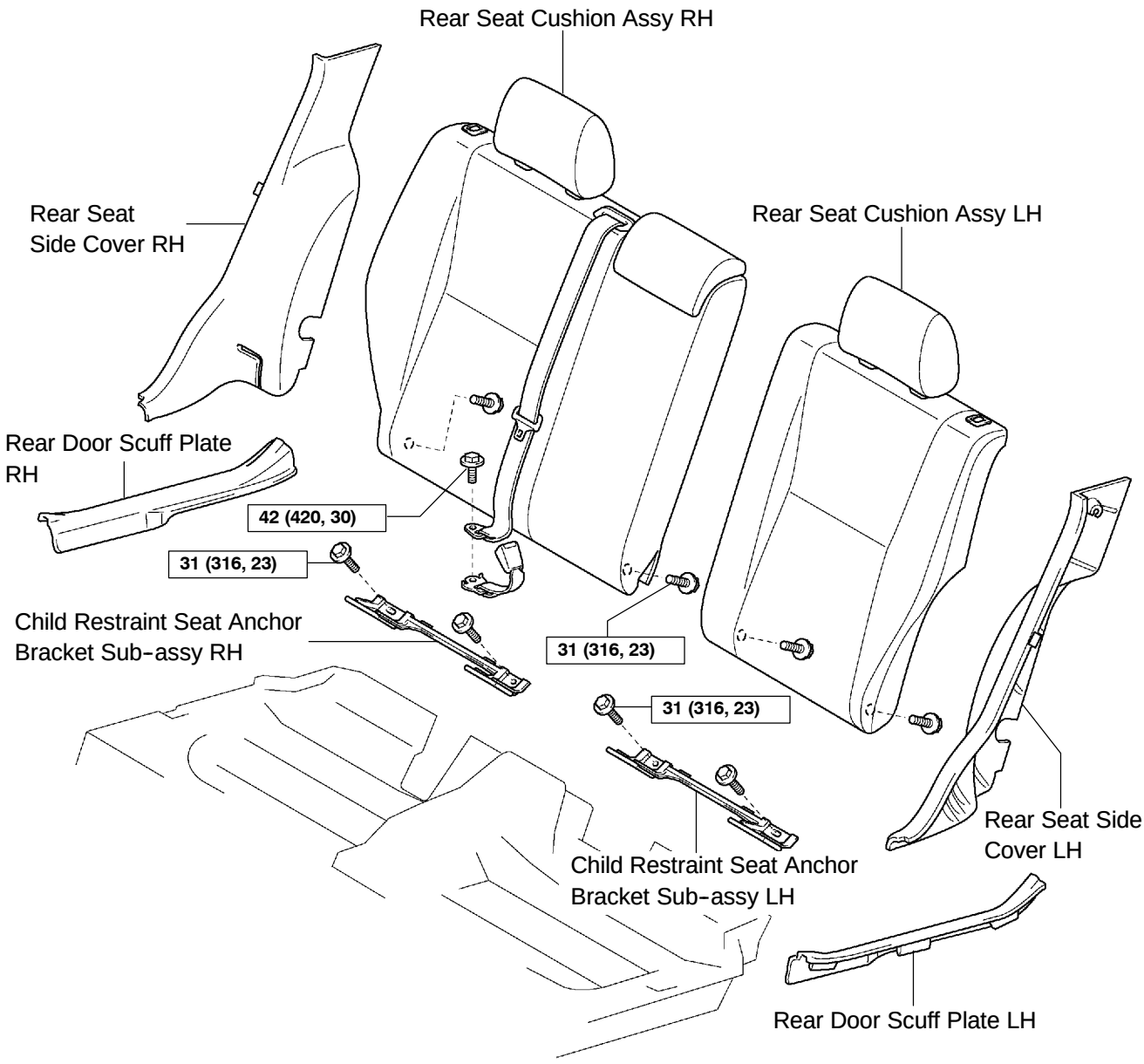
41. INSTALL REAR SEAT CUSHION ASSEMBLY(SEDAN BODY TYPE)

FUEL TANK ASSY (GASOLINE(HATCH BACK))

COMPONENTS

110CK-01

5 Door Hatch Back:

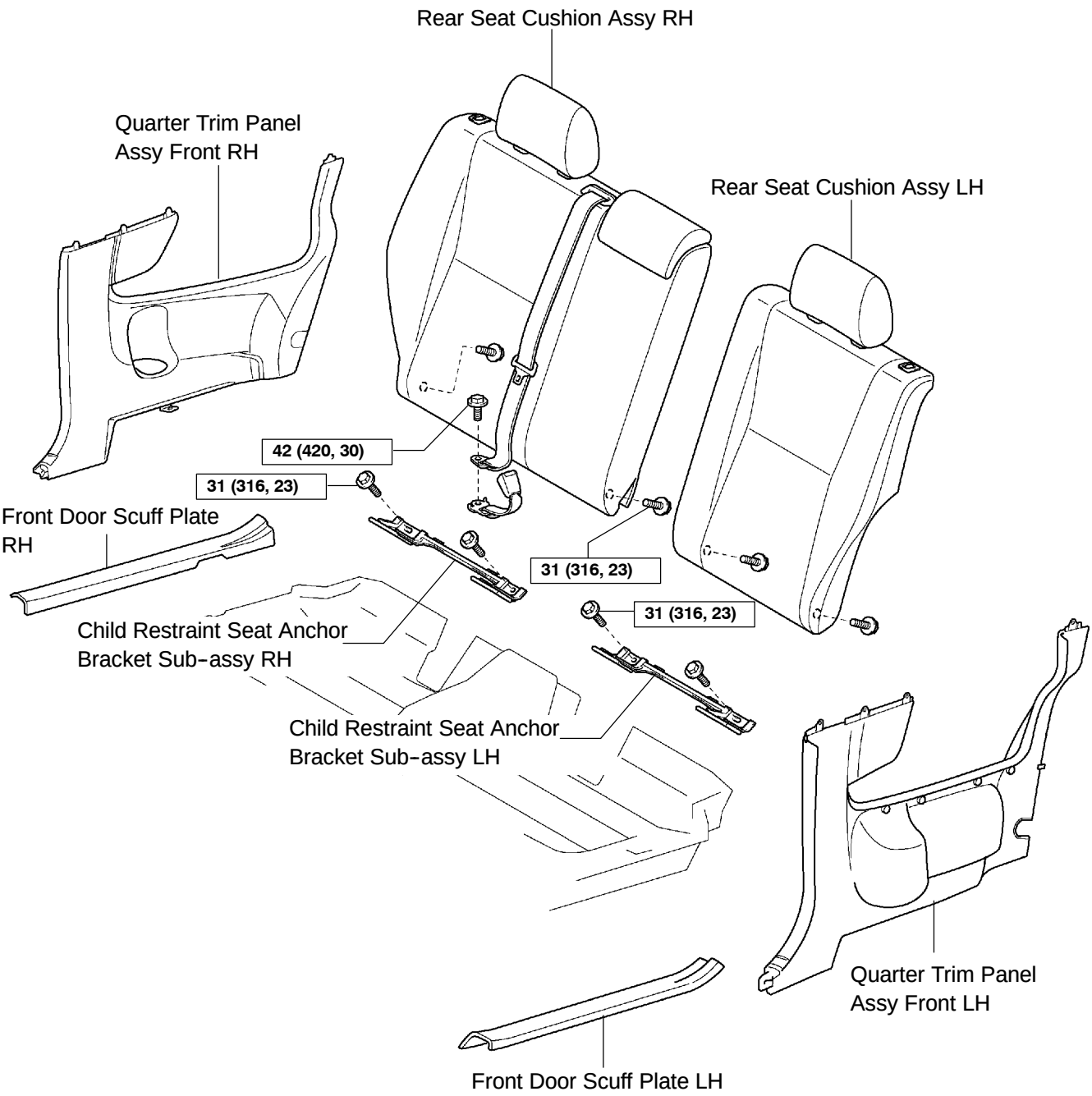


N·m (kgf·cm, ft·lbf): Specified torque

Y

A63003

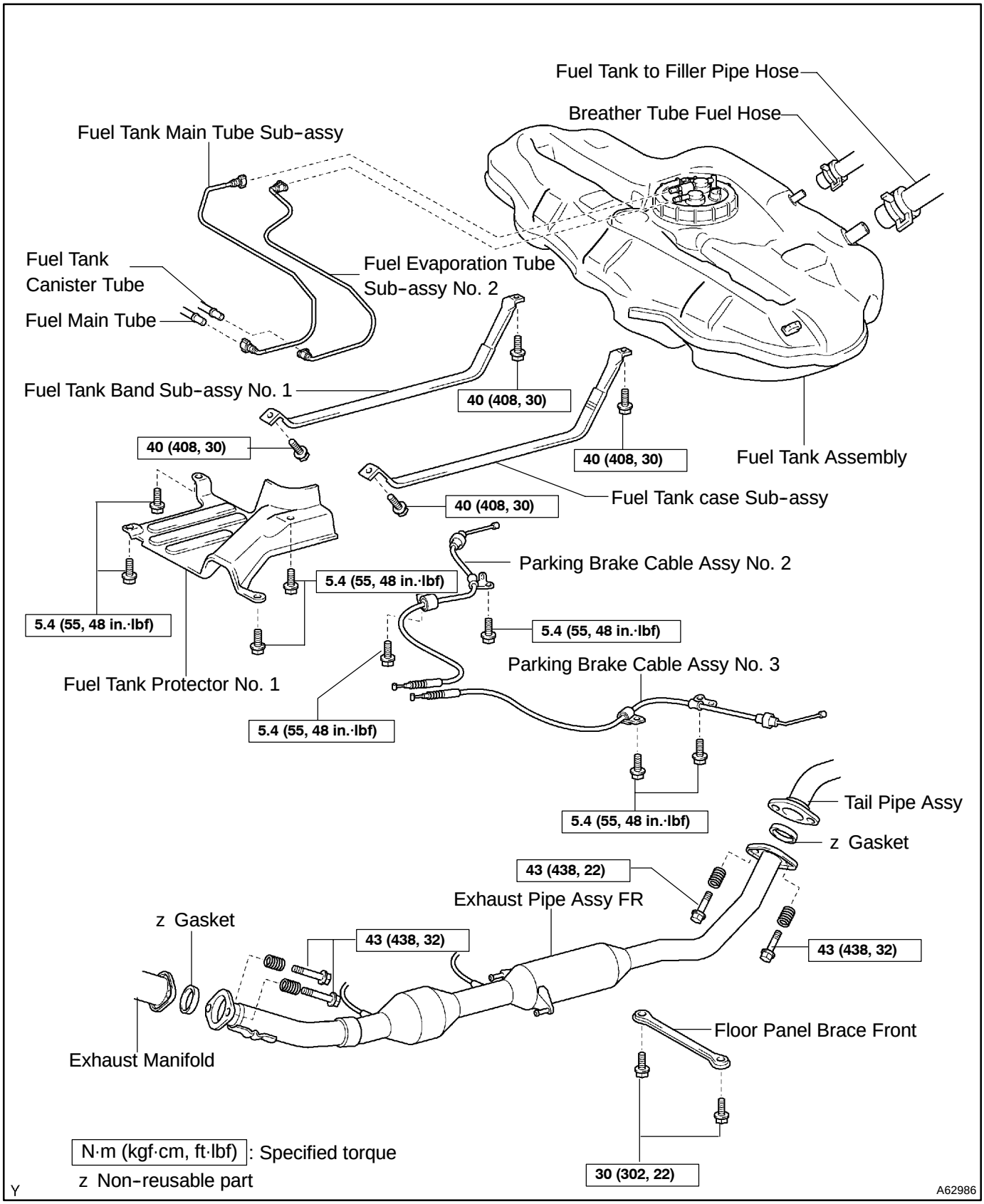
3 Door Hatch Back:

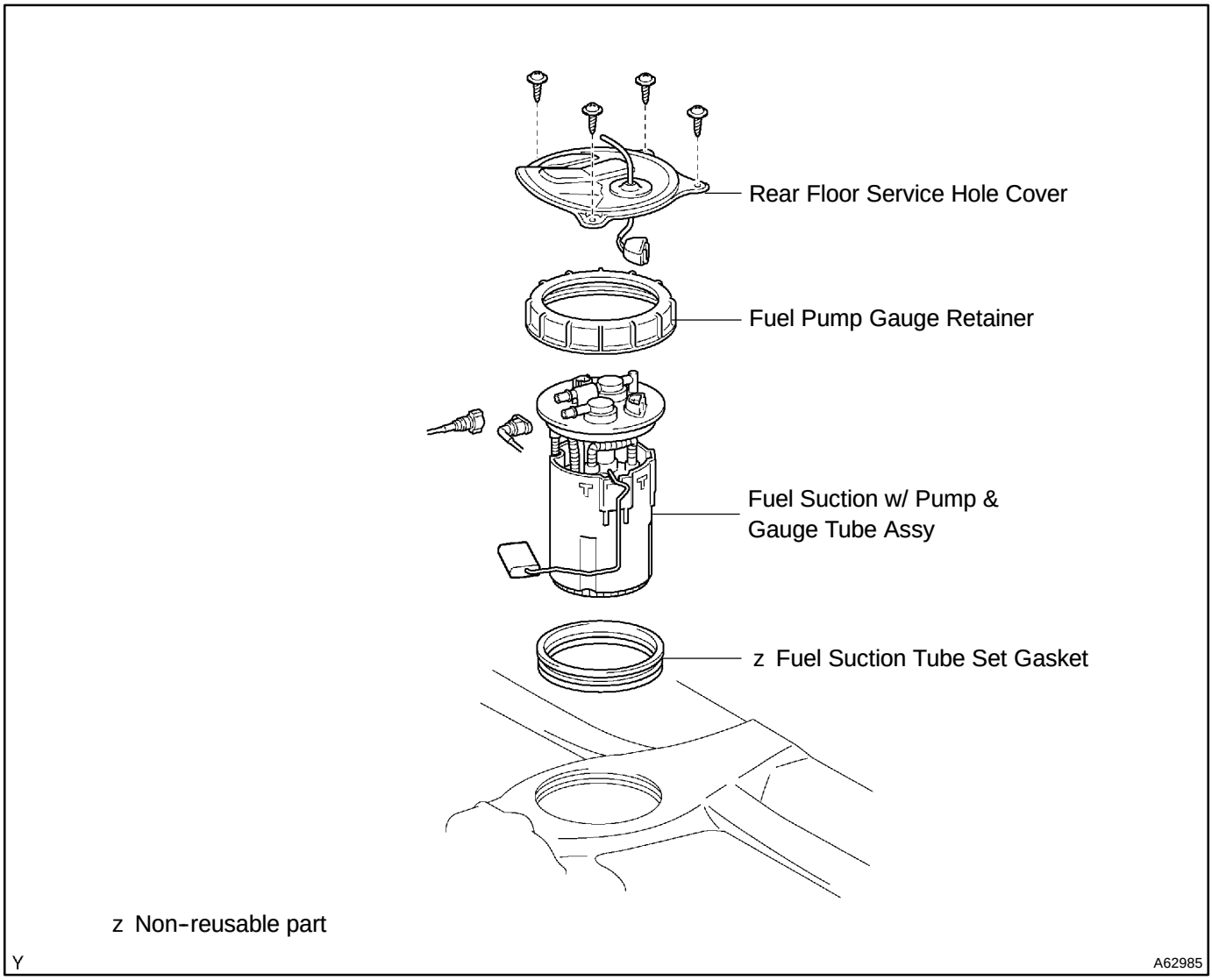


Y

N·m (kgf·cm, ft·lbf): Specified torque

A63349


Fuel Tank to Filler Pipe Hose
Breather Tube Fuel Hose
Fuel Tank Main Tube Sub-assy
Fuel Tank Canister Tube
Fuel Main Tube
Fuel Evaporation Tube Sub-assy No. 2
Fuel Tank Band Sub-assy No. 1
40 (408, 30)
40 (408, 30)
40 (408, 30)
40 (408, 30)
Fuel Tank Assembly
Fuel Tank case Sub-assy
Parking Brake Cable Assy No. 2
5.4 (55, 48 in.·lbf)
5.4 (55, 48 in.·lbf)
5.4 (55, 48 in.·lbf)
Fuel Tank Protector No. 1
Parking Brake Cable Assy No. 3
5.4 (55, 48 in.·lbf)
5.4 (55, 48 in.·lbf)
Tail Pipe Assy
z Gasket
43 (438, 22)
Exhaust Pipe Assy FR
z Gasket
43 (438, 32)
43 (438, 32)
Floor Panel Brace Front
Exhaust Manifold
30 (302, 22)
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
Y
A62986


Rear Floor Service Hole Cover
Fuel Pump Gauge Retainer
Fuel Suction w/ Pump &
Gauge Tube Assy
z Fuel Suction Tube Set Gasket
z Non-reusable part
Y
A62985

Removal & Installation and Disassembly & Reassembly

1. REMOVE REAR SEAT CUSHION ASSY LH (See page 11-29)
2. REMOVE REAR SEAT CUSHION ASSY RH (See page 11-29)
3. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH
   (See page 11-29)
4. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH
   (See page 11-29)
5. REMOVE FRONT DOOR SCUFF PLATE LH(3 DOOR HATCH BACK BODY TYPE)
   (See page 76-48)
6. REMOVE FRONT DOOR SCUFF PLATE RH(3 DOOR HATCH BACK BODY TYPE)
   (See page 76-48)
7. REMOVE QUARTER TRIM PANEL ASSY FRONT LH(3 DOOR HATCH BACK BODY TYPE)
   (See page 76-49)
8. REMOVE QUARTER TRIM PANEL ASSY FRONT RH(3 DOOR HATCH BACK BODY TYPE)
   (See page 76-49)
9. REMOVE REAR DOOR SCUFF PLATE LH(5 DOOR HATCH BACK BODY TYPE)
   (See page 76-56)
10. REMOVE REAR DOOR SCUFF PLATE RH(5 DOOR HATCH BACK BODY TYPE)
    (See page 76-56)
11. REMOVE REAR SEAT SIDE COVER LH(5 DOOR HATCH BACK BODY TYPE)
    (See page 76-58)
12. REMOVE REAR SEAT SIDE COVER RH(5 DOOR HATCH BACK BODY TYPE)
    (See page 76-58)
13. REMOVE FLOOR CARPET ASSY FRONT

14. REMOVE REAR FLOOR SERVICE HOLE COVER

15. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT (See page 11-1)
16. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY
    (See page 11-30)
17. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2
    (See page 11-30)
18. REMOVE FUEL SUCTION W/PUMP & GAGE TUBE ASSY
    (See page 11-31)
19. DRAIN FUEL
20. FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY(2ZZ-GE ENGINE TYPE)

21. SHIFTING HOLE COVER SUB-ASSY(2ZZ-GE ENGINE TYPE)
    (See page 15-2)
22. PARKING BRAKE HOLE COVER SUB-ASSY(2ZZ-GE ENGINE TYPE)
    (See page 15-2)
23. CONSOLE BOX SUB-ASSY REAR(2ZZ-GE ENGINE TYPE)
    (See page 15-2)
24. REMOVE FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)
    (See page 15-2)
25. REMOVE FLOOR CARPET ASSY FRONT
    (See page 15-2)
26. REMOVE OXYGEN SENSOR
    (See page 15-2)

27. REMOVE FLOOR PANEL BRACE FRONT

(See page 15-2)

28. REMOVE EXHAUST PIPE ASSY FRONT

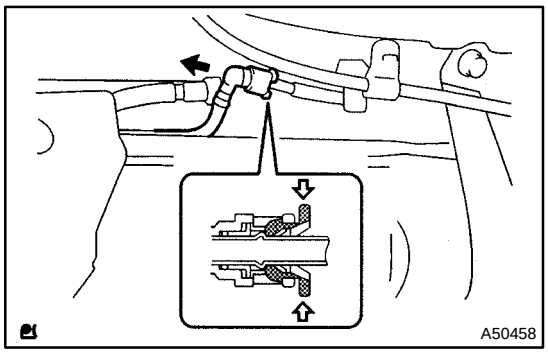
(a) Remove the 4 bolts, 4 compression spring and exhaust pipe assy front.

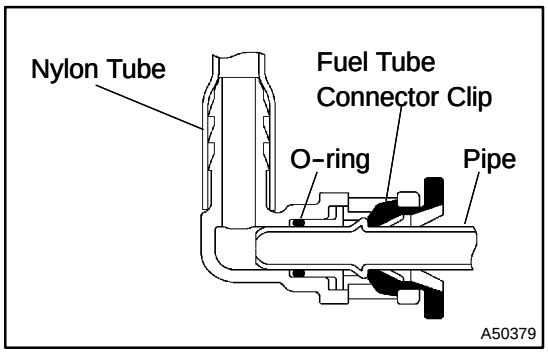
29. DISCONNECT BREATHER TUBE FUEL HOSE

(a) Disconnect the breather tube fuel hose from the fuel tank.

30. DISCONNECT FUEL TANK TO FILLER PIPE HOSE

(a) Disconnect the fuel tank to filler pipe hose from the fuel tank.



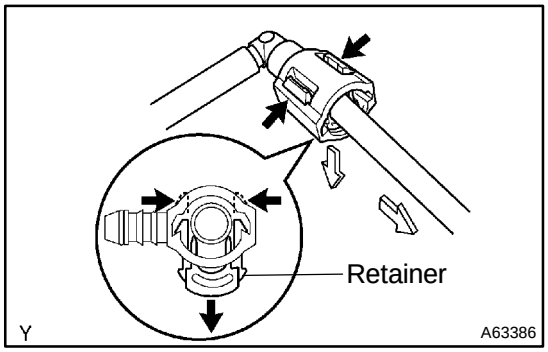


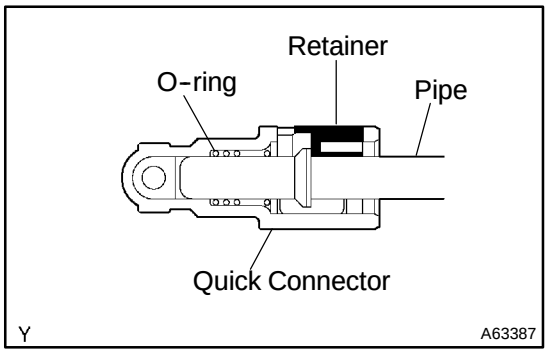
31. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the fuel tube connector clip and then pull out the tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **After disconnecting the tube, cover the connector with a vinyl bag.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**





32. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Pinch the projections of the retainer to remove the lock claws, and pull down it as shown in the illustration.
(b) Pull out the pipe.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **After disconnecting the tube, cover the connector with a vinyl bag.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**

33. REMOVE FUEL TANK PROTECTOR NO.1

34. REMOVE FUEL TANK ASSY

(a) Remove the clamp of the parking brake cable.
(b) Set a mission jack to the fuel tank.
(c) Remove the fuel tank bands, and fuel tank assembly.

35. REMOVE FUEL TANK MAIN TUBE SUB-ASSY

36. REMOVE FUEL EVAPORATION TUBE SUB-ASSY NO.2

37. INSTALL FUEL EVAPORATION TUBE SUB-ASSY NO.2

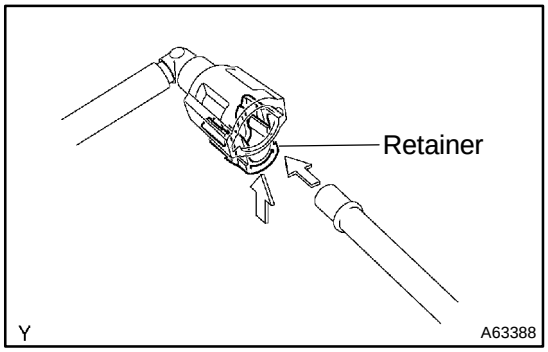
38. INSTALL FUEL TANK MAIN TUBE SUB-ASSY

39. INSTALL FUEL TANK ASSY

Torque:
Fuel tank band 39 N·m (400 kgf·cm, 29 ft·lbf)
Parking brake cable 5.4 N·m (55 kgf·cm, 48 in.·lbf)

40. INSTALL FUEL TANK PROTECTOR NO.1

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

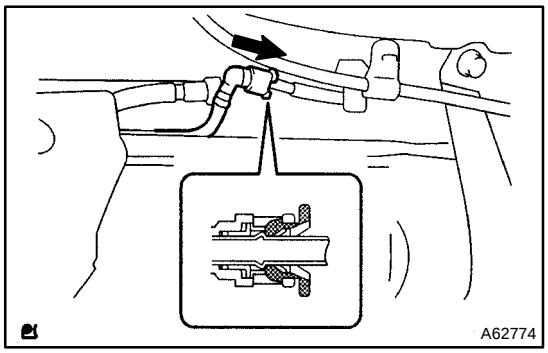


41. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Insert the pipe into the quick connector, and push up the retainer to the claws lock.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**



42. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

43. CONNECT FUEL TANK TO FILLER PIPE HOSE

44. CONNECT BREATHER TUBE FUEL HOSE

45. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-2)

46. INSTALL FLOOR PANEL BRACE FRONT
(See page 15-3)

47. INSTALL OXYGEN SENSOR
(See page 15-3)

48. INSTALL FLOOR CARPET ASSY FRONT

49. INSTALL FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)

50. INSTALL CONSOLE BOX SUB-ASSY REAR(2ZZ-GE ENGINE TYPE)

51. INSTALL PARKING BRAKE HOLE COVER SUB-ASSY(2ZZ-GE ENGINE TYPE)

52. INSTALL SHIFTING HOLE COVER SUB-ASSY(2ZZ-GE ENGINE TYPE)

53. INSTALL FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY(2ZZ-GE ENGINE TYPE)

54. INSTALL FUEL SUCTION W/PUMP & GAGE TUBE ASSY
(See page 11-31)
SST 09808-14010

55. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2
(See page 11-32)

56. CONNECT FUEL TANK MAIN TUBE SUB-ASSY
(See page 11-32)

57. INSPECT FUEL LEAK (See Page 11-1)

58. INSTALL REAR FLOOR SERVICE HOLE COVER

(a) Install the rear floor service hole cover with 4 screws.

59. INSTALL FLOOR CARPET ASSY FRONT

60. INSTALL REAR SEAT SIDE COVER RH(5 DOOR HATCH BACK BODY TYPE)

61. INSTALL REAR SEAT SIDE COVER LH(5 DOOR HATCH BACK BODY TYPE)

62. INSTALL REAR DOOR SCUFF PLATE RH(5 DOOR HATCH BACK BODY TYPE)

63. INSTALL REAR DOOR SCUFF PLATE LH(5 DOOR HATCH BACK BODY TYPE)

64. INSTALL QUARTER TRIM PANEL ASSY FRONT RH(3 DOOR HATCH BACK BODY TYPE)

65. INSTALL QUARTER TRIM PANEL ASSY FRONT LH(3 DOOR HATCH BACK BODY TYPE)

66. INSTALL FRONT DOOR SCUFF PLATE RH(3 DOOR HATCH BACK BODY TYPE)

67. INSTALL FRONT DOOR SCUFF PLATE LH(3 DOOR HATCH BACK BODY TYPE)

68. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH
(See page 11-29)

69. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH
(See page 11-29)

70. INSTALL REAR SEAT CUSHION ASSY RH **(See page 11-29)**

71. INSTALL REAR SEAT CUSHION ASSY LH **(See page 11-29)**

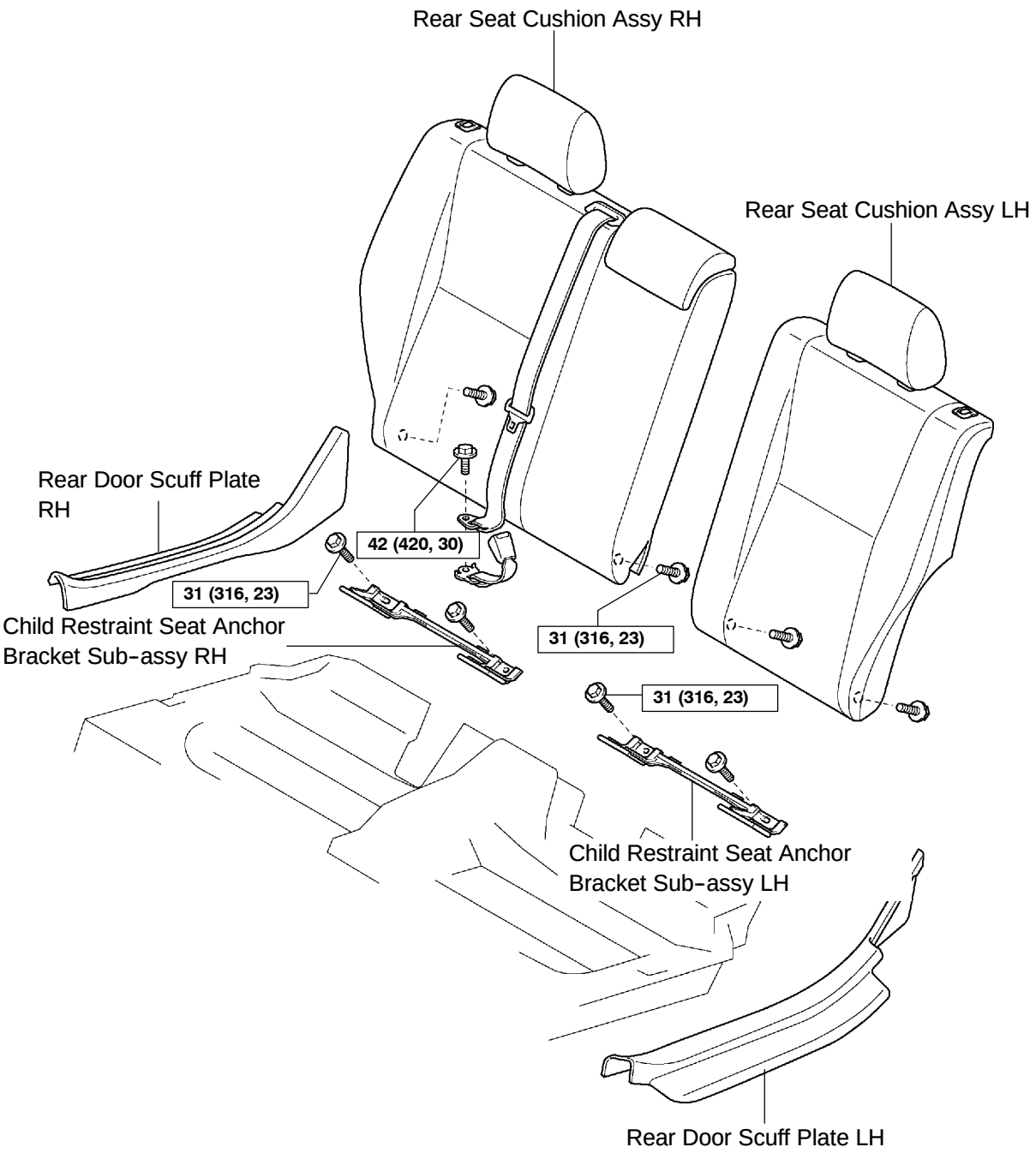
72. CHECK EXHAUST GAS LEAK

FUEL TANK ASSY (GASOLINE(SEDAN/STATION WAGON))

COMPONENTS

110CR-01

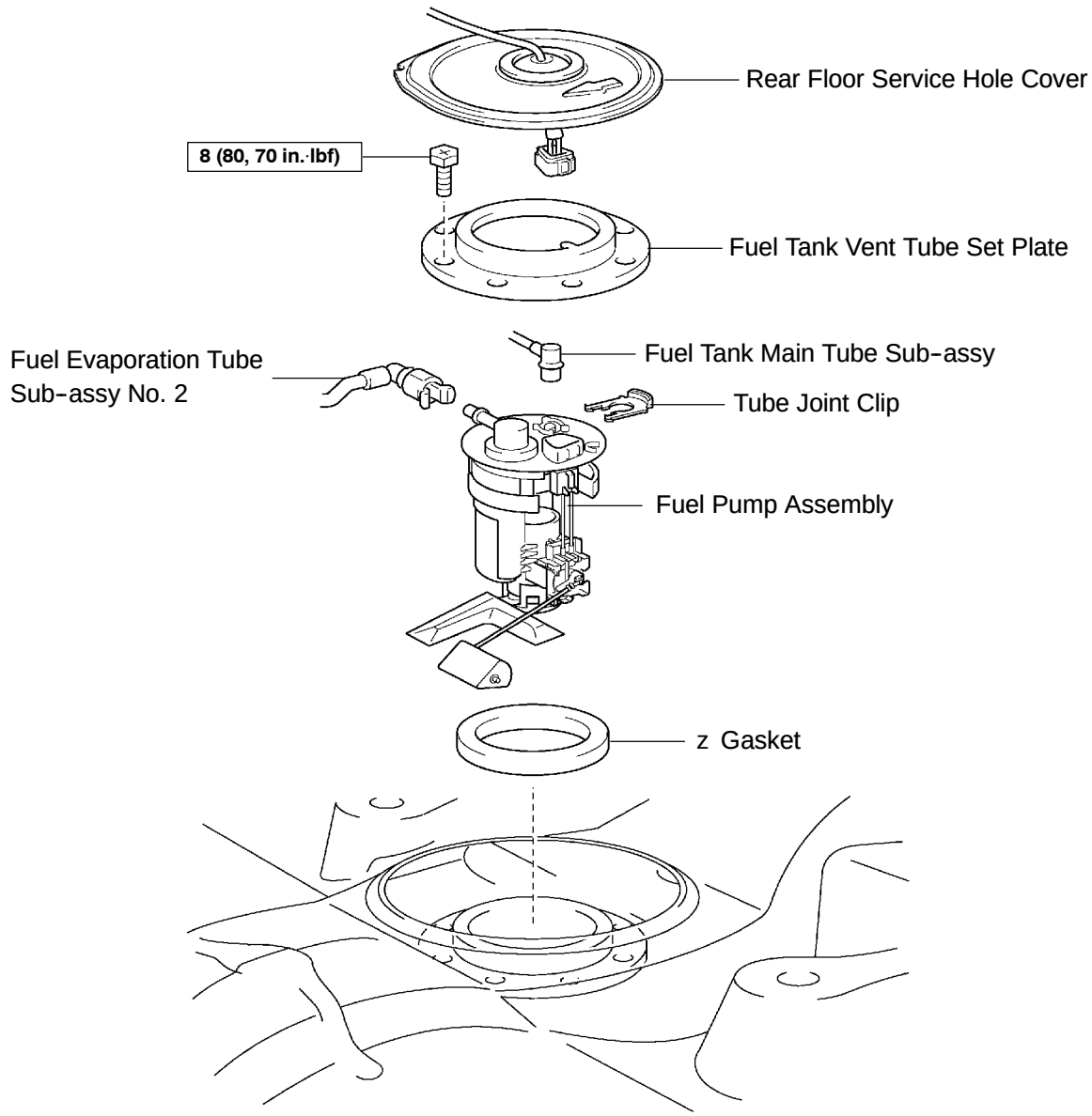
Station Wagon:



N·m (kgf·cm, ft·lbf): Specified torque

Y

A63350

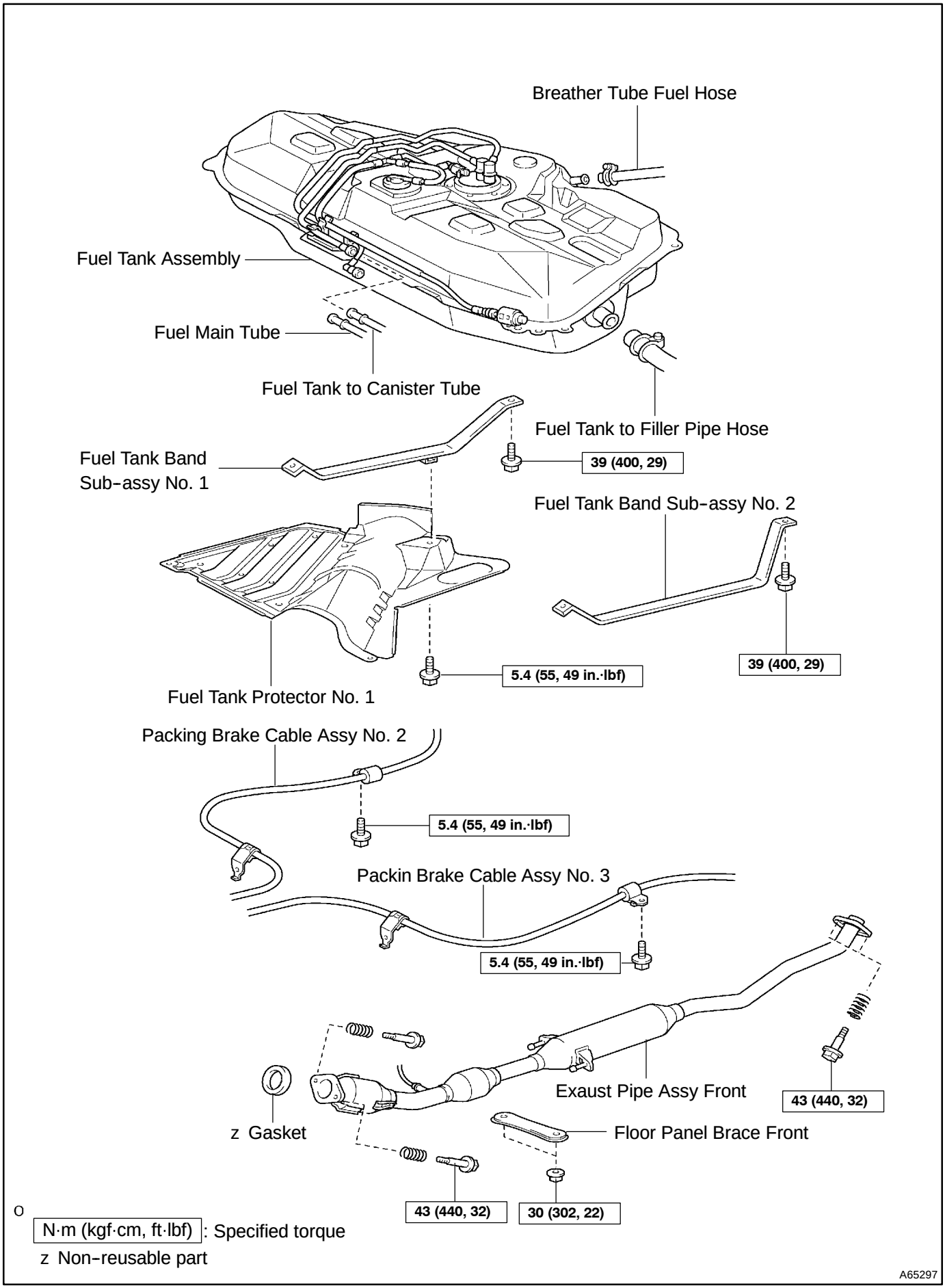


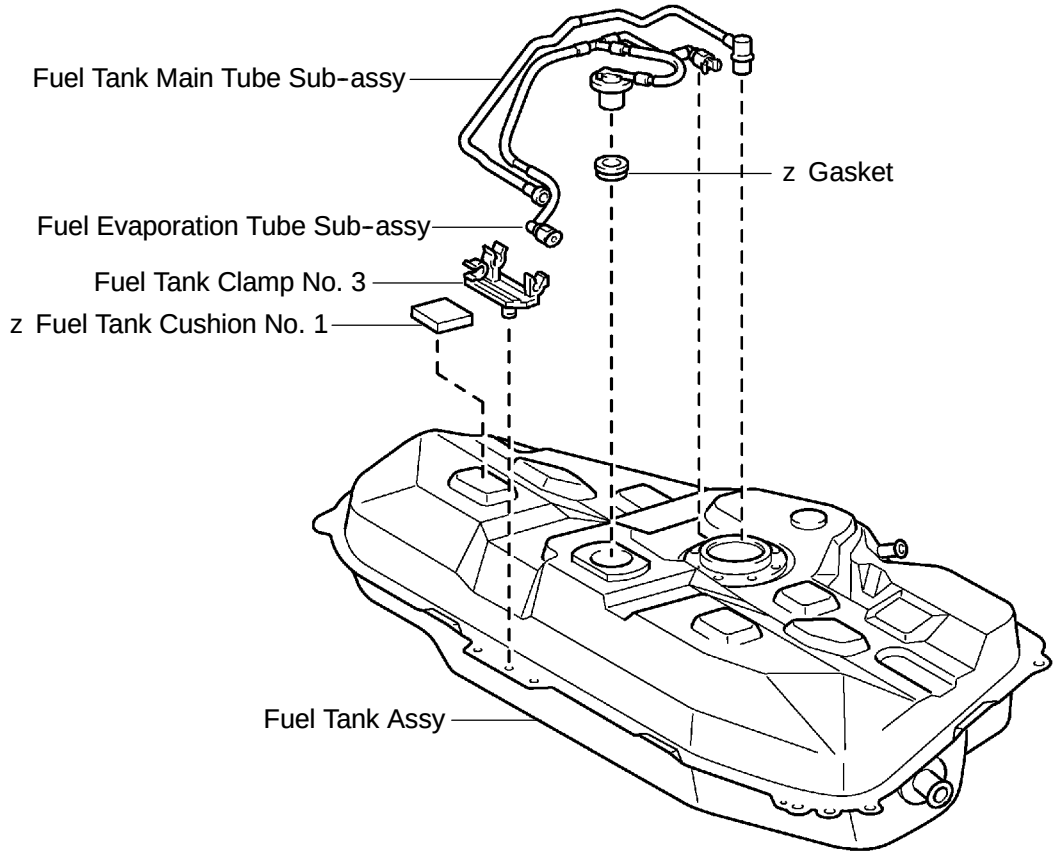
O

N·m (kgf·cm, in.·lbff): Specified torque

z Non-reusable part

A63351


Breather Tube Fuel Hose
Fuel Tank Assembly
Fuel Main Tube
Fuel Tank to Canister Tube
Fuel Tank to Filler Pipe Hose
39 (400, 29)
Fuel Tank Band Sub-assy No. 1
Fuel Tank Band Sub-assy No. 2
39 (400, 29)
5.4 (55, 49 in.·lbf)
Fuel Tank Protector No. 1
Packing Brake Cable Assy No. 2
5.4 (55, 49 in.·lbf)
Packin Brake Cable Assy No. 3
5.4 (55, 49 in.·lbf)
Exaust Pipe Assy Front
43 (440, 32)
z Gasket
Floor Panel Brace Front
43 (440, 32)
30 (302, 22)
O
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A65297



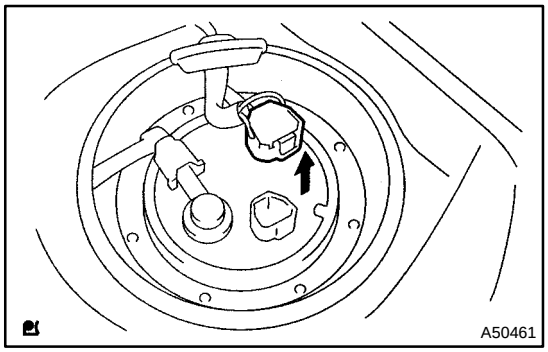
O z Non-reusable part

A63365

110CS-01

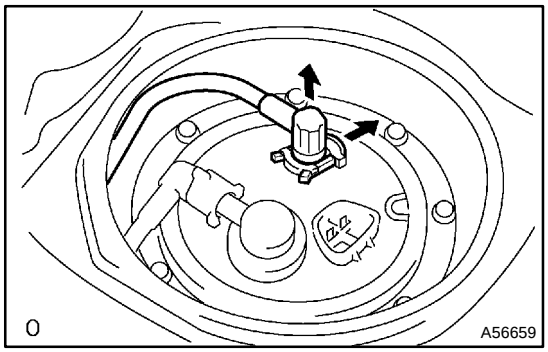
Removal & Installation and Disassembly & Reassembly

1. REMOVE REAR SEAT ASSEMBLY(SEDAN BODY TYPE)
2. REMOVE REAR SEAT CUSHION ASSY LH(WAGON BODY TYPE)
3. REMOVE REAR SEAT CUSHION ASSY RH(WAGON BODY TYPE)
4. REMOVE REAR DOOR SCUFF PLATE LH(WAGON BODY TYPE)
(See page 76-40)
5. REMOVE REAR DOOR SCUFF PLATE RH(WAGON BODY TYPE)
(See page 76-40)
6. REMOVE FLOOR CARPET ASSY FRONT
7. REMOVE REAR FLOOR SERVICE HOLE COVER



8. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT

(a) Disconnect the fuel pump connector.
(b) Start the engine.
(c) After the engine has stopped on the its own, turn the ignition switch to lock.

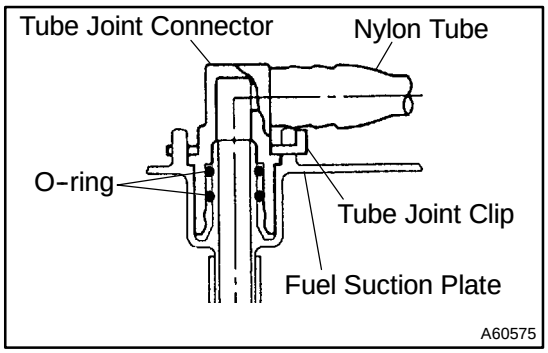


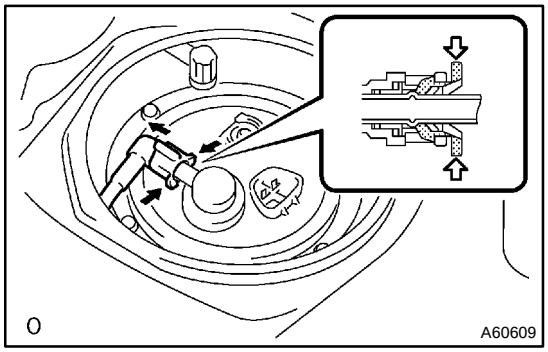
9. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

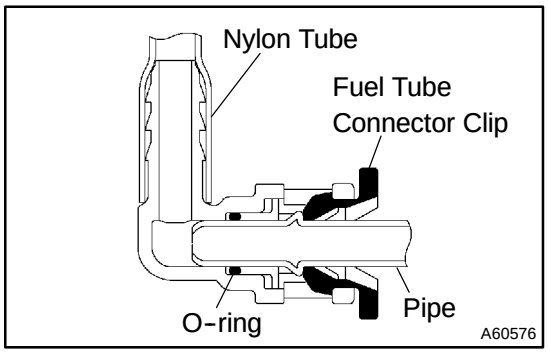
(a) Remove the tube joint clip, and pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**







10. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the tube connector then pull out the fuel evaporation tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When connector and the pipe are stuck, pinch the tube between fingers, and turn it carefully to free and then disconnect the tube.**

11. REMOVE FUEL TANK VENT TUBE SET PLATE

(a) Remove the 8 bolts and fuel tank vent tube set plate.

12. REMOVE FUEL PUMP ASSEMBLY

(a) Pull out the fuel pump assembly.

NOTICE:

- **Do not damage the fuel pump filter.**
- **Be careful that the arm of the sender gauge should not bent.**

(b) Remove the gasket from the pump assembly.

13. DRAIN FUEL

14. REMOVE FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)

(See page 15-5)

15. REMOVE FLOOR CARPET ASSY FRONT

16. REMOVE OXYGEN SENSOR

(See page 15-5)

17. REMOVE FLOOR PANEL BRACE FRONT

(See page 15-5)

18. REMOVE EXHAUST PIPE ASSY FRONT

(a) Remove the 4 bolts, 4 compression spring and exhaust pipe.

19. REMOVE FUEL TANK PROTECTOR NO.1

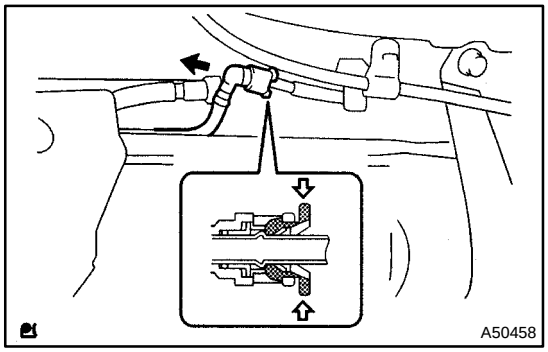
(a) Remove the 3 bolts, the nut and fuel tank protector.

20. DISCONNECT BREATHER TUBE FUEL HOSE

(a) Disconnect the breather tube fuel hose from the fuel tank.

21. DISCONNECT FUEL TANK TO FILLER PIPE HOSE

(a) Disconnect the fuel tank to filler pipe hose from the fuel tank.

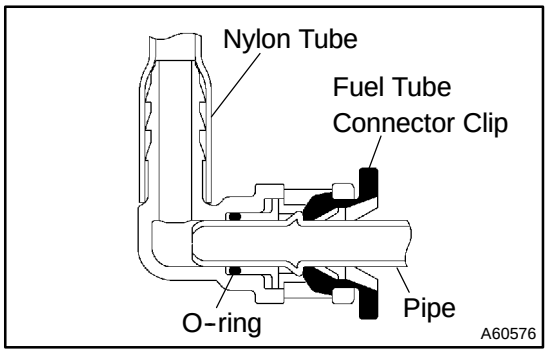


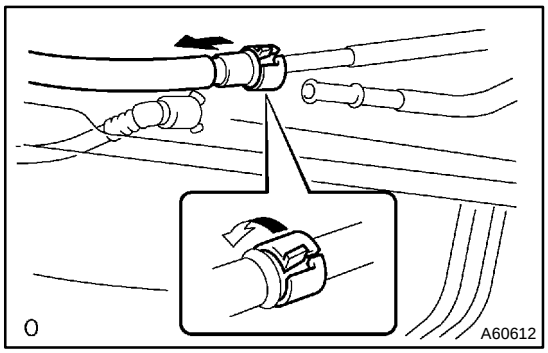
22. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the fuel tube connector clip and then pull out the fuel evaporation tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When connector and the pipe are stuck, pinch the tube between fingers, and turn it carefully to free and then disconnect the tube.**



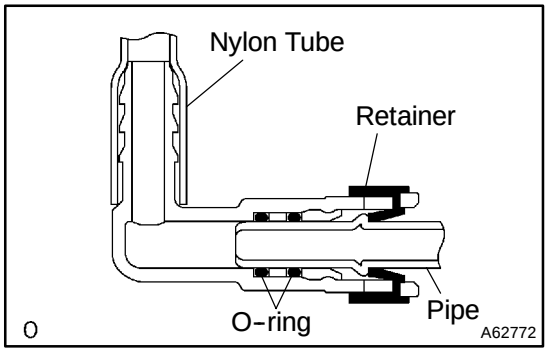


23. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Pinch the projections of the retainer to remove the lock claws and pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When connector and the pipe are stuck, pinch the tube between fingers, and turn it carefully to free and then disconnect the tube.**

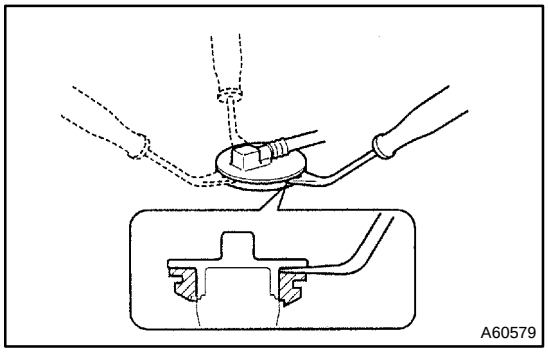


24. REMOVE FUEL TANK ASSY

(a) Remove the 4 installing bolts of the parking brake cable clamp, and separate the parking brake cable.
(b) Set a mission jack to the fuel tank.
(c) Remove the 4 bolts, 2 fuel tank bands and fuel tank.

25. REMOVE FUEL TANK MAIN TUBE SUB-ASSY

(a) Remove fuel tank main tube from the fuel tube clamp.



26. REMOVE FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Using a screwdriver, unlock the claw and remove the protector by turning it counter clockwise.
(b) Insert a clip remover between the check valve and the gasket, remove the valve by gradually pushing it upward.

NOTICE:

- **Work accurately to maintain the sealing performance of the check valve, since it is made from resin. It is easy to damage by removing and installing forcibly.**
- **Be sure to install new check valve and gasket.**

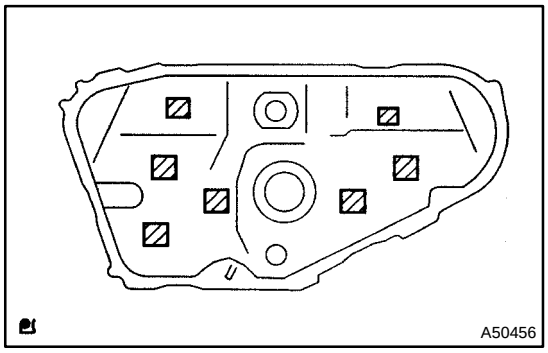
(c) Remove fuel evaporation tube from the fuel tube clamp.

27. REMOVE FUEL TUBE CLAMP NO.3

(a) Remove the fuel tube clamp from the fuel tank.

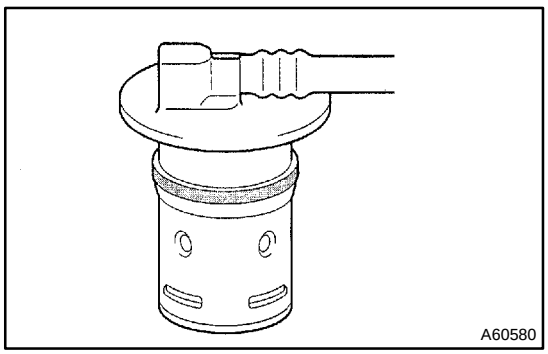
28. REMOVE FUEL TANK CUSHION NO.1

(a) Remove the 7 fuel tank cushion from the fuel tank.



29. INSTALL FUEL TANK CUSHION NO.1

(a) Install a new fuel tank cushion as shown in the illustration.

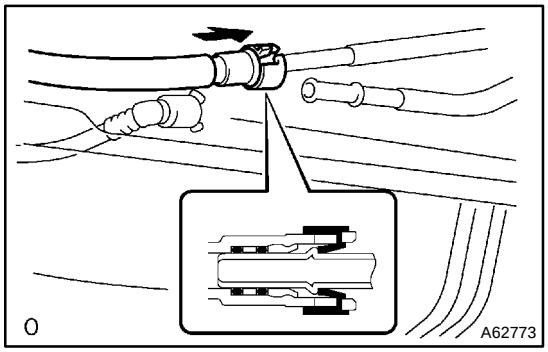


30. INSTALL FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Install a new gasket to the fuel tank.
(b) Apply light oil around the new fuel cut off valve as shown in the illustration, and inspect it into the tank without force. Be careful not to drop the gasket into the tank.
(c) Check that the fuel cut off valve is fully inserted.

31. INSTALL FUEL TANK ASSY

Torque:
Fuel tank band 39 N·m (400 kgf·cm, 29 ft·lbf)
Parking brake cable 5.4 N·m (55 kgf·cm, 48 in.·lbf)

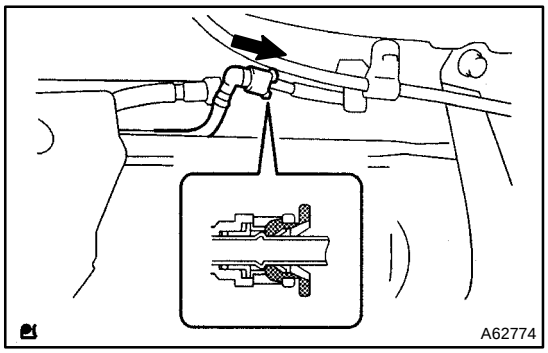


32. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Push in the tube connector to the pipe until and install the retainer.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**



33. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

34. INSTALL FUEL TANK PROTECTOR NO.1

(a) Install the fuel tank protector with the 3 bolts and nut
Torque: 5.4 N·m (55 kgf·cm, 49 in.·lbf)

35. INSTALL OXYGEN SENSOR
(See page 15-6)

36. INSTALL FLOOR CARPET ASSY FRONT

37. FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)

38. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-5)

39. INSTALL FLOOR PANEL BRACE FRONT
(See page 15-5)

40. INSTALL FUEL PUMP ASSEMBLY (See page 11-39)

41. INSTALL FUEL TANK VENT TUBE SET PLATE
(See page 11-40)

42. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2
(See page 11-40)

43. CONNECT FUEL TANK MAIN TUBE SUB-ASSY
(See page 11-40)

44. CHECK FUEL LEAK (See page 11-14)

45. INSTALL REAR FLOOR SERVICE HOLE COVER

(a) Using butyl tape, install the rear floor service hole cover.

46. INSTALL FLOOR CARPET ASSY FRONT

47. INSTALL REAR DOOR SCUFF PLATE RH(WAGON BODY TYPE)

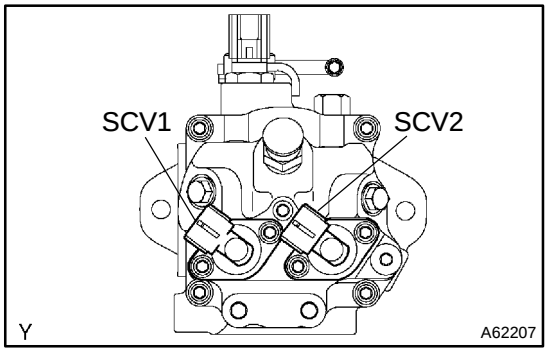
48. INSTALL REAR DOOR SCUFF PLATE LH(WAGON BODY TYPE)

49. INSTALL REAR SEAT CUSHION ASSY RH(WAGON BODY TYPE)
50. INSTALL REAR SEAT CUSHION ASSY LH(WAGON BODY TYPE)
51. INSTALL REAR SEAT ASSEMBLY(SEDAN BODY TYPE)
52. INSTALL CHECK EXHAUST GAS LEAK

FUEL SYSTEM (1CD-FTV)

INSPECTION

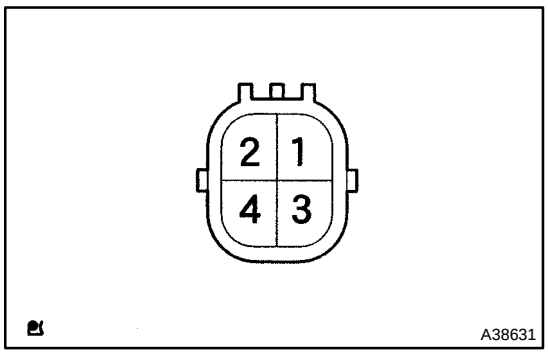
110CX-01



1. INJECTION PUMP ASSY

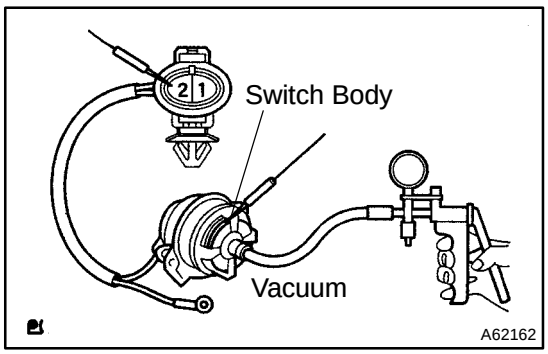
(a) Resistance inspection. (SCV1)
(1) Using an ohmmeter, measure the resistance between terminals.
Resistance: 1.5 - 1.7 Ω at 20_C (68_F)

(b) Resistance inspection. (SCV2)
(1) Using an ohmmeter, measure the resistance between terminals.
Resistance: 1.5 - 1.7 Ω at 20_C (68_F)



2. INJECTOR ASSY

(a) Resistance inspection.
(1) Using an ohmmeter, measure the resistance betweens 3 and 4.
Resistance: 2.6 - 2.8 Ω at 20_C (68_F)



3. FUEL HEATER ASSY(W/ COLD AREA)

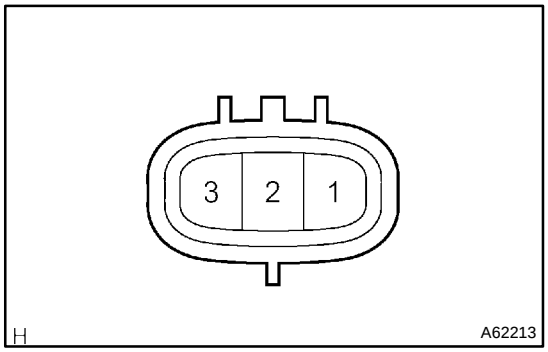
(a) Resistance inspection.
(1) Apply a vacuum of 34.7 ± 5.3 kPa (260 ± 40 mmHg, 10.24 ± 1.57 in Hg) or more to the vacuum switch port.
(2) Using an ohmmeter, measure the resistance between terminal 2 and switch body.
Resistance: 0.5 - 20 Ω at 20_C (68_F)

4. LEVEL WARNING SWITCH

(a) Continuity inspection.
(1) Using an ohmmeter, check that there is continuity between terminals.
Specified condition:
Float Upper limit Continuity
Float Lower limit No continuity

5. FUEL TEMPERATURE SENSOR

(a) Resistance inspection.
(1) Using an ohmmeter, measure the resistance between terminals.
Resistance:
Approx. 20_C (68_F) 2.21 - 2.69 Ω
Approx. 80_C (176_F) 0.287 - 0.349 Ω



6. COMMON RAIL ASSY

(a) Resistance inspection.

(1) Using an ohmmeter, measure the resistance between terminals 2 and 3.

Resistance: 3 kΩ or less

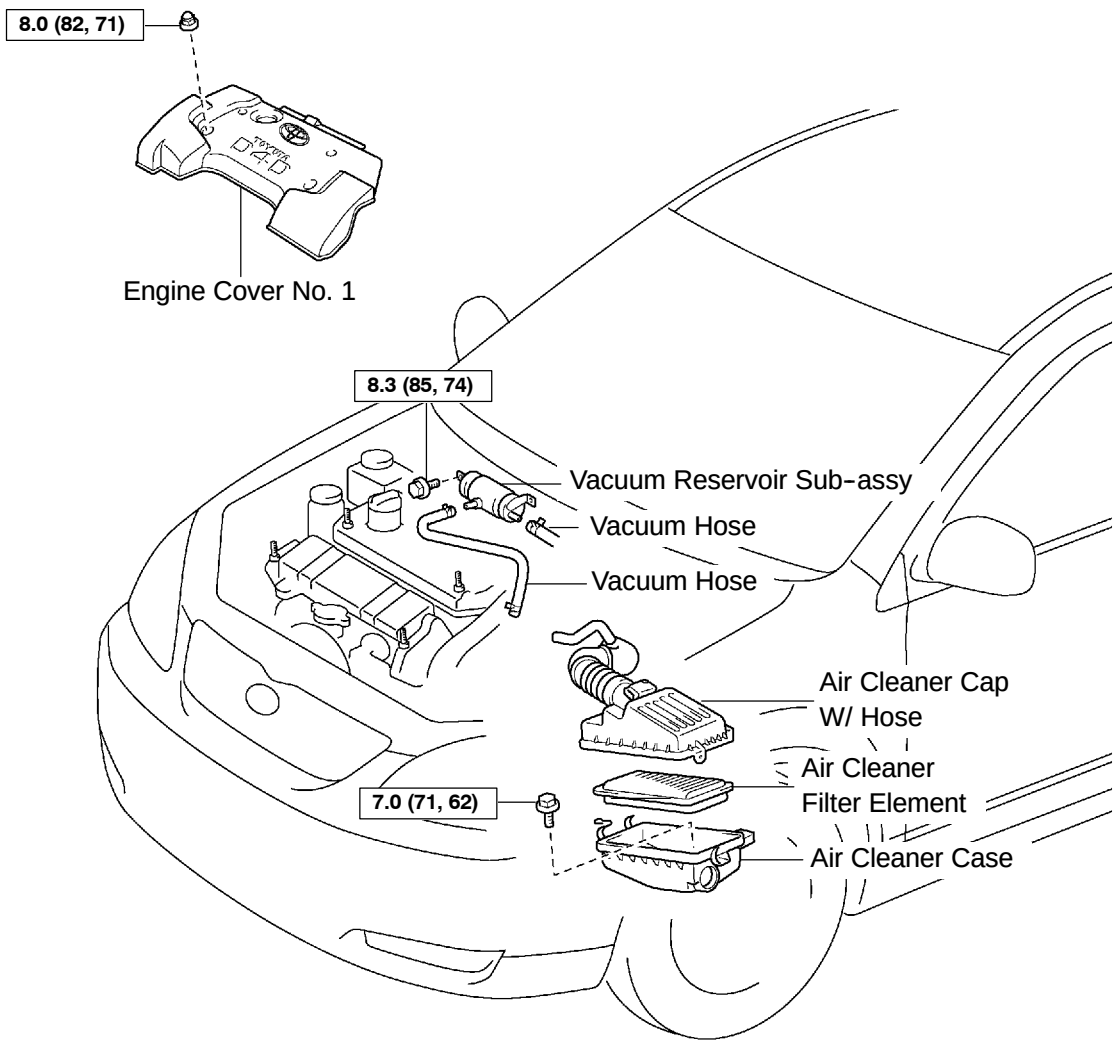
(2) Using an ohmmeter, measure the resistance between terminals 1 and 2.

Resistance: 16.4 kΩ or less

INJECTOR ASSY (1CD-FTV)

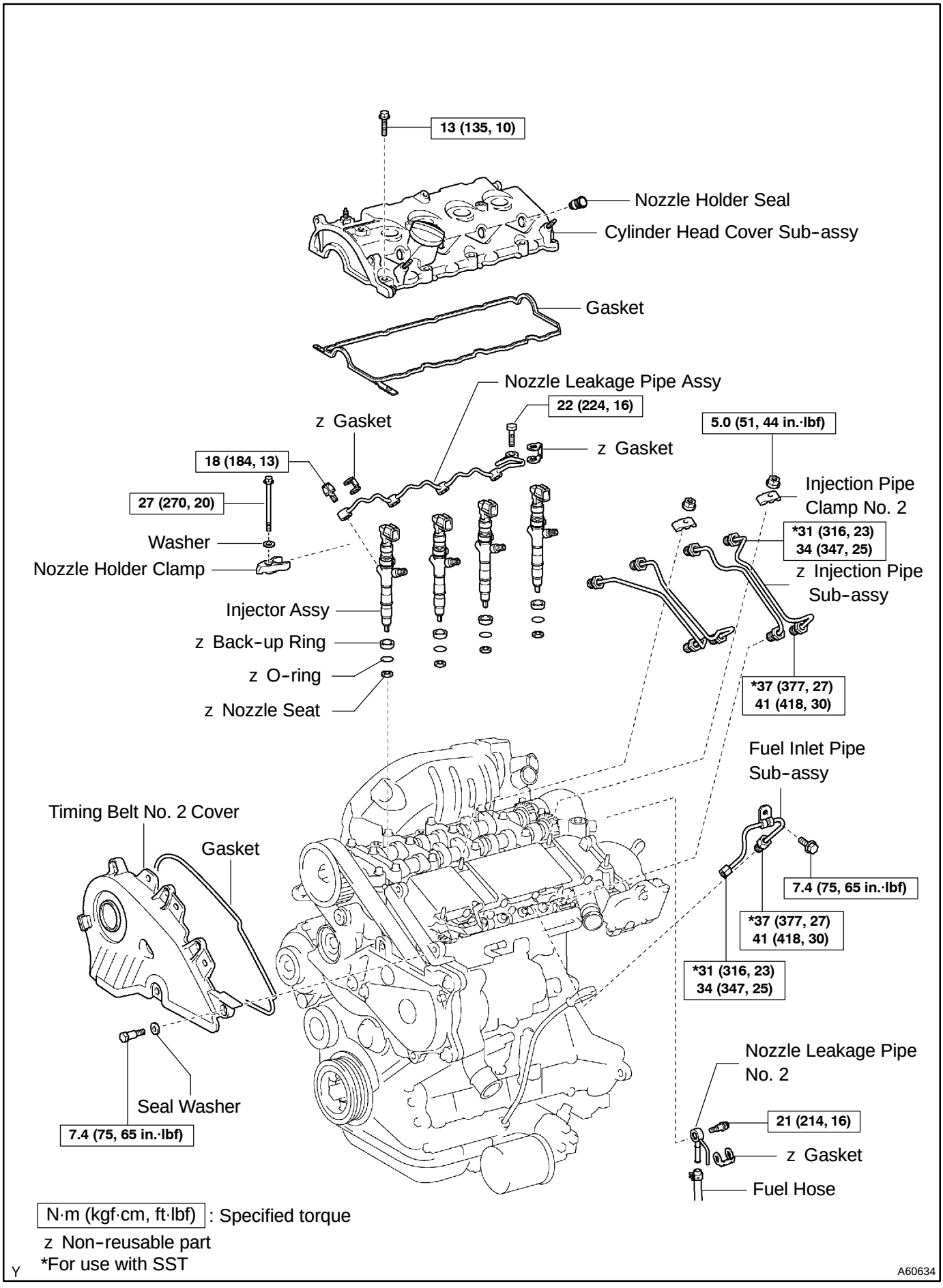
COMPONENTS

110CY-01



O N·m (kgf·cm, in.·lbf) : Specified torque

A64094


13 (135, 10)
Nozzle Holder Seal
Cylinder Head Cover Sub-assy
Gasket
Nozzle Leakage Pipe Assy
22 (224, 16)
z Gasket
z Gasket
5.0 (51, 44 in.·lbf)
18 (184, 13)
27 (270, 20)
Washer
Nozzle Holder Clamp
Injection Pipe Clamp No. 2
*31 (316, 23)
34 (347, 25)
z Injection Pipe Sub-assy
Injector Assy
z Back-up Ring
z O-ring
z Nozzle Seat
*37 (377, 27)
41 (418, 30)
Fuel Inlet Pipe Sub-assy
Timing Belt No. 2 Cover
Gasket
7.4 (75, 65 in.·lbf)
*37 (377, 27)
41 (418, 30)
*31 (316, 23)
34 (347, 25)
Nozzle Leakage Pipe No. 2
Seal Washer
7.4 (75, 65 in.·lbf)
21 (214, 16)
z Gasket
Fuel Hose
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
*For use with SST
Y
A60634

110CZ-01

REPLACEMENT

1. REMOVE VACUUM RESERVOIR SUB-ASSY

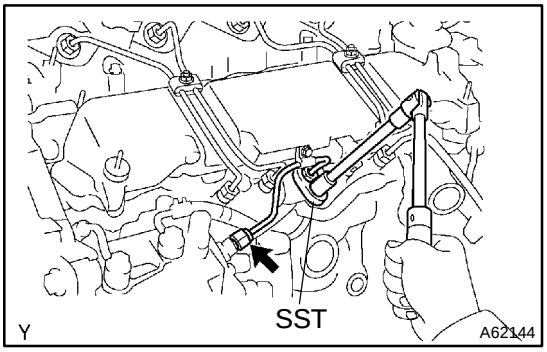
(a) Disconnect the 2 vacuum hoses and connector.
(b) Remove the 2 bolts and vacuum reservoir.

2. REMOVE ENGINE COVER SUB-ASSY NO.1

(a) Remove the 5 nuts and engine cover.

3. REMOVE AIR CLEANER ASSY

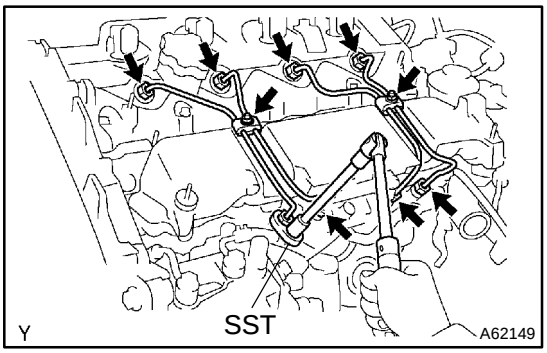
(a) Disconnect the connector.
(b) Loosen the air cleaner hose clamp bolt.
(c) Remove the air cleaner cap with hose.
(d) Remove the air cleaner filter element.
(e) Remove the 3 bolts and air cleaner case.



4. REMOVE FUEL INLET PIPE SUB-ASSY

NOTICE:
After removing the fuel inlet pipe affix the gum tape on the coomon rail and injection pump for preventing dust from coming into them.

(a) Remove the wire bracket and slide the engine wire.
(b) Remove the pipe clamp bolt.
(c) Using SST, remove the fuel inlet pipe from the common rail.
SST 09023-12700
(d) Using SST, remove the fuel inlet pipe from the injection pump.
SST 09023-12900



5. REMOVE INJECTION PIPE SUB-ASSY

NOTICE:
After removing the fuel inlet pipe affix the gum tape on the coomon rail for preventing dust from coming into them.

(a) Remove the 2 nuts and 2 upper injection pipe clamp from the intake manifold.
(b) Using SST, remove the injection pipe from the common rail.
SST 09023-12700
(c) Using SST, remove the injection pipe from the injector.
SST 09023-12900

6. REMOVE TIMING BELT NO.2 COVER

(a) Remove the 7 bolts, 7 seal washers and timing belt cover.

7. REMOVE NOZZLE HOLDER SEAL

(a) Using a screwdriver, pry out the 4 nozzle holder seals.

8. REMOVE CYLINDER HEAD COVER SUB-ASSY

(a) Remove the 10 bolts and cylinder head cover.

9. REMOVE NOZZLE LEAKAGE PIPE ASSY

(a) Remove the union bolt, 4 hollow screws, nozzle leakage pipe and 5 gaskets.

NOTICE:

When removing the return pipe, place the shop rag and the likes under pipe.

10. REMOVE NOZZLE HOLDER CLAMP

(a) Remove the 4 bolts, 4 washers and 4 nozzle holder clamps.

11. REMOVE INJECTOR ASSY

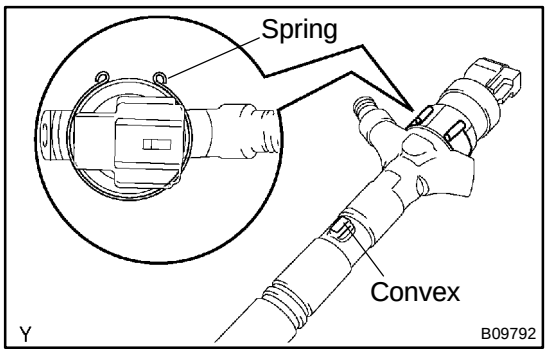
(a) Remove the 4 injectors from the cylinder head.

HINT:

Arrange the injectors in correct order.

(b) Remove the O-ring and back-up ring from each injector.

(c) Remove the 4 nozzle seats from the cylinder head.



12. INSTALL INJECTOR ASSY

(a) Install 4 new nozzle seats to the cylinder head.

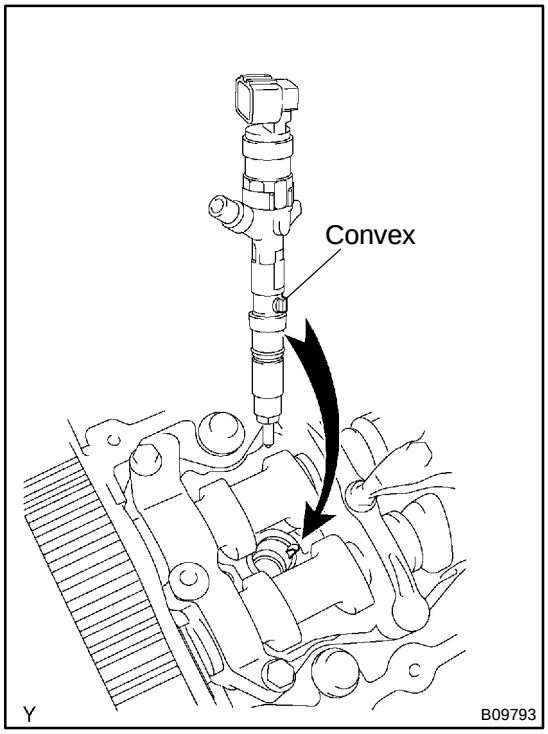
(b) Set the spring to each injector.

NOTICE:

Be sure to make the opening direction of the spring and the direction of the injector positioning convex meet.

(c) Install a new back-up ring and O-ring to each injector.

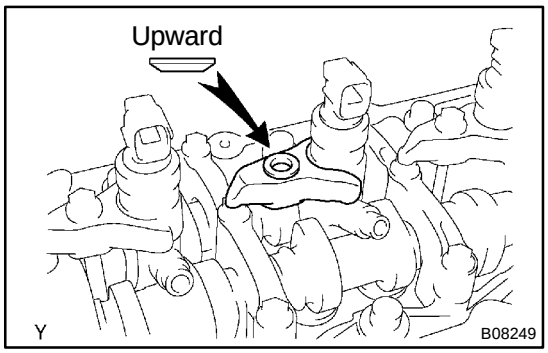
(d) Apply a light coat of oil onto O-ring to each injector.



(e) Meet the injector positioning convex to the positioning concave at the cylinder head side and install the injector to the cylinder head.

NOTICE:

- **At this insert the injector until it touches the nozzle sheet surface.**
- **When installing the injector to the cylinder head and in case that the injector comes to float up with the reaction of O-ring, pull out the injector once, install it again.**
- **During the time after equipping the head cover and before installing the injection pipe, install the irregular object prevention cover.**
- **Do not exchange the injector cylinder.**



13. INSTALL NOZZLE HOLDER CLAMP

(a) Place the 4 nozzle holder clamps to each injector.

(b) Set the washer on the nozzle holder clamp as shown in the illustration.

(c) Tighten the bolt.

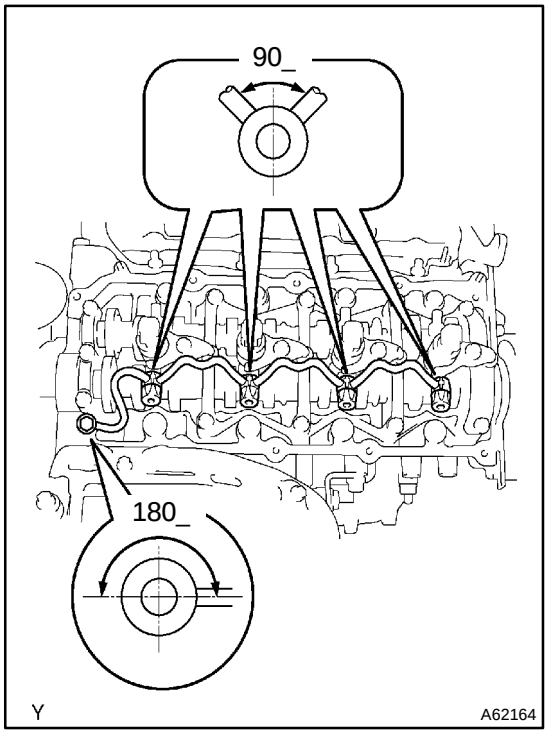
Torque: 27 N·m (270 kgf·cm, 20 ft·lbf)

HINT:

Apply a light coat of engine oil on the threads and under the heads of the nozzle holder clamp bolts.

NOTICE:

At this time, the clamp has its cam cap bolt as a fulcrum and clip the injector at the fork portion.



14. INSTALL NOZZLE LEAKAGE PIPE ASSY

(a) Place the nozzle leakage pipe and 5 new gaskets.

NOTICE:

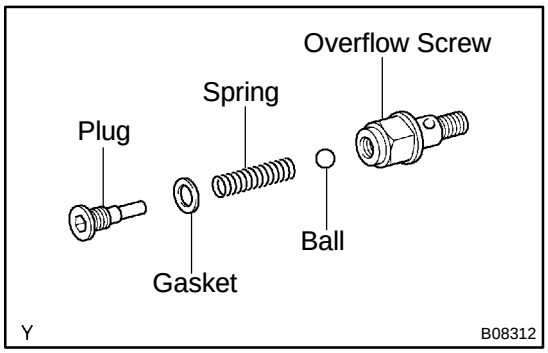
Do the installation of the gasket craw within the angle range shown in the illustration.

(b) Apply a light coat of oil onto 4 hollow screws and union bolt.

(c) Tighten the 4 hollow screws and union bolt by hand.

(d) Tighten the 4 hollow screws and union bolt.

Torque:
Hollow screw 18 N·m (184 kgf·cm, 13 ft·lbf)
Union bolt 22 N·m (224 kgf·cm, 16 ft·lbf)



(e) Check that there are no leaks from nozzle leakage pipe connection.

(1) Disconnect the fuel hose, and remove the check valve, nozzle leakage No. 2 pipe and gasket.

(2) Purchase a new check valve (Part No. 23122 - 27010).

(3) Remove the plug, gasket, spring and ball.

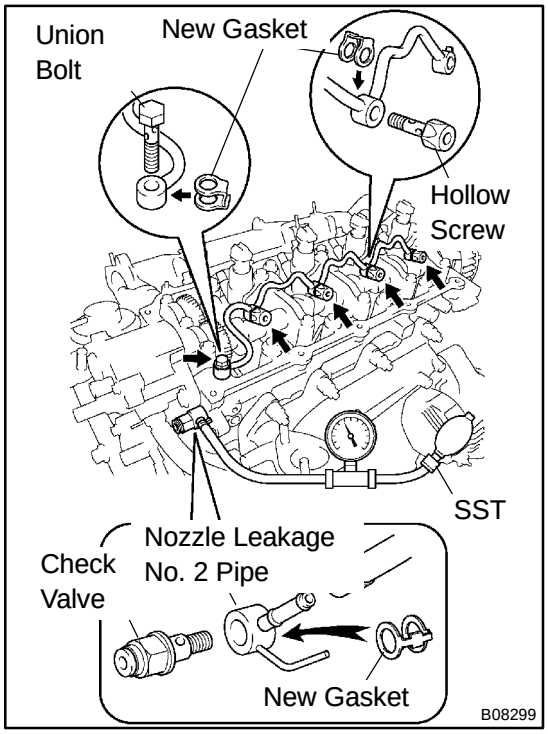
(4) Install the plug with the gasket to the overflow screw.

Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

(5) Install the nozzle leakage No. 2 pipe and gasket with the check valve to the cylinder head.

Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

(6) Apply a light coat of soapy water (any fluid to detect fuel leakage) on the nozzle leakage pipe connection.

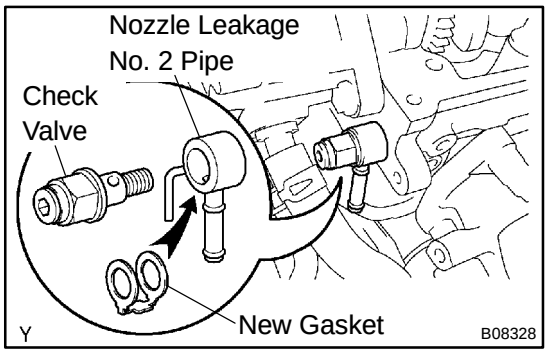


(7) Using SST (turbocharger pressure gauge), apply the SST to the fuel return side of the nozzle leakage No. 2 pipe, and maintain 100 kPa (1 kgf/cm^2, 14.5 psi) of pressure for 600 seconds to check that there are no bubbles from applying the soapy water place.

SST 09992-00242

(8) After checking fuel leaks, wipe off soapy water from nozzle leakage pipe connection.

(9) Remove SST, check valve, nozzle leakage No.2 pipe and gasket.



(10) Reinstall the nozzle leakage No. 2 pipe and a new gasket with the check valve.

Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

HINT:

Never reinstall the disassembled check valve on the engine.

(11) Reconnect the fuel hose to nozzle leakage No. 2 pipe.

15. INSTALL CYLINDER HEAD COVER SUB-ASSY

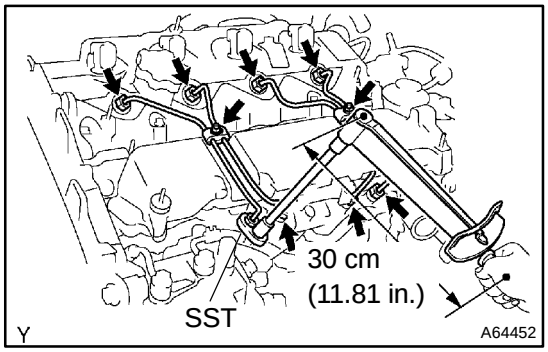
(See page 14-243)

16. INSTALL NOZZLE HOLDER SEAL

(a) Install new 4 nozzle holder seals.

17. INSTALL TIMING BELT NO.2 COVER

(See page 14-218)



18. INSTALL INJECTION PIPE SUB-ASSY

NOTICE:

In case of having the injectors replaced, must replace injection pipes, too.

(a) Using SST, tighten the injection pipe to common rail.
SST 09023-12900
Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(b) Using SST, tighten the injection pipe to the injector.
SST 09023-12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(c) Install the 2 upper injection pipe clamps with the 2 nuts.
Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

19. INSTALL FUEL INLET PIPE SUB-ASSY

(a) Temporarily tighten the inlet pipe and pipe clamp bolt.

(b) Using SST, tighten the fuel inlet pipe to common rail .
SST 09023-12900
Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(c) Using SSt, tighten the injection pipe to the injection pump.
SST 09023-12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(d) Tighten the pipe clamp bolt.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

20. INSTALL AIR CLEANER ASSY

(a) Install air cleaner case with the 3 bolts.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

21. INSTALL ENGINE COVER SUB-ASSY NO.1

(a) Install the 5 nuts and engine cover.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

22. INSTALL VACUUM RESERVOIR SUB-ASSY

(a) Install the vacuum reservoir with the 2 bolts.
Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)

23. CHECK FUEL LEAK

CAUTION:
- **During ACTIVE TEST mode, engine speed goes high and combustion noise becomes loud, so pay attention.**
- **During ACTIVE TEST mode, fuel becomes high-pressured, so take much care for not expose your eyes, hands or body to the escaped fuel.**

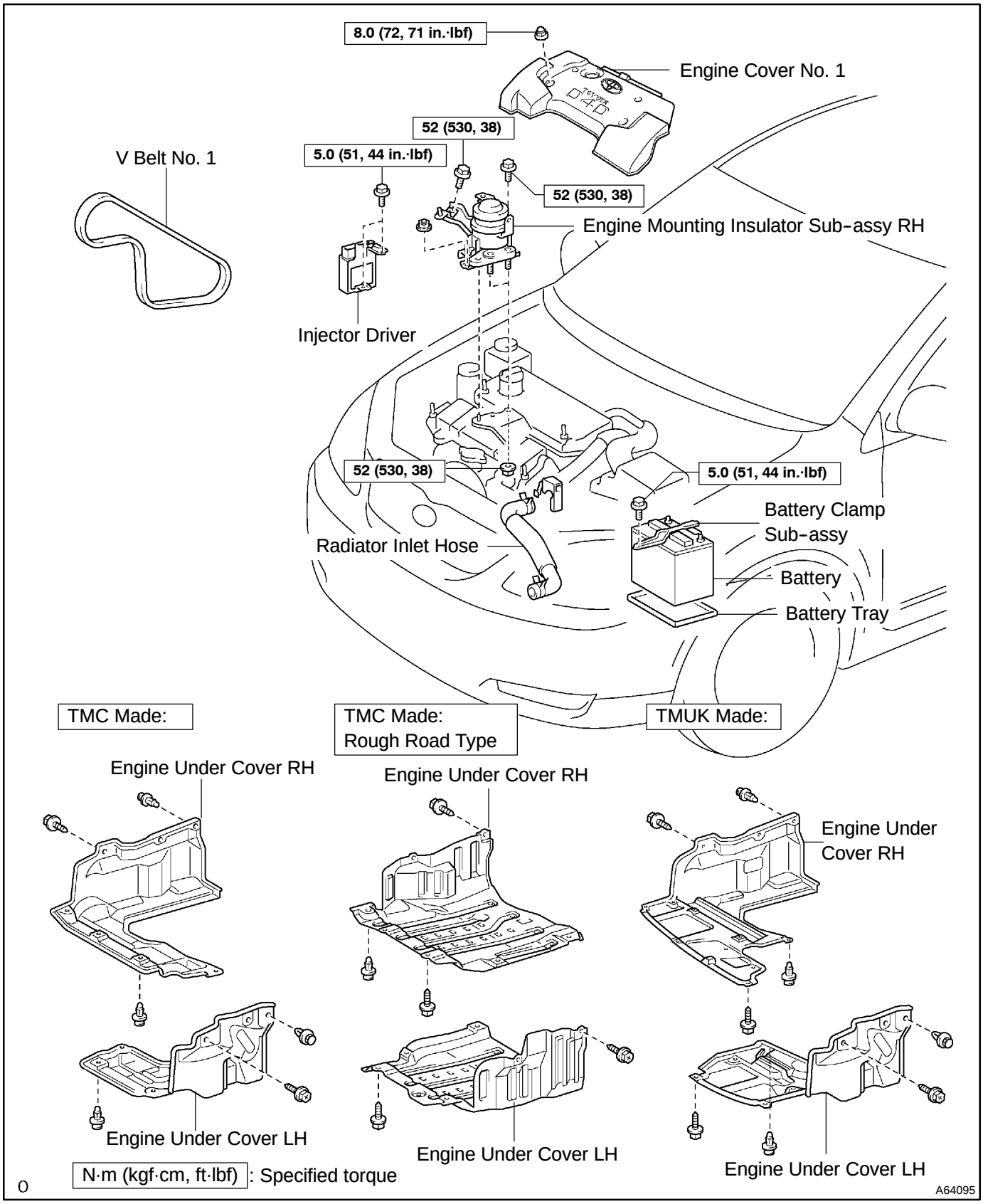
(a) Check that there are no leaks from any part of the fuel system at the engine stops.
HINT:
If there is fuel leakage, replace these parts.
(b) While cranking or start the engine, check that there are no leaks from any part of the fuel system.
HINT:
If there is fuel leakage, replace these parts.
(c) Disconnect the fuel hose from the common rail.
(d) While cranking the engine, check fuel leaks from the return pipe.
HINT:
If there is fuel leakage, replace the common rail.
(e) Connect the hand-held tester to the DLC3.
(f) Start the engine and push the hand-held tester main switch ON.
(g) Select the FUEL LEAK test of ACTIVE TEST mode on the hand-held tester.
(h) If you have no hand-held tester, depress the accelerator pedal quickly and fully to increase the engine speed at maximum and keep it for 2 seconds. Repeat this operation several tomes.
(i) Check that there are no leaks from any part to the fuel system.

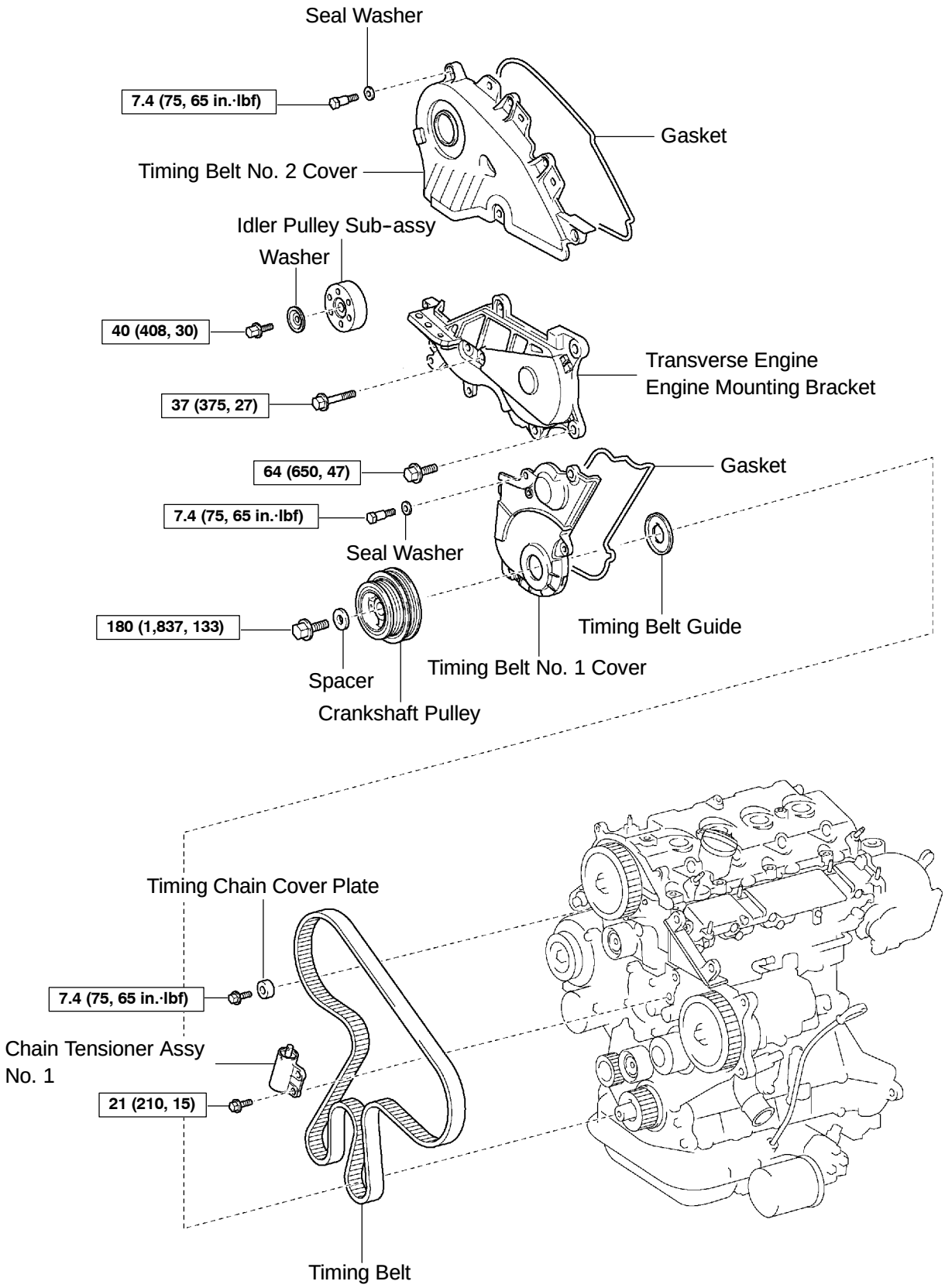
NOTICE:
However, if the leakage from the return pipe is less than 10 cc (0.6 cu in.) in a minute, it is acceptable.
HINT:
If there is fuel leakage, replace these parts.
(j) Reconnect the fuel hose to the common rail.

INJECTION PUMP ASSY (1CD-FTV)

COMPONENTS

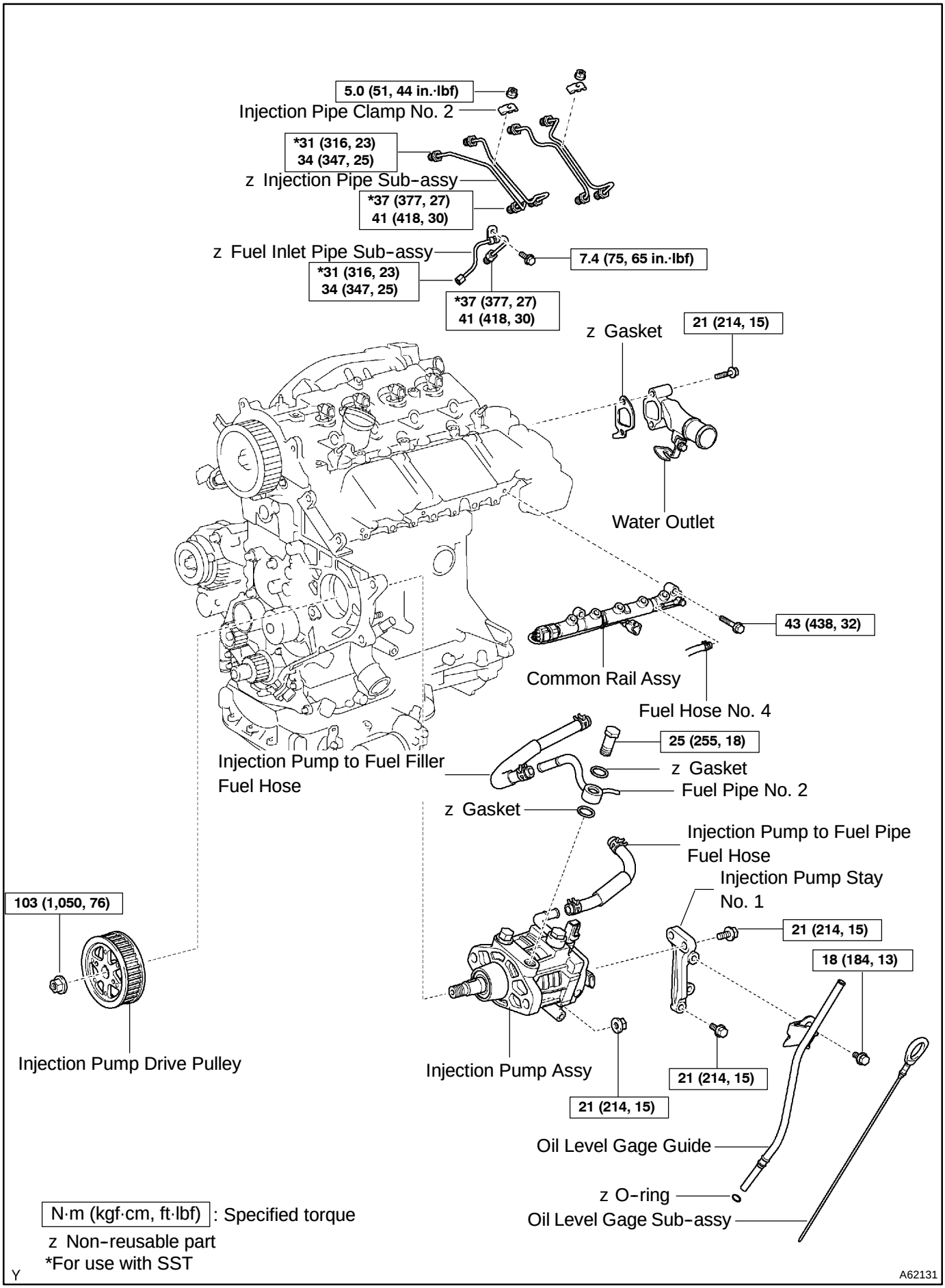
110D0-01





N·m (kgf·cm, ft·lbf): Specified torque

A60635


5.0 (51, 44 in.·lbf)
Injection Pipe Clamp No. 2
*31 (316, 23)
34 (347, 25)
z Injection Pipe Sub-assy
*37 (377, 27)
41 (418, 30)
z Fuel Inlet Pipe Sub-assy
7.4 (75, 65 in.·lbf)
*31 (316, 23)
34 (347, 25)
*37 (377, 27)
41 (418, 30)
z Gasket
21 (214, 15)
Water Outlet
43 (438, 32)
Common Rail Assy
Fuel Hose No. 4
25 (255, 18)
z Gasket
Fuel Pipe No. 2
Injection Pump to Fuel Filler
Fuel Hose
z Gasket
Injection Pump to Fuel Pipe
Fuel Hose
Injection Pump Stay
No. 1
21 (214, 15)
18 (184, 13)
103 (1,050, 76)
Injection Pump Drive Pulley
Injection Pump Assy
21 (214, 15)
21 (214, 15)
Oil Level Gage Guide
z O-ring
Oil Level Gage Sub-assy
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
*For use with SST
Y
A62131

REPLACEMENT

1. REMOVE ENGINE UNDER COVER LH

(a) Remove the 2 screws, 3 clips and engine under cover.

2. DRAIN COOLANT **(See page 16-33)**

3. REMOVE ENGINE UNDER COVER RH

(a) Remove the 2 screws, 3 clips and engine under cover.

4. REMOVE FRONT WHEEL RH

5. REMOVE BATTERY

6. REMOVE AIR INTAKE SEPARATOR

7. REMOVE ENGINE COVER SUB-ASSY NO.1

(a) Remove the 5 nuts and engine cover.

8. DISCONNECT RADIATOR HOSE INLET

(a) Disconnect the radiator hose inlet from the water outlet.

9. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 **(See page 14-172)**

10. REMOVE GENERATOR V BELT **(See page 14-172)**

11. REMOVE INJECTOR DRIVER

(a) Disconnect the 2 connectors.
(b) Remove the 2 bolts and injector driver.

12. REMOVE ENGINE MOUNTING BRACKET NO.2 RH **(See page 14-213)**

13. REMOVE CRANKSHAFT PULLEY **(See page 14-213)**

SST 09213-54015 (91651-60855), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05030)

14. REMOVE IDLER PULLEY SUB-ASSY

(a) Remove the bolt, washer and idler pulley.

15. REMOVE TIMING BELT NO.2 COVER

(a) Remove the 7 bolts, 7 seal washers and timing belt cover.

16. REMOVE TIMING BELT NO.1 COVER

(a) Remove the 5 bolts, 5 seal washers and timing belt cover.

17. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 6 bolts and transverse engine engine mounting bracket.

18. REMOVE TIMING BELT GUIDE

19. SET NO.1 CYLINDER TO TDC/COMPRESSION **(See page 14-214)**

20. REMOVE TIMING CHAIN COVER PLATE

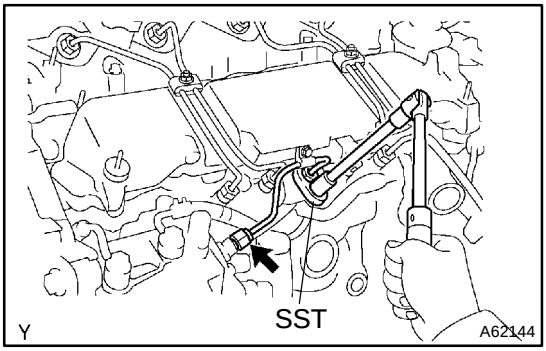
(a) Remove the bolt and timing chain cover plate.

21. REMOVE CHAIN TENSIONER ASSY NO.1

(a) Remove the 2 bolts and chain tensioner.

22. REMOVE TIMING BELT

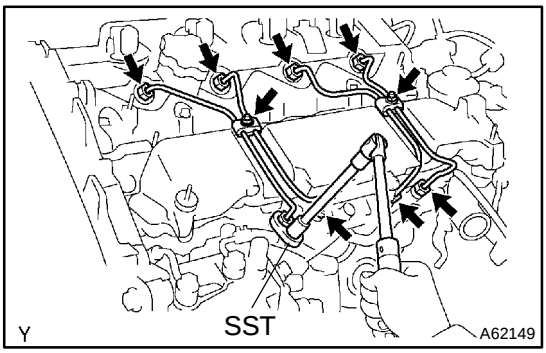
(See page 14-215)



23. REMOVE FUEL INLET PIPE SUB-ASSY

NOTICE:
After removing the fuel inlet pipe affix the gum tape on the common rail and injection pump for preventing dust from coming into them.

(a) Remove the wire bracket and slide the engine wire.
(b) Remove the pipe clamp bolt.
(c) Using SST, remove the fuel inlet pipe from the common rail.
SST 09023-12700
(d) Using SST, remove the fuel inlet pipe from the injection pump.
SST 09023-12900



24. REMOVE INJECTION PIPE SUB-ASSY

NOTICE:
After removing the fuel inlet pipe affix the gum tape on the common rail for preventing dust from coming into them.

(a) Remove the 2 nuts and 2 upper injection pipe clamp from the intake manifold.
(b) Using SST, remove the injection pipe from the common rail.
SST 09023-12700
(c) Using SST, remove the injection pipe from the injector.
SST 09023-12900

25. REMOVE WATER OUTLET

(a) Remove the 2 bolts, water outlet and gasket.

26. DISCONNECT FUEL HOSE NO.4

(a) Disconnect the fuel hose from the common rail.

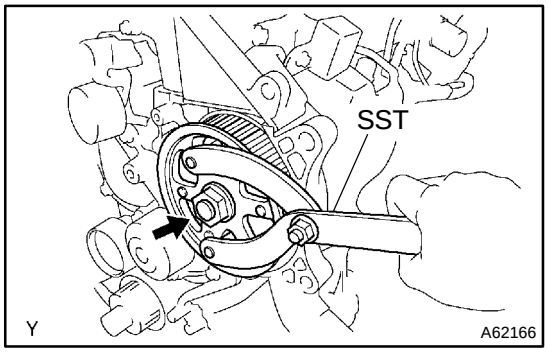
27. REMOVE COMMON RAIL ASSY

(a) Remove the fuel pressure sensor connector from the bracket.
(b) Remove the 2 bolts and common rail.

28. REMOVE OIL LEVEL GAGE SUB-ASSY

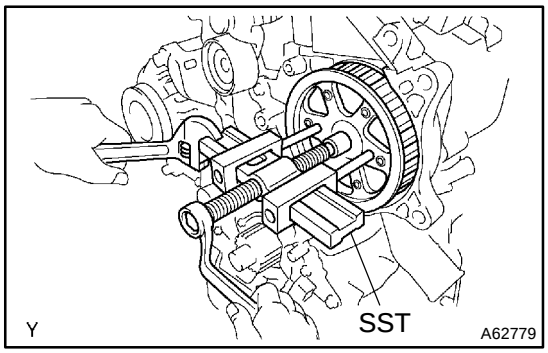
29. REMOVE OIL LEVEL GAGE GUIDE

(See page 17-15)



30. REMOVE INJECTION PUMP DRIVE PULLEY

(a) Using SSt, remove the pulley nut.
SST 09960-10010 (09962-01000, 09963-01000)



(b) Using SST, remove the injection pump drive pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

31. DISCONNECT INJECTION PUMP TO FUEL PIPE FUEL HOSE

(a) Disconnect the injection pump to fuel pipe fuel hose from the fuel pipe.

32. DISCONNECT INJECTION PUMP TO FUEL FILTER FUEL HOSE OR PIPE

(a) Disconnect the injection pump to fuel filter fuel hose or pipe from the fuel pipe.

33. REMOVE INJECTION PUMP STAY NO.1

(a) Remove the 4 bolts and injection pump stay.

34. REMOVE INJECTION PUMP ASSY

(a) Remove the 2 nuts and injection pump.

35. REMOVE FUEL PIPE NO.2

(a) Remove the union bolt, 2 gaskets and fuel pipe.

36. INSTALL FUEL PIPE NO.2

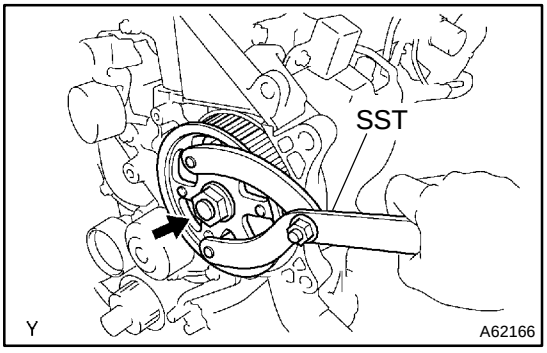
(a) Install the 2 new gaskets, fuel pipe to the injection pump with the union bolt.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

37. INSTALL INJECTION PUMP ASSY

(a) Install the injection pump with the 2 nuts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

38. INSTALL INJECTION PUMP STAY NO.1

(a) Tighten the 2 bolts at the injection pump side until 2 or 3 threads of a screw.
(b) Stick the injection pump stay to both cylinder block and injection pump and torque the cylinder block side.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)
(c) Torque the injection pump side.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



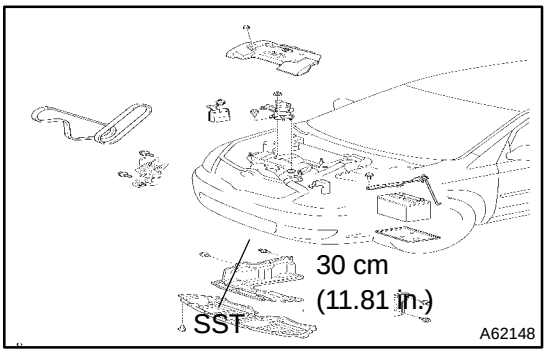
39. INSTALL INJECTION PUMP DRIVE PULLEY

(a) Using SST, install the pulley nut.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

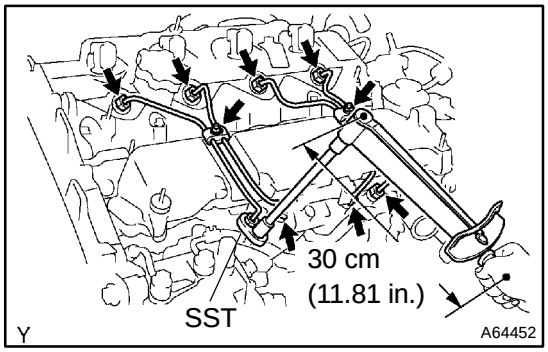
40. INSTALL OIL LEVEL GAGE GUIDE
(See page 17-20)

41. INSTALL COMMON RAIL ASSY

(a) Install the common rail with the 2 bolts.
Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)



42. INSTALL INJECTION PIPE SUB-ASSY
NOTICE:
In case of having the injectors replaced, must replace injection pipes. too.
(a) Using SST, tighten the injection pipe to common rail.
SST 09023-12900
Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)
HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)
(b) Using SST, tighten the injection pipe to the injector.
SST 09023-12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft·lbf)
HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)
(c) Install the 2 upper injection pipe clamps with the 2 nuts.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



43. INSTALL FUEL INLET PIPE SUB-ASSY

(a) Temporarily tighten the inlet pipe and pipe clamp bolt.
(b) Using SST, tighten the fuel inlet pipe to common rail.
SST 09023-12900
Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)
HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)
(c) Using SSt, tighten the injection pipe to the injection pump.
SST 09023-12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft·lbf)
HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)
(d) Tighten the pipe clamp bolt.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

44. SET NO.1 CYLINDER TO TDC/COMPRESSION **(See page 14-214)**
SST 09960-10010 (09962-01000, 09963-01000)

45. INSTALL TIMING BELT
(See page 14-215)

46. CHECK VALVE TIMING **(See page 14-216)**

47. INSTALL TIMING BELT GUIDE

48. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the transverse engine engine mounting bracket with the 6 bolts.
Torque:
37 N·m (375 kgf·cm, 27 ft·lbf) for 14mm head bolt
64 N·m (650 kgf·cm, 47 ft·lbf) for 17mm head bolt

49. INSTALL TIMING BELT NO.1 COVER
(See page 14-217)

50. INSTALL TIMING BELT NO.2 COVER
(See page 14-218)

51. INSTALL IDLER PULLEY SUB-ASSY

(a) Install the idler pulley and washer with the bolt.
Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)

52. INSTALL CRANKSHAFT PULLEY
(See page 14-219)
SST 09213-54015 (91651-60855), 09330-00021

53. INSTALL ENGINE MOUNTING BRACKET NO.2 RH

(a) Install the engine mounting insulator with the 2 bolts and 3 nuts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

54. INSTALL GENERATOR V BELT
(See page 14-172)

55. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page 14-172)

56. INSTALL ENGINE COVER SUB-ASSY NO.1

(a) Install the 5 nuts and engine cover.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

57. INSTALL BATTERY
Torque:
Bolt 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Nut 3.0 - 4.0 N·m (31 - 41 kgf·cm, 27 - 35 in.·lbf)

58. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

59. ADD COOLANT (See page 16-33)

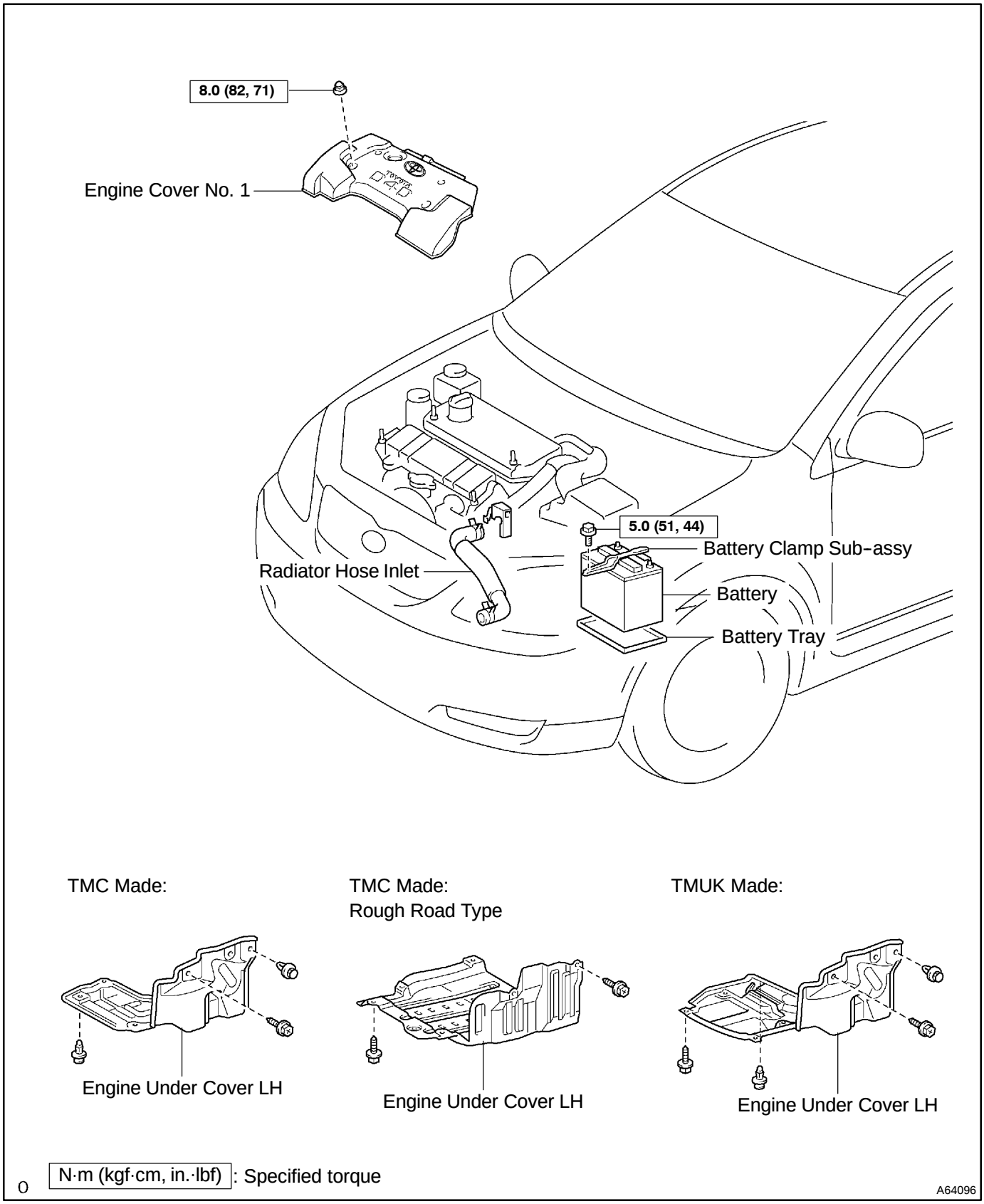
60. CHECK COOLANT LEAK (See page 16-27)

61. CHECK FUEL LEAK (See page 11-70)

COMMON RAIL ASSY (1CD-FTV)

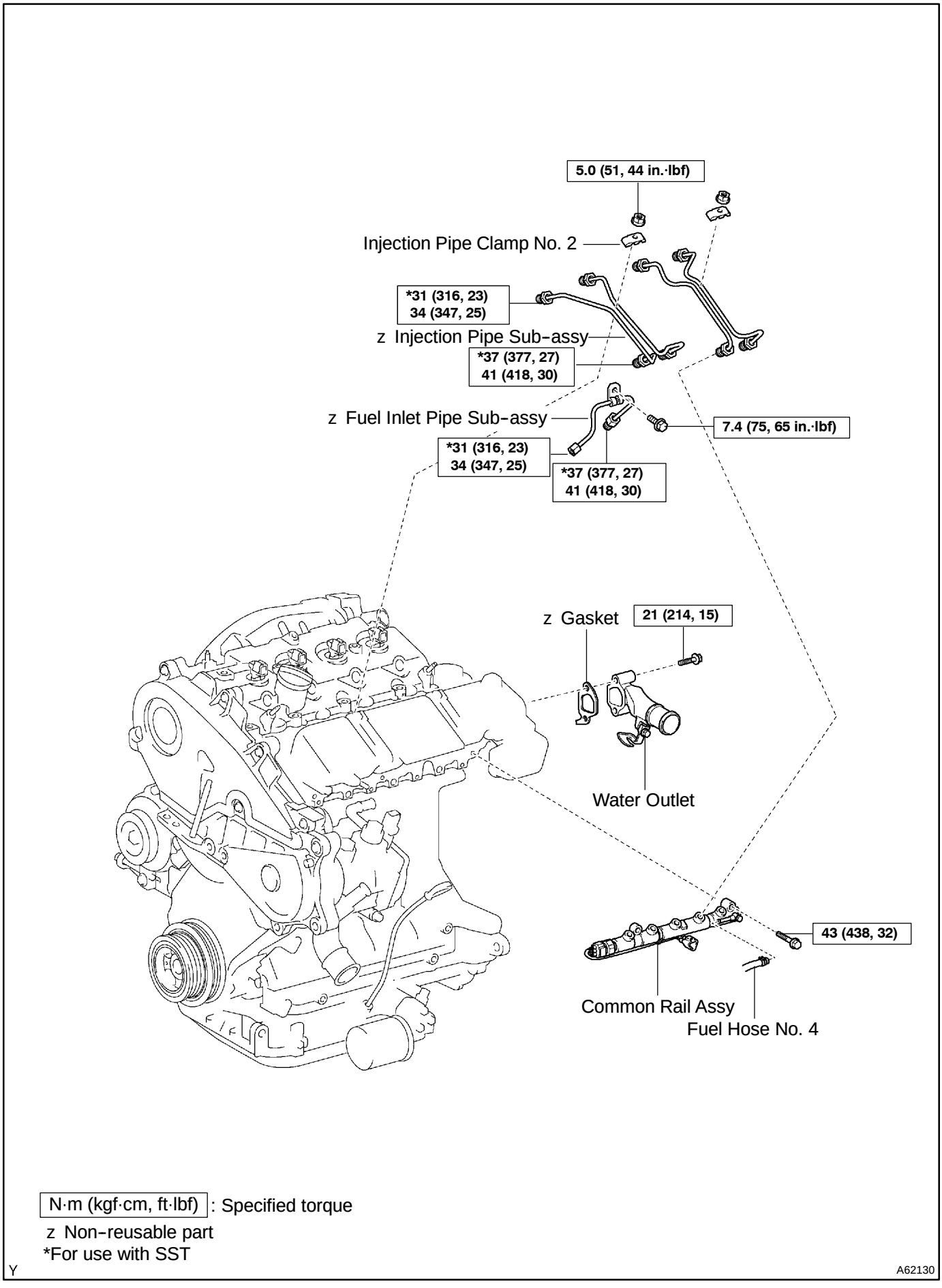
COMPONENTS

110D2-01



O N·m (kgf·cm, in.·lbf): Specified torque

A64096



N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
*For use with SST

Y A62130

REPLACEMENT

1. REMOVE ENGINE UNDER COVER LH

(a) Remove the 2 screws, 3 clips and engine under cover.

2. DRAIN COOLANT (See page 16-33)

3. REMOVE BATTERY

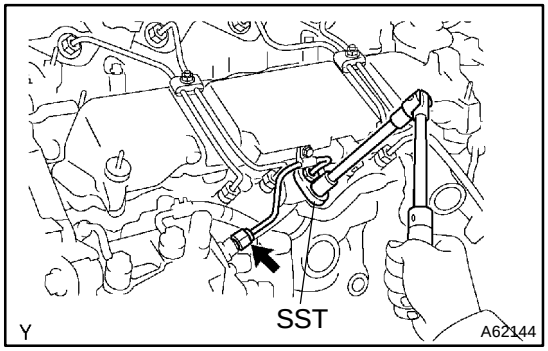
4. REMOVE ENGINE COVER SUB-ASSY NO.1

(a) Remove the 5 nuts and engine cover.

5. REMOVE AIR INTAKE SEPARATOR

6. DISCONNECT RADIATOR HOSE INLET

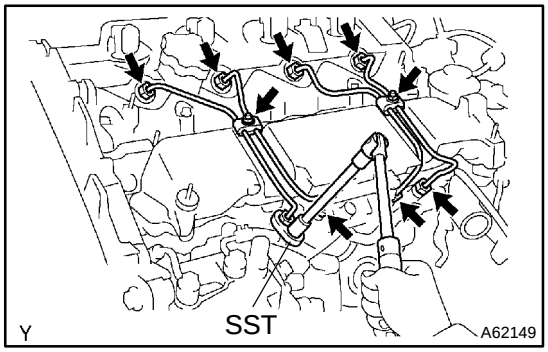
(a) Disconnect the radiator hose inlet from the water outlet.



7. REMOVE FUEL INLET PIPE SUB-ASSY

NOTICE:
After removing the fuel inlet pipe affix the gum tape on the common rail and injection pump for preventing dust from coming into them.

(a) Remove the wire bracket and slide the engine wire.
(b) Remove the pipe clamp bolt.
(c) Using SST, remove the fuel inlet pipe from the common rail.
SST 09023-12700
(d) Using SST, remove the fuel inlet pipe from the injection pump.
SST 09023-12900



8. REMOVE INJECTION PIPE SUB-ASSY

NOTICE:
After removing the fuel inlet pipe affix the gum tape on the common rail for preventing dust from coming into them.

(a) Remove the 2 nuts and 2 upper injection pipe clamp from the intake manifold.
(b) Using SST, remove the injection pipe from the common rail.
SST 09023-12700
(c) Using SST, remove the injection pipe from the injector.
SST 09023-12900

9. REMOVE WATER OUTLET

(a) Remove the 2 bolts, water outlet and gasket.

10. DISCONNECT FUEL HOSE NO.4

(a) Disconnect the fuel hose from the common rail.

11. REMOVE COMMON RAIL ASSY

(a) Remove the fuel pressure sensor connector from the bracket.

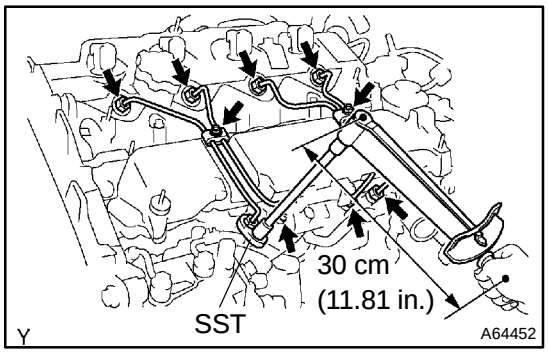
(b) Remove the 2 bolts and common rail.

12. INSTALL COMMON RAIL ASSY

(a) Install the common rail with the 2 bolts.
Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

13. INSTALL WATER OUTLET

(a) Install a new gasket and the water outlet with the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



14. INSTALL INJECTION PIPE SUB-ASSY

NOTICE:
In case of having the injectors replaced, must replace injection pipes. too.

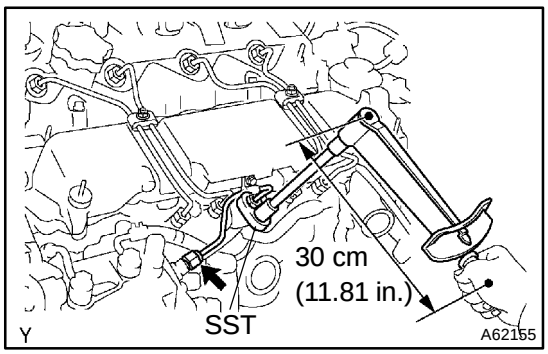
(a) Using SST, tighten the injection pipe to common rail.
SST 09023-12900
Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(b) Using SST, tighten the injection pipe to the injector.
SST 09023-12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(c) Install the 2 upper injection pipe clamps with the 2 nuts.
Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)



15. INSTALL FUEL INLET PIPE SUB-ASSY

(a) Temporarily tighten the inlet pipe and pipe clamp bolt.

(b) Using SST, tighten the fuel inlet pipe to common rail.
SST 09023-12900
Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(c) Using SSt, tighten the injection pipe to the injection pump.
SST 09023-12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

(d) Tighten the pipe clamp bolt.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

16. INSTALL ENGINE COVER SUB-ASSY NO.1

(a) Install the 5 nuts and engine cover.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

17. INSTALL BATTERY
Torque:
Bolt 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Nut 3.0 - 4.0 N·m (31 - 41 kgf·cm, 27 - 35 in.·lbf)

18. ADD COOLANT **(See page 16-33)**

19. CHECK COOLANT LEAK **(See page 16-27)**

20. CHECK FUEL LEAK **(See page 11-70)**

FUEL FILTER ASSY (1CD-FTV)

110D4-01

REPLACEMENT

1. REMOVE AIR CLEANER ASSY

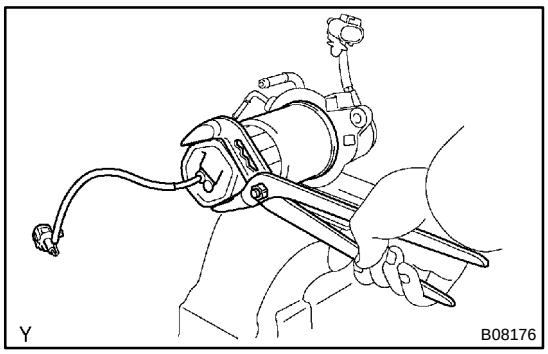
(a) Disconnect the connector.
(b) Loosen the air cleaner hose clamp bolt.
(c) Remove the air cleaner cap w/ hose.
(d) Remove the air cleaner filter element.
(e) Remove the 3 bolts and air cleaner case.

2. REMOVE FUEL FILTER ASSY

(a) Disconnect the 2 fuel hose from the fuel filter. (STD)
(b) Disconnect the 3 fuel hose from the fuel filter. (COLD)
(c) Disconnect the connector. (STD)
(d) Disconnect the 2 connectors. (COLD)
(e) Remove the 2 bolts and fuel filter.

3. DRAIN FUEL

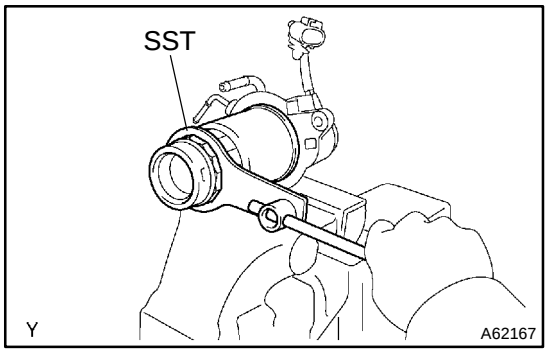
(a) Loosen the drain plug, and drain the fuel from the fuel filter.



4. REMOVE LEVEL WARNING SWITCH

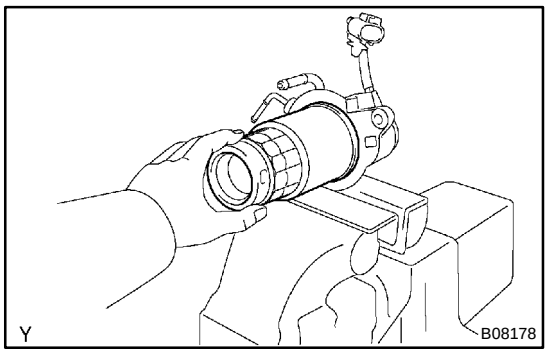
(a) Mount the fuel filter in a soft jaw vise.
(b) Using pliers, remove the level warning switch.

NOTICE:
Be careful not to damage the level warning switch.



5. REMOVE FUEL FILTER ELEMENT SUB-ASSY

(a) Using SST, remove the fuel filter element.
SST 09228-64030



6. INSTALL FUEL FILTER ELEMENT SUB-ASSY

(a) Check and clean the fuel filter installation surface.
(b) Apply fuel to the gasket of a new fuel filter element.
(c) Lightly screw the fuel filter element into place, and tighten it until the gasket comes into contact with the seat.
(d) Tighten it additional 3/4 turn by hand.

7. INSTALL LEVEL WARNING SWITCH

(a) Install a new O-ring to the level warning switch.
(b) Apply fuel to the O-ring of the level warning switch.
(c) Install the level warning switch to the fuel filter by hand.

8. INSTALL FUEL FILTER ASSY

(a) Install the fuel filter with the 2 bolts.
Torque: 18 N·m (178 kgf·cm, 13 ft·lbf)

9. INSTALL AIR CLEANER ASSY

(a) Install air cleaner case with the 3 bolts.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

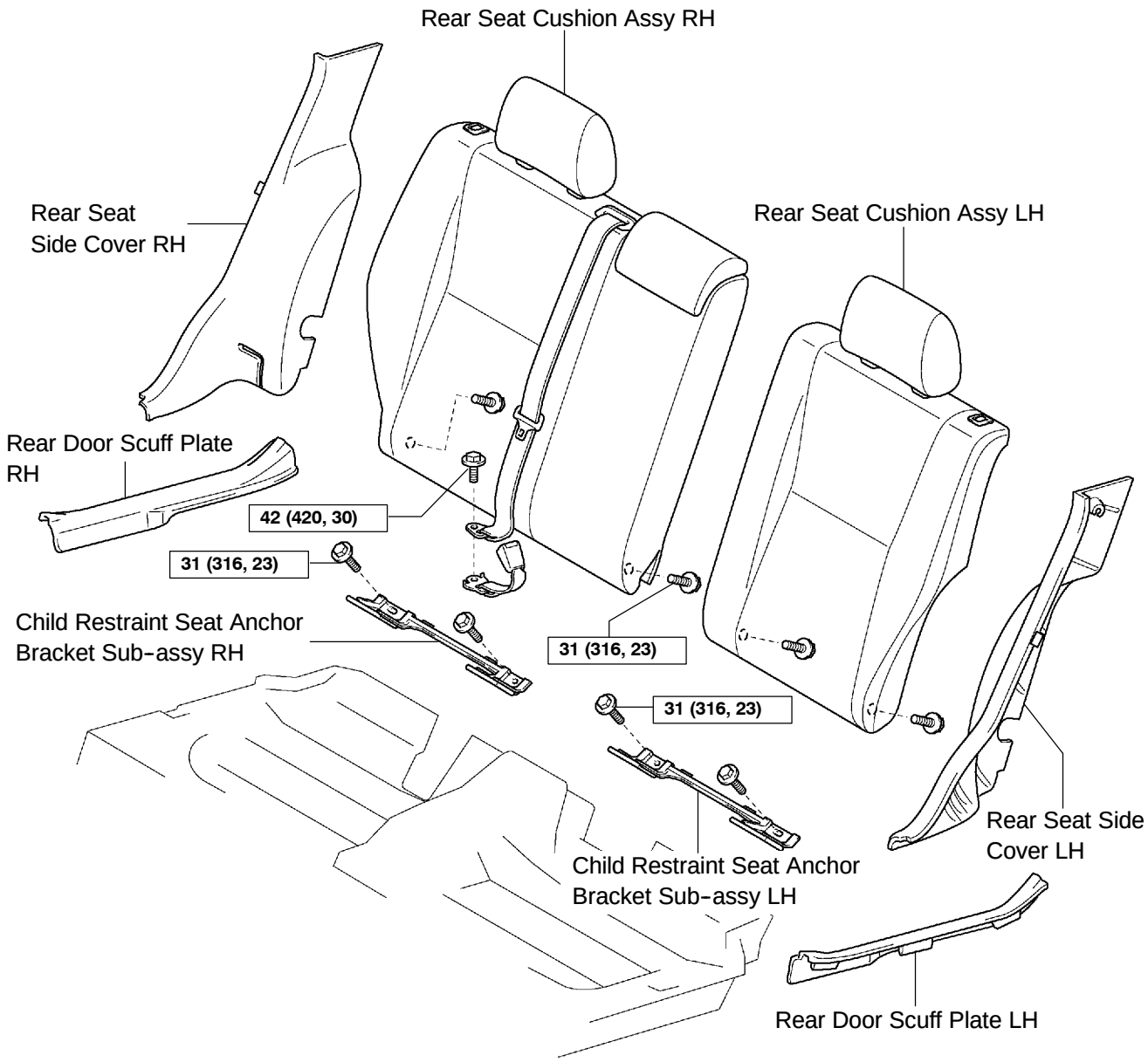
10. CHECK FUEL LEAK **(See page 11-70)**

FUEL TANK ASSY (DIESEL(HATCH BACK))

COMPONENTS

110CT-01

5 Door Hatch Back:

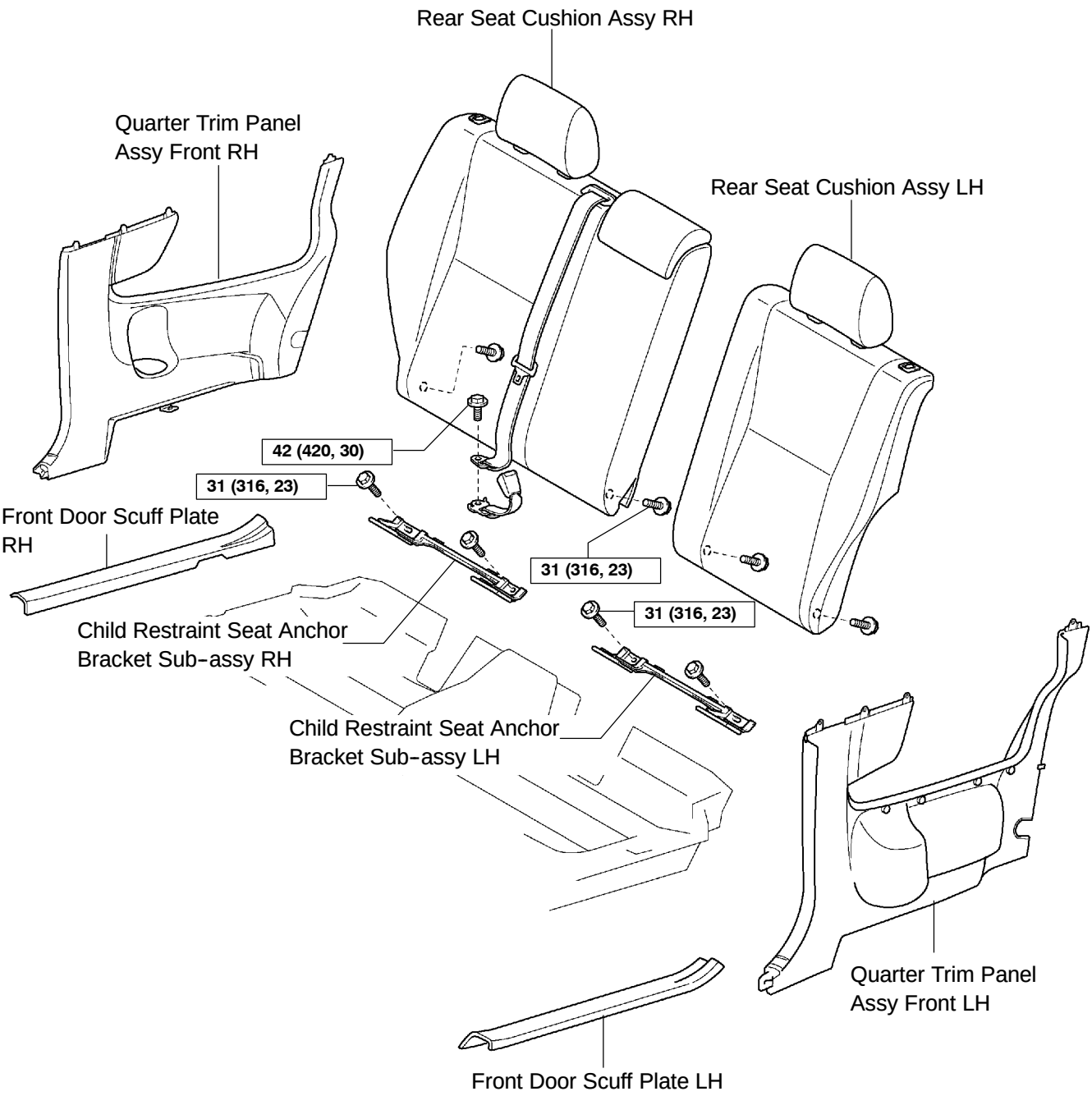


N·m (kgf·cm, ft·lbf): Specified torque

Y

A63003

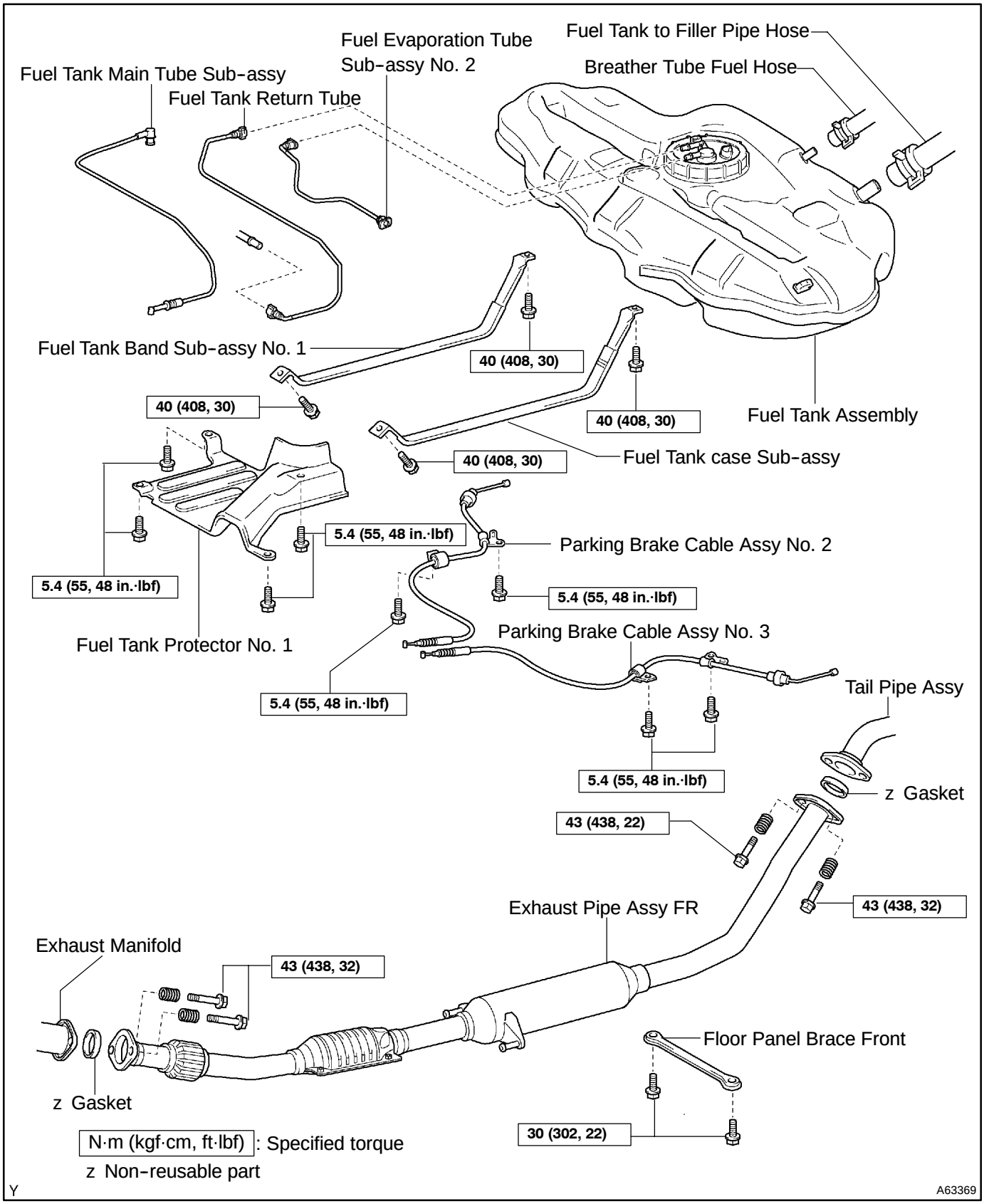
3 Door Hatch Back:

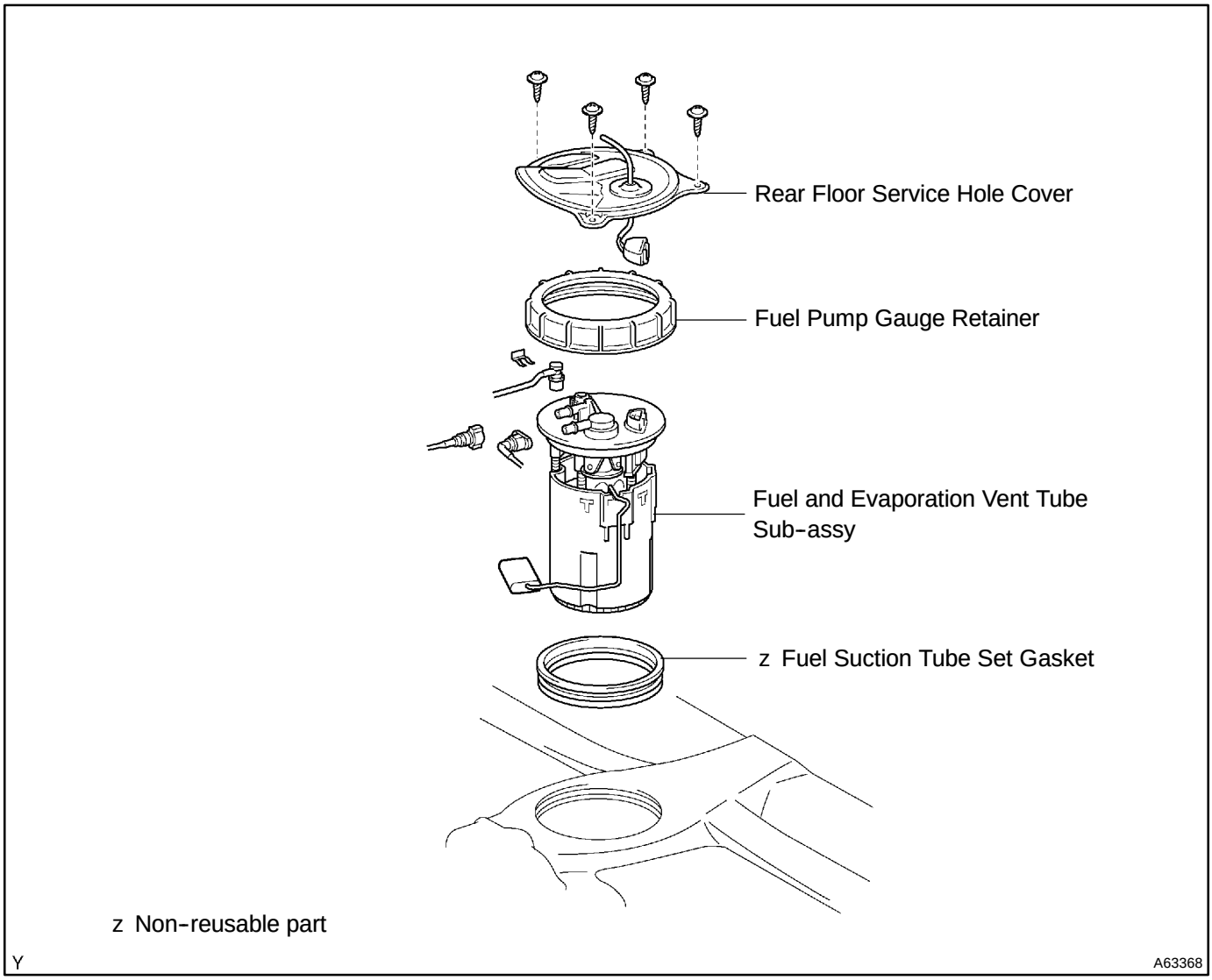


Y

N·m (kgf·cm, ft·lbf): Specified torque

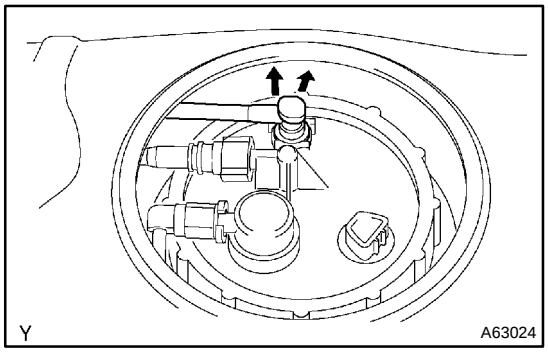
A63349

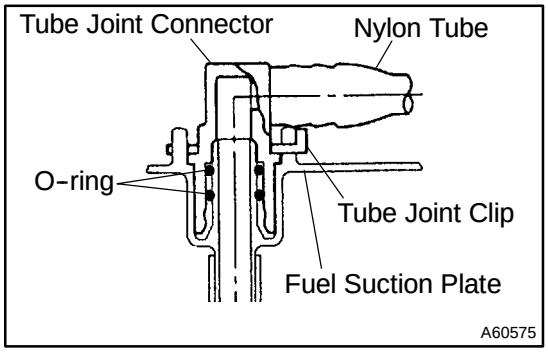

Fuel Evaporation Tube Sub-assy No. 2
Fuel Tank to Filler Pipe Hose
Fuel Tank Main Tube Sub-assy
Fuel Tank Return Tube
Breather Tube Fuel Hose
Fuel Tank Band Sub-assy No. 1
40 (408, 30)
40 (408, 30)
40 (408, 30)
40 (408, 30)
Fuel Tank Assembly
Fuel Tank case Sub-assy
5.4 (55, 48 in.·lbf)
Parking Brake Cable Assy No. 2
5.4 (55, 48 in.·lbf)
5.4 (55, 48 in.·lbf)
Fuel Tank Protector No. 1
Parking Brake Cable Assy No. 3
5.4 (55, 48 in.·lbf)
Tail Pipe Assy
5.4 (55, 48 in.·lbf)
z Gasket
43 (438, 22)
43 (438, 32)
Exhaust Pipe Assy FR
Exhaust Manifold
43 (438, 32)
Floor Panel Brace Front
z Gasket
30 (302, 22)
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
Y
A63369


Rear Floor Service Hole Cover
Fuel Pump Gauge Retainer
Fuel and Evaporation Vent Tube Sub-assy
z Fuel Suction Tube Set Gasket
z Non-reusable part
Y
A63368

Removal & Installation and Disassembly & Reassembly

1. REMOVE REAR SEAT BACK ASSY LH (See page 11-29)
2. REMOVE REAR SEAT BACK ASSY RH (See page 11-29)
3. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH (See page 11-29)
4. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH (See page 11-29)
5. REMOVE FRONT DOOR SCUFF PLATE LH(3 DOOR HATCH BACK BODY TYPE) (See page 76-48)
6. REMOVE FRONT DOOR SCUFF PLATE RH(3 DOOR HATCH BACK BODY TYPE) (See page 76-48)
7. REMOVE QUARTER TRIM PANEL ASSY FRONT LH(3 DOOR HATCH BACK BODY TYPE) (See page 76-49)
8. REMOVE QUARTER TRIM PANEL ASSY FRONT RH(3 DOOR HATCH BACK BODY TYPE) (See page 76-49)
9. REMOVE REAR DOOR SCUFF PLATE LH(5 DOOR HATCH BACK BODY TYPE) (See page 76-56)
10. REMOVE REAR DOOR SCUFF PLATE RH(5 DOOR HATCH BACK BODY TYPE) (See page 76-56)
11. REMOVE REAR SEAT SIDE COVER LH(5 DOOR HATCH BACK BODY TYPE) (See page 76-58)
12. REMOVE REAR SEAT SIDE COVER RH(5 DOOR HATCH BACK BODY TYPE) (See page 76-58)
13. REMOVE FLOOR CARPET ASSY FRONT
14. REMOVE REAR FLOOR SERVICE HOLE COVER



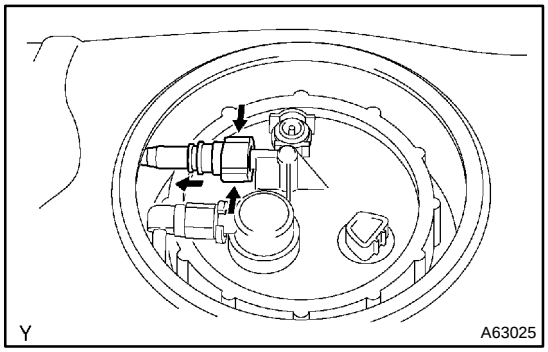


15. DISCONNECT FUEL TANK RETURN TUBE

(a) Remove the tube joint clip and pull out the fuel tank return tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**

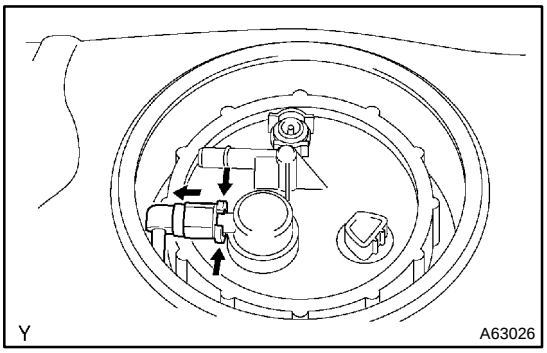


16. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Pinch the tube connector then pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**

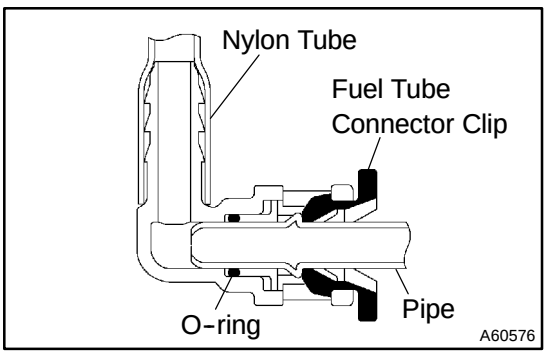


17. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the tube connector then pull out the fuel evaporation tube sub-assy No. 2.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**



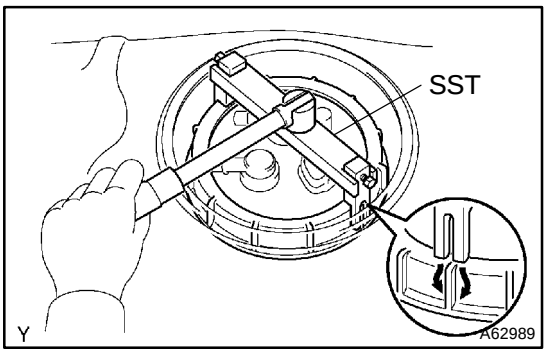
18. REMOVE FUEL AND EVAPORATION VENT TUBE SUB-ASSY

SST 09808-14010

(a) Using SST, loosen the retainer.

SST 09808-14010

(b) Remove the retainer.



(c) Pull out the fuel pump assembly.

CAUTION:
Be careful that the arm of the sender gauge should not bent.

(d) Remove the gasket from the pump assembly.

19. DRAIN FUEL

20. REMOVE FLOOR PANEL BRACE FRONT
(See page 15-8)

21. REMOVE EXHAUST PIPE ASSY FRONT

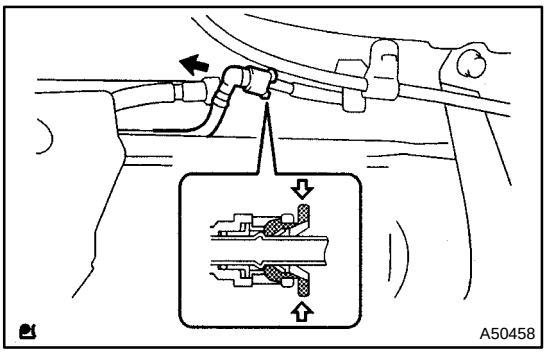
(a) Remove the 4 bolts, 4 compression spring and exhaust pipe assy front.

22. DISCONNECT BREATHER TUBE FUEL HOSE

(a) Disconnect the breather tube fuel hose from the fuel tank.

23. DISCONNECT FUEL TANK TO FILLER PIPE HOSE

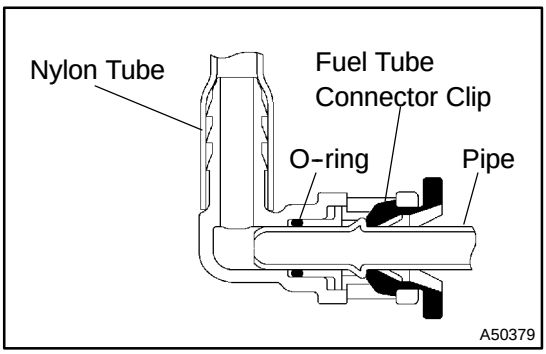
(a) Disconnect the fuel tank to filler pipe hose from the fuel tank.

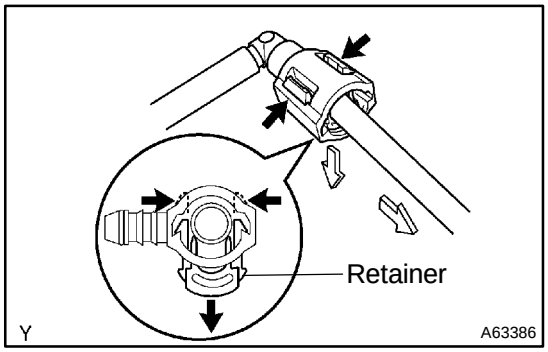


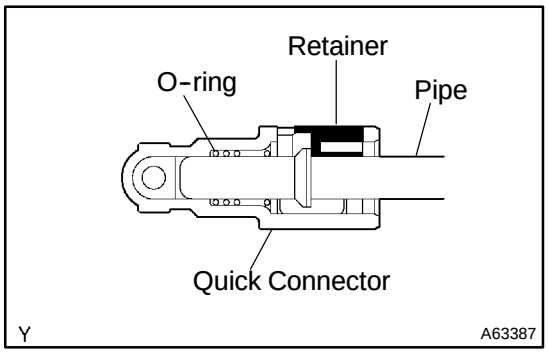
24. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the fuel tube connector clip and then pull out the tube.

NOTICE:
- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **After disconnecting the tube, cover the connector with a vinyl bag.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**







25. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Pinch the projections of the retainer to remove the lock claws, and pull down it as shown in the illustration.
(b) Pull out the pipe.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **After disconnecting the tube, cover the connector with a vinyl bag.**
- **When the connector and the pipe are stuck, pinch the tube between fingers, and tun it carefully to free and then disconnect the tube.**

26. REMOVE FUEL TANK PROTECTOR NO.1

27. REMOVE FUEL TANK ASSY

(a) Remove the clamp of the parking brake cable.
(b) Set a mission jack to the fuel tank.
(c) Remove the fuel tank bands, and fuel tank assembly.

28. REMOVE FUEL TANK MAIN TUBE SUB-ASSY

29. REMOVE FUEL EVAPORATION TUBE SUB-ASSY NO.2

30. INSTALL FUEL EVAPORATION TUBE SUB-ASSY NO.2

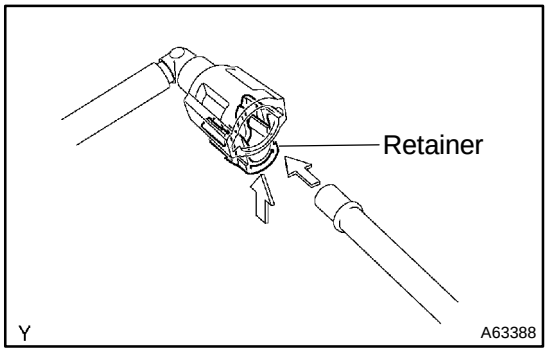
31. INSTALL FUEL TANK MAIN TUBE SUB-ASSY

32. INSTALL FUEL TANK ASSY

Torque:
Fuel tank band 39 N·m (400 kgf·cm, 29 ft·lbf)
Parking brake cable 5.4 N·m (55 kgf·cm, 48 in.·lbf)

33. INSTALL FUEL TANK PROTECTOR NO.1

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

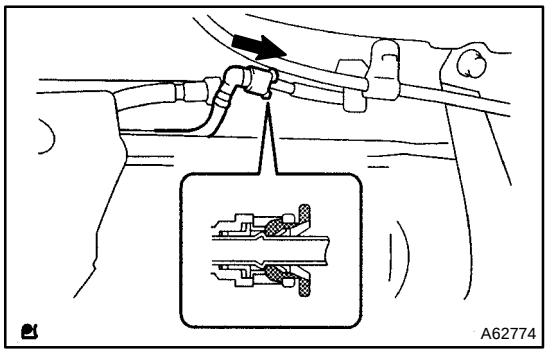


34. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Insert the pipe into the quick connector, and push up the retainer to the claws lock.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**



35. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

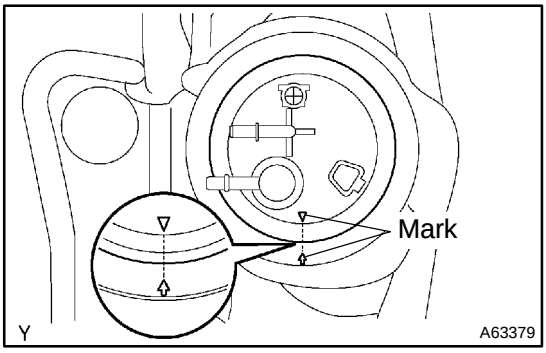
- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

36. CONNECT FUEL TANK TO FILLER PIPE HOSE

37. CONNECT BREATHER TUBE FUEL HOSE

38. INSTALL EXHAUST PIPE ASSY FRONT

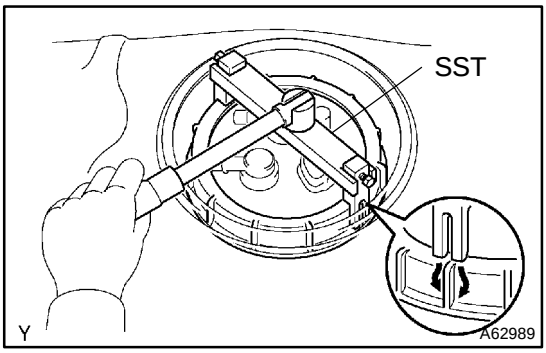
39. INSTALL FLOOR PANEL BRACE FRONT



40. INSTALL FUEL AND EVAPORATION VENT TUBE SUB-ASSY

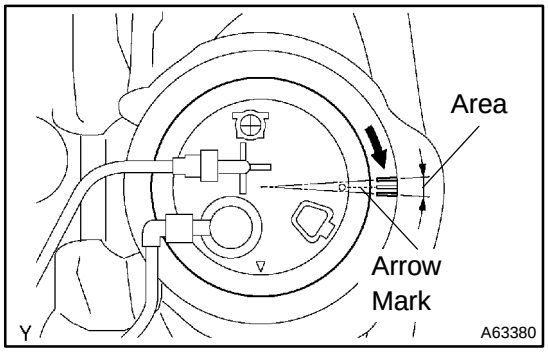
(a) Align the arrow narks of the fuel pump bracket and fuel tank.

(b) Temporarily install the retainer.

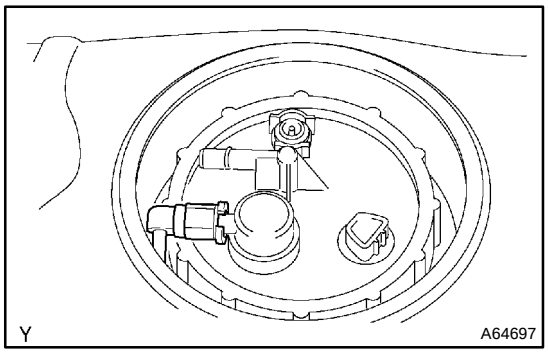


(c) Using SST, tighten the retainer until the arrow mark on the retainer is within the lines on the fuel tank.

SST 09808-14010



(d) Check that the arrow marks of the fuel pump bracket and fuel tank are aligned.

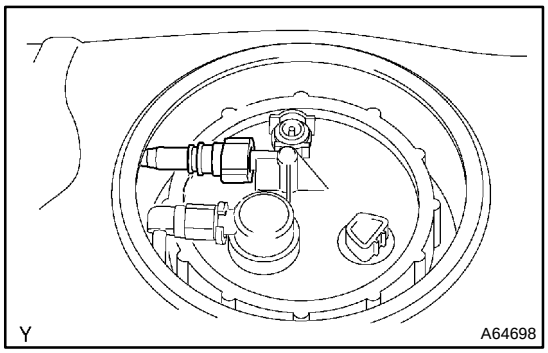


41. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

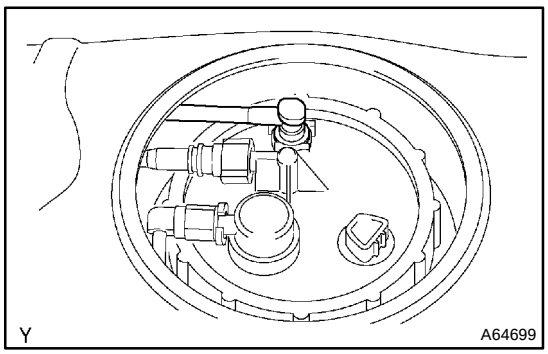


42. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**



43. CONNECT FUEL TANK RETURN TUBE

(a) Connect the fuel tank main tube with the tube joint clip.

NOTICE:

- **Check that there is no scratch or foreign objects on the connecting parts.**
- **Check that the connector is inserted fully and securely.**
- **Check that the clip of the tube joint is on the collar of the connector.**
- **After installing the tube joint clip, check that the connector is not pulled off.**

44. INSPECT FUEL LEAK

45. INSTALL REAR FLOOR SERVICE HOLE COVER

(a) Install the rear floor service hole cover with 4 screws.

46. INSTALL FLOOR CARPET ASSY FRONT

47. INSTALL REAR SEAT SIDE COVER RH(5 DOOR HATCH BACK BODY TYPE)

48. INSTALL REAR SEAT SIDE COVER LH(5 DOOR HATCH BACK BODY TYPE)

49. INSTALL REAR DOOR SCUFF PLATE RH(5 DOOR HATCH BACK BODY TYPE)

50. INSTALL REAR DOOR SCUFF PLATE LH(5 DOOR HATCH BACK BODY TYPE)

51. INSTALL QUARTER TRIM PANEL ASSY FRONT RH(3 DOOR HATCH BACK BODY TYPE)

52. INSTALL QUARTER TRIM PANEL ASSY FRONT LH(3 DOOR HATCH BACK BODY TYPE)

53. INSTALL FRONT DOOR SCUFF PLATE RH(3 DOOR HATCH BACK BODY TYPE)

54. INSTALL FRONT DOOR SCUFF PLATE LH(3 DOOR HATCH BACK BODY TYPE)

55. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

56. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH

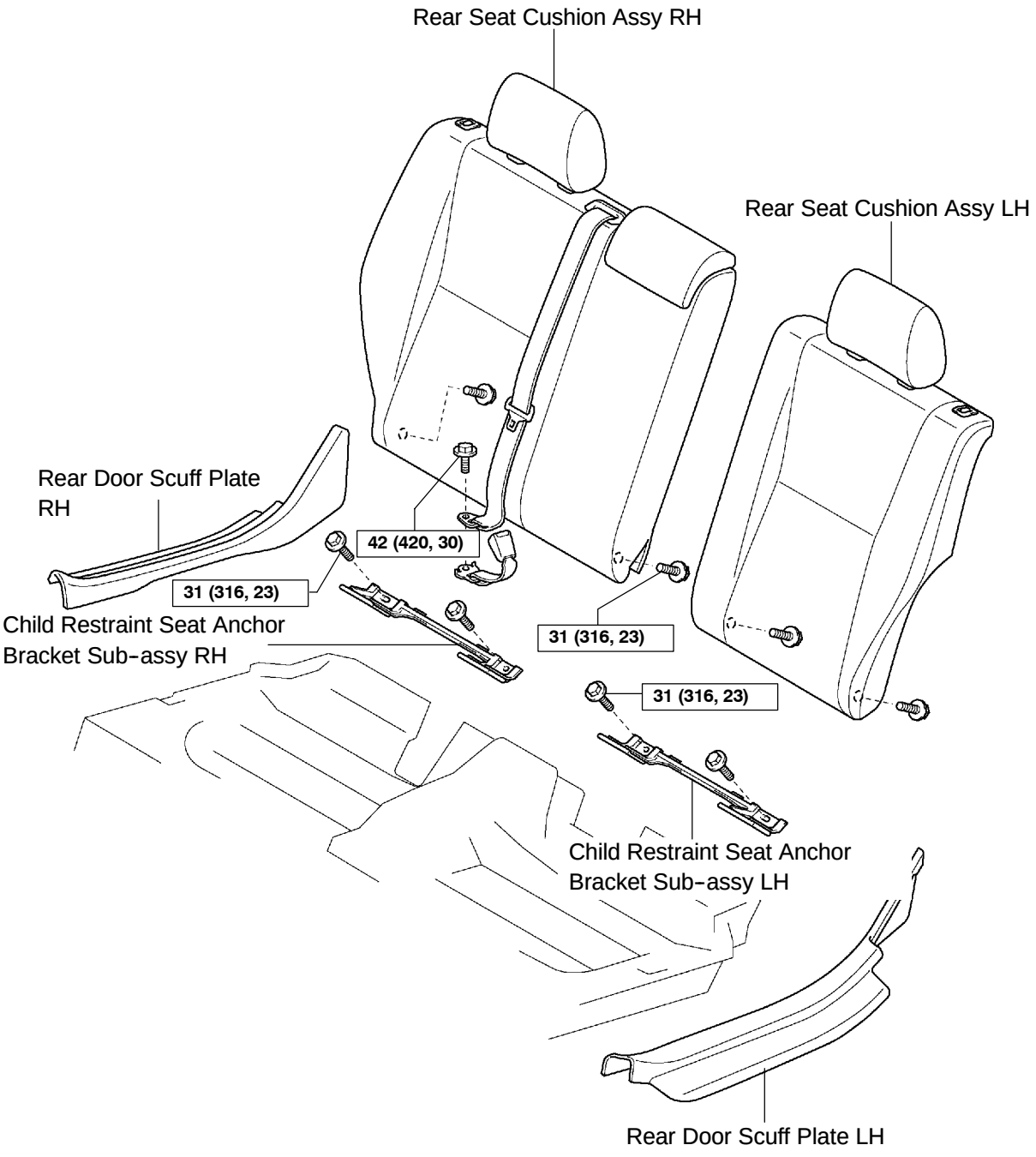
57. INSTALL REAR SEAT BACK ASSY RH (See page 11-33)
58. INSTALL REAR SEAT BACK ASSY LH (See page 11-33)
59. CHECK EXHAUST GAS LEAK

FUEL TANK ASSY (DIESEL(SEDAN/STATION WAGON))

COMPONENTS

110CV-01

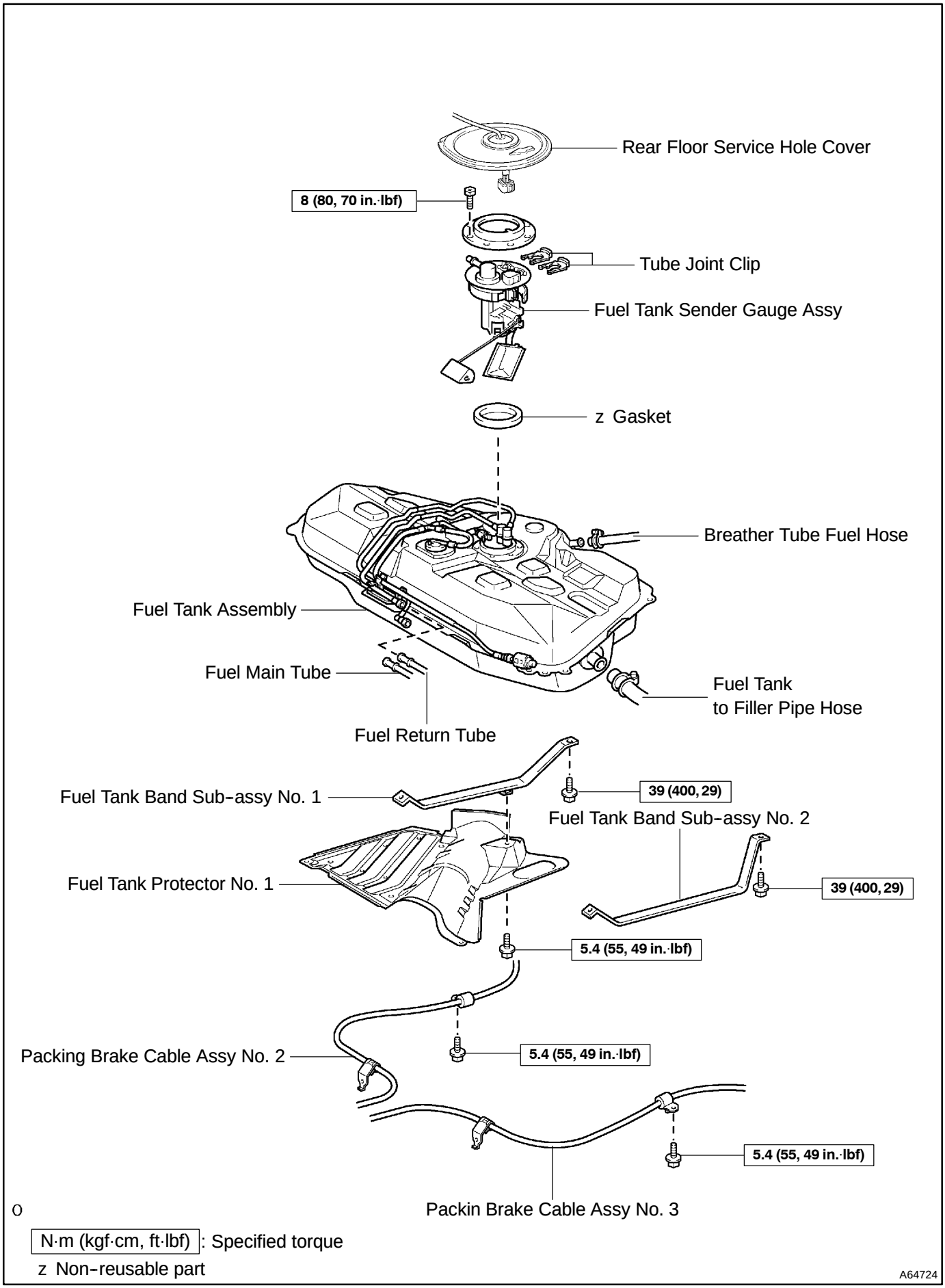
Station Wagon:

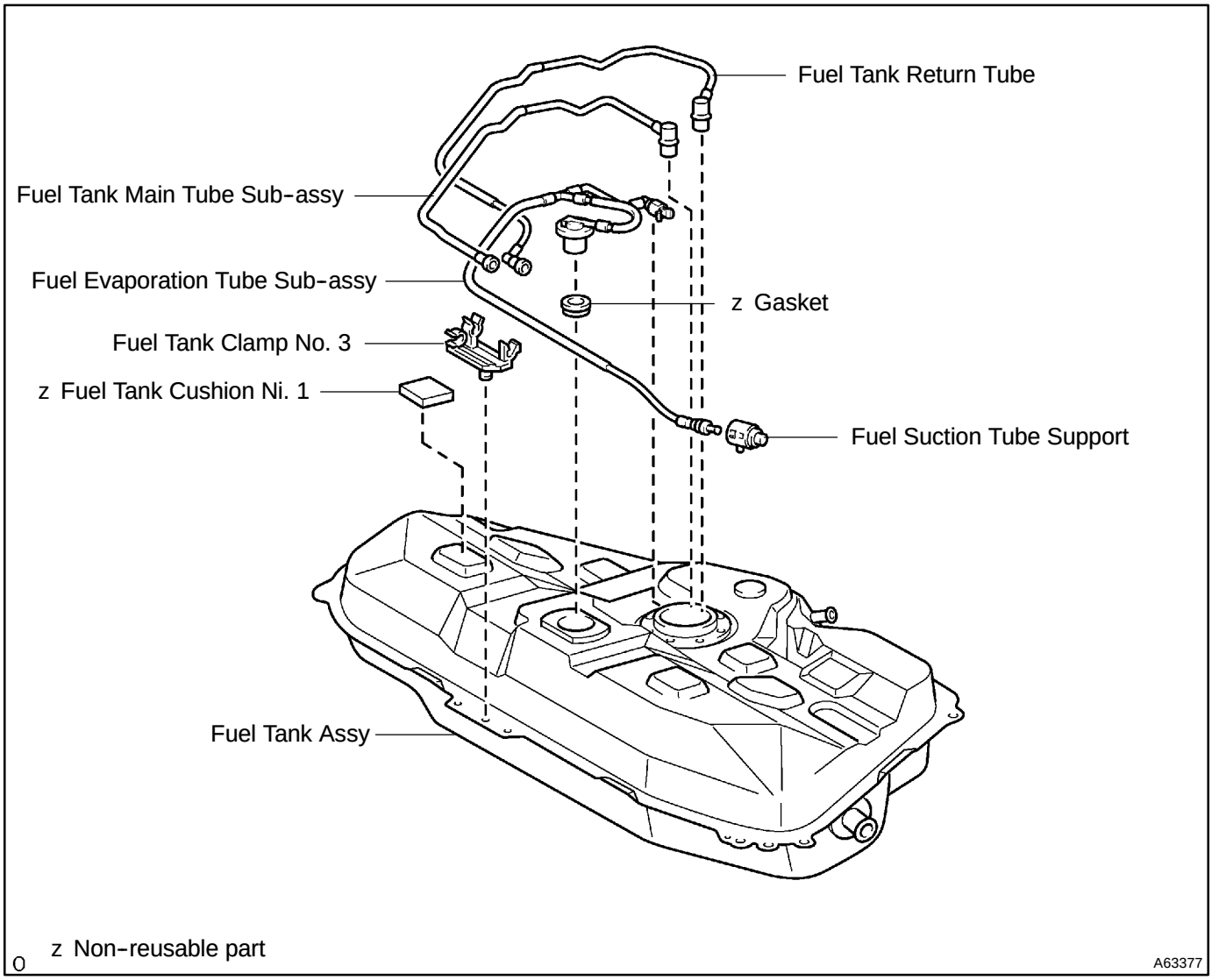


N·m (kgf·cm, ft·lbf) : Specified torque

Y

A63350

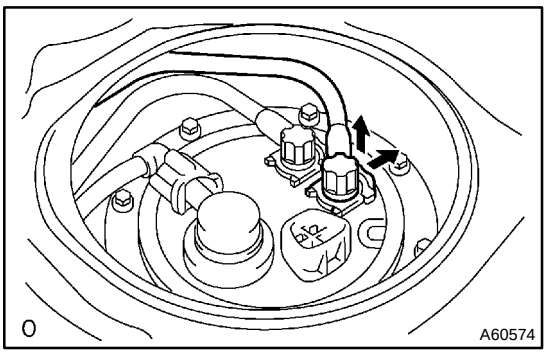

Rear Floor Service Hole Cover
8 (80, 70 in.·lbf)
Tube Joint Clip
Fuel Tank Sender Gauge Assy
z Gasket
Breather Tube Fuel Hose
Fuel Tank Assembly
Fuel Main Tube
Fuel Tank
to Filler Pipe Hose
Fuel Return Tube
Fuel Tank Band Sub-assy No. 1
39 (400, 29)
Fuel Tank Band Sub-assy No. 2
Fuel Tank Protector No. 1
39 (400, 29)
5.4 (55, 49 in.·lbf)
Packing Brake Cable Assy No. 2
5.4 (55, 49 in.·lbf)
5.4 (55, 49 in.·lbf)
Packin Brake Cable Assy No. 3
O
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A64724

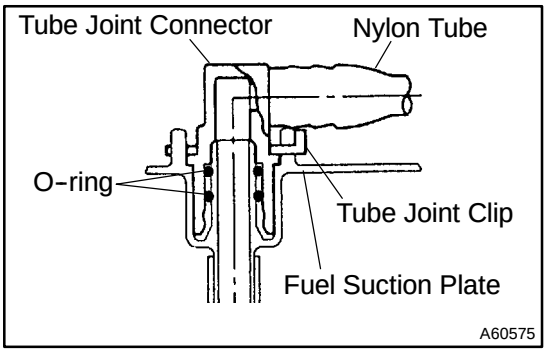

Fuel Tank Return Tube
Fuel Tank Main Tube Sub-assy
Fuel Evaporation Tube Sub-assy
z Gasket
Fuel Tank Clamp No. 3
z Fuel Tank Cushion Ni. 1
Fuel Suction Tube Support
Fuel Tank Assy
z Non-reusable part
A63377

110CW-01

Removal & Installation and Disassembly & Reassembly

1. REMOVE REAR SEAT CUSHION ASSEMBLY(SEDAN BODY TYPE)
2. REMOVE REAR SEAT BACK ASSY LH(WAGON BODY TYPE) (See page 11-37)
3. REMOVE REAR SEAT BACK ASSY RH(WAGON BODY TYPE) (See page 11-37)
4. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH (See page 11-37)
5. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH (See page 11-37)
6. REMOVE REAR DOOR SCUFF PLATE LH(WAGON BODY TYPE) (See Page 76-40)
7. REMOVE REAR DOOR SCUFF PLATE RH(WAGON BODY TYPE) (See Page 76-40)
8. REMOVE FLOOR CARPET ASSY FRONT
9. REMOVE REAR FLOOR SERVICE HOLE COVER



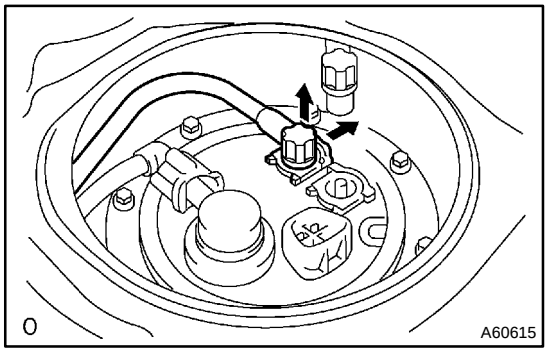


10. DISCONNECT FUEL TANK RETURN TUBE

(a) Remove the tube joint clip, and pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**

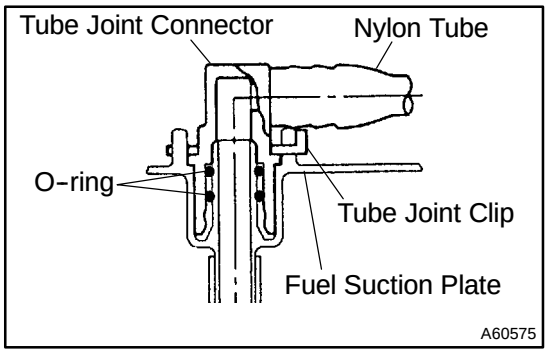


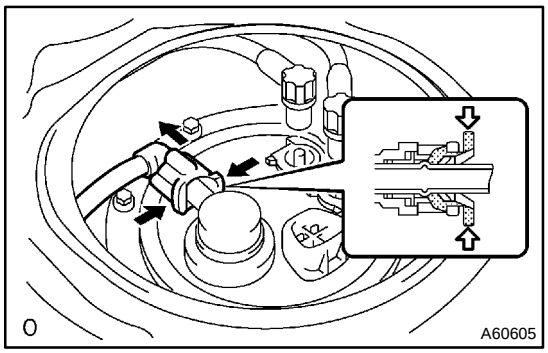
11. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Remove the tube joint clip, and pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**



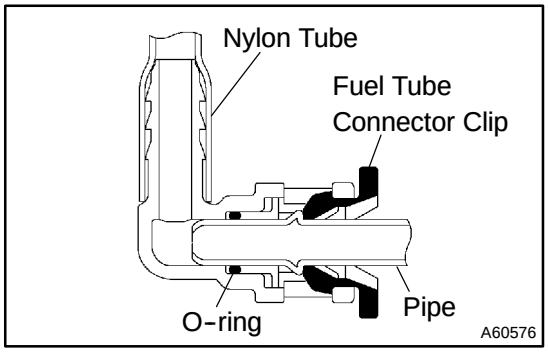


12. DISCONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Pinch the tube connector then pull out the fuel evaporation tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When connector and the pipe are stuck, pinch the tube between fingers, and turn it carefully to free and then disconnect the tube.**



13. REMOVE FUEL TANK VENT TUBE SET PLATE

(a) Remove the 8 bolts and fuel tank vent tube set plate.

14. REMOVE FUEL SENDER GAGE ASSY

(a) Pull out the fuel tank sender gauge.

NOTICE:

Be careful that the arm of the sender gauge should not bent.

(b) Remove the gasket from the fuel tank sender gauge.

15. DRAIN FUEL

16. REMOVE FLOOR PANEL BRACE FRONT

(a) Remove the 2 nuts and floor panel brace front.

17. REMOVE EXHAUST PIPE ASSY FRONT

(a) Disconnect the 2 connectors.
(b) Remove the 4 bolts, 4 compression spring and exhaust pipe.

18. REMOVE FUEL TANK PROTECTOR NO.1

(a) Remove the 3 bolts, the nut and fuel tank protector.

19. DISCONNECT PARKING BRAKE CABLE ASSY NO.2

(a) Remove the 2 installing bolts of the parking brake cable.

20. DISCONNECT PARKING BRAKE CABLE ASSY NO.3

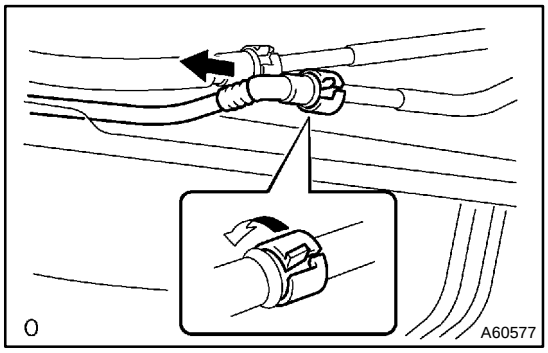
(a) Remove the 2 installing bolts of the parking brake cable.

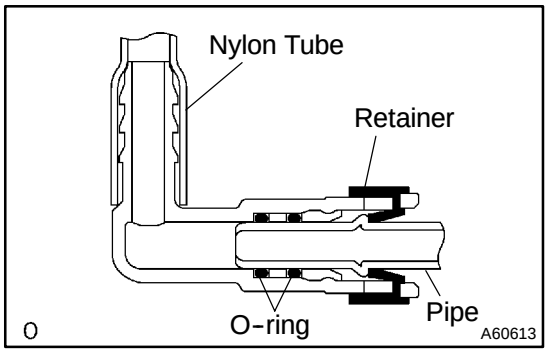
21. DISCONNECT BREATHER TUBE FUEL HOSE

(a) Disconnect the breather tube fuel hose from the fuel tank.

22. DISCONNECT FUEL TANK TO FILLER PIPE HOSE

(a) Disconnect the fuel tank to filler pipe hose from the fuel tank.



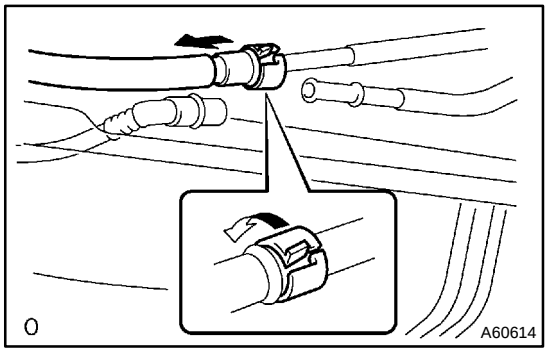


23. DISCONNECT FUEL TANK RETURN TUBE

(a) Pinch the fuel tube connector clip and then pull out the fuel tank return tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When connector and the pipe are stuck, pinch the tube between fingers, and turn it carefully to free and then disconnect the tube.**

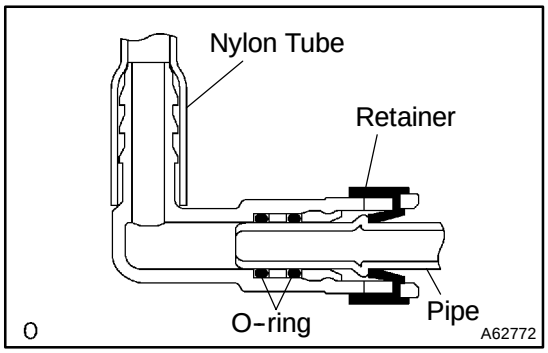


24. DISCONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Pinch the projections of the retainer to remove the lock claws and pull out the fuel tank main tube.

NOTICE:

- **Check if there is any dirt like mud around the connector before this work and clean the dirt away.**
- **Be careful of dirt like mud because the quick connector has an O-ring to seal the pipe and the connector.**
- **Do not use any tool in this work.**
- **Do not bend or twist the nylon tube by force.**
- **Keep off plug from foreign subjects.**
- **To protect the tube, cover it with a vinyl bag after checking.**
- **When connector and the pipe are stuck, pinch the tube between fingers, and turn it carefully to free and then disconnect the tube.**



25. REMOVE FUEL TANK ASSY

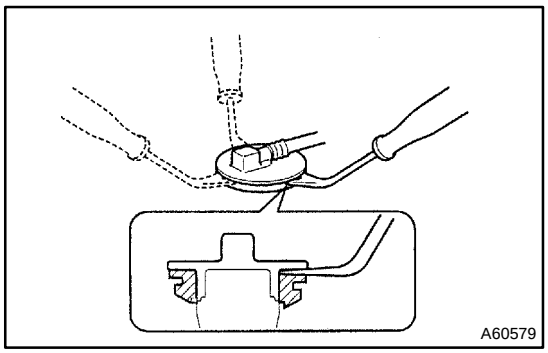
(a) Set a mission jack to the fuel tank.
(b) Remove the 4 bolts, 2 fuel tank bands and fuel tank.

26. REMOVE FUEL TANK RETURN TUBE

(a) Remove fuel tank main tube from the fuel tube clamp.

27. REMOVE FUEL TANK MAIN TUBE SUB-ASSY

(a) Remove the fuel tank main tube from the fuel tube clamp.



28. REMOVE FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Using a screwdriver, unlock the claw and remove the protector by turning it counter clockwise.
(b) Insert a clip remover between the check valve and the gasket, remove the valve by gradually pushing it upward.

NOTICE:

- **Work accurately to maintain the sealing performance of the check valve, since it is made from resin. It is easy to damage by removing and installing forcibly.**
- **Be sure to install new check valve and gasket.**

(c) Remove fuel evaporation tube from the fuel tube clamp.

29. REMOVE TANK SUCTION TUBE SUPPORT

(a) Remove the tank suction tube support from the fuel tank.

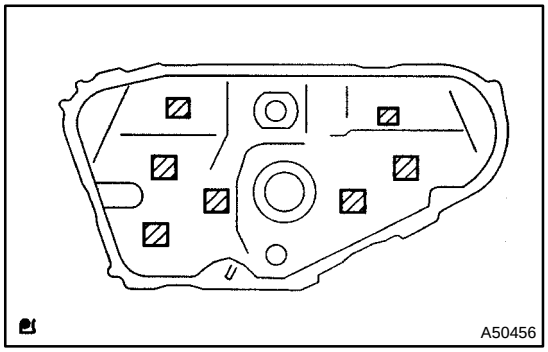
30. REMOVE FUEL TUBE CLAMP NO.3

(a) Remove the fuel tube clamp from the fuel tank.

31. REMOVE FUEL TANK CUSHION NO.1

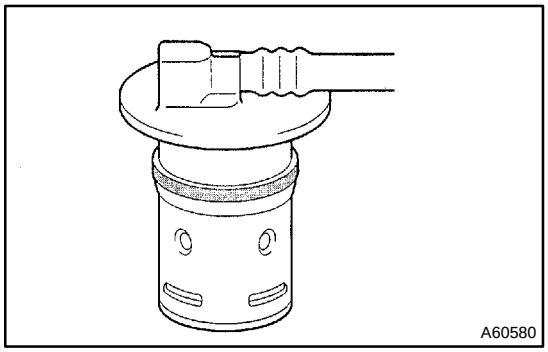
(a) Remove the 7 fuel tank cushion from the fuel tank.

32. REPLACE FUEL TANK ASSY



33. INSTALL FUEL TANK CUSHION NO.1

(a) Install the new fuel tank cushions as shown in the illustration.

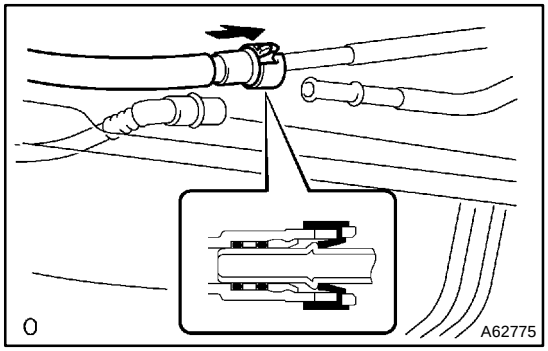


34. INSTALL FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Install a new gasket to the fuel tank.
(b) Apply light oil around the new fuel cut off valve as shown in the illustration, and inspect it into the tank without force. Be careful not to drop the gasket into the tank.
(c) Check that the fuel cut off valve is fully inserted.

35. INSTALL FUEL TANK ASSY

(a) Set a mission jack to the fuel tank.
(b) Install the fuel tank and 2 fuel tank bands with the 4 bolts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

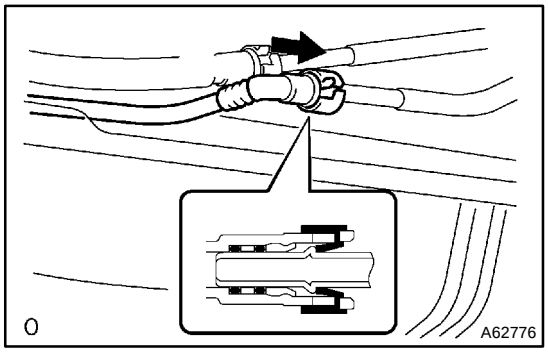


36. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Push in the tube connector to the pipe until and install the retainer.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**



37. CONNECT FUEL TANK RETURN TUBE

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

38. INSTALL PARKING BRAKE CABLE ASSY NO.3

(a) Install the 2 clamps of the parking brake cable with the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 49 in.·lbf)

39. INSTALL PARKING BRAKE CABLE ASSY NO.2

(a) Install the 2 clamps of the parking brake cable with the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 49 in.·lbf)

40. INSTALL FUEL TANK PROTECTOR NO.1

(a) Install the fuel tank protector with the 3 bolts and nut
Torque: 5.4 N·m (55 kgf·cm, 49 in.·lbf)

41. INSTALL EXHAUST PIPE ASSY FRONT

42. INSTALL FLOOR PANEL BRACE FRONT

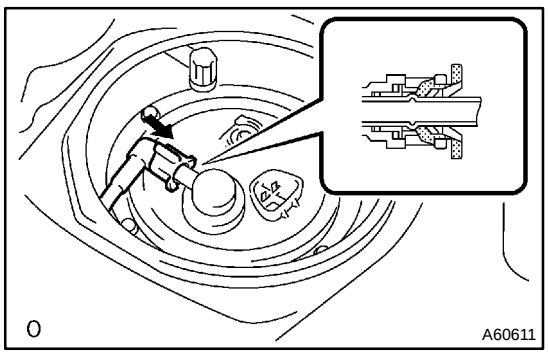
(a) Install the floor panel brace front with the 2 nuts.
Torque: 30 N·m (302 kgf·cm, 22 ft·lbf)

43. INSTALL FUEL TANK SENDER GAUGE ASSY

(a) Install a new gasket to the fuel pump assembly.
(b) Install the fuel pump assembly to the fuel tank.

44. INSTALL FUEL TANK VENT TUBE SET PLATE

(a) Install the fuel tank vent tube set plate with the 8 bolts.
Torque: 8 N·m (80 kgf·cm, 70 in.·lbf)

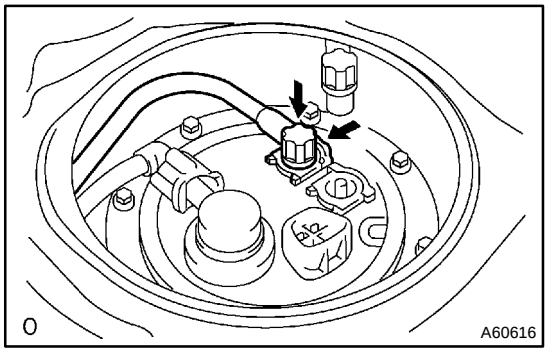


45. CONNECT FUEL EVAPORATION TUBE SUB-ASSY NO.2

(a) Push in the tube connector to the pipe until connector makes "click" sound.

NOTICE:

- **Check if there is any damage or foreign objects on the connected part of the pipe.**
- **After connecting, check if the pipe and the connector are securely connected by pulling them.**

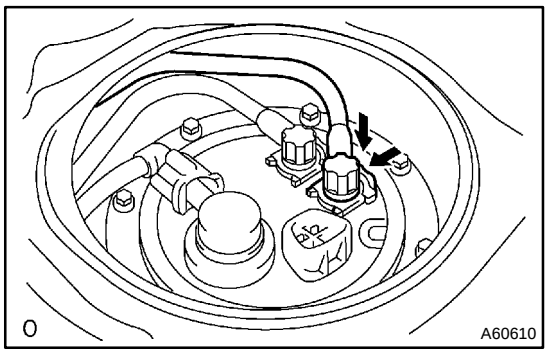


46. CONNECT FUEL TANK MAIN TUBE SUB-ASSY

(a) Connect the fuel tank main tube with the tube joint clip.

NOTICE:

- **Check that there is no scratch or foreign objects on the connecting parts.**
- **Check that the connector is inserted fully and securely.**
- **Check that the clip of the tube joint is on the collar of the connector.**
- **After installing the tube joint clip, check that the connector is not pulled off.**



47. CONNECT FUEL TANK RETURN TUBE

(a) Connect the fuel tank main tube with the tube joint clip.

NOTICE:

- **Check that there is no scratch or foreign objects on the connecting parts.**
- **Check that the connector is inserted fully and securely.**
- **Check that the clip of the tube joint is on the collar of the connector.**
- **After installing the tube joint clip, check that the connector is not pulled off.**

48. CHECK FUEL LEAK **(See Page 11-14)**

49. INSTALL REAR FLOOR SERVICE HOLE COVER

(a) Using butyl tape, install the rear floor service hole cover.

50. INSTALL REAR DOOR SCUFF PLATE RH(WAGON BODY TYPE)

51. INSTALL REAR DOOR SCUFF PLATE LH(WAGON BODY TYPE)

52. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH **(See page 11-40)**

53. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH **(See page 11-40)**

54. INSTALL REAR SEAT BACK ASSY RH(WAGON BODY TYPE) **(See page 11-40)**

55. INSTALL REAR SEAT BACK ASSY LH(WAGON BODY TYPE) **(See page 11-40)**

56. INSTALL REAR SEAT CUSHION ASSEMBLY(SEDAN BODY TYPE)

57. CHECK EXHAUST GAS LEAK

EMISSION CONTROL

EMISSION CONTROL SYSTEM (2ZZ-GE) 12-1
ON-VEHICLE INSPECTION 12-1/3
INSPECTION 12-4/5
AIR SWITCHING VALVE ASSY (2ZZ-GE) 12-6
REPLACEMENT 12-6/7
AIR PUMP ASSY (2ZZ-GE) 12-8
REPLACEMENT 12-8
EMISSION CONTROL SYSTEM (3ZZ-FE/4ZZ-FE) 12-9
ON-VEHICLE INSPECTION 12-9/10
INSPECTION 12-11/12
EMISSION CONTROL SYSTEM (1CD-FTV) 12-13
ON-VEHICLE INSPECTION 12-13
EGR SYSTEM (1CD-FTV) 12-14
ON-VEHICLE INSPECTION 12-14/15
INSPECTION 12-16/17

EMISSION CONTROL SYSTEM (2ZZ-GE)

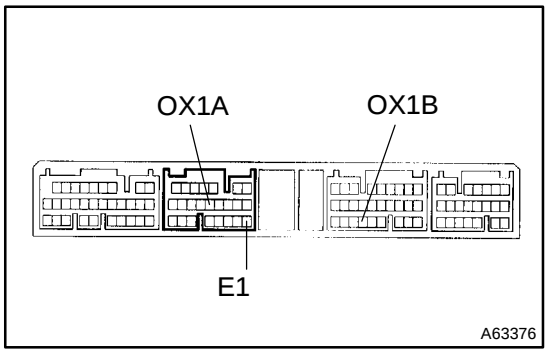
ON-VEHICLE INSPECTION

12041-01

1. INSPECT AIR-FUEL RATIO COMPENSATION SYSTEM

HINT:

You can also check the system by choosing "DATA MONITOR", then "O_2 SENSOR OUTPUT VOLTAGE" on the monitor of the hand-held tester.



(a) Connect the hand-held tester to the terminals OX1A and E1 of the ECM.

(b) Connect the hand-held tester to the terminals OX1B and E1 of the ECM.

CAUTION:

Connect test leads from the back side of the connector with the ECM connected.

(c) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 2 minutes.

(d) Confirm that the voltage changes between 0 V to 1 V with the engine speed at 2,500 rpm.

OK:

The voltage changes more than 8 times in 10 seconds.

CAUTION:

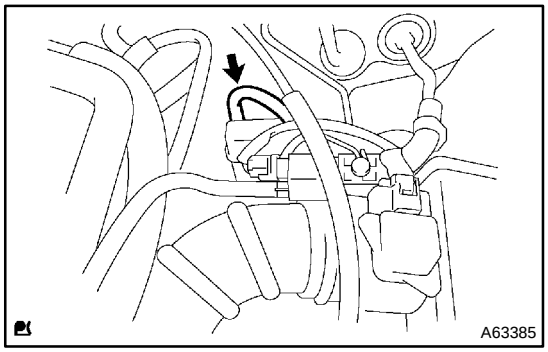
- **Perform the check immediately after the end of the warming up.**
- **If not confirming the change of voltage, warming up the oxygen sensor again.**

2. INSPECT FUEL CUT OFF RPM

(a) Increase the engine speed to at least 3,500 rpm.

(b) Use a sound scope to check for injector operating noise.

(c) Check that when the throttle lever is released, injector operation noise stops momentarily and then resumes.



3. INSPECT EVAPORATIVE EMISSION CONTROL SYSTEM

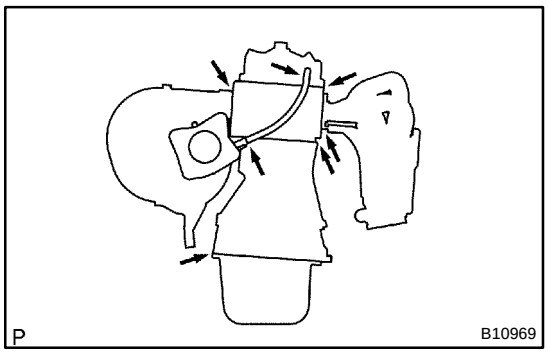
(a) After starting the engine, disconnect the vacuum hose shown in the illustration.

(b) Confirm vacuum occurs at the vsv port, when choosing "ACTIVE TEST" and "PURGE VSV" according to the display on hand-held tester.

(c) Finish "ACTIVE TEST", then connect the vacuum hose again.

(d) After going to "ECU DATA MONITOR" on the hand-held tester, choose "PURGE VSV" to check the operation of the purge vsv.

(e) After warm up the engine and drive the vehicle, confirm the vsv turns on from off.

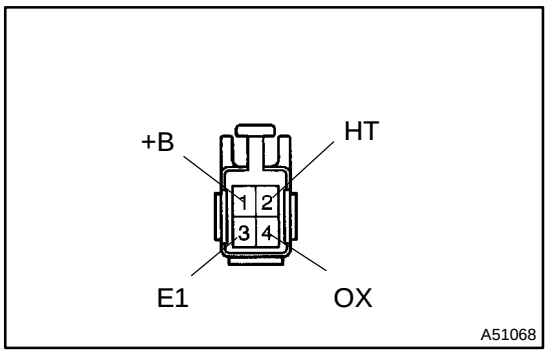


4. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

(a) Check for cracks, leaks or damage.

HINT:

Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause the engine to run out of turn. Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will allow air suction and cause the engine to run out of turn.

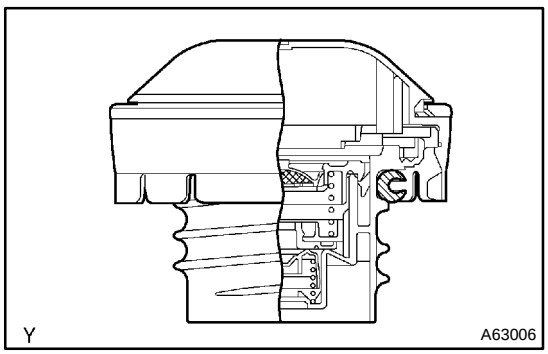


5. INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSOR

(a) Disconnect the oxygen sensor connector.

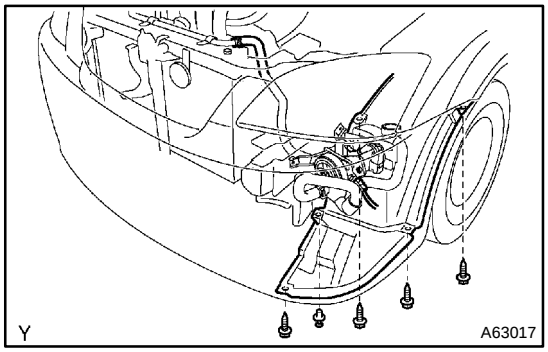
(b) Using an ohmmeter, measure the resistance between the terminals HT and +B.

Resistance:11 - 16 Ω at 20 _C (68 _F)



6. INSPECT FUEL TANK CAP

(a) Visually check if the cap and/or gasket are deformed or damaged.

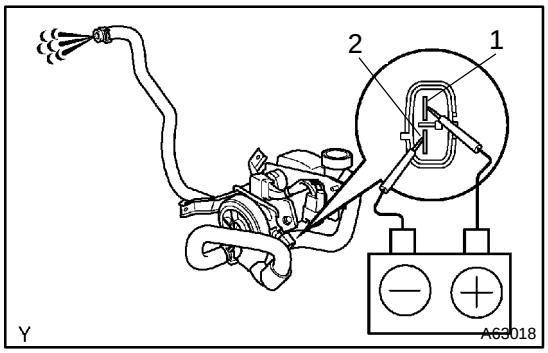


7. AIR PUMP ASSEMBLY

(a) Using a plier, grip the claws of the hose clip and slide the clip along the hose.

(b) Disconnect the hose.

(c) Disconnect the connector.

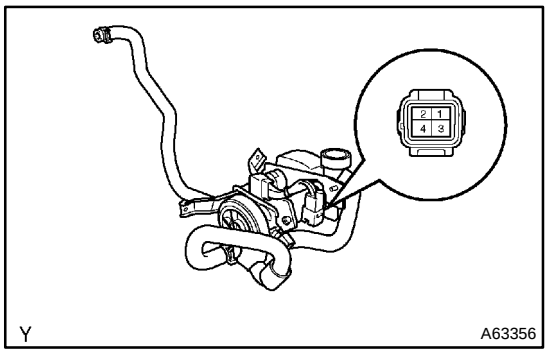


(d) Check operation air pump assy.

(1) Test conditions.

- Water temperature
  - 15 - 45_C (5_F - 113_F)
- Battery voltage Above 10.5 V
- DTC No displayed

(2) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2 then check that air flow.



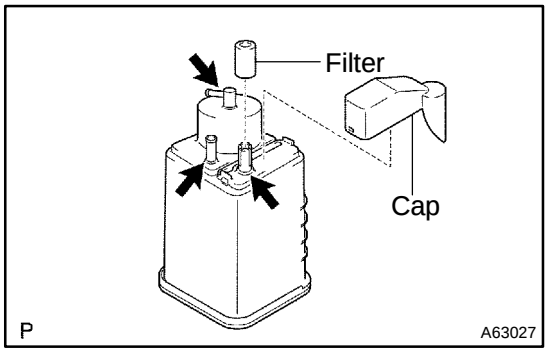
(e) Check operation air pump relay.

(1) Using an ohmmeter, check that there is no continuity between terminals 3 and 4.

(2) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2.

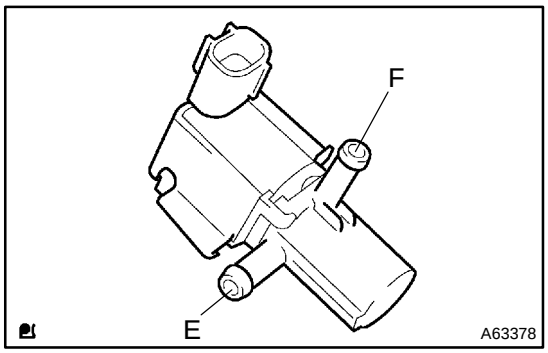
(3) Using an ohmmeter, check that there is continuity between terminals 3 and 4.

INSPECTION



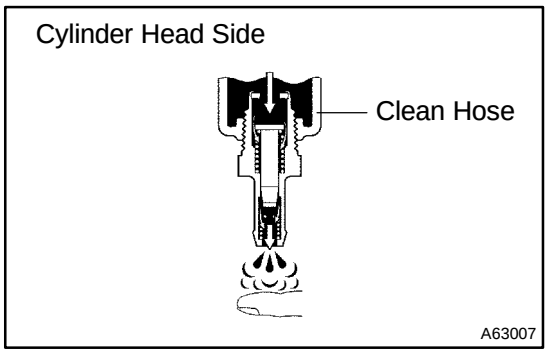
1. CHARCOAL CANISTER ASSY

(a) Remove the charcoal canister cap.
(b) Using a small screwdriver remove the charcoal canister cap and filter.
(c) Visually check the charcoal canister for cracks or damage.



2. VACUUM SWITCHING VALVE NO.1

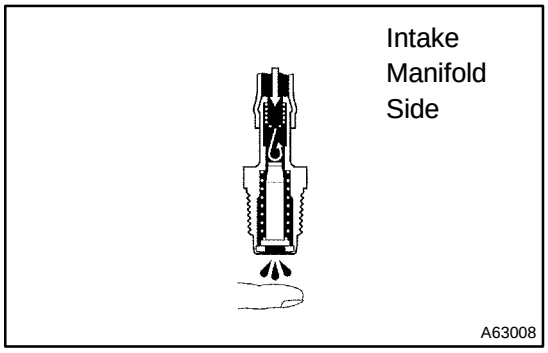
(a) Inspect vsv for open circuit
  (1) Using an ohmmeter, check that there is no continuity between the terminals.
  Resistance: 30 - 34 Ω at 20_C (68_F)
(b) Inspect vsv operation
  (1) Apply battery voltage across the terminals.
  (2) Check that air flows from port E to port F.
  Operation: Air flows from the port F



3. VENTILATION VALVE SUB-ASSY

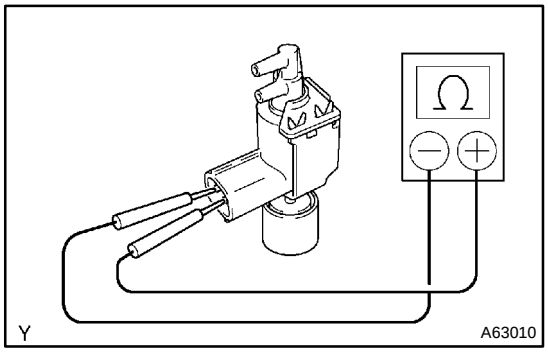
(a) Blow air into the cylinder head side, and check that air passes through easily.

CAUTION:
Do not suck air through the value. Petroleum substances inside the valve air harmful.



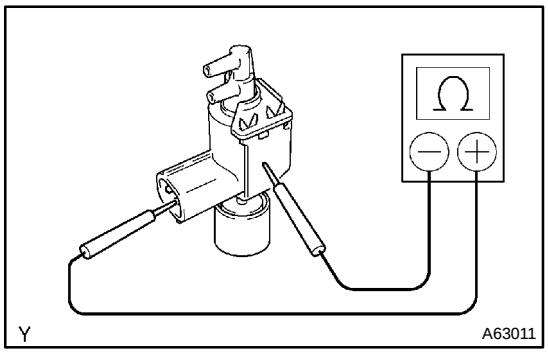
(b) Blow air into the intake manifold side, and check that air passes through with difficulty.

HINT:
If operation is not as specified, replace the PCV valve.

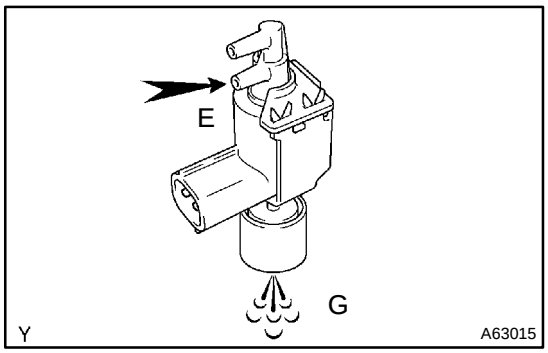


4. VACUUM SWITCHING VALVE ASSY

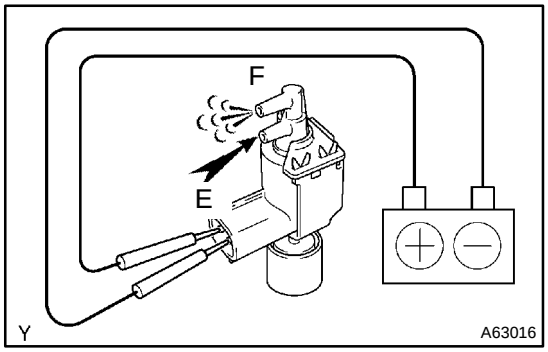
(a) Inspect VSV for open circuit.
(1) Using an ohmmeter, check that there is continuity between terminals.
Resistance: 37 - 44 Ω at 20_C (68_F)



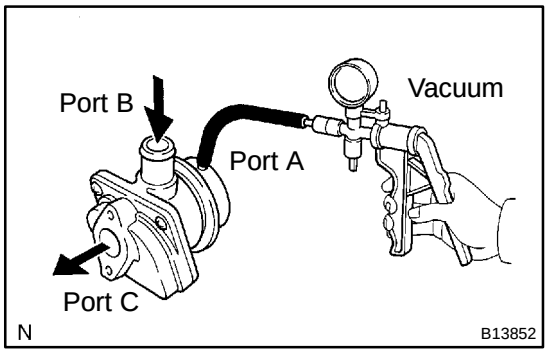
(b) Inspect VSV for ground.
(1) Using an ohmmeter, check that there is no continuity between each terminal and the body.



(c) Inspect VSV operation.
(1) Check that air flows from ports E to G.



(2) Apply battery positive voltage across the terminals.
(3) Check that air flows from ports E to F.



5. AIR SWITCHING VALVE ASSY

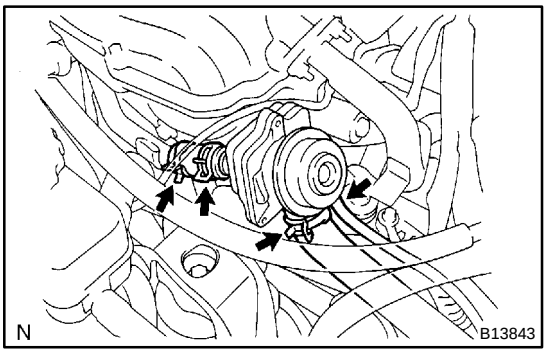
(a) Apply vacuum (45 kPa (459 gf/cm^2, 6.53 psi) to port A, blow air into port B and check that air is discharged from port C.

AIR SWITCHING VALVE ASSY (2ZZ-GE)

12042-01

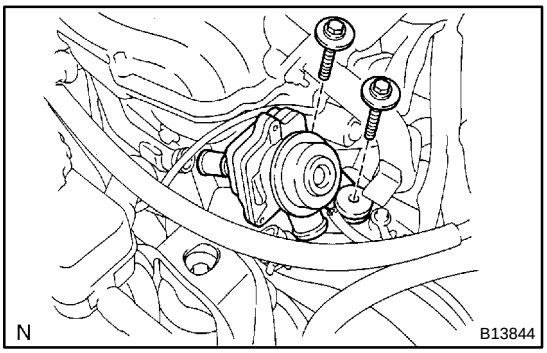
REPLACEMENT

1. CYLINDER HEAD COVER NO.2

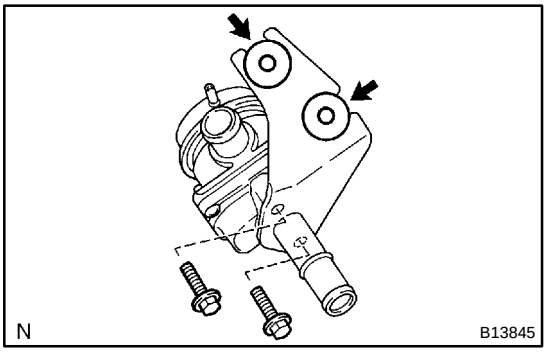


2. REMOVE AIR SWITCHING VALVE ASSY

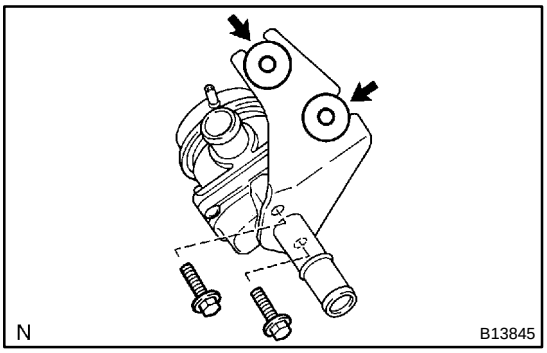
(a) Using a plier, grip the claws of the hose clip and slide the clip along the hose.
(b) Disconnect the 3 hoses.



(c) Remove the 2 bolts and air switching valve assy.

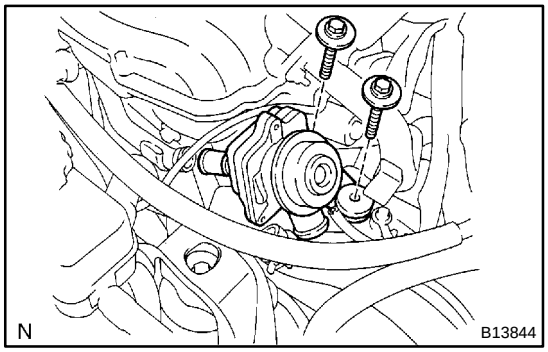


(d) Remove the 2 bolts and bracket.
(e) Remove the 2 bushes.

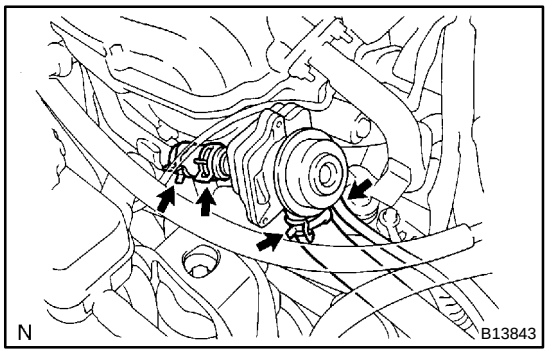


3. INSTALL AIR SWITCHING VALVE ASSY

(a) Install the 2 bolts and bracket.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
(b) Install the 2 bushes.



(c) Install the 2 bolts and air switching valve assy.
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)



(d) Connect the 3 hoses.

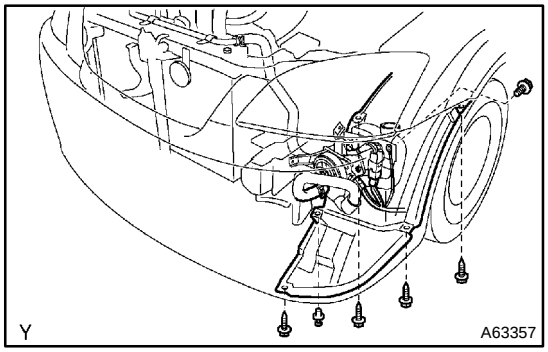
4. CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

AIR PUMP ASSY (2ZZ-GE)

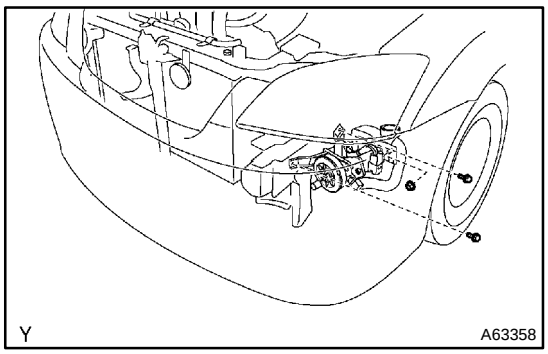
REPLACEMENT

12043-01

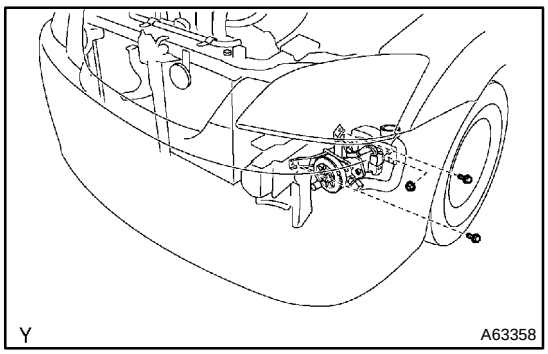


1. REMOVE AIR PUMP ASSY

(a) Remove the 4 screws, nut and front fender liner LH.
(b) Disconnect the 2 connectors and earth line.
(c) Disconnect the air injection system hose No. 5.

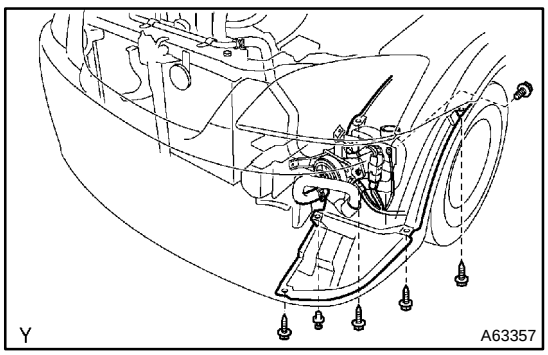


(d) Remove the 2 bolts, nut and the air pump assy.



2. INSTALL AIR PUMP ASSY

(a) Install the 2 bolts, nut and the air pump assy
Torque:
Bolt 7.0 N·m (71 kgf·cm, 62 in.·lbf)
Nut 7.0 N·m (71 kgf·cm, 62 in.·lbf)

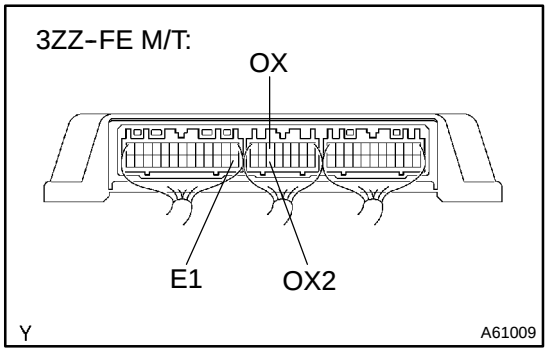


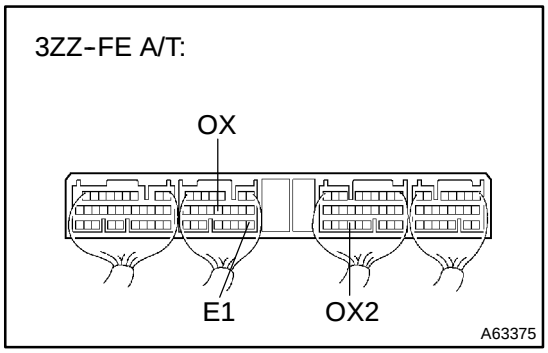
(b) Connect the air injection system hose No. 5.
(c) Connect the 2 connectors and earth line.
(d) Install the 4 screws, nut and front fender line LH.

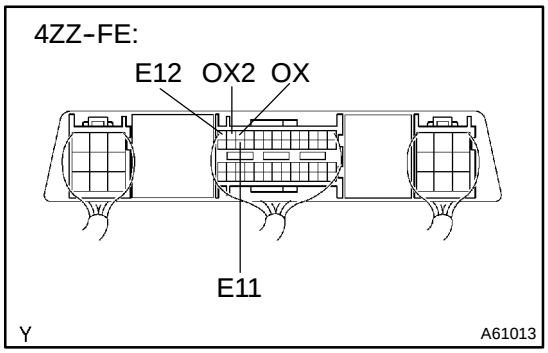
EMISSION CONTROL SYSTEM (3ZZ-FE/4ZZ-FE)

12044-01

ON-VEHICLE INSPECTION







1. INSPECT AIR-FUEL RATIO COMPENSATION SYSTEM

HINT:

You can also check the system by choosing "DATA MONITOR", then "O_2 SENSOR OUTPUT VOLTAGE" on the monitor of the hand-held tester.

(a) 3ZZ-FE

(1) Connect the hand-held tester to the terminals OX and E1 of the ECM.

(2) Connect the hand-held tester to the terminals OX2 and E1 of the ECM.

(b) 4ZZ-FE

(1) Connect the hand-held tester to the terminals OX and E11 of the ECM.

(2) Connect the hand-held tester to the terminals OX2 and E12 of the ECM.

CAUTION:

Connect test leads from the back side of the connector with the ECM connected.

(c) Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 2 minutes.

(d) Confirm that the voltage changes between 0 V to 1 V with the engine speed at 2,500 rpm.

OK:

The voltage changes more than 8 times in 10 seconds.

CAUTION:

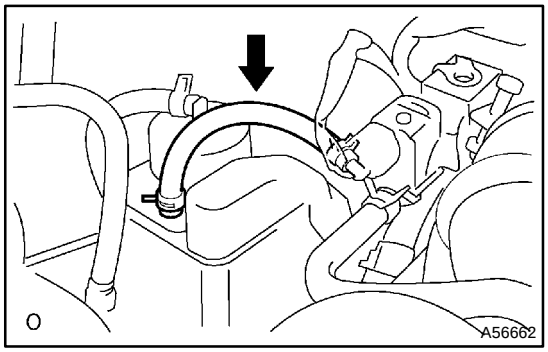
- **Perform the check immediately after the end of the warming up.**
- **If not confirming the change of voltage, warming up the oxygen sensor again.**

2. INSPECT FUEL CUT OFF R/MIN

(a) Increase the engine speed to at least 3,500 rpm.

(b) Use a sound scope to check for injector operating noise.

(c) Check that when the throttle lever is released, injector operation noise stops momentarily and then resumes.



3. INSPECT EVAPORATIVE EMISSION CONTROL SYSTEM

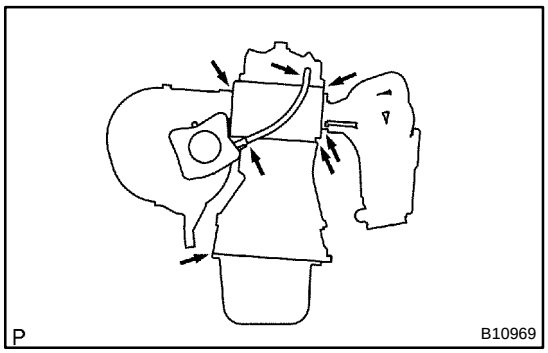
(a) After starting the engine, disconnect the vacuum hose shown in the illustration.

(b) Confirm vacuum occurs at the vsv port, when choosing "ACTIVE TEST" and "PURGE VSV" according to the display on hand-held tester.

(c) Finish "ACTIVE TEST", then connect the vacuum hose again.

(d) After going to "ECU DATA MONITOR" on the hand-held tester, choose "PURGE VSV" to check the operation of the purge vsv.

(e) After warm up the engine and drive the vehicle, confirm the vsv turns on from off.

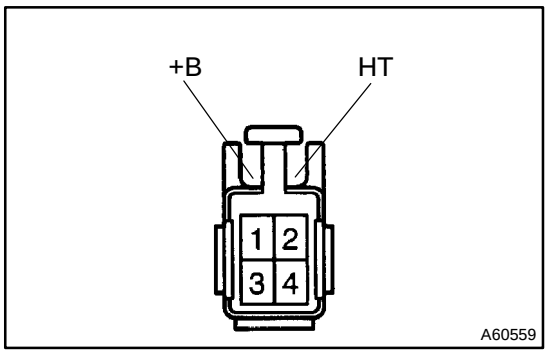


4. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

(a) Check for cracks, leaks or damage.

HINT:

Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause the engine to run out of turn. Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will allow air suction and cause the engine to run out of turn.

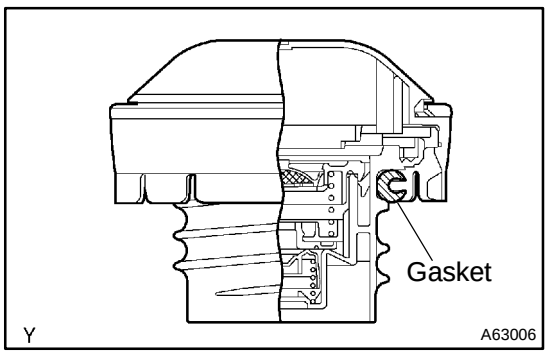


5. INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSOR

(a) Disconnect the oxygen sensor connector.

(b) Using an ohmmeter, measure the resistance between the terminals 2 (HT) and 1 (+B).

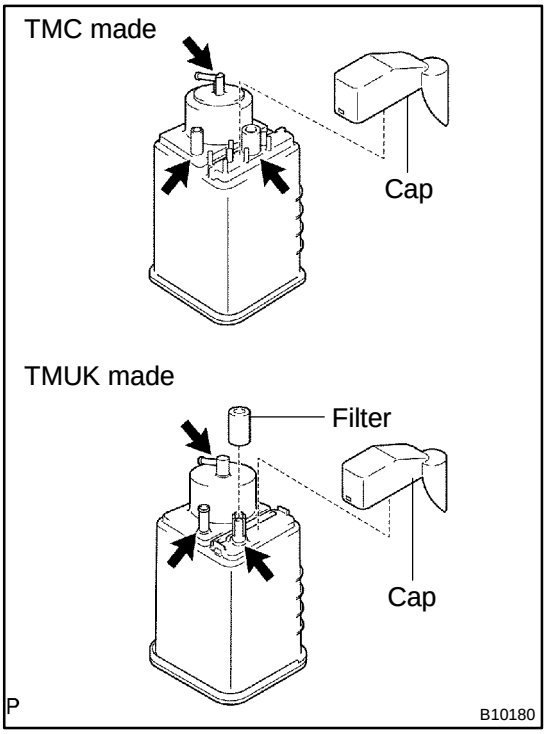
Resistance: 11 - 16 Ω at 20 _C (68 _F)



6. INSPECT FUEL TANK CAP

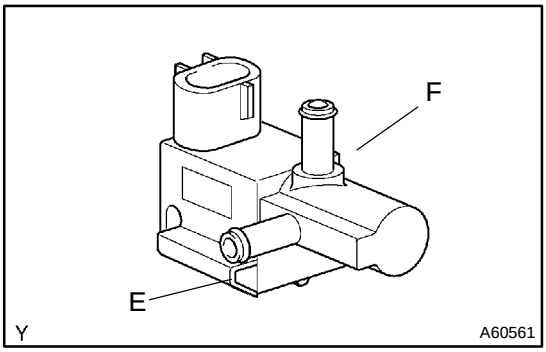
(a) Visually check if the cap and/or gasket are deformed or damaged.

INSPECTION



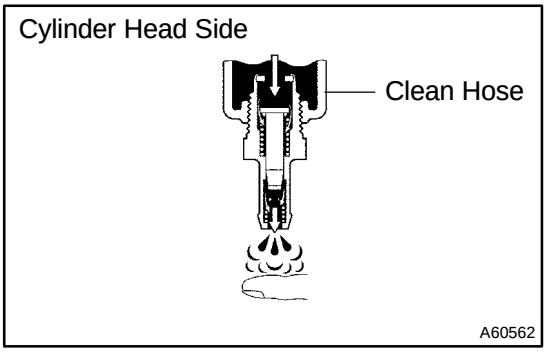
1. CHARCOAL CANISTER ASSY

(a) Remove the charcoal canister cap.
  (1) TMC made:
  Using a small screwdriver, remove the charcoal canister cap.
  (2) TMUK made:
  Using a small screwdriver, remove the charcoal canister cap and filter.
(b) Visually check the charcoal canister for cracks or damage.



2. VACUUM SWITCHING VALVE

(a) Inspect VSV for open circuit
  (1) Using an ohmmeter, measure the resistance between each terminal.
  Resistance: 30 - 34 Ω at 20 _C (68 _F)
(b) Inspect VSV operation
  (1) Apply battery voltage across the terminals.
  (2) Check that air flows from port E to port F.
  Operation: Air flows from the port F

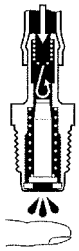


3. VENTILATION VALVE SUB-ASSY

(a) Blow air into the cylinder head side, and check that air passes through easily.

CAUTION:
Do not suck air through the value. Petroleum substances inside the valve air harmful.

Intake Manifold Side



A60563

(b) Blow air into the intake manifold side, and check that air passes through with difficulty.

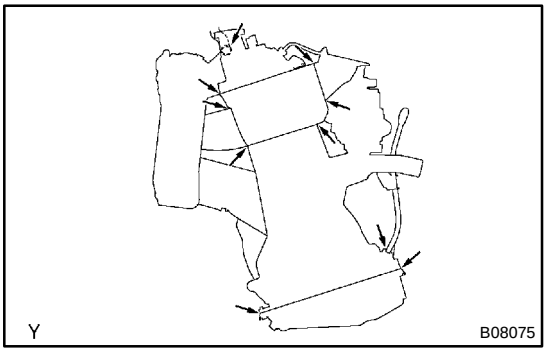
HINT:

If operation is not as specified, replace the PCV valve.

EMISSION CONTROL SYSTEM (1CD-FTV)

12045-01

ON-VEHICLE INSPECTION



1. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

(a) Check for cracks, leak or damage.

HINT:

Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause the engine to run out of turn. Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will allow air suction and cause the engine to run out of turn.

EGR SYSTEM (1CD-FTV)

12046-01

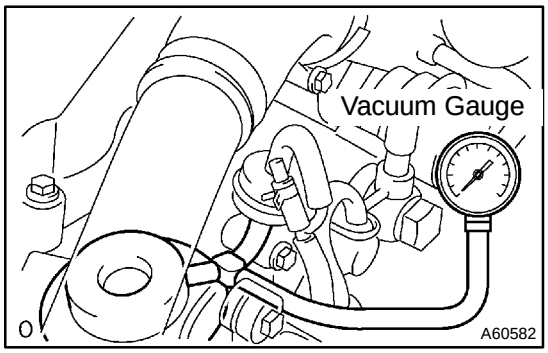
ON-VEHICLE INSPECTION

NOTICE:

Always stop the engine when installing or removing the vacuum gauge, or removing the vacuum hose.

HINT:

In a malfunction where the EGR system is always on, black smoke or white smoke may be output from the exhaust pipe. If this occurs, inspect the EGR system also.



1. INSTALL VACUUM GAUGE

(a) Using a 3 way connector, connect a vacuum gauge to the hose between the EGR valve and E-VRV.

2. INSPECT SEATING OF EGR VALVE

(a) Start the engine and check that the engine starts and run at idle.

3. INSPECT COLD ENGINE CONDITION

(a) The coolant temperature should be below 20_C (64_F).

(b) Check that the vacuum gauge indicates 0 at idle.

4. INSPECT HOT ENGINE CONDITION

(a) Warm up the engine, the coolant temperature should be above 70_C (140_F) and below 96_C (205_F).

(b) Check that the vacuum gauge indicates about more than 28.0 kPa (210 mmHg, 8.3 in.Hg) at idle.

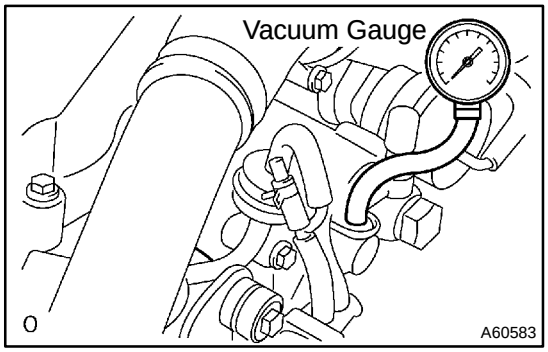
(c) Check that the vacuum gauge indicates increases about more than 28.0 kPa (210 mmHg, 8.3 in.Hg) at 1,500 r/min.

(d) When the accelerator pedal is quickly depress to the full open, check that the vacuum gauge indicator drops momentarily.

(e) Keep the engine speed at more than 4,400 r/min.

(f) Check that the accelerator pedal is released, check that the vacuum gauge indicator drops momentarily while the engine speed decreases from more than 4,000 r/min to idle.

5. REMOVE VACUUM GAUGE



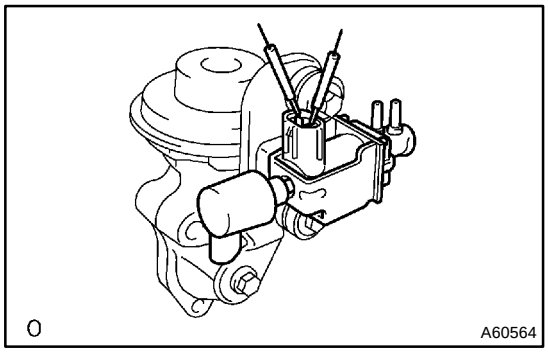
6. CHECK OUTPUT VACUUM WITH VACUUM GAUGE

(a) Connect a vacuum gauge to the output pipe.

(b) Warm up the engine and check that the vacuum gauge indicates above 86.7 kPa (650 mmHg, 25.59 in.Hg).

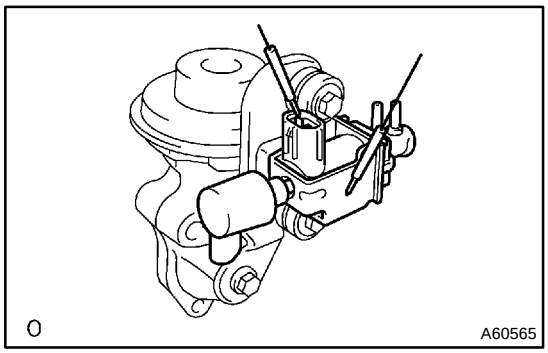
12047-01

INSPECTION

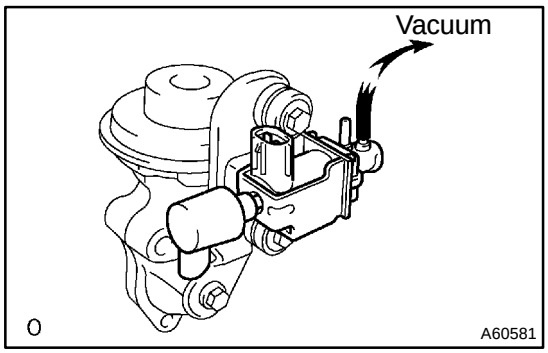


1. EGR VALVE ASSY

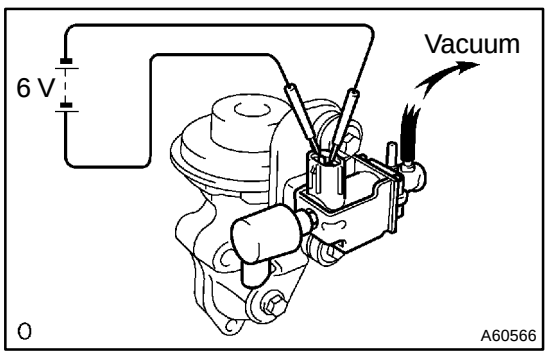
(a) Inspect the E-VRV for open circuit.
(1) Using an ohmmeter, measure the resistance between each terminal.
Resistance: 11 - 13 Ω at 20_C (68_F)



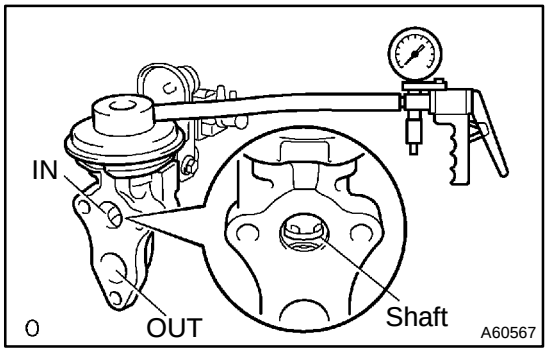
(b) Inspect the E-VRV for ground.
(1) Using an ohmmeter, check that there is continuity between terminals and body.
Specified condition: No continuity



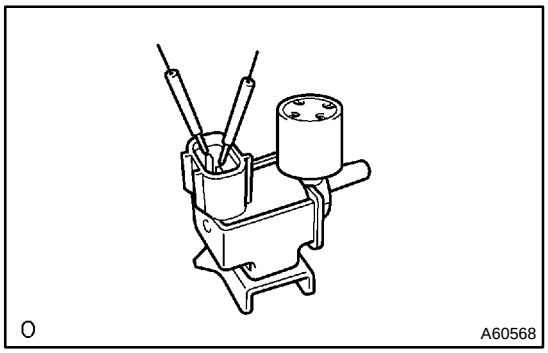
(c) Inspect the E-VRV for air tightness.
(1) Check that when vacuum is applied to the vacuum outlet port shown, the needle of vacuum pump indicates an increase of 66.7 kPa (500 mmHg, 19.7 in.Hg) or more.



(d) Inspect the E-VRV operation.
(1) Apply about 6 V of DC power to the terminals.
(2) Check that when vacuum is applied to the vacuum outlet port shown, the need does not move.

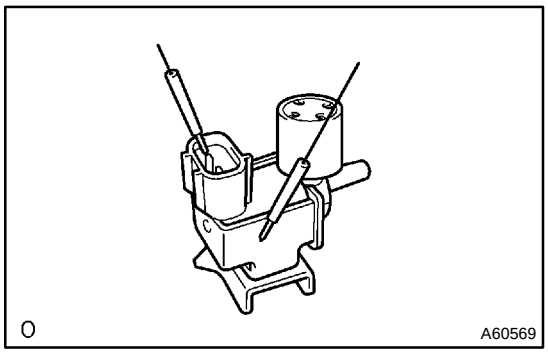


(e) Inspect the EGR Valve operation.
(1) When a vacuum of 26.7 kPa (200 mmHg, 7.87 in.HG) is applied to the diaphragm chamber, check that the shaft rises up and that air flows from IN to OUT.
(2) Maintain the above conditions, and check again that there are no leaks.
(3) Check the valve for sticking and heavy carbon deposits.

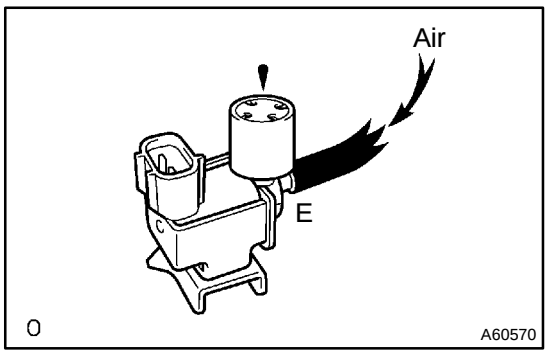


2. VACUUM SWITCHING VALVE ASSY NO.1

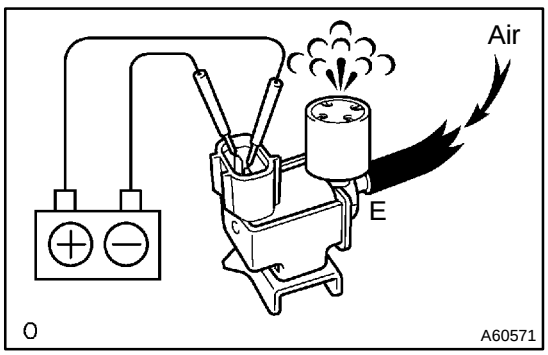
(a) Inspect the VSV for open circuit.
(1) Using an ohmmeter, check that resistance between each terminal.
Resistance: 33 - 39 Ω at 20_C (68_F)



(b) Inspect the VSV for ground.
(1) Using an ohmmeter, check that there is continuity between terminals and body.
Specified condition: No continuity



(c) Inspect the VSV operation.
(1) Check that air does not flows from port E to the filter.



(2) Apply battery voltage across the terminals.
(3) Check that air flows from port E to filter.

INTAKE

TURBO CHARGER SYSTEM (1CD-FTV) . . . 13-1
PRECAUTION 13-1/2
ON-VEHICLE INSPECTION 13-3/4
INSPECTION 13-5
TURBOCHARGER SUB-ASSY (1CD-FTV) 13-6
COMPONENTS 13-6/7
REPLACEMENT 13-8/11
INTERCOOLER ASSY (1CD-FTV) 13-12
REPLACEMENT 13-12/13

TURBO CHARGER SYSTEM (1CD-FTV)

PRECAUTION

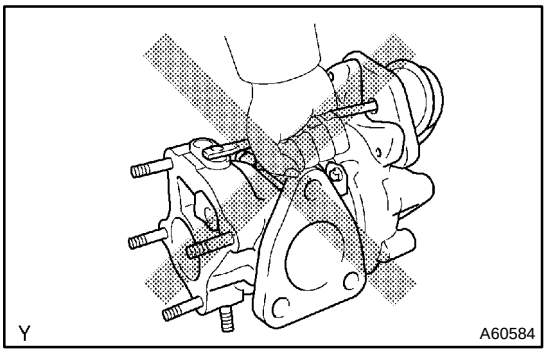
13037-01

1. MAINTENANCE PRECAUTION

(a) Do not stop the engine immediately after pulling a trailer or after high speed or uphill driving. Idle the engine for 20 – 120 seconds, depending on how hard the vehicle has been driven.

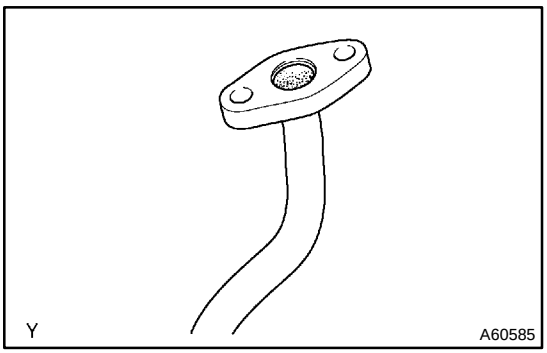
(b) Avoid sudden acceleration or racing immediately after starting a cold engine.

(c) If the turbocharger is found to be defective and must be replaced, check for the cause, and repair or replace these items as necessary:
- (1) Engine oil level and quality
- (2) Conditions under which the turbocharger was used
- (3) Oil lines leading to the turbocharger



(d) Use caution when removing and reinstalling the turbocharger assembly do not drop it or bang it against anything or grasp it by easily-deformed parts, such as the actuator or push rod, when moving it.

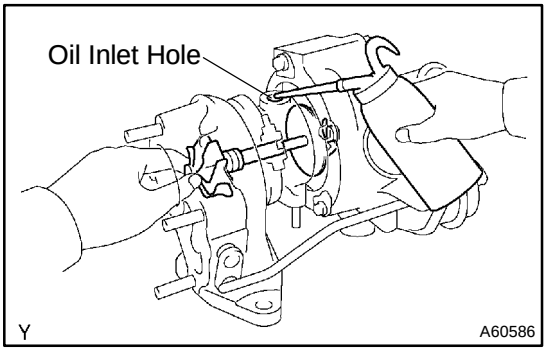
(e) Before removing the turbocharger, plug the intake and exhaust ports and oil inlet to prevent entry of dirt or other foreign material.



(f) If replacing the turbocharger, check for accumulation of sludge particles in the oil pipe, and if necessary, replace the oil pipe.

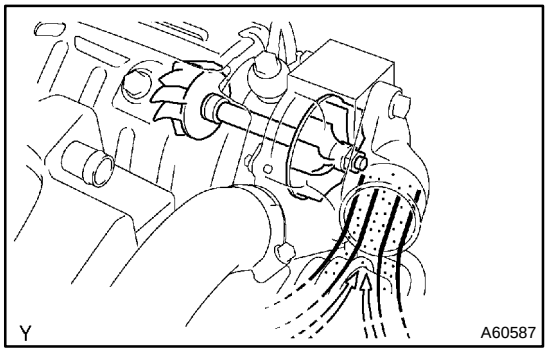
(g) Completely remove the gasket adhered to the lubrication oil pipe flange and turbocharger oil flange.

(h) When replacing the bolts or nuts, use only authorized replacement parts to prevent breakage or deformation.



(i) If replacing the turbocharger, put 20 cm^3 (1.2 cu in.) of fresh oil into the turbocharger oil inlet hole and turn the turbine wheel by hand to spread oil to the bearing.

(j) If overhauling or replacing the engine, cut the fuel supply after reassembly and crank the engine for 30 seconds to distribute oil throughout the engine then allow the engine to idle for 60 seconds.



(k) If the engine is running without the air cleaner, case cover and hose, entry of foreign particles will damage the wheels which run at extremely high speed.

13038-01

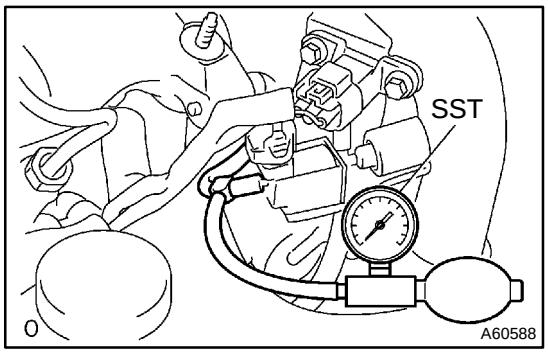
ON-VEHICLE INSPECTION

1. INSPECT INTAKE AIR SYSTEM

(a) Check for leakage or clogging between the air cleaner housing and turbocharger inlet and between the turbocharger outlet and cylinder head.
- (1) Clogged air cleaner...Clean or replace element
- (2) Hoses collapsed or deformed...Repair or replace
- (3) Leakage from connections...Check each connection and repair
- (4) Cracks in components...Check and replace

2. INSPECT EXHAUST SYSTEM

(a) Check for leakage or clogging between the cylinder head and turbocharger inlet and between the turbocharger outlet and exhaust pipe.
- (1) Deformed components...Repair or replace
- (2) Foreign material in passages...Remove
- (3) Leakage from components...Repair or replace
- (4) Cracks in components...Check and replace



3. CHECK TURBOCHARGING PRESSURE

(a) Warm up engine.

(b) Using a 3-way connector, connect SST (turbocharger pressure gauge) to the hose leading to the intake air connector.

SST 09992 - 00242

(c) Depress in the clutch pedal, then press the accelerator pedal down as far as it will go. Measure the turbocharging pressure at maximum speed (5,100 - 5,250 r/min).

Standard pressure:

w/ Inter cooler

59 - 79 kPa (0.60 - 0.80 kgf/cm^2, 8.5 - 11.4 psi)

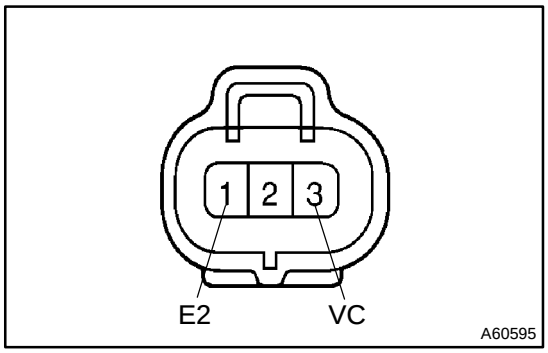
w/o Inter cooler

40 - 70 kPa (0.41 - 0.71 kgf/cm^2, 5.8 - 10.2 psi)

If the pressure is less than specified, check the intake air and exhaust systems for leakage.

If there is no leakage, check the actuator hose it disconnected. If not, check the turbocharger.

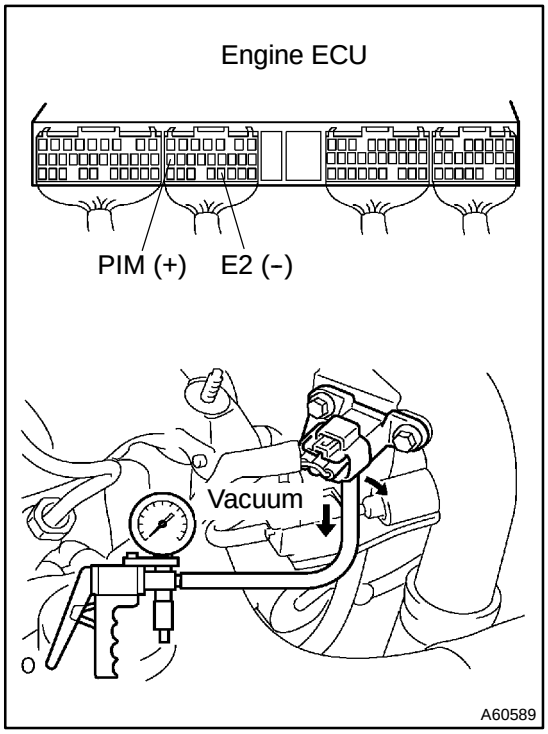
If the pressure is above specification, check if the actuator hose it disconnected or cracked. If not, check the turbocharger.



4. INSPECT TURBO PRESSURE SENSOR

(a) Inspect power source voltage
- (1) Disconnect the turbo pressure sensor connector.
- (2) Turn the ignition switch ON.
- (3) Using a voltmeter, measure the voltage between connector terminals 3 (VC) and 1 (E2) of the wiring harness side.

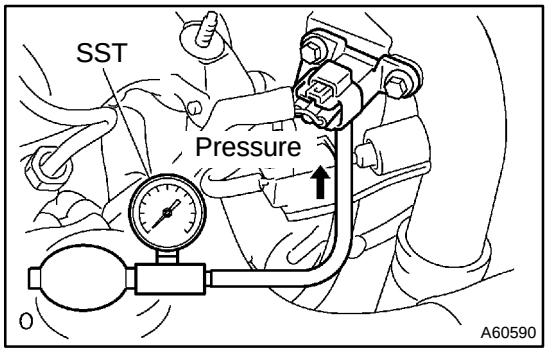
Voltage: 4.5 - 5.5 V
- (4) Turn the ignition switch OFF.
- (5) Reconnect the turbo pressure sensor connector.



(b) Inspect supply power
(1) Turn the ignition switch ON.
(2) Disconnect the vacuum hose from the turbo pressure sensor.
(3) Connect a voltmeter to terminals 16 (PIM) and 20 (E2) of the ECM and measure the output voltage under ambient atmospheric pressure.
(4) Apply vacuum to the turbo pressure sensor in 13.3 kPa (100 mmHg, 3.94 in.Hg) segments to 66.7 kPa (500 mmHg, 19.96 in.Hg).
(5) Measure the voltage drop from step (c) above for each segment.

Voltage drop:

Apply vacuum [kPa (mmHg, in.Hg)]	Voltage drop [V]
13.3 (100, 3.94)	0.1 - 0.3
26.7 (200, 7.87)	0.3 - 0.5
40.0 (300, 11.81)	0.5 - 0.7
57.3 (400, 15.75)	0.7 - 0.9
66.7 (500, 19.96)	0.9 - 1.0



(6) Using SST (turbocharger pressure gauge), apply pressure to the turbo pressure sensor in 19.6 kPa (0.20 kgf/cm^2, 2.84 psi) segments to 98.0 kPa (1.00 kgf/cm^2, 14.2 psi).

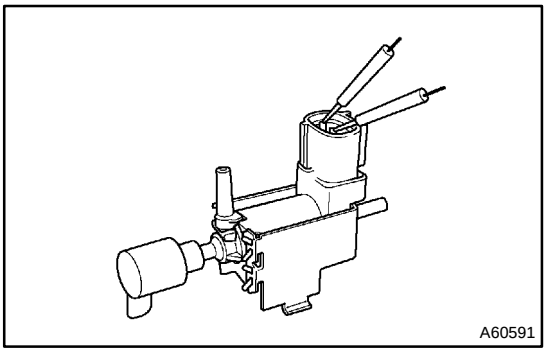
SST 09992-00242

(7) Measure the voltage up from step (c) above for each segment.

Voltage up:

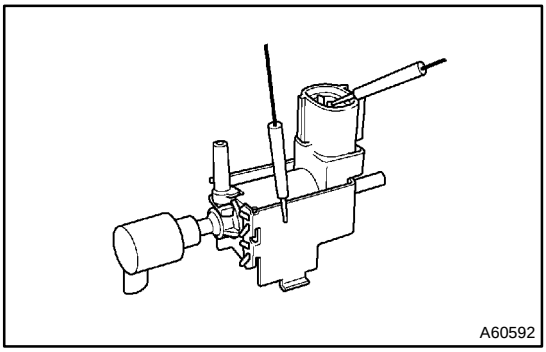
Applied pressure [kPa (kgf/cm^2, psi)]	Voltage up [V]
19.6 (0.20, 2.84)	0.1 - 0.4
39.2 (0.40, 5.69)	0.4 - 0.7
58.8 (0.60, 8.53)	0.7 - 1.0
78.5 (0.80, 11.4)	1.0 - 1.3
98.0 (1.00, 14.2)	1.3 - 1.6

INSPECTION

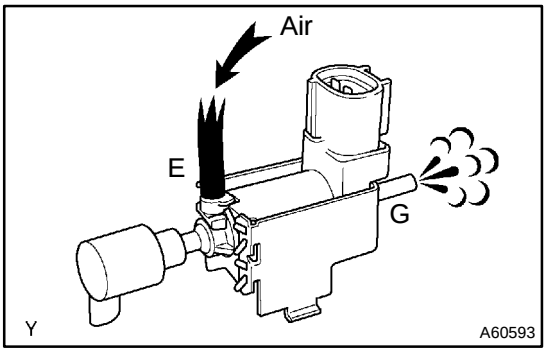


1. VACUUM SWITCHING VALVE ASSY NO.1

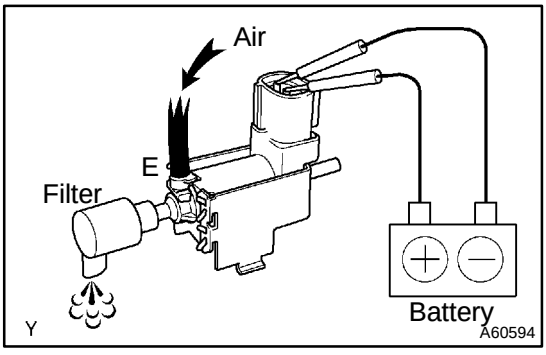
(a) Inspect VSV for open circuit.
(1) Using an ohmmeter, check that the there is continuity between the terminals.
Resistance: 37 - 44 Ω at 20_C (68_F)



(b) Inspect VSV for ground.
(1) Using an ohmmeter, check that there is no continuity between each terminal and the body.
Specified condition: No continuity



(c) Inspect VSV operation.
(1) Check that air flows from port E to G.

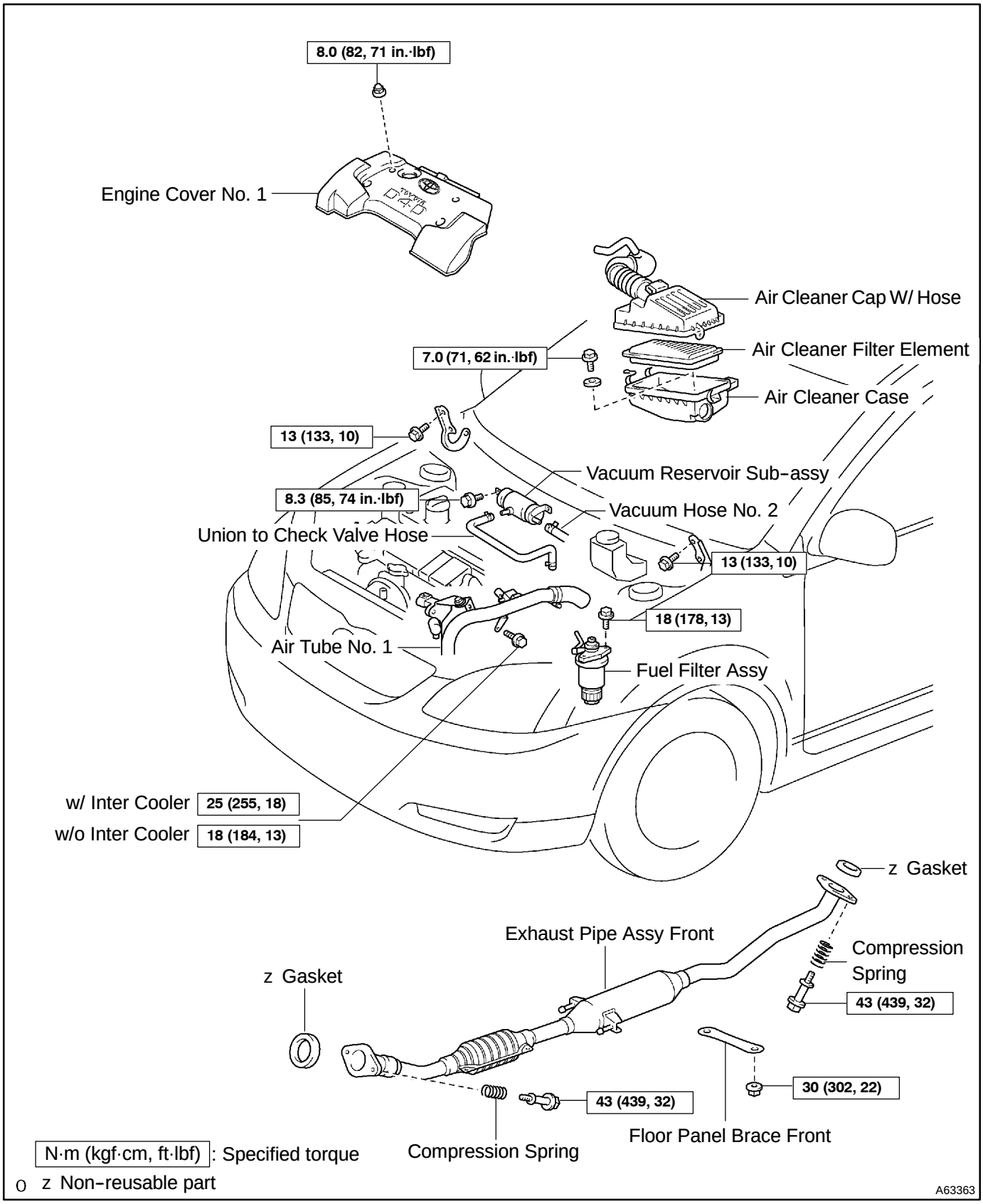


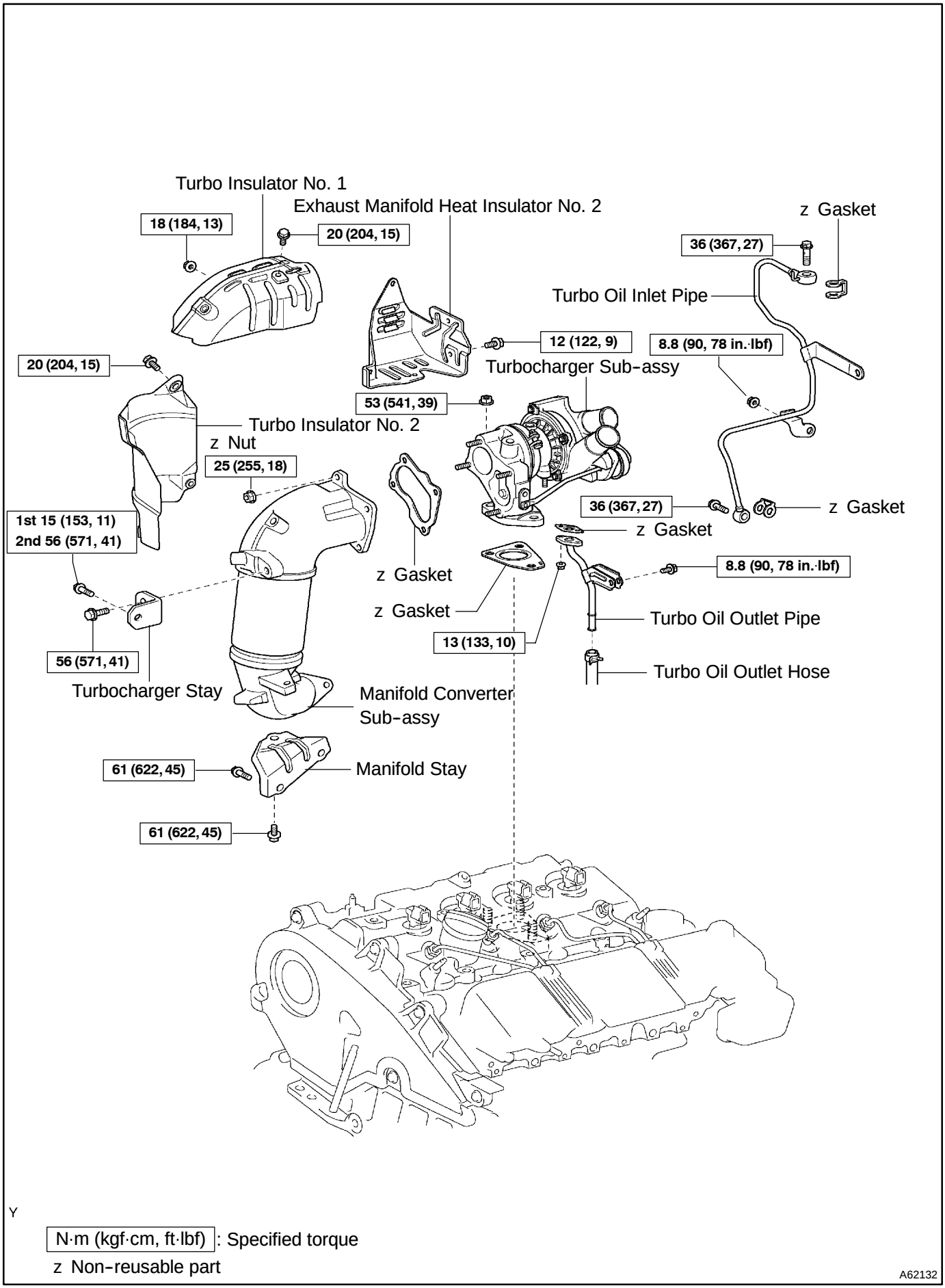
(2) Apply battery voltage across the terminals.
(3) Check that air flows from port E to filter.

TURBOCHARGER SUB-ASSY (1CD-FTV)

COMPONENTS

1303B-01




Turbo Insulator No. 1
Exhaust Manifold Heat Insulator No. 2
z Gasket
18 (184, 13)
20 (204, 15)
36 (367, 27)
Turbo Oil Inlet Pipe
12 (122, 9)
8.8 (90, 78 in.·lbf)
Turbocharger Sub-assy
20 (204, 15)
53 (541, 39)
Turbo Insulator No. 2
z Nut
25 (255, 18)
36 (367, 27)
z Gasket
z Gasket
1st 15 (153, 11)
2nd 56 (571, 41)
z Gasket
8.8 (90, 78 in.·lbf)
z Gasket
Turbo Oil Outlet Pipe
13 (133, 10)
56 (571, 41)
Turbocharger Stay
Turbo Oil Outlet Hose
Manifold Converter Sub-assy
61 (622, 45)
Manifold Stay
61 (622, 45)
Y
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A62132

REPLACEMENT

1. REMOVE VACUUM RESERVOIR SUB-ASSY

(a) Disconnect the 2 vacuum hoses and connector.
(b) Remove the 2 bolts and vacuum reservoir.

2. REMOVE ENGINE COVER SUB-ASSY NO.1

(a) Remove the 5 nuts and engine cover.

3. REMOVE AIR CLEANER ASSY

(a) Disconnect the connector.
(b) Loosen the air cleaner hose clamp bolt.
(c) Remove the air cleaner cap w/ hose.
(d) Remove the air cleaner filter element.
(e) Remove the 3 bolts and air cleaner case.

4. DISCONNECT AIR TUBE NO.1

(a) Remove the vacuum hose.
(b) Remove the 2 bolts installing the air tube.
(c) Loosen the air hose clamp bolt.
(d) Disconnect the air tube.

5. SEPARATE FUEL FILTER ASSY

(a) Disconnect the connector.
(b) Remove the 2 bolts installing the fuel filter.

6. REMOVE FLOOR PANEL BRACE FRONT

(a) Remove the 2 nuts and floor panel brace front.

7. REMOVE EXHAUST PIPE ASSY FRONT

(a) Remove the 4 bolts and 4 compression springs.
(b) Remove the exhaust pipe from the 2 exhaust pipe supports.

8. REMOVE TURBO INSULATOR NO.2

(a) Remove the 4 bolts and turbo insulator.

9. REMOVE TURBO INSULATOR NO.1

(a) Remove the 2 bolts, the nut and the turbo insulator.

10. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.2

(a) Remove the 2 bolts and exhaust manifold heat insulator.

11. REMOVE TURBOCHARGER STAY

(a) Remove the 2 bolts and turbocharger stay.

12. REMOVE MANIFOLD STAY

(a) Remove the 3 bolts and manifold stay.

13. REMOVE MANIFOLD CONVERTER SUB-ASSY

(a) Remove the 4 nuts, manifold converter and gasket.

14. REMOVE TURBO OIL INLET PIPE

(a) Remove the bolt and nut.
(b) Remove the 2 union bolts, 2 gaskets and turbo oil inlet pipe.

15. DISCONNECT TURBO OIL OUTLET HOSE

(a) Disconnect the turbo oil outlet hose from the turbo oil outlet pipe.

16. REMOVE TURBO OIL OUTLET PIPE

(a) Remove the 2 nuts, turbo oil outlet pipe and gasket.

17. REMOVE TURBOCHARGER SUB-ASSY

(a) Remove the 3 nuts, turbocharger and gasket.

18. INSTALL TURBOCHARGER SUB-ASSY

(a) Install a new gasket, the turbocharger, and temporarily tighten the 3 nuts.
(b) Tighten the 3 nuts.
Torque: 53 N·m (541 kgf·cm, 39 ft·lbf)

19. INSTALL TURBO OIL OUTLET PIPE

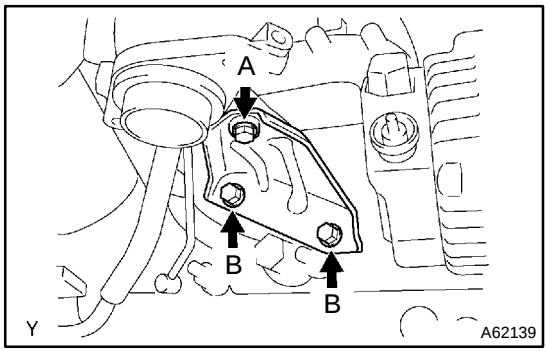
(a) Install a new gasket and the turbo oil outlet pipe with the 2 nuts.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

20. INSTALL TURBO OIL INLET PIPE

(a) Install 2 new gaskets and the turbo oil inlet pipe with the 2 union bolts.
Torque: 36 N·m (367 kgf·cm, 27 ft·lbf)
(b) Tighten the bolt and nut.
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

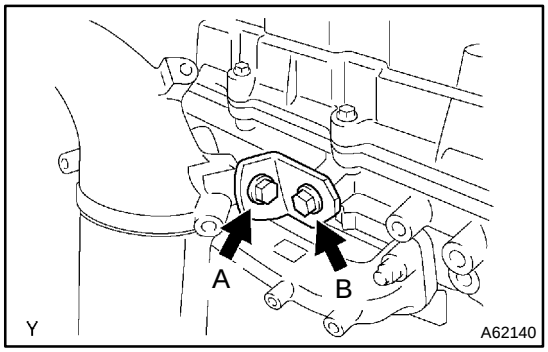
21. INSTALL MANIFOLD CONVERTER SUB-ASSY

(a) Install a new gasket, the manifold converter, manifold stay, and temporarily tighten the new 4 nuts and 3 bolts.
(b) Tighten the 4 nuts.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)



22. INSTALL MANIFOLD STAY

(a) Tighten the bolt A.
Torque: 61 N·m (622 kgf·cm, 45 ft·lbf)
(b) Tighten the 2 bolts B.
Torque: 61 N·m (622 kgf·cm, 45 ft·lbf)



23. INSTALL TURBOCHARGER STAY

(a) Install the turbocharger stay, and temporarily tighten the bolt A.
(b) Temporarily tighten the bolt B while pushing the turbocharger stay toward the cylinder head.
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)
(c) Tighten the bolt A.
Torque: 56 N·m (571 kgf·cm, 41 ft·lbf)
(d) Tighten the bolt B.
Torque: 56 N·m (571 kgf·cm, 41 ft·lbf)

24. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.2

(a) Install the exhaust manifold heat insulator with the 2 bolts.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)

25. INSTALL TURBO INSULATOR NO.1

(a) Install the turbo insulator with the 2 bolts and nut.
Torque:
Bolt 20 N·m (204 kgf·cm, 15 ft·lbf)
Nut 18 N·m (184 kgf·cm, 13 ft·lbf)

26. INSTALL TURBO INSULATOR NO.2

(a) Install the turbo insulator with the 4 bolts.
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

27. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-8)

28. INSTALL FLOOR PANEL BRACE FRONT

(a) Install the floor panel brace front with the 2 nuts.
Torque: 30 N·m (302 kgf·cm, 22 ft·lbf)

29. INSTALL FUEL FILTER ASSY
(a) Install the fuel filter with the 2 bolts.
Torque: 18 N·m (178 kgf·cm, 13 ft·lbf)

30. INSTALL AIR TUBE NO.1

(a) Install the air tube with the 2 bolts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

31. INSTALL AIR CLEANER ASSY

(a) Install the air cleaner lower case with the 3 bolts.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

32. INSTALL ENGINE COVER SUB-ASSY NO.1

(a) Install the engine cover with 5 nuts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

33. INSTALL VACUUM RESERVOIR SUB-ASSY

(a) Install the vacuum reservoir with the 2 bolts.
Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)

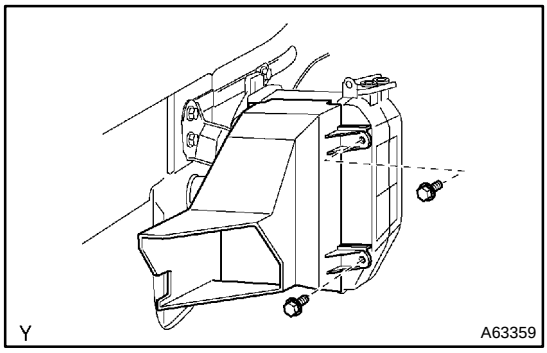
34. CHECK ENGINE OIL LEVEL
35. CHECK ENGINE OIL LEAK
36. CHECK EXHAUST GAS LEAK

INTERCOOLER ASSY (1CD-FTV)

1303A-01

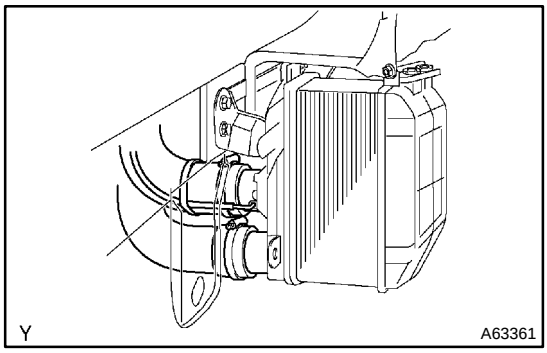
REPLACEMENT

1. REMOVE FRONT BUMPER COVER
(See page 76-5)



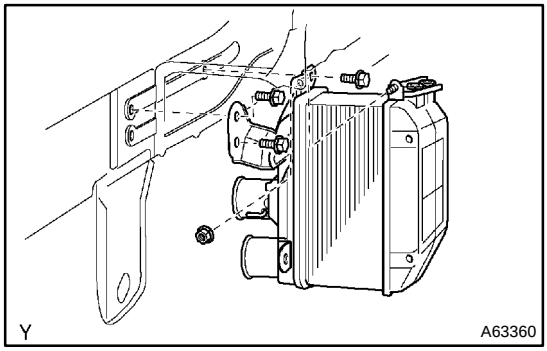
2. REMOVE INTERCOOLER COOLING AIR DUCT SUB-ASSY

(a) Remove the 2 bolts and the cooling air duct.

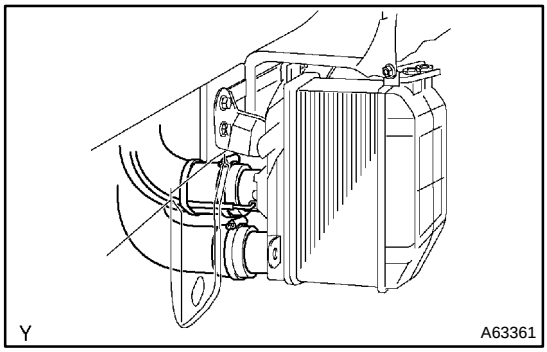


3. REMOVE INTERCOOLER ASSY

(a) Disconnect the vacuum hose, air tube assy No. 1 and air tube assy No. 2 from intercooler.



(b) Remove the 3 bolts, nut and intercooler assy.



4. INSTALL INTERCOOLER ASSY

(a) Install the 3 bolts,nut and intercooler assy.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

(b) Connect the vacuum hose, air tube assy No. 1 and air tube assy No. 2

5. INSTALL INTERCOOLER COOLING AIR DUCT SUB-ASSY

(a) Install the 2 bolts and the cooling air duct.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

6. INSTALL FRONT BUMPER COVER
(See page 76-5)

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ENGINE ASSEMBLY (2ZZ-GE)

140LZ-01

INSPECTION

1. INSPECT COOLANT (See page 16-1)
2. INSPECT ENGINE OIL (See page 17-1)
3. INSPECT BATTERY
   (See page 19-5)
4. INSPECT AIR CLEANER FILTER ELEMENT SUB-ASSY

5. INSPECT SPARK PLUG
   (See page 18-3)

6. INSPECT IGNITION TIMING

(a) Warm up engine.

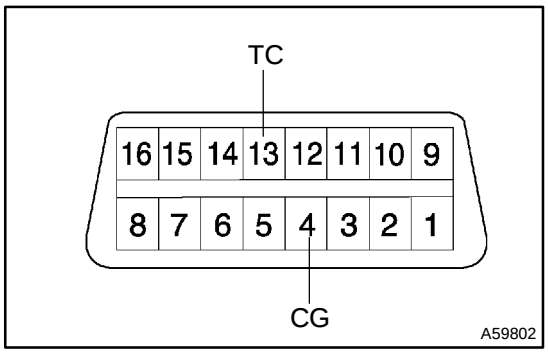
(b) When using hand-held tester.

(1) Connect the hand-held tester to the DLC3.

HINT:

Please refer to the hand-held tester operator's manual for further details.

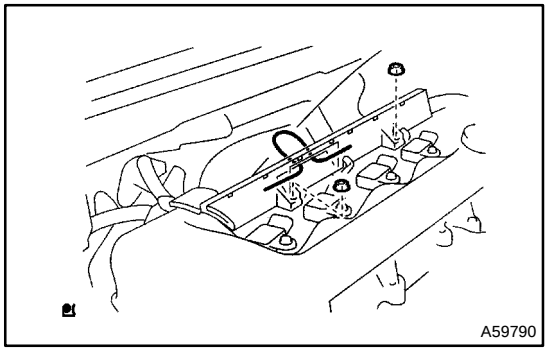
(c) When not using hand-held tester.



(1) Using SST,connect terminals 13 (TC) and 4 (CG) of DLC3.

SST 09843-18030

(2) Connect timing light to engine.



NOTICE:

- **Use a timing light which can detect the first signal.**
- **After checking, be sure to tape the wire harness.**

(d) Inspect ignition timing at idle.

Ignition timing: 8 - 12_BTDC

NOTICE:

When checking the ignition timing, the transmission is at neutral position.

HINT:

After engine rpm is kept at 1,000 - 1,300 rpm for 5 seconds, check that it returns idle speed.

7. INSPECT ENGINE IDLE SPEED

(a) Warm up engine.

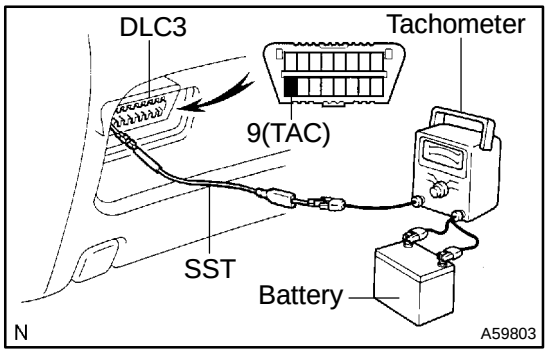
(b) When using hand-held tester.

(1) Connect the hand-held tester to the DLC3.

HINT:

Please refer to the hand - held tester operator's manual for further details.

(c) When not using hand-held tester.



(1) Using SST, connect tachometer test prove to terminal 9 (TAC) of DLC3.

SST 09843-18040

(d) Check the idle speed.

Idle speed:750 - 850 rpm

NOTICE:

- **Check idle speed with cooling fan OFF.**
- **Switch off all accessories and air conditioning.**

8. INSPECT COMPRESSION

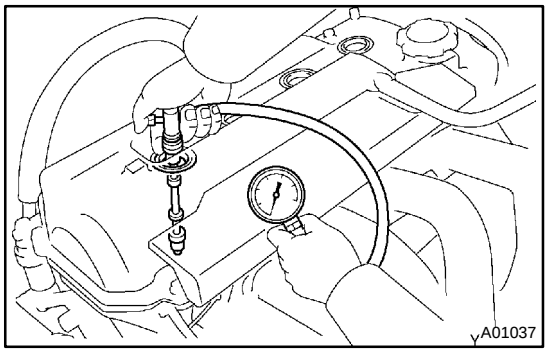
(a) Warm up and stop engine.

(b) Remove ignition coil.

(c) Remove spark plugs.

(d) Inspect cylinder compression pressure.

SST 09992-00500



(1) Insert a compression gauge into the spark plug hole.

(2) Fully open the throttle.

(3) While cranking the engine, measure the compression pressure.

NOTICE:

- **Always use a fully charged battery to obtain engine speed of 250 rpm or more.**
- **Check other cylinder's compression pressure in the same way.**
- **This measurement must be done in as short a time as possible.**

Compression pressure:
1,400 kpa (14.3 kgf/cm^2, 203 psi)
Minimum pressure:
1,000 kpa (10.3 kgf/cm^2, 145 psi)
Difference between each cylinder:
110 kpa (1.1 kgf/cm^2, 16 psi)

(4) If the cylinder compression in one more cylinders is low, pour a small amount of engine oil into the cylinder through the spark plug hole and repeat steps (1) through (3) for cylinders with low compression.
- If adding oil helps the compression, it is likely that the piston rings and/or cylinder bore are worn or damaged.
- If pressure stays low, a valve may be sticking or seating is improper, or there may be leakage past the gasket.

9. INSPECT CO/HC

(a) Start engine.
(b) Race engine at 2,500 rpm for approx. 180 seconds.
(c) Insert CO/HC meter testing probe at least 40 cm (1.3 ft) into tailpipe during idling.
(d) Immediately check CO/HC concentration at idle and/or 2,500 rpm.

HINT:
- Complete the measuring within 3 minutes.
- When doing the 2 mode (idle and 2,500 rpm) test, these measuring orders are prescribed by the applicable local regulations.

(e) If the CO/HC concentration does not comply with regulations, troubleshoot in the order given below.
(1) Check heated oxygen sensor operation.(See page 05–53)

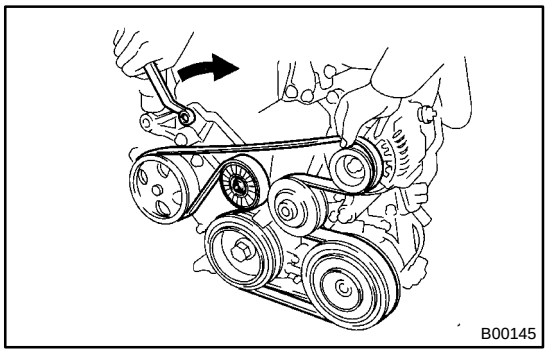
CO	HC	Problems	Causes
Normal	High	Rough idle	1. Faulty ignitions: S Incorrect timing S Fouled, shorted or improperly gapped plugs 2. Incorrect valve clearance 3. Leaky intake and exhaust valves 4. Leaky cylinders
Low	High	Rough idle (Fluctuating HC reading)	1. Vacuum leaks: S PCV hoses S Intake manifold S Throttle body S ISC valve S Brake booster line 2. Lean mixture causing misfire
High	High	Rough idle (Black smoke form exhaust)	1. Restricted air filter 2. Plugged PCV valve 3. Faulty EFI systems: S Faulty pressure regulator S Defective water temperature sensor S DEFECTIVE Air–flow meter S Faulty ECM S Faulty injectors S Faulty throttle position sensor

FAN AND GENERATOR V BELT (2ZZ-GE)

1401Y-03

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH



2. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

VALVE CLEARANCE (2ZZ-GE)

140M0-01

ADJUSTMENT

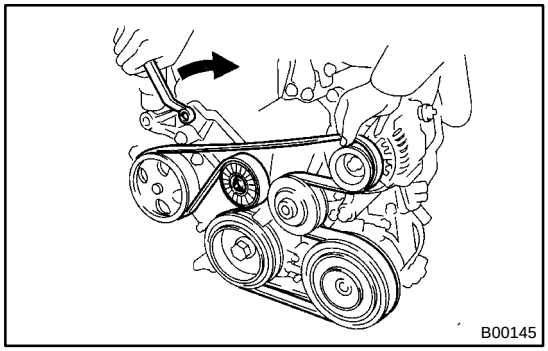
1. REMOVE CYLINDER HEAD COVER NO.2

2. REMOVE IGNITION COIL ASSY

3. DISCONNECT VENTILATION NO.1 TUBE

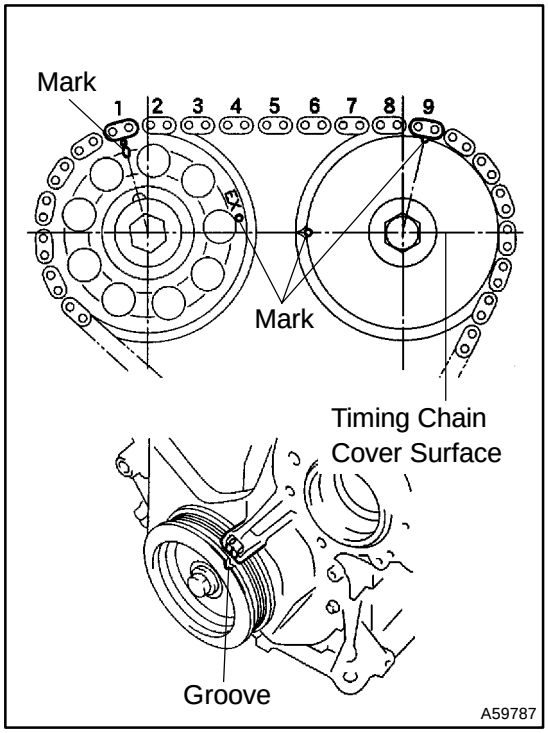
4. REMOVE CYLINDER HEAD COVER SUB-ASSY

5. REMOVE ENGINE UNDER COVER RH



6. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.



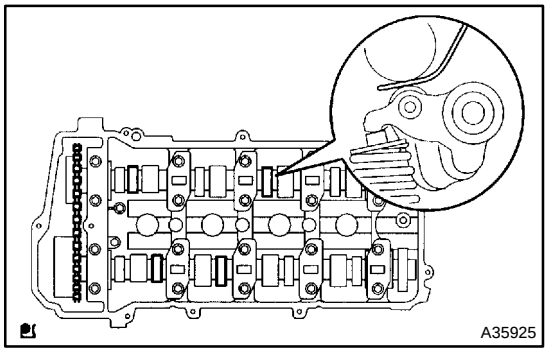
7. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.

(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

HINT:

If not, turn the crankshaft 1 revolution (360_) and align the marks as above.



8. INSPECT VALVE CLEARANCE

(a) Check only the valves indicated.

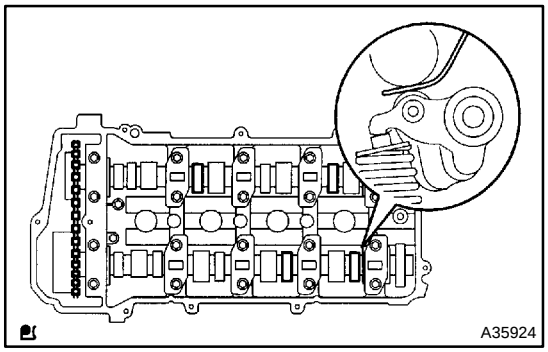
(1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

(2) Record the out-of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

Valve clearance (Cold)

Intake	0.08 - 0.18 mm (0.003 - 0.007 in.)
Exhaust	0.22 - 0.32 mm (0.009 - 0.013 in.)

(b) Turn the crankshaft 1 revolution (360 _) and set No. 4 cylinder to TDC/compression.



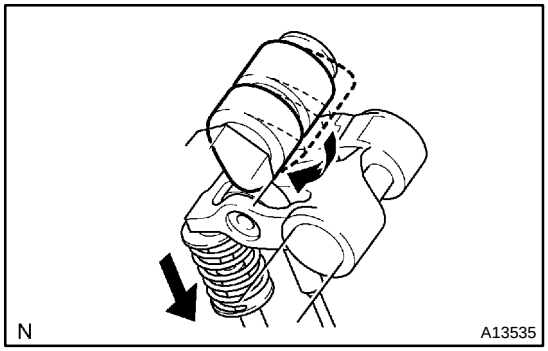
(c) Check only the valves indicated.

(1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

(2) Record the out-of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

Valve clearance (Cold)

Intake	0.08 - 0.18 mm (0.003 - 0.007 in.)
Exhaust	0.22 - 0.32 mm (0.009 - 0.013 in.)



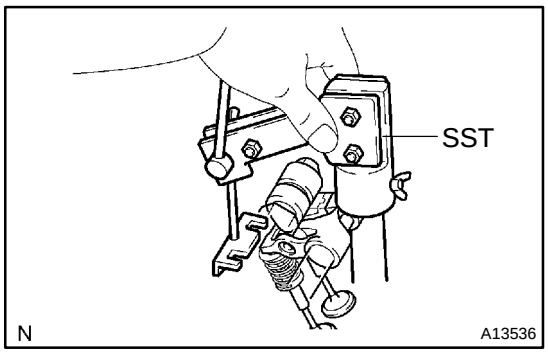
9. ADJUST VALVE CLEARANCE

(a) Set the SST.

(1) Turn the crankshaft so that the related rocker arm,where the valve clearance is adjusted, is fully pushed down.

NOTICE:

Remove the spark plug and take off the compression.

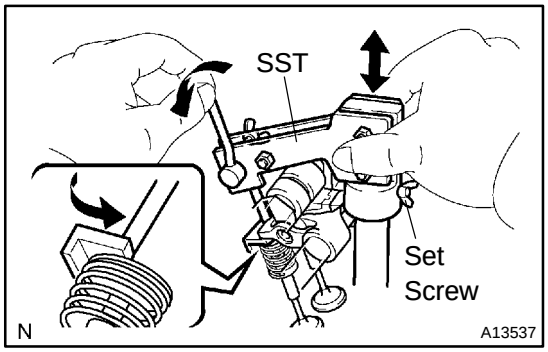


(2) Insert SST into the plug tube.

SST 09248-77010 (09248-07010)

NOTICE:

- **SST cannot be insreted unles the set screw is loosened.**
- **Make sure that the camshaft is in the same condition as step (1).**



(3) Operate the lever so that SST's seat surfase comes to contact with the valve retainer and lock them with the set screw.

NOTICE:

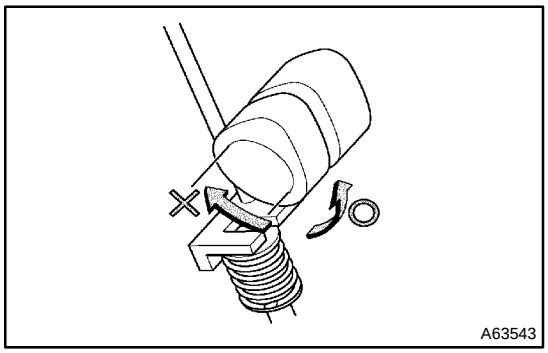
- **Clearance between the valve retainer and SST's seat surface is not allowed.**
- **Care should be taken not to make clearance when inserting SST, since a presence of clearance may unlock the keeper.**

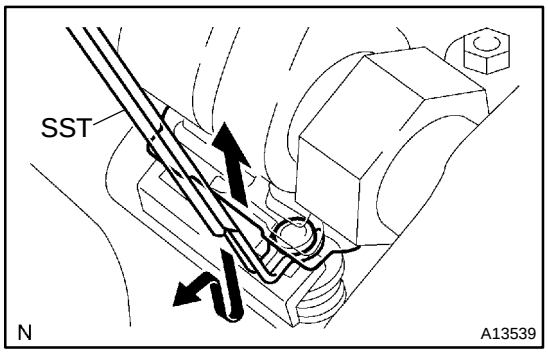
(4) lock the set screw on the plug tube side of SST.

(5) Rotate the crankshaft so that the camshaft is positioned as shown in the illustration.

NOTICE:

- **Pay attention to the direction of the rotation to prevent the nose of the camshaft from interfering with the SST's shaft.**
- **Do not rotate the crankshaft excessively.**





(b) Remove the adjusting shim.

(1) Lift the rocker arm to make a room and remove the adjusting shim using SST.

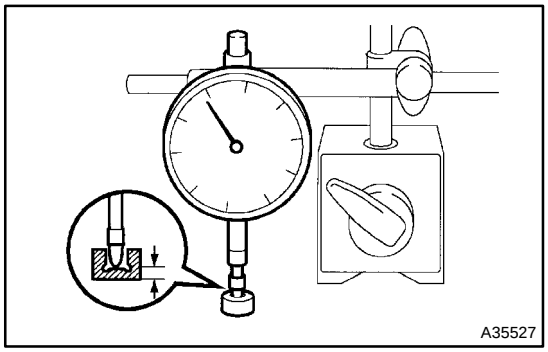
SST 09248-77010 (09248-07010)

NOTICE:

Do not remove SST in the condition that adjusting shim is removed.

HINT:

- Setting SST from the right above makes the removal easy.
- If there is not enough room, reset SST.



(2) Determine the size of the replaced shim according to there Formula or Charts:

- Using a dial indicator, measure the thickness of the removed shim.
- Calculate the thickness of a new shim so that the valve clearance comes within the specified value.

A	Thickness of new shim
B	Thickness of used shim
C	Measured valve clearance

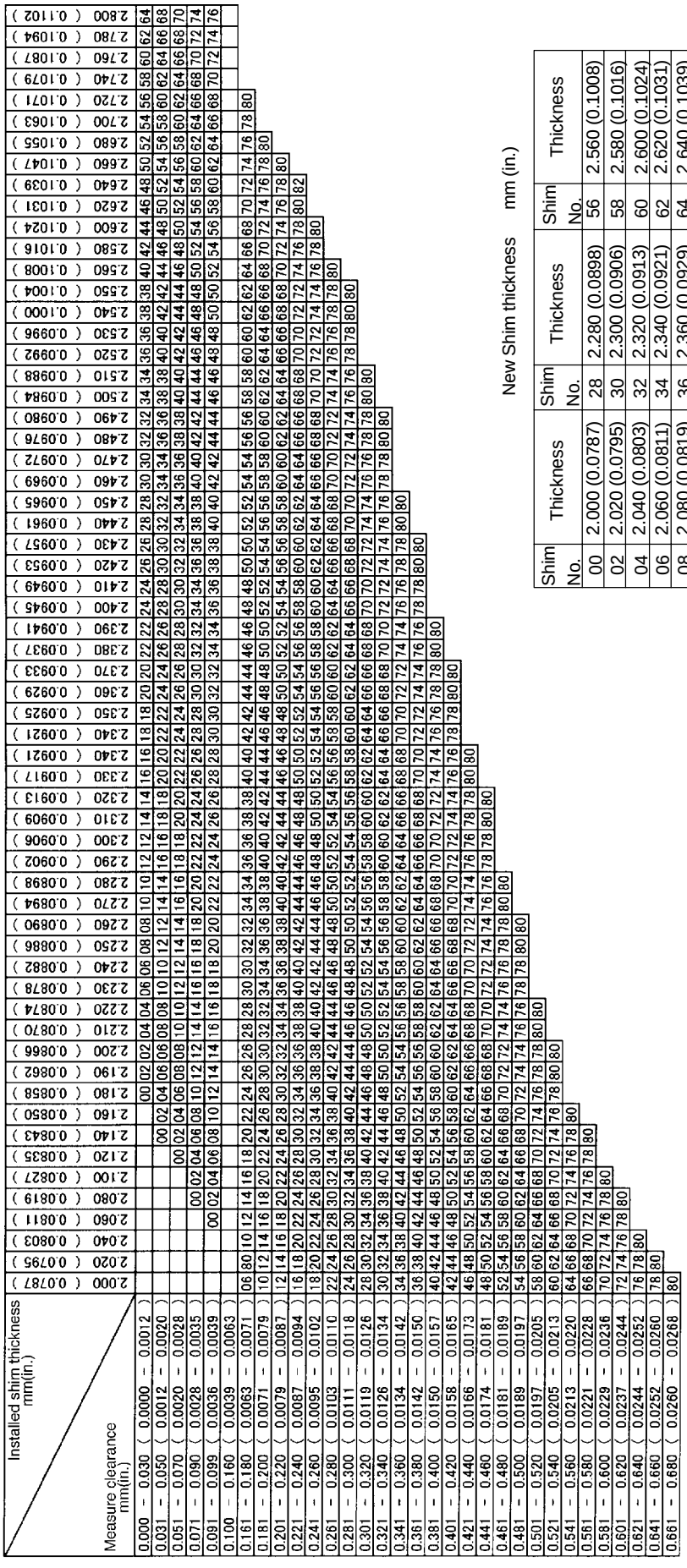
Intake: A = B + (C - 0.13 mm (0.005 in.)) × 1.5

Exhaust: A = B + (C - 0.27 mm (0.011 in.)) × 1.5

HINT:

Shim are available in 41 sizes in increments of 0.020 mm (0.0008 in.), from 2.000 mm (0.0787 in.) to 2.800 mm (0.1102 in.).

2ZZ-GE: Valve Shim Selection Chart (Intake)



New Shim thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness	Shim No.	Thickness
00	2.000 (0.0787)	28	2.280 (0.0898)	56	2.560 (0.1008)
02	2.020 (0.0795)	30	2.300 (0.0906)	58	2.580 (0.1016)
04	2.040 (0.0803)	32	2.320 (0.0913)	60	2.600 (0.1024)
06	2.060 (0.0811)	34	2.340 (0.0921)	62	2.620 (0.1031)
08	2.080 (0.0819)	36	2.360 (0.0929)	64	2.640 (0.1039)
10	2.100 (0.0827)	38	2.380 (.0.0937)	66	2.660 (0.1047)
12	2.120 (0.0835)	40	2.400 (0.0945)	68	2.680 (0.1055)
14	2.140 (0.0843)	42	2.420 (0.0953)	70	2.700 (0.1063)
16	2.160 (0.0850)	44	2.440 (0.0961)	72	2.720 (0.1071)
18	2.180 (0.0858)	46	2.460 (0.0969)	74	2.740 (0.1079)
20	2.200 (0.0866)	48	2.480 (0.0976)	76	2.760 (0.1087)
22	2.220 (0.0874)	50	2.500 (0.0984)	78	2.780 (0.1094)
24	2.240 (0.0882)	52	2.520 (0.0992)	80	2.800 (0.1102)
26	2.260 (0.0890)	54	2.540 (0.1000)		

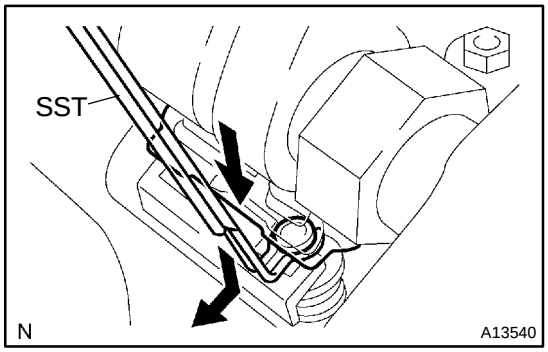
Intake valve clearance (Cold):
0.08 - 0.18 mm (0.0032 - 0.0071 in.)
EXAMPLE: The 2.200 mm (0.0826 in.) shim is installed, and the measured clearance is 0.400 mm (0.0157 in.).
Replace the 2.600 mm (0.1024 in.) shim with a new No. 60 shim.

P

A10466

2ZZ-GE: Valve Shim Selection Chart (Exhaust)

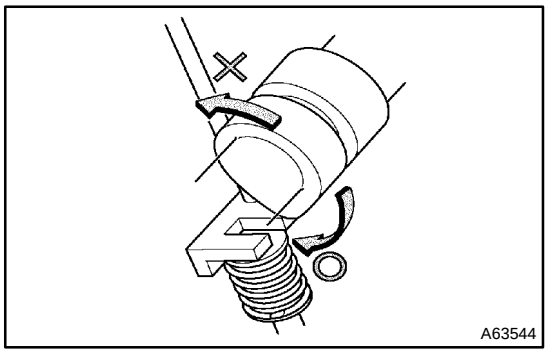
| Measure clearance mm(in.) \ Installed shim thickness mm(in.) | 2.000 (0.0787) | 2.020 (0.0795) | 2.040 (0.0803) | 2.060 (0.0811) | 2.080 (0.0819) | 2.100 (0.0827) | 2.120 (0.0835) | 2.140 (0.0843) | 2.160 (0.0850) | 2.180 (0.0858) | 2.200 (0.0866) | 2.210 (0.0870) | 2.220 (0.0874) | 2.230 (0.0878) | 2.240 (0.0882) | 2.250 (0.0886) | 2.260 (0.0890) | 2.270 (0.0894) | 2.280 (0.0898) | 2.290 (0.0902) | 2.300 (0.0906) | 2.310 (0.0909) | 2.320 (0.0913) | 2.330 (0.0917) | 2.340 (0.0921) | 2.340 (0.0921) | 2.350 (0.0925) | 2.360 (0.0929) | 2.370 (0.0933) | 2.380 (0.0937) | 2.390 (0.0941) | 2.400 (0.0945) | 2.410 (0.0949) | 2.420 (0.0953) | 2.430 (0.0957) | 2.440 (0.0961) | 2.450 (0.0965) | 2.460 (0.0969) | 2.470 (0.0972) | 2.480 (0.0976) | 2.490 (0.0980) | 2.500 (0.0984) | 2.510 (0.0988) | 2.520 (0.0992) | 2.530 (0.0996) | 2.540 (0.1000) | 2.550 (0.1004) | 2.560 (0.1008) | 2.580 (0.1016) | 2.600 (0.1024) | 2.620 (0.1031) | 2.640 (0.1039) | 2.660 (0.1047) | 2.680 (0.1055) | 2.700 (0.1063) | 2.720 (0.1071) | 2.740 (0.1079) | 2.760 (0.1087) | 2.780 (0.1094) | 2.800 (0.1102) |
|---|---|---



(c) Lift the rockr arm to make a room and use SST, install the adjusting shim.

HINT:

- Setting SST from the right above makes the removal easy.
- To remove SST from the adjusting shim, it is advisable to push down the rocker arm.



(d) Turn the crankshaft so that the related rocker arm, where the valve clearance is adjustted, is fully pushed down.

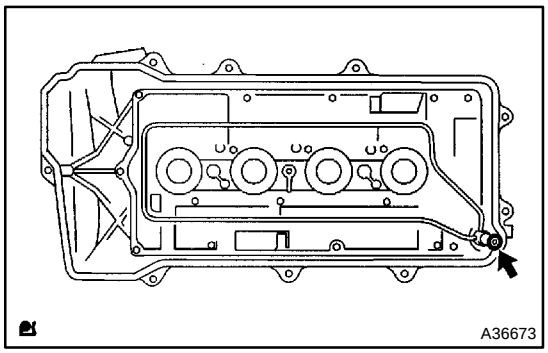
NOTICE:

- **Pay attention to the direction of the rotation to prevent the nose of the camshaft from interfering with the SST's shaft.**
- **Do not rotate the crankshaft excessively.**

(e) After loosening the 2 set screws of SST, remove SST itself.

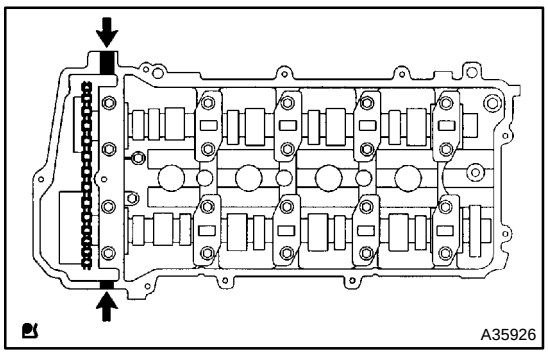
SST 09248-77010 (09248-07010)

10. INSTALL CYLINDER HEAD COVER SUB-ASSY



(a) Install the gasket to the cylinder head cover.

(b) Remove any old packing (FIPG) material.

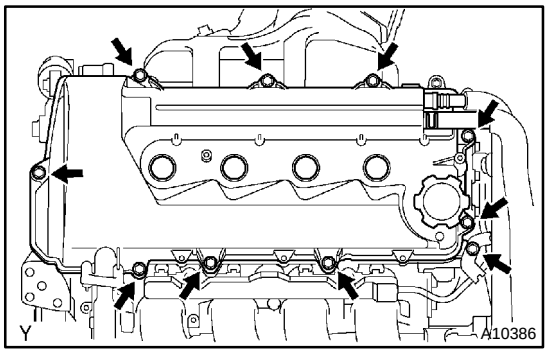


(c) Apply seal packing to 2 locations as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

NOTICE:

- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**



(d) Install the cylinder head cover and cable bracket with the 10 bolts.

Uniformly tighten the bolts, in the several passes,in the sequence shown.

Torque: 10 N·m (102 kgf·cm, 89 in.·lbf)

11. INSTALL VENTILATION NO.1 TUBE

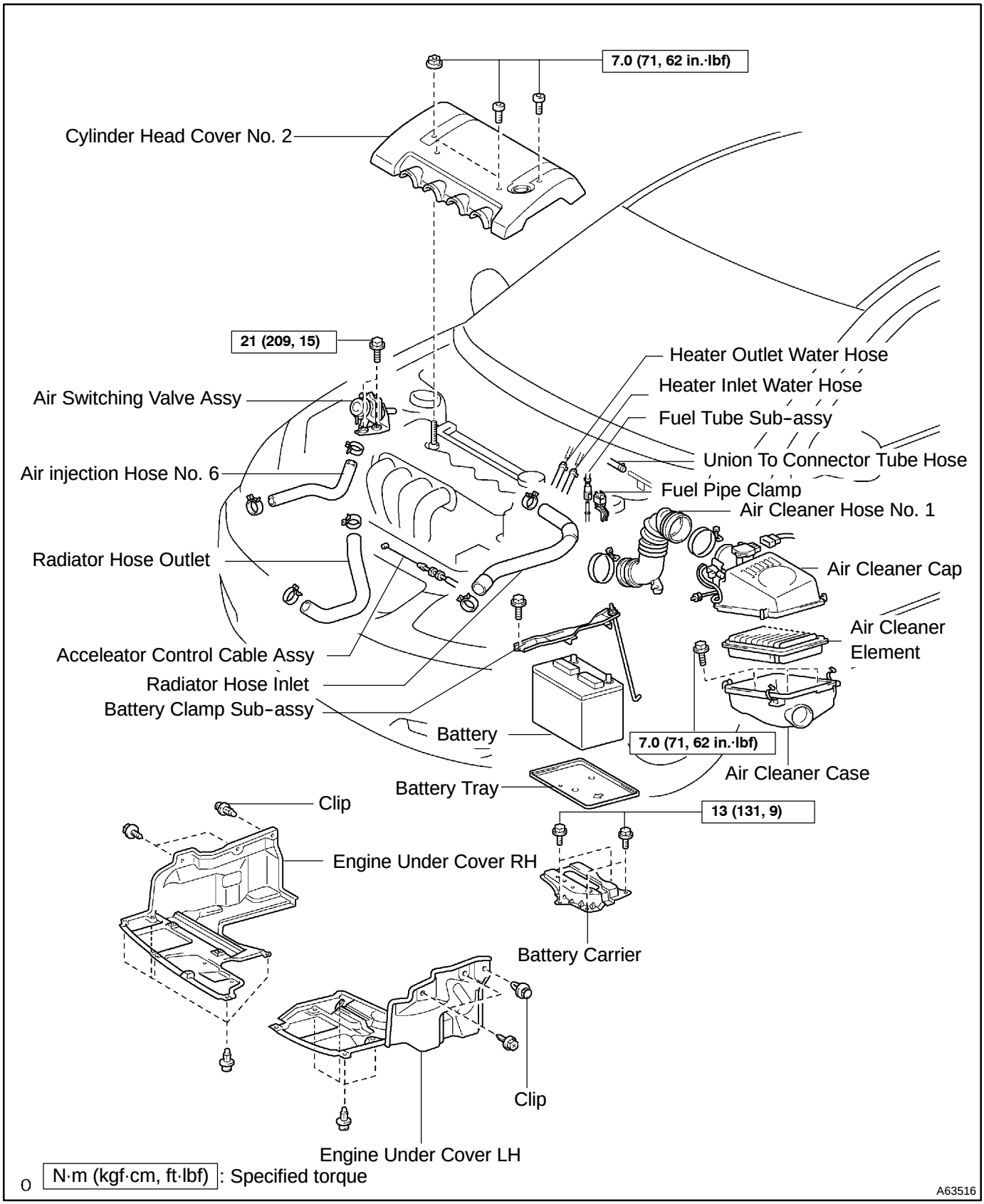
(a) Install a new gasket and the ventilation NO.1 tube.
Torque: 10 N·m (102 kgf·cm, 89 in.·lbf)

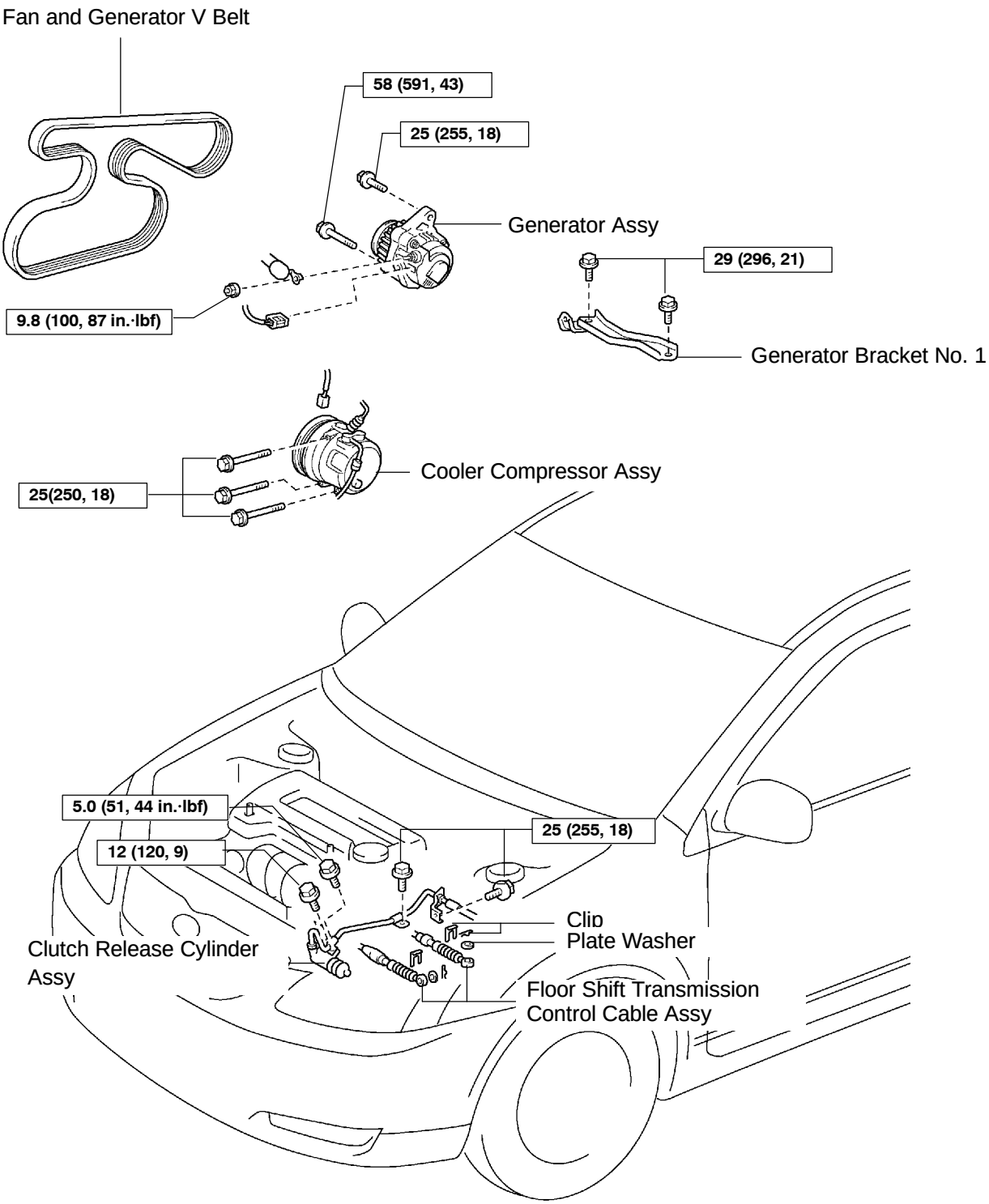
12. INSPECT OIL LEAK

PARTIAL ENGINE ASSY (2ZZ-GE)

COMPONENTS

140M1-01

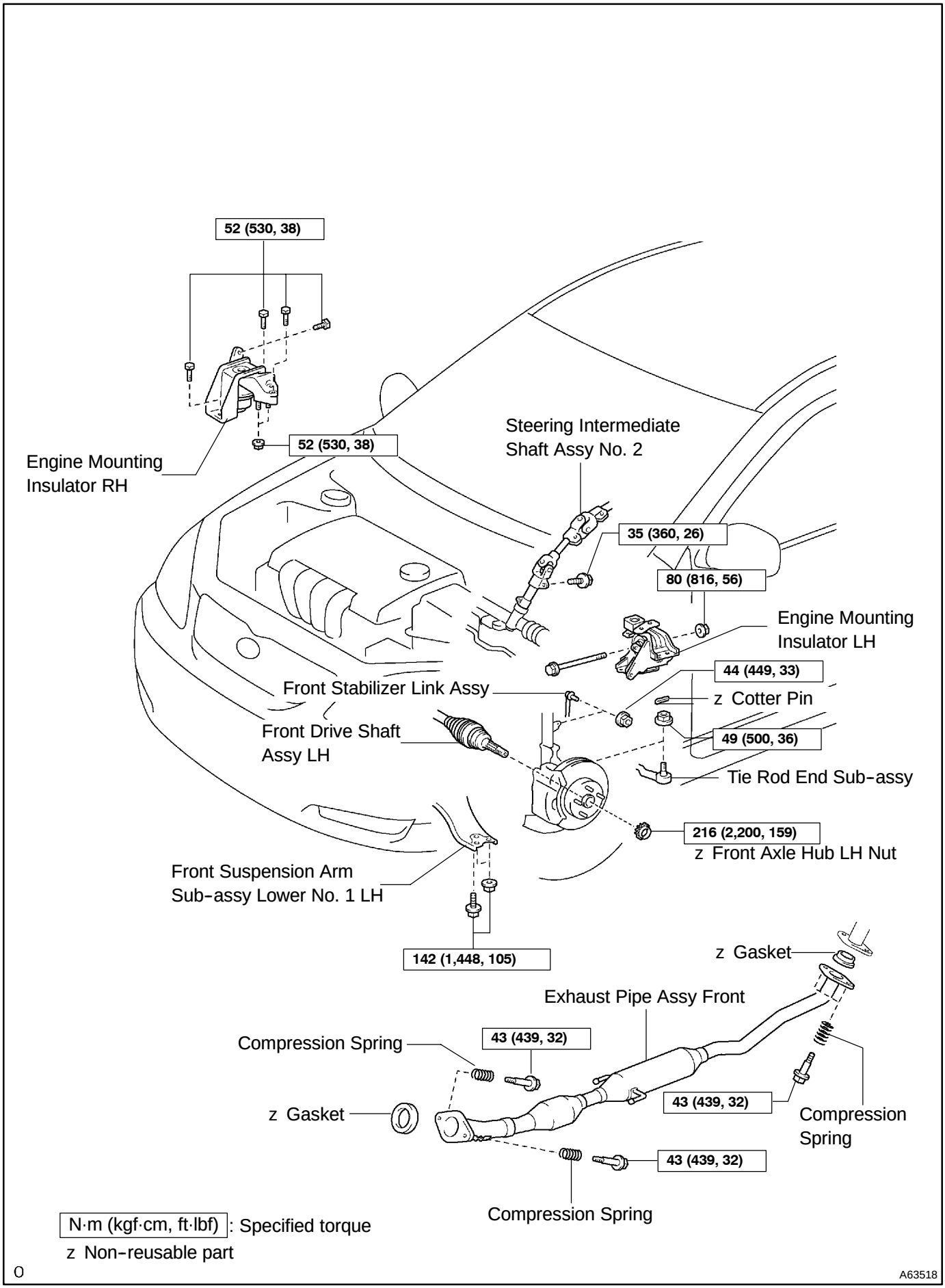


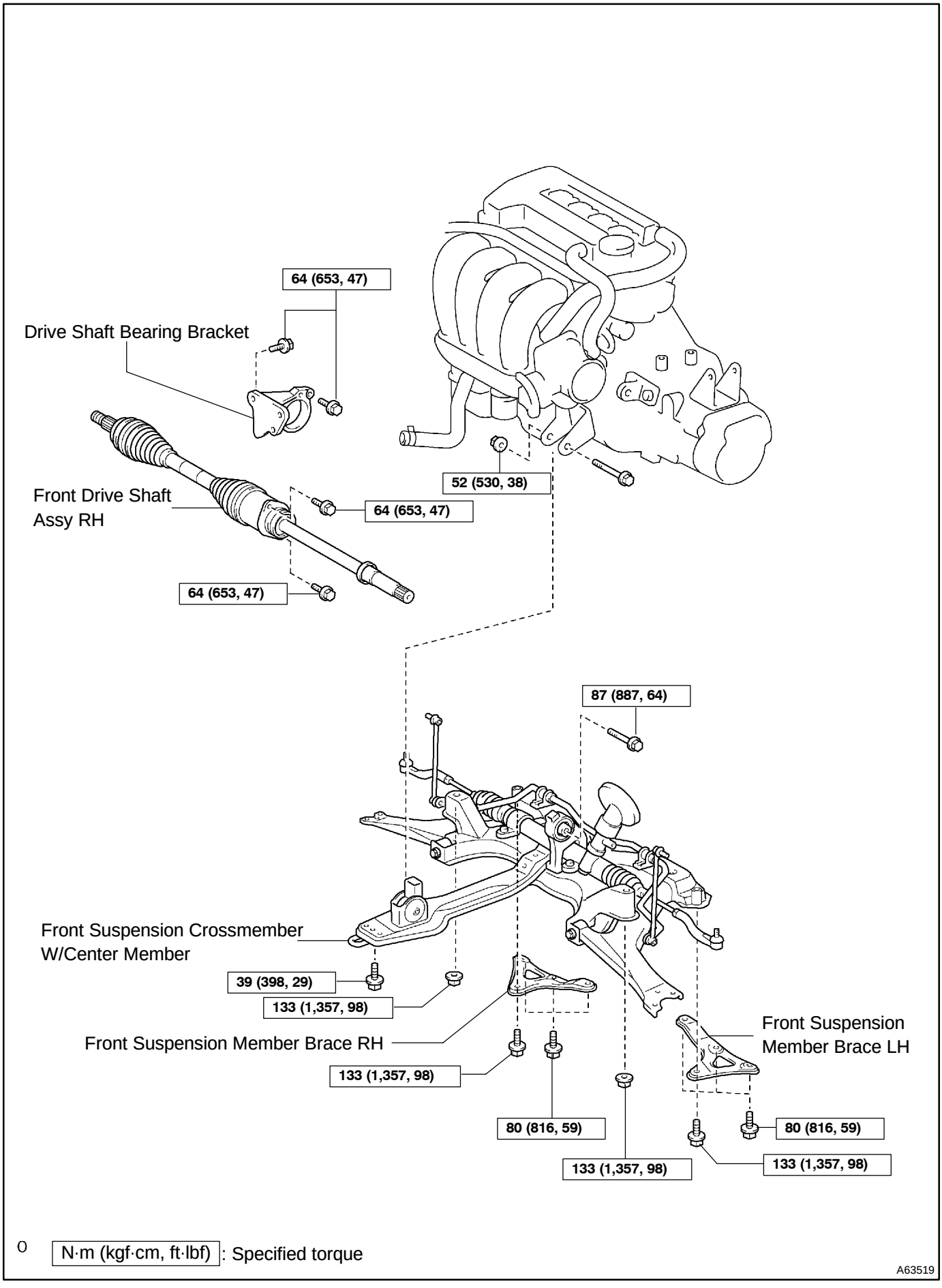


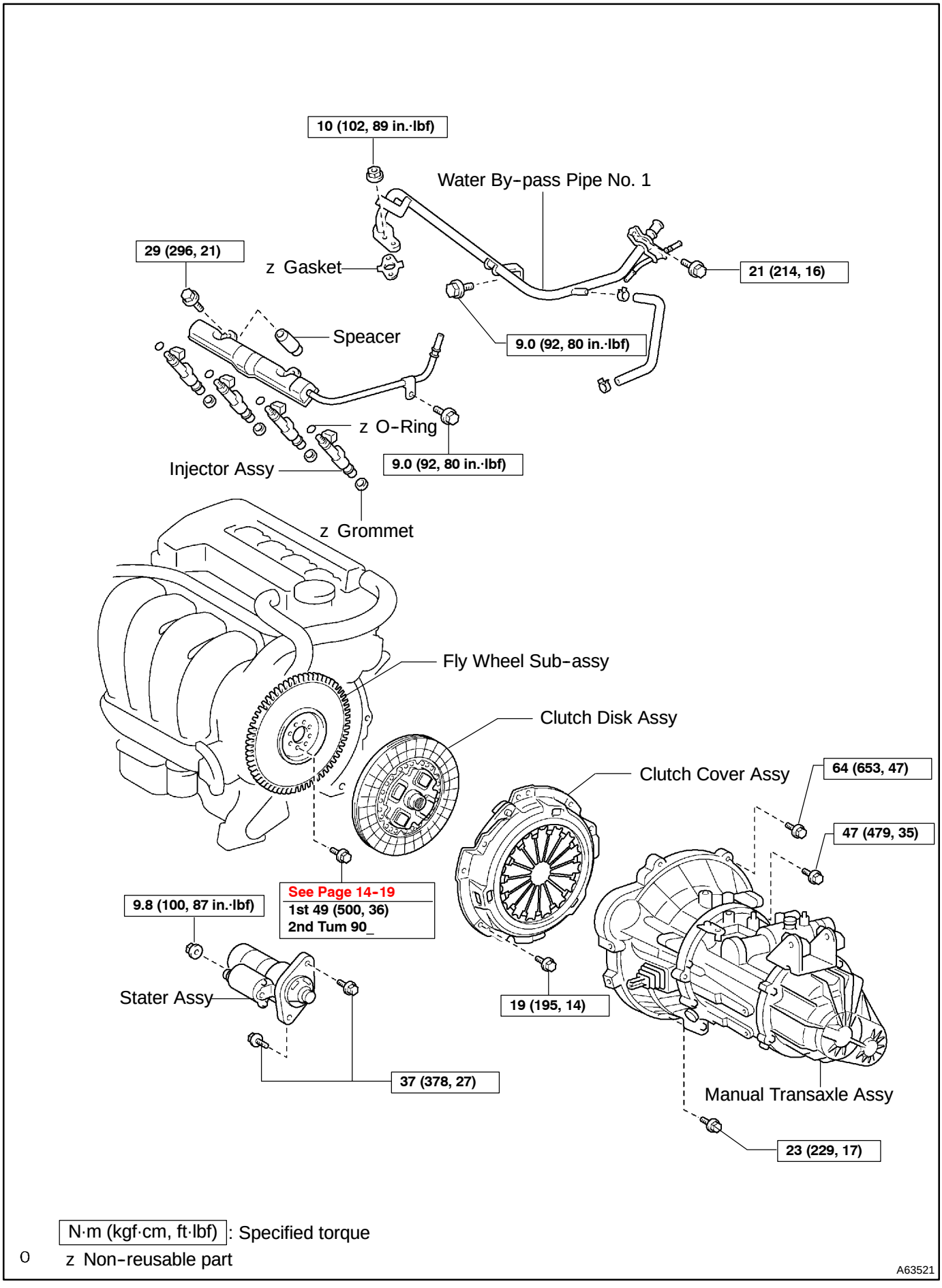
N·m (kgf·cm, ft·lbf) : Specified torque

O

A63568


52 (530, 38)
52 (530, 38)
Engine Mounting Insulator RH
Steering Intermediate Shaft Assy No. 2
35 (360, 26)
80 (816, 56)
Engine Mounting Insulator LH
44 (449, 33)
z Cotter Pin
Front Stabilizer Link Assy
Front Drive Shaft Assy LH
49 (500, 36)
Tie Rod End Sub-assy
216 (2,200, 159)
z Front Axle Hub LH Nut
Front Suspension Arm Sub-assy Lower No. 1 LH
142 (1,448, 105)
z Gasket
Exhaust Pipe Assy Front
Compression Spring
43 (439, 32)
z Gasket
43 (439, 32)
Compression Spring
43 (439, 32)
Compression Spring
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A63518

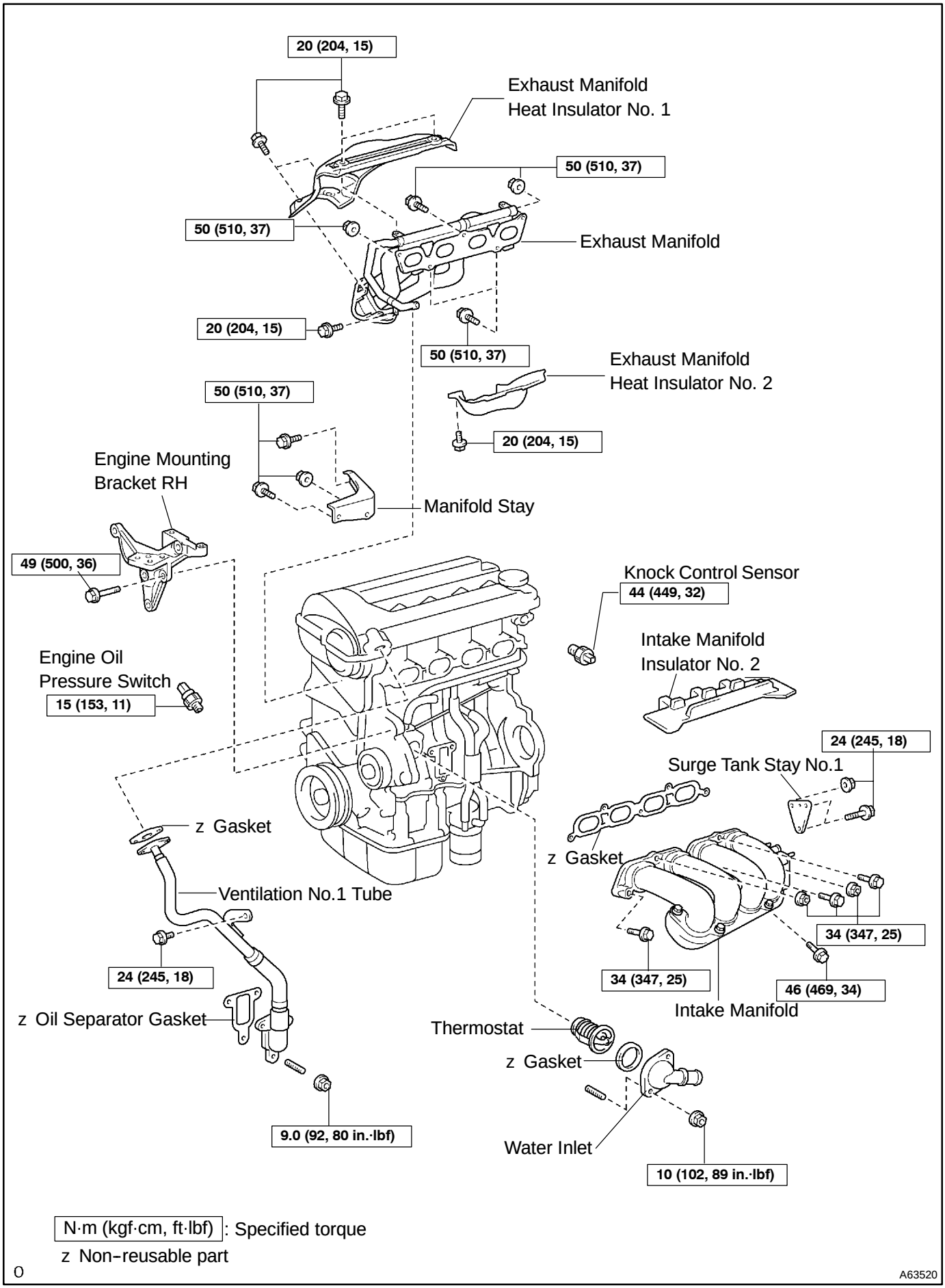

64 (653, 47)
Drive Shaft Bearing Bracket
52 (530, 38)
Front Drive Shaft
Assy RH
64 (653, 47)
64 (653, 47)
87 (887, 64)
Front Suspension Crossmember
W/Center Member
39 (398, 29)
133 (1,357, 98)
Front Suspension Member Brace RH
133 (1,357, 98)
Front Suspension
Member Brace LH
80 (816, 59)
80 (816, 59)
133 (1,357, 98)
133 (1,357, 98)
O N·m (kgf·cm, ft·lbf): Specified torque
A63519



N·m (kgf·cm, ft·lbf): Specified torque

z Non-reusable part

A63521


20 (204, 15)
Exhaust Manifold
Heat Insulator No. 1
50 (510, 37)
50 (510, 37)
Exhaust Manifold
20 (204, 15)
50 (510, 37)
Exhaust Manifold
Heat Insulator No. 2
50 (510, 37)
20 (204, 15)
Engine Mounting
Bracket RH
Manifold Stay
49 (500, 36)
Knock Control Sensor
44 (449, 32)
Intake Manifold
Insulator No. 2
Engine Oil
Pressure Switch
15 (153, 11)
24 (245, 18)
Surge Tank Stay No.1
z Gasket
z Gasket
Ventilation No.1 Tube
34 (347, 25)
24 (245, 18)
34 (347, 25)
46 (469, 34)
Intake Manifold
z Oil Separator Gasket
Thermostat
z Gasket
9.0 (92, 80 in.·lbf)
Water Inlet
10 (102, 89 in.·lbf)
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A63520

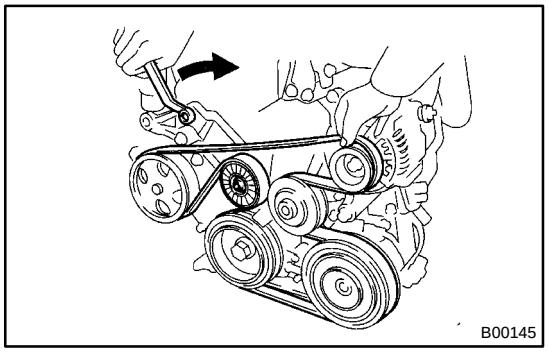
REPLACEMENT

1. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT (See page 11-1)
2. REMOVE ENGINE UNDER COVER RH
3. REMOVE ENGINE UNDER COVER LH
4. DRAIN COOLANT (See page 16-6)
5. REMOVE FRONT WHEELS
6. REMOVE CYLINDER HEAD COVER NO.2
7. REMOVE BATTERY
8. REMOVE AIR CLEANER ASSY
9. REMOVE AIR CLEANER HOSE NO.1
10. REMOVE BATTERY CARRIER
11. SEPARATE FUEL DELIVERY PIPE SUB-ASSY
12. SEPARATE ACCELERATOR CONTROL CABLE ASSY
13. SEPARATE RADIATOR HOSE INLET
14. SEPARATE RADIATOR HOSE OUTLET
15. SEPARATE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY
16. SEPARATE HEATER INLET WATER HOSE
17. SEPARATE HEATER OUTLET WATER HOSE
18. SEPARATE UNION TO CONNECTOR TUBE HOSE
19. SEPARATE ENGINE WIRE

(a) Remove the glove compartment door.
(b) Disconnect the engine wire from ECM and junction block.
(c) Pull out the engine wire.
(d) Disconnect the engine wire from engine room junction block.
(e) Remove the body ground.

20. REMOVE CLUTCH RELEASE CYLINDER ASSY

HINT:
Put aside the hoses instead of detaching.



21. REMOVE FAN AND GENERATOR V BELT

(a) The drive belt tension can be released by turning the belt tensioner clockwise.

22. REMOVE AIR INJECTION SYSTEM NO.6 HOSE

23. REMOVE AIR SWITCHING VALVE ASSY

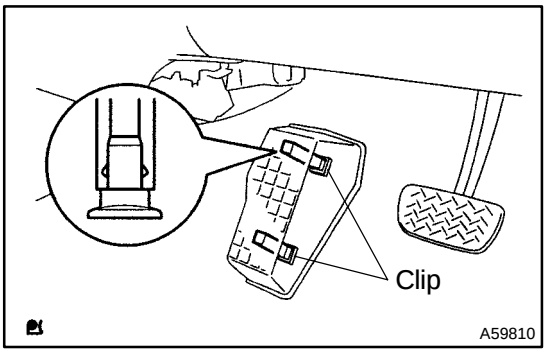
24. REMOVE GENERATOR BRACKET NO.1

25. REMOVE GENERATOR ASSY

26. REMOVE COMPRESSOR

HINT:
Hung up the hoses instead of detaching.

27. REMOVE FLOOR PANEL BRACE FRONT

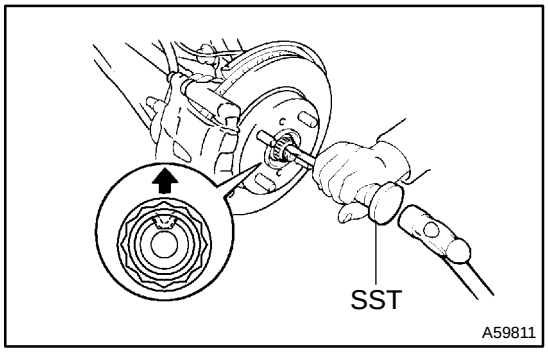


28. REMOVE EXHAUST PIPE ASSY FRONT

(a) Remove the foot rest. (RHD)
(b) Disconnect the oxygen sensor connecter, after removing the carpet.
(c) Remove the exhaust pipe with oxygen sensor.

29. REMOVE STEERING INTERMEDIATE SHAFT ASSY NO.2

(See page 50-10)



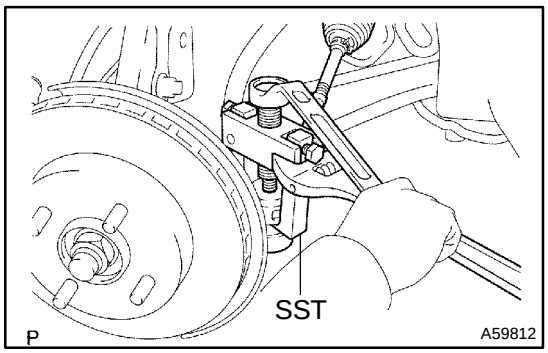
30. REMOVE FRONT AXLE HUB LH NUT

(a) Using a SST and a hammer, unstake the staked part of the lock nut.
SST 09930-00010

NOTICE:
- **When removing the nut, unstake the staked part of it completely.**
- **Do not damage the threads of the drive shaft.**
- **Be sure not to sharpen the tip of the SST.**
- **Set the SST to the groove with the flat face upword.**

(b) Using a socket wrench (30 mm), remove the lock nut.

HINT:
Perform the same procedure as above on the opposite side.



31. SEPARATE END SUB-ASSY, TIE ROD, NO.2

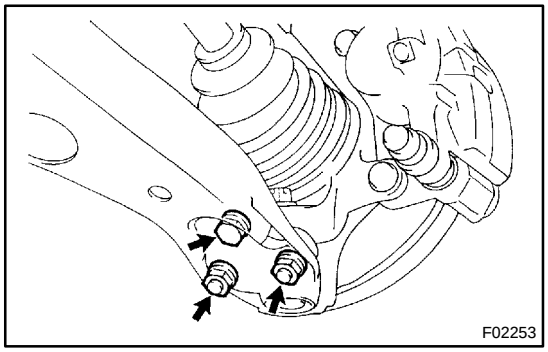
(a) Using a SST ,disconnect the tie rod end from the steering knuckle.
SST 09628-62011

HINT:
Perform the same procedure as above on the opposite side.

32. SEPARATE FRONT STABILIZER LINK ASSY

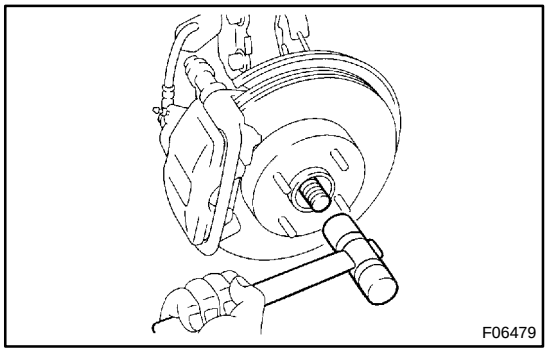
(a) Remove the nut by using socket hexagon wrench (5) to fix the stud bolt.

HINT:
Perform the same procedure as above on the opposite side.



33. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

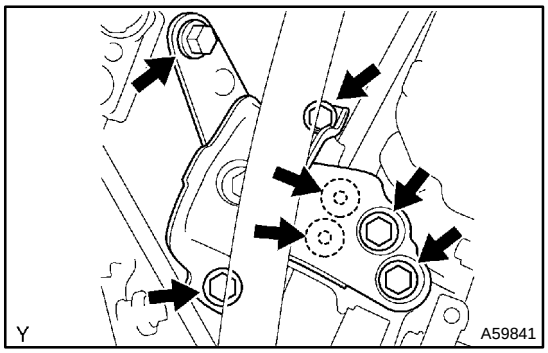
(a) Remove the bolt and 2 nuts shown in the illustration.



(b) Using a plastic hammer, disconnect the drive shaft from the axle hub.

HINT:

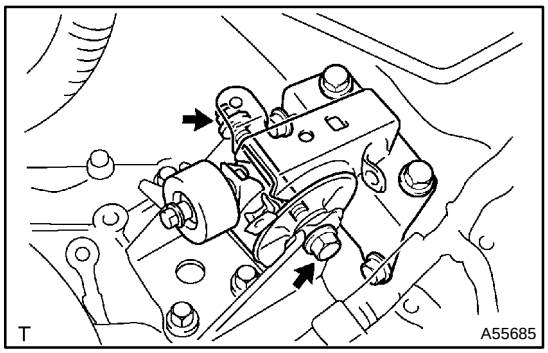
Perform the same procedure as above on the opposite side.



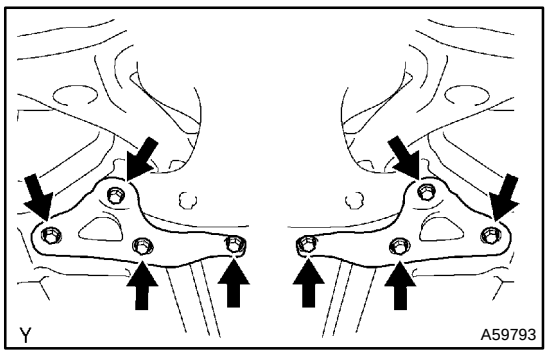
34. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

(a) Set the engine lifter.

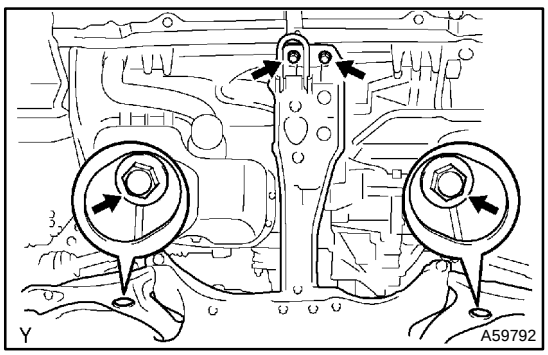
(b) Remove the 5 bolts, 2 nuts and engine mounting insulator RH.



(c) Remove the through bolt and nut, detach the engine mounting insulator LH from the vehicle.

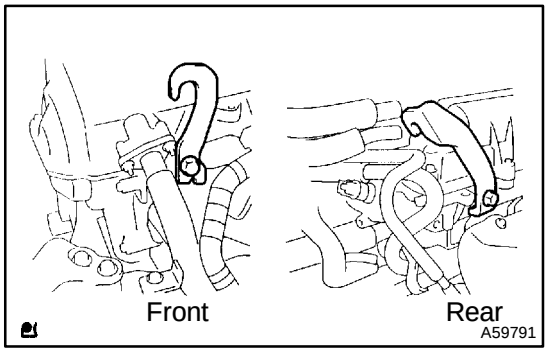


(d) Remove the 8 bolts and front suspension member brace rear RH and LH.



(e) Remove the 2 bolts, 2 nuts and separate the front cross-member sub-assembly from the vehicle.

(f) Carefully, remove the engine assembly from the vehicle.



(g) Install the 2 engine hangers as shown in the illustration.
Parts No.:
No. 1 engine hanger 12281-88600
No. 2 engine hanger 12282-88600
Bolt: 91512-61020
Torque: 38 N·m (385 kgf·cm, 28 ft·lbf)

HINT:
Be sure to install engine hanger (12281-88600) to the front side of the engine, and engine hanger (12282-88600) to the rear side.

(h) Using the chain block and engine sling device, hang the engine assembly.

35. REMOVE FRONT SUSPENSION COSSMENBER W/CENTER MENBER

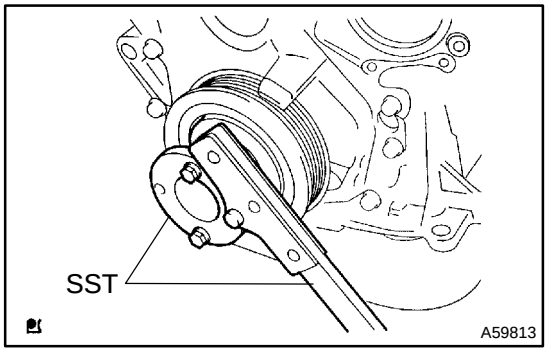
(a) Detach the engine mounting insulator FR and engine mounting insulator RR from the engine assembly.

(b) Remove the front crossmember assembly.

36. REMOVE STARTER ASSY

37. REMOVE MANUAL TRANSAXLE

38. REMOVE CLUTCH DISC ASSY



39. REMOVE FLYWHEEL SUB-ASSY

(a) Fix the crank shaft with SST, then remove the flywheel or the ring gear.
SST 09213-70011, 09330-00021

40. REMOVE OIL LEVEL GAGE SUB-ASSY

41. REMOVE OIL LEVEL GAGE GUIDE

42. REMOVE SURGE TANK STAY NO.1

43. REMOVE INTAKE MANIFOLD

44. REMOVE V-RIBBED BELT TENSIONER ASSY

45. REMOVE MANIFOLD STAY

46. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.1

47. REMOVE EXHAUST MANIFOLD

48. REMOVE FUEL DELIVERY PIPE SUB-ASSY

49. REMOVE IGNITION COIL ASSY

50. REMOVE THERMOSTAT

51. REMOVE WATER BY-PASS PIPE NO.1

52. REMOVE ENGINE OIL PRESSURE SWITCH ASSY

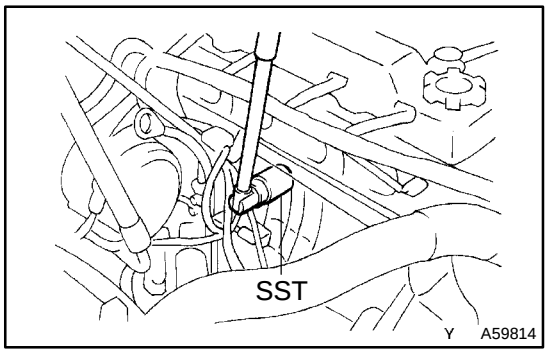
(a) Using the SST, remove the 2 oil pressure switches.
SST 09268-46021

53. REMOVE UNION TO CONNECTOR TUBE HOSE

(a) Remove the clamp and tube.

54. REMOVE CRANK POSITION SENSOR

55. REMOVE CAM POSITION SENSOR



56. REMOVE KNOCK CONTROL SENSOR

(a) Using a SST, remove the knock control sensor.
SST 09816-30010

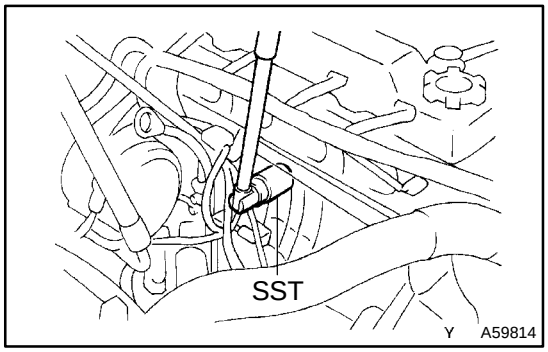
57. REMOVE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Using a SST, remove the water temperature sensor.
SST 09817-33190

58. REPLACE PARTIAL ENGINE ASSY

59. INSTALL E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Install a new gasket to the water temperature sensor.
(b) Using a SST, install the water temperature sensor.
SST 09817-33190
Torque: 20 N·m (208 kgf·cm, 15 ft·lbf)



60. INSTALL KNOCK CONTROL SENSOR

(a) Using a SST, install the knock control sensor.
SST 09816-30010
Torque: 44 N·m (449 kgf·cm, 32 ft·lbf)

61. INSTALL CAM POSITION SENSOR

(a) Install the crank position sensor and cord wiring clamp.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

62. INSTALL CRANK POSITION SENSOR

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

63. INSTALL UNION TO CONNECTOR TUBE HOSE

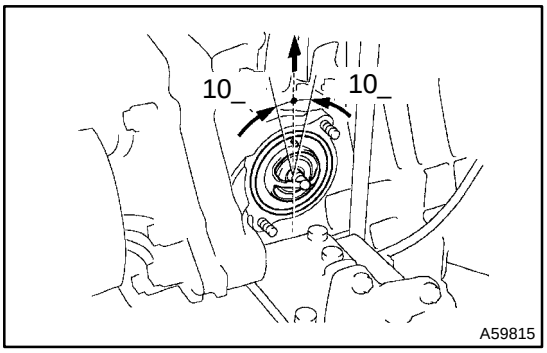
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

64. INSTALL ENGINE OIL PRESSURE SWITCH ASSY

(a) Clean the threads of the oil pressure switch, apply adhesive there.
Adhesive:
Part No. 08833-00080, THREE BOND 1344,
(b) Using a SST, install the oil pressure switch.
SST 09268-46021
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

65. INSTALL WATER BY-PASS PIPE NO.1

(a) Install a new gasket and the water by-pass pipe.
Torque:10 N·m (102 kgf·cm, 7 ft·lbf)



66. INSTALL THERMOSTAT

(a) Install the new gasket to the thermostat.
(b) Install the thermostat as shown in the illustration.

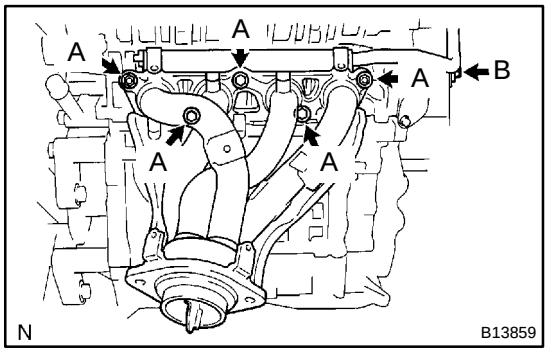
(c) Install the water inlet.
Torque: 10 N·m (102 kgf·cm, 89 in.·lbf)

67. INSTALL IGNITION COIL ASSY

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

68. INSTALL FUEL DELIVERY PIPE SUB-ASSY

(a) Replace the fuel injector grommet.
(b) Install the spacer to the cylinder head.
(c) Install the fuel delivery pipe with the fuel injector.
Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)
(d) Install the fuel pipe clamp.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



69. INSTALL EXHAUST MANIFOLD

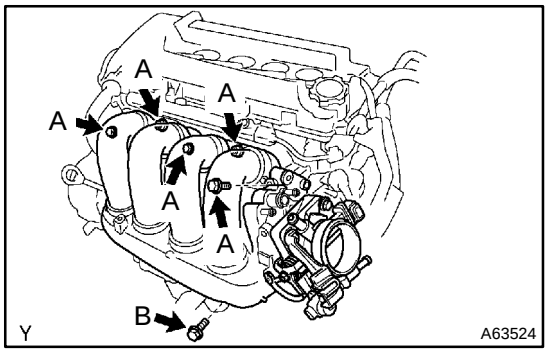
(a) Install the exhaust manifold with the 4 bolts and 2 nuts.
Torque:
A: 50 N·m (510 kgf·cm, 37 ft·lbf)
B: 21 N·m (214 kgf·cm, 16 ft·lbf)

70. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.1

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

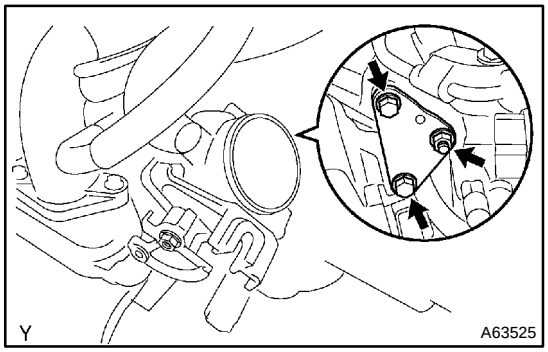
71. INSTALL V-RIBBED BELT TENSIONER ASSY

Torque:
Nut: 29 N·m (296 kgf·cm, 21 ft·lbf)
Bolt: 100 N·m (1,020 kgf·cm, 74 ft·lbf)
INSTALL MANIFOLD STAY
[17118 / 1701]
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)



72. INSTALL INTAKE MANIFOLD

(a) Install a new gasket, the intake manifold with the 4 bolts and 2 nuts.
Torque:
A: 34 N·m (347 kgf·cm, 25 ft·lbf)
B: 46 N·m (469 kgf·cm, 34 ft·lbf)



73. INSTALL SURGE TANK STAY NO.1

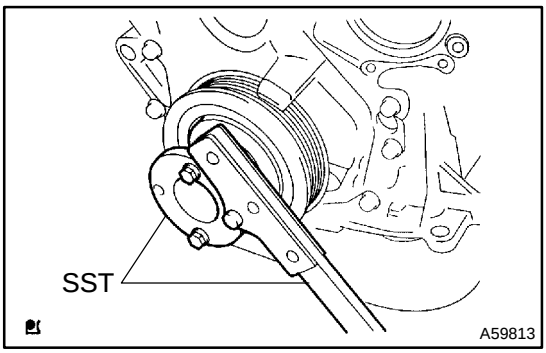
(a) Install the surge tank staywith the 2 bolts and nut.
Torque:24 N·m (245 kgf·cm, 18 ft·lbf)

74. INSTALL MANIFOLD STAY

Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

75. INSTALL OIL LEVEL GAGE GUIDE

(a) Apply a light coat of engine oil on a new O-ring, install it ti the oil level gage guide.
Torque: 24 N·m (245 kgf·cm, 18 ft·lbf)

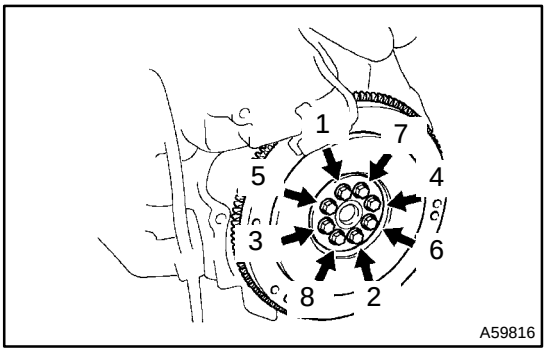


76. INSTALL DRIVE PLATE AND RING GEAR OR FLYWHEEL

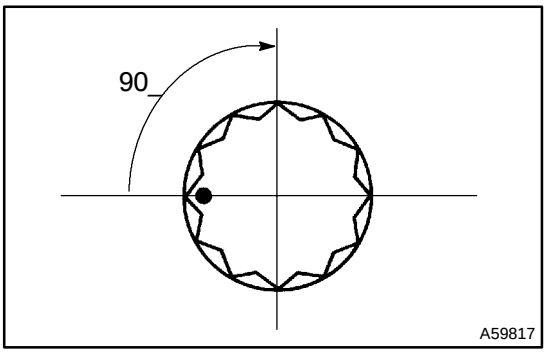
(a) Fix the crankshaft with SST.
SST 09213-70011, 09330-00021

(b) Clean the bolt and the bolt hole.

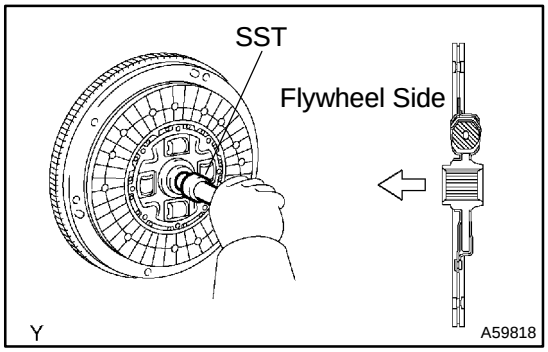
(c) Apply Adhesive to the bolts.
Adhesive:
Part No. 0933-00070, THREE BOND or equivalent.



(d) Install the flywheel.
(1) Install and uniformly tighten the 8 bolts, in several passes, in the sequence shown.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

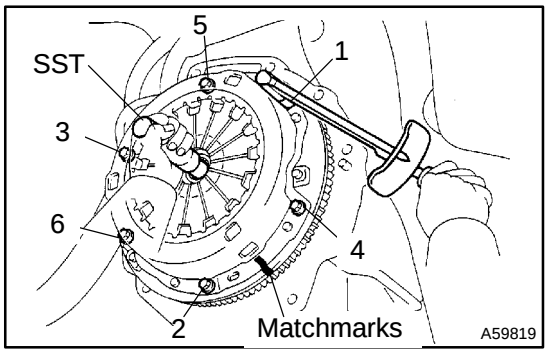


(2) Mark the flywheel bolt with paint.
(3) Retighten the flywheel bolts by an additional 90_.
(4) Check that the point marked bolts are moved at 90_ angle.



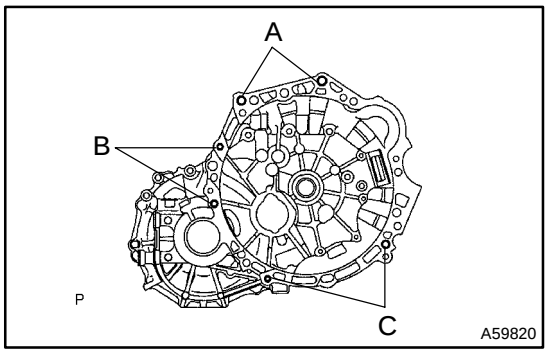
77. INSTALL CLUTCH DISC ASSY

(a) Using SST, define the clutch disk center.
SST 09301-00210



78. INSTALL CLUTCH COVER ASSY

(a) Install the clutch cover assembly with aligning the match mark on the clutch cover and flywheel.
(b) Tighten the 6 bolts lightly in order of the nearness to the flywheel knock pin, then move SST up and down, right and left lightly to check the disk is in the center position.
SST 09301-00210
(c) Tighten the 6 bolts.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)



79. INSTALL MANUAL TRANSAXLE

(a) Install the manual transaxle.
Torque:
A: 64 N·m (653 kgf·cm, 47 ft·lbf)
B: 47 N·m (479 kgf·cm, 35 ft·lbf)
C: 23 N·m (229 kgf·cm, 17 ft·lbf)

80. INSTALL STARTER ASSY

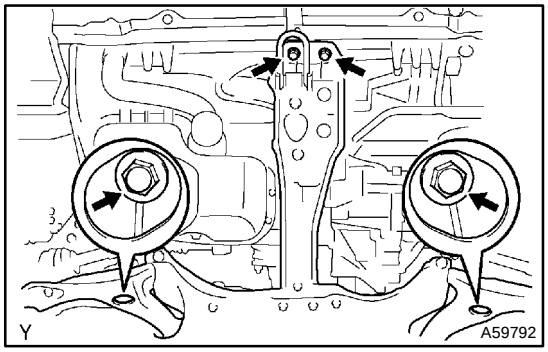
Torque:
Bolt 37 N·m (377 kgf·cm, 27 ft·lbf)
Wiring 9.8 N·m (100 kgf·cm, 7 ft·lbf)

81. INSTALL FRONT SUSPENSION COSSMENBER W/CENTER MENBER

(a) Install the engine mounting insulator FR and engine mounting insulator RR.
Torque:
Front: 52 N·m (530 kgf·cm, 38 ft·lbf)
Rear: 87 N·m (887 kgf·cm, 64 ft·lbf)

82. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE

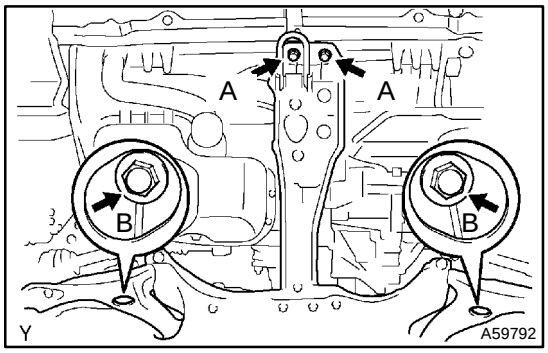
(a) Set the engine assembly with transaxle on the engine lifter.



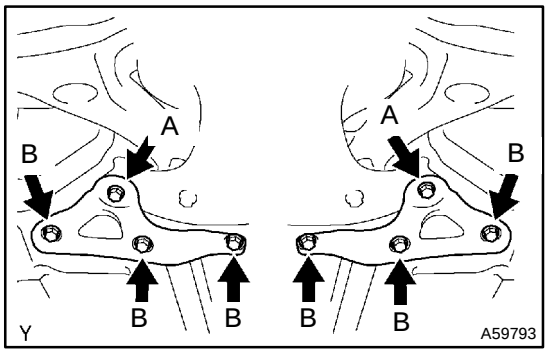
(b) Temporarily, install the suspension crossmember, 2 bolts and 2 nuts.

(c) Install the engine mounting insulator LH.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

(d) Install the engine mounting insulator RH.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



(e) Install the 2 bolts and, 2 nuts and front suspension crossmember.
Torque:
Bolt A: 39 N·m (398 kgf·cm, 29 ft·lbf)
Nut B: 133 N·m (1,357 kgf·cm, 98 ft·lbf)



(f) Install the 8 bolts and front suspension member brace LH and RH.
Torque:
A: 133 N·m (1,357 kgf·cm, 98 ft·lbf)
B: 80 N·m (816 kgf·cm, 59 ft·lbf)

NOTICE:
After installing the crossmember, check that the positioning holes on the corssmember and the vehicle are aligned with each other.

83. INSTALL COMPRESSOR
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

84. INSTALL AIR SWITCHING VALVE ASSY

Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)

85. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

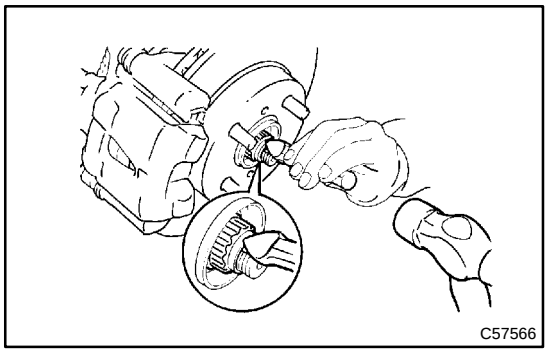
(a) Install the drive shaft to steering knuckle.

(b) Install the suspension lower arm.
Torque: 142 N·m (1,448 kgf·cm, 105 ft·lbf)

HINT:
Perform the same procedure as above on the opposite side.

86. INSTALL FRONT AXLE HUB LH NUT

(a) Using a socket wrench (30 mm), install the lick nut.
Torque: 216 N·m (2,204 kgf·cm, 160 ft·lbf)



(b) Using a chisel, stake the hub nut.

HINT:
Perform the same procedure as above on the opposite side.

87. INSTALL FRONT STABILIZER LINK ASSY

(a) Install the nut by using socket hexagon wrench (5) to fix the stud bolt.
Torque: 44 N·m (449 kgf·cm, 33 ft·lbf)

HINT:
Perform the same procedure as above on the opposite side.

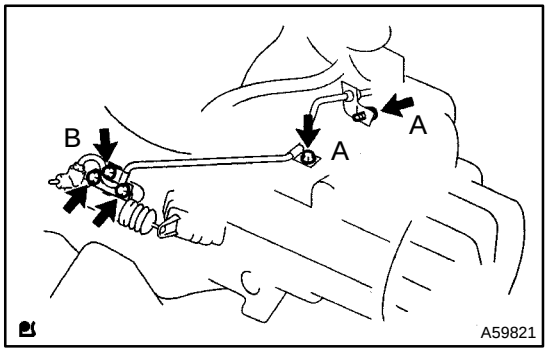
88. INSTALL END SUB-ASSY, TIE ROD, NO.2

(a) Connect the tie rod end to the steering knuckle and install a new castle nut.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

NOTICE:

- **Prevent any lubricant from the thread and the taper portions.**
- **After tightening the castle nut, tighten it to the additional direction within 60_ to put into a cotter pin.**

(b) Insert a new cotter pin.



89. INSTALL CLUTCH RELEASE CYLINDER ASSY

(a) Install the clutch release cylinder and 5 bolts.
Torque:
Release cylinder 12 N·m (120 kgf·cm, 9 ft·lbf)
Clamp bolt A 25 N·m (255 kgf·cm, 18 ft·lbf)
Clamp bolt B 5.0 N·m (51 kgf·cm, 44 in.·lbf)

90. CONNECT FUEL TUBE SUB-ASSY

91. INSTALL BATTERY CARRIER

Torque: 13 N·m (131 kgf·cm, 9 ft·lbf)

92. INSTALL GENERATOR ASSY

    Torque:
    25 N·m (255 kgf·cm, 18 ft·lbf)(6M)
    58 N·m (591 kgf·cm, 43 ft·lbf)(8M)

93. INSTALL GENERATOR BRACKET NO.1

    Torque:29 N·m (296 kgf·cm, 21 ft·lbf)

94. INSTALL AIR CLEANER ASSY

95. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2
    (See page 50-12)

96. INSTALL EXHAUST PIPE ASSY FRONT
    (See page 15-2)

97. INSTALL FLOOR PANEL BRACE FRONT

    Torque: 30 N·m (302 kgf·cm, 22 ft·lbf)

98. ADD ENGINE OIL

99. ADD COOLANT (See page 16-6)

100. INSPECT OIL LEAK

101. INSPECT CHECK ENGINE COOLANT LEAK (See page 16-7)

102. INSPECT CHECK IDLE SPEED AND IGNITION TIMING (See page 14-1/2)

103. INSPECT CO/HC (See page 14-3)

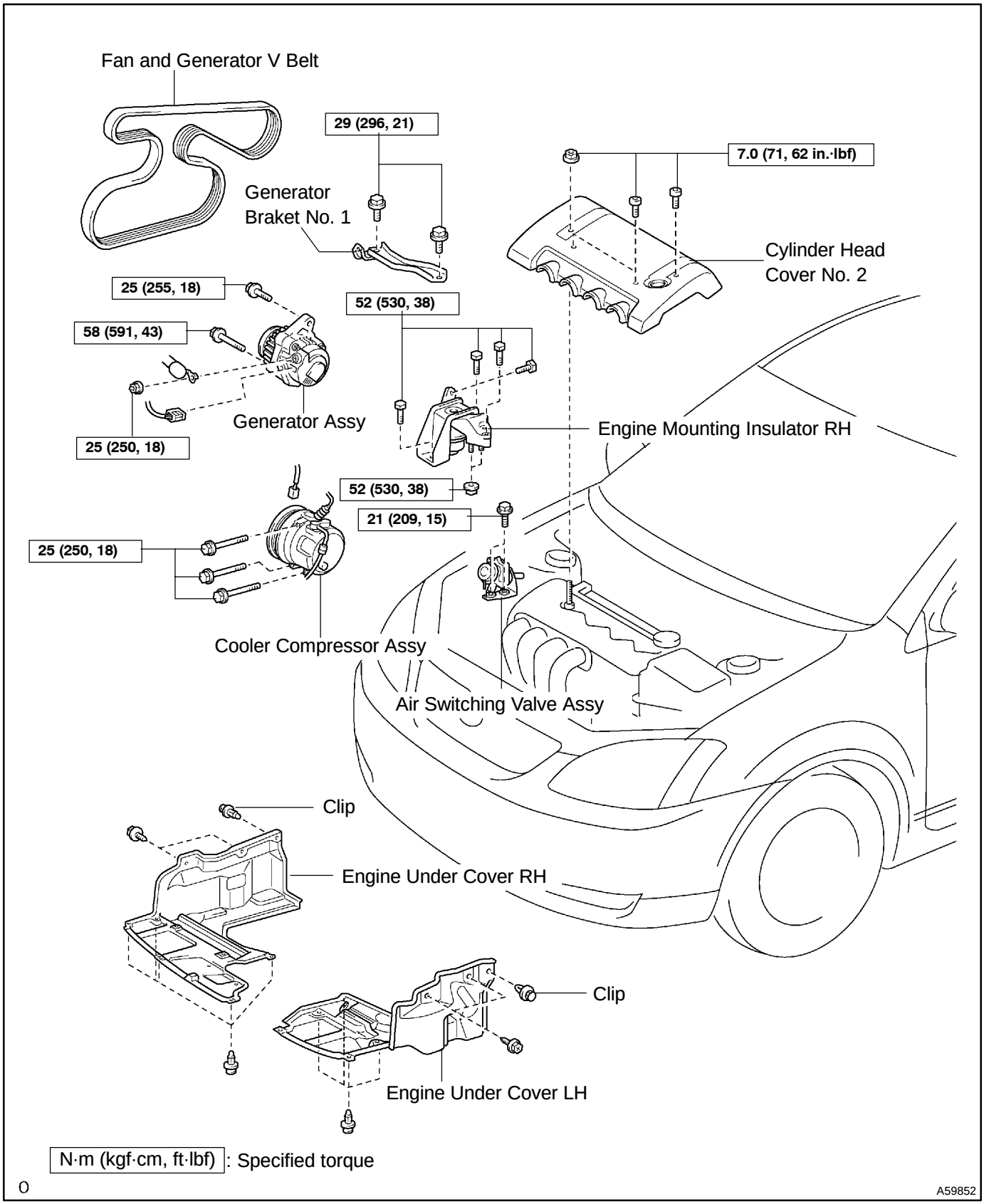
104. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT

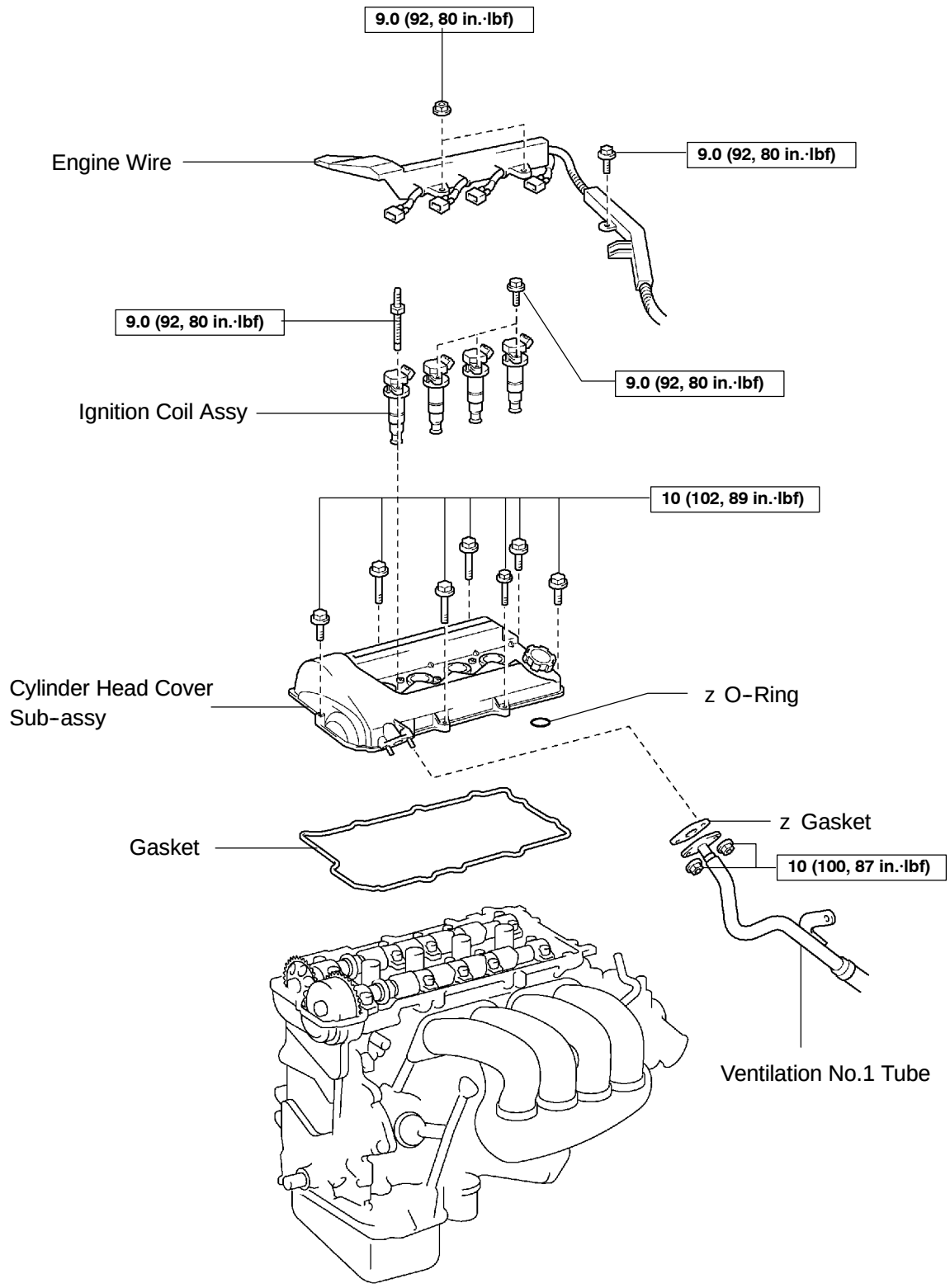
105. CHECK ABS SPEED SENSOR SIGNAL

CHAIN SUB-ASSY (2ZZ-GE)

COMPONENTS

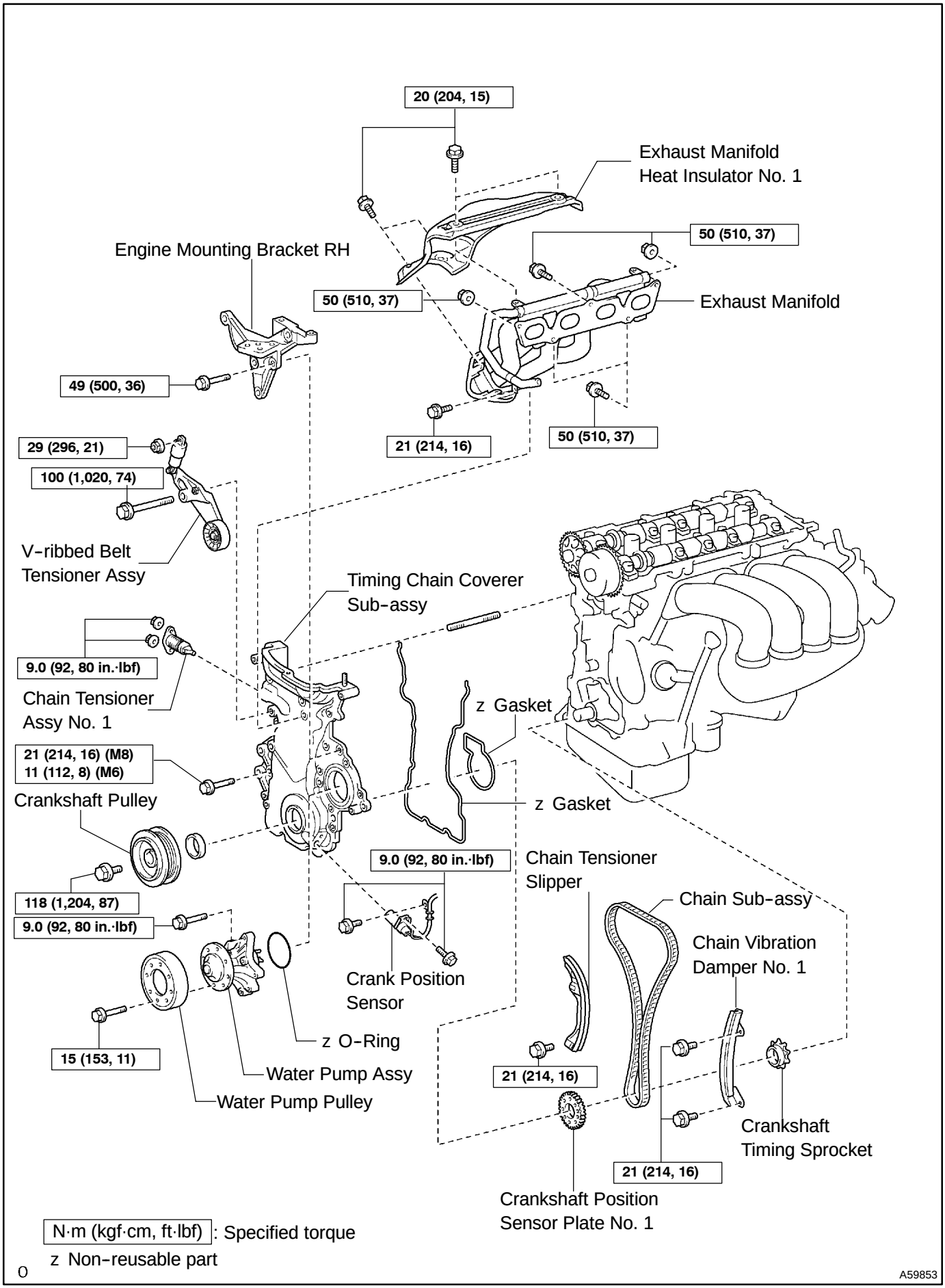
140M3-01





N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part

A59854


20 (204, 15)
Exhaust Manifold
Heat Insulator No. 1
50 (510, 37)
Engine Mounting Bracket RH
50 (510, 37)
Exhaust Manifold
49 (500, 36)
21 (214, 16)
50 (510, 37)
29 (296, 21)
100 (1,020, 74)
V-ribbed Belt
Tensioner Assy
Timing Chain Coverer
Sub-assy
9.0 (92, 80 in.·lbf)
Chain Tensioner
Assy No. 1
z Gasket
21 (214, 16) (M8)
11 (112, 8) (M6)
Crankshaft Pulley
z Gasket
9.0 (92, 80 in.·lbf)
Chain Tensioner
Slipper
118 (1,204, 87)
9.0 (92, 80 in.·lbf)
Chain Sub-assy
Chain Vibration
Damper No. 1
Crank Position
Sensor
z O-Ring
15 (153, 11)
Water Pump Assy
Water Pump Pulley
21 (214, 16)
Crankshaft
Timing Sprocket
21 (214, 16)
Crankshaft Position
Sensor Plate No. 1
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A59853

140M4-01

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH

2. REMOVE ENGINE UNDER COVER LH

3. DRAIN COOLANT **(See page 16-6)**

4. REMOVE CYLINDER HEAD COVER NO.2

5. REMOVE FAN AND GENERATOR V BELT

6. REMOVE GENERATOR BRACKET NO.1

7. REMOVE GENERATOR ASSY

8. DISCONNECT ENGINE WIRE

(a) Disconnect the ignition coil connectors, oil control valve connector and crankshaft position sensor connector.
(b) Remove the bolt and nut for the earth and put the engine wiring aside.

9. REMOVE IGNITION COIL ASSY

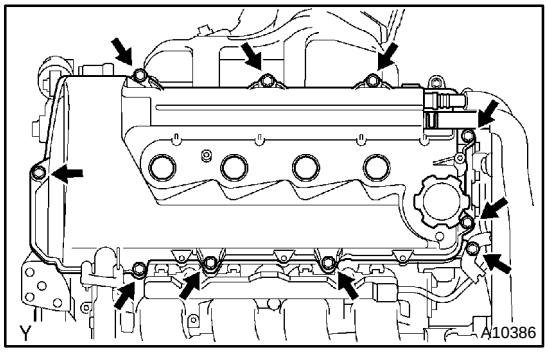
10. DISCONNECT EXHAUST PIPE ASSY FRONT

11. DISCONNECT VENTILATION NO.1 TUBE

12. REMOVE CYLINDER HEAD COVER SUB-ASSY

(a) Disconnect the fuel hose clamp and 2 PCV hoses from the cylinder head cover.

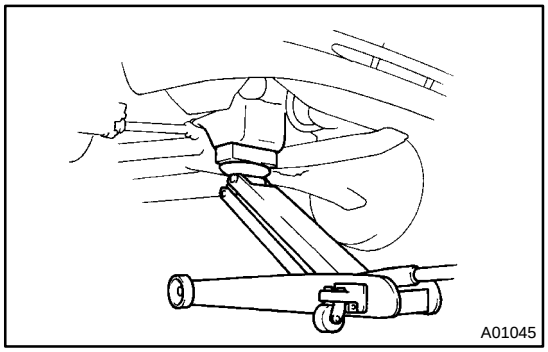
(b) Remove the 10 bolts, wire harness protector, cylinder head cover and gasket.



13. REMOVE AIR INJECTION SYSTEM NO.6 HOSE

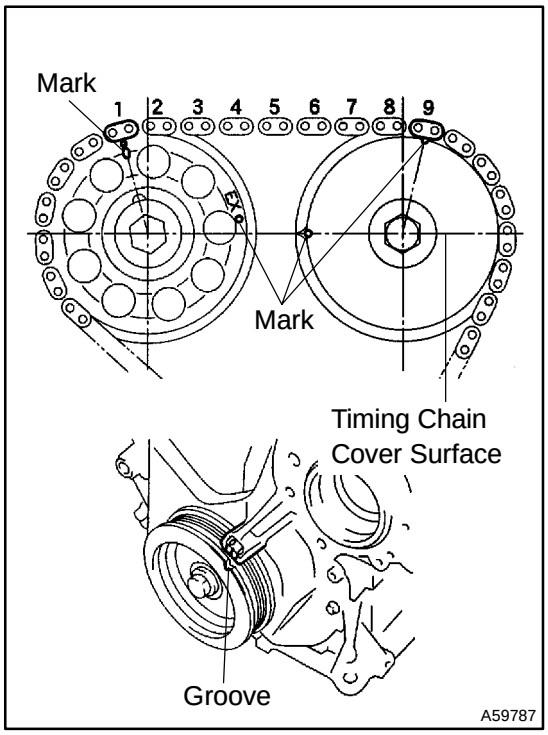
14. REMOVE AIR SWITCHING VALVE ASSY

(a) Remove the 2 bolts, and air switching valve assembly.



15. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Place a wooden block between the jack and engine, and set the jack, then remove the engine mounting inslator.



16. SET NO.1 CYLINDER TO TDC/COMPRESSION

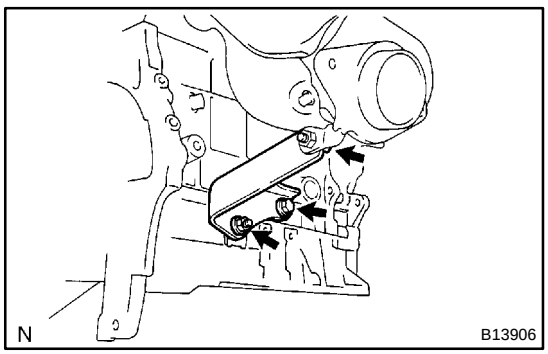
(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.

(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

HINT:
If not, turn the crankshaft 1 revolution (360_) and align the marks as above.

17. REMOVE V-RIBBED BELT TENSIONER ASSY

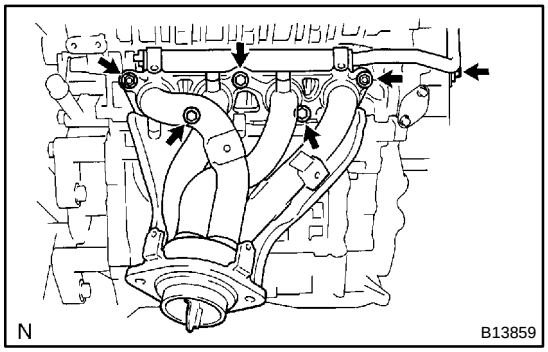
HINT:
Handle a jack up and down to remove the bolt.



18. REMOVE MANIFOLD STAY

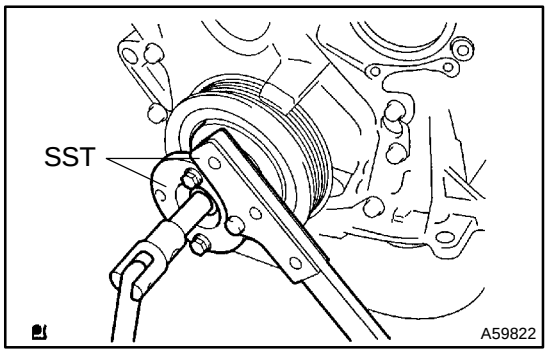
(a) Remove the 2 bolts, nut and exhaust manifold stay.

19. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.1



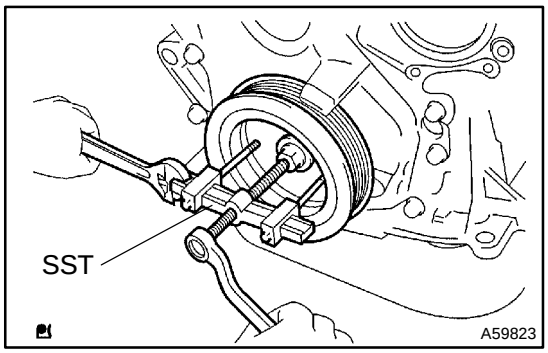
20. REMOVE EXHAUST MANIFOLD

(a) Remove the 4 bolts, 2 nuts and exhaust manifold.

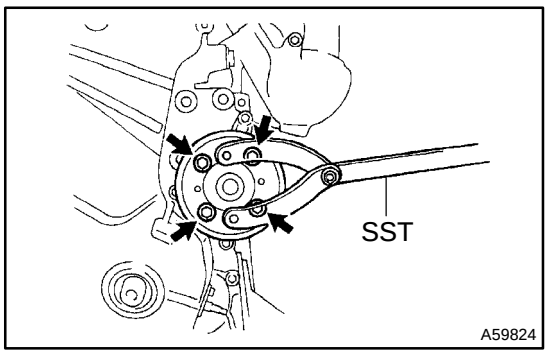


21. REMOVE CRANKSHAFT PULLEY

(a) Using SST, remove the pulley bolt.
SST 09213-70011, 09330-00021

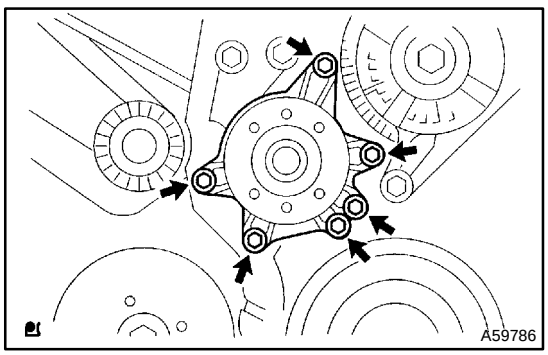


(b) Using SST, remove the crankshaft pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021, 09957-04010)



22. REMOVE WATER PUMP PULLEY

(a) Using SST, remove the water pump pulley.
SST 09960-10010



23. REMOVE PUMP ASSY, WATER

(a) Remove the 6 bolts and water pump.

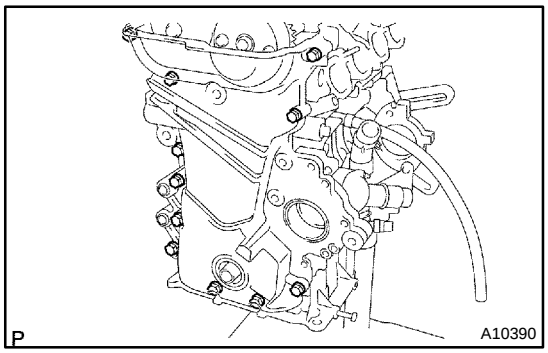
24. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

25. REMOVE COMPRESSOR

26. REMOVE CRANK POSITION SENSOR

27. REMOVE CHAIN TENSIONER ASSY NO.1

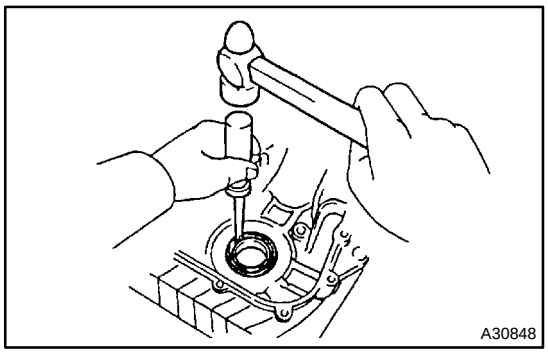
NOTICE:
Be sure not to revolve the crankshaft without the chain tensioner.



28. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY

(a) Remove the 12 bolts and the stud bolt.
(b) Remove the timing chain cover and 2 gaskets.

NOTICE:
Be careful no tot damage the contact surfaces of the timing chain cover, cylinder head and cylinder block.



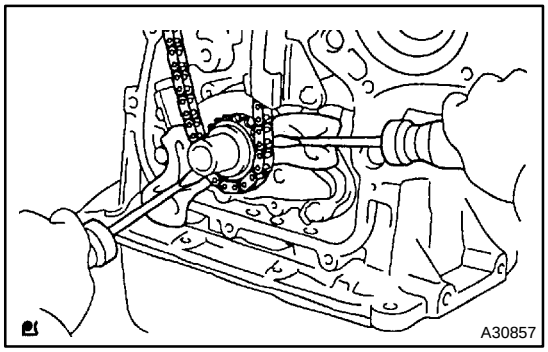
29. REMOVE TIMING GEAR COVER OIL SEAL

(a) Using a screwdriver, remove the oil seal.

30. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1

31. REMOVE CHAIN TENSIONER SLIPPER

32. REMOVE CHAIN VIBRATION DAMPER NO.1

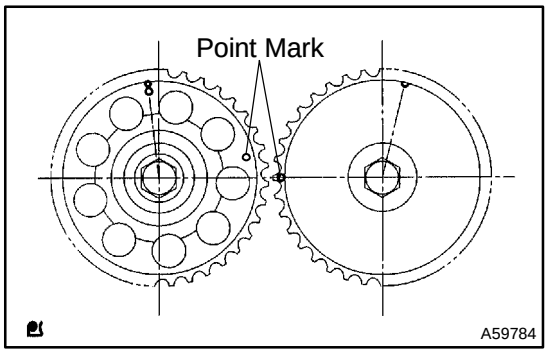


33. REMOVE CHAIN SUB-ASSY

(a) Remove the timing chain with the crankshaft timing gear plying screwdrivers as shown in the illustration.

NOTICE:

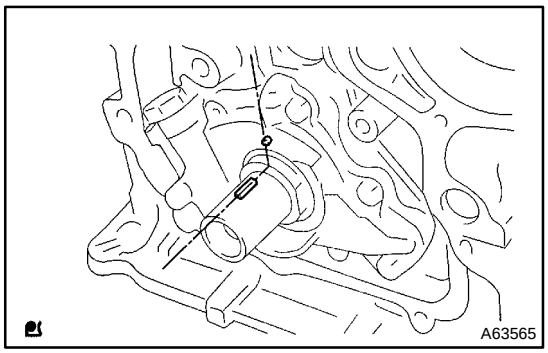
- **Put shop rag to protect the engine.**
- **In case of revolving the camshafts with the chain off the sprockets, turn the crankshaft 1/4 revolution for valves not to touch the pistons.**



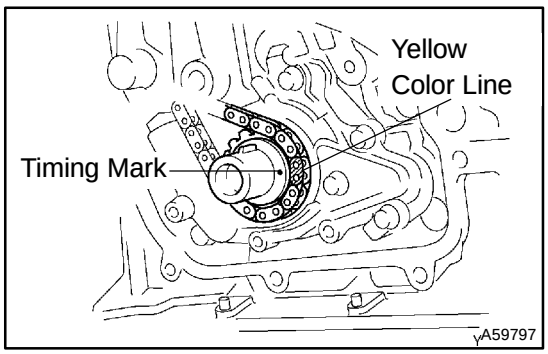
34. INSTALL CHAIN SUB-ASSY

(a) Set No. 1 cylinder to TDC/compression.

(1) Turn the hexagonal wrench head portion of the camshafts, and align the point marks of the camshaft timing sprockets.



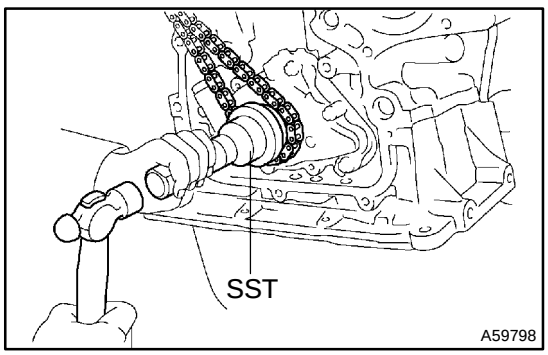
(2) Turn the crankshaft and set the set key on the crankshaft upward.



(b) Install the timing chain on the crankshaft timing sprocket with the yellow color link aligned with the timing mark on the crankshaft timing sprocket.

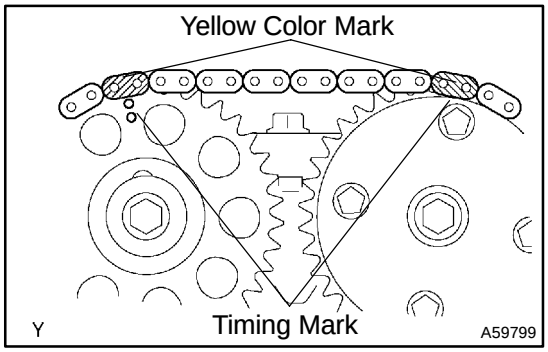
HINT:

Three yellow color links are on the chain.



(c) Using a SST, install the sprocket.

SST 09223-22010



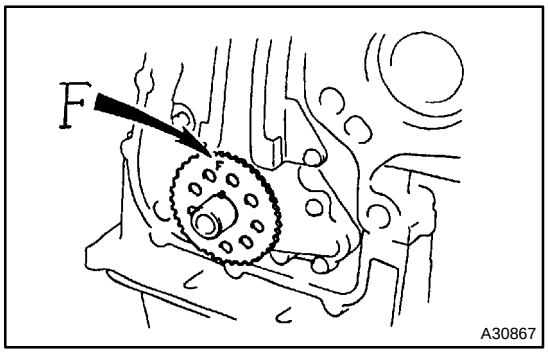
(d) Install the timing chain on the camshaft timing sprockets with the yellow color links aligned with the timing marks on the camshaft timing sprockets.

35. INSTALL CHAIN VIBRATION DAMPER NO.1

Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

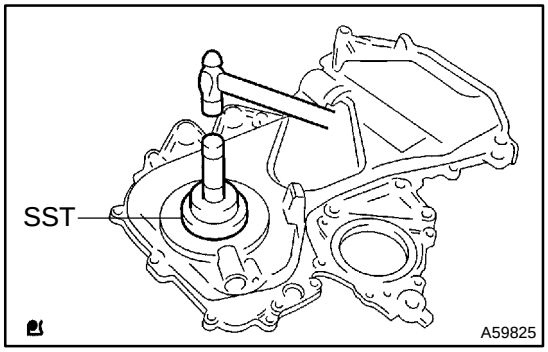
36. INSTALL CHAIN TENSIONER SLIPPER

Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)



37. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1

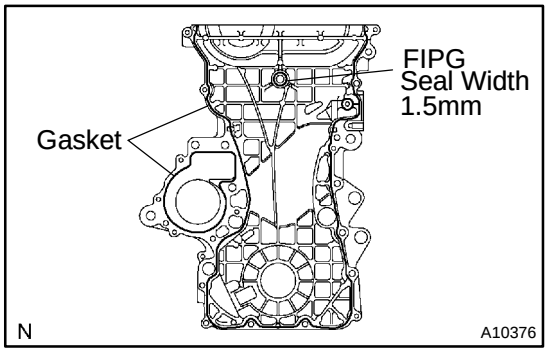
(a) Install the plate with the "F" mark facing forward.



38. INSTALL TIMING GEAR COVER OIL SEAL

(a) Apply MP grease to the oil seal lip.
(b) Using SST and a hammer, tap in a new oil seal until its surface is flush with the timing chain cover edge.
SST 09223-22010

NOTICE:
Keep the lip off foreign materials.



39. INSTALL TIMING CHAIN OR BELT COVER SUB–ASSY

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surface of the timing chain cover, cylinder head and cylinder block.
- S Using a razor blade and a gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing grooves.
- S Thoroughly clean all components to remove all the loose material.
- S Using a non–residue solvent, clean both sealing surfaces.

(b) Apply seal packing to the timing chain cover an shown in the illustration.

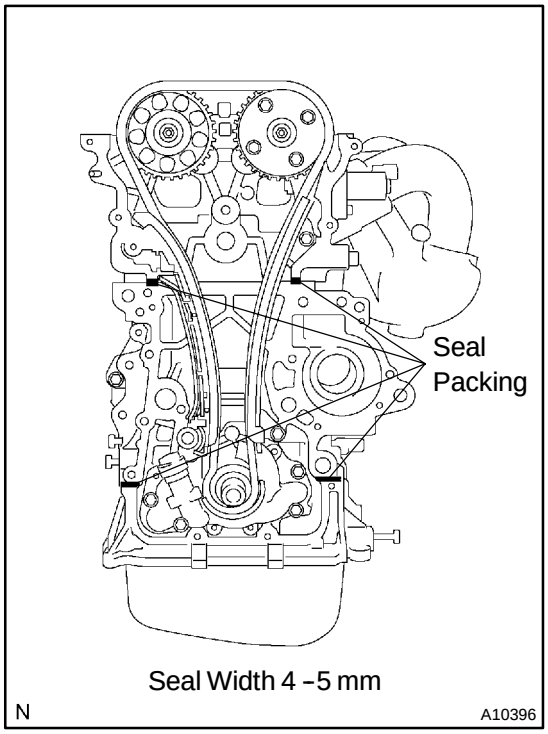
Seal packing:

Part No. 08826–00100 or equivalent
- S Install a nozzle that has been cut to a 1.5 mm opening.

HINT:

Avoid applying an excessive amount to the surface.
- S Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- S Immediately remove nozzle from the tube and reinstall cap.

(c) Install the 2 gaskets to the timing chain cover an shown in the illustration.



(d) Apply seal packing to 4 locations an shown in the illustration.

Seal packing:

Part No. 08826-00080 or equivalent

- Install a nozzle that has been cut to a 4 - 5 mm (0.16 - 0.20 in.)opening.

HINT:

Avoid applying an excessive amount to the surface.

- Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

NOTICE:

- **Do not put into engine oil within 2 hours after installing.**

(e) Install the timing chain cover, with the 12 bolts and nut.

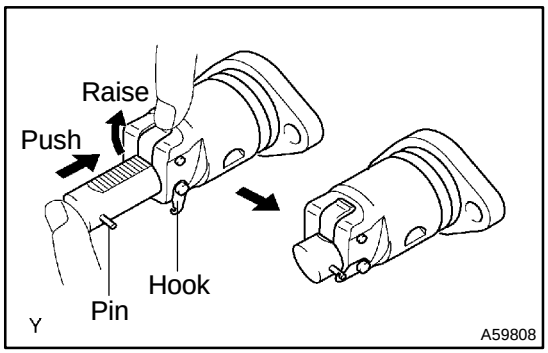
Torque:

21 N·m (214 kgf·cm, 16 ft·lbf) (M8)

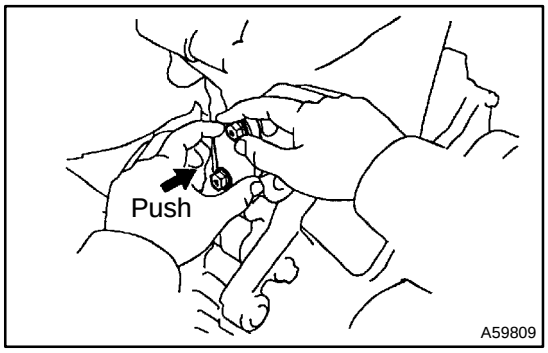
11 N·m (112 kgf·cm, 8 ft·lbf) (M6)

(f) Install the stud bolt.

40. INSTALL CHAIN TENSIONER ASSY NO.1



(a) Check the O-ring is clean, and set the hook as shown in the illustration.

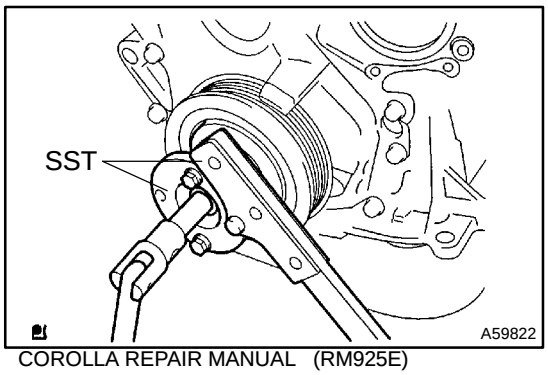


(b) Apply engine oil to the chain tensioner and install it.

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

NOTICE:

When installing the tensioner, set the hook again if the hook release the plunger.



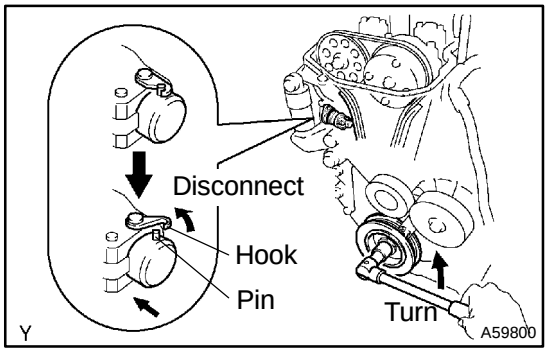
41. INSTALL CRANKSHAFT PULLEY

(a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.

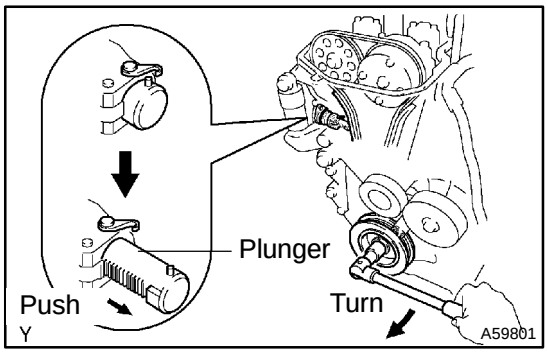
(b) Using SST, install the pulley bolt.

SST 09213-70011, 09330-00021

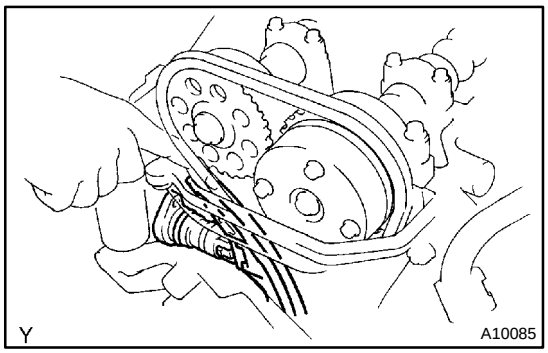
Torque: 118 N·m (1,204 kgf·cm, 87 ft·lbf)



(c) Turn the crankshaft counterclockwise, and disconnect the plunger knock pin form the hook.



(d) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.



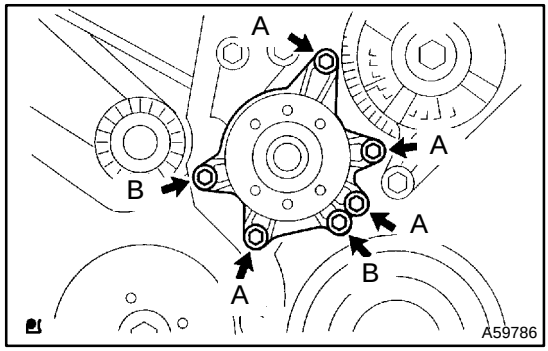
HINT:
If the plunger does not spring out, press the slipper into the chain tensioner with a screwdriver or your finger so that the hook is released from the knock pin and the plunger springs out.

42. INSTALL CRANK POSITION SENSOR

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

43. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



44. INSTALL PUMP ASSY, WATER

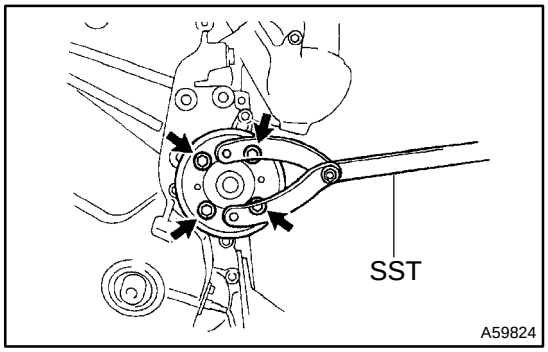
(a) Place a new O-ring on the timing chain cover.

(b) Install the water pump with the 6 bolts.

Torque:9.0 N·m (92 kgf·cm, 80 in.·lbf)

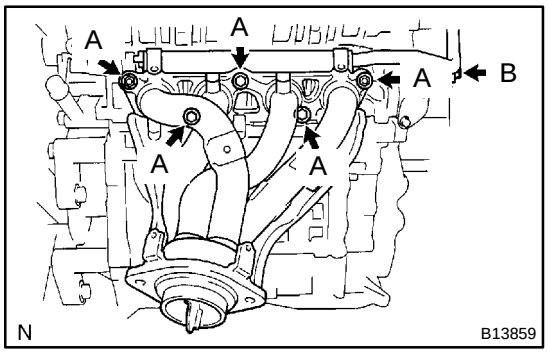
HINT:
Each bolt length is indicated in the illustration.

Bolt A	35 mm (1.38 in.)
Bolt B	28 mm (1.10 in.)



45. IINSTALL WATER PUMP PULLEY

(a) Using SSt, Install the water pump pulley.
SST 09960-10010 (09962-01000, 09963-00600)
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

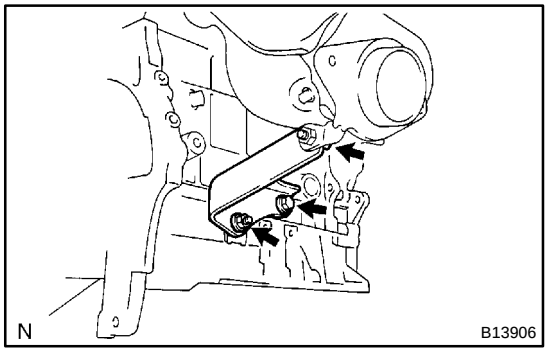


46. INSTALL EXHAUST MANIFOLD

(a) Install the exhaust manifold with the 4 bolts and 2 nuts.
Torque:
A:50 N·m (510 kgf·cm, 37 ft·lbf)
B:21 N·m (214 kgf·cm, 16 ft·lbf)

47. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.1

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)



48. INSTALL MANIFOLD STAY

(a) Install the exhaust manifold stay with the 2 bolts and nut.
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

49. INSTALL V-RIBBED BELT TENSIONER ASSY

Torque:
Nut 29 N·m (296 kgf·cm, 21 ft·lbf)
Bolt 100 N·m (1,016 kgf·cm, 74 ft·lbf)

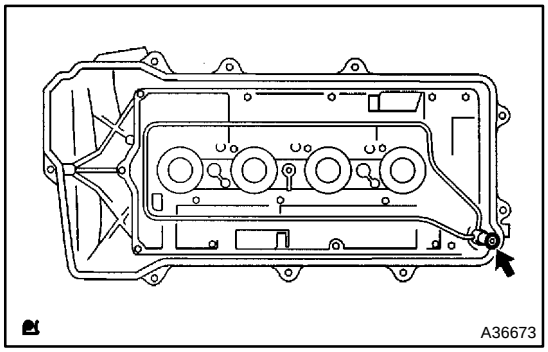
50. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

51. INSTALL EXHAUST PIPE ASSY FRONT
(See page15-2)

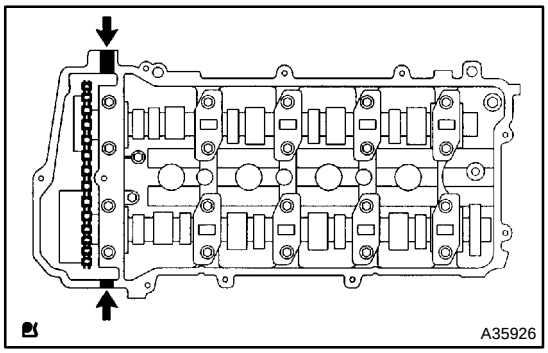
52. INSTALL AIR SWITCHING VALVE ASSY

(a) Install the air switching valve assembly and the 2 bolts.
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)



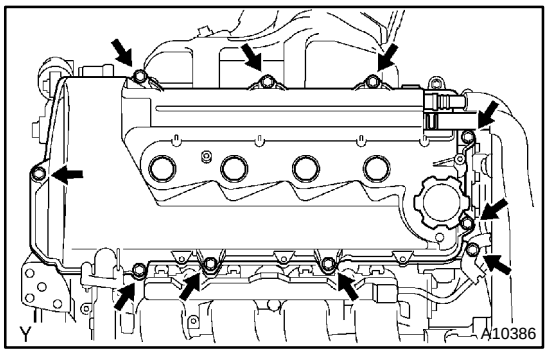
53. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Install the gasket to the cylinder head cover.
(b) Remove any old pacing (FIPG) material.



(c) Apply seal packing to 2 locations as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**



(d) Install the cylinder head cover and cable bracket with the 10 bolts.
Torque: 10 N·m (100 kgf·cm, 89 in.·lbf)

54. INSTALL VENTILATION NO.1 TUBE

(a) Install a new gasket and the ventilation No. 1 tube.
Torque: 10 N·m (102 kgf·cm, 89 in.·lbf)

55. INSTALL IGNITION COIL ASSY

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

56. INSTALL GENERATOR ASSY
(See page19-8)

57. INSTALL GENERATOR BRACKET NO.1

Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

58. ADD COOLANT **(See page 16-6)**

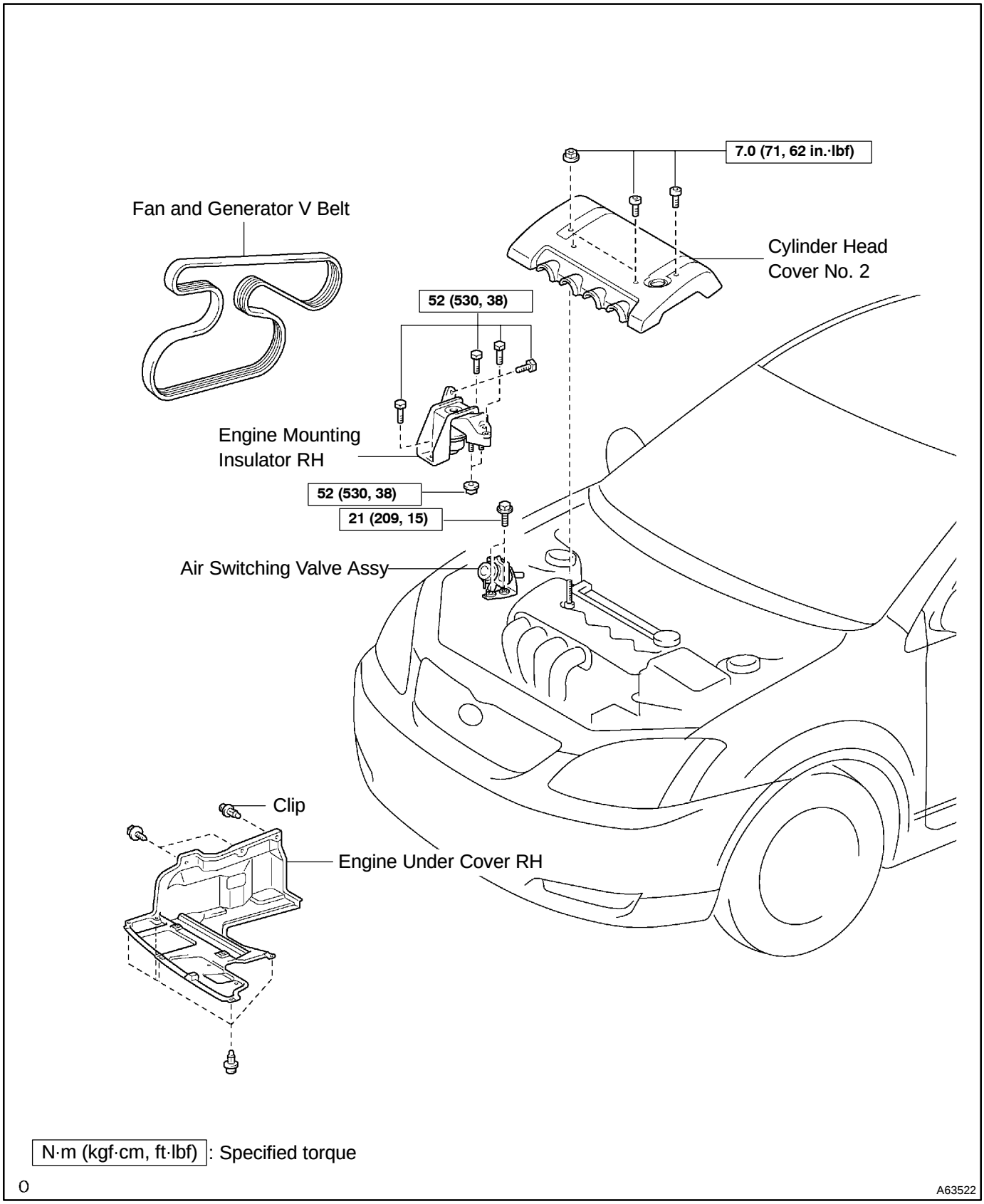
59. INSPECT CHECK ENGINE COOLANT LEAK **(See page 16-7)**

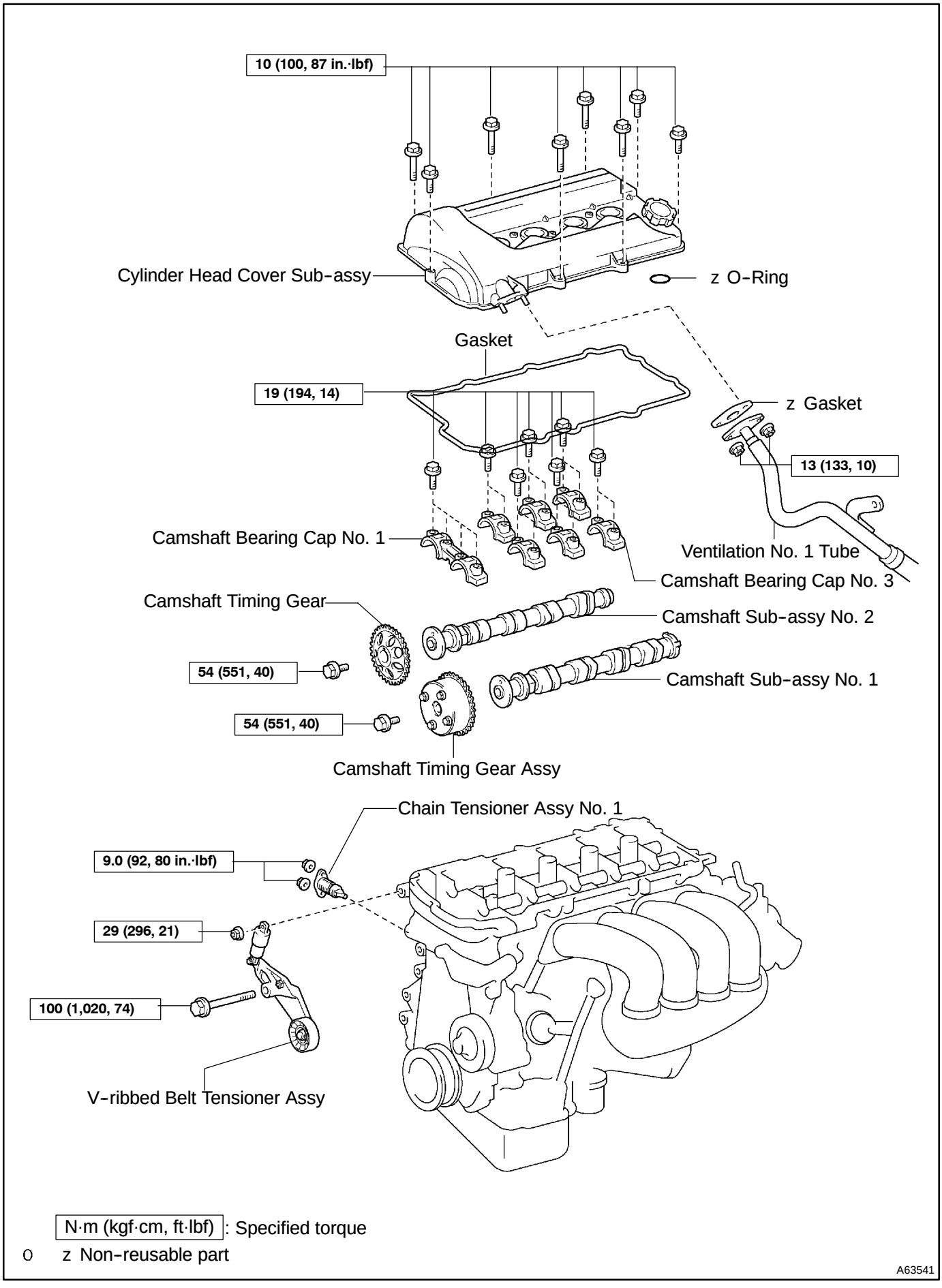
60. INSPECT OIL LEAK

CAMSHAFT (2ZZ-GE)

COMPONENTS

140MN-01

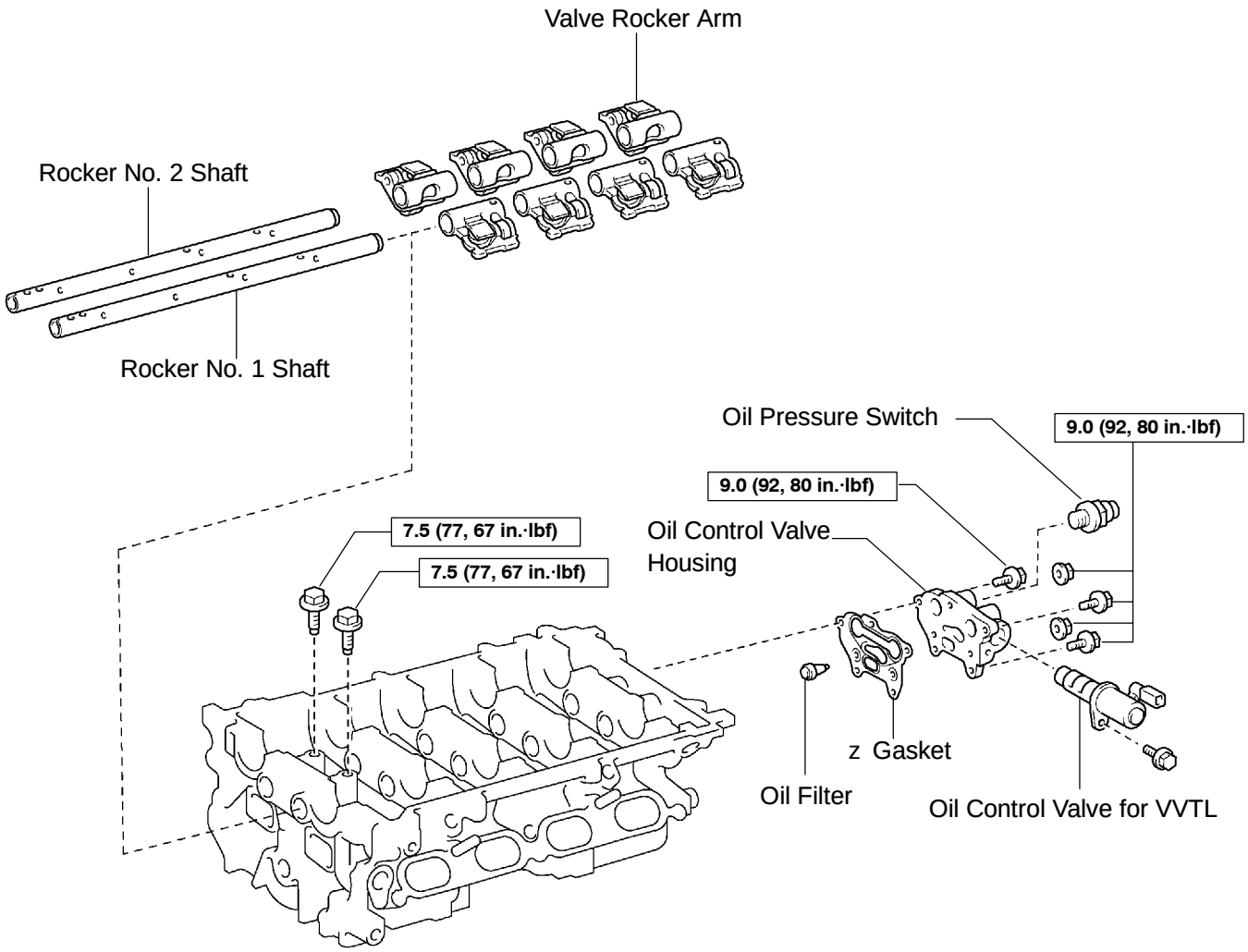




N·m (kgf·cm, ft·lbf): Specified torque

o z Non-reusable part

A63541



N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part

A63542

REPLACEMENT

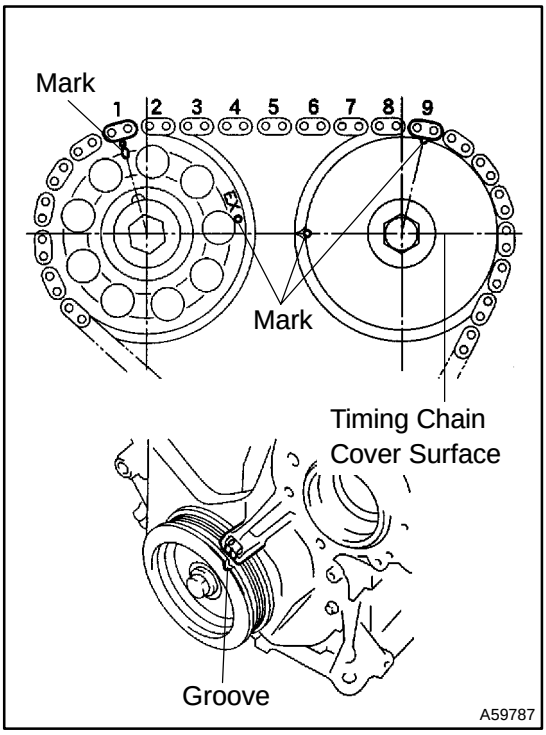
1. REMOVE CYLINDER HEAD COVER NO.2

2. REMOVE IGNITION COIL ASSY

3. DISCONNECT VENTILATION NO.1 TUBE

4. REMOVE CYLINDER HEAD COVER SUB-ASSY

5. REMOVE ENGINE UNDER COVER RH



6. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.

(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

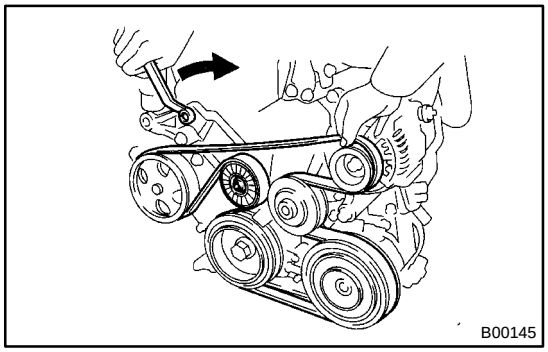
HINT:

If not, turn the crankshaft 1 revolution (360_) and align the marks as above.

7. REMOVE AIR INJECTION SYSTEM NO.6 HOSE

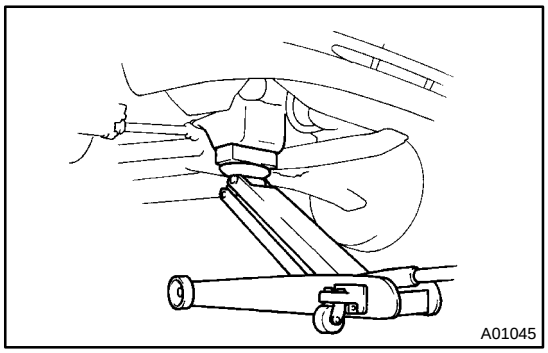
8. REMOVE AIR SWITCHING VALVE ASSY

(a) Remove the 2 bolts, and air switching valve assembly.



9. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.



10. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

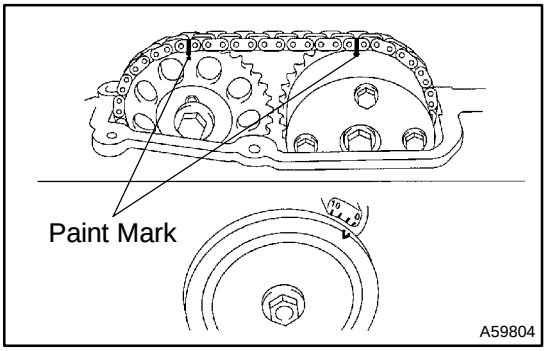
(a) Place a wooden block between the jack and engine, and set the jack, then remove the engine mounting insulator.

11. REMOVE V-RIBBED BELT TENSIONER ASSY

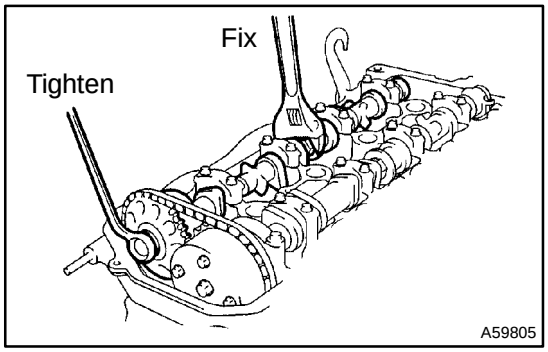
HINT:
Handle a jack up and down to remove the bolt.

12. REMOVE CAMSHAFT

NOTICE:
Be sure not to revolve the crankshaft without the chain tensioner.



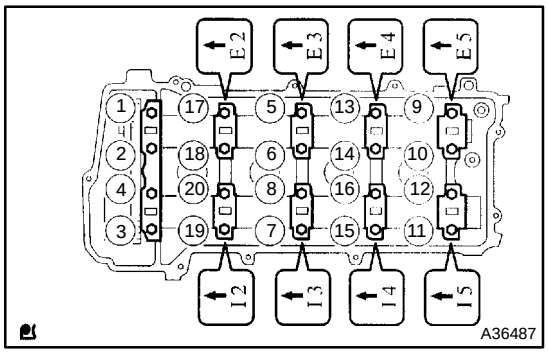
(a) Set the No. 1 cylinder to the TDC/compression.
(b) Place match marks on the timing chain and camshaft timing sprockets.
(c) Remove the 2 bolts and chain tensioner.



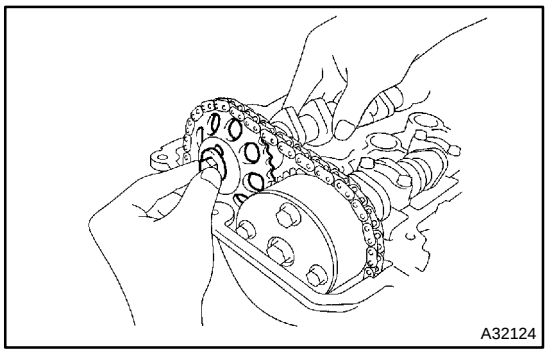
(d) Fix the camshaft with a wrench and so on, then loosen the camshaft timing gear set bolt.

NOTICE:

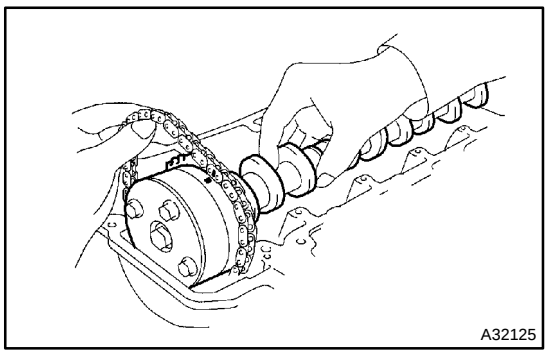
Be careful not to damage the valve lifter.



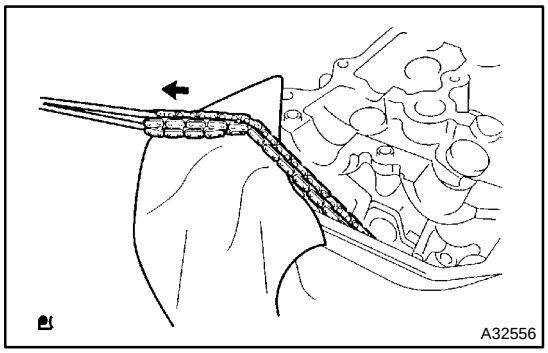
(e) Loosen the camshaft bearing cap bolts on No. 2 camshaft in the order as shown in the illustration in several passes,and remove the caps.



(f) Remove the camshaft timing gear as shown in the illustration.



(g) Remove the camshaft with holding the timing chain.



(h) Tie the timing chain with a string as shown in the illustration.

NOTICE:

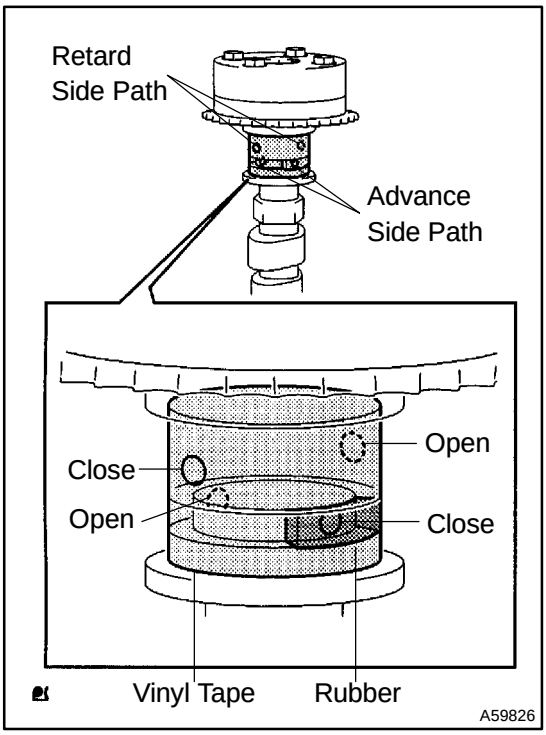
Be careful not to drop anything inside the timing chain cover.

13. INSPECT CAMSHAFT TIMING GEAR ASSY

(a) Check the lock of camshaft timing gear.

(1) Grip the camshaft with a vice, and confirm the camshaft timing gear is locked.

NOTICE:
Be careful not to damage the camshaft.

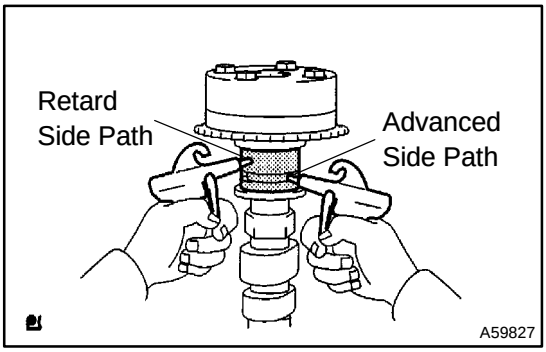


(b) Release lock pin.

(1) Cover 4 oil paths of cam journal with vinyl tape as shown in the illustration.

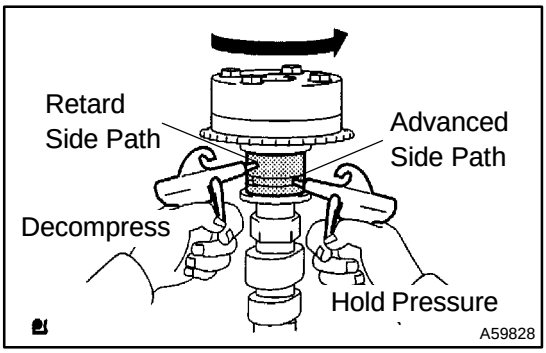
HINT:
Two advance side paths are provided in the groove of the camshaft. Plug one of the path with a rubber piece.

(2) Break through the tapes of the advance side path and the retard side path on the opposite side of the groove.



(3) Put air pressure into two broken paths (the advance side path and the retard side path) with about 150 kPa {1.5 kgf/cm^2}.

CAUTION:
Cover the paths with shop rag to avoid oil splashing.



(4) Confirm if the camshaft timing gear assembly revolves in the timing advance direction when weakening the air pressure of the timing retard path.

HINT:
The lock pin is released, and camshaft timing gear, revolves in the advance direction.

(5) When the camshaft timing gear comes to the most advanced position, take out the air pressure of the timing retard side path, and then, take out that of timing advance side path.

CAUTION:
Camshaft timing assembly gear occasionally shifts to the retard side abruptly, if the air compression of the advanced side path is released before retard side path. It often causes the breakage of the lock pin.

(c) Check smooth revolution

(1) Revolve the camshaft timing gear assembly within the movable range except for the most retarded position several times, and check the smooth revolution.

CAUTION:
Be sure to perform this check by hand, instead of air pressure.

(d) Check the lock in the most retarded position.

(1) Confirm that the camshaft timing gear assembly is locked at the most retarded position.

14. REMOVE CAMSHAFT TIMING GEAR ASSY

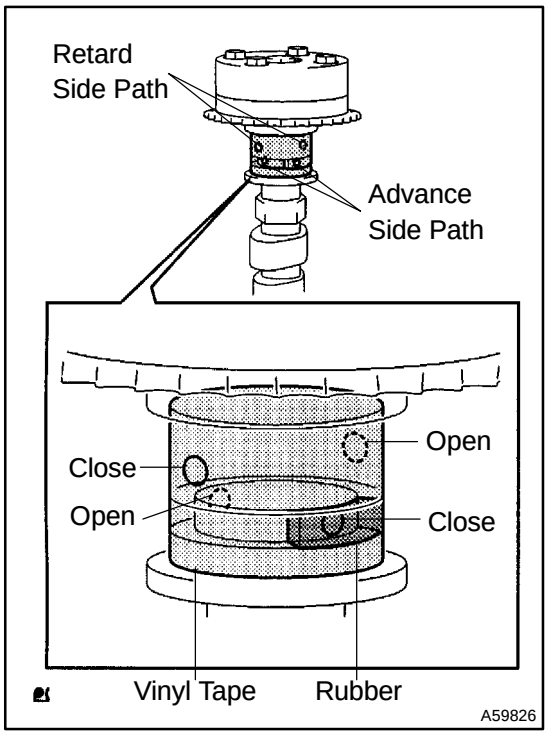
(a) Grip the camshaft with a vice, and confirm that the gear is locked.

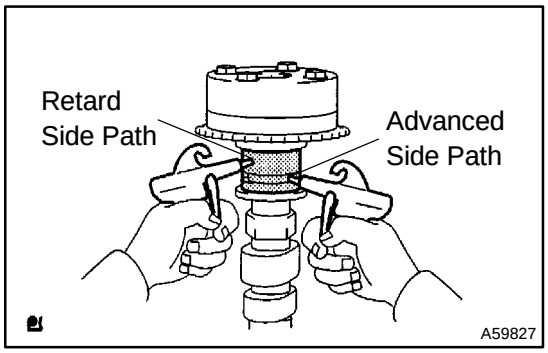
CAUTION:
Be careful not to damage the camshaft.

(b) Cover 4 oil paths of cam journal with vinyl tape as shown in the illustration.

HINT:
Two advance side paths are provided in the groove of the camshaft. Plug one of the path with a rubber piece.

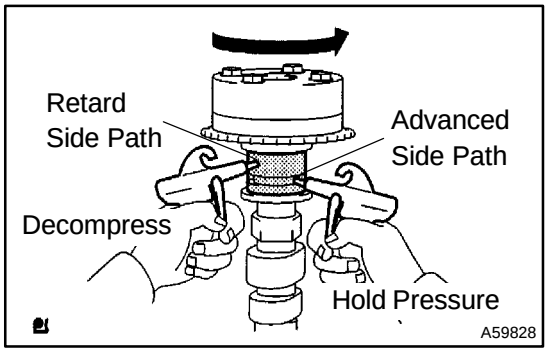
(c) Break through the tapes of the advance side path and the retard side path on the opposite side of the groove.





(d) Put air pressure into two broken paths (the advance side path and the retard side path) with about 150 kPa {1.5 kgf/cm^2}.

CAUTION:
Cover the paths with shop rag to avoid oil splashing.



(e) Confirm if the camshaft timing gear assembly revolves in the timing advance direction when weakening the air pressure of the timing retard path.

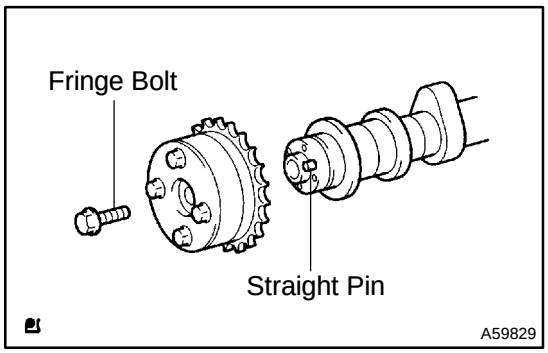
HINT:

The lock pin is released, and camshaft timing gear revolves in the advance direction.

(f) When the camshaft timing gear comes to the most advanced position, take out the air pressure of the timing retard side path, and then, takeout that of timing advance side path.

CAUTION:

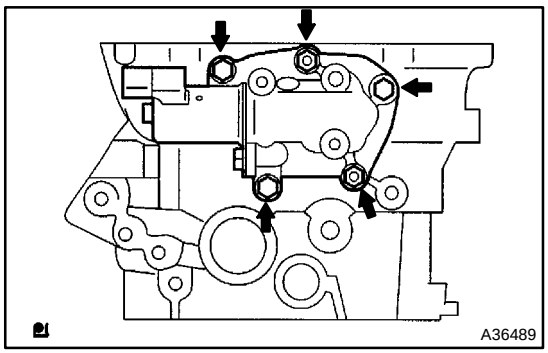
Camshaft timing gear assembly occasionally shifts to the retard side abruptly, if the air compression of the advanced side path is released before retard side paths. It often causes the breakage of the lock pin.



(g) Remove the fringe bolt of camshaft timing gear assembly.

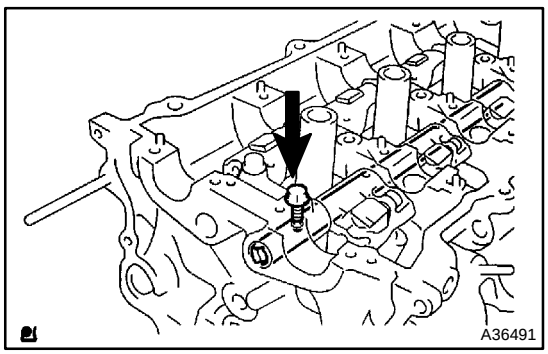
NOTICE:

- **Be sure not to remove the other 4 bolts.**



15. REMOVE CAM TIMING CONTROL VALVE HOUSING

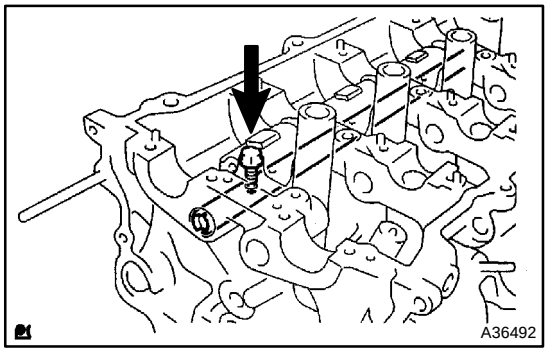
(a) Remove the 3 bolts, 2 nuts and cam timing oil control valve housing.



16. REMOVE VALVE ROCKER SHAFT SUB-ASSY NO.1

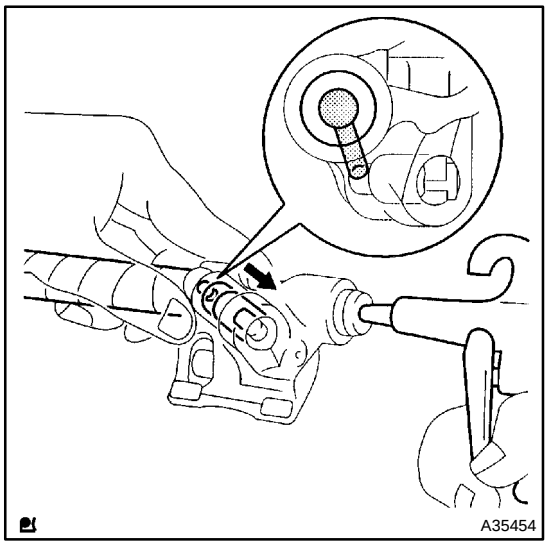
(a) Remove the bolt and the rocker shaft No.1.

(b) Remove the valve rocker arm.



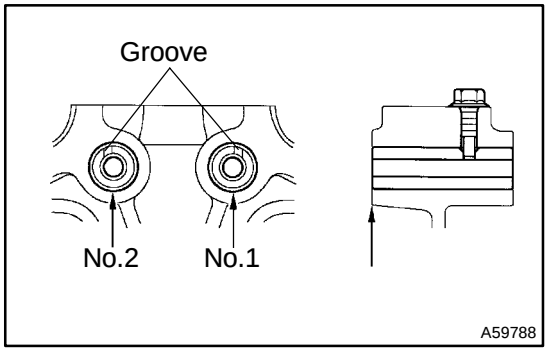
17. REMOVE VALVE ROCKER SHAFT SUB-ASSY NO.2

(a) Remove the bolt and the rocker shaft No.2
(b) Remove the valve rocker arm.



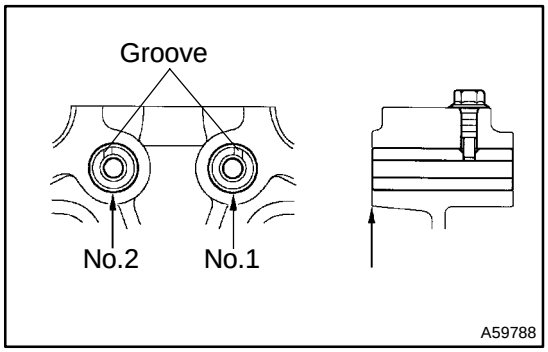
18. INSPECT VALVE ROCKER ARM

(a) Cover oil paths of the rocker arm shaft except 2 paths with vinyl type.
(b) Align the oil path of the rocker arm shaft to the oil path of the rocker arm.
(c) Check that the piston inside of the rocker arm moves when air pressure 150 kpa {1.5kgf/cm^2 } is put to the oil paths.



19. INSTALL VALVE ROCKER SHAFT SUB-ASSY NO.2

(a) Put the valve rocker shaft through the cylinder head and the hole of the valve rocker arm, and check the direction of the groove.
(b) Install a bolt to fix the rocker shaft No.2.
Torque: 7.5 N·m (77 kgf·cm 67 in·lbf)

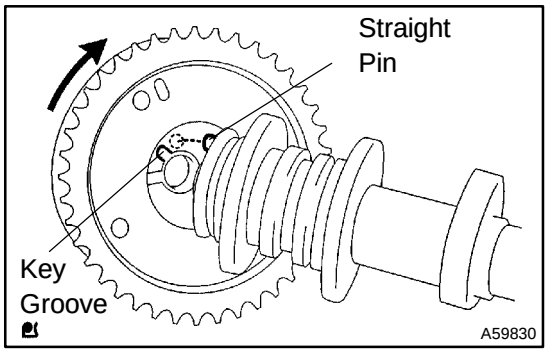


20. INSTALL VALVE ROCKER SHAFT SUB-ASSY NO.1

(a) Put the valve rocker shaft through the cylinder head and the hole of the valve rocker arm, and check the direction of the groove.
(b) Install a bolt to fix the rocker shaft No.1.
Torque: 7.5 N·m (77 kgf·cm 67 in·lbf)

21. INSTALL CAM TIMING CONTROL VALVE HOUSING

(a) Install the cam timing control valve housing with a new gasket.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

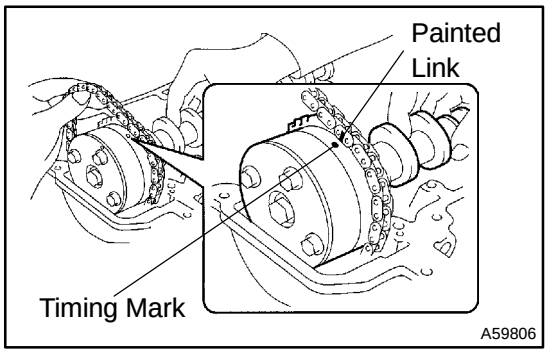


22. INSTALL CAMSHAFT TIMING GEAR ASSY

(a) Put the camshaft timing gear assembly and the camshaft together with the straight pin off the key groove.
(b) Turn the camshaft timing gear assembly to the left direction (as shown in the illustration) with pushing it lightly against the camshaft. Push further at the position where the pin gets into the groove.

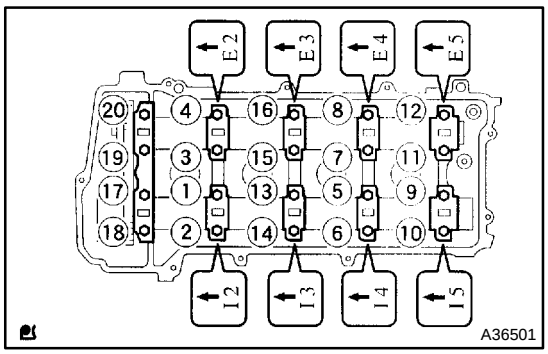
CAUTION:
Be sure not to turn the camshaft timing gear to the retard angle side (to the right angle).

(c) Check that there is no clearance between the gear's fringe and the camshaft.
(d) Tighten the fringe bolt with the camshaft timing gear fixed.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)
(e) Check that the camshaft timing gear assembly can move to the retard angle side (the right angle), and is locked at the most retarded position.

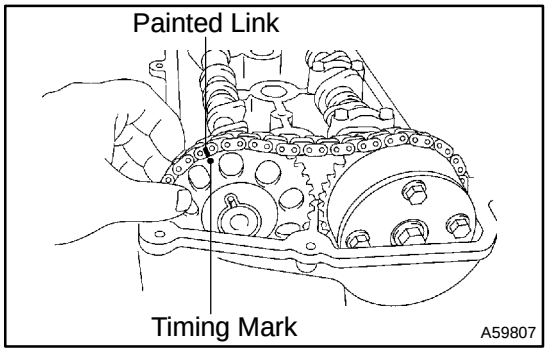


23. INSTALL CAMSHAFT

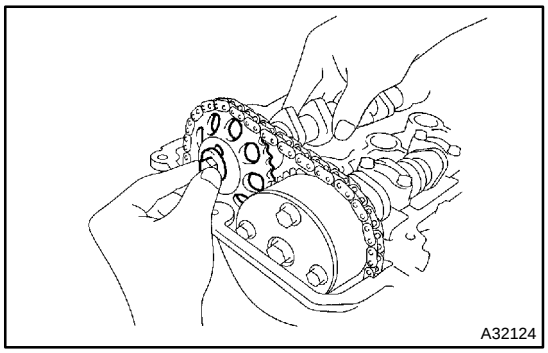
(a) As shown in the illustration, install the timing chain on the camshaft timing gear, with the painted links aligned with the timing marks on the camshaft timing sprockets.



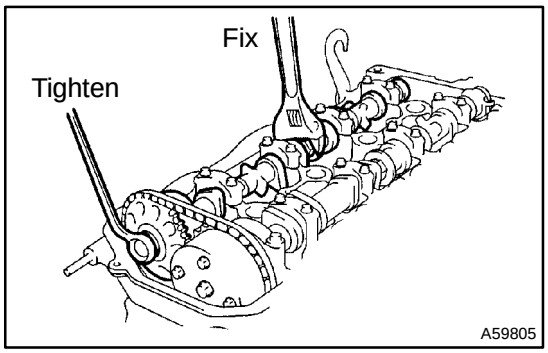
(b) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque: 19 N·m (189 kgf·cm, 17 ft·lbf)



(c) Put the camshaft No.2 on the cylinder head with the painted links of the chain aligned with the timing mark on the camshaft timing sprockets.

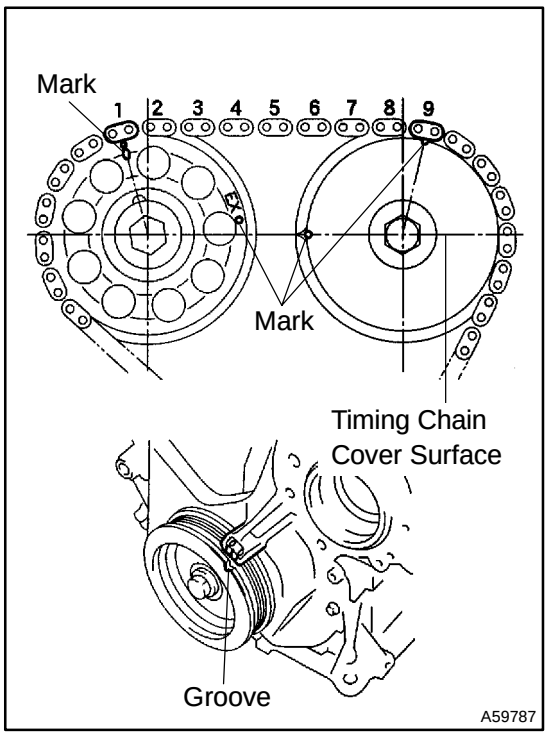


(d) Tighten the set bolt temporarily.



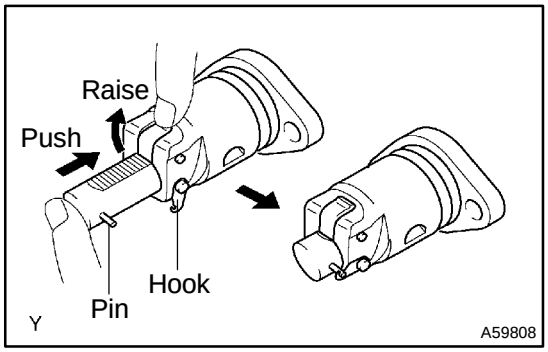
(e) Fix the camshaft with a wrench and so on, then tighten the camshaft timing gear set bolt.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

NOTICE:
Be careful not damage the valve lifter.

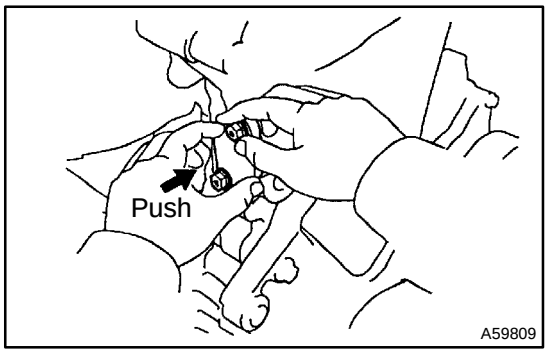


(f) Check the match marks on the timing chain and camshaft timing sprockets, and then the alignment of the pulley groove with timing mark of the chain cover as shown in the illustration.

(g) Install chain tensioner.

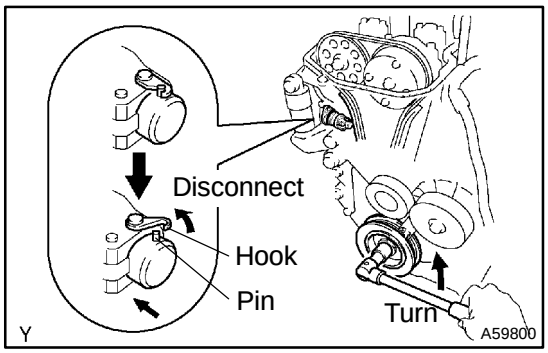


(1) Check the O-ring is clean, and set the hook as shown in the illustration.

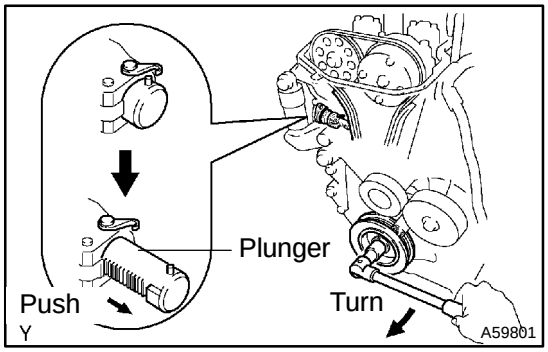


(2) Apply engine oil to the chain tensioner and install it.
Torque: 9.0 N·m (92 kgf·cm, 80 in·lbf)

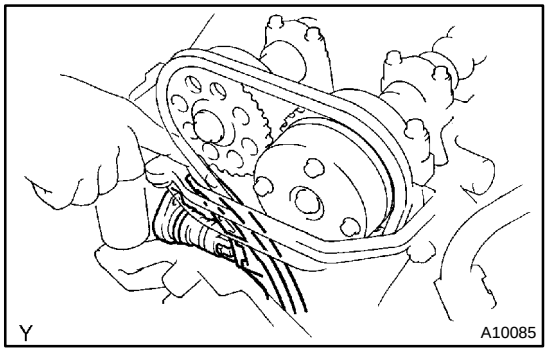
NOTICE:
When installing the tensioner, set the hook again if the hook release the plunger.



(3) Turn the crankshaft counterclockwise, and disconnect the plunger knock pin from the hook.



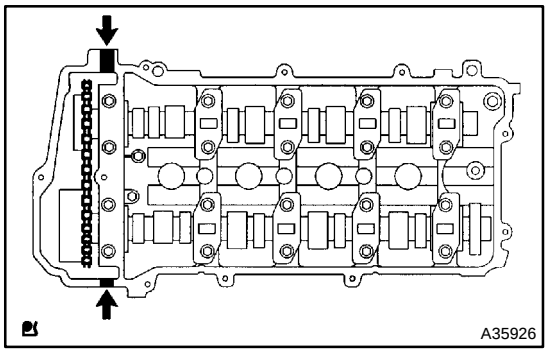
(4) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.



HINT:
If the plunger does not spring out, press the slipper into the chain tensioner with a screwdriver or your finger so that the hook is released from the knock pin and the plunger springs out.

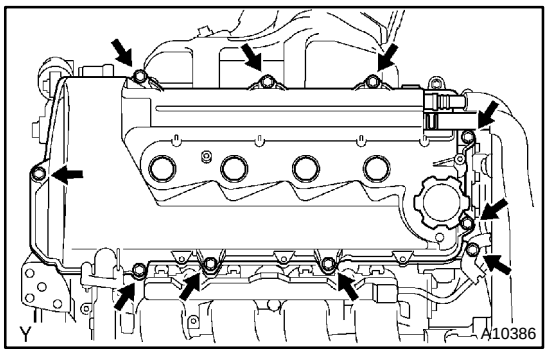
24. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Install the gasket to the cylinder head cover.
(b) Remove any old packing (FIPG) material.



(c) Apply seal packing to 2 locations as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**



(d) Install the cylinder head cover and cable bracket with the 10 bolts,.
Uniformly tighten the bolts and nuts, in the several passes.
Torque: : 10 N·m (102 kgf·cm, 89 in.·lbf)

25. INSTALL VENTILATION NO.1 TUBE

(a) Install a new gasket and the ventilation No. 1 tube.
Torque: 10 N·m (102 kgf·cm, 89 in.·lbf)

26. INSTALL V-RIBBED BELT TENSIONER ASSY

Torque:
Nut 29 N·m (296 kgf·cm, 21 ft·lbf)
Bolt 100 N·m (1,020 kgf·cm, 74 ft·lbf)

27. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

Torque: 52 N·m (531 kgf·cm, 38 ft·lbf)

28. INSTALL AIR SWITCHING VALVE ASSY

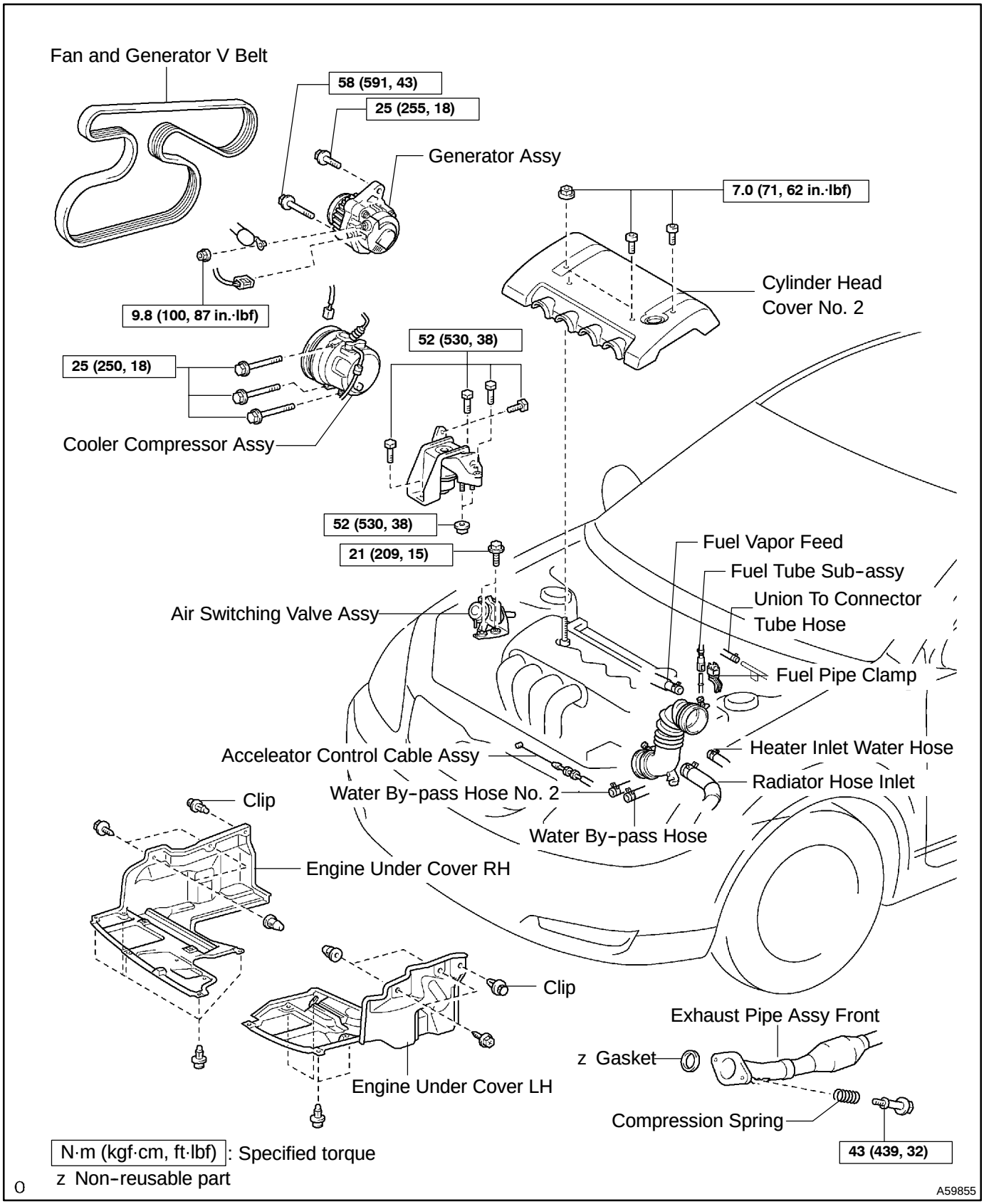
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)

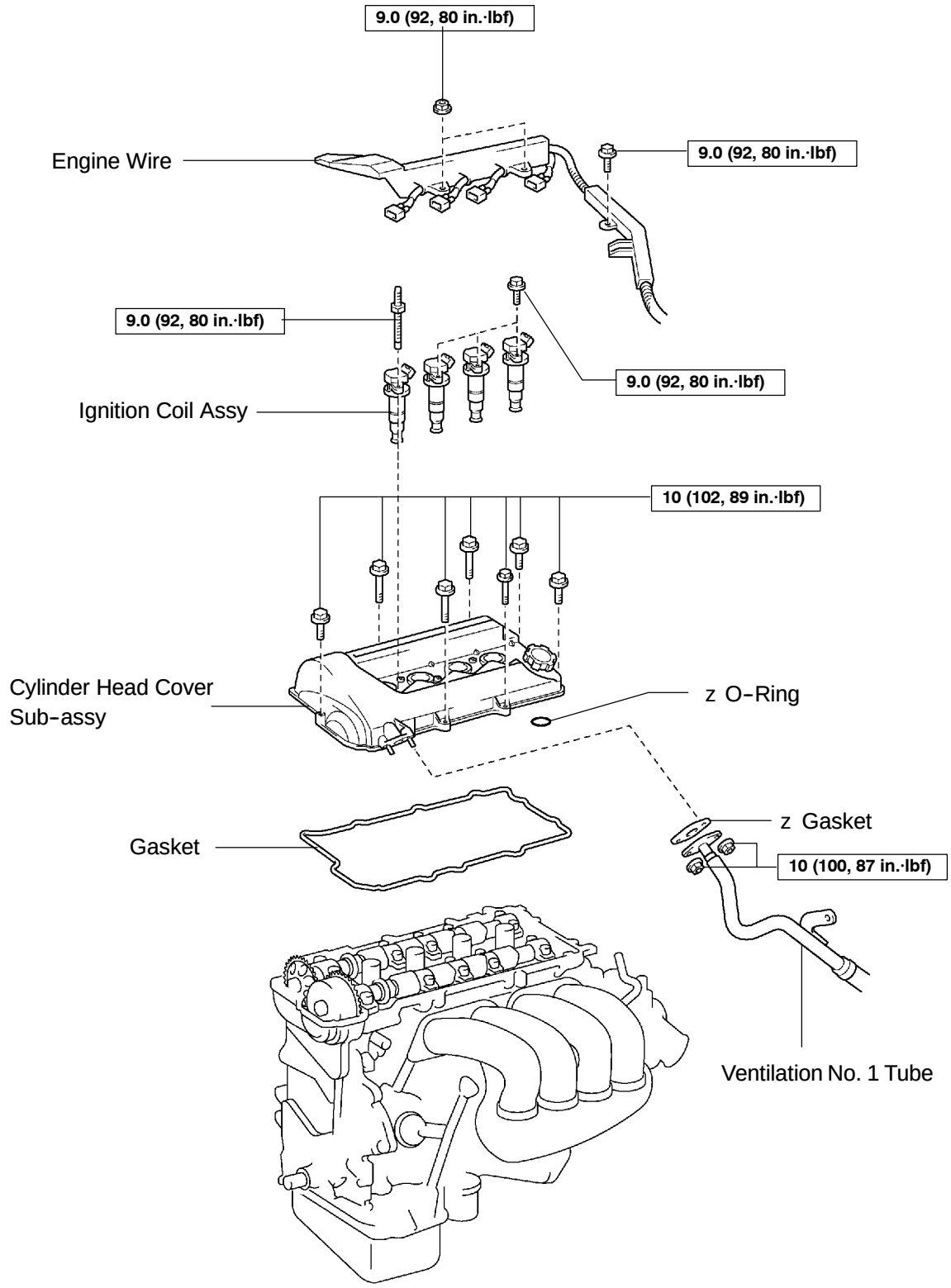
29. INSPECT OIL LEAK

CYLINDER HEAD GASKET (2ZZ-GE)

COMPONENTS

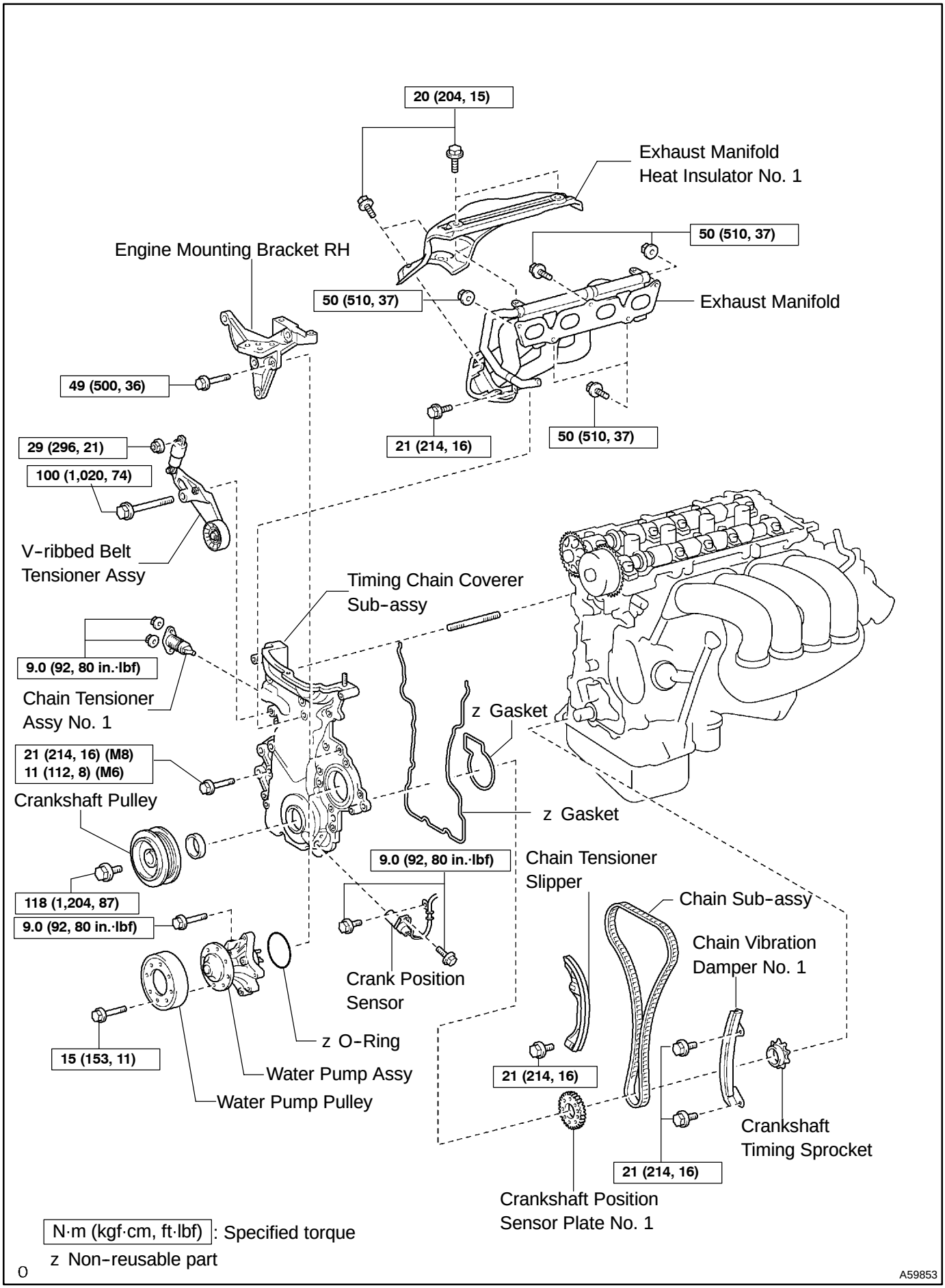
140MY-01

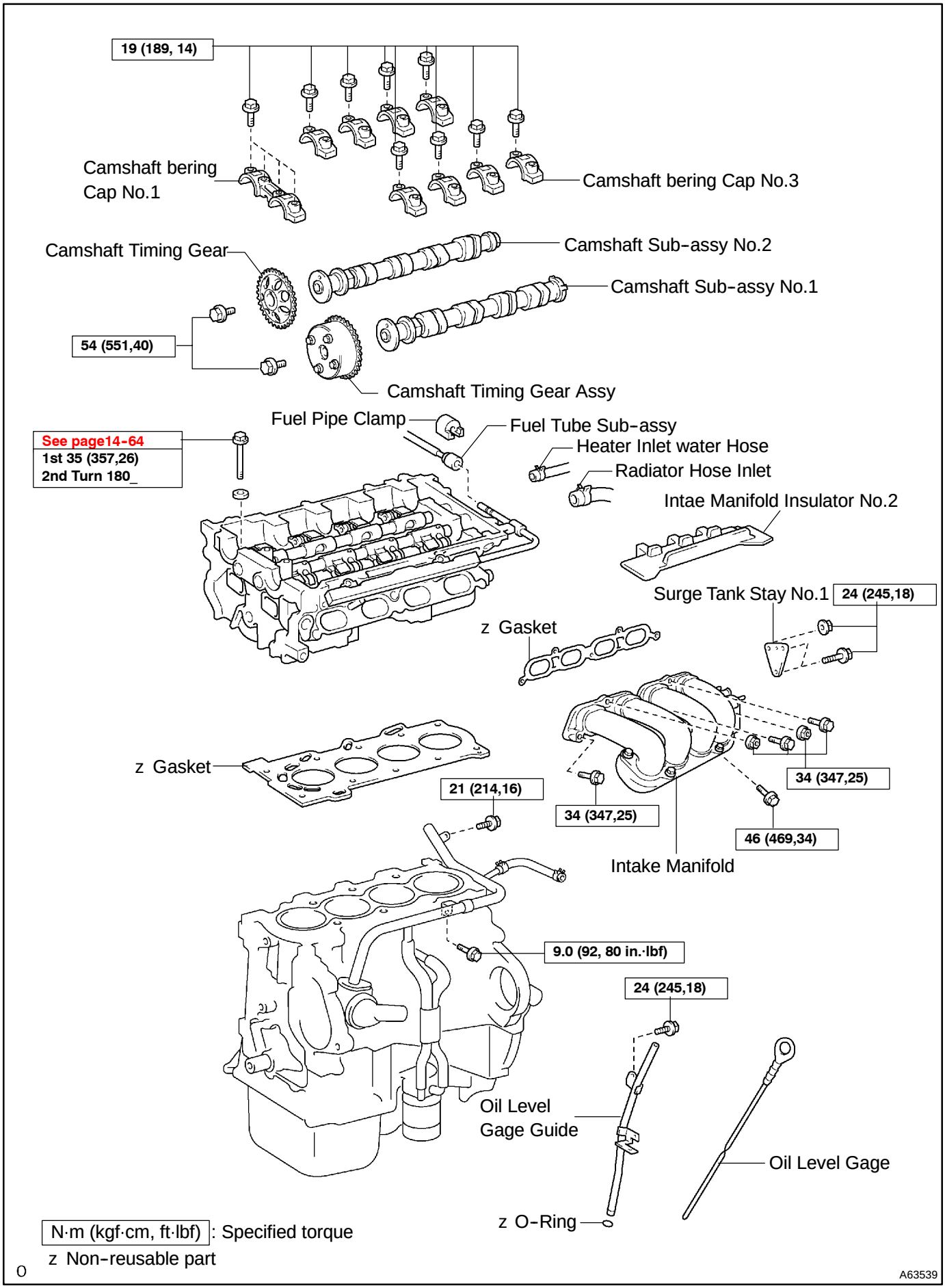




N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part

A59854

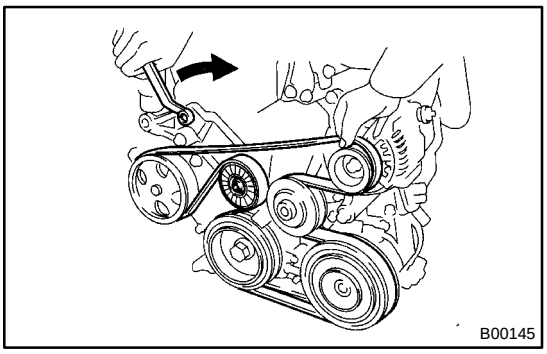

20 (204, 15)
Exhaust Manifold Heat Insulator No. 1
50 (510, 37)
Engine Mounting Bracket RH
50 (510, 37)
Exhaust Manifold
49 (500, 36)
21 (214, 16)
50 (510, 37)
29 (296, 21)
100 (1,020, 74)
V-ribbed Belt Tensioner Assy
Timing Chain Coverer Sub-assy
9.0 (92, 80 in.·lbf)
Chain Tensioner Assy No. 1
z Gasket
21 (214, 16) (M8)
11 (112, 8) (M6)
Crankshaft Pulley
z Gasket
9.0 (92, 80 in.·lbf)
Chain Tensioner Slipper
118 (1,204, 87)
9.0 (92, 80 in.·lbf)
Chain Sub-assy
Chain Vibration Damper No. 1
Crank Position Sensor
z O-Ring
15 (153, 11)
Water Pump Assy
Water Pump Pulley
21 (214, 16)
Crankshaft Timing Sprocket
21 (214, 16)
Crankshaft Position Sensor Plate No. 1
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A59853


19 (189, 14)
Camshaft bering Cap No.1
Camshaft bering Cap No.3
Camshaft Timing Gear
Camshaft Sub-assy No.2
Camshaft Sub-assy No.1
54 (551,40)
Camshaft Timing Gear Assy
Fuel Pipe Clamp
Fuel Tube Sub-assy
Heater Inlet water Hose
Radiator Hose Inlet
Intae Manifold Insulator No.2
See page14-64
1st 35 (357,26)
2nd Turn 180_
Surge Tank Stay No.1
24 (245,18)
z Gasket
z Gasket
21 (214,16)
34 (347,25)
34 (347,25)
46 (469,34)
Intake Manifold
9.0 (92, 80 in.·lbf)
24 (245,18)
Oil Level Gage Guide
Oil Level Gage
z O-Ring
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A63539

140N1-01

REPLACEMENT

1. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT
2. REMOVE ENGINE UNDER COVER RH
3. REMOVE ENGINE UNDER COVER LH
4. DRAIN COOLANT
5. REMOVE FRONT WHEEL RH
6. REMOVE CYLINDER HEAD COVER NO.2
7. REMOVE AIR CLEANER HOSE NO.1
8. DISCONNECT ACCELERATOR CONTROL CABLE ASSY
9. DISCONNECT WATER BY-PASS HOSE NO.2
10. DISCONNECT WATER BY-PASS HOSE NO.3
11. REMOVE EFI FUEL PIPE CLAMP
12. DISCONNECT FUEL TUBE SUB-ASSY
13. DISCONNECT UNION TO CONNECTOR TUBE HOSE
14. DISCONNECT RADIATOR HOSE INLET
15. DISCONNECT HEATER INLET WATER HOSE



16. REMOVE FAN AND GENERATOR V BELT

(a) The drive belt tension can be released by turning the belt tensioner clockwise.

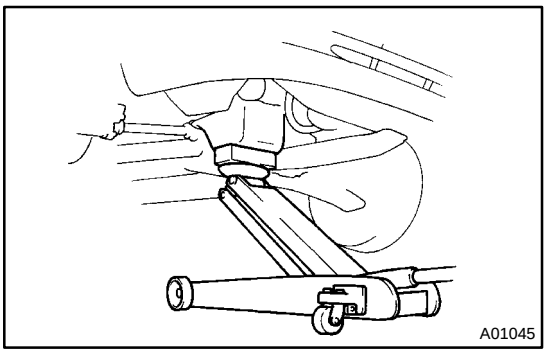
17. REMOVE GENERATOR BRACKET NO.1
18. REMOVE GENERATOR ASSY
19. REMOVE COOLER COMPRESSOR ASSY
20. DISCONNECT EXHAUST PIPE ASSY FRONT

(a) Remove the 2 bolts, 2 nuts compression spring installing the front side of exhaust pipe.
(b) Remove the gasket.

21. DISCONNECT AIR INJECTION SYSTEM NO.6 HOSE

22. REMOVE AIR SWITCHING VALVE ASSY

(a) Remove the 2 bolts, and air switching valve assembly.



23. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Place a wooden block between the jack and engine, and set the jack, then remove the engine mounting insulator.

24. INSTALL IGNITION COIL ASSY

(a) Disconnect the 4 connectors.
(b) Remove 4 bolts and ignition coils.

25. DISCONNECT ENGINE WIRE

(a) Disconnevt the connectors.
(b) Disconnect the 2 ground wires.

26. DISCONNECT VENTILATION HOSE

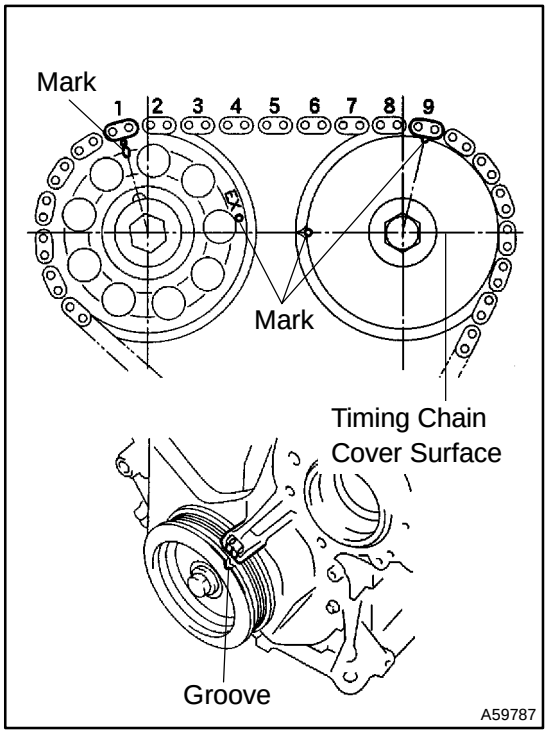
(a) Disconnect the ventilation hose from the cylinder head cover.

27. DISCONNECT VENTILATION HOSE NO.2

(a) Disconnect the ventilation hose from the cylinder head cover.

28. DISCONNECT VENTILATION NO.1 TUBE

29. REMOVE CYLINDER HEAD COVER SUB-ASSY

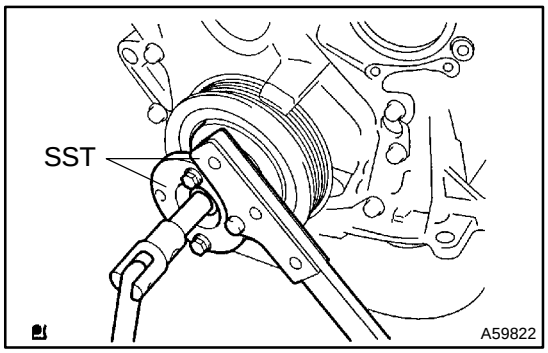


30. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.

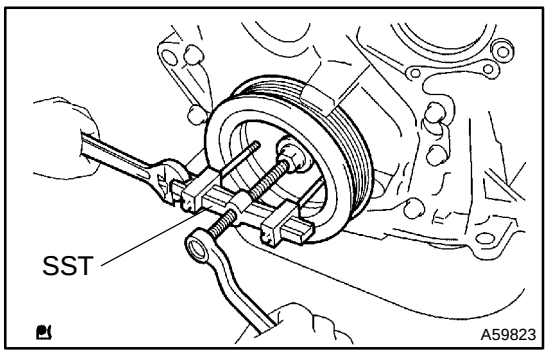
(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

HINT:
If not, turn the crankshaft 1 revolution (360_) and align the marks as above.



31. REMOVE CRANKSHAFT PULLEY

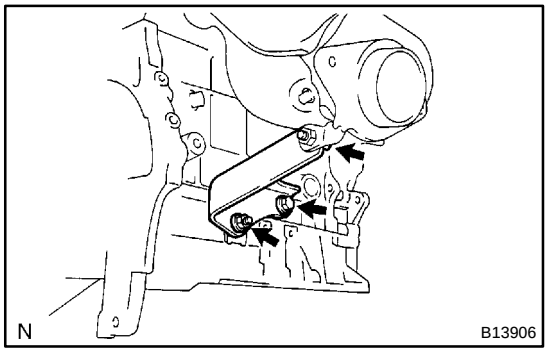
(a) Using SST, remove the pulley bolt.
SST 09213-70011, 09330-00021



(b) Using SST, remove the crankshaft pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021, 09957-04010)

32. REMOVE V-RIBBED BELT TENSIONER ASSY

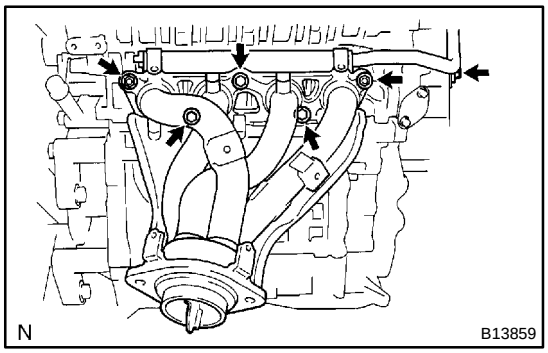
HINT:
Handle a jack up and down to remove the bolt.



33. REMOVE MANIFOLD STAY

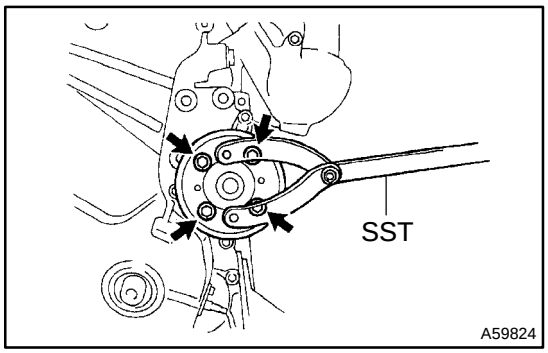
(a) Remove the 2 bolts, nut and exhaust manifold stay.

34. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.1



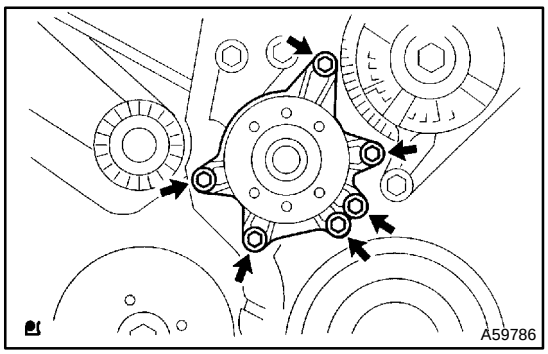
35. REMOVE EXHAUST MANIFOLD

(a) Remove the 4 bolts, 2 nuts and exhaust manifold.



36. REMOVE WATER PUMP PULLEY

(a) Using SST, remove the water pump pulley.
SST 09960-10010



37. REMOVE PUMP ASSY, WATER

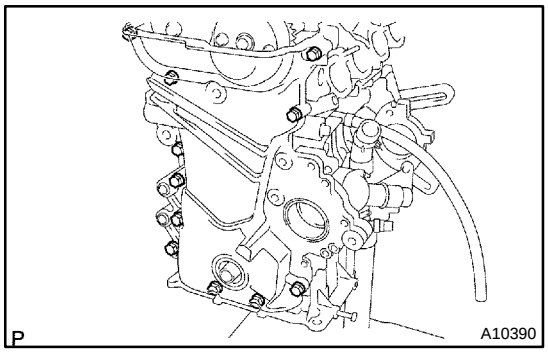
(a) Remove the 6 bolts and water pump.

38. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

39. REMOVE CRANK POSITION SENSOR

40. REMOVE CHAIN TENSIONER ASSY NO.1

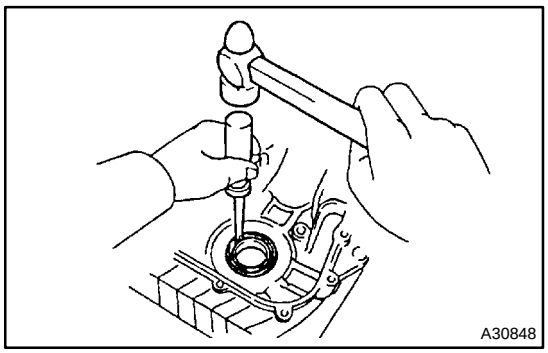
NOTICE:
Be sure not to revolve the crankshaft without the chain tensioner.



41. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY

(a) Remove the 12 bolts and the stud bolt.
(b) Remove the timing chain cover and 2 gaskets.

NOTICE:
Be careful no tot damage the contact surfaces of the timing chain cover, cylinder head and cylinder block.



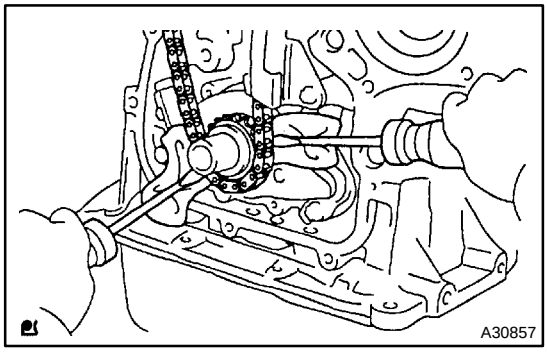
42. REMOVE TIMING GEAR COVER OIL SEAL

(a) Using a screwdriver, remove the oil seal.

43. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1

44. REMOVE CHAIN TENSIONER SLIPPER

45. REMOVE CHAIN VIBRATION DAMPER NO.1



46. REMOVE CHAIN SUB-ASSY

(a) Remove the timing chain with the crankshaft timing gear plying screwdrivers as shown in the illustration.

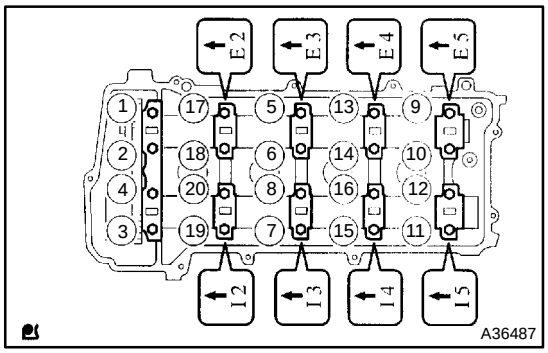
NOTICE:
- **Put shop rag to protect the engine.**
- **In case of revolving the camshafts with the chain off the sprockets, turn the crankshaft 1/4 revolution for valves not to touch the pistons.**

47. REMOVE SURGE TANK STAY NO.1

48. REMOVE INTAKE MANIFOLD

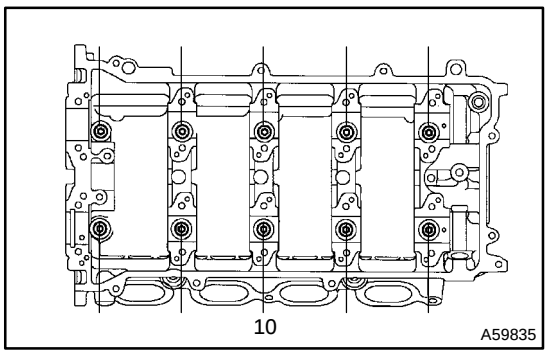
49. REMOVE OIL LEVEL GAGE GUIDE

50. REMOVE OIL LEVEL GAGE SUB-ASSY



51. REMOVE CAMSHAFT

(a) Uniformly loosen and remove the 20 bearing cap bolts, in several passes, in the sequence shown, and remove the 9 bearing caps, of the intake and exhaust camshafts.



52. REMOVE HEAD SUB-ASSY, CYLINDER

(a) Detach the water bypass pipe from the cylinder head.

(b) Using a 10 mm bi-hexagon wrench, uniformly loosen and remove the 10 cylinder head bolts, in several passes, in the sequence shown. Remove the 10 cylinder head bolts and plate washers.

NOTICE:

- **Be careful not to drop washers into the cylinder head.**
- **Head warpage or cracking could result from removing bolts in and incorrect order.**

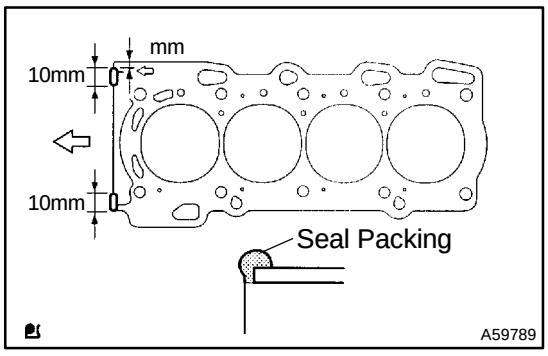
53. REMOVE CYLINDER HEAD GASKET

54. INSTALL CYLINDER HEAD GASKET

(a) Place a new cylinder head gasket on the cylinder block.

NOTICE:

- **Pay attention to the installation direction.**
- **Place the cylinder head quietly in order not to damage the gasket with the bottom part of the head.**

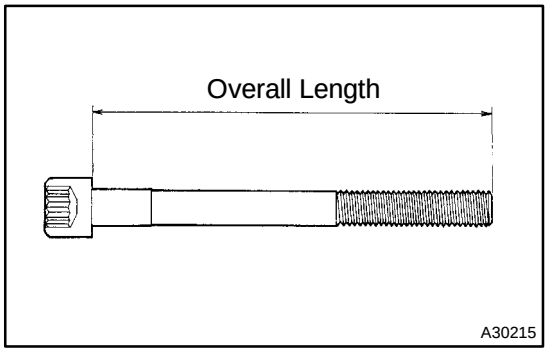


(b) Apply seal packing to the cylinder head gasket as shown in the illustration.

Seal packing:
Part No. 08826-00080 or equivalent

HINT:
avoid applying an excessive amount to the surfase.

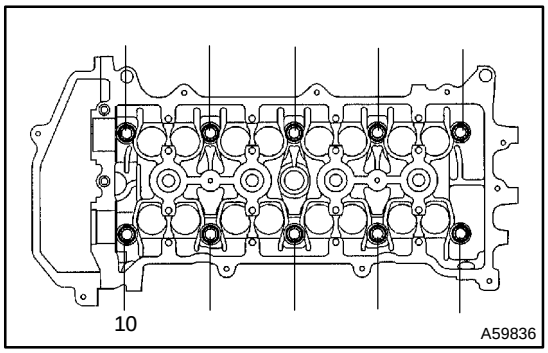
- Parts must be assembled with in 3 minutes of application. Otherwise the material must be removed and repplied.
- Immediately remove nozzle from the tube and reinstall cap.



55. INSPECT CYLINDER HEAD SET BOLT

(a) Using vernier calipers, measure the length of head bolts from the seat to the end.
Standard bolt length:
146.0 - 148.2 mm (5.780-5.835 in.)
Maximum bolt length: 148.5 mm(5.846 in.)

(b) If the length surpasses the maximum, replace the bolt.

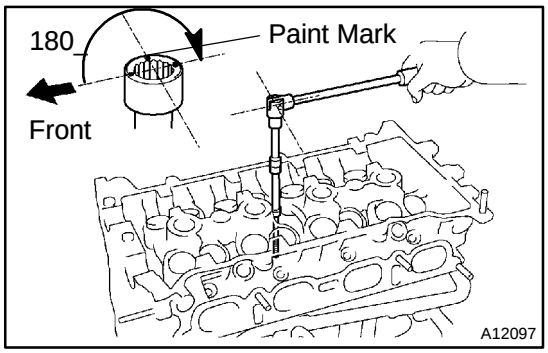


56. INSTALL HEAD SUB-ASSY, CYLINDER

HINT:
The cylinder head bolts are tightened in 2 progressive steps.

(a) Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.

(b) Using a 10 mm bi-hexagon wrench, install and uniformly tighten the 10 cylinder head bolts and plate washers, in several passes, in the sequence shown.
Torque: 35 N·m (357 kgf·cm, 26 ft·lbf)

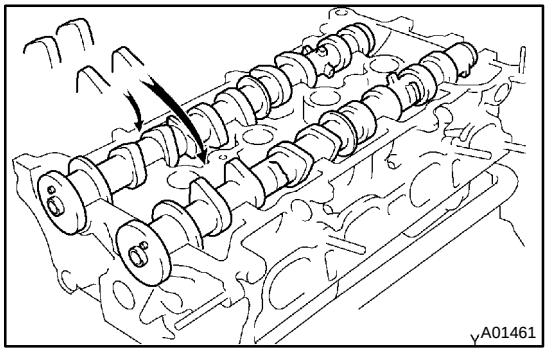


(c) Make the front of the cylinder head bolt with paint.

(d) Retighten the cylinder head bolts 180_ in the numerical order shown.

(e) Check that the point marked bolts are moved at 90_ angle.

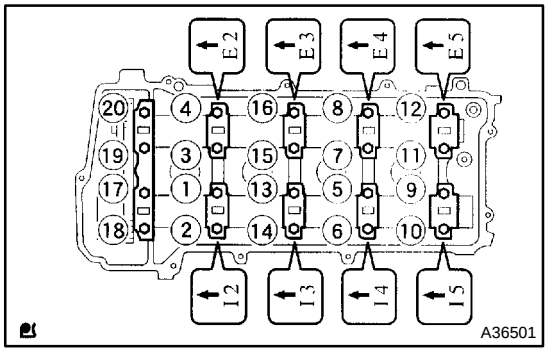
(f) Install the water bypass pipe.
Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)



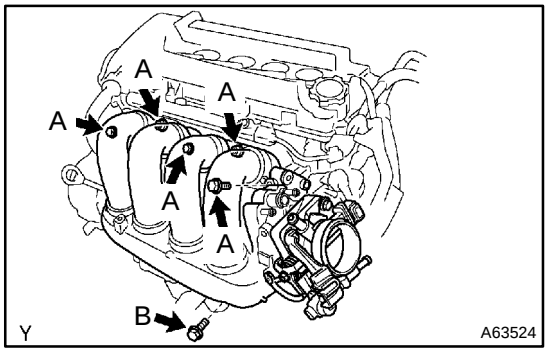
57. INSTALL CAMSHAFT

(a) Apply light coat of engine oil on the camshaft journals.

(b) Place the 2 camshafts on the cylinder head with the No. 1 cam lobes facing as shown the illustration.

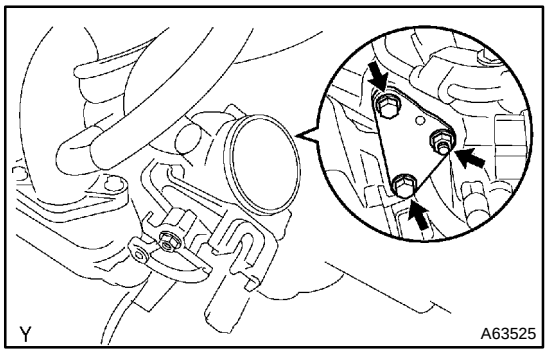


(c) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque: 19 N·m (189 kgf·cm, 14 ft·lbf)



58. INSTALL INTAKE MANIFOLD

(a) Install a new gasket, the intake manifold with the 4 bolts and 2 nuts.
Torque:
A: 34 N·m (347 kgf·cm, 25 ft·lbf)
B: 46 N·m (469 kgf·cm, 34 ft·lbf)

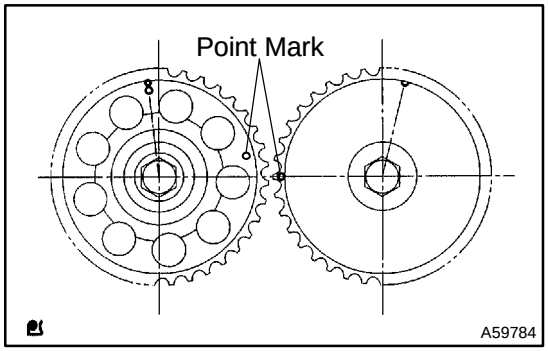


59. INSTALL SURGE TANK STAY NO.1

(a) Install the surge tank staywith the 2 bolts and nut.
Torque:24 N·m (245 kgf·cm, 18 ft·lbf)

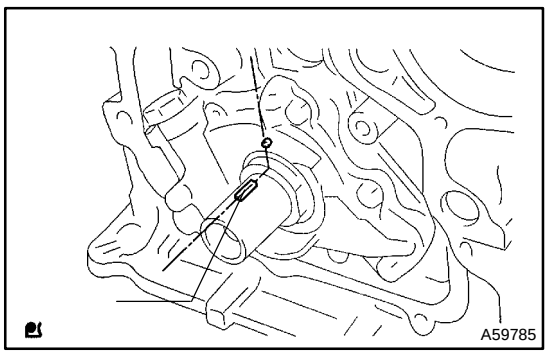
60. INSTALL OIL LEVEL GAGE GUIDE

(a) Apply a light coat of engine oil on a new O-ring, install it ti the oil level gage guide.
Torque:24 N·m (245 kgf·cm, 18 ft·lbf)

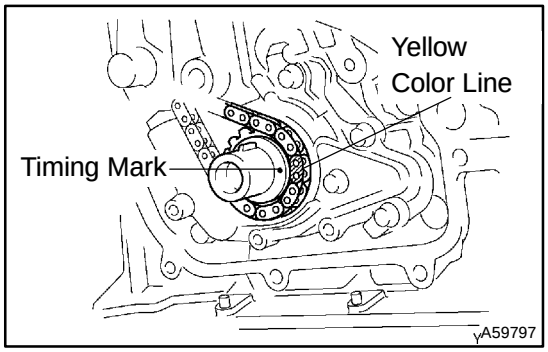


61. INSTALL CHAIN SUB-ASSY

(a) Set No. 1 cylinder to TDC/compression.
(1) Turn the hexagonal wrench head portion of the camshafts, and align the point marks of the camshaft timing sprockets.

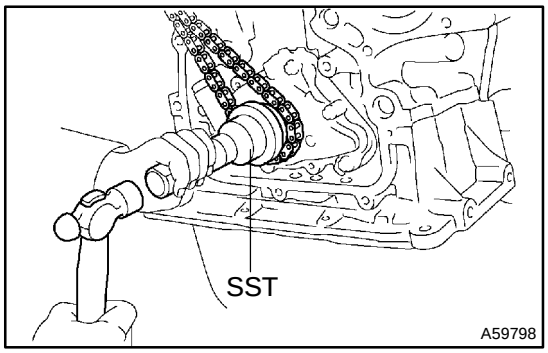


(2) Turn the crankshaft and set the set key on the crankshaft upward.

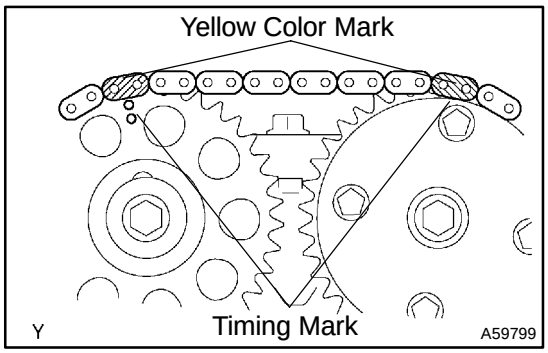


(b) Install the timing chain on the crankshaft timing sprocket with the yellow color link aligned with the timing mark on the crankshaft timing sprocket.

HINT:
Three yellow color links are on the chain.



(c) Using a SST, install the sprocket.
SST 09223-22010



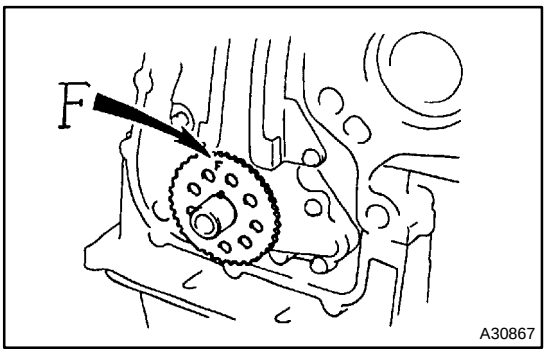
(d) Install the timing chain on the camshaft timing sprockets with the yellow color links aligned with the timing marks on the camshaft timing sprockets.

62. INSTALL CHAIN VIBRATION DAMPER NO.1

Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

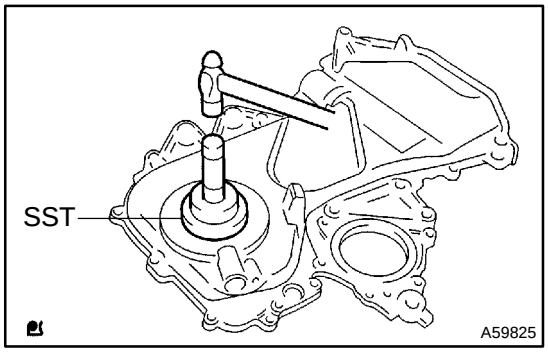
63. INSTALL CHAIN TENSIONER SLIPPER

Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)



64. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1

(a) Install the plate with the "F" mark facing forward.



65. INSTALL TIMING GEAR COVER OIL SEAL

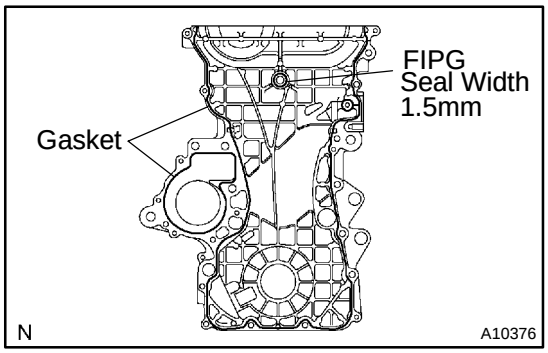
(a) Apply MP grease to the oil seal lip.

(b) Using SST and a hammer, tap in a new oil seal until its surface is flush with the timing chain cover edge.

SST 09223–22010

NOTICE:

Keep the lip off foreign materials.



66. INSTALL TIMING CHAIN OR BELT COVER SUB–ASSY

(a) Remove any old packing (FIPG)material and be careful not to drop any oil on the contact surface of the timing chain cover, cylinder head and cylinder block.

- Using a razor blade and a gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing grooves.
- Thoroughly clean all components to remove all the loose material.
- Using a non–residue solvent, clean both sealing surfaces.

(b) Apply seal packing to the timing chain cover an shown in the illustration.

Seal packing:

Part No. 08826–00100 or equivalent

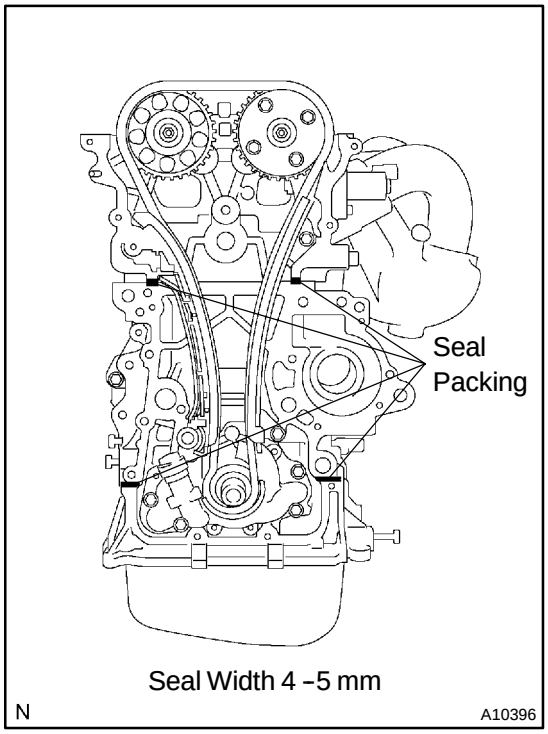
- Install a nozzle that has been cut to a 1.5 mm opening.

HINT:

Avoid applying an excessive amount to the surface.

- Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

(c) Install the 2 gaskets to the timing chain cover an shown in the illustration.



(d) Apply seal packing to 4 locations an shown in the illustration.

Seal packing:

Part No. 08826-00080 or equivalent

- Install a nozzle that has been cut to a 4 - 5 mm (0.16 - 0.20 in.)opening.

HINT:

Avoid applying an excessive amount to the surface.

- Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

NOTICE:

- **Do not put into engine oil within 2 hours after installing.**

(e) Install the timing chain cover, with the 12 bolts and nut.

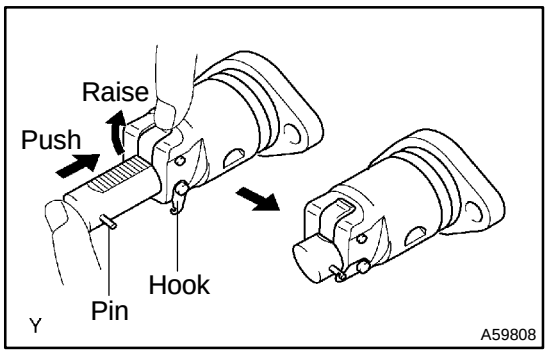
Torque:

21 N·m (214 kgf·cm, 16 ft·lbf) (M8)

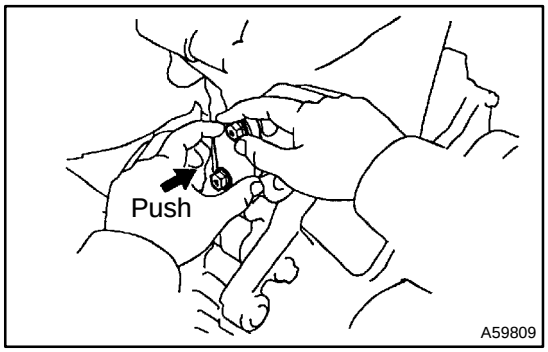
11 N·m (112 kgf·cm, 8 ft·lbf) (M6)

(f) Install the stud bolt.

67. INSTALL CHAIN TENSIONER ASSY NO.1



(a) Check the O-ring is clean, and set the hook as shown in the illustration.



(b) Apply engine oil to the chain tensioner and install it.

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

NOTICE:

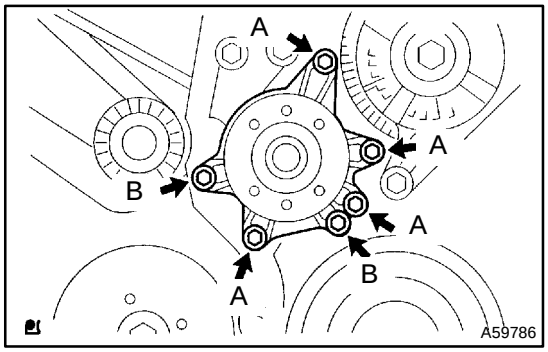
When installing the tensioner, set the hook again if the hook release the plunger.

68. INSTALL CRANK POSITION SENSOR

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

69. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



70. INSTALL PUMP ASSY, WATER

(a) Place a new O-ring on the timing chain cover.

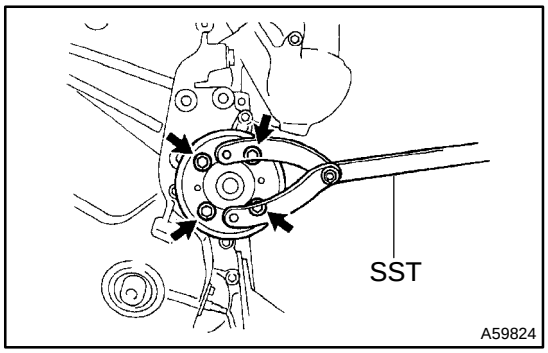
(b) Install the water pump with the 6 bolts.

Torque:9.0 N·m (92 kgf·cm, 80 in.·lbf)

HINT:

Each bolt length is indicated in the illustration.

Bolt A	35 mm (1.38 in.)
Bolt B	28 mm (1.10 in.)

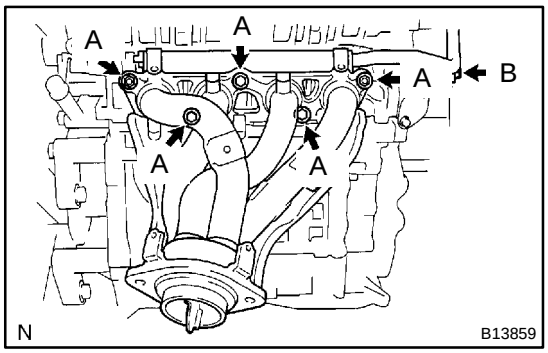


71. INSTALL WATER PUMP PULLEY

(a) Using SSt, Install the water pump pulley.

Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

SST 09960-10010



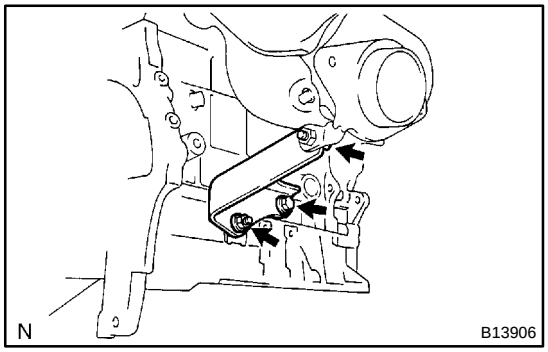
72. INSTALL EXHAUST MANIFOLD

(a) Install the exhaust manifold with the 4 bolts and 2 nuts.

Torque:

A:50 N·m (510 kgf·cm, 37 ft·lbf)

B:21 N·m (214 kgf·cm, 16 ft·lbf)



73. INSTALL MANIFOLD STAY

(a) Install the exhaust manifold stay with the 2 bolts and nut

Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

74. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.1

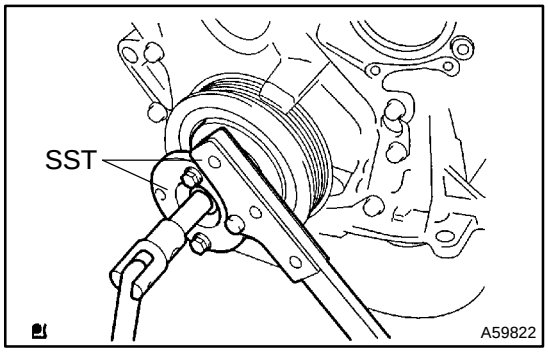
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

75. INSTALL V-RIBBED BELT TENSIONER ASSY

Torque:

Nut 29 N·m (296 kgf·cm, 21 ft·lbf)

Bolt 100 N·m (1,016 kgf·cm, 74 ft·lbf)



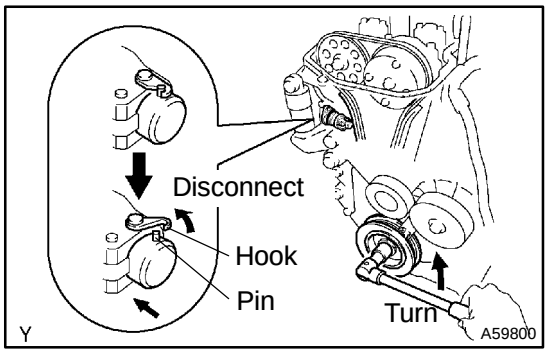
76. INSTALL CRANKSHAFT PULLEY

(a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.

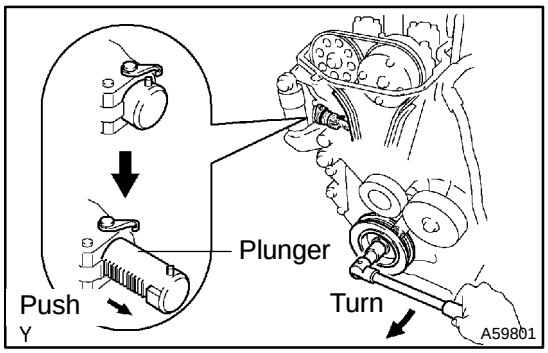
(b) Using SST, install the pulley bolt.

SST 09213-70011, 09330-00021

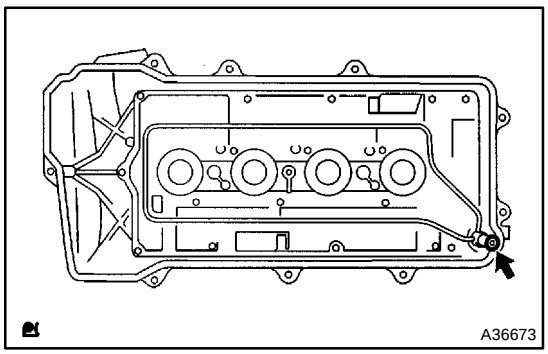
Torque: 118 N·m (1,204 kgf·cm, 87 ft·lbf)



(c) Turn the crankshaft counterclockwise, and disconnect the plunger knock pin form the hook.



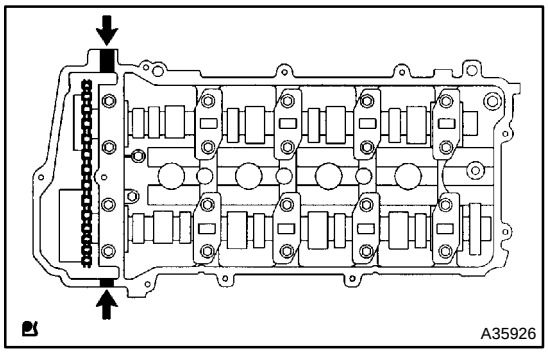
(d) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.



77. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Install the gasket to the cylinder head cover.

(b) Remove any old pacing (FIPG) material.

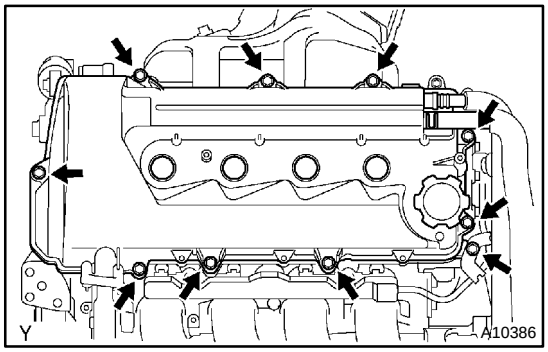


(c) Apply seal packing to 2 locations as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

NOTICE:

- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**



(d) Install the cylinder head cover and cable bracket with the 10 bolts.
Torque 10 N·m (100 kgf·cm, 87 in.·lbf)

78. INSTALL VENTILATION NO.1 TUBE

(a) Install a new gasket and the ventilation No. 1 tube.
Torque:10 N·m (102 kgf·cm, 87 in.·lbf)

79. INSTALL IGNITION COIL ASSY

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

80. INSTALL ENGINE WIRE

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

81. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

82. INSTALL EXHAUST PIPE ASSY FRONT
(See page15-2)

83. INSTALL COOLER COMPRESSOR ASSY
(See page55-86)

84. INSTALL AIR SWITCHING VALVE ASSY

Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)

85. INSTALL AIR INJECTION SYSTEM NO.6 HOSE

86. INSTALL GENERATOR ASSY
(See page19-9)

87. INSTALL GENERATOR BRACKET NO.1
(See page19-9)

88. INSTALL CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

89. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

90. ADD COOLANT (See page16-6)

91. INSPECT CHECK ENGINE COOLANT LEAK

92. INSPECT OIL LEAK

93. INSPECT CHECK IDLE SPEED AND IGNITION TIMING (See page 14-1/2)
SST 09843-18030, 09843-18040

94. INSPECT COMPRESSION (See page 14-2)
SST 09992-00500

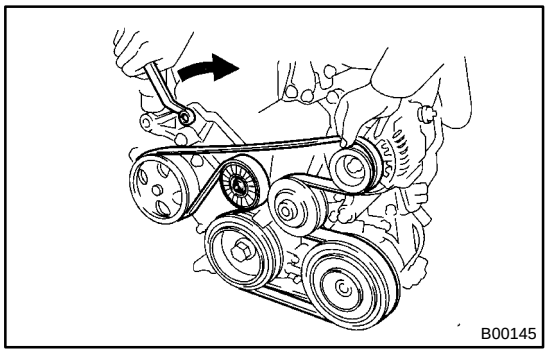
95. INSPECT CO/HC (See page 14-3)

TIMING GEAR COVER OIL SEAL (2ZZ-GE)

1401W-02

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH



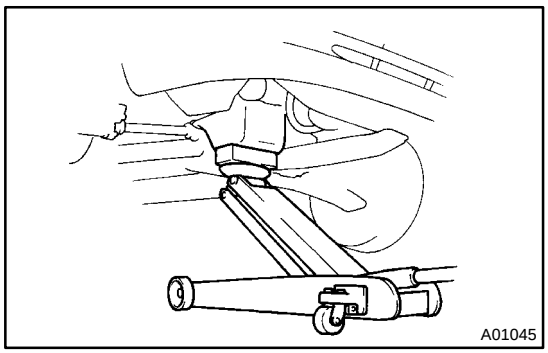
2. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

3. REMOVE AIR INJECTION SYSTEM NO.6 HOSE

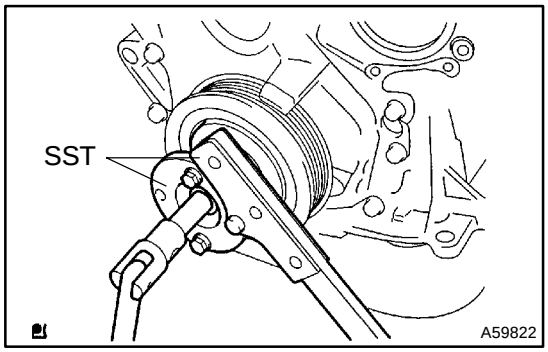
4. REMOVE AIR SWITCHING VALVE ASSY

(a) Remove 2 bolts and air switching valve assembly.



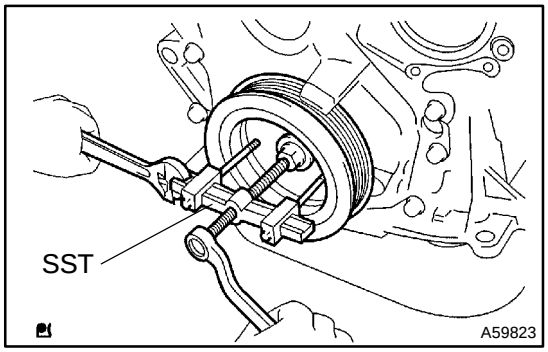
5. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Place a wooden block between the jack and engine, and set the jack, then remove the engine mounting insulator.

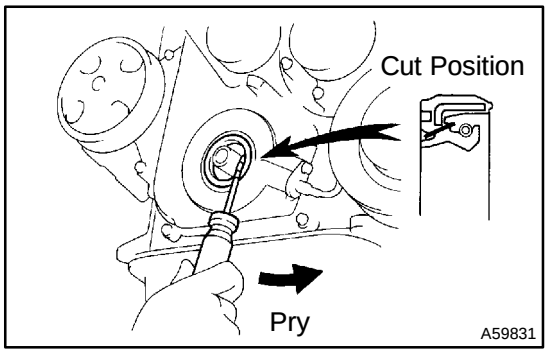


6. REMOVE CRANKSHAFT PULLEY

(a) Using SST, remove the pulley bolt.
SST 09213-70011, 09330-00021



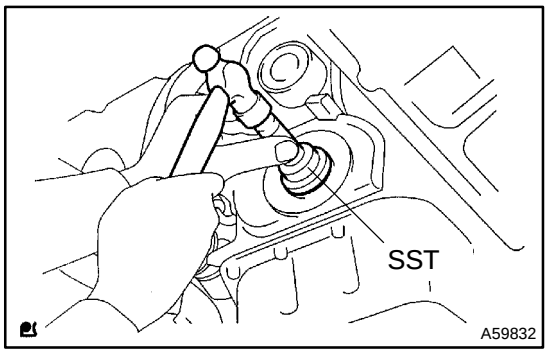
(b) Using SST, remove the crankshaft pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09954-05021, 09953-05020, 09957-04010)



7. REMOVE TIMING GEAR COVER OIL SEAL

(a) Using a knife, cut off the oil seal lip.
(b) Using a screwdriver with taping its tip, pry out the oil seal.

NOTICE:
After the removal, check if the crankshaft is not damaged. If there is, mend it with a sandpaper (#400).



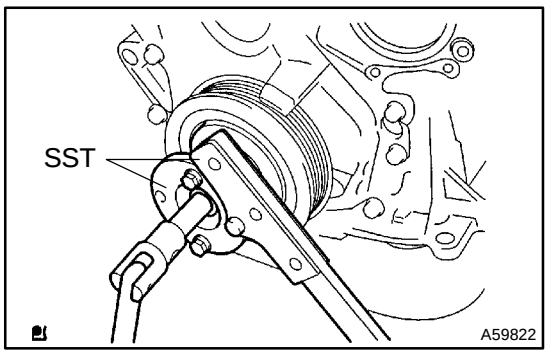
8. INSTALL TIMING GEAR COVER OIL SEAL

(a) Apply MP grease to a new oil seal lip.

NOTICE:
Keep the lip off foreign materials.

(b) Using SST and a hammer, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.
SST 09223-22010

NOTICE:
Wipe off extra grease on the crank shaft.



9. INSTALL CRANKSHAFT PULLEY

(a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.
(b) Using SST, install the pulley bolt.
Torque: 118 N·m (1,203 kgf·cm, 87 ft·lbf)
SST 09213-70011, 09330-00021

10. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

11. INSTALL AIR SWITCHING VALVE ASSY

Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)

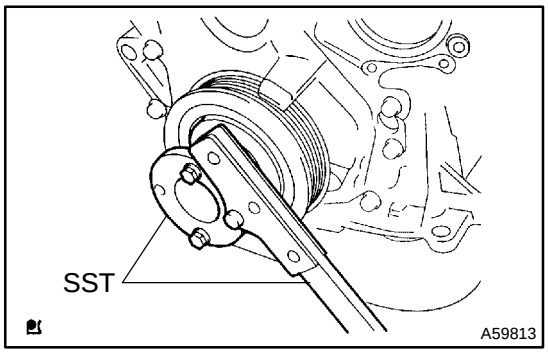
12. INSPECT OIL LEAK

ENGINE REAR OIL SEAL (2ZZ-GE)

140MW-01

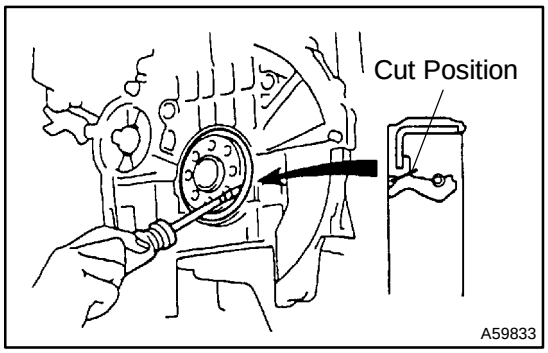
REPLACEMENT

1. REMOVE MANUAL TRANSAXLE ASSY
(See page 41-28)
2. REMOVE CLUTCH COVER ASSY
(See page 42-29)
3. REMOVE CLUTCH DISC ASSY
(See page 42-30)



4. REMOVE DRIVE PLATE AND RING GEAR OR FLYWHEEL

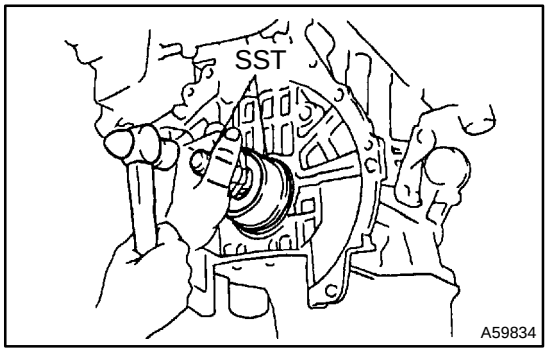
(a) Fix the crank shaft with SST, then remove the flywheel or the ring gear.
SST 09213-70011, 09330-00021



5. REMOVE ENGINE REAR OIL SEAL

(a) Using a knife, cut off the oil seal lip.
(b) Using a screwdriver with taping its tip, pry out the oil seal.

NOTICE:
After the removal, check if the crankshaft is not damaged. If there is, mend it with a sandpaper (#400).



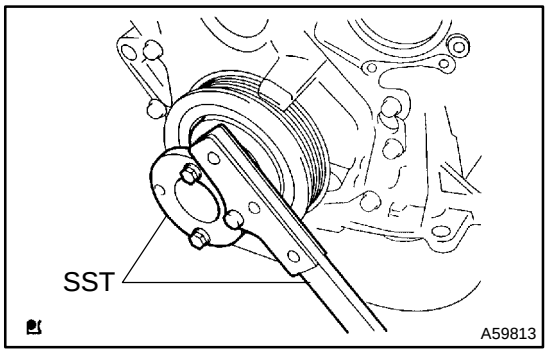
6. INSTALL ENGINE REAR OIL SEAL

(a) Apply MP grease to a new oil seal lip.

NOTICE:
Keep the lip off foreign materials.

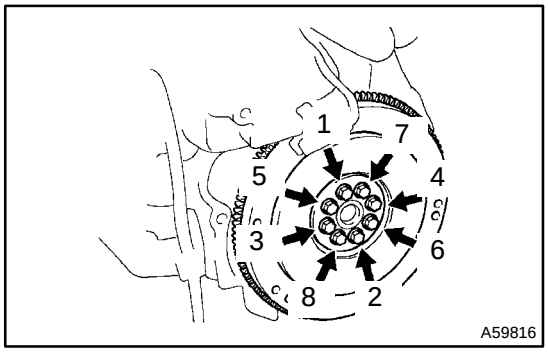
(b) Using SST and a hammer, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.
SST 09223-15020, 09950-70010 (09951-07100)

NOTICE:
Wipe off extra grease on the crank shaft.



7. INSTALL DRIVE PLATE AND RING GEAR OR FLYWHEEL

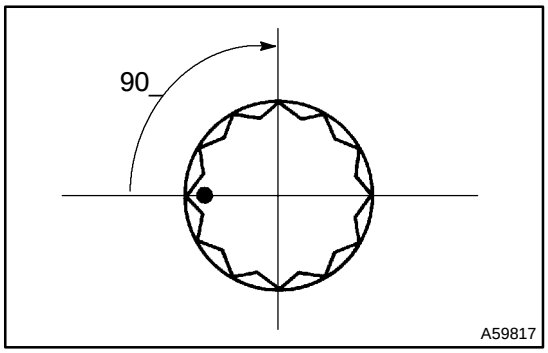
(a) Fix the crankshaft with SST.
SST 09213-70011, 09330-00021
(b) Clean the bolt and the bolt hole.
(c) Apply Adhesive to the bolts.
Adhesive:
Part No. 0933-00070, THREE BOND or equivalent.



(d) Install the flywheel.

(1) Install and uniformly tighten the 8 bolts, in several passes, in the sequence shown.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



(2) Mark the flywheel bolt with paint.

(3) Retighten the flywheel bolts by an additional 90_.

(4) Check that the point marked bolts are moved at 90_ angle.

8. INSTALL CLUTCH DISC ASSY
(See page 42-31)
SST 09301-00210

9. INSTALL CLUTCH COVER ASSY
(See page 42-31)

10. INSTALL MANUAL TRANSAXLE ASSY
(See page 41-29)

ENGINE ASSEMBLY (3ZZ-FE/4ZZ-FE)

140M7-01

INSPECTION

1. **INSPECT COOLANT** **(See page 16-15)**
2. **INSPECT ENGINE OIL** **(See page 17-6)**
3. **INSPECT BATTERY**
   (See page 19-17)
4. **INSPECT AIR CLEANER FILTER ELEMENT SUB-ASSY**
5. **INSPECT SPARK PLUG**
   (See page 18-7)
6. **INSPECT FAN AND GENERATOR V BELT**

HINT:
You don't need to check the belt deflection because auto tensioner is adopted.

7. **INSPECT IGNITION TIMING**

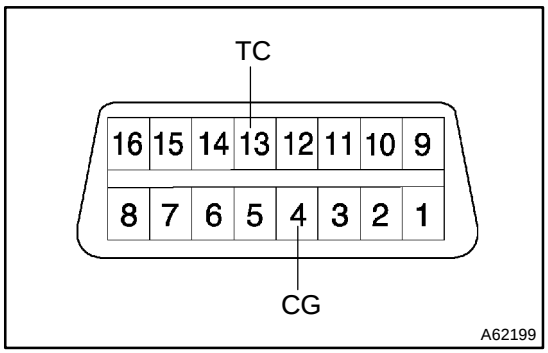
(a) Warm up engine.

(b) When using hand-held tester.

(1) Connect the hand-held tester to the DLC3.

Ignition timing : 8 - 12 _BTDC

HINT:
Please refer to the hand-held tester operator's manual for further details.



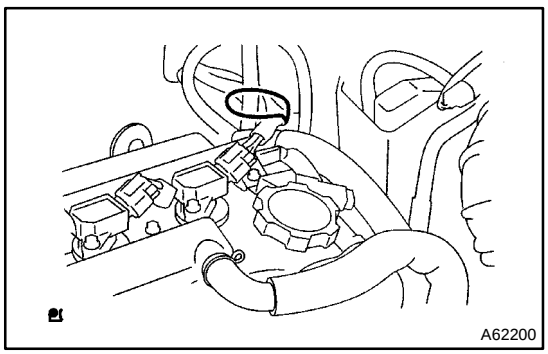
(c) When not using hand-held tester.

(1) Using SST, connect terminal 13 (TC) and 4 (CG) of the DLC3.

SST 09843-18030

NOTICE:

- **Be sure not to connect incorrectly. It causes breakage of the engine.**
- **Turn OFF all electrical systems.**
- **Operate the inspection when the cooling fan motor is turned OFF**



(2) Remove the 2 nuts, 2 clips and cylinder head cover.

(3) Pull out the wire harness as shown in the illustration.

(4) Connect the clip of the timing light to the engine.

NOTICE:

- **Use a timing light which can detect the first signal.**
- **After checking, be sure to tape the wire harness.**

(5) Inspect ignition timing at idle.

Ignition timing : 8 – 12 _BTDC

NOTICE:

When checking the ignition timing, the transmission is at neutral position.

HINT:

After engine r/min is kept at 1,000 – 1,300 rpm for 5 seconds, check that it returns idle speed.

(6) Disconnect the terminal 13 (TC) and 4 (CG) of the DLC3.

(7) Inspect ignition timing at idle.

Ignition timing :

3 – 13 _BTDC (3ZZ–FE)

–6 – 9 _BTDC (4ZZ–FE)

(8) Confirm that ignition timing moves to advanced angle side when the engine r/min is increased.

(9) Remove the timing light.

(10) Install cylinder head cover with the 2 nuts and 2 clips.

Torque: 7 N·m (71 kgf·cm, 62 in.·lbf)

8. INSPECT ENGINE IDLE SPEED

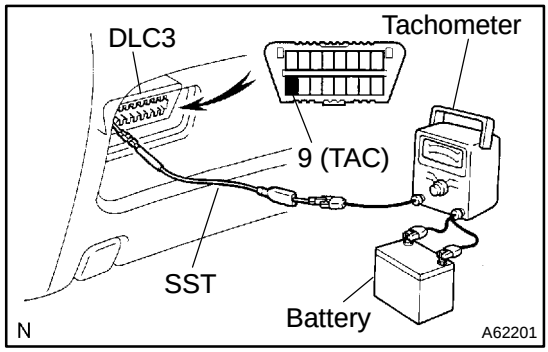
(a) Warm up engine.

(b) When using hand–held tester.

(1) Connect the hand–held tester to the DLC3.

HINT:

Please refer to the hand – held tester operator's manual for further details.



(c) When not using hand–held tester.

(1) Using SST, connect tachometer test prove to terminal 9 (TAC) of DLC3.

SST 09843–18040

(d) Check the idle speed.

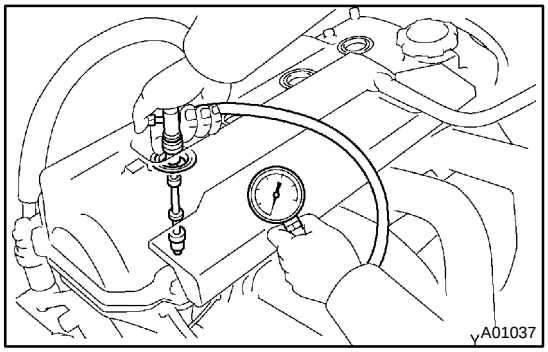
Idle speed:

600 – 700 rpm (M/T)

650 – 750 rpm (A/T)

NOTICE:

- **Check idle speed with cooling fan OFF.**
- **Switch off all accessories and air conditioning.**



9. INSPECT COMPRESSION

(a) Warm up and stop engine.

(b) Remove ignition coil.

(c) Remove spark plugs.

(d) Inspect cylinder compression pressure.

SST 09992-00500

(1) Insert a compression gauge into the spark plug hole.

(2) Fully open the throttle.

(3) While cranking the engine, measure the compression pressure.

Compression pressure
1,300 kPa (13.3 kgf·cm^2, 189 psi)
Minimum pressure: 1,000 kPa (10.2 kgf·cm^2, 145 psi)
Difference between each cylinder:
100 kPa (1.0 kgf·cm^2, 14 psi)

NOTICE:

- **Always use a fully charged battery to obtain engine speed of 250 rpm or more.**
- **Check other cylinder's compression pressure in the same way.**
- **This measurement must be done in as short a time as possible.**

(4) If the cylinder compression in one more cylinders is low, pour a small amount of engine oil into the cylinder through the spark plug hole and repeat steps (1) through (3) for cylinders with low compression.

HINT:

- If adding oil helps the compression, it is likely that the piston rings and/or cylinder bore are worn or damaged.
- If pressure stays low, a valve may be sticking or seating is improper, or there may be leakage past the gasket.

10. INSPECT CO/HC

(a) Start the engine.
(b) Race engine at 2,500 rpm for approx. 180 seconds.
(c) Insert CO/HC meter testing probe at least 40 cm (1.3 ft) into tailpipe during idling.
(d) Immediately check CO/HC concentration at idle and/or 2,500 rpm.

HINT:

- Complete the measuring within 3 minutes.
- When doing the 2 mode (idle and 2,500 rpm) test, these measuring orders are prescribed by the applicable local regulations.

(e) If the CO/HC concentration does not comply with regulations, troubleshoot in the order given below.
  (1) Check heated oxygen sensor operation. (See page 05–216 or 05–354)
  (2) See the table below for possible causes, and then inspect and correct the applicable causes if necessary.

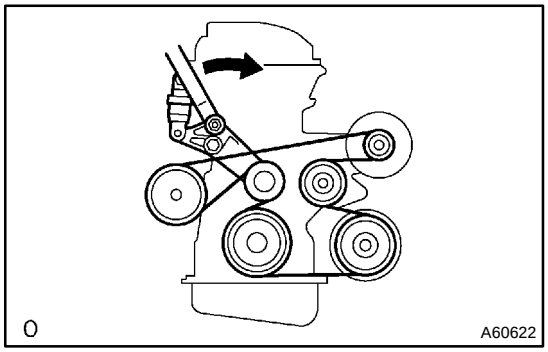
CO	HC	Problems	Causes
Normal	High	Rough idle	4. Faulty ignitions: S Incorrect timing S Fouled, shorted or improperly gapped plugs 5. Incorrect valve clearance 6. Leaky intake and exhaust valves 7. Leaky cylinders
Low	High	Rough idle (Fluctuating HC reading)	1. Vacuum leaks: S PCV hoses S Intake manifold S Throttle body S ISC valve S Brake booster line 2. Lean mixture causing misfire
High	High	Rough idle (Black smoke form exhaust)	1. Restricted air filter 2. Plugged PCV valve 3. Faulty EFI systems: S Faulty pressure regulator S Defective water temperature sensor S DEFECTIVE Air–flow meter S Faulty ECU S Faulty injectors S Faulty throttle position sensor

FAN AND GENERATOR V BELT (3ZZ-FE/4ZZ-FE)

140M8-01

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH



2. REMOVE FAN AND GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner slowly clockwise and loosen it. Then, remove the fan and generator belt and put back the V-ribbed belt tensioner little by little and fix it quietly.

VALVE CLEARANCE (3ZZ-FE/4ZZ-FE)

140M9-01

ADJUSTMENT

1. REMOVE CYLINDER HEAD COVER NO.2

(a) Remove the 2 nuts, 2 clips and cylinder head cover.

2. REMOVE IGNITION COIL ASSY

(a) Disconnect the 4 connectors.
(b) Remove the 4 bolts and 4 ignition coils.

3. DISCONNECT ENGINE WIRE

(a) Disconnect the connectors.
(b) Remove the 3 clamps from the 3 clamp brackets.
(c) Remove the bolt and nut installing the engine wire.

4. DISCONNECT VENTILATION HOSE

(a) Disconnect the ventilation hose from the cylinder head cover.

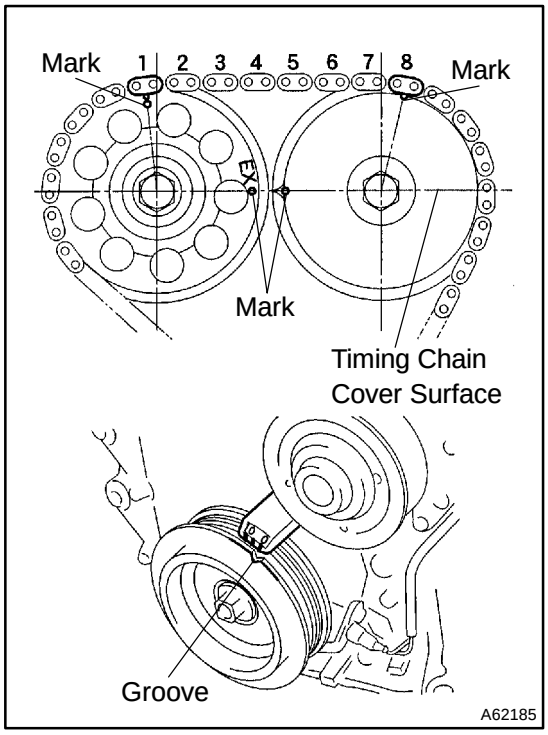
5. DISCONNECT VENTILATION HOSE NO.2

(a) Disconnect the ventilation hose from the cylinder head cover.

6. REMOVE CYLINDER HEAD COVER SUB-ASSY

(a) Remove the 9 bolts, 2 seal washers, 2 nuts, 3 clamp brackets and cylinder head cover.

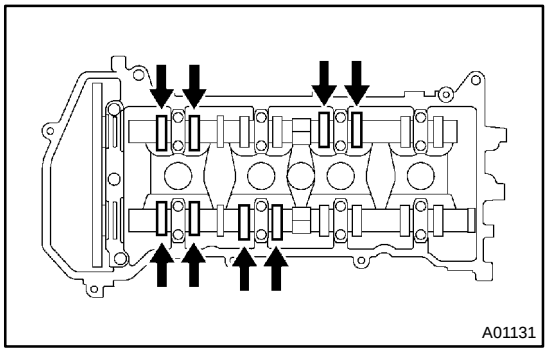
7. REMOVE ENGINE UNDER COVER RH



8. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.
(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

HINT:
If not, turn the crankshaft 1 revolution (360_) and align the marks as above.

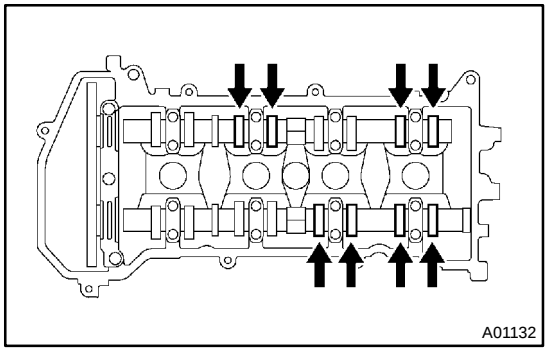


9. INSPECT VALVE CLEARANCE

(a) Check only the valves indicated.
(1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
(2) Record the out-of specification valve clearance measurements. They will be used later to determine the required replacement valve lefter.

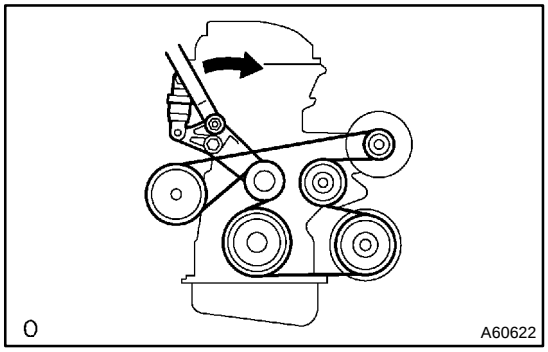
Valve clearance (Cold):
Intake 0.15 - 0.25 mm (0.006 - 0.010 in.)
Exhaust 0.25 - 0.35 mm (0.010 - 0.014 in.)

(b) Turn the crankshaft 1 revolution (360 _) and set No. 4 cylinder to TDC/compression.



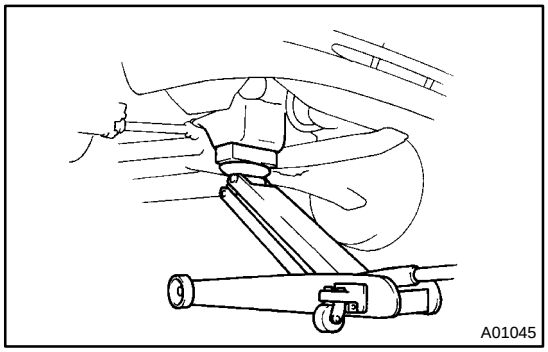
(c) Check only the valves indicated.
(1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
(2) Record the out-of specification valve clearance measurements. They will be used later to determine the required replacement valve lefter.

Valve clearance (Cold):
Intake 0.15 - 0.25 mm (0.006 - 0.010 in.)
Exhaust 0.25 - 0.35 mm (0.010 - 0.014 in.)



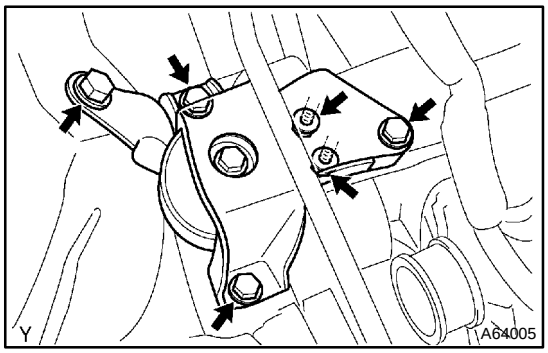
10. REMOVE FAN AND GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner slowly clockwise and loosen it. Then, remove the fan and generator belt and put back the V-ribbed belt tensioner little by little and fix it quietly.



11. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Place a wooden block between the jack and engine, and set the jack, then remove the 4 bolts, 2nuts and engine mounting insulator RH.

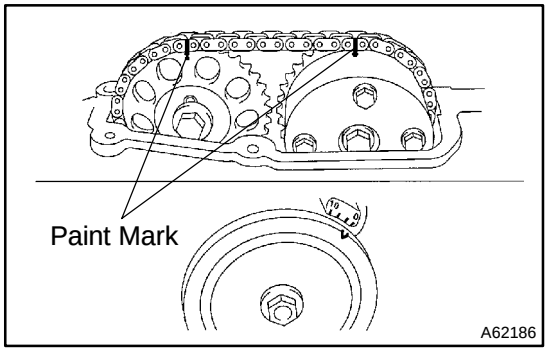


12. REMOVE V–RIBBED BELT TENSIONER ASSY

(a) Remove the bolt, nut and V–ribbed belt tensioner.

HINT:

Handle a jack up and down to remove the bolt.



13. ADJUST VALVE CLEARANCE

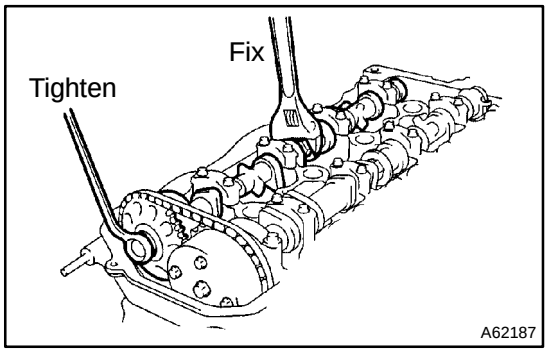
NOTICE:

Be sure not to revolve the crankshaft without the chain tensioner.

(a) Set the No. 1 cylinder to the TDC/compression.

(b) Place match marks on the timing chain and camshaft timing sprockets.

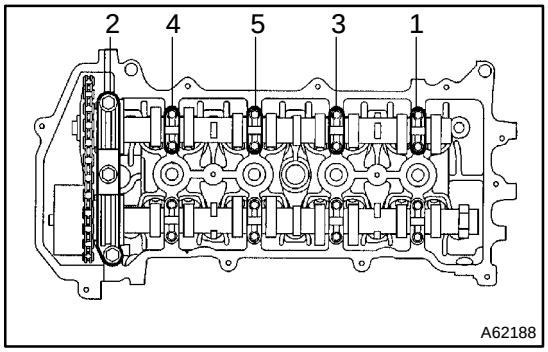
(c) Remove the 2 nuts and chain tensioner.



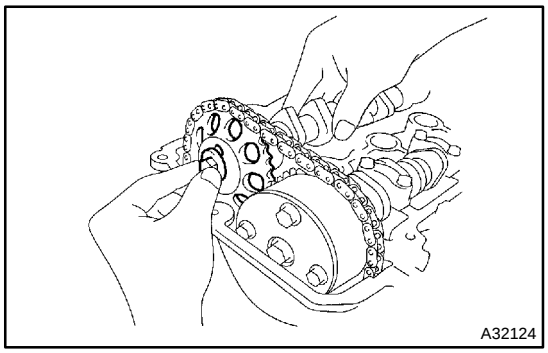
(d) Fix the camshaft with a spanner and so on, then loosen the camshaft timing gear set bolt.

NOTICE:

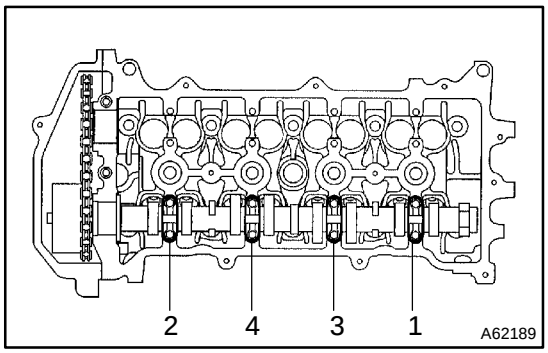
Be careful not to damage the valve lifter.



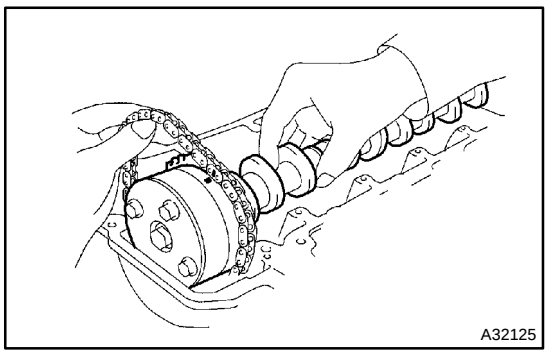
(e) Loosen the camshaft bearing capbolts on No. 2 camshaft in the order as shown in the illustration in several passes,and remove the caps.



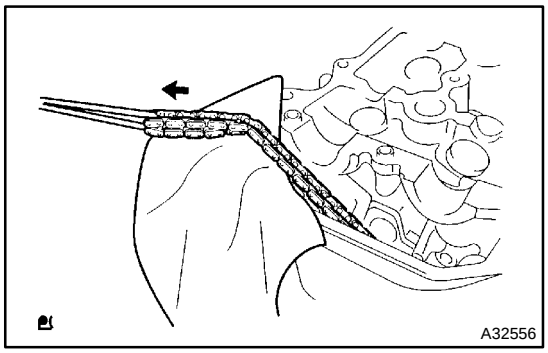
(f) Remove the camshaft timing gear as shown in the illustration.



(g) Loosen the camshaft bearing capbolts on camshaft in the order as shown in the illustration in several passes,and remove the caps.



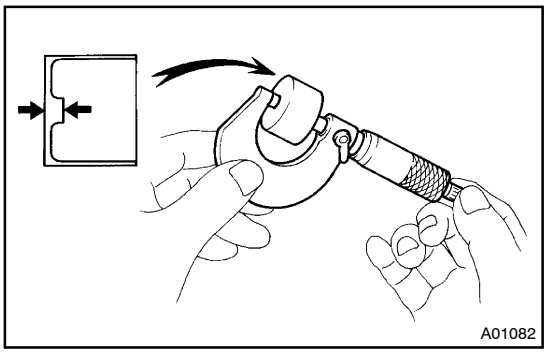
(h) Remove the camshaft with holding the timing chain.



(i) Tie the timing chain with a string as shown in the illustration.

NOTICE:

Be careful not to drop anything inside the timing chain cover.



(j) Remove the valve lifters.

(k) Using a micrometer, measure the thickness of the removed lifter.

(l) Calculate the thickness of a new lifter so that the valve clearance comes within the specified value.

A	Thickness of new lifter
B	Thickness of used lifter
C	Measured valve clearance

Valve clearance:
Intake A = B + (C – 0.20 mm (0.008 in.)
Exhaust A = B + (C – 0.30 mm (0.012 in.)

Example (Intake):
Measured intake valve clearance = 0.40 mm (0.0158 in.)
0.40 mm (0.0158 in.) – 0.20 mm (0.0079 in.) = 0.20 mm (0.0079 in.)
(Measured – Specification = Excess clearance)
Used lifter measurement = 5.250 mm (0.2067 in.)
0.20 mm (0.0079 in.) + 5.250 mm (0.2067 in.) = 5.450 mm (0.2146 in.)
(Excess clearance + Used lifter = Ideal new lifter)
Closest new lifter = 5.460 mm (0.2150 in.)
Select No. 46 lifter

HINT:

- Select a new lifter with a thickness as close to the calculated values as possible.
- Lifters are available in 35 sizes in increments of 0.020 mm (0.0008 in.), from 5.060 mm (0.1992 in.) to 5.740 mm (0.2260 in.).
- Refer to the New Lifter Thickness table on the next 2 pages.

Valve Lifter Selection Chart (Intake)

Measured clearance mm (in.) \ Installed lifter thickness mm (in.)	5.060 (0.1992)	5.080 (0.2000)	5.100 (0.2008)	5.120 (0.2016)	5.140 (0.2024)	5.160 (0.2031)	5.180 (0.2039)	5.200 (0.2047)	5.210 (0.2051)	5.220 (0.2055)	5.230 (0.2059)	5.240 (0.2063)	5.250 (0.2067)	5.260 (0.2071)	5.270 (0.2075)	5.280 (0.2079)	5.290 (0.2083)	5.300 (0.2087)	5.310 (0.2091)	5.320 (0.2094)	5.330 (0.2098)	5.340 (0.2102)	5.350 (0.2106)	5.360 (0.2110)	5.370 (0.2114)	5.380 (0.2118)	5.390 (0.2122)	5.400 (0.2126)	5.410 (0.2130)	5.420 (0.2134)	5.430 (0.2138)	5.440 (0.2142)	5.450 (0.2146)	5.460 (0.2150)	5.470 (0.2154)	5.480 (0.2157)	5.490 (0.2161)	5.500 (0.2165)	5.510 (0.2169)	5.520 (0.2173)	5.530 (0.2177)	5.540 (0.2181)	5.550 (0.2185)	5.560 (0.2189)	5.570 (0.2193)	5.580 (0.2197)	5.590 (0.2201)	5.600 (0.2205)	5.620 (0.2213)	5.640 (0.2220)	5.660 (0.2228)	5.680 (0.2236)	5.700 (0.2244)	5.720 (0.2252)	5.740 (0.2260)
0.000 – 0.030 (0.0000 – 0.0012)									06	06	06	06	06	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	46	48	50	52	54	56
0.031 – 0.050 (0.0012 – 0.0020)							06	06	06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	48	50	52	54	56	58
0.051 – 0.070 (0.0020 – 0.0028)						06	06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	50	52	54	56	58	60
0.071 – 0.090 (0.0028 – 0.0035)					06	06	06	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	52	54	56	58	60	62
0.091 – 0.110 (0.0036 – 0.0043)				06	06	06	08	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	50	50	52	54	56	58	60	62	64
0.111 – 0.130 (0.0044 – 0.0051)			06	06	06	08	10	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	56	58	60	62	64	66
0.131 – 0.149 (0.0052 – 0.0059)		06	06	06	08	10	12	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	58	60	62	64	66	68
0.150 – 0.250 (0.0059 – 0.0098)																																																									
0.251 – 0.270 (0.0099 – 0.0106)	12	14	16	18	20	22	24	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	70	72	74	74	74
0.271 – 0.290 (0.0107 – 0.0114)	14	16	18	20	22	24	26	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	72	74	74	74	
0.291 – 0.310 (0.0115 – 0.0122)	16	18	20	22	24	26	28	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	74	74	74		
0.311 – 0.330 (0.0122 – 0.0130)	18	20	22	24	26	28	30	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74			
0.331 – 0.350 (0.0130 – 0.0138)	20	22	24	26	28	30	32	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74				
0.351 – 0.370 (0.0138 – 0.0146)	22	24	26	28	30	32	34	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74					
0.371 – 0.390 (0.0146 – 0.0154)	24	26	28	30	32	34	36	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74						
0.391 – 0.410 (0.0154 – 0.0161)	26	28	30	32	34	36	38	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74							
0.411 – 0.430 (0.0162 – 0.0169)	28	30	32	34	36	38	40	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74										
0.431 – 0.450 (0.0170 – 0.0177)	30	32	34	36	38	40	42	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74												
0.451 – 0.470 (0.0178 – 0.0185)	32	34	36	38	40	42	44	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74														
0.471 – 0.490 (0.0185 – 0.0193)	34	36	38	40	42	44	46	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																
0.491 – 0.510 (0.0193 – 0.0201)	36	38	40	42	44	46	48	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																		
0.511 – 0.530 (0.0201 – 0.0209)	38	40	42	44	46	48	50	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																			
0.531 – 0.550 (0.0209 – 0.0217)	40	42	44	46	48	50	52	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																				
0.551 – 0.570 (0.0217 – 0.0224)	42	44	46	48	50	52	54	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																					
0.571 – 0.590 (0.0225 – 0.0232)	44	46	48	50	52	54	56	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																					
0.591 – 0.610 (0.0233 – 0.0240)	46	48	50	52	54	56	58	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																					
0.611 – 0.630 (0.0241 – 0.0248)	48	50	52	54	56	58	60	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																					
0.631 – 0.650 (0.0248 – 0.0256)	50	52	54	56	58	60	62	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																					
0.651 – 0.670 (0.0256 – 0.0264)	52	54	56	58	60	62	64	66	68	68	70	70	72	72	74	74	74	74	74	74																					
0.671 – 0.690 (0.0264 – 0.0272)	54	56	58	60	62	64	66	68	70	70	72	72	74	74	74	74	74	74																					
0.691 – 0.710 (0.0272 – 0.0280)	56	58	60	62	64	66	68	70	72	72	74	74	74	74	74	74																					
0.711 – 0.730 (0.0280 – 0.0287)	58	60	62	64	66	68	70	72	74	74	74	74	74	74																					
0.731 – 0.750 (0.0288 – 0.0295)	60	62	64	66	68	70	72	74	74	74	74	74																							
0.751 – 0.770 (0.0296 – 0.0303)	62	64	66	68	70	72	74	74	74	74																							
0.771 – 0.790 (0.0304 – 0.0311)	64	66	68	70	72	74	74	74																									
0.791 – 0.810 (0.0311 – 0.0319)	66	68	70	72	74	74	74																										
0.811 – 0.830 (0.0319 – 0.0327)	68	70	72	74	74	74																											
0.831 – 0.850 (0.0327 – 0.0335)	70	72	74	74	74																												
0.851 – 0.870 (0.0335 – 0.0343)	72	74	74	74																													
0.871 – 0.890 (0.0343 – 0.0350)	74	74	74																														
0.891 – 0.910 (0.0351 – 0.0358)	74	74																															
0.911 – 0.930 (0.0359 – 0.0366)	74																																

Intake valve clearance (Cold):
0.15 to 0.25 mm (0.0059 to 0.0098 in.)

EXAMPLE: The 5.250 mm (0.2067 in.) lifter is installed, and the measured clearance is 0.400 mm (0.0157 in.).
Replace the 5.250 mm (0.2067 in.) lifter with a new No. 46 lifter.

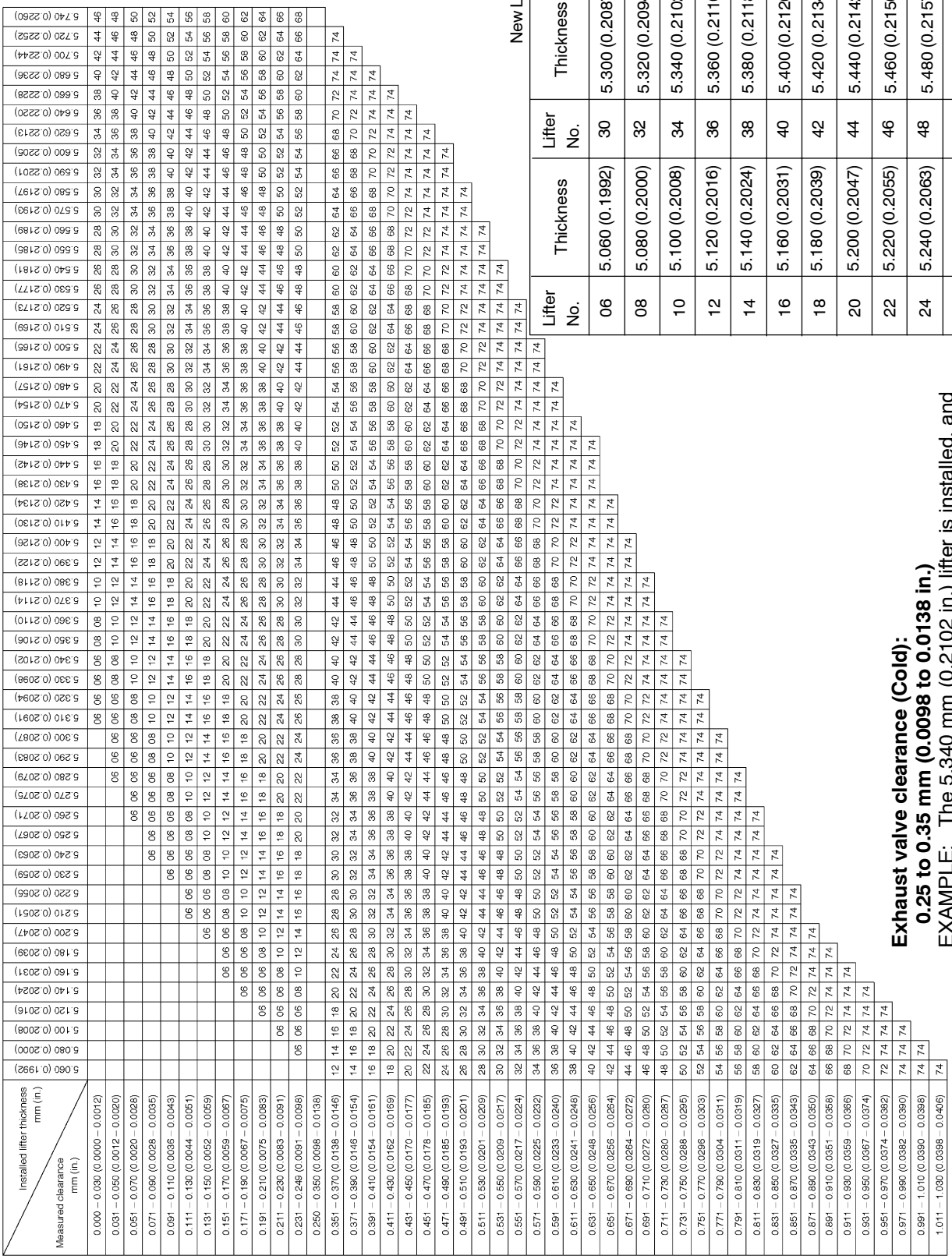
New Lifter Thickness mm (in.)

Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
06	5.060 (0.1992)	30	5.300 (0.2087)	54	5.540 (0.2181)
08	5.080 (0.2000)	32	5.320 (0.2094)	56	5.560 (0.2189)
10	5.100 (0.2008)	34	5.340 (0.2102)	58	5.580 (0.2197)
12	5.120 (0.2016)	36	5.360 (0.2110)	60	5.600 (0.2205)
14	5.140 (0.2024)	38	5.380 (0.2118)	62	5.620 (0.2213)
16	5.160 (0.2031)	40	5.400 (0.2126)	64	5.640 (0.2220)
18	5.180 (0.2039)	42	5.420 (0.2134)	66	5.660 (0.2228)
20	5.200 (0.2047)	44	5.440 (0.2142)	68	5.680 (0.2236)
22	5.220 (0.2055)	46	5.460 (0.2150)	70	5.700 (0.2244)
24	5.240 (0.2063)	48	5.480 (0.2157)	72	5.720 (0.2252)
26	5.260 (0.2071)	50	5.500 (0.2165)	74	5.740 (0.2260)
28	5.280 (0.2079)	52	5.520 (0.2173)		

A79322

PREVIOUS PAGE
NEXT PAGE

Valve Lifter Selection Chart (Exhaust)

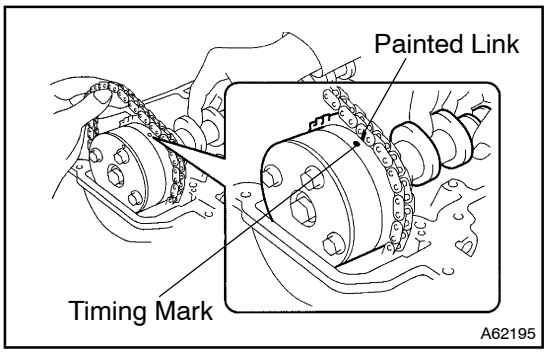


New Lifter Thickness mm (in.)

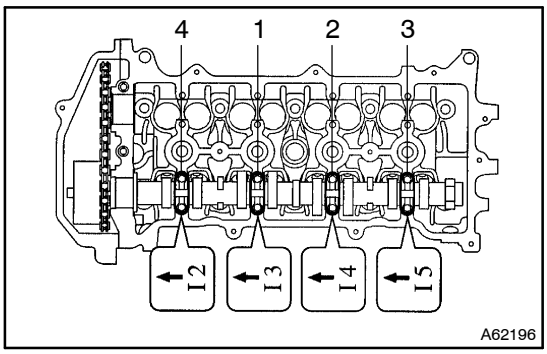
Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
06	5.060 (0.1992)	30	5.300 (0.2087)	54	5.540 (0.2181)
08	5.080 (0.2000)	32	5.320 (0.2094)	56	5.560 (0.2189)
10	5.100 (0.2008)	34	5.340 (0.2102)	58	5.580 (0.2197)
12	5.120 (0.2016)	36	5.360 (0.2110)	60	5.600 (0.2205)
14	5.140 (0.2024)	38	5.380 (0.2118)	62	5.620 (0.2213)
16	5.160 (0.2031)	40	5.400 (0.2126)	64	5.640 (0.2220)
18	5.180 (0.2039)	42	5.420 (0.2134)	66	5.660 (0.2228)
20	5.200 (0.2047)	44	5.440 (0.2142)	68	5.680 (0.2236)
22	5.220 (0.2055)	46	5.460 (0.2150)	70	5.700 (0.2244)
24	5.240 (0.2063)	48	5.480 (0.2157)	72	5.720 (0.2252)
26	5.260 (0.2071)	50	5.500 (0.2165)	74	5.740 (0.2260)
28	5.280 (0.2079)	52	5.520 (0.2173)		

Exhaust valve clearance (Cold):
0.25 to 0.35 mm (0.0098 to 0.0138 in.)
EXAMPLE: The 5.340 mm (0.2102 in.) lifter is installed, and the measured clearance is 0.440 mm (0.0173 in.).
Replace the 5.340 mm (0.2102 in.) lifter with a new No. 48 lifter.

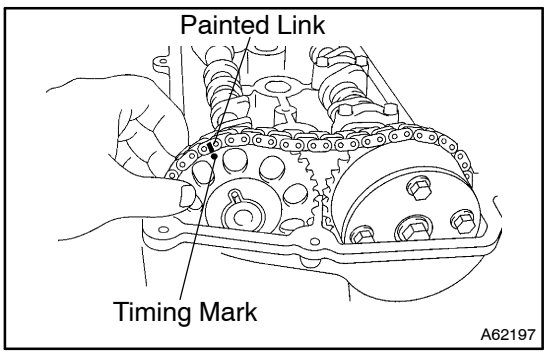
A79323



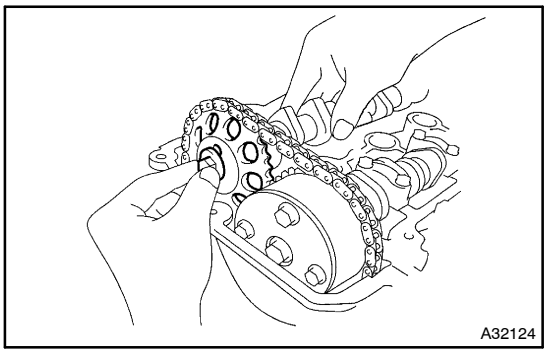
(m) As shown in the illustration, install the timing chain on the camshaft timing gear, with the painted links aligned with the timing marks on the camshaft timing sprocket.



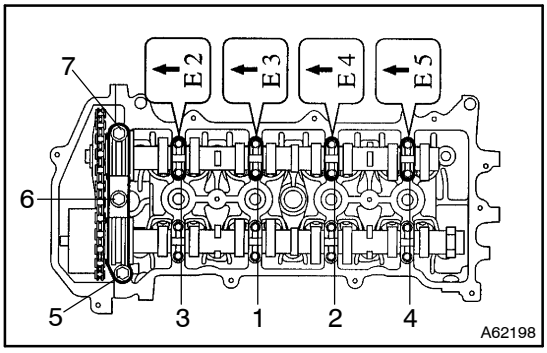
(n) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)



(o) Put the camshaft No.2 on the cylinder head with the painted links of the chain aligned with the timing mark on the camshaft timing sprocket.

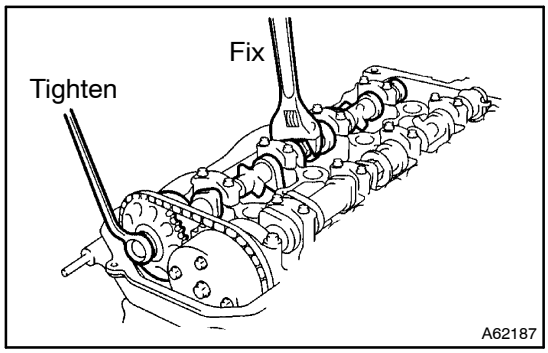


(p) Tighten the camshaft timing gear set bolt temporarily.



(q) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

(r) Install the bearing cap No. 1.
Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

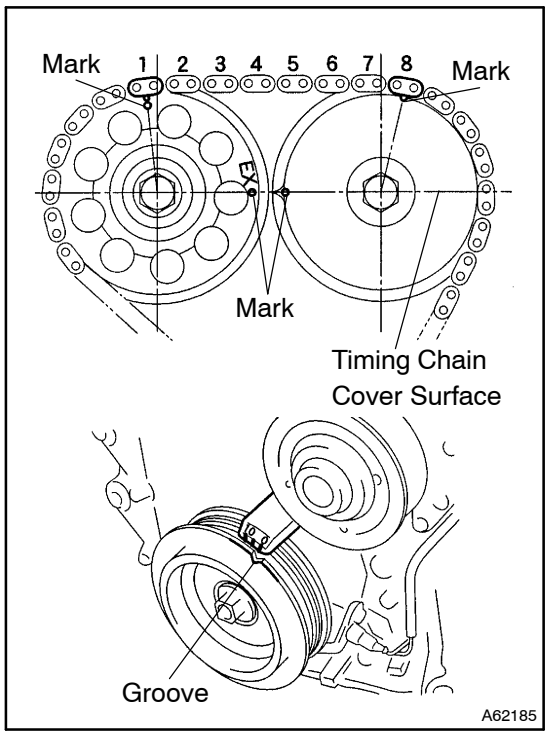


(s) Fix the camshaft with a spanner and so on, then tighten the camshaft timing gear set bolt.

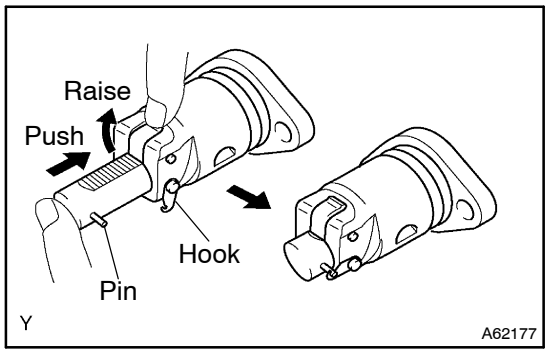
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

NOTICE:

Be careful not damage the valve lifter.

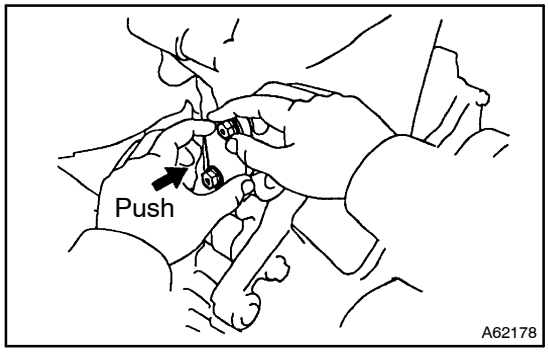


(t) Check the match marks on the timing chain and camshaft timing sprockets, and then the alignment of the pully groove with timing mark of the chain cover as shown in the illustration.



(u) Install chain tensioner.

(1) Check the O–ring is clean, and set the hook as shown in the illustration.

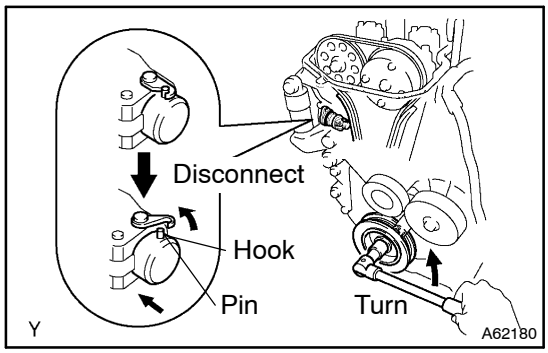


(2) Apply engine oil to the chain tensioner and install it with the 2 nuts.

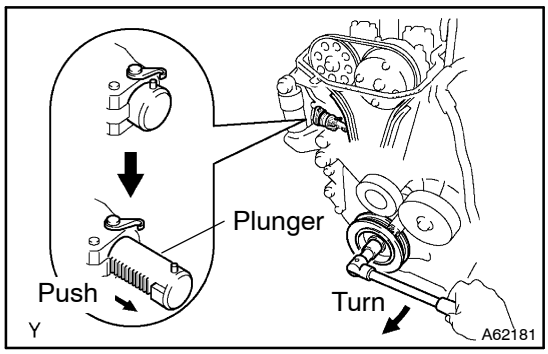
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

NOTICE:

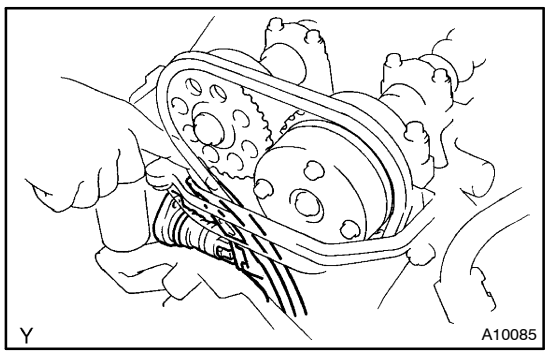
When installing the tensioner, set the hook again if the hook release the plunger.



(3) Turn the crankshaft counterclockwise, and disconnect the plunger knock pin from the hook.



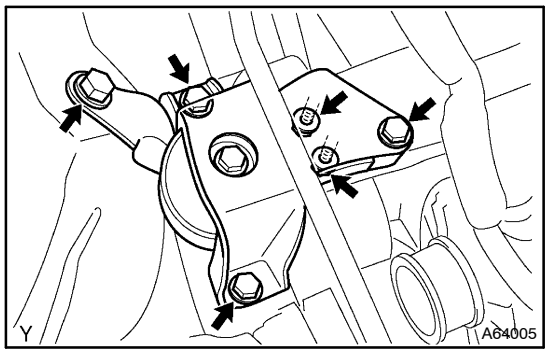
(4) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.



HINT:
If the plunger does not spring out, press the slipper into the chain tensioner with a screwdriver or your finger so that the hook is released from the knock pin and the plunger springs out.

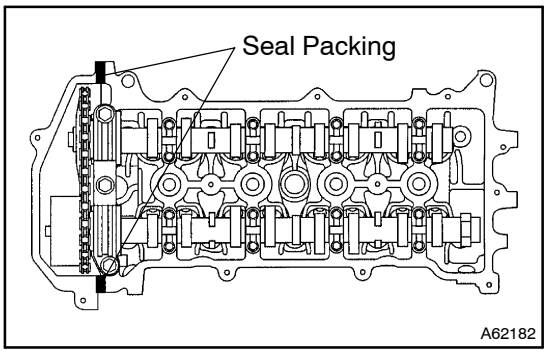
14. INSTALL V–RIBBED BELT TENSIONER ASSY

(a) Install the V–ribbed belt tensioner with the nut and bolt.
Torque:
29 N·m (296 kgf·cm, 21 ft·lbf) for Nut
69 N·m (704 kgf·cm, 51 ft·lbf) for Bolt



15. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install engine mounting insulator RH with the 4 bolts and 2 nuts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



16. INSTALL CYLINDER HEAD COVER SUB–ASSY

(a) Remove any old packing (FIPG) material.
(b) Apply seal packing to 2 locations as shown in the illustration.
Seal packing: Part No. 08826–00080 or equivalent

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**

(c) Install the cylinder head cover and cable bracket with the 9 bolts, 2 seal washers and 2 nuts. Uniformly tighten the bolts and nuts, in the several passes.
Torque:
11 N·m (112 kgf·cm, 8 ft·lbf) for w/o washer
9 N·m (92 kgf·cm, 80 in.·lbf) for w/ washer

17. INSTALL ENGINE WIRE

(a) Install the engine wire with the bolt and nut.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

18. INSTALL IGNITION COIL ASSY

(a) Install the 4 ignition coils with the 4 bolts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

19. INSTALL CYLINDER HEAD COVER NO.2

(a) Install the cylinder head cover with the 2 nuts and 2 clips.
Torque: 7 N·m (71 kgf·cm, 62 in.·lbf)

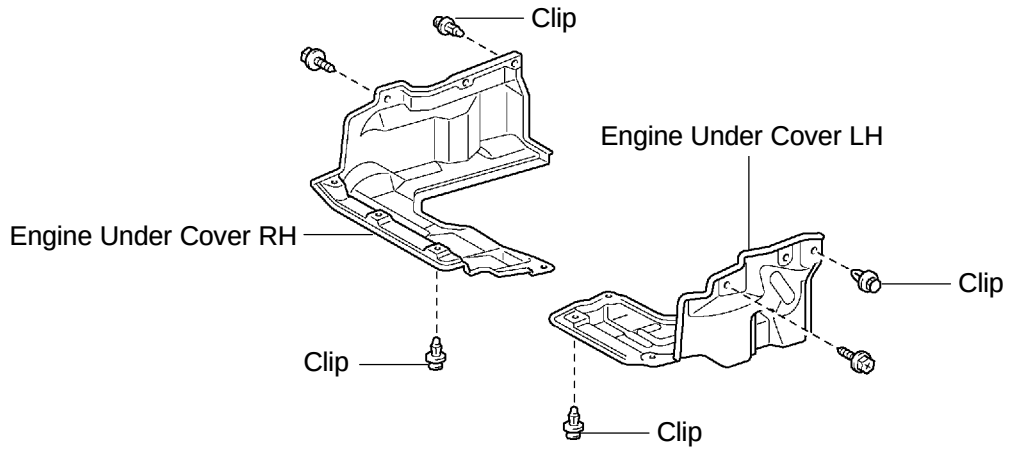
20. CHECK ENGINE OIL LEAK

PARTIAL ENGINE ASSY (3ZZ-FE/4ZZ-FE)

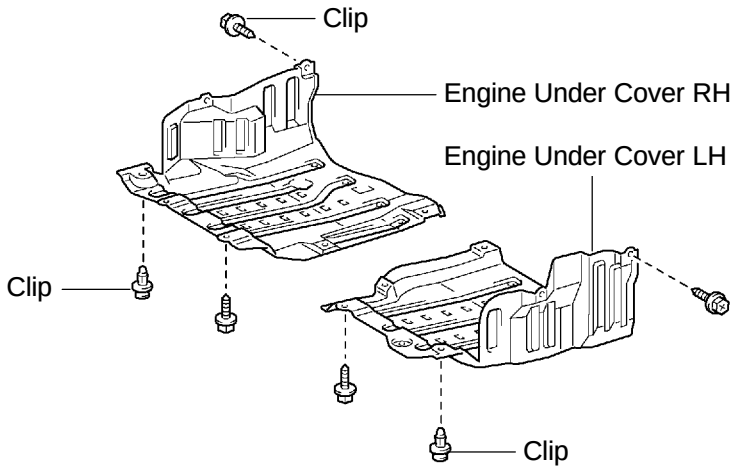
COMPONENTS

140MA-01

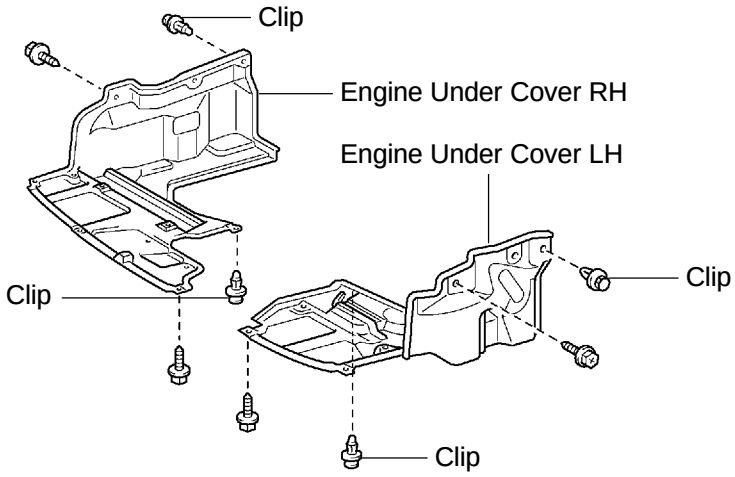
TMC MADE:



TMC MADE, ROUGH ROAD TYPE:

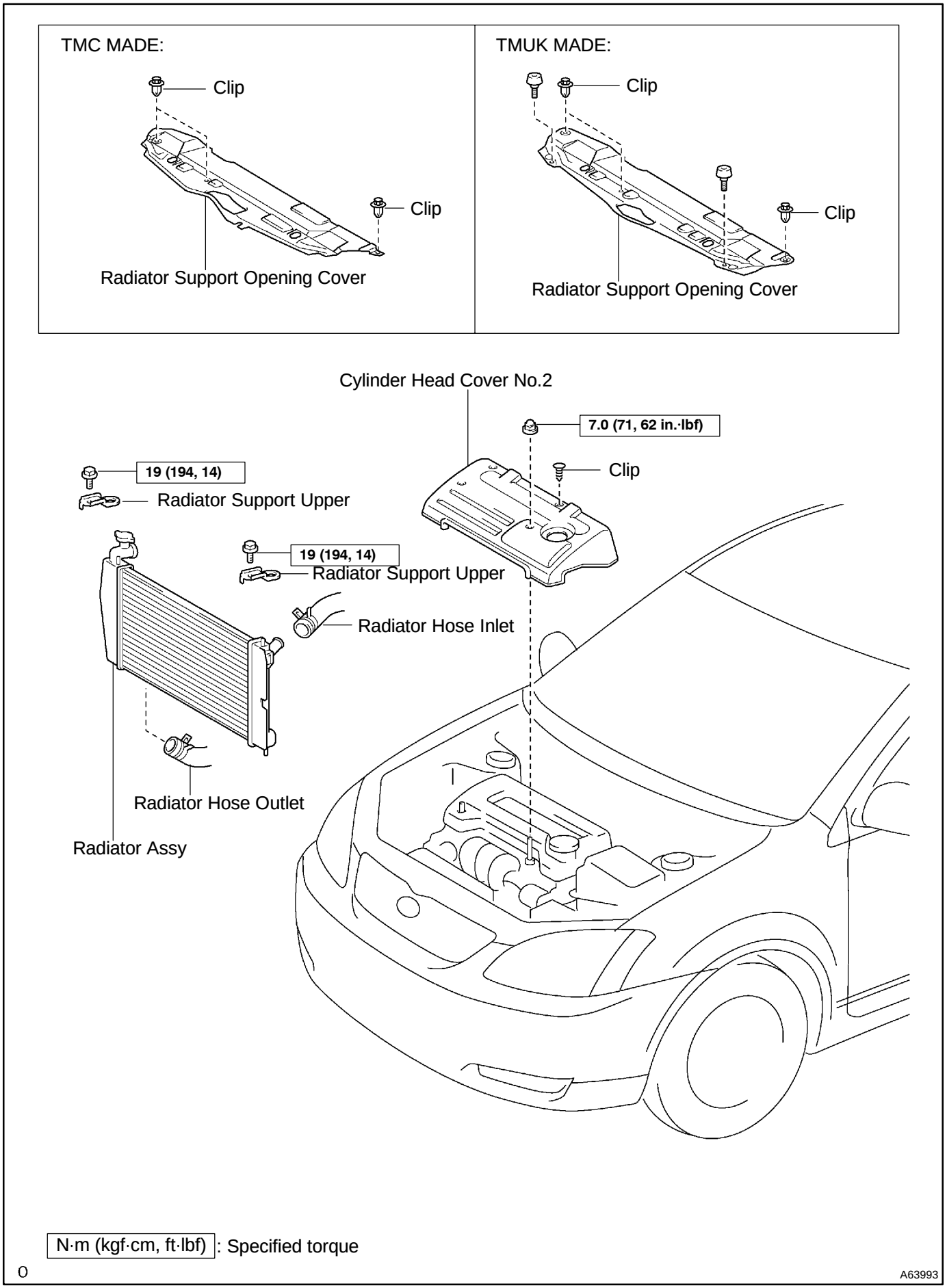


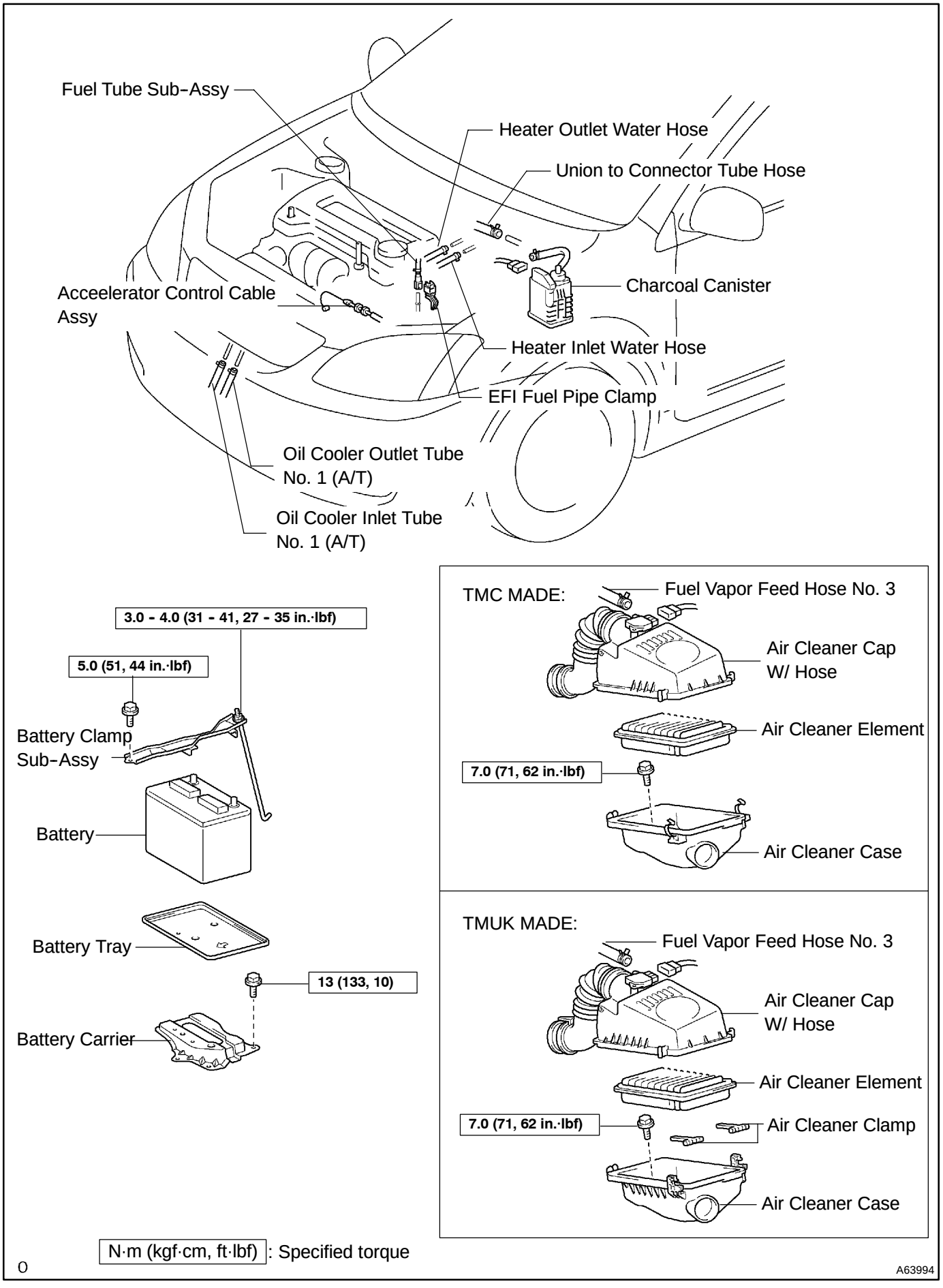
TMUK MADE:

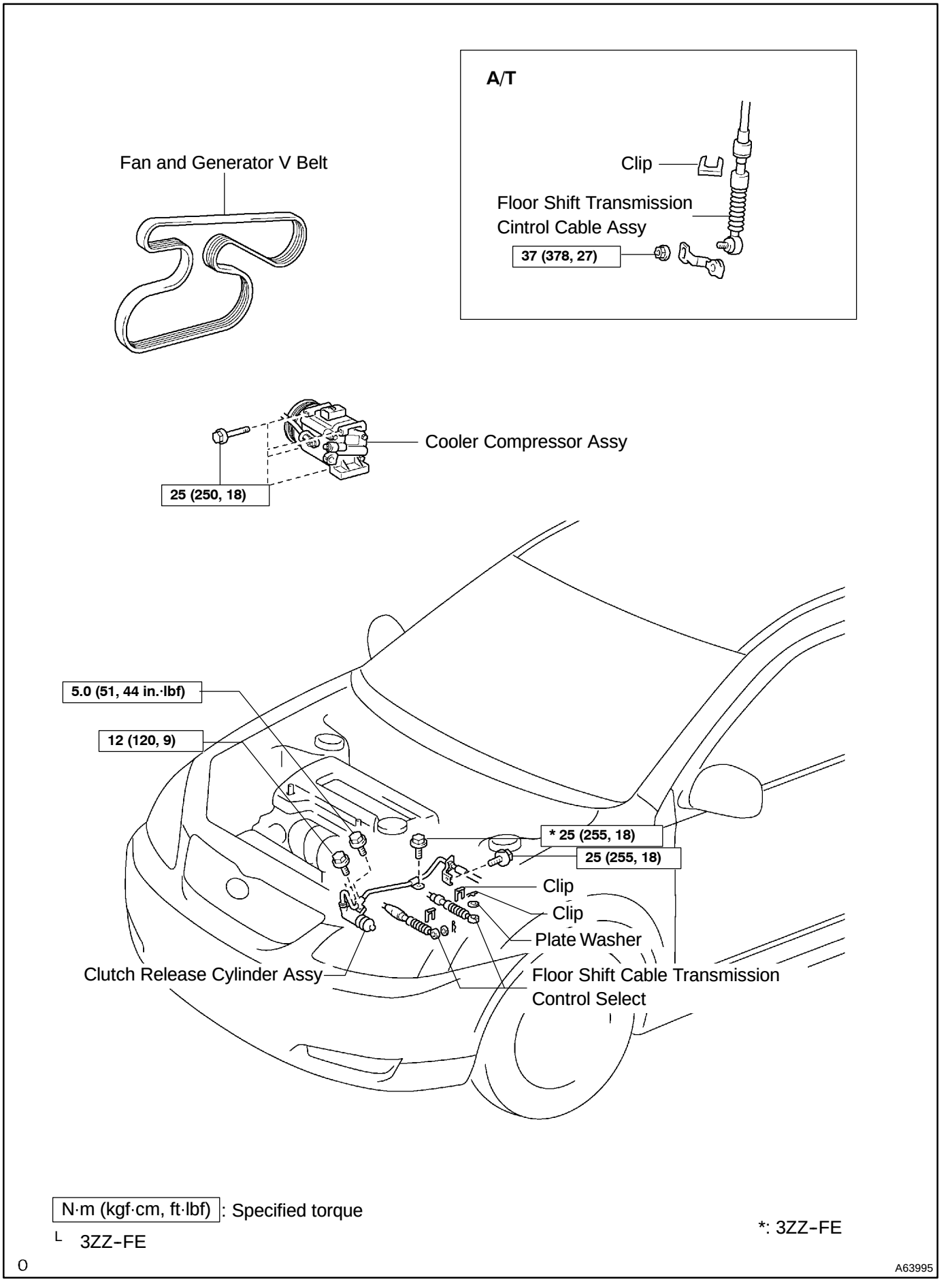


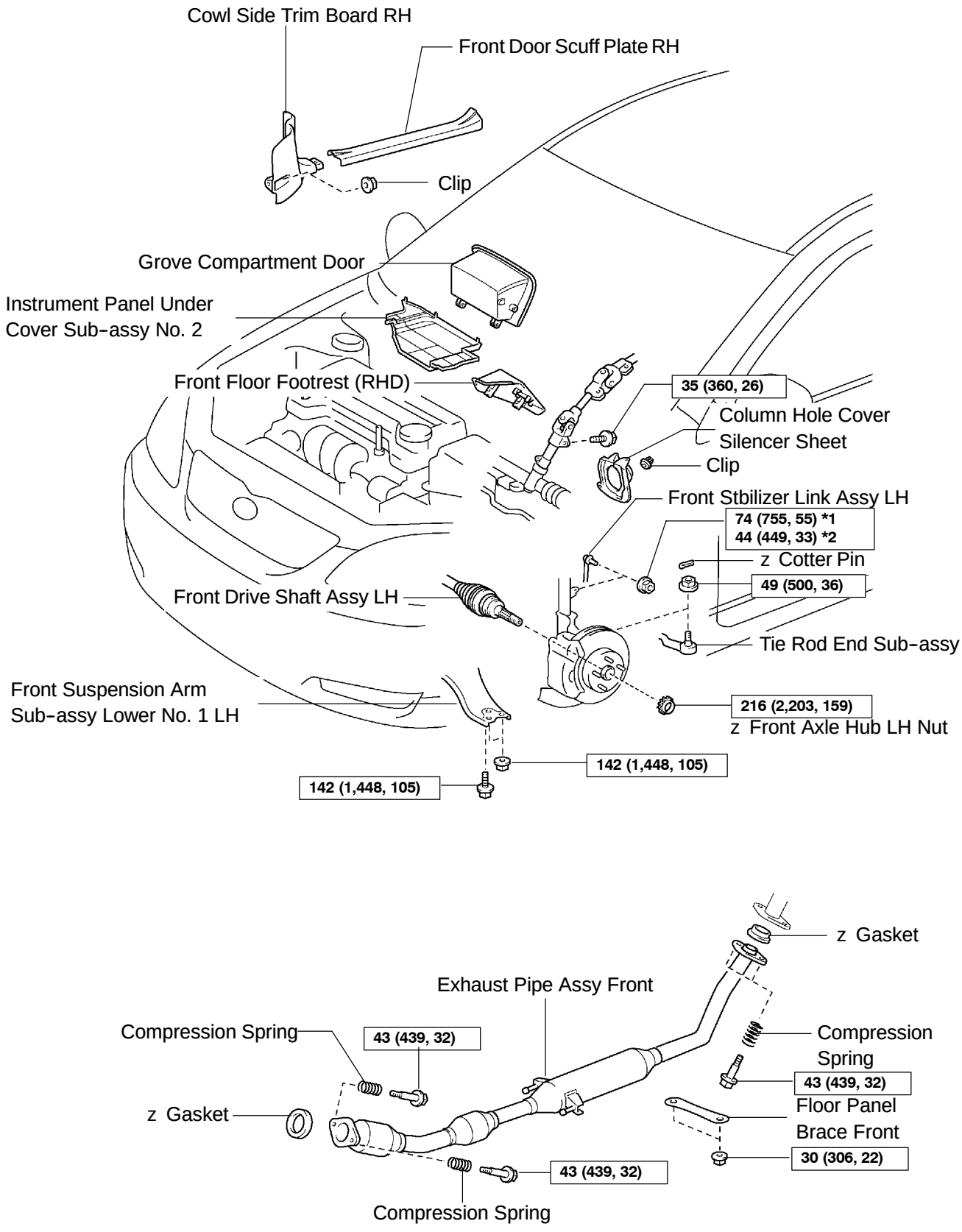
O

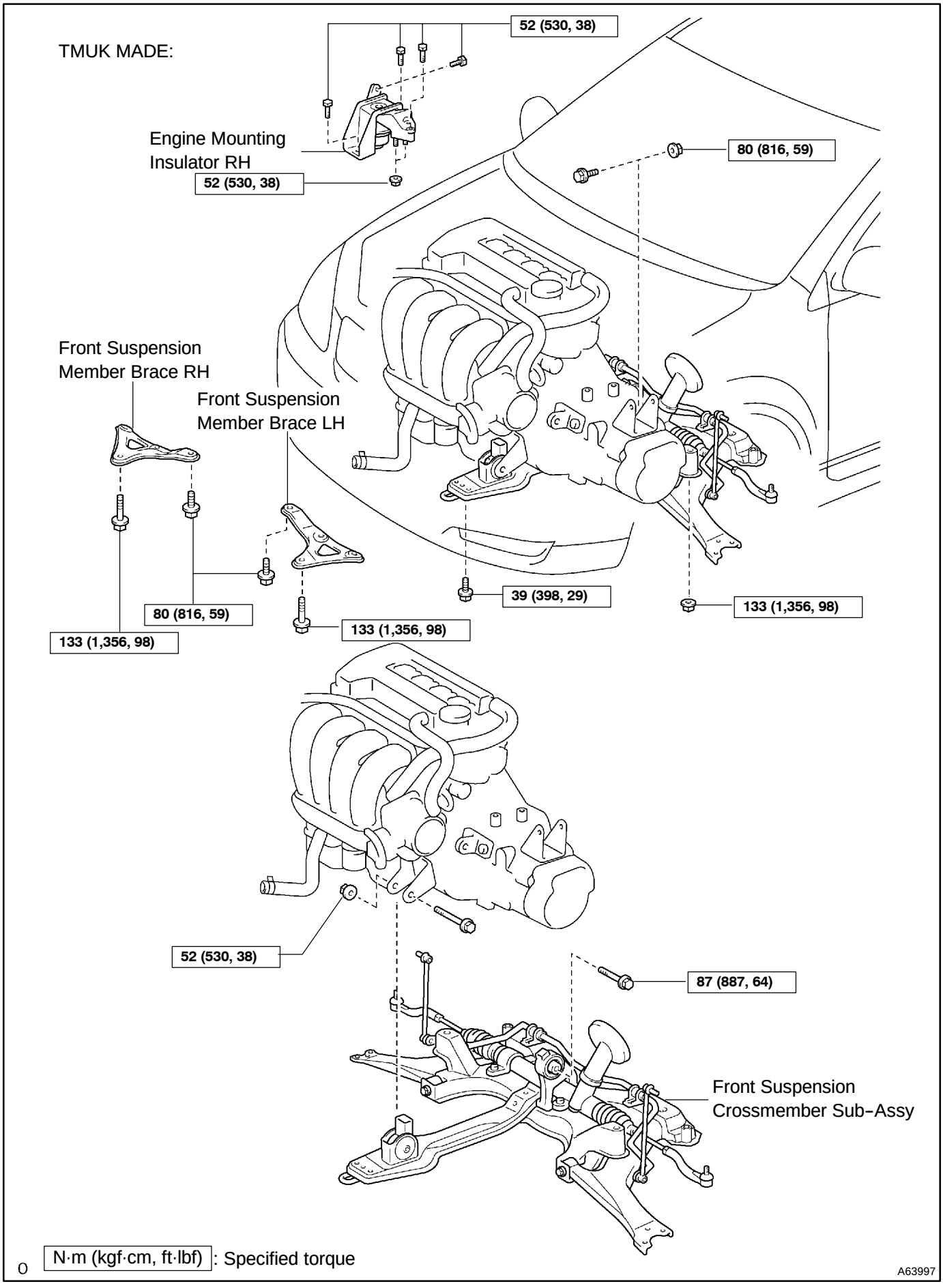
A61481

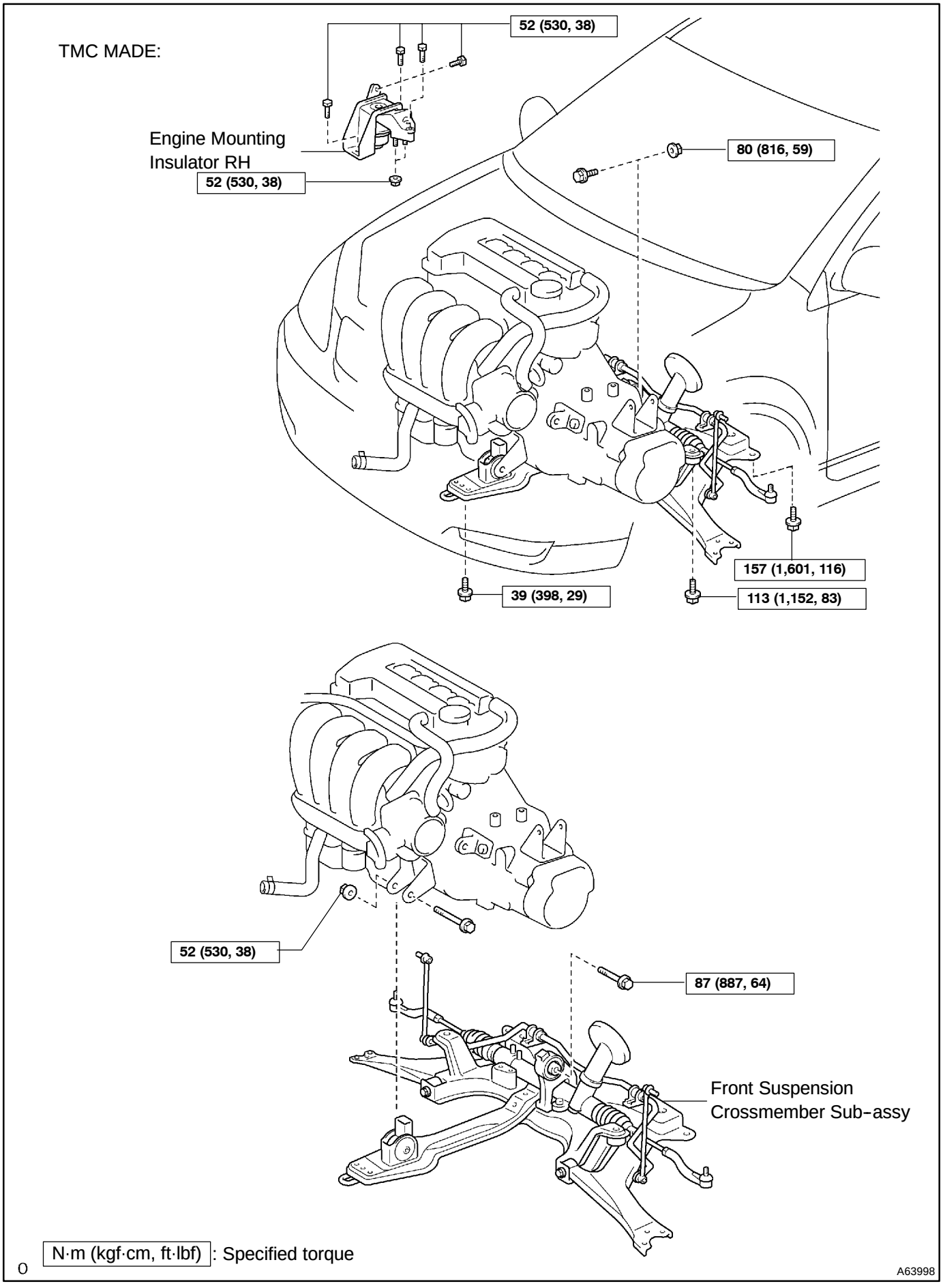

TMC MADE:
Clip
Clip
Radiator Support Opening Cover
TMUK MADE:
Clip
Clip
Radiator Support Opening Cover
Cylinder Head Cover No.2
7.0 (71, 62 in.·lbf)
Clip
19 (194, 14)
Radiator Support Upper
19 (194, 14)
Radiator Support Upper
Radiator Hose Inlet
Radiator Hose Outlet
Radiator Assy
N·m (kgf·cm, ft·lbf): Specified torque
A63993

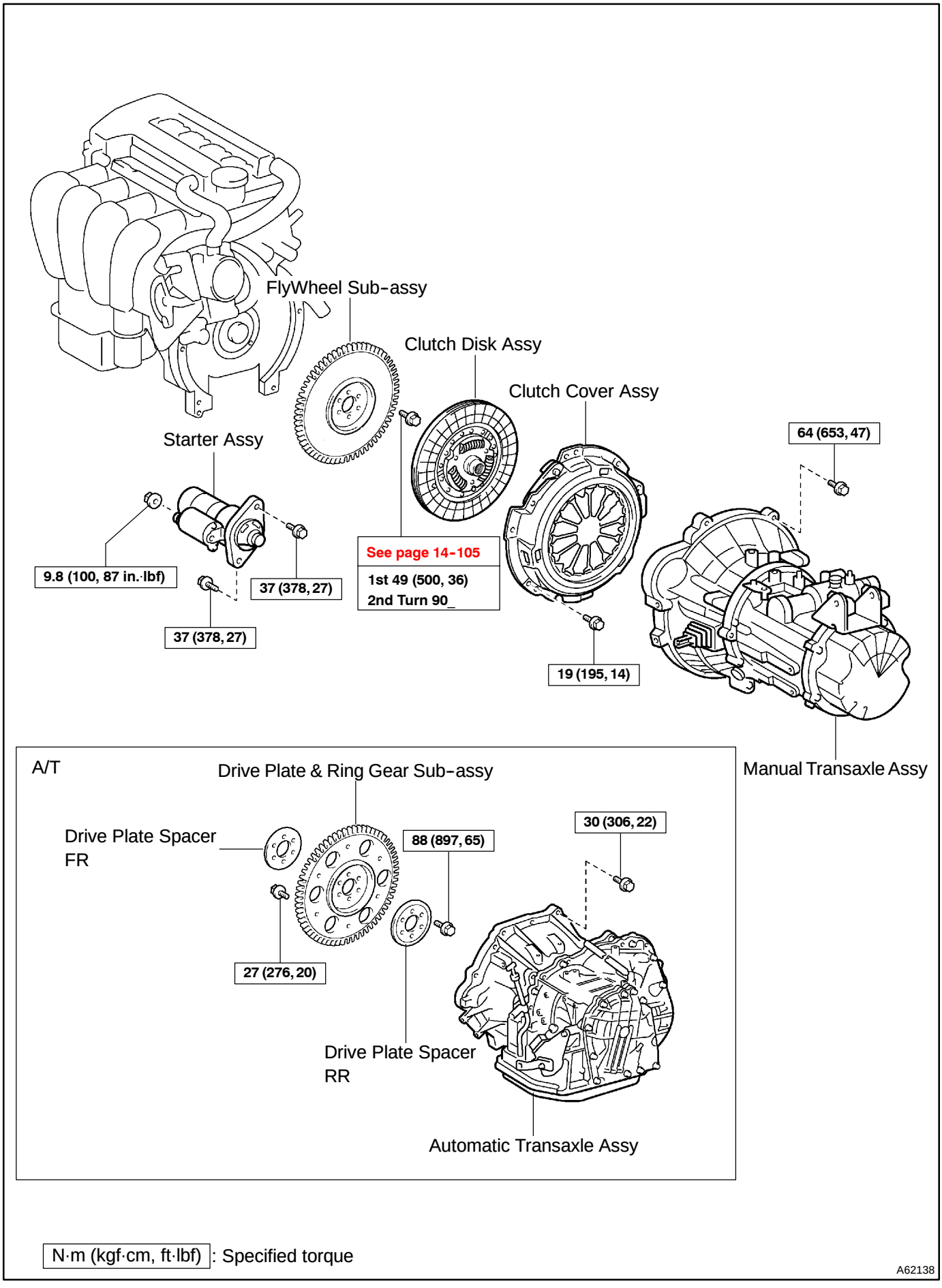

Fuel Tube Sub-Assy
Heater Outlet Water Hose
Union to Connector Tube Hose
Acceelerator Control Cable Assy
Charcoal Canister
Heater Inlet Water Hose
EFI Fuel Pipe Clamp
Oil Cooler Outlet Tube No. 1 (A/T)
Oil Cooler Inlet Tube No. 1 (A/T)
3.0 - 4.0 (31 - 41, 27 - 35 in.·lbf)
5.0 (51, 44 in.·lbf)
Battery Clamp Sub-Assy
Battery
Battery Tray
13 (133, 10)
Battery Carrier
TMC MADE:
Fuel Vapor Feed Hose No. 3
Air Cleaner Cap W/ Hose
Air Cleaner Element
7.0 (71, 62 in.·lbf)
Air Cleaner Case
TMUK MADE:
Fuel Vapor Feed Hose No. 3
Air Cleaner Cap W/ Hose
Air Cleaner Element
7.0 (71, 62 in.·lbf)
Air Cleaner Clamp
Air Cleaner Case
N·m (kgf·cm, ft·lbf): Specified torque
A63994

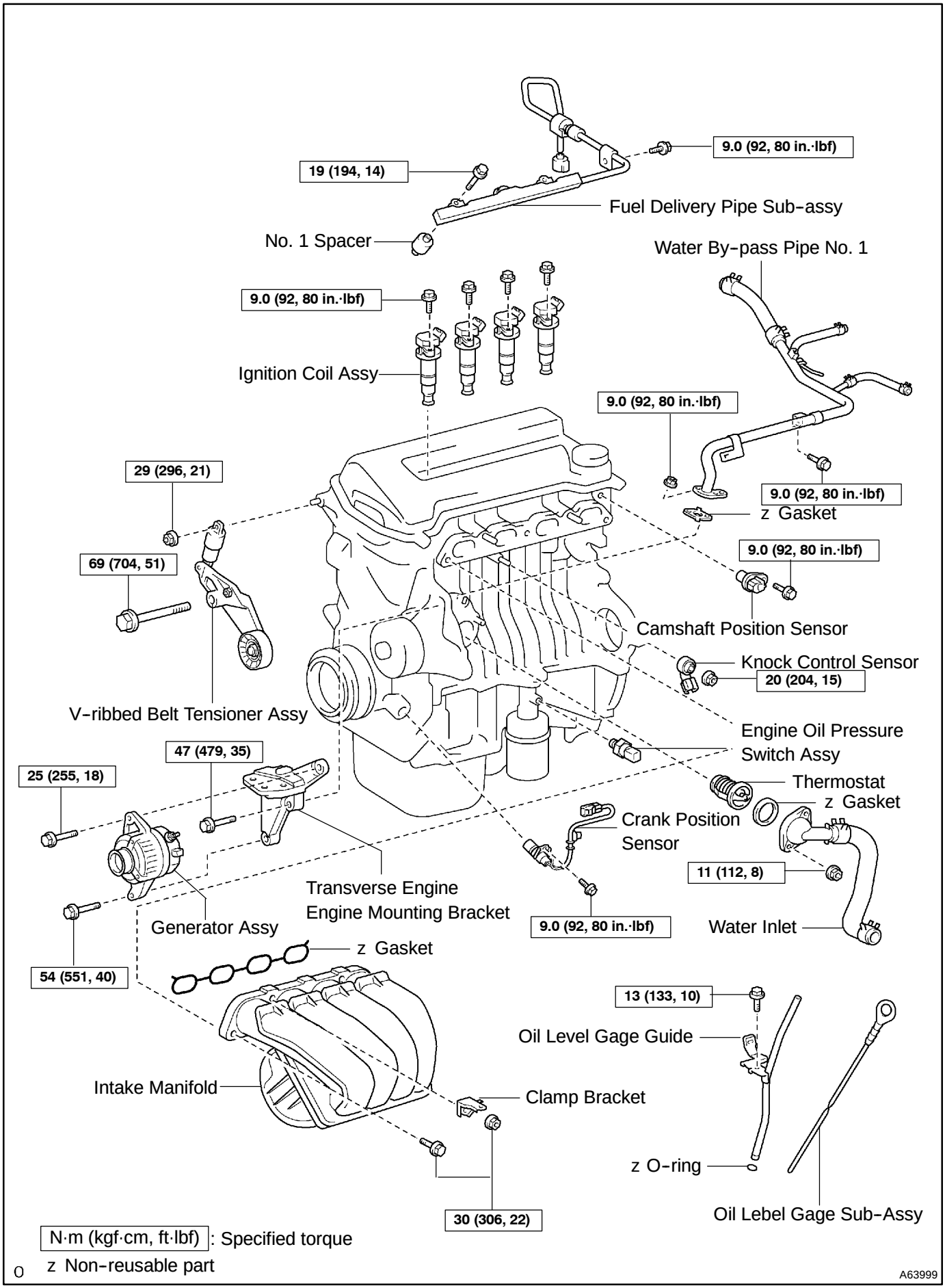

A/T
Clip
Floor Shift Transmission
Cintrol Cable Assy
37 (378, 27)
Fan and Generator V Belt
Cooler Compressor Assy
25 (250, 18)
5.0 (51, 44 in.·lbf)
12 (120, 9)
* 25 (255, 18)
25 (255, 18)
Clip
Clip
Plate Washer
Clutch Release Cylinder Assy
Floor Shift Cable Transmission
Control Select
N·m (kgf·cm, ft·lbf): Specified torque
└ 3ZZ-FE
*: 3ZZ-FE
A63995

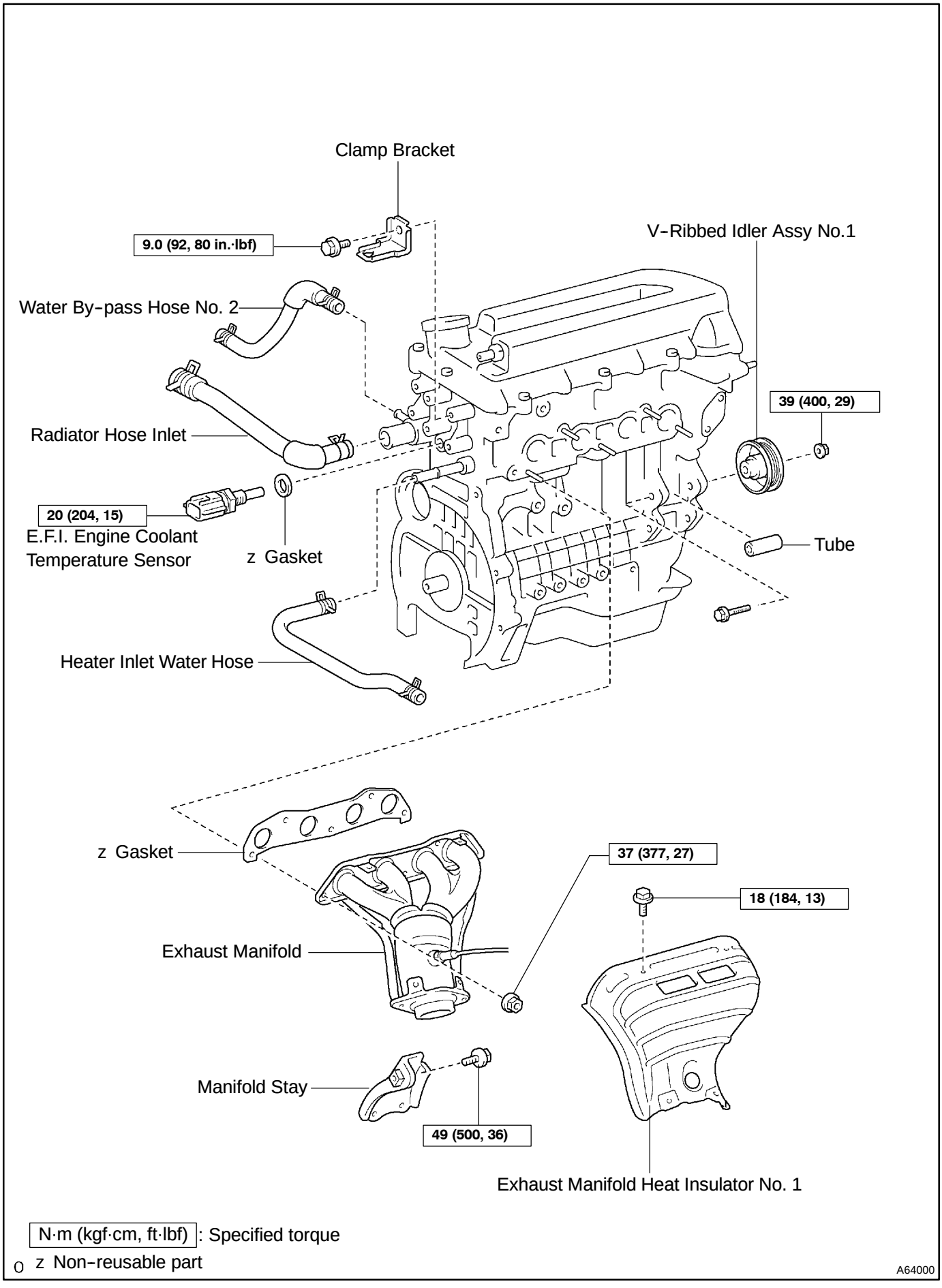

Cowl Side Trim Board RH
Front Door Scuff Plate RH
Clip
Grove Compartment Door
Instrument Panel Under Cover Sub-assy No. 2
Front Floor Footrest (RHD)
35 (360, 26)
Column Hole Cover
Silencer Sheet
Clip
Front Stbilizer Link Assy LH
74 (755, 55) *1
44 (449, 33) *2
z Cotter Pin
49 (500, 36)
Front Drive Shaft Assy LH
Tie Rod End Sub-assy
Front Suspension Arm Sub-assy Lower No. 1 LH
216 (2,203, 159)
z Front Axle Hub LH Nut
142 (1,448, 105)
142 (1,448, 105)
z Gasket
Exhaust Pipe Assy Front
Compression Spring
43 (439, 32)
Compression Spring
43 (439, 32)
Floor Panel Brace Front
z Gasket
30 (306, 22)
43 (439, 32)
Compression Spring
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
*1: TMC MADE
*2: TMUK MADE
A63996


TMUK MADE:
52 (530, 38)
Engine Mounting Insulator RH
52 (530, 38)
80 (816, 59)
Front Suspension Member Brace RH
Front Suspension Member Brace LH
39 (398, 29)
133 (1,356, 98)
80 (816, 59)
133 (1,356, 98)
133 (1,356, 98)
52 (530, 38)
87 (887, 64)
Front Suspension Crossmember Sub-Assy
o
N·m (kgf·cm, ft·lbf): Specified torque
A63997


TMC MADE:
52 (530, 38)
Engine Mounting
Insulator RH
52 (530, 38)
80 (816, 59)
157 (1,601, 116)
39 (398, 29)
113 (1,152, 83)
52 (530, 38)
87 (887, 64)
Front Suspension
Crossmember Sub-assy
N·m (kgf·cm, ft·lbf): Specified torque
A63998


FlyWheel Sub-assy
Clutch Disk Assy
Clutch Cover Assy
Starter Assy
64 (653, 47)
9.8 (100, 87 in.·lbf)
37 (378, 27)
37 (378, 27)
See page 14-105
1st 49 (500, 36)
2nd Turn 90_
19 (195, 14)
Manual Transaxle Assy
A/T
Drive Plate & Ring Gear Sub-assy
Drive Plate Spacer
FR
88 (897, 65)
30 (306, 22)
27 (276, 20)
Drive Plate Spacer
RR
Automatic Transaxle Assy
N·m (kgf·cm, ft·lbf): Specified torque
A62138


19 (194, 14)
9.0 (92, 80 in.·lbf)
Fuel Delivery Pipe Sub-assy
No. 1 Spacer
Water By-pass Pipe No. 1
9.0 (92, 80 in.·lbf)
Ignition Coil Assy
9.0 (92, 80 in.·lbf)
29 (296, 21)
9.0 (92, 80 in.·lbf)
z Gasket
69 (704, 51)
9.0 (92, 80 in.·lbf)
Camshaft Position Sensor
Knock Control Sensor
20 (204, 15)
V-ribbed Belt Tensioner Assy
Engine Oil Pressure Switch Assy
47 (479, 35)
25 (255, 18)
Thermostat
z Gasket
Crank Position Sensor
11 (112, 8)
Transverse Engine Engine Mounting Bracket
9.0 (92, 80 in.·lbf)
Water Inlet
Generator Assy
z Gasket
54 (551, 40)
13 (133, 10)
Oil Level Gage Guide
Intake Manifold
Clamp Bracket
z O-ring
30 (306, 22)
Oil Lebel Gage Sub-Assy
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A63999


Clamp Bracket
9.0 (92, 80 in.·lbf)
V-Ribbed Idler Assy No.1
Water By-pass Hose No. 2
39 (400, 29)
Radiator Hose Inlet
20 (204, 15)
E.F.I. Engine Coolant Temperature Sensor
z Gasket
Tube
Heater Inlet Water Hose
z Gasket
37 (377, 27)
18 (184, 13)
Exhaust Manifold
Manifold Stay
49 (500, 36)
Exhaust Manifold Heat Insulator No. 1
N·m (kgf·cm, ft·lbf): Specified torque
o z Non-reusable part
A64000

REPLACEMENT

1. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT **(See page 11-1)**
2. REMOVE FRONT WHEELS
3. REMOVE ENGINE UNDER COVER RH

4. REMOVE ENGINE UNDER COVER LH

5. DRAIN COOLANT **(See page 16-20)**
6. REMOVE CYLINDER HEAD COVER NO.2

7. REMOVE RADIATOR SUPPORT OPENING COVER

8. DISCONNECT RADIATOR HOSE INLET

(a) Disconnect the radiator hose inlet from the radiator.

9. SEPARATE RADIATOR HOSE OUTLET

(a) Disconnect the radiator hose outlet from the radiator.

10. REMOVE RADIATOR SUPPORT UPPER

(a) Remove the 2 bolts and 2 radiator support upper.

11. REMOVE RADIATOR ASSY

12. REMOVE BATTERY
13. REMOVE BATTERY CARRIER

(a) Remove the 4 bolts and battery carrier.

14. DISCONNECT FUEL VAPOR FEED HOSE NO.3

(a) Disconnect the fuel vapor feed hose from the air cleaner cap.

15. REMOVE AIR CLEANER ASSY

(a) Loosen the air cleaner hose clamp.
(b) Remove the 2 air cleaner clamps. (TMUK MADE)
(c) Disconnect the connector, vacuum hose and air cleaner cap with hose.
(d) Remove the air cleaner element.
(e) Remove the 3 bolts and air cleaner case.

16. REMOVE EFI FUEL PIPE CLAMP
(See page 11-5)
17. DISCONNECT FUEL TUBE SUB-ASSY
(See page 11-5)
18. DISCONNECT UNION TO CONNECTOR TUBE HOSE

(a) RHD
  (1) Disconnect the union to connector tube hose from the hose to hose tube.
(b) LHD
  (1) Disconnect the union to connector tube hose from the brake booster.

19. DISCONNECT HEATER INLET WATER HOSE

(a) Disconnect the heater inlet water hose from the air conditioner tube.

20. DISCONNECT HEATER OUTLET WATER HOSE

(a) Disconnect the heater outlet water hose from the air conditioner tube.

21. REMOVE CHARCOAL CANISTER ASSY

(a) Disconnect the connector and vacuum hose, and remove the charcoal canister.

22. DISCONNECT ACCELERATOR CONTROL CABLE ASSY

(a) Loosen the nut, and remove the accelerator control cable.

23. DISCONNECT OIL COOLER INLET TUBE NO.1 (A/T TRANSAXLE)

(a) Disconnect the oil cooler inlet tube from the oil cooler inlet tube.

24. DISCONNECT OIL COOLER OUTLET TUBE NO.1 (A/T TRANSAXLE)

(a) Disconnect the oil cooler outlet tube from the oil cooler inlet tube.

25. DISCONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY (M/T TRANSAXLE)
(See page 41-24)

26. DISCONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY (A/T TRANSAXLE)
(See page 40-9)

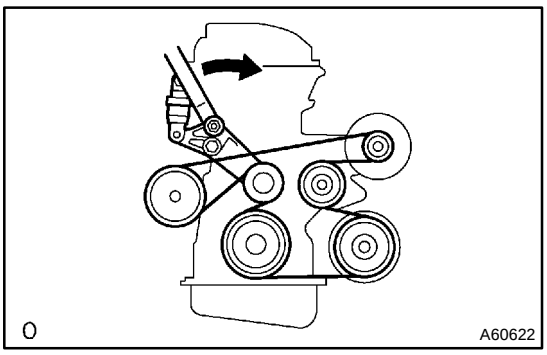
27. DISCONNECT CLUTCH RELEASE CYLINDER ASSY (M/T TRANSAXLE)
(See page 41-24)

28. REMOVE GLOVE COMPARTMENT DOOR ASSY
(See page 71-23)

29. REMOVE INSTRUMENT PANEL UNDER COVER SUB-ASSY NO.2
(See page 71-23)

30. DISCONNECT ENGINE WIRE

(a) Disconnect the engine wire from the engine ECU and junction block.
(b) Pull out the engine wire.
(c) Disconnect the engine wire from the engine room junction block.



31. REMOVE FAN AND GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner slowly clockwise and loosen it. Then, remove the fan and generator belt and put back the V-ribbed belt tensioner little by little and fix it quietly.

32. DISCONNECT COOLER COMPRESSOR ASSY (W/ AIR CONDITIONER)

(a) Disconnect the connector.
(b) Remove the 3 bolts installing the cooler compressor.

33. REMOVE FRONT DOOR SCUFF PLATE RH
(See page 76-48)

34. REMOVE COWL SIDE TRIM BOARD RH
(See page 71-29)

35. REMOVE FRONT FLOOR FOOTREST (RHD STEERING POSITION TYPE)

36. REMOVE COLUMN HOLE COVER SILENCER SHEET

(a) Remove the 2 clips and column hole cover silencer sheet.

37. DISCONNECT STEERING INTERMEDIATE SHAFT ASSY NO.2
(See page 51-6)

38. REMOVE FLOOR PANEL BRACE FRONT

(a) Remove the 2 nuts and floor panel brace front.

39. REMOVE EXHAUST PIPE ASSY FRONT
(See page 15-5)

40. REMOVE FRONT AXLE HUB LH NUT
(See page 30-6)
SST 09930-00010

HINT:
Perform the same procedure as above on the opposite side.

41. DISCONNECT END SUB-ASSY, TIE ROD, NO.2 (See page 30-6)
SST 09628-62011

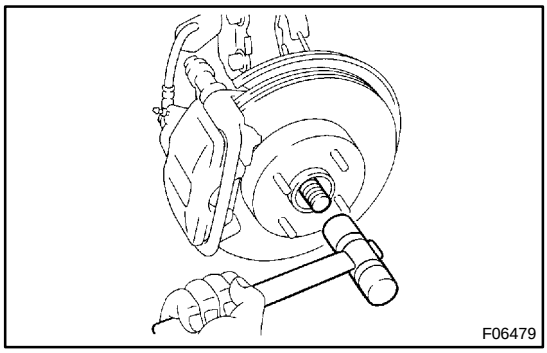
HINT:
Perform the same procedure as above on the opposite side.

42. DISCONNECT LINK ASSY, FR STABILIZER (See page 26-20)

HINT:
Perform the same procedure as above on the opposite side.

43. DISCONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH
(See page 30-6)

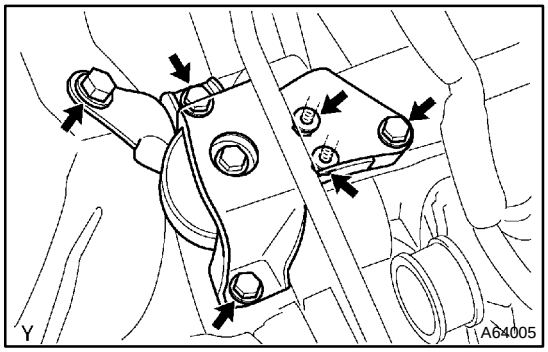
HINT:
Perform the same procedure as above on the opposite side.



44. DISCONNECT FRONT DRIVE SHAFT ASSY LH

(a) Using a platic hammer, disconnect the front drive shaft from the axle hab.

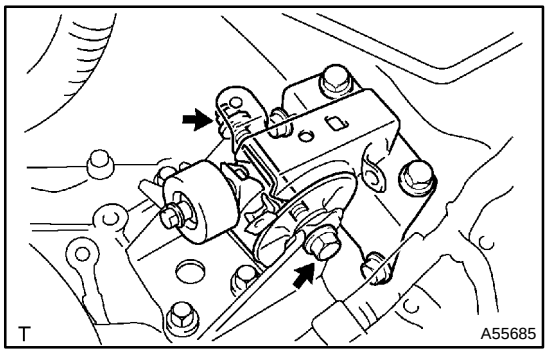
HINT:
Perform the same procedure as above on the opposite side.



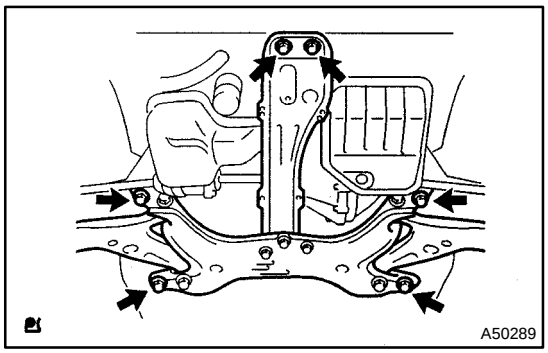
45. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

(a) Set the engine lifter.

(b) Remove the 4 bolts, 2 nuts and engine mounting insulator.



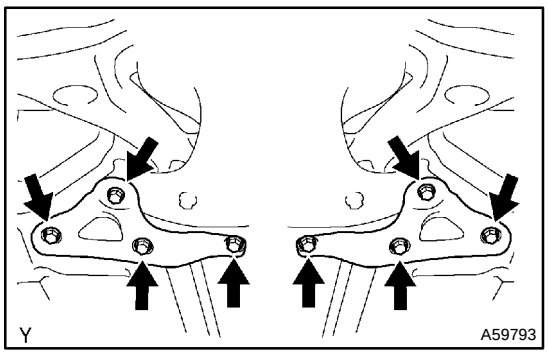
(c) Remove the through bolt and nut, detach the engine mounting insulator from the vehicle.



(d) Remove the engine with transaxle. (TMC MADE)

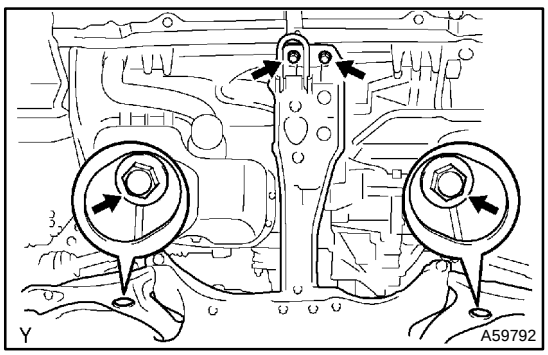
(1) Remove the 6 bolts, as shown in the illustration.

(2) Carefully, remove the engine with transaxle from the vehicle.



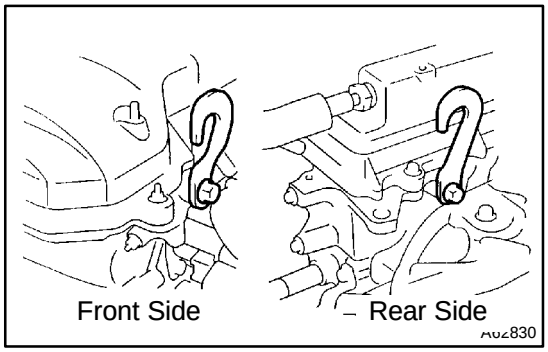
(e) Remove the engine with transaxle. (TMUK MADE).

(1) Remove the 8 bolts and front suspension member brace rear RH and LH.



(2) Remove the 2 bolts, 2 nuts, as shown in the illustration.

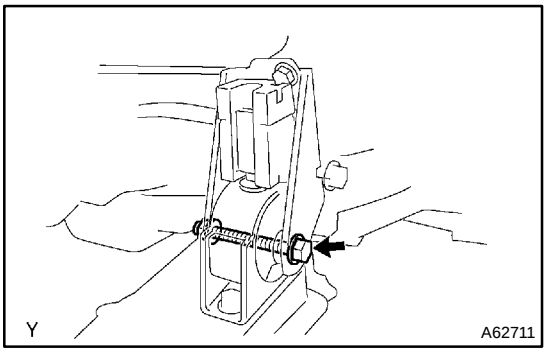
(3) Carefully, remove the engine with transaxle from the vehicle.



(f) Install the 2 engine hangers with the 2 bolts.
Part No.:
No. 1 engine hanger 12281-15040
No. 2 engine hanger 12281-22021
Bolt 91512-B1016
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

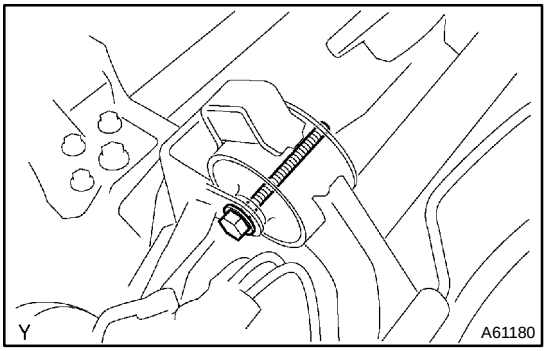
HINT:
Be sure to install engine hanger (12281-22021) to the front side of the engine and engine hanger (12281-15040) to the rear side.

(g) Using the chain block and engine sling device, hang the engine assembly.



46. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSY

(a) Remove the through bolt and a nut, detach the engine mounting insulator FR from the engine mounting bracket.



(b) Remove the through bolt, detach the engine mounting insulator RR from the suspension crossmember.

(c) Separate the engine and transaxle assembly from the suspension crossmember and engine mounting member.

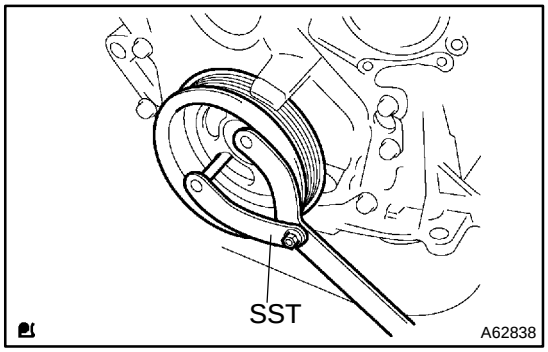
47. REMOVE STARTER ASSY
(See page 19-15)

48. REMOVE MANUAL TRANSAXLE ASSY (M/T TRANSAXLE)
(See page 41-24)

49. REMOVE AUTOMATIC TRANSAXLE ASSY (A/T TRANSAXLE)
(See page 40-9)
SST 09213-70011, 09330-00021

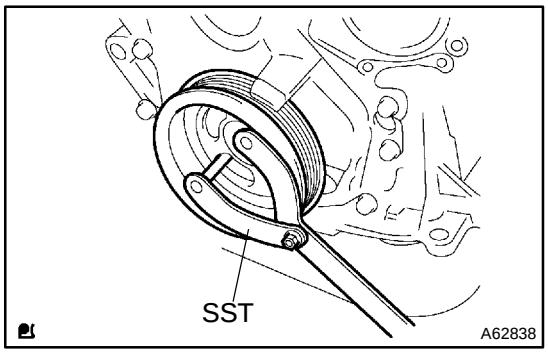
50. REMOVE CLUTCH COVER ASSY (M/T TRANSAXLE)
(See page 42-29)

51. REMOVE CLUTCH DISC ASSY (M/T TRANSAXLE)
(See page 42-30)



52. REMOVE FLYWHEEL SUB-ASSY (M/T TRANSAXLE)

(a) Fix the crankshaft with SST, then remove the 8 bolts and flywheel.
SST 09960-10010 (09962-01000, 09963-01000)



53. REMOVE DRIVE PLATE & RING GEAR SUB-ASSY (A/T TRANSAXLE)

(a) Fix the crankshaft with SST, then remove the 8 bolts and drive plate & ring gear.
SST 09960-10010 (09962-01000, 09963-01000)

54. REMOVE IGNITION COIL ASSY

(a) Remove the 4 bolts and 4 ignition coils.

55. REMOVE FUEL DELIVERY PIPE SUB-ASSY

(a) Remove the 3 bolts and fuel delivery pipe with fuel injectors.

56. REMOVE GENERATOR ASSY
(See page 19-20)

57. REMOVE INTAKE MANIFOLD

(a) Remove the 4 bolts, 2 nuts, 2 clamp brackets and intake manifold.

58. REMOVE OIL LEVEL GAGE SUB-ASSY

(a) Remove the oil level gage guide from the oil level gage guide.

59. REMOVE OIL LEVEL GAGE GUIDE

(a) Remove the bolt and oil level gage guide.

60. REMOVE WATER BY-PASS PIPE NO.1

(a) Remove the 2 bolts, 2 nuts, water by-pass pipe and gasket.

61. REMOVE WATER INLET

(a) Remove the 2 nuts and water inlet.

62. REMOVE THERMOSTAT

63. REMOVE ENGINE OIL PRESSURE SWITCH ASSY

(a) Using SST, remove the engine oil pressure switch.
SST 09268-46021

64. REMOVE CAMSHAFT POSITION SENSOR

(a) Remove the bolt and camshaft position sensor.

65. REMOVE CRANK POSITION SENSOR

(a) Remove the 2 bolts and crank position sensor.

66. REMOVE KNOCK CONTROL SENSOR

(a) Remove the nut and knock control sensor.

67. REMOVE V-RIBBED BELT TENSIONER ASSY

(a) Remove the bolt, nut and V-ribbed belt tensioner.

68. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 3 bolts and transverse engine engine mounting bracket.

69. REMOVE MANIFOLD STAY

(a) Remove the 3 bolts and manifold stay.

70. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.1

(a) Remove the 4 bolts and exhaust manifold heat insulator.

71. REMOVE EXHAUST MANIFOLD

(a) Remove the 5 nuts, exhaust manifold and gasuket.

72. REMOVE V-RIBBED IDLER ASSY NO.1

(a) Remove the nut, bolt, tube and idler.

73. REMOVE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Using SST, remove the E.F.I. engine coolant temperature sensor.
SST 09817-33190

74. REMOVE WATER BY-PASS HOSE NO.2

75. REMOVE RADIATOR HOSE INLET

76. REMOVE HEATER INLET WATER HOSE

77. REPLACE PARTIAL ENGINE ASSY

78. INSTALL E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Install a new gasket to the E.F.I. engine coolant temperature sensor.
(b) Using SST, install the E.F.I. engine coolant temperature sensor.
SST 09817-33190
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

79. INSTALL V-RIBBED IDLER ASSY NO.1

(a) Install the tube and idler with the nut and bolt.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

80. INSTALL EXHAUST MANIFOLD

(a) Install a new gasket and the exhaust manifold with the 5 nuts.
Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)

81. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.1

(a) Install the exhaust manifold heat insulator with the 4 bolts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

82. INSTALL MANIFOLD STAY

(a) Install the manifold stay with 3 bolts.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

83. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the transverse engine engine mounting bracket with the 3 bolts.
Torque: 47 N·m (479 kgf·cm, 35 ft·lbf)

84. INSTALL V-RIBBED BELT TENSIONER ASSY

(a) Install the V-ribbed belt tensioner with the bolt and nut.
Torque:
Nut 29 N·m (296 kgf·cm, 21 ft·lbf)
Bolt 69 N·m (704 kgf·cm, 51 ft·lbf)

85. INSTALL KNOCK CONTROL SENSOR

(a) Install the knock control sensor with the nut.
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

86. INSTALL CRANK POSITION SENSOR

(a) Apply engine oil on a new O-ring, install the it to the crank position sensor.
(b) Install the crank position sensor with the 2 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

87. INSTALL CAMSHAFT POSITION SENSOR

(a) Apply engine oil on a new O-ring, install the it to the camshaft position sensor.
(b) Install the camshaft position sensor with the bolt.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

88. INSTALL ENGINE OIL PRESSURE SWITCH ASSY

(a) Clean the threads of the engine oil pressure switch, and apply adhesive there.
Adhesive: Prat No. 08833-00080, THREE BOND 1344
(b) Using SST, install the engine oil pressure switch.
SST 09268-46021
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

89. INSTALL THERMOSTAT
(See page 16-24)

90. INSTALL WATER INLET

(a) Install the water inlet with the 2 nuts.
Torque: 11 N·m (112 kgf·cm, 8 ft·lbf)

91. INSTALL WATER BY-PASS PIPE NO.1

(a) Install a new gaseket and water by-pass pipe with the 2 nuts and 2 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

92. INSTALL OIL LEVEL GAGE GUIDE

(a) Apply a light coat of a new O-ring and install it to the oil level gage guide.
(b) Install the oil level gage guide with the bolt.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

93. INSTALL INTAKE MANIFOLD

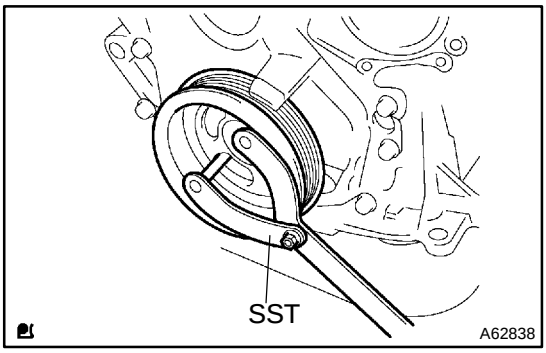
(a) Install a new gasket to the intake manifold.
(b) Install the intake manifold and 2 clamp brackets with the 2 nuts and 4 bolts,
Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

94. INSTALL GENERATOR ASSY
(See page 19-20)

95. INSTALL FUEL DELIVERY PIPE SUB-ASSY
(See page 11-25)

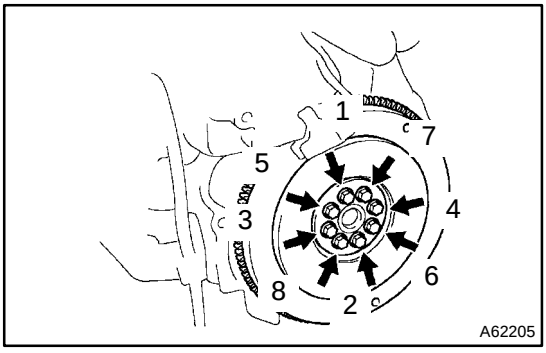
96. INSTALL IGNITION COIL ASSY

(a) Install the 4 ignition coils with the 4 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

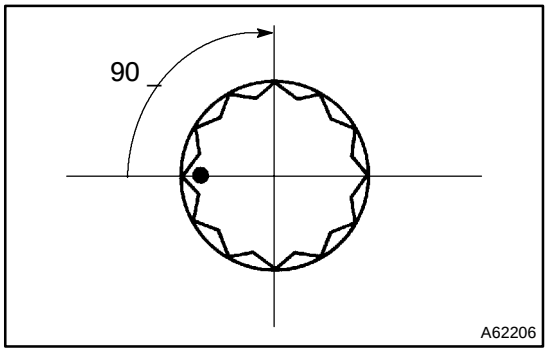


97. INSTALL FLYWHEEL SUB-ASSY (M/T TRANSAXLE)

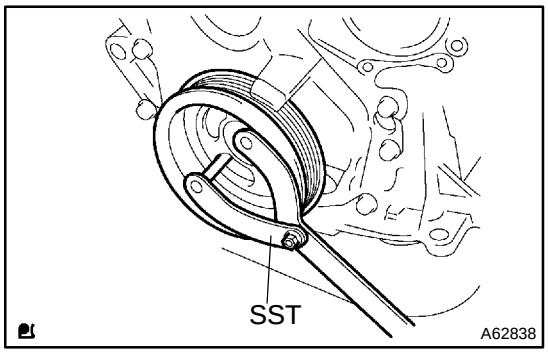
(a) Fix the crankshaft with SST.
SST 09960-10010 (09962-01000, 09963-01000)



(b) Clean the bolt and bolt hole.
(c) Apply adhesive to the bolts.
Adhesive:
Part No. 09330-00070, THREE BOND or equivalent.
(d) Install and uniformly tighten the 8 bolts, in several passes, in the sequence shown.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

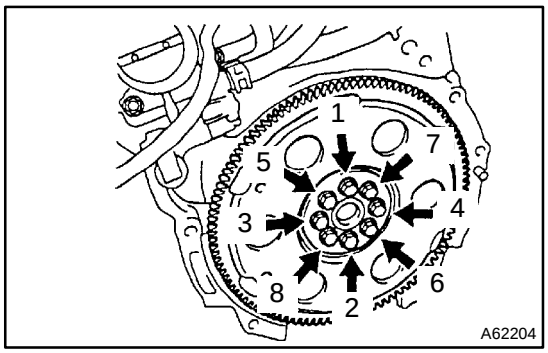


(e) Mark the bolts with paint.
(f) Retighten the bolts by an additional 90 _.
(g) Check that the point marked bolts are moved at 90 _ angle.



98. INSTALL DRIVE PLATE & RING GEAR SUB-ASSY (A/T TRANSAXLE)

(a) Fix the crankshaft with SST.
SST 09960-10010 (09962-01000, 09963-01000)



(b) Clean the bolt and bolt hole.
(c) Apply adhesive to the bolts.
Adhesive:
Part No. 09330-00070, THREE BOND or equivalent.
(d) Install and uniformly tighten the 8 bolts, in several passes, in the sequence shown.
Torque: 88 N·m (897 kgf·cm, 65 ft·lbf)

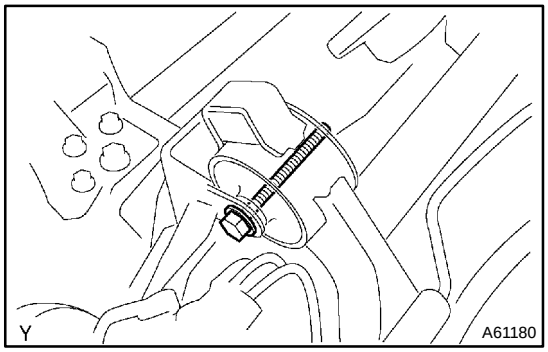
99. INSTALL CLUTCH DISC ASSY (M/T TRANSAXLE)
(See page 41-24)
SST 09301-00210

100. INSTALL CLUTCH COVER ASSY (M/T TRANSAXLE)
(See page 41-24)
SST 09301-00210

101. INSTALL MANUAL TRANSAXLE ASSY (M/T TRANSAXLE)
(See page 41-24)

102. INSTALL AUTOMATIC TRANSAXLE ASSY (A/T TRANSAXLE)
(See page 40-14)

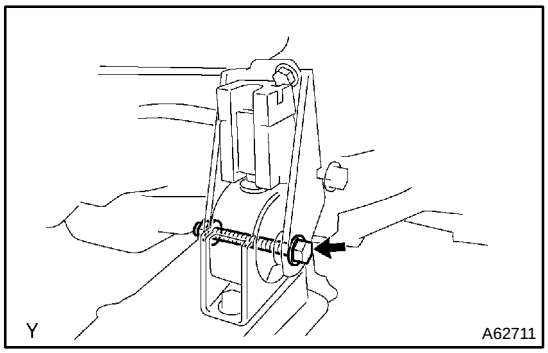
103. INSTALL STARTER ASSY
(See page 19-15)



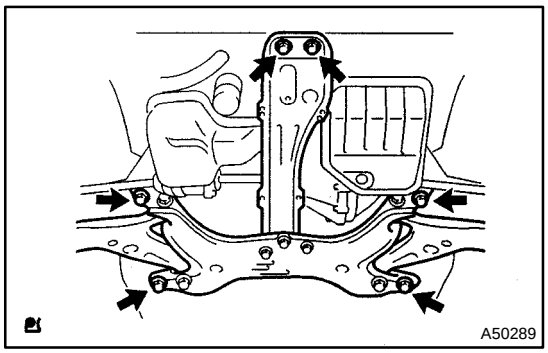
104. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSY

(a) Attach the engine and transaxle assembly to the suspension crossmember and engine mounting member.

(b) Install the bolt holding the rear engine mounting bracket to the mounting insulator.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)



(c) Install the bolt holding the front engine mounting bracket to the mounting insulator.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



105. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE (TMC MADE)

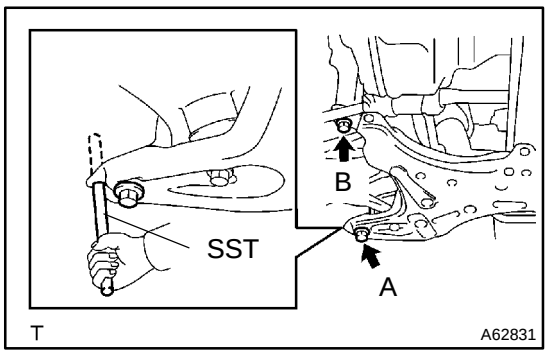
(a) Set the engine with transaxle on the engine lifter.

(b) Install the engine with transaxle to the vhicle.

(c) Temporarily, install the suspension crossmember and 6 bolts.

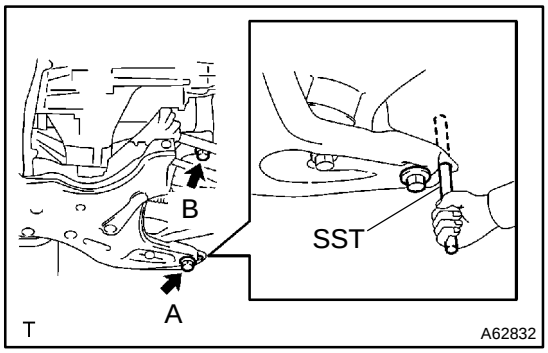
(d) Install the engine mounting insulator LH.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

(e) Install the engine mounting insulator RH.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



(f) Insert SST to the positioning holes on the right handle crossmember and on the right-handle of the vehicle.
SST 09670-00010

(g) Temporarily tighten the bolt A first, then Bolt B.

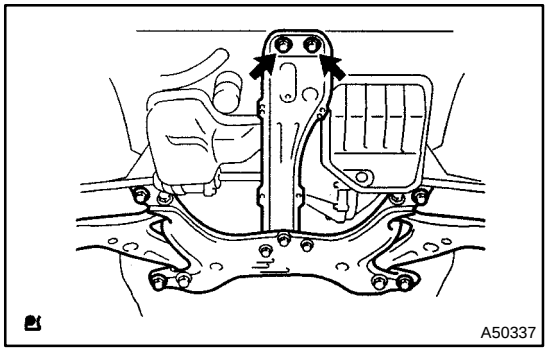


(h) Insert SST to the positioning holes on the left handle crossmember and on the left-handle of the vehicle.
SST 09670-00010

(i) Temporarily tighten the bolt A first, then Bolt B.

(j) Insert SST to the positioning holes on the right-handle crossmember and right-handleof the vhicle, then tighten the bolts with a specified torque.

(k) Insert SST to the positioning holes on the right-handle crossmember and left-handleof the vhicle, then tighten the bolts with a specified torque.
SST 09670-00010
Torque:
Bolt A 157 N·m (1,601 kgf·cm, 116 ft·lbf)
Bolt B 113 N·m (1,152 kgf·cm, 83 ft·lbf)

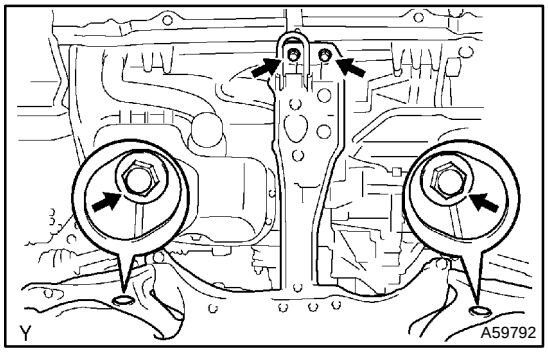


(l) Tighten the 2 bolts, as shown in the illustration.
Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)

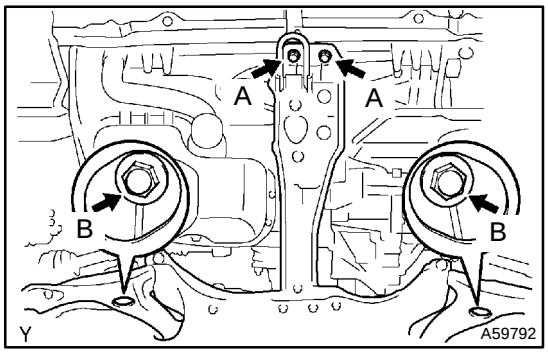
NOTICE:
After installing the crossmember, check that the positioning holes on the crossmember and vhicle are alligned with each other.

106. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE (TMUK MADE)

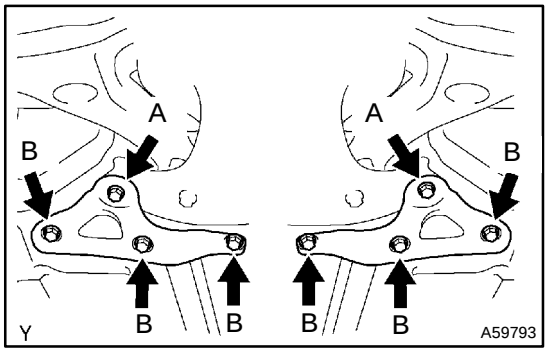
(a) Set the engine assembly with transaxle on the ingine lifter.



(b) Temporarily, install the suspension crossmember, 2 bolts and 2 nuts.
(c) Install the engine mounting insulator LH.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)
(d) Install the engine mounting insulator RH.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



(e) Install the 2 bolts and, 2 nuts and front suspension crossmember.
Torque:
Bolt A 39 N·m (398 kgf·cm, 29 ft·lbf)
Nut B 133 N·m (1,356 kgf·cm, 98 ft·lbf)



(f) Install the 8 bolts and front suspension member brace LH and RH.
Torque:
Bolt A 133 N·m (1,356 kgf·cm, 98 ft·lbf)
Bolt B 80 N·m (816 kgf·cm, 59 ft·lbf)

NOTICE:
After installing the crossmember, check that the positioning holes on the crossmember and the vehicle are aligned with each other.

107. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH
(See page 30-6)

HINT:
Perform the same procedure as above on the opposite side.

108. INSTALL LINK ASSY, FR STABILIZER (See page 26-20)

HINT:
Perform the same procedure as above on the opposite side.

109. INSTALL END SUB-ASSY, TIE ROD, NO.2 (See page 30-6)

HINT:
Perform the same procedure as above on the opposite side.

110. INSTALL FRONT AXLE HUB LH NUT
(See page 30-6)

HINT:
Perform the same procedure as above on the opposite side.

111. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-5)

112. INSTALL FLOOR PANEL BRACE FRONT

(a) Install front floor panel brace with the 2 nuts.
Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

113. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2
(See page 51-6)

114. INSTALL COOLER COMPRESSOR ASSY (W/ AIR CONDITIONER)
(See page 55-80)

115. INSTALL CLUTCH RELEASE CYLINDER ASSY (M/T TRANSAXLE)
(See page 41-24)

116. INSTALL AIR CLEANER ASSY

(a) Install air cleaner case with 3 bolts.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)
(b) Install air cleaner cap with 2 clamps. (TMUK MADE)

117. INSTALL BATTERY CARRIER

(a) Install battery carrier with the 4 bolts.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

118. INSTALL BATTERY
Torque:
Bolt 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Nut 3.0 - 4.0 N·m (31 - 41 kgf·cm, 27 - 35 in.·lbf)

119. INSTALL RADIATOR ASSY

120. INSTALL RADIATOR SUPPORT UPPER

Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)

121. INSTALL CYLINDER HEAD COVER NO.2

(a) Install the cylinder head cover with the 2 nuts and 2 clips.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

122. INSTALL FRONT WHEELS
Torque: 103 N·m (1050 kgf·cm, 76 ft·lbf)

123. ADD AUTOMATIC TRANSAXLE FLUID (A/T TRANSAXLE)

124. ADD ENGINE OIL

125. ADD COOLANT **(See page 16-20)**

126. CHECK ENGINE OIL LEAK

127. CHECK ENGINE COOLANT LEAK **(See page 16-21)**

128. CHECK FUEL LEAK

129. CHECK EXHAUST GAS LEAK

130. INSPECT CHECK IDLE SPEED AND IGNITION TIMING **(See page 14-82)**
SST 09843-18030, 09843-18040

131. INSPECT CO/HC **(See page 14-82)**

132. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT

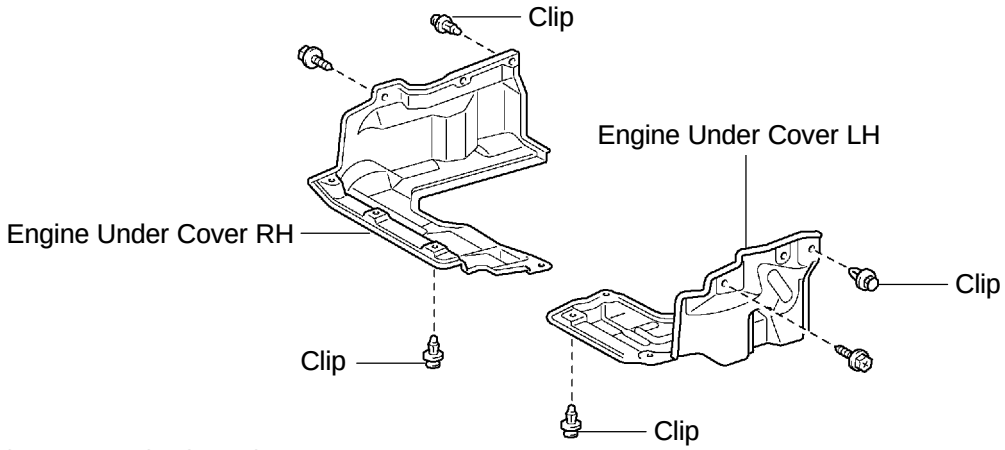
133. CHECK ABS SPEED SENSOR SIGNAL

CHAIN SUB-ASSY (3ZZ-FE/4ZZ-FE)

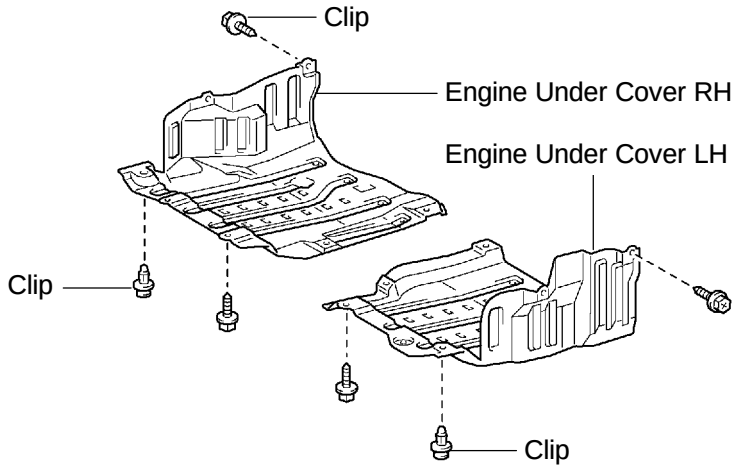
COMPONENTS

140MC-01

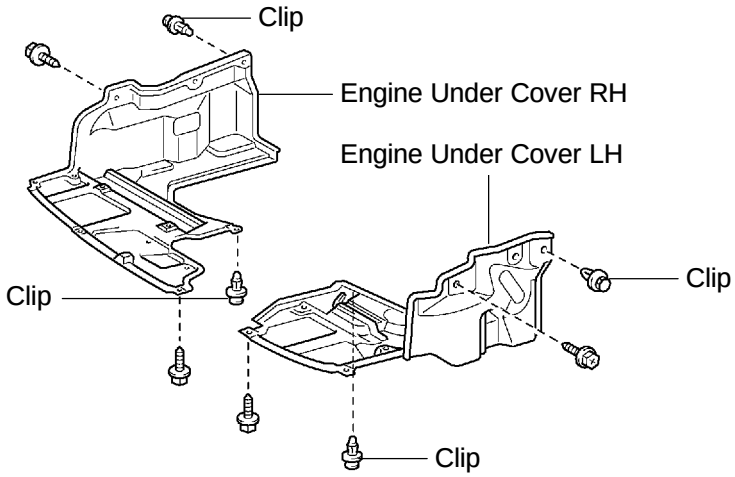
TMC MADE:



TMC MADE, ROUGH ROAD TYPE:

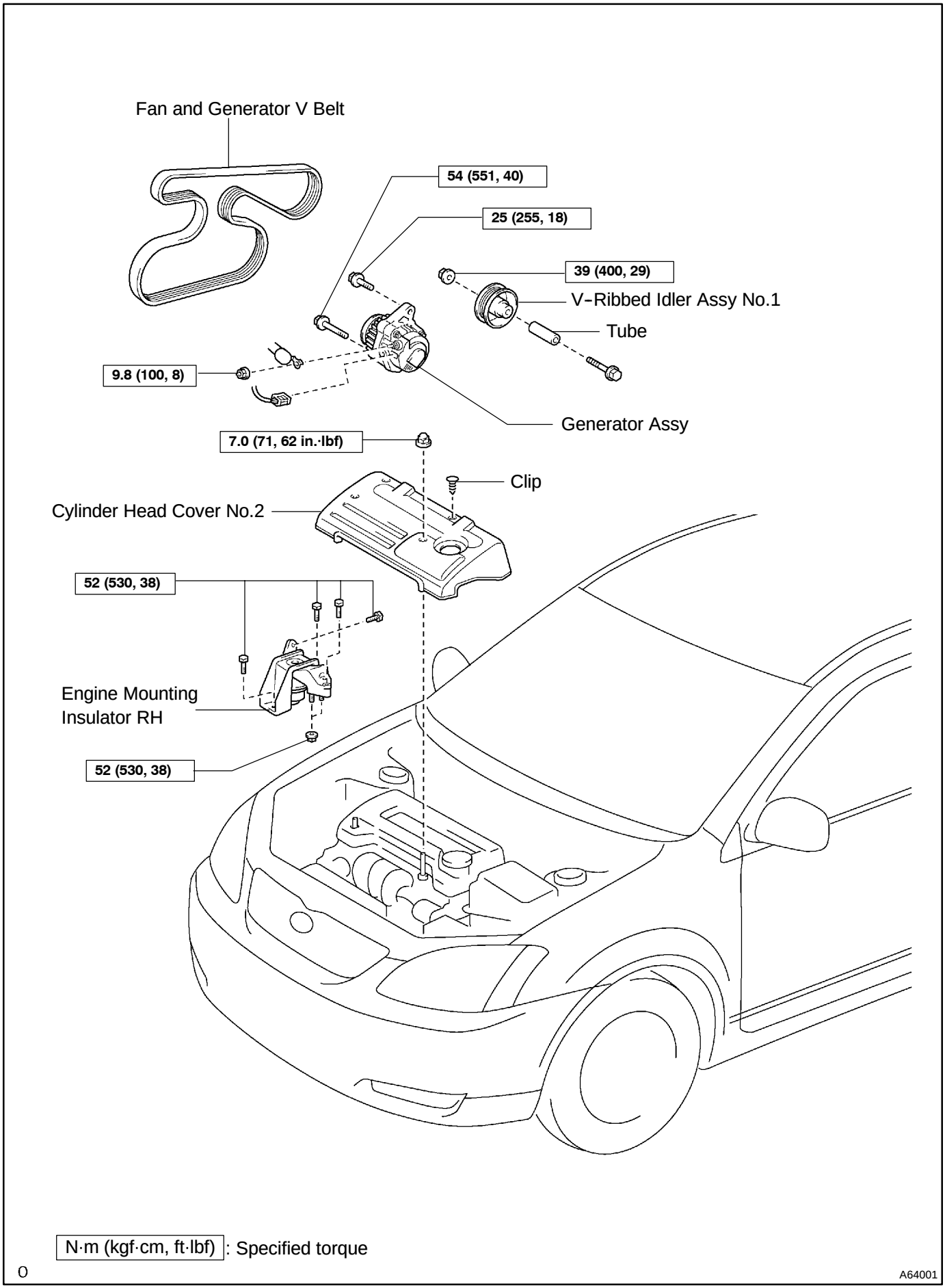


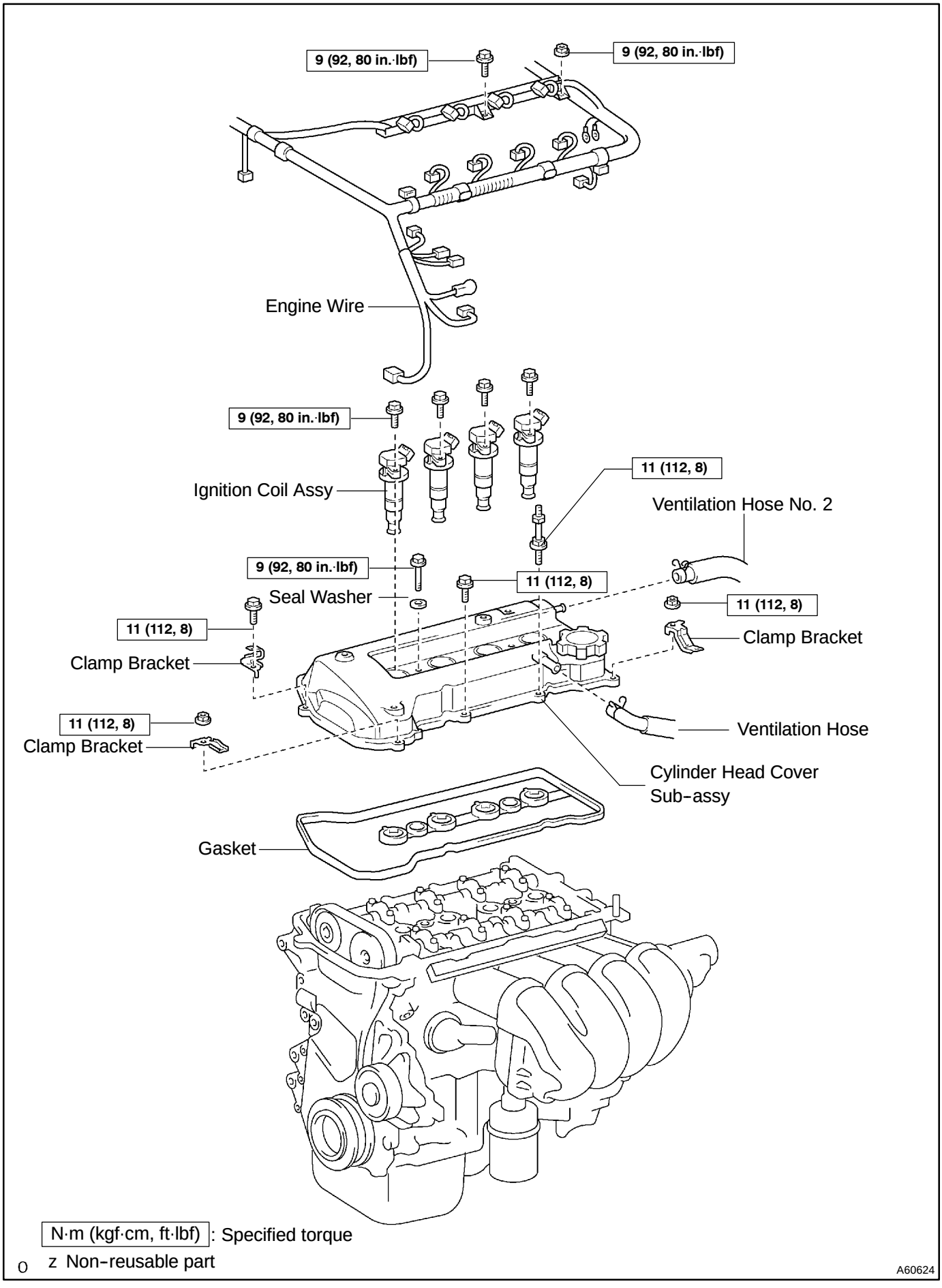
TMUK MADE:

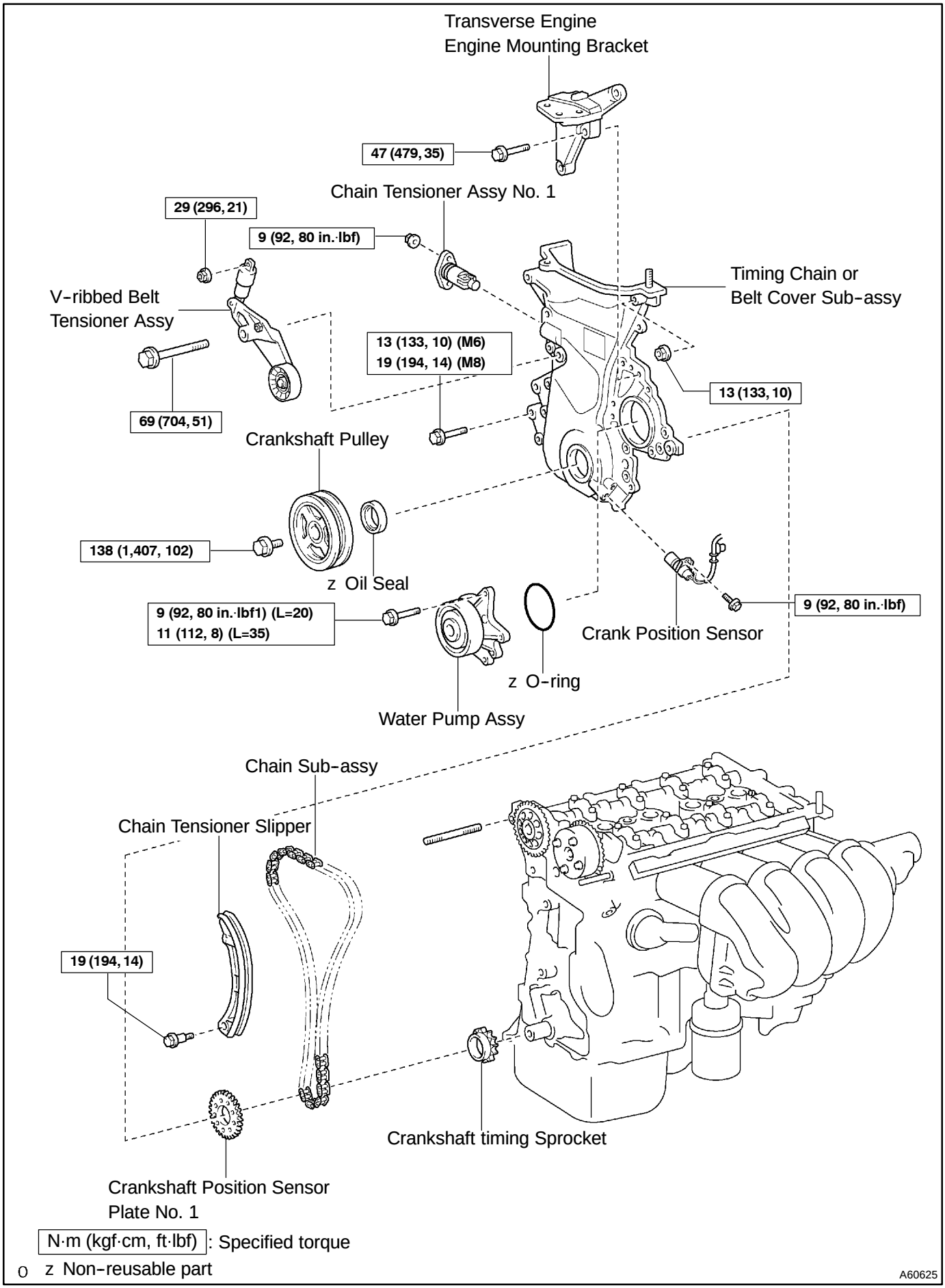


O

A61481


Fan and Generator V Belt
54 (551, 40)
25 (255, 18)
39 (400, 29)
V-Ribbed Idler Assy No.1
Tube
9.8 (100, 8)
Generator Assy
7.0 (71, 62 in.·lbf)
Clip
Cylinder Head Cover No.2
52 (530, 38)
Engine Mounting
Insulator RH
52 (530, 38)
N·m (kgf·cm, ft·lbf): Specified torque
A64001


9 (92, 80 in.·lbf)
9 (92, 80 in.·lbf)
Engine Wire
9 (92, 80 in.·lbf)
Ignition Coil Assy
11 (112, 8)
Ventilation Hose No. 2
9 (92, 80 in.·lbf)
Seal Washer
11 (112, 8)
11 (112, 8)
11 (112, 8)
Clamp Bracket
Clamp Bracket
11 (112, 8)
Clamp Bracket
Ventilation Hose
Cylinder Head Cover Sub-assy
Gasket
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A60624


Transverse Engine
Engine Mounting Bracket
47 (479, 35)
Chain Tensioner Assy No. 1
29 (296, 21)
9 (92, 80 in.·lbf)
V-ribbed Belt
Tensioner Assy
Timing Chain or
Belt Cover Sub-assy
13 (133, 10) (M6)
19 (194, 14) (M8)
13 (133, 10)
69 (704, 51)
Crankshaft Pulley
138 (1,407, 102)
z Oil Seal
9 (92, 80 in.·lbf1) (L=20)
11 (112, 8) (L=35)
9 (92, 80 in.·lbf)
Crank Position Sensor
z O-ring
Water Pump Assy
Chain Sub-assy
Chain Tensioner Slipper
19 (194, 14)
Crankshaft timing Sprocket
Crankshaft Position Sensor
Plate No. 1
N·m (kgf·cm, ft·lbf): Specified torque
o z Non-reusable part
A60625

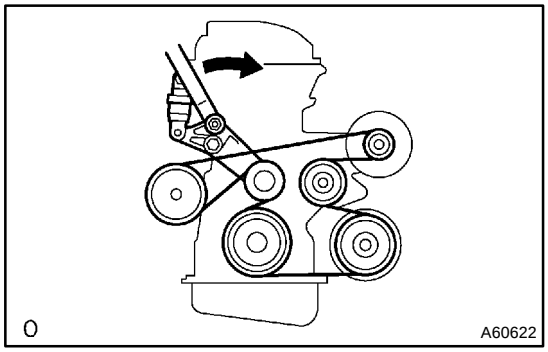
REPLACEMENT

1. REMOVE ENGINE UNDER COVER LH

2. REMOVE ENGINE UNDER COVER RH

3. DRAIN COOLANT **(See page 16-20)**
4. REMOVE FRONT WHEEL RH
5. REMOVE CYLINDER HEAD COVER NO.2

(a) Remove the 2 nuts, 2 clips and cylinder head cover.



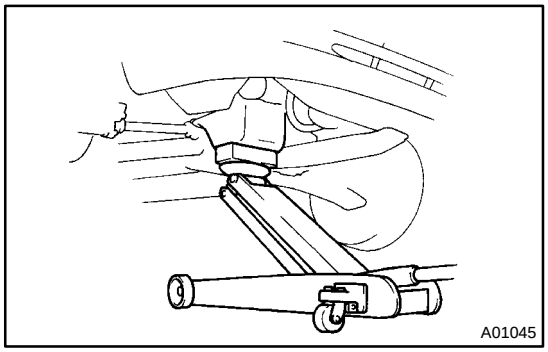
6. REMOVE FAN AND GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner slowly clockwise and loosen it. Then, remove the fan and generator belt and put back the V-ribbed belt tensioner little by little and fix it quietly.

7. REMOVE V-RIBBED IDLER ASSY NO.1

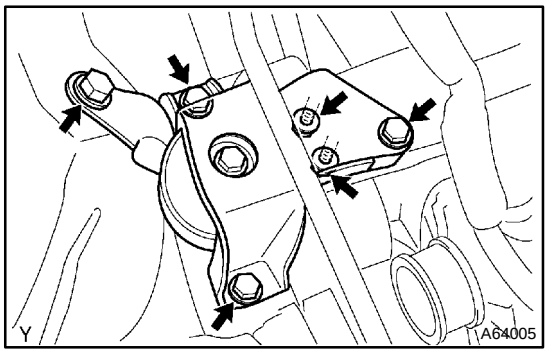
(a) Remove the nut, bolt, tube and idler.

8. REMOVE GENERATOR ASSY
(See page 19-20)



9. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Place a wooden block between the jack and engine, and set the jack, then remove the 4 bolts, 2nuts and engine mounting insulator RH.



10. REMOVE IGNITION COIL ASSY

(a) Disconnect the 4 connectors.
(b) Remove 4 bolts and 4 ignition coils.

11. DISCONNECT ENGINE WIRE

(a) Disconnect the connectors.
(b) Remove the 3 clamps from the 3 clamp brackets.
(c) Remove the bolt and nut installing the engine wire.

12. DISCONNECT VENTILATION HOSE

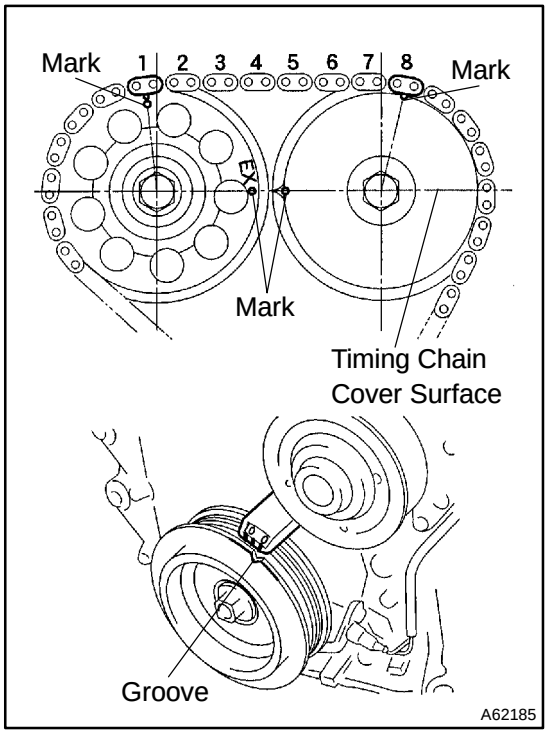
(a) Disconnect the ventilation hose from the cylinder head cover.

13. DISCONNECT VENTILATION HOSE NO.2

(a) Disconnect the ventilation hose from the cylinder head cover.

14. REMOVE CYLINDER HEAD COVER SUB-ASSY

(a) Remove the 9 bolts, 2 seal washers, 2 nuts, 3 clamp brackets and cylinder head cover.



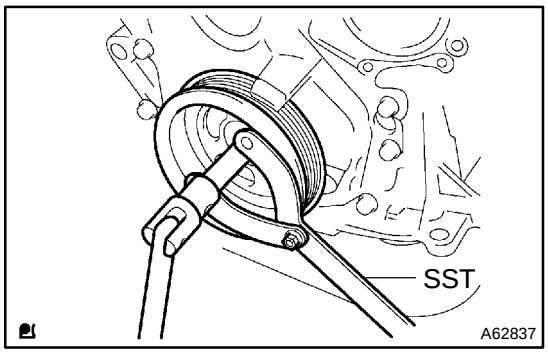
15. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.

(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

HINT:

If not, turn the crankshaft 1 revolution (360_) and align the marks as above.



16. REMOVE CRANKSHAFT PULLEY

(a) Using SST, remove the pulley bolt.

SST 09960-10010 (09962-01000, 09963-01000)

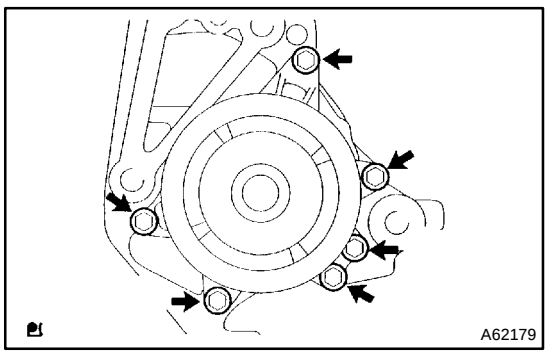
(b) Remove the crankshaft pulley from the crankshaft.

17. REMOVE V-RIBBED BELT TENSIONER ASSY

(a) Remove the bolt, nut and V-ribbed belt tensioner.

HINT:

Handle a jack up and down to remove the bolt.



18. REMOVE WATER PUMP ASSY

(a) Remove the 6 bolts, water pump and O-ring.

19. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 3 bolts and transverse engine engine mounting bracket.

20. REMOVE CRANK POSITION SENSOR

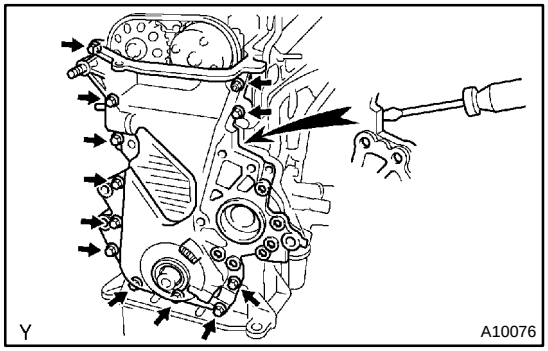
(a) Remove the 2 bolts installing the crank position sensor.

21. REMOVE CHAIN TENSIONER ASSY NO.1

(a) Remove the 2 nuts and chain tensioner.

NOTICE:

Be sure not to revolve the crankshaft without the chain tensioner.

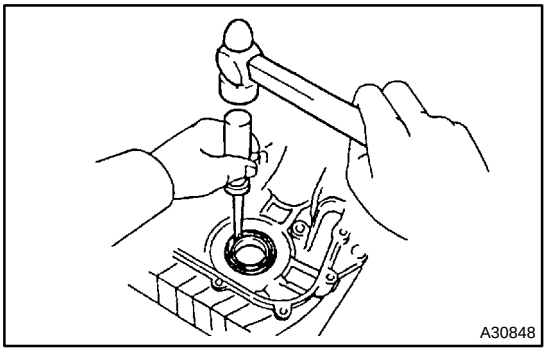


22. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY

(a) Remove the 11 bolts and nuts.
(b) Using a torx wrench socket (E8), remove the stud bolt.
(c) Remove the timing chain cover by prying the portions between the cylinder head and cylinder block with a screwdriver.

NOTICE:

Be careful no tot damage the contact surfaces of the timing chain cover, cylinder head and cylinder block.



23. REMOVE TIMING GEAR COVER OIL SEAL

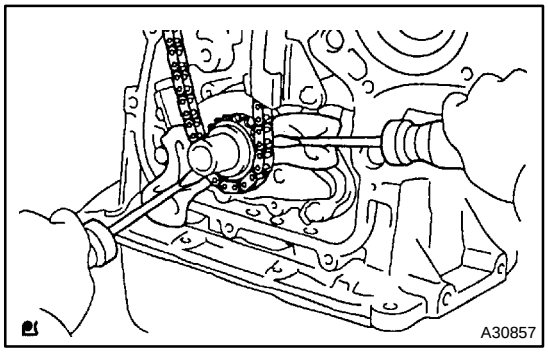
(a) Using a screwdriver, remove the oil seal.

24. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1

(a) Remove the crankshaft position sensor plate from the crankshaft.

25. REMOVE CHAIN TENSIONER SLIPPER

(a) Remove the bolt and chain tensioner slipper.

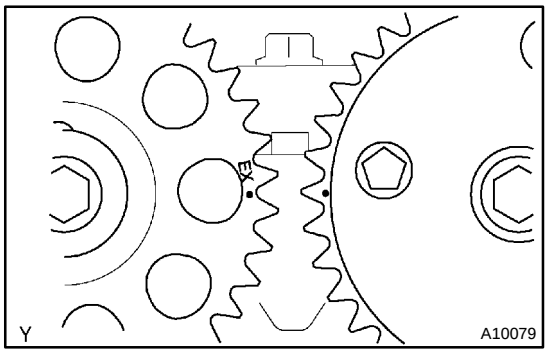


26. REMOVE CHAIN SUB-ASSY

(a) Remove the timing chain with the crankshaft timing gear plying screwdrivers as shown in the illustration.

NOTICE:

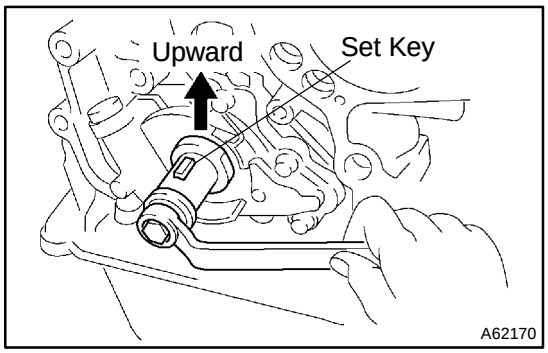
- **Put shop rag to protect the engine.**
- **In case of revolving the camshafts with the chain off the sprockets, turn the crankshaft 1/4 revolution for valves not to touch the pistons.**



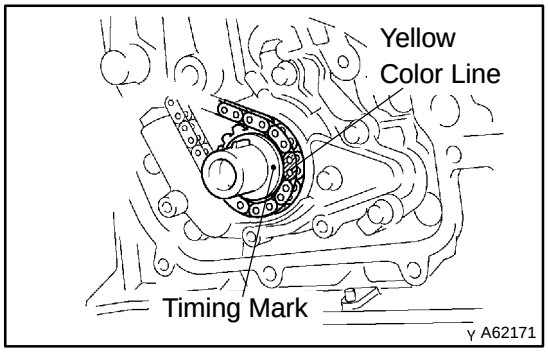
27. INSTALL CHAIN SUB-ASSY

(a) Set No. 1 cylinder to TDC/compression.

(1) Turn the hexagonal wrench head portion of the camshafts, and align the point marks of the camshaft timing sprockets.

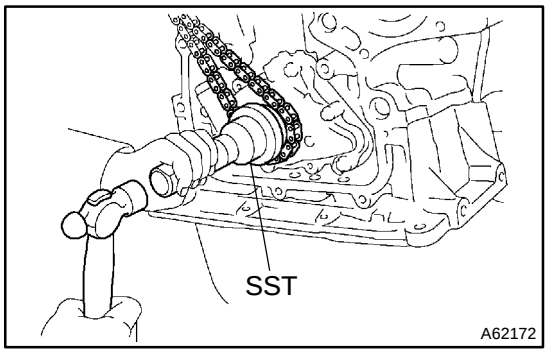


(2) Using a crankshaft pulley bolt, turn the crankshaft and set the set key on the crankshaft upward.

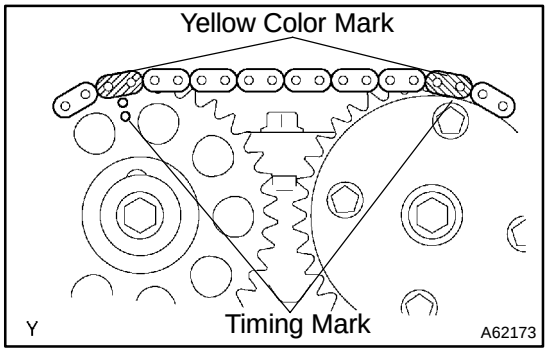


(b) Install the timing chain on the crankshaft timing sprocket with the yellow color link aligned with the timing mark on the crankshaft timing sprocket.

HINT:
Three yellow color links are on the chain.



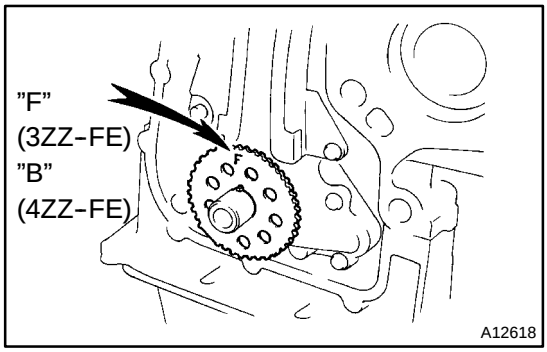
(c) Using SST, install the crankshaft timing sprocket.
SST 09223-22010



(d) Install the timing chain on the camshaft timing sprockets with the yellow color links aligned with the timing marks on the camshaft timing sprockets.

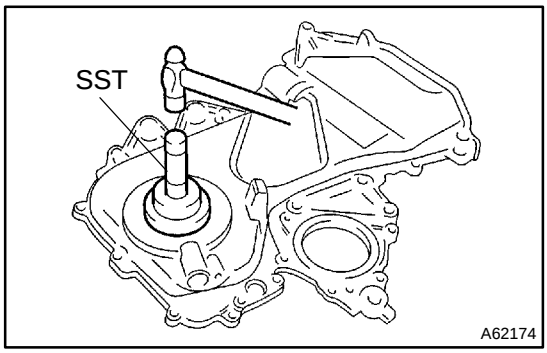
28. INSTALL CHAIN TENSIONER SLIPPER

(a) Install the chain tensioner slipper with the bolt.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



29. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1

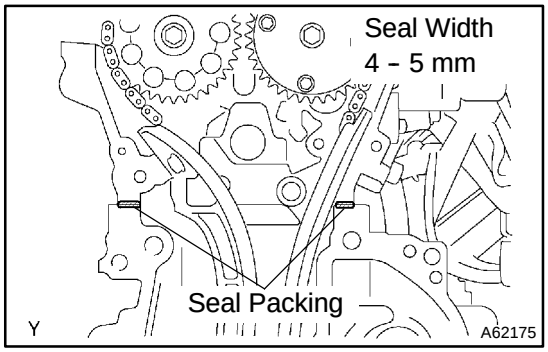
(a) Install the plate with the "F" (3ZZ-FE) or "B" (4ZZ-FE) mark facing forward.



30. INSTALL TIMING GEAR COVER OIL SEAL

(a) Apply MP grease to a new oil seal lip.
(b) Using SST, tap in the oil seal until its surface is flush with the timing chain cover edge.
SST 09223-22010

NOTICE:
Keep the lip off foreign materials.



31. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSY

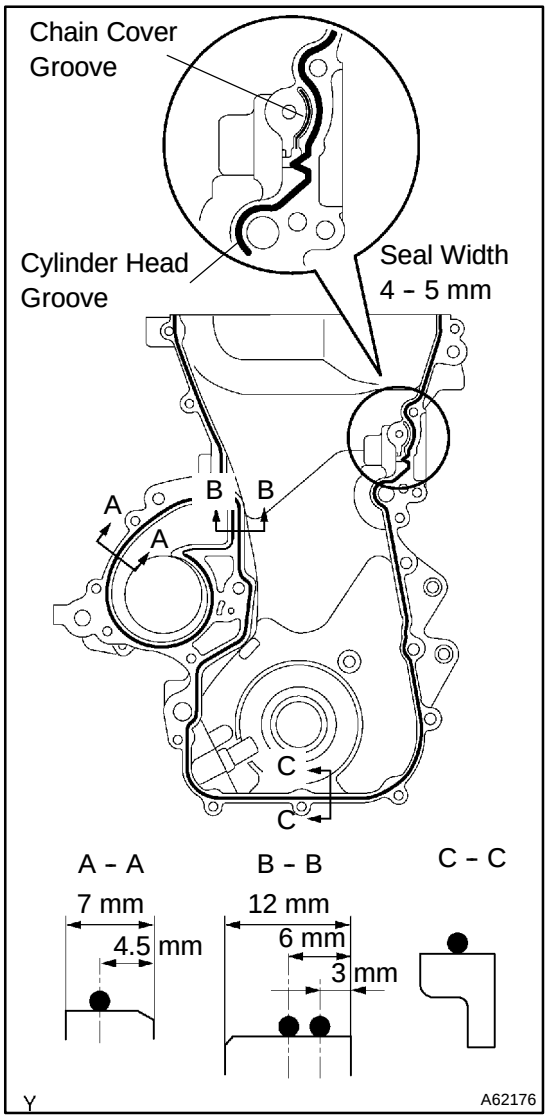
(a) Remove any old packing material from the contact surface.

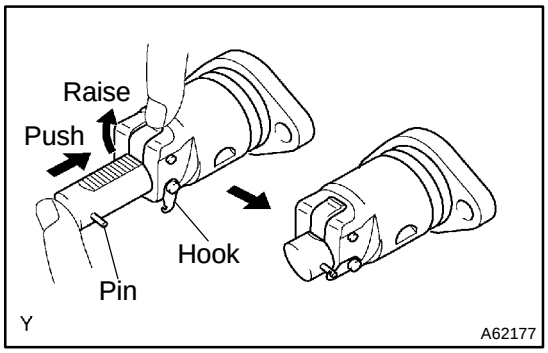
(b) Apply seal packing in the shape of bead (Diameter 3.5 mm - 4.5 mm (0.1379 - 0.177 in.)) consequently as shown in the illustration.
Seal packing:
Water pump part part No. 08826-00100 or equivalent
Other part part No. 08826-00080 or equivalent.

(c) Install the timing chain cover with the 11 bolts and nut.
Torque:
13 N·m (133 kgf·cm, 10 ft·lbf) (M6)
19 N·m (194 kgf·cm, 14 ft·lbf) (M8)

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the oil pan within 3 minutes after applying seal packing.**
- **Do not put into engine oil within 2 hours after installing.**

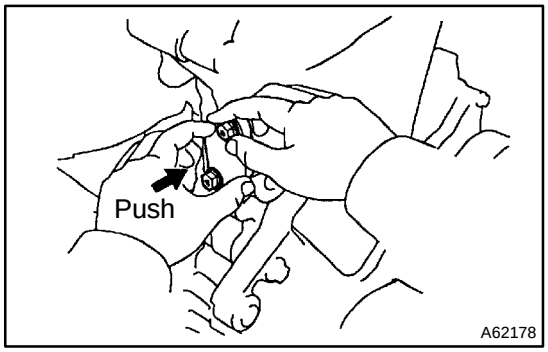
(d) Using a torx wrench socket (E8), install the stud bolt.





32. INSTALL CHAIN TENSIONER ASSY NO.1

(a) Check the O-ring is clean, and set the hook as shown in the illustration.



(b) Apply engine oil to the chain tensioner and install it withe 2 nuts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

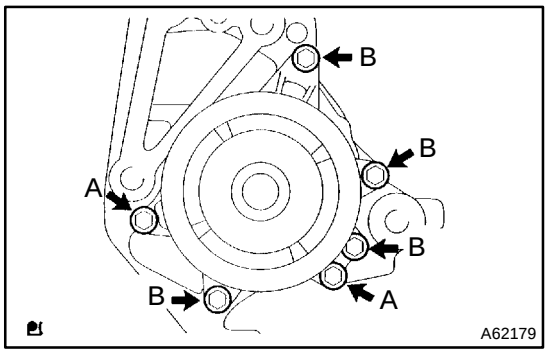
NOTICE:
When installing the tensioner, set the hook again if the hook release the plunger.

33. INSTALL CRANK POSITION SENSOR

(a) Apply a coat of the engine oil to the O-ring of the crank position sensor.
(b) Install the crank position sensor with the 2 bolts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

34. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the transverse engine engine mounting bracket with the 3 bolts.
Torque: 47 N·m (479 kgf·cm, 35 ft·lbf)

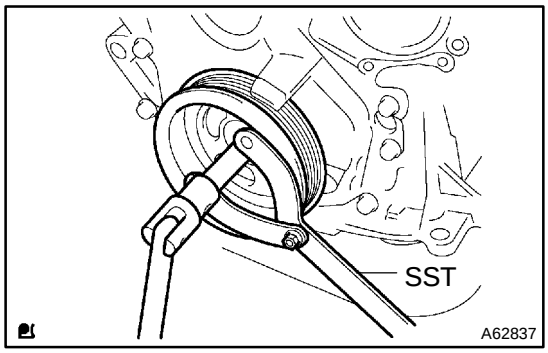


35. INSTALL WATER PUMP ASSY

(a) Place a new O-ring on the timing chain cover.
(b) Install the water pump with the 6 bolts.
Torque:
9 N·m (92 kgf·cm, 80 in.·lbf) for Bolt A
11 N·m (112 kgf·cm, 8 ft·lbf) for Bolt B

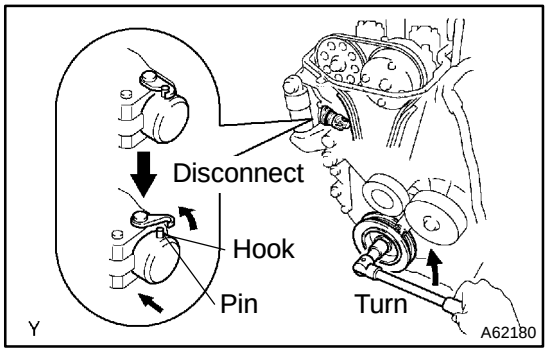
36. INSTALL V-RIBBED BELT TENSIONER ASSY

(a) Install the V-ribbed belt tensioner with the nut and bolt.
Torque:
29 N·m (296 kgf·cm, 21 ft·lbf) for Nut
69 N·m (704 kgf·cm, 51 ft·lbf) for Bolt

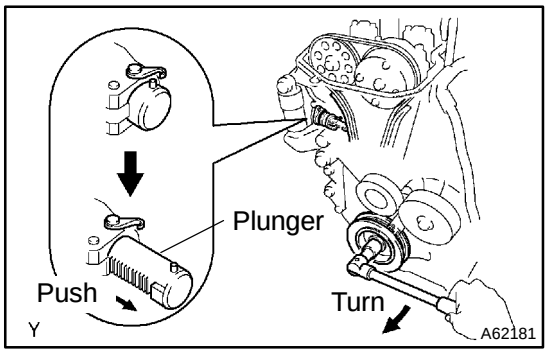


37. INSTALL CRANKSHAFT PULLEY

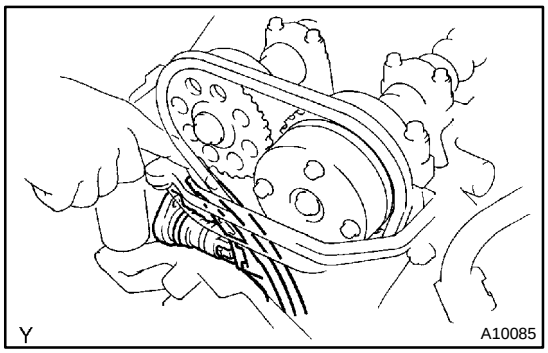
(a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.
(b) Using SST, install the crankshaft pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 138 N·m (1,407 kgf·cm, 102 ft·lbf)



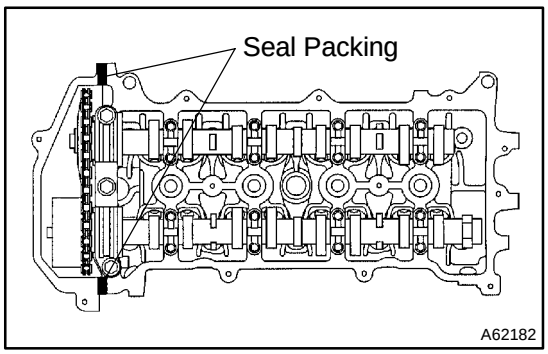
(c) Turn the crankshaft counter clockwise, and disconnect the plunger knock pin form the hook.



(d) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.



HINT:
If the plunger does not spring out, press the slipper into the chain tensioner with a screwdriver or your finger so that the hook is released from the knock pin and the plunger springs out.



38. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Remove any old pacing (FIPG) material.
(b) Apply seal packing to 2 locations as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**

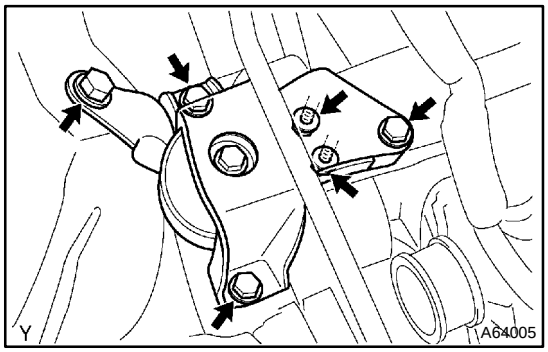
(c) Install the cylinder head cover and 3 cable brackets with the 9 bolts, 2 seal washers and 2 nuts. Uniformly tighten the bolts and nuts, in the several passes.
Torque:
11 N·m (112 kgf·cm, 8 ft·lbf) for w/o washer
9.0 N·m (92 kgf·cm, 80 in.·lbf) for w/ washer

39. INSTALL IGNITION COIL ASSY

(a) Install the 4 ignition coils with the 4 bolts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

40. INSTALL ENGINE WIRE

(a) Install the engine wire with the bolt and nut.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



41. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install engine mounting insulator RH with the 4 bolts and 2 nuts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

42. INSTALL GENERATOR ASSY
(See page 19-20)

43. INSTALL V-RIBBED IDLER ASSY NO.1

(a) Install the tube and idler with the nut and bolt.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

44. INSTALL CYLINDER HEAD COVER NO.2

(a) Install the cylinder head cover with the 2 nuts and 2 clips.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

45. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1050 kgf·cm, 76 ft·lbf)

46. ADD COOLANT **(See page 16-20)**

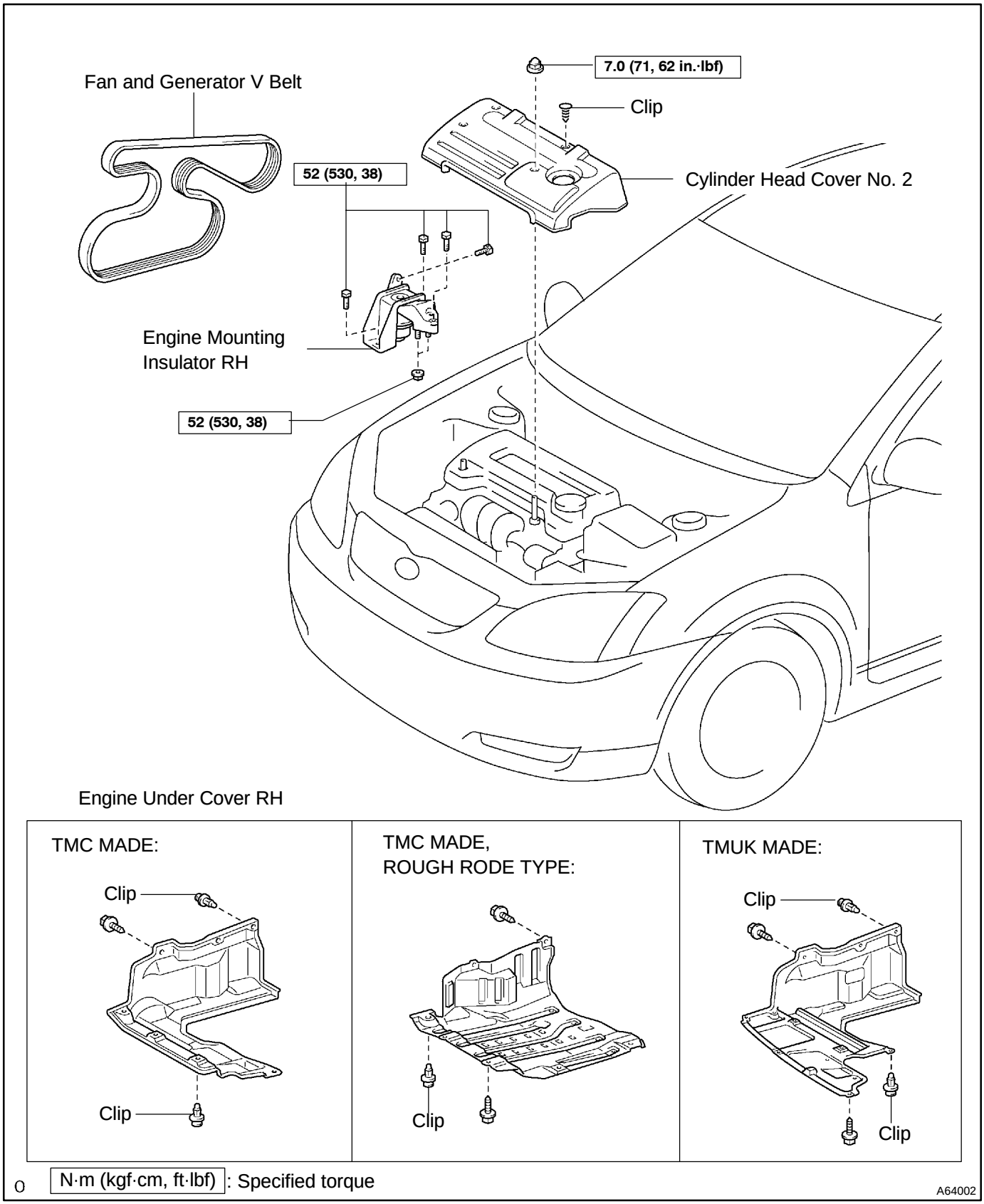
47. CHECK ENGINE COOLANT LEAK **(See page 16-15)**

48. CHECK ENGINE OIL LEAK

CAMSHAFT (3ZZ-FE/4ZZ-FE)

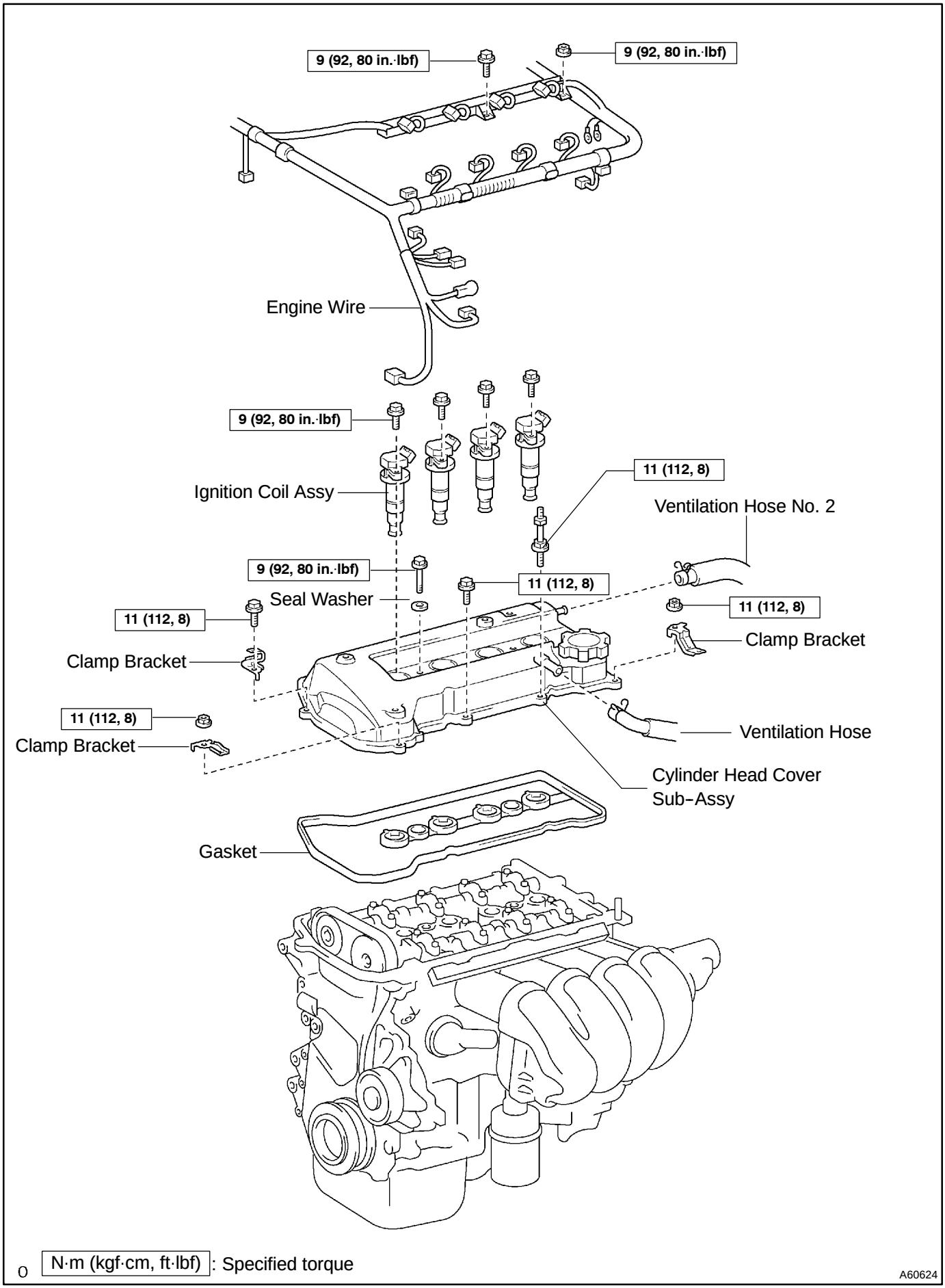
COMPONENTS

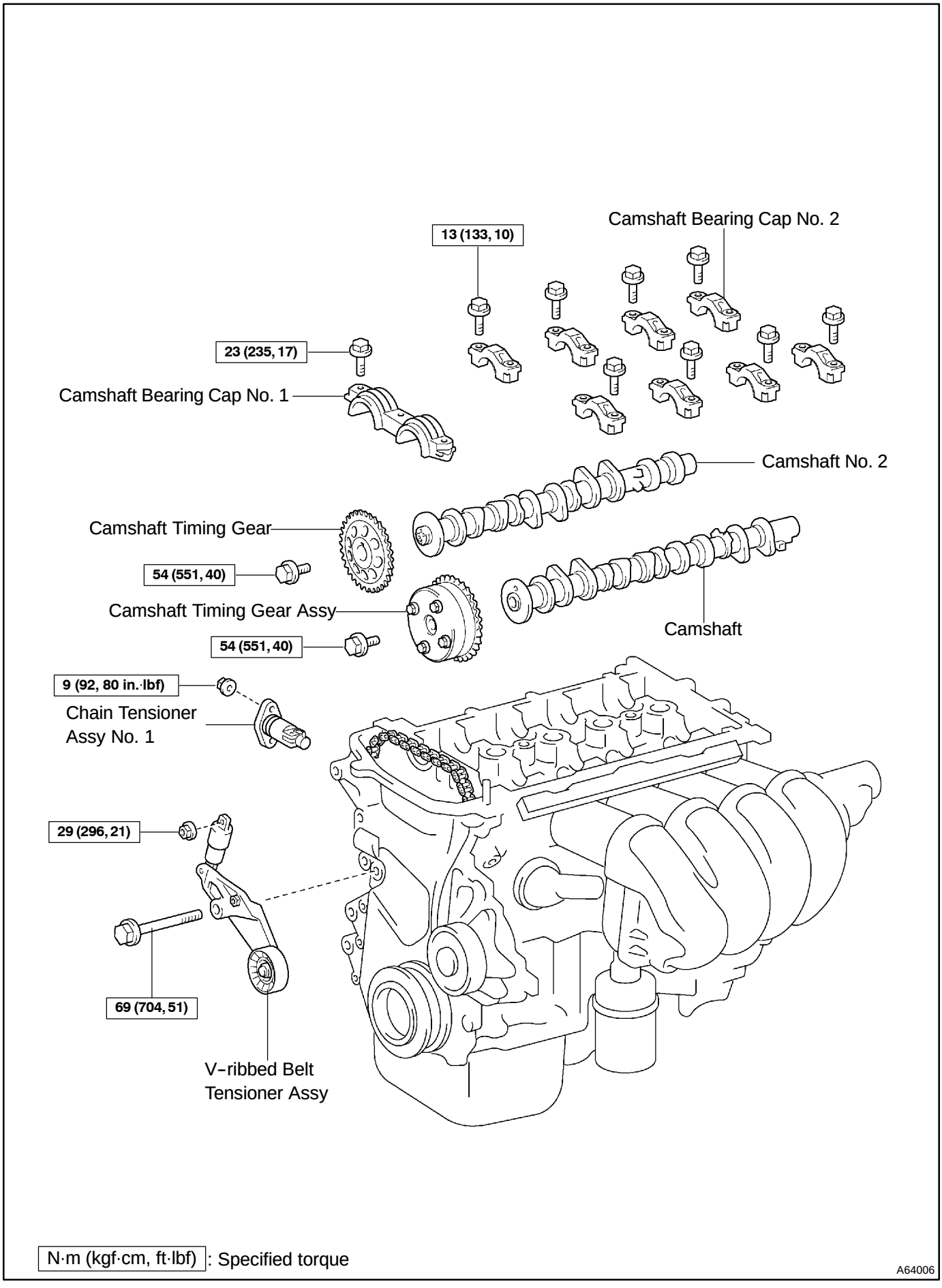
140ME-01



o N·m (kgf·cm, ft·lbf): Specified torque

A64002

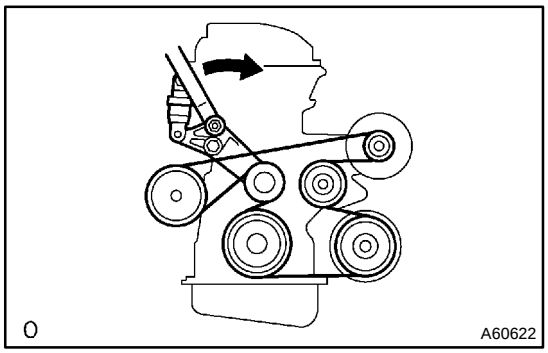

9 (92, 80 in.·lbf)
9 (92, 80 in.·lbf)
Engine Wire
9 (92, 80 in.·lbf)
Ignition Coil Assy
11 (112, 8)
Ventilation Hose No. 2
9 (92, 80 in.·lbf)
11 (112, 8)
Seal Washer
11 (112, 8)
11 (112, 8)
Clamp Bracket
Clamp Bracket
11 (112, 8)
Clamp Bracket
Ventilation Hose
Cylinder Head Cover Sub-Assy
Gasket
o N·m (kgf·cm, ft·lbf): Specified torque
A60624


Camshaft Bearing Cap No. 2
13 (133, 10)
23 (235, 17)
Camshaft Bearing Cap No. 1
Camshaft No. 2
Camshaft Timing Gear
54 (551, 40)
Camshaft Timing Gear Assy
54 (551, 40)
Camshaft
9 (92, 80 in.·lbf)
Chain Tensioner Assy No. 1
29 (296, 21)
69 (704, 51)
V-ribbed Belt Tensioner Assy
N·m (kgf·cm, ft·lbf): Specified torque
A64006

REPLACEMENT

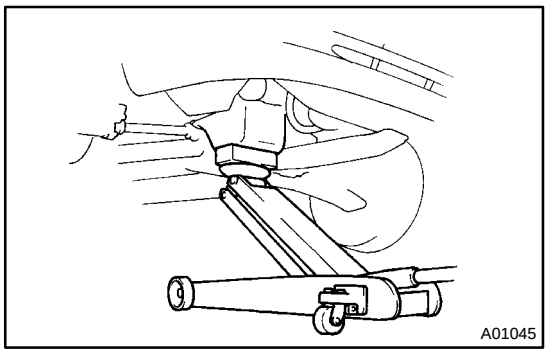
1. REMOVE ENGINE UNDER COVER RH

2. REMOVE CYLINDER HEAD COVER NO.2



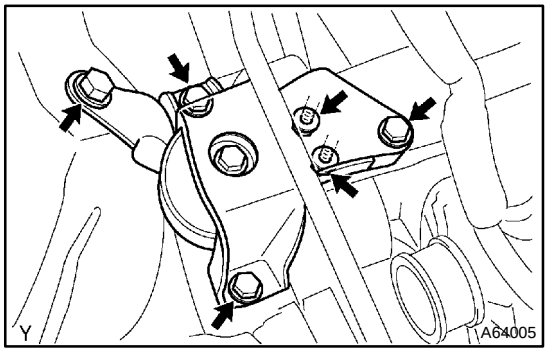
3. REMOVE FAN AND GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner slowly clockwise and loosen it. Then, remove the fan and generator belt and put back the V-ribbed belt tensioner little by little and fix it quietly.



4. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Place a wooden block between the jack and engine, and set the jack, then remove the 4 bolts, 2nuts and engine mounting insulator RH.



5. REMOVE IGNITION COIL ASSY

(a) Disconnect the 4 connectors.
(b) Remove the 4 bolts and 4 ignition coils.

6. DISCONNECT ENGINE WIRE

(a) Disconnect the connectors.
(b) Remove the 3 clamps from the 3 clamp brackets.
(c) Remove the bolt and nut installing the engine wire.

7. DISCONNECT VENTILATION HOSE

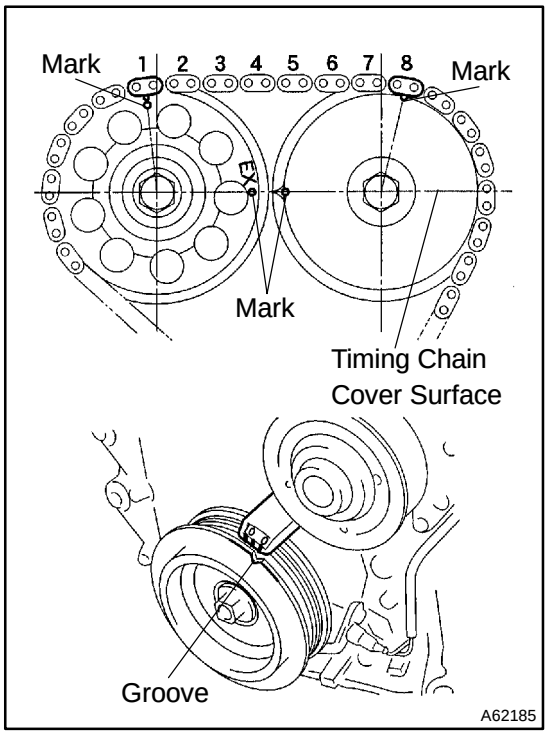
(a) Disconnect the ventilation hose from the cylinder head cover.

8. DISCONNECT VENTILATION HOSE NO.2

(a) Disconnect the ventilation hose from the cylinder head cover.

9. REMOVE CYLINDER HEAD COVER SUB-ASSY

(a) Remove the 9 bolts, 2 seal washers, 2 nuts, 3 clamp brackets and cylinder head cover.



10. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.

(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

HINT:

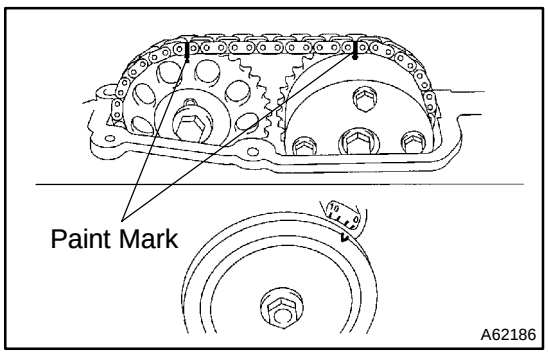
If not, turn the crankshaft 1 revolution (360_) and align the marks as above.

11. REMOVE V-RIBBED BELT TENSIONER ASSY

(a) Remove the bolt, nut and V-ribbed belt tensioner.

HINT:

Handle a jack up and down to remove the bolt.



12. REMOVE CAMSHAFT

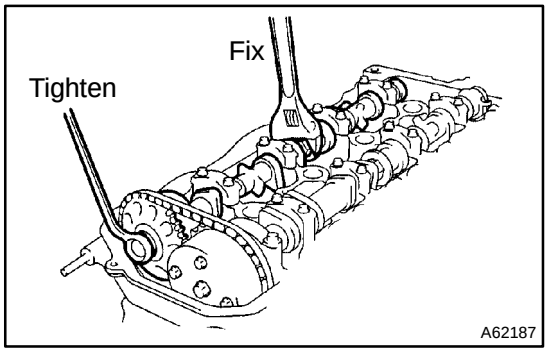
NOTICE:

Be sure not to revolve the crankshaft without the chain tensioner.

(a) Set the No. 1 cylinder to the TDC/compression.

(b) Place match marks on the timing chain and camshaft timing sprockets.

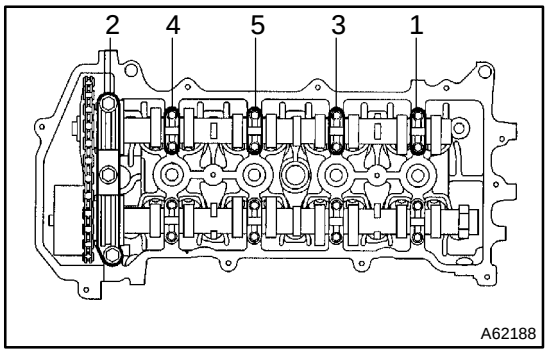
(c) Remove the 2 nuts and chain tensioner.



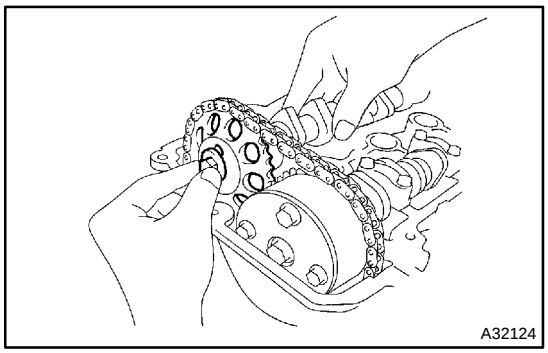
(d) Fix the camshaft with a wrench and so on, then loosen the camshaft timing gear set bolt.

NOTICE:

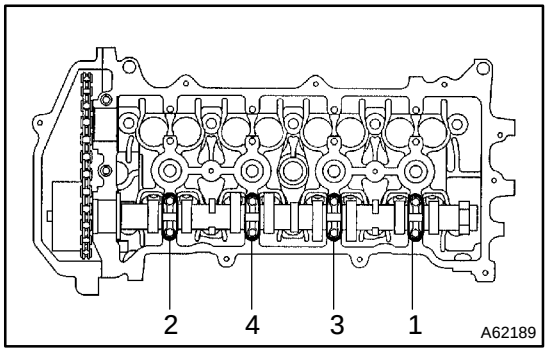
Be careful not to damage the valve lifter.



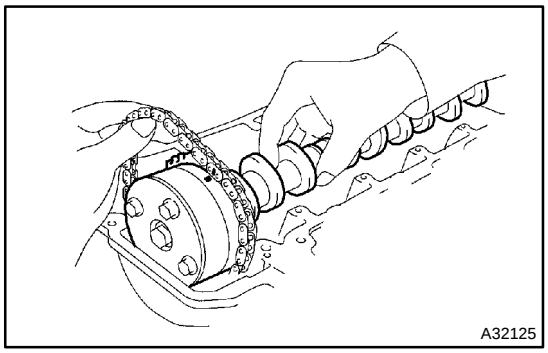
(e) Loosen the camshaft bearing cap bolts on No. 2 camshaft in the order as shown in the illustration in several passes,and remove the caps.



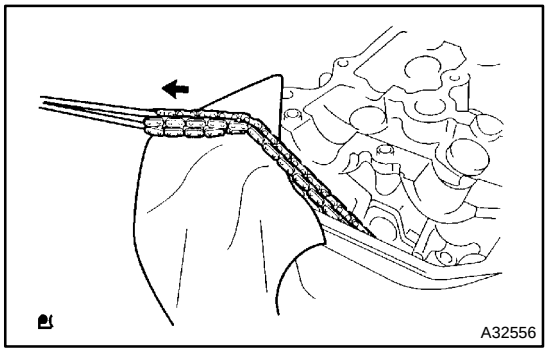
(f) Remove the camshaft timing gear as shown in the illustration.



(g) Loosen the camshaft bearing cap bolts on camshaft in the order as shown in the illustration in several passes,and remove the caps.



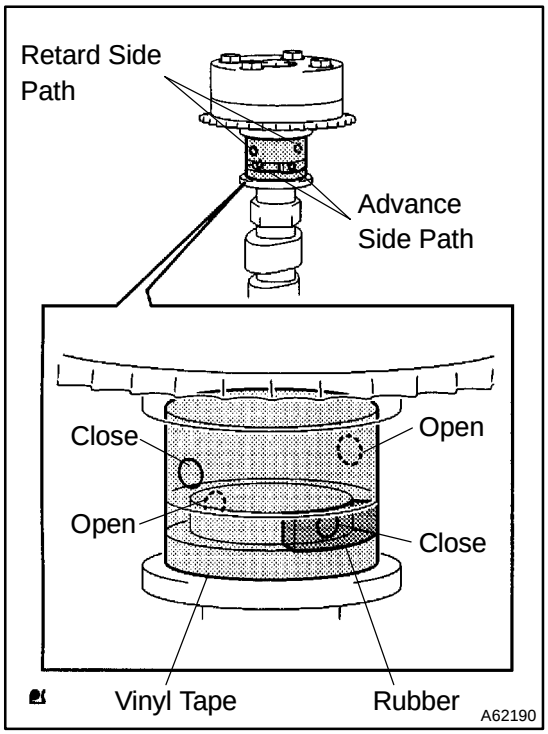
(h) Remove the camshaft with holding the timing chain.



(i) Tie the timing chain with a string as shown in the illustration.

NOTICE:

Be careful not to drop anything inside the timing chain cover.



13. INSPECT CAMSHAFT TIMING GEAR ASSY(W/ VVT-i)

(a) Check the lock of camshaft timing gear.

(1) Grip the camshaft with a vice, and confirm the camshaft timing gear is locked.

NOTICE:

Be careful not to damage the camshaft.

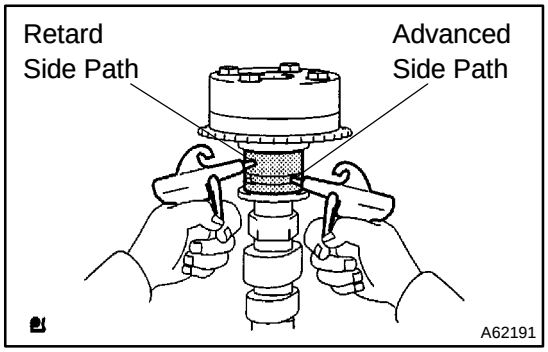
(b) Release lock pin.

(1) Cover 4 oil paths of cam journal with vinyl tape as shown in the illustration.

HINT:

Two advance side paths are provided in the groove of the camshaft. Plug one of the path with a rubber piece.

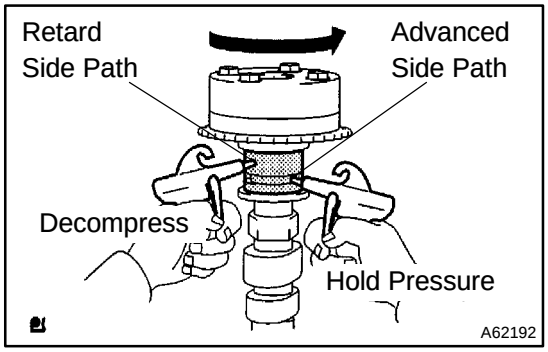
(2) Break through the tapes of the advance side path and the retard side path on the opposite side of the groove.



(3) Put air pressure into two broken paths (the advance side path and the retard side path) with about 150 kPa {1.5 kgf·cm}.

CAUTION:

Cover the pathes with shop rag to avoid oil splashing.



(4) Confirm if the camshaft timing gear assembly revolves in the timing advance direction when weakening the air pressure of the timing retard path.

HINT:

The lock pin is released, and camshaft timing gear, revolves in the advance direction.

(5) When the camshaft timing gear comes to the most advanced position, take out the air pressure of the timing retard side path, and then, take out that of timing advance side path.

CAUTION:
Camshaft timing assembly gear occasionally shifts to the retard side abruptly, if the air compression of the advanced side path is released before retard side path. It often causes the breakage of the lock pin.

(c) Check smooth revolution

(1) Revolve the camshaft timing gear assembly within the movable range except for the most retarded position several times, and check the smooth revolution.

CAUTION:
Be sure to perform this check by hand, instead of air pressure.

(d) Check the lock in the most retarded position.

(1) Confirm that the camshaft timing gear assembly is locked at the most retarded position.

14. REMOVE CAMSHAFT TIMING GEAR ASSY(W/ VVT-i)

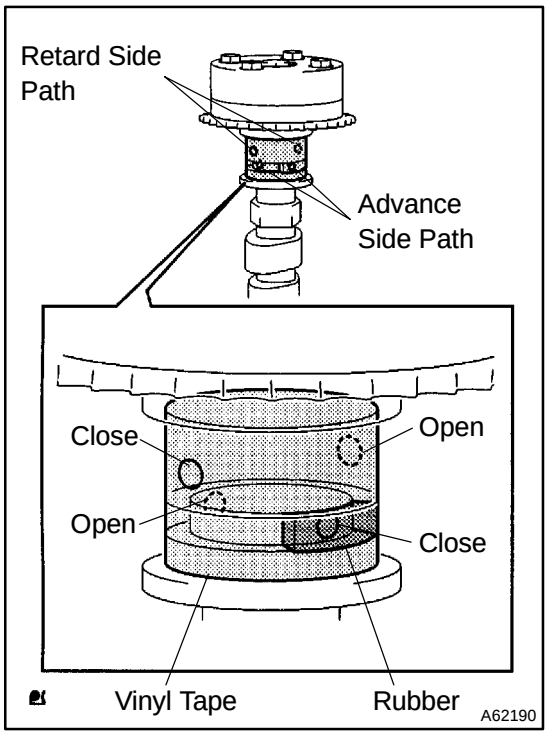
(a) Grip the camshaft with a vice, and confirm that it the gear locked.

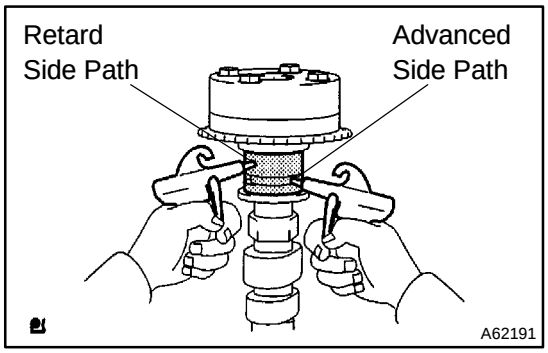
CAUTION:
Be careful not to damage the camshaft.

(b) Cover 4 oil paths of cam journal with vinyl tape as shown in the illustration.

HINT:
Two advance side paths are provided in the groove of the camshaft. Plug one of the path with a rubber piece.

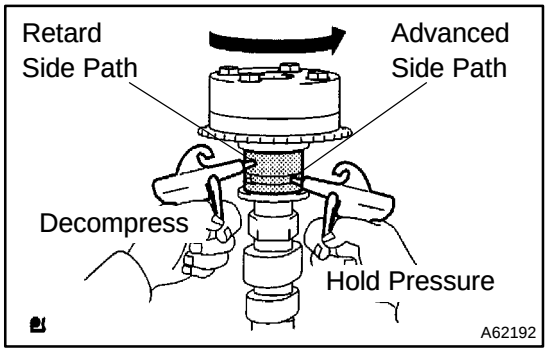
(c) Break through the tapes of the advance side path and the retard side path on the opposite side of the groove.





(d) Put air pressure into two broken paths (the advance side path and the retard side path) with about 150 kPa {1.5 kgf·cm}.

CAUTION:
Cover the pathes with shop rag to avoid oil splashing.



(e) Confirm if the camshaft timing gear assembly revolves in the timing advance direction when weakening the air pressure of the timing retard path.

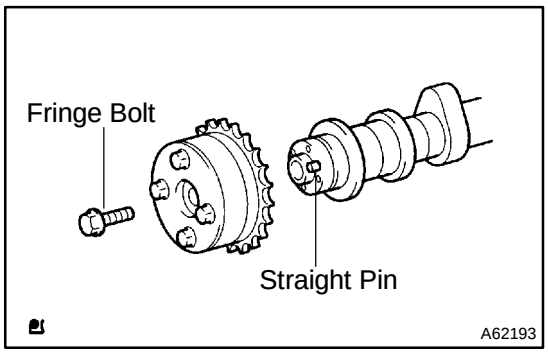
HINT:

The lock pin is released, and camshaft timing gear revolves in the advance direction.

(f) When the camshaft timing gear comes to the most advanced position, take out the air pressure of the timing retard side path, and then, takeout that of timing advance side path.

CAUTION:

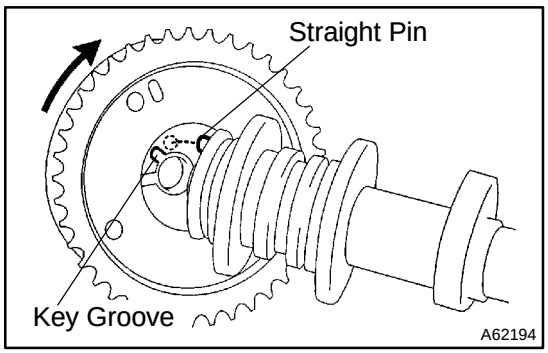
Camshaft timing gear assembly occasionally shifts to the retard side abruptly, if the air compression of the advanced side path is released before retard side paths. It often causes the breakage of the lock pin.



(g) Remove the fringe bolt of camshaft timing gear assembly.

NOTICE:

- **Be sure not to remove the other 4 bolts.**
- **In case of reusing the camshaft timing gear, release the strait pin locking first, and then install the gear.**



15. INSTALL CAMSHAFT TIMING GEAR ASSY(W/ VVT-i)

(a) Put the camshaft timing gear assembly and the camshaft together with the straight pin off the key groove.

(b) Turn the camshaft timing gear assembly to the left direction (as shown in the illustration) with pushing it lightly against the camshaft. Push further at the position where the pin gets into the groove.

CAUTION:

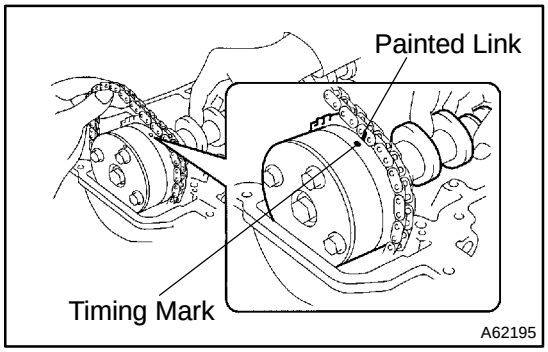
Be sure not to turn the camshaft timing gear to the retard angle side (to the right angle).

(c) Check that there is no clearance between the gear's fringe and the camshaft.

(d) Tighten the fringe bolt with the camshaft timing gear fixed.

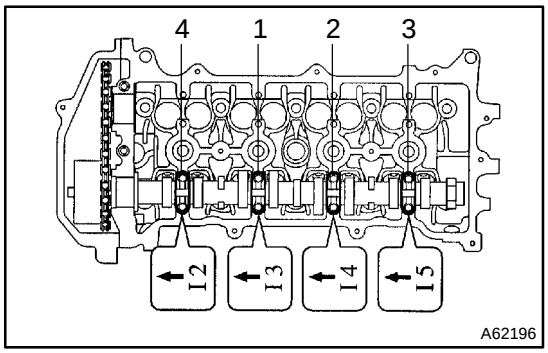
Torque: 54 N·m (551 kgf·cm 40 ft·lbf)

(e) Check that the camshaft timing gear assembly can move to the retard angle side (the right angle), and is locked at the most retarded position.

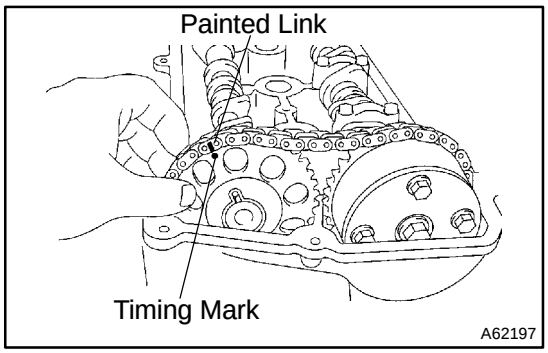


16. INSTALL CAMSHAFT

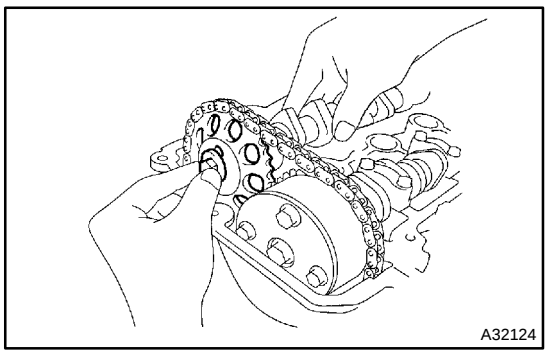
(a) As shown in the illustration, install the timing chain on the camshaft timing gear, with the painted links aligned with the timing marks on the camshaft timing gear.



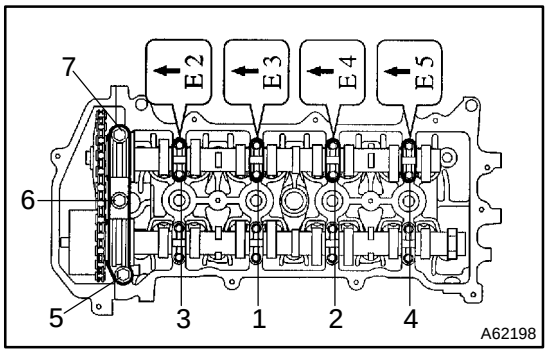
(b) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)



(c) Put the camshaft No.2 on the cylinder head with the painted links of the chain aligned with the timing mark on the camshaft timing gear.

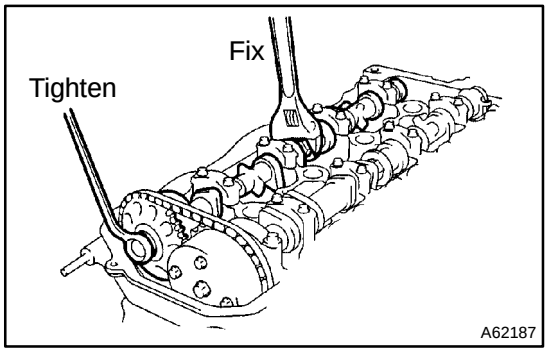


(d) Tighten the camshaft timing gear set bolt temporarily.



(e) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

(f) Install the bearing cap No. 1.
Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

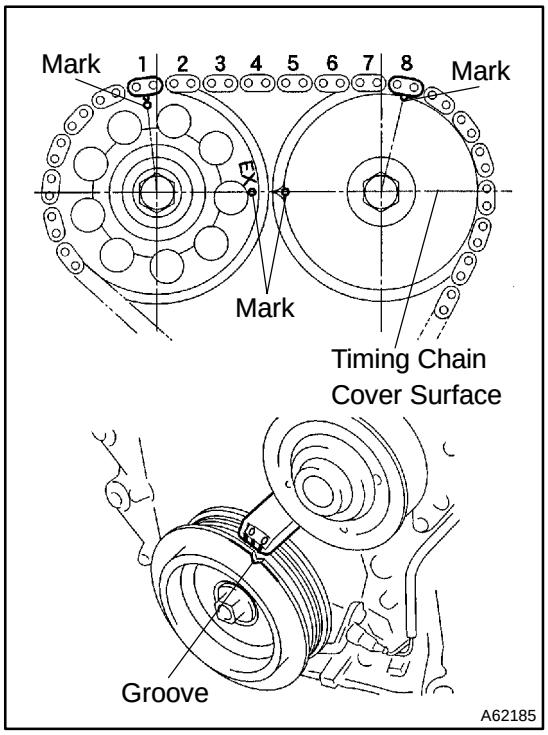


(g) Fix the camshaft with a wrench and so on, then tighten the camshaft timing gear set bolt.

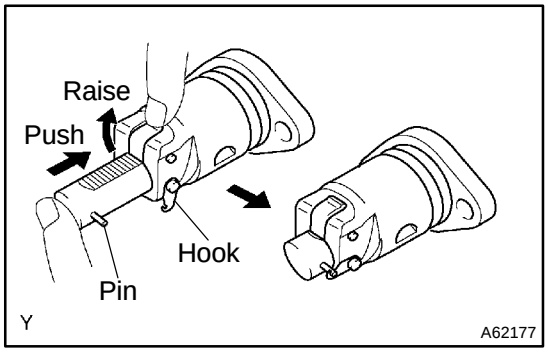
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

NOTICE:

Be careful not damage the valve lifter.

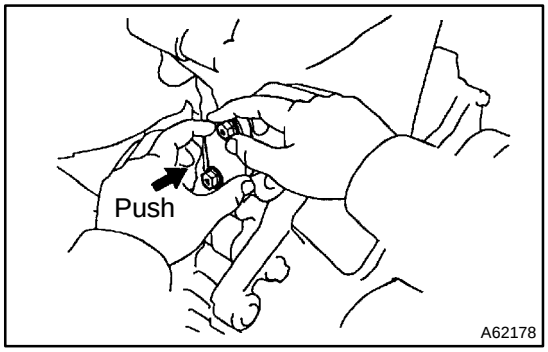


(h) Check the match marks on the timing chain and camshaft timing sprockets, and then the alignment of the pulley groove with timing mark of the chain cover as shown in the illustration.



(i) Install chain tensioner.

(1) Check the O-ring is clean, and set the hook as shown in the illustration.

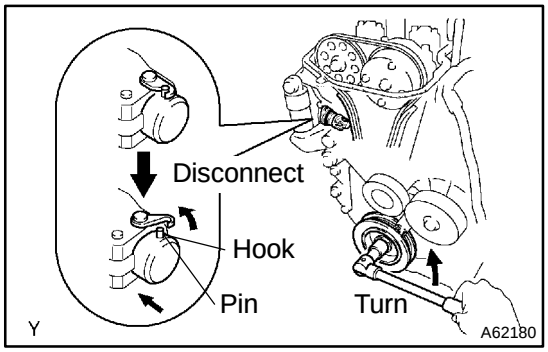


(2) Apply engine oil to the chain tensioner and install it with the 2 nuts.

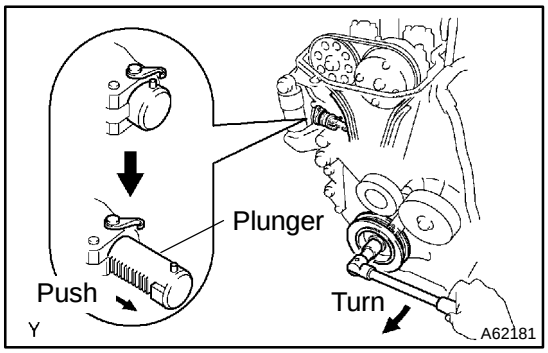
Torque: 9 N·m (92 kgf·cm, 80 in·lbf)

NOTICE:

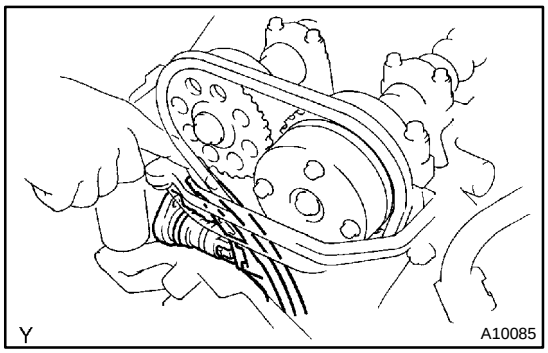
When installing the tensioner, set the hook again if the hook release the plunger.



(3) Turn the crankshaft counterclockwise, and disconnect the plunger knock pin from the hook.



(4) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.

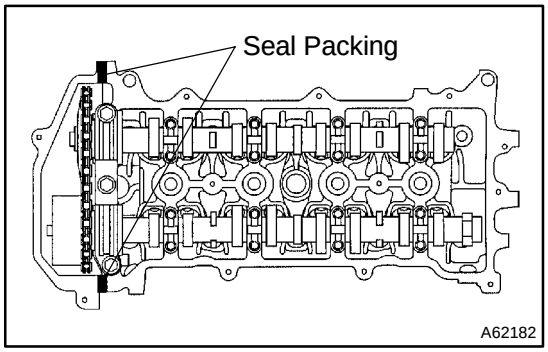


HINT:
If the plunger does not spring out, press the slipper into the chain tensioner with a screwdriver or your finger so that the hook is released from the knock pin and the plunger springs out.

17. ADJUST VALVE CLEARANCE **(See page 14-89)**

18. INSTALL V-RIBBED BELT TENSIONER ASSY

(a) Install the V-ribbed belt tensioner with the nut and bolt.
Torque:
29 N·m (296 kgf·cm, 21 ft·lbf) for Nut
69 N·m (704 kgf·cm, 51 ft·lbf) for Bolt



19. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Remove any old packing (FIPG) material.
(b) Apply seal packing to 2 locations as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**

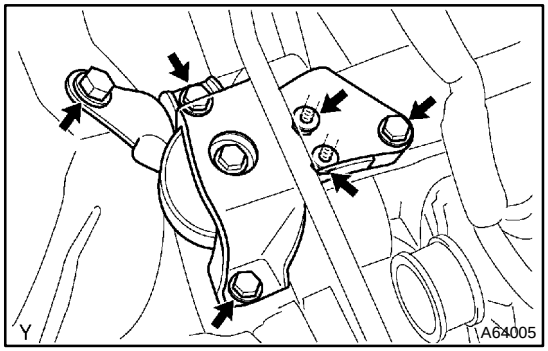
(c) Install the cylinder head cover and 3 cable brackets with the 9 bolts, 2 seal washers and 2 nuts. Uniformly tighten the bolts and nuts, in the several passes.
Torque:
11 N·m (112 kgf·cm, 8 ft·lbf) for w/o washer
9 N·m (92 kgf·cm, 80 in·lbf) for w/ washer

20. INSTALL ENGINE WIRE

(a) Install the engine wire with the bolt and nut.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

21. INSTALL IGNITION COIL ASSY

(a) Install the 4 ignition coils with the 4 bolts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)



22. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install engine mounting insulator RH with the 4 bolts and 2 nuts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

23. INSTALL CYLINDER HEAD COVER NO.2

(a) Install the cylinder head cover with the 2 nuts and 2 clips.
Torque: 7 N·m (71 kgf·cm, 62 in.·lbf)

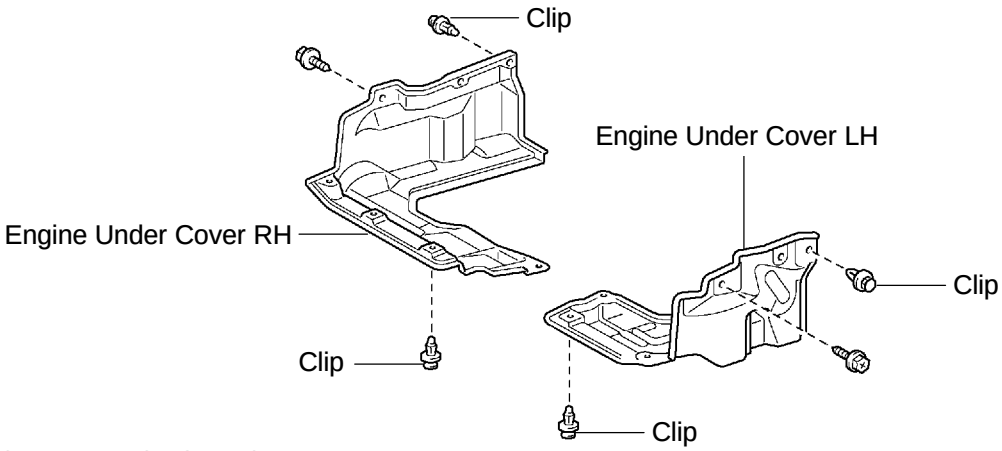
24. CHECK ENGINE OIL LEAK

CYLINDER HEAD GASKET (3ZZ-FE/4ZZ-FE)

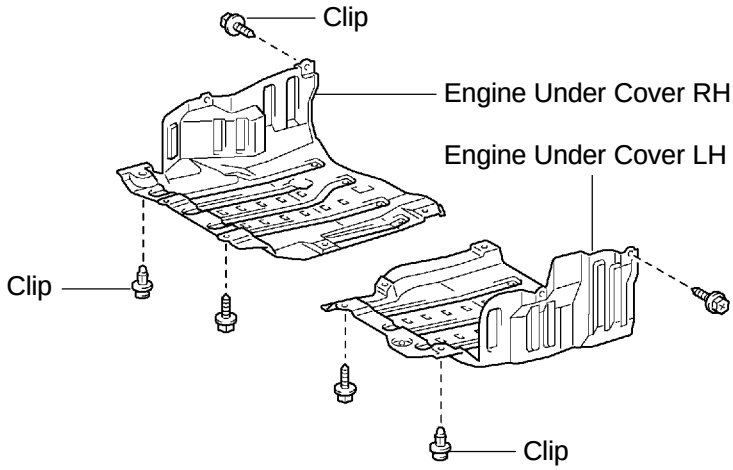
COMPONENTS

140MG-01

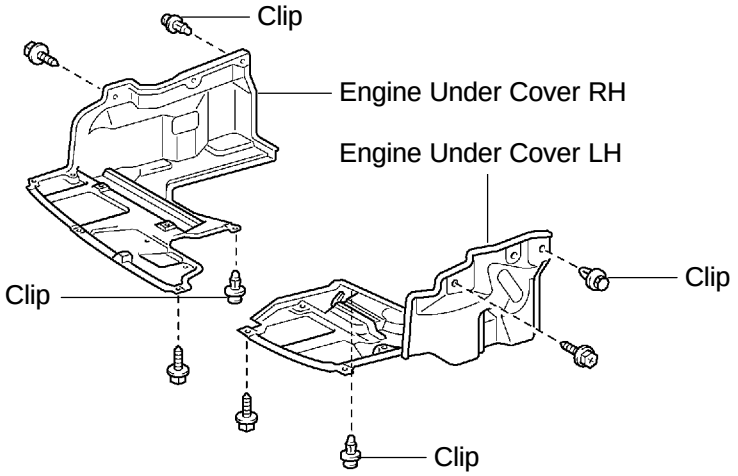
TMC MADE:



TMC MADE, ROUGH ROAD TYPE:

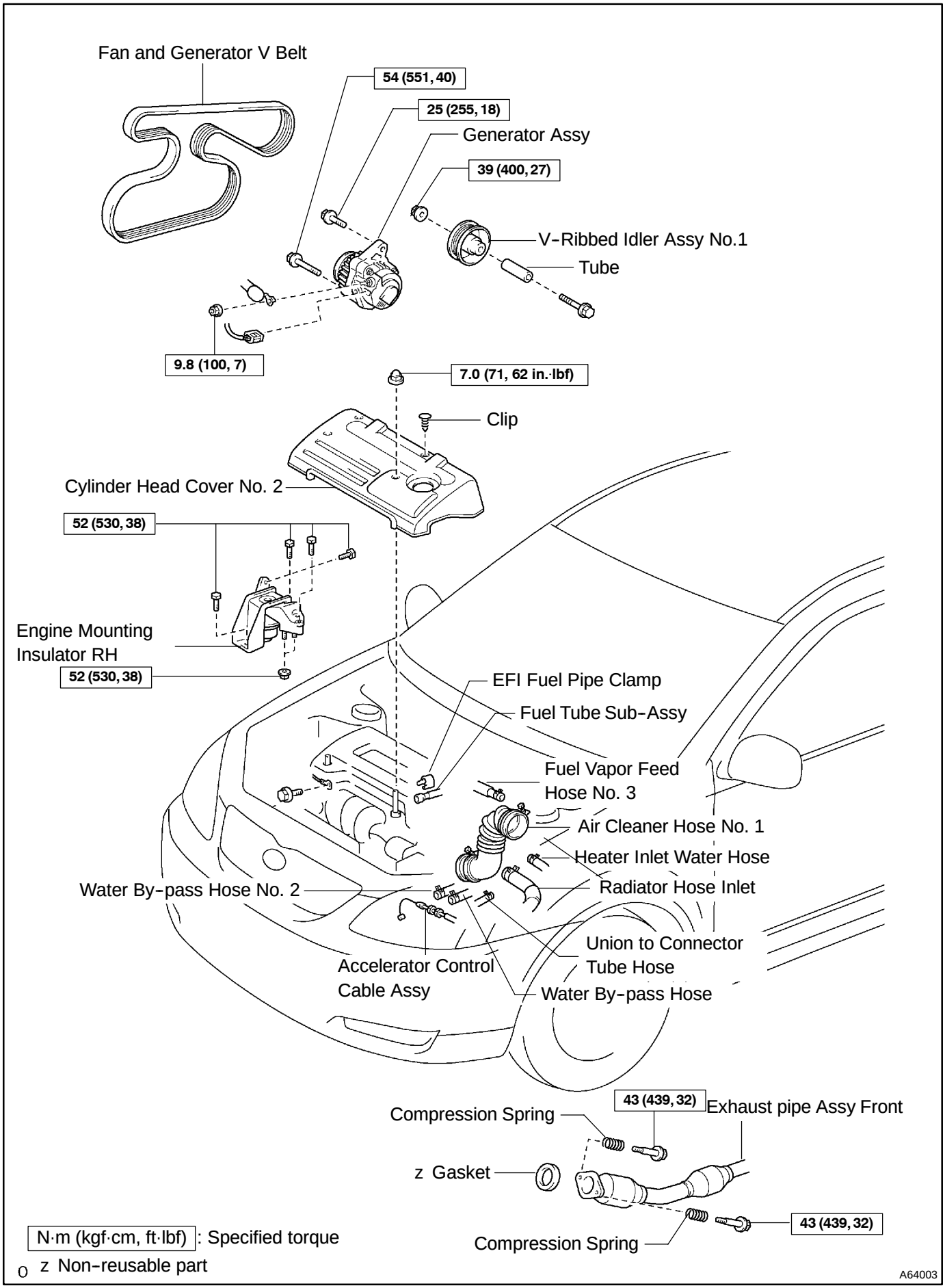


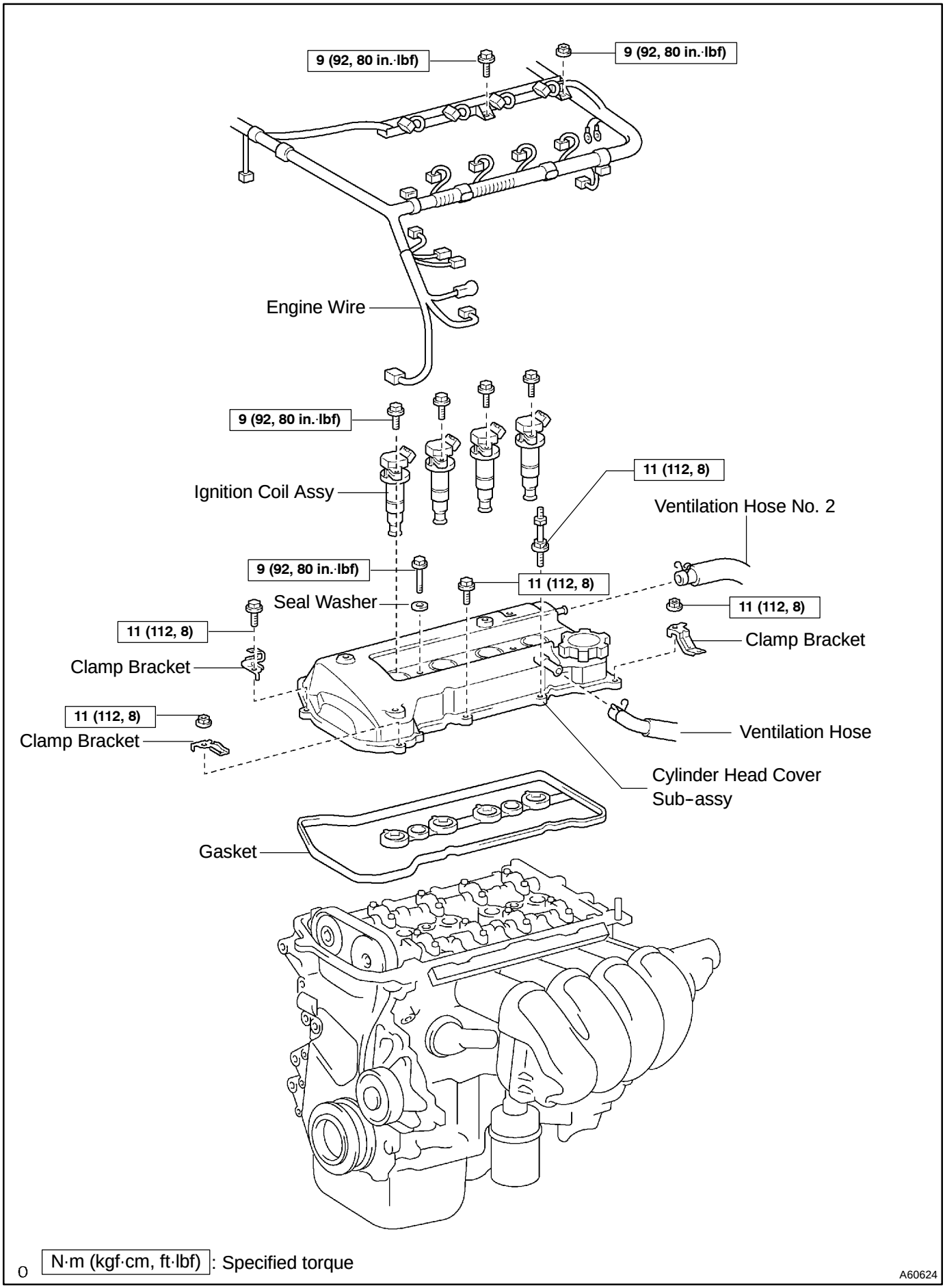
TMUK MADE:

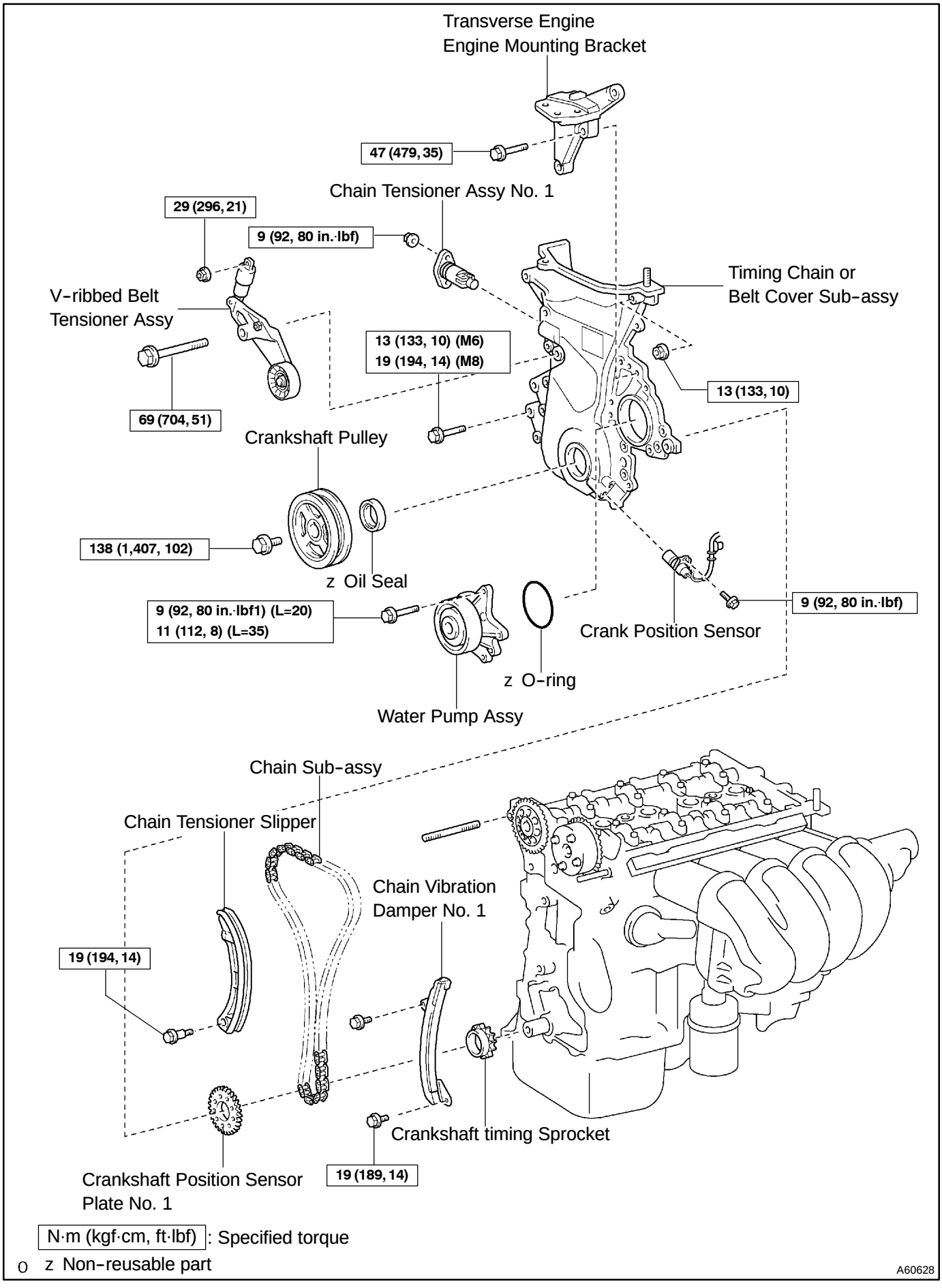


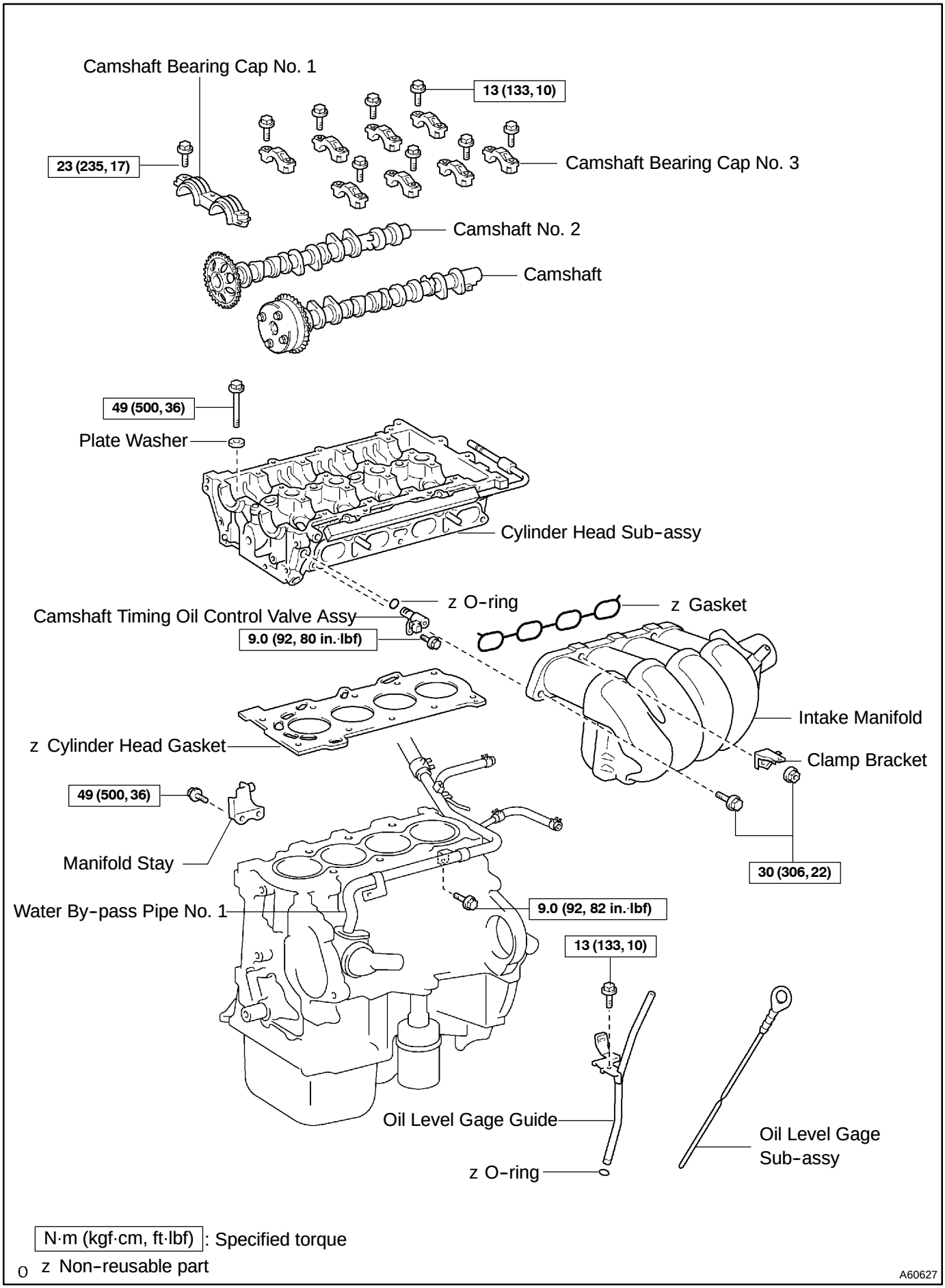
O

A61481


Fan and Generator V Belt
54 (551, 40)
25 (255, 18)
Generator Assy
39 (400, 27)
V-Ribbed Idler Assy No.1
Tube
9.8 (100, 7)
7.0 (71, 62 in.·lbf)
Clip
Cylinder Head Cover No. 2
52 (530, 38)
Engine Mounting Insulator RH
52 (530, 38)
EFI Fuel Pipe Clamp
Fuel Tube Sub-Assy
Fuel Vapor Feed Hose No. 3
Air Cleaner Hose No. 1
Heater Inlet Water Hose
Radiator Hose Inlet
Water By-pass Hose No. 2
Union to Connector Tube Hose
Accelerator Control Cable Assy
Water By-pass Hose
43 (439, 32)
Exhaust pipe Assy Front
Compression Spring
z Gasket
43 (439, 32)
Compression Spring
N·m (kgf·cm, ft·lbf): Specified torque
o z Non-reusable part
A64003


9 (92, 80 in.·lbf)
9 (92, 80 in.·lbf)
Engine Wire
9 (92, 80 in.·lbf)
Ignition Coil Assy
11 (112, 8)
Ventilation Hose No. 2
9 (92, 80 in.·lbf)
11 (112, 8)
Seal Washer
11 (112, 8)
11 (112, 8)
Clamp Bracket
Clamp Bracket
11 (112, 8)
Clamp Bracket
Ventilation Hose
Cylinder Head Cover Sub-assy
Gasket
o N·m (kgf·cm, ft·lbf): Specified torque
A60624


Transverse Engine
Engine Mounting Bracket
47 (479, 35)
Chain Tensioner Assy No. 1
29 (296, 21)
9 (92, 80 in.·lbf)
V-ribbed Belt
Tensioner Assy
Timing Chain or
Belt Cover Sub-assy
13 (133, 10) (M6)
19 (194, 14) (M8)
13 (133, 10)
69 (704, 51)
Crankshaft Pulley
138 (1,407, 102)
z Oil Seal
9 (92, 80 in.·lbf1) (L=20)
11 (112, 8) (L=35)
9 (92, 80 in.·lbf)
Crank Position Sensor
z O-ring
Water Pump Assy
Chain Sub-assy
Chain Tensioner Slipper
Chain Vibration
Damper No. 1
19 (194, 14)
Crankshaft timing Sprocket
19 (189, 14)
Crankshaft Position Sensor
Plate No. 1
N·m (kgf·cm, ft·lbf): Specified torque
o z Non-reusable part
A60628


Camshaft Bearing Cap No. 1
13 (133, 10)
23 (235, 17)
Camshaft Bearing Cap No. 3
Camshaft No. 2
Camshaft
49 (500, 36)
Plate Washer
Cylinder Head Sub-assy
z O-ring
z Gasket
Camshaft Timing Oil Control Valve Assy
9.0 (92, 80 in.·lbf)
Intake Manifold
z Cylinder Head Gasket
Clamp Bracket
49 (500, 36)
Manifold Stay
30 (306, 22)
Water By-pass Pipe No. 1
9.0 (92, 82 in.·lbf)
13 (133, 10)
Oil Level Gage Guide
Oil Level Gage Sub-assy
z O-ring
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A60627

REPLACEMENT

1. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT **(See page 11-1)**
2. REMOVE ENGINE UNDER COVER LH

3. REMOVE ENGINE UNDER COVER RH

4. DRAIN COOLANT **(See page 16-20)**
5. REMOVE FRONT WHEEL RH
6. REMOVE CYLINDER HEAD COVER NO.2

(a) Remove the 2 nuts, 2 clips and cylinder head cover.

7. REMOVE AIR CLEANER HOSE NO.1

(a) Loosen the 2 air cleaner hose clamp bolts, and remove the air cleaner hose.

8. DISCONNECT ACCELERATOR CONTROL CABLE ASSY

(a) Loosen the nut, and remove the accelerator control cable from the accelerator control cable bracket.

9. DISCONNECT WATER BY-PASS HOSE

(a) Disconnect the water by-pass hose from the throttle body.

10. DISCONNECT WATER BY-PASS HOSE NO.2

(a) Disconnect the water by-pass hose from the throttle body.

11. DISCONNECT FUEL VAPOUR FEED HOSE NO.3

(a) Disconnect the fuel vapor feed hose from the air cleaner cap.

12. REMOVE EFI FUEL PIPE CLAMP
(See page 11-24)

13. DISCONNECT FUEL TUBE SUB-ASSY
(See page 11-24)
SST 09268-21010

14. DISCONNECT UNION TO CONNECTOR TUBE HOSE

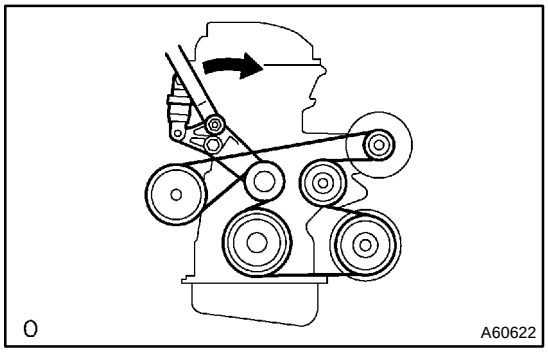
(a) RHD
(1) Disconnect the union to connector tube hose from the brake booster.
(b) LHD
(1) Disconnect the union to connector tube hose from the hose to hose tube.

15. DISCONNECT RADIATOR HOSE INLET

(a) Disconnect radiator hose inlet from the cylinder head.

16. DISCONNECT HEATER INLET WATER HOSE

(a) Disconnect the heater inlet water hose from the cylinder head.



17. REMOVE FAN AND GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner slowly clockwise and loosen it. Then, remove the fan and generator belt and put back the V-ribbed belt tensioner little by little and fix it quietly.

18. REMOVE V-RIBBED IDLER ASSY NO.1

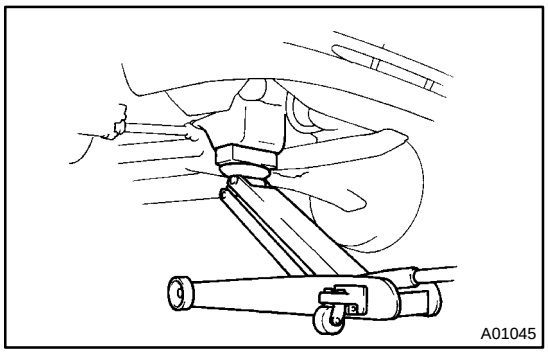
(a) Remove the nut, bolt, tube and idler.

19. REMOVE GENERATOR ASSY

(See page 19-20)

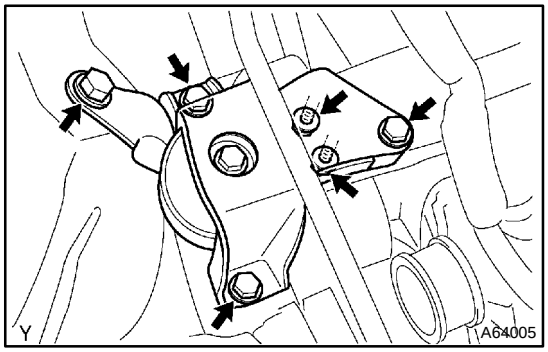
20. DISCONNECT EXHAUST PIPE ASSY FRONT

(a) Remove the 2 bolts, 2 compression spring installing the front side of exhaust pipe.
(b) Remove the gasket.



21. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Place a wooden block between the jack and engine, and set the jack, then remove the 4 bolts, 2nuts and engine mounting insulator RH.



22. REMOVE IGNITION COIL ASSY

(a) Disconnect the 4 connectors.
(b) Remove 4 bolts and 4 ignition coils.

23. DISCONNECT ENGINE WIRE

(a) Disconnect the connectors.
(b) Remove the 3 clamps from the 3 clamp brackets.
(c) Remove the bolt and nut installing the engine wire.

24. DISCONNECT VENTILATION HOSE

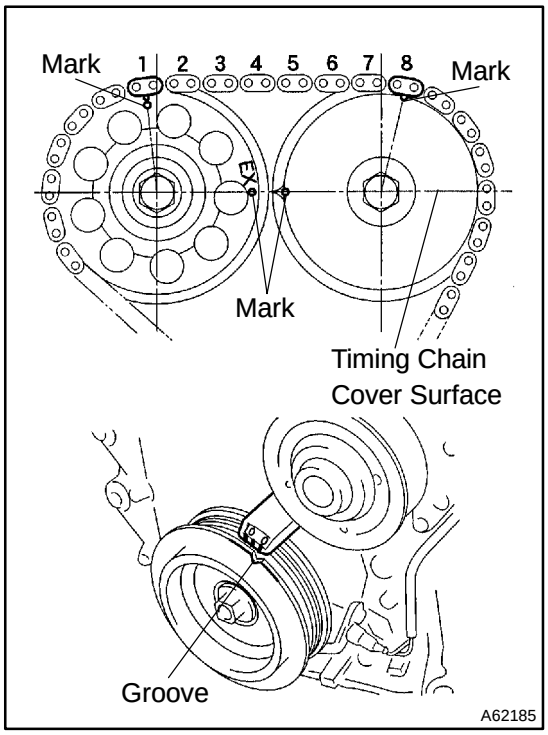
(a) Disconnect the ventilation hose from the cylinder head cover.

25. DISCONNECT VENTILATION HOSE NO.2

(a) Disconnect the ventilation hose from the cylinder head cover.

26. REMOVE CYLINDER HEAD COVER SUB-ASSY

(a) Remove the 9 bolts, 2 seal washers, 2 nuts, 3 clamp brackets and cylinder head cover.



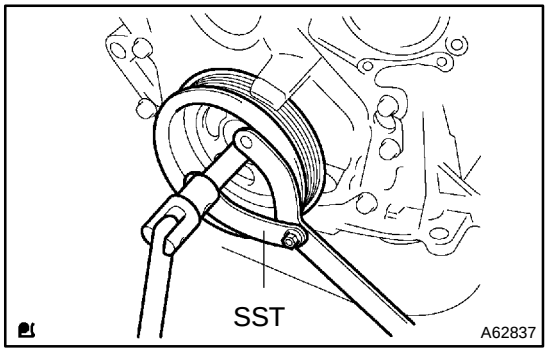
27. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.

(b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

HINT:

If not, turn the crankshaft 1 revolution (360_) and align the marks as above.



28. REMOVE CRANKSHAFT PULLEY

(a) Using SST, remove the pulley bolt.

SST 09960-10010 (09962-01000, 09963-01000)

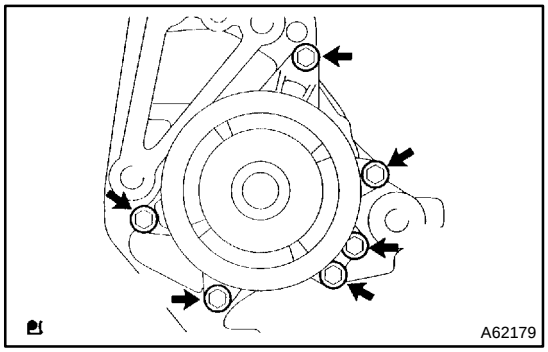
(b) Remove the crankshaft pulley from the crankshaft.

29. REMOVE V-RIBBED BELT TENSIONER ASSY

(a) Remove the bolt, nut and V-ribbed belt tensioner.

HINT:

Handle a jack up and down to remove the bolt.



30. REMOVE WATER PUMP ASSY

(a) Remove the 6 bolts, water pump and O-ring.

31. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 3 bolts and transverse engine engine mounting bracket.

32. REMOVE CRANK POSITION SENSOR

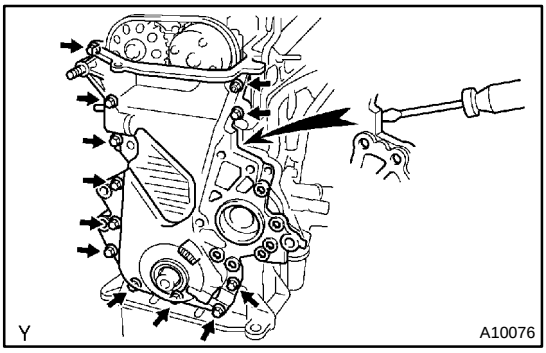
(a) Remove the 2 bolts installing the crank position sensor.

33. REMOVE CHAIN TENSIONER ASSY NO.1

(a) Remove the 2 nuts and chain tensioner.

NOTICE:

Be sure not to revolve the crankshaft without the chain tensioner.

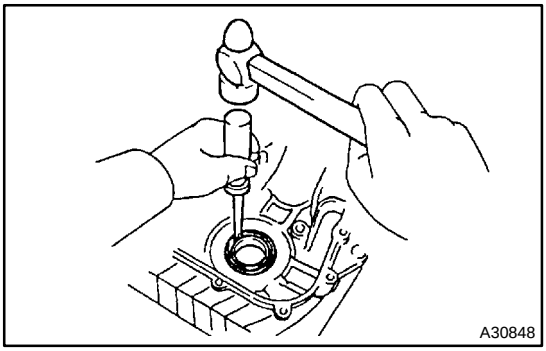


34. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY

(a) Remove the 11 bolts and nuts.
(b) Using a torx wrench socket (E8), remove the stud bolt.
(c) Remove the timing chain cover by prying the portions between the cylinder head and cylinder block with a screwdriver.

NOTICE:

Be careful no tot damage the contact surfaces of the timing chain cover, cylinder head and cylinder block.



35. REMOVE TIMING GEAR COVER OIL SEAL

(a) Using a screwdriver, remove the oil seal.

36. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1

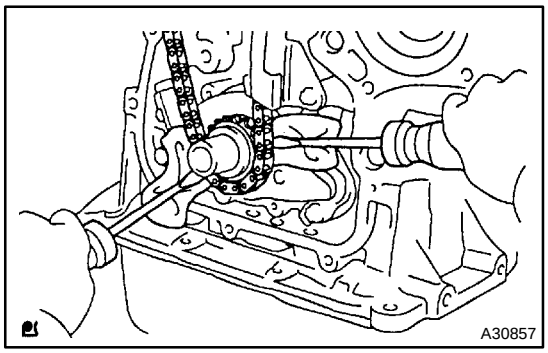
(a) Remove the crankshaft position sensor plate from the crankshaft.

37. REMOVE CHAIN TENSIONER SLIPPER

(a) Remove the bolt and chain tensioner slipper.

38. REMOVE CHAIN VIBRATION DAMPER NO.1

(a) Remove the 2 bolt and chain vibration damper.



39. REMOVE CHAIN SUB-ASSY

(a) Remove the timing chain with the crankshaft timing gear plying screwdrivers as shown in the illustration.

NOTICE:

- **Put shop rag to protect the engine.**
- **In case of revolving the camshafts with the chain off the sprockets, turn the crankshaft 1/4 revolution for valves not to touch the pistons.**

40. REMOVE INTAKE MANIFOLD

(a) Remove the 4 bolts, 2 nuts, 2 clamp brackets and intake manifold.

41. REMOVE OIL LEVEL GAGE SUB-ASSY

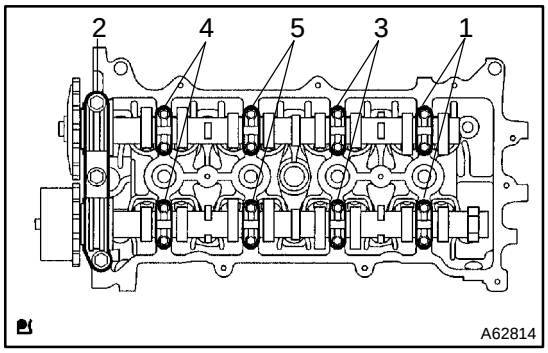
(a) Remove the oil level gage from the oil level gage guide.

42. REMOVE OIL LEVEL GAGE GUIDE

(a) Remove the bolt and oil level gage guide.

43. DISCONNECT WATER BY-PASS PIPE NO.1

(a) Remove the 2 bolts installing the water by-pass pipe.



44. REMOVE CAMSHAFT

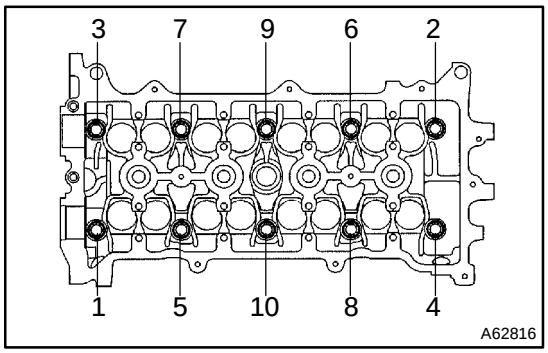
(a) Uniformly loosen and remove the 19 bearing cap bolts, in several passes, in the sequence shown, and remove the 9 bearing caps, intake and exhaust camshafts.

45. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE ASSY

(a) Remove the bolt and camshaft timing oil control valve.

46. REMOVE MANIFOLD STAY

(a) Remove the 3 bolts and manifold stay.

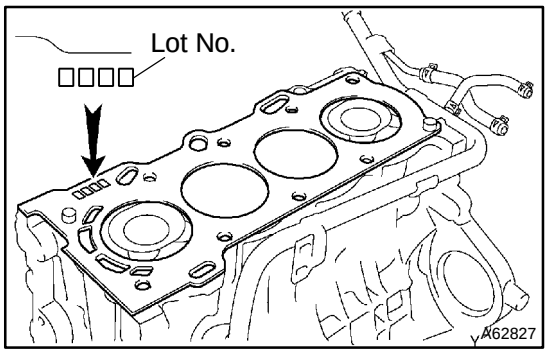


47. REMOVE CYLINDER HEAD SUB-ASSY

(a) Using a 10 mm bi-hexagon wrench, uniformly loosen and remove the 10 cylinder head bolts, in several passes, in the sequence shown, and remove the 10 cylinder head bolts and 10 plate washers.

(b) Remove the cylinder head.

48. REMOVE CYLINDER HEAD GASKET

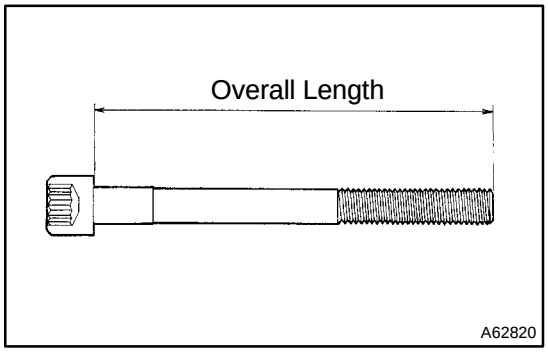


49. INSTALL CYLINDER HEAD GASKET

(a) Place a new cylinder head gasket on the cylinder block surface with the Lot No. stamp upward.

NOTICE:

- **Pay attention to the installation direction.**
- **Place the cylinder head quietly in order not to damage the gasket with the bottom part of the head.**



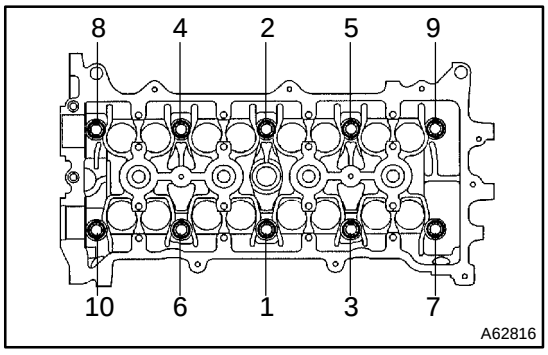
50. INSPECT CYLINDER HEAD SET BOLT

(a) Using a vernier calipers, measure the length of cylinder head bolt from the seat to the end.

Standard length: 156.0 - 159.0 mm (6.142 - 6.260 in.)

Maximum length: 159.5 mm (6.280 in.)

If the length surpasses the maximum, replace the bolt.



51. INSTALL CYLINDER HEAD SUB-ASSY

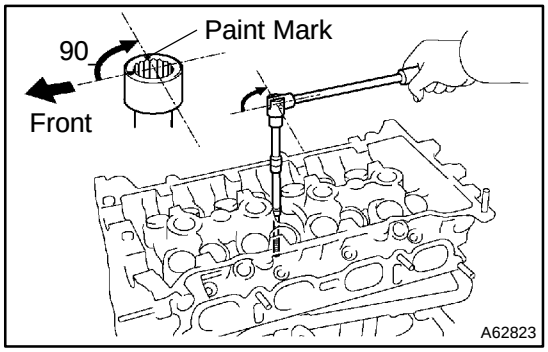
HINT:

The cylinder head bolts are tightened in 2 progressive steps.

(a) Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.

(b) Using a 10 mm bi-hexagon wrench, install and uniformly tighten the 10 cylinder head bolts and plate washers, in several passes, in the sequence shown.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



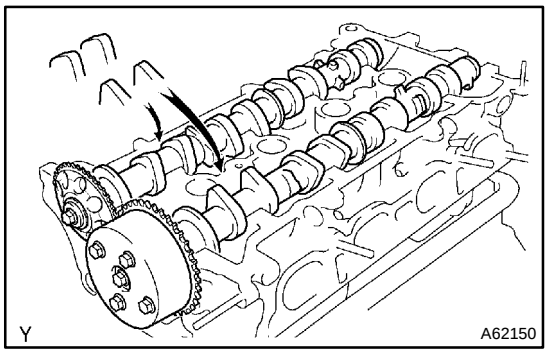
(c) Make the front of the cylinder head bolt with paint.
(d) Retighten the cylinder head bolts 90 _ in the numerical order shown.
(e) Check that the point marked bolts are moved at 90 _ angle.

52. INSTALL MANIFOLD STAY

(a) Install the manifold stay with 3 bolts.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

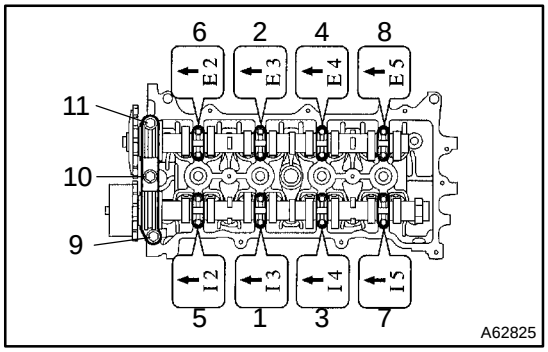
53. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSY

(a) Apply a light coat of engine oil on a new O–ring, and install it to the camshaft timing oil control valve.
(b) Install the camshaft timing oil control valve with the bolt.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



54. INSTALL CAMSHAFT

(a) Apply a light coat of engine oil on the camshaft journals.
(b) Place the 2 camshafts on the cylinder head with the No. 1 cam lobes facing as shown the illustration.



(c) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque:
Bearing cap No. 1 23 N·m (235 kgf·cm, 17 ft·lbf)
Bearing cap No. 3 13 N·m (133 kgf·cm, 10 ft·lbf)

55. INSTALL WATER BY–PASS PIPE NO.1

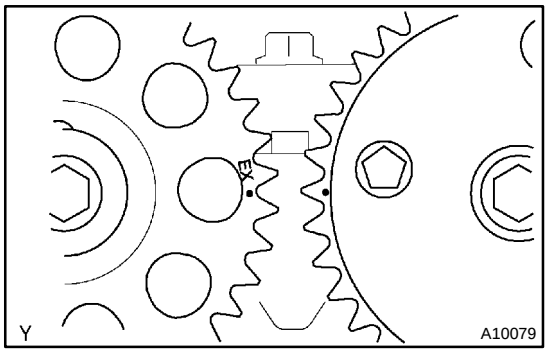
(a) Install the water by–pass pipe with the 2 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

56. INSTALL OIL LEVEL GAGE GUIDE

(a) Apply a light coat of engine oil on a new O–ring, and install it to the oil level gage guide.
(b) Install the oil level gage guide with the bolt.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

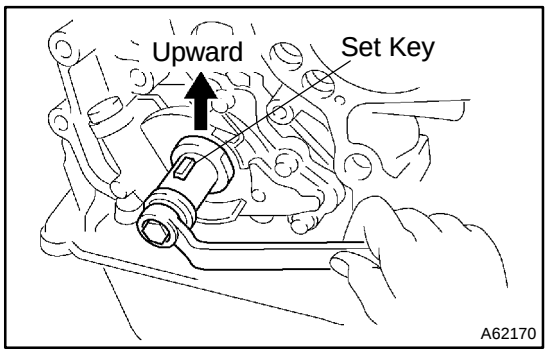
57. INSTALL INTAKE MANIFOLD

(a) Install a new gasket to the intake manifold.
(b) Install the intake manifold and 2 clamp brackets with the 4 bolts and 2 nuts.
Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

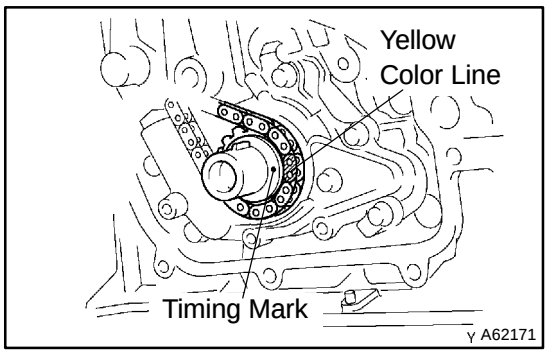


58. INSTALL CHAIN SUB-ASSY

(a) Set No. 1 cylinder to TDC/compression.
(1) Turn the hexagonal wrench head portion of the camshafts, and align the point marks of the camshaft timing sprockets.

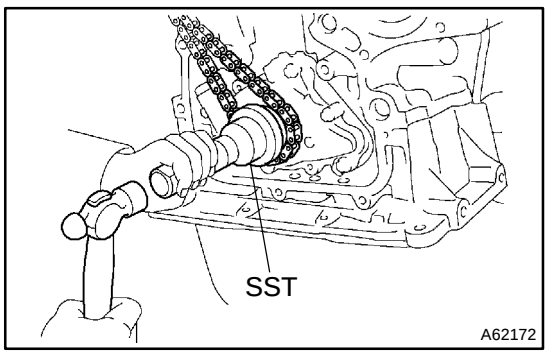


(2) Using a crankshaft pulley bolt, turn the crankshaft and set the set key on the crankshaft upward.

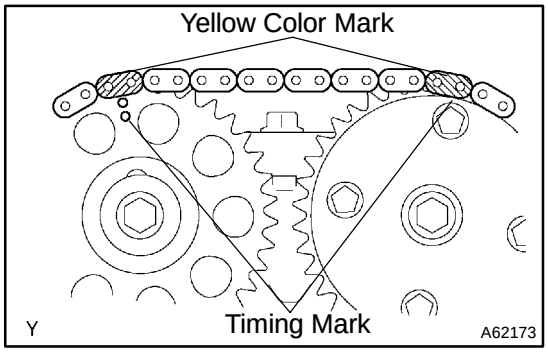


(b) Install the timing chain on the crankshaft timing sprocket with the yellow color link aligned with the timing mark on the crankshaft timing sprocket.

HINT:
Three yellow color links are on the chain.



(c) Using SST, install the crankshaft timing sprocket.
SST 09223-22010



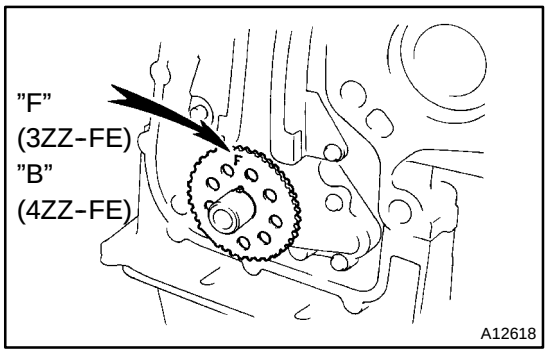
(d) Install the timing chain on the camshaft timing sprockets with the yellow color links aligned with the timing marks on the camshaft timing sprockets.

59. INSTALL CHAIN VIBRATION DAMPER NO.1

(a) Install chain vibration damper with the 2 bolts.
Torque: 19 N·m (189 kgf·cm, 14 ft·lbf)

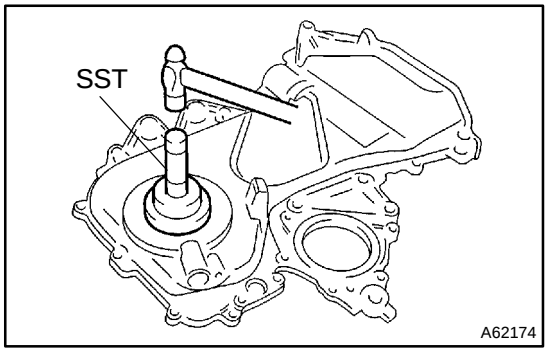
60. INSTALL CHAIN TENSIONER SLIPPER

(a) Install the chain tensioner slipper with the bolt.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



61. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1

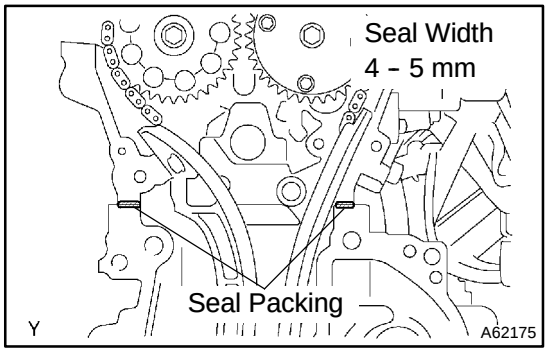
(a) Install the plate with the "F" (3ZZ-FE) or "B" (4ZZ-FE) mark facing forward.



62. INSTALL TIMING GEAR COVER OIL SEAL

(a) Apply MP grease to a new oil seal lip.
(b) Using SST, tap in the oil seal until its surface is flush with the timing chain cover edge.
SST 09223-22010

NOTICE:
Keep the lip off foreign materials.



63. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSY

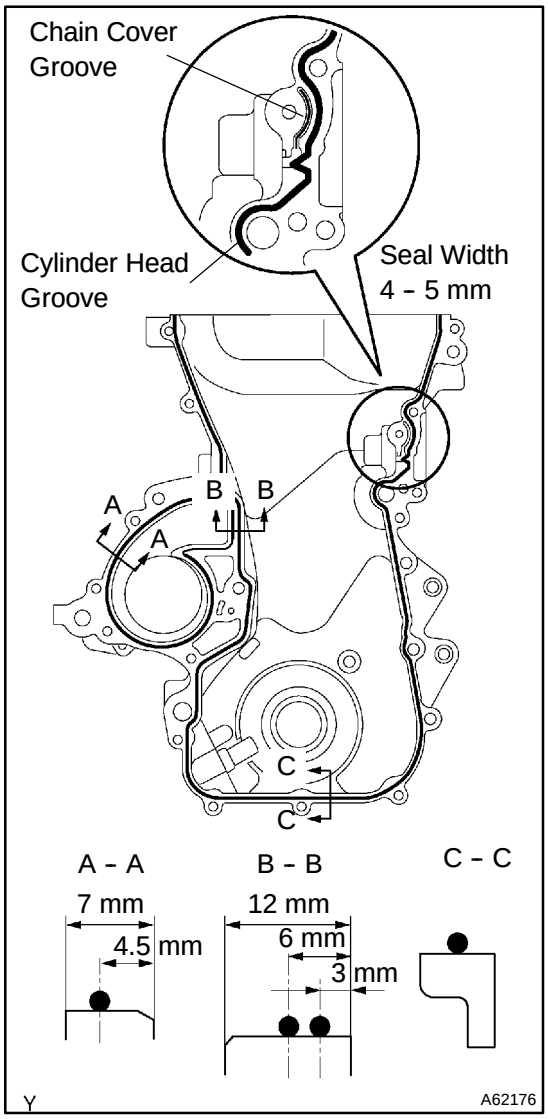
(a) Remove any old packing material from the contact surface.

(b) Apply seal packing in the shape of bead (Diameter 3.5 mm - 4.5 mm (0.1379 - 0.177 in.)) consequently as shown in the illustration.
Seal packing:
Water pump part part No. 08826-00100 or equivalent
Other part part No. 08826-00080 or equivalent.

(c) Install the timing chain cover with the 11 bolts and nut.
Torque:
M6 13 N·m (133 kgf·cm, 10 ft·lbf)
M8 19 N·m (194 kgf·cm, 14 ft·lbf)

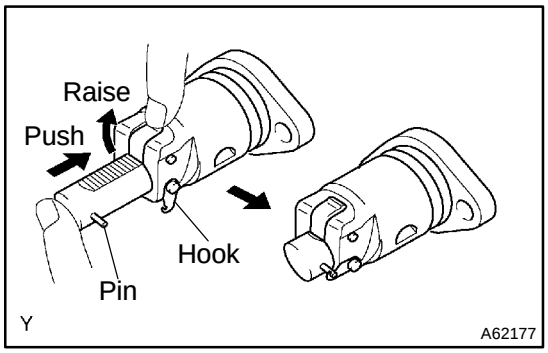
NOTICE:
- **Remove any oil from the contact surface.**
- **Install the oil pan within 3 minutes after applying seal packing.**
- **Do not put into engine oil within 2 hours after installing.**

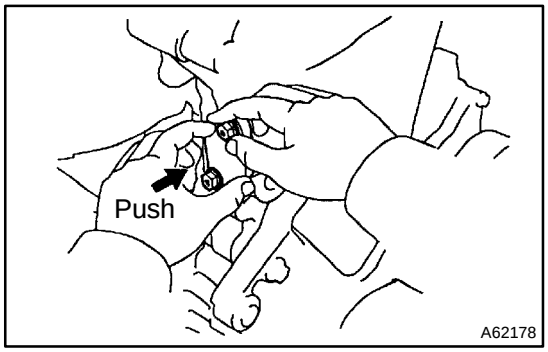
(d) Using a torx wrench socket (E8), install the stud bolt.



64. INSTALL CHAIN TENSIONER ASSY NO.1

(a) Check the O-ring is clean, and set the hook as shown in the illustration.





(b) Apply engine oil to the chain tensioner and install it withe 2 nuts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

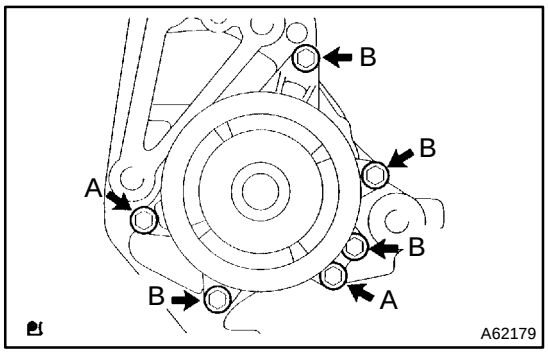
NOTICE:
When installing the tensioner, set the hook again if the hook release the plunger.

65. INSTALL CRANK POSITION SENSOR

(a) Apply a coat of the engine oil to the O-ring of the crank position sensor.
(b) Install the crank position sensor with the 2 bolts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

66. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the transverse engine engine mounting bracket with the 3 bolts.
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)

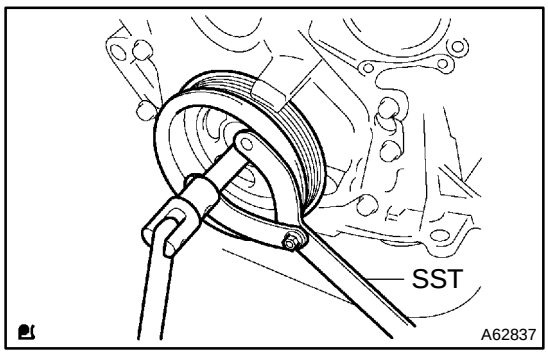


67. INSTALL WATER PUMP ASSY

(a) Place a new O-ring on the timing chain cover.
(b) Install the water pump with the 6 bolts.
Torque:
9 N·m (92 kgf·cm, 80 in.·lbf) for Bolt A
11 N·m (112 kgf·cm, 8 ft·lbf) for Bolt B

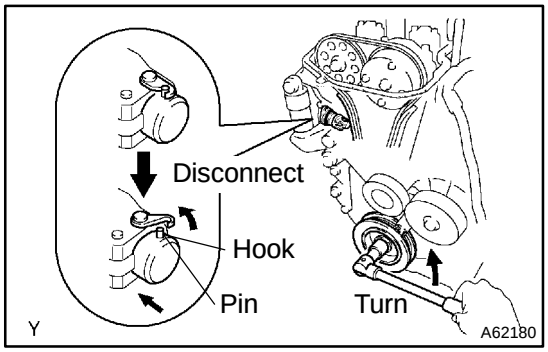
68. INSTALL V-RIBBED BELT TENSIONER ASSY

(a) Install the V-ribbed belt tensioner with the nut and bolt.
Torque:
29 N·m (296 kgf·cm, 21 ft·lbf) for Nut
69 N·m (704 kgf·cm, 51 ft·lbf) for Bolt

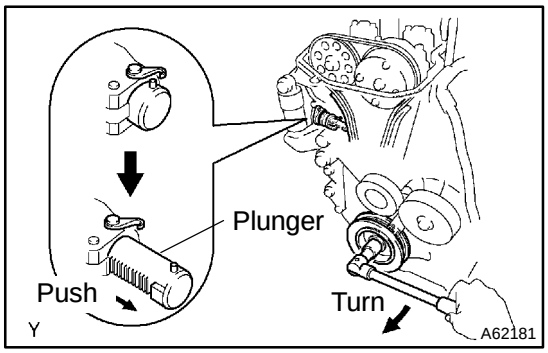


69. INSTALL CRANKSHAFT PULLEY

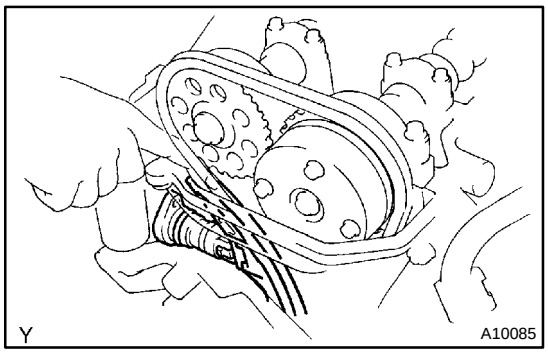
(a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.
(b) Using SST, install the crankshaft pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 138 N·m (1,407 kgf·cm, 102 ft·lbf)



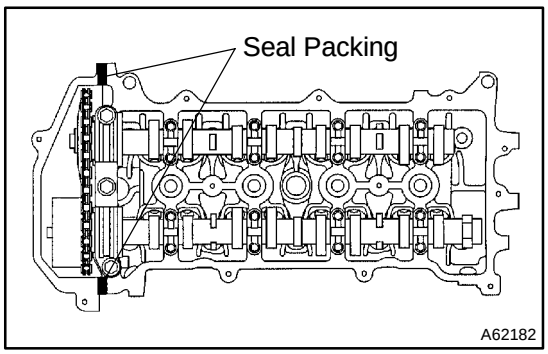
(c) Turn the crankshaft counter clockwise, and disconnect the plunger knock pin form the hook.



(d) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.



HINT:
If the plunger does not spring out, press the slipper into the chain tensioner with a screwdriver or your finger so that the hook is released from the knock pin and the plunger springs out.



70. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Remove any old pacing (FIPG) material.
(b) Apply seal packing to 2 locations as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**

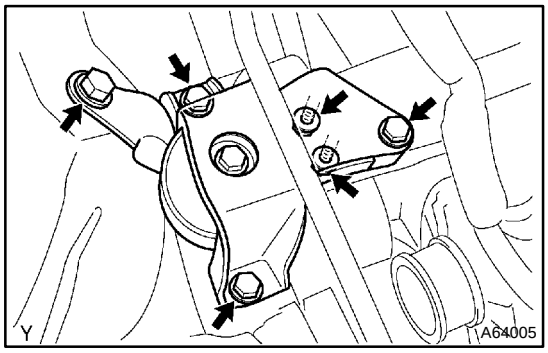
(c) Install the cylinder head cover and 3 cable brackets with the 9 bolts, 2 seal washers and 2 nuts. Uniformly tighten the bolts and nuts, in the several passes.
Torque:
11 N·m (112 kgf·cm, 8 ft·lbf) for w/o washer
9.0 N·m (92 kgf·cm, 80 in.·lbf) for w/ washer

71. INSTALL IGNITION COIL ASSY

(a) Install the 4 ignition coils with the 4 bolts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

72. INSTALL ENGINE WIRE

(a) Install the engine wire with the bolt and nut.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



73. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install engine mounting insulator RH with the 4 bolts and 2 nuts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

74. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-5)

75. INSTALL V-RIBBED IDLER ASSY NO.1

(a) Install the tube and idler with the nut and bolt.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

76. INSTALL GENERATOR ASSY
(See page 19-20)

77. INSTALL CYLINDER HEAD COVER NO.2

(a) Install the cylinder head cover with the 2 nuts and 2 clips.
Torque: 7 N·m (71 kgf·cm, 62 in.·lbf)

78. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1050 kgf·cm, 76 ft·lbf)

79. ADD COOLANT **(See page 16-20)**

80. INSPECT COMPRESSION
SST 09992-00500

81. INSPECT CO/HC

82. INSPECT IGNITION TIMING
SST 09843-18030, 09843-18040

83. CHECK ENGINE COOLANT LEAK **(See page 16-15)**

84. CHECK ENGINE OIL LEAK

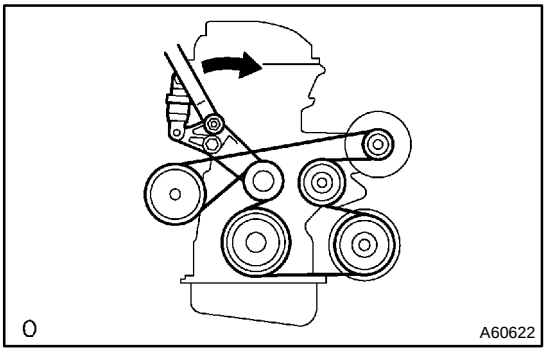
TIMING GEAR COVER OIL SEAL (3ZZ-FE/4ZZ-FE)

140MI-01

REPLACEMENT

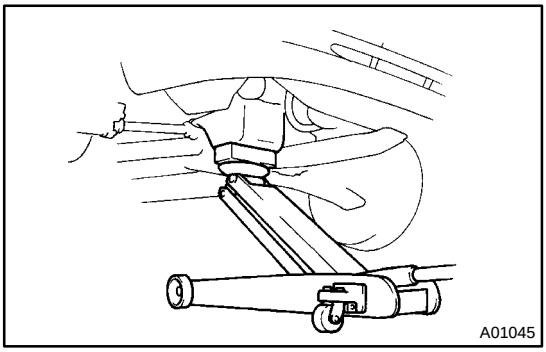
1. REMOVE ENGINE UNDER COVER RH

2. REMOVE FRONT WHEEL RH



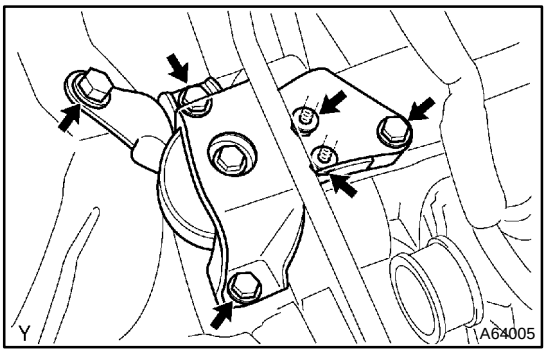
3. REMOVE FAN AND GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner slowly clockwise and loosen it. Then, remove the fan and generator belt and put back the V-ribbed belt tensioner little by little and fix it quietly.



4. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

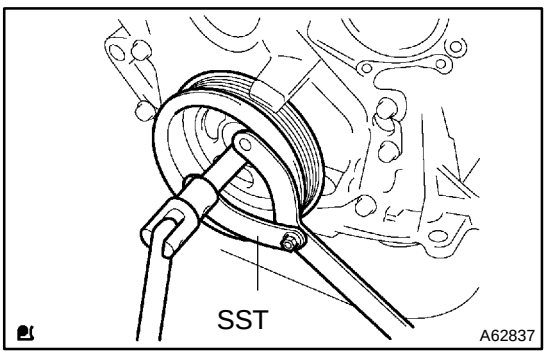
(a) Place a wooden block between the jack and engine, and set the jack. Then, remove the 4 bolts, 2nuts and engine mounting insulator RH.

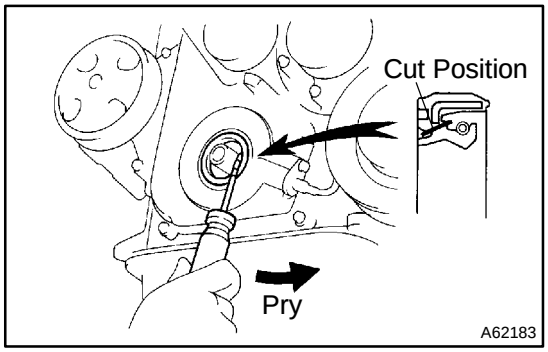


5. REMOVE CRANKSHAFT PULLEY

(a) Using SST, remove the crankshaft pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)

(b) Remove the crankshaft pulley from the crankshaft.

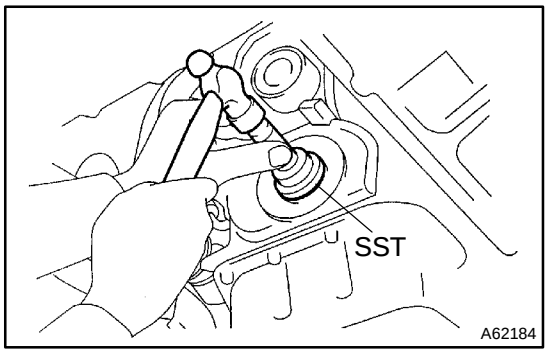




6. REMOVE TIMING GEAR COVER OIL SEAL

(a) Using a knife, cut off the oil seal lip.
(b) Using a screwdriver with taping its tip, pry out the oil seal.

NOTICE:
After the removal, check if the crankshaft is not damaged. If there is, mend it with a sandpaper (#400).



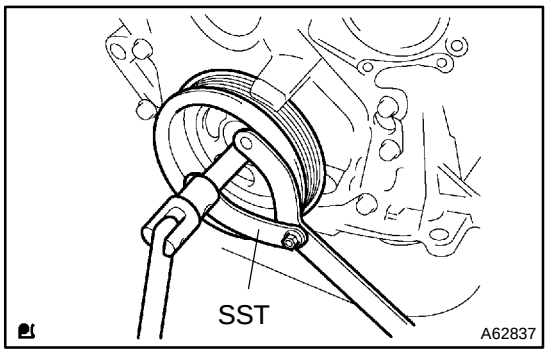
7. INSTALL TIMING GEAR COVER OIL SEAL

(a) Apply MP grease to a new oil seal lip.

NOTICE:
Keep the lip off foreign materials.

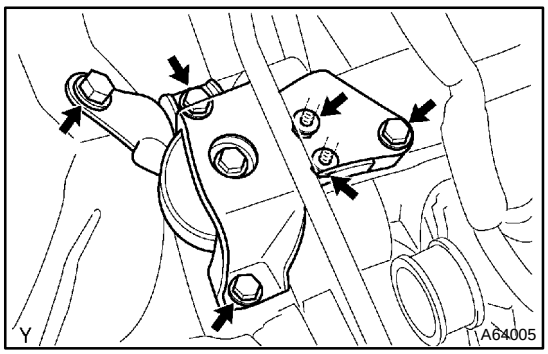
(b) Using SST, tap in the oil seal until its surface is flush with the timing chain cover edge.
SST 09223-22010

NOTICE:
Wipe off extra grease on the crankshaft.



8. INSTALL CRANKSHAFT PULLEY

(a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.
(b) Using SST, install the crankshaft pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 138 N·m (1,407 kgf·cm, 102 ft·lbf)



9. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the engine mounting insulator RH with the 4 bolts and 2 nuts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

10. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1050 kgf·cm, 76 ft·lbf)

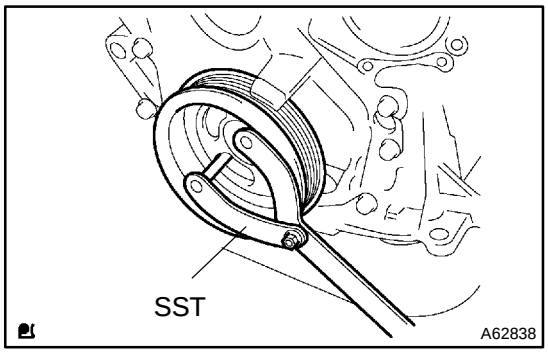
11. CHECK ENGINE OIL LEAK

ENGINE REAR OIL SEAL (3ZZ-FE/4ZZ-FE)

140MJ-01

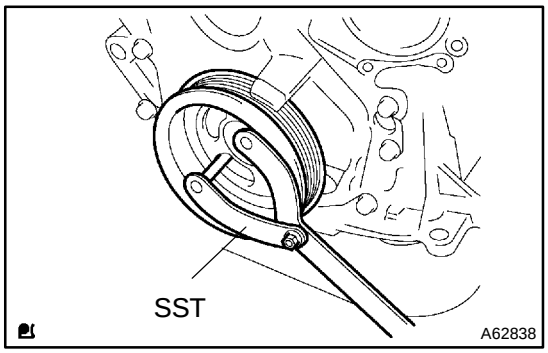
REPLACEMENT

1. **REMOVE MANUAL TRANSAXLE ASSY(M/T TRANSAXLE)**
   (See page 41-24)
   SST 09930-00010, 09628-62011, 09520-01010, 09520-24010 (09520-32040)
2. **REMOVE AUTOMATIC TRANSAXLE ASSY(A/T TRANSAXLE)**
   (See page 40-9)
   SST 09960-10010 (09962-01000, 09963-01000), 09023-12700, 09930-00010, 09628-62011, 09520-01010, 09520-24010 (09520-32040)
3. **REMOVE CLUTCH COVER ASSY(M/T TRANSAXLE)**
   (See page 41-24)
4. **REMOVE CLUTCH DISC ASSY(M/T TRANSAXLE)**



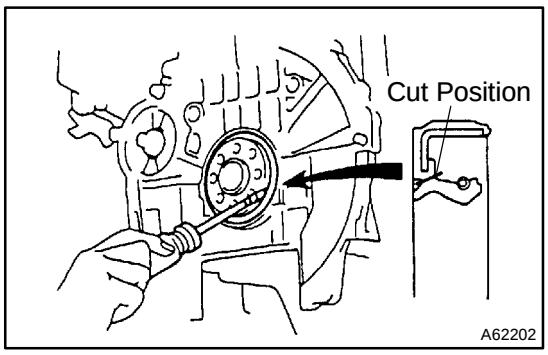
5. **REMOVE FLYWHEEL SUB-ASSY(M/T TRANSAXLE)**

(a) Fix the crankshaft with SST, then remove the 8 bolts and flywheel.
SST 09960-10010 (09962-01000, 09963-01000)



6. **REMOVE DRIVE PLATE & RING GEAR SUB-ASSY(A/T TRANSAXLE)**

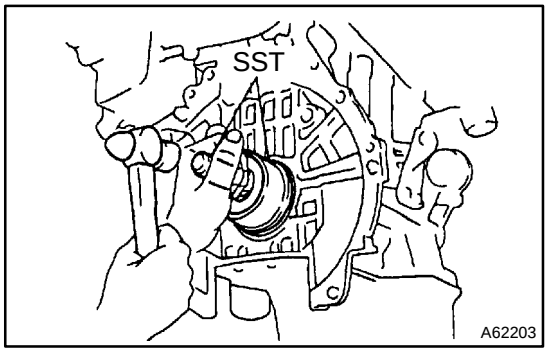
(a) Fix the crankshaft with SST, then remove the 8 bolts and drive plate & ring gear.
SST 09960-10010 (09962-01000, 09963-01000)



7. **REMOVE ENGINE REAR OIL SEAL**

(a) Using a knife, cut off the oil seal lip.
(b) Using a screwdriver with taping its tip, pry out the oil seal.

NOTICE:
After the removal, check if the crankshaft is not damaged. If there is, mend it with a sandpaper (#400).



8. INSTALL ENGINE REAR OIL SEAL

(a) Apply MP grease to a new oil seal lip.

NOTICE:

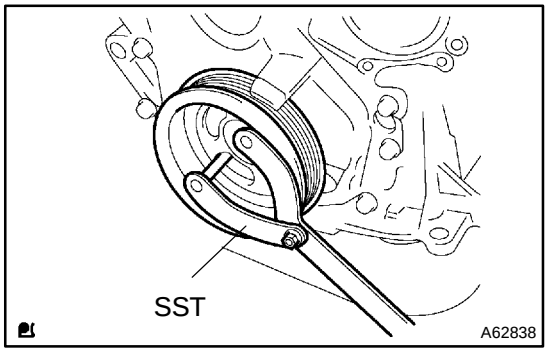
Keep the lip off foreign materials.

(b) Using SST, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.

SST 09223-15020, 09950-70010 (09951-07100), 09223-15030

NOTICE:

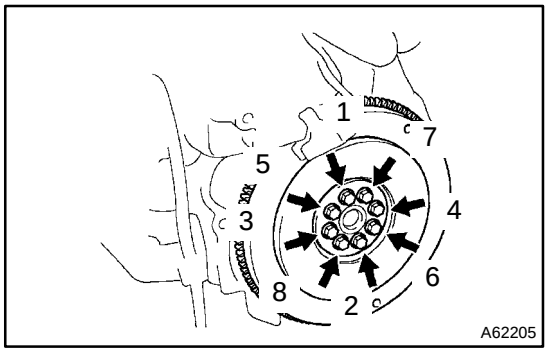
Wipe off extra grease on the crankshaft.



9. INSTALL FLYWHEEL SUB-ASSY(M/T TRANSAXLE)

(a) Fix the crankshaft with SST.

SST 09960-10010 (09962-01000, 09963-01000)



(b) Clean the bolt and bolt hole.

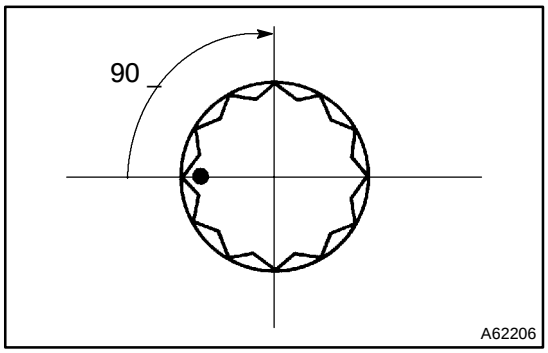
(c) Apply adhesive to the bolts.

Adhesive:

Part No. 09330-00070, THREE BOND or equivalent.

(d) Install and uniformly tighten the 8 bolts, in several passes, in the sequence shown.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



(e) Mark the bolts with paint.

(f) Retighten the bolts by an additional 90 _.

(g) Check that the point marked bolts are moved at 90 _ angle.

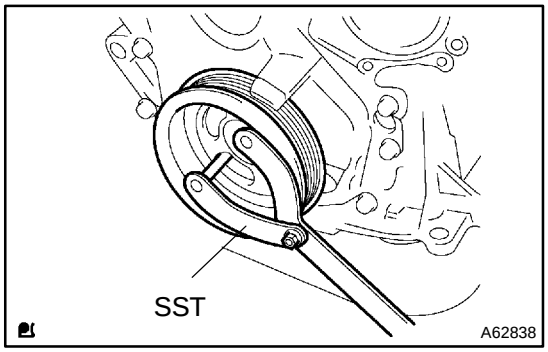
10. INSTALL CLUTCH DISC ASSY(M/T TRANSAXLE)

(See page 41-24)

SST 09301-00210

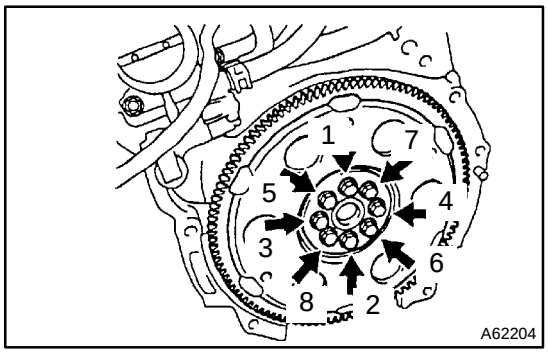
11. INSTALL CLUTCH COVER ASSY(M/T TRANSAXLE)

(See page 41-24)



12. INSTALL DRIVE PLATE & RING GEAR SUB-ASSY(A/T TRANSAXLE)

(a) Fix the crankshaft with SST.
SST 09960-10010 (09962-01000, 09963-01000)



(b) Clean the bolt and bolt hole.
(c) Apply adhesive to the bolts.
Adhesive:
Part No. 09330-00070, THREE BOND or equivalent.
(d) Install and uniformly tighten the 8 bolts, in several passes, in the sequence shown.
(e) Fix the crankshaft with SST.
Torque: 88 N·m (897 kgf·cm, 65 ft·lbf)

13. INSTALL MANUAL TRANSAXLE ASSY(M/T TRANSAXLE)
(See page 41-24)

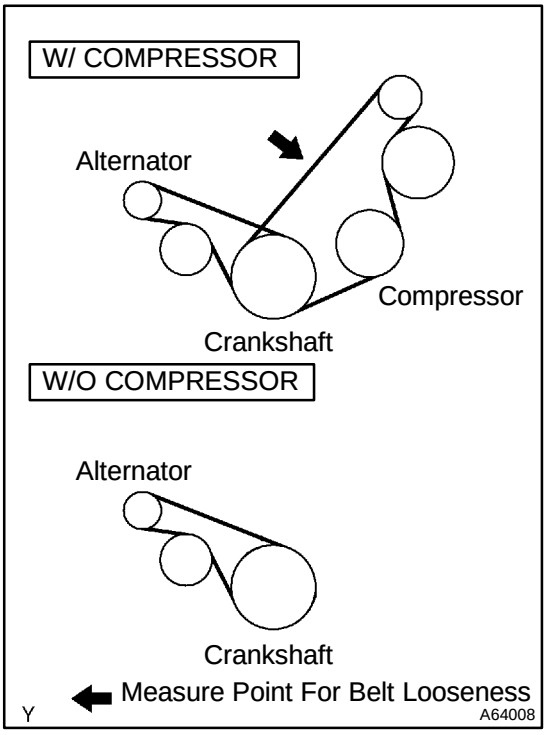
14. INSTALL AUTOMATIC TRANSAXLE ASSY(A/T TRANSAXLE)
(See page 40-9)
SST 09960-10010 (09962-01000, 09963-01000), 09023-12700

ENGINE ASSEMBLY (1CD-FTV)

140MK-01

INSPECTION

1. **INSPECT COOLANT** **(See page 16-33)**
2. **INSPECT ENGINE OIL** **(See page 17-12)**
3. **INSPECT BATTERY** **(See page 19-27)**
4. **INSPECT AIR CLEANER FILTER ELEMENT SUB-ASSY**



5. **INSPECT DRIVE BELT**

(a) Inspect cooler conpressor V belt.

(1) Belt deflection

Pressing force: 98 N·m (10 kgf, 22 lbf)

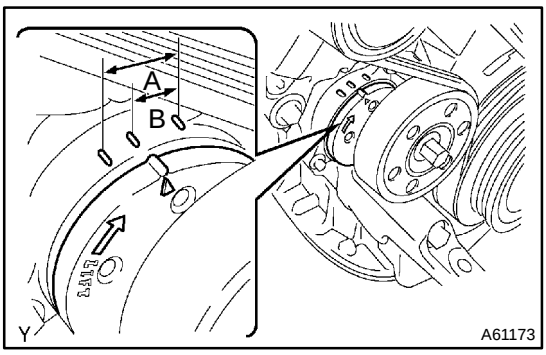
	New belt mm (in.)	Used belt mm (in.)
W/ Air Conditioner	9.5 - 11.5 (0.37 - 0.45)	12.5 - 15.5 (0.49 - 0.61)
W/O Air Conditioner	—	—

(2) Tension

	New belt N (kg, lb)	Used belt N (kg, lb)
W/ Air Conditioner	519 - 755 (53 - 77, 117 - 170)	196 - 392 (20 - 40, 44 - 88)
W/O Air Conditioner	—	—

NOTICE:

- **Check the drive belt deflection at the specified point.**
- **When installing a new belt, set its tension value as specified.**
- **When checking a belt used for over 5 minutes, confirm the deflection value is within the specified one.**
- **When reinstalling a belt used for over 5 minutes, perform the check based on the used deflection value.**
- **V-ribbed belt tension and deflection value should be checked after 2 revolutions of engine cranking.**
- **When using a belt tension gauge, confirm the accuracy first by using a master gauge.**



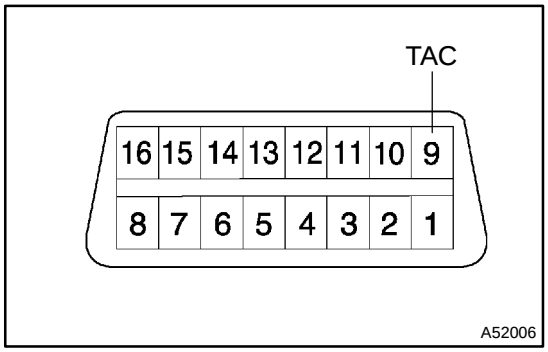
(b) Inspect generator V belt.

(1) Check that the tension is within A range on the auto tensioner scale.

If the tension is not within the A range on the scale, replace the belt with a new one.

HINT:

When replacing the drive belt with a new one, the belt's tension should be within the B range on the belt tensioner scale.



6. INSPECT ENGINE IDLE SPEED

(a) Using SST, connect tachometer test prove to terminal 9 (TAC) of DLC3.
SST 09843-18040

(b) Check the idle speed.
Idle speed: 700 - 800 rpm

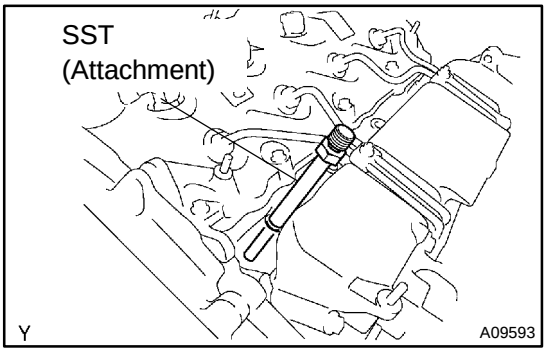
NOTICE:
- **Check idle speed with cooling fan OFF.**
- **Switch off all accessories and air conditioning.**

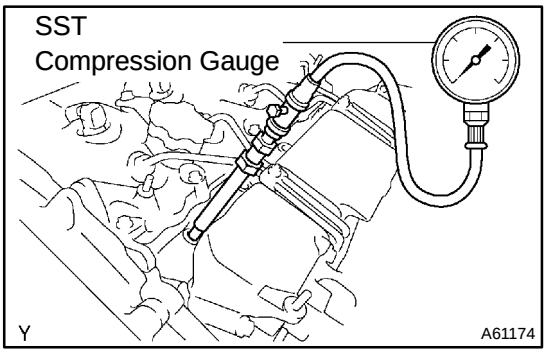
7. INSPECT MAXIMUM SPEED

(a) Start the engine.
(b) Depress the accelerator pedal all the way.
(c) Check the maximum speed.
Maximum speed: 5,100 - 5,250 rpm

8. INSPECT COMPRESSION

(a) Warm up and stop engine.
(1) Allow the engine to warm up to normal operating temperature.
(b) Remove the glow plugs. (See page 19-33)
(c) Disconnect the injector connectors.
(d) Inspect cylinder compression pressure.
(1) Install SST (attachment) to the glow plug hole.
SST 09992-00025 (09992-00121)
Torque: 12 N·m (125 kgf·cm, 95 ft·lbf)





(2) Connect SST (compression gauge) to the SST (attachment).
SST 09992-00025 (09992-00211)
(3) Fully open the throttle valve, and start the engine.

(4) While cranking the engine, measure the compression pressure.

NOTICE:

- **Always use a fully charged battery to obtain engine speed of 250 rpm or more.**
- **Check other cylinder's compression pressure in the same way.**
- **This measurement must be done in as short a time as possible.**

Compression pressure:
2,746 kPa (28.0 kgf/cm^2, 398 psi) or more
Minimum pressure:
2,256 kPa (23.0 kgf/cm^2, 327 psi) or more
Difference between each cylinder:
490 kPa (5.0 kgf/cm^2, 71 psi) or less

(5) If the cylinder compression is low, pour a small amount of engine oil into the cylinder through the glow plug hole and inspect again.

HINT:

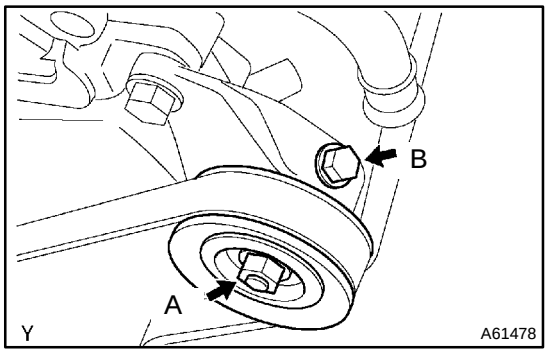
- If adding oil raises the compression, there are chances of the piston rings and/or cylinder bore wear or damage.
- If pressure stays low, a valve may be sticking or seating improperly, or there may be leakage past the gasket.

DRIVE BELT (1CD-FTV)

REPLACEMENT

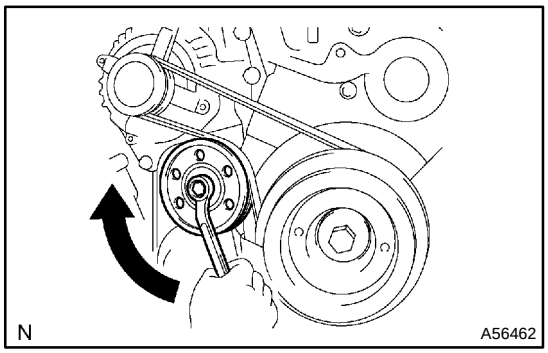
140ML-01

1. REMOVE ENGINE UNDER COVER RH



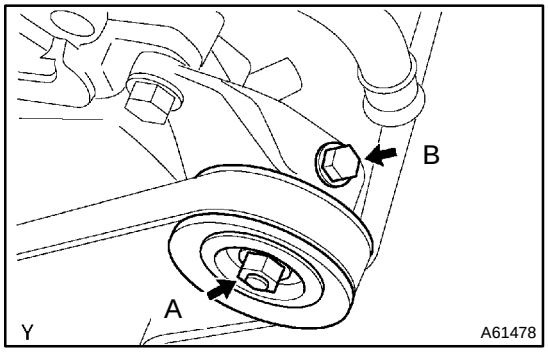
2. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Loosen the nut A and the bolt B.
(b) Remove the V-ribbed belt.



3. REMOVE GENERATOR V BELT

(a) Turn the V-ribbed belt tensioner assy slowly clockwise, and remove the V-ribbed belt.



4. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Install the V-ribbed belt.
(b) Tighten the bolt B and adjust the drive belt tension.
(See page 14-169)
(c) Torque the nut A.
Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)

VALVE CLEARANCE (1CD-FTV)

140MM-01

ADJUSTMENT

HINT:

Inspect and adjust the valve clearance when the engine is cold.

NOTICE:

- **Before removing the injection pipes, clean them up with a soft brush and compressed air.**
- **After removing the injection pipe, affix the gum tape on the supply pump, common rail and the whole injector installation area of the cylinder head cover for preventing dust from coming into them.**
- **After removing the cylinder head cover, put a vinyl bag and rubber band for preventing from mixing foreign objects over the injector inlet.**

1. REMOVE FRONT WHEEL RH

2. REMOVE ENGINE UNDER COVER RH

3. DRAIN ENGINE COOLANT **(See page 16-33)**

4. REMOVE ENGINE COVER SUB-ASSY NO.1

(a) Remove the 5 nuts and engine cover.

5. REMOVE AIR TUBE NO.1
(See page 13-8)

6. REMOVE TIMING BELT NO.2 COVER
(See page 14-214)

7. REMOVE INJECTION PIPE CLAMP NO.2
(See page 11-64)

8. REMOVE INJECTION PIPE SUB-ASSY NO.1
(See page 11-64)
SST 09023-12700, 09023-12900

9. REMOVE INJECTION PIPE SUB-ASSY NO.2
(See page 11-64)
SST 09023-12700, 09023-12900

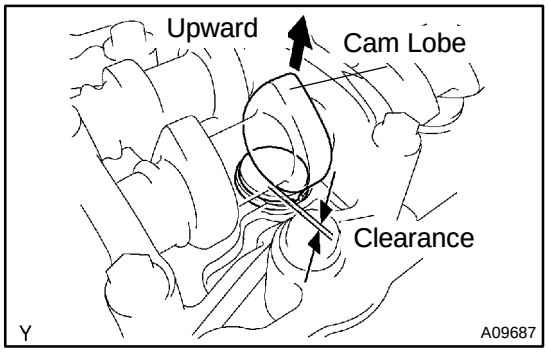
10. REMOVE INJECTION PIPE SUB-ASSY NO.3
(See page 11-64)
SST 09023-12700, 09023-12900

11. REMOVE INJECTION PIPE SUB-ASSY NO.4
(See page 11-64)
SST 09023-12700, 09023-12900

12. REMOVE CYLINDER HEAD COVER SUB-ASSY
(See page 11-65)

13. REMOVE NOZZLE LEAKAGE PIPE ASSY
(See page 11-65)

14. REMOVE INJECTOR ASSY
(See page 11-65)



15. INSPECT VALVE CLEARANCE

(a) Turn the crankshaft to the cam lobe of the camshaft on the inspecting valve point upward.

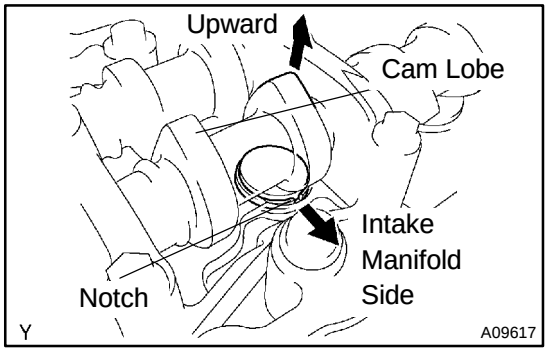
(b) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

(c) Measure the clearance at 16 places.

(d) Record the out-of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

Valve clearance (Cold):

Intake	0.20 - 0.30 mm (0.008 - 0.012 in.)
Exhaust	0.35 - 0.45 mm (0.014 - 0.018 in.)

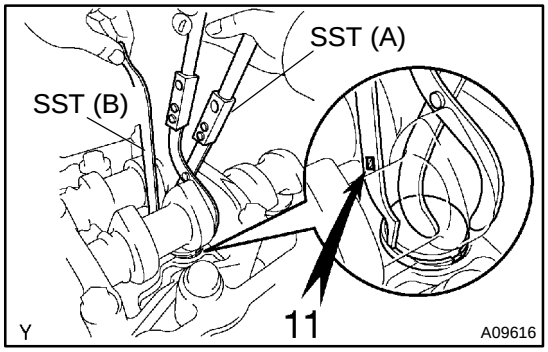


16. ADJUST VALVE CLEARANCE

(a) Remove the adjusting shim.

(1) Turn the crankshaft to the cam lobe of the camshaft on the adjusting valve point upward.

(2) Position the notch of the valve lifter facing the intake manifold side.

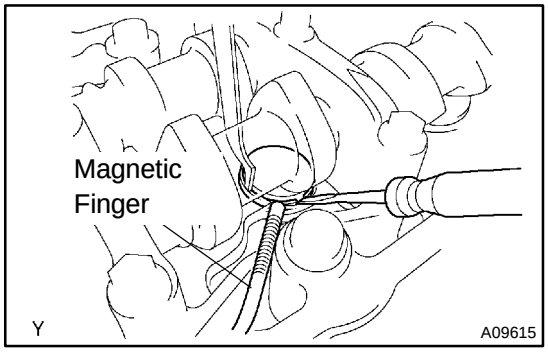


(3) Using SST (A), press down the valve lifter and place SST (B) between the camshaft and valve lifter. Remove SST (A).

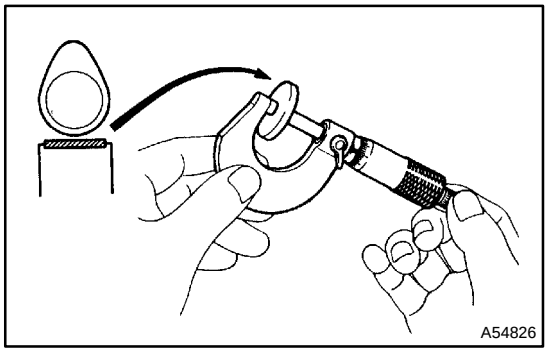
SST 09248-55050 (09248-05510, 09248-05520)

HINT:

Apply SST (B) on the side marked with "11".



(4) Remove the adjusting shim with a small screwdriver and a magnetic finger.



(b) Determine the replacement adjusting shim size by following the Formula or Charts:

(1) Using a micrometer, measure the thickness of the removed shim.

(2) Calculate the thickness of a new shim so that the valve clearance comes within specified value.

HINT:

T ..... Thickness of removed adjusting shim

A ..... Measured valve clearance

N ..... Thickness of new adjusting shim

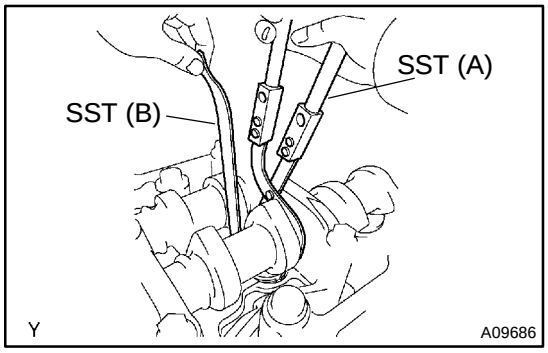
Intake: N = T + (A - 0.25 mm (0.010 in.))

Exhaust: N = T + (A - 0.40 mm (0.016 in.))

(3) Select a new shim with a thickness as close as possible to the calculated value.

HINT:

Shims are available in 17 sizes in increments of 0.05 mm (0.0020 in.), from 2.50 mm (0.0984 in.) to 3.30 mm (0.1299 in.).



(c) Install a new adjusting shim.

(1) Place a new adjusting shim on the valve lifter.

(2) Using SST (A), press down the valve lifter and remove SST (B).

SST 09248-55050 (09248-05510, 09248-05520)

(d) Recheck the valve clearance.

SST 09248-55050 (09248-05510, 09248-05520)

17. INSTALL INJECTOR ASSY
(See page 11-65)

18. INSTALL NOZZLE LEAKAGE PIPE ASSY
(See page 11-67)
SST 09992-00242

19. INSTALL CYLINDER HEAD COVER SUB-ASSY
(See page 11-68)

20. INSTALL INJECTION PIPE SUB-ASSY NO.1
(See page 11-64)
SST 09023-12700, 09023-12900

21. INSTALL INJECTION PIPE SUB-ASSY NO.2
(See page 11-64)
SST 09023-12900, 09023-12700

22. INSTALL INJECTION PIPE SUB-ASSY NO.3
(See page 11-64)
SST 09023-12700, 09023-12900

23. INSTALL INJECTION PIPE SUB-ASSY NO.4
(See page 11-64)
SST 09023-12900, 09023-12700

24. INSTALL INJECTION PIPE CLAMP NO.2
(See page 11-64)
25. INSTALL TIMING BELT NO.2 COVER
(See page 11-68)
26. INSTALL AIR TUBE NO.1
(See page 13-10)
27. INSTALL ENGINE COVER SUB-ASSY NO.1

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
28. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
29. ADD COOLANT (See page 16-33)
30. CHECK ENGINE COOLANT LEAK (See page 16-34)
31. CHECK FUEL LEAK (See page 11-64)

Adjusting Shim Selection Chart (Intake)

Measured clearance mm (in.) \ Installed shim thickness mm (in.)	2.500 (0.0984)	2.525 (0.0994)	2.550 (0.1004)	2.575 (0.1014)	2.600 (0.1024)	2.625 (0.1033)	2.650 (0.1043)	2.675 (0.1053)	2.700 (0.1063)	2.725 (0.1073)	2.750 (0.1083)	2.775 (0.1093)	2.800 (0.1102)	2.825 (0.1112)	2.850 (0.1122)	2.875 (0.1132)	2.900 (0.1142)	2.925 (0.1152)	2.950 (0.1161)	2.975 (0.1171)	3.000 (0.1181)	3.025 (0.1191)	3.050 (0.1201)	3.075 (0.1211)	3.100 (0.1220)	3.125 (0.1230)	3.150 (0.1240)	3.175 (0.1250)	3.200 (0.1260)	3.225 (0.1270)	3.250 (0.1280)	3.275 (0.1289)	3.300 (0.1299)
0.000 ~ 0.020 (0.0000 ~ 0.0008)									01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23
0.021 ~ 0.040 (0.0008 ~ 0.0016)									01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25
0.041 ~ 0.060 (0.0016 ~ 0.0024)								01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25
0.061 ~ 0.080 (0.0024 ~ 0.0031)							01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25
0.081 ~ 0.100 (0.0032 ~ 0.0039)						01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27
0.101 ~ 0.120 (0.0040 ~ 0.0047)					01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27
0.121 ~ 0.140 (0.0048 ~ 0.0055)					01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29
0.141 ~ 0.160 (0.0056 ~ 0.0063)				01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29
0.161 ~ 0.180 (0.0063 ~ 0.0071)			01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29
0.181 ~ 0.199 (0.0071 ~ 0.0078)		01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31
0.200 ~ 0.300 (0.0079 ~ 0.0118)																																	
0.301 ~ 0.320 (0.0119 ~ 0.0126)	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	
0.321 ~ 0.340 (0.0126 ~ 0.0134)	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33		
0.341 ~ 0.360 (0.0134 ~ 0.0142)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33			
0.361 ~ 0.380 (0.0142 ~ 0.0150)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33				
0.381 ~ 0.400 (0.0150 ~ 0.0157)	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33				
0.401 ~ 0.420 (0.0158 ~ 0.0165)	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33					
0.421 ~ 0.440 (0.0166 ~ 0.0173)	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33						
0.441 ~ 0.460 (0.0174 ~ 0.0181)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33							
0.461 ~ 0.480 (0.0181 ~ 0.0189)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33								
0.481 ~ 0.500 (0.0189 ~ 0.0197)	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33								
0.501 ~ 0.520 (0.0197 ~ 0.0205)	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33									
0.521 ~ 0.540 (0.0205 ~ 0.0213)	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33										
0.541 ~ 0.560 (0.0213 ~ 0.0220)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33											
0.561 ~ 0.580 (0.0221 ~ 0.0228)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33												
0.581 ~ 0.600 (0.0229 ~ 0.0236)	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33												
0.601 ~ 0.620 (0.0237 ~ 0.0244)	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33													
0.621 ~ 0.640 (0.0244 ~ 0.0252)	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33														
0.641 ~ 0.660 (0.0252 ~ 0.0260)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33															
0.661 ~ 0.680 (0.0260 ~ 0.0268)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33																
0.681 ~ 0.700 (0.0268 ~ 0.0276)	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																
0.701 ~ 0.720 (0.0276 ~ 0.0283)	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																	
0.721 ~ 0.740 (0.0284 ~ 0.0291)	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																		
0.741 ~ 0.760 (0.0292 ~ 0.0299)	21	23	23	25	25	27	27	29	29	31	31	33	33	33																			
0.761 ~ 0.780 (0.0300 ~ 0.0307)	21	23	23	25	25	27	27	29	29	31	31	33	33																				
0.781 ~ 0.800 (0.0307 ~ 0.0315)	23	23	25	25	27	27	29	29	31	31	33	33	33																				
0.801 ~ 0.820 (0.0315 ~ 0.0323)	23	25	25	27	27	29	29	31	31	33	33	33																					
0.821 ~ 0.840 (0.0323 ~ 0.0331)	25	25	27	27	29	29	31	31	33	33	33																						
0.841 ~ 0.860 (0.0331 ~ 0.0339)	25	27	27	29	29	31	31	33	33	33																							
0.861 ~ 0.880 (0.0339 ~ 0.0346)	25	27	27	29	29	31	31	33	33																								
0.881 ~ 0.900 (0.0347 ~ 0.0354)	27	27	29	29	31	31	33	33	33																								
0.901 ~ 0.920 (0.0355 ~ 0.0362)	27	29	29	31	31	33	33	33																									
0.921 ~ 0.940 (0.0363 ~ 0.0370)	29	29	31	31	33	33	33																										
0.941 ~ 0.960 (0.0370 ~ 0.0378)	29	31	31	33	33	33																											
0.961 ~ 0.980 (0.0378 ~ 0.0386)	29	31	31	33	33																												
0.981 ~ 1.000 (0.0386 ~ 0.0394)	31	31	33	33	33																												
1.001 ~ 1.020 (0.0394 ~ 0.0402)	31	33	33	33																													
1.121 ~ 1.040 (0.0402 ~ 0.0409)	33	33	33																														
1.041 ~ 1.060 (0.0410 ~ 0.0417)	33	33																															
1.161 ~ 1.080 (0.0418 ~ 0.0425)	33																																
1.081 ~ 1.100 (0.0426 ~ 0.0433)	33																																

New shim thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness
01	2.500 (0.0984)	19	2.950 (0.1161)
03	2.550 (0.1004)	21	3.000 (0.1181)
05	2.600 (0.1024)	23	3.050 (0.1201)
07	2.650 (0.1043)	25	3.100 (0.1220)
09	2.700 (0.1063)	27	3.150 (0.1240)
11	2.750 (0.1083)	29	3.200 (0.1260)
13	2.800 (0.1102)	31	3.250 (0.1280)
15	2.850 (0.1122)	33	3.300 (0.1299)
17	2.900 (0.1142)		

Intake valve clearance (Cold):

0.20 - 0.30 mm (0.008 - 0.012 in.)

EXAMPLE: The 2.800 mm (0.1102 in.) shim is installed, and the measured clearance is 0.450 mm (0.0177 in.). Replace the 2.800 mm (0.1102 in.) shim with a new No.21 shim.

Y

A57526

Adjusting Shim Selection Chart (Exhaust)

Measured clearance mm (in.) \ Installed shim thickness mm (in.)	2.500 (0.0984)	2.525 (0.0994)	2.550 (0.1004)	2.575 (0.1014)	2.600 (0.1024)	2.625 (0.1033)	2.650 (0.1043)	2.675 (0.1053)	2.700 (0.1063)	2.725 (0.1073)	2.750 (0.1073)	2.775 (0.1093)	2.800 (0.1102)	2.825 (0.1112)	2.850 (0.1122)	2.875 (0.1132)	2.900 (0.1142)	2.925 (0.1152)	2.950 (0.1161)	2.975 (0.1171)	3.000 (0.1181)	3.025 (0.1191)	3.050 (0.1201)	3.075 (0.1211)	3.100 (0.1220)	3.125 (0.1230)	3.150 (0.1240)	3.175 (0.1250)	3.200 (0.1260)	3.225 (0.1270)	3.250 (0.1280)	3.275 (0.1289)	3.300 (0.1299)
0.000 ~ 0.020 (0.0000 ~ 0.0008)															01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17
0.021 ~ 0.040 (0.0008 ~ 0.0016)															01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	
0.041 ~ 0.060 (0.0016 ~ 0.0024)														01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19		
0.061 ~ 0.080 (0.0024 ~ 0.0031)													01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19		
0.081 ~ 0.100 (0.0032 ~ 0.0039)												01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	
0.101 ~ 0.120 (0.0040 ~ 0.0047)											01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21		
0.121 ~ 0.140 (0.0048 ~ 0.0055)											01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23		
0.141 ~ 0.160 (0.0056 ~ 0.0063)										01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23		
0.161 ~ 0.180 (0.0063 ~ 0.0071)									01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23		
0.181 ~ 0.200 (0.0071 ~ 0.0079)								01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25		
0.201 ~ 0.220 (0.0079 ~ 0.0087)							01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25		
0.221 ~ 0.240 (0.0087 ~ 0.0094)							01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25		
0.241 ~ 0.260 (0.0095 ~ 0.0102)						01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27		
0.261 ~ 0.280 (0.0103 ~ 0.0110)				01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27		
0.281 ~ 0.300 (0.0111 ~ 0.0118)			01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29		
0.301 ~ 0.320 (0.0119 ~ 0.0126)			01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29		
0.321 ~ 0.340 (0.0126 ~ 0.0134)			01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29		
0.341 ~ 0.349 (0.0134 ~ 0.0137)		01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31		
0.350 ~ 0.450 (0.0138 ~ 0.0177)																																		
0.451 ~ 0.460 (0.0178 ~ 0.0181)	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33		
0.461 ~ 0.480 (0.0181 ~ 0.0189)	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33			
0.481 ~ 0.500 (0.0189 ~ 0.0197)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33			
0.501 ~ 0.520 (0.0197 ~ 0.0205)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33				
0.521 ~ 0.540 (0.0205 ~ 0.0213)	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33					
0.541 ~ 0.560 (0.0213 ~ 0.0220)	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33						
0.561 ~ 0.580 (0.0221 ~ 0.0228)	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33							
0.581 ~ 0.600 (0.0229 ~ 0.0236)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33							
0.601 ~ 0.620 (0.0237 ~ 0.0244)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33								
0.621 ~ 0.640 (0.0244 ~ 0.0252)	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33									
0.641 ~ 0.660 (0.0252 ~ 0.0260)	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33										
0.661 ~ 0.680 (0.0260 ~ 0.0268)	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33											
0.681 ~ 0.700 (0.0268 ~ 0.0276)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33											
0.701 ~ 0.720 (0.0276 ~ 0.0283)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33												
0.721 ~ 0.740 (0.0284 ~ 0.0291)	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33													
0.741 ~ 0.760 (0.0292 ~ 0.0299)	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33														
0.761 ~ 0.780 (0.0300 ~ 0.0307)	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33															
0.781 ~ 0.800 (0.0307 ~ 0.0315)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33															
0.801 ~ 0.820 (0.0315 ~ 0.0323)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																
0.821 ~ 0.840 (0.0323 ~ 0.0331)	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																	
0.841 ~ 0.860 (0.0331 ~ 0.0339)	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																		
0.861 ~ 0.880 (0.0339 ~ 0.0346)	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																			
0.881 ~ 0.900 (0.0347 ~ 0.0354)	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33																			
0.901 ~ 0.920 (0.0355 ~ 0.0362)	21	23	23	25	25	27	27	29	29	31	31	33	33	33																				
0.921 ~ 0.940 (0.0363 ~ 0.0370)	23	23	25	25	27	27	29	29	31	31	33	33	33																					
0.941 ~ 0.960 (0.0370 ~ 0.0378)	23	25	25	27	27	29	29	31	31	33	33	33																						
0.961 ~ 0.980 (0.0378 ~ 0.0386)	25	25	27	27	29	29	31	31	33	33	33																							
0.981 ~ 1.000 (0.0386 ~ 0.0394)	25	27	27	29	29	31	31	33	33	33	33																							
1.001 ~ 1.020 (0.0394 ~ 0.0402)	25	27	27	29	29	31	31	33	33	33																								
1.021 ~ 1.040 (0.0402 ~ 0.0409)	27	27	29	29	31	31	33	33	33																									
1.041 ~ 1.060 (0.0410 ~ 0.0417)	27	29	29	31	31	33	33	33																										
1.061 ~ 1.080 (0.0418 ~ 0.0425)	29	29	31	31	33	33	33																											
1.081 ~ 1.100 (0.0426 ~ 0.0433)	29	31	31	33	33	33	33																											
1.101 ~ 1.120 (0.0433 ~ 0.0441)	29	31	31	33	33	33																												
1.121 ~ 1.140 (0.0441 ~ 0.0449)	31	31	33	33	33																													
1.141 ~ 1.160 (0.0449 ~ 0.0457)	31	33	33	33																														
1.161 ~ 1.180 (0.0457 ~ 0.0465)	33	33	33																															
1.181 ~ 1.200 (0.0465 ~ 0.0472)	33	33	33																															
1.201 ~ 1.220 (0.0473 ~ 0.0480)	33	33																																
1.221 ~ 1.240 (0.0481 ~ 0.0488)	33																																	

New shim thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness
01	2.500 (0.0984)	19	2.950 (0.1161)
03	2.550 (0.1004)	21	3.000 (0.1181)
05	2.600 (0.1024)	23	3.050 (0.1201)
07	2.650 (0.1043)	25	3.100 (0.1220)
09	2.700 (0.1063)	27	3.150 (0.1240)
11	2.750 (0.1083)	29	3.200 (0.1260)
13	2.800 (0.1102)	31	3.250 (0.1280)
15	2.850 (0.1122)	33	3.300 (0.1299)
17	2.900 (0.1142)		

Exhaust valve clearance (Cold):
0.35 - 0.45 mm (0.014 - 0.018 in.)

EXAMPLE: The 2.800 mm (0.1102 in.) shim is installed, and the measured clearance is 0.590 mm (0.0232 in.). Replace the 2.800 mm (0.1102 in.) shim with a new No.21 shim.

Y

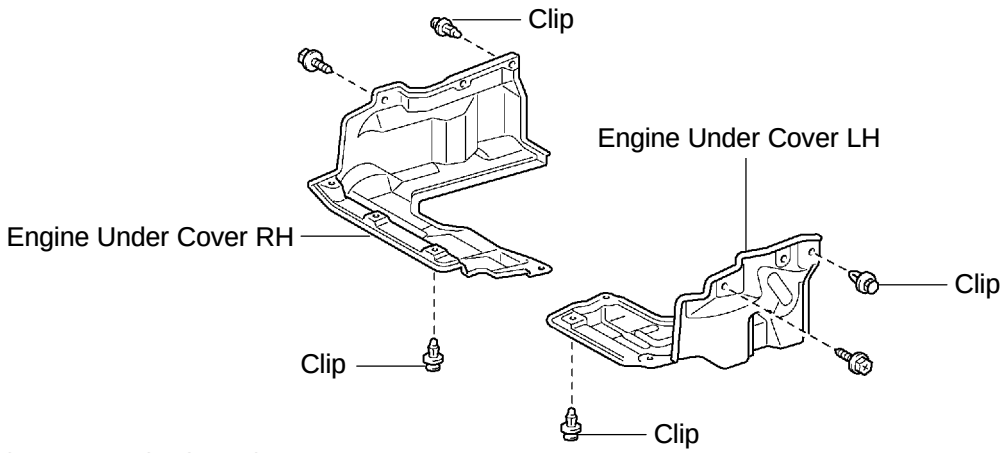
A57527

PARTIAL ENGINE ASSY (1CD-FTV)

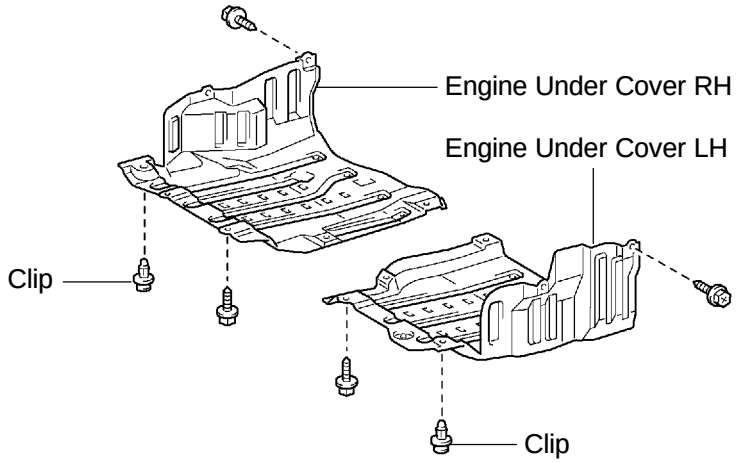
COMPONENTS

140MO-01

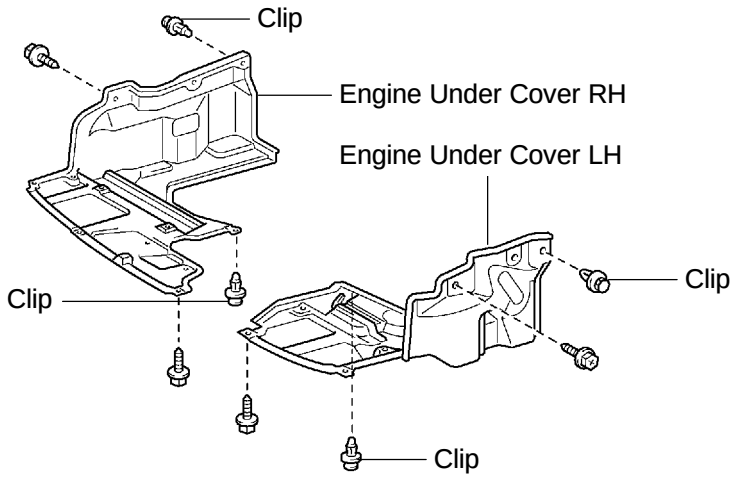
TMC MADE:



TMC MADE, ROUGH ROAD TYPE:

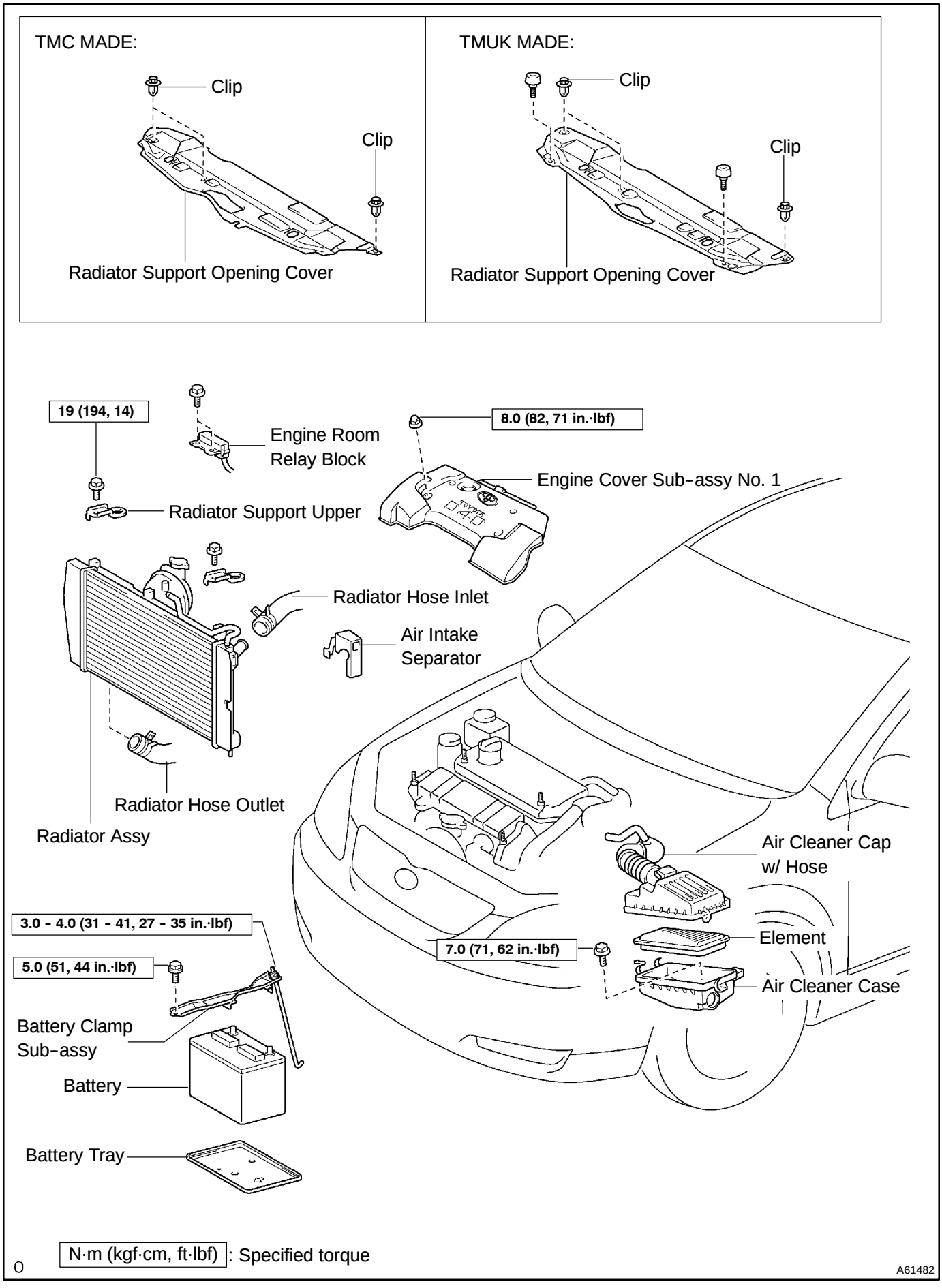


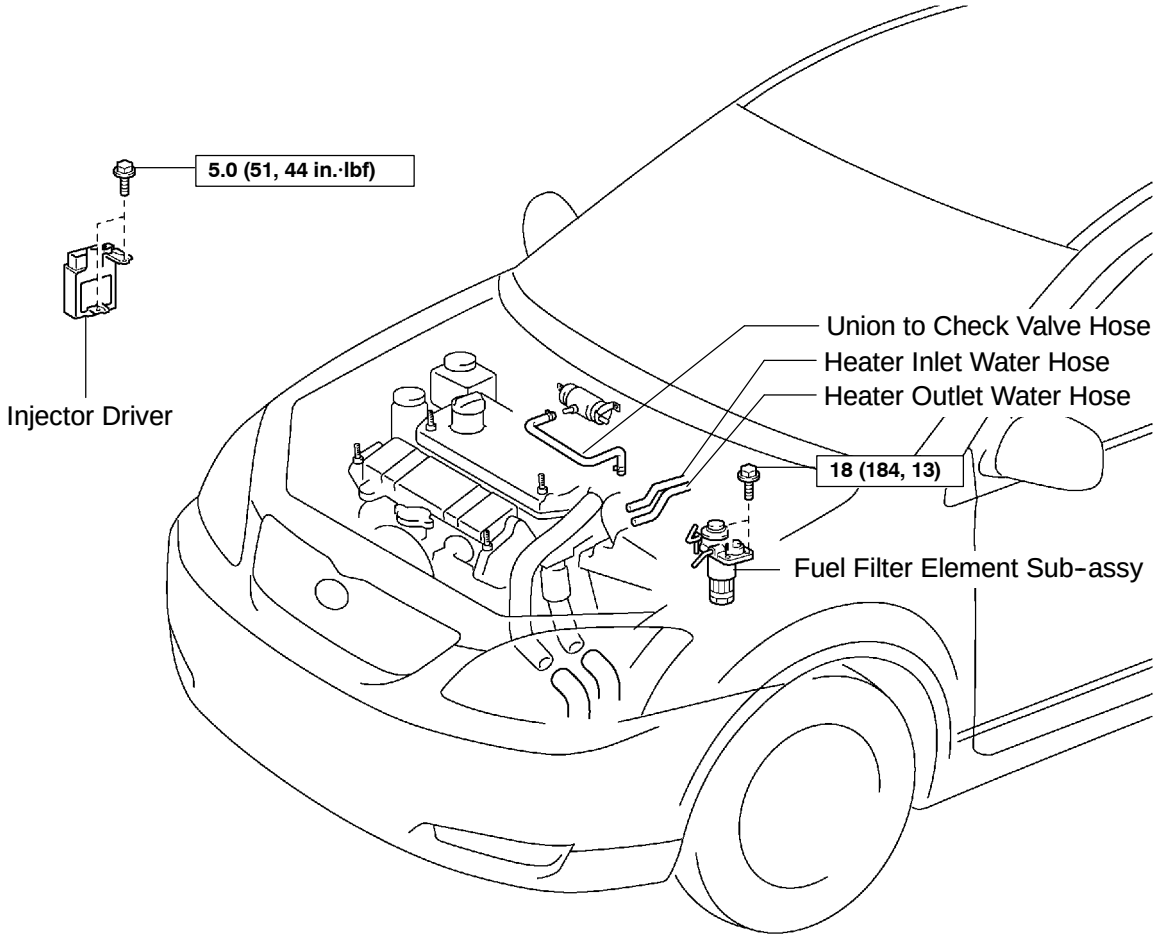
TMUK MADE:



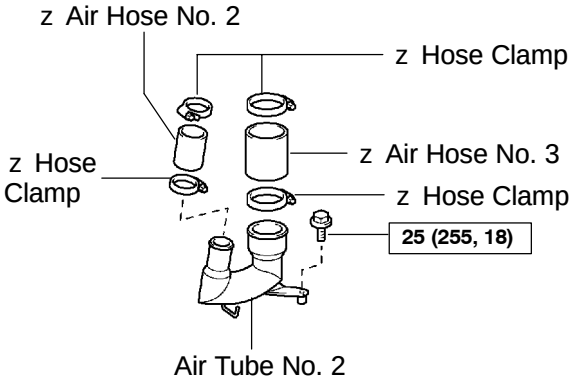
O

A61481

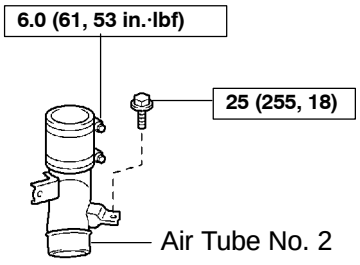

TMC MADE:
Clip
Clip
Radiator Support Opening Cover
TMUK MADE:
Clip
Clip
Radiator Support Opening Cover
19 (194, 14)
Engine Room
Relay Block
8.0 (82, 71 in.·lbf)
Engine Cover Sub-assy No. 1
Radiator Support Upper
Radiator Hose Inlet
Air Intake
Separator
Radiator Hose Outlet
Radiator Assy
Air Cleaner Cap
w/ Hose
Element
7.0 (71, 62 in.·lbf)
Air Cleaner Case
3.0 - 4.0 (31 - 41, 27 - 35 in.·lbf)
5.0 (51, 44 in.·lbf)
Battery Clamp
Sub-assy
Battery
Battery Tray
N·m (kgf·cm, ft·lbf): Specified torque
A61482



w/o Inter Cooler

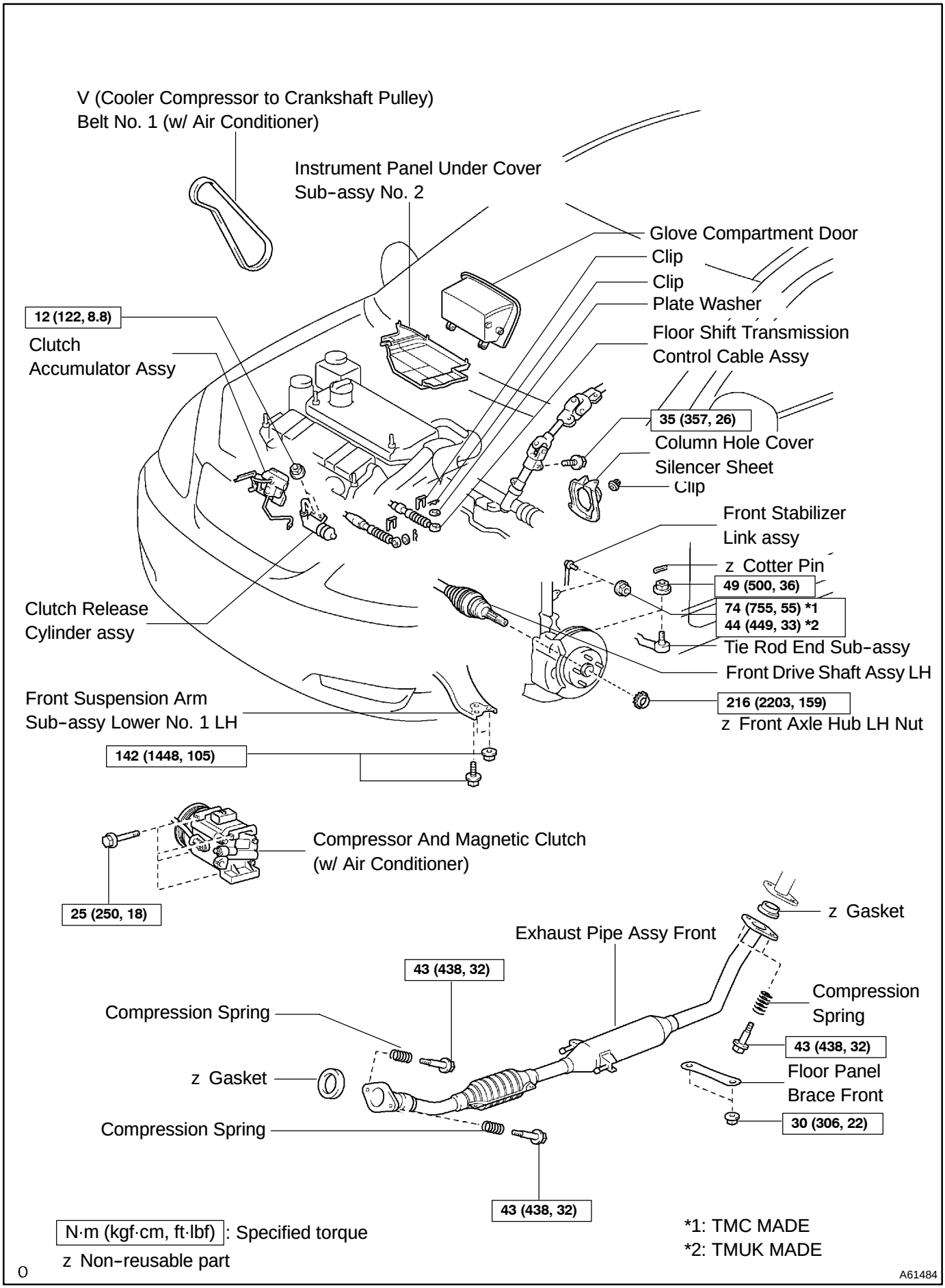


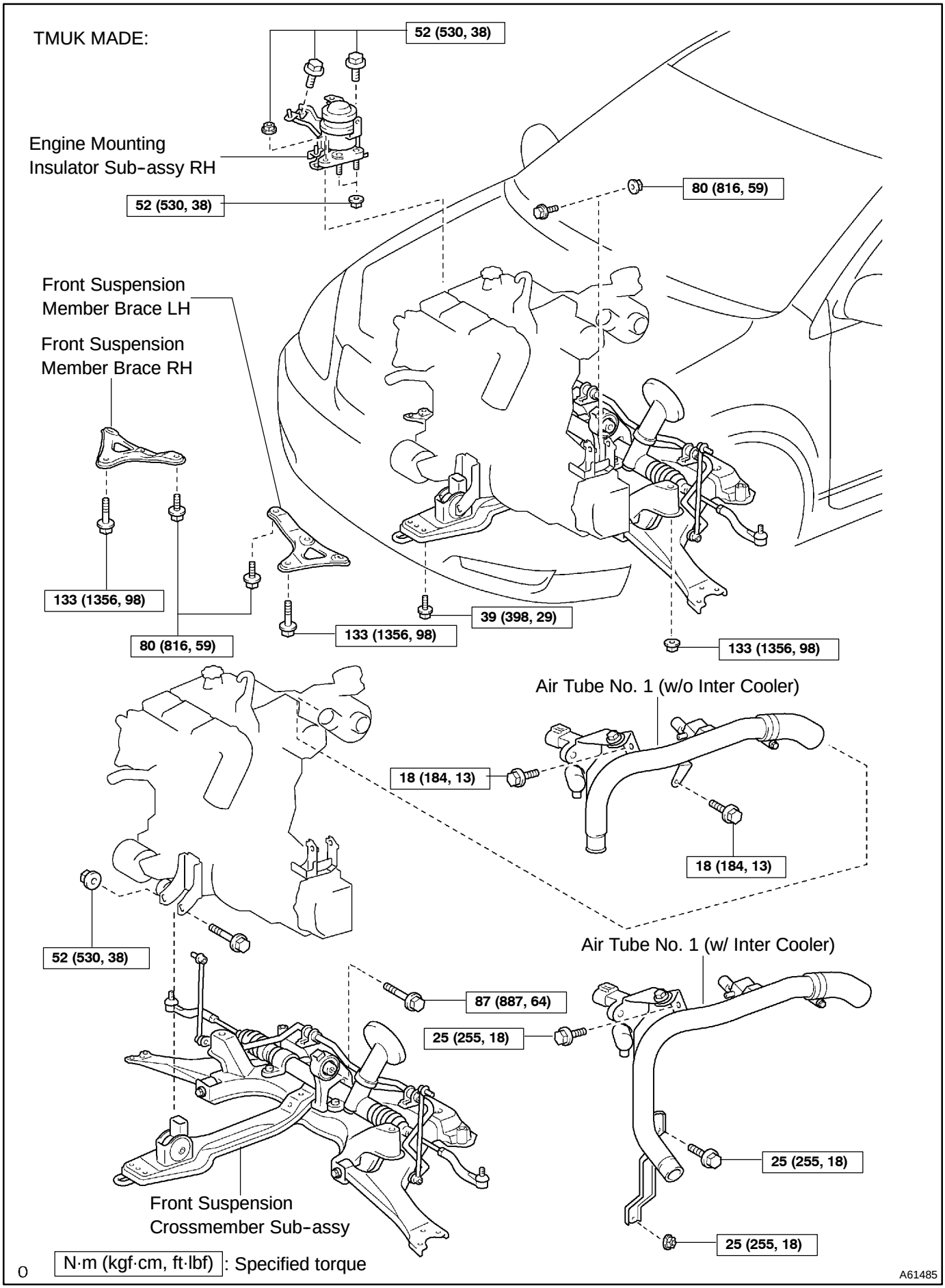
w/ Inter Cooler

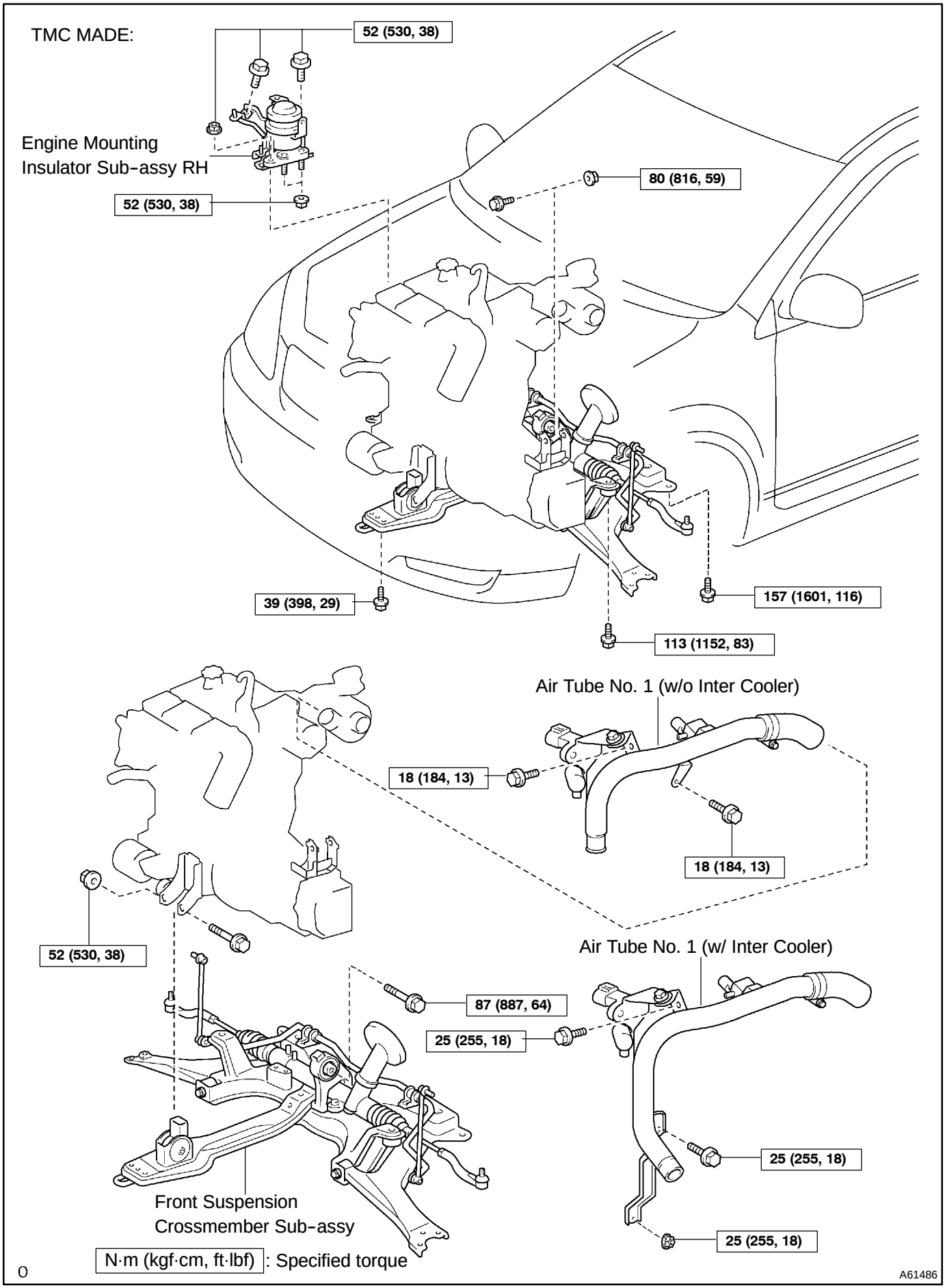


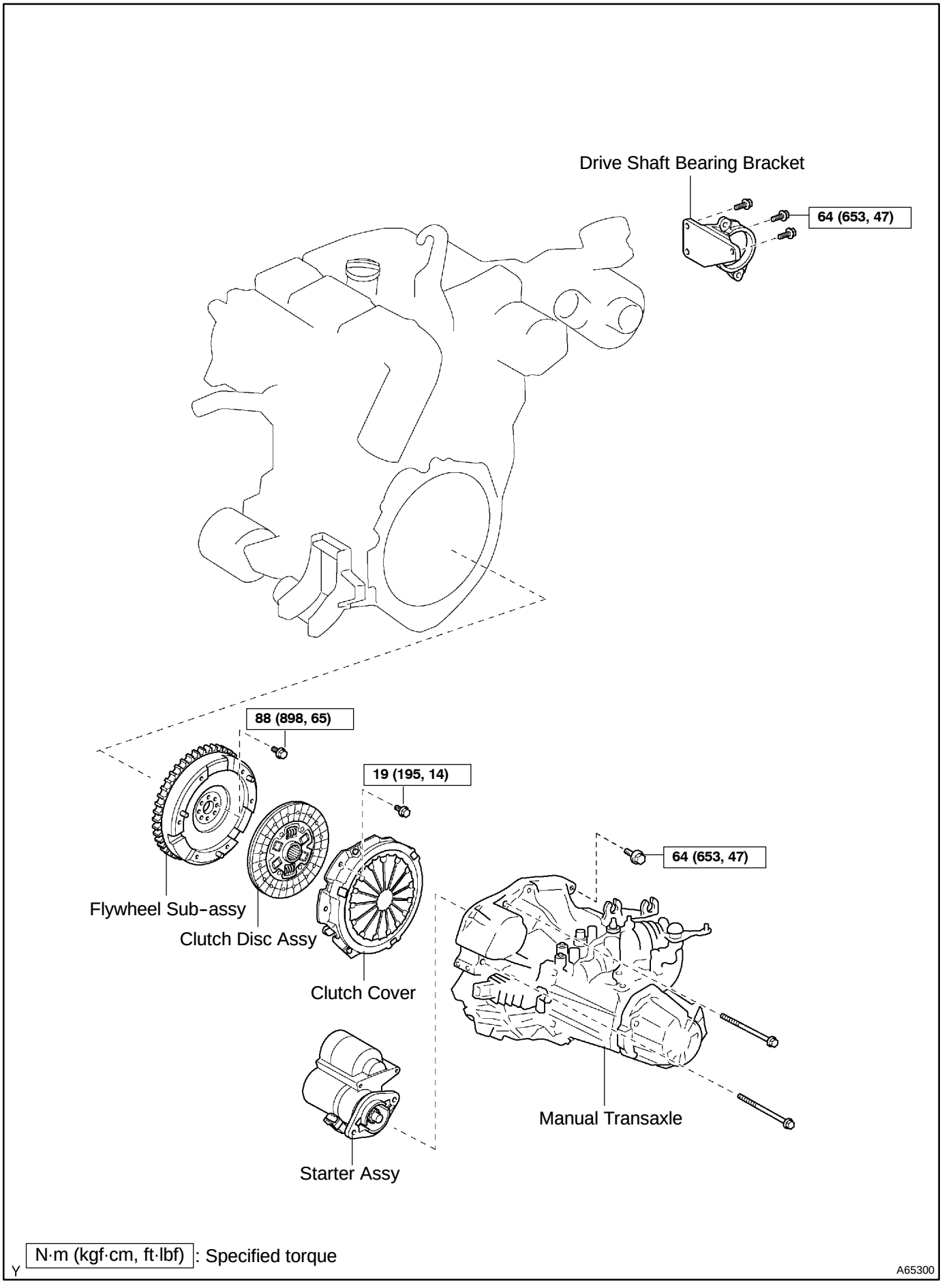
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part

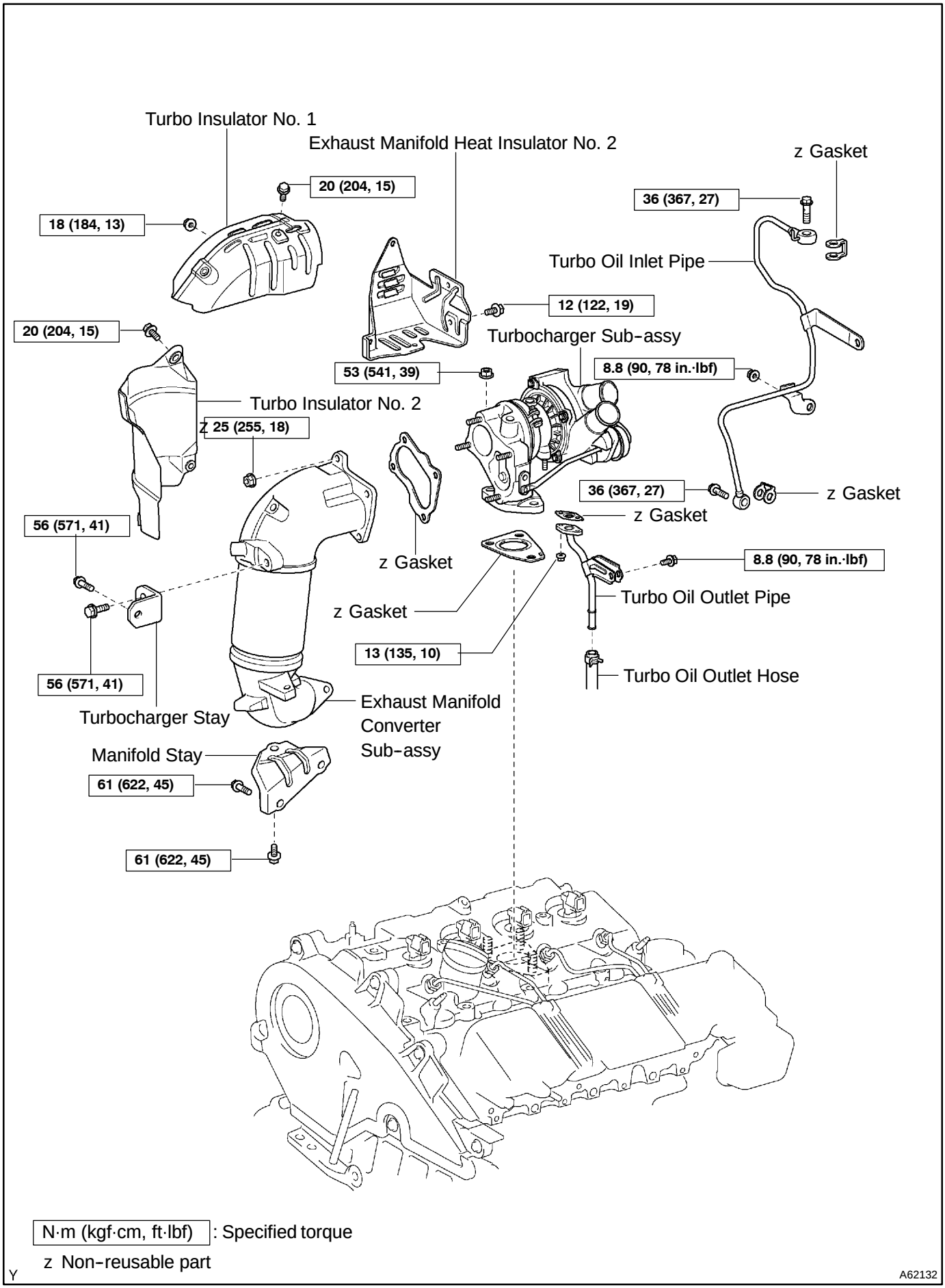
A61483

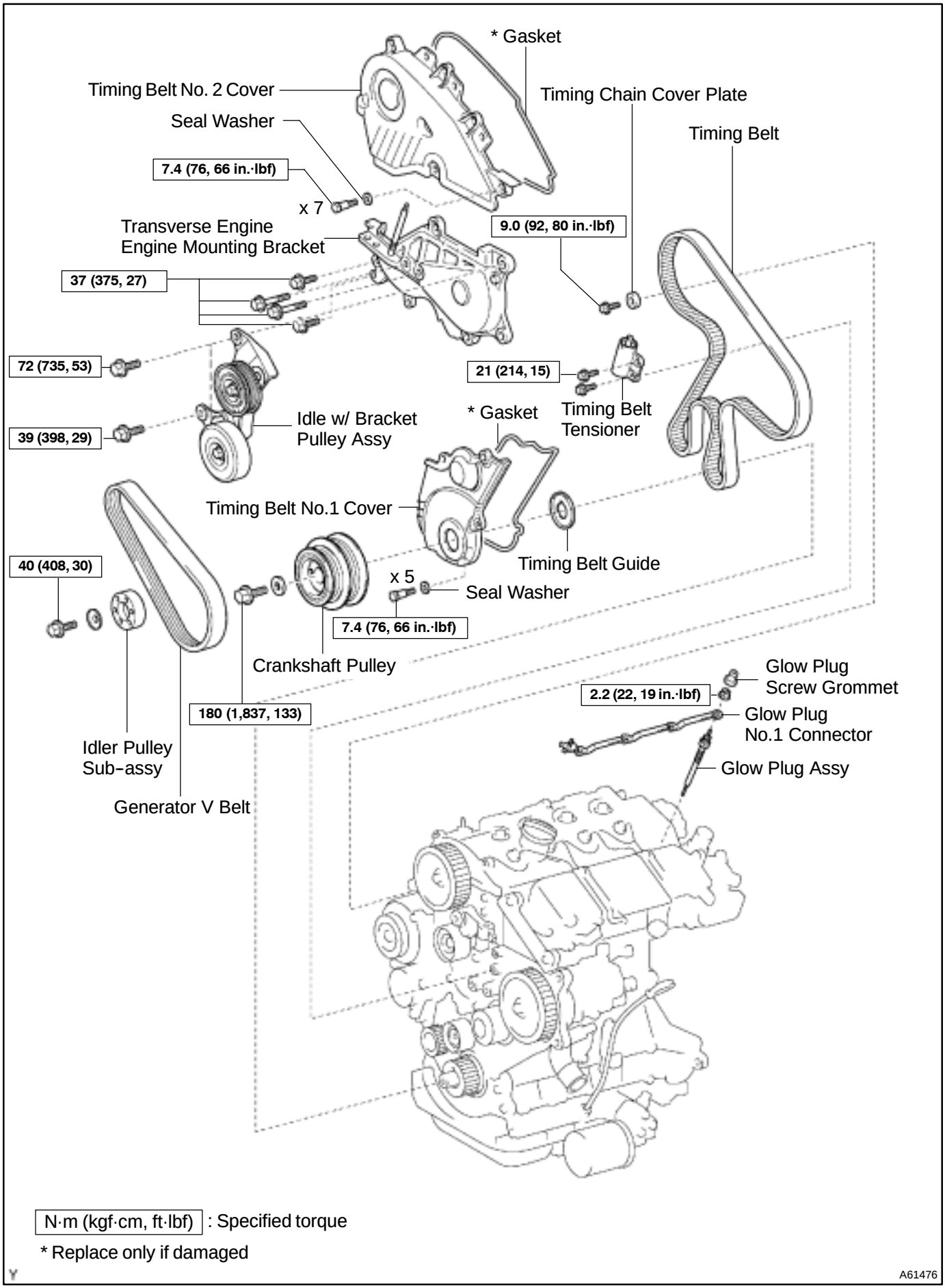

V (Cooler Compressor to Crankshaft Pulley) Belt No. 1 (w/ Air Conditioner)
Instrument Panel Under Cover Sub-assy No. 2
Glove Compartment Door
Clip
Clip
Plate Washer
Floor Shift Transmission Control Cable Assy
12 (122, 8.8)
Clutch Accumulator Assy
35 (357, 26)
Column Hole Cover
Silencer Sheet
Clip
Front Stabilizer Link assy
z Cotter Pin
49 (500, 36)
74 (755, 55) *1
44 (449, 33) *2
Tie Rod End Sub-assy
Front Drive Shaft Assy LH
216 (2203, 159)
z Front Axle Hub LH Nut
Clutch Release Cylinder assy
Front Suspension Arm Sub-assy Lower No. 1 LH
142 (1448, 105)
Compressor And Magnetic Clutch (w/ Air Conditioner)
25 (250, 18)
z Gasket
Exhaust Pipe Assy Front
43 (438, 32)
Compression Spring
Compression Spring
43 (438, 32)
z Gasket
Floor Panel Brace Front
Compression Spring
30 (306, 22)
43 (438, 32)
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
*1: TMC MADE
*2: TMUK MADE
A61484

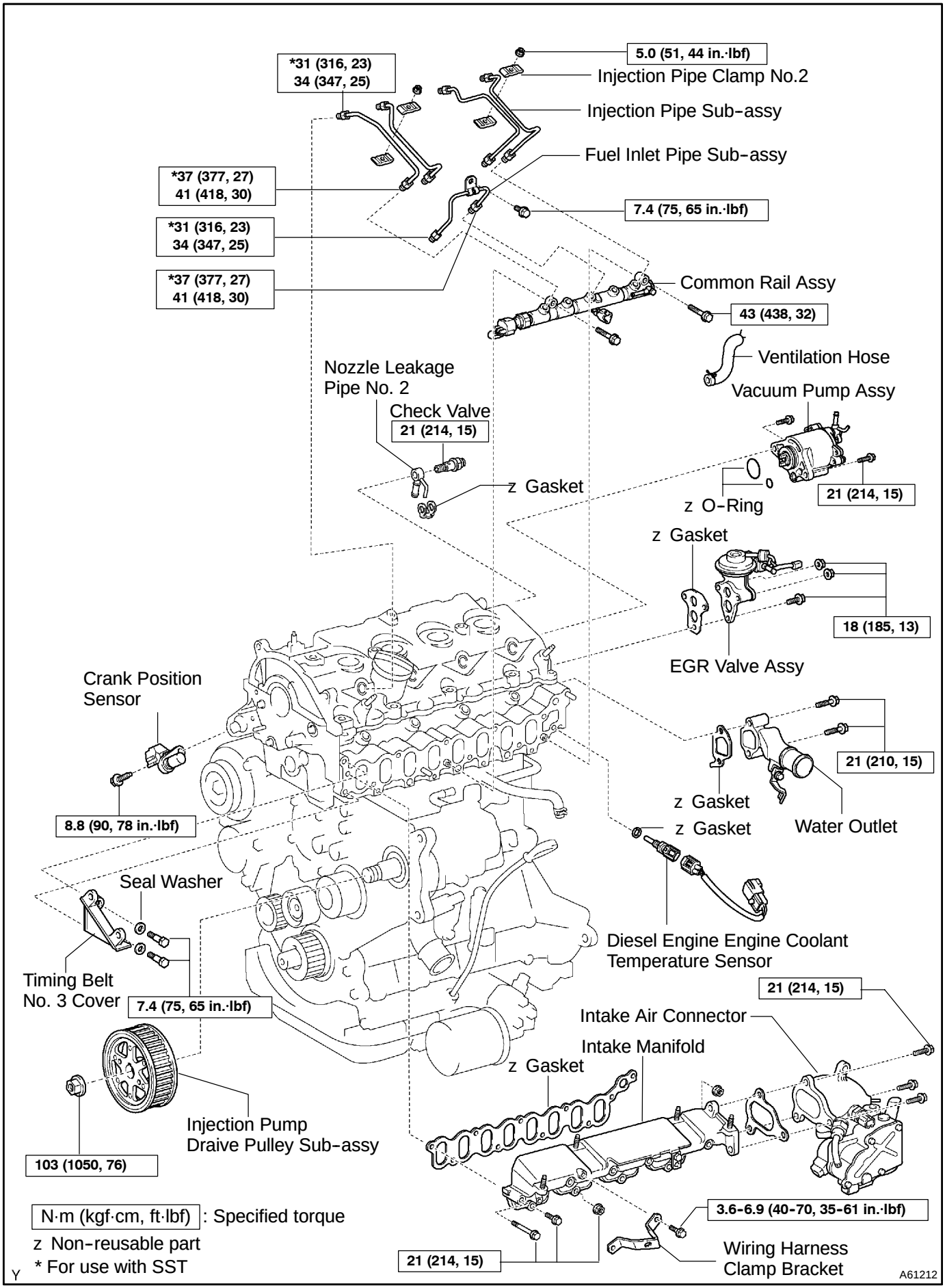

TMUK MADE:
52 (530, 38)
Engine Mounting Insulator Sub-assy RH
52 (530, 38)
80 (816, 59)
Front Suspension Member Brace LH
Front Suspension Member Brace RH
133 (1356, 98)
80 (816, 59)
133 (1356, 98)
39 (398, 29)
133 (1356, 98)
Air Tube No. 1 (w/o Inter Cooler)
18 (184, 13)
18 (184, 13)
52 (530, 38)
Air Tube No. 1 (w/ Inter Cooler)
87 (887, 64)
25 (255, 18)
25 (255, 18)
25 (255, 18)
Front Suspension Crossmember Sub-assy
N·m (kgf·cm, ft·lbf): Specified torque
A61485

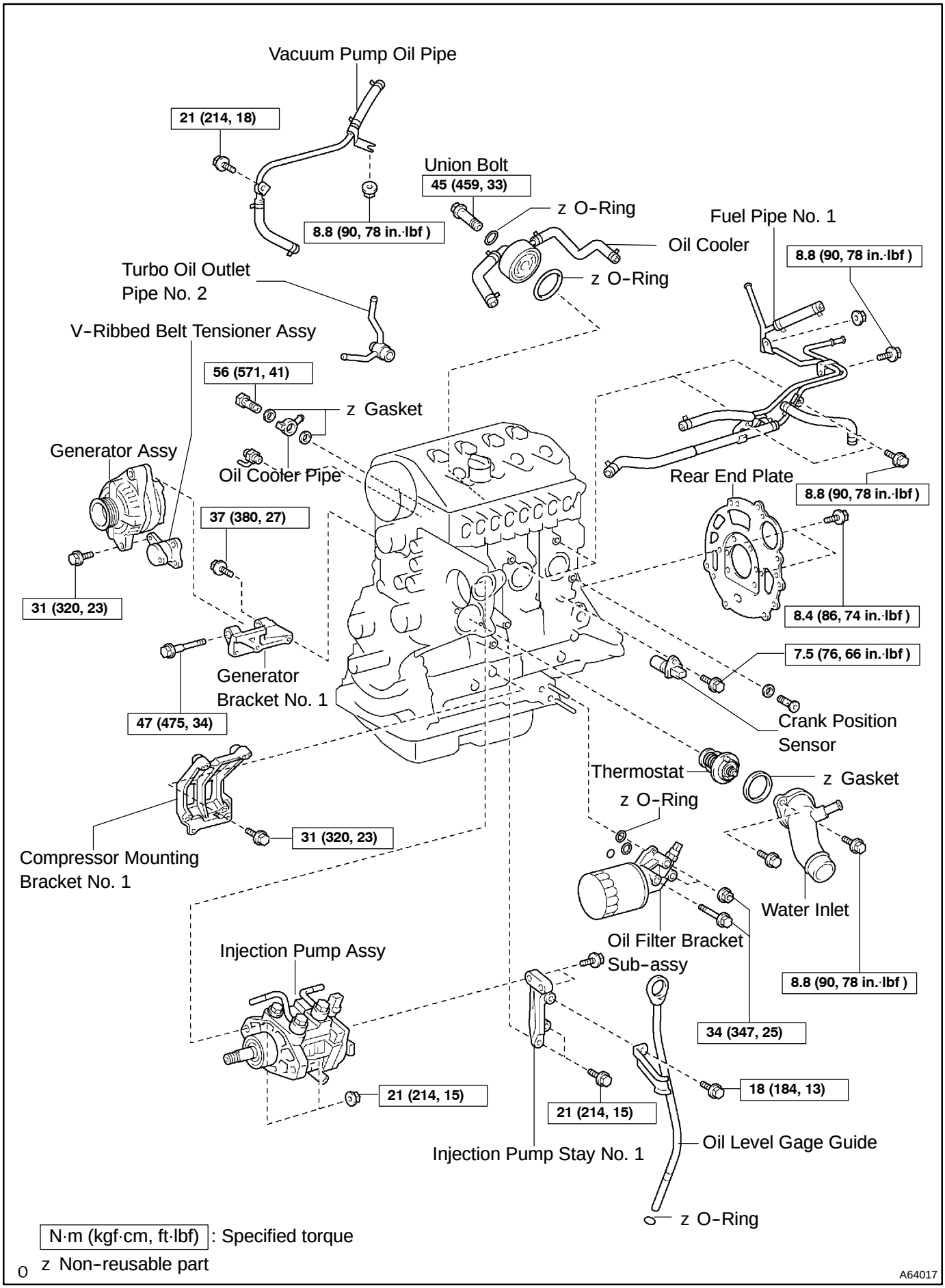

TMC MADE:
52 (530, 38)
Engine Mounting
Insulator Sub-assy RH
52 (530, 38)
80 (816, 59)
39 (398, 29)
157 (1601, 116)
113 (1152, 83)
Air Tube No. 1 (w/o Inter Cooler)
18 (184, 13)
18 (184, 13)
52 (530, 38)
Air Tube No. 1 (w/ Inter Cooler)
87 (887, 64)
25 (255, 18)
25 (255, 18)
25 (255, 18)
Front Suspension
Crossmember Sub-assy
N·m (kgf·cm, ft·lbf) : Specified torque
A61486


Drive Shaft Bearing Bracket
64 (653, 47)
88 (898, 65)
19 (195, 14)
64 (653, 47)
Flywheel Sub-assy
Clutch Disc Assy
Clutch Cover
Manual Transaxle
Starter Assy
N·m (kgf·cm, ft·lbf): Specified torque
Y
A65300


Turbo Insulator No. 1
Exhaust Manifold Heat Insulator No. 2
z Gasket
20 (204, 15)
36 (367, 27)
18 (184, 13)
Turbo Oil Inlet Pipe
12 (122, 19)
20 (204, 15)
Turbocharger Sub-assy
53 (541, 39)
8.8 (90, 78 in.·lbf)
Turbo Insulator No. 2
z 25 (255, 18)
36 (367, 27)
z Gasket
z Gasket
56 (571, 41)
z Gasket
8.8 (90, 78 in.·lbf)
Turbo Oil Outlet Pipe
z Gasket
13 (135, 10)
Turbo Oil Outlet Hose
56 (571, 41)
Turbocharger Stay
Exhaust Manifold
Converter
Sub-assy
Manifold Stay
61 (622, 45)
61 (622, 45)
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
Y
A62132


* Gasket
Timing Belt No. 2 Cover
Timing Chain Cover Plate
Seal Washer
Timing Belt
7.4 (76, 66 in.·lbf)
x 7
Transverse Engine
Engine Mounting Bracket
9.0 (92, 80 in.·lbf)
37 (375, 27)
72 (735, 53)
21 (214, 15)
Timing Belt
Tensioner
Idle w/ Bracket
Pulley Assy
* Gasket
39 (398, 29)
Timing Belt No.1 Cover
Timing Belt Guide
40 (408, 30)
x 5
Seal Washer
7.4 (76, 66 in.·lbf)
Crankshaft Pulley
Glow Plug
Screw Grommet
2.2 (22, 19 in.·lbf)
Glow Plug
No.1 Connector
180 (1,837, 133)
Glow Plug Assy
Idler Pulley
Sub-assy
Generator V Belt
N·m (kgf·cm, ft·lbf) : Specified torque
* Replace only if damaged
A61476


*31 (316, 23)
34 (347, 25)
5.0 (51, 44 in.·lbf)
Injection Pipe Clamp No.2
Injection Pipe Sub-assy
Fuel Inlet Pipe Sub-assy
*37 (377, 27)
41 (418, 30)
7.4 (75, 65 in.·lbf)
*31 (316, 23)
34 (347, 25)
*37 (377, 27)
41 (418, 30)
Common Rail Assy
43 (438, 32)
Ventilation Hose
Vacuum Pump Assy
Nozzle Leakage
Pipe No. 2
Check Valve
21 (214, 15)
z Gasket
z O-Ring
21 (214, 15)
z Gasket
18 (185, 13)
EGR Valve Assy
Crank Position
Sensor
8.8 (90, 78 in.·lbf)
21 (210, 15)
z Gasket
z Gasket
Water Outlet
Seal Washer
Diesel Engine Engine Coolant
Temperature Sensor
Timing Belt
No. 3 Cover
7.4 (75, 65 in.·lbf)
21 (214, 15)
Intake Air Connector
Intake Manifold
z Gasket
Injection Pump
Draive Pulley Sub-assy
103 (1050, 76)
3.6-6.9 (40-70, 35-61 in.·lbf)
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
* For use with SST
21 (214, 15)
Wiring Harness
Clamp Bracket
A61212


Vacuum Pump Oil Pipe
21 (214, 18)
8.8 (90, 78 in.·lbf)
Union Bolt
45 (459, 33)
z O-Ring
Oil Cooler
z O-Ring
Fuel Pipe No. 1
8.8 (90, 78 in.·lbf)
Turbo Oil Outlet Pipe No. 2
V-Ribbed Belt Tensioner Assy
56 (571, 41)
z Gasket
Oil Cooler Pipe
Generator Assy
37 (380, 27)
31 (320, 23)
Generator Bracket No. 1
47 (475, 34)
Rear End Plate
8.8 (90, 78 in.·lbf)
8.4 (86, 74 in.·lbf)
7.5 (76, 66 in.·lbf)
Crank Position Sensor
Thermostat
z Gasket
z O-Ring
Compressor Mounting Bracket No. 1
31 (320, 23)
Water Inlet
Oil Filter Bracket Sub-assy
Injection Pump Assy
8.8 (90, 78 in.·lbf)
34 (347, 25)
18 (184, 13)
21 (214, 15)
21 (214, 15)
Injection Pump Stay No. 1
Oil Level Gage Guide
z O-Ring
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
A64017

REPLACEMENT

1. REMOVE FRONT WHEELS
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER RH
4. DRAIN COOLANT (See page 16-33)
5. DRAIN ENGINE OIL (See page 14-246)
6. DRAIN MANUAL TRANSAXLE OIL
   Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
7. REMOVE AIR INTAKE SEPARATOR
8. REMOVE ENGINE COVER SUB-ASSY NO.1

(a) Remove the 5 nuts and engine cover.

9. REMOVE BATTERY
10. REMOVE AIR CLEANER ASSY

(a) Remove the connector and the air cleaner cap with the air cleaner hose.
(b) Remove the air cleaner filter element.
(c) Remove the 3 bolts and the air cleaner case.

11. DISCONNECT UNION TO CHECK VALVE HOSE
12. REMOVE FUEL FILTER ELEMENT SUB-ASSY
    (See page 11-85)
    SST 09228-64030
13. REMOVE RADIATOR HOSE INLET
14. REMOVE RADIATOR HOSE OUTLET
15. REMOVE WATER BY-PASS HOSE NO.2
16. REMOVE BLOCK, ENGINE ROOM RELAY

(a) Remove the 2 bolt and the engine room relay block.

17. REMOVE RADIATOR ASSY(W/ AIR CONDITIONER)
18. DISCONNECT HEATER INLET WATER HOSE
19. DISCONNECT HEATER OUTLET WATER HOSE
20. DISCONNECT INJECTION PUMP TO FUEL PIPE FUEL HOSE
21. REMOVE AIR TUBE NO.2(W/O INTER COOLER)

(a) Disconnect the vacuum hose.
(b) Disconnect the air hoses.
(c) Remove the bolt and air tube No. 2.

22. DISCONNECT AIR HOSE NO.3(W/ INTER COOLER)

23. DISCONNECT AIR HOSE NO.4(W/ INTER COOLER)

24. REMOVE AIR TUBE NO.2(W/ INTER COOLER)

(a) Disconnect the air hose.
(b) Remove the bolt and air tube No.2.

25. SEPARATE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Remove the 2 clips, 2 washers and separate the control cable assy.

26. REMOVE INJECTOR DRIVER

(a) Remove the 2 bolts installing the injector driver.
(b) Disconnect the injector driver connector.
(c) Remove the injector driver.

27. DISCONNECT ENGINE WIRE

(a) Remove the glove compartment door.
(b) Disconnect the engine wire from engine ECU and junction block.
(c) Pull out the engine wire.
(d) Disconnect the engine wire from engine room junction block.

28. REMOVE CLUTCH ACCUMULATOR ASSY
(See page 42-18)
SST 09023-00100

29. REMOVE CLUTCH RELEASE CYLINDER ASSY
(See page 42-18)

30. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)
(See page 14-172)

31. SEPARATE COMPRESSOR AND MAGNETIC CLUTCH(W/ AIR CONDITIONER)
HINT:
Hang up the hoses instead of detaching.

32. REMOVE FLOOR PANEL BRACE FRONT

33. REMOVE EXHAUST PIPE ASSY FRONT
(See page 15-8)

34. REMOVE COLUMN HOLE COVER SILENCER SHEET

(a) Remove the 2 clips and column hole cover silencer sheet.

35. REMOVE STEERING INTERMEDIATE SHAFT ASSY NO.2
(See page 51-6)

36. REMOVE FRONT AXLE HUB LH NUT
(See page 30-18)
SST 09930-00010
HINT:
Preform the same procedure as above on the opposite side.

37. SEPARATE END SUB-ASSY, TIE ROD, NO.2 (See page 30-18)
SST 09628-62011
HINT:
Preform the same procedure as above on the opposite side.

38. SEPARATE LINK ASSY, FR STABILIZER **(See page 26-20)**

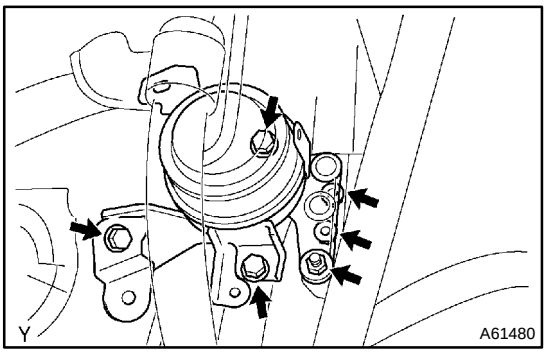
HINT:

Perform the same procedure as above on the opposite side.

39. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH **(See page 26-14)**

HINT:

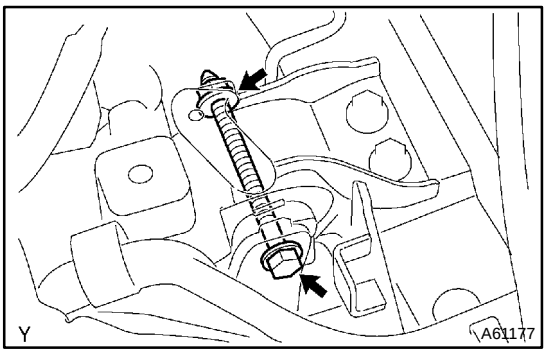
Preform the same procedure as above on the opposite side.



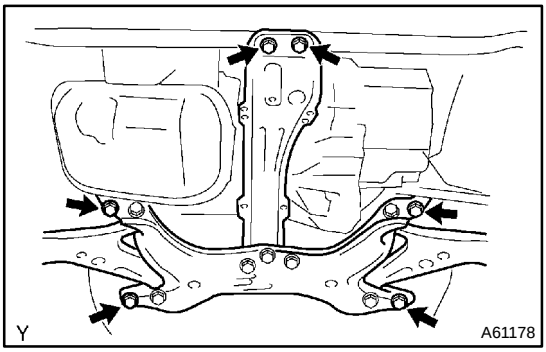
40. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

(a) Set the engine lifter.

(b) Remove the 3 bolts, 3 nuts and the engine mounting insulator sub-assy RH.



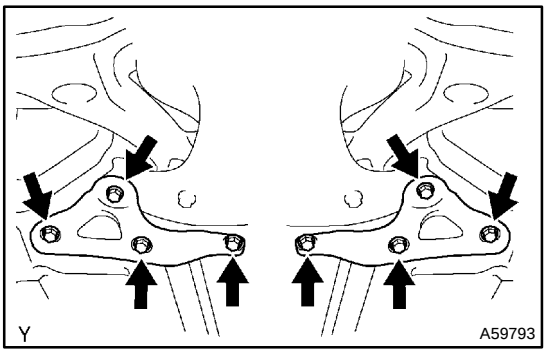
(c) Remove the through bolt and a nut, detach the engine mounting insulator LH from the vehicle.



(d) Remove the engine with transaxle. (TMC made)

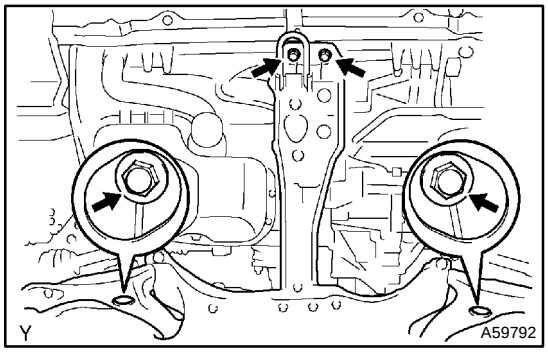
(1) Remove the 6 bolts, as shown in the illustration.

(2) Carefully, remove the engine with transaxle from the vehicle.



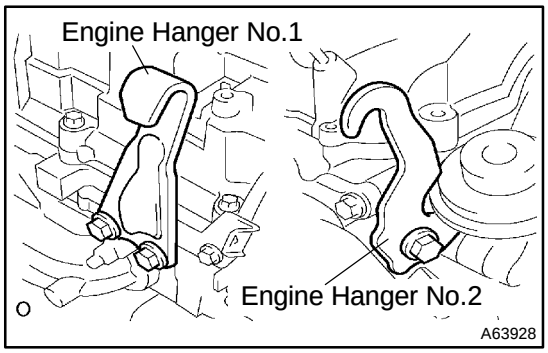
(e) Remove the engine with transaxle. (TMUK made)

(1) Remove the 8 bolts and front suspension member brace rear RH and LH.



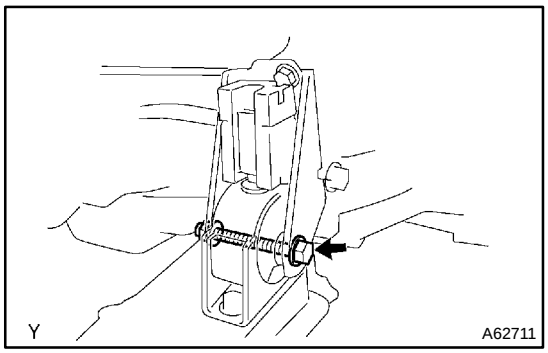
(2) Remove the 2 bolts, 2 nuts, as shown in the illustration.

(3) Carefully, remove the engine with transaxle from the vehicle.



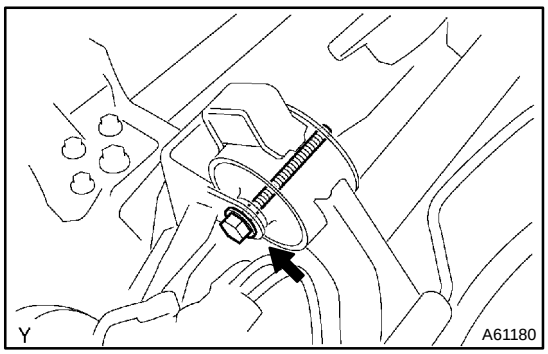
(f) Install the 2 engine hangers with the 2 bolts.
Part No.:
No. 1 engine hanger 12281-27010
No. 2 engine hanger 12282-27010
Bolt 91642-81025
Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)

(g) Using the chain block and engine sling device, hang the engine assembly.



41. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSY

(a) Remove the through bolt and a nut, detach the engine mounting insulator FR from the engine mounting bracket.



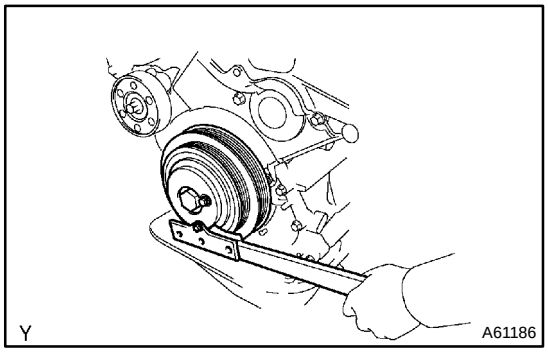
(b) Remove the through bolt and a nut, detach the engine mounting insulator RR from the suspension crossmember.

(c) Separate the engine and transaxle assembly from the suspension crossmember and engine mounting member.

42. REMOVE STARTER ASSY
(See page 19-25)

43. REMOVE MANUAL TRANSAXLE **(See page 41-36)**

44. REMOVE CLUTCH DISC ASSY
(See page 42-30)



45. REMOVE FLYWHEEL SUB-ASSY

(a) Fix the crank shaft with SST, then remove the 8 set bolts.
SST 09213-70010 (09213-70020), 09330-00021

46. REMOVE REAR END PLATE

(a) Remove the 2 bolts and the rear end plate.

47. REMOVE DRIVE SHAFT BEARING BRACKET

48. REMOVE AIR TUBE NO.1
(See page 13-8)

49. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

50. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

51. REMOVE GLOW PLUG ASSY
(See page 19-33)

52. REMOVE GENERATOR V BELT

53. REMOVE CRANKSHAFT PULLEY
(See page 14-213)
SST 09213-70010 (09213-70020), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021, 09954-05030)

54. REMOVE TIMING BELT NO.2 COVER

55. REMOVE IDLER PULLEY SUB-ASSY

56. REMOVE TIMING BELT NO.1 COVER

57. REMOVE TIMING BELT GUIDE

58. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

59. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-214)

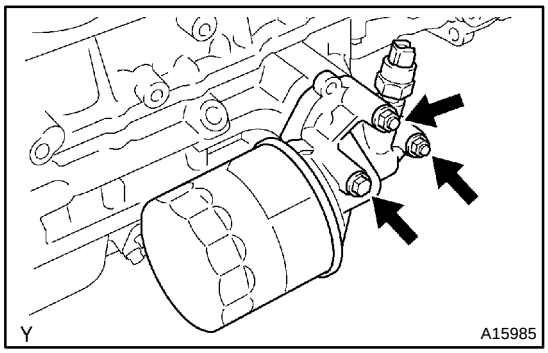
60. REMOVE TIMING BELT
(See page 14-215)

HINT:
If re-using the timing belt, draw a direction arrow on the timing belt (in direction of engine revolution), and place matchmarks on the pulleys and timing belt.

61. REMOVE GENERATOR ASSY

62. REMOVE GENERATOR BRACKET NO.1

63. REMOVE V-RIBBED BELT TENSIONER ASSY



64. REMOVE OIL FILTER BRACKET SUB-ASSY

(a) Remove the bolt, 2 nuts, oil filter bracket and gasket.

65. REMOVE TURBO INSULATOR NO.2

66. REMOVE TURBO INSULATOR NO.1

67. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.2

68. REMOVE MANIFOLD CONVERTER SUB-ASSY

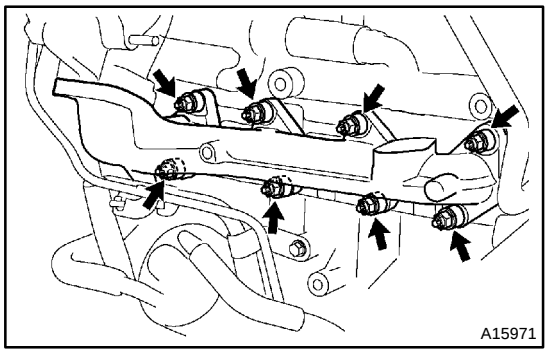
69. REMOVE TURBO OIL INLET PIPE

70. REMOVE TURBO OIL OUTLET PIPE

71. REMOVE TURBO OIL OUTLET PIPE NO.2

72. REMOVE TURBOCHARGER SUB-ASSY

(See page 13-9)



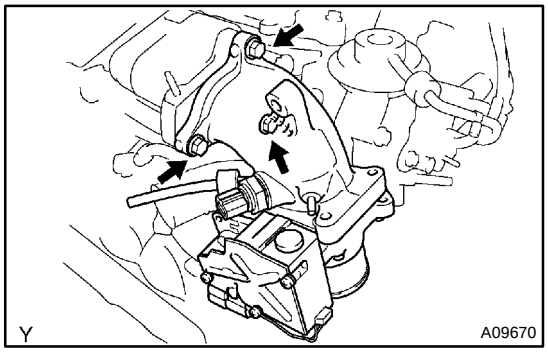
73. REMOVE EXHAUST MANIFOLD

(a) Remove the 8 nuts, exhaust manifold and gasket.

74. REMOVE OIL COOLER ASSY

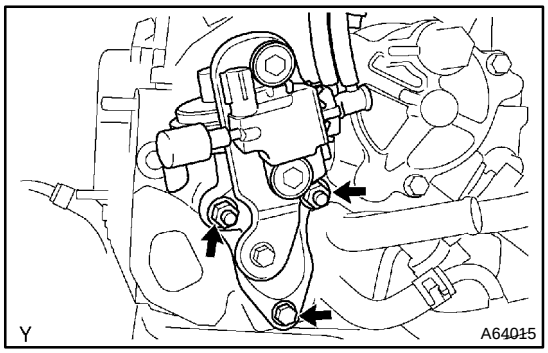
(See page 17-22)

75. REMOVE WATER OUTLET



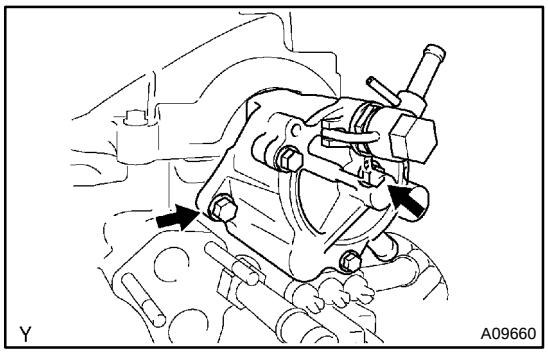
76. REMOVE INTAKE AIR CONNECTOR

(a) Remove the 3 bolts, intake air connector and gasket.



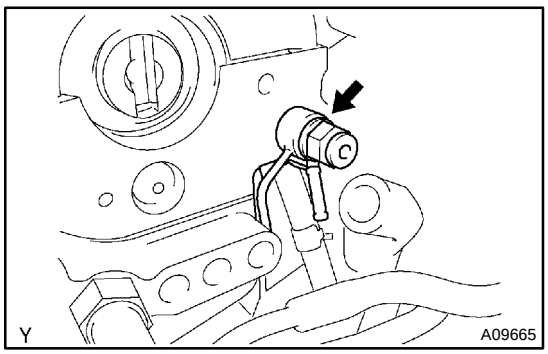
77. REMOVE EGR VALVE ASSY

(a) Remove the bolt, 2 nuts, EGR valve and gasket.



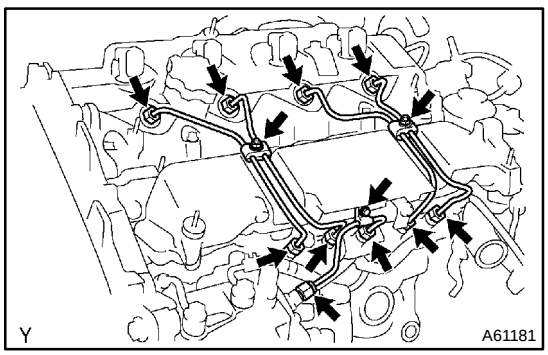
78. REMOVE VACUUM PUMP ASSY

(a) Remove the 2 bolts, vacuum pump and 2 O-rings.



79. REMOVE NOZZLE LEAKAGE PIPE NO.2

(a) Remove the check valve, leakage pipe and gasket.



80. REMOVE FUEL INLET PIPE SUB-ASSY

(a) Remove the pipe clamp bolt from the intake manifold.
(b) Using SST, remove the fuel inlet pipe from the common rail side.
SST 09023-12900
(c) Using SST, remove the fuel inlet pipe from the pimp side.
SST 09023-12700
(d) Remove the 2 nuts and 2 upper infection pipe clamps from the intake manifold.

(e) Using SST, remove the injection pipe from the common rail side.
SST 09023-12900

(f) Using SST, remove the injection pipe from the injector side.
SST 09023-12700

NOTICE:

- **After removing the fuel pipe, affix the gum tape on the common rail for preventing dust from coming into them.**
- **After removing the fuel pipe, put a vinyl bag and rubber band for preventing from mixing foreign objects over the injectors inlet.**

(g) Remove the 2 lower injection pipe clamps from the intake manifold.

81. REMOVE INJECTION PIPE SUB-ASSY NO.1

SST 09023-12700, 09023-12900

HINT:
Perform the same procedures as fuel inlet pipe.

82. REMOVE INJECTION PIPE SUB-ASSY NO.2

SST 09023-12700, 09023-12900

HINT:
Perform the same procedures as fuel inlet pipe.

83. REMOVE INJECTION PIPE SUB-ASSY NO.3

SST 09023-12700, 09023-12900

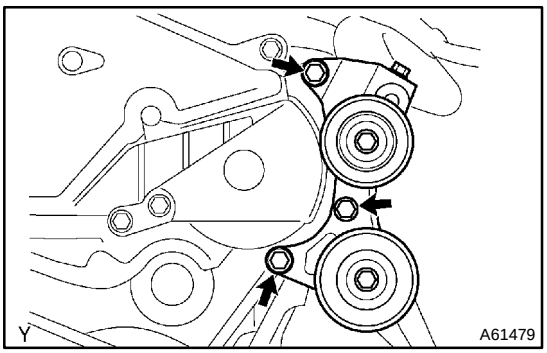
HINT:
Perform the same procedures as fuel inlet pipe.

84. REMOVE INJECTION PIPE SUB-ASSY NO.4

SST 09023-12700, 09023-12900

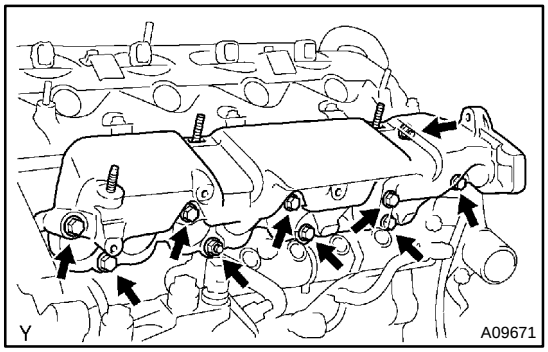
HINT:
Perform the same procedures as fuel inlet pipe.

85. REMOVE COMMON RAIL ASSY



86. REMOVE PULLEY ASSY, IDLE W/BRACKET(W/ AIR CONDITIONER)

(a) Remove the 3 bolts and the idle w/ bracket pully.



87. REMOVE INTAKE MANIFOLD

(a) Remove the supply pump insulator.
(b) Remove the 2 bolts and wiring harness clamp bracket.
(c) Remove the 8 bolts, 2 nuts, intake manifold and gasket.

88. REMOVE INJECTION PUMP DRIVE PULLEY
(See page 11-76)
SST 09960-10010 (09962-01000, 09963-01000)

89. REMOVE TIMING BELT NO.3 COVER

90. REMOVE OIL LEVEL GAGE GUIDE

91. REMOVE INJECTION PUMP STAY NO.1

92. REMOVE INJECTION PUMP ASSY

93. REMOVE COMPRESSOR MOUNTING BRACKET NO.1

94. REMOVE WATER INLET

95. REMOVE THERMOSTAT

96. REMOVE OIL COOLER PIPE

97. REMOVE FUEL FILTER TO INJECTION PUMP FUEL PIPE

98. REMOVE CRANK POSITION SENSOR

99. REMOVE CRANK POSITION SENSOR

100. REMOVE DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR

101. REPLACE PARTIAL ENGINE ASSY

102. INSTALL DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

103. INSTALL CRANK POSITION SENSOR

Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)

104. INSTALL CRANK POSITION SENSOR

Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

105. INSTALL OIL COOLER PIPE

(a) Install 2 new gaskets and the oil cooler pipe with the union bolt.
Torque: 56 N·m (571 kgf·cm, 41 ft·lbf)

106. INSTALL THERMOSTAT
(See page 16-39)

107. INSTALL WATER INLET
(See page 16-39)

108. INSTALL COMPRESSOR MOUNTING BRACKET NO.1

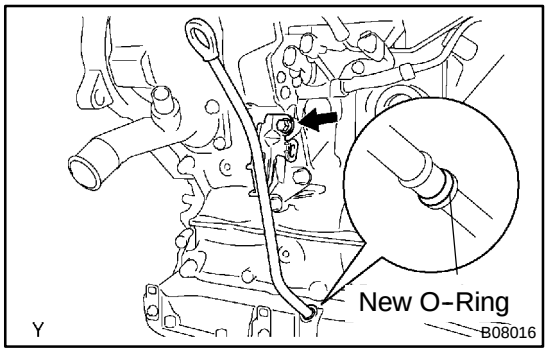
Torque: 31 N·m (320 kgf·cm, 23 ft·lbf)

109. INSTALL INJECTION PUMP ASSY

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

110. INSTALL INJECTION PUMP STAY NO.1

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



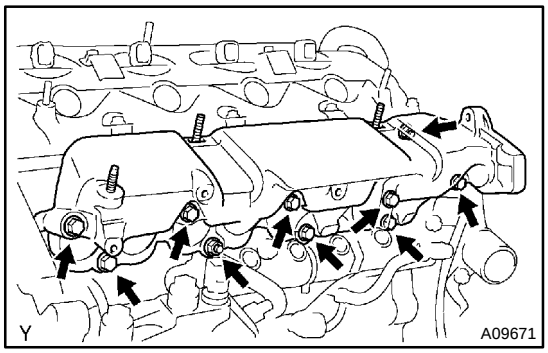
111. INSTALL OIL LEVEL GAGE GUIDE

(a) Install a new O-ring to the oil level gage guide.
(b) Apply engine oil to the O-ring.
(c) Push in the oil level gage guide end into the guide hole of the No. 1 oil pan.
(d) Install the oil level gage guide with the bolt.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)
(e) Apply engine oil to the O-ring on the oil level gage.
(f) Install the oil level gage.

112. INSTALL TIMING BELT NO.3 COVER

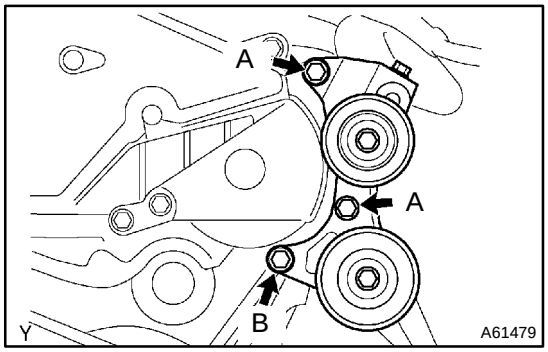
(a) Install the timing belt cover with the 2 bolts and 2 seal washers.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

113. INSTALL INJECTION PUMP DRIVE PULLEY
(See page 11-77)
SST 09960-10010 (09962-01000, 09963-01000)



114. INSTALL INTAKE MANIFOLD

(a) Install a new gasket and the intake manifold with the 8 bolts and 2 nuts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)
(b) Install the wiring harness clamp bradket with 2 bolts.
Torque: 3.9 - 6.9 N·m (40 - 70 kgf·cm, 35 - 61 in.·lbf)



115. INSTALL PULLEY ASSY, IDLE W/BRACKET(W/ AIR CONDITIONER)

(a) Install the idle w/ bracket pully with the 3 bolts.

Torque:
Bolt A 72 N·m (735 kgf·cm, 53 ft·lbf)
Bolt B 39 N·m (398 kgf·cm, 29 ft·lbf)

116. INSTALL COMMON RAIL ASSY

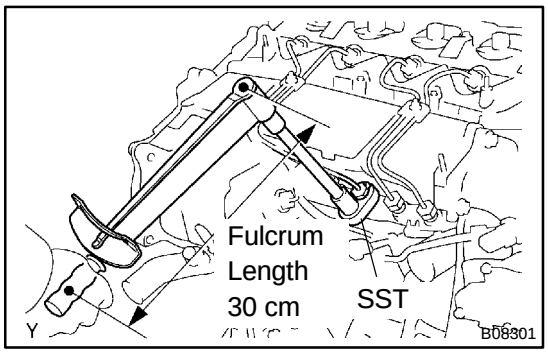
Torque: 43 N·m (439 kgf·cm, 32 ft·lbf)

117. INSTALL INJECTION PIPE SUB-ASSY NO.1

(a) Install the 2 lower injection pipe clamps to the intake manifold.

(b) Remove the vinyl bag and rubber band to the infectors.

(c) Temporarily tighten the injection pipe.



(d) Using SST, tighten the injection pipe to the common rail side.

SST 09023-12900

Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

(e) Using SST, tighten the injection pipe to the injector side.

SST 09023-12700

Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

(f) Install 2 upper injection pipe clamps and 2 nuts.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

118. INSTALL INJECTION PIPE SUB-ASSY NO.2

SST 09023-12700, 09023-12900

HINT:
Perform the same procedures as injection pipe No. 1.

119. INSTALL INJECTION PIPE SUB-ASSY NO.3

SST 09023-12700, 09023-12900

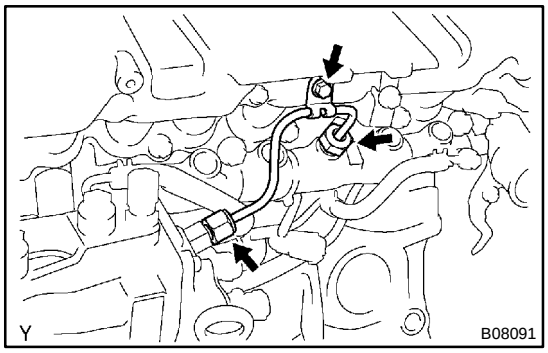
HINT:
Perform the same procedures as injection pipe No. 1.

120. INSTALL INJECTION PIPE SUB-ASSY NO.4

SST 09023-12700, 09023-12900

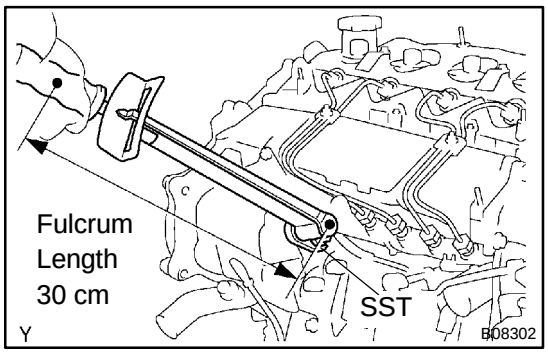
HINT:

Perform the same procedures as injection pipe No. 1.



121. INSTALL FUEL INLET PIPE SUB-ASSY

(a) Temporarily tighten the inlet pipe and pipe clamp bolts.



(b) Using SST, tighten the inlet pipe to the common rail side.

SST 09023-12900

Torque:

37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST

41 N·m (418 kgf·cm, 30 ft·lbf)

HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

(c) Using SST, tighten the inlet pipe to the pump side.

SST 09023-12700

Torque:

31 N·m (316 kgf·cm, 23 ft·lbf) for use with SST

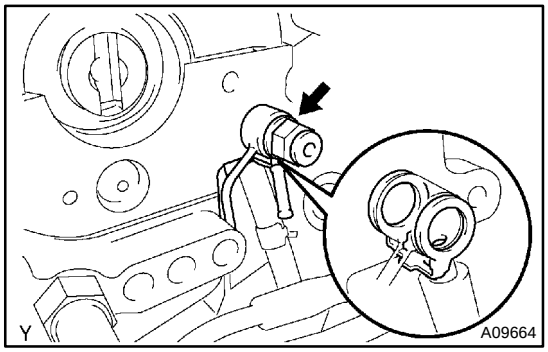
34 N·m (347 kgf·cm, 25 ft·lbf)

HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

(d) Tighten the pipe clamp bolt.

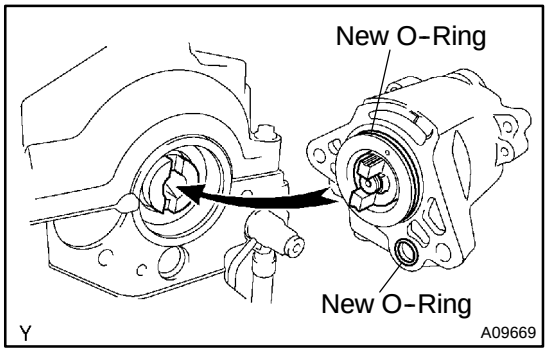
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



122. INSTALL NOZZLE LEAKAGE PIPE NO.2

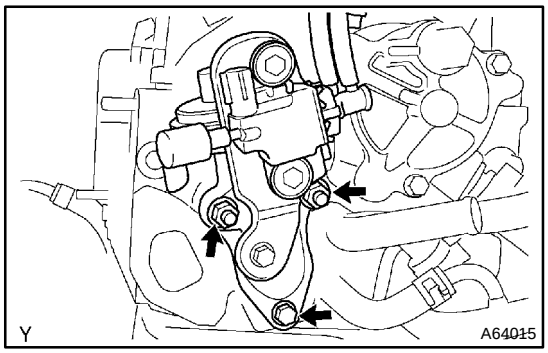
(a) Install a new gasket and the leakage pipe with the check valve.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



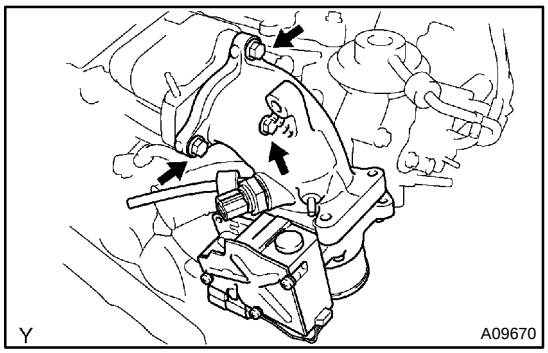
123. INSTALL VACUUM PUMP ASSY

(a) Install 2 new O-rings to the vacuum pump.
(b) Insert the vacuum pump, aligning the slit of the exhaust camshaft with the coupling of the vacuum pump. Install the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



124. INSTALL EGR VALVE ASSY

(a) Install a new gasket and the EGR valve with a bolt and 2 nuts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



125. INSTALL INTAKE AIR CONNECTOR

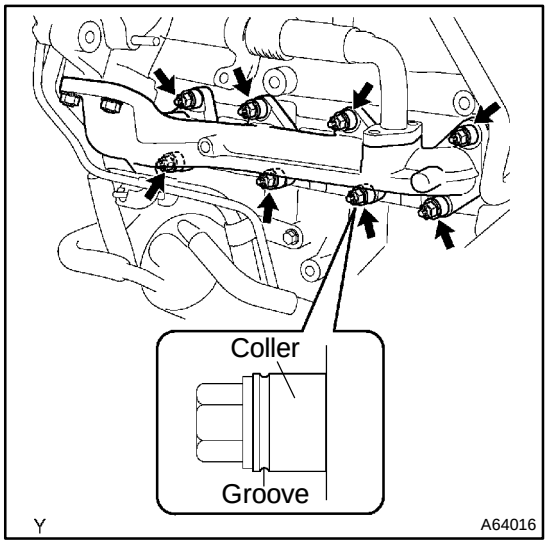
(a) Install a new gasket and the intake air connector with diesel throttle body with the 3 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

126. INSTALL WATER OUTLET

(a) Install a new gasket and the water outlet with the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

127. INSTALL OIL COOLER ASSY

(See page 17-22)



128. INSTALL EXHAUST MANIFOLD

(a) Install a new gasket, the exhaust manifold and 8 collars with the 8 nuts.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

HINT:
Install the collers, those grooves are to the nuts side.

129. INSTALL TURBOCHARGER SUB-ASSY
(See page 13-9)

130. INSTALL TURBO OIL OUTLET PIPE NO.2

(a) Apply adhesive around turbo oil outlet pipe No.2.
Adhesive: Part No. 08833-00070, THREE BOND 1324 or equivalent.

(b) Using a prastic-faced hammer, tap to the turbo oul outlet pipe No.2.

131. INSTALL TURBO OIL OUTLET PIPE
(See page 13-9)

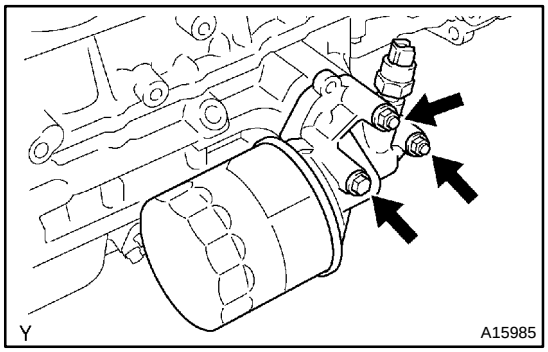
132. INSTALL TURBO OIL INLET PIPE
(See page 13-9)

133. INSTALL MANIFOLD CONVERTER SUB-ASSY
(See page 13-9)

134. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.2
(See page 13-10)

135. INSTALL TURBO INSULATOR NO.1
(See page 13-10)

136. INSTALL TURBO INSULATOR NO.2
(See page 13-10)



137. INSTALL OIL FILTER BRACKET SUB-ASSY

(a) Install a new gasket and oil filter bracket with a bolt and 2 nuts.
Torque: 34 N·m (347 kgf·cm, 25 ft·lbf)

138. INSTALL V-RIBBED BELT TENSIONER ASSY

(a) Install the drive belt tensioner with 2 bolts.
Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)

139. INSTALL GENERATOR BRACKET NO.1

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

140. INSTALL GENERATOR ASSY
(See page 19-30)

141. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-215)
SST 09960-10010 (09962-01000, 09963-01000)

142. INSTALL TIMING BELT
(See page 14-215)

143. CHECK VALVE TIMING (See page 14-216)

144. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
(See page 14-217)

145. INSTALL TIMING BELT GUIDE
(See page 14-217)

146. INSTALL TIMING BELT NO.1 COVER
(See page 14-217)

147. INSTALL IDLER PULLEY SUB-ASSY

(a) Install the pulley and washer with the bolt.
Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)

148. INSTALL TIMING BELT NO.2 COVER
(See page 14-218)

149. INSTALL CRANKSHAFT PULLEY
(See page 14-219)
SST 09213-70010 (09213-70020), 09330-00021

150. INSTALL GLOW PLUG ASSY
(See page 19-33)

151. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)

152. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)

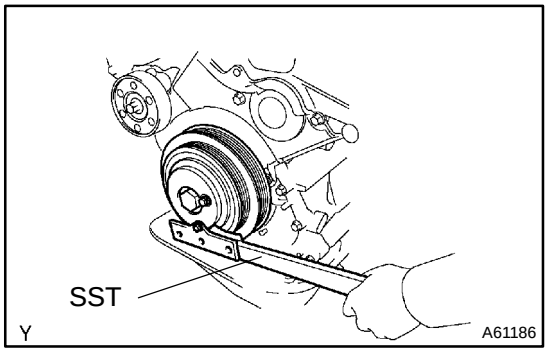
153. INSTALL AIR TUBE NO.1
(See page 13-10)

154. INSTALL DRIVE SHAFT BEARING BRACKET

(a) Install the bearing bracket with 3 bolts.
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)

155. INSTALL REAR END PLATE

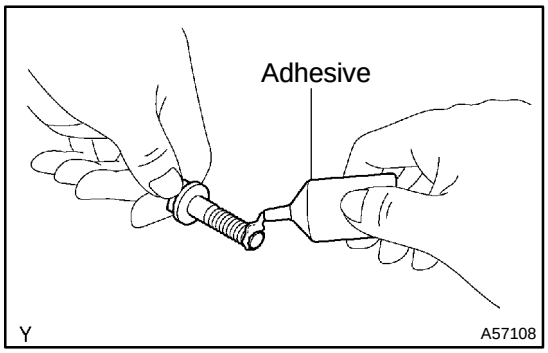
(a) Install the rear end plate.
Torque: 8.4 N·m (86 kgf·cm, 74 in.·lbf)



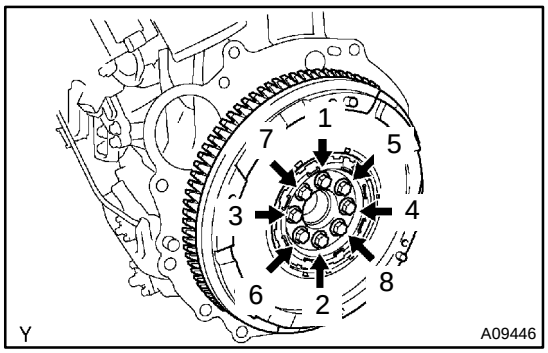
156. INSTALL FLYWHEEL SUB-ASSY

(a) Using SST, hold the crankshaft.
SST 09213-70010 (09213-70020), 09330-00021

(b) Clean the bolts and bolt holes.



(c) Apply adhesive to 2 or 3 threads of the bolt end.
Adhesive: Part No. 08833-00070, THREE BOND 1324 or equivalent

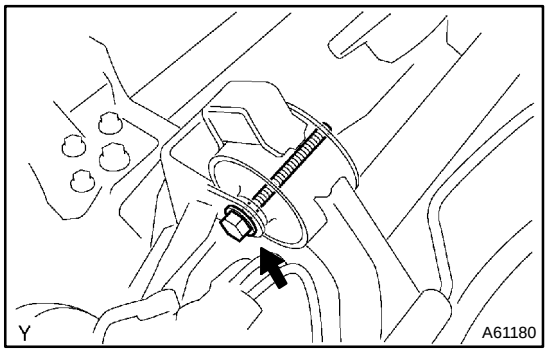


(d) Install and uniformly tighten the 8 bolts in several passes and in the sequence shown.
Torque: 88 N·m (898 kgf·cm, 65 ft·lbf)

157. INSTALL CLUTCH DISC ASSY
(See page 42-31)

158. INSTALL MANUAL TRANSAXLE (See page)

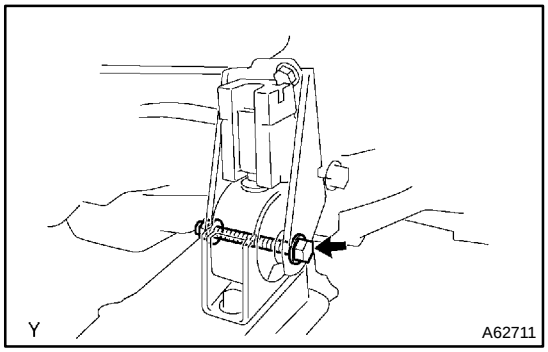
159. INSTALL STARTER ASSY
(See page 19-25)



160. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSY

(a) Attach the engine and transaxle assembly to the suspension crossmember and engine mounting member.

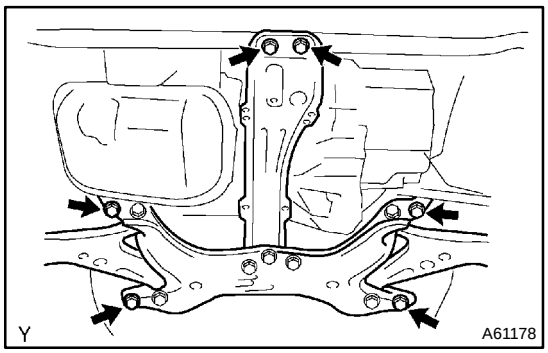
(b) Install the bolt holding the rear engine mounting bracket to the mounting insulator.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)



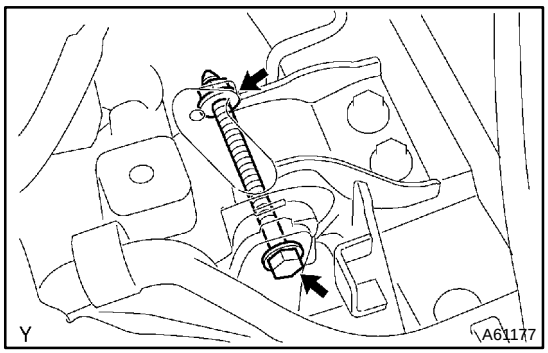
(c) Install the bolt holding the front engine mounting bracket to the mounting insulator.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

161. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE(TMC MADE)

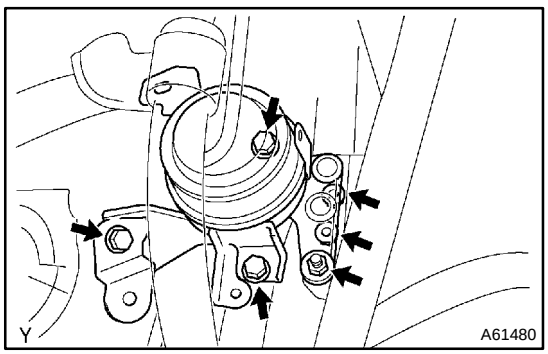
(a) Set the engine assembly with transaxle on the engine lifter.



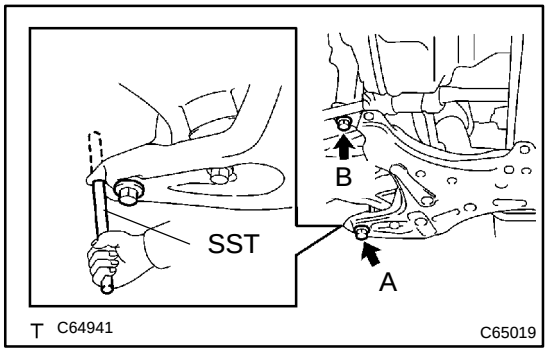
(b) Install the engine assembly to the vehicle.
(c) Temporarily, install the suspension crossmember and 6 bolts.



(d) Install the engine mounting insulator LH.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

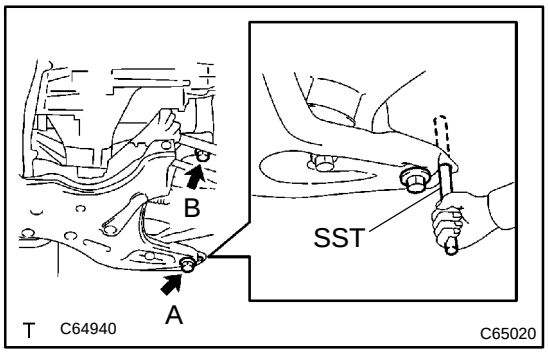


(e) Install the engine mounting insulator RH.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



(f) Insert SST to the positioning holes on the right handle crossmember and on the right-handle of the vehicle.
SST 09670-00010

(g) Temporarily tighten the bolt A first, then bolt B.

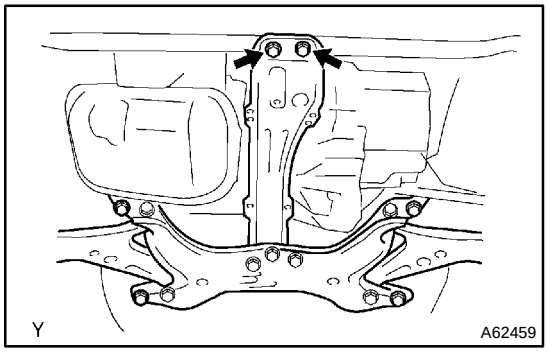


(h) Insert SST to the positioning holes on the left-handle crossmember and on the left-handle of the vehicle.
SST 09670-00010

(i) Temporarily tighten the bolt A first, then bolt B.

(j) Insert SST to the positioning holes on the right-handle crossmember and on the right-handle of the vehicle, then tighten the bolts with a specified torque.
SST 09670-00010
Torque:
Bolt A 157 N·m (1,601 kgf·cm, 116 ft·lbf)
Bolt B 113 N·m (1,152 kgf·cm, 83 ft·lbf)

(k) Insert SST to the positioning holes on the left-handle crossmember and on the left-handle of the vehicle, then tighten the bolts with a specified torque.
SST 09670-00010
Torque:
Bolt A 157 N·m (1,601 kgf·cm, 116 ft·lbf)
Bolt B 113 N·m (1,152 kgf·cm, 83 ft·lbf)

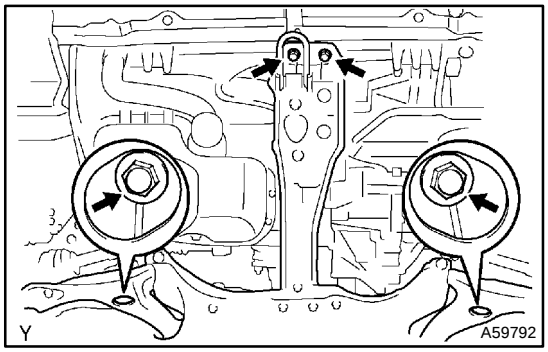


(l) Tighten the 2 bolts as shown in the illustration.
Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)

NOTICE:
After installing the crossmember, check that the positioning holes on the crossmember and the vehicle are aligned with each other.

162. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE(TMUK MADE)

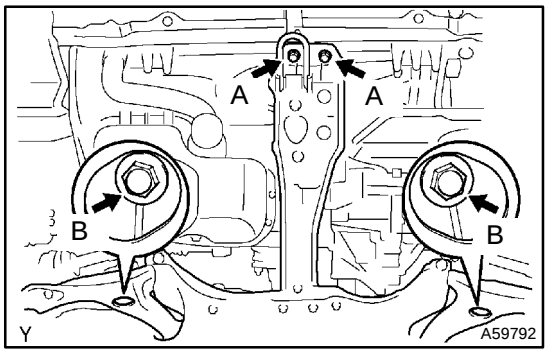
(a) Set the engine assembly with transaxle on the ingine lifter.



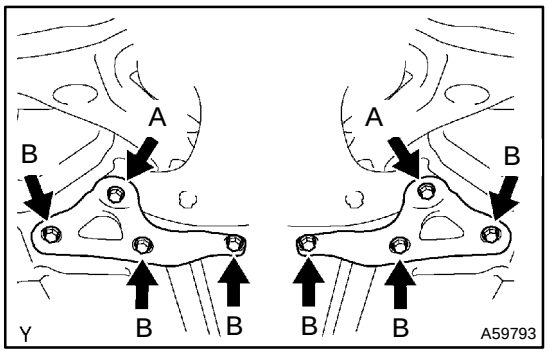
(b) Temporarily, install the suspension crossmember, 2 bolts and 2 nuts.

(c) Install the engine mounting insulator LH.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

(d) Install the engine mounting insulator RH.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



(e) Install the 2 bolts and, 2 nuts and front suspension crossmember.
Torque:
Bolt A 39 N·m (398 kgf·cm, 29 ft·lbf)
Nut B 133 N·m (1,356 kgf·cm, 98 ft·lbf)



(f) Install the 8 bolts and front suspension member brace LH and RH.
Torque:
Bolt A 133 N·m (1,356 kgf·cm, 98 ft·lbf)
Bolt B 80 N·m (816 kgf·cm, 59 ft·lbf)

NOTICE:
After installing the crossmember, check that the positioning holes on the crossmember and the vehicle are aligned with each other.

163. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH
(See page 26-14)

HINT:
Perform the same procedure as above on the opposite side.

164. INSTALL FRONT AXLE HUB LH NUT
(See page 30-30)

HINT:
Perform the same procedure as above on the opposite side.

165. INSTALL LINK ASSY, FR STABILIZER (See page 26-22)

HINT:
Perform the same procedure as above on the opposite side.

166. INSTALL END SUB-ASSY, TIE ROD, NO.2 (See page 30-18)

HINT:
Perform the same procedure as above on the opposite side.

167. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2
(See page 51-14)

168. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-8)

169. INSTALL FLOOR PANEL BRACE FRONT

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

170. INSTALL COMPRESSOR AND MAGNETIC CLUTCH(W/ AIR CONDITIONER)
(See page 55-95)

171. INSTALL GENERATOR V BELT
(See page 14-172)

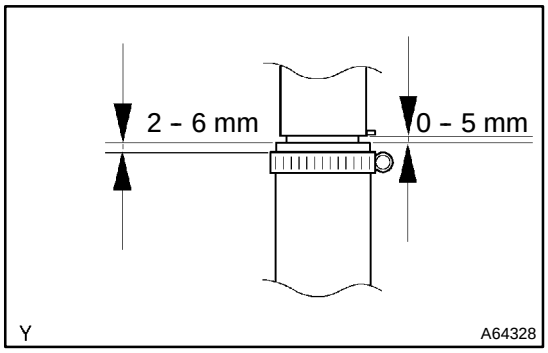
172. INSPECT V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)
(See page 14-169)

173. INSTALL CLUTCH RELEASE CYLINDER ASSY
(See page 42-19/20)

174. INSTALL CLUTCH ACCUMULATOR ASSY
(See page 42-20)
SST 09023-00100

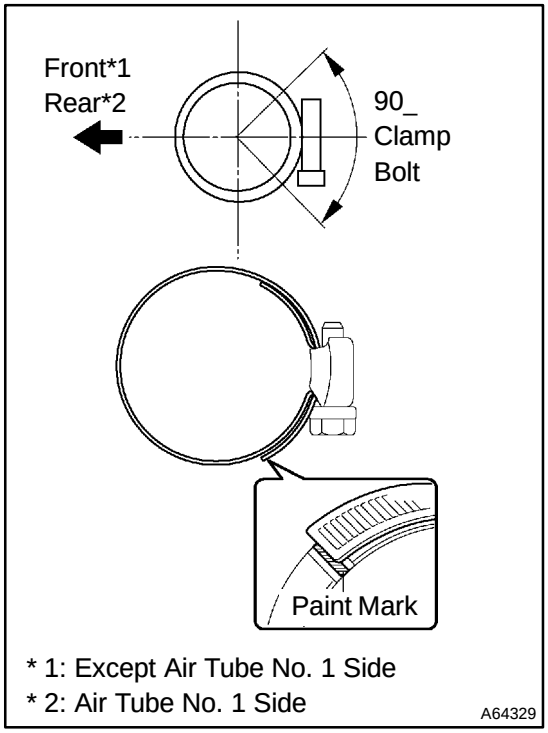
175. INSTALL INJECTOR DRIVER

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

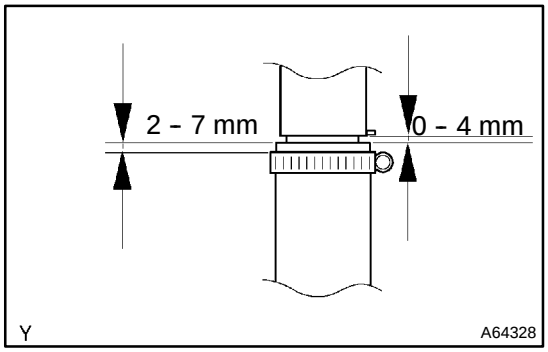


176. INSTALL AIR TUBE NO.2(W/O INTER COOLER)

(a) Install the new air hoses had new hose clamps as shown in the illustration.

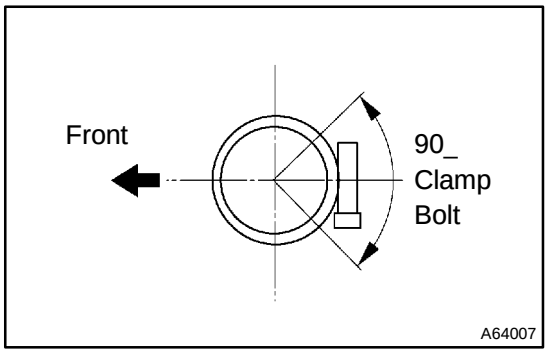


(b) Tighten the hose clamps as shown in the illustration.
(c) Install the bolt and the air tube No.2 assy.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)



177. INSTALL AIR TUBE NO.2(W/ INTER COOLER)

(a) Install the air hose had hose clamps as shown in the illustration.



(b) Tighten the hose clamps as shown in the illustration.
Torque: 6 N·m (61 kgf·cm, 53 ft·lbf)

(c) Install the bolt and the air tube No.2 assy.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

178. INSTALL FUEL FILTER ELEMENT SUB-ASSY
(See page 11-85)
179. INSTALL AIR CLEANER ASSY

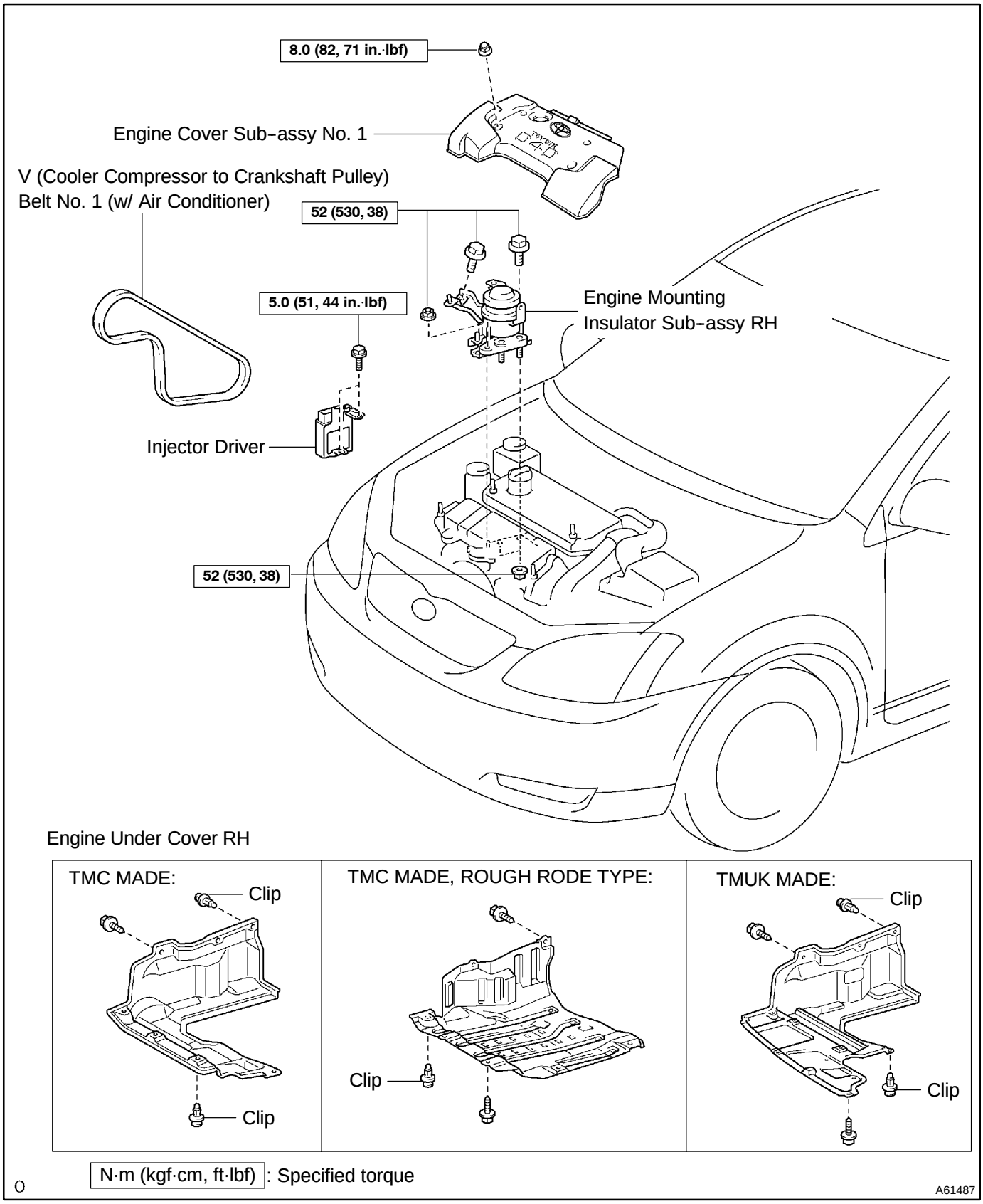
(a) Install the air cleaner case with 3 bolts.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)
180. INSTALL ENGINE COVER SUB-ASSY NO.1

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
181. INSTALL CYLINDER ASSY, CLUTCH RELEASE (See Page 42-19/20)
182. INSTALL ACCUMULATOR ASSY, CLUTCH (See Page 42-20)
SST 09023-00100
183. BLEED CLUTCH PIPE LINE (See Page 42-21)
184. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
185. ADD MANUAL TRANSAXLE OIL
186. ADD ENGINE OIL
187. ADD COOLANT (See page 16-33)
188. CHECK CLUTCH FLUID LEAKAGE
189. CHECK FLUID LEVEL IN RESERVOIR
190. CHECK BRAKE FLUID LEAKAGE
191. INSPECT OIL LEAK
192. CHECK FUEL LEAK (See page 11-64)
193. CHECK ENGINE COOLANT LEAK (See page 16-34)
194. CHECK EXHAUST GAS LEAK
195. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See page 26-2)
196. INSPECT ENGINE IDLE SPEED (See page 14-170)

TIMING BELT (1CD-FTV)

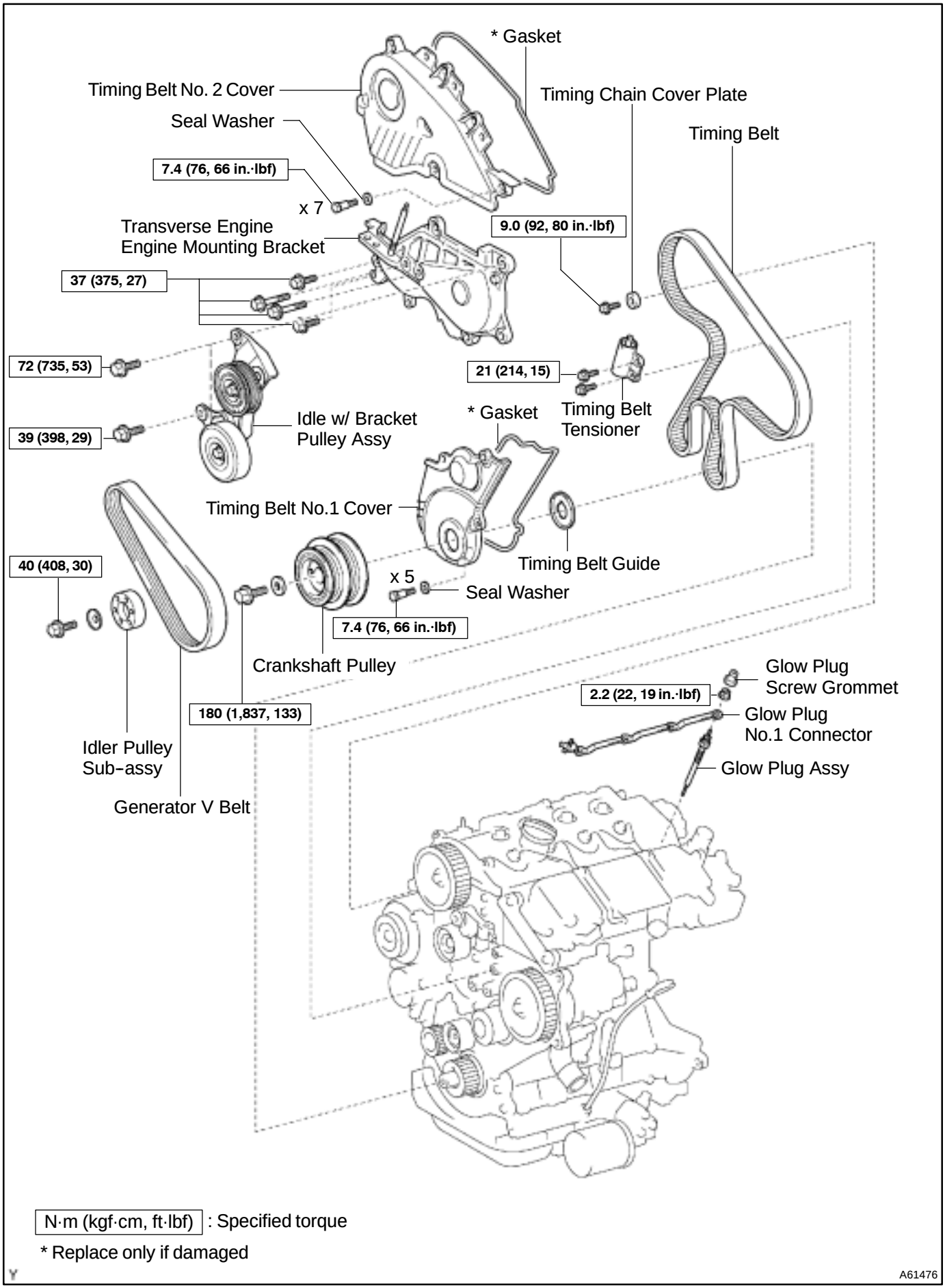
COMPONENTS

140MQ-01



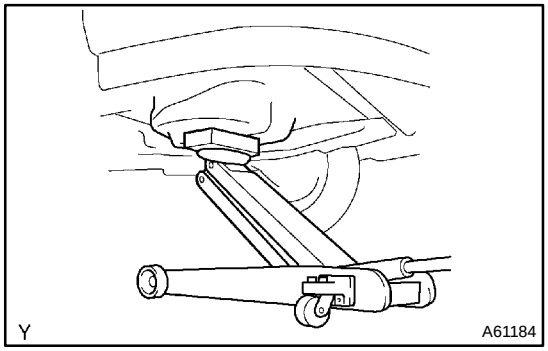
N·m (kgf·cm, ft·lbf) : Specified torque

A61487


* Gasket
Timing Belt No. 2 Cover
Timing Chain Cover Plate
Seal Washer
Timing Belt
7.4 (76, 66 in.·lbf)
x 7
9.0 (92, 80 in.·lbf)
Transverse Engine
Engine Mounting Bracket
37 (375, 27)
72 (735, 53)
21 (214, 15)
Timing Belt
Tensioner
Idle w/ Bracket
Pulley Assy
* Gasket
39 (398, 29)
Timing Belt No.1 Cover
Timing Belt Guide
40 (408, 30)
x 5
Seal Washer
7.4 (76, 66 in.·lbf)
Crankshaft Pulley
Glow Plug
Screw Grommet
2.2 (22, 19 in.·lbf)
Glow Plug
No.1 Connector
180 (1,837, 133)
Glow Plug Assy
Idler Pulley
Sub-assy
Generator V Belt
N·m (kgf·cm, ft·lbf) : Specified torque
* Replace only if damaged
A61476

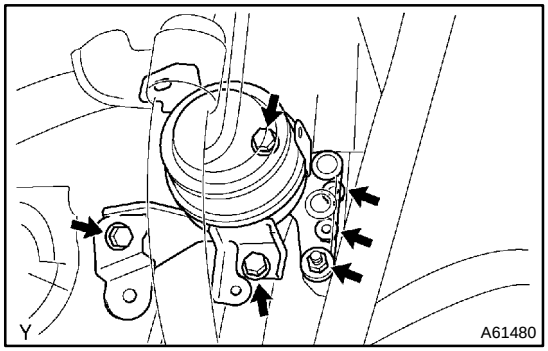
REPLACEMENT

1. REMOVE FRONT WHEEL RH
2. REMOVE ENGINE UNDER COVER RH
3. REMOVE ENGINE COVER SUB-ASSY NO.1
4. REMOVE INJECTOR DRIVER
(See page 14-105)
5. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)
(See page 14-172)
6. REMOVE GENERATOR V BELT
(See page 14-172)
7. SEPARATE PULLEY ASSY, IDLE W/BRACKET (See page 14-190)

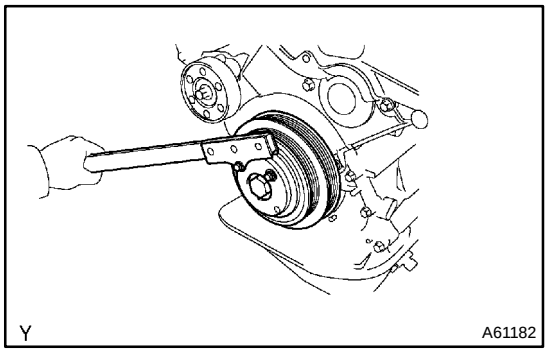


8. REMOVE ENGINE MOUNTING INSULATOR SUB ASSY RH

(a) Place a wooden block between the jack and engine, and set the jack.



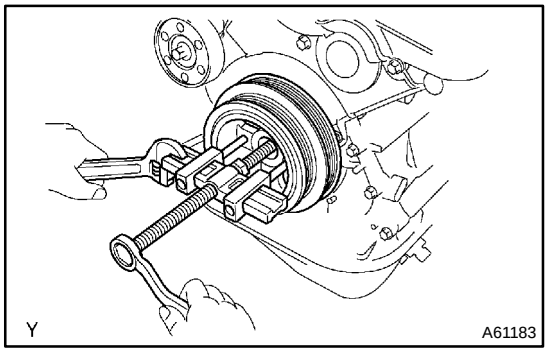
(b) Remove the 3 bolts, 3 nuts and engine mounting insulator sub assy.



9. REMOVE CRANKSHAFT PULLEY

(a) Using SST, remove the pulley bolt.
SST 09213-70010 (09213-70020), 09330-00021

HINT:
When using bolt (91651-60855), a plate washer (5 mm or 0.20 in.) must be inserted between the bolt and SST.



(b) Using SST, remove the pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021, 09954-05030)

10. REMOVE IDLER PULLEY SUB-ASSY

(a) Remove the bolt, washer and pulley.

11. REMOVE TIMING BELT NO.2 COVER

(a) Remove 7 bolts, 7 seal washers and timing belt cover.

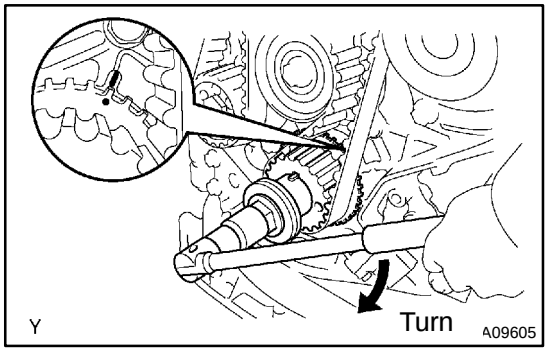
12. REMOVE TIMING BELT NO.1 COVER

(a) Remove 5 bolts, 5 seal washers and timing belt cover.
(b) Remove the oil pump insulator.

13. REMOVE TIMING BELT GUIDE

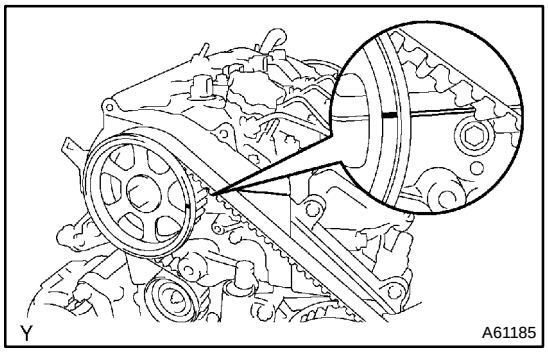
14. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove 6 bolts and the engine mounting bracket.



15. SET NO.1 CYLINDER TO TDC/COMPRESSION

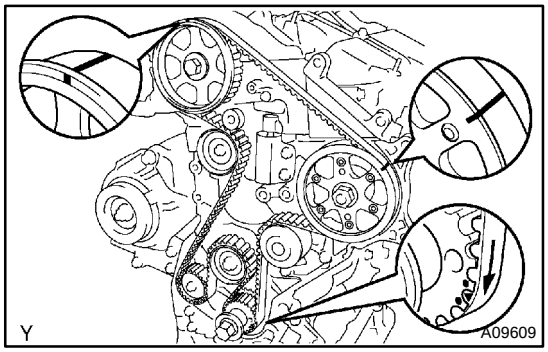
(a) Using the crankshaft pulley bolt, align the dot mark of the crankshaft timing pulley with the TDC mark of the oil pump by turning the crankshaft.



(b) Check that the timing mark of the camshaft timing pulley is aligned with the top end of the cylinder head.

If not, revolve the crankshaft 1 revolution (360˚) and align the mark as above.

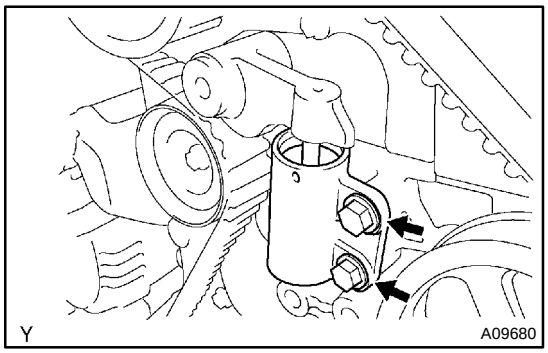
16. REMOVE TIMING CHAIN COVER PLATE



17. REMOVE TIMING BELT

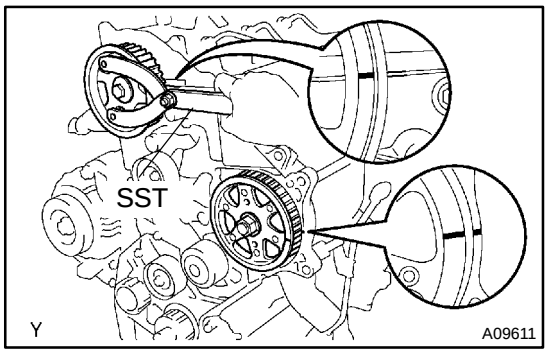
HINT:
If re-using the timing belt, draw a direction arrow on the timing belt (in direction of engine revolution), and place matchmarks on the pulleys and timing belt.

(a) Remove the bolt and timing belt plate.



(b) Alternately loosen the 2 bolts, and remove them and the timing belt tensioner.

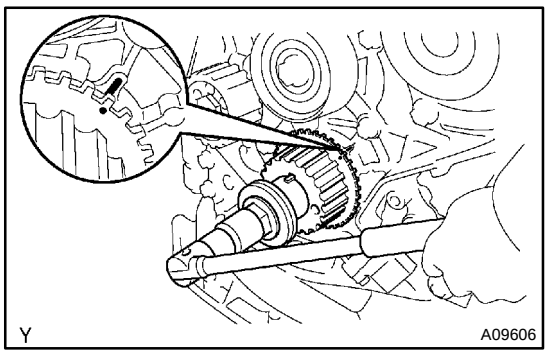
(c) Remove the timing belt.



18. SET NO.1 CYLINDER TO TDC/COMPRESSION

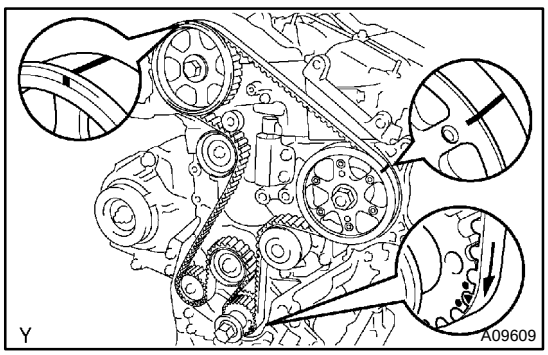
(a) Using SST, set the timing and drive pulleys at each position.

SST 09960-10010 (09962-01000, 09963-01000)



(b) Using the crankshaft pulley bolt, align the dot mark of the crankshaft timing pulley with the TDC mark of the oil pump by turning the crankshaft.

NOTICE:
When turning the camshaft or crankshaft, the valve heads will hit against the piston top; do not turn them more than necessary.

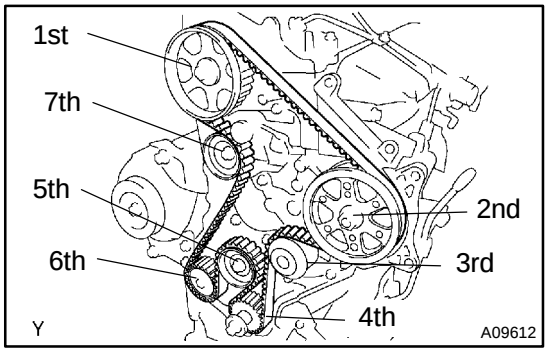


19. INSTALL TIMING BELT

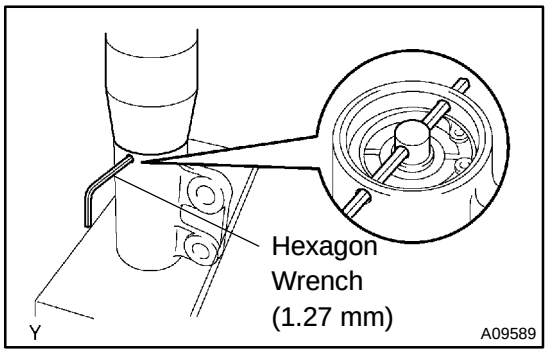
NOTICE:
The engine should be cold.

(a) Remove any oil or water on each pulley, and keep them clean.

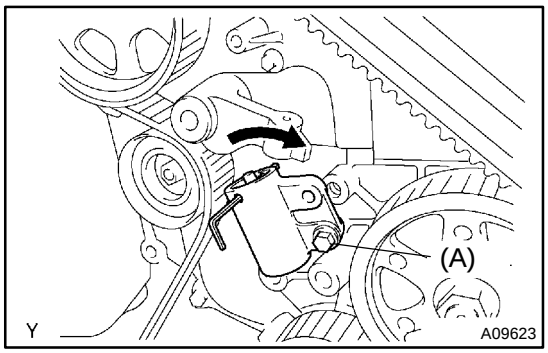
NOTICE:
Wipe only the pulleys; do not use any cleansing agent.



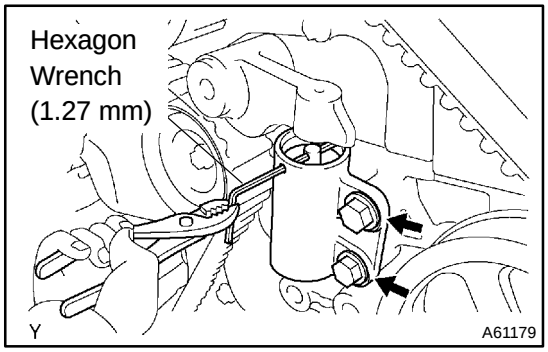
(b) Install the timing belt in the following order:
1st: Camshaft timing pulley
2nd: Supply pump drive pulley
3rd: Water pump pulley
4th: Crankshaft timing pulley
5th: No. 2 idler pulley
6th: Oil pump pulley
7th: No. 1 idler pulley



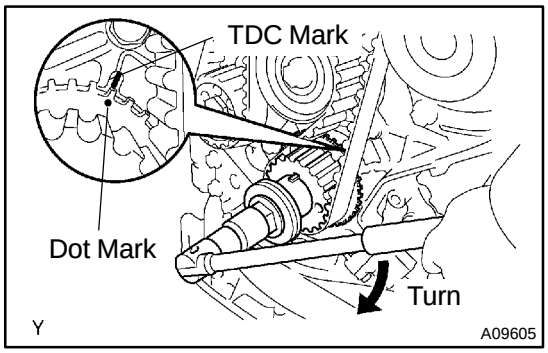
(c) Install the timing belt tensioner.
(1) Using a press, slowly press in the push rod using 981 – 9,807 N (100 – 1,000 kgf, 200 – 2,205 lbf) of pressure.
(2) Align the holes of the push rod and housing, pass a hexagon wrench (1.27 mm) through the holes to keep the setting position of the push rod.
(3) Release the press.



(4) Temporarily install the tensioner with the bolt (A).
(5) Turn the tensioner clockwise and temporarily install the other bolt.

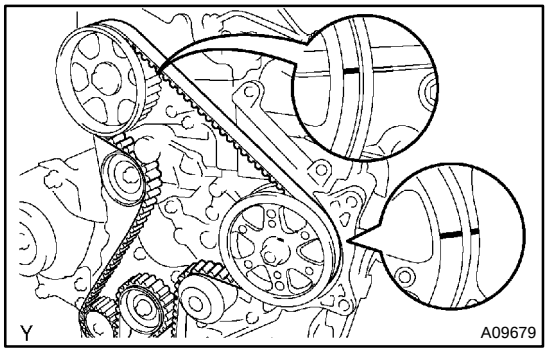


(6) Alternately tighten the 2 bolts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)
(7) Remove the hexagon wrench (1.27 mm) from the tensioner.



20. CHECK VALVE TIMING
(a) Slowly turn the crankshaft 2 revolutions (720_) from TDC to TDC.

NOTICE:
Always turn the crankshaft clockwise.



(b) Check that each pulley aligns with the timing marks as shown in the illustration.

If the timing marks do not align, remove the timing belt and reinstall it.

(c) Remove the crankshaft pulley bolt.

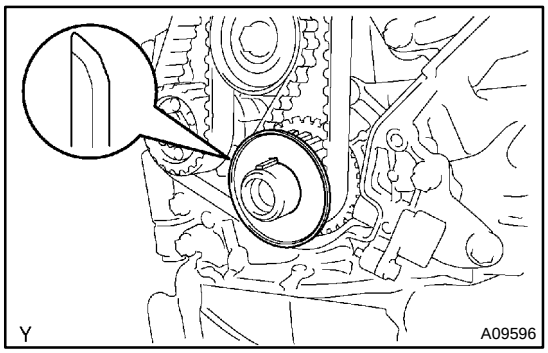
21. INSTALL TIMING CHAIN COVER PLATE

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

22. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket with 6 bolts.

Torque:
37 N·m (375 kgf·cm, 27 ft·lbf) for 14 mm head bolt
64 N·m (650 kgf·cm, 47 ft·lbf) for 17 mm head bolt



23. INSTALL TIMING BELT GUIDE

(a) Install the belt guide, facing the cap side outward.

24. INSTALL TIMING BELT NO.1 COVER

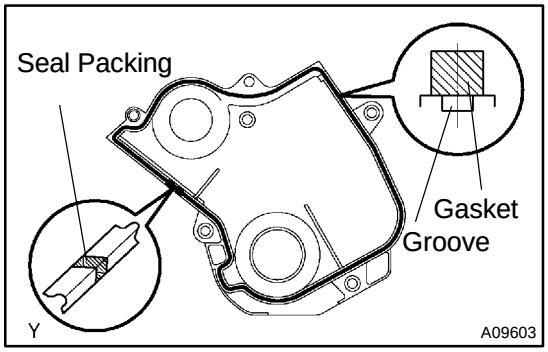
(a) Check that the timing belt cover gasket for cracks and peelings etc.

If the gasket has cracks or peelings etc., replace it by using these steps:

(1) Using a screwdriver and gasket scraper, remove all the old gasket material.

(2) Thoroughly clean all components to remove all the loose material.

(3) Remove the backing paper from a new gasket and install the gasket evenly to the part of the timing belt cover shaded black in the illustration.

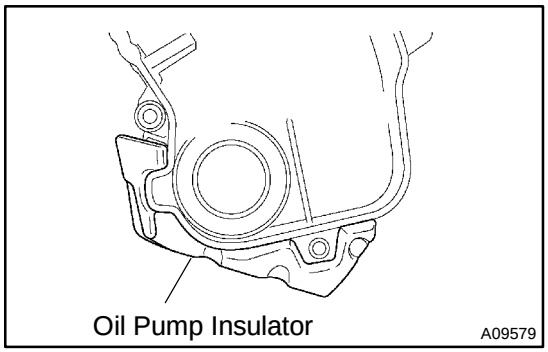


NOTICE:

- **Affix the gasket at the center of the groove.**
- **At the corner portion, affix the gasket without making its thickness lessen.**

(4) After installing the gasket, press it down so that the adhesive firmly sticks to the timing belt cover.

(5) In case that there is a clearance between the joint portion of the gasket, apply the same amount of seal packing as the width and height of the gasket.
Seal packing: Part No. 08826-00080 or equivalent



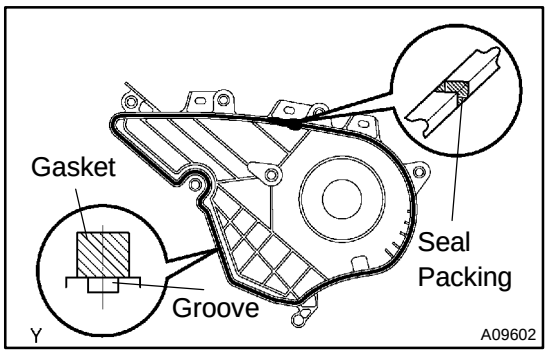
(b) Install the oil pump insulator to the belt cover.
(c) Install the No. 1 timing belt cover and gasket with 5 bolts and 5 seal washers.
(d) After installing the belt cover, check that there is no peelings of the gasket.

25. INSTALL TIMING BELT NO.2 COVER

(a) Check that the timing belt cover gasket for cracks and peelings etc.

If the gasket has cracks or peelings etc., replace it using these steps:

(1) Using a screwdriver and gasket scraper, remove all the old gasket material.
(2) Thoroughly clean all components to remove all the loose material.
(3) Remove the backing paper from a new gasket and install the gasket evenly to the part of the timing belt cover shaded black in the illustration.



NOTICE:

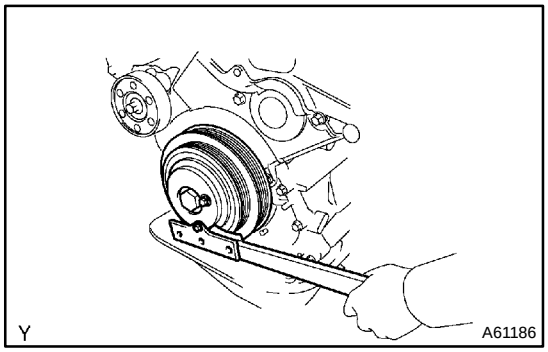
- **Affix the gasket at the center of the groove.**
- **At the corner portion, affix the gasket without making its thickness lessen.**

(4) After installing the gasket, press it down so that the adhesive firmly sticks to the timing belt cover.
(5) In case that there is a clearance between the joint portion of the gasket, apply the same amount of seal packing as the width and height of the gasket.
Seal packing: Part No. 08826-00080 or equivalent

(b) Install the No. 2 timing belt cover and gasket with 7 bolts and 7 seal washers.

26. INSTALL IDLER PULLEY SUB-ASSY

(a) Install the pulley and washer with the bolt.
Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)



27. INSTALL CRANKSHAFT PULLEY

(a) Align the pulley set key with the key groove of the pulley, and slide the pulley to the crankshaft.

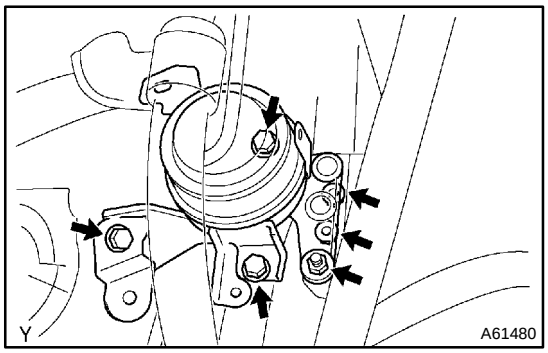
(b) Using SST, install the pulley bolt.

SST 09213-70010 (09213-70020), 09330-00021

Torque: 180 N·m (1,800 kgf·cm, 130 ft·lbf)

HINT:

When using a bolt (91651-60855), a plate washer (5 mm or 0.20 in.) must be inserted between the bolt and SST.



28. INSTALL ENGINE MOUNTING INSULATOR SUB ASSY RH

(a) Install the 3 bolts, 3 nuts and engine mounting insulator sub assy RH.

Torque:52 N·m (530 kgf·cm, 38 ft·lbf)

29. INSTALL PULLEY ASSY, IDLE W/BRACKET **(See page 14-200)**

30. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER) **(See page 14-172)**

31. INSTALL INJECTOR DRIVER **(See page 14-209)**

32. INSTALL ENGINE COVER SUB-ASSY NO.1 **(See page 14-176)**

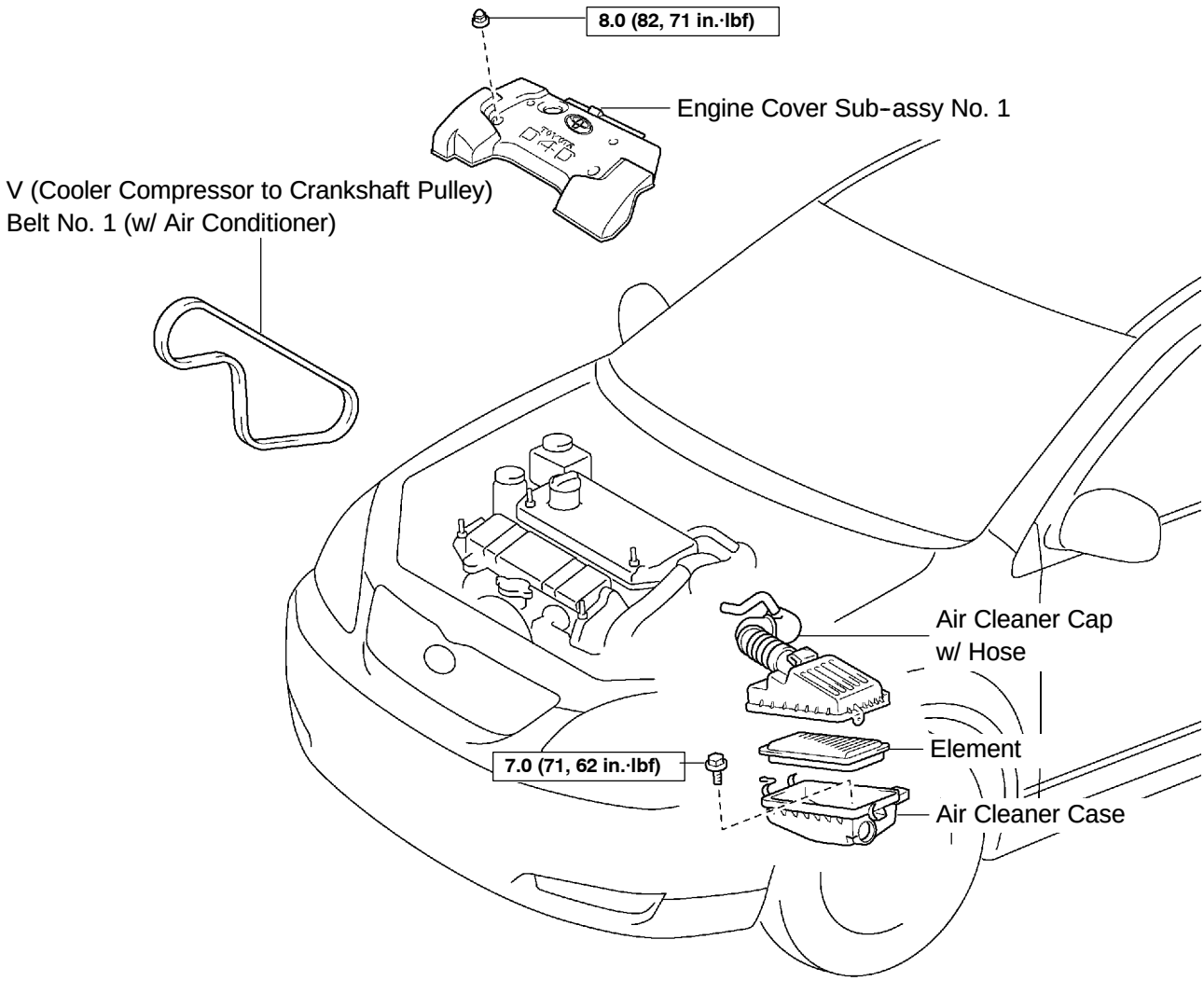
33. INSTALL FRONT WHEEL RH

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

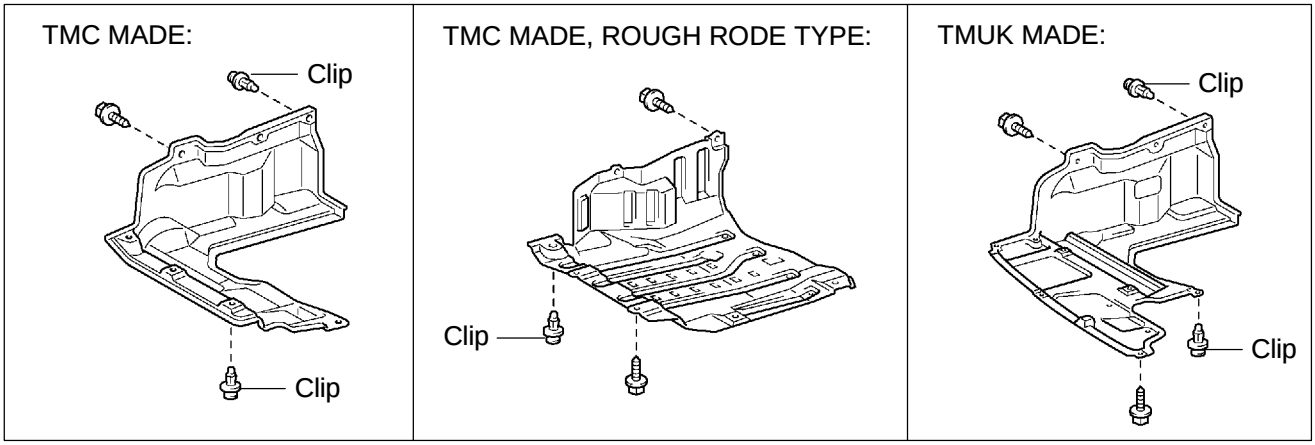
CAMSHAFT (1CD-FTV)

COMPONENTS

140MS-01

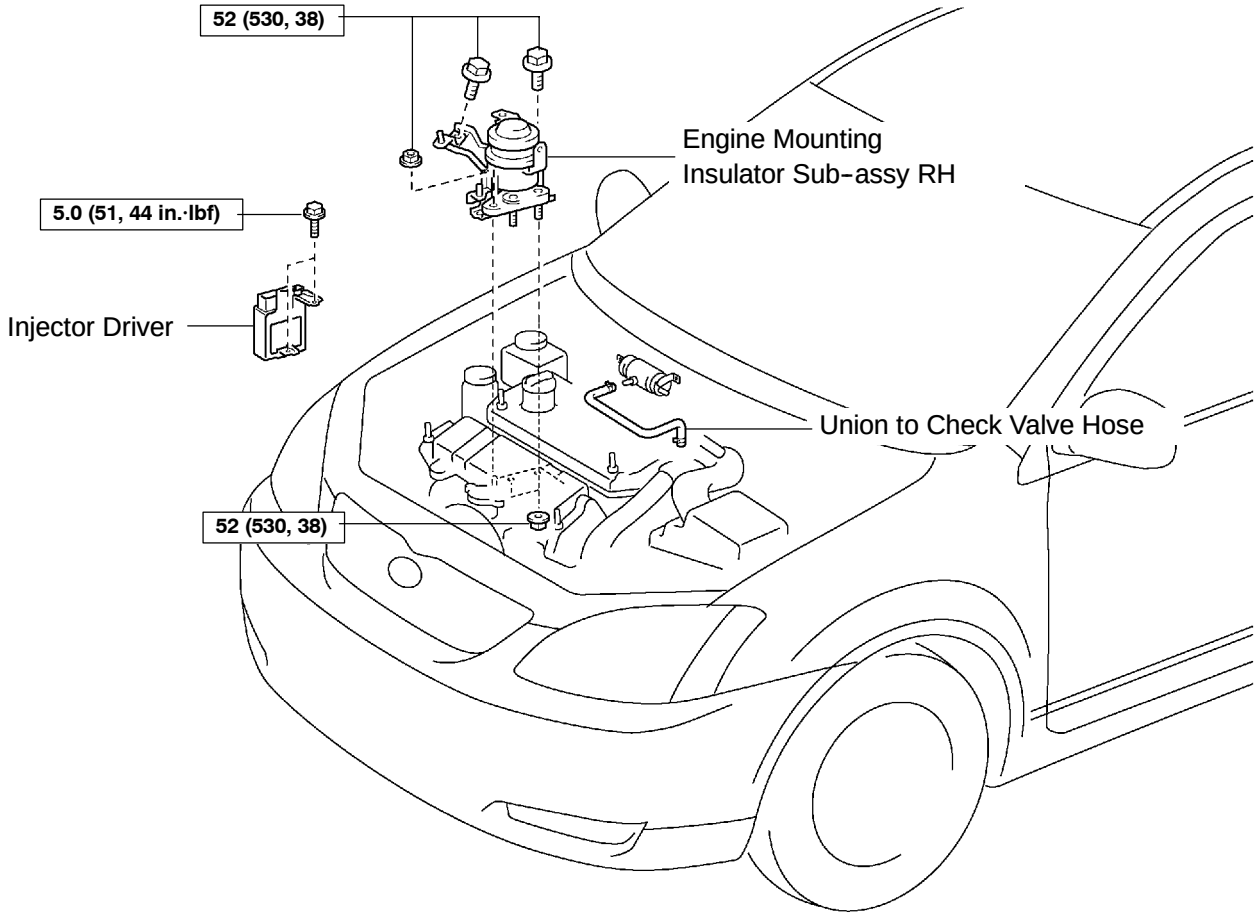


Engine Under Cover RH



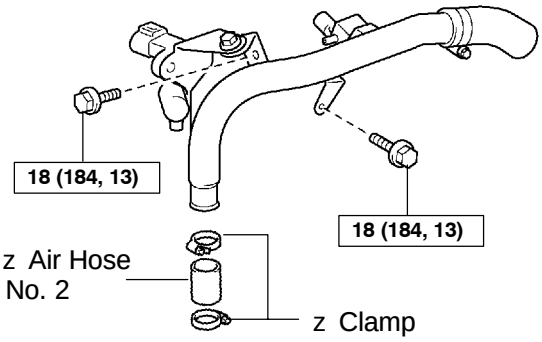
o N·m (kgf·cm, ft·lbf) : Specified torque

A61488

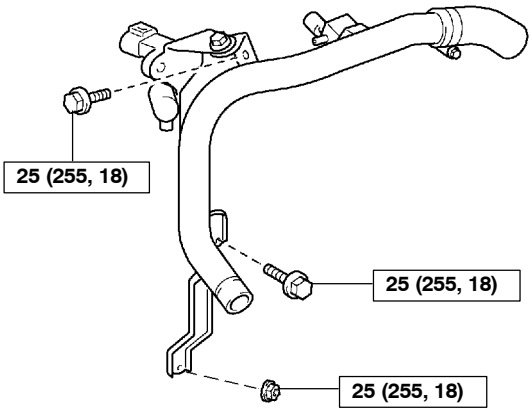


Air Tube No. 1

w/o Inter Cooler:



w/ Inter Cooler:

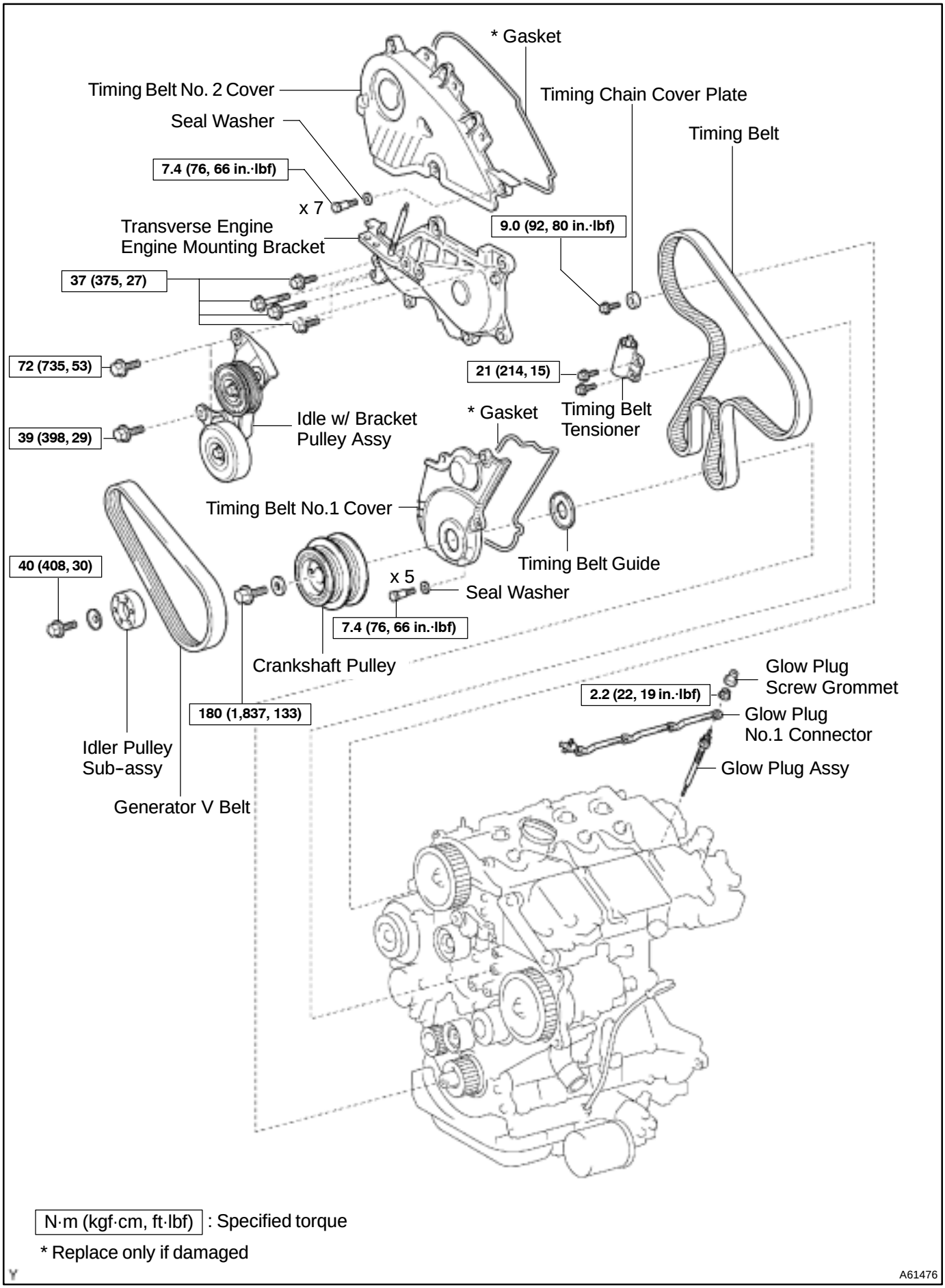


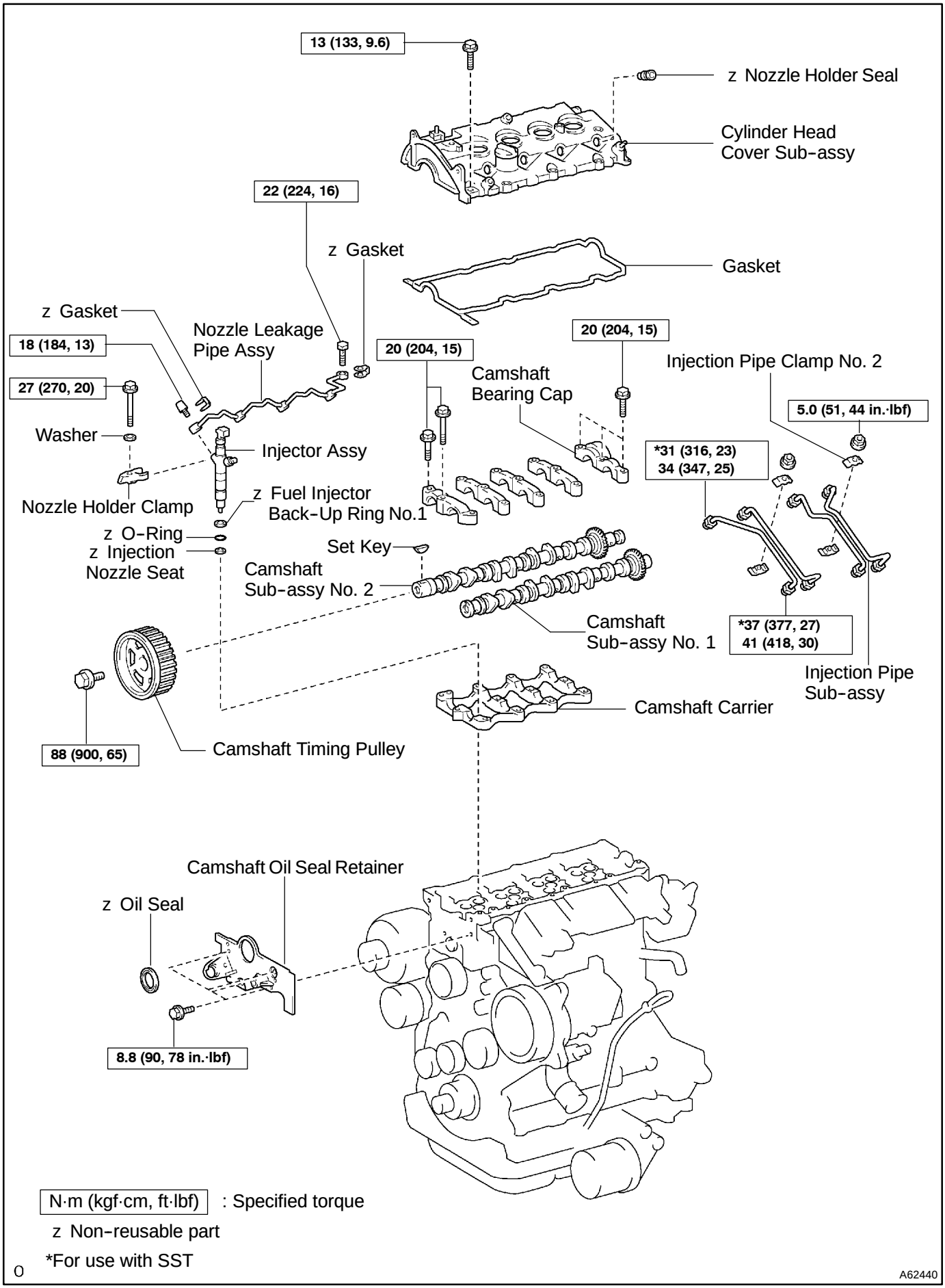
N·m (kgf·cm, ft·lbf): Specified torque

z Non-reusable part

O

A61489


* Gasket
Timing Belt No. 2 Cover
Timing Chain Cover Plate
Seal Washer
Timing Belt
7.4 (76, 66 in.·lbf)
x 7
9.0 (92, 80 in.·lbf)
Transverse Engine
Engine Mounting Bracket
37 (375, 27)
72 (735, 53)
21 (214, 15)
Timing Belt
Tensioner
Idle w/ Bracket
Pulley Assy
* Gasket
39 (398, 29)
Timing Belt No.1 Cover
Timing Belt Guide
40 (408, 30)
x 5
Seal Washer
7.4 (76, 66 in.·lbf)
Crankshaft Pulley
Glow Plug
Screw Grommet
2.2 (22, 19 in.·lbf)
Glow Plug
No.1 Connector
180 (1,837, 133)
Glow Plug Assy
Idler Pulley
Sub-assy
Generator V Belt
N·m (kgf·cm, ft·lbf) : Specified torque
* Replace only if damaged
A61476


13 (133, 9.6)
z Nozzle Holder Seal
Cylinder Head Cover Sub-assy
22 (224, 16)
z Gasket
Gasket
z Gasket
Nozzle Leakage Pipe Assy
18 (184, 13)
27 (270, 20)
Washer
Injector Assy
Nozzle Holder Clamp
z Fuel Injector Back-Up Ring No.1
z O-Ring
z Injection Nozzle Seat
20 (204, 15)
Camshaft Bearing Cap
20 (204, 15)
Injection Pipe Clamp No. 2
5.0 (51, 44 in.·lbf)
*31 (316, 23)
34 (347, 25)
Set Key
Camshaft Sub-assy No. 2
Camshaft Sub-assy No. 1
*37 (377, 27)
41 (418, 30)
Injection Pipe Sub-assy
Camshaft Carrier
88 (900, 65)
Camshaft Timing Pulley
Camshaft Oil Seal Retainer
z Oil Seal
8.8 (90, 78 in.·lbf)
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
*For use with SST
A62440

140MT-01

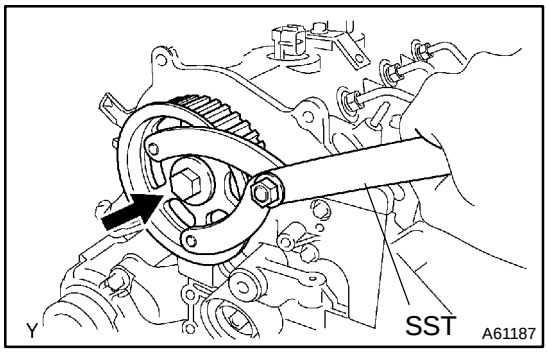
REPLACEMENT

1. REMOVE FRONT WHEEL RH
2. REMOVE ENGINE UNDER COVER RH

3. DRAIN ENGINE COOLANT (See page 16-33)
4. REMOVE ENGINE COVER SUB-ASSY NO.1

5. DISCONNECT UNION TO CHECK VALVE HOSE

6. REMOVE AIR TUBE NO.1
   (See page 13-8)
7. REMOVE INJECTOR DRIVER
   (See page 14-191)
8. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)
   (See page 14-172)
9. REMOVE GENERATOR V BELT
   (See page 14-172)
10. REMOVE PULLEY ASSY, IDLE W/BRACKET (See page 14-197)
11. REMOVE ENGINE MOUNTING INSULATOR SUB ASSY RH (See page 14-213)
12. REMOVE CRANKSHAFT PULLEY
    (See page 14-213)
    SST 09213-70010 (09213-70020), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05030, 09954-05021)
13. REMOVE IDLER PULLEY SUB-ASSY
    (See page 14-214)
14. REMOVE TIMING BELT NO.2 COVER
    (See page 14-214)
15. REMOVE TIMING BELT NO.1 COVER
    (See page 14-214)
16. REMOVE TIMING BELT GUIDE
17. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
    (See page 14-214)
18. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-214)
19. REMOVE TIMING BELT
    (See page 14-215)



20. REMOVE CAMSHAFT TIMING PULLEY

(a) Using SST, remove the pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
(b) Remove the timing pully.
HINT:
Using a plastic-faced hammer, tap out the pulley.
(c) Remove the set key.

21. REMOVE INJECTION PIPE SUB-ASSY NO.1
(See page 11-64)
SST 09023-12900, 09023-12700

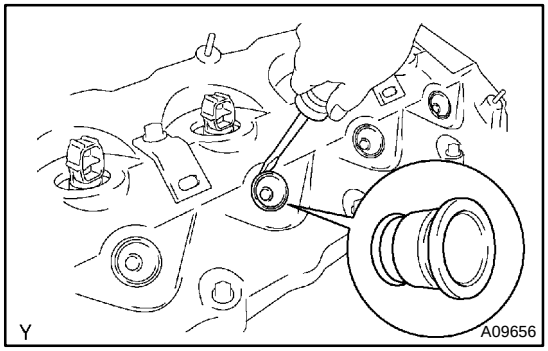
22. REMOVE INJECTION PIPE SUB-ASSY NO.2
(See page 11-64)
SST 09023-12900, 09023-12700

23. REMOVE INJECTION PIPE SUB-ASSY NO.3
(See page 11-64)
SST 09023-12900, 09023-12700

24. REMOVE INJECTION PIPE SUB-ASSY NO.4
(See page 11-64)
SST 09023-12900, 09023-12700

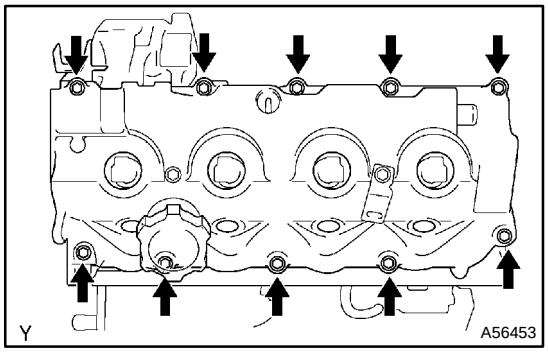
25. REMOVE VACUUM PUMP ASSY

(a) Remove vacuum hose.
(b) Remove vacuum pump oil hose.
(c) Remove the 2 bolts and the vacuum pump assy.



26. REMOVE CYLINDER HEAD COVER SUB-ASSY

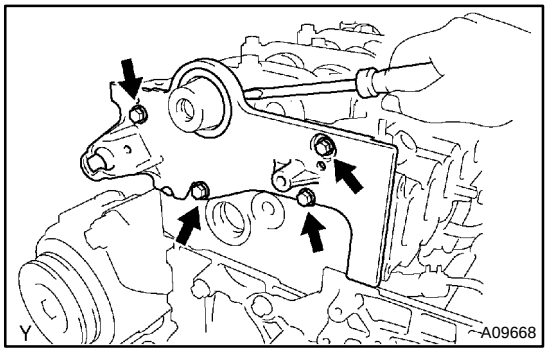
(a) Using a screwdriver, pry out the 4 nozzle holder seals.



(b) Remove the 10 bolts, cylinder head cover and gasket.

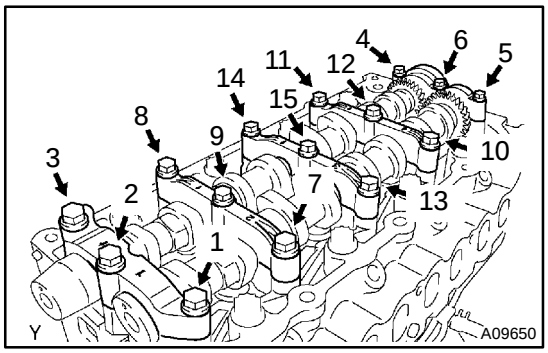
27. REMOVE NOZZLE LEAKAGE PIPE ASSY
(See page 11-65)

28. REMOVE INJECTOR ASSY
(See page 11-65)



29. REMOVE CAMSHAFT OIL SEAL RETAINER

(a) Remove the 4 bolts.
(b) Using a screwdriver, remove the oil seal retainer by prying the portions between the oil seal retainer and camshaft bearing cap.

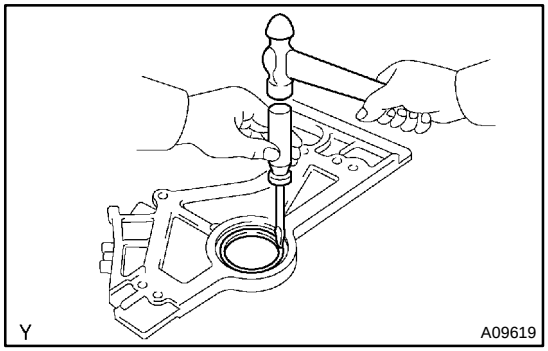


30. REMOVE CAMSHAFT

(a) Uniformly loosen and remove the 15 bearing cap bolts in several passes and in the sequence shown.
(b) Remove the 5 bearing caps and camshaft sub-assy.

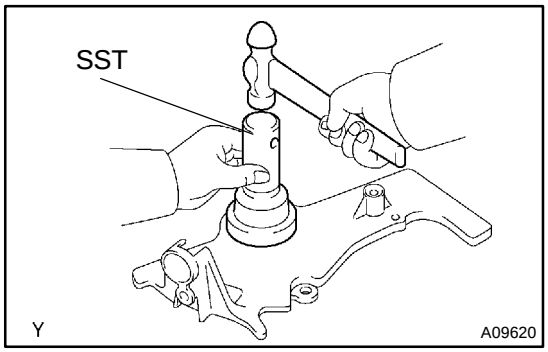
31. REMOVE NO.2 CAMSHAFT

(a) Remove the camshaft sub-assy and camshaft carrier.



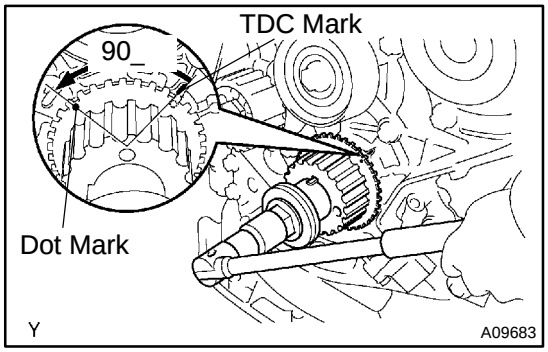
32. REMOVE CAMSHAFT OIL SEAL

(a) Using a screwdriver and a hammer, tap out the oil seal.



33. INSTALL CAMSHAFT OIL SEAL

(a) Using SST and a hammer, tap in a new oil seal until its surface is flush with the camshaft oil seal retainer edge.
SST 09223-46011



34. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Using the crankshaft pulley bolt, turn the crankshaft, and set the dot mark of the crankshaft timing pulley at the position of 90_ BTDC.

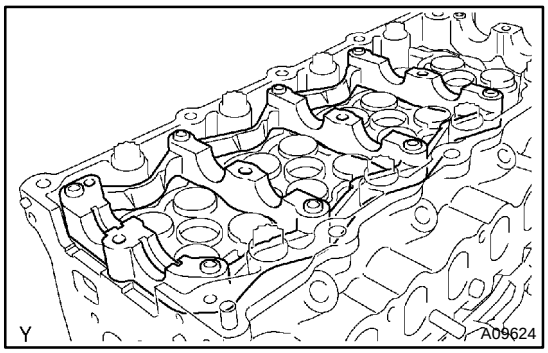
NOTICE:

If the timing belt is disengaged, having the crankshaft timing pulley at wrong angle can cause the piston head and valve head to come into contact with each other.

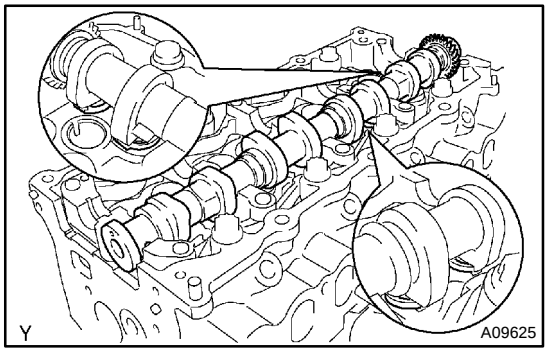
35. INSTALL CAMSHAFT

NOTICE:

Since the thrust clearance of the camshaft is small, the camshaft must be kept leveled while it is being installed. If the camshaft is not kept leveled, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, the following procedures should be carried out.



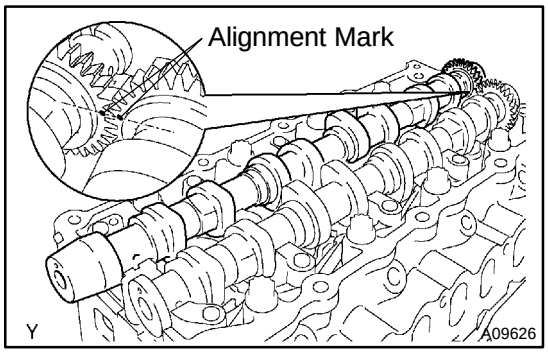
(a) Place the camshaft carrier in position on the cylinder head.



(b) Install the camshaft sub-assy No. 1.

(c) Apply engine oil to the cam and gear of the camshaft, and the journal of the camshaft carrier.

(d) Place the intake camshaft on top of the camshaft carrier as shown in the illustration so that the No. 3 and No. 4 of cylinder cam lobes face downward.



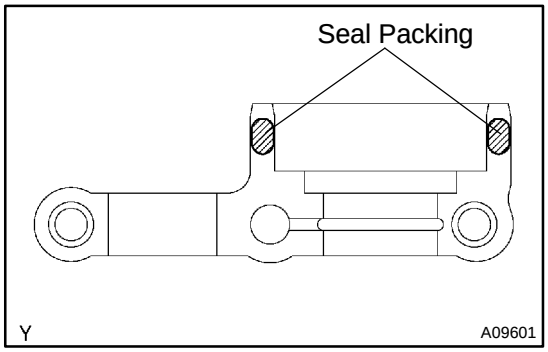
36. INSTALL NO.2 CAMSHAFT

(a) Install the exhaust camshaft.

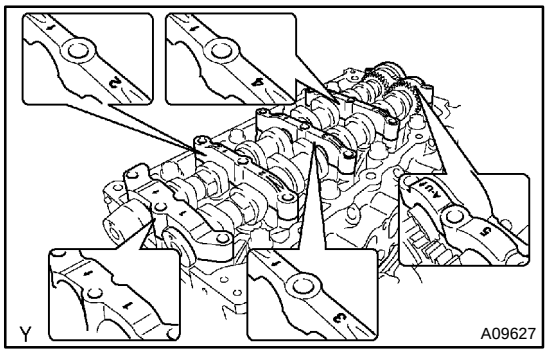
(b) Apply engine oil to the cam and gear of the camshaft, and the journal of the camshaft carrier.

(c) Engage the exhaust camshaft gear to the intake camshaft gear by matching the alignment marks on each gear.

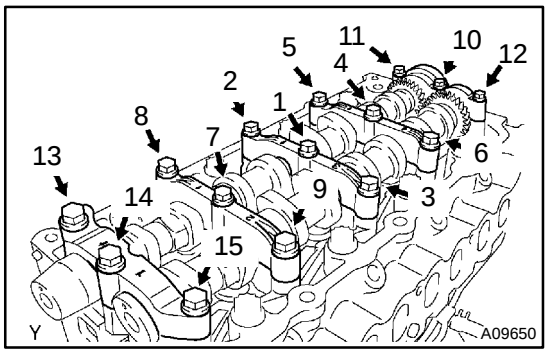
(d) Roll down the exhaust camshaft onto the bearing journals while engaging gears with each other.



(e) Install the camshaft bearing caps.
(1) Remove any oil packing (FIPG) material from the No. 5 camshaft bearing cap.
(2) Apply seal packing to the No. 5 camshaft bearing cap as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent



(3) Place the 5 bearing caps in their proper locations.

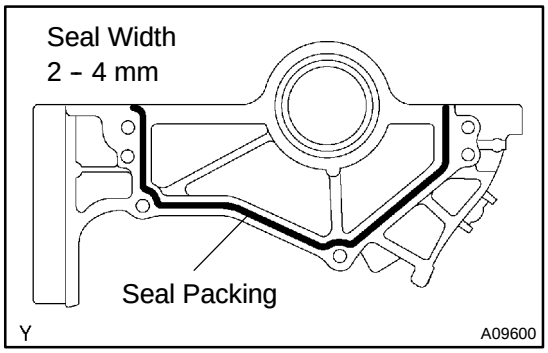


(4) Install and uniformly tighten the 15 bearing cap bolts in several passes in the sequence shown.
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

37. INSPECT VALVE CLEARANCE (See page 14-174)

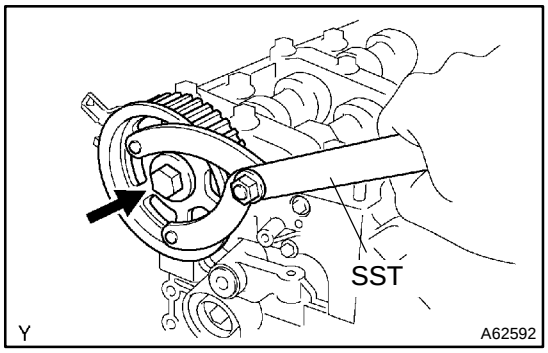
38. INSTALL CAMSHAFT OIL SEAL RETAINER

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the oil seal retainer and cylinder block.
(1) Thoroughly clean all components to remove all the loose material.
(2) Using non-residue solvent, clean both sealing surfaces.



(b) Apply seal packing to the oil seal retainer as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent
(1) Install a nozzle that has been cut to a 2 - 4 mm (0.08 - 0.16 in.) opening.
(2) Parts must be assembled within 15 minutes of application. Otherwise the material must be removed and reapplied.
(3) Immediately remove nozzle from the tube and reinstall the cap.

(c) Install the oil seal retainer with the 4 bolts. Uniformly tighten the 4 bolts in several passes.
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

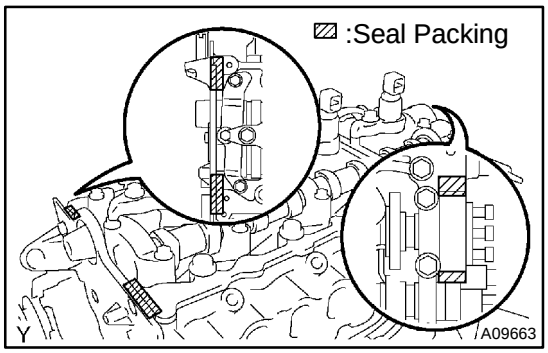


39. INSTALL CAMSHAFT TIMING PULLEY

(a) Install the pulley set key to the key groove of the camshaft.
(b) Align the pulley set key with the key groove of the timing pulley, and slide on the timing pulley.
(c) Using SST, install the pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

40. INSTALL INJECTOR ASSY
(See page 11-65)

41. INSTALL NOZZLE LEAKAGE PIPE ASSY
(See page 11-67)
SST 09992-00242



42. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Remove any old packing (FIPG) material.
(b) Apply seal packing to the cylinder head.
Seal packing: Part No. 08826-00080 or equivalent
(c) Install the gasket to the head cover.
(d) Install the cylinder head cover with 10 bolts.
Torque: 13 N·m (133 kgf·cm, 9.6 ft·lbf)
(e) Install 4 new nozzle holder seals.

43. INSTALL VACUUM PUMP ASSY

(a) Instal the 2 bolts and the vacuum pump assy.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)
(b) Install vacuum pump oil hose.
(c) Install vacuum hose.

44. INSTALL INJECTION PIPE SUB-ASSY NO.1
(See page 11-64)
SST 09023-12900, 09023-12700

45. INSTALL INJECTION PIPE SUB-ASSY NO.2
(See page 11-64)
SST 09023-12700, 09023-12900

46. INSTALL INJECTION PIPE SUB-ASSY NO.3
(See page 11-64)
SST 09023-12900, 09023-12700

47. INSTALL INJECTION PIPE SUB-ASSY NO.4
(See page 11-64)
SST 09023-12900, 09023-12700

48. INSTALL TIMING BELT
(See page 14-215)

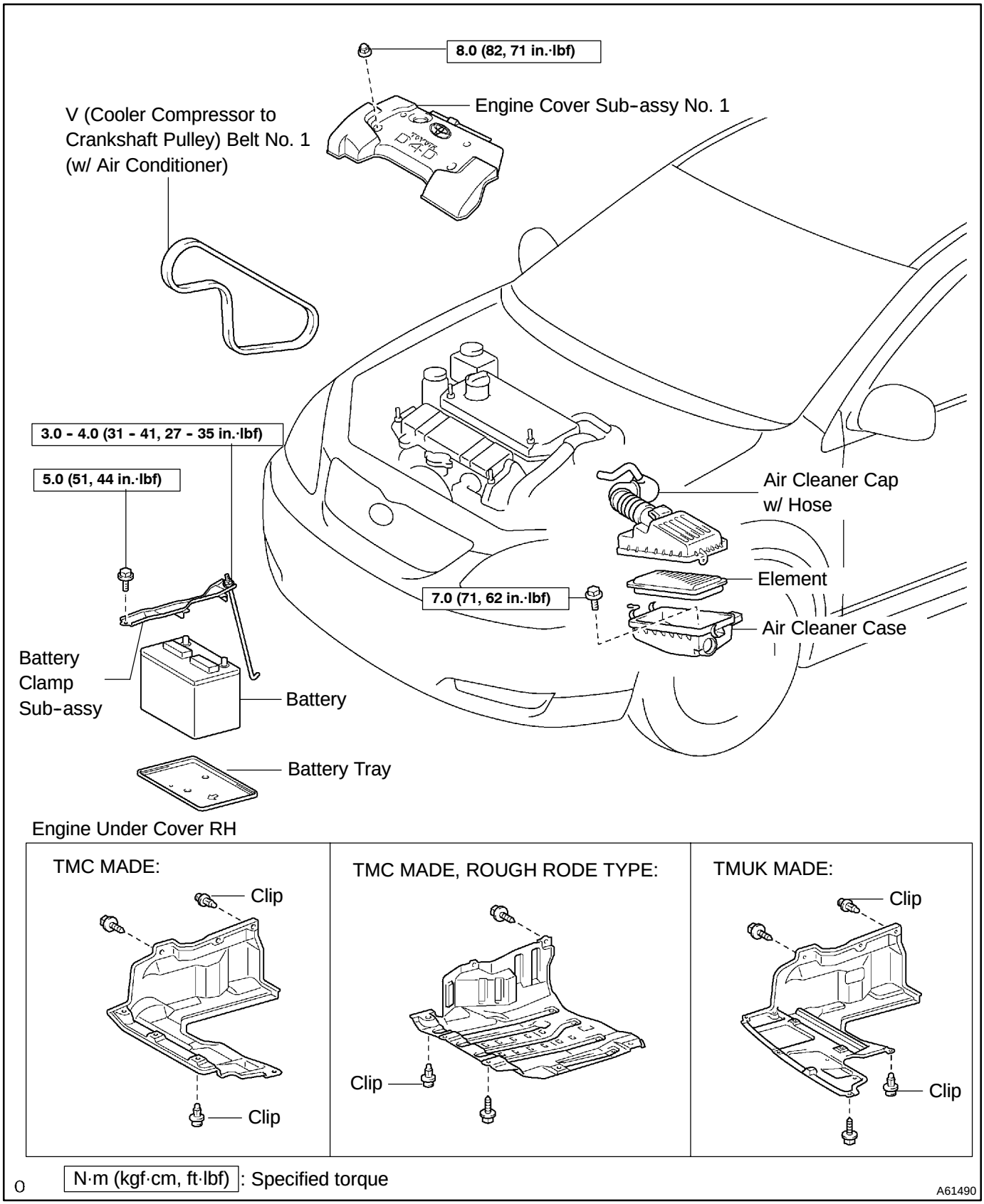
49. CHECK VALVE TIMING (See page 14-216)
50. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
(See page 14-217)
51. INSTALL TIMING BELT GUIDE
(See page 14-217)
52. INSTALL TIMING BELT NO.1 COVER
(See page 14-217)
53. INSTALL TIMING BELT NO.2 COVER
(See page 14-218)
54. INSTALL IDLER PULLEY SUB-ASSY
(See page 14-218)
55. INSTALL CRANKSHAFT PULLEY
(See page 14-219)
SST 09213-70010 (09213-70020), 09330-00021
56. INSTALL ENGINE MOUNTING INSULATOR SUB ASSY RH (See page 14-219)
57. INSTALL PULLEY ASSY, IDLE W/BRACKET (See page 14-200)
58. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)
(See page 14-172)
59. INSTALL INJECTOR DRIVER
(See page 14-209)
60. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
61. INSTALL AIR TUBE NO.1
(See page 13-10)
62. INSTALL ENGINE COVER SUB-ASSY NO.1

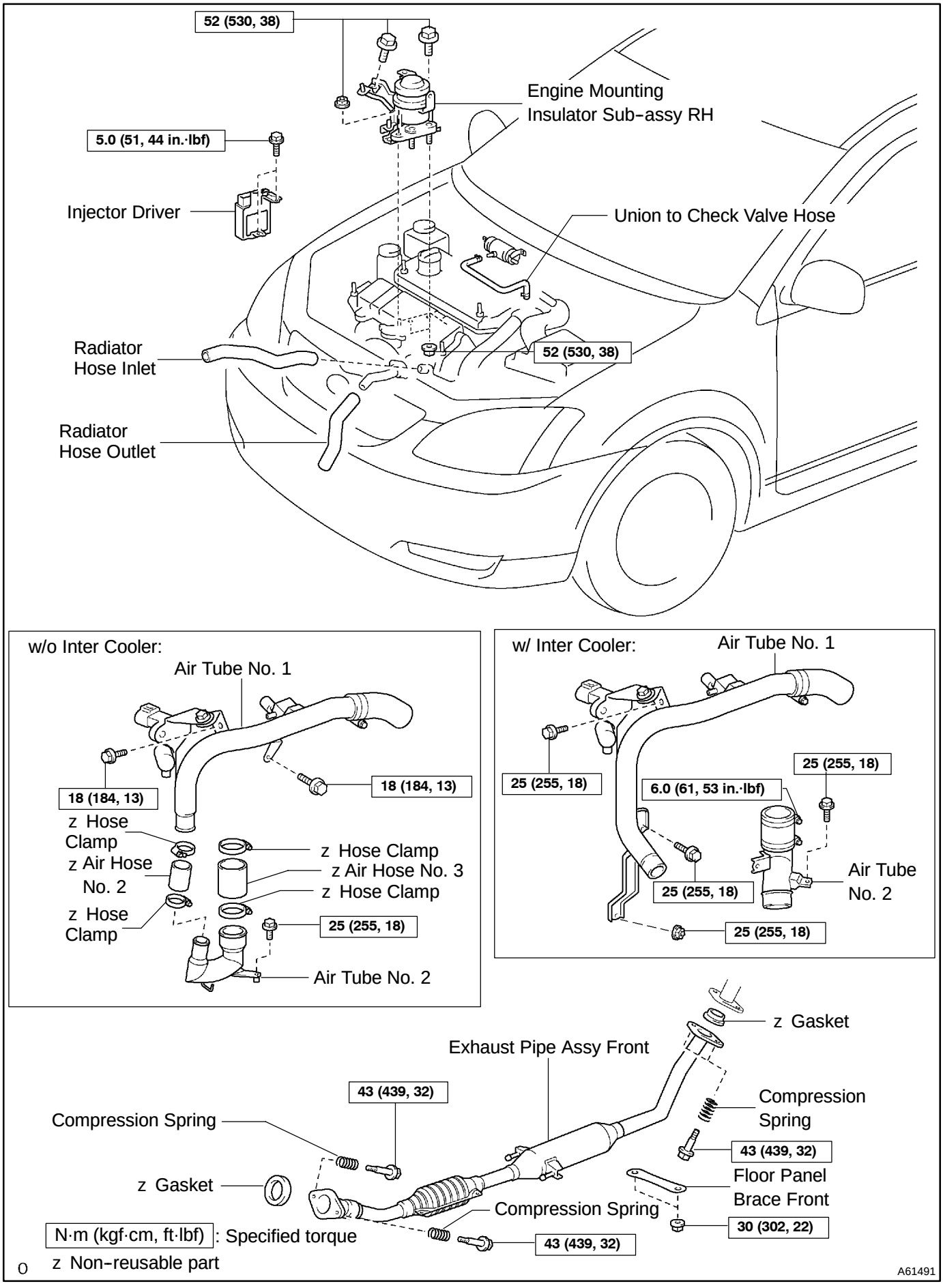
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
63. ADD COOLANT (See page 16-33)
64. CHECK ENGINE COOLANT LEAK (See page 16-34)
65. CHECK FUEL LEAK (See page 11-70)

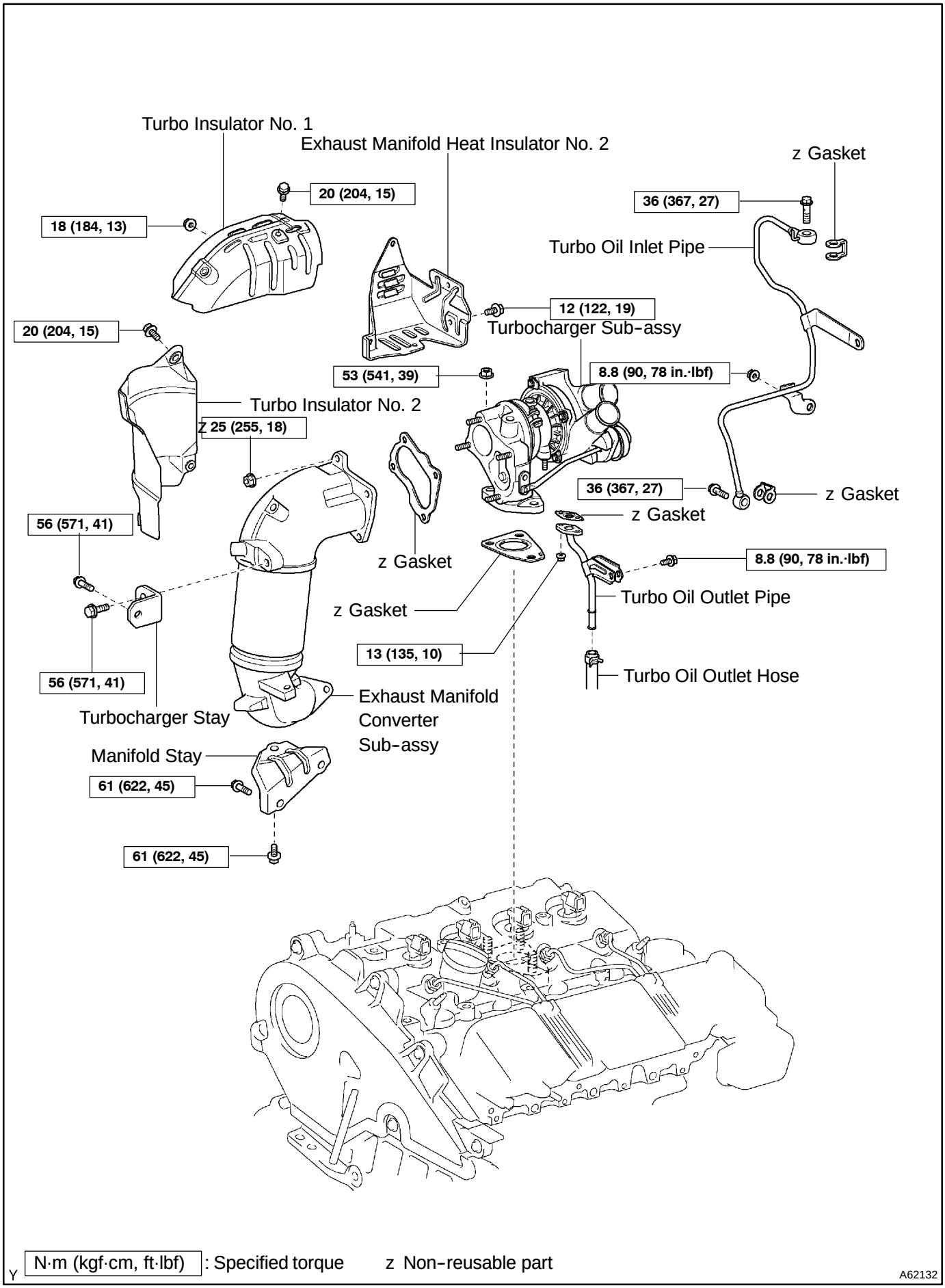
CYLINDER HEAD GASKET (1CD-FTV)

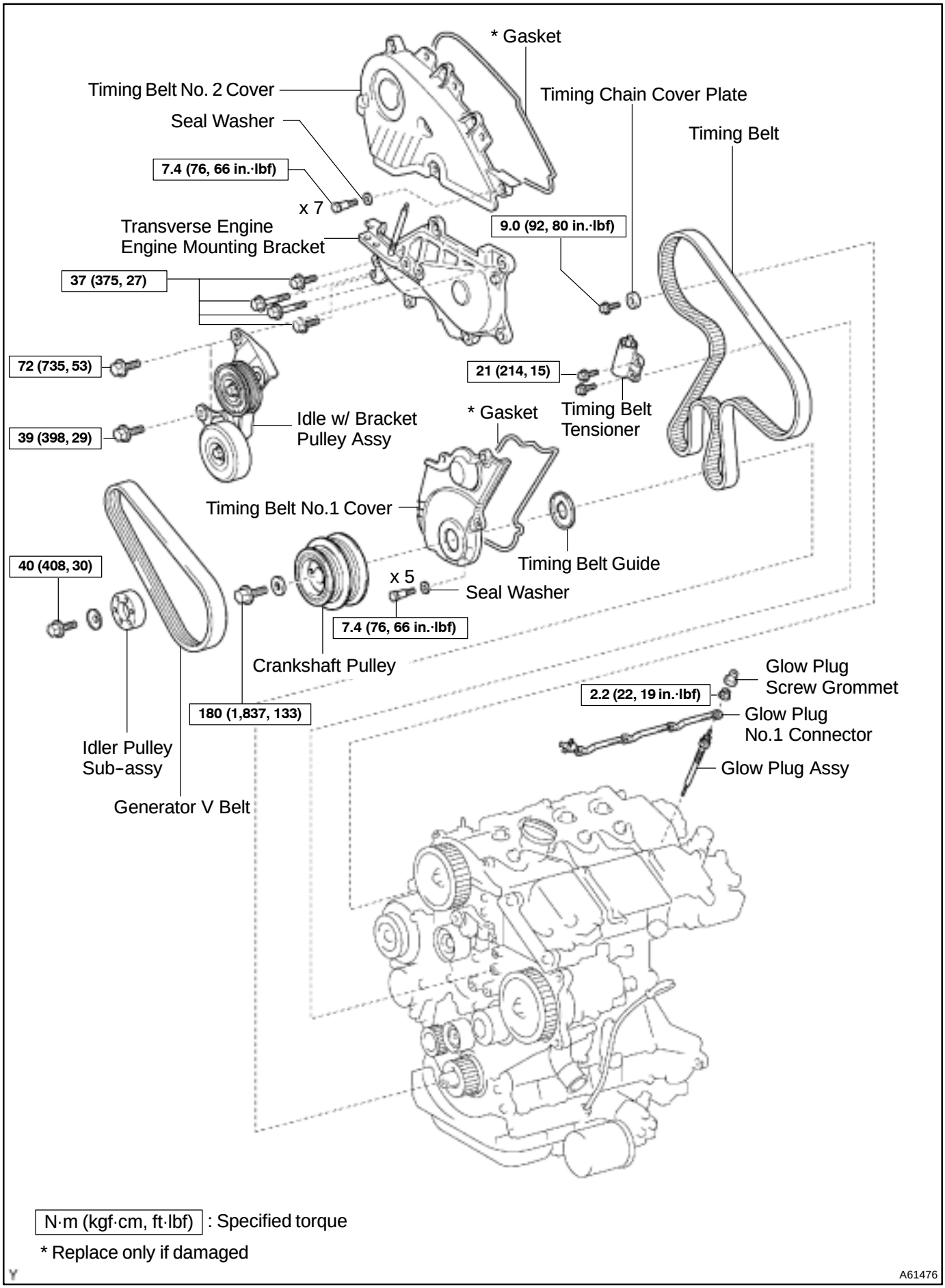
COMPONENTS

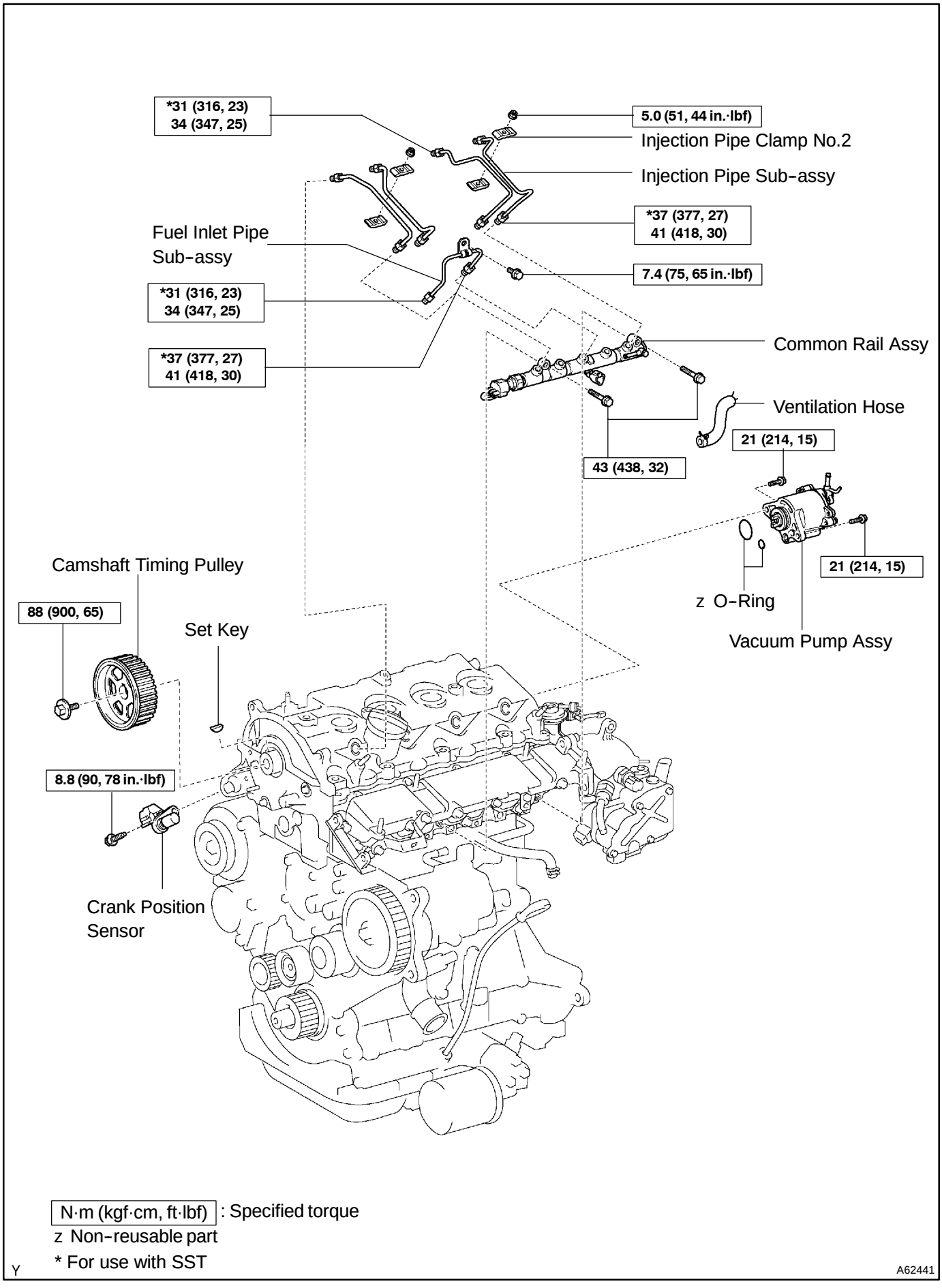
140MV-01

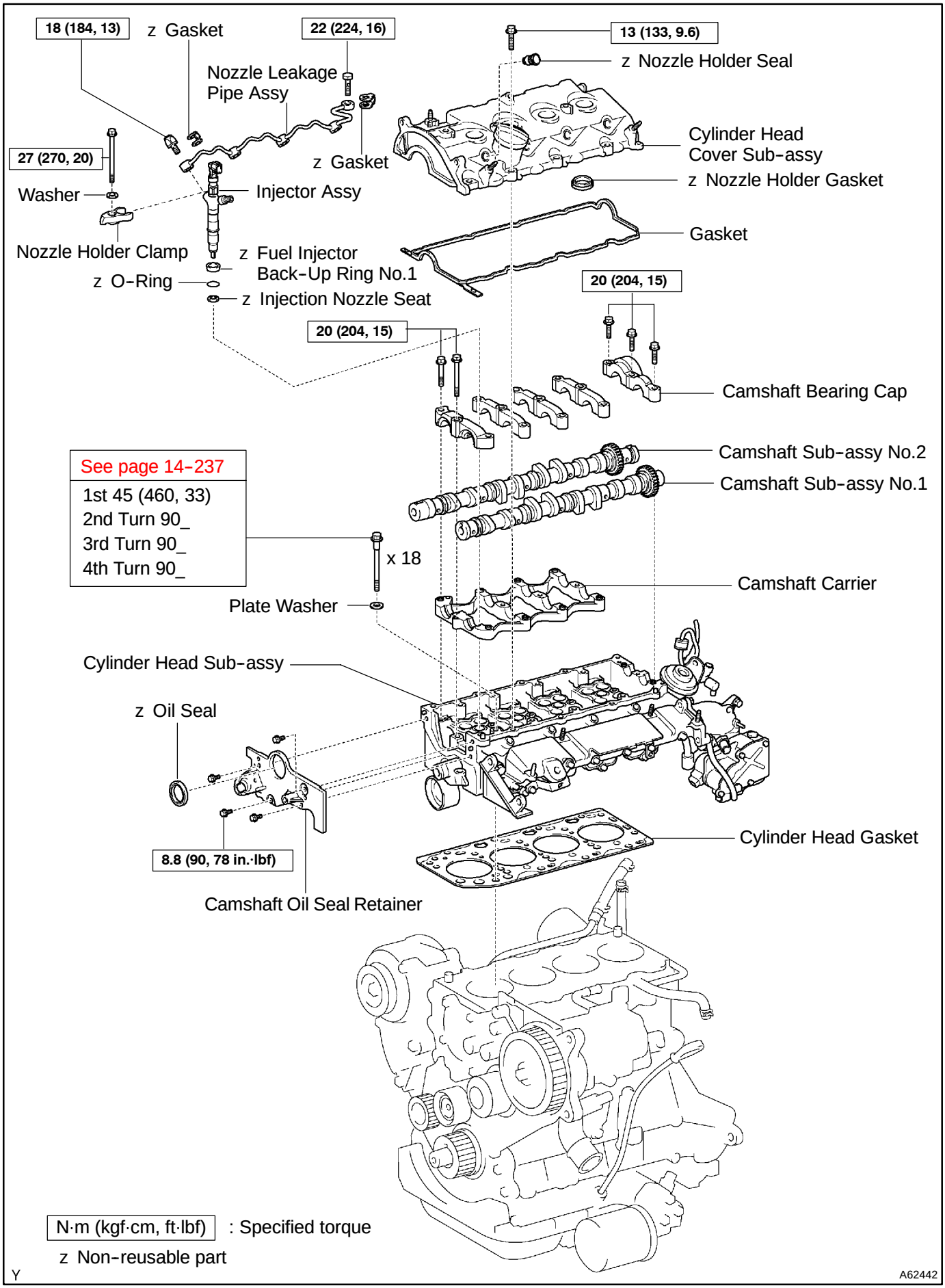



52 (530, 38)
Engine Mounting Insulator Sub-assy RH
5.0 (51, 44 in.·lbf)
Injector Driver
Union to Check Valve Hose
Radiator Hose Inlet
52 (530, 38)
Radiator Hose Outlet
w/o Inter Cooler:
Air Tube No. 1
18 (184, 13)
18 (184, 13)
z Hose Clamp
z Air Hose No. 2
z Hose Clamp
z Air Hose No. 3
z Hose Clamp
z Hose Clamp
25 (255, 18)
Air Tube No. 2
w/ Inter Cooler:
Air Tube No. 1
25 (255, 18)
25 (255, 18)
6.0 (61, 53 in.·lbf)
25 (255, 18)
Air Tube No. 2
25 (255, 18)
z Gasket
Exhaust Pipe Assy Front
43 (439, 32)
Compression Spring
Compression Spring
43 (439, 32)
z Gasket
Floor Panel Brace Front
Compression Spring
30 (302, 22)
43 (439, 32)
N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
A61491


Turbo Insulator No. 1
Exhaust Manifold Heat Insulator No. 2
z Gasket
20 (204, 15)
36 (367, 27)
18 (184, 13)
Turbo Oil Inlet Pipe
12 (122, 19)
Turbocharger Sub-assy
20 (204, 15)
53 (541, 39)
8.8 (90, 78 in.·lbf)
Turbo Insulator No. 2
Z 25 (255, 18)
36 (367, 27)
z Gasket
z Gasket
56 (571, 41)
z Gasket
8.8 (90, 78 in.·lbf)
Turbo Oil Outlet Pipe
z Gasket
13 (135, 10)
Turbo Oil Outlet Hose
56 (571, 41)
Exhaust Manifold Converter Sub-assy
Turbocharger Stay
Manifold Stay
61 (622, 45)
61 (622, 45)
Y
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
A62132


* Gasket
Timing Belt No. 2 Cover
Timing Chain Cover Plate
Seal Washer
Timing Belt
7.4 (76, 66 in.·lbf)
x 7
Transverse Engine
Engine Mounting Bracket
9.0 (92, 80 in.·lbf)
37 (375, 27)
72 (735, 53)
21 (214, 15)
Timing Belt
Tensioner
Idle w/ Bracket
Pulley Assy
* Gasket
39 (398, 29)
Timing Belt No.1 Cover
Timing Belt Guide
40 (408, 30)
x 5
Seal Washer
7.4 (76, 66 in.·lbf)
Crankshaft Pulley
Glow Plug
Screw Grommet
2.2 (22, 19 in.·lbf)
Glow Plug
No.1 Connector
180 (1,837, 133)
Idler Pulley
Sub-assy
Glow Plug Assy
Generator V Belt
N·m (kgf·cm, ft·lbf) : Specified torque
* Replace only if damaged
A61476


*31 (316, 23)
34 (347, 25)
5.0 (51, 44 in.·lbf)
Injection Pipe Clamp No.2
Injection Pipe Sub-assy
*37 (377, 27)
41 (418, 30)
Fuel Inlet Pipe
Sub-assy
7.4 (75, 65 in.·lbf)
*31 (316, 23)
34 (347, 25)
Common Rail Assy
*37 (377, 27)
41 (418, 30)
Ventilation Hose
21 (214, 15)
43 (438, 32)
21 (214, 15)
z O-Ring
Vacuum Pump Assy
Camshaft Timing Pulley
88 (900, 65)
Set Key
8.8 (90, 78 in.·lbf)
Crank Position
Sensor
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
* For use with SST
A62441


18 (184, 13)
z Gasket
22 (224, 16)
Nozzle Leakage Pipe Assy
27 (270, 20)
Washer
Injector Assy
z Gasket
Nozzle Holder Clamp
z Fuel Injector Back-Up Ring No.1
z O-Ring
z Injection Nozzle Seat
13 (133, 9.6)
z Nozzle Holder Seal
Cylinder Head Cover Sub-assy
z Nozzle Holder Gasket
Gasket
20 (204, 15)
20 (204, 15)
Camshaft Bearing Cap
Camshaft Sub-assy No.2
Camshaft Sub-assy No.1
See page 14-237
1st 45 (460, 33)
2nd Turn 90_
3rd Turn 90_
4th Turn 90_
x 18
Plate Washer
Camshaft Carrier
Cylinder Head Sub-assy
z Oil Seal
8.8 (90, 78 in.·lbf)
Cylinder Head Gasket
Camshaft Oil Seal Retainer
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
Y
A62442

140MX-01

REPLACEMENT

1. REMOVE FRONT WHEEL RH
2. REMOVE ENGINE UNDER COVER RH

3. DRAIN ENGINE COOLANT (See page 16-33)
4. DRAIN ENGINE OIL (See page 14-246)
5. REMOVE ENGINE COVER SUB-ASSY NO.1

6. DISCONNECT UNION TO CHECK VALVE HOSE

7. REMOVE AIR TUBE NO.2(W/O INTER COOLER) (See page 14-190)
8. REMOVE AIR TUBE NO.2(W/ INTER COOLER)

9. REMOVE AIR TUBE NO.1 (See page 13-8)
10. REMOVE INJECTOR DRIVER (See page 14-191)
11. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER) (See page 14-172)
12. REMOVE GENERATOR V BELT (See page 14-172)
13. REMOVE PULLEY ASSY, IDLE W/BRACKET(W/ AIR CONDITIONER) (See page 14-197)
14. REMOVE ENGINE MOUNTING INSULATOR SUB ASSY RH (See page 14-190)
15. REMOVE CRANKSHAFT PULLEY (See page 14-213)
    SST 09213-70010 (09213-70020), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021, 09954-05030)
16. REMOVE IDLER PULLEY SUB-ASSY

17. REMOVE TIMING BELT NO.2 COVER

18. REMOVE TIMING BELT NO.1 COVER

19. REMOVE TIMING BELT GUIDE

20. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

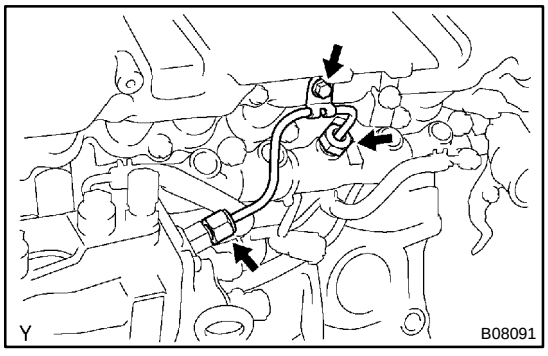
21. REMOVE SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-214)
22. REMOVE TIMING BELT (See page 14-215)

HINT:
If re-using the timing belt, draw a direction arrow on the timing belt (in direction of engine revolution), and place matchmarks on the pulleys and the timing belt.

23. REMOVE FLOOR PANEL BRACE FRONT

24. REMOVE EXHAUST PIPE ASSY FRONT

25. REMOVE BATTERY
26. REMOVE AIR CLEANER ASSY
27. DISCONNECT RADIATOR HOSE INLET
28. DISCONNECT HEATER INLET WATER HOSE
29. DISCONNECT HEATER OUTLET WATER HOSE
30. DISCONNECT FUEL PIPE TO FUEL TUBE FUEL HOSE
31. DISCONNECT OIL COOLER HOSE
32. REMOVE TURBO INSULATOR NO.2
33. REMOVE TURBO INSULATOR NO.1
34. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.2
35. REMOVE MANIFOLD CONVERTER SUB-ASSY
36. REMOVE TURBO OIL INLET PIPE
37. REMOVE TURBO OIL OUTLET PIPE
38. REMOVE TURBO OIL OUTLET PIPE NO.2
39. REMOVE TURBOCHARGER SUB-ASSY
(See page 13-9)
40. REMOVE CAMSHAFT TIMING PULLEY
(See page 14-224)
SST 09960-10010 (09962-01000, 09963-01000)



41. REMOVE FUEL INLET PIPE SUB-ASSY

(a) Remove the pipe clamp bolt from the intake manifold.
(b) Using SST, remove the fuel inlet pipe from the common rail side.
SST 09023-12900
(c) Using SST, remove the fuel inlet pipe from the pump side.
SST 09023-12700

NOTICE:
After removing the fuel pipe, affix the gum tape on the pump, the common rail, and the hole injector installation area of the cylinder head cover for preventing dust from coming into them.

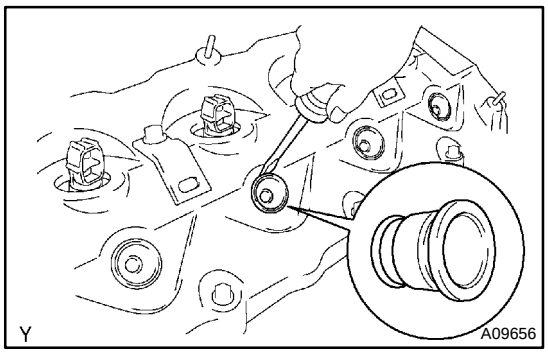
42. REMOVE INJECTION PIPE SUB-ASSY NO.1
(See page 11-64)
SST 09023-12700, 09023-12900

43. REMOVE INJECTION PIPE SUB-ASSY NO.2
(See page 11-64)
SST 09023-12700, 09023-12900

44. REMOVE INJECTION PIPE SUB-ASSY NO.3
(See page 11-64)
SST 09023-12700, 09023-12900

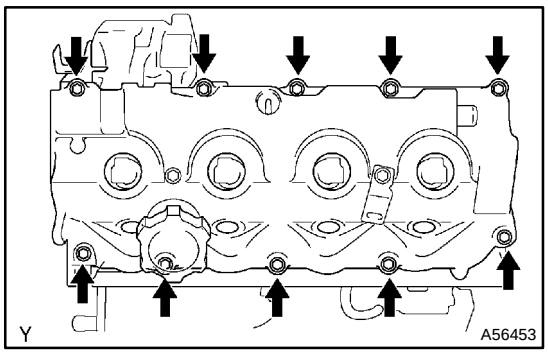
45. REMOVE INJECTION PIPE SUB-ASSY NO.4
(See page 11-64)
SST 09023-12700, 09023-12900

46. REMOVE VACUUM PUMP ASSY
(See page 14-225)



47. REMOVE CYLINDER HEAD COVER SUB-ASSY

(a) Using a screwdriver, pry out the 4 nozzle holder seals.



(b) Remove the 10 bolts, cylinder head cover and gasket.

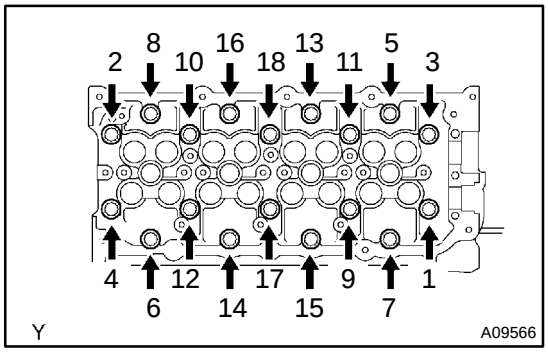
48. REMOVE NOZZLE LEAKAGE PIPE ASSY
(See page 11-65)

49. REMOVE INJECTOR ASSY
(See page 11-65)

50. REMOVE CAMSHAFT OIL SEAL RETAINER
(See page 14-226)

51. REMOVE NO.2 CAMSHAFT
(See page 14-226)

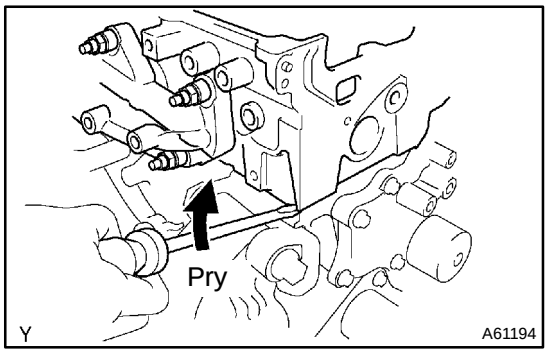
52. REMOVE CAMSHAFT
(See page 14-226)



53. REMOVE CYLINDER HEAD SUB-ASSY

(a) Uniformly loosen the 18 cylinder head bolts in several passes in the sequence shown. Remove the 18 cylinder head bolts and plate washers.

NOTICE:
Cylinder head warpage or cracking could result from removing bolts in incorrect order.

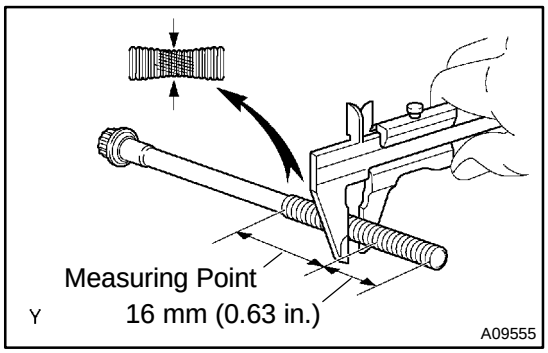


(b) Lift the cylinder head from the dowels on the cylinder block, and place the cylinder head on wooden blocks on a bench.

HINT:
If the cylinder head is lift off, pry between the cylinder head and cylinder block with a screwdriver.

NOTICE:
Be careful not to damage the contact surfaces of the cylinder head and cylinder block.

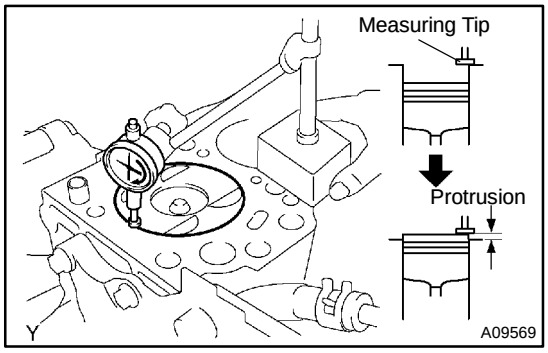
54. REMOVE CYLINDER HEAD GASKET



55. INSPECT CYLINDER HEAD SET BOLT

(a) Using vernier calipers, measure the tension portion diameter of the bolts.
Standard outside diameter:
10.75 - 11.00 mm (0.4232 - 0.4331 in.)
Minimum outside diameter: 10.40 mm (0.4904 in.)

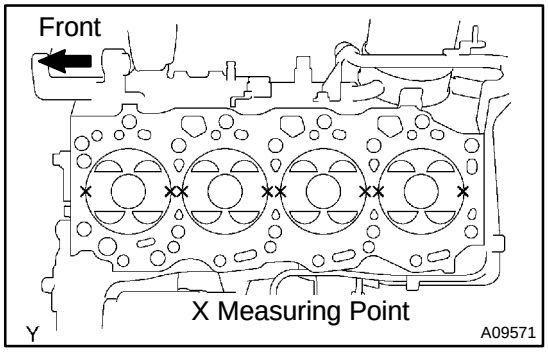
If the diameter is less than minimum, replace the bolt.



56. INSTALL CYLINDER HEAD GASKET

(a) Check piston protrusions for each cylinder.
(1) Clean the cylinder block with solvent.
(2) Set the piston of the cylinder to be measured to slightly before TDC.
(3) Place a dial indicator on the cylinder block, and set the dial indicator at 0 mm (0 in.).

HINT:
- Use a dial indicator measuring tip as shown in the illustration.
- Make sure that the measuring tip is square to the cylinder block gasket surface and piston head when taking the measurements.



(4) Find where the piston head protrudes the most by slowly turning the crankshaft clockwise and counterclockwise.

(5) Measure each cylinder at 2 places as shown in the illustration, marking a total of 8 measurements.

(6) For the piston protrusion valve of each cylinder, use the average of the 2 measurements of each cylinder.

Protrusion: 0.165 - 0.425 mm (0.0065 - 0.0168 in.)

(b) Select new cylinder head gasket.

HINT:

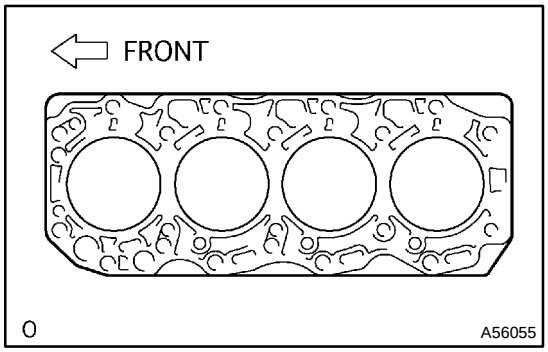
There are 5 sizes of new cylinder head gaskets, marked "A", "B", "C", "D", or "E" according.

New installed cylinder head gasket thickness:

A	0.85 - 0.95 mm (0.0335 - 0.0374 in.)
B	0.90 - 1.00 mm (0.0354 - 0.0394 in.)
C	0.95 - 1.05 mm (0.0374 - 0.0413 in.)
D	1.00 - 1.10 mm (0.0394 - 0.0433 in.)
E	1.05 - 1.15 mm (0.0413 - 0.0453 in.)

(1) Select the largest piston protrusion valve from the measurements made, then select a new appropriate gasket according to the table below.

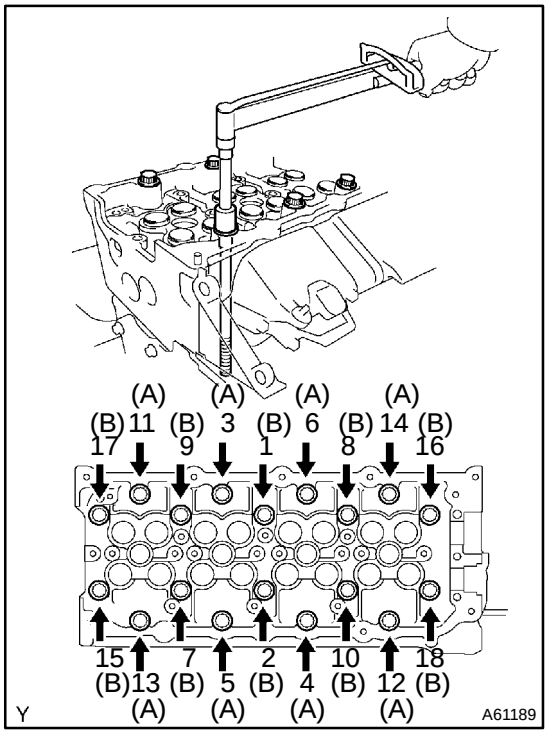
Piston protrusion mm (in.)	Gasket size
0.165 - 0.220 (0.0065 - 0.0087)	Use A
0.220 - 0.270 (0.0087 - 0.0106)	Use B
0.270 - 0.320 (0.0106 - 0.0126)	Use C
0.320 - 0.370 (0.0126 - 0.0146)	Use D
0.370 - 0.425 (0.0146 - 0.0167)	Use E



(c) Place new cylinder head gasket in position on the cylinder block.

NOTICE:

Be careful of the installation direction.



57. INSTALL CYLINDER HEAD SUB-ASSY

HINT:

- The cylinder head bolts are tightened in 4 progressive steps (steps (c), (e), (f) and (g)).
- If any cylinder head bolt is broken or deformed, replace it.

(a) Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts and plate washers.

(b) Install the plate washer to the cylinder head bolt.

(c) Install and uniformly tighten the 18 cylinder head bolts and plate washers in several passes in the sequence shown.

Torque: 45 N·m (460 kgf·cm, 33 ft·lbf)

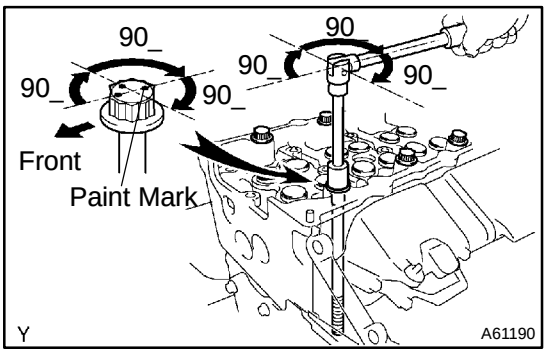
HINT:

Each bolt length is indicated in the illustration.

Bolt length:

(A)	160mm (6.30 in.)
(B)	104mm (4.09 in.)

If any of the cylinder head bolt does not meet the torque specification, replace the cylinder head bolt.



(d) Mark the front of the cylinder head bolt with paint.

(e) Retighten the cylinder head bolts by 90_ in the numerical order shown first.

(f) Retighten the cylinder head bolts by 90_ in the numerical order shown secondary.

(g) Retighten the cylinder head bolts by additional 90_ in the numerical order shown third.

(h) Check that the painted mark is at the intake manifold side now.

58. INSTALL CAMSHAFT
(See page 14-227)

59. INSTALL NO.2 CAMSHAFT
(See page 14-227)

60. REMOVE CAMSHAFT OIL SEAL
(See page 14-226)

61. INSTALL CAMSHAFT OIL SEAL
(See page 14-226)
SST 09223-46011

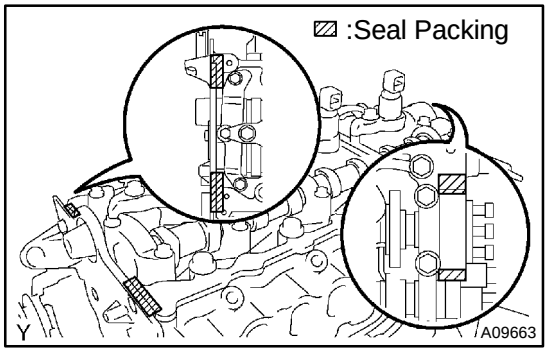
62. INSTALL CAMSHAFT OIL SEAL RETAINER
(See page 14-228)

63. INSTALL INJECTOR ASSY
(See page 11-65)

64. INSTALL NOZZLE LEAKAGE PIPE ASSY

(See page 11-67)

SST 09992-00242



65. INSTALL CYLINDER HEAD COVER SUB-ASSY

(a) Remove any old packing (FIPG) material.
(b) Apply seal packing to the cylinder head.
Seal packing: Part No. 08826-00080 or equivalent
(c) Install the gasket to the head cover.
(d) Install the cylinder head cover with 10 bolts.
Torque: 13 N·m (133 kgf·cm, 9.6 ft·lbf)
(e) Install 4 new nozzle holder seals.

66. INSTALL VACUUM PUMP ASSY

(See page 14-229)

67. INSTALL INJECTION PIPE SUB-ASSY NO.1

(See page 11-64)

SST 09023-12700, 09023-12900

NOTICE:
When removing the injection pipe, clean up with a brush and compressed air.

68. INSTALL INJECTION PIPE SUB-ASSY NO.2

(See page 11-64)

SST 09023-12700, 09023-12900

NOTICE:
When removing the injection pipe, clean up with a brush and compressed air.

69. INSTALL INJECTION PIPE SUB-ASSY NO.3

(See page 11-64)

SST 09023-12700, 09023-12900

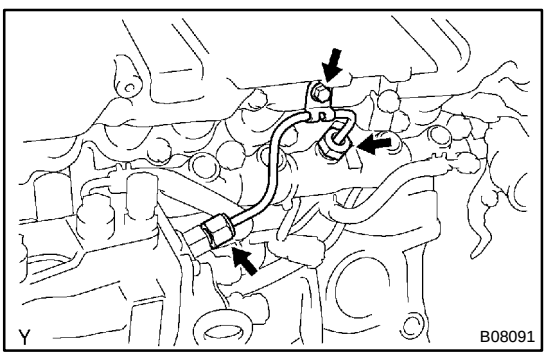
NOTICE:
When removing the injection pipe, clean up with a brush and compressed air.

70. INSTALL INJECTION PIPE SUB-ASSY NO.4

(See page 11-64)

SST 09023-12700, 09023-12900

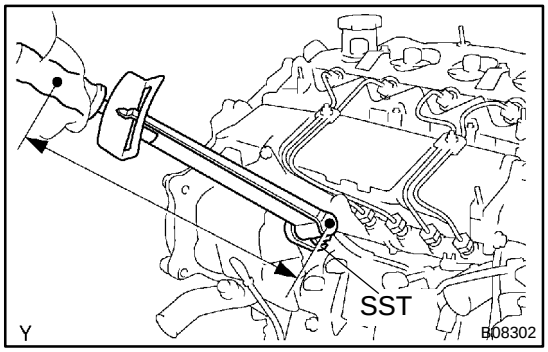
NOTICE:
When removing the injection pipe, clean up with a brush and compressed air.



71. INSTALL FUEL INLET PIPE SUB-ASSY

(a) Temporarily tighten the new inlet pipe and pipe clamp bolt.

NOTICE:
In case of having the cylinder head gasket replaced, must replace fuel inlet pipe, too.



(b) Using SST, tighten the inlet pipe to the common rail side.
SST 09023-12900
Torque:
37 N·m (377 kgf·cm, 27 ft·lbf) for use with SST
41 N·m (418 kgf·cm, 30 ft·lbf)
HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

(c) Using SST, tighten the inlet pipe to the pump side.
SST 09023-12700
Torque:
31 N·m (316 kgf·cm, 23 ft.·lbf) for use with SST
34 N·m (347 kgf·cm, 25 ft.·lbf)
HINT:
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

(d) Tighten the pipe clamp bolt.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

72. INSTALL CAMSHAFT TIMING PULLEY
(See page 14-229)
SST 09960-10010 (09962-01000, 09963-01000)

73. INSTALL TURBOCHARGER SUB-ASSY
(See page 13-9)

74. INSTALL TURBO OIL OUTLET PIPE NO.2

75. INSTALL TURBO OIL OUTLET PIPE
(See page 13-9)

76. INSTALL TURBO OIL INLET PIPE
(See page 13-9)

77. INSTALL MANIFOLD CONVERTER SUB-ASSY
(See page 13-8)

78. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.2
(See page 13-10)

79. INSTALL TURBO INSULATOR NO.1
(See page 13-10)

80. INSTALL TURBO INSULATOR NO.2
(See page 13-10)

81. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-8)

82. INSTALL FLOOR PANEL BRACE FRONT

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

83. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-215)
SST 09960-10010 (09962-01000, 09963-01000)

84. INSTALL TIMING BELT
(See page 14-215)

85. CHECK VALVE TIMING (See page 14-216)

86. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
(See page 14-217)

87. INSTALL TIMING BELT GUIDE
(See page 14-217)

88. INSTALL TIMING BELT NO.1 COVER
(See page 14-217)
89. INSTALL TIMING BELT NO.2 COVER
(See page 14-218)
90. INSTALL IDLER PULLEY SUB-ASSY
(See page 14-218)
91. INSTALL CRANKSHAFT PULLEY
(See page 14-219)
SST 09213-70010 (09213-70020), 09330-00021
92. INSTALL ENGINE MOUNTING INSULATOR SUB ASSY RH (See page 14-219)
93. INSTALL PULLEY ASSY, IDLE W/BRACKET(W/ AIR CONDITIONER) (See page 14-219)
94. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)
(See page 14-172)
95. INSTALL INJECTOR DRIVER
(See page 14-209)
96. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
97. INSTALL AIR TUBE NO.1
(See page 13-10)
98. INSTALL AIR TUBE NO.2(W/O INTER COOLER)
(See page 14-209)
99. INSTALL AIR TUBE NO.2(W/ INTER COOLER)
(See page 14-210)
100. INSTALL ENGINE COVER SUB-ASSY NO.1

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
101. ADD ENGINE OIL
102. ADD COOLANT (See page 16-33)
103. CHECK FUEL LEAK
104. CHECK ENGINE OIL LEAK
105. CHECK ENGINE COOLANT LEAK (See page 16-34)
106. CHECK EXHAUST GAS LEAK

CRANKSHAFT SEAL (1CD-FTV)

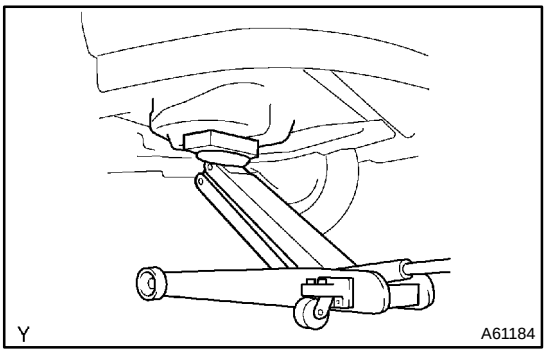
140MZ-01

REPLACEMENT

1. **DRAIN ENGINE OIL**

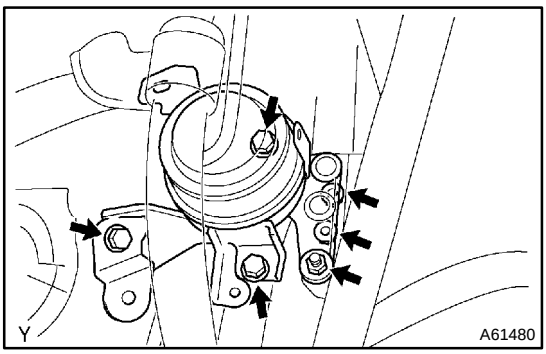
(a) Install a new gasket and the drain plug after draining engine oil.
Torque: 25 N·m (250 kgf·cm, 8 ft·lbf)

2. **REMOVE FRONT WHEEL RH**
3. **REMOVE ENGINE UNDER COVER RH**
4. **REMOVE ENGINE COVER SUB-ASSY NO.1**
5. **REMOVE INJECTOR DRIVER**
(See page 14-191)
6. **REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)**
(See page 14-172)
7. **REMOVE GENERATOR V BELT**
(See page 14-172)
8. **REMOVE PULLEY ASSY, IDLE W/BRACKET(W/ AIR CONDITIONER)** (See page 14-197)



9. **REMOVE ENGINE MOUNTING INSULATOR SUB ASSY RH**

(a) Place a wooden block between the jack and engine, and set the jack.



(b) Remove the 3 bolts, 3 nuts and engine mounting insulator sub assy.

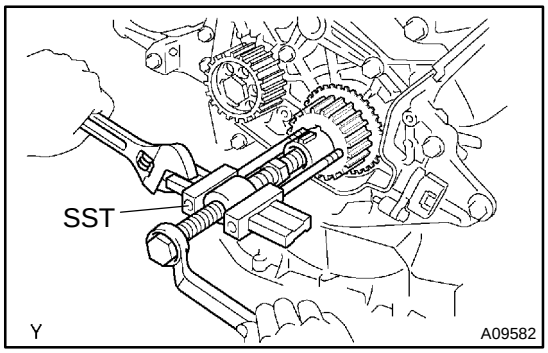
10. **REMOVE CRANKSHAFT PULLEY**
(See page 14-213)
SST 09213-70010 (09213-70020), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021, 09954-05030)
11. **REMOVE IDLER PULLEY SUB-ASSY**
Remove idler pulley set bolt and idler pulley.

(a) **REMOVE TIMING BELT NO.2 COVER**

12. (See page 14-214)

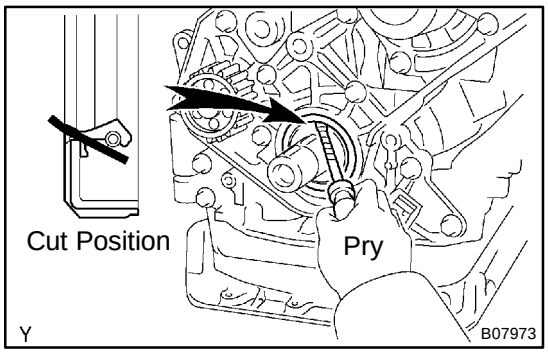
13. REMOVE TIMING BELT NO.1 COVER
(See page 14-214)
14. REMOVE TIMING BELT GUIDE

15. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
(See page 14-214)
16. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-214)
17. REMOVE TIMING BELT
(See page 14-215)



18. REMOVE CRANKSHAFT TIMING PULLEY

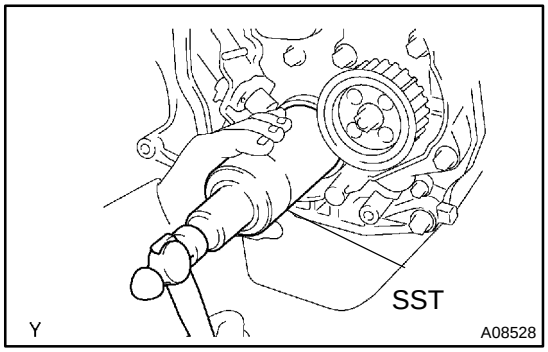
(a) If the pulley cannot be removed by hand, use SST to remove the timing pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021)



19. REMOVE CRANKSHAFT SEAL

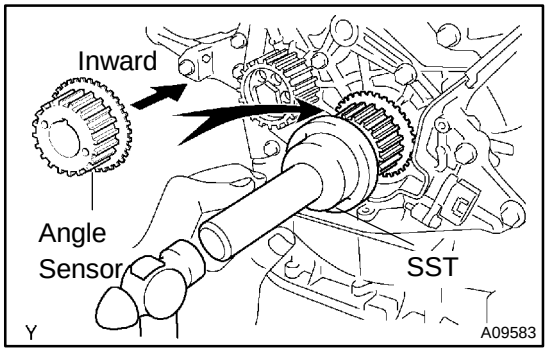
(a) Using a knife, cut off the oil seal lip.
(b) Using a screw drive, pry out the oil seal.

NOTICE:
Be careful not to damage the crankshaft. Tape the screwdriver tip.



20. INSTALL CRANKSHAFT SEAL

(a) Using SST and a hammer, tap in the oil seal until its surface is flush with the oil pump edge.
SST 09316-60011 (09316-00011)



21. INSTALL CRANKSHAFT TIMING PULLEY

(a) Align the pulley set key with the key groove of the timing pulley.
(b) Using SST and a hammer, tap in the timing pulley, facing the angle sensor inward.
SST 09223-46011

22. SET NO.1 CYLINDER TO TDC/COMPRESSION **(See page 14-214)**
SST 09960-10010 (09962-01000, 09963-01000)

23. INSTALL TIMING BELT
(See page 14-215)

24. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
(See page 14-217)

25. INSTALL TIMING BELT GUIDE
(See page 14-217)

26. INSTALL TIMING BELT NO.1 COVER
(See page 14-217)

27. INSTALL TIMING BELT NO.2 COVER
(See page 14-218)

28. INSTALL IDLER PULLEY SUB-ASSY
(See page 14-218)

(a) Install idler pulley set bolt and idler pulley.
Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)

29. INSTALL CRANKSHAFT PULLEY
(See page 14-219)
SST 09213-70010 (09213-70020), 09330-00021

30. INSTALL ENGINE MOUNTING INSULATOR SUB ASSY RH **(See page 14-219)**

31. INSTALL PULLEY ASSY, IDLE W/BRACKET(W/ AIR CONDITIONER) **(See page 14-200)**

32. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1(W/ AIR CONDITIONER)
(See page 14-172)

33. INSTALL INJECTOR DRIVER
(See page 14-209)

34. INSTALL ENGINE COVER SUB-ASSY NO.1
(See page 14-176)

35. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

36. ADD ENGINE OIL

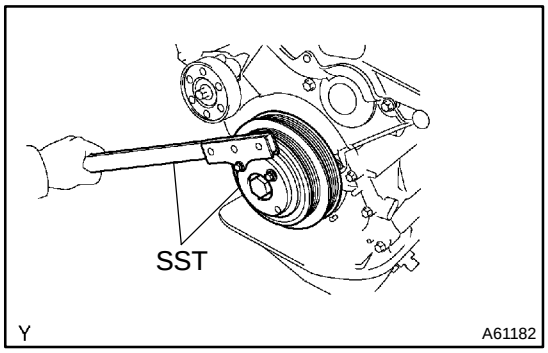
37. CHECK ENGINE OIL LEAK

ENGINE REAR OIL SEAL (1CD-FTV)

140N0-01

REPLACEMENT

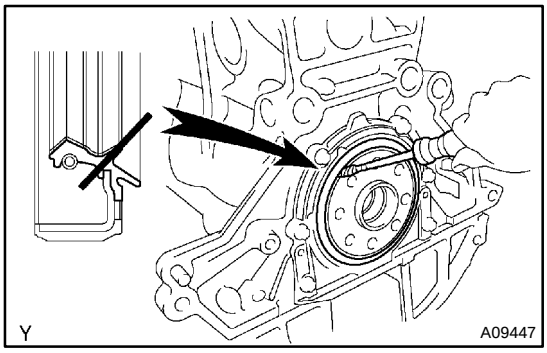
1. REMOVE MANUAL TRANSAXLE ASSY
(See page 41-36)
SST 09930-00010, 09628-62011, 09520-01010, 09520-24010 (09520-32040)
2. REMOVE CLUTCH COVER ASSY
(See page 42-29)
3. REMOVE CLUTCH DISC ASSY
(See page 42-30)



4. REMOVE FLYWHEEL SUB-ASSY

(a) Fix the crankshaft with SST, then remove the flywheel.
SST 09213-70010 (09213-70020), 09330-00021

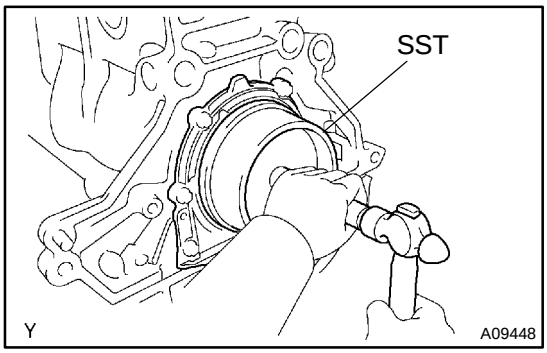
5. REMOVE REAR END PLATE



6. REMOVE ENGINE REAR OIL SEAL

(a) Using a knife, cut off the oil seal lip.
(b) Using a screwdriver, pry out the oil seal.

NOTICE:
After the removal, check if the crankshaft is not damaged. If there is, mend it with a sandpaper (#400).



7. INSTALL ENGINE REAR OIL SEAL

(a) Apply MP grease to a new oil seal lip.

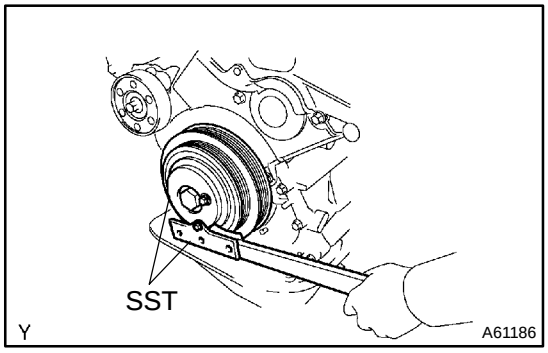
NOTICE:
Keep the lip off foreign materials.

(b) Using SST and a hammer, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.
SST 09223-15030, 09950-70010 (09951-07100)

NOTICE:
Wipe off extra grease on the crankshaft.

8. INSTALL REAR END PLATE

Torque: 8.4 N·m (86 kgf·cm, 74 in.·lbf)

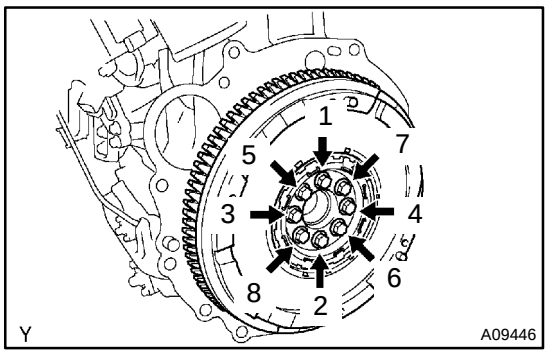


9. INSTALL FLYWHEEL SUB-ASSY

(a) Fix the crankshaft with SST.
SST 09213-70010 (09213-70020), 09330-00021

(b) Clean the bolt and the bolt hole.

(c) Apply Adhesive to the bolts.
Adhesive:
Part No. 08833-00070, THREE BOND or equivalent



(d) Install and uniformly tighten the 8 bolts in several passes as the sequence shown.
Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

10. INSTALL CLUTCH DISC ASSY
(See page 42-31)
SST 09301-00220

11. INSTALL CLUTCH COVER ASSY
(See page 42-31)

12. INSTALL MANUAL TRANSAXLE ASSY
(See page 41-33)
SST 09670-00010

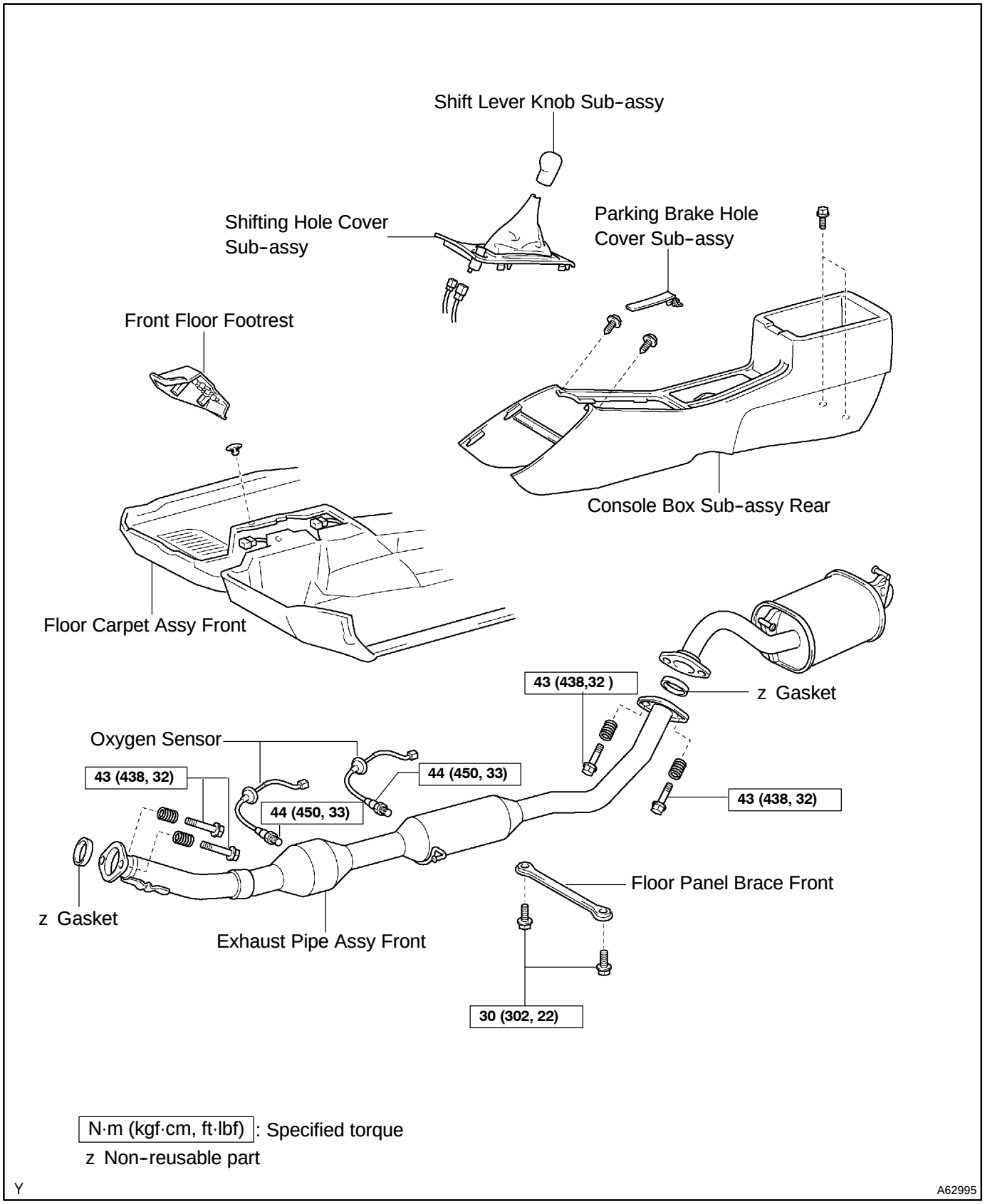
EXHAUST

EXHAUST PIPE (2ZZ-GE) 15-1
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Removal & Installation
and Disassembly & Reassembly 15-2/3
EXHAUST PIPE (3ZZ-FE/4ZZ-FE) 15-4
COMPONENTS 15-4
Removal & Installation
and Disassembly & Reassembly 15-5/6
EXHAUST PIPE (1CD-FTV) 15-7
COMPONENTS 15-7
Removal & Installation
and Disassembly & Reassembly 15-8

EXHAUST PIPE (2ZZ-GE)

COMPONENTS

1503T-01



15003-03

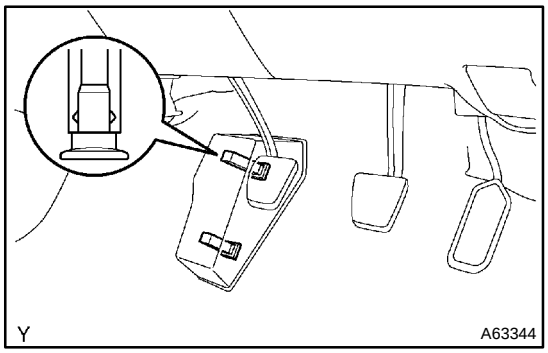
Removal & Installation and Disassembly & Reassembly

1. REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY

2. REMOVE SHIFTING HOLE COVER SUB-ASSY

3. REMOVE PARKING BRAKE HOLE COVER SUB-ASSY

4. REMOVE CONSOLE BOX SUB-ASSY REAR



5. REMOVE FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)

6. REMOVE FLOOR CARPET ASSY FRONT

(a) Using the clip remover, remove the clip and front floor carpet.

7. REMOVE OXYGEN SENSOR

(a) Disconnect the 2 oxygen sensor connectors.
(b) Remove the 2 oxygen sensors.

8. REMOVE FLOOR PANEL BRACE FRONT

(a) Remove the 2 bolts and the floor panel brace front.

9. REMOVE TAIL PIPE ASSY

(a) Remove the 2 bolts, 2 compression springs and tall pipe assy.

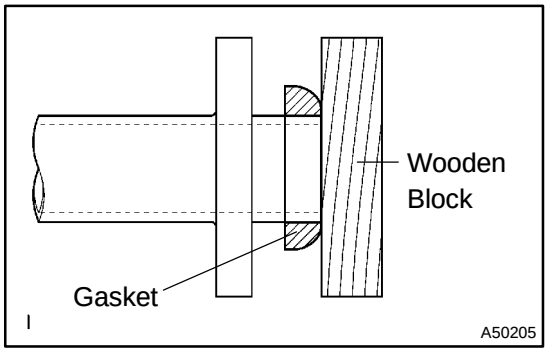
10. REMOVE EXHAUST PIPE ASSY FRONT

(a) Remove the 2 bolt, 2 compression springs and exhaust pipe assy front.

11. INSTALL EXHAUST PIPE ASSY FRONT

(a) Using vernier calipers, measure the free length of the compression spring.
Free length: 44 mm (1.7322 in.)

HINT:
If the free length is not as specified, replace the compression spring.



(b) Using a hammer and a wooden block, tap in a new gasket until its surface is flush with the exhaust manifold.

NOTICE:

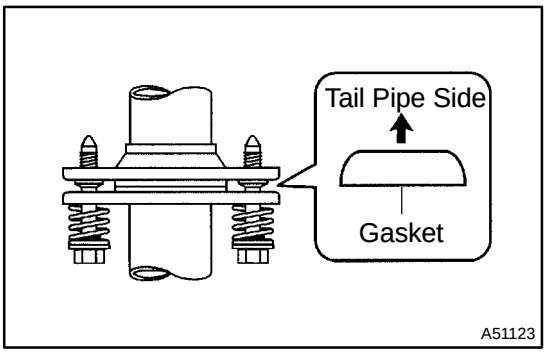
- **Tap in the gasket in the correct direction.**
- **Do not reuse the removed gasket.**
- **Be sure not to push in the gasket by installing the exhaust pipe.**

HINT:

The exhaust pipe gasket can be reused if it is not damaged.

(c) Install the exhaust pipe.

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)



12. INSTALL TAIL PIPE ASSY

(a) Using vernier calipers, measure the free length of the compression spring.

Free length: 40 mm (1.5748 in.)

HINT:

If the free length is not as specified, replace the compression spring.

(b) Using a new gasket, install tail pipe to front pipe.

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

13. INSTALL FLOOR PANEL BRACE FRONT

Torque: 30 N·m (302 kgf·cm, 22 ft·lbf)

14. INSTALL OXYGEN SENSOR

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

15. INSTALL FLOOR CARPET ASSY FRONT

16. INSTALL FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)

17. INSTALL CONSOLE BOX SUB-ASSY REAR

18. INSTALL PARKING BRAKE HOLE COVER SUB-ASSY

19. INSTALL SHIFTING HOLE COVER SUB-ASSY

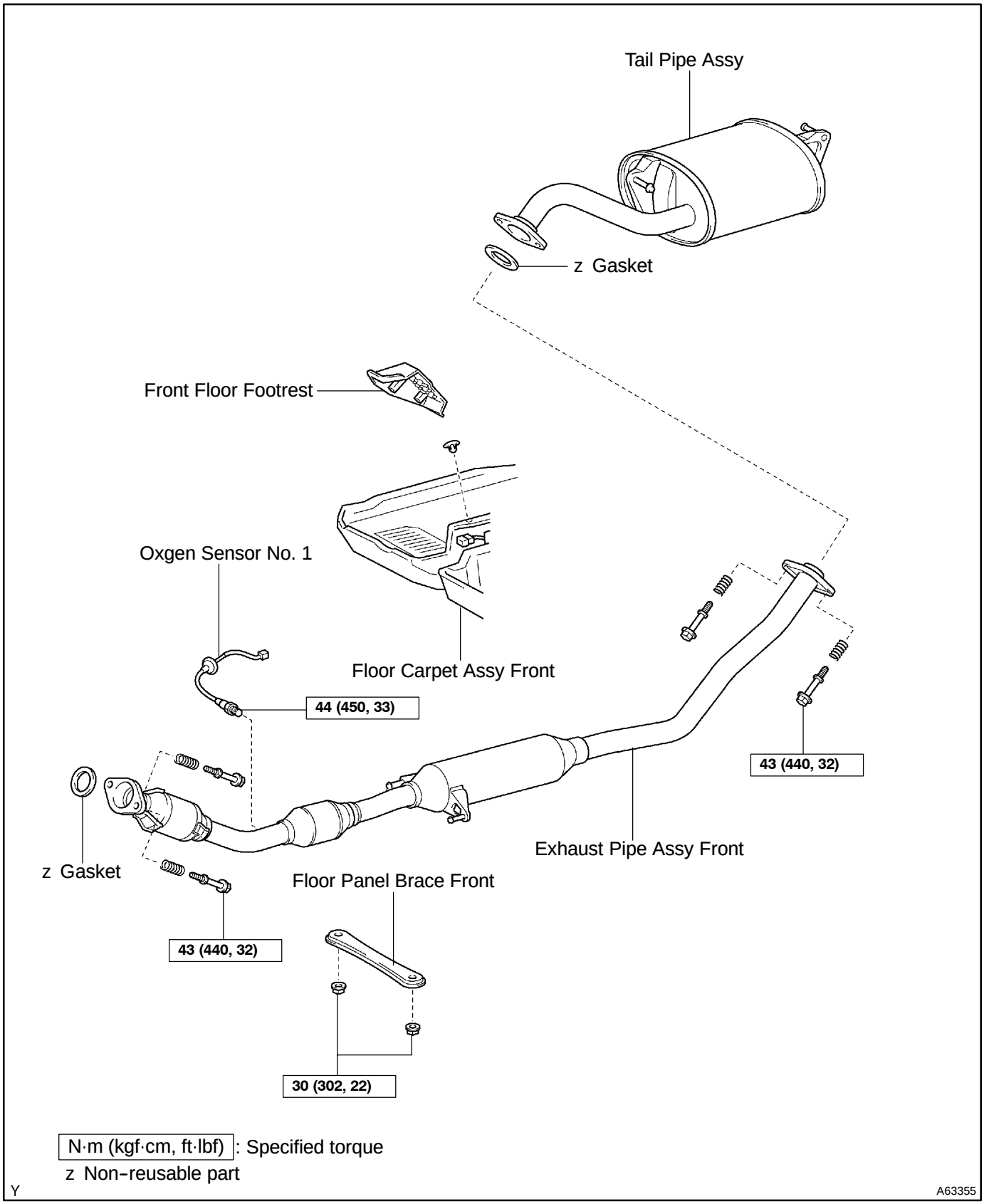
20. INSTALL FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY

21. CHECK EXHAUST GAS LEAK

EXHAUST PIPE (3ZZ-FE/4ZZ-FE)

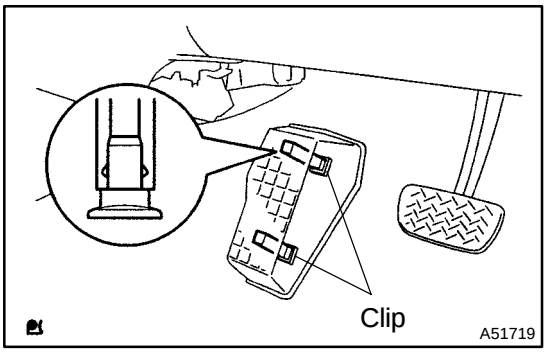
COMPONENTS

1503U-01



1503V-01

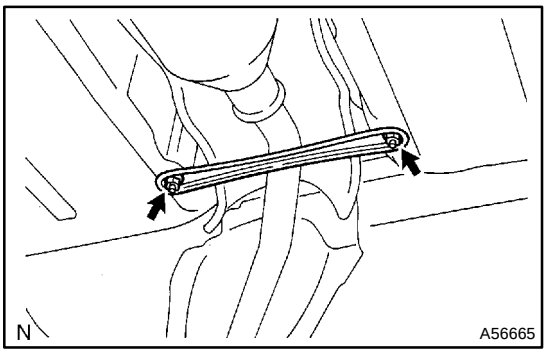
Removal & Installation and Disassembly & Reassembly



1. REMOVE FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)

2. REMOVE OXYGEN SENSOR

(a) Remove the floor carpet, and disconnect the oxygen sensor connector.
(b) Remove the oxygen sensor.



3. REMOVE FLOOR PANEL BRACE FRONT

(a) Remove the 2 bolts and the floor panel brace front.

4. REMOVE TAIL PIPE ASSY

(a) Remove the 2 bolts, 2 compression springs and tail pipe assy.

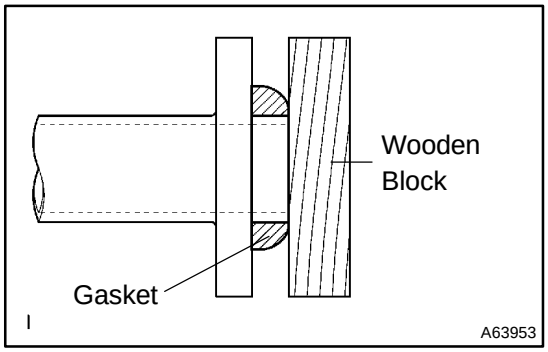
5. REMOVE EXHAUST PIPE ASSY FRONT

(a) Remove the 2 bolts, 2 compression springs and exhaust pipe assy front.

6. INSTALL EXHAUST PIPE ASSY FRONT

(a) Using vernier calipers, measure the free length of the compression spring.
Free length: 44 mm (1.7322 in.)

HINT:
If the free length is not as specified, replace the compression spring.



(b) Using a hammer and a wooden block, tap in a new gasket until its surface is flush with the exhaust manifold.

NOTICE:

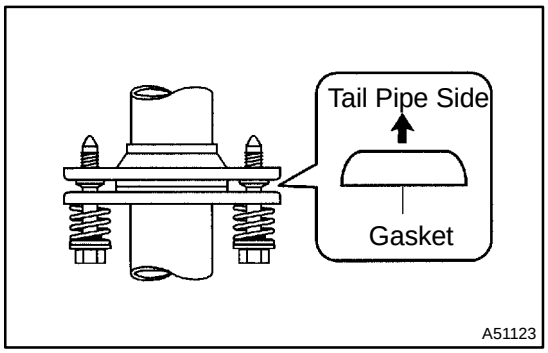
- **Tap in the gasket in the correct direction.**
- **Do not reuse the removed gasket.**
- **Be sure not to push in the gasket by installing the exhaust pipe.**

HINT:

The exhaust pipe gasket can be reused if it is not damaged.

(c) Install the front exhaust pipe assy front.

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)



7. INSTALL TAIL PIPE ASSY

(a) Using vernier calipers, measure the free length of the compression spring.

Free length: 40 mm (1.5748 in.)

HINT:

If the free length is not as specified, replace the compression spring.

(b) Using a new gasket, install tail pipe to front pipe.

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

8. INSTALL FLOOR PANEL BRACE FRONT

Torque: 30 N·m (302 kgf·cm, 22 ft·lbf)

9. INSTALL OXYGEN SENSOR

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

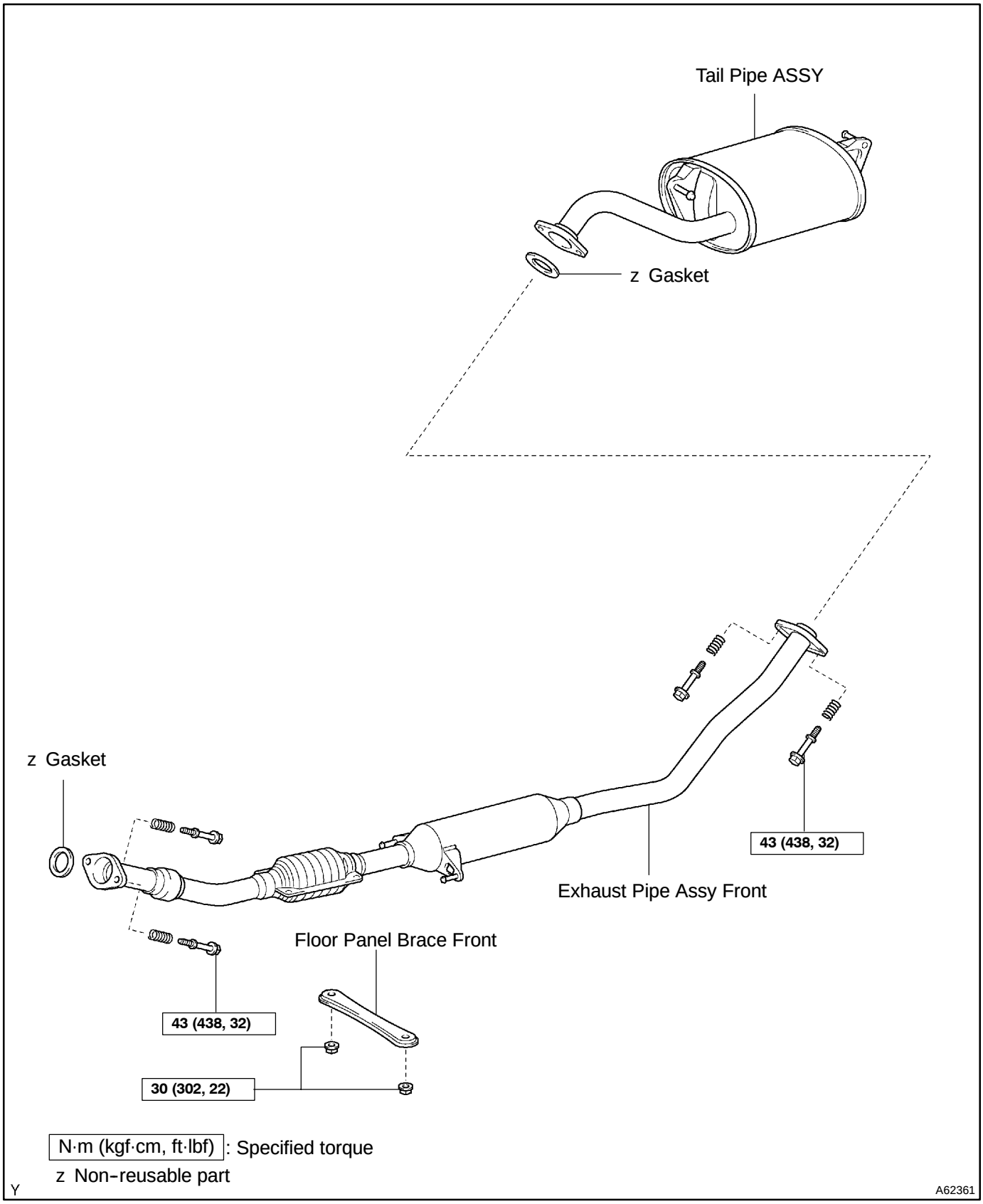
10. INSTALL FRONT FLOOR FOOTREST(RHD STEERING POSITION TYPE)

11. CHECK EXHAUST GAS LEAK

EXHAUST PIPE (1CD-FTV)

COMPONENTS

1503W-01



1503X-01

Removal & Installation and Disassembly & Reassembly

1. REMOVE FLOOR PANEL BRACE FRONT

(a) Remove the 2 bolts and the floor panel brace front.

2. REMOVE TAIL PIPE ASSY

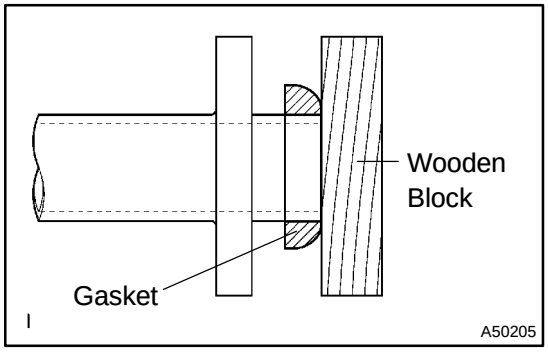
(a) Remove the 2 bolts, 2 compression springs and exhaust pipe assy front.

3. REMOVE EXHAUST PIPE ASSY FRONT

(a) Remove the 2 bolt, 2 compression springs and exhaust pipe assy front.

4. INSTALL EXHAUST PIPE ASSY FRONT

(a) Using vernier calipers, measure the free length of the compression spring.
Free length: 44 mm (1.7323 in.)
If the free length is not as specified, replace the compression spring.

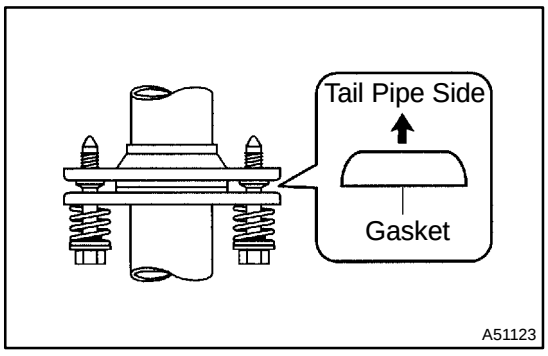


(b) Using a hammer and a wooden block, tap in a new gasket until its surface is flush with the exhaust manifold.

NOTICE:
- **Tap in the gasket in the correct direction.**
- **Do not reuse the removed gasket.**
- **Be sure not to push in the gasket by installing the exhaust pipe.**

HINT:
The exhaust pipe gasket can be reused if it is not damaged.

(c) Install the exhaust pipe assy front.
Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)



5. INSTALL TAIL PIPE ASSY

(a) Using vernier calipers, measure the free length of the compression spring.
Free length: 40 mm (1.5748 in.)

HINT:
If the free length is not as specified, replace the compression spring.

(b) Using a new gasket, install tail pipe to front pipe.
Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

6. INSTALL FLOOR PANEL BRACE FRONT

Torque: 30 N·m (302 kgf·cm, 22 ft·lbf)

7. CHECK EXHAUST LEAKAGE

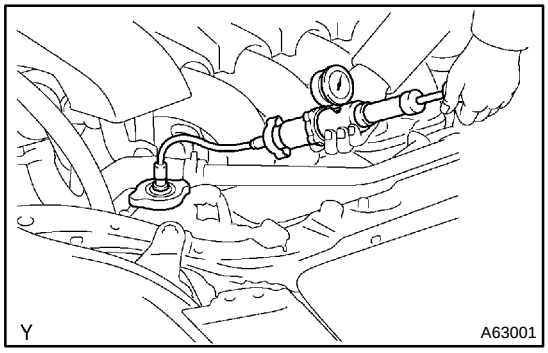
COOLING

COOLING SYSTEM (2ZZ-GE) 16-1
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COOLING SYSTEM (2ZZ-GE)

1600T-05

ON-VEHICLE INSPECTION



1. INSPECT COOLING SYSTEM FOR LEAKS

CAUTION:

To avoid the danger of being burned, do no remove the reservoir cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

(a) Remove the radiator support opening cover.

(b) Fill the radiator with coolant and attach a radiator cap tester.

(c) Warm up the engine.

(d) Pump it to 118 kPa (1.2 kgf/cm^2, 17.1 psi), and check that the pressure does not drop.

HINT:

If the pressure drops, check to hoses, radiator or water pump for leaks. If no external leaks are found, check the heater core, cylinder block and head.

2. CHECK ENGINE COOLANT LEVEL AT RESERVOIR

(a) The engine coolant level should be between the ”LOW” and ”FULL” line.

HINT:

If low, check for leaks and add ”Toyota Long Life Coolant” or equivalent up to the ”FULL” line.

3. CHECK ENGINE COOLANT QUALITY

(a) Remove the radiator cap.

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

(b) Check if there is any excessive deposits of rust or scale around the radiator cap and radiator filler hole; the coolant should be free from oil.

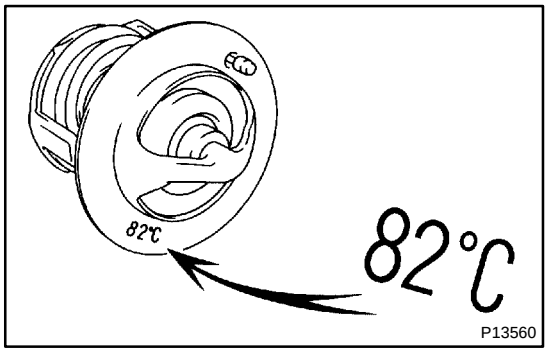
HINT:

If excessively dirty, replace the coolant.

(c) Reinstall the radiator cap.

1600U-05

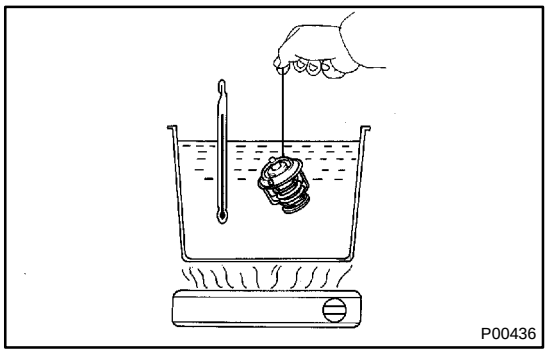
INSPECTION



P13560

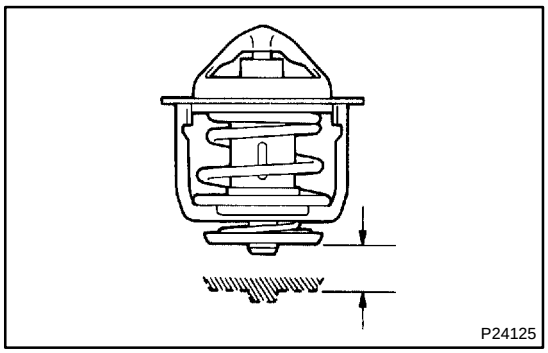
1. THERMOSTAT

HINT:
The thermostat is numbered with the valve opening temperature.


P00436

(a) Immerse the thermostat in water an gradually heat the water.
(b) Check the valve opening temperature.
Valve opening temperature: 80 - 84_C (176 - 183_F)

HINT:
If the valve opening temperature is not as specified, replace the thermostat.


P24125

(c) Check the valve lift.
Valve lift: 10 mm (0.39 in) or more at 90_C (194_F)

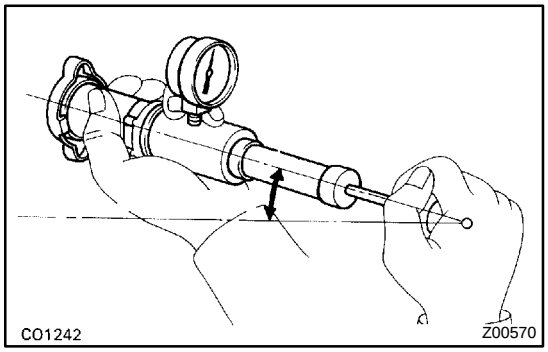
HINT:
If the valve lift is not as specified, replace the thermostat.
(d) Check that the valve is fully closed when the thermostat is at low temperatures (below 77_C (171_F)).

HINT:
If not closed, replace the thermostat.

2. RADIATOR CAP SUB-ASSY

NOTICE:

- **If the reservoir cap has contaminations, always rinse it with water.**
- **Before using a radiator cap tester, wet the relief valve and pressure valve with engine coolant or water.**



(a) Using a radiator cap tester, slowly pump the tester and check that air is coming from the vacuum valve.
Pump speed: 1 push / (3 seconds or more)

NOTICE:
Push the pump at a constant speed.

HINT:

- Pump speed: 1 push / (3 seconds or more)
- If air is not coming from the vacuum valve, replace the reservoir cap.

(b) Pump the tester and measure the relief valve opening pressure.
Standard opening pressure:
74 - 103 kPa (0.75 - 1.05 kgf/cm^2, 10.7 - 14.9 psi)
Minimum opening pressure:
59 kPa (0.6 kgf/cm^2, 8.5 psi)

NOTICE:
This pump speed is for the first pump only (in order to close the vacuum valve). After this, the pump speed can be reduced.

HINT:

- Pump speed: 1 push within 1 second
- Use the tester's maximum reading as the opening pressure.
- If the opening pressure is less than minimum, replace the reservoir cap.

COOLING FAN SYSTEM (2ZZ-GE)

1600R-05

ON-VEHICLE INSPECTION

1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE (Below 83_C (181_F))

(a) Turn the ignition switch ON.

(b) Check that the cooling fan stops.

HINT:

If not, check the cooling fan relay and water temperature sensor, and check for separated connector or severed wire between the cooling fan relay and water temperature sensor.

(c) Disconnect the water temperature sensor connector.

(d) Check that the cooling fan rotates.

If not, check the fuses, cooling fan relay, engine ECM and cooling fan, and check for a short circuit between the cooling fan relay and water temperature sensor.

(e) Reconnect the water temperature sensor connector.

2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE (Above 93_C (199_F))

(a) Start the engine, and raise coolant temperature to above 93_C (199_F).

HINT:

Coolant temperature is the detected value by the water temperature sensor on the water outlet.

(b) Check that the cooling fan rotates.

HINT:

If not, replace the water temperature sensor.

3. INSPECT COOLING FAN

(a) Disconnect the cooling fan connector.

(b) Connect battery and ammeter to the connector.

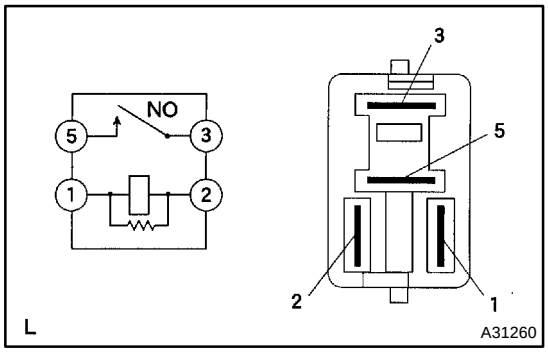
(c) Check that the cooling fan rotates smoothly, and check the reading on the ammeter.

Standard amperage: 8 - 12 A

(d) Reconnect the cooling fan connector.

1600S-04

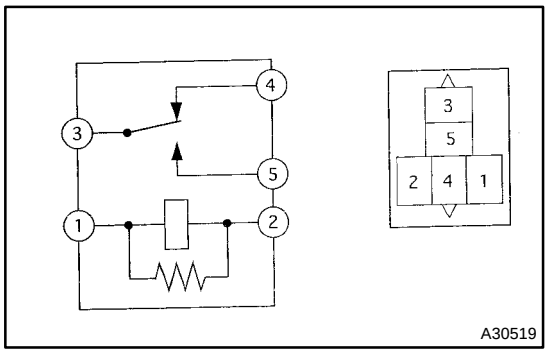
INSPECTION



1. COOLING FAN RELAY

Specified condition:

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2	3 - 5	Continuity



2. COOLING FAN RELAY NO.3

Specified condition:

Condition	Tester connection	Specified condition
Constant	1 - 2 3 - 4	Continuity
Apply B+ between terminals 1 and 2	2 - 5	Continuity

3. COOLING FAN RESISTOR

(a) Using an ohmmeter, measure the resistance between the terminals.
Resistance: 1.17 - 1.43 Ω at 20 _C (68 _F)

COOLANT (2ZZ-GE)

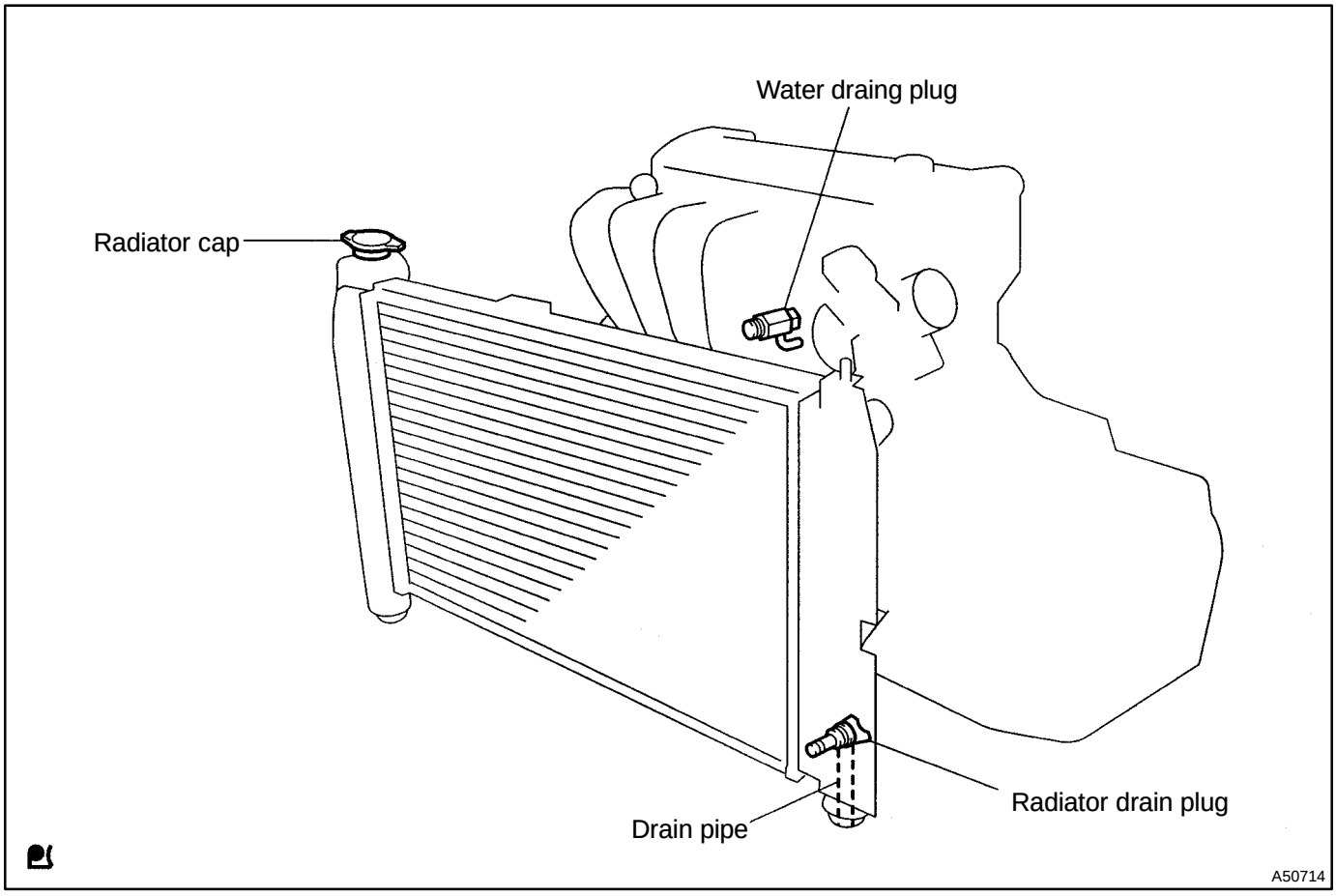
REPLACEMENT

1600V-05

1. DRAIN COOLANT

CAUTION:
To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

(a) Remove radiator support opening cover.
(b) Remove the radiator cap.
(c) Loosen the radiator drain plug and drain the coolant.



2. ADD COOLANT

(a) Tighten the radiator drain plug, and pour coolant into radiator until it overflows.
Capacity: 6.7 liters (7.1 US qts, 5.9 Imp. qts)

HINT:
- Press the radiator inlet and outlet hose several times with hard.
- If the coolant level gets lower, pour coolant.

(b) Tighten the radiator cap.
(c) Pour engine coolant into the reservoir tank until it reaches full line.
(d) Warm up the engine until the thermostat valve begins to open.

HINT:
Press the radiator inlet and outlet hose several times with hard during the warming up.

(e) Stop the engine and wait until the coolant temp. gets cold. Then remove the radiator cap to check the coolant level.
(f) If the level gets lower, perform the procedures above again.

(g) If the level does not gets lower, adjust the reservoir tank coolant level.

3. INSPECT CHECK ENGINE COOLANT LEAK

(a) Fill the radiator with coolant and attach a radiator cap tester.

(b) Pump it to 118 kPa (1.2 kgf/cm^2, 17.1 psi) and check leakage.

WATER PUMP ASSY (2ZZ-GE)

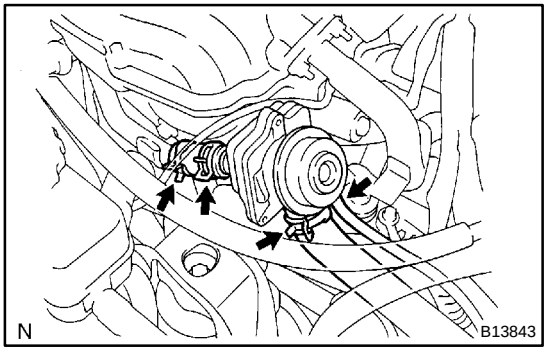
160B5-01

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH

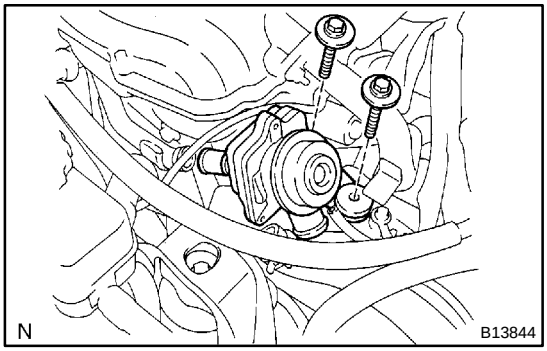
2. REMOVE RADIATOR SUPPORT OPENING COVER

3. DRAIN COOLANT (See page 16-6)
4. REMOVE CYLINDER HEAD COVER NO.2

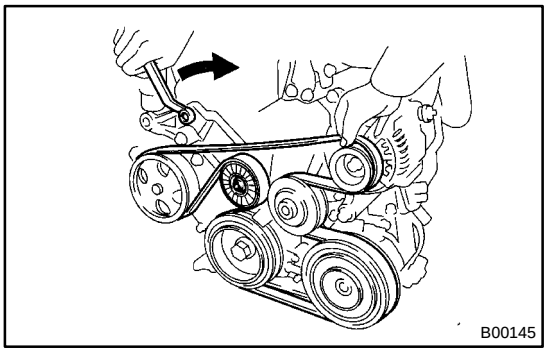


5. REMOVE AIR SWITCHING VALVE ASSY

(a) Using a plier, grip the claws of the hose clip and slide the clip along the hose.
(b) Disconnect the 3 hoses.



(c) Remove the 2 bolts and air switching valve assy.

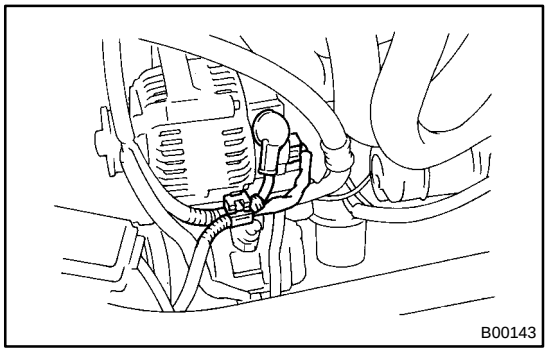


6. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

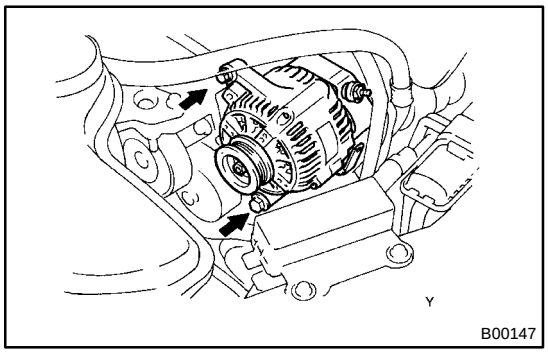
7. REMOVE GENERATOR BRACKET NO.1

(a) Remove 2 bolts and the alternator bracket.

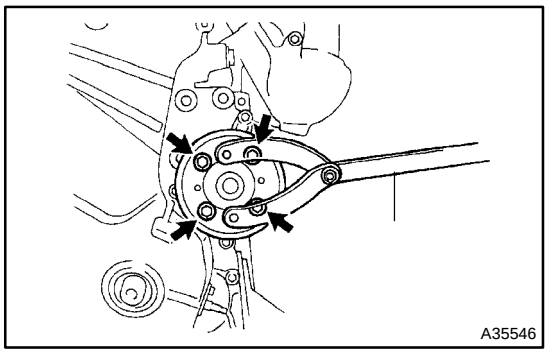


8. REMOVE GENERATOR ASSY

(a) Disconnect the wire clamp from the wire clip on the rectifire end frame.
(b) Remove the rubber cap and nut, and disconnect the alternator wire.
(c) Disconnect the alternator connector.

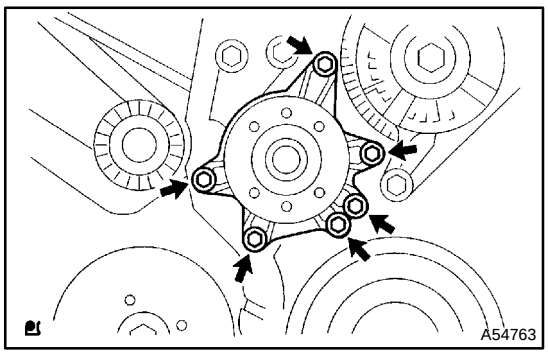


(d) Remove the 2 bolts and alternator.

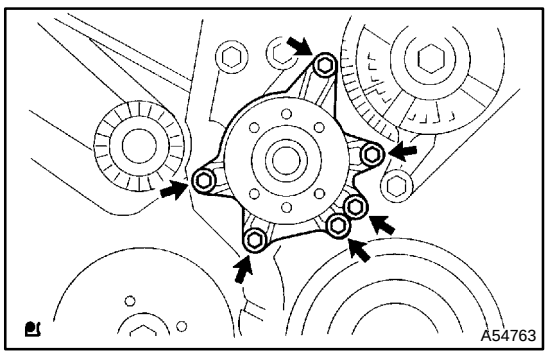


9. REMOVE WATER PUMP ASSY

(a) Using SST, remove 4 bolts and the water pump pulley.
SST 09960-10010 (09962-01000, 09963-00600)



(b) Remove the 6 bolts, water pump and O-ring.



10. INSTALL WATER PUMP ASSY

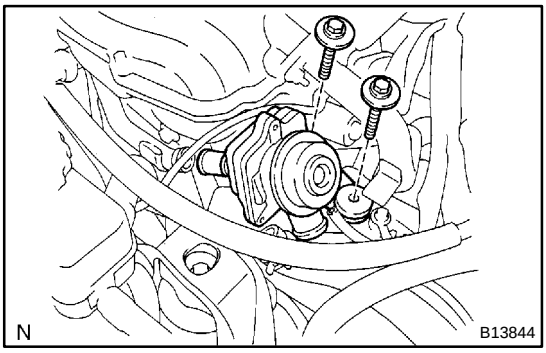
(a) Place a new O-ring on the timing chain cover.
(b) Install the water pump with the 6 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in·lbf)
(c) Using SST, install the water pump pulley.
SST 09960-10010 (09962-01000, 09963-00600)

11. INSTALL GENERATOR ASSY

Torque:
12 mm head 25 N·m (250 kgf·cm, 18 ft·lbf)
14 mm head 58 N·m (591 kgf·cm, 43 ft·lbf)

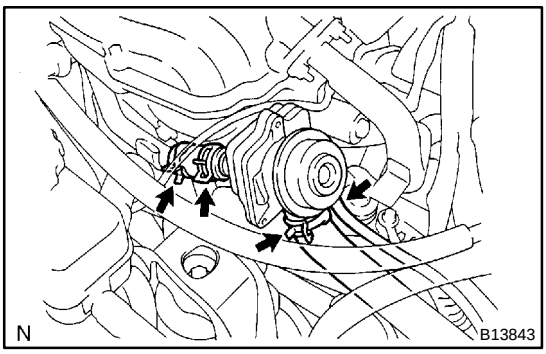
12. INSTALL GENERATOR BRACKET NO.1

Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)



13. INSTALL AIR SWITCHING VALVE ASSY

(a) Install the 2 bolts and air switching valve assy.
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)



(b) Connect the 3 hoses.

14. INSTALL CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

15. ADD COOLANT **(See page 16-6)**

16. INSPECT CHECK ENGINE COOLANT LEAK **(See page 16-1)**

17. INSTALL RADIATOR SUPPORT OPENING COVER

18. INSTALL ENGINE UNDER COVER RH

THERMOSTAT (2ZZ-GE)

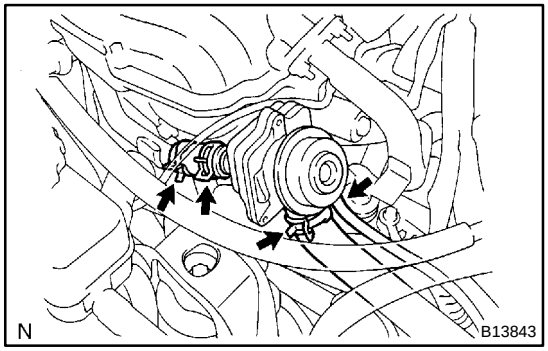
160B4-01

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH

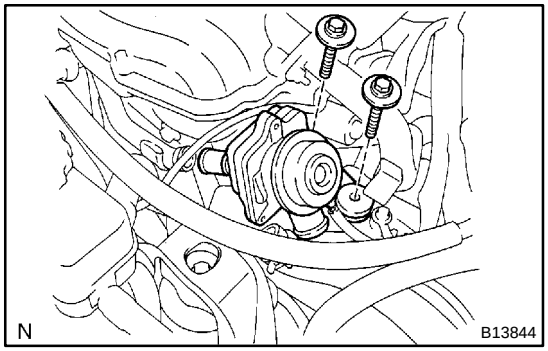
2. REMOVE RADIATOR SUPPORT OPENING COVER

3. DRAIN COOLANT (See page 16-6)
4. REMOVE CYLINDER HEAD COVER NO.2

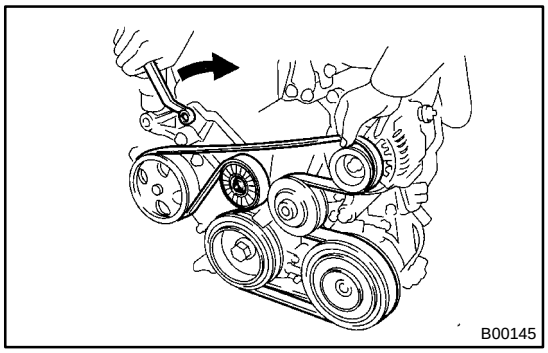


5. REMOVE AIR SWITCHING VALVE ASSY

(a) Using a plier, grip the claws of the hose clip and slide the clip along the hose.
(b) Disconnect the 3 hoses.



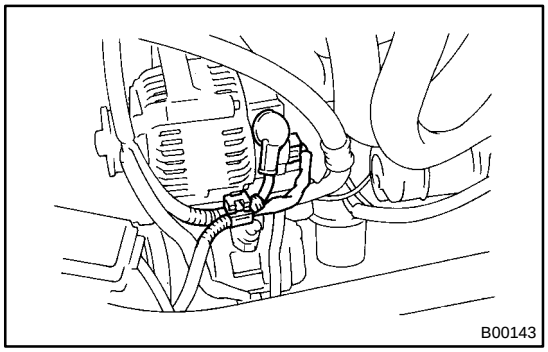
(c) Remove the 2 bolts and air switching valve assy.



6. REMOVE FAN AND GENERATOR V BELT

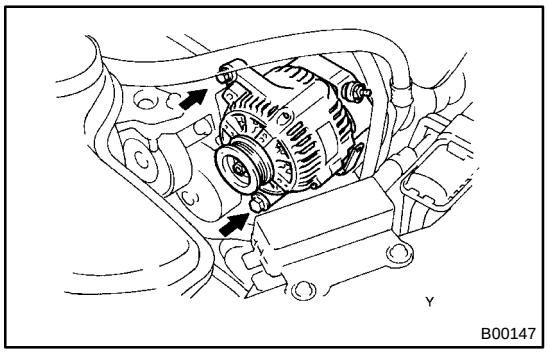
(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

7. REMOVE GENERATOR BRACKET NO.1



8. REMOVE GENERATOR ASSY

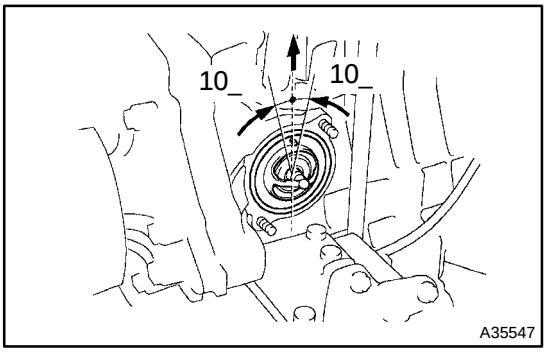
(a) Disconnect the wire clamp from the wire clip on the rectifire end frame.
(b) Remove the rubber cap and nut, and disconnect the alternator wire.
(c) Disconnect the alternator connector.



(d) Remove the 2 bolts and alternator.

9. REMOVE WATER INLET

10. REMOVE THERMOSTAT



11. INSTALL THERMOSTAT

(a) Install a new gasket to the thermostat.
(b) Install the thermostat with the jiggle valve upward as shown in the illustration.

12. INSTALL WATER INLET

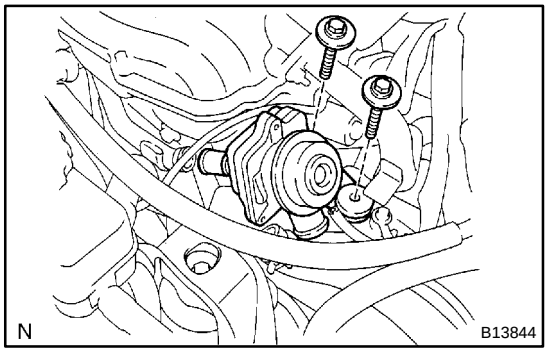
Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)

13. INSTALL GENERATOR ASSY

Torque:
12mm head 25 N·m (250 kgf·cm, 18 ft·lbf)
14mm head 58 N·m (591 kgf·cm, 43 in.·lbf)

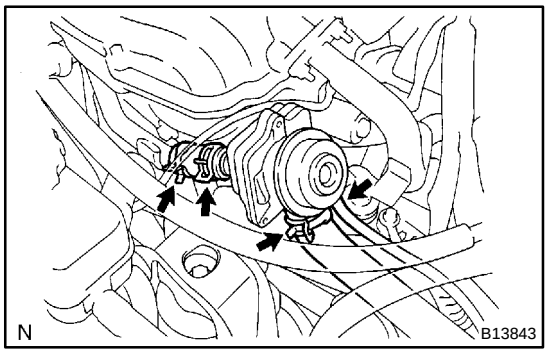
14. INSTALL GENERATOR BRACKET NO.1

Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)



15. INSTALL AIR SWITCHING VALVE ASSY

(a) Install the 2 bolts and air switching valve assy.
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)



(b) Connect the 3 hoses.

16. INSTALL CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

17. ADD COOLANT **(See page 16-6)**

18. INSPECT CHECK ENGINE COOLANT LEAK **(See page 16-1)**

19. INSTALL RADIATOR SUPPORT OPENING COVER

20. INSTALL ENGINE UNDER COVER RH

RADIATOR ASSY (2ZZ-GE)

1600W-04

REPLACEMENT

1. REMOVE RADIATOR SUPPORT OPENING COVER

2. REMOVE AIR PUMP OUTLET PIPE

3. DRAIN COOLANT (See page 16-6)
4. SEPARATE RADIATOR HOSE INLET

5. SEPARATE RADIATOR HOSE OUTLET

6. REMOVE FAN ASSY,W/MOTOR

(a) Disconnect the fan motor connector.
(b) Disconnect two clamps for wire-harness from fan-shroud.
(c) Remove the fan w/motor.

7. REMOVE RADIATOR SUPPORT SUB-ASSY UPPER

8. REMOVE RADIATOR ASSY

9. INSTALL RADIATOR ASSY

10. INSTALL RADIATOR SUPPORT SUB-ASSY UPPER

Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)

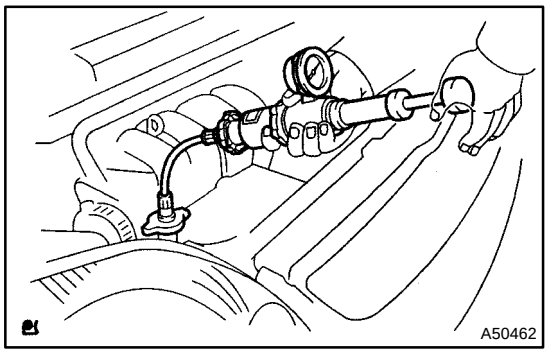
11. INSTALL FAN ASSY,W/MOTOR
12. INSTALL AIR PUMP OUTLET PIPE

13. ADD COOLANT (See page 16-6)
14. INSPECT CHECK ENGINE COOLANT LEAK (See page 16-1)
15. INSTALL RADIATOR SUPPORT OPENING COVER

COOLING SYSTEM (3ZZ-FE/4ZZ-FE)

ON-VEHICLE INSPECTION

1600T-06



1. INSPECT COOLING SYSTEM FOR LEAKS

CAUTION:

To avoid the danger of being burned, do no remove the reservoir cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

(a) Fill the radiator with coolant and attach a radiator cap tester.

(b) Warm up the engine.

(c) Pump it to 118 kPa (1.2 kgf/cm^2, 17.1 psi), and check that the pressure does not drop.

HINT:

If the pressure drops, check to hoses, radiator or water pump for leaks. If no external leaks are found, check the heater core, cylinder block and head.

2. CHECK ENGINE COOLANT LEVEL AT RESERVOIR

(a) The engine coolant level should be between the "LOW" and "FULL" line.

HINT:

If low, check for leaks and add "Toyota Long Life Coolant" or equivalent up to the "FULL" line.

3. CHECK ENGINE COOLANT QUALITY

(a) Remove the radiator cap.

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

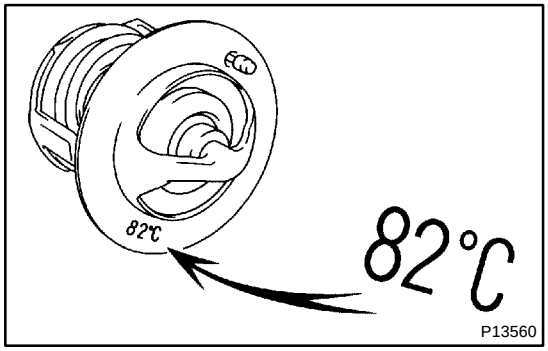
(b) Check if there is any excessive deposits of rust or scale around the radiator cap and radiator filler hole; the coolant should be free from oil.

HINT:

If excessively dirty, replace the coolant.

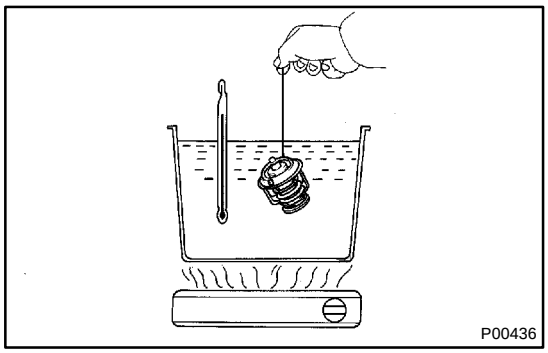
(c) Reinstall the radiator cap.

INSPECTION



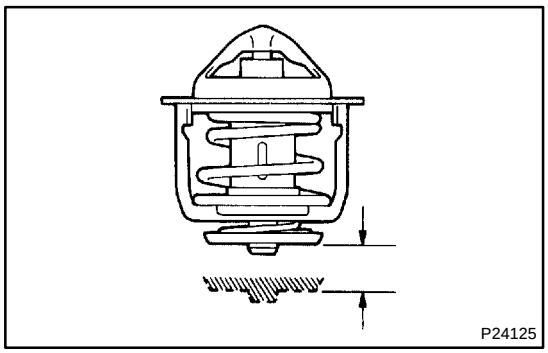
1. THERMOSTAT

HINT:
The thermostat is numbered with the valve opening temperature.



(a) Immerse the thermostat in water an gradually heat the water.
(b) Check the valve opening temperature.
Valve opening temperature:
74.0 - 78.5_C (152 - 173_F)

HINT:
If the valve opening temperature is not as specified, replace the thermostat.



(c) Check the valve lift.
Valve lift: 10 mm (0.394 in.) or more at 95_C (203_F)

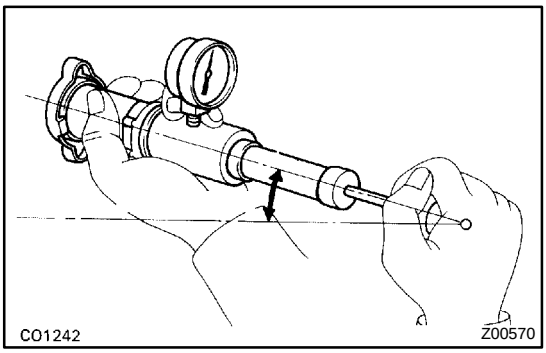
HINT:
If the valve lift is not as specified, replace the thermostat.
(d) Check that the valve is fully closed when the thermostat is at low temperatures (below 77_C (171_F)).

HINT:
If not closed, replace the thermostat.

2. RADIATOR CAP SUB-ASSY

NOTICE:

- **If the reservoir cap has contaminations, always rinse it with water.**
- **Before using a radiator cap tester, wet the relief valve and pressure valve with engine coolant or water.**



(a) Using a radiator cap tester, slowly pump the tester and check that air is coming from the vacuum valve.
Pump speed: 1 push / (3 seconds or more)

NOTICE:
Push the pump at a constant speed.

HINT:

- Pump speed: 1 push / (3 seconds or more)
- If air is not coming from the vacuum valve, replace the reservoir cap.

(b) Pump the tester and measure the relief valve opening pressure.
Standard opening pressure:
74 - 103 kPa (0.75 - 1.05 kgf/cm^2, 10.7 - 14.9 psi)
Minimum opening pressure:
59 kPa (0.6 kgf/cm^2, 8.5 psi)

NOTICE:
This pump speed is for the first pump only (in order to close the vacuum valve). After this, the pump speed can be reduced.

HINT:

- Pump speed: 1 push within 1 second
- Use the tester's maximum reading as the opening pressure.
- If the opening pressure is less than minimum, replace the reservoir cap.

COOLING FAN SYSTEM (3ZZ-FE/4ZZ-FE)

1600R-06

ON-VEHICLE INSPECTION

1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE (Below 83_C (181_F))

(a) Turn the ignition switch ON.

(b) Check that the cooling fan stops.

HINT:

If not, check the cooling fan relay and water temperature sensor, and check for separated connector or severed wire between the cooling fan relay and water temperature sensor.

(c) Disconnect the water temperature sensor connector.

(d) Check that the cooling fan rotates.

If not, check the fuses, cooling fan relay, engine ECM and cooling fan, and check for a short circuit between the cooling fan relay and water temperature sensor.

(e) Reconnect the water temperature sensor connector.

2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE (Above 93_C (199_F))

(a) Start the engine, and raise coolant temperature to above 93_C (199_F).

HINT:

Coolant temperature is the detected value by the water temperature sensor on the water outlet.

(b) Check that the cooling fan rotates.

HINT:

If not, replace the water temperature sensor.

3. INSPECT COOLING FAN

(a) Disconnect the cooling fan connector.

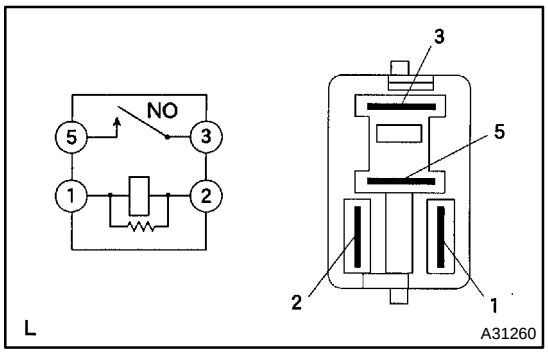
(b) Connect battery and ammeter to the connector.

(c) Check that the cooling fan rotates smoothly, and check the reading on the ammeter.

Standard amperage: Approx. 8 - 12 A at 20_C (68_F)

(d) Reconnect the cooling fan connector.

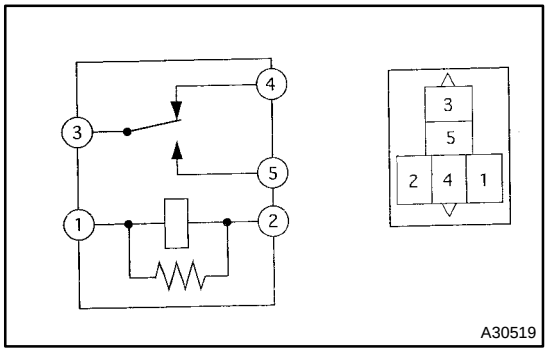
INSPECTION



1. COOLING FAN RELAY

Specified condition:

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2	3 - 5	Continuity



2. COOLING FAN RELAY NO.2

Specified condition:

Condition	Tester connection	Specified condition
Constant	1 - 2 3 - 4	Continuity
Apply B+ between terminals 1 and 2	2 - 5	Continuity

3. COOLING FAN RESISTOR

(a) Using an ohmmeter, measure the resistance between the terminals.
Resistance: 1.17 - 1.43 Ω at 20 _C (68 _F)

COOLANT (3ZZ-FE/4ZZ-FE)

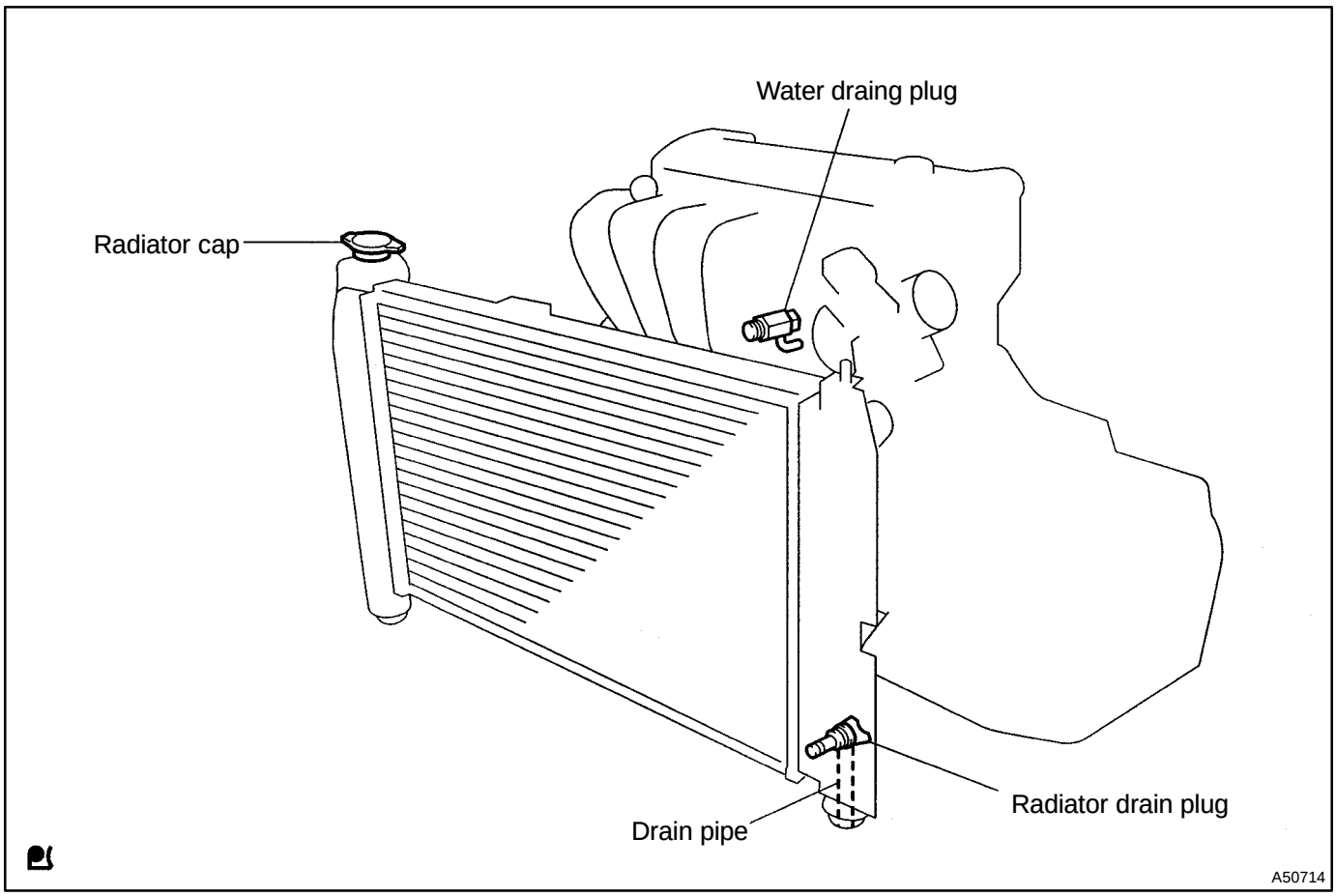
REPLACEMENT

1600V-06

1. DRAIN COOLANT

CAUTION:
To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

(a) Remove the radiator cap.
(b) Loosen the radiator plug and drain the coolant.



2. ADD COOLANT

(a) Tighten the radiator drain plug, and pour coolant into radiator until it overflows.
Capacity: 6.5 liters (6.9 US qts, 5.7 Imp. qts)

HINT:
- Press the radiator inlet and outlet hose several times with hard.
- If the coolant level gets lower, pour coolant.

(b) Tighten the radiator cap.
(c) Pour engine coolant into the reservoir tank until it reaches full line.
(d) Warm up the engine until the thermostat valve begins to open.

HINT:
Press the radiator inlet and outlet hose several times with hard during the warming up.

(e) Stop the engine and wait until the coolant temp. gets cold. Then remove the radiator cap to check the coolant level.
(f) If the level gets lower, perform the procedures above again.
(g) If the level does not gets lower, adjust the reservoir tank coolant level.

3. CHECK ENGINE COOLANT LEAK

(a) Fill the radiator with coolant and attach a radiator cap tester.

(b) Pump it to 118 kPa (1.2 kgf/cm^2, 17.1 psi) and check leakage.

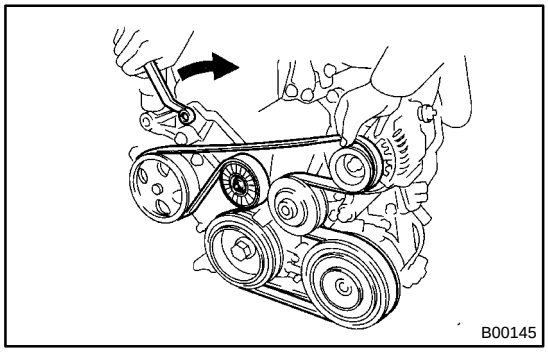
WATER PUMP ASSY (3ZZ-FE/4ZZ-FE)

1601A-03

REPLACEMENT

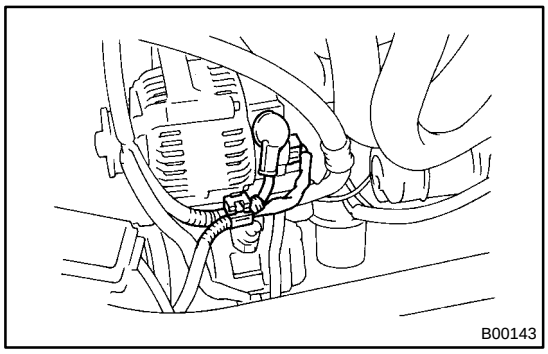
1. REMOVE ENGINE UNDER COVER RH

2. DRAIN COOLANT (See page 16-20)



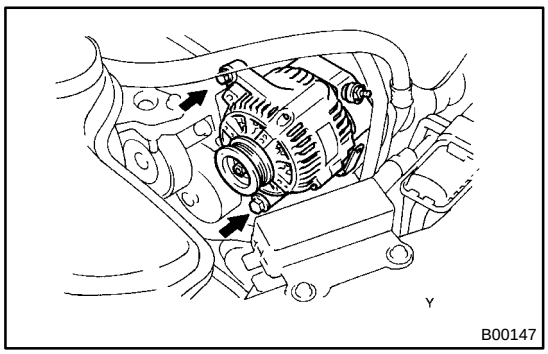
3. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

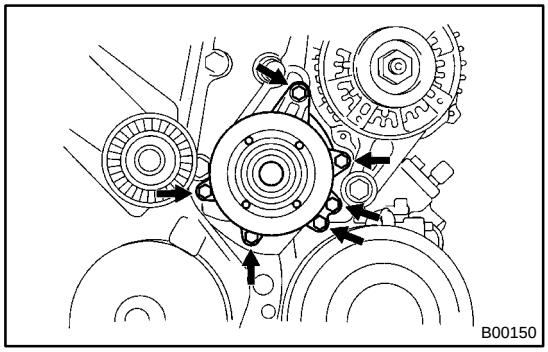


4. REMOVE GENERATOR ASSY

(a) Disconnect the wire clamp from the wire clip on the rectifire end frame.
(b) Remove the rubber cap and nut, and disconnect the alternator wire.
(c) Disconnect the alternator connector.

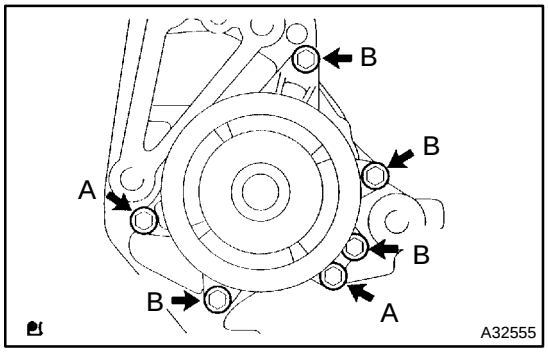


(d) Remove the 2 bolts and alternator.



5. REMOVE WATER PUMP ASSY

(a) Remove the 6 bolts, water pump and O-ring.



6. INSTALL WATER PUMP ASSY

(a) Place a new O-ring on the timing chain cover.
(b) Install the water pump with the 6 bolts.
Torque:
9.0 N·m (92 kgf·cm, 80 in·lbf) for Bolt A
11 N·m (113 kgf·cm, 8 ft·lbf) for Bolt B

7. INSTALL GENERATOR ASSY

Torque:
12 mm head 25 N·m (250 kgf·cm, 18 ft·lbf)
14 mm head 54 N·m (550 kgf·cm, 39 ft·lbf)

8. ADD COOLANT **(See page 16-20)**

9. CHECK ENGINE COOLANT LEAK **(See page 16-15)**

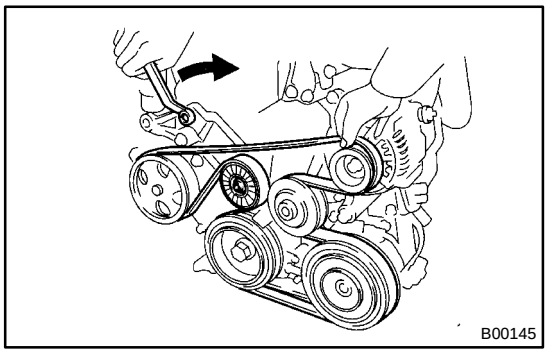
THERMOSTAT (3ZZ-FE/4ZZ-FE)

1601B-03

REPLACEMENT

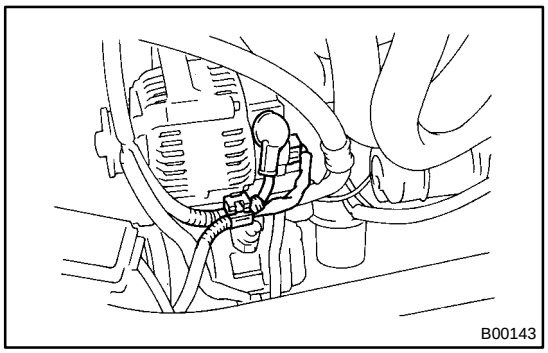
1. REMOVE ENGINE UNDER COVER RH

2. DRAIN COOLANT (See page 16-20)



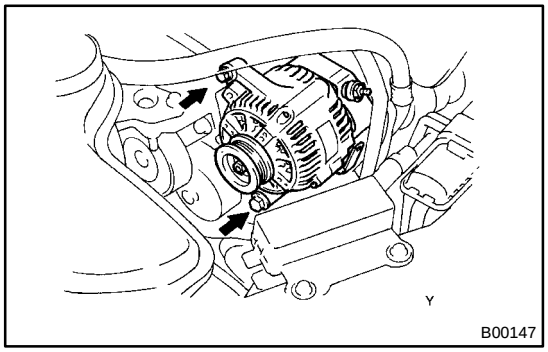
3. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.



4. REMOVE GENERATOR ASSY

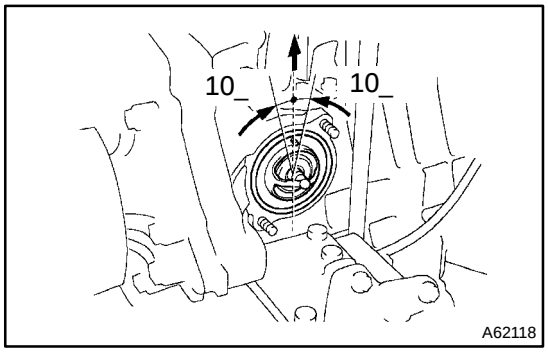
(a) Disconnect the wire clamp from the wire clip on the rectifire end frame.
(b) Remove the rubber cap and nut, and disconnect the alternator wire.
(c) Disconnect the alternator connector.



(d) Remove the 2 bolts and alternator.

5. REMOVE WATER INLET

6. REMOVE FAN AND GENERATOR V BELT



7. INSTALL FAN AND GENERATOR V BELT

(a) Install a new gasket to the thermostat.
(b) Install the thermostat with the jiggle valve upward as shown in the illustration.

8. INSTALL WATER INLET

Torque: 11 N·m (113 kgf·cm, 8 ft·lbf)

9. INSTALL GENERATOR ASSY

Torque:
12mm head 25 N·m (250 kgf·cm, 18 ft·lbf)
14mm head 54 N·m (550 kgf·cm, 39 in.·lbf)

10. ADD COOLANT **(See page 16-20)**

11. CHECK ENGINE COOLANT LEAK **(See page 16-15)**

RADIATOR ASSY (3ZZ-FE/4ZZ-FE)

1600W-03

REPLACEMENT

1. **DRAIN COOLANT** **(See page 16-20)**
2. **SEPARATE RADIATOR HOSE INLET**
3. **SEPARATE RADIATOR HOSE OUTLET**
4. **SEPARATE OIL COOLER INLET TUBE NO.1**
5. **SEPARATE OIL COOLER OUTLET TUBE NO.1**
6. **REMOVE RADIATOR ASSY**

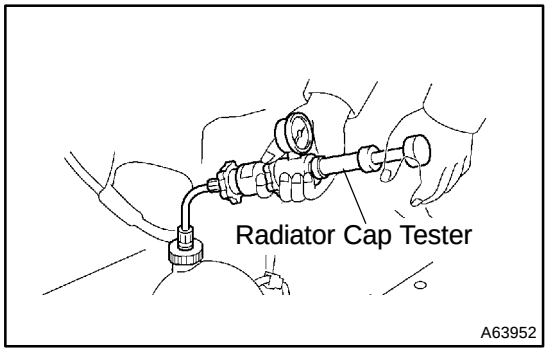
(a) Disconnect the fan motor connector.
(b) Disconnect two clamps for wire-harness from fan-shroud.
(c) Remove the two fan mount bolts.
(d) Remove the fan w/motor.

7. **ADD COOLANT** **(See page 16-20)**
8. **CHECK ENGINE COOLANT LEAK** **(See page 16-15)**

COOLING SYSTEM (1CD-FTV)

ON-VEHICLE INSPECTION

160B6-01



1. INSPECT COOLING SYSTEM FOR LEAKS

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

(a) Fill the radiator with coolant and attach a radiator cap tester.

(b) Warm up the engine.

(c) Pump it to 137 kPa (1.4 kgf/cm^2, 19.9 psi), and check that the pressure does not drop.

If the pressure drops, check to hoses, radiator or water pump for leaks. If no external leaks are found, check the heater core, cylinder block and head.

2. CHECK ENGINE COOLANT LEVEL AT RESERVOIR

(a) The engine coolant level should be between the "LOW" and "FULL" lines, when the engine is cold.

If low, check for leaks and add "Toyota Long Life Coolant" or equivalent up to the "FULL" line.

3. CHECK ENGINE COOLANT QUALITY

(a) Remove the radiator cap.

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

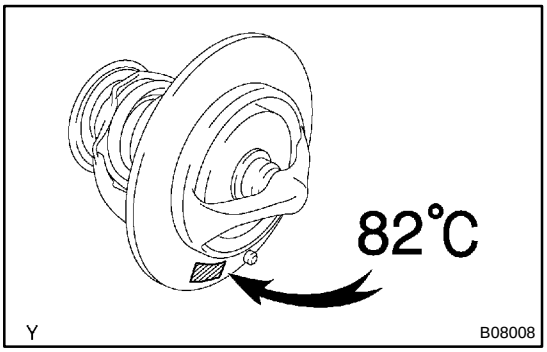
(b) Check if there is any excessive deposits of rust or scale around the radiator cap and radiator filler hole; the coolant should be free from oil.

If excessively dirty, replace the coolant.

(c) Reinstall the radiator cap.

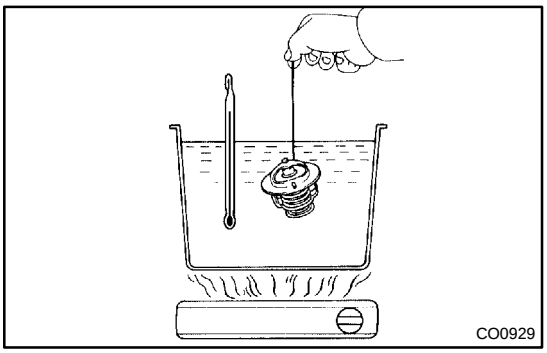
160B7-01

INSPECTION



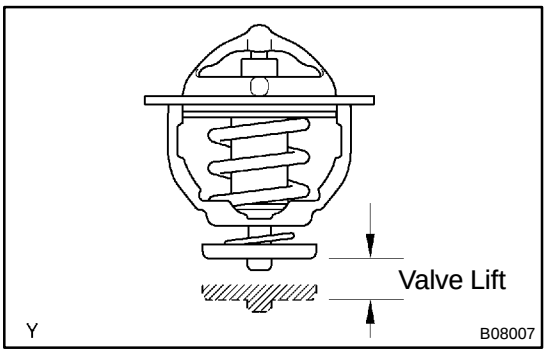
1. THERMOSTAT

HINT:
The thermostat is numbered with the valve opening temperature.



(a) Immerse the thermostat in water and gradually heat the water.
(b) Check the valve opening temperature.
Valve opening temperature:
80 - 84_C (176 - 183_F)

If the valve opening temperature is not as specified, replace the thermostat.



(c) Check the valve lift.
Valve lift: 8.5 mm (0.33 in.) or more at 95_C (203_F)

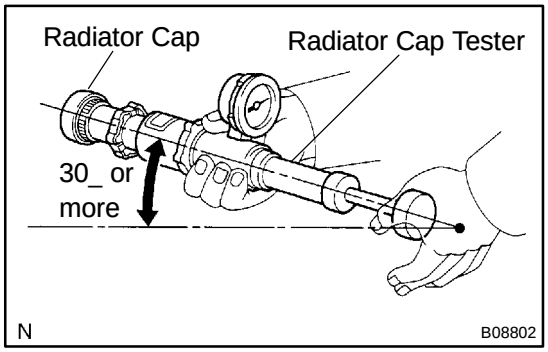
If the valve lift is not as specified, replace the thermostat.
(d) Check that the valve is fully closed when the thermostat is at low temperatures (below 40_C (104_F)).

If not closed, replace the thermostat.

2. RESERVE TANK CAP SUB-ASSY

NOTICE:

- **If the radiator cap has contaminations, always rinse it with water.**
- **Before using a radiator cap tester, wet the relief valve and pressure valve with engine coolant or water.**



(a) Using a radiator cap tester, slowly pump the tester and check that air is coming from the vacuum valve.
Pump speed: 1 push / (3 seconds or more)

NOTICE:
Push the pump at a constant speed.

If air is not coming from the vacuum valve, replace the radiator cap.

(b) Pump the tester and measure the relief valve opening pressure.
Pump speed: 1 push within 1 second

NOTICE:
This pump speed is for the first pump only (in order to close the vacuum valve). After this, the pump speed can be reduced.

Standard opening pressure:
93 - 122 kPa (0.95 - 1.25 kgf/cm^2, 13.4 - 17.6 psi)
Minimum opening pressure:
78 kPa (0.8 kgf/cm^2, 11.4 psi)

HINT:
Use the tester's maximum reading as the opening pressure.
If the opening pressure is less than minimum, replace the radiator cap.

COOLING FAN SYSTEM (1CD-FTV)

160B8-01

ON-VEHICLE INSPECTION

1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE (Below 83_C (181_F))

(a) Turn the ignition switch ON.
(b) Check that the cooling fan stops.
(c) Disconnect the water temperature switch connector.
(d) Connect the terminals on the water temperature switch connector.
(e) Check that the cooling fan rotates.

If not, check the fuses, cooling fan relay, cooling fan, and check for and check for a open circuit between the cooling fan relay and water temperature switch.

(f) Reconnect the water temperature switch connector.

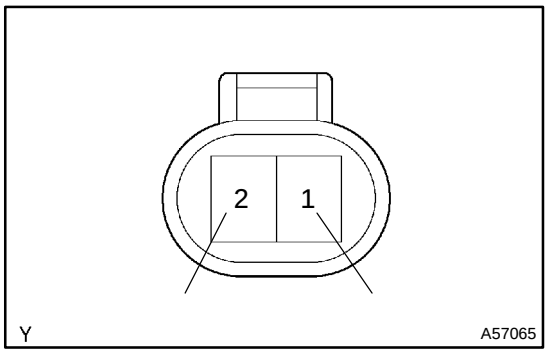
2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE (Above 93_C (199_F))

(a) Start the engine, and raise coolant temperature to above 93_C (199_F)

HINT:
Coolant temperature is the detected value by the water temperature switch on the radiator lower tank.

(b) Check that the cooling fan rotates.

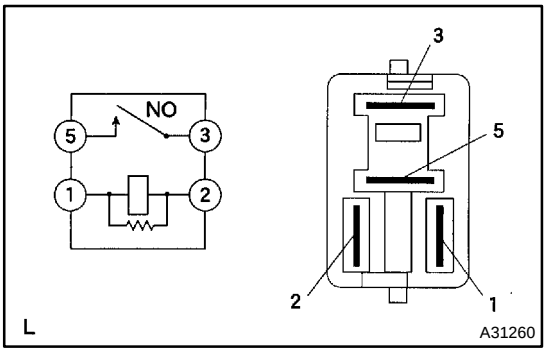
If not, replace the water temperature switch.



3. INSPECT COOLING FANS

(a) Disconnect the cooling fan connector.
(b) Connect battery and ammeter to the cooling fan connector.
(c) Check that the cooling fan rotates smoothly, and check the reading on the ammeter.
Standard amperage:
Approx. 13.2 A at 20_C (68_F)
(d) Reconnect the cooling fan connector.

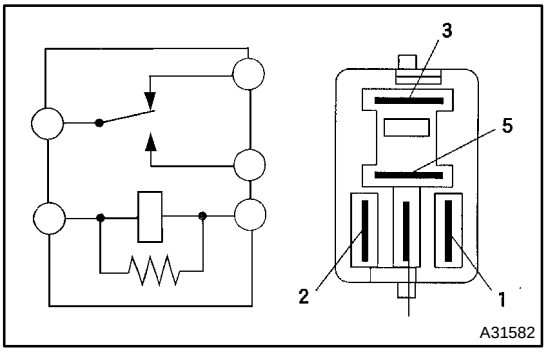
INSPECTION



1. COOLING FAN RELAY

(a) Inspect the cooling fan relay continuity.
(1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.
Specified condition: Continuity
(2) Check that there is no continuity between terminals 3 and 5.
Specified condition: No continuity

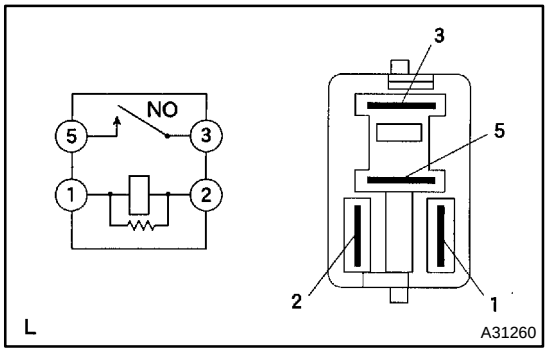
(b) Inspect the cooling fan relay operation.
(1) Apply battery voltage across terminals 1 and 2.
(2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.
Specified condition: Continuity



2. COOLING FAN RELAY NO.2

(a) Inspect the cooling fan relay continuity.
(1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.
Specified condition: Continuity
(2) Check that there is continuity between terminals 3 and 4.
Specified condition: Continuity
(3) Check that there is no continuity between terminals 3 and 5.
Specified condition: No continuity

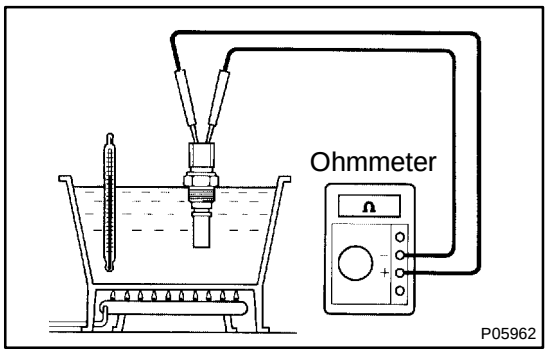
(b) Inspect the cooling fan relay operation.
(1) Apply battery positive voltage across terminals 1 and 2.
(2) Using an ohmmeter, check that there is no continuity between terminals 3 and 4.
Specified condition: No continuity
(3) Check that there is continuity between terminals 3 and 5.
Specified condition: Continuity



3. COOLING FAN RELAY NO.3

(a) Inspect the cooling fan relay continuity.
  (1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.
  Specified condition: Continuity
  (2) Check that there is no continuity between terminals 3 and 5.
  Specified condition: No continuity

(b) Inspect the cooling fan relay operation.
  (1) Apply battery voltage across terminals 1 and 2.
  (2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.
  Specified condition: Continuity



4. TEMPERATURE DETECT SWITCH NO.2

(a) Using an ohmmeter, check that there is continuity between the terminals when the coolant temperature is above 93_C (199_F).
Specified condition: Continuity

(b) Using an ohmmeter, check that there is no continuity between the terminals when the coolant temperature is below 83_C (181_F).
Specified condition: No continuity

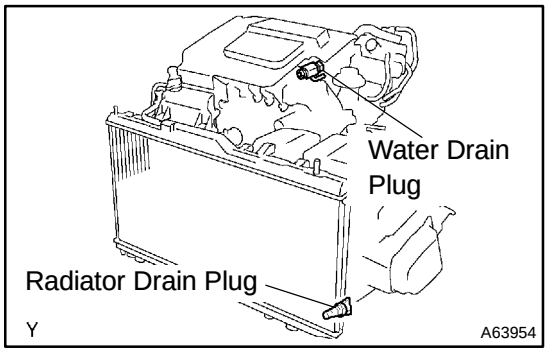
COOLANT (1CD-FTV)

REPLACEMENT

160BA-01

1. DRAIN ENGINE COOLANT

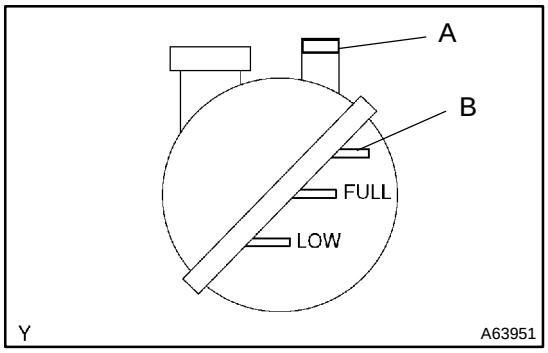
(a) Remove the radiator cap.



(b) Loosen the radiator and engine drain plugs, and drain the coolant.

(c) Close the drain plugs.

Torque: 13 N·m (133 kgf·cm, 10 ft·lbf) for engine



2. FILL COOLANT

(a) Loosen the air bread valve A.

(b) Fill the system with coolant up to the line B.

Capacity:

7.6 liters (8.0 US qts, 6.7 Imp. qts)w/ heater

7.4 liters (7.8 US qts, 6.5 Imp. qts) w/o heater

HINT:

- Use of improper coolants may damage engine cooling system.
- Use "Toyota Long Life Coolant" or equivalent and mix it with plain water according to the manufacturer's directions.
- Using of coolant with includes more than 50 % (freezing protection down to -35_C (-31_F)) or 60 % (freezing protection down to -50_C (-58_F)) of ethylene-glycol is recommended but not more than 70 %.

(c) Tighten the air bread valve securely.

(d) Install the radiator cap securely.

(e) Warm up the engine.

HINT:

Warm up the engine with the speed of 2,000 rpm or more and continue doing it until the thermostat has open and the radiator reservoir has become hot.

(f) Run the engine intermittently for 5 seconds at 3,000 rpm and 45 seconds.

(g) Do the above operation for 7 minutes or more.

(h) After the engine has become cold, check the coolant level is between LOW and FULL lines.

3. CHECK ENGINE COOLANT LEAK

(a) Fill the radiator with coolant and attach a radiator cap tester.

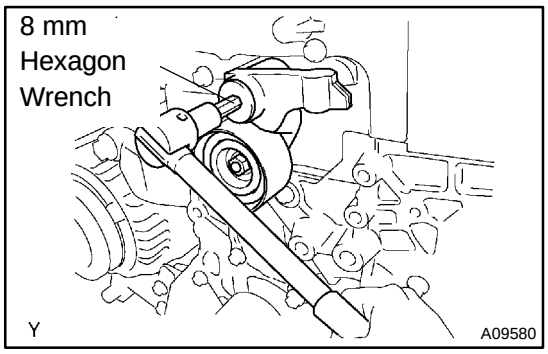
(b) Pump it to 137 kPa (1.4 kgf/cm^{2,} 19.9 psi), and check that the pressure does not drop.

WATER PUMP ASSY (1CD-FTV)

160BC-01

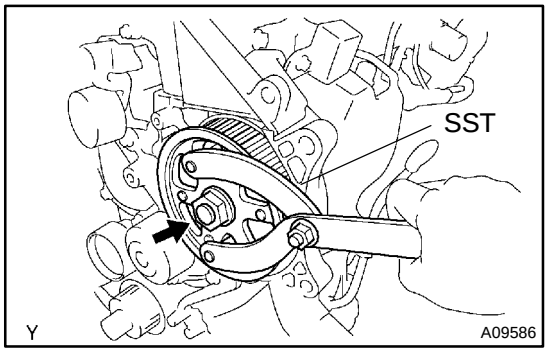
REPLACEMENT

1. DRAIN ENGINE COOLANT (See page 16-33)
2. REMOVE FRONT WHEEL RH
3. REMOVE ENGINE UNDER COVER RH
4. REMOVE ENGINE COVER SUB-ASSY NO.1
5. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (W/ AIR CONDITIONER)
   (See page 14-172)
6. REMOVE GENERATOR V BELT
   (See page 14-172)
7. SEPARATE ENGINE MOUNTING BRACKET NO.2 RH
   (See page 14-213)
8. REMOVE CRANKSHAFT PULLEY
   (See page 14-213)
   SST 09213-54015 (91651-60855), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05030)
9. REMOVE TIMING BELT NO.2 COVER
   (See page 14-214)
10. REMOVE TIMING BELT NO.1 COVER
    (See page 14-214)
11. REMOVE TIMING BELT GUIDE
12. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
    (See page 14-214)
13. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-214)
14. REMOVE TIMING BELT
    (See page 14-215)



15. REMOVE TIMING BELT IDLER SUB-ASSY NO.1

(a) Using an 8 mm hexagon wrench, remove the idler pulley shaft, idler pulley and plate washer.



16. REMOVE INJECTION PUMP DRIVE PULLEY

(a) Using SST, remove the pulley nut.
SST 09960-10010 (09962-01000, 09963-01000)

17. REMOVE FUEL INLET PIPE SUB-ASSY
(See page 11-75)

18. REMOVE INJECTION PIPE SUB-ASSY NO.1
(See page 11-64)

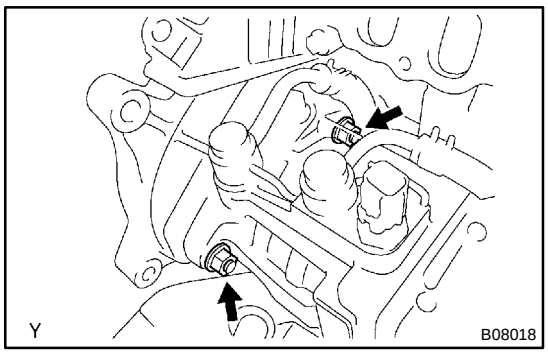
19. REMOVE INJECTION PIPE SUB-ASSY NO.2
(See page 11-64)

20. REMOVE INJECTION PIPE SUB-ASSY NO.3
(See page 11-64)

21. REMOVE INJECTION PIPE SUB-ASSY NO.4
(See page 11-64)

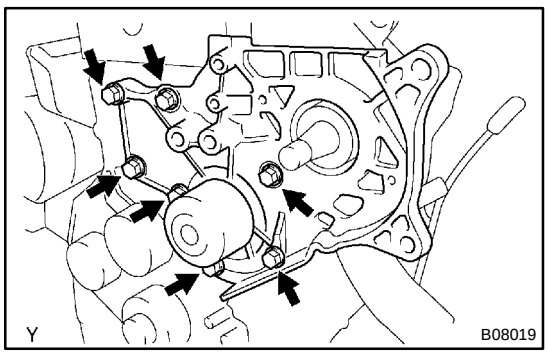
22. REMOVE INTAKE SHUTTER ASSY
(See page 10-20)

23. REMOVE INTAKE MANIFOLD
(See page 11-74)

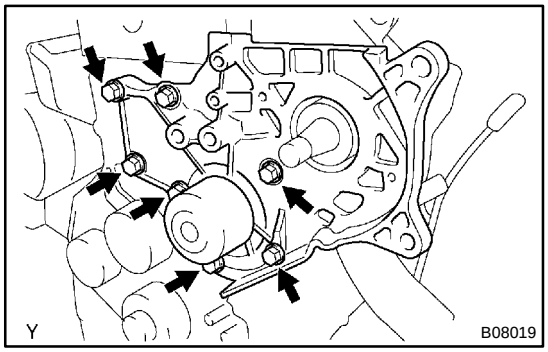


24. REMOVE WATER PUMP ASSY

(a) Remove the 2 supply pump set nuts.

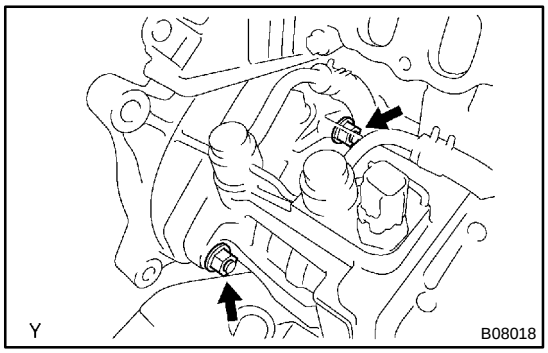


(b) Remove the 7 bolts, water pump and gasket.



25. INSTALL WATER PUMP ASSY

(a) Install a new gasket and the water pump with the 7 bolts.
Torque: 31 N·m (320 kgf·cm, 23 ft.·lbf)



(b) Install the 2 supply pump set nuts.
Torque: 21 N·m (214 kgf·cm, 15 ft.·lbf)

26. INSTALL INTAKE MANIFOLD
(See page 11-74)

27. INSTALL INTAKE SHUTTER ASSY
(See page 10-20)

28. INSTALL INJECTION PIPE SUB-ASSY NO.1
(See page 11-64)
SST 09023-12700, 09023-12900

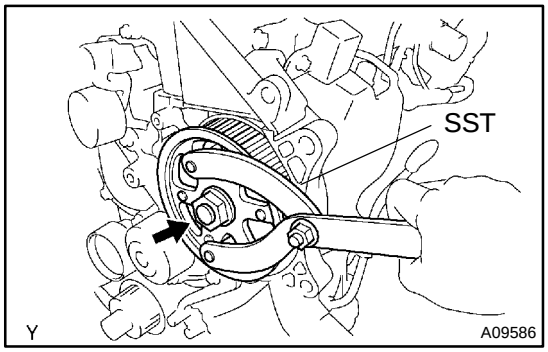
29. INSTALL INJECTION PIPE SUB-ASSY NO.2
(See page 11-64)
SST 09023-12700, 09023-12900

30. INSTALL INJECTION PIPE SUB-ASSY NO.3
(See page 11-64)
SST 09023-12700, 09023-12900

31. INSTALL INJECTION PIPE SUB-ASSY NO.4
(See page 11-64)
SST 09023-12700, 09023-12900

32. INSTALL FUEL INLET PIPE SUB-ASSY
(See page 11-78)
SST 09023-12700, 09023-12900

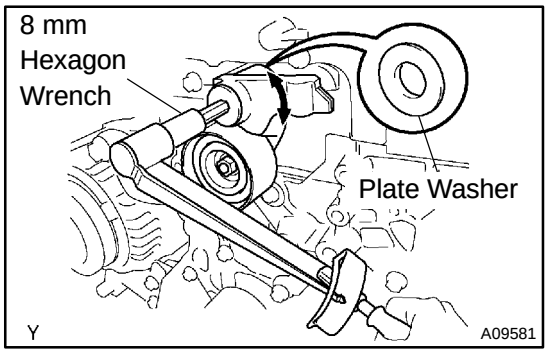
NOTICE:
In case of having the water pump and / or water pump gasket replaced, must replace fuel inlet pipe, too.



33. INSTALL INJECTION PUMP DRIVE PULLEY

(a) Align the pulley set key with the key groove of the drive pulley, and slide on the timing pulley.

(b) Using SST, install the pulley nut.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



34. INSTALL TIMING BELT IDLER SUB-ASSY NO.1

(a) Using an 8 mm hexagon wrench, install the plate washer and idler pulley with the idler pulley shaft.
Torque: 35 N·m (357 kgf·cm, 26 ft·lbf)

(b) Check that the pulley bracket moves smoothly.

35. SET NO.1 CYLINDER TO TDC/COMPRESSION **(See page 14-214)**
SST 09960-10010 (09962-01000, 09963-01000)

36. INSTALL TIMING BELT
(See page 14-215)

37. CHECK VALVE TIMING **(See page 14-216)**

38. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
(See page 14-217)

39. INSTALL TIMING BELT GUIDE
(See page 14-217)

40. INSTALL TIMING BELT NO.1 COVER
(See page 14-217)

41. INSTALL TIMING BELT NO.2 COVER
(See page 14-218)

42. INSTALL CRANKSHAFT PULLEY
(See page 14-219)
SST 09213-54015 (91651-60855), 09330-00021

43. INSTALL ENGINE MOUNTING BRACKET NO.2 RH
(See page 14-213)

44. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (W/ AIR CONDITIONER)
(See page 14-172)

45. INSTALL FRONT WHEEL RH

46. INSTALL ENGINE COVER SUB-ASSY NO.1

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

47. ADD COOLANT **(See page 16-33)**

48. CHECK ENGINE COOLANT LEAK **(See page 16-34)**

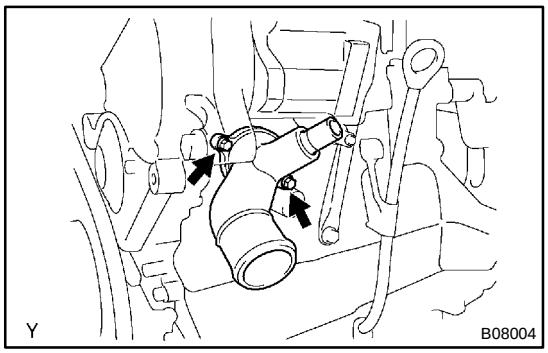
49. CHECK FUEL LEAK **(See page 11-70)**

THERMOSTAT (1CD-FTV)

160BB-01

REPLACEMENT

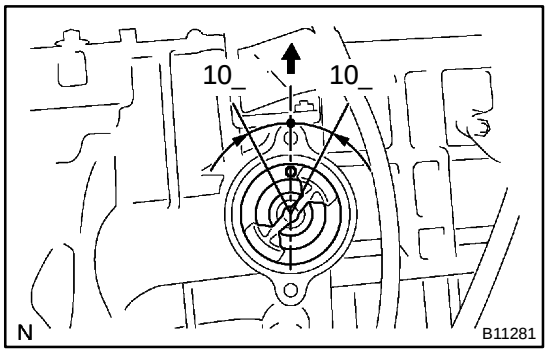
1. DRAIN ENGINE COOLANT (See page 16-33)
2. REMOVE RADIATOR RESERVE TANK ASSY
3. REMOVE RADIATOR HOSE OUTLET



4. REMOVE WATER INLET

(a) Remove the 2 bolts and water inlet.

5. REMOVE THERMOSTAT



6. INSTALL THERMOSTAT

(a) Install a new gasket to the thermostat.
(b) Install the thermostat with the jiggle valve upward.

HINT:
The jiggle valve may be set within 10_ on either side of the prescribed position.

7. INSTALL WATER INLET

(a) Install the water inlet with 2 bolts.
Torque: 9.0 N·m (90 kgf·cm, 78 in.·lbf)

8. ADD COOLANT (See page 16-33)
9. CHECK ENGINE COOLANT LEAK (See page 16-34)

RADIATOR ASSY (1CD-FTV)

160BD-01

Removal & Installation and Disassembly & Reassembly

1. **DRAIN ENGINE COOLANT** **(See page 16-33)**
2. **REMOVE RADIATOR RESERVE TANK ASSY**
3. **REMOVE RADIATOR HOSE INLET**
4. **REMOVE RADIATOR HOSE OUTLET**
5. **REMOVE RADIATOR ASSY**

(a) Remove the 2 bolts and separate the relay box
(b) Remove the 2 upper support, and radiator assy.

6. **REMOVE RADIATOR SUPPORT LOWER**
7. **REMOVE FAN ASSY,W/MOTOR**

(a) Remove the 2 bolts and fan w/motor.

8. **ADD COOLANT** **(See page 16-33)**
9. **CHECK ENGINE COOLANT LEAK** **(See page 16-34)**

LUBRICATION

LUBRICATION SYSTEM (2ZZ-GE) 17-1
ON-VEHICLE INSPECTION 17-1/2
OIL FILTER SUB-ASSY (2ZZ-GE) 17-3
REPLACEMENT 17-3
OIL PUMP ASSY (2ZZ-GE) 17-4
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OIL COOLER ASSY (2ZZ-GE) 17-5
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LUBRICATION SYSTEM (3ZZ-FE/4ZZ-FE) 17-6
ON-VEHICLE INSPECTION 17-6/7
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REPLACEMENT 17-14/21
OIL COOLER ASSY (1CD-FTV) 17-22
REPLACEMENT 17-22

LUBRICATION SYSTEM (2ZZ-GE)

1700F-05

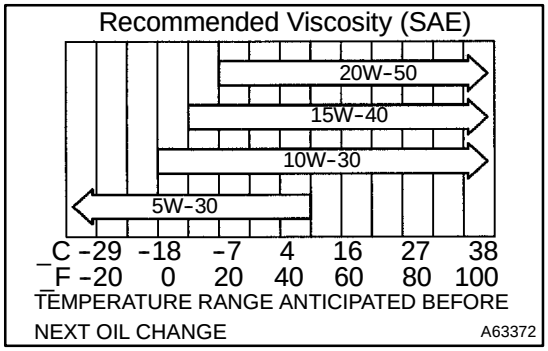
ON-VEHICLE INSPECTION

1. CHECK ENGINE OIL LEVEL

(a) After warming up the engine and then 5 minutes after the engine stop, oil level should be between the "L" and "F" marks on the dipstick. If low, check for leakage and add oil up to the "F" mark.

NOTICE:

Do not fill with engine oil above the "F" mark.



2. CHECK ENGINE OIL QUALITY

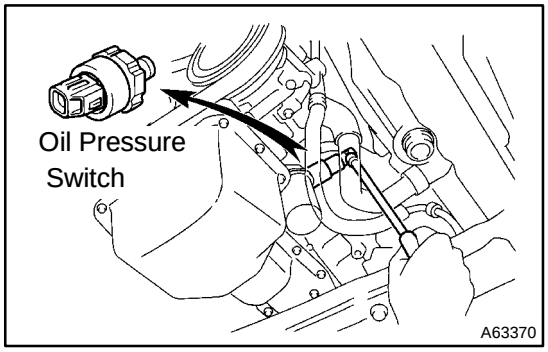
(a) Check the oil for deterioration, entry of water, discoloring or thinning.

(b) If the quality is visibly poor, replace the oil.

HINT:

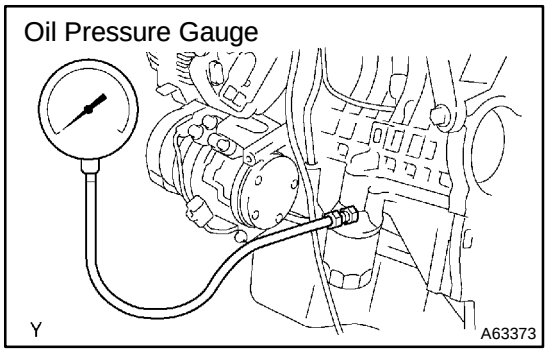
Oil grade:

API grade "SJ" Energy-Conserving, "SL" Energy-Conserving or ILSAC multigrade engine oil. Recommended viscosity is as shown in the illustration.



3. REMOVE OIL PRESSURE SWITCH ASSY

(a) Disconnect the oil pressure switch connector and remove the oil pressure switch.



4. INSTALL OIL PRESSURE GAUGE

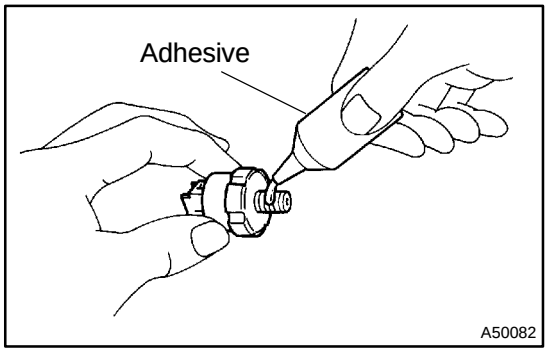
(a) Install the oil pressure gauge.

5. WARM UP ENGINE

6. CHECK OIL PRESSURE

Oil pressure:

At idle	39 kPa (0.4 kgf·cm^2, 5.7 psi) or more
At 3,000 rpm	294 - 539 kPa (3.0 - 5.5 kgf·cm^2, 43 - 78 psi) or more



7. INSTALL OIL PRESSURE SWITCH

(a) Apply adhesive to 2 or 3 threads of the oil pressure switch.
Adhesive:
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Install the oil pressure switch.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(c) Connect the oil pressure switch connector.

8. START ENGINE AND CHECK FOR LEAKS

OIL FILTER SUB-ASSY (2ZZ-GE)

1700V-05

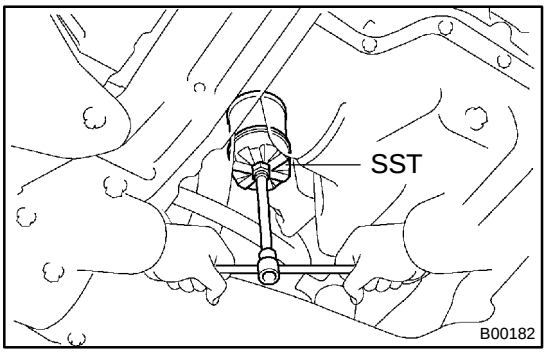
REPLACEMENT

CAUTION:

- **Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.**
- **Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less hand cleaner to remove any used engine oil. Do not use gasoline, thinners, or solvents.**
- **In order to preserve the environment, used oil and used oil filter must be disposed of only at designated disposal sites.**

1. REMOVE ENGINE UNDER COVER RH

2. DRAIN ENGINE OIL

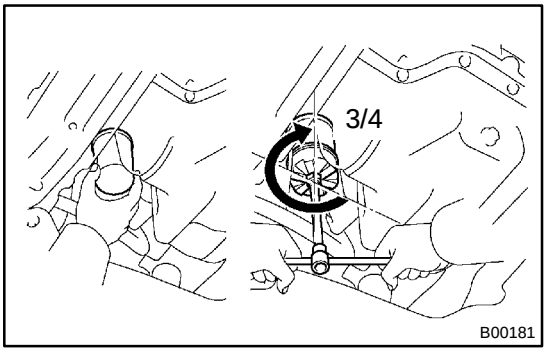


3. REMOVE OIL FILTER SUB-ASSY

(a) Using SST, remove the oil filter.
SST 09228-06501

4. INSTALL OIL FILTER SUB-ASSY

(a) Check and clean the oil filter installation surface.
(b) Apply clean engine oil to the gasket of a new oil filter.



(c) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
(d) Using SST, tighten it an additional 3/4 turn.
SST 09228-06501

5. INSTALL OIL PAN DRAIN PLUG

(a) Clean and install the oil drain plug with a new gasket.
Torque: 37 N·m (377 kgf·cm, 27 ft.·lbf)

6. ADD ENGINE OIL
Capacity:
Drain and refill w/ Oil filter change 4.4 liters (4.7 US qts, 3.9 Imp. qts)
Drain and refill w/o Oil filter change 4.2 liters (4.4 US qts, 3.7 Imp. qts)
Dry fill 5.15 liters (5.4 US qts, 4.5 Imp. qts)

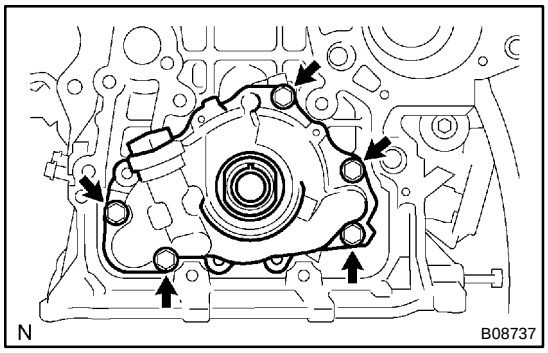
7. INSPECT OIL LEAK

OIL PUMP ASSY (2ZZ-GE)

1700T-03

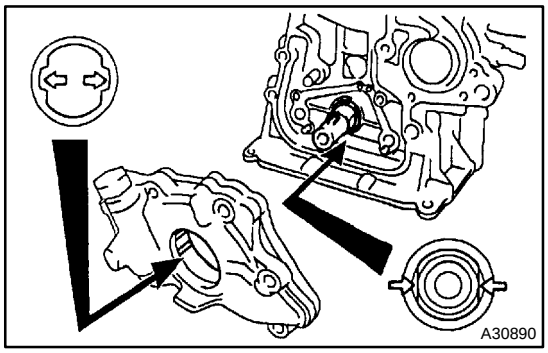
REPLACEMENT

1. REMOVE CHAIN SUB-ASSY
(See page 14-39)



2. REMOVE OIL PUMP ASSY

(a) Remove the 5 bolts, oil pump and gasket.



3. INSTALL OIL PUMP ASSY

(a) Place a new gasket on the cylinder block.
(b) Engage the spline teeth of the oil pump drive rotor with the large teeth of the crankshaft, and side the oil pump.
(c) Install the oil pump with the 5 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

4. INSTALL CHAIN SUB-ASSY
(See page 14-39)

OIL COOLER ASSY (2ZZ-GE)

1700U-02

REPLACEMENT

1. **REMOVE ENGINE UNDER COVER RH**

2. **DRAIN ENGINE OIL**
3. **DRAIN COOLANT** **(See Page 16-6)**
4. **REMOVE OIL FILTER SUB-ASSY**
   (See Page 17-3)
   SST 09228-06501
5. **REMOVE OIL COOLER ASSY**

(a) Disconnect the 2 water by pass hoses.
(b) Using socket wrench (30mm), remove the union.
(c) Remove the oil cooler and O-ring.

6. **INSTALL OIL COOLER ASSY**

(a) Check and clean the oil cooler surface.
(b) Install the new O-ring to oil cooler.
(c) Apply clean engine oil to the O-ring.
(d) Using socket wrench (30mm), install the union and oil cooler.
Torque: 79 N·m (806 kgf·cm, 58 ft·lbf)

7. **INSTALL OIL FILTER SUB-ASSY**
   (See Page 17-3)
   SST 09228-06501
8. **INSTALL OIL PAN DRAIN PLUG**

(a) Clean and install the oil drain plug with a new gasket.
Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)

9. **ADD ENGINE OIL**
10. **ADD COOLANT** **(See Page 16-6)**
11. **INSPECT OIL LEAK**
12. **INSPECT CHECK ENGINE COOLANT LEAK** **(See Page 16-1)**

LUBRICATION SYSTEM (3ZZ-FE/4ZZ-FE)

1700F-06

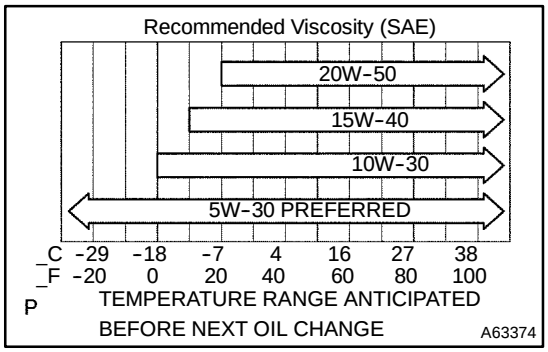
ON-VEHICLE INSPECTION

1. CHECK ENGINE OIL LEVEL

(a) After warming up the engine and then 5 minutes after the engine stop, oil level should be between the "L" and "F" marks on the dipstick. If low, check for leakage and add oil up to the "F" mark.

NOTICE:

Do not fill with engine oil above the "F" mark.



2. CHECK ENGINE OIL QUALITY

(a) Check the oil for deterioration, entry of water, discoloring or thinning.

(b) If the quality is visibly poor, replace the oil.

HINT:

Oil grade:

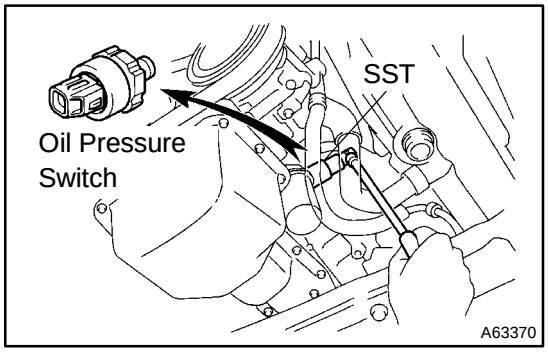
API grade "SJ" Energy-Conserving, "SL" Energy-Conserving or ILSAC multigrade engine oil is recommended. SAE 5W - 30 is the best choice for your vehicle, for good fuel economy, and good starting in cold weather.

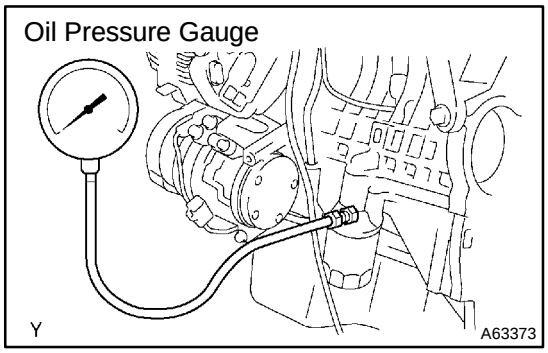
3. REMOVE OIL PRESSURE SWITCH ASSY

(a) Disconnect the oil pressure switch connector.

(b) Using SST, remove the oil pressure switch.

SST 09816-30010





4. INSTALL OIL PRESSURE GAUGE

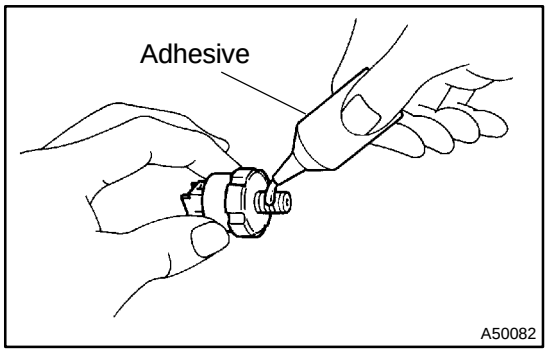
(a) Install the oil pressure gauge.

5. WARM UP ENGINE

6. CHECK OIL PRESSURE

Oil pressure:

At idle	29 kPa (0.3 kgf·cm^2, 4.3 psi) or more
At 3,000 rpm	294 - 539 kPa (3.0 - 5.5 kgf·cm^2, 43 - 78 psi) or more



7. INSTALL OIL PRESSURE SWITCH

(a) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Using SST, install the oil pressure switch.

SST 09816-30010

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(c) Connect the oil pressure switch connector.

8. START ENGINE AND CHECK FOR LEAKS

OIL FILTER SUB-ASSY (3ZZ-FE/4ZZ-FE)

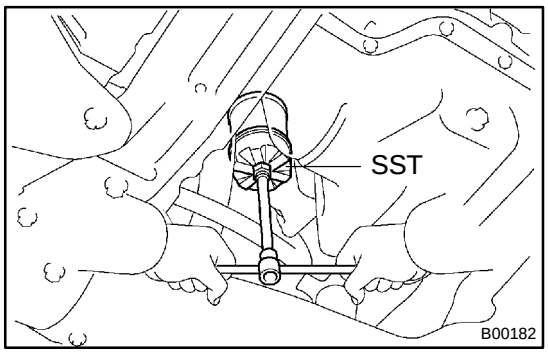
1700V-06

REPLACEMENT

CAUTION:

- **Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.**
- **Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less hand cleaner to remove any used engine oil. Do not use gasoline, thinners, or solvents.**
- **In order to preserve the environment, used oil and used oil filter must be disposed of only at designated disposal sites.**

1. DRAIN ENGINE OIL

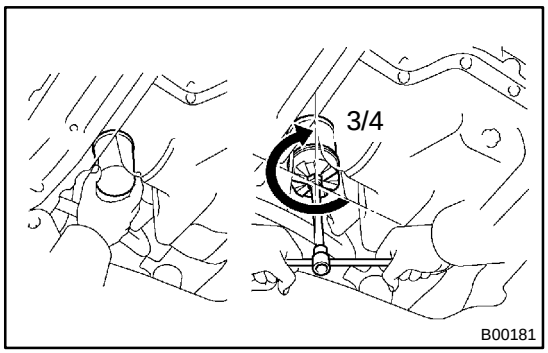


2. REMOVE OIL FILTER SUB-ASSY

(a) Using SST, remove the oil filter.
SST 09228-06501

3. INSTALL OIL FILTER SUB-ASSY

(a) Check and clean the oil filter installation surface.
(b) Apply clean engine oil to the gasket of a new oil filter.



(c) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
(d) Using SST, tighten it an additional 3/4 turn.
SST 09228-06501

4. INSTALL OIL PAN DRAIN PLUG

(a) Clean and install the oil drain plug with a new gasket.
Torque: 37 N·m (378 kgf·cm, 27 ft.·lbf)

5. ADD ENGINE OIL
Capacity:
Drain and refill w/ Oil filter change 3.7 liters (3.9 US qts, 3.3 Imp. qts)
Drain and refill w/o Oil filter change 3.5 liters (3.7 US qts, 3.1 Imp. qts)
Dry fill 4.2 liters (4.4 US qts, 3.7 Imp. qts)

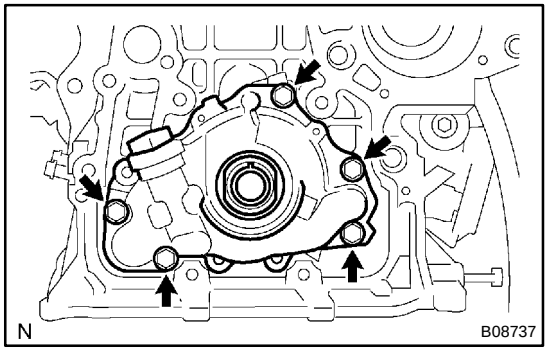
6. INSPECT OIL LEAK

OIL PUMP ASSY (3ZZ-FE/4ZZ-FE)

1700T-04

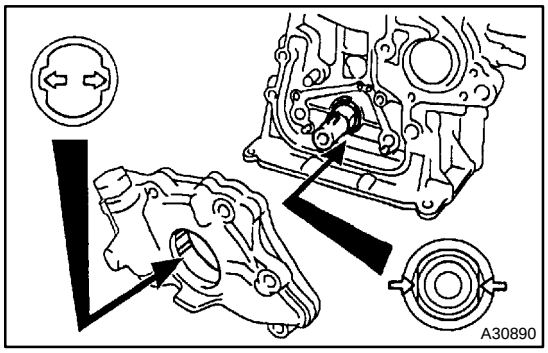
REPLACEMENT

1. **REMOVE CHAIN SUB-ASSY**
(See page 14-127)



2. **REMOVE OIL PUMP ASSY**

(a) Remove the 5 bolts, oil pump and gasket.



3. **INSTALL OIL PUMP ASSY**

(a) Place a new gasket on the cylinder block.
(b) Engage the spline teeth of the oil pump drive rotor with the large teeth of the crankshaft, and side the oil pump.
(c) Install the oil pump with the 5 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

4. **INSTALL CHAIN SUB-ASSY**
(See page 14-127)

LUBRICATION SYSTEM (1CD-FTV)

1706P-01

ON-VEHICLE INSPECTION

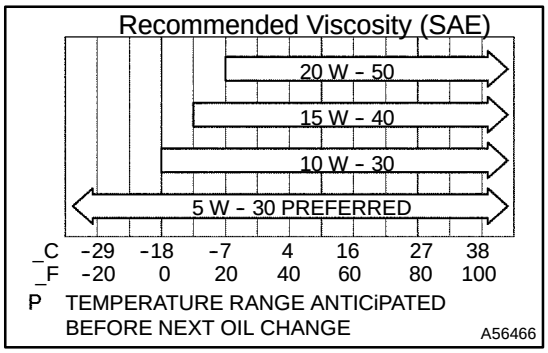
1. CHECK ENGINE OIL LEVEL

(a) After warm up the engine and then 5 minutes after the engine stop, oil level should be between the low level and full level marks of the dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

Do not fill with engine oil above the full level mark.



2. CHECK ENGINE OIL QUALITY

(a) Check the oil for deterioration, entry of water, discoloring or thinning.

If the quality is visibly poor, replace the oil.

Oil grade:

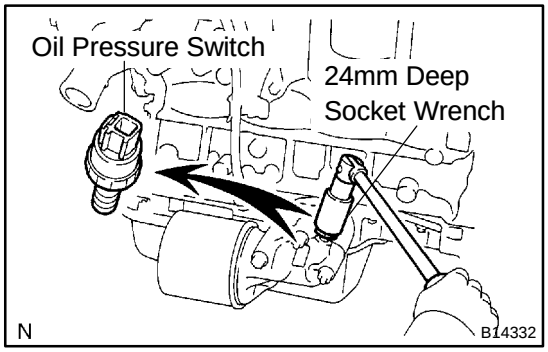
API grade CF - 4 or CF

(You may also use API CE or CD)

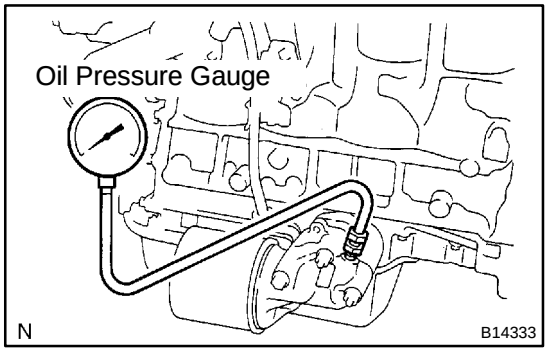
SAE 5W - 30 is the best choice for your vehicle, for good fuel economy, and good starting in cold weather.

3. REMOVE OIL PRESSURE SWITCH ASSY

(a) Disconnect the oil pressure switch connector.



(b) Using a 24 mm deep socket wrench, remove the oil pressure switch.



4. INSTALL OIL PRESSURE GAUGE

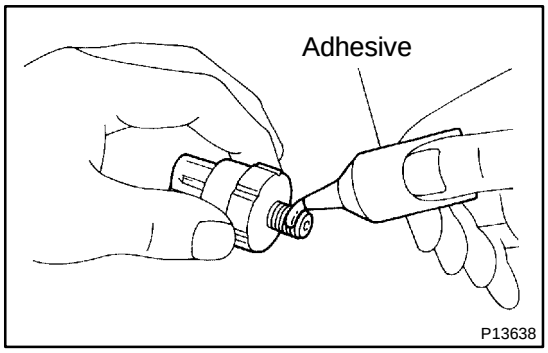
(a) Install the oil pressure gauge.

5. WARM UP ENGINE

6. CHECK OIL PRESSURE

Oil pressure:

At idle	29 kPa (0.3 kgf·cm^2, 4.2 psi) or more
At 4,500 rpm	245 - 588 kPa (2.5 - 6.0 kgf·cm^2, 36 - 85 psi)



7. INSTALL OIL PRESSURE SWITCH

(a) Remove the oil pressure gauge.

(b) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:
Part No. 08833 - 00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Install the oil pressure switch.

Torque: 15 N·m (152 kgf·cm, 11 ft·lbf)

(d) Connect the oil pressure switch connector.

8. START ENGINE AND CHECK FOR LEAKS

OIL FILTER SUB-ASSY (1CD-FTV)

REPLACEMENT

1706Q-01

NOTICE:

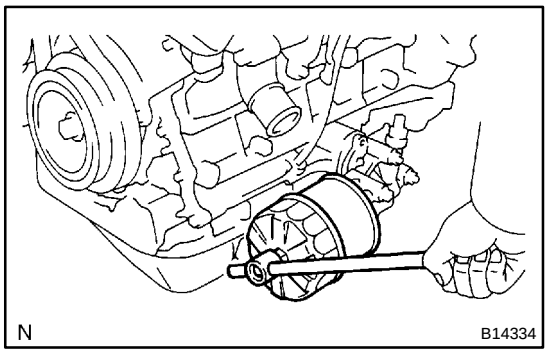
- **Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.**
- **Exercise caution in order to minimize the length and frequency of contact of you skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less hand cleaner to remove any used engine oil. Do not use gasoline, thinners, or solvents.**
- **In order to preserve the environment, used oil and oil filter must be disposed of only at designated disposal sites.**

1. REMOVE ENGINE UNDER COVER RH

2. DRAIN ENGINE OIL

(a) Remove the oil filler cap.

(b) Remove the oil drain plug, and drain the oil into a container.



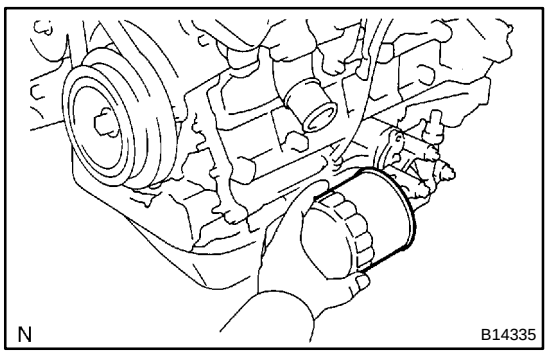
3. REMOVE OIL FILTER SUB-ASSY

(a) Using SST, remove the oil filter.
SST 09228-10002

4. INSTALL OIL FILTER SUB-ASSY

(a) Check and clean the oil filter installation surface.

(b) Apply clean engine oil to the gasket of a new oil filter.



(c) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.

(d) Using SST, tighten it an additional 3/4 turn.
SST 09228-10002

5. ADD ENGINE OIL

(a) Clean and install the oil drain plug with a new gasket.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(b) Fill with fresh engine oil.
Capacity:
Drain and refill w/ Oil filter change 5.9 liters (6.2 US qts, 5.2 Imp. qts)
Drain and refill w/o Oil filter change 5.3 liters (5.6 US qts, 4.7 Imp. qts)
Dry fill 6.7 liters (7.1 US qts, 5.9 Imp. qts)

(c) Install the oil filler cap.

6. CHECK ENGINE OIL LEAK

OIL PUMP ASSY (1CD-FTV)

1706R-01

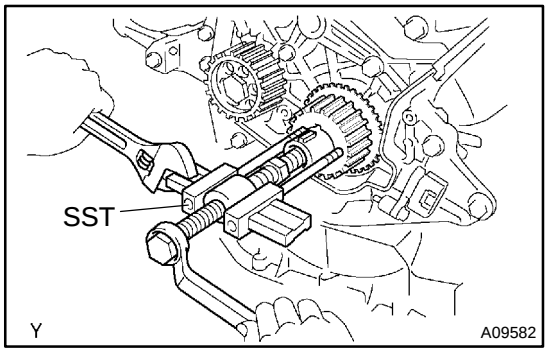
REPLACEMENT

1. DRAIN ENGINE OIL (See page 17-12)
2. REMOVE FRONT WHEEL RH
3. REMOVE ENGINE UNDER COVER RH

4. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (W/ AIR CONDITIONER)
(See page 14-172)
5. REMOVE GENERATOR V BELT
(See page 14-172)
6. REMOVE ENGINE MOUNTING BRACKET NO.2 RH
(See page 14-213)
7. REMOVE CRANKSHAFT PULLEY
(See page 14-213)
SST 09213-54015 (91651-60855), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021, 09954-05030)
8. REMOVE TIMING BELT NO.2 COVER
(See page 14-214)
9. REMOVE TIMING BELT NO.1 COVER
(See page 14-214)
10. REMOVE TIMING BELT GUIDE

11. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
(See page 14-214)
12. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14-214)
13. REMOVE TIMING BELT

14. REMOVE TIMING BELT IDLER SUB-ASSY NO.2

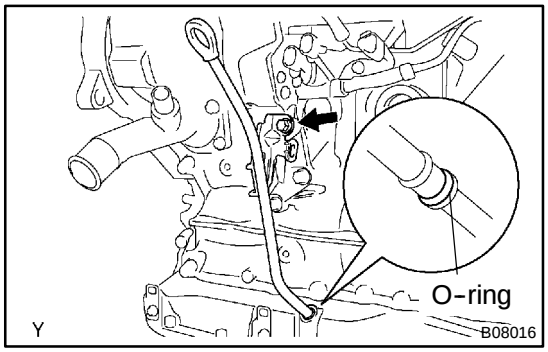


15. REMOVE CRANKSHAFT TIMING PULLEY

(a) If the pulley cannot be removed by had, use SST to remove the timing pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021)

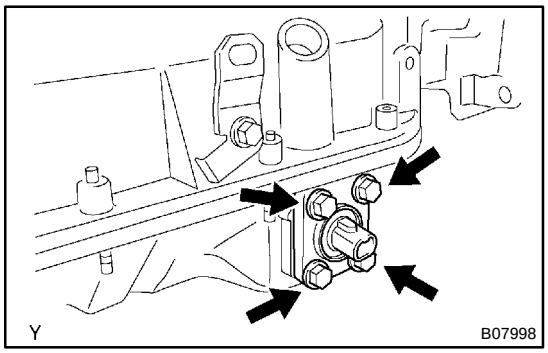
16. REMOVE GENERATOR ASSY
(See page 19-30)
17. REMOVE CHAIN TENSIONER ASSY NO.1

(a) Remove the bolt, 2 nuts and V-ribbed belt tensioner.



18. REMOVE OIL LEVEL GAGE GUIDE

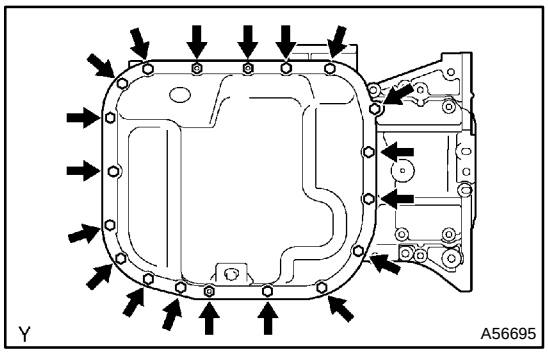
(a) Remove the bolt holding the oil level gage guide to the supply pump stay.
(b) Pull out the oil level gage guide together with the oil level gage from the No. 1 oil pan.
(c) Remove the O-ring from the oil level gage guide.



19. REMOVE ENGINE OIL LEVEL SENSOR

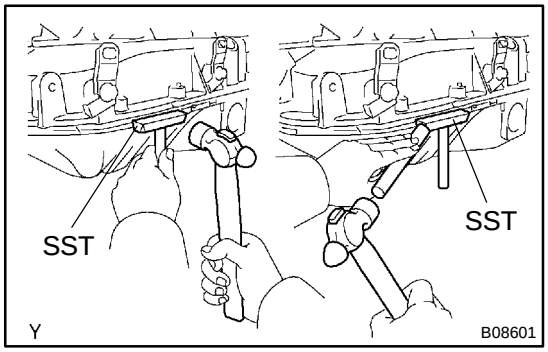
(a) Remove the 4 bolts and level sensor.

NOTICE:
Be careful not to drop the oil level sensor when removing it.



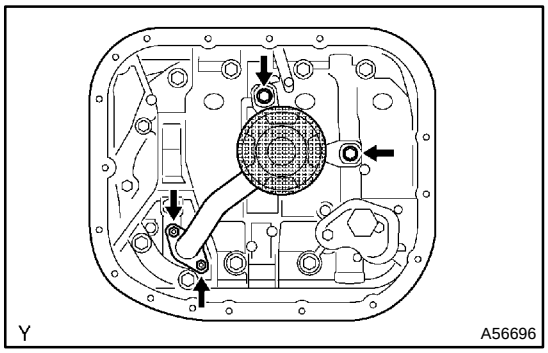
20. REMOVE OIL PAN SUB-ASSY NO.2

(a) Remove the 16 bolts and 3 nuts.



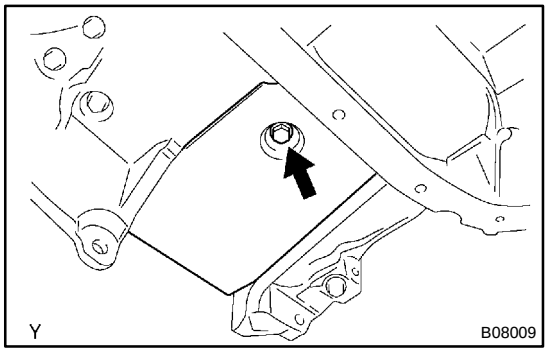
(b) Insert the blade of SST between the No. 1 and No. 2 oil pans, and cut off applied sealer and remove the No. 2 oil pan.
SST 09032-00100

NOTICE:
Be careful not to damage the contact surfaces of the No. 1 and No. 2 oil pans.



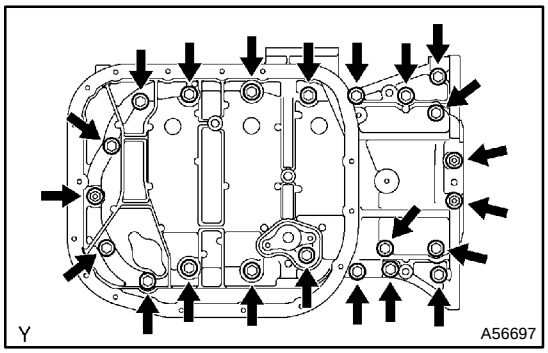
21. REMOVE OIL STRAINER SUB-ASSY

(a) Remove the 2 bolts, 2 nuts, oil strainer and gasket.



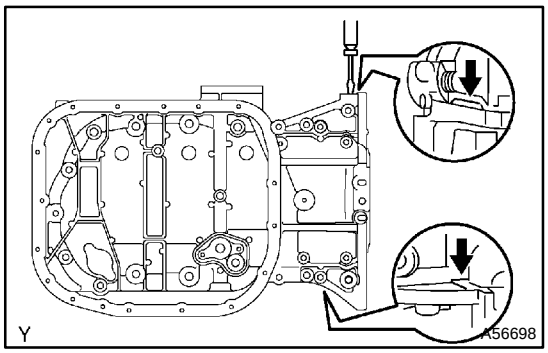
22. REMOVE OIL PAN INSULATOR

(a) Remove the bolt and oil pan insulator.



23. REMOVE OIL PAN SUB-ASSY

(a) Remove the 19 bolts and 3 nuts.

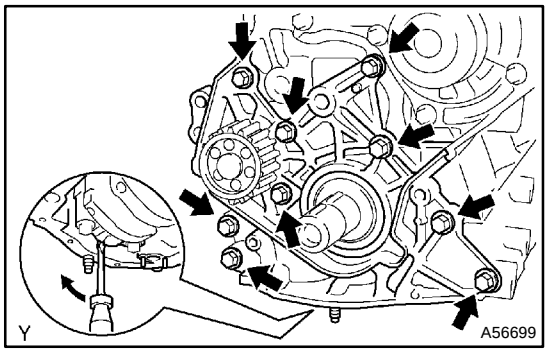


(b) Using a screwdriver, remove the oil pan by prying the portions between the cylinder block and No. 1 oil pan.

NOTICE:
Be careful not to damage the contact surfaces of the cylinder block and No. 1 oil pan.

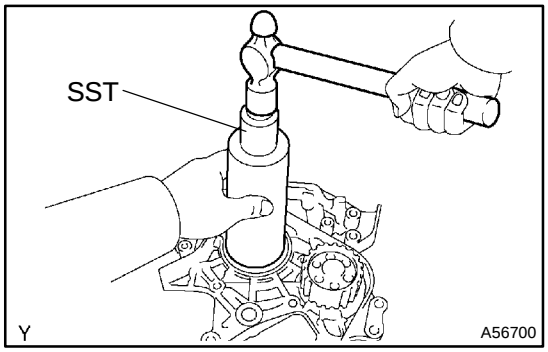
24. REMOVE CRANK POSITION SENSOR

25. REMOVE OIL PUMP INSULATOR



26. REMOVE OIL PUMP ASSY

(a) Remove the 9 bolts.
(b) Remove the oil pump by prying a screwdriver between the oil pump and main bearing cap.
(c) Remove the gasket.

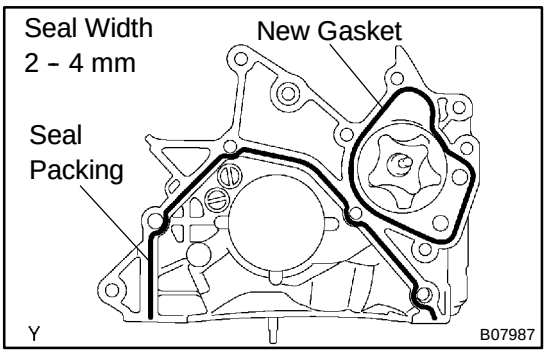


27. INSTALL CRANKSHAFT SEAL

(a) Using SST and a hammer, tap in a new oil seal until its surface is flush with the oil pump edge.
SST 09316-60011 (09316-00011, 09316-00021)

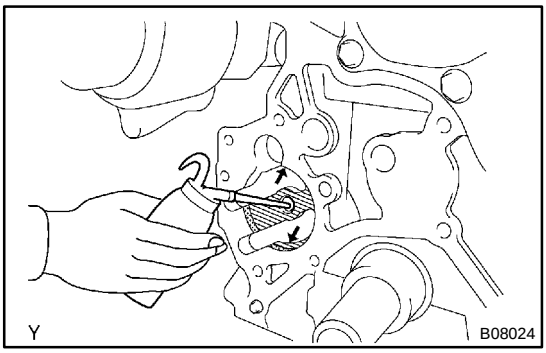
28. INSTALL OIL PUMP ASSY

(a) Remove any old packing (FIPG) material and be careful no to drop any oil on the contact surfaces of the oil pump and cylinder block.
(1) Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.
(2) Thoroughly clean all components to remove all the loose material.
(3) Using a non-residue solvent, clean both sealing surfaces.

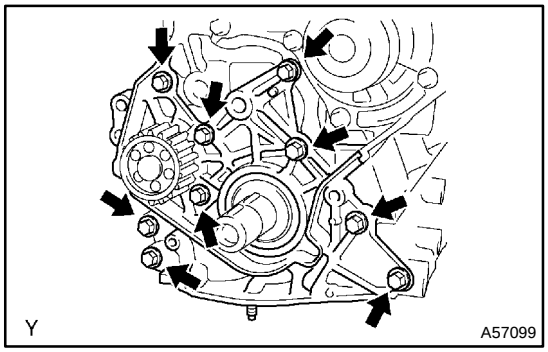


(b) Apply seal packing to the oil pump as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent

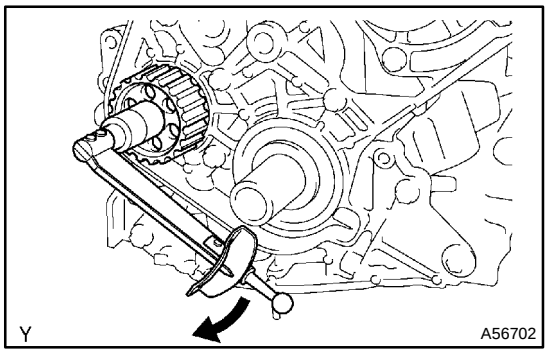
NOTICE:
Avoid applying an excessive amount to the surface.
(1) Install a nozzle that has been cut to a 2 - 4 mm (0.08 - 0.16 in.) opening.
(2) Parts must be assembled within 15 minutes of application. Otherwise the material must be removed and reapplied.
(3) Immediately remove nozzle from the tube and reinstall cap.
(c) Install a new gasket to the oil pump.



(d) Pour in 0.5 cm^3 (0.03 cu in.) or more of engine oil into the bushing of the cylinder block.
(e) Apply engine oil to the cylinder block side where it contacts with the oil pump driven rotor.



(f) Install the oil pump with the 9 bolts.
Torque: 31 N·m (320 kgf·cm, 23 ft·lbf)



(g) Measure the oil pump rotating torque.
(1) Check that the pump rotates smoothly without abnormal noise.
(2) Using a torque wrench, check the pump rotating torque.
Rotating torque: 3.0 N·m (30 kgf·cm, 26 in.·lbf) or less

29. INSTALL OIL PUMP INSULATOR

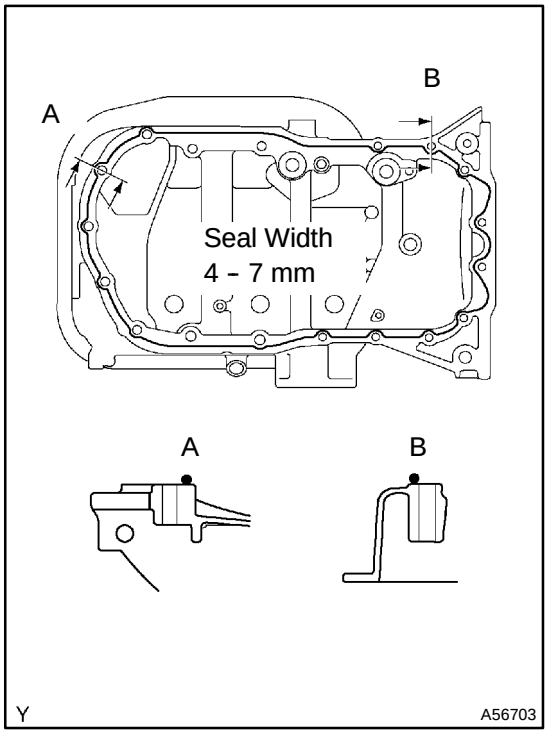
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)

30. INSTALL CRANK POSITION SENSOR

Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

31. INSTALL OIL PAN SUB-ASSY

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the No. 1 oil pan, cylinder block and oil pump and rear oil seal retainer.
(1) Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.
(2) Thoroughly clean all components to remove all the loose material.
(3) Using a non-residue solvent, clean both sealing surfaces.

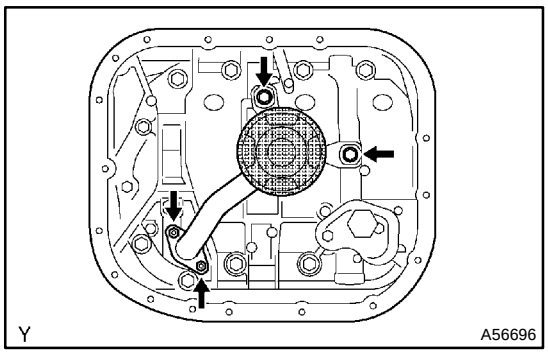


(b) Apply a seal packing to the No. 1 oil pan as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent
(1) Install a nozzle that has been cut to a 4 - 7 mm (0.16 - 0.28 in.) opening.
(2) Parts must be assembled within 15 minutes of application. Otherwise the material must be removed and reapplied.
(3) Immediately remove nozzle from the tube and reinstall cap.

(c) Install the oil pan with the 19 bolts and 3 nuts.
Torque:
11 N·m (112 kgf·cm, 8 ft·lbf) for 10 mm head bolt and nut
21 N·m (214 kgf·cm, 15 ft·lbf) for 12 mm head bolt

32. INSTALL OIL PAN INSULATOR

(a) Install the oil pan insulator with the bolt.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)



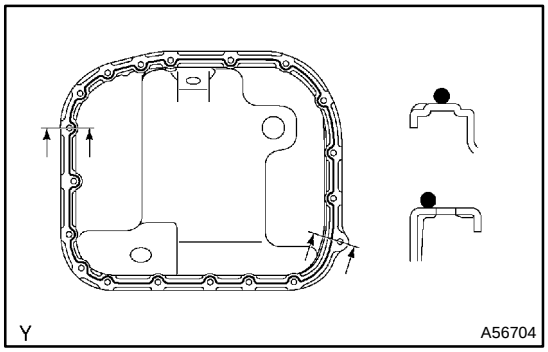
33. INSTALL OIL STRAINER SUB-ASSY

(a) Install a new gasket and the oil strainer with the 2 bolts and 2 nuts.
Torque:
21 N·m (209 kgf·cm, 15 ft·lbf) for bolt
13 N·m (135 kgf·cm, 10 ft·lbf) for nut

34. INSTALL OIL PAN SUB-ASSY NO.2

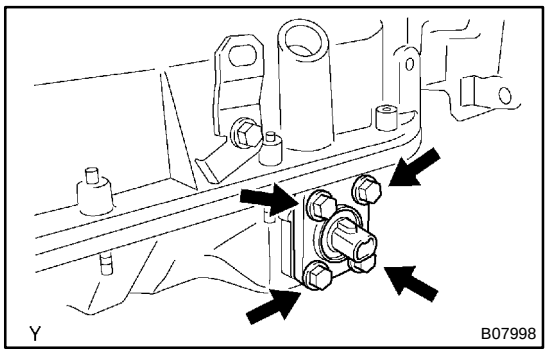
(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the No. 1 and No. 2 oil pans.
(1) Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.
(2) Thoroughly clean all components to remove all the loose material.
(3) Using a non-residue solvent, clean both sealing surfaces.

NOTICE:
Do not use a solvent which will affect the painted surfaces.



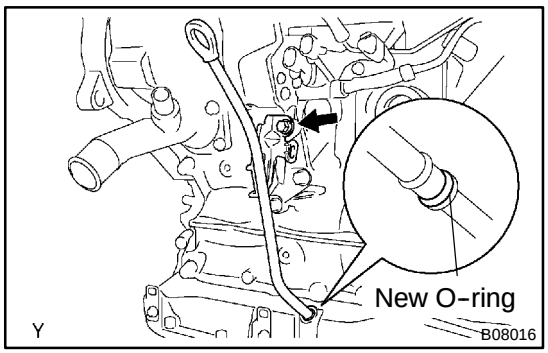
(b) Apply a seal packing to the oil pan as shown in the illustration.
Seal packing: Part No. 08826-00080 or equivalent
(1) Install a nozzle that has been cut to a 4 - 7 mm (0.16 - 0.28 in.) opening.
(2) Parts must be assembled within 15 minutes of application. Otherwise the material must be removed and reapplied.
(3) Immediately remove nozzle from the tube and reinstall the cap.

(c) Install the oil pan with the 16 bolts and 3 nuts. Uniformly tighten the bolts and nuts in several passes.
Torque: 12 N·m (119 kgf·cm, 9 ft·lbf)



35. INSTALL ENGINE OIL LEVEL SENSOR

(a) Install the level sensor with the 4 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



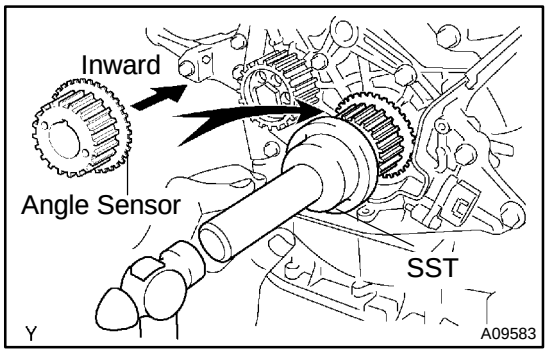
36. INSTALL OIL LEVEL GAGE GUIDE

(a) Install a new O-ring to the oil level gage guide.
(b) Apply engine oil to the O-ring.
(c) Push in the oil level gage guide end into the guide hole of the No. 1 oil pan.
(d) Install the oil level gage guide with the bolt.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)
(e) Apply engine oil to the O-ring on the oil level gage.
(f) Install the oil level gage.

37. INSTALL CHAIN TENSIONER ASSY NO.1

Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

38. INSTALL GENERATOR ASSY
(See page 19-30)



39. INSTALL CRANKSHAFT TIMING PULLEY

(a) Align the pulley set key with the key groove of the timing pulley.
(b) Using SST and a hammer, tap in the timing pulley, facing the angle sensor inward.
SST 09223-46011

40. INSTALL TIMING BELT IDLER SUB-ASSY NO.2

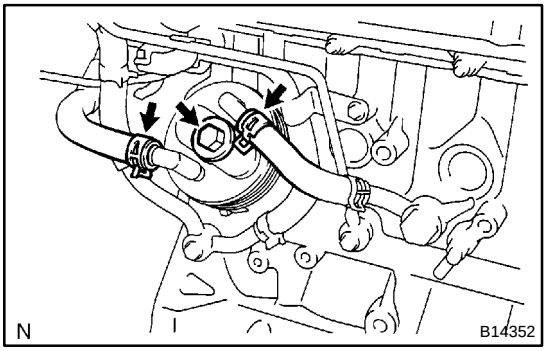
    Torque: 47 N·m (479 kgf·cm, 35 ft·lbf)
41. SET NO.1 CYLINDER TO TDC/COMPRESSION (See Page 14-215)
42. INSTALL TIMING BELT
    (See Page 14-215)
43. CHECK VALVE TIMING (See Page 14-216)
44. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
    (See Page 14-217)
45. INSTALL TIMING BELT GUIDE
    (See Page 14-217)
46. INSTALL TIMING BELT NO.1 COVER
    (See Page 14-217)
47. INSTALL TIMING BELT NO.2 COVER
    (See Page 14-218)
48. INSTALL CRANKSHAFT PULLEY
    (See Page 14-219)
    SST 09213-54015 (91651-60855), 09330-00021
49. INSTALL ENGINE MOUNTING BRACKET NO.2 RH
    (See Page 14-213)
50. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (W/ AIR CONDITIONER)
    (See Page 14-172)
51. INSTALL FRONT WHEEL RH
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
52. ADD ENGINE OIL (See Page 17-12)
53. CHECK ENGINE OIL LEAK

OIL COOLER ASSY (1CD-FTV)

1706S-01

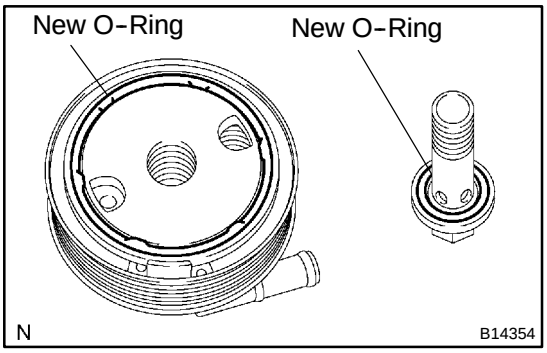
REPLACEMENT

1. DRAIN ENGINE COOLANT (See page 16-33)
2. DRAIN ENGINE OIL (See page 17-12)



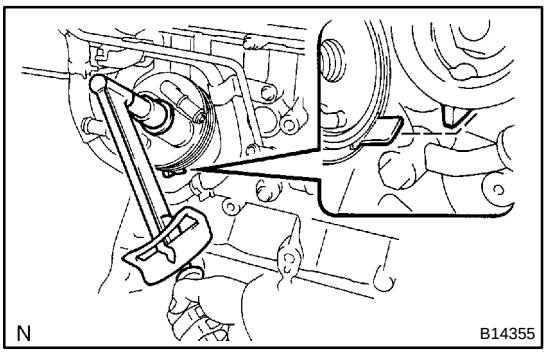
3. REMOVE OIL COOLER ASSY

(a) Disconnect the 2 cooler hoses from the oil cooler.
(b) Remove the union bolt and oil cooler.
(c) Remove the O-ring from the oil cooler.
(d) Remove the O-ring from the union bolt.



4. INSTALL OIL COOLER ASSY

(a) Clean the oil cooler contact surface on the oil cooler mounting.
(b) Install a new O-ring to the union bolt.
(c) Install a new O-ring to the oil cooler.



(d) Apply a light coat of engine oil on the threads and under the union bolt.
(e) Align the protrusion of the oil cooler with the protrusion of the cylinder block.
(f) Install the oil cooler with the union bolt.
Torque: 45 N·m (454 kgf·cm, 33 ft·lbf)
(g) Connect the 2 cooler hoses to the oil cooler.

5. ADD ENGINE OIL (See page 17-12)
6. ADD COOLANT (See page 16-33)
7. CHECK ENGINE COOLANT LEAK (See page 16-34)
8. CHECK ENGINE OIL LEAK

IGNITION

IGNITION SYSTEM (2ZZ-GE) 18-1
ON-VEHICLE INSPECTION 18-1/2
INSPECTION 18-3/4
IGNITION SYSTEM (3ZZ-FE/4ZZ-FE) 18-5
ON-VEHICLE INSPECTION 18-5/6
INSPECTION 18-7/8

IGNITION SYSTEM (2ZZ-GE)

18005-03

ON-VEHICLE INSPECTION

NOTICE:

"Cold" and "Hot" in these sentences express the temperature of the coils themselves."Cold" is from -10_C (14_F) to 50 _C (122 _F) and "Hot" is from 50 _C (122 _F) to 100 _C (212 _F).

1. INSPECT IGNITION COIL (WITH IGNITER) AND SPARK TEST

(a) Confirm DTC.

NOTICE:

If DTC is indicated, carry out troubleshooting in accordance with the procedure on the following DTC.

(b) Check that the spark occurs.

(1) Remove the ignition coils (with igniter).

(2) Using a 16mm (0.63 in) plug wrench, remove the spark plugs.

(3) Install the spark plugs to each ignition coils (with igniter), and connect the ignition coil connectors.

(4) Disconnect the 4 injector connectors.

(5) Ground the spark plugs.

(6) Check if spark occurs while engine is being cranked.

NOTICE:

- **Be sure to ground the spark plug, when checking.**
- **Replace the ignition coil when it is given an impact.**
- **Do not crank the engine for more than 2 seconds.**

If the spark does not occur, do the test as follow.

(c) Using a 16 mm (0.63 in.) plug wrench, install the spark plugs.

Torque: 18 N·m (178 kgf·cm, 13 ft·lbf)

(d) Install the ignition coil with igniter.

Torque: 8.5 N·m (87 kgf·cm, 76 in.·lbf)

2. FLOW CHART IN CASE THAT NO SPARK OCCURS

1	SPARK TEST (IF PARTIALLY OK, GO TO YES)

NO → GO TO STEP 3

YES

2	CHANGE THE FAILED SPARK PLUG TO THE OK PLUG, AND PERFORM SPARK TEST AGAIN.

OK → REPLACE THE SPARK PLUG NEW

NO

CHANGE TO NEW IGNITION COIL WITH IGNITER

3	CHANGE ALL SPARK PLUGS NEW, AND PERFORM SPARK TEST AGAIN.

OK → THE SPARK PLUGS WERE BAD

NO

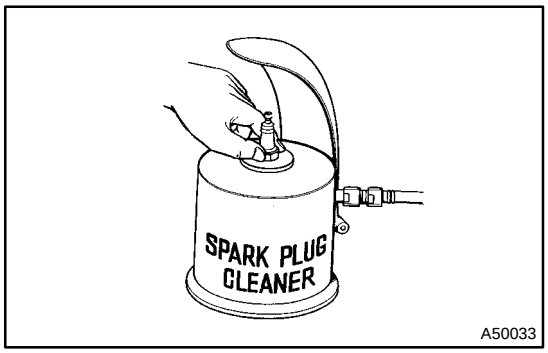
CHANGE TO NEW IGNITION COIL WITH IGNITER FOR FAILED ONES.

INSPECTION

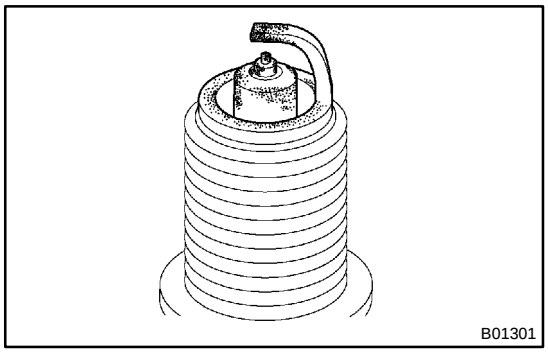
1. SPARK PLUG

NOTICE:

- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on used spark plug.**
- **Spark plug should be replaced every 100,000 km (60,000 miles).**

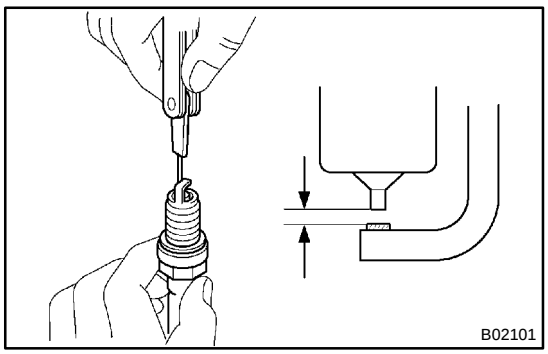


(a) Clean the spark plugs.
Air pressure: Below 588 kPa (6kg/cm^2, 85 psi)
Duration: 20 seconds or less



(b) Check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.
Recommended spark plug:
SK20R11 (DENSO made)
IFR6A11 (NGK made)



(c) Check the spark plug electrode gap.
Electrode gap: 1.1mm (0.043 in.)

2. CAM POSITION SENSOR

(a) Using an ohmmeter, measure the resistance between terminals.
RESISTANCE:

Cold	835 - 1400 Ω
Hot	1060 - 1645 Ω

If the resistance is not as specified, replace the camshaft position sensor.
NOTICE:
"Cold" and "Hot" on the table express the temperature of the coils themselves."Cold" is from -10_C (14_F) to 50 _C (122 _F) and "Hot" is from 50 _C (122 _F) to 100 _C (212 _F).

3. CRANK POSITION SENSOR

(a) Using an ohmmeter, measure the resistance between terminals.
RESISTANCE:

Cold	1630 - 2740 Ω
Hot	2065 - 3225 Ω

If the resistance is not as specified, replace the camshaft position sensor.
NOTICE:
"Cold" and "Hot" on the table express the temperature of the coils themselves."Cold" is from -10_C (14_F) to 50 _C (122 _F) and "Hot" is from 50 _C (122 _F) to 100 _C (212 _F).

IGNITION SYSTEM (3ZZ-FE/4ZZ-FE)

18005-04

ON-VEHICLE INSPECTION

NOTICE:

"Cold" and "Hot" in these sentences express the temperature of the coils themselves."Cold" is from -10_C (14_F) to 50 _C (122 _F) and "Hot" is from 50 _C (122 _F) to 100 _C (212 _F).

1. INSPECT IGNITION COIL (WITH IGNITER) AND SPARK TEST

(a) Confirm DTC.

NOTICE:

If DTC is indicated, carry out troubleshooting in accordance with the procedure on the following DTC.

(b) Check that the spark occurs.

(1) Remove the ignition coils (with igniter).

(2) Using a 16mm (0.63 in) plug wrench, remove the spark plugs.

(3) Install the spark plugs to each ignition coils (with igniter), and connect the ignition coil connectors.

(4) Disconnect the 4 injector connectors.

(5) Ground the spark plugs.

(6) Check if spark occurs while engine is being cranked.

NOTICE:

- **Be sure to ground the spark plug, when checking.**
- **Replace the ignition coil when it is given an impact.**
- **Do not crank the engine for more than 2 seconds.**

If the spark does not occur, do the test as follow.

(c) Using a 16 mm (0.63 in.) plug wrench, install the spark plugs.

Torque: 25 N·m (225 kgf·cm, 18 ft·lbf)

(d) Install the ignition coil with igniter.

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

2. FLOW CHART IN CASE THAT NO SPARK OCCURS

1	SPARK TEST (IF PARTIALLY OK, GO TO YES)

NO → GO TO STEP 3

YES

2	CHANGE THE FAILED SPARK PLUG TO THE OK PLUG, AND PERFORM SPARK TEST AGAIN.

OK → REPLACE THE SPARK PLUG NEW

NO

CHANGE TO NEW IGNITION COIL WITH IGNITER

3	CHANGE ALL SPARK PLUGS NEW, AND PERFORM SPARK TEST AGAIN.

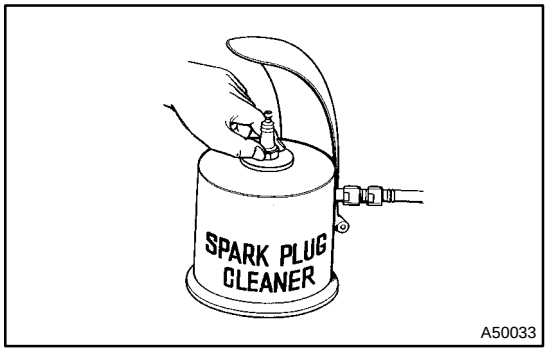
OK → THE SPARK PLUGS WERE BAD

NO

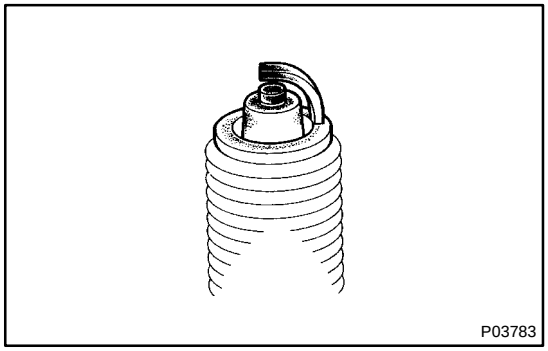
CHANGE TO NEW IGNITION COIL WITH IGNITER FOR FAILED ONES.

INSPECTION

1. SPARK PLUG



(a) Clean the spark plugs.
Air pressure: Below 588 kPa (6kg/cm^2, 85 psi)
Duration: 20 seconds or less



(b) Check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

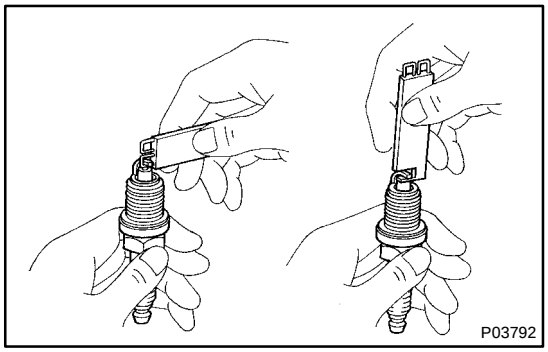
Recommended spark plug:

3ZZ-FE

DENSO made	K16R-U11
NGK made	BKR5EYA-11

4ZZ-FE

DENSO made	K16R-U11
BOSCH made	FR8KCU



(c) Adjust electrode gap.

Electrode gap:

3ZZ-FE

DENSO made	1.1 mm (0.043 in.)
NGK made	1.1 mm (0.043 in.)

4ZZ-FE

DENSO made	1.1 mm (0.043 in.)
BOSCH made	1.0 mm (0.039 in.)

2. CRANK POSITION SENSOR NO.1 (3ZZ-FE ENGINE TYPE)

(a) Using an ohmmeter, measure the resistance between terminals.
RESISTANCE:

Cold	835 - 1400 Ω
Hot	1060 - 1645 Ω

If the resistance is not as specified, replace the camshaft position sensor.
NOTICE:
"Cold" and "Hot" on the table express the temperature of the coils themselves."Cold" is from -10_C (14_F) to 50 _C (122 _F) and "Hot" is from 50 _C (122 _F) to 100 _C (212 _F).

3. CRANK POSITION SENSOR (3ZZ-FE ENGINE TYPE)

(a) Using an ohmmeter, measure the resistance between terminals.
RESISTANCE:

Cold	1630 - 2740 Ω
Hot	2065 - 3225 Ω

If the resistance is not as specified, replace the camshaft position sensor.
NOTICE:
"Cold" and "Hot" on the table express the temperature of the coils themselves."Cold" is from -10_C (14_F) to 50 _C (122 _F) and "Hot" is from 50 _C (122 _F) to 100 _C (212 _F).

4. CRANK POSITION SENSOR NO.1 (4ZZ-FE ENGINE TYPE)

HINT:
Judge it by the pulse on oscilloscope because of check by value of resistance is impossible in this case.
(See page 05-385)

5. CRANK POSITION SENSOR (4ZZ-FE ENGINE TYPE)

HINT:
Judge it by the pulse on oscilloscope because of check by value of resistance is impossible in this case.
(See page 05-381)

STARTING & CHARGING

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CHARGING SYSTEM (2ZZ–GE) 19–4
PRECAUTION 19–4
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GENERATOR ASSY (2ZZ–GE) 19–8
REPLACEMENT 19–8/10
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INSPECTION 19–11/14
STARTER ASSY (3ZZ–FE/4ZZ–FE) 19–15
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INSPECTION 19–31
GLOW PLUG ASSY (1CD–FTV) 19–32
REPLACEMENT 19–32

STARTING SYSTEM (2ZZ-GE)

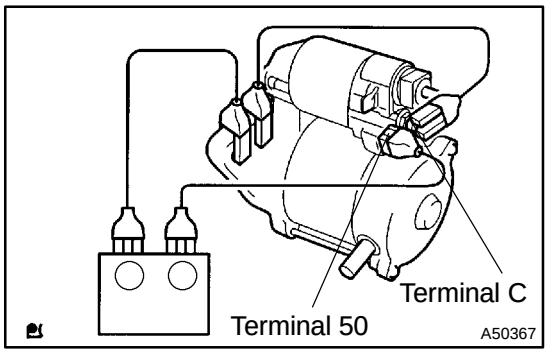
INSPECTION

1900K-03

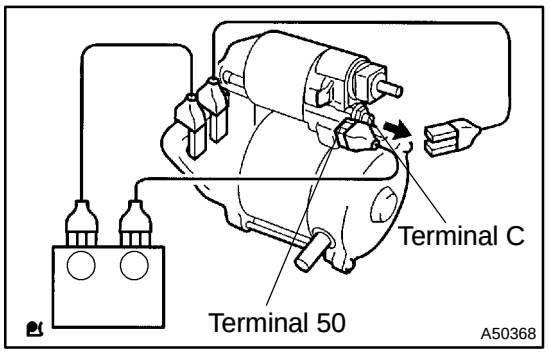
1. STARTER ASSY

NOTICE:
These tests must be done within 3 to 5 seconds to avoid burning out the coil.

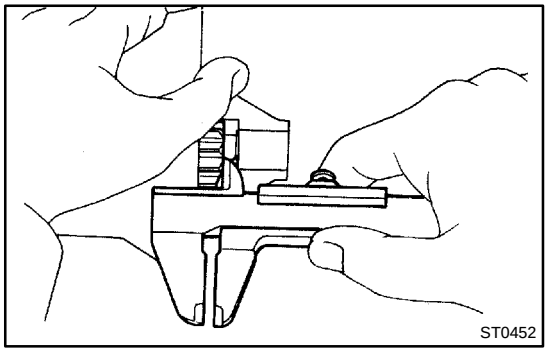
(a) Disconnect the field coil lead wire from terminal C.



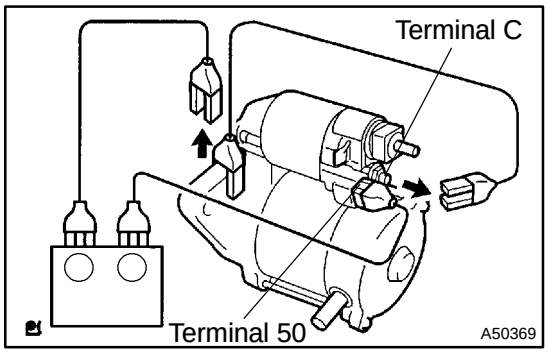
(b) Connect the battery to the magnetic switch as shown. Check that the clutch pinion gear moves outward.



(c) With battery connected as above with the clutch pinion gear out, disconnect the negative (–) lead from terminal C. Check that the pinion gear remains out.

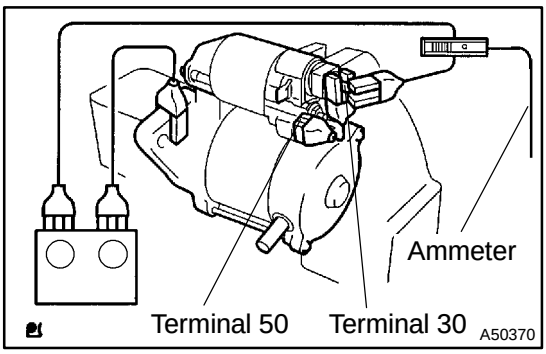


(d) Move the pinion gear toward the armature to remove slack and measure the clearance between the pinion gear end and stop collar.
Standard clearance: 1.0 - 5.0 mm (0.04 - 0.20 in.)

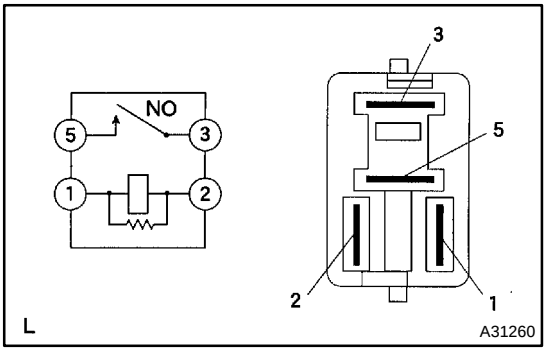


(e) Disconnect the negative (–) lead from the switch body. Check that the clutch pinion gear returns inward.

(f) Connect the field coil lead wire to terminal C.
Torque: 9.8 N·m (100 kgf·cm, 7.2 ft·lbf)



(g) Grip the starter with a vise.
(h) Connect the battery and ammeter to the starter as shown.
(i) Check that the ammeter reads the specified current.
Specified current: 90 A or less at 11.5 V



2. STARTER RELAY ASSY

Specified condition:

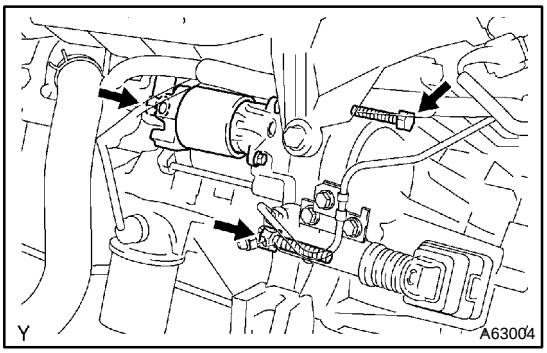
Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2	3 - 5	Continuity

STARTER ASSY (2ZZ-GE)

19013-04

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH



2. REMOVE STARTER ASSY

(a) Disconnect the starter connector.
(b) Remove the nut and disconnect the starter wire.
(c) Remove the 2 bolts and starter.

3. INSTALL STARTER ASSY

Torque:
Bolt 37 N·m (380 kgf·cm, 28 ft·lbf)
Wiring 9.8 N·m (100 kgf·cm, 7 ft·lbf)

CHARGING SYSTEM (2ZZ-GE)

1900M-05

PRECAUTION

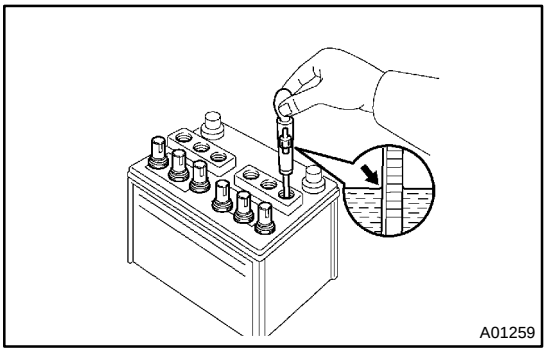
1. Check that the battery cables are connected to the correct terminals.
2. Disconnect the battery cables when the battery is given a quick charge.
3. Do not perform tests with a high voltage insulation resistance tester.
4. Never disconnect the battery while the engine is running.

ON-VEHICLE INSPECTION

1. CHECK BATTERY ELECTROLYTE LEVEL

(a) Check the electrolyte quantity of each cell (Maintenance-Free Battery).
  (1) If under the lower level, replace the battery (or add distilled water if possible) and check the charging system.

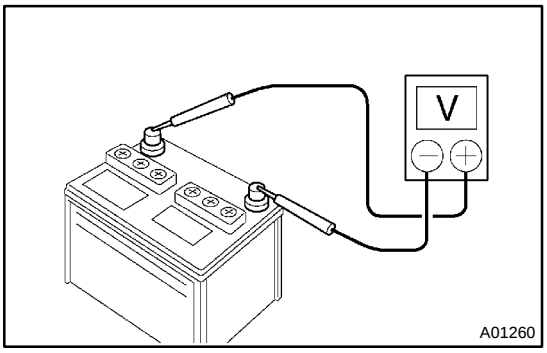
(b) Check the electrolyte quantity of each cell (Except Maintenance-Free Battery).
  (1) If under the lower level, add distilled water.



2. CHECK BATTERY SPECIFIC GRAVITY (Except Maintenance-Free Battery)

(a) Check the specific gravity of each cell.
  Standard specific gravity: 1.25 - 1.29 at 20_C (68_F)

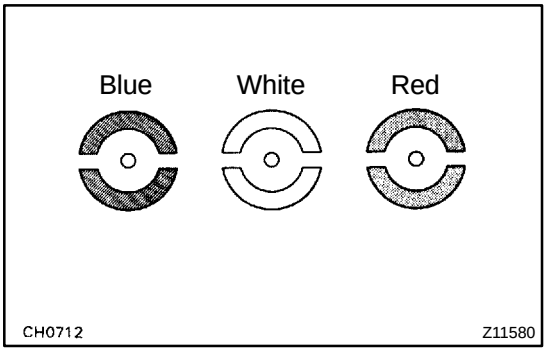
HINT:
If the specific gravity is less than specification, charge the battery.



3. CHECK BATTERY VOLTAGE

(a) After having driven the vehicle and in the case that 20 minutes have not passed after having stopped the engine, turn the ignition switch ON and turn on the electrical system (headlight, blower motor, rear defogger etc.) for 60 seconds to remove the surface charge.
(b) Turn the ignition switch OFF and turn off the electrical systems.
(c) Measure the battery voltage between the negative (-) and positive (+) terminals of the battery.
  Standard voltage: 12.5 - 12.9 V at 20_C (68_F)

HINT:
If the voltage is less than specification, charge the battery.

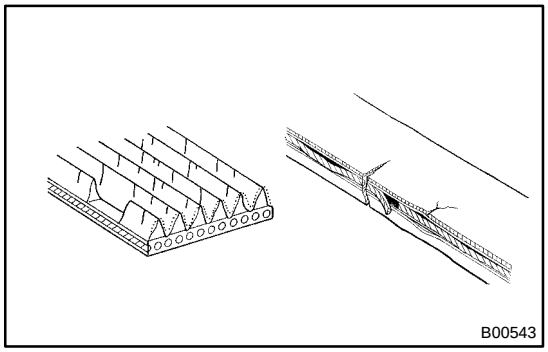


(d) Check the indicator as shown in the illustration (Except Maintenance-Free Battery).

HINT:
- Blue: OK
- White: Charging Necessary
- Red: Insufficient Water

4. CHECK BATTERY TERMINALS, FUSIBLE LINK AND FUSES

(a) Check that the battery terminals are not loose or corroded.
(b) Check the fusible link, H-fuses and fuses for continuity.

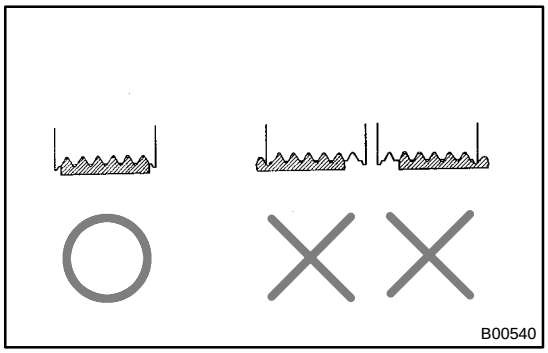


5. INSPECT DRIVE BELT

(a) Visually check the belt for excessive wear, frayed cords etc.

HINT:

- If any defect has been found, replace the drive belt.
- Cracks on the rib side of a belt are considered acceptable. If the belt has chunks missing from the ribs, it should be replaced.



(b) Check that it fits properly in the ribbed grooves.

HINT:

Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.

6. VISUALLY CHECK ALTERNATOR WIRING

(a) Check that the wiring is in good condition.

7. LISTEN FOR ABNORMAL NOISES FROM ALTERNATOR

(a) Check that there is no abnormal noise from the alternator while the engine is running.

8. INSPECT CHARGE WARNING LIGHT CIRCUIT

(a) Turn the ignition switch ON. Check that the charge warning light comes on.

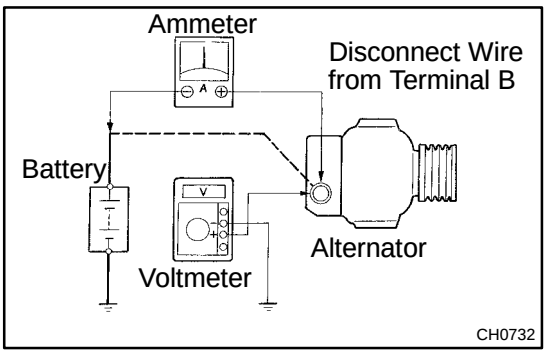
(b) Start the engine. Check that the light goes off.

HINT:

If the light does not operate as specified, troubleshoot the charge warning light circuit.

9. INSPECT CHARGING CIRCUIT WITHOUT LOAD

(a) If a battery/alternator tester is available, connect the tester to the charging circuit as permanufacturer's instructions.



(b) If a tester is not available, connect a voltmeter to the charging circuit as follows.

(1) Disconnect to the wire from terminal B of the alternator and connect it to the negative (−) lead of the ammeter.

(2) Connect the positive (+) lead of the ammeter to terminal B of the alternator.

(3) Connect the positive (+) lead of the voltmeter to terminal B of the alternator.

(4) Ground the negative (−) lead of the voltmeter.

(c) Check the charging circuit (DENSO made).

(1) With the engine running from idle to 2,000 rpm, check the reading on the ammeter and voltmeter.

Standard amperage: 10 A or less

Standard voltage: 12.9 - 14.9 V

HINT:

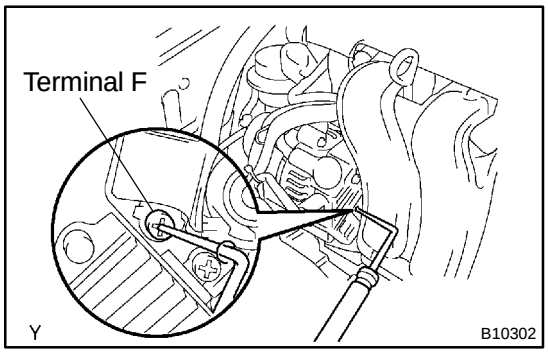
- If the voltmeter reading is more than standard voltage, replace the voltage regulator.
- If the voltmeter reading is less than the standard voltage, check the voltage regulator and alternator as follows:

(2) With terminal F grounded, start the engine and check the voltmeter reading of terminal B.

Standard voltage: 12.9 - 14.9 V

HINT:

- If the voltmeter reading is more than standard voltage, replace the voltage regulator.
- If the voltmeter reading is less than standard voltage, check the alternator.



(d) Check the charging circuit (BOSCH made).

(1) With the engine running from idle to 2,500 rpm, check the reading on the ammeter and voltmeter.

Standard amperage: 5 A or less

Standard voltage: 13.2 - 14.6 V

HINT:

- If the voltmeter reading is more than standard voltage, replace the voltage regulator.
- If the voltmeter reading is less than the standard voltage, check the voltage regulator and alternator.

10. INSPECT CHARGING CIRCUIT WITH LOAD

(a) With the engine running at 2,000 rpm, turn on the high beam headlights and place the heater blower switch at "HI".

(b) Check the reading on the ammeter.

Standard amperage: 30 A or more

HINT:

- If the ammeter reading is less than standard amperage, repair the alternator.
- If the battery is fully charged, the indication will sometimes be less than standard amperage.

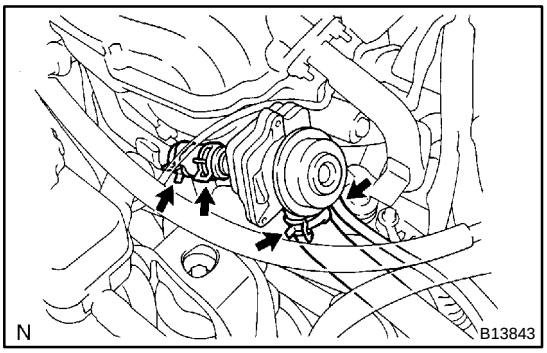
GENERATOR ASSY (2ZZ-GE)

REPLACEMENT

190B1-01

1. REMOVE ENGINE UNDER COVER RH

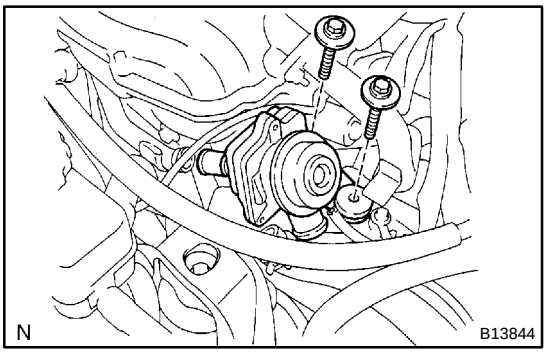
2. REMOVE CYLINDER HEAD COVER NO.2



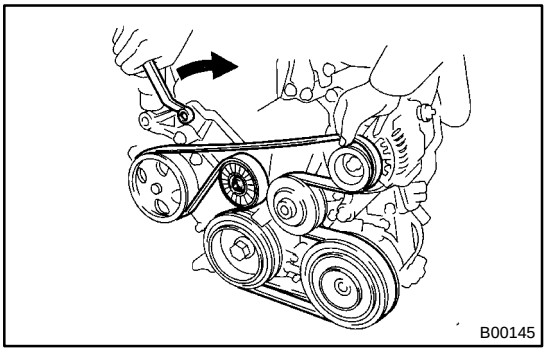
3. REMOVE AIR SWITCHING VALVE ASSY

(a) Using a plier, grip the claws of the hose clip and slide the clip along the hose.

(b) Disconnect the 3 hoses.



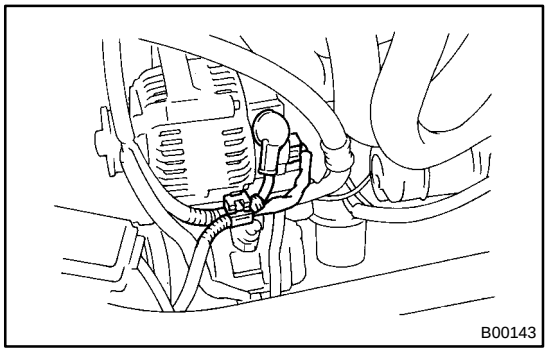
(c) Remove the 2 bolts and air switching valve assy.



4. REMOVE FAN AND GENERATOR V BELT

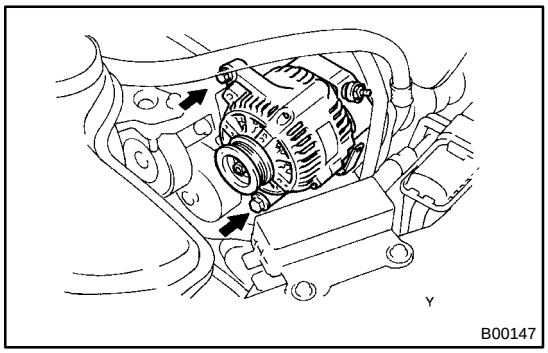
(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

5. REMOVE GENERATOR BRACKET NO.1

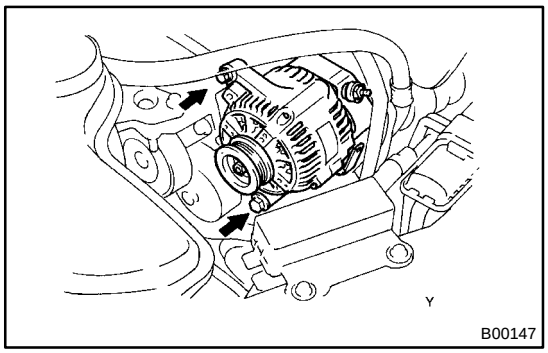


6. REMOVE GENERATOR ASSY

(a) Disconnect the wire clamp from the wire clip on the rectifire end frame.
(b) Remove the rubber cap and nut, and disconnect the alternator wire.
(c) Disconnect the alternator connector.



(d) Remove the 2 bolts and alternator.



7. INSTALL GENERATOR ASSY

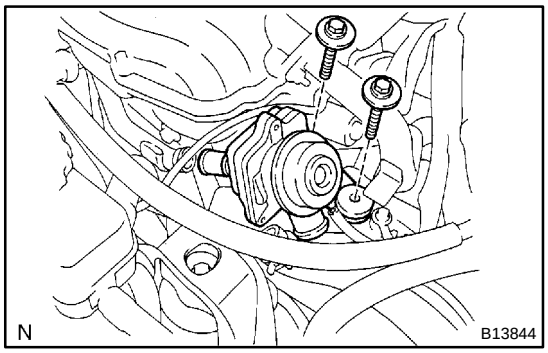
Torque:
12 mm head 25 N·m (250 kgf·cm, 18 ft·lbf)
14 mm head 58 N·m (591 kgf·cm, 43 ft·lbf)

8. INSTALL GENERATOR BRACKET NO.1

Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

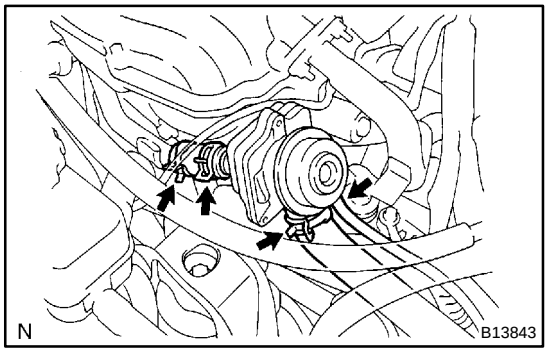
9. INSTALL FAN AND GENERATOR V BELT

10. INSTALL ENGINE UNDER COVER RH



11. INSTALL AIR SWITCHING VALVE ASSY

(a) Install the 2 bolts and air switching valve assy.
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)



(b) Connect the 3 hoses.

12. CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

STARTING SYSTEM (3ZZ-FE/4ZZ-FE)

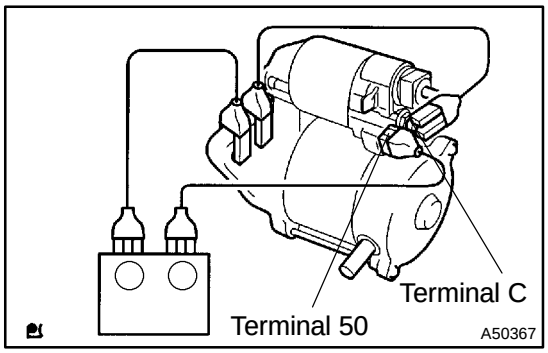
INSPECTION

190B2-01

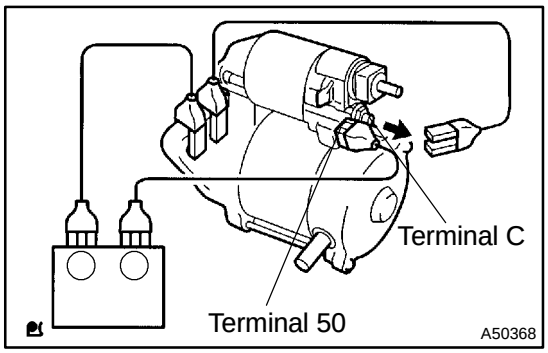
1. STARTER ASSY(DENSO MADE)

NOTICE:
These tests must be done within 3 to 5 seconds to avoid burning out the coil.

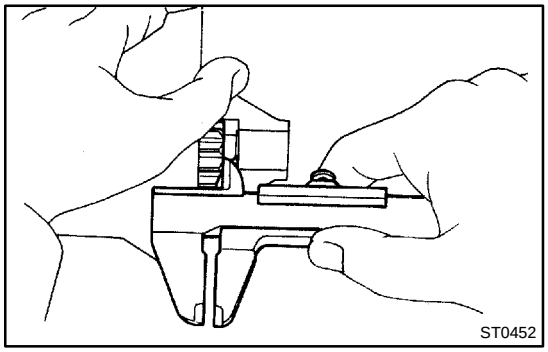
(a) Disconnect the field coil lead wire from terminal C.



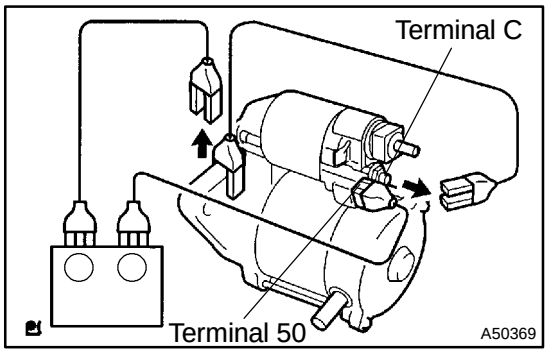
(b) Connect the battery to the magnetic switch as shown. Check that the clutch pinion gear moves outward.



(c) With battery connected as above with the clutch pinion gear out, disconnect the negative (-) lead from terminal C. Check that the pinion gear remains out.

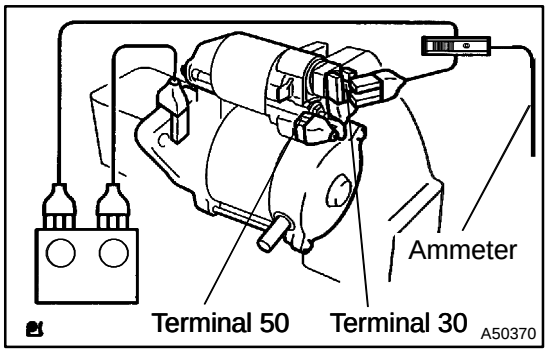


(d) Move the pinion gear toward the armature to remove slack and measure the clearance between the pinion gear end and stop collar.
Standard clearance: 1.0 - 5.0 mm (0.04 - 0.20 in.)



(e) Disconnect the negative (-) lead from the switch body. Check that the clutch pinion gear returns inward.

(f) Connect the field coil lead wire to terminal C.
Torque: 9.8 N·m (100 kgf·cm, 7.2 ft·lbf)

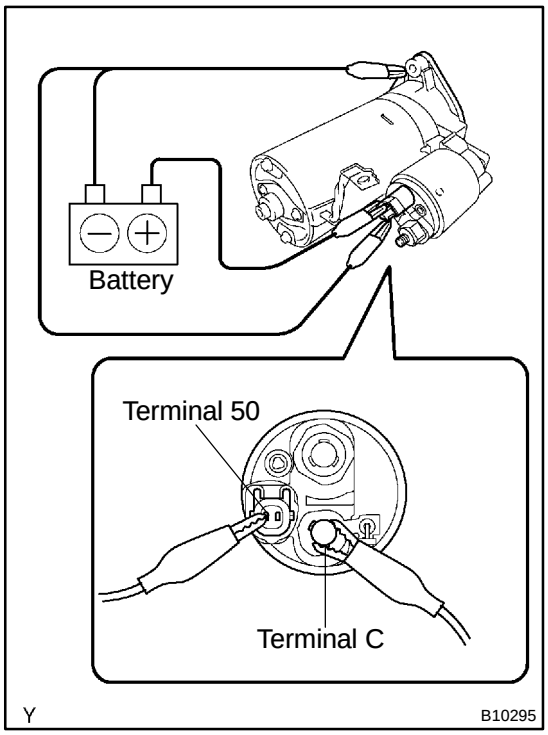


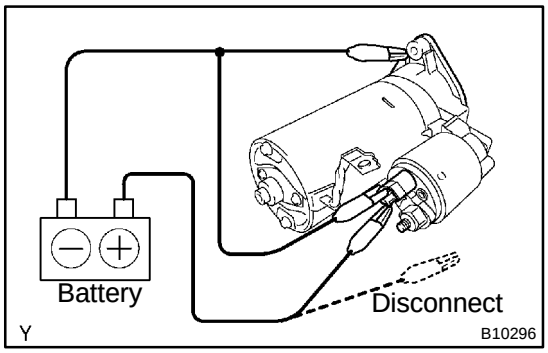
(g) Grip the starter with a vise.
(h) Connect the battery and ammeter to the starter as shown.
(i) Check that the ammeter reads the specified current.
Specified current: 90 A or less at 11.5 V

2. STARTER ASSY(BOSCH MADE)

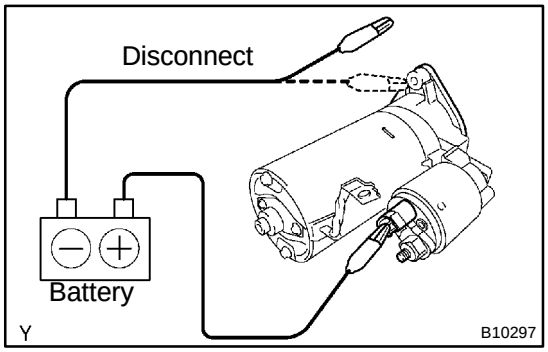
NOTICE:
These tests must be done within 3 to 5 seconds to avoid burning out the coil.

(a) Disconnect the field coil lead from terminal C.
(b) Connect the battery to the magnetic switch as shown.
Check that the clutch pinion gear moves outward.

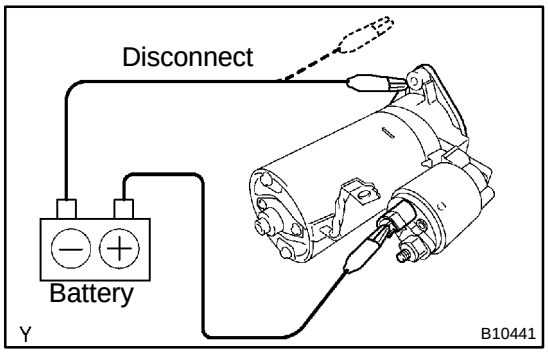




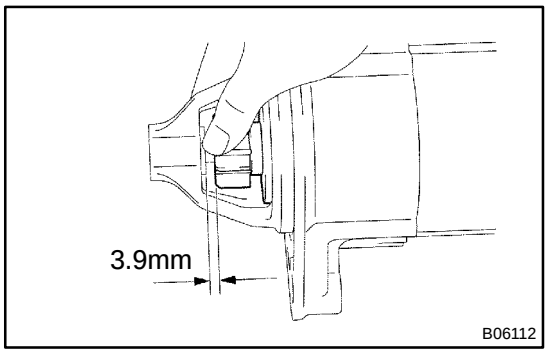
(c) With the battery connected as above and with the clutch pinion gear out, disconnect the negative (-) lead from terminal C.
Check that the clutch pinion gear remains out.



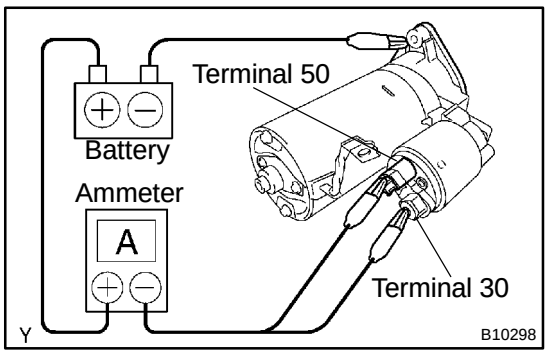
(d) Disconnect the negative (−) lead from the starter housing. Check that the clutch pinion gear returns inward.



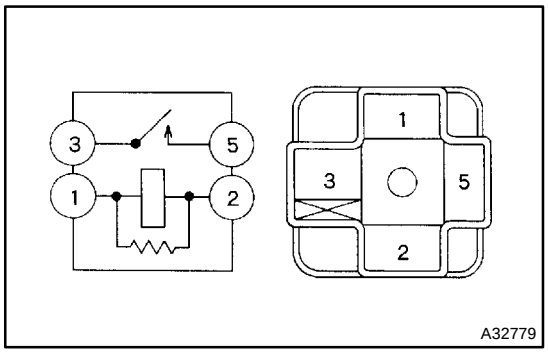
(e) Reconnect the negative (−) lead to the starter housing.



(f) Move the pinion gear toward the armature to remove slack and measure the clearance between the pinion gear end and stop collar.
Maximum clearance: 3.9 mm (0.154 in.)



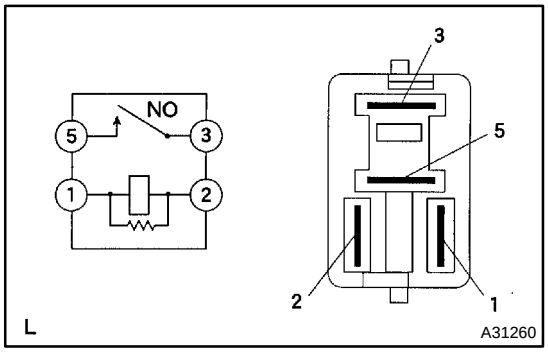
(g) Connect the field coil lead to terminal C. Make sure the lead is not grounded.
(h) Connect the battery and ammeter to the starter as shown.
(i) Check that the starter rotates smoothly and steadily with the clutch pinion gear moving out. Check that the ammeter reads the specified current.
Specified current: 160 A or less at 10.5 V



3. STARTER RELAY ASSY(TMC MADE)

Specified condition:

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2	3 - 5	Continuity



4. STARTER RELAY ASSY(TMUK MADE)

Specified condition:

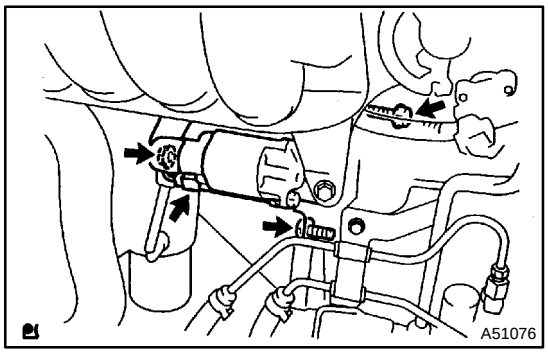
Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2	3 - 5	Continuity

STARTER ASSY (3ZZ-FE/4ZZ-FE)

190B3-01

REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH



2. REMOVE STARTER ASSY

(a) Disconnect the starter connector.
(b) Remove the nut and disconnect the starter wire.
(c) Remove the 2 bolts and starter.

3. INSTALL STARTER ASSY

Torque:
Bolt 37 N·m (378 kgf·cm, 28 ft·lbf)
Wiring 9.8 N·m (100 kgf·cm, 7 ft·lbf)

CHARGING SYSTEM (3ZZ-FE/4ZZ-FE)

1900M-06

PRECAUTION

1. Check that the battery cables are connected to the correct terminals.
2. Disconnect the battery cables when the battery is given a quick charge.
3. Do not perform tests with a high voltage insulation resistance tester.
4. Never disconnect the battery while the engine is running.

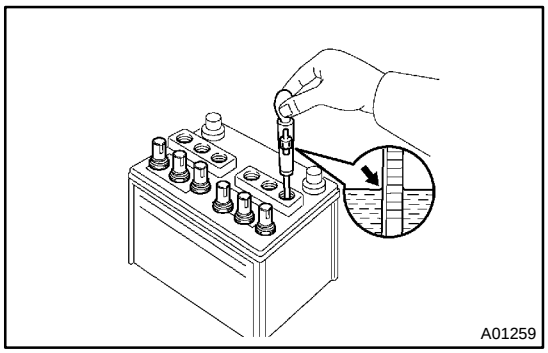
1900L-04

ON-VEHICLE INSPECTION

1. CHECK BATTERY ELECTROLYTE LEVEL

(a) Check the electrolyte quantity of each cell (Maintenance-Free Battery).
  (1) If under the lower level, replace the battery (or add distilled water if possible) and check the charging system.

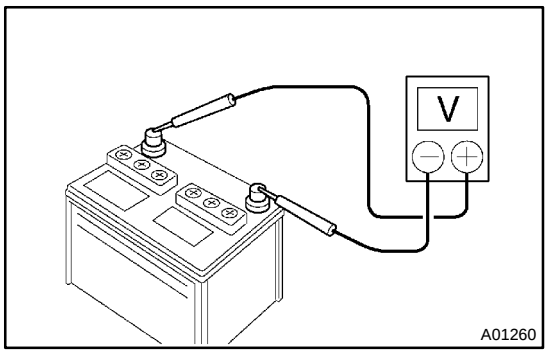
(b) Check the electrolyte quantity of each cell (Except Maintenance-Free Battery).
  (1) If under the lower level, add distilled water.



2. CHECK BATTERY SPECIFIC GRAVITY (Except Maintenance-Free Battery)

(a) Check the specific gravity of each cell.
  Standard specific gravity: 1.25 - 1.29 at 20_C (68_F)

HINT:
If the specific gravity is less than specification, charge the battery.



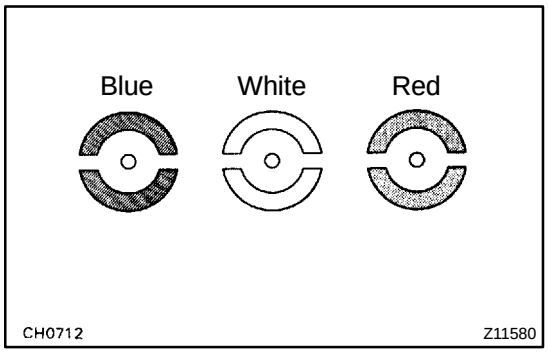
3. CHECK BATTERY VOLTAGE

(a) After having driven the vehicle and in the case that 20 minutes have not passed after having stopped the engine, turn the ignition switch ON and turn on the electrical system (headlight, blower motor, rear defogger etc.) for 60 seconds to remove the surface charge.

(b) Turn the ignition switch OFF and turn off the electrical systems.

(c) Measure the battery voltage between the negative (-) and positive (+) terminals of the battery.
  Standard voltage: 12.5 - 12.9 V at 20_C (68_F)

HINT:
If the voltage is less than specification, charge the battery.



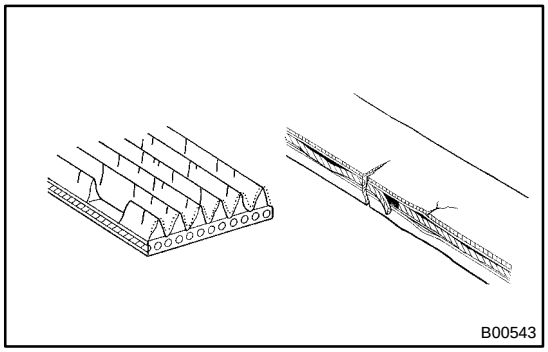
(d) Check the indicator as shown in the illustration (Except Maintenance-Free Battery).

HINT:
- Blue: OK
- White: Charging Necessary
- Red: Insufficient Water

4. CHECK BATTERY TERMINALS, FUSIBLE LINK AND FUSES

(a) Check that the battery terminals are not loose or corroded.

(b) Check the fusible link, H-fuses and fuses for continuity.

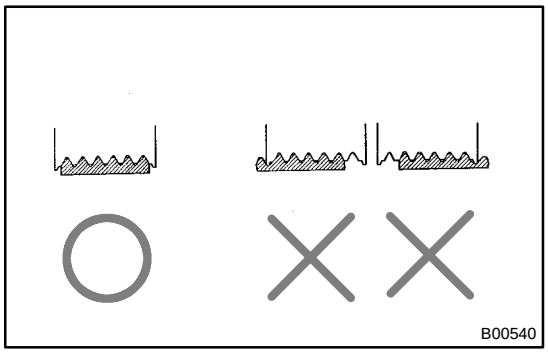


5. INSPECT DRIVE BELT

(a) Visually check the belt for excessive wear, frayed cords etc.

HINT:

- If any defect has been found, replace the drive belt.
- Cracks on the rib side of a belt are considered acceptable. If the belt has chunks missing from the ribs, it should be replaced.



(b) Check that it fits properly in the ribbed grooves.

HINT:

Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.

6. VISUALLY CHECK ALTERNATOR WIRING

(a) Check that the wiring is in good condition.

7. LISTEN FOR ABNORMAL NOISES FROM ALTERNATOR

(a) Check that there is no abnormal noise from the alternator while the engine is running.

8. INSPECT CHARGE WARNING LIGHT CIRCUIT

(a) Turn the ignition switch ON. Check that the charge warning light comes on.

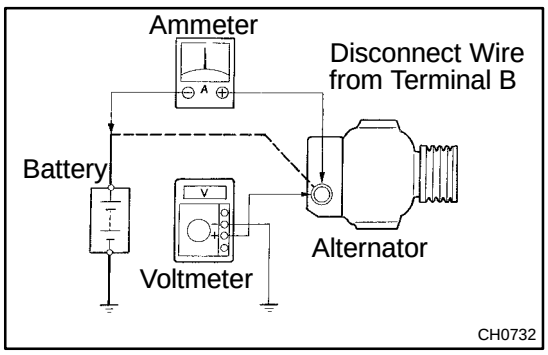
(b) Start the engine. Check that the light goes off.

HINT:

If the light does not operate as specified, troubleshoot the charge warning light circuit.

9. INSPECT CHARGING CIRCUIT WITHOUT LOAD

(a) If a battery/alternator tester is available, connect the tester to the charging circuit as permanufacturer's instructions.



(b) If a tester is not available, connect a voltmeter to the charging circuit as follows.

(1) Disconnect to the wire from terminal B of the alternator and connect it to the negative (-) lead of the ammeter.

(2) Connect the positive (+) lead of the ammeter to terminal B of the alternator.

(3) Connect the positive (+) lead of the voltmeter to terminal B of the alternator.

(4) Ground the negative (-) lead of the voltmeter.

(c) Check the charging circuit (DENSO made).

(1) With the engine running from idle to 2,000 rpm, check the reading on the ammeter and voltmeter.

Standard amperage: 10 A or less

Standard voltage: 12.9 - 14.9 V

HINT:

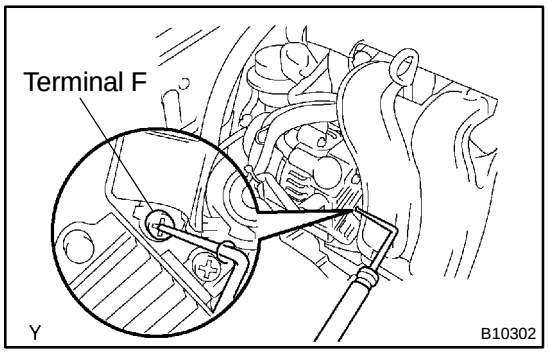
- If the voltmeter reading is more than standard voltage, replace the voltage regulator.
- If the voltmeter reading is less than the standard voltage, check the voltage regulator and alternator as follows:

(2) With terminal F grounded, start the engine and check the voltmeter reading of terminal B.

Standard voltage: 12.9 - 14.9 V

HINT:

- If the voltmeter reading is more than standard voltage, replace the voltage regulator.
- If the voltmeter reading is less than standard voltage, check the alternator.



(d) Check the charging circuit (BOSCH made).

(1) With the engine running from idle to 2,500 rpm, check the reading on the ammeter and voltmeter.

Standard amperage: 5 A or less

Standard voltage: 13.2 - 14.6 V

HINT:

- If the voltmeter reading is more than standard voltage, replace the voltage regulator.
- If the voltmeter reading is less than the standard voltage, check the voltage regulator and alternator.

10. INSPECT CHARGING CIRCUIT WITH LOAD

(a) With the engine running at 2,000 rpm, turn on the high beam headlights and place the heater blower switch at "HI".

(b) Check the reading on the ammeter.

Standard amperage: 30 A or more

HINT:

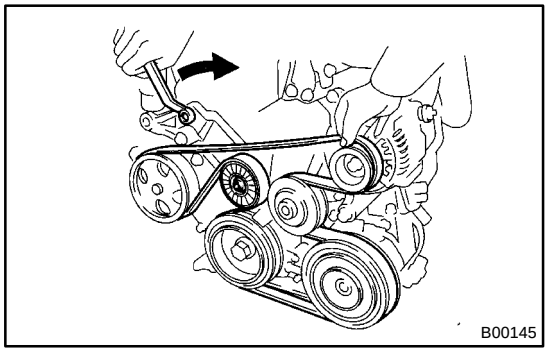
- If the ammeter reading is less than standard amperage, repair the alternator.
- If the battery is fully charged, the indication will sometimes be less than standard amperage.

GENERATOR ASSY (3ZZ-FE/4ZZ-FE)

190B4-01

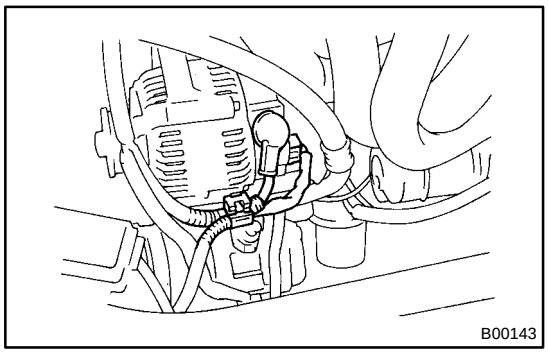
REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH



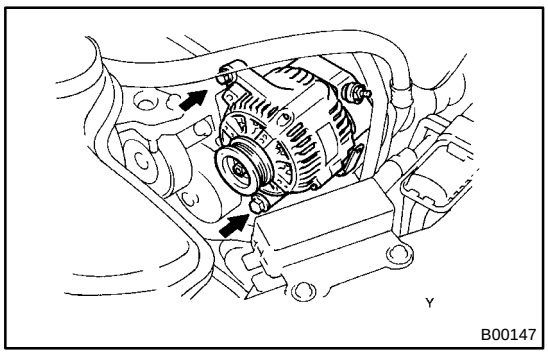
2. REMOVE FAN AND GENERATOR V BELT

(a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

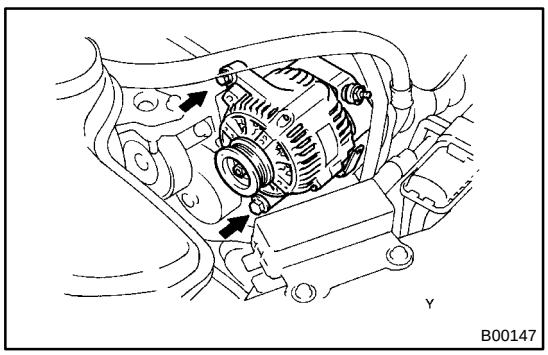


3. REMOVE GENERATOR ASSY

(a) Disconnect the wire clamp from the wire clip on the rectifire end frame.
(b) Remove the rubber cap and nut, and disconnect the alternator wire.
(c) Disconnect the alternator connector.



(d) Remove the 2 bolts and alternator.



4. INSTALL GENERATOR ASSY

Torque:
12 mm head 25 N·m (250 kgf·cm, 18 ft·lbf)
14 mm head 54 N·m (550 kgf·cm, 39 ft·lbf)

STARTING SYSTEM (1CD-FTV)

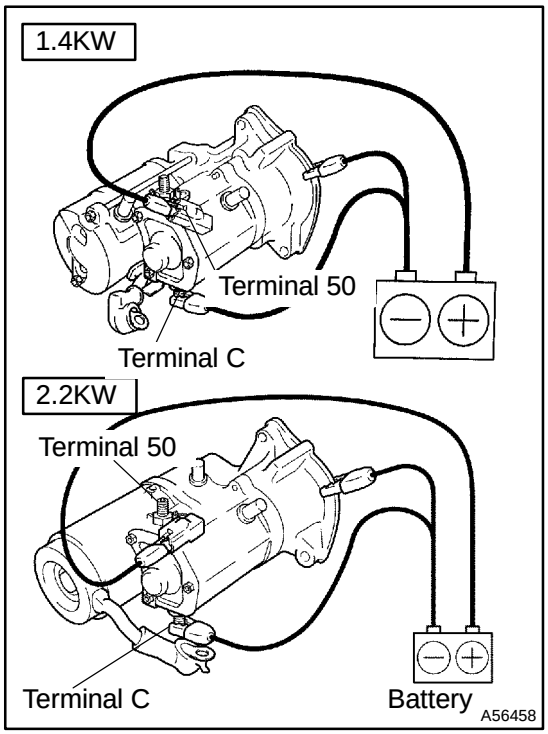
INSPECTION

190B5-01

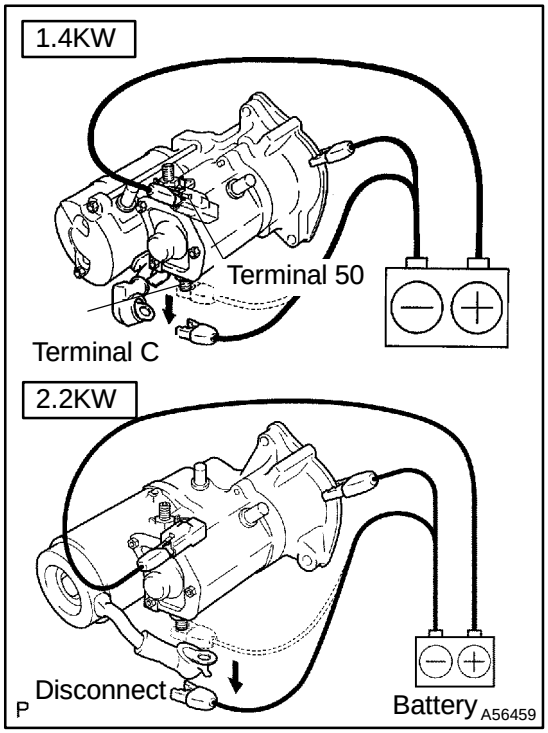
1. STARTER ASSY(DENSO MADE)

NOTICE:
These tests must be done within 3 to 5 seconds to avoid burning out the coil.

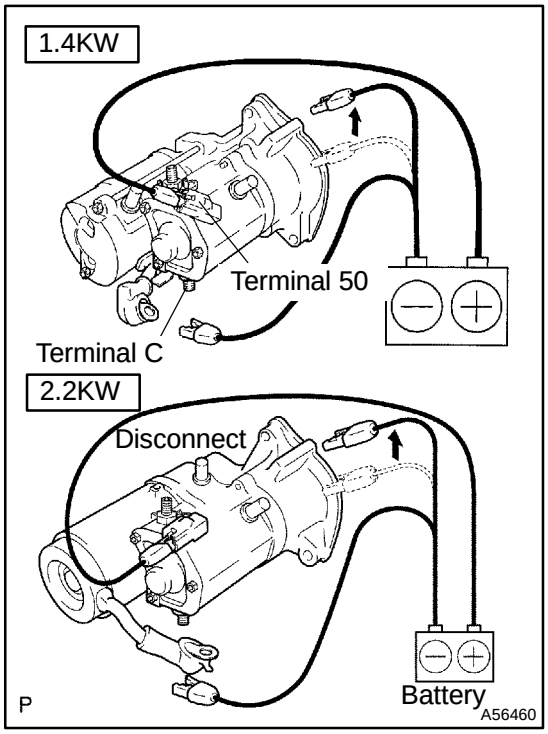
(a) Disconnect the field coil lead wire from terminal C.



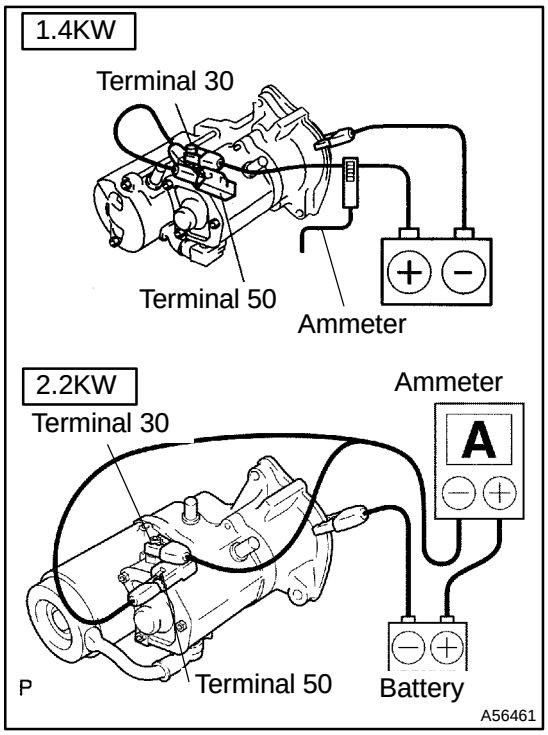
(b) Connect the battery to the magnetic switch as shown. Check that the clutch pinion gear moves outward.



(c) With battery connected as above with the clutch pinion gear out, disconnect the negative (-) lead from terminal C. Check that the pinion gear remains out.



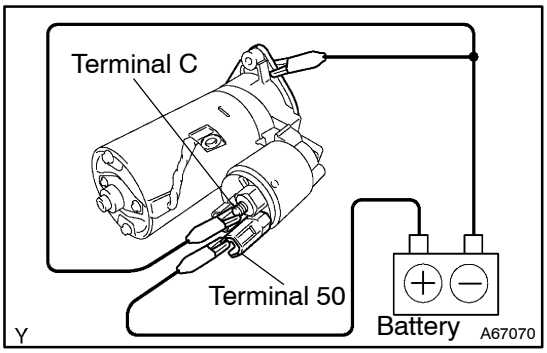
(d) Disconnect the negative (–) lead from the switch body. Check that the clutch pinion gear returns inward.



(e) Connect the lead wire to the terminal C with the nut.
Torque:
1.4kw 5.9 N·m (60 kgf·cm, 52 in.·lbf)
2.2kw 5.9 N·m (60 kgf·cm, 52 in.·lbf)

(f) Connect the battery and ammeter to the starter as shown.

(g) Check that the starter rotates smoothly and steadily with the pinion gear moving out. Check that the ammeter shows the specified current.
Specified current:
1.4kw 90 A or less at 11.5 V
2.2kw 120 A or less at 11.5 V



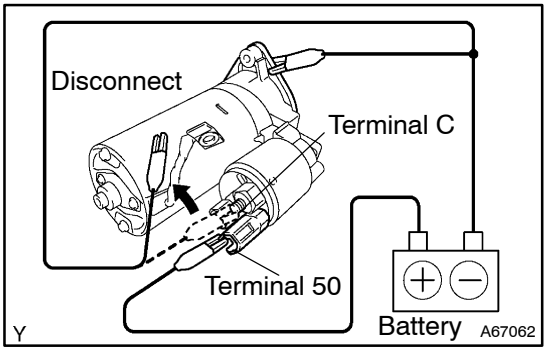
2. STARTER ASSY(BOSCH MADE)

NOTICE:
These tests must be done within 3 to 5 seconds to avoid burning out the coil.

(a) Disconnect the field coil lead from terminal C.

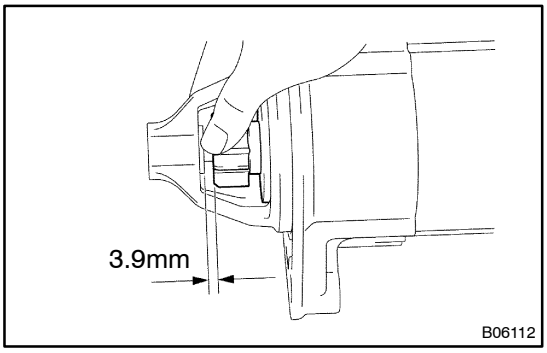
(b) Connect the battery to the magnetic switch as shown. Check that the clutch pinion gear moves outward.

If the clutch pinion gear does not move, replace the magnetic switch.

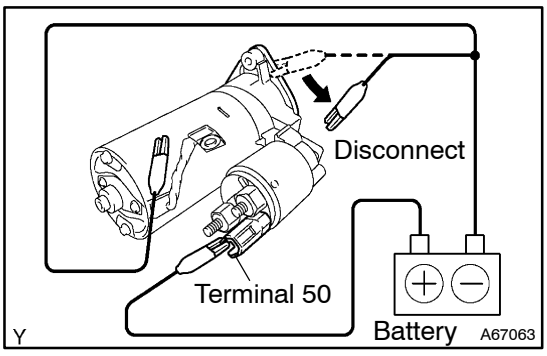


(c) With the battery connected as above and with the clutch pinion gear out, disconnect the negative (–) lead from terminal C. Check that the clutch pinion gear remains out.

If the clutch pinion gear returns inward, replace the magnetic switch.

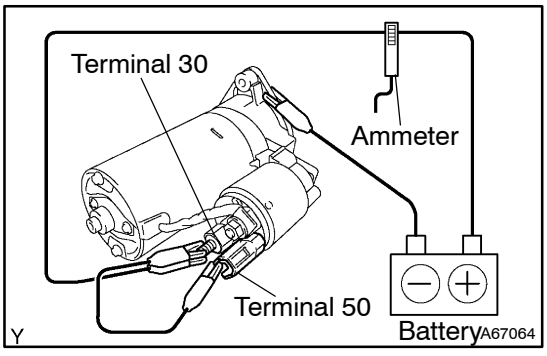


(d) Move the pinion gear toward the armature to remove slack and measure the clearance between the pinion gear end and stop collar.
Maximum clearance: 3.9 mm (0.154 in.)



(e) Disconnect the negative (–) lead from the starter housing. Check that the clutch pinion gear returns inward.

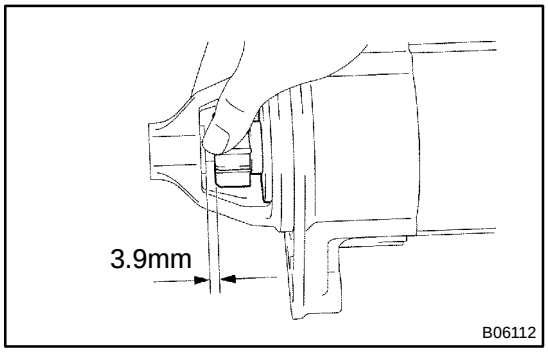
If the clutch pinion gear does not return, replace the magnetic switch.



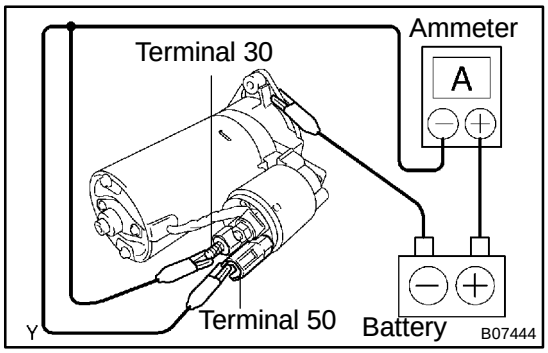
(f) Connect the field coil lead to terminal C. Make sure the lead is not grounded.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(g) Connect the battery and ammeter to the starter as shown.

(h) Check that the starter rotates smoothly and steadily with the clutch pinion gear moving out. Check that the ammeter reads the specified current.
Specified current: 160 A or less at 10.5 V



(f) Move the pinion gear toward the armature to remove slack and measure the clearance between the pinion gear end and stop collar.
Maximum clearance: 3.9 mm (0.154 in.)



(g) Connect the field coil lead to terminal C. Make sure the lead is not grounded.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
(h) Connect the battery and ammeter to the starter as shown.
(i) Check that the starter rotates smoothly and steadily with the clutch pinion gear moving out. Check that the ammeter reads the specified current.
Specified current: 160 A or less at 10.5 V

STARTER ASSY (1CD-FTV)

19068-04

REPLACEMENT

1. **REMOVE ENGINE UNDER COVER RH**

2. **DRAIN ENGINE COOLANT** **(See page 16-33)**
3. **REMOVE RADIATOR RESERVE TANK ASSY**

4. **REMOVE STARTER ASSY**

(a) Disconnect the starter connector.
(b) Remove the nut and disconnect the terminal 30.
(c) Remove the 2 bolts and starter.

5. **INSTALL STARTER ASSY**

Torque:
Bolt 37 N·m (378 kgf·cm, 28 ft·lbf)
Terminal 30 13 N·m (130 kgf·cm, 9 ft·lbf)

6. **ADD COOLANT** **(See page 16-33)**
7. **CHECK ENGINE COOLANT LEAK** **(See page 16-27)**

CHARGING SYSTEM (1CD-FTV)

19069-03

PRECAUTION

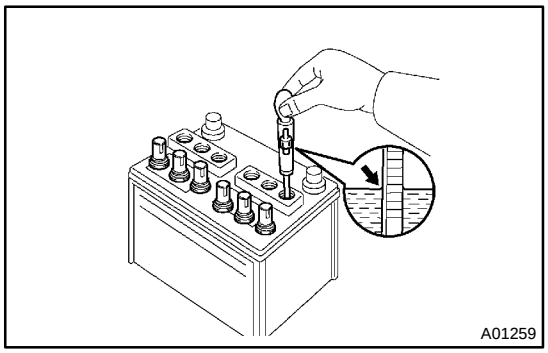
1. Check that the battery cables are connected to the correct terminals.
2. Disconnect the battery cables when the battery is given a quick charge.
3. Do not perform tests with a high voltage insulation resistance tester.
4. Never disconnect the battery while the engine is running.
5. Check that the charging cable is tightened on terminal B of the alternator and the fuse box.
6. Do not check whether the alternator generators or not with connecting terminal F to the other terminal.

ON-VEHICLE INSPECTION

1. CHECK BATTERY ELECTROLYTE LEVEL

(a) Check the electrolyte quantity of each cell (Maintenance - Free Battery).
  (1) If under the lower level, replace the battery (or add distilled water if possible) and check the charging system.

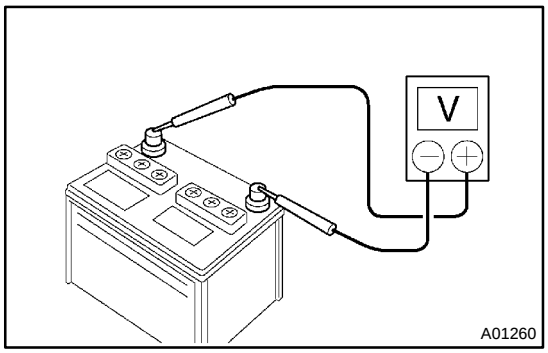
(b) Check the electrolyte quantity of each cell (Except Maintenance - Free Battery).
  (1) If under the lower level, add distilled water.



2. CHECK BATTERY SPECIFIC GRAVITY (Except Maintenance - Free Battery)

(a) Check the specific gravity of each cell.
  Standard specific gravity: 1.25 - 1.29 at 20_C (68_F)

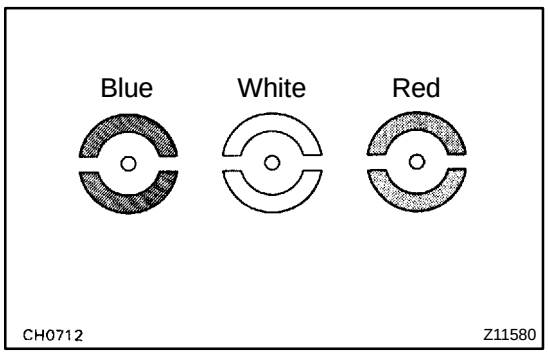
If the specific gravity is less than specification, charge the battery.



3. CHECK BATTERY VOLTAGE

(a) After having driven the vehicle and in the case that 20 minutes have not passed after having stopped the engine, turn the ignition switch ON and turn on the electrical system (headlight, blower motor, rear defogger etc.) for 60 seconds to remove the surface charge.
(b) turn the ignition switch OFF and turn off the electrical systems.
(c) Measure the battery voltage between the negative (-) and positive (+) terminals of the battery.
  Standard voltage: 12.5 - 12.9 at 20_C (68_F)

If the voltage is less than specification, charge the battery.



(d) Check the indicator as shown in the illustration (Except Maintenance - Free Battery).

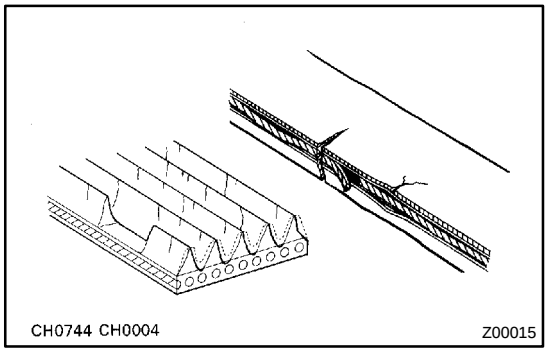
HINT:
- Blue: OK
- White: Charging Necessary
- Red: Insufficient Water

4. CHECK BATTERY TERMINALS, FUSIBLE LINK AND FUSES

(a) Check that the battery terminals are not loose or corroded.

If the terminals are corroded clean the terminals.

(b) Check the fusible link, H-fuses and fuses for continuity.



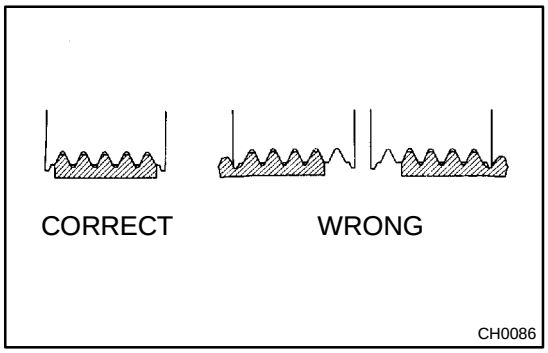
5. INSPECT DRIVE BELT

(a) Visually check the drive belt for excessive wear, frayed cords etc.

If any defect has been found, replace the drive belt.

HINT:

Cracks on the rib side of a drive belt are considered acceptable. If the drive belt has chunks missing from the ribs, it should be replaced.



(b) Check that the drive belt fits properly in the ribbed grooves.

6. VISUALLY CHECK ALTERNATOR WIRING

(a) Check that the wiring is in good condition.

7. LISTEN FOT ABNORMAL NOISES FORM ALTERNATOR

(a) Check that there is no abnormal noise from the alternator while the engine is running.

8. INSPECT CHARGE WARNING LIGHT CIRCUIT

(a) Turn the ignition switch ON. Check that the charge warning light comes on.

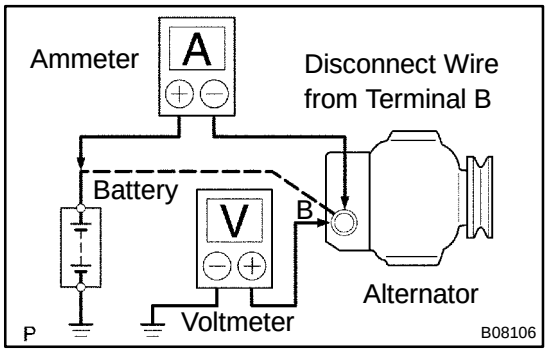
(b) Start the engine. Check that the light goes off.

If the light does not operate as specified, troubleshoot the charge warning light circuit.

9. INSPECT CHARGING CIRCUIT WITHOUT LOAD

HINT:

If a battery/alternator tester is available, connect the tester to the charging circuit as manufacturer's instructions.



(a) If a tester is not available, connect a voltmeter to the charging circuit as follows.

(1) Disconnect to the wire from terminal B of the alternator and connect it to the negative (-) lead of the ammeter.

(2) Connect the positive (+) lead of the ammeter to terminal B of the alternator.

(3) Connect the positive (+) lead of the voltmeter to terminal B of the alternator.

(4) Ground the negative (-) lead of the voltmeter.

(b) Check the charging circuit (as follows.).

(1) With the engine running from idle to 5,000 rpm, check the reading on the ammeter and voltmeter.

Standard amperage: 10 A or less

Standard voltage: 13.2 - 14.0 V at 115_C (239_F)

If the voltmeter reading is more than standard voltage, replace the voltage regulator.

10. INSPECT CHARGING CIRCUIT WITH LOAD

(a) With the engine running at 2,000 rpm, turn on the high beam headlights and place the heater blower switch at "HI".

(b) Check the reading on the ammeter.

Standard amperage: 30 A or more

If the ammeter reading is less than standard amperage, repair the alternator.

HINT:

If the battery is fully charged, the indication will sometimes be less than standard amperage.

GENERATOR ASSY (1CD-FTV)

1906B-03

REPLACEMENT

1. **REMOVE ENGINE UNDER COVER RH**

2. **REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1**
   (See page 14-172)
3. **REMOVE GENERATOR V BELT**
   (See page 14-172)
4. **REMOVE EXHAUST PIPE ASSY FRONT**

5. **REMOVE GENERATOR ASSY**

(a) Remove the cap and nut, and disconnect the generator wire.
(b) Disconnect the generator connector.
(c) Remove the 2 bolts and generator.

6. **INSTALL GENERATOR ASSY**

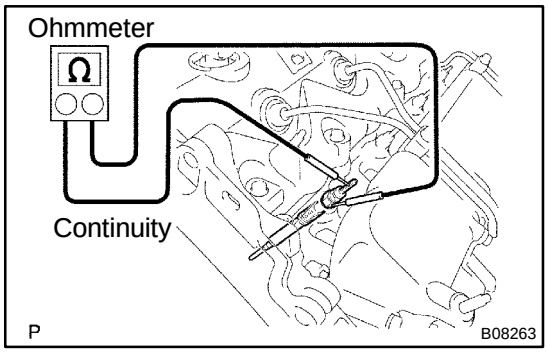
   Torque:
   M8 21 N·m (214 kgf·cm, 15 ft·lbf)
   M10 52 N·m (530 kgf·cm, 38 ft·lbf)
   Alternator wire 9.8 N·m (100 kgf·cm, 7 ft·lbf)
7. **INSTALL EXHAUST PIPE ASSY FRONT**
   (See page 15-8)
8. **INSTALL GENERATOR V BELT**
   (See page 14-172)
9. **INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1**
   (See page 14-172)
10. **ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1**
    (See page 14-172)
11. **CHECK EXHAUST LEAKAGE**

PRE-HEATING SYSTEM (1CD-FTV)

ON-VEHICLE INSPECTION

1906C-03

1. INSPECT GLOW PLUGS



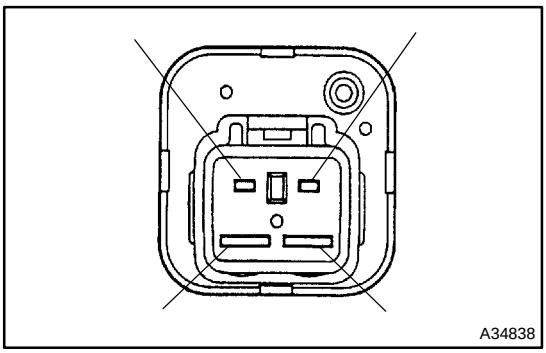
(a) Using an ohmmeter, check that there is continuity between the glow plug terminal and ground.

Standard resistance: Approx. 0.72 Ω at 20_C (68_F)

NOTICE:

- **Be careful not to damage the glow plug pipes as it could cause an open circuit or shorten life of the glow plugs.**
- **Avoid getting oil and gasoline on the glow plug when cleaning.**
- **During inspection, be sure to wipe any oil of the terminal and bakelite washer with a dry cloth.**
- **Be careful not to apply more than 11 V to the glow plug as it could cause an open circuit.**

INSPECTION



1. GLOW PLUG RELAY ASSY

(a) Inspect the glow plug relay continuity.
(1) Using an ohmmeter, check that there is no continuity between terminals 1 and 2.
Specified condition: No continuity
(2) Check that there is continuity between terminals 3 and 4.
Specified condition: Continuity

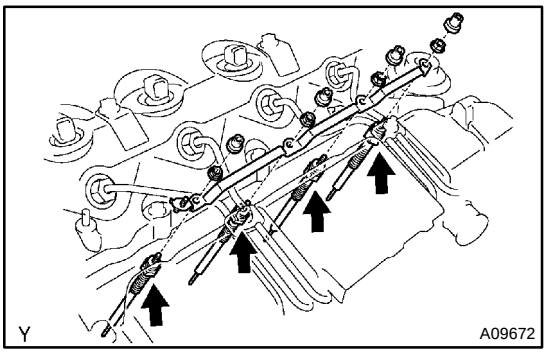
(b) Inspect the glow plug relay operation.
(1) Apply battery voltage across terminals 3 and 4.
(2) Using an ohmmeter, check that there is continuity between terminals 1 and 2.
Specified condition: Continuity

GLOW PLUG ASSY (1CD-FTV)

1906E-03

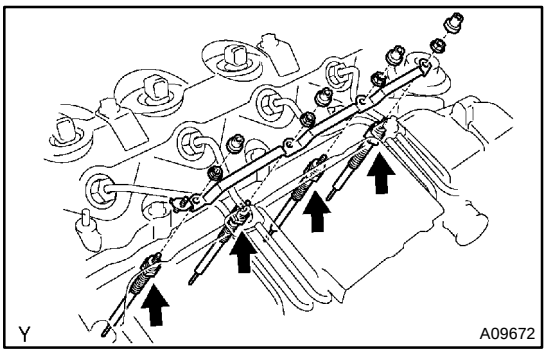
REPLACEMENT

1. REMOVE ENGINE COVER SUB-ASSY NO.1



2. REMOVE GLOW PLUG ASSY

(a) Remove the 4 grommets.
(b) Remove the 4 nuts and glow plug connector.
(c) Remove the 4 glow plugs.



3. INSTALL GLOW PLUG ASSY

(a) Install the glow plugs.
Torque: 12.3 N·m (125 kgf·cm, 9 ft·lbf)
(b) Install the glow plug connector with the 4 nuts.
(c) Install the 4 grommets.

4. INSTALL ENGINE COVER SUB-ASSY NO.1

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

FRONT SUSPENSION

FRONT SUSPENSION SYSTEM 26–1
PROBLEM SYMPTOMS TABLE 26–1
FRONT WHEEL ALIGNMENT 26–2
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FRONT SHOCK ABSORBER
WITH COIL SPRING 26–6
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LOWER BALL JOINT ASSY FRONT LH 26–16
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REPLACEMENT 26–20/22

FRONT SUSPENSION SYSTEM

PROBLEM SYMPTOMS TABLE

2600K-05

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

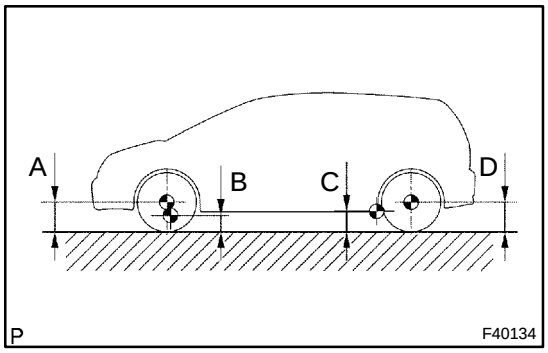
Symptom	Suspect Area	See page
Wander/pulls	4. Tire (Worn or improperly inflated)	28-1
	5. Wheel alignment (Incorrect)	26-2
	6. Steering linkage (Loose or worn)	-
	7. Hub bearing (Worn)	30-32
	8. Steering gear (Out of adjustment or broken)	51-6
	9. Suspension parts (Worn)	-
Bottoming	1. Vehicle (Overloaded)	-
	2. Spring (Weak)	26-7
	3. Shock absorber (Worn)	26-7
Sways/pitches	1. Tire (Worn or improperly inflated)	28-1
	2. Stabilizer bar (Bent or broken)	26-20
	3. Shock absorber (Worn)	26-7
Front wheel shimmy	1. Tire (Worn or improperly inflated)	28-1
	2. Wheel (Out of balance)	28-1
	3. Shock absorber (Worn)	26-7
	4. Wheel alignment (Incorrect)	26-2
	5. Ball joint (Worn)	26-17
	6. Hub bearing (Worn)	30-32
	7. Steering linkage (Loose or worn)	-
	8. Steering gear (Out of adjustment or broken)	51-6
Abnormal tire wear	1. Tire (Worn or improperly inflated)	28-1
	2. Wheel alignment (Incorrect)	26-2
	3. Shock absorber (Worn)	26-7
	4. Suspension parts (Worn)	-

FRONT WHEEL ALIGNMENT

26075-01

ADJUSTMENT

1. INSPECT TIRE (See page 28-1)



2. MEASURE VEHICLE HEIGHT

Measuring points:

A: Ground clearance of front wheel center

B: Ground clearance of lower suspension arm front bolt center

C: Ground clearance of axle beam set bolt center

D: Ground clearance of rear wheel center

Vehicle height:

(Normal package)

Tire size	175/70R14	195/60R15		195/55R16
Engine type	4ZZ-FE	3ZZ-FE, 4ZZ-FE	1CD-FTV	2ZZ-GE
Front	A - B: 86 mm (3.46 in.)	A - B: 88 mm (3.43 in.)	A - B: 90 mm (3.54 in.)	A - B: 85 mm (3.35 in.)
Rear	D - C: 38 mm (1.73 in.)	D - C: 40 mm (1.73 in.)	D - C: 45 mm (1.77 in.)	D - C: 41 mm (1.61 in.)

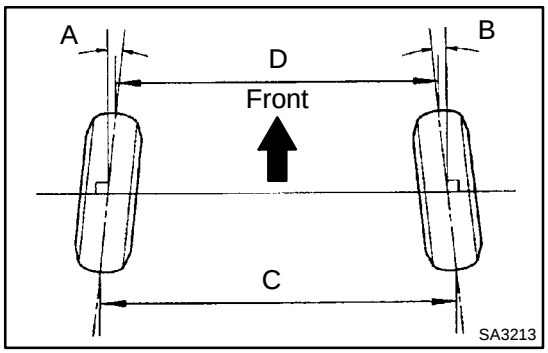
(Rough road package)

Tire size	175/70R14	195/60R15
Engine type	4ZZ-FE	3ZZ-FE, 4ZZ-FE
Front	A - B: 69 mm (2.72 in.)	A - B: 68 mm (2.68 in.)
Rear	D - C: 26 mm (1.02 in.)	D - C: 25 mm (0.98 in.)

NOTICE:

Before inspecting the wheel alignment, adjust the vehicle height to the specified value.

If the vehicle height is not the specified value, try to adjust it by pushing down on or lifting the body.



3. INSPECT TOE-IN

Toe-in:

Toe-in (total)	A + B: 6' ± 12' (0.1° ± 0.2°) C - D: 1 ± 2 mm (0.04 ± 0.08 in.)

If the toe-in is not within the specified value, adjust it at the rack ends.

4. ADJUST TOE-IN

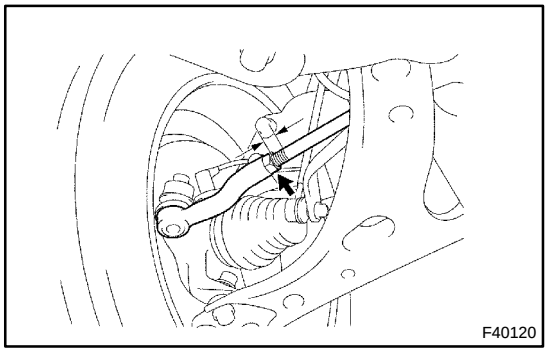
(a) Remove the rack boot set clips.

(b) Loosen the tie rod end lock nuts.

(c) Turn the right and left rack ends by an equal amount to adjust the toe-in.

HINT:

Try to adjust the toe-in to the center of the specified value.

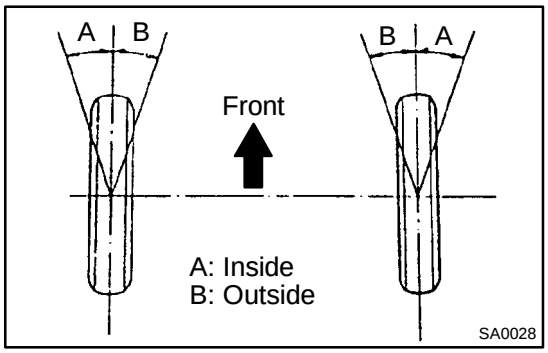


(d) Make sure that the lengths of the right and left rack ends are the same.

(e) Torque the tie rod end lock nuts.
Torque: 74 N·m (750 kgf·cm, 55 ft·lbf)

(f) Place the boots on the seats and install the clips.

HINT:
Make sure that the boots are not twisted.



5. INSPECT WHEEL ANGLE

(a) Turn the steering wheel fully and measure the turning angle.

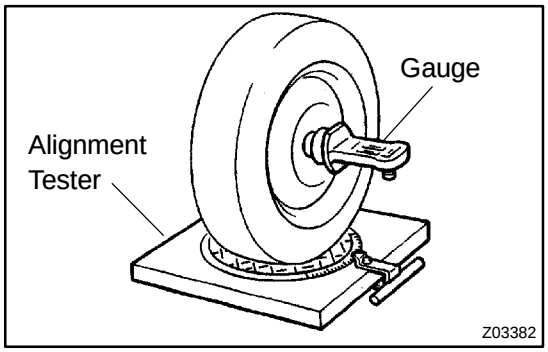
Wheel turning angle:
(Normal package)

Tire size	175/70R14	195/60R15		195/55R16
Engine type	4ZZ-FE	3ZZ-FE, 4ZZ-FE	1CD-FTV	2ZZ-GE
Inside wheel	38˚44' ± 2˚ (38.73˚ ± 2˚)	38˚45' ± 2˚ (38.75˚ ± 2˚)	38˚41' ± 2˚ (38.68˚ ± 2˚)	38˚45' ± 2˚ (38.75˚ ± 2˚)
Outside wheel: Reference	32˚50' (32.83˚)	32˚50' (32.83˚)	32˚47' (32.78˚)	32˚50' (32.83˚)

(Rough road package)

Tire size	175/70R14	195/60R15
Engine type	4ZZ-FE	3ZZ-FE, 4ZZ-FE
Inside wheel	39˚05' ± 2˚ (39.08˚ ± 2˚)	39˚06' ± 2˚ (39.10˚ ± 2˚)
Outside wheel: Reference	33˚11' (33.18˚)	33˚11' (33.18˚)

If the right and left inside wheel angles differ from the specified value, check the right and left rack end lengths.



6. INSPECT CAMBER, CASTER AND STEERING AXIS INCLINATION

(a) Install the camber-caster-kingpin gauge or position vehicle on wheel alignment tester.

(b) Inspect the camber, caster and steering axis inclination.

Camber, caster and steering axis inclination:
(Normal package)

Tire size	175/70R14	195/60R15		195/55R16
Engine type	4ZZ-FE	3ZZ-FE, 4ZZ-FE	1CD-FTV	2ZZ-GE
Camber Right-left error	−0°30' ± 45' (−0.50° ± 0.75°) 45' (0.75°) or less	−0°31' ± 45' (−0.52° ± 0.75°) 45' (0.75°) or less	−0°33' ± 45' (−0.55° ± 0.75°) 45' (0.75°) or less	−0°31' ± 45' (−0.52° ± 0.75°) 45' (0.75°) or less
Caster Right-left error	2°51' ± 45' (2.85° ± 0.75°) 45' (0.75°) or less	2°53' ± 45' (2.88° ± 0.75°) 45' (0.75°) or less	2°46' ± 45' (2.77° ± 0.75°) 45' (0.75°) or less	2°52' ± 45' (2.87° ± 0.75°) 45' (0.75°) or less
Steering axis inclination Right-left error	11°19' (11.32°) 45' (0.75°) or less	11°19' (11.32°) 45' (0.75°) or less	11°23' (11.38°) 45' (0.75°) or less	11°19' (11.32°) 45' (0.75°) or less

(Rough road package)

Tire size	175/70R14	195/60R15
Engine type	4ZZ-FE	3ZZ-FE, 4ZZ-FE
Camber Right-left error	−0°16' ± 45' (−0.27° ± 0.75°) 45' (0.75°) or less	−0°17' ± 45' (−0.28° ± 0.75°) 45' (0.75°) or less
Caster Right-left error	2°40' ± 45' (2.67° ± 0.75°) 45' (0.75°) or less	2°41' ± 45' (2.68° ± 0.75°) 45' (0.75°) or less
Steering axis inclination Right-left error	10°50' (10.83°) 45' (0.75°) or less	10°50' (10.83°) 45' (0.75°) or less

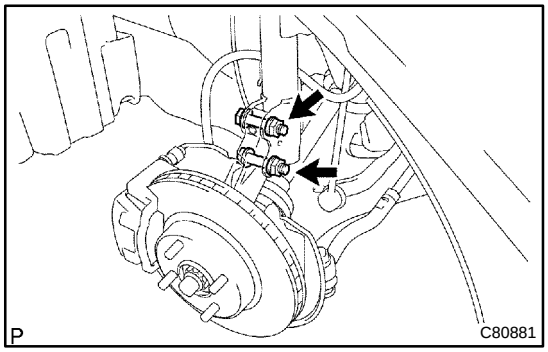
If the caster and steering axis inclination are not within the specified values, after the camber has been correctly adjusted, recheck the suspension parts for damaged and/or worn out parts.

7. ADJUST CAMBER

NOTICE:

After the camber has been adjusted, inspect the toe-in.

(a) Remove the front wheel.

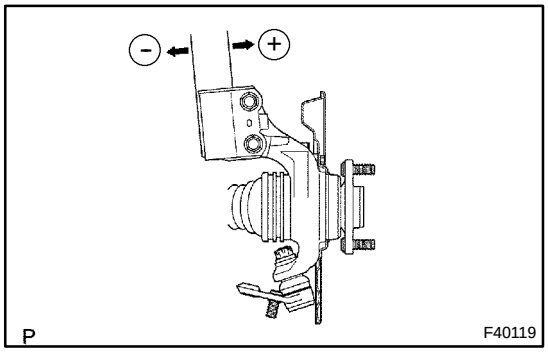


(b) Remove the 2 nuts on the lower side of the shock absorber.

If reusing the bolts and/or nuts, coat the threads of nuts with engine oil.

(c) Clean the installation surfaces of the shock absorber and the steering knuckle.

(d) Temporarily install the 2 nuts.

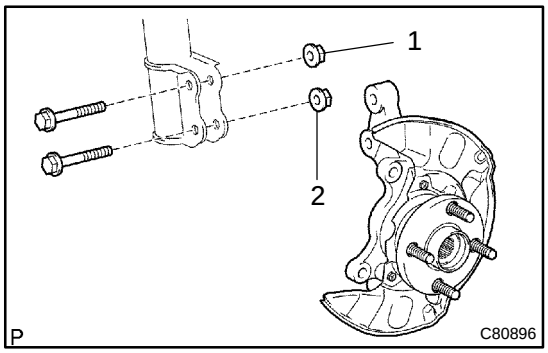


(e) Adjust the camber by pushing or pulling the lower side of the shock absorber in the direction in which the camber adjustment is required.

(f) Tighten the nuts.
Torque: 153 N·m (1,560 kgf·cm, 113 ft·lbf)

(g) Install the front wheel.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(h) Check the camber.



HINT:

- Try to adjust the camber to the center of the specified value.
- Adjusting value for the set bolts is 6' - 30' (0.1° - 0.5°).

If the camber is not within the specified value, using the following table, estimate how much additional camber adjustment will be required, and select the camber adjusting bolt.

NOTICE:
Tighten the adjusting bolt with a washer and a new nut.

Bolt / Adjusting Value	Set Bolt		Adjusting Bolt					
	90105-15001		90105-15004		90105-15005		90105-15006	
			1 Dot		2 Dots		3 Dots	
	1	2	1	2	1	2	1	2
-1°30' - -1°15'							●	●
-1°15' - -1°00'					●			●
-1°00' - -45'			●					●
-45' - -30'	●							●
-30' - -15'	●					●		
-15' - 0'	●			●				
0' - 15'	●			●				
15' - 30'	●					●		
30' - 45'	●							●
45' - 1°00'			●					●
1°00' - 1°15'					●			●
1°15' - 1°30'							●	●

N
F12938

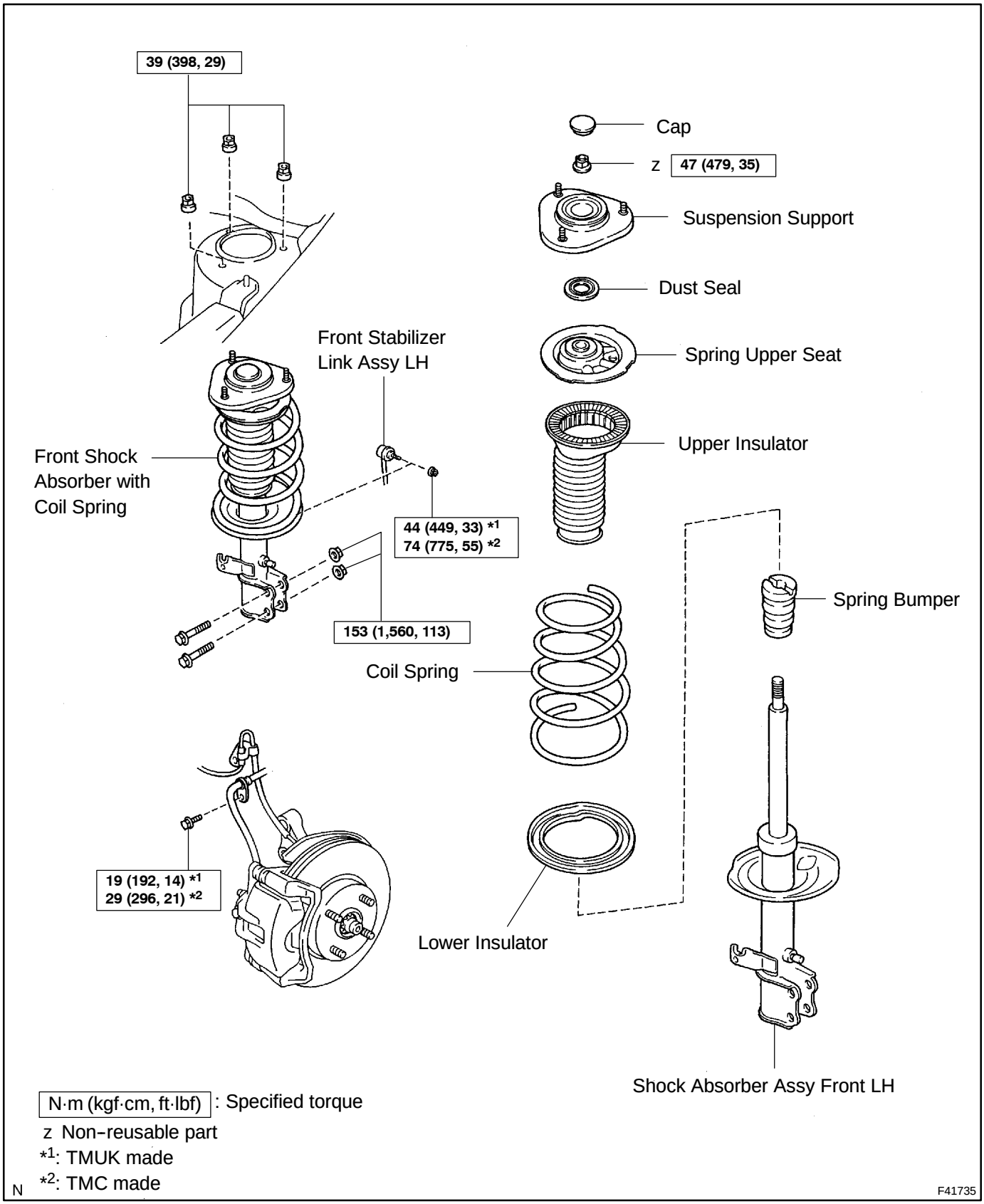
(i) Do the steps mentioned above again. At step (b), replace 1 or 2 selected bolts.

HINT:
When replacing the 2 bolts, replace 1 bolt for each time.

FRONT SHOCK ABSORBER WITH COIL SPRING

COMPONENTS

26076-01



N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
*1: TMUK made
*2: TMC made

N

F41735

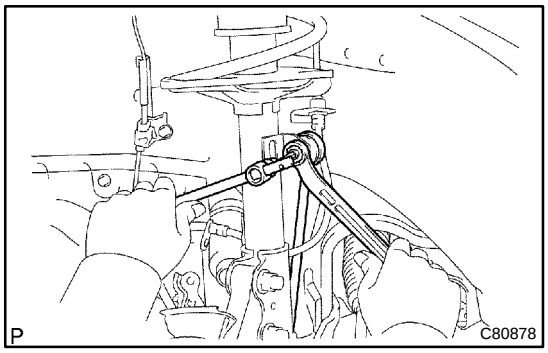
2600M-03

OVERHAUL

HINT:

Overhaul the RH side by the same procedures with the LH side.

1. REMOVE FRONT WHEEL

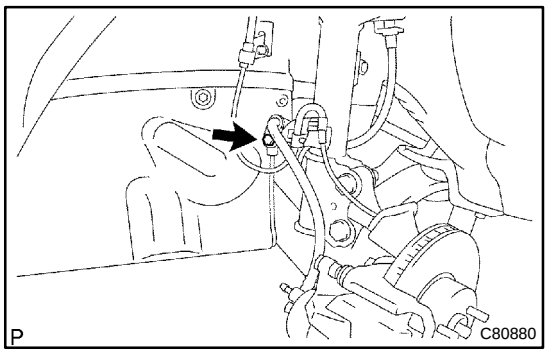


2. DISCONNECT FRONT STABILIZER LINK ASSY LH

(a) Remove the nut and disconnect the stabilizer link from the shock absorber.

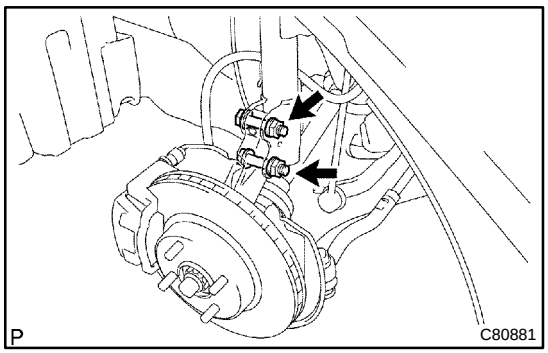
HINT:

If the ball joint turns together with the nut, use a hexagon (TMUK made: 5 mm, TMC made: 6 mm) wrench to hold the stud.

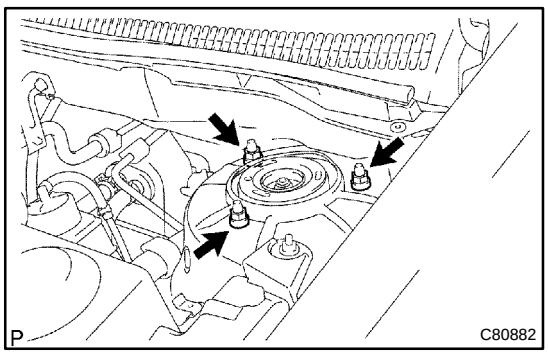


3. REMOVE FRONT SHOCK ABSORBER WITH COIL SPRING

(a) Remove the bolt, disconnect the flexible hose and speed sensor wire harness bracket.

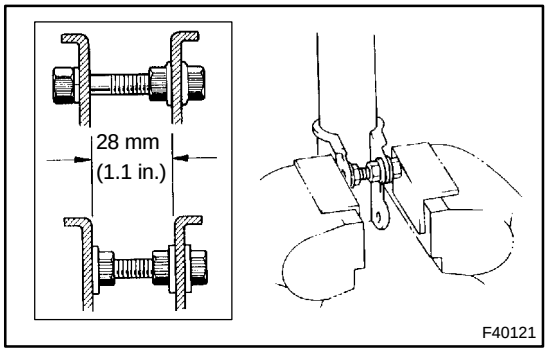


(b) Remove the 2 nuts and bolts on the lower side of shock absorber.



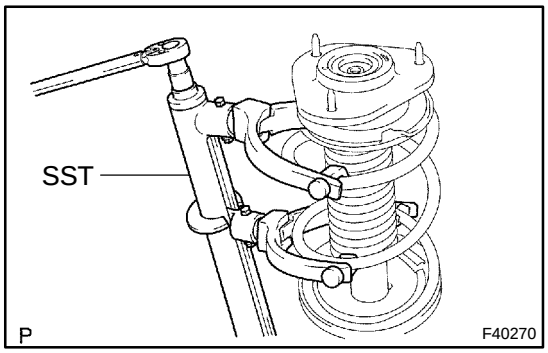
(c) Remove the 3 nuts on the upper side of the shock absorber.

(d) Remove the shock absorber with the coil spring.



4. FIX FRONT SHOCK ABSORBER WITH COIL SPRING

(a) Install 2 nuts and a bolt to the bracket at the lower side of the shock absorber and secure it in a vise.

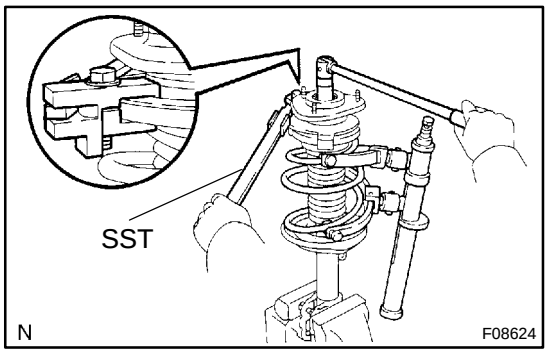


5. REMOVE SHOCK ABSORBER ASSY FRONT LH

(a) Using SST, compress the coil spring.
SST 09727-30021

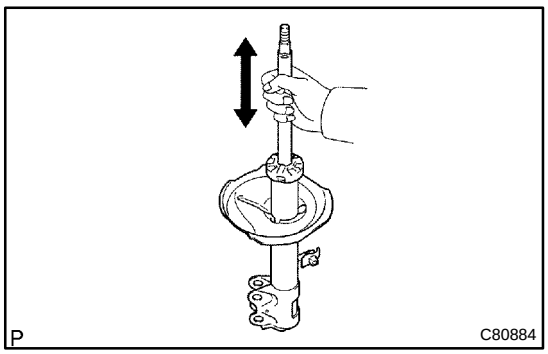
NOTICE:
Do not use an impact wrench. It will damage the SST.

(b) Remove the cap from the suspension support.



(c) Using SST to hold the spring seat, remove the nut.
SST 09729-22031

(d) Remove the suspension support, dust seal, spring upper seat, upper insulator, coil spring, spring bumper and lower insulator.



6. INSPECT SHOCK ABSORBER ASSY FRONT LH

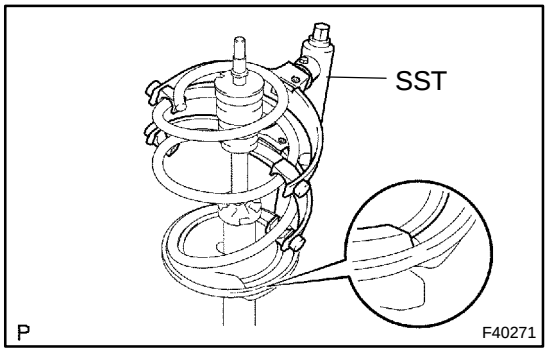
(a) Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual sound during operation.

If there is any abnormality, replace the shock absorber with a new one.

NOTICE:
When disposing of the shock absorber,
see DISPOSAL page 26-12.

7. INSTALL SHOCK ABSORBER ASSY FRONT LH

(a) Install the lower insulator onto the shock absorber.
(b) Install the spring bumper to the piston rod.

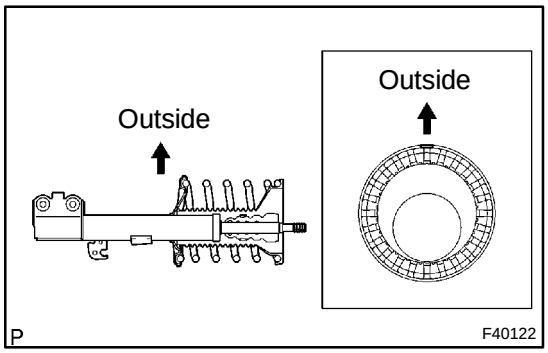


(c) Using SST, compress the coil spring.
SST 09727-30021

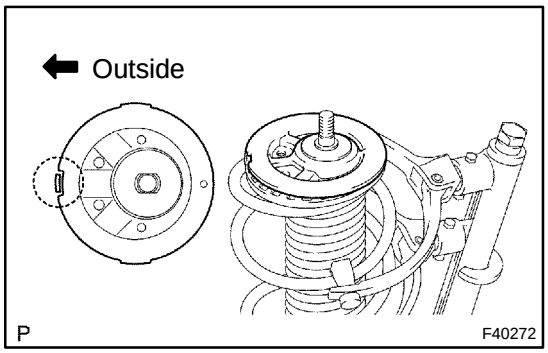
NOTICE:
Do not use an impact wrench. It will damage the SST.

(d) Install the coil spring to the shock absorber.

HINT:
Fit the lower end of the coil spring into the gap of the spring lower seat.

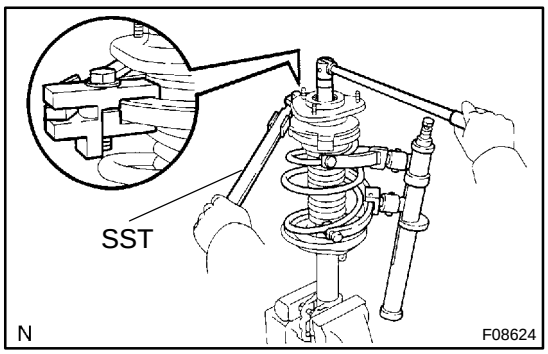


(e) Install the upper insulator as shown in the illustration.



(f) Install the spring seat to the shock absorber with the mark facing to the outside of the vehicle.

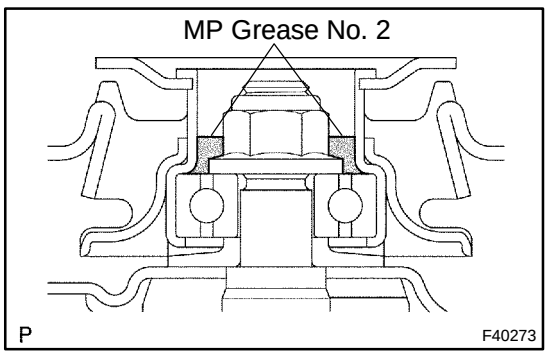
(g) Install a dust seal and suspension support.



(h) Using SST to hold the suspension support, install a new nut.
SST 09729-22031
Torque: 47 N·m (479 kgf·cm, 35 ft·lbf)

(i) Remove the SST.
SST 09727-30021, 09729-22031

(j) Install the cap.

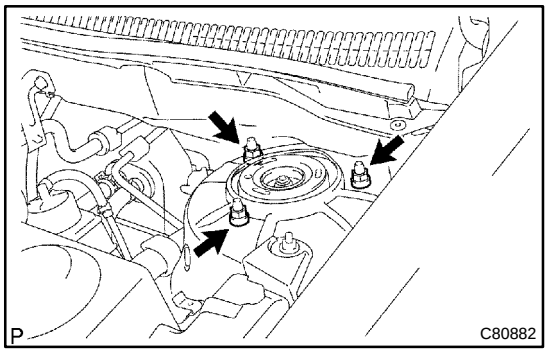


(k) Apply MP grease No. 2 into the suspension support.

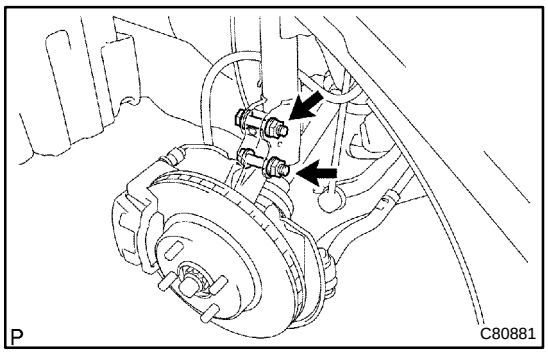
CAUTION:
Do not touch grease on rubber surface of upper support.

8. INSTALL FRONT SHOCK ABSORBER WITH COIL SPRING

(a) Install the shock absorber with the 2 bolts.

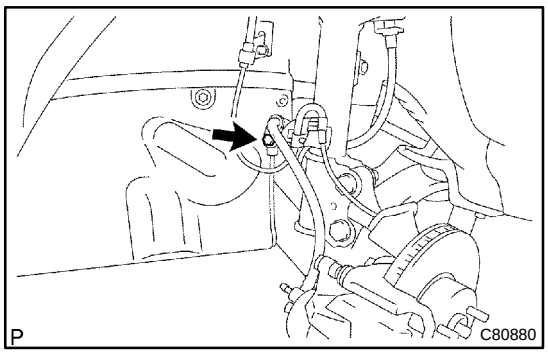


(b) Install the 3 nuts to the upper side of shock absorber.
Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)

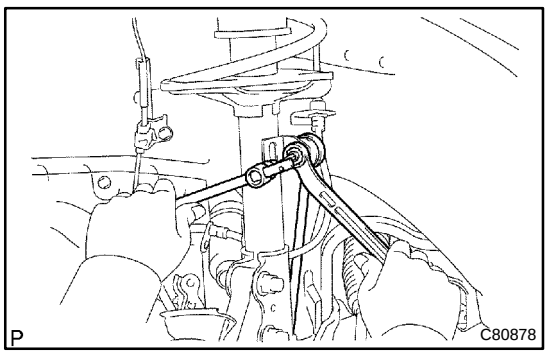


(c) Install the 2 nuts to the lower side of shock absorber.
Torque: 153 N·m (1,560 kgf·cm, 113 ft·lbf)

HINT:
Coat the nut's thread with engine oil.



(d) Install the flexible hose and speed sensor wire harness bracket with the bolt.
Torque:
TMUK made:
19 N·m (192 kgf·cm, 14 ft·lbf)
TMC made:
29 N·m (296 kgf·cm, 21 ft·lbf)



9. INSTALL FRONT STABILIZER LINK ASSY LH

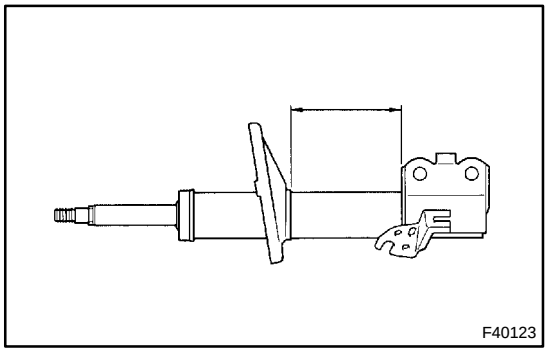
(a) Install the stabilizer link with the nut.
Torque:
TMUK made:
44 N·m (449 kgf·cm, 33 ft·lbf)
TMC made:
74 N·m (755 kgf·cm, 55 ft·lbf)

HINT:
If the ball joint turns together with the nut, use a hexagon (TMUK made: 5 mm, TMC made: 6 mm) wrench to hold the stud.

10. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

11. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT **(See page 26-2)**

2600N-03



DISPOSAL

HINT:

Dispose the RH side by the same procedures with the LH side.

1. DISPOSE SHOCK ABSORBER ASSY FRONT LH

(a) Fully extend the shock absorber rod.

(b) Using a drill, make a hole in the cylinder as shown in the illustration to discharge the gas inside.

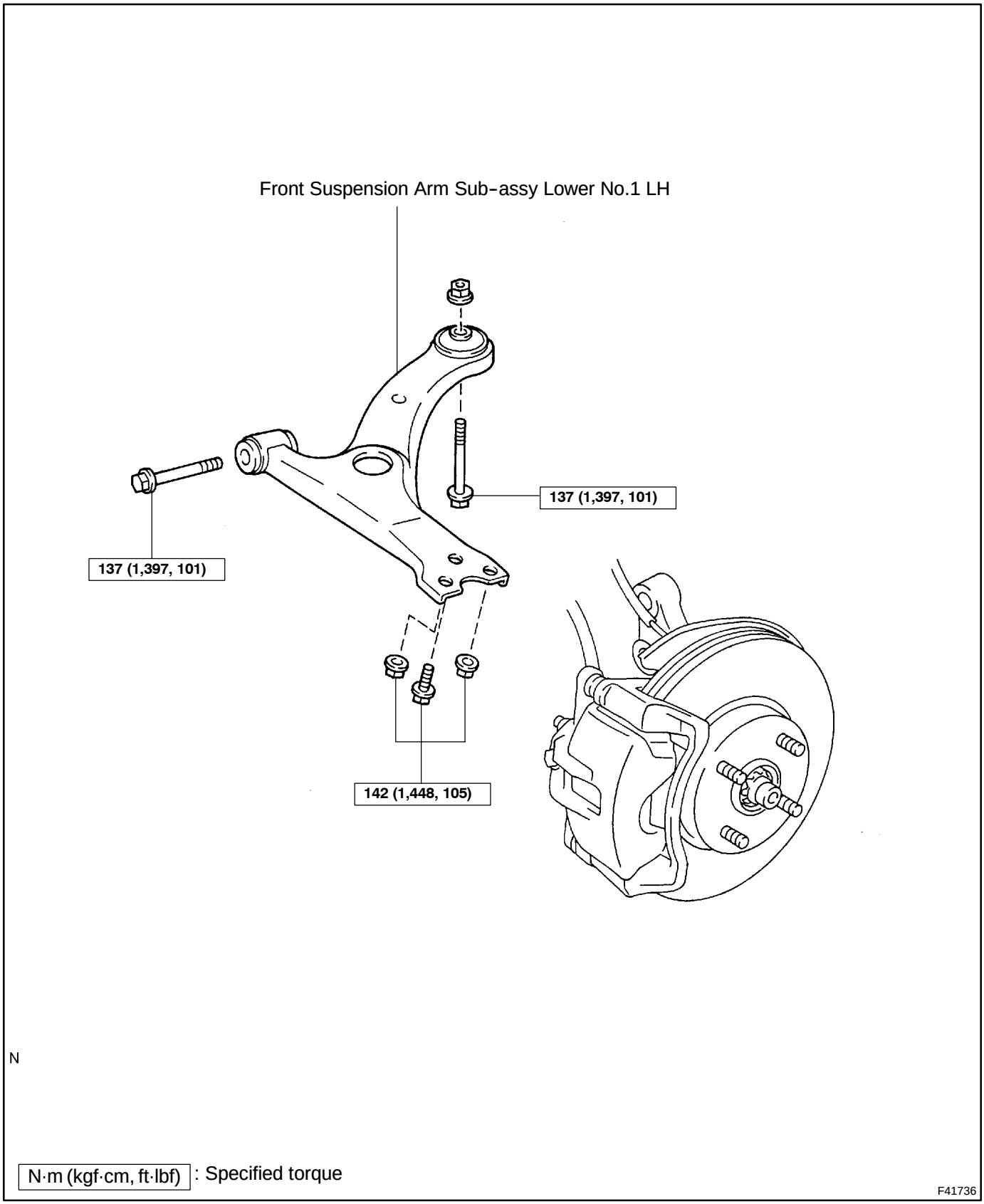
CAUTION:

- **When drilling, chips may fly out, work carefully.**
- **The gas is colorless, odorless and non-poisonous.**

FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

COMPONENTS

26077-01



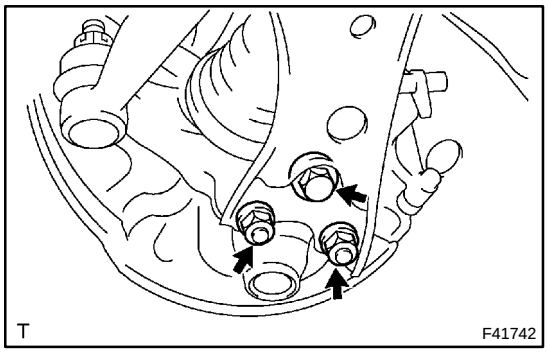
26078-01

REPLACEMENT

HINT:

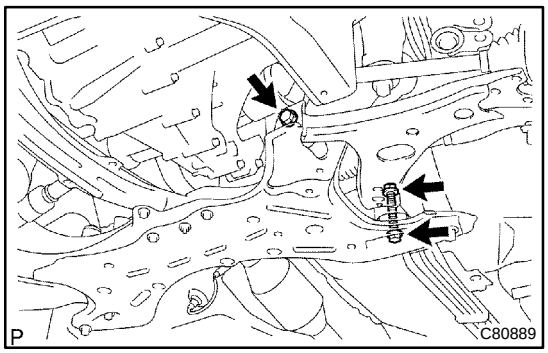
Replace the RH side by the same procedures with the LH side.

1. REMOVE FRONT WHEEL



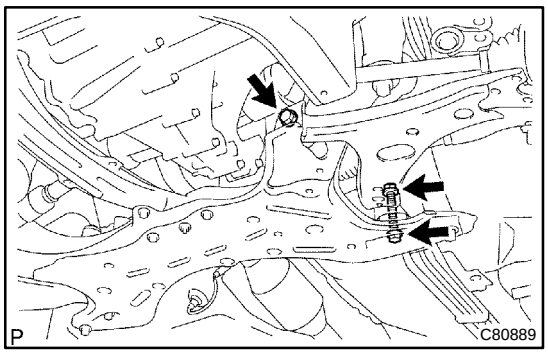
2. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Remove the bolt and 2 nuts, and separate the lower suspension arm from the lower ball joint.



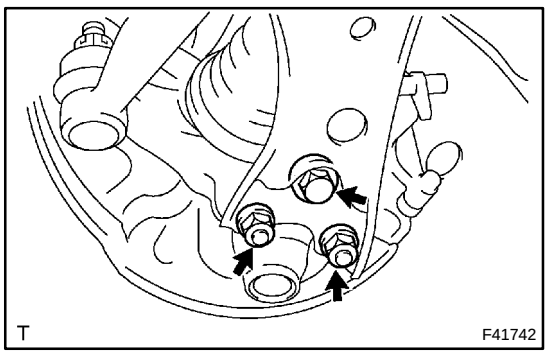
3. REMOVE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Remove the 2 bolts, nut and lower suspension arm.



4. TEMPORARY TIGHTEN FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Install the lower suspension arm, temporary tighten the 2 bolts and nut.



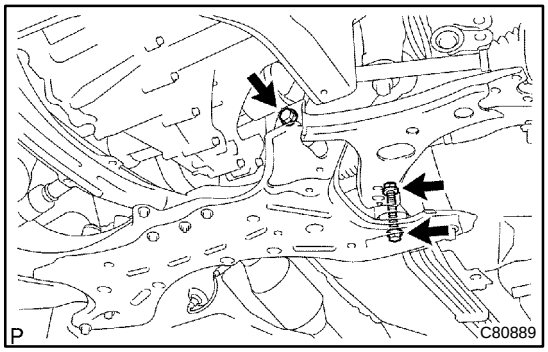
5. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Connect the lower suspension arm to the lower ball joint with the 2 nuts and bolt.
Torque: 142 N·m (1,448 kgf·cm, 105 ft·lbf)

6. STABILIZE SUSPENSION

(a) Install the front wheel and jack down the vehicle.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Bounce the vehicle up and down several times to stabilize the suspension.



7. FULLY TIGHTEN FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

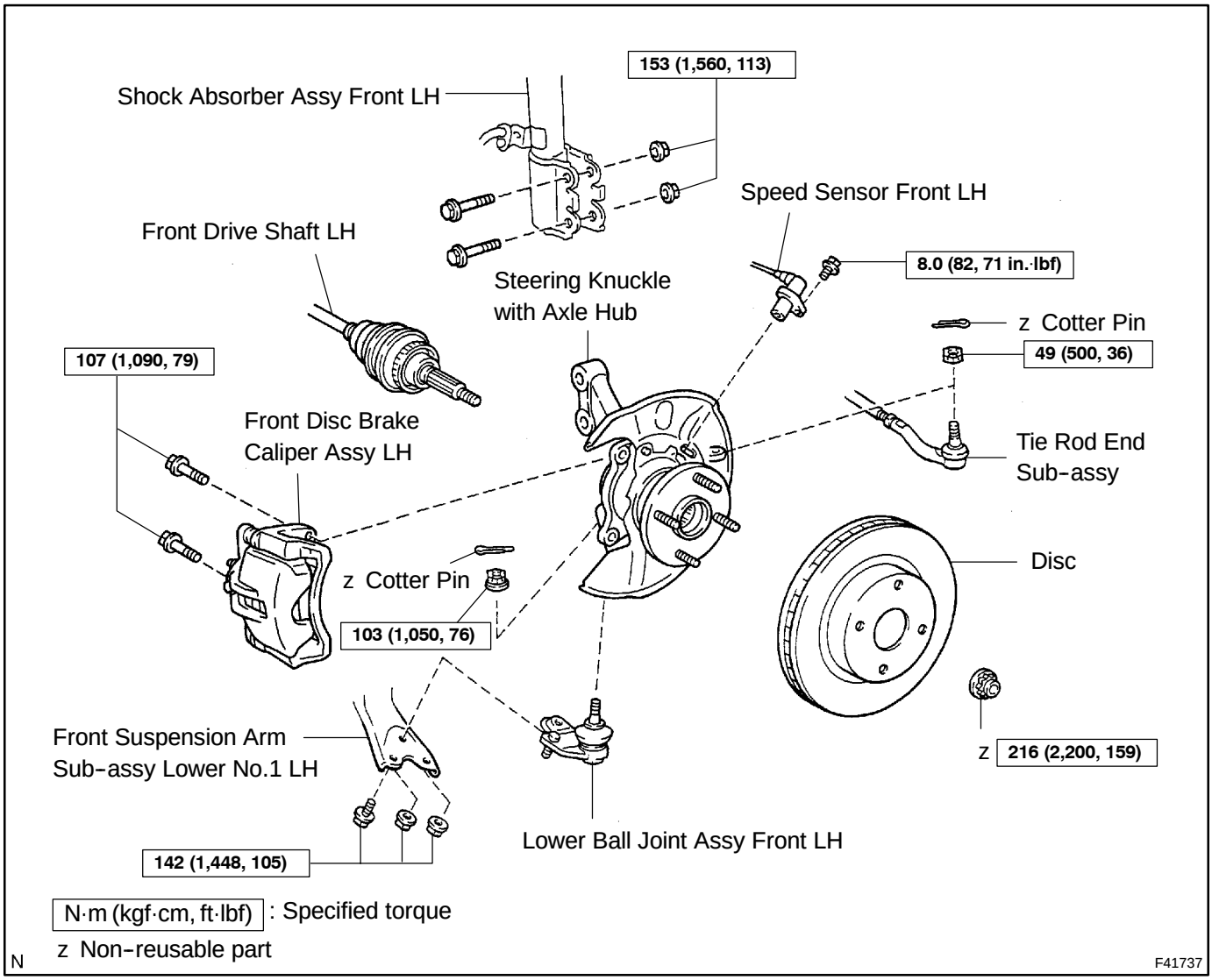
(a) Fully tighten the 2 bolts and nut.
Torque: 137 N·m (1,397 kgf·cm, 101 ft·lbf)

8. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT **(See page 26-2)**

LOWER BALL JOINT ASSY FRONT LH

COMPONENTS

26079-01



2600J-02

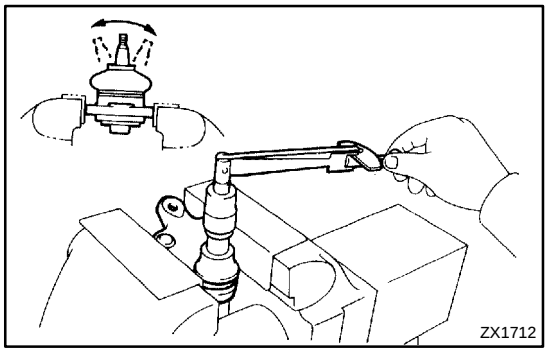
REPLACEMENT

HINT:

Replace the RH side by the same procedures with the LH side.

1. **REMOVE FRONT WHEEL**
2. **REMOVE FRONT AXLE HUB LH NUT**
   (See page 30-32)
   SST 09930-00010
3. **DISCONNECT SPEED SENSOR FRONT LH**
   (See page 30-32)
4. **DISCONNECT FRONT DISC BRAKE CALIPER ASSY LH (See page 30-32)**
5. **REMOVE FRONT DISC**

6. **DISCONNECT TIE ROD END SUB-ASSY LH**
   (See page 30-33)
   SST 09628-62011
7. **DISCONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH**
   (See page 30-33)
8. **REMOVE FRONT AXLE ASSY LH (See page 30-33)**
9. **REMOVE LOWER BALL JOINT ASSY FRONT LH**
   (See page 30-33)
   SST 09628-62011



10. **INSPECT LOWER BALL JOINT ASSY FRONT LH**

(a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.

(b) Using a torque wrench, turn the nut continuously at a rate of 2 - 4 seconds per 1 turn and take the torque reading on the 5th turn.
Turning torque:
1.0 - 5.0 N·m (10 - 51 kgf·cm, 8.7 - 44 in.·lbf)

11. **INSTALL LOWER BALL JOINT ASSY FRONT LH**
    (See page 30-35)
12. **INSTALL FRONT AXLE ASSY LH (See page 30-36)**
13. **INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH**
    (See page 30-36)
14. **INSTALL TIE ROD END SUB-ASSY LH**
    (See page 30-36)
15. **INSTALL FRONT DISC**

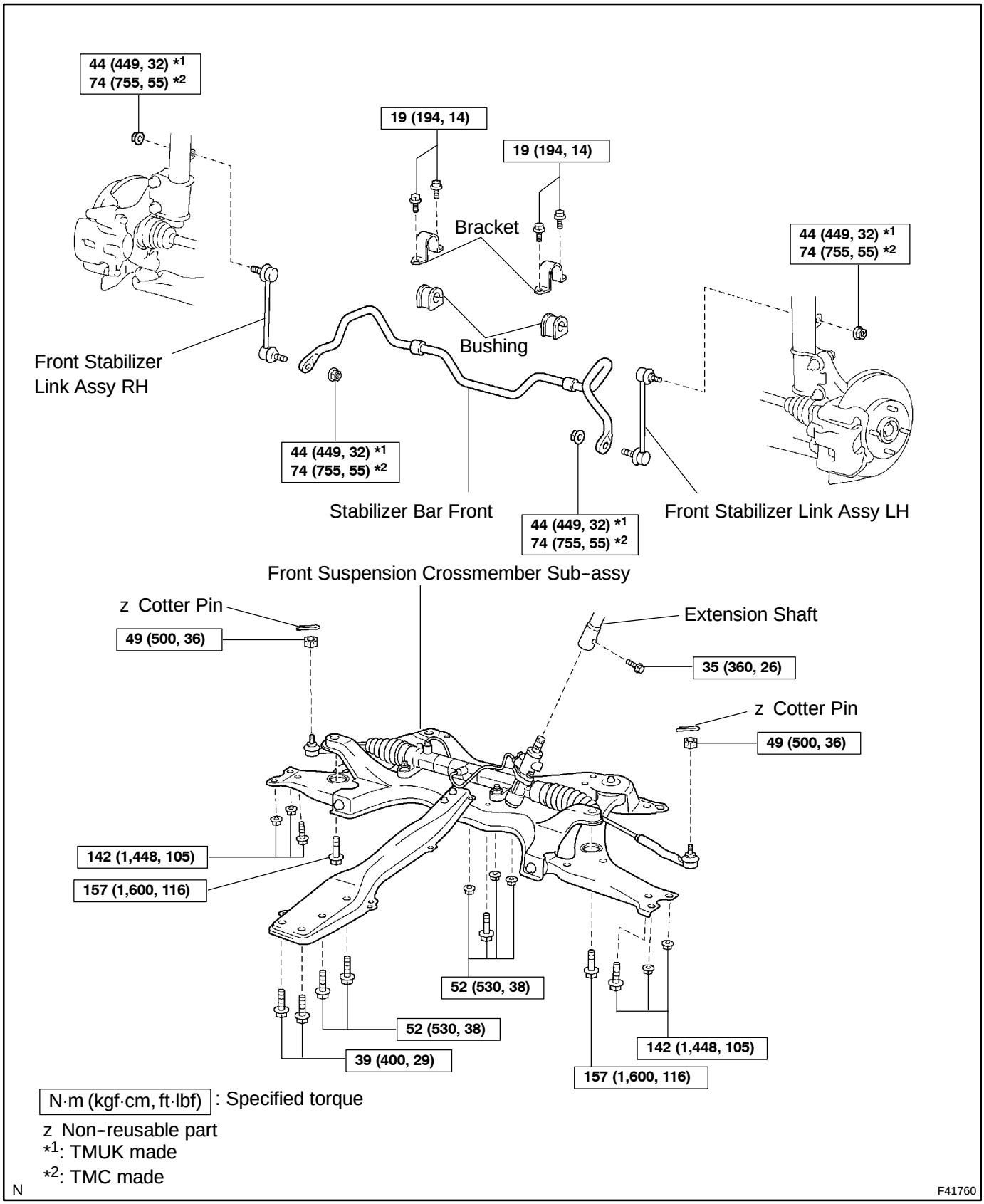
16. **INSTALL FRONT DISC BRAKE CALIPER ASSY LH (See page 30-36)**
17. **INSTALL FRONT AXLE HUB LH NUT**
    (See page 30-36)
18. **INSTALL FRONT WHEEL**
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
19. **INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See page 26-2)**

20. CHECK ABS SPEED SENSOR SIGNAL **(See page 05-565 or 05-618 or 05-673)**

STABILIZER BAR FRONT

COMPONENTS

2607A-01



N·m (kgf·cm, ft·lbf) : Specified torque

z Non-reusable part

*1: TMUK made

*2: TMC made

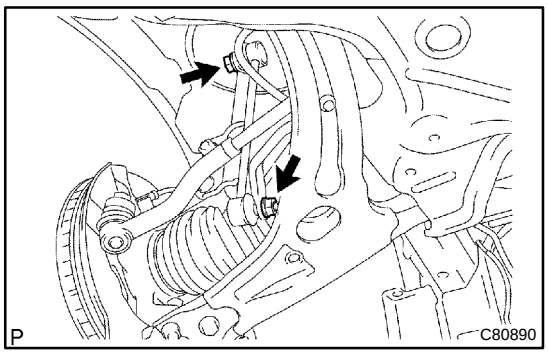
N

F41760

2600P-02

REPLACEMENT

1. REMOVE COLUMN HOLE COVER SILENCER SHEET
(See page 50-8)
2. DISCONNECT STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)
(See page 50-10)
3. DISCONNECT STEERING SLIDING YOKE SUB-ASSY (LHD STEERING POSITION TYPE)
(See page 50-10)
4. REMOVE FRONT WHEEL
5. REMOVE ENGINE UNDER COVER RH
6. REMOVE ENGINE UNDER COVER LH



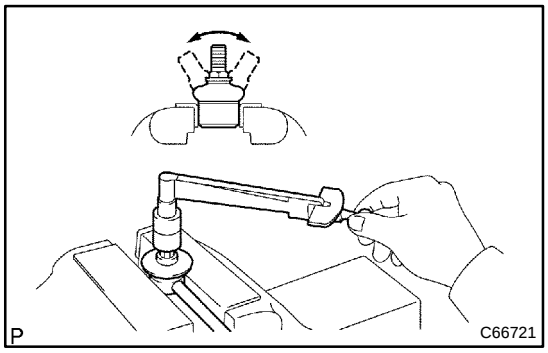
7. REMOVE FRONT STABILIZER LINK ASSY LH

(a) Remove the 2 nuts and stabilizer link.

HINT:
If the ball joint turns together with the nut, use a hexagon (TMUK made: 5 mm, TMC made: 6 mm) wrench to hold the stud.

8. REMOVE FRONT STABILIZER LINK ASSY RH

HINT:
Remove the RH side by the same procedures with the LH side.



9. INSPECT FRONT STABILIZER LINK ASSY LH

(a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.
(b) Using a torque wrench, turn the nut continuously at a rate of 2 - 4 seconds per 1 turn and take the torque reading on the 5th turn.
Turning torque:
0.05 - 2.0 N·m (0.5 - 20 kgf·cm, 0.4 - 17.7 in.·lbf)

10. DISCONNECT TIE ROD END SUB-ASSY LH
(See page 30-33)
SST 09628-62011
11. DISCONNECT TIE ROD END SUB-ASSY RH

HINT:
Disconnect the RH side by the same procedures with the LH side.
SST 09628-62011
12. DISCONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH
(See page 30-33)

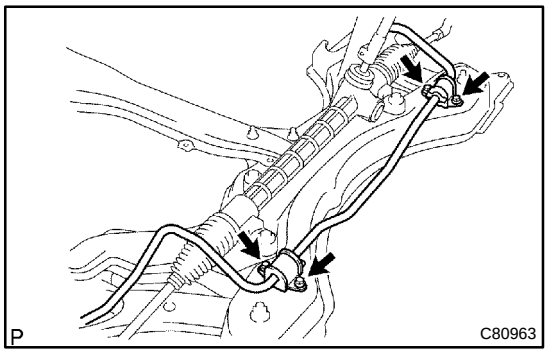
13. DISCONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 RH

HINT:
Disconnect the RH side by the same procedures with the LH side.

14. REMOVE HOOD SUB-ASSY
(See page 50-7)

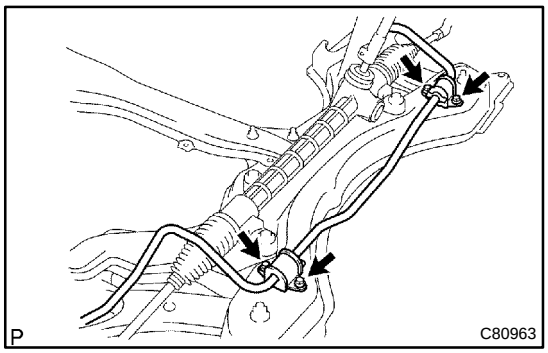
15. SUSPEND ENGINE ASSEMBLY (See page 50-7)

16. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSY
(See page 50-7)



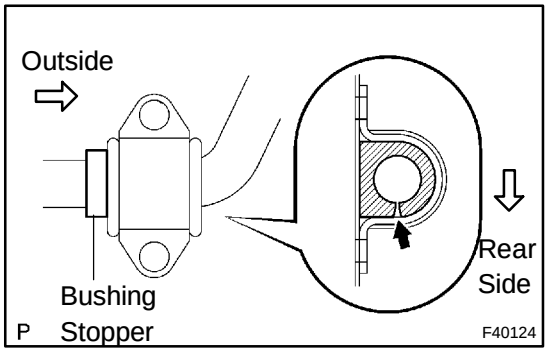
17. REMOVE STABILIZER BAR FRONT

(a) Remove the 4 bolts, brackets and bushings.
(b) Remove the stabilizer bar.



18. INSTALL STABILIZER BAR FRONT

(a) Install the 2 bushings and brackets with the 4 bolts.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



HINT:
Install the bushing to the outside of the bushing stopper on the stabilizer bar.

19. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSY
(See page 50-7)
SST 09670-00010

20. INSTALL ENGINE ASSEMBLY

21. INSTALL HOOD SUB-ASSY

22. CONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH
(See page 30-36)

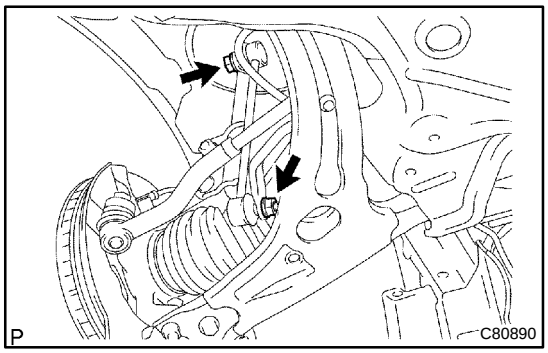
23. CONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 RH

HINT:
Connect the RH side by the same procedures with the LH side.

24. CONNECT TIE ROD END SUB-ASSY LH
(See page 30-36)

25. CONNECT TIE ROD END SUB-ASSY RH

HINT:
Connect the RH side by the same procedures with the LH side.



26. INSTALL FRONT STABILIZER LINK ASSY LH

(a) Install the stabilizer link with the 2 nuts.
Torque:
TMUK made:
74 N·m (755 kgf·cm, 55 ft·lbf)
TMC made:
44 N·m (449 kgf·cm, 32 ft·lbf)

HINT:
If the ball joint turns together with the nut, use a hexagon (TMUK made: 5 mm, TMC made: 6 mm) wrench to hold the stud.

27. INSTALL FRONT STABILIZER LINK ASSY RH

HINT:
Install the RH side by the same procedures with the LH side.

28. INSTALL ENGINE UNDER COVER RH

29. INSTALL ENGINE UNDER COVER LH

30. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

31. CONNECT STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)

32. CONNECT STEERING SLIDING YOKE SUB-ASSY (LHD STEERING POSITION TYPE)

33. INSPECT CENTER FRONT WHEEL

34. INSTALL COLUMN HOLE COVER SILENCER SHEET
(See page 50-14)

35. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See page 26-2)

REAR SUSPENSION

REAR SUSPENSION SYSTEM 27-1
PROBLEM SYMPTOMS TABLE 27-1
REAR WHEEL ALIGNMENT 27-2
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REAR SHOCK ABSORBER
WITH COIL SPRING 27-3
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OVERHAUL 27-4/6
DISPOSAL 27-7
REAR AXLE BEAM ASSY 27-8
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STABILIZER BAR REAR 27-14
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REPLACEMENT 27-15

REAR SUSPENSION SYSTEM

PROBLEM SYMPTOMS TABLE

2700P-05

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Wander/pulls	1. Tire (Worn or improperly inflated) 2. Wheel alignment (Incorrect) 3. Hub bearing (Worn) 4. Suspension parts (Worn)	28-1 27-2 30-41 -
Bottoming	1. Vehicle (Overloaded) 2. Spring (Weak) 3. Shock absorber (Worn)	- 27-4 27-4
Sways/pitches	1. Tire (Worn or improperly inflated) 2. Stabilizer bar (Bent or broken) 3. Shock absorber (Worn)	28-1 27-15 27-4
Rear wheel shimmy	1. Tire (Worn or improperly inflated) 2. Wheel (Out of balance) 3. Shock absorber (Worn) 4. Wheel alignment (Incorrect)	28-1 28-1 27-4 27-2
Abnormal tire wear	1. Tire (Worn or improperly inflated) 2. Wheel alignment (Incorrect) 3. Shock absorber (Worn) 4. Suspension parts (Worn)	28-1 27-2 27-4 -

REAR WHEEL ALIGNMENT

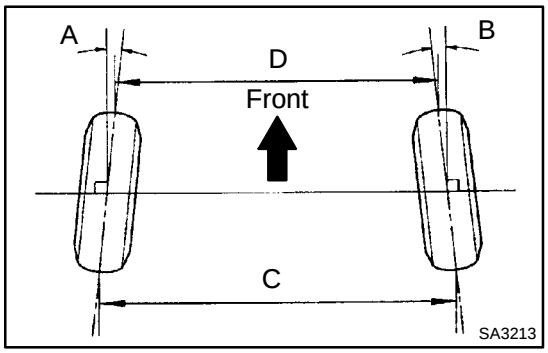
ADJUSTMENT

2700Q-03

1. INSPECT TIRE (See page 28-1)
2. MEASURE VEHICLE HEIGHT (See page 26-2)

NOTICE:

Before inspecting the wheel alignment, adjust the vehicle height to the specified value.



3. INSPECT TOE-IN

Toe-in:

(Normal package)

Toe-in (total)	A + B: 0°15' ± 15' (0.25° ± 0.25°) C - D: 1 . 7 ± 2.5 mm (0.09 ± 0.1 in.)

(Rough road package)

Toe-in (total)	A + B: 0°06' ± 15' (0.1° ± 0.25°) C - D: 1.0 ± 2.5 mm (0.04 ± 0.1 in.)

If the toe-in is not within the specified value, inspect and replace the suspension parts as necessary.

4. INSPECT CAMBER

(a) Install the camber-caster-kingpin gauge or position vehicle on wheel alignment tester.

(b) Inspect the camber.

Camber:

(Normal package)

Camber	-1°27' ± 30' (-1.47° ± 0.5°)
Right-left error	30' (0.5°) or less

(Rough road package)

Camber	-1°26' ± 30' (-1.43° ± 0.5°)
Right-left error	30' (0.5°) or less

If the measured value is not within the specified value, inspect the suspension parts for damage and/or wear and replace them if necessary become camber is not adjustable.

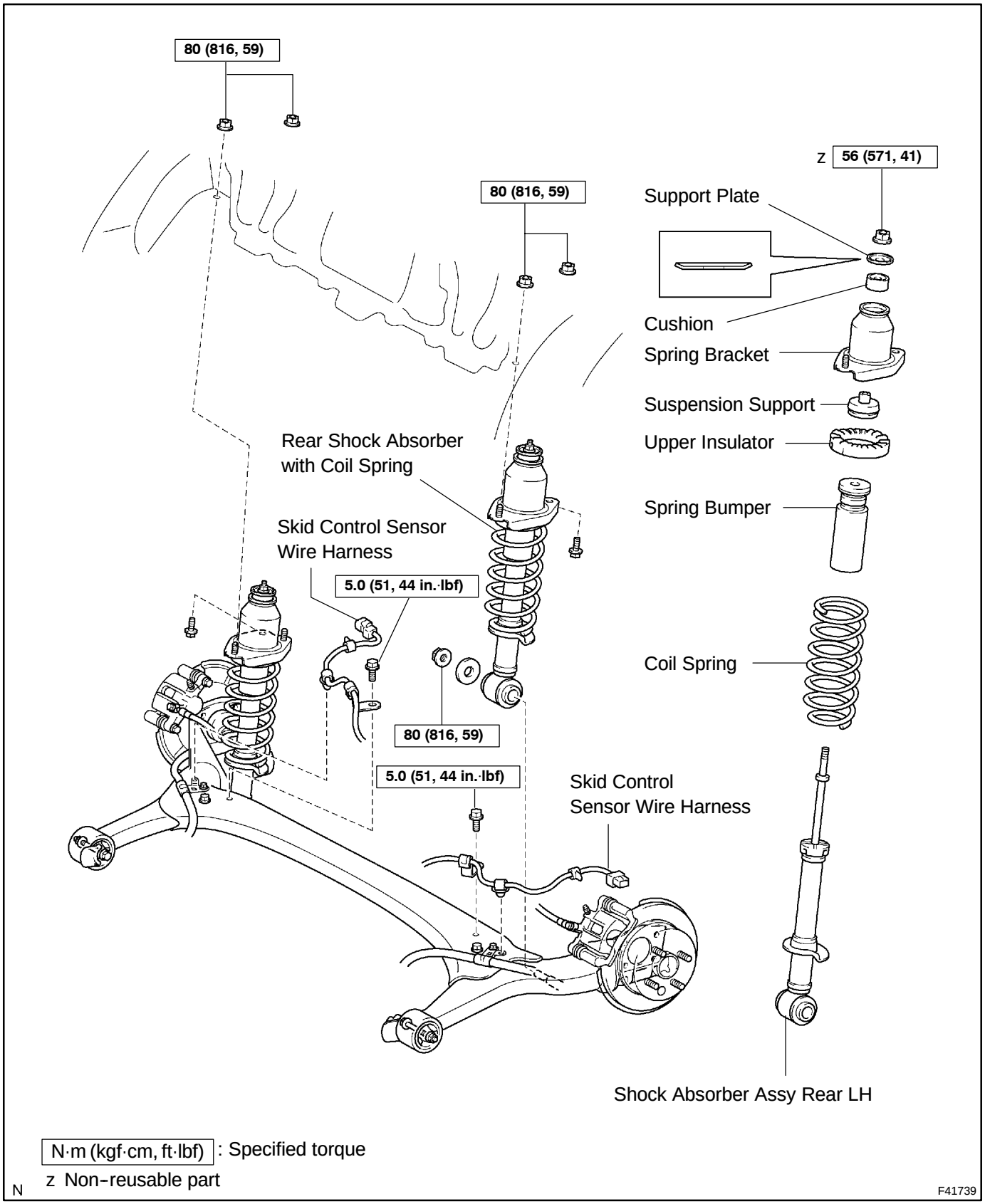
Note:

Rear axle toe must not differ by more than30' or 3mm from left to right.

REAR SHOCK ABSORBER WITH COIL SPRING

COMPONENTS

2706X-01



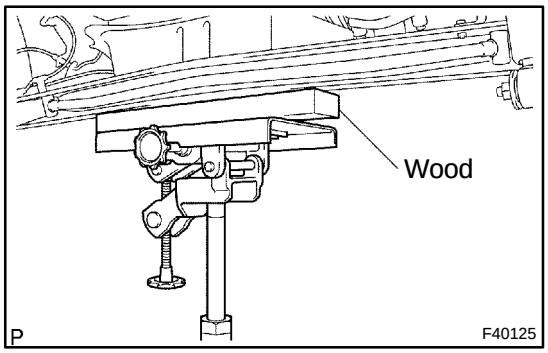
2700U-03

OVERHAUL

HINT:

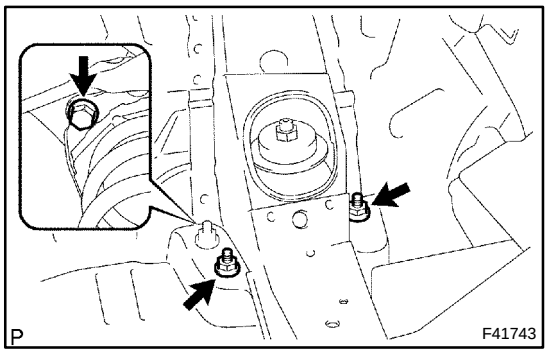
Overhaul the RH side by the same procedurer with the LH side.

1. **REMOVE REAR WHEEL**
2. **REMOVE LUGGAGE COMPARTMENT TRIM COVER ASSY LH (SEDAN BODY TYPE)**
3. **REMOVE DECK TRIM SIDE PANEL ASSY LH (WAGON/HATCH BACK BODY TYPE)**

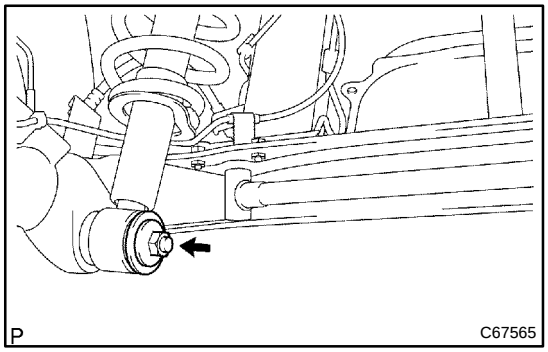


4. **REMOVE REAR SHOCK ABSORBER WITH COIL SPRING**

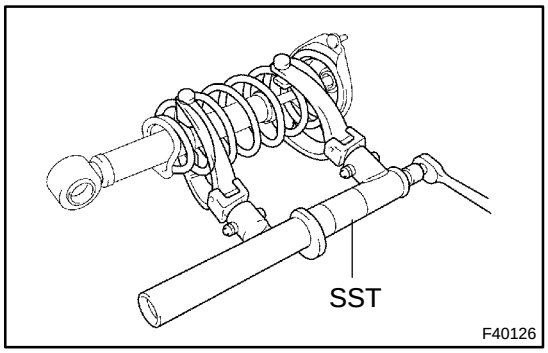
(a) Support the rear axle beam with jack.



(b) Remove the 2 nuts and bolt.



(c) Remove the nut, washer and shock absorber.



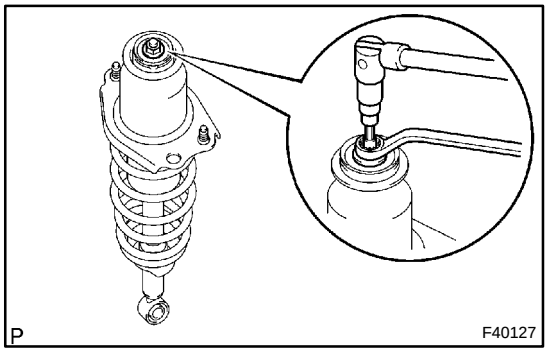
5. **REMOVE SHOCK ABSORBER ASSY REAR LH**

(a) Using SST, compress the coil spring.

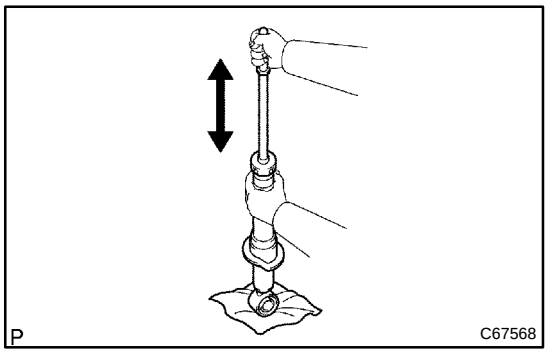
SST 09727-30021

NOTICE:

Do not use an impact wrench. It will damage the SST.



(b) Using a 6 mm hexagon wrench to hold the piston rod, remove the nut.
(c) Remove the support plate, cushion, spring bracket, upper insulator, suspension support, spring bumper and coil spring.



6. INSPECT SHOCK ABSORBER ASSY REAR LH

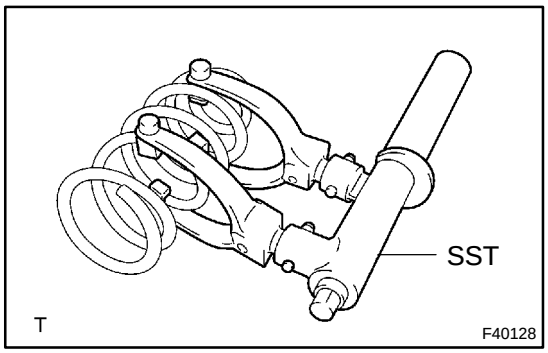
(a) Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual sound during operation.

If there is any abnormality, replace the shock absorber with a new one.

NOTICE:

When disposing of the shock absorber,

see DISPOSAL page 27-7.



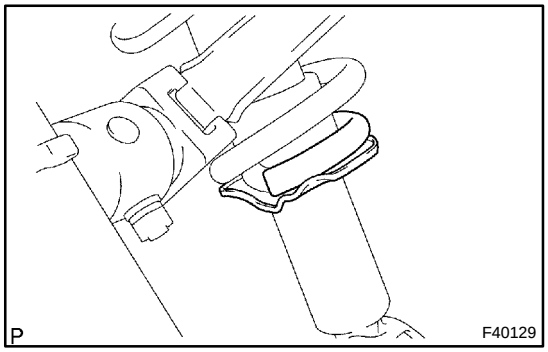
7. INSTALL SHOCK ABSORBER ASSY REAR LH

(a) Using SST, compress the coil spring.
SST 09727-30021

NOTICE:

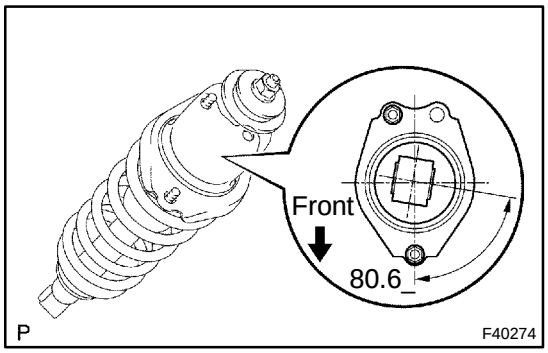
Do not use an impact wrench. It will damage the SST.

(b) Insert the coil spring to the shock absorber.

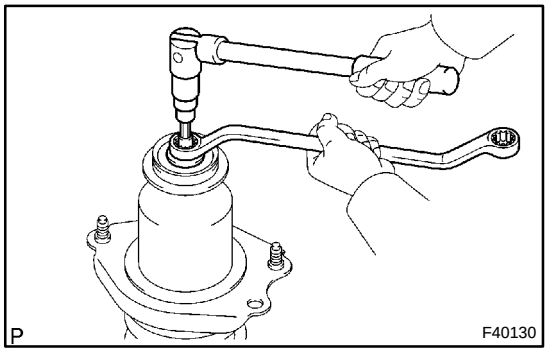


HINT:
Fit the lower end of the coil spring into the gap of the spring lower seat.

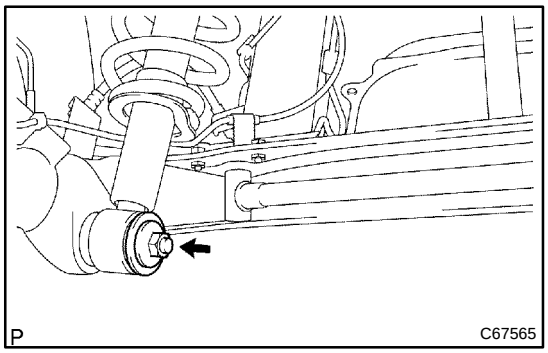
(c) Install the spring bumper and suspension support.
(d) Set the upper insulator to the spring bracket.



(e) Position the spring bracket with upper insulator as shown in the illustration.
(f) Install the cushion and support plate.
(g) Temporarily tighten a new center nut.
(h) Remove the SST.
SST 09727-30021
(i) Recheck the direction of the spring bracket.

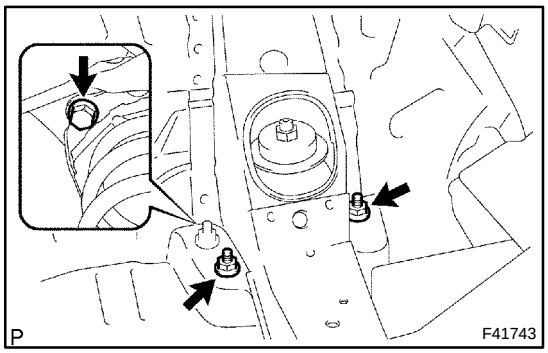


(j) Using a 6 mm hexagon wrench to hold the piston rod, tighten the nut.
Torque: 56 N·m (571 kgf·cm, 41 ft·lbf)



8. INSTALL REAR SHOCK ABSORBER WITH COIL SPRING

(a) Install the shock absorber, temporary tighten the nut and washer.

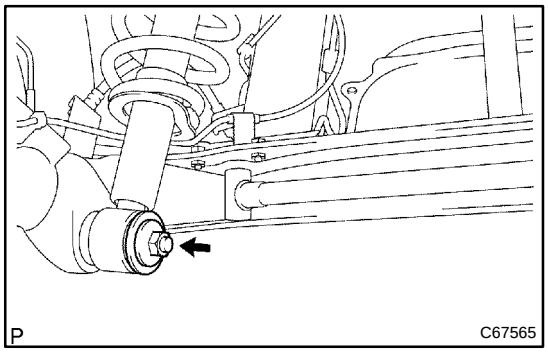


(b) Install the 2 nuts and bolt.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

9. STABILIZE SUSPENSION

(a) Install the rear wheel and jack down the vehicle.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Bounce the vehicle up and down several times to stabilize the suspension.



10. FULLY TIGHTEN REAR SHOCK ABSORBER WITH COIL SPRING

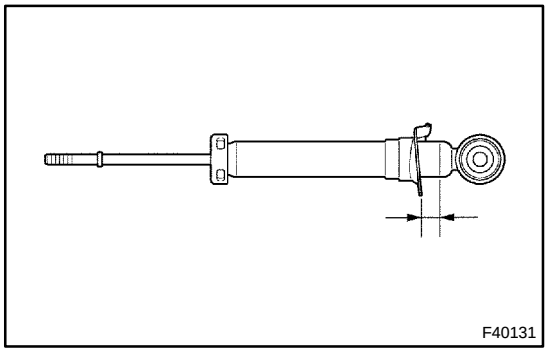
(a) Fully tighten the nut.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

11. INSTALL LUGGAGE COMPARTMENT TRIM COVER ASSY LH (SEDAN BODY TYPE)

12. INSTALL DECK TRIM SIDE PANEL ASSY LH (WAGON/HATCH BACK BODY TYPE)

13. INSPECT REAR WHEEL ALIGNMENT **(See page 27-2)**

2700R-03



DISPOSAL

HINT:

Dispose the RH side by the same procedures with the LH side.

1. DISPOSE SHOCK ABSORBER ASSY REAR LH

(a) Fully extend the shock absorber rod.

(b) Using a drill, make a hole in the cylinder as shown in the illustration to discharge the gas inside.

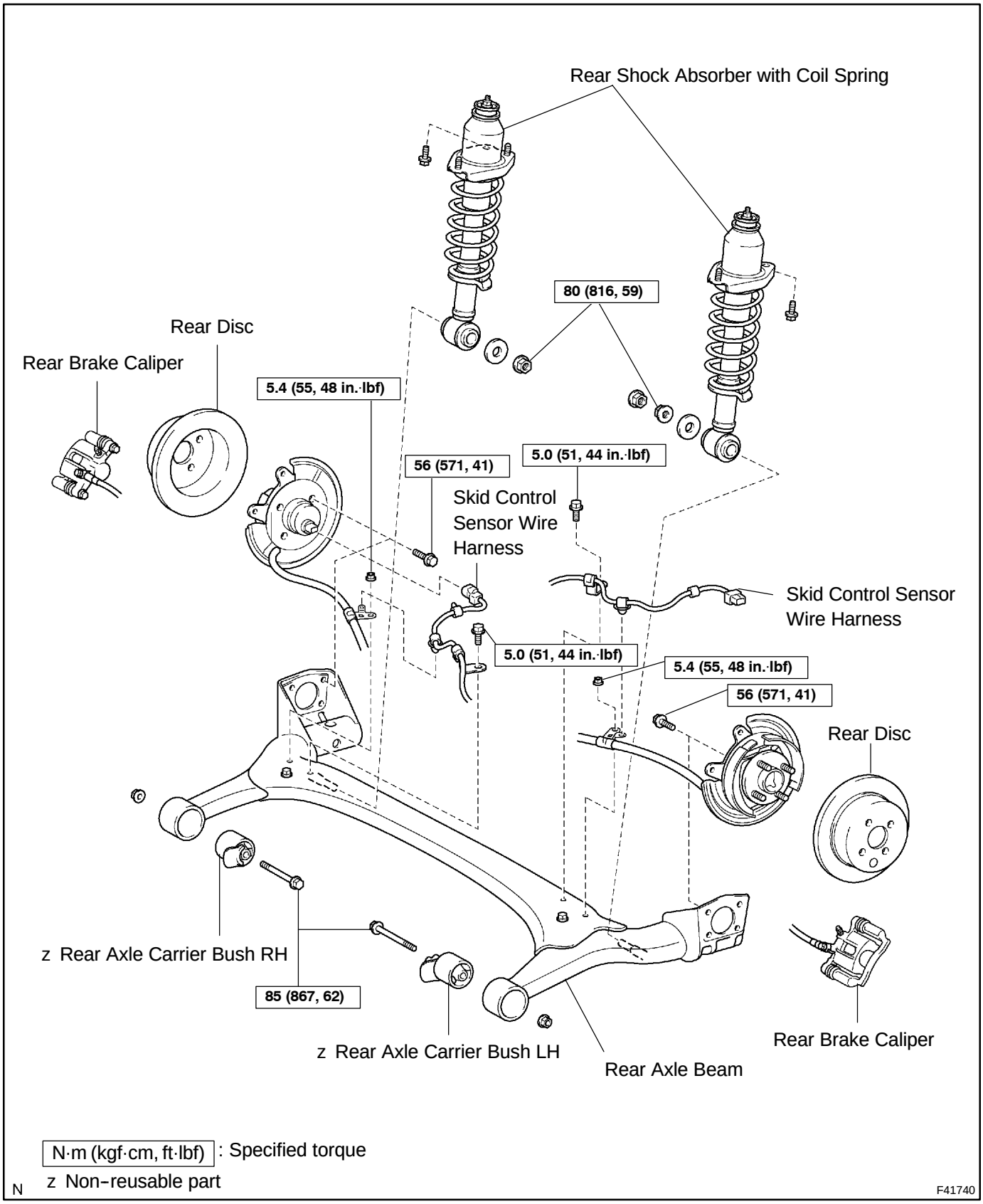
CAUTION:

- **When drilling, chips may fly out, work carefully.**
- **The gas is colorless, odorless and non-poisonous.**

REAR AXLE BEAM ASSY

COMPONENTS

2706Y-01

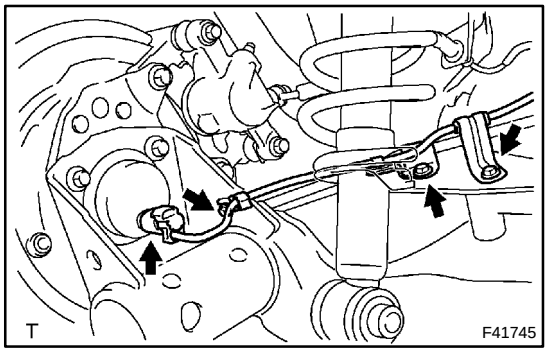


REPLACEMENT

1. REMOVE REAR WHEEL
2. SEPARATE REAR DISC BRAKE CALIPER ASSY LH (See page 30-43)
3. SEPARATE REAR DISC BRAKE CALIPER ASSY RH

HINT:
Separate the RH side by the same procedures with the LH side.

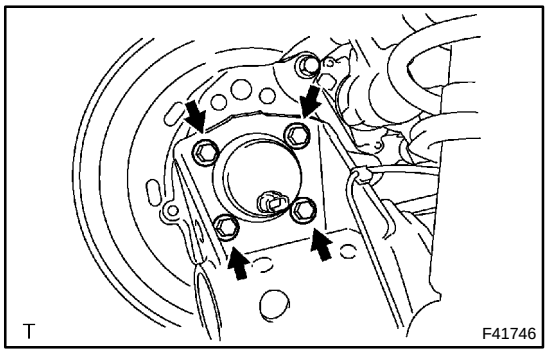
4. REMOVE REAR DISC



5. SEPARATE SKID CONTROL SENSOR WIRE

(a) Disconnect the skid control sensor connector.
(b) Remove the bolt and separate the skid control sensor wire harness clamps.
(c) Remove the bolt and separate parking brake cable clamp.

6. REMOVE STABILIZER BAR REAR (W/ REAR STABILIZER) (See page 27-15)



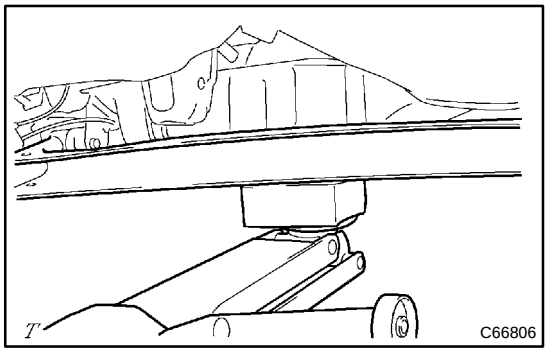
7. REMOVE REAR AXLE HUB & BEARING ASSY LH

Remove the 4 bolts and rear axle hub from axle beam.

8. REMOVE REAR AXLE HUB & BEARING ASSY RH

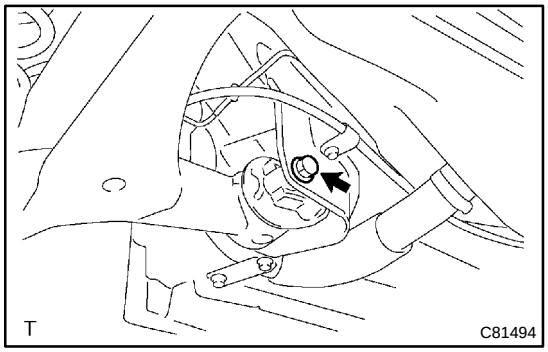
HINT:
Remove the RH side by the same procedures with the LH side.

9. REMOVE REAR SHOCK ABSORBER WITH COIL SPRING (See page 27-4)

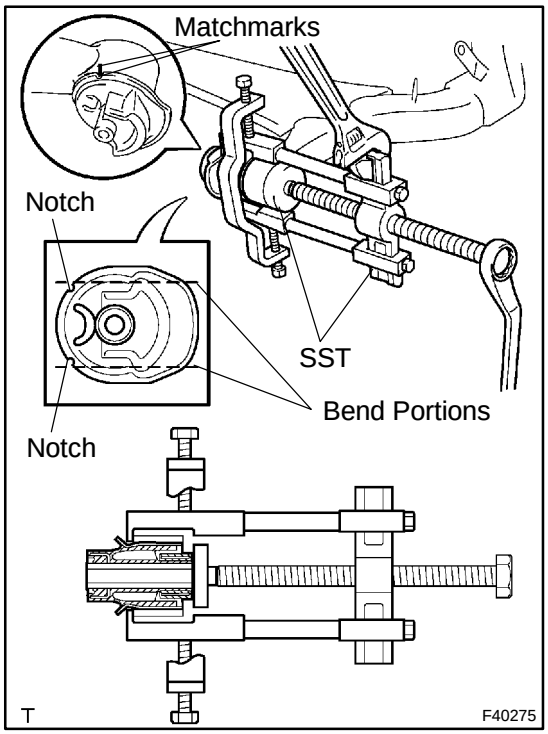


10. REMOVE REAR AXLE BEAM ASSY

(a) Support the rear axle beam with jack.



(b) Remove the 2 bolts, washers, nuts and rear axle beam.



11. REMOVE REAR AXLE CARRIER BUSH LH

(a) Place matchmarks on the 2 notches of the bushing and axle beam.

(b) Using a chisel and hammer, bend the 2 portions of the bushing rib.

HINT:

Bend the bushing rib until the claw of SST can be hung.

(c) Using SST, remove the bushing from the axle beam.

SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04020, 09957-04010, 09958-04011), 09950-60010 (09951-00630)

NOTICE:

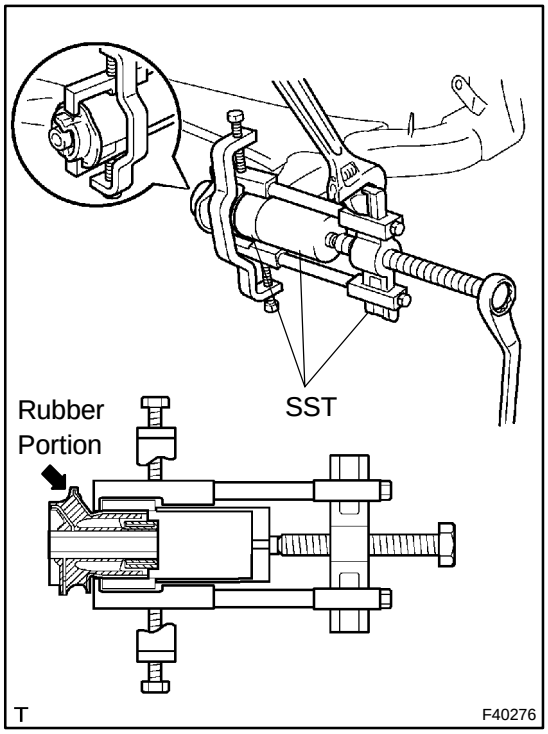
If the axle beam has been scratched, apply the paint.

12. REMOVE REAR AXLE CARRIER BUSH RH

HINT:

Remove the RH side by the same procedures with the LH side.

SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04020, 09957-04010, 09958-04011), 09950-60010 (09951-00630)



13. INSTALL REAR AXLE CARRIER BUSH LH

(a) Align the matchmarks on the axle beam with the 2 notches of a new bushing and temporarily install the bushing to the axle beam.

(b) Using SST, install the bushing to the axle beam.

SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04020, 09957-04010, 09958-04011), 09950-60010 (09951-00620), 09710-04101

NOTICE:

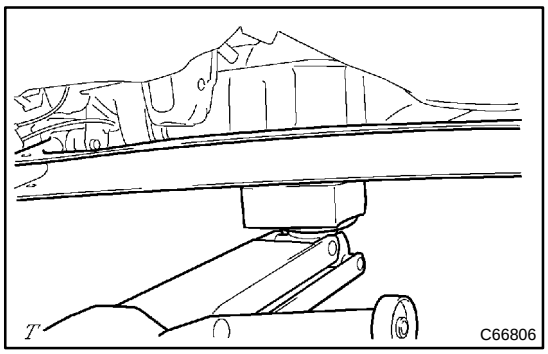
- **Hang the claw of SST to the bushing deeply and firmly.**
- **Do not scratch the rubber portion of the bushing.**
- **Do not deform the bushing rib.**

14. INSTALL REAR AXLE CARRIER BUSH RH

HINT:

Install the RH side by the same procedures with the LH side.

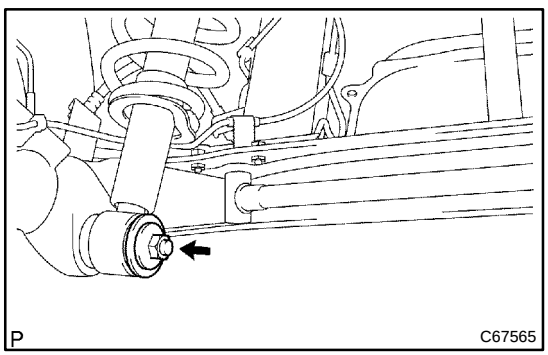
SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04020, 09957-04010, 09958-04011), 09950-60010 (09951-00620), 09710-04101



15. TEMPORARY TIGHTEN REAR AXLE BEAM ASSY

(a) Support the rear axle beam with jack.

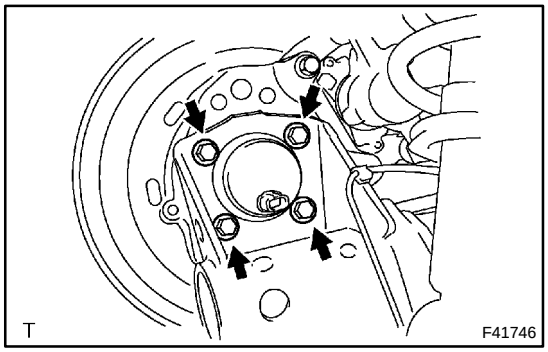
(b) Install the rear axle beam, 2 bolts, washers, and temporary tighten the 2 nuts.



16. TEMPORARY TIGHTEN REAR SHOCK ABSORBER WITH COIL SPRING

(a) Install the rear shock absorber, washer and temporary tighten the nut.

(b) Employ the same manner described above to the other side.



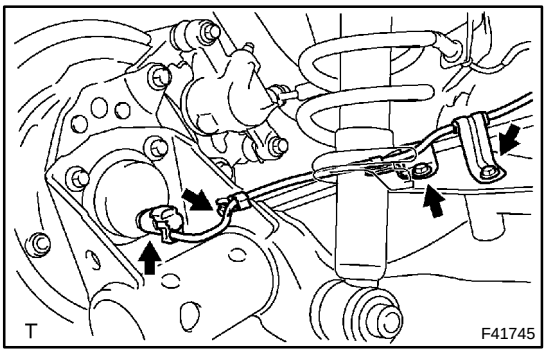
17. INSTALL REAR AXLE HUB & BEARING ASSY LH

Install the rear axle hub with the 4 bolts.
Torque: 56 N·m (571 kgf·cm, 41 ft·lbf)

18. INSTALL REAR AXLE HUB & BEARING ASSY RH

HINT:
Install the RH side by the same procedures with the LH side.

19. INSTALL STABILIZER BAR REAR (W/ REAR STABILIZER)
(See page 27-15)



20. INSTALL SKID CONTROL SENSOR WIRE

(a) Install the parking brake cable with a bolt.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
(b) Install the skid control sensor wire harness with a bolt.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
(c) Connect the skid control sensor connector.

21. INSTALL REAR DISC

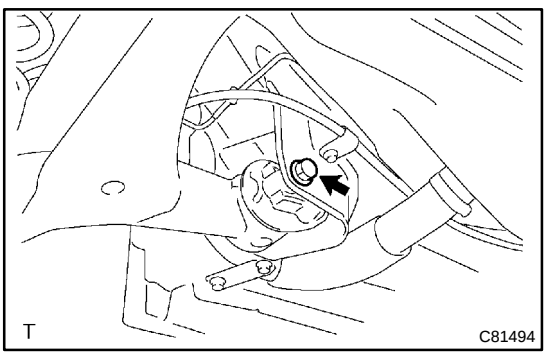
22. INSTALL REAR DISC BRAKE CALIPER ASSY LH **(See page 30-42)**

23. INSTALL REAR DISC BRAKE CALIPER ASSY RH

HINT:
Install the RH side by the same procedures with the LH side.

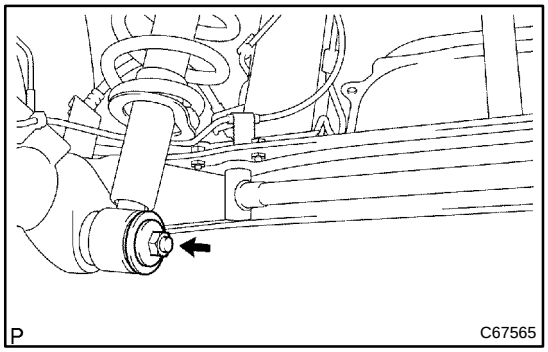
24. STABILIZE SUSPENSION

(a) Install the rear wheel and jack down the vehicle.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
(b) Bounce the vehicle up and down several times to stabilize the suspension.



25. FULLY TIGHTEN REAR AXLE BEAM ASSY

(a) Fully tighten the bolt.
Torque: 85 N·m (867 kgf·cm, 62 ft·lbf)
(b) Employ the same manner described above to the other side.



26. FULLY TIGHTEN REAR SHOCK ABSORBER WITH COIL SPRING

(a) Fully tighten the nut.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

(b) Employ the same manner described above to the other side.

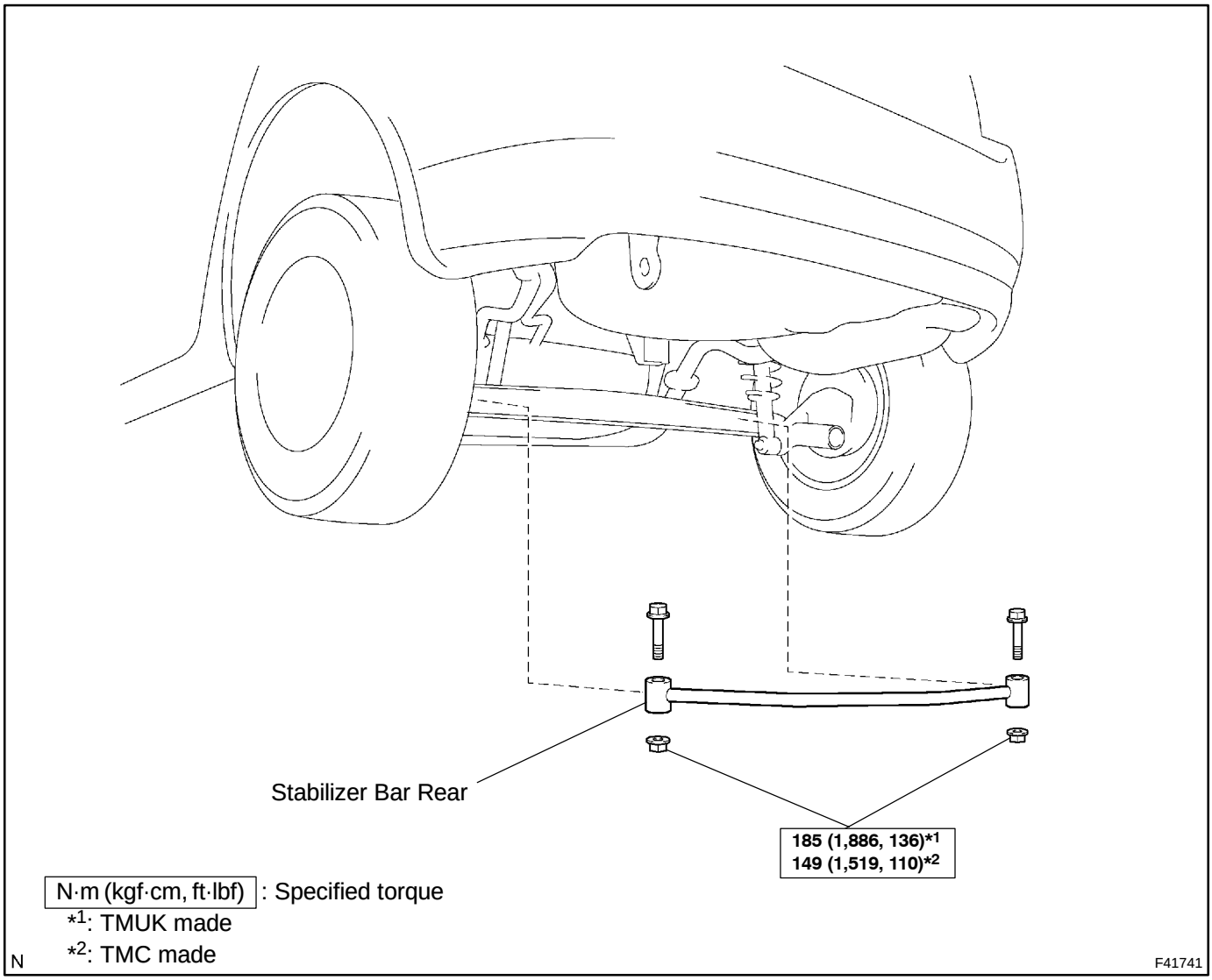
27. INSPECT REAR WHEEL ALIGNMENT **(See page 27-2)**

28. CHECK ABS SPEED SENSOR SIGNAL **(See page 05-565 or 05-618 or 05-673)**

STABILIZER BAR REAR

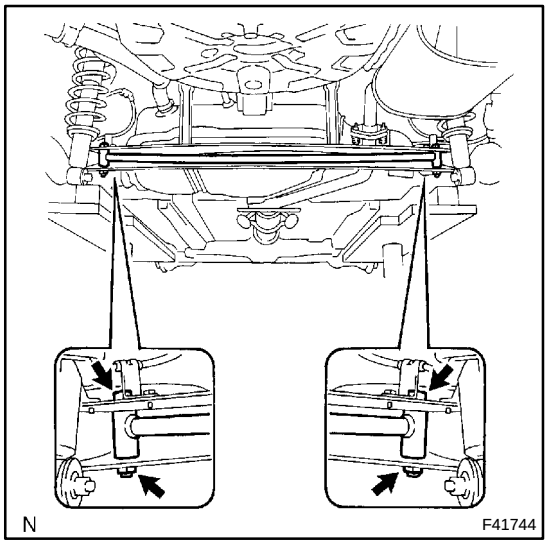
COMPONENTS

27070-01



2700S-03

REPLACEMENT

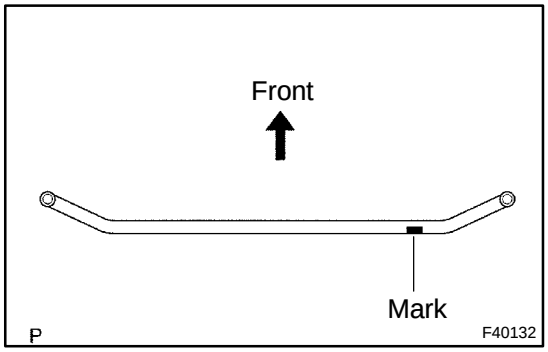


1. REMOVE STABILIZER BAR REAR

(a) Remove the 2 bolts, nuts and stabilizer bar.

2. INSTALL STABILIZER BAR REAR

(a) Install the 2 bolts, nuts and stabilizer bar.
Torque:
TMUK made:
185 N·m (1,886 kgf·cm, 136 ft·lbf)
TMC made:
149 N·m (1,519 kgf·cm, 110 ft·lbf)



HINT:
Install the stabilizer bar so that the mark is positioned on the rear right side of the vehicle.

TIRE & WHEEL

WHEEL AND TIRE SYSTEM 28–1
INSPECTION 28–1/3

WHEEL AND TIRE SYSTEM

INSPECTION

28003-02

1. INSPECT TIRE

(a) Check the tires for wear and proper inflation pressure.

Cold tire inflation pressure:

w/o rear seat:

For driving at 160 km/h (100 mph) or over:

Engine type (Body type)	Tire size	Front, Rear kPa (kgf/cm^2, psi)
4ZZ-FE	175/70R14 84H	270 (2.7, 39) *1,*2
	195/60R15 88V	260 (2.6, 37) *1,*2
3ZZ-FE	195/60R15 88V	270 (2.7, 39) *1,*2
1CD-FTV (W/G)	195/60R15 88V	270 (2.7, 39) *1,*2
1CD-FTV (H/B)	195/60R15 88V	290 (2.9, 42) *1,*2

For driving under 160 km/h (100 mph):

Engine type (Body type)	Tire size	Front, Rear kPa (kgf/cm^2, psi)
4ZZ-FE	175/70R14 84H	230 (2.3, 33) *1,*2
	195/60R15 88V	220 (2.2, 32) *1,*2
3ZZ-FE	195/60R15 88V	220 (2.2, 32) *1,*2
1CD-FTV	195/60R15 88V	240 (2.4, 35) *1,*2

w/ rear seat:

For driving at 160 km/h (100 mph) or over:

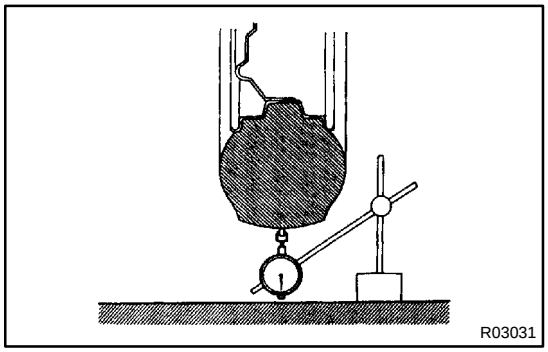
Engine type (Body type)	Tire size	Front, Rear kPa (kgf/cm^2, psi)
4ZZ-FE	175/70R14 84H	260 (2.6, 37) *1 270 (2.7, 39) *2
	195/60R15 88V	260 (2.6, 37) *1,*2
3ZZ-FE	195/60R15 88V	270 (2.7, 39) *1,*2
	195/60R15 88H	270 (2.7, 39) *1,*2
2ZZ-GE	195/55R16 87V	280 (2.8, 41) *1 290 (2.9, 42) *2
1CD-FTV (S/D, W/G)	195/60R15 88V	270 (2.7, 39) *1,*2
1CD-FTV (H/B)	195/60R15 88V	290 (2.9, 42) *1,*2

For driving under 160 km/h (100 mph):

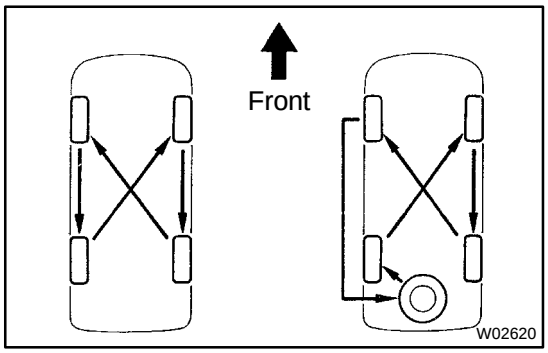
Engine type	Tire size	Front, Rear kPa (kgf/cm^2, psi)
4ZZ-FE	175/70R14 84H	220 (2.2, 32) *1 230 (2.3, 33) *2
	195/60R15 88V	220 (2.2, 32) *1,*2
3ZZ-FE	195/60R15 88V	220 (2.2, 32) *1,*2
	195/60R15 88H	220 (2.2, 32) *1,*2
2ZZ-GE	195/55R16 87V	220 (2.2, 32) *1 230 (2.3, 33) *2
1CD-FTV	195/60R15 88V	240 (2.4, 35) *1,*2

***1: Standard inflation for all loads including full rated loads**

***2: Inflation for heavy loads, e.g. trailer towing**

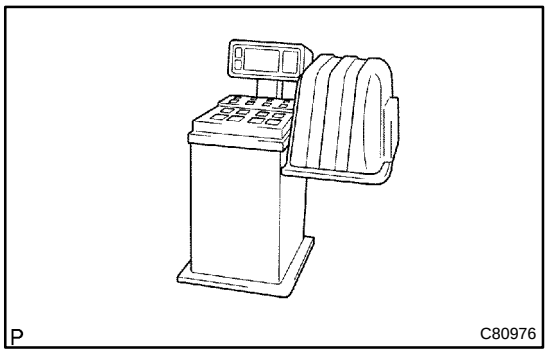


(b) Using a dial indicator, check the tire runout.
Tire runout: 1.4 mm (0.055 in.) or less



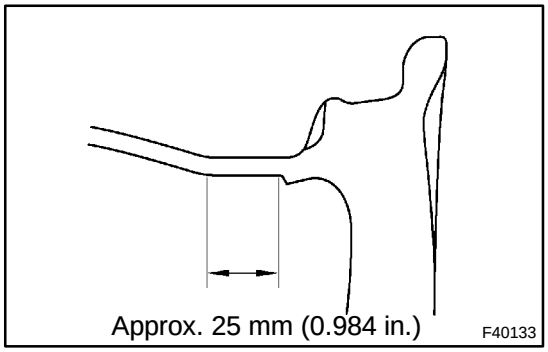
2. ROTATE TIRE

HINT:
See the illustration for where to rotate each tire when you include the spare tire in the rotation and when you do not.



3. INSPECT WHEEL BALANCE

(a) Check and adjust the Off-the-car balance.
(b) If necessary, check and adjust the On-the-car balance.
Imbalance after adjustment: 8.0 g (0.018 lb) or less



NOTICE:

- **Adhere the sticking type balance weight to the felt position as shown in the illustration.**
- **Push the balance weight securely with a finger to adhere it to the position.**
  (Pushing force: 10 kgf/more than 2 secs.)
- **After cleaning the surface which the balance weight will be adhered to of dirt, oil and water with a cleaning detergent, adhere the balance weight to the surface.**
- **Do not touch the sticking surface of the tape.**
- **Do not use the once used balance weight.**
- **Please use the TOYOTA genuine sticking type balance weight.**

4. INSPECT BEARING BACKLASH **(See page 30-37)**
5. INSPECT AXLE HUB DEVIATION **(See page 30-37)**
6. INSPECT BEARING BACKLASH **(See page 30-42)**
7. INSPECT AXLE HUB DEVIATION **(See page 30-42)**
8. CHECK FRONT SUSPENSION FOR LOOSENESS
9. CHECK STEERING LINKAGE FOR LOOSENESS
10. CHECK BALL JOINT FOR LOOSENESS

11. CHECK SHOCK ABSORBER WORKS PROPERLY

- Check if oil leaks
- Check mounting bushings for wear
- Bounce front and rear of the vehicle

DRIVE SHAFT / PROPELLER SHAFT

DRIVE SHAFT,
PROPELLER SHAFT, AXLE 30-1
PROBLEM SYMPTOMS TABLE 30-1
ON-VEHICLE INSPECTION 30-2
FRONT DRIVE SHAFT
(3ZZ-FE/4ZZ-FE) 30-3
COMPONENTS 30-3/5
OVERHAUL 30-6/15
FRONT DRIVE SHAFT
(2ZZ-GE/1CD-FTV) 30-16
COMPONENTS 30-16/17
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COMPONENTS 30-31
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FRONT AXLE LH HUB BOLT 30-39
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REPLACEMENT 30-41/42
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REPLACEMENT 30-43/44

DRIVE SHAFT, PROPELLER SHAFT, AXLE

3000O-04

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Wander	5. Steering linkage (Loosen or worn)	-
	6. Hub bearing (Worn)	30-32 30-41
Front wheel shimmy	1. Ball joint (Worn)	30-32
	2. Hub bearing (Worn)	30-32 30-41
	3. Steering linkage (Loosen or worn)	-
Noise	1. Inboard joint (Worn)	30-6 30-18
	2. Outboard joint (Worn)	30-6 30-18

3000P-02

ON-VEHICLE INSPECTION

1. INSPECT FRONT AXLE HUB BEARING

(a) Remove the front wheels.
(b) Separate the front disc brake caliper assy.
(c) Remove the front disc.
(d) Inspect the bearing backlash (See page 30-37).
(e) Inspect the axle hub deviation (See page 30-37).
(f) Install the front disc.
(g) Install the front disc brake caliper assy.
Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)
(h) Install the front wheels.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

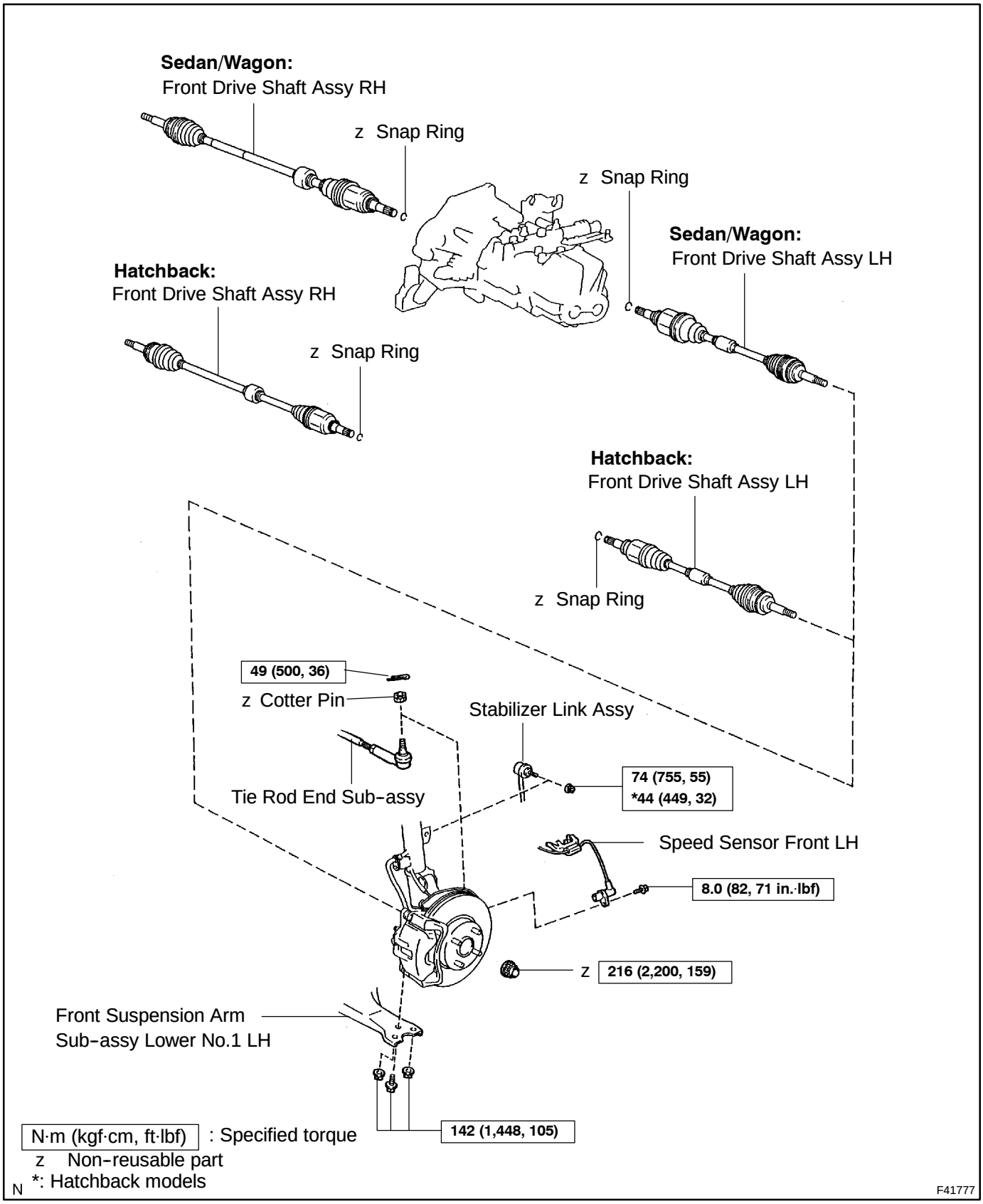
2. INSPECT REAR AXLE HUB BEARING

(a) Remove the rear wheels.
(b) Remove the rear disc brake caliper assy.
(c) Remove the rear disc.
(d) Inspect the bearing backlash (See page 30-42).
(e) Inspect the axle hub deviation (See page 30-42).
(f) Install the rear disc.
(g) Install the rear disc brake caliper assy.
Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)
(h) Install the rear wheels.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

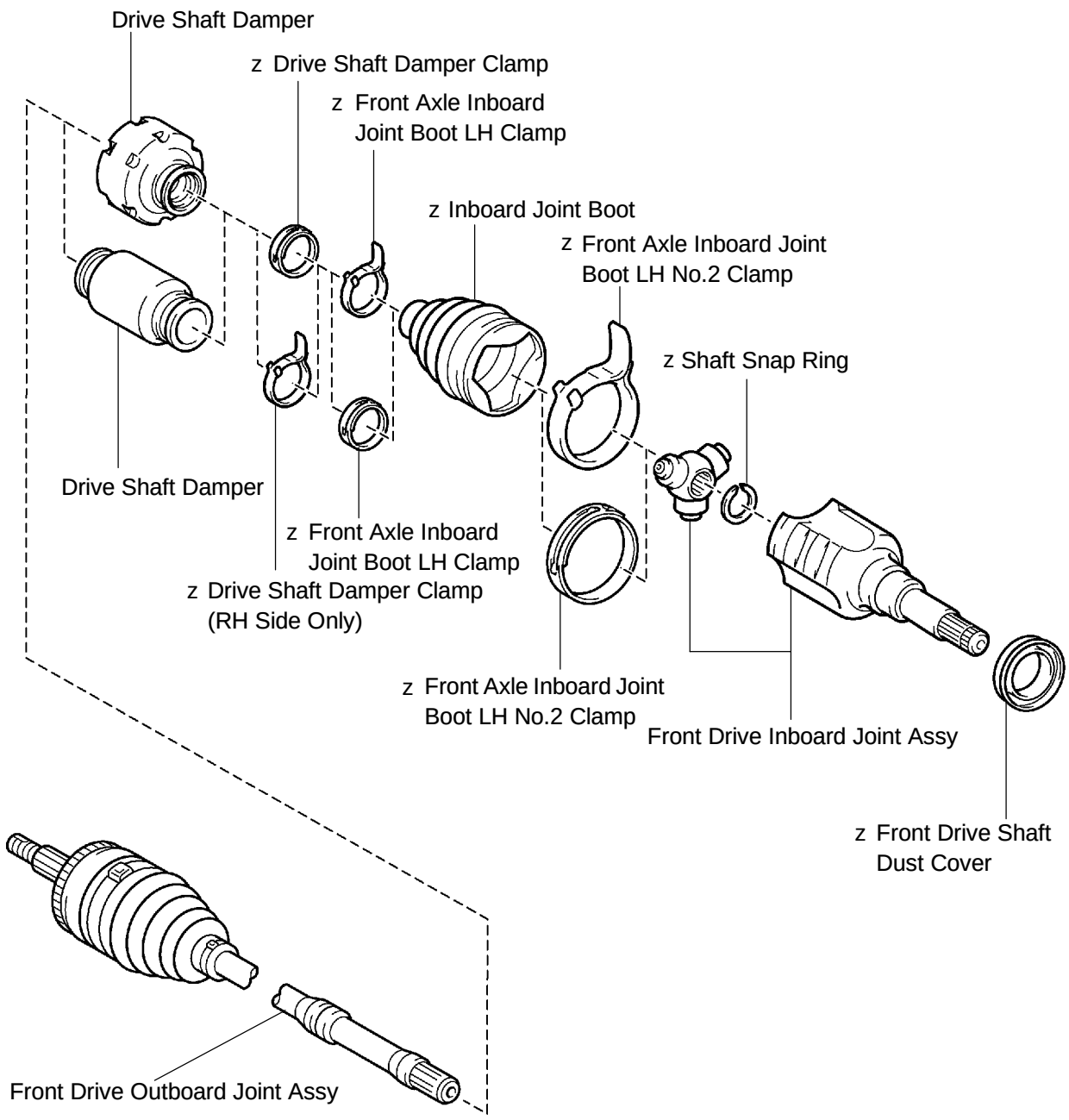
FRONT DRIVE SHAFT (3ZZ-FE/4ZZ-FE)

COMPONENTS

3008Y-01



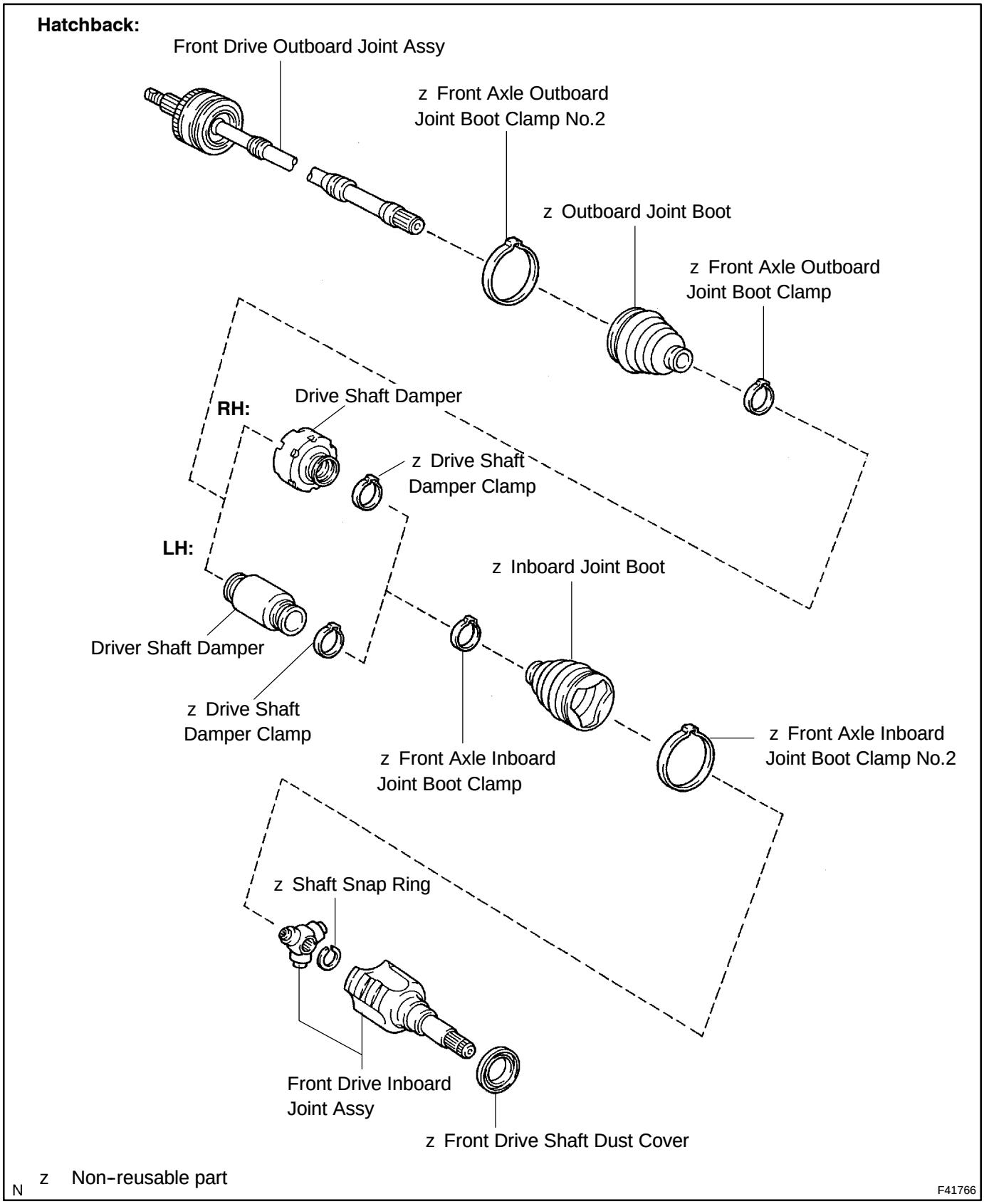
Sedan/Wagon:



T

z Non-reusable parts

F41897


Hatchback:
Front Drive Outboard Joint Assy
z Front Axle Outboard Joint Boot Clamp No.2
z Outboard Joint Boot
z Front Axle Outboard Joint Boot Clamp
RH:
Drive Shaft Damper
z Drive Shaft Damper Clamp
LH:
z Inboard Joint Boot
Driver Shaft Damper
z Drive Shaft Damper Clamp
z Front Axle Inboard Joint Boot Clamp
z Front Axle Inboard Joint Boot Clamp No.2
z Shaft Snap Ring
Front Drive Inboard Joint Assy
z Front Drive Shaft Dust Cover
z Non-reusable part
N
F41766

3008Z-01

OVERHAUL

HINT:

Overhaul the RH side by the same procedures with LH side.

1. DRAIN MANUAL TRANSAXLE OIL (M/T TRANSAXLE)

(a) Remove the filler plug and gasket.

(b) Remove the drain plug and gasket.

(c) Install 2 new gaskets, drain plug and filler plug.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

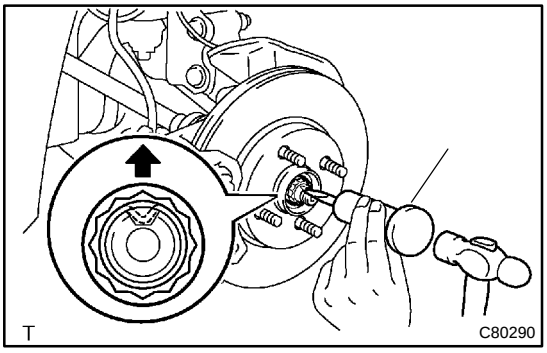
2. DRAIN AUTOMATIC TRANSAXLE FLUID (A/T TRANSAXLE)

(a) Remove the drain plug and gasket, drain the ATF.

(b) Install a new gasket and drain plug.

Torque: 17.2 N·m (175 kgf·cm, 13 ft·lbf)

3. REMOVE FRONT WHEEL

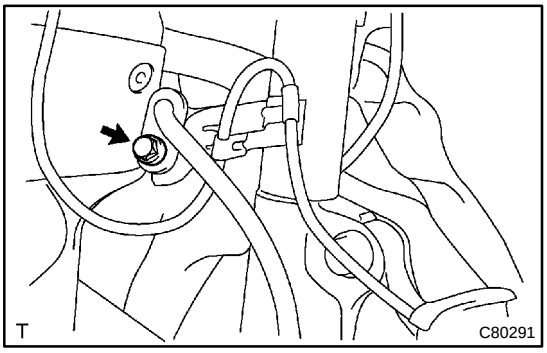


4. REMOVE FRONT AXLE HUB LH NUT

(a) Using SST and a hammer, unstake the staked part of the nut.

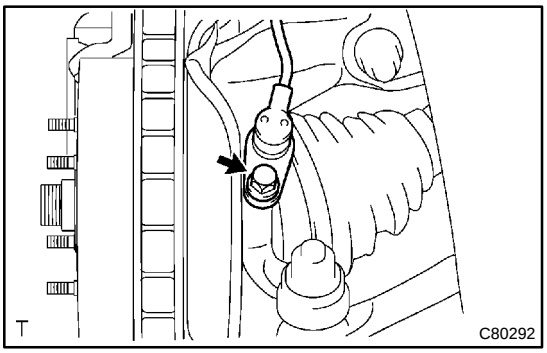
SST 09930-00010

(b) While applying the brakes, remove the lock nut.

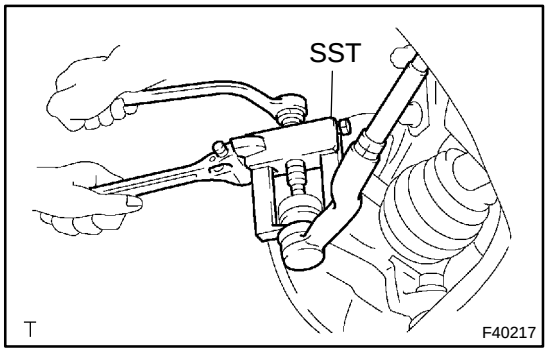


5. DISCONNECT SPEED SENSOR FRONT LH

(a) Remove the bolt, disconnect the speed sensor wire and flexible hose from the shock absorber.

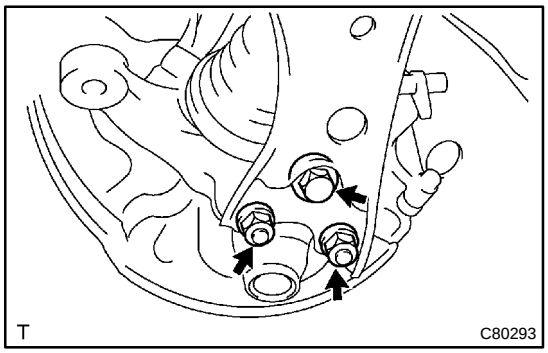


(b) Remove the bolt, disconnect the speed sensor from the steering knuckle.



6. SEPARATE TIE ROD END SUB-ASSY LH

(a) Remove the cotter pin and nut.
(b) Using SST, separate the tie rod end from the steering knuckle.
SST 09628-62011



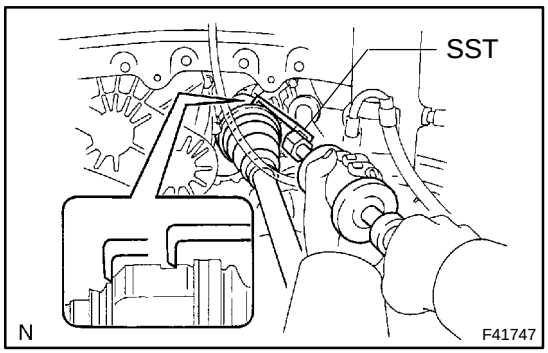
7. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Remove the bolt and 2 nuts, and separate the front suspension arm from the lower ball joint.

8. SEPARATE FRONT AXLE ASSY LH

(a) Using a plastic hammer, separate the drive shaft from the axle hub.

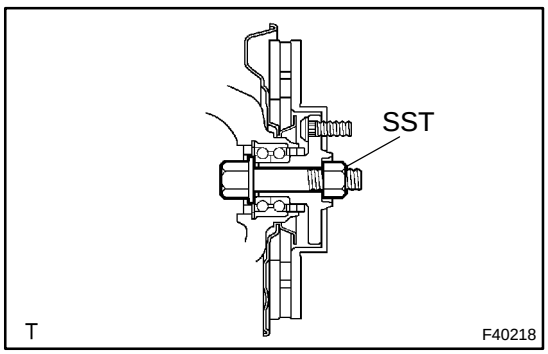
NOTICE:
Be careful not to damage the boot and speed sensor rotor.



9. REMOVE FRONT DRIVE SHAFT ASSY LH

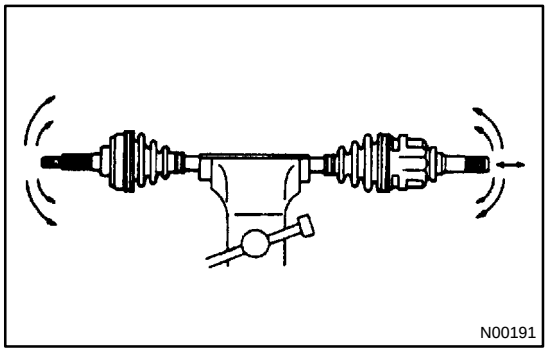
(a) Remove the front fender epron seal LH.
(b) Using SST, remove the front drive shaft assy LH.
SST 09520-01010, 09520-24010 (09520-32040)

NOTICE:
Be careful not to damage the oil seal.



10. FIX FRONT AXLE ASSY LH

NOTICE:
The hub bearing could be damaged if it is subjected to the vehicle weight, such as when moving the vehicle with the drive shaft removed.
Therefore, if it is absolutely necessary to place the vehicle weight on the hub bearing, first support it with SST.
SST 09608-16042 (09608-02021, 09608-02041)


N00191

11. INSPECT FRONT DRIVE SHAFT

(a) Check that there is no remarkable play in the outboard joint.

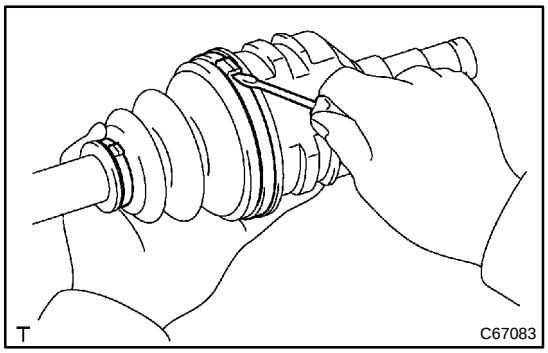
(b) Check that the inboard joint slides smoothly in the thrust direction.

(c) Check that there is no remarkable play in the radial direction of the inboard joint.

(d) Check the boots for damage.

NOTICE:

Keep the drive shaft assy level during inspection.


T C67083

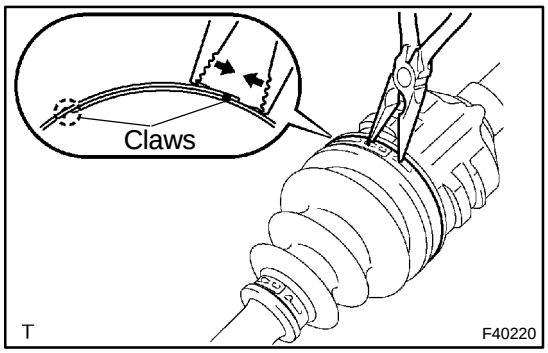
12. REMOVE FRONT AXLE INBOARD JOINT BOOT CLAMP

(a) One touch type:

Using a screwdriver, remove the inboard joint boot LH No.2 clamp.

HINT:

Remove the inboard joint boot LH clamp by the same procedure with inboard joint boot LH No.2 clamp.



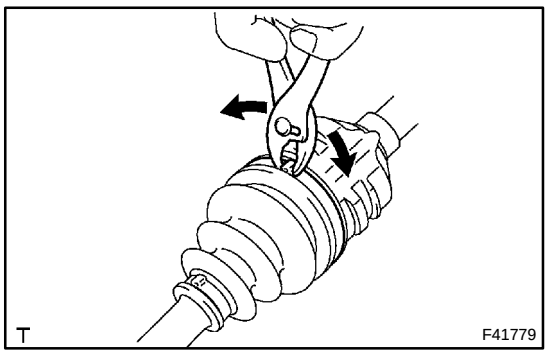
T F40220

(b) Clew engagement type:

Using needle-nose pliers and remove the inboard joint boot LH No.2 clamp, as shown in the illustration.

HINT:

Remove the inboard joint boot LH clamp by the same procedure with inboard joint boot LH No.2 clamp.


T F41779

(c) Omega type:

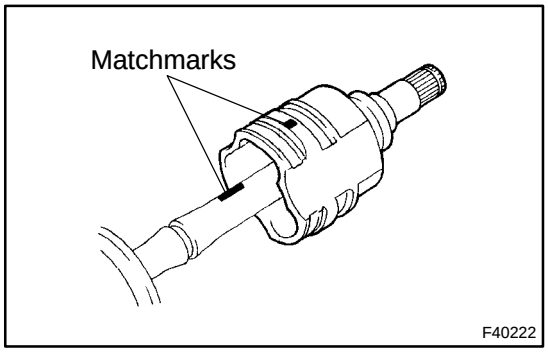
Using a pliers, remove the inboard joint boot LH No.2 clamp.

HINT:

Remove the inboard joint boot LH clamp by the same procedure with inboard joint boot LH No.2 clamp.

13. SEPARATE FR AXLE INBOARD JOINT BOOT

(a) Separate the boot from the inboard joint assy LH.

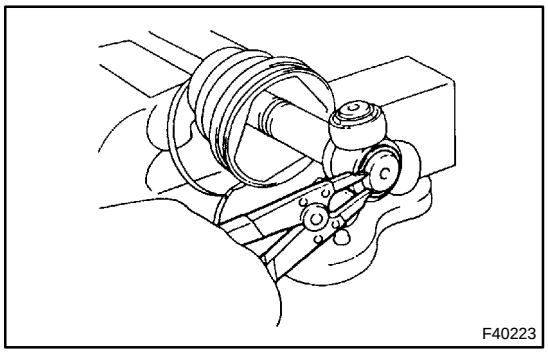


14. REMOVE FRONT DRIVE INBOARD JOINT ASSY LH

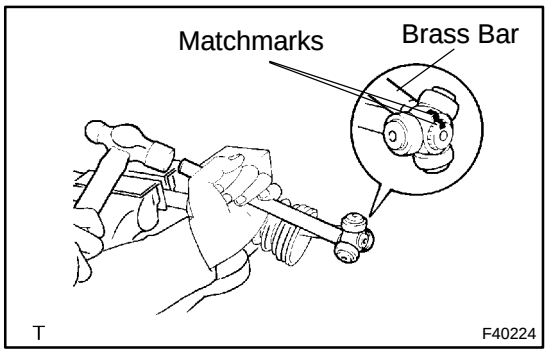
(a) Remove the old grease from the inboard joint.
(b) Place matchmarks on the inboard joint assy LH and outboard joint shaft assy.

NOTICE:
Do not punch the marks.

(c) Remove the inboard joint assy LH from the outboard joint shaft assy.



(d) Using a snap ring expander, remove the snap ring.



(e) Place matchmarks on the outboard joint shaft assy and tripod joint assy.

NOTICE:
Do not punch the marks.

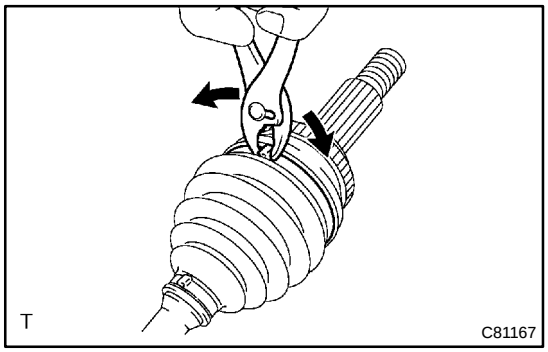
(f) Using a brass bar and hammer, remove the tripod joint assy from the outboard joint shaft assy.

NOTICE:
Do not tap the roller.

(g) Remove the inboard joint boot LH No.2 clamp, inboard joint boot and inboard joint boot LH clamp.

15. REMOVE DRIVE SHAFT DAMPER

(a) Using needle-nose pliers, remove the drive shaft damper clamp.
(b) Remove the drive shaft damper.



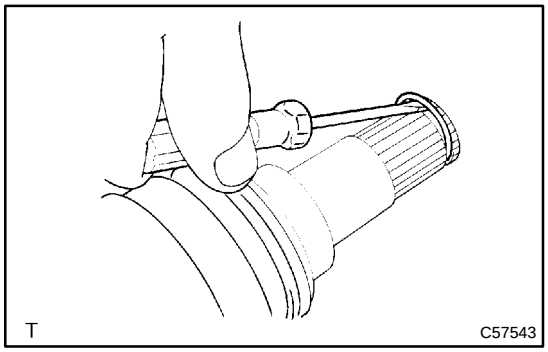
16. REMOVE FRONT AXLE OUTBOARD JOINT BOOT CLAMP (HATCH BACK BODY TYPE)

(a) Using a pliers, remove the outboard joint boot LH No.2 clamp.

HINT:
Remove the outboard joint boot LH clamp by the same procedure with outboard joint boot LH No.2 clamp.

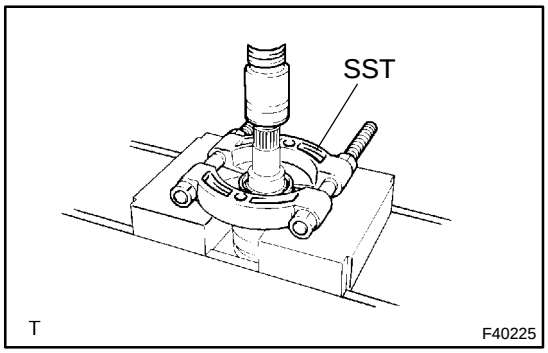
17. REMOVE OUTBOARD JOINT BOOT (HATCH BACK BODY TYPE)

(a) Remove the outboard joint boot from the outboard joint shaft assy.
(b) Remove the old grease from the outboard joint.



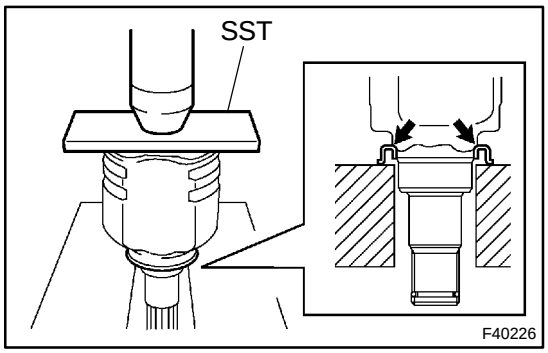
18. REMOVE FRONT DRIVE SHAFT LH HOLE SNAP RING

(a) Using a screwdriver, remove the snap ring.



19. REMOVE FRONT DRIVE SHAFT DUST COVER LH

(a) Using SST and a press, remove the dust cover.
SST 09950-00020



20. INSTALL FRONT DRIVE SHAFT DUST COVER LH

(a) Using SST, a steel plate and press, install a new dust cover, as shown in the illustration.
SST 09527-10011

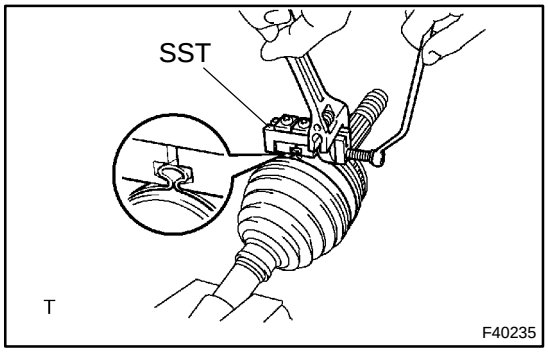
NOTICE:
- **Dust cover should be installed completely.**
- **Not to damage the dust cover.**

21. INSTALL FRONT DRIVE SHAFT LH HOLE SNAP RING

(a) Install a new snap ring.

22. INSTALL OUTBOARD JOINT BOOT (HATCH BACK BODY TYPE)

(a) Wrap the spline of the outboard joint shaft with vinyl tape to prevent them from being damaged.
(b) Install new parts to the outboard joint shaft assy in the following order.
  (1) Outboard joint boot LH No.2 clamp
  (2) Outboard joint boot
  (3) Outboard joint boot LH clamp
(c) Pack the outboard joint assy LH with grease.
  Grease capacity:
  85 - 105 g (3.00 - 3.70 oz.)
(d) Install the outboard joint boot to the outboard joint shaft assy.



23. INSTALL FRONT AXLE OUTBOARD JOINT BOOT CLAMP (HATCH BACK BODY TYPE)

(a) Pinch the outboard joint large clamp.

(1) Secure the outboard joint large clamp onto the boot.

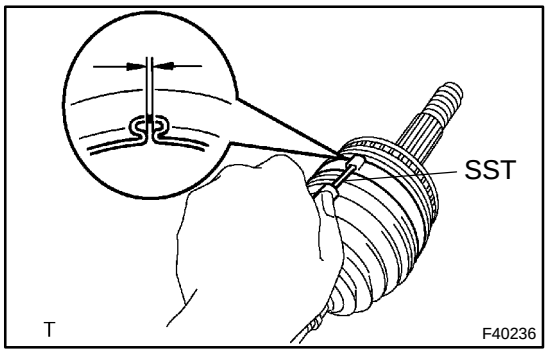
(2) Place SST onto the outboard joint large boot clamp.

SST 09521-24010

(3) Tighten the SST so that the large clamp is pinched.

NOTICE:

Do not overtighten the SST.



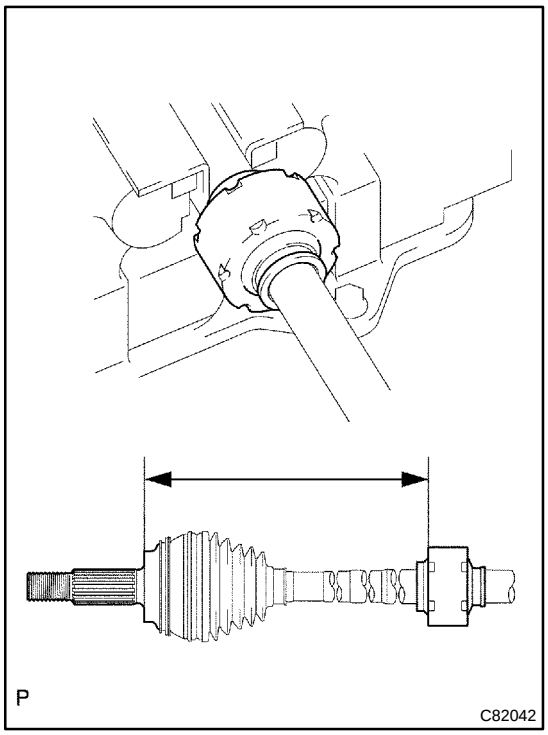
(4) Using SST, adjust the clearance of the large clamp.

SST 09240-00020

Clearance: 0.8 mm (0.031 in.) or less

HINT:

Install the outboard joint boot LH clamp by the same procedure with outboard joint boot LH No.2 clamp.



24. INSTALL DRIVE SHAFT DAMPER (RH DRIVE SHAFT)

(a) RH drive shaft:

Set the distance (A), as described below.

Body type	Distance mm (in.)
Sedan/Wagon	440 ± 2 (17.32 ± 0.08)
Hatchback	422 ± 2 (16.61 ± 0.08)

(b) LH drive shaft:

Set the distance (A), as described below.

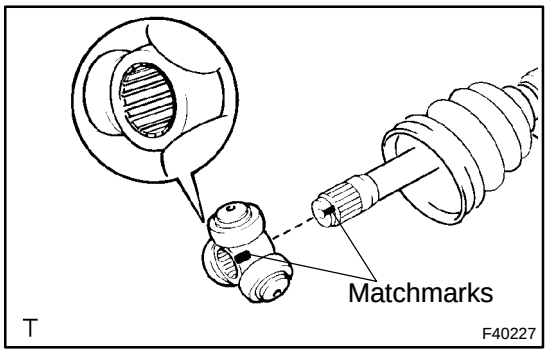
Body type	Distance mm (in.)
Wagon	217 ± 2 (8.54 ± 0.08)
Hatchback	213 ± 2 (8.39 ± 0.08)

25. INSTALL DRIVE SHAFT DAMPER SETTING CLAMP

(a) Set a new damper setting clamp to the drive shaft damper and install the damper setting clamp with pliers.

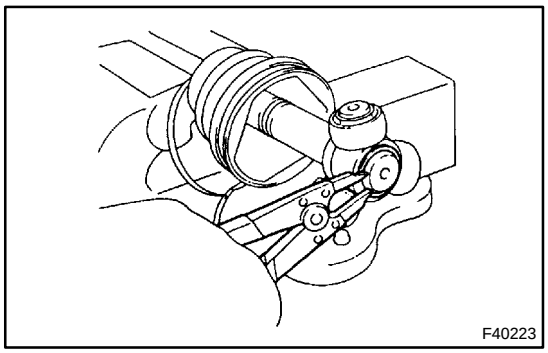
26. INSTALL FRONT DRIVE INBOARD JOINT ASSY LH

(a) Wrap the sprine of the outboard joint shaft with vinyl tape to prevent them from being damaged.
(b) Install new parts to the inboard joint shaft assy in the following order.
  (1) Inboard joint boot LH clamp
  (2) Inboard joint boot
  (3) Inboard joint boot LH No.2 clamp



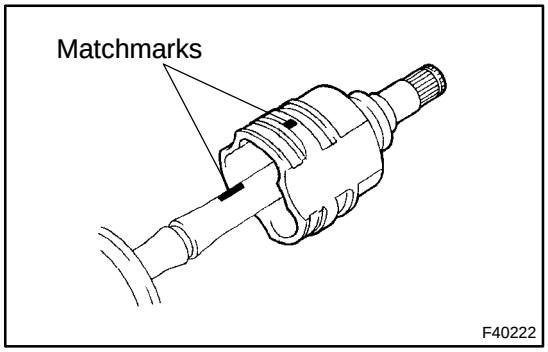
(c) Align the matchmarks and install tripod joint assy to the outboard joint assy.
(d) Using a brass bar and hammer, install the tripod joint assy.

NOTICE:
Do not tap the roller.



(e) Using a snap ring expander, install the snap ring.
(f) Pack the inboard joint assy LH with grease.

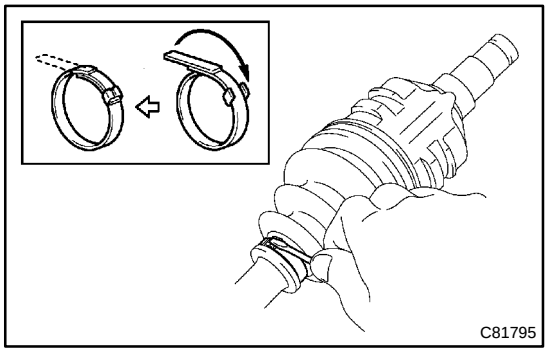
Body type	Grease capacity
Sedan/Wagon	180 - 190 g (6.35 - 6.70 oz.)
Hatchback	126 - 136 g (4.44 - 4.80 oz.)



(g) Align the matchmarks install the inboard joint assy LH to the outboard joint shaft assy.

27. INSTALL FR AXLE INBOARD JOINT BOOT

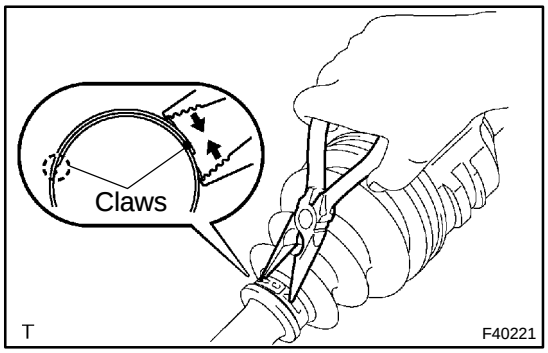
(a) Install the inboard joint boot to the inboard joint assy and outboard joint shaft assy.



28. INSTALL FRONT AXLE INBOARD JOINT BOOT CLAMP

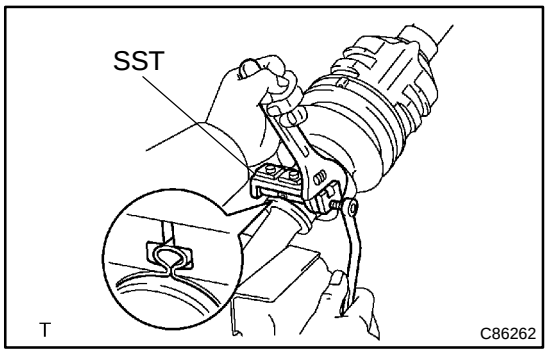
(a) One touch type:
Using a screwdriver, install the inboard joint boot LH clamp to the inboard joint boot, as shown in the illustration.

HINT:
Install the inboard joint boot LH clamp No.2 by the same procedure with outboard joint boot LH clamp.



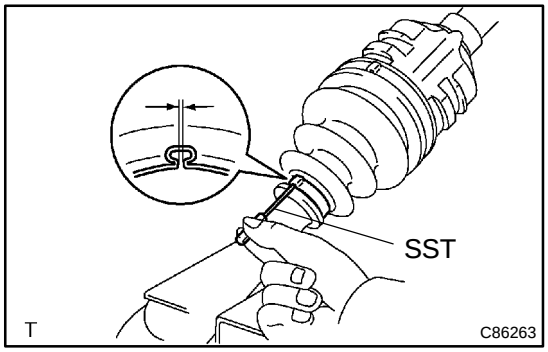
(b) Clew engagement type:
Using a pliers, install the inboard joint boot LH clamp, as shown in the illustration.

HINT:
Install the inboard joint boot LH clamp No.2 by the same procedure with outboard joint boot LH clamp.



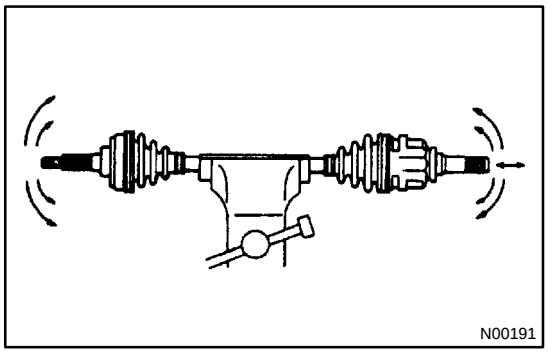
(c) Omega type
(1) Mount drive shaft in a soft vise.
(2) Secure the 2 outboard joint boot clamps onto the boot.
(3) Place SST onto the outboard joint small boot clamp.
SST 09521-24010
(4) Tighten the SST so that the small clamp is pinched.

NOTICE:
Do not overtighten the SST.



(5) Using SST, adjust the clearance of the small clamp.
SST 09240-00020
Clearance: 0.8 mm (0.031 in.) or less
(6) Employ the same manner to the outboard joint large boot clamp.

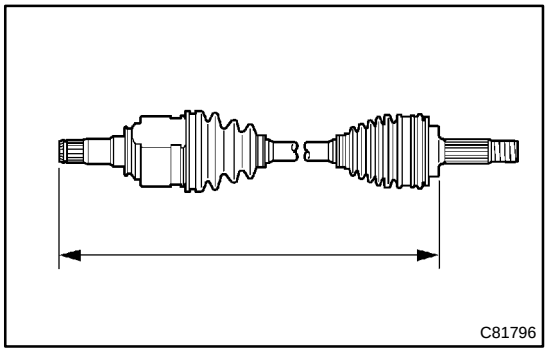
HINT:
Install the inboard joint boot LH clamp No.2 by the same procedure with outboard joint boot LH clamp.



29. INSPECT FRONT DRIVE SHAFT

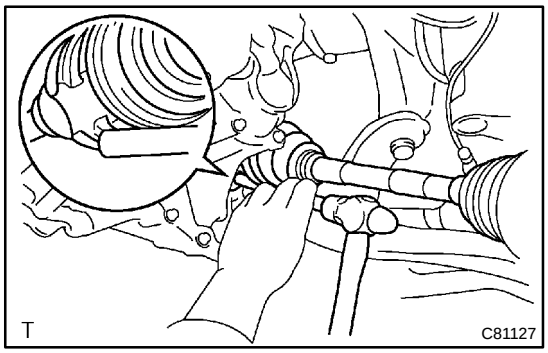
(a) Check to see that there is no remarkable play in the outboard joint.
(b) Check to see that the inboard joint slides smoothly in the thrust direction.
(c) Check to see that there is no remarkable play in the radial direction of the inboard joint.
(d) Check the boots for damage.

NOTICE:
Keep the drive shaft assy level during inspection.



HINT:
For dimension (A), refer to the following table.

Body type	LH mm (in.)	RH mm (in.)
Sedan/Wagon	571.9 (22.52) ± 5.0 (0.20)	839.7 (33.06) ± 5.0 (0.20)
Hatchback	570.8 (22.47) ± 5.0 (0.20)	842.8 (33.18) ± 5.0 (0.20)



30. INSTALL FRONT DRIVE SHAFT ASSY LH

(a) M/T only:
Coat the spline of the inboard joint shaft assy with gear oil.
(b) A/T only:
Coat the spline of the inboard joint shaft assy with ATF.
(c) Aline the shaft splines and install the drive shaft assy with brass bar and hammer.

NOTICE:
- **Set the snap ring with opening side facing downward.**
- **Be careful not to damage the oil seal.**

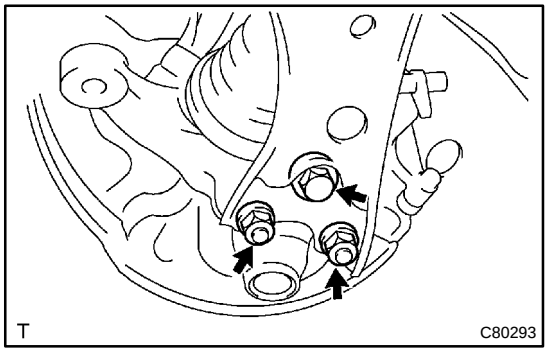
HINT:
Whether the inboard joint shaft is in contact with the pinion shaft or not can be known from the sound or feeling when driving it.

(d) Install fender epron seal LH.

31. INSTALL FRONT AXLE ASSY LH

(a) Install the drive shaft assy LH to the front axle assy LH.

NOTICE:
- **Be careful not to damage the outboard joint boot.**
- **Be careful not to damage the speed sensor rotor.**



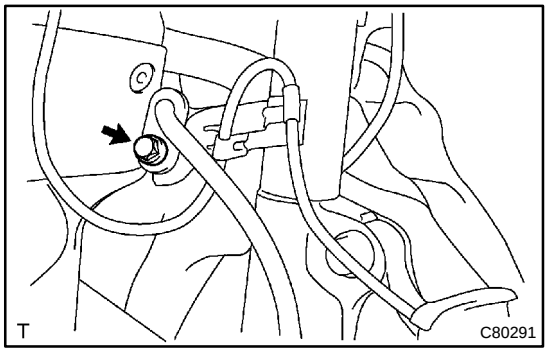
32. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Install the lower ball joint to the lower suspension arm with the bolt and nut.
Torque: 142 N·m (1,448 kgf·cm, 105 ft·lbf)

33. INSTALL TIE ROD END SUB-ASSY LH

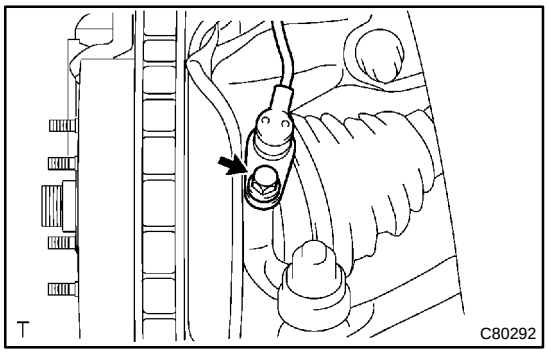
(a) Install the tie rod end to the steering knuckle with the nut.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
(b) Install a new cotter pin.

NOTICE:
If the holes for the cotter pin are not aligned, tighten the nut further to 60_.



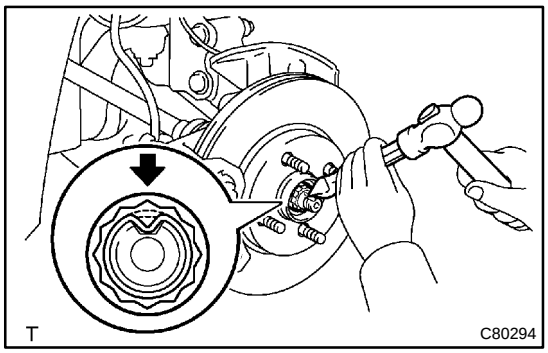
34. INSTALL SPEED SENSOR FRONT LH

(a) Install the speed sensor wire and flexible hose to shock absorber with the bolt
Torque:
TMUK made:
19 N·m (192 kgf·cm, 14 ft·lbf)
TMC made:
29 N·m (296 kgf·cm, 21 ft·lbf)



(b) Install the speed sensor to the steering knuckle with the bolt.
Torque: 8.0 N·m (82 kgf·cm, 71 ft·lbf)

NOTICE:
- **Be careful not to damage the speed sensor.**
- **Prevent foreign matter from being attached.**
- **Do not twist the sensor wire when installing the sensor.**



35. INSTALL FRONT AXLE HUB LH NUT

(a) Install a new hub nut.
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)

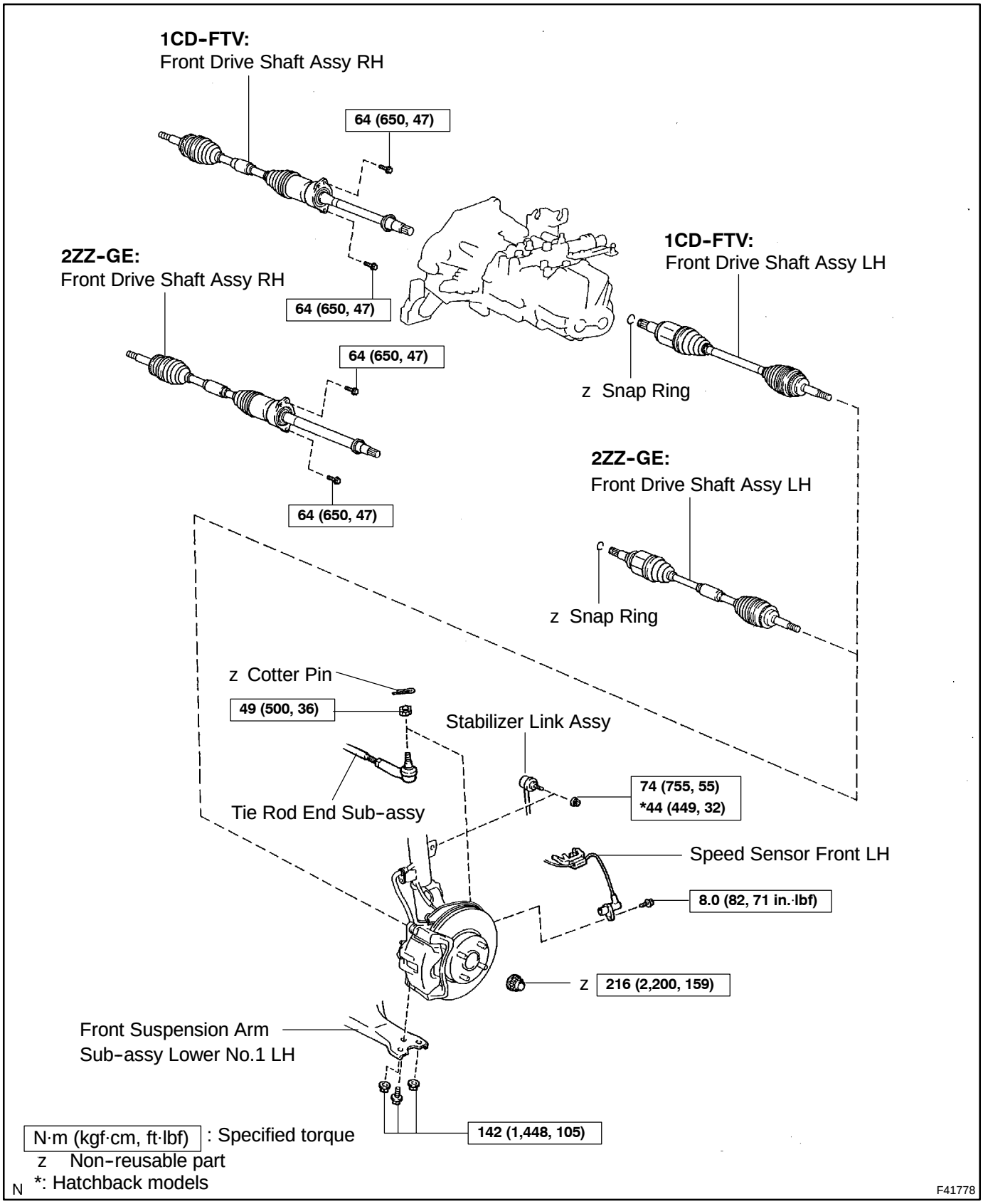
(b) Using a chisel and hammer, stake the lock nut.

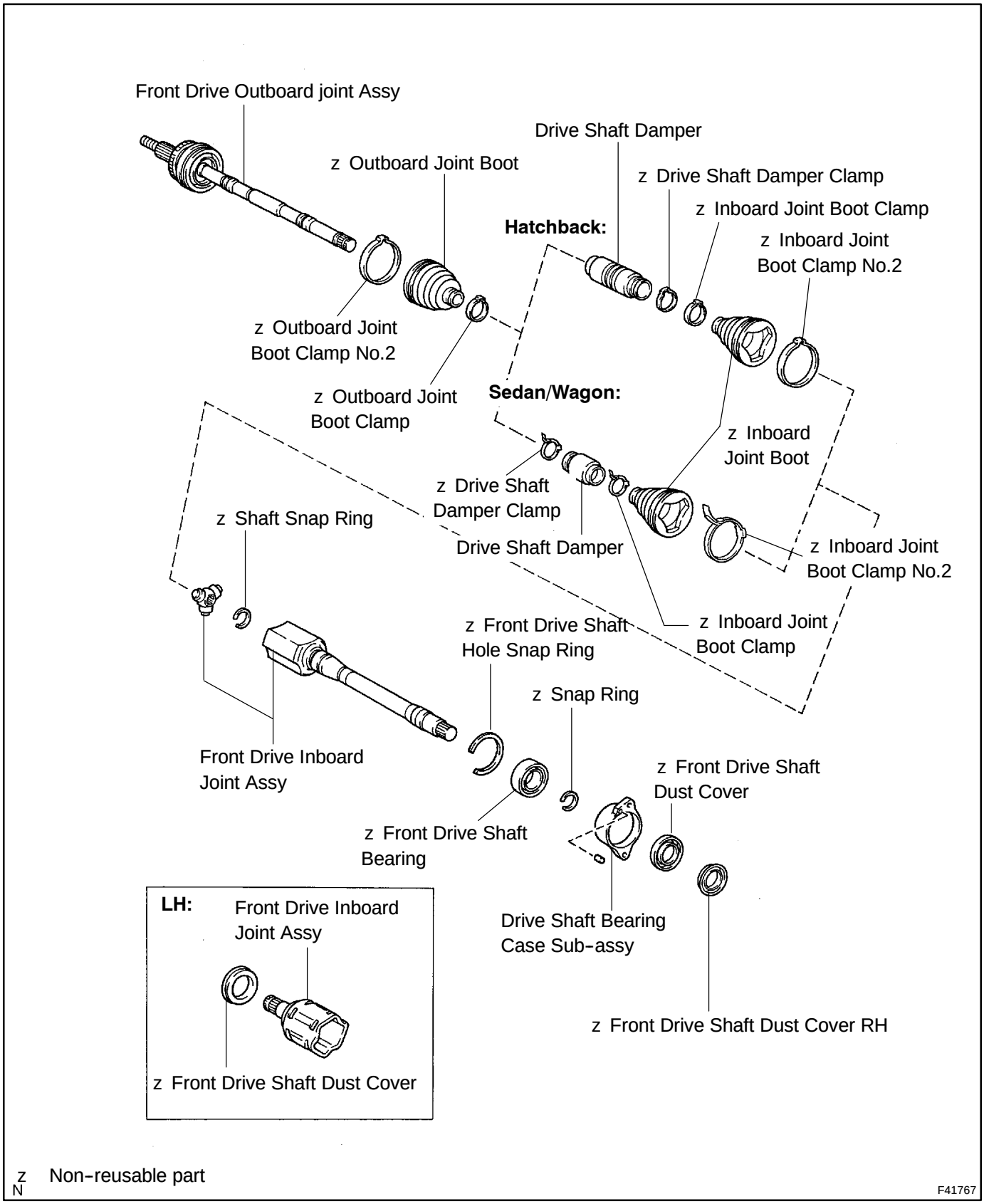
36. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
37. ADD MANUAL TRANSAXLE OIL (M/T TRANSAXLE)
38. INSPECT AND ADJUST MANUAL TRANSAXLE OIL (M/T TRANSAXLE) **(See page 41-2)**
39. ADD AUTOMATIC TRANSAXLE FLUID (A/T TRANSAXLE)
40. INSPECT AND ADJUST AUTOMATIC TRANSAXLE FLUID (A/T TRANSAXLE) **(See page 40-2)**
41. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT **(See page 26-2)**
42. CHECK ABS SPEED SENSOR SIGNAL **(See page 05-565 or 05-618 or 05-673)**

FRONT DRIVE SHAFT (2ZZ-GE/1CD-FTV)

COMPONENTS

3008U-02




Front Drive Outboard joint Assy
z Outboard Joint Boot
Drive Shaft Damper
z Drive Shaft Damper Clamp
z Inboard Joint Boot Clamp
Hatchback:
z Inboard Joint Boot Clamp No.2
z Outboard Joint Boot Clamp No.2
z Outboard Joint Boot Clamp
Sedan/Wagon:
z Inboard Joint Boot
z Drive Shaft Damper Clamp
Drive Shaft Damper
z Inboard Joint Boot Clamp No.2
z Shaft Snap Ring
z Front Drive Shaft Hole Snap Ring
z Inboard Joint Boot Clamp
z Snap Ring
Front Drive Inboard Joint Assy
z Front Drive Shaft Dust Cover
z Front Drive Shaft Bearing
Drive Shaft Bearing Case Sub-assy
z Front Drive Shaft Dust Cover RH
LH:
Front Drive Inboard Joint Assy
z Front Drive Shaft Dust Cover
z Non-reusable part
F41767

30090-01

OVERHAUL

HINT:

Overhaul the RH side by the same procedures with LH side.

1. DRAIN MANUAL TRANSAXLE OIL

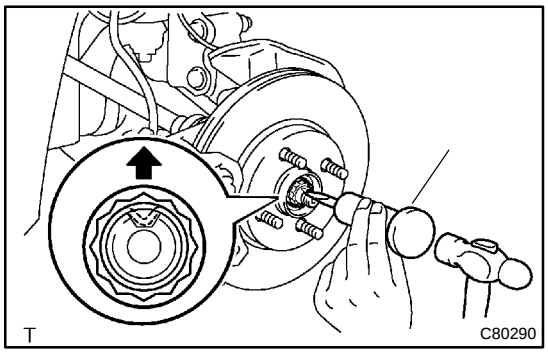
(a) Remove the filler plug and gasket.

(b) Remove the drain plug and gasket.

(c) Install 2 new gaskets, drain plug and filler plug.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

2. REMOVE FRONT WHEEL



3. REMOVE FRONT AXLE HUB LH NUT

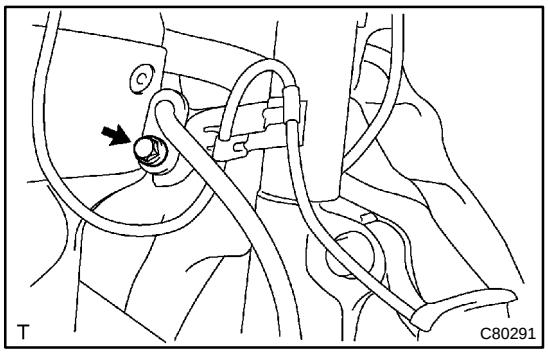
(a) Using SST and a hammer, unstake the staked part of the nut.

SST 09930-00010

(b) While applying the brakes, remove the lock nut.

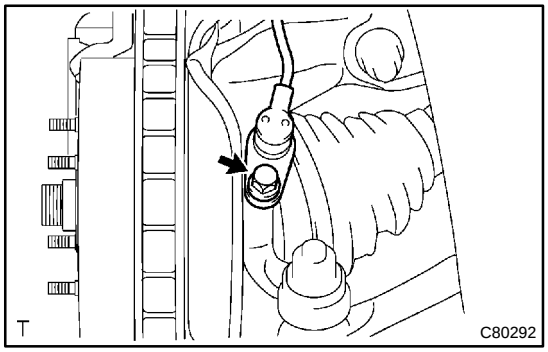
NOTICE:

Loosen the staked part of the lock nut completely, otherwise the screw of the drive shaft may be damaged.

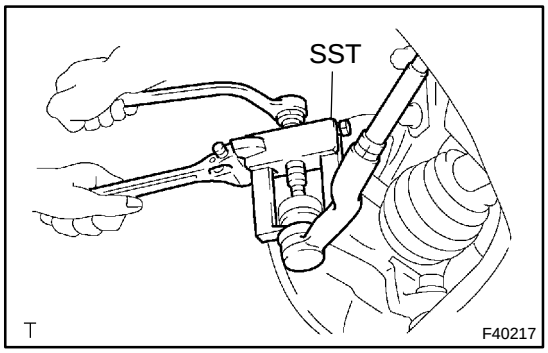


4. DISCONNECT SPEED SENSOR FRONT LH

(a) Remove the bolt, disconnect the speed sensor wire and flexible hose from the shock absorber.



(b) Remove the bolt, disconnect the speed sensor from the steering knuckle.

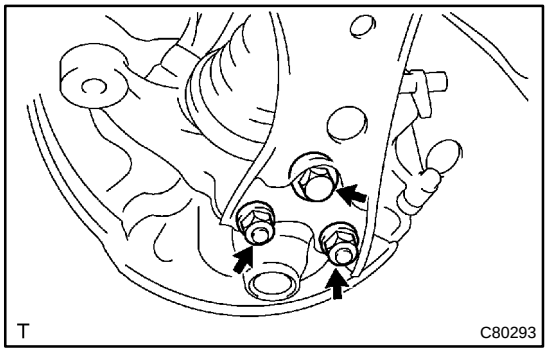


5. SEPARATE TIE ROD END SUB-ASSY LH

(a) Remove the cotter pin and nut.

(b) Using SST, separate the tie rod end from the steering knuckle.

SST 09628-62011



6. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

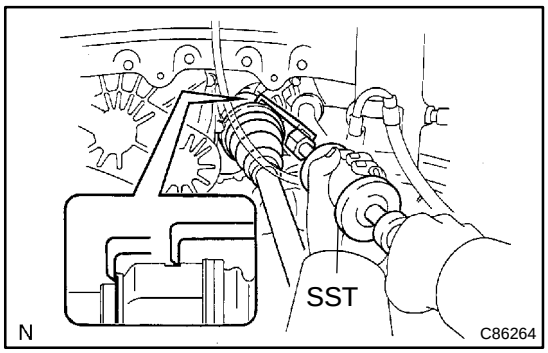
(a) Remove the bolt and 2 nuts, and separate the front suspension arm from the lower ball joint.

7. SEPARATE FRONT AXLE ASSY LH

(a) Using a plastic hammer, separate the drive shaft from the axle hub.

NOTICE:

Be careful not to damage the boot and speed sensor rotor.



8. REMOVE FRONT DRIVE SHAFT ASSY LH

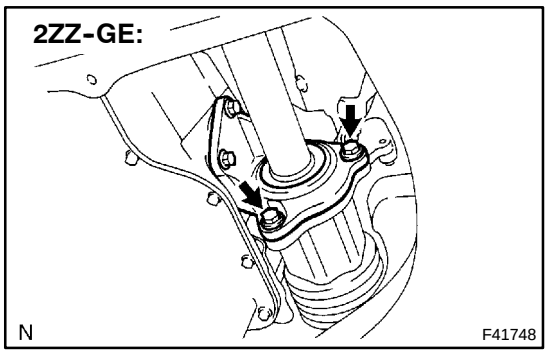
(a) Remove the front fender apron seal LH.

(b) Using SST, remove the front drive shaft assy LH.

SST 09520-01010, 09520-24010 (09520-32040)

NOTICE:

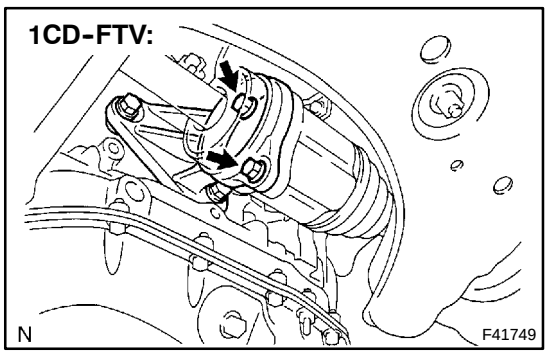
Be careful not to damage the oil seal.

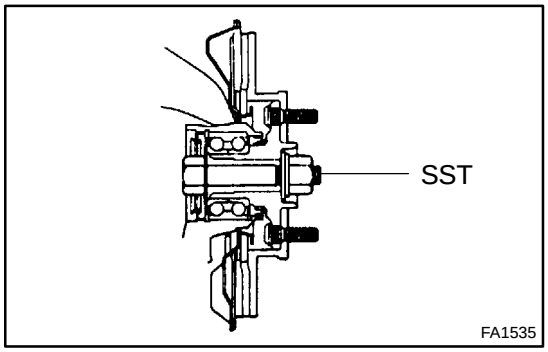


9. REMOVE FRONT DRIVE SHAFT ASSY RH

(a) Remove the 2 bolts and pull out the drive shaft together with the center bearing bracket.

(b) Remove the drive shaft.





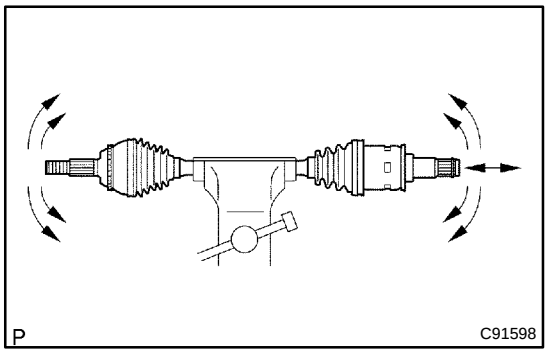
10. FIX FRONT AXLE ASSY LH

NOTICE:

The hub bearing could be damaged if it is subjected to the vehicle weight, such as when moving the vehicle with the drive shaft removed.

Therefore, make sure to support the hub bearing with SST when the vehicle weight is applied.

SST 09608-16042 (09608-02021, 09608-02041)



11. INSPECT FRONT DRIVE SHAFT ASSY LH

(a) Check to see that there is no remarkable play in the outboard joint.

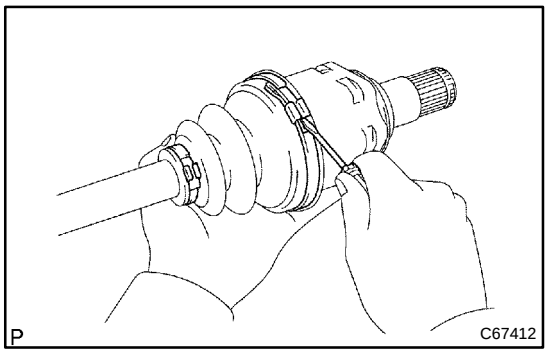
(b) Check to see that the inboard joint slides smoothly in the thrust direction.

(c) Check to see that there is no remarkable play in the radial direction of the inboard joint.

(d) Check the boots for damage.

NOTICE:

Keep the drive shaft assy level during inspection.

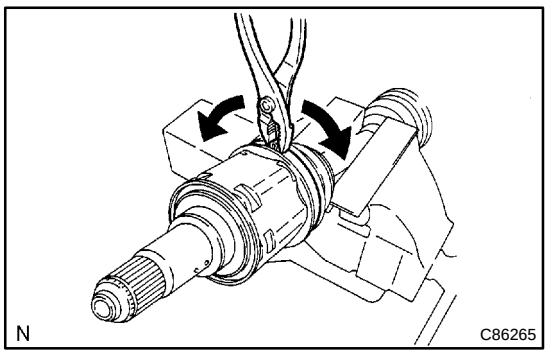


12. REMOVE FRONT AXLE INBOARD JOINT BOOT CLAMP

(a) One touch type:
Using a screwdriver, remove the inboard joint boot LH No.2 clamp.

HINT:

Remove the inboard joint boot LH clamp by the same procedures with inboard joint boot LH No.2 clamp.



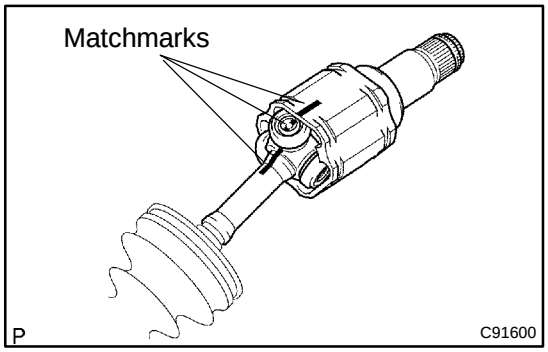
(b) Omega type:
Using pliers, remove the inboard joint boot LH No.2 clamp.

HINT:

Remove the inboard joint boot LH clamp by the same procedures with inboard joint boot LH No.2 clamp.

13. REMOVE FR AXLE INBOARD JOINT BOOT

(a) Remove the boot from the inboard joint assy LH.



14. REMOVE FRONT DRIVE INBOARD JOINT ASSY LH

(a) Remove the old grease from the inboard joint.
(b) Place matchmarks on the tripod, inboard and outboard joint shafts.

NOTICE:
Do not punch the marks.

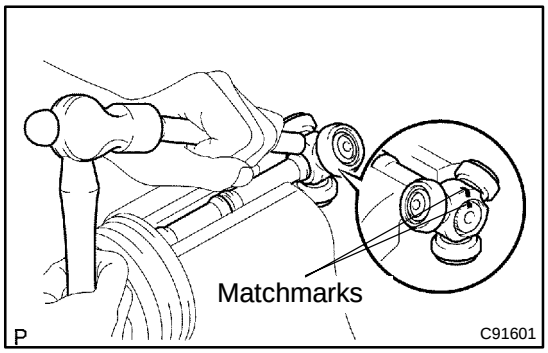
(c) Remove the inboard joint shaft from the outboard joint shaft.
(d) Using a snap ring expander, remove the snap ring.
(e) Place matchmarks on the outboard joint shaft and tripod.

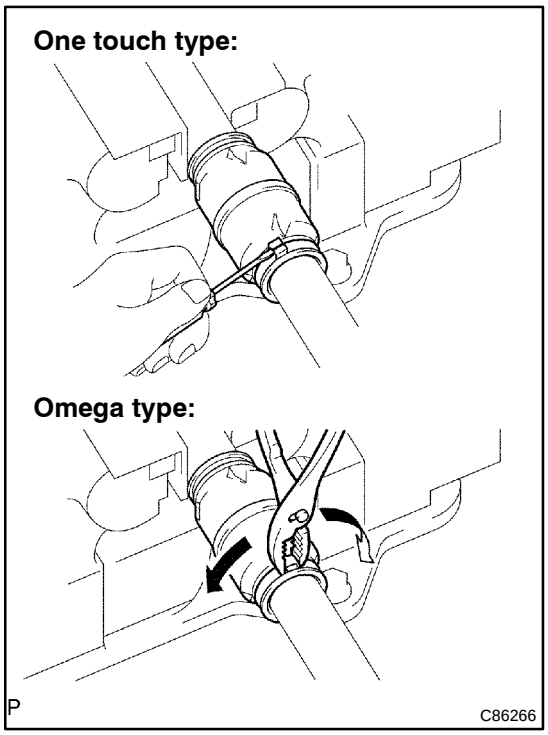
NOTICE:
Do not punch the marks.

(f) Using a brass bar and hammer, remove the tripod from the drive shaft.

NOTICE:
Do not tap the roller.

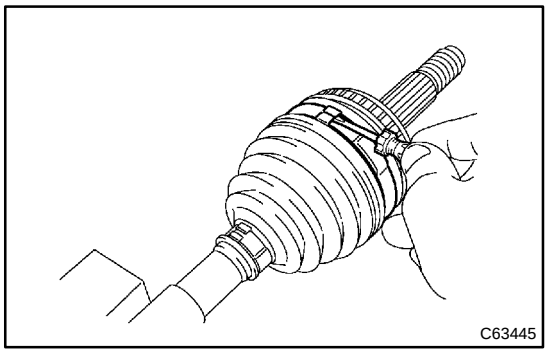
(g) Remove the inboard joint boot and 2 clamps.





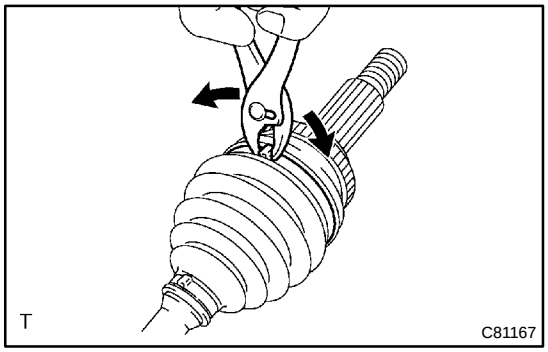
15. REMOVE FRONT DRIVE SHAFT DAMPER LH

(a) One touch type:
Using a screwdriver, remove the damper clamp, as shown in the illustration.
(b) Omega type:
Using pliers and remove the damper clamp, as shown in the illustration.
(c) Remove the drive shaft damper.



16. REMOVE FRONT AXLE OUTBOARD JOINT BOOT CLAMP

(a) One touch type:
Using a screwdriver, disclamp the outboard joint boot clamp.



(b) Omega type:
Using pliers and remove the 2 outboard joint boot clamp.

HINT:
Remove the outboard joint boot LH clamp by the same procedures with outboard joint boot LH No.2 clamp.

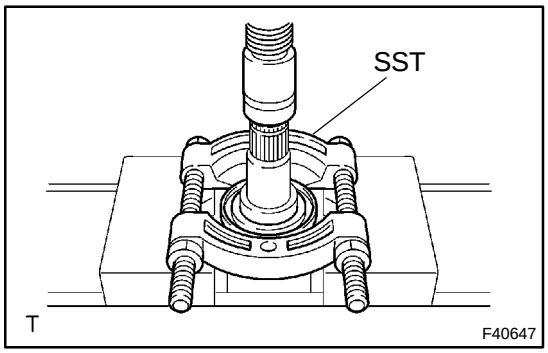
17. REMOVE OUTBOARD JOINT BOOT

(a) Remove the outboard joint boot from the outboard joint shaft.

(b) Remove the old grease from the outboard joint.

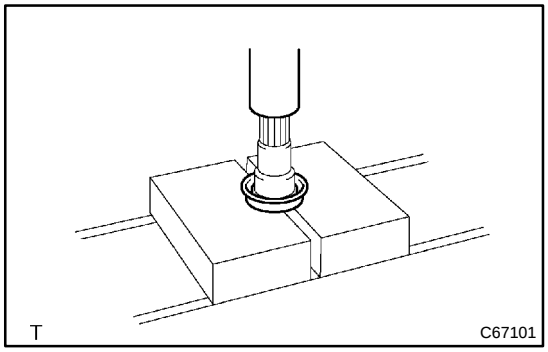
18. REMOVE FRONT DRIVE SHAFT LH HOLE SNAP RING

(a) Using a screwdriver, remove the snap ring.



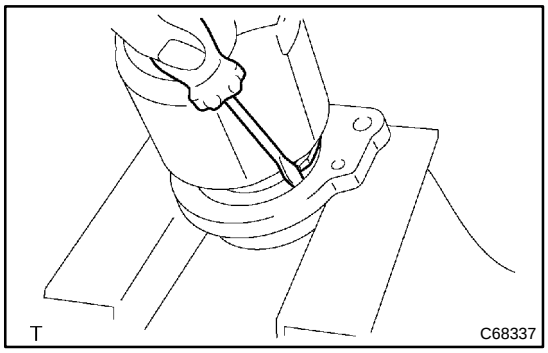
19. REMOVE FRONT DRIVE SHAFT DUST COVER LH

(a) Using SST and a press, remove the dust cover.
SST 09950-00020



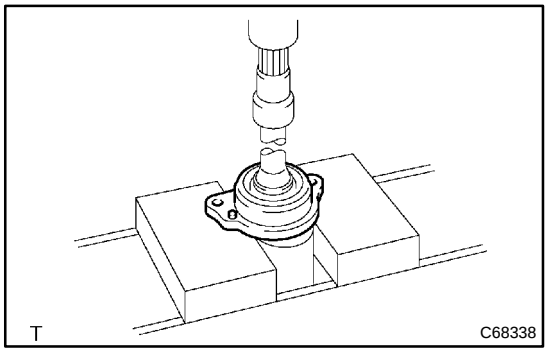
20. REMOVE FRONT DRIVE SHAFT DUST COVER RH

(a) Using a press, remove a dust cover.



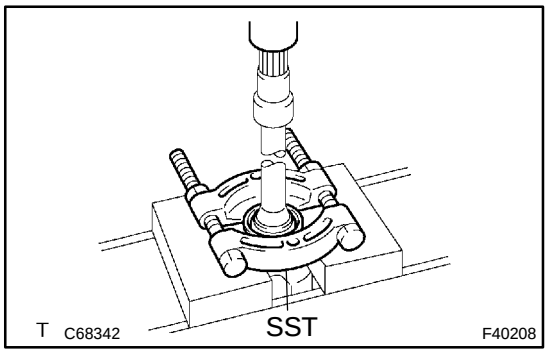
21. REMOVE CASE SUB ASSY, DRIVE SHAFT BEARING SNAP RING

(a) Using a screwdriver, remove the snap ring.



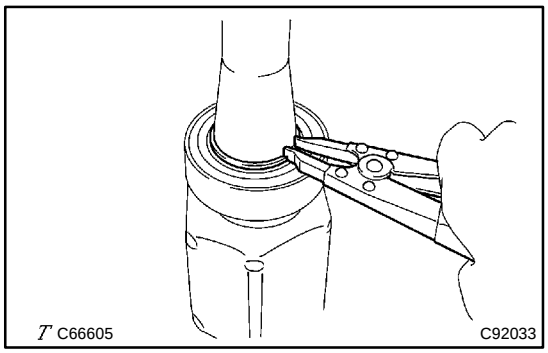
22. REMOVE DRIVE SHAFT BEARING CASE SUB ASSY

(a) Using a press, remove the bearing case.



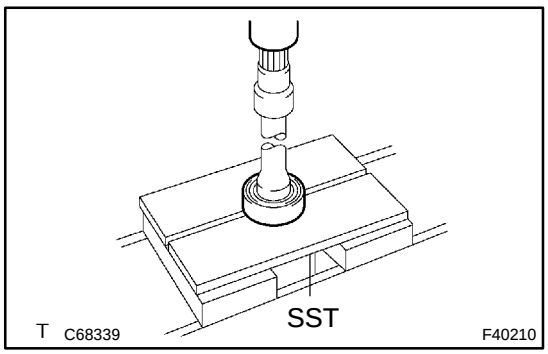
23. REMOVE FRONT DRIVE SHAFT DUST COVER

(a) Using SST and a press, remove the dust cover.
SST 09950-00020



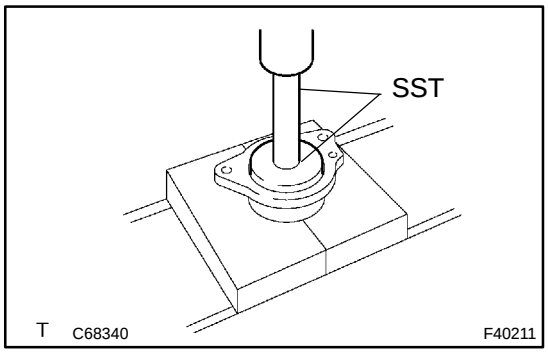
24. REMOVE FRONT DRIVE SHAFT BEARING

(a) Using a snap ring expander, remove the snap ring.



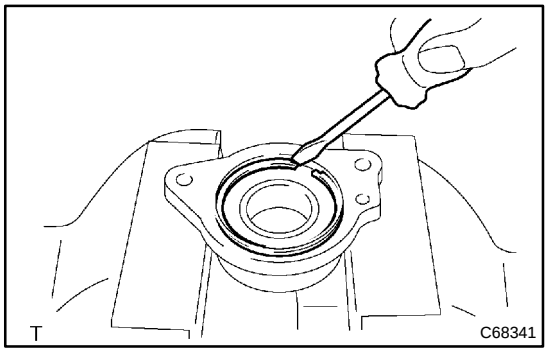
(b) Using SST and a press, remove the bearing.
SST 09527-10011

(c) Remove the snap ring.



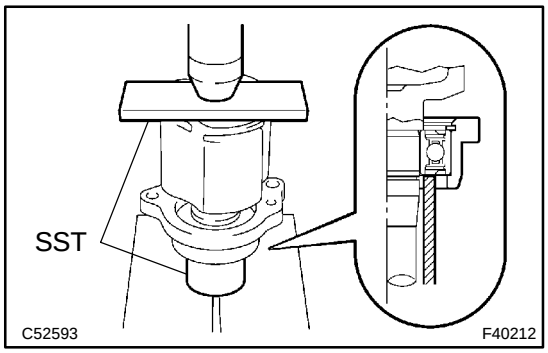
25. INSTALL FRONT DRIVE SHAFT BEARING

(a) Using SST and a press, install a new bearing.
SST 09950-60020 (09951-00710), 09950-70010 (09951-07100)



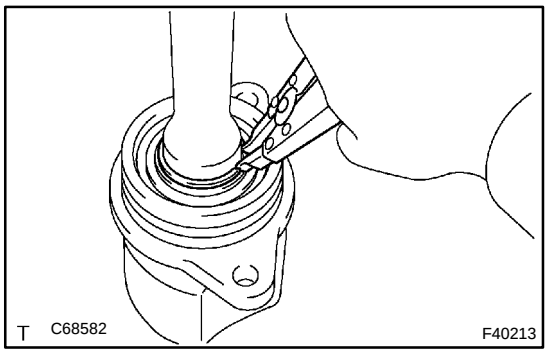
26. INSTALL CASE SUB ASSY, DRIVE SHAFT BEARING SNAP RING

(a) Using a screwdriver, install a new snap ring.

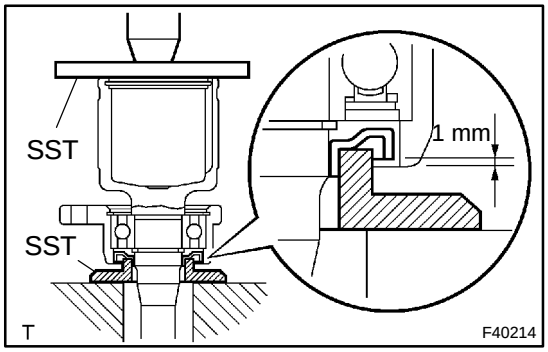


27. INSTALL DRIVE SHAFT BEARING CASE SUB ASSY

(a) Using SST and a press, install the bearing case to the inboard joint.
SST 09527-10011, 09710-04081

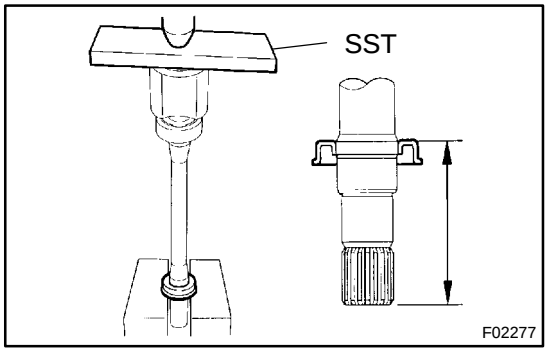


(b) Using a snap ring expander, install a new snap ring.



28. INSTALL FRONT DRIVE SHAFT DUST COVER

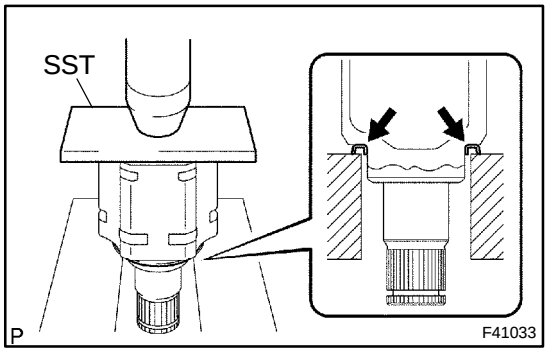
(a) Using SST and a press, install a new dust cover.
SST 09726-40010, 09527-10011



29. INSTALL FRONT DRIVE SHAFT DUST COVER RH

(a) Using SST and a press, install a new dust cover until the distance from the tip of center drive shaft to the dust cover reaches the specification, as shown in the illustration.
SST 09527-10011

Engine type	Distance mm (in.)
2ZZ-GE	86.5 ± 0.5 (3.41 ± 0.02)
1CD-FTV	91.5 ± 0.5 (3.60 ± 0.02)

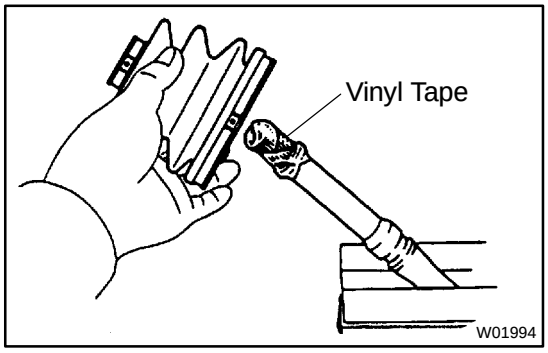


30. INSTALL FRONT DRIVE SHAFT DUST COVER LH

(a) Using SST and a press, install a new dust cover.
SST 09527-10011

31. INSTALL FRONT DRIVE SHAFT LH HOLE SNAP RING

(a) Install a new snap ring.



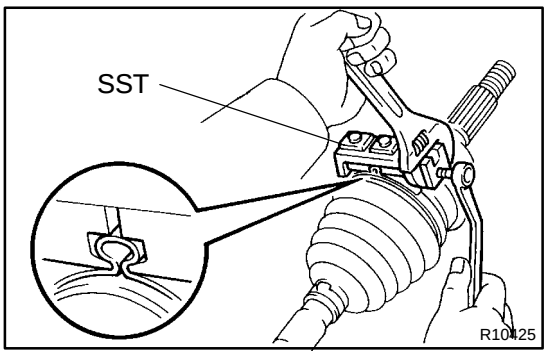
32. INSTALL OUTBOARD JOINT BOOT

HINT:
Before installing the boots, wrap the spline of the drive shaft with vinyl tape to prevent the boots from being damaged.

(a) Install new parts to the outboard joint shaft assy in the following order.
  (1) Outboard joint boot LH No.2 clamp
  (2) Outboard joint boot
  (3) Outboard joint boot LH clamp
(b) Pack the outboard joint shaft and boot with grease in the boot kit.

Grease capacity:

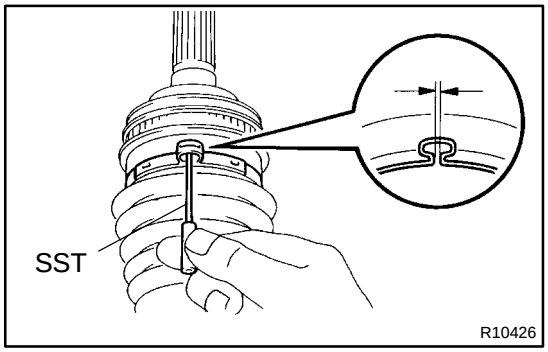
Body type	Engine type	Grease capacity
Sedan/Wagon	1CD-FTV	190 - 200 g (6.70 - 7.05 oz.)
Hatchback	2ZZ-GE, 1CD-FTV	152 - 162 g (5.36 - 5.71 oz.)



33. INSTALL FRONT AXLE OUTBOARD JOINT BOOT CLAMP

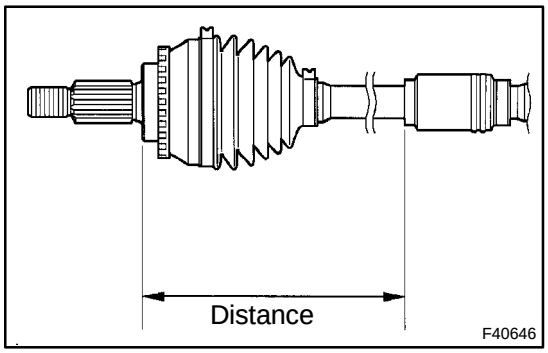
(a) Mount drive shaft in a soft vise.
(b) Secure the 2 outboard joint boot clamps onto the boot.
(c) Place SST onto the outboard joint large boot clamp.
SST 09521-24010
(d) Tighten the SST so that the large clamp is pinched.

NOTICE:
Do not overtighten the SST.



(e) Using SST, adjust the clearance of the large clamp.
SST 09240-00020
Clearance: 0.8 mm (0.031 in.) or less

HINT:
Install the outboard joint boot LH clamp by the same procedures with outboard joint boot LH No.2 clamp.

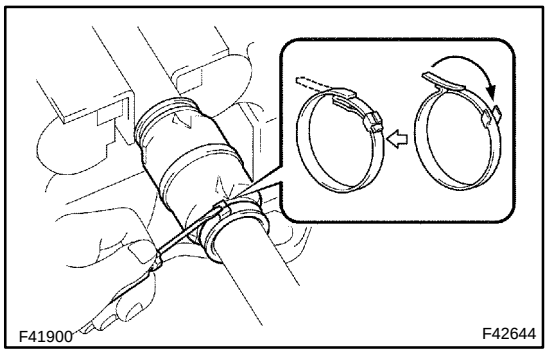


34. INSTALL FRONT DRIVE SHAFT DAMPER LH

(a) Sedan/Wagon body type:
Temporarily install a new damper clamp.

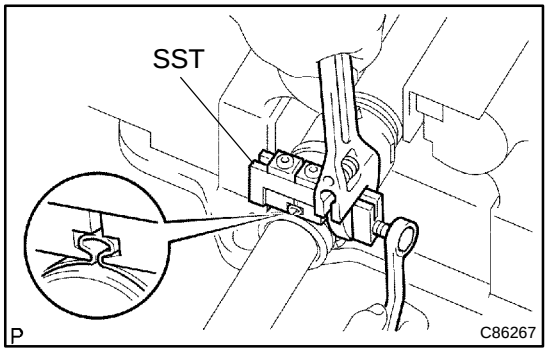
(b) Set the distance, as described below.

Body type	Engine type	Distance mm (in.)
Sedan/Wagon	1CD-FTV	204.4 ± 2.0 (8.047 ± 0.08)
Hatchback	2ZZ-GE, 1CD-FTV	200.0 ± 2.0 (7.874 ±0.08)



(c) One touch type:
Install the damper clamp.
(1) Using a screwdriver, install the damper clamp, as shown in the illustration.

HINT:
Install the damper clamp to outboard joint side.

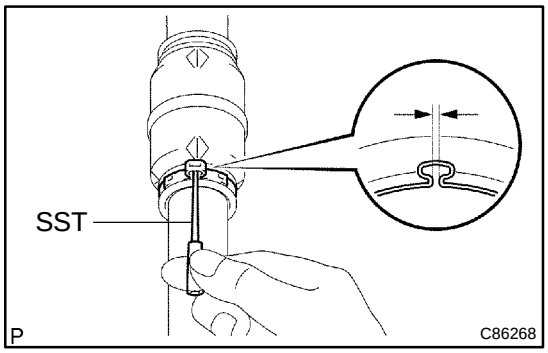


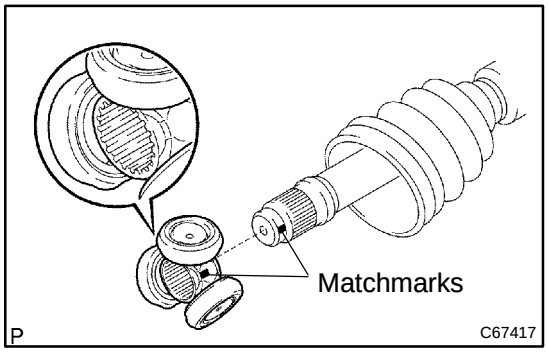
(d) Omega type:
Install the damper clamp.
(1) Mount drive shaft in a soft vise.
(2) Secure the damper clamp onto the damper.
(3) Place SST onto the damper clamp.
SST 09521-24010
(4) Tighten the SST so that the damper clamp is pinched.

NOTICE:
Do not overtighten the SST.

(5) Using SST, adjust the clearance of the damper clamp.
SST 09240-00020
Clearance: 0.8 mm (0.031 in.) or less

HINT:
Install the damper clamp to inboard joint side.





35. INSTALL FRONT DRIVE INBOARD JOINT ASSY LH

(a) Wrap the spline of the outboard joint shaft with vinyl tape to prevent them from being damaged.

(b) Install new parts to the outboard joint shaft assy in the following order.
  (1) Inboard joint boot LH clamp
  (2) Inboard joint boot
  (3) Inboard joint boot LH No.2 clamp

(c) Place the beveled side of the tripod axial spline toward the outboard joint.

(d) Align the matchmarks placed before removal.

(e) Using a brass bar and hammer, tap in the tripod to the drive shaft.

NOTICE:

Do not tap the roller.

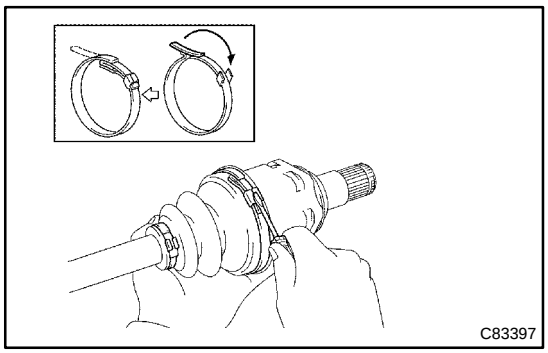
(f) Pack the outboard joint shaft and boot with grease in the boot kit.

Body type	Engine type	Grease capacity g (oz.)
Sedan/Wagon	1CD-FTV	185 - 195 (6.52 - 6.88)
Hatchback	2ZZ-GE	160 - 180 (5.64 - 6.35)
	1CD-FTV	170 - 190 (6.00 - 6.70)

(g) Using a snap ring expander, install a new snap ring.

36. INSTALL FR AXLE INBOARD JOINT BOOT

(a) Install the inboard joint boot to the inboard joint shaft.



37. INSTALL FRONT AXLE INBOARD JOINT BOOT CLAMP

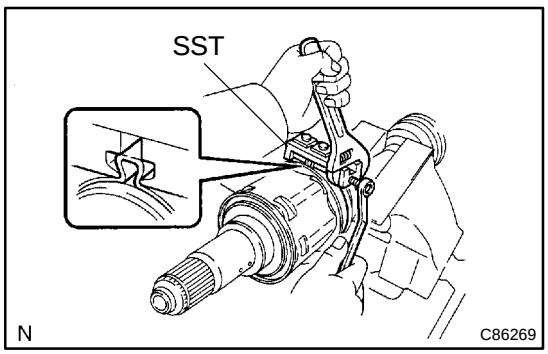
(a) One touch type:

Install the inboard joint boot clamp.

  (1) Bend the band and lock the inboard joint boot clamps with a screwdriver.

HINT:

Install the inboard joint boot LH clamp by the same procedures with inboard joint boot LH No.2 clamp.



(b) Omega type:

Install the inboard joint boot clamp.

  (1) Mount drive shaft in a soft vise.

  (2) Secure the 2 inboard joint boot clamps onto the boot.

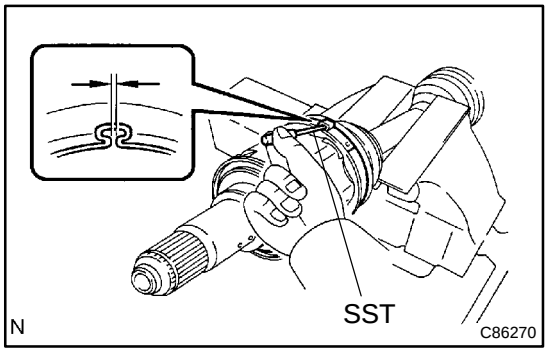
  (3) Place SST onto the inboard joint large boot clamp.

  SST 09521-24010

  (4) Tighten the SST so that the large clamp is pinched.

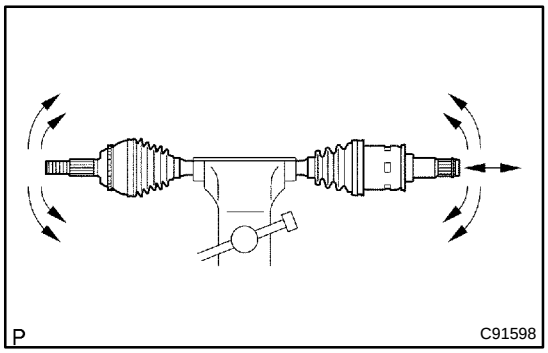
NOTICE:

Do not overtighten the SST.



(5) Using SST, adjust the clearance of the large clamp.
SST 09240-00020
Clearance: 0.8 mm (0.031 in.) or less

HINT:
Install the inboard joint boot LH clamp by the same procedures with inboard joint boot LH No.2 clamp.

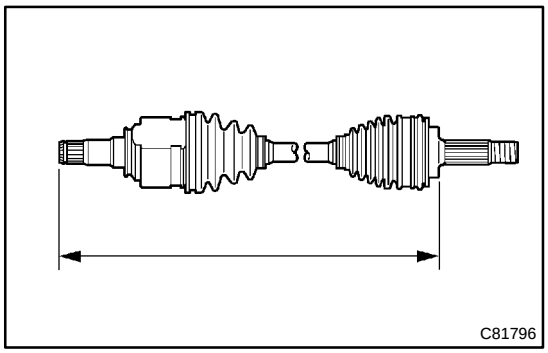


38. INSPECT FRONT DRIVE SHAFT

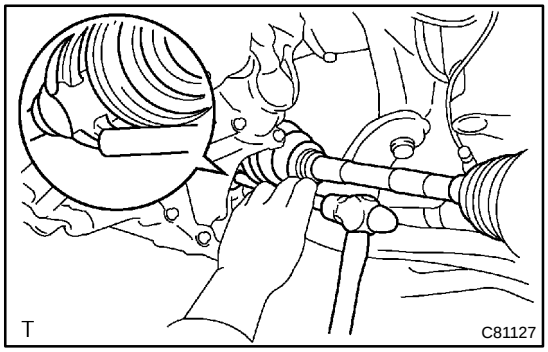
(a) Check that there is no remarkable play in the outboard joint.
(b) Check that the inboard joint slides smoothly in the thrust direction.
(c) Check that there is no remarkable play in the radial direction of the inboard joint.
(d) Check the boots for damage.

NOTICE:
Keep the drive shaft assy level during inspection.

HINT:
For dimension (A), refer to the following table.



Drive Shaft	LH mm (in.)	RH mm (in.)
Sedan/Wagon body type (1CD-FTV)	537.2 (21.15) ± 5.0 (0.20)	878.0 (34.57) ± 5.0 (0.20)
Hatchback body type (2ZZ-GE)	563.7 (22.19) ± 5.0 (0.20)	850.0 (33.46) ± 5.0 (0.20)
Hatchback body type (1CD-FTV)	532.8 (20.98) ± 5.0 (0.20)	874.0 (34.41) ± 5.0 (0.20)



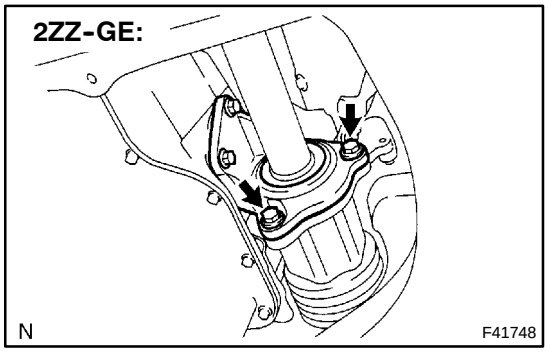
39. INSTALL FRONT DRIVE SHAFT ASSY LH

(a) Coat the spline of the inboard joint shaft assy with gear oil.
(b) Aline the shaft splines and install the drive shaft assy with brass bar and hammer.

NOTICE:
- **Set the snap ring with opening side facing downwards.**
- **Be careful not to damage the oil seal.**

HINT:
Whether the inboard joint shaft is in contact with the pinion shaft or not can be known from the sound or feeling when driving it in.

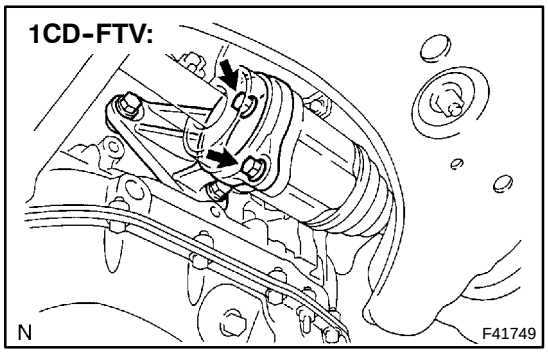
(c) Install fender apron seal LH.



40. INSTALL FRONT DRIVE SHAFT ASSY RH

(a) Coat the spline of the inboard joint shaft assy with gear oil.
(b) Aline the shaft splines and install the drive shaft assy with the 2 bolts.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

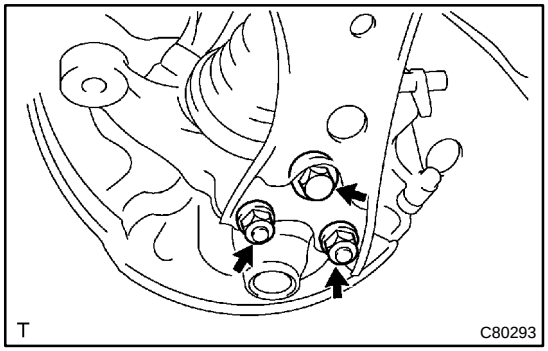
NOTICE:
Do not damage the oil seal.



41. INSTALL FRONT AXLE ASSY LH

(a) Install the drive shaft assy LH to the front axle assy LH.

NOTICE:
- **Be careful not to damage the outboard joint boot.**
- **Be careful not to damage the speed sensor rotor.**



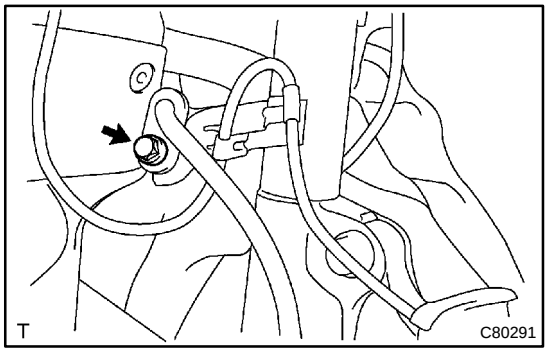
42. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Install the lower ball joint to the lower suspension arm with the bolt and nut.
Torque: 142 N·m (1,448 kgf·cm, 105 ft·lbf)

43. INSTALL TIE ROD END SUB-ASSY LH

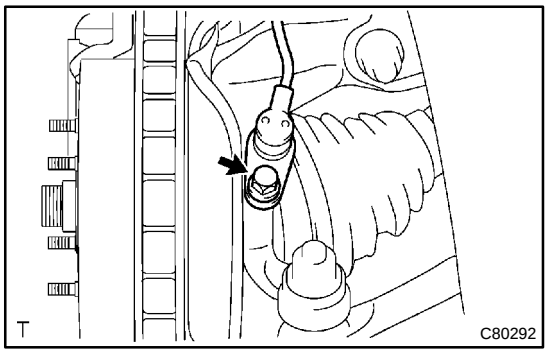
(a) Install the tie rod end to the steering knuckle with the nut.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
(b) Install a new cotter pin.

NOTICE:
If the holes for the cotter pin are not aligned, tighten the nut further to 60_.



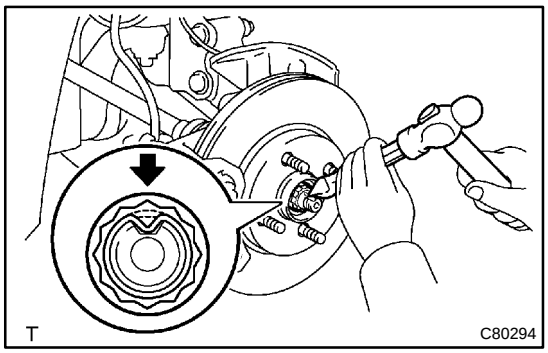
44. CONNECT SPEED SENSOR FRONT LH

(a) Connect the speed sensor wire and flexible hose to shock absorber with the bolt.
Torque:
TMUK made:
19 N·m (192 kgf·cm, 14 ft·lbf)
TMC made:
29 N·m (296 kgf·cm, 21 ft·lbf)



(b) Install the speed sensor to the steering knuckle with the bolt.
Torque: 8.0 N·m (82 kgf·cm, 71 ft·lbf)

NOTICE:
- **Be careful not to damage the speed sensor.**
- **Keep the speed sensor clean.**
- **Do not twist the sensor wire when installing the sensor.**



45. INSTALL FRONT AXLE HUB LH NUT

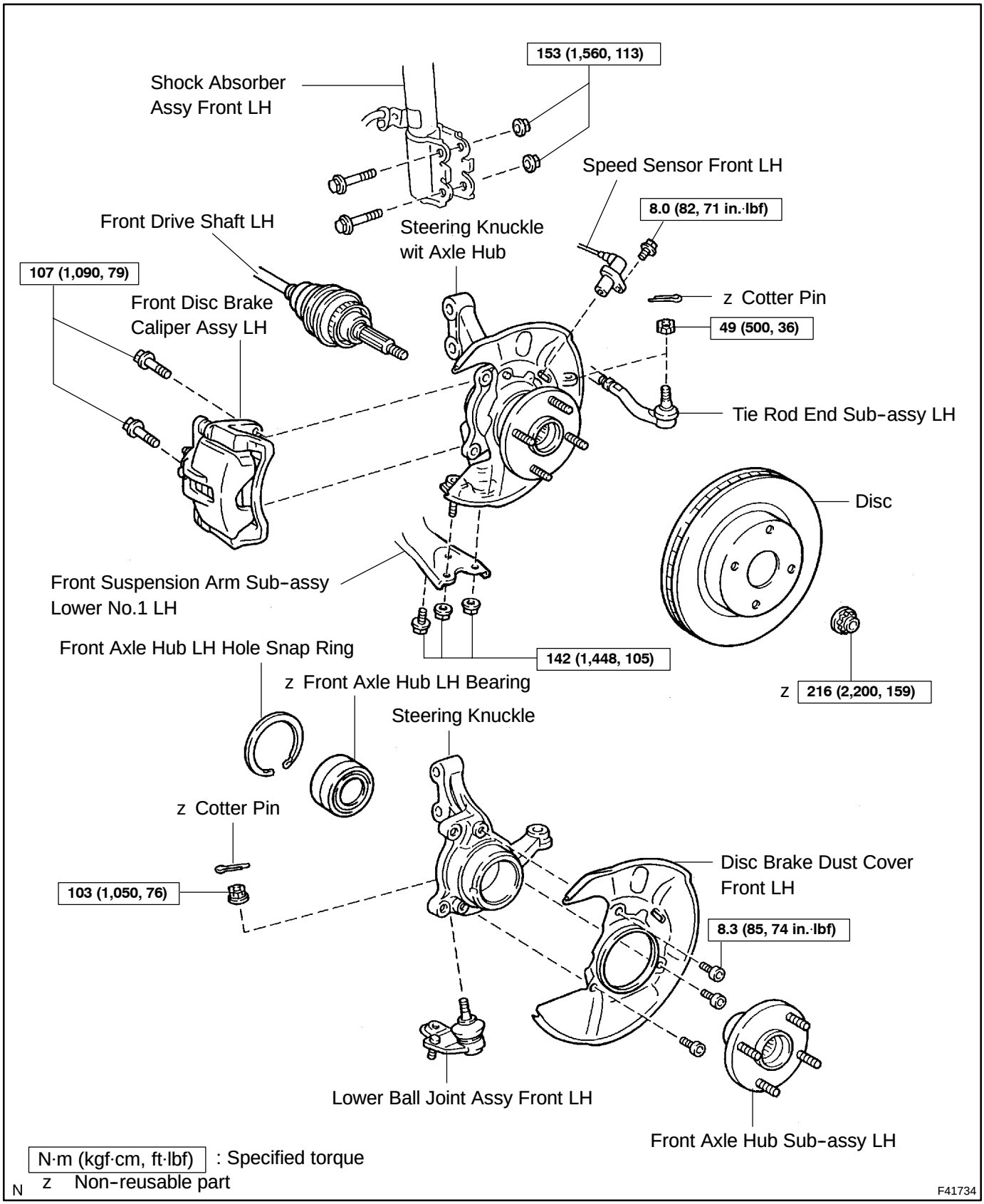
(a) Install a new hub nut.
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)
(b) Using a chisel and hammer, stake the lock nut.

46. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
47. ADD MANUAL TRANSAXLE OIL
48. INSPECT MANUAL TRANSAXLE OIL **(See page 41-2)**
49. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT **(See page 26-2)**
50. CHECK ABS SPEED SENSOR SIGNAL **(See page 05-565 or 05-618 or 05-673)**

FRONT AXLE HUB SUB-ASSY LH

COMPONENTS

30091-01



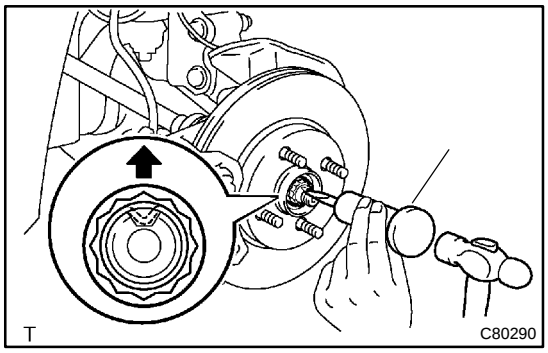
3000U-02

REPLACEMENT

HINT:

Replacement the RH side by the same procedures with LH side.

1. REMOVE FRONT WHEEL

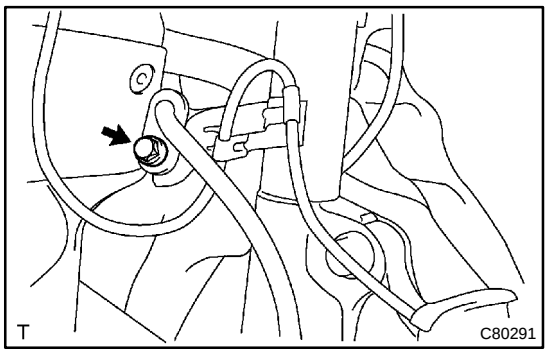


2. REMOVE FRONT AXLE HUB LH NUT

(a) Using SST and a hammer, unstake the staked part of the lock nut.

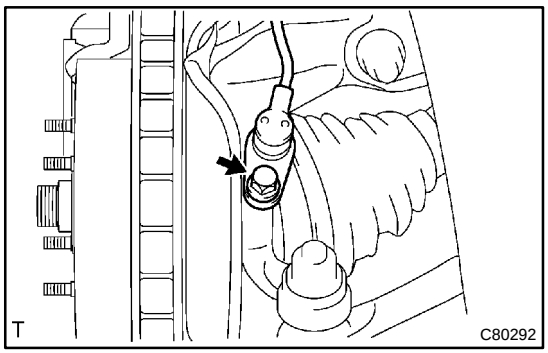
SST 09930-00010

(b) While applying the brakes, remove the lock nut.

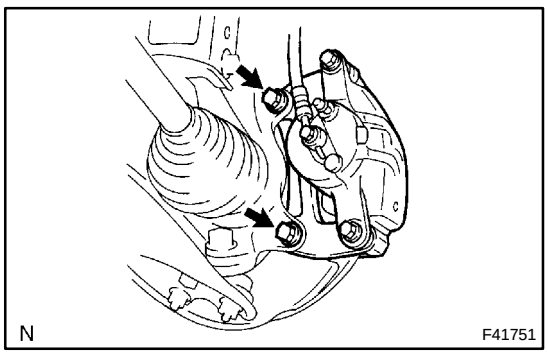


3. SEPARATE SPEED SENSOR FRONT LH

(a) Remove the bolt, separate the speed sensor wire and flexible hose from the shock absorber.



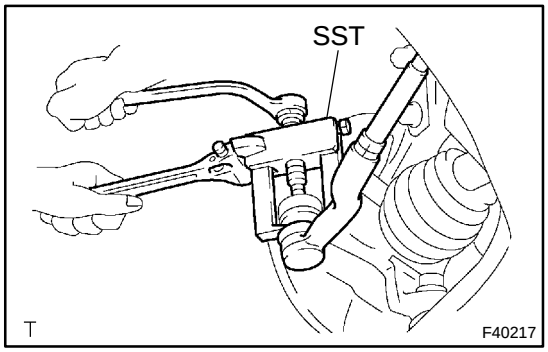
(b) Remove the bolt, separate the speed sensor from the steering knuckle.



4. SEPARATE FRONT DISC BRAKE CALIPER ASSY LH

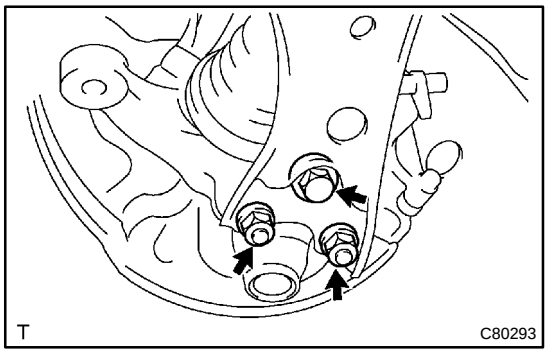
(a) Remove the 2 bolts, separate the brake caliper from the drive shaft.

5. REMOVE FRONT DISC



6. SEPARATE TIE ROD END SUB-ASSY LH

(a) Remove the cotter pin and nut.
(b) Using SST, separate the tie rod end from the steering knuckle.
SST 09628-62011



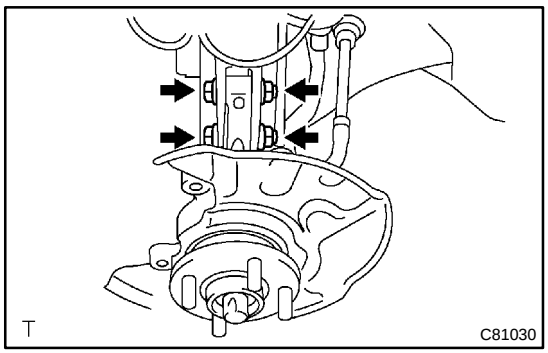
7. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Remove the bolt and 2 nuts, and separate the lower suspension arm from the lower ball joint.

8. REMOVE FRONT AXLE ASSY LH

(a) Using a plastic hammer, separate the drive shaft from the axle hub.

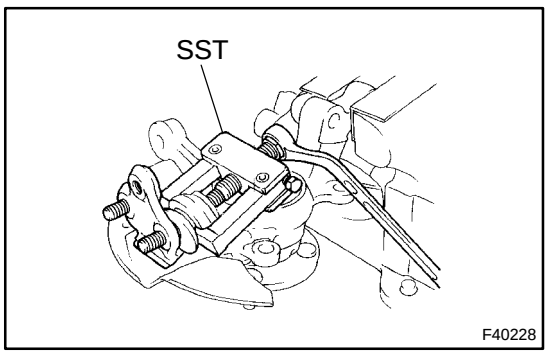
NOTICE:
Be careful not to damage the boot and ABS speed sensor rotor.



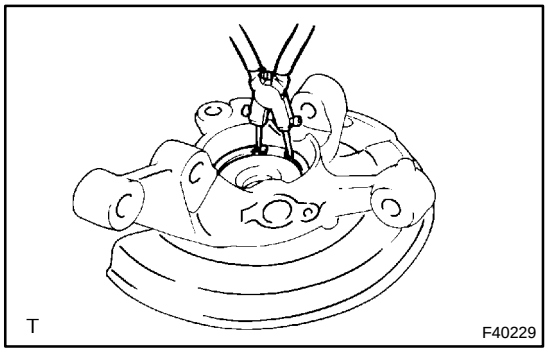
(b) Remove the 2 bolts, nuts and steering knuckle with the axle hub.

9. REMOVE LOWER BALL JOINT ASSY FRONT LH

(a) Remove the cotter pin and nut.

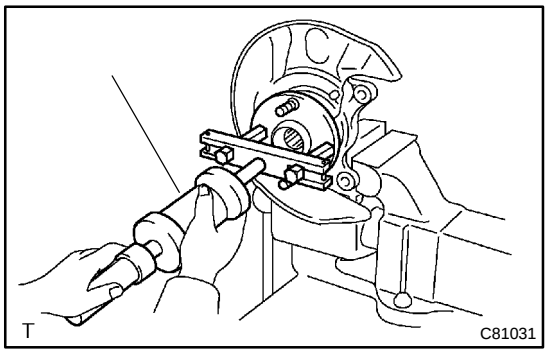


(b) Using SST, remove the ball joint.
SST 09628-62011



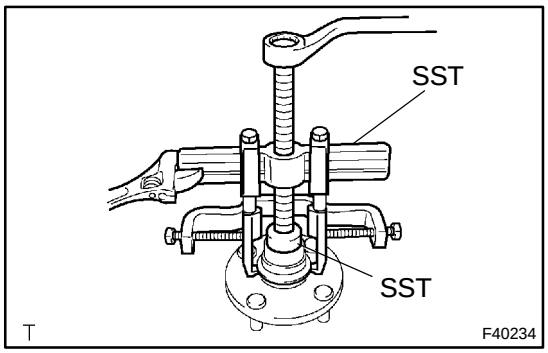
10. REMOVE FRONT AXLE HUB LH HOLE SNAP RING

(a) Using a snap ring pliers, remove the snap ring.



11. REMOVE FRONT AXLE HUB SUB-ASSY LH

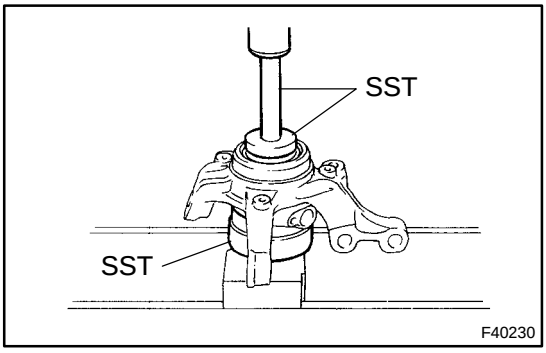
(a) Using SST, remove the axle hub.
SST 09520-00031



(b) Using SST, remove the inner race (Outside) from the axle hub.
SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04010, 09955-04061, 09957-04010, 09958-04010), 09950-60010 (09951-00370)

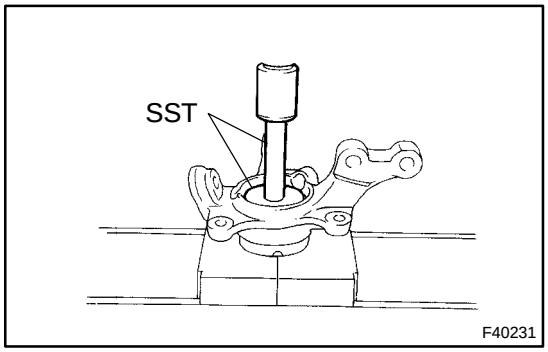
12. REMOVE DISC BRAKE DUST COVER FRONT LH

(a) Remove the 3 bolts and brake dust cover.



13. REMOVE FRONT AXLE HUB LH BEARING

(a) Place the inner race (outside) on the bearing.
(b) Using SST and a press, remove the bearing from the steering knuckle.
SST 09527-17011, 09950-60010 (09951-00640), 09950-70010 (09951-07100)

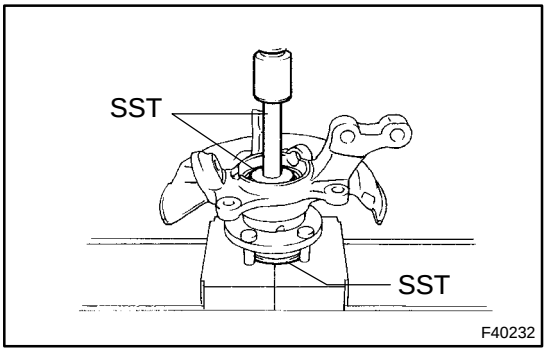


14. INSTALL FRONT AXLE HUB LH BEARING

(a) Using SST and a press, install a new bearing to the steering knuckle.
SST 09950-60020 (09951-00720), 09950-70010 (09951-07100)

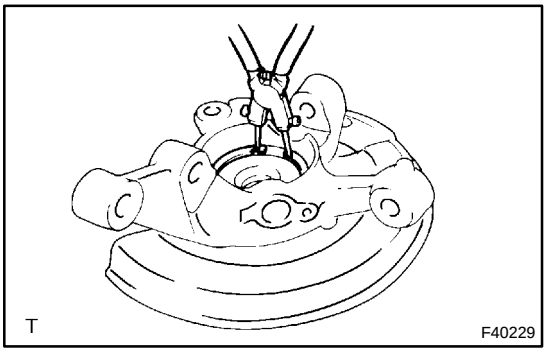
15. INSTALL DISC BRAKE DUST COVER FRONT LH

(a) Install the dust cover with the 3 bolts.



16. INSTALL FRONT AXLE HUB SUB-ASSY LH

(a) Using SST and a press, install the axle hub.
SST 09608-32010, 09950-60010 (09951-00600), 09950-70010 (09951-07100)

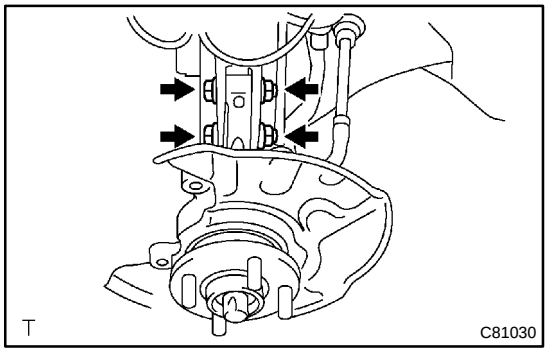


17. INSTALL FRONT AXLE HUB LH HOLE SNAP RING

(a) Using snap ring pliers, install the snap ring.

18. INSTALL LOWER BALL JOINT ASSY FRONT LH

(a) Install the lower ball joint and torque the nut.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
(b) Install a new cotter pin.
If the holes for the cotter pin are not aligned, tighten the nut further up to 60_.



19. INSTALL FRONT AXLE ASSY LH

(a) Install the 2 bolts, nuts and axle assembly to the shock absorber.
Torque: 153 N·m (1,560 kgf·cm, 113 ft·lbf)

NOTICE:

Only when reusing the bolts and nuts, apply engine oil to the screw part of the nuts.

(b) Push the front axle assy toward the outside of the vehicle, fit the splined part of the drive shaft assy to that of the front axle assy and insert the drive shaft assy into the front axle assy.

NOTICE:

- **Do not push out the front axle assy excessively.**
- **Be careful not to damage the drive shaft outboard joint boot.**
- **Be careful not to damage the speed sensor rotor.**

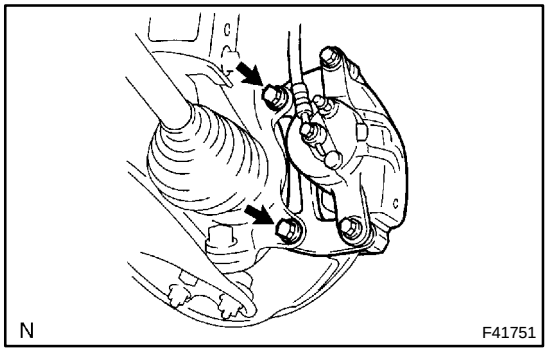
20. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Install the front suspension arm and lower ball joint with the 2 nuts and bolt.
Torque: 142 N·m (1,448 kgf·cm, 105 ft·lbf)

21. INSTALL TIE ROD END SUB-ASSY LH

(a) Install the tie rod end to the steering knuckle.
(b) Install the nut and a new cotter pin.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

22. INSTALL FRONT DISC



23. INSTALL FRONT DISC BRAKE CALIPER ASSY LH

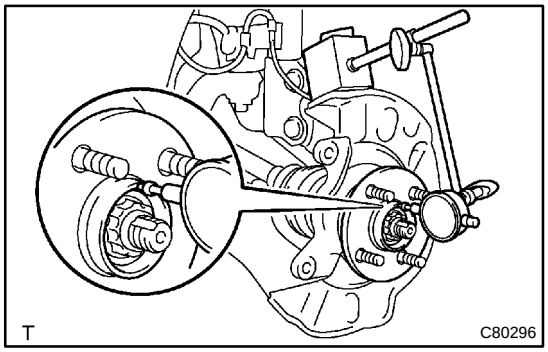
(a) Install the brake caliper assembly with the 2 bolts to the steering knuckle.
Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)

24. INSTALL FRONT AXLE HUB LH NUT

(a) Using a socket wrench (30 mm), install a new hub nut.

25. SEPARATE FRONT DISC BRAKE CALIPER ASSY LH

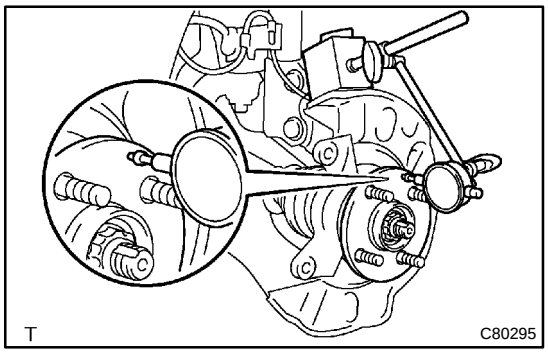
26. REMOVE FRONT DISC



27. INSPECT BEARING BACKLASH

(a) Using a dial indicator, check the backlash near the center of the axle hub.
Maximum: 0.05 mm (0.0020 in.)

If the backlash exceeds the maximum, replace the bearing.

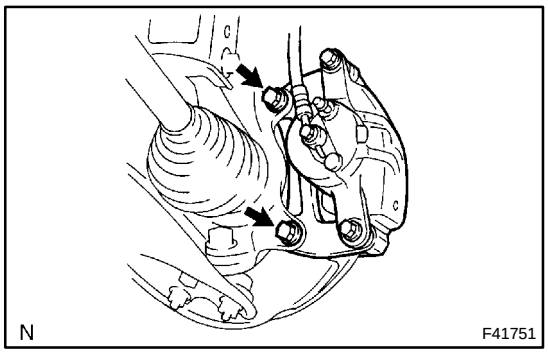


28. INSPECT AXLE HUB DEVIATION

(a) Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.
Maximum: 0.05 mm (0.0020 in.)

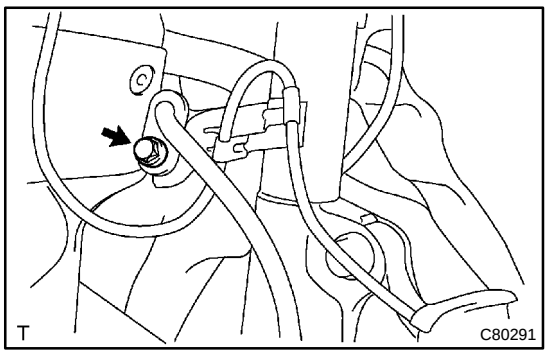
If the backlash exceeds the maximum, replace the axle hub.

29. INSTALL FRONT DISC



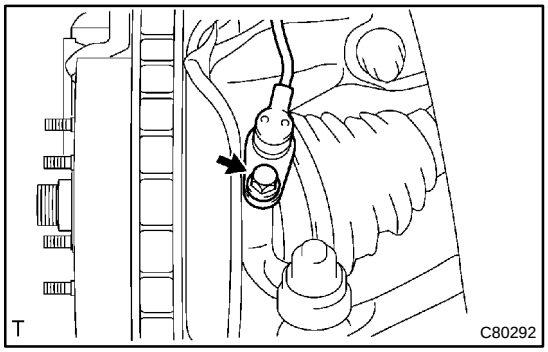
30. INSTALL FRONT DISC BRAKE CALIPER ASSY LH

(a) Install the brake caliper assy with the 2 bolts to the steering knuckle.
Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)



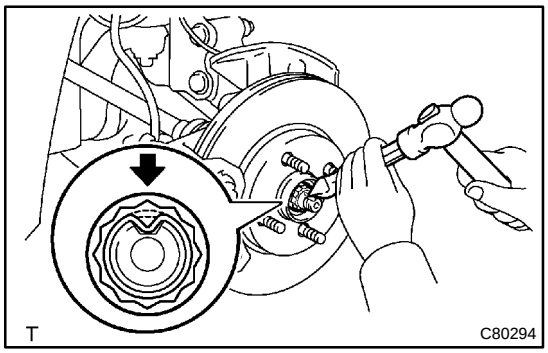
31. INSTALL SPEED SENSOR FRONT LH

(a) Install the speed sensor to shock absorber with the bolt.
Torque:
TMUK made:
19 N·m (192 kgf·cm, 14 ft·lbf)
TMC made:
29 N·m (296 kgf·cm, 21 ft·lbf)



(b) Install the speed sensor to the steering knuckle with the bolt.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

NOTICE:
- **Be careful not to damage the speed sensor.**
- **Prevent foreign matter from being attatched.**
- **Do not twist the sensor wire when installing the sensor.**



32. INSTALL FRONT AXLE HUB LH NUT

(a) While applying the brakes, install a new lock nut.
Torque: 216 N·m (2,200 kgf·cm, 159 in.·lbf)

(b) Using a chisel and hammer, stake the axle hub LH nut.

33. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 in.·lbf)

34. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT **(See page 26-2)**

35. CHECK ABS SPEED SENSOR SIGNAL **(See page 05-565 or 05-618 or 05-673)**

FRONT AXLE LH HUB BOLT

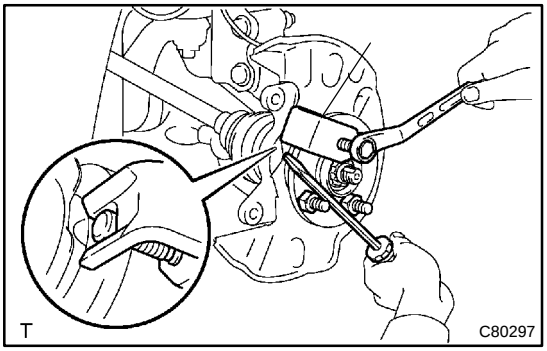
REPLACEMENT

30092-01

HINT:

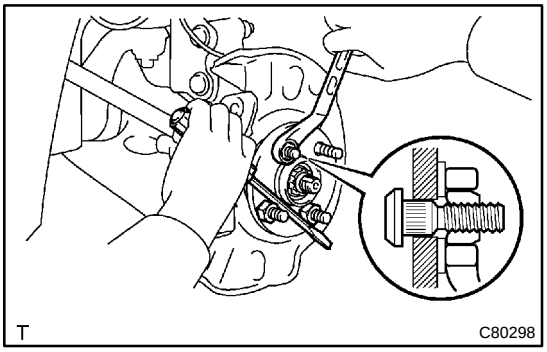
Replacement the RH side by the same procedures with LH side.

1. **REMOVE FRONT WHEEL**
2. **SEPARATE FRONT DISC BRAKE CALIPER ASSY LH**
3. **REMOVE FRONT DISC**



4. **REMOVE FRONT AXLE LH HUB BOLT**

(a) Using SST and a screwdriver, remove the hub bolt.
SST 09628-10011



5. **INSTALL FRONT AXLE LH HUB BOLT**

(a) Install a washer and nut to a new hub bolt as shown in the illustration.
(b) Using a screwdriver to hold, install the hub bolt by torquing the nut.

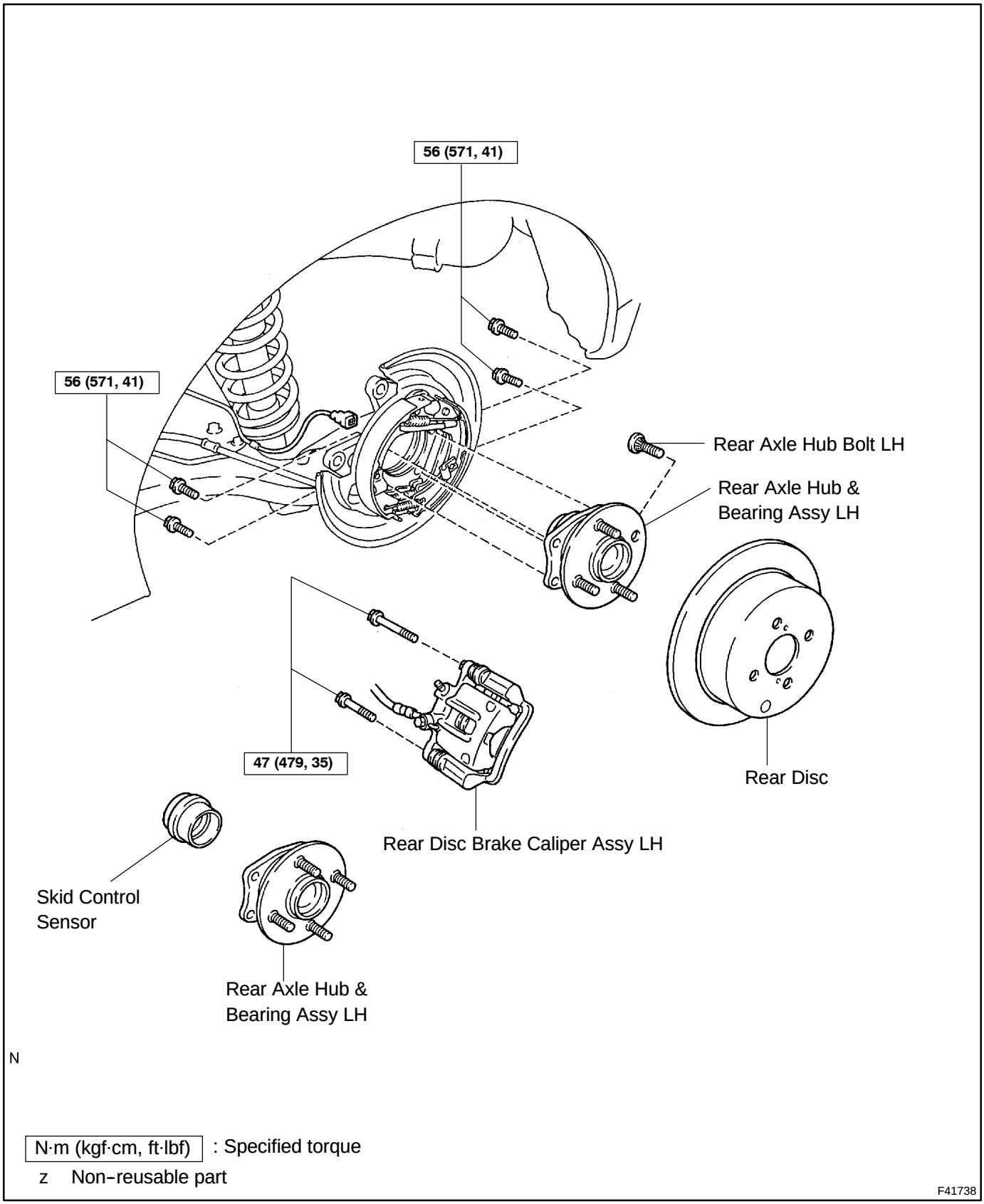
6. **INSTALL FRONT DISC**

7. **INSTALL FRONT DISC BRAKE CALIPER ASSY LH**
Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)
8. **INSTALL FRONT WHEEL**
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR AXLE HUB & BEARING ASSY LH

COMPONENTS

30093-01



N·m (kgf·cm, ft·lbf) : Specified torque

z Non-reusable part

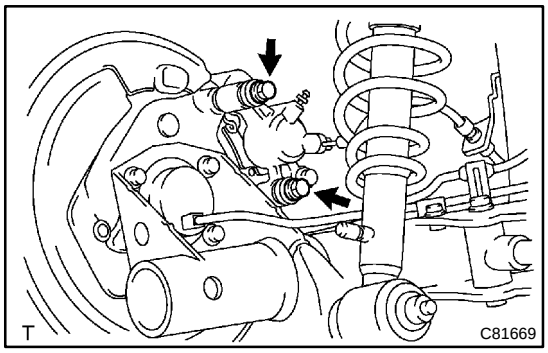
F41738

REPLACEMENT

HINT:

Replacement the RH side by the same procedures with LH side.

1. REMOVE REAR WHEEL



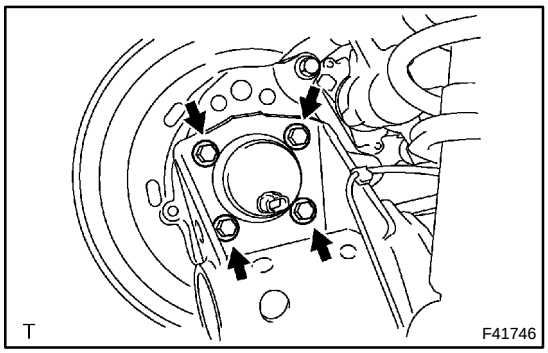
2. REMOVE REAR DISC BRAKE CALIPER ASSY, LH

(a) Remove the 2 bolts and rear disc brake caliper.

3. REMOVE REAR DISC

4. DISCONNECT SKID CONTROL SENSOR WIRE

(a) Disconnect the skid control sensor connector.



5. REMOVE REAR AXLE HUB & BEARING ASSY LH

(a) Remove the 4 bolts and hub and bearing assembly.

6. REMOVE SKID CONTROL SENSOR

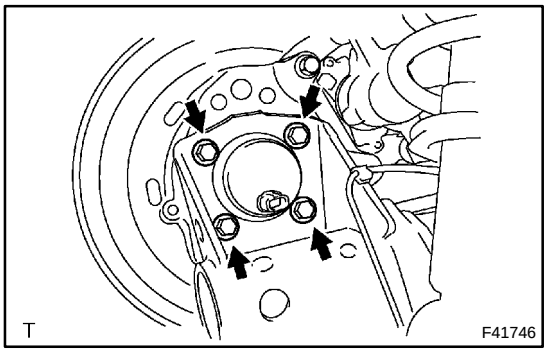
(See page 32-94)

SST 09520-00031 (09520-00040), 09521-00020, 09950-00020

7. INSTALL SKID CONTROL SENSOR

(See page 32-94)

SST 09214-76011

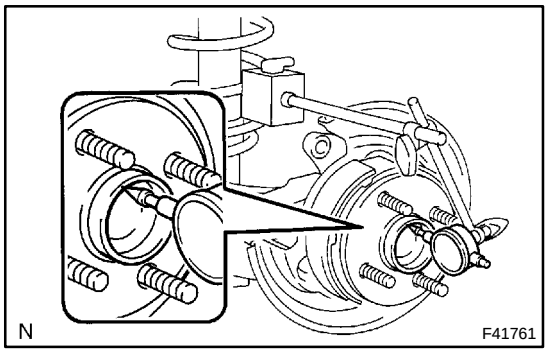


8. INSTALL REAR AXLE HUB & BEARING ASSY LH

(a) Install the rear axle hub & bearing assy LH with the 4 bolts.
Torque: 56 N·m (571 kgf·cm, 41 ft·lbf)

9. CONNECT SKID CONTROL SENSOR WIRE

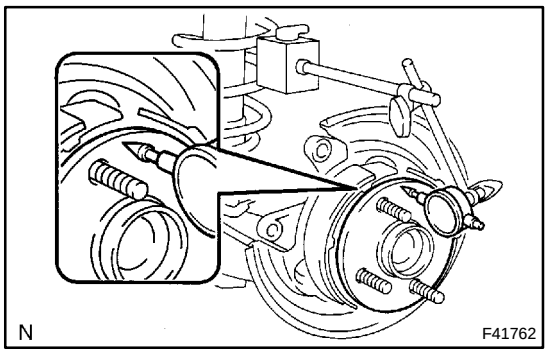
(a) Connect the skid control sensor connector.



10. INSPECT BEARING BACKLASH

(a) Set a dial indicator near the center of the axle hub and check the backlash in the bearing shaft sirection.
Maximum: 0.05 mm (0.0020 in.)

If the backlash exceeds the maximum, replace the axle hub assembly.

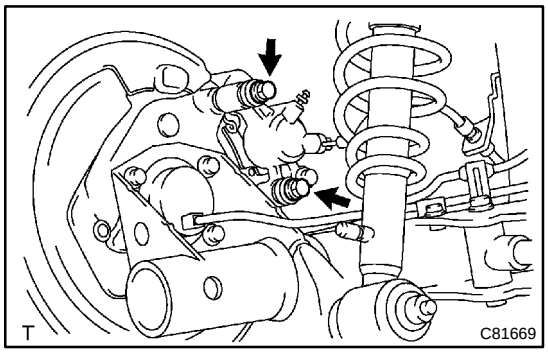


11. INSPECT AXLE HUB DEVIATION

(a) Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.
Maximum: 0.07 mm (0.0028 in.)

If the backlash exceeds the maximum, replace the axle hub assembly.

12. INSTALL REAR DISC



13. INSTALL REAR DISC BRAKE CALIPER ASSY, LH

(a) Install the rear disc brake caliper with the 2 bolts.
Torque: 47 N·m (479 kgf·cm, 35 ft·lbf)

14. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

15. CHECK ABS SPEED SENSOR SIGNAL **(See page 05-565 or 05-618 or 05-673)**

REAR AXLE LH HUB BOLT

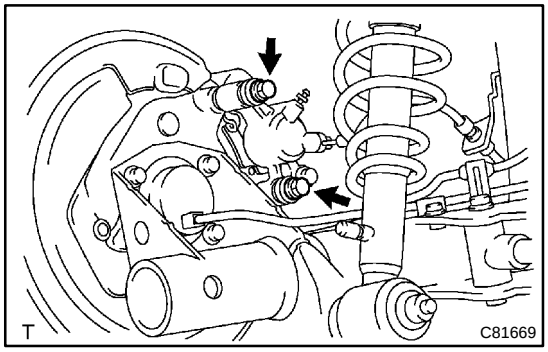
REPLACEMENT

3000T-02

HINT:

Replacement the RH side by the same procedures with LH side.

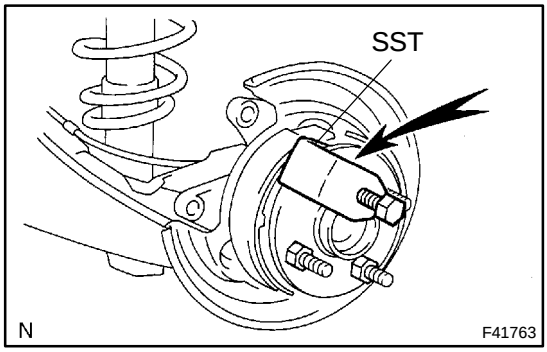
1. REMOVE REAR WHEEL



2. SEPARATE REAR DISC BRAKE CALIPER ASSY, LH

(a) Remove the 2 bolts and rear disc brake caliper.

3. REMOVE REAR DISC

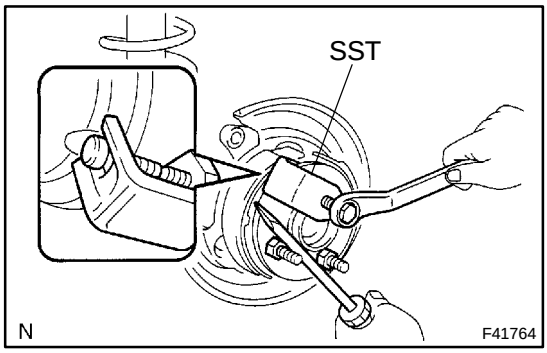


4. REMOVE REAR AXLE LH HUB BOLT

(a) Turn the axle hub to move the hub bolt and SST, that are to be removed, to the place shown in the illustration.

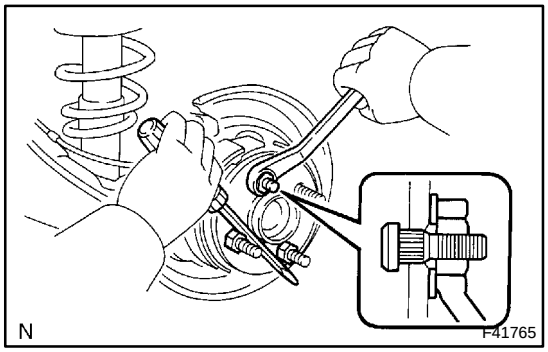
NOTICE:

Do not replace the hub bolt in any places other than that in the illustration.



(b) Using SST and a screwdriver, remove the hub bolt.

SST 09628-10011

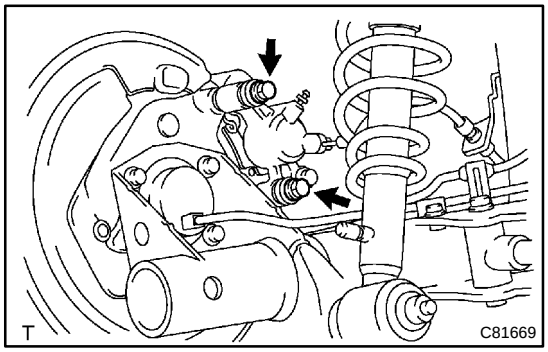


5. INSTALL REAR AXLE LH HUB BOLT

(a) Install a washer and nut to a new hub bolt as shown in the illustration.

(b) Using a screwdriver to hold, install the hub bolt by torquing the nut.

6. INSTALL REAR DISC



7. INSTALL REAR DISC BRAKE CALIPER ASSY, LH

(a) Install the rear disc brake caliper with the 2 bolts.
Torque: 47 N·m (479 kgf·cm, 35 ft·lbf)

8. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

BRAKE

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BRAKE SYSTEM

3201A-06

PRECAUTION

- Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with parts having the same part number or equivalent.
- It is very important to keep parts and the area clean when repairing the brake system.
- If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

3201B-06

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the probability of the problems in descending order. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area		See page
Low pedal or spongy pedal	3. Fluid leaks for brake system		-
	4. Air in brake system		32-5
	5. Piston seals (Worn or damaged)	TMC Made:	32-56
			32-68
		TMUK Made:	32-62
			32-74
	6. Rear brake shoe clearance (Out of adjustment)		
		TMC Made:	33-18
		TMUK Made:	33-24
	7. Master cylinder (faulty)		32-15
	8. Booster push rod (Out of adjustment)		32-15
Brake drag	1. Brake pedal free play (Minimal)		32-7
	2. Parking brake lever travel (Out of adjustment)		33-2
	3. Parking brake wire (Sticking)	TMC Made:	33-7
			33-10
		TMUK Made:	33-7
			33-14
	4. Rear brake shoe clearance (Out of adjustment)		
		TMC Made:	33-18
		TMUK Made:	33-24
	5. Pad or lining(Cracked or distorted)	TMC Made:	32-56
			32-68
		TMUK Made:	32-62
			32-74
	6. Piston (Stuck)	TMC Made:	32-56
			32-68
		TMUK Made:	32-62
			32-74
	7. Piston (Frozen)	TMC Made:	32-56
			32-68
		TMUK Made:	32-62
			32-74
	8. Tension or return spring (Faulty)	TMC Made:	33-18
		TMUK Made:	33-24
	9. Booster push rod (Out adjustment)		32-15
	10. Vacuum leaks for booster system		32-23
			32-29
	11. Master cylinder (Faulty)		32-15

Brake pull	1. Piston (Stuck)	TMC Made:	32-56 32-68
		TMUK made:	32-62 32-74
	2. Pad or lining (Oily)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	3. Piston (Frozen)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	4. Disc (Scored)	TMC made:	32-56 32-68
		TMUK Made:	32-62 32-74
	5. Pad or lining (Cracked or distorted)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
Hard pedal but brake inefficient	1. Fluid leaks for brake system		-
	2. Air in brake system		32-5
	3. Pad or lining (Worn)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	4. Pad or lining (Cracked or distorted)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	5. Rear brake shoe clearance (Out of adjustment)		
		TMC Made:	33-18
		TMUK Made:	33-24
	6. Pad or lining (Oily)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	7. Pad or lining (Glanzed)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	8. Disc (Scored)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	9. Booster push rod (Out of adjustment)		32-15
	10. Vacuum leaks for booster system		32-23 32-29

Noise from brakes	1. Pad or lining (Cracked or distorted)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	2. Installation bolt (Loose)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	3. Disc (Scored)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	4. Pad support plate (Loose)	TMC Made:	32-56
		TMUK Made:	32-62 32-74
	5. Sliding pin (Worn)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	6. Pad or lining (dirty)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	7. Pad or lining (Glanzed)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	8. Anchor, return or tension spring (Faulty)	TMC Made:	33-18
		TMUK Made:	33-24
	9. Anti-squeal shim (Damaged)	TMC Made:	32-56 32-68
		TMUK Made:	32-62 32-74
	10. Shoe hold-down spring (Damaged)	TMC Made:	33-18
		TMUK Made	33-24

BRAKE FLUID

BLEEDING

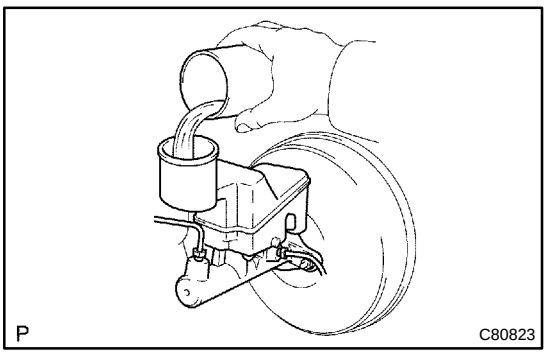
3201C-03

HINT:

If any work is done on the brake system or if air in the brake lines is suspected, bleed the air from the system.

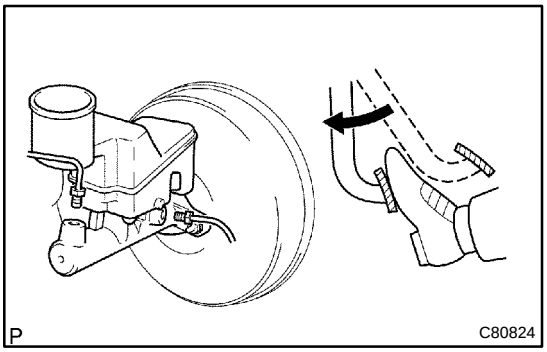
NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surfaces.



1. FILL RESERVOIR WITH BRAKE FLUID

Fluid: SAE J1703 or FMVSS No. 116 DOT3



2. BLEED MASTER CYLINDER

HINT:

If the master cylinder has been disassembled or if the reservoir becomes empty, bleed the air from the master cylinder.

(a) w/ ABS:

Disconnect the brake lines from the master cylinder.

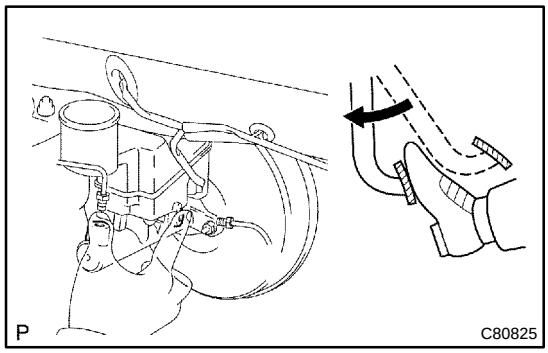
SST 09023-00100

(b) w/ VSC:

Disconnect the brake lines from the master cylinder.

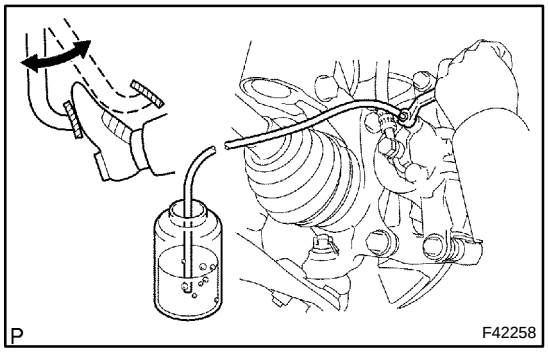
SST 09023-38400

(c) Slowly depress the brake pedal and hold it.



(d) Block off the outer holes with your fingers, and release the brake pedal.

(e) Repeat (b) and (c) 3 or 4 times.



3. BLEED BRAKE LINE

(a) Connect the vinyl tube to the brake caliper.

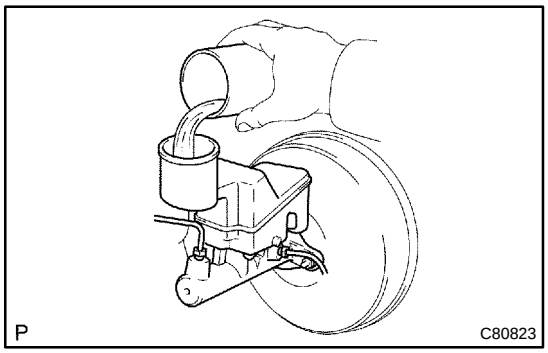
(b) Depress the brake pedal several times, then loosen the bleeder plug with the pedal held down.

(c) At the point where the fluid which has come out stops, tighten the bleeder plug, then release the brake pedal.

(d) Repeat (b) and (c) until all the air in the fluid has been bled out.

(e) Repeat the above procedure to bleed the air out of the brake line for each wheel.

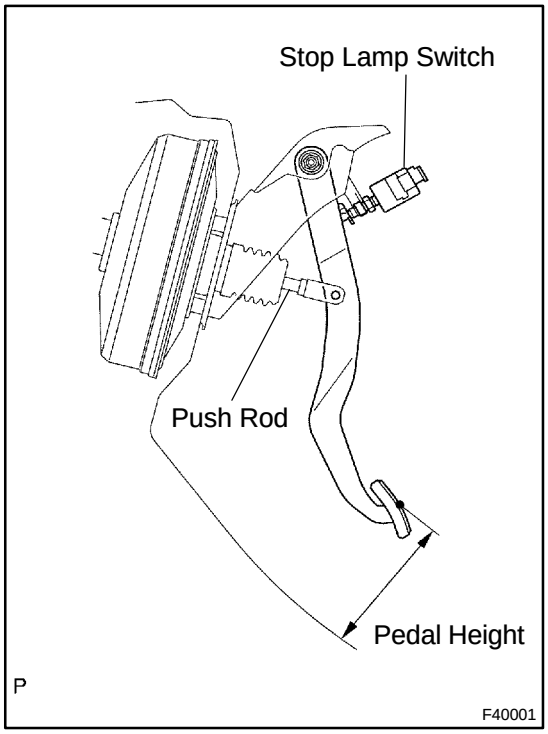
Torque: 8.3 N·m (84 kgf·cm, 73 in.·lbf)



4. CHECK FLUID LEVEL IN RESERVOIR

(a) Check the fluid level and add fluid if necessary.

Fluid: SAE J1703 or FMVSS No. 116 DOT3



BRAKE PEDAL SUB-ASSY

3201D-04

ADJUSTMENT

1. CHECK AND ADJUST BRAKE PEDAL HEIGHT

(a) Inspect brake pedal height.

Pedal height from asphalt sheet:

LHD:

M/T: 134.9 - 144.9 mm (5.311 - 5.703 in.)

A/T: 134.3 - 144.3 mm (5.287 - 5.681 in.)

RHD:

M/T: 131.6 - 141.6 mm (5.181 - 5.575 in.)

A/T: 131.1 - 141.1 mm (5.161 - 5.555 in.)

(b) Adjust brake pedal height.

(1) Remove the instrument finish panel lower.

(2) Disconnect the connector from the stop lamp switch.

(3) Loosen the stop lamp switch lock nut and remove the stop lamp switch.

(4) Loosen the clevis lock nut.

(5) Adjust the pedal height by turning the pedal push rod.

(6) Tighten the push rod lock nut.

Torque:

TMC made: 26 N·m (265 kgf·cm, 19 ft·lbf)

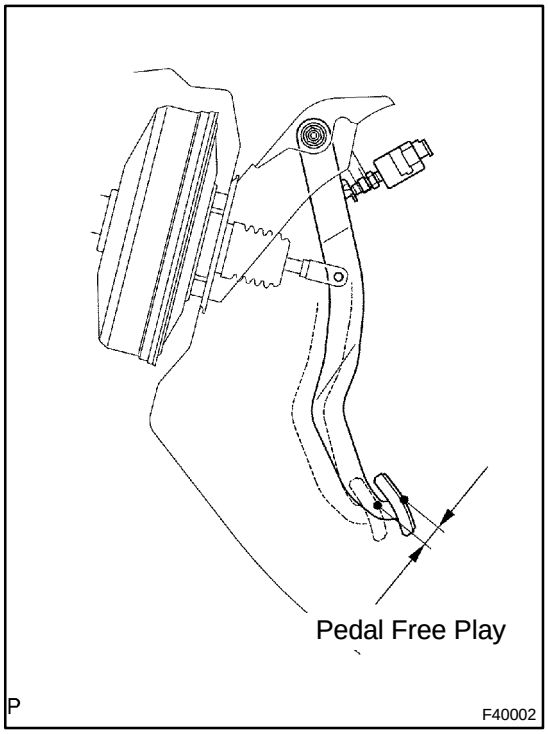
TMUK made: 19 N·m (194 kgf·cm, 14 ft·lbf)

(7) Install the stop lamp switch.

(8) Connect the connector to the stop lamp switch.

(9) Push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), turn the stop lamp switch to lock the nut in the position where the stop lamp goes off.

(10) After installation, push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), check that stop lamp lights up.



2. CHECK PEDAL FREE PLAY

(a) Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.

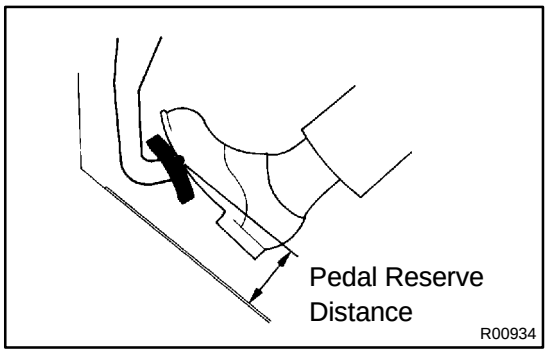
(b) Push in the pedal until the beginning of the resistance is felt. Measure the distance, as shown.

Pedal free play: 1 - 6 mm (0.04 - 0.24 in.)

If the pedal free play is outside of the above specification, check the stop lamp switch clearance.

If the clearance is OK, then troubleshoot the brake system.

Stop lamp switch clearance:
0.5 - 2.4 mm (0.020 - 0.094 in.)



3. CHECK PEDAL RESERVE DISTANCE

(a) Release the parking brake lever.

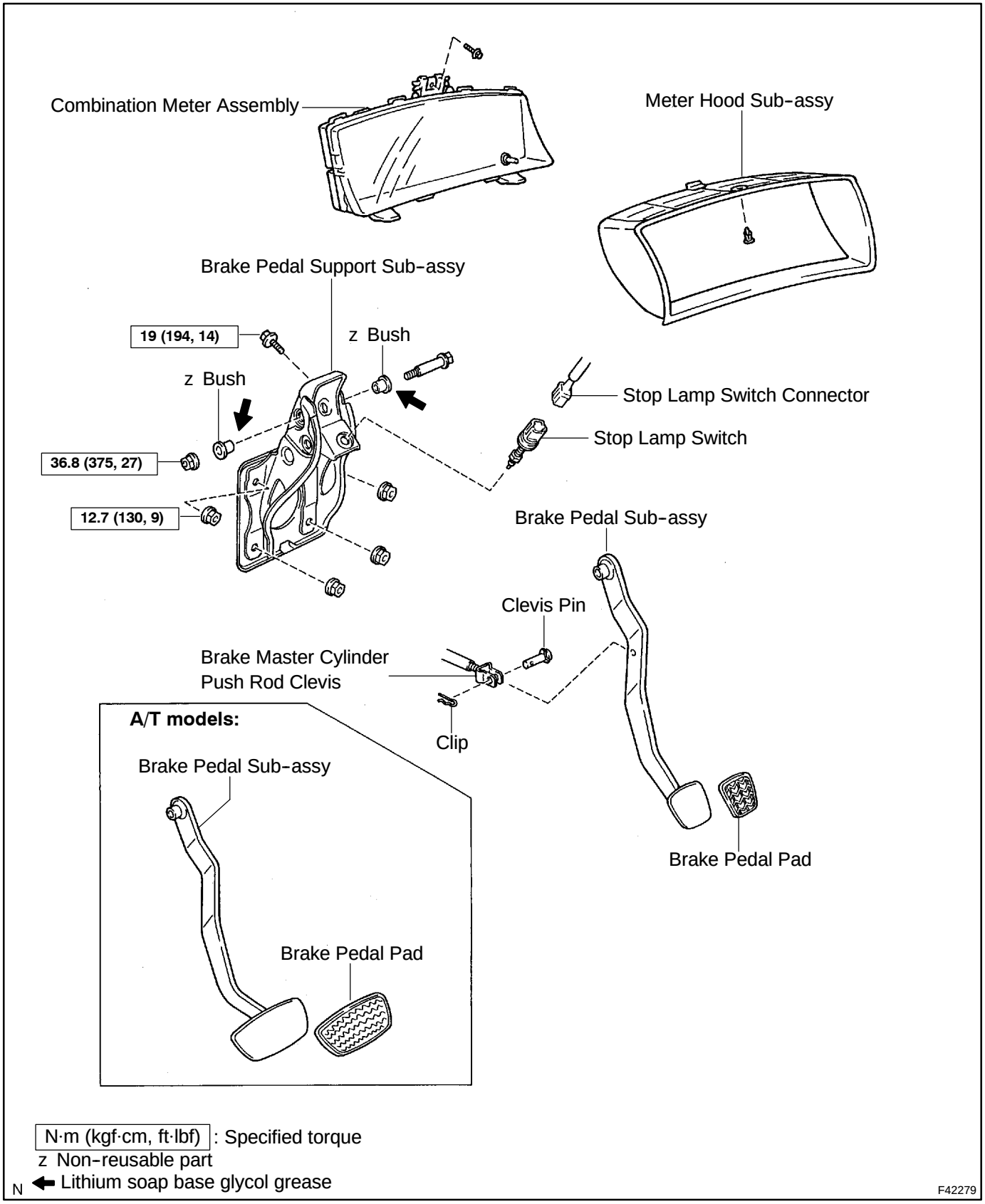
With engine running, depress the pedal and measure the pedal reserve distance, as shown.

Pedal reserve distance from asphalt sheet at 490 N (50 kgf, 110.2 lbf): More than 60 mm (2.36 in.)

If incorrect, troubleshoot the brake system.

320G0-01

COMPONENTS



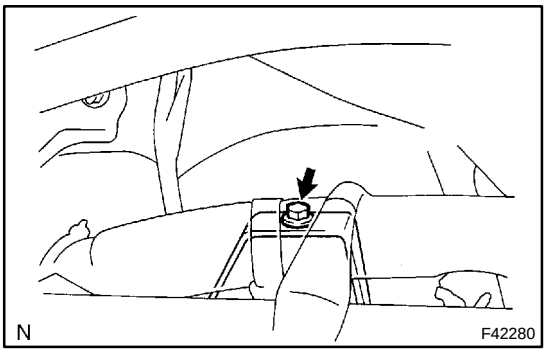
320G1-01

OVERHAUL

1. REMOVE COMBINATION METER ASSEMBLY **(See page 71-32)**

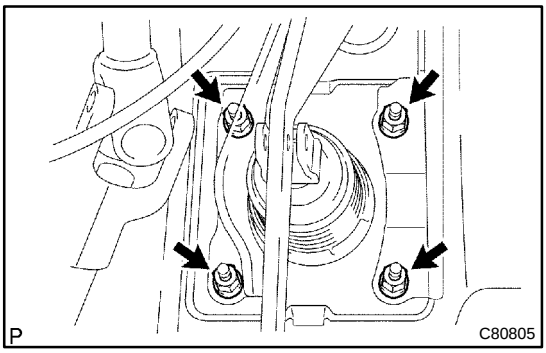
2. DISCONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

(a) Remove the clip and push rod clevis pin, and disconnect the push rod clevis from the brake pedal.



3. REMOVE BRAKE PEDAL SUPPORT SUB-ASSY

(a) Remove the bolt from the brake pedal support.
(b) Disconnect the stop lamp switch connector.



(c) Remove the 4 nuts and brake pedal support assy.

4. REMOVE BRAKE PEDAL SUB-ASSY

(a) Remove the bolt and nut from the brake pedal support assy.
(b) Remove the brake pedal sub-assy and 2 bushes.

5. REMOVE STOP LAMP SWITCH ASSY

(a) Loosen the stop lamp switch lock nut.
(b) Remove the stop lamp switch from the brake pedal support sub-assy.

6. REMOVE BRAKE PEDAL PAD

(a) Remove the brake pedal pad from the brake pedal sub-assy.

7. INSTALL BRAKE PEDAL PAD

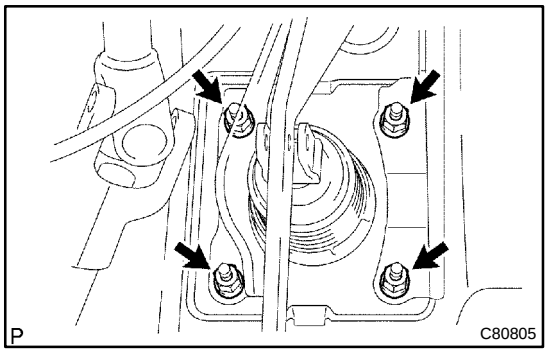
(a) Install the brake pedal pad to the brake pedal sub-assy.

8. INSTALL STOP LAMP SWITCH ASSY

(a) Install the stop lamp switch to the brake pedal sub-assy.

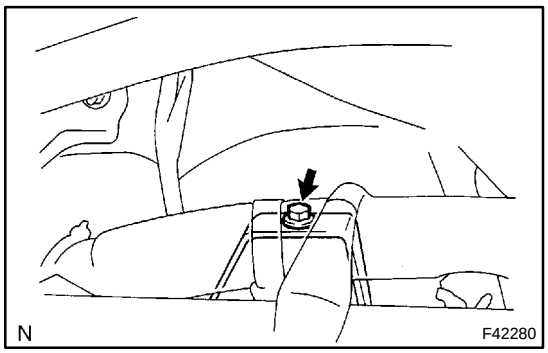
9. INSTALL BRAKE PEDAL SUB-ASSY

(a) Apply the lithium soap base glycol grease to inside surface of 2 new bushes.
(b) Install the brake pedal sub-assy and 2 bushes to the brake pedal sub-assy with the bolt and nut.
Torque: 36.8 N·m (375 kgf·cm, 27 ft·lbf)



10. INSTALL BRAKE PEDAL SUPPORT SUB-ASSY

(a) Install the brake pedal support assy with the 4 nuts.
Torque: 12.7 N·m (130 kgf·cm, 9 ft·lbf)
(b) Connect the stop lamp switch connector to the stop lamp switch.



(c) Install the bolt to the brake pedal support.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)

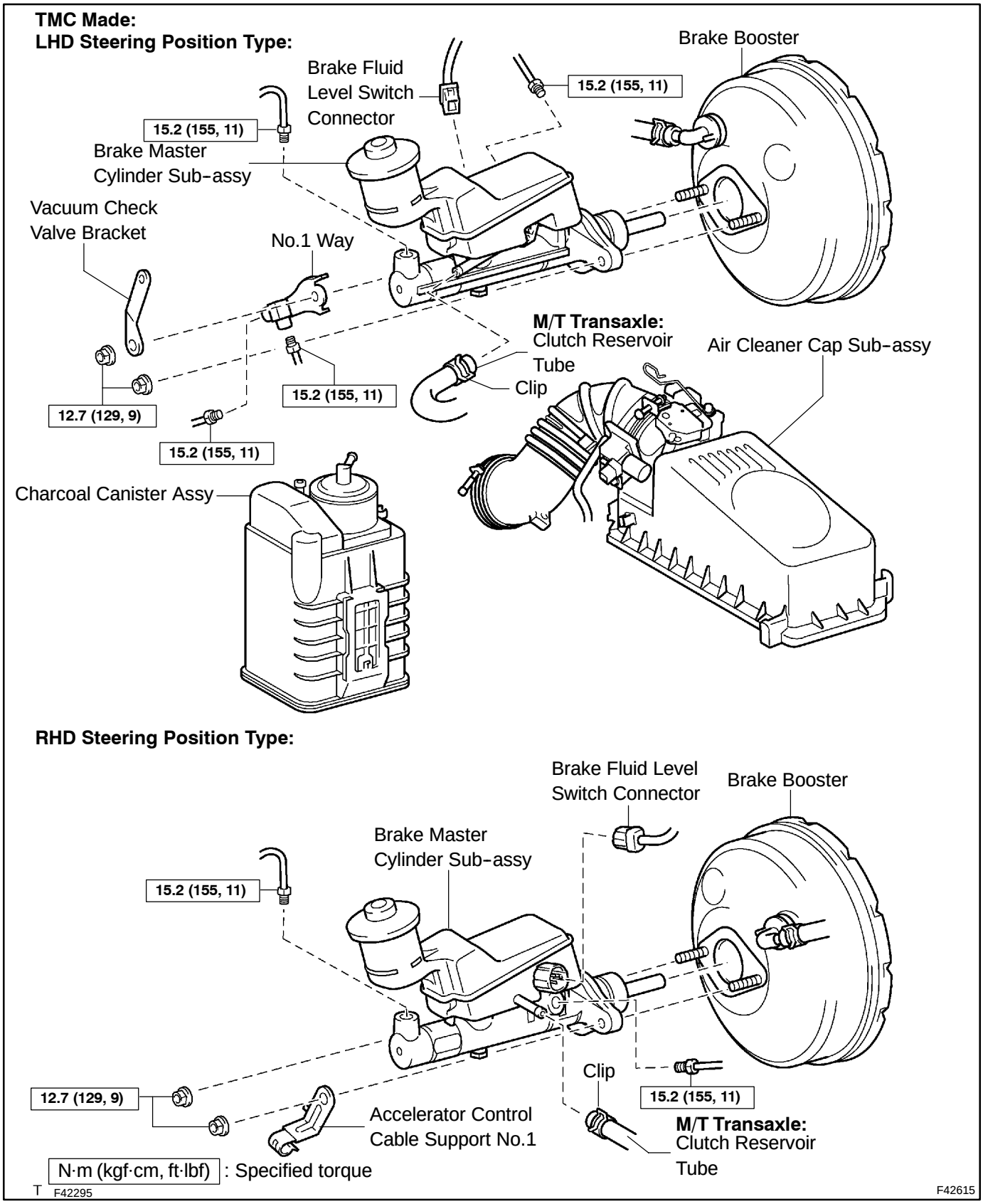
11. CONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

(a) Apply the lithium soap base glycol grease to the push rod clevis pin.
(b) Connect the brake master cylinder push rod clevis with the push rod clevis pin and clip.
12. INSTALL COMBINATION METER ASSEMBLY **(See page 71-32)**
13. CHECK AND ADJUST BRAKE PEDAL HEIGHT **(See page 32-7)**
14. CHECK PEDAL FREE PLAY **(See page 32-8)**
15. CHECK PEDAL RESERVE DISTANCE **(See page 32-8)**

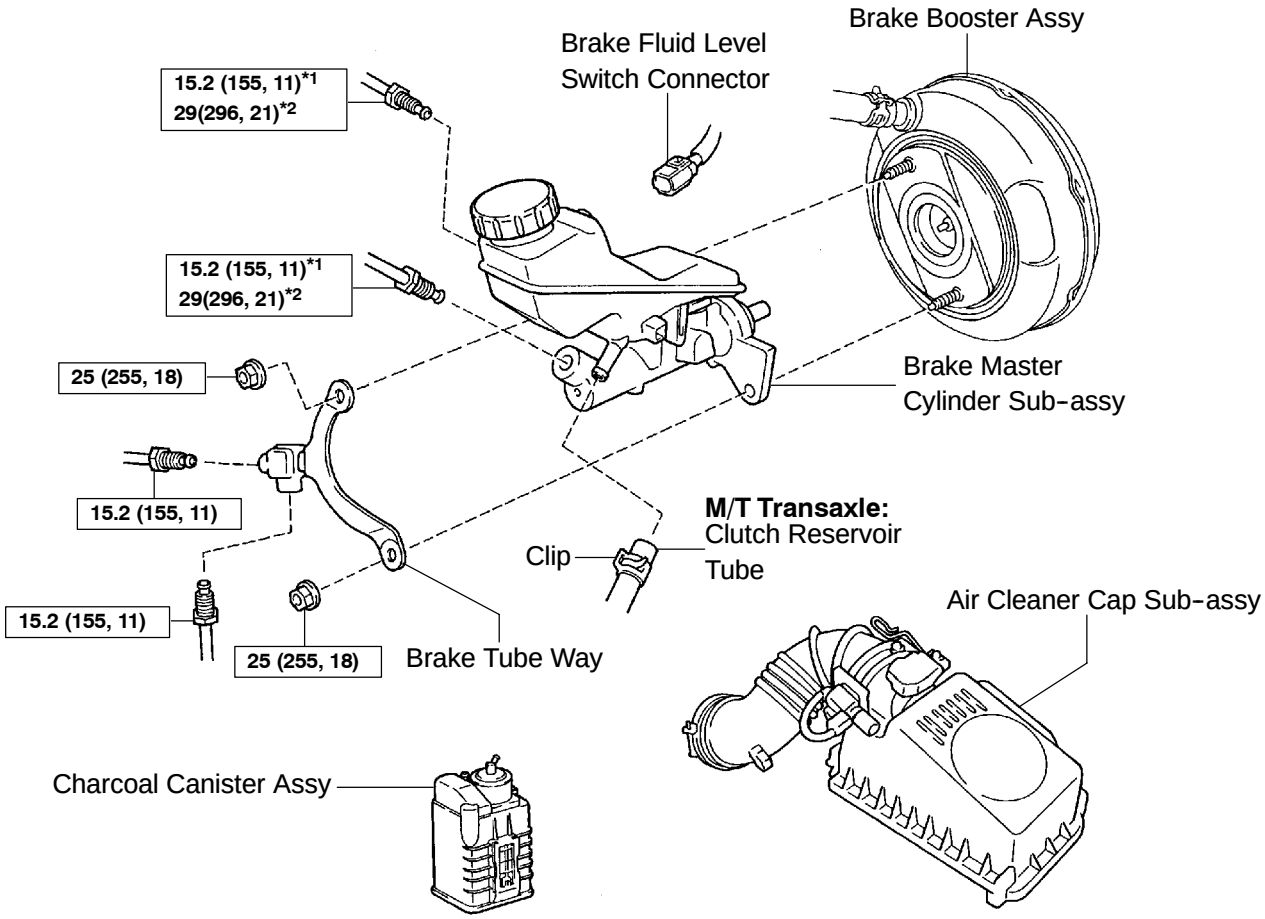
BRAKE MASTER CYLINDER SUB-ASSY

COMPONENTS

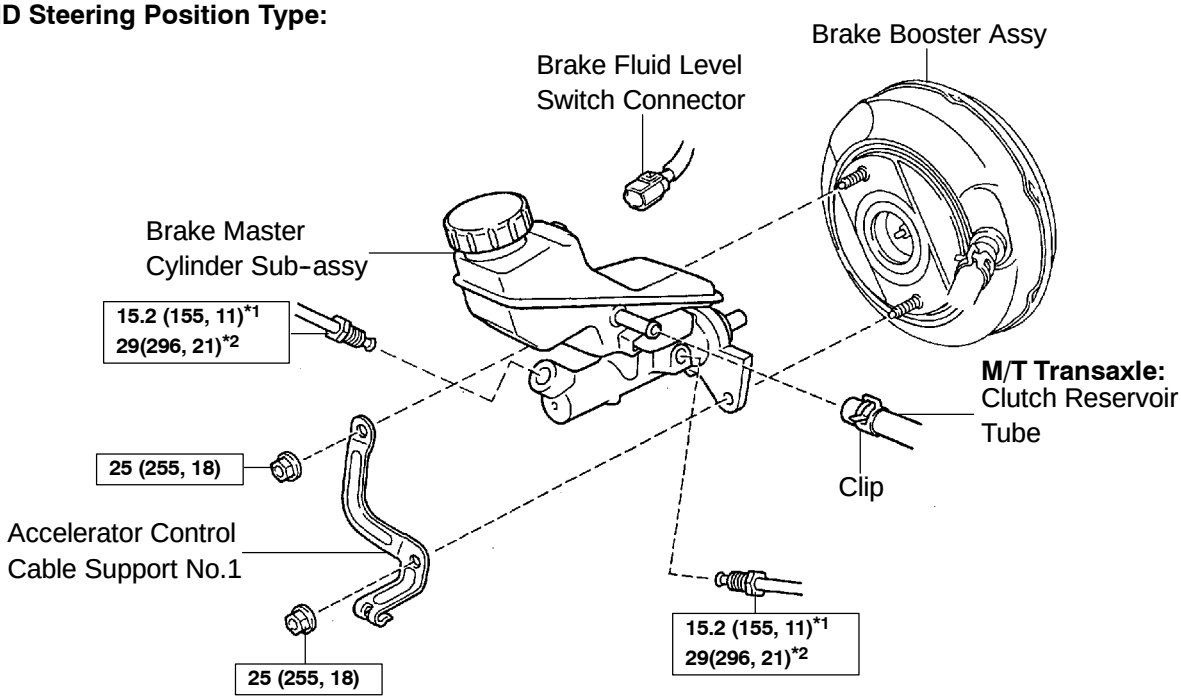
320G2-01



TMUK Made:
LHD Steering Position Type:



RHD Steering Position Type:

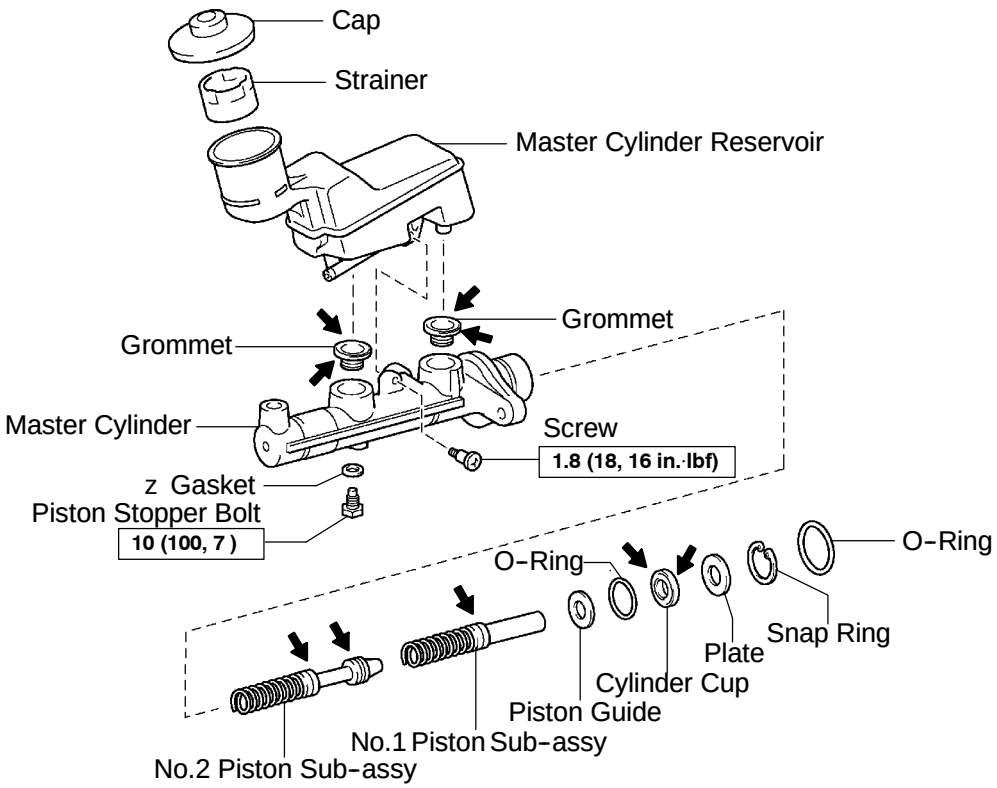


N·m (kgf·cm, ft·lbf) : Specified torque
*1 w/ ABS:
*2 w/ VSC:

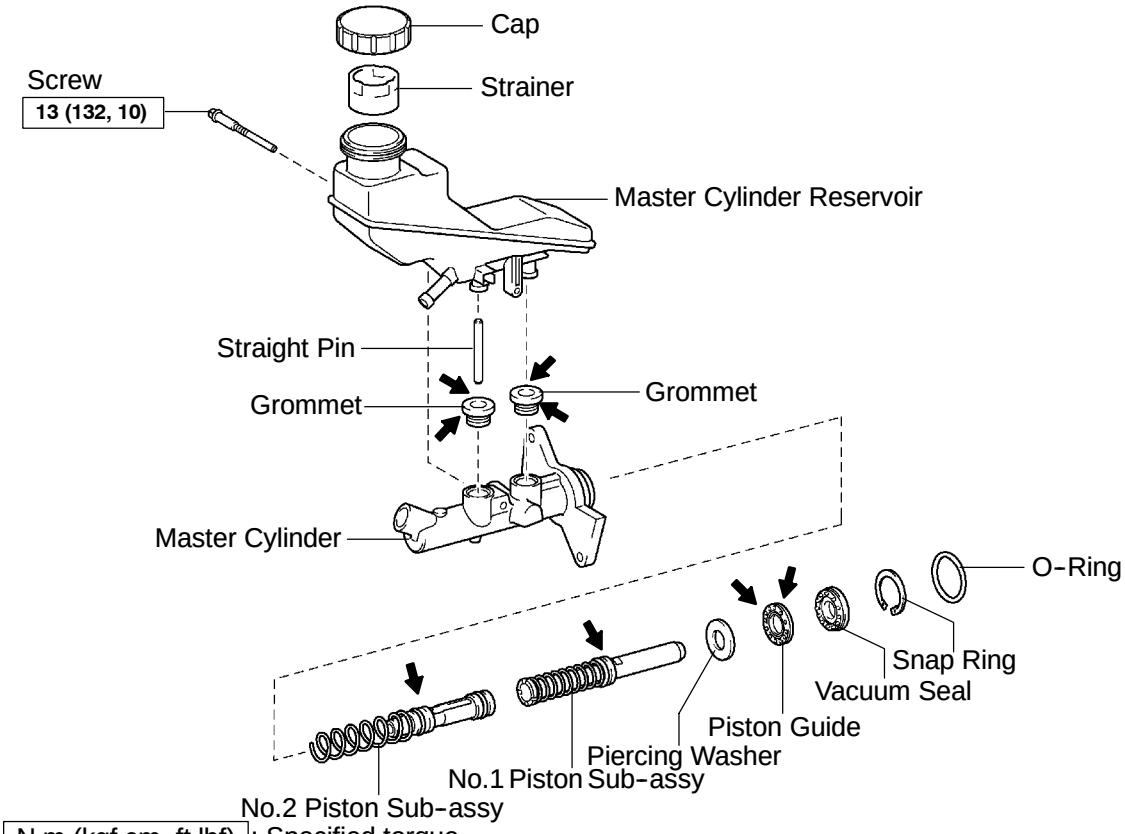
N

F42281

TMC Made:



TMUK Made:



N·m (kgf·cm, ft·lbf): Specified torque
z Non-reusable part
T F42282 ⬅ Lithium soap base glycol grease

F42616

320G3-01

OVERHAUL

1. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately is it comes into contact with any painted surface.

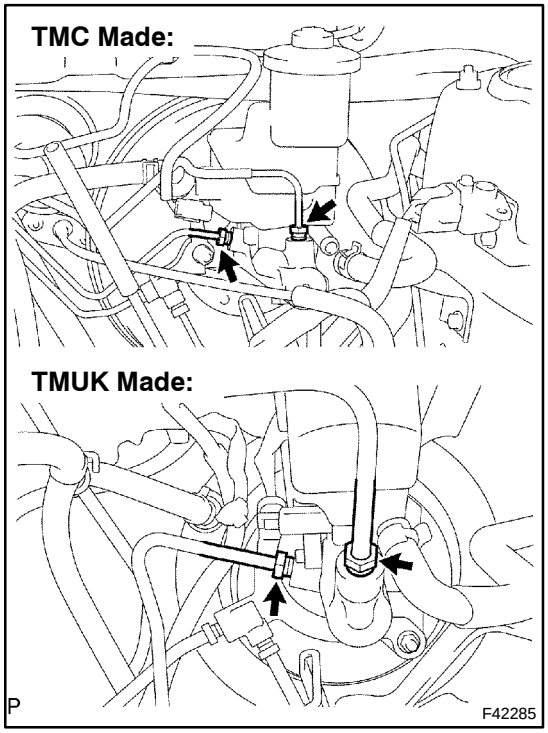
2. REMOVE AIR CLEANER CAP SUB-ASSY (LHD STEERING POSITION TYPE)

3. REMOVE CHARCOAL CANISTER ASSY (LHD STEERING POSITION TYPE)

4. REMOVE BRAKE MASTER CYLINDER SUB-ASSY (LHD STEERING POSITION TYPE)

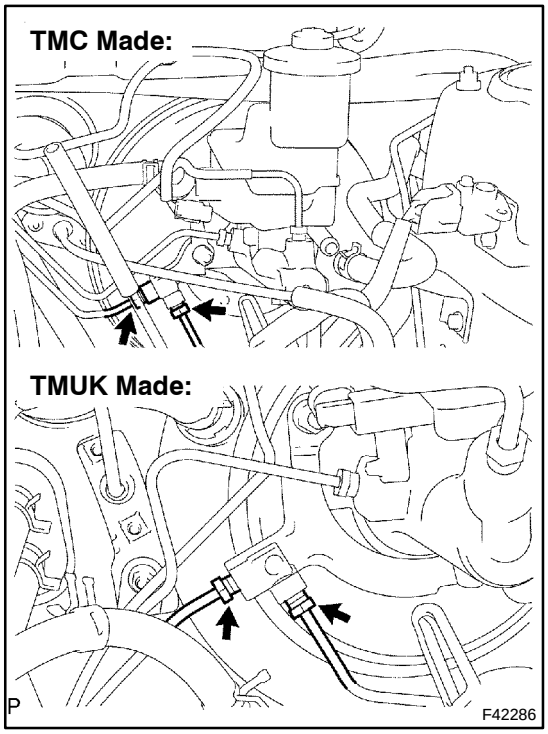
(a) Disconnect the brake fluid level switch connector.

(b) M/T transaxle:
Slide the clip and disconnect the clutch reservoir tube.



(c) w/ ABS:
Using SST, disconnect the 2 brake lines from the master cylinder.
SST 09023-00100

(d) w/ VSC:
Using SST, disconnect the 2 brake lines from the master cylinder.
SST 09023-38400



(e) Using SST, disconnect the 2 brake lines from the No.1 way or brake tube way.
SST 09023-00100

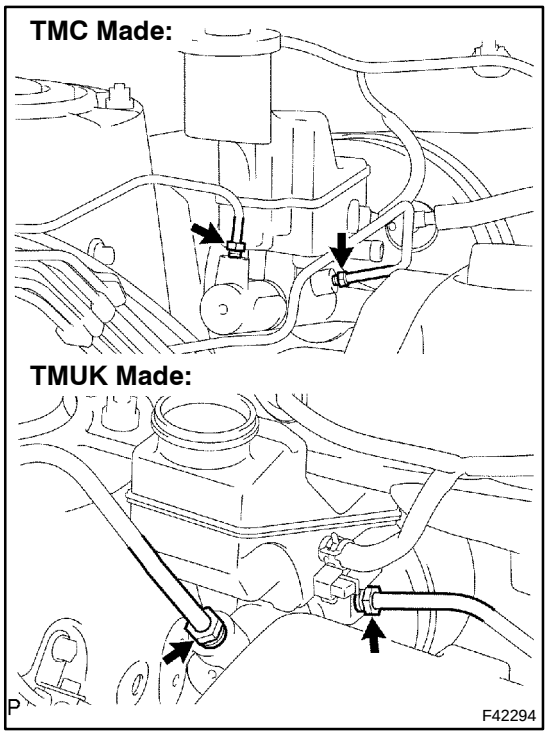
(f) TMC made:
Remove the 2 nuts, and pull out the No.1 way, vacuum check valve bracket and master cylinder.

(g) TMUK made:
Remove the 2 nuts, and pull out the brake tube way and brake master cylinder.

5. REMOVE BRAKE MASTER CYLINDER SUB-ASSY (RHD STEERING POSITION TYPE)

(a) Disconnect the brake fluid level switch connector.

(b) M/T transaxle:
Slide the clip and disconnect the clutch reservoir tube.



(c) w/ ABS:
Using SST, disconnect the 2 brake lines from the master cylinder.
SST 09023-00100

(d) w/ VSC:
Using SST, disconnect the 2 brake lines from the master cylinder.
SST 09023-38400

(e) Remove the 2 nuts and pull out the accelerator control cable support No.1 and master cylinder.

6. REMOVE BRAKE MASTER CYLINDER RESERVOIR SUB-ASSY

(a) TMC made:
Using a screwdriver, remove the screw.

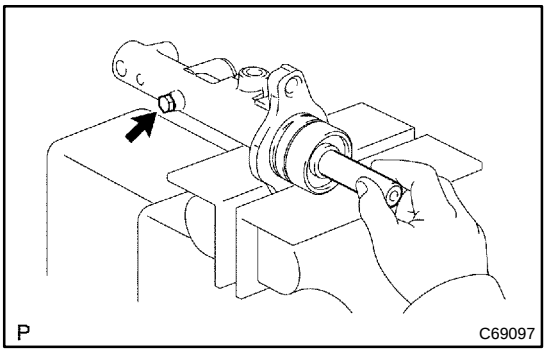
(b) TMUK made:
Using a torx driver (T30), remove the screw.

(c) Remove the master cylinder reservoir and 2 grommets from master cylinder.

7. REMOVE BRAKE MASTER CYLINDER KIT (TMC MADE)

(a) Hold the master cylinder in the vise through aluminum plates.

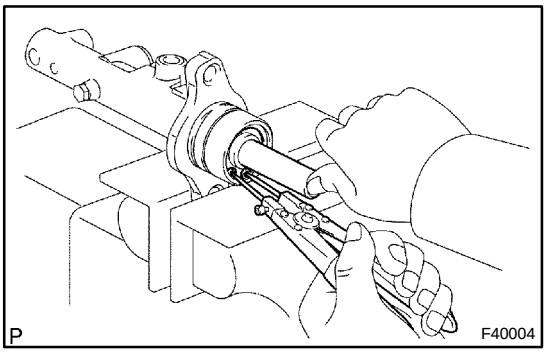
(b) Remove the O-ring.



(c) Push in the piston by hand, remove the piston stopper bolt and gasket.

NOTICE:

When pushing into the piston by hand, the oil left in the cylinder may spatter.



(d) Push in the piston by hand, remove the snap ring with snap ring pliers.

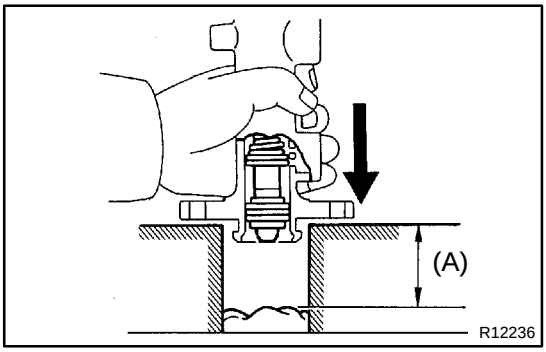
NOTICE:

When pushing into the piston by hand, the oil left in the cylinder may spatter.

(e) Remove the No.1 piston sub-assy, plate, cylinder cup, O-ring and piston guide by hand, pulling straight out, at not angle.

NOTICE:

If pulled out at an angle, there is a possibility that the cylinder bore could be damaged.



(f) Place a rag and 2 wooden blocks on the work table and lightly edges until the No.2 piston sub-assy drops out of the cylinder.

NOTICE:

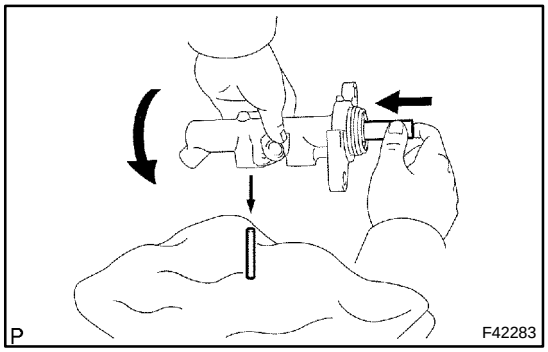
If pulled out at an angle, there is a possibility that the cylinder bore could be damaged.

HINT:

Make sure the distance (A), from the rag to the top of the blocks, is at least 100 mm (3.94 in.).

8. REMOVE BRAKE MASTER CYLINDER KIT (TMUK MADE)

(a) Remove O-ring.

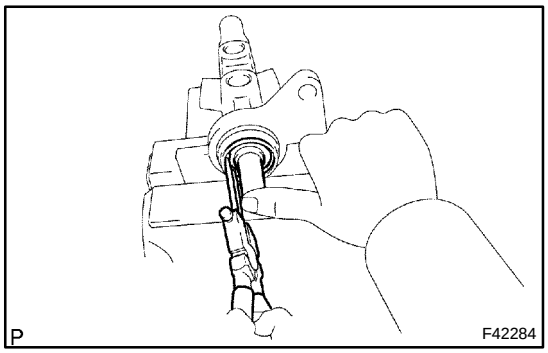


(b) Push in the piston by hand, remove the straight pin by turning over the cylinder body.

NOTICE:

When pushing into the piston by hand, the oil left in the cylinder may spatter.

(c) Hold the master cylinder in the vise through aluminum plates.



(d) Push in the piston by hand, remove the snap ring with snap ring pliers.

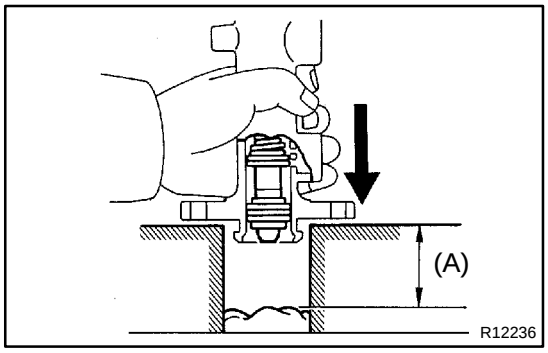
NOTICE:

When pushing into the piston by hand, the oil left in the cylinder may spatter.

(e) Remove the No.1 piston sub-assy, piercing washer, piston guide and vacuum seal by hand, pulling straight out, not at angle.

NOTICE:

If pulled out at an angle, there is a possibility that the cylinder bore could be damaged.



(f) Place a rag and 2 wooden blocks on the work table and lightly edges until the No.2 piston sub-assy drops out of the cylinder.

NOTICE:

If pulled out at an angle, there is a possibility that the cylinder bore could be damaged.

HINT:

Make sure the distance (A), from the rag to the top of the blocks, is at least 100 mm (3.94 in.).

9. INSPECT BRAKE MASTER CYLINDER

(a) Check the cylinder bore for rust or scoring.

10. INSTALL BRAKE MASTER CYLINDER KIT (TMC MADE)

(a) Hold the master cylinder in the vise through aluminum plates.

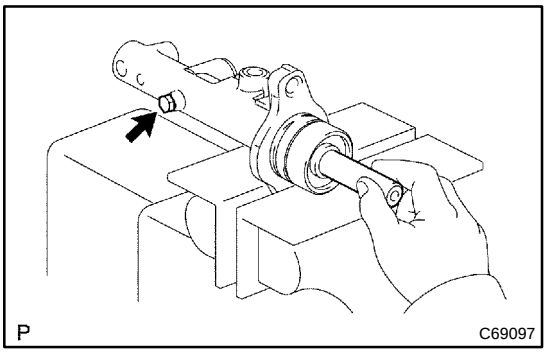
(b) Apply the lithium soap base glycol grease to No.1 and No.2 piston sub-assy.

(c) Install the No.2 and No.1 piston sub-assy with plate, cylinder cup, O-ring and piston guide.

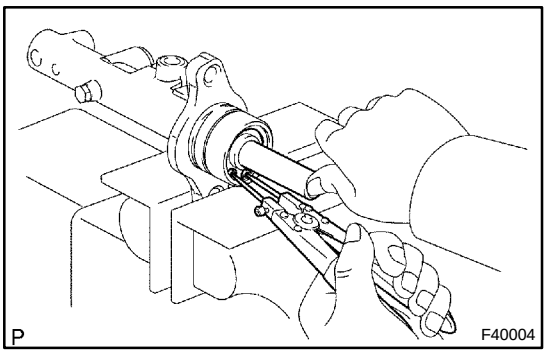
NOTICE:

S **If the piston is inserted at an angle, there is a possibility that the cylinder bore could be damage.**

S **Be careful not to damage the rubber lips on the pistons.**



(d) Push in the piston and install a new gasket and a new piston stopper bolt.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



(e) Push in the piston and install the snap ring with snap ring pliers.
(f) Apply the lithium soap base glycol grease on a O-ring and install the O-ring to the master cylinder.

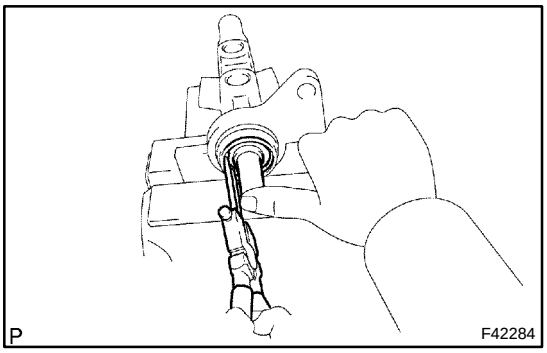
11. INSTALL BRAKE MASTER CYLINDER KIT (TMUK MADE)

(a) Apply the lithium soap base glycol grease to a No.1 and No.2 piston sub-assy.
(b) Install the No.2 and No.1 piston sub-assy with piercing washer, piston guide and vacuum seal.

NOTICE:

S **If the piston is inserted at an angle, there is a possibility that the cylinder bore could be damaged.**
S **Be careful not to damage the rubber lips on the pistons.**

(c) Push in the piston and install a straight pin.



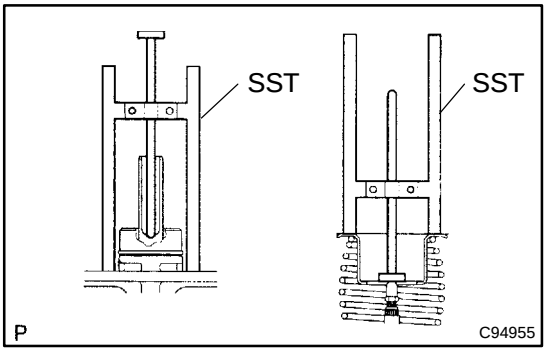
(d) Push in the piston and install the snap ring with snap ring pliers.

12. INSTALL BRAKE MASTER CYLINDER RESERVOIR SUB-ASSY

(a) Apply the lithium soap base glycol grease to the 2 brake master cylinder reservoir grommets and install it to the master cylinder.

(b) TMC made:
Using a screwdriver, install the master cylinder reservoir with the screw.
Torque: 1.8 N·m (18 kgf·cm, 16 in.·lbf)

(c) TMUK made:
Using a torx driver (T30), instal the master cylinder reservoir with the screw.
Torque: 13 N·m (132 kgf·cm, 10 ft·lbf)



13. INSPECT AND ADJUST BRAKE BOOSTER PUSH ROD (TMC MADE)

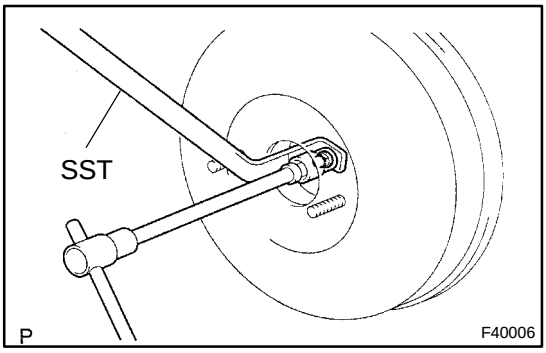
(a) Apply the chalk to the flat surfaced tip of the SST pin.

(b) Set SST on the master cylinder and lower the pin of the SST until it slightly touches the piston.
SST 09737-00012

(c) Turn SST upside down and place it on the brake booster.
Clearance: 0 mm (0 in.)

HINT:

- If there is a space between the SST main body and the booster shell (chalk is applied to the booster push rod), it means that the clearance is too small.
- If chalk is not applied to the booster push rod after placing the SST on the brake booster, it means that the clearance is too large.



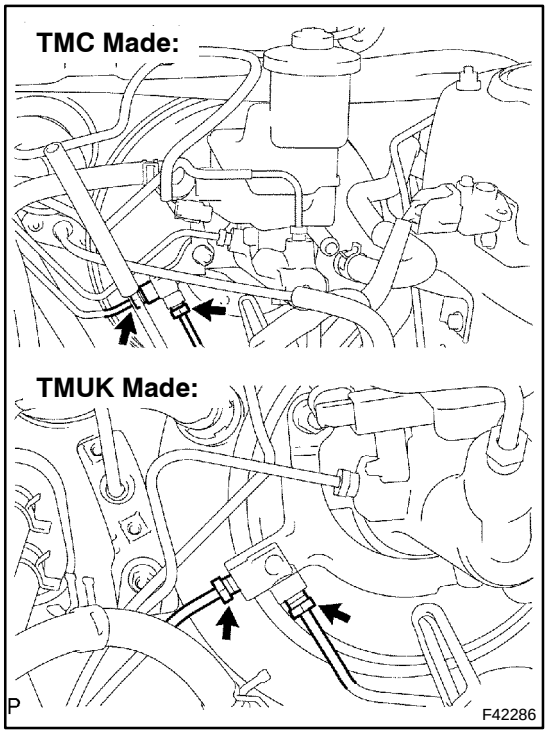
(d) If clearance is outside of the specified range, fix the push rod using SST and adjust the length of the protruding adjusting bolt.
SST 09737-00020

HINT:
When adjusting the push rod, depress the brake pedal enough so that the push rod sticks out.

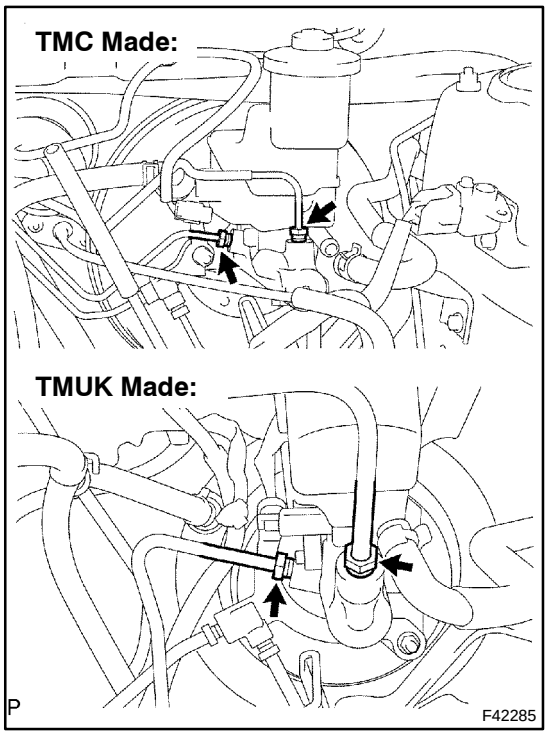
14. INSTALL BRAKE MASTER CYLINDER SUB-ASSY (LHD STEERING POSITION TYPE)

(a) TMC made:
Install the master cylinder, No.1 way and vacuum check valve bracket with the 2 nuts.
Torque: 12.7 N·m (129 kgf·cm, 9 ft·lbf)

(b) TMUK made:
Install the master cylinder and brake tube way with the 2 nuts.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)



(c) Using SST, connect the 2 brake lines to the No.1 way or brake tube way.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)



(d) w/ ABS:
Using SST, connect the 2 brake lines to the master cylinder.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

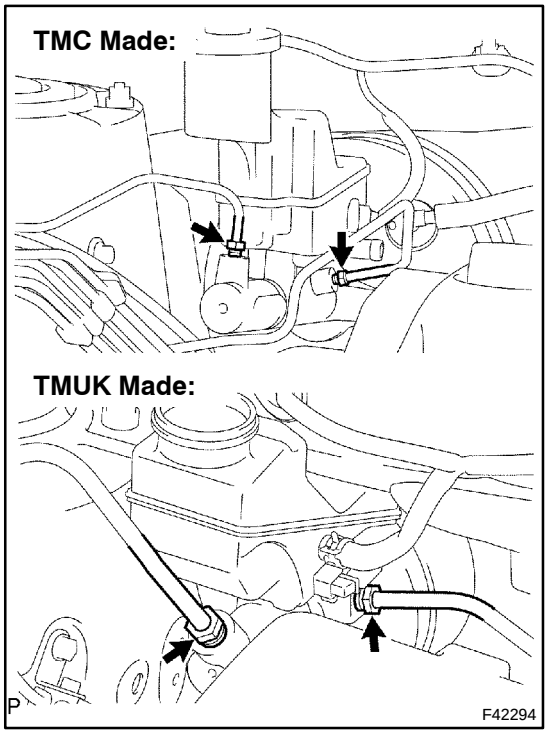
(e) w/ VSC:
Using SST, connect the 2 brake lines to the master cylinder.
SST 09023-38400
Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

(f) M/T transaxle:
Connect the clutch reservoir tube.

(g) Connect the brake fluid level switch connector.

15. INSTALL BRAKE MASTER CYLINDER SUB-ASSY (RHD STEERING POSITION TYPE)

(a) Install the master cylinder and accelerator control cable support No.1 with the 2 nuts.
Torque:
TMC made: 12.7 N·m (129 kgf·cm, 9 ft·lbf)
TMUK made: 25 N·m (255 kgf·cm, 18 ft·lbf)



(b) w/ ABS:
Using SST, connect the 2 brake lines to the master cylinder.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

(c) w/ VSC:
Using SST, connect the 2 brake lines to the master cylinder.
SST 09023-38400
Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

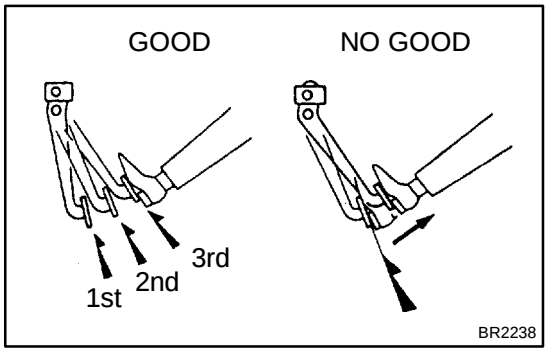
(d) M/T transaxle:
Connect the clutch reservoir tube.

(e) Connect the brake fluid level switch connector.

16. INSTALL CHARCOAL CANISTER ASSY (LHD STEERING POSITION TYPE)

17. INSTALL AIR CLEANER CAP SUB-ASSY (LHD STEERING POSITION TYPE)

18. FILL RESERVOIR WITH BRAKE FLUID
19. BLEED MASTER CYLINDER (W/ ABS)
SST 09023-00100
20. BLEED MASTER CYLINDER (W/ VSC)
SST 09023-38400
21. BLEED BRAKE LINE **(See page 32-6)**
22. BLEED CLUTCH PIPE LINE (M/T TRANSAXLE) **(See page 42-15)**
23. CHECK FLUID LEVEL IN RESERVOIR
24. CHECK BRAKE FLUID LEAKAGE



BRAKE BOOSTER ASSY (LHD)

3201G-03

ON-VEHICLE INSPECTION

1. INSPECT BRAKE BOOSTER

(a) Airtightness check.

(1) Start the engine and stop it after 1 or 2 minutes. Depress the brake pedal several times slowly.

HINT:

If the pedal goes down farthest at the 1st time, but gradually rises after the 2nd or 3rd time, the booster is airtight.

(2) Depress the brake pedal while the engine is running, and stop the engine with the pedal depressed.

HINT:

If there is no change in the pedal reserve distance after holding the pedal for 30 seconds, the booster is airtight.

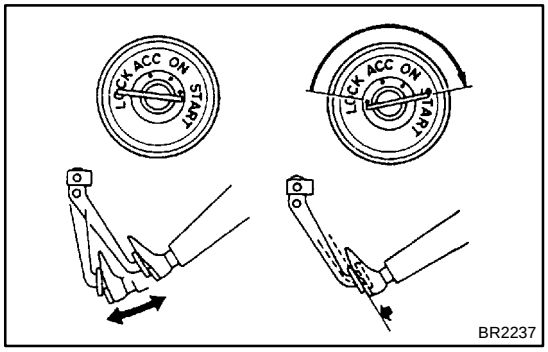
(b) Operating check.

(1) Depress the brake pedal several times with the ignition switch OFF and check that there is no change in the pedal reserve distance.

(2) Depress the brake pedal and start the engine.

HINT:

If the pedal goes down slightly, operation is normal.



2. INSPECT VACUUM CHECK VALVE

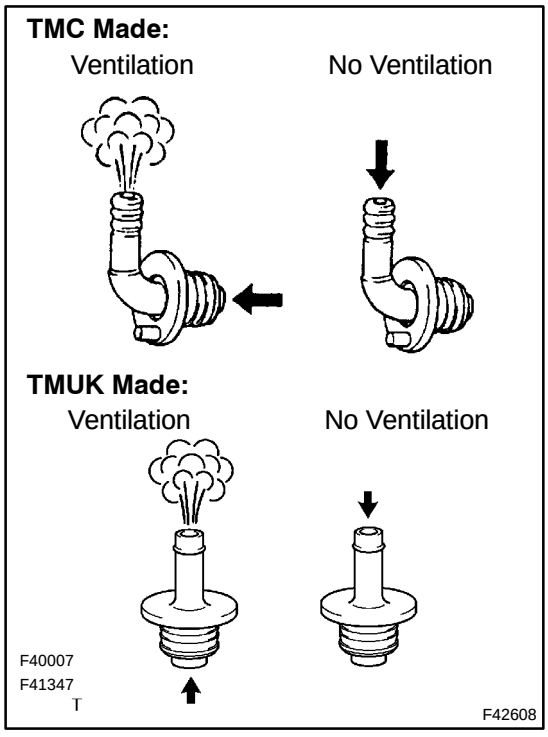
(a) Check vacuum check valve.

(1) Slide the clip and disconnect the vacuum hose.

(2) Remove the vacuum check valve.

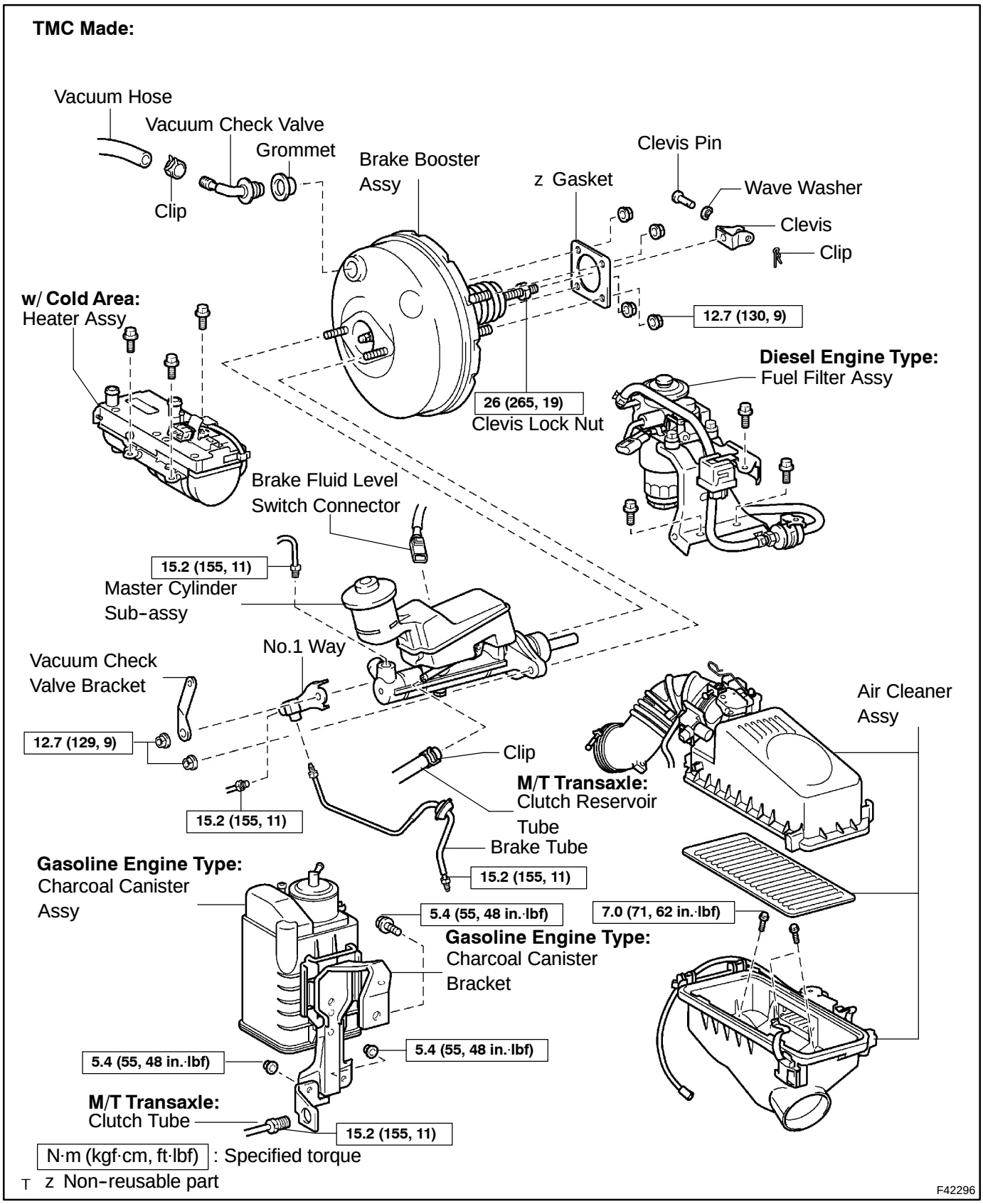
(3) Check that there is ventilation from the booster to engine, and no ventilation from the engine to the booster.

(4) If any fault is found, replace the vacuum check valve.

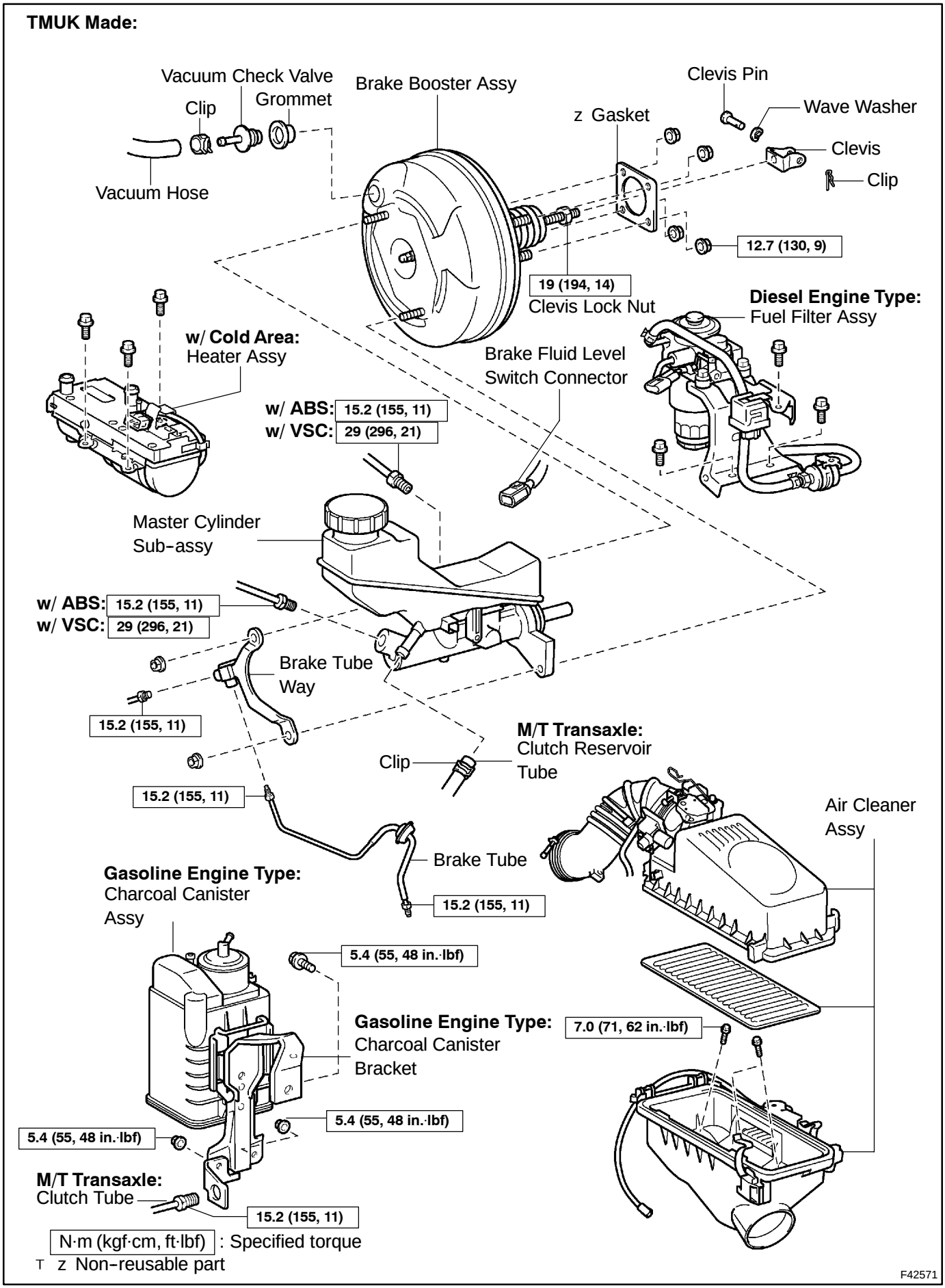


320G6-01

COMPONENTS



TMUK Made:


Vacuum Check Valve
Clip
Grommet
Vacuum Hose
Brake Booster Assy
z Gasket
Clevis Pin
Wave Washer
Clevis
Clip
12.7 (130, 9)
19 (194, 14)
Clevis Lock Nut
Diesel Engine Type:
Fuel Filter Assy
w/ Cold Area:
Heater Assy
Brake Fluid Level
Switch Connector
w/ ABS: 15.2 (155, 11)
w/ VSC: 29 (296, 21)
Master Cylinder
Sub-assy
w/ ABS: 15.2 (155, 11)
w/ VSC: 29 (296, 21)
Brake Tube
Way
15.2 (155, 11)
M/T Transaxle:
Clutch Reservoir
Tube
Clip
15.2 (155, 11)
Air Cleaner
Assy
Brake Tube
15.2 (155, 11)
Gasoline Engine Type:
Charcoal Canister
Assy
5.4 (55, 48 in.·lbf)
Gasoline Engine Type:
Charcoal Canister
Bracket
7.0 (71, 62 in.·lbf)
5.4 (55, 48 in.·lbf)
5.4 (55, 48 in.·lbf)
M/T Transaxle:
Clutch Tube
15.2 (155, 11)
N·m (kgf·cm, ft·lbf) : Specified torque
T z Non-reusable part
F42571

320G7-01

REPLACEMENT

1. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surfaces.

2. REMOVE AIR CLEANER ASSY

3. REMOVE CHARCOAL CANISTER ASSY (GASOLINE ENGINE TYPE)

4. REMOVE BRAKE MASTER CYLINDER SUB-ASSY (W/ ABS)

(See page 32-15)

SST 09023-00100

5. REMOVE BRAKE MASTER CYLINDER SUB-ASSY (W/ VSC)

(See page 32-15)

SST 09023-38400

6. REMOVE FUEL FILTER ASSY (DIESEL ENGINE TYPE)

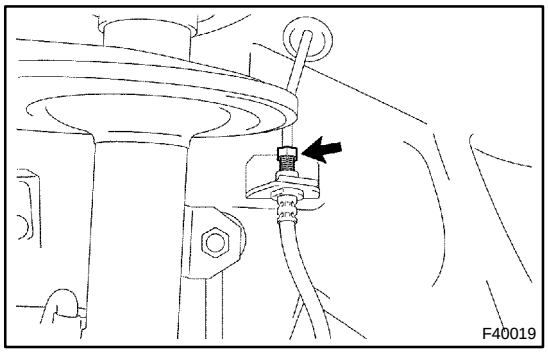
7. REMOVE HEATER ASSY (W/ COLD AREA)

8. DISCONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

(a) Loosen the push rod clevis lock nut.

(b) Remove the clip, wave washer and clevis pin.

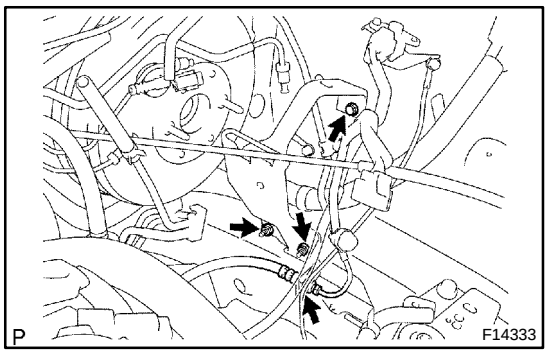
9. REMOVE FRONT WHEEL LH



10. REMOVE BRAKE BOOSTER ASSY

(a) Using SST and spanner, disconnect the brake tube from the flexible hose of front brake LH.

SST 09023-00100

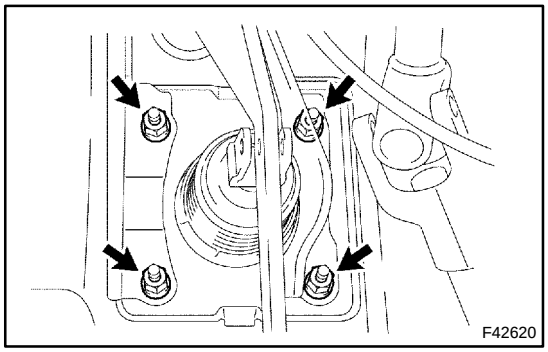


(b) M/T transaxle:
Using SST and spanner, disconnect the clutch tube.

SST 09023-00100

(c) Gasoline engine type:
Remove the bolt, 2 nuts and charcoal canister bracket.

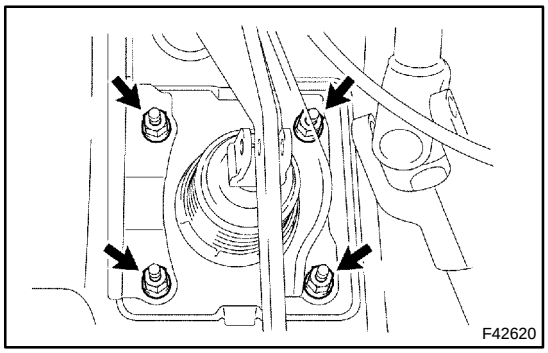
(d) Disconnect the vacuum hose from the brake booster.



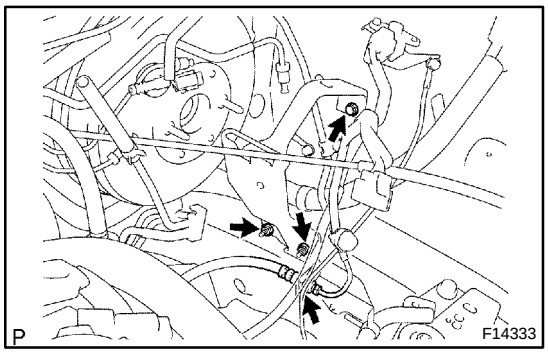
(e) Remove the 4 nuts and clevis.
(f) Pull out the brake booster and gasket.

11. INSTALL BRAKE BOOSTER ASSY

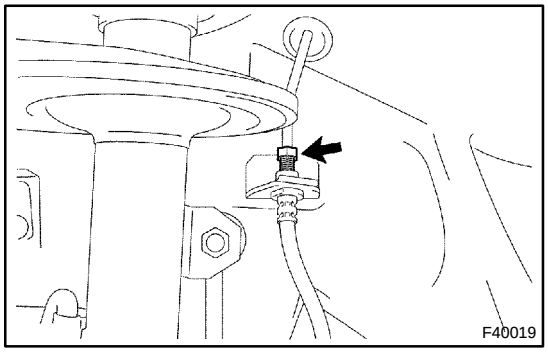
(a) Install the clevis to the booster push rod.



(b) Install a new gasket and brake booster with the 4 nuts.
Torque: 12.7 N·m (130 kgf·cm, 9 ft·lbf)
(c) Connect the vacuum hose to the brake booster.



(d) Gasoline engine type:
Install the charcoal canister bracket with the bolt and 2 nuts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
(e) M/T transaxle:
Using SST and spanner, connect the clutch tube.
SST 09023-00100



(f) Using SST and spanner, connect the brake tube to the flexible hose.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

12. INSTALL FRONT WHEEL LH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

13. CONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

(a) Install the clevis pin and wave washer into the clevis and brake pedal, and install the clip to the clevis pin.

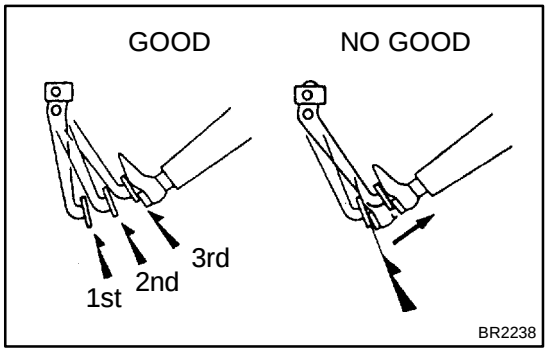
14. INSTALL HEATER ASSY (W/ COLD AREA)

15. INSTALL FUEL FILTER ASSY (DIESEL ENGINE TYPE)

16. **INSTALL BRAKE MASTER CYLINDER SUB-ASSY (W/ ABS)**
(See page 32-15)
SST 09023-00100

HINT:
TMC made:
Before installation, adjust length of the brake booster push rod (See page 32-15).

17. **INSTALL BRAKE MASTER CYLINDER SUB-ASSY (W/ VSC)**
(See page 32-15)
SST 09023-38400
18. **INSTALL CHARCOAL CANISTER ASSY (GASOLINE ENGINE TYPE)**
19. **INSTALL AIR CLEANER ASSY**
20. **FILL RESERVOIR WITH BRAKE FLUID**
21. **BLEED MASTER CYLINDER (W/ ABS)** **(See page 32-5)**
SST 09023-00100
22. **BLEED MASTER CYLINDER (W/ VSC)** **(See page 32-5)**
SST 09023-38400
23. **BLEED BRAKE LINE** **(See page 32-6)**
24. **BLEED CLUTCH PIPE LINE (M/T TRANSAXLE)** **(See page 42-15)**
25. **CHECK AND ADJUST BRAKE PEDAL HEIGHT** **(See page 32-7)**
26. **CHECK PEDAL FREE PLAY** **(See page 32-8)**
27. **CHECK PEDAL RESERVE DISTANCE** **(See page 32-8)**
28. **CHECK FUEL LEAK**
29. **CHECK FLUID LEVEL IN RESERVOIR**
30. **CHECK BRAKE FLUID LEAKAGE**



BRAKE BOOSTER ASSY (RHD)

320GN-01

ON-VEHICLE INSPECTION

1. INSPECT BRAKE BOOSTER

(a) Airtightness check.

(1) Start the engine and stop it after 1 or 2 minutes. Depress the brake pedal several times slowly.

HINT:

If the pedal goes down farthest at the 1st time, but gradually rises after the 2nd or 3rd time, the booster is airtight.

(2) Depress the brake pedal while the engine is running, and stop the engine with the pedal depressed.

HINT:

If there is no change in the pedal reserve distance after holding the pedal for 30 seconds, the booster is airtight.

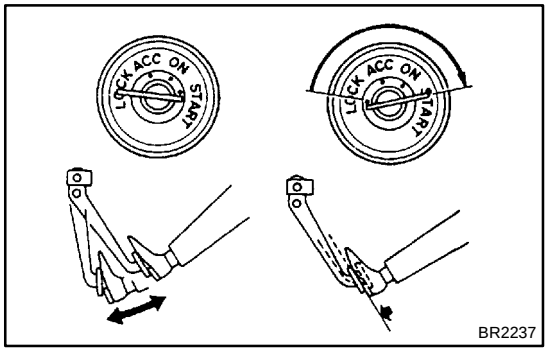
(b) Operating check.

(1) Depress the brake pedal several times with the ignition switch OFF and check that there is no change in the pedal reserve distance.

(2) Depress the brake pedal and start the engine.

HINT:

If the pedal goes down slightly, operation is normal.



2. INSPECT VACUUM CHECK VALVE

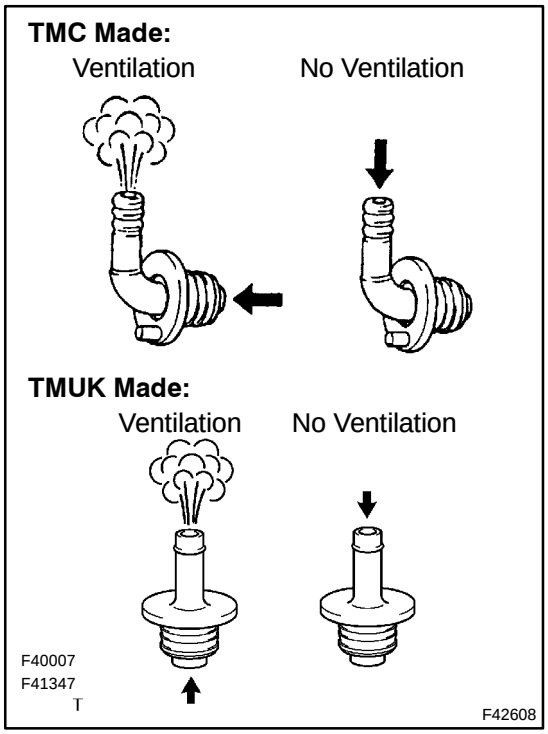
(a) Check vacuum check valve.

(1) Slide the clip and disconnect the vacuum hose.

(2) Remove the vacuum check valve.

(3) Check that there is ventilation from the booster to engine, and no ventilation from the engine to the booster.

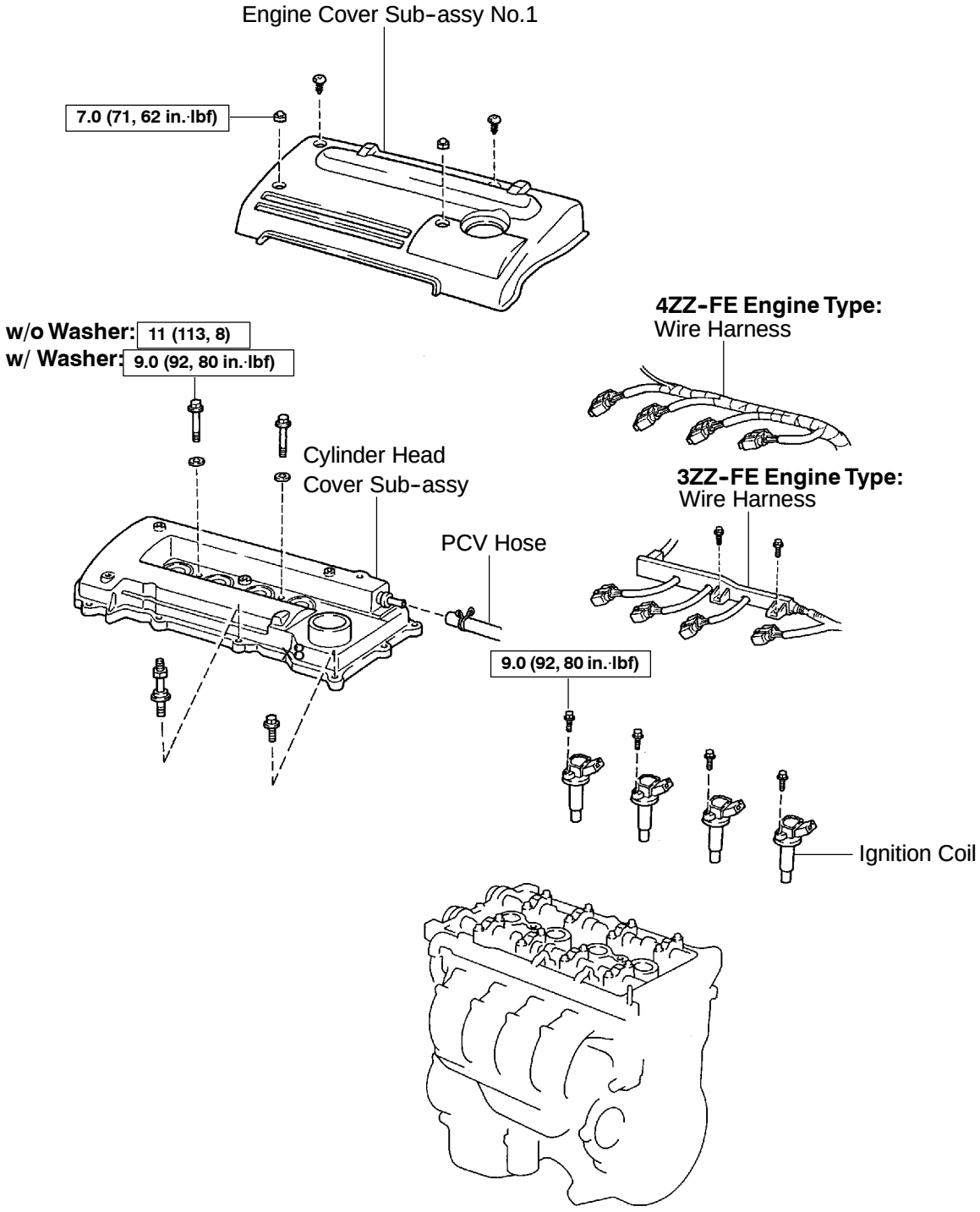
(4) If any fault is found, replace the vacuum check valve.



320GO-01

COMPONENTS

3ZZ-FE/4ZZ-FE Engine Type:

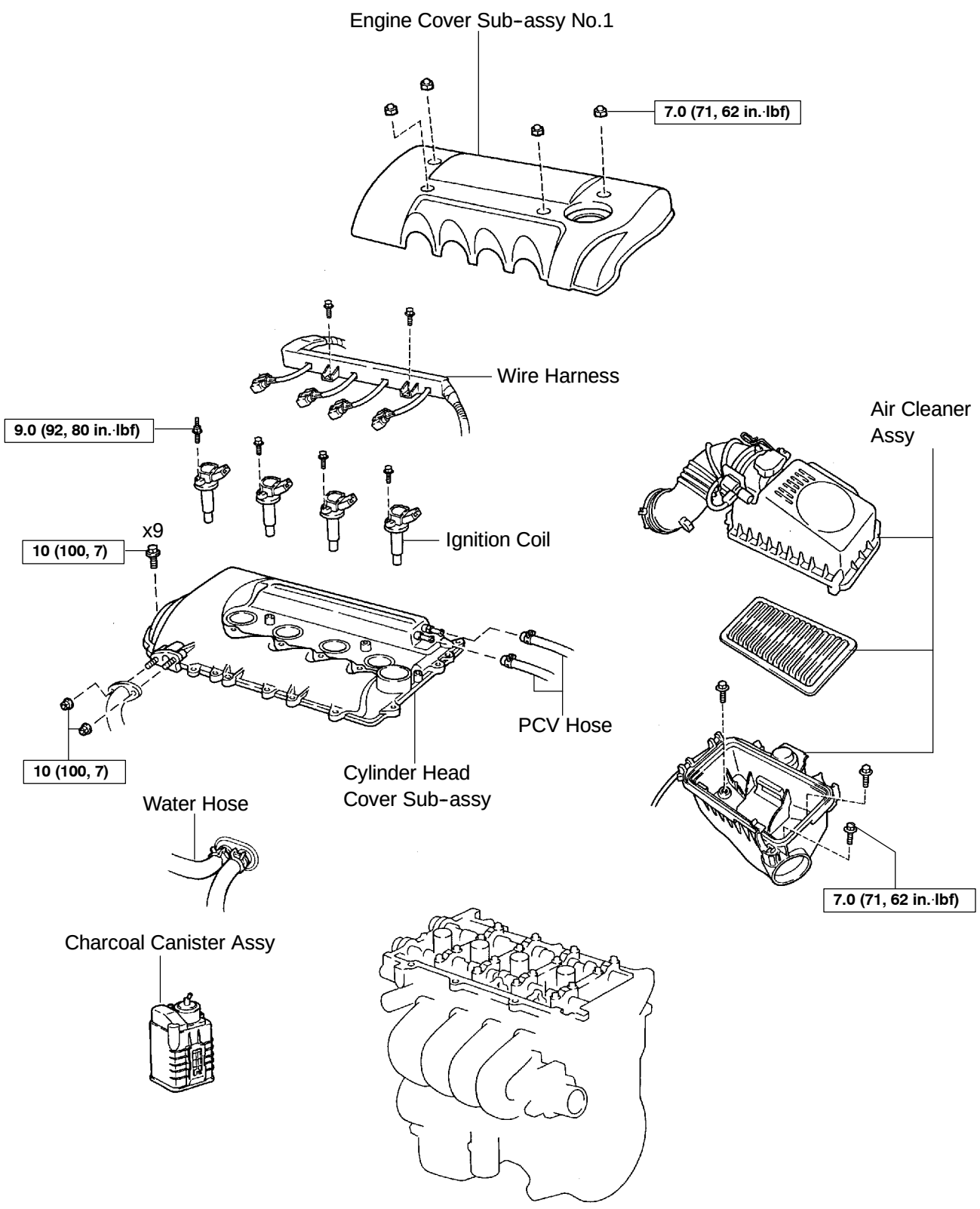


N·m (kgf·cm, ft·lbf) : Specified torque

N

F42297

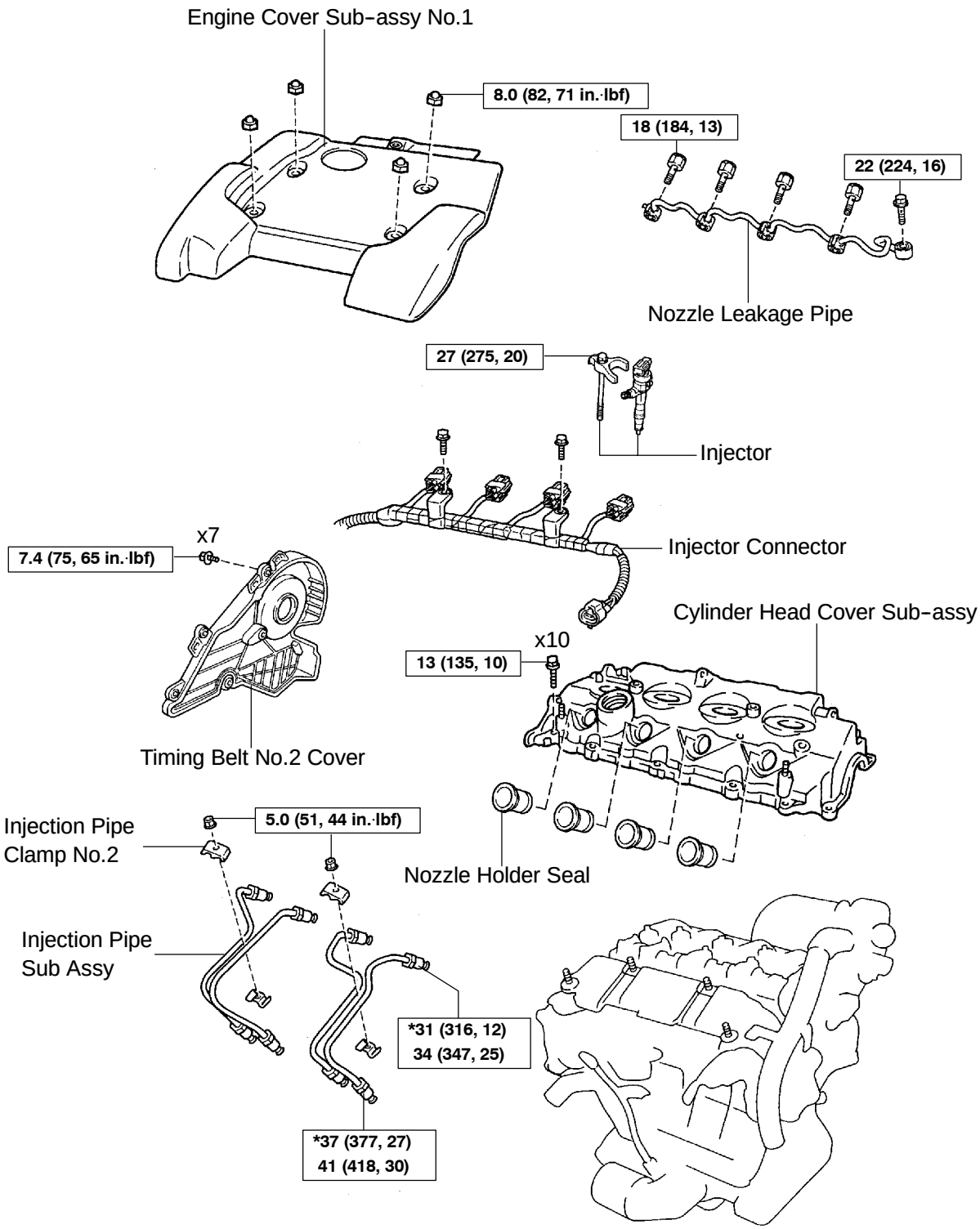
2ZZ-GE Engine Type:



N N·m (kgf·cm, ft·lbf) : Specified torque

F42570

1CD-FTV Engine Type:

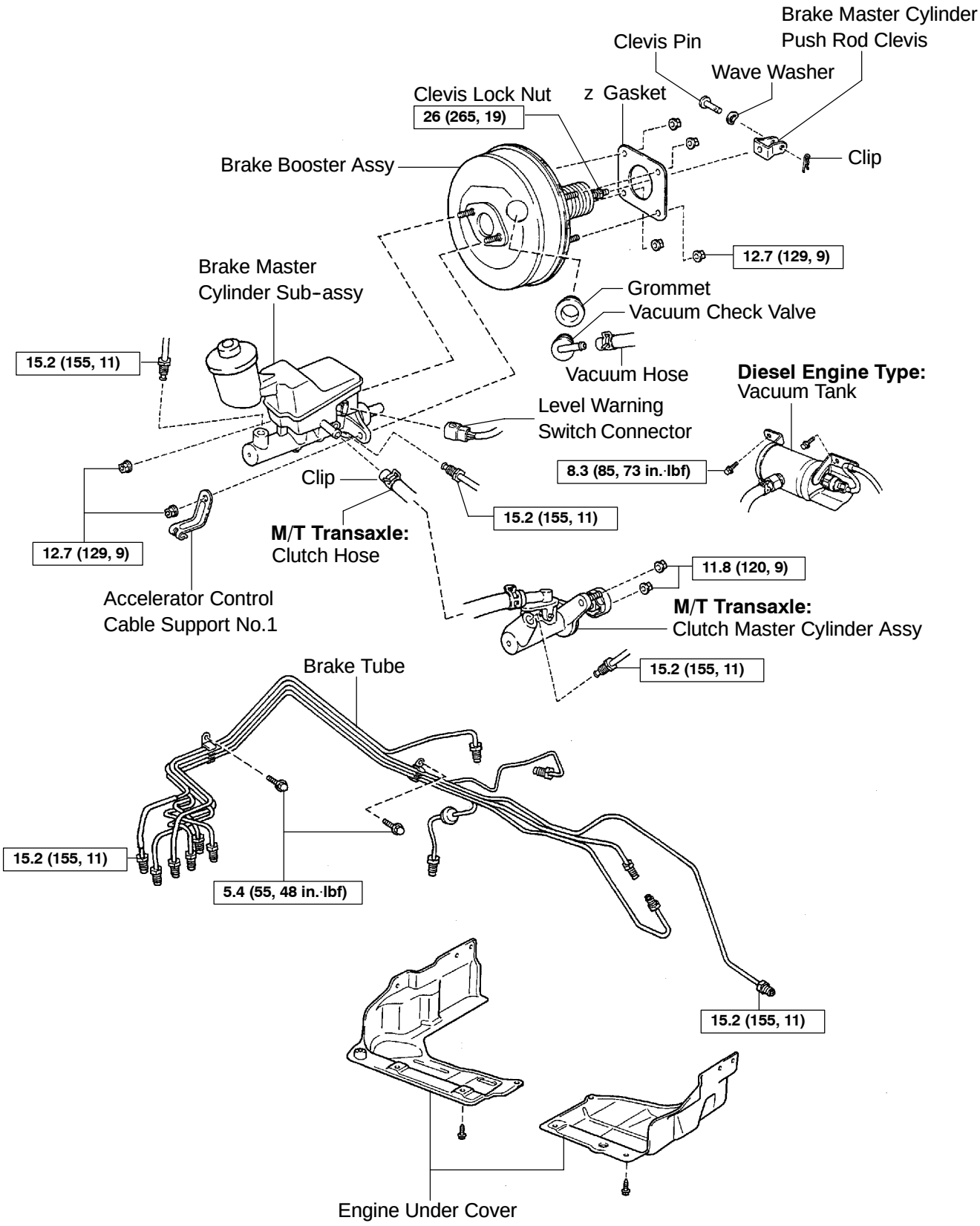


N·m (kgf·cm, ft·lbf) : Specified torque

N F42298 * For use with SST

F42611

TMC Made:

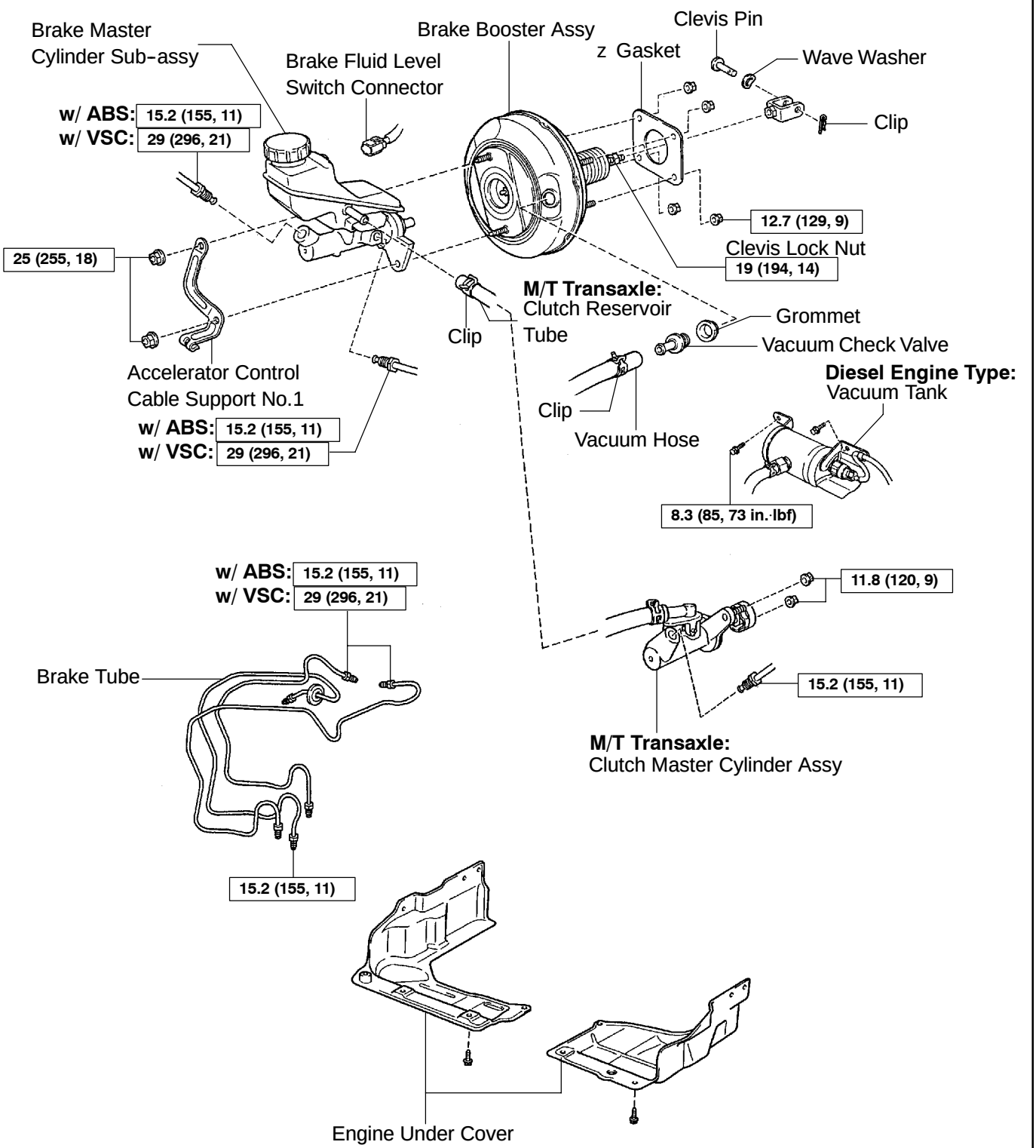


N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part

N

F42299

TMUK Made:



N·m (kgf·cm, ft·lbf) : Specified torque
N z Non-reusable part

F42300

REPLACEMENT

1. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surface.

2. REMOVE BRAKE MASTER CYLINDER SUB-ASSY(W/ ABS)

(See page 32-15)

SST 09023-00100

3. REMOVE BRAKE MASTER CYLINDER SUB-ASSY(W/ VSC)

(See page 32-15)

SST 09023-38400

4. REMOVE CLUTCH MASTER CYLINDER ASSY(M/T TRANSAXLE)

(See page 42-12)

SST 09023-00100

5. REMOVE AIR CLEANER ASSY(2ZZ-GE ENGINE TYPE)

6. REMOVE CHARCOAL CANISTER ASSY(2ZZ-GE ENGINE TYPE)

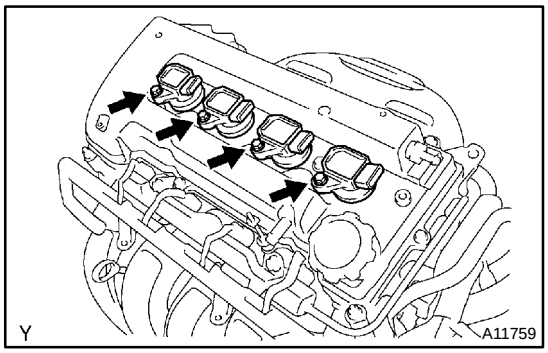
7. DISCONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

(a) Loosen the push rod clevis lock nut.
(b) Remove the clip, wave washer and clevis pin.

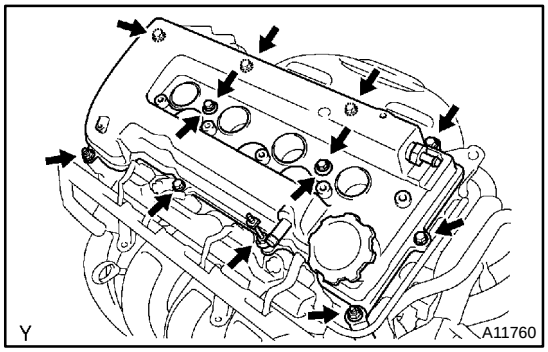
8. REMOVE ENGINE COVER SUB-ASSY NO.1

9. REMOVE IGNITION COIL ASSY(GASOLINE ENGINE TYPE)

(a) 3ZZ-FE/4ZZ-FE Engine type:
Disconnect the PCV hose from the cylinder head cover.
(b) 2ZZ-GE Engine type:
Disconnect the 2 PCV hoses from the cylinder head cover.
(c) 4ZZ-FE Engine type:
Disconnect the 4 ignition coil connectors and wire harness clamp, and release the wire harness.
(d) 2ZZ-GE/3ZZ-FE Engine type:
Disconnect the 4 ignition coil connectors and wire harness clamp, and remove the 2 bolts and release the wire harness.

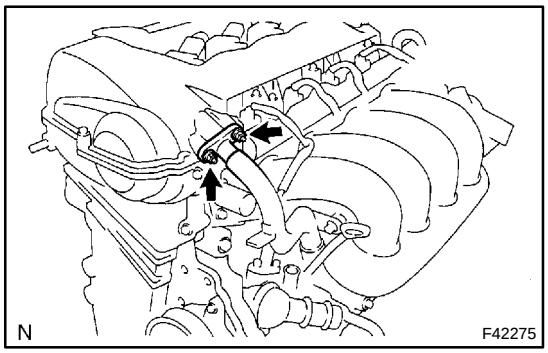


(e) Remove the 4 bolts and ignition coils.

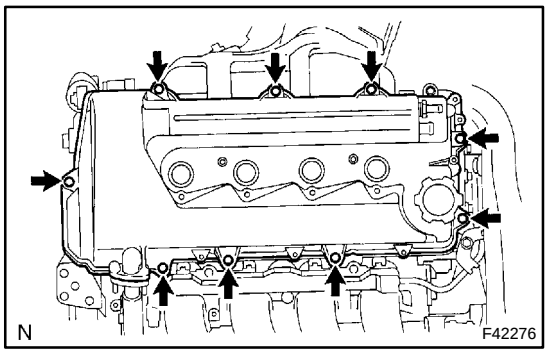


10. REMOVE CYLINDER HEAD COVER SUB-ASSY(GASOLINE ENGINE TYPE)

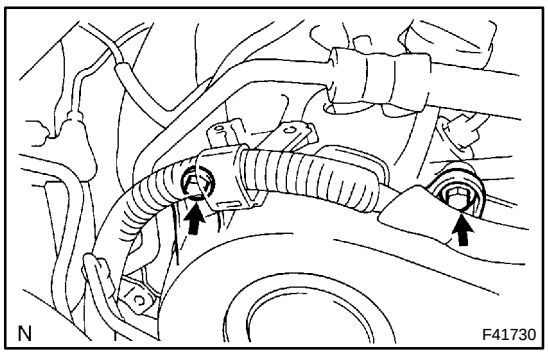
(a) 3ZZ-FE/4ZZ-FE Engine type:
Disconnect the hose, then remove the 9 bolts, 2 seal washers, 2 nuts and cylinder head cover with gasket.



(b) 2ZZ-GE Engine type:
Remove the 2 nuts, and disconnect the No.1 ventilation hose from the cylinder head cover.



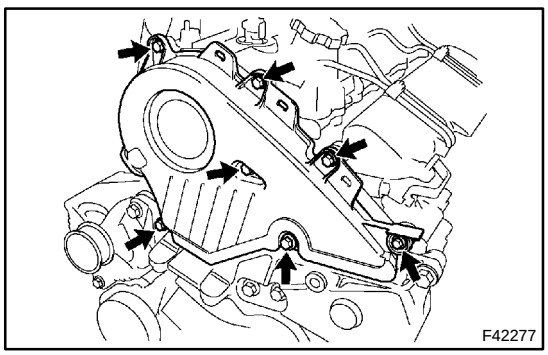
(c) 2ZZ-GE Engine type:
Remove the 9 bolts and cylinder head cover with gasket.



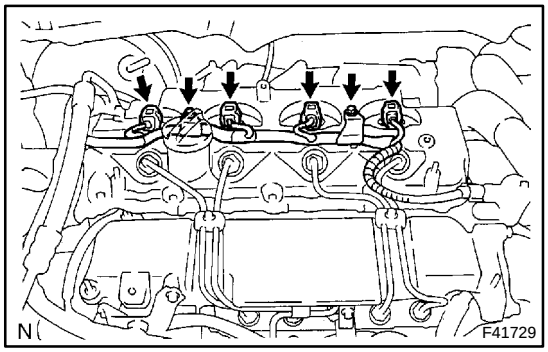
11. REMOVE TIMING BELT NO.2 COVER(DIESEL ENGINE TYPE)

(a) Remove the bolt and disconnect the PS tube from the cylinder head cover.

(b) Remove the bolt and disconnect the wire harness from the cylinder head cover.

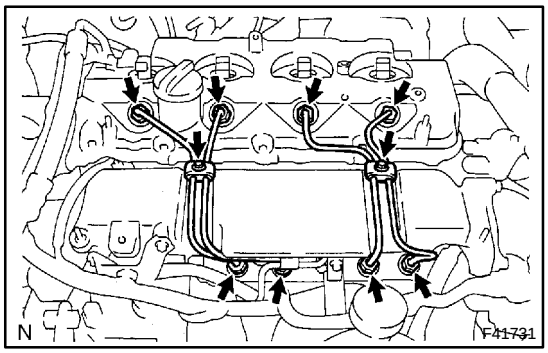


(c) Remove the 7 bolts, 7 seal washers and timing belt cover.

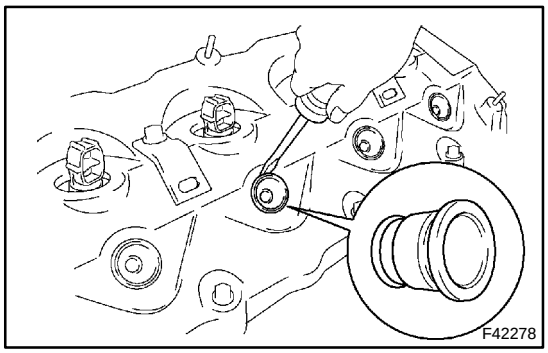


12. REMOVE CYLINDER HEAD COVER SUB-ASSY(DIESEL ENGINE TYPE)

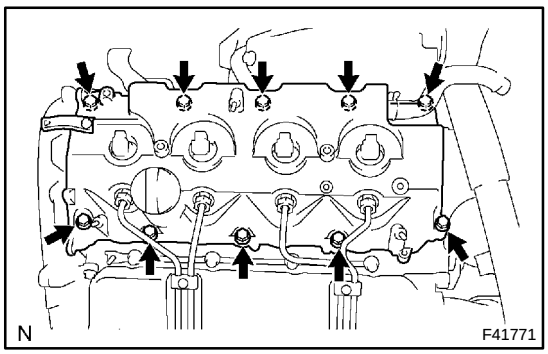
(a) Remove the 2 bolts and disconnect the injector connector.



(b) Remove the 4 injection pipes.



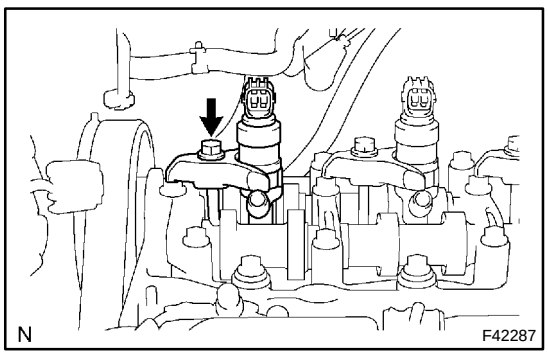
(c) Using a screwdriver, pry out the 4 nozzle holder seals.



(d) Remove the 10 bolts and cylinder head cover sub-assy.

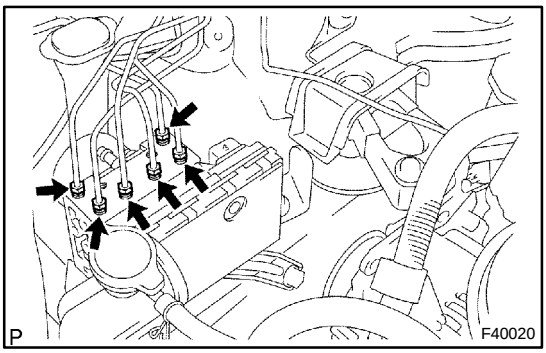
13. REMOVE INJECTOR ASSY(DIESEL ENGINE TYPE)

(a) Remove the 5 bolts and 5 gaskets, remove the nozzle leakage pipe.



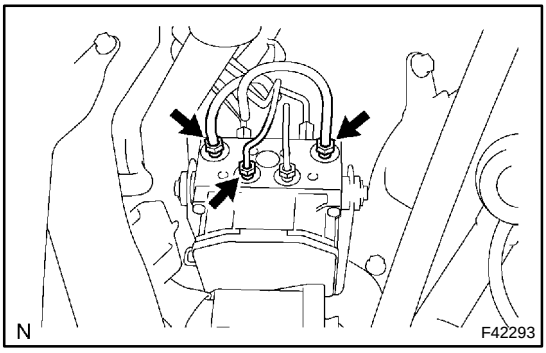
(b) Remove the bolt, washer and No.1 injector.

14. REMOVE FRONT WHEEL RH

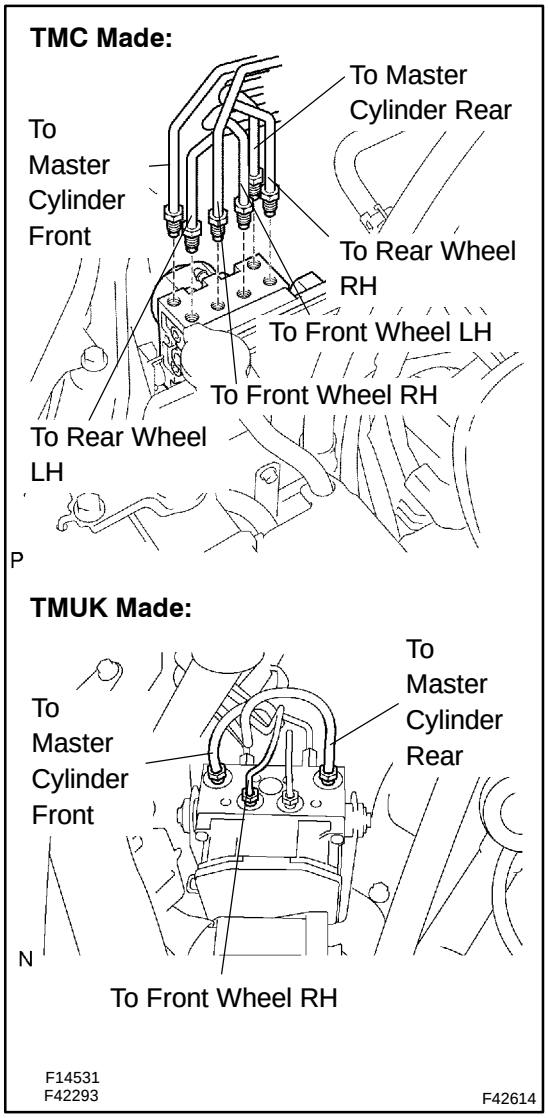


15. REMOVE BRAKE TUBE

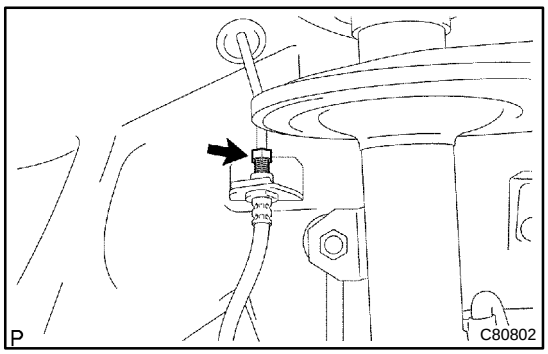
(a) TMC made:
Using SST, disconnect the 6 brake tubes from the brake actuator.
SST 09023-00100



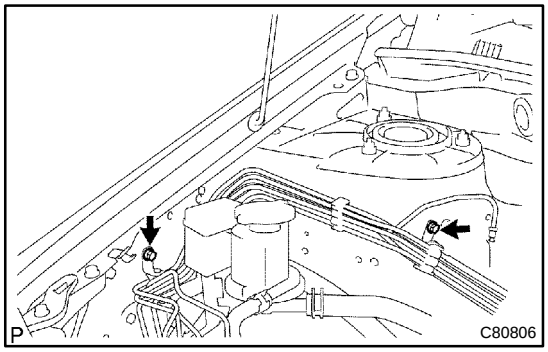
(b) TMUK made:
Using SST, disconnect the 3 brake tubes from the brake actuator.
SST 09023-00100, 09023-38400



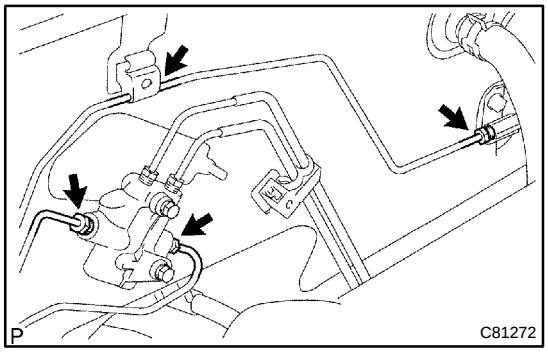
(c) Use tags or make a memo to identify the place to reconnect.



(d) Using SST and spanner, disconnect the brake tube from the flexible hose of front brake RH.
SST 09023–00100



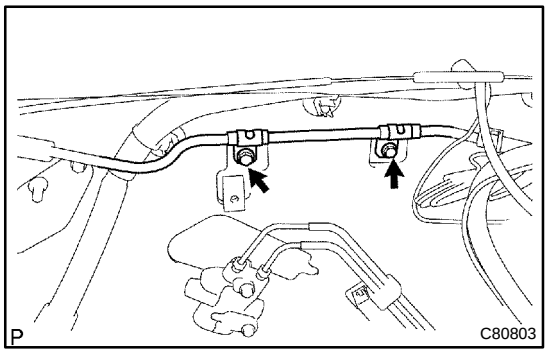
(e) TMC made:
Remove the 2 bolts and disconnect the 2 brake tube clamps.



(f) TMC made:
Using SST, disconnect the 3 brake tubes from the ways.
SST 09023-00100

(g) TMC made:
Disconnect the brake tube from the clamp and remove the brake tubes.

(h) TMUK made:
Disconnect the 3 brake tubes from the clamp and remove the brake tubes.



16. REMOVE BRAKE BOOSTER ASSY

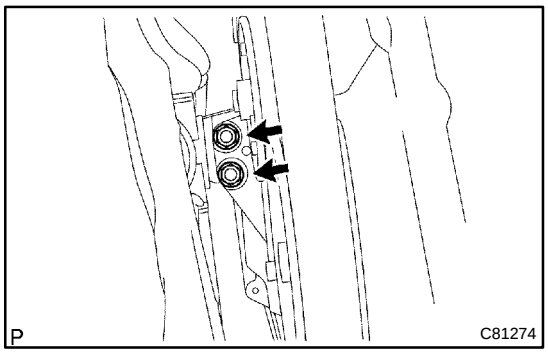
(a) Gasoline engine type:
Remove the 2 bolts and separate the vacuum pipe from the body.

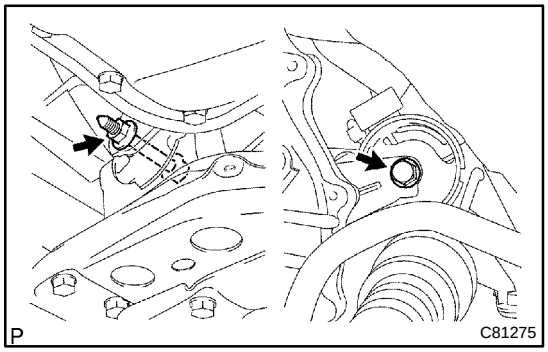
(b) Diesel engine type:
Remove the 2 bolts and remove the vacuum tank from the body.

(c) Disconnect the vacuum hose from the booster.

(d) Remove the engine under cover.

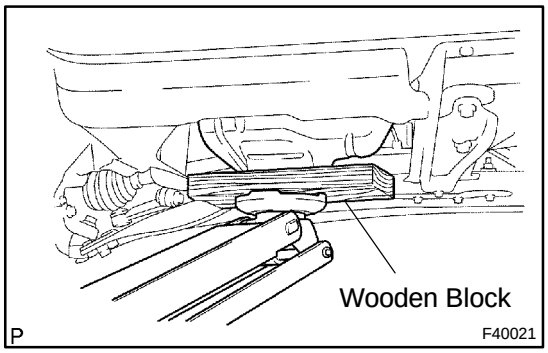
(e) Remove the 2 nuts from the engine mounting bracket RH.



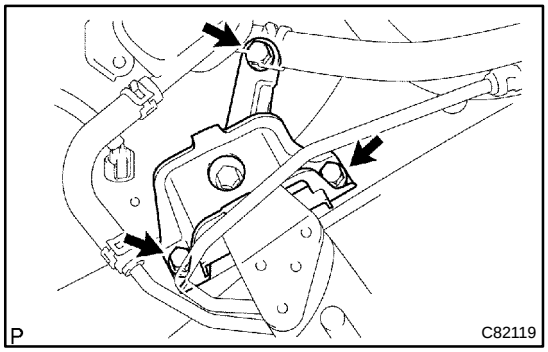


(f) Remove the bolt from the rear engine mounting bracket.

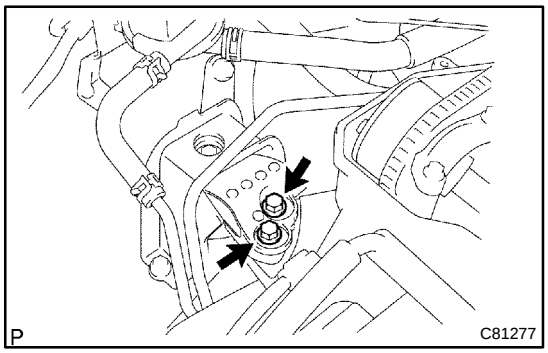
(g) Remove the bolt and nut from the front engine mounting bracket.



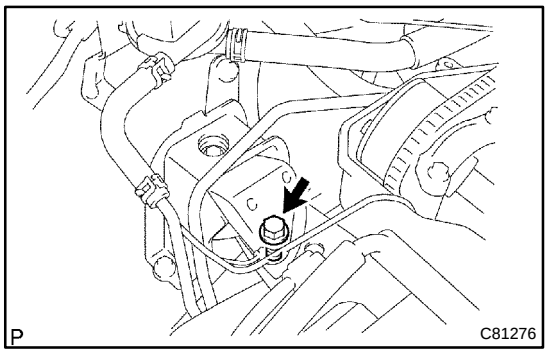
(h) Hold the engine with the jack, putting a wooden block between them.



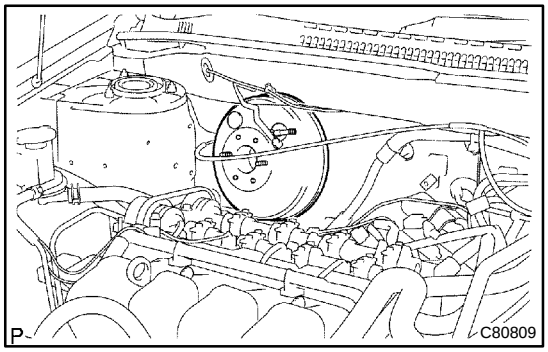
(i) Remove the 3 bolts and separate the engine mounting bracket RH from the body.



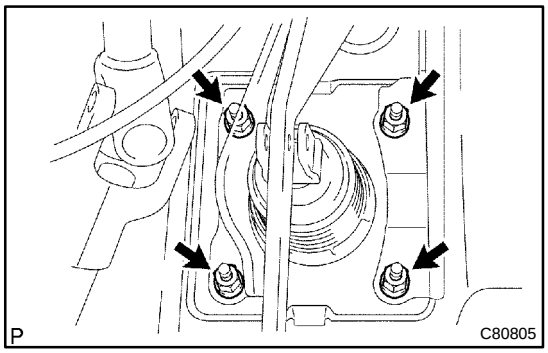
(j) 2ZZ-GE Engine type:
Remove the 2 bolts from the engine mounting bracket RH.



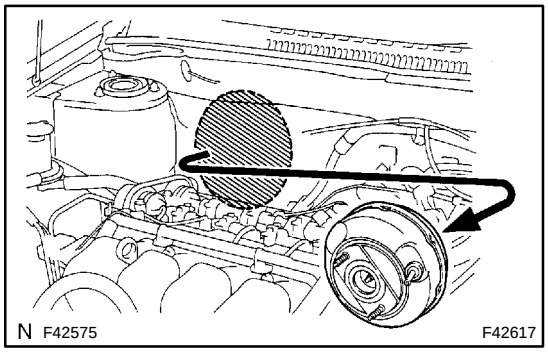
(k) Except 2ZZ-GE engine type:
Remove the bolt from the engine mounting bracket RH.



(l) Gradually tilt the engine by lowering the jack to remove the brake booster.



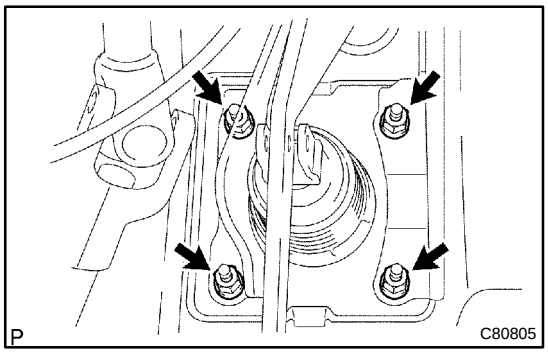
(m) Remove the 4 nuts and clevis.
(n) Pull out the brake booster and gasket.



(o) 2ZZ-GE Engine type:
Disconnect the 2 water hoses, then move the brake booster through the engine and body.

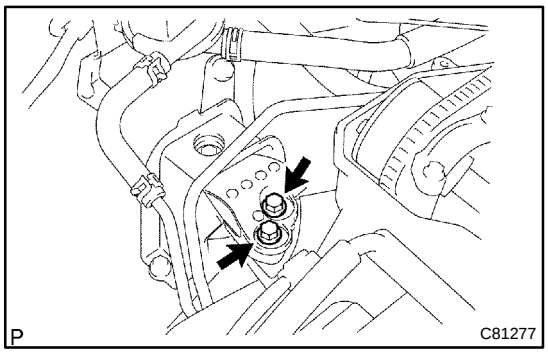
17. INSTALL BRAKE BOOSTER ASSY

(a) Install the clevis to the booster push rod.

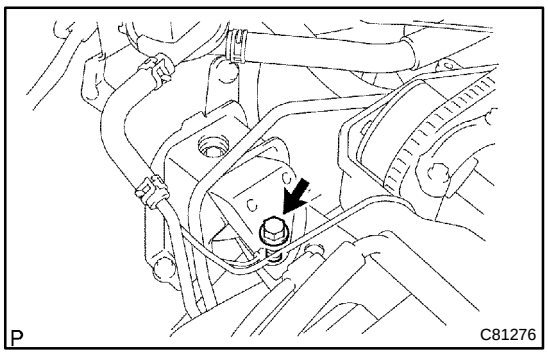


(b) Install a new gasket and brake booster with the 4 nuts.
Torque: 12.7 N·m (130 kgf·cm, 9 ft·lbf)

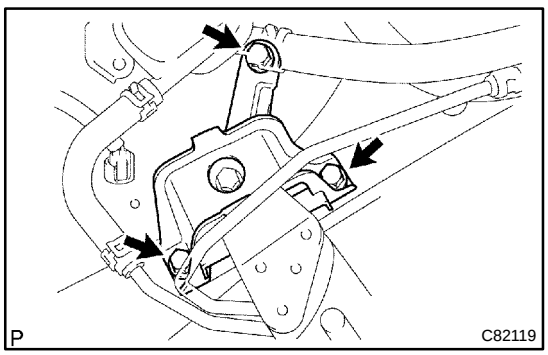
(c) Connect the vacuum hose to the brake booster.



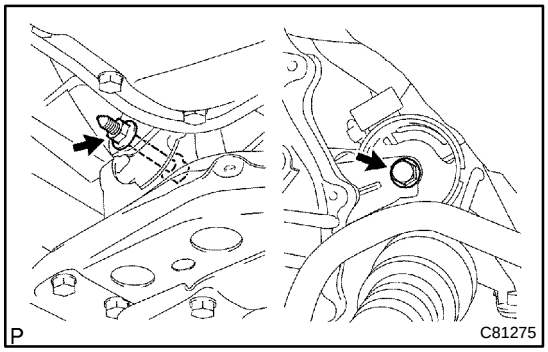
(d) 2ZZ-GE Engine type:
Gradually jack up the engine, connect the engine mounting bracket RH with the 2 bolts.
Torque: 52 N·m (530 kgf·cm, 39 ft·lbf)



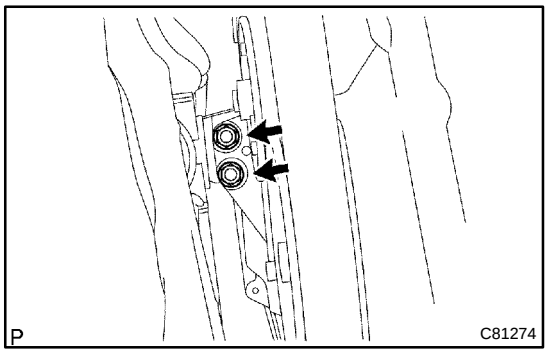
(e) Except 2ZZ-GE Engine type:
Gradually jack up the engine, connect the engine mounting bracket RH with the bolt.
Torque: 52 N·m (530 kgf·cm, 39 ft·lbf)



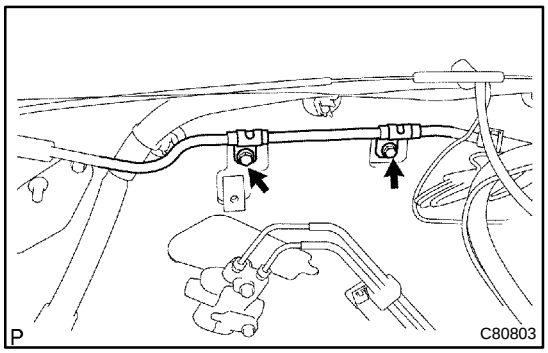
(f) Install the engine mounting bracket RH to the body with the 3 bolts.
Torque: 52 N·m (530 kgf·cm, 39 ft·lbf)



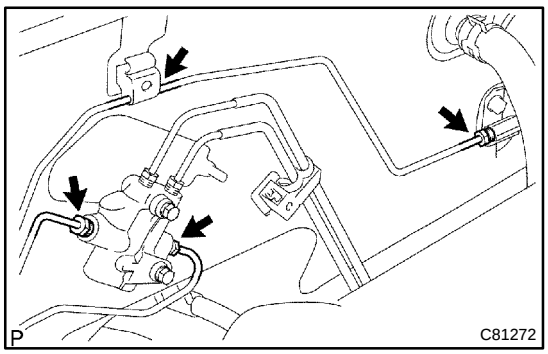
(g) Install the bolt to the rear engine mounting bracket.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)
(h) Install the bolt and nut to the front engine mounting bracket.
Torque: 52 N·m (530 kgf·cm, 39 ft·lbf)



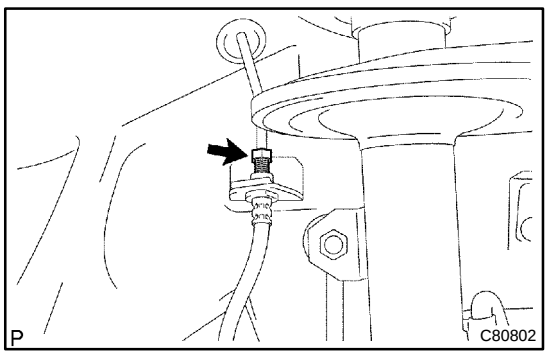
(i) Install the 2 nuts to the engine mounting bracket RH.
Torque: 52 N·m (530 kgf·cm, 39 ft·lbf)
(j) Install the engine under cover.
(k) Connect the vacuum hose to the booster.



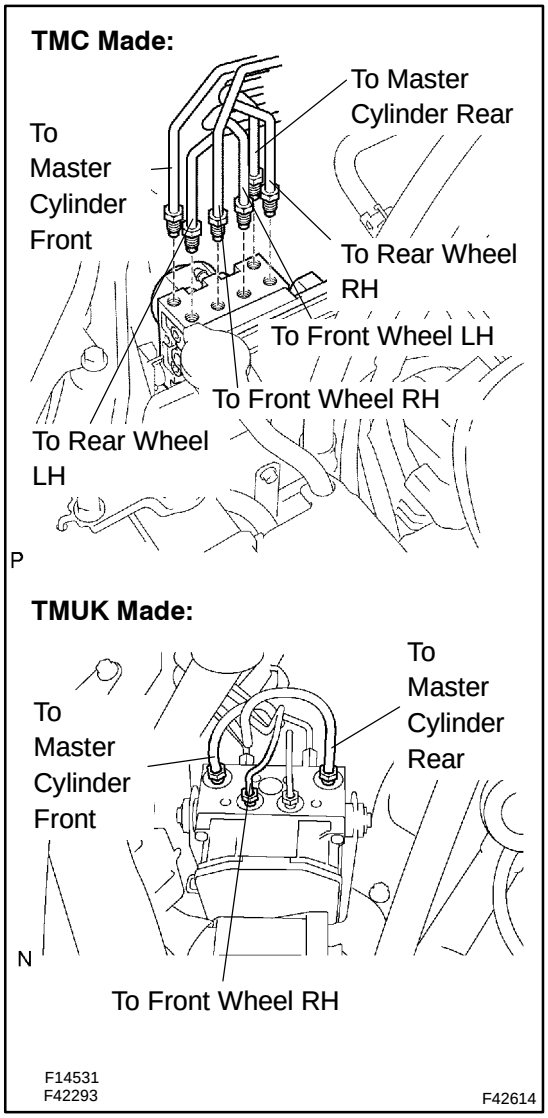
(l) Gasoline engine type:
Install the vacuum pipe with 2 bolts to the body.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
(m) Diesel engine type:
Install the vacuum tank with 2 bolts.
Torque: 8.3 N·m (85 kgf·cm, 73 in.·lbf)



18. INSTALL BRAKE TUBE
(a) TMC made:
Using SST, connect the 3 brake tubes to the ways.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)
(b) TMC made:
Connect the brake tube to the clamp.

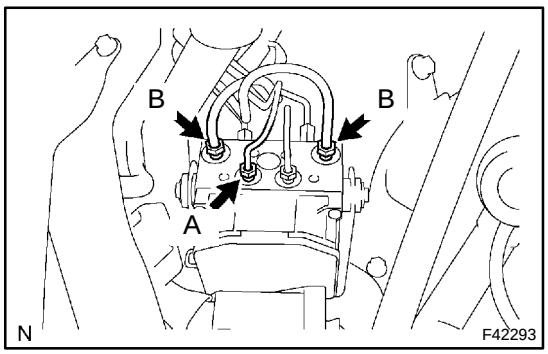


(c) Using SST and spanner, connect the brake tube to the flexible hose of front brake RH.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

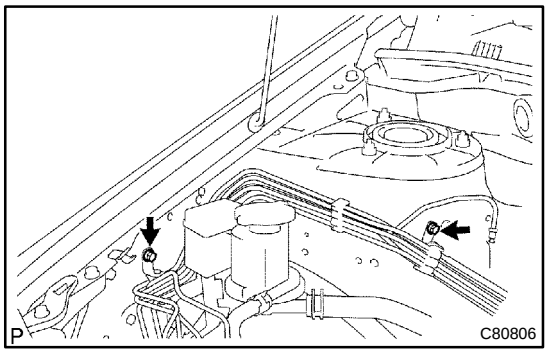


(d) TMC made:
Using SST, connect the 6 brake tubes to the brake actuator, as shown in the illustration.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

(e) TMUK made:
w/ ABS:
Using SST, connect the 3 brake tubes to the brake actuator as shown in the illustration.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)



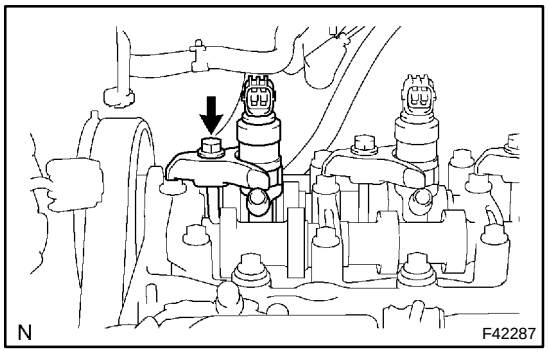
(f) TMUK made:
w/ VSC:
Using SST, connect the 3 brake tubes to the brake actuator as shown in the illustration.
SST 09023-00100, 09023-38400
Torque:
A: 15.2 N·m (155 kgf·cm, 11 ft·lbf)
B: 29 N·m (296 kgf·cm, 21 ft·lbf)



(g) TMC made:
Install the brake tube clamps with the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(h) TMUK made:
Connect the 3 brake lines to the clamp and install the brake tube.

19. **INSTALL FRONT WHEEL RH**
20. **INSTALL CYLINDER HEAD COVER SUB-ASSY(GASOLINE ENGINE TYPE)**
21. **INSTALL IGNITION COIL ASSY(GASOLINE ENGINE TYPE)**



22. **INSTALL INJECTOR ASSY(DIESEL ENGINE TYPE)**

(a) Install the injector with bolt and washer to the engine.
(b) Install the nozzle leakage pipe with 5 bolts and 5 new gaskets.
Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)

23. **INSTALL CYLINDER HEAD COVER SUB-ASSY(DIESEL ENGINE TYPE)**
24. **INSTALL TIMING BELT NO.2 COVER(DIESEL ENGINE TYPE)**
25. **INSTALL ENGINE COVER SUB-ASSY NO.1**
26. **INSTALL BRAKE MASTER CYLINDER PUSH ROD CLEVIS**
27. **INSTALL CHARCOAL CANISTER ASSY(2ZZ-GE ENGINE TYPE)**
28. **INSTALL AIR CLEANER ASSY(2ZZ-GE ENGINE TYPE)**
29. **INSTALL CLUTCH MASTER CYLINDER ASSY(M/T TRANSAXLE)**
(See page 42-12)
SST 09023-00100
30. **INSTALL BRAKE MASTER CYLINDER SUB-ASSY(W/ ABS)**
(See page 32-15)
SST 09023-00100

HINT:
TMC made:
Before installation, adjust length of the brake booster push rod (See page 32-15).

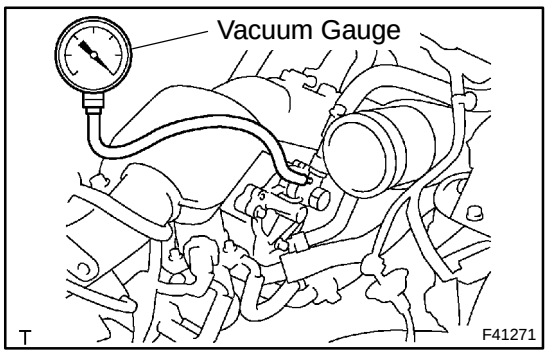
31. **INSTALL BRAKE MASTER CYLINDER SUB-ASSY(W/ VSC)**
(See page 32-15)
SST 09023-38400
32. **FILL RESERVOIR WITH BRAKE FLUID**
33. **BLEED MASTER CYLINDER(W/ ABS) (See page 32-5)**
SST 09023-00100
34. **BLEED MASTER CYLINDER(W/ VSC) (See page 32-5)**
SST 09023-38400
35. **BLEED BRAKE LINE (See page 32-6)**
36. **CHECK AND ADJUST BRAKE PEDAL HEIGHT (See page 32-7)**
37. **CHECK PEDAL FREE PLAY (See page 32-8)**
38. **CHECK PEDAL RESERVE DISTANCE (See page 32-8)**
39. **BLEED CLUTCH PIPE LINE(M/T TRANSAXLE) (See page 42-12)**

40. INSPECT AND ADJUST CLUTCH PEDAL SUB-ASSY(M/T TRANSAXLE)
(See page 42-2)
41. CHECK FLUID LEVEL IN RESERVOIR
42. CHECK BRAKE FLUID LEAKAGE
43. CHECK CLUTCH FLUID LEAKAGE(M/T TRANSAXLE)

VACUUM PUMP ASSY (1CD-FTV)

ON-VEHICLE INSPECTION

32091-03



1. OPERATIONING CHECK

(a) Disconnect the vacuum hose.

(b) Connect the vacuum gauge to the vacuum pump.

(c) Start the engine.

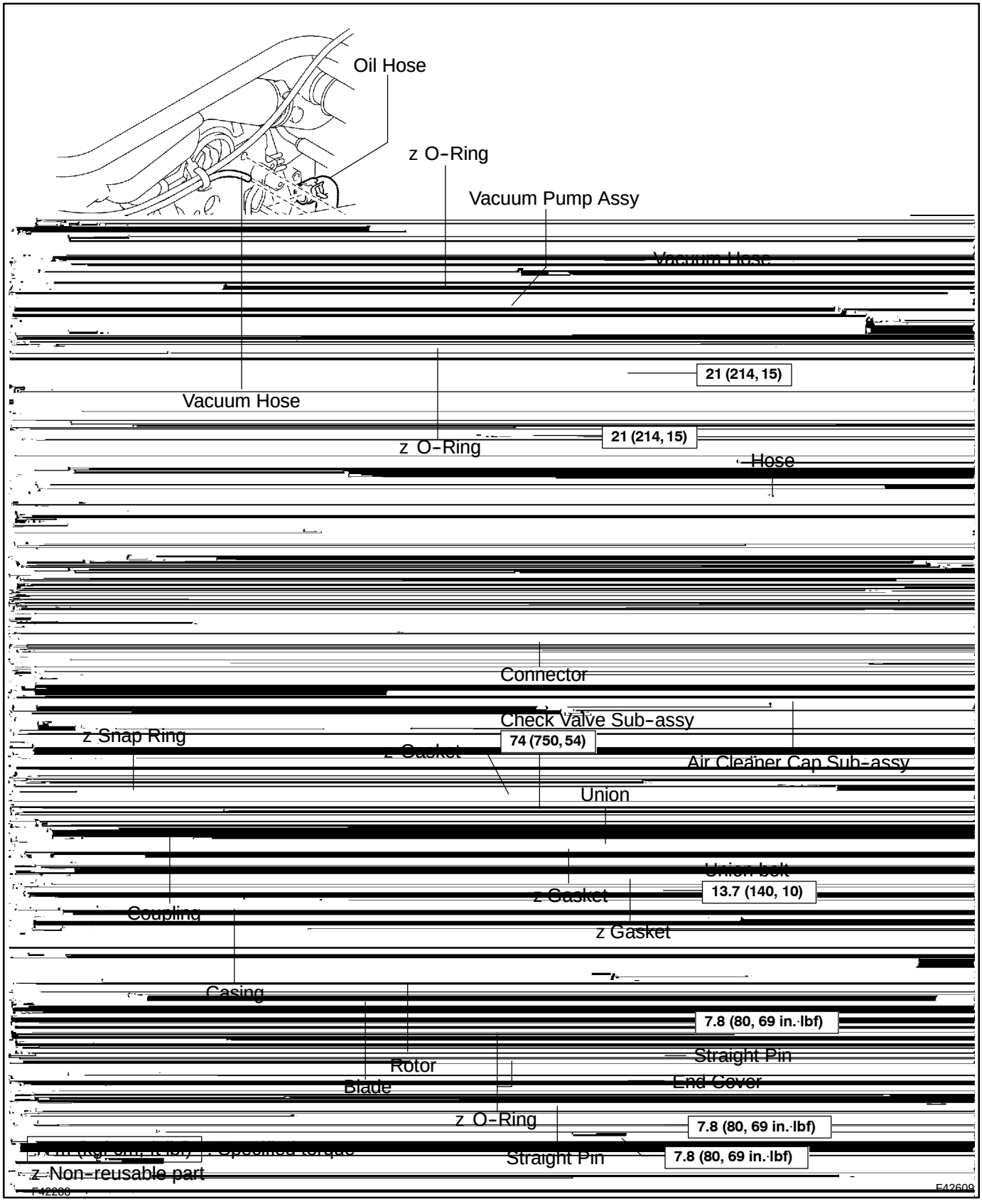
(d) Measure the vacuum with the engine idling.

Vacuum will be at standard (sea-level) atmospheric pressure (1,013 mbar) after engine running and when 2 minutes or more elapses:

620 mmHg (24.4 in.Hg) or more

32092-03

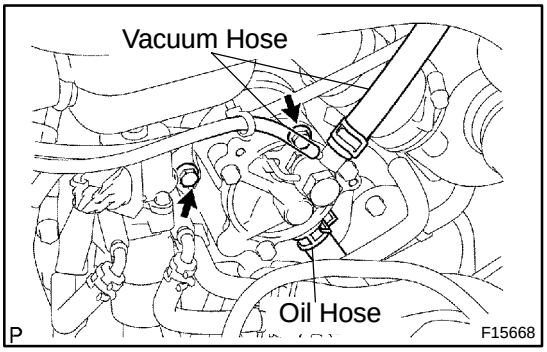
COMPONENTS



32093-03

OVERHAUL

1. REMOVE AIR CLEANER CAP SUB-ASSY



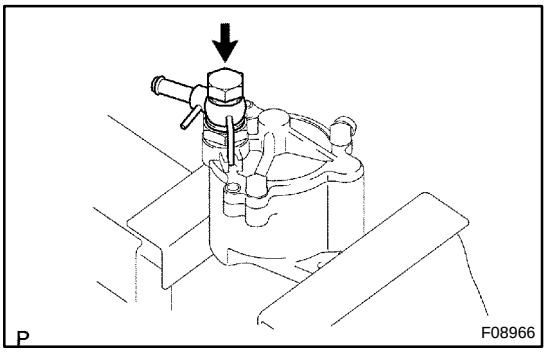
2. REMOVE VACUUM PUMP ASSY

(a) Disconnect 2 vacuum hoses and oil hose from the vacuum pump.
(b) Remove the 2 bolts and vacuum pump.
(c) Remove the 2 O-rings from the vacuum pump.

3. FIX VACUUM PUMP ASSY

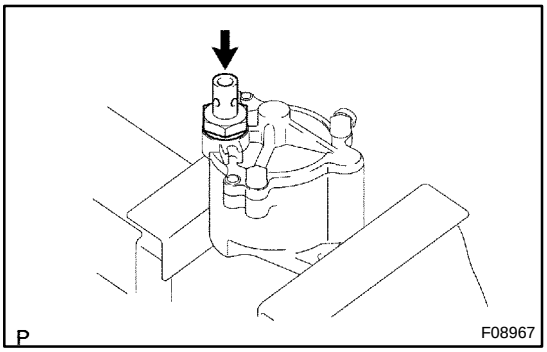
(a) Using soft jaws on the vice, place the vacuum pump in the vice.

NOTICE:
Do not tighten the vice too tightly.



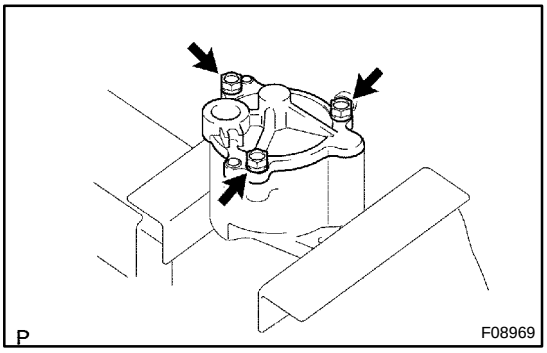
4. REMOVE UNION

(a) Remove the union bolt, union and 2 gaskets.



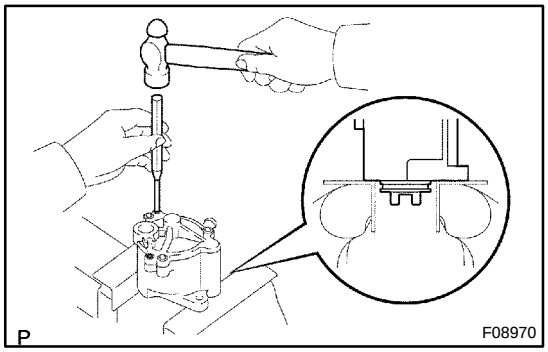
5. REMOVE CHECK VALVE SUB-ASSY

(a) Remove the check valve and gasket.



6. REMOVE VACUUM PUMP ROTOR SUB-ASSY

(a) Remove the 3 bolts.



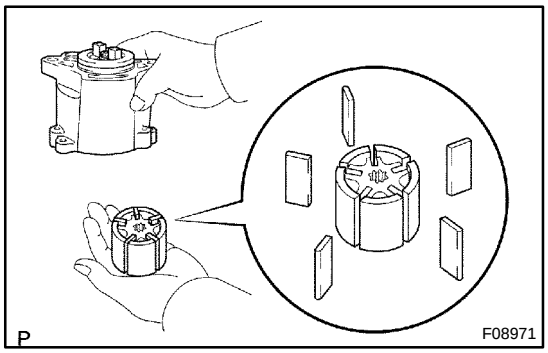
(b) Place the vacuum pump on vise, as shown in the illustration.

NOTICE:

Do not tighten the vise.

(c) Using a pin punch and hammer, drive out the 2 straight pins.

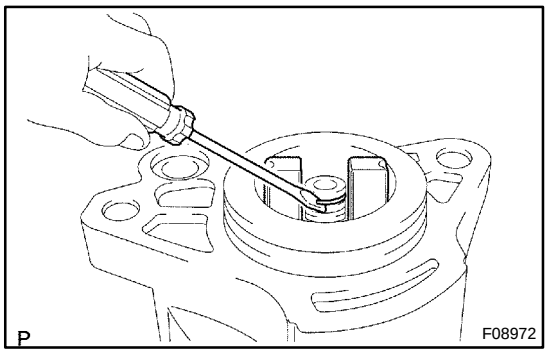
(d) Remove the end cover and 2 O-rings.



(e) Remove the rotor and 5 blades.

NOTICE:

Be careful not to drop the blades.



7. REMOVE VACUUM PUMP COUPLING

(a) Using a screwdriver, remove the snap ring.

(b) Remove the coupling.

8. INSPECT VACUUM PUMP BLADE A

(a) Check the blades for wear or damage.

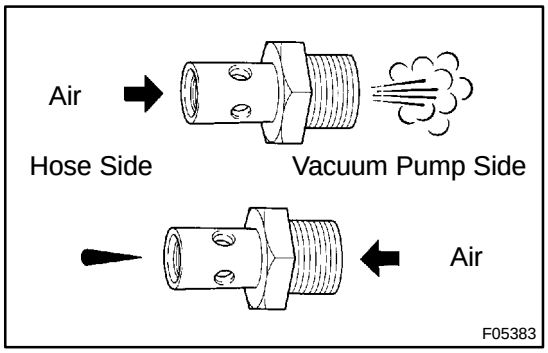
(b) Using a micrometer, measure the height, width and length of the blades.

Minimum height: 16.20 mm (0.6378 in.)

Minimum width: 5.95 mm (0.2343 in.)

Minimum length: 44.96 mm (1.7701 in.)

If necessary, replace the blade.

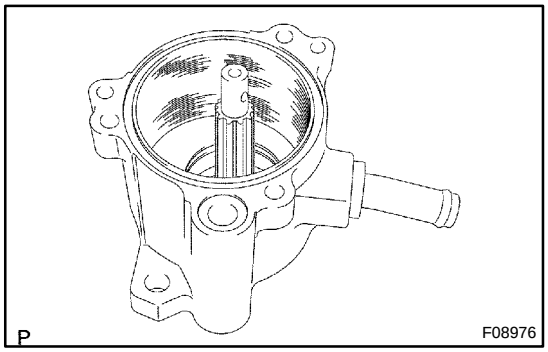


9. INSPECT CHECK VALVE SUB-ASSY

(a) Check that air flows from the hose side to the pump side.

(b) Check that air does not flow from the pump side to the hose side.

If necessary, replace the check valve.



10. INSPECT CASING

(a) Inspect the inside surface on the casing for scoring.

If necessary, replace the vacuum pump.

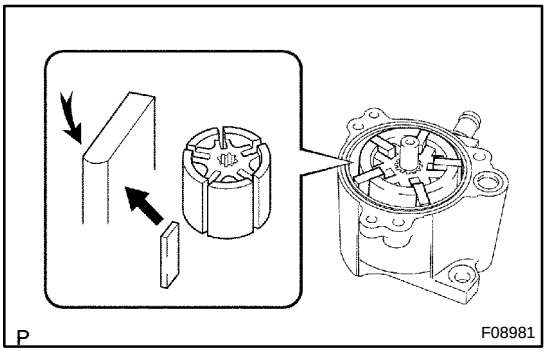
11. INSTALL VACUUM PUMP COUPLING

(a) Place the coupling to the rotor shaft.

(b) Install a new snap ring to the rotor shaft.

12. INSTALL VACUUM PUMP ROTOR SUB-ASSY

(a) Coat the rotor with engine oil, and install it to the rotor shaft.



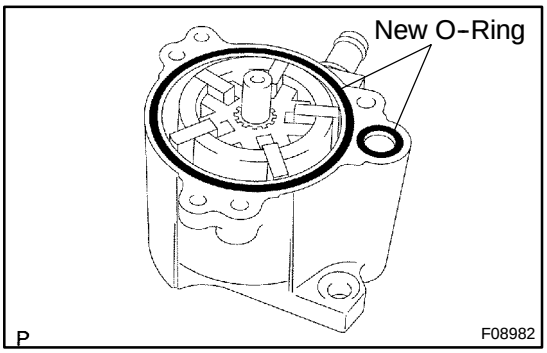
13. INSTALL VACUUM PUMP BLADE A

(a) Coat the 5 blades with engine oil.

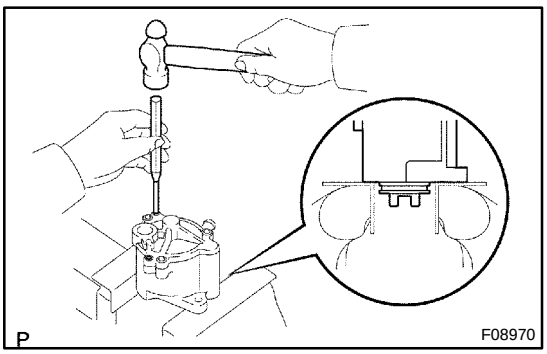
(b) Install the 5 blades with the round end facing outward.

HINT:

Be sure that the blades and rotor surfaces are even.



(c) Coat 2 new O-rings with engine oil, and place them to the casing.



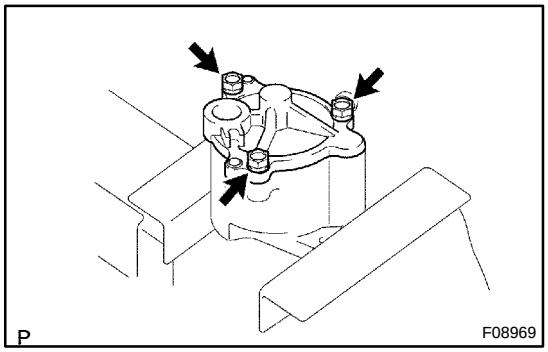
(d) Place the vacuum pump on the vise, as shown in the illustration.

NOTICE:

Do not tighten the vise.

(e) Place the end cover, and temporarily install the 3 bolts.

(f) Using a pin punch and hammer, drive in the 2 straight pins.



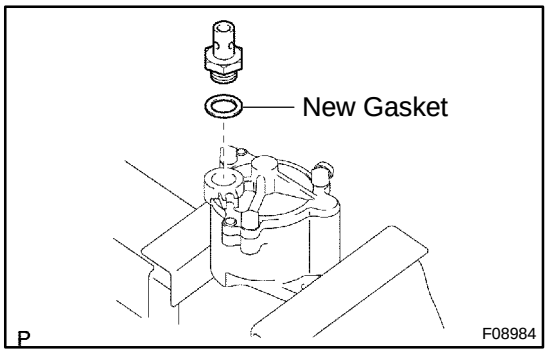
(g) Using soft jaws on the vise, place the vacuum pump in the vise.

NOTICE:

Do not tighten the vise excessively.

(h) Tighten the 3 bolts.

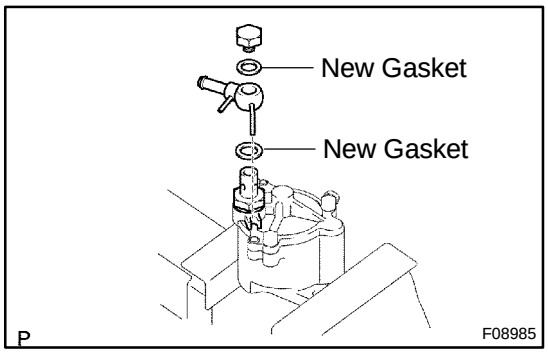
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)



14. INSTALL CHECK VALVE SUB-ASSY

(a) Install the check valve and a new gasket.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



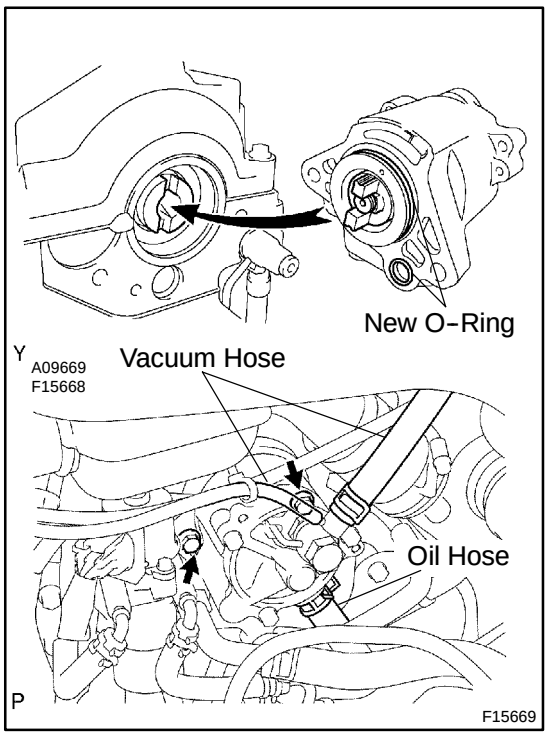
15. INSTALL UNION

(a) Install the vacuum hose union and 2 new gaskets with the union bolt.

Torque: 13.7 N·m (140 kgf·cm, 10 ft·lbf)

HINT:

Align and insert the pin of the union into the matching hole of the casing.



16. INSTALL VACUUM PUMP ASSY

(a) Coat 2 new O-rings with engine oil, and install them to the vacuum pump.

(b) Insert the vacuum pump, align the coupling with slit of the camshaft.

(c) Install the 2 bolts.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(d) Connect 2 vacuum hoses and oil hose.

17. INSTALL AIR CLEANER CAP SUB-ASSY

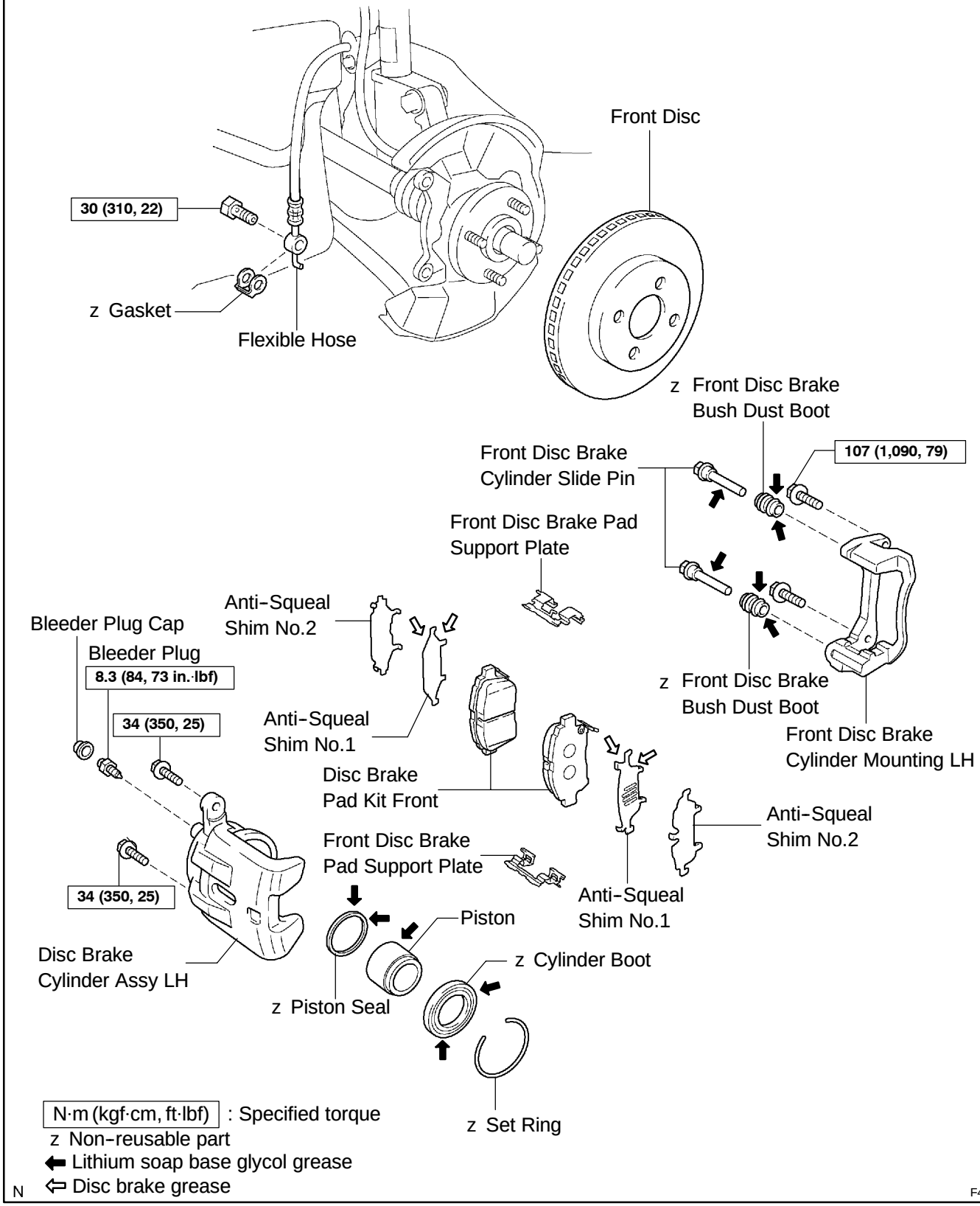
18. CHECK VACUUM PUMP OPERATION (See page 32-47)

FRONT BRAKE (TMC MADE)

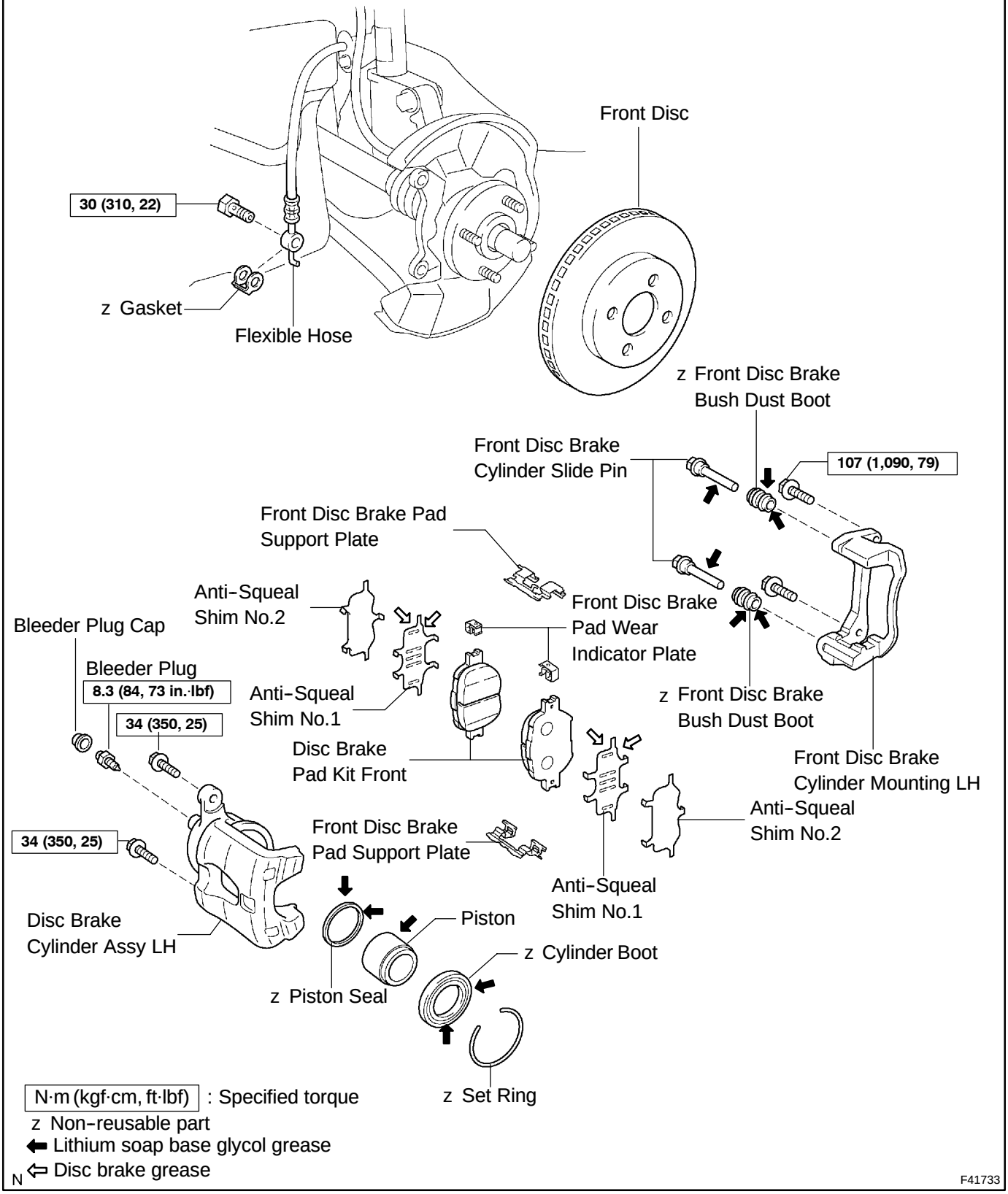
COMPONENTS

320G8-01

3ZZ-FE/4ZZ-FE Engine Type:



1CD-FTV Engine Type:



320G9-01

OVERHAUL

HINT:

Overhaul of the RH side is the same procedures as the LH side.

1. REMOVE FRONT WHEEL

2. DRAIN BRAKE FLUID

NOTICE:

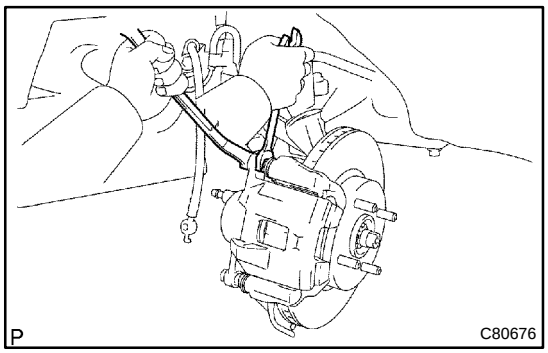
Wash the brake fluid off immediately if it comes into contact with any painted surfaces.

3. REMOVE FRONT DISC BRAKE CYLINDER SUB-ASSY

(a) Remove the union bolt and gasket from the disc brake cylinder, then disconnect the flexible hose.

HINT:

Gasket has 2 types: 2-piece type and 1-piece type.



(b) Hold the cylinder slide pin and remove the 2 bolts.

4. REMOVE DISC BRAKE PAD KIT FRONT (PAD ONLY)

(a) Remove the 2 brake pads with anti-squeal shims.

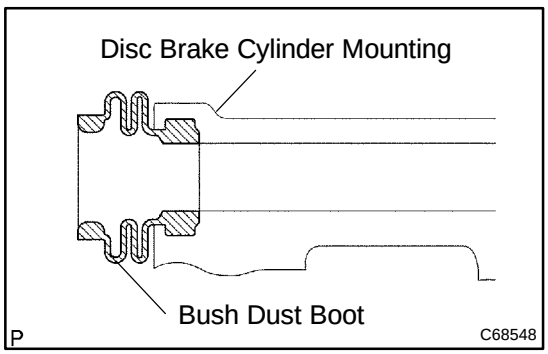
(b) Remove the anti-squeal shim No.1 and anti-squeal shim No.2 from each pad.

5. REMOVE FRONT DISC BRAKE PAD SUPPORT PLATE

6. REMOVE FRONT DISC BRAKE PAD SUPPORT PLATE

7. REMOVE FRONT DISC BRAKE CYLINDER SLIDE PIN

(a) Remove the cylinder slide pins from the disc brake cylinder mounting.

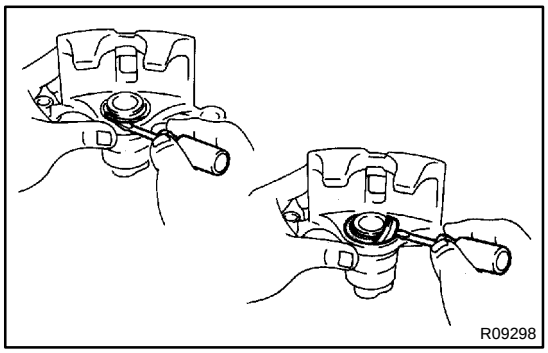


8. REMOVE FRONT DISC BRAKE BUSH DUST BOOT

(a) Remove the 2 bush dust boots from the disc brake cylinder mounting.

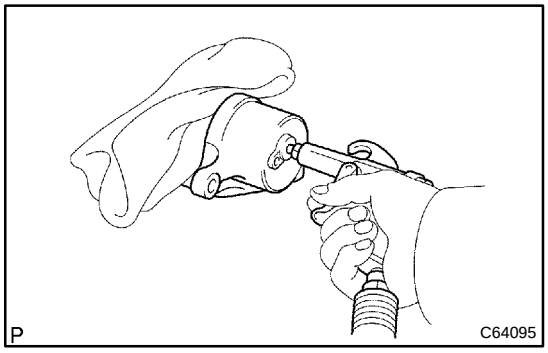
9. REMOVE FRONT DISC BRAKE CYLINDER MOUNTING LH

(a) Remove the 2 bolts and disc brake cylinder mounting.



10. REMOVE CYLINDER BOOT

(a) Using a screwdriver, remove the set ring and cylinder boot.



11. REMOVE FRONT DISC BRAKE PISTON

(a) Place a piece of cloth or equivalent, between the piston and the disc brake cylinder.

(b) Use compressed air to remove the piston from the disc brake cylinder.

CAUTION:
Do not place your fingers in front of the piston when using compressed air.
NOTICE:
Do not spatter the brake fluid.

12. REMOVE PISTON SEAL

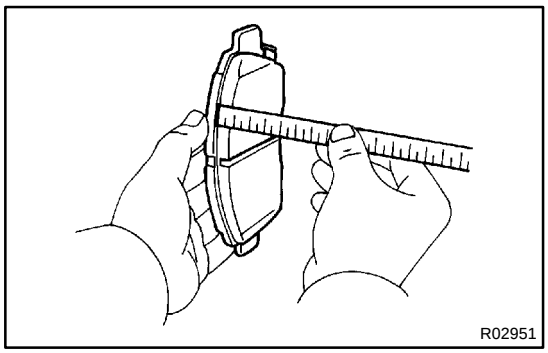
(a) Using a screwdriver, remove the piston seal from the disc brake cylinder.

13. REMOVE FRONT DISC BRAKE BLEEDER PLUG

(a) Remove the bleeder plug cap and bleeder plug from the disc brake cylinder.

14. INSPECT BRAKE CYLINDER AND PISTON

(a) Check the cylinder bore and piston for rust or scoring.



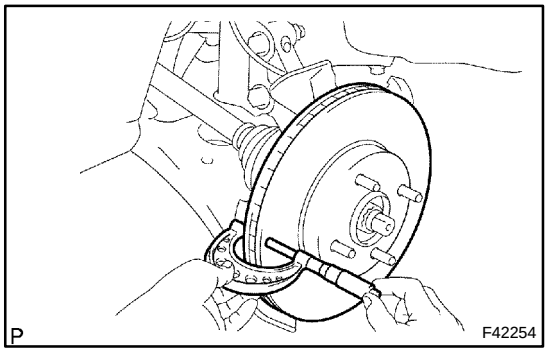
15. INSPECT PAD LINING THICKNESS

(a) Using a ruler, measure the pad lining thickness.

3ZZ-FE/4ZZ-FE Engine type:
Standard thickness: 11.0 mm (0.433 in.)
Minimum thickness: 1.0 mm (0.039 in.)
1CD-FTV Engine type:
Standard thickness: 11.5 mm (0.453 in.)
Minimum thickness: 1.0 mm (0.039 in.)

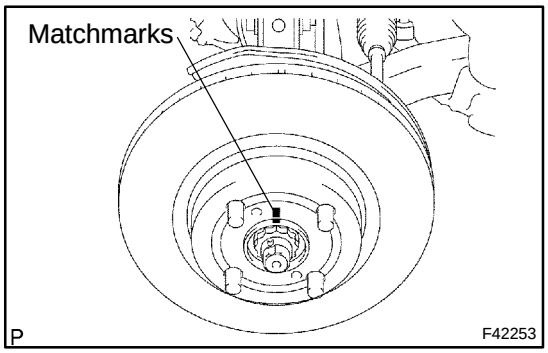
16. INSPECT FRONT DISC BRAKE PAD SUPPORT PLATE

(a) Make sure that they have sufficient rebound, no deformation, cracks nor wear, and have had all rust, dirt and foreign particles cleaned off.



17. INSPECT DISC THICKNESS

(a) Using a micrometer, measure the disc thickness.
Standard thickness: 25.0 mm (0.984 in.)
Minimum thickness: 23.0 mm (0.906 in.)



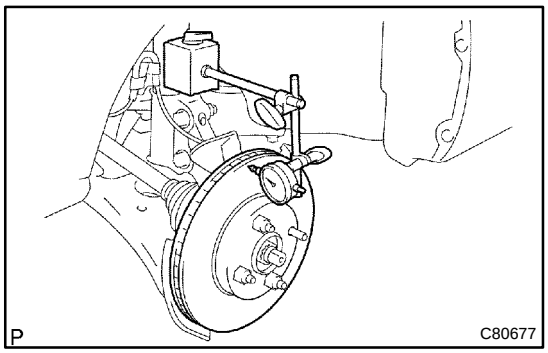
18. REMOVE FRONT DISC

(a) Put matchmarks on the disc and the axle hub.
(b) Remove the disc.

19. INSTALL FRONT DISC

(a) Aligning the matchmarks, install the front disc.

HINT:
Select the installation position where the disc has the minimum runout.



20. INSPECT DISC RUNOUT

(a) Temporarily fasten the disc with hub nuts.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
(b) Using a dial indicator, measure the disc runout 10 mm (0.39 in.) away from the outer edge of the disc.
Maximum disc runout: 0.05 mm (0.0020 in.)
(c) If the disc's runout is maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page 30-2). If the bearing play and axle hub runout are normal, adjust the disc runout or grind it on a "On-car" brake lathe.

21. TEMPORARY TIGHTEN FRONT DISC BRAKE BLEEDER PLUG

(a) Temporarily tighten the bleeder plug to the disc brake cylinder.
(b) Install the bleeder plug cap to the disc brake cylinder.

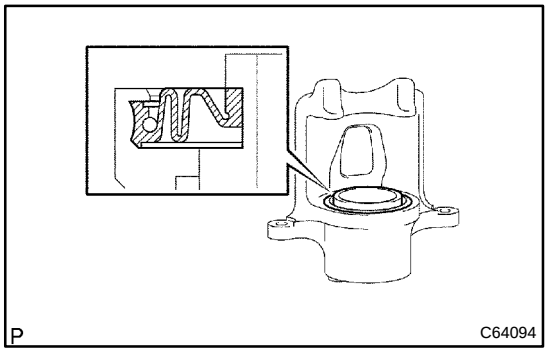
22. INSTALL PISTON SEAL

(a) Apply the lithium soap base glycol grease to a new piston seal.
(b) Install the piston seal to the disc brake cylinder.

23. INSTALL FRONT DISC BRAKE PISTON

(a) Apply the lithium soap base glycol grease to the piston.
(b) Install the piston to the disc brake cylinder.

NOTICE:
Do not screw the piston forcedly in the disc brake cylinder.



24. INSTALL CYLINDER BOOT

(a) Apply the lithium soap base glycol grease to a new cylinder boot. Install the cylinder boot to the disc brake cylinder.

HINT:

Install the boot securely to the grooves of the cylinder and piston.

(b) Using a screwdriver, install the set ring.

NOTICE:

Do not damage the cylinder boot.

25. INSTALL FRONT DISC BRAKE CYLINDER MOUNTING LH

(a) Install the disc brake cylinder mounting with the 2 bolts.

Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)

26. INSTALL FRONT DISC BRAKE BUSH DUST BOOT

(a) Apply the lithium soap base glycol grease to seal surface of 2 new bush dust boots.

(b) Install the 2 bush dust boots to the disc brake cylinder mounting.

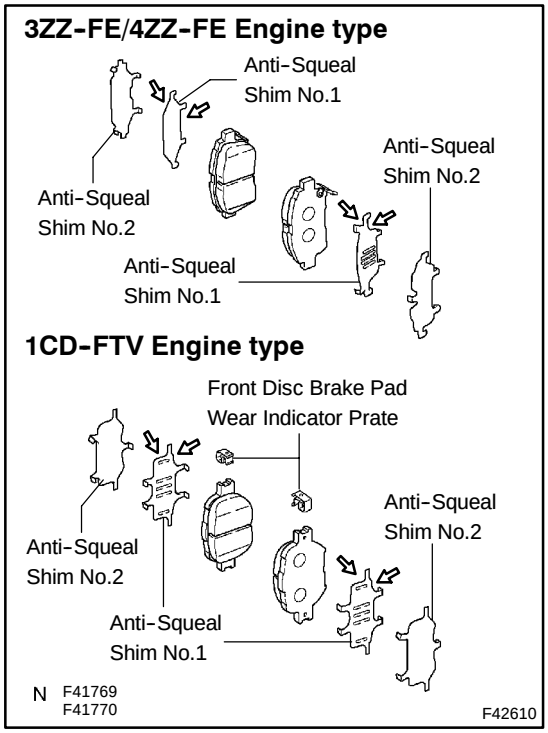
27. INSTALL FRONT DISC BRAKE CYLINDER SLIDE PIN

(a) Apply the lithium soap base glycol grease to the sliding part and the seal surface of the 2 cylinder slide pins.

(b) Install the 2 cylinder slide pins to the disc brake cylinder mounting.

28. INSTALL FRONT DISC BRAKE PAD SUPPORT PLATE

29. INSTALL FRONT DISC BRAKE PAD SUPPORT PLATE



30. INSTALL DISC BRAKE PAD KIT FRONT (PAD ONLY)

NOTICE:

When replacing worn pads, the anti-squeal shims must be replaced together with the pads.

(a) Apply disc brake grease to both sides of each anti-squeal shim No.1.

(b) Install anti-squeal shims on each pad.

(c) 1CD-FTV Engine type:

Install the each pad with the wear indicator plate facing upward, and install the outer pad.

NOTICE:

There should be no oil or grease on the friction surfaces of the pads and the disc.

31. INSTALL FRONT DISC BRAKE CYLINDER SUB-ASSY

(a) Install the disc brake cylinder with the 2 bolts.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(b) Install a new gasket and flexible hose with the union bolt.
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:

- Gasket has 2 types: 2-piece type and 1-piece type.
- Install the flexible hose lock securely in the lock hole in the disc brake cylinder.

32. FILL RESERVOIR WITH BRAKE FLUID

33. BLEED MASTER CYLINDER **(See page 32-5)**
SST 09023-00100

34. BLEED BRAKE LINE **(See page 32-6)**

35. CHECK FLUID LEVEL IN RESERVOIR

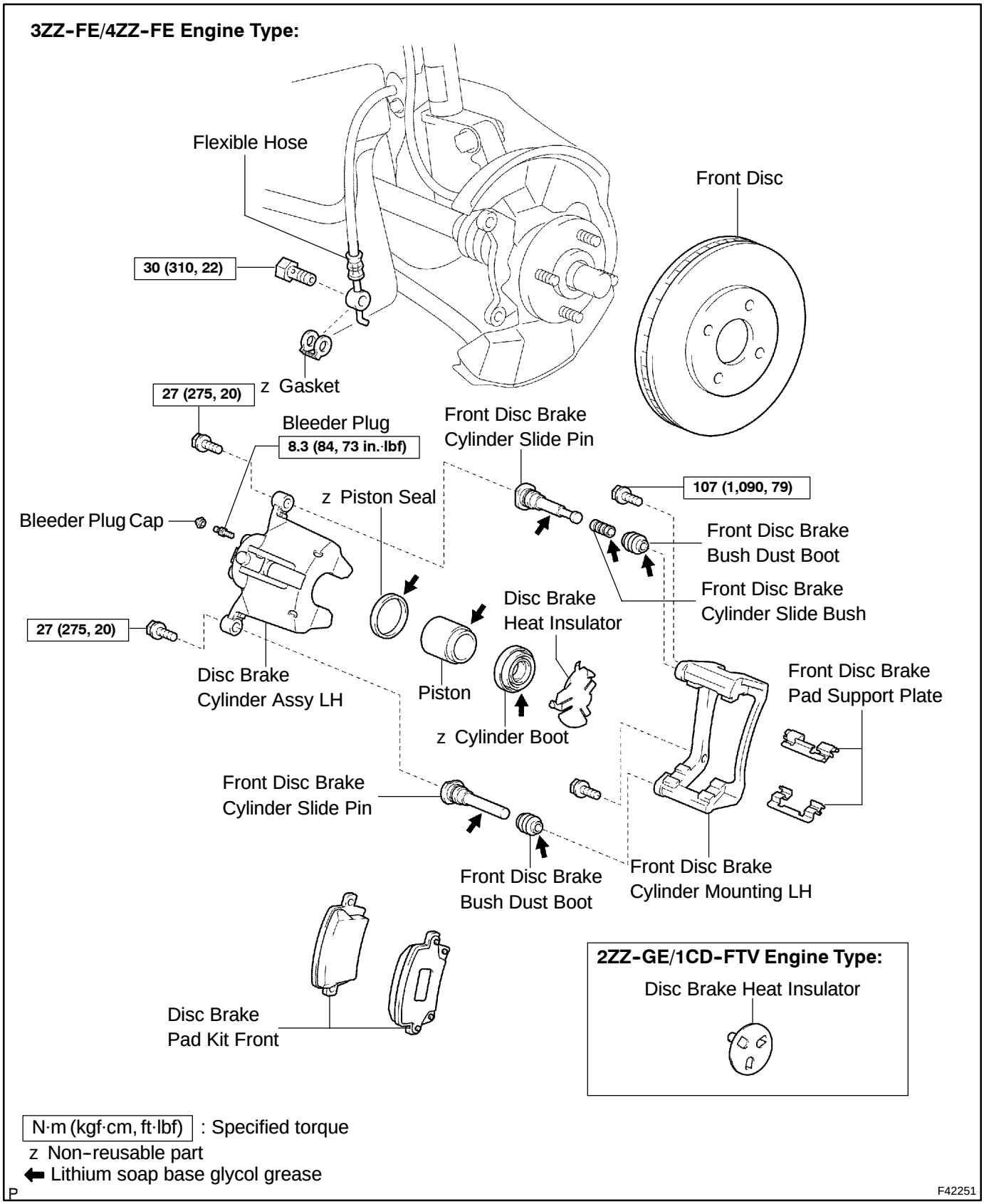
36. CHECK BRAKE FLUID LEAKAGE

37. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

FRONT BRAKE (TMUK MADE)

COMPONENTS

320GA-01



OVERHAUL

HINT:

Overhaul of the RH side is the same procedures as the LH side.

1. REMOVE FRONT WHEEL

2. DRAIN BRAKE FLUID

NOTICE:

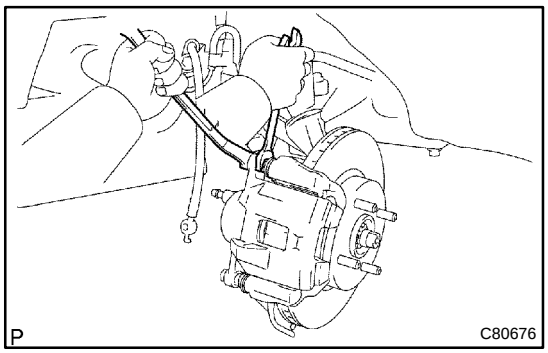
Wash the brake fluid off immediately if it comes into contact with any painted surfaces.

3. REMOVE DISC BRAKE CYLINDER ASSY LH

(a) Remove the union bolt and gasket from the disc brake cylinder, then disconnect the flexible hose.

HINT:

Gasket has 2 types: 2-piece type and 1-piece type.



(b) Hold the cylinder slide pin and remove the 2 bolts.

4. REMOVE DISC BRAKE PAD KIT FRONT (PAD ONLY)

(a) Remove the 2 brake pads from the cylinder mounting.

5. REMOVE DISC BRAKE HEAT INSULATOR

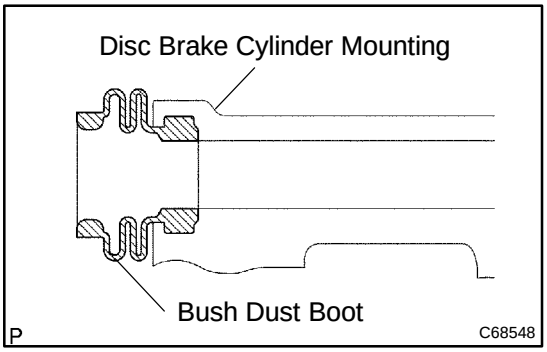
6. REMOVE DISC BRAKE FITTING KIT FRONT

(a) Remove the 2 pad support plates from the cylinder mounting.

7. REMOVE FRONT DISC BRAKE CYLINDER SLIDE PIN KIT

(a) Remove the 2 cylinder slide pins from the disc brake cylinder mounting.

(b) Remove the cylinder slide bush from the upper side slide pin.

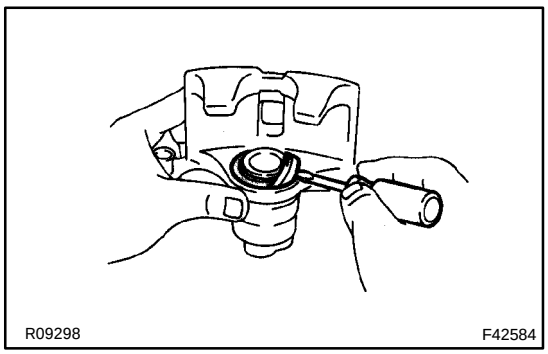


8. REMOVE FRONT DISC BRAKE CYLINDER SLIDE PIN BOOT KIT

(a) Remove the 2 bush dust boots from the disc brake cylinder mounting.

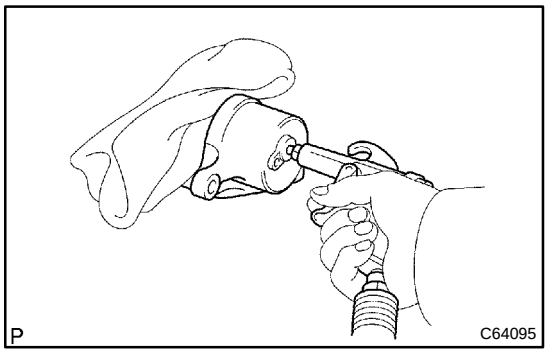
9. REMOVE FRONT DISC BRAKE CYLINDER MOUNTING LH

(a) Remove the 2 bolts and disc brake cylinder mounting.



10. REMOVE CYLINDER BOOT

(a) Using a screwdriver, remove the cylinder boot.



11. REMOVE FRONT DISC BRAKE PISTON

(a) Place a piece of cloth or equivalent, between the piston and the disc brake cylinder.

(b) Use compressed air to remove the piston from the disc brake cylinder.

CAUTION:
Do not place your fingers in front of the piston when using compressed air.
NOTICE:
Do not spatter the brake fluid.

12. REMOVE PISTON SEAL

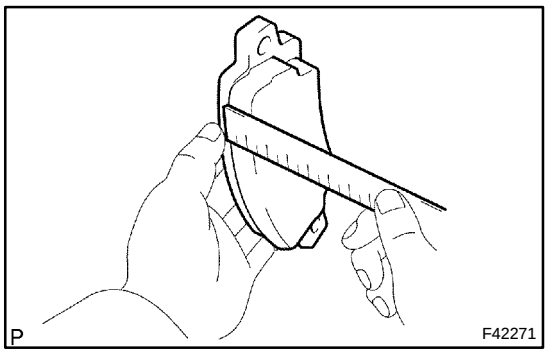
(a) Using a screwdriver, remove the piston seal from the disc brake cylinder.

13. REMOVE FRONT DISC BRAKE BLEEDER PLUG

(a) Remove the bleeder plug cap and bleeder plug from the disc brake cylinder.

14. INSPECT BRAKE CYLINDER AND PISTON

(a) Check the cylinder bore and piston for rust or scoring.

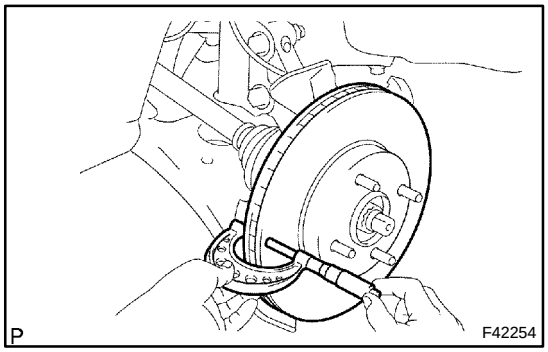


15. INSPECT PAD LINING THICKNESS

(a) Using a ruler, measure the pad lining thickness.
Standard thickness: 11.5 mm (0.453 in.)
Minimum thickness: 1.0 mm (0.039 in.)

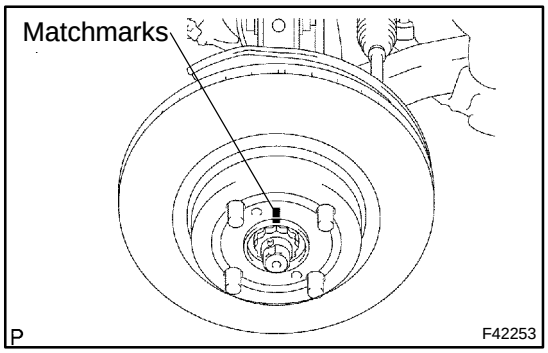
16. INSPECT DISC BRAKE FITTING KIT FRONT

(a) Inspect the 2 pad support plates.
Make sure that they have sufficient rebound, no deformation, cracks nor wear, and have had all rust, dirt and foreign particles cleaned off.



17. INSPECT DISC THICKNESS

(a) Using a micrometer, measure the disc thickness.
Standard thickness: 25.0 mm (0.984 in.)
Minimum thickness: 23.0 mm (0.906 in.)



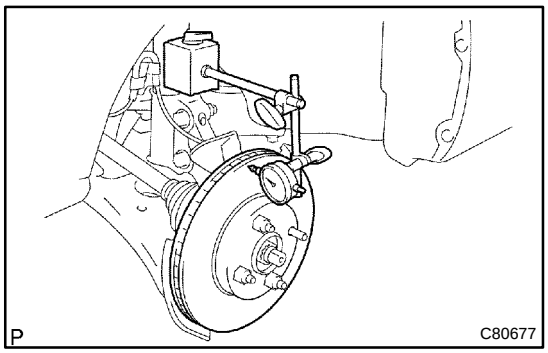
18. REMOVE FRONT DISC

(a) Put matchmarks on the disc and the axle hub.
(b) Remove the disc.

19. INSTALL FRONT DISC

(a) Aligning the matchmarks, install the front disc.

HINT:
Select the installation position where the disc has the minimum runout.



20. INSPECT DISC RUNOUT

(a) Temporarily fasten the disc with hub nuts.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
(b) Using a dial indicator, measure the disc runout 10 mm (0.39 in.) away from the outer edge of the disc.
Maximum disc runout: 0.05 mm (0.0020 in.)
(c) If the disc's runout is maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page 30-2). If the bearing play and axle hub runout are normal, adjust the disc runout or grind it on a "On-car" brake lathe.

21. TEMPORARY TIGHTEN FRONT DISC BRAKE BLEEDER PLUG

(a) Temporarily tighten the bleeder plug to the disc brake cylinder.
(b) Install the bleeder plug cap to the disc brake cylinder.

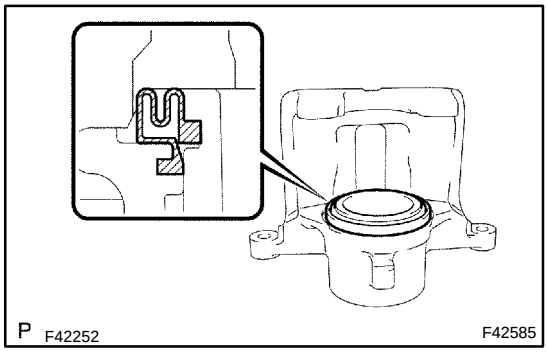
22. INSTALL PISTON SEAL

(a) Apply the lithium soap base glycol grease to a new piston seal.
(b) Install the piston seal to the disc brake cylinder.

23. INSTALL FRONT DISC BRAKE PISTON

(a) Apply the lithium soap base glycol grease to the piston.
(b) Install the piston to the disc brake cylinder.

NOTICE:
Do not screw the piston forcedly in the disc brake cylinder.



24. INSTALL CYLINDER BOOT

(a) Apply the lithium soap base glycol grease to a new cylinder boot. Install the cylinder boot to the disc brake cylinder.

NOTICE:

Do not damage the cylinder boot.

HINT:

Install the boot securely to the grooves of the cylinder and piston.

25. INSTALL FRONT DISC BRAKE CYLINDER MOUNTING LH

(a) Install the disc brake cylinder mounting with the 2 bolts.
Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)

26. INSTALL FRONT DISC BRAKE CYLINDER SLIDE PIN BOOT KIT

(a) Apply the lithium soap base glycol grease to seal surface of 2 new bush dust boots.
(b) Install the 2 bush dust boots to the disc brake cylinder mounting.

27. INSTALL FRONT DISC BRAKE CYLINDER SLIDE PIN KIT

(a) Apply the lithium soap base glycol grease to the new cylinder slide bush.
(b) Install the cylinder slide bush to the upper slide cylinder slide pin.
(c) Apply the lithium soap base glycol grease to the sliding part and the seal surface of the 2 cylinder slide pins.
(d) Install the 2 cylinder slide pins to the disc brake cylinder mounting.

28. INSTALL DISC BRAKE FITTING KIT FRONT

(a) Install the 2 pad support plates to the cylinder mounting.

29. INSTALL DISC BRAKE HEAT INSULATOR

30. INSTALL DISC BRAKE PAD KIT FRONT (PAD ONLY)

(a) Install the inner pad with the wear indicator plate facing upward, and install the outer pad.

NOTICE:

There should be no oil or grease on the friction surfaces of the pads and the disc.

31. INSTALL DISC BRAKE CYLINDER ASSY LH

(a) Install the disc brake cylinder with the 2 bolts.
Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)
(b) Install a new gasket and flexible hose with the union bolt.
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:

- Gasket has 2 types: 2-piece type and 1-piece type.
- Install the flexible hose lock securely in the lock hole in the disc brake cylinder.

32. FILL RESERVOIR WITH BRAKE FLUID

33. BLEED MASTER CYLINDER(W/ ABS) **(See page 32-5)**
SST 09023-00100

34. BLEED MASTER CYLINDER(W/ VSC) **(See page 32-5)**
SST 09023-38400

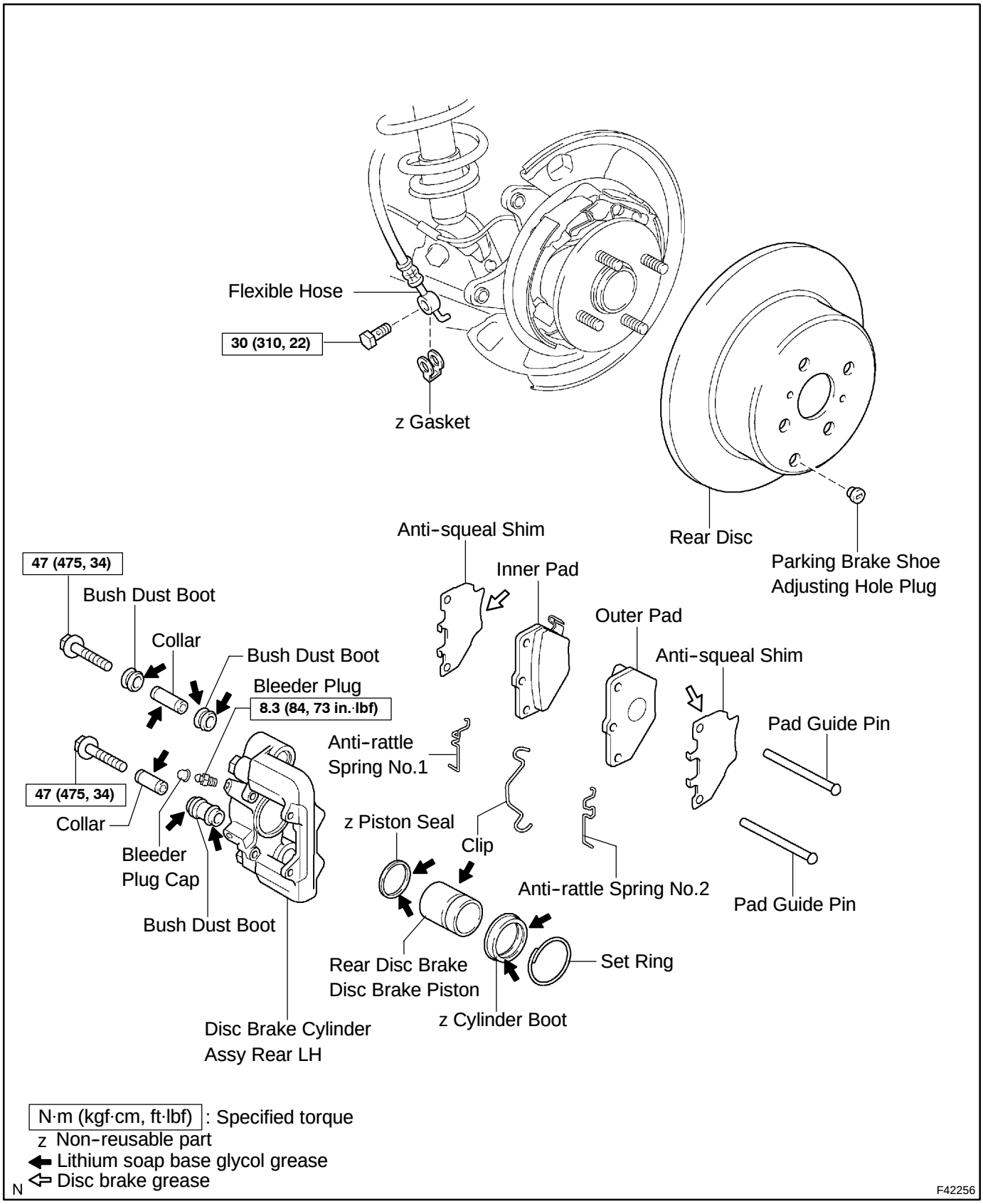
35. BLEED BRAKE LINE **(See page 32-6)**

36. CHECK FLUID LEVEL IN RESERVOIR
37. CHECK BRAKE FLUID LEAKAGE
38. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR DISC BRAKE (TMC MADE)

COMPONENTS

320GD-01



OVERHAUL

HINT:

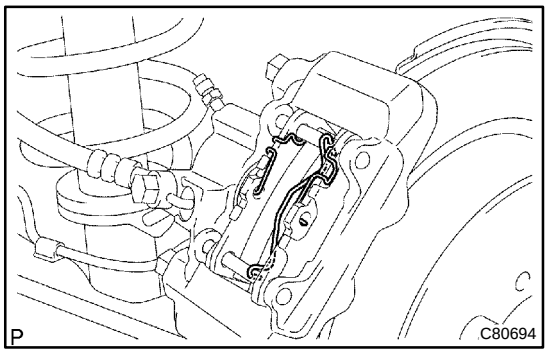
Overhaul of the RH side is the same procedures as the LH side.

1. REMOVE REAR WHEEL

2. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surface.

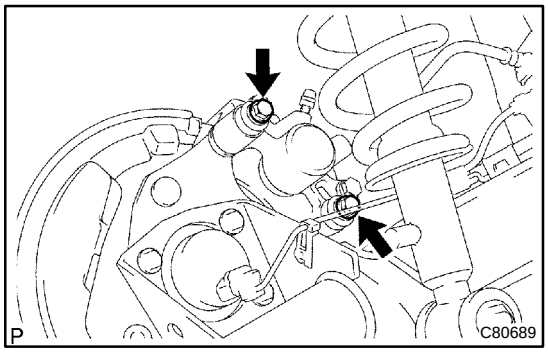


3. REMOVE DISC BRAKE PAD KIT REAR (PAD ONLY)

(a) Remove the clip, anti-rattle spring No.1 and anti-rattle spring No.2.

(b) Remove the 2 pad guide pins and disc brake pads with anti-squeal shims.

(c) Remove the anti-squeal shims from each pad.



4. REMOVE DISC BRAKE CYLINDER ASSY REAR LH

(a) Remove the union bolt and gasket from the disc brake cylinder, then disconnect flexible hose from the disc brake cylinder.

HINT:

Gasket has 2 types: 2-piece type and 1-piece type.

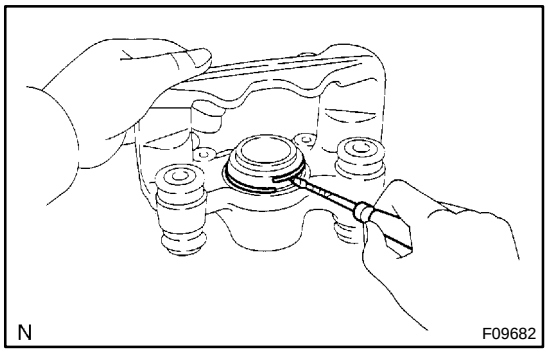
(b) Remove the 2 bolts and disc brake cylinder.

5. REMOVE REAR DISC BRAKE CYLINDER MOUNTING COLLAR

(a) Remove the 2 cylinder mounting collars from the disc brake cylinder.

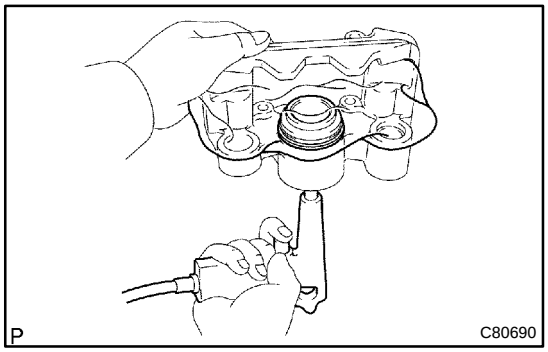
6. REMOVE REAR DISC BRAKE BUSH DUST BOOT

(a) Remove the 3 bush dust boots.



7. REMOVE CYLINDER BOOT

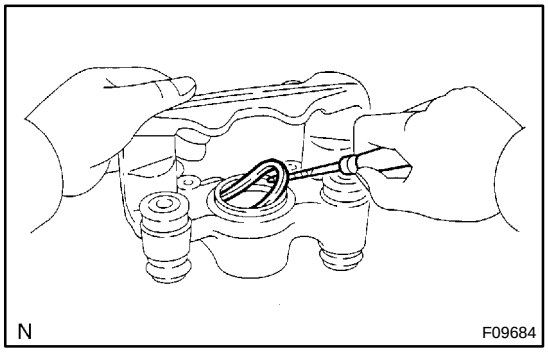
(a) Using a screwdriver, remove the set ring and cylinder boot.



8. REMOVE REAR DISC BRAKE DISC BRAKE PISTON

(a) Place a piece of cloth or equivalent, between the piston and the disc brake cylinder.
(b) Use compressed air to remove the piston from the disc brake cylinder.

CAUTION:
Do not place your fingers in front of the piston when using compressed air.
NOTICE:
Do not spatter the brake fluid.



9. REMOVE PISTON SEAL

(a) Using a screwdriver, remove the piston seal from the brake cylinder.

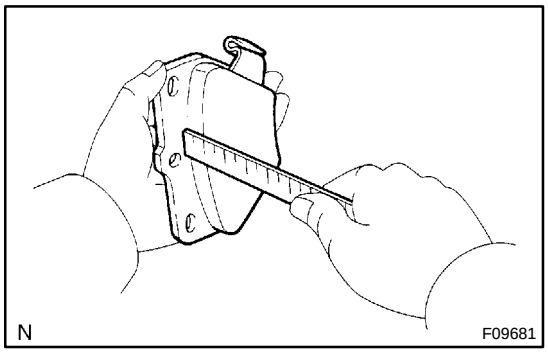
NOTICE:
Do not damage the inner cylinder and the cylinder groove.

10. REMOVE REAR DISC BRAKE BLEEDER PLUG

(a) Remove the rear disc brake bleeder plug cap and bleeder plug from the disc brake cylinder.

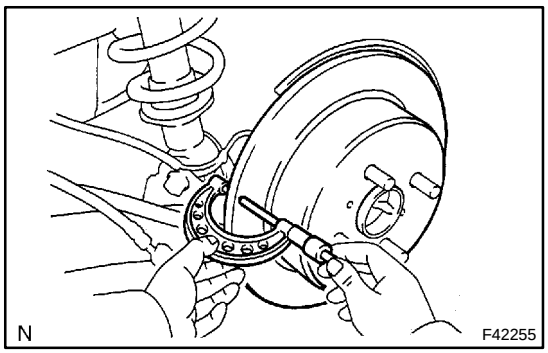
11. INSPECT BRAKE CYLINDER AND PISTON

(a) Check the cylinder bore and piston for rust or scoring.



12. INSPECT PAD LINING THICKNESS

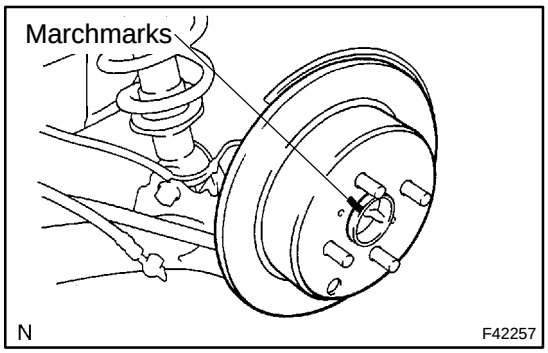
(a) Using a ruler, measure the pad lining thickness.
Standard thickness: 10.0 mm (0.394 in.)
Minimum thickness: 1.0 mm (0.039 in.)



13. INSPECT DISC THICKNESS

(a) Using a micrometer, measure the disc thickness.
Standard thickness: 9.0 mm (0.354 in.)
Minimum thickness: 8.0 mm (0.315 in.)

14. REMOVE PARKING BRAKE SHOE ADJUSTING HOLE PLUG



15. REMOVE REAR DISC

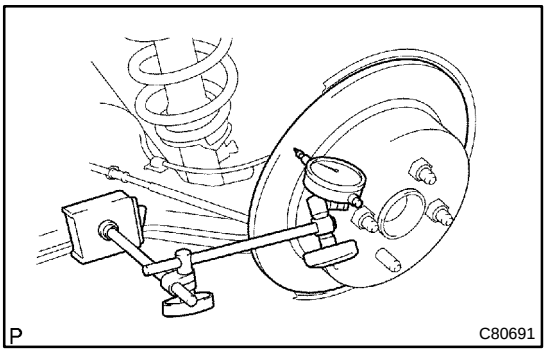
(a) Put matchmarks on the disc and the axle hub.
(b) Remove the disc.

16. INSTALL REAR DISC

(a) Aligning the matchmarks, install the rear disc.

HINT:
Select the installation position where the disc has the minimum runout.

17. INSTALL PARKING BRAKE SHOE ADJUSTING HOLE PLUG



18. INSPECT DISC RUNOUT

(a) Temporarily fasten the disc with hub nuts.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
(b) Using dial indicator, measure the disc runout 10 mm (0.39 in.) away from the outer edge of the disc.
Maximum disc runout: 0.15 mm (0.0059 in.)
(c) If the disc's runout is maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page 30-2). If the bearing play and axle hub runout are normal, adjust the disc runout or grind it on a "On-car" brake lathe.

19. TEMPORARY TIGHTEN REAR DISC BRAKE BLEEDER PLUG

(a) Temporarily tighten the bleeder plug to the disc brake cylinder.

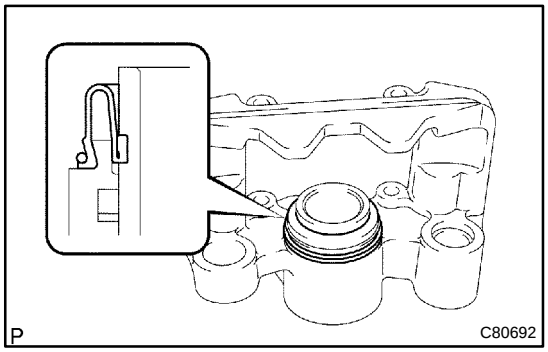
20. INSTALL PISTON SEAL

(a) Apply the lithium soap base glycol grease on a new piston seal.
(b) Install the piston seal to the disc brake cylinder.

21. INSTALL REAR DISC BRAKE DISC BRAKE PISTON

(a) Apply the lithium soap base glycol grease to the piston.
(b) Install the piston to the disc brake cylinder.

NOTICE:
Do not screw the piston forcedly in the disc brake cylinder.



22. INSTALL CYLINDER BOOT

(a) Apply the lithium soap base glycol grease to a new cylinder boot.

(b) Install the cylinder boot to the disc brake cylinder.

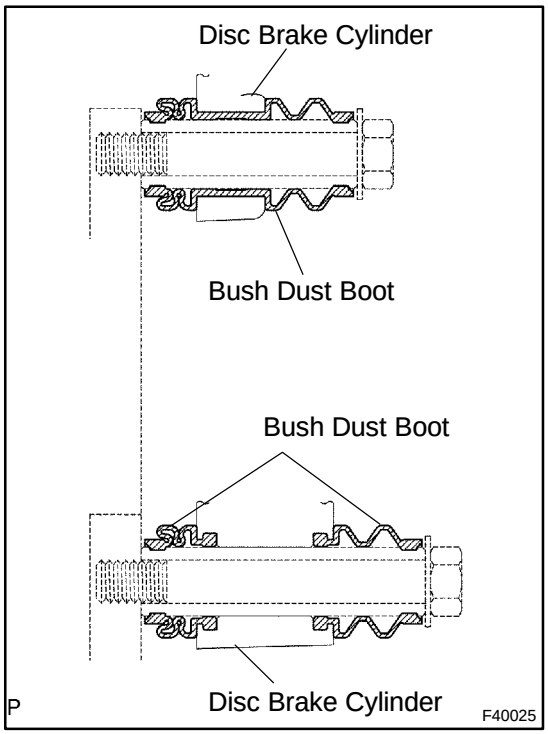
HINT:

Install the boot securely to the grooves of the cylinder and piston.

(c) Using a screwdriver, install the set ring.

NOTICE:

Do not damage the cylinder boot.



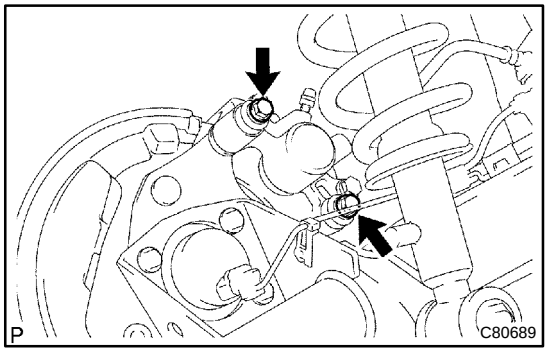
23. INSTALL REAR DISC BRAKE BUSH DUST BOOT

(a) Apply the lithium soap base glycol grease to seal surface of 3 new bush dust boots.

(b) Install the 3 bush dust boots to the disc brake cylinder.

24. INSTALL REAR DISC BRAKE CYLINDER MOUNTING COLLAR

(a) Install the 2 cylinder mounting collars.



25. INSTALL DISC BRAKE CYLINDER ASSY REAR LH

(a) Install the disc brake cylinder with the 2 bolts.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

(b) Install a new gasket and flexible hose with the union bolt.
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:

- Gasket has 2 types: 2–piece type and 1–piece type.
- Install the flexible hose lock securely in the lock hole in the brake cylinder.

26. INSTALL DISC BRAKE PAD KIT REAR (PAD ONLY)

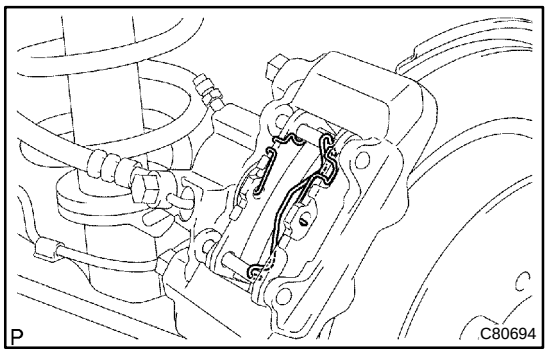
NOTICE:
When replacing worn pads, the anti-squeal shims must be replaced together with the pads.

(a) Apply disc brake grease to inside of anti-squeal shims, and install the anti-squeal shims on each pad.

(b) Install the inner pad with the pad wear indicator plate facing upward, and install the outer pad.

NOTICE:
There should be no oil or grease on the friction surface of the pads and the disc.

(c) Install the 2 pad guide pins.



(d) Install the anti-rattle spring No.1 anti-rattle spring No.2 and clip.

27. FILL RESERVOIR WITH BRAKE FLUID

28. BLEED MASTER CYLINDER **(See page 32-5)**
SST 09023-00100

29. BLEED BRAKE LINE **(See page 32-6)**

30. CHECK FLUID LEVEL IN RESERVOIR

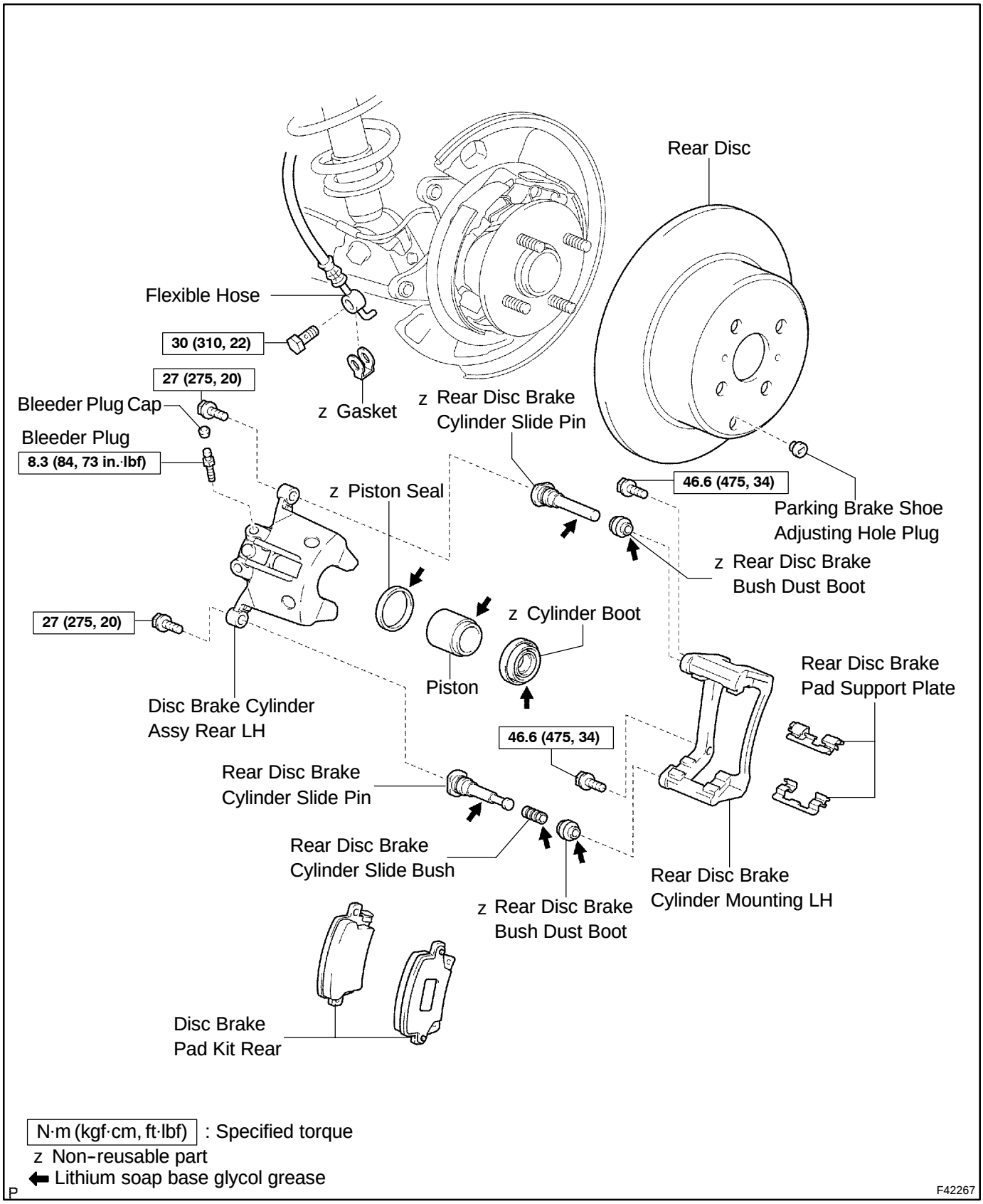
31. CHECK BRAKE FLUID LEAKAGE

32. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR DISC BRAKE (TMUK MADE)

COMPONENTS

320GE-01



320GF-01

OVERHAUL

HINT:

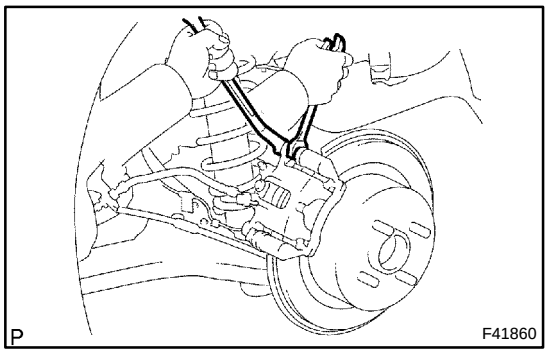
Overhaul of the RH side is the same procedures as the LH side.

1. REMOVE REAR WHEEL

2. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surfaces.



3. REMOVE DISC BRAKE CYLINDER ASSY REAR LH

(a) Remove the union bolt and gasket from the brake cylinder, then disconnect the flexible hose from the disc brake cylinder.

HINT:

Gasket has 2 types: 2-piece type and 1-piece type.

(b) Hold the cylinder slide pin and remove the 2 bolts.

4. REMOVE DISC BRAKE PAD KIT REAR (PAD ONLY)

(a) Remove the 2 brake pads with anti-squeal shims.

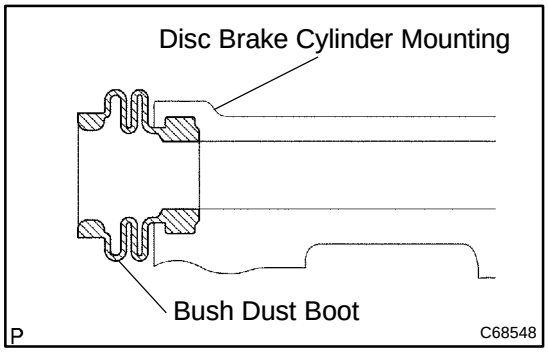
5. REMOVE DISC BRAKE FITTING KIT REAR

(a) Remove the 2 pad support plates from the cylinder mounting.

6. REMOVE REAR DISC BRAKE CYLINDER SLIDE PIN KIT

(a) Remove the 2 cylinder slide pins from the disc brake cylinder mounting.

(b) Remove the cylinder slide bush from the bottom side cylinder slide pin.

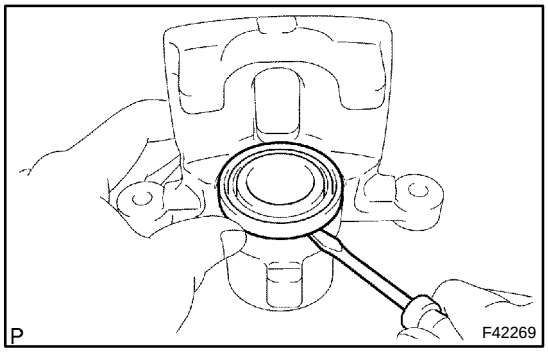


7. REMOVE REAR DISC BRAKE CYLINDER SLIDE PIN BOOT KIT

(a) Remove the 2 bush dust boots from the disc brake cylinder mounting.

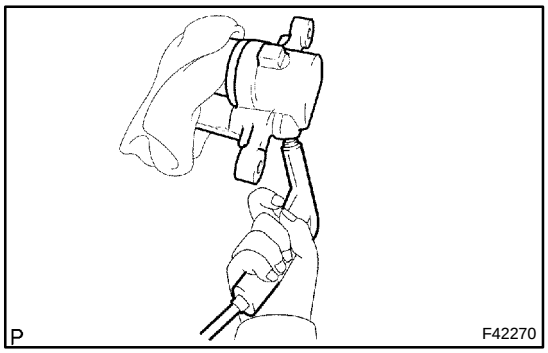
8. REMOVE REAR DISC BRAKE CYLINDER MOUNTING LH

(a) Remove the 2 bolts and disc brake cylinder mounting.



9. REMOVE CYLINDER BOOT

(a) Using a screwdriver, remove the cylinder boot.



10. REMOVE REAR DISC BRAKE DISC BRAKE PISTON

(a) Place a piece of cloth or equivalent, between the piston and the disc brake cylinder.

(b) Use compressed air to remove the piston from the disc brake cylinder.

CAUTION:
Do not place your fingers in front of the piston when using compressed air.
NOTICE:
Do not spatter the brake fluid.

11. REMOVE PISTON SEAL

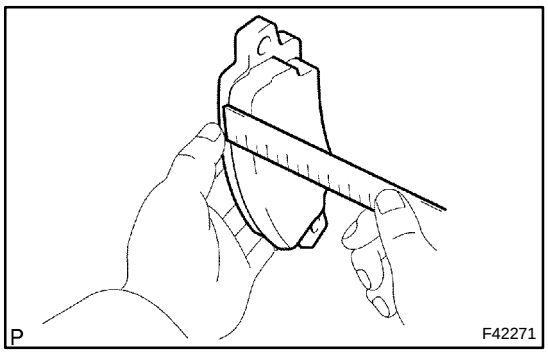
(a) Using a screwdriver, remove the piston seal from the disc brake cylinder.

12. REMOVE REAR DISC BRAKE BLEEDER PLUG

(a) Remove rear disc brake bleeder plug cap and bleeder plug from the disc brake cylinder.

13. INSPECT BRAKE CYLINDER AND PISTON

(a) Check the cylinder bore and piston for rust or scoring.

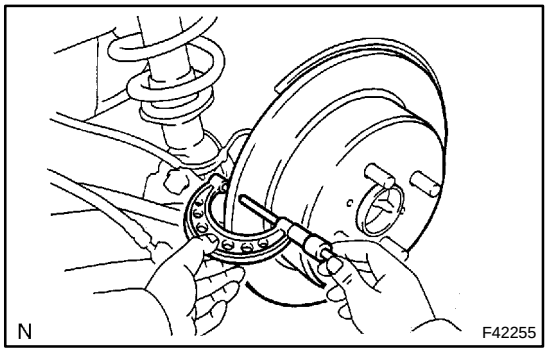


14. INSPECT PAD LINING THICKNESS

(a) Using a ruler, measure the pad lining thickness.
Standard thickness: 9.5 mm (0.374 in.)
Minimum thickness: 1.0 mm (0.039 in.)

15. INSPECT DISC BRAKE FITTING KIT REAR

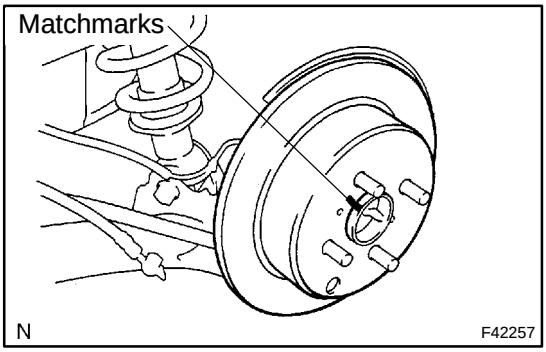
(a) Inspect the 2 brake pad support plates. Make sure that they have sufficient rebound, no deformation cracks or wear, and have had all rust, dirt and foreign particles cleaned off.



16. INSPECT DISC THICKNESS

(a) Using a micrometer, measure the disc thickness.
Standard thickness: 9.0 mm (0.354 in.)
Minimum thickness: 8.0 mm (0.315 in.)

17. REMOVE PARKING BRAKE SHOE ADJUSTING HOLE PLUG



18. REMOVE REAR DISC

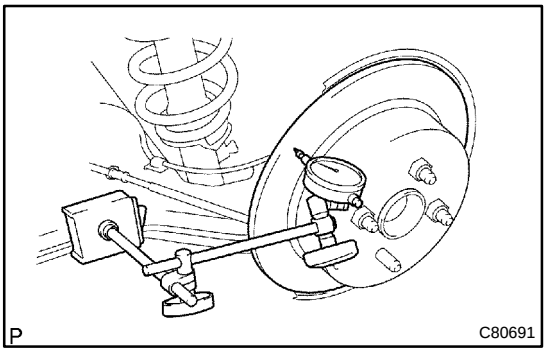
(a) Put matchmarks on the disc and the axle hub.
(b) Remove the rear disc.

19. INSTALL REAR DISC

(a) Aligning the matchmarks, install the rear disc.

HINT:
Select the installation position where the disc has the minimum runout.

20. INSTALL PARKING BRAKE SHOE ADJUSTING HOLE PLUG



21. INSPECT DISC RUNOUT

(a) Temporarily fasten the disc with hub nuts.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
(b) Using a dial indicator, measure the disc runout 10 mm (0.39 in.) away from the outer edge of the disc.
Maximum disc runout: 0.15 mm (0.0060 in.)
(c) If the disc's runout is maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page 30-2). If the bearing play and axle hub runout are normal, adjust the disc runout or grind it on a "On-car" brake lathe.

22. TEMPORARY TIGHTEN REAR DISC BRAKE BLEEDER PLUG

(a) Temporarily tighten the bleeder plug to the disc brake cylinder.

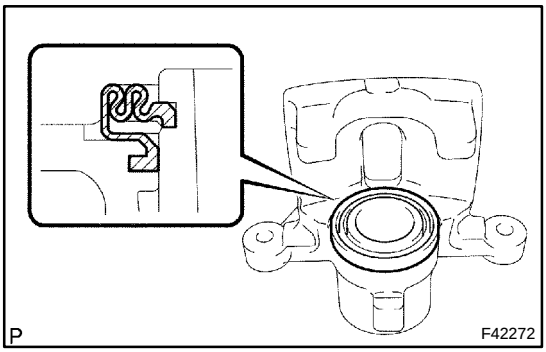
23. INSTALL PISTON SEAL

(a) Apply the lithium soap base glycol grease to a new piston seal.
(b) Install the piston seal to the disc brake cylinder.

24. INSTALL REAR DISC BRAKE DISC BRAKE PISTON

(a) Apply the lithium soap base glycol grease to the piston.
(b) Install the piston to the disc brake cylinder.

NOTICE:
Do not screw the piston forcedly in the disc brake cylinder.



25. INSTALL CYLINDER BOOT

(a) Apply the lithium soap base glycol grease to a new cylinder boot.
(b) Install the cylinder boot to the disc brake cylinder.

NOTICE:
Do not damage the cylinder boot.
HINT:
Install the boot securely to the grooves of the cylinder and piston.

26. INSTALL REAR DISC BRAKE CYLINDER MOUNTING LH

(a) Install the disc brake cylinder mounting with the 2 bolts.
Torque: 46.6 N·m (475 kgf·cm, 34 ft·lbf)

27. INSTALL REAR DISC BRAKE CYLINDER SLIDE PIN BOOT KIT

(a) Apply the lithium soap base glycol grease to seal surface of 2 new bush dust boots.
(b) Install the 2 bush dust boots to the disc brake cylinder mounting.

28. INSTALL REAR DISC BRAKE CYLINDER SLIDE PIN

(a) Apply the lithium soap base glycol grease to seal surface of new cylinder slide bush.
(b) Install the cylinder slide bush to the bottom side cylinder slide pin.
(c) Apply the lithium soap base glycol grease to the sliding part and the seal surface of the 2 cylinder slide pins.
(d) Install the 2 cylinder slide pins to the disc brake cylinder mounting.

29. INSTALL DISC BRAKE FITTING KIT REAR

(a) Install the 2 pad support plates to the cylinder mounting.

30. INSTALL DISC BRAKE PAD KIT REAR (PAD ONLY)

(a) Install the inner pad with the wear indicator plate facing downward, and install the outer pad.

31. INSTALL DISC BRAKE CYLINDER ASSY REAR LH

(a) Install the disc brake cylinder with the 2 bolts.
Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)
(b) Install a new gasket and flexible hose with the union bolt.
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:
- Gasket has 2 types: 2–piece type and 1–piece type.
- Install the flexible hose lock securely in the lock hole in the disc brake cylinder.

32. FILL RESERVOIR WITH BRAKE FLUID
33. BLEED MASTER CYLINDER(W/ ABS) (See page 32-5)
    SST 09023-00100
34. BLEED MASTER CYLINDER(W/ VSC) (See page 32-5)
    SST 09023-38400
35. BLEED BRAKE LINE (See page 32-6)
36. CHECK FLUID LEVEL IN RESERVOIR
37. CHECK BRAKE FLUID LEAKAGE
38. INSTALL REAR WHEEL
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

BRAKE ACTUATOR ASSY (TMC MADE)

3201N-04

ON-VEHICLE INSPECTION

1. CONNECT HAND-HELD TESTER:

(a) Connect the hand-held tester to the DLC3.

(b) Start the engine and run it at idle.

(c) Select the ACTIVE TEST mode on the hand-held tester.

HINT:

Please refer to the hand-held tester operator's manual for further details.

2. INSPECT ACTUATOR MOTOR OPERATION

(a) With the motor relay ON, check the actuator motor operation noise.

(b) Turn the motor relay to OFF.

(c) Depress the brake pedal and hold it for about 15 seconds. Check that the brake pedal cannot be depressed.

(d) With the motor relay ON, check that the pedal does not pulsate.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval more than 20 seconds.

(e) Turn the motor relay to OFF and release the brake pedal.

3. INSPECT RIGHT FRONT WHEEL OPERATION

NOTICE:

Never turn ON the solenoid which is not described below.

(a) With the brake pedal depressed, perform the following operations.

(b) Turn the SFRH and SFRR solenoid to ON simultaneously, and check that the pedal cannot be depressed.

NOTICE:

Do not keep solenoid ON for more than 10 seconds continuously. When operating it continuously, set the interval more than 20 seconds.

(c) Turn the SFRH and SFRR solenoid to OFF simultaneously, and check that the pedal can be depressed.

(d) Turn the motor relay to ON, and check that the pedal returns.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval more than 20 seconds.

(e) Turn the motor relay to OFF and release the brake pedal.

4. INSPECT OTHER WHEEL OPERATION

(a) As the same procedure, check the solenoids of other wheels.

HINT:

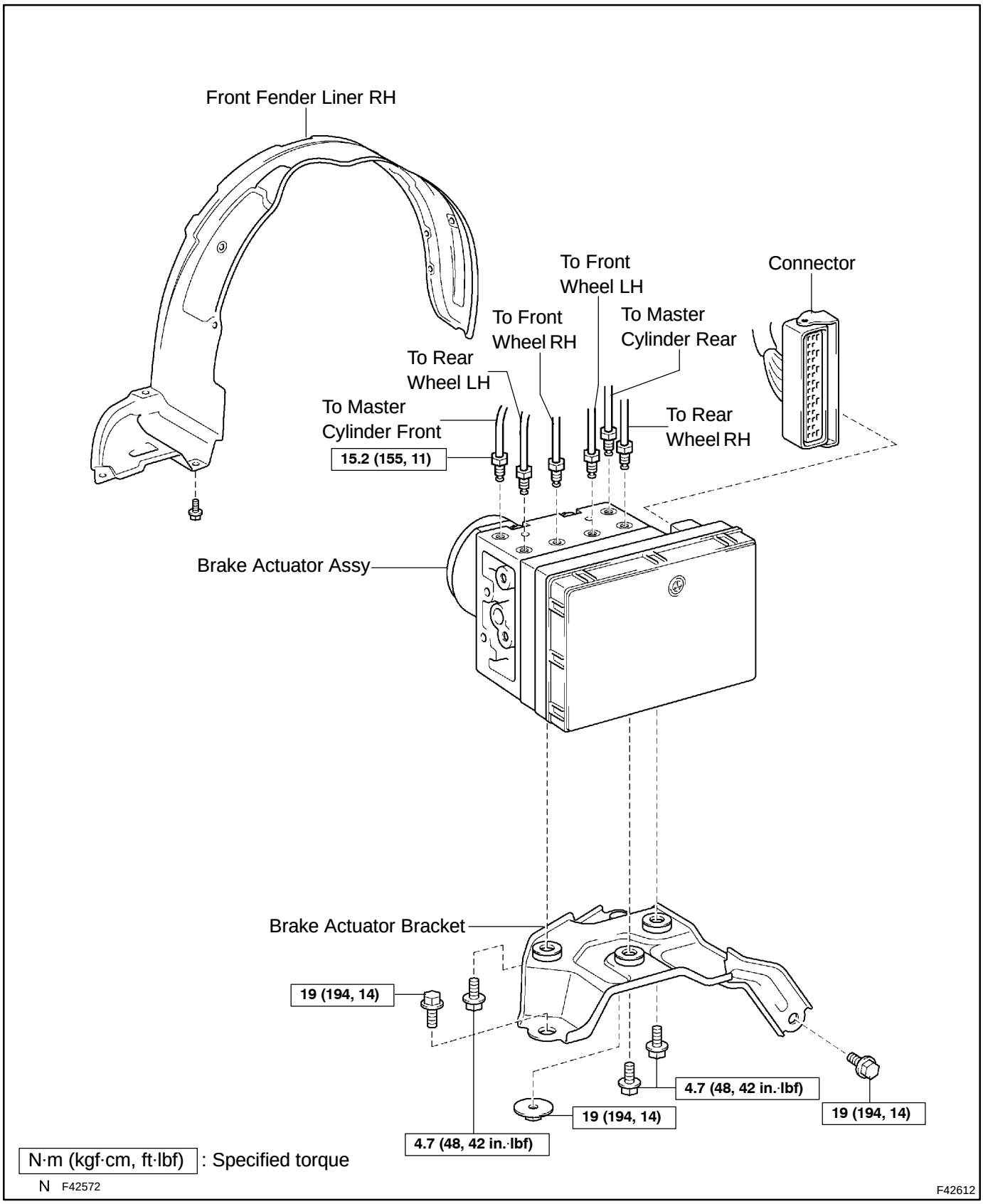
Left front wheel: SFLH, SFLR

Right rear wheel: SRRH, SRRR

Left rear wheel: SRLH, SRLR

320GG-01

COMPONENTS



REPLACEMENT

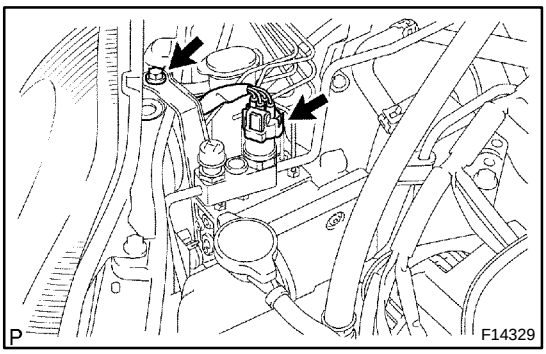
1. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surfaces.

2. REMOVE FRONT WHEEL RH

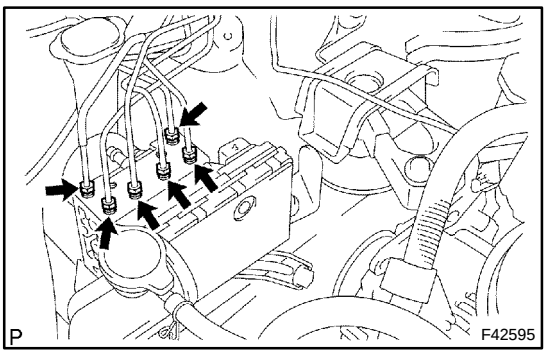
3. REMOVE FRONT FENDER LINER RH



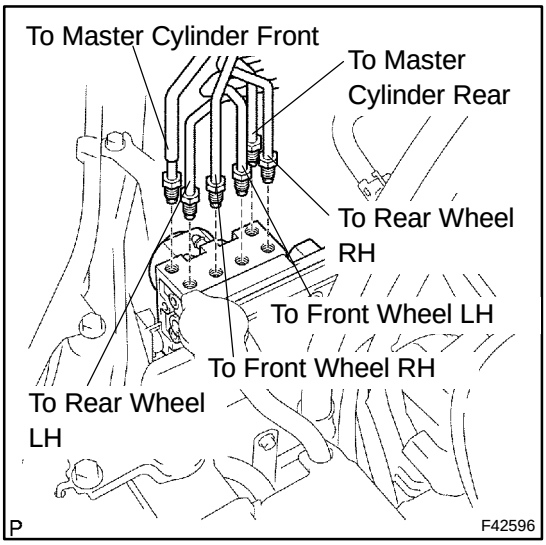
4. REMOVE BRAKE ACTUATOR WITH BRACKET

(a) LHD steering position type:
Disconnect the connector and remove the bolt.

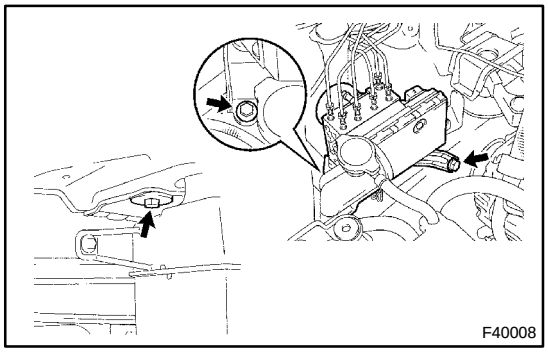
(b) Turn the latch of the actuator connector to disconnect the connector.



(c) Using SST, disconnect the brake tubes from the brake actuator.
SST 09023-00100



(d) Use tags or make a memo to identify the place to reconnect.



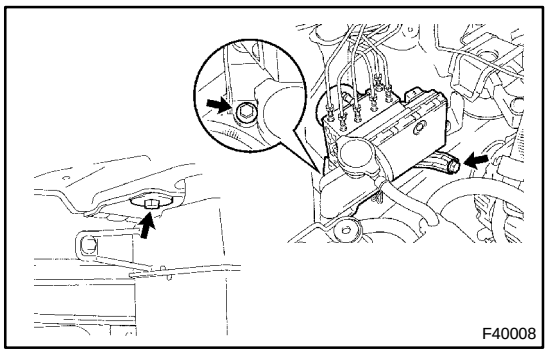
(e) Remove the nut, 2 bolts and brake actuator with bracket.

5. REMOVE BRAKE ACTUATOR ASSY

(a) Remove the 3 bolts and brake actuator from the bracket.

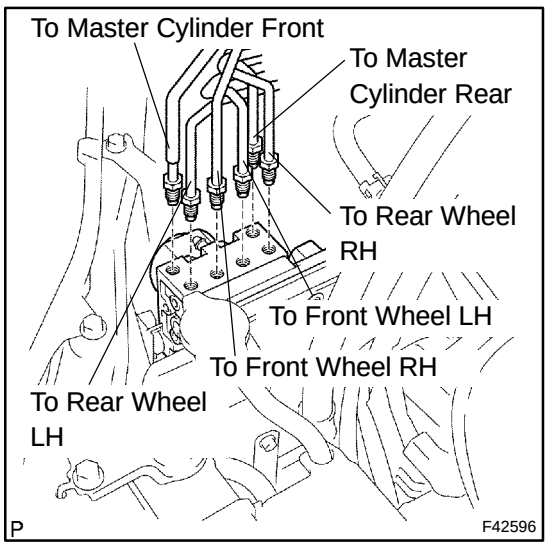
6. INSTALL BRAKE ACTUATOR ASSY

(a) Install the brake actuator with the 3 bolts to the bracket.
Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)



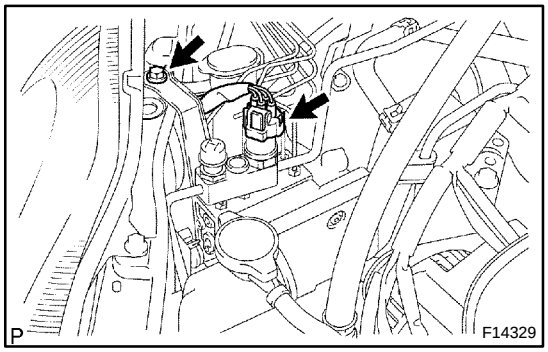
7. INSTALL BRAKE ACTUATOR WITH BRACKET

(a) Install the brake actuator with bracket with the nut and 2 bolts.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



(b) Using SST, connect each brake line to the correct position of brake actuator, as shown in the illustration.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

(c) Connect the brake actuator connector.



(d) LHD steering position type:
Install the bolt and connect the connector.

8. INSTALL FRONT FENDER LINER RH

9. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

10. FILL RESERVOIR WITH BRAKE FLUID

11. BLEED MASTER CYLINDER **(See page 32-5)**
SST 09023-00100

12. BLEED BRAKE LINE **(See page 32-6)**

13. CHECK FLUID LEVEL IN RESERVOIR

14. CHECK BRAKE FLUID LEAKAGE

15. CHECK BRAKE ACTUATOR WITH HAND-HELD TESTER

BRAKE ACTUATOR ASSY (TMUK MADE)

3201N-05

ON-VEHICLE INSPECTION

1. CONNECT HAND-HELD TESTER:

(a) Connect the hand-held tester to the DLC3.

(b) Start the engine and run it at idle.

(c) Select the ACTIVE TEST mode on the hand-held tester.

HINT:

Please refer to the hand-held tester operator's manual for further details.

2. INSPECT ACTUATOR MOTOR OPERATION

(a) With the motor relay ON, check the actuator motor operation noise.

(b) Turn the motor relay to OFF.

(c) Depress the brake pedal and hold it for about 15 seconds. Check that the brake pedal cannot be depressed.

(d) With the motor relay ON, check that the pedal does not pulsate.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval more than 20 seconds.

(e) Turn the motor relay to OFF and release the brake pedal.

3. INSPECT RIGHT FRONT WHEEL OPERATION

NOTICE:

Never turn ON the solenoid which is not described below.

(a) With the brake pedal depressed, perform the following operations.

(b) Turn the SFRH and SFRR solenoid to ON simultaneously, and check that the pedal cannot be depressed.

NOTICE:

Do not keep solenoid ON for more than 10 seconds continuously. When operating it continuously, set the interval more than 20 seconds.

(c) Turn the SFRH and SFRR solenoid to OFF simultaneously, and check that the pedal can be depressed.

(d) Turn the motor relay ON, and check that the pedal returns.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval more than 20 seconds.

(e) Turn the motor relay to OFF and release the brake pedal.

4. INSPECT OTHER WHEEL OPERATION

(a) As the same procedure, check the solenoids of other wheels.

HINT:

Left front wheel: SFLH, SFLR

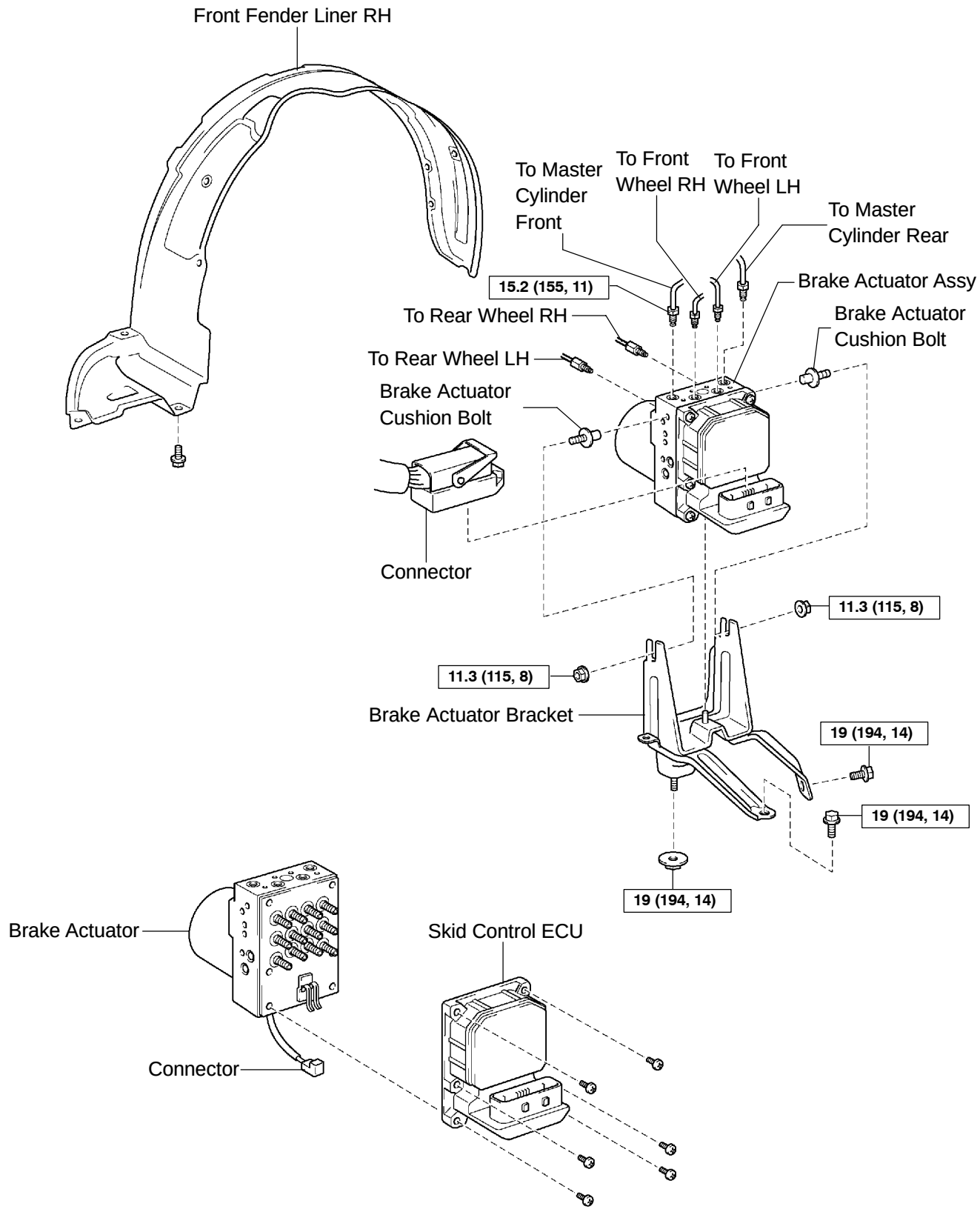
Right rear wheel: SRRH, SRRR

Left rear wheel: SRLH, SRLR

320GH-01

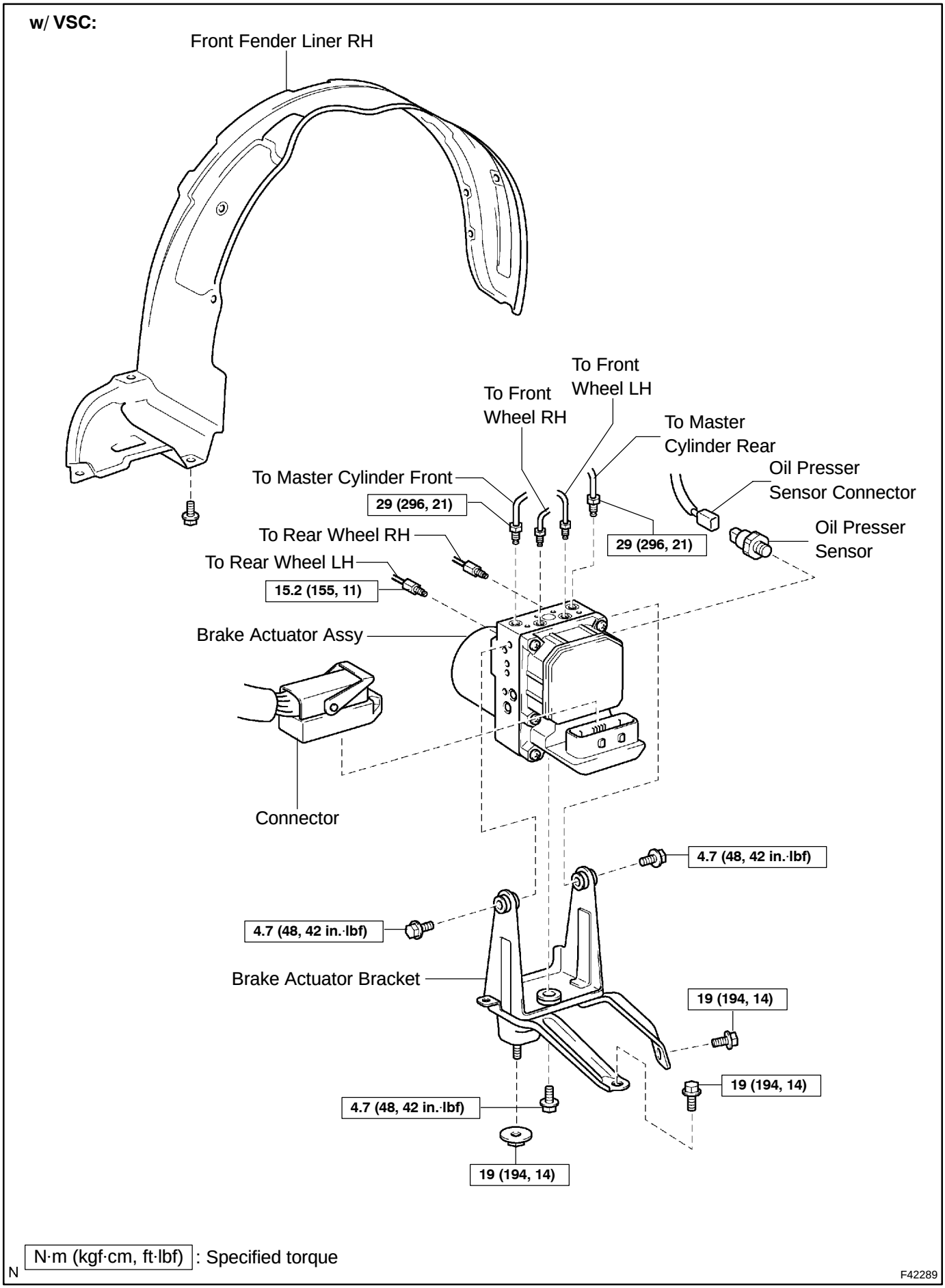
COMPONENTS

w/ ABS:



N·m (kgf·cm, ft·lbf) : Specified torque

F42598


w/ VSC:
Front Fender Liner RH
To Front Wheel LH
To Front Wheel RH
To Master Cylinder Rear
Oil Presser Sensor Connector
To Master Cylinder Front
29 (296, 21)
29 (296, 21)
Oil Presser Sensor
To Rear Wheel RH
To Rear Wheel LH
15.2 (155, 11)
Brake Actuator Assy
Connector
4.7 (48, 42 in.·lbf)
4.7 (48, 42 in.·lbf)
Brake Actuator Bracket
19 (194, 14)
19 (194, 14)
4.7 (48, 42 in.·lbf)
19 (194, 14)
N·m (kgf·cm, ft·lbf) : Specified torque
N
F42289

REPLACEMENT

1. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surfaces.

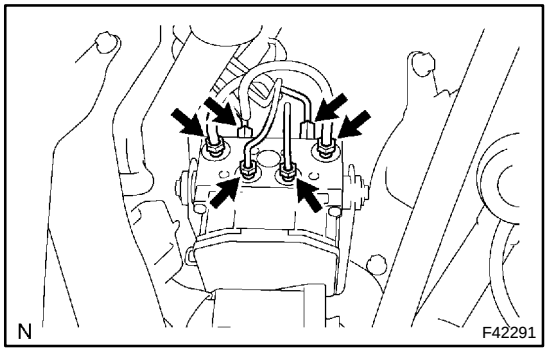
2. REMOVE FRONT WHEEL RH

3. REMOVE FRONT FENDER LINER RH

4. REMOVE BRAKE ACTUATOR WITH BRACKET

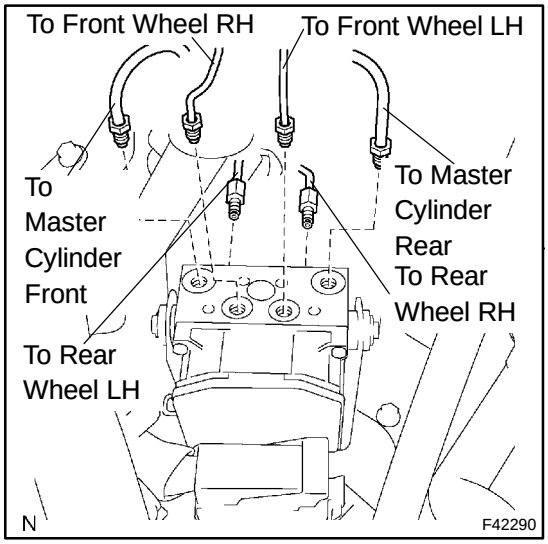
(a) Turn the latch of the actuator connector to disconnect the connector.

(b) w/ VSC:
Disconnect oil presser sensor connector.

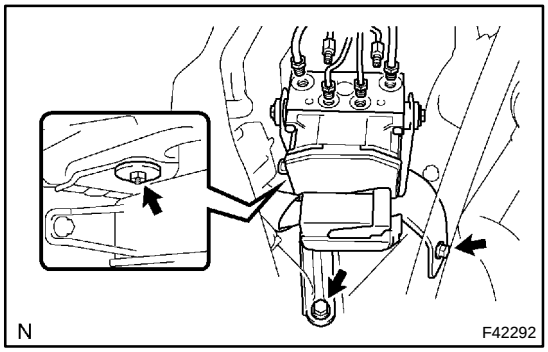


(c) w/ ABS:
Using SST, disconnect the brake tubes from the brake actuator.
SST 09023-00100

(d) w/ VSC:
Using SST, disconnect the brake tubes from the brake actuator.
SST 09023-00100, 09023-38400



(e) Use tags or make a memo to identify the place to reconnect.



(f) Remove the nut, 2 bolts and brake actuator with bracket.

5. REMOVE BRAKE ACTUATOR ASSY (W/ ABS)

(a) Remove the 2 nuts and brake actuator from the bracket.
(b) Remove the 2 brake actuator cushion bolts from the brake actuator.

6. REMOVE BRAKE ACTUATOR ASSY (W/ VSC)

(a) Remove the 3 bolts and brake actuator from the bracket.

7. REMOVE SKID CONTROL ECU ASSY (W/ ABS)

(a) Disconnect the connector from the skid control ECU.
(b) Using a torx driver (T20), remove the 6 screws, and remove the skid control ECU from the brake actuator.

8. REMOVE OIL PRESSURE SENSOR (W/ VSC)

9. INSTALL OIL PRESSURE SENSOR (W/ VSC)

10. INSTALL SKID CONTROL ECU ASSY (W/ ABS)

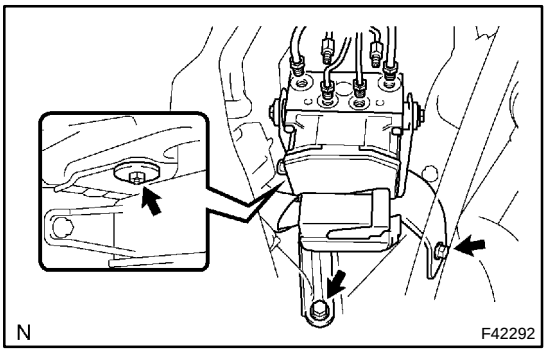
(a) Install the skid control ECU and 6 screws with torx driver (T20).
(b) Connect the connector to the skid control ECU.

11. INSTALL BRAKE ACTUATOR ASSY (W/ ABS)

(a) Install the brake actuator with the 2 nuts to the bracket.
Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)

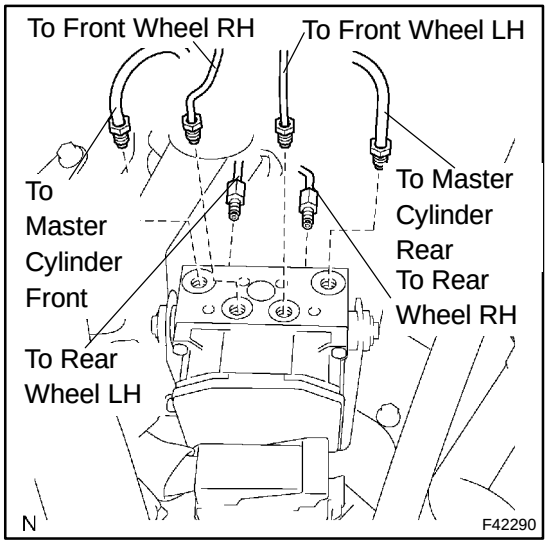
12. INSTALL BRAKE ACTUATOR ASSY (W/ VSC)

(a) Install the brake actuator with 3 bolts to the bracket.
Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)

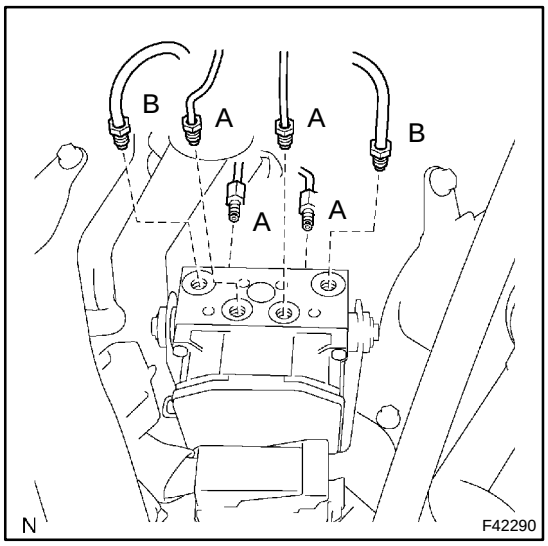


13. INSTALL BRAKE ACTUATOR WITH BRACKET

(a) Install the brake actuator with bracket with the nut and 2 bolts.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



(b) w/ ABS:
Using SST, connect each brake line to the correct position of brake actuator, as shown in the illustration.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)



(c) w/ VSC:
Using SST, connect each brake line to the correct position of brake actuator, as shown in the illustration.
SST 09023-00100, 09023-38400
Torque:
A: 15.2 N·m (155 kgf·cm, 11 ft·lbf)
B: 29 N·m (296 kgf·cm, 21 ft·lbf)

(d) w/ VSC:
Connect the oil presser sensor connector.

(e) Connect the brake actuator connector.

14. INSTALL FRONT FENDER LINER RH

15. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

16. FILL RESERVOIR WITH BRAKE FLUID

17. BLEED MASTER CYLINDER (W/ ABS) **(See page 32-5)**
SST 09023-00100

18. BLEED MASTER CYLINDER (W/ VSC) **(See page 32-5)**
SST 09023-38400

19. BLEED BRAKE LINE **(See page 32-6)**

20. CHECK FLUID LEVEL IN RESERVOIR

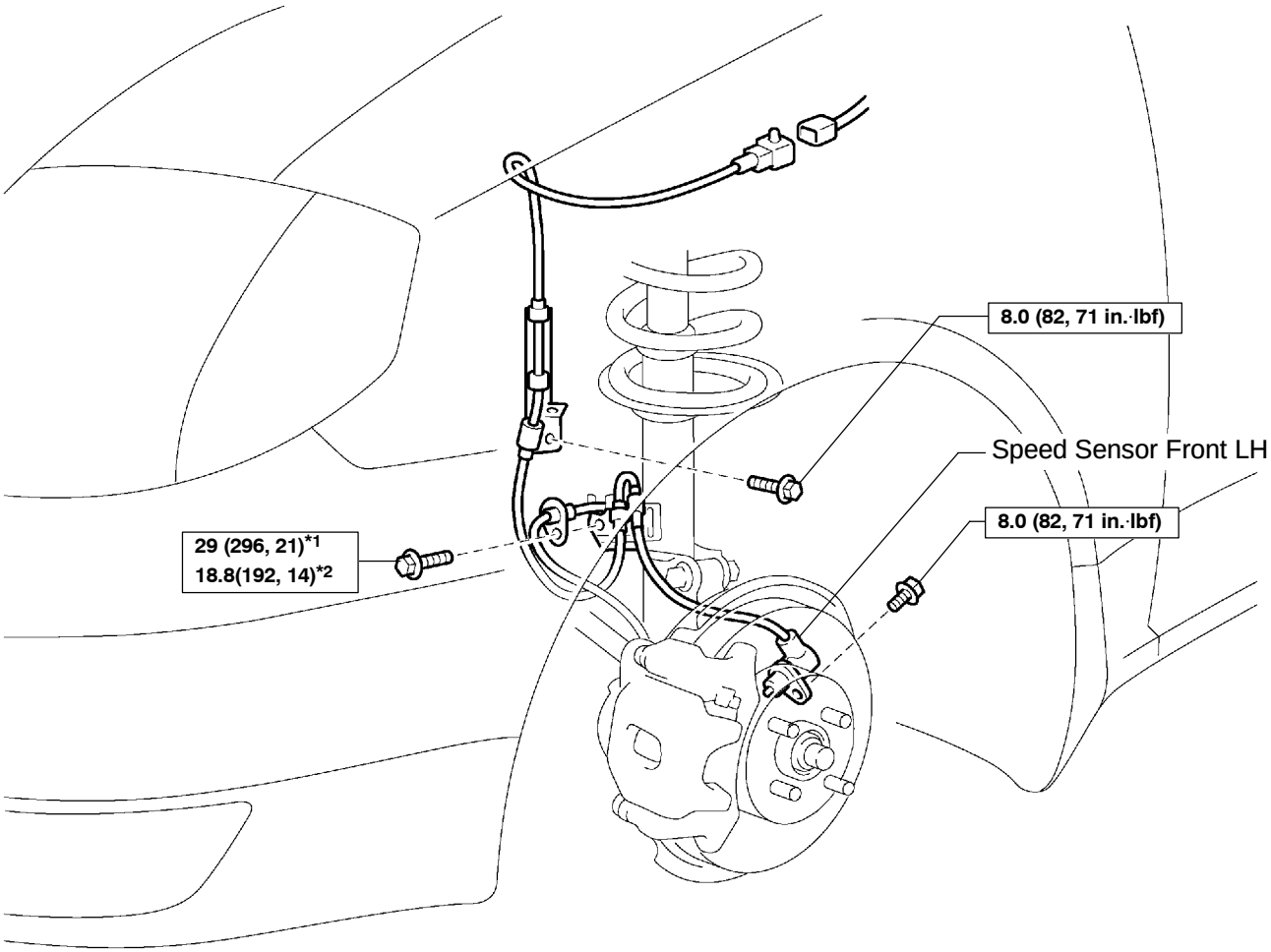
21. CHECK BRAKE FLUID LEAKAGE

22. CHECK BRAKE ACTUATOR WITH HAND-HELD TESTER

SPEED SENSOR FRONT LH

COMPONENTS

320GJ-01



N·m (kgf·cm, ft·lbf) : Specified torque
*1 TMC made:
*2 TMUK made:

N

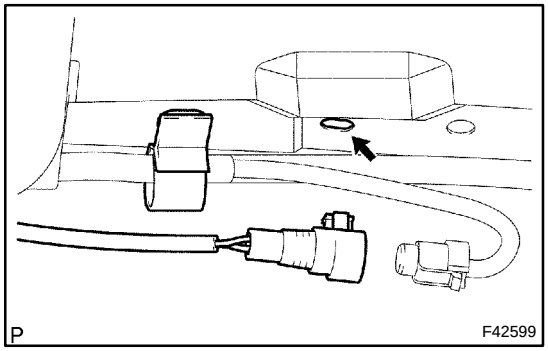
F42621

REPLACEMENT

HINT:

Replace of the RH side is the same procedures as the LH side.

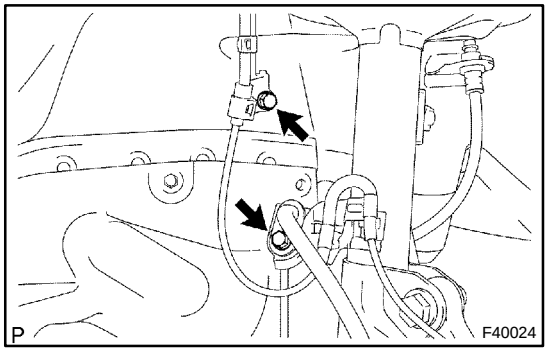
1. **REMOVE FRONT WHEEL**
2. **REMOVE FRONT FENDER LINER LH**



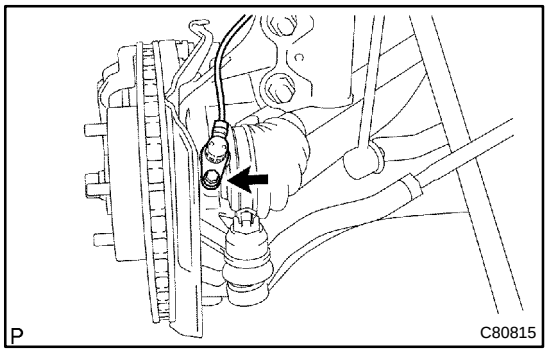
3. **REMOVE SPEED SENSOR FRONT LH**

(a) Disconnect the resin clip and speed sensor wire harness from the body and clamp.

(b) Disconnect the speed sensor connector.



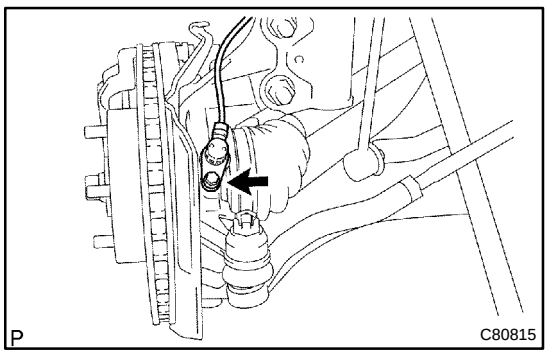
(c) Remove the 2 clamp bolts holding the sensor harness from the body and shock absorber.



(d) Remove the bolt and speed sensor front LH.

NOTICE:

Make sure the sensor tip is clean.



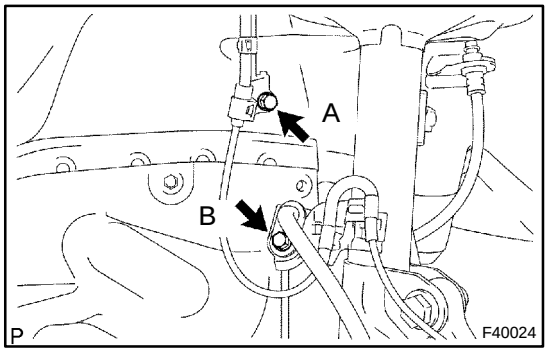
4. **INSTALL SPEED SENSOR FRONT LH**

(a) Install the speed sensor front LH with the bolt.

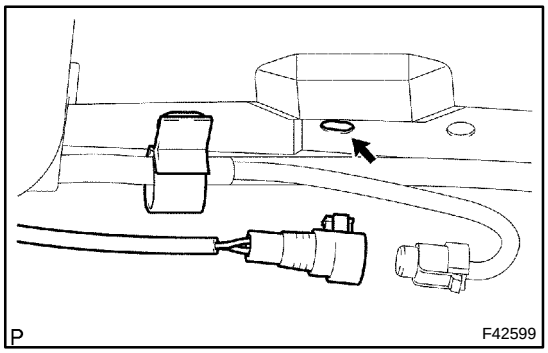
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

NOTICE:

Make sure the sensor tip is clean.



(b) Install the sensor harness clamp with the 2 bolts "A" and "B" to the body and shock absorber.
Torque:
TMC made:
Bolt A: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
Bolt B: 29 N·m (296 kgf·cm, 21 ft·lbf)
TMUK made:
Bolt A: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
Bolt B: 18.8 N·m (192 kgf·cm, 14 ft·lbf)



(c) Connect the speed sensor connector.
(d) Connect the resin clip and speed sensor wire harness to the body and clamp.

5. INSTALL FRONT FENDER LINER LH

6. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

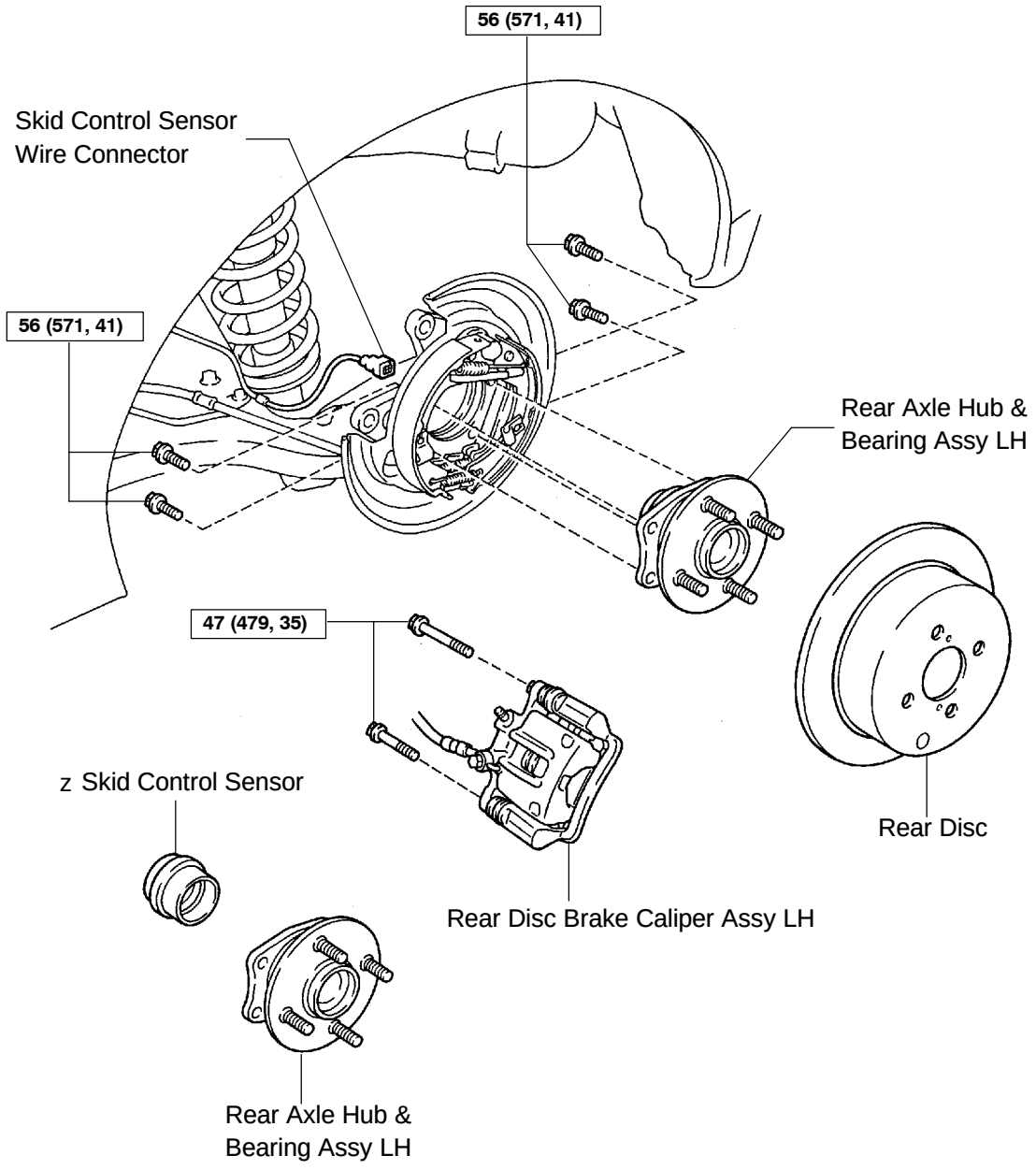
7. CHECK ABS SPEED SENSOR SIGNAL (W/ ABS)
TMC Made: See page 05-565
TMUK Made: See page 05-618

8. CHECK ABS SPEED SENSOR SIGNAL (W/ VSC) (See page 05-673)

SKID CONTROL SENSOR

COMPONENTS

320GK-01



N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part

N F41738

F42645

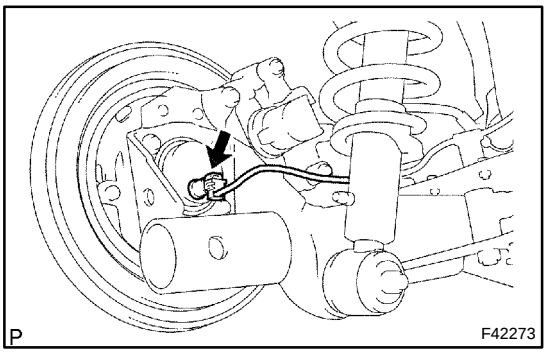
3201Q-02

REPLACEMENT

HINT:

Replace of the RH side is the same procedures as the LH side.

1. REMOVE REAR WHEEL



2. DISCONNECT SKID CONTROL SENSOR WIRE

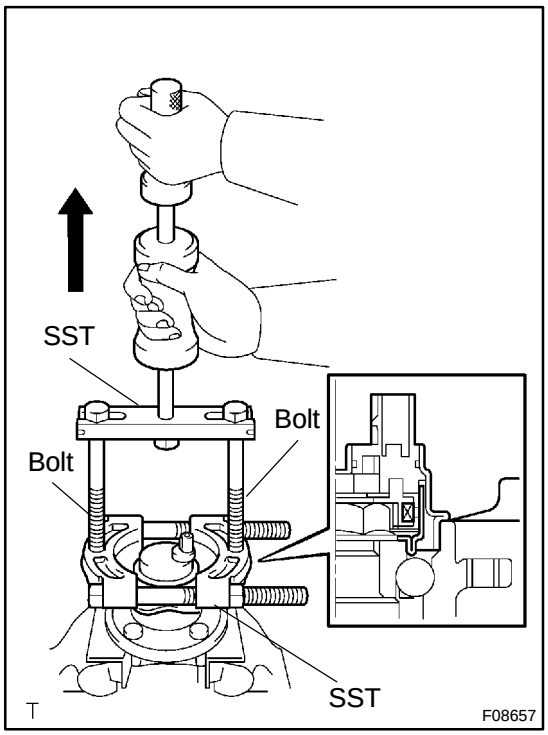
(a) Disconnect the connector from the skid control sensor.

3. REMOVE REAR DISC BRAKE CALIPER ASSY LH

4. REMOVE REAR DISC

5. REMOVE REAR AXLE HUB & BEARING ASSY LH

(See page 30-41)



6. REMOVE SKID CONTROL SENSOR

(a) Mount the rear axle hub in a soft jaw vise.

NOTICE:

Replace the axle hub assembly if it is dropped or it receives a strong shock.

(b) Using a pin punch and hammer, drive out the 2 pins and remove the 2 attachments from SST.

(c) Using SST and 2 bolts (Diameter: 12 mm, pitch: 1.5 mm), remove the skid control sensor from the rear axle hub.

SST 09520-00031 (09520-00040), 09521-00020, 09950-00020

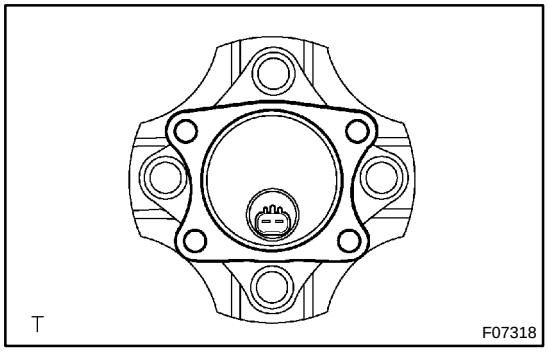
NOTICE:

- **If a damage is inflicted to the sensor rotor, replace the axle hub assembly.**
- **Do not scratch the contacting surface of axle hub and speed sensor.**

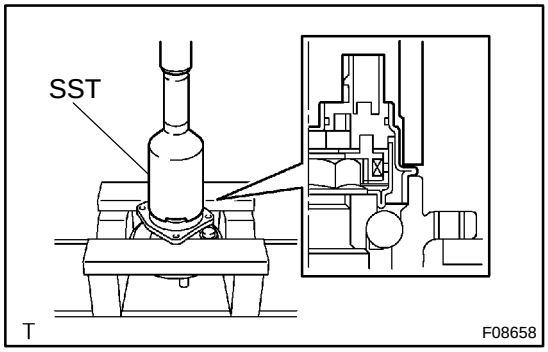
7. INSTALL SKID CONTROL SENSOR

(a) Clean the contacting surface of the axle hub and that of a new skid control sensor.

NOTICE:
Make sure the sensor rotor is clean.



(b) Place the speed sensor on the axle hub so that the connector comes into the most downward position under the on vehicle condition.



(c) Using SST and a press, install the skid control sensor to the axle hub.
SST 09214-76011

NOTICE:
- **Do not tap the skid control sensor with a hammer directly.**
- **Check that there is no foreign matter on the skid control sensor detection portion.**
- **Press in the skid control sensor straight and slowly.**

8. INSTALL REAR AXLE HUB & BEARING ASSY LH
(See page 30-41)
9. INSTALL REAR DISC

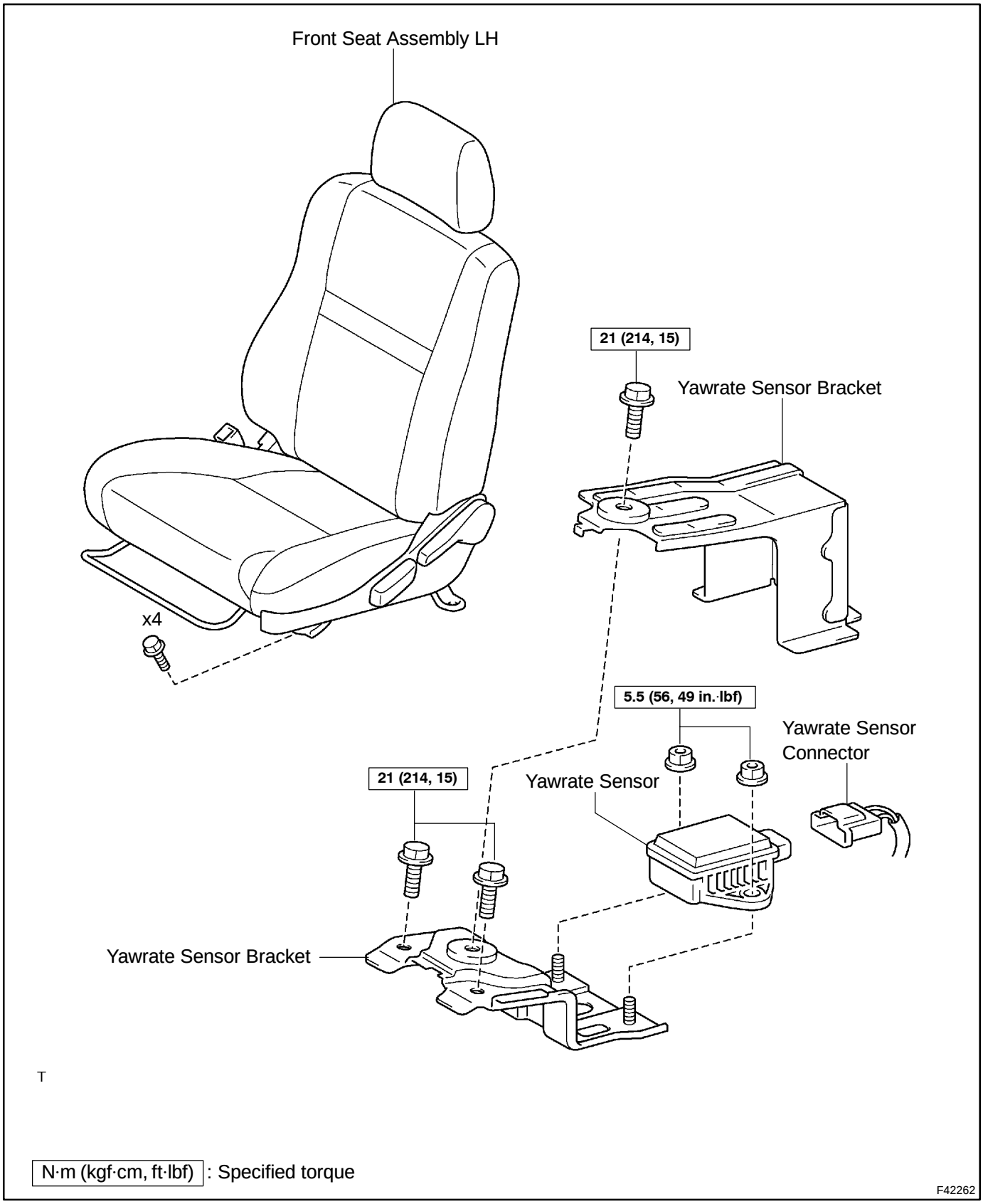
10. INSTALL REAR DISC BRAKE CALIPER ASSY LH
11. CONNECT SKID CONTROL SENSOR WIRE

12. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
13. INSPECT AND ADJUST REAR WHEEL ALIGNMENT
14. CHECK ABS SPEED SENSOR SIGNAL (W/ ABS)
TMC Made: See page 05-565
TMUK Made: See page 05-618
15. CHECK ABS SPEED SENSOR SIGNAL (W/ VSC) (See page 05-673)

YAWRATE SENSOR (w/ VSC)

COMPONENTS

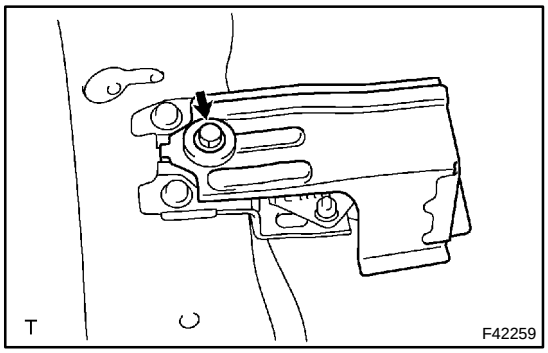
320GL-01



320GM-01

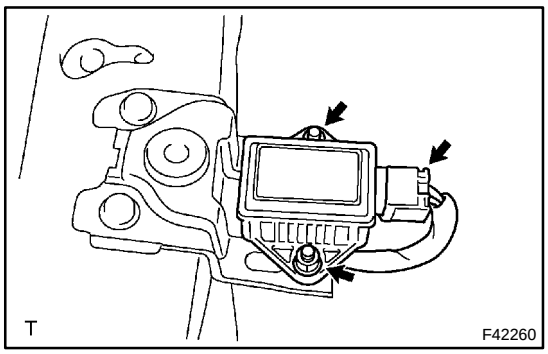
REPLACEMENT

1. REMOVE FRONT SEAT ASSEMBLY LH **(See page 72-8)**



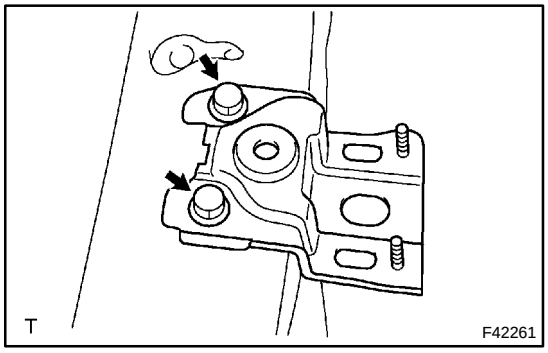
2. REMOVE YAWRATE SENSOR BRACKET

(a) Remove the bolt and upper side yawrate sensor bracket.



3. REMOVE YAWRATE SENSOR

(a) Disconnect the yawrate sensor connector from the yawrate sensor, then remove the 2 nuts and yawrate sensor from the yawrate sensor bracket.

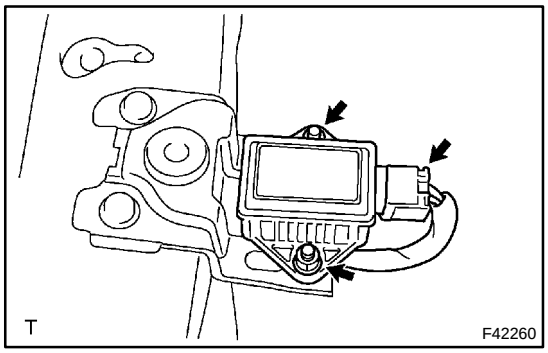


4. REMOVE YAWRATE SENSOR BRACKET

(a) Remove the 2 bolts and bottom side yawrate sensor bracket.

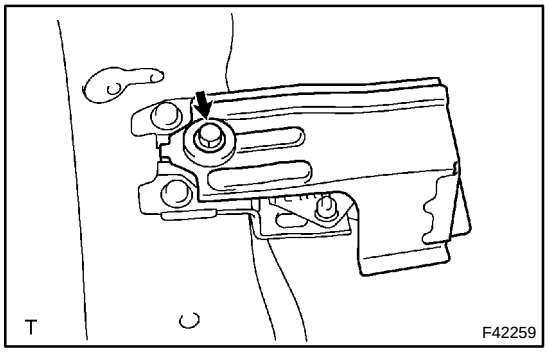
5. INSTALL YAWRATE SENSOR BRACKET

(a) Install the 2 bolts and bottom side yawrate sensor bracket.
Torque: 21 N·m (214 ft·lbf, 15 ft·lbf)



6. INSTALL YAWRATE SENSOR

(a) Install the 2 nuts and yawrate sensor to the yawrate sensor bracket, then connect the yawrate sensor connector to the yawrate sensor.
Torque: 5.5 N·m (56 ft·lbf, 49 in.·lbf)



7. INSTALL YAWRATE SENSOR BRACKET

(a) Install the bolt and upper side yawrate sensor bracket.
Torque: 21 N·m (214 ft·lbf, 15 ft·lbf)

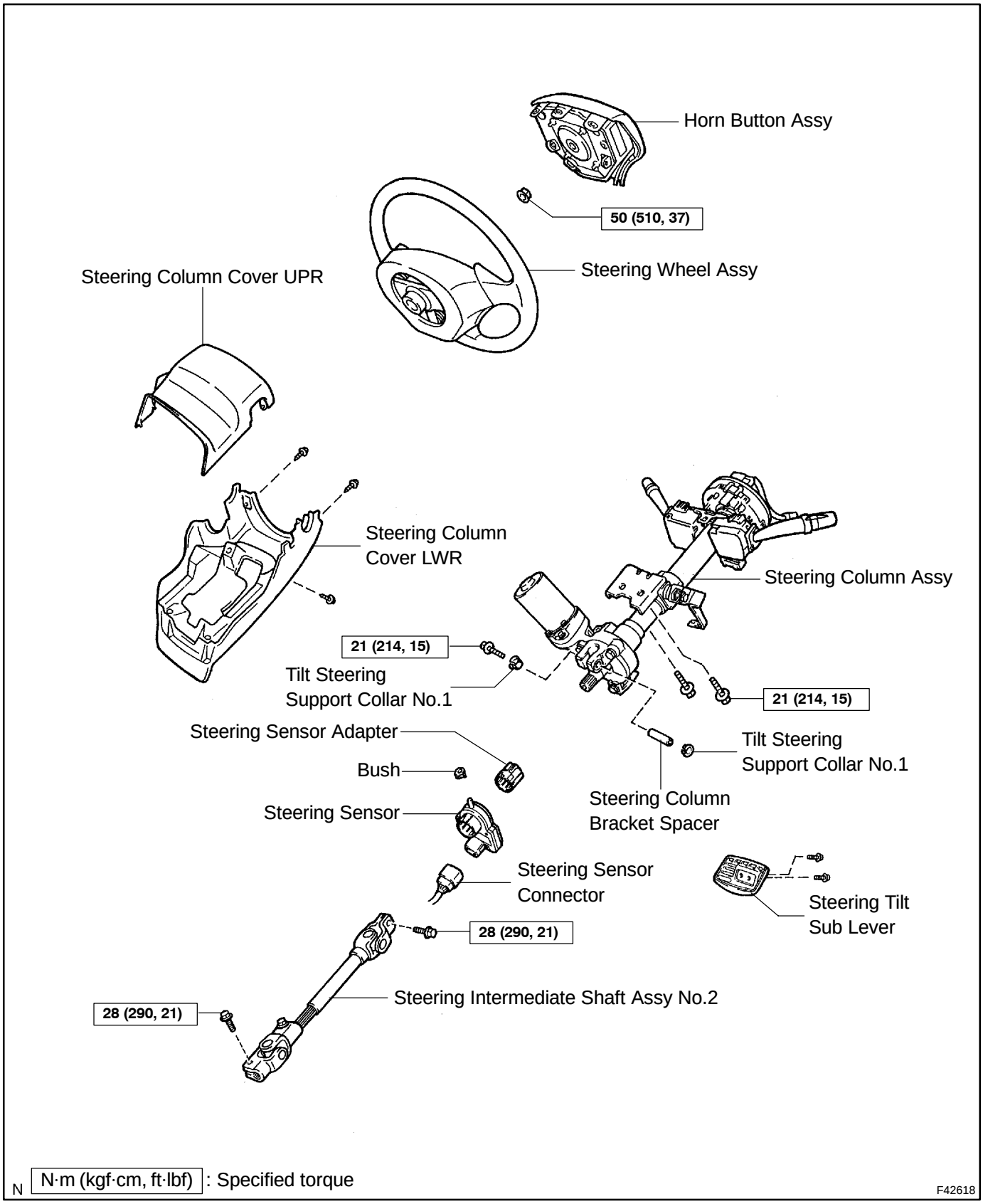
8. INSTALL FRONT SEAT ASSEMBLY LH **(See page 72-10)**

9. PERFORM YAWRATE SENSOR ZERO POINT CALIBRATION **(See page 05-666)**

STEERING SENSOR (w/ VSC)

COMPONENTS

320G4-01



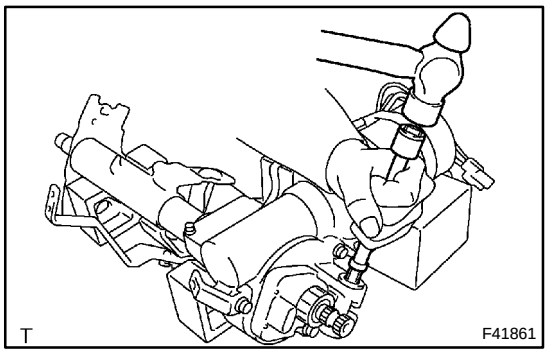
320G5-01

REPLACEMENT

1. PRECAUTION (See page 60-1)
2. DISCONNECT BATTERY NEGATIVE TERMINAL (See page 60-1)
3. REMOVE PLACE FRONT WHEELS FACING STRAIGHT AHEAD (See page 60-22)
4. REMOVE HORN BUTTON ASSY (See page 60-13)
5. REMOVE STEERING WHEEL ASSY (See page 50-8)
6. REMOVE STEERING COLUMN COVER UPR (See page 50-7)
7. REMOVE STEERING COLUMN COVER LWR (See page 50-7)
8. REMOVE STEERING COLUMN ASSY (See page 50-9)
9. REMOVE STEERING INTERMEDIATE SHAFT ASSY NO.2 (See page 50-10)

10. REMOVE STEERING SENSOR

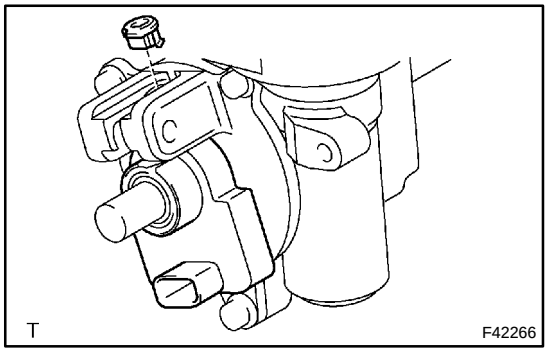
(a) Place the steering column assy on the V-blocks and rubber stick.



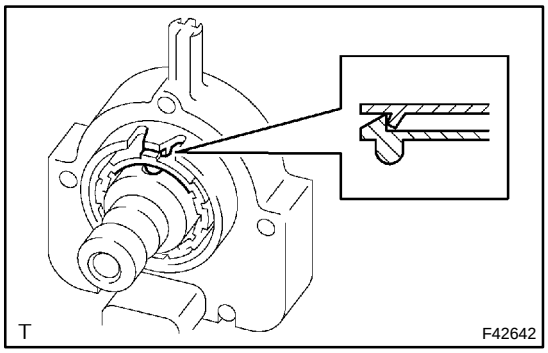
(b) Using a extension bar and hammer, remove the steering column bracket spacer and 2 tilt steering support collar No.1 from the steering column assy.

NOTICE:

- **During this procedure, do not give the strong shock to the EMPS motor body, wire harness and steering sensor.**
- **Do not apply any oil or grease on the bushes and pin.**

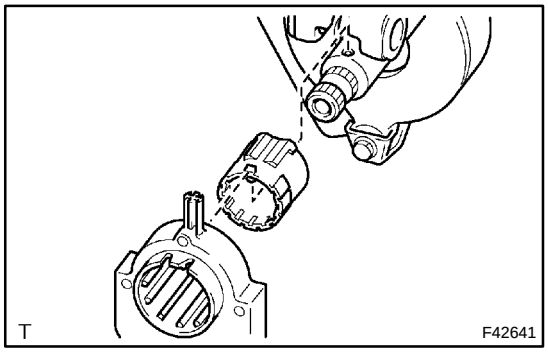


(c) Using a screwdriver, remove the bush from the steering column assy.



(d) Disconnect the pick on the steering sensor and steering sensor adapter, then remove the steering sensor from the column shaft.

(e) Remove the steering sensor adapter.

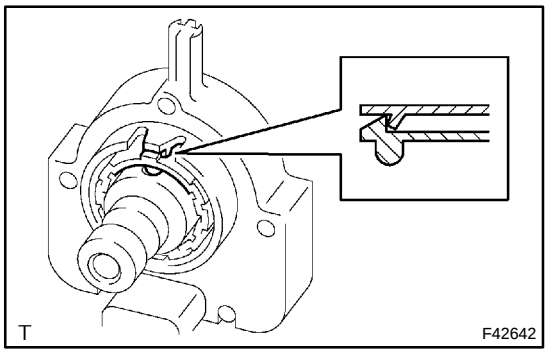


11. INSTALL STEERING SENSOR

(a) Install the steering sensor adapter to the column shaft.

HINT:

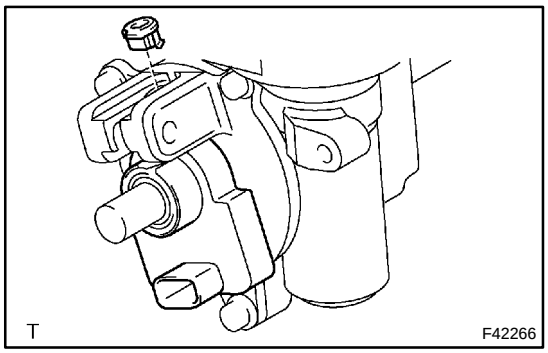
At that time, the projection of the steering sensor adapter should be fit to the hole on the steering column shaft.



(b) Install the steering sensor to the column shaft.

HINT:

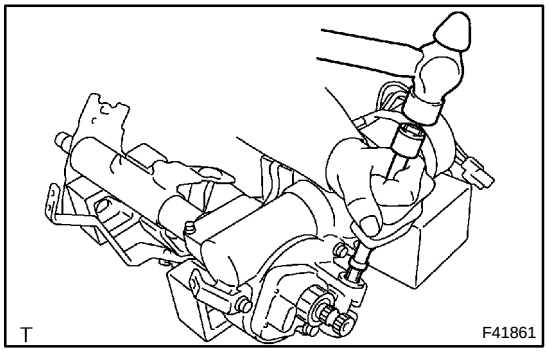
- At that time, the pick of the steering sensor should be fit to the pick of the steering sensor adapter.
- After installation, make sure the steering sensor lock securely in the steering sensor adapter.



(c) Install the bush to the steering sensor.

(d) Place the steering column assy on the V-blocks and rubber stick.

(e) Install the 2 new tilt steering support collar No.1 to the steering column assy.



(f) Using a extension bar and hammer, install the steering column bracket spacer to the steering column assy.

NOTICE:

- **During this procedure, do not give the strong shock to the EMPS motor body, wire harness and steering sensor.**
- **Do not apply any grease or oil on the pin and bush.**

12. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2
(See page 50-12)

13. INSTALL STEERING COLUMN ASSY
(See page 50-12)

14. INSTALL SPIRAL CABLE SUB-ASSY
(See page 60-22)

15. INSTALL STEERING COLUMN COVER LWR (See page 50-7)

16. INSTALL STEERING COLUMN COVER UPR (See page 50-7)

17. INSTALL STEERING WHEEL ASSY
(See page 50-15)

18. INSPECT STEERING WHEEL CENTER POINT
19. INSTALL HORN BUTTON ASSY
    (See page 60-13)
20. INSPECT SRS WARNING LIGHT (See page 05-942)
21. INSPECT ABS WARNING LIGHT AND VSC WARNING LIGHT (See page 05-666)

PARKING BRAKE

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COMPONENTS 33-3
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PARKING BRAKE ASSY (TMUK MADE) 33-23
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PARKING BRAKE SYSTEM

PROBLEM SYMPTOMS TABLE

3300E-04

Use the table below to help you find the cause of the problem. The numbers indicate the probability of the problems in descending order. Check each parts in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Brake drag	1. Parking brake lever travel (Out of adjustment)	33-2
	2. Parking brake wire (Sticking) TMC Made:	33-7
		33-10
	TMUK Made:	33-7
		33-14
	3. Parking brake shoe clearance (Out of adjustment)	
	TMC Made:	33-18
	TMUK Made:	33-24
	4. Parking brake shoe lining (Cracked or distorted)	
	TMC Made:	33-18
	TMUK Made:	33-24
	5. Tension or return spring (Damaged) TMC Made:	33-18
	TMUK Made:	33-24

3300F-04

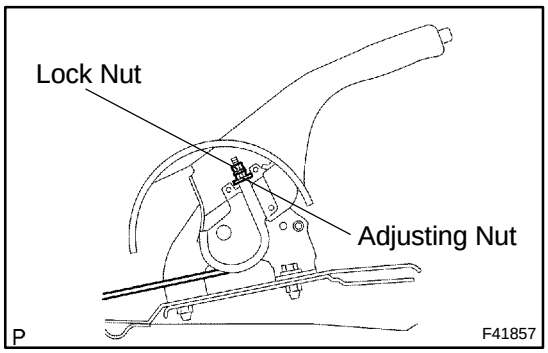
ADJUSTMENT

1. **REMOVE REAR WHEEL**
2. **ADJUST PARKING BRAKE SHOE CLEARANCE**
   TMC made: **See page 33-22**
   TMUK made: **See page 33-27**
3. **INSTALL REAR WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
4. **INSPECT PARKING BRAKE LEVER TRAVEL**

(a) Pull the parking brake lever all the way up, and count the number of clicks.
Parking brake lever travel: 6 - 9 clicks at 196 N (20 kgf, 44.1 lbf)

5. **ADJUST PARKING BRAKE LEVER TRAVEL**

(a) Remove the rear console box sub-assy.
Sedan/Station wagon type: See page 71-14
Hatchback type: See page 71-23



(b) Loosen the lock nut and turn the adjusting nut until the lever travel turns correct.

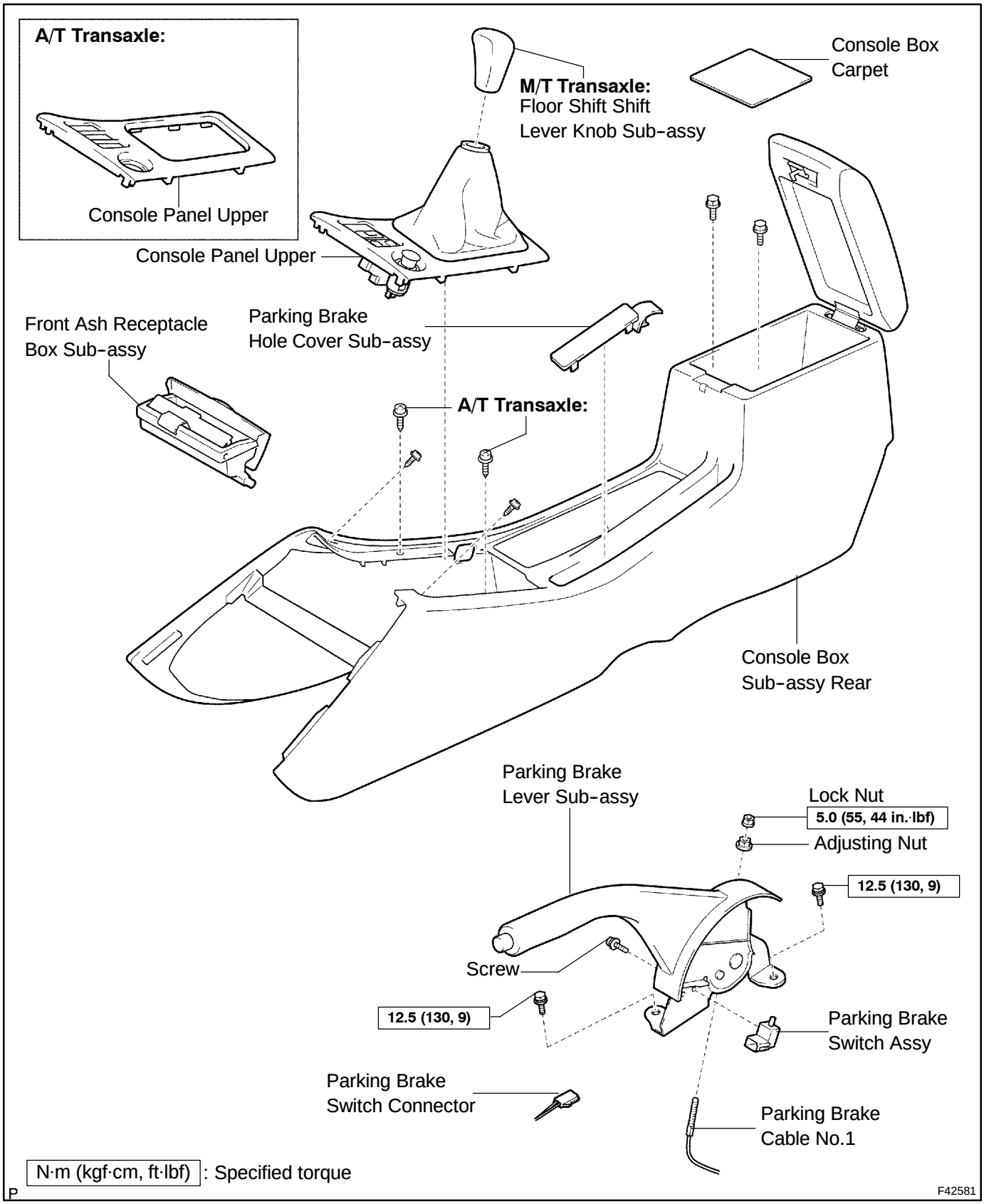
(c) Tighten the lock nut.
Torque: 5.0 N·m (55 kgf·cm, 44 in.·lbf)

(d) Install the rear console box sub-assy.
Sedan/Station wagon type: See page 71-14
Hatchback type: See page 71-23

PARKING BRAKE LEVER SUB-ASSY

COMPONENTS

33068-02

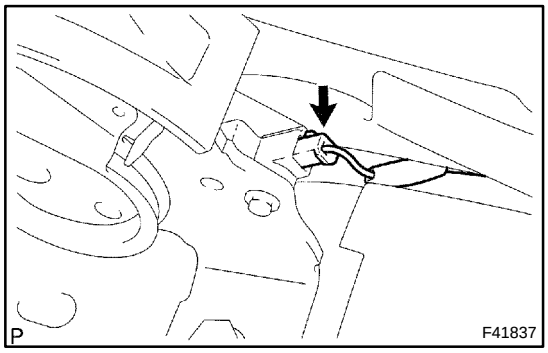


3306I-01

REPLACEMENT

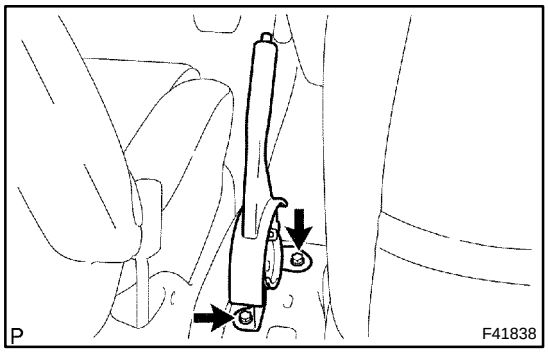
1. REMOVE CONSOLE BOX SUB-ASSY REAR

SEDAN/STATION WAGON TYPE: See page 71-19
HATCHBACK TYPE: See page 71-28

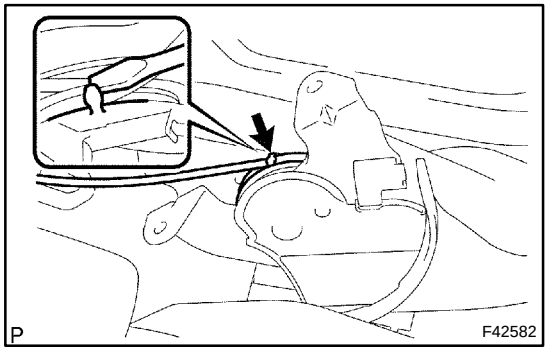


2. REMOVE PARKING BRAKE LEVER SUB-ASSY

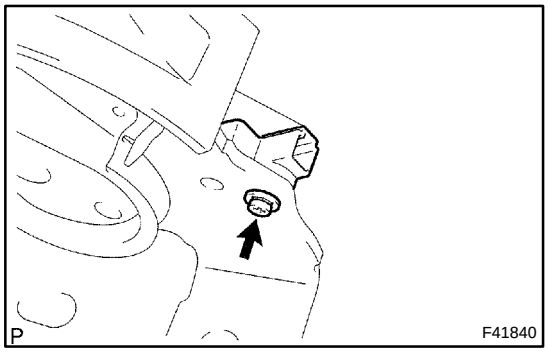
(a) Disconnect the parking brake switch connector from the parking brake switch.
(b) Remove the lock nut and adjusting nut from the parking brake cable assy No.1.



(c) Remove the 2 bolts.

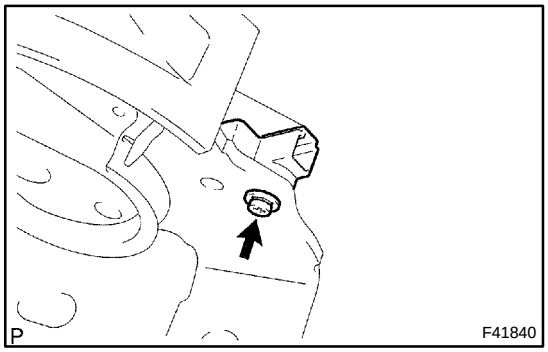


(d) Using a screwdriver, raise the pick on the parking brake lever, and disconnect the parking brake cable assy No.1 from the parking brake lever.
(e) Remove the parking brake lever from the body.



3. REMOVE PARKING BRAKE SWITCH ASSY

(a) Remove the screw and parking brake switch.

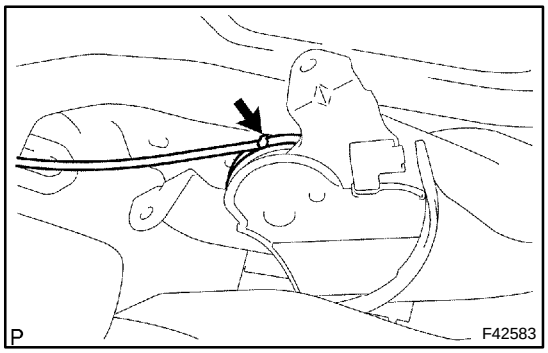


4. INSTALL PARKING BRAKE SWITCH ASSY

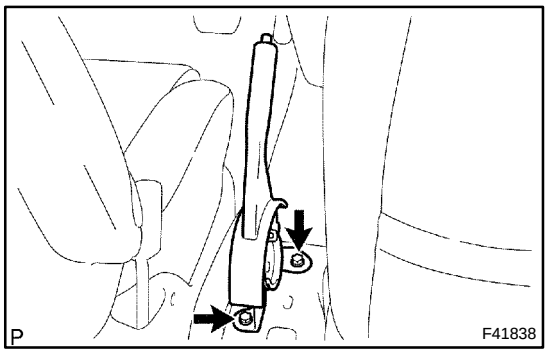
(a) Install the parking brake switch to the parking brake lever with the screw.

5. INSTALL PARKING BRAKE LEVER SUB-ASSY

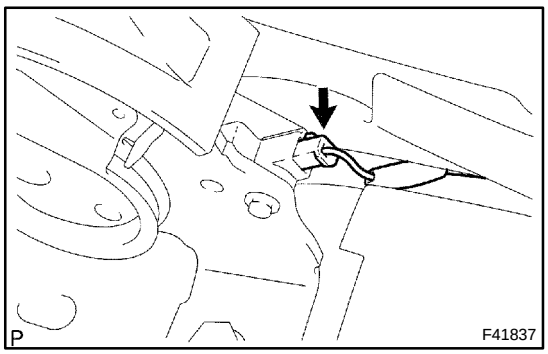
(a) Install the parking brake cable assy No.1 to the parking brake lever, temporally tighten the adjusting nut and lock nut.



(b) Using a screwdriver, fix the parking brake cable No.1 to the pick.



(c) Install the parking brake lever with the 2 bolts.
Torque: 12.5 N·m (130 kgf·cm, 9 ft·lbf)



(d) Connect the parking brake switch connector to the parking brake switch.

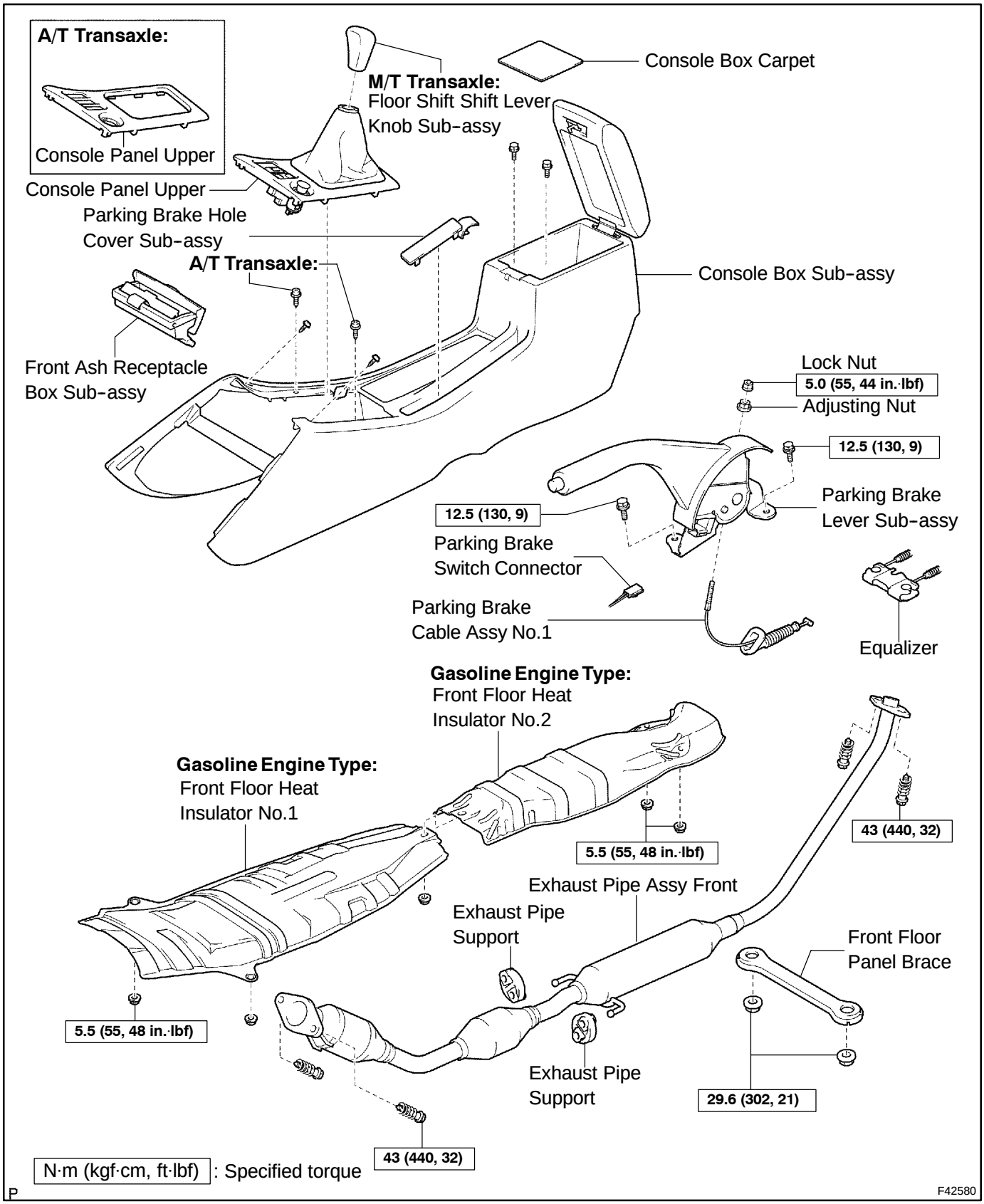
6. INSPECT PARKING BRAKE LEVER TRAVEL **(See page 33-2)**
7. ADJUST PARKING BRAKE LEVER TRAVEL **(See page 33-2)**
8. INSTALL CONSOLE BOX SUB-ASSY REAR

SEDAN/STATION WAGON TYPE: **See page 71-14**
HATCHBACK TYPE: **See page 71-23**

PARKING BRAKE CABLE ASSY NO.1

COMPONENTS

3306A-02



3306B-02

REPLACEMENT

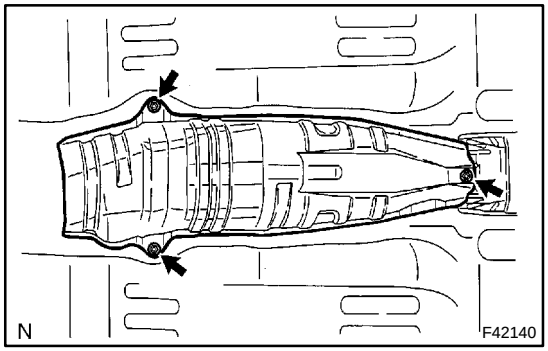
1. REMOVE CONSOLE BOX SUB-ASSY REAR

SEDAN/STATION WAGON TYPE: See page 71-19
HATCHBACK TYPE: See page 71-28

2. REMOVE PARKING BRAKE LEVER SUB-ASSY
(See page 33-4)

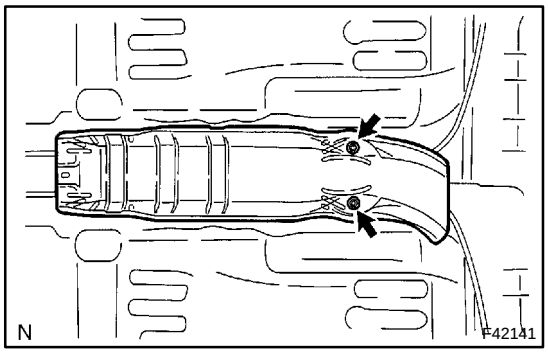
3. REMOVE EXHAUST PIPE ASSY FRONT

2ZZ-GE ENGINE TYPE: See page 15-2
3ZZ-FE/4ZZ-FE ENGINE TYPE: See page 15-5
1CD-FTV ENGINE TYPE: See page: 15-8



4. REMOVE FRONT FLOOR HEAT INSULATOR NO.1 (GASOLINE ENGINE TYPE)

(a) Remove the 3 nuts and front floor heat insulator No.1.



5. REMOVE FRONT FLOOR HEAT INSULATOR NO.2 (GASOLINE ENGINE TYPE)

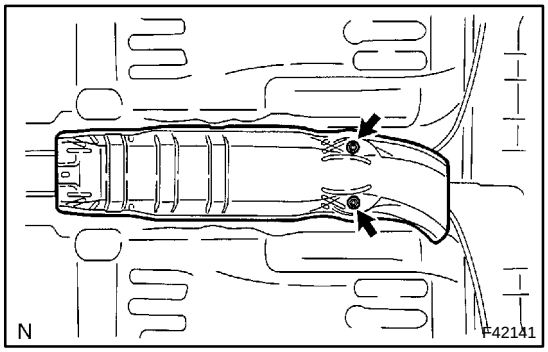
(a) Remove the 2 nuts and front floor heat insulator No.2.

6. REMOVE PARKING BRAKE CABLE ASSY NO.1

(a) Disconnect the parking brake cable assy No.1 from the equalizer and remove the parking brake cable assy No.1 from the body.

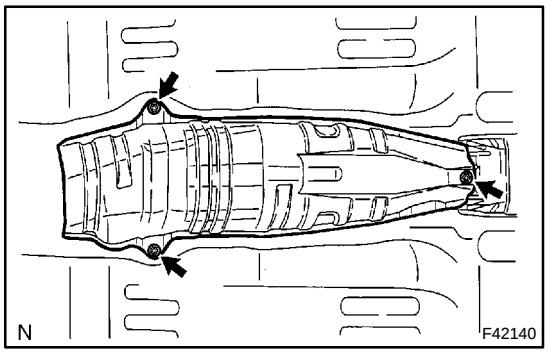
7. INSTALL PARKING BRAKE CABLE ASSY NO.1

(a) Connect the parking brake cable assy No.1 to the equalizer and install the parking brake cable assy No.1 to the body.



8. INSTALL FRONT FLOOR HEAT INSULATOR NO.2 (GASOLINE ENGINE TYPE)

(a) Install the front floor heat insulator No.2 with the 2 nuts.
Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)



9. INSTALL FRONT FLOOR HEAT INSULATOR NO.1 (GASOLINE ENGINE TYPE)

(a) Install the front floor heat insulator No.1 with the 3 nuts.
Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

10. INSTALL EXHAUST PIPE ASSY FRONT

2ZZ-GE ENGINE TYPE: See page 15-2
3ZZ-FE/4ZZ-FE ENGINE TYPE: See page 15-5
1CD-FTV ENGINE TYPE: See page: 15-8

11. INSTALL PARKING BRAKE LEVER SUB-ASSY (See page 33-5)

12. INSPECT PARKING BRAKE LEVER TRAVEL (See page 33-2)

13. ADJUST PARKING BRAKE LEVER TRAVEL (See page 33-2)

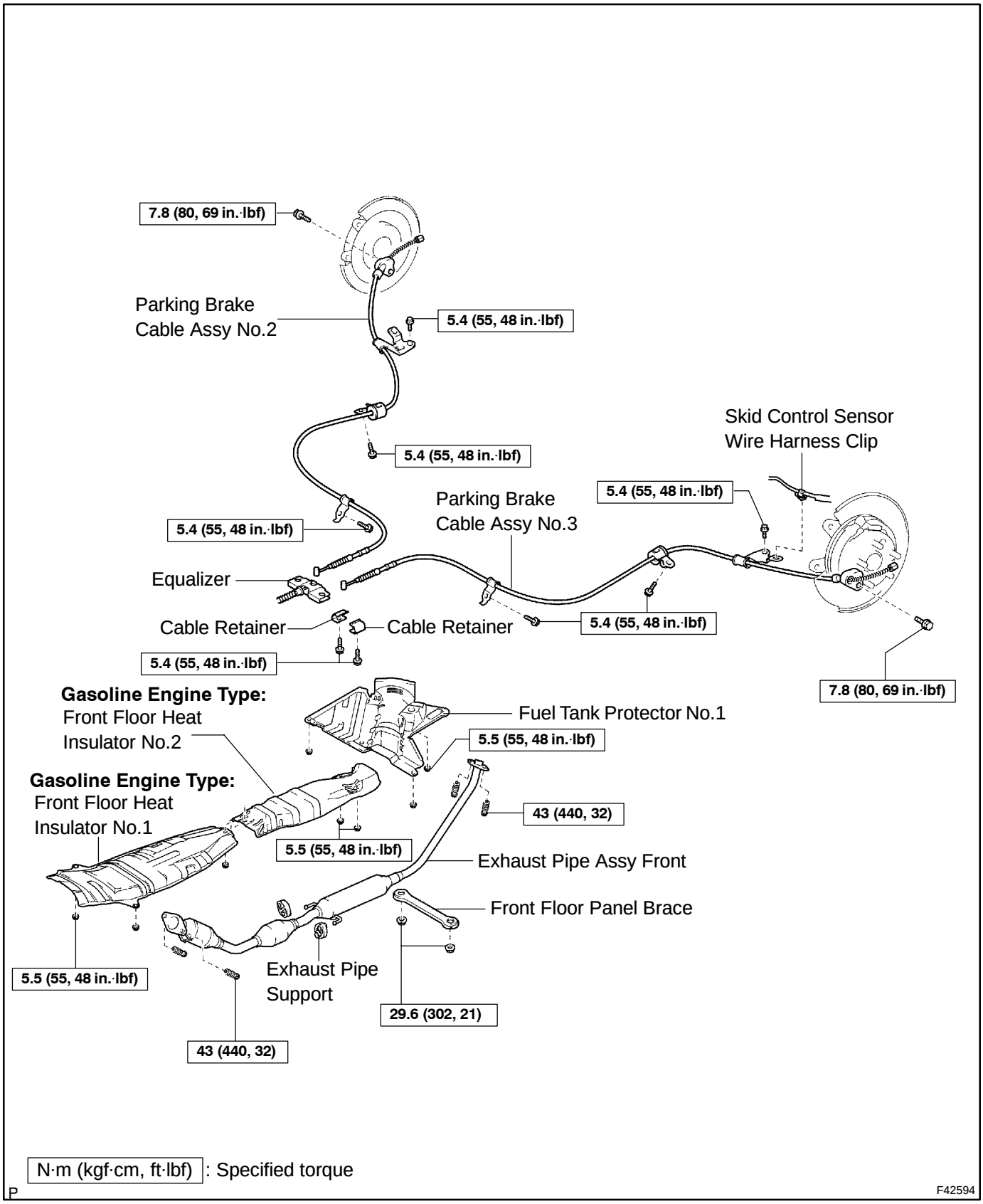
14. INSTALL CONSOLE BOX SUB-ASSY REAR

SEDAN/STATION WAGON TYPE: See page 71-14
HATCHBACK TYPE: See page 71-23

PARKING BRAKE CABLE ASSY NO.3 (TMC MADE)

COMPONENTS

3306C-02



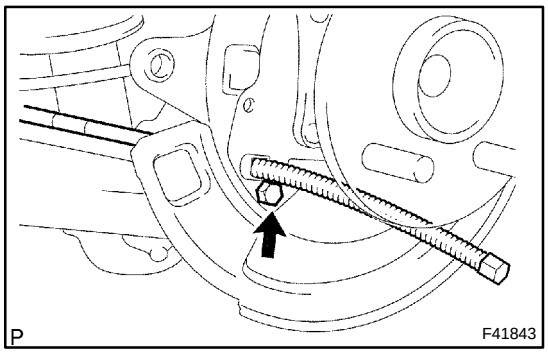
3306D-03

REPLACEMENT

HINT:

For parking brake cable assy No.2, perform the same procedure to the parking brake cable assy No.3.

1. **REMOVE REAR WHEEL**
2. **DISCONNECT REAR DISC BRAKE CALIPER ASSY LH** **(See page 32-68)**
3. **REMOVE REAR DISC**
   (See page 32-68)
4. **REMOVE PARKING BRAKE SHOE STRUT LH**
   (See page 33-18)
5. **REMOVE PARKING BRAKE SHOE ADJUSTING SCREW SET**
   (See page 33-18)
6. **REMOVE PARKING BRAKE SHOE ASSY LH NO.1**
   (See page 33-18)
   SST 09718-00010
7. **REMOVE PARKING BRAKE SHOE ASSY LH NO.2**
   (See page 33-19)
   SST 09718-00010
8. **REMOVE PARKING BRAKE SHOE LEVER LH**
   (See page 33-19)



9. **DISCONNECT PARKING BRAKE CABLE ASSY NO.3**

(a) Remove the bolt, and disconnect the parking brake cable assy No.3 from the backing plate.

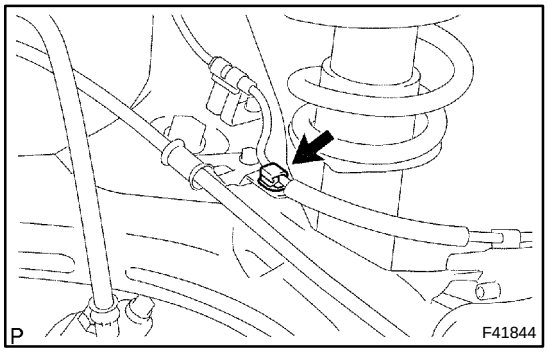
10. **REMOVE EXHAUST PIPE ASSY FRONT**

3ZZ-FE/4ZZ-FE ENGINE TYPE: **See page 15-5**
1CD-FTV ENGINE TYPE: **See page: 15-8**

11. **REMOVE FRONT FLOOR HEAT INSULATOR NO.1 (GASOLINE ENGINE TYPE)**
    (See page 33-7)
12. **REMOVE FRONT FLOOR HEAT INSULATOR NO.2 (GASOLINE ENGINE TYPE)**
    (See page 33-7)

13. **REMOVE PARKING BRAKE CABLE ASSY NO.3**

(a) Remove the 3 nuts and fuel tank protector No.1 (When replacing parking brake cable assy No.2).



(b) Using a clip remover, disconnect the skid control sensor wire harness clip from the clamp.

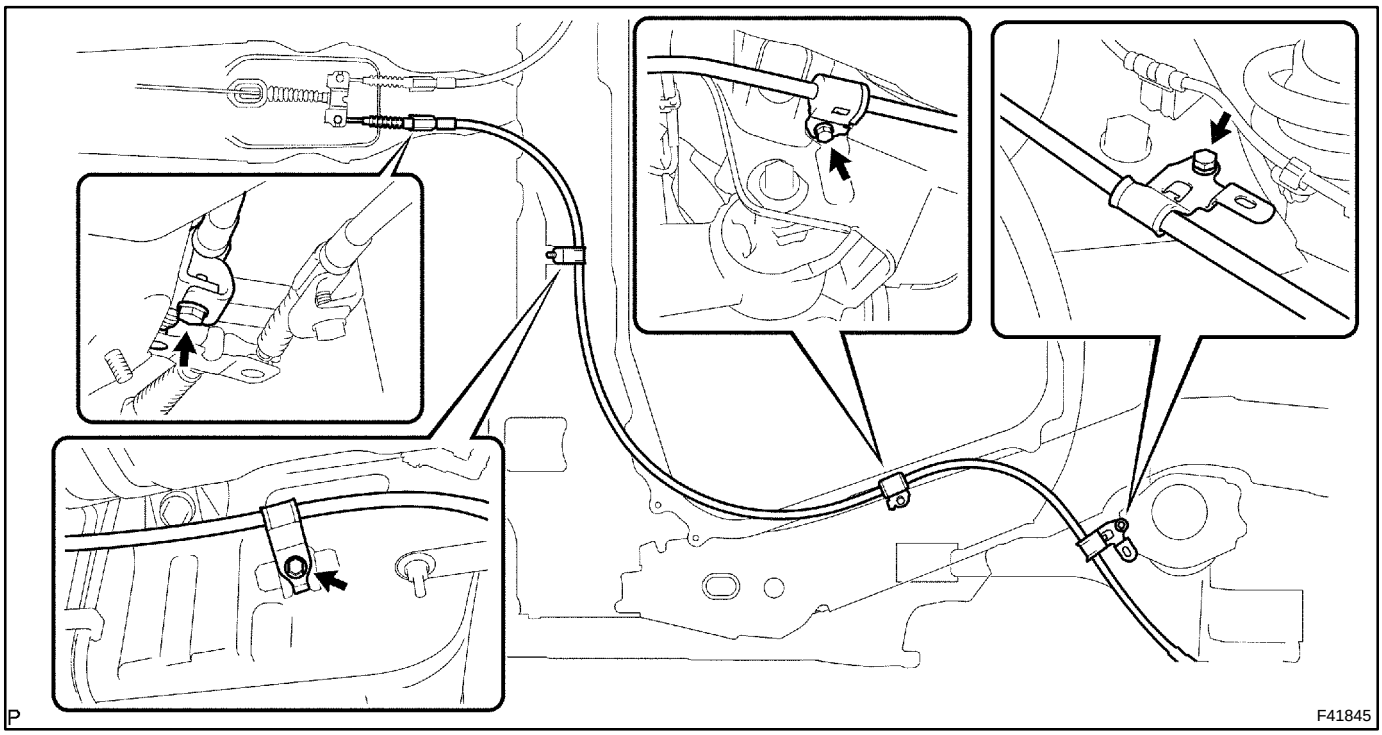
(c) Remove the 4 bolts and cable retainer from the body.

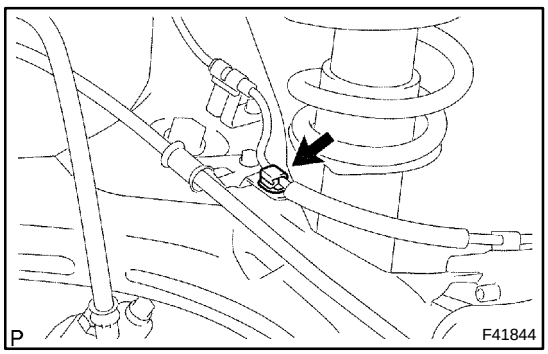
(d) Disconnect the parking brake cable assy No.3 from the equalizer, and remove the parking brake cable assy No.3.

14. INSTALL PARKING BRAKE CABLE ASSY NO.3

(a) Connect the parking brake cable assy No.3 to the equalizer.

(b) Install the parking brake cable assy No.3 with the 4 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)





(c) Connect the skid control sensor wire harness clip to the clamp.

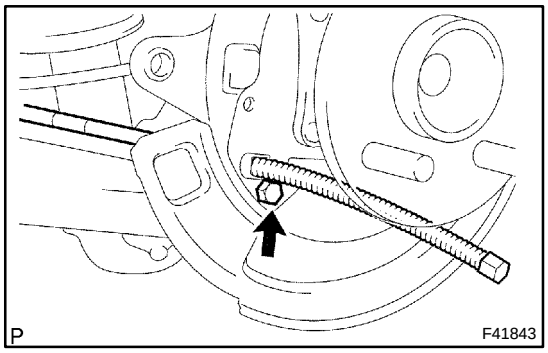
(d) Install the fuel tank protector No.1 and 3 nuts (When replacing parking brake cable assy No.2).
Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

15. INSTALL FRONT FLOOR HEAT INSULATOR NO.2 (GASOLINE ENGINE TYPE)
(See page 33-8)

16. INSTALL FRONT FLOOR HEAT INSULATOR NO.1 (GASOLINE ENGINE TYPE)
(See page 33-8)

17. **INSTALL EXHAUST PIPE ASSY FRONT**

3ZZ-FE/4ZZ-FE ENGINE TYPE: **See page 15-5**
1CD-FTV ENGINE TYPE: **See page: 15-8**



18. **CONNECT PARKING BRAKE CABLE ASSY NO.3**

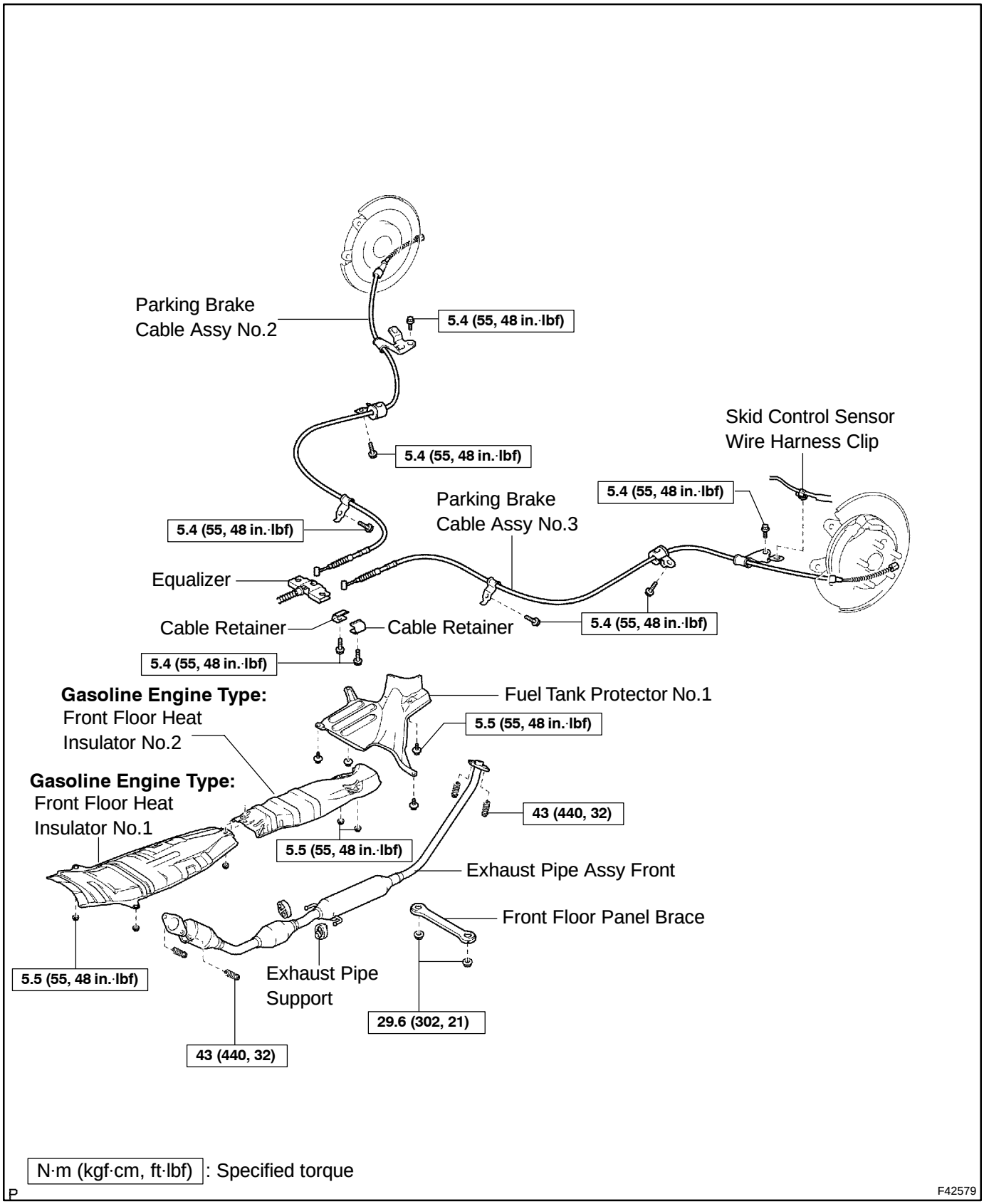
(a) Connect the parking brake cable assy No.3 to the backing plate with a bolt.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

19. **APPLY HIGH TEMPERATURE GREASE** **(See page 33-19)**
20. **INSTALL PARKING BRAKE SHOE LEVER LH**
(See page 33-20)
21. **INSTALL PARKING BRAKE SHOE ASSY LH NO.2**
(See page 33-20)
SST 09718-00010
22. **INSTALL PARKING BRAKE SHOE ASSY LH NO.1**
(See page 33-18)
SST 09718-00010
23. **INSTALL PARKING BRAKE SHOE ADJUSTING SCREW SET**
(See page 33-20)
24. **INSTALL PARKING BRAKE SHOE STRUT LH**
(See page 33-21)
25. **INSTALL REAR DISC**
(See page 32-70)
26. **CONNECT REAR DISC BRAKE CALIPER ASSY LH** **(See page 32-68)**
27. **ADJUST PARKING BRAKE SHOE CLEARANCE** **(See page 33-22)**
28. **INSTALL REAR WHEEL**
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
29. **INSPECT PARKING BRAKE LEVER TRAVEL** **(See page 33-2)**
30. **ADJUST PARKING BRAKE LEVER TRAVEL** **(See page 33-2)**
31. **CHECK EXHAUST LEAKAGE**

PARKING BRAKE CABLE ASSY NO.3 (TMUK MADE)

COMPONENTS

3306C-03



3306J-01

REPLACEMENT

HINT:

For parking brake cable assy No.2, perform the same procedure to the parking brake cable assy No.3.

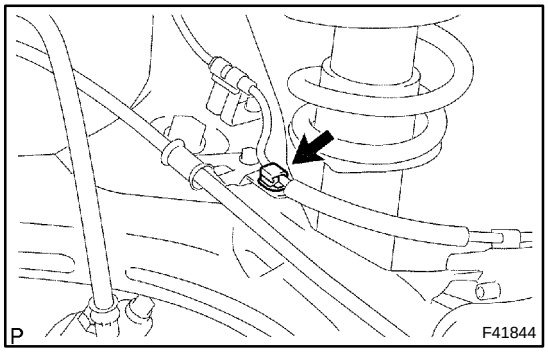
1. **REMOVE REAR WHEEL**
2. **DISCONNECT REAR DISC BRAKE CALIPER ASSY LH** **(See page 32-74)**
3. **REMOVE REAR DISC**
   (See page 32-76)
4. **REMOVE PARKING BRAKE SHOE STRUT LH**
   (See page 33-24)
5. **REMOVE PARKING BRAKE SHOE ADJUSTING SCREW SET**
   (See page 33-24)
6. **REMOVE PARKING BRAKE SHOE ASSY LH NO.1**
   (See page 33-24)
7. **REMOVE PARKING BRAKE SHOE ASSY LH NO.2**
   (See page 33-25)
8. **DISCONNECT PARKING BRAKE CABLE ASSY NO.3**

(a) Disconnect the parking brake cable assy No.3 from the backing plate.

9. **REMOVE EXHAUST PIPE ASSY FRONT**

   2ZZ-GE ENGINE TYPE: **See page 15-2**
   3ZZ-FE/4ZZ-FE ENGINE TYPE: **See page 15-5**
   1CD-FTV ENGINE TYPE: **See page: 15-8**
10. **REMOVE FRONT FLOOR HEAT INSULATOR NO.1 (GASOLINE ENGINE TYPE)**
    (See page 33-7)
11. **REMOVE FRONT FLOOR HEAT INSULATOR NO.2 (GASOLINE ENGINE TYPE)**
    (See page 33-7)
12. **REMOVE PARKING BRAKE CABLE ASSY NO.3**

(a) Remove the bolt and 3 nuts, then remove the fuel tank protector No.1 (When replacing parking brake cable assy No.2).

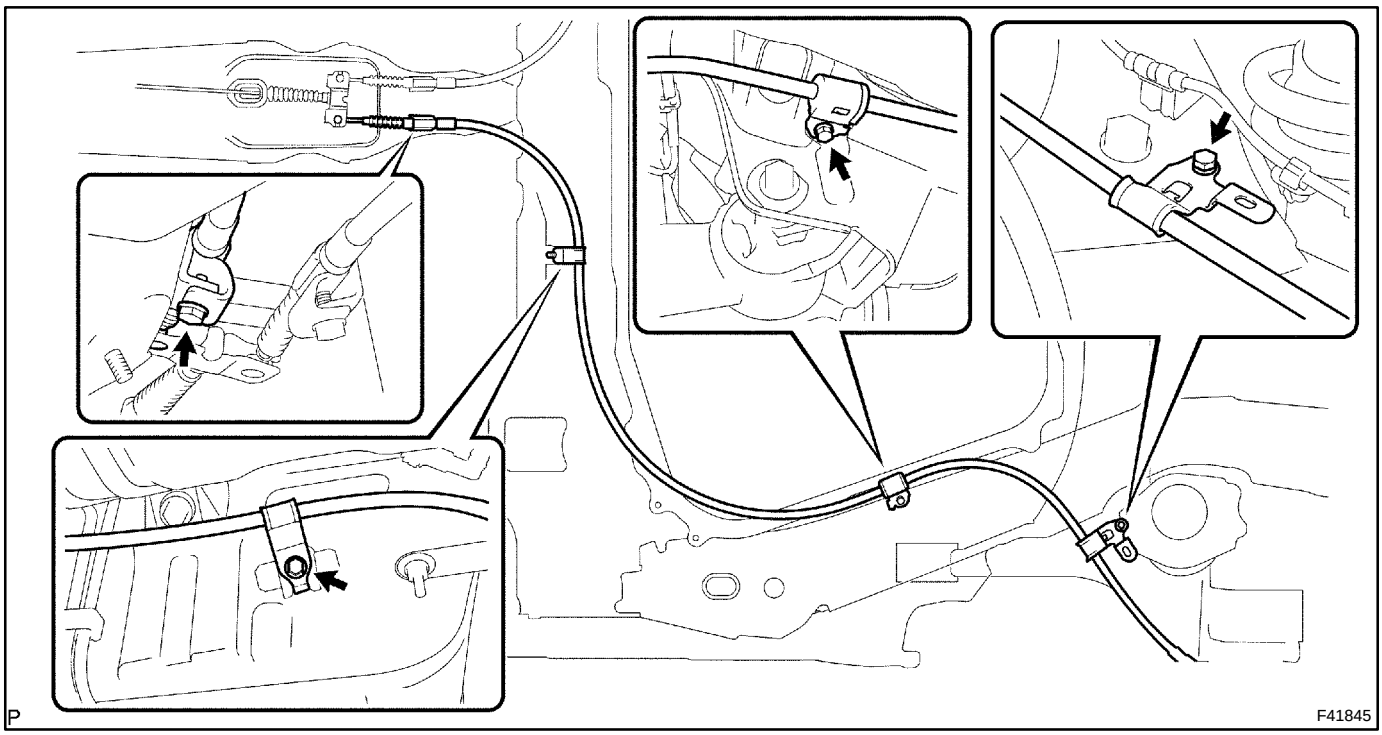


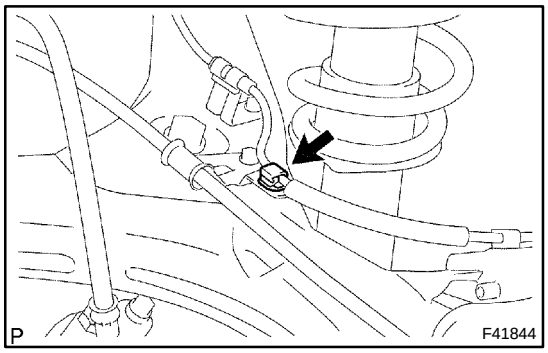
(b) Using a clip remover, disconnect the skid control sensor wire harness clip from the clamp.
(c) Remove the 4 bolts and cable retainer from the body.
(d) Disconnect the parking brake cable assy No.3 from the equalizer, and remove the parking brake cable assy No.3.

13. **INSTALL PARKING BRAKE CABLE ASSY NO.3**

(a) Connect the parking brake cable assy No.3 to the equalizer.

(b) Install the parking brake cable assy No.3 with the 4 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)





(c) Connect the skid control sensor wire harness clip to the clamp.

(d) Install the fuel tank protector No.1, bolt and 3 nuts (When replacing parking brake cable assy No.2).
Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

14. INSTALL FRONT FLOOR HEAT INSULATOR NO.2 (GASOLINE ENGINE TYPE)
(See page 33-8)
15. INSTALL FRONT FLOOR HEAT INSULATOR NO.1 (GASOLINE ENGINE TYPE)
(See page 33-8)
16. INSTALL EXHAUST PIPE ASSY FRONT

2ZZ-GE ENGINE TYPE: See page 15-2
3ZZ-FE/4ZZ-FE ENGINE TYPE: See page 15-5
1CD-FTV ENGINE TYPE: See page: 15-8
17. CONNECT PARKING BRAKE CABLE ASSY NO.3

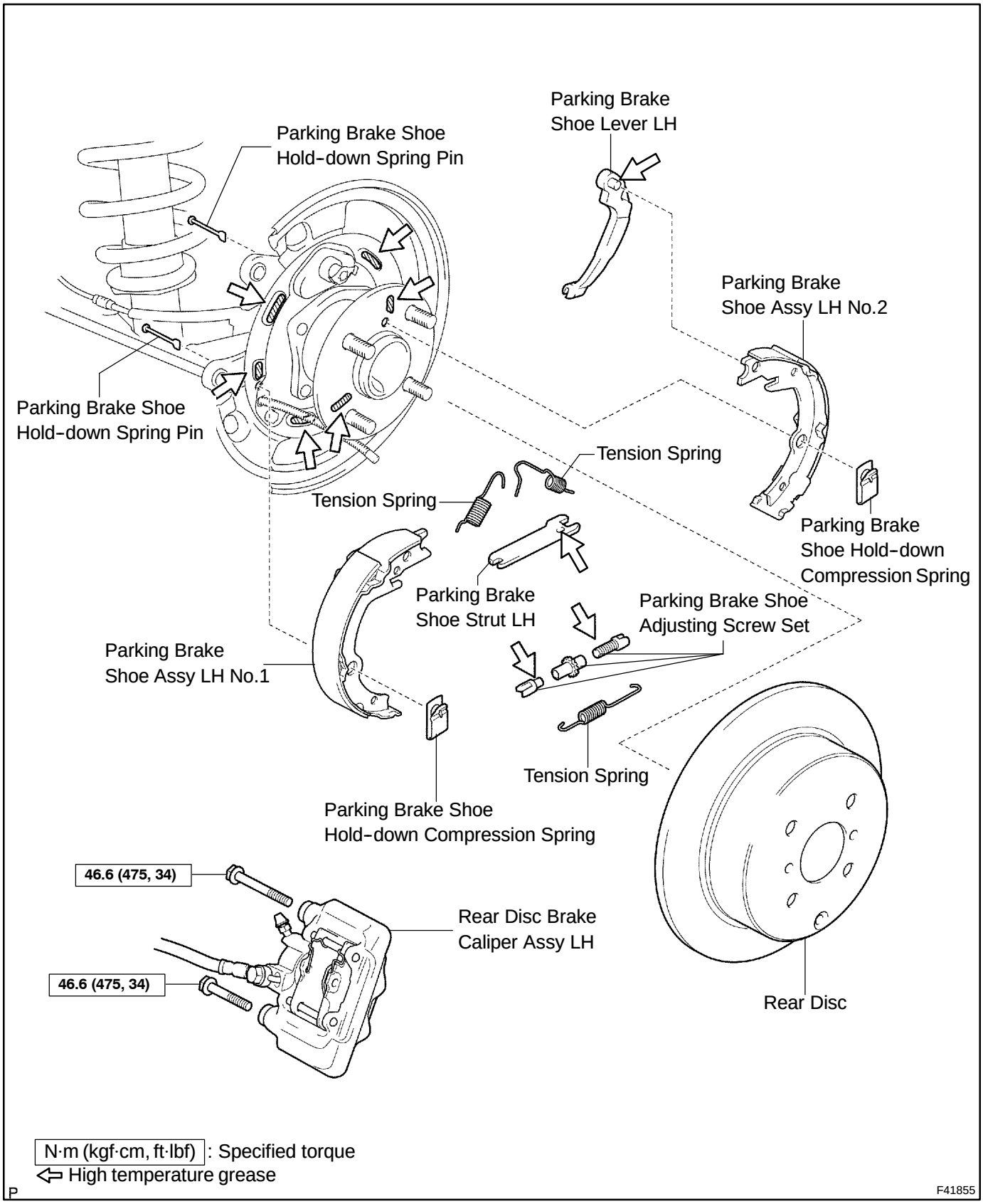
(a) Connect the parking brake cable assy No.3 to the backing plate.
18. APPLY HIGH TEMPERATURE GREASE (See page 33-25)
19. INSTALL PARKING BRAKE SHOE ASSY LH NO.2
(See page 33-25)

20. INSTALL PARKING BRAKE SHOE ASSY LH NO.1
(See page 33-26)
21. INSTALL PARKING BRAKE SHOE ADJUSTING SCREW SET
(See page 33-26)
22. INSTALL PARKING BRAKE SHOE STRUT LH
(See page 33-26)
23. INSTALL REAR DISC
(See page 32-76)
24. CONNECT REAR DISC BRAKE CALIPER ASSY LH (See page 32-74)
25. ADJUST PARKING BRAKE SHOE CLEARANCE (See page 33-27)
26. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
27. INSPECT PARKING BRAKE LEVER TRAVEL (See page 33-2)
28. ADJUST PARKING BRAKE LEVER TRAVEL (See page 33-2)
29. CHECK EXHAUST LEAKAGE

PARKING BRAKE ASSY (TMC MADE)

COMPONENTS

3306E-02



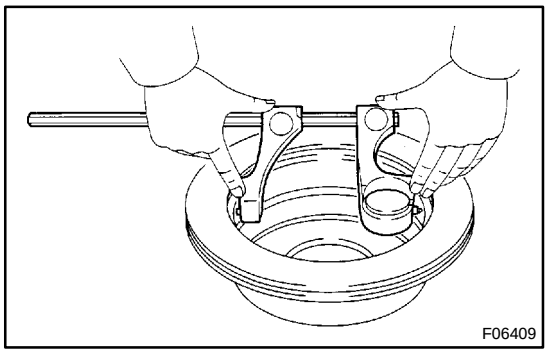
3306F-02

OVERHAUL

HINT:

Overhaul of the RH side is the same procedures as the LH side.

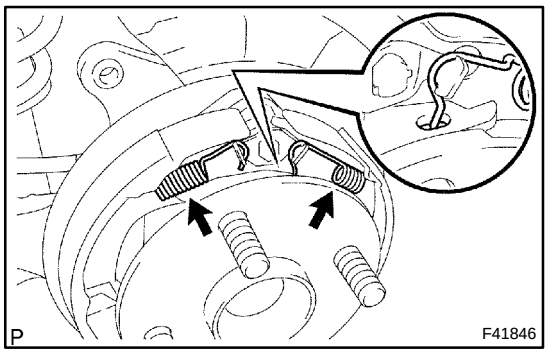
1. **REMOVE REAR WHEEL**
2. **DISCONNECT REAR DISC BRAKE CALIPER ASSY LH** **(See page 32-68)**
3. **REMOVE REAR DISC**
   (See page 32-76)



4. **INSPECT BRAKE DISC INSIDE DIAMERTER**

(a) Using a brake drum gauge or equivalent, measure the inside diameter of the disc.

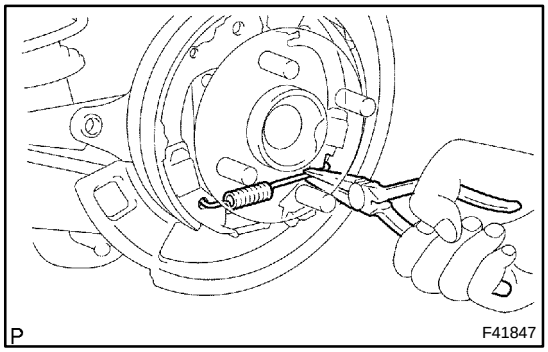
Standard inside diameter: 173 mm (6.81 in.)
Maximum inside diameter: 174 mm (6.85 in.)



5. **REMOVE PARKING BRAKE SHOE STRUT LH**

(a) Using needle-nose pliers, remove the shoe upper side 2 tension springs.

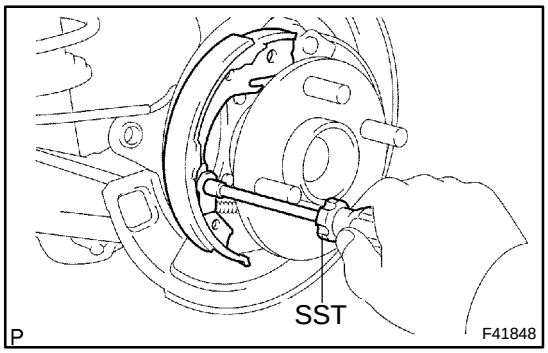
(b) Remove the parking brake shoe strut LH.



6. **REMOVE PARKING BRAKE SHOE ADJUSTING SCREW SET**

(a) Using needle-nose pliers, remove the anchor side tension spring.

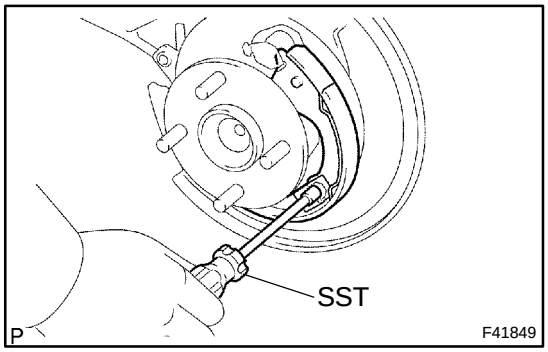
(b) Remove the shoe adjusting screw set.



7. **REMOVE PARKING BRAKE SHOE ASSY LH NO.1**

(a) Using SST, remove the parking brake shoe hold-down compression spring, parking brake shoe hold-down spring pin and parking brake shoe assy LH No.1.

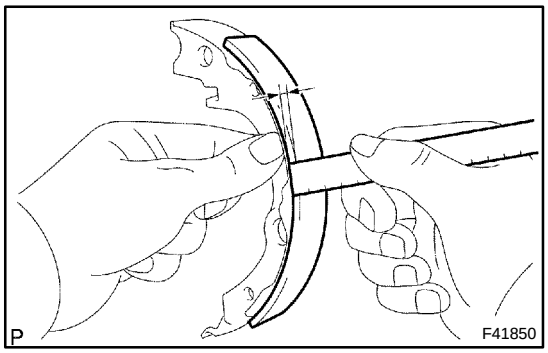
SST 09718-00010



8. REMOVE PARKING BRAKE SHOE ASSY LH NO.2

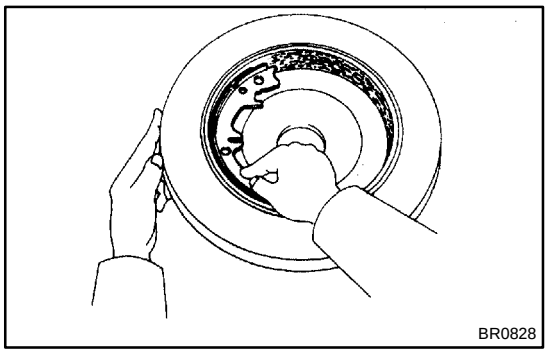
(a) Using SST, remove the parking brake shoe hold-down compression spring and parking brake shoe hold-down spring pin.
SST 09718-00010

(b) Disconnect the parking brake shoe assy LH No.2 from the parking brake shoe lever LH, and remove the parking brake shoe LH No.2.



9. INSPECT PARKING BRAKE SHOE LINING THICKNESS

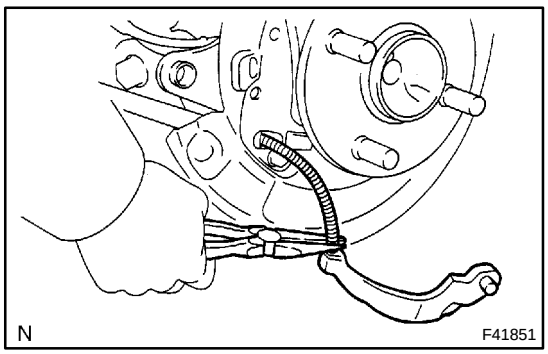
(a) Using a ruler, measure the thickness of the shoe lining.
Standard thickness: 3.5 mm (0.138 in.)
Minimum thickness: 1.0 mm (0.039 in.)



10. INSPECT BRAKE DISC AND PARKING BRAKE SHOE LINING FOR PROPER CONTACT

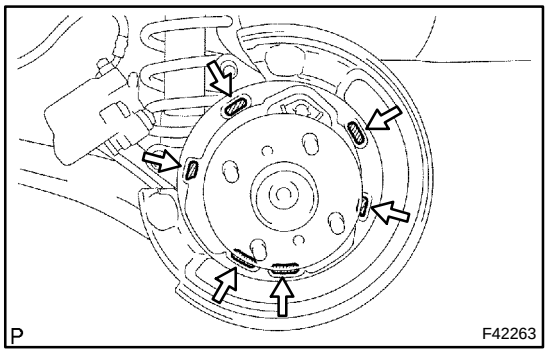
(a) Apply chalk to the inside surface of the disc, then grind down the brake shoe lining to fit.

If the contact between the brake disc and the shoe lining is improper, repair it using a brake shoe grinder or replace the brake shoe assembly.



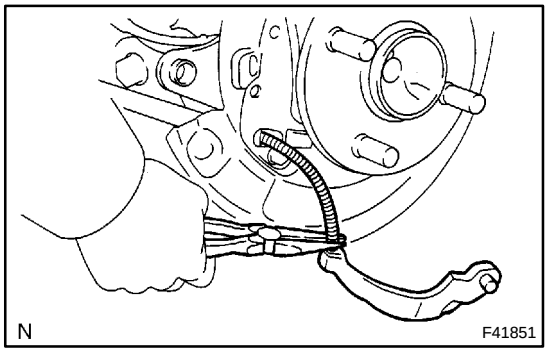
11. REMOVE PARKING BRAKE SHOE LEVER LH

(a) Using needle-nose pliers, disconnect the parking brake cable assy No.3 and remove the parking brake shoe lever LH.



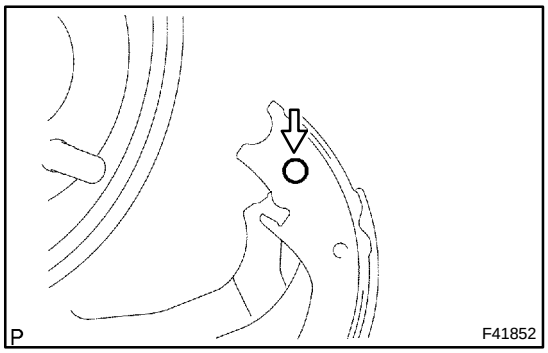
12. APPLY HIGH TEMPERATURE GREASE

(a) Apply the high temperature grease to the shoe attached surface of backing plate.



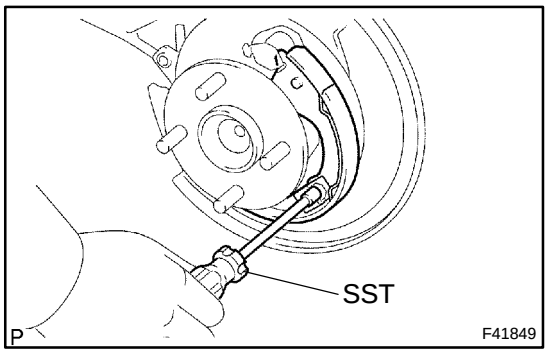
13. INSTALL PARKING BRAKE SHOE LEVER LH

(a) Using needle-nose pliers, connect the parking brake cable assy No.3 to the parking brake shoe lever LH.

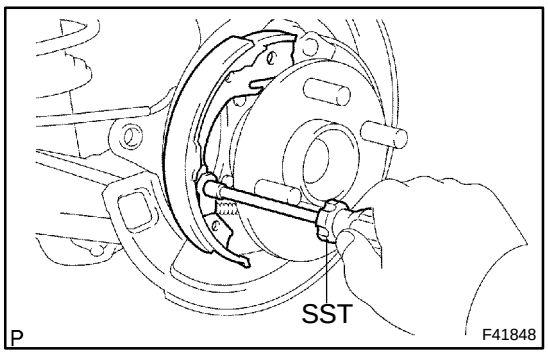


14. INSTALL PARKING BRAKE SHOE ASSY LH NO.2

(a) Apply the high temperature grease to the contact part of the parking brake shoe and parking brake shoe lever.
(b) Connect the parking brake shoe and parking brake shoe lever.

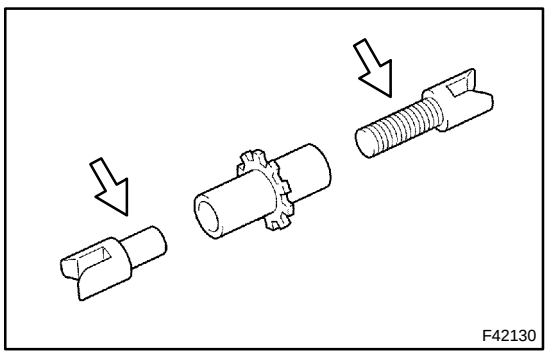


(c) Using SST, install the parking brake shoe LH No.2 with the parking brake shoe hold-down compression spring and parking brake shoe hold-down spring pin.
SST 09718-00010



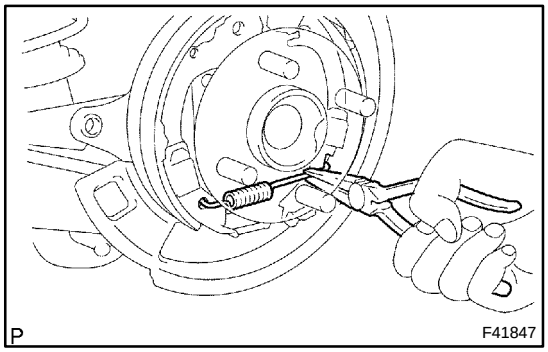
15. INSTALL PARKING BRAKE SHOE ASSY LH NO.1

(a) Using SST, install the parking brake shoe LH No.1 with the parking brake shoe hold-down compression spring and parking brake shoe hold-down spring pin.
SST 09718-00010

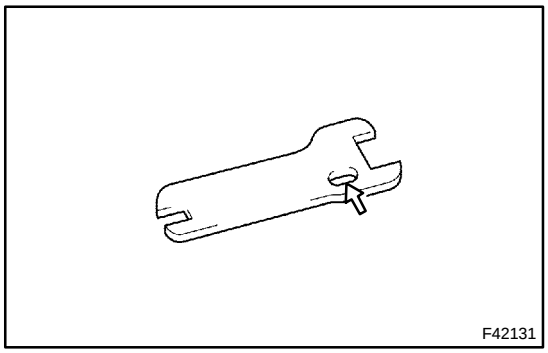


16. INSTALL PARKING BRAKE SHOE ADJUSTING SCREW SET

(a) Apply the high temperature grease to the shoe adjusting screw set.
(b) Install the parking brake shoe adjusting screw set.



(c) Using needle-nose pliers, install the bottom side tension spring.

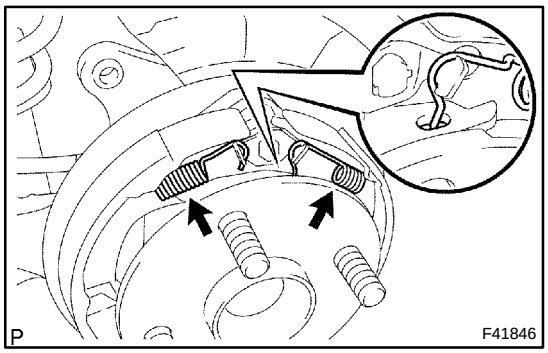


17. INSTALL PARKING BRAKE SHOE STRUT LH

(a) Apply the high temperature grease to the contact part of the shoe strut and tension spring.

(b) Install the parking brake shoe strut LH.

(c) Apply the high temperature grease to the contact part of the □ parking brake shoe assy and upper side 2 tension springs.



(d) Using needle-nose pliers, install the upper side 2 tension springs.

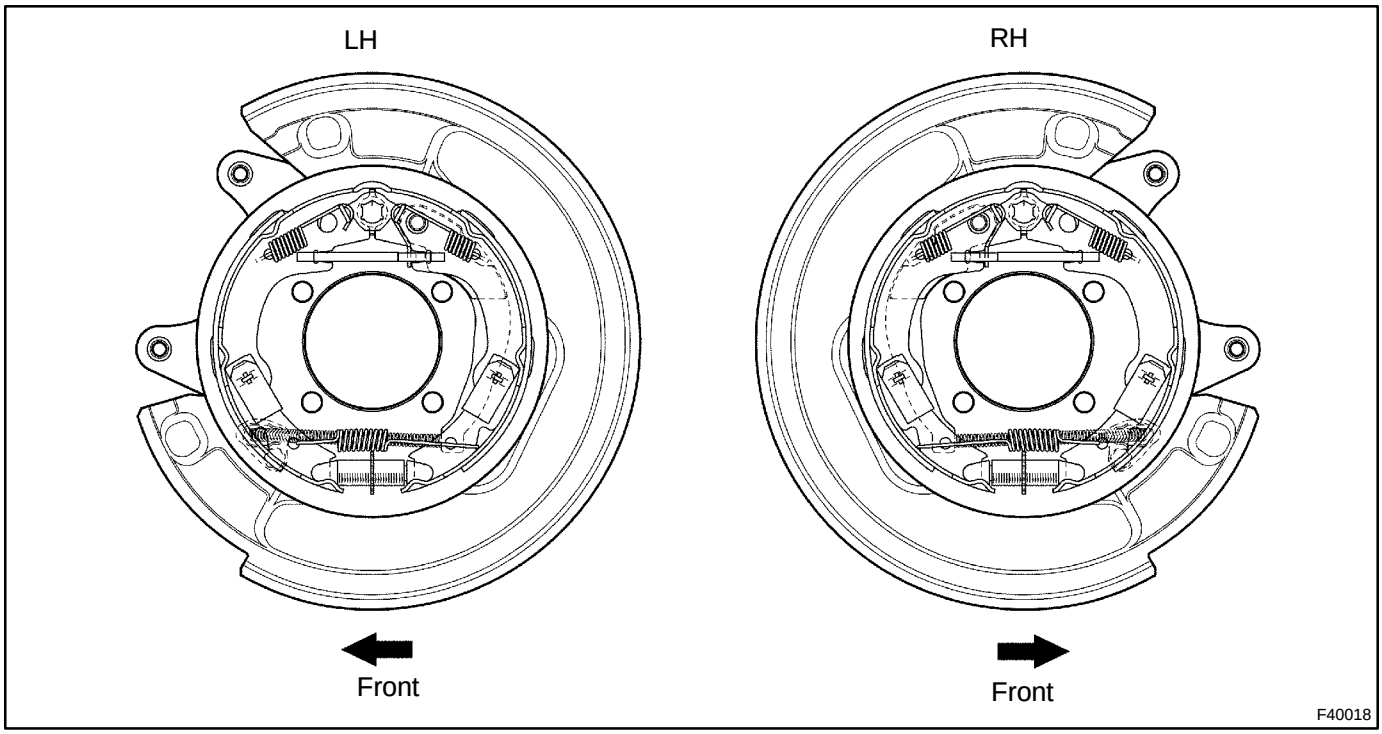
HINT:
Install the 2 tension spring securely to the grooves of the shoe strut.

18. CHECK PARKING BRAKE INSTALLATION

(a) Check that each part is installed properly.

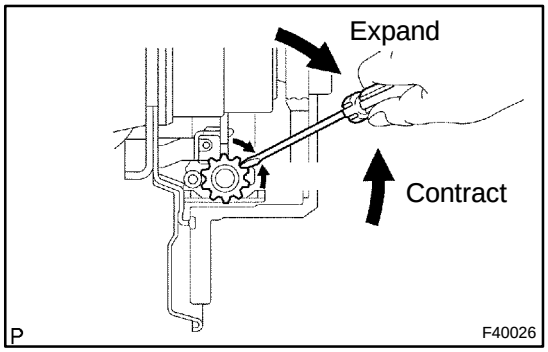
NOTICE:

There should be no oil or grease on the friction surface of the shoe lining and disc.



19. INSTALL REAR DISC

(See page 32-76)



20. ADJUST PARKING BRAKE SHOE CLEARANCE

(a) Temporarily install the hub nuts.

(b) Remove the hole plug, and turn the adjuster and expand the shoes until the disc locks.

(c) Contract the shoe adjuster until the disc can rotate smoothly.

Standard : Return 8 notches

(d) Check that there is no brake drag.

(e) Install the hole plug.

21. CONNECT REAR DISC BRAKE CALIPER ASSY LH **(See page 32-68)**

22. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

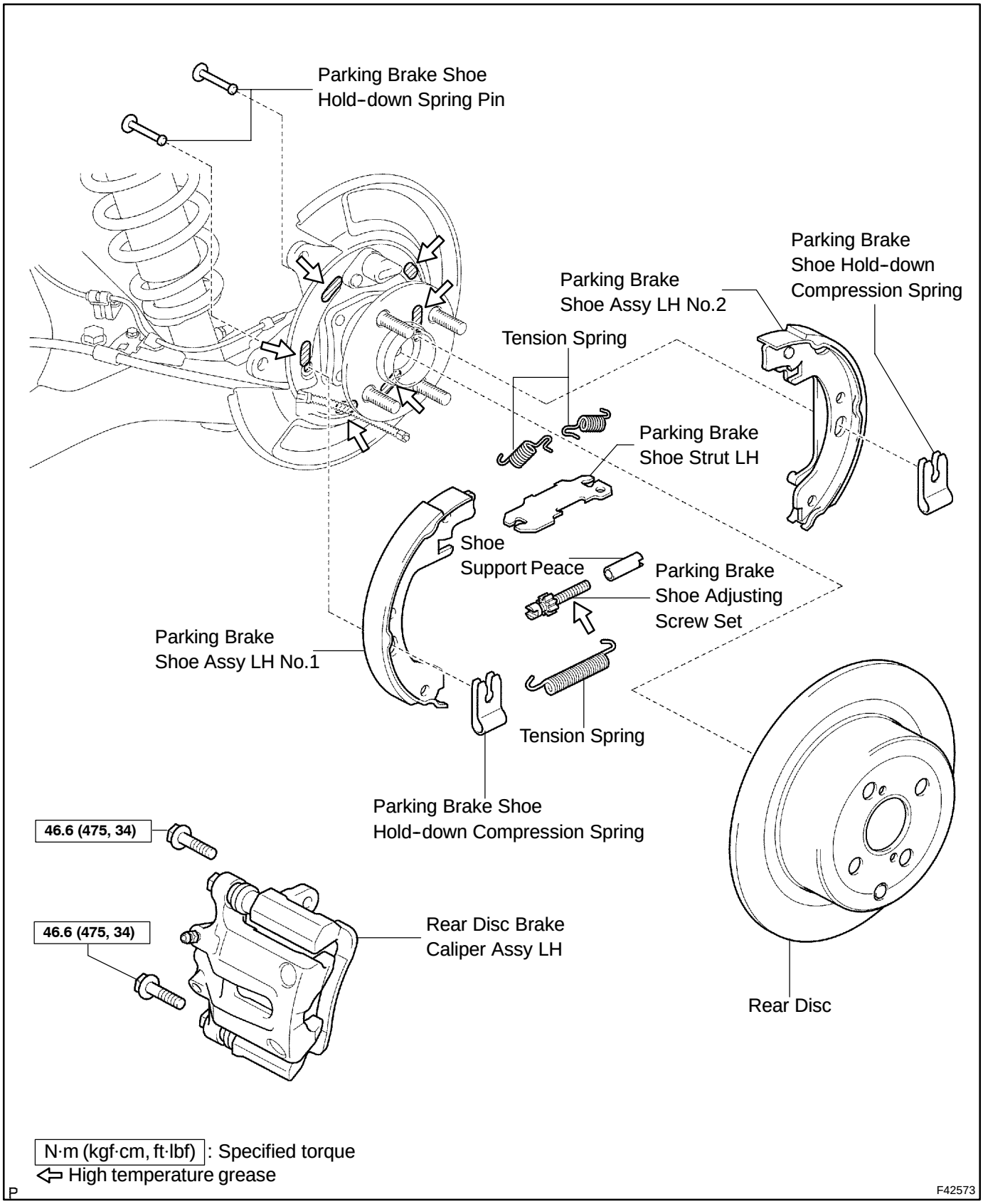
23. INSPECT PARKING BRAKE LEVER TRAVEL **(See page 33-2)**

24. ADJUST PARKING BRAKE LEVER TRAVEL **(See page 33-2)**

PARKING BRAKE ASSY (TMUK MADE)

COMPONENTS

3306E-03



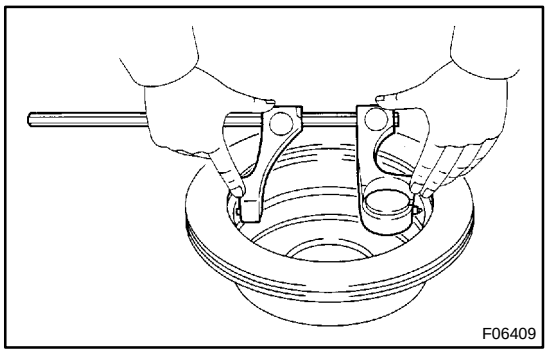
3306K-01

OVERHAUL

HINT:

Overhaul of the RH side is the same procedures as the LH side.

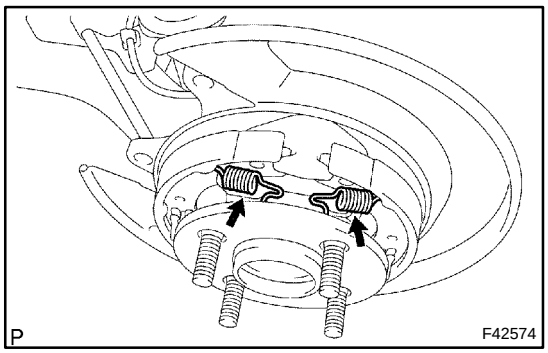
1. **REMOVE REAR WHEEL**
2. **DISCONNECT REAR DISC BRAKE CALIPER ASSY LH** **(See page 32-74)**
3. **REMOVE REAR DISC**
   (See page 32-76)



4. **INSPECT BRAKE DISC INSIDE DIAMERTER**

(a) Using a brake drum gauge or equivalent, measure the inside diameter of the disc.

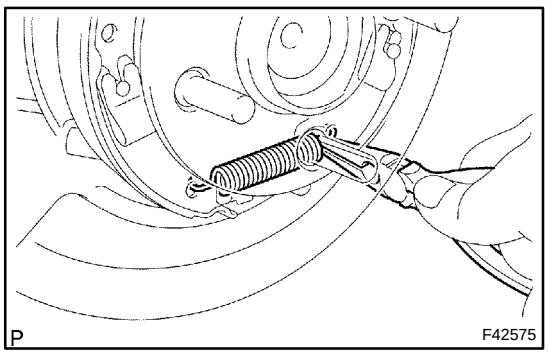
Standard inside diameter: 172 mm (6.77 in.)
Maximum inside diameter: 173 mm (6.81 in.)



5. **REMOVE PARKING BRAKE SHOE STRUT LH**

(a) Using needle-nose pliers, remove the shoe upper side 2 tension springs.

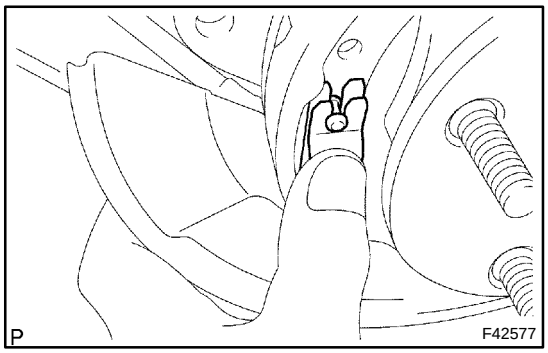
(b) Remove the parking brake shoe strut LH.



6. **REMOVE PARKING BRAKE SHOE ADJUSTING SCREW SET**

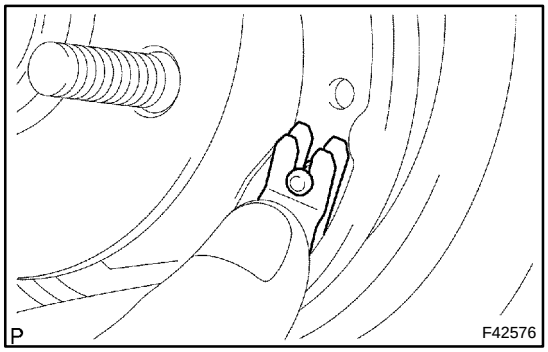
(a) Using needle-nose pliers, remove the anchor side tension spring.

(b) Remove the parking brake shoe adjusting screw set with shoe support peace.



7. **REMOVE PARKING BRAKE SHOE ASSY LH NO.1**

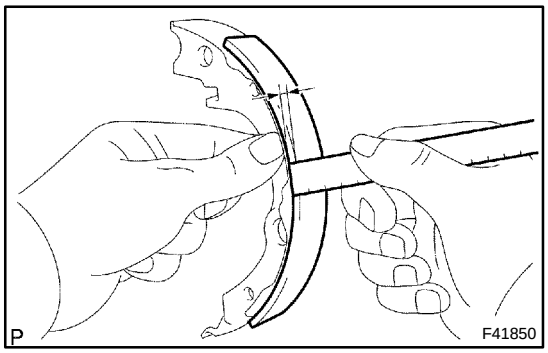
(a) Pushing the parking brake shoe hold-down compression spring by hand, and remove the parking brake shoe hold-down compression spring, parking brake shoe hold-down spring pin and parking brake shoe assy LH No.1.



8. REMOVE PARKING BRAKE SHOE ASSY LH NO.2

(a) Pushing the parking brake shoe hold-down compression spring by hand, and remove the parking brake shoe hold-down compression spring and parking brake shoe hold-down spring pin.

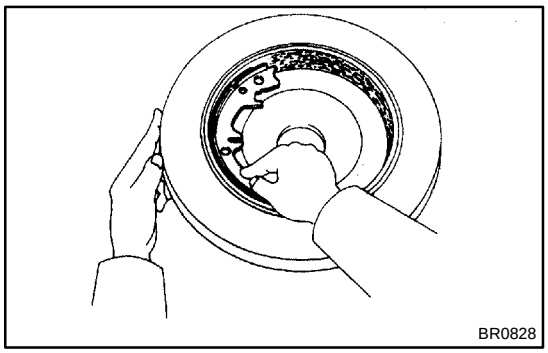
(b) Using a needle-nose pliers, disconnect the parking brake cable assy No.3 from the parking brake shoe assy LH No.2.



9. INSPECT PARKING BRAKE SHOE LINING THICKNESS

(a) Using a ruler, measure the thickness of the shoe lining.

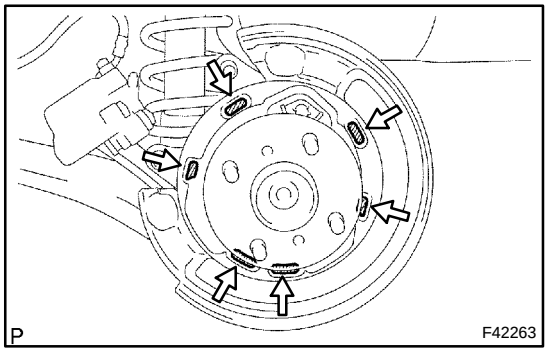
Standard thickness: 3.1 mm (0.122 in.)
Minimum thickness: 1.0 mm (0.039 in.)



10. INSPECT BRAKE DISC AND PARKING BRAKE SHOE LINING FOR PROPER CONTACT

(a) Apply chalk to the inside surface of the disc, then grind down the brake shoe lining to fit.

If the contact between the brake disc and the shoe lining is improper, repair it using a brake shoe grinder or replace the brake shoe assembly.

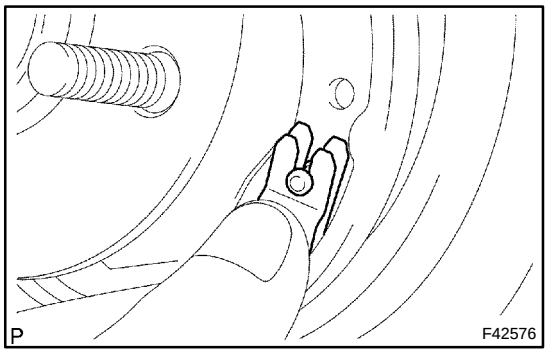


11. APPLY HIGH TEMPERATURE GREASE

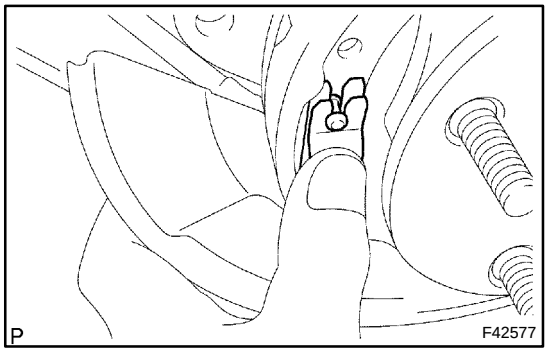
(a) Apply the high temperature grease to the shoe attached surface of backing plate.

12. INSTALL PARKING BRAKE SHOE ASSY LH NO.2

(a) Using needle-nose pliers, connect the parking brake cable No.3 to the parking brake shoe assy LH No.2.

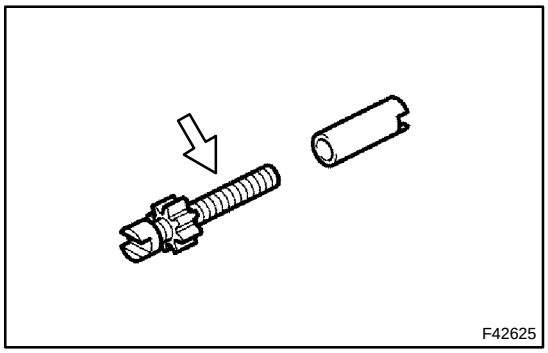


(b) Install the parking brake shoe LH No.2 with the parking brake shoe hold-down compression spring and parking brake shoe hold-down spring pin.



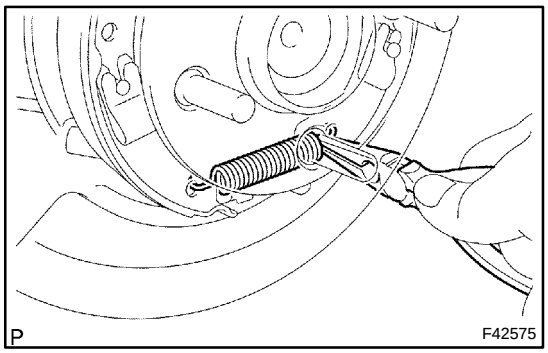
13. INSTALL PARKING BRAKE SHOE ASSY LH NO.1

(a) Install the parking brake shoe LH No.1 with the parking brake shoe hold-down compression spring and parking brake shoe hold-down spring pin.



14. INSTALL PARKING BRAKE SHOE ADJUSTING SCREW SET

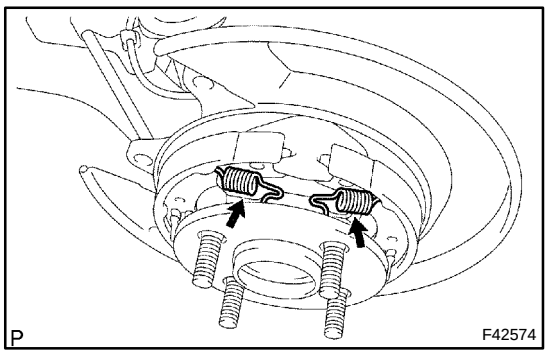
(a) Apply the high temperature grease to the shoe adjusting screw set.
(b) Install the parking brake shoe adjusting screw set with shoe support piece.



(c) Using needle-nose pliers, install the bottom side tension spring.

15. INSTALL PARKING BRAKE SHOE STRUT LH

(a) Install the parking brake shoe strut LH.



(b) Using needle-nose pliers, install the upper side 2 tension springs.

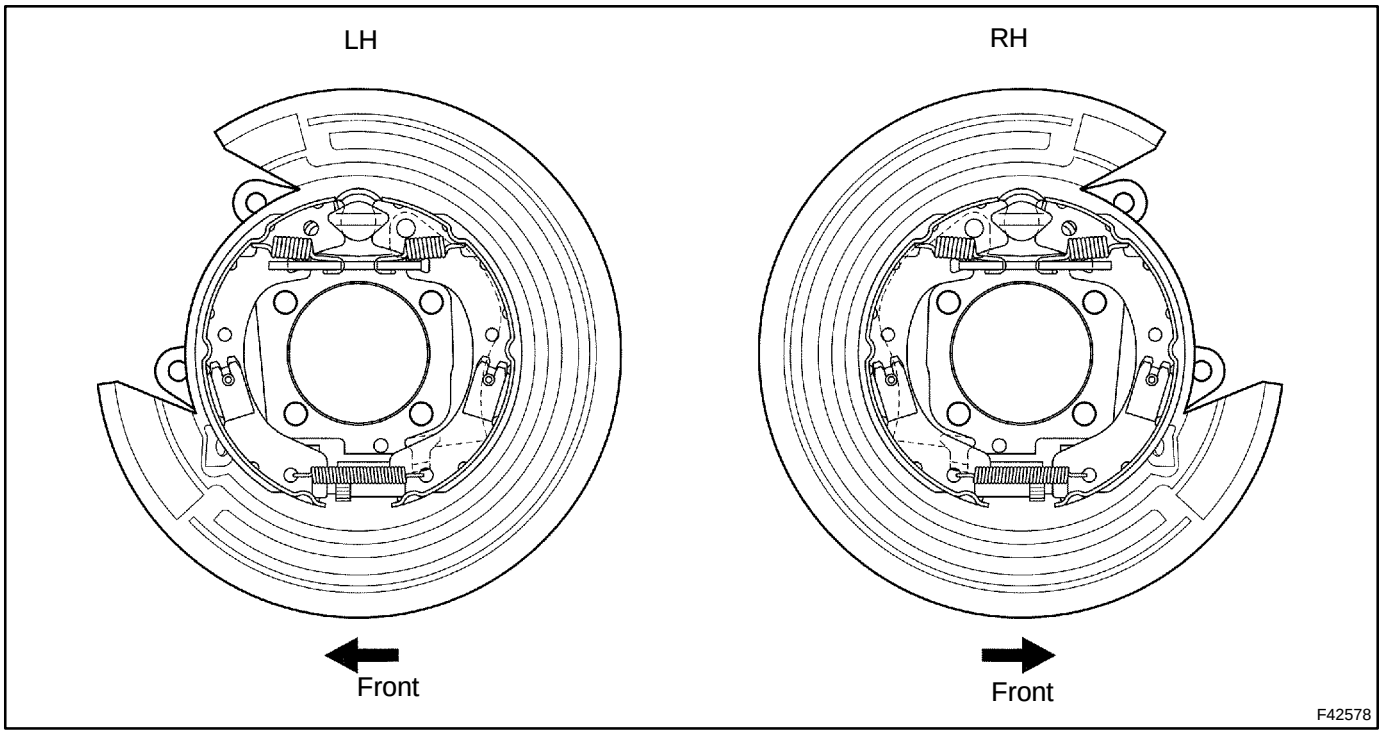
HINT:
Install the 2 tension spring securely to the grooves of the shoe strut.

16. CHECK PARKING BRAKE INSTALLATION

(a) Check that each part is installed properly.

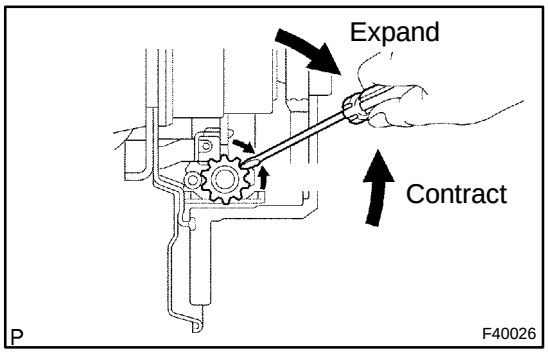
NOTICE:

There should be no oil or grease on the friction surface of the shoe lining and disc.



17. INSTALL REAR DISC

(See page 32-76)



18. ADJUST PARKING BRAKE SHOE CLEARANCE

(a) Temporarily install the hub nuts.

(b) Remove the hole plug, and turn the adjuster and expand the shoes until the disc locks.

(c) Contract the shoe adjuster until the disc can rotate smoothly.

Standard : Return 6 notches

(d) Check that there is no brake drag.

(e) Install the hole plug.

19. CONNECT REAR DISC BRAKE CALIPER ASSY LH **(See page 32-74)**

20. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

21. INSPECT PARKING BRAKE LEVER TRAVEL **(See page 33-2)**

22. ADJUST PARKING BRAKE LEVER TRAVEL **(See page 33-2)**

AUTOMATIC TRANSMISSION / TRANS

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AUTOMATIC TRANSAXLE FLUID (ATM) 40-2
ON-VEHICLE INSPECTION 40-2
PARK/NEUTRAL POSITION SWITCH ASSY (ATM) 40-3
REPLACEMENT 40-3/5
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AUTOMATIC TRANSAXLE ASSY (ATM)

4002Y-03

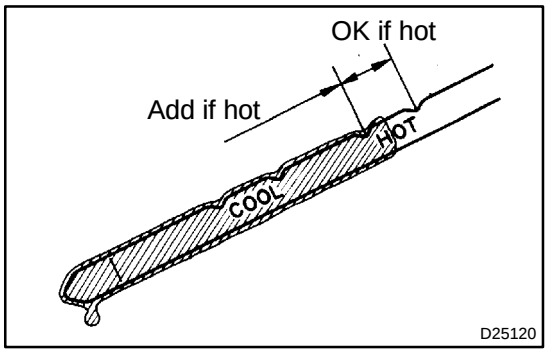
PRECAUTION

1. The automatic transaxle is composed of highly precision-finished parts, necessitating careful inspection before reassembly because even a small nick could cause fluid leakage or affect the performance. The instructions here are organized so that you work on only one component group at a time. This will help avoid confusion from similar-looking parts of different sub-assemblies being on your workbench at the same time. The component groups are inspected and repaired from the converter housing side. As much as possible, complete the inspection, repair and reassembly before proceeding to the next component group. If a defect is found in a certain component group during reassembly, inspect and repair this group immediately. If a component group cannot be assembled because parts are being ordered, be sure to keep all parts of the group in a separate container while proceeding with disassembly, inspection, repair and reassembly of other component groups.
   Recommended ATF: T-IV
2. All disassembled parts should be washed clean and any fluid passages and holes should be blown through with compressed air.
3. Dry all parts with compressed air-never use shop rags.
4. When using compressed air, always aim away from yourself to prevent accidentally spraying ATF or kerosene on your face.
5. The recommended automatic transaxle fluid or kerosene should be used for cleaning.
6. After cleaning, the parts should be arranged in the correct order for efficient inspection, repairs, and reassembly.
7. When disassembling a valve body, be sure to match each valve together with the corresponding spring.
8. New discs for the brakes and clutches that are to be used for replacement must be soaked in ATF for at least 15 minutes before reassembly.
9. All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with ATF prior to reassembly.
10. All gaskets and rubber O-rings should be replaced.
11. Do not apply adhesive cements to gaskets and similar parts.
12. Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.
13. If a worn bushing is to be replaced, the sub-assembly containing the bushing must also be replaced.
14. Check thrust bearings and races for wear or damage. Replace if necessary.
15. Use petroleum jelly to keep parts in place.
16. When working with FIPG material, you must observe the following.
    Using a razor blade and a gasket scraper, remove all the old packing (FIPG) material from the gasket surface.
    Thoroughly clean all components to remove all the loose material.
    Clean both sealing surfaces with a non-residue solvent.
    Parts must be reassembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.

AUTOMATIC TRANSAXLE FLUID (ATM)

ON-VEHICLE INSPECTION

4002Z-04



1. CHECK THE FLUID LEVEL

HINT:

Drive the vehicle so that the engine and transaxle are at normal operating temperature.

Fluid temperature: 70 - 80 ˚C (158 - 176 ˚F)

(1) Park the vehicle on a level surface and set the parking brake.

(2) With the engine idling and the brake pedal depressed, shift the shift lever into all ranges from P to L range and return to P range.

(3) Pull out the dipstick and wipe it clean.

(4) Push it back fully into the pipe.

(5) Pull it out and check that the fluid level is in the HOT range.

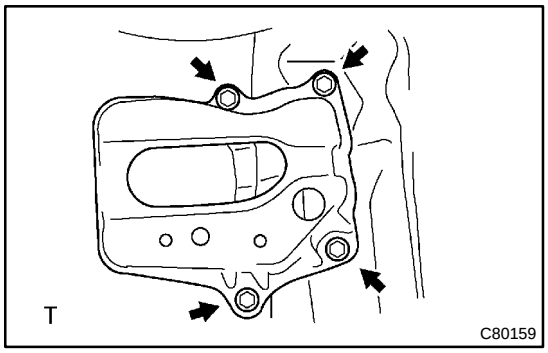
If there are leaks, it is necessary to repair or replace O-rings, FIPGs, oil seals, plugs or other parts.

PARK/NEUTRAL POSITION SWITCH ASSY (ATM)

400J8-01

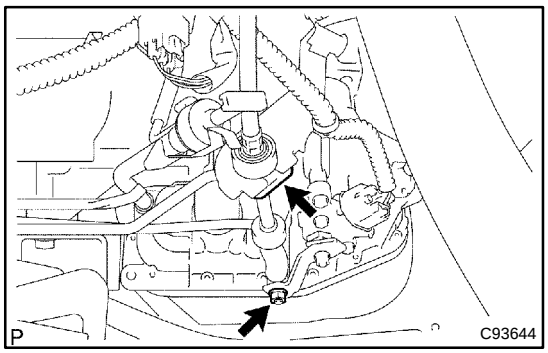
REPLACEMENT

1. REMOVE BATTERY



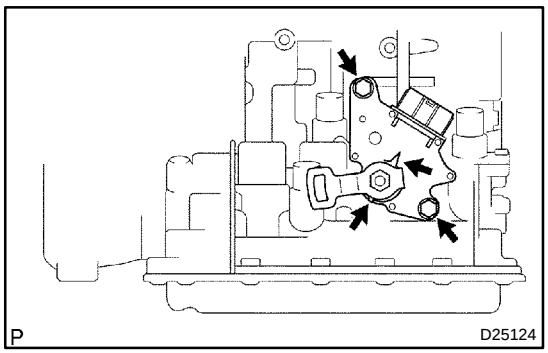
2. REMOVE BATTERY CARRIER

(a) Remove the 4 bolts and battery carrier.



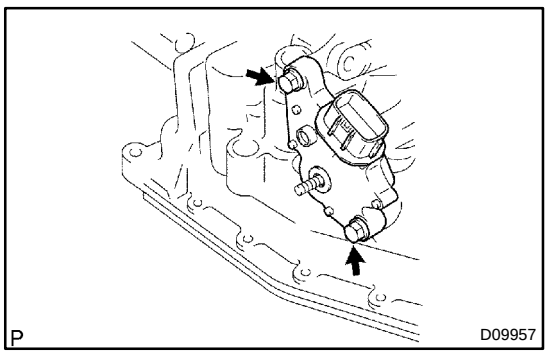
3. DISCONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Remove the nut from the control shaft lever.
(b) Disconnect the control cable from the control shaft lever.
(c) Remove the clip and disconnect the control cable from the control cable bracket.



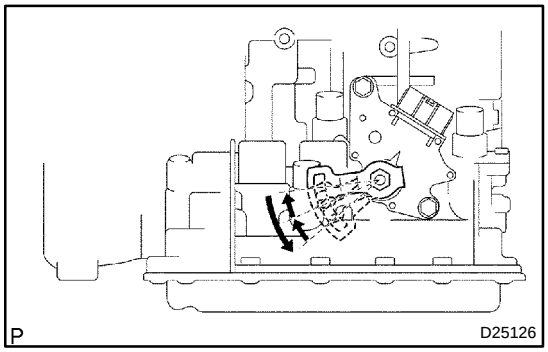
4. REMOVE PARK/NEUTRAL POSITION SWITCH ASSY

(a) Disconnect the park/neutral position switch connector.
(b) Remove the nut, washer and control shaft lever.
(c) Pry out the lock plate and remove the manual valve shaft nut.
(d) Remove the 2 bolts and pull out the park/neutral position switch.

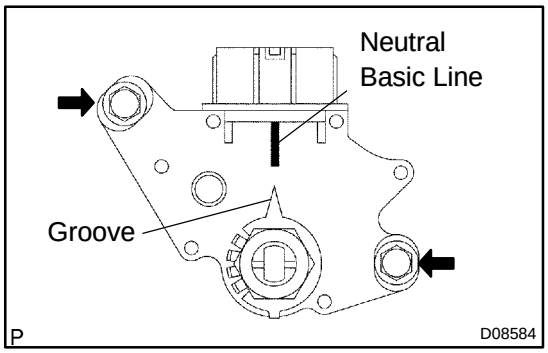


5. INSTALL PARK/NEUTRAL POSITION SWITCH ASSY

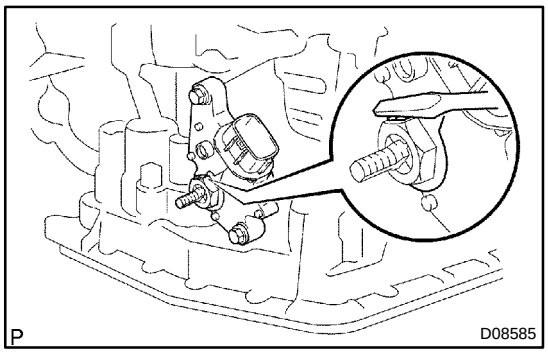
(a) Install the park/neutral position switch to the manual valve shaft.
(b) Temporarily install the 2 bolts.
(c) Place a new lock plate and tighten the nut.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(d) Temporarily install the control shaft lever.



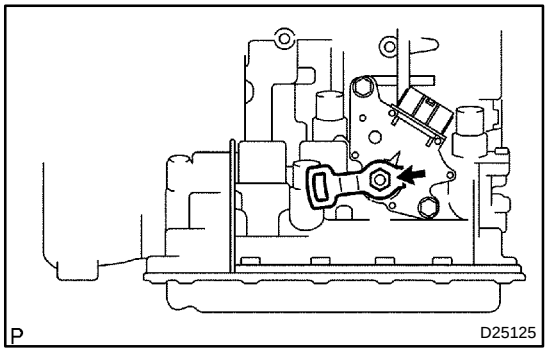
(e) Turn the lever counterclockwise until it stops, then turn it clockwise 2 notches.
(f) Remove the control shaft lever.



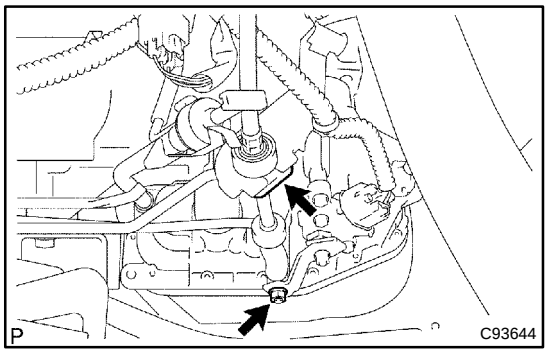
(g) Align the groove with neutral basic line.
(h) Hold the switch in position and tighten the 2 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



(i) Using a screwdriver, stake the nut with the lock plate.

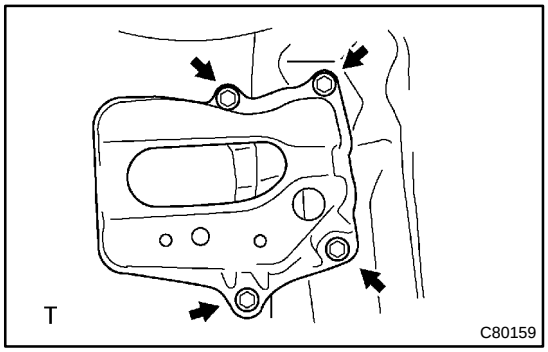


(j) Install the control shaft lever, washer and nut.
Torque: 12.5 N·m (127 kgf·cm, 9 ft·lbf)
(k) Connect the park/neutral position switch connector.



6. INSTALL FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Temporarily install the control cable to the control shaft lever with nuts.
(b) Install the control cable and clip to the bracket.



7. INSTALL BATTERY CARRIER

(a) Install the battery carrier and 4 bolts.
Torque: 13 N·m (132 kgf·cm, 10 ft·lbf)

8. ADJUST SHIFT LEVER POSITION **(See page 40-43)**
9. INSPECT SHIFT LEVER POSITION **(See page 40-43)**
10. INSPECT PARK/NEUTRAL POSITION SWITCH ASSY **(See page 40-6)**

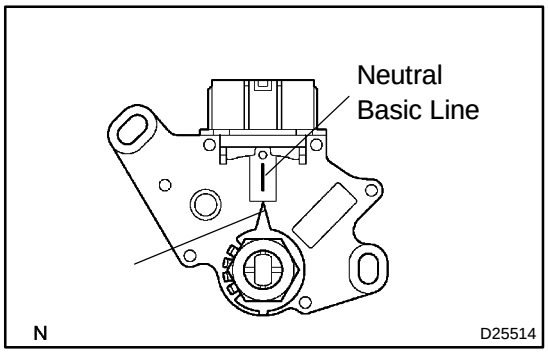
40030-03

ADJUSTMENT

1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSY

(a) Apply the parking brake and turn the ignition switch ON.
(b) Depress the brake pedal and check that the engine starts only when the shift lever is set in N or P range and it does not start in other range.
(c) Check that the back-up light is lit and the reverse warning buzzer sounds only when the shift lever is set in R range and these do not function in other ranges.

If a failure is found, check the park/ neutral position switch for continuity.



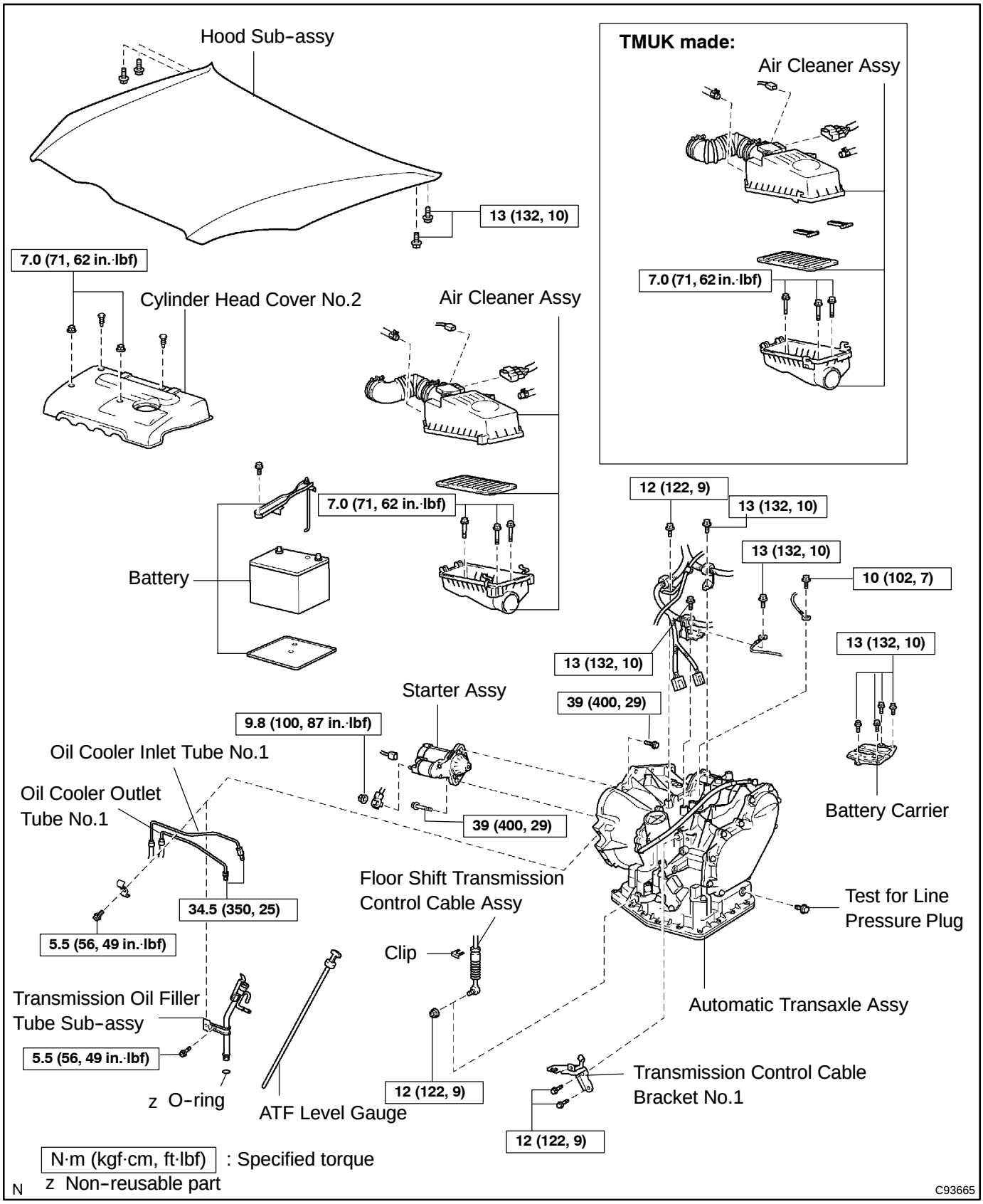
2. ADJUST PARK/NEUTRAL POSITION SWITCH ASSY

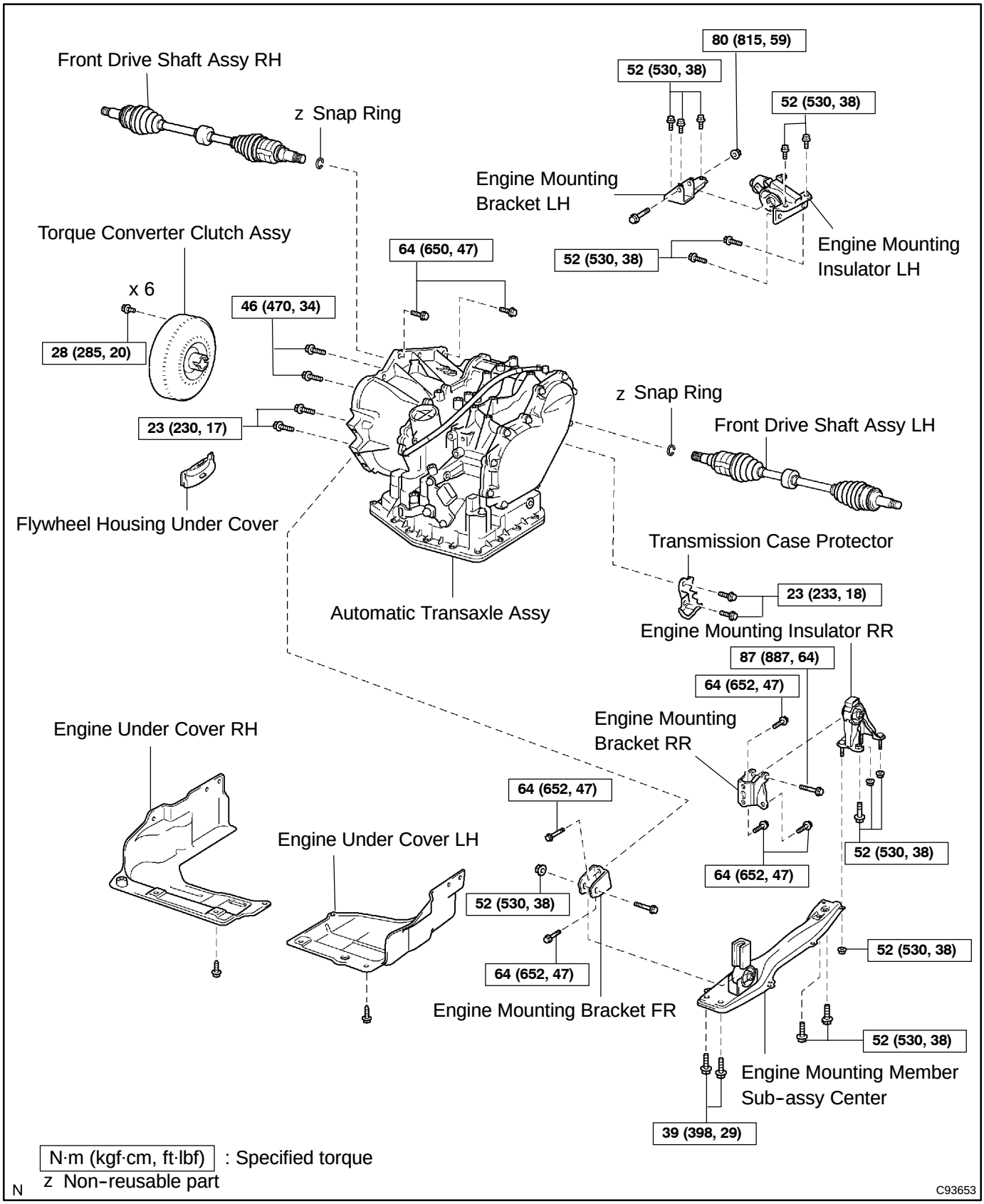
(a) Loosen the 2 bolts of park/ neutral position switch and set the shift lever to the N range.
(b) Align the groove and neutral basic line.
(c) Hold the switch in position and tighten the 2 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(d) After adjustment, perform the inspection described in step 1.

AUTOMATIC TRANSAXLE ASSY (ATM)

COMPONENTS

400J9-01




Front Drive Shaft Assy RH
z Snap Ring
80 (815, 59)
52 (530, 38)
52 (530, 38)
Engine Mounting Bracket LH
Engine Mounting Insulator LH
52 (530, 38)
Torque Converter Clutch Assy
x 6
28 (285, 20)
64 (650, 47)
46 (470, 34)
23 (230, 17)
Flywheel Housing Under Cover
Automatic Transaxle Assy
z Snap Ring
Front Drive Shaft Assy LH
Transmission Case Protector
23 (233, 18)
Engine Mounting Insulator RR
87 (887, 64)
64 (652, 47)
Engine Mounting Bracket RR
Engine Under Cover RH
Engine Under Cover LH
64 (652, 47)
52 (530, 38)
64 (652, 47)
52 (530, 38)
64 (652, 47)
Engine Mounting Bracket FR
52 (530, 38)
52 (530, 38)
Engine Mounting Member Sub-assy Center
39 (398, 29)
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
N
C93653

REPLACEMENT

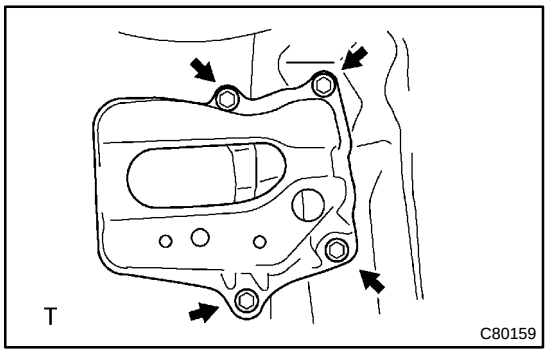
HINT:

COMPONENTS: See page 40-7, 15-4 and 30-3

1. REMOVE HOOD SUB-ASSY

2. REMOVE CYLINDER HEAD COVER NO.2

3. REMOVE BATTERY

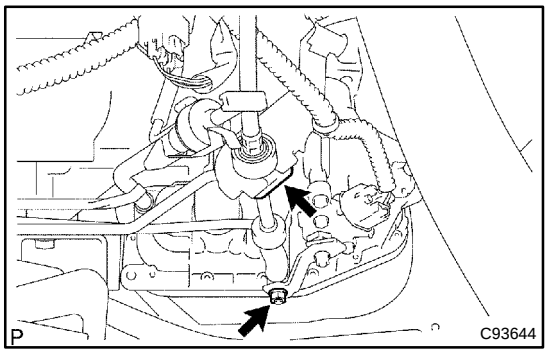


4. REMOVE BATTERY CARRIER

(a) Remove the 4 bolts and battery carrier.

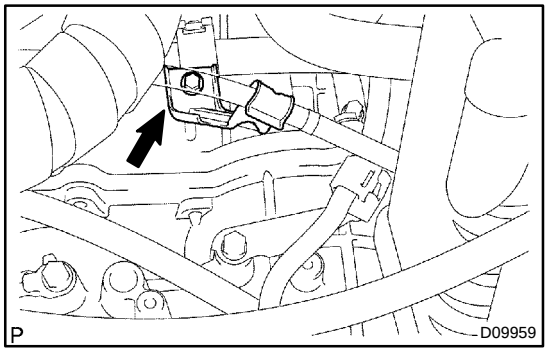
5. REMOVE AIR CLEANER ASSY

6. REMOVE AIR CLEANER HOSE NO.1



7. REMOVE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Remove the nut from the control shaft lever.
(b) Disconnect the control cable from the control shaft lever.
(c) Remove the clip and disconnect the control cable from the control cable bracket.

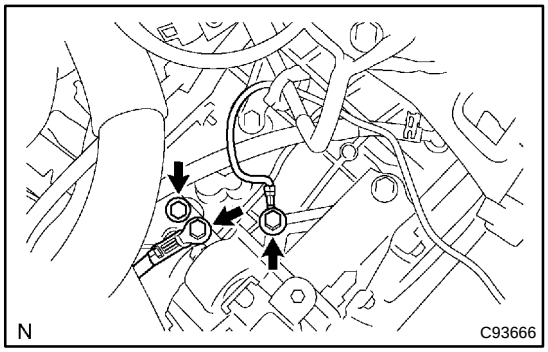


8. REMOVE TRANSMISSION CONTROL CABLE SUPPORT

(a) Disconnect the control cable from the control cable support.
(b) Remove the bolt and control cable support.

9. REMOVE TRANSMISSION CONTROL CABLE BRACKET NO.1

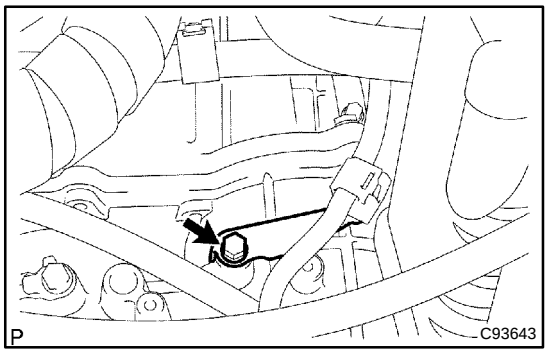
(a) Remove the 2 bolts and control cable bracket.



10. DISCONNECT WIRE HARNESS

(a) Remove the 2 bolts and disconnect the 2 wire harnesses.

(b) Remove the bolt and disconnect the wire harness clamp bracket.

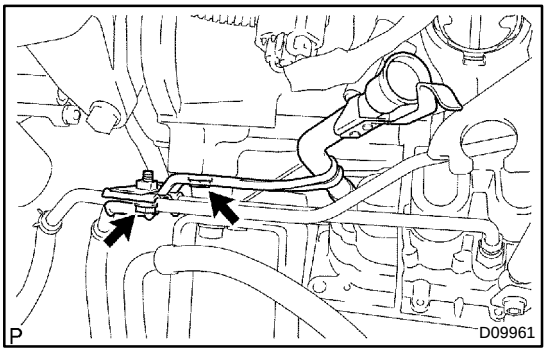


(c) Remove the bolt and disconnect the wire harness clamp bracket.

11. DISCONNECT CONNECTOR

(a) Disconnect the transmission wire connector.

(b) Disconnect the park/neutral position switch connector.

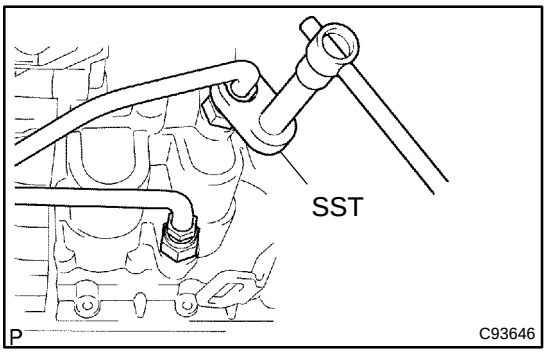


12. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSY

(a) Remove the ATF lever gauge.

(b) Remove the 2 bolts, oil cooler tube clamp and oil filler tube.

(c) Remove the O-ring from the oil filler tube.



13. DISCONNECT OIL COOLER INLET TUBE NO.1

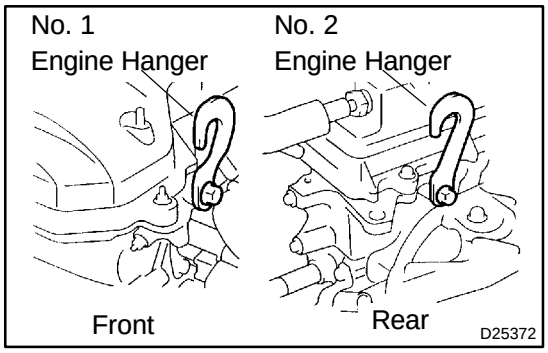
(a) Disconnect the oil cooler inlet tube No. 1.
SST 09023-12700

14. DISCONNECT OIL COOLER OUTLET TUBE NO.1

(a) Disconnect the oil cooler outlet tube No. 1.
SST 09023-12700

15. DISCONNECT OXYGEN SENSOR CONNECTOR

(a) Remove the foot rest.
(b) Pull up the floor carpet.
(c) Disconnect the oxygen sensor connector.



16. SUSPEND ENGINE ASSY

(a) Disconnect the 2 PCV hoses.
(b) Install the No.1 and No.2 engine hangers in the correct direction.
Parts No.:
No.1 engine hanger: 12281-22021
No.2 engine hanger: 12281-15040
Bolt: 91512-B1016
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)
(c) Attach the engine chain hoist to the engine hangers.

CAUTION:
Do not attempt to hang the engine by hooking the chain to any other part.

17. REMOVE FRONT WHEELS

18. REMOVE ENGINE UNDER COVER RH

19. REMOVE ENGINE UNDER COVER LH

20. DRAIN AUTOMATIC TRANSAXLE FLUID

(a) Remove the drain, plug, gasket and drain ATF.
(b) Install a new gasket and drain plug.
Torque: 17.2 N·m (175 kgf·cm, 13 ft·lbf)

21. REMOVE EXHAUST PIPE ASSY FRONT
(See page 15-5)

22. REMOVE FRONT DRIVE SHAFT ASSY RH
(See page 30-6)
SST 09520-01010, 09520-24010 (09520-32040)

23. REMOVE FRONT DRIVE SHAFT ASSY LH
(See page 30-6)
SST 09520-01010, 09520-24010 (09520-32040)

24. REMOVE AUTOMATIC TRANSMISSION CASE PROTECTOR

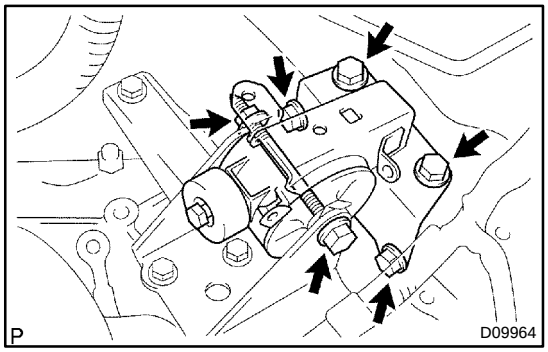
(a) Remove the 2 bolts and case protector.

25. REMOVE STARTER ASSY

(a) Remove the nut and disconnect the starter wire.
(b) Disconnect the connector.
(c) Remove the 2 bolts and starter.

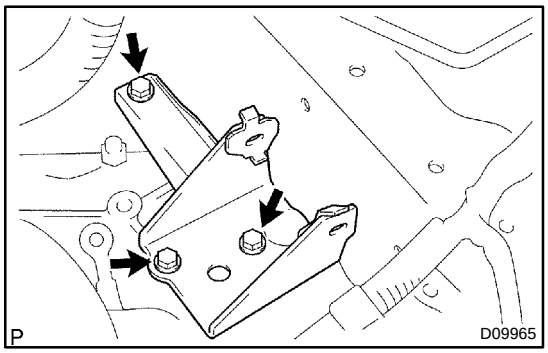
26. SUPPORT AUTOMATIC TRANSAXLE ASSY

(a) Support the automatic transaxle with a transmission jack.



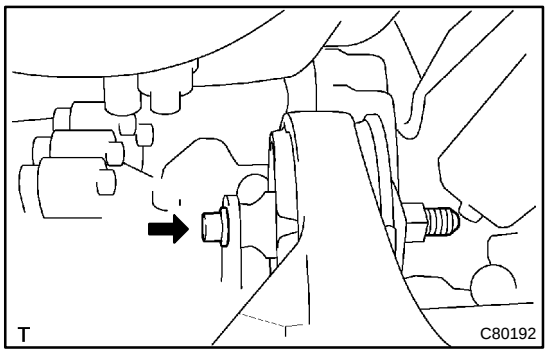
27. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the 5 bolts, nut and engine mounting insulator LH.



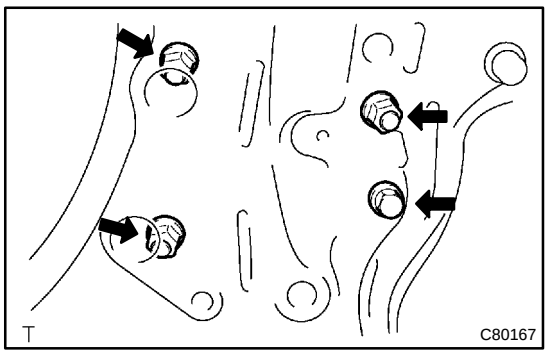
28. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 3 bolts, engine mounting bracket LH.

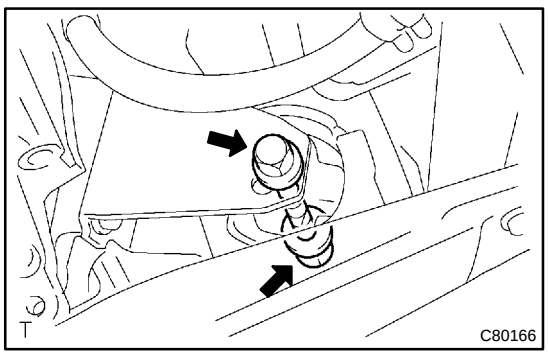


29. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the bolt from the engine mounting bracket RR.

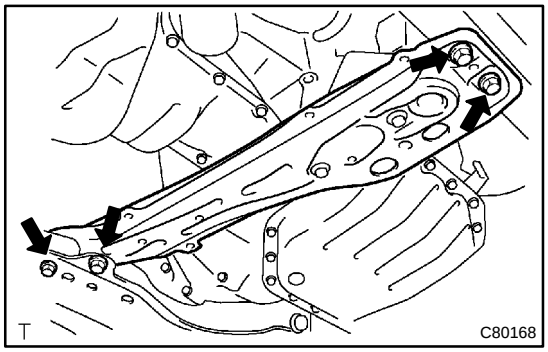


(b) Remove the 3 nuts, bolt and engine mounting insulator RR from the suspension member.



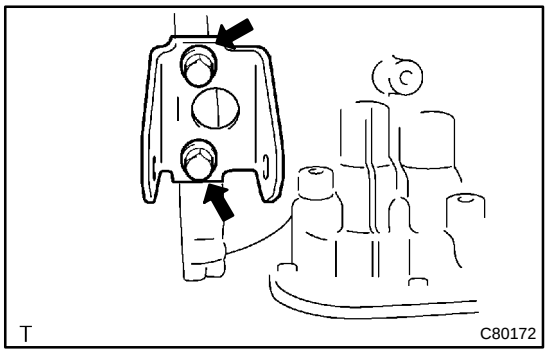
30. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the bolt and nut from the engine mounting bracket FR.



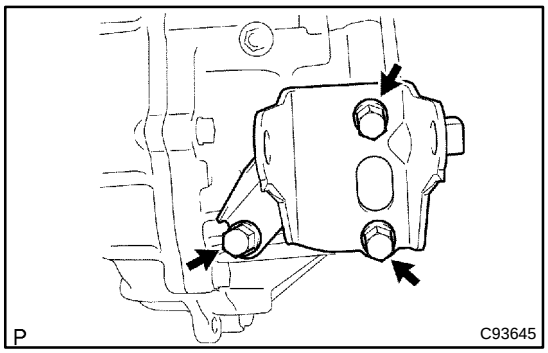
31. REMOVE ENGINE MOUNTING MEMBER SUB-ASSY CENTER

(a) Remove the 4 bolts and center member with engine mounting insulator FR.



32. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

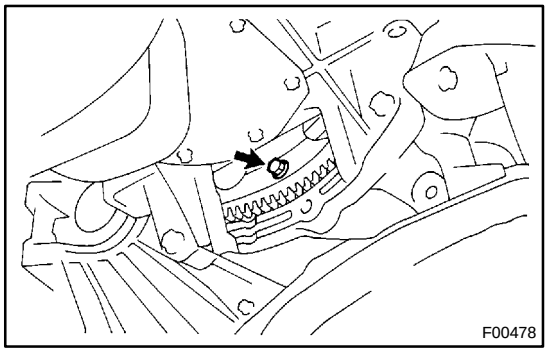
(a) Remove the 2 bolts and engine mounting bracket FR.



33. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

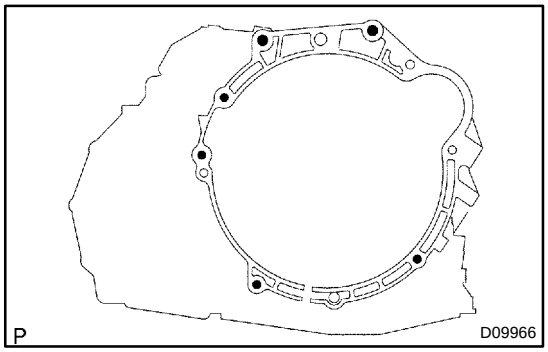
(a) Remove the 3 bolts and engine mounting bracket RR.

34. REMOVE FLYWHEEL HOUSING UNDER COVER



35. REMOVE AUTOMATIC TRANSAXLE ASSY

(a) Turn the crankshaft to gain access and remove the 6 bolts while holding the crankshaft pulley bolt with a wrench.



(b) Remove the 6 bolts.
(c) Separate and remove the automatic transaxle.

36. REMOVE TORQUE CONVERTER CLUTCH ASSY

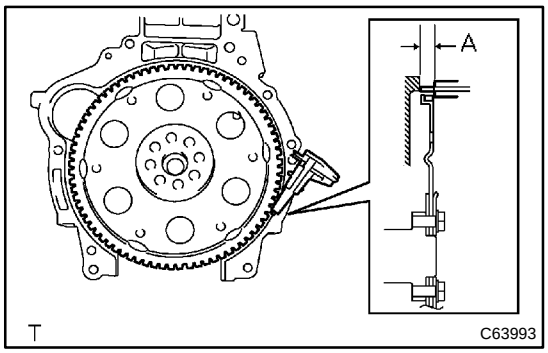
37. INSPECT TORQUE CONVERTER CLUTCH ASSY

(See page 40–20)

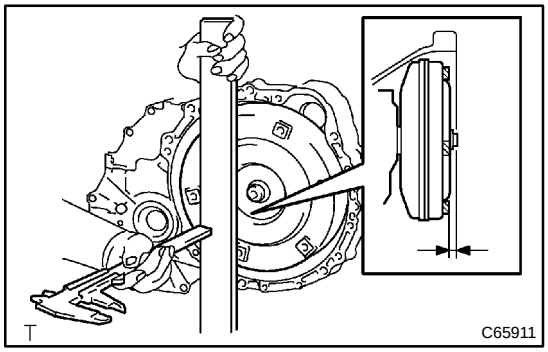
SST 09350–32014 (09351–32010, 09351–32020)

38. INSTALL TORQUE CONVERTER CLUTCH ASSY

(a) Install the torque converter clutch to the automatic transaxle.

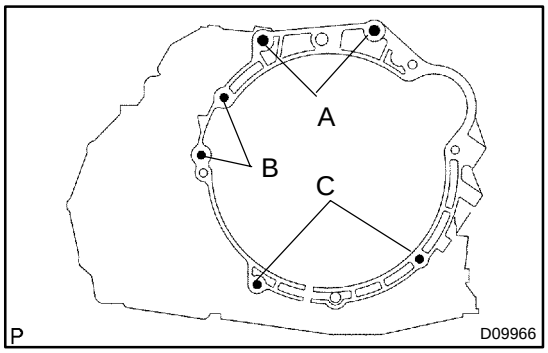


(b) Using vernier calipers, measure the dimension ”A” between the transaxle fitting part and the converter fitting part of the drive plate.



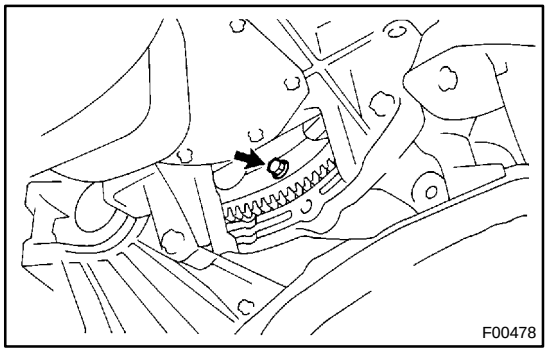
(c) Using vernier calipers and a straight edge, measure the dimension ”B” shown in the illustration and check that ”B” is greater than ”A” measured in (b).
Standard: A + 1 mm or more

NOTICE:
Do not add the thickness of straight edge.



39. INSTALL AUTOMATIC TRANSAXLE ASSY

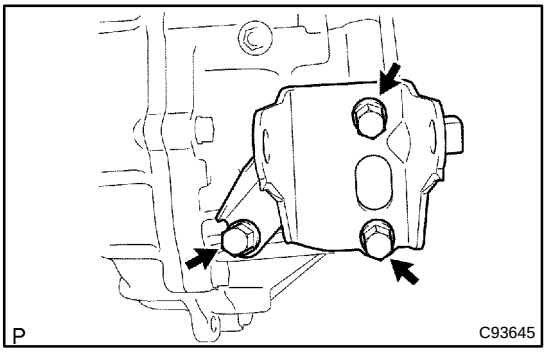
(a) Install the automatic transaxle and 6 bolts to the engine.
Torque:
Bolt A: 64 N·m (650 kgf·cm, 47 ft·lbf)
Bolt B: 46 N·m (470 kgf·cm, 34 ft·lbf)
Bolt C: 23 N·m (230 kgf·cm, 17 ft·lbf)



(b) Install the 6 torque converter mounting bolts.
Torque: 28 N·m (285 kgf·cm, 20 ft·lbf)

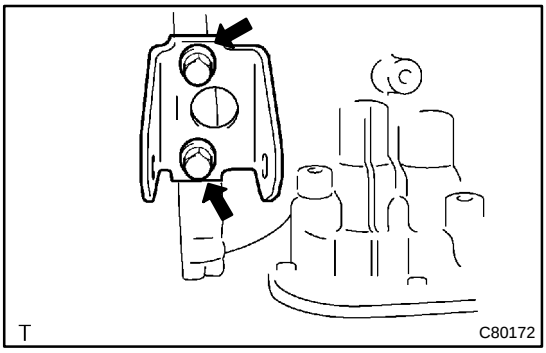
HINT:
First install yellowish green colored bolt and then the 5 bolts.

40. INSTALL FLYWHEEL HOUSING UNDER COVER



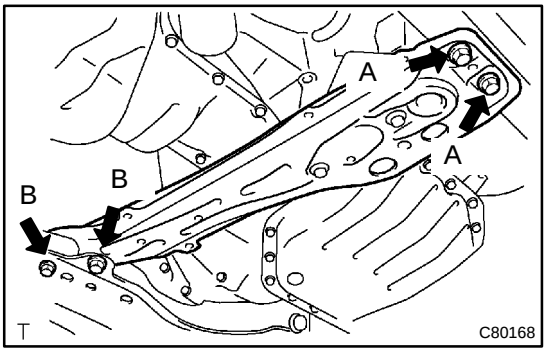
41. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket RR and 3 bolts to the automatic transaxle.
Torque: 64 N·m (652 kgf·cm, 47 ft·lbf)



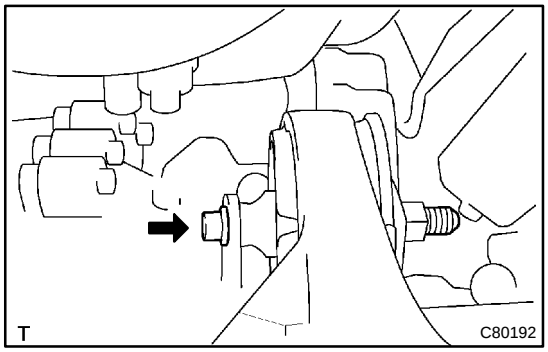
42. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket FR and 2 bolts to the automatic transaxle.
Torque: 64 N·m (652 kgf·cm, 47 ft·lbf)



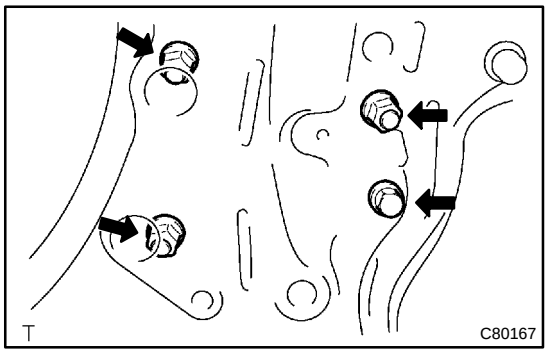
43. INSTALL ENGINE MOUNTING MEMBER SUB-ASSY CENTER

(a) Install the center member and 4 bolts.
Torque:
Bolt A: 39 N·m (398 kgf·cm, 29 ft·lbf)
Bolt B: 52 N·m (530 kgf·cm, 38 ft·lbf)

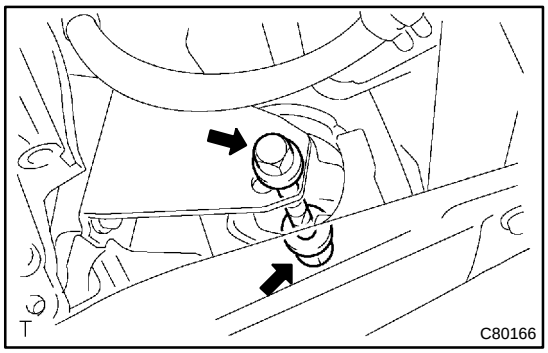


44. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the engine mounting insulator RR and bolt to the engine mounting bracket RR.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)

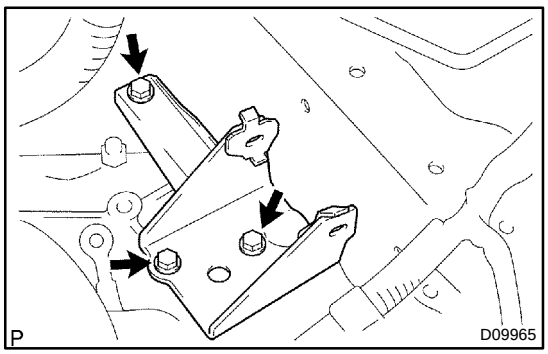


(b) Tighten the 3 nuts and bolt.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



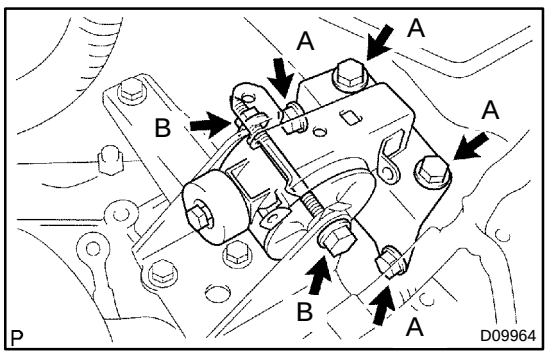
45. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the bolt and nut to the engine mounting bracket FR.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



46. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket LH and 3 bolts to the automatic transaxle.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



47. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the engine mounting insulator LH, 5 bolts and nut.
Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Bolt B: 80 N·m (815 kgf·cm, 59 ft·lbf)
Nut B: 80 N·m (815 kgf·cm, 59 ft·lbf)

48. INSTALL STARTER ASSY

(a) Install the starter and 2 bolts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
(b) Connect the connecter.
(c) Install the starter wire and nut.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

49. INSTALL AUTOMATIC TRANSMISSION CASE PROTECTOR

(a) Install the case protector with the 2 bolts.
Torque: 23 N·m (233 kgf·cm, 18 ft·lbf)

50. INSTALL FRONT DRIVE SHAFT ASSY LH
(See page 30-14)

51. INSTALL FRONT DRIVE SHAFT ASSY RH
(See page 30-6)

52. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15-5)

53. INSTALL ENGINE UNDER COVER LH

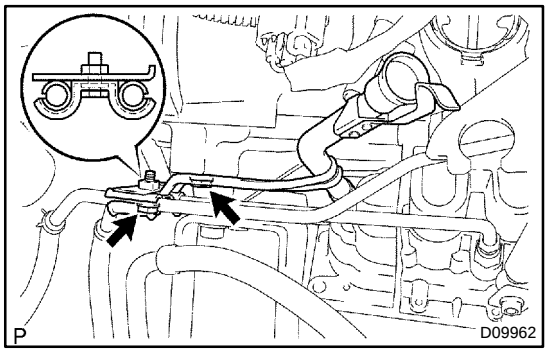
54. INSTALL ENGINE UNDER COVER RH

55. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

56. INSTALL OXYGEN SENSOR CONNECTOR
(a) Connect the oxygen sensor connector.
(b) Install the floor carpet and foot rest.

57. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSY

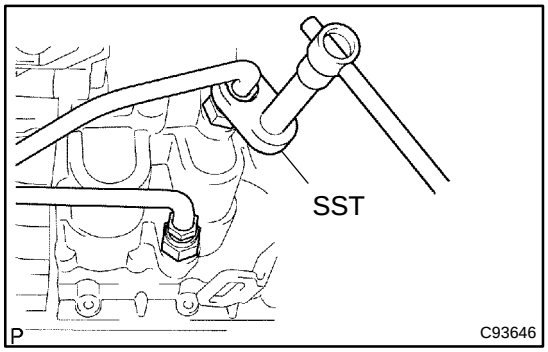
(a) Temporarily install the oil cooler outlet tube No. 1.
(b) Temporarily install the oil cooler inlet tube No. 1.
(c) Coat a new O-ring with ATF, and install them to the oil filler tube.
(d) Install the oil filler tube to the automatic transaxle.



(e) Install the oil cooler tube clamp and 2 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(f) Install the ATF lever gauge.

58. INSTALL OIL COOLER OUTLET TUBE NO.1

(a) Tighten the oil cooler outlet tube No. 1.
Torque: 34.5 N·m (350 kgf·cm, 25 ft·lbf)
SST 09023-12700

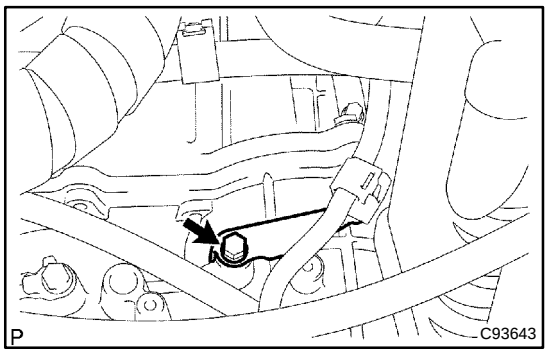


59. INSTALL OIL COOLER INLET TUBE NO.1

(a) Tighten the oil cooler inlet tube No. 1.
Torque: 34.5 N·m (350 kgf·cm, 25 ft·lbf)
SST 09023–12700

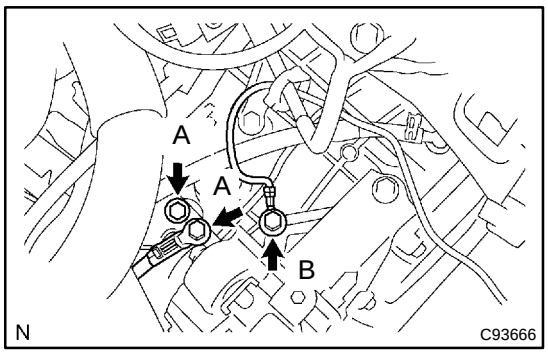
60. CONNECT CONNECTOR

(a) Connect the transmission wire connector.
(b) Connect the park/neutral position switch connector.



61. INSTALL WIRE HARNESS

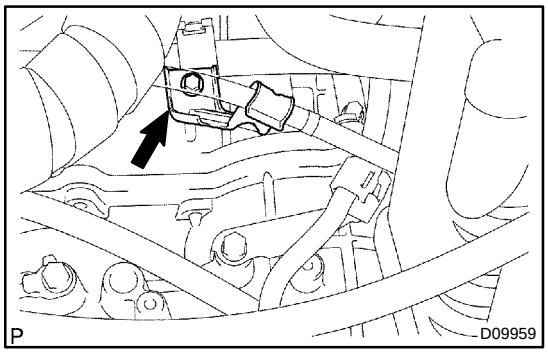
(a) Install the wire harness clamp bracket and bolt.
Torque: 13 N·m (132 kgf·cm, 10 ft·lbf)



(b) Install the wire harness clamp bracket and 2 wire harnesses with the 3 bolts.
Torque:
Bolt A: 13 N·m (132 kgf·cm, 10 ft·lbf)
Bolt B: 10 N·m (102 kgf·cm, 7 ft·lbf)

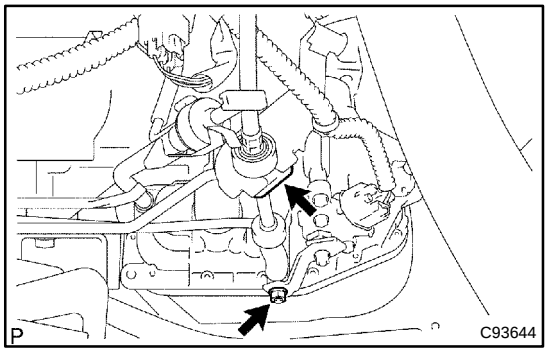
62. INSTALL TRANSMISSION CONTROL CABLE BRACKET NO.1

(a) Install the control cable bracket and 2 bolts.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)



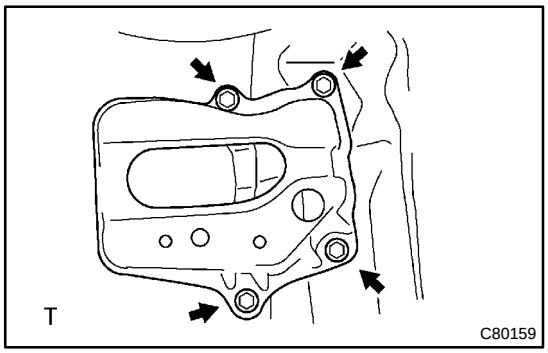
63. INSTALL TRANSMISSION CONTROL CABLE SUPPORT

(a) Install the control cable support and bolt.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)
(b) Connect the control cable to the control cable support.



64. INSTALL FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Temporarily install the control cable to the control shaft lever with the nut.
(b) Install the control cable and clip to the bracket.



65. INSTALL BATTERY CARRIER

(a) Install the battery carrier and 4 bolts.
Torque: 13 N·m (132 kgf·cm, 10 ft·lbf)

66. INSTALL CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

67. INSTALL HOOD SUB-ASSY

Torque: 13 N·m (130 kgf·cm, 10 ft·lbf)

68. INSPECT HOOD SUB-ASSY
(See page 75-1)

69. ADJUST HOOD SUB-ASSY
(See page 75-2)

70. ADD AUTOMATIC TRANSAXLE FLUID

71. INSPECT AUTOMATIC TRANSAXLE FLUID **(See page 40-2)**

72. ADJUST SHIFT LEVER POSITION **(See page 40-43)**

73. INSPECT SHIFT LEVER POSITION **(See page 40-43)**

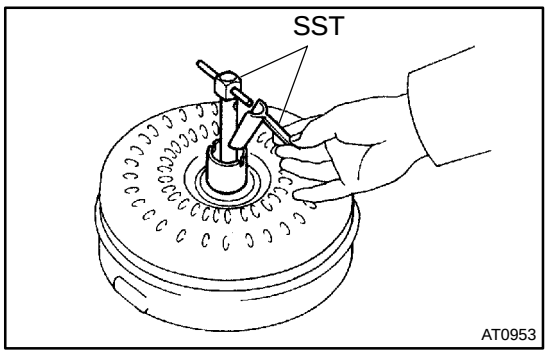
74. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT **(See page 26-11)**

75. CHECK ABS SPEED SENSOR SIGNAL **(See page 05-565, 05-618 or 05-673)**

TORQUE CONVERTER CLUTCH AND DRIVE PLATE (ATM)

40037-03

INSPECTION



1. INSPECT TORQUE CONVERTER CLUTCH ASSY

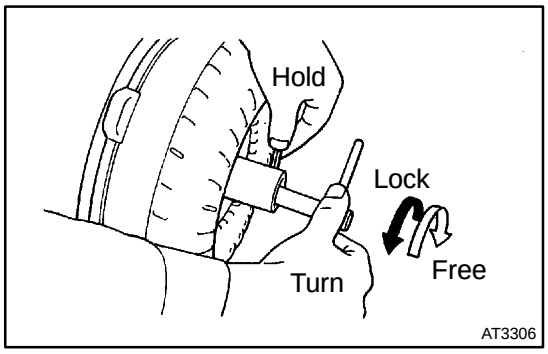
(a) Inspect the one-way clutch.

(1) Install SST into the inner race of the one-way clutch.

SST 09350-32014 (09351-32010)

(2) Install SST so that it fits in the notch of the converter hub and outer race of the one-way clutch.

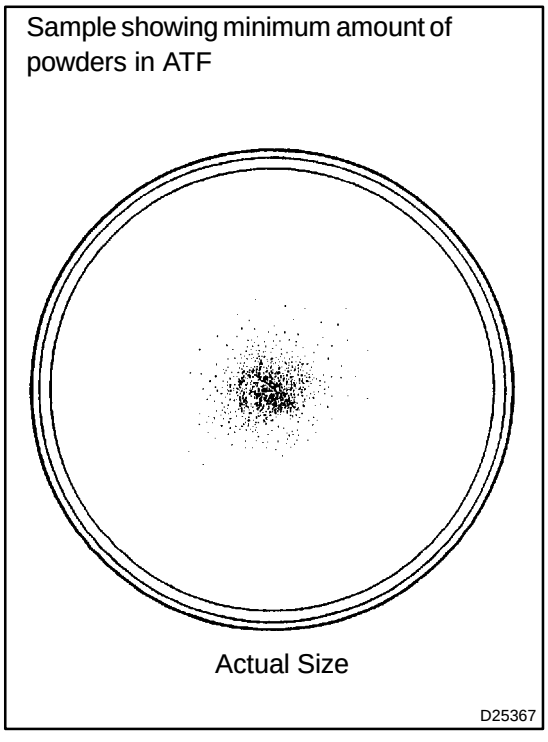
SST 09350-32014 (09351-32020)



(3) With the torque converter clutch setting up on its side, check that the one-way clutch locks when it is turned counterclockwise, and rotates smoothly clockwise.

If necessary, clean the torque converter clutch and retest the one-way clutch.

Replace the torque converter clutch if the one-way clutch still fails the test.



(b) Determine the condition of the torque converter clutch assy.

(1) If the inspection result of the torque converter clutch assy meets the following item, replace the torque converter clutch.

Malfunction item:

Any metallic sound is heard from the torque converter clutch during stall test or when the shift lever is in neutral position.

One-way clutch is free or locked in both directions.

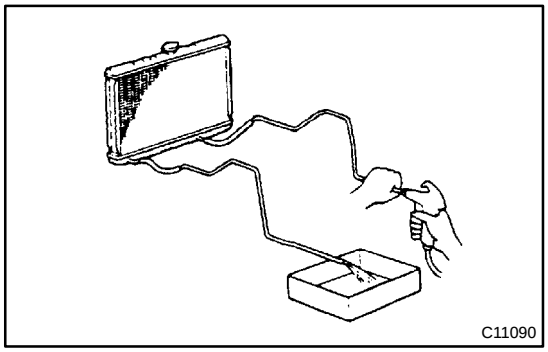
Fine powders exceeding the sample limit is identified in ATF. (See the sample.)

HINT:

The sample shows the auto fluid of approx. 0.25 liters (0.26 US qts, 0.22 Imp. qts) that is taken out from the removed torque converter clutch

(c) Replace the ATF in the torque converter clutch.

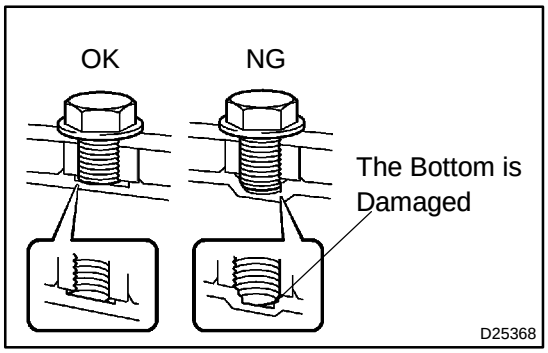
(1) If the ATF is discolored and/or has a foul odor, completely stir the ATF in the torque converter clutch and drain it with the face for installation facing up.


C11090

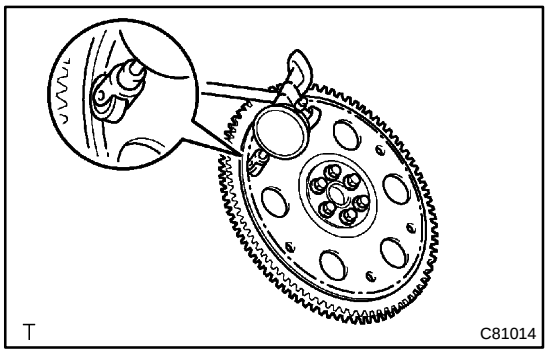
(d) Clean and check the oil cooler and oil pipe line.
(1) If the torque converter clutch is inspected or the ATF is exchanged, clean the oil cooler and oil pipe line.

HINT:
- Spray compressed air of 196 kPa (2 kgf/cm^2, 28 psi) from the inlet hose.
- If plenty of fine powders are identified in the ATF, add new ATF using a bucket pump and clean it again.

(2) If the ATF is cloudy, inspect the oil cooler.



(e) Prevent deformation of the torque converter clutch and damage to the oil pump gear.
(1) When any marks due to interference are found on the end of the bolt for the torque converter clutch and on the bottom of the bolt hole, replace the bolt and the torque converter clutch.
(2) All of the bolts shall have the same length.
(3) No missing spring washer.


C81014

2. INSPECT DRIVE PLATE & RING GEAR SUB-ASSY

(a) Set up a dial indicator and measure the drive plate runout.
(b) Check the damage of the ring gear.
Maximum runout: 0.20 mm (0.0079 in.)

If the runout is not within the specification or ring gear is damaged, replace the drive plate.

TRANSMISSION VALVE BODY ASSY (ATM)

4003D-02

REPLACEMENT

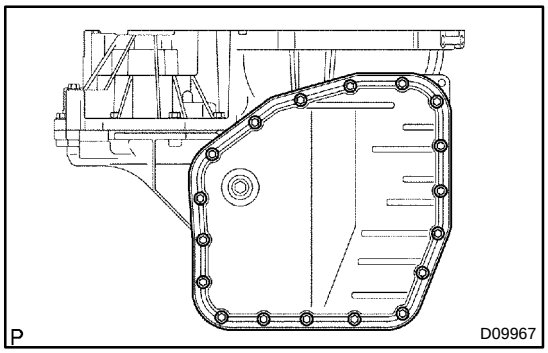
1. REMOVE ENGINE UNDER COVER LH

2. DRAIN AUTOMATIC TRANSAXLE FLUID

(a) Remove the drain plug, gasket and drain ATF.

(b) Install a new gasket and drain plug.

Torque: 17.2 N·m (175 kgf·cm, 13 ft·lbf)



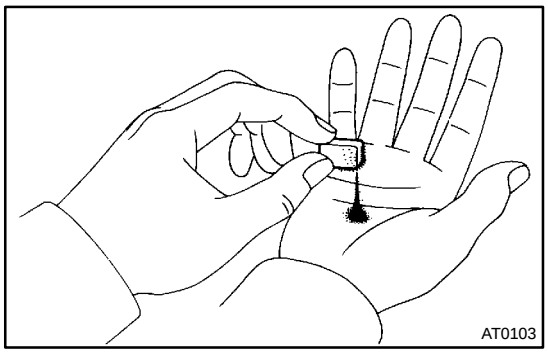
3. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSY

(a) Remove the 18 bolts, oil pan and gasket.

NOTICE:

Some fluid will remain in the oil pan. Remove all pan bolts, and carefully remove the oil pan assembly. Discard the gasket.

(b) Remove the 2 magnets from oil pan.

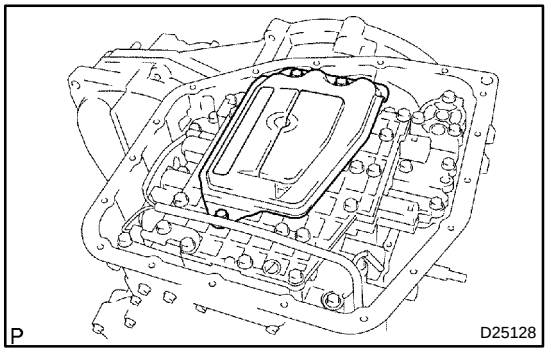


(c) Examine particles in pan.

(1) Remove the magnets and use them to collect any steel chips. Look carefully at the chips and particles in the pan and the magnet to anticipate what type of wear you will find in the transaxle.

Steel (magnetic): bearing, gear and plate wear

Brass (non-magnetic): bearing wear

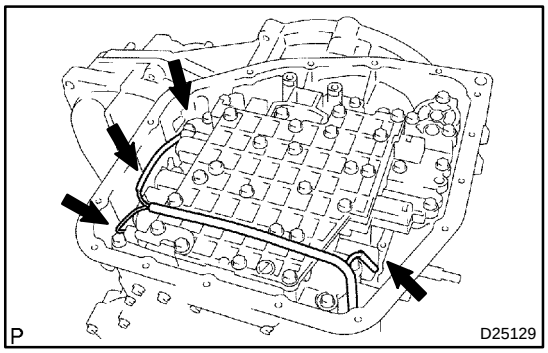


4. REMOVE VALVE BODY OIL STRAINER ASSY

(a) Remove the 3 bolts and oil strainer.

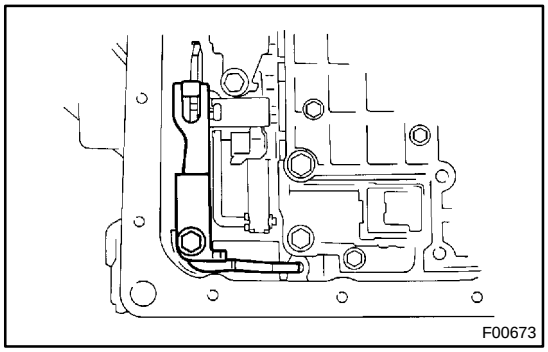
NOTICE:

Be careful as some fluid will come out with the oil strainer.

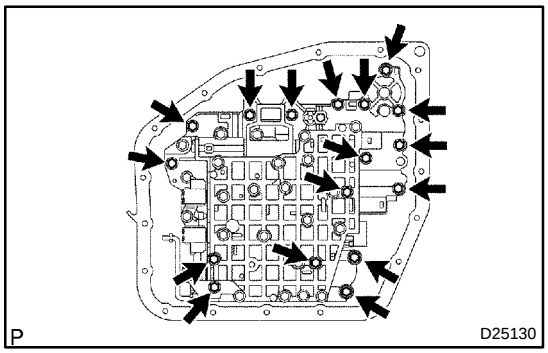


5. REMOVE TRANSMISSION VALVE BODY ASSY

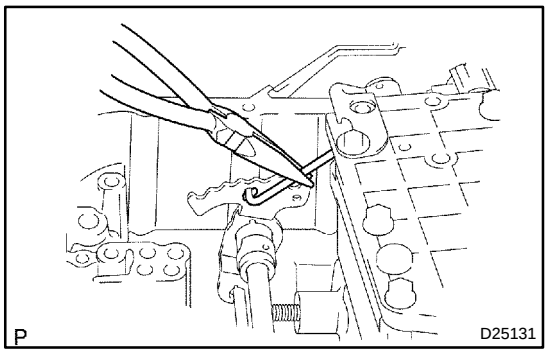
(a) Disconnect the 4 solenoid connecters.



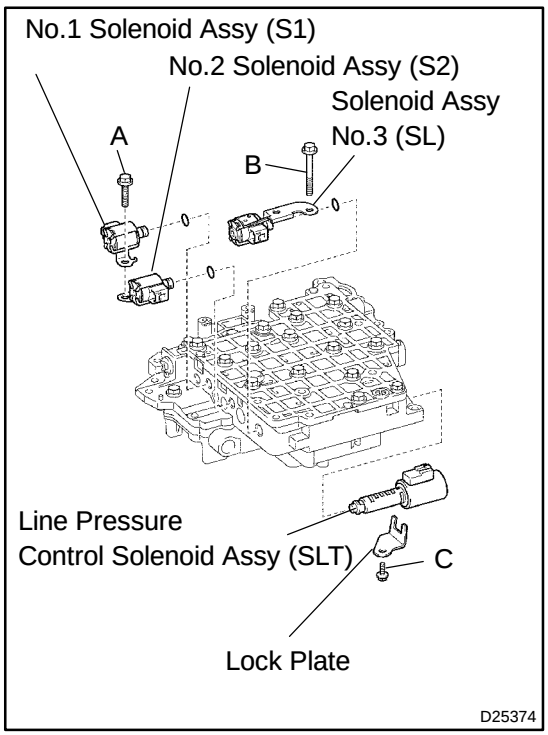
(b) Remove the bolt and manual detent spring.



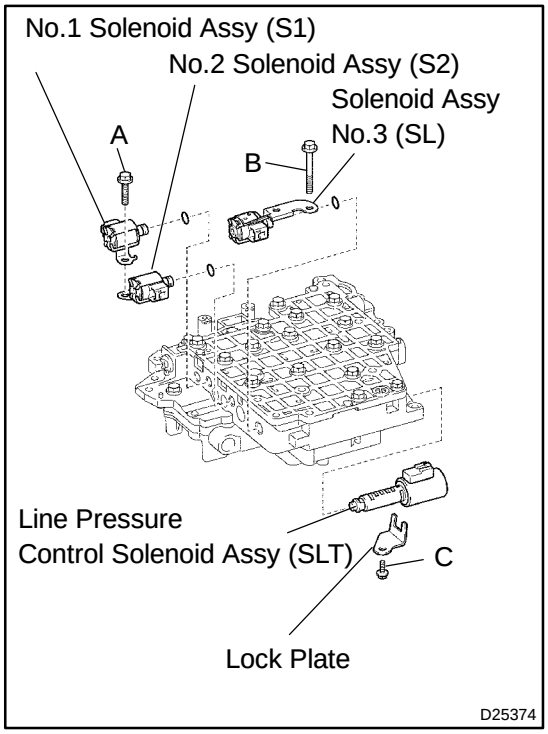
(c) Remove the 17 bolts.



(d) While disconnecting the manual valve connecting rod from the manual valve lever, remove the valve body with the manual valve together.



(e) Remove the 2 bolts and 3 solenoid valves.
(f) Remove the 3 O-rings from each of the solenoid valves.
(g) Remove the bolt, lock plate and line pressure control valve.



6. INSTALL TRANSMISSION VALVE BODY ASSY

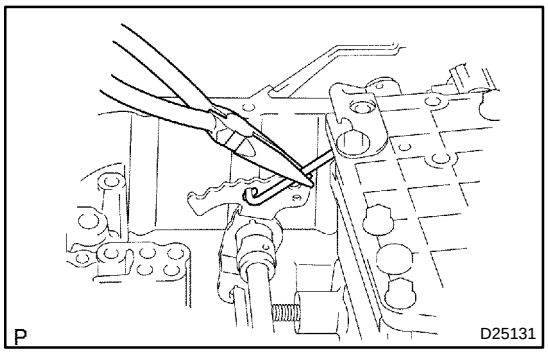
(a) Coat 3 new O–rings with ATF and install them to each solenoid valves.

(b) Install the No. 1, No. 2 solenoid valves with the bolt.

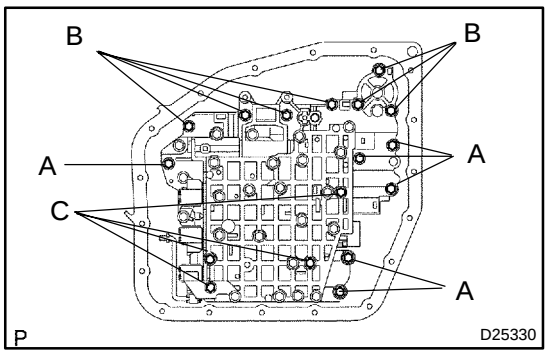
(c) Install the No. 3 solenoid valve with the bolt.

(d) Install the line pressure control solenoid valve and lock plate with the bolt.

Torque:
Bolt A: 11 N·m (110 kgf·cm, 8 ft·lbf)
Bolt B: 11 N·m (110 kgf·cm, 8 ft·lbf)
Bolt C: 6.5 N·m (66 kgf·cm, 58 in.·lbf)
Bolt length:
Bolt A: 25 mm (0.984 in.)
Bolt B: 60 mm (2.362 in.)
Bolt C: 12 mm (0.472 in.)

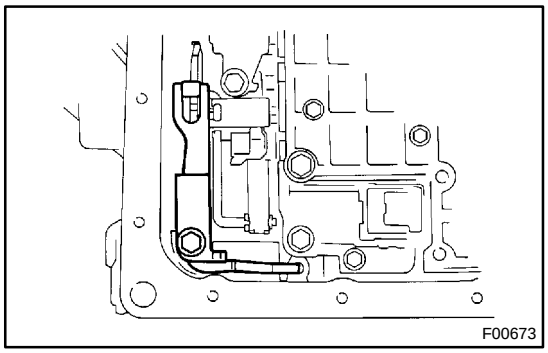


(e) While connecting the manual valve connecting rod to the manual valve lever, install the valve body with the manual valve together.



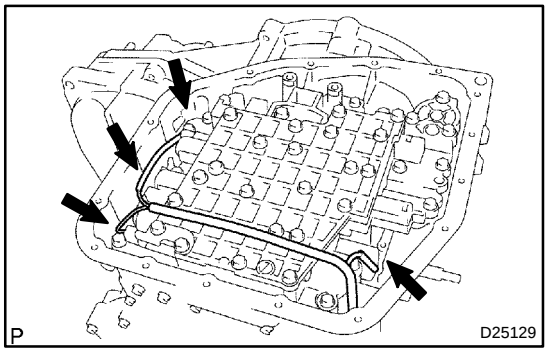
(f) Install the 17 bolts.

Bolt length:
Bolt A: 20 mm (0.79 in.)
Bolt B: 28 mm (1.10 in.)
Bolt C: 50 mm (1.97 in.)
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

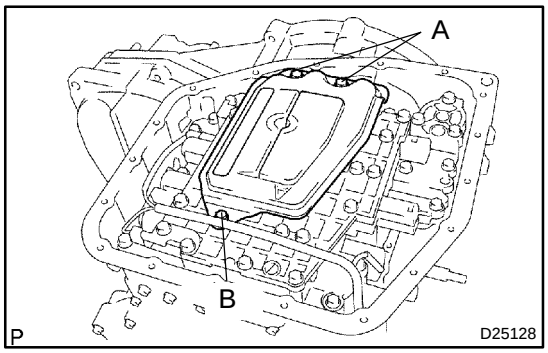


(g) Install the manual detent spring and bolt.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

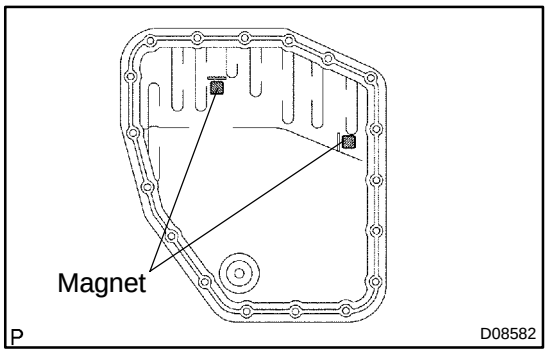


(h) Connect the 4 solenoid connectors.



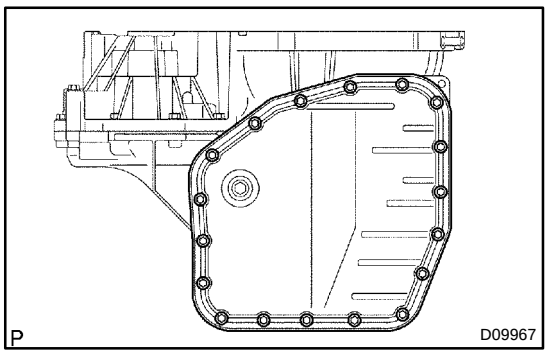
7. INSTALL VALVE BODY OIL STRAINER ASSY

(a) Install the oil strainer with the 3 bolts.
Bolt length:
A bolt: 12 mm (0.47 in.)
B bolt: 20 mm (0.79 in.)
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



8. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSY

(a) Install the 2 magnets to the oil pan.



(b) Install a new gasket to the oil pan and install them to the transaxle.
(c) Install the 18 bolts.
Torque: 5.3 N·m (55 kgf·cm, 48 in.·lbf)

9. INSTALL ENGINE UNDER COVER LH

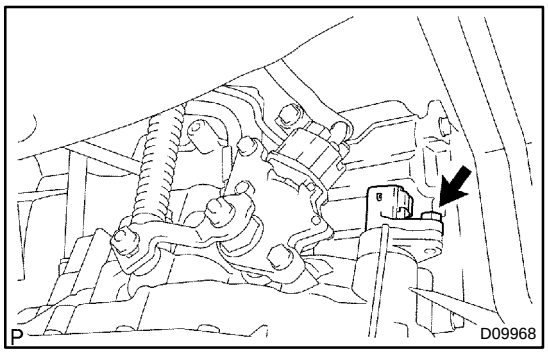
10. ADD AUTOMATIC TRANSAXLE FLUID
11. INSPECT AUTOMATIC TRANSAXLE FLUID **(See page 40-2)**

TRANSMISSION WIRE (ATM)

4003A-02

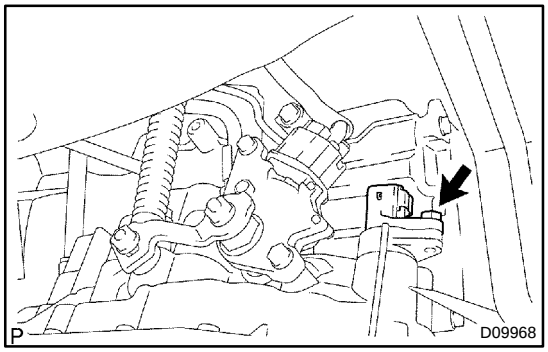
REPLACEMENT

1. REMOVE TRANSMISSION VALVE BODY ASSY
(See page 40-22)



2. REMOVE TRANSMISSION WIRE

(a) Removal the bolt and transmission wire.



3. INSTALL TRANSMISSION WIRE

(a) Coat a O-ring with ATF.
(b) Install the transmission wire and bolt.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

4. INSTALL TRANSMISSION VALVE BODY ASSY
(See page 40-24)

FRONT DIFFERENTIAL OIL SEAL (ATM)

4003G-02

REPLACEMENT

1. **REMOVE FRONT WHEELS**
2. **REMOVE ENGINE UNDER COVER RH**
3. **REMOVE ENGINE UNDER COVER LH**
4. **DRAIN AUTOMATIC TRANSAXLE FLUID**

(a) Remove the drain plug, gasket and drain ATF.

(b) Install a new gasket and drain plug.

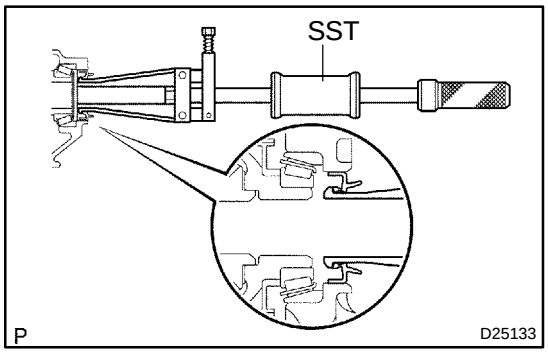
Torque: 17.2 N·m (175 kgf·cm, 13 ft·lbf)

5. **REMOVE FRONT DRIVE SHAFT ASSY RH**

(See page 30-6)

6. **REMOVE FRONT DRIVE SHAFT ASSY LH**

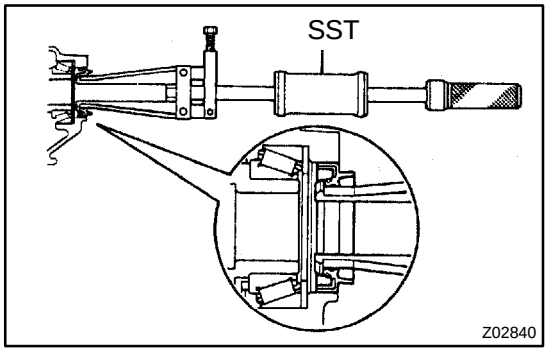
(See page 30-7)



7. **REMOVE TRANSAXLE HOUSING OIL SEAL (RH)**

(a) Using SST, pull out the oil seal.

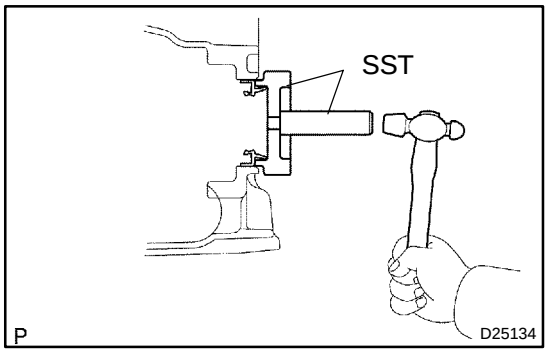
SST 09308-00010



8. **REMOVE TRANSAXLE CASE OIL SEAL (LH)**

(a) Using SST, pull out the oil seal.

SST 09308-00010



9. **INSTALL TRANSAXLE HOUSING OIL SEAL (RH)**

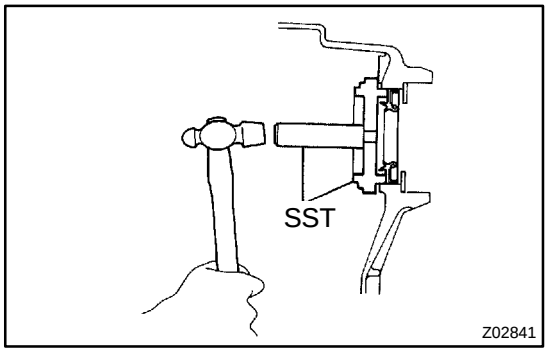
(a) Using SST and a hammer, drive in a new oil seal.

Oil seal drive in depth:

2.0 ± 0.5 mm (0.079 ± 0.020 in.)

(b) Coat the lip of the oil seal with MP grease.

SST 09350-32014 (09351-32130, 09351-32150)



10. INSTALL TRANSAXLE CASE OIL SEAL (LH)

(a) Using SST and a hammer, drive in a new oil seal.
Oil seal drive in depth:
5.3 ± 0.5 mm (0.209 ± 0.020 in.)

(b) Coat the lip of the oil seal with MP grease.
SST 09350-32014 (09351-32111, 09351-32130)

11. INSTALL FRONT DRIVE SHAFT ASSY LH
(See page 30-14)

12. INSTALL FRONT DRIVE SHAFT ASSY RH
(See page 30-6)

13. INSTALL ENGINE UNDER COVER LH

14. INSTALL ENGINE UNDER COVER RH

15. INSTALL FRONT WHEELS
Torque: 103 N·m (1050 kgf·cm, 76 ft·lbf)

16. ADD AUTOMATIC TRANSAXLE FLUID

17. INSPECT AUTOMATIC TRANSAXLE FLUID (See page 40-2)

18. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See page 26-2)

19. CHECK ABS SPEED SENSOR SIGNAL (See page 05-565, 05-618 or 05-673)

SHIFT LOCK SYSTEM (ATM)

4003I-03

ON-VEHICLE INSPECTION

1. CHECK SHIFT LOCK OPERATION

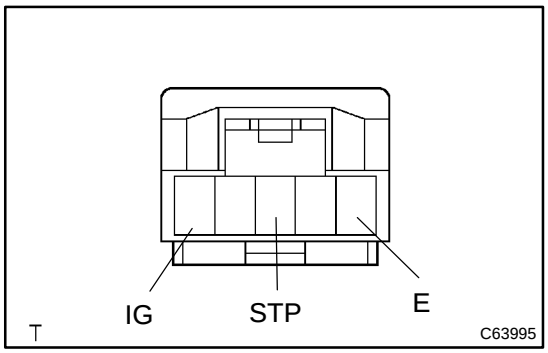
(a) Shift the shift lever to P range.
(b) Turn the ignition switch to LOCK.
(c) Check that the shift lever cannot be shifted to any other ranges that P.
(d) Turn the ignition switch ON, depress the brake pedal and check that the shift lever can be shifted to any other ranges.

2. CHECK SHIFT LOCK RELEASE BUTTON OPERATION

(a) When operating the shift lever with the shift lock release button pressed and the ignition key in ACC or ON, check that the lever can be shifted to any other range.

3. CHECK KEY INTERLOCK OPERATION

(a) Turn the ignition switch ON.
(b) Depress the brake pedal and shift the shift lever to any other range than P.
(c) Check that the ignition key cannot be turned to LOCK.
(d) Shift the shift lever to P range, turn the ignition key to LOCK and check that the ignition key can be removed.



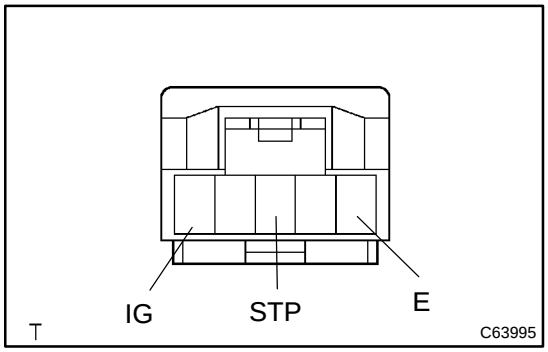
4. INSPECT SHIFT LOCK CONTROL SWITCH

(a) Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift lock control unit assembly connector.

Terminal	Measuring Condition	Voltage (V)
5 (IG) - 1 (E)	Ignition switch ON	10 - 14
5 (IG) - 1 (E)	Ignition switch OFF	0
3 (STP) - 1 (E)	Depress brake pedal	10 - 14
3 (STP) - 1 (E)	Release brake pedal	0



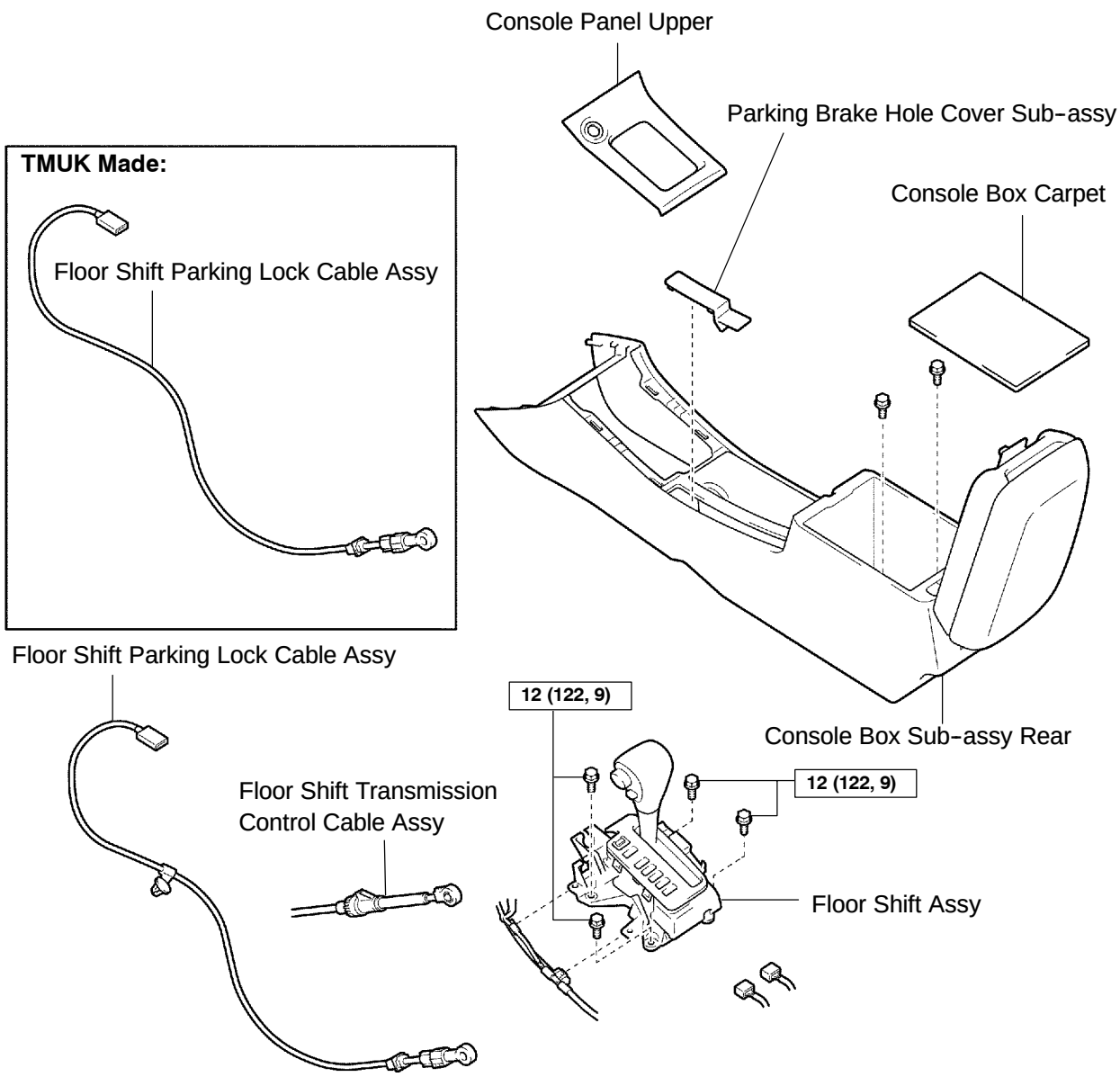
(b) Using an ohmmeter, measure the resistance at terminal E (1) and body ground.

Terminal	Measuring Condition	Specified Value
1 (E) – Body ground	Always	Continuity

FLOOR SHIFT ASSY (ATM)

COMPONENTS

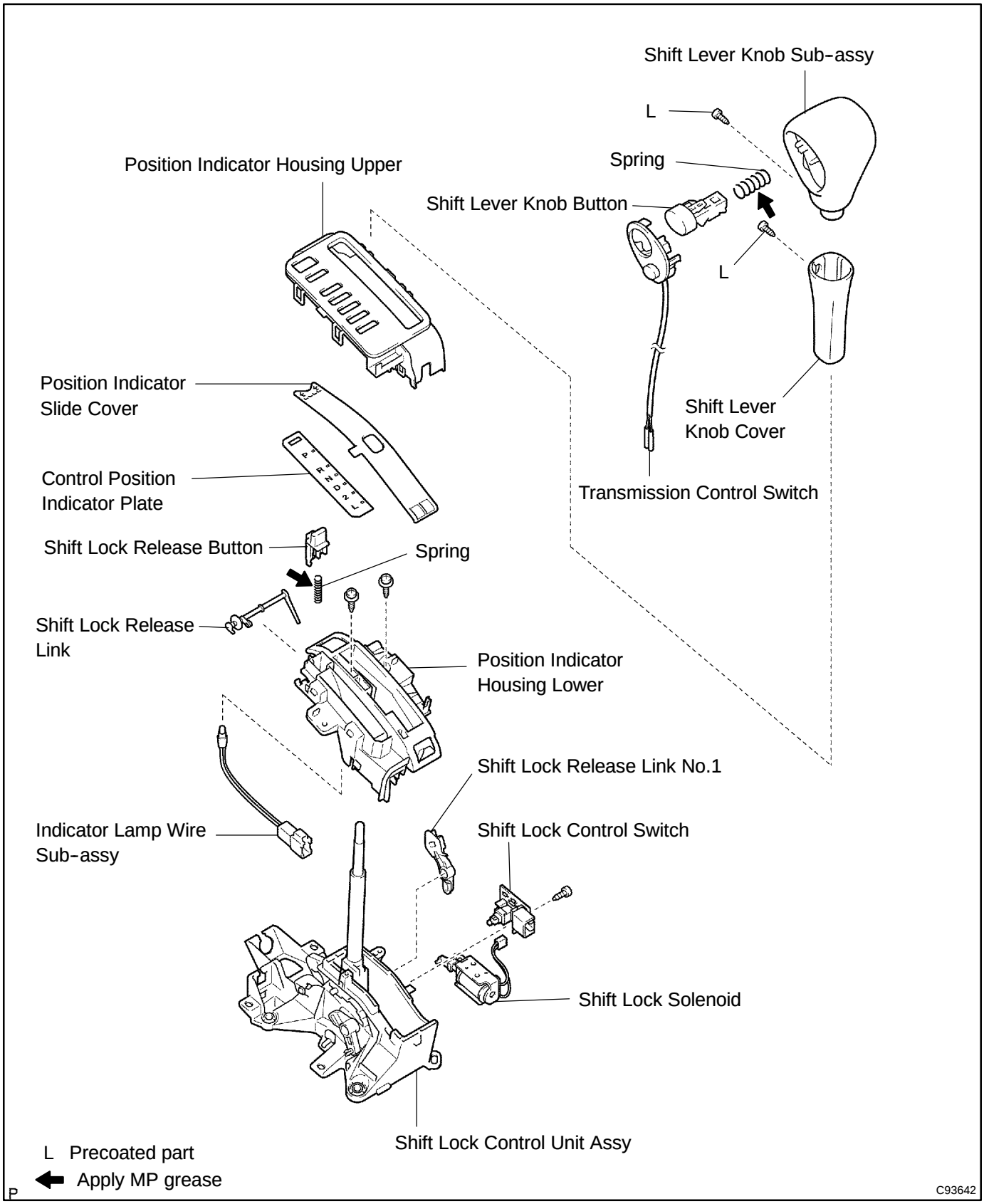
400JB-01



N·m (kgf·cm, ft·lbf) : Specified torque

P

C93641


Shift Lever Knob Sub-assy
L
Spring
Position Indicator Housing Upper
Shift Lever Knob Button
L
Position Indicator Slide Cover
Shift Lever Knob Cover
Control Position Indicator Plate
Transmission Control Switch
Shift Lock Release Button
Spring
Shift Lock Release Link
Position Indicator Housing Lower
Shift Lock Release Link No.1
Indicator Lamp Wire Sub-assy
Shift Lock Control Switch
Shift Lock Solenoid
Shift Lock Control Unit Assy
L Precoated part
Apply MP grease
P
C93642

OVERHAUL

HINT:

COMPONENTS: See page 40-31 and 71-9

1. REMOVE CONSOLE PANEL UPPER

(a) SEDAN/STATION WAGON: (See page 71-16)

(b) HATCHBACK: (See page 71-25)

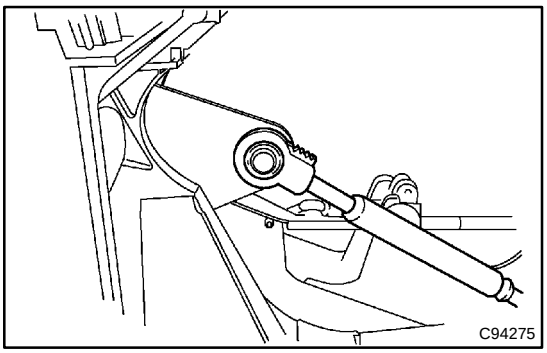
2. REMOVE CONSOLE BOX CARPET

3. REMOVE CONSOLE BOX SUB-ASSY REAR

(a) SEDAN/STATION WAGON: (See page 71-19)

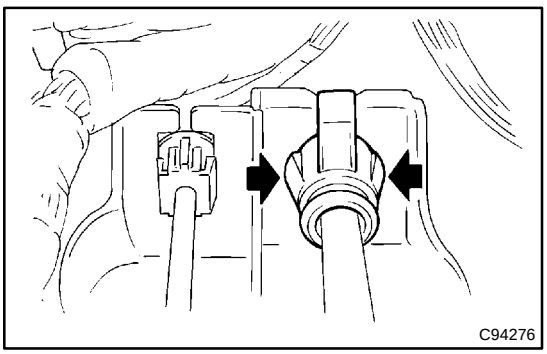
(b) HATCHBACK: (See page 71-28)

4. REMOVE PARKING BRAKE HOLE COVER SUB-ASSY

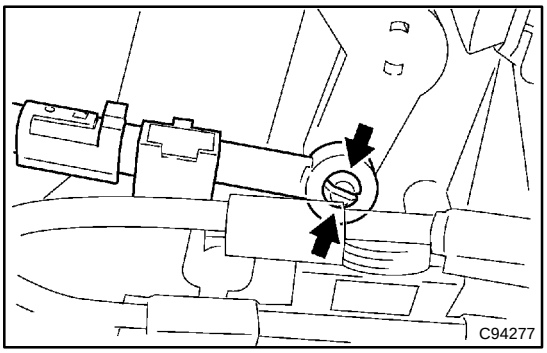


5. DISCONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Remove the cable end from the rod of the floor shift assembly.

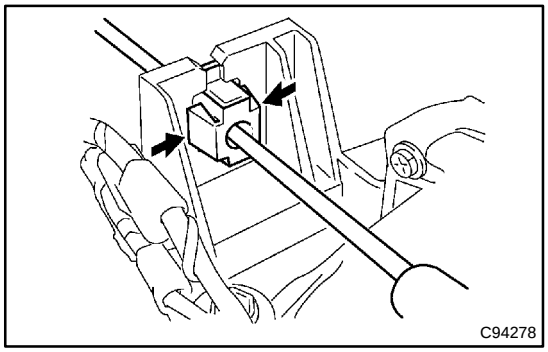


(b) Using a screw driver, disconnect the control cable from the shift lever plate.

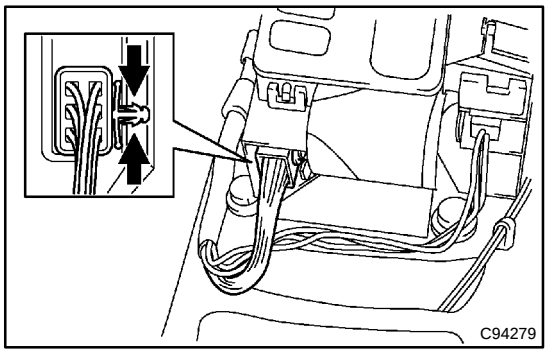


6. DISCONNECT FLOOR SHIFT PARKING LOCK CABLE ASSY

(a) Remove the cable end from the lever pin of the floor shift assembly.



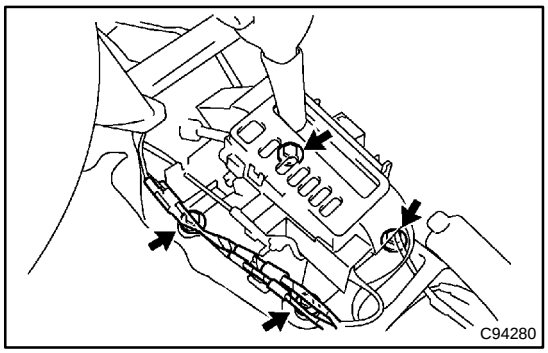
(b) Using screw driver, disconnect the parking lock cable from the floor shift assembly.



7. REMOVE FLOOR SHIFT ASSY

(a) Using screwdriver, remove the connector.

(b) Disconnect the 2 connector.

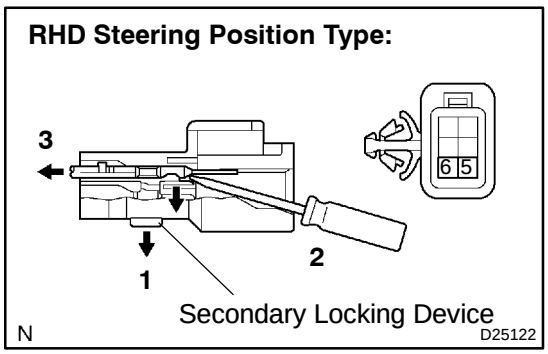


(c) Remove the 2 wire harness clamps from the shift lever assembly.

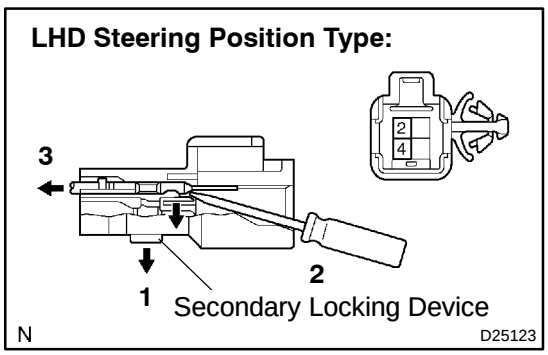
(d) Remove the 4 bolts and floor shift assembly.

8. REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY

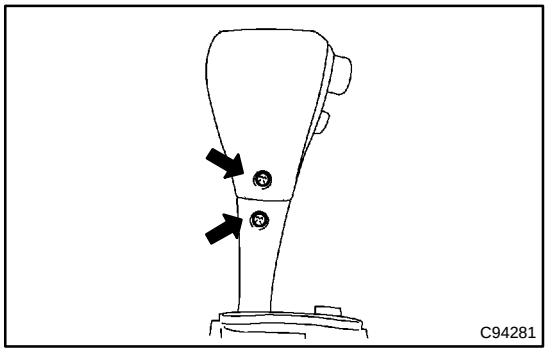
(a) Disengage the secondary locking device.



(b) Release the locking lug of the terminals 5 and 6, and pull the terminals out from the rearward. (RHD steering position type)



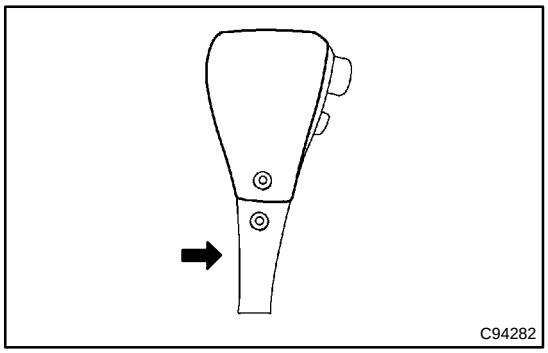
(c) Release the locking lug of the terminals 2 and 4, and pull the terminals out from the rearward. (LHD steering position type)



(d) Remove the 2 screws and shift lever knob sub-assembly.

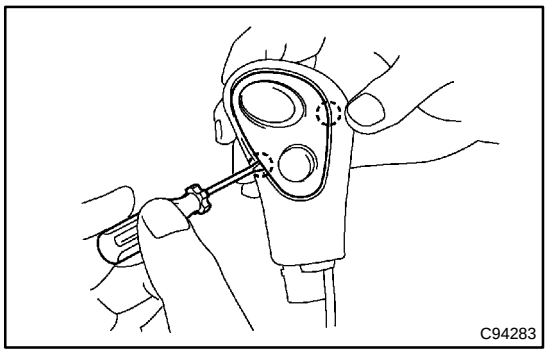
NOTICE:

Pay attention not to apply unnatural load to O/D main switch wire harness.



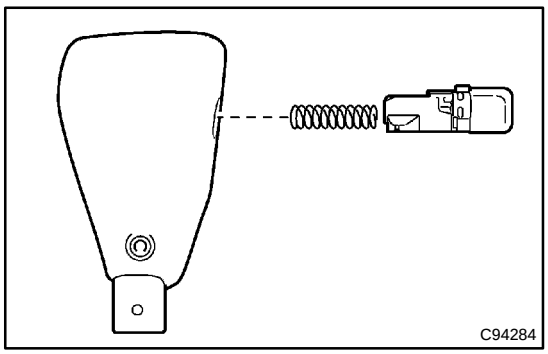
9. REMOVE FLOOR SHIFT SHIFT LEVER KNOB COVER

(a) Remove the shift lever knob cover.



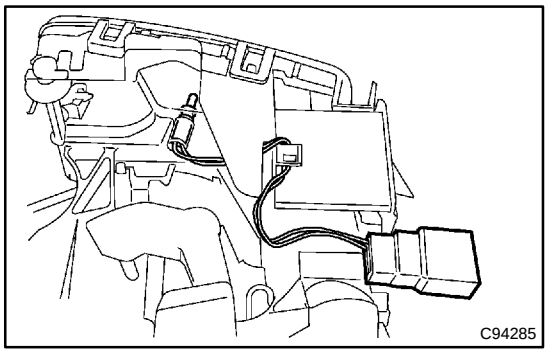
10. REMOVE TRANSMISSION CONTROL SWITCH

(a) Using a small screw driver, remove the transmission control switch.



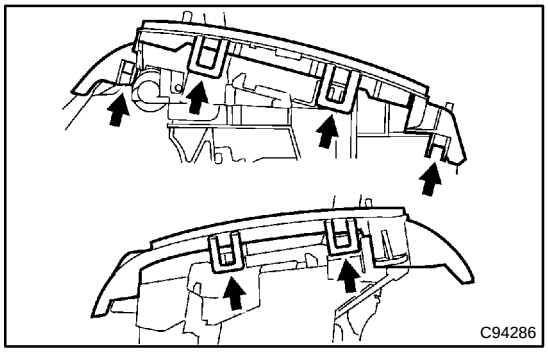
11. REMOVE SHIFT LEVER KNOB BUTTON

(a) Remove the shift lever knob button and spring.



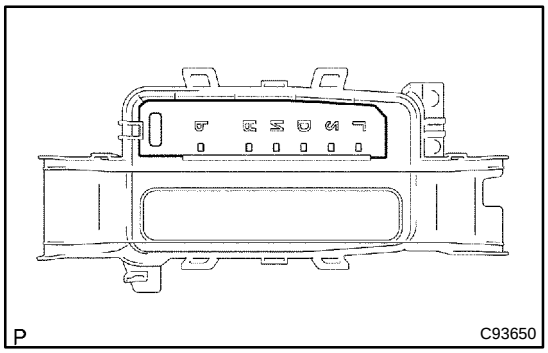
12. REMOVE INDICATOR LAMP WIRE SUB-ASSY

(a) Remove the indicator lamp wire sub-assy.



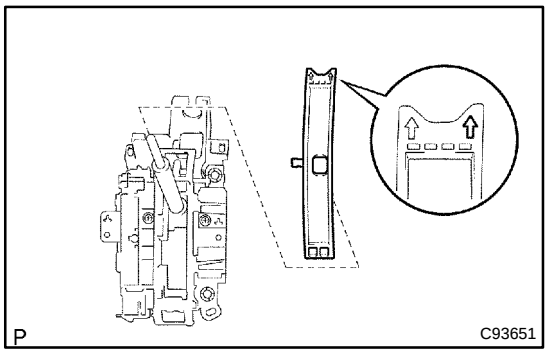
13. REMOVE POSITION INDICATOR HOUSING UPPER

(a) Remove the position indicator housing upper.



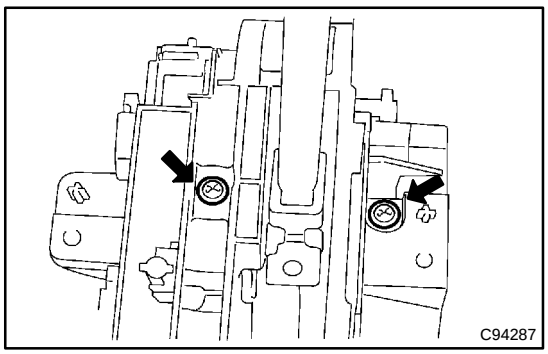
14. REMOVE CONTROL POSITION INDICATOR PLATE

(a) Remove the position indicator plate from the position indicator housing upper.



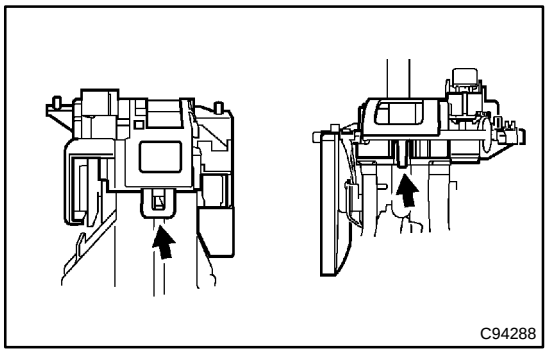
15. REMOVE POSITION INDICATOR SLIDE COVER

(a) Remove the position indicator slide cover.

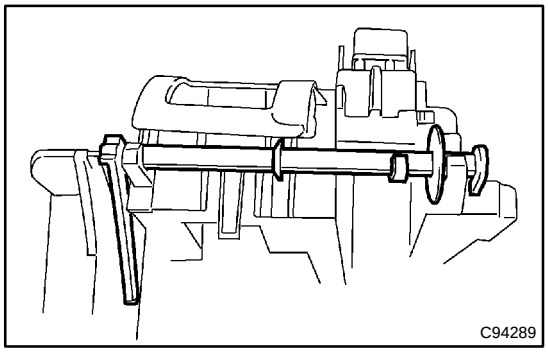


16. REMOVE POSITION INDICATOR HOUSING LOWER

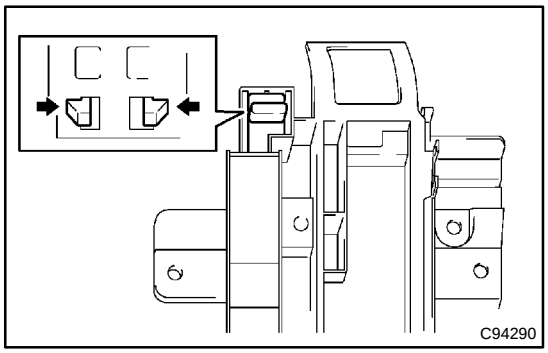
(a) Remove the 2 screws.



(b) Remove the position indicator housing lower.

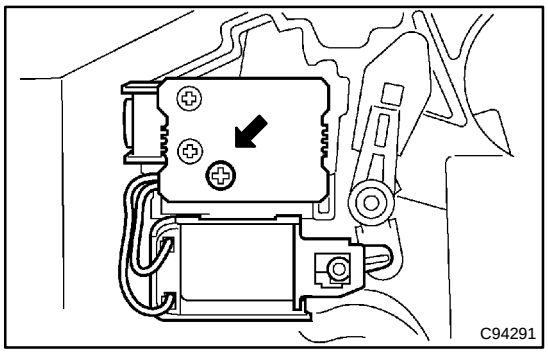


(c) Remove the shift lock release link from the position indicator housing lower.



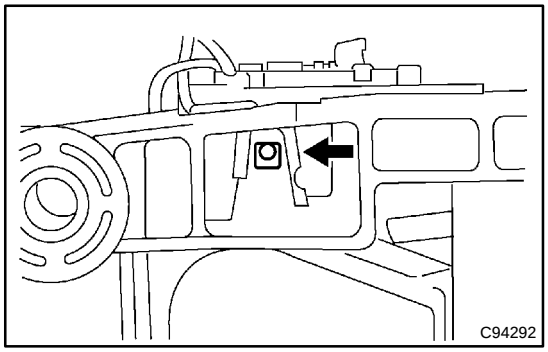
17. REMOVE SHIFT LOCK RELEASE BUTTON

(a) Remove the shift lock release button and spring.

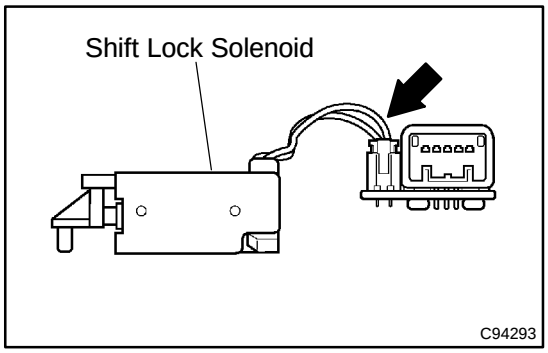


18. REMOVE SHIFT LOCK CONTROL SWITCH

(a) Remove the screw.

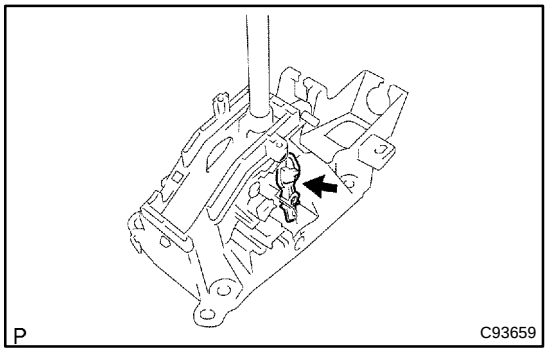


(b) Unlodk the claw, remove the shift lock control switch together with shift lock solenoid from the shift lever plate.



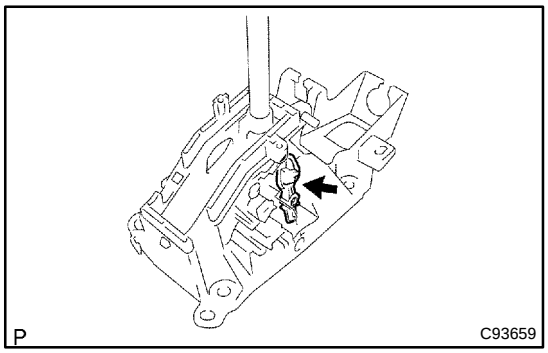
19. REMOVE SHIFT LOCK SOLENOID

(a) Disconnect the shift lock solenoid connector from shift lock control switch.



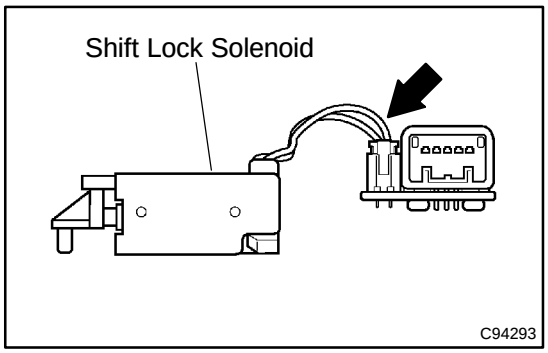
20. REMOVE SHIFT LOCK RELEASE LINK NO.1

(a) Remove the shift lock release link No. 1 from the shift lever plate.



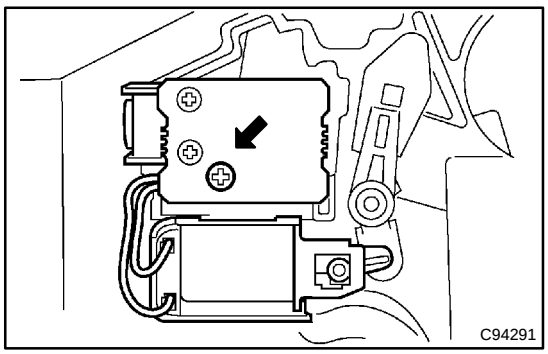
21. INSTALL SHIFT LOCK RELEASE LINK NO.1

(a) Install the shift lock release link No. 1 to the shift lever plate.



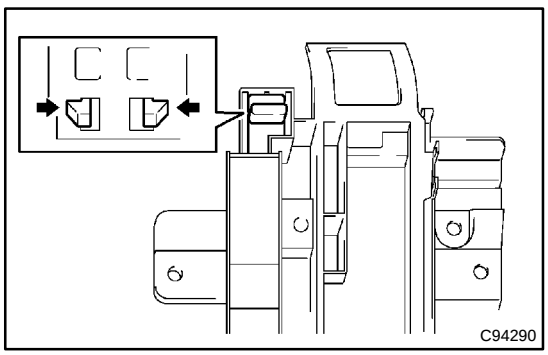
22. INSTALL SHIFT LOCK SOLENOID

(a) Connect the shift lock solenoid connector.



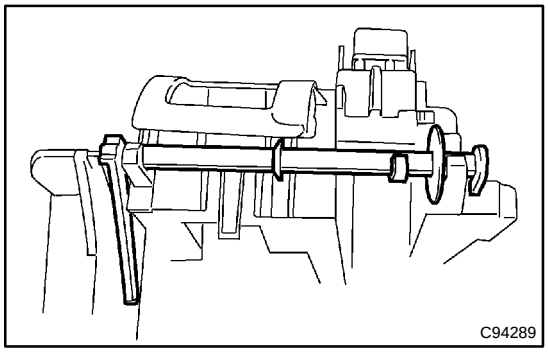
23. INSTALL SHIFT LOCK CONTROL SWITCH

(a) Install the shift lock control switch together with shift lock solenoid and screw to the shift lever plate.



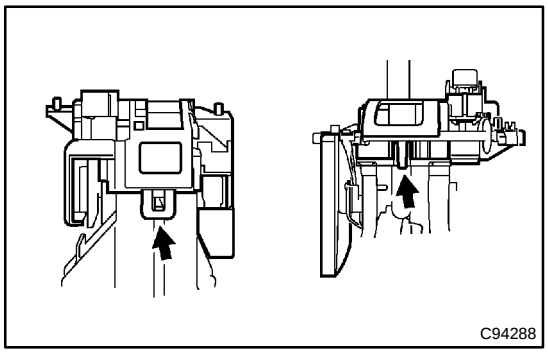
24. INSTALL SHIFT LOCK RELEASE BUTTON

(a) Apply MP grease on the spring.
(b) Install the spring and shift lock release button.

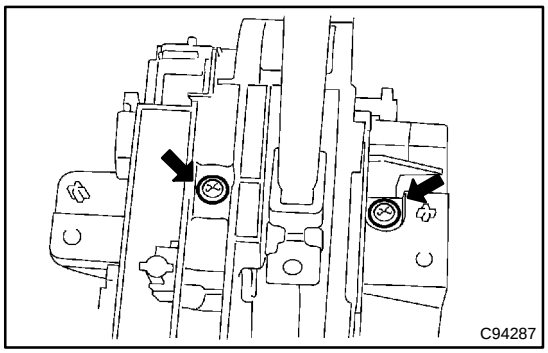


25. INSTALL POSITION INDICATOR HOUSING LOWER

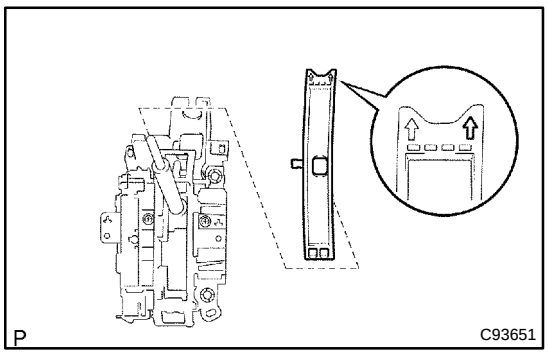
(a) Install the shift lock release link to the position indicator housing lower.



(b) Install the position indicator housing lower.

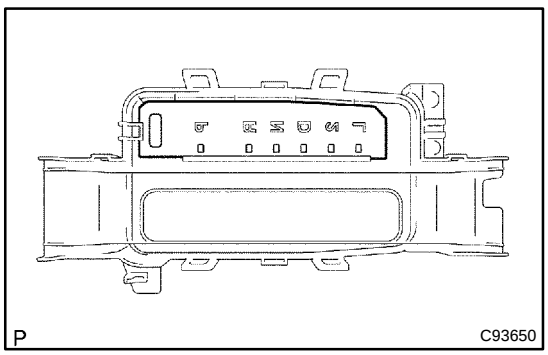


(c) Install the 2 screws.



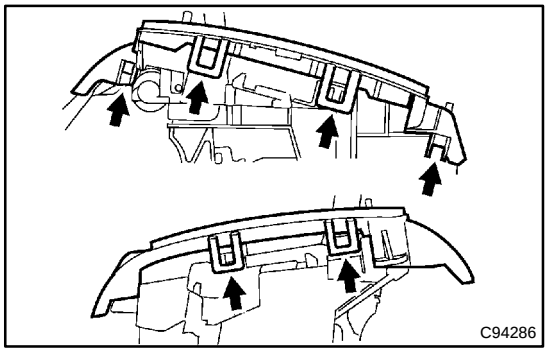
26. INSTALL POSITION INDICATOR SLIDE COVER

(a) Install the position indicator slide cover.



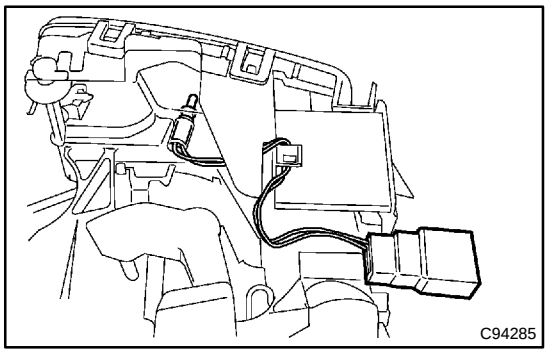
27. INSTALL CONTROL POSITION INDICATOR PLATE

(a) Install the position indicator plate to the position indicator housing upper.



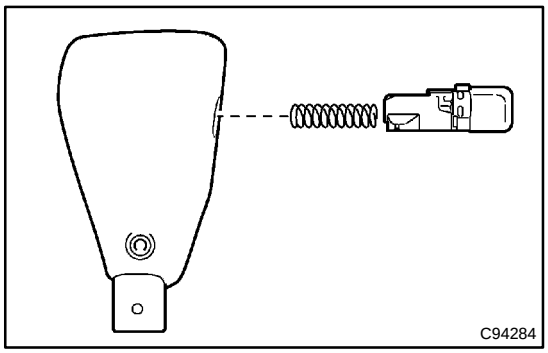
28. INSTALL POSITION INDICATOR HOUSING UPPER

(a) Install the position indicator housing upper.



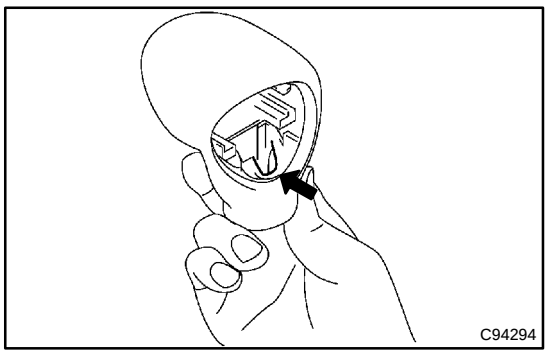
29. INSTALL INDICATOR LAMP WIRE SUB-ASSY

(a) Install the indicator lamp wire sub-assy.



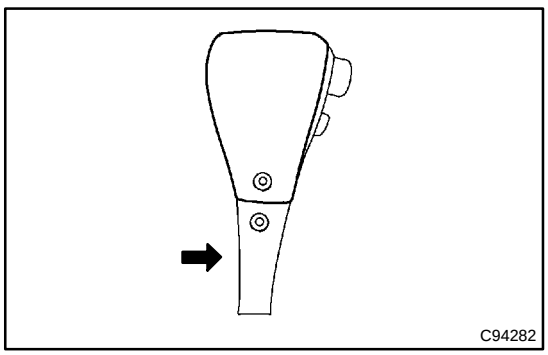
30. INSTALL SHIFT LEVER KNOB BUTTON

(a) Apply MP grease on the spring.
(b) Install the spring and shift lever knob button.



31. INSTALL TRANSMISSION CONTROL SWITCH

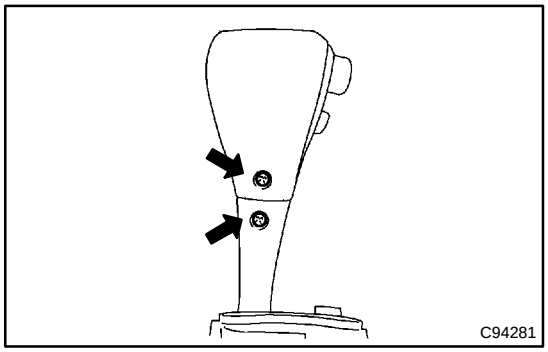
(a) Insert the wire harness into the shift lever knob from the part shown by the arrow, and install the transmission control switch to the shift lever knob.



32. INSTALL FLOOR SHIFT SHIFT LEVER KNOB COVER

(a) Install the shift lever knob cover.

33. INSTALL FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY



(a) Install the shift lever knob sub-assembly with the 2 screws.

HINT:

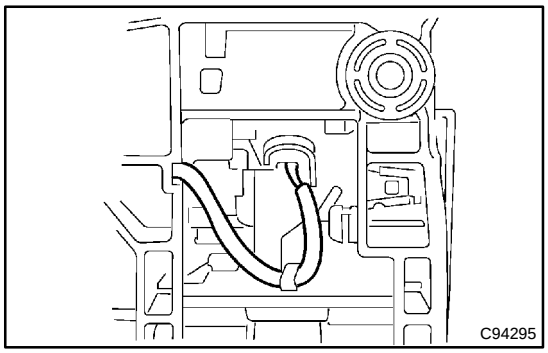
Coat the threads of screws with sealant.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

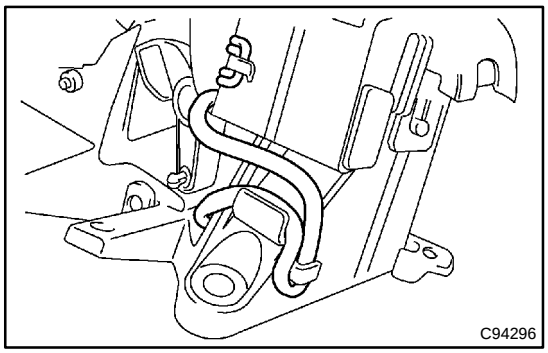
NOTICE:

Make sure not to catch wire harness.

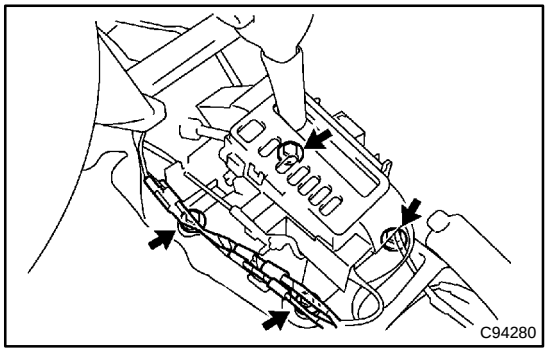


(b) Clamp the wire harness to the shift lever plate.

(c) Install the 2 terminals into the connector.



(d) Clamp the wire harness to the shift lever plate.



34. INSTALL FLOOR SHIFT ASSY

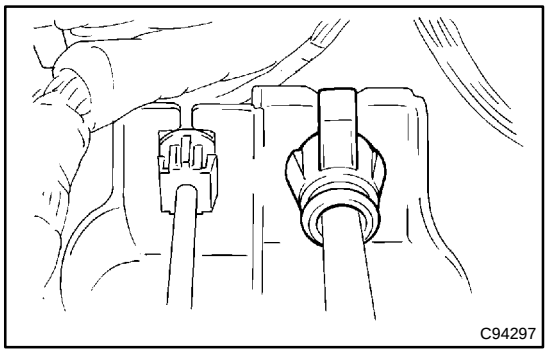
(a) Install the floor shift assy with the 4 bolts.

Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)

(b) Install the 2 wire harness clamps to the shift lever plate.

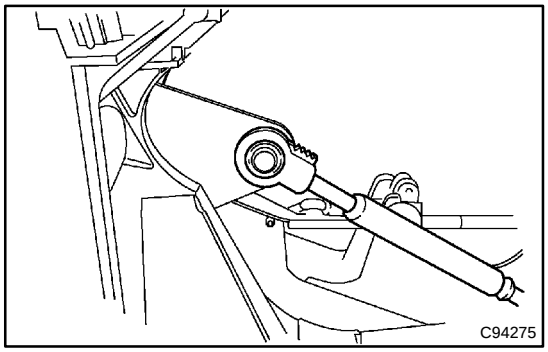
(c) Connect the 2 connector.

(d) Install the connector to the shift lever plate.

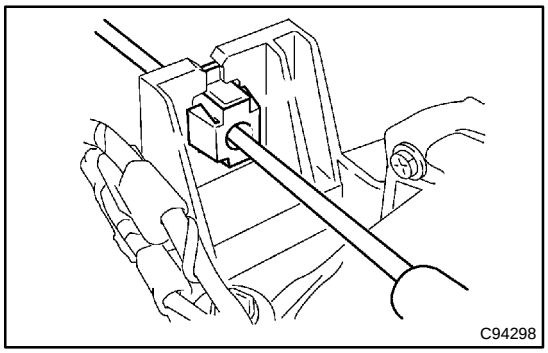


35. INSTALL FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Install the control cable to the shift lever plate.

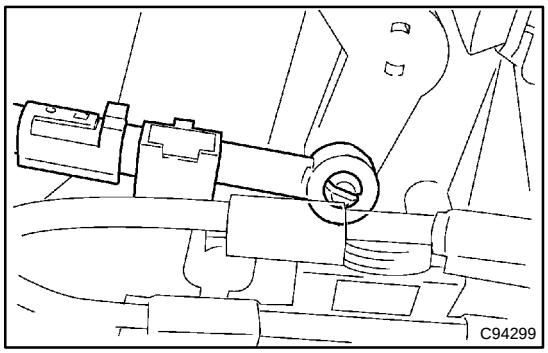


(b) Install the cable end to the rod of the floor shift assy.



36. INSTALL FLOOR SHIFT PARKING LOCK CABLE ASSY

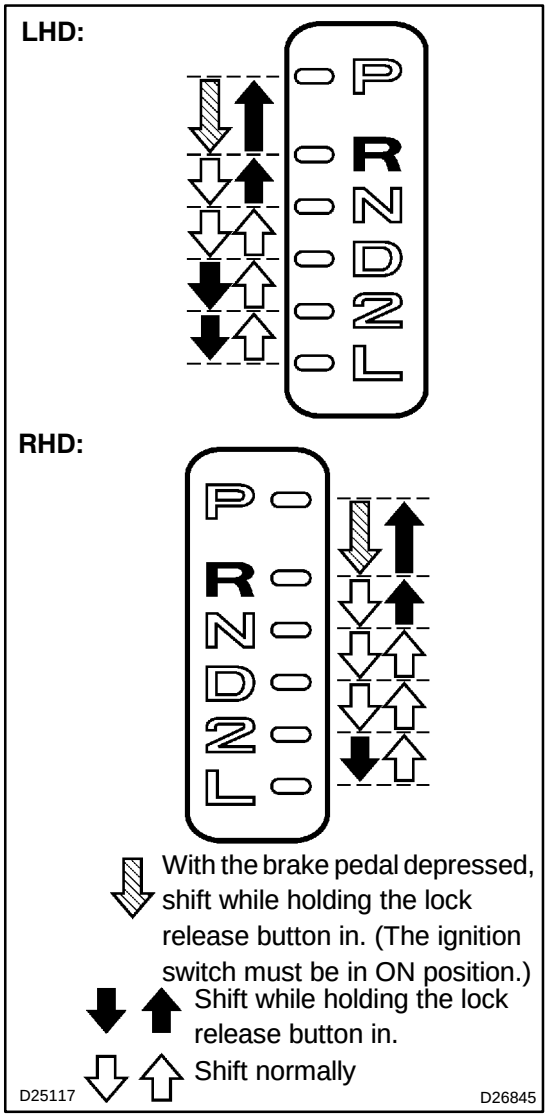
(a) Insert the slide cap into the through hole and install.



(b) Insert the lever pin into the hole in the cable end.

37. CHECK KEY INTERLOCK OPERATION **(See page 40-29)**

ADJUSTMENT



1. INSPECT SHIFT LEVER POSITION

(a) When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the position indicator displays correctly.

Ranges which can be operated without pressing the shift lever knob button

LHD:

R → N → D, L → 2 → D → N

RHD:

R → N → D → 2, L → 2 → D → N

Ranges which can be operated only while pressing the shift lever knob button

LHD:

D → 2 → L, N → R → P

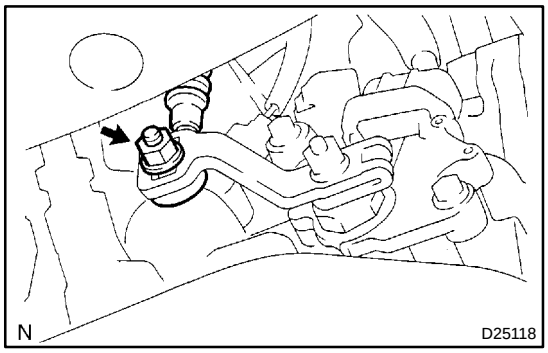
RHD:

2 → L, N → R → P

Ranges which can be operated only while pressing the shift lever knob button, ignition switch ON and brake pedal depressed

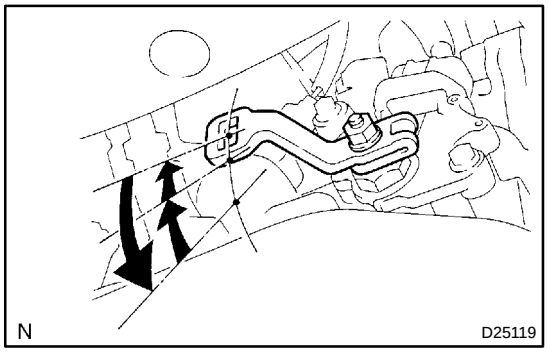
P → R

(b) When starting the engine, make sure that the vehicle moves forward when shifting from N to D range, and moves rearward when shifting to R range.



2. ADJUST SHIFT LEVER POSITION

(a) Loosen the nut on the control shaft lever.

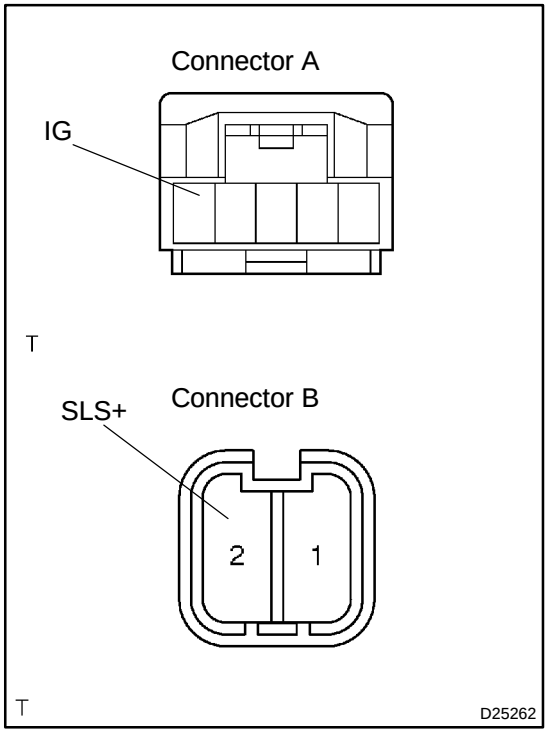


(b) Push the control shaft fully downward.
(c) Return the control shaft lever 2 notches to N range.
(d) Set the shift lever to N range.
(e) While holding the shift lever lightly toward the R range side, tighten the shift lever nut.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)
(f) Start the engine and make sure that the vehicle moves forward when shifting the lever from the N to D range and reverses when shifting it to the R range.

SHIFT LOCK CONTROL SWITCH (ATM)

INSPECTION

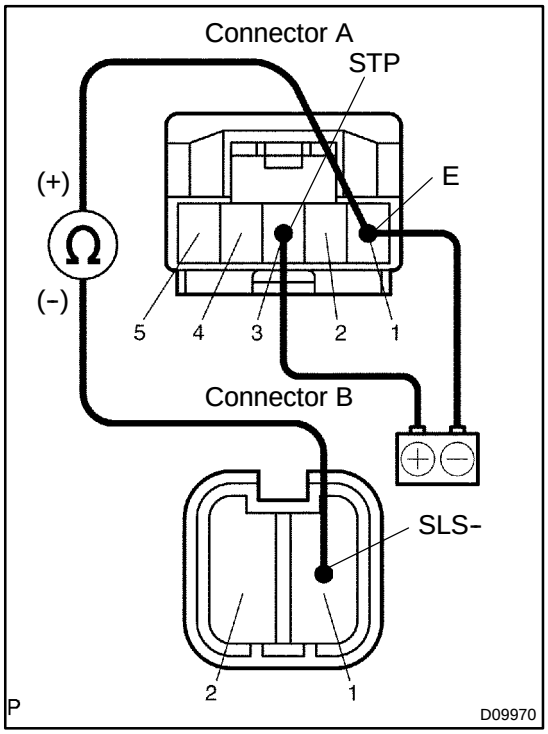
4003K-02



1. INSPECT SHIFT LOCK CONTROL SWITCH

(a) Disconnect the connector of shift lock control switch.
(b) Using an ohmmeter, measure the resistance between terminals.

Terminal	Measuring Condition	Specified Value
A5(IG) - B2(SLS+)	Switch ON	Continuity
A5(IG) - B2(SLS+)	Switch OFF	NO Continuity



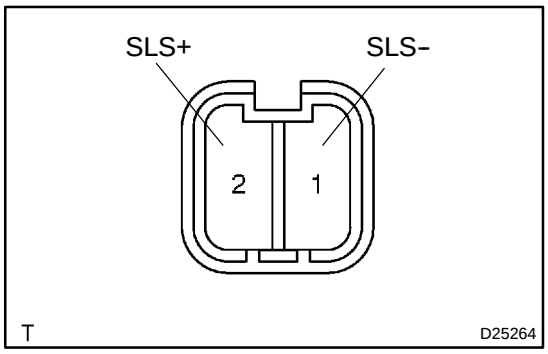
(c) Connect STP terminal to the batteries' positive (+) terminal, and E terminal to the battery negative (-) terminal, and apply about 12 V between STP - E terminals.
(d) Using an ohmmeter, measure the resistance between terminals.

Terminal	Measuring Condition	Specified Value
A1 (E) - B1 (SLS-)	Connect Battery	Continuity
A1 (E) - B1 (SLS-)	Disconnect Battery	NO Continuity

SHIFT LOCK SOLENOID (ATM)

INSPECTION

4003J-03



1. INSPECT SHIFT LOCK SOLENOID

(a) Disconnect the solenoid connector.

(b) Apply battery positive voltage between terminals 1 and 2. Check that operation noise can be heard from the solenoid.

If the solenoid does not operate, replace the solenoid.

FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY (ATM)

400JD-01

REPLACEMENT

1. **PRECAUTION** **(See page 60-1)**
2. **SEPARATE BATTERY NEGATIVE TERMINAL**
3. **REMOVE CONSOLE PANEL UPPER**

(a) SEDAN/STATION WAGON: (See page 71-16)
(b) HATCHBACK: (See page 71-25)

4. **REMOVE HEATER CONTROL KNOB(MANUAL AIR CONDITIONER)**
5. **REMOVE INSTRUMENT CLUSTER FINISH PANEL**
6. **REMOVE CONSOLE BOX CARPET**
7. **REMOVE PARKING BRAKE HOLE COVER SUB-ASSY**
8. **REMOVE CONSOLE BOX SUB-ASSY REAR**

(a) SEDAN/STATION WAGON: (See page 71-19)
(b) HATCHBACK: (See page 71-28)

9. **REMOVE AIR BAG SENSOR ASSY CENTER** **(See page 60-38)**
10. **DISCONNECT OXYGEN SENSOR CONNECTOR**

(a) Remove the foot rest.
(b) Pull up the floor carpet.
(c) Disconnect the oxygen sensor connector.

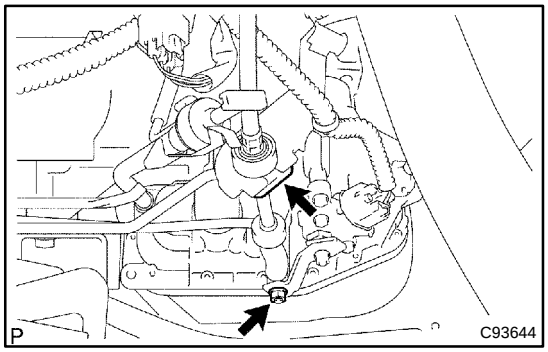
11. **REMOVE FLOOR PANEL BRACE FRONT**

(a) Remove the 2 nuts and floor panel brace.

12. **REMOVE EXHAUST PIPE ASSY FRONT** **(See page 15-5)**
13. **REMOVE FRONT FLOOR HEAT INSULATOR NO.1**

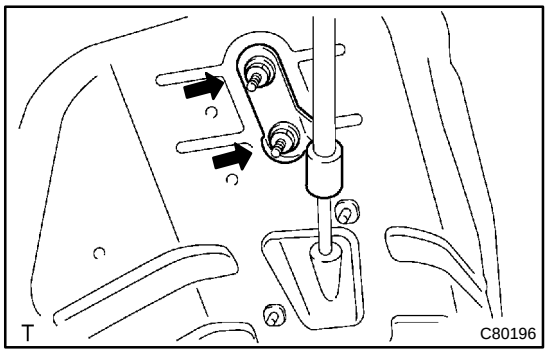
(a) Remove the 3 nuts and heat insulator.

14. **REMOVE AIR CLEANER ASSY**
15. **REMOVE AIR CLEANER HOSE NO.1**

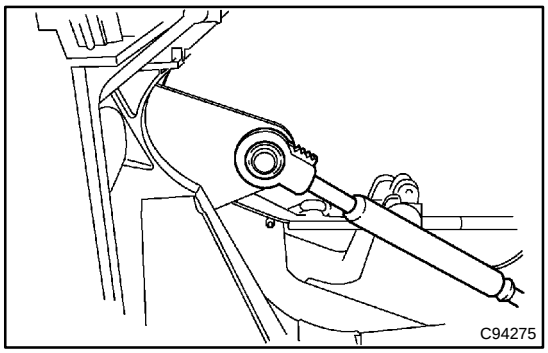


16. REMOVE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

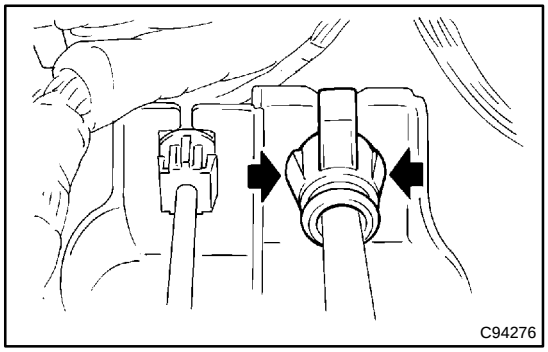
(a) Remove the nut from control shaft lever.
(b) Disconnect the control cable from the control shaft lever.
(c) Remove the clip and disconnect the control cable from the control cable bracket.
(d) Disconnect the control cable from control cable support.



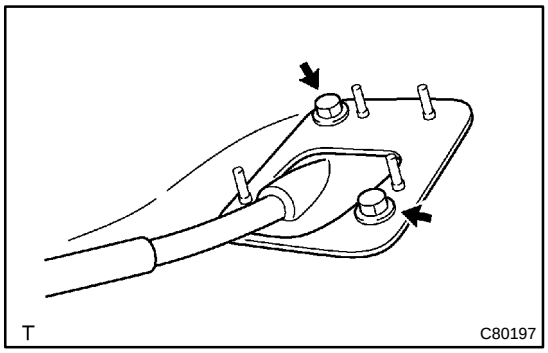
(e) Remove the 2 nuts.



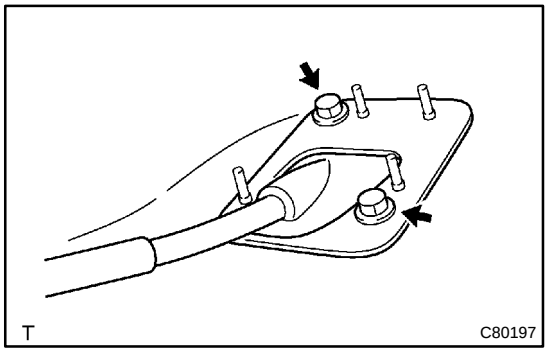
(f) Remove the cable end from the rod of the floor shift assembly.



(g) Using a screw driver, disconnect the control cable from the shift lever plate.

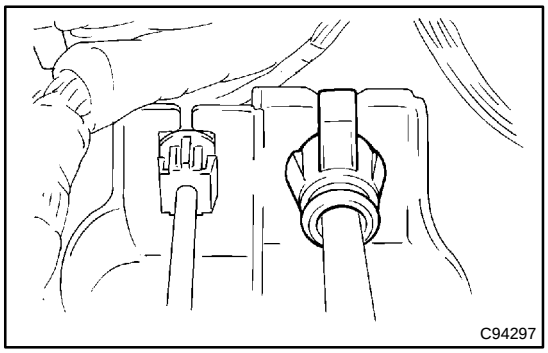


(h) Remove the 2 bolts.
(i) Pull out the control cable from the body.

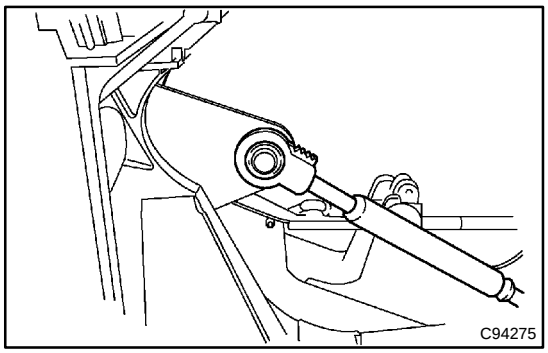


17. INSTALL FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

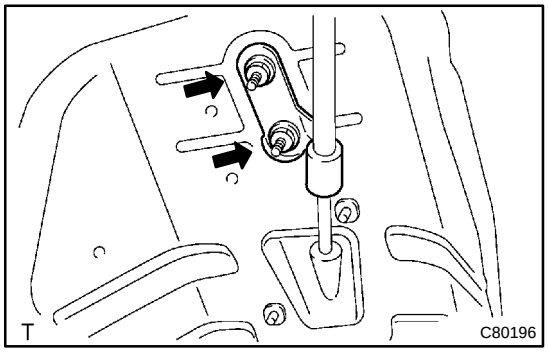
(a) Pull in the control cable to the body.
(b) Install the 2 bolts.
Torque: 5.0 N·m (50 kgf·cm, 43 in.·lbf)



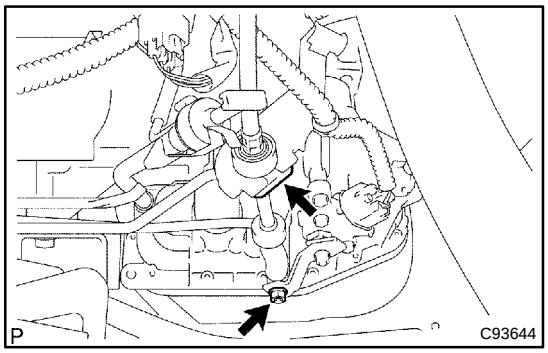
(c) Install the control cable to the shift lever plate.



(d) Install the cable end to the rod of the floor shift assy.



(e) Install the control cable and 2 nuts.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)
(f) Connect the control cable to the control cable support.



(g) Temporarily install the control cable to the control shaft lever with the nut.
(h) Install the control cable and clip to the bracket.

18. INSTALL AIR CLEANER ASSY

19. INSTALL FRONT FLOOR HEAT INSULATOR NO.1

(a) Install the heat insulator with the 3 nuts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

20. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15–5)

21. INSTALL FLOOR PANEL BRACE FRONT

(a) Install the floor panel brace with the 2 nuts .
Torque: 29.6 N·m (302 kgf·cm, 22 ft·lbf)

22. INSTALL OXYGEN SENSOR CONNECTOR

(a) Connect the oxygen sensor connector.

(b) Install the floor carpet and foot rest.

23. INSTALL AIR BAG SENSOR ASSY CENTER
(See page 60–38)
SST 09249–63010

24. ADJUST SHIFT LEVER POSITION (See page 40–43)

25. INSPECT SHIFT LEVER POSITION (See page 40–43)

26. INSPECT SRS WARNING LIGHT (See page 60–8)

FLOOR SHIFT PARKING LOCK CABLE ASSY (ATM)

400JE-01

REPLACEMENT

1. **PRECAUTION** **(See page 60-1)**
2. **DISCONNECT BATTERY NEGATIVE TERMINAL**
3. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
4. **REMOVE HORN BUTTON ASSY**
   (See page 60-13)
5. **REMOVE STEERING WHEEL ASSY**

   SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)
6. **REMOVE STEERING COLUMN COVER**
   (See page 50-8)
7. **REMOVE CONSOLE PANEL UPPER**

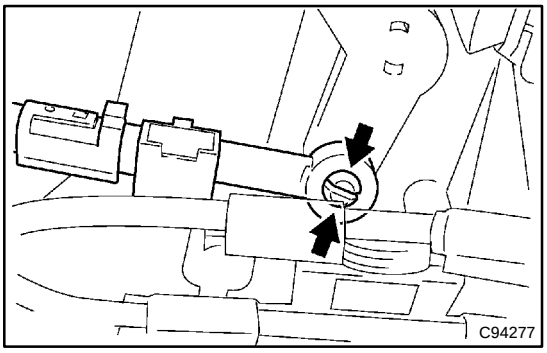
(a) SEDAN/STATION WAGON: (See page 71-16)
(b) HATCHBACK: (See page 71-25)

8. **REMOVE PARKING BRAKE HOLE COVER SUB-ASSY**

9. **REMOVE CONSOLE BOX CARPET**

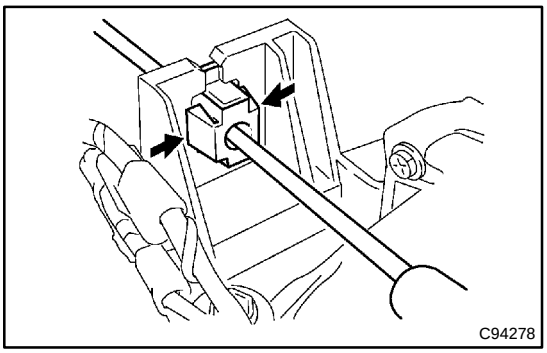
10. **REMOVE CONSOLE BOX SUB-ASSY REAR**

(a) SEDAN/STATION WAGON: (See page 71-19)
(b) HATCHBACK: (See page 71-28)

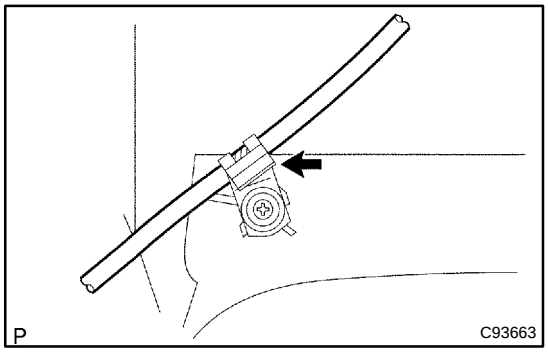


11. **REMOVE FLOOR SHIFT PARKING LOCK CABLE ASSY**

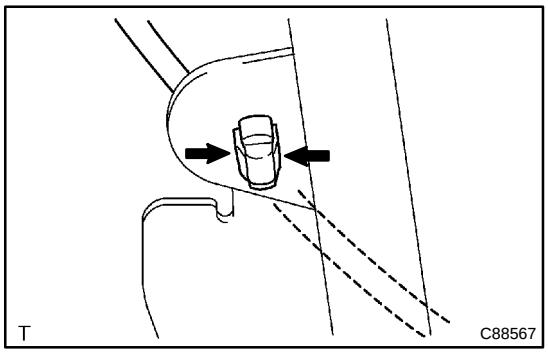
(a) Remove the cable end from the lever pin of the floor shift assembly.



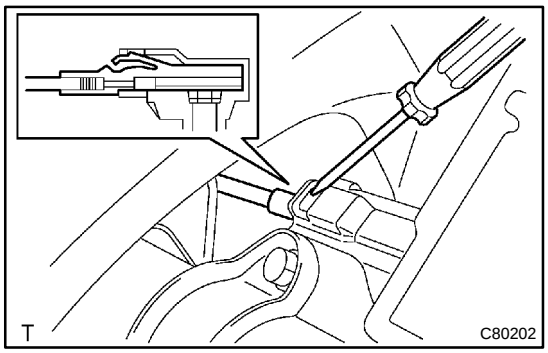
(b) Using a screwdriver, disconnect the parking lock cable from the floor shift assembly.



(c) TMUK made:
Disconnect the cable from the clamp.

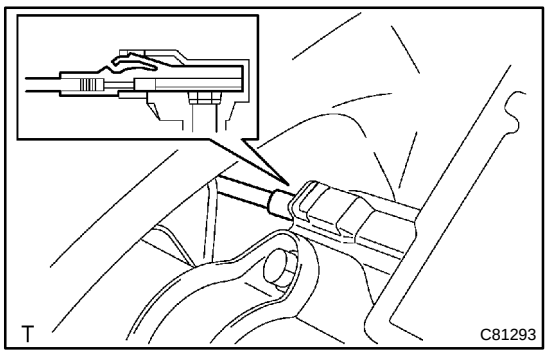


(d) TMC made:
Disconnect the cable clamp.
(e) Turn the ignition switch ACC or ON.



(f) Using a screwdriver, remove the cable from the upper bracket.

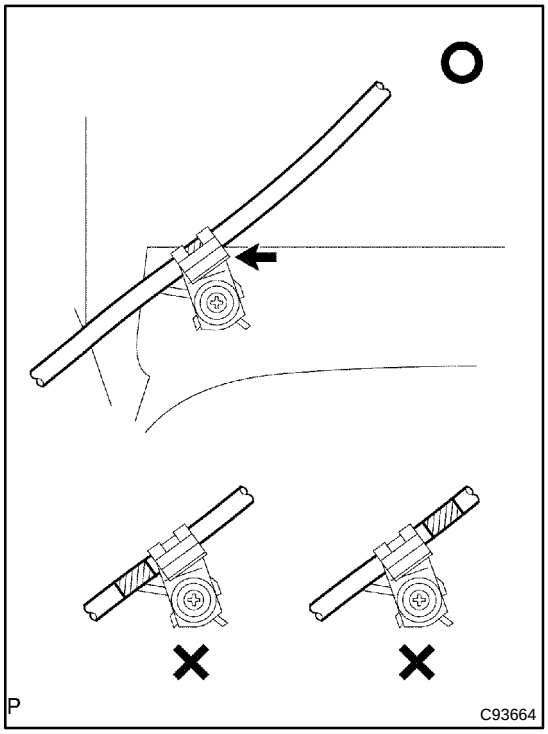
HINT:
Before disconnecting the cable, keep in mind each of the physical relationship between the connector and wire harness or other cables.



12. INSTALL FLOOR SHIFT PARKING LOCK CABLE ASSY

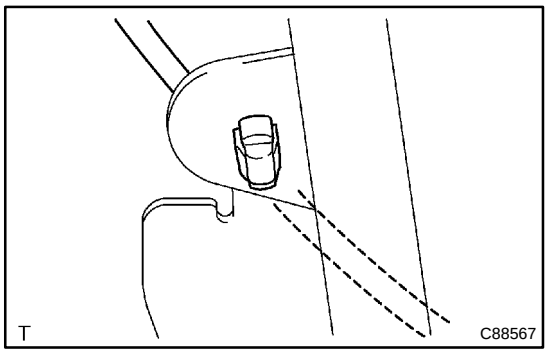
(a) Turn the ignition switch ACC or ON.
(b) Install the cable to the upper bracket.

HINT:
Connect the removed cable so that it will be the same physical relationship you kept in mind prior to its disconnection.



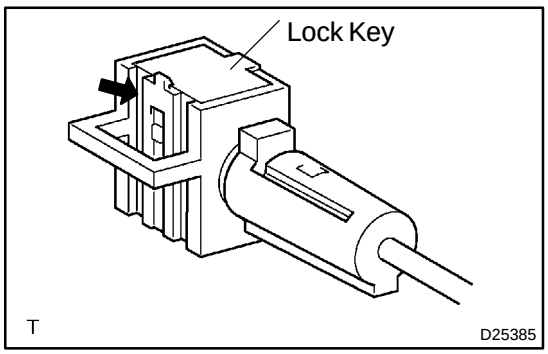
(c) TMUK made:
Connect the cable to the clamp.

HINT:
Setting taping on cable to clamp.

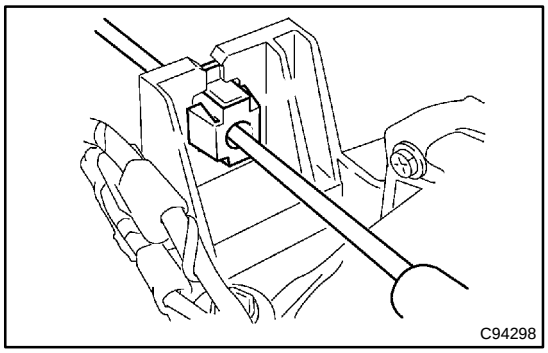


(d) TMC made:
Connect the cable clamp.

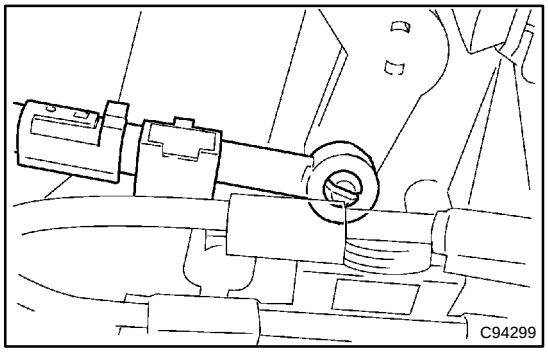
(e) Shift the shift lever to N range.



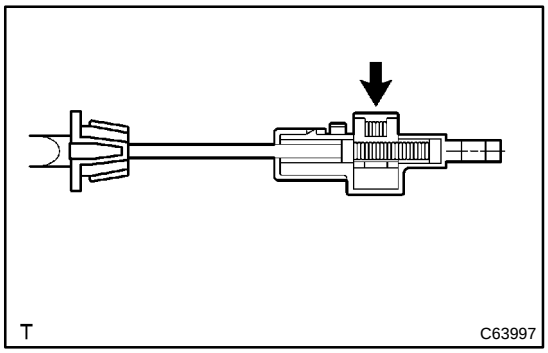
(f) Using a screwdriver, unlock the claw of the lock key of automatic adjustment part.



(g) Insert the slide cap into the through hole and install.



(h) Insert the lever pin into the hole in the cable end.



(i) Lock the lock key.

HINT:

At this time, the shift lever should be in N range and the ignition key should be set to ACC or ON.

13. INSTALL STEERING WHEEL ASSY

14. INSPECT STEERING WHEEL CENTER POINT

15. INSTALL HORN BUTTON ASSY
(See page 60-13)

16. INSPECT SRS WARNING LIGHT (See page 60-8)

17. CHECK KEY INTERLOCK OPERATION (See page 40-29)

MANUAL TRANSMISSION/TRANSAXLE

MANUAL TRANSAXLE SYSTEM (MTM) 41-1
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MANUAL TRANSAXLE SYSTEM (MTM)

4100Y-03

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

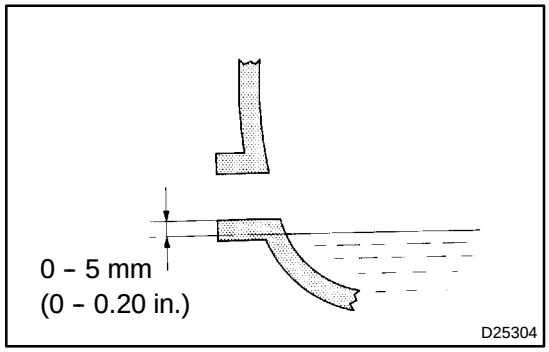
L: (C51, C52 MANUAL TRANSAXLE Repair Manual Pub. No. RM826E or C64 MANUAL TRANSAXLE Repair Manual Pub. No. RM930E or C150 MANUAL TRANSAXLE Repair Manual Pub. No. RE827E or E355, E356 MANUAL TRANSAXLE Repair Manual Pub. No. RM867E)

Symptom	Suspect Area		See page
Noise	6. Oil (Level low)		41-2
	7. Oil (Wrong)	C50/ C64/ C150:	41-3
		E351:	41-5
	8. Gear (Worn or damaged)		L
	9. Bearing (Worn or damaged)		L
Oil leakage	1. Oil (Level too high)		41-2
	2. Gasket (Damaged)		L
	3. Oil seal (Worn or damaged)	C50/ C64/ C150:	41-3
		E351:	41-5
	4. O-Ring (Worn or damaged)		L
Hard to shift or will not shift	1. Control cable (Faulty)	HATCHBACK:	41-7
		SEDAN/ STATION WAGON:	41-10
			41-14
	2. Synchronizer ring (Worn or damaged)		L
	3. Shift key spring (Damaged)		L
Jumps out of gear	1. Locking ball spring (Damaged)		L
	2. Shift fork (Worn)		L
	3. Gear (Worn or damaged)		L
	4. Bearing (Worn or damaged)		L

MANUAL TRANSAXLE OIL (MTM)

ON-VEHICLE INSPECTION

4100Z-03



1. INSPECT TRANSAXLE OIL

(a) Stop the vehicle on the level place.

(b) Remove the transmission filler plug and gasket.

(c) Check that the oil surface is within 5 mm (0.20 in.) from the lowest position of the inner surface of the transmission filler plug opening.

NOTICE:

- **Excessively large or small amount of oil may cause troubles.**
- **After replacing oil, drive the vehicle and check the oil level.**

(d) Check for oil leakage when the oil level is low.

(e) Install the transmission filler plug and new gasket.

Torque:
C50, C64, C150: 39.2 N·m (400 kgf·cm, 29 ft·lbf)
E351: 49 N·m (500 kgf·cm, 36 ft·lbf)

FRONT DIFFERENTIAL OIL SEAL (C50/C64/C150)

41046-05

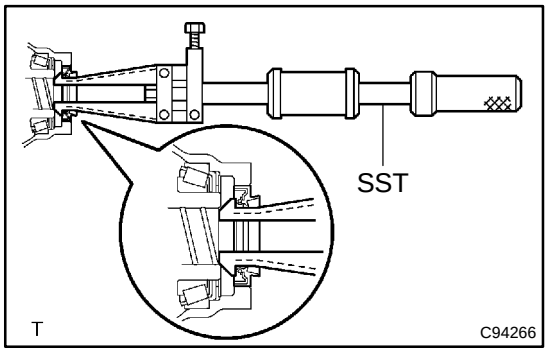
REPLACEMENT

1. **DRAIN MANUAL TRANSAXLE OIL**
   Torque: 39.2 N·m (400 kgf·cm, 29 ft·lbf)
2. **REMOVE FRONT WHEELS**
3. **REMOVE ENGINE UNDER COVER LH**
4. **REMOVE ENGINE UNDER COVER RH**
5. **REMOVE FRONT DRIVE SHAFT ASSY LH**

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-7)
SST 09520-01010, 09520-24010 (09520-32040)
(b) 2ZZ-GE Engine (See page 30-19)
SST 09520-01010, 09520-24010 (09520-32040)

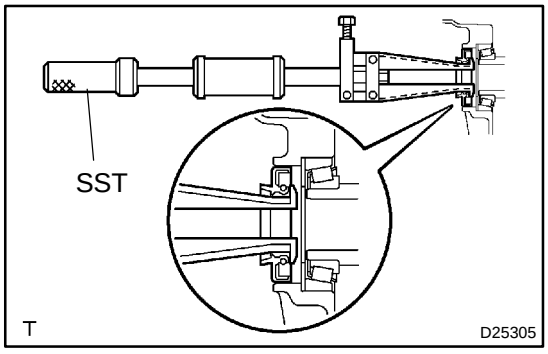
6. **REMOVE FRONT DRIVE SHAFT ASSY RH**

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-6)
SST 09520-01010, 09520-24010 (09520-32040)
(b) 2ZZ-GE Engine (See page 30-19)



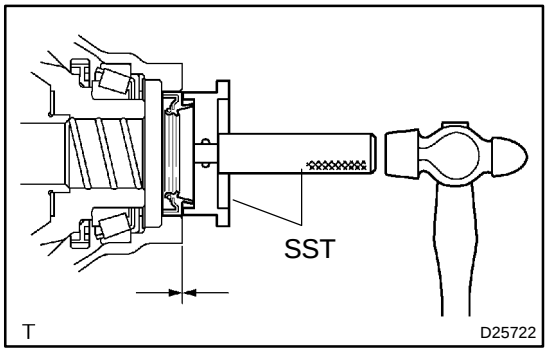
7. **REMOVE TRANSAXLE CASE OIL SEAL**

(a) Using SST, remove the oil seal.
SST 09308-00010



8. **REMOVE TRANSMISSION CASE OIL SEAL**

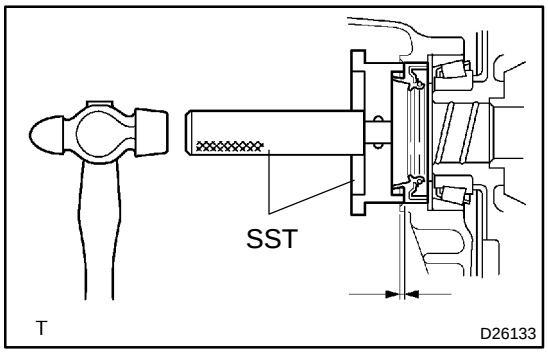
(a) Using SST, remove the oil seal.
SST 09308-00010



9. INSTALL TRANSAXLE CASE OIL SEAL

(a) Coat a new oil seal lip with MP grease.
(b) Using SST and a hammer, install the oil seal.
SST 09554-14010, 09950-70010 (09951-07200)
Drive in depth: 1.9 ± 0.3 mm (0.075 ± 0.012 in.)

NOTICE:
Be careful not to damage the oil seal lip.



10. INSTALL TRANSMISSION CASE OIL SEAL

(a) Coat a new oil seal lip with MP grease.
(b) Using SST and a hammer, install the oil seal.
SST 09554-14010, 09950-70010 (09951-07200)
Drive in depth:
C50, C150: 2.4 ± 0.3 mm (0.095 ± 0.012 in.)
C64: 9.9 ± 0.3 mm (0.390 ± 0.012 in.)

NOTICE:
Be careful not to damage the oil seal lip.

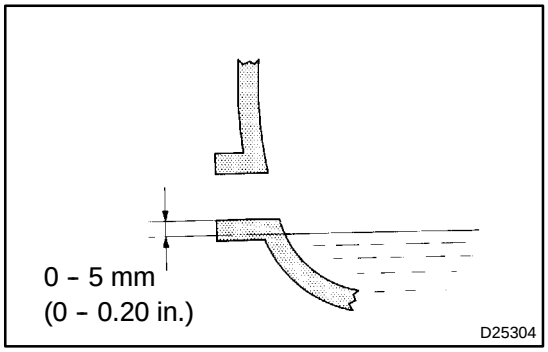
11. INSTALL FRONT DRIVE SHAFT ASSY LH

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-14)
(b) 2ZZ-GE Engine (See page 30-28)

12. INSTALL FRONT DRIVE SHAFT ASSY RH

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-6)
(b) 2ZZ-GE Engine (See page 30-29)

13. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



14. ADD MANUAL TRANSAXLE OIL
Oil grade: API GL-4 or GL-5
Viscosity: SAE 75 W-90
Capacity:
C50, C150: 1.9 liters (2.0 US qts, 1.7 Imp. qts)
C64: 2.3 liters (2.4 US qts, 2.0 Imp. qts)
Torque: 39.2 N·m (400 kgf·cm, 29 ft·lbf)

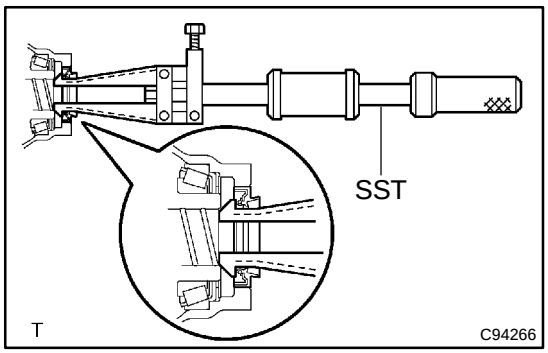
15. INSPECT MANUAL TRANSAXLE OIL (See page 41-2)
16. INSPECT FRONT WHEEL ALIGNMENT (See page 26-2)
17. CHECK ABS SPEED SENSOR SIGNAL
(a) TMC made (See page 05-565)
(b) TMUK made
(1) w/ VSC (See page 05-673)
(2) w/o VSC (See page 05-618)

FRONT DIFFERENTIAL OIL SEAL (E351)

41046-06

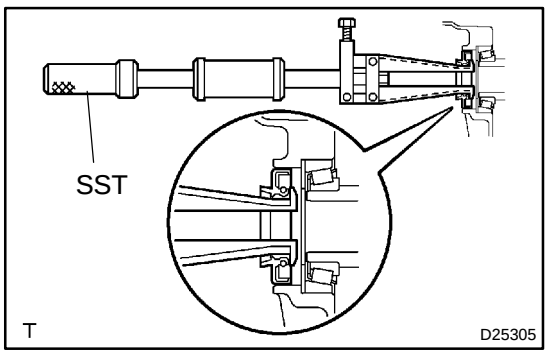
REPLACEMENT

1. **DRAIN MANUAL TRANSAXLE OIL**
   Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
2. **REMOVE FRONT WHEELS**
3. **REMOVE ENGINE UNDER COVER LH**
4. **REMOVE ENGINE UNDER COVER RH**
5. **REMOVE FRONT DRIVE SHAFT ASSY LH**
   (See page 30-19)
   SST 09520-01010, 09520-24010 (09520-32040)
6. **REMOVE FRONT DRIVE SHAFT ASSY RH**
   (See page 30-19)



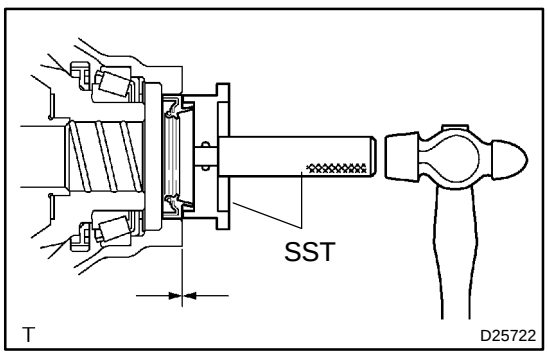
7. **REMOVE FRONT TRANSAXLE CASE COVER OIL SEAL**

(a) Using SST, remove the oil seal.
SST 09308-00010



8. **REMOVE TRANSMISSION CASE OIL SEAL**

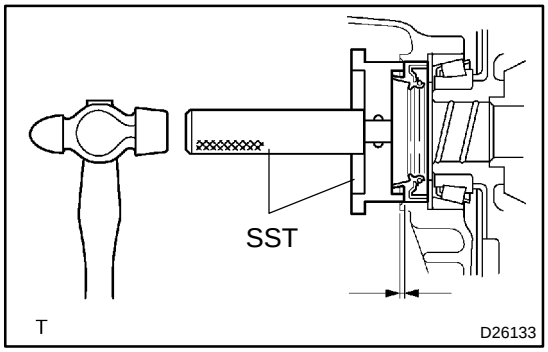
(a) Using SST, remove the oil seal.
SST 09308-00010



9. **INSTALL FRONT TRANSAXLE CASE COVER OIL SEAL**

(a) Coat a new oil seal lip with MP grease.
(b) Using SST and a hammer, install the oil seal.
SST 09608-10010, 09950-70010 (09951-07200)
Drive in depth: 0 ± 0.5 mm (0 ± 0.020 in.)

NOTICE:
Be careful not to damage the oil seal lip.

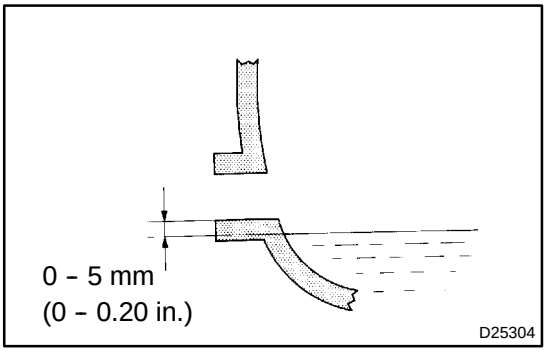


10. INSTALL TRANSMISSION CASE OIL SEAL

(a) Coat a new oil seal lip with MP grease.
(b) Using SST and a hammer, install the oil seal.
SST 09608-32010, 09950-70010 (09951-07200)
Drive in depth: 3.5 ± 0.5 mm (0.138 ± 0.020 in.)

NOTICE:
Be careful not to damage the oil seal lip.

11. INSTALL FRONT DRIVE SHAFT ASSY LH
(See page 30-28)
12. INSTALL FRONT DRIVE SHAFT ASSY RH
(See page 30-29)
13. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



14. ADD MANUAL TRANSAXLE OIL
Oil grade: API GL-4 or GL-5
Viscosity: SAE 75 W-90
Capacity: 2.5 liters (2.6 US qts, 2.2 lmp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

15. INSPECT MANUAL TRANSAXLE OIL (See page 41-2)
16. INSPECT FRONT WHEEL ALIGNMENT(See page 26-2)
17. CHECK ABS SPEED SENSOR SIGNAL
(a) TMC made (See page 05-565)
(b) TMUK made
(1) w/ VSC (See page 05-673)
(2) w/o VSC (See page 05-618)

FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY (MTM(HATCH BACK))

4105R-01

REPLACEMENT

HINT:

COMPONENTS: See page 41-18

1. REMOVE AIR CONDITIONER UNIT ASSY (See page 55-49)

HINT:

Refer to the instructions for removal of the instrument panel sub-assy lower.

2. SEPARATE AIR BAG SENSOR ASSY CENTER

(a) Remove the 3 bolts, separate the air bag sensor assy center.

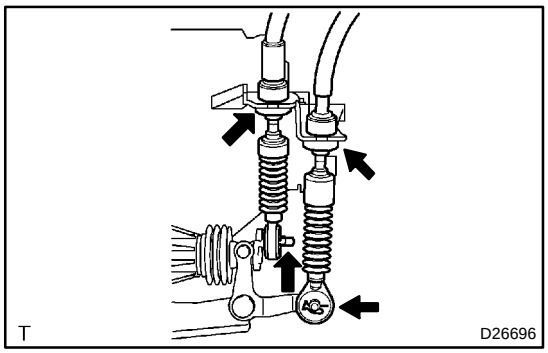
3. REMOVE EXHAUST PIPE ASSY

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 15-5)

(b) 2ZZ-GE, 1CD-FTV Engine (See page 15-2)

4. REMOVE FRONT FLOOR HEAT INSULATOR NO.1(GASOLINE ENGIN TYPE)

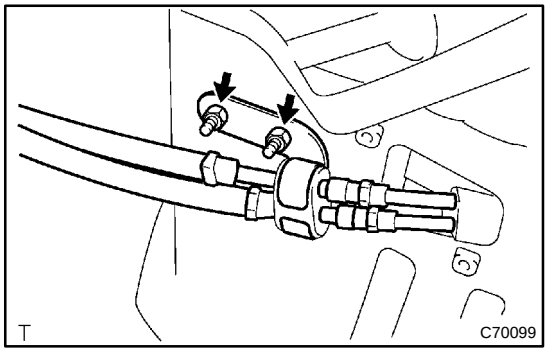
(a) Remove the 3 nuts and heat insulator No.1.



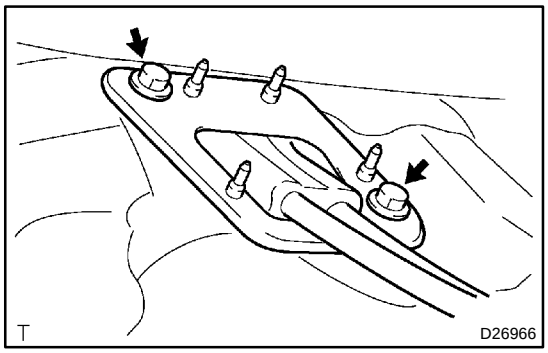
5. REMOVE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Remove the 2 clips and 2 washers, separate the 2 cables from the transaxle.

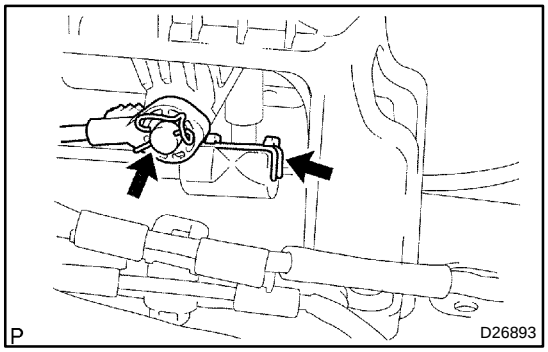
(b) Remove the 2 clips, separate the 2 cables from the bracket.



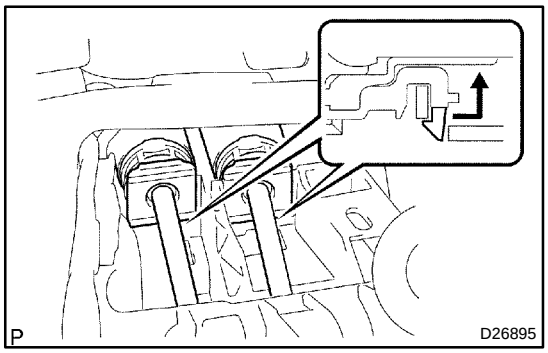
(c) Remove the 2 nuts, separate the control cable assy.



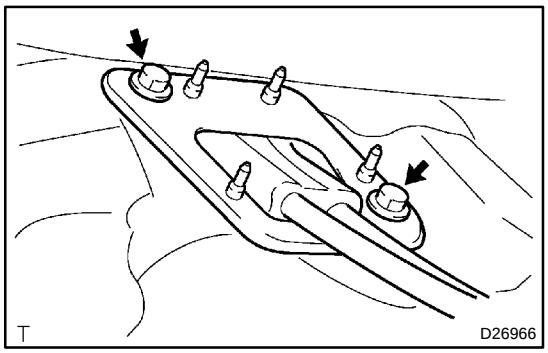
(d) Remove the 2 bolts, separate the control cable assy.



(e) Remove the 2 clips, separate the cable ends of the control cable assy.

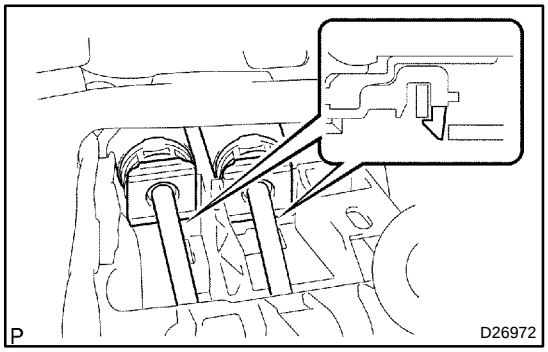


(f) Release the claws, remove the control cable assy.

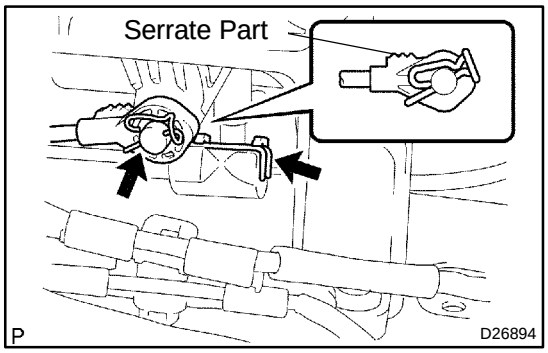


6. INSTALL FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Pull in the control cable assy to the floor.
(b) Install the control cable assy with the 2 bolts.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

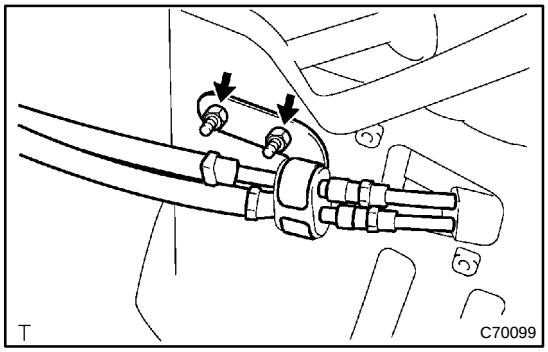


(c) Connect the control cable assy to the shift lever assy.
NOTICE:
Make sure that the claws are firmly engaged.

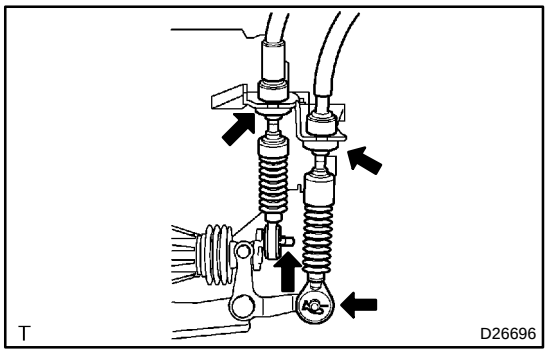


(d) Connect the end of the select cable to the shift lever assy and install the clip.
NOTICE:
- **The serrate part of the select cable point should face upward when the select cable point is connected.**
- **The clip should be inserted to the direction shown in the illustration.**

(e) Connect the end of the shift cable to the shift lever assy.



(f) Connect the control cable assy with the 2 nuts.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



(g) Connect the 2 cable ends, install the 2 washers and 2 clips.
(h) Install the 2 clips to the control cable bracket.

7. INSTALL FRONT FLOOR HEAT INSULATOR NO.1(GASOLINE ENGIN TYPE)

(a) Install the heat insulator No.1 with the 3 nuts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

8. INSTALL EXHAUST PIPE ASSY

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 15-5)
(b) 2ZZ-GE, 1CD-FTV Engine (See page 15-2)

9. CONNECT AIR BAG SENSOR ASSY CENTER

(a) Install the airbag sensor assy center with the 3 bolts.
Torque: 17.5 N·m (178 kgf·cm, 13 ft·lbf)

10. INSPECT SRS WARNING LIGHT

FLOOR SHIFT CABLE TRANSMISSION CONTROL SHIFT (MTM(SEDAN/STAION WAGON))

4105S-01

REPLACEMENT

HINT:

COMPONENTS: See page 41-18

1. REMOVE AIR CONDITIONER UNIT ASSY (See page 55-49)

HINT:

Refer to the instructions for removal of the air conditioner unit assy.

2. SEPARATE AIR BAG SENSOR ASSY CENTER

(a) Remove the 3 bolts, separate the airbag sensor assy center.

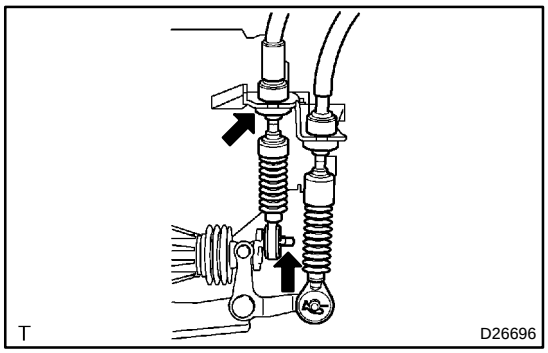
3. REMOVE EXHAUST PIPE ASSY

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 15-5)

(b) 1CD-FTV Engine (See page 15-2)

4. REMOVE FRONT FLOOR HEAT INSULATOR NO.1(GASOLINE ENGIN TYPE)

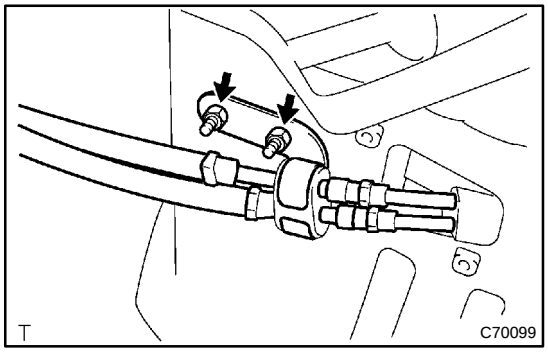
(a) Remove the 3 nuts and heat insulator No.1.



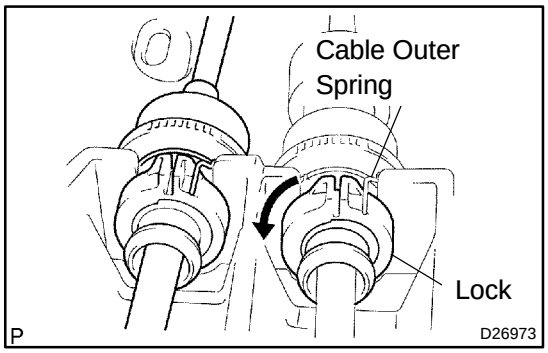
5. REMOVE FLOOR SHIFT CABLE TRANSMISSION CONTROL SHIFT

(a) Remove the clip and washer, separate the top of the shift cable from the transaxle.

(b) Remove the clip, separate the shift cable from the control cable bracket.

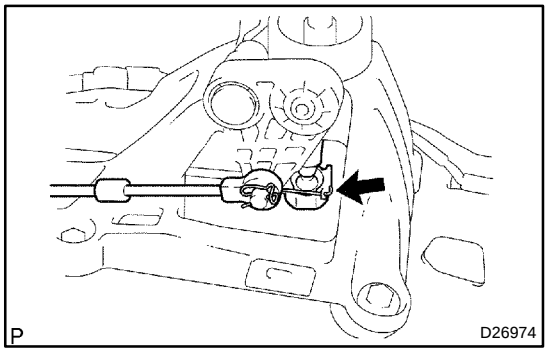


(c) Remove the 2 nuts and clamp.

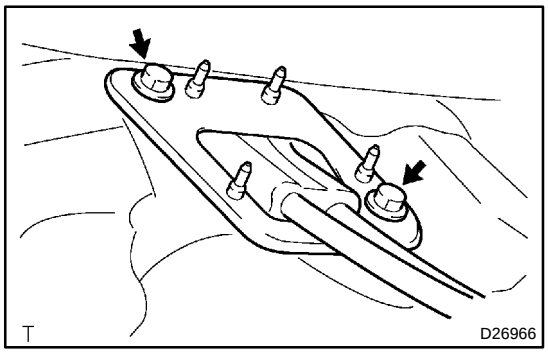


(d) Using a screwdriver, release the cable outer spring.

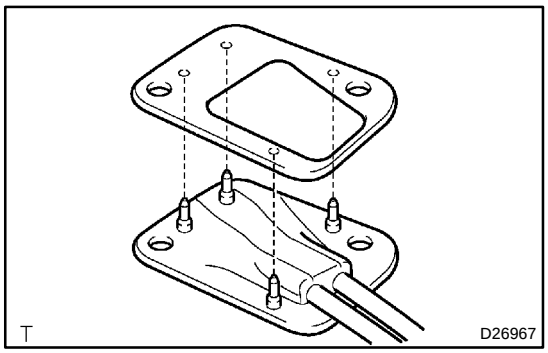
(e) Turn the lock, separate the shift cable from the shift lever retainer.



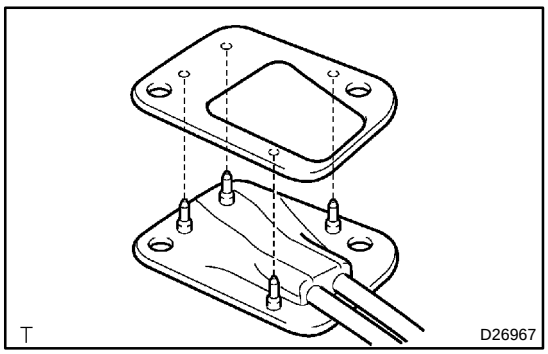
(f) Separate the end of the shift cable from the shift lever assy.



(g) Remove the 2 bolts and retainer from the floor.
(h) Pull out the control cable assy from the floor.



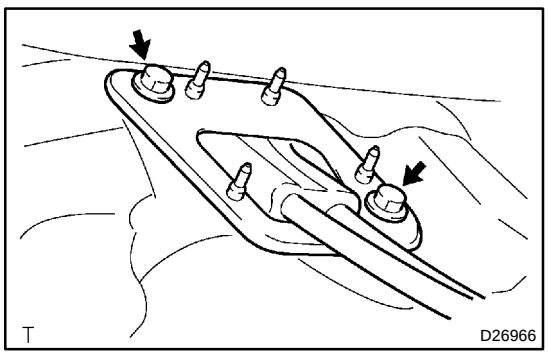
(i) Remove the retainer from the grommet.
(j) Remove the select cable from the grommet.



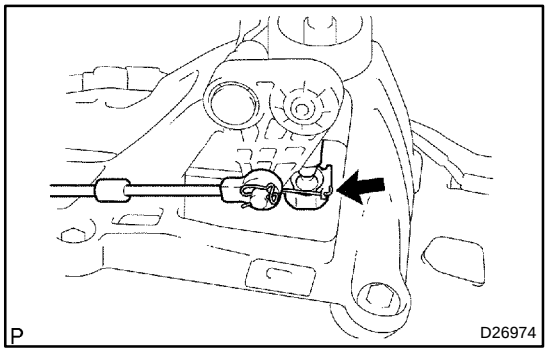
6. INSTALL FLOOR SHIFT CABLE TRANSMISSION CONTROL SHIFT

(a) Install the select cable to the grommet.
(b) Put the control cable assy through the floor hole and retainer.
(c) Install the retainer to the grommet.

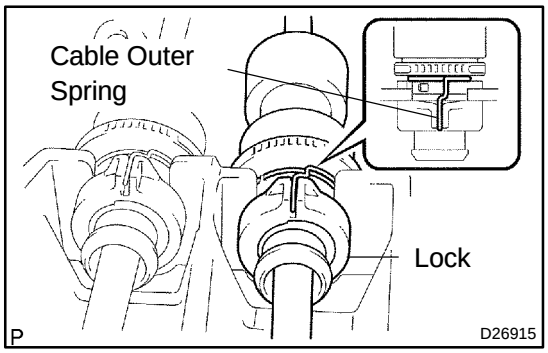
NOTICE:
Fit 4 projections of the grommet into 4 holes of the retainer.



(d) Install the control cable assy with the 2 bolts.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



(e) Connect the end of the shift cable to the shift lever assy.



(f) Connect the shift cable to the retainer of shift lever assy, turn the lock.

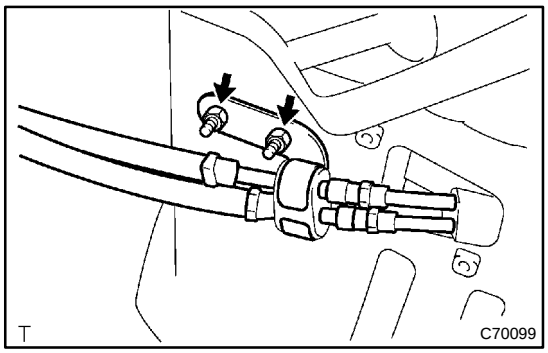
NOTICE:

The projecting part of the lock should face upward when the shift cable is installed.

(g) Install the cable outer spring to the lock.

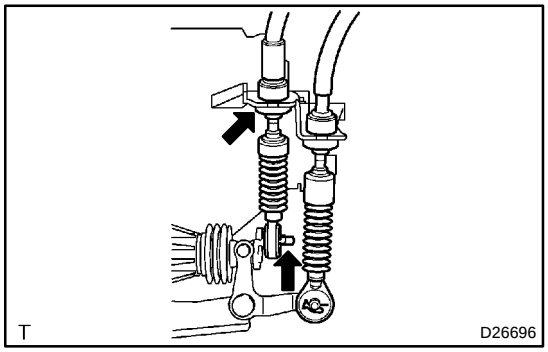
NOTICE:

Make sure that after installation the cable outer spring is moved to the place shown in the illustration.



(h) Install the clamp with the 2 nuts

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



(i) Connect the shift cable to the control cable bracket, install a new clip.

(j) Connect the shift cable to the transaxle, install the washer and clip.

7. INSTALL FRONT FLOOR HEAT INSULATOR NO.1(GASOLINE ENGIN TYPE)

(a) Install the heat insulator No.1 with the 3 nuts.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

8. INSTALL EXHAUST PIPE ASSY

(a) 4ZZ–FE, 3ZZ–FE Engine (See page 15–5)

(b) 1CD–FTV Engine (See page 15–2)

9. CONNECT AIR BAG SENSOR ASSY CENTER

(a) Install the airbag sensor assy center with the 3 bolts.
Torque: 17.5 N·m (178 kgf·cm, 13 ft·lbf)

10. INSPECT SRS WARNING LIGHT

FLOOR SHIFT CABLE TRANSMISSION CONTROL SELECT (MTM(SEDAN/STAION WAGON))

4105T-01

REPLACEMENT

HINT:

COMPONENTS: See page 41-18

1. REMOVE AIR CONDITIONER UNIT ASSY (See page 55-49)

HINT:

Refer to the instructions for removal of the air conditioner unit assy.

2. SEPARATE AIR BAG SENSOR ASSY CENTER

(a) Remove the 3 bolts, separate the airbag sensor assy center.

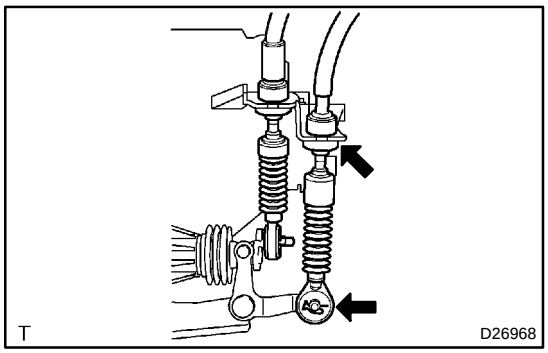
3. REMOVE EXHAUST PIPE ASSY

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 15-5)

(b) 1CD-FTV Engine (See page 15-2)

4. REMOVE FRONT FLOOR HEAT INSULATOR NO.1(GASOLINE ENGIN TYPE)

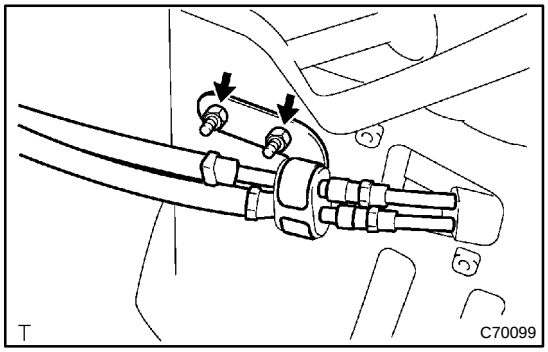
(a) Remove the 3 nuts and heat insulator No.1.



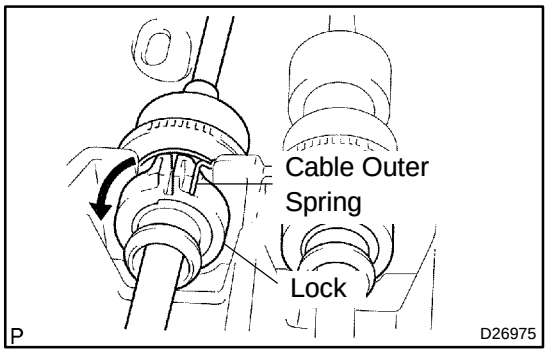
5. REMOVE FLOOR SHIFT CABLE TRANSMISSION CONTROL SELECT

(a) Remove the clip and washer, separate the top of the select cable from the transaxle.

(b) Remove the clip, separate the select cable from the control cable bracket.

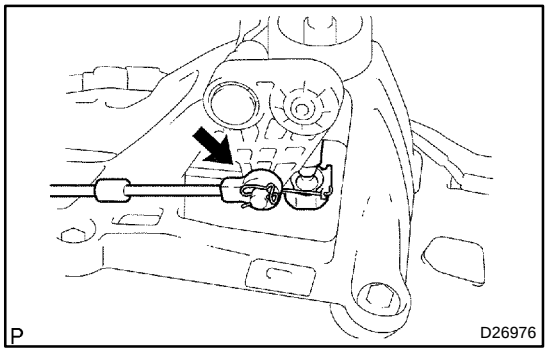


(c) Remove the 2 nuts and clamp.

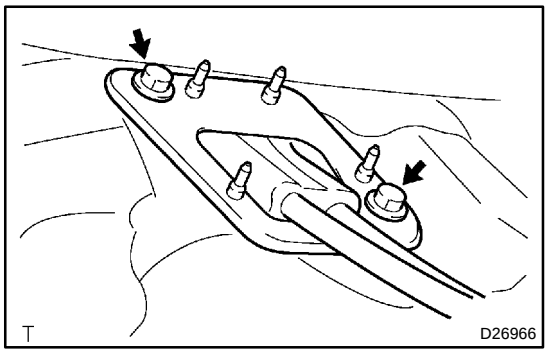


(d) Using a screwdriver, release the cable outer spring.

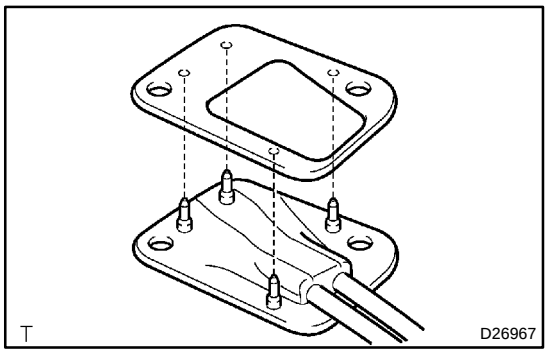
(e) Turn the lock, separate the select cable from the shift lever retainer.



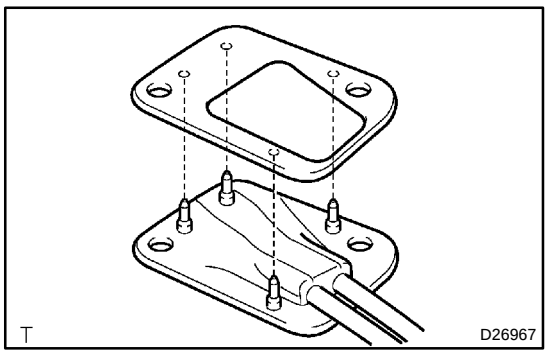
(f) Separate the end of the select cable from the shift lever assy.



(g) Remove the 2 bolts and retainer from the floor.
(h) Pull out the control cable assy from the floor.



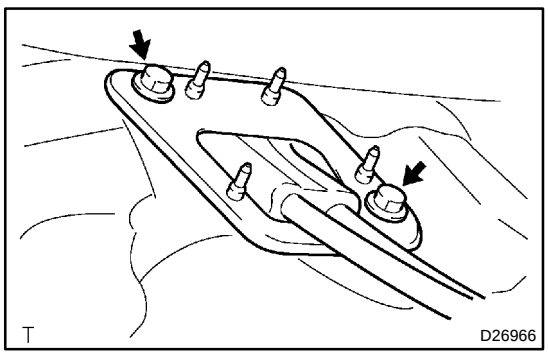
(i) Remove the retainer from the grommet.
(j) Remove the select cable from the grommet.



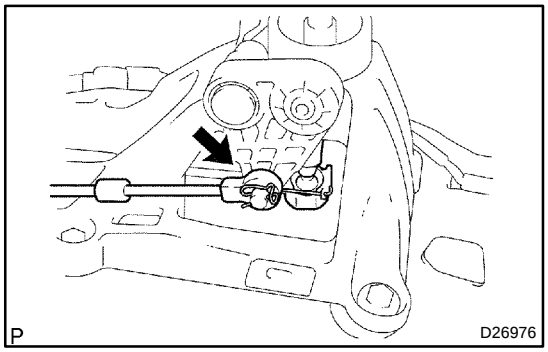
6. INSTALL FLOOR SHIFT CABLE TRANSMISSION CONTROL SELECT

(a) Install the select cable to the grommet.
(b) Put the control cable assy through the floor hole and retainer.
(c) Install the retainer to the grommet.

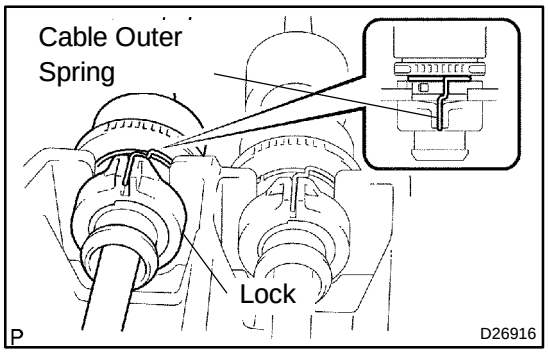
NOTICE:
Fit 4 projections of the grommet into 4 holes of the retainer.



(d) Install the control cable assy with the 2 bolts.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



(e) Connect the end of the select cable to the shift lever assy.



(f) Connect the select cable to the retainer of shift lever assy, turn the lock.

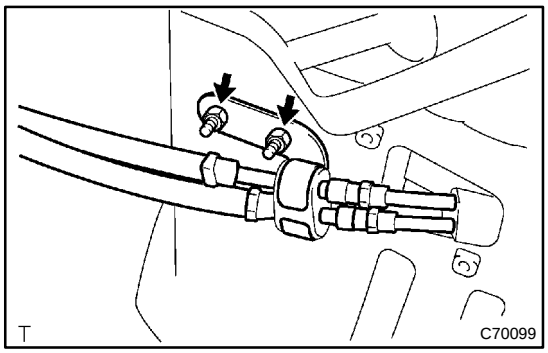
NOTICE:

The projecting part of the lock should face upward when the select cable is installed.

(g) Install the cable outer spring to the lock.

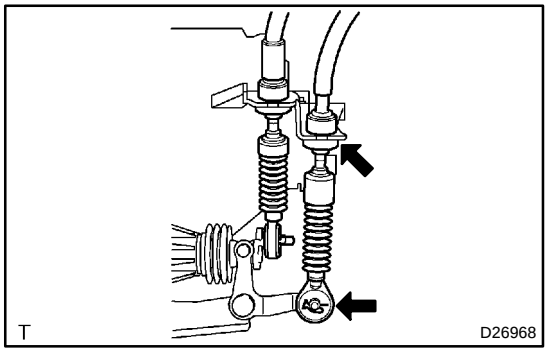
NOTICE:

Make sure that after installation the cable outer spring is moved to the place shown in the illustration.



(h) Install the clamp with the 2 nuts

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



(i) Connect the select cable to the control cable bracket, install a new clip.

(j) Connect the select cable to the transaxle, install the washer and clip.

7. INSTALL FRONT FLOOR HEAT INSULATOR NO.1(GASOLINE ENGIN TYPE)

(a) Install the heat insulator No.1 with the 3 nuts.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

8. INSTALL EXHAUST PIPE ASSY

(a) 4ZZ–FE, 3ZZ–FE Engine (See page 15–5)

(b) 1CD–FTV Engine (See page 15–2)

9. CONNECT AIR BAG SENSOR ASSY CENTER

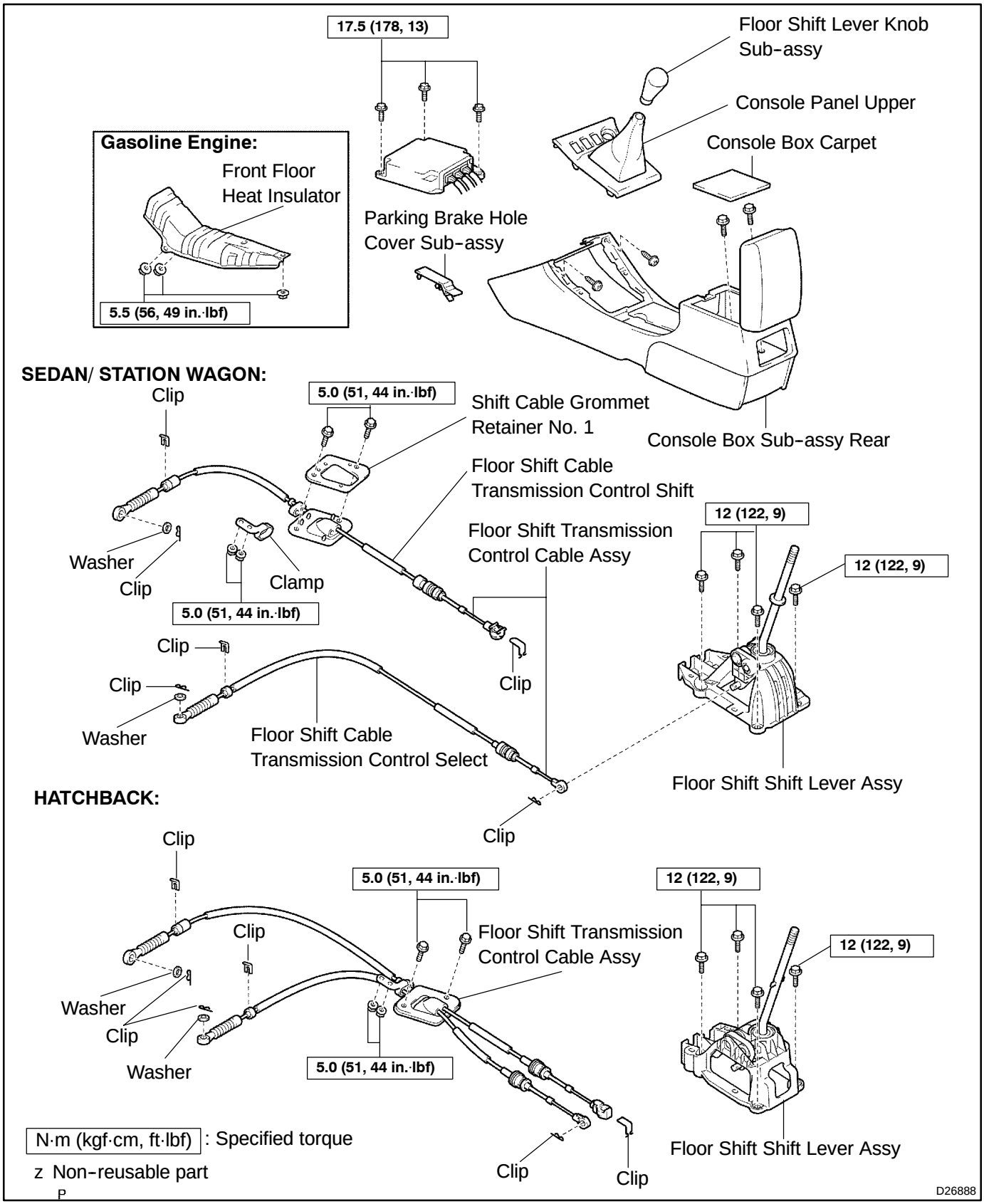
(a) Install the airbag sensor assy center with the 3 bolts.
Torque: 17.5 N·m (178 kgf·cm, 13 ft·lbf)

10. INSPECT SRS WARNING LIGHT

FLOOR SHIFT SHIFT LEVER ASSY (MTM)

COMPONENTS

4105U-01



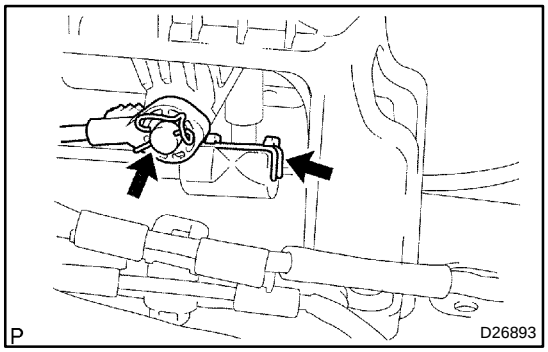
4105V-01

REPLACEMENT

HINT:

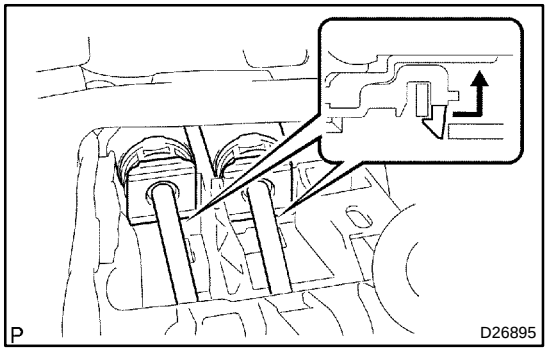
COMPONENTS: See page 41-18

1. **REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY**
   (See page 71-16 or 71-25)
2. **REMOVE CONSOLE PANEL UPPER**
   (See page 71-16 or 71-25)
3. **REMOVE PARKING BRAKE HOLE COVER SUB-ASSY**
   (See page 71-19 or 71-28)
4. **REMOVE CONSOLE BOX SUB-ASSY REAR**
   (See page 71-19 or 71-28)

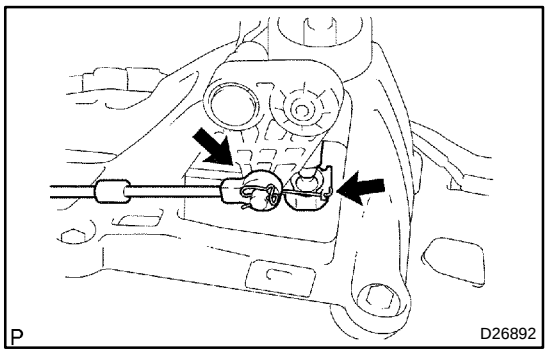


5. **SEPARATE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY(HATCH BACK BODY TYPE)**

(a) Remove the 2 clips, separate the cable ends of the control cable assy.

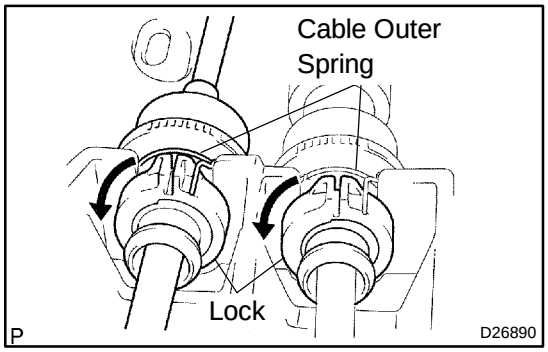


(b) Release the claws, separate the control cable assy.

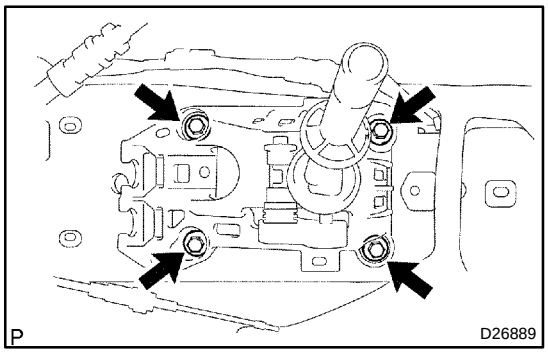


6. **SEPARATE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY(SEDAN/STATION WAGON BODY TYPE)**

(a) Remove the 2 clips, separate the cable ends of the control cable assy.

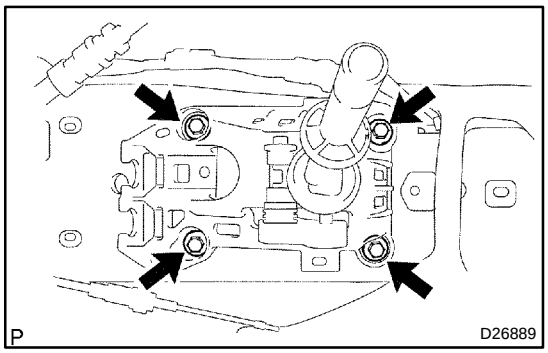


(b) Using a screwdriver, release the cable outer springs.
(c) Turn the locks, separate the control cable assy from the shift lever retainer.



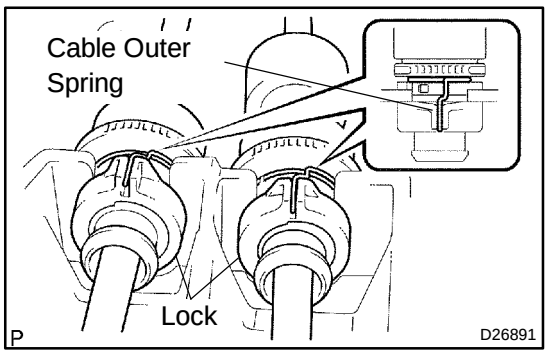
7. REMOVE FLOOR SHIFT SHIFT LEVER ASSY

(a) Remove the 4 bolts and shift lever assy.



8. INSTALL FLOOR SHIFT SHIFT LEVER ASSY

(a) Install the shift lever assy with the 4 bolts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



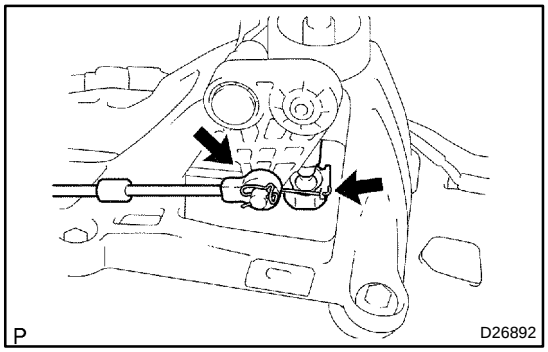
9. CONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY(SEDAN/STATION WAGON BODY TYPE)

(a) Connect the control cable assy to the shift lever assy, turn the locks.

NOTICE:
The projecting part of the locks should face upward when the control cable assy is installed.

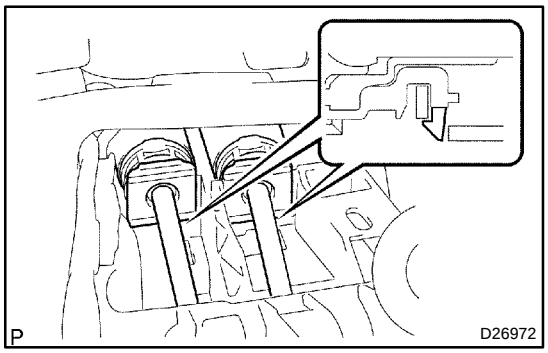
(b) Install the cable outer springs to the locks.

NOTICE:
Make sure that after installation the cable outer springs are moved to the place shown in the illustration.



(c) Connect the end of the select cable to the shift lever assy, install the clip.

(d) Connect the end of the shift cable to the shift lever assy.

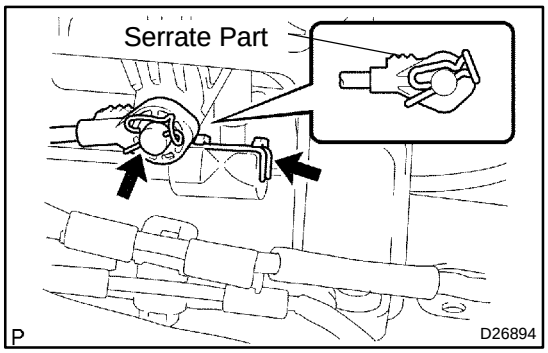


10. CONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY(HATCH BACK BODY TYPE)

(a) Connect the control cable assy to the shift lever assy.

NOTICE:

Make sure that the claws are firmly engaged.



(b) Connect the end of the select cable to the shift lever assy, install the clip.

NOTICE:

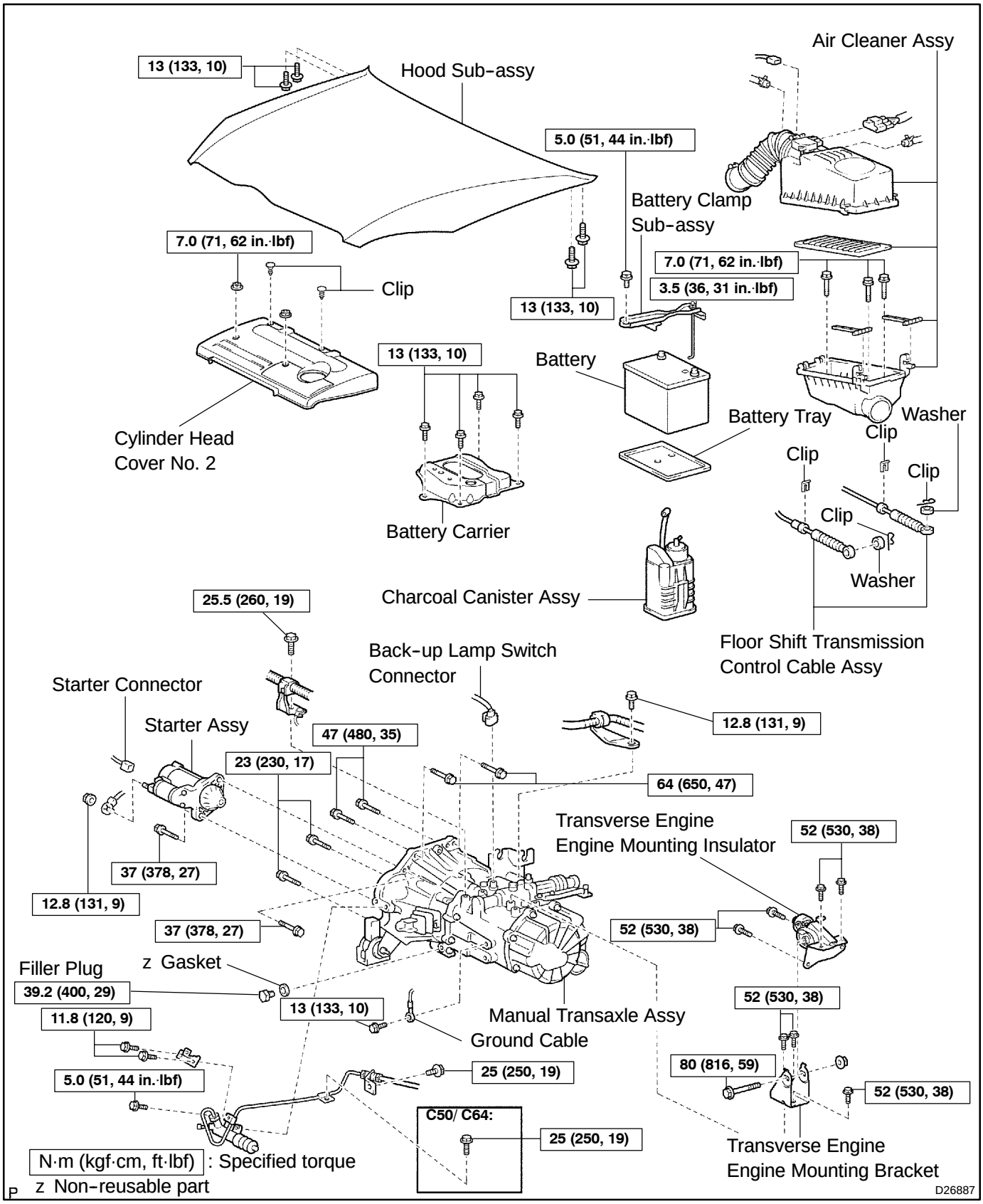
- **The serrate part of the select cable point should face upward when the select cable point is connected.**
- **The clip should be inserted to the direction shown in the illustration.**

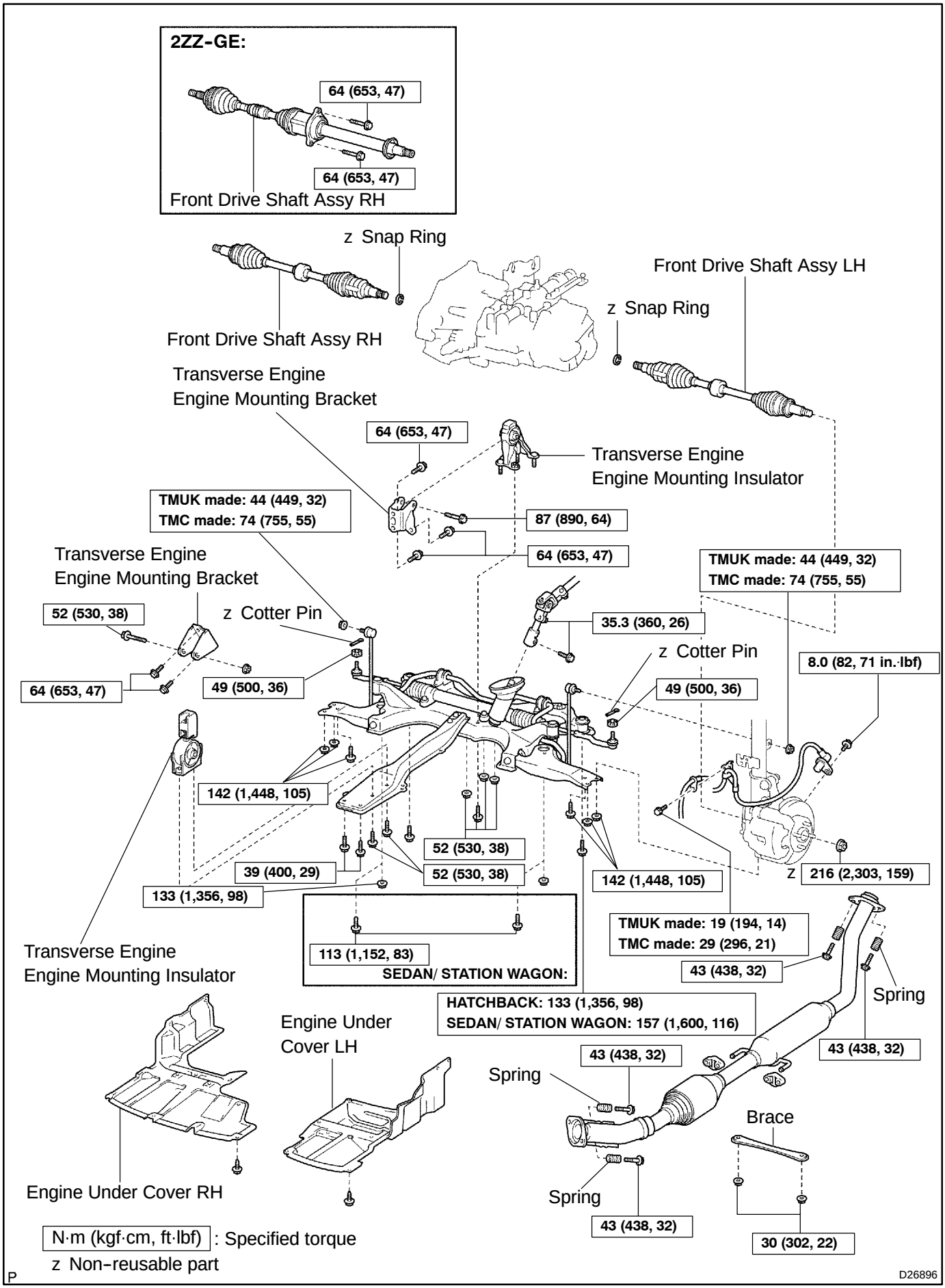
(c) Connect the end of the shift cable to the shift lever assy.

MANUAL TRANSAXLE ASSY (C50/C64/C150)

COMPONENTS

4105W-01




2ZZ-GE:
64 (653, 47)
64 (653, 47)
Front Drive Shaft Assy RH
z Snap Ring
Front Drive Shaft Assy RH
Front Drive Shaft Assy LH
z Snap Ring
Transverse Engine
Engine Mounting Bracket
64 (653, 47)
Transverse Engine
Engine Mounting Insulator
TMUK made: 44 (449, 32)
TMC made: 74 (755, 55)
87 (890, 64)
64 (653, 47)
Transverse Engine
Engine Mounting Bracket
52 (530, 38)
z Cotter Pin
64 (653, 47)
49 (500, 36)
35.3 (360, 26)
z Cotter Pin
49 (500, 36)
TMUK made: 44 (449, 32)
TMC made: 74 (755, 55)
8.0 (82, 71 in.·lbf)
142 (1,448, 105)
52 (530, 38)
52 (530, 38)
39 (400, 29)
133 (1,356, 98)
142 (1,448, 105)
z
216 (2,303, 159)
113 (1,152, 83)
SEDAN/ STATION WAGON:
TMUK made: 19 (194, 14)
TMC made: 29 (296, 21)
43 (438, 32)
Transverse Engine
Engine Mounting Insulator
HATCHBACK: 133 (1,356, 98)
SEDAN/ STATION WAGON: 157 (1,600, 116)
Spring
43 (438, 32)
Engine Under
Cover LH
Spring
43 (438, 32)
Brace
Engine Under Cover RH
Spring
43 (438, 32)
30 (302, 22)
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
P
D26896

4105X-01

REPLACEMENT

HINT:

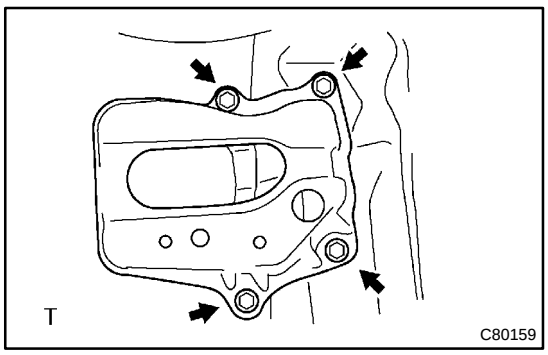
COMPONENTS: See page 41-22

1. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
2. **REMOVE HORN BUTTON ASSY**
   (See page 60-13)
3. **REMOVE STEERING WHEEL ASSY**
   (See page 50-8)
4. **REMOVE COLUMN HOLE COVER SILENCER SHEET**
   (See page 51-6)
5. **SEPARATE STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)**
   (See page 51-6)
6. **SEPARATE STEERING SLIDING YOKE SUB-ASSY (LHD STEERING POSITION TYPE)**
   (See page 51-6)
7. **REMOVE FRONT WHEELS**
8. **REMOVE ENGINE UNDER COVER LH**
9. **REMOVE ENGINE UNDER COVER RH**
10. **REMOVE EXHAUST PIPE**

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 15-5)

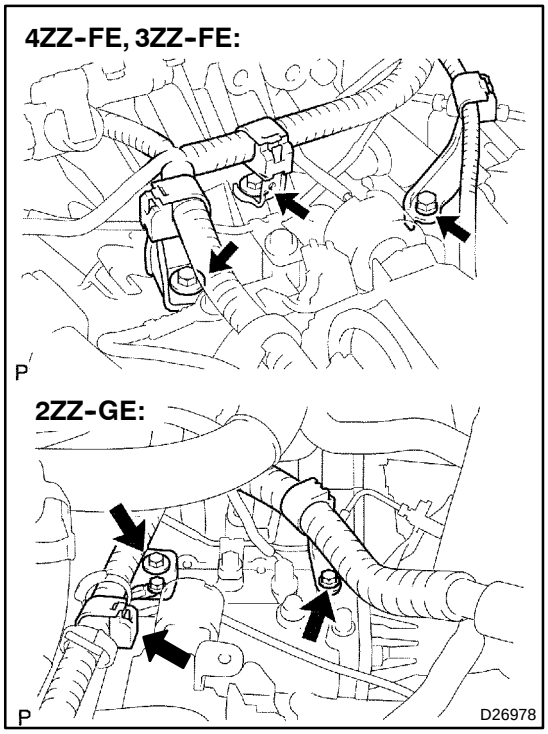
(b) 2ZZ-GE Engine (See page 15-2)

11. **DRAIN TRANSAXLE OIL**
    Torque: 39.2 N·m (400 kgf·cm, 29 ft·lbf)
12. **REMOVE HOOD SUB-ASSY**
13. **REMOVE CYLINDER HEAD COVER NO.2**
14. **REMOVE AIR CLEANER ASSY**
15. **REMOVE BATTERY CLAMP SUB-ASSY**
16. **REMOVE BATTERY**
17. **REMOVE BATTERY TRAY**



18. **REMOVE BATTERY CARRIER**

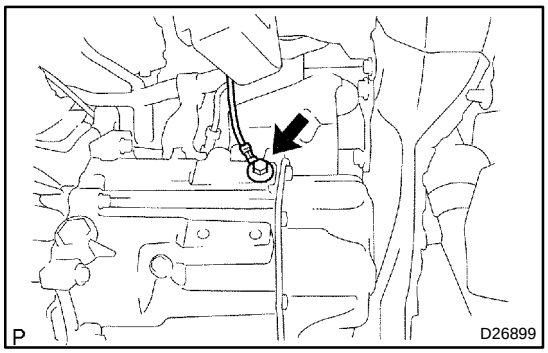
(a) Remove the 4 bolts and battery carrier.



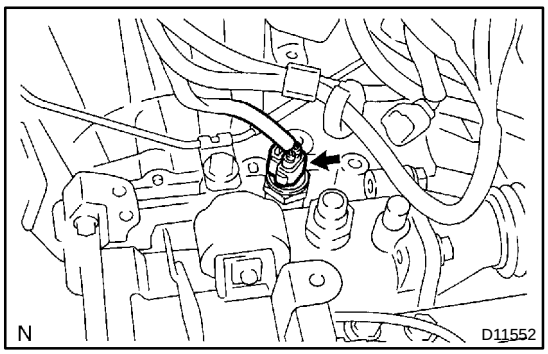
19. DISCONNECT WIRE HARNESS

(a) 4ZZ-FE, 3ZZ-FE Engine:
Remove the 3 bolts, disconnect the wire harness clamps.

(b) 2ZZ-GE Engine:
Disconnect the wire harness clamp and remove the 2 bolts, disconnect the wire harness clamps.

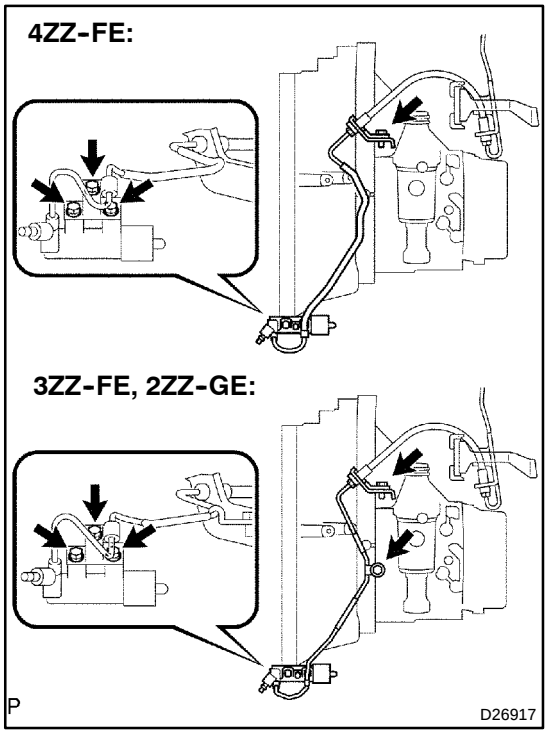


(c) Remove the bolt, disconnect the ground cable.



20. DISCONNECT CONNECTOR

(a) Disconnect the back-up lamp switch connector.

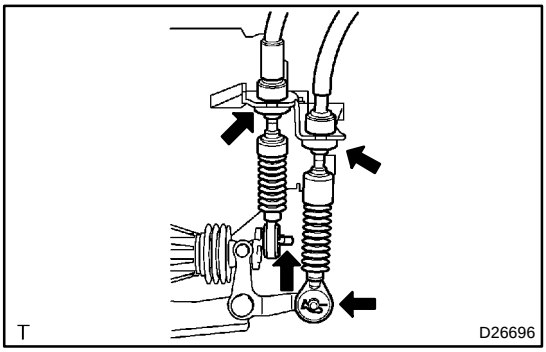


21. SEPARATE CLUTCH RELEASE CYLINDER ASSY

(a) 4ZZ-FE Engine:
Remove the 4 bolts, separate the release cylinder assy with clutch piping from the transaxle.

(b) 3ZZ-FE, 2ZZ-GE Engine:
Remove the 5 bolts, separate the release cylinder assy with clutch piping from the transaxle.

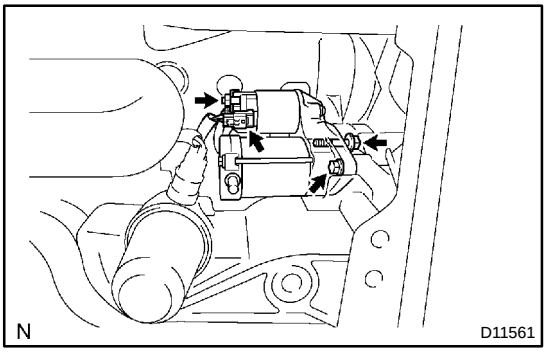
22. SEPARATE CHARCOAL CANISTER ASSY



23. SEPARATE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Remove the 2 clips, 2 washers and disconnect the 2 cables from the transaxle.

(b) Remove the 2 clips, disconnect the 2 cables from the control cable bracket.



24. REMOVE STARTER ASSY

(a) Remove the nut and disconnect the starter wire.

(b) Disconnect the connector.

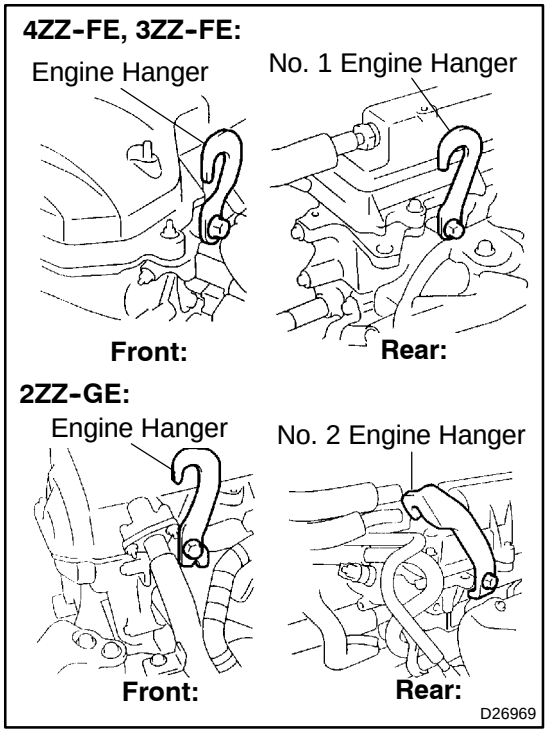
(c) Remove the 2 bolts and starter assy.

25. REMOVE FRONT DRIVE SHAFT ASSY LH

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-7)
SST 09520-01010, 09520-24010 (09520-32040)
(b) 2ZZ-GE Engine (See page 30-19)
SST 09520-01010, 09520-24010 (09520-32040)

26. REMOVE FRONT DRIVE SHAFT ASSY RH

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-6)
SST 09520-01010, 09520-24010 (09520-32040)
(b) 2ZZ-GE Engine (See page 30-19)
SST 09520-01010, 09520-24010 (09520-32040)



27. SUSPEND ENGINE ASSY

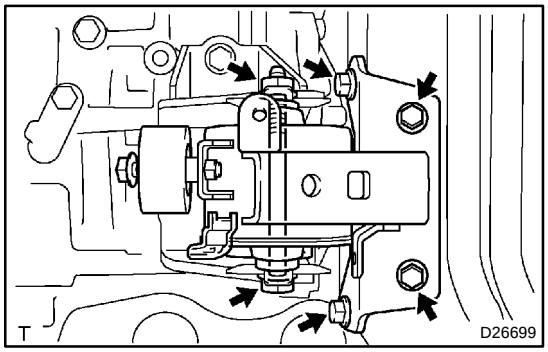
(a) Remove the 2 PCV hoses.
(b) Install the 2 hangers in the correct direction.
Parts No.:
Engine hanger:
4ZZ-FE, 3ZZ-FE: 12281-22021
2ZZ-GE: 12281-88600
No.1 engine hanger:
12281-15040
No.2 engine hanger:
12282-88600
Bolt:
4ZZ-FE, 3ZZ-FE: 91512-B1016
2ZZ-GE: 91512-61020
Torque:
4ZZ-FE, 3ZZ-FE: 30 N·m (306 kgf·cm, 22 ft·lbf)
2ZZ-GE: 38 N·m (387 kgf·cm, 28 ft·lbf)
(c) Attach the engine chain hoist to the hangers.

CAUTION:
Do not attempt to hang the engine by hooking the chain to any other part.

28. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSY
(See page 51-8)

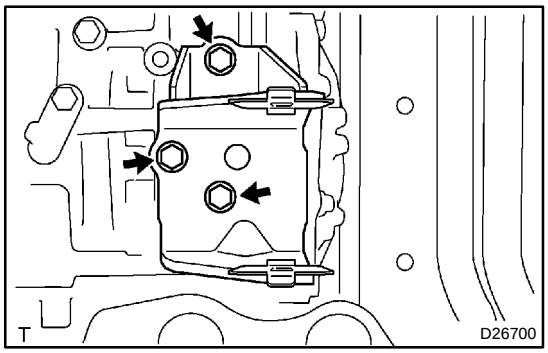
29. SUPPORT MANUAL TRANSAXLE ASSY

(a) Support the transaxle with a transmission jack.



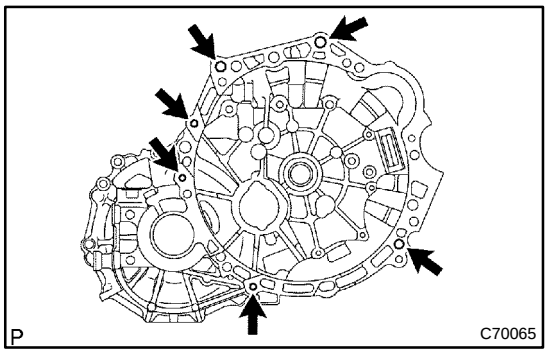
30. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the 5 bolts, nut and engine mounting insulator LH from the body.



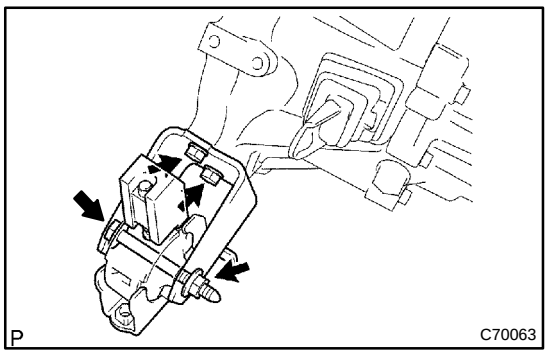
31. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 3 bolts and engine mounting bracket LH from the transaxle.



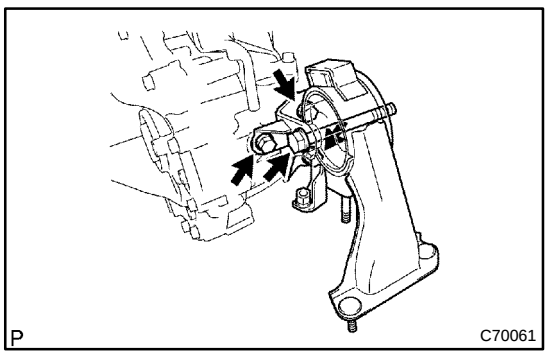
32. REMOVE MANUAL TRANSAXLE ASSY

(a) Remove the 6 bolts and transaxle from the engine.



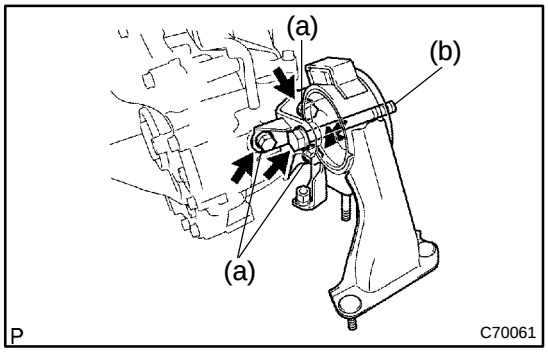
33. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the bolt, nut and engine mounting insulator FR from the engine mounting bracket FR.
(b) Remove the 2 bolts and engine mounting bracket FR from the transaxle.



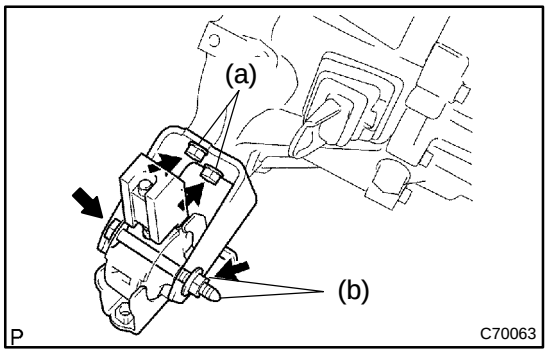
34. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the bolt and engine mounting insulator RR from the engine mounting bracket RR.
(b) Remove the 3 bolts and engine mounting bracket RR from the transaxle.



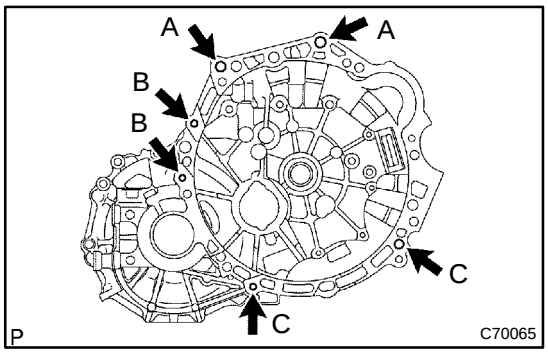
35. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket RR and 3 bolts to the transaxle.
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)
(b) Install the engine mounting insulator RR and bolt to the engine mounting bracket RR.
Torque: 87 N·m (888 kgf·cm, 64 ft·lbf)



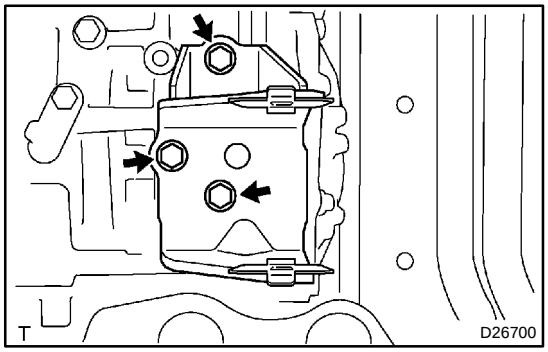
36. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket FR and 2 bolts to the transaxle.
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)
(b) Install the engine mounting insulator FR, bolt and nut to the engine mounting bracket FR.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



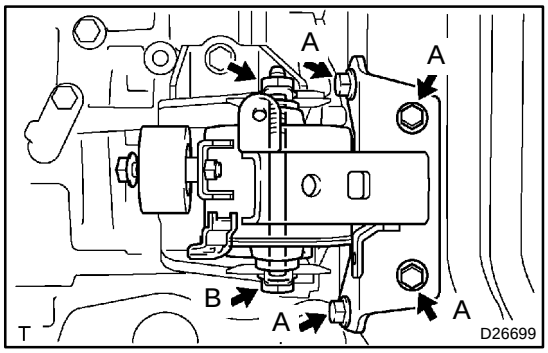
37. INSTALL MANUAL TRANSAXLE ASSY

(a) Align the input shaft with the clutch disc and install the transaxle to the engine.
(b) Install the 6 bolts.
Torque:
Bolt A: 64 N·m (650 kgf·cm, 47 ft·lbf)
Bolt B: 47 N·m (480 kgf·cm, 35 ft·lbf)
Bolt C: 23 N·m (230 kgf·cm, 17 ft·lbf)



38. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket LH to the transaxle with the 3 bolts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



39. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the engine mounting insulator LH with the 5 bolts and nut.
Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Bolt B: 80 N·m (816 kgf·cm, 59 ft·lbf)

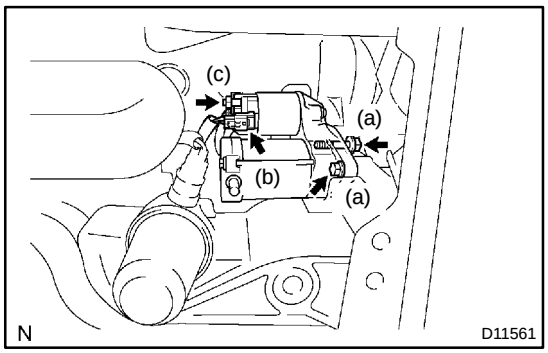
40. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSY
(See page 51-12)
SST 09670-00010

41. INSTALL FRONT DRIVE SHAFT ASSY LH

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-14)
(b) 2ZZ-GE Engine (See page 30-28)

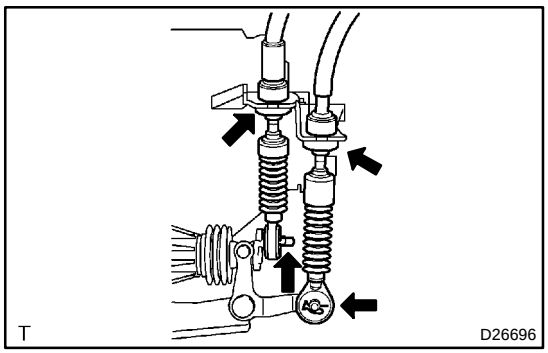
42. INSTALL FRONT DRIVE SHAFT ASSY RH

(a) 4ZZ-FE, 3ZZ-FE Engine (See page 30-6)
(b) 2ZZ-GE Engine (See page 30-29)



43. INSTALL STARTER ASSY

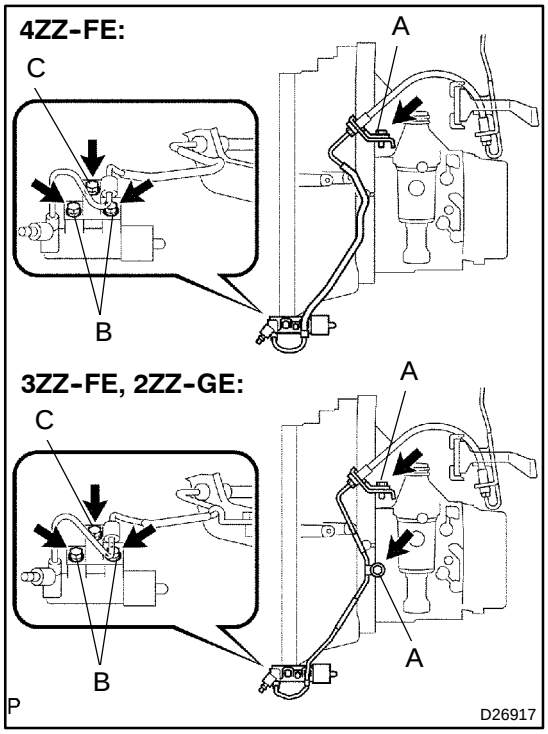
(a) Install the starter assy and 2 bolts to the transaxle.
Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)
(b) Connect the starter connector.
(c) Install the wire and nut to starter assy.
Torque: 12.8 N·m (131 kgf·cm, 9 ft·lbf)



44. CONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Connect the 2 cable ends, install the 2 washers and 2 clips.
(b) Install the 2 clips to the control cable bracket.

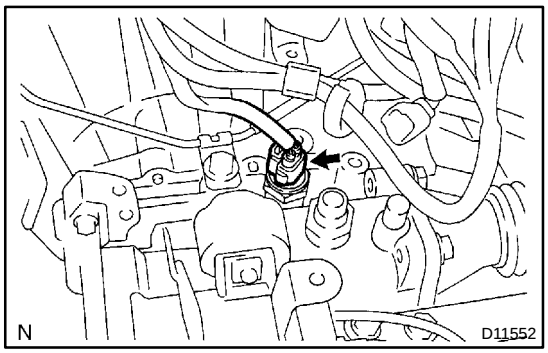
45. CONNECT CHARCOAL CANISTER ASSY



46. CONNECT CLUTCH RELEASE CYLINDER ASSY

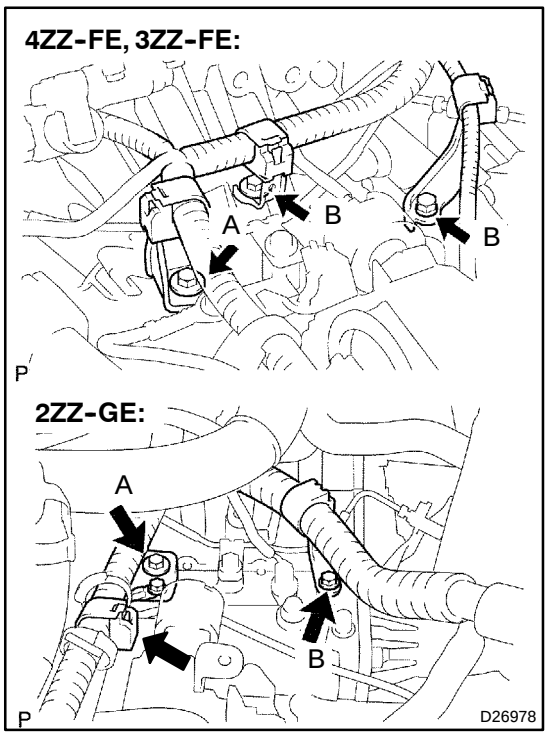
(a) 4ZZ-FE Engine:
Install the release cylinder with the 4 bolts.
Torque:
Bolt A: 25 N·m (250 kgf·cm, 19 ft·lbf)
Bolt B: 11.8 N·m (120 kgf·cm, 9 ft·lbf)
Bolt C: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

(b) 3ZZ-FE, 2ZZ-GE Engine:
Install the release cylinder with the 5 bolts.
Torque:
Bolt A: 25 N·m (250 kgf·cm, 19 ft·lbf)
Bolt B: 11.8 N·m (120 kgf·cm, 9 ft·lbf)
Bolt C: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



47. CONNECT CONNECTOR

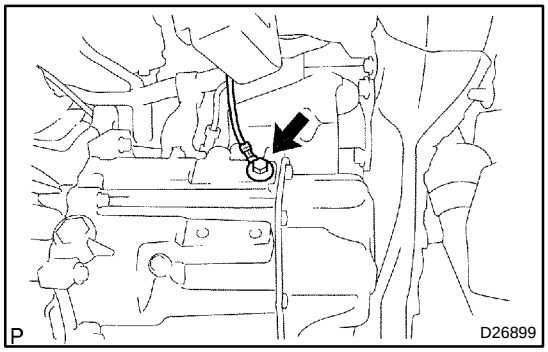
(a) Connect the back-up lamp switch connector.



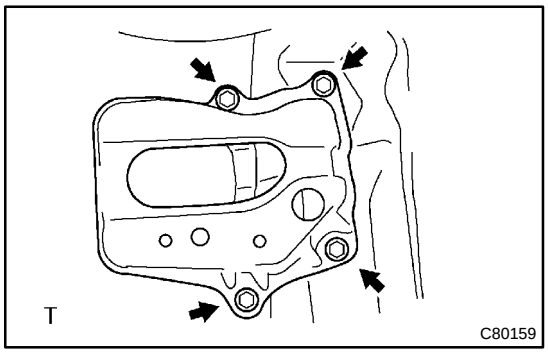
48. CONNECT WIRE HARNESS

(a) 4ZZ-FE, 3ZZ-FE Engine:
Install the 3 wire harness clamps to the transaxle with the 3 bolts.
Torque:
Bolt A: 25.5 N·m (260 kgf·cm, 19 ft·lbf)
Bolt B: 12.8 N·m (131 kgf·cm, 9 ft·lbf)

(b) 2ZZ-GE Engine:
Install the 2 wire harness clamps to the transaxle with the 2 bolts, connect the wire harness clamp.
Torque:
Bolt A: 25.5 N·m (260 kgf·cm, 19 ft·lbf)
Bolt B: 12.8 N·m (131 kgf·cm, 9 ft·lbf)



(c) Install the bolt and ground cable.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)



49. INSTALL BATTERY CARRIER

(a) Install the battery carrier and 4 bolts.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

50. INSTALL BATTERY TRAY

51. INSTALL BATTERY

52. INSTALL BATTERY CLAMP SUB-ASSY

Torque:
Bolt: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Nut: 3.5 N·m (36 kgf·cm, 31 in.·lbf)

53. INSTALL AIR CLEANER ASSY

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

54. INSTALL CYLINDER HEAD COVER NO.2

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

55. INSTALL HOOD SUB-ASSY

Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

56. INSPECT HOOD SUB-ASSY
(See page 75-1)

57. ADJUST HOOD SUB-ASSY
(See page 75-1)

58. ADD TRANSAXLE OIL (See page 41-3)

59. INSPECT TRANSAXLE OIL (See page 41-2)

60. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

61. INSTALL STEERING COLUMN HOLE COVER SUB-ASSY NO.1
(See page 51-12)

62. CONNECT STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)
(See page 51-14)

63. CONNECT STEERING SLIDING YOKE SUB-ASSY (LHD STEERING POSITION TYPE)
(See page 51-15)
64. INSTALL COLUMN HOLE COVER SILENCER SHEET
(See page 51-15)
65. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
66. CENTER SPIRAL CABLE (See page 60-23)
67. INSTALL STEERING WHEEL ASSY
(See page 50-15)
68. STEERING WHEEL CENTER POINT
69. INSTALL HORN BUTTON ASSY
(See page 60-13)
70. INSTALL EXHAUST PIPE
(a) 4ZZ-FE, 3ZZ-FE Engine (See page 15-5)
(b) 2ZZ-GE Engine (See page 15-2)
71. INSTALL ENGINE UNDER COVER LH

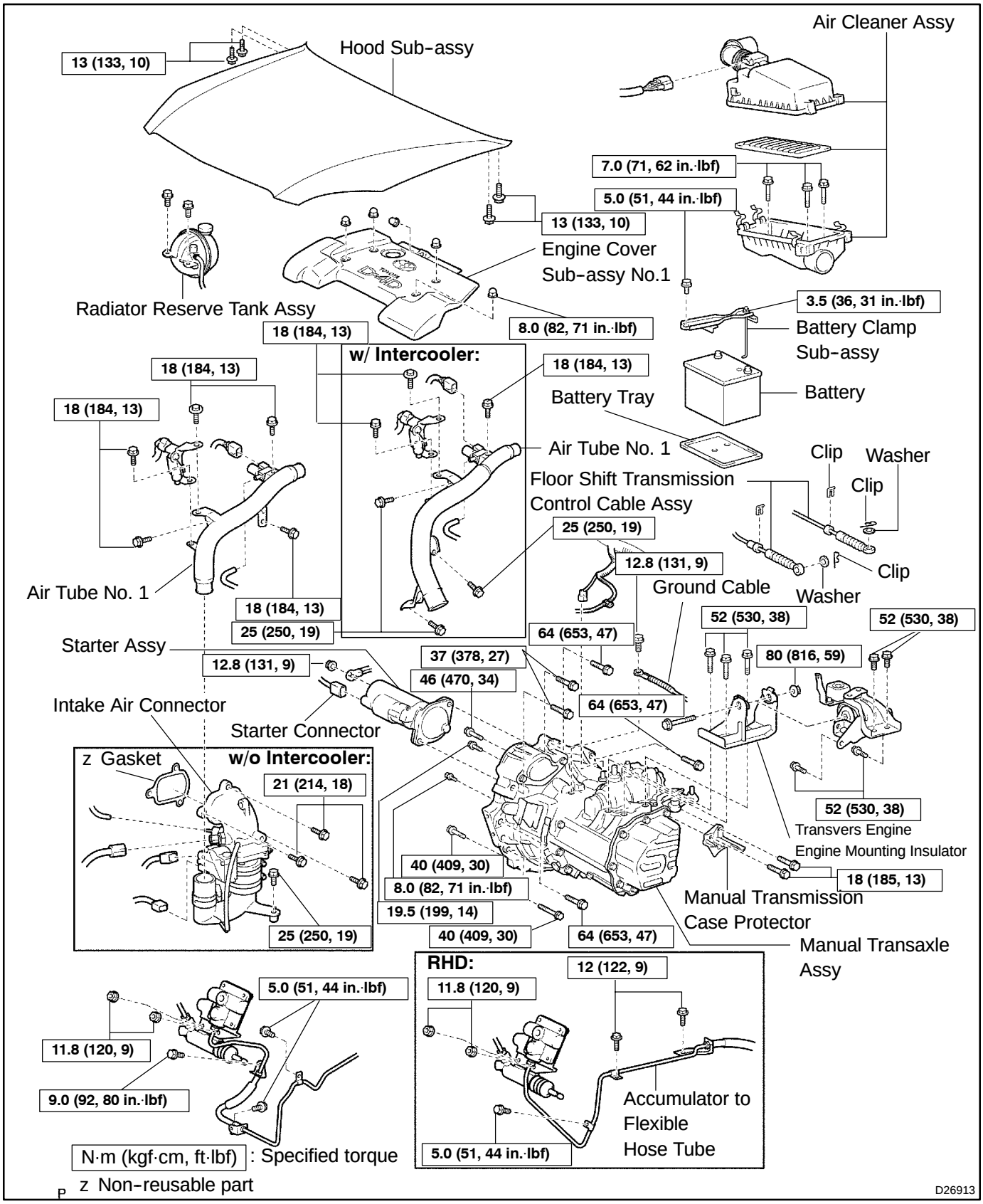
72. INSTALL ENGINE UNDER COVER RH

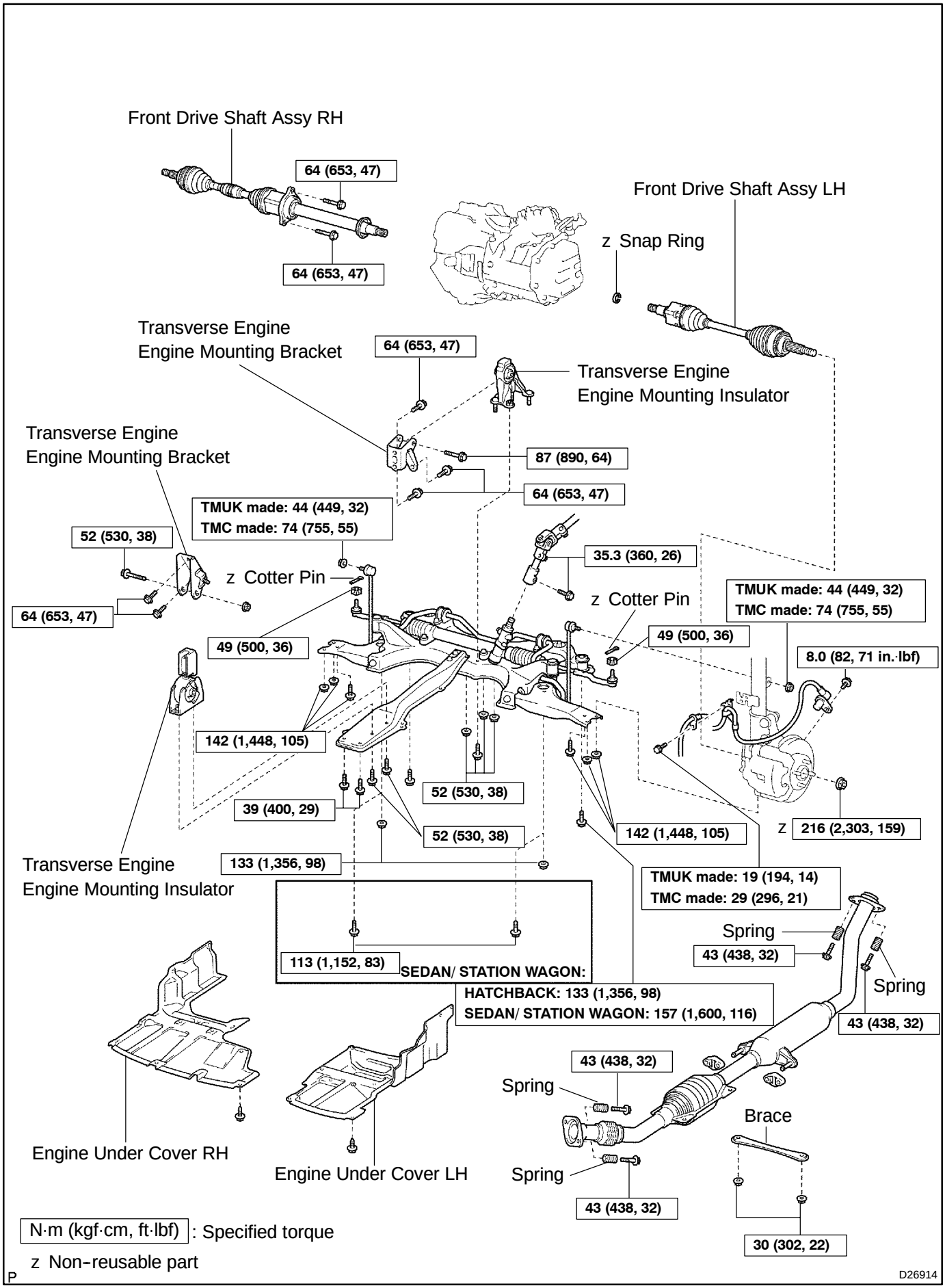
73. INSPECT FRONT WHEEL ALIGNMENT (See page 26-2)
74. CHECK ABS SPEED SENSOR SIGNAL
(a) TMC made (See page 05-565)
(b) TMUK made
    (1) w/ VSC (See page 05-673)
    (2) w/o VSC (See page 05-618)

MANUAL TRANSAXLE ASSY (E351)

COMPONENTS

4105Y-01




Front Drive Shaft Assy RH
64 (653, 47)
64 (653, 47)
Front Drive Shaft Assy LH
z Snap Ring
Transverse Engine
Engine Mounting Bracket
64 (653, 47)
Transverse Engine
Engine Mounting Insulator
Transverse Engine
Engine Mounting Bracket
87 (890, 64)
64 (653, 47)
TMUK made: 44 (449, 32)
TMC made: 74 (755, 55)
52 (530, 38)
z Cotter Pin
64 (653, 47)
35.3 (360, 26)
z Cotter Pin
TMUK made: 44 (449, 32)
TMC made: 74 (755, 55)
49 (500, 36)
49 (500, 36)
8.0 (82, 71 in.·lbf)
142 (1,448, 105)
52 (530, 38)
39 (400, 29)
52 (530, 38)
142 (1,448, 105)
z 216 (2,303, 159)
Transverse Engine
Engine Mounting Insulator
133 (1,356, 98)
TMUK made: 19 (194, 14)
TMC made: 29 (296, 21)
Spring
43 (438, 32)
113 (1,152, 83)
SEDAN/ STATION WAGON:
HATCHBACK: 133 (1,356, 98)
SEDAN/ STATION WAGON: 157 (1,600, 116)
Spring
43 (438, 32)
43 (438, 32)
Spring
Brace
Engine Under Cover RH
Engine Under Cover LH
Spring
43 (438, 32)
30 (302, 22)
N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
P
D26914

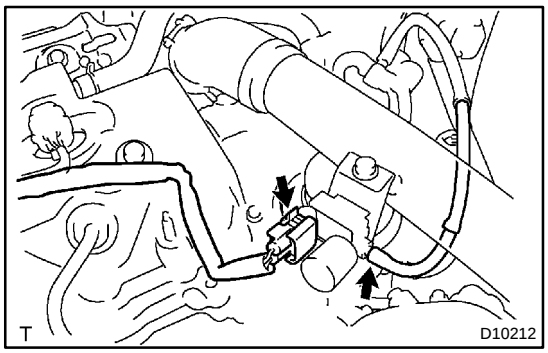
4105Z-01

REPLACEMENT

HINT:

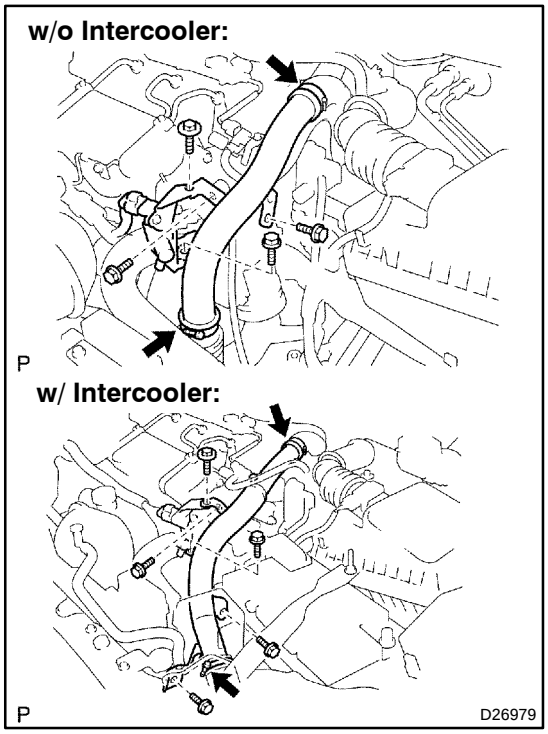
COMPONENTS: See page 41-34

1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. REMOVE HORN BUTTON ASSY
   (See page 60-13)
3. REMOVE STEERING WHEEL ASSY
   (See page 50-8)
4. REMOVE COLUMN HOLE COVER SILENCER SHEET
   (See page 51-6)
5. SEPARATE STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)
   (See page 51-6)
6. SEPARATE STEERING SLIDING YOKE SUB-ASSY (LHD STEERING POSITION TYPE)
   (See page 51-6)
7. REMOVE FRONT WHEELS
8. REMOVE ENGINE UNDER COVER RH
9. REMOVE ENGINE UNDER COVER LH
10. REMOVE EXHAUST PIPE (See page 15-8)
11. DRAIN TRANSAXLE OIL
    Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
12. REMOVE HOOD SUB-ASSY
13. REMOVE ENGINE COVER SUB-ASSY NO.1
14. REMOVE AIR CLEANER ASSY
15. REMOVE BATTERY CLAMP SUB-ASSY
16. REMOVE BATTERY
17. REMOVE BATTERY TRAY



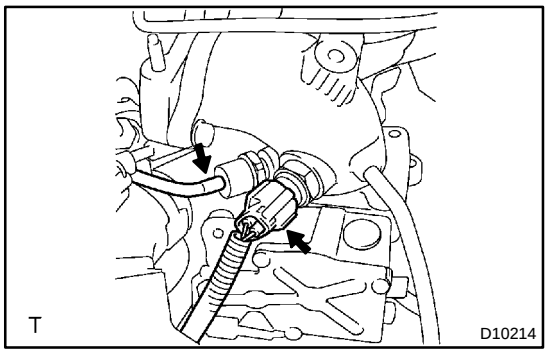
18. REMOVE AIR TUBE NO.1

(a) Disconnect the vacuum hose and connector.



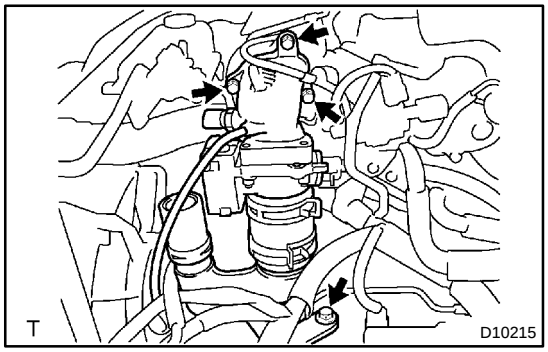
(b) w/o Intercooler:
(1) Remove the 2 bolts, disconnect the VSV for turbo-charging pressure control assembly.
(2) Remove the 2 bolts.
(3) Disconnect the 2 hose clamps, and remove the No.1 air tube.

(c) w/ Intercooler:
(1) Remove the 2 bolts, disconnect the VSV for turbo-charging pressure control assembly.
(2) Remove the 3 bolts.
(3) Disconnect the 2 hose clamps, remove the No.1 air tube.

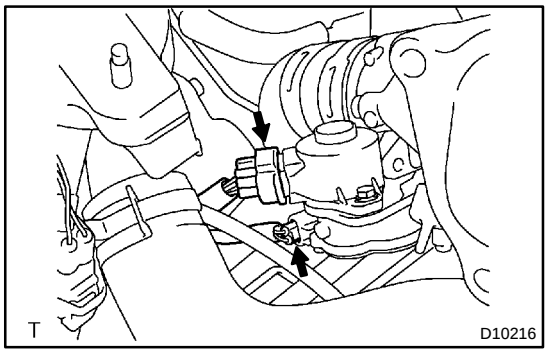


19. REMOVE INTAKE AIR CONNECTOR (W/O INTER COOLER)

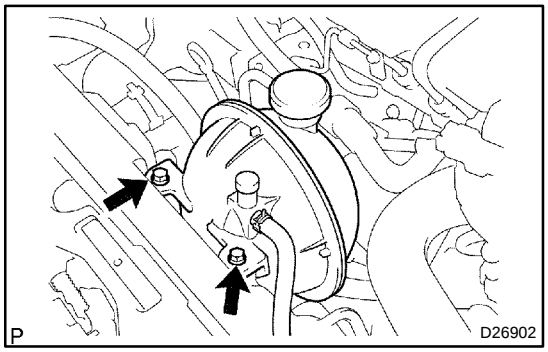
(a) Disconnect the intake air temperature sensor connector and vacuum hose.



(b) Remove the 4 bolts from the air connector with No.2 air tube assembly.

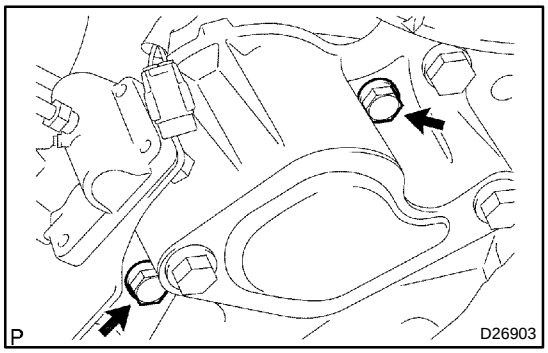


(c) Disconnect the throttle control motor connector.
(d) Disconnect the throttle full switch connector.
(e) Disconnect the 2 hose clips, remove the air connector with the No.2 air tube assembly.



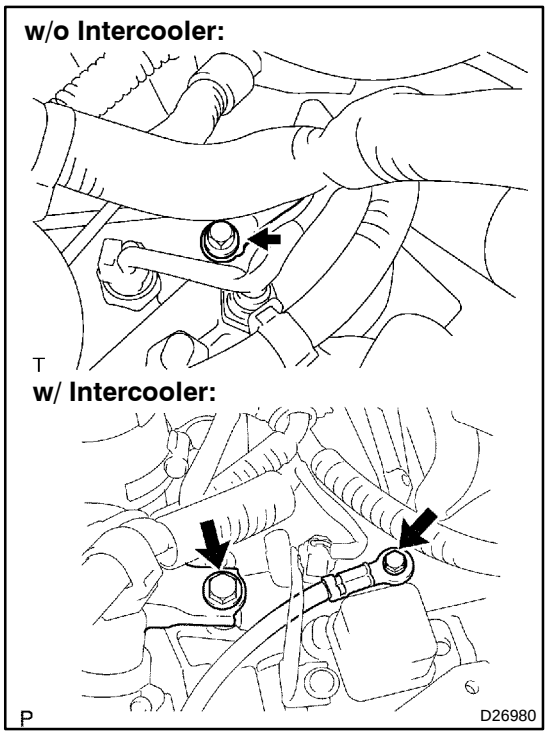
20. SEPARATE RADIATOR RESERVE TANK ASSY

(a) Remove the 2 bolts, separate the radiator reserve tank assy.



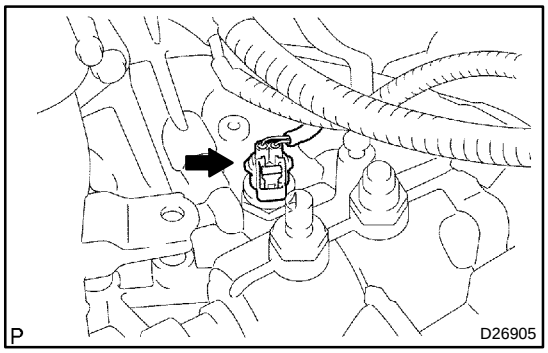
21. REMOVE STARTER ASSY

(a) Remove the nut, disconnect the starter wire.
(b) Disconnect the connector.
(c) Remove the 2 bolts and starter assy.



22. DISCONNECT WIRE HARNESS

(a) w/o Intercooler:
  (1) Remove the bolt, disconnect the ground cable.
(b) w/ Intercooler:
  (1) Remove the bolt, disconnect the ground cable.
  (2) Remove the bolt, separate the air tube.



23. DISCONNECT CONNECTOR

(a) Disconnect the back-up lamp switch connector.

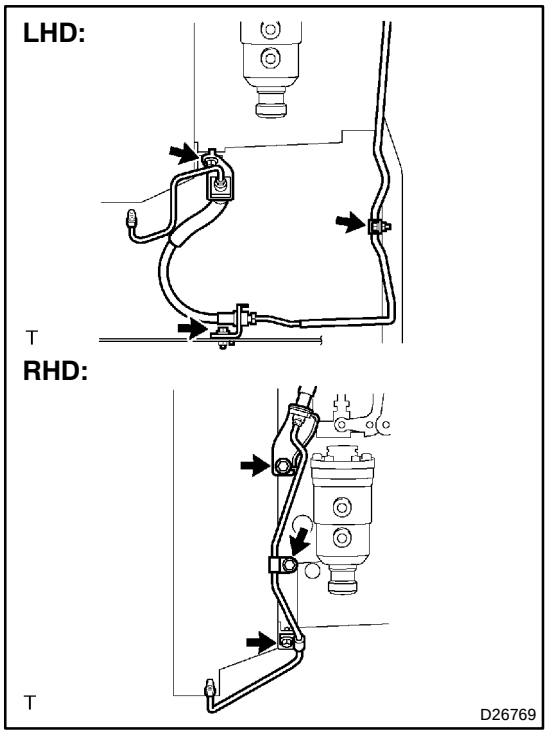
24. REMOVE CLUTCH ACCUMULATOR ASSY

(See page 42-24)

SST 09023-00100

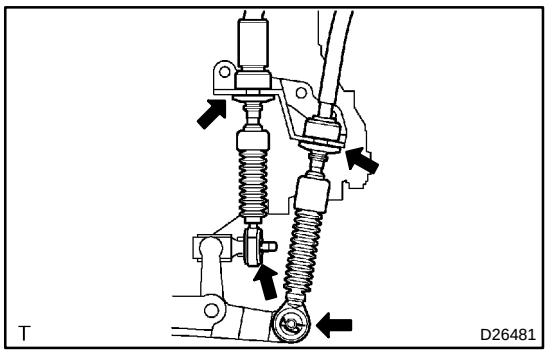
25. REMOVE CLUTCH RELEASE CYLINDER ASSY

(See page 42-18)



26. SEPARATE ACCUMULATOR TO FLEXIBLE HOSE TUBE

(a) Remove the 3 bolts, separate the flexible hose tube with bracket from the transaxle.



27. SEPARATE FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Remove the 2 clips and 2 washers, separate the 2 cables from the transaxle.

(b) Remove the 2 clips, separate the 2 cables from the bracket.

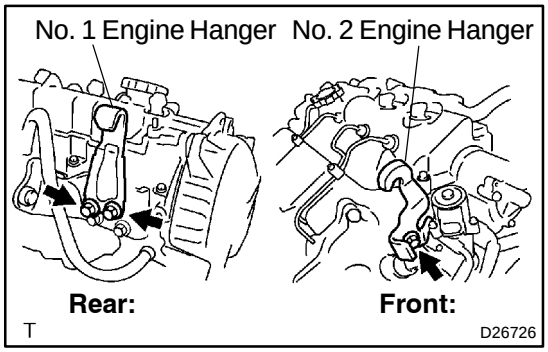
28. REMOVE FRONT DRIVE SHAFT ASSY LH

(See page 30-18)

SST 09520-01010, 09520-24010 (09520-32040)

29. REMOVE FRONT DRIVE SHAFT ASSY RH

(See page 30-18)



30. SUSPEND ENGINE ASSY

(a) Install the hangers in the correct direction.
Parts No.:
No.1 engine hanger: 12281-27010
No.2 engine hanger: 12282-27010
Bolt: 91642-81025
Torque: 36.8 N·m (375 kgf·cm, 27 ft·lbf)

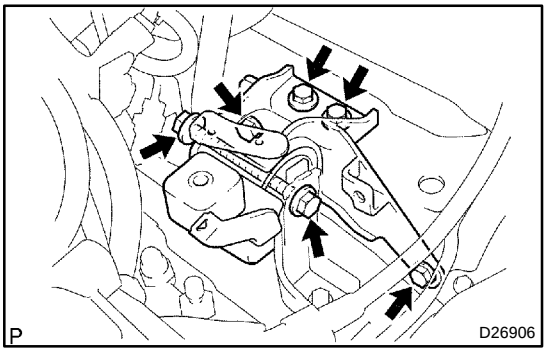
(b) Attach the engine chain hoist to the hanger.

CAUTION:
Do not attempt to hang the engine by hooking the chain to any other part.

31. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSY
(See page 51-8)

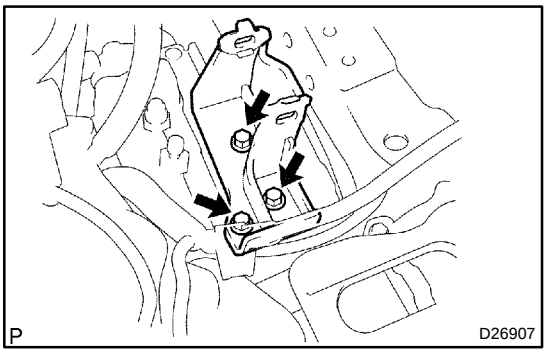
32. SUPPORT MANUAL TRANSAXLE ASSY

(a) Support the transaxle with a transmission jack.



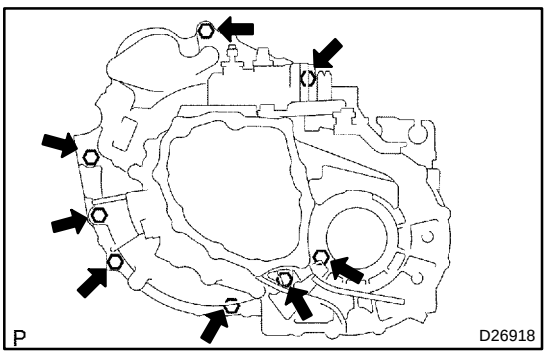
33. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the 5 bolts, nut and engine mounting insulator LH from the body.



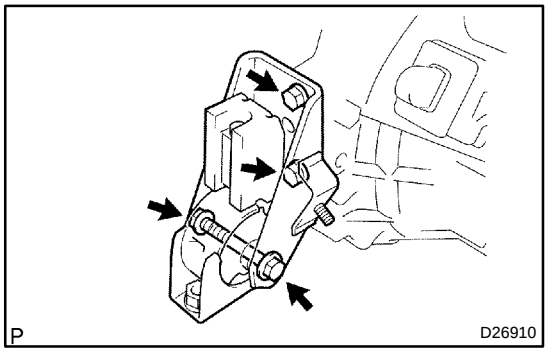
34. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 3 bolts and engine mounting bracket LH from the transaxle.



35. REMOVE MANUAL TRANSAXLE ASSY

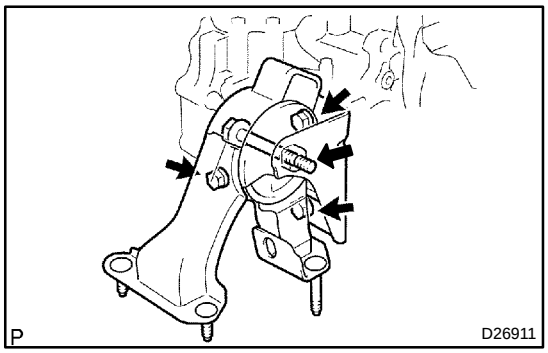
(a) Remove the 8 bolts.
(b) Remove the transaxle from the engine.



36. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the bolt, nut and engine mounting insulator from the engine mounting bracket.

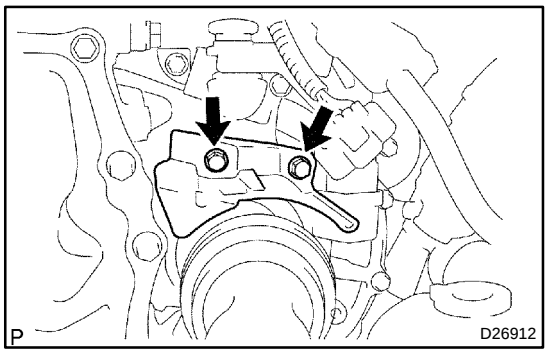
(b) Remove the 2 bolts and engine mounting bracket from the transaxle.



37. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

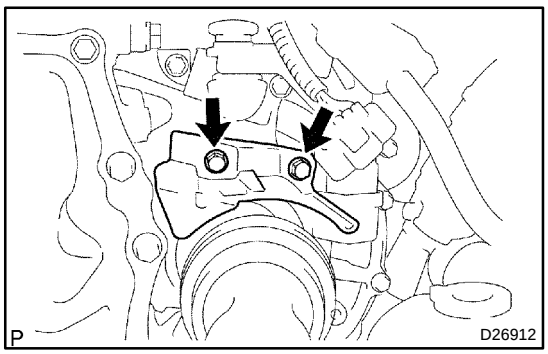
(a) Remove the bolt and engine mounting insulator from the engine mounting bracket.

(b) Remove the 3 bolts and engine mounting bracket from the transaxle.



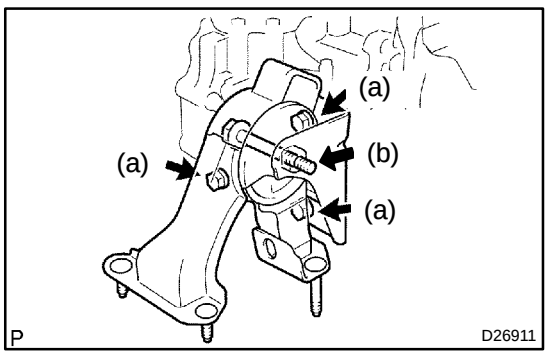
38. REMOVE MANUAL TRANSMISSION CASE PROTECTOR

(a) Remove the 2 bolts and case protector.



39. INSTALL MANUAL TRANSMISSION CASE PROTECTOR

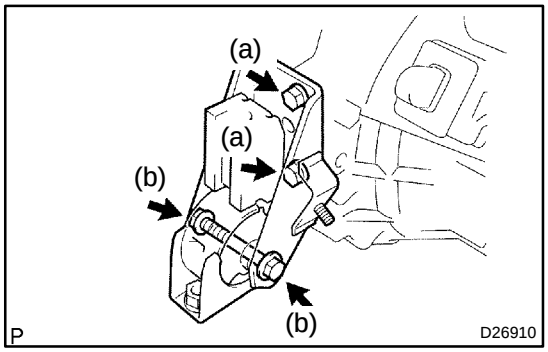
(a) Install the case protector with the 2 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



40. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket and 3 bolts to the transaxle.
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)

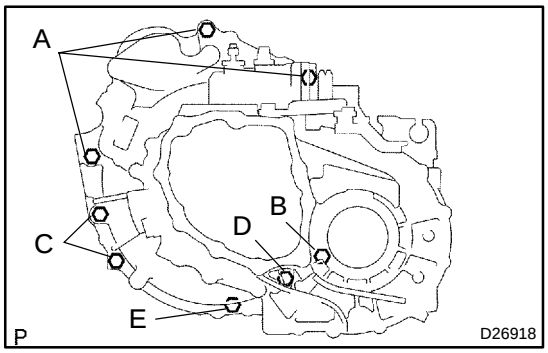
(b) Install the engine mounting insulator and bolt to the engine mounting bracket.
Torque: 87 N·m (888 kgf·cm, 64 ft·lbf)



41. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket and 2 bolts to the transaxle.
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)

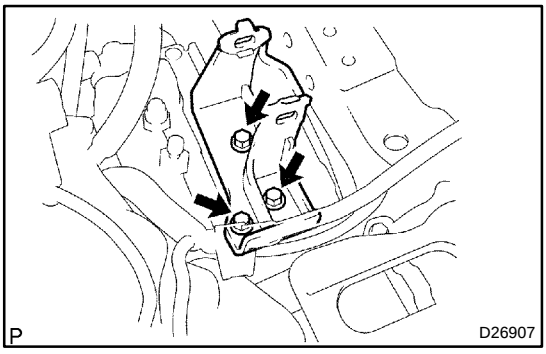
(b) Install the engine mounting insulator, bolt and nut to the engine mounting bracket.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



42. INSTALL MANUAL TRANSAXLE ASSY

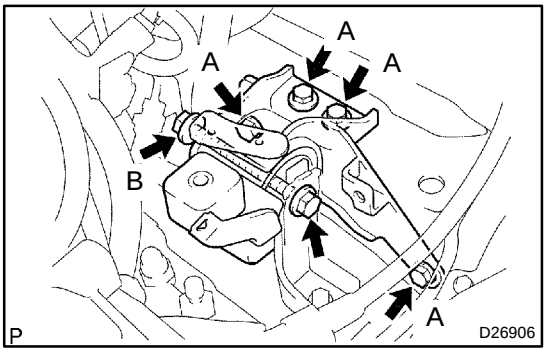
(a) Align the input shaft with the clutch disc and install the transaxle to the engine.

(b) Install the 8 bolts.
Torque:
Bolt A: 64 N·m (650 kgf·cm, 47 ft·lbf)
Bolt B: 46 N·m (470 kgf·cm, 34 ft·lbf)
Bolt C: 40 N·m (409 kgf·cm, 30 ft·lbf)
Bolt D: 19.5 N·m (199 kgf·cm, 14 ft·lbf)
Bolt E: 8.0 N·m (82 kgf·cm, 71 in.·lbf)



43. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Install the engine mounting bracket LH to the transaxle with the 3 bolts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



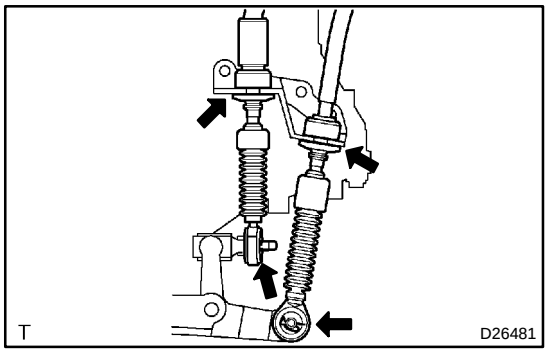
44. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the engine mounting insulator LH with the 5 bolts and nut.
Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B: 80 N·m (816 kgf·cm, 59 ft·lbf)

45. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSY
(See page 51-12)

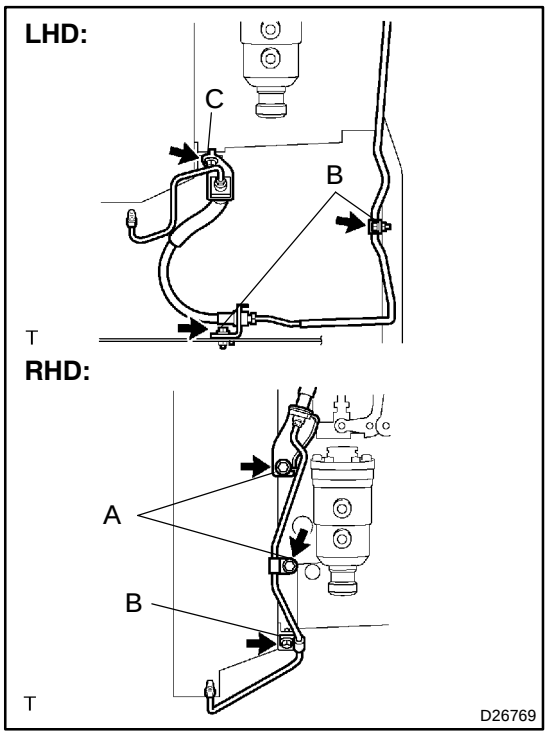
46. INSTALL FRONT DRIVE SHAFT ASSY LH
(See page 30-28)

47. INSTALL FRONT DRIVE SHAFT ASSY RH
(See page 30-29)



48. CONNECT FLOOR SHIFT TRANSMISSION CONTROL CABLE ASSY

(a) Connect the 2 cable ends, install the 2 washers and 2 clips.
(b) Install the 2 clips to the control cable bracket.



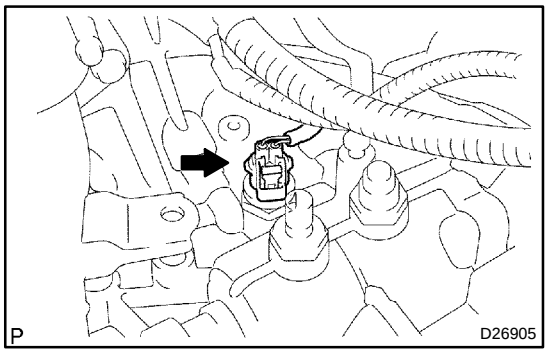
49. INSTALL ACCUMULATOR TO FLEXIBLE HOSE TUBE

(a) Install the flexible hose tube with the 3 bolts.
Torque:
Bolt A: 11.8 N·m (120 kgf·cm, 9 ft·lbf)
Bolt B: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Bolt C: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

50. INSTALL CLUTCH RELEASE CYLINDER ASSY
(See page 42-19)

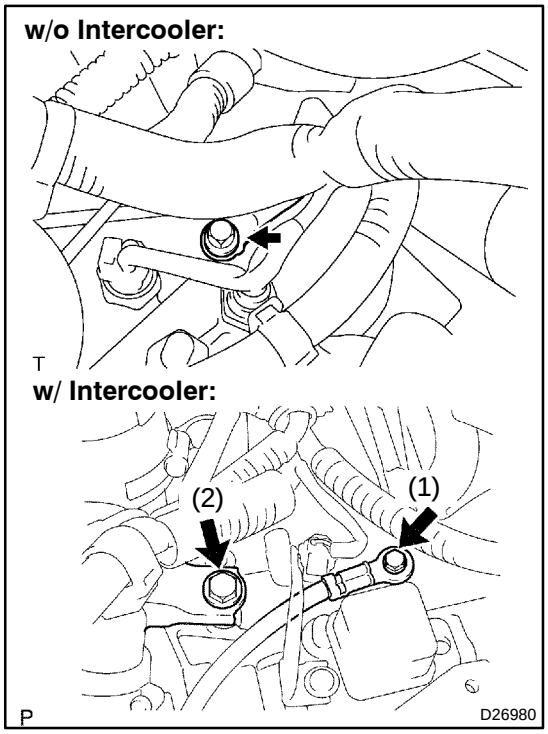
51. INSTALL CLUTCH ACCUMULATOR ASSY
(See page 42-24)

SST 09023-00100



52. CONNECT CONNECTOR

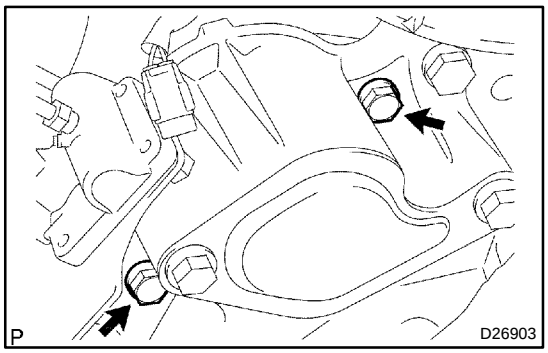
(a) Connect the back-up lamp switch connector.



53. CONNECT WIRE HARNESS

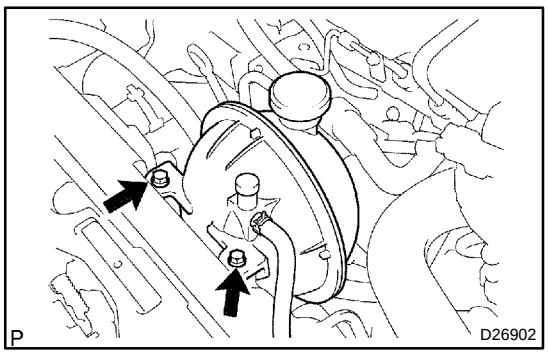
(a) w/o Intercooler:
(1) Install the ground cable with bolt.
Torque: 12.8 N·m (131 kgf·cm, 9 ft·lbf)

(b) w/ Intercooler:
(1) Install the ground cable with bolt.
Torque: 12.8 N·m (131 kgf·cm, 9 ft·lbf)
(2) Install the air tube with bolt.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)



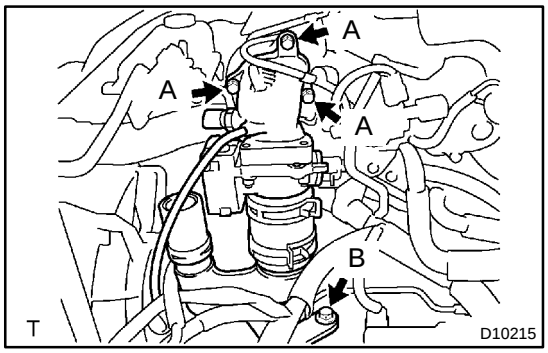
54. INSTALL STARTER ASSY

(a) Connect the starter connector.
(b) Install the starter assy to the transaxle with 2 bolts.
Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)
(c) Install the starter wire to starter assy with the nut.
Torque: 12.8 N·m (131 kgf·cm, 9 ft·lbf)



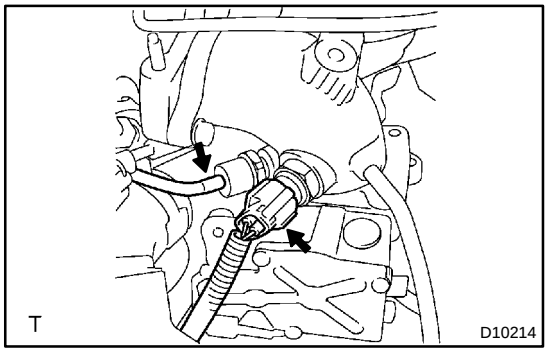
55. CONNECT RADIATOR RESERVE TANK ASSY

(a) Install the radiator reserve tank assy with 2 bolts.

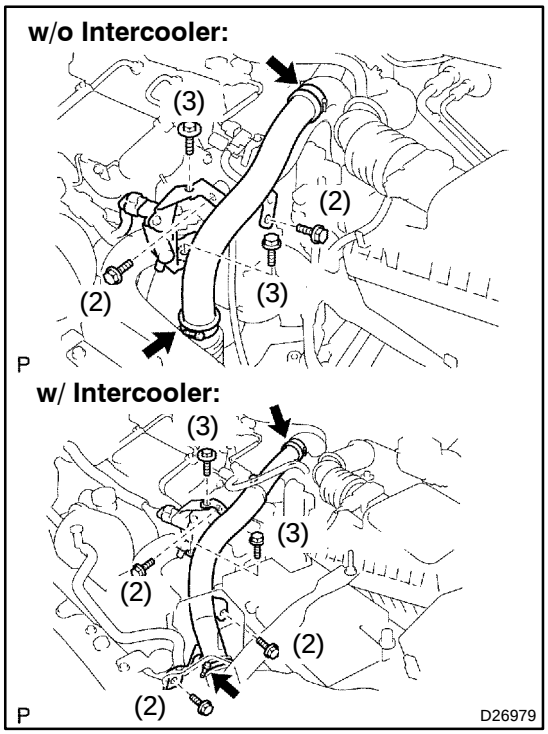


56. INSTALL INTAKE AIR CONNECTOR (W/O INTER COOLER)

(a) Install the intake air connector assy with 4 bolts.
Torque:
Bolt A: 21 N·m (214 kgf·cm, 15 ft·lbf)
Bolt B: 25 N·m (255 kgf·cm, 18 ft·lbf)



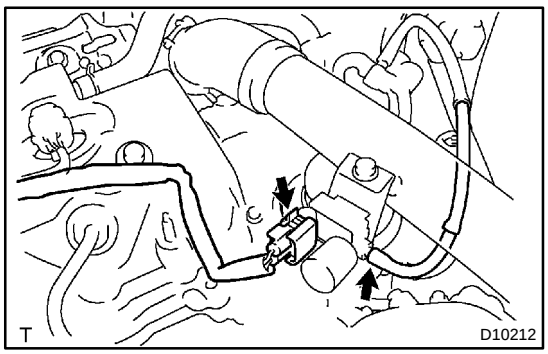
(b) Connect the intake air temperature sensor connector and vacuum hose.



57. INSTALL AIR TUBE NO.1

(a) w/o Intercooler:
(1) Connect the 2 hose clamps.
(2) Install the 2 bolts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)
(3) Install the 2 bolts, connect the VSV for turbocharging pressure control assembly.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(b) w/ Intercooler:
(1) Connect the 2 hose clamps.
(2) Install the 3 bolts.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)
(3) Install the 2 bolts, connect the VSV for turbocharging pressure control assembly.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)



(c) Connect the vacuum hose and connector.

58. INSTALL BATTERY TRAY

59. INSTALL BATTERY

60. INSTALL BATTERY CLAMP SUB-ASSY

Torque:
Bolt: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Nut: 3.5 N·m (36 kgf·cm, 31 in.·lbf)

61. INSTALL AIR CLEANER ASSY

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

62. INSTALL ENGINE COVER SUB-ASSY NO.1

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

63. INSTALL STEERING COLUMN HOLE COVER SUB-ASSY NO.1
(See page 51-12)

64. CONNECT STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)
(See page 51-14)

65. CONNECT STEERING SLIDING YOKE SUB-ASSY (LHD STEERING POSITION TYPE)
(See page 51-15)

66. INSTALL COLUMN HOLE COVER SILENCER SHEET
(See page 51-15)

67. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

68. CENTER SPIRAL CABLE(See page 60-23)

69. INSTALL STEERING WHEEL ASSY
(See page 50-15)

70. STEERING WHEEL CENTER POINT

71. INSTALL HORN BUTTON ASSY
(See page 60-13)

72. INSTALL HOOD SUB-ASSY

Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

73. INSPECT HOOD SUB-ASSY
(See page 75-1)

74. ADJUST HOOD SUB-ASSY
(See page 75-1)

75. ADD TRANSAXLE OIL (See page 41-6)

76. INSPECT TRANSAXLE OIL (See page 41-2)

77. INSTALL EXHAUST PIPE (See page 15-8)

78. INSTALL ENGINE UNDER COVER RH

79. INSTALL ENGINE UNDER COVER LH

80. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

81. INSPECT FRONT WHEEL ALIGNMENT (See page 26-2)

82. CHECK ABS SPEED SENSOR SIGNAL

(a) TMC made (See page 05-565)

(b) TMUK made

(1) w/ VSC (See page 05-673)

(2) w/o VSC (See page 05-618)

CLUTCH

CLUTCH SYSTEM (MTM) 42-1
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CLUTCH SYSTEM (MTM)

PROBLEM SYMPTOMS TABLE

4200B-03

HINT:

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Clutch grabs/chatters	5. Engine mounting (Loosen)	-
	6. Clutch disc assy (Runout is excessive)	42-29
	7. Clutch disc assy (Oily)	42-29
	8. Clutch disc assy (Worn out)	42-29
	9. Clutch disc torsion rubber (Damaged)	42-29
	10. Clutch disc assy (Glazed)	42-29
	11. Diaphragm spring (Out of tip alignment)	42-29
Clutch pedal spongy	1. Clutch Line (Air in line)	-
	2. Master cylinder cup (Damaged)	42-12
	3. Release cylinder rubber (Damaged)	42-17
Clutch noisy	1. Clutch release bearing assy (Worn, dirty, or damaged)	42-29
	2. Clutch disc torsion rubber (Damaged)	42-29
Clutch slips	1. Clutch pedal (Free play out of adjustment)	42-6
	2. Clutch disc assy (Oily)	42-29
	3. Clutch disc assy (Worn out)	42-29
	4. Diaphragm spring (Damaged)	42-29
	5. Pressure plate (Distortion)	42-29
	6. Flywheel sub-assy (Distortion)	-
Clutch does not disengage	1. Clutch pedal (Free play out of adjustment)	42-6
	2. Clutch line (Air in line)	-
	3. Master cylinder cup (Damaged)	42-12
	4. Release cylinder cup (Damaged)	42-17
	5. Clutch disc assy (Out of true)	42-29
	6. Clutch disc assy (Runout of excessive)	42-29
	7. Clutch disc assy (Lining broken)	42-29
	8. Clutch disc assy (Dirty or burned)	42-29
	9. Clutch disc assy (Oily)	42-29
	10. Clutch disc assy (Lack of spline grease)	42-29

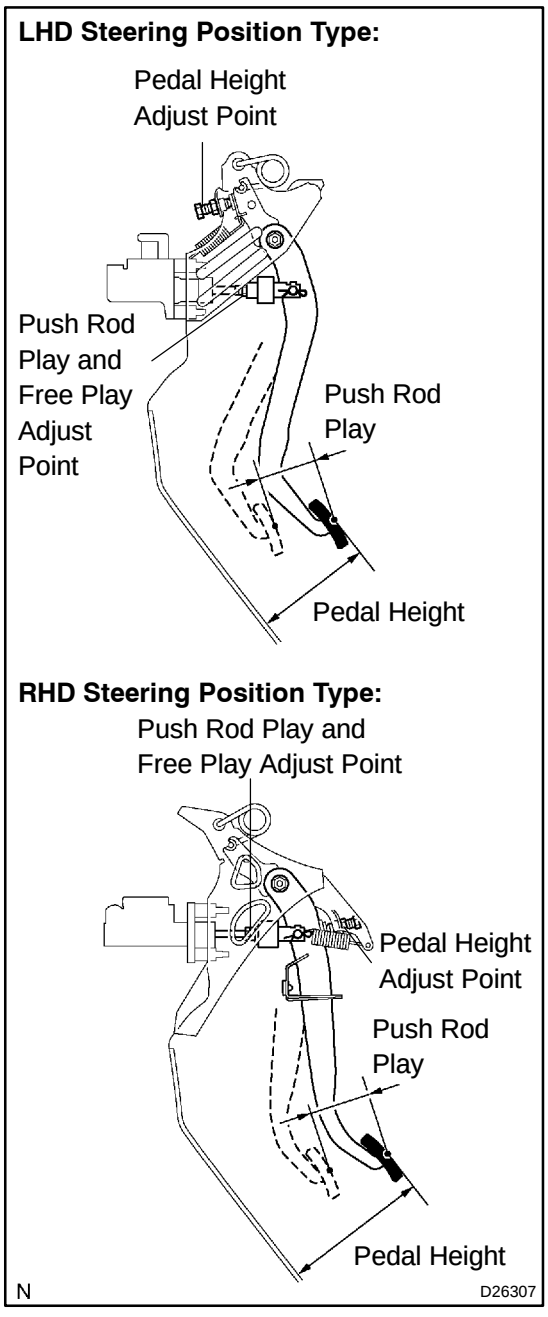
CLUTCH PEDAL SUB-ASSY (MTM)

ADJUSTMENT

4200D-02

1. INSPECT AND ADJUST CLUTCH PEDAL SUB-ASSY

(a) Turn over the floor carpet.



(b) Check that the pedal height is correct.

Pedal height from asphalt sheet:
LHD Steering Position Type:
1CD-FTV Engine Type w/ Intercooler:
139.5 - 149.5 mm (5.492 - 5.886 in.)
Others:
135.5 - 145.5 mm (5.334 - 5.728 in.)
RHD Steering Position Type:
1CD-FTV Engine Type w/ Intercooler:
146.0 - 156.0 mm (5.748 - 6.142 in.)
Others:
142.0 - 152.0 mm (5.590 - 5.984 in.)

(c) Adjust the pedal height.

(1) Loosen the lock nut and turn the stopper bolt until the height is correct. Tighten the lock nut.

Torque: 11.8 N·m (120 kgf·cm, 9 ft·lbf)

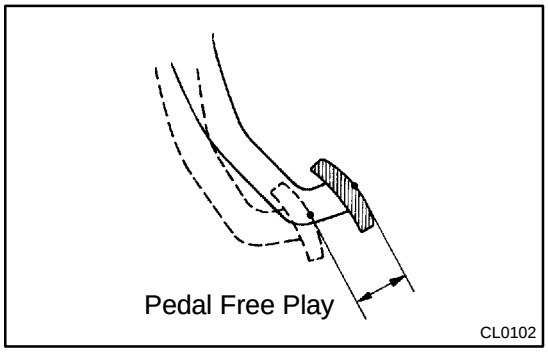
(d) Check that the pedal free play and push rod play are correct.

(1) Depress the pedal until the clutch resistance begin to be felt.

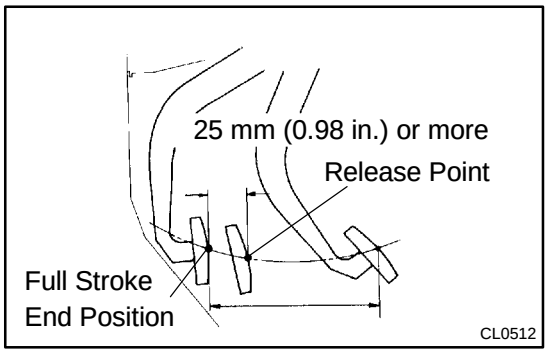
Pedal free play: 5.0 - 15.0 mm (0.197 - 0591 in.)

(2) Gently depress the pedal until the resistance begins to increase a little.

Push rod play at pedal top:
1.0 - 5.0 mm (0.039 - 0.197 in.)



(e) Adjust the pedal free play and push rod play.
(1) Loosen the lock nut and turn the push rod until the free play and push rod play are correct.
(2) Tighten the lock nut.
(3) After adjusting the pedal free play, check the pedal height.
(4) Connect the air duct and install the lower finish panel.



(f) Check the clutch release point.
(1) Pull the parking brake lever and install wheel stopper.
(2) Start the engine and idle the engine.
(3) Without depressing the clutch pedal, slowly shift the shift lever into reverse position until the gears contact.
(4) Gradually depress the clutch pedal and measure the stroke distance from the point that the gear noise stops (release point) up to the full stroke end position.

Standard distance: 25 mm (0.98 in.) or more
(From pedal stroke end position to release point)

If the distance is not as specified, perform the following operations.

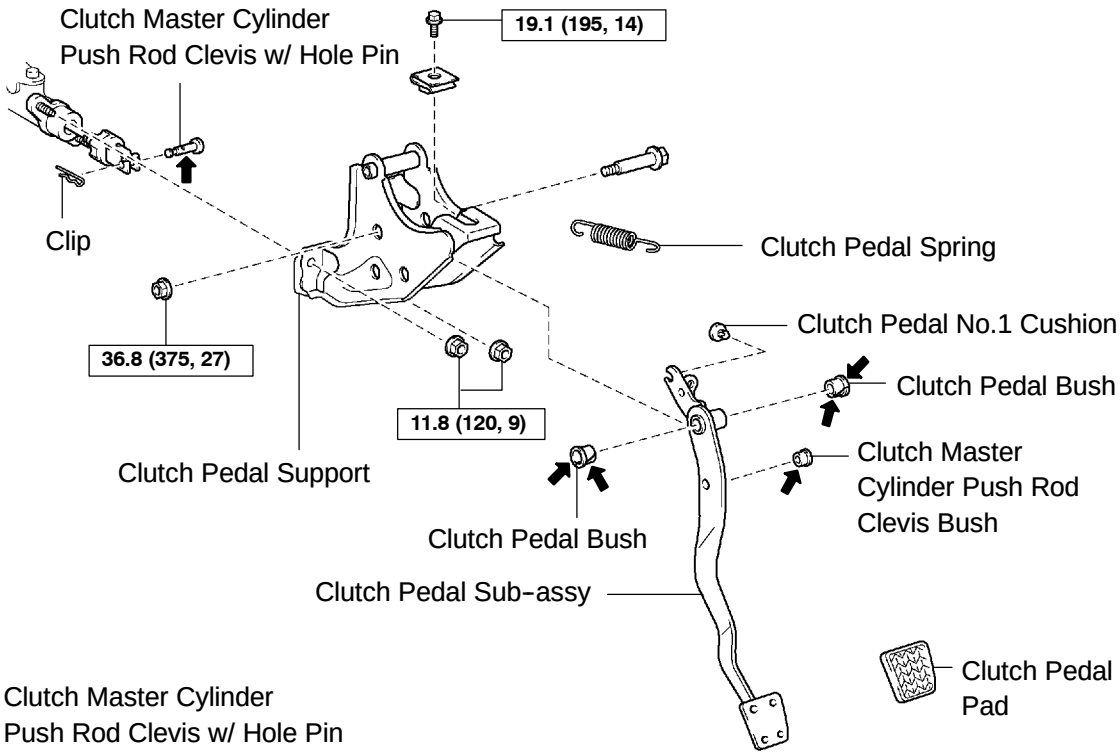
- Check pedal height.
- Check push rod play and pedal free play.
- Bleed the clutch line.
- Check the clutch cover assy and disc assy.

4202T-01

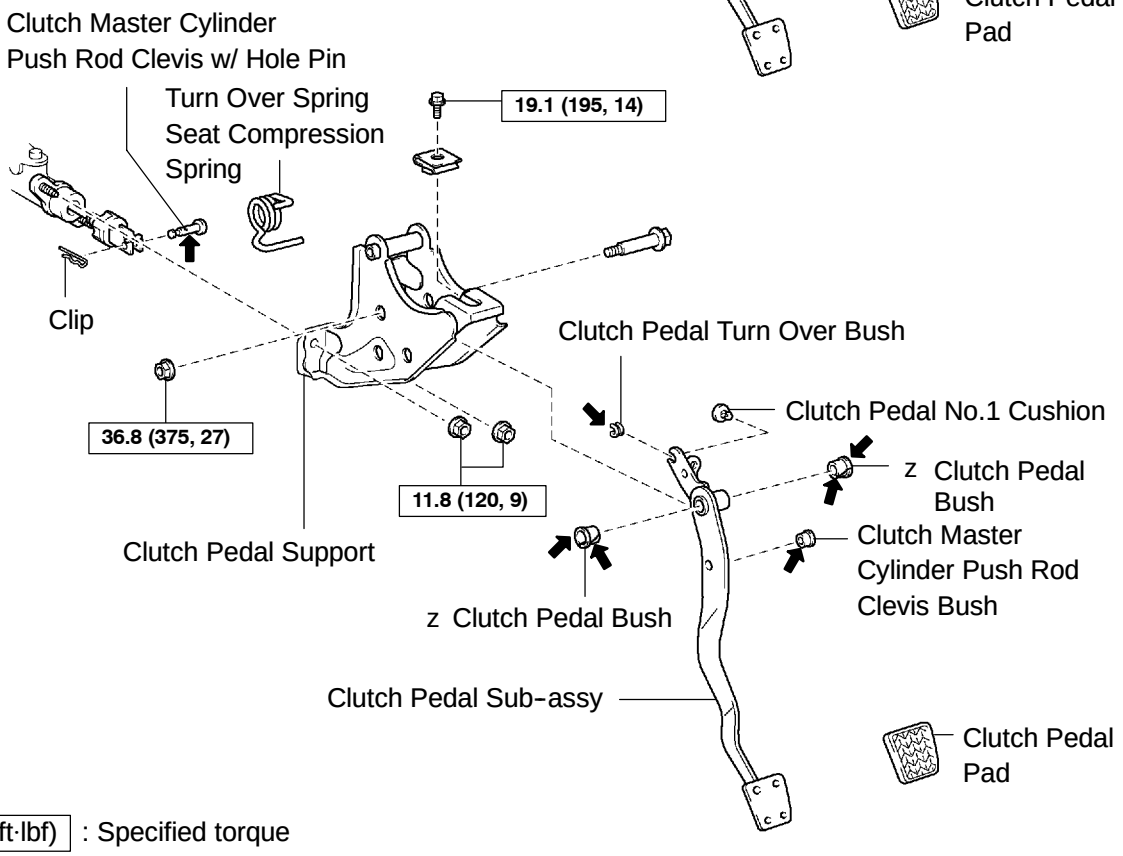
COMPONENTS

LHD Steering Position Type:

w/o Turn Over:



w/ Turn Over:



N·m (kgf·cm, ft·lbf) : Specified torque

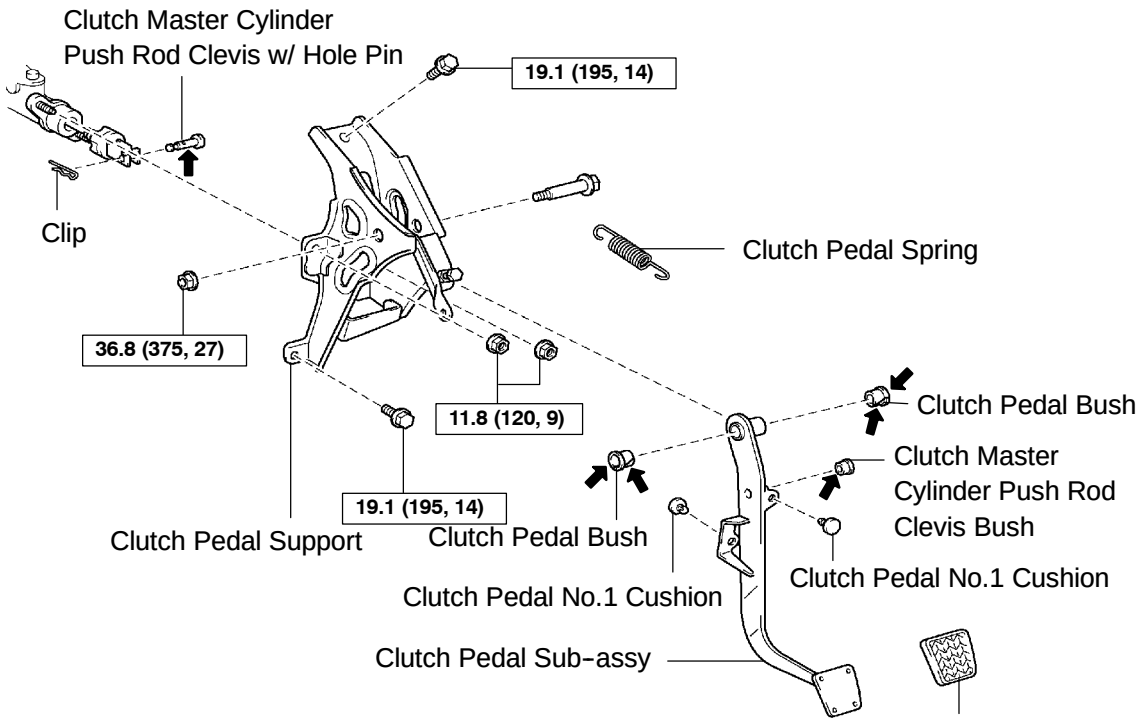
z Non-reusable part

MP Grease

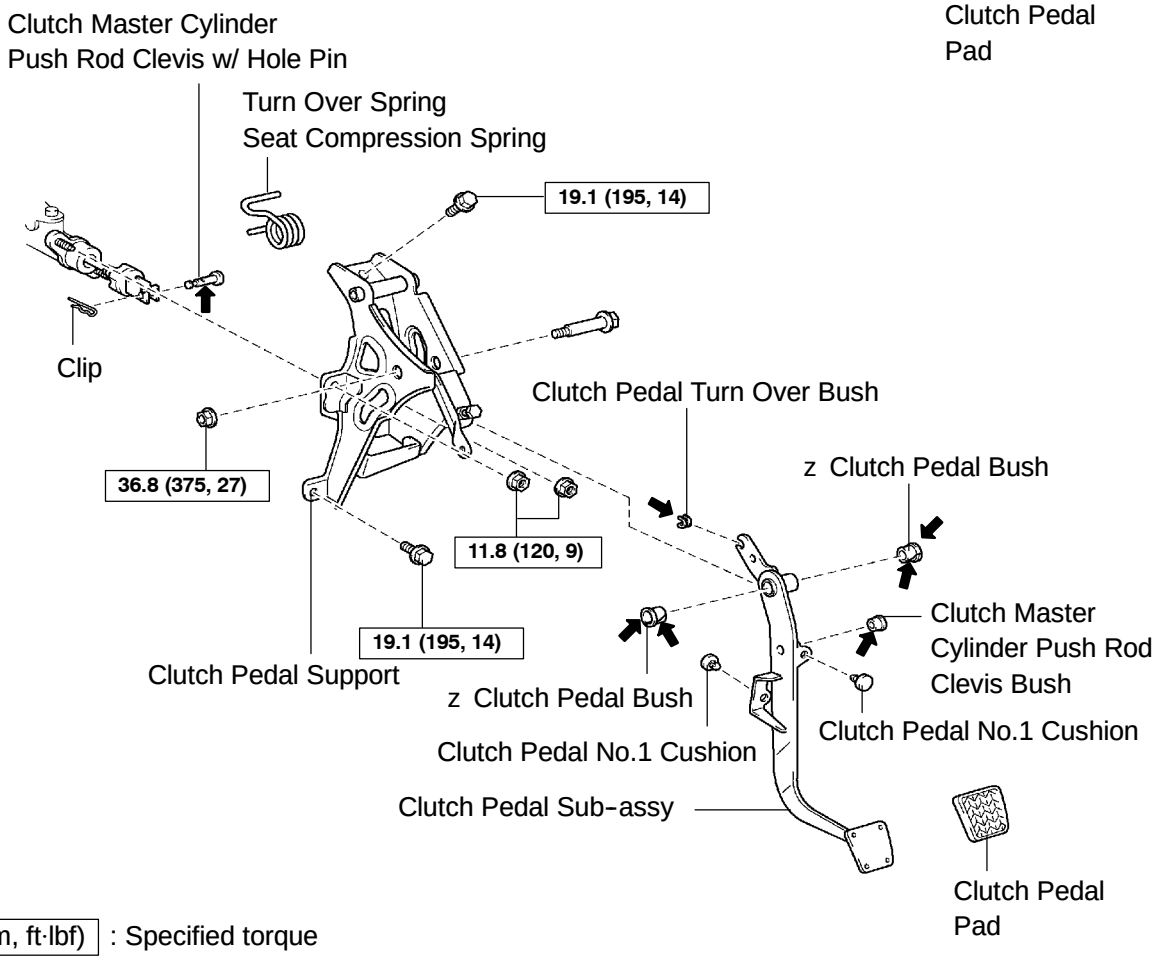
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RHD Power Steering Type:
w/o Turn Over:



w/ Turn Over:



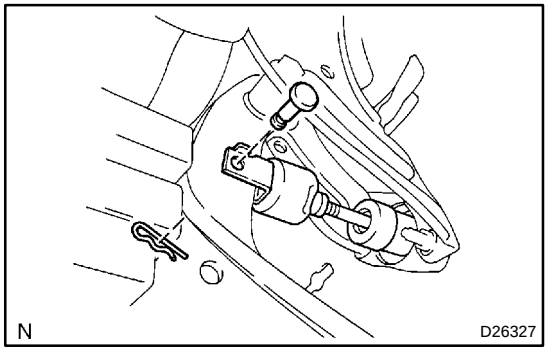
N N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
⬅ MP Grease

D26311

4202U-01

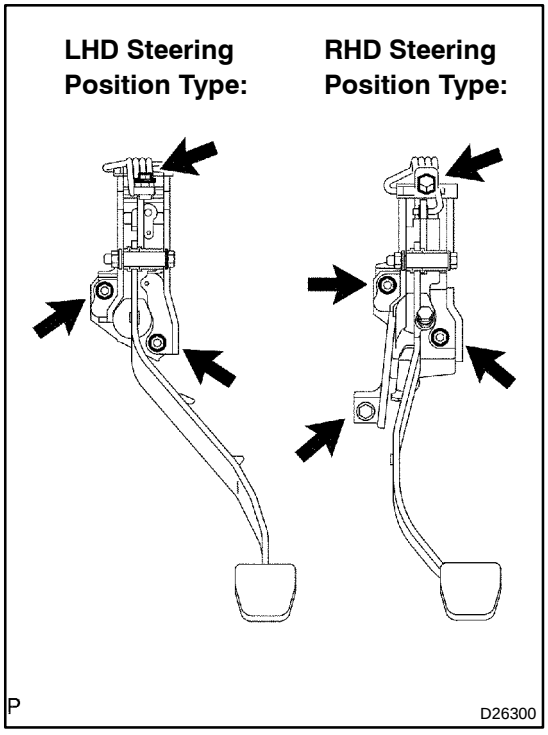
REPLACEMENT

1. REMOVE INSTRUMENT PANEL SUB-ASSY LOWER (LHD STEERING POSITION TYPE) (See page 71-21 or 71-30)
2. REMOVE COMBINATION METER ASSY(RHD STEERING POSITION TYPE) (See page 71-32)
3. REMOVE CLUTCH PEDAL SPRING(W/O TURN OVER)



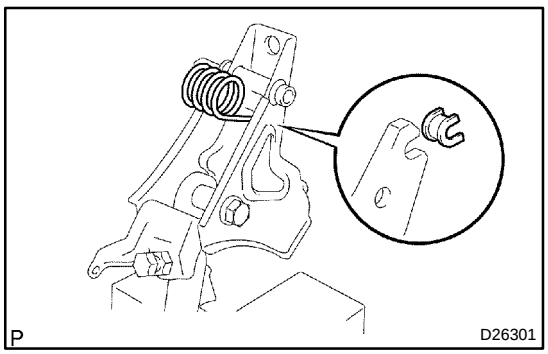
4. REMOVE CLUTCH MASTER CYLINDER PUSH ROD CLEVIS W/HOLE PIN

(a) Remove the clip and hole pin.



5. REMOVE CLUTCH PEDAL SUPPORT SUB-ASSY

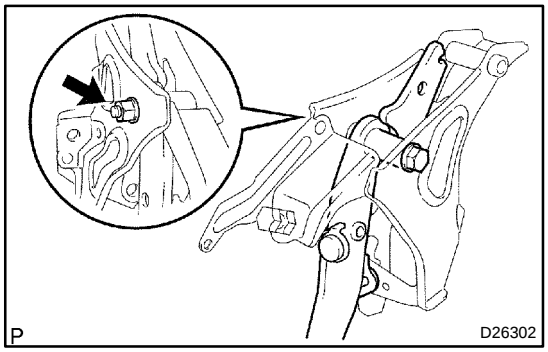
(a) LHD steering position type:
Remove the 2 nuts, bolt and clutch pedal support assy.
(b) RHD steering position type:
Remove the 2 bolts, 2 nuts and clutch pedal support assy.



6. REMOVE TURN OVER SPRING SEAT COMPRESSION SPRING(W/ TURN OVER)

(a) Mount the clutch pedal in a soft jaw vise.
(b) Using a screwdriver, remove the spring.

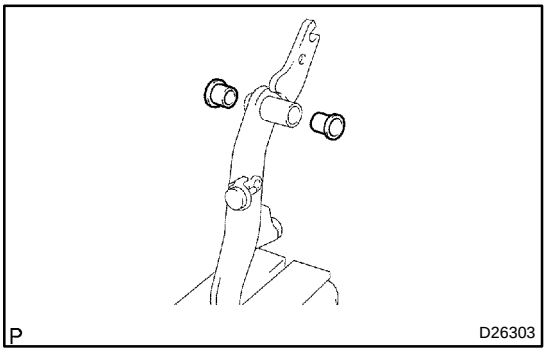
7. REMOVE CLUTCH PEDAL TURNOVER BUSH(W/ TURN OVER)



8. REMOVE CLUTCH PEDAL SUB-ASSY

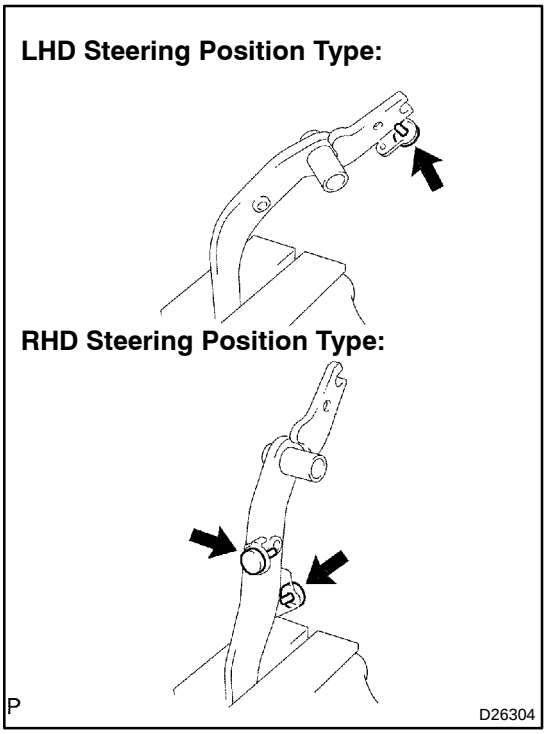
(a) Remove the bolt and nut.
(b) Remove the clutch pedal from the clutch pedal support.

9. REMOVE CLUTCH PEDAL PAD



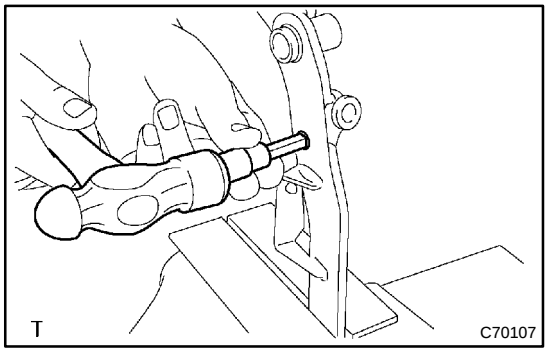
10. REMOVE CLUTCH PEDAL BUSH

(a) Remove the 2 bushes from the clutch pedal.



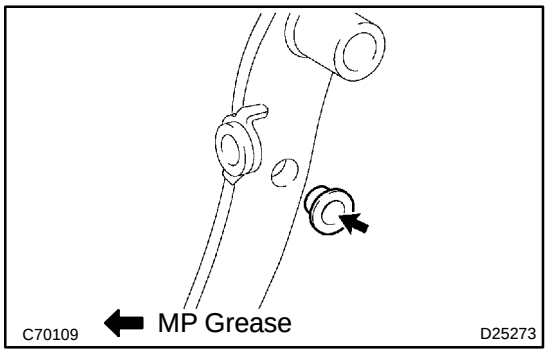
11. REMOVE CLUTCH PEDAL NO.1 CUSHION

(a) LHD steering position type:
Using needle-nose pliers, remove the No.1 cushion from the clutch pedal.
(b) RHD steering position type:
Using needle-nose pliers, remove the 2 No.1 cushions from the clutch pedal.



12. REMOVE CLUTCH MASTER CYLINDER PUSH ROD CLEVIS BUSH

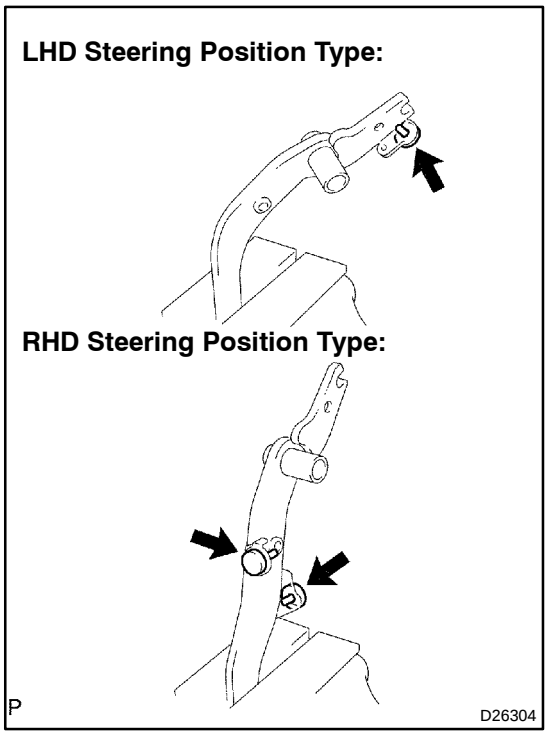
(a) Using a 8 mm hexagon wrench and a hammer, remove the clevis bush from the clutch pedal.



13. INSTALL CLUTCH MASTER CYLINDER PUSH ROD CLEVIS BUSH

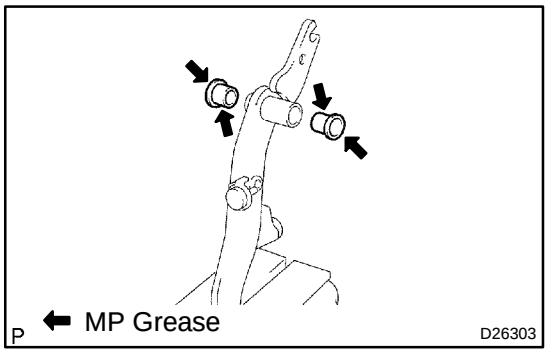
(a) Apply MP grease to inside of a new clevis bush.
(b) Install the clevis bush to the clutch pedal.

HINT:
Install the clevis bush from the right side of the vehicle.



14. INSTALL CLUTCH PEDAL NO.1 CUSHION

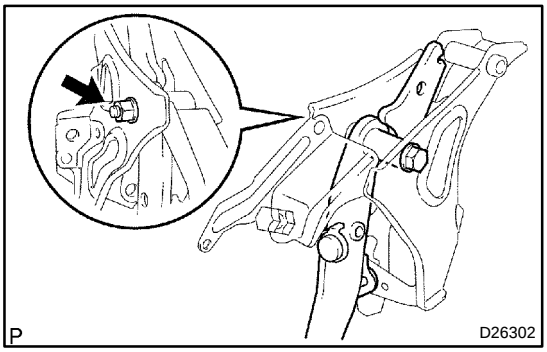
(a) LHD steering position type:
Using needle-nose pliers, install the No.1 cushion to the clutch pedal.
(b) RHD steering position type:
Using needle-nose pliers, install the 2 No.1 cushions to the clutch pedal.



15. INSTALL CLUTCH PEDAL BUSH

(a) Apply MP grease to both side of 2 new bushes.
(b) Install the bush to the clutch pedal.

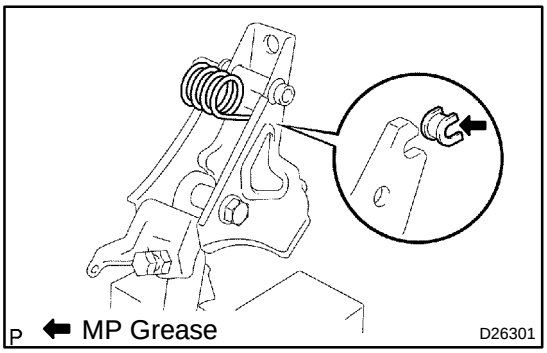
16. INSTALL CLUTCH PEDAL PAD



17. INSTALL CLUTCH PEDAL SUB-ASSY

(a) Install the clutch pedal to the clutch pedal support with the bolt and nut.
Torque: 36.8 N·m (375 kgf·cm, 27 ft·lbf)

HINT:
Install the bolt from the right side of the vehicle.

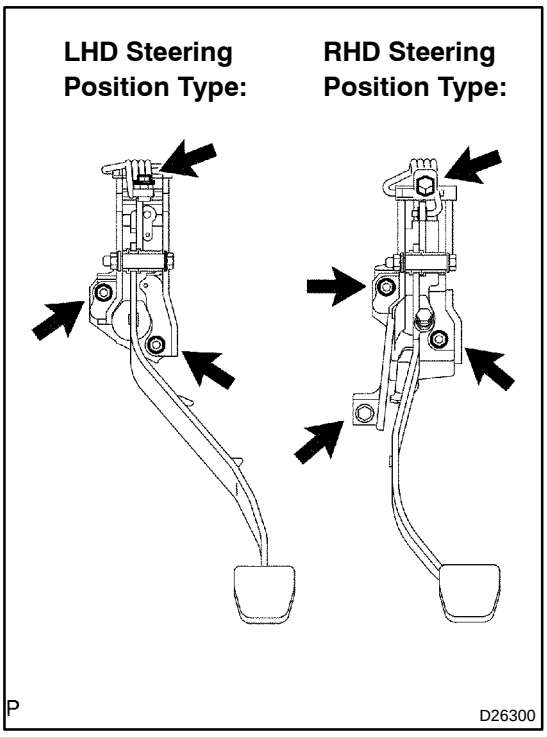


18. INSTALL CLUTCH PEDAL TURNOVER BUSH(W/ TURN OVER)

(a) Apply MP grease to inside of the turn over bush.
(b) Install the turn over bush to the clutch pedal.

19. INSTALL TURN OVER SPRING SEAT COMPRESSION SPRING(W/ TURN OVER)

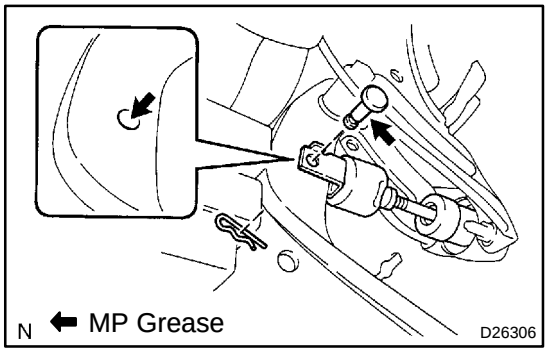
(a) Apply MP grease to the contact surface of the bush and spring.
(b) Install the spring to the clutch pedal and clutch pedal support.



20. INSTALL CLUTCH PEDAL SUPPORT SUB-ASSY

(a) LHD steering position type:
Install the clutch pedal support to the vehicle with the 2 nuts and bolt.
Torque:
Bolt: 19.1 N·m (195 kgf·cm, 14 ft·lbf)
Nut: 11.8 N·m (120 kgf·cm, 9 ft·lbf)

(b) RHD steering position type:
Install the clutch pedal support to the vehicle with the 2 bolts and 2 nuts.
Torque:
Bolt: 19.1 N·m (195 kgf·cm, 14 ft·lbf)
Nut: 11.8 N·m (120 kgf·cm, 9 ft·lbf)



21. INSTALL CLUTCH MASTER CYLINDER PUSH ROD CLEVIS W/HOLE PIN

(a) Apply MP grease to the contact surface of the hole pin and clevis bush.
(b) Connect the clevis to the clutch pedal with the hole pin.
HINT:
Install the hole pin from the right side of the vehicle.
(c) Install the clip to the hole pin.

22. INSTALL CLUTCH PEDAL SPRING(W/O TURN OVER)

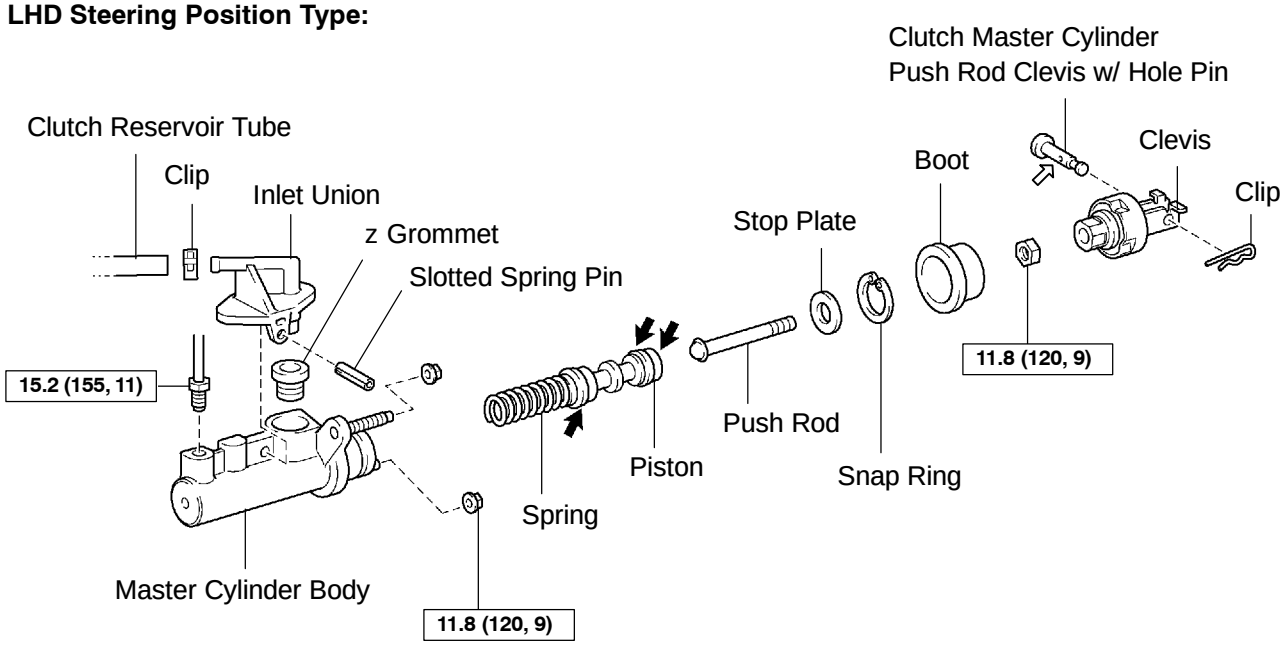
23. INSTALL COMBINATION METER ASSY(RHD STEERING POSITION TYPE)
(See page 71-32)
24. INSTALL INSTRUMENT PANEL SUB-ASSY LOWER(LHD STEERING POSITION TYPE)
(See page 71-14 or 71-23)
25. INSPECT SRS WARNING LIGHT(LHD STEERING POSITION TYPE) (See page 05-942)
26. INSPECT AND ADJUST CLUTCH PEDAL SUB-ASSY
(See page 42-2)

CLUTCH MASTER CYLINDER ASSY (MTM)

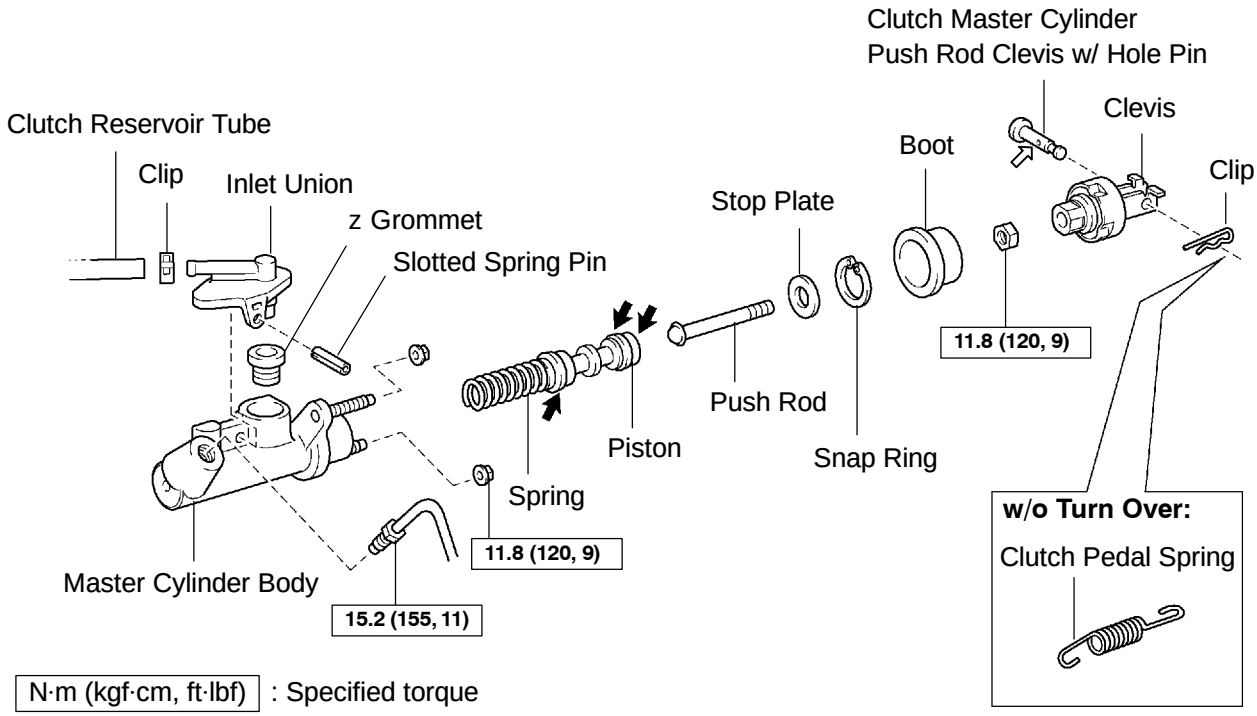
COMPONENTS

4202V-01

LHD Steering Position Type:



RHD Steering Position Type:



N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
⬅ Lithium soap base glycol grease
⇦ MP grease

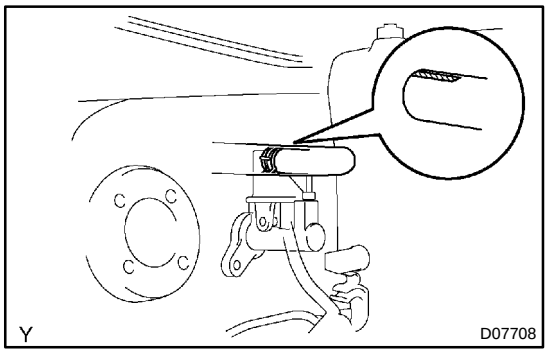
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OVERHAUL

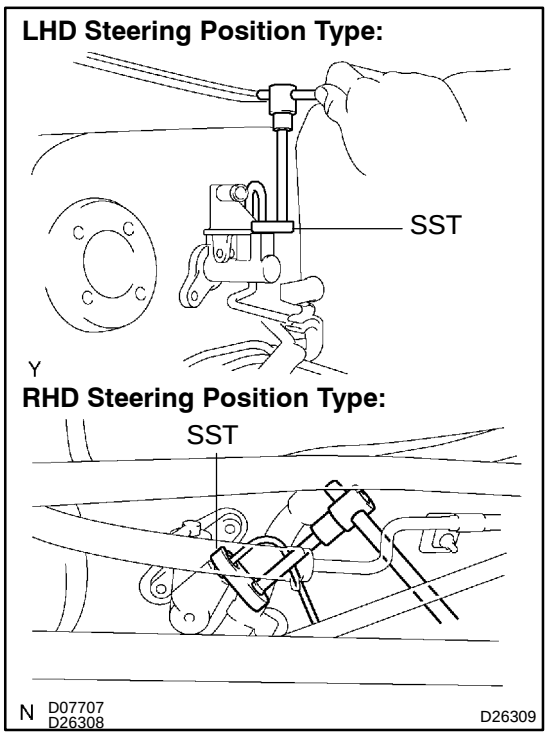
1. DRAIN CLUTCH FLUID
2. REMOVE BRAKE MASTER CYLINDER SUB-ASSY (LHD STEERING POSITION TYPE)
(See page 32-15)
3. REMOVE BRAKE BOOSTER ASSY (LHD STEERING POSITION TYPE)
(See page 32-26)



4. DISCONNECT CLUTCH RESERVOIR TUBE

(a) Loosen the clip and disconnect the clutch reservoir tube from the clutch master cylinder assy.

HINT:
Use a container to catch the fluid.

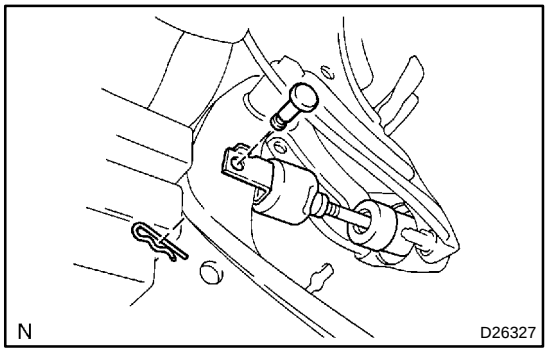


5. DISCONNECT CLUTCH MASTER CYLINDER TO FLEXIBLE HOSE TUBE

(a) Using SST, disconnect the flexible hose tube.
SST 09023-00100

HINT:
Use a container to catch the fluid.

6. REMOVE CLUTCH PEDAL SPRING (RHD STEERING POSITION TYPE)

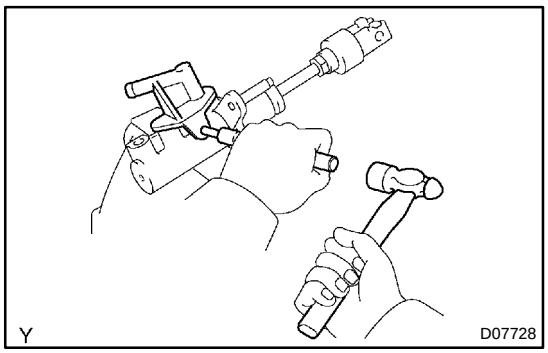


7. REMOVE CLUTCH MASTER CYLINDER PUSH ROD CLEVIS W/HOLE PIN

(a) Remove the clip and hole pin.

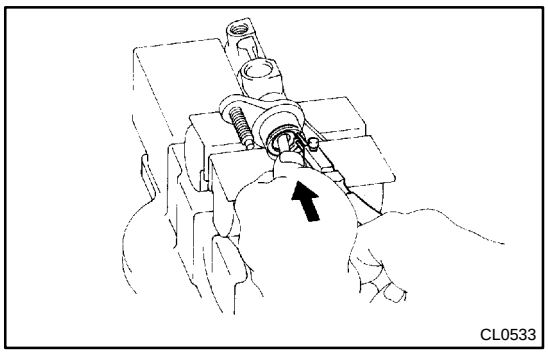
8. REMOVE CLUTCH MASTER CYLINDER ASSY

(a) Remove the 2 nuts and clutch master cylinder assy.



9. REMOVE CLUTCH MASTER CYLINDER KIT

(a) Using a pin punch and a hammer, drive out the slotted spring pin.
(b) Remove the inlet union and grommet.
(c) Loosen the lock nut, and remove the push rod clevis.
(d) Remove the lock nut from the push rod.
(e) Remove the boot from the cylinder body.



(f) While pushing the push rod, using snap ring pliers, remove the snap ring.
(g) Remove the push rod from the cylinder body.

NOTICE:

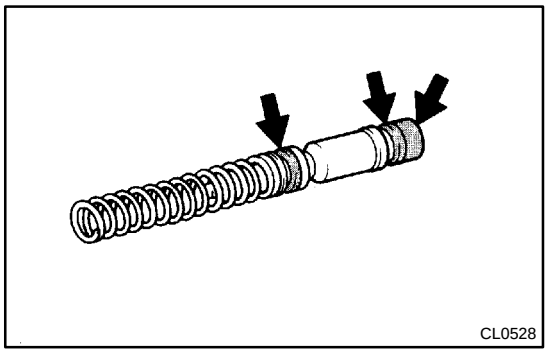
The piston may pop up out of the cylinder body. Therefore, slowly remove the push rod from the cylinder body.

(h) Remove the stop plate from the push rod.
(i) Remove the piston with spring from the cylinder.

NOTICE:

Be careful not to damage the inside of the cylinder body.

10. INSTALL CLUTCH MASTER CYLINDER KIT

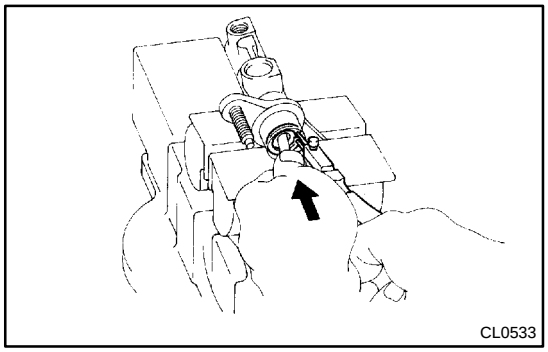


(a) Coat parts with lithium soap base glycol grease, as shown in the illustration.
(b) Install the piston with spring into the cylinder.

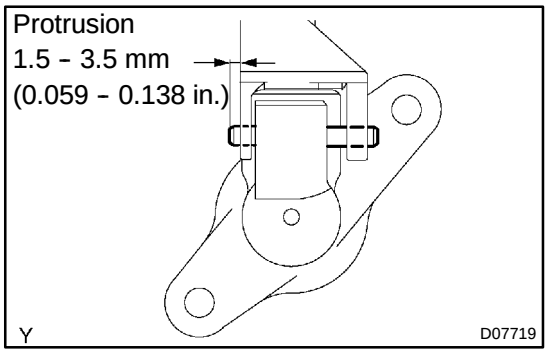
NOTICE:

Be careful not to damage the inside of the cylinder body.

(c) Install the stop plate to the push rod.
(d) Install the push rod to the cylinder body.



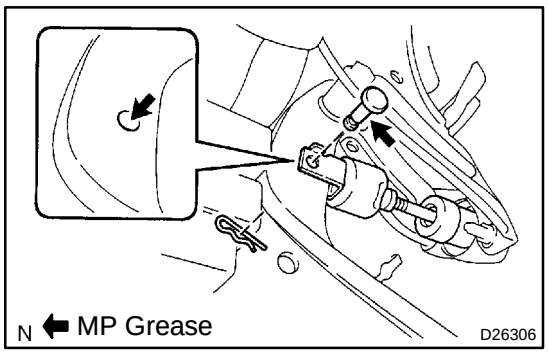
(e) While pushing the push rod, using snap ring pliers, install the snap ring.
(f) Install the boot to the cylinder body.
(g) Install the lock nut to the push rod.
(h) Temporarily install the push rod clevis with the lock nut to the push rod.
(i) Install the inlet union and a new grommet.



(j) Using a pin punch and a hammer, drive in the slotted spring pin.

11. INSTALL CLUTCH MASTER CYLINDER ASSY

(a) Install the clutch master cylinder assy with the 2 nuts.
Torque: 11.8 N·m (120 kgf·cm, 9 ft·lbf)



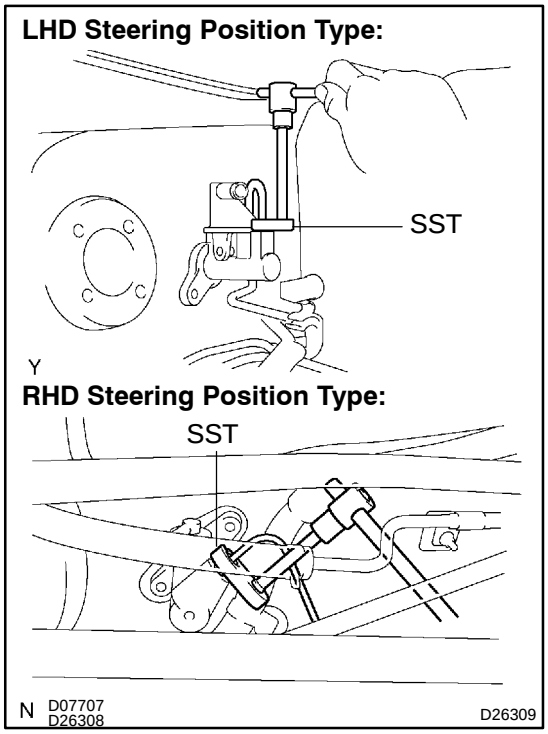
12. INSTALL CLUTCH MASTER CYLINDER PUSH ROD CLEVIS W/HOLE PIN

(a) Apply MP grease to the contact surface of the hole pin and clevis bush.
(b) Connect the clevis to the clutch pedal assy with the hole pin.

HINT:
Install the hole pin from the right side of the vehicle.

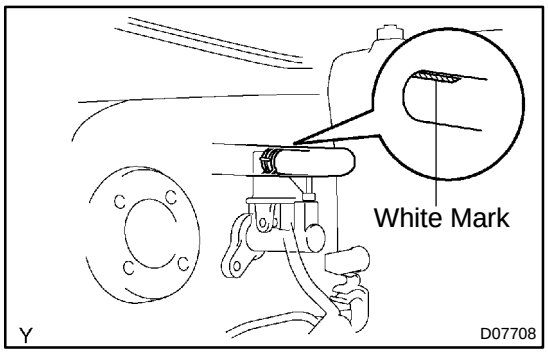
(c) Install the clip to the hole pin.

13. INSTALL CLUTCH PEDAL SPRING (RHD STEERING POSITION TYPE)



14. CONNECT CLUTCH MASTER CYLINDER TO FLEXIBLE HOSE TUBE

(a) Using SST, connect the flexible hose tube.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)



15. CONNECT CLUTCH RESERVOIR TUBE

(a) Connect the clutch reservoir tube with the clip to the clutch master cylinder assy.

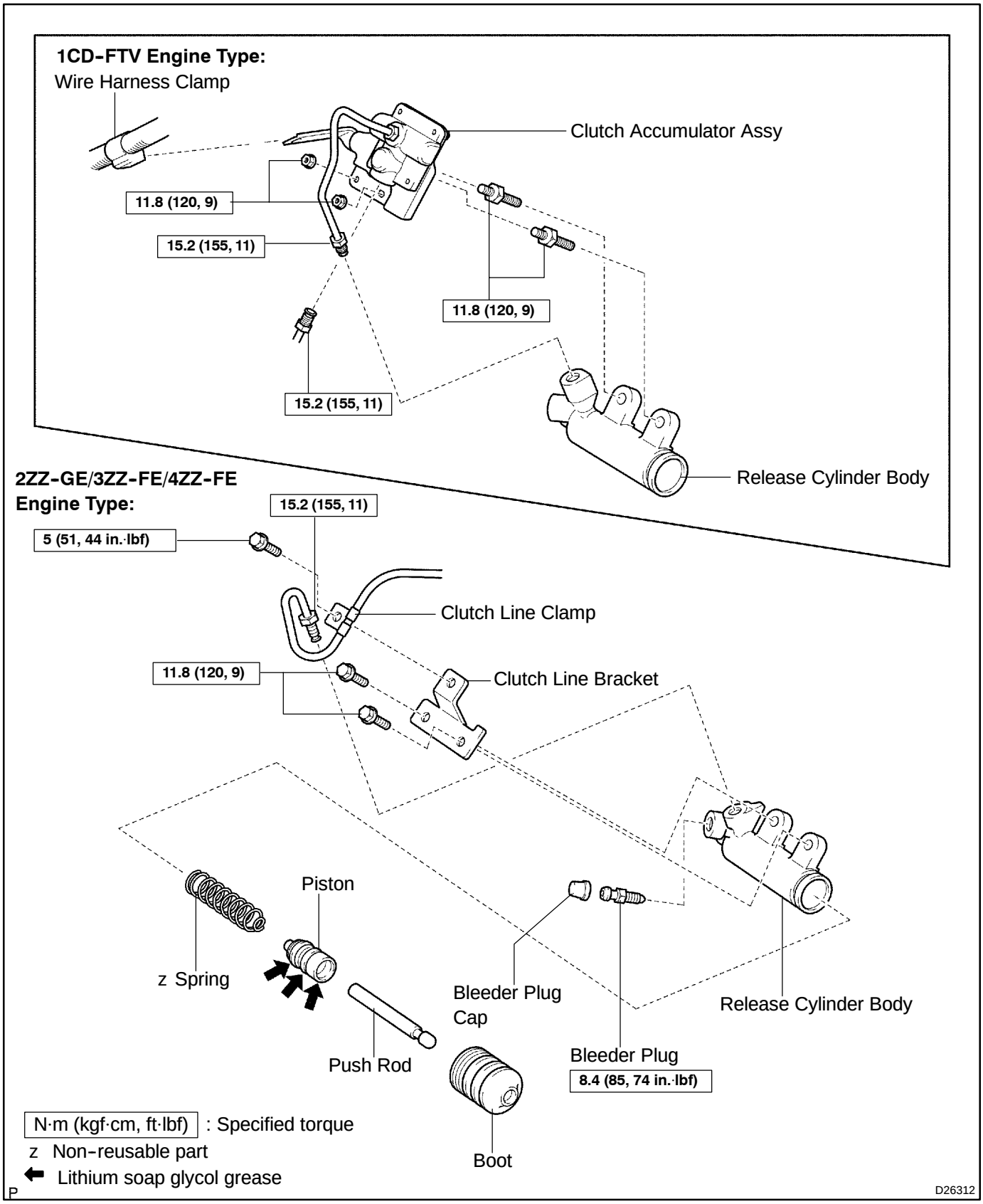
NOTICE:
Connect the clutch reservoir tube so that it will not be twisted.

16. INSTALL BRAKE BOOSTER ASSY (LHD STEERING POSITION TYPE)
(See page 32-27)
17. INSTALL BRAKE MASTER CYLINDER SUB-ASSY (LHD STEERING POSITION TYPE)
(See page 32-28)
18. BLEED BRAKE LINE (LHD STEERING POSITION TYPE) (See page 32-6)
19. BLEED CLUTCH PIPE LINE
(a) Fill the brake reservoir tank with clutch fluid and bleed clutch system.
Torque: 8.4 N·m (85 kgf·cm, 73 in.·lbf)
20. CHECK AND ADJUST BRAKE PEDAL HEIGHT (LHD STEERING POSITION TYPE)
(See page 32-7)
21. INSPECT AND ADJUST CLUTCH PEDAL SUB-ASSY
(See page 42-2)
22. CHECK BRAKE FLUID LEAKAGE (LHD STEERING POSITION TYPE)
23. CHECK CLUTCH FLUID LEAKAGE
24. CHECK FLUID LEVEL IN RESERVOIR

CLUTCH RELEASE CYLINDER ASSY (MTM)

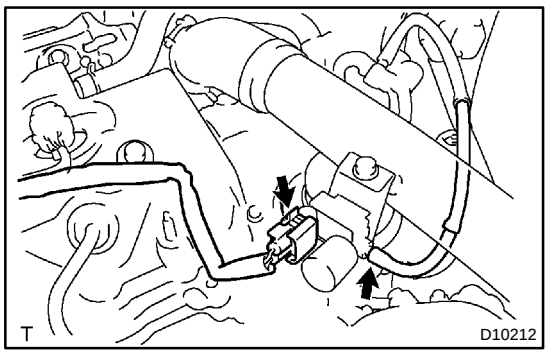
COMPONENTS

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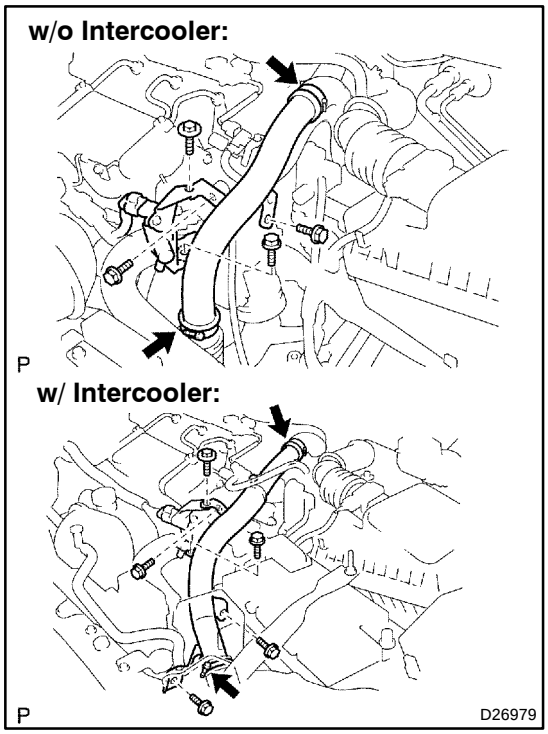
OVERHAUL

1. REMOVE BATTERY (1CD-FTV ENGINE TYPE)



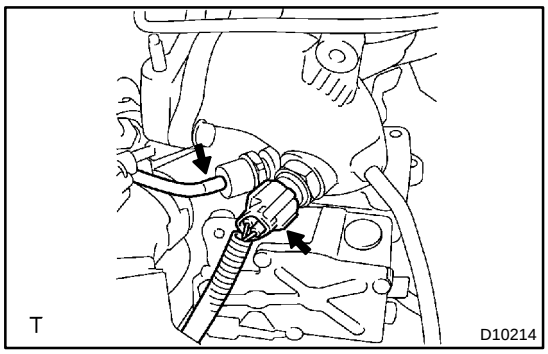
2. REMOVE AIR TUBE NO.1 (1CD-FTV ENGINE TYPE)

(a) Disconnect the vacuum hose and connector.



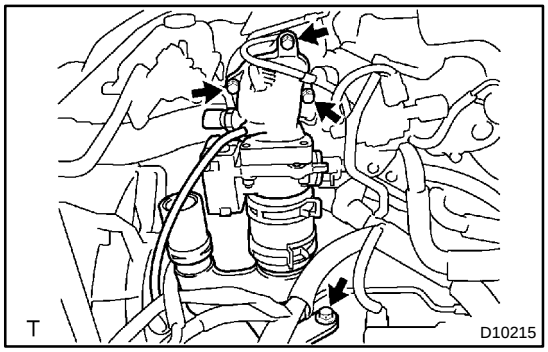
(b) w/o Intercooler:
(1) Remove the 2 bolts, disconnect the VSV for turbo-charging pressure control assembly.
(2) Remove the 2 bolts.
(3) Disconnect the 2 hose clamps, and remove the No.1 air tube.

(c) w/ Intercooler:
(1) Remove the 2 bolts, disconnect the VSV for turbo-charging pressure control assembly.
(2) Remove the 3 bolts.
(3) Disconnect the 2 hose clamps, remove the No.1 air tube.

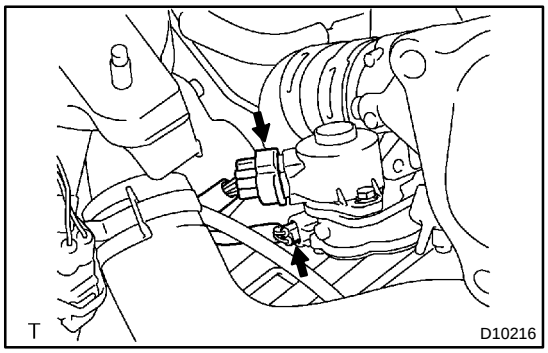


3. REMOVE INTAKE AIR CONNECTOR (W/O INTER COOLER 1CD-FTV ENGINE TYPE)

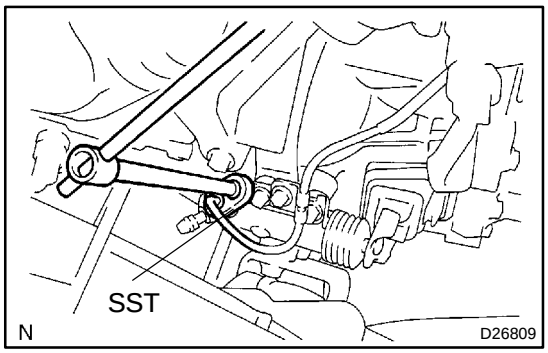
(a) Disconnect the intake air temperature sensor connector and vacuum hose.



(b) Remove the 4 bolts from the air connector with No.2 air tube assembly.



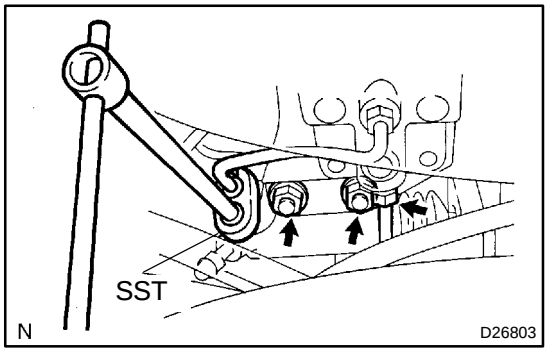
(c) Disconnect the throttle control motor connector.
(d) Disconnect the throttle full switch connector.
(e) Disconnect the 2 hose clips, remove the air connector with the No.2 air tube assembly.



4. DISCONNECT CLUTCH RELEASE CYLINDER TO FLEXIBLE HOSE TUBE (2ZZ-GE/3ZZ-FE/4ZZ-FE ENGINE TYPE)

(a) Using SST, disconnect the flexible hose tube.
SST 09023-00100

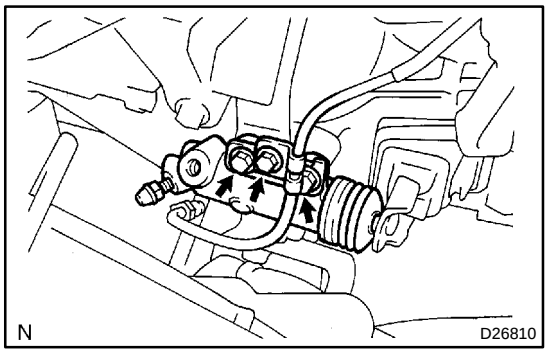
HINT:
Use a container to catch the fluid.



5. REMOVE CLUTCH ACCUMULATOR ASSY (1CD-FTV ENGINE TYPE)

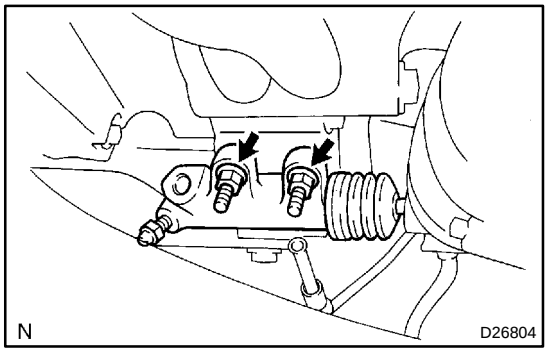
(a) Disconnect the wire harness clamp.
(b) Using SST, disconnect the 2 flexible hose tubes.
SST 09023-00100

HINT:
Use a container to catch the fluid.
(c) Remove the 2 nuts and clutch accumulator assy.



6. REMOVE CLUTCH RELEASE CYLINDER ASSY (2ZZ-GE/3ZZ-FE/4ZZ-FE ENGINE TYPE)

(a) Remove the 3 bolts and clutch release cylinder assy, clutch line bracket.



7. REMOVE CLUTCH RELEASE CYLINDER ASSY (1CD-FTV ENGINE TYPE)

(a) Using 12 mm deep socket wrench, remove the 2 bolts and clutch release cylinder assy.

8. REMOVE CLUTCH RELEASE CYLINDER KIT

(a) Remove the boot from the cylinder body.
(b) Remove the push rod from the cylinder body.
(c) Remove the piston from the cylinder body.

NOTICE:
Be careful not to damage the inside of the cylinder body.

(d) Remove the spring from the cylinder body.
(e) Remove the bleeder plug cap from the bleeder plug.

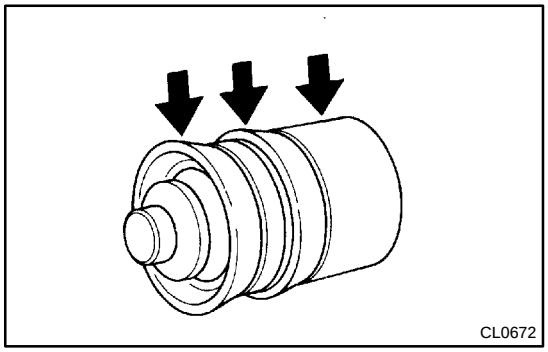
9. REMOVE RELEASE CYLINDER BLEEDER PLUG

10. INSTALL RELEASE CYLINDER BLEEDER PLUG

Torque: 8.4 N·m (85 kgf·cm, 74 in.·lbf)

11. INSTALL CLUTCH RELEASE CYLINDER KIT

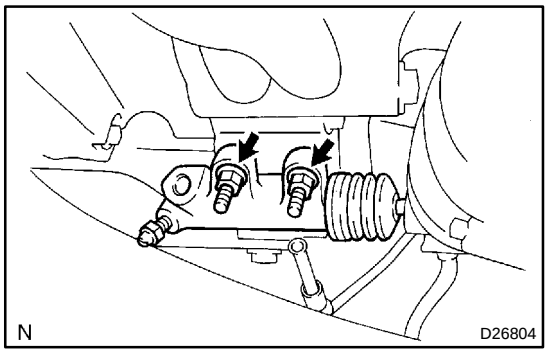
(a) Install the bleeder plug cap to the bleeder plug.
(b) Install a new spring to the cylinder body.



(c) Coat parts with lithium soap base glycol grease, as shown in the illustration.
(d) Install the piston to the cylinder body.

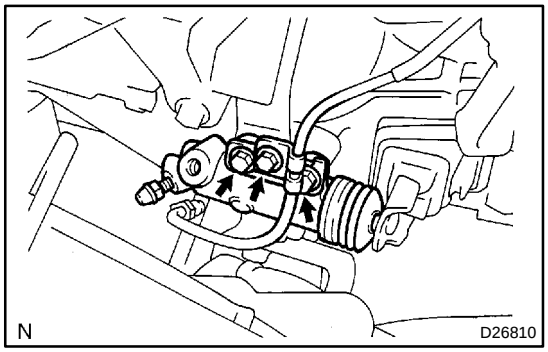
NOTICE:
Be careful not to damage the inside of the cylinder body.

(e) Install the push rod t the cylinder body.
(f) Install the boot to the cylinder body.



12. INSTALL CLUTCH RELEASE CYLINDER ASSY (1CD-FTV ENGINE TYPE)

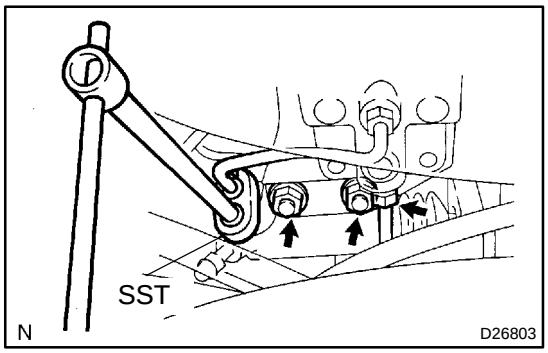
(a) Using 12 mm deep socket wrench, install the clutch release cylinder assy with the 2 bolts.
Torque: 11.8 N·m (120 kgf·cm, 9 ft·lbf)



13. INSTALL CLUTCH RELEASE CYLINDER ASSY (2ZZ-GE/3ZZ-FE/4ZZ-FE ENGINE TYPE)

(a) Install the clutch release cylinder and clutch line bracket with the 2 bolts.
Torque: 11.8 N·m (120 kgf·cm, 9 ft·lbf)

(b) Install the flexible hose tube with the bolt.
Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

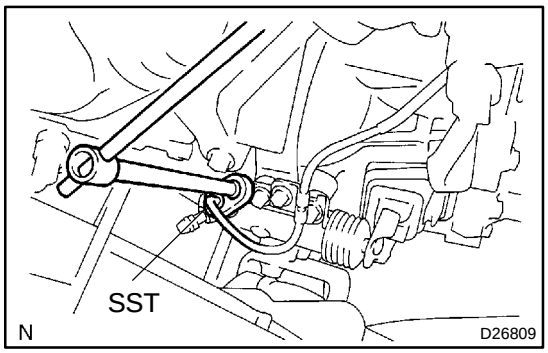


14. INSTALL CLUTCH ACCUMULATOR ASSY (1CD-FTV ENGINE TYPE)

(a) Install the clutch accumulator assy with the 2 nuts.
Torque: 11.8 N·m (120 kgf·cm, 9 ft·lbf)

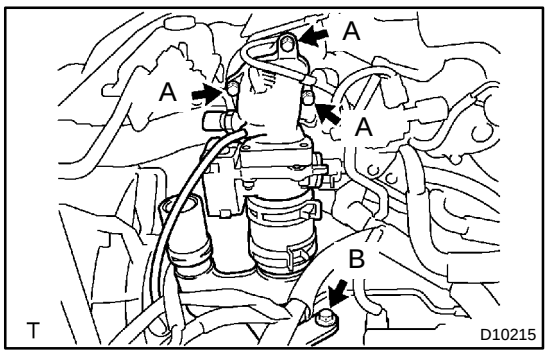
(b) Using SST, connect the 2 flexible hose tubes.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

(c) Connect the wire harness clamp.



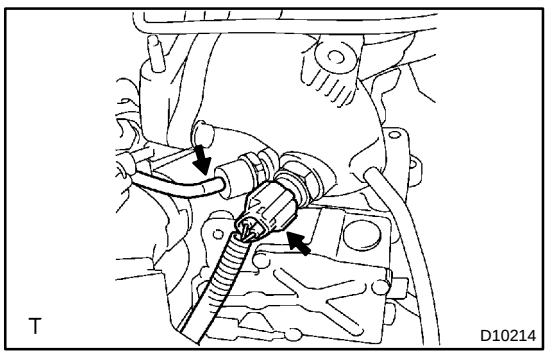
15. CONNECT CLUTCH RELEASE CYLINDER TO FLEXIBLE HOSE TUBE (2ZZ-GE/3ZZ-FE/4ZZ-FE ENGINE TYPE)

(a) Using SST, connect the flexible hose tube.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

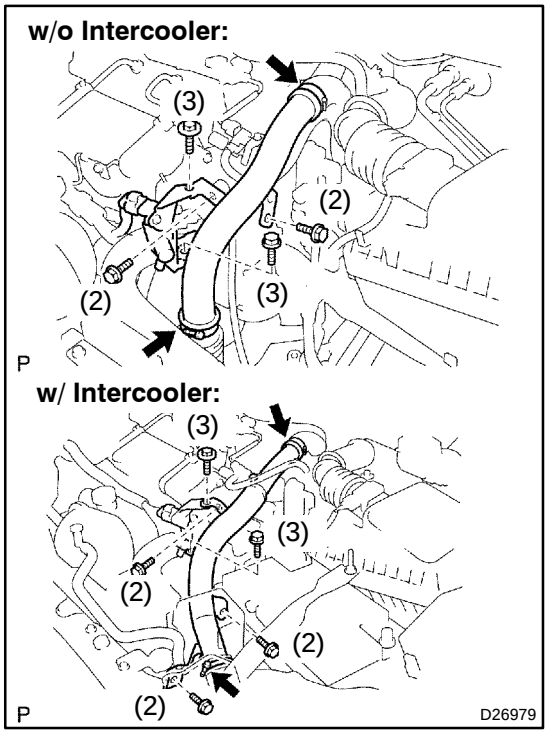


16. INSTALL INTAKE AIR CONNECTOR (W/O INTER COOLER 1CD-FTV ENGINE TYPE)

(a) Install the intake air connector with 4 bolts.
Torque:
Bolt A: 21 N·m (214 kgf·cm, 15 ft·lbf)
Bolt B: 25 N·m (255 kgf·cm, 18 ft·lbf)



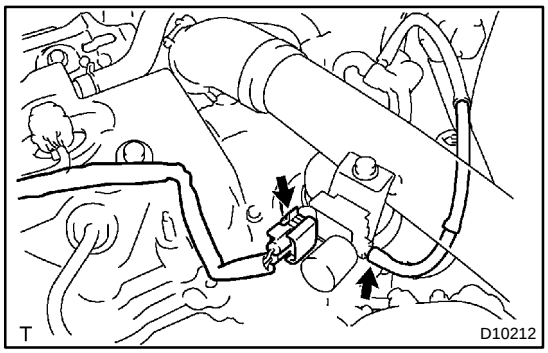
(b) Connect the intake air temperature sensor connector and vacuum hose.



17. INSTALL AIR TUBE NO.1 (1CD-FTV ENGINE TYPE)

(a) w/o Intercooler:
(1) Connect the 2 hose clamps.
(2) Install the 2 bolts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)
(3) Install the 2 bolts, connect the VSV for turbocharging pressure control assembly.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(b) w/ Intercooler:
(1) Connect the 2 hose clamps.
(2) Install the 3 bolts.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)
(3) Install the 2 bolts, connect the VSV for turbocharging pressure control assembly.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)



(c) Connect the vacuum hose and connector.

18. INSTALL BATTERY (1CD-FTV ENGINE TYPE)

19. BLEED CLUTCH PIPE LINE

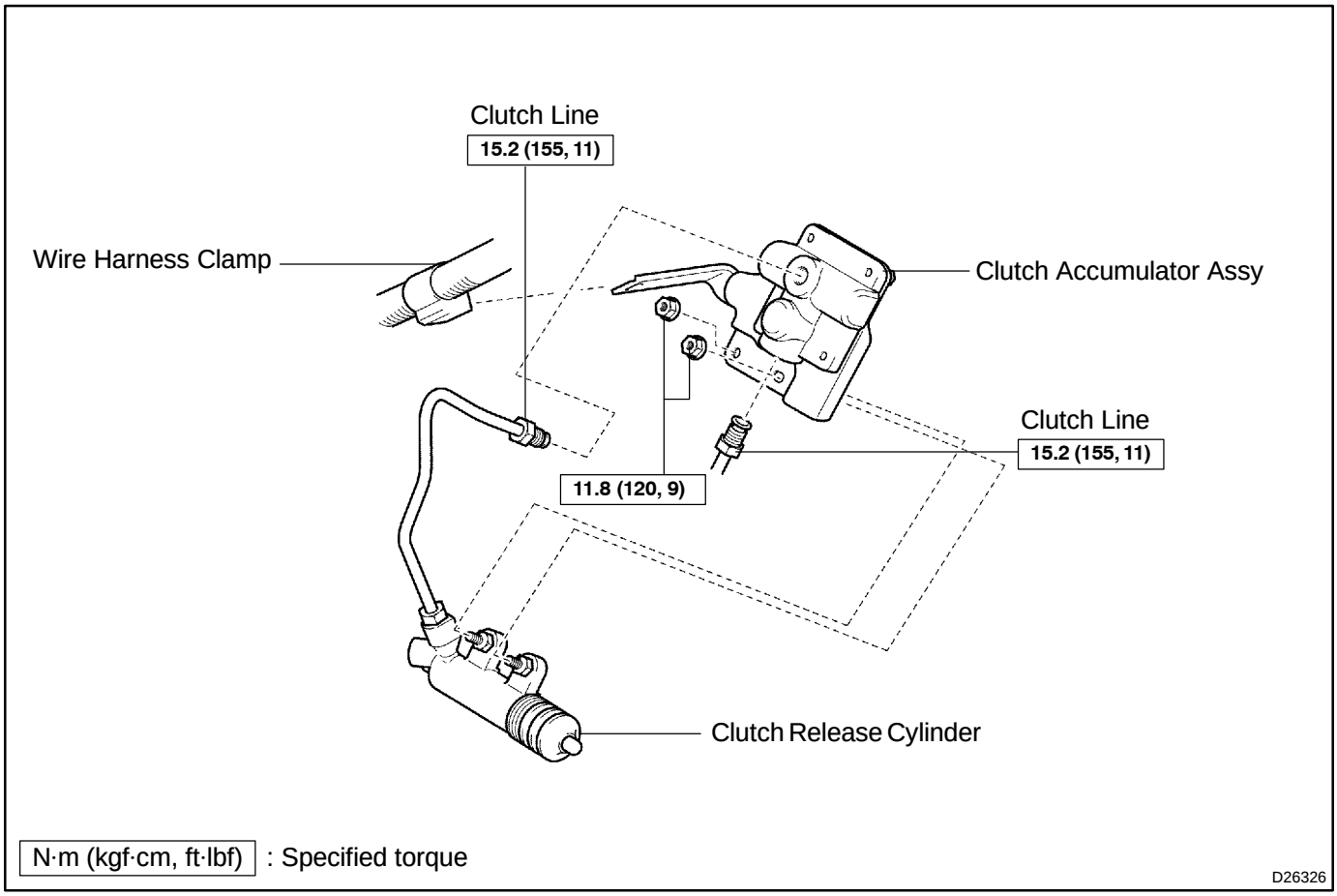
(a) Fill the brake reservoir tank with brake fluid and bleed clutch system.
Torque: 8.4 N·m (85 kgf·cm, 74 in.·lbf)

20. CHECK CLUTCH FLUID LEAKAGE

CLUTCH ACCUMULATOR ASSY (1CD-FTV)

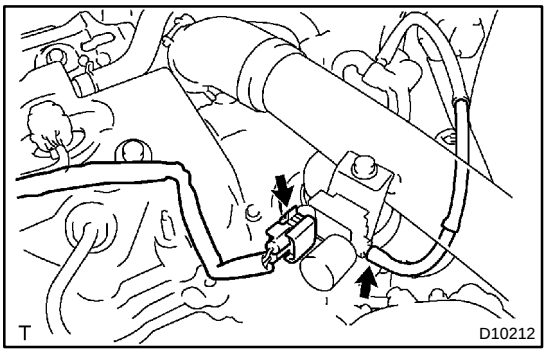
COMPONENTS

4202Z-01



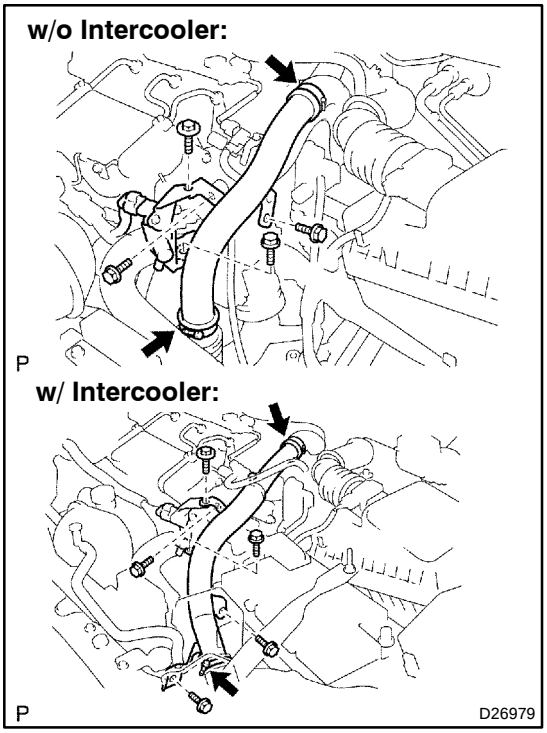
REPLACEMENT

1. REMOVE BATTERY



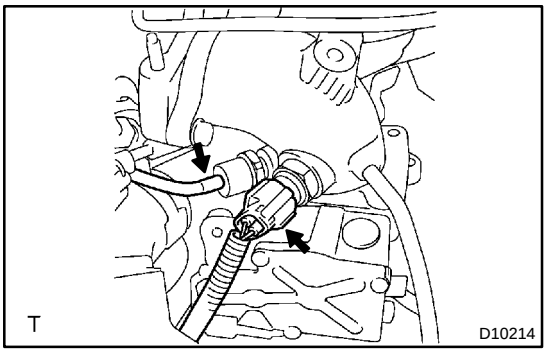
2. REMOVE AIR TUBE NO.1

(a) Disconnect the vacuum hose and connector.



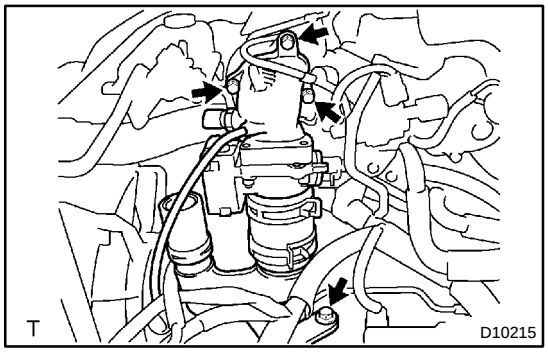
(b) w/o Intercooler:
  (1) Remove the 2 bolts, disconnect the VSV for turbo-charging pressure control assembly.
  (2) Remove the 2 bolts.
  (3) Disconnect the 2 hose clamps, and remove the No.1 air tube.

(c) w/ Intercooler:
  (1) Remove the 2 bolts, disconnect the VSV for turbo-charging pressure control assembly.
  (2) Remove the 3 bolts.
  (3) Disconnect the 2 hose clamps, remove the No.1 air tube.

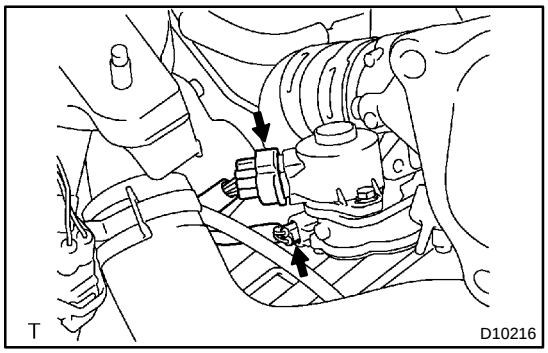


3. REMOVE INTAKE AIR CONNECTOR (W/O INTER COOLER)

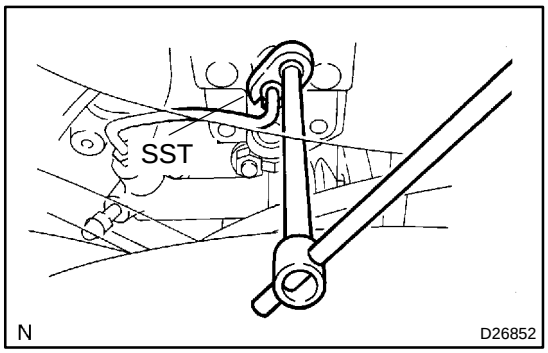
(a) Disconnect the intake air temperature sensor connector and vacuum hose.



(b) Remove the 4 bolts from the air connector with No.2 air tube assembly.



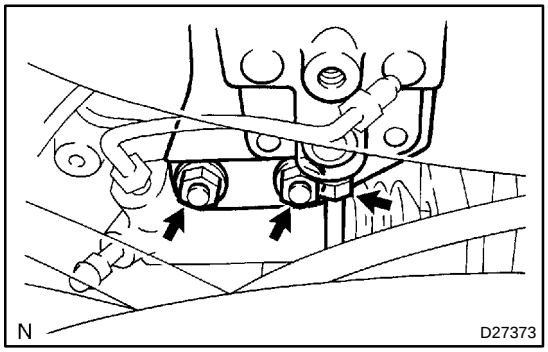
(c) Disconnect the throttle control motor connector.
(d) Disconnect the throttle full switch connector.
(e) Disconnect the 2 hose clips, remove the air connector with the No.2 air tube assembly.



4. REMOVE CLUTCH ACCUMULATOR ASSY

(a) Using SST, disconnect the flexible hose tube.
SST 09023-00100

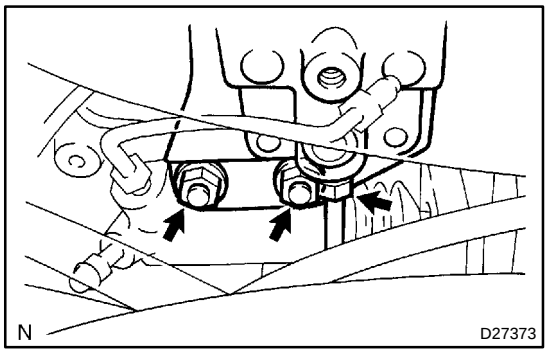
HINT:
Use a container to catch the fluid.



(b) Using SST, disconnect the flexible hose tube.
SST 09023-00100

HINT:
Use a container to catch the fluid.

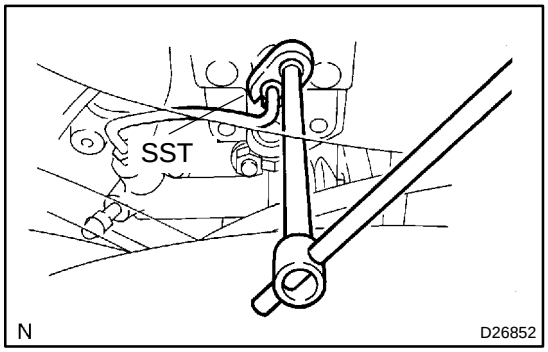
(c) Remove the 2 nuts and clutch accumulator assy.



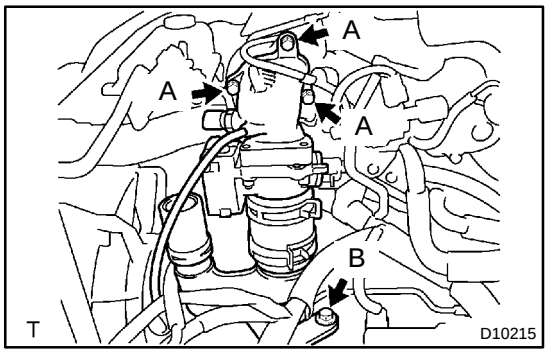
5. INSTALL CLUTCH ACCUMULATOR ASSY

(a) Using SST, connect the 2 flexible hose tubes to clutch accumulator assy.
SST 09023-00100

(b) Install the clutch accumulator assy with the 2 nuts.
Torque: 11.8 N·m (120 kgf·cm, 9 ft·lbf)

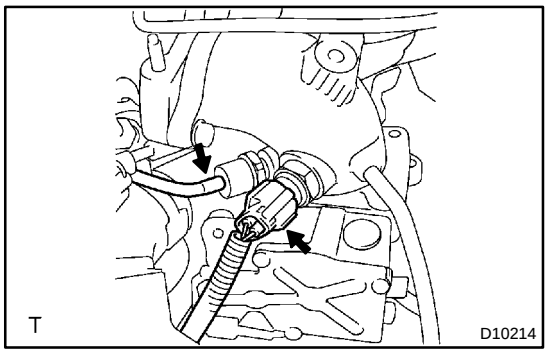


(c) Using SST, tighten the flexible hose tube.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

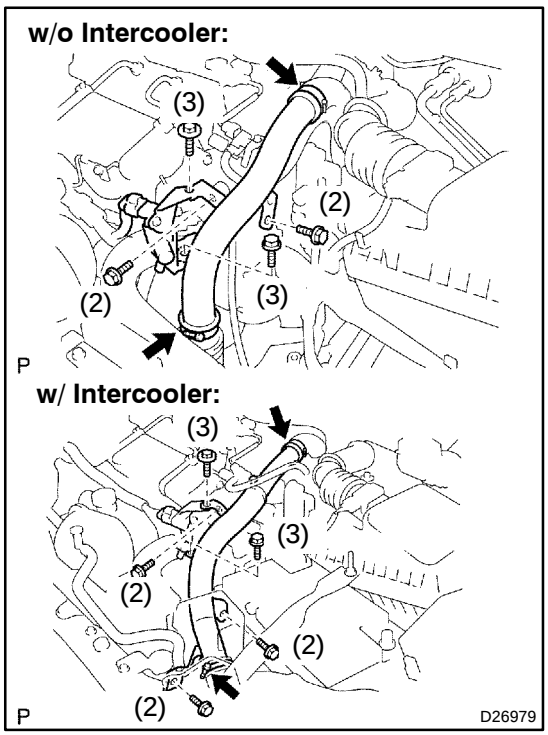


6. INSTALL CONNECTOR, INTAKE AIR (W/O INTER COOLER)

(a) Install the intake air connector with 4 bolts.
Torque:
Bolt A: 21 N·m (214 kgf·cm, 15 ft·lbf)
Bolt B: 25 N·m (255 kgf·cm, 18 ft·lbf)



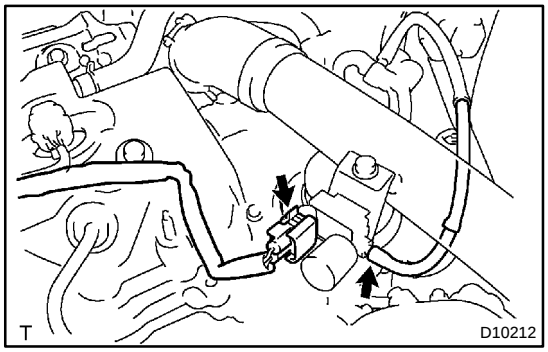
(b) Connect the intake air temperature sensor connector and vacuum hose.



7. INSTALL AIR TUBE NO.1

(a) w/o Intercooler:
(1) Connect the 2 hose clamps.
(2) Install the 2 bolts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)
(3) Install the 2 bolts, connect the VSV for turbocharging pressure control assembly.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(b) w/ Intercooler:
(1) Connect the 2 hose clamps.
(2) Install the 3 bolts.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)
(3) Install the 2 bolts, connect the VSV for turbocharging pressure control assembly.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)



(c) Connect the vacuum hose and connector.

8. INSTALL BATTERY

9. BLEED CLUTCH PIPE LINE

(a) Fill the brake reservoir tank with brake fluid and bleed clutch system.
Torque: 8.4 N·m (85 kgf·cm, 74 in.·lbf)

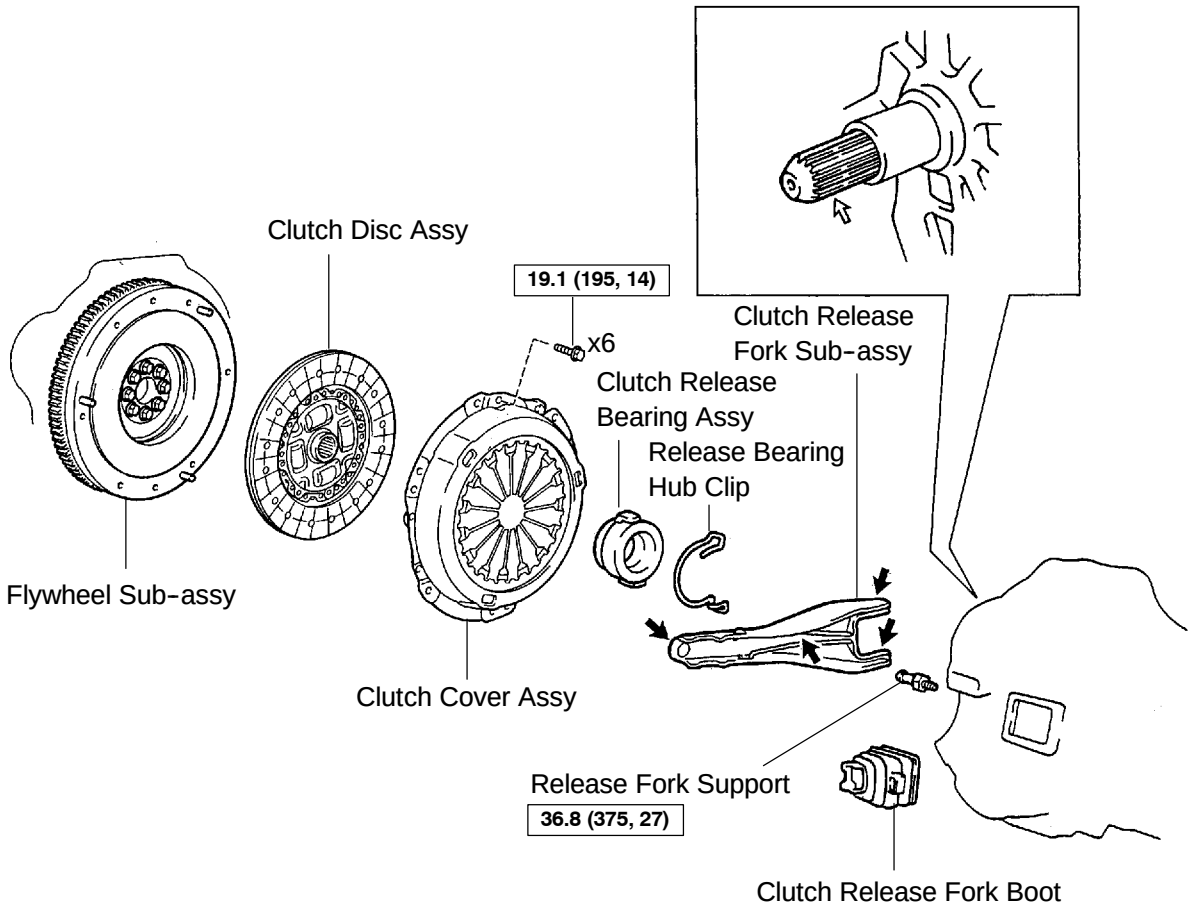
10. CHECK CLUTCH FLUID LEAKAGE

CLUTCH UNIT (MTM)

COMPONENTS

42031-01

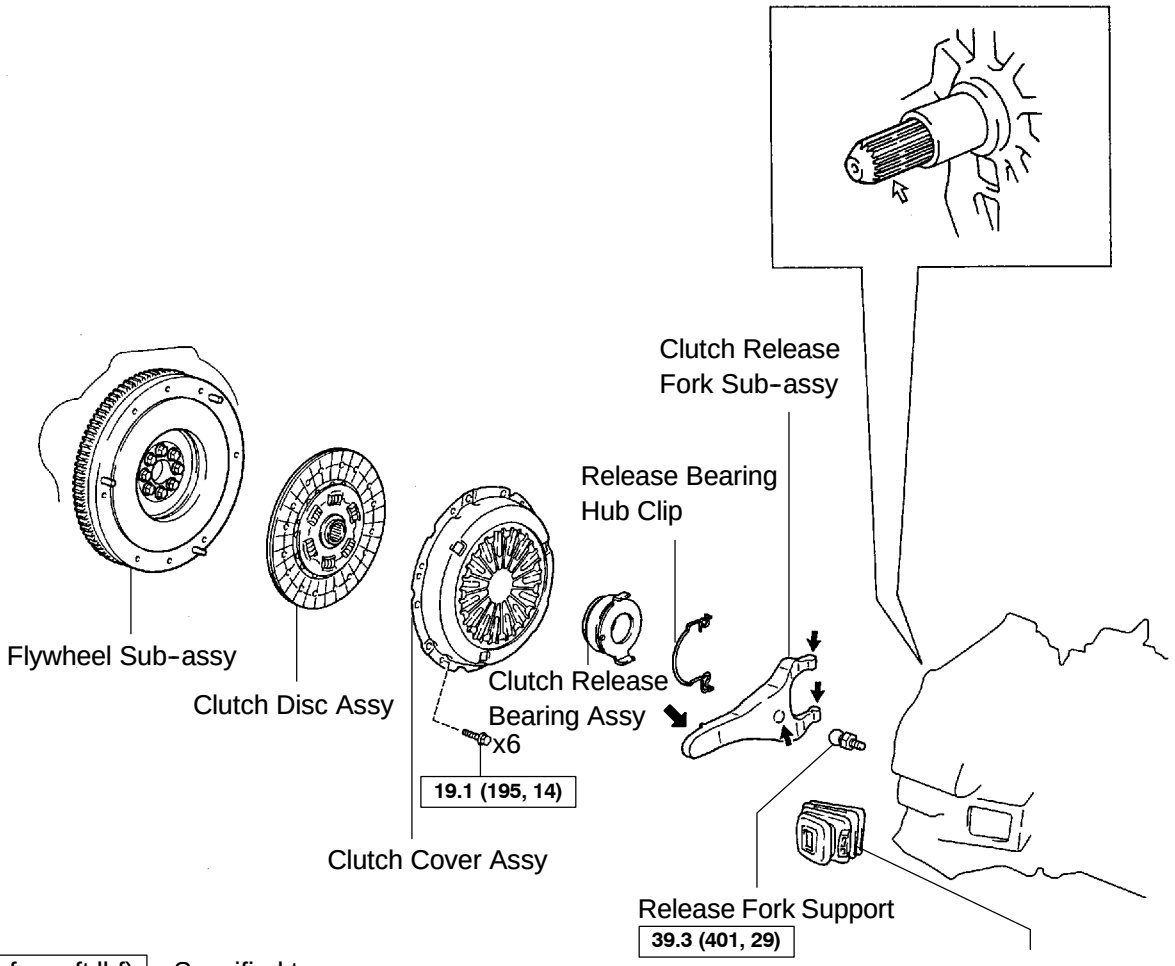
2ZZ-GE/3ZZ-FE/4ZZ-FE Engine Type:



N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
⇦ Clutch spline grease
⬅ Release hub grease

D26321

1CD-FTV Engine Type:



N·m (kgf·cm, ft·lbf) : Specified torque
z Non-reusable part
⇦ Clutch spline grease
⬅ Release hub grease

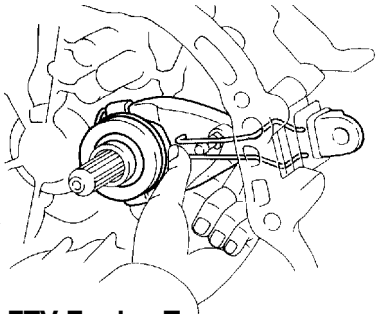
D26322

OVERHAUL

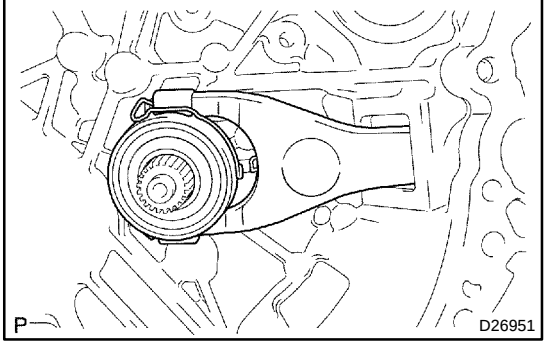
1. REMOVE MANUAL TRANSAXLE ASSY

(See page 41-28 or 41-40)

2ZZ-GE/3ZZ-FE/4ZZ-FE Engine Type:



1CD-FTV Engine Type:



2. REMOVE CLUTCH RELEASE FORK SUB-ASSY

(a) Remove the clutch release fork with clutch release bearing from the transaxle assy.

3. REMOVE CLUTCH RELEASE BEARING ASSY

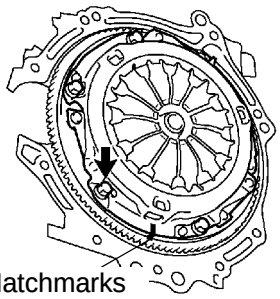
(a) Remove the clutch release bearing assy from the clutch release fork.

4. REMOVE RELEASE FORK SUPPORT

(a) Remove the release fork support from the transaxle assy.

5. REMOVE RELEASE BEARING HUB CLIP

6. REMOVE CLUTCH RELEASE FORK BOOT



7. REMOVE CLUTCH COVER ASSY

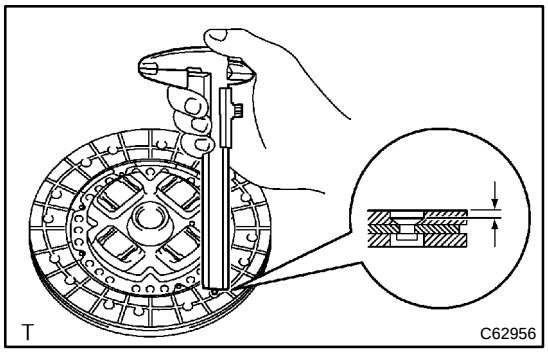
(a) Align the matchmarks on the clutch cover assy with the one on the flywheel sub-assy.
(b) Loosen each set bolt one turn at a time until spring tension is released.
(c) Remove the set bolts, and pull off the clutch cover assy.

NOTICE:

Do not drop the clutch disc assy.

8. REMOVE CLUTCH DISC ASSY

NOTICE:
Keep the lining part of the clutch disc assy, the pressure plate and surface of the flywheel sub-assy away from oil and foreign attachment.



9. INSPECT CLUTCH DISC ASSY

(a) Using vernier calipers, measure the rivet head depth.
Maximum rivet depth: 0.3 mm (0.012 in.)

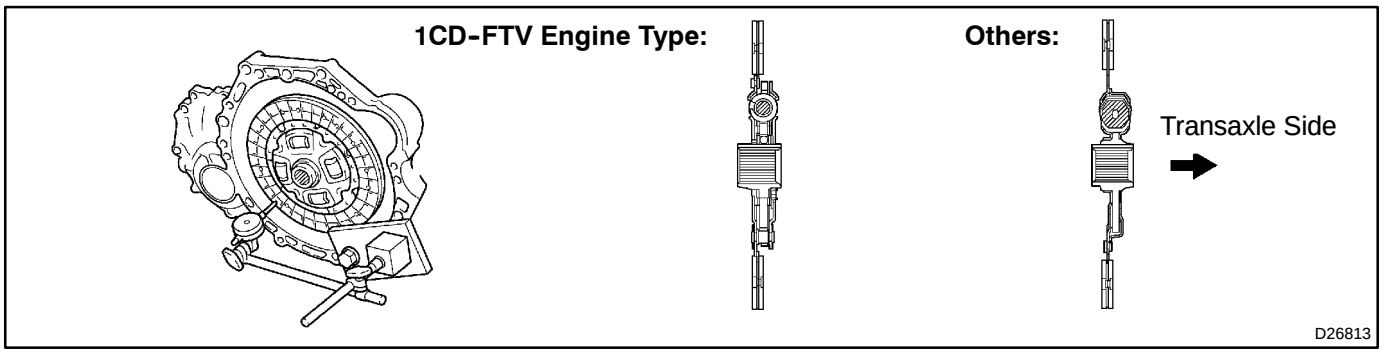
If necessary, replace the clutch disc assy.

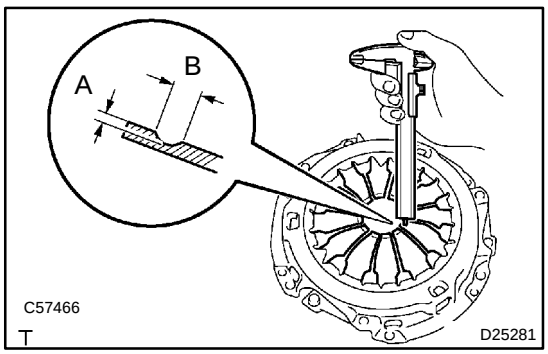
(b) Install the clutch disc assy to the transaxle assy.

NOTICE:
Take care not to insert the clutch disc assy in the wrong direction.

(c) Using a dial indicator, check the clutch disc assy runout.
Minimum runout: 0.8 mm (0.031 in.)

If necessary, replace the clutch disc assy.

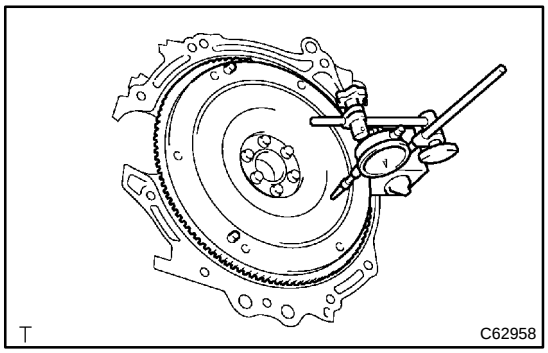




10. INSPECT CLUTCH COVER ASSY

(a) Using vernier calipers, inspect the diaphragm spring for depth and width of wear.
Maximum:
A (Depth): 0.5 mm (0.020 in.)
B (Width): 6.0 mm (0.236 in.)

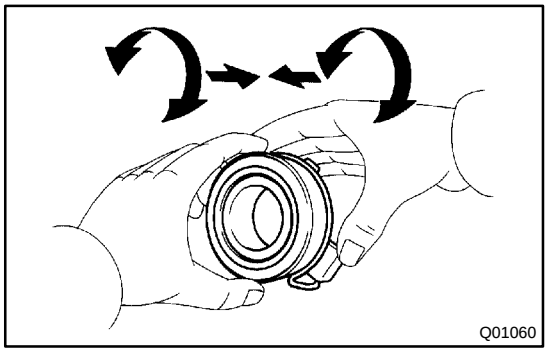
If necessary, replace clutch cover assy.



11. INSPECT FLYWHEEL SUB-ASSY

(a) Using a dial indicator, inspect the flywheel sub-assy run-out.
Maximum runout: 0.1 mm (0.004 in.)

If necessary, replace the flywheel sub-assy.



12. INSPECT CLUTCH RELEASE BEARING ASSY

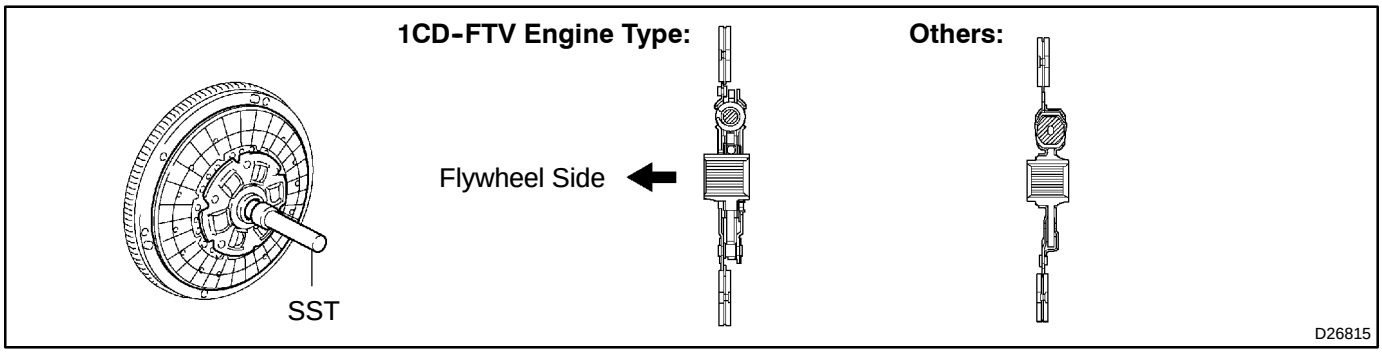
(a) Turn the release bearing by hand while applying force in the axial direction.

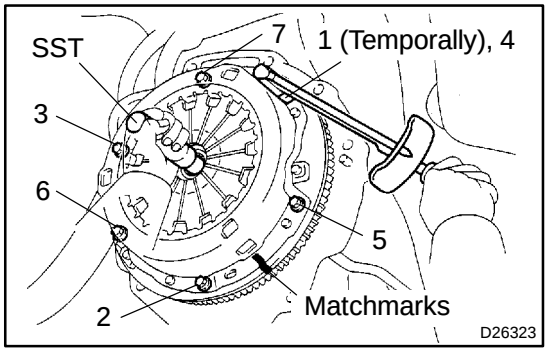
HINT:
The bearing is permanently lubricated and requires no cleaning or lubrication.
If necessary, replace the release bearing assy.

13. INSTALL CLUTCH DISC ASSY

(a) Insert SST in the clutch disc assy, then insert them in the flywheel sub-assy.
SST 09301-00210

NOTICE:
Take care not to insert clutch disc assy in the wrong direction.

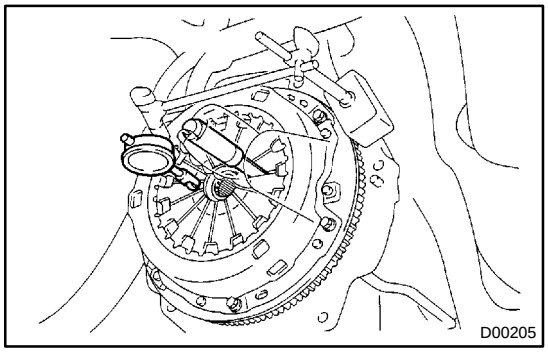




14. INSTALL CLUTCH COVER ASSY

(a) Align the matchmarks on the clutch cover assy and flywheel sub-assy.
(b) Following the procedures shown in the illustration, tighten the 6 bolts, in the order starting the bolt locating near the knock pin on the top.
Torque: 19.1 N·m (195 kgf·cm, 14 ft·lbf)

HINT:
- Following the order in the illustration, tighten the bolts at a time evenly.
- Move SST up and down, right and left lightly, after checking that the disc is in the center, tighten the bolts.



15. INSPECT AND ADJUST CLUTCH COVER ASSY

(a) Using a dial indicator with roller instrument, check the diaphragm spring tip alignment.
Maximum non-alignment: 0.5 mm (0.020 in.)

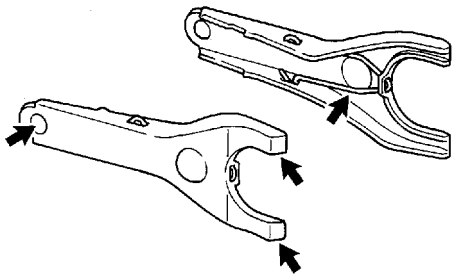
If alignment is not as specified, using SST, adjust the diaphragm spring tip alignment.
SST 09333-00013

16. INSTALL RELEASE FORK SUPPORT

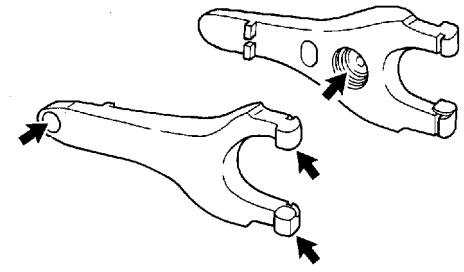
(a) Install the release fork support to the transaxle assy.
Torque:
2ZZ-GE/3ZZ-FE/4ZZ-FE Engine Type: 36.8 N·m (375 kgf·cm, 27 ft·lbf)
1CD-FTV Engine Type: 39.3 N·m (401 kgf·cm, 29 ft·lbf)

17. INSTALL RELEASE BEARING HUB CLIP

2ZZ-GE/3ZZ-FE/4ZZ-FE Engine Type:



1CD-FTV Engine Type:



18. INSTALL CLUTCH RELEASE FORK SUB-ASSY

(a) Apply release hub grease to the release fork and release bearing assy contact, release fork and push rod contact and release fork pivot points.
Sealant:
Part No. 08887-01806, RELEASE HUB GREASE or equivalent

(b) Install the release fork to the release bearing assy.

19. INSTALL CLUTCH RELEASE BEARING ASSY

(a) Apply the clutch spline grease to the input shaft spline.
Sealant:
Part No. 08887-01706, CLUTCH SPLINE GREASE or equivalent

(b) Install the bearing to the release fork, and then install them to the transaxle assy.

NOTICE:
After the installation, move the folk forward and backward to check that the release bearing slides smoothly.

20. INSTALL CLUTCH RELEASE FORK BOOT

21. INSTALL MANUAL TRANSAXLE ASSY
(See page 41-29 or 41-42)

STEERING COLUMN

STEERING SYSTEM 50-1
PRECAUTION 50-1
PROBLEM SYMPTOMS TABLE 50-2
ON-VEHICLE INSPECTION 50-3
STEERING COLUMN ASSY 50-4
COMPONENTS 50-4/5
OVERHAUL 50-7/15

STEERING SYSTEM

PRECAUTION

5000C-08

1. HANDLING PRECAUTIONS ON STEERING SYSTEM

(a) Care must be taken to replace parts properly because they could affect the performance of the steering system and result in a driving hazard.

2. HANDLING PRECAUTIONS ON SRS AIRBAG SYSTEM

(a) The vehicle is equipped with SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the supplemental restraint system (See page 60-1).

3. HANDLING PRECAUTIONS ON STEERING COLUMN

(a) Do not give an impact to the steering column assy, especially the motor and the torque sensor. If a great impact is given (dropping it to the floor, etc.), replace it with new one.

(b) When removing steering column assy, do not pull the harness.

(c) When having replaced the steering column assy and/or the ECU, calibrate the zero point of the steering torque sensor.

(d) In the case of disconnecting a connector related to the power steering system, turn the ignition switch ON, set the steering wheel in the straight-ahead position and turn the ignition switch OFF before disconnecting the connector.

(e) In the case of connecting a connector related to the power steering system, make sure that the ignition switch is OFF at first. After connecting the connector, set the steering wheel assy in the straight-ahead position and then turn the ignition switch ON.

NOTICE:

Never turn on the ignition switch when the steering wheel assy is set in order than the straight-ahead position.

(f) If the above operation is not done, the zero point of the steering torque sensor is shifted away from the proper position, making difference in the steering effort between right and left. If this happens, perform the zero point calibration of the steering torque sensor (See page 05-809).

5000D-08

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in the order shown. If necessary, repair or replace these parts.

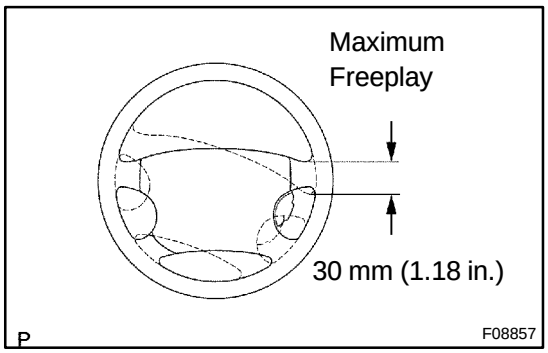
Symptom	Suspect Area	See page
Hard steering	1. Tires (Improperly inflated)	28-1
	2. Front wheel alignment (Incorrect)	26-2
	3. Steering system joints (Worn)	-
	4. Suspension arm ball joints (Worn)	26-17
	5. Steering column (Binding)	-
	6. Steering column (Electric power steering system)	50-7
Poor return	1. Tires (Improperly inflated)	28-1
	2. Front wheel alignment (Incorrect)	26-2
	3. Steering column (Binding)	-
	4. Steering column (Electric power steering system)	50-7
Excessive play	1. Steering system joints (Worn)	-
	2. Suspension arm ball joints (Worn)	26-17
	3. Intermediate shaft, Sliding yoke (Worn)	-
	4. Front wheel bearing (Worn)	30-32
	5. Steering column (Electric power steering system)	50-7
Abnormal noise	1. Steering system joints (Worn)	-
	2. Steering column (Electric power steering system)	50-7

HINT:

When the problem occurs on the Electric Power Steering system, refer to the DI section (See page 05-809).

5000E-03

ON-VEHICLE INSPECTION



1. CHECK STEERING WHEEL FREEPLAY

(a) Stop the vehicle and face the tires straight ahead.

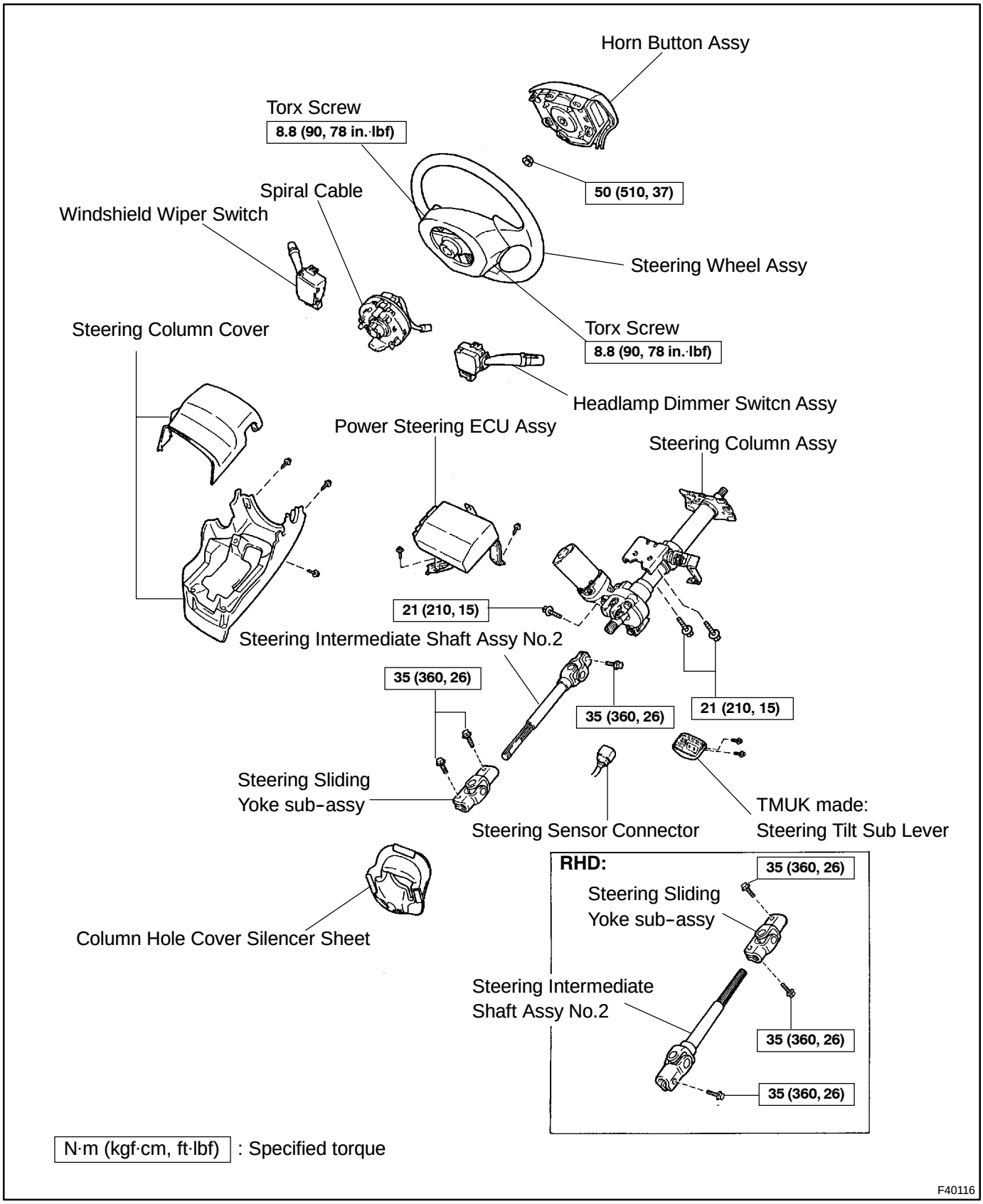
(b) Rock the steering wheel gently up and down with a finger lightly, check the steering wheel freeplay.

Maximum freeplay: 30 mm (1.18 in.)

STEERING COLUMN ASSY

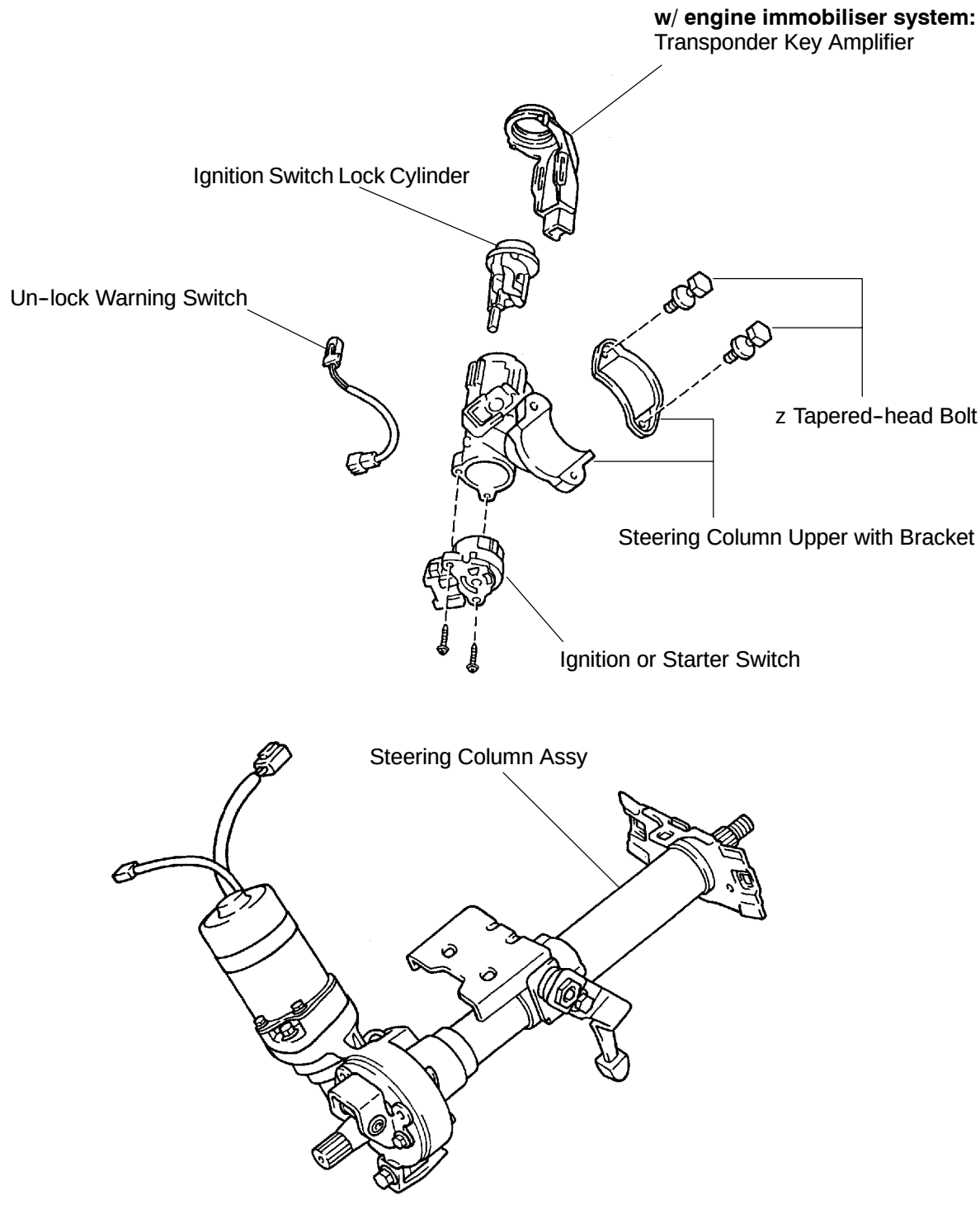
COMPONENTS

5003I-01



F40116

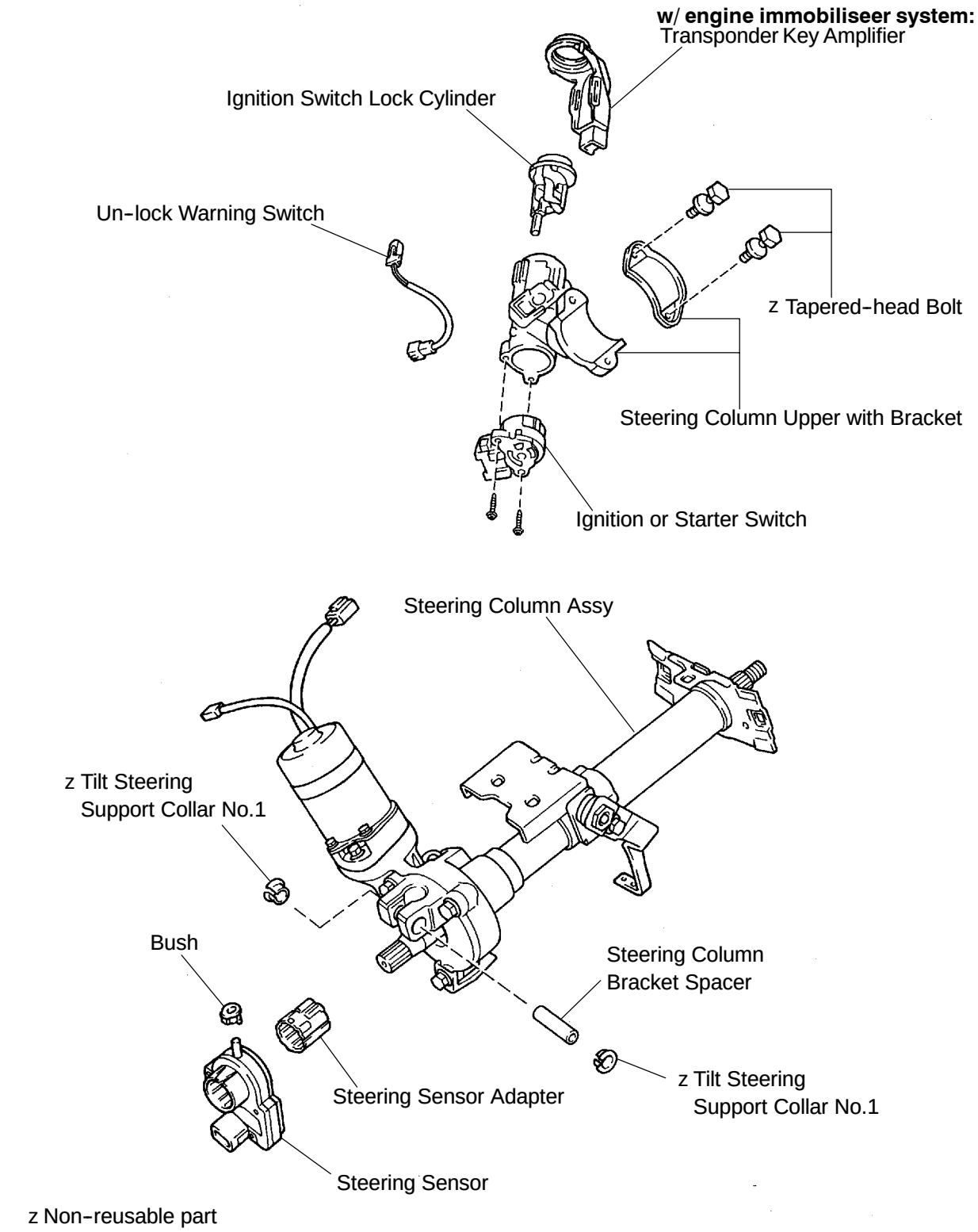
TMC Made:



N z Non-reusable part

F42393

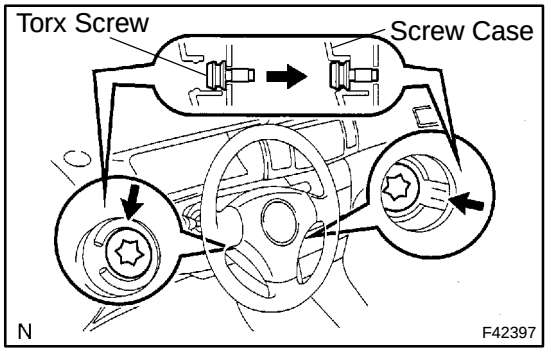
TMUK Made:


w/ engine immobiliseer system:
Transponder Key Amplifier
Ignition Switch Lock Cylinder
Un-lock Warning Switch
z Tapered-head Bolt
Steering Column Upper with Bracket
Ignition or Starter Switch
Steering Column Assy
z Tilt Steering
Support Collar No.1
Bush
Steering Column
Bracket Spacer
z Tilt Steering
Support Collar No.1
Steering Sensor Adapter
Steering Sensor
z Non-reusable part
N
F42408

5003J-01

OVERHAUL

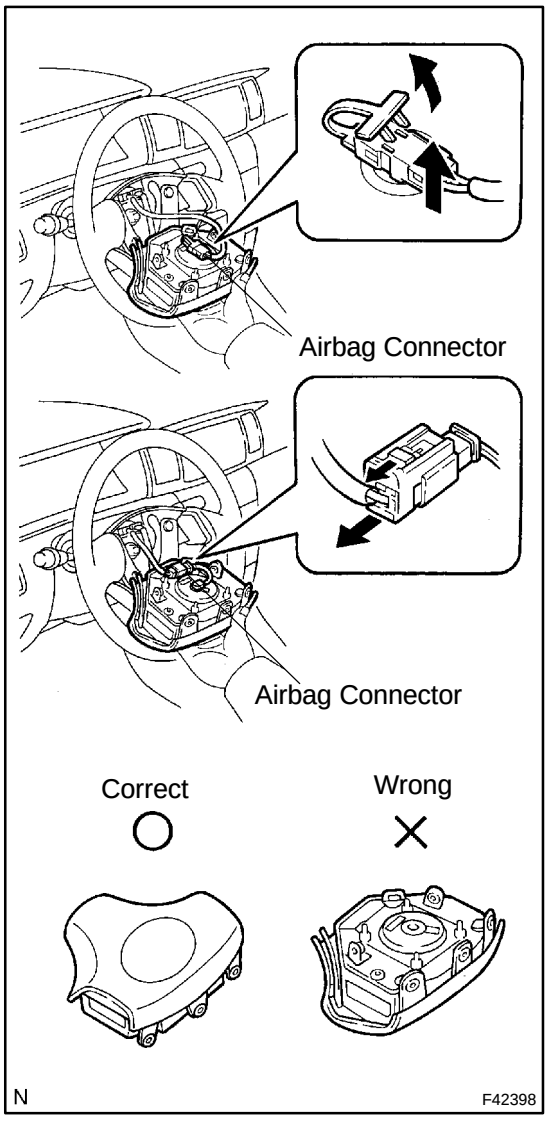
1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. DISCONNECT BATTERY NEGATIVE TERMINAL



3. REMOVE HORN BUTTON ASSY

NOTICE:
If the airbag connector is disconnected with the ignition switch at ON, DTCs will be recorded.

(a) Using a torx socket wrench, loosen the 2 torx screws until the groove along the screw circumference catches on the screw case.



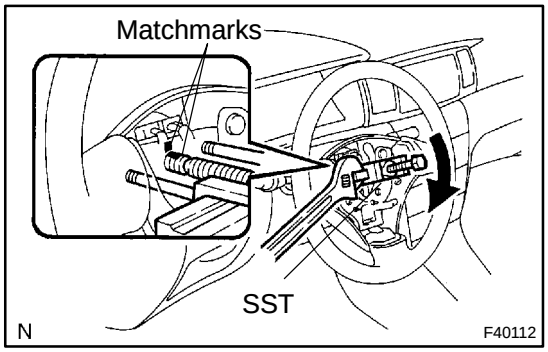
(b) Pull out the horn button assy from the steering wheel and disconnect the airbag connector.

(c) Disconnect the terminal.

CAUTION:

- **When storing the horn button assy, keep the upper surface of the horn button assy facing upward.**
- **Never disassemble the horn button assy.**

NOTICE:
When removing the horn button assy, take care not to pull the airbag wire harness.



4. REMOVE STEERING WHEEL ASSY

(a) Remove the steering wheel set nut.
(b) Place matchmarks on the steering wheel and main shaft assembly.
(c) Using SST, remove the steering wheel.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

5. REMOVE STEERING COLUMN COVER

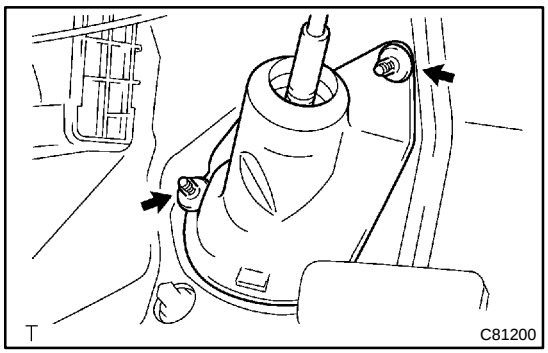
(a) TMUK Made:
Remove the 2 bolts and steering tilt sub lever.
(b) Remove the 3 screws and steering column cover.

6. REMOVE HEADLAMP DIMMER SWITCH ASSY
(See page 65-36)

7. REMOVE WINDSHIELD WIPER SWITCH ASSY
(See page 66-19)

8. REMOVE SPIRAL CABLE SUB-ASSY

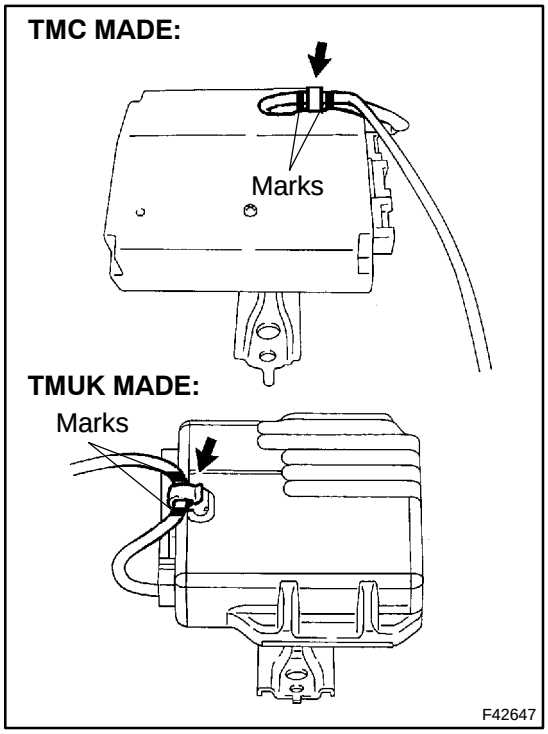
NOTICE:
Do not disassemble the spiral cable or apply oil to it.



9. REMOVE COLUMN HOLE COVER SILENCER SHEET

(a) Remove the 2 nuts and column hole cover silencer sheet.

10. REMOVE INSTRUMENT PANEL SUB-ASSY UPPER
(See page 71-9)



11. REMOVE POWER STEERING ECU ASSY

(a) Mark the clamp position of the harness in order to reinstall.

(b) Disconnect the harness of the connector from the clamp of the power steering ECU assy.

NOTICE:

Do not remove the clamp from the power steering ECU assy to reuse it.

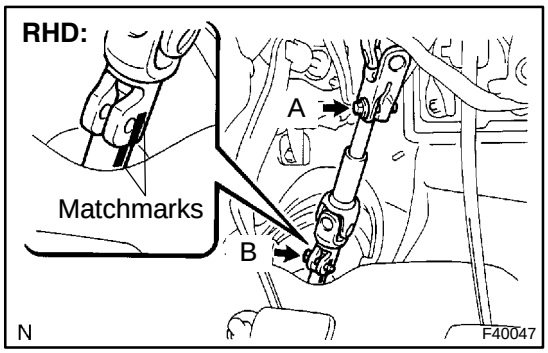
(c) Disconnect the connector.

(d) Remove the 2 screws and power steering ECU assy.

12. REMOVE STEERING COLUMN ASSY

(a) Disconnect the wire harness and wire harness clamps.

(b) Loosen the 3 steering column assy set bolts.

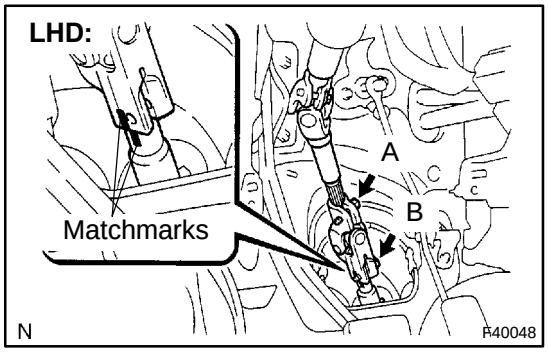


(c) RHD:

(1) Place matchmarks on the intermediate shaft assy No. 2 and steering intermediate shaft.

(d) RHD:

(1) Loosen the bolt A and remove the bolt B, then disconnect the intermediate shaft assy No. 2.

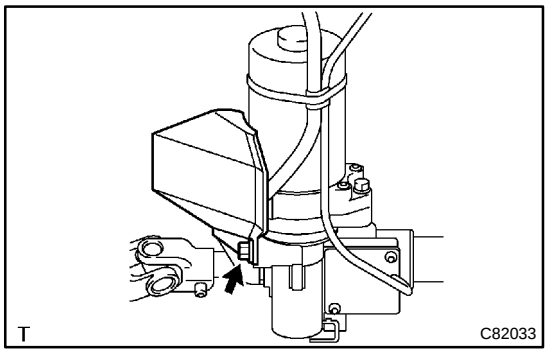


(e) LHD:

(1) Place matchmarks on the steering sliding yoke sub-assy and steering intermediate shaft.

(f) LHD:

(1) Loosen the bolt A and remove the bolt B, then disconnect the steering sliding yoke sub-assy.



(g) RHD, M/T:

(1) Remove the bolt and protector.

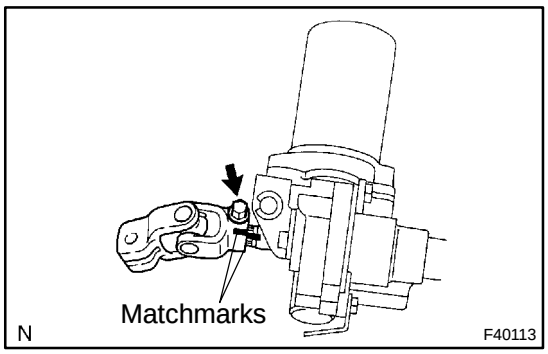
(h) Remove the 3 bolts and steering column assembly.

13. REMOVE STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)

(a) Remove the bolt A and steering intermediate shaft assy No. 2.

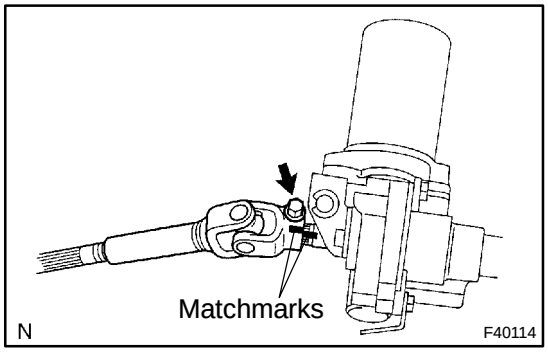
14. REMOVE STEERING SLIDING YOKE SUB-ASSY (LHD STEERING POSITION TYPE)

(a) Remove the bolt A and steering sliding yoke sub-assy.



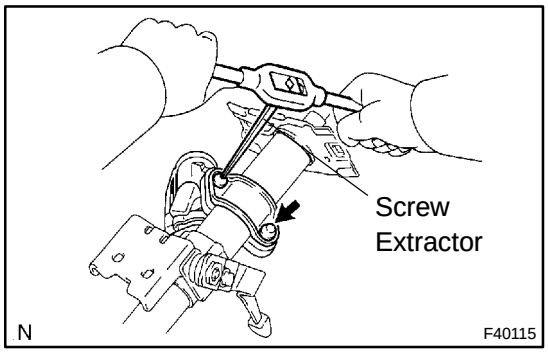
15. REMOVE STEERING SLIDING YOKE SUB-ASSY (RHD STEERING POSITION TYPE)

(a) Place matchmarks on the steering sliding yoke sub-assy and steering main shaft.
(b) Remove the bolt and steering sliding yoke sub-assy.
(c) TMUK Made:
Remove the steering sensor (See page 32-100).



16. REMOVE STEERING INTERMEDIATE SHAFT ASSY NO.2 (LHD STEERING POSITION TYPE)

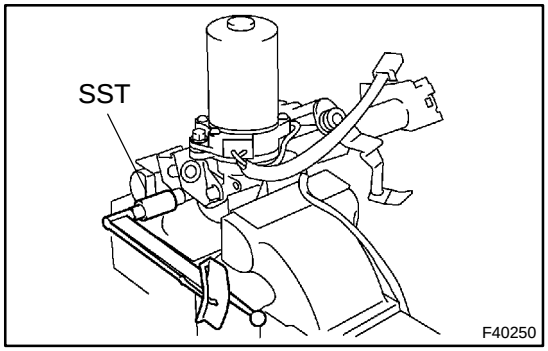
(a) Place matchmarks on the steering intermediate shaft assy No. 2 and steering main shaft.
(b) Remove the bolt and steering intermediate shaft assy No. 2.
(c) TMUK Made:
Remove the steering sensor (See page 32-100).



17. REMOVE STEERING COLUMN UPPER W/SWITCH BRACKET ASSY

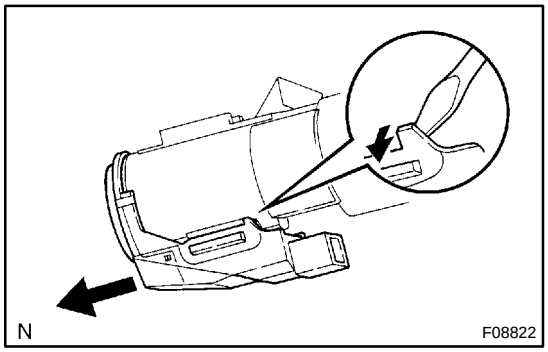
(a) Using a centering punch, mark the center of the 2 tapered-head bolts.
(b) Using a 3 - 4 mm (0.12 - 0.16 in.)drill, drill into the 2 bolts.
(c) Using a screw extractor, remove the 2 bolts and steering column upper with switch bracket assy.

NOTICE:
Do not give the strong force to the motor part.



18. INSPECT STEERING COLUMN ASSY

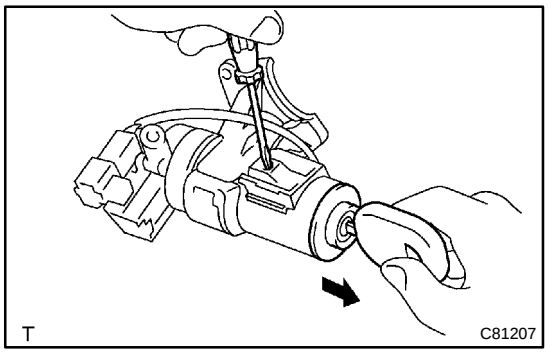
(a) Using SST and a torque wrench, check the rotating torque.
SST 09616-00011
Rotating torque (1 turn for 2 sec.):
0.4 - 1.1 N·m (4 - 11 kgf·cm, 3.5 - 9.5 in.·lbf)



19. REMOVE TRANSPONDER KEY AMPLIFIER (W/ ENGINE IMMOBILISER SYSTEM)

(a) Widen the claw hung on the upper bracket by approx. 1.0 mm (0.039 in.) using a screwdriver.
(b) Pull the transponder key amplifier toward the rear of the vehicle with the claw open.

NOTICE:
Take care not to use excessive force to prevent the case from being damaged.



20. REMOVE IGNITION SWITCH LOCK CYLINDER ASSY

(a) Place the ignition switch lock cylinder assy at the ACC position.
(b) Push down the stop pin with a screwdriver, and pull out the cylinder assy.

21. REMOVE UN-LOCK WARNING SWITCH ASSY

(a) Slide the unlock warning switch assy out of the steering column upper bracket.

22. REMOVE IGNITION OR STARTER SWITCH ASSY

23. INSTALL IGNITION OR STARTER SWITCH ASSY

(a) Remove the 2 screws and ignition or starter switch assy.

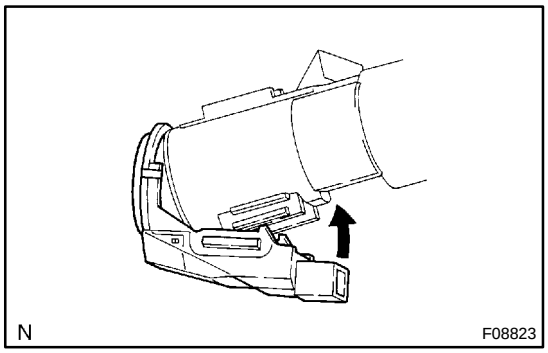
24. INSTALL UN-LOCK WARNING SWITCH ASSY

25. INSTALL IGNITION SWITCH LOCK CYLINDER ASSY

(a) Make sure the ignition switch lock cylinder assy at the ACC position.
(b) Install the ignition switch lock cylinder assy.

26. INSPECT STEERING LOCK OPERATION

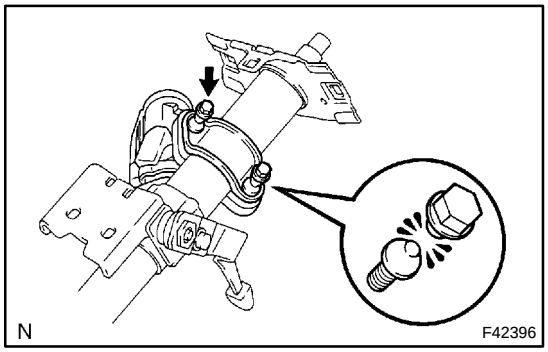
(a) Check that the steering lock mechanism is activated when removing the key.
(b) Check that the steering lock mechanism is deactivated when inserting the key and turning it to ACC position.



27. INSTALL TRANSPONDER KEY AMPLIFIER (W/ ENGINE IMMOBILISER SYSTEM)

(a) Align the transponder key amplifier with the installation position of the upper bracket with the amplifier inclined.
(b) Push the transponder key amplifier up and connect it to the upper bracket.

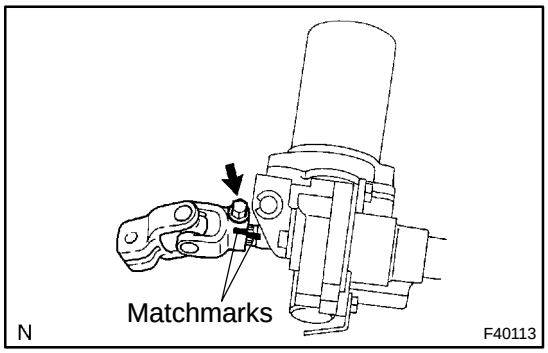
NOTICE:
Take care not to push the amplifier up with excessive force to prevent it from being damaged.



28. INSTALL STEERING COLUMN UPPER W/SWITCH BRACKET ASSY

(a) Temporarily install the steering column upper with switch bracket assy and steering column upper clamp with 2 new tapered–head bolts.

(b) Tighten the 2 tapared–head bolts until the bolt heads break off.

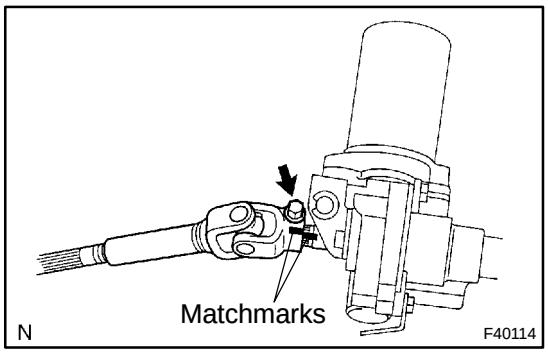


29. INSTALL STEERING SLIDING YOKE SUB–ASSY (RHD STEERING POSITION TYPE)

(a) TMUK Made:
Install the steering sensor (See page 32–101).

(b) Align the matchmarks on the steering sliding yoke and steering main shaft.

(c) Install the steering sliding yoke with the bolt.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)



30. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2 (LHD STEERING POSITION TYPE)

(a) TMUK Made:
Install the steering sensor (See page 32–100).

(b) Align the matchmarks on the steering intermediate shaft assy No. 2 and steering main shaft.

(c) Install the steering intermediate shaft assy No. 2 with the bolt.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

31. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2 (RHD STEERING POSITION TYPE)

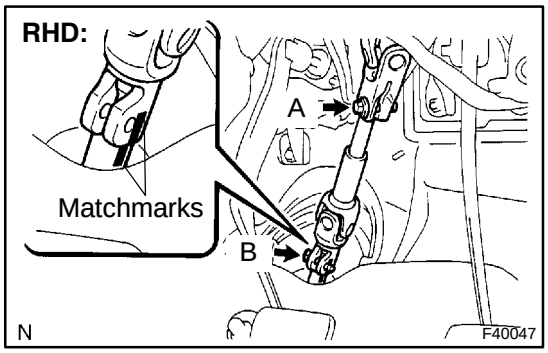
(a) Temporarily install the steering intermediate shaft assy No. 2 with the bolt A.

32. INSTALL STEERING SLIDING YOKE SUB–ASSY (LHD STEERING POSITION TYPE)

(a) Temporarily install the steering sliding yoke with the bolt A.

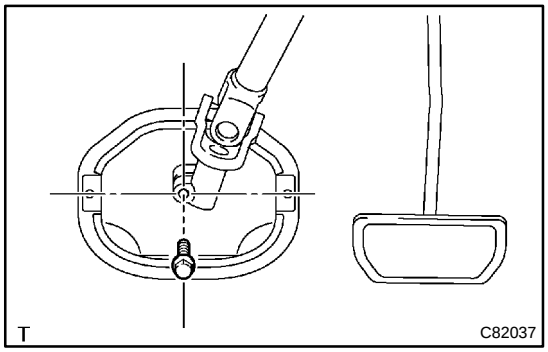
33. INSTALL STEERING COLUMN ASSY

(a) Install the steering column assembly with the 3 bolts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

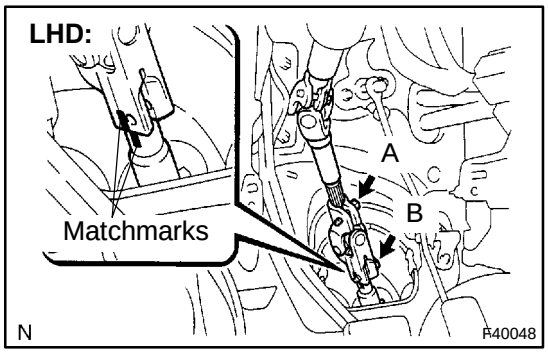


(b) RHD:
(1) Align the matchmarks on the intermediate shaft assy No. 2 and steering intermediate shaft.

(c) RHD:
(1) Install the bolt B and tighten the bolt A.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

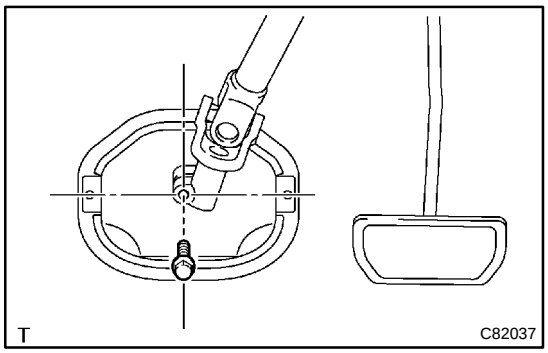


HINT:
When replacing the intermediate shaft assy No. 2 with new one, set the front tires in the straight ahead position and make the bolt hole for the intermediate shaft assy No. 2 and extension face straight rearward as illustrated, and install the bolt.

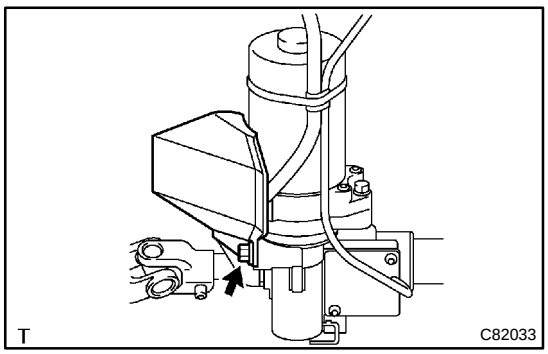


(d) LHD:
(1) Align the matchmarks on the sliding yoke and steering intermediate shaft.

(e) LHD:
(1) Install the bolt B and tighten the bolt A.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

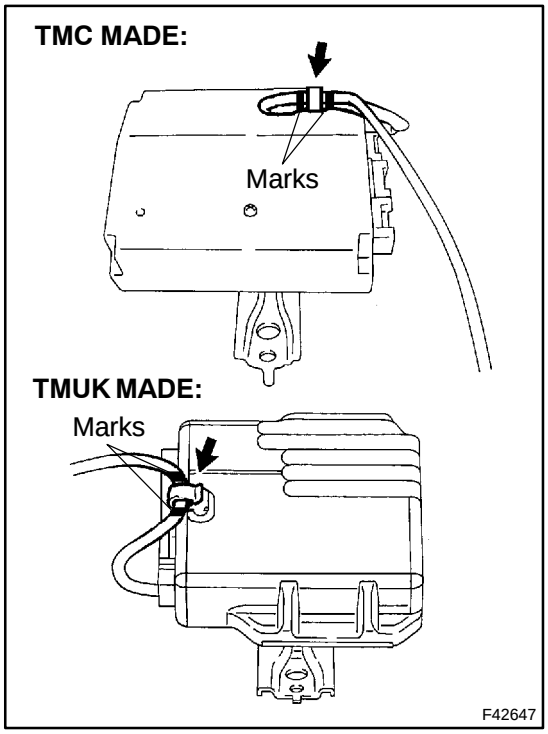


HINT:
When replacing the sliding yoke with new one, set the front tires in the straight ahead position and make the bolt hole for the yoke and extension face straight rearward as illustrated, and install the bolt.



(f) RHD, M/T:
(1) Install the protector with the bolt.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(g) Connect the connectors and wire harness clamps.



34. INSTALL POWER STEERING ECU ASSY

(a) Install the power steering ECU assy with the 2 screws.
(b) Connect the harness to clamp of power steering ECU assy.

NOTICE:

- **In case that the column assy has been replaced with a new supplied one, remove the clamp attached to the column and connect the harness to the power steering ECU assy clamp. Mark the clamp position before removing it.**
- **Hold the mark position on the harness to the clamp.**
- **In case that the power steering ECU is replaced with a new supplied one, be sure to use the appropriate power steering ECU assy to the vehicle.**

35. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER

36. INSTALL COLUMN HOLE COVER SILENCER SHEET

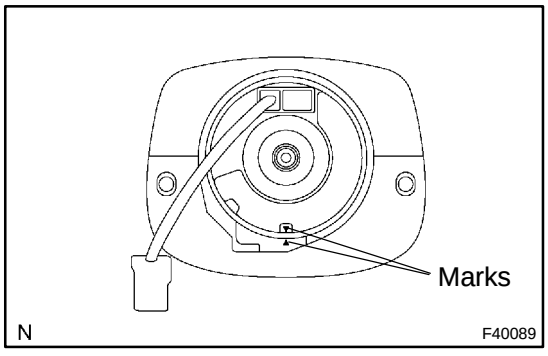
37. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

38. INSTALL SPIRAL CABLE SUB-ASSY

39. INSTALL WINDSHIELD WIPER SWITCH ASSY

40. INSTALL HEADLAMP DIMMER SWITCH ASSY

41. INSTALL STEERING COLUMN COVER



42. CENTER SPIRAL CABLE

(a) Check that the front wheels are facing straight ahead.
(b) Turn the cable counterclockwise by hand until it becomes harder to turn.
(c) TMC Made:
Then rotate the cable clockwise about 2.5 turns to align the marks.

HINT:
The cable will rotate about 2.5 turns to either left or right of the center.

(d) TMUK Made:
Then rotate the cable clockwise about 2 turns to align the marks.

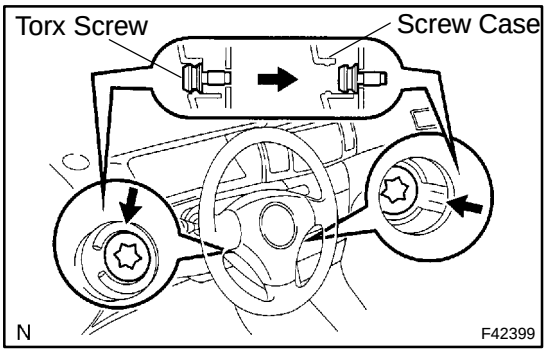
43. INSTALL STEERING WHEEL ASSY

(a) Align the matchmarks on the steering wheel and main shaft assembly.
(b) Install the steering wheel set nut.
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)
(c) Connect the connector.

44. INSTALL HORN BUTTON ASSY

NOTICE:
- **Never use airbag parts from another vehicle. When replacing parts, replace with new ones.**
- **Make sure the horn button assy is installed with the specified torque.**
- **If the horn button assy has been dropped, or there are cracks, dents or other defects in the case or connector, replace the horn button assy with a new one.**
- **When installing the horn button assy, take care that the wirings do not interfere with other parts and that they are not pinched between other parts.**

(a) Connect the terminal.
(b) Connect the airbag connector.



(c) Install the steering horn button assy after confirming that the circumference groove of the torx screws is caught on the screw case.
(d) Using a torx socket wrench, torque the 2 screws.
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

45. STEERING WHEEL CENTER POINT
46. CONNECT BATTERY NEGATIVE TERMINAL
47. INSPECT SRS WARNING LIGHT
48. PERFORM CALIBRATION OF TORQUE SENSOR ZERO POINT

POWER STEERING

POWER STEERING SYSTEM 51-1
PRECAUTION 51-1
PROBLEM SYMPTOMS TABLE 51-2
ON-VEHICLE INSPECTION 51-3
GEAR ASSY, STEERING 51-4
COMPONENTS 51-4/5
OVERHAUL 51-6/15

POWER STEERING SYSTEM

5100F-03

PRECAUTION

1. HANDLING PRECAUTIONS ON STEERING SYSTEM

(a) Care must be taken to replace parts properly because they could affect the performance of the steering system and result in a driving hazard.

2. HANDLING PRECAUTIONS ON SRS AIRBAG SYSTEM

(a) The vehicle is equipped with SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the supplemental restraint system (See page 60-1).

5100G-03

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in the order shown. If necessary, repair or replace these parts.

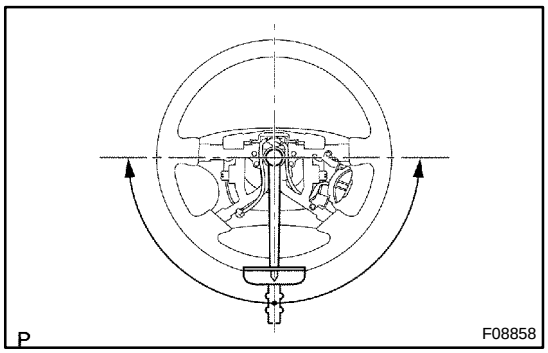
Symptom	Suspect Area	See page
Hard steering	1. Tires (Improperly inflated)	28-1
	2. Front wheel alignment (Incorrect)	26-2
	3. Steering system joints (Worn)	-
	4. Suspension arm ball joints (Worn)	26-17
	5. Steering column (Binding)	-
	6. Steering column (Electric power steering system)	50-7
	7. Steering gear (torque)	51-6
Poor return	1. Tires (Improperly inflated)	28-1
	2. Front wheel alignment (Incorrect)	26-2
	3. Steering column (Binding)	-
	4. Steering column (Electric power steering system)	50-7
	5. Steering gear (torque)	51-6
Excessive play	1. Steering system joints (Worn)	-
	2. Suspension arm ball joints (Worn)	26-17
	3. Intermediate shaft, Sliding yoke (Worn)	-
	4. Front wheel bearing (Worn)	30-32
	5. Steering column (Electric power steering system)	50-7
	6. Steering gear (torque)	51-6
Abnormal noise	1. Steering system joints (Worn)	-
	2. Steering column (Electric power steering system)	50-7
	3. Steering gear (torque)	51-6

HINT:

When the problem occurs on the Electric Power Steering system, refer to the DI section (See page 05-809).

51074-01

ON-VEHICLE INSPECTION



1. CHECK STEERING EFFORT

(a) Center the steering wheel.

(b) Remove the steering wheel pad (See page 50-7).

(c) Start the engine and run it at idle.

(d) Measure the steering effort in both directions.

Steering effort (Reference):

5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:

Take the tire type, pressure and contact surface into consideration before making your diagnosis.

(e) Torque the steering wheel set nut.

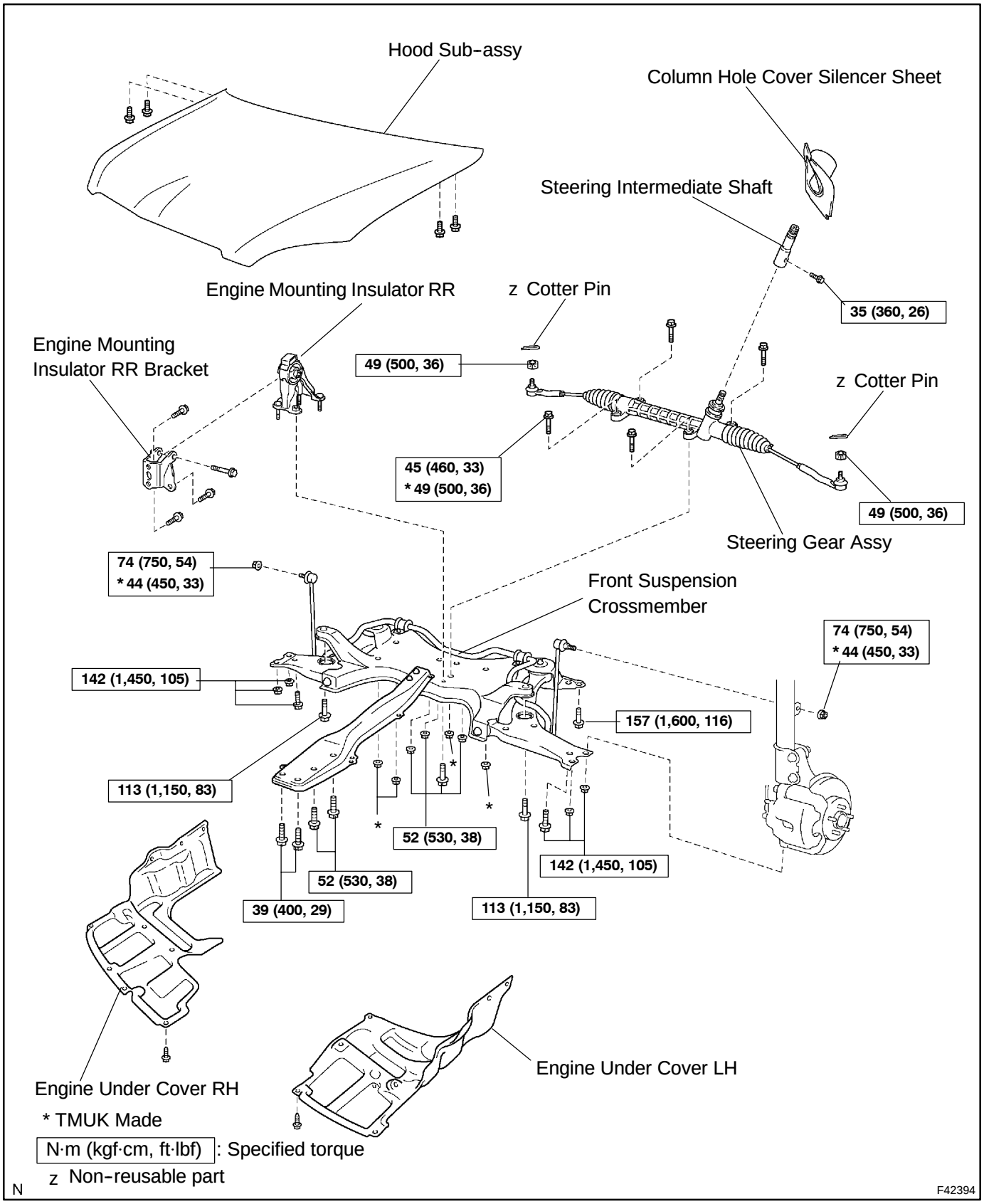
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

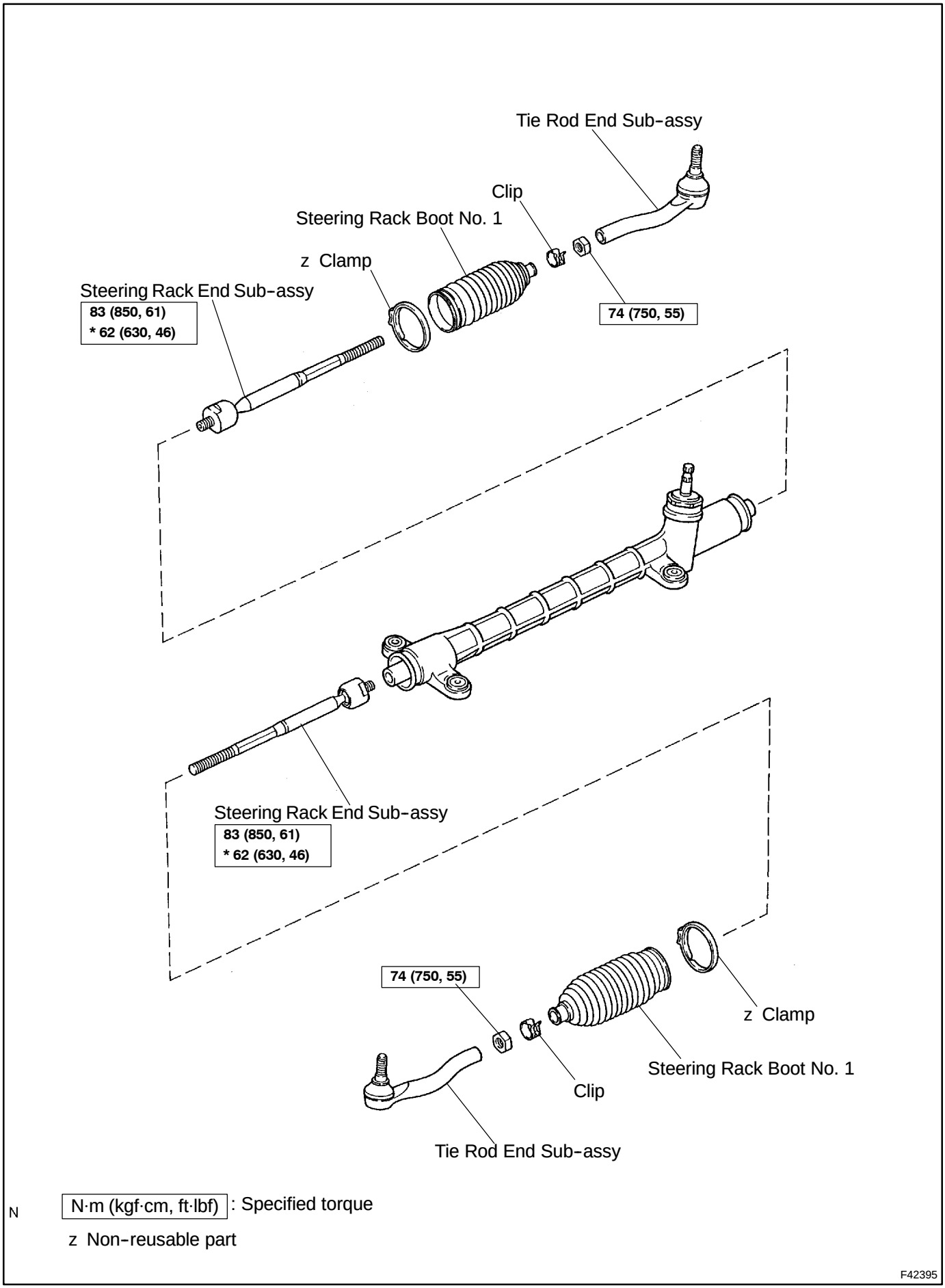
(f) Install the steering wheel pad (See page 50-7).

STEERING GEAR ASSY

COMPONENTS

51075-01





N N·m (kgf·cm, ft·lbf) : Specified torque

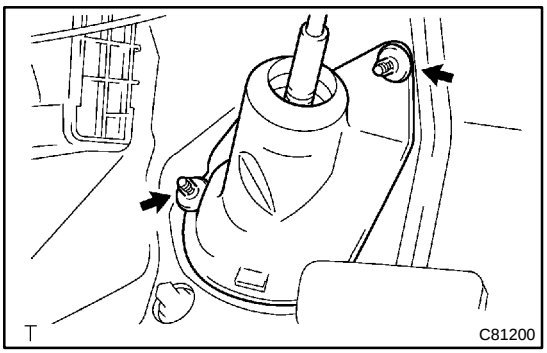
z Non-reusable part

F42395

51076-01

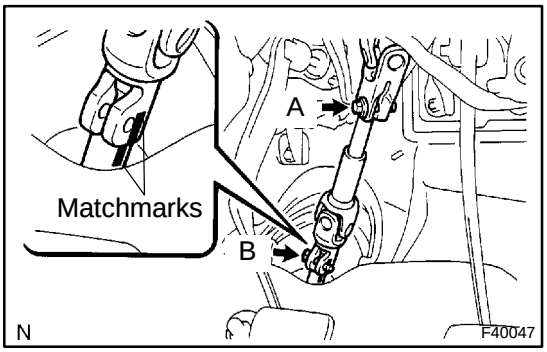
OVERHAUL

1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. REMOVE HORN BUTTON ASSY
3. REMOVE STEERING WHEEL ASSY



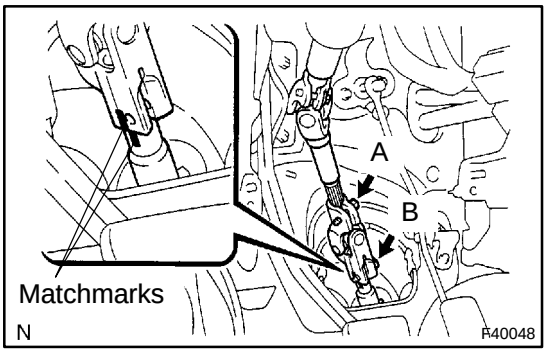
4. REMOVE COLUMN HOLE COVER SILENCER SHEET

(a) Remove the 2 nuts and column hole cover silencer sheet.



5. SEPARATE STEERING INTERMEDIATE SHAFT ASSY NO.2(RHD STEERING POSITION TYPE)

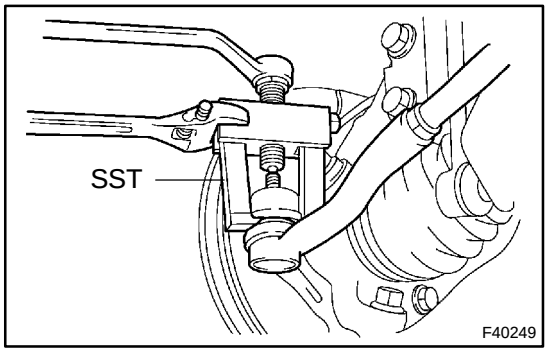
(a) Place matchmarks on the steering intermediate shaft assy No. 2 and steering intermediate shaft.
(b) Loosen the bolt A and remove the bolt B, then disconnect the steering intermediate shaft assy No. 2.



6. SEPARATE STEERING SLIDING YOKE SUB-ASSY(LHD STEERING POSITION TYPE)

(a) Place matchmarks on the sliding yoke sub-assembly and steering intermediate shaft.
(b) Loosen the bolt A and remove the bolt B, then disconnect the sliding yoke sub-assembly.

7. REMOVE FRONT WHEELS
8. REMOVE ENGINE UNDER COVER RH
9. REMOVE ENGINE UNDER COVER LH



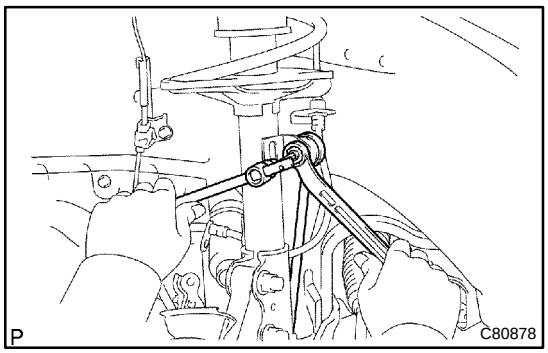
10. SEPARATE TIE ROD END SUB-ASSY LH

(a) Remove the cotter pin and nut.
(b) Using SST, disconnect the tie rod end sub-assy LH from the steering knuckle.
SST 09628-62011

11. SEPARATE TIE ROD END SUB-ASSY RH

SST 09628-62011

HINT:
Employ the same manner described above to the other side.

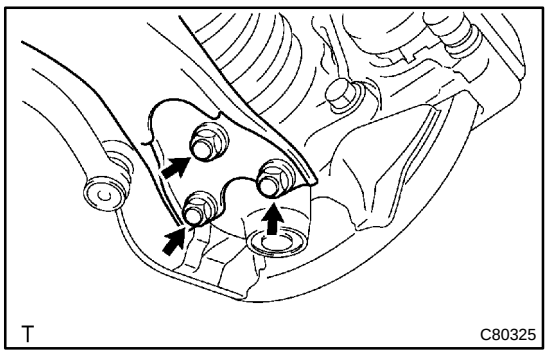


12. SEPARATE FRONT STABILIZER LINK ASSY LH

(a) Using a hexagon wrench (5 mm), hold the stud and remove the nut.
(b) Disconnect the front stabilizer link assy LH.

13. SEPARATE FRONT STABILIZER LINK ASSY RH

HINT:
Employ the same manner described above to the other side.



14. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

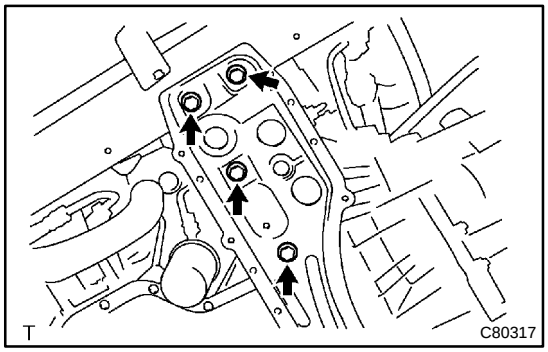
(a) Remove the bolt and 2 nuts, and disconnect the front suspension arm sub-assy lower No. 1 LH from the steering knuckle.

15. SEPARATE FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 RH

HINT:
Employ the same manner described above to the other side.

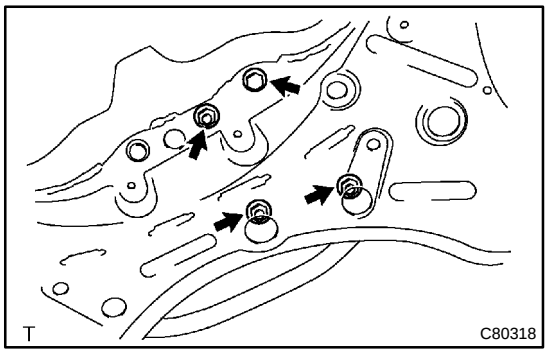
16. REMOVE HOOD SUB-ASSY

17. SUSPEND ENGINE ASSEMBLY



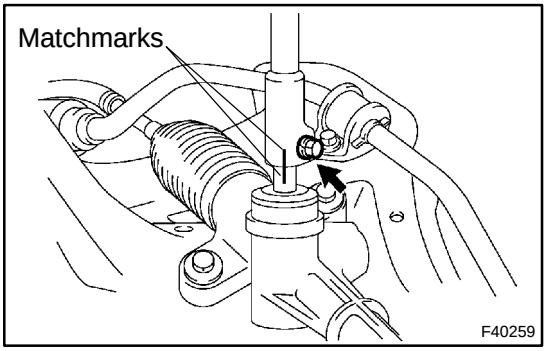
18. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSY

(a) Remove the 2 bolts and disconnect the center member from the engine mounting insulator FR.
(b) Remove the 2 bolts and disconnect the center member from the frame.



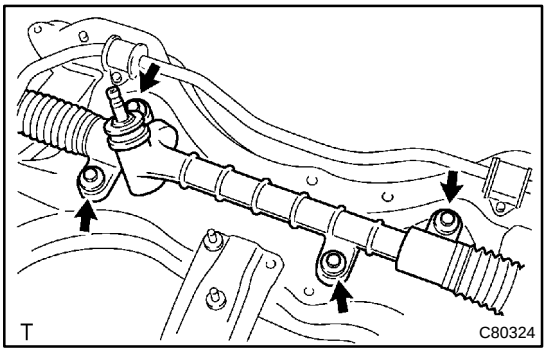
(c) Remove the bolt and 3 nuts, and disconnect the engine mounting insulator RR from the crossmember.
(d) Using a transmission jack, support the crossmember.
(e) Remove the 4 bolts and front suspension crossmember sub-assy with the steering gear assy.

19. REMOVE STEERING COLUMN HOLE COVER SUB-ASSY NO.1



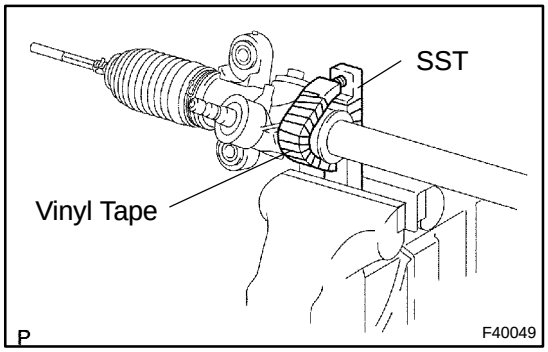
20. REMOVE STEERING INTERMEDIATE SHAFT

(a) Place matchmarks on the intermediate shaft and steering pinion shaft.
(b) Remove the bolt and steering intermediate shaft.



21. REMOVE STEERING GEAR ASSY

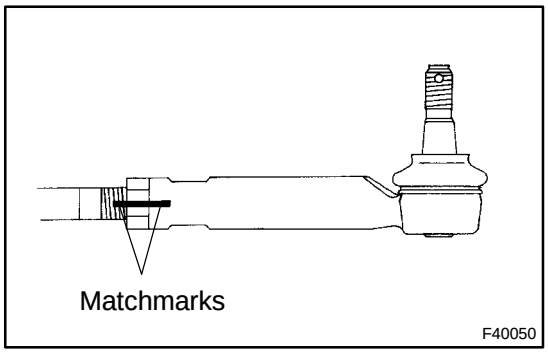
(a) TMC Made:
Remove the 4 bolts and steering gear assy from the crossmember.
(b) TMUK Made:
Remove the 4 bolts, 4nuts and steering gear assy from the crossmember.



22. FIX STEERING GEAR ASSY

(a) Using SST, secure the steering gear assy in a vise.
SST 09612-00012

HINT:
Tape the SST before use.

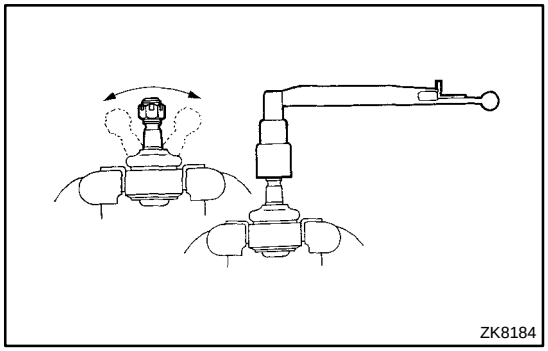


23. REMOVE TIE ROD END SUB-ASSY LH

(a) Place matchmarks on the tie rod end and rack end.
(b) Loosen the lock nut, and remove the tie rod end and lock nut.

24. REMOVE TIE ROD END SUB-ASSY RH

HINT:
Employ the same manner described above to the other side.

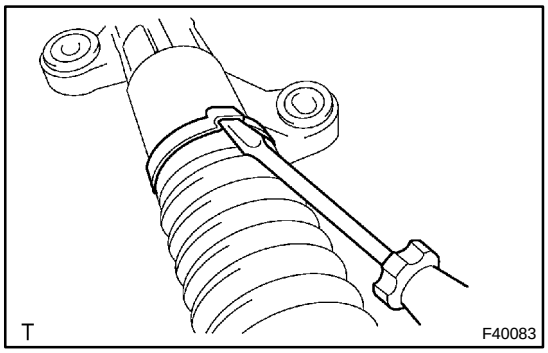


25. INSPECT TIE ROD END SUB-ASSY LH

(a) Secure the tie rod end LH in a vise.
(b) Install the nut to the stud bolt.
(c) Flip the ball joint stud back and forth 5 times.
(d) Using a torx wrench, turn the nut continuously at a rate of 2 - 4 seconds per 1 turn and take the torque reading of the 5th turn.
Turning torque:
0.49 - 3.43 N·m (5.0 - 35 kgf·cm, 4.34 - 30.38 in.·lbf)

26. INSPECT TIE ROD END SUB-ASSY RH

HINT:
Employ the same manner described above to the other side.

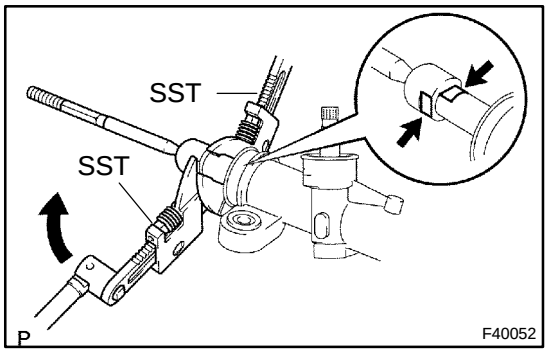


27. REMOVE STEERING RACK BOOT NO.1

(a) Using pliers, remove the clip.
(b) Using a screwdriver, unstake the boot clamp.
NOTICE:
Be careful not to damage the boot.
(c) Remove the boot clamp and rack boot.
HINT:
Mark the RH and LH rack boots.

28. REMOVE STEERING RACK BOOT NO.2

HINT:
Employ the same manner described above to the other side.

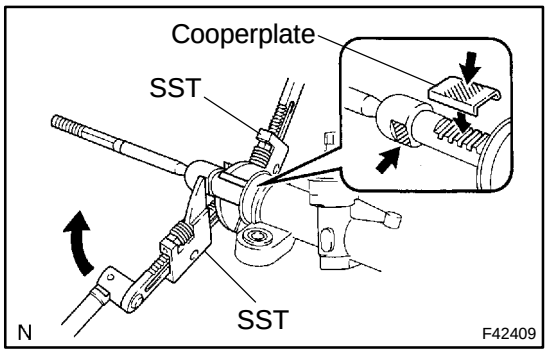


29. REMOVE STEERING RACK END SUB-ASSY

(a) TMC Made:
Using SST, hold the steering rack steadily and using another SST, remove the rack end.
SST 09922-10010

NOTICE:
Use SST 09922-10010 in the direction shown in the illustration.

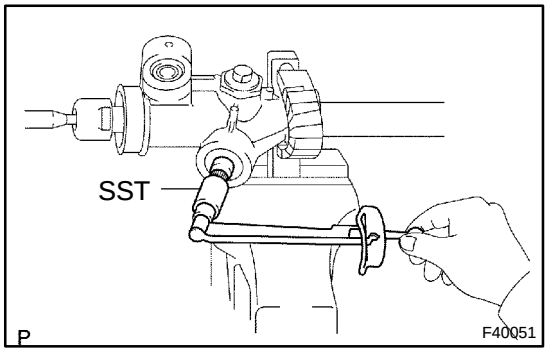
HINT:
Mark the RH and LH rack ends.



(b) TMUK Made:
Using copperplate and SST, hold the steering rack steadily and using another SST, remove the rack end.
SST 09922-10010

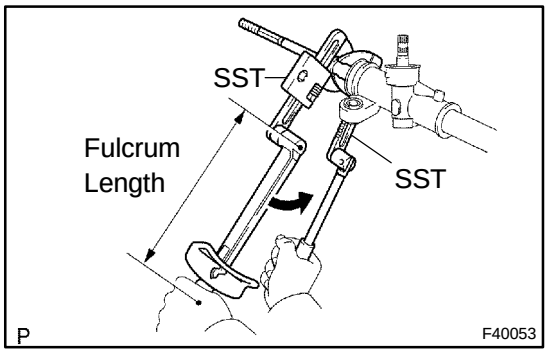
NOTICE:
Use SST 09922-10010 in the direction shown in the illustration.

HINT:
Mark the RH and LH rack ends.



30. INSPECT TOTAL PRELOAD

(a) Temporarily install the RH and LH rack ends.
(b) Using SST and a torque wrench, check the preload.
SST 09616-00011
Preload (turning):
0.60 - 1.30 N·m (6 - 13 kgf·cm, 5.31 - 11.51 in.·lbf)

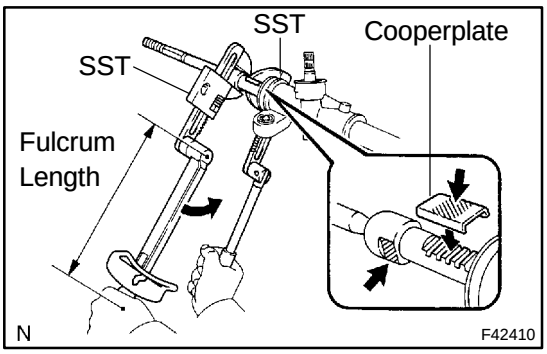


31. INSTALL STEERING RACK END SUB-ASSY

(a) TMC Made:
Using SST, hold the steering rack steadily and using another SST, torque the rack end.
SST 09922-10010
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

NOTICE:
Use SST 09922-10010 in the direction shown in the illustration.

HINT:
Use a torque wrench with a fulcrum length of 380 mm (14.96 in.)



(b) TMUK Made:
Using copperplate and SST, hold the steering rack steadily and using another SST, torque the rack end.
SST 09922-10010
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

NOTICE:
Use SST 09922-10010 in the direction shown in the illustration.

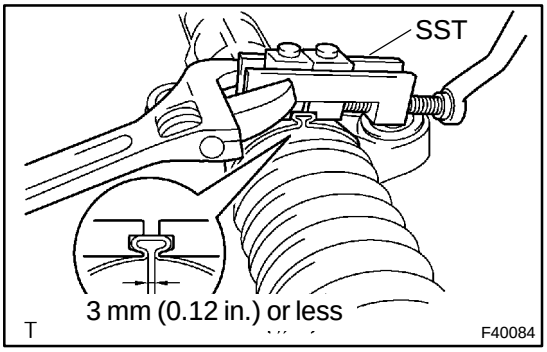
HINT:
Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).

32. INSTALL STEERING RACK BOOT NO.2

(a) Install the rack boot.

NOTICE:
Be careful not to damage or twist the boot.

(b) Install a new boot clamp.

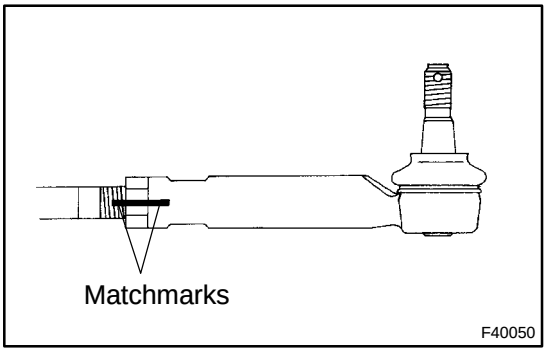


(c) Using SST, stake the boot clamp as shown in the illustration.

(d) Using pliers, install the clip.
SST 09521-24010, 09616-00011

33. INSTALL STEERING RACK BOOT NO.1

HINT:
Employ the same manner described above to the other side.
SST 09521-24010, 09616-00011



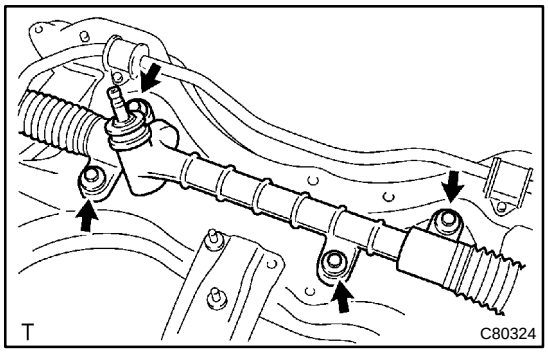
34. INSTALL TIE ROD END SUB-ASSY LH

(a) Screw the lock nut and tie rod end onto the rack end until the matchmarks are aligned.

(b) After adjusting toe-in, torque the nut
(See page 26-2).
Torque: 74 N·m (750 kgf·cm, 55 ft·lbf)

35. INSTALL TIE ROD END SUB-ASSY RH

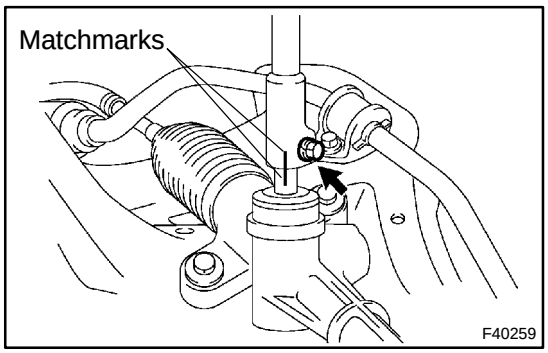
HINT:
Employ the same manner described above to the other side.



36. INSTALL STEERING GEAR ASSY

(a) TMC Made:
Install the steering gear assy to the crossmember with the 4 bolts.
Torque: 45 N·m (460 kgf·cm, 33 ft·lbf)

(b) TMUK Made:
Install the steering gear assy to the crossmember with the 4 bolts and 4 nuts.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

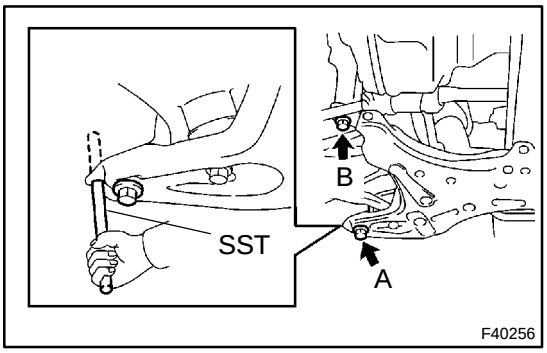


37. INSTALL STEERING INTERMEDIATE SHAFT

(a) Align the matchmarks on the steering intermediate shaft and steering pinion shaft.

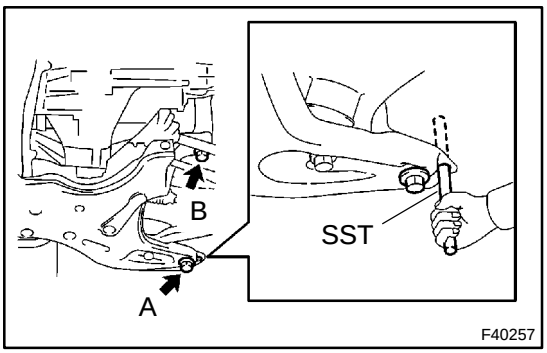
(b) Install the bolt.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

38. INSTALL STEERING COLUMN HOLE COVER SUB-ASSY NO.1



39. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSY

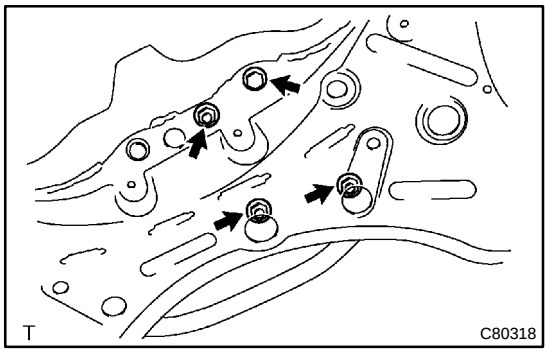
(a) Using SST, align the holes of the front suspension member RH and body, and temporarily tighten the bolt in order of A, B.
SST 09670-00010



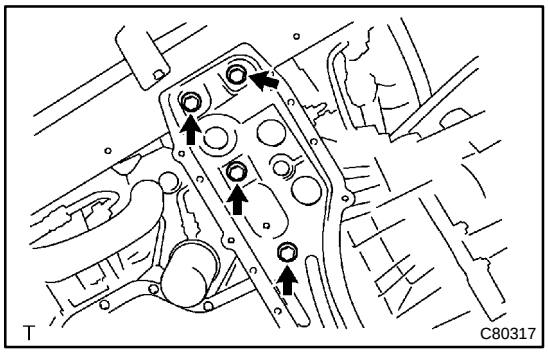
(b) Using SST, align the holes of the front suspension member LH and body, and temporarily tighten the bolt in order of A, B.
SST 09670-00010

(c) Using SST, align the holes of the front suspension member RH and body, and torque the bolt A and B.
SST 09670-00010
Torque:
Bolt A: 157 N·m (1,600 kgf·cm, 116 ft·lbf)
Bolt B: 113 N·m (1,152 kgf·cm, 83 ft·lbf)

(d) Using SST, align the holes of the front suspension member LH and body, and torque the bolt A and B.
SST 09670-00010
Torque:
Bolt A: 157 N·m (1,600 kgf·cm, 116 ft·lbf)
Bolt B: 113 N·m (1,152 kgf·cm, 83 ft·lbf)

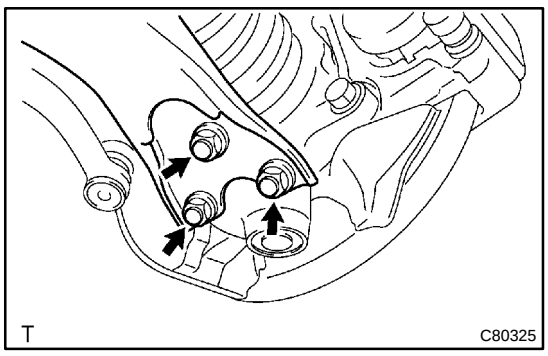


(e) Connect the engine mounting insulator RR to the cross-member with the bolt and 3 nuts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



(f) Install the center member to the frame with the 2 bolts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(g) Connect the engine mounting insulator FR to the center member with the 2 bolts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

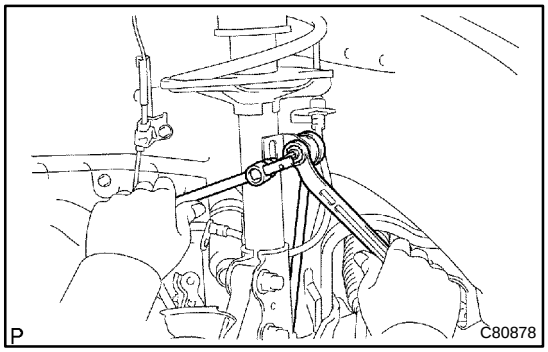


40. CONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH

(a) Connect the front suspension arm sub-assy lower No. 1 LH to the steering knuckle with the bolt and 2 nuts.
Torque: 142 N·m (1,450 kgf·cm, 105 ft·lbf)

41. CONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 RH

HINT:
Employ the same manner described above to the other side.



42. CONNECT FRONT STABILIZER LINK ASSY RH

(a) TMC Made:
Using a hexagon wrench (5 mm), hold the stud and connect the stabilizer link with the nut.
Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)

(b) TMUK Made:
Using a hexagon wrench (5 mm), hold the stud and connect the stabilizer link with the nut.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

43. CONNECT FRONT STABILIZER LINK ASSY LH

HINT:
Employ the same manner described above to the other side.

44. CONNECT TIE ROD END SUB-ASSY LH

(a) Connect the tie rod end LH with the nut.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(b) Install a new cotter pin.

NOTICE:
If the holes for a new cotter pin are not aligned, tighten the nut further up to 60 _.

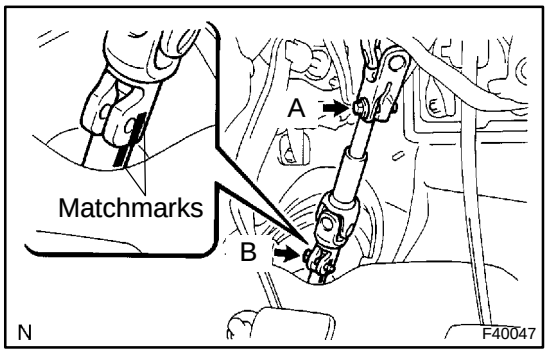
45. CONNECT TIE ROD END SUB-ASSY RH

HINT:
Employ the same manner described above to the other side.

46. INSTALL ENGINE UNDER COVER LH

47. INSTALL ENGINE UNDER COVER RH

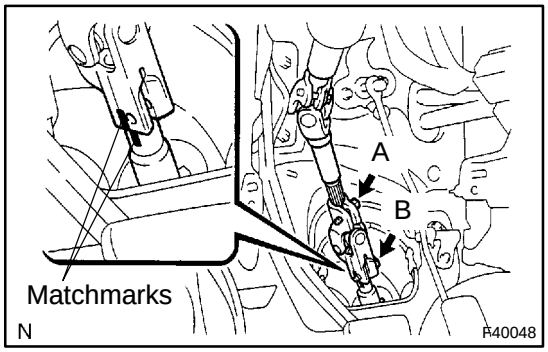
48. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



49. CONNECT STEERING INTERMEDIATE SHAFT ASSY NO.2(RHD STEERING POSITION TYPE)

(a) Align the matchmarks on the steering intermediate shaft and intermediate shaft assy No. 2.

(b) Install the bolt B and tignten the bolt A.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)



50. CONNECT STEERING SLIDING YOKE SUB-ASSY(LHD STEERING POSITION TYPE)

(a) Align the matchmarks on the steering intermediater shaft and sliding yoke sub-assembly.
(b) Install the bolt B and tighten the bolt A.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

51. INSTALL COLUMN HOLE COVER SILENCER SHEET

(a) Install the column hole cover silencer sheet with the 2 nuts.

52. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

HINT:
Do it with the front of the vehicle jacked up.

53. CENTER SPIRAL CABLE **(See page 50-14)**

54. INSTALL STEERING WHEEL ASSY

(a) Align the matchmarks on the steering wheel and steering column main shaft.
(b) Temporarily tighten the steering wheel set nut.

55. STEERING WHEEL CENTER POINT

(a) Check the steering wheel center point.
(b) Torque the steering wheel set nut.
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

56. INSTALL HORN BUTTON ASSY
(See page 50-15)

57. INSPECT HOOD SUB-ASSY

58. ADJUST HOOD SUB-ASSY
(See page 75-2)

59. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT **(See page 26-2)**

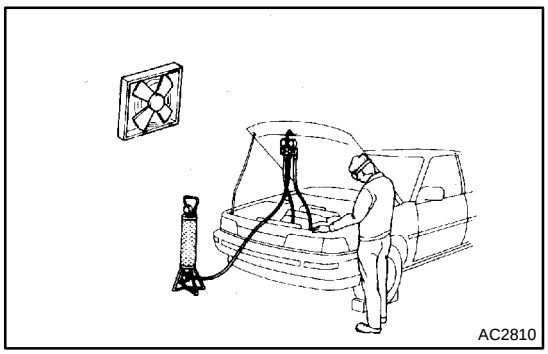
HEATER & AIR CONDITIONER

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INSPECTION 55-7/9
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REPLACEMENT 55-116

AIR CONDITIONING SYSTEM

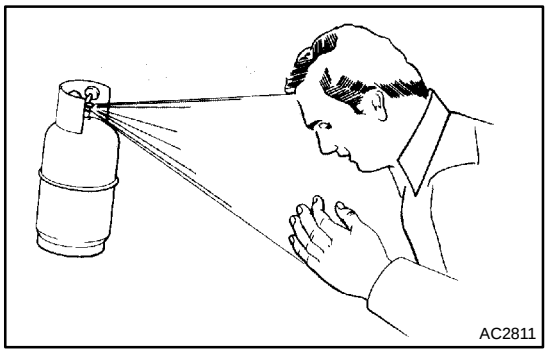
PRECAUTION

5500Z-02



1. DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR NEAR AN OPEN FLAME

2. ALWAYS WEAR EYE PROTECTION



3. BE CAREFUL NOT TO GET LIQUID REFRIGERANT IN YOUR EYES OR ON YOUR SKIN

If liquid refrigerant gets in your eyes or on your skin.

(a) Wash the area with lots of cool water.

CAUTION:

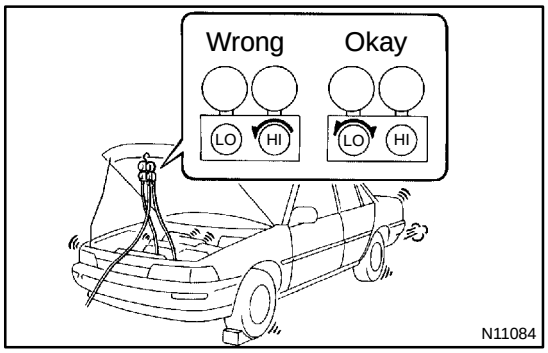
Do not rub your eyes or skin.

(b) Apply clean petroleum jelly to the skin.

(c) Go immediately to a physician or hospital for professional treatment.

4. NEVER HEAT CONTAINER OR EXPOSE IT TO NAKED FLAME

5. BE CAREFUL NOT TO DROP CONTAINER AND NOT TO APPLY PHYSICAL SHOCKS TO IT



6. DO NOT OPERATE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN REFRIGERANT SYSTEM

If there is not enough refrigerant in the refrigerant system oil lubrication will be insufficient and compressor burnout may occur, so take care to avoid this, necessary care should be taken.

7. DO NOT OPEN HIGH PRESSURE MANIFOLD VALVE WHILE COMPRESSOR IS OPERATING

If the high pressure valves opened, refrigerant flows in the reverse direction and could cause the charging cylinder to rupture, so open and close the only low pressure valve.

8. BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT

If refrigerant is overcharged, it causes problems such as insufficient cooling, poor fuel economy, engine overheating etc.

550FZ-01

PROBLEM SYMPTOMS TABLE

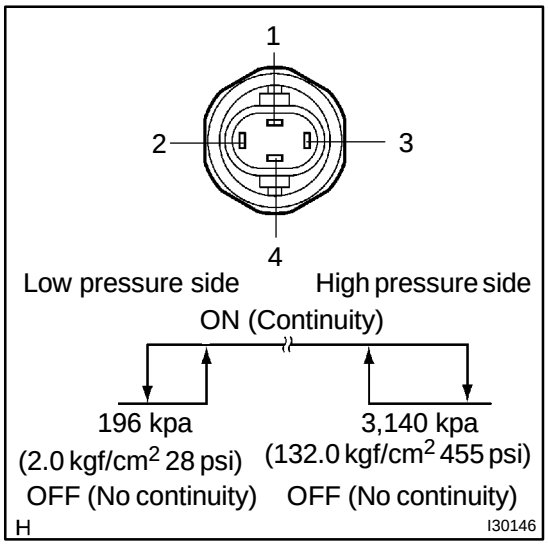
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
No blower operation	4. HEATER Fuse	-
	5. Heater relay	55-7
	6. Blower motor	55-7
	7. Blower resistor	55-7
	8. Blower switch	-
	9. Wire harness	-
No air temperature control	1. Engine coolant volume	-
	2. A/C control assy	55-7
No compressor operation	1. Refrigerant volume	55-19
	2. A/C Fuse	-
	3. Magnetic clutch	55-4
	4. Compressor	-
	5. Pressure switch	55-4
	6. Heater relay	55-7
	7. Blower switch	-
	8. A/C switch	55-7
	9. A/C amplifier assy	55-4
	10. Thermistor	55-7
	11. Wire harness	-
No cool air comes out	1. Refrigerant volume	55-19
	2. Refrigerant pressure	55-19
	3. Drive belt	55-34
	4. Magnetic clutch	55-4
	5. Pressure switch	55-4
	6. Thermistor	55-7
	7. A/C switch	55-7
	8. A/C amplifier assy	55-4
	9. A/C control assy	55-7
	10. Wire harness	-
Insufficient cooling	1. Refrigerant volume	55-19
	2. Drive belt	55-34
	3. Magnetic clutch	55-4
	4. Compressor	55-74 55-80 55-86 55-92
	5. Condenser	55-98
	6. Receiver	-
	7. Expansion valve	-
	8. Evaporator	-
	9. Refrigerant lines	55-19
	10. Pressure switch	55-4
	11. A/C amplifier assy	55-4
	12. A/C control assy	55-7
No engine idle-up when A/C switch ON	1. A/C amplifier assy	55-4
	2. Idle control system	-
	3. Wire harness	-
No air inlet control	1. A/C control assy	55-7
No mode control	1. A/C control assy	55-7
Brightness does not change when light control switch is turned	1. Headlight and taillight system	-
	2. A/C switch	55-7

No condenser fan operation (Gasoline, Low speed condition)	1. RDI FAN Fuse 2. FAN No.1 relay 3. FAN No.2 relay 4. Radiator fan motor 5. Radiator fan resistor 6. A/C amplifier assy 7. Wire harness	- - - 55-7 55-7 55-4 -
No condenser fan operation (Gasoline, High speed condition)	1. RDI FAN Fuse 2. FAN No.1 relay 3. FAN No.2 relay 4. Pressure switch 5. Radiator fan motor 6. A/C amplifier assy 7. Wire harness	- - - 55-7 55-7 55-4 -
No condenser fan operation (Diesel, Low speed condition)	1. CDS FAN Fuse 2. RDI FAN Fuse 3. FAN No.2 relay 4. FAN No.3 relay 5. Radiator fan motor 6. A/C condensor fan motor 7. A/C amplifier assy 8. Wire harness	- - - - 55-7 55-7 55-4 -
No condenser fan operation (Diesel, High speed condition)	1. CDS FAN Fuse 2. RDI FAN Fuse 3. FAN No.1 relay 4. FAN No.2 relay 5. FAN No.3 relay 6. Radiator fan motor 7. A/C condensor fan motor 8. Water temp. switch 9. A/C pressure switch 10. A/C amplifier assy 11. Wire harness	- - - - - 55-7 55-7 55-7 55-7 55-4 -

5501E-02

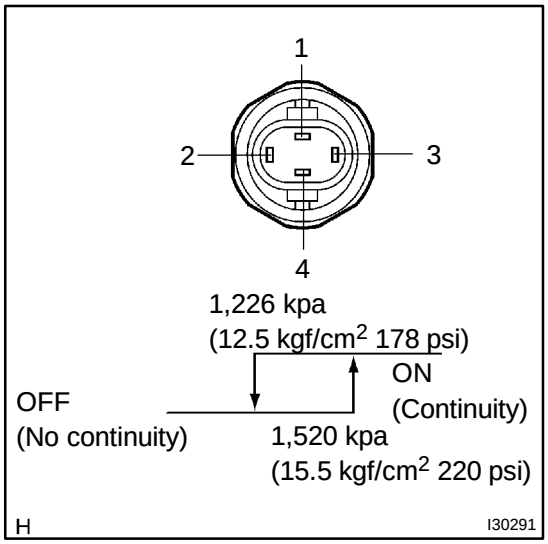
ON-VEHICLE INSPECTION



1. INSPECT PRESSURE SWITCH NO.1.

(a) Magnetic clutch control:
Inspect pressure switch operation.
(1) Set on the manifold gauge set.
(2) Connect the positive (+) lead from the ohmmeter to terminal 4 and the negative (–) lead to terminal 1.
(3) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

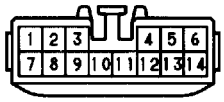
If operation is not as specified, replace the pressure switch.



(b) Cooling fan control:
Inspect pressure switch operation.
(1) Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (–) lead to terminal 3.
(2) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.

Wire Harness Side:



Z13472

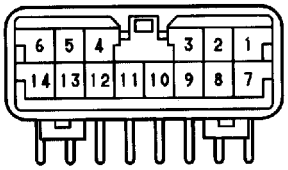
2. INSPECT AIR CONDITIONER AMPLIFIER CIRCUIT

(a) Disconnect the connector from the A/C amplifier assy and inspect the on wire harness side, as shown the chart.

Tester connection	Condition	Specified condition
5 - Ground	Constant	Continuity
3 - 13	Evaporator temp.: 25 _C (78 _F)	1.5 kΩ
8 - Ground	Ignition switch ON and A/C switch ON	Battery voltage
8 - Ground	Ignition switch ON and A/C switch OFF	No voltage

If the circuit is as specified, try to replace the A/C amplifier assy with a new one. If the circuit is as specified, inspect the circuits connected to other parts.

From Back Side:



e-14-2-F

Z13473

(b) Connect the connector to A/C amplifier assy and inspect wire harness side connector from the back side, as shown in the chart.

Tester connection	Condition	Specified condition
1 - Ground	Start engine and A/C switch OFF. Engine speed: Idle speed	10 - 14 V
1 - Ground	Start engine and A/C switch ON. Engine speed: Idle-up speed	Below 1 V
2 - Ground	Start engine and A/C switch ON Refrigerant pressure is less than 196 kPa or more than 3,140 kPa	Below 1 V
2 - Ground	Start engine and A/C switch ON Refrigerant pressure is 196 - 3,140 kPa	Battery voltage
6 - Ground	Start engine and A/C switch ON Magnetic clutch is engaged	Below 2 V
6 - Ground	Start engine and A/C switch ON Magnetic clutch is not engaged	Battery voltage
6 - Ground	Start engine and A/C switch ON Refrigerant pressure is less than 1,226 kPa	Battery voltage
6 - Ground	Start engine and A/C switch ON Refrigerant pressure is more than 1,520 kPa	Below 1 V
7 - Ground	Start engine and A/C switch ON Magnetic clutch is engaged	5 - 6 V
7 - Ground	Start engine and A/C switch ON Magnetic clutch is not engaged	Below 1 V

Tester connection	Condition	Specified condition
10 - Ground	Start engine and A/C switch ON	Below 4 V
10 - Ground	Start engine and A/C switch OFF	No voltage

If the circuit is as specified, try to replace the A/C amplifier assy with a new one. If the circuit is as specified, inspect the circuits connected to other parts.

3. INSPECT MAGNETIC CLUTCH ASSY

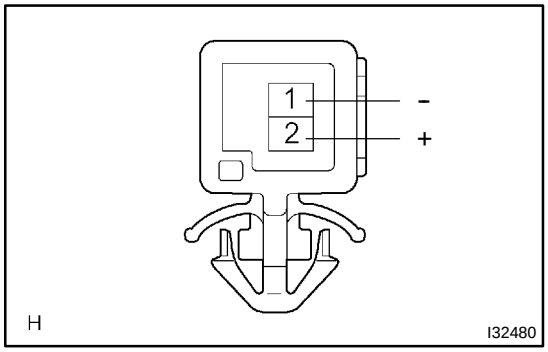
(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to the body ground.

(b) Check that the magnetic clutch energized.

If operation is not as specified, replace the magnet clutch assy.

550G0-01

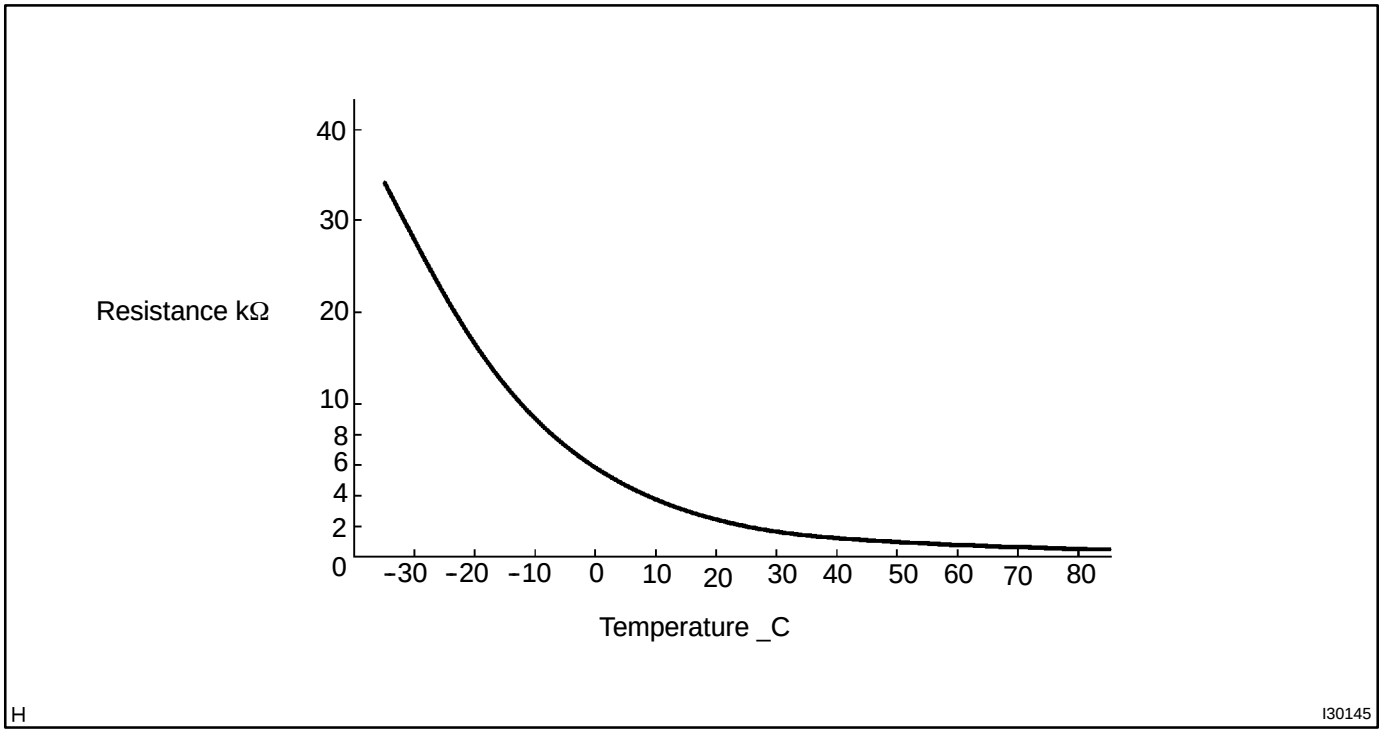
INSPECTION



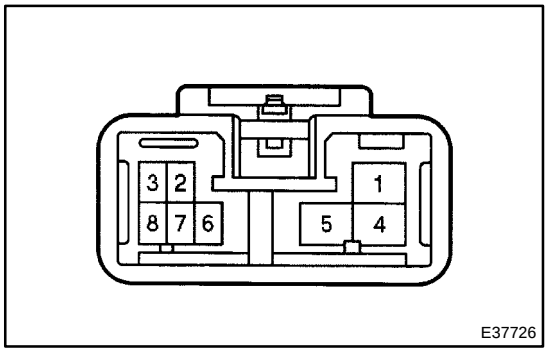
1. COOLER THERMISTOR NO.1 (MANUAL AIR CONDITIONER)

(a) Check resistance between terminals 1 and 2 of cooler thermistor No. 1 at each temperature, as shown in the chart.

Resistance:



If resistance value is not as specified, replace the sensor.



2. AIR CONDITIONING CONTROL ASSY (MANUAL AIR CONDITIONER)

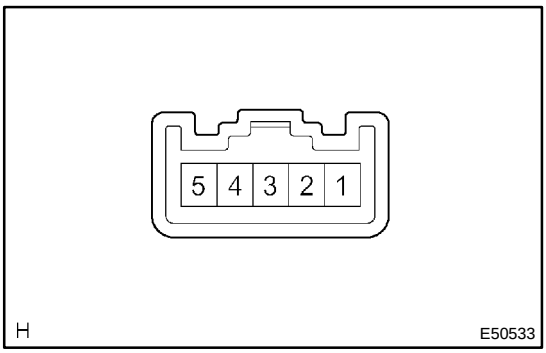
(a) Inspect blower switch continuity.

Condition / Circuit	Tester connection	Specified condition
OFF	-	No continuity
LO	1 - 8	Continuity
M1	1 - 6 - 8	Continuity
M2	1 - 5 - 8	Continuity
HI	1 - 4 - 8	Continuity

If continuity is not as specified, replace the air conditioner control assy.

(b) Inspect illumination operation.
Connect the positive (+) lead from the battery to terminal 2 and negative (-) lead to terminal 3 then check that the illuminations light up.

If there is bulb not light up, replace the bulb.



3. COOLER SWITCH (MANUAL AIR CONDITIONER)

(a) Inspect switch continuity.
Check the continuity between terminals while switch is pressed, as shown in the chart.

Tester connection	Specified condition
2 - 5	Continuity

If continuity is not as specified, replace the cooler switch.

(b) Inspect illumination operation.
Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 3 then check that the illuminations light up.

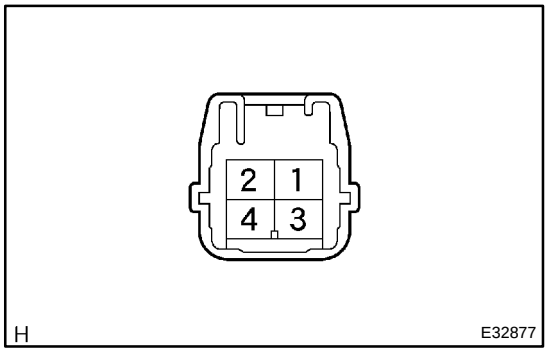
If operation is not as specified, replace the cooler switch.

(c) Inspect indicator operation.
(1) Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1.
(2) Push the A/C button in and then check that the indicator lights up.

If operation is not as specified, replace the cooler switch.

(d) Inspect dimming operation.
(1) Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1 while press the switch.
(2) Connect the positive (+) lead from battery to terminal 4 and then check that the indicator dims.

If operation is not as specified, replace the cooler switch.

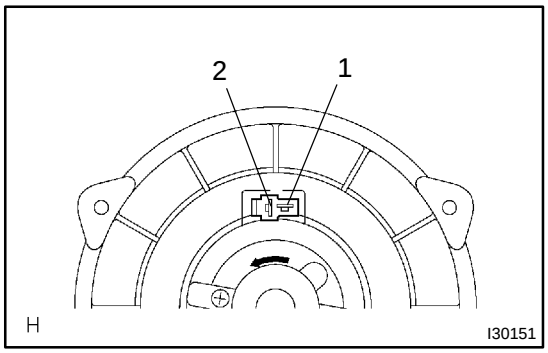


4. BLOWER RESISTOR (MANUAL AIR CONDITIONER)

(a) Measure resistance between terminals, as shown in the chart below.

Tester connection	Specified condition
1 - 2	1.398 - 1.605 Ω
1 - 3	0.465 - 0.535 Ω
1 - 4	3.069 - 3.531 Ω

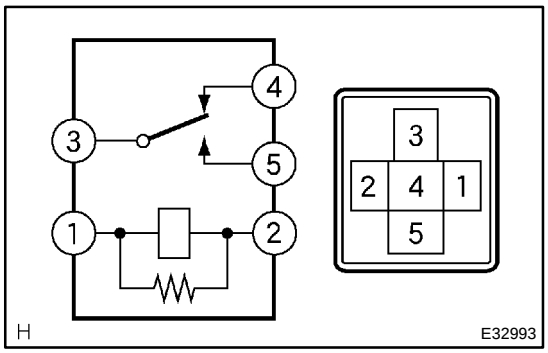
If resistance is not as specified, replace the blower resistor.



5. BLOWER W/FAN MOTOR SUB-ASSY (MANUAL AIR CONDITIONER)

(a) Connect the positive (+) lead from the battery to terminal 2 and negative (-) to terminal 1, then check that the motor operation smoothly.

If operation is not as specified, replace the blower motor.



6. HEATER BLOWER MOTOR RELAY ASSY (MANUAL AIR CONDITIONER)

Condition	tester connection	Specified condition
constant	1 - 2 3 - 4	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If continuity is not as specified, replace the heater blower motor relay.

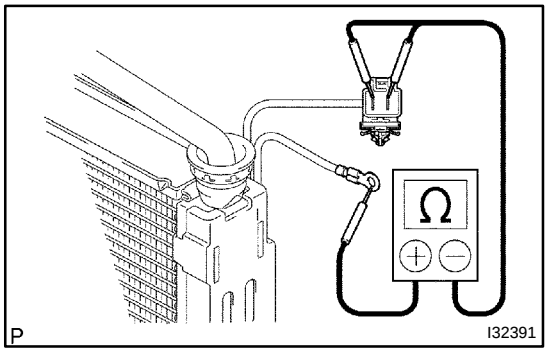
ELECTRICAL TYPE POWER HEATER SYSTEM

PROBLEM SYMPTOMS TABLE

550G1-01

Symptom	Suspect Area	See page
PTC heater does not operate, when perform in these conditions: S Engine coolant temp.: 60_C (140_F) or below S Engine speed: 650 rpm or above	1. HTR1 Fuse	-
	2. HTR2 Fuse	-
	3. HTR1 relay	-
	4. HTR2 relay	-
	5. PTC heater	55-11
	6. ECM	-
	7. Wire harness	-

550G2-01



INSPECTION

1. HEATER ASSY

(a) Check continuity.

(1) Using an ohmmeter, check continuity exists between each terminal of connector and earth wire.

If no continuity, replace the heater radiator.

COMBUSTION TYPE POWER HEATER SYSTEM

ON-VEHICLE INSPECTION

550FX-01

NOTICE:

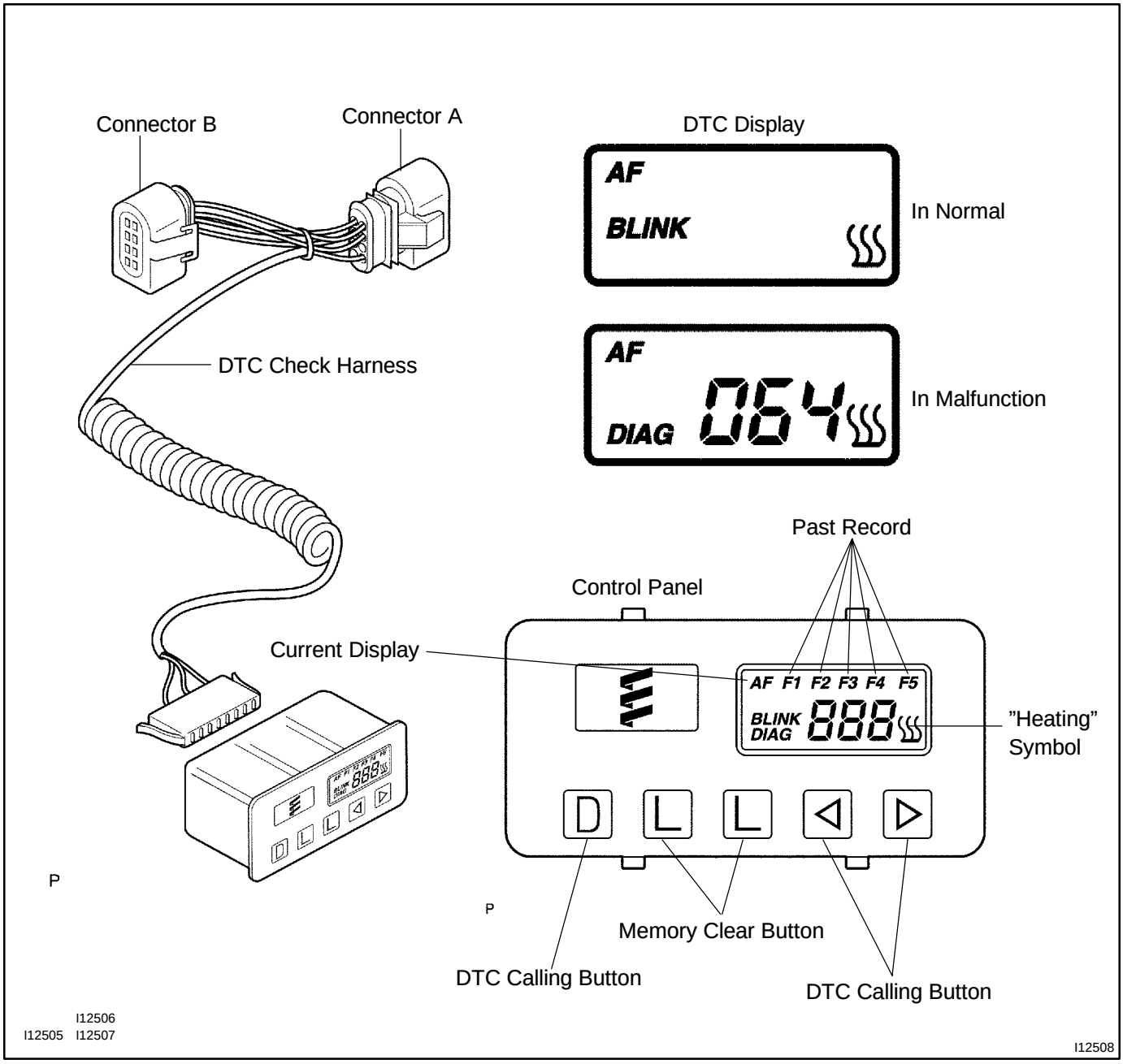
- **If the glow plug breaks, the ECU detects the breakage and stops the automatic operation, so the burner heater does not activate. (For other failures, similarly activated.)**
- **The cause of failures (such as voltage malfunction, overheating malfunction, short-circuit or breakage of functional componects, etc.) and how to remedy are shown by connecting the DTC tester and reading the DTC.**

1. DIAGNOSTICS FUNCTION

(a) Connect the DTC tester between the connector A (Vehicle harness) of DTC check harness and connector B (Power heater harness).

(b) Start the engine.

(c) Pressing the DTC calling button displays a 3-digit number DTC.



2. DESCRIPTION OF DISPLAY AND BUTTONS

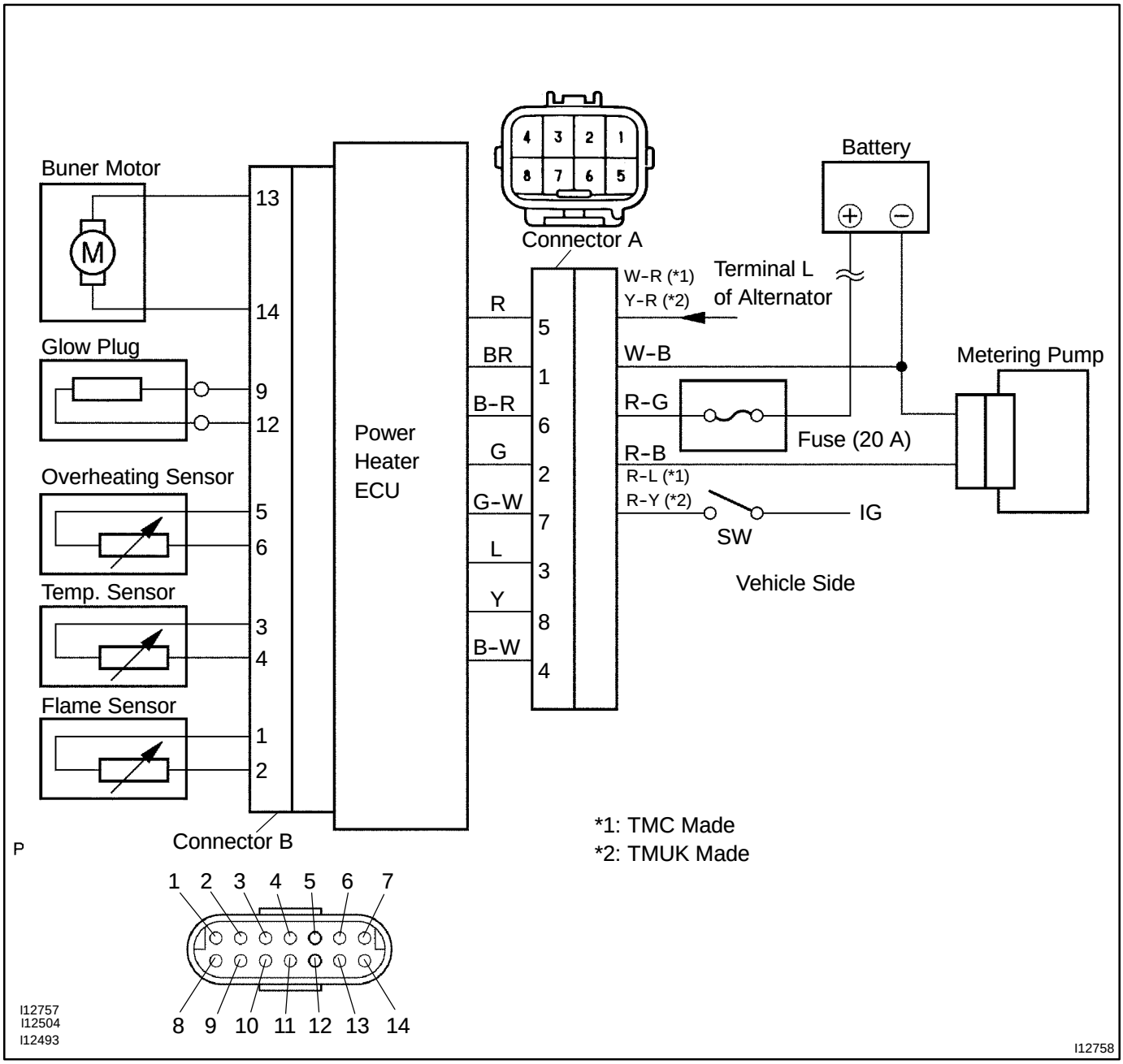
(a) AF: Current Value Malfunction (Blinking at current failure)
Diag: DTC (Example: 064 Flame sensor break)
Memory Clear button: Deletion of faulty memory (Press both buttons together for longer than 2 sec.)
> Button: Scroll up of faulty memory (The past 5 codes can be stored.)
< Button: Scroll down of faulty memory (The past 5 codes can be stored.)

3. FAULTY MEMORY

(a) The ECU is able to store up to 5 pieces of faulty memory. If it is full, the new data is written over F5.

4. WIRING DIAGRAM

(a) Wire colors are indicated by an alphabetical code.
B = Black W = White BR = Brown L = Blue R = Red G = Green Y = Yellow V = Violet
The first letter indicates the basic wire color and the second letter indicates the color of the stripe.



5. DIAGNOSTIC TROUBLE CODE CHART

If a malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the appropriate page.

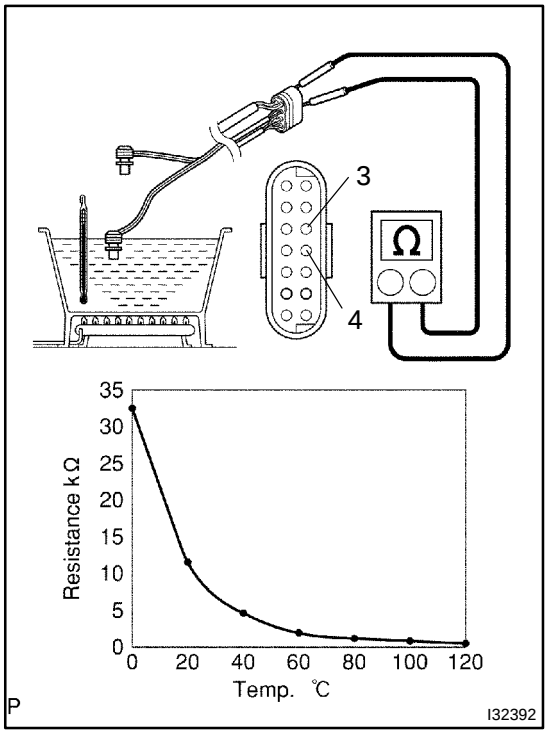
DTC No.	Description of fault	Comment / Remedy
000	No malfunction	–
010 011	Overvoltage shutoff Undervoltage shutoff	Voltage between 1 and 5 at connector A > 16 V Voltage between 1 and 5 at connector A < 10.2 V (Voltage values must be present > 20 seconds) Check battery, regulator and electrical leads.
012	Overheating	Check temperature at temperature or overheating sensor > 125 _C Check water circuit.
014	Possible overheating detected (Hardware threshold value)	Difference of measured values at temperature sensor > 15 _C (min. 70 _C water temperature and metering pump in operation); Check temperature sensor and overheating sensor, replace if necessary.
017	Overheating delected (Hardware threshold value)	Temperature at temperature or overheating sensor > 130 _C, emergency OFF if DTC No. 012 or 014 not applicable; Check water circuit, check temperature sensor and overheating sensor, replace if necessary.
020	Glow plug break	Check glow plug, replace if necessary.
021	Glow plug output overload	Check glow plug, replace if necessary.
030	Combustion air blower motor EMF outside perm. range.	Blower impeller or burner motor fammed (frozen solid, dirty, etc.) Remedy jam, replace burner motor if necessary.
031	Combustion air blower motor break	Check lead to combustion air motor (burner motor) for continuity, replace if necessary.
032	Combustion air blower motor short–circuit	Check combustion air blower motor (burner motor), replace if necessary. Check supply lead (chafed, etc.).
047	Metering pump short–circuit	Check supply lead to metering pump for short–circuit, check metering pump, replace if necessary.
048	Metering pump break	Check supply lead to metering pump for continuity, remedy break, replace metering pump if necessary.
051	Cold blow time exceeded	At start, if flame sensor above 70 _C > 240 sec.; Check exhaust gas combustion air supply, check flame sensor, replace if necessary.
052	Safety time exceeded	When all perm. start attempts used up; Check fuel delivery and fuel supply. Check exhaust gas and combustion air ducts.
054 056	Flame cutout, High setting Flame cutout, LOW setting	Check fuel delivery and fuel supply. Check exhaust gas combustion air ducts. If combustion OK → Check flame sensor, replace if necessary.
060	Temperature sensor break	Check connecting leads. Resistance value between 6 and 13 connector B > 2 MΩ (if break)
061	Temperature sensor short–circuit	Check connecting leads. Resistance value between 6 and 13 at connector B < 2 MΩ (If short– circuit)
064	Flame sensor break	Check connecting leads. Resistance value between 7 and 14 at connector B > 3,040 Ω (If break)
065	Flame sensor short–circuit	Check connecting leads. Resistance value between 7 and 14 at connector B > 780 Ω (If short–circuit)

DTC No.	Description of fault	Comment / Remedy
071	Overheating sensor break	Check connecting leads. Resistance value between 5 and 12 at connector B > 2 MΩ (If break)
072	Overheating sensor short-circuit	Check connecting leads. Resistance value between 5 and 12 at connector B > 50 Ω (If short-circuit)
090 092 093	Control unit detective (Internal fault / Reset) Control unit detective (ROM error) Control unit detective (RAM error)	Control unit malfunction due to interference voltage from vehicle electrical system; possible causes low batteries, chargers, other sources of interference; eliminate interference voltages. Internal faults detected in microprocessor / memory detected. Replace control unit.
097	Internal control unit faults	Other faults which cannot lead to DTC No. 90, 92 and 93, replace control unit.

550FY-01

INSPECTION

1. HEATER WIRING

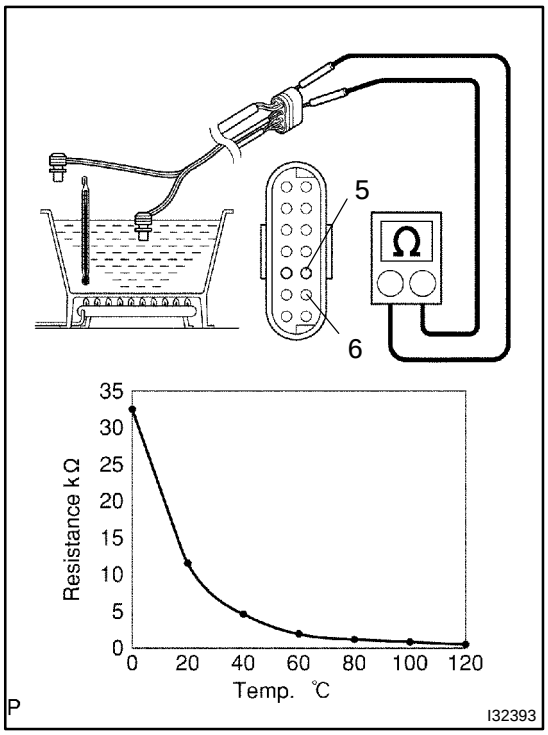


(a) Inspect the water temperature sensor.

(1) Using an ohmmeter, measure the resistance between the terminals 3 and 4 of heater wire.

Resistance: Refer to the graph

If the resistance is not as specified, replace the heater wire.

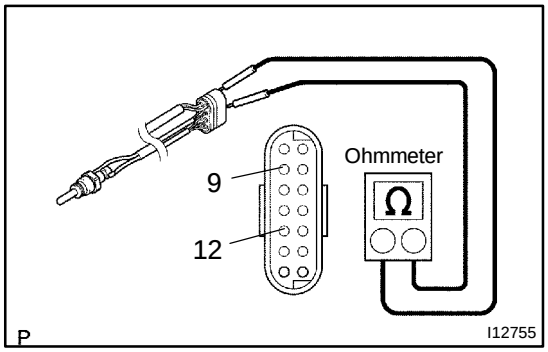


(b) Inspect the overheat sensor.

(1) Using an ohmmeter, measure the resistance between the terminals 5 and 6 of heater wire.

Resistance: Refer to the graph

If the resistance is not as specified, replace the heater wire.

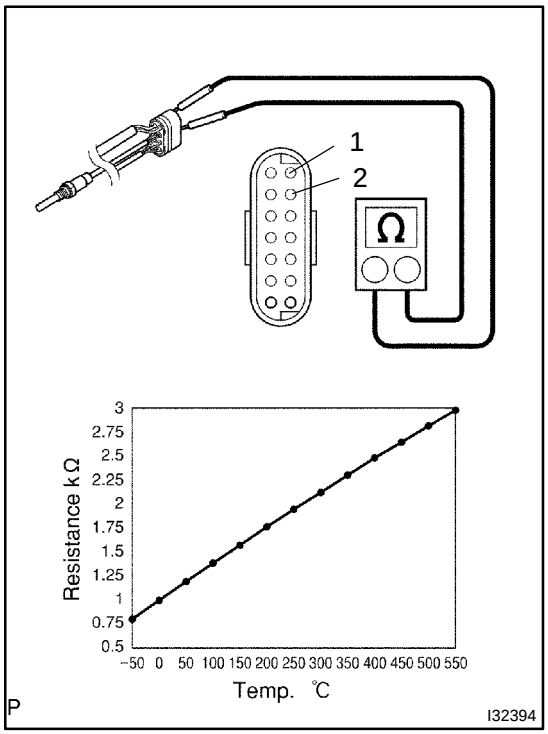


(c) Inspect the glow plug.

(1) Using an ohmmeter, check the continuity by measure the resistance between terminals 9 and 12 of heater wire.

Standard resistance: about 0.5 Ω (20_C, reference value)

If the resistance is over 1 Ω, replace the heater wire.

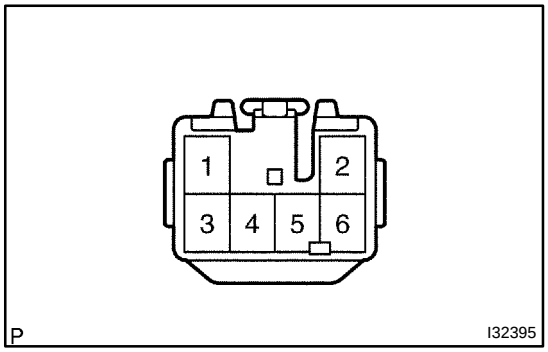


(d) Inspect the flame sensor.

(1) Using an ohmmeter, measure the resistance between terminals 1 and 2 of heater wire.

Resistance: Refer to the graph

If the resistance is not as specified, replace the heater wire.



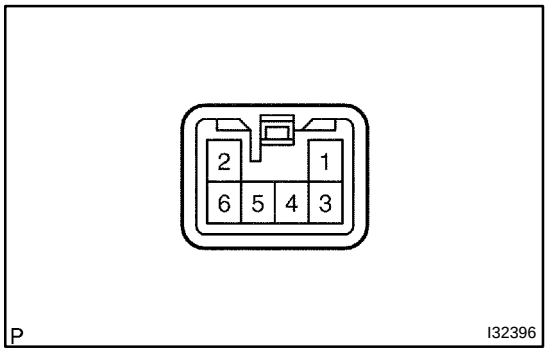
2. HETER SWITCH ASSY

(a) Disconnect the connector from the power heater switch and inspect the connector on the wire harness side, as shown in the chart.

Tester connection	Condition	Specified condition
2 - Ground	Constant	Continuity
4 - Ground	Constant	Continuity
1 - Ground	Turn ignition switch ON	Battery voltage
1 - Ground	Turn ignition switch OFF	No voltage
3 - Ground	Turn light control switch TAIL or HEAD	Battery voltage
3 - Ground	Turn light control switch OFF	No voltage

S If the circuit is as specified, replace the power heater switch.

S If the circuit is not as specified, inspect the circuits connected to other parts.



(b) Connect the connector to the power heater switch and inspect the connector from the back side, as shown in the chart.

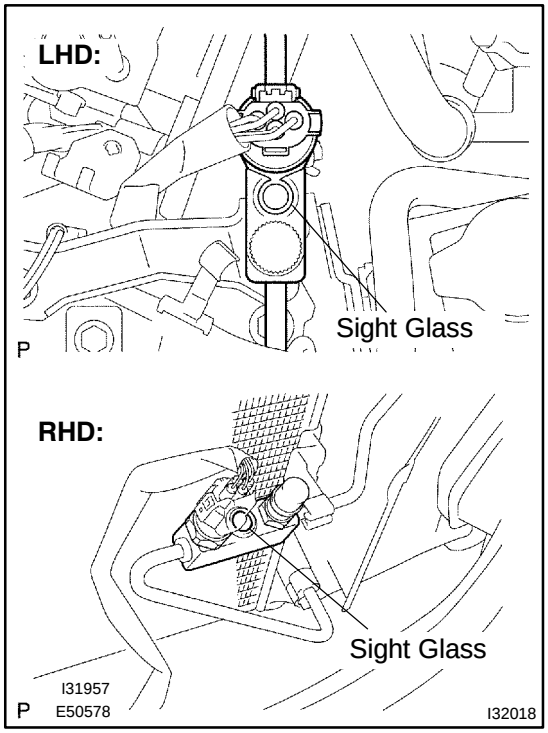
Tester connection	Condition	Specified condition
6 – Ground	Turn ignition switch ON and power heater switch ON	Battery voltage
6 – Ground	Turn ignition switch ON and power heater switch ON	No voltage

S If the circuit is not as specified, replace the power heater switch.

REFRIGERANT

ON-VEHICLE INSPECTION

550G3-01



1. **Except Hatchback Only:**
INSPECT REFRIGERANT VOLUME ON SIGHT GLASS

(a) Observe the sight glass on the liquid tube.
Test conditions:
- Running engine at 1,500 rpm
- Blower speed control switch at "HI"
- A/C switch ON
- Temperature control dial at "MAX. COOL"
- Fully open the doors

Item	Symptom	Amount of refrigerant	Corrective Actions
1	Bubbles present	Insufficient*	(1) Check for gas leakage and repair if necessary (2) Add refrigerant until bubbles disappear
2	No bubbles present	None, insufficient or too much	Refer 3 and 4
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Add refrigerant until bubbles disappear
4	Considerable temperature difference between compressor inlet and outlet.	Correct or too much	Refer to 5 and 6
5	Immediately after air conditioning is turned off, refrigerant clear	Too much	(1) Discharge refrigerant (2) Remove air and supply proper amount or purified refrigerant
6	Immediately after air conditioning is turned off, refrigerant foams and then becomes clear	Correct	-

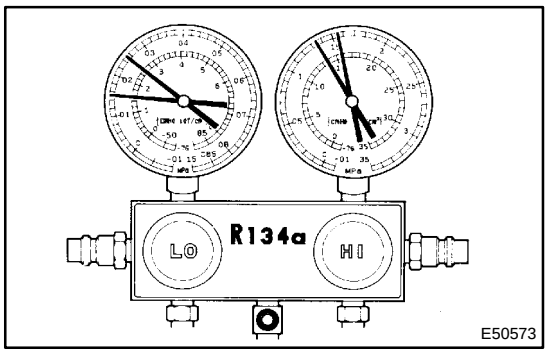
*: Bubbles in the sight glass with ambient temperatures higher than usual can be considered normal if cooling is sufficient.

2. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

(a) This is a method in witch the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when the these conditions are established.

Test conditions:

- Temperature at the air inlet with the switch set at RECIRC is 30 – 35 ˚C (86 – 95 ˚F)
- Engine running at 1500 rpm
- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position
- A/C switch ON
- Fully open doors



E50573

(1) Normally functioning refrigeration system.

Gauge reading:

Low pressure side:

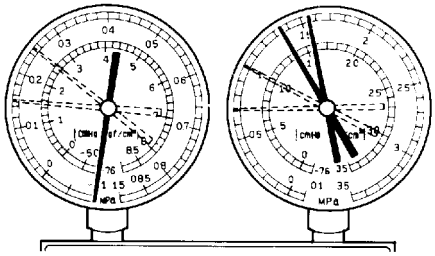
0.15 – 0.25 MPa (1.5 – 2.5 kgf/cm^2)

High pressure side:

1.37 – 1.57 MPa (14 – 16 kgf/cm^2)

(2) Moisture present in refrigeration system.

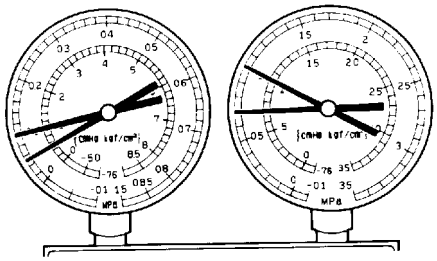
Condition : Periodically cools and then fails to cool


I22117

Symptom	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture in refrigerating system freezes at expansion valve orifice causing a temporary stop of cycle, however, when it melts, normal state is restored.	- Drier in oversaturected state - Moisture in refrigerating system freezes at expansion valve orifice and blocks circulation of refrigerant	(1) Replace condenser (2) Remove moisture in cycle by repeatedly evacuating air (3) Supply proper amount of new refrigerant

(3) Insufficient cooling

Condition: Cooling system does not function effectively.

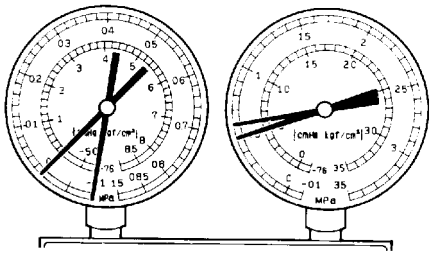


I22118

Symptom	Probable cause	Diagnosis	Corrective Actions
S Pressure low on both low and high pressure sides S Sedan / Station Wagon Only: Bubbles seen thought sight glass continuously S Insufficient cooling performance	Gas leakage in refrigeration system	S Insufficient refrigerant S Refrigerant leaking	(1) Check for gas leakage and repair if necessary (2) Supply proper amount of new refrigerant (3) If indicated pressure value is close to a 0 when connected to gauge, create the vacuum after inspecting and repairing location of leak

(4) Poor circulation of refrigerant

Condition: Cooling system close not function effectively.

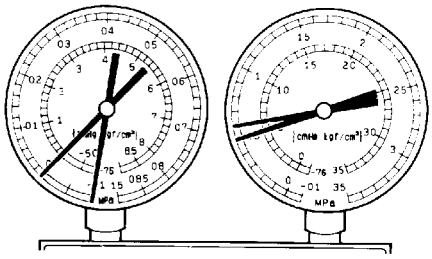


I22119

Symptom	Probable cause	Diagnosis	Corrective Action
S Pressure low on both low and high pressure sides S Frost on pipe from condenser to unit	Refrigerant flow obstructed by dirt in receiver	Receiver clogged	Replace condenser

(5) Refrigerant does not circulate

Condition: Cooling system does not function. (Sometimes it way function)

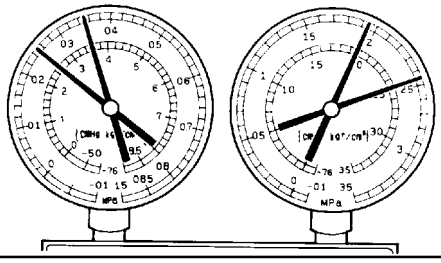


I22120

Symptom	Probable cause	Diagnosis	Corrective Actions
S Vacuum indicated on low pressure side, very low pressure indicated on high pressure side S Frost or dew seen on piping before and after receiver/ drier or expansion valve	S Refrigerant flow obstructed by moisture or dirt in refrigerating system S Refrigerant flow obstructed by gas leaked from expansion valve	Refrigerant does not circulate	(1) Check expansion valve (2) Clean out dirt in expansion valve by air blowing (3) Replace condenser (4) Evaporate air and supply proper amount of new refrigerant. (5) For gas leakage from expansion valve, replace expansion valve

(6) Refrigerant overcharged or insufficient cooling of condenser

Condition: Cooling system does not function dftectively.

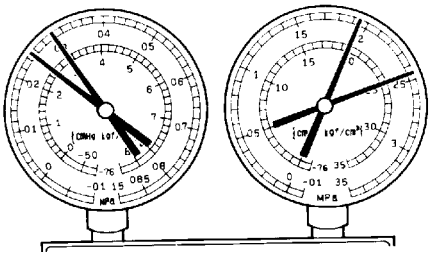


I22121

Symptom	Probable cause	Diagnosis	Remedy
S Pressure too high on both low and high pressure sides S Sedan / Station Wagon Only: No sir bubbles seen through the sight glass even when the engine rpm is lowered	S Unable to develop sufficient performance due to excessive use of refrigerating system S Insufficient cooling of condenser	S Excessive refrigerant in cycle→too much refrigerant supplied S Condenser cooling insufficient→condenser fins clogged at cooling fan	(1) Clean condenser (2) Check cooling fan with cooling fan motor operation (3) If (1) and (2) are in normal state, check amount of refrigerant and supply proper amount of refrigerant

(7) Air present in refrigeration system

Condition: Cooling system does not function.



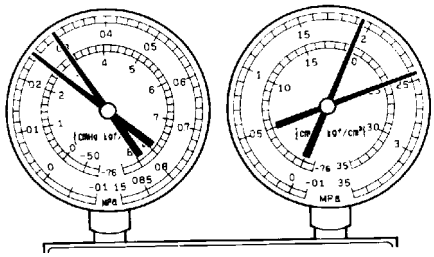
NOTE : These gauge indications are shown when the refrigerating system has been opens and the refrigerant charged without vacuum purging.

I22122

Symptom	Probable cause	Diagnosis	Corrective Actions
S Pressure too high on both low and high pressure sides S The low pressure piping too hot to the touch S Sedan / Station Wagon Only: Bubbles seen through sight glass	Air entered in refrigerating system	S Air present in refrigerating system S Insufficient vacuum purging	(1) Check compressor oil to see if it is see if it is dirty or insufficient (2) Evacuate air and supply new refrigerant

(8) Expansion valve improperly

Condition: Refrigerant functions insufficient.

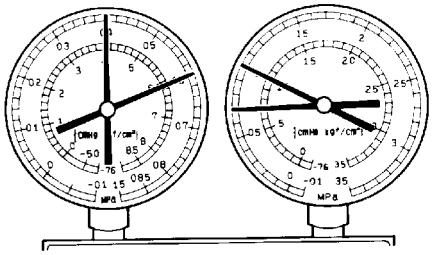


I22123

Symptom	Probable cause	Diagnosis	Corrective Actions
S Pressure too high on both low and high pressure sides S Frost or large amount of dew on piping on low pressure side	Trouble in expansion valve	S Excessive refrigerant in low pressure piping S Expansion valve opened too wide	Check expansion valve

(9) Defective compression compressor

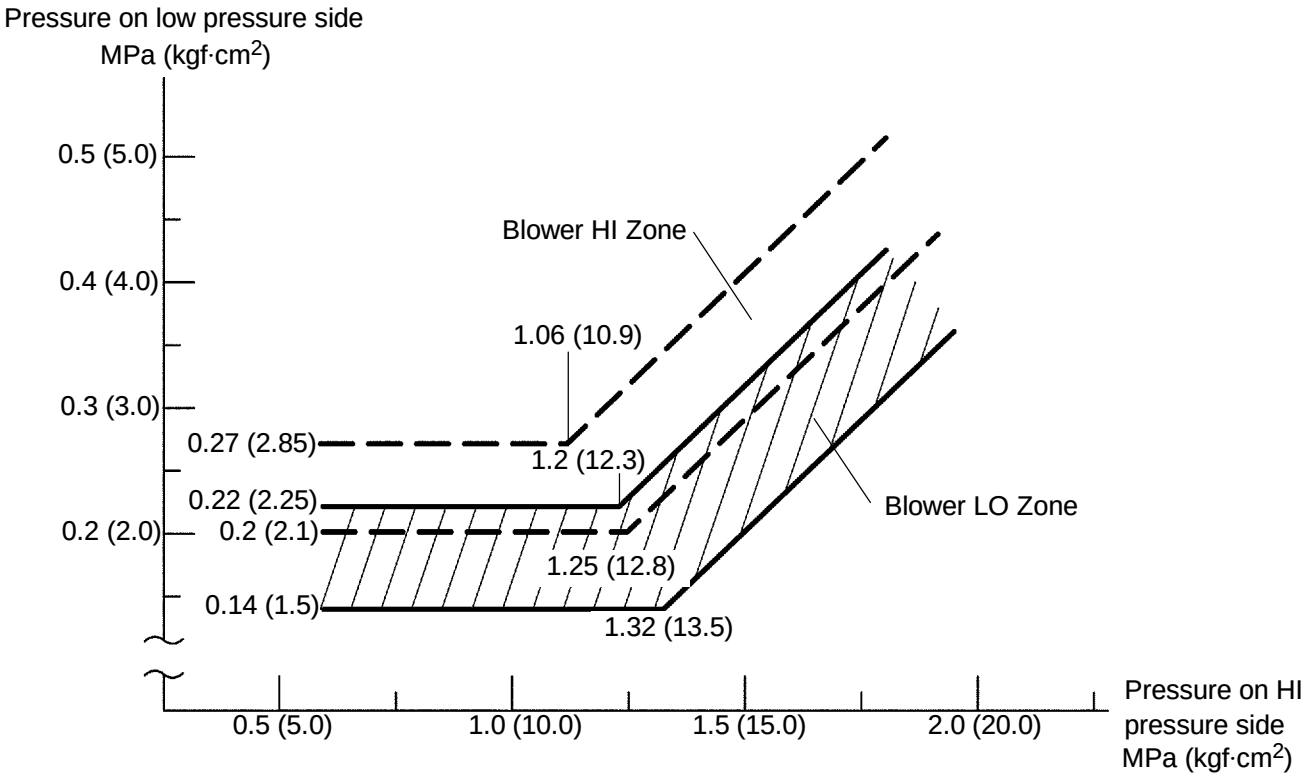
Condition : Refrigerant is not effective.



I22124

Symptom	Probable cause	Diagnosis	Corrective Actions
S Pressure too high on low high pressure sides S Pressure too low to on high pressure side	Internal leak in compressor	S Compression failure S Leakage from valve damaged or broken sliding parts	Repair or replace compressor

Gauge readings (Reference)



I30081

550G4-01

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

(a) Turn the A/C switch ON.

(b) Operating the cooler compressor at the engine rpm of approx. 1000 for 5 to 6 min., circulate the refrigerant and collect compressor oil remaining in each component into the cooler compressor as much as possible.

(c) Stop the engine.

(d) Let the refrigerant gas out.

SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

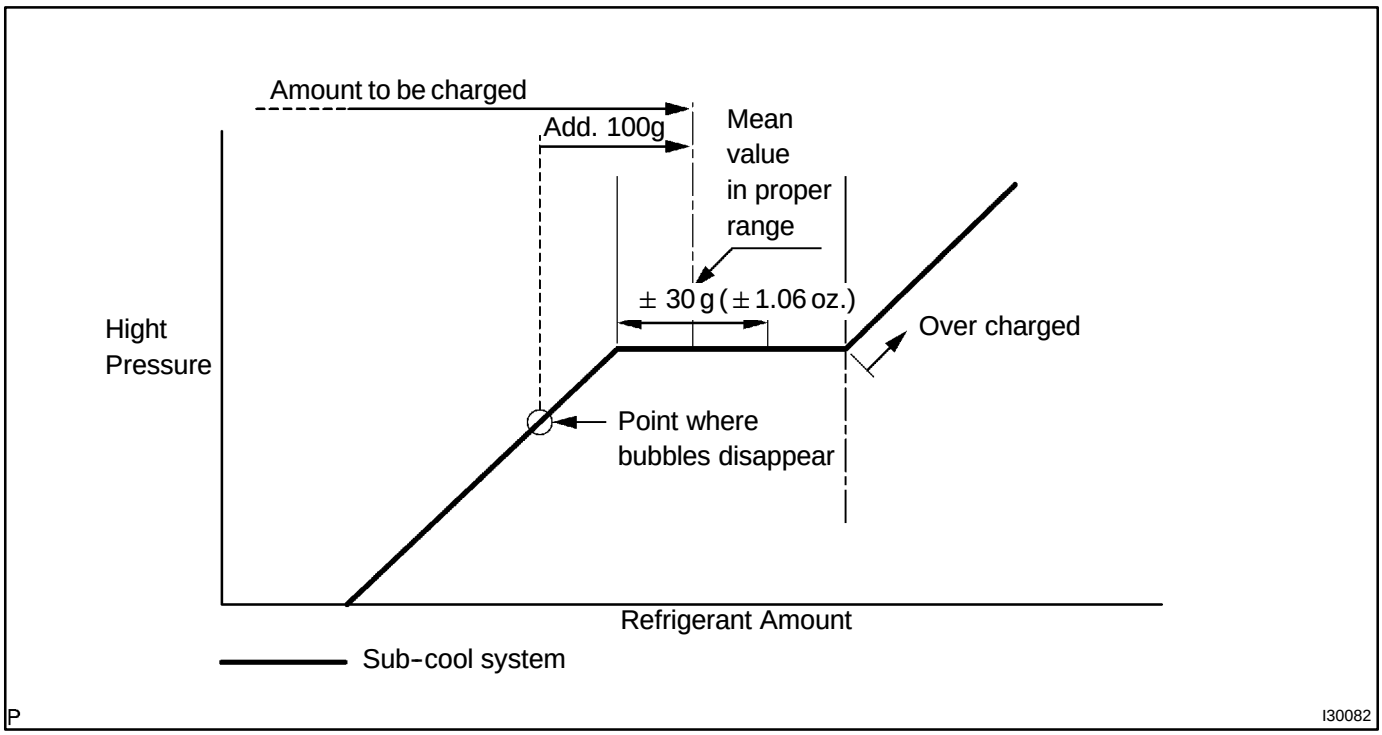
2. CHARGE REFRIGERANT

(a) Using a vacuum pump, perform a vacuum purping.

(b) Supply refrigerant, HFC-134a (R134a).

Standard: 490 ± 30 g (17.28 ± 1.06 oz.)

SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080), 07117-48130, 07117-48140



3. WARM UP ENGINE

4. INSPECT LEAKAGE OF REFRIGERANT

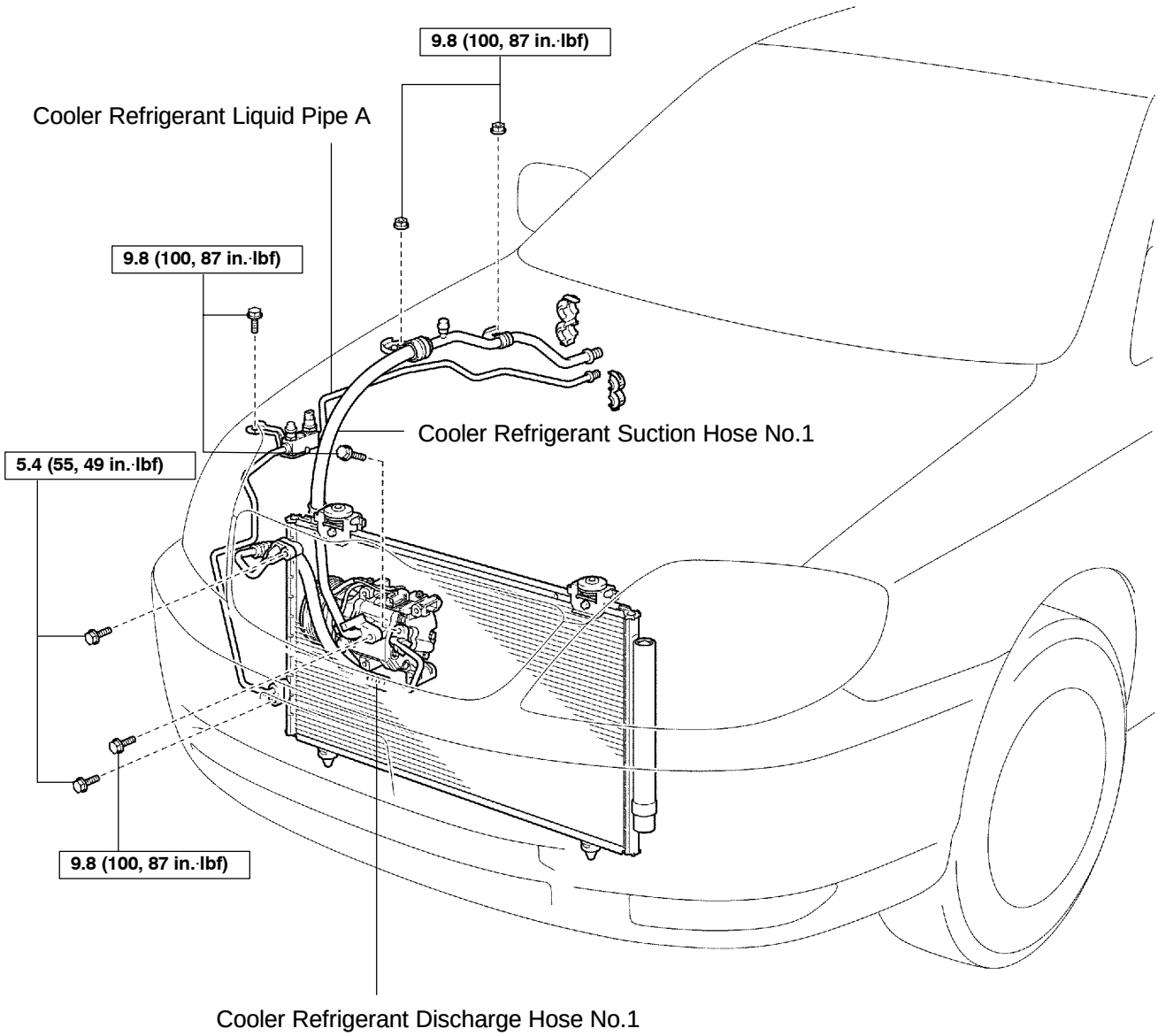
(a) Using a gas leak detector, check for leakage of refrigerant.

REFRIGERANT LINE

COMPONENTS

550FI-01

LHD SEDAN / STATION WAGON:
3ZZ-FE:
4ZZ-FE:

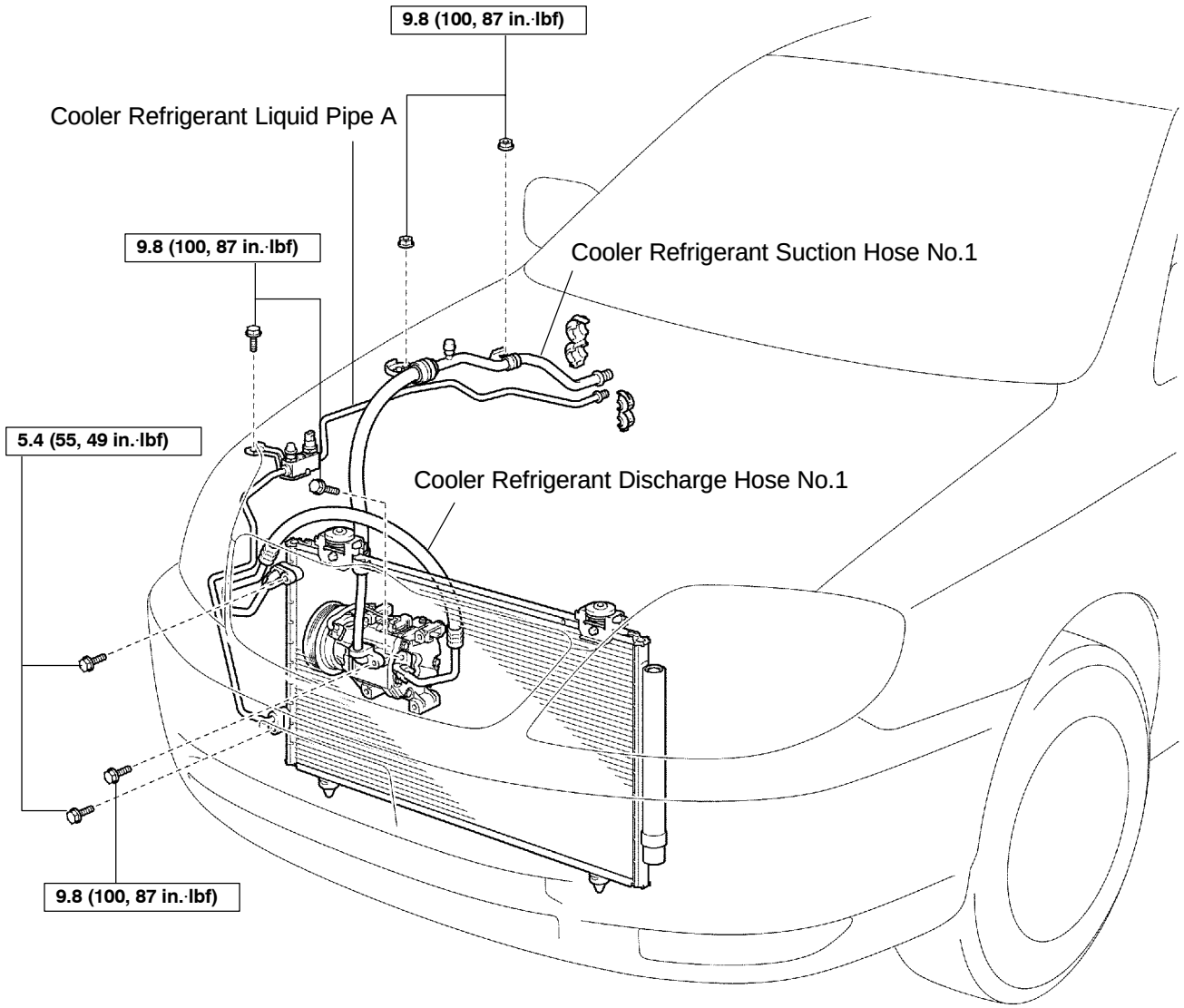


N·m (kgf·cm, ft·lbf) : Specified torque

P

I32162

LHD SEDAN / STATION WAGON:
1CD-FTV:

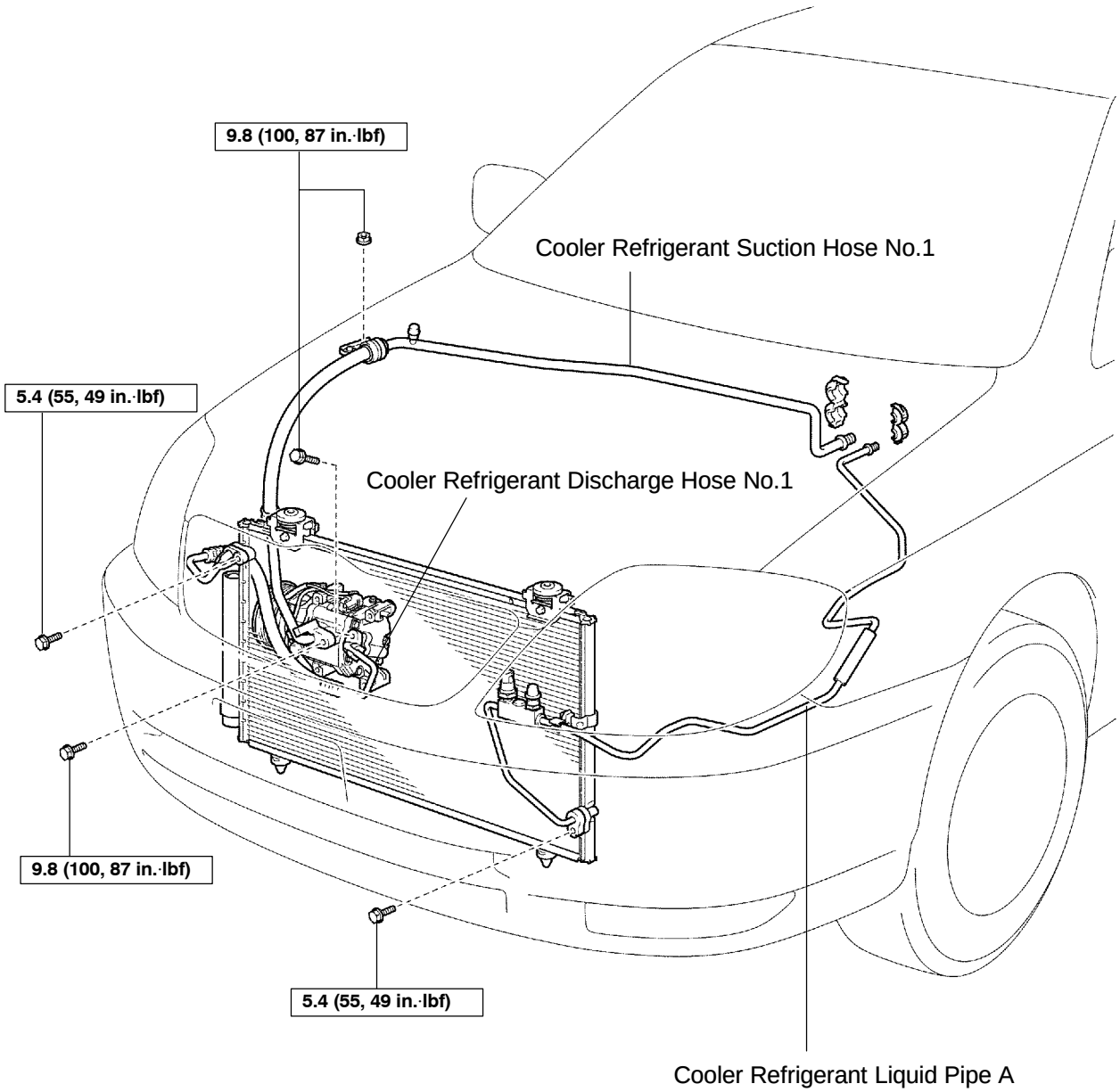


N·m (kgf·cm, ft·lbf) : Specified torque

P

I32163

RHD SEDAN / STATION WAGON:
3ZZ-FE:
4ZZ-FE:

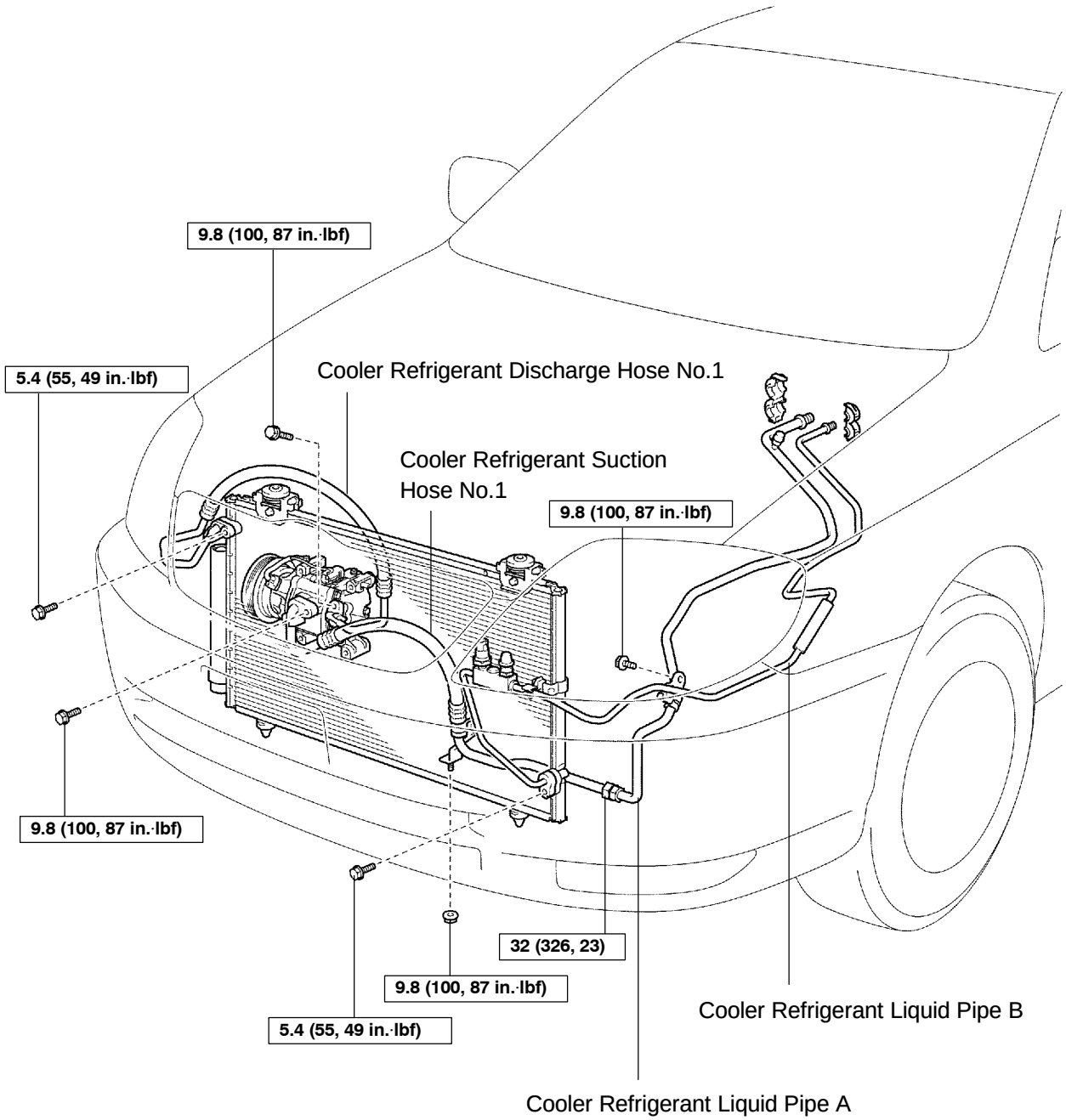


N·m (kgf·cm, ft·lbf) : Specified torque

P

I32164

RHD SEDAN / STATION WAGON:
1CD-FTV:

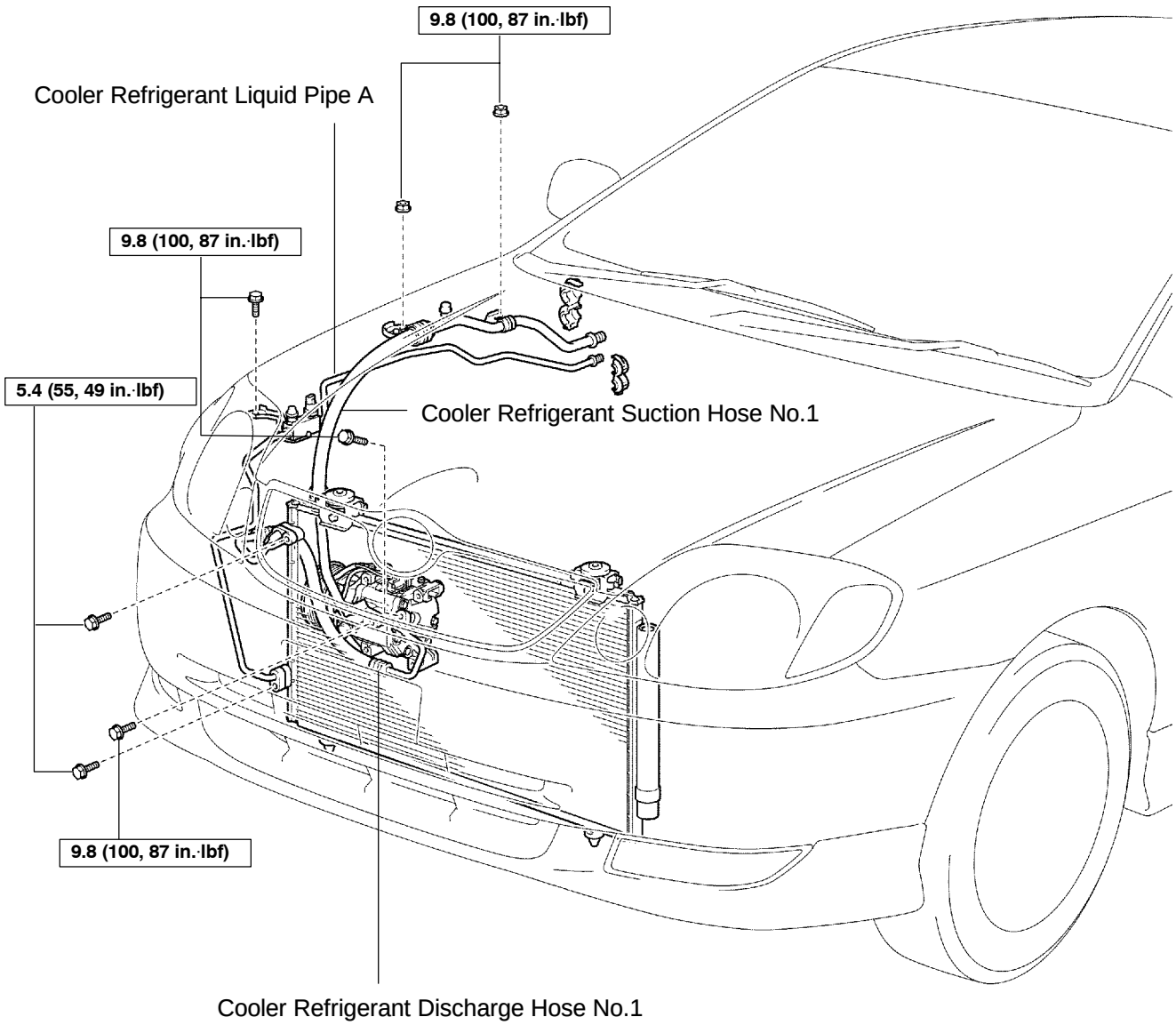


N·m (kgf·cm, ft·lbf) : Specified torque

P

I32195

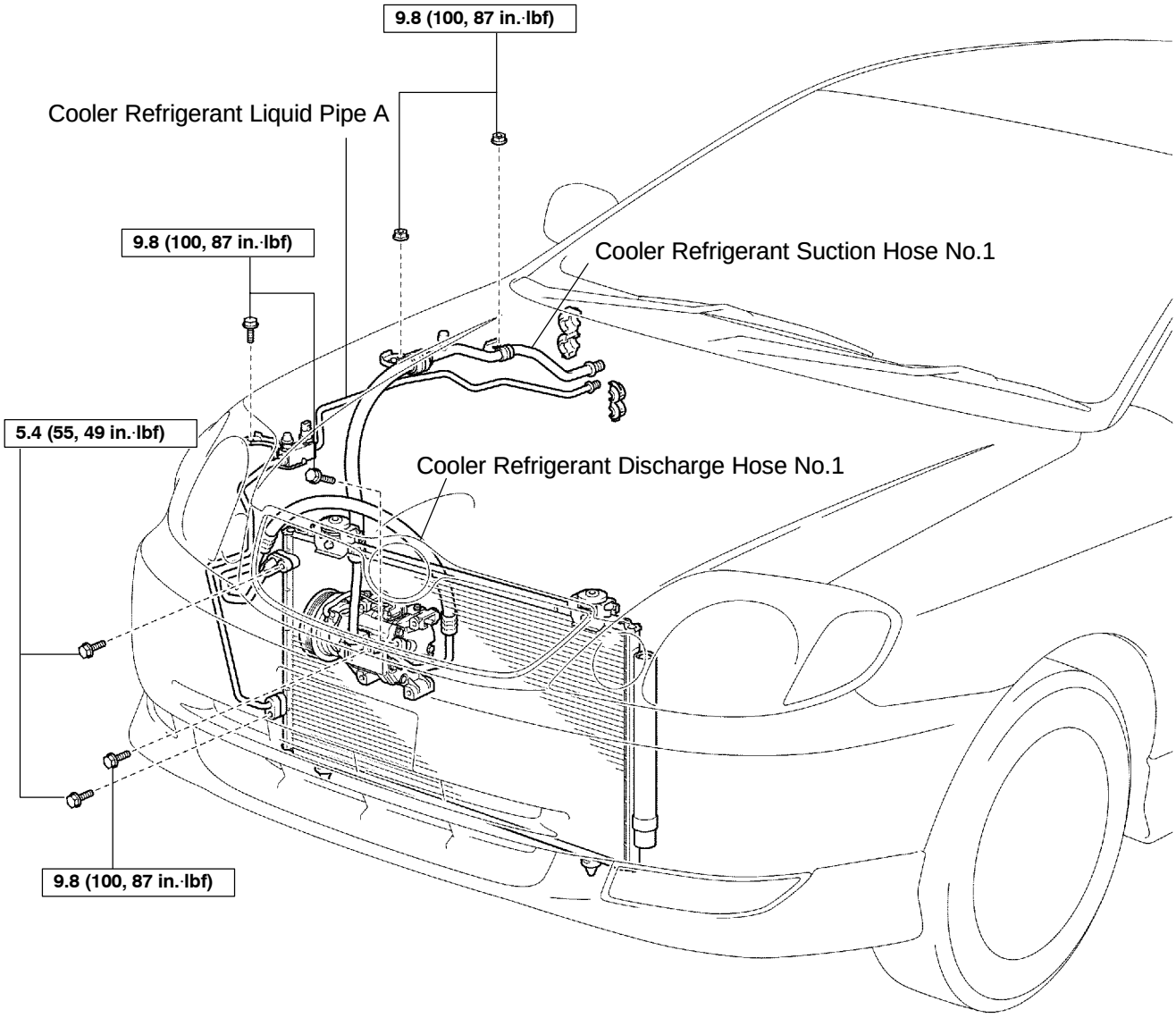
LHD HATCH BACK:
2ZZ-GE:
3ZZ-FE:
4ZZ-FE:



P N·m (kgf·cm, ft·lbf) : Specified torque

I32207

LHD HATCH BACK:
1CD-FTV:

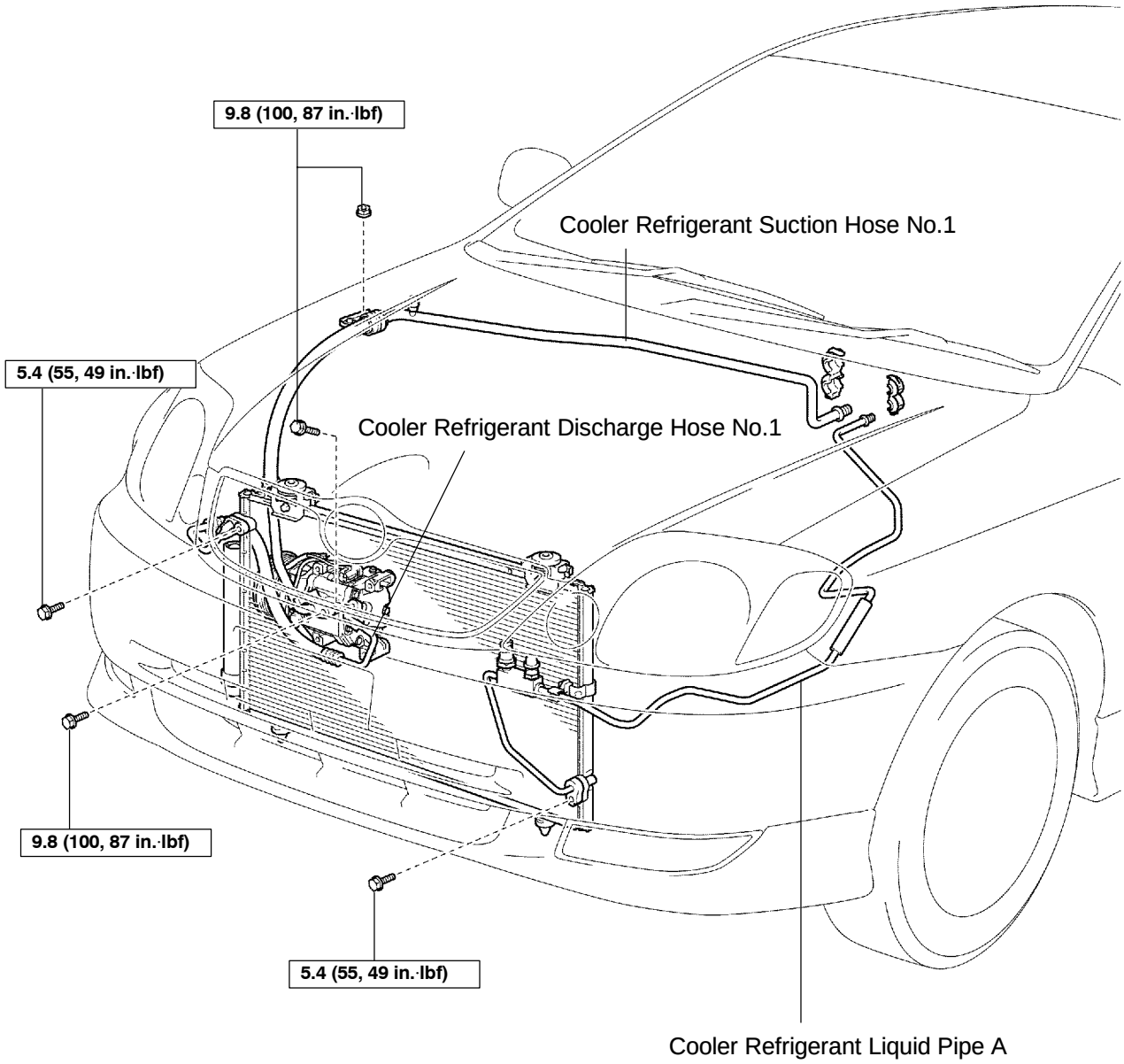


N·m (kgf·cm, ft·lbf) : Specified torque

P

I32209

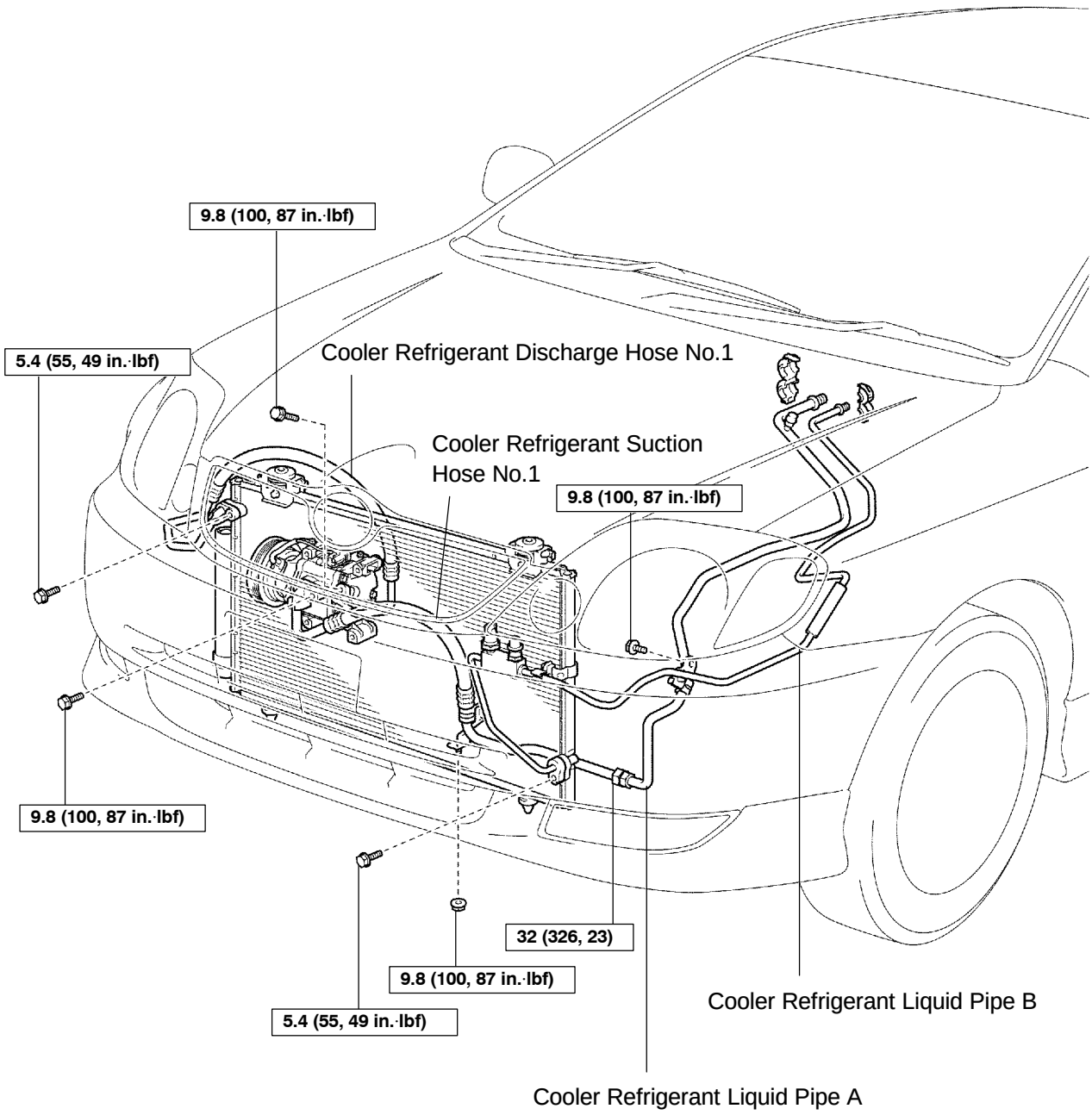
RHD HATCH BACK:
2ZZ-GE
3ZZ-FE:
4ZZ-FE:



P N·m (kgf·cm, ft·lbf) : Specified torque

I32208

RHD HATCH BACK:
1CD-FTV:



N·m (kgf·cm, ft·lbf) : Specified torque

P

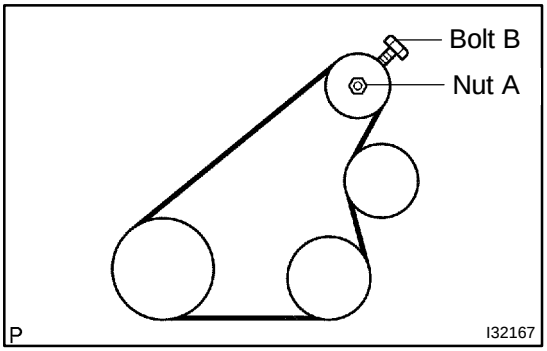
I32210

V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (1CD-FTV)

550FJ-01

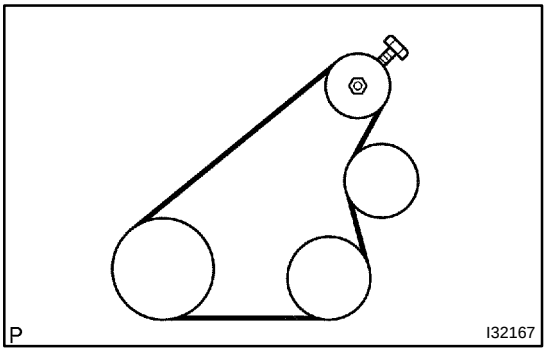
REPLACEMENT

1. REMOVE ENGINE UNDER COVER RH



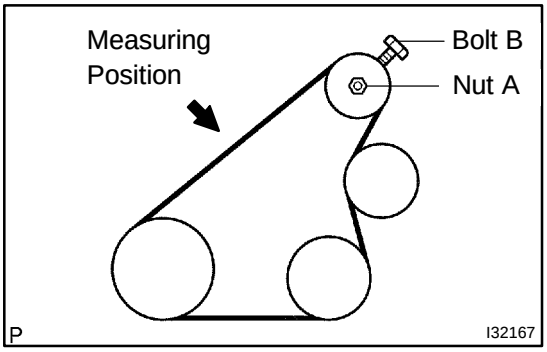
2. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Loosen the nut A.
(b) Loosen the bolt B and remove the V (cooler compressor to crankshaft pulley) belt No. 1.



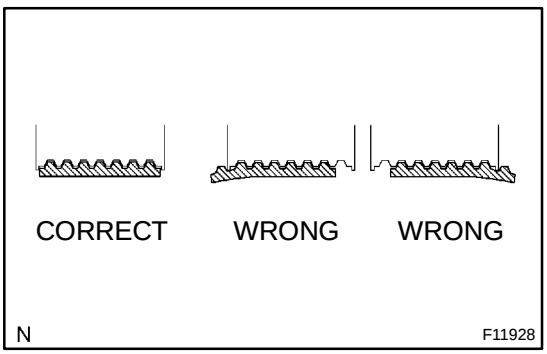
3. INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Temporarily install the V (cooler compressor to crankshaft pulley) belt No. 1 as illustrated.

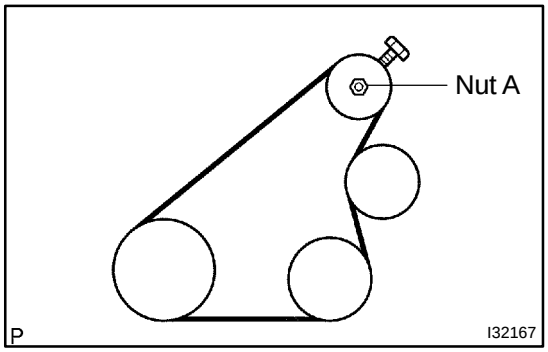


4. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Tighten the nut A.
Torque: 2.5 N·m (25 kgf·cm, 21 in.·lbf)
(b) Apply drive belt tension by turning bolt B.
Belt deflection:
New belt: 11 - 13 mm (0.43 - 0.51 in.)
Used belt: 13.5 - 16.5 mm (0.53 - 0.64 in.)



HINT:
- New belt refers to a belt which has been used less than 5 minutes on the running engine.
- Used belt refers to a belt which has been on a running engine for 5 minutes or more.
- After installing the drive belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the drive belt has not slipped groove on the bottom of the pulley.



5. FULLY TIGHTEN V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Tighten the nut A.
Torque: 39 N·m (390 kgf·cm, 29 ft·lbf)

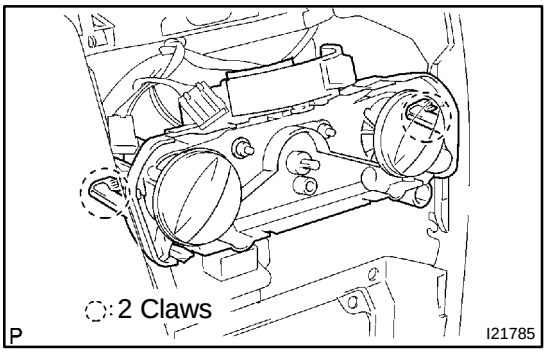
AIR CONDITIONING CONTROL ASSY

OVERHAUL

550FW-01

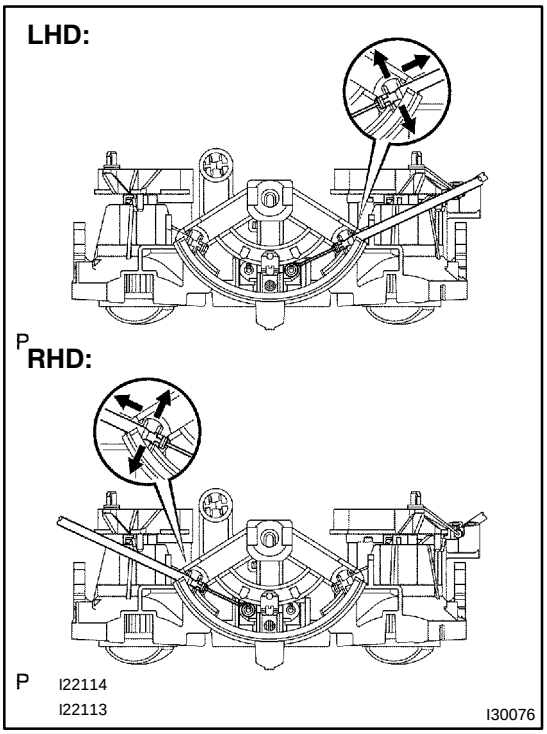
1. REMOVE CONSOLE PANEL UPPER
   SEDAN / STATION WAGON: (See page 71-16)
   HATCH BACK: (See page 71-25)
2. REMOVE INSTRUMENT CLUSTER FINISH PANEL
   SEDAN / STATION WAGON: (See page 71-16)
   HATCH BACK: (See page 71-25)
3. REMOVE COOLER SWITCH(W/ AIR CONDITIONER)

(a) Remove the cooler switch from the instrument cluster finish panel assy center.

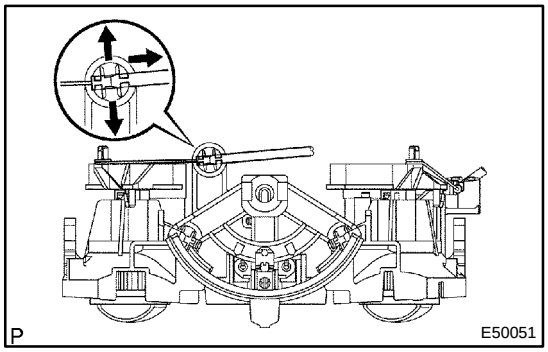


4. REMOVE AIR CONDITIONING CONTROL ASSY

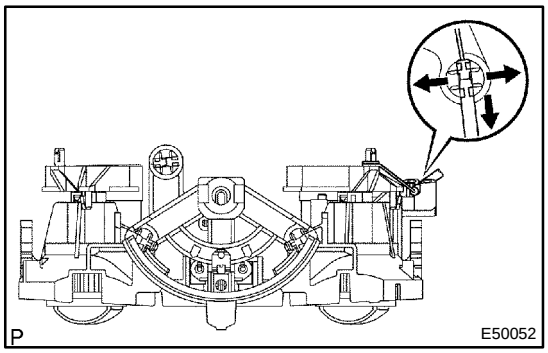
(a) Release the 2 fitting claws and pull out the air conditioning control assy.



(b) Spread the clamp's claws of the air inlet damper control cable and disconnect the inner cable.



(c) Spread the clamp's claws of the defroster damper control cable and disconnect the inner cable.



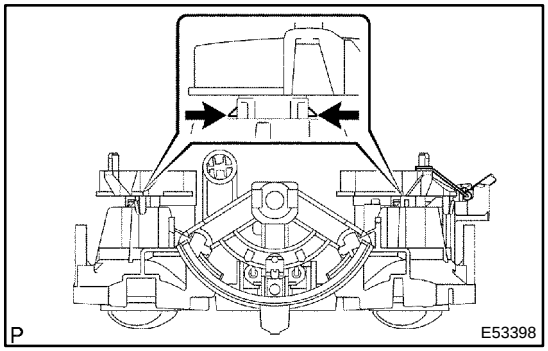
(d) Spread the clamp's claws of the air mix damper control cable and disconnect the inner cable.

(e) Disconnect the connector, remove the air conditioning control assy.

5. REMOVE AIR CONDITIONING CONTROL BULB

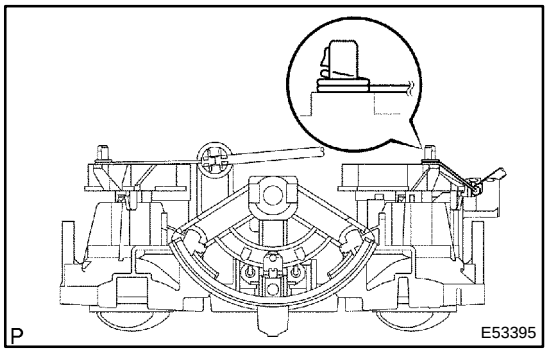
(a) HATCH BACK:
Remove the blower switch assy from the air conditioning control assy.

(b) Remove the 2 air conditioning control bulbs.



6. REMOVE HEATER CONTROL RETAINER

(a) Release the 2 fitting claws, remove the 2 heater control retainers.



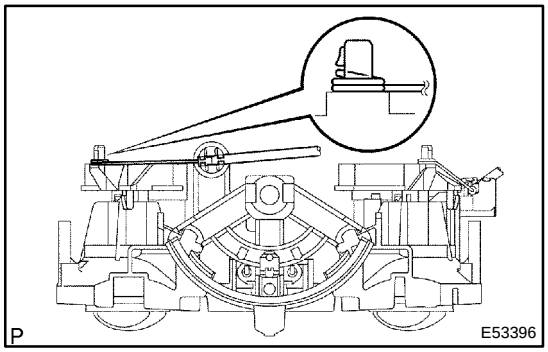
7. INSTALL AIR CONDITIONING CONTROL ASSY

(a) Install the inner cable end of the air mix damper control cable to the heater control lever.

(b) Install the outer cable of the air mix damper control cable to the cable clamp.

HINT:

- Operating the heater control knob and check that it properly stops at both ends of MAX. COOL and MAX. HOT and no recoil is identified.
- Check that the outer cable should not be disengaged (moved) from the air conditioning control assy when the cable is pulled.

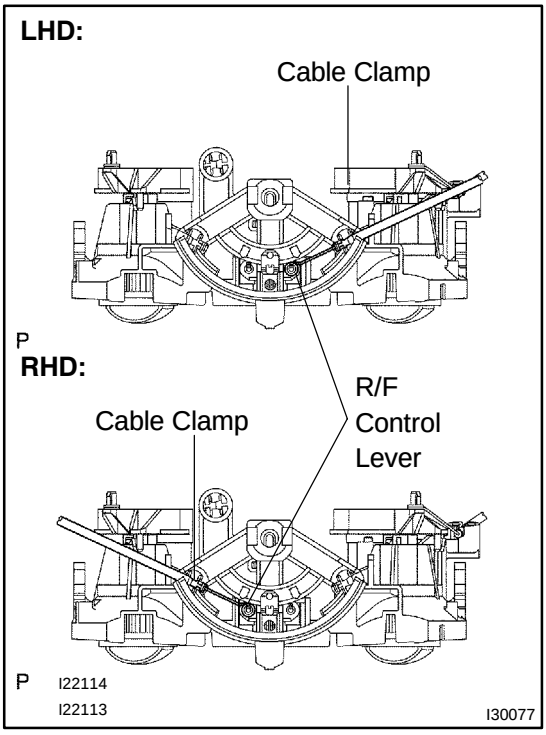


(c) Install the inner cable end of the defroster damper control cable to the heater control lever.

(d) Install the outer cable of the defroster damper control cable to the cable clamp.

HINT:

- Operating the heater control knob and check that it properly stops at both ends of FACE and DEF and no recoil is identified.
- Check that the outer cable should not be disengaged (moved) from the air conditioning control assy when the cable is pulled.



(e) Install the inner cable end of the air inlet damper control cable to the control lever.

(f) Install the outer cable of the air inlet damper control cable to the cable clamp.

HINT:

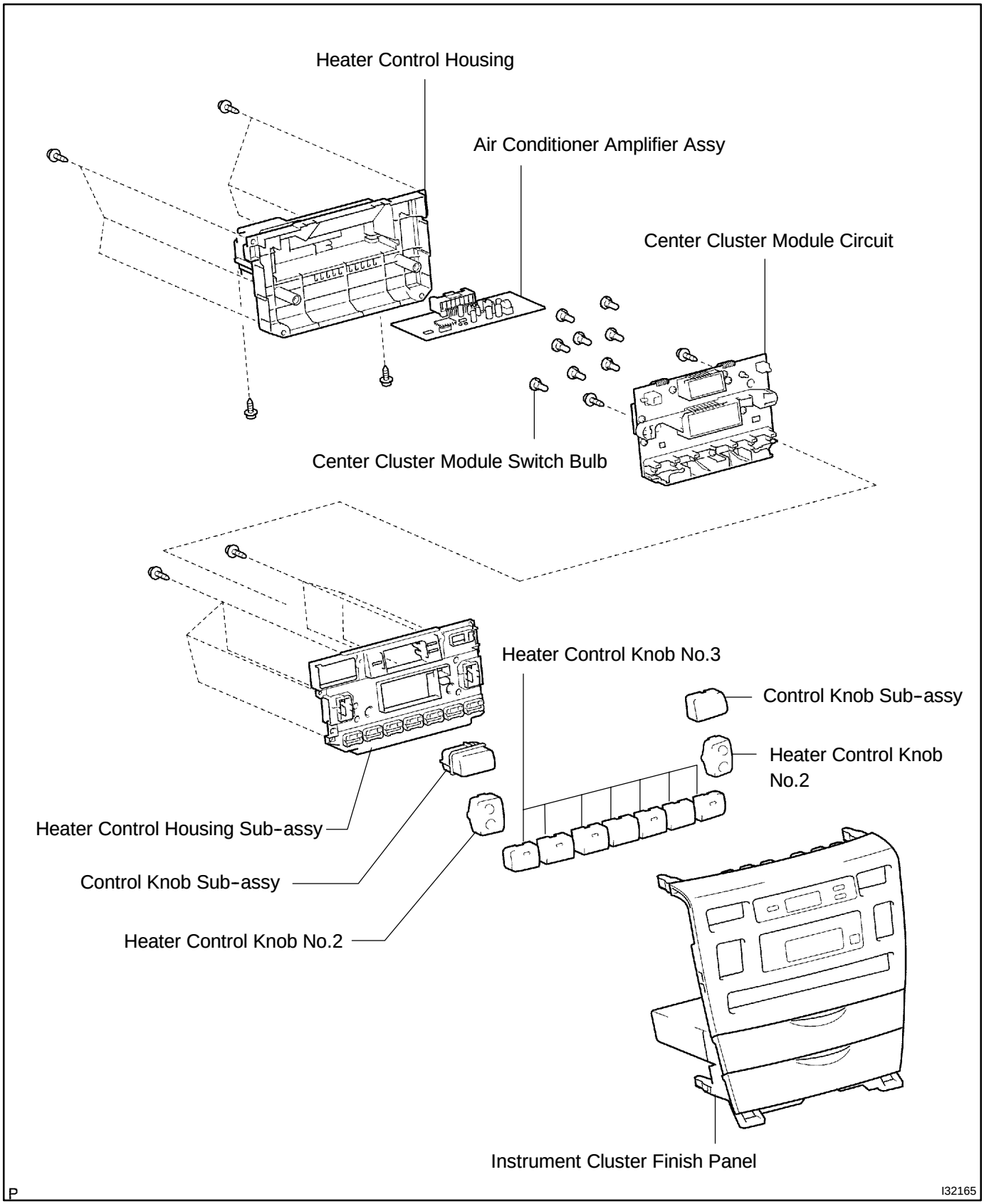
- Operating the R/F control knob, check that it properly stops at both ends of RECIRC and FRESH and no recoil is identified.
- Check that the outer cable should not be disengaged (moved) from the air conditioning control assy when the cable is pulled.

(g) Connect the connector, install the air conditioning control assy.

CONTROL ASSY,CTR CLUSTER MODULE

COMPONENTS

550FK-01



550FL-01

OVERHAUL

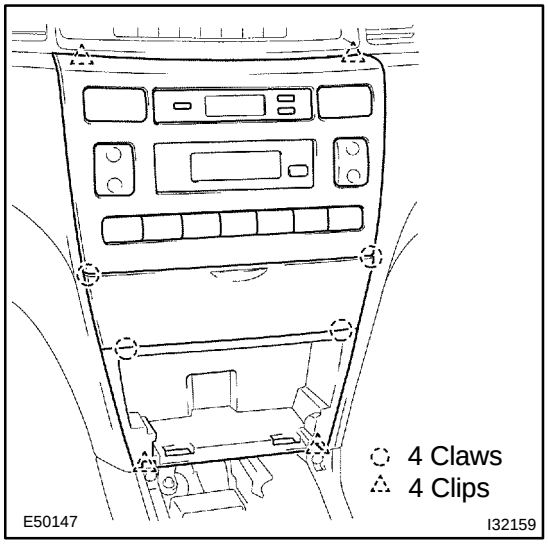
HINT:

COMPONENTS: 55-39

1. REMOVE CONSOLE PANEL UPPER

SEDAN / STATION WAGON: (See page 71-16)

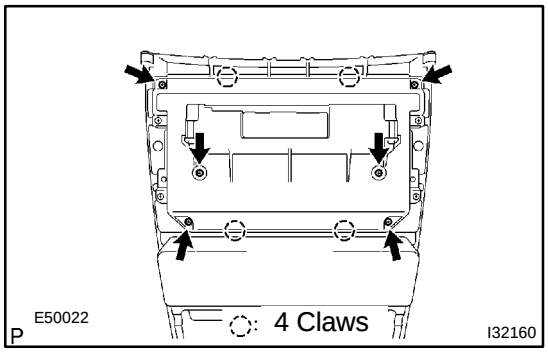
HATCH BACK: (See page 71-25)



2. REMOVE CONTROL ASSY,CTR CLUSTER MODULE

(a) Release the 4 fitting claws and 4 clips, remove the control assy, ctr cluster module.

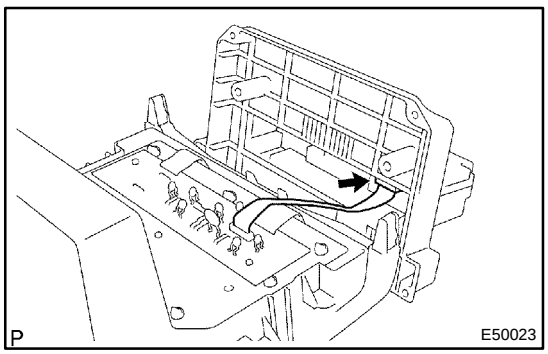
(b) Disconnect the connector.



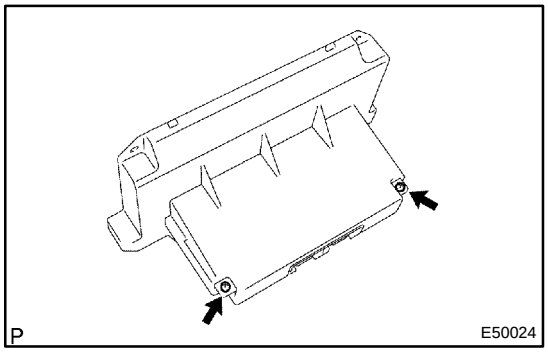
3. REMOVE HEATER CONTROL HOUSING

(a) Remove the 6 screws.

(b) Release the 4 fitting claws, remove the heater control housing.

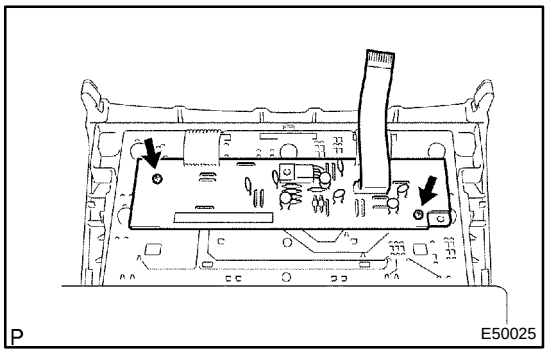


(c) Disconnect the flat cable and remove the heater control housing.



4. REMOVE AIRCONDITIONER AMPLIFIER ASSY

(a) Remove the 2 screws.
(b) Remove the air conditioner amplifier assy from the heater control housing.

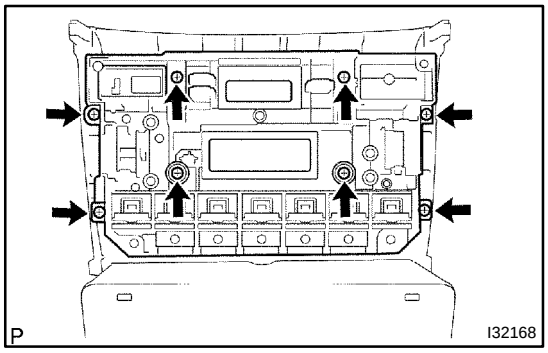


5. REMOVE CENTER CLUSTER MODULE CIRCUIT

(a) Remove the 2 screws.
(b) Remove the center cluster module circuit from the heater control housing sub-assy.

6. REMOVE CENTER CLUSTER MODULE SWITCH BLUB

(a) Remove the air conditioning control bulb from the center cluster module circuit.



7. REMOVE HEATER CONTROL HOUSING SUB-ASSY

(a) Remove the 8 screws.
(b) Remove the heater control housing sub-assy from the instrument cluster finish panel assy.

8. REMOVE HEATER CONTROL KNOB NO.2

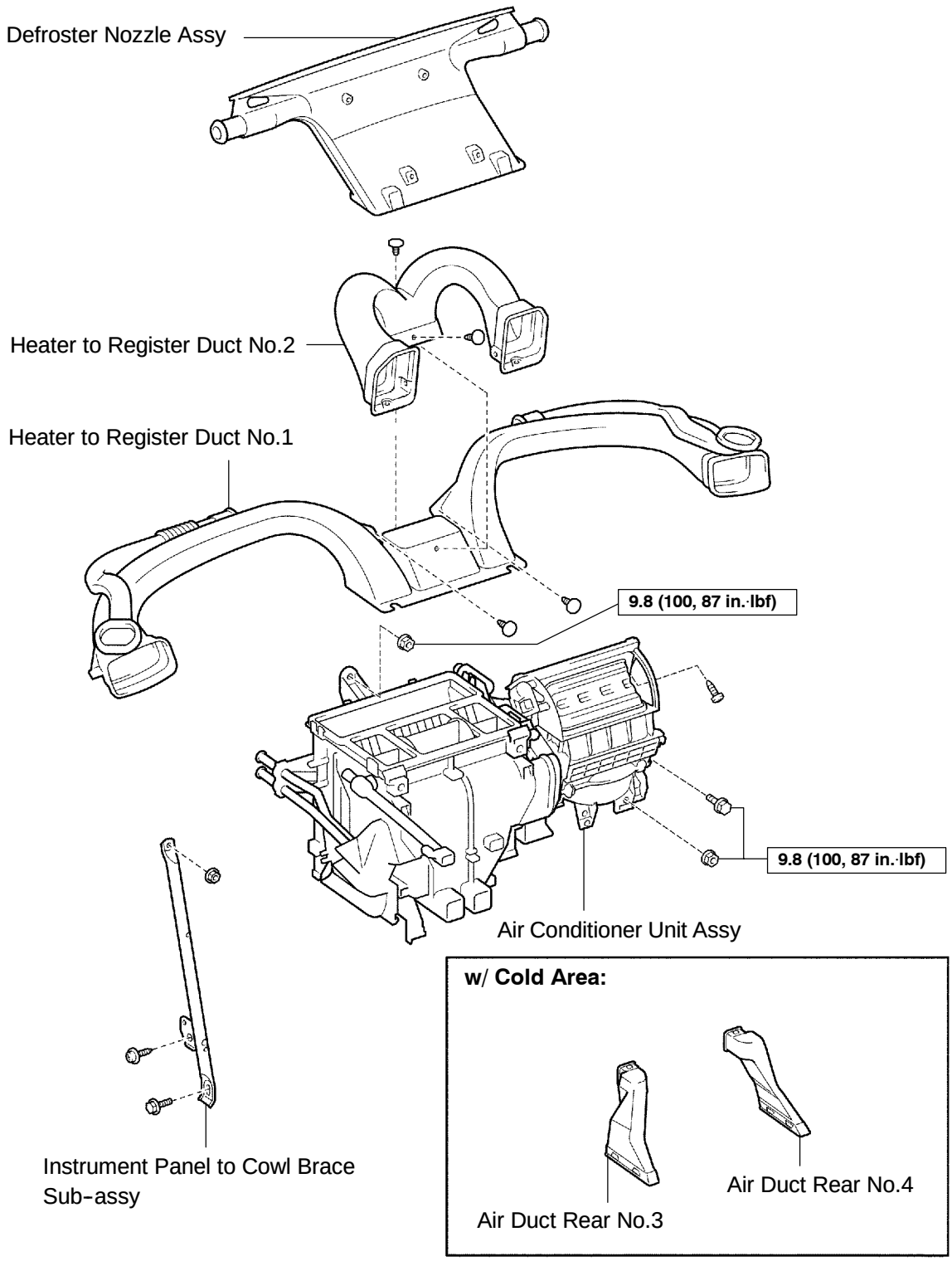
9. REMOVE HEATER CONTROL KNOB NO.3

10. REMOVE CONTROL KNOB SUB-ASSY

AIR CONDITIONING RADIATOR ASSY

COMPONENTS

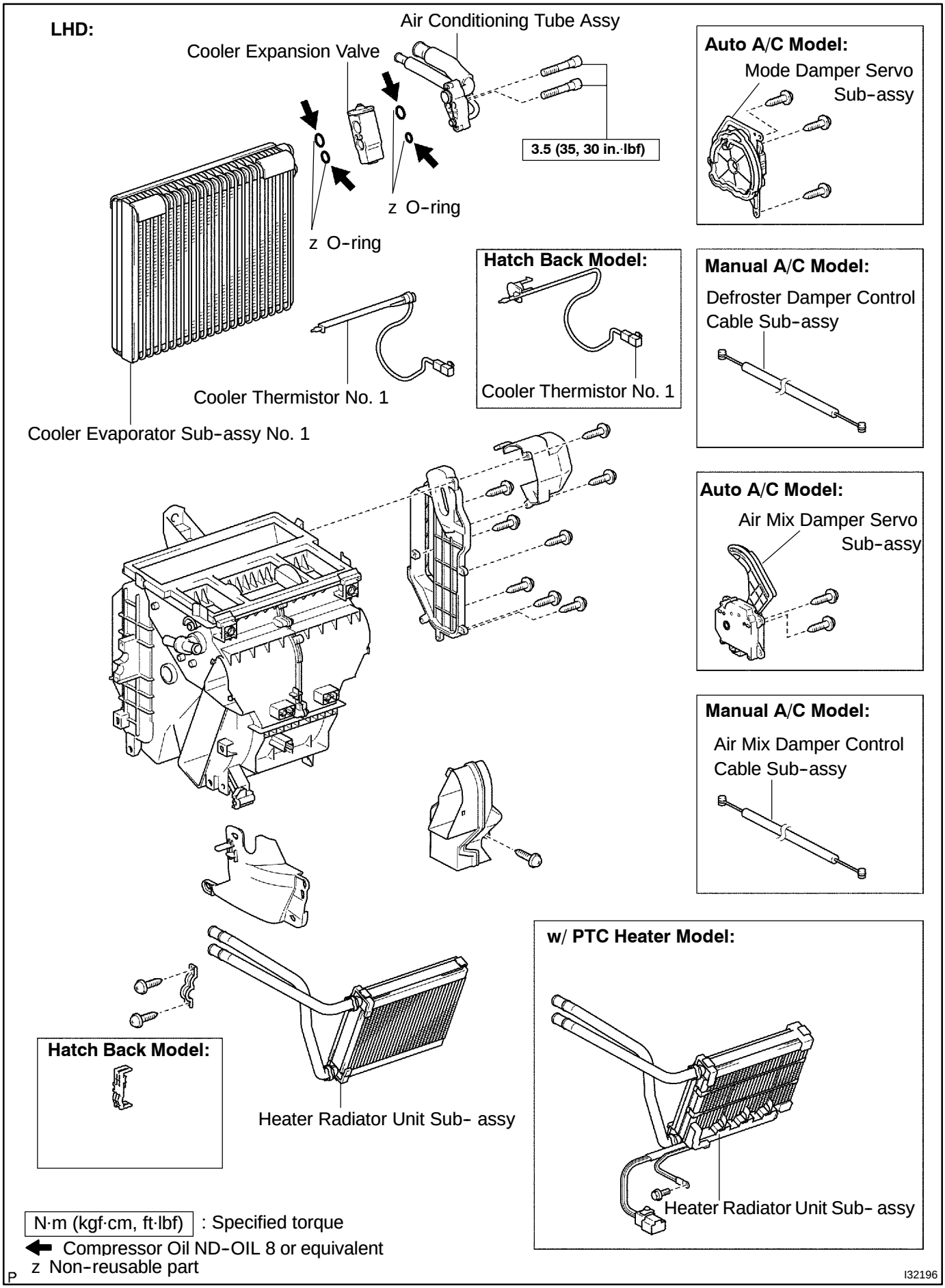
550G5-01

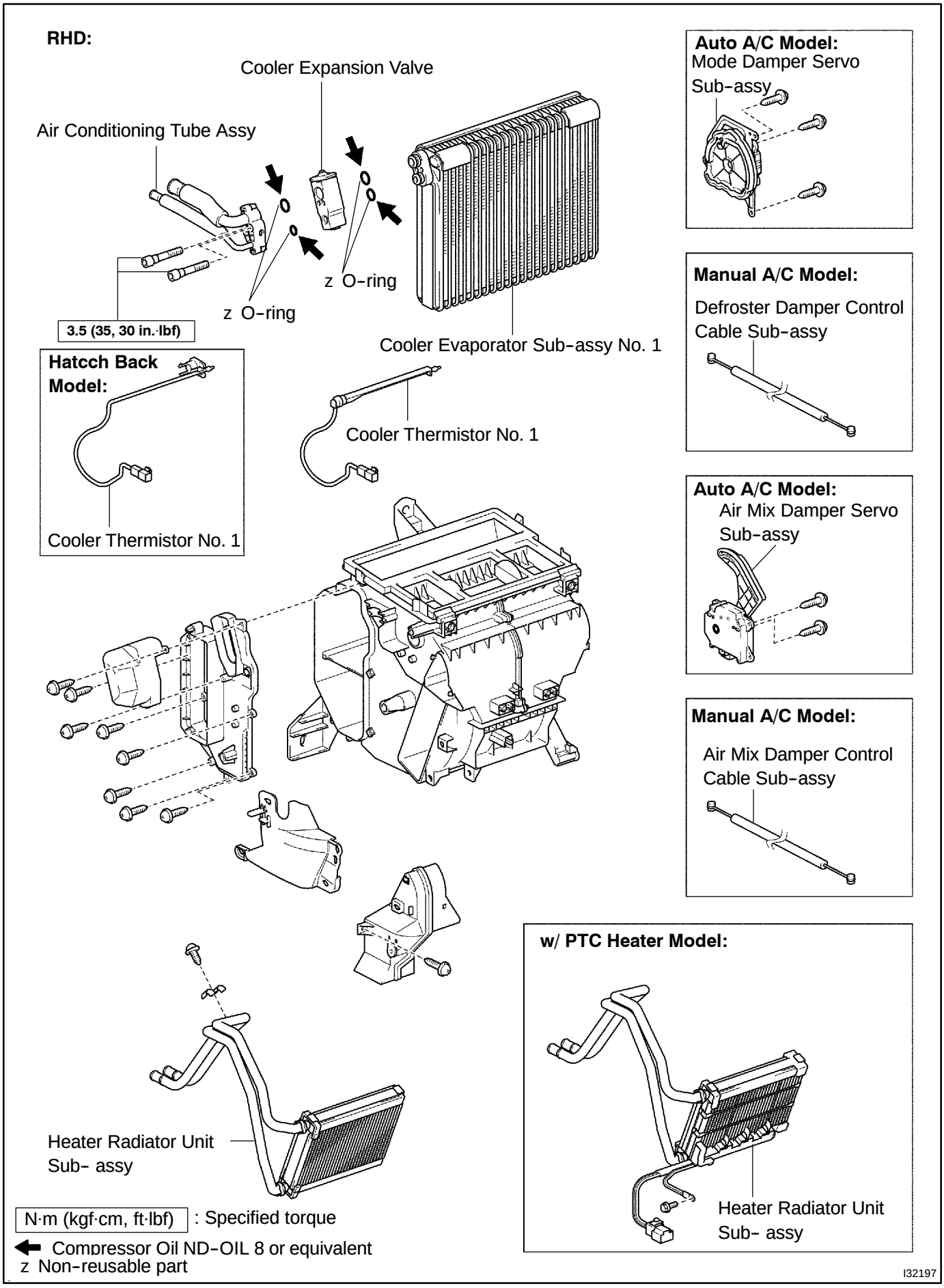


N·m (kgf·cm, ft·lbf) : Specified torque

P

I32166


LHD:
Air Conditioning Tube Assy
Cooler Expansion Valve
3.5 (35, 30 in.·lbf)
z O-ring
z O-ring
Cooler Thermistor No. 1
Cooler Evaporator Sub-assy No. 1
Auto A/C Model:
Mode Damper Servo Sub-assy
Hatch Back Model:
Cooler Thermistor No. 1
Manual A/C Model:
Defroster Damper Control Cable Sub-assy
Auto A/C Model:
Air Mix Damper Servo Sub-assy
Manual A/C Model:
Air Mix Damper Control Cable Sub-assy
w/ PTC Heater Model:
Heater Radiator Unit Sub- assy
Hatch Back Model:
Heater Radiator Unit Sub- assy
N·m (kgf·cm, ft·lbf) : Specified torque
Compressor Oil ND-OIL 8 or equivalent
z Non-reusable part
P
I32196


RHD:
Cooler Expansion Valve
Air Conditioning Tube Assy
z O-ring
z O-ring
3.5 (35, 30 in.·lbf)
Cooler Evaporator Sub-assy No. 1
Auto A/C Model:
Mode Damper Servo Sub-assy
Manual A/C Model:
Defroster Damper Control Cable Sub-assy
Hatcch Back Model:
Cooler Thermistor No. 1
Cooler Thermistor No. 1
Auto A/C Model:
Air Mix Damper Servo Sub-assy
Manual A/C Model:
Air Mix Damper Control Cable Sub-assy
w/ PTC Heater Model:
Heater Radiator Unit Sub- assy
Heater Radiator Unit Sub- assy
N·m (kgf·cm, ft·lbf) : Specified torque
Compressor Oil ND-OIL 8 or equivalent
z Non-reusable part
I32197

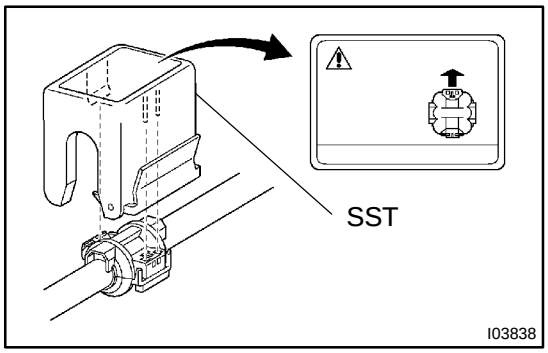
550G6-01

OVERHAUL

HINT:

COMPONENT: 55-42

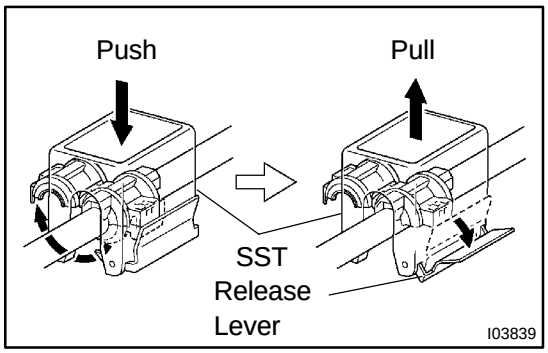
1. **REMOVE RADIATOR SUPPORT OPENING COVER (HATCH BACK BODY TYPE)** **(See page 76-5)**
2. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM** **(See page 55-25)**
   SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



3. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**

(a) Install SST to piping clamp.
SST 09870-00015

HINT:
Confirm the direction of the piping clamp claw and SST using the illustration showing on the caution label.



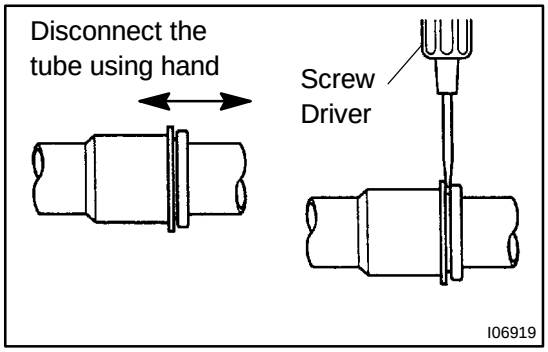
(b) Push down SST and release the clamp lock.

NOTICE:

Be careful not to deform the tube, when pushing SST.

(c) Pull SST slightly and push the release lever, then remove the piping clamp with SST.

(d) Remove the piping clamp from SST.



(e) Disconnect the hose.

NOTICE:

- **Do not use tools like screwdriver to remove the tube.**
- **Cap the open fittings immediately to keep moisture or dirt out of the system.**

4. **DISCONNECT COOLER REFRIGERANT LIQUID PIPE A (RHD(1CD-FTV) STEERING POSITION TYPE)**

SST 09870-00015

HINT:
Disconnect in the same way as the cooler refrigerant suction hose No. 1.

5. DISCONNECT COOLER REFRIGERANT LIQUID PIPE A

SST 09870-00025

HINT:

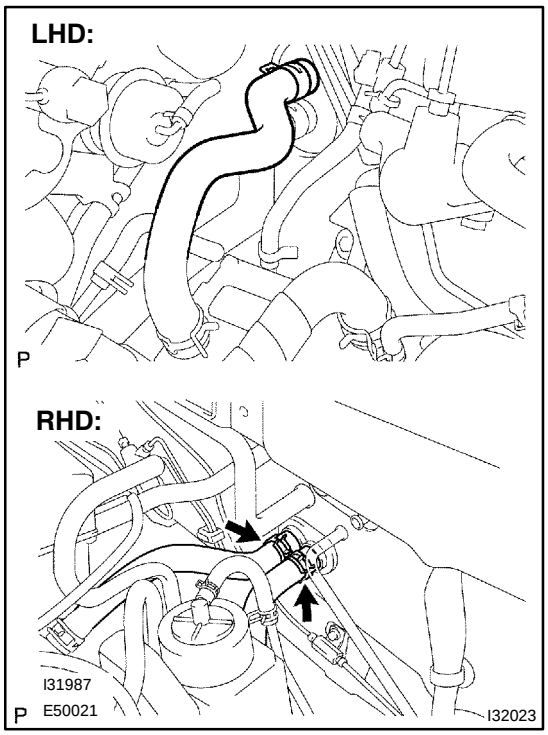
Disconnect in the same way as the cooler refrigerant suction hose No. 1.

6. DISCONNECT COOLER REFRIGERANT LIQUID PIPE B (RHD(1CD-FTV) STEERING POSITION TYPE)

SST 09870-00025

HINT:

Disconnect in the same way as the cooler refrigerant suction hose No. 1.



7. DISCONNECT HEATER INLET WATER HOSE

(a) Using pliers, grip the claws of clip and slide the clip and disconnect the heater inlet water hose.

8. DISCONNECT HEATER OUTLET WATER HOSE

HINT:

Disconnect in the same way as the heater inlet water hose.

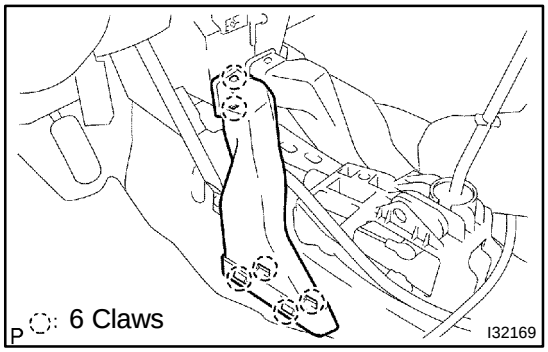
9. REMOVE INSTRUMENT PANEL SUB-ASSY LOWER
SEDAN / STATION WAGON: (See page 71-21)
HATCH BACK: (See page 71-30)

HINT:

Refer to the instructions for removal of the instrument panel sub-assy lower.

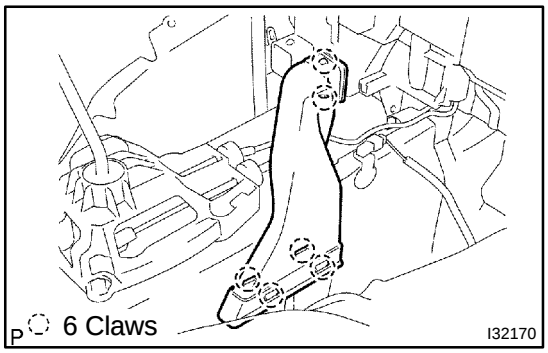
10. REMOVE AIR CONDITIONING AMPLIFIER ASSY (MANUAL AIR CONDITIONER)
(See page 55-115)

11. REMOVE COOLER STABILIZER AMPLIFIER ASSY(MANUAL AIR CONDITIONER)
(See page 55-116)



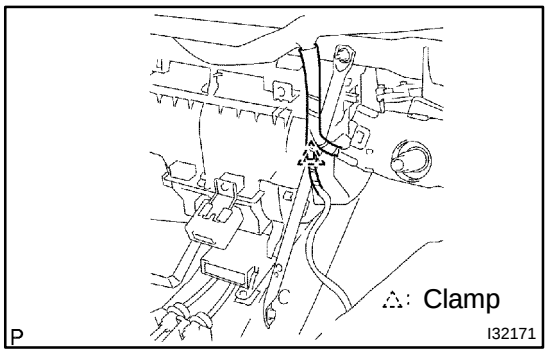
12. REMOVE AIR DUCT REAR NO.3 (W/ COLD AREA)

(a) Release the 6 fitting claws, remove the air duct rear No.3.



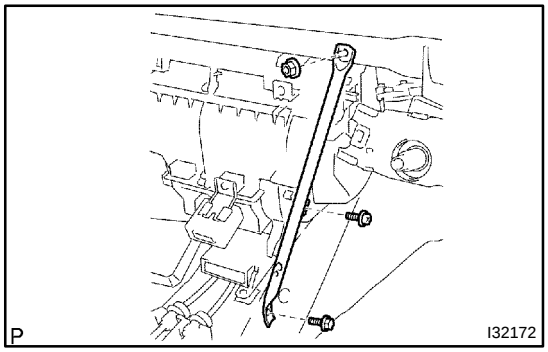
13. REMOVE AIR DUCT REAR NO.4 (W/ COLD AREA)

(a) Release the 6 fitting claws, remove the air duct rear No.4.

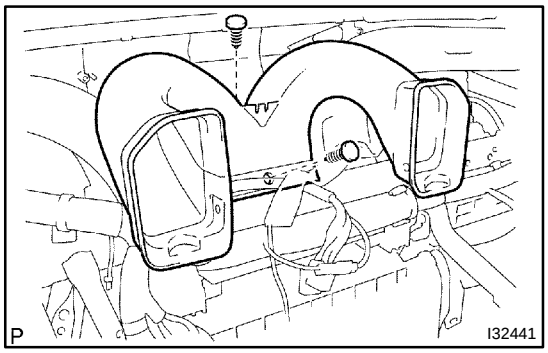


14. REMOVE INSTRUMENT PANEL TO COWL BRACE SUB-ASSY

(a) Remove the clamp.

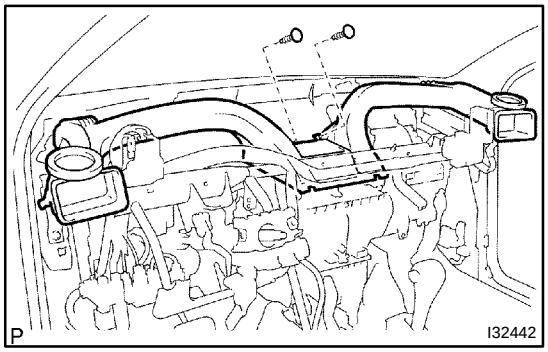


(b) Remove the screw.
(c) Remove the bolt, nut and instrument panel to cowl brace sub-assy.



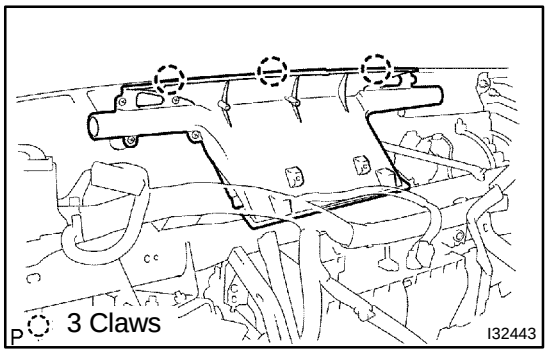
15. REMOVE HEATER TO REGISTER DUCT NO.2

(a) Remove the 2 clips and heater to register duct No. 2.



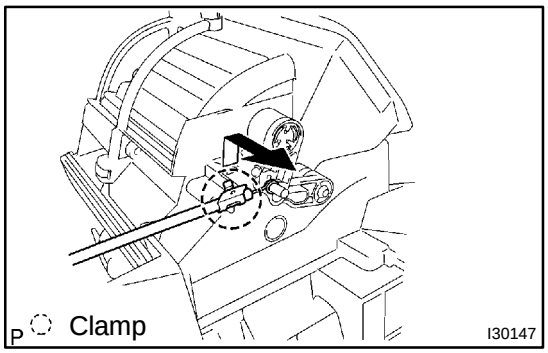
16. REMOVE HEATER TO REGISTER DUCT NO.1

(a) Remove the 2 clips and heater to register duct No. 1.



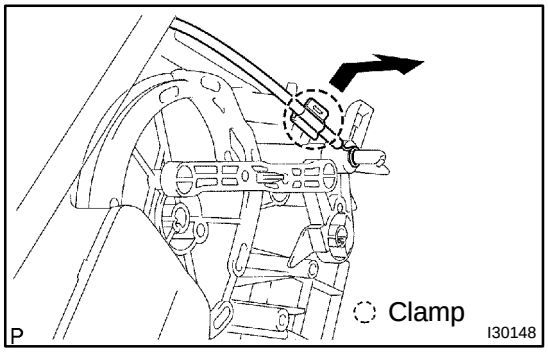
17. REMOVE DEFROSTER NOZZLE ASSY

(a) Release the 3 fitting claws, remove the defroster nozzle assy.



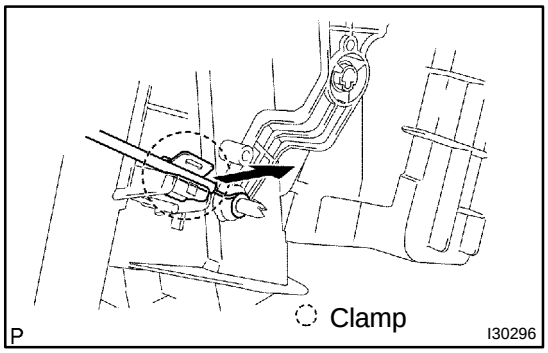
18. DISCONNECT AIR INLET DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) Disconnect the outer cable from the clamp.
(b) Disconnect the inner cable and air inlet damper control cable sub-assy.



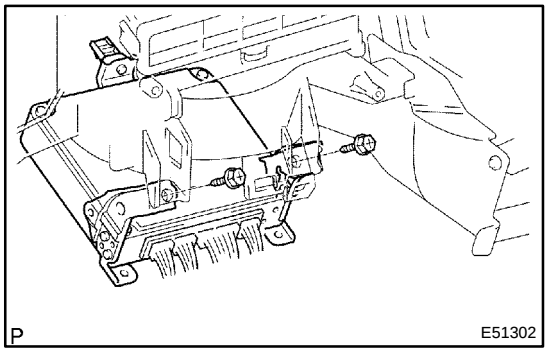
19. DISCONNECT DEFROSTER DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) Disconnect the outer cable from the clamp.
(b) Disconnect the inner cable and defroster damper control cable sub-assy.



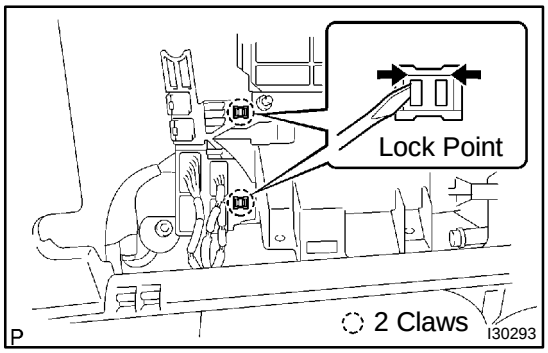
20. DISCONNECT AIRMIX DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) Disconnect the outer cable from the clamp.
(b) Disconnect the inner cable and air mix control control cable sub-assy.



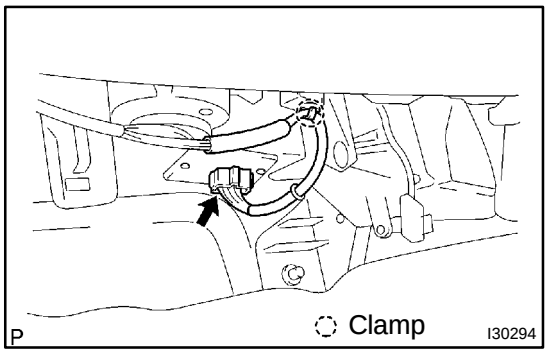
21. DISCONNECT ECM

(a) Remove the 2 bolts and disconnect the ECM.

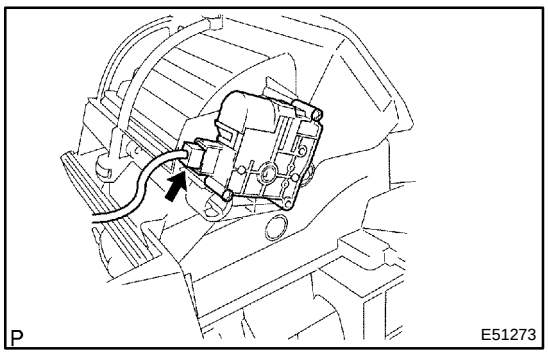


22. REMOVE AIR CONDITIONER UNIT ASSY

(a) Release the 2 fitting claws, disconnect the connector holder.

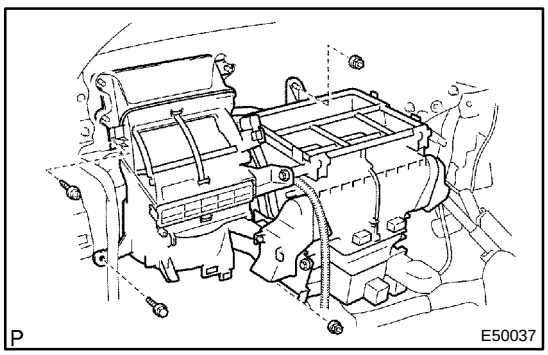


(b) Disconnect the connector and clamp.

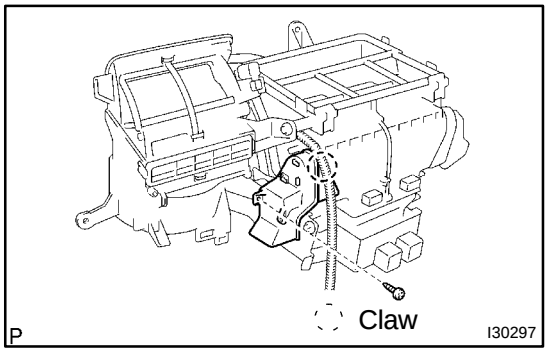


(c) AUTO A/C:
Disconnect the connector from the recirculation damper servo sub-assy.

(d) w/ PTC heater model:
Remove the earth wire bolt.

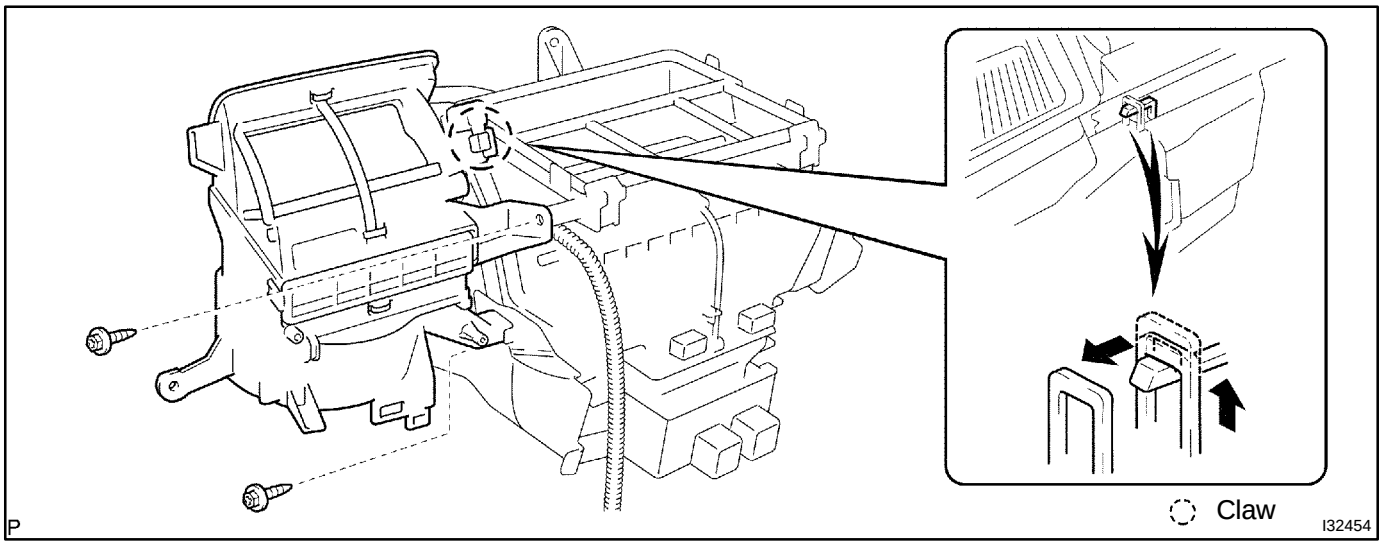


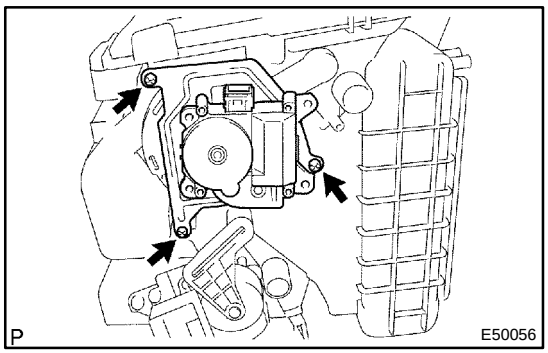
(e) Remove the 2 nuts, screw, bolt and air conditioner unit assy.



23. REMOVE AIR CONDITIONING RADIATOR ASSY

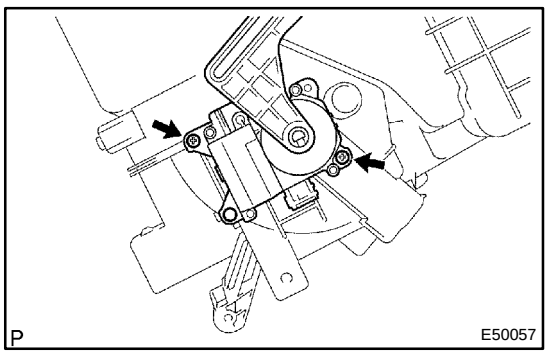
(a) Release the fitting claw, remove the screw and air duct.
(b) Remove the 2 screws.
(c) Separate the claw and remove the air conditioner radiator assy.





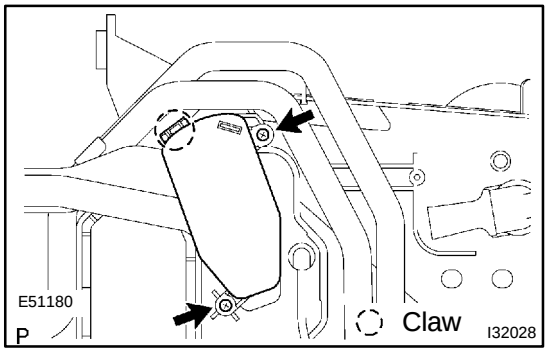
24. REMOVE MODE DAMPER SERVO SUB-ASSY (AUTO AIR CONDITIONER)

(a) Remove the 3 screws and mode damper servo sub-assy.



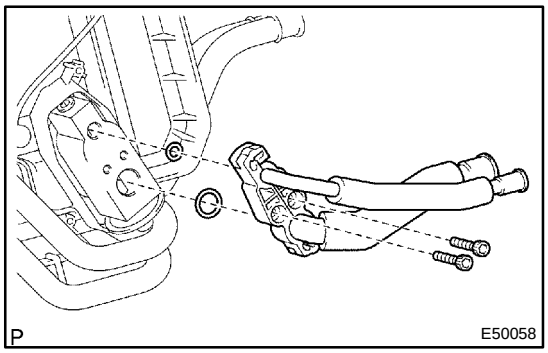
25. REMOVE AIRMIX DAMPER SERVO SUB-ASSY (AUTO AIR CONDITIONER)

(a) Remove the 2 screws and air mix damper servo sub-assy.

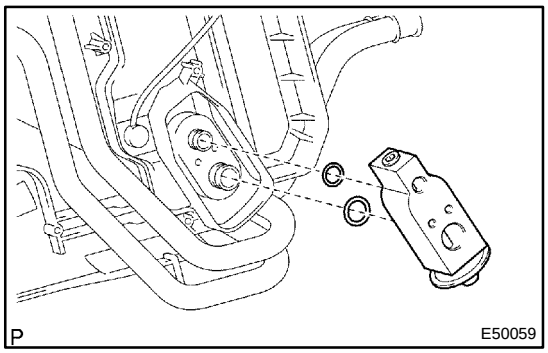


26. REMOVE AIR CONDITIONING TUBE ASSY

(a) Release the fitting claw, remove the 2 screws and expansion cover.

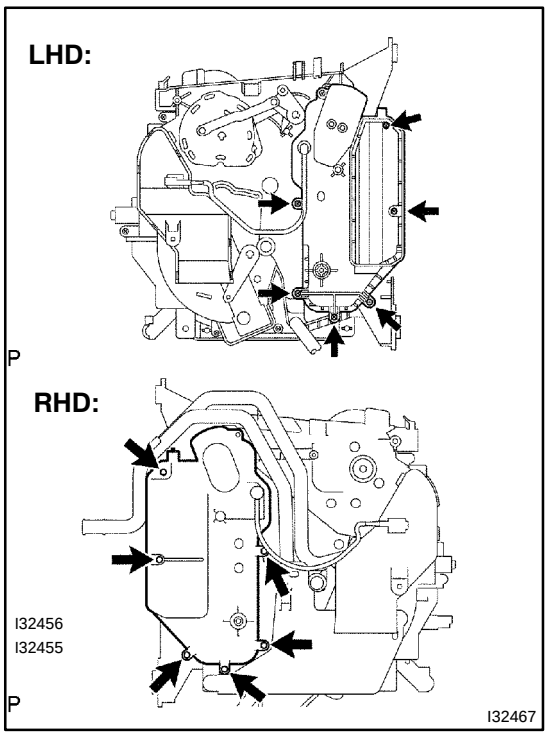


(b) Using a hexagon wrench 5.0 mm (0.20 in.), remove the 2 hexagon bolts and air conditioner tube assy.
(c) Remove the 2 O-rings from the air conditioning tube assy.



27. REMOVE COOLER EXPANSION VALVE

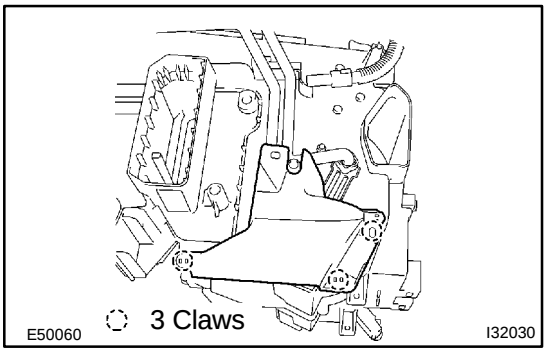
(a) Remove the cooler expansion valve from the air conditioner unit assy.
(b) Remove the 2 O-rings from the cooler evaporator sub-assy No. 1.



28. REMOVE COOLER EVAPORATOR SUB-ASSY NO.1

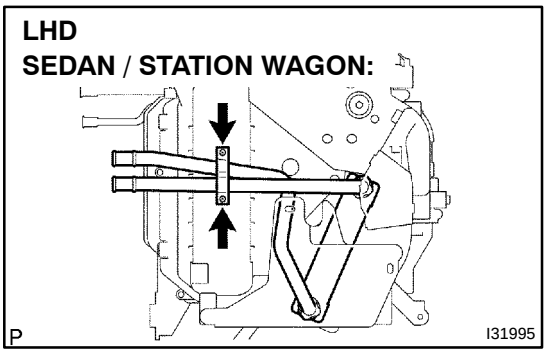
(a) Remove the 6 screws and cooler unit parts.
(b) Pull out the cooler evaporator sub-assy No. 1.

29. REMOVE COOLER THERMISTOR NO.1

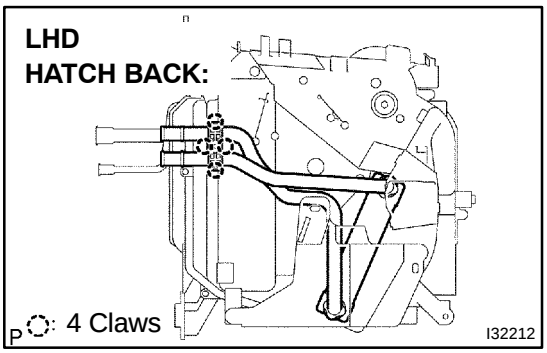


30. REMOVE HEATER RADIATOR UNIT SUB-ASSY

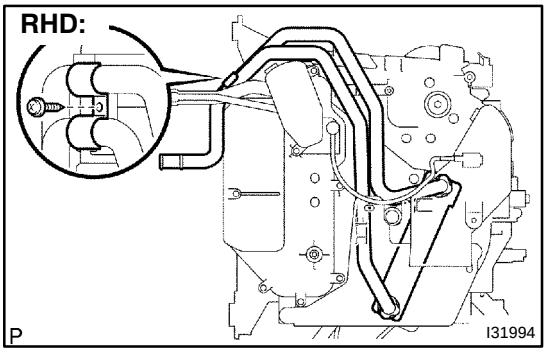
(a) Release the 3 fitting claws, remove the heater piping cover.



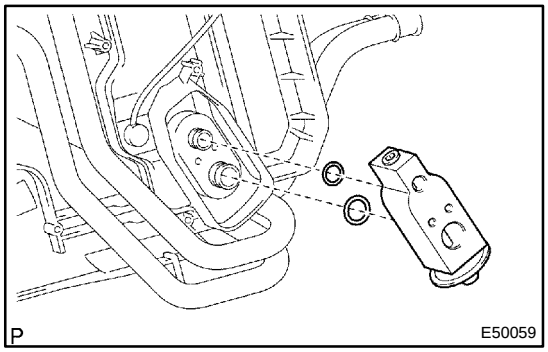
(b) LHD SEDAN / STATION WAGON:
Remove the 2 screws, heater piping clamp and heater radiator unit sub-assy.



(c) LHD HATCH BACK:
Release the 4 fitting claws, remove the heater piping clamp and heater radiator unit sub-assy



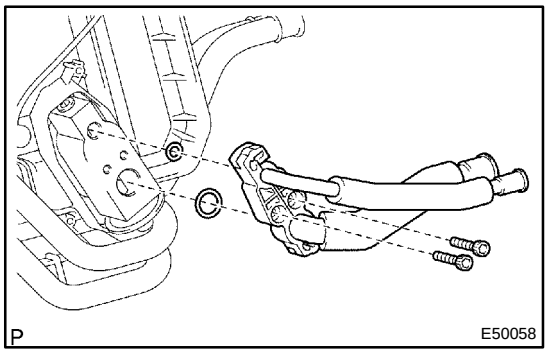
(d) RHD:
Remove the screw, heater piping clamp and heater radiator unit sub-assy.



31. INSTALL COOLER EXPANSION VALVE

(a) Lubricate 2 new O-rings with compressor oil and install them to the cooler expansion valve.
Compressor oil: ND-OIL 8 or equivalent

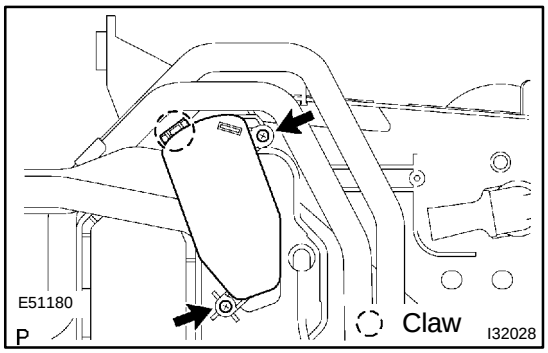
(b) Install the cooler expansion valve from cooler evaporator No. 1.



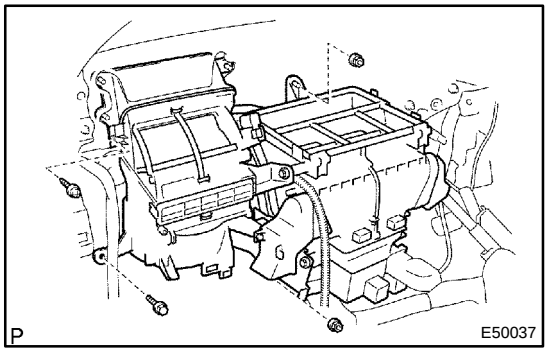
32. INSTALL AIR CONDITIONING TUBE ASSY

(a) Lubricate 2 new O-rings with compressor oil and install them to the air conditioning tube assy.
Compressor oil: ND-OIL 8 or equivalent

(b) Using a hexagon wrench 5.0 mm (0.20 in.), install the air conditioning tube assy with the 2 hexagon bolts.
Torque: 3.5 N·m (35 kgf·cm, 30 in.·lbf)



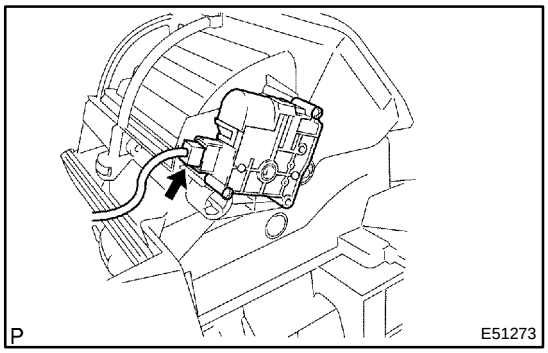
(c) Install the expansion cover with the 2 screws and claw.



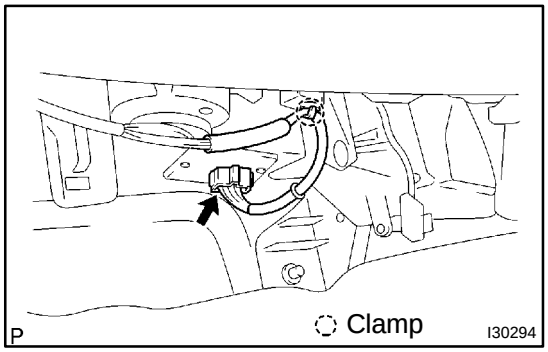
33. INSTALL AIR CONDITIONER UNIT ASSY

(a) Install the air conditioner unit assy with the 2 nuts, screw and bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

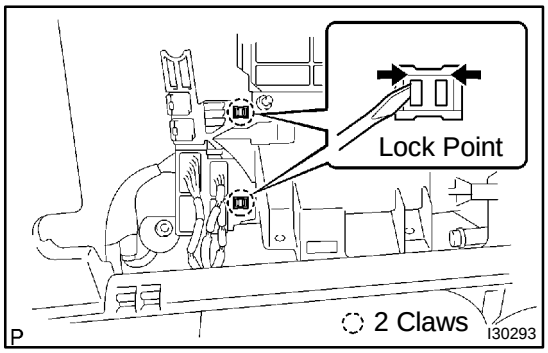
(b) w/ PTC heater model:
Install the earth wire with the bolt.



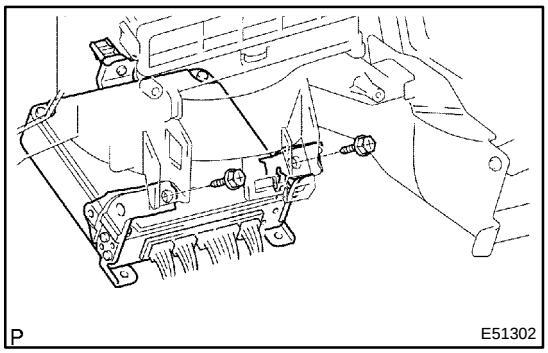
(c) AUTO A/C:
Connect the connector to the recirculation damper servo sub-assy.



(d) Connect the connector and clamp.



(e) Install the 2 claws, connect the connector holder.



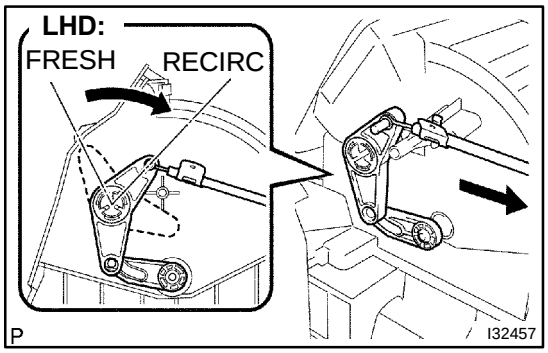
34. INSTALL ECM

(a) Install the ECM with the 2 bolts.
Torque: 3.0 N·m (30 kgf·cm, 26 in.·lbf)

35. INSTALL INSTRUMENT PANEL SUB-ASSY LOWER
SEDAN / STATION WAGON: (See page 71-14)
HATCH BACK: (See page 71-23)

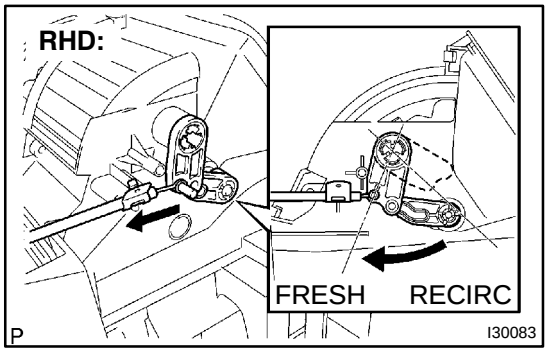
36. INSTALL AIR CONDITIONING CONTROL ASSY

(a) Connect the air inlet damper control cable sub-assy to the air conditioning control assy.
(b) Connect the defroster damper control cable sub-assy to the air conditioning control assy.
(c) Connect the air mix damper control cable sub-assy to the air conditioning control assy.
(d) Install the air conditioning control assy to the instrument panel sub-assy lower.



37. INSTALL AIR INLET DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) LHD:
Set the arm in RECIRC position.
(b) LHD:
Install the inner cable end to the control lever with the arm in RECIRC position.

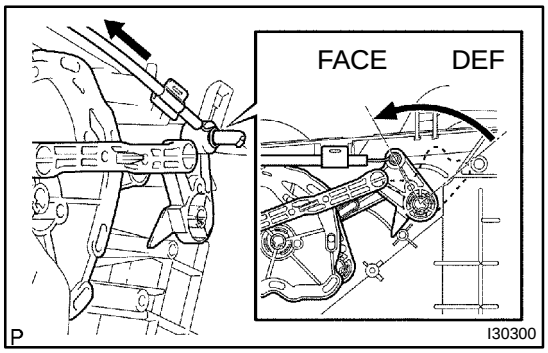


(c) RHD:
Set the arm in FRESH position.

(d) RHD:
Install the inner cable end to the control lever with the arm in FRESH position.

(e) Install the outer cable to the cable clamp while slightly pressing it in the direction of the arrow.

HINT:
Operating the R/F control lever, check that it properly stops at both ends of RECIRC and FRESH and no recoil is identified.



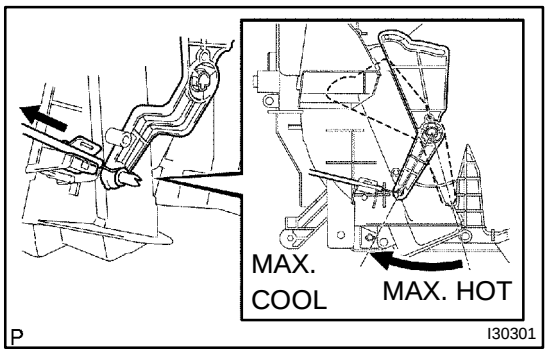
38. INSTALL DEFROSTER DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) Set the arm in FACE position.

(b) Install the inner cable end to the control lever with the arm in FACE position.

(c) Install the outer cable to the cable clamp while slightly pressing it in the direction of the arrow.

HINT:
Operating the mode control lever, check that it properly stops at both ends of FACE and DEF and no recoil is identified.



39. INSTALL AIRMIX DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) Set the arm in MAX. COOL position.

(b) Install the inner cable end to the control lever with the arm in MAX. COOL position.

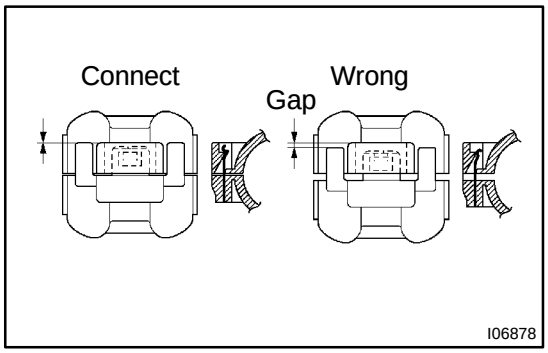
(c) Install the outer cable to the cable clamp while slightly pressing it in the direction of the arrow.

HINT:
Operating the temperature control lever, check that it properly stops at both ends of MAX. COOL and MAX. HOT and no recoil is identified.

40. REMOVE AIR CONDITIONING CONTROL ASSY

(a) Release the 2 fitting claws and pull out the air conditioning control assy.
(b) Disconnect the air inlet damper control cable sub-assy from the air conditioning control assy.
(c) Disconnect the defroster damper control cable sub-assy from the air conditioning control assy.
(d) Disconnect the air mix damper control cable sub-assy from the air conditioning control assy.
(e) Remove the air conditioning control assy from the instrument panel sub-assy lower.

41. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER
SEDAN / STATION WAGON: (See page 71-21)
HATCH BACK: (See page 71-30)



42. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

(a) Lubricate a new O-ring with compressor oil and install them to the hose.
Compressor oil: ND-OIL 8 or equivalent
(b) Install the cooler refrigerant suction hose No. 1 and piping clamp.
HINT:
After connection, check the fitting for claw of the piping clamp.

43. INSTALL COOLER REFRIGERANT LIQUID PIPE A (RHD(1CD-FTV) STEERING POSITION TYPE)

(a) Lubricate a new O-ring with compressor oil and install them to the pipe.
Compressor oil: ND-OIL 8 or equivalent
(b) Install the cooler refrigerant liquid pipe A and piping clamp.
HINT:
After connection, check the fitting for claw of the piping clamp.

44. INSTALL COOLER REFRIGERANT LIQUID PIPE A

(a) Lubricate a new O-ring with compressor oil and install them to the pipe.
Compressor oil: ND-OIL 8 or equivalent
(b) Install the cooler refrigerant liquid pipe A and piping clamp.
HINT:
After connection, check the fitting for claw of the piping clamp.

45. INSTALL COOLER REFRIGERANT LIQUID PIPE B (RHD(1CD-FTV) STEERING POSITION TYPE)

(a) Lubricate a new O-ring with compressor oil and install them to the pipe.
Compressor oil: ND-OIL 8 or equivalent
(b) Install the cooler refrigerant liquid pipe B and piping clamp.
HINT:
After connection, check the fitting for claw of the piping clamp.

46. ADD COOLANT
2ZZ-GE: (See page 16-6)
3ZZ-FE / 4 ZZ - FE: (See page 16-20)
1CD-FTV: (See page 16-33)

47. CHECK ENGINE COOLANT LEAK
2ZZ-GE: (See page 16-1)
3ZZ-FE / 4 ZZ - FE: (See page 16-15)
1CD-FTV: (See page 16-27)

48. CHARGE REFRIGERANT (See page 55-25)
Specified amount: 490 ± 30 g (17.28 ± 1.06 oz.)
SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080), 07117-48130, 07117-48140

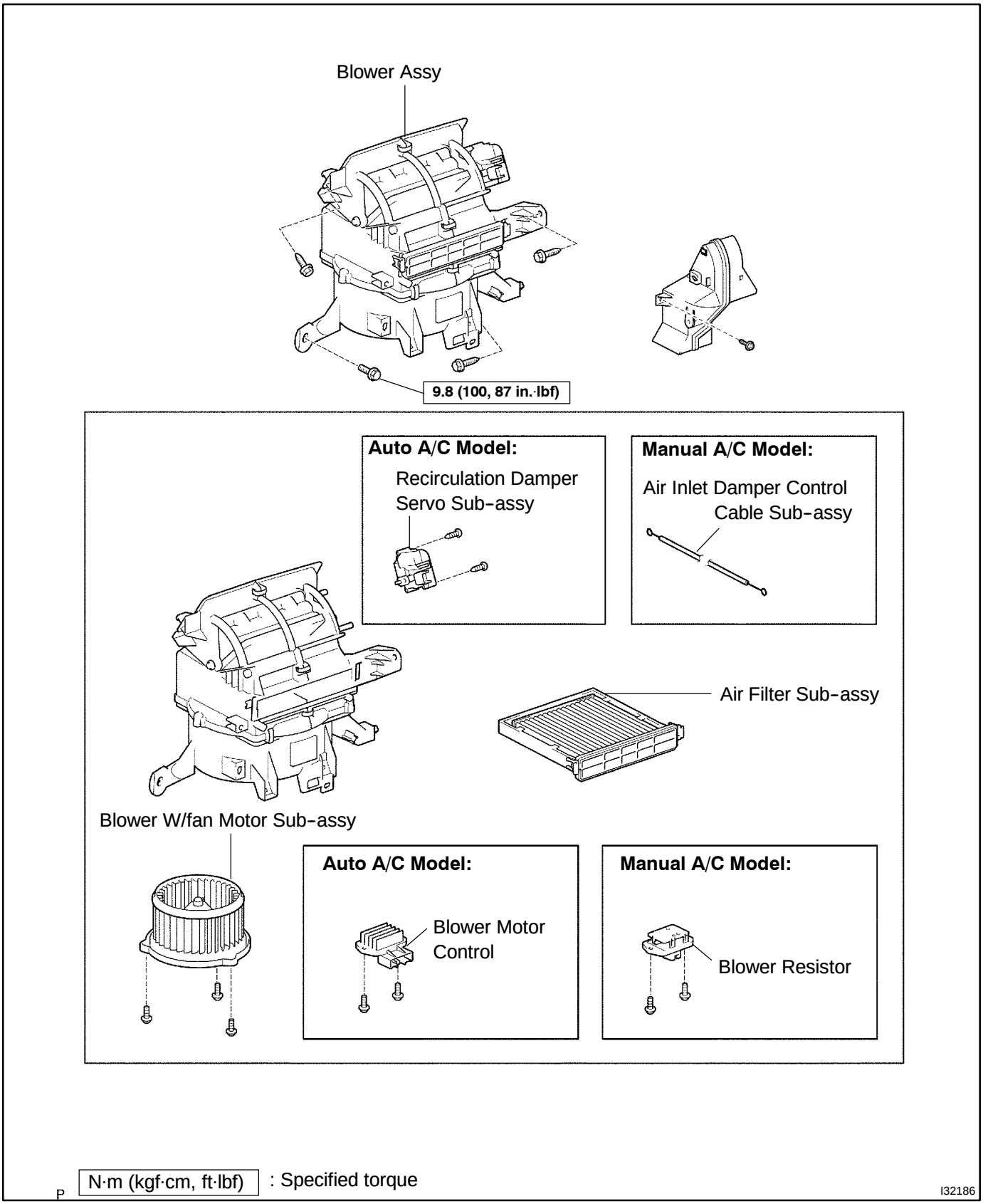
49. WARM UP ENGINE

50. INSPECT LEAKAGE OF REFRIGERANT (See page 55-25)

BLOWER ASSY (SEDAN/STATION WAGON)

COMPONENTS

550FM-01



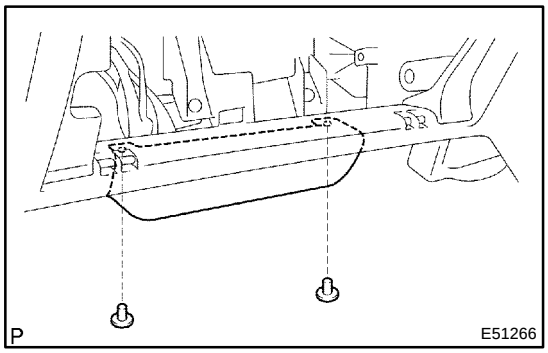
550FN-01

OVERHAUL

HINT:

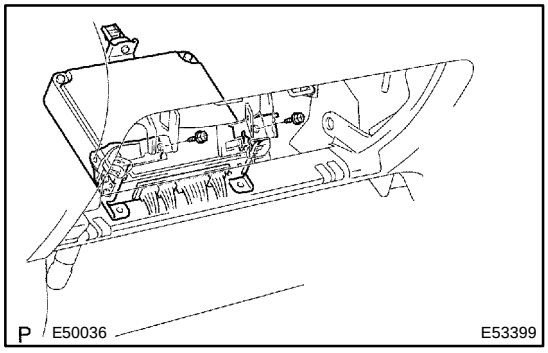
COMPONENTS: 55-57

1. **REMOVE GLOVE COMPARTMENT DOOR ASSY**
   (See page 71-17)
2. **REMOVE FRONT DOOR SCUFF PLATE RH(LHD STEERING POSITION TYPE)**
   (See page 71-19)
3. **REMOVE FRONT DOOR SCUFF PLATE LH(RHD STEERING POSITION TYPE)**
   (See page 71-19)
4. **REMOVE COWL SIDE TRIM BOARD RH(LHD STEERING POSITION TYPE)**
   (See page 71-20)
5. **REMOVE COWL SIDE TRIM BOARD LH(RHD STEERING POSITION TYPE)**
   (See page 71-20)

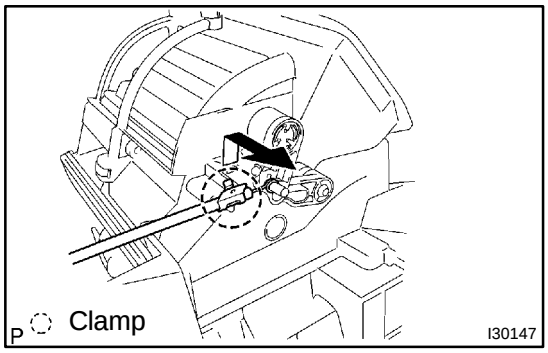


6. **DISCONNECT ECM**

(a) Remove the 2 clips and ECM cover.

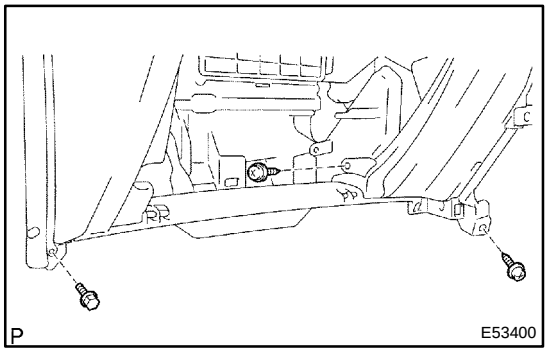


(b) Remove the 2 bolts and disconnect the ECM.



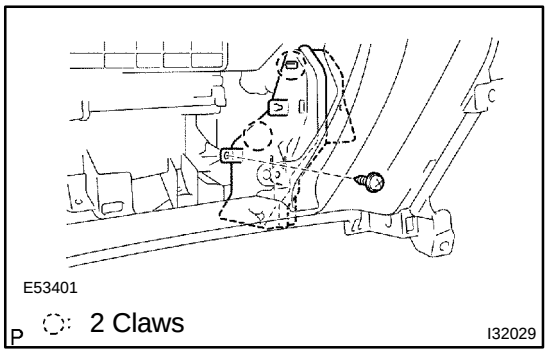
7. **DISCONNECT AIR INLET DAMPER CONTROL CABLE SUB-ASSY(MANUAL AIR CONDITIONER)**

(a) Disconnect the outer cable from the clamp.
(b) Disconnect the inner cable and air inlet damper control cable sub-assy.

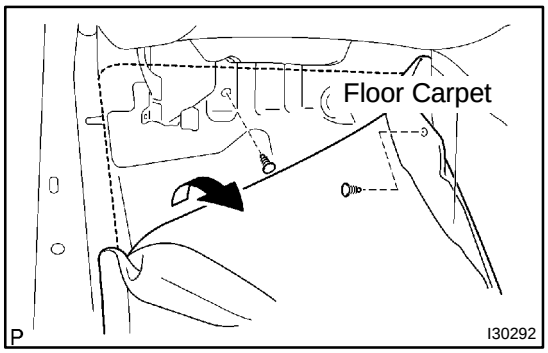


8. REMOVE BLOWER ASSY

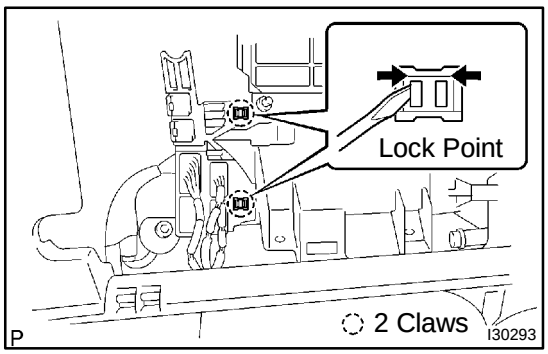
(a) Remove the bolt and 2 screws.



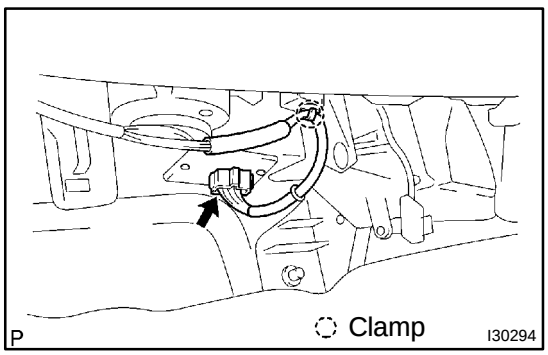
(b) Release the 2 fitting claws, remove the screw and air duct.



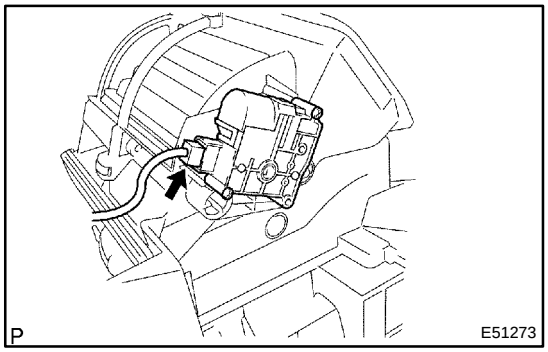
(c) Remove the 2 clips and backward the floor carpet.



(d) Release the 2 fitting claws, disconnect the connector holder.

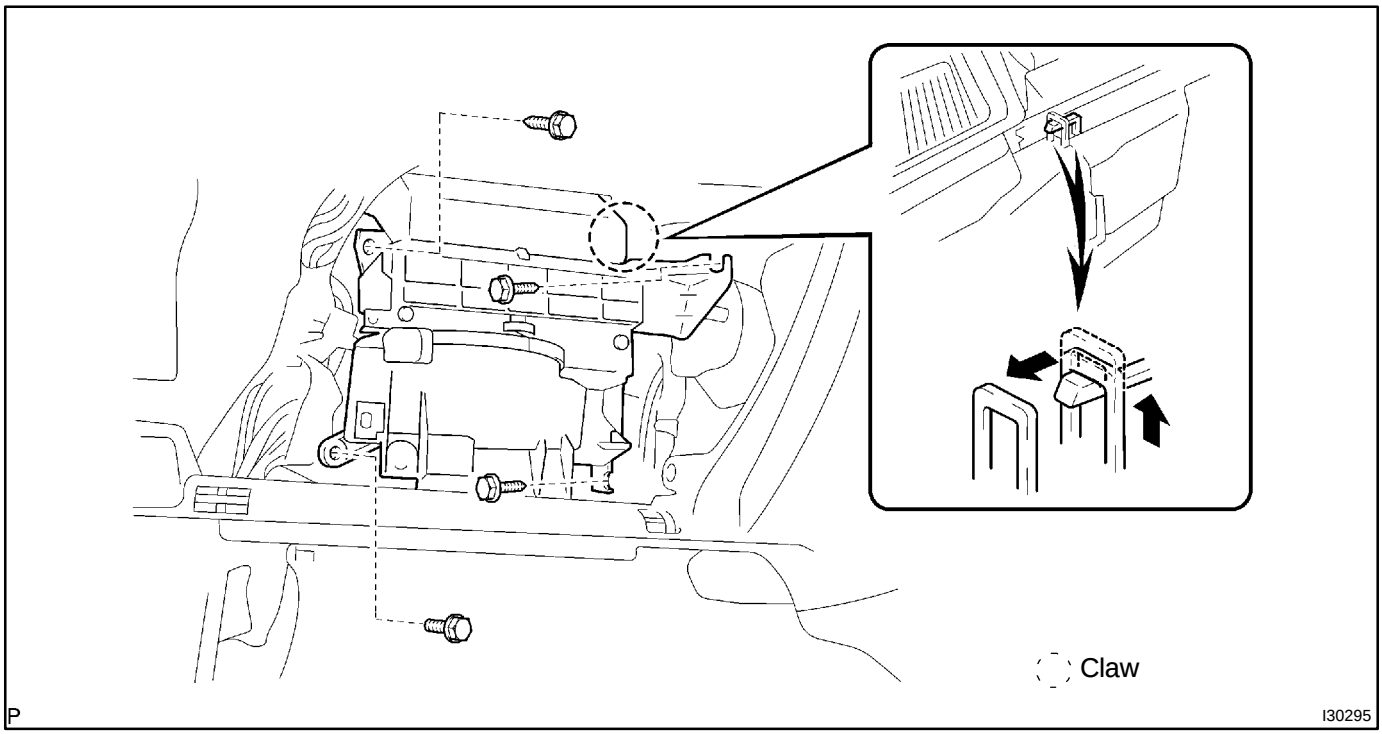


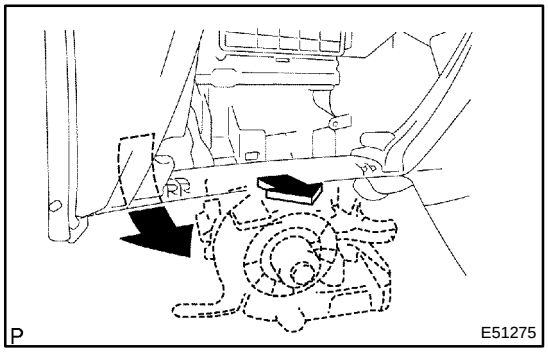
(e) Disconnect the connector and clamp.



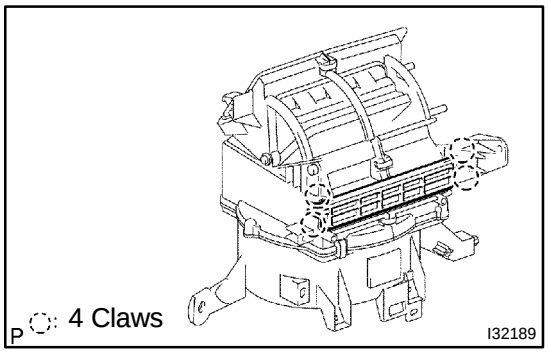
(f) AUTO A/C:
Disconnect the connector from the recirculation damper servo sub-assy.

(g) Remove the 3 screws and bolt.
(h) Separate the claw and remove the blower motor.



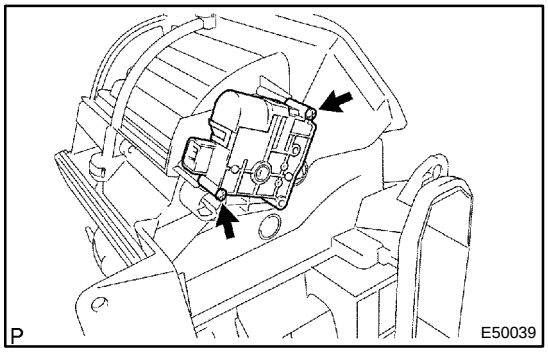


(i) Remove the blower assy.



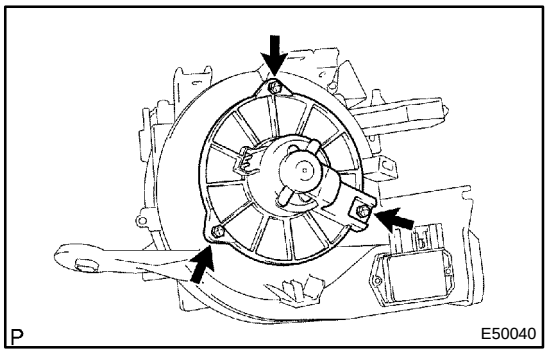
9. REMOVE AIR FILTER SUB-ASSY

(a) Release the 4 fitting claws, remove the air filter sub-assy.



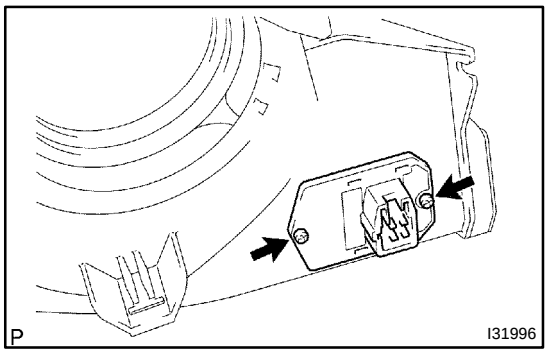
10. REMOVE RECIRCULATION DAMPER SERVO SUB-ASSY(AUTO AIR CONDITIONER)

(a) Remove the 2 screws and recirculation damper servo sub-assy.



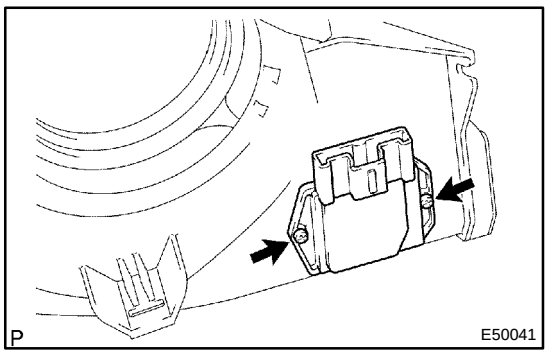
11. REMOVE BLOWER W/FAN MOTOR SUB-ASSY

(a) Remove the 3 screws and blower w/ fan motor sub-assy.



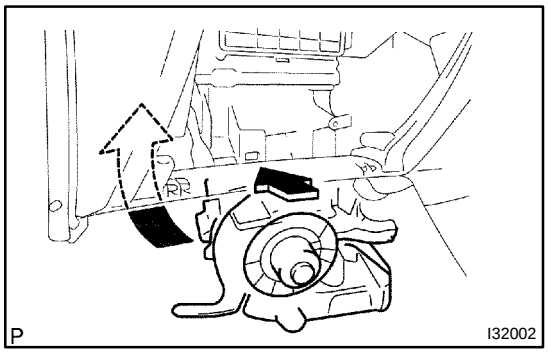
12. REMOVE BLOWER RESISTOR(MANUAL AIR CONDITIONER)

(a) Remove the 2 screws and blower resistor.



13. REMOVE BLOWER MOTOR CONTROL(AUTO AIR CONDITIONER)

(a) Remove the 2 screws and blower motor control.

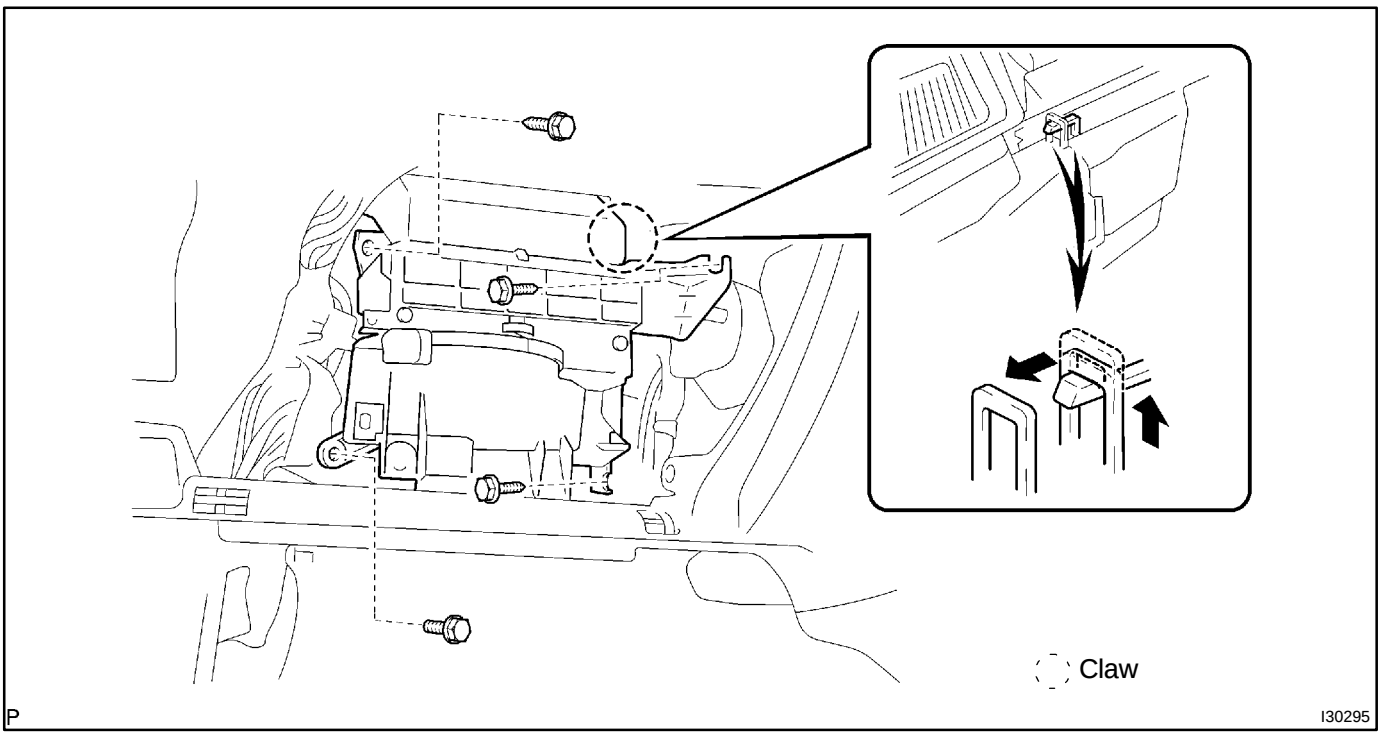


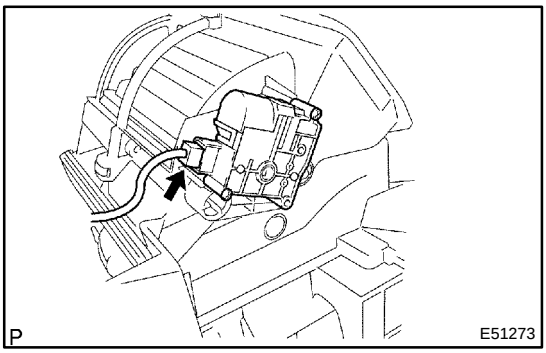
14. INSTALL BLOWER ASSY

(a) Install the blower assy.

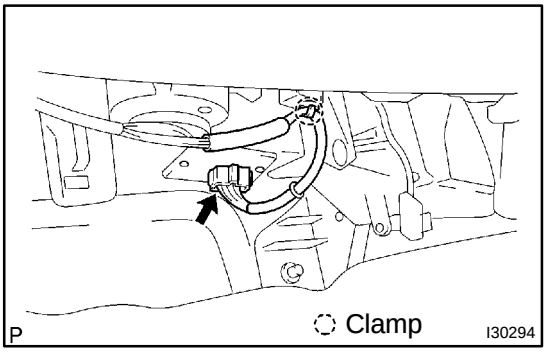
(b) Install the blower assy with the claw.

(c) Install the blower assy with the 3 screws and bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf) (Bolt)

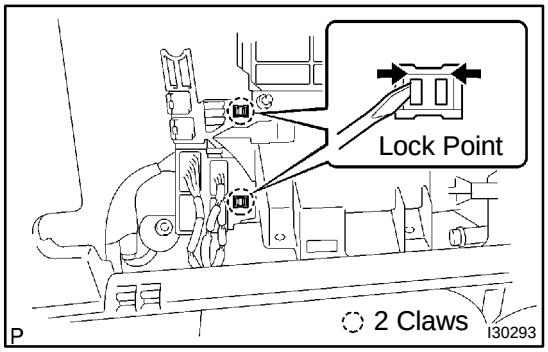




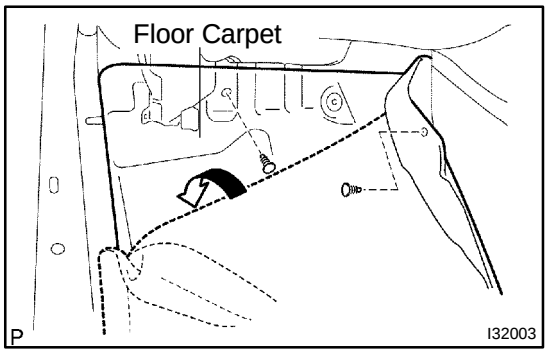
(d) AUTO A/C:
Connect the connector to the recirculation damper servo sub-assy.



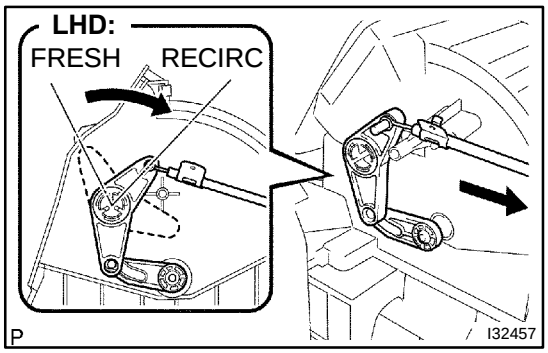
(e) Connect the connector and clamp.



(f) Install the 2 claws, connect the connector holder.



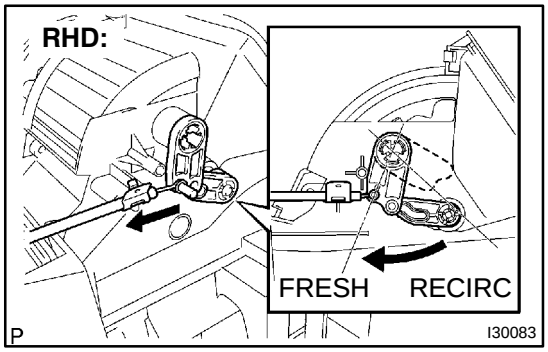
(g) Install the floor carpet with the 2 clips.



15. INSTALL AIR INLET DAMPER CONTROL CABLE SUB-ASSY(MANUAL AIR CONDITIONER)

(a) LHD:
Set the arm in RECIRC position.

(b) LHD:
Install the inner cable end to the control lever with the arm in RECIRC position.

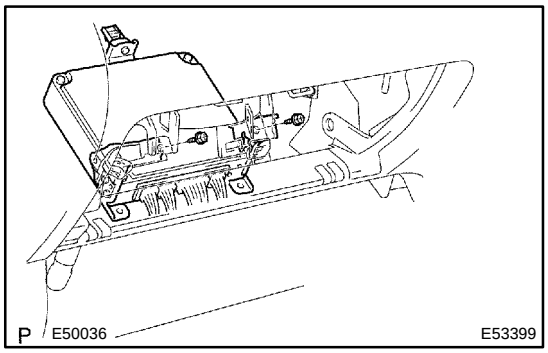


(c) RHD:
Set the arm in FRESH position.

(d) RHD:
Install the inner cable end to the control lever with the arm in FRESH position.

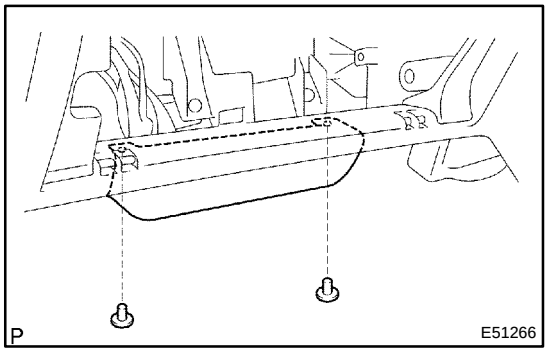
(e) Install the outer cable to the cable clamp while slightly pressing it in the direction of the arrow.

HINT:
Operating the R/F control lever, check that it properly stops at both ends of RECIRC and FRESH and no recoil is identified.



16. INSTALL ECM

(a) Install the ECM with the 2 bolts.
Torque: 3.0 N·m (30 kgf·cm, 26 in.·lbf)

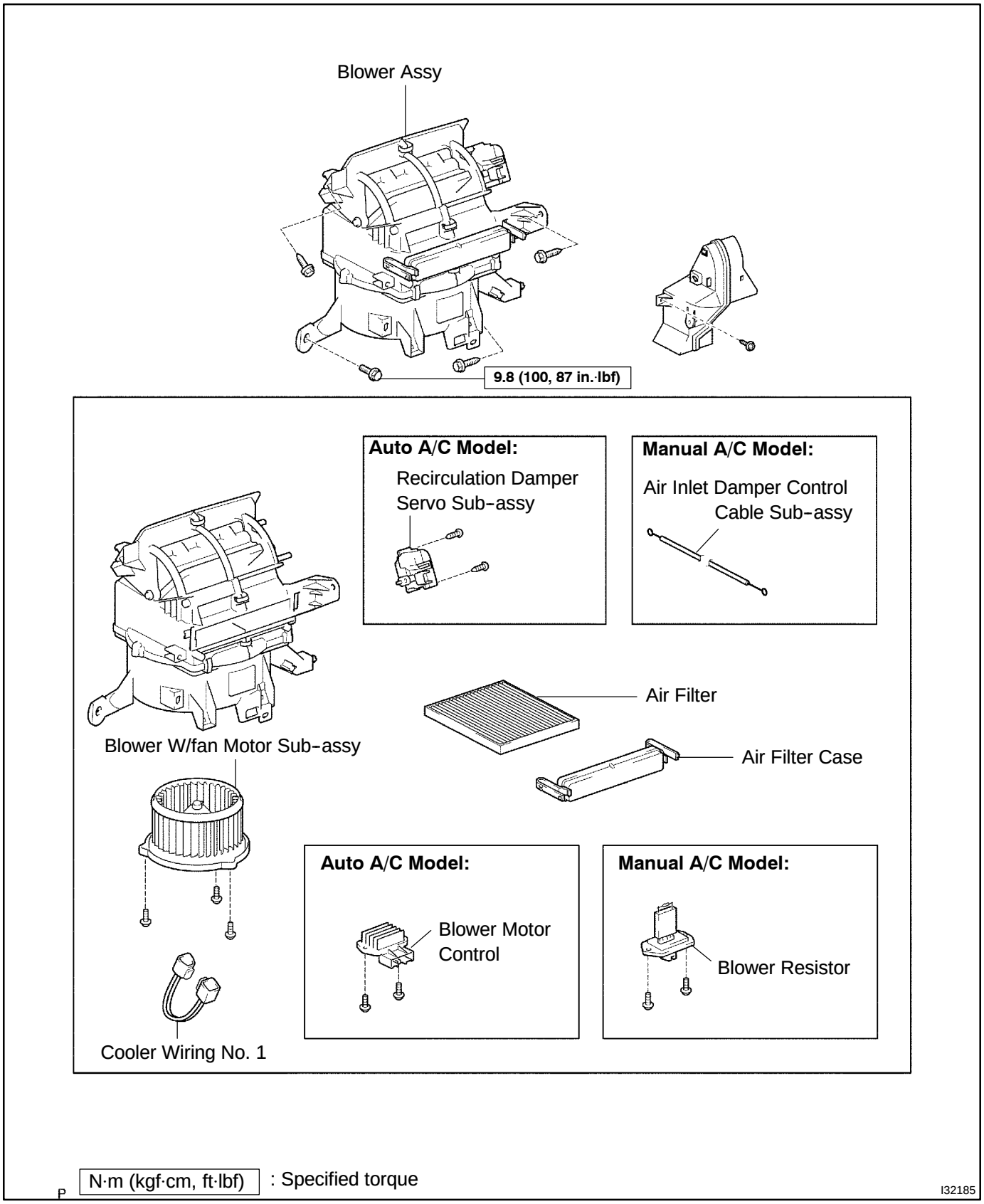


(b) Install the and ECM cover with the 2 clips.

BLOWER ASSY (HATCHBACK)

COMPONENTS

550FO-01



N·m (kgf·cm, ft·lbf) : Specified torque

P

I32185

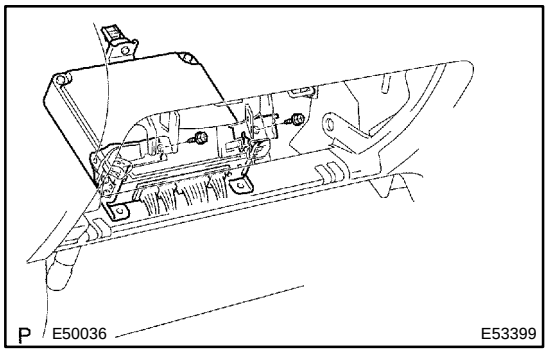
550FP-01

OVERHAUL

HINT:

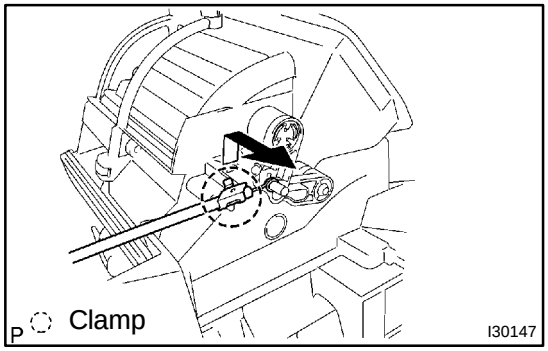
COMPONENTS: 55-65

1. **REMOVE GLOVE COMPARTMENT DOOR ASSY**
   (See page 71-26)
2. **REMOVE FRONT DOOR SCUFF PLATE RH (LHD STEERING POSITION TYPE)**
   (See page 71-28)
3. **REMOVE FRONT DOOR SCUFF PLATE LH (RHD STEERING POSITION TYPE)**
   (See page 71-28)
4. **REMOVE COWL SIDE TRIM BOARD RH (LHD STEERING POSITION TYPE)**
   (See page 71-29)
5. **REMOVE COWL SIDE TRIM BOARD LH (RHD STEERING POSITION TYPE)**
   (See page 71-29)
6. **REMOVE INSTRUMENT PANEL UNDER COVER SUB-ASSY NO.2**
   (See page 71-29)



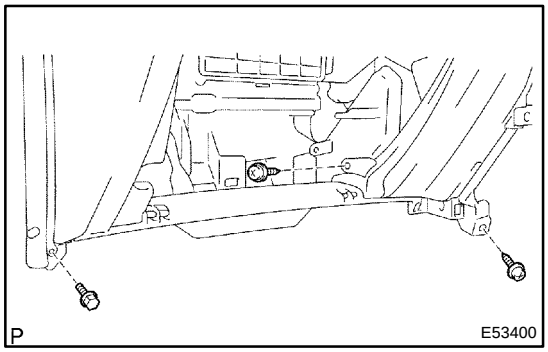
7. DISCONNECT ECM

(a) Remove the 2 bolts and disconnect the ECM.



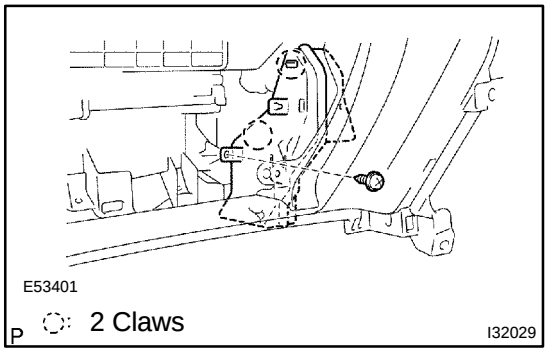
8. DISCONNECT AIR INLET DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) Disconnect the outer cable from the clamp.
(b) Disconnect the inner cable and air inlet damper control cable sub-assy.

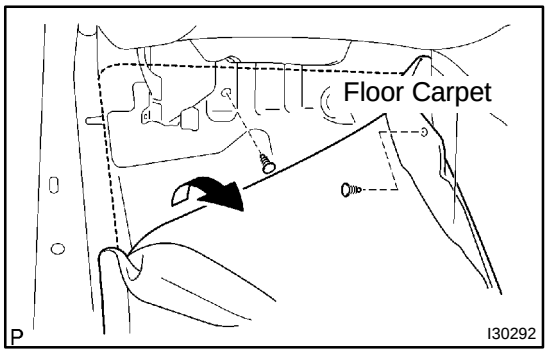


9. REMOVE BLOWER ASSY

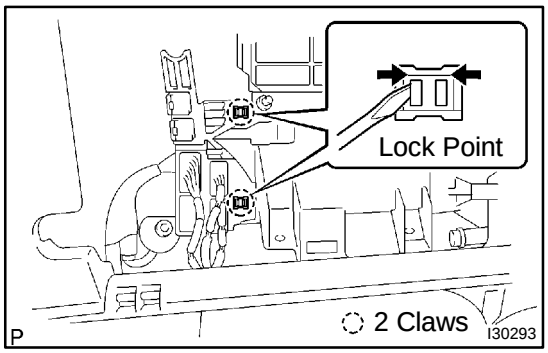
(a) Remove the bolt and 2 screws.



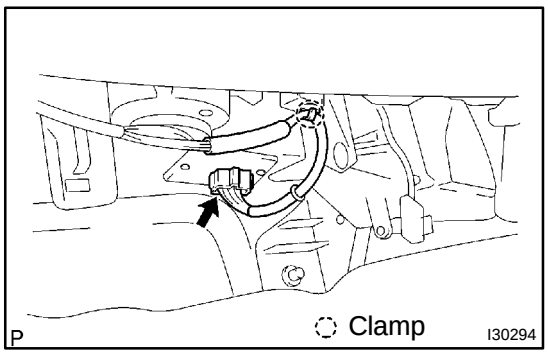
(b) Release the 2 fitting claws, remove the screw and air duct.



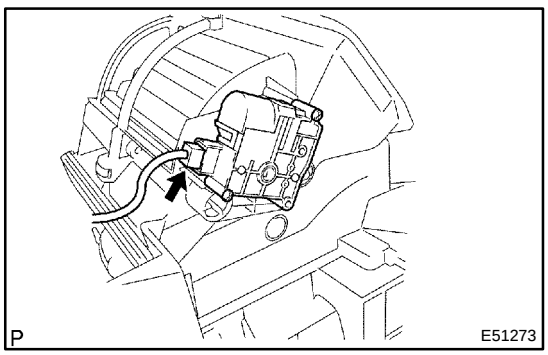
(c) Remove the 2 clips and backward the floor carpet.



(d) Release the 2 fitting claws, disconnect the connector holder.

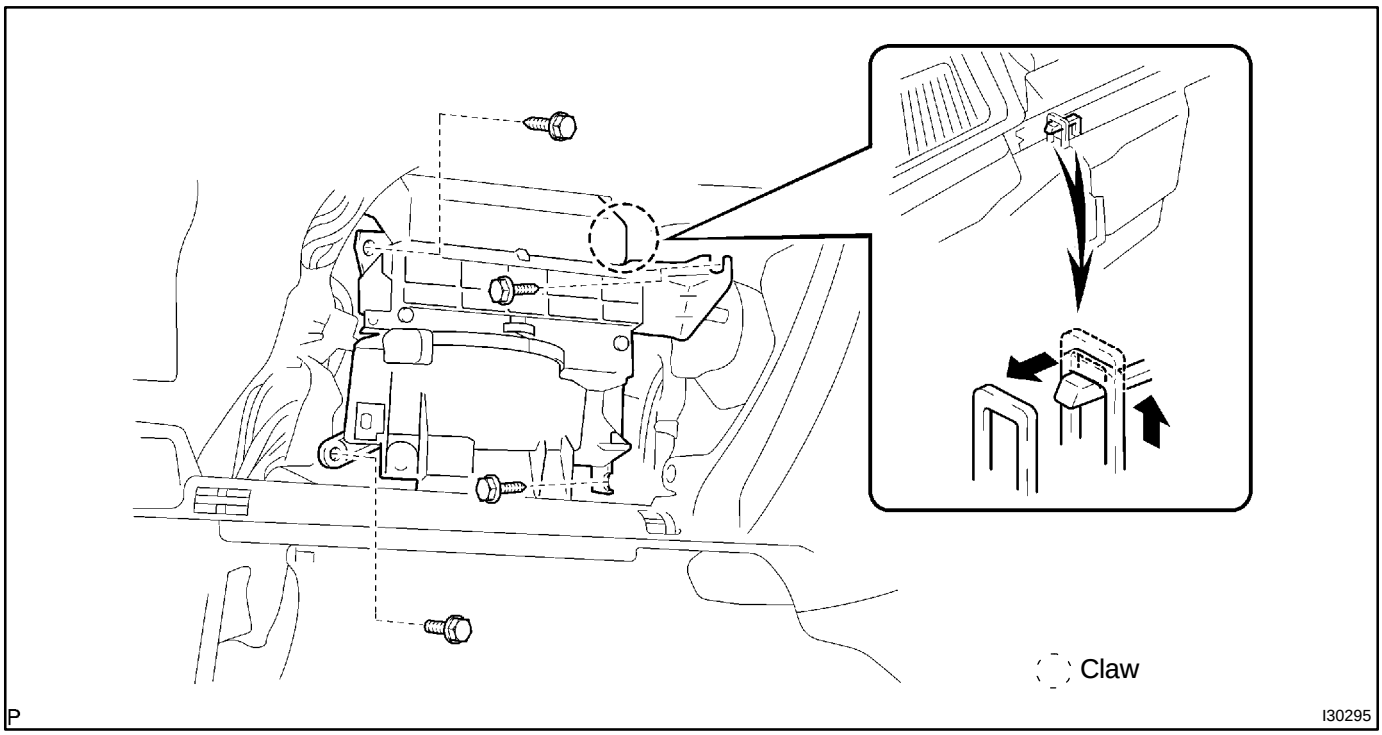


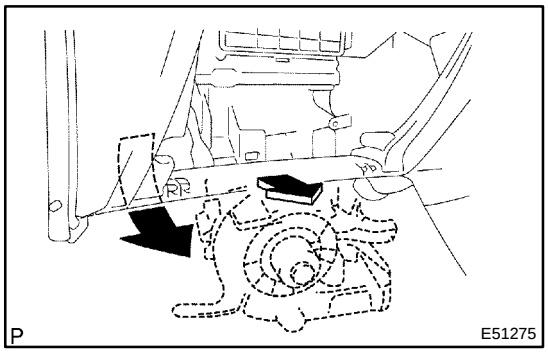
(e) Disconnect the connector and clamp.



(f) AUTO A/C:
Disconnect the connector from the recirculation damper servo sub-assy.

(g) Remove the 3 screws and bolt.
(h) Separate the claw and remove the blower motor.

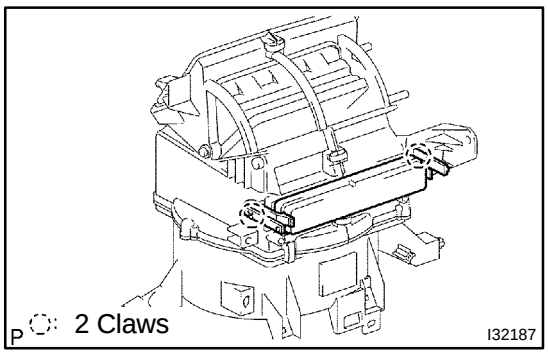




(i) Remove the blower assy.

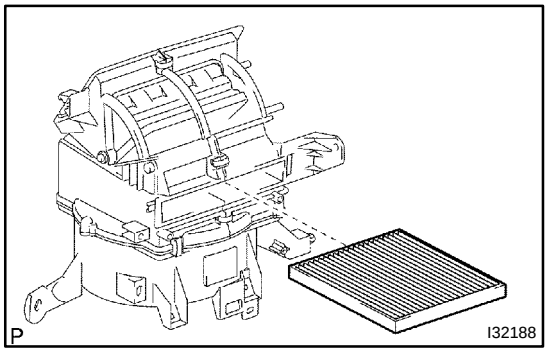
10. REMOVE COOLER WIRING NO.1

(a) Remove the cooler wiring No. 1 from the blower assy.



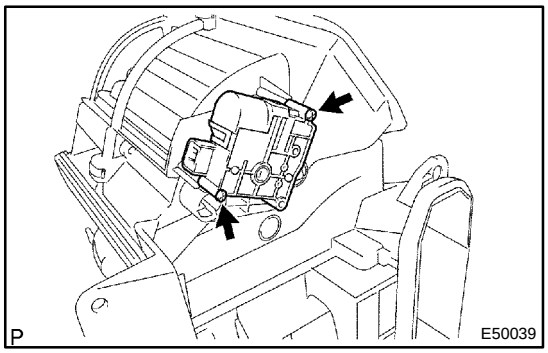
11. REMOVE AIR FILTER CASE

(a) Release the 2 fitting claws, remove the air filter case.



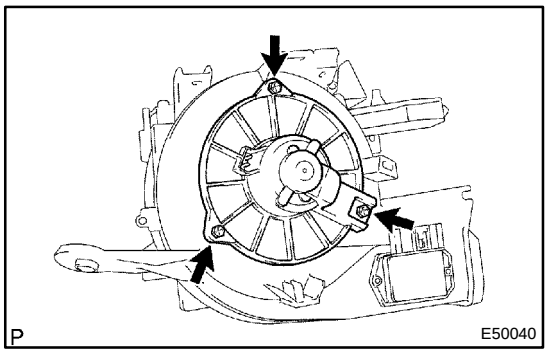
12. REMOVE AIR FILTER

(a) Remove the air filter from the blower assy.



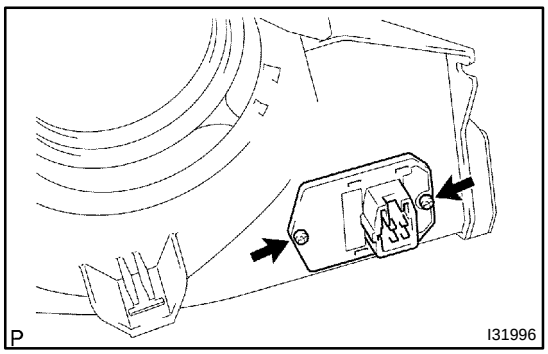
13. REMOVE RECIRCULATION DAMPER SERVO SUB-ASSY (AUTO AIR CONDITIONER)

(a) Remove the 2 screws and recirculation damper servo sub-assy.



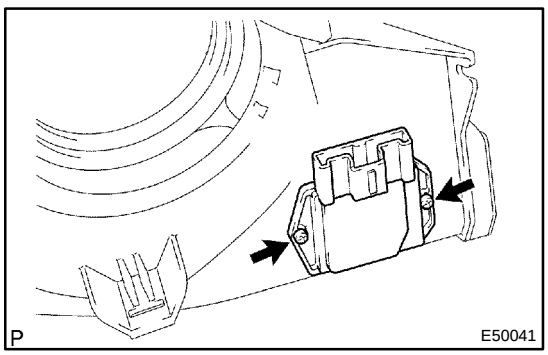
14. REMOVE BLOWER W/FAN MOTOR SUB-ASSY

(a) Remove the 3 screws and blower w/ fan motor sub-assy.



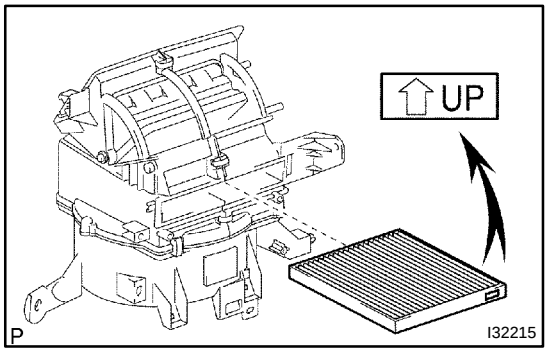
15. REMOVE BLOWER RESISTOR (MANUAL AIR CONDITIONER)

(a) Remove the 2 screws and blower resistor.



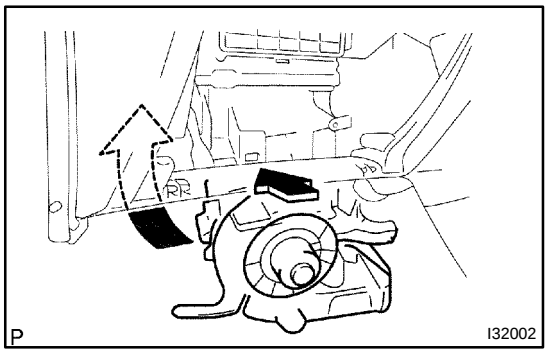
16. REMOVE BLOWER MOTOR CONTROL (AUTO AIR CONDITIONER)

(a) Remove the 2 screws and blower motor control.



17. INSTALL AIR FILTER

(a) Install the air filter to the blower assy.

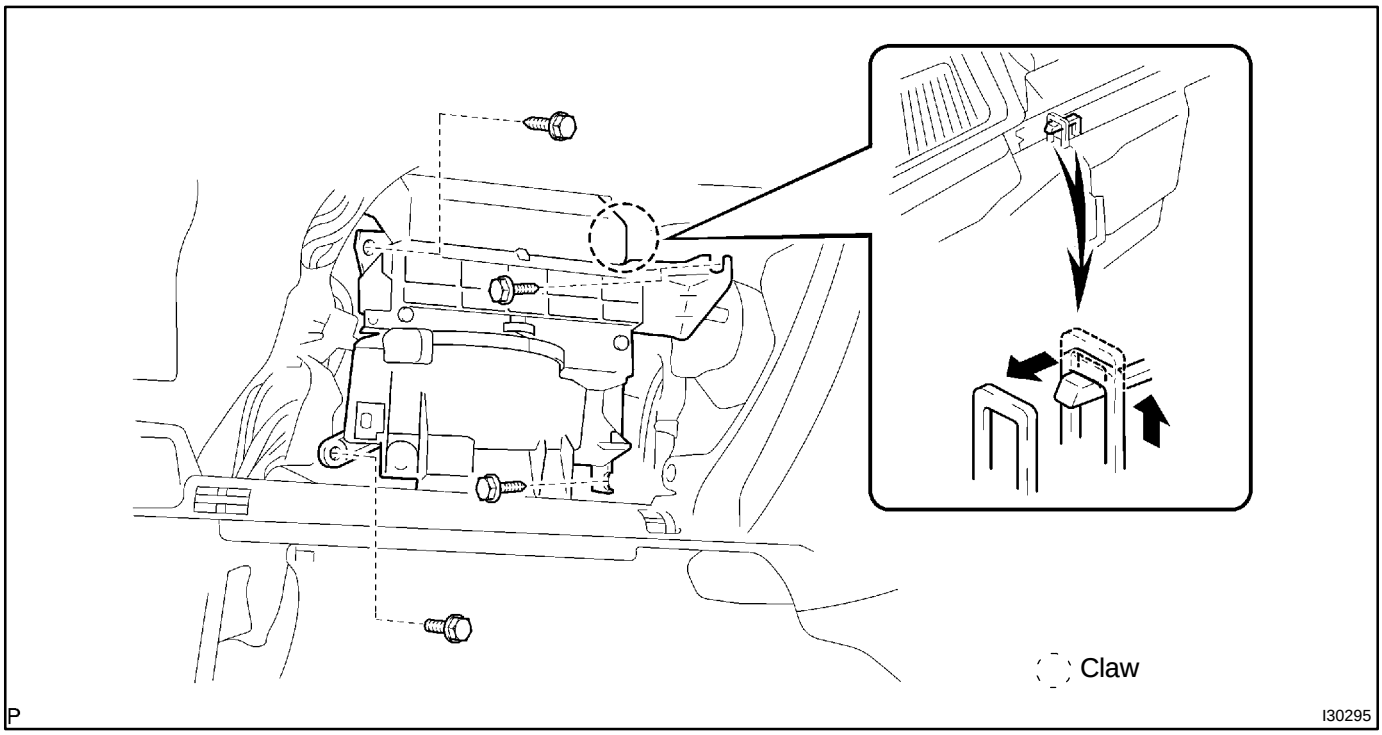


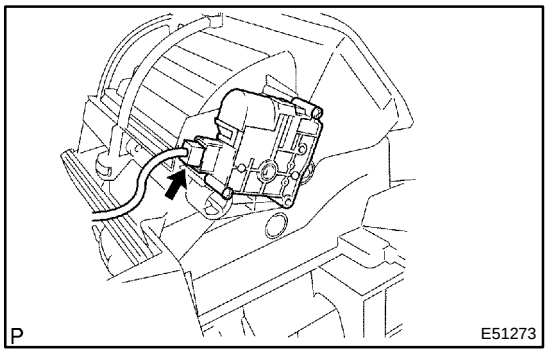
18. INSTALL BLOWER ASSY

(a) Install the blower assy.

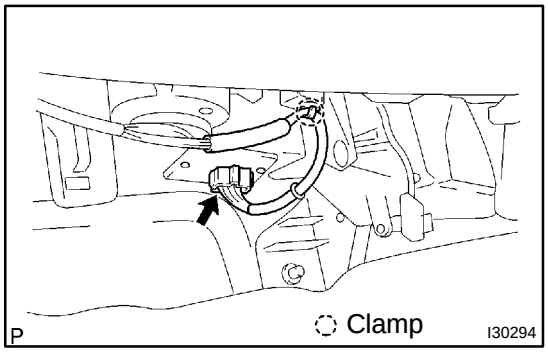
(b) Install the blower assy with the claw.

(c) Install the blower assy with the 3 screws and bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf) (Bolt)

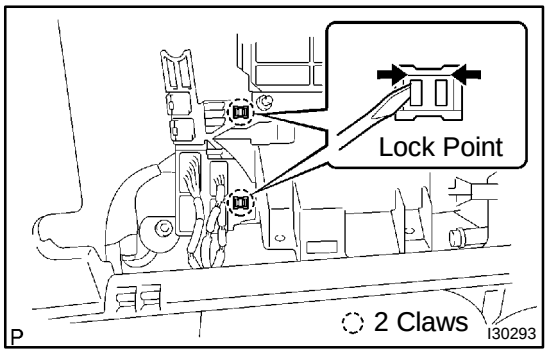




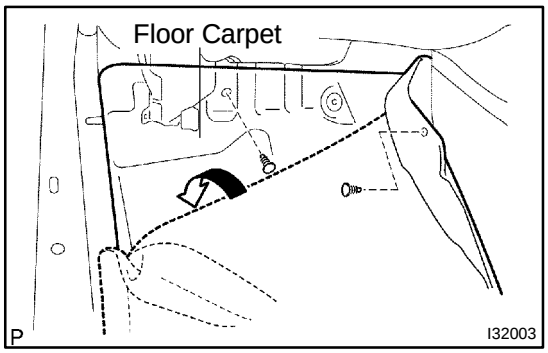
(d) AUTO A/C:
Connect the connector to the recirculation damper servo sub-assy.



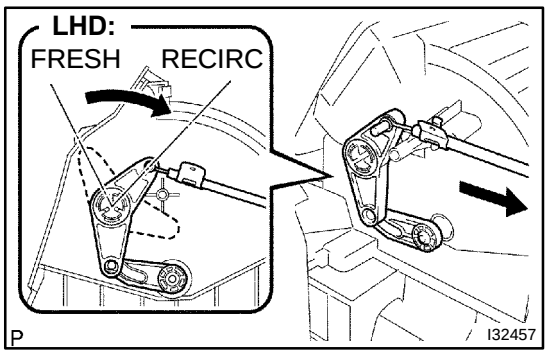
(e) Connect the connector and clamp.



(f) Install the 2 claws, connect the connector holder.



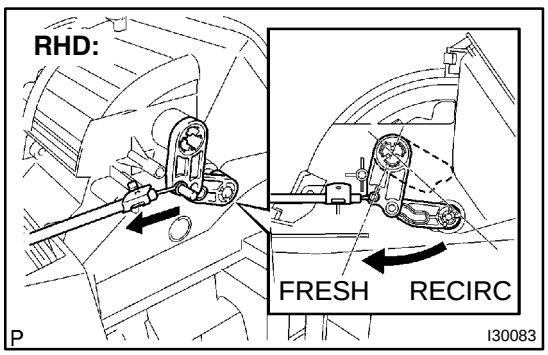
(g) Install the floor carpet with the 2 clips.



19. INSTALL AIR INLET DAMPER CONTROL CABLE SUB-ASSY (MANUAL AIR CONDITIONER)

(a) LHD:
Set the arm in RECIRC position.

(b) LHD:
Install the inner cable end to the control lever with the arm in RECIRC position.

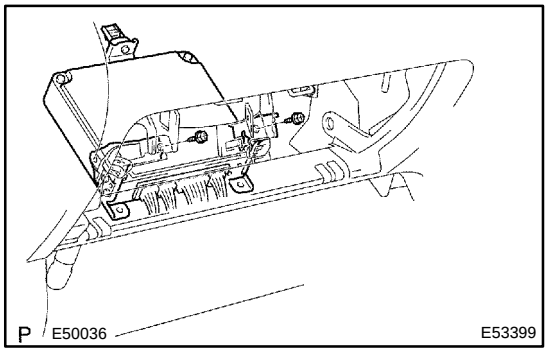


(c) RHD:
Set the arm in FRESH position.

(d) RHD:
Install the inner cable end to the control lever with the arm in FRESH position.

(e) Install the outer cable to the cable clamp while slightly pressing it in the direction of the arrow.

HINT:
Operating the R/F control lever, check that it properly stops at both ends of RECIRC and FRESH and no recoil is identified.



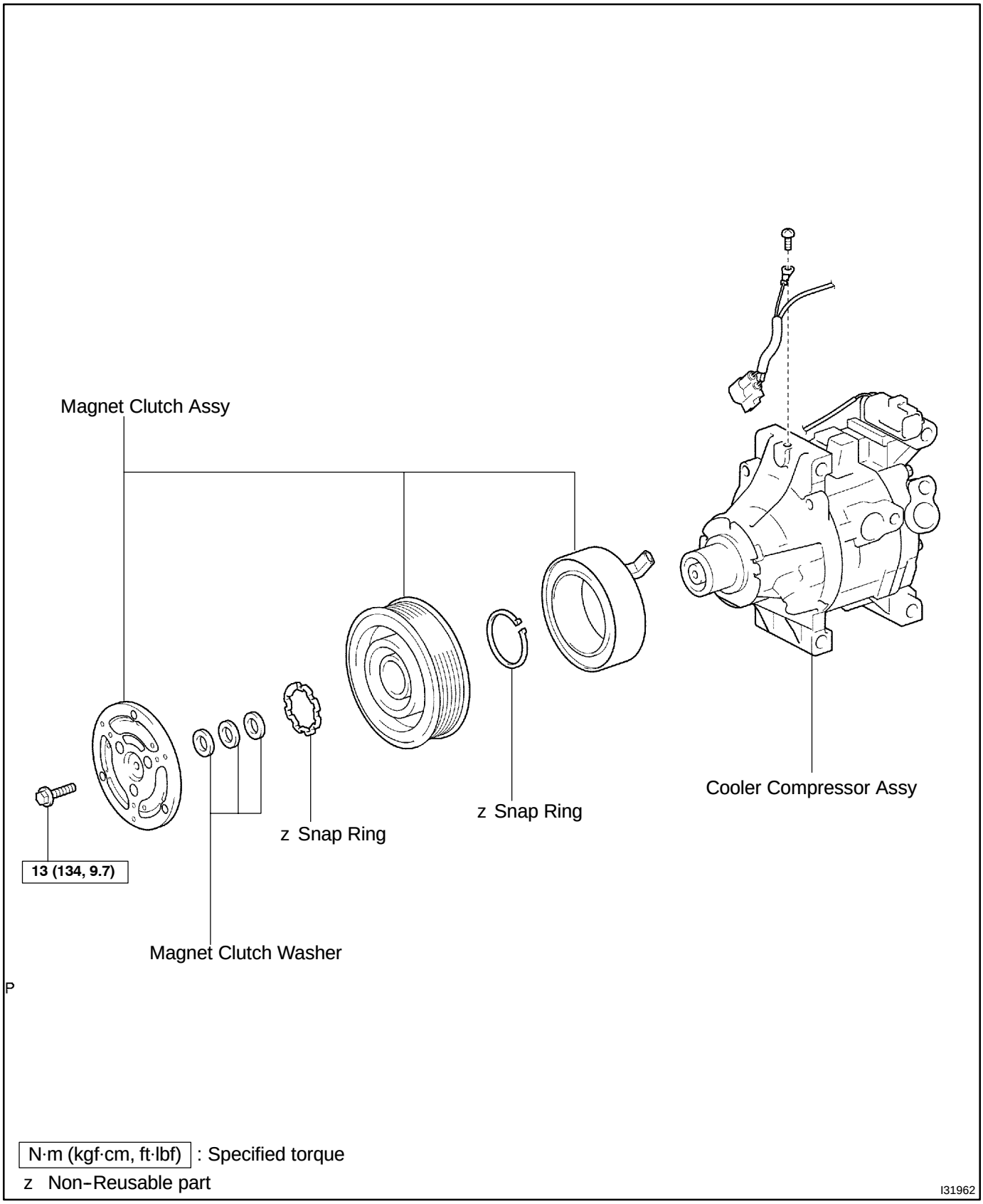
20. INSTALL ECM

(a) Install the ECM with the 2 bolts.
Torque: 3.0 N·m (30 kgf·cm, 26 in.·lbf)

COOLER COMPRESSOR ASSY (4ZZ-FE)

COMPONENTS

550FQ-01



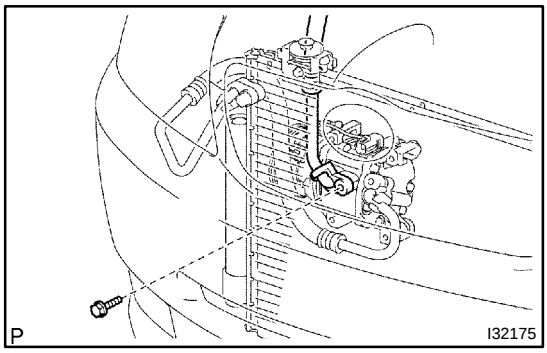
550FR-01

REPLACEMENT

HINT:

COMPONENTS: 55-73

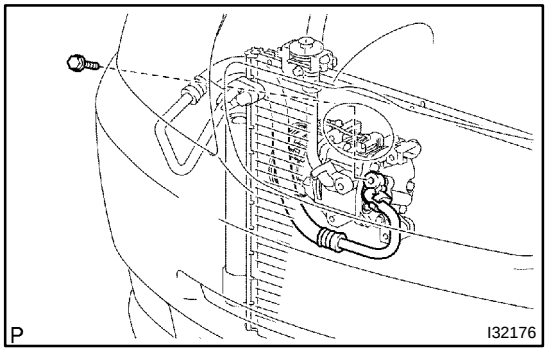
1. **REMOVE RADIATOR SUPPORT OPENING COVER (HATCH BACK BODY TYPE)** **(See page 76-5)**
2. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM** **(See page 55-25)**
   SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



3. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant suction hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant suction hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



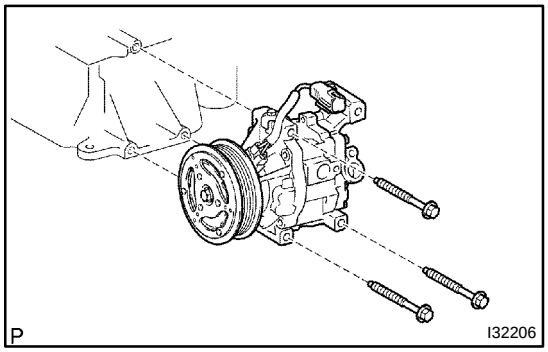
4. **DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant discharge hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant discharge hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

5. **REMOVE ENGINE UNDER COVER RH**

6. **REMOVE FAN AND GENERATOR V BELT** **(See page 14-86)**



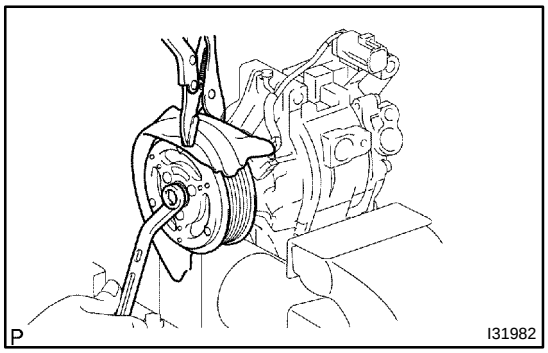
7. REMOVE COMPRESSOR AND MAGNETIC CLUTCH

(a) Disconnect the connector.

(b) Remove the 3 bolts and compressor and magnetic clutch.

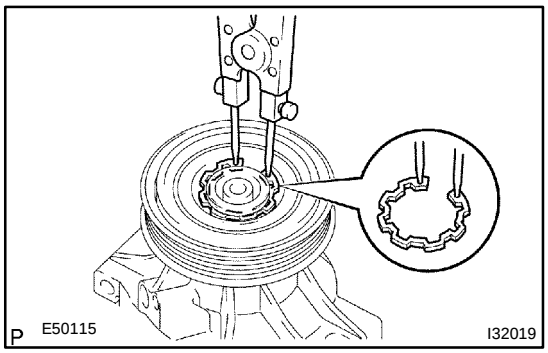
8. REMOVE MAGNET CLUTCH ASSY

(a) Place the compressor and magnetic clutch in vise.



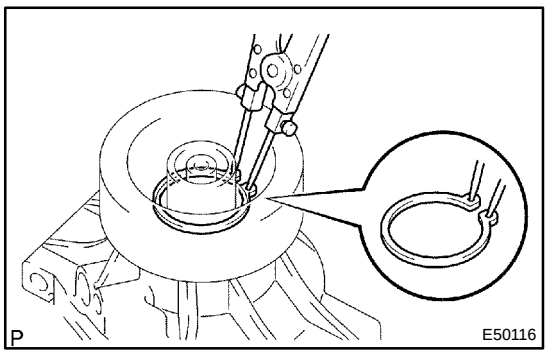
(b) Using a vise pliers, hold the magnet clutch hub.

(c) Remove the bolt, magnet clutch hub and magnet clutch washer.



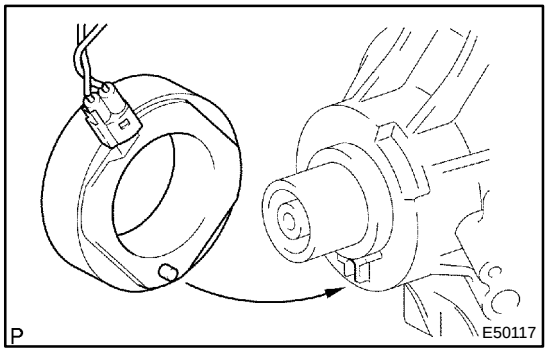
(d) Using a snap ring expander, remove the snap ring and magnet clutch rotor.

(e) Remove the screw, disconnect the connector.



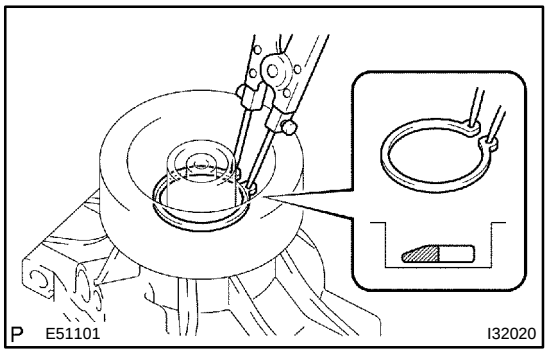
(f) Using a snap ring expander, remove the snap ring and magnet clutch starter.

9. REMOVE COOLER COMPRESSOR ASSY

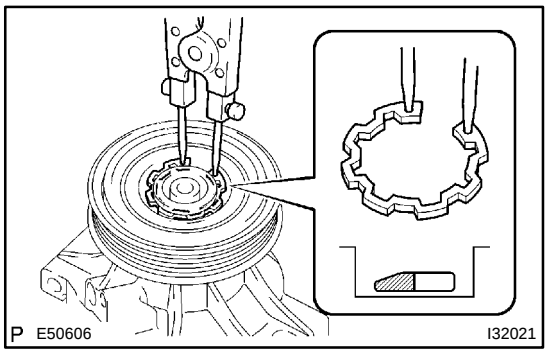


10. INSTALL MAGNET CLUTCH ASSY

(a) Matching the parts shown in the illustration, install the magnet clutch starter.

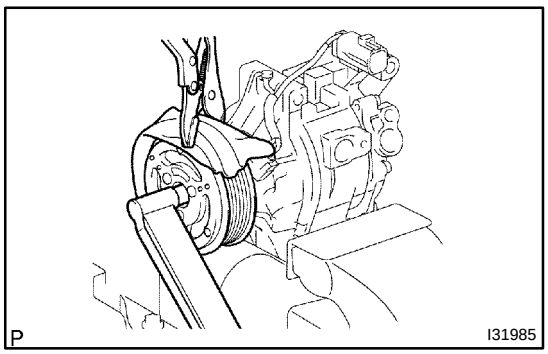


(b) Using a snap ring expander, install a new snap ring with the chamfered side facing up.
(c) Install the screw, connect the connector.

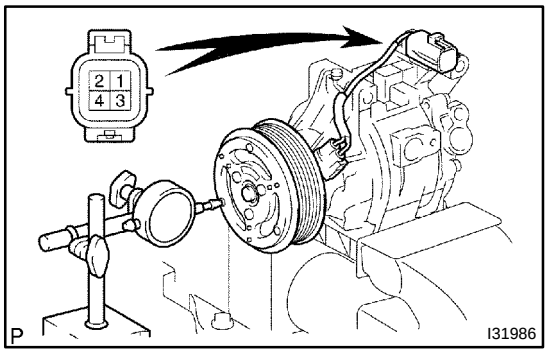


(d) Using a snap ring expander, install the magnet clutch rotor and a new snap ring with the chamfered side facing up.
(e) Install the magnet clutch washer and magnet clutch hub.

NOTICE:
Do not change the combination of the magnet clutch washers used before disassembly.



(f) Using a vise pliers, hold the magnet clutch hub and install the bolt.
Torque: 13 N·m (134 kgf·cm, 9.7 ft·lbf)



11. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the magnet clutch hub.
(b) Connect the battery positive lead to the terminal 1 of magnet clutch connector and the negative lead to the earth wire. Turn on and off the magnet clutch and measure the clearance.
Standard clearance:
0.20 - 0.45 mm (0.008 - 0.018 in.)

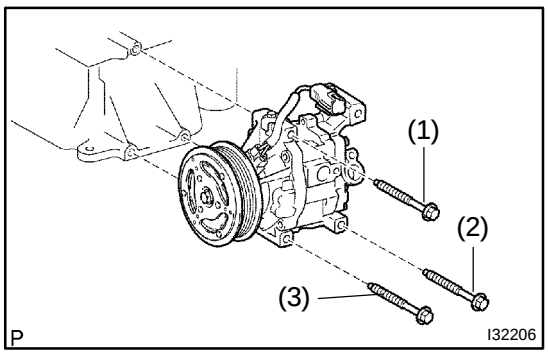
If the measured value is out of the standard range, remove the magnet clutch hub and adjust it with magnet clutch washers.

NOTICE:
Adjustment shall be performed with 3 or less magnet clutch washers.

12. INSPECT COMPRESSOR OIL

(a) When replacing the compressor and magnetic clutch with new one, after gradually removing the refrigerant gas from the service valve, drain the following amount of oil from the new compressor and magnetic clutch before installation.
Standard:
(Oil capacity inside new compressor and magnetic clutch: 60 + 10 cc (2.0 + 0.3 fl. oz.)) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed when replacing)

NOTICE:
- **When checking the compressor oil level, observe the precautions on the cooler removal/installation.**
- **Because compressor oil remains in the pipes of the vehicle, if a new compressor and magnetic clutch is installed without removing some oil inside, the oil amount becomes too much, preventing heat exchange in the refrigerant cycle and causing refrigerant failure.**
- **If the remaining oil in the removed compressor and magnetic clutch is too small in volume, check for oil leakage.**
- **Be sure to use ND-OIL8 for compressor oil.**



13. INSTALL COMPRESSOR AND MAGNETIC CLUTCH

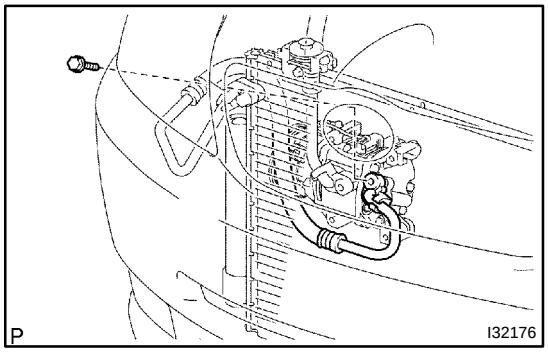
(a) Install the compressor and magnetic clutch with the 3 bolts.
Toque: 29 N·m (295 kgf·cm, 21 ft·lbf)

NOTICE:
Tighten the bolts in following order shown in the illustration to install the compressor and magnetic clutch.

(b) Connect the connector.

14. INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1

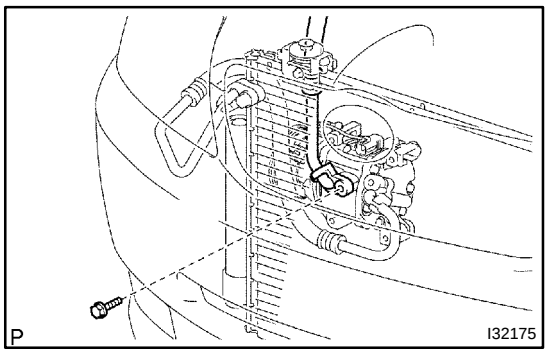
(a) Remove the attached vinyl tape from the hose.
(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent
(c) Install a O-ring to the cooler refrigerant discharge hose No.1.



(d) Connect the cooler refrigerant discharge hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

15. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

(a) Remove the attached vinyl tape from the hose.
(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent
(c) Install a O-ring to the cooler refrigerant suction hose No.1.



(d) Connect the cooler refrigerant suction hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

16. CHARGE REFRIGERANT **(See page 55-25)**
SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)
Specified amount: 490 ± 30 g (17.28 ± 1.06 oz.)

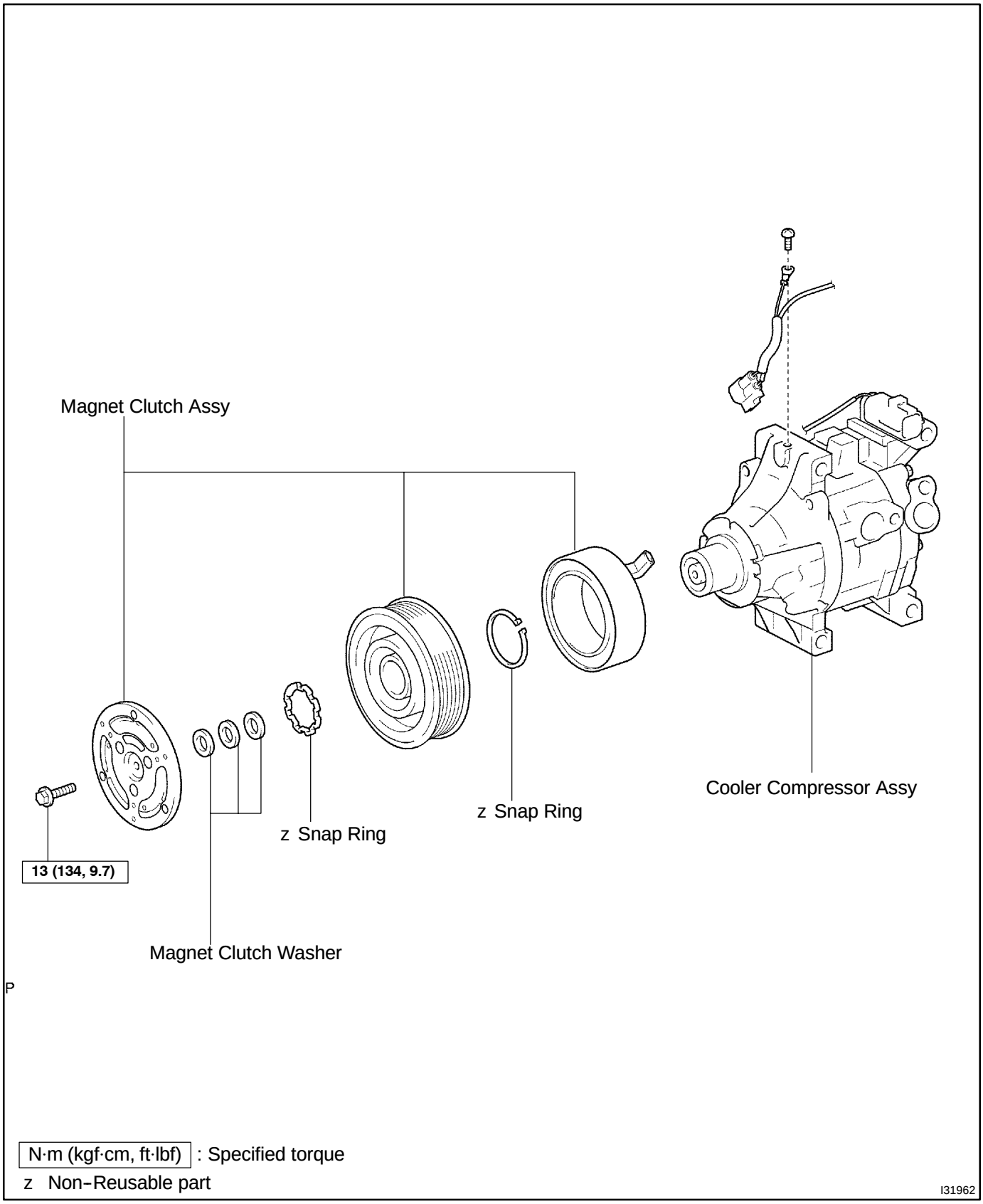
17. WARM UP ENGINE

18. INSPECT LEAKAGE OF REFRIGERANT **(See page 55-25)**

COOLER COMPRESSOR ASSY (3ZZ-FE)

COMPONENTS

550FS-01



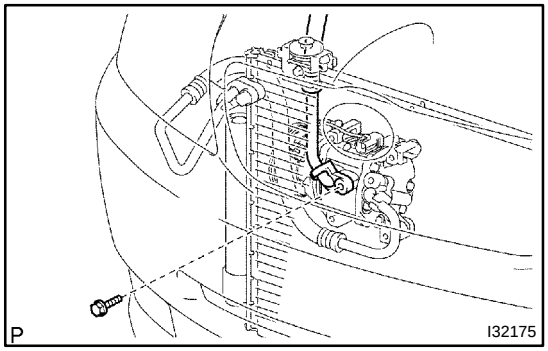
550FT-01

REPLACEMENT

HINT:

COMPONENTS: 55-79

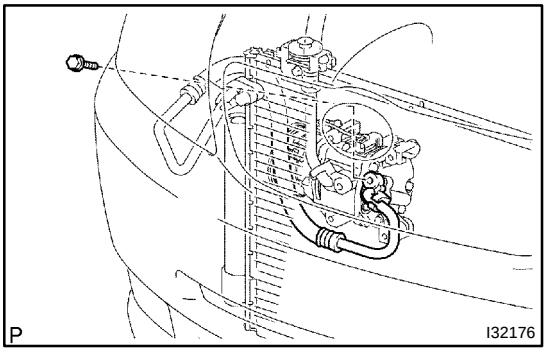
1. **REMOVE RADIATOR SUPPORT OPENING COVER (HATCH BACK BODY TYPE)** **(See page 76-5)**
2. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM** **(See page 55-25)**
   SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



3. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant suction hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant suction hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



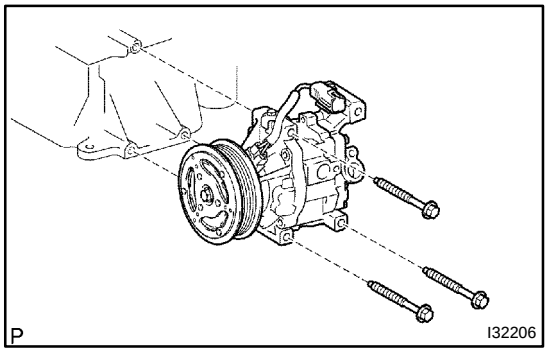
4. **DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant discharge hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant discharge hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

5. **REMOVE ENGINE UNDER COVER RH**

6. **REMOVE FAN AND GENERATOR V BELT** **(See page 14-86)**



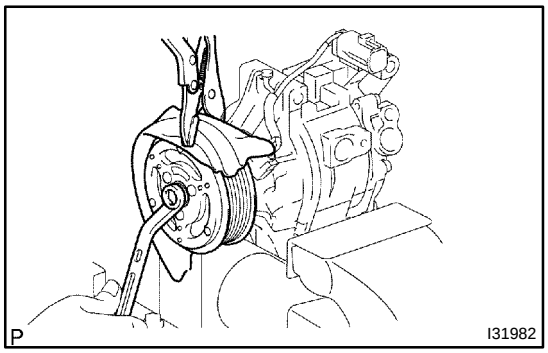
7. REMOVE COMPRESSOR AND MAGNETIC CLUTCH

(a) Disconnect the connector.

(b) Remove the 3 bolts and compressor and magnetic clutch.

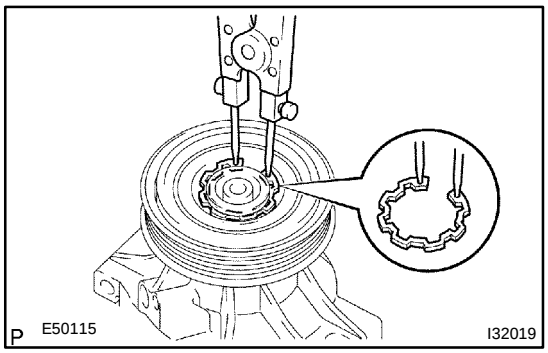
8. REMOVE MAGNET CLUTCH ASSY

(a) Place the compressor and magnetic clutch in vise.



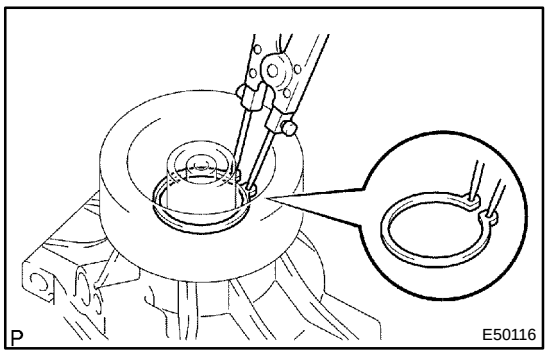
(b) Using a vise pliers, hold the magnet clutch hub.

(c) Remove the bolt, magnet clutch hub and magnet clutch washer.



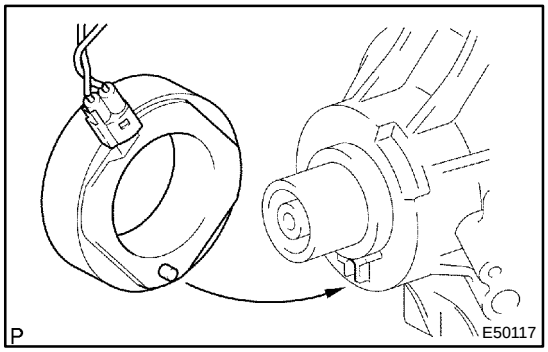
(d) Using a snap ring expander, remove the snap ring and magnet clutch rotor.

(e) Remove the screw, disconnect the connector.



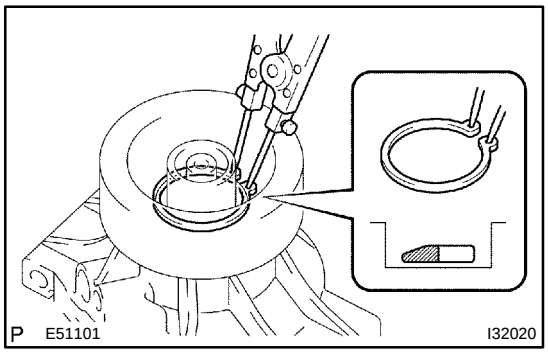
(f) Using a snap ring expander, remove the snap ring and magnet clutch starter.

9. REMOVE COOLER COMPRESSOR ASSY

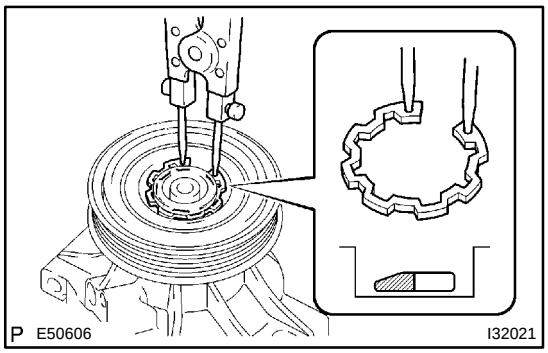


10. INSTALL MAGNET CLUTCH ASSY

(a) Matching the parts shown in the illustration, install the magnet clutch starter.

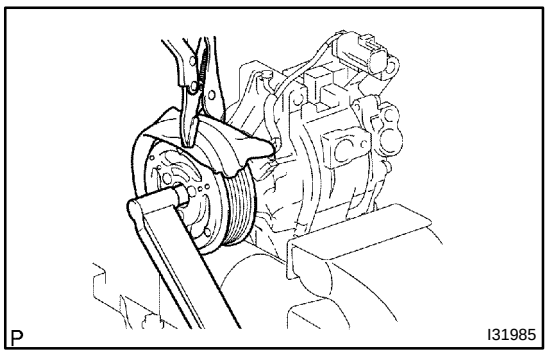


(b) Using a snap ring expander, install a new snap ring with the chamfered side facing up.
(c) Install the screw, connect the connector.

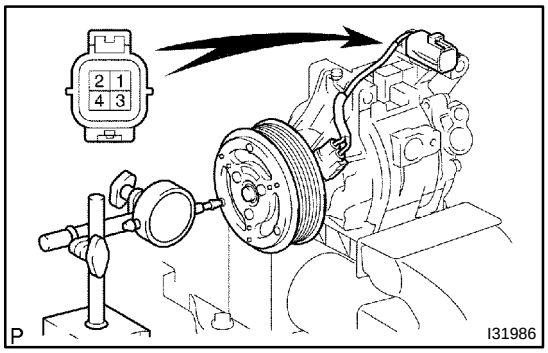


(d) Using a snap ring expander, install the magnet clutch rotor and a new snap ring with the chamfered side facing up.
(e) Install the magnet clutch washer and magnet clutch hub.

NOTICE:
Do not change the combination of the magnet clutch washers used before disassembly.



(f) Using a vise pliers, hold the magnet clutch hub and install the bolt.
Torque: 13 N·m (134 kgf·cm, 9.7 ft·lbf)



11. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the magnet clutch hub.
(b) Connect the battery positive lead to the terminal 1 of magnet clutch connector and the negative lead to the earth wire. Turn on and off the magnet clutch and measure the clearance.
Standard clearance:
0.20 - 0.45 mm (0.008 - 0.018 in.)

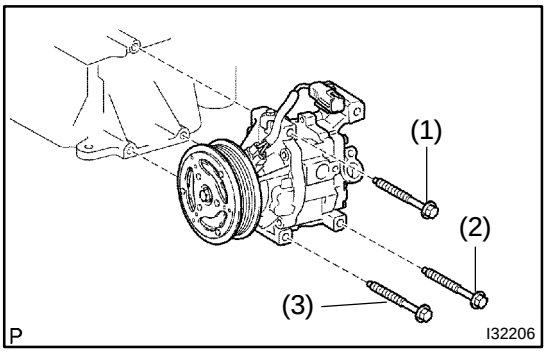
If the measured value is out of the standard range, remove the magnet clutch hub and adjust it with magnet clutch washers.

NOTICE:
Adjustment shall be performed with 3 or less magnet clutch washers.

12. INSPECT COMPRESSOR OIL

(a) When replacing the compressor and magnetic clutch with new one, after gradually removing the refrigerant gas from the service valve, drain the following amount of oil from the new compressor and magnetic clutch before installation.
Standard:
(Oil capacity inside new compressor and magnetic clutch: 60 + 10 cc (2.0 + 0.3 fl oz.)) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed when replacing)

NOTICE:
- **When checking the compressor oil level, observe the precautions on the cooler removal/installation.**
- **Because compressor oil remains in the pipes of the vehicle, if a new compressor and magnetic clutch is installed without removing some oil inside, the oil amount becomes too much, preventing heat exchange in the refrigerant cycle and causing refrigerant failure.**
- **If the remaining oil in the removed compressor and magnetic clutch is too small in volume, check for oil leakage.**
- **Be sure to use ND-OIL8 for compressor oil.**



13. INSTALL COMPRESSOR AND MAGNETIC CLUTCH

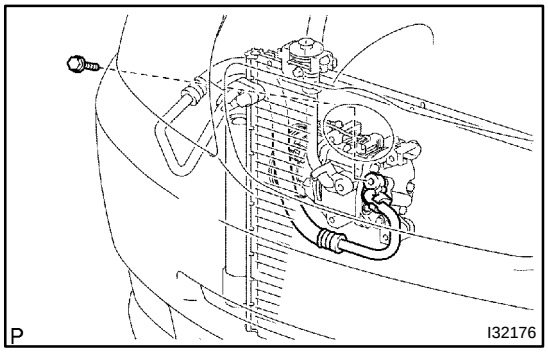
(a) Install the compressor and magnetic clutch with the 3 bolts.
Toque: 29 N·m (295 kgf·cm, 21 ft·lbf)

NOTICE:
Tighten the bolts in following order shown in the illustration to install the compressor and magnetic clutch.

(b) Connect the connector.

14. INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1

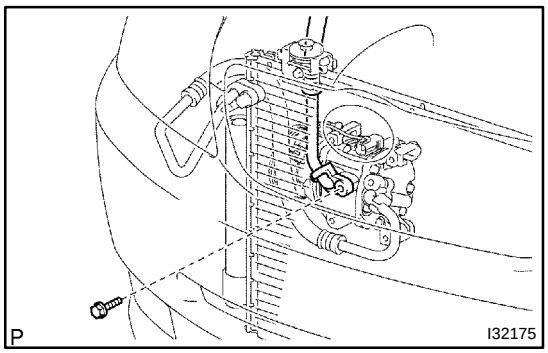
(a) Remove the attached vinyl tape from the hose.
(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent
(c) Install a O-ring to the cooler refrigerant discharge hose No.1.



(d) Connect the cooler refrigerant discharge hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

15. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

(a) Remove the attached vinyl tape from the hose.
(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent
(c) Install a O-ring to the cooler refrigerant suction hose No.1.



(d) Connect the cooler refrigerant suction hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

16. CHARGE REFRIGERANT **(See page 55-25)**
SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)
Specified amount: 490 ± 30 g (17.28 ± 1.06 oz.)

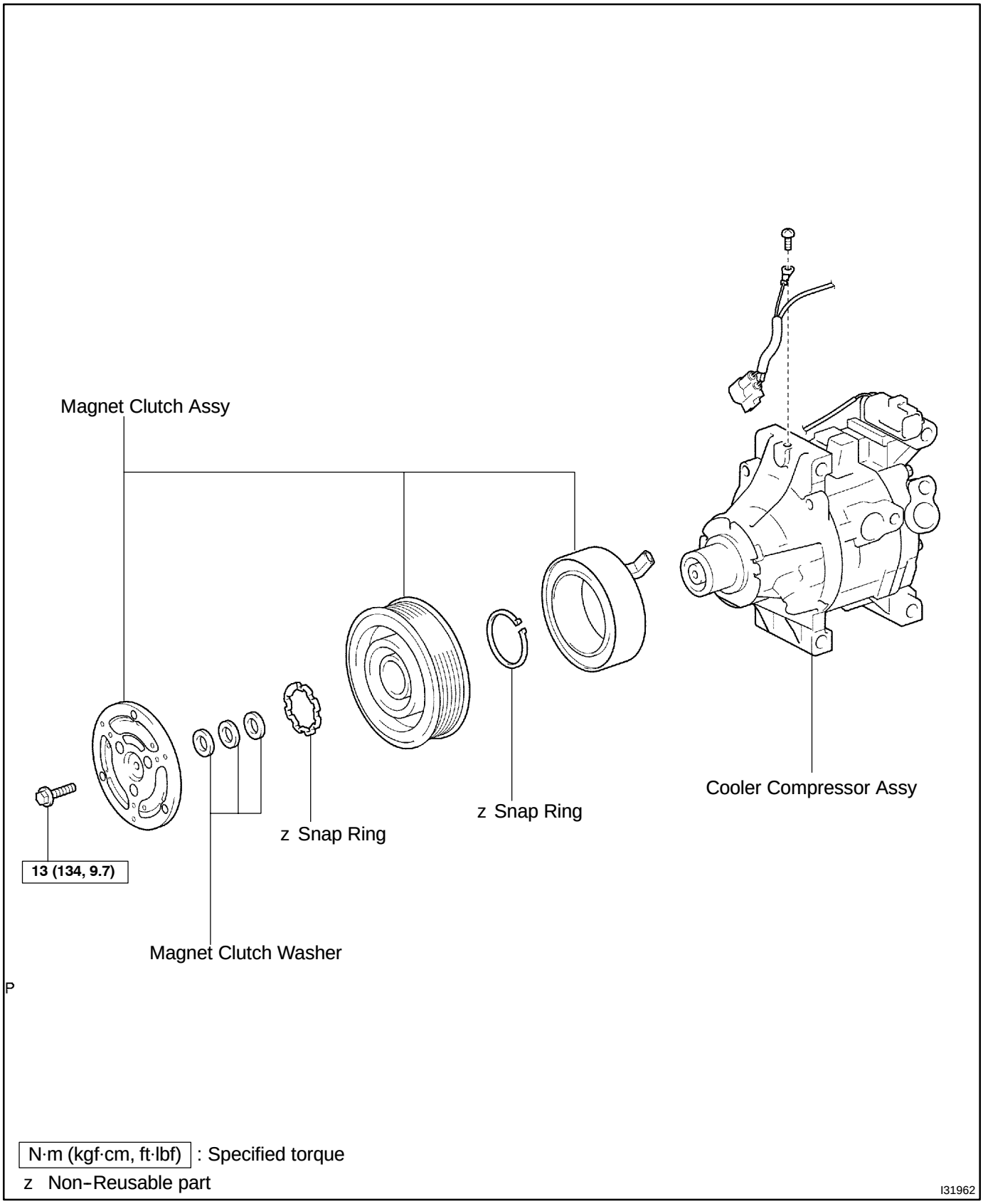
17. WARM UP ENGINE

18. INSPECT LEAKAGE OF REFRIGERANT **(See page 55-25)**

COOLER COMPRESSOR ASSY (2ZZ-GE)

COMPONENTS

550FU-01



N·m (kgf·cm, ft·lbf) : Specified torque
z Non-Reusable part

I31962

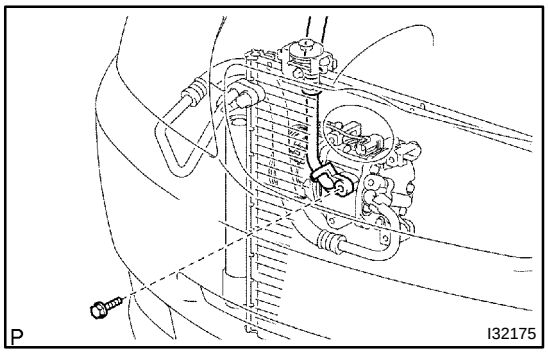
550FV-01

REPLACEMENT

HINT:

COMPONENTS: 55-85

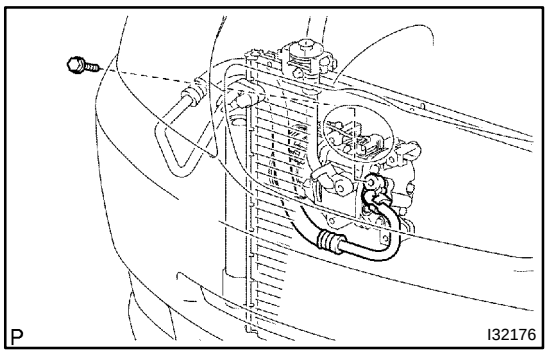
1. **REMOVE RADIATOR SUPPORT OPENING COVER**
   (See page 76-5)
2. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM (See page 55-25)**
   SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



3. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant suction hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant suction hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



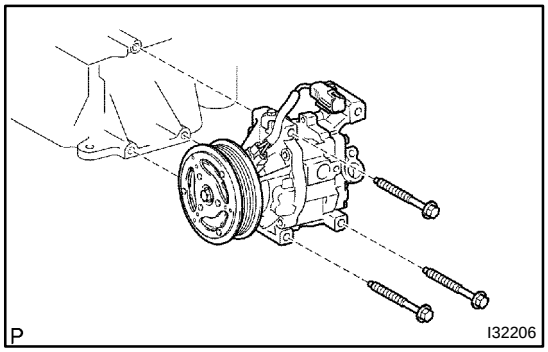
4. **DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant discharge hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant discharge hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

5. **REMOVE ENGINE UNDER COVER RH**

6. **REMOVE FAN AND GENERATOR V BELT**
   (See page 14-4)



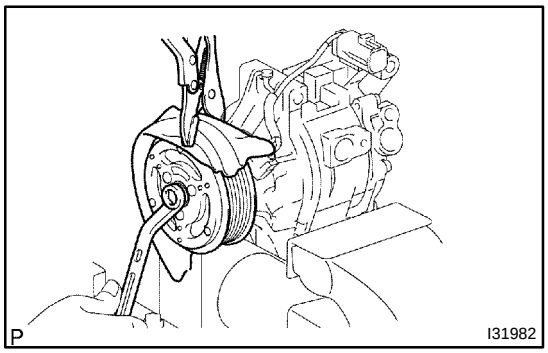
7. REMOVE COMPRESSOR AND MAGNETIC CLUTCH

(a) Disconnect the connector.

(b) Remove the 3 bolts and compressor and magnetic clutch.

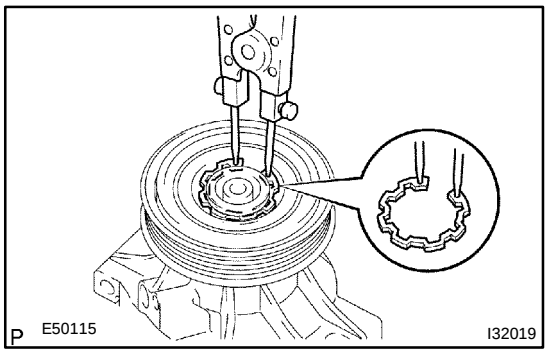
8. REMOVE MAGNET CLUTCH ASSY

(a) Place the compressor and magnetic clutch in vise.



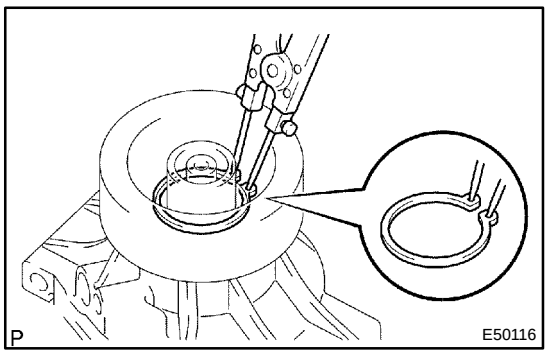
(b) Using a vise pliers, hold the magnet clutch hub.

(c) Remove the bolt, magnet clutch hub and magnet clutch washer.



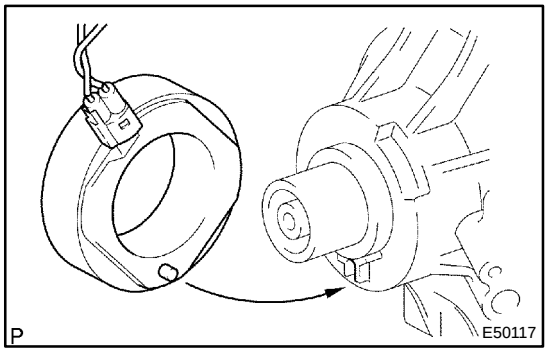
(d) Using a snap ring expander, remove the snap ring and magnet clutch rotor.

(e) Remove the screw, disconnect the connector.



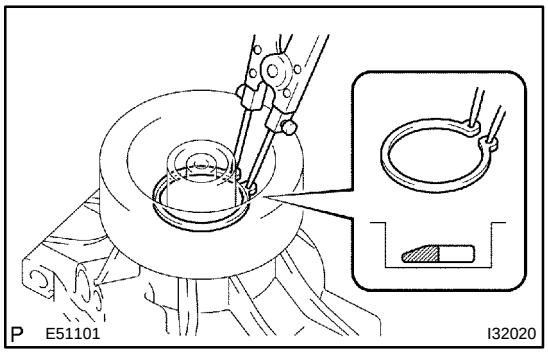
(f) Using a snap ring expander, remove the snap ring and magnet clutch starter.

9. REMOVE COOLER COMPRESSOR ASSY

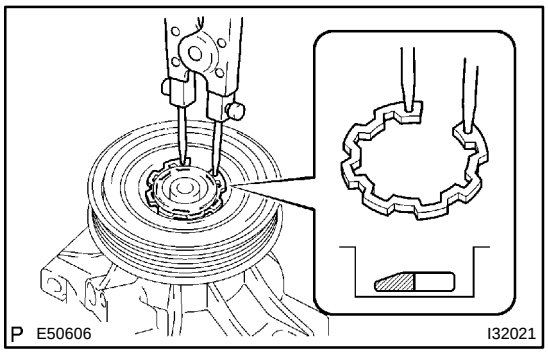


10. INSTALL MAGNET CLUTCH ASSY

(a) Matching the parts shown in the illustration, install the magnet clutch starter.

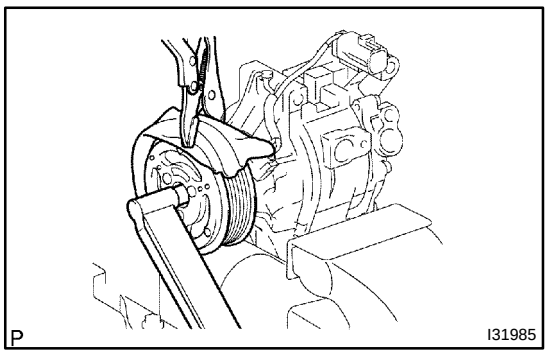


(b) Using a snap ring expander, install a new snap ring with the chamfered side facing up.
(c) Install the screw, connect the connector.

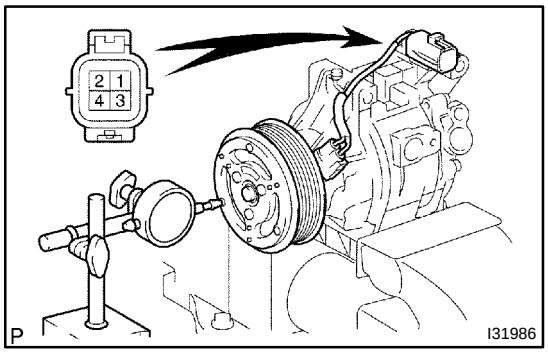


(d) Using a snap ring expander, install the magnet clutch rotor and a new snap ring with the chamfered side facing up.
(e) Install the magnet clutch washer and magnet clutch hub.

NOTICE:
Do not change the combination of the magnet clutch washers used before disassembly.



(f) Using a vise pliers, hold the magnet clutch hub and install the bolt.
Torque: 13 N·m (134 kgf·cm, 9.7 ft·lbf)



11. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the magnet clutch hub.
(b) Connect the battery positive lead to the terminal 1 of magnet clutch connector and the negative lead to the earth wire. Turn on and off the magnet clutch and measure the clearance.
Standard clearance:
0.20 - 0.45 mm (0.008 - 0.018 in.)

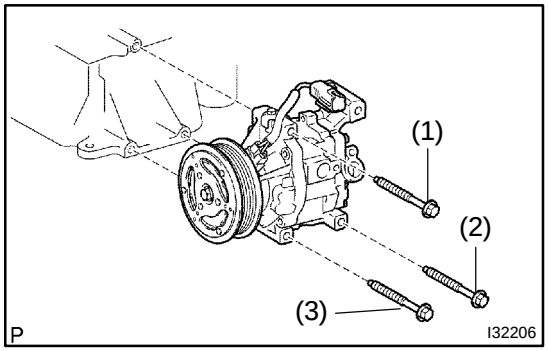
If the measured value is out of the standard range, remove the magnet clutch hub and adjust it with magnet clutch washers.

NOTICE:
Adjustment shall be performed with 3 or less magnet clutch washers.

12. INSPECT COMPRESSOR OIL

(a) When replacing the compressor and magnetic clutch with new one, after gradually removing the refrigerant gas from the service valve, drain the following amount of oil from the new compressor and magnetic clutch before installation.
Standard:
(Oil capacity inside new compressor and magnetic clutch: 60 + 10 cc (2.0 + 0.3 fl. oz.)) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed when replacing)

NOTICE:
- **When checking the compressor oil level, observe the precautions on the cooler removal/installation.**
- **Because compressor oil remains in the pipes of the vehicle, if a new compressor and magnetic clutch is installed without removing some oil inside, the oil amount becomes too much, preventing heat exchange in the refrigerant cycle and causing refrigerant failure.**
- **If the remaining oil in the removed compressor and magnetic clutch is too small in volume, check for oil leakage.**
- **Be sure to use ND-OIL8 for compressor oil.**



13. INSTALL COMPRESSOR AND MAGNETIC CLUTCH

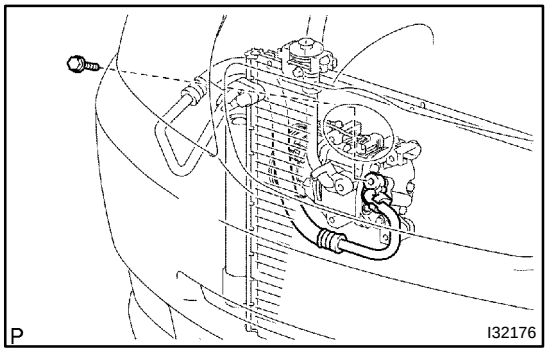
(a) Install the compressor and magnetic clutch with the 3 bolts.
Toque: 29 N·m (295 kgf·cm, 21 ft·lbf)

NOTICE:
Tighten the bolts in following order shown in the illustration to install the compressor and magnetic clutch.

(b) Connect the connector.

14. INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1

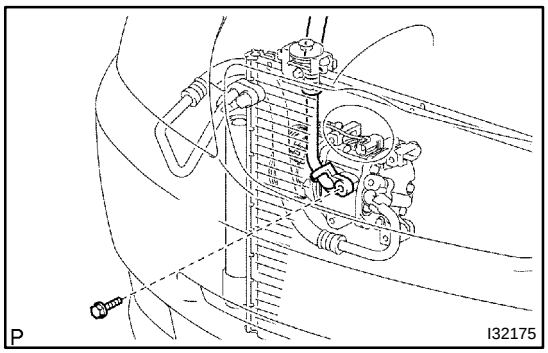
(a) Remove the attached vinyl tape from the hose.
(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent
(c) Install a O-ring to the cooler refrigerant discharge hose No.1.



(d) Connect the cooler refrigerant discharge hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

15. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

(a) Remove the attached vinyl tape from the hose.
(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent
(c) Install a O-ring to the cooler refrigerant suction hose No.1.



(d) Connect the cooler refrigerant suction hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

16. CHARGE REFRIGERANT **(See page 55-25)**
SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)
Specified amount: 490 ± 30 g (17.28 ± 1.06 oz.)

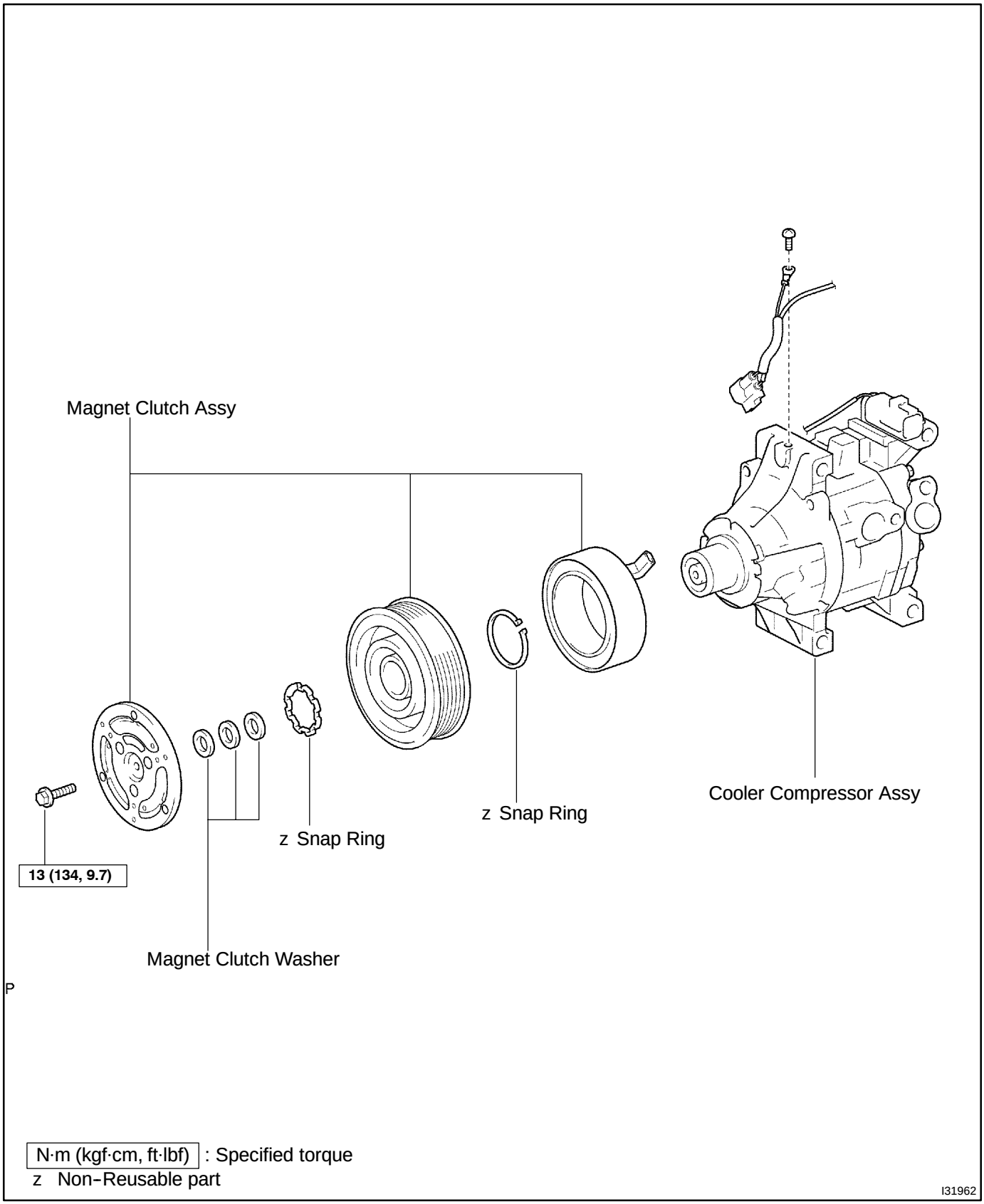
17. WARM UP ENGINE

18. INSPECT LEAKAGE OF REFRIGERANT **(See page 55-25)**

COOLER COMPRESSOR ASSY (1CD-FTV)

COMPONENTS

550G7-01



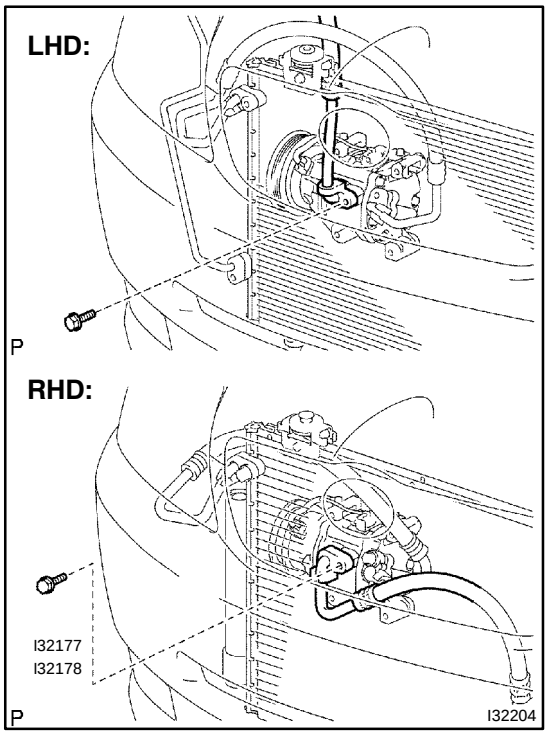
550G8-01

REPLACEMENT

HINT:

COMPONENTS: 55-91

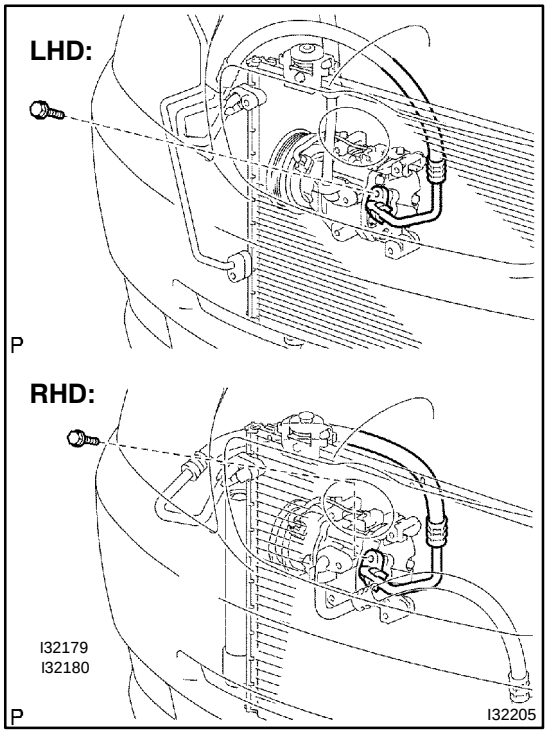
1. **REMOVE RADIATOR SUPPORT OPENING COVER (HATCH BACK BODY TYPE)** **(See page 76-5)**
2. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM** **(See page 55-25)**
   SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



3. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant suction hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant suction hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



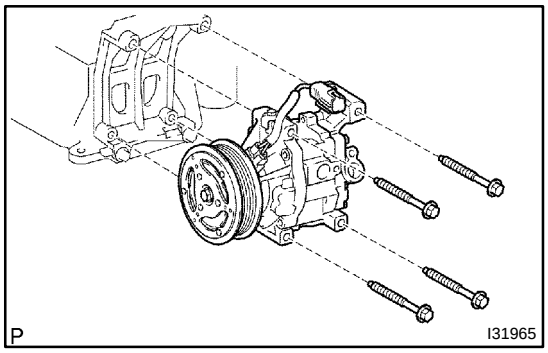
4. **DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1**

(a) Remove the bolt and disconnect the cooler refrigerant discharge hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant discharge hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

5. REMOVE ENGINE UNDER COVER RH

6. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page 55-34)



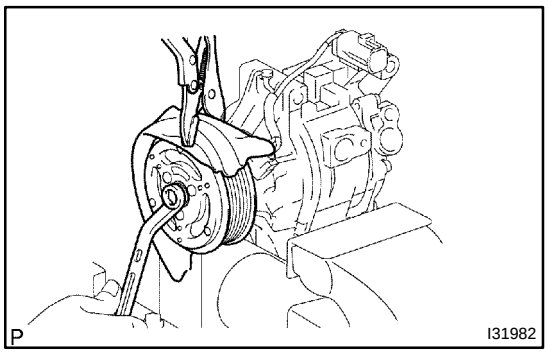
7. REMOVE COMPRESSOR AND MAGNETIC CLUTCH

(a) Disconnect the connector.

(b) Remove the 4 bolts and compressor and magnetic clutch.

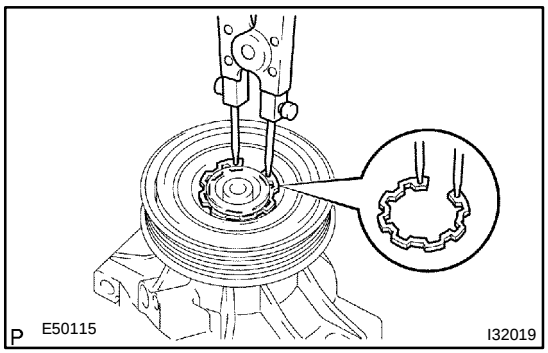
8. REMOVE MAGNET CLUTCH ASSY

(a) Place the compressor and magnetic clutch in vise.



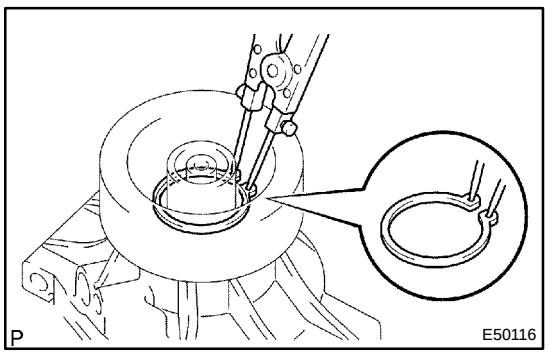
(b) Using a vise pliers, hold the magnet clutch hub.

(c) Remove the bolt, magnet clutch hub and magnet clutch washer.



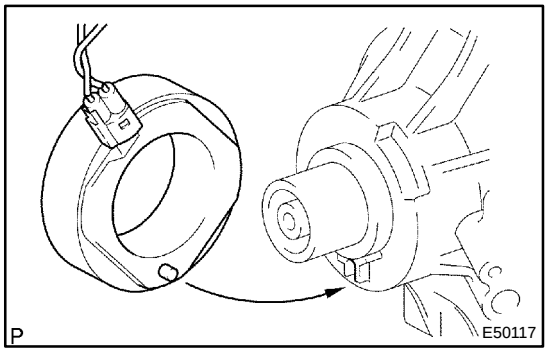
(d) Using a snap ring expander, remove the snap ring and magnet clutch rotor.

(e) Remove the screw, disconnect the connector.



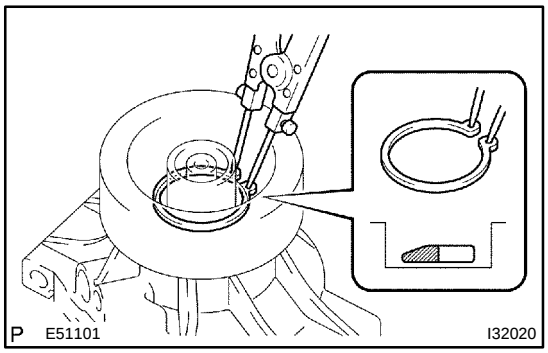
(f) Using a snap ring expander, remove the snap ring and magnet clutch starter.

9. REMOVE COOLER COMPRESSOR ASSY

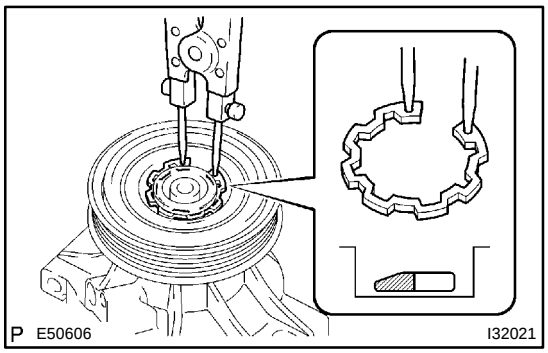


10. INSTALL MAGNET CLUTCH ASSY

(a) Matching the parts shown in the illustration, install the magnet clutch starter.

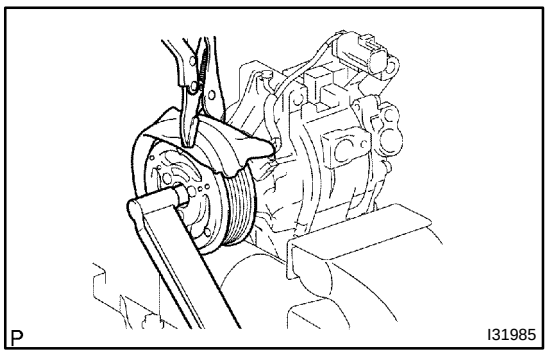


(b) Using a snap ring expander, install a new snap ring with the chamfered side facing up.
(c) Install the screw, connect the connector.

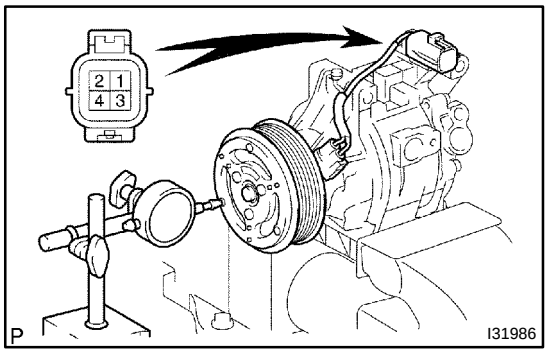


(d) Using a snap ring expander, install the magnet clutch rotor and a new snap ring with the chamfered side facing up.
(e) Install the magnet clutch washer and magnet clutch hub.

NOTICE:
Do not change the combination of the magnet clutch washers used before disassembly.



(f) Using a vise pliers, hold the magnet clutch hub and install the bolt.
Torque: 13 N·m (134 kgf·cm, 9.7 ft·lbf)



11. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the magnet clutch hub.
(b) Connect the battery positive lead to the terminal 1 of magnet clutch connector and the negative lead to the earth wire. Turn on and off the magnet clutch and measure the clearance.
Standard clearance:
0.20 - 0.45 mm (0.008 - 0.018 in.)

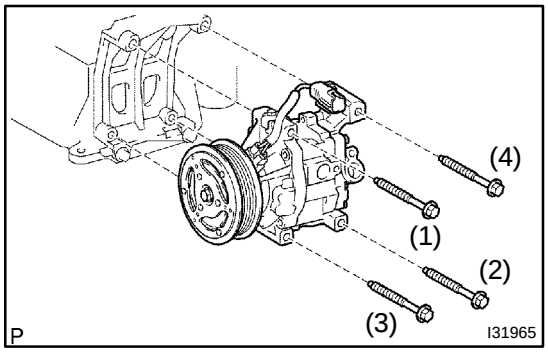
If the measured value is out of the standard range, remove the magnet clutch hub and adjust it with magnet clutch washers.

NOTICE:
Adjustment shall be performed with 3 or less magnet clutch washers.

12. INSPECT COMPRESSOR OIL

(a) When replacing the compressor and magnetic clutch with new one, after gradually removing the refrigerant gas from the service valve, drain the following amount of oil from the new compressor and magnetic clutch before installation.
Standard:
(Oil capacity inside new compressor and magnetic clutch: 60 + 10 cc (2.0 + 0.3 fl. oz.)) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed when replacing)

NOTICE:
- **When checking the compressor oil level, observe the precautions on the cooler removal/installation.**
- **Because compressor oil remains in the pipes of the vehicle, if a new compressor and magnetic clutch is installed without removing some oil inside, the oil amount becomes too much, preventing heat exchange in the refrigerant cycle and causing refrigerant failure.**
- **If the remaining oil in the removed compressor and magnetic clutch is too small in volume, check for oil leakage.**
- **Be sure to use ND-OIL8 for compressor oil.**



13. INSTALL COMPRESSOR AND MAGNETIC CLUTCH

(a) Install the compressor and magnetic clutch with the 4 bolts.
Toque: 29 N·m (295 kgf·cm, 21 ft·lbf)

NOTICE:
Tighten the bolts in following order shown in the illustration to install the compressor and magnetic clutch.

(b) Connect the connector.

14. INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page 55-34)

15. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page 55-34)

16. FULLY TIGHTEN V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page 55-35)

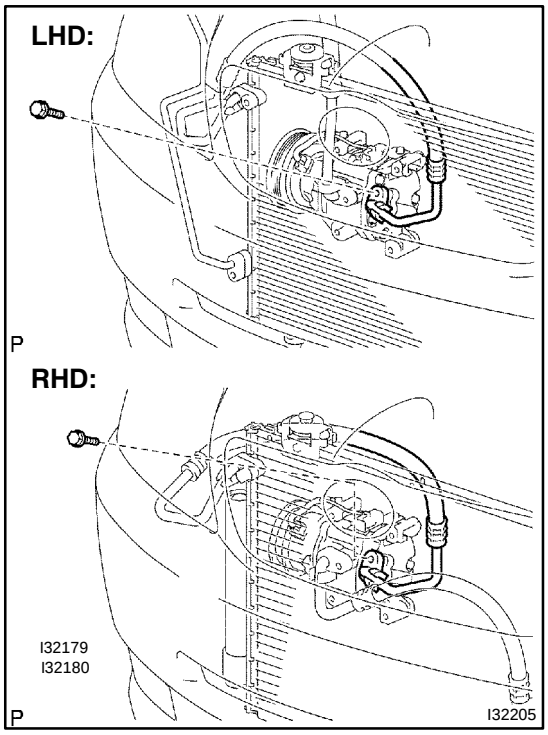
17. INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1

(a) Remove the attached vinyl tape from the hose.

(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent

(c) Install a O-ring to the cooler refrigerant discharge hose No.1.

(d) Connect the cooler refrigerant discharge hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)



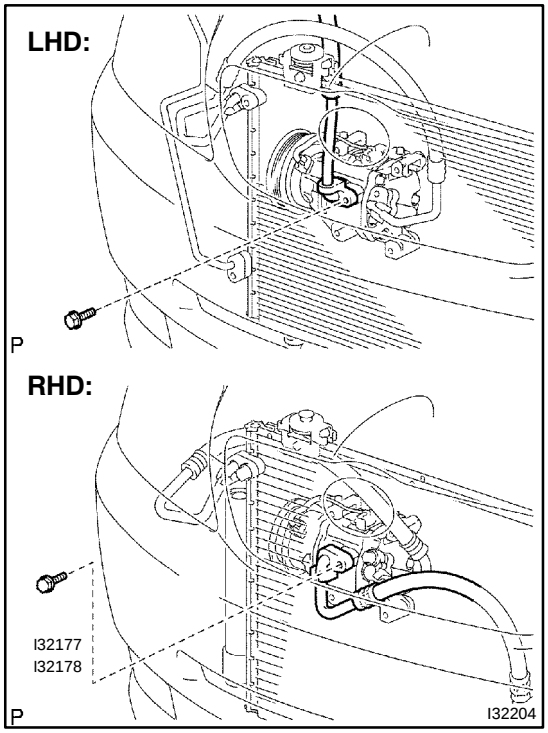
18. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

(a) Remove the attached vinyl tape from the hose.

(b) Sufficiently apply compressor oil to the new O-ring and fit surface of the compressor and magnetic clutch.
Compressor oil: ND-OIL8 or equivalent

(c) Install a O-ring to the cooler refrigerant suction hose No.1.

(d) Connect the cooler refrigerant suction hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)



19. CHARGE REFRIGERANT **(See page 55-25)**

SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

Specified amount: 490 ± 30 g (17.28 ± 1.06 oz.)

20. WARM UP ENGINE

21. INSPECT LEAKAGE OF REFRIGERANT **(See page 55-25)**

COOLER CONDENSER ASSY

550G9-01

ON-VEHICLE INSPECTION

1. INSPECT COOLER CONDENSER ASSY

(a) If a fin of the cooler condenser assy is dirty, clean it with water and dry it with compressor air.

NOTICE:

Do not damage the fin of the condenser assy.

(b) If a fin of the condenser assy is bent, make it straight using a screwdriver or pliers.

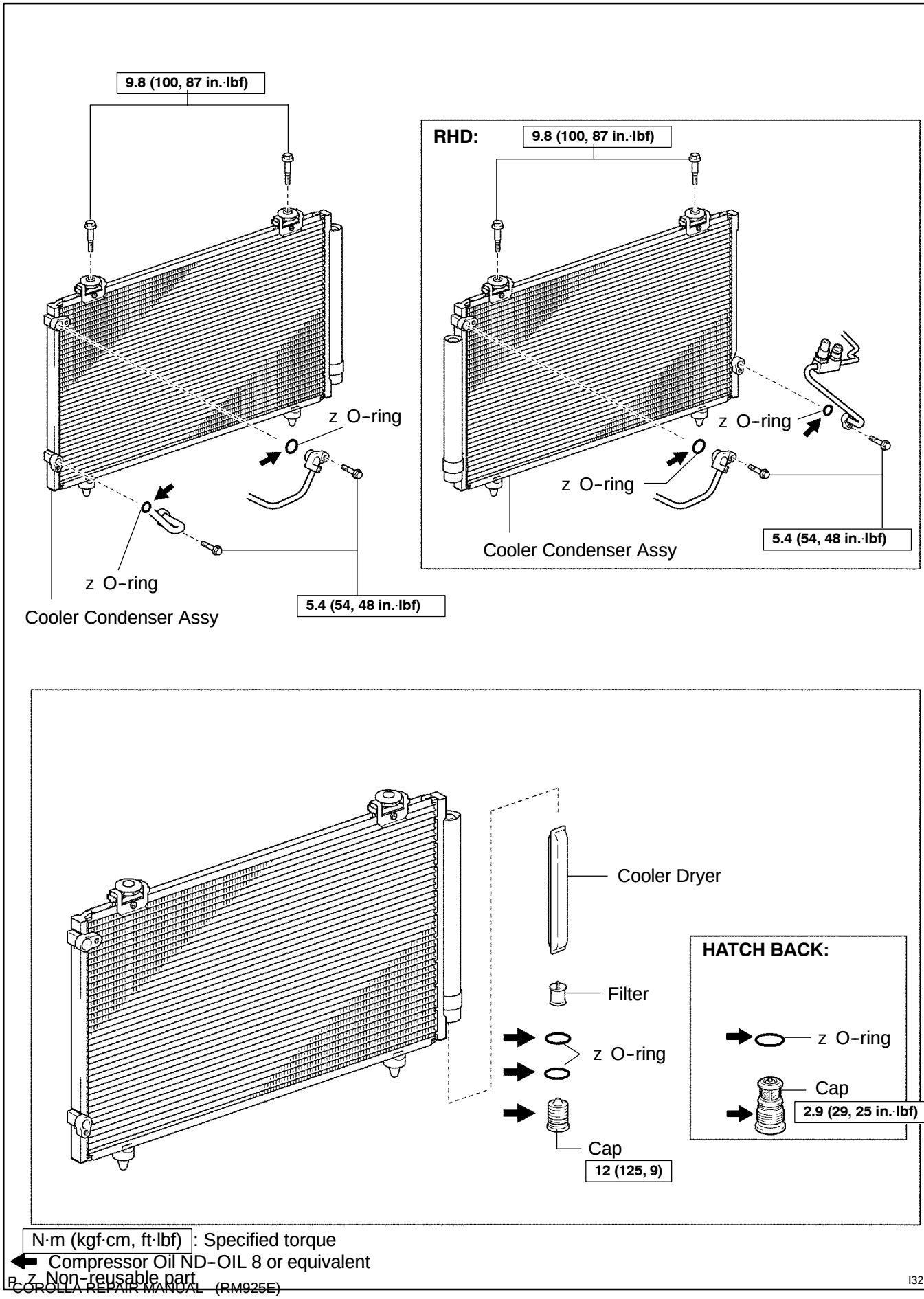
2. INSPECT CONDENSER FOR LEAKAGE OF REFRIGERANT

(a) Using a halogen leak detector, check pipe joints for gas leakage.

(b) If gas leakage is detected in a joint, check the torque of the joint.

550GA-01

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque
Compressor Oil ND-OIL 8 or equivalent
z Non-reusable part

I32190

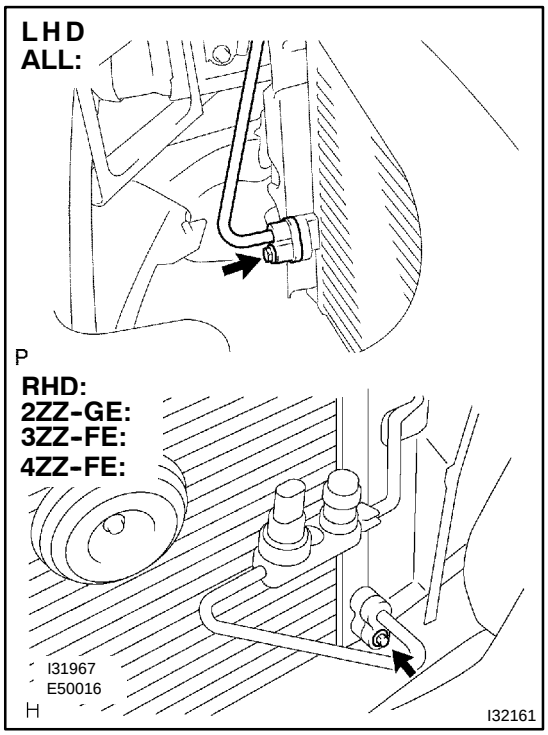
550GB-01

OVERHAUL

HINT:

COMPONENTS: 55-99

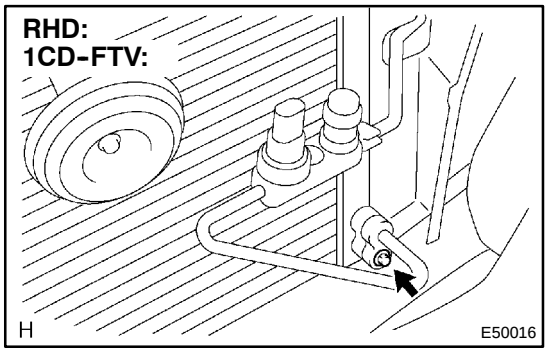
1. REMOVE RADIATOR SUPPORT OPENING COVER (HATCH BACK BODY TYPE) (See page 76-5)
2. REMOVE RADIATOR GRILLE
   SEDAN / STATION WAGON: (See page 76-2)
   HATCH BACK: (See page 76-5)
3. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM (See page 55-25)
   SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



4. DISCONNECT COOLER REFRIGERANT LIQUID PIPE A

(a) Remove the bolt and disconnect the cooler refrigerant liquid pipe A from the condenser assy.
(b) Remove the O-ring from the cooler refrigerant liquid pipe A.

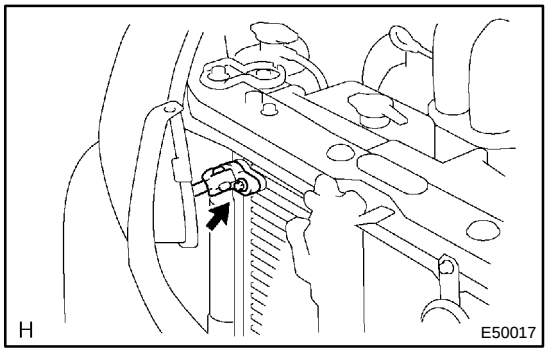
NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



5. DISCONNECT COOLER REFRIGERANT LIQUID PIPE B(RHD(1CD-FTV) STEERING POSITION TYPE)

(a) Remove the bolt and disconnect the cooler refrigerant liquid pipe B from the condenser assy.
(b) Remove the O-ring from the cooler refrigerant liquid pipe B.

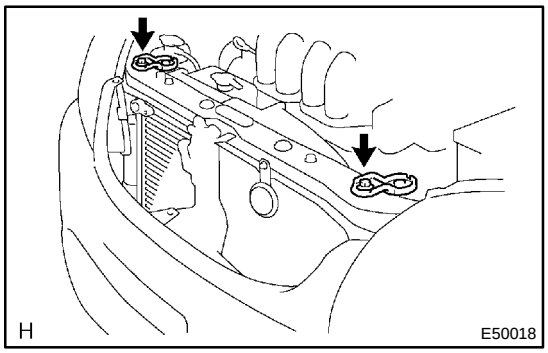
NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



6. DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1

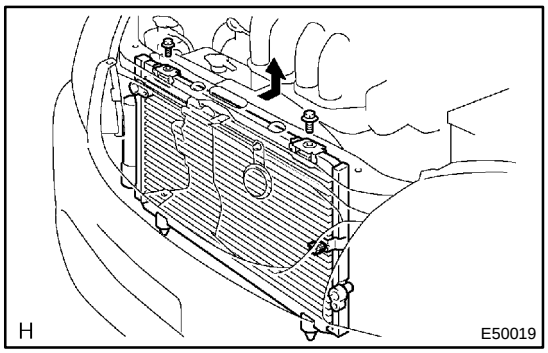
(a) Remove the bolt and cooler refrigerant discharge hose No. 1 from the condenser assy.
(b) Remove the O-ring from the cooler refrigerant discharge hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

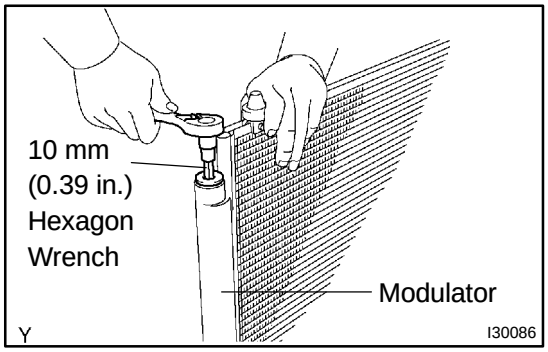


7. REMOVE COOLER CONDENSER ASSY

(a) Remove the 2 bolts and 2 radiator upper supports.

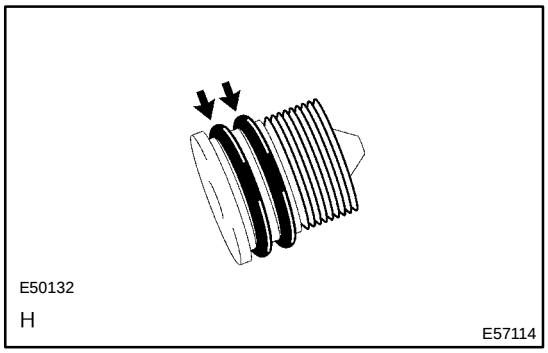


(b) Remove the 2 bolts.
(c) Slide the upper part of the radiator assy rearward to remove the cooler condenser assy.

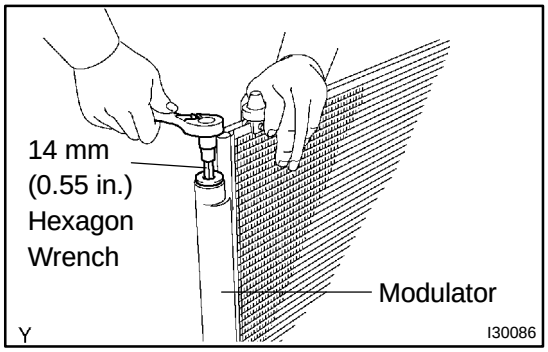


8. REMOVE COOLER DRYER

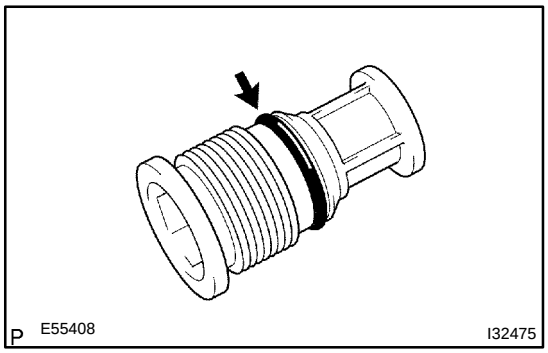
(a) SEDAN / STATION WAGON:
Using a socket hexagon wrench 10 mm (0.39 in.), remove the cap and filter from the modulator.



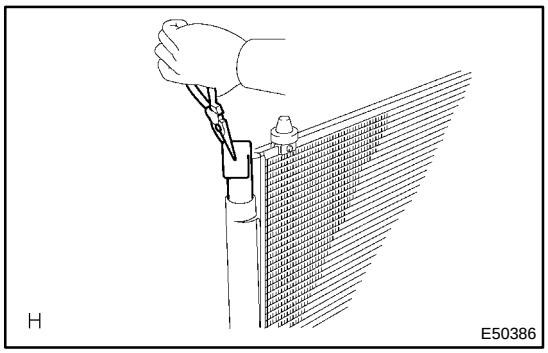
(b) SEDAN / STATION WAGON:
Remove the 2 O-rings from the cap.



(c) HATCH BACK:
Using a socket hexagon wrench 14 mm (0. 55 in.), remove the cap from the modulator.



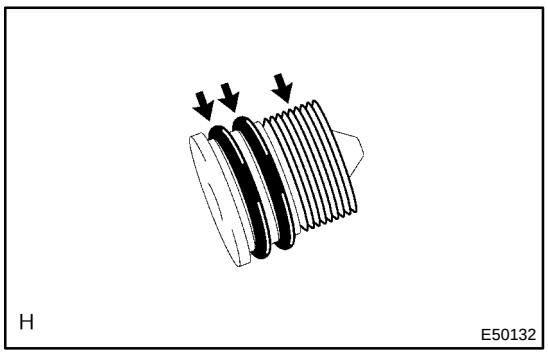
(d) HATCH BACK:
Remove the O-ring from the cap.



(e) Using pliers, remove the cooler drier.

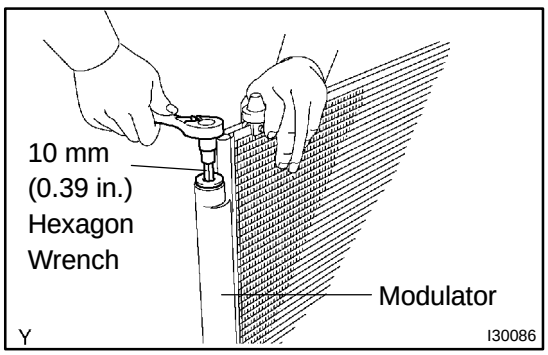
9. INSTALL COOLER DRYER

(a) Using pliers, install the cooler drier.

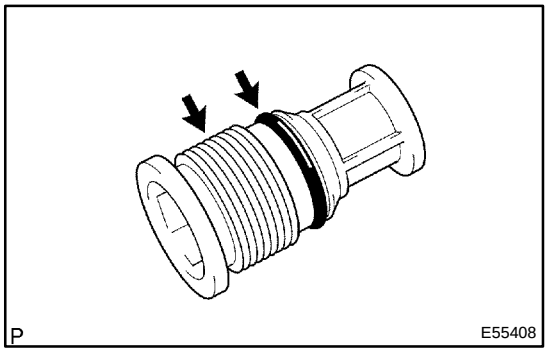


(b) SEDAN / STATION WAGON:
Install the 2 new O-rings to the cap.

(c) SEDAN / STATION WAGON:
Sufficiently apply compressor oil to the fit surfaces of the O-ring and the cap.
Compressor oil: ND-OIL 8 or equivalent

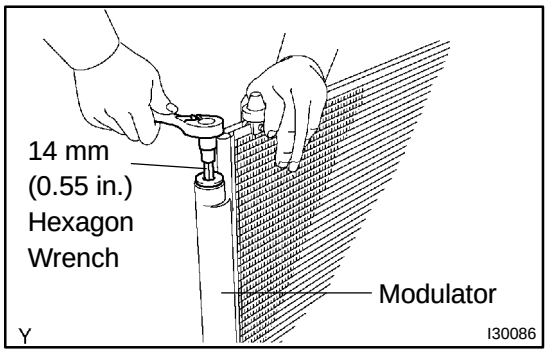


(d) SEDAN / STATION WAGON:
Using a socket hexagon wrench 10 mm (0.39 in.), install the cap and filter to the cooler condenser assy.
Torque: 12 N·m (125 kgf·cm, 9 ft·lbf)

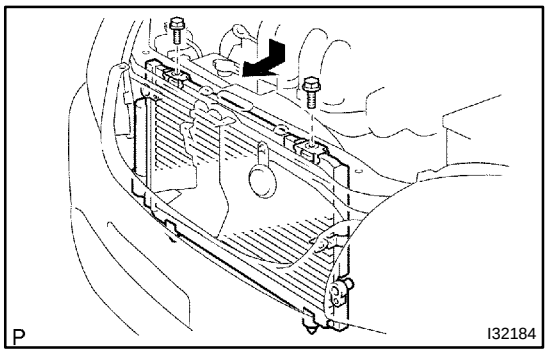


(e) HATCH BACK:
Install the new O-ring to the cap.

(f) HATCH BACK:
Sufficiently apply compressor oil to the fit surfaces of the O-ring and the cap.
Compressor oil: ND-OIL 8 or equivalent

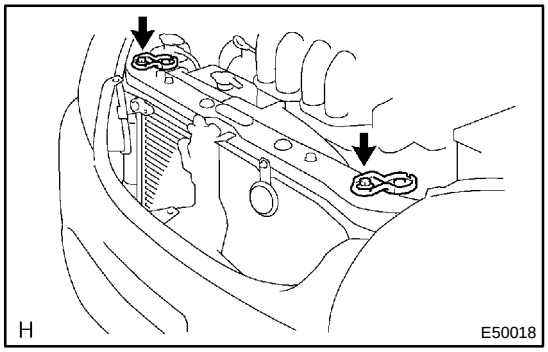


(g) HATCH BACK:
Using a socket hexagon wrench 14 mm (0.55 in.), install the cap to the cooler condenser assy.
Torque: 2.9 N·m (29 kgf·cm, 25 in.·lbf)



10. INSTALL COOLER CONDENSER ASSY

(a) Install the cooler condenser assy with the 2 bolts.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)



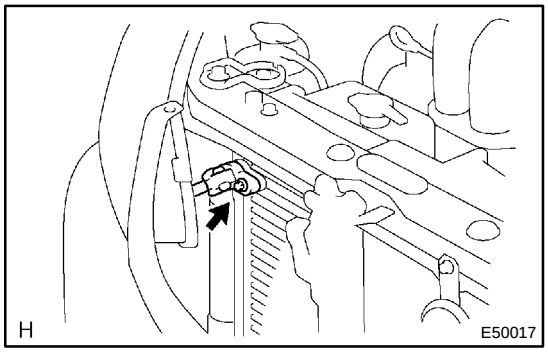
(b) Install the 2 radiator upper supports with the 2 bolts.

11. INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1

(a) Remove the attached vinyl tape from the hose and connecting part of the condenser assy.

(b) Sufficiently apple compressor oil to the new O-ring and hose joint.
Compressor oil: ND-OIL 8 or equivalent

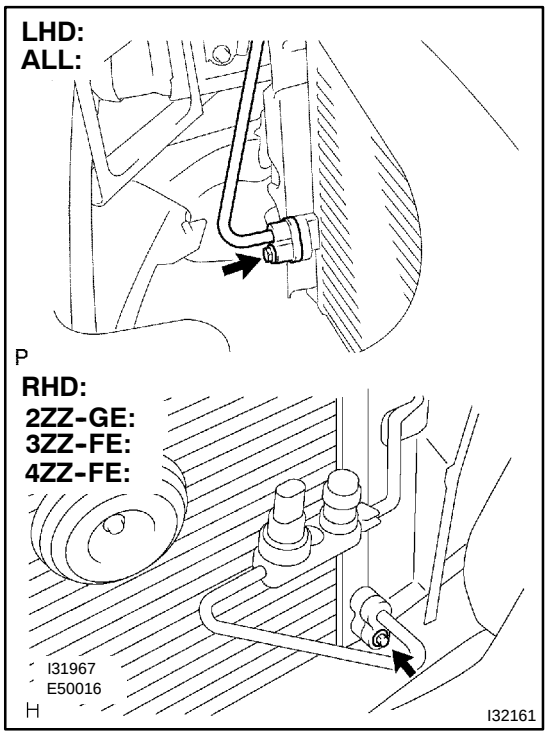
(c) Install a O-ring to the cooler refrigerant discharge hose No. 1.



(d) Connect the cooler refrigerant discharge hose No. 1 to the cooler condenser assy with the bolt.
Torque: 5.4 N·m (54 kgf·cm, 48 in.·lbf)

12. INSTALL COOLER REFRIGERANT LIQUID PIPE A

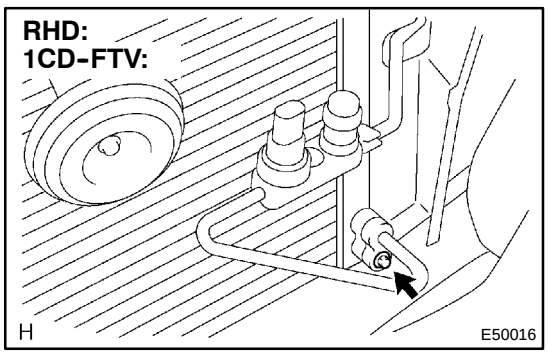
(a) Remove the attached vinyl tape from the pipe and condenser assy.
(b) Sufficiently apple compressor oil to the new O-ring and pipe joint.
Compressor oil: ND-OIL 8 or equivalent
(c) Install a O-rings to the cooler refrigerant liquid pipe.



(d) Connect the cooler refrigerant liquid pipe A to the cooler condenser assy with the bolt.
Torque: 5.4 N·m (54 kgf·cm, 48 in.·lbf)

13. INSTALL COOLER REFRIGERANT LIQUID PIPE B(RHD(1CD-FTV) STEERING POSITION TYPE)

(a) Remove the attached vinyl tape from the pipe and connecting part of the condenser assy.
(b) Sufficiently apple compressor oil to the new O-ring and pipe joint.
Compressor oil: ND-OIL 8 or equivalent
(c) Install a O-ring to the cooler refrigerant liquid pipe B.



(d) Connect the cooler refrigerant liquid pipe B to the cooler condenser assy with the bolt.
Torque: 5.4 N·m (54 kgf·cm, 48 in.·lbf)

14. CHARGE REFRIGERANT **(See page 55-25)**
SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080), 07117-48130, 07117-48140
Specified amount: 490 ± 30 g (17.28 ± 1.06 oz.)

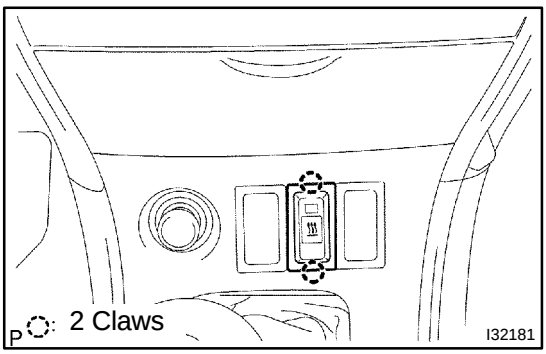
15. WARM UP ENGINE

16. INSPECT LEAKAGE OF REFRIGERANT (See page 55-25)

HEATER SWITCH ASSY

REPLACEMENT

550FH-01



1. REMOVE HEATER SWITCH ASSY

(a) Using a screwdriver, release the 2 fitting claws.

HINT:

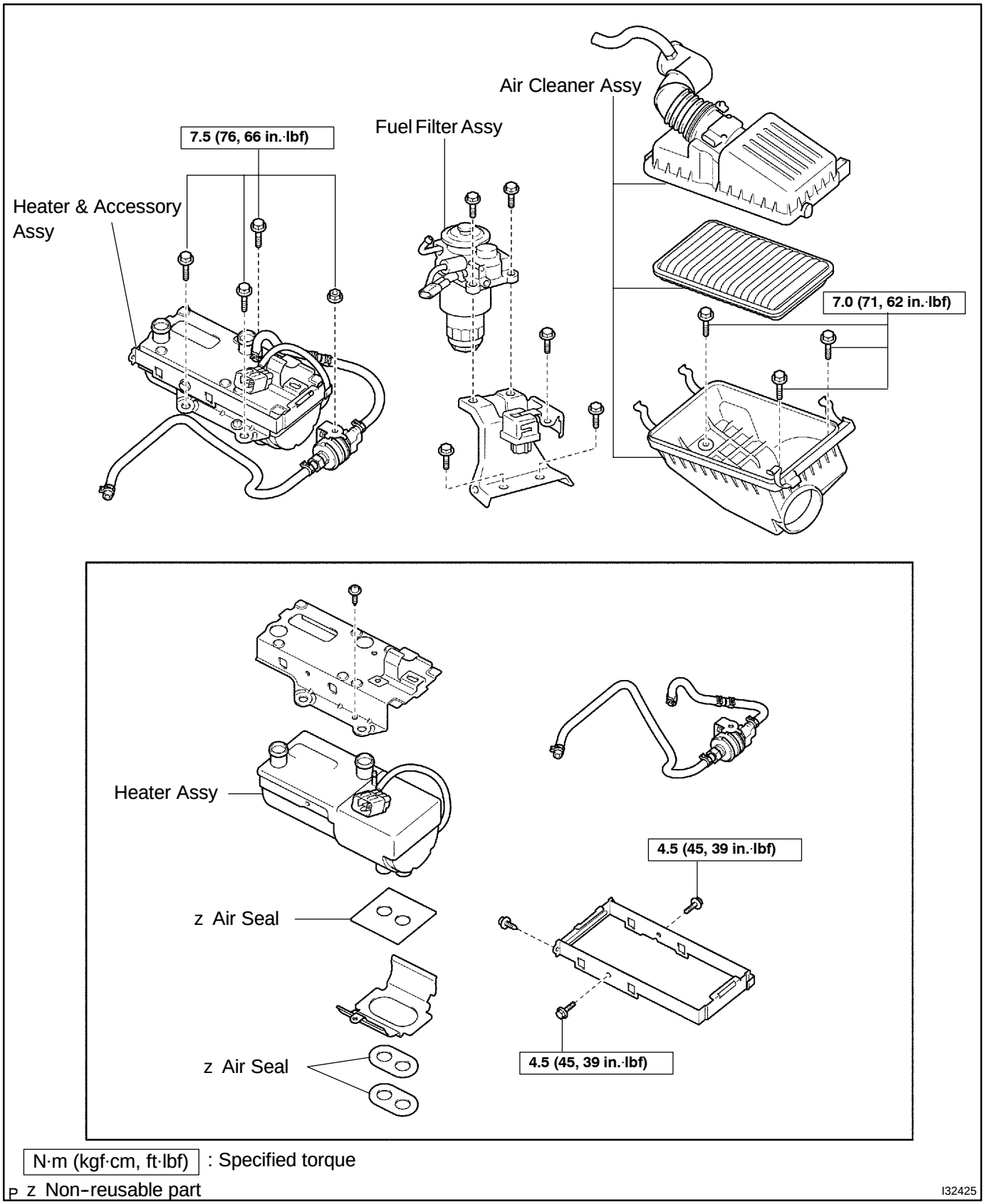
Tape the screwdriver tip before use.

(b) Disconnect the connector, remove the heater switch assy.

HEATER ASSY

COMPONENTS

550GC-01



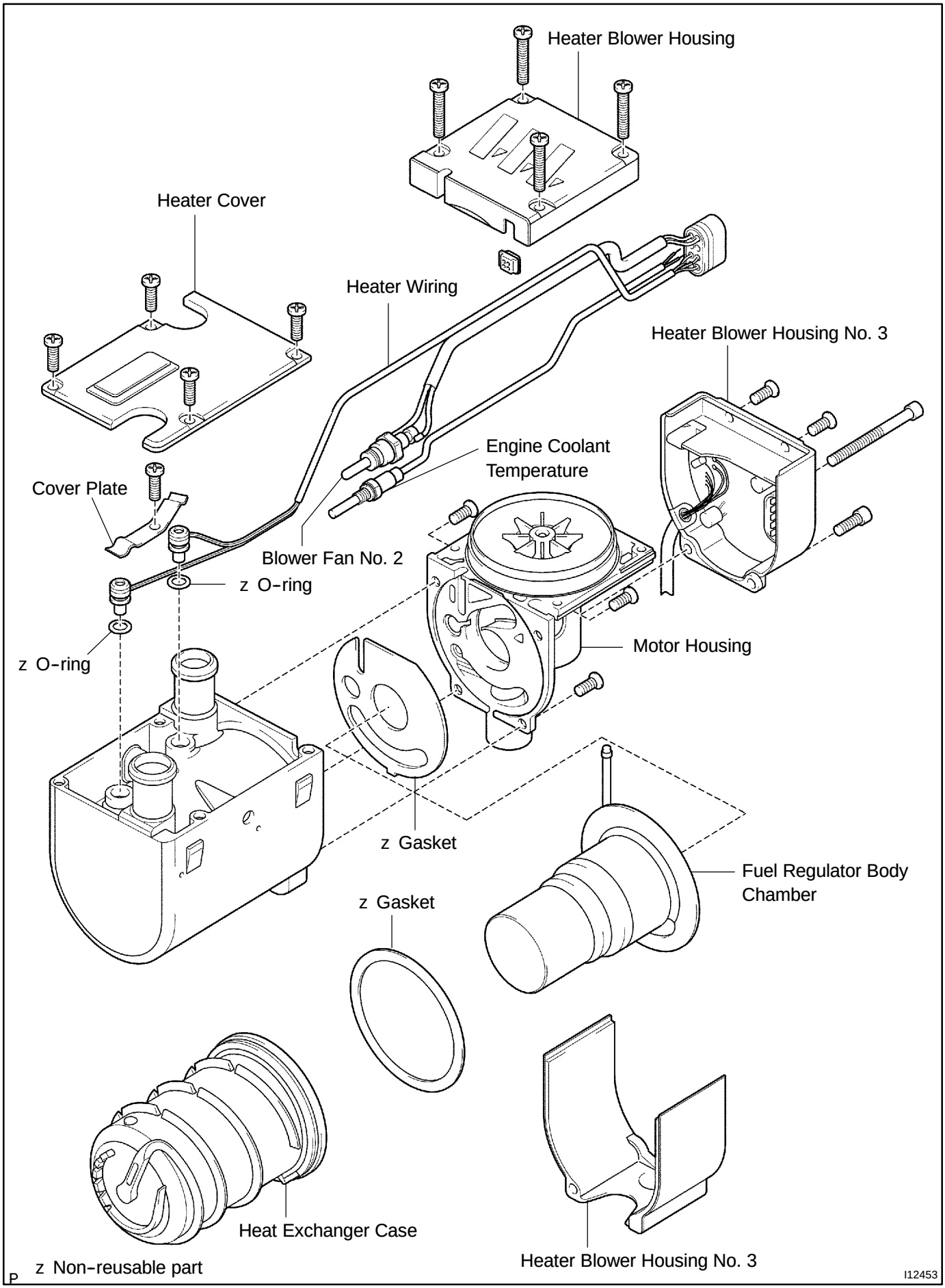
N·m (kgf·cm, ft·lbf) : Specified torque

P z Non-reusable part

I32425

55-108

HEATER & AIR CONDITIONER - HEATER ASSY



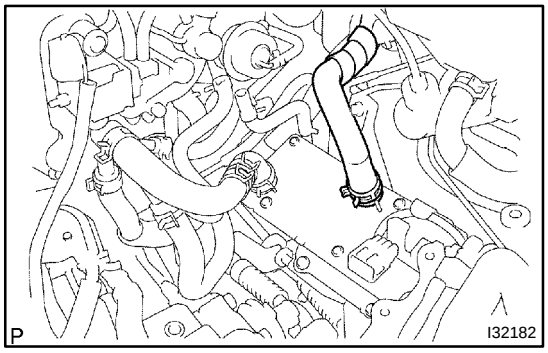
550GD-01

OVERHAUL

HINT:

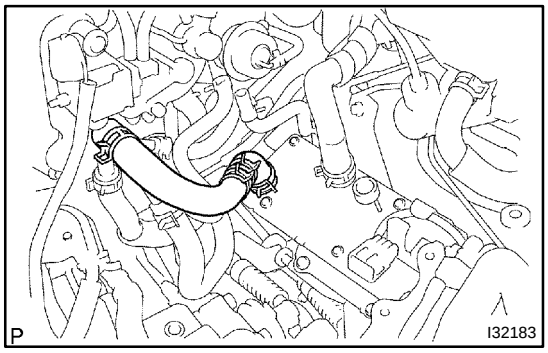
COMPONENTS: 55-107

1. **DRAIN ENGINE COOLANT** **(See page 16-33)**
2. **REMOVE AIR CLEANER ASSY** **(See page 11-85)**
3. **REMOVE FUEL FILTER ASSY** **(See page 11-85)**



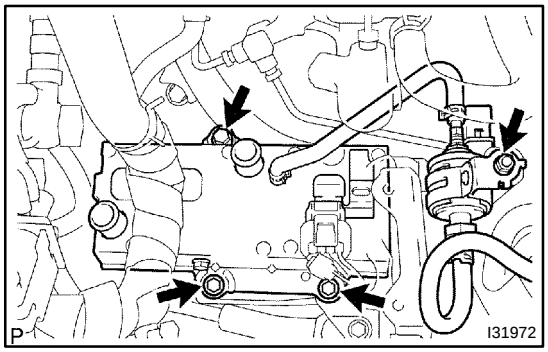
4. DISCONNECT HEATER OUTLET WATER HOSE

(a) Using pliers, grip the claws of clip and slide the clip and disconnect the heater outlet water hose.



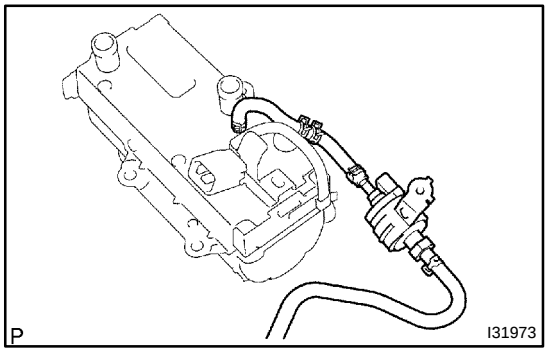
5. DISCONNECT HEATER WATER INLET HOSE A

(a) Using pliers, grip the claws of clip and slide the clip and disconnect the heater water inlet hose A.



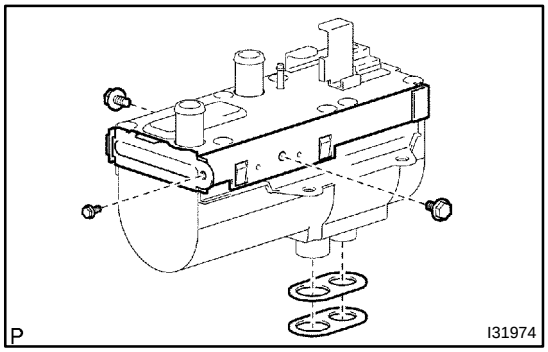
6. REMOVE HEATER & ACCESSORY ASSY

(a) Remove the 3 bolts and fuel filter assy bracket.
(b) Disconnect the connector.
(c) Remove the 3 bolts, nut and heater & accessory assy.

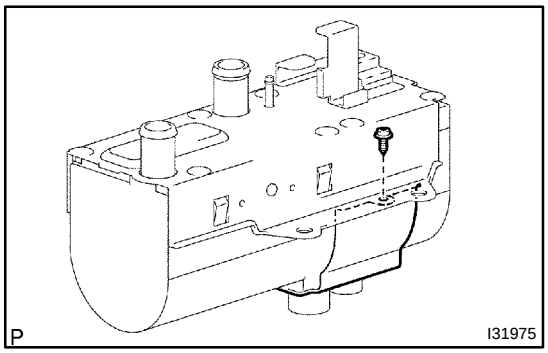


7. REMOVE HEATER ASSY

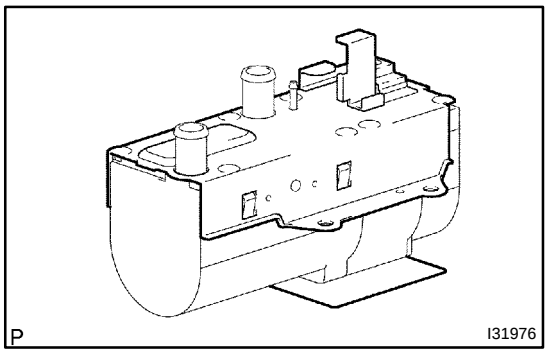
(a) Using pliers, grip the claws of clip and slide the clip and disconnect the heater fuel hose.



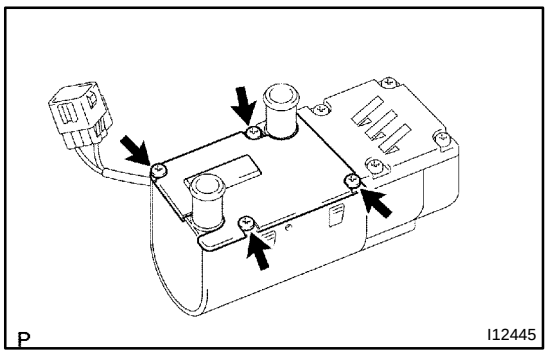
(b) Remove the 2 air seals.
(c) Remove the 2 bolts, screw and 2 brackets.



(d) Remove the screw and bracket.

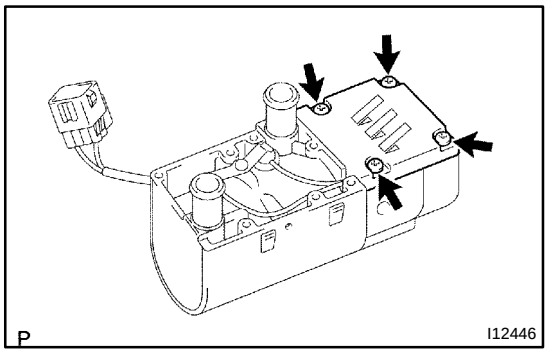


(e) Remove the packing, air seal and bracket.



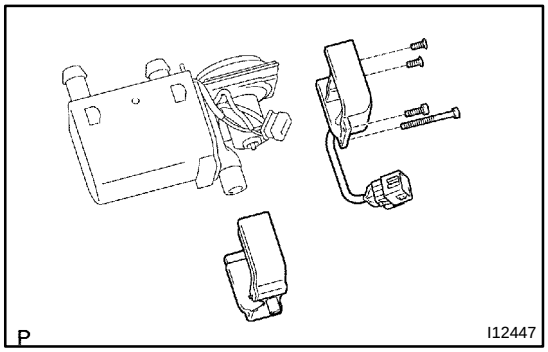
8. REMOVE HEATER COVER

(a) Remove the 4 screws and heater cover.



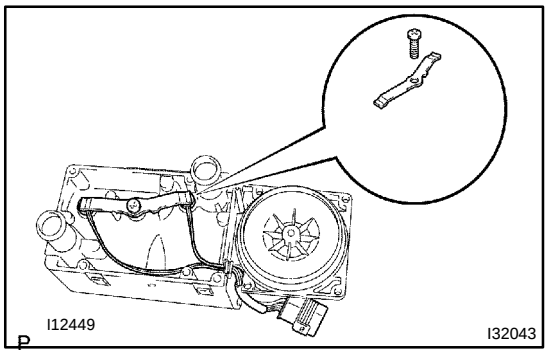
9. REMOVE HEATER BLOWER HOUSING

(a) Remove the 4 screws and heater blower housing.



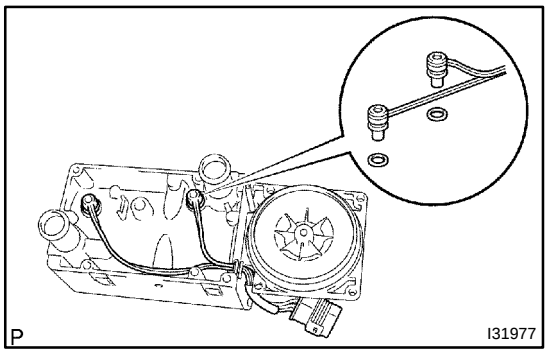
10. REMOVE HEATER BLOWER HOUSING NO.3

(a) Remove the 2 screws.
(b) Using a hexagon wrench 4 mm (0.16 in.), remove the 2 hexagon bolts.
(c) Disconnect the connector.
(d) Remove the 2 heater blower housing No. 3.



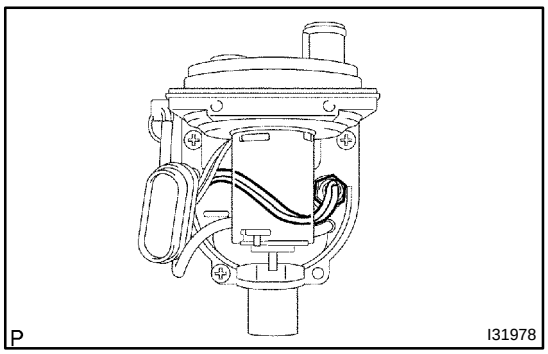
11. REMOVE COVER PLATE

(a) Remove the screw and cover plate.



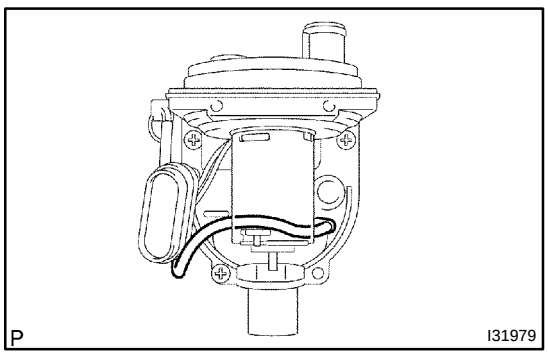
12. REMOVE HEATER WIRING

(a) Remove the heater wiring.
(b) Remove the 2 O-rings from the heater wiring.



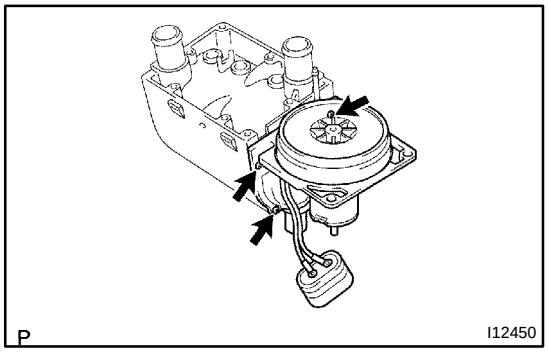
13. REMOVE BLOWER FAN NO.2

(a) Remove the blower fan No. 2.



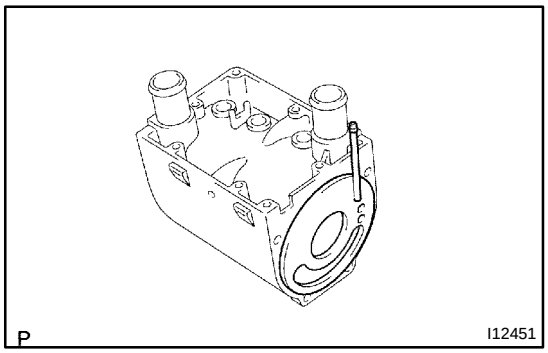
14. REMOVE ENGINE COOLANT TEMPERATURE SENSOR

(a) Remove the engine coolant temperature sensor.



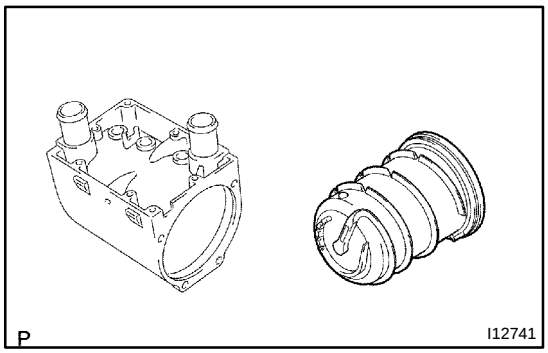
15. REMOVE MOTOR HOUSING

(a) Remove the 3 screws and motor housing.
(b) Remove the gasket.



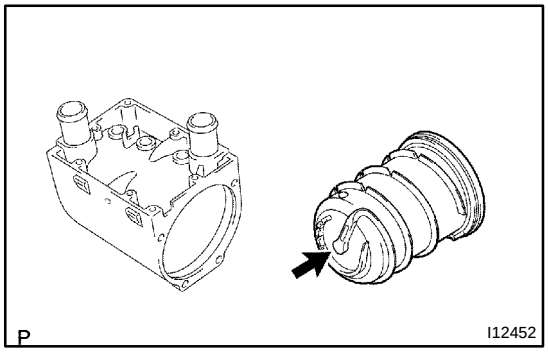
16. REMOVE FUEL REGULATOR BODY CHAMBER

(a) Remove the gasket.
(b) Remove the fuel regulator body chamber.



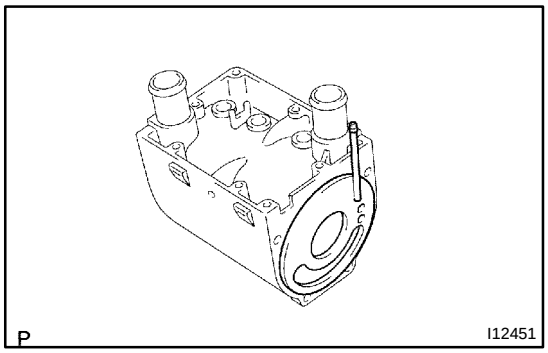
17. REMOVE HEAT EXCHANGER CASE

(a) Remove the heat exchanger case.



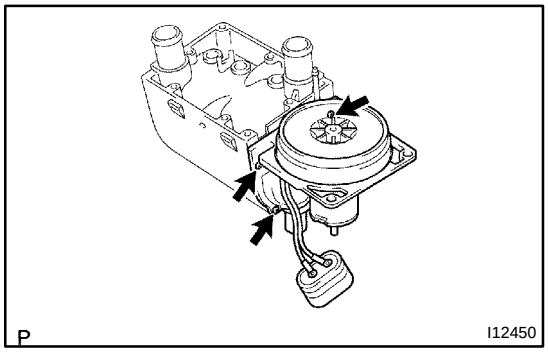
18. INSTALL HEAT EXCHANGER CASE

(a) Align slot on heat exchanger case (arrow) with lug in case.



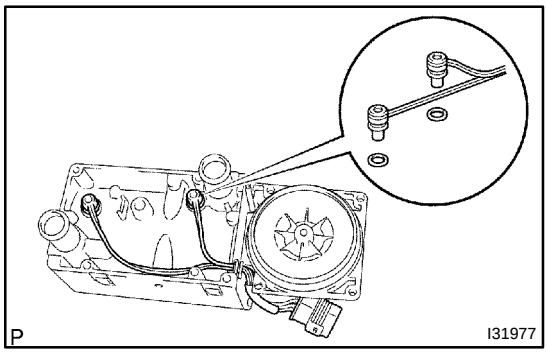
19. INSTALL FUEL REGULATOR BODY CHAMBER

(a) Install the fuel regulator body chamber.
(b) Install the new gasket.



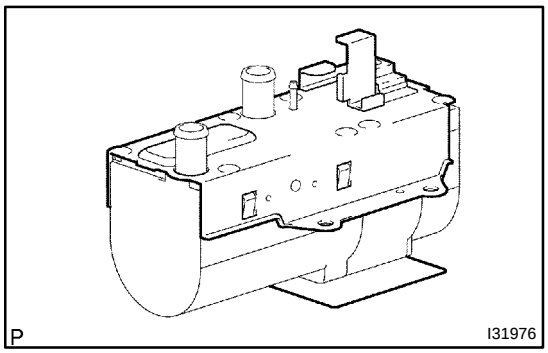
20. INSTALL MOTOR HOUSING

(a) Install the new gasket.
(b) Install the motor housing with the 3 screws.



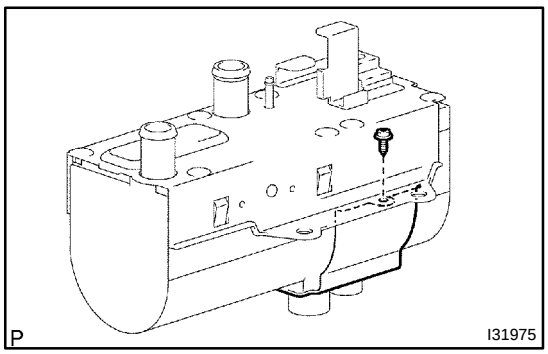
21. INSTALL HEATER WIRING

(a) Install the 2 new O-rings to the heater wiring.
(b) Install the heater wiring.

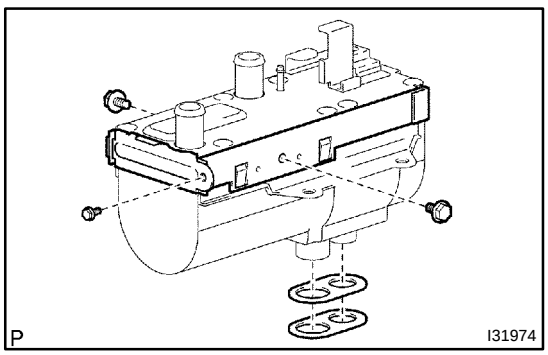


22. INSTALL HEATER ASSY

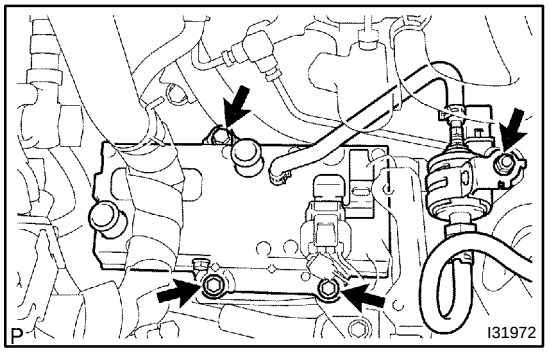
(a) Install the new packing, new air seal and bracket.



(b) Install the bracket with the screw.



(c) Install the 2 brackets with the 2 bolts and screw.
Torque: 4.5 N·m (45 kgf·cm, 39 in.·lbf) (Bolt)
(d) Install the 2 new air seals.



23. INSTALL HEATER & ACCESSORY ASSY

(a) Install the heater & accessory assy with the 3 bolts and nut.

Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)

(b) Connect the connector.

(c) Install the fuel filter assy bracket with the 3 bolts.

24. INSTALL FUEL FILTER ASSY **(See page 11-86)**

25. INSTALL AIR CLEANER ASSY **(See page 11-86)**

26. ADD COOLANT **(See page 16-33)**

27. CHECK FUEL LEAK **(See page 11-70)**

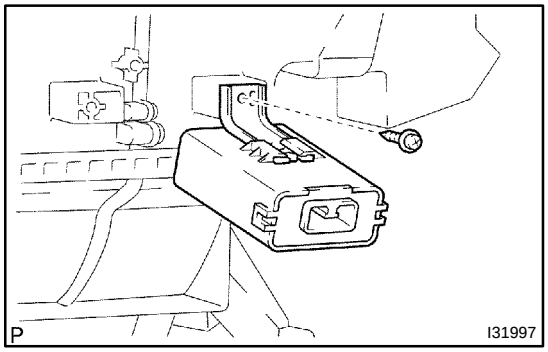
28. CHECK ENGINE COOLANT LEAK **(See page 16-27)**

AIR CONDITIONING AMPLIFIER ASSY (SEDAN/STATION WAGON)

550FG-01

REPLACEMENT

1. REMOVE CONSOLE PANEL UPPER
(See page 71-16)
2. REMOVE INSTRUMENT CLUSTER FINISH PANEL
(See page 71-16)
3. REMOVE AIR CONDITIONING CONTROL ASSY
(See page 55-36)



4. REMOVE AIR CONDITIONING AMPLIFIER ASSY

(a) Disconnect the connecter.
(b) Remove the screw and air conditioning amplifier assy.

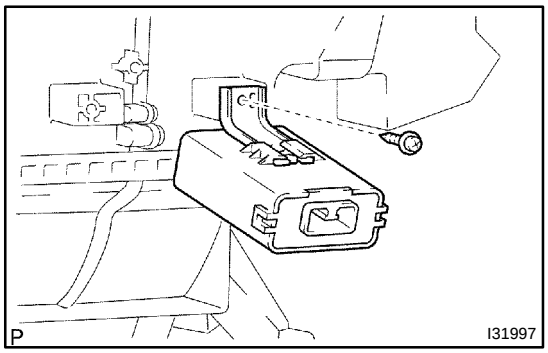
5. INSTALL AIR CONDITIONING CONTROL ASSY
(See page 55-37)

COOLER STABILIZER AMPLIFIER ASSY (HATCHBACK)

550FF-01

REPLACEMENT

1. REMOVE CONSOLE PANEL UPPER
(See page 71-25)
2. REMOVE INSTRUMENT CLUSTER FINISH PANEL ASSY CENTER
(See page 71-25)
3. REMOVE AIR CONDITIONING CONTROL ASSY
(See page 55-36)



4. REMOVE COOLER STABILIZER AMPLIFIER ASSY

(a) Disconnect the connecter.
(b) Remove the screw and cooler stabilizer amplifier assy.

5. INSTALL AIR CONDITIONING CONTROL ASSY
(See page 55-37)

SUPPLEMENTAL RESTRAINT SYSTEM

SUPPLEMENTAL RESTRAINT SYSTEM 60-1
PRECAUTION 60-1/7
ON-VEHICLE INSPECTION 60-8/11
HORN BUTTON ASSY 60-12
COMPONENTS 60-12
REPLACEMENT 60-13
DISPOSAL 60-14/20
SPIRAL CABLE SUB-ASSY 60-21
COMPONENTS 60-21
REPLACEMENT 60-22/23
INSTR PNL PASS L/DOOR AIR BAG ASSY 60-24
COMPONENTS 60-24
REPLACEMENT 60-25/26
DISPOSAL 60-27/31
FRONT SEAT AIRBAG ASSY RH 60-32
DISPOSAL 60-32/36
AIR BAG SENSOR ASSY CENTER 60-37
COMPONENTS 60-37
REPLACEMENT 60-38
AIR BAG FRONT RH SENSOR 60-39
COMPONENTS 60-39
REPLACEMENT 60-40
AIR BAG SENSOR FRONT LH 60-41
COMPONENTS 60-41
REPLACEMENT 60-42
SIDE AIR BAG SENSOR ASSY RH (3-DOOR HATCHBACK) 60-43
COMPONENTS 60-43
REPLACEMENT 60-44
SIDE AIR BAG SENSOR ASSY RH (EXCEPT 3-DOOR HATCHBACK) 60-45
COMPONENTS 60-45
REPLACEMENT 60-46/47

SUPPLEMENTAL RESTRAINT SYSTEM

600AX-01

PRECAUTION

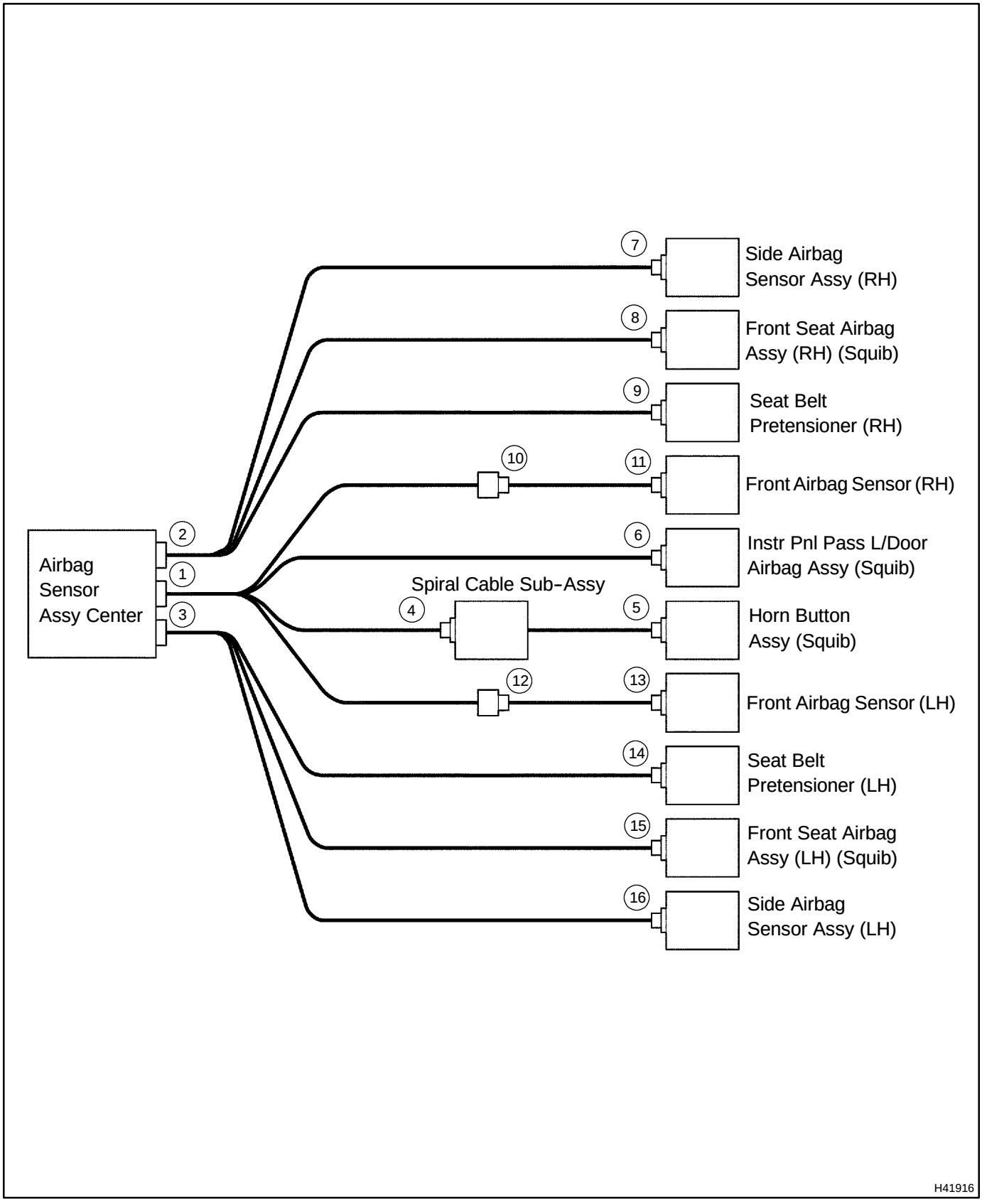
CAUTION:

- **The COROLLA is equipped with SRS, which comprises a driver airbag, front passenger airbag, and side airbag. Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Further, if a mistake is made in servicing the SRS, it is possible that the SRS may fail to operate when required. Before performing servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedures described in the repair manual.**
- **Work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.**
  (The SRS is equipped with a back-up power source so that if work is started within 90 seconds from disconnecting the negative (-) terminal cable of the battery, the SRS may be deployed.)
- **Do not expose the horn button assy, instrument panel passenger airbag assy, airbag sensor assy center, airbag front sensor, front seat airbag assy, and side airbag sensor assy directly to hot air or flames.**

NOTICE:

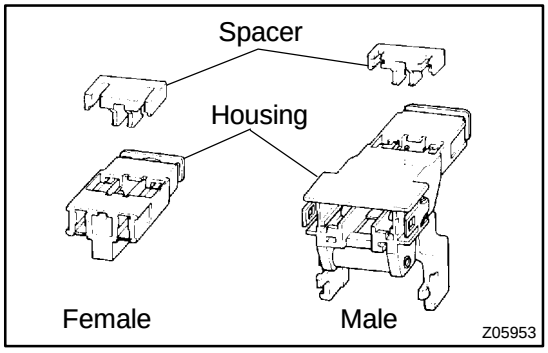
- **Malfunction symptoms of the SRS are difficult to confirm, so the DTCs become the most important source of information when troubleshooting. When troubleshooting the SRS, always inspect the DTCs before disconnecting the battery.**
- **Even in cases of a minor collision where the SRS does not deploy, the horn button assy, instrument panel passenger airbag assy, airbag sensor assy center, airbag front sensor, front seat airbag assy, and side airbag sensor assy should be inspected** **(See page 60-8).**
- **Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.**
- **Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.**
- **Never disassemble and repair the horn button assy, instrument panel passenger airbag assy, airbag sensor assy center, airbag front sensor, front seat airbag assy or side airbag sensor assy in order to reuse it.**
- **If the horn button assy, instrument panel passenger airbag assy, airbag sensor assy center, airbag front sensor, front seat airbag assy or side airbag sensor assy has been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace it with a new one.**
- **Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting the system's electrical circuits.**
- **Information labels are attached to the periphery of the SRS components. Follow the instructions on the notices.**
- **After work on the SRS is completed, perform the SRS warning light check** **(See page 60-8).**
- **When the negative (-) terminal cable is disconnected from the battery, the memory of the clock and audio system will be canceled. So before starting work, make a record of the contents memorized in the audio memory system. When work is finished, reset the audio systems as they were before and adjust the clock. To avoid erasing the memory in each memory system, never use a back- up power supply from outside the vehicle.**
- **If the vehicle is equipped with a mobile communication system,**
  refer to the precaution in the IN section.

1. SRS CONNECTORS



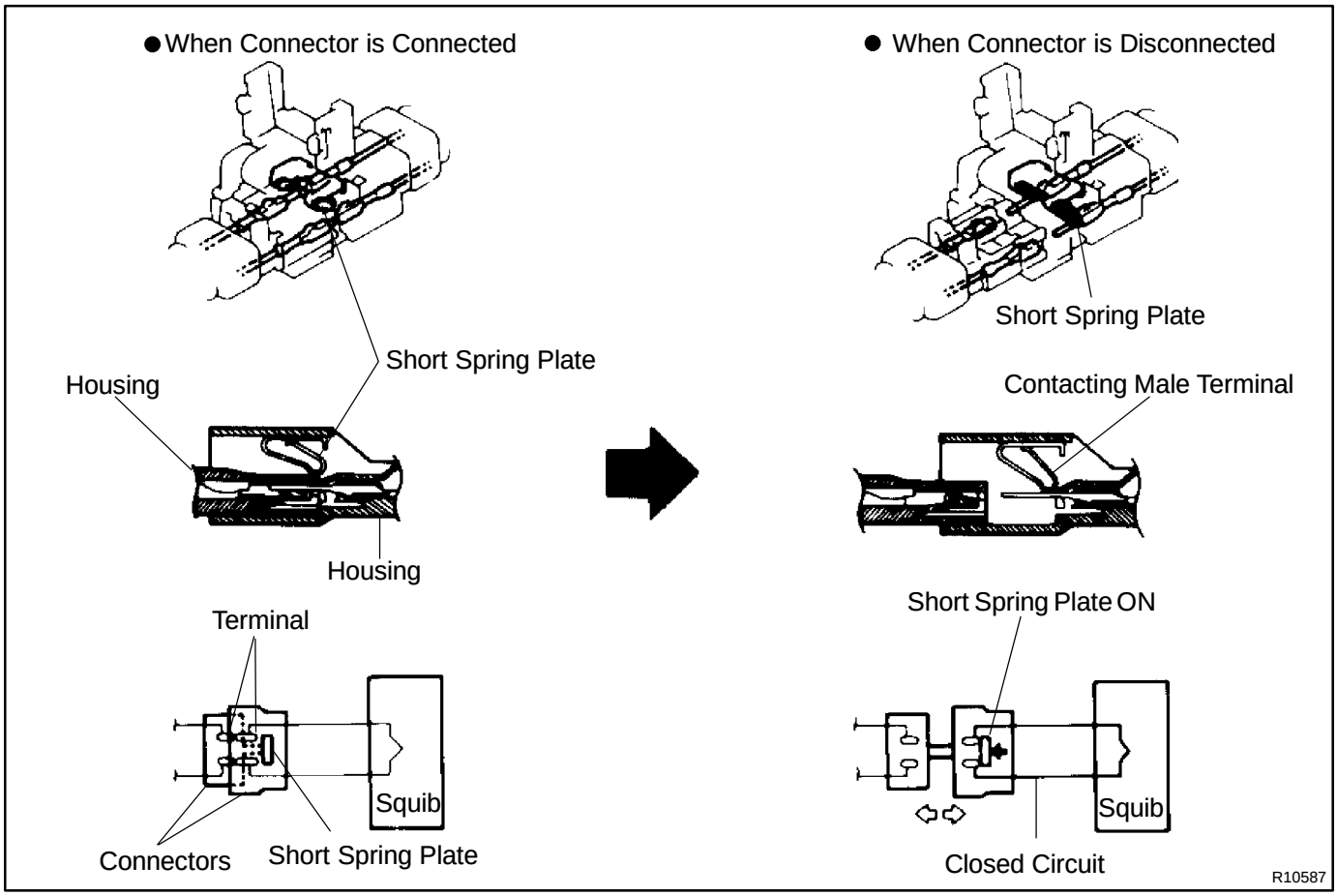
No.	Item	Application
(1)	Terminal Twin-Lock Mechanism	Connectors 1, 2, 3, 4, 6, 7, 9, 10, 11, 12, 13, 14, 16
(2)	Airbag Activation Prevention Mechanism	Connectors 1, 2, 3, 4, 5, 6, 8, 9, 14, 15
(3)	Electrical Connection Check Mechanism	Connectors 1, 2, 3
(4)	Half Connection Prevention Mechanism	Connectors 4, 5, 6, 7, 11, 13, 16
(5)	Connector Lock Mechanism	Connectors 9, 14

(a) All connectors in the SRS are colored in yellow to distinguish them from other connectors. Connectors having special functions and specifically designed for the SRS are used in the locations shown on the previous page to ensure high reliability. These connectors use durable gold-plated terminals.

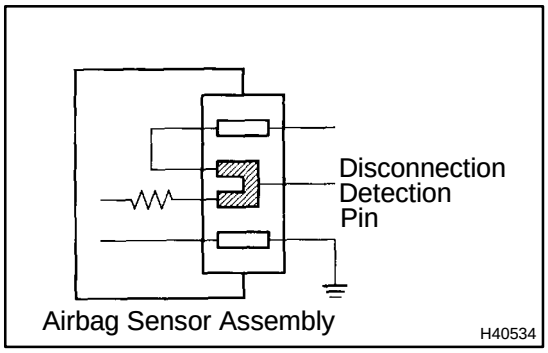


(1) Terminal twin-lock mechanism:
Each connector has a two-piece component consisting of a housing and a spacer. This design enables the terminal to be locked securely by two locking devices (the retainer and the lance) to prevent terminals from coming out.

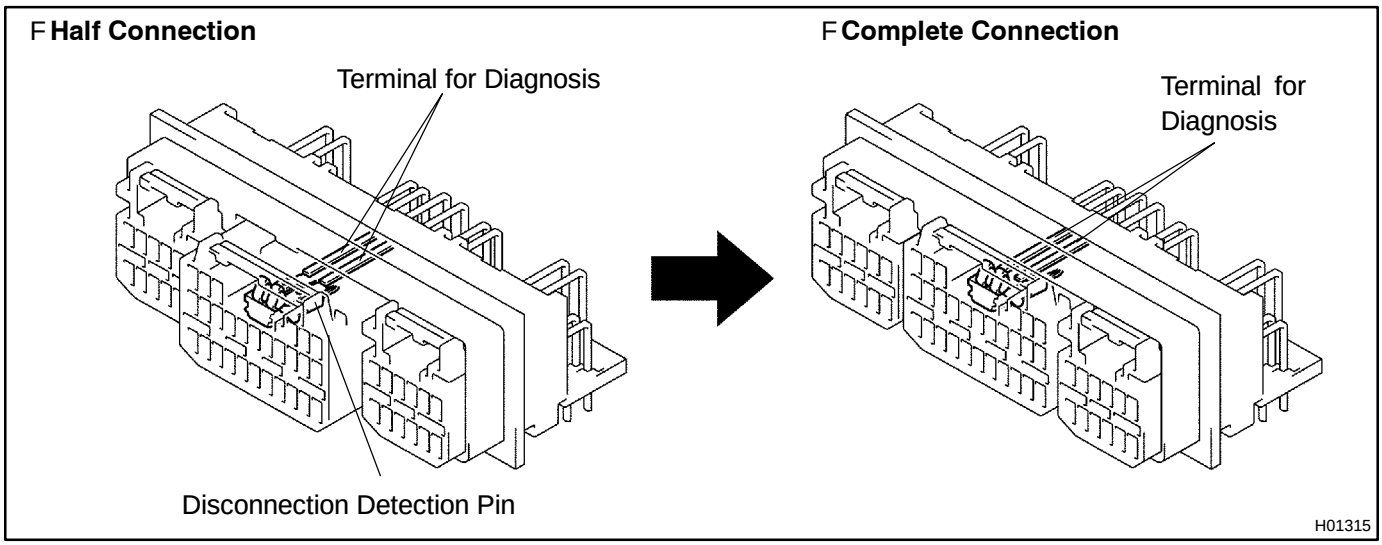
(2) Airbag activation prevention mechanism:
Each connector contains a short spring plate. When the connector is disconnected, the short spring plate automatically connects positive (+) terminal and negative (-) terminal of the squib.



HINT:
The type of connector is shown in the diagram on the previous page.

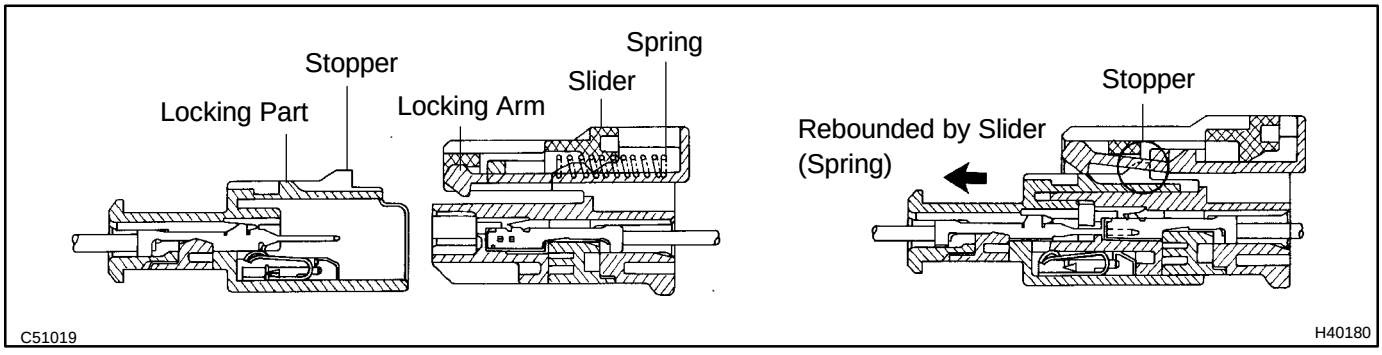


(3) Electrical connection check mechanism:
This mechanism electrically checks that connectors are connected correctly and completely. The electrical connection check mechanism is designed so that the disconnection detection pin connects with the diagnosis terminals when the connector housing lock is locked.

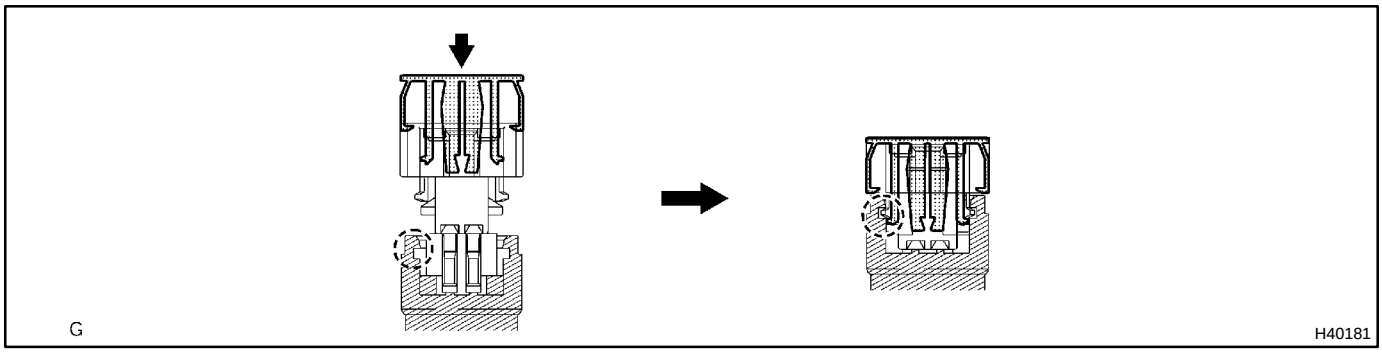


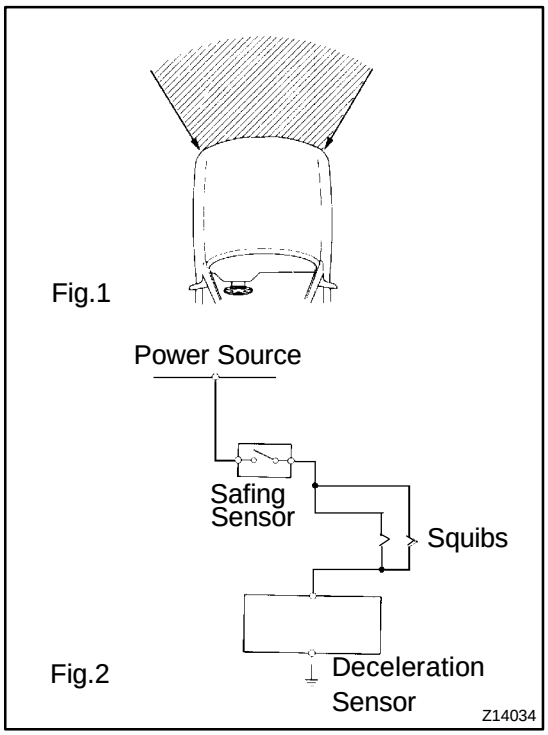
HINT:
The connectors shown in this illustration are connectors, "1", "2" and "3" in step 1.

(4) Half connection prevention mechanism:
If the connector is not completely connected, the connector is disconnected due to the spring operation to the extent that no continuity exists.



(5) Connector lock mechanism:
Locking the connector lock button securely connects the connector.

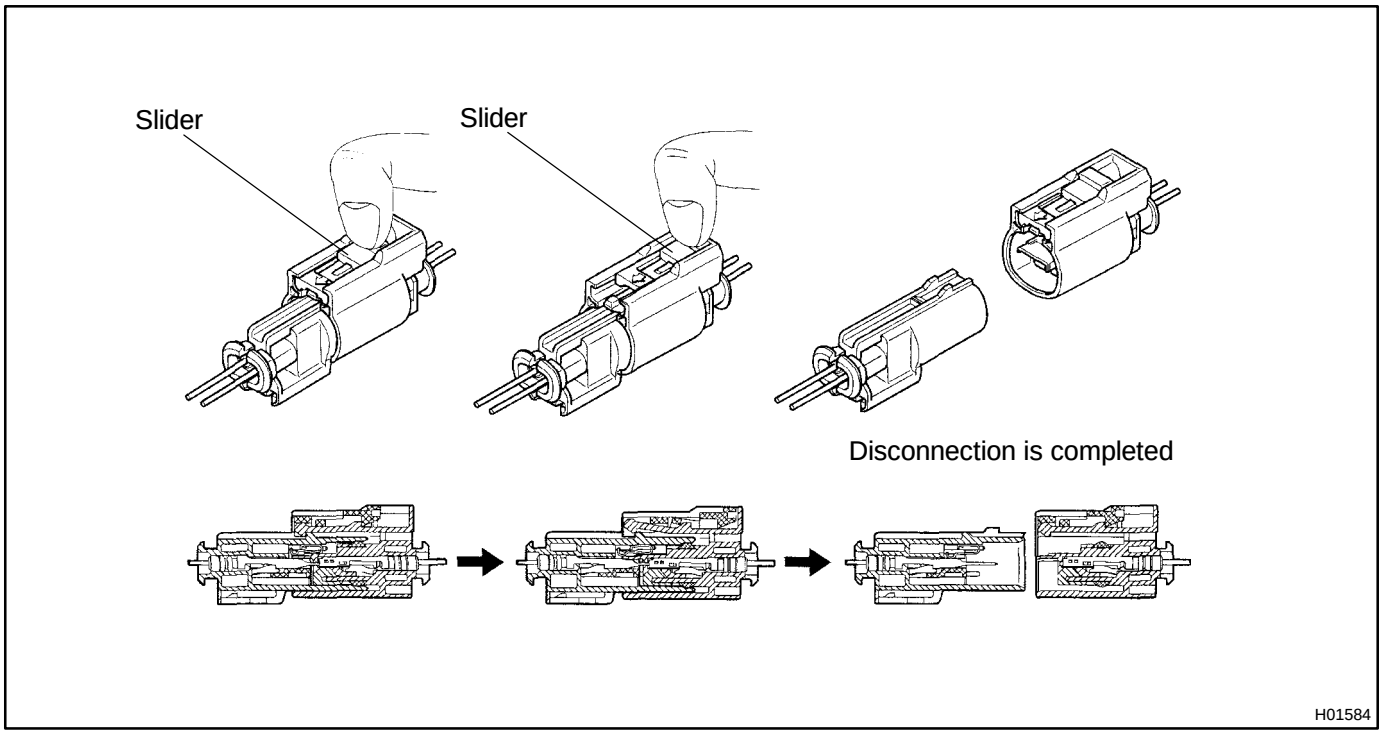




(b) When the vehicle is involved in a frontal collision in the hatched area (Fig. 1) and the shock is larger than the predetermined level, the SRS is activated automatically. A safing sensor is designed to go on at a smaller deceleration rate than the airbag sensor. As illustrated in Fig. 2, ignition is caused when current flows to the squib, which happens when a safing sensor and the deceleration sensor go on simultaneously. When a deceleration force acts on the sensors, 2 squibs in the driver airbag and front passenger airbag ignite and generate gas. The gas discharging into the driver airbag and front passenger airbag rapidly increases the pressure inside the bags, breaking open the horn button assy and instrument panel. Bag inflation then ends, and the bags deflate as the gas is discharged through discharge holes at the bag's rear or side.

2. DISCONNECTION OF CONNECTOR FRONT SEAT AIRBAG ASSY

(a) Place a finger on the slider.
(b) Slide the slider to release lock.
(c) Disconnect the connector.

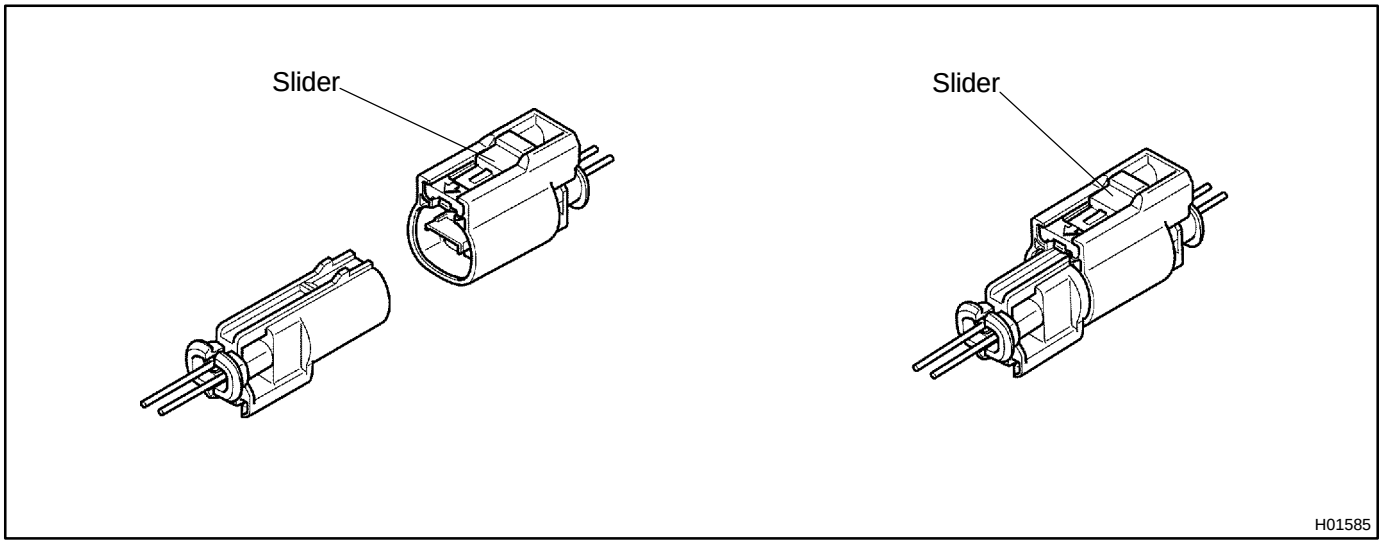


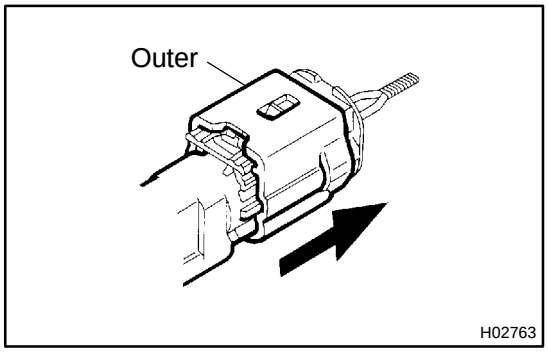
3. CONNECTION OF CONNECTOR FOR FRONT SEAT AIRBAG ASSY

(a) Align a lock part of male connector and a slider of female connector in the same direction as shown in the illustration, fit in them without rubbing.
(b) Be sure to insert until they are locked. After fitting in pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

HINT:

- As the slider slides, do not touch it.
- Be careful not to deform the release board. If the release board is deformed, replace it with a new one.





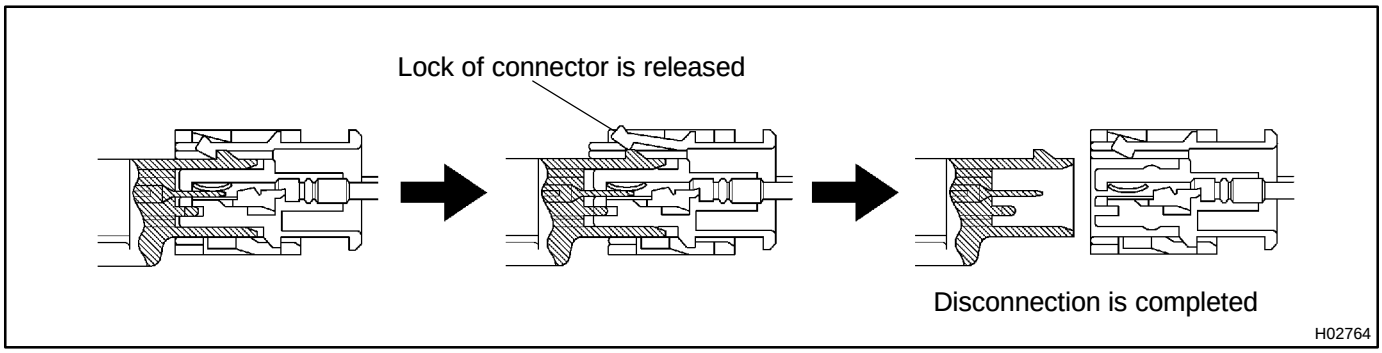
4. DISCONNECTION OF AIRBAG FRONT SENSOR AND SIDE AIRBAG SENSOR CONNECTOR

(a) While holding both flank sides of the outer, slide the outer to the direction shown by an arrow.

(b) Lock of the connectors is released, then disconnect the connectors.

HINT:

Be sure to hold both flank sides of the outer. If holding the top and bottom sides, it will obstruct disconnection.



5. CONNECTION OF CONNECTORS FOR AIRBAG FRONT SENSOR AND SIDE AIRBAG SENSOR

(a) Align the male connector (on the side of sensor) and female connector in the same direction as shown in the illustration and fit in them without rubbing.

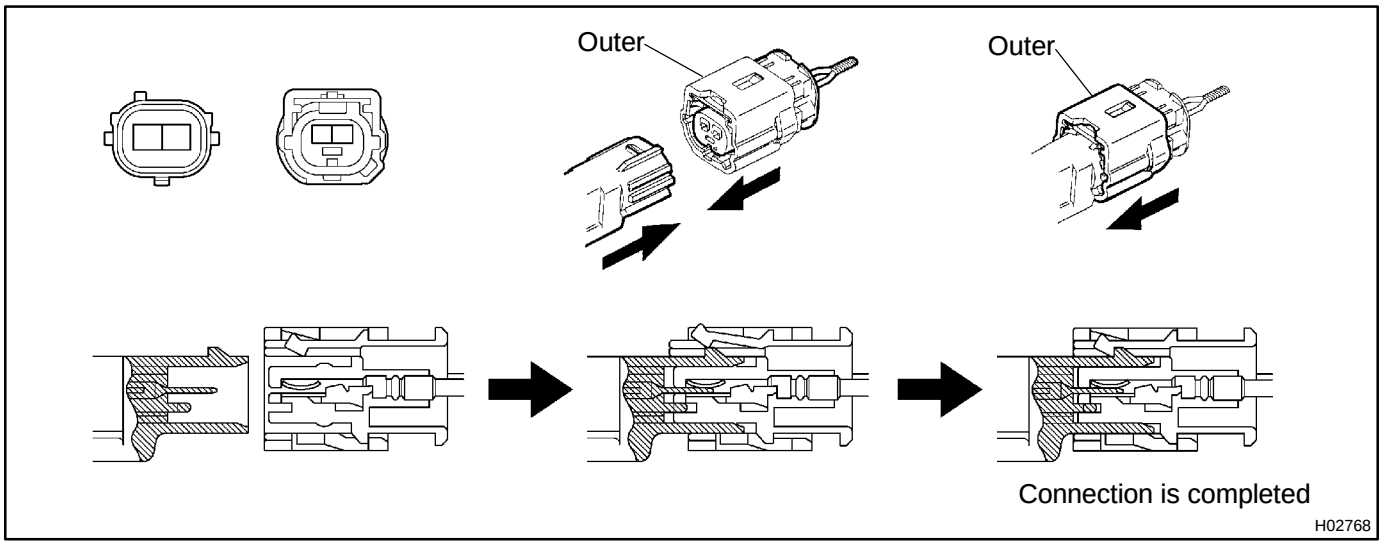
(b) As they are fitted in, the outer slides rearward. Press it until the outer returns to its original position again.

If fitting stops half way, connectors will separate.

(c) Be sure to insert until they are locked. After fitting in, pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

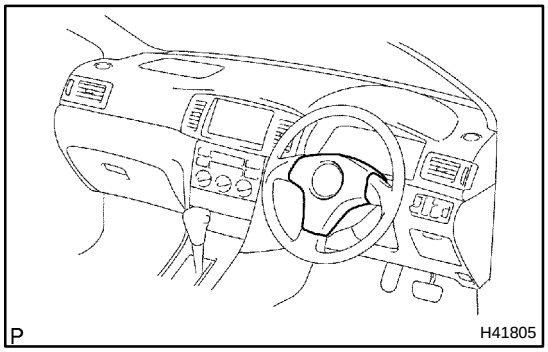
HINT:

- Do not fit in while holding the outer.
- When fitting in, the outer slides. Do not touch it.



600AY-01

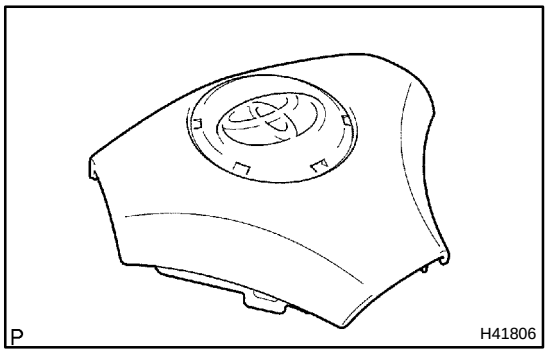
ON-VEHICLE INSPECTION



1. HORN BUTTON ASSY (VEHICLES NOT INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05-942).

(b) Do a visual check which includes the following item with the horn button assy (with airbag) installed in the vehicle. Check cuts, minute cracks or marked discoloration on the horn button assy top surface and in the grooved portion.

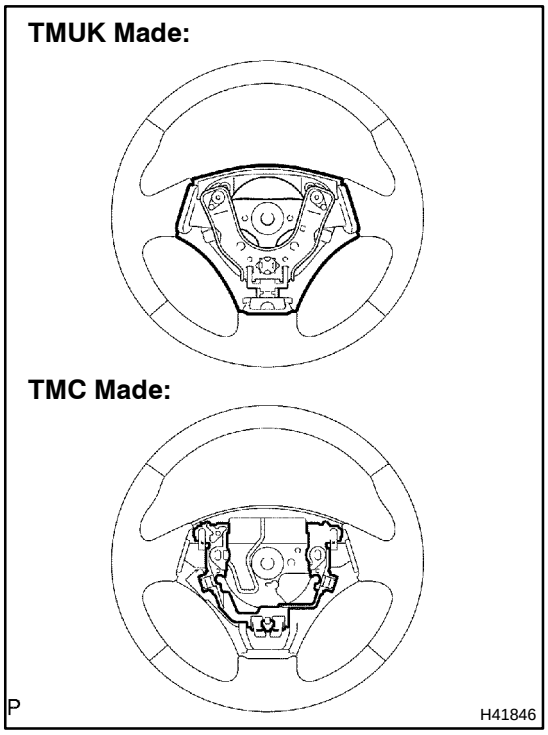


2. HORN BUTTON ASSY(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED)

(a) Do a diagnostic system check (See page 05-942).

(b) Do a visual check which includes the following items with the horn button assy (with airbag) removed from the vehicle.

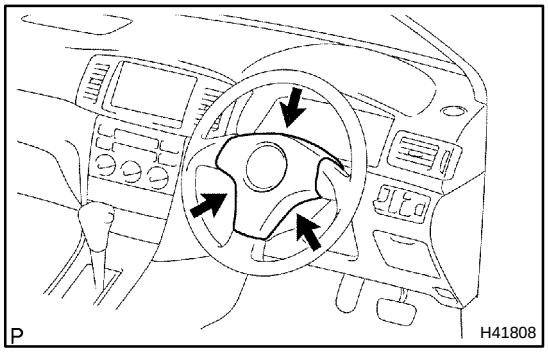
- Check cuts, minute cracks or marked discoloration on the horn button assy top surface and in the grooved portion.
- Check cuts and cracks in wire harness, and chipping in connectors.
- Check the deformation on the steering wheel.



- Check the deformation on the horn button contact plate of the steering wheel assy.

HINT:

- If the horn button contact plate of the steering wheel assy is deformed, never repair it. Always replace the steering wheel assy with a new one.



S There should be no interference between the horn button assy and steering wheel, and the clearance should be uniform all the way around when the new horn button assy is installed on the steering wheel.

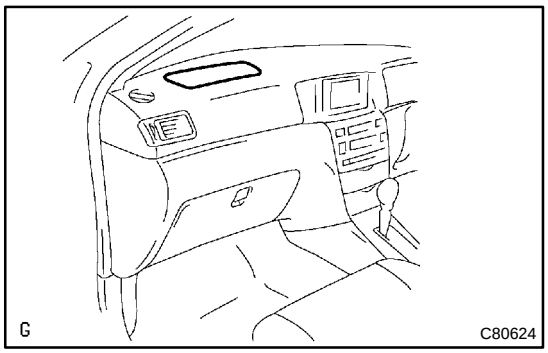
CAUTION:
For removal and installation of the horn button assy, see page 60-13, and be sure to follow the correct procedure.

3. HORN BUTTON ASSY(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED)

(a) Do a diagnostic system check (See page 05-942).

(b) Do a visual check which includes the following item with the horn button assy (with airbag) removed from the vehicle.
TMC Made only:
Check the damage on the spiral cable connector and wire harness.

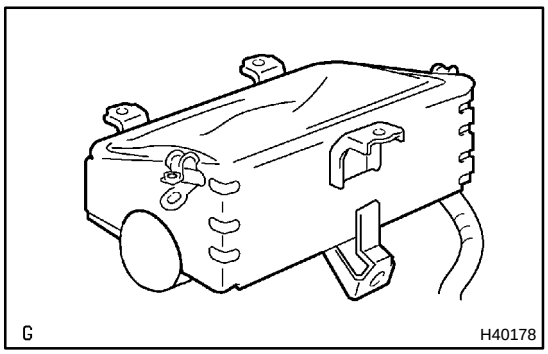
HINT:
There should be no interference between the horn button assy and steering wheel, and the clearance should be uniform all the way around when the new horn button assy is installed on the steering wheel.



4. INSTR PNL PASS L/DOOR AIRBAG ASSY(VEHICLE NOT INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05-942).

(b) Do a visual check which includes the following item with the instr pnl pass l/door airbag assy installed in the vehicle.
Check cuts, minute cracks or marked discoloration on the instr pnl pass l/door airbag assy and instrument panel.



5. INSTR PNL PASS L/DOOR AIRBAG ASSY(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED)

(a) Do a diagnostic system check (See page 05-942).

(b) Do a visual check which includes the following items with the instr pnl pass l/door airbag assy removed from the vehicle.
- S Check cuts, minute cracks or marked discoloration on the instr pnl pass l/door airbag assy.
- S Check cuts and cracks in wire harness, and for chipping in connectors.
- S Check the deformation or cracks on the instrument panel and instrument panel reinforcement.

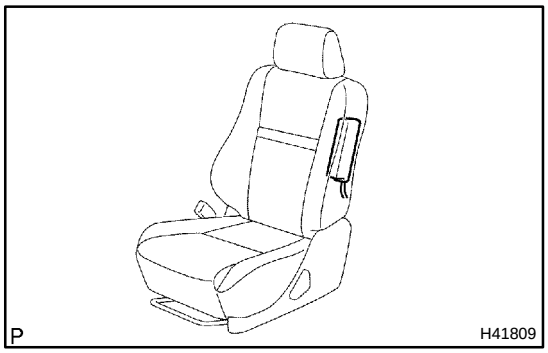
HINT:
If the instrument panel or instrument panel reinforcement is deformed or cracked, never repair it. Always replace it with a new one.

CAUTION:
For removal and installation of the instrument panel passenger airbag assy, see page 60–25, and be sure to follow the correct procedure.

6. INSTR PNL PASS L/DOOR AIRBAG ASSY(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED)

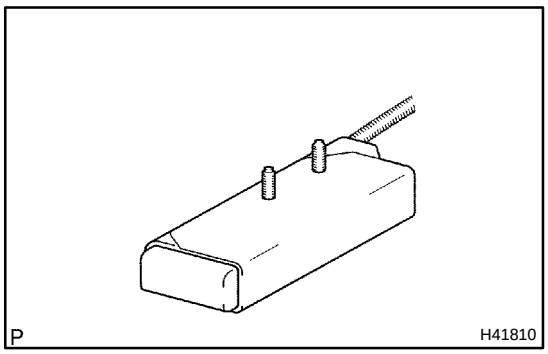
(a) Do a diagnostic system check (See page 05–942).
(b) Do a visual check which includes the following items with the instr pnl pass l/door airbag assy removed from the vehicle.
- S Check the deformation or cracks on the instrument panel and instrument panel reinforcement.
- S Check the damage on the connector and wire harness.

HINT:
If the instrument panel or instrument panel reinforcement is deformed or cracked, never repair it. Always replace it with a new one.



7. FRONT SEAT AIRBAG ASSY(VEHICLE NOT INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05–942).
(b) Do a visual check which includes the following item with the front seat airbag assy installed in the vehicle.
Check cuts, minute cracks or marked discoloration on the front passenger airbag assy and instrument panel.



8. FRONT SEAT AIRBAG ASSY(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED)

(a) Do a diagnostic system check (See page 05–942).
(b) Do a visual check which includes the following items with the front seat airbag assy removed from the vehicle.
- S Check cuts, minute cracks or marked discoloration on the front seat airbag assy.
- S Check cuts and cracks in wire harness, and for chipping in connectors.

9. AIRBAG SENSOR ASSY CENTER(VEHICLE NOT INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05–942).

10. AIRBAG SENSOR ASSY CENTER(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED)

(a) Do a diagnostic system check (See page 05–942).

11. AIRBAG SENSOR ASSY CENTER(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED)

(a) Replace the airbag sensor assy center (See page 60–38).

12. AIRBAG FRONT SENSOR(VEHICLE NOT INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05–942).

13. AIRBAG FRONT SENSOR(VEHICLE INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05–942).

(b) If the front fender of the car or its periphery is damaged, do a visual check for damage to the airbag front sensor, which includes the following items even if the airbag was not deployed:

- Cracks, dents or chips in the case
- Cracks, dents, chipping and scratches in the connector
- Peeling off of the label or damage to the serial number

14. SIDE AIRBAG SENSOR ASSY(VEHICLE NOT INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05–942).

15. SIDE AIRBAG SENSOR ASSY(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED)

(a) Do a diagnostic system check (See page 05–942).

16. SIDE AIRBAG SENSOR ASSY(VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED)

(a) Replace the front seat airbag assy and side airbag sensor assy (See page 72-2, 60-44 and 60–46).

17. WIRE HARNESS AND CONNECTOR(VEHICLE NOT INVOLVED IN COLLISION)

Do a diagnostic system check (See page 05–942).

18. WIRE HARNESS AND CONNECTOR(VEHICLE INVOLVED IN COLLISION)

(a) Do a diagnostic system check (See page 05–942).

(b) Check breaks in all wires of the SRS wire harness, and exposed conductors.

(c) Check to see if the SRS wire harness connectors are cracked or chipped.

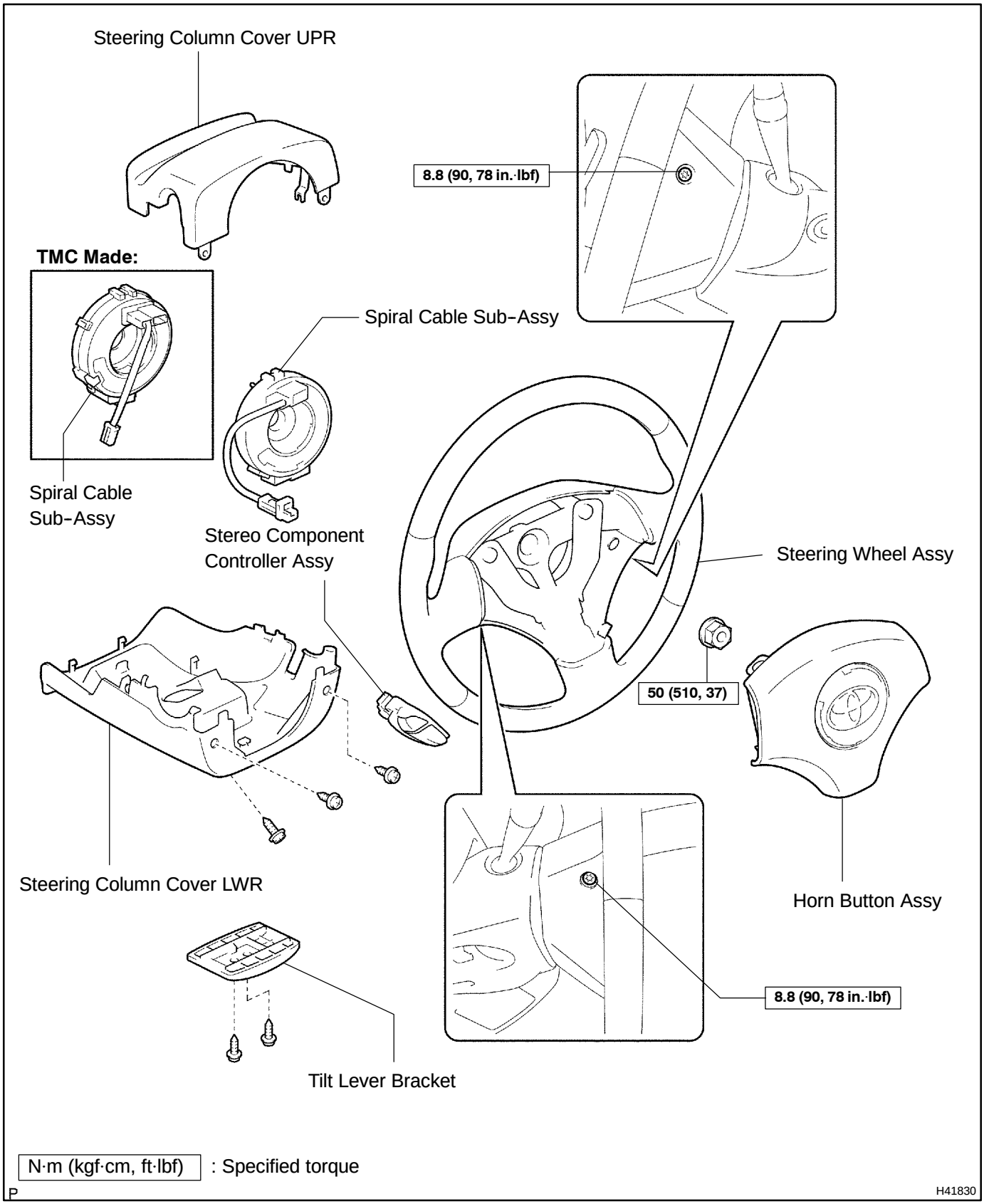
HINT:

The SRS wire harness is integrated with the instrument panel wire harness assembly. All the connectors in the system are a standard yellow color.

HORN BUTTON ASSY

COMPONENTS

600AZ-01

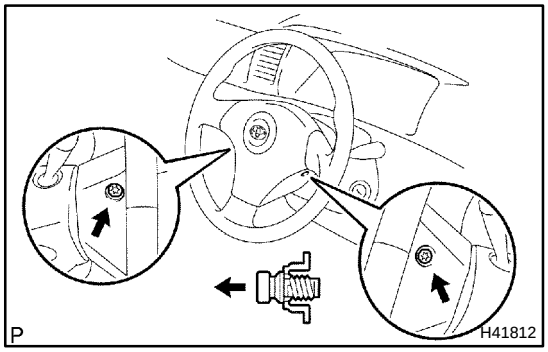


REPLACEMENT

HINT:

COMPONENTS: See page 60-12.

1. **PRECAUTION (See page 60-1)**
2. **SEPARATE BATTERY NEGATIVE TERMINAL (See page 60-1)**
3. **REMOVE STEREO COMPONENT CONTROLLER ASSY**



4. **REMOVE HORN BUTTON ASSY**

NOTICE:

If the airbag connector is disconnected with the ignition switch at ON or ACC, DTCs will be recorded.

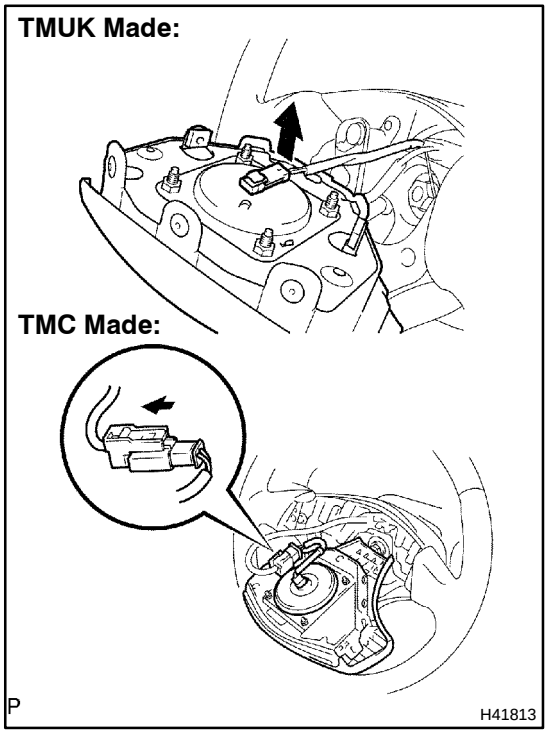
(a) Place the front wheels facing straight ahead.

(b) Using a torx socket wrench (T30), loosen the 2 torx screws until the groove along the screw circumference catches on the screw case.

(c) Pull out the wheel pad from the horn button assy.

(d) TMUK Made:
Using a screwdriver, disconnect the airbag connector and remove the horn button assy.

(e) TMC Made:
Disconnect the airbag connector and remove the horn button assy.



5. **INSTALL HORN BUTTON ASSY**

(a) Connect the airbag connector and horn connector.

(b) Install the horn button after confirming that the circumference groove of the torx screws is caught on the screw case.

(c) Using a torx socket wrench, install the 2 screws.
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

6. **INSPECT HORN BUTTON ASSY (See page 60-8)**

7. **INSPECT SRS WARNING LIGHT (See page 05-942)**

600B1-01

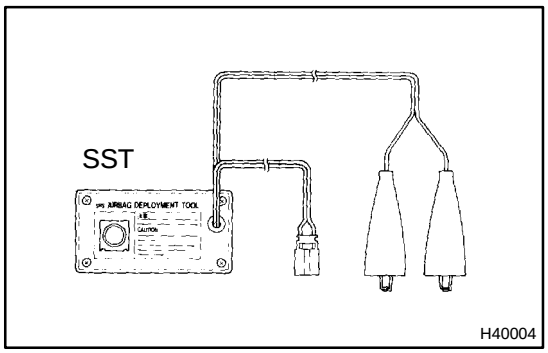
DISPOSAL

HINT:

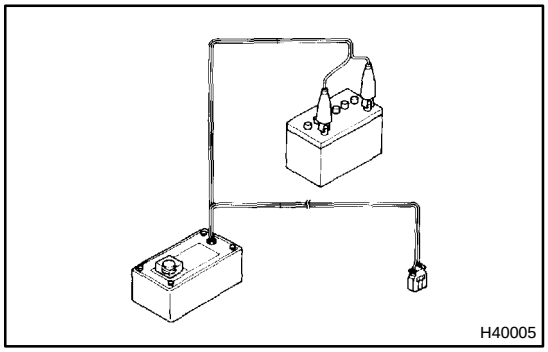
When scrapping vehicle equipped with an SRS or disposing of a horn button assy, always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of the DISTRIBUTOR.

CAUTION:

- **Never dispose of a horn button assy which has an undeployed airbag.**
- **The airbag produces a sizeable exploding sound when it deploys, so perform the operation out-of-doors and where it will not create a nuisance to nearby residents.**



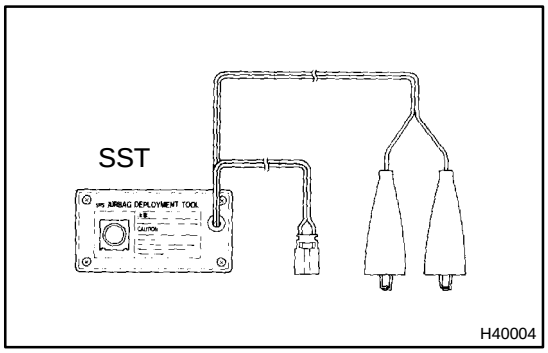
- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool). Perform the operation in a place away from electrical noise.**
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the horn button assy.**
- **The horn button assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a horn button assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a horn button assy with the deployed airbag.**



1. DISPOSE HORN BUTTON ASSY(WHEN SCRAPPING VEHICLE DEPLOYMENT METHOD)

HINT:

Have a battery ready as the power source to deploy the airbag.

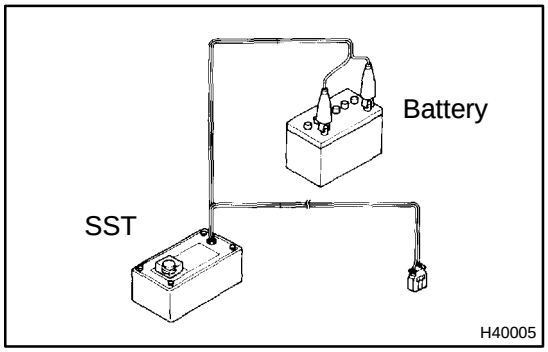


(a) Check functioning of the SST.

CAUTION:

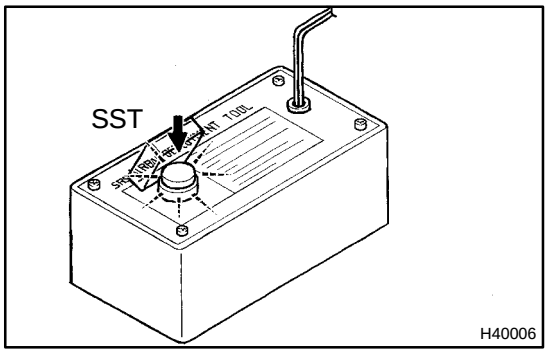
When deploying the airbag, always use the specified SST: SRS Airbag Deployment Tool.

SST 09082-00700



(1) Connect the SST to the battery.
Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

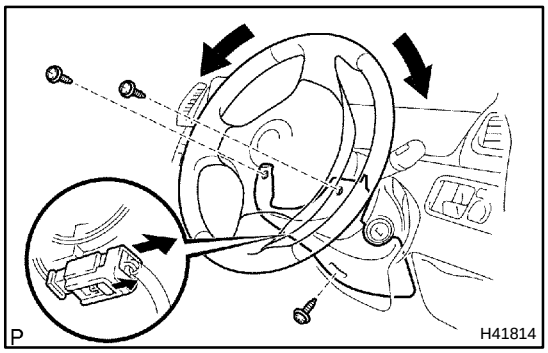
HINT:
Do not connect the yellow connector which will be connected with the supplemental restraint system.



(2) Check functioning of the SST.
Press the SST activation switch, and check that the LED of the SST activation switch lights up.

CAUTION:
If the LED lights up when the activation switch is not being pressed, SST malfunction is probable, so definitely do not use the SST.

(3) Disconnect the SST from the battery.

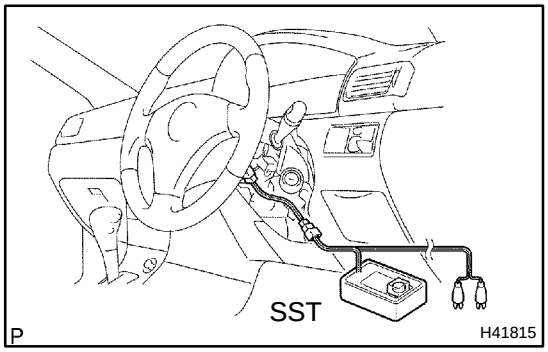


(b) Install the SST.

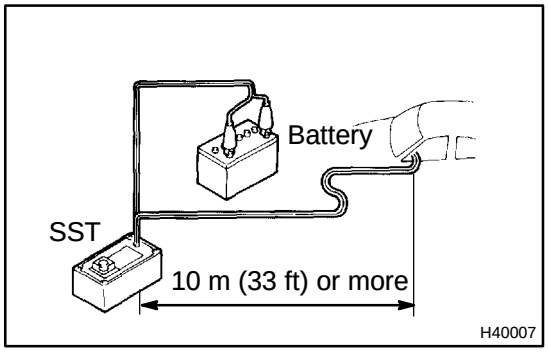
CAUTION:
Check that there is no looseness in the steering wheel and horn button assy.

(1) While turning the steering wheel right / left, remove the 3 screws and steering column lower cover after removing the tilt lever bracket.

(2) Disconnect the airbag connector of the spiral cable.



(3) Connect the connectors of the 2 SST to the airbag connector of the spiral cable back side.
SST 09082-00700, 09082-00760



(4) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(5) Close all the doors and windows of the vehicle.

NOTICE:
Take care not to damage the SST wire harness.

(6) Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the negative (-) terminal.

(c) Deploy the airbag.
(1) Confirm that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.
(2) Press the SST activation switch and deploy the airbag.

HINT:
The airbag deploys simultaneously as the LED of the SST activation switch lights up.

(d) Dispose the horn button assy (with airbag).

CAUTION:
- **The horn button assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **When moving a vehicle for scrapping which has a horn button assy with deployed airbag, use gloves and safety glasses.**
- **Use gloves and safety glasses when handling a horn button assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a horn button assy with the deployed airbag.**

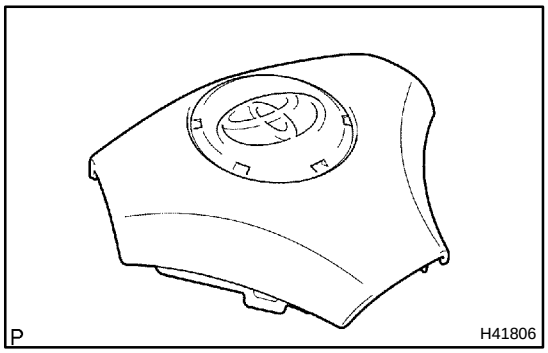
HINT:
When scrapping a vehicle, deploy the airbag and scrap the vehicle with the horn button assy still installed.

2. DISPOSE HORN BUTTON ASSY(WHEN DISPOSING OF AIRBAG ASSEMBLY DEPLOYMENT METHOD)

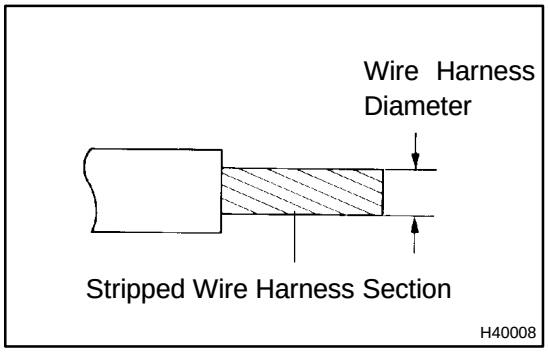
NOTICE:
- **When disposing of the horn button assy (with airbag) only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

HINT:
Have a battery ready as the power source to deploy the airbag.

(a) Remove the horn button assy. (See page 60–13)



CAUTION:
When storing the horn button assy, keep the upper surface of the pad facing upward.



(b) Using a service-purpose wire harness, tie down the horn button assy to the disc wheel.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2. or more)

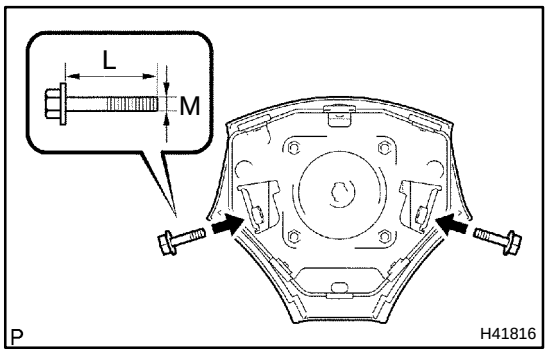
CAUTION:

If a wire harness which is too thin or some other thing is used to tie down the horn button assy, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2.).

HINT:

To calculate the square of the stripped wire harness section:

Square = 3.14 x (Diameter)^2 divided by 4



(1) Install the 2 bolts with washers in the 2 bolt holes in the horn button assy.

Bolt:

L: 35.0 mm (1.387 in.)

M: 6.0 mm (0.236 in.)

Pitch: 1.0 mm (0.039 in.)

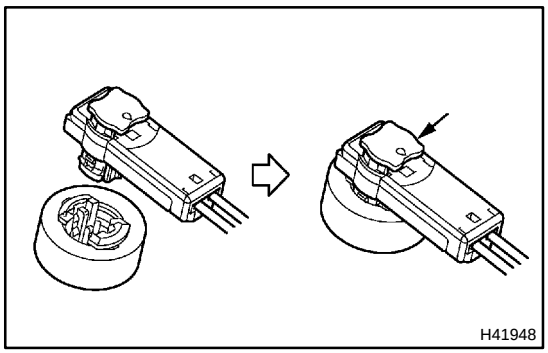
NOTICE:

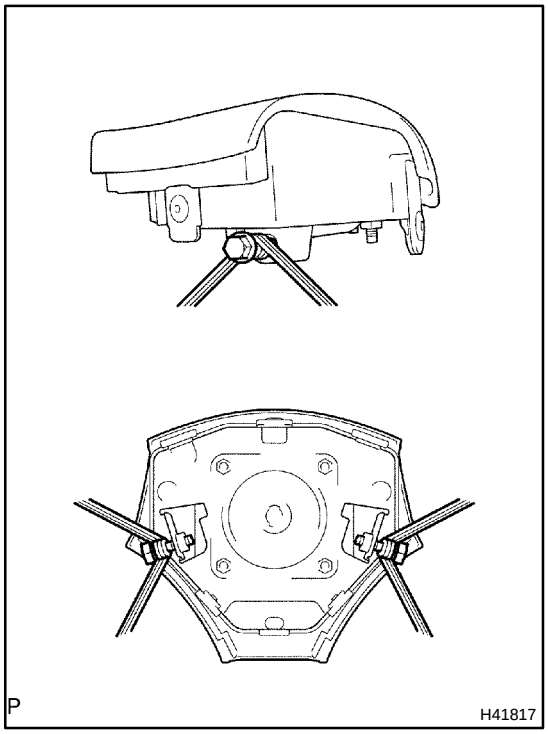
- **Tighten the bolts by hand until the bolts become difficult to turn.**
- **Do not tighten the bolts too much.**

(2) TMUK Made:

Connect the connector of the SST to the horn button assy connector.

SST 09082-00801 (09082-10801, 09082-20801)

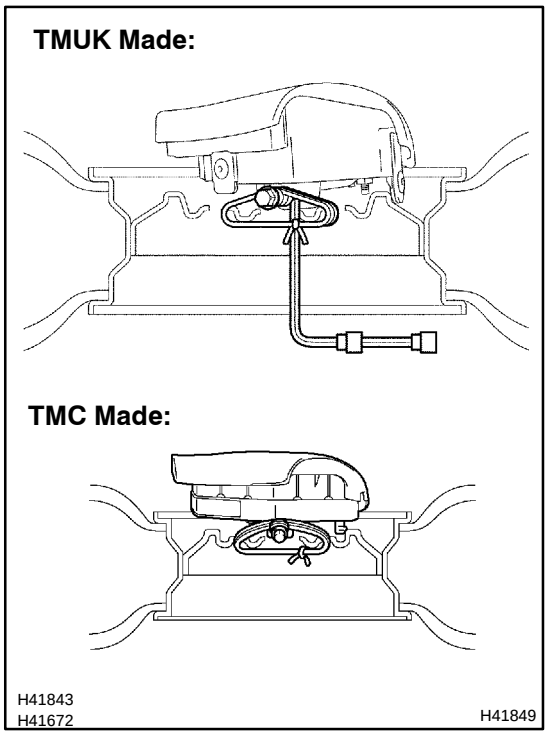




(3) Using 3 wire harness, wind the wire harness at least 2 times each around the bolts installed on the left and right sides of the horn button assy.

CAUTION:

- **Tightly wind the wire harness around the bolts so that there is no slack.**
- **If there is slack in the wire harness, the horn button assy may come loose due to the shock when the air-bag is deployed. This is highly dangerous.**



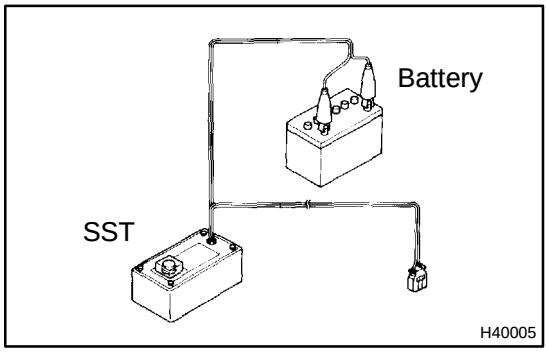
(4) Face the upper surface of the horn button assy upward. Separately tie the left and right sides of the horn button assy to the disc wheel through the hub nut holes. Position the horn button assy connector so that it hangs downward through a hub hole in the disc wheel.

CAUTION:

- **Make sure that the wire harness is tight. It is very dangerous when looseness in the wire harness results in the horn button assy coming free through the shock from the airbag deploying.**
- **Always tie down the horn button assy with the pad side facing upward. It is very dangerous if the horn button assy is tied down with the metal surface facing upward as the wire harness will be cut by the shock from the airbag deploying and the horn button assy will be thrown into the air.**

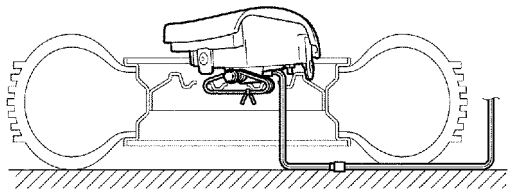
NOTICE:

The disc wheel will be marked by airbag deployment, so when disposing of the airbag, use a redundant disc wheel.

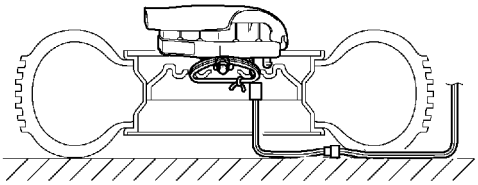


(c) Check functioning of the SST. (See step 1-(a))
SST 09082-00700

TMUK Made:



TMC Made:



(d) Install the SST.

CAUTION:

Place the disc wheel on the level ground.

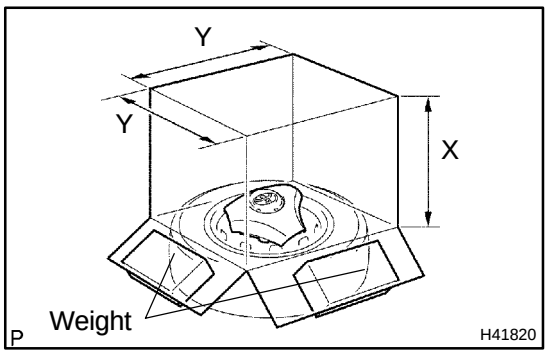
(1) TMUK Made:
Connect the connectors of the SST to the horn button assy connector.
SST 09082-00700

(2) TMC Made:
Connect the connectors of the SST to the horn button assy connector.
SST 09082-00700, 09082-00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock. Also, secure some slack for the SST wire harness inside the disc wheel.

(3) Move the SST to at least 10 m (33 ft) away from the horn button assy tied down on the disc wheel.



(e) Cover the horn button assy with a cardboard box or tires.

S Covering method using a cardboard box:
Cover the horn button assy with the cardboard box and weight the cardboard box down in 4 places with at least 190 N (20 kg, 44 lb).

Size of cardboard box:

Must exceed the following dimensions:

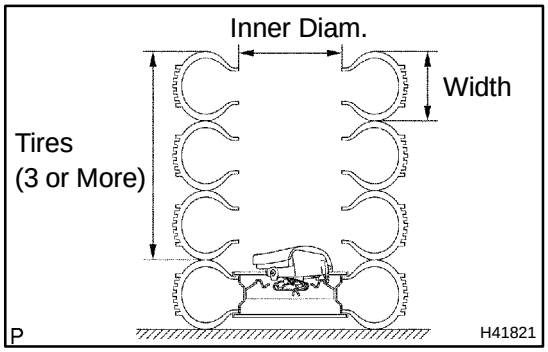
X = 460 mm (18.11 in.)

Y = 650 mm (25.59 in.)

NOTICE:

S **When dimension Y of the cardboard box exceeds the diameter of the disc wheel with tire to which the horn button assy is tied, X should be the following size.**
X = 460 mm (18.11 in.) + width of tire

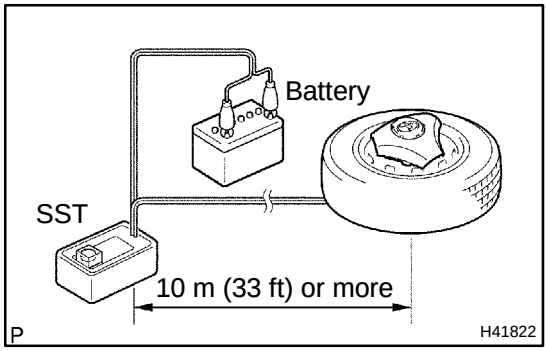
S **If a cardboard box smaller than the specified size is used, the cardboard box will be broken by the shock from the airbag deployment.**



S Covering method using tires:
Place at least 3 tires without disc wheel on top of the disc wheel with tire to which the horn button assy is tied.

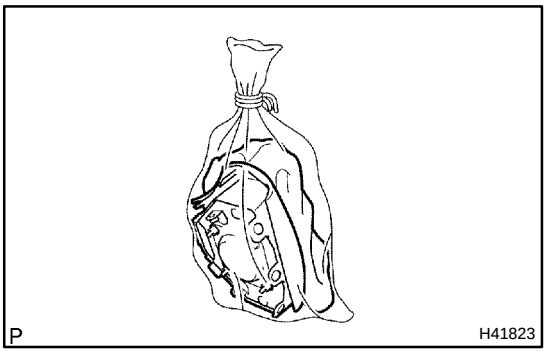
Tire size: Must exceed the following dimensions-
Width: 185 mm (7.28 in.)
Inner diameter: 360 mm (14.17 in.)

CAUTION:
Do not use tires with disc wheels.
NOTICE:
The tires may be marked by the airbag deployment, so use the redundant tires.



(f) Deploy the airbag.
(1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.
(2) Check that no one is within 10 m (33 ft) area around the disc wheel which the horn button assy is tied to.
(3) Press the SST activation switch and deploy the airbag.

HINT:
The airbag deploys simultaneously as the LED of the SST activation switch lights up.



(g) Dispose the horn button assy (with airbag).

CAUTION:
- **The horn button assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a horn button assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a horn button assy with the deployed airbag.**

(1) Remove the horn button assy from the disc wheel.
(2) Place the horn button assy in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

SPIRAL CABLE SUB-ASSY

600B2-01

COMPONENTS

(See page 60-12)

6000X-04

REPLACEMENT

HINT:

COMPONENTS: See page 60-12.

1. PRECAUTION (See page 60-1)

2. SEPARATE BATTERY NEGATIVE TERMINAL (See page 60-1)

3. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

4. REMOVE STEREO COMPONENT CONTROLLER ASSY(W/ STEERING PAD SWITCH)

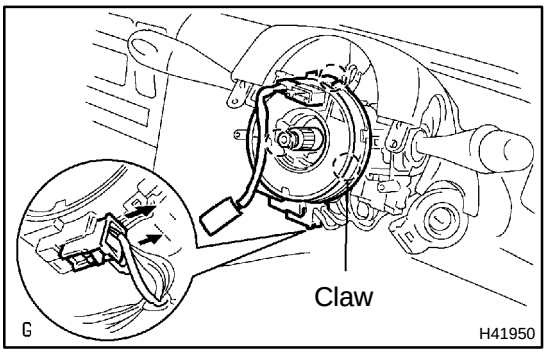
5. REMOVE HORN BUTTON ASSY
(See page 60-13)

6. REMOVE STEERING WHEEL ASSY
(See page 50-7)
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

7. SEPARATE STEERING COLUMN LWR COVER

(a) Remove the 2 screws and tilt lever bracket.

(b) Remove the 3 screws and column lower cover.



8. REMOVE SPIRAL CABLE SUB-ASSY

(a) Slide the column upper cover.

(b) Disconnect the airbag connector and other connector from the spiral cable.

(c) Release the 3 claws and remove the spiral cable.

9. INSPECT CENTER FRONT WHEEL

(a) Check that the front wheels are facing straight ahead.

10. INSTALL SPIRAL CABLE SUB-ASSY

(a) Set the turn signal switch in neutral position.

NOTICE:

Make sure of the neutral position since the pin of the turn signal switch may be snapped.

(b) Engage the 3 claws and install the spiral cable.

NOTICE:

When replacing the spiral cable with a new one, remove the lock pin before installing the handle.

(c) Connect the airbag connector and other connector.

(d) Install the steering column lower cover with the 3 screws.

(e) Install the tilt lever bracket with the 2 screws.

11. INSPECT SPIRAL CABLE SUB-ASSY

(a) If the following condition is identified, replace the spiral cable sub-assy with a new one.
Condition:
Scratches or cracks on the connector
Cracks, dents or chipping of the spiral cable sub-assy

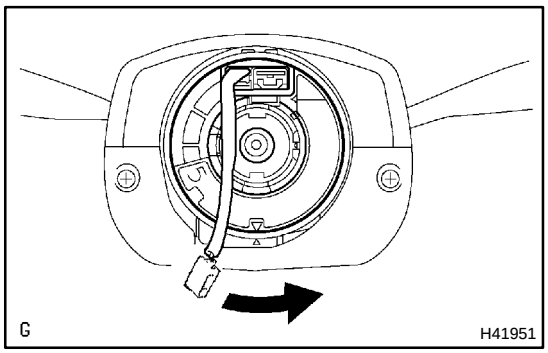
12. INSTALL STEERING COLUMN LWR COVER

13. CENTER SPIRAL CABLE

(a) Check that the ignition switch is OFF.

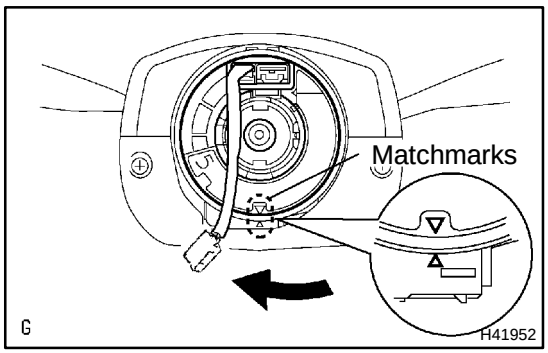
(b) Check that the battery negative terminal is disconnected.

NOTICE:
Do not start the operation for 90 seconds after removing the terminal.



(c) Turn the cable counterclockwise by hand until it becomes harder to turn.

HINT:
The cable will rotate about 2.5 turns to either left or right of the center.



(d) Then rotate the cable clockwise about 2.5 turns to align the marks.

14. INSTALL STEERING WHEEL ASSY
(See page 50-15)

15. INSPECT STEERING WHEEL CENTER POINT

16. INSTALL HORN BUTTON ASSY
(See page 60-13)

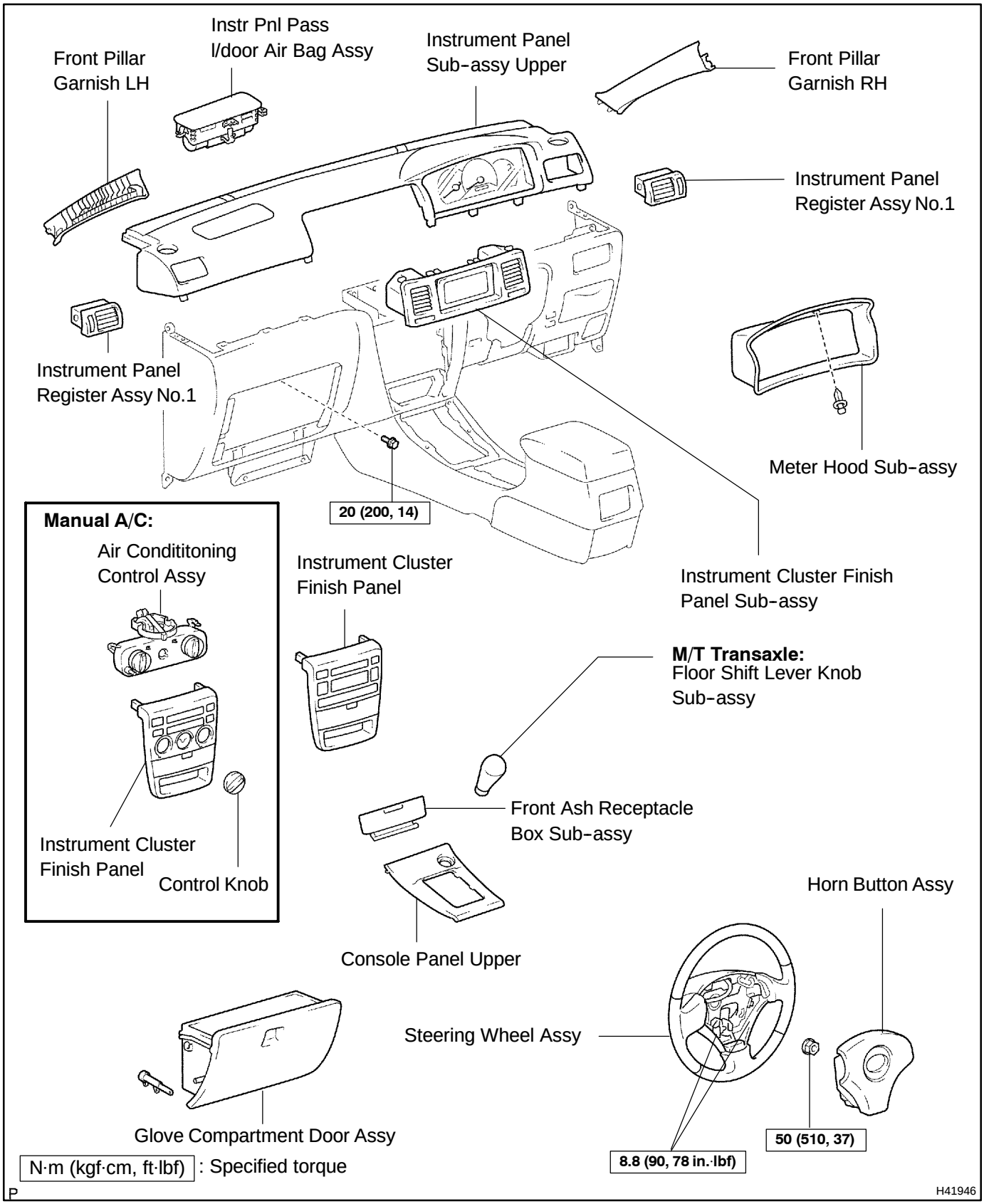
17. INSPECT HORN BUTTON ASSY
(See page 60-8)

18. INSPECT SRS WARNING LIGHT (See page 05-942)

INSTR PNL PASS L/DOOR AIR BAG ASSY

COMPONENTS

600B3-01



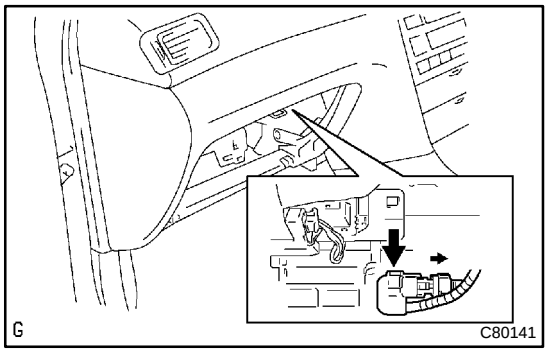
REPLACEMENT

HINT:

COMPONENTS: See page 71-9.

1. **PRECAUTION (See page 60-1)**
2. **SEPARATE BATTERY NEGATIVE TERMINAL (See page 60-1)**
3. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
4. **REMOVE HORN BUTTON ASSY**
5. **REMOVE STEERING WHEEL ASSY (See page 50-8)**

   SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)
6. **REMOVE METER HOOD SUB-ASSY**
7. **REMOVE INSTRUMENT PANEL REGISTER ASSY NO.1 (See page 71-15 or 71-24)**
8. **REMOVE INSTRUMENT PANEL REGISTER ASSY NO.1 (See page 71-15 or 71-24)**
9. **REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY (See page 71-16 or 71-24)**
10. **REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY(M/T TRANSAXLE) (See page 71-16 or 71-25)**
11. **REMOVE CONSOLE PANEL UPPER (See page 71-16 or 71-25)**
12. **REMOVE INSTRUMENT CLUSTER FINISH PANEL (See page 71-16 or 71-25)**
13. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER (See page 71-17 or 71-26)**
14. **REMOVE GLOVE COMPARTMENT DOOR ASSY (See page 71-17 or 71-26)**
15. **REMOVE FRONT PILLAR GARNISH RH (See page 71-18 or 71-27)**
16. **REMOVE FRONT PILLAR GARNISH LH (See page 71-18 or 71-27)**



17. **SEPARATE PASSENGER AIRBAG CONNECTOR**

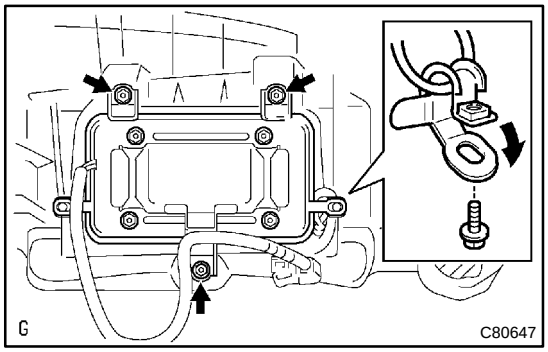
(a) Remove the connector cover from the lower instrument panel.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

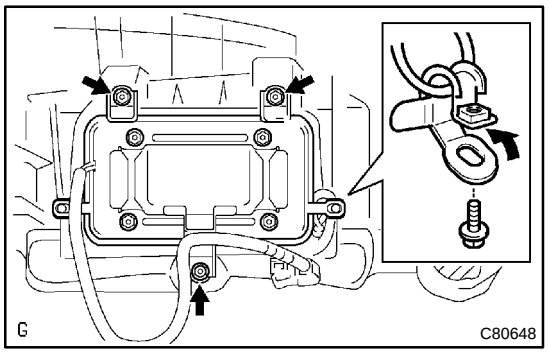
(b) Disconnect the instr pnl l/door air bag assy connector.

18. **REMOVE INSTRUMENT PANEL SUB-ASSY UPPER**



19. REMOVE INSTR PNL PASS L/DOOR AIR BAG ASSY

(a) Remove the 2 bolts and 2 strings from the right and left brackets of the instr pnl l/door air bag assy.
(b) Remove the 3 nuts and instr pnl l/door air bag assy from the instrument panel UPR.



20. INSTALL INSTR PNL PASS L/DOOR AIR BAG ASSY

(a) Install the instr pnl l/door air bag assy with the 3 nuts to the instrument panel UPR.
(b) Install the 2 strings to the right and left brackets of the instr pnl l/door air bag assy.
(c) With the 2 bolts, fix the brackets of the instr pnl l/door air bag assy.

21. INSPECT INSTR PNL PASS L/DOOR AIR BAG ASSY **(See page 60-9)**

22. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER **(See page 71-21 or 71-30)**

23. INSTALL AIR CONDITIONING CONTROL ASSY(MANUAL AIR CONDITIONER) **(See page 71-21 or 71-30)**
24. INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER **(See page 71-14 or 71-31)**
25. CENTER SPIRAL CABLE **(See page 60-23)**
26. INSTALL STEERING WHEEL ASSY **(See page 50-15)**

27. INSPECT STEERING WHEEL CENTER POINT
28. INSTALL HORN BUTTON ASSY **(See page 60-13)**

29. INSPECT HORN BUTTON ASSY **(See page 60-8)**

30. INSPECT SRS WARNING LIGHT **(See page 05-942)**

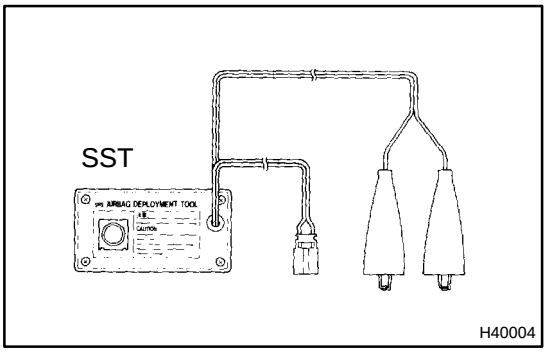
DISPOSAL

HINT:

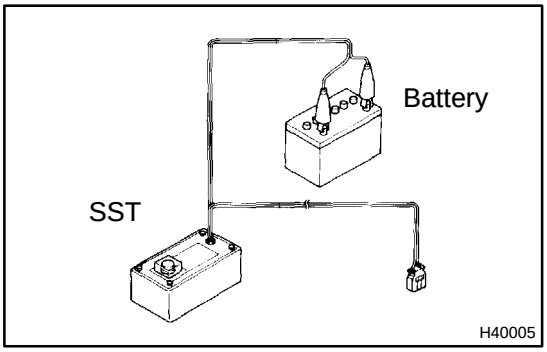
When scrapping vehicle equipped with an SRS or disposing of a instr pnl pass l/door air bag assy, always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of the DISTRIBUTOR.

CAUTION:

- **Never dispose of a instr pnl pass l/door air bag assy which has an undeployed airbag.**
- **The airbag produces a sizeable exploding sound when it deploys, so perform the operation out-of-doors and where it will not create a nuisance to nearby residents.**



- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool). Perform the operation in a place away from electrical noise.**
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the instr pnl pass l/door air bag assy.**
- **The instr pnl pass l/door air bag assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a instr pnl pass l/door air bag assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a instr pnl pass l/door air bag assy with the deployed airbag.**



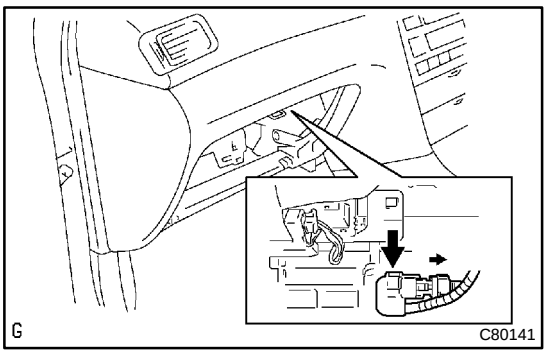
1. DISPOSE INSTR PNL PASS L/DOOR AIR BAG ASSY(WHEN SCRAPPING VEHICLE DEPLOYMENT METHOD)

HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Check functioning of the SST (See step 1-(a) on page 60-14).

SST 09082-00700



(b) Disconnect the airbag connector.

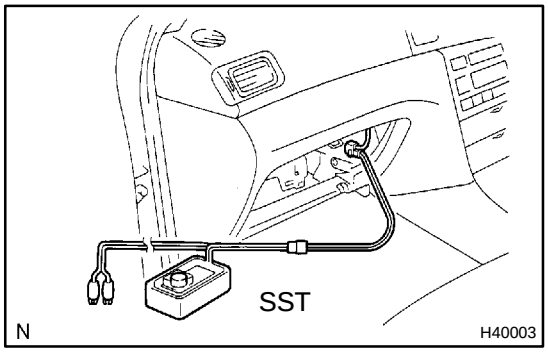
(1) Remove the glove compartment door assy.

(2) Disconnect the connector cover.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

(3) Disconnect the airbag connector.



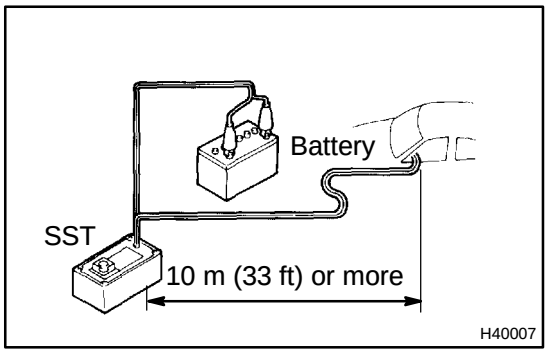
(c) Install the SST.

(1) Connect the connectors of the 2 SST to the instr pnl pass l/door air bag assy connector.

SST 09082-00700, 09082-00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.



(2) Move the SST to at least 10 m (33 ft) away from the front of the vehicle.

(3) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(4) Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the negative (-) terminal.

(d) Deploy the airbag.

(1) Check that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and deploy the airbag.

HINT:

The airbag deploys simultaneously as the LED of the SST activation switch lights up.

(e) Dispose the instr pnl pass l/door air bag assy.

CAUTION:

- **The instr pnl pass l/door air bag assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a instr pnl pass l/door air bag assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a instr pnl pass l/door air bag assy with the deployed airbag.**
- **When moving a vehicle for scrapping which has a instr pnl pass l/door air bag assy with the deployed airbag, use gloves and safety glasses.**

HINT:

When scrapping a vehicle, deploy the airbag and scrap the vehicle with the instr pnl pass l/door air bag assy still installed.

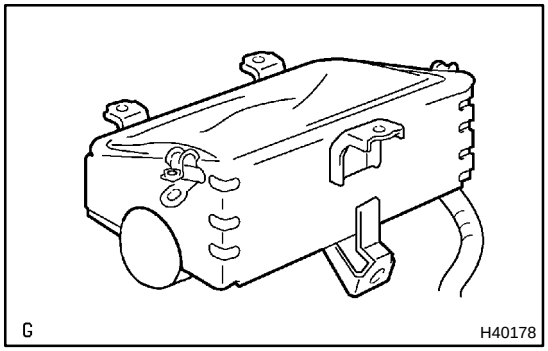
2. DISPOSE INSTR PNL PASS L/DOOR AIR BAG ASSY(WHEN DISPOSING OF AIRBAG ASSEMBLY DEPLOYMENT METHOD)

NOTICE:

- **When disposing of the instr pnl pass l/door air bag assy only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

HINT:

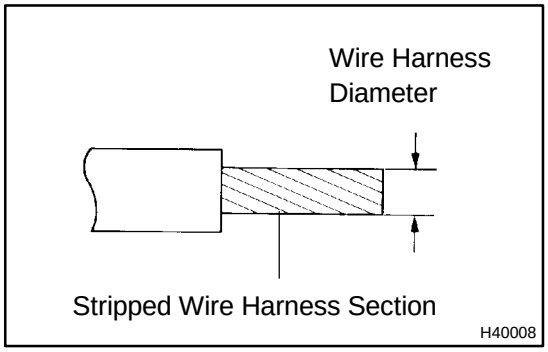
Have a battery ready as the power source to deploy the airbag.



(a) Remove the instr pnl pass l/door air bag assy (See page 60-25).

CAUTION:

- **When removing the instr pnl pass l/door air bag assy, work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.**
- **Store the instr pnl pass l/door air bag assy with the airbag deployment side facing upward.**



(b) Using a service-purpose wire harness for the vehicle, tie down the instr pnl pass l/door air bag assy to the tire.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2. or more)

CAUTION:

If the instr pnl pass l/door air bag assy is tied down with too thin wire harness, it may snap. This is highly dangerous. Always use a wire harness which is at least 1.25 mm^2 (0.0019 in^2.).

HINT:

To calculate the square of the stripped wire harness section:

Square = 3.14 X (Diameter)^2 divided by 4

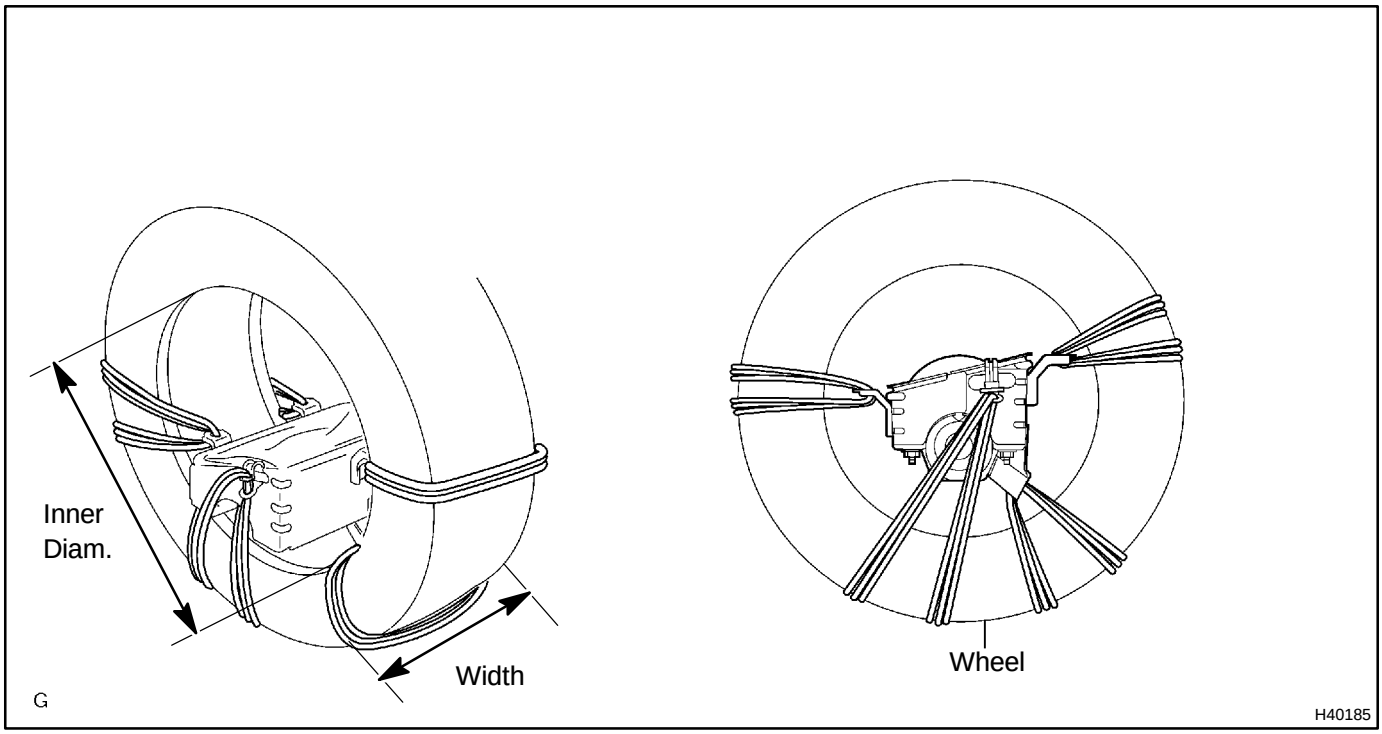
Position the instr pnl pass l/door air bag assy inside the tire with the airbag deployment side facing inside.

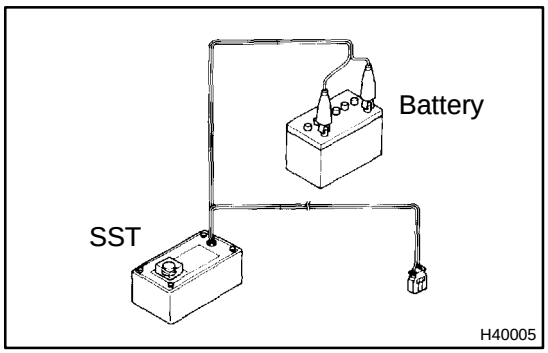
Tire size: Must exceed the following dimensions-
Width: 185 mm (7.28 in.)
Inner diameter: 360 mm (14.17 in.)

CAUTION:

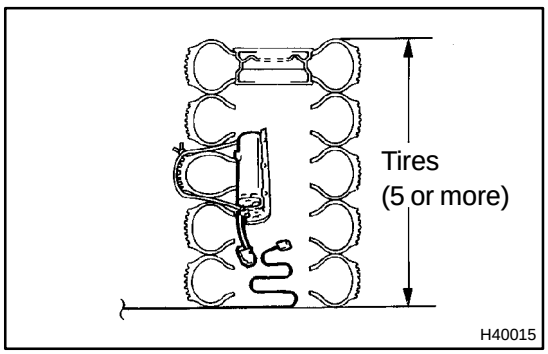
- **Make sure that the wire harness is tight. It is very dangerous if looseness in the wire harness results in the instr pnl pass l/door air bag assy coming free due to the shock from the airbag deploying.**
- **Always tie down the instr pnl pass l/door air bag assy with the airbag deployment side facing inside.**

NOTICE:
The tire will be marked by the airbag deployment, so use a redundant tire.

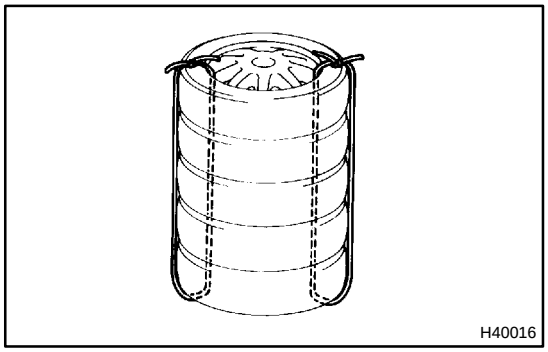




(c) Check functioning of the SST (See step 1-(a) on page 60-14).
SST 09082-00700



(d) Place tires.
(1) Place at least 2 tires under the tire to which the instr pnl pass l/door air bag assy is tied.
(2) Place at least 2 tires over the tire to which the instr pnl pass l/door air bag assy is tied. The top tire should have the wheel installed.


H40016

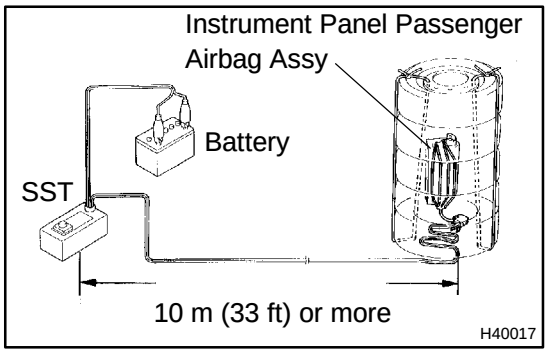
(3) Tie the tires together with 2 wire harness.

CAUTION:

Make sure that the wire harness is tight. It is very dangerous if loose wire harness result in the tires coming free due to the shock from the airbag deploying.

HINT:

Place the SST connector and wire harness inside tires. Secure at least 1 m (3 ft) of slack for the wire harness.



H40017

(e) Install the SST.

Connect the connectors of the 2 SST to the instr pnl pass l/door air bag assy connector.

SST 09082-00700, 09082-00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.

(f) Deploy the airbag.

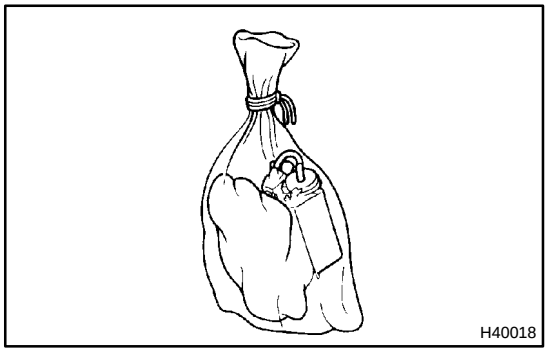
(1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

(2) Check that no one is within 10 m (33 ft) area around the tire which the instr pnl pass l/door air bag assy is tied to.

(3) Press the SST activation switch and deploy the airbag.

HINT:

The airbag deploys simultaneously as the LED of the SST activation switch lights up.


H40018

(g) Dispose the instr pnl pass l/door air bag assy.

CAUTION:

- **The instr pnl pass l/door air bag assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a instr pnl pass l/door air bag assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a instr pnl pass l/door air bag assy with the deployed airbag.**

(1) Remove the instr pnl pass l/door air bag assy from the tire.

(2) Place the instr pnl pass l/door air bag assy in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts.

FRONT SEAT AIRBAG ASSY RH

6008H–02

DISPOSAL

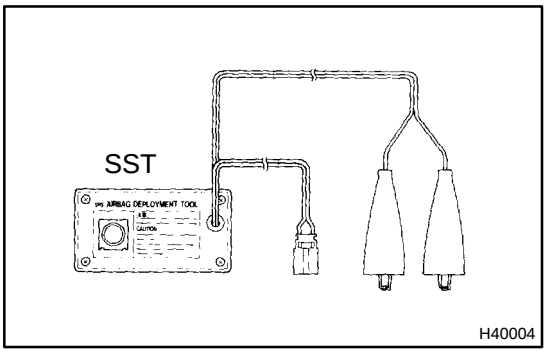
HINT:

When scrapping vehicles equipped with an SRS or disposing of the front seat airbag assy always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of DISTRIBUTOR.

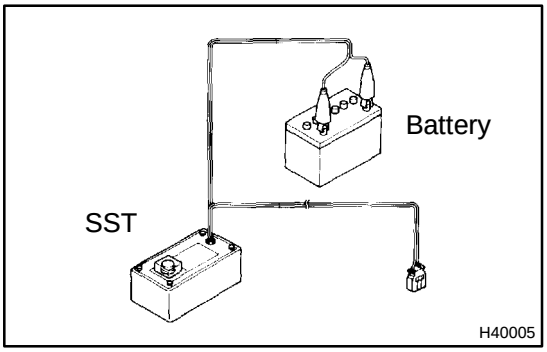
When disposing of a front seat airbag assy with an airbag deployed in a collision, follow the same procedure given in step 1–(e) in "DISPOSAL".

CAUTION:

- **Never dispose of a front seat airbag assy which has an undeployed airbag.**
- **The airbag produces a sizeable exploding sound when it deploys, so perform the operation out of doors and where it will not create a nuisance to nearby residents.**



- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool), perform the operation in a place away from electrical noise.**
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the airbag assy.**
- **The front seat airbag assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling front seat airbag assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front seat airbag assy with the deployed airbag.**

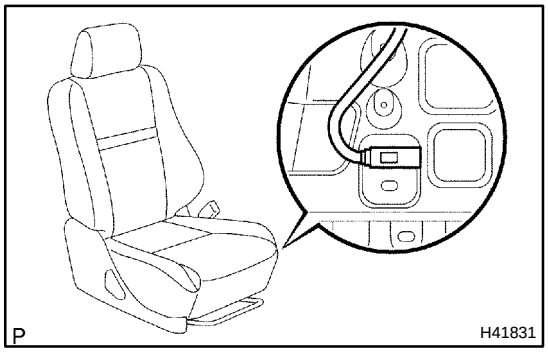


1. DISPOSE FRONT SEAT AIRBAG ASSY RH(WHEN SCRAPPING VEHICLE DEPLOYMENT METHOD)

HINT:

Have a battery ready as the power source to deploy the airbag.

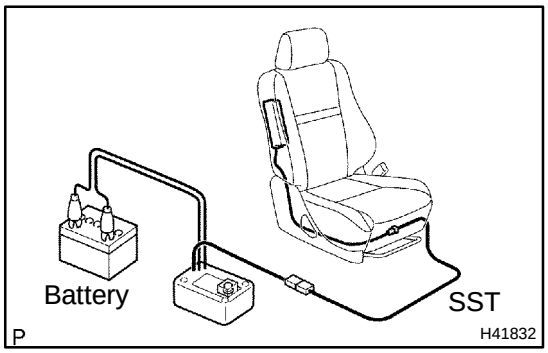
(a) Check functioning of the SST (See page 60–14).



(b) Disconnect the front seat airbag connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



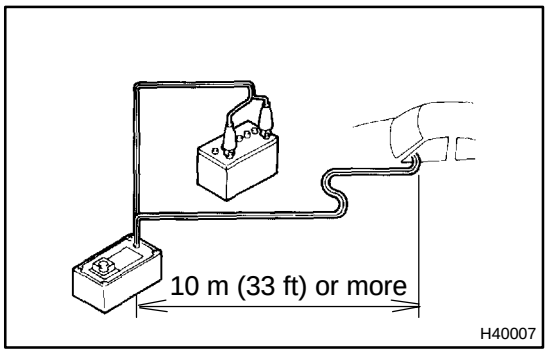
(c) Install the SST.

(1) Connect the 2 SST connector to the airbag connector.

SST 09082-00700, 09082-00750

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.



(2) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(3) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(4) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

(d) Deploy the airbag.

(1) Check that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and deploy the airbag.

HINT:

The airbag deploys simultaneously as the LED of SST activation switch lights up.

(e) Dispose of the front seat airbag assy.

CAUTION:

- **The front seat airbag assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a front seat airbag assy with the deployed airbag.**
- **Do not apply water, etc. to a front seat airbag assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **When scrapping a vehicle, deploy the airbag and scrap the vehicle with the front seat airbag assy still installed.**

2. DISPOSE FRONT SEAT AIRBAG ASSY RH(WHEN DISPOSING OF AIRBAG ASSEMBLY DEPLOYMENT METHOD)

NOTICE:

- **When disposing of the front seat airbag assy only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

HINT:

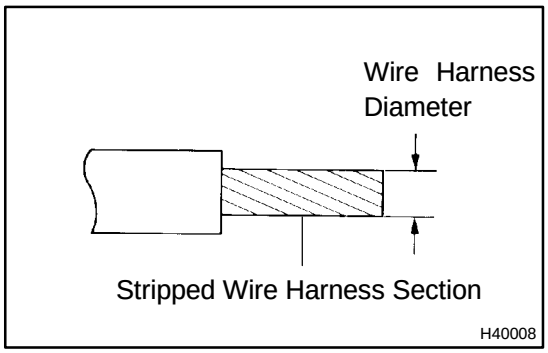
Have a battery ready as the power source to deploy the airbag.

(a) Remove the front seat airbag assy.

(1) Remove the 2 nuts and front seat airbag assy from the seatback assembly.

CAUTION:

Store the front seat airbag assy with the airbag deployment side facing upward.



(b) Using a service–purpose wire harness, tie down the front seat airbag assy.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2. or more)

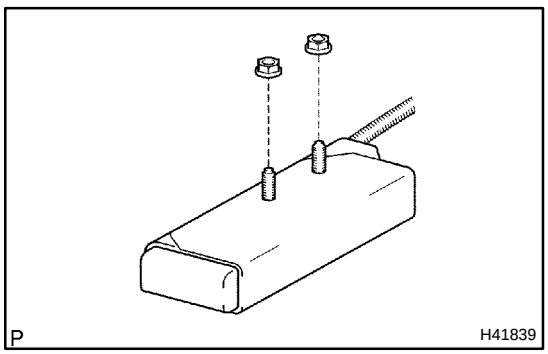
HINT:

To calculate the square of the stripped wire harness section :

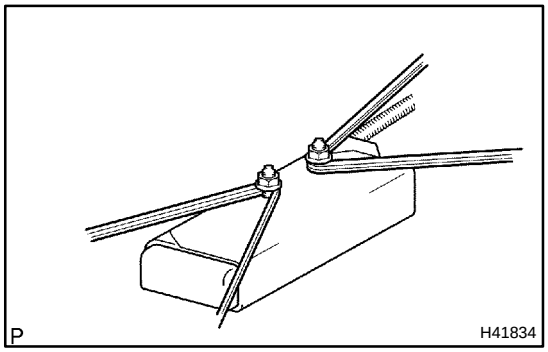
Square = 3.14 x $(Diameter)^2$ divided by 4

CAUTION:

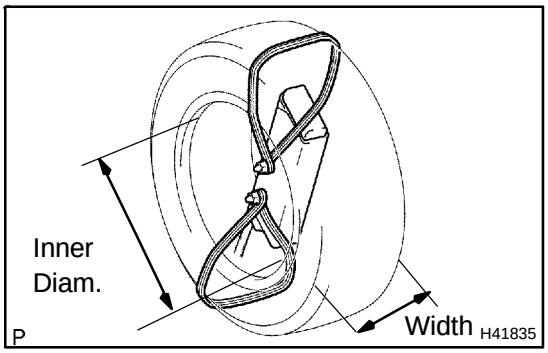
If a wire harness which is too thin or some other thing is used to tie down the front seat airbag assy, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2.).



(1) Install the 2 nuts in the front seat airbag assy.



(2) Wind the wire harness around the stud bolts of the front seat airbag assy as shown in the illustration.



(3) Position the front seat airbag assy inside the tire with the airbag deployment direction facing inside.

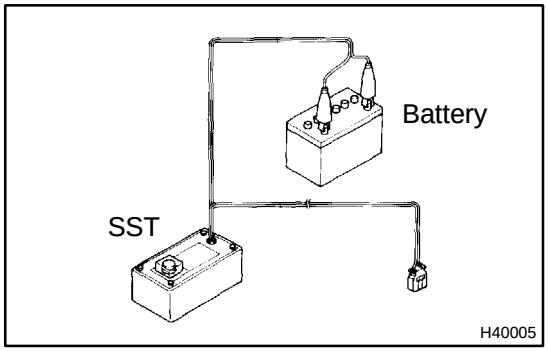
Tire size : Must exceed the following dimensions:-
Width 185 mm (7.28 in.)
Inner diameter 360 mm (14.17 in.)

CAUTION:

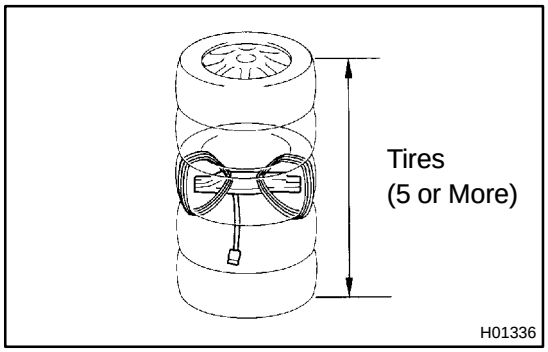
- **Make sure the wire harness is tight. It is very dangerous when a loose wire harness results in the front seat airbag assy coming free due to the shock from the airbag deploying.**
- **Always tie down the front seat airbag assy with the airbag door facing inside.**

NOTICE:

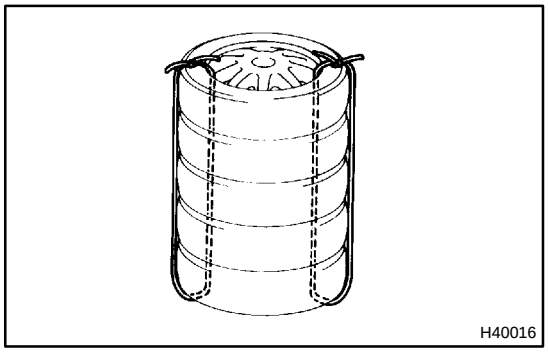
The tire will be marked by the airbag deployment, so use the redundant tire.



(c) Check functioning of the SST.
SST 09082-00700



(d) Place the tires.
(1) Place at least 2 tires under the tire to which the front seat airbag assy is tied.
(2) Place at least 2 tires over the tire to which the front seat airbag assy is tied. The top tire should have the wheel installed.



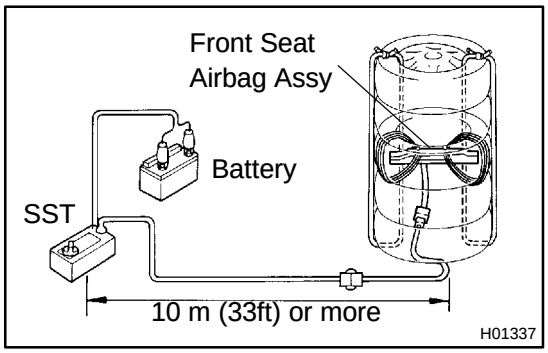
(3) Tie the tires together with 2 wire harnesses.

CAUTION:

Make sure that the wire harnesses are tight. It is very dangerous when loose wire harnesses results in the tires coming free due to the shock from the airbag deploying.

HINT:

Place the SST connector and wire harness inside tires. Secure at least 1 m (3 ft) of slack for the wire harness.



(e) Install the SST.

Connect the connector of 2 SST to the front seat airbag assy connector.

SST 09082-00700, 09082-00750

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.

(f) Deploy the airbag.

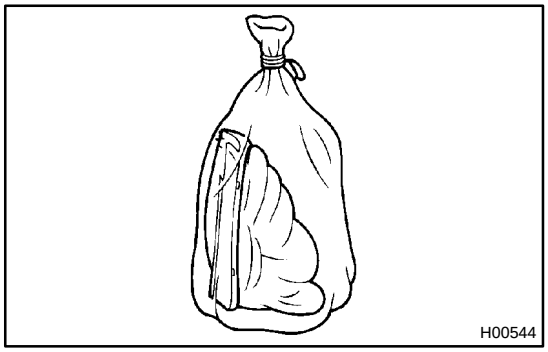
(1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

(2) Check that no one is within 10 m (33 ft) area around the tire which the front seat airbag assy is tied to.

(3) Press the SST activation switch and deploy the airbag.

HINT:

The airbag deploys simultaneously as the LED of the SST activation switch lights up.



(g) Dispose of the front seat airbag assy.

CAUTION:

- **The front seat airbag assy is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a front seat airbag assy with the deployed airbag.**
- **Do not apply water etc. to a front seat airbag assy with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**

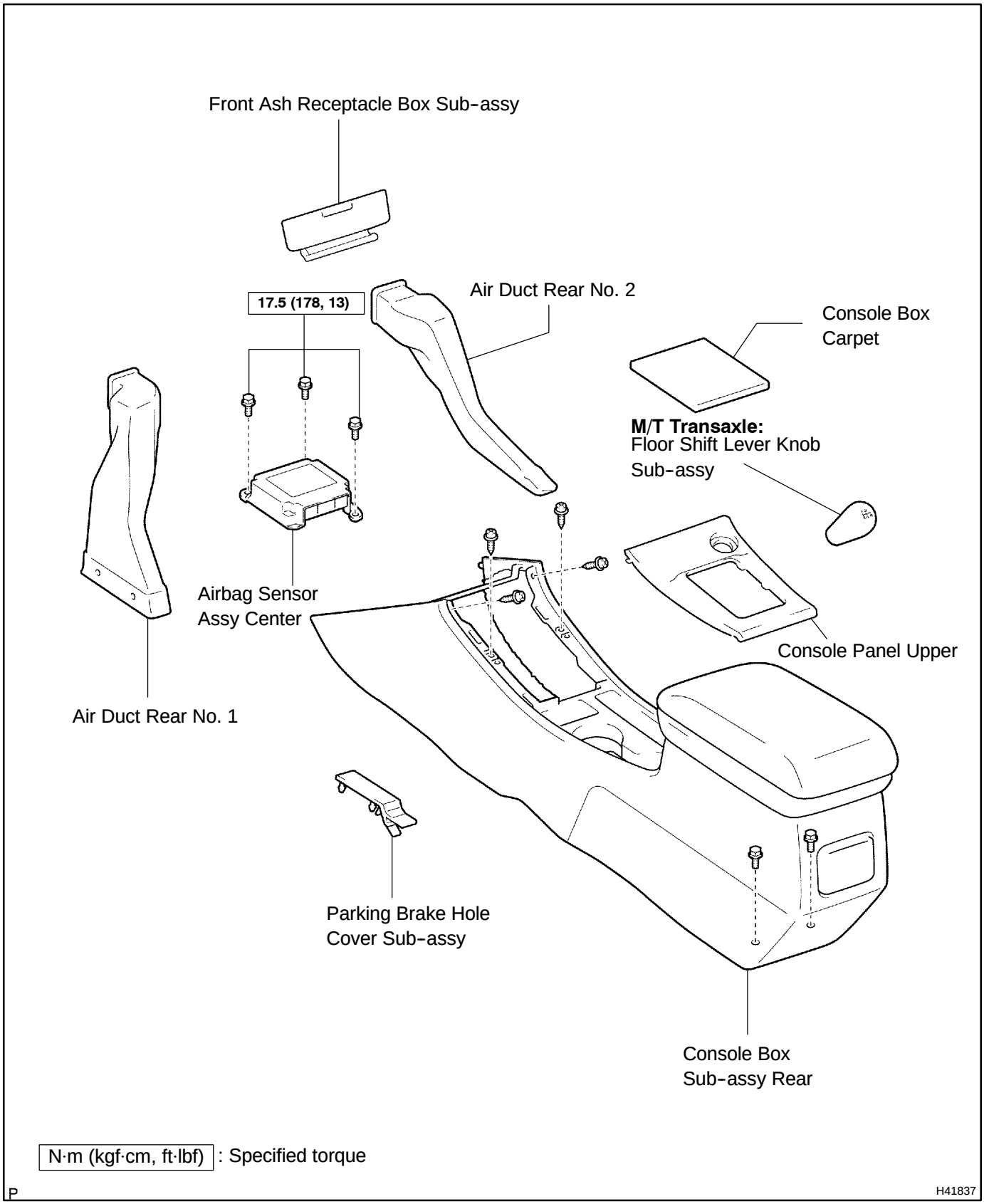
(1) Remove the front seat airbag assy from the tire.

(2) Place the front seat airbag assy in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

AIR BAG SENSOR ASSY CENTER

COMPONENTS

6008I-02



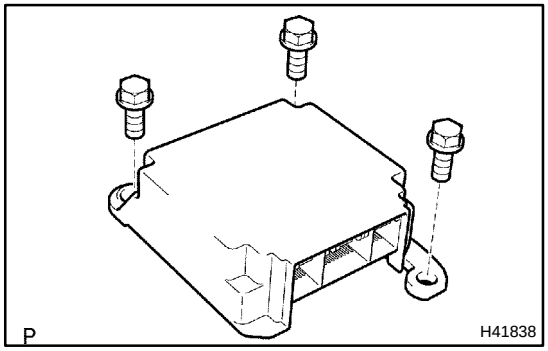
6008J-02

REPLACEMENT

HINT:

COMPONENTS: See page 60-37.

1. **PRECAUTION (See page 60-1)**
2. **DISCONNECT BATTERY NEGATIVE TERMINAL (See page 60-1)**
3. **REMOVE PARKING BRAKE HOLE COVER SUB-ASSY (See page 71-19 or 71-28)**
4. **REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY (See page 71-16 or 71-24)**
5. **REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE) (See page 71-16 or 71-25)**
6. **REMOVE CONSOLE PANEL UPPER (See page 71-16 or 71-25)**
7. **REMOVE CONSOLE BOX CARPET (See page 71-19 or 71-28)**
8. **REMOVE CONSOLE BOX SUB-ASSY REAR (See page 71-19 or 71-28)**
9. **REMOVE AIR DUCT REAR NO.1 (See page 55-45)**
10. **REMOVE AIR DUCT REAR NO.2 (See page 55-45)**



11. **REMOVE AIR BAG SENSOR ASSY CENTER**

(a) Disconnect the 3 connectors from the air bag sensor assy center.
(b) Remove the 3 bolts and air bag sensor assy center.

12. **INSPECT AIR BAG SENSOR ASSY CENTER (See page 60-8)**
13. **INSTALL AIR BAG SENSOR ASSY CENTER**

(a) Check that the ignition switch turn OFF.
(b) Check that the battery negative terminal is disconnected.

NOTICE:

Do not start the operation for 90 seconds after removing the terminal.

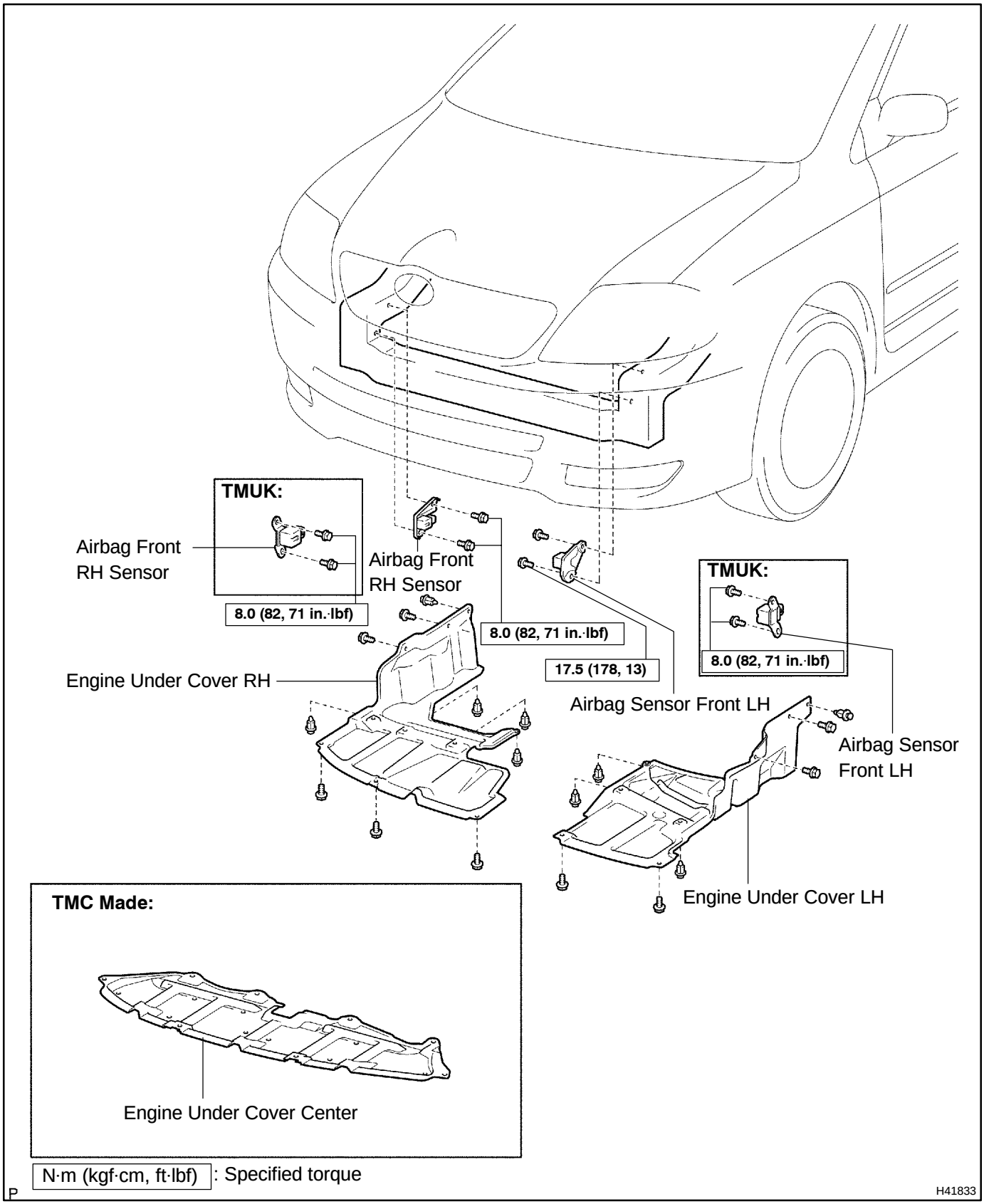
(c) Temporarily install the air bag sensor assy center with the 3 bolts.
(d) Tighten the 3 bolts to the specified torque.
Torque: 17.5 N·m (178 kgf·cm, 13 ft·lbf)
(e) Connect the connector to the air bag sensor assy center.
(f) Check that no play is identified.
(g) Check that the water-proof sheet is properly set.

14. **INSPECT SRS WARNING LIGHT (See page 05-942)**

AIR BAG FRONT RH SENSOR

COMPONENTS

6008K-02



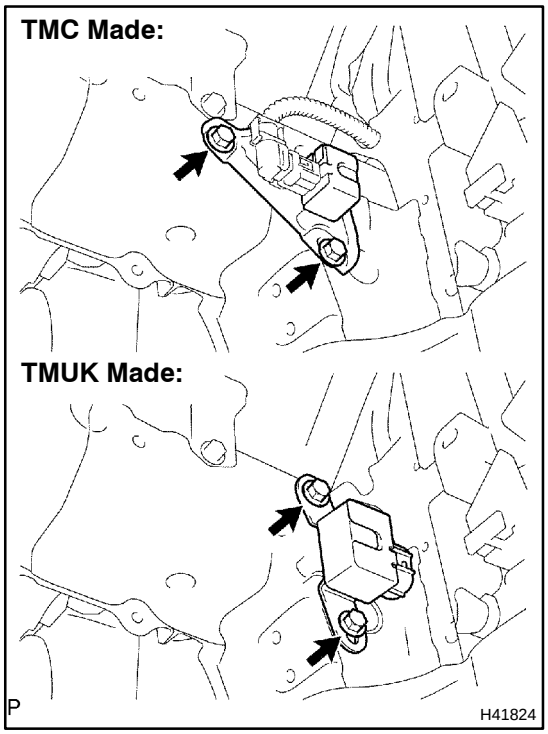
600B6-01

REPLACEMENT

HINT:

COMPONENTS: See page 60-39.

1. **PRECAUTION (See page 60-1)**
2. **DISCONNECT BATTERY NEGATIVE TERMINAL (See page 60-1)**
3. **REMOVE ENGINE UNDER COVER RH**



4. **REMOVE AIR BAG FRONT RH SENSOR**

(a) Disconnect the connector from the air bag front RH sensor.
(b) Remove the 2 bolts and air bag front RH sensor.

5. **INSPECT AIR BAG FRONT RH SENSOR (See page 60-8)**
6. **INSTALL AIR BAG FRONT RH SENSOR**

(a) Check that the ignition switch is OFF.
(b) Check that the battery negative terminal is disconnected.

NOTICE:

Do not start the operation for 90 seconds after removing the terminal.

(c) Install the air bag front RH sensor with the 2 bolts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
(d) Connect the connector to the air bag front RH sensor.
(e) Check that no play is identified.

7. **INSPECT SRS WARNING LIGHT (See page 05-942)**

AIR BAG SENSOR FRONT LH

6008M-02

COMPONENTS

(See page 60-39)

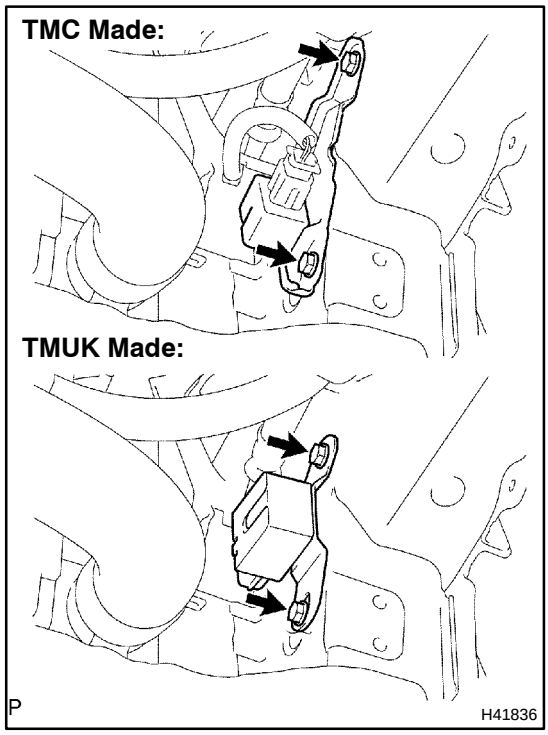
600B7-01

REPLACEMENT

HINT:

COMPONENTS: See page 60-39.

1. **PRECAUTION (See page 60-1)**
2. **DISCONNECT BATTERY NEGATIVE TERMINAL (See page 60-1)**
3. **REMOVE ENGINE UNDER COVER LH**



4. **REMOVE AIR BAG SENSOR FRONT LH**

(a) Remove the 2 bolts and air bag sensor front LH.
(b) Disconnect the connector from the air bag sensor front LH.

5. **INSPECT AIR BAG SENSOR FRONT LH (See page 60-8)**
6. **INSTALL AIR BAG SENSOR FRONT LH**

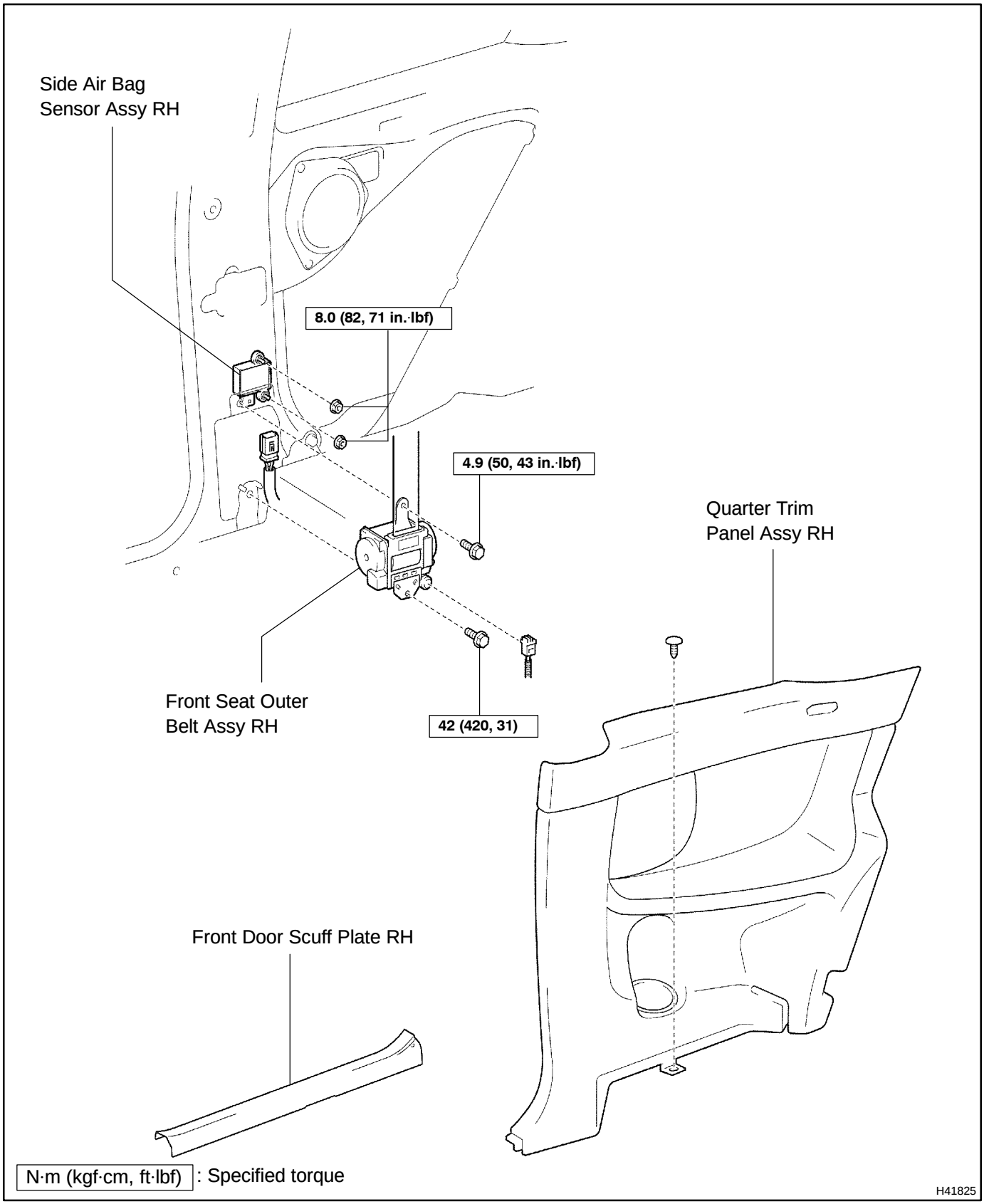
(a) Check that the ignition switch is OFF.
(b) Install the air bag sensor front LH with the 2 bolts.
Torque: 17.5 N·m (178 kgf·cm, 13 ft·lbf)
(c) Connect the connector to the air bag sensor front LH.
(d) Check that no play is identified.

7. **INSPECT SRS WARNING LIGHT (See page 05-942)**

SIDE AIR BAG SENSOR ASSY RH (3-DOOR HATCHBACK)

600B8-01

COMPONENTS



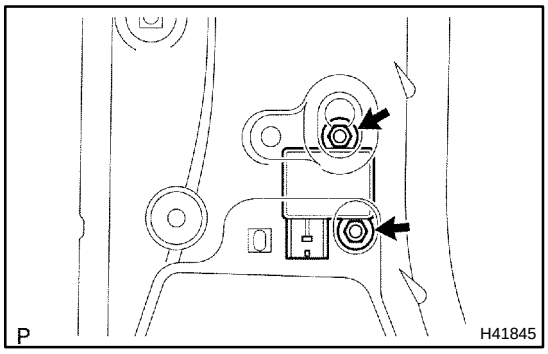
600B9-01

REPLACEMENT

HINT:

COMPONENTS: See page 60-43.

1. **PRECAUTION (See page 60-1)**
2. **DISCONNECT BATTERY NEGATIVE TERMINAL (See page 60-1)**
3. **REMOVE FRONT DOOR SCUFF PLATE RH (See page 71-19 or 71-28)**
4. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH (See page 71-14 or 71-23)**
5. **REMOVE REAR SEAT BACK ASSY RH (See page 72-12)**
6. **REMOVE QUARTER TRIM PANEL ASSY FRONT RH (See page 71-14 or 71-23)**
7. **REMOVE FRONT SEAT OUTER BELT ASSY RH (See page 61-2)**



8. **REMOVE SIDE AIR BAG SENSOR ASSY RH**

(a) Disconnect the connector from the side airbag sensor assy RH.

(b) Remove the 2 nuts and side airbag sensor assy RH.

9. **INSPECT SIDE AIR BAG SENSOR ASSY RH (See page 60-8)**
10. **INSTALL SIDE AIR BAG SENSOR ASSY RH**

(a) Install the side airbag sensor assy RH with the 2 nuts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Connect the side airbag sensor assy RH connector.

NOTICE:

- **Installation of the connector is done with the sensor assy installed. Make sure the sensor assy is installed with the specified torque.**
- **If the sensor assy has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assy with a new one.**
- **When installing the sensor assy, take care that the SRS wiring does not interfere with other parts and is not pinched between other parts.**
- **After installation, shake the sensor assy to check that there is no looseness.**

11. **INSTALL FRONT SEAT OUTER BELT ASSY RH**

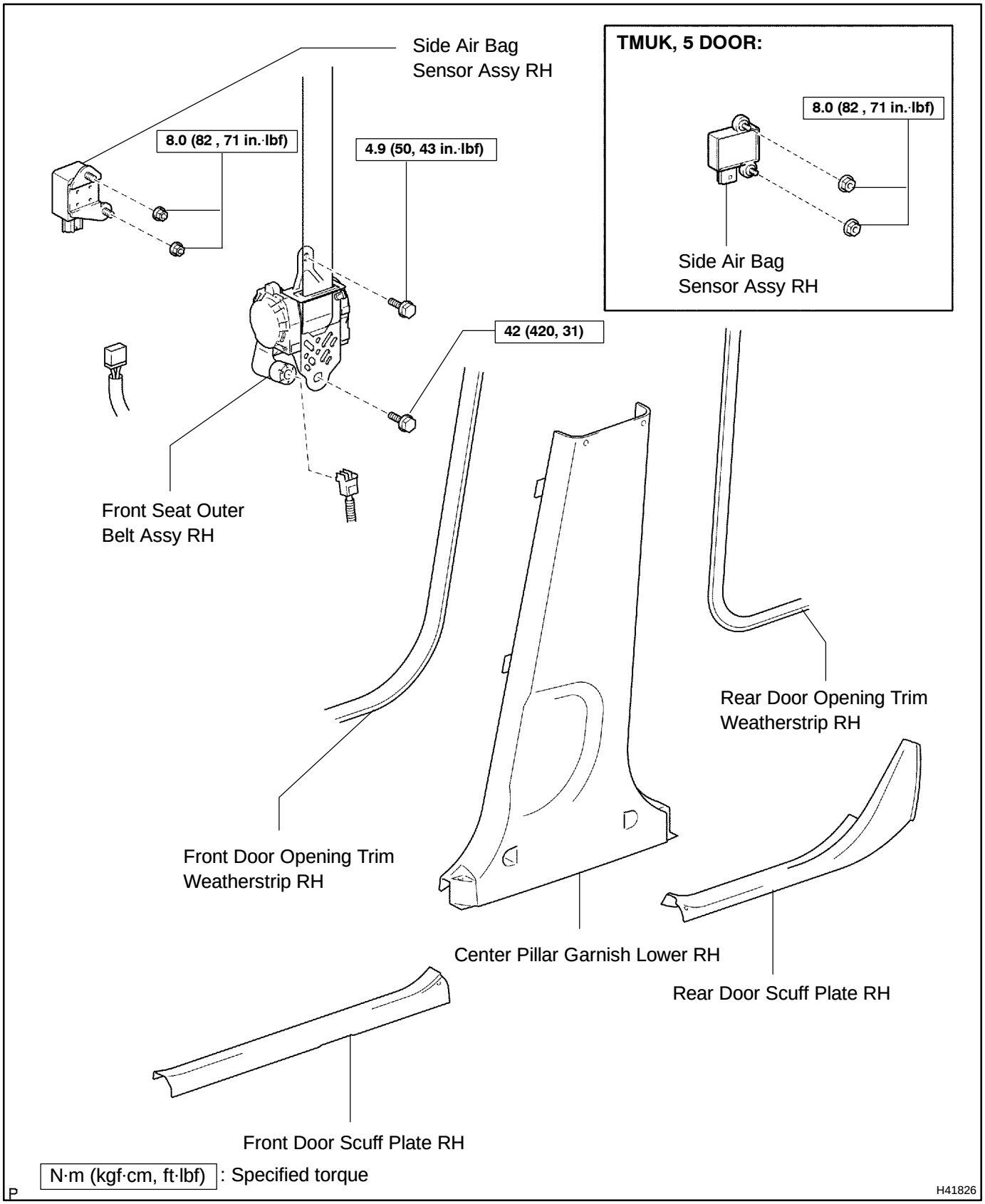
Torque:
Upper bolt: 4.9 N·m (50 kgf·cm, 43 in.·lbf)
Lower bolt: 42 N·m (420 kgf·cm, 31 ft·lbf)

12. **INSPECT SRS WARNING LIGHT (See page 05-942)**

SIDE AIR BAG SENSOR ASSY RH (EXCEPT 3-DOOR HATCHBACK)

COMPONENTS

6008O-02



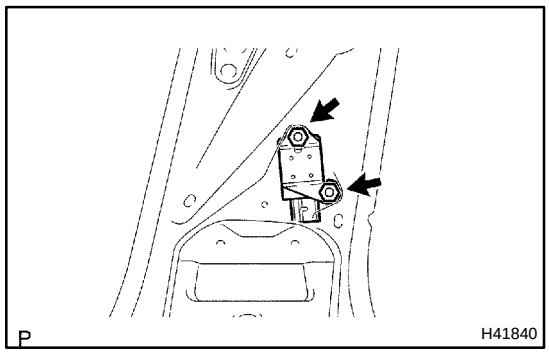
6008P-02

REPLACEMENT

HINT:

COMPONENTS: See page 60-43.

1. **PRECAUTION (See page 60-1)**
2. **DISCONNECT BATTERY NEGATIVE TERMINAL (See page 60-1)**
3. **REMOVE FRONT DOOR SCUFF PLATE RH (See page 71-19)**
4. **REMOVE REAR DOOR SCUFF PLATE RH (See page 71-19)**
5. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH (See page 71-14)**
6. **REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH (See page 71-14)**
7. **REMOVE CENTER PILLAR GARNISH LOWER RH (See page 76-34, 76-41)**
8. **REMOVE FRONT SEAT OUTER BELT ASSY RH (See page 76-33)**



9. **REMOVE SIDE AIR BAG SENSOR ASSY RH**

(a) Disconnect the connector from the side air bag sensor assy RH.

(b) Remove the 2 nuts and side air bag sensor assy RH.

10. **INSPECT SIDE AIR BAG SENSOR ASSY RH (See page 05-942)**
11. **INSTALL SIDE AIR BAG SENSOR ASSY RH**

(a) Install the side airbag sensor assy RH with the 2 nuts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Connect the side airbag sensor assy RH connector.

NOTICE:

- **Installation of the connector is done with the sensor assy installed. Make sure the sensor assy is installed with the specified torque.**
- **If the sensor assy has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assy with a new one.**
- **When installing the sensor assy, take care that the SRS wiring does not interfere with other parts and is not pinched between other parts.**
- **After installation, shake the sensor assy to check that there is no looseness.**

12. INSTALL FRONT SEAT OUTER BELT ASSY RH

Torque:
Upper bolt: 4.9 N·m (50 kgf·cm, 43 in.·lbf)
Lower bolt: 42 N·m (420 kgf·cm, 31 ft·lbf)

13. INSPECT SRS WARNING LIGHT **(See page 05-942)**

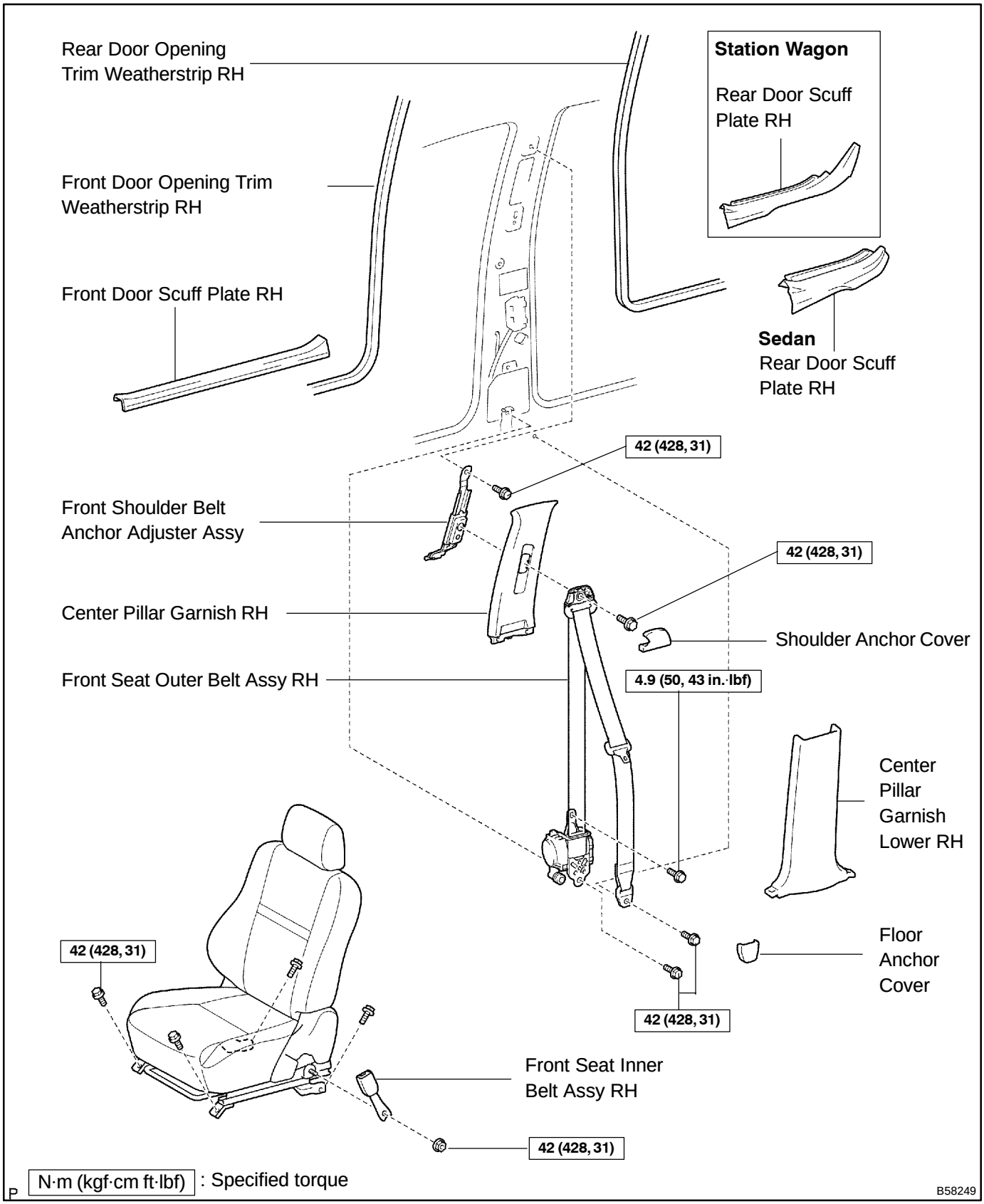
SEAT BELT

FRONT SEAT BELT
(SEDAN/STATION WAGON) 61-1
COMPONENTS 61-1
REPLACEMENT 61-2/3
DISPOSAL 61-4/6
FRONT SEAT BELT (HATCHBACK) 61-7
COMPONENTS 61-7/8
REPLACEMENT 61-9/11
DISPOSAL 61-12/15
REAR SEAT BELT (SEDAN) 61-16
COMPONENTS 61-16
REPLACEMENT 61-17/20
REAR SEAT BELT (STATION WAGON) 61-21
COMPONENTS 61-21
REPLACEMENT 61-22/25
REAR SEAT BELT (HATCHBACK) 61-26
COMPONENTS 61-26/27
REPLACEMENT 61-28/31

FRONT SEAT BELT (SEDAN/STATION WAGON)

COMPONENTS

6106P-01



REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But, the installation is indicated only when it has a point.
- In the LH side, work in the same procedure as in the RH side.

1. SEPARATE BATTERY NEGATIVE TERMINAL

2. REMOVE FRONT SEAT ASSEMBLY RH **(See page 72-2)**

3. REMOVE FRONT SEAT INNER BELT ASSY RH

(a) Remove the nut and front seat inner belt.

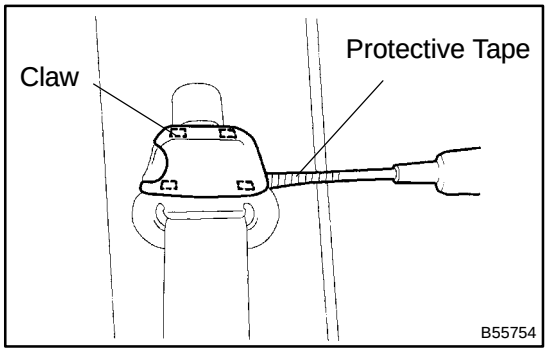
4. REMOVE FRONT DOOR SCUFF PLATE RH
(See page 76-33 or 76-40)

5. REMOVE REAR DOOR SCUFF PLATE RH
(See page 76-33 or 76-40)

6. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH

7. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH

8. REMOVE CENTER PILLAR GARNISH LOWER RH
(See page 76-34 or 76-41)

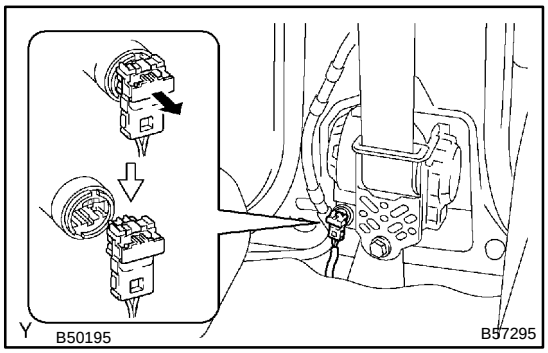


9. REMOVE FRONT SEAT OUTER BELT ASSY RH

(a) Remove the floor anchor cover.
(b) Remove the bolt and disconnect the front seat outer belt assembly RH (floor anchor side).
(c) Using a screwdriver, and remove the seat belt anchor cover.

HINT:
Tape the screwdriver tip before use.

(d) Remove the bolt and the front seat outer belt (shoulder anchor side).



NOTICE:

- **Removal operation of the seat belt with pretensioner must be started in 90 seconds or more after the ignition switch is turned OFF and the battery negative terminal is disconnected.**
- **Carefully read the notices for the "pretensioner" in the SRS airbag system and the front seat outer belt assembly.**

(e) Disconnect the connector and remove the 2 bolts.

10. REMOVE CENTER PILLAR GARNISH RH

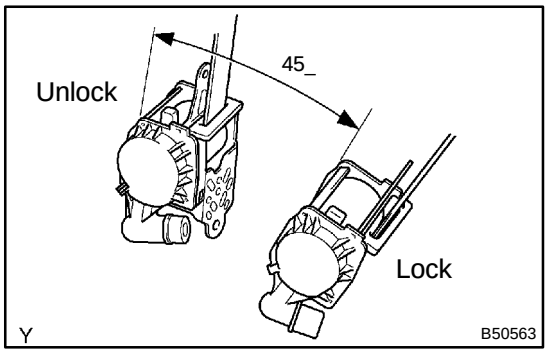
(See page 76-34 or 76-41)

11. REMOVE FRONT SHOULDER BELT ANCHOR ADJUSTER ASSY

(a) Remove the 2 bolts and the front shoulder belt anchor adjuster assembly.

12. INSTALL FRONT SHOULDER BELT ANCHOR ADJUSTER ASSY

(a) Install the front shoulder belt anchor adjuster assembly with the 2 bolts.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)



13. INSTALL FRONT SEAT OUTER BELT ASSY RH

NOTICE:
Do not disassemble the retractor.

(a) Check the degree of tilt when beginning to lock the ELR.
(1) Check the belt will not lock within 15 degrees of tilt in all the direction but the belt will lock over 45 degrees of tilt when moving the installed retractor gently.

If the operation is not as specified, replace the front seat outer belt assembly.

(b) Install the retractor with the 2 bolts.
Torque:
4.9 N·m (50 kgf·cm, 43 in.·lbf) (Upper part of retractor)
42 N·m (428 kgf·cm, 31 ft·lbf) (Lower part of retractor)

(c) Install the shoulder anchor with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(d) Install the seat belt anchor cover.

(e) Install the floor anchor with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(f) Install the floor anchor cover.

(g) Check the ELR lock.

NOTICE:
Check should be done with the assembly installed.
(1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

If the operation is not as specified, replace the front seat outer belt assembly.

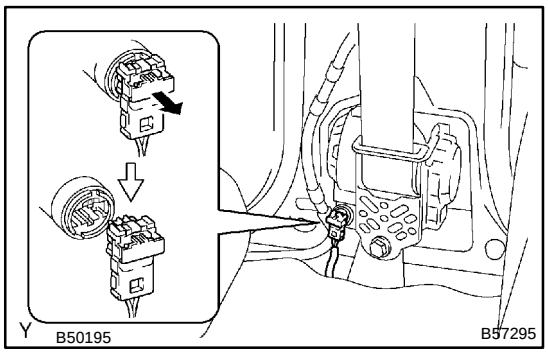
14. INSTALL FRONT SEAT INNER BELT ASSY RH

(a) Install the front seat inner belt assembly RH with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

DISPOSAL

1. DISPOSE FRONT SEAT OUTER BELT ASSY RH(WHEN SCRAPPING VEHICLE DEPLOYMENT METHOD)

(a) Disconnect the battery negative terminal.
(b) Check the SRS airbag system (See page 60-1).
(c) Remove the front door scuff plate RH (See page 76-33 or 76-40).
(d) Remove the rear door scuff plate RH (See page 76-33 or 76-40).
(e) Remove the front door opening trim weatherstrip RH.
(f) Remove the rear door opening trim weatherstrip RH.
(g) Remove center pillar garnish lower (See page 76-34 or 76-41).



(h) Dispose of the pretensioner.
(1) Using a screwdriver, pull the locking button of the pretensioner connector to your side to release the lock.

HINT:
Tape the screwdriver tip before use.

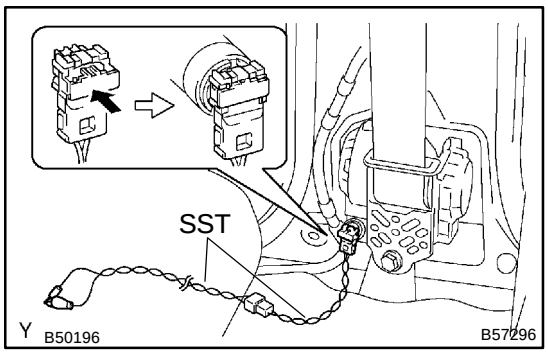
(2) Separate the pretensioner connector.

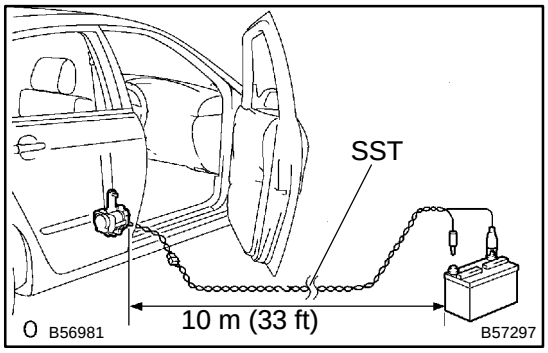
NOTICE:
- **Check that the outer belt is securely installed.**
- **Check that the seat belt is not loose.**

(3) Short the clip and terminal of the SST.
(4) Connect the SST with the pretensioner.
SST 09082-00700, 09082-00770

NOTICE:
Close all the doors and windows.

HINT:
When connecting the SST with the pretensioner, the locking button of the pretensioner connector should be in the locking condition.



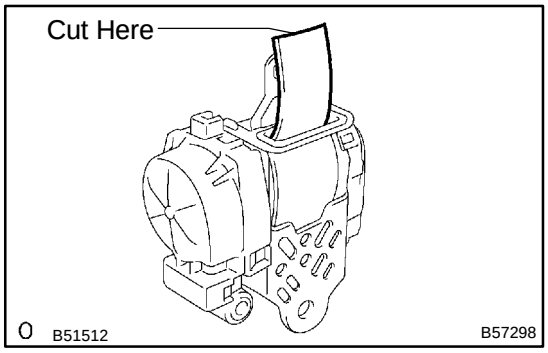


(5) Fully stretch the SST and put a battery at least 10 m 33 ft) or more apart from the vehicle.
(6) Check the safety inside and outside the vehicle, and then connect the clip of SST with the battery negative.
(7) Connecting the terminal of SST with the battery positive, activate the pretensioner.

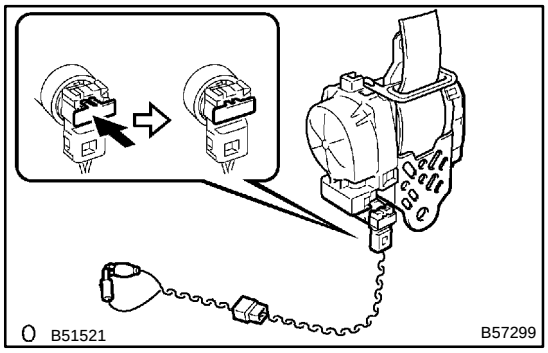
CAUTION:
- **Be sure that no one is present inside the vehicle and also near the vehicle before it is activated.**
- **Be sure to warn the people around the working place loudly before it is activated.**

2. DISPOSE FRONT SEAT OUTER BELT ASSY RH(WHEN DISPOSING OF FRONT SEAT BELT DEPLOYMENT METHOD)

(a) Disconnect the battery negative terminal.
(b) Check the SRS airbag system (See page 60-1).
(c) Remove the front door scuff plate RH (See page 76-33 or 76-40).
(d) Remove the rear door scuff plate RH (See page 76-33 or 76-40).
(e) Remove the front door opening trim weatherstrip RH.
(f) Remove the rear door opening trim weatherstrip RH.
(g) Remove the center pillar garnish lower (See page 76-34 or 76-41).
(h) Remove the front seat outer belt assembly RH (See page 61-2).

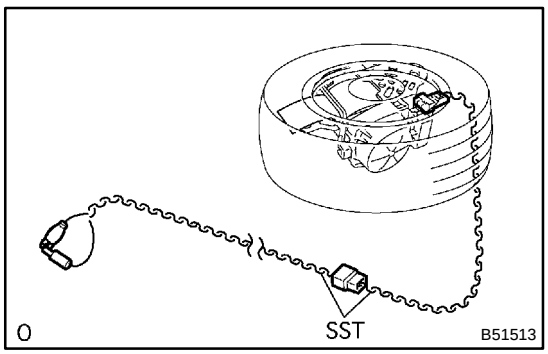


(i) Activate the pretensioner
(1) Cut the seat belt in the illustrated position.

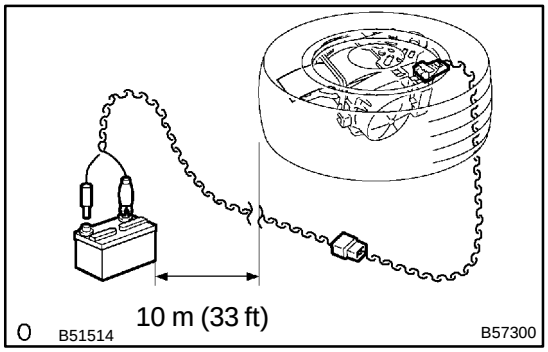


(2) Short the clip and terminal of the SST.
(3) Connect the SST with the pretensioner.
SST 09082-00700, 09082-00770

HINT:
When connecting the SST with the pretensioner, the locking button of the pretensioner connector should be in the locking condition.



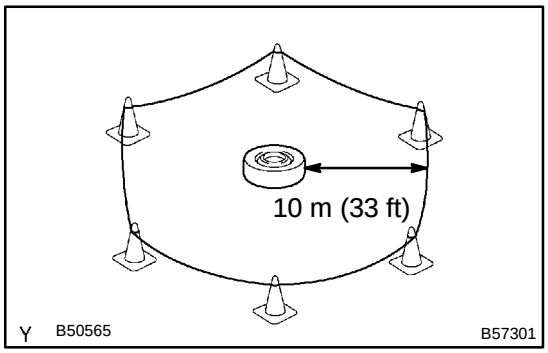
(4) Place the front seat outer belt on the ground, with the pretensioner connector facing upward, and cover it with a disc wheel with tire, as shown in the illustration.



(5) Fully stretch the SST and put a battery at least 10 m (33 ft) apart from the pretensioner.

CAUTION:

- **Work must be done in an open and flat safe space.**
- **Avoid a residential area.**
- **The pretensioner produces sizeable exploding sound when it is activated, so perform the work outdoor where it will not disturb the nearby residents.**



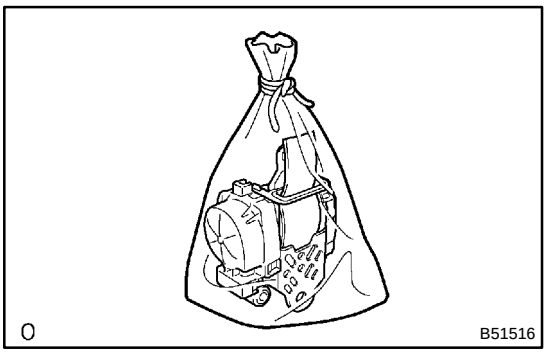
(6) Enclose the front seat outer belt, as shown in the illustration.

(7) Check the safety around the working place, and then connect the clip of SST to the battery negative.

(8) Connecting the terminal of SST with the battery positive, activate the pretensioner.

CAUTION:

- **Be sure that no one is present inside the vehicle and also near the vehicle before it is activated.**
- **Be sure to warn the people around the working place loudly before it is activated.**



(j) Dispose of the pretensioner.

(1) Put the activated pretensioner in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts.

CAUTION:

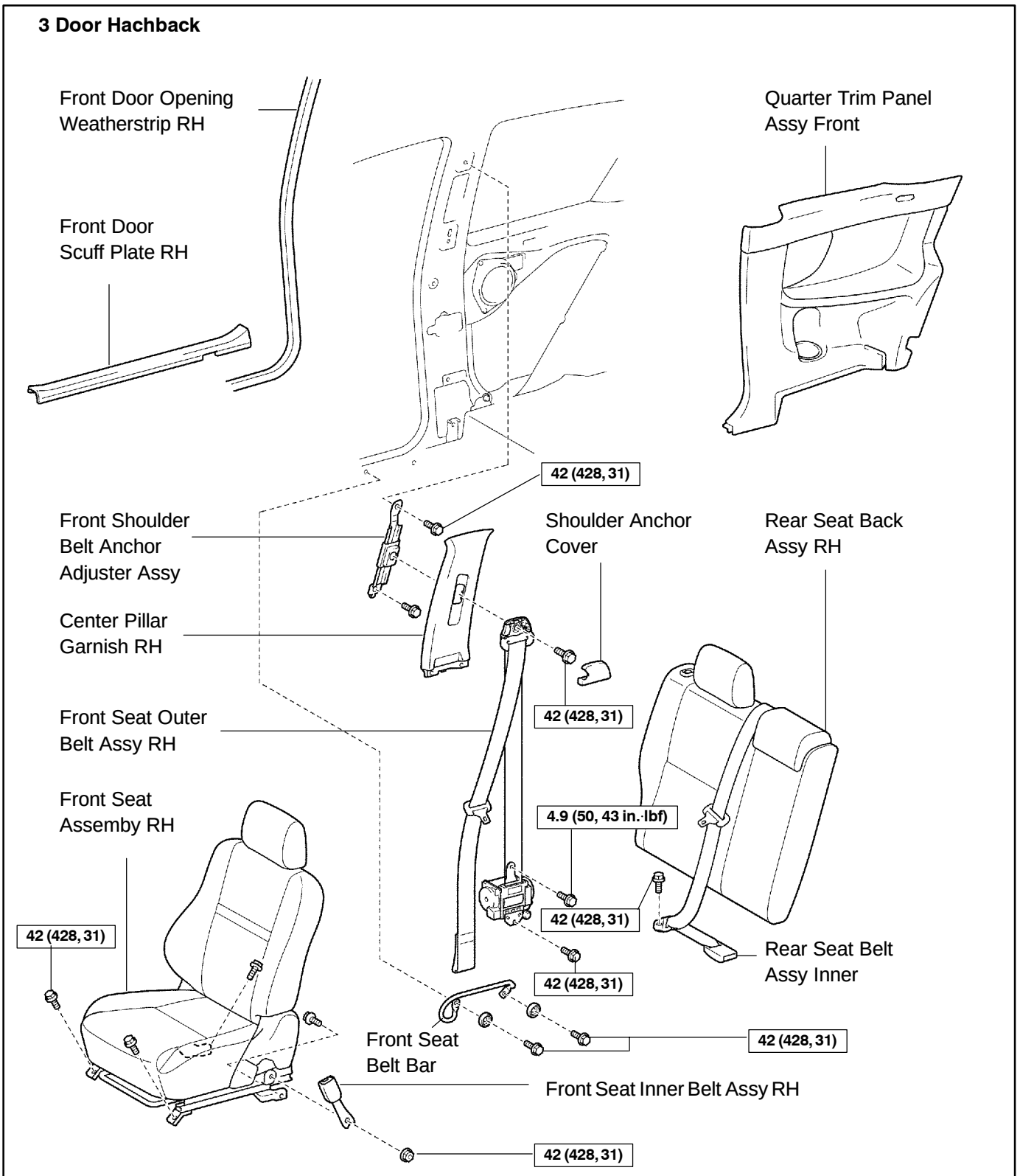
- **Do not touch the activated pretensioner in 30 minutes, because it is very hot in a part.**
- **keep the activated pretensioner away from water.**
- **Use gloves and safety glasses when handling the activated pretensioner.**
- **Always wash your hands with water after the work.**
- **Never dispose of an inactivated pretensioner.**

FRONT SEAT BELT (HATCHBACK)

COMPONENTS

6106S-01

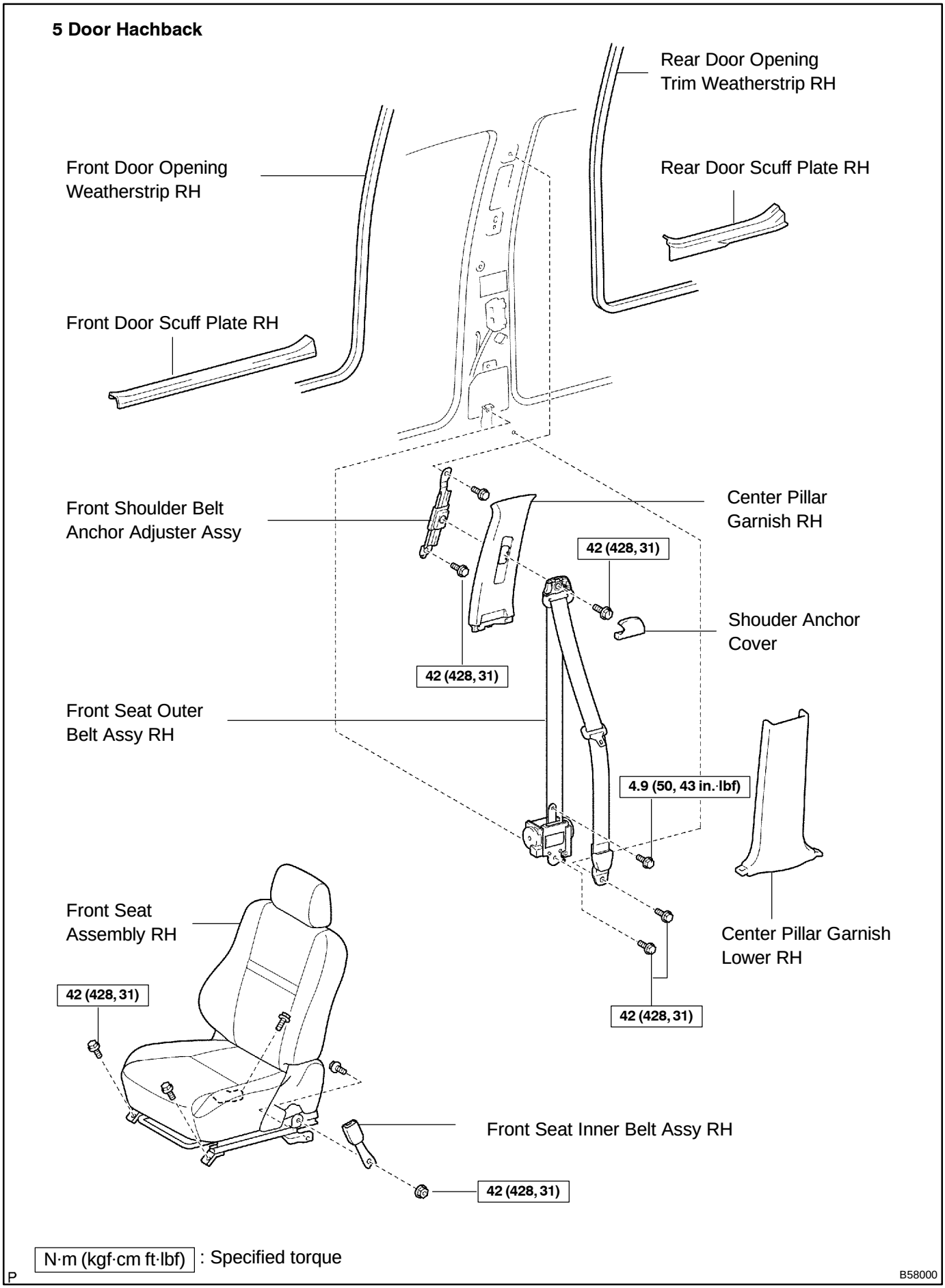
3 Door Hachback



N·m (kgf·cm ft·lbf) : Specified torque

P

B57999


5 Door Hachback
Rear Door Opening Trim Weatherstrip RH
Front Door Opening Weatherstrip RH
Rear Door Scuff Plate RH
Front Door Scuff Plate RH
Front Shoulder Belt Anchor Adjuster Assy
Center Pillar Garnish RH
42 (428, 31)
Shouder Anchor Cover
42 (428, 31)
Front Seat Outer Belt Assy RH
4.9 (50, 43 in.·lbf)
Front Seat Assembly RH
Center Pillar Garnish Lower RH
42 (428, 31)
42 (428, 31)
Front Seat Inner Belt Assy RH
42 (428, 31)
N·m (kgf·cm ft·lbf) : Specified torque
P
B58000

6106T-01

REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But, the installation is indicated only when it has a point.
- In the LH side, work in the same procedure as in the RH side.

1. DISCONNECT BATTERY NEGATIVE TERMINAL

2. REMOVE FRONT SEAT ASSEMBLY RH **(See page 72-8)**

3. REMOVE FRONT SEAT INNER BELT ASSY RH

(a) Remove the nut and front seat inner belt.

4. REMOVE FRONT DOOR SCUFF PLATE RH
(See page 76-48 or 76-56)

5. REMOVE REAR DOOR SCUFF PLATE RH(5 DOOR HATCH BACK BODY TYPE)
(See page 76-56)

6. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH

7. REMOVE REAR SEAT BELT ASSY INNER(3 DOOR HATCH BACK BODY TYPE)
(See page 61-28)

8. REMOVE REAR SEAT BACK ASSY RH(3 DOOR HATCH BACK BODY TYPE)
(See page 72-26)

9. REMOVE FRONT SEAT BELT BAR SUB-ASSY OUTER RH(3 DOOR HATCH BACK BODY TYPE)

(a) Remove the 2 bolts and front seat belt bar outer RH.

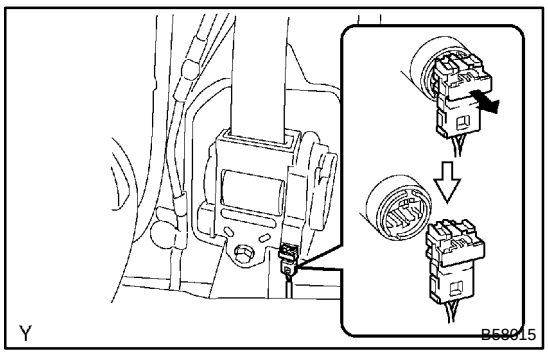
10. REMOVE QUARTER TRIM PANEL ASSY FRONT RH(3 DOOR HATCH BACK BODY TYPE)
(See page 76-49)

11. DISCONNECT FRONT SEAT OUTER BELT ASSY RH(5 DOOR HATCH BACK BODY TYPE)

(a) Remove the bolt and disconnect the front seat outer belt assembly (floor anchor side).

12. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH(5 DOOR HATCH BACK BODY TYPE)

13. REMOVE CENTER PILLAR GARNISH LOWER RH(5 DOOR HATCH BACK BODY TYPE)
(See page 76-57)

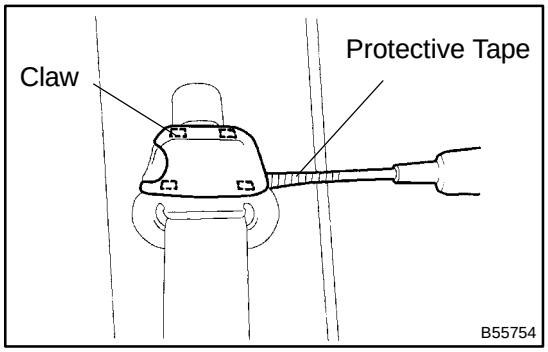


14. REMOVE FRONT SEAT OUTER BELT ASSY RH

NOTICE:

- **Removal operation of the seat belt with pretensioner must be started in 90 seconds or more after the ignition switch is turned OFF and the battery negative terminal is disconnected.**
- **Carefully read the notices for the "pretensioner" in the SRS airbag system and the front seat outer belt assembly.**

(a) Disconnect the connector and remove the 2 bolts.



(b) Using a screwdriver, remove the seat belt anchor cover cap.

HINT:

Tape the screwdriver tip before use.

(c) Remove the bolt and front seat outer belt (shoulder anchor side).

15. REMOVE CENTER PILLAR GARNISH RH

(See page 76-49 or 76-57)

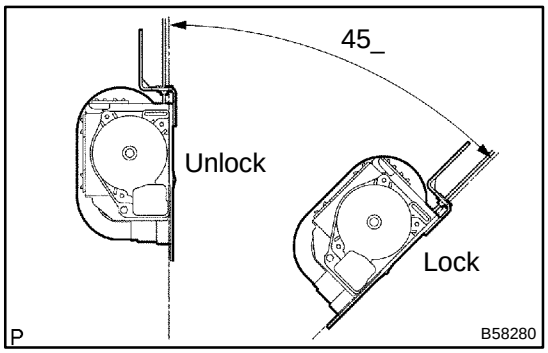
16. REMOVE FRONT SHOULDER BELT ANCHOR ADJUSTER ASSY

(a) Remove the 2 bolts and the front shoulder belt anchor adjuster assembly.

17. INSTALL FRONT SHOULDER BELT ANCHOR ADJUSTER ASSY

(a) Install the front shoulder belt anchor adjuster assembly with the 2 bolts.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)



18. INSTALL FRONT SEAT OUTER BELT ASSY RH

NOTICE:

Do not disassemble the retractor.

(a) Check the degree of tilt when beginning to lock the ELR.

(1) Check the belt will not lock within 15 degrees of tilt in all the direction but the belt will lock over 45 degrees of tilt when moving the installed retractor gently.

If the operation is not as specified, replace the front seat outer belt assembly.

(b) Install the retractor with the 2 bolts.

Torque:

4.9 N·m (50 kgf·cm, 43 in.·lbf) (Upper part of retractor)

42 N·m (428 kgf·cm, 31 ft·lbf) (Lower part of retractor)

(c) Install the shoulder anchor with the bolt.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(d) Install the floor anchor with the bolt.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(e) Check the ELR lock.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

If the operation is not as specified, replace the front seat outer belt assembly.

19. INSTALL FRONT SEAT INNER BELT ASSY RH

(a) Install the front seat inner belt assembly RH with the nut.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

20. INSTALL FRONT SEAT OUTER BELT ASSY RH(5 DOOR HATCH BACK BODY TYPE)

(a) Install the front seat outer belt assembly RH with the bolt (floor anchor side).
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

21. INSTALL FRONT SEAT BELT BAR SUB-ASSY OUTER RH(3 DOOR HATCH BACK BODY TYPE)

(a) Install the front seat outer belt bar outer RH with the 2 bolts.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

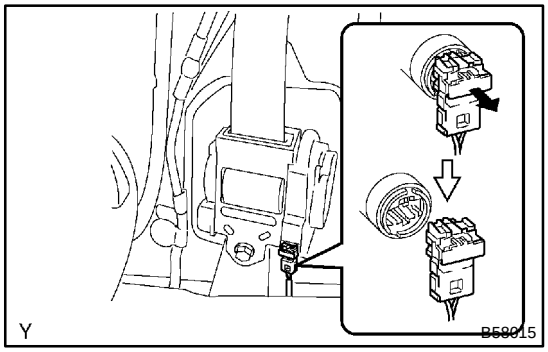
22. INSTALL FRONT SEAT ASSEMBLY RH **(See page 72-8)**

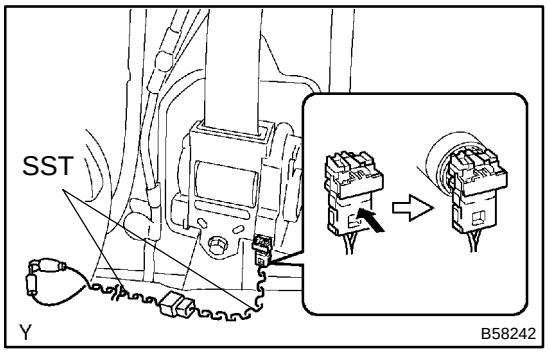
6106U-01

DISPOSAL

1. DISPOSE OF FRONT SEAT OUTER BELT ASSY RH(WHEN SCRAPPING VEHICLE DEPLOYMENT METHOD)

(a) Disconnect the battery negative terminal.
(b) Check the SRS airbag system (See page 60-1).
(c) Remove the front door scuff plate RH (See page 76-48 or 76-56).
(d) 5-door hatchback models:
Remove the rear door scuff plate RH (See page 76-56).
(e) Remove the front door opening trim weatherstrip RH.
(f) 5-door hatchback models:
Remove the rear door opening trim weatherstrip RH.
(g) 3-door hatchback models:
Remove the rear seat belt inner (See page 61-28)
(h) 3-door hatchback models:
Remove the seat back assembly RH (See page 72-26).
(i) 3-door hatchback models:
Remove the quarter trim panel assy front (See page 76-49).
(j) 5-door hatchback models:
Remove the center pillar garnish lower RH (See page 76-57).





(k) Dispose of the pretensioner.
(1) Using a screwdriver, pull the locking button of the pretensioner connector to your side to release the lock.

HINT:
Tape the screwdriver tip before use.

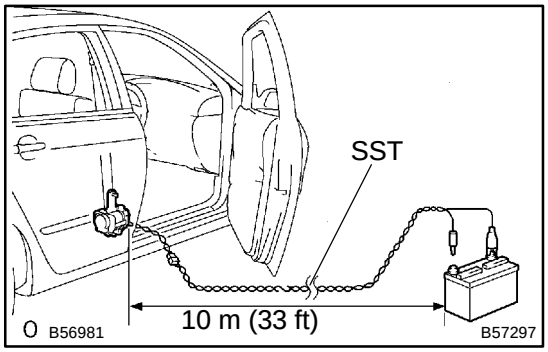
(2) Separate the pretensioner connector.

NOTICE:
- **Check that the outer belt is securely installed.**
- **Check that the seat belt is not loose.**

(3) Short the clip and terminal of the SST.
(4) Connect the SST with the pretensioner.
SST 09082-00700, 09082-00770

NOTICE:
Close all the doors and windows.

HINT:
When connecting the SST with the pretensioner, the locking button of the pretensioner connector should be in the locking condition.

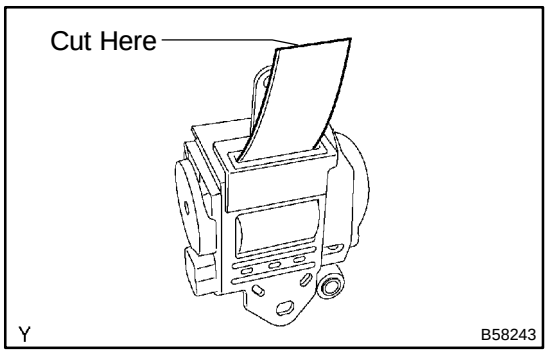


(5) Fully stretch the SST and put a battery at least 10 m (33 ft) or more apart from the vehicle.
(6) Check the safety inside and outside the vehicle, and then connect the clip of SST with the battery negative.
(7) Connecting the terminal of SST with the battery positive, activate the pretensioner.

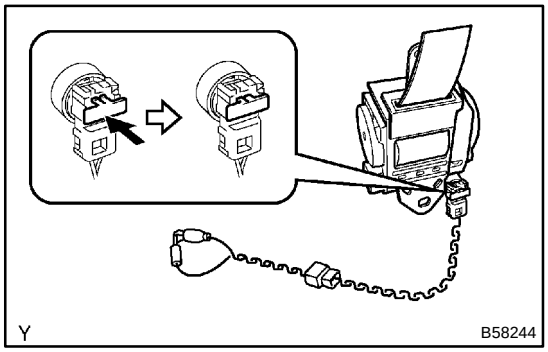
CAUTION:
- **Be sure that no one is present inside the vehicle and also near the vehicle before it is activated.**
- **Be sure to warn the people around the working place loudly before it is activated.**

2. DISPOSE OF FRONT SEAT OUTER BELT ASSY RH(WHEN DISPOSING OF FRONT SEAT BELT DEPLOYMENT METHOD)

(a) Disconnect the battery negative terminal.
(b) Check the SRS airbag system (See page 60-1).
(c) Remove the front door scuff plate RH (See page 76-48 or 76-56).
(d) 5-door hatchback models:
Remove the rear door scuff plate RH (See page 76-56).
(e) Remove the front door opening trim weatherstrip RH.
(f) 5-door hatchback models:
Remove the rear door opening trim weatherstrip RH.
(g) 3-door hatchback models:
Remove the rear seat belt inner (See page 61-28)
(h) 3-door hatchback models:
Remove the seat back assembly RH (See page 72-26).
(i) 3-door hatchback models:
Remove the quarter trim panel assy front (See page 76-48).
(j) 5-door hatchback models:
Remove the center pillar garnish lower RH (See page 76-56).
(k) Remove the front seat belt bar (See page 61-9).

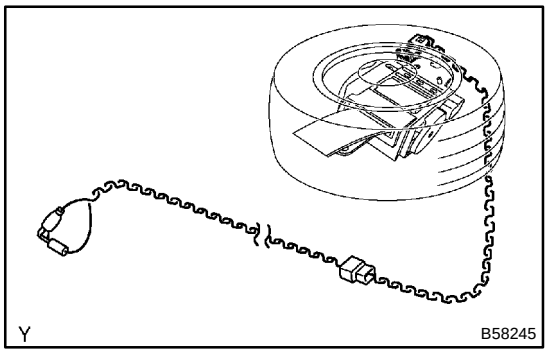


(l) Activate the pretensioner
(1) Cut the seat belt in the illustrated position.

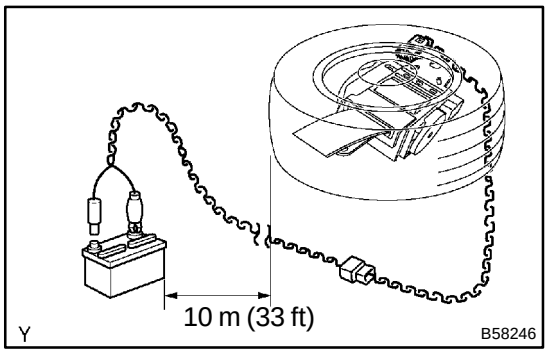


(2) Short the clip and terminal of the SST.
(3) Connect the SST with the pretensioner.
SST 09082-00700, 09082-00770

HINT:
When connecting the SST with the pretensioner, the locking button of the pretensioner connector should be in the locking condition.

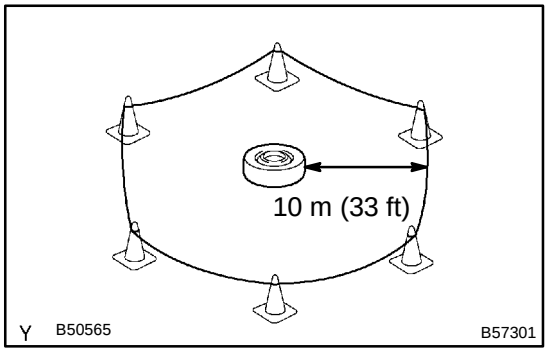


(4) Place the front seat outer belt on the ground, with the pretensioner connector facing upward, and cover it with a disc wheel with tire, as shown in the illustration.



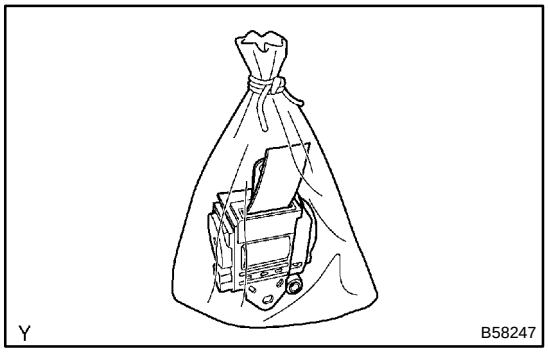
(5) Fully stretch the SST and put a battery at least 10m (33 ft) apart from the pretensioner.

CAUTION:
- **Work must be done in an open and flat safe space.**
- **Avoid a residential area.**
- **The pretensioner produces sizeable exploding sound when it is activated, so perform the work outdoor where it will not disturb the nearby residents.**



(6) Enclose the front seat outer belt, as shown in the illustration.
(7) Check the safety around the working place, and then connect the clip of SST to the battery negative.
(8) Connecting the terminal of SST with the battery positive, activate the pretensioner.

CAUTION:
- **Be sure that no one is present inside the vehicle and also near the vehicle before it is activated.**
- **Be sure to warn the people around the working place loudly before it is activated.**



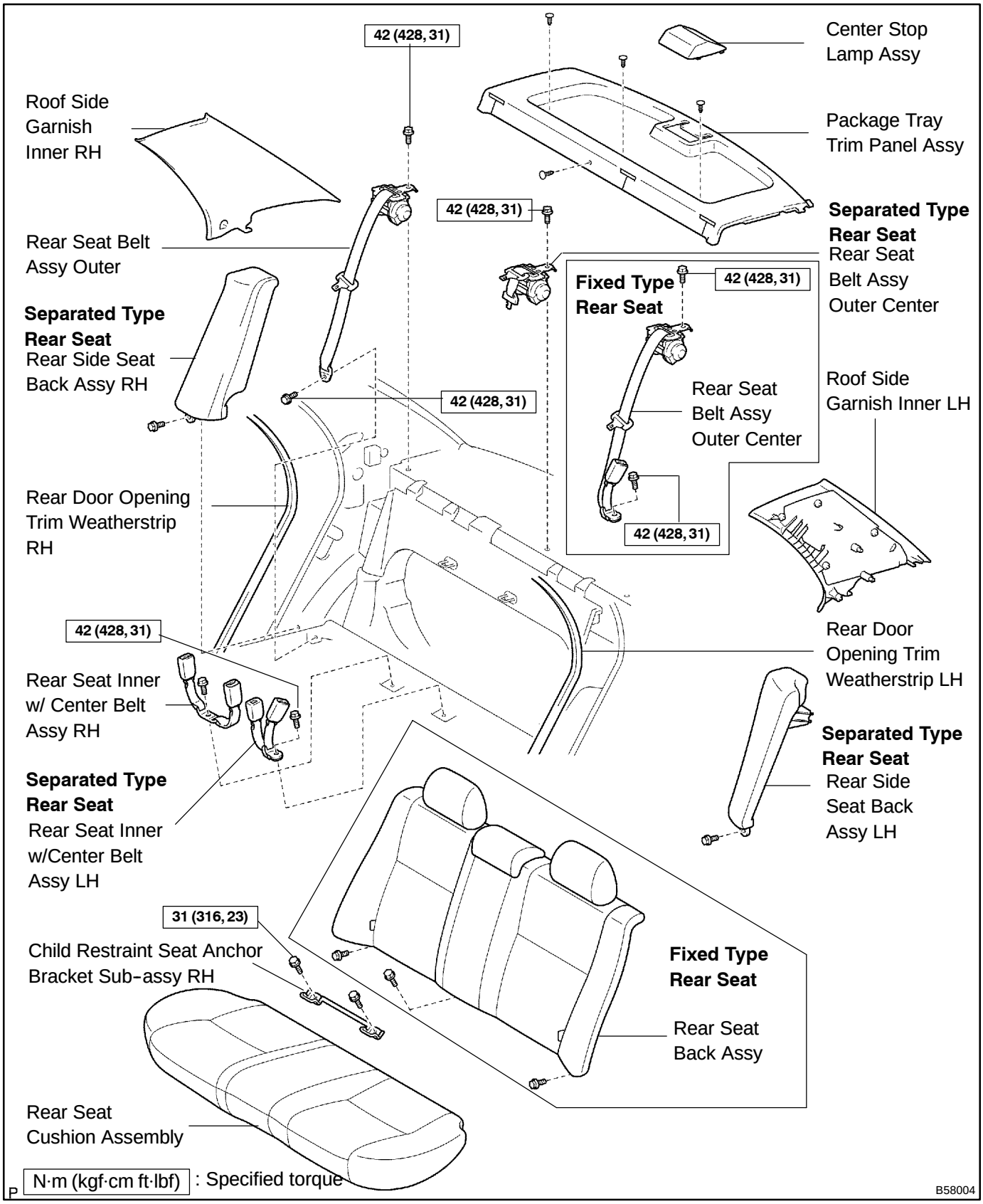
(m) Dispose of the pretensioner.
(1) Put the activated pretensioner in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts.

CAUTION:
- **Do not touch the activated pretensioner in 30 minutes, because it is very hot in a part.**
- **keep the activated pretensioner away from water.**
- **Use gloves and safety glasses when handling the activated pretensioner.**
- **Always wash your hands with water after the work.**
- **Never dispose of an inactivated pretensioner.**

REAR SEAT BELT (SEDAN)

COMPONENTS

6106V-01



6106W-01

REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But, the installation is indicated only when it has a point.
- In the LH side, work in the same procedure as in the RH side.

1. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH

2. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH

3. REMOVE REAR SEAT CUSHION ASSEMBLY **(See page 72-12 or 72-16)**

4. REMOVE REAR SEAT BACK ASSY(FIXED TYPE REAR SEAT) **(See page 72-16)**

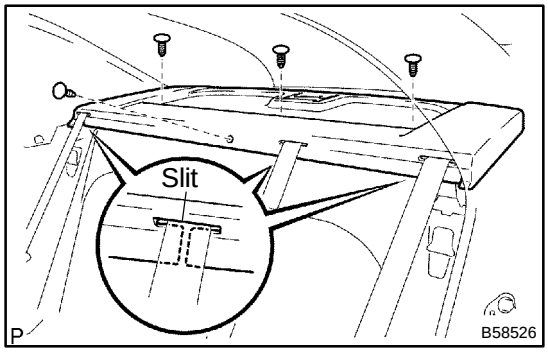
5. REMOVE REAR SIDE SEAT BACK ASSY RH(SEPARATED TYPE REAR SEAT) **(See page 72-12)**

6. REMOVE REAR SIDE SEAT BACK ASSY LH(SEPARATED TYPE REAR SEAT) **(See page 72-12)**

7. REMOVE ROOF SIDE GARNISH INNER RH **(See page 76-34)**

8. REMOVE ROOF SIDE GARNISH INNER LH **(See page 76-34)**

9. REMOVE CENTER STOP LAMP ASSY **(See page 65-33)**



10. REMOVE PACKAGE TRAY TRIM PANEL ASSY

(a) Using a clip remover, remove the 5 clips.
(b) Pull out the belt from the slit and then remove the package trim panel.

11. REMOVE REAR SEAT BELT ASSY OUTER

(a) Remove the bolt and disconnect the rear seat belt assembly outer (floor anchor).
(b) Remove the bolt and the rear seat belt assembly outer.

12. REMOVE REAR SEAT BELT ASSY OUTER CENTER

(a) Remove the bolt and rear seat belt assembly outer center.

13. REMOVE REAR SEAT INNER W/CENTER BELT ASSY RH

(a) Remove the bolt and the rear seat inner w/center belt assembly RH.

14. REMOVE REAR SEAT INNER W/CENTER BELT ASSY LH

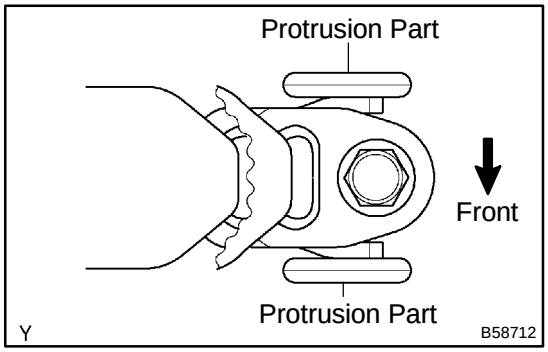
(a) Remove the bolt and the rear seat inner w/center belt assembly LH.

15. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

(a) Remove the 2 bolts and child restraint seat anchor bracket RH.

16. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

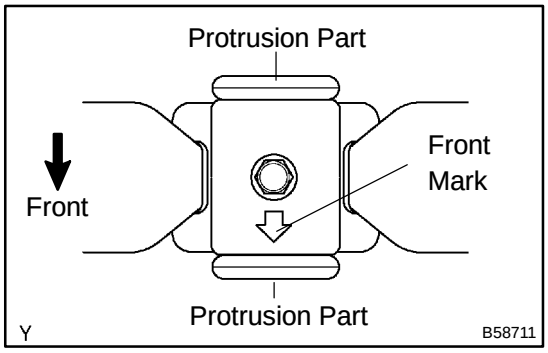
(a) Install the child restraint seat anchor bracket RH with the 2 bolts.
Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)



17. INSTALL REAR SEAT INNER W/CENTER BELT ASSY LH

(a) Install the rear seat inner with center belt assembly LH with the bolt, as shown in the illustration.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

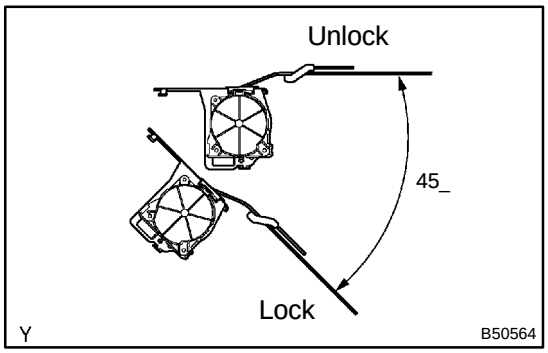
NOTICE:
Do not make the anchor part run onto the protrusion part of the floor panel.



18. INSTALL REAR SEAT INNER W/CENTER BELT ASSY RH

(a) Install the rear seat inner with center belt assembly RH with the bolt, as shown in the illustration.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

NOTICE:
Do not make the anchor part run onto the protrusion part of the floor panel.



19. INSTALL REAR SEAT BELT ASSY OUTER CENTER

NOTICE:
Do not disassemble the retractor.

(a) Check the degree of tilt when the belt begins to lock the ELR.
  (1) Check the belt will not lock within 15 degrees of tilt in all the direction but the belt will lock over 45 degrees of tilt when moving the installed retractor gently.

If the operation is not as specified, replace the rear seat belt assembly outer center.

(b) Install the rear seat belt assembly outer center with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(c) Check the ELR lock.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

If the operation is not as specified, replace the rear seat belt assembly outer center.

(d) Check the fastening function for child restraint system.

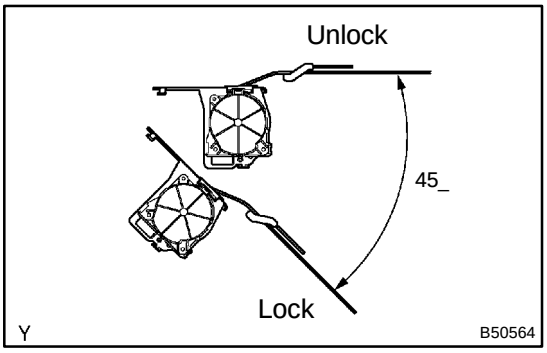
NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt cannot be pulled out any more but can be rewound after the belt is fully pulled out.

(2) Check that the belt can be pulled out and rewound after the belt is fully rewound.

If the operation is not as specified, replace the rear seat belt assembly outer center.



20. INSTALL REAR SEAT BELT ASSY OUTER

NOTICE:

Do not disassemble the retractor.

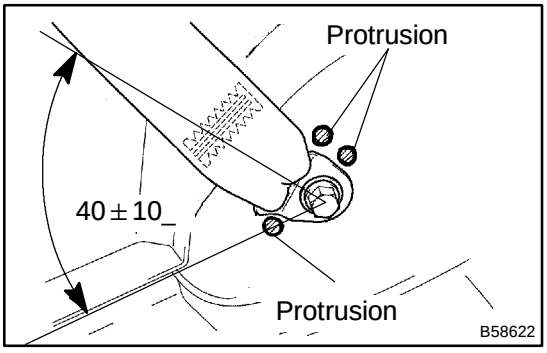
(a) Check the degree of tilt when the belt begins to lock the ELR.

(1) Check the belt will not lock within 15 degrees of tilt in all the direction but the belt will lock over 45 degrees of tilt when moving the installed retractor gently.

If operation is not as specified, replace the rear seat belt assembly outer.

(b) Install the rear seat belt assembly outer (retractor side) with the bolt.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)



(c) Install the rear seat belt assembly outer (floor anchor side) with the bolt.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

NOTICE:

Take care for the anchor not to run onto the protrusion part of the floor panel.

(d) Check the ELR lock.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

If the operation is not as specified, replace the rear seat belt assembly outer.

(e) Check the fastening function for child restraint system.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt cannot be pulled out any more but can be rewound after the belt is fully pulled out.

(2) Check that the belt can be pulled out and rewound after the belt is fully rewound.

If the operation is not as specified, replace the rear seat belt assembly outer.

21. INSTALL REAR SIDE SEAT BACK ASSY LH(SEPARATED TYPE REAR SEAT)
(See page 72-14)

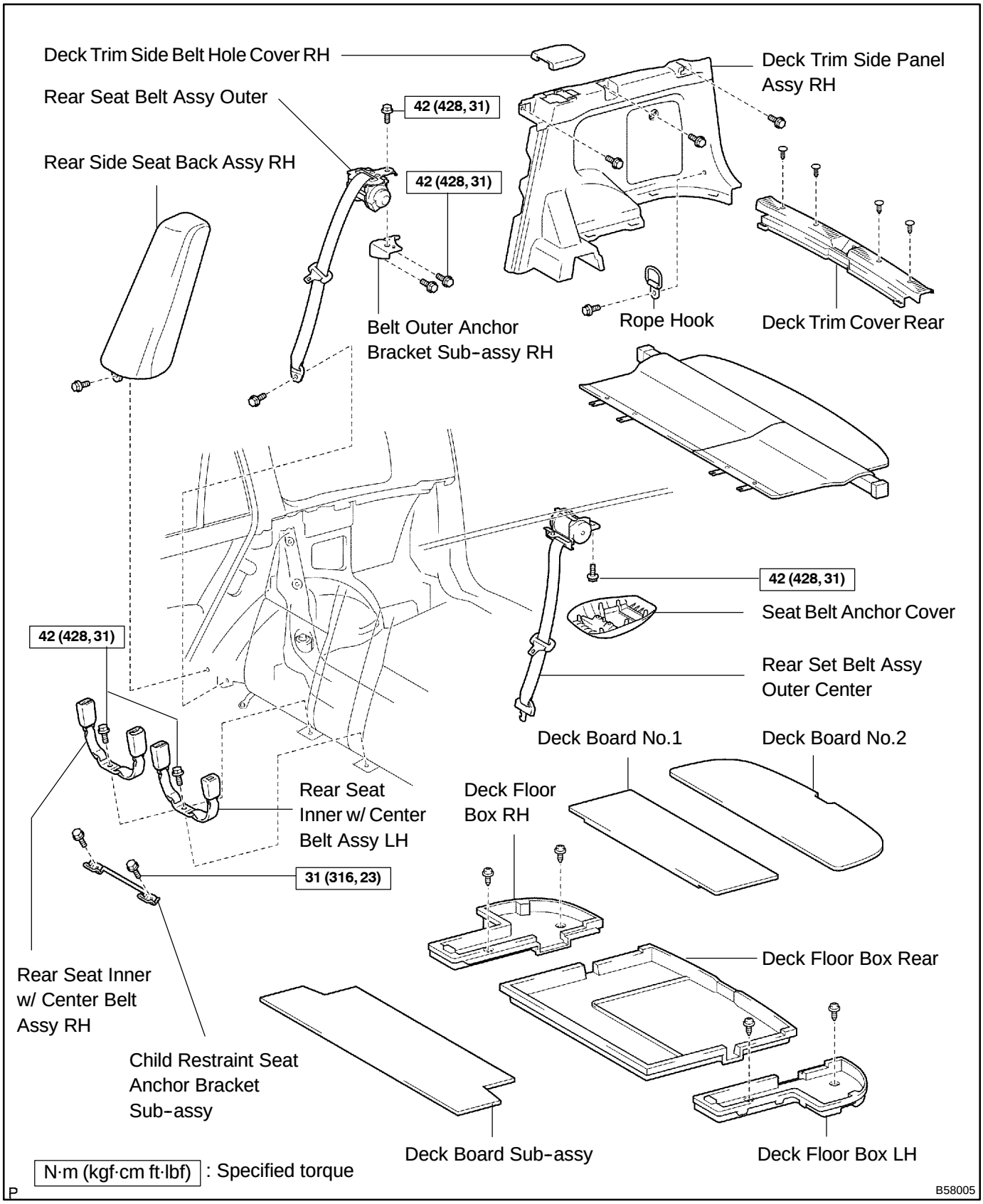
22. INSTALL REAR SIDE SEAT BACK ASSY RH(SEPARATED TYPE REAR SEAT)
(See page 72-14)

23. INSTALL REAR SEAT BACK ASSY(FIXED TYPE REAR SEAT)
(See page 72-14)

REAR SEAT BELT (STATION WAGON)

COMPONENTS

6106X-01

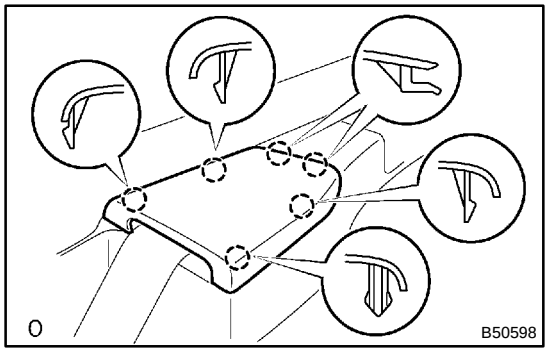


REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But, the installation is indicated only when it has a point.
- In the LH side, work in the same procedure as in the RH side.

1. **REMOVE REAR SIDE SEAT BACK ASSY RH**
   (See page 76-41)
2. **REMOVE DECK BOARD NO.1**
3. **REMOVE DECK BOARD NO.2**
4. **REMOVE DECK BOARD SUB-ASSY**
5. **REMOVE DECK FLOOR BOX REAR**
6. **REMOVE DECK FLOOR BOX RH**
7. **REMOVE DECK FLOOR BOX LH**
8. **REMOVE DECK TRIM COVER REAR**
   (See page 76-42)

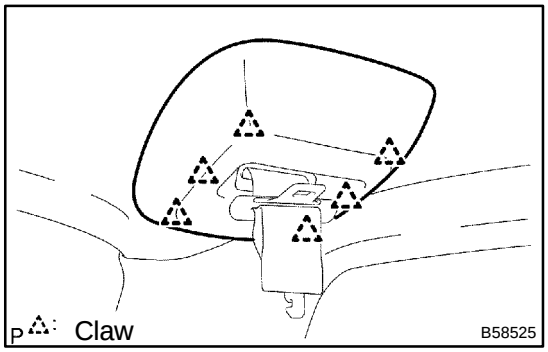


9. **REMOVE DECK TRIM SIDE BELT HOLE COVER RH**

(a) Using a screwdriver, remove the deck side belt hole cover RH.

HINT:
Tape the screwdriver tip before use.

10. **REMOVE DECK TRIM SIDE PANEL ASSY RH**
    (See page 76-42)
11. **REMOVE REAR SEAT BELT ASSY OUTER**
12. **REMOVE BELT OUTER ANCHOR BRACKET SUB-ASSY RH**



13. REMOVE SEAT BELT ANCHOR COVER

(a) Using a screwdriver, remove the seat belt anchor cover.

HINT:
Tape the screwdriver tip before use.

14. REMOVE REAR SEAT BELT ASSY OUTER CENTER

(a) Remove the bolt and the rear seat belt assembly outer center.

15. REMOVE REAR SEAT INNER W/CENTER BELT ASSY RH

(a) Remove the bolt and the rear seat inner with center belt assembly RH.

16. REMOVE REAR SEAT INNER W/CENTER BELT ASSY LH

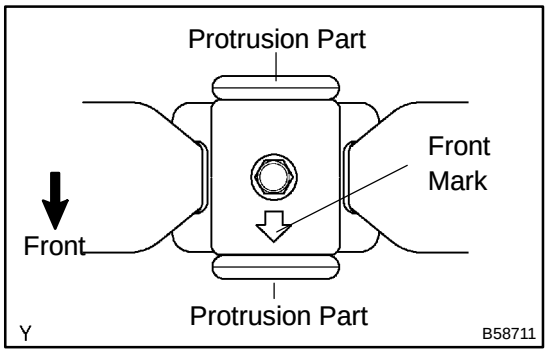
(a) Remove the bolt and the rear seat inner with center belt assembly LH.

17. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

(a) Remove the 2 bolts and child restraint seat anchor bracket RH.

18. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

(a) Install the child restraint seat anchor bracket RH with the 2 bolts.
Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)



19. INSTALL REAR SEAT INNER W/CENTER BELT ASSY LH

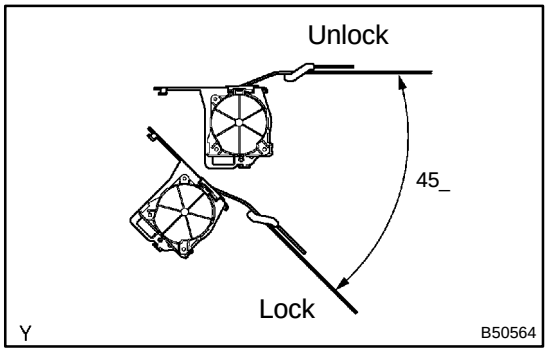
(a) Install the rear seat inner with center belt assembly LH with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

NOTICE:
Do not make the anchor part run onto the protrusion part of the floor panel.

20. INSTALL REAR SEAT INNER W/CENTER BELT ASSY RH

(a) Install the rear seat inner with center belt assembly LH with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

NOTICE:
Do not make the anchor part run onto the protrusion part of the floor panel.



21. INSTALL REAR SEAT BELT ASSY OUTER CENTER

NOTICE:
Do not disassemble the retractor.

(a) Check the degree of tilt when the belt begins to lock the ELR.
  (1) Check that the belt will not lock within 15 degrees of tilt in all the direction but the belt will lock over 45 degrees of tilt when moving the installed retractor gently.

If the operation is not as specified, replace the rear seat belt assembly outer center.

(b) Install the rear seat belt assembly outer center with the bolt.
  Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(c) Check the ELR lock.

NOTICE:
Check should be done with the assembly installed.
  (1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

If the operation is not as specified, replace the rear seat belt assembly outer center.

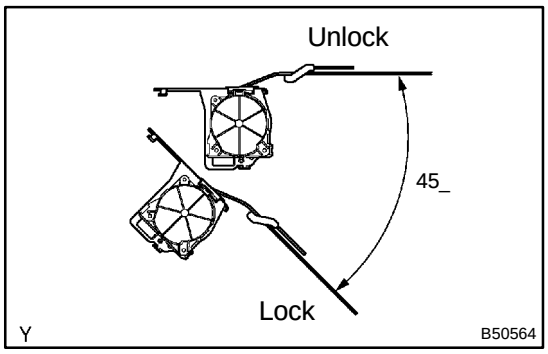
(d) Check the fastening function for child restraint system.

NOTICE:
Check should be done with the assembly installed.
  (1) Check that the belt cannot be pulled out any more but can be rewound after the belt is fully pulled out.
  (2) Check that the belt can be pulled out and rewound after the belt is fully rewound.

If the operation is not as specified, replace the rear seat belt assembly outer center.

22. INSTALL BELT OUTER ANCHOR BRACKET SUB-ASSY RH

(a) Install the belt outer anchor bracket RH with the bolt.
  Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)



23. INSTALL REAR SEAT BELT ASSY OUTER

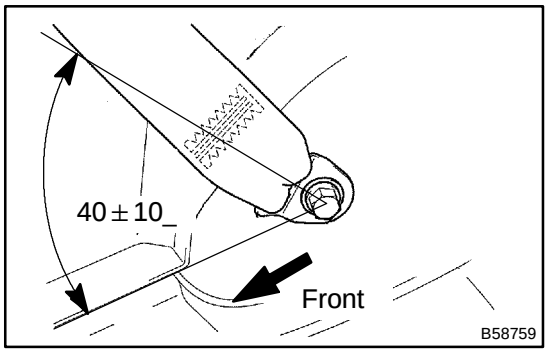
NOTICE:
Do not disassemble the retractor.

(a) Check the degree of tilt when the belt begins to lock the ELR.
  (1) Check that the belt will not lock within 15 degrees of tilt in all the direction but the belt will lock over 45 degrees of tilt when moving the installed retractor gently.

If the operation is not as specified, replace the rear seat belt assembly outer.

(b) Install the rear seat belt assembly outer (retractor side) with the bolt.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)



(c) Install the rear seat belt assembly outer (floor anchor side) with the bolt, as shown in the illustration.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(d) Check the ELR lock.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

If the operation is not as specified, replace the rear seat belt assembly outer.

(e) Check the fastening function for child restraint system.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt cannot be pulled out any more but can be rewound after the belt is fully pulled out.

(2) Check that the belt can be pulled out and rewound after the belt is fully rewound.

If the operation is not as specified, replace the rear seat belt assembly outer.

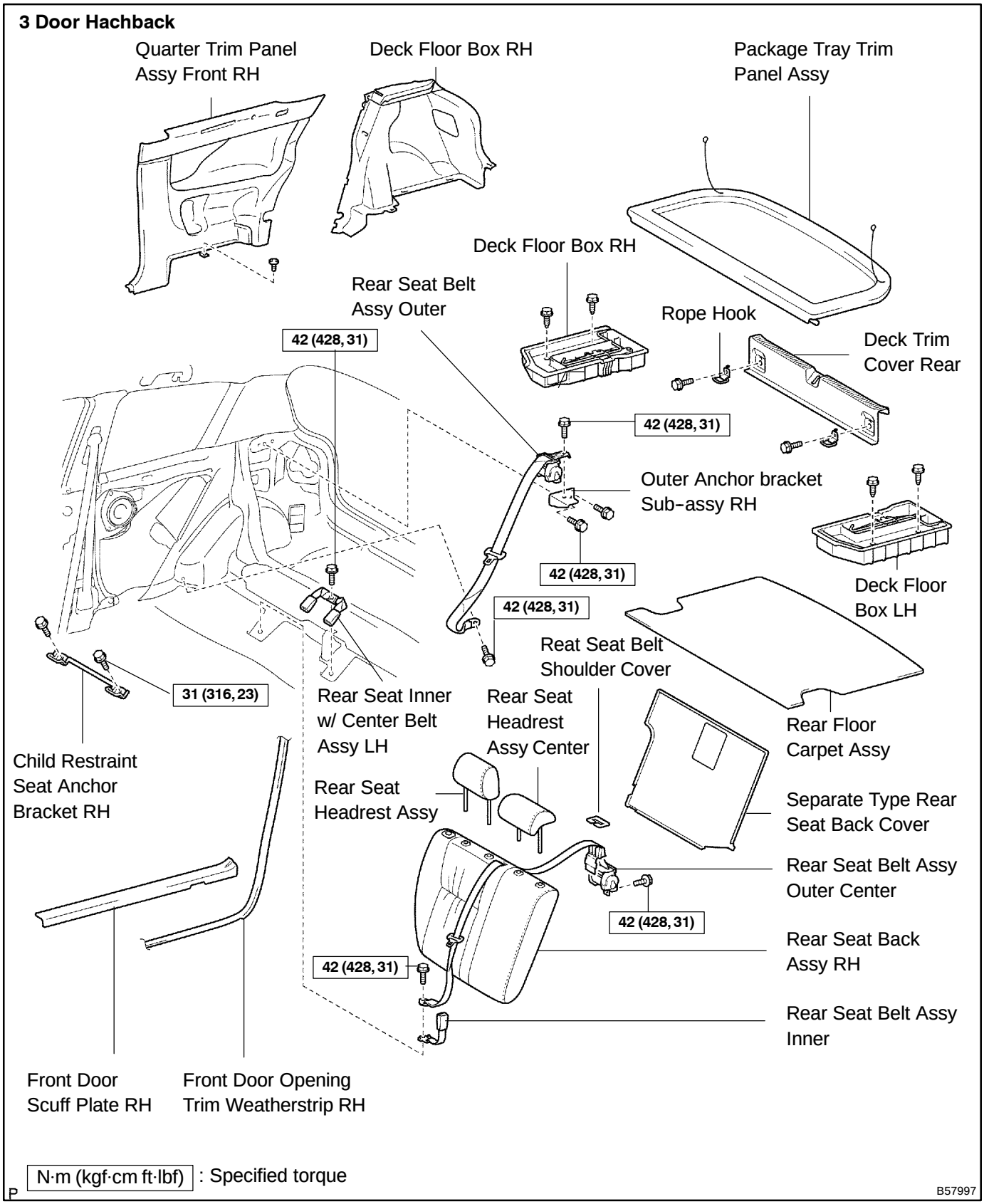
24. INSTALL REAR SIDE SEAT BACK ASSY RH

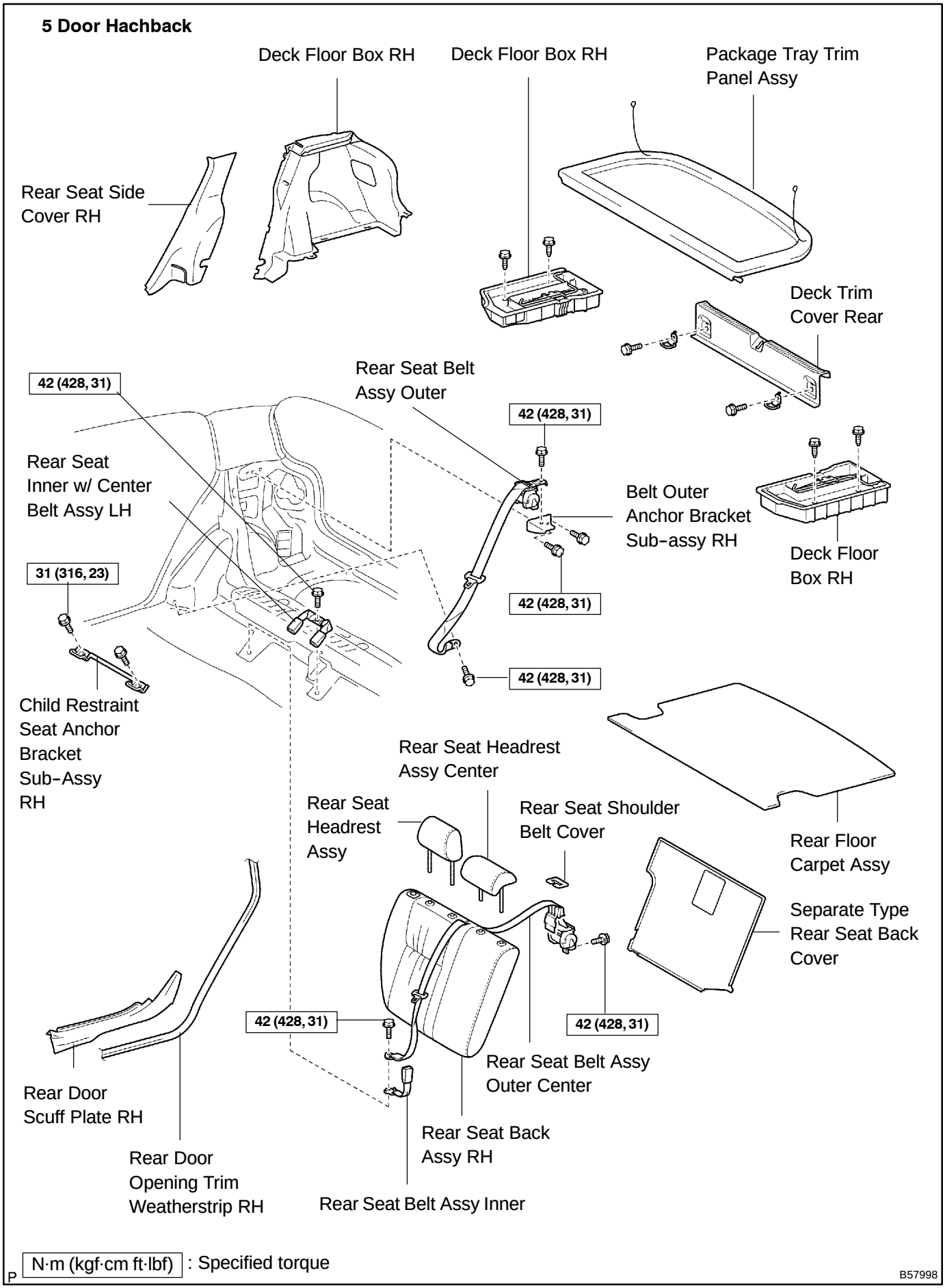
(See page 76-45)

REAR SEAT BELT (HATCHBACK)

COMPONENTS

6106Z-01




5 Door Hachback
Deck Floor Box RH
Deck Floor Box RH
Package Tray Trim Panel Assy
Rear Seat Side Cover RH
Deck Trim Cover Rear
42 (428, 31)
Rear Seat Belt Assy Outer
42 (428, 31)
Rear Seat Inner w/ Center Belt Assy LH
Belt Outer Anchor Bracket Sub-assy RH
Deck Floor Box RH
42 (428, 31)
31 (316, 23)
42 (428, 31)
Child Restraint Seat Anchor Bracket Sub-Assy RH
Rear Seat Headrest Assy Center
Rear Seat Headrest Assy
Rear Seat Shoulder Belt Cover
Rear Floor Carpet Assy
Separate Type Rear Seat Back Cover
42 (428, 31)
42 (428, 31)
Rear Seat Belt Assy Outer Center
Rear Door Scuff Plate RH
Rear Seat Back Assy RH
Rear Door Opening Trim Weatherstrip RH
Rear Seat Belt Assy Inner
N·m (kgf·cm ft·lbf) : Specified torque
P
B57998

REPLACEMENT

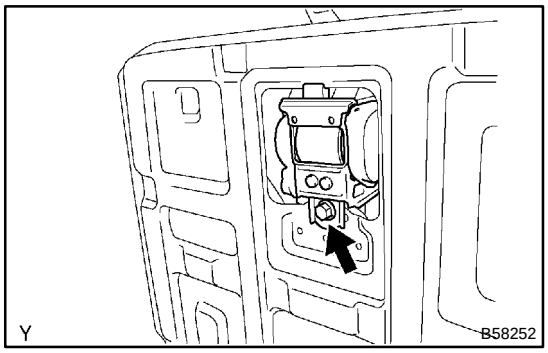
HINT:

- Installation is in the reverse order of the removal. But, the installation is indicated only when it has a point.
- In the LH side, work in the same procedure as in the RH side.

1. **REMOVE FRONT DOOR SCUFF PLATE RH(3 DOOR HATCH BACK BODY TYPE)** **(See page 76-48)**
2. **REMOVE REAR DOOR SCUFF PLATE RH(5 DOOR HATCH BACK BODY TYPE)** **(See page 76-56)**
3. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH(3 DOOR HATCH BACK BODY TYPE)**
4. **REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH(5 DOOR HATCH BACK BODY TYPE)**
5. **REMOVE REAR SEAT BELT ASSY INNER**

(a) Remove the bolt and the rear seat belt assembly inner.

6. **REMOVE REAR SEAT BACK ASSY RH** **(See page 72-26)**
7. **REMOVE REAR SEAT HEADREST ASSY** **(See page 72-26)**
8. **REMOVE REAR SEAT HEADREST ASSY CENTER** **(See page 72-26)**
9. **REMOVE REAR SEAT SHOULDER BELT COVER** **(See page 72-27)**
10. **REMOVE SEPARATE TYPE REAR SEAT BACK COVER** **(See page 72-27)**



11. **REMOVE REAR SEAT BELT ASSY OUTER CENTER**

(a) Remove the bolt and the rear seat belt assembly outer center from the rear seat back assembly RH.

12. **REMOVE REAR FLOOR CARPET ASSY**
13. **REMOVE QUARTER TRIM PANEL ASSY FRONT RH(3 DOOR HATCH BACK BODY TYPE)** **(See page 76-49)**
14. **REMOVE REAR SEAT SIDE COVER RH(5 DOOR HATCH BACK BODY TYPE)** **(See page 76-58)**
15. **REMOVE PACKAGE TRAY TRIM PANEL ASSY**
16. **REMOVE DECK FLOOR BOX RH**

17. REMOVE DECK FLOOR BOX LH

18. REMOVE DECK TRIM COVER REAR
(See page 76-49 or 76-58)

19. REMOVE DECK TRIM SIDE PANEL ASSY RH
(See page 76-49 or 76-58)

20. REMOVE REAR SEAT BELT ASSY OUTER

(a) Remove the 2 bolts and the rear seat belt assembly outer.

21. REMOVE BELT OUTER ANCHOR BRACKET SUB-ASSY RH

(a) Remove the bolt and belt outer anchor bracket from the rear seat belt assembly outer.

22. REMOVE REAR SEAT INNER W/CENTER BELT ASSY LH

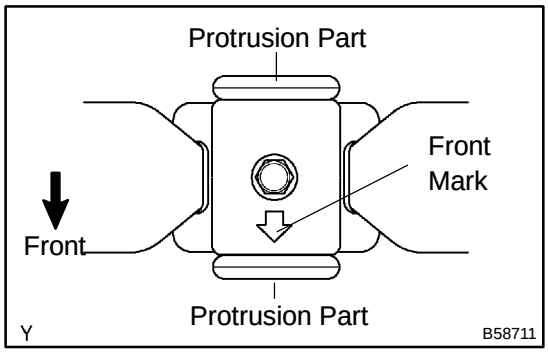
(a) Remove the bolt and rear seat inner with center belt assembly LH.

23. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

(a) Remove the 2 bolts and child restraint seat anchor bracket RH.

24. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

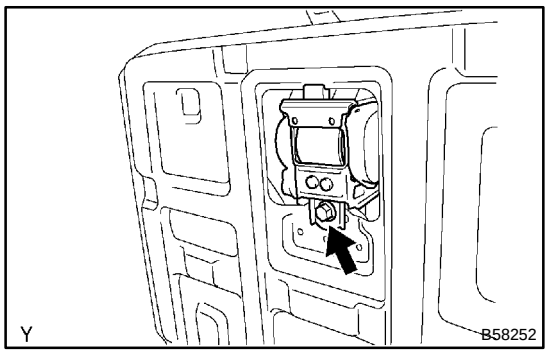
(a) Install the child restraint seat anchor bracket RH with the 2 bolts.
Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)



25. INSTALL REAR SEAT INNER W/CENTER BELT ASSY LH

(a) Install the rear seat inner with center belt assembly LH with the bolt, as shown in the illustration.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

NOTICE:
Do not make the anchor part run onto the protrusion part of the floor panel.



26. INSTALL REAR SEAT BELT ASSY OUTER CENTER

NOTICE:
Do not disassemble the retractor.

(a) Install the rear seat belt assembly outer center to the rear seat back assembly RH with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(b) Check the ELR lock.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

HINT:

The seat belt will not lock when the pull-out amount of the belt is 955 mm (37.60 in.) or less.

If the operation is not as specified, replace the rear seat belt assembly outer center.

(c) Check the fastening function for child restraint system.

NOTICE:

Check should be done with the assembly installed.

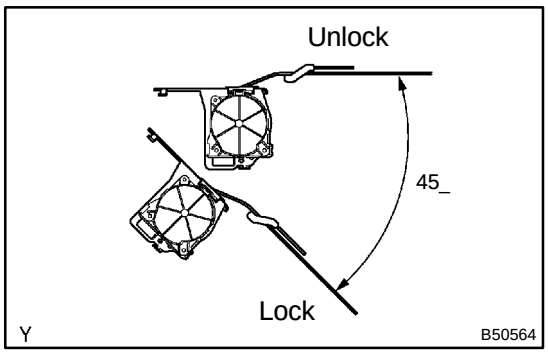
(1) Check that the belt cannot be pulled out any more but can be rewound after the belt is fully pulled out.

(2) Check that the belt can be pulled out and rewound after the belt is fully rewound.

If the operation is not as specified, replace the rear seat belt assembly outer center.

27. INSTALL BELT OUTER ANCHOR BRACKET SUB-ASSY RH

(a) Install the belt outer anchor bracket RH to the rear seat belt assembly outer with the bolt.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)



28. INSTALL REAR SEAT BELT ASSY OUTER

NOTICE:

Do not disassemble the retractor.

(a) Check the degree of tilt when the belt begins to lock the ELR.

(1) Check that the belt will not lock within 15 degrees of tilt in all the direction but the belt will lock over 45 degrees of tilt when moving the installed retractor gently.

If the operation is not as specified, replace the rear seat belt assembly outer.

(b) Install the rear seat belt assembly outer with the 2 bolts.
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(c) Check the ELR lock.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt will lock when pulling out the belt quickly with the belt installed.

If the operation is not as specified, replace the rear seat belt assembly outer.

(d) Check the fastening function for child restraint system.

NOTICE:

Check should be done with the assembly installed.

(1) Check that the belt cannot be pulled out any more but can be rewound after the belt is fully pulled out.

(2) Check that the belt can be pulled out and rewound after the belt is fully rewound.

If the operation is not as specified, replace the rear seat belt assembly outer.

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LIGHTING SYSTEM

6500X-02

PRECAUTION

1. PRECAUTION OF HEADLIGHT BULB REPLACEMENT

(a) When the halogen lamp (headlight and front fog light) surface is contaminated by oil, the lamp service life is shortened as it becomes hot when it is turned on.

(b) Since the internal pressure of a halogen lamp bulb (headlight and front fog light) is high, carefully handle it as dropping a bulb may cause an explosion with jumping glass chips.

(c) When the lens are held with the bulb being removed for a long period of time, the lens may be contaminated by dirt or moisture. So being the work after preparing a new one when replacing a bulb.

(d) Always use a replacement bulb having the same watt rating.

(e) Firmly reinstall the socket after bulb replacement. Other wise, cloudy lens or invasion by water will occur.

6500Y-02

PROBLEM SYMPTOMS TABLE

1. HEADLIGHT AND TAILLIGHT (w/o Daytime Running Light System)

Symptom	Suspect Area	See page
Only one headlight comes on.	8. Bulb 9. HEAD-LH Fuse 10. HEAD-RH Fuse 11. Wire Harness	- - - -
"LO-Beam" does not light (All).	1. Bulb 2. Headlamp dimmer switch 3. Wire Harness	- 65-8 -
"LO-Beam" does not light (One side).	1. Bulb 2. Wire Harness	- -
"HI-Beam" does not light (All).	1. Bulb 2. Headlamp Dimmer Switch 3. Wire Harness	- 65-8 -
"HI-Beam" does not light (One side).	1. Bulb 2. Wire Harness	- -
"Flash" does not light.	1. Bulb 2. Headlamp Dimmer Switch 3. Wire harness	- 65-8 -
Headlight is dark.	1. Bulb 2. Wire Harness	- -
Only one taillight comes on.	1. Bulb 2. Wire Harness	- -
Taillight does not come on (Headlight is normal).	1. TAIL Fuse 2. Taillamp Relay 3. Headlamp Dimmer Switch 4. Wire Harness	- 65-8 65-8 -
Taillight does not come on (Headlight does not light).	1. Headlamp Dimmer Switch 2. Wire Harness	65-8 -
Rear combination light does not come on.	1. Bulb 2. Wire Harness	- -

(w/ Daytime Running Light System)

Symptom	Suspect Area	See page
Headlight does not come on with engine running and headlamp dimmer switch in Off.	1. Bulb 2. ECU-B Fuse 3. Daytime Running Light Main Relay 4. Dim Dip Lamp Relay 5. Alternator L Terminal 6. Wire Harness	- - 65-5 65-8 - -
Only one headlight comes on.	1. Bulb 2. Daytime Running Light Main Relay 3. Dim Dip Lamp Relay 4. Wire Harness	- 65-5 65-8 -
"LO-Beam" does not light (All).	1. Bulb 2. Headlamp Dimmer Switch 3. Wire Harness	- 65-8 -
"LO-Beam" does not light (One side).	1. Bulb 2. LO-LH Fuse or LO-RH Fuse 3. Wire Harness	- - -

"HI-Beam" does not light (All).	1. Bulb 2. Headlamp Dimmer Switch 3. Daytime Running Light Main Relay 4. Wire Harness	- 65-8 65-5 -
"HI-Beam" does not light (One side).	1. Bulb 2. HI-LH Fuse or HI-RH Fuse 3. Dim Dip Lamp Relay 4. Wire Harness	- - 65-8 -
"Flash" does not light.	1. Bulb 2. Headlamp Dimmer Switch 3. Daytime Running Light Main Relay 4. Wire harness	- 65-8 65-5 -
Headlight is dark.	1. Bulb 2. Wire Harness	- -
Only one taillight comes on.	1. Bulb 2. Wire Harness	- -
Taillight does not come on (Headlight is normal).	1. TAIL Fuse 2. Taillamp Relay 3. Headlamp Dimmer Switch 4. Wire Harness	- 65-8 65-8 -
Taillight does not come on (Headlight does not light).	1. Headlamp Dimmer Switch 2. Wire Harness	65-8 -
Rear combination light does not come on.	1. Bulb 2. Wire Harness	- -

2. HEADLAMP BEAM LEVEL CONTROL SYSTEM

Symptom	Suspect Area	See page
Headlight beam level control system does not operate (All).	1. TAIL Fuse 2. Headlight Beam Level Control Switch 3. Headlight Beam Level Control Actuator 4. Wire Harness	- 65-8 - -
Headlight beam level control system does not operate (One side).	1. Headlight Beam Level Control Switch 2. Headlight Beam Level Control Actuator 3. Wire Harness	65-8 - -
Abnormal Operation (All).	1. Headlight Beam Level Control Switch 2. Headlight Beam Level Control Actuator 3. Wire Harness	65-8 - -
Abnormal Operation (One side).	1. Headlight Beam Level Control Switch 2. Headlight Beam Level Control Actuator 3. Wire Harness	65-8 - -

3. FOG LIGHT SYSTEM (w/o Daytime Running LIght System)

Symptom	Suspect Area	See page
Front fog light does not light up with light control SW HEAD (Headlight is normal.).	1. FOG Fuse 2. Fog Lamp Relay 3. Fog Lamp Switch 4. Wire Harness	- 65-8 65-8 -
Front fog light does not light up with light control SW HEAD (Headlight does not light).	1. *1 Other Parts 2. Wire Harness	- -
Only one front fog light does not light up.	1. Bulb 2. Wire Harness	- -

*1: Inspect Headlight System

(w/ Daytime Running Light System)

Symptom	Suspect Area	See page
Front fog light does not light up with light control SW HEAD (Headlight is normal.).	1. FOG Fuse 2. Fog Lamp Relay 3. Fog Lamp Switch 4. Wire Harness	- 65-8 65-8 -
Front fog light does not light up with light control SW HEAD (Headlight does not light).	1. *1 Other Parts 2. Wire Harness	- -
Only one front fog light does not light up.	1. Bulb 2. Wire Harness	- -

*1: Inspect Headlight System

4. TURN SIGNAL AND HAZARD WARNING SYSTEM

Symptom	Suspect Area	See page
"Hazard" and "Turn" do not light up.	1. GAUGE Fuse 2. TURN HAZ Fuse 3. Ignition Switch 4. Turn Signal Flasher Relay 5. Wire Harness	- - - 65-5 -
Hazard warning light does not light up (Turn is normal).	1. Hazard Warning Switch 2. Wire Harness	65-8 -
Turn signal does not light up (Hazard is normal).	1. Turn Signal Switch 2. Wire Harness	65-8 -
Turn signal does not light up in one direction.	1. Turn Signal Switch 2. Wire Harness	65-8 -
Only one bulb does not light up.	1. Bulb 2. Wire Harness	- -

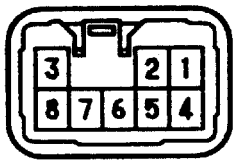
5. INTERIOR LIGHT SYSTEM

Symptom	Suspect Area	See page
All the lights do not come ON.	1. DOME Fuse	-
The light does not come ON when the driver's door is opened.	1. Driver's Door Courtesy Switch 2. Wire Harness	65-8 -
The light does not come ON when the passenger's door is opened.	1. Passenger's Door Courtesy Switch 2. Wire Harness	65-8 -
The light does not come on when the rear-right door is opened.	1. Rear-Right Door Courtesy Switch 2. Wire Harness	65-8 -
The light does not come on when the rear-left door is opened.	1. Rear-Left Door Courtesy Switch 2. Wire Harness	65-8 -
Only one of the bulbs comes ON.	1. Bulb	-
The illumination does not fade out when all the doors are closed.	1. Courtesy Switch 2. Wire Harness	65-8 -
The illumination does not fade out immediately when the ignition switch is turned to ACC or ON within 15 seconds after all the doors are closed.	1. Ignition Switch 2. GAUGE Fuse 3. Integration relay 4. Wire Harness	80-2, 80-4 - 65-8 -

650E0-01

ON-VEHICLE INSPECTION

Flasher Side



E15683

1. INSPECT TURN SIGNAL FLASHER CIRCUIT

(a) Disconnect the connector from turn signal flasher and inspect the connector on wire harness side as shown in the chart.

Standard:

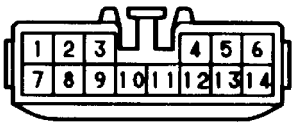
Tester connection	Condition	Specified condition
7 – Ground	Constant	Continuity
1 – Ground	Turn ignition switch ON	Battery voltage
4 –Ground	Constant	Battery voltage

(b) Connect the connector to turn signal flasher and inspect the wire harness side connector from the back side, as shown in the chart.

Standard:

Tester connection	Condition	Specified condition
2 – Ground	Hazard switch OFF → ON	0V → 0 ⇔ 9V (60 to 120 time per minutes)
2 – Ground	Turn signal switch (right turn) OFF → ON	0V → 0 ⇔ 9V (60 to 120 time per minutes)
3 – Ground	Hazard switch OFF → ON	0V → 0 ⇔ 9V (60 to 120 time per minutes)
3 – Ground	Turn signal switch (left turn) OFF → ON	0V → 0 ⇔ 9V (60 to 120 time per minutes)
5 – Ground	Turn signal switch (left turn) OFF → ON	Above 9 V → 0 V
6 – Ground	Turn signal switch (right turn) OFF → ON	Above 9 V → 0 V
8 – Ground	Hazard switch OFF → ON	Above 9 V → 0 V

Wire Harness Side:



I01326

2. INSPECT DAYTIME RUNNING LIGHT MAIN RELAY CIRCUIT

(a) Disconnect the connector from the relay and inspect the connector on the wire harness side.

Standard:

Tester connection	Condition	Specified condition
2 - Ground	Light control switch OFF	No continuity
2 - Ground	Light control switch TAIL or HEAD	Continuity
4 - Ground	Light control switch OFF or TAIL	No continuity
4 - Ground	Light control switch HEAD	Continuity
6 - Ground	Headlight dimmer switch FLASH	Continuity
8 - Ground	Engine running	Battery Positive Voltage
7 - Ground	Constant	Continuity
10 - Ground	Constant	Continuity
13 - Ground	Headlight dimmer switch FLASH or HI	Continuity
12 - Ground	Constant	Battery Positive Voltage
1 - Ground	Ignition switch OFF	No voltage
1 - Ground	Ignition switch ON	Battery Positive Voltage
9 - Ground	Terminal 3 ground	Battery Positive Voltage
11 - Ground	Rear fog light switch ON , terminal 3 ground	Battery Positive Voltage
5 - Ground	Constant	Battery Positive Voltage
14 - Ground	Terminal 5 ground	Battery Positive Voltage

If circuit is specified, try replacing the relay with a new one.
If circuit is not as specified, inspect the circuits connected to other parts.

3. ILLUMINATED ENTRY SYSTEM OPERATION CHECK

(a) The light that is lit in the illuminated entry system is explained below.

HINT:

Reference:

Key cylinder light, room light.

(b) Turn the ignition switch OFF open all the doors, and set the driver door in the lock condition.

(c) Unlock the driver door and open any one of the doors, and check that the room light goes on. Close the door and check that the room light goes off in about 15 sec..

(d) Turn the ignition switch ON and open and close any one of the doors. Check that the room light immediately goes off.

(e) Turn ignition switch OFF.

(f) Open and close any one of the doors to light the room light. Before the room light goes off in about 15 sec., turn the ignition switch ON. Check that the room light goes off immediately.

(g) Turn ignition switch OFF.

(h) Open and close any one of the doors to light the room light. Before the light goes off in about 15 sec., lock the driver door. Check that the light goes off immediately.

4. BATTERY SAVER OPERATION CHECK

(a) Remove the ignition key and close all the doors.

(b) Open the driver door to light the room light and leave it as it is. Check that the light goes off in about 20 min..

(c) After the room light goes off, close the driver door.

(d) Open the passenger door or one of the rear doors to light the room light. Open the driver door within 20 min.. Check that the room light goes off in about 20 min. from the time when the driver door is opened.

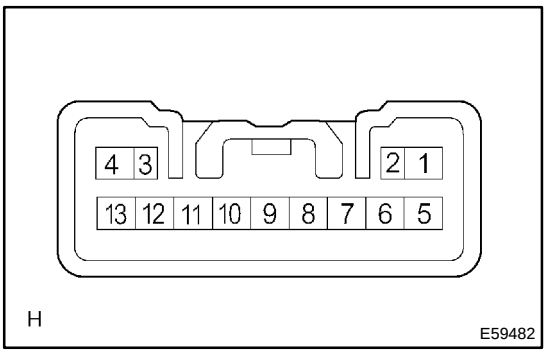
(e) Close all the doors. With the ignition key being inserted, open any one of the doors room light the room light. In this condition, remove the ignition key. Check that the room light goes off in about 20 min..

(f) Close all the doors.

(g) Open any one of the doors to light the room light. Insert the ignition key within 20 min.. Check that the room light goes off in about 20 min. form the time when the ignition key is inserted.

650E1-01

INSPECTION



1. HEADLAMP DIMMER SWITCH ASSY(W/ FOG LIGHT)

(a) Inspect light control switch continuity.
(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
OFF	-	No continuity
TAIL	10 - 13	Continuity
HEAD	10 - 13	Continuity
HEAD	11 - 12	Continuity

(b) Inspect headlight dimmer switch continuity.
(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
FLASH	8 - 9 - 11	Continuity
LOW BEAM	8 - 11	Continuity
HI BEAM	8 - 9 - 11	Continuity

HINT:
Turn Headlight dimmer switch to "HEAD" when checking "LOW-BEAM" and "HI BEAM"

(c) Inspect turn signal switch continuity.
(1) Check that the continuity between terminals at each switch position, as shown in the chart.

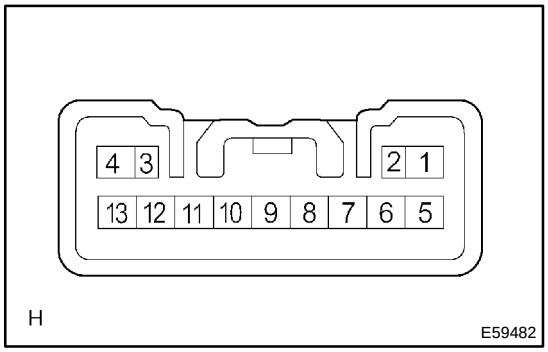
Standard:

Switch operation	Tester connection	Specified condition
Right turn	6 - 7	Continuity
Neutral	-	No continuity
Left turn	6 - 5	Continuity

(d) Inspect front & rear fog light switch continuity.
(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
OFF	2 - 4	No continuity
Front fag	2 - 4	Continuity
Front fog + Rear fog	2 - 4 - 3	Continuity



2. HEADLAMP DIMMER SWITCH ASSY(W/O FOG LIGHT)

(a) Inspect light control switch continuity.

(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
OFF	-	No continuity
TAIL	10 - 13	Continuity
HEAD	10 - 13	Continuity
HEAD	11 - 12	Continuity

(b) Inspect headlight dimmer switch continuity.

(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
FLASH	8 - 9 - 11	Continuity
LOW BEAM	8 - 11	Continuity
HI BEAM	8 - 9 - 11	Continuity

HINT:
Turn headlight dimmer switch to "HEAD" when checking "LOW BEAM" and "HI BEAM"

(c) Inspect turn signal switch continuity.

(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

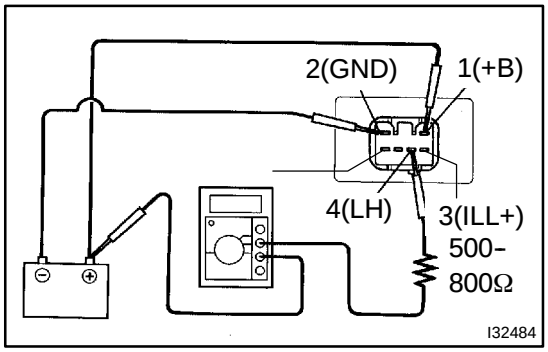
Switch operation	Tester connection	Specified condition
Right turn	6 - 7	Continuity
Neutral	-	No continuity
Left turn	6 - 5	Continuity

(d) Inspect rear fog light switch continuity.

(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
OFF	-	No continuity
ON	3 - 4	Continuity



3. HEADLAMP LEVELING SWITCH

(a) Inspect headlamp leveling switch.
(1) Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2.
(2) Measure the resistance between terminal 4 and body ground.

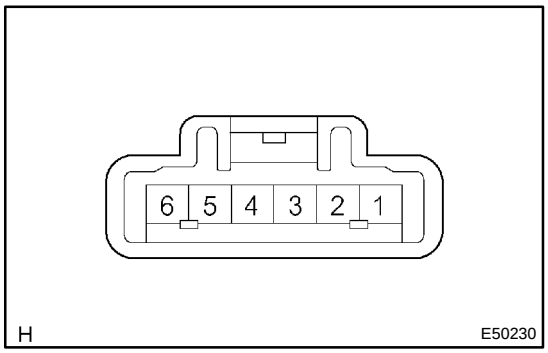
Standard:

Switch position	resistance (Ω)
0	1.4-1.6
1	1.6-1.7
2	1.7-1.8
3	1.8-2.0
4	2.0-2.1
5	2.1-2.2

(b) Inspect switch illumination.
(1) Connect the positive (+) lead from the battery to terminal 3 and negative (-) lead to terminal 6, and check that the illumination light up.

4. BACK UP LAMP SWITCH ASSY

(a) Inspect back-up lamp switch continuity.
(1) Check continuity exists between terminals, when switch operation.
Standard:
OFF (When ball is not pressed): No continuity
ON (when ball is pressed): Continuity



5. HAZARD WARNING SIGNAL SWITCH ASSY

(a) Inspect hazard warning signal switch continuity
(1) Check that the continuity exists between terminals 3 and 4, when switch is operated.
Standard:
ON: Continuity
OFF: No continuity
(b) Inspect illumination operation.
(1) Connect the positive (+) lead from the battery to terminal 6 and negative (-) lead to terminal 5, then check that the illumination lights up.

6. FRONT DOOR COURTESY LAMP SWITCH ASSY

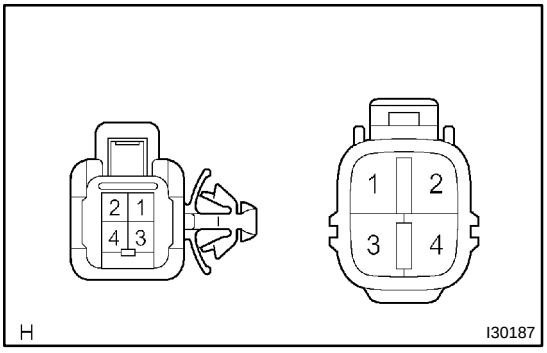
(a) Inspect front door courtesy lamp switch continuity.
(1) Check that the continuity exists between terminal 1 and body ground, when switch is operated.
Standard:
ON (When shaft is pressed): No continuity
OFF (When shaft is not pressed): Continuity

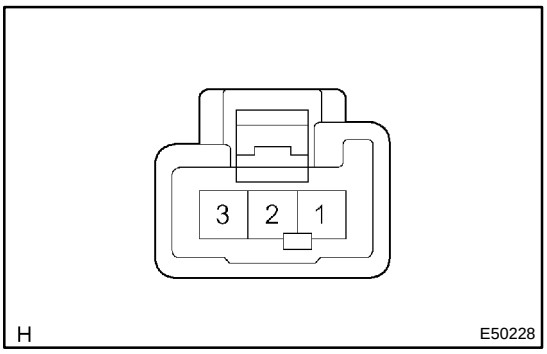
7. REAR DOOR COURTESY LAMP SWITCH ASSY

(a) Inspect rear door courtesy lamp switch continuity.
(1) Check that the continuity exists between terminal 1 and body ground, when switch is operated.
Standard:
ON (When shaft is pressed): No continuity
OFF (When shaft is not pressed): Continuity

8. LUGGAGE COMPARTMENT ROOM COURTESY LAMP SWITCH ASSY

(a) Inspect rear door courtesy lamp switch continuity.
(1) Check that the continuity exists between terminal 1 and bracket, when switch is operated.
Standard:
ON (When shaft is pressed): No continuity
OFF (When shaft is not pressed): Continuity





9. BACK DOOR LOCK ASSY(WAGON/HATCH BACK BODY TYPE)

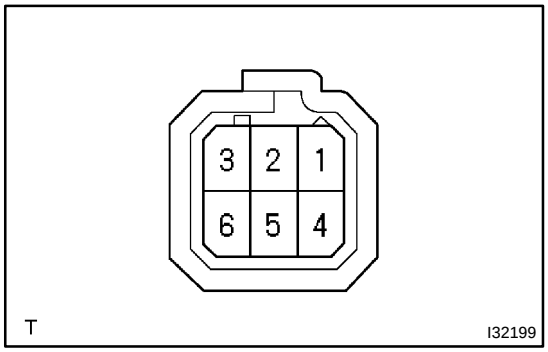
(a) Inspect back door courtesy lamp switch continuity.
(1) Check that the continuity exists between terminal A-1 and A-2, when switch is operated.
Standard:
ON (When hook is fully engaged condition): No continuity
OFF (When hook is released condition): Continuity

10. ROOM LAMP ASSY NO.1

(a) Inspect room lamp No. 1 continuity.
(1) Check that the continuity between terminals at each switch position, as shown in the chart.

Standard:

Switch operation	Tester connection	Specified condition
OFF	-	No continuity
DOOR	1 - 2	Continuity
ON	2 - Body ground	Continuity



11. MAP LAMP ASSY(W/ SLIDING ROOF)

(a) Inspect map lamp continuity.
(1) Check that the continuity exists between terminals 2 and 6, when switch is operated.
Standard:
ON: Continuity
OFF: No continuity

12. MAP LAMP ASSY(W/O SLIDING ROOF)

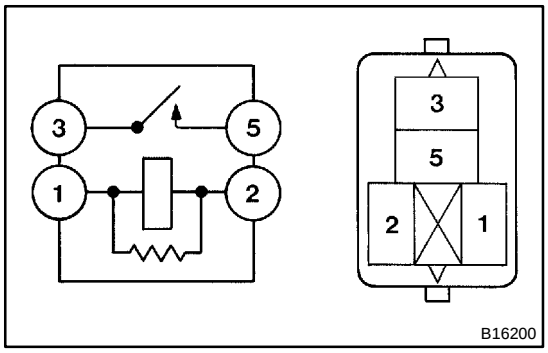
(a) Inspect map lamp continuity.
(1) Check that the continuity exists between terminals, when switch is operated.
Standard:
ON: Continuity
OFF: No continuity

13. REAR ROOM LAMP ASSY LH

(a) Check that the continuity exists between terminals.
Standard: Continuity exists

14. LUGGAGE COMPARTMENT LAMP ASSY NO.1(SEDAN BODY TYPE)

(a) Check that the continuity exists between terminals.
Standard: Continuity exists

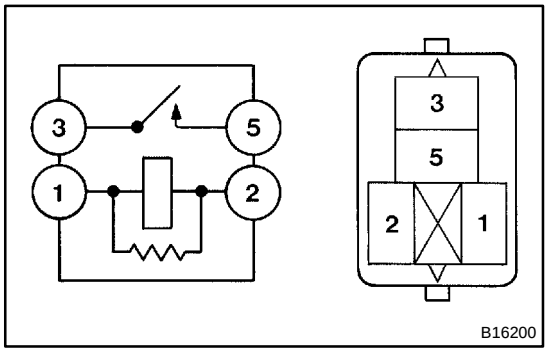


15. HEADLAMP RELAY(W/ DAY TIME RUNNING LIGHT)

(a) Inspect headlamp relay continuity.
(1) Check that the continuity exists between terminals.
Standard:

Tester connection	Specified condition
1 - 2	Continuity
3 - 5	No continuity

(2) Apply battery voltage (10 – 14 V) between terminals 1 and 2, then check that the continuity exists between terminals 3 and 5.
Standard: Continuity exists



16. FOG LAMP RELAY(W/ DAY TIME RUNNING LIGHT)

(a) Inspect fog lamp relay continuity.

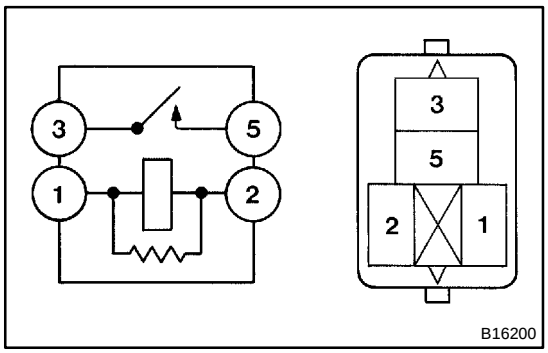
(1) Check that the continuity exists between terminals.

Standard:

Tester connection	Specified condition
1 - 2	Continuity
3 - 5	No continuity

(2) Apply battery voltage (10 – 14 V) between terminals 1 and 2, then check that the continuity exists between terminals 3 and 5.

Standard: Continuity exists



17. TAIL LAMP RELAY(W/ DAY TIME RUNNING LIGHT)

(a) Inspect tail lamp relay continuity.

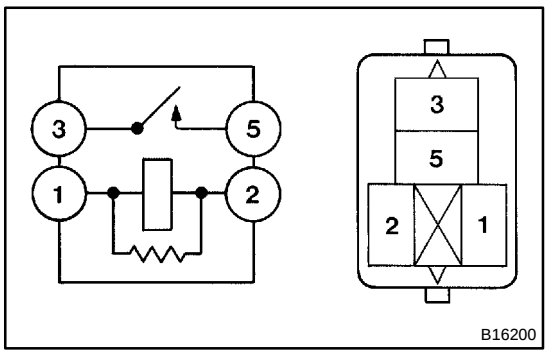
(1) Check that the continuity exists between terminals.

Standard:

Tester connection	Specified condition
1 - 2	Continuity
3 - 5	No continuity

(2) Apply battery voltage (10 – 14 V) between terminals 1 and 2, then check that the continuity exists between terminals 3 and 5.

Standard: Continuity exists



18. DIM DIP LAMP RELAY

(a) Inspect dim dip lamp relay continuity.

(1) Check that the continuity exists between terminals.

Standard:

Tester connection	Specified condition
1 - 2	Continuity
3 - 5	No continuity

(2) Apply battery voltage (10 – 14 V) between terminals 1 and 2, then check that the continuity exists between terminals 3 and 5.

Standard: Continuity exists

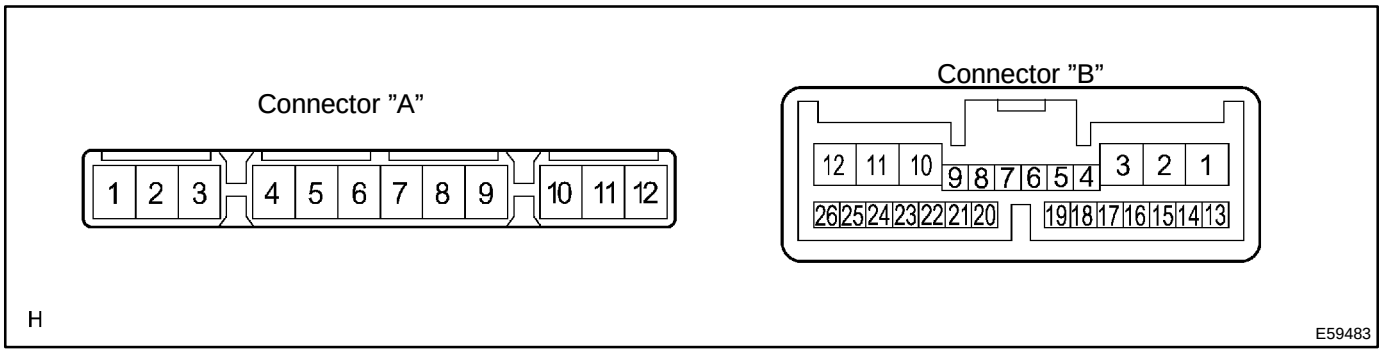
19. INTEGRATION RELAY(W/ DOUBLE DOOR LOCK)

(a) Inspect battery saver operation.

(1) Connect the positive (+) lead from the battery to terminal A–1 and negative (–) lead to terminal A–9.

(2) Check that the battery voltage (10 – 14 V) generates between terminals A–12 and A–9, then connect the negative (–) lead from the battery to terminal A–5 and A–6.
(3) Disconnect the negative (–) lead from the battery to terminal A–5 and A–6, or connect the positive (+) lead from the battery to terminal B–19, or connect the positive (+) lead from the battery to terminal A–10 then check the no voltage between terminals A12 and A–9.

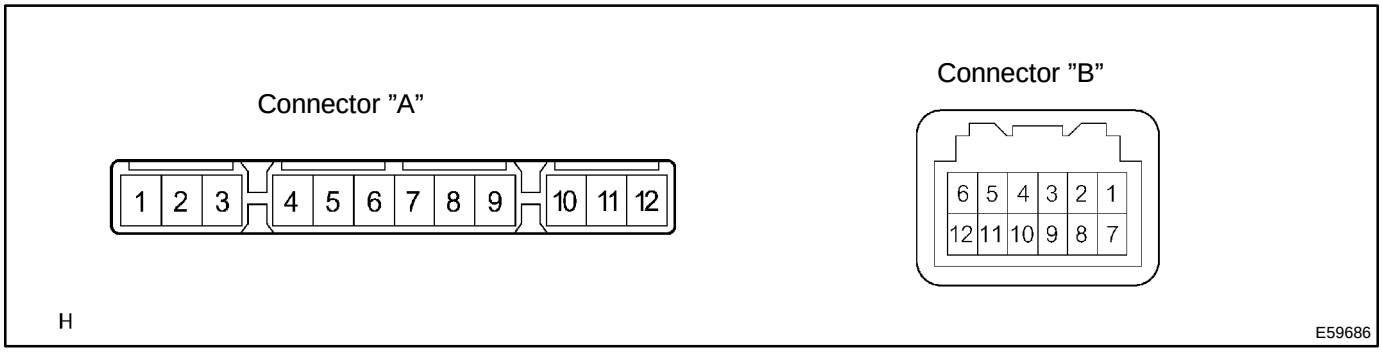
(b) Inspect battery saver operation.
(1) Connect the positive (+) lead from the battery to terminal A–1 and negative (–) lead to terminal A–9.
(2) Connect the negative (–) lead from the battery to terminals A–5 and A–6, then check that the battery voltage (10 – 14 V) generates between terminals A–12 and A–9.
(3) After 20 min., check that the no voltage between terminals A–12 and A–9.



20. INTEGRATION RELAY(W/O DOUBLE DOOR LOCK)

(a) Check illuminated entry operation.
(1) Connect the positive (+) lead from the battery to terminal A–1 and negative (–) lead to terminal A–9.
(2) Check that the battery voltage (10 – 14 V) generates between terminals A–12 and A–9, then connect the negative (–) lead from the battery to terminal A–5 and A–6.
(3) Disconnect the negative (–) lead from the battery to terminal A–5 and A–6, or connect the positive (+) lead from the battery to terminal B–5, or connect the positive (+) lead from the battery to terminal A–10 then check the no voltage between terminals A12 and A–9.

(b) Inspect battery saver operation.
(1) Connect the positive (+) lead from the battery to terminal A–1 and negative (–) lead to terminal A–9.
(2) Connect the negative (–) lead from the battery to terminals A–5 and A–6, then check that the battery voltage (10 – 14 V) generates between terminals A–12 and A–9.
(3) After 20 min., check that the no voltage between terminals A–12 and A–9.

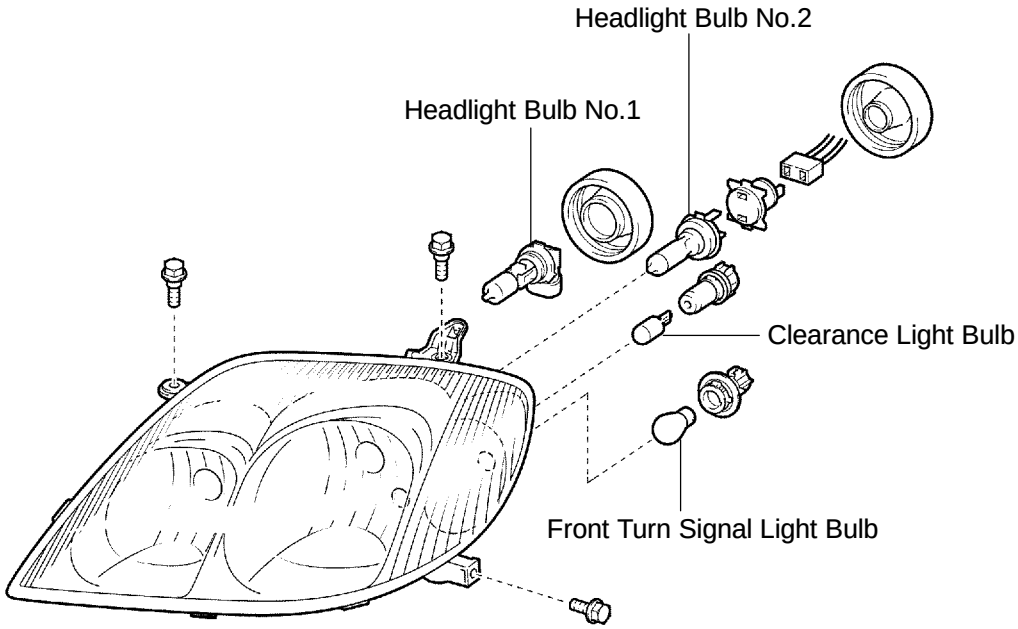


LIGHTING

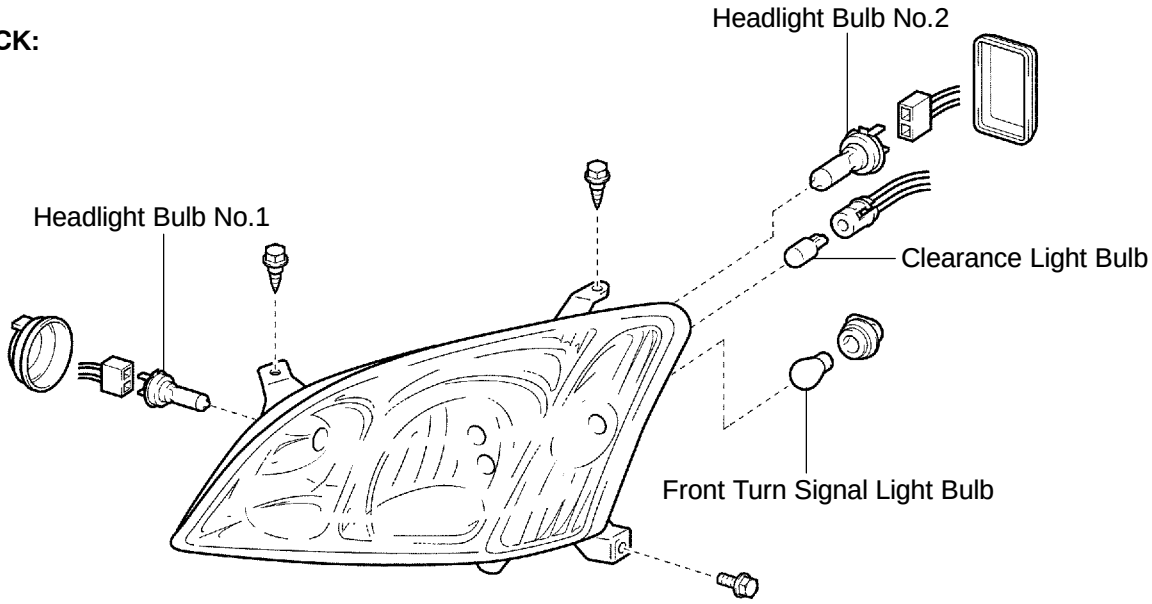
COMPONENTS

650E2-01

SEDAN/WAGON:



HATCHBACK:



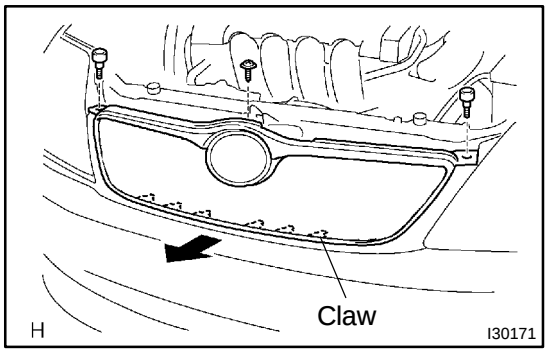
P

E59796

HEADLAMP UNIT ASSY LH (SEDAN/STATION WAGON)

REPLACEMENT

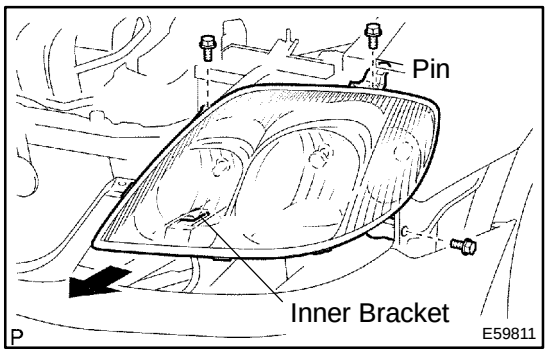
6501B-02



1. REMOVE RADIATOR GRILLE

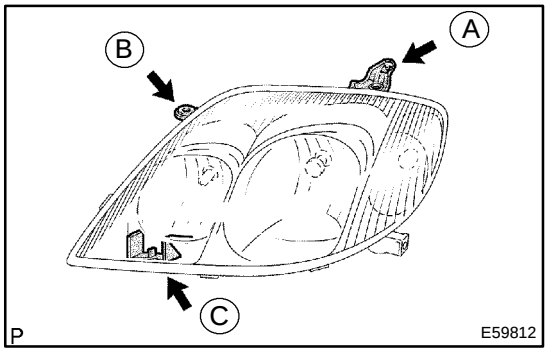
(a) Remove the screw and 2 bolts.
(b) Pull out the radiator grill forward, then release the 6 claws.

NOTICE:
Be careful not to damage the 6 claws.



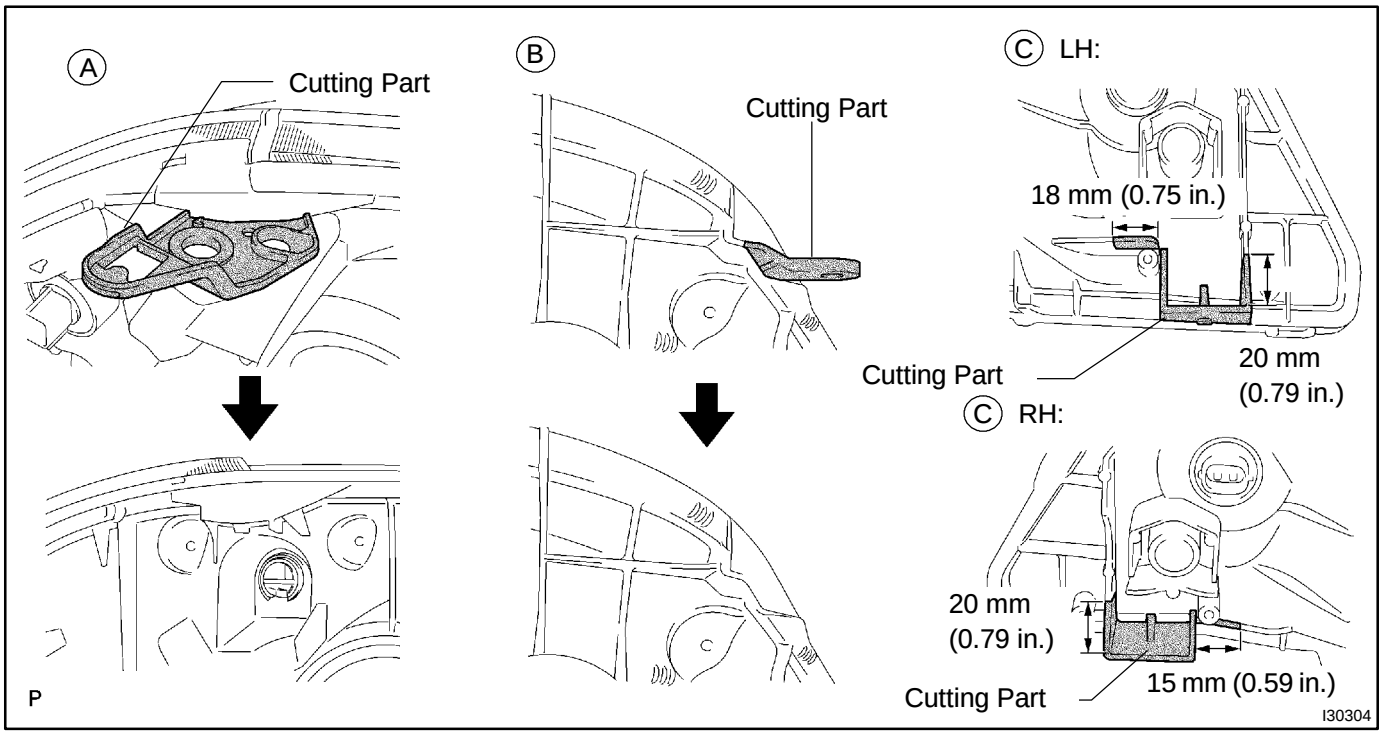
2. REMOVE HEADLAMP UNIT ASSY LH

(a) Disconnect the engine under cover, front fender liner LH and front bumper cover.
(b) Remove the 3 bolts.
(c) Disconnect the connectors.
(d) Pull out the headlight unit forward, then disconnect the bracket of body side.
(e) Remove the sockets cover and bulbs.



3. INSTALL HEADLAMP UNIT ASSY LH

(a) If the shown part of the headlight unit is damaged, the headlight unit can be reinstalled to the body by installing a bracket to it.



(1) After cutting off the damaged part (shaded part in the illustration) of the installing part, properly form it using a sandpaper, etc.

(2) Install retainers or bracket (supply parts) to the boss of the headlight unit with screws.

Supply part:

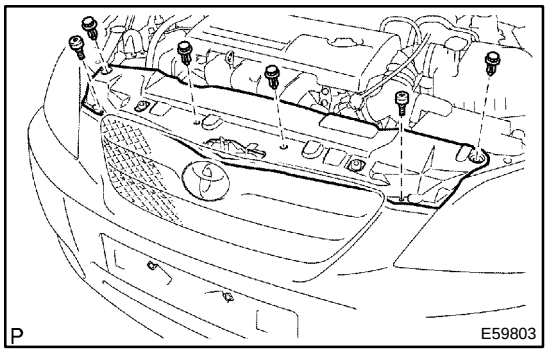
LH/RH	Position	Part No.
LH	"A"	81194-12010
LH	"B"	81196-12010
LH	"C"	81198-12010
RH	"A"	81193-12010
RH	"B"	81195-12010
RH	"C"	81197-12010

4. ADJUST HEADLIGHT AIM ONLY (See page 65-20)

LH HEADLAMP ASSY (HATCHBACK)

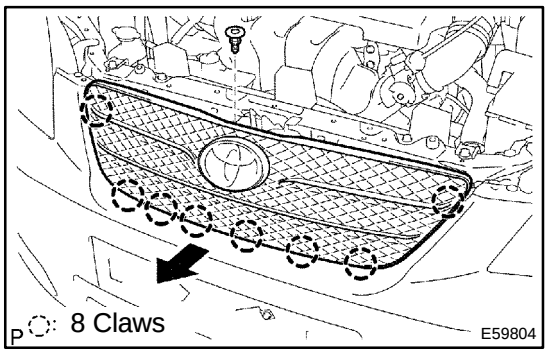
REPLACEMENT

650EB-01



1. REMOVE RADIATOR SUPPORT OPENING COVER

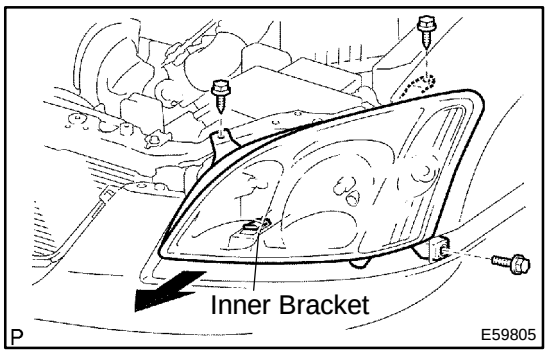
(a) Remove the 2 hood stopper and 4 clips.
(b) Remove the radiator support opening cover.



2. REMOVE RADIATOR GRILLE

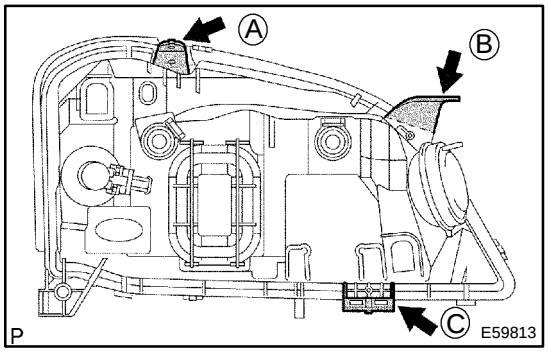
(a) Remove the clip.
(b) Pull out the radiator grill forward, then release the 8 claws.

NOTICE:
Be careful not to damage the 8 claws.



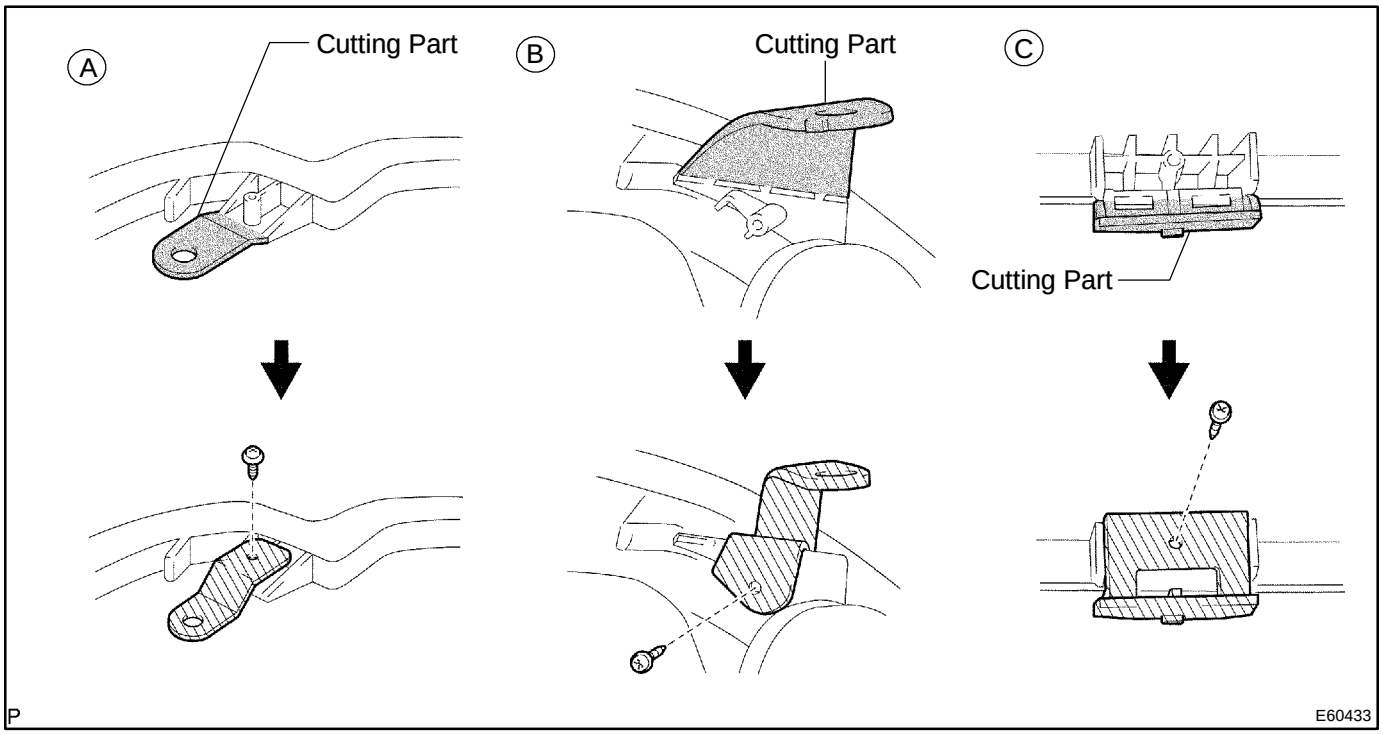
3. REMOVE LH HEADLAMP ASSY

(a) Disconnect the engine under cover, front fender liner LH and front bumper cover.
(b) Remove the bolt and 2 screws.
(c) Disconnect the connectors.
(d) Pull out the headlight assy forward, then disconnect the bracket of body side.



4. INSTALL LH HEADLAMP ASSY

(a) If the shown part of the headlight unit is damaged, the headlight unit can be reinstalled to the body by installing a bracket to it.



(1) After cutting off the damaged part (shaded part in the illustration) of the installing part, properly form it using a sandpaper, etc.

(2) Install retainers or bracket (supply parts) to the boss of the headlight unit with screws.

Supply part:

LH/RH	Position	Part No.
LH	"A"	81193-02020
LH	"B"	81196-02020
LH	"C"	81197-02020
RH	"A"	81193-02020
RH	"B"	81195-02030
RH	"C"	81197-02020

5. ADJUST HEADLIGHT AIM ONLY (See page 65-20)

650E3-01

ADJUSTMENT

1. ADJUST HEADLIGHT AIM ONLY

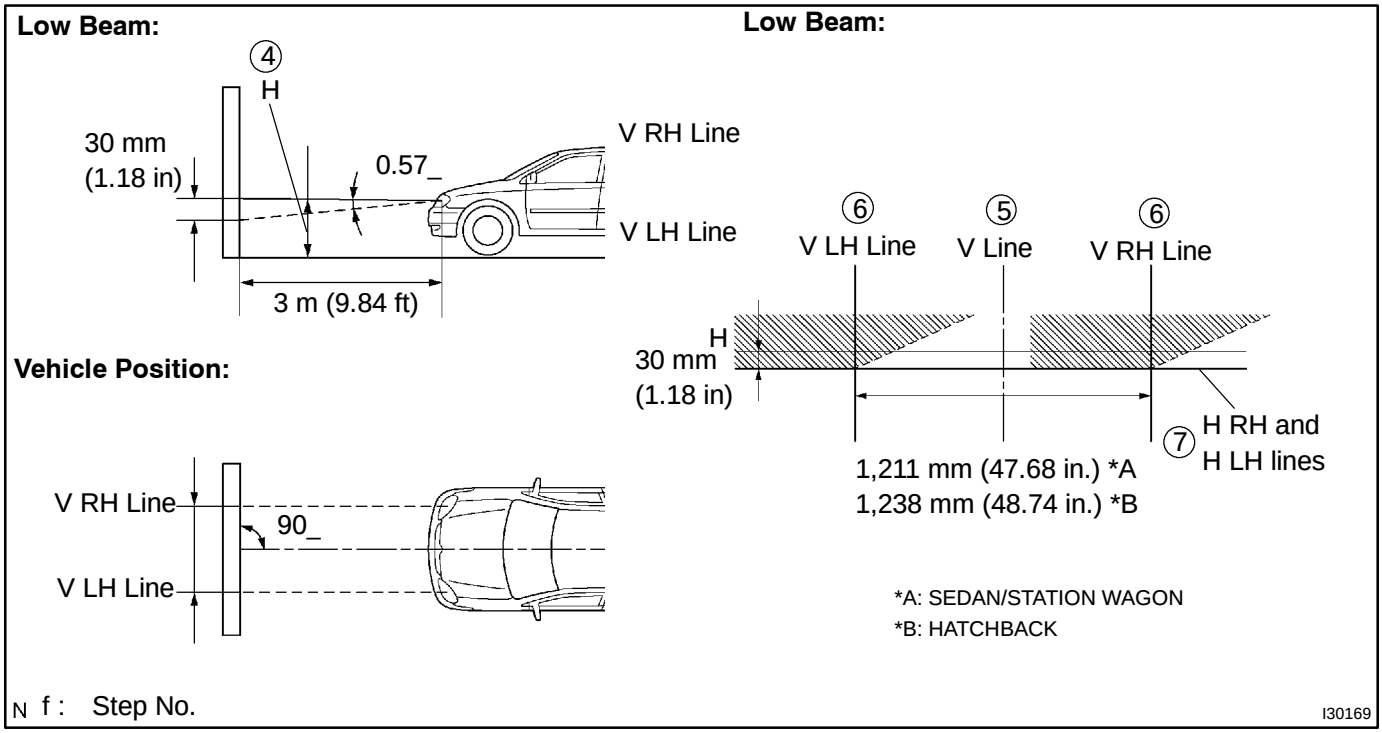
(a) Place the vehicle in the following conditions.
- The area around the headlight is not deformed.
- The vehicle is parked on a level surface.
- Tire inflation pressure is in the specified value.
- A driver is in the driver's seat and the vehicle is in a state ready for driving (with a tank full).
- The vehicle has been bounced several times.

(b) Check the headlight aiming.
(1) Prepare a thick white paper.
(2) Stand the paper perpendicular to the ground at the position 9.84 ft away from the headlights.
(3) Ensure that the center line of the vehicle and the paper face forms a 90−degree angle as shown in the illustration.
(4) Draw a horizontal line (H line) on the paper, showing where the headlights should strike.
(5) Draw a vertical line (V line) to where the center line of the vehicle is to be.
(6) Draw 2 vertical lines to where the both headlights should strike (V RH and V LH lines).
(7) Draw a horizontal line (by connecting the both low beam center marks) to where the headlights should strike (H RH and H LH lines).
(8) Take appropriate measures to prevent any influence of other lights.
(9) Set the headlights leveling position to "0" position and adjust the angle of the headlight axis.

HINT:

The H RH and H LH line is 0.57˚ below the horizontal line (H line) of the light axis.

(10) Start the engine.
(11) Turn the headlights ON.
(12) Check that the headlights properly strike the position shown in the illustration.
(13) If not, adjust the lights in the vertical or horizontal direction.

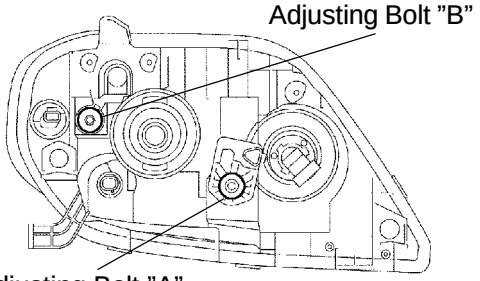


N f : Step No.

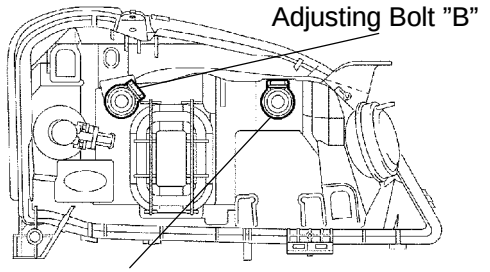
I30169

HINT:
- As shown in the illustration, adjust each aim of the RH and LH lights.
- Since the horizontal direction is impossible to adjust, the value * of the "Low Beam" aim is reference value.

SEDAN/STATION WAGON:



HATCHBACK:



(c) When adjusting the headlight aim in the horizontal direction:
Using adjusting bolt B, adjust the headlight aim to be within the specified range.

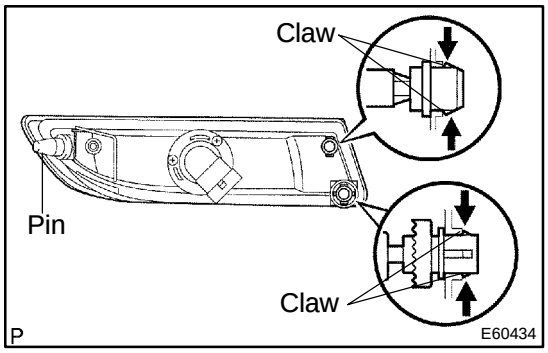
(d) When adjusting it in the vertical direction:
Using adjusting bolt A, adjust the headlight aim to be within the specified range.

HINT:
The optical aim moves upward when turning a screwdriver clockwise, while it moves downward when turning a screwdriver counterclockwise.

FOG LAMP LAMP UNIT LH (SEDAN/STATION WAGON)

REPLACEMENT

65011-02



1. REMOVE FOG LAMP LAMP UNIT LH

(a) Release the 2 claws from the front bumper and pull out the fog light, as shown in the illustration.
(b) Remove the fog light assy.
(c) Remove the blub and fog light unit.

2. ADJUST FOG LIGHT AIM (See page 65-23)

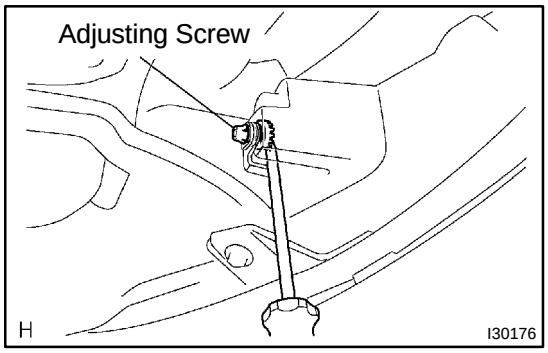
65012-02

ADJUSTMENT

1. PUT VEHICLE THESE CONDITIONS

(a) Tire inflation pressure is the specified value (See page 28-1).

(b) Start the engine.



2. ADJUST FOG LIGHT AIM

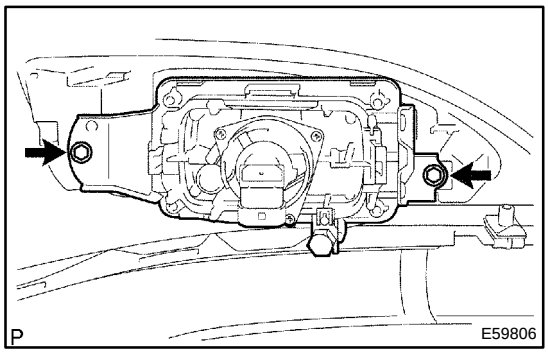
(a) The fog light aim can be adjusting by moving the aiming screw in the vertical direction.

FOG LAMP ASSY LH (HATCHBACK)

650E4-01

REPLACEMENT

1. REMOVE FRONT FENDER LINER LH
(See page 76-5)



2. REMOVE FOG LAMP ASSY LH

(a) Disconnect the connector.
(b) Remove the 2 bolts.
(c) Remove the fog light assy.

3. ADJUST FOG LIGHT AIM (See page 65-25)

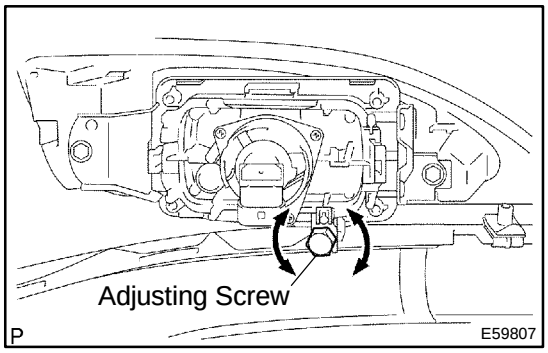
650E5-02

ADJUSTMENT

1. PUT VEHICLE THESE CONDITIONS

(a) Tire inflation pressure is the specified value (See page 28-1).

(b) Start the engine.



2. ADJUST FOG LIGHT AIM

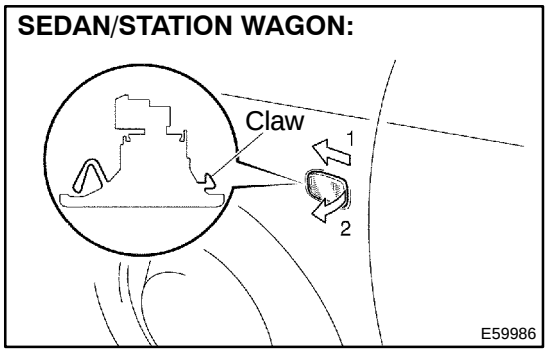
(a) The fog light aim can be adjusting by moving the aiming screw in the vertical direction.

SIDE TURN SIGNAL LAMP LENS LH

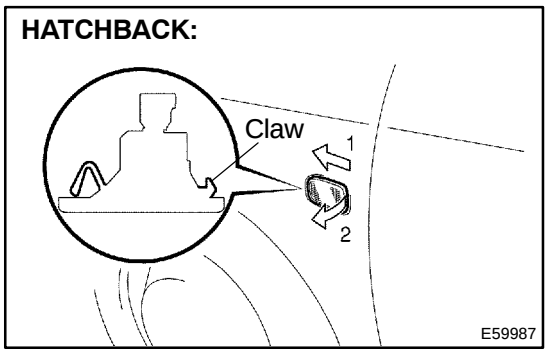
REPLACEMENT

650E6-01

SEDAN/STATION WAGON:



HATCHBACK:



1. REMOVE SIDE TURN SIGNAL LAMP LENS LH

(a) Pull the side turn signal light lens LH as shown in the illustration, and release the claw.

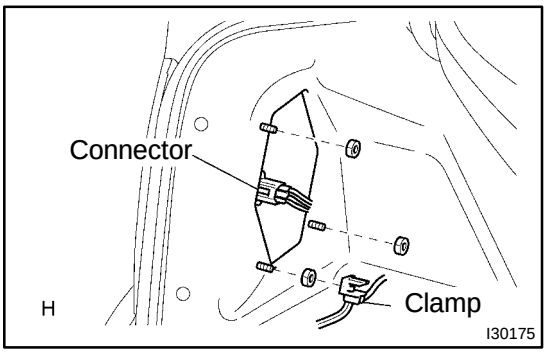
(b) Remove the socket and side turn signal light assy.

REAR COMBINATION LAMP LENS LH (SEDAN)

65013-02

REPLACEMENT

1. REMOVE REAR COMBINATION LAMP SERVICE COVER LH



2. REMOVE REAR COMBINATION LAMP LENS LH

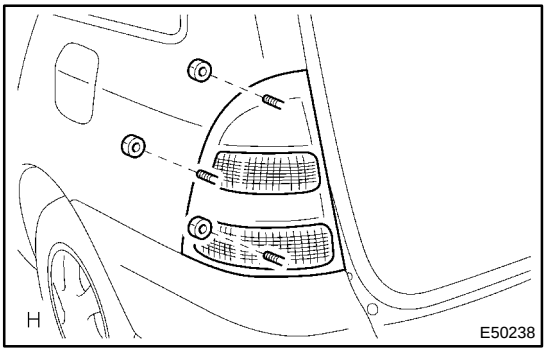
(a) Disconnect the connector and wire harness clamp.
(b) Remove the 3 nut and rear combination light.
(c) Remove the bulb socket and lens.

REAR COMBINATION LAMP LENS LH (STATION WAGON)

650E7-01

REPLACEMENT

1. REMOVE DECK SIDE TRIM COVER SUB-ASSY LH



2. REMOVE REAR COMBINATION LAMP LENS LH

(a) Disconnect the connector.
(b) Remove the 3 nuts and rear combination light.
(c) Remove the 3 bulb socket and lens.

REAR COMBINATION LAMP LENS LH (HATCHBACK)

65014-03

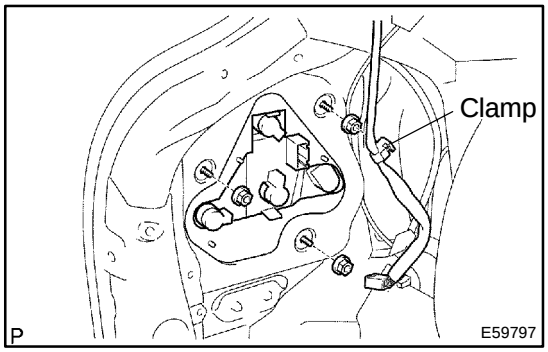
REPLACEMENT

1. REMOVE REAR DOOR SCUFF PLATE LH
   (5 DOOR HATCHBACK: See page 76-56)
2. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH

3. REMOVE BACK DOOR WEATHERSTRIP

4. REMOVE REAR SEAT CUSHION ASSY LH (See page 72-26)
5. REMOVE REAR SEAT BACK ASSY LH (See page 72-26)
6. REMOVE REAR SIDE SEAT BACK ASSY LH
   (See page 72-26)
7. REMOVE REAR FLOOR CARPET ASSY

8. REMOVE DECK FLOOR BOX RH
   (3 DOOR HATCHBACK: See page 76-48)
   (5 DOOR HATCHBACK: See page 76-57)
9. REMOVE DECK FLOOR BOX LH
   (3 DOOR HATCHBACK: See page 76-48)
   (5 DOOR HATCHBACK: See page 76-57)
10. REMOVE DECK TRIM COVER REAR
    (3 DOOR HATCHBACK: See page 76-49)
    (5 DOOR HATCHBACK: See page 76-58)
11. REMOVE DECK TRIM SIDE BOARD LH
    (3 DOOR HATCHBACK: See page 76-48)
    (5 DOOR HATCHBACK: See page 76-58)



12. REMOVE REAR COMBINATION LAMP LENS LH

(a) Disconnect the connector and wire harness clamp.
(b) Remove the 3 nuts and rear combination light.
(c) Remove the 4 bulb socket and lens.

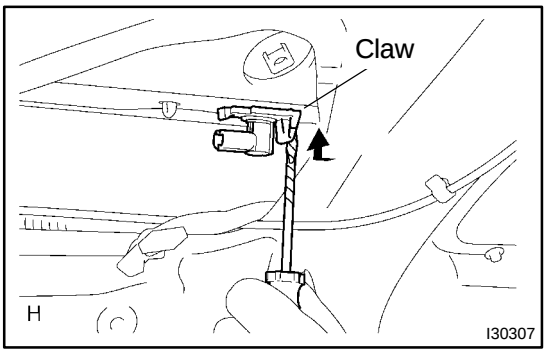
13. INSTALL REAR SEAT BACK ASSY LH (See page 72-28)
14. INSTALL REAR SIDE SEAT BACK ASSY LH
    (See page 72-26)

LICENSE PLATE LAMP LENS (SEDAN)

65015-02

REPLACEMENT

1. REMOVE LUGGAGE COMPARTMENT LOCK CYLINDER & KEY SET
(See page 76-25)
2. REMOVE LUGGAGE COMPARTMENT DOOR GARNISH OUTSIDE
(See page 76-25)



3. REMOVE LICENSE PLATE LAMP LENS

(a) Disconnect the connector.
(b) Using a screwdriver, remove the licence plate light assy.

HINT:
Tape the screwdriver tip before use.

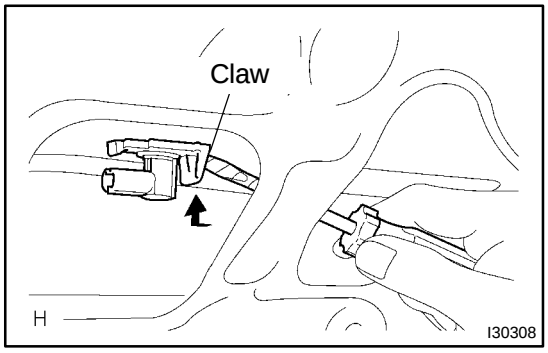
(c) Remove the bulb socket and licence plate light lens.

LICENSE PLATE LAMP LENS (STATION WAGON)

650E8-01

REPLACEMENT

1. REMOVE BACK DOOR TRIM BOARD ASSY
(See page 75-55)
2. REMOVE BACK DOOR OUTSIDE HANDLE
(See page 75-55)
3. REMOVE BACK DOOR LOCK CYLINDER & KEY SET
(See page 75-55)
4. REMOVE BACK DOOR GARNISH OUTSIDE
(See page 76-26)



5. REMOVE LICENSE PLATE LAMP LENS

(a) Disconnect the connector.
(b) Using a screwdriver, remove the license plate light assy.

HINT:
Tape the screwdriver tip before use.

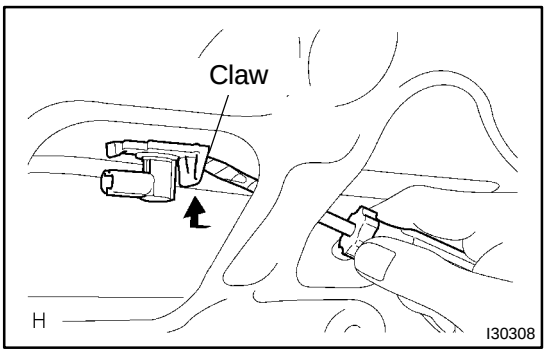
(c) Remove the bulb socket and license plate light lens.

LICENSE PLATE LAMP LENS (HATCHBACK)

65016-02

REPLACEMENT

1. REMOVE BACK DOOR TRIM PANEL ASSY UPPER
(See page 75-58)
2. REMOVE BACK DOOR SIDE GARNISH RH
(See page 75-58)
3. REMOVE BACK DOOR SIDE GARNISH LH
(See page 75-58)
4. REMOVE BACK DOOR TRIM BOARD ASSY
(See page 75-58)
5. REMOVE BACK DOOR OUTSIDE HANDLE
(See page 75-59)
6. REMOVE LUGGAGE COMPARTMENT LOCK CYLINDER & KEY SET
(See page 75-59)
7. REMOVE LUGGAGE COMPARTMENT DOOR GARNISH SUB-ASSY OUTSIDE
(See page 76-27)



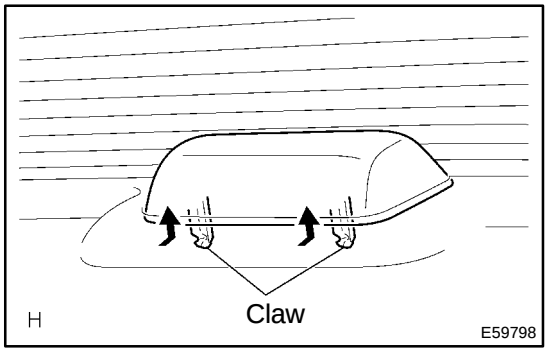
8. REMOVE LICENSE PLATE LAMP LENS

(a) Disconnect the connector.
(b) Using a screwdriver, remove the license plate light assy.
HINT:
Tape the screwdriver tip before use.
(c) Remove the bulb socket and license plate light lens.

CENTER STOP LAMP ASSY (SEDAN)

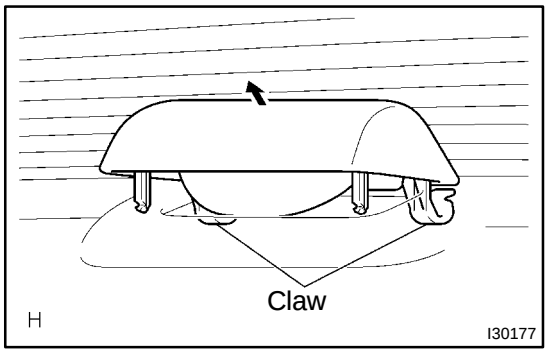
REPLACEMENT

65017-02



1. REMOVE CENTER STOP LAMP ASSY

(a) Release the 2 claws, as shown in the illustration.

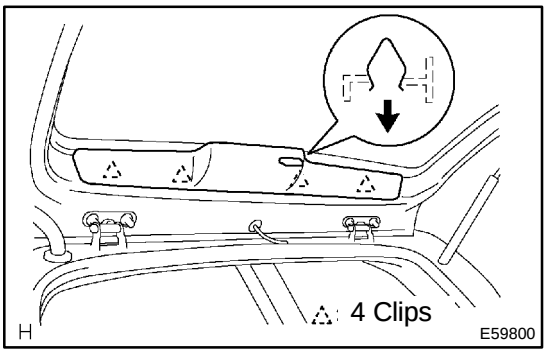


(b) Release the 2 claws and remove the center stop light assy, then disconnect the connector, as shown in the illustration.

CENTER STOP LAMP ASSY (STATION WAGON)

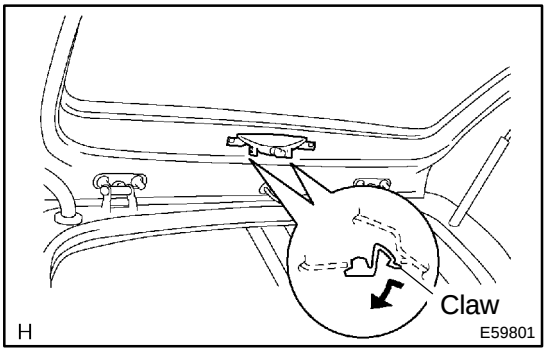
650E9-01

REPLACEMENT



1. REMOVE BACK DOOR GARNISH CENTER

(a) Release the 4 fitting clip and center garnish.



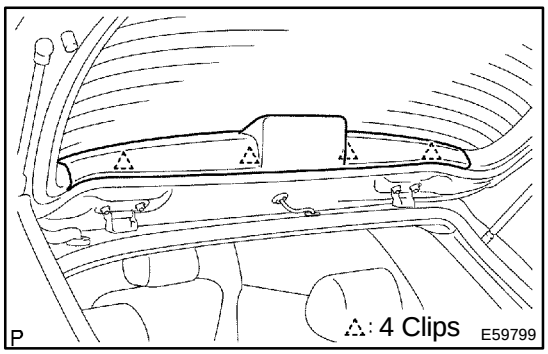
2. REMOVE CENTER STOP LAMP ASSY

(a) Disconnect the connector.
(b) Release the 2 claws and center stop light assy.

CENTER STOP LAMP ASSY (HATCHBACK)

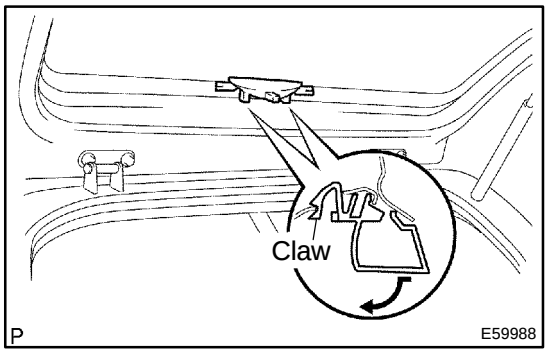
650EA-01

REPLACEMENT



1. REMOVE BACK DOOR TRIM PANEL ASSY UPPER

(a) Release the 4 fitting clip and center garnish.



2. REMOVE CENTER STOP LAMP ASSY

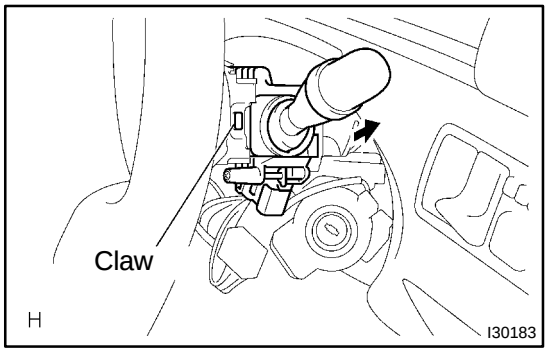
(a) Disconnect the connector.
(b) Release the 2 claws and center stop light assy.

HEADLAMP DIMMER SWITCH ASSY

65018-03

REPLACEMENT

1. REMOVE STEERING COLUMN COVER
(See page 50-7)



2. REMOVE HEADLAMP DIMMER SWITCH ASSY

(a) Disconnect the connector.
(b) Release the claw and pull out the head light dimmer switch assy.

WIPER & WASHER

WIPER AND WASHER SYSTEM 66-1
PROBLEM SYMPTOMS TABLE 66-1
ON-VEHICLE INSPECTION 66-2/3
INSPECTION 66-4/9
WINDSHIELD WIPER MOTOR ASSY 66-10
REPLACEMENT 66-10/12
WIPER RUBBER LH 66-13
REPLACEMENT 66-13
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(STATION WAGON) 66-14
REPLACEMENT 66-14/15
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(HATCHBACK) 66-16
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(STATION WAGON/HATCHBACK) 66-18
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WIPER AND WASHER SYSTEM

PROBLEM SYMPTOMS TABLE

6600K-02

WIPER AND WASHER SYSTEM

Symptom	Suspect Area	See page
Front wiper and washers do not operate.	1. IG Relay 2. WIP Fuse (I/P J/B) 3. Front Wiper Switch 4. Wire Harness	- - 66-2 -
Front wipers do not operate in LO or HI.	1. Front Wiper Switch 2. Front Wiper Motor 3. Wire Harness	66-4 66-4 -
Front wipers do not operate in INT.	1. Front Wiper Switch 2. Front Wiper Motor 3. Wire Harness	66-4 66-4 -
Front Washer motor does not operate.	1. WASH Fuse (I/P J/B) 2. Front Washer Switch 3. Front Washer Motor 4. Wire Harness	- 66-4 66-4 -
Front Wipers do not operate when washer switch in ON.	1. Front Wiper Switch 2. Front Wiper Motor 3. Wire Harness	66-4 66-4 -
Rear wiper and washers do not operate.	1. IG Relay 2. WIP Fuse (I/P J/B) 3. Rear Wiper Switch 4. Wire Harness	- - 66-4 -
Rear wipers do not operate in INT.	1. Rear Wiper Switch 2. Rear Wiper Motor 3. Wire Harness	66-4 66-4 -
Rear washer motor does not operate.	1. WASH Fuse (I/P J/B) 2. Rear Washer Switch 3. Rear Washer Motor 4. Wire Harness	- 66-4 66-4 -
Rear wipers do not operate when washer switch in ON.	1. Rear Wiper Switch 2. Rear Wiper Motor 3. Wire Harness	66-4 66-4 -
Washer fluid does not operate.	1. Washer Hose and Nozzle	-
D At wiper switch HI position, the wiper blade is in contact with the body. D When the wiper switch is OFF, the wiper blade does not retract or the retract position wrong.	1. *1Wiper Switch 2. Wire Harness	66-10 -

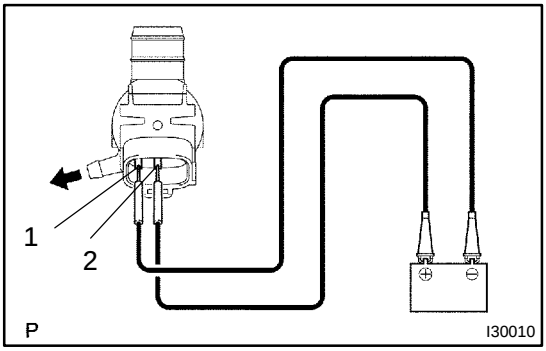
*1: Inspect wiper arm and blade set position

HEADLIGHT CLEANER SYSTEM

Symptom	Suspect Area	See page
"Headlight Cleaner System" does not operate. (All)	1. ECU-IG Fuse 2. IG1 Relay 3. Ignition Switch 4. Headlight Cleaner Switch 5. Headlight Cleaner Relay 6. Headlight Cleaner Motor 7. Headlight CleanerNozzle and Hose 8. Wire Harness	- - 80-2, 80-4 66-4 66-4 66-2 - -
Washer fluid does not spray	1. Washer Hose and Nozzle	-

6605V-01

ON-VEHICLE INSPECTION

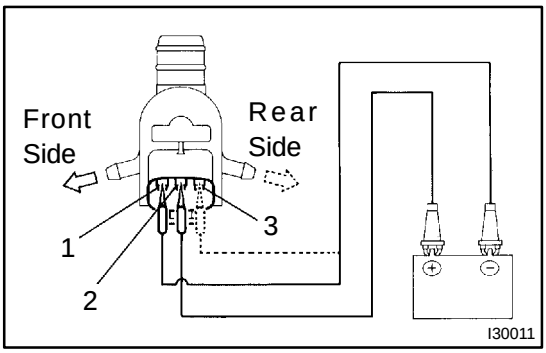


1. WASHER MOTOR (W/O REAR WIPER)

(a) Operation Check(TMC MADE)

(1) Pour the water into the washer jar with the washer motor and the pump installed to the washer jar assy.

(2) Connect the battery (+) to terminal 2 of the washer motor and the pump, the battery (–) to terminal 1 of the washer motor and the pump. Check that the water comes out from the washer jar.



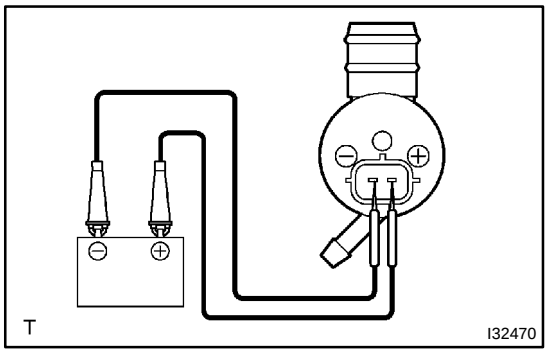
2. WASHER MOTOR (W/ REAR WIPER)

(a) Operation Check(TMC MADE)

(1) Pour the water into the washer jar with the washer motor and the pump installed to the washer jar assy.

(2) Connect the battery (+) to terminal 2 of the washer motor and the pump, the battery (–) to terminal 1 of the washer motor and the pump. Check that the water comes out from the washer jar.

(3) Connect the battery (+) to terminal 2 of the washer motor and the pump, the battery (–) to terminal 3 of the washer motor and the pump. Check that the water comes out from the washer jar.

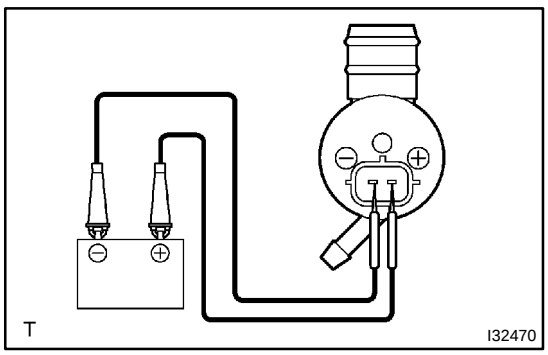


3. WASHER MOTOR (W/O REAR WIPER)

(a) Operation Check(TMUK MADE)

(1) Pour the water into the washer jar with the washer motor and the pump installed to the washer jar assy.

(2) Connect the battery (+) to terminal 2 of the washer motor and the pump, the battery (–) to terminal 1 of the washer motor and the pump. Check that the water comes out from the washer jar.

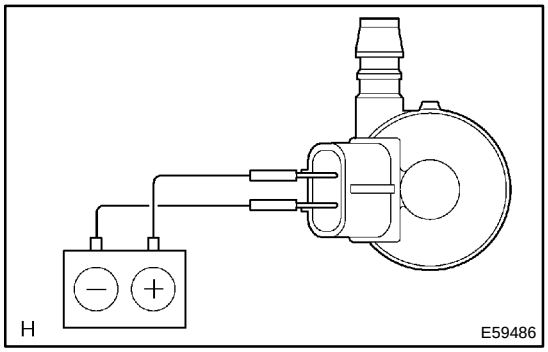


4. WASHER MOTOR (W/O REAR WIPER)

(a) Operation Check(TMUK MADE)

(1) Pour the water into the washer jar with the washer motor and the pump installed to the washer jar assy.

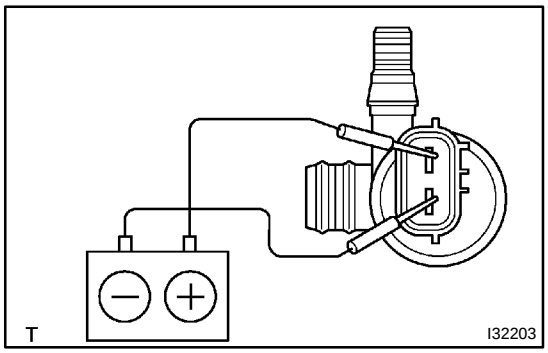
(2) Connect the battery (+) to terminal 2 of the washer motor and the pump, the battery (–) to terminal 1 of the washer motor and the pump. Check that the water comes out from the washer jar.



5. INSPECT HEADLAMP CLEANER MOTOR OPERATION (SEDAN/WAGON)

(a) Pour the washerfruid into the washer jar with the washer motor and the installed to the washer jar assy.

(b) Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1, check that the motor comes out from the washer jar.



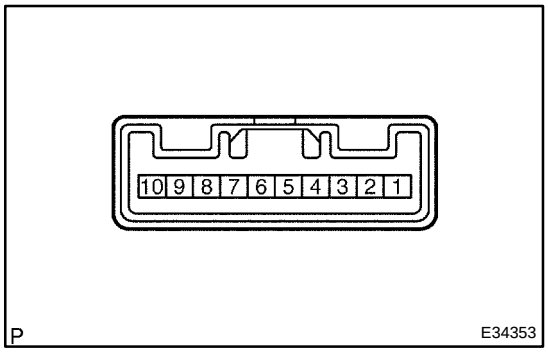
6. INSPECT HEADLAMP CLEANER MOTOR OPERATION (HATCH BACK)

(a) Pour the washerfruid into the washer jar with the washer motor and the installed to the washer jar assy.

(b) Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1, check that the motor comes out from the washer jar.

6605W-01

INSPECTION



1. WINDSHIELD WIPER SWITCH ASSY(W/ RR WIPER)

(a) Continuity Check

(1) Check the continuity of each terminal of the connector.

Front Wiper Switch

Standard:

Switch position	Tester connection	Specified condition
MIST	7 (+1) - 8 (+B)	Continuity
OFF	6 (+S) - 7 (+1)	Continuity
INT	6 (+S) - 7 (+1)	Continuity
LO	7 (+1) - 8 (+B)	Continuity
HI	8 (+B) - 9 (+2)	Continuity

Front Washer Switch

Standard:

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	4 (W) - 5 (EW)	Continuity

Rear Wiper Switch

Standard:

Switch position	Tester connection	Specified condition
Wash	3 (WR) - 5 (EW)	Continuity
OFF	-	No continuity
INT	1 (CIR) - 5 (EW)	Continuity
ON	2 (+1R) - 5 (EW)	Continuity
ON + WASH	3 (WR) - 2 (+1R) - 5 (EW)	Continuity

(b) Intermittent Operation Check (Front Wiper)

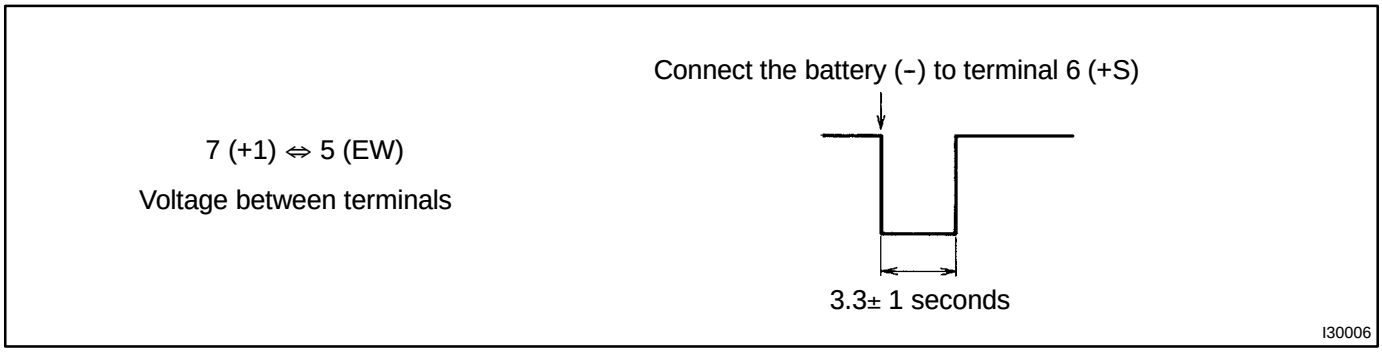
(1) Connect the voltmeter (+) terminal to terminal 7 (+1) of the connector, the voltmeter (-) terminal to terminal 5 (EW) of the connector.

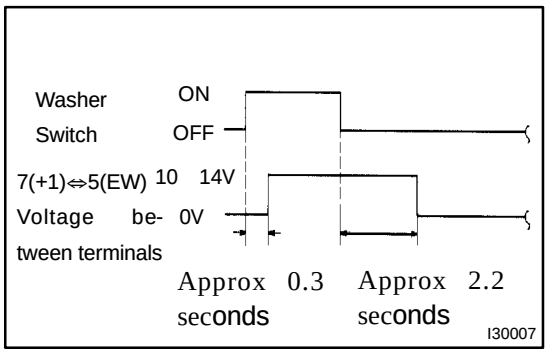
(2) Connect the battery (+) to terminal 8 (+B) of the connector, the battery (-) to terminal 5 (EW) and 6 (+S) of the connector.

(3) Turn the wiper switch INT.

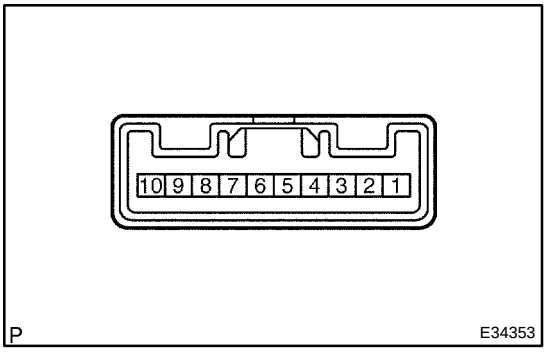
(4) Connect the battery (+) to terminal 6 (+S) of the connector for 5 seconds.

(5) Connect the battery (–) to terminal 6 (+S) of the connector, Operate the intermittent wiper relay and check voltage between terminal 7 (+1) and terminal 5 (EW).





(c) Operation Check (Front Wiper)
(1) Turn the wiper switch OFF.
(2) Connect the battery (+) to terminal 8 (+B) of the connector, the battery (–) to terminal 6 (+S) and 5 (EW) of the connecter.
(3) Connect the voltmeter (+) terminal to terminal 7 (+1) of the connector, the voltmeter (–) terminal to terminal 5 (EW) of the connector. Turn the washer switch ON and OFF and check voltage between terminal 7 (+1) and terminal 5 (EW).



2. WINDSHIELD WIPER SWITCH ASSY(W/O RR WIPER)

(a) Continuity Check
(1) Check the continuity of each terminal of the connector.

Front Wiper Switch

Standard:

Switch position	Tester connection	Specified condition
MIST	7 (+1) - 8 (+B)	Continuity
OFF	6 (+S) - 7 (+1)	Continuity
INT	6 (+S) - 7 (+1)	Continuity
LO	7 (+1) - 8 (+B)	Continuity
HI	8 (+B) - 9 (+2)	Continuity

Front Washer Switch

Standard:

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	4 (W) - 5 (EW)	Continuity

(b) Intermittent Operation Check (Front Wiper)

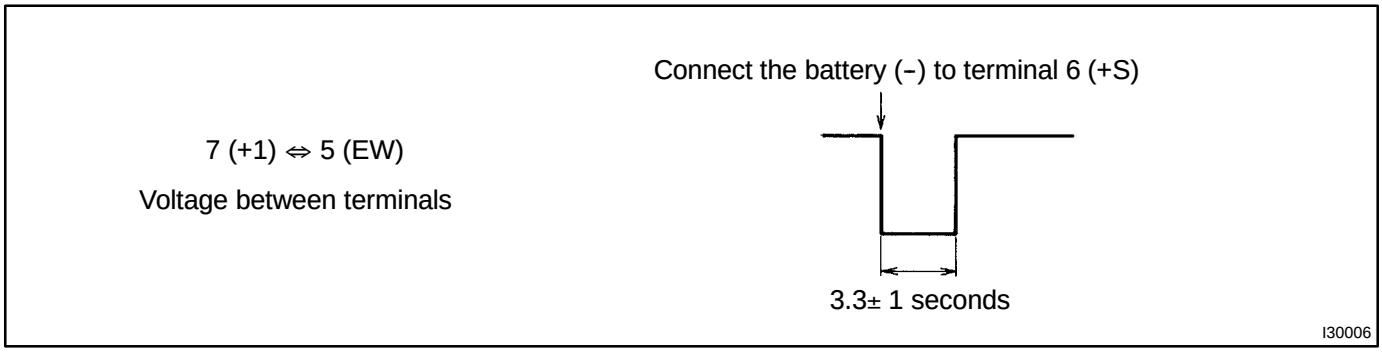
(1) Connect the voltmeter (+) terminal to terminal 7 (+1) of the connector, the voltmeter (–) terminal to terminal 5 (EW) of the connector.

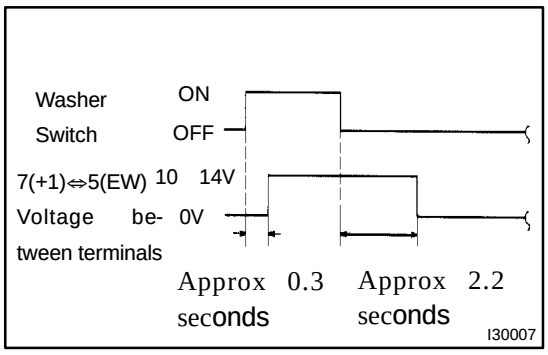
(2) Connect the battery (+) to terminal 8 (+B) of the connector, the battery (–) to terminal 5 (EW) and 6 (+S) of the connector.

(3) Turn the wiper switch INT.

(4) Connect the battery (+) to terminal 6 (+S) of the connector for 5 seconds.

(5) Connect the battery (–) to terminal 6 (+S) of the connector, Operate the intermittent wiper relay and check voltage between terminal 7 (+1) and terminal 5 (EW).





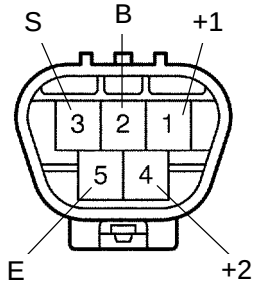
(c) Operation Check (Front Wiper)

(1) Turn the wiper switch OFF.

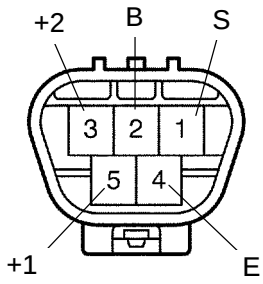
(2) Connect the battery (+) to terminal 8 (+B) of the connector, the battery (–) to terminal 6 (+S) and 5 (EW) of the connecter.

(3) Connect the voltmeter (+) terminal to terminal 7 (+1) of the connector, the voltmeter (–) terminal to terminal 5 (EW) of the connector. Turn the washer switch ON and OFF and check voltage between terminal 7 (+1) and terminal 5 (EW).

LHD:



RHD:



I32200

3. WINDSHIELD WIPER MOTOR ASSY(SEDAN/STATION WAGON BODY TYPE)

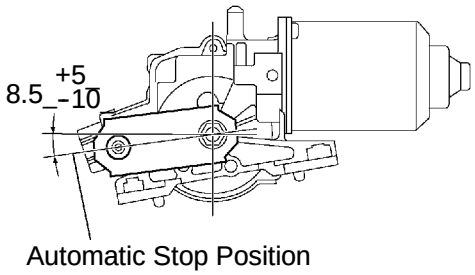
(a) LO Operation Check (LHD)
(1) Connect the battery (+) to terminal 1 (+1) of the connector, the battery (-) to terminal 5 (E) of the connector, and check that the motor operates with low speed (LO).

(b) HI Operation Check (LHD)
(1) Connect the battery (+) to terminal 4 (+2) of the connector, the battery (-) to terminal 5 (E) of the connector, and check that the motor operates with low speed (HI).

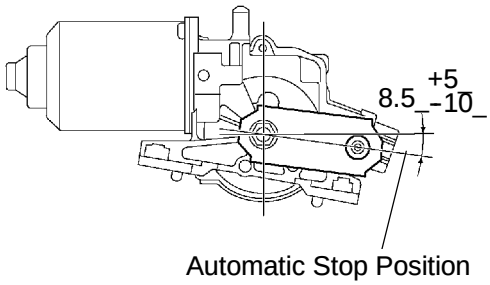
(c) LO Operation Check (RHD)
(1) Connect the battery (+) to terminal 5 (+1) of the connector, the battery (-) to terminal 4 (E) of the connector, and check that the motor operates with low speed (LO).

(d) HI Operation Check (RHD)
(1) Connect the battery (+) to terminal 3 (+2) of the connector, the battery (-) to terminal 4 (E) of the connector, and check that the motor operates with low speed (HI).

LHD:



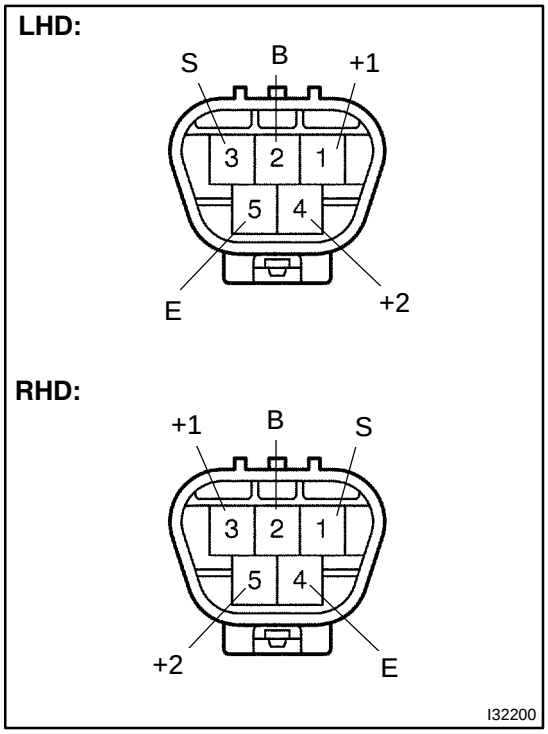
RHD:



I32201

(e) Automatic Stop Operation Check (LHD)
(1) Connect the battery (+) to terminal 1 (+1) of the connector, the battery (-) to terminal 5 (E) of the connector, with the motor being rotated with low speed (LO), disconnect terminal 1 (+1) to stop the wiper motor operation at any position except the automatic stop position.
(2) Connect terminals 1 (+1) and 3 (S).
(3) Check that connecting the battery (+) to terminal 2 (B) restarts the motor operation with low speed (LO), and the motors automatic stop position.

(f) Automatic Stop Operation Check (RHD)
(1) Connect the battery (+) to terminal 5 (+1) of the connector, the battery (-) to terminal 4 (E) of the connector, with the motor being rotated with low speed (LO), disconnect terminal 5 (+1) to stop the wiper motor operation at any position except the automatic stop position.
(2) Connect terminals 5 (+1) and 1 (S).
(3) Check that connecting the battery (+) to terminal 2 (B) restarts the motor operation with low speed (LO), and the motors automatic stop position.



4. WINDSHIELD WIPER MOTOR ASSY(HATCH BACK BODY TYPE)

(a) LO Operation Check (LHD)

(1) Connect the battery (+) to terminal 1 (+1) of the connector, the battery (−) to terminal 5 (E) of the connector, and check that the motor operates with low speed (LO).

(b) HI Operation Check (LHD)

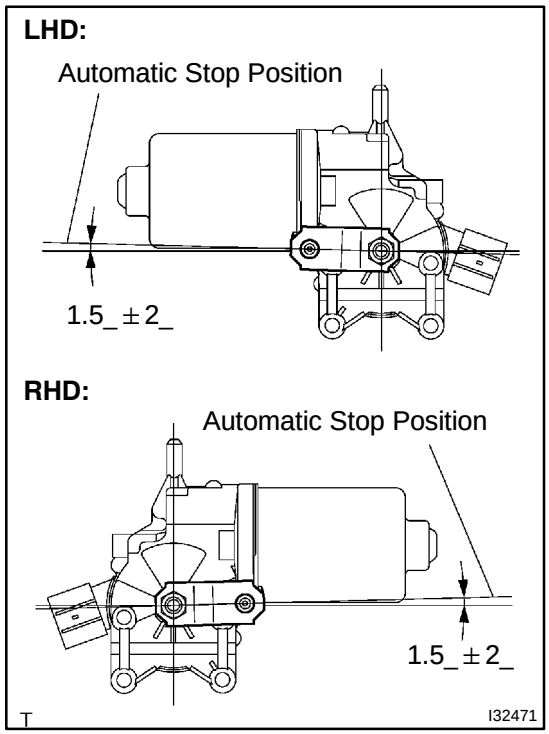
(1) Connect the battery (+) to terminal 4 (+2) of the connector, the battery (−) to terminal 5 (E) of the connector, and check that the motor operates with low speed (HI).

(c) LO Operation Check (RHD)

(1) Connect the battery (+) to terminal 3 (+1) of the connector, the battery (−) to terminal 4 (E) of the connector, and check that the motor operates with low speed (LO).

(d) HI Operation Check (RHD)

(1) Connect the battery (+) to terminal 5 (+2) of the connector, the battery (−) to terminal 4 (E) of the connector, and check that the motor operates with low speed (HI).



(e) Automatic Stop Operation Check (LHD)

(1) Connect the battery (+) to terminal 1 (+1) of the connector, the battery (−) to terminal 5 (E) of the connector, with the motor being rotated with low speed (LO), disconnect terminal 1 (+1) to stop the wiper motor operation at any position except the automatic stop position.

(2) Connect terminals 1 (+1) and 3 (S).

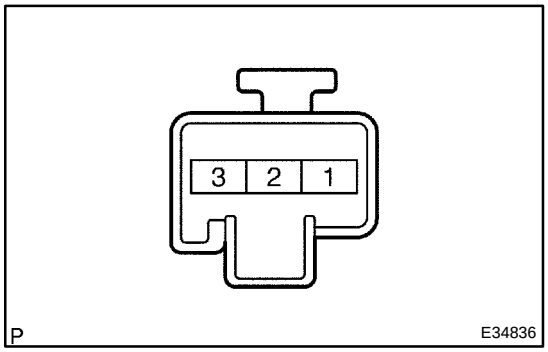
(3) Check that connecting the battery (+) to terminal 2 (B) restarts the motor operation with low speed (LO), and the motors automatic stop position.

(f) Automatic Stop Operation Check (RHD)

(1) Connect the battery (+) to terminal 3 (+1) of the connector, the battery (−) to terminal 4 (E) of the connector, with the motor being rotated with low speed (LO), disconnect terminal 3 (+1) to stop the wiper motor operation at any position except the automatic stop position.

(2) Connect terminals 3 (+1) and 1 (S).

(3) Check that connecting the battery (+) to terminal 2 (B) restarts the motor operation with low speed (LO), and the motors automatic stop position.



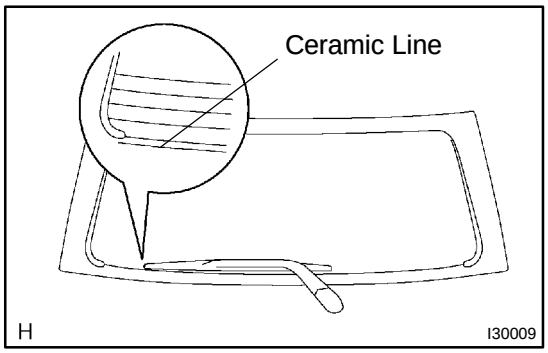
5. REAR WIPER MOTOR ASSY

(a) Operation Check

(1) Connect the battery (+) to terminal 1 (+B) of the connector, the battery (-) to terminal 3 (LS) of the connector, and check that the rear wiper motor operates.

NOTICE:

The body earth should be connected.



(b) Automatic Stop Position Operation Check

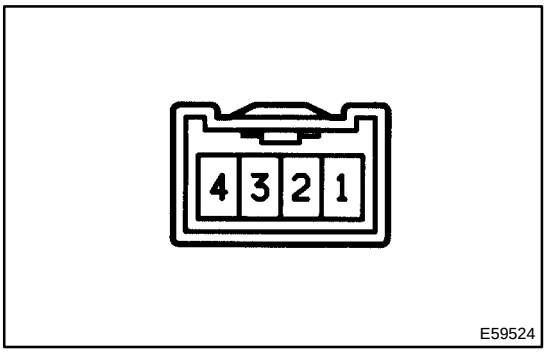
(1) Connect the battery (+) to terminal 1 (+B) of the connector, the battery (-) to terminal 3 (LS) of the connector.

NOTICE:

The body earth should be connected.

(2) With the motor being rotated, disconnect terminal 1 (+B) and terminal 3 (LS) to stop the motor operation at any position except the automatic stop position.

(3) Connect the battery (+) to terminal 1 (+B). Check that the motor is restarted and automatically stopped.



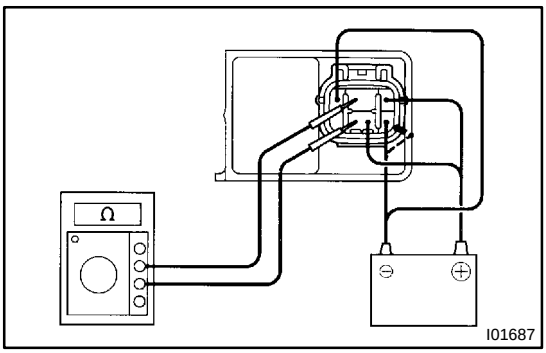
6. HEADLAMP CLEANER SWITCH ASSY

(a) Inspect headlamp cleaner switch continuity.

(1) Check that continuity exists between terminals.

Standard:

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	1 - 4	Continuity
Illumination circuit	2 - 3	continuity



7. HEADLAMP CLEANER CONTROL RELAY

(a) Inspect headlamp cleaner control relay operation.

(1) Check that no continuity exists between terminals 2 and 5.

(2) Connect the positive (+) lead from the battery to terminals 1 and 5, and the negative (-) lead to terminal 3.

(3) Connect the negative (-) lead from the battery to terminal 4, and check that continuity exists between terminals 2 and 5 for 0.8 - 0.9 seconds, then no continuity exists.

If operation is not as specified, replace the motor.

WINDSHIELD WIPER MOTOR ASSY

REPLACEMENT

6605X-01

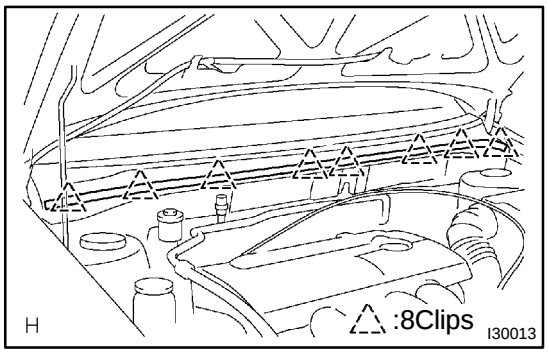
1. REMOVE WINDSHIELD WIPER ARM COVER

2. REMOVE FR WIPER ARM RH

(a) Remove the nut to remove the front wiper arm RH.

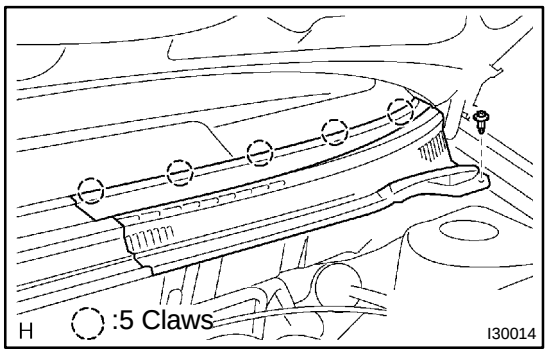
3. REMOVE FR WIPER ARM LH

(a) Remove the nut to remove the front wiper arm LH.



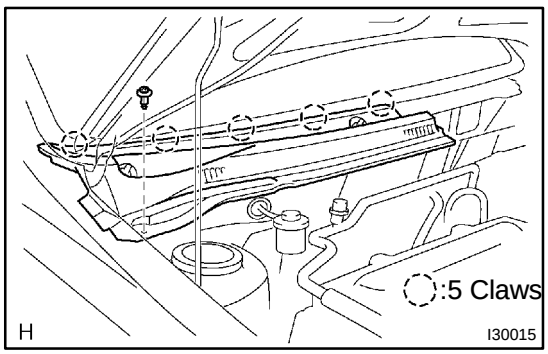
4. REMOVE HOOD TO COWL TOP SEAL

(a) Disengage the meshing of 8 clips to remove the hood to cowl top seal.



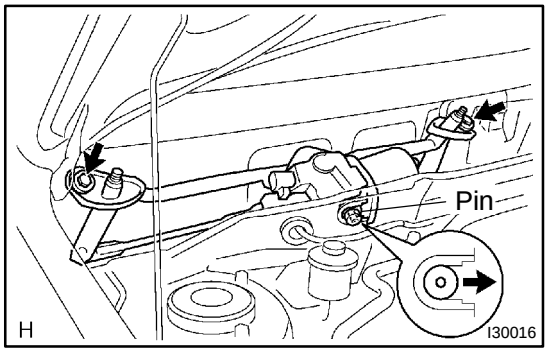
5. REMOVE COWL TOP VENTILATOR LOUVER LH

(a) Remove the 5 claws to remove the cowl top ventilator louver passenger side.



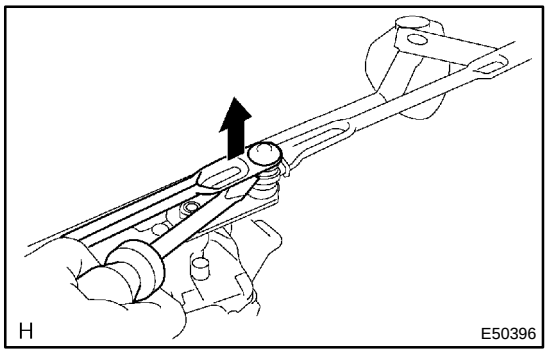
6. REMOVE COWL TOP VENTILATOR LOUVER RH

(a) Remove the 5 claws to remove the cowl top ventilator louver driver side.



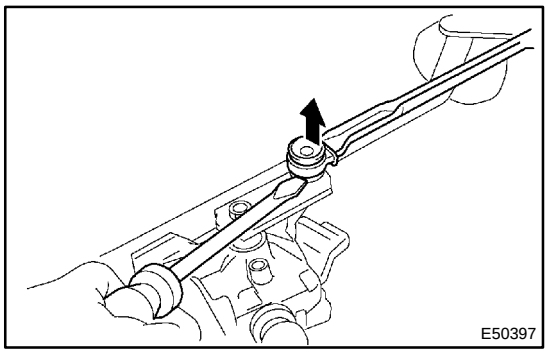
7. REMOVE WINDSHIELD WIPER LINK ASSY

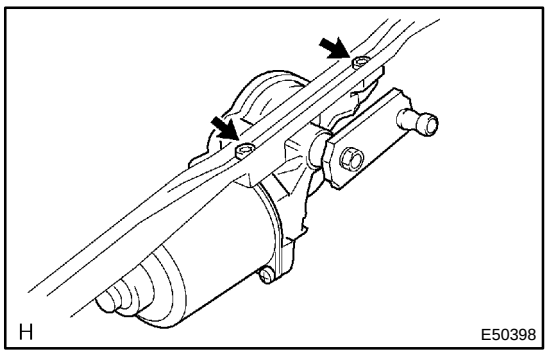
(a) Disconnect the connector.
(b) Remove the 2 bolts.
(c) Slide the wiper link assy to vehicle's passenger side. Disengage the meshing of the rubber pin to remove the wiper link assy.



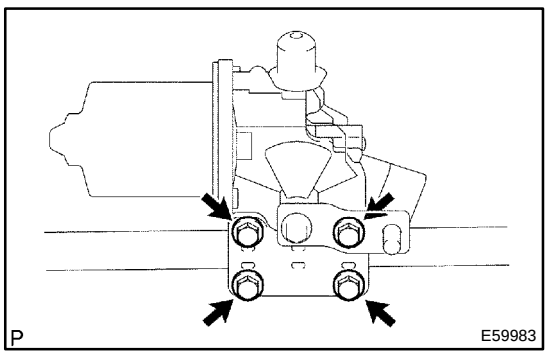
8. REMOVE WINDSHIELD WIPER MOTOR ASSY

(a) Disengage the meshing of 2 rods at the clank arm pivot of the windshield wiper motor assy.





(b) SEDAN/STATION WAGON:
Remove 2 torx screws to remove the windshield wiper motor assy.



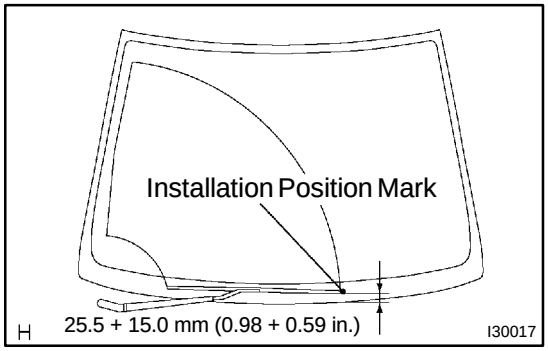
(c) HATCHBACK:
Remove 4 bolts to remove the windshield wiper motor assy.

9. INSTALL WINDSHIELD WIPER MOTOR ASSY

(a) Apply MP grease to the clank arm pivot of the windshield wiper motor assy.
(b) SEDAN / STATION WAGON:
Using 2 torx screws, install the windshield wiper motor assy to the windshield wiper link assy.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
(c) HATCHBACK:
Using 4 bolts, install the windshield wiper motor assy to the windshield wiper link assy.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)

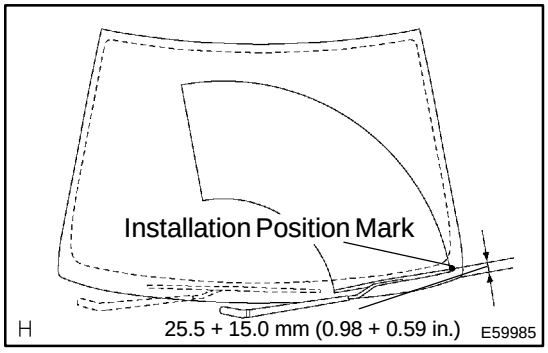
10. INSTALL WINDSHIELD WIPER LINK ASSY

(a) Engine the meshing of the rubber pin.
(b) Using 2 bolt, install the windshield wiper link assy.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(c) Connect the connecter.



11. INSTALL FR WIPER ARM RH

(a) Clean the wiper pivot serration with the with brush.
(b) Fix the front wiper arm driver side with a nut in the way that the front wiper blade on the position shown in the illustration.
Torque: 20.5 N·m (209 kgf·cm, 15 ft·lbf)



12. INSTALL FR WIPER ARM LH

(a) Clean the wiper pivot serration with the with brush.
(b) Fix the front wiper arm passenger side with a nut in the way that the front wiper blaced on the position shown in the illustration.
Torque: 20.5 N·m (209 kgf·cm, 15 ft·lbf)

WIPER RUBBER LH

66000-03

REPLACEMENT

1. REMOVE FR WIPER BLADE LH

(a) Remove the front wiper blade LH from the front wiper arm LH.

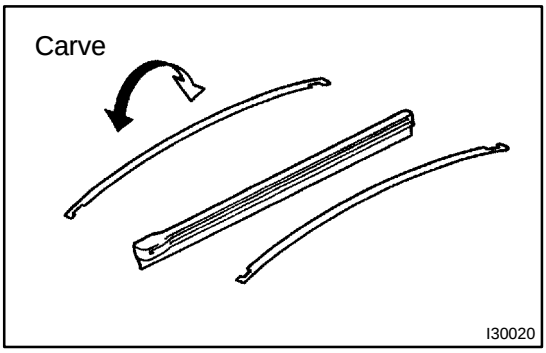
NOTICE:

Do not fold down the front wiper arm with the front wiper blade being removed from it.

2. REMOVE WIPER RUBBER LH

(a) Remove the front wiper rubber LH from the front wiper blade.

(b) Remove the 2 wiper rubber backing plates from the wiper rubber LH.



3. INSTALL WIPER RUBBER LH

(a) Install the 2 wiper rubber backing plates to the wiper rubber LH.

NOTICE:

Be careful not to install the packing plate back or front.

(b) Install the wiper rubber LH in the way that the head part (Langer side) of the wiper rubber faces the arm axle side.

NOTICE:

Push in the front wiper blade into the grooves of the wiper rubber to completely engage them.

REAR WIPER MOTOR ASSY (STATION WAGON)

6600N-03

REPLACEMENT

1. REMOVE REAR WIPER ARM COVER

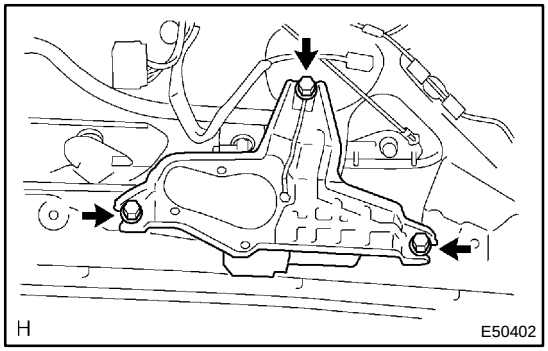
2. REMOVE REAR WIPER ARM ASSY

(a) Remove the nut to remove the rear wiper arm assy.

3. REMOVE REAR WIPER MOTOR GROMMET

4. REMOVE BACK DOOR TRIM BOARD ASSY

(See page 75-55)

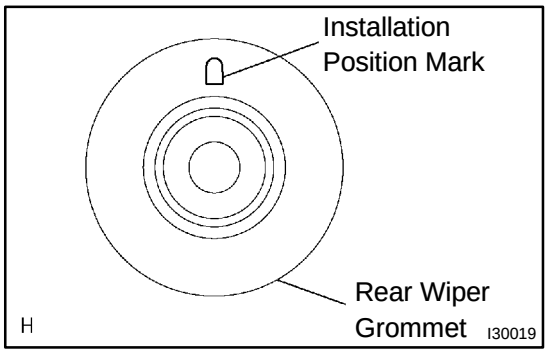


5. REMOVE REAR WIPER MOTOR ASSY

(a) Disconnect the connector.
(b) Remove the 3 bolts and rear wiper motor assy.

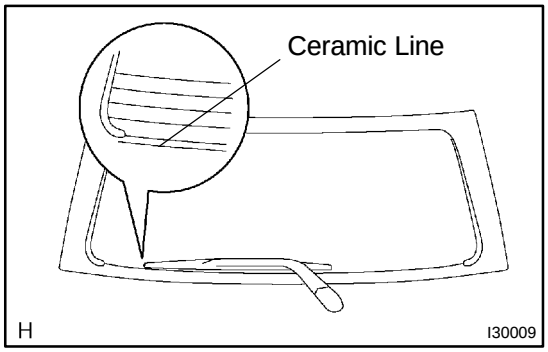
6. INSTALL REAR WIPER MOTOR ASSY

(a) Install the rear wiper motor assy with 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(b) Connect the connector.



7. INSTALL REAR WIPER MOTOR GROMMET

(a) As shown in the illustration, install the rear wiper motor grommet with it is position mark upside.



8. INSTALL REAR WIPER ARM ASSY

(a) Clean the rear wiper pivot serration with the wire brush.

(b) Stop the rear wiper motor assy at the automatic stop position. Install the rear wiper arm at the position shown in the illustration.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:

Hold down the arm hinge with hand to fasten a nut.

(c) Operate the rear wiper while running the water or the washer fluid over the rear window, and check the wiping condition and that the rear wiper does not hit against the vehicle body.

REAR WIPER MOTOR ASSY (HATCHBACK)

6600N-04

REPLACEMENT

1. REMOVE REAR WIPER ARM HEAD CAP

2. REMOVE REAR WIPER ARM

(a) Remove the nut to remove the rear wiper arm.

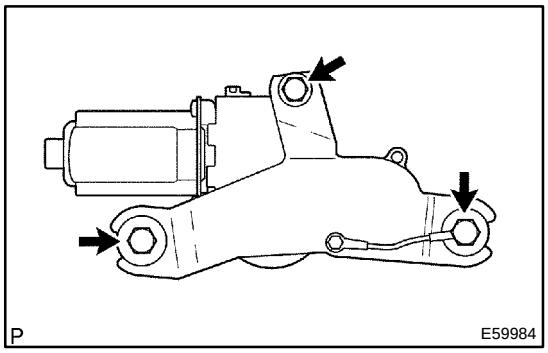
3. REMOVE REAR WIPER MOTOR GROMMET

4. REMOVE BACK DOOR TRIM PANEL ASSY UPPER
(See page 75-58)

5. REMOVE BACK DOOR SIDE GARNISH RH
(See page 75-58)

6. REMOVE BACK DOOR SIDE GARNISH LH
(See page 75-58)

7. REMOVE BACK DOOR TRIM BOARD ASSY
(See page 75-58)

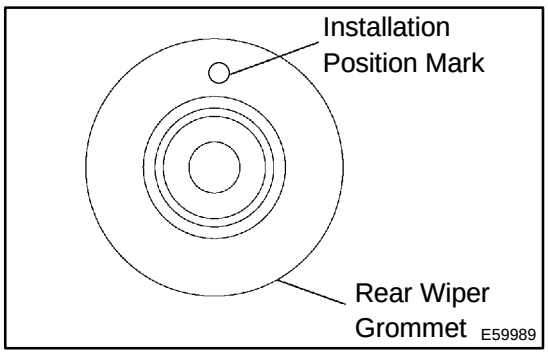


8. REMOVE REAR WIPER MOTOR ASSY

(a) Disconnect the connector.
(b) Remove the 3 bolts and rear wiper motor assy.

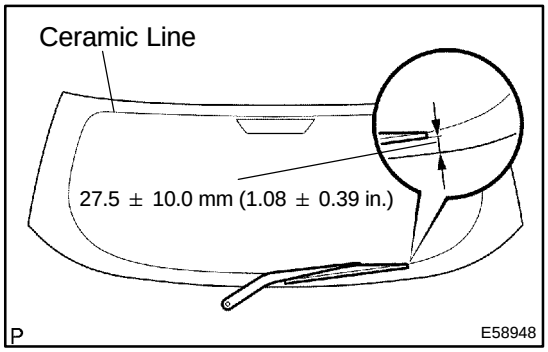
9. INSTALL REAR WIPER MOTOR ASSY

(a) Install the rear wiper motor assy with 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(b) Connect the connector.



10. INSTALL REAR WIPER MOTOR GROMMET

(a) As shown in the illustration, install the rear wiper motor grommet with it is position mark upside.



11. INSTALL REAR WIPER ARM

(a) Clean the rear wiper pivot serration with the wire brush.

(b) Stop the rear wiper motor assy at the automatic stop position. Install the rear wiper arm at the position shown in the illustration.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:

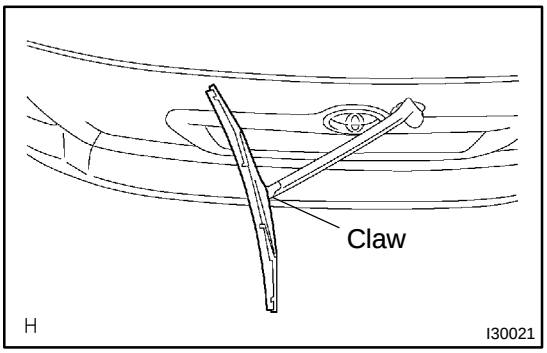
Hold down the arm hinge with hand to fasten a nut.

(c) Operate the rear wiper while running the water or the washer fluid over the rear window, and check the wiping condition and that the rear wiper does not hit against the vehicle body.

REAR WIPER RUBBER (STATION WAGON/HATCHBACK)

6600T-03

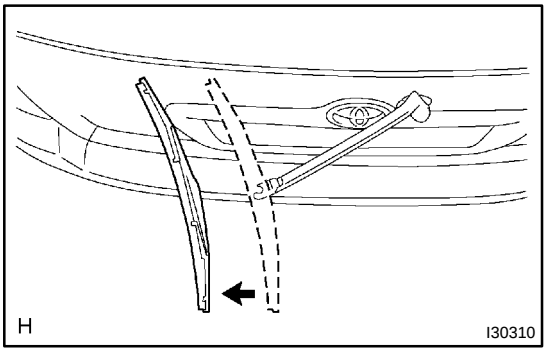
REPLACEMENT



1. REMOVE RR WIPER BLADE

(a) Raise the rear wiper blade to the position shown in the illustration, to the extent that the meshing of the claw is disengaged with the click sound.

NOTICE:
Be careful not to break the claw.



(b) Pull straight the rear wiper blade to vehicle's left from the wiper arm.

NOTICE:
Do not fold the rear wiper arm with the rear wiper blade being removed from it.

2. REMOVE REAR WIPER RUBBER

(a) Pull the rear wiper rubber to the axle direction.

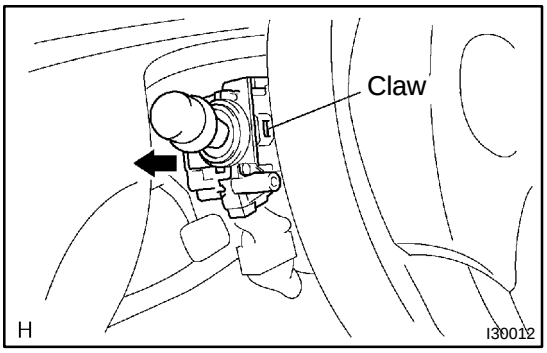
WINDSHIELD WIPER SWITCH ASSY

6600L-03

REPLACEMENT

1. REMOVE STEERING COLUMN COVER

(See page 50-8)



2. REMOVE WINDSHIELD WIPER SWITCH ASSY

(a) Disconnect the connecter.
(b) Press the claw shown in the illustratuion to disengage it is meshing and remove the windshield wiper switch assy.

NOTICE:

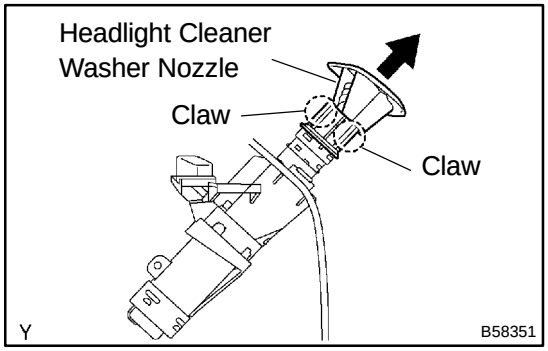
Pressing the claw hard breaks the claw.

HEADLAMP WASHER ACTUATOR SUB-ASSY LH (STATION WAGON)

6605Y-01

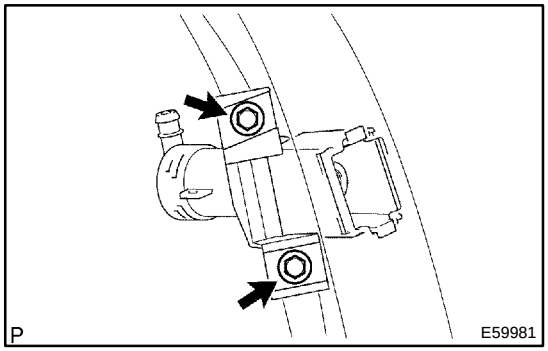
REPLACEMENT

1. REMOVE RADIATOR GRILLE
(See page 76-2)
2. REMOVE ENGINE UNDER COVER
(See page 76-2)
3. REMOVE FRONT FENDER LINER LH
(See page 76-2)
4. REMOVE FRONT FENDER LINER RH
(See page 76-2)
5. REMOVE FRONT BUMPER COVER
(See page 76-2)

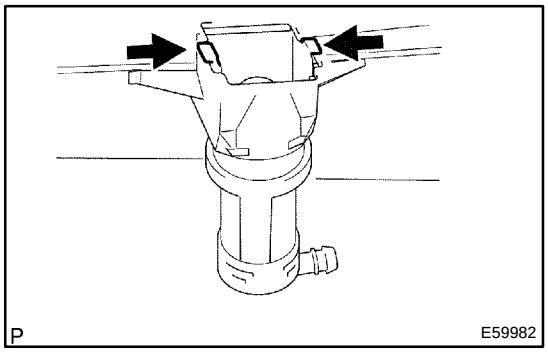


6. REMOVE HEADLAMP WASHER ACTUATOR SUB-ASSY LH

(a) Pull out the head light cleaner washer nozzle.
(b) Disengage the 2 claws, remove the head light cleaner washer nozzle.



(c) Remove the 2 bolts.



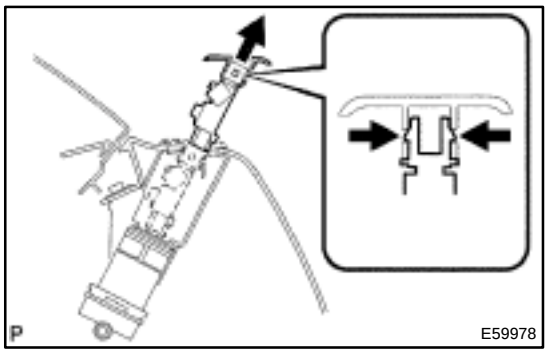
(d) Deform the upper part of the head light washer actuator sub-assy LH, to remove it.

HEADLAMP WASHER ACTUATOR SUB-ASSY LH (HATCHBACK)

6605Z-01

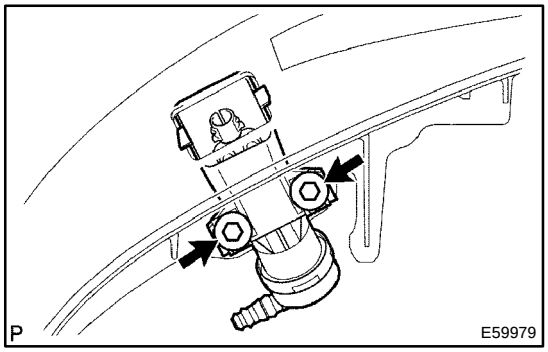
REPLACEMENT

1. REMOVE RADIATOR SUPPORT OPENING COVER
(See page 76-5)
2. REMOVE RADIATOR GRILLE
(See page 76-5)
3. REMOVE ENGINE UNDER COVER RH
(See page 76-5)
4. REMOVE ENGINE UNDER COVER LH
(See page 76-5)
5. REMOVE FRONT FENDER LINER LH
(See page 76-5)
6. REMOVE FRONT FENDER LINER RH
(See page 76-5)
7. REMOVE FRONT BUMPER COVER
(See page 76-5)

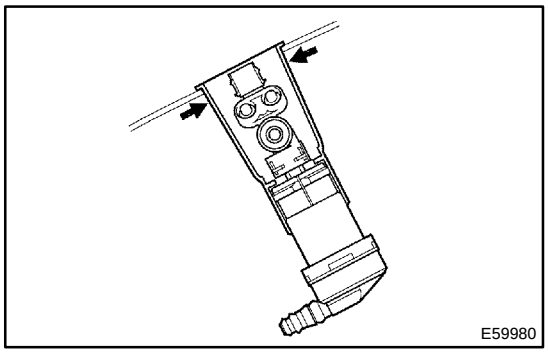


8. REMOVE HEADLAMP WASHER ACTUATOR SUB-ASSY LH

(a) Pull out the head light cleaner washer nozzle.
(b) Disengage the 2 claws, remove the head light cleaner washer nozzle.



(c) Remove the 2 bolts.



(d) Deform the upper part of the head light washer actuator sub-assy LH, to remove it.

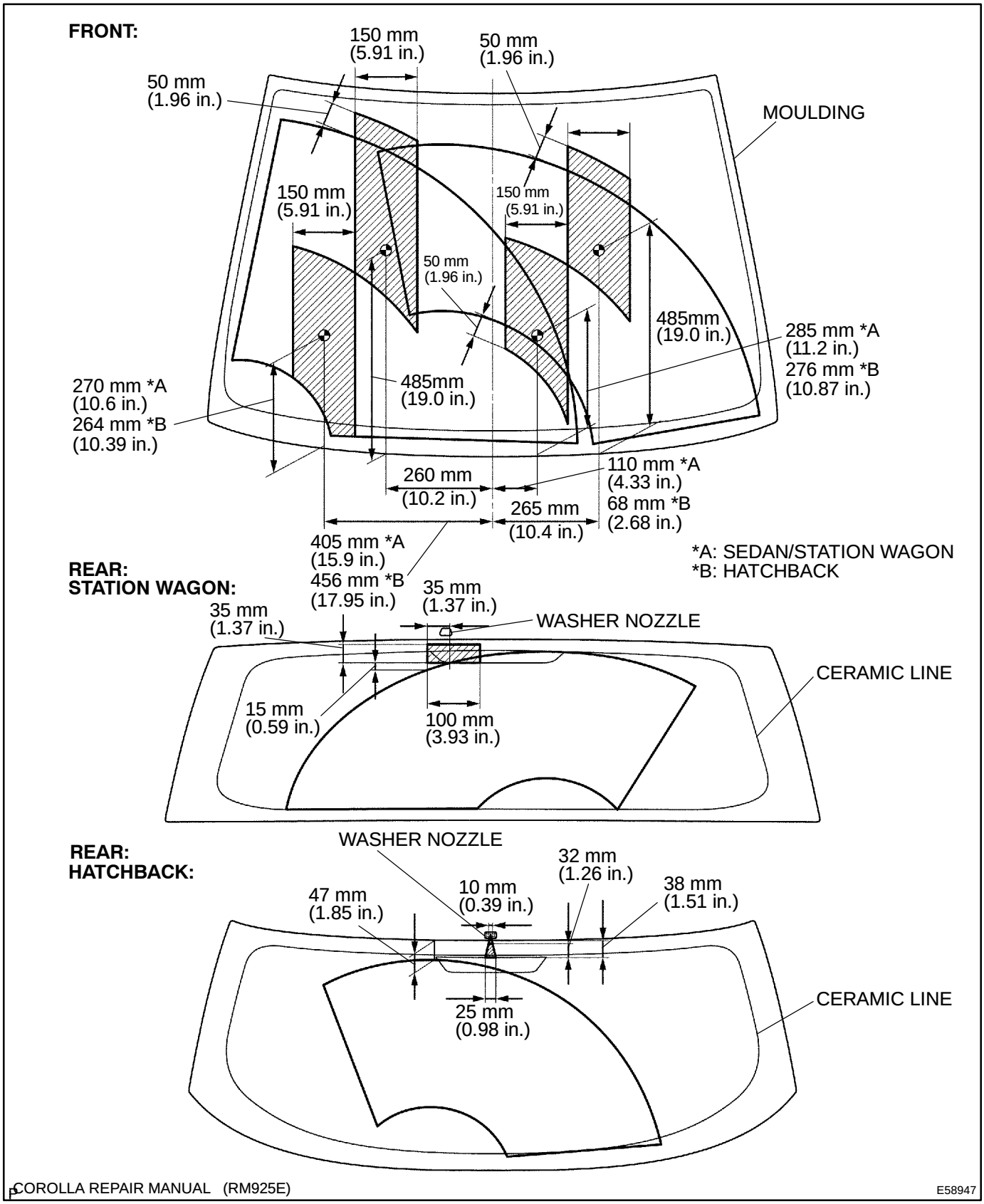
WASHER NOZZLE

ADJUSTMENT

6600Q-03

1. INSPECT WASHER NOZZLE

(a) With the engine running, check that the point where the washer fluid hits the windshield and the rear window is within the range indicated by the hatched line.



E58947

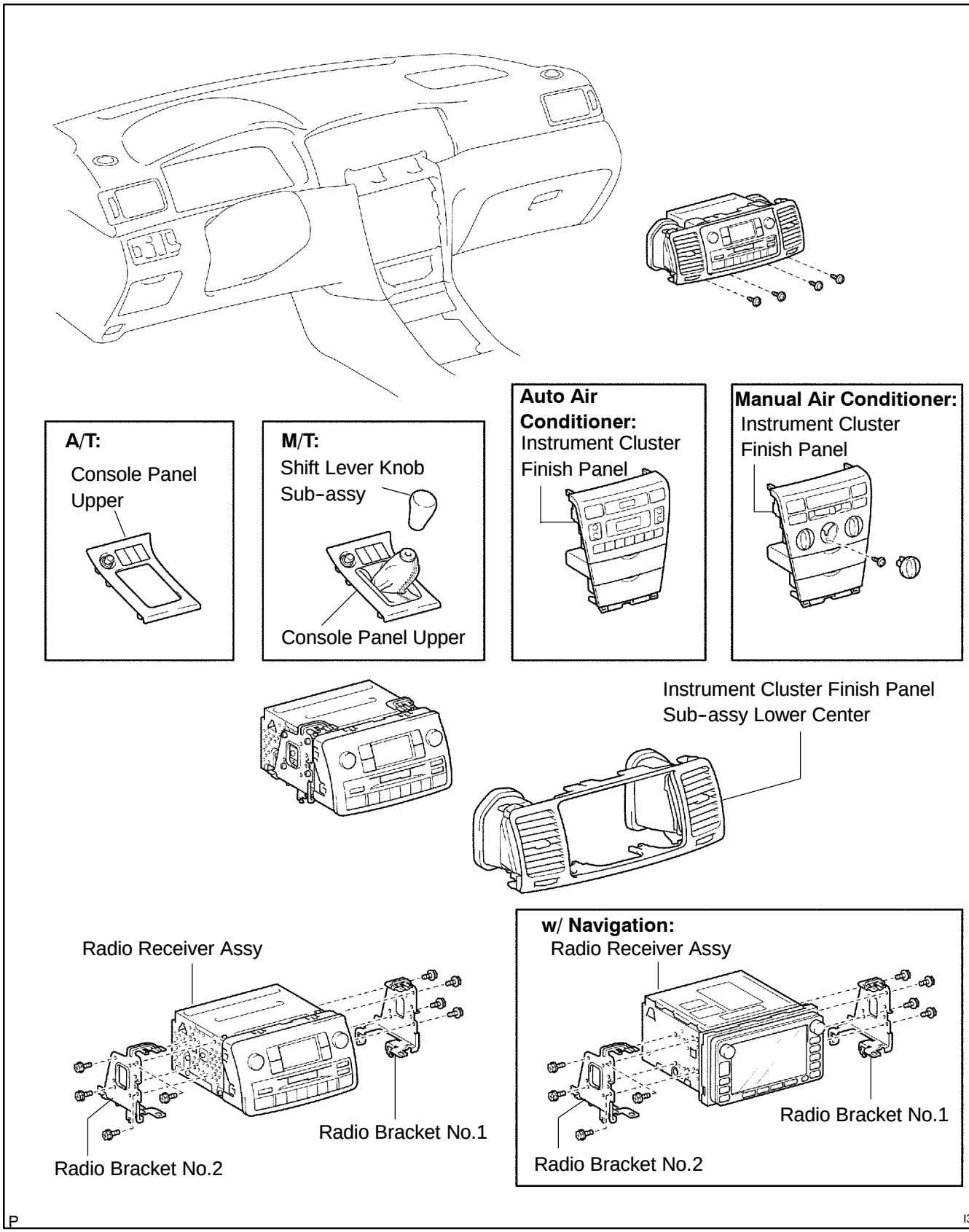
AUDIO & VISUAL SYSTEM

AUDIO & VISUAL SYSTEM 67-1
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REPLACEMENT 67-4/5
RADIO RECEIVER ASSY 67-6
REPLACEMENT 67-6/7
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REPLACEMENT 67-8
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(5-DOOR HATCHBACK) 67-11
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(3-DOOR HATCHBACK) 67-12
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REPLACEMENT 67-13
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REPLACEMENT 67-14/17
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REPLACEMENT 67-18/19
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ROOF ANTENNA POLE SUB-ASSY 67-21
REPLACEMENT 67-21
NAVIGATION ECU 67-22
REPLACEMENT 67-22/23
NAVIGATION ANTENNA ASSY 67-24
REPLACEMENT 67-24
CIGARETTE LIGHTER ASSY 67-25
REPLACEMENT 67-25

AUDIO & VISUAL SYSTEM

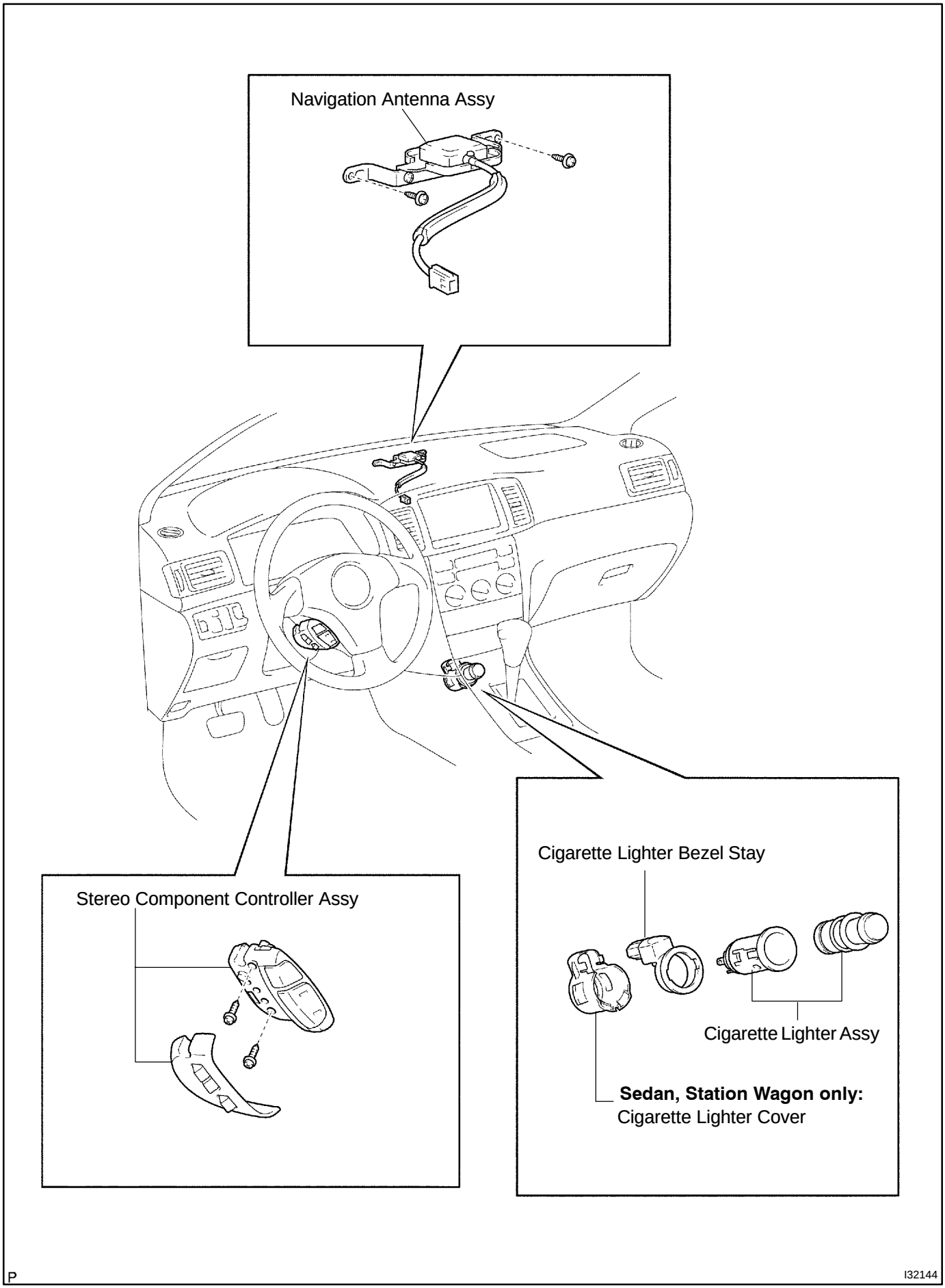
COMPONENTS

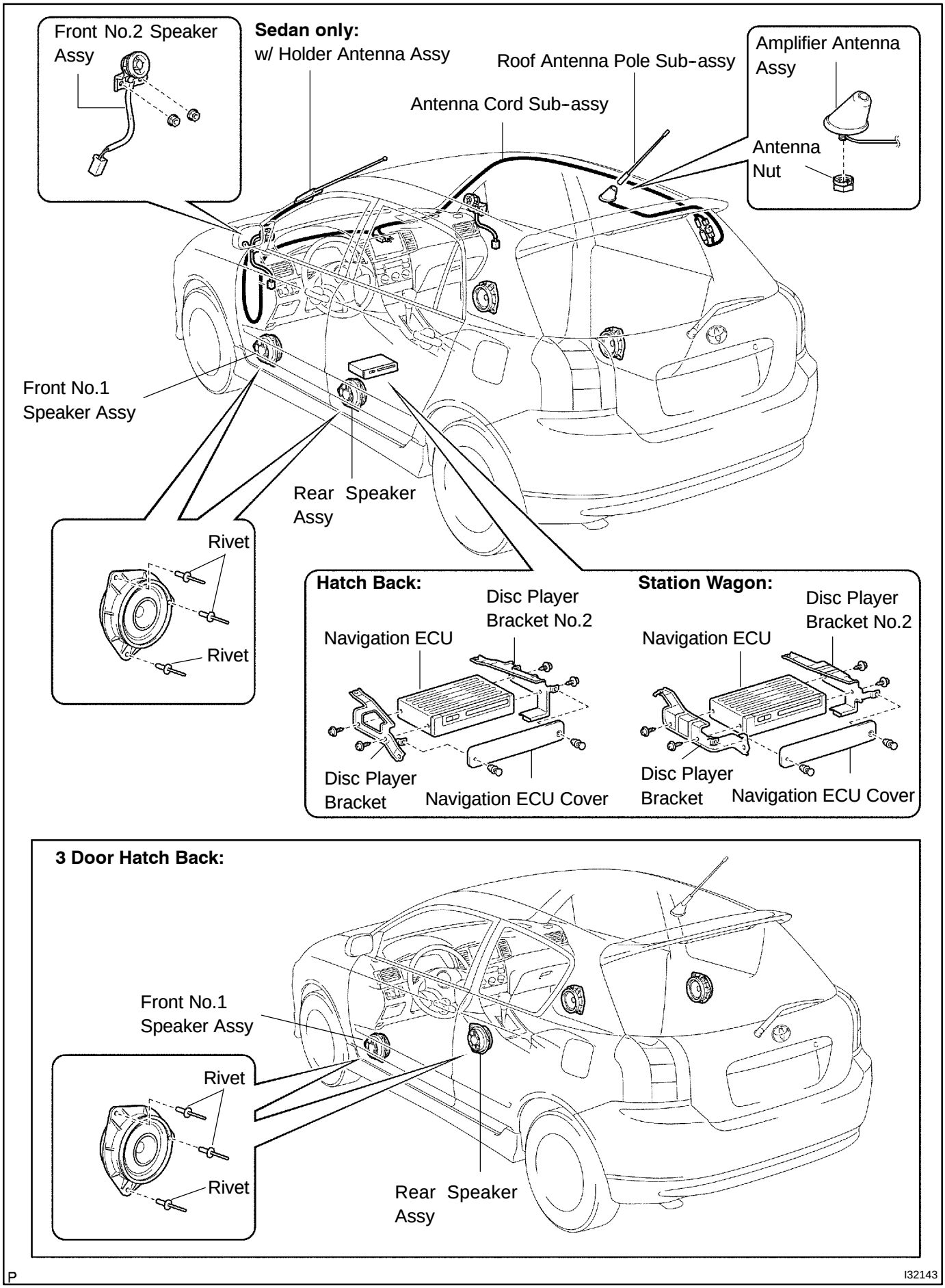
670BD-01



P

I32142


Navigation Antenna Assy
Stereo Component Controller Assy
Cigarette Lighter Bezel Stay
Cigarette Lighter Assy
Sedan, Station Wagon only:
Cigarette Lighter Cover
P
I32144


Front No.2 Speaker Assy
Sedan only:
w/ Holder Antenna Assy
Roof Antenna Pole Sub-assy
Antenna Cord Sub-assy
Amplifier Antenna Assy
Antenna Nut
Front No.1 Speaker Assy
Rear Speaker Assy
Rivet
Rivet
Hatch Back:
Disc Player Bracket No.2
Navigation ECU
Disc Player Bracket
Navigation ECU Cover
Station Wagon:
Disc Player Bracket No.2
Navigation ECU
Disc Player Bracket
Navigation ECU Cover
3 Door Hatch Back:
Front No.1 Speaker Assy
Rivet
Rivet
Rear Speaker Assy
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I32143

RADIO RECEIVER ASSY

67014-02

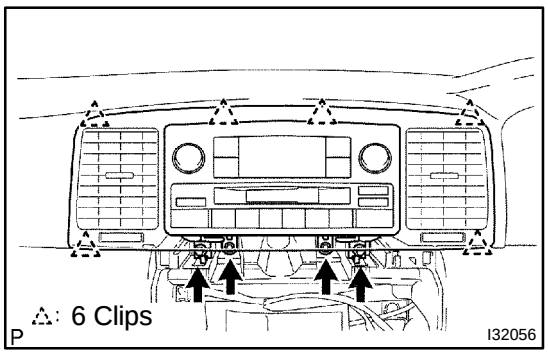
REPLACEMENT

HINT:

COMPONENTS: See page 67-1

1. **REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY**

2. **REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE)**
   (See page 71-16 or 71-25)
3. **REMOVE CONSOLE PANEL UPPER**
   (See page 71-16 or 71-25)
4. **REMOVE INSTRUMENT CLUSTER FINISH PANEL**
   (See page 71-16 or 71-25)



5. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER**

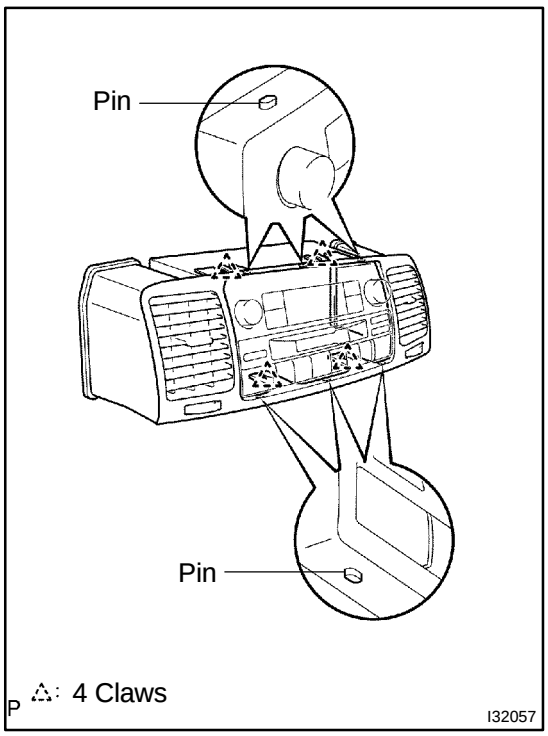
(a) Remove the 4 screws.
(b) Using a screwdriver, disengage the 6 clips, then remove the instrument cluster finish panel sub-assy lower center and radio receiver assy.

HINT:

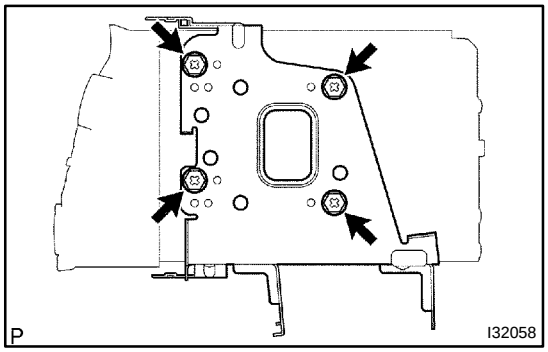
Tape the screwdriver tip before use.

(c) Disconnect the connectors.

6. **REMOVE RADIO RECEIVER ASSY**

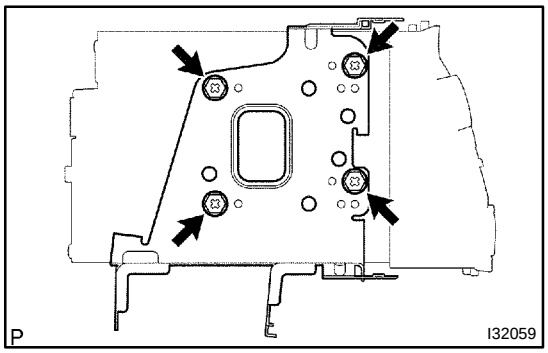


(a) Disengage the 4 claws and 6 pins.
(b) Remove the radio receiver assy from the instrument cluster finish panel sub-assy lower center.



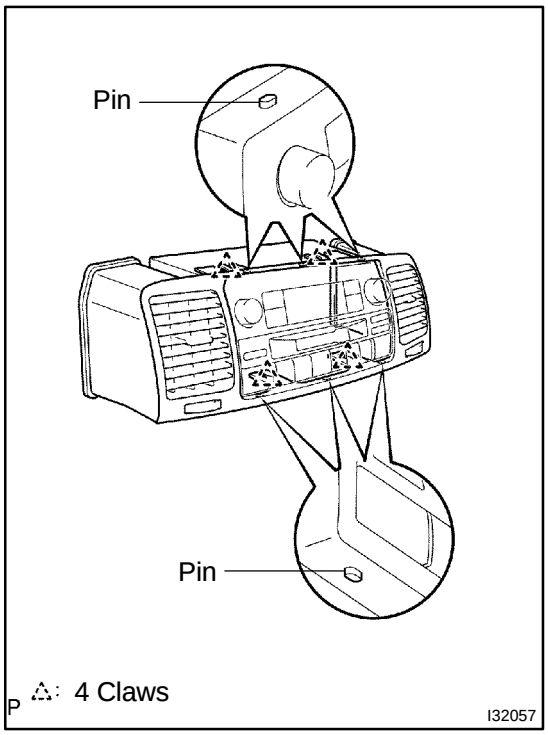
7. REMOVE RADIO BRACKET NO.1

(a) Remove the 4 screws and radio bracket No. 1.



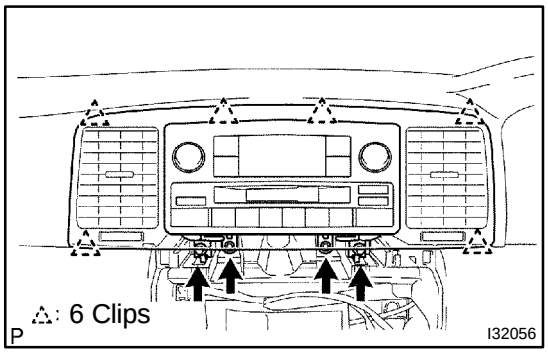
8. REMOVE RADIO BRACKET NO.2

(a) Remove the 4 screws and radio bracket No. 2.



9. INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER

(a) Place the radio receiver assy temporarily on the instrument panel UPR. (*1)
(b) Under the condition of (*1), engage the 6 pins and 4 claws of the radio receiver assy with the instrument cluster finish panel sub-assy lower center. (*2)
(c) Under the condition of (*2), slide the instrument cluster finish panel sub-assy lower center and the radio receiver assy forward of the vehicle.



(d) Connect the connectors and install the 6 clips.
(e) Install the 4 screws and instrument cluster finish panel sub-assy lower center with radio receiver assy.

RADIO RECEIVER ASSY

REPLACEMENT

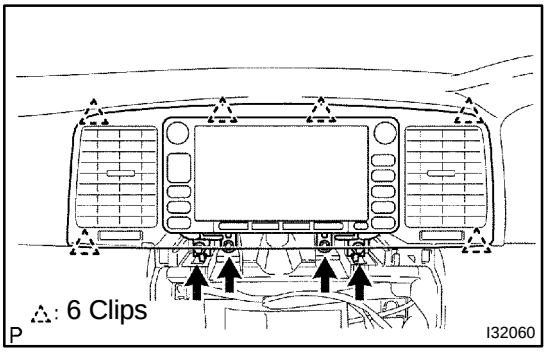
670BE-01

HINT:

COMPONENTS: See page 67-1

1. **REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY**

2. **REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE)**
   (See page 71-16 or 71-25)
3. **REMOVE CONSOLE PANEL UPPER**
   (See page 71-16 or 71-25)
4. **REMOVE INSTRUMENT CLUSTER FINISH PANEL**
   (See page 71-16 or 71-25)



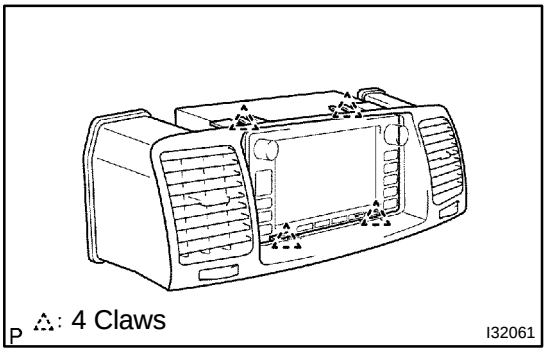
5. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER**

(a) Remove the 4 screws.
(b) Using a screwdriver, disengage the 6 clips, then remove the instrument cluster finish panel sub-assy lower center and radio receiver assy.

HINT:

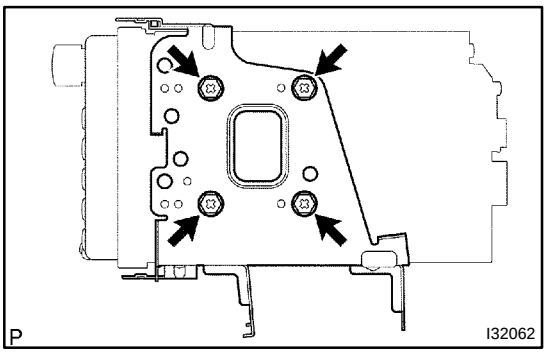
Tape the screwdriver tip before use.

(c) Disconnect the connectors.



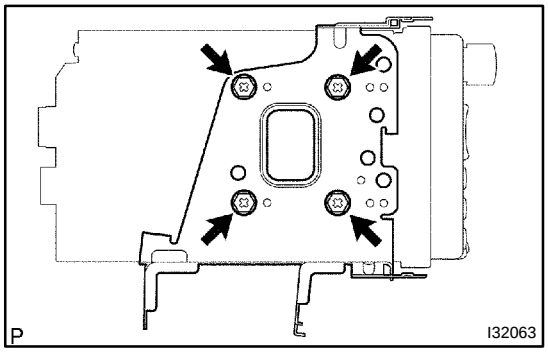
6. **REMOVE RADIO RECEIVER ASSY**

(a) Disengage the 4 claws.
(b) Remove the radio receiver assy from the instrument cluster finish panel sub-assy lower center.



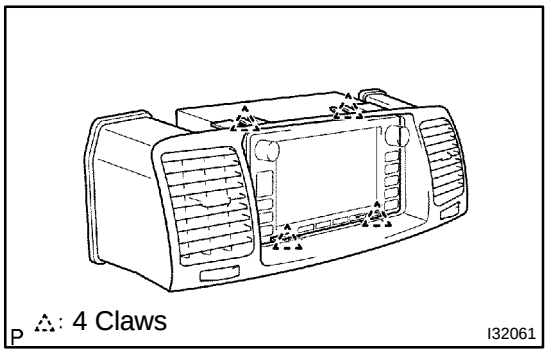
7. **REMOVE RADIO BRACKET NO.1**

(a) Remove the 4 screws and radio bracket No. 1.



8. REMOVE RADIO BRACKET NO.2

(a) Remove the 4 screws and radio bracket No. 2.

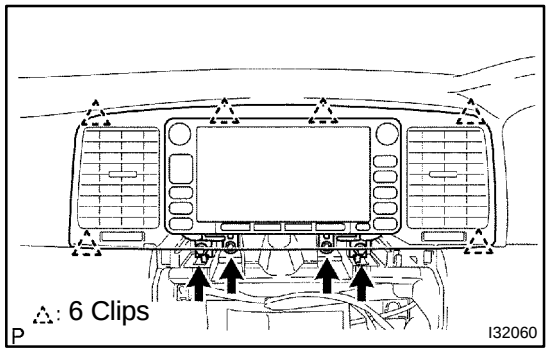


9. INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER

(a) Place the radio receiver assy temporarily on the instrument panel UPR. (*1)

(b) Under the condition of (*1), engage the 4 claws of the radio receiver assy with the instrument cluster finish panel sub-assy lower center. (*2)

(c) Under the condition of (*2), slide the instrument cluster finish panel sub-assy lower center and the radio receiver assy forward of the vehicle.



(d) Connect the connectors and install the 6 clips.

(e) Install the 4 screws and instrument cluster finish panel sub-assy lower center with radio receiver assy.

FRONT NO.1 SPEAKER ASSY

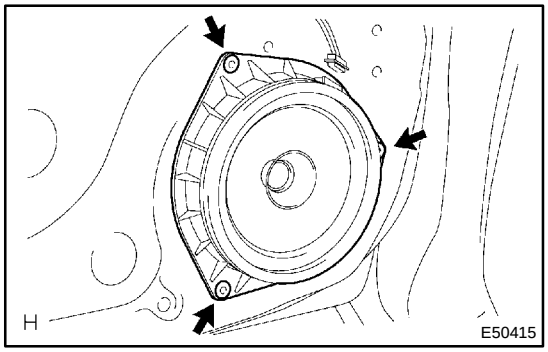
REPLACEMENT

67015-04

HINT:

COMPONENTS: See page 67-1

1. **REMOVE FRONT ARMREST ASSY LH**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
2. **REMOVE POWER WINDOW REGULATOR MASTER SWITCH ASSY (W/ POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
   (3 DOOR HATCH BACK: See page 75-16)
3. **REMOVE FRONT ARMREST BASE PANEL UPPER LH (W/O POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
4. **REMOVE FRONT DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
   (3 DOOR HATCH BACK: See page 75-16)
5. **REMOVE FRONT DOOR TRIM BOARD SUB-ASSY LH**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
   (3 DOOR HATCH BACK: See page 75-16)



6. **REMOVE FRONT NO.1 SPEAKER ASSY**

(a) Disconnect the connector.
(b) Using a drill, remove the 3 rivets and front No. 1 speaker assy.

7. **INSTALL FRONT NO.1 SPEAKER ASSY**

(a) Using an air riveter, install the front No. 1 speaker assy with the 3 rivets.
(b) Connect the connector.

8. **INSTALL FRONT DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-10)
   (5 DOOR HATCH BACK: See page 75-28)
   (3 DOOR HATCH BACK: See page 75-20)

FRONT NO.2 SPEAKER ASSY

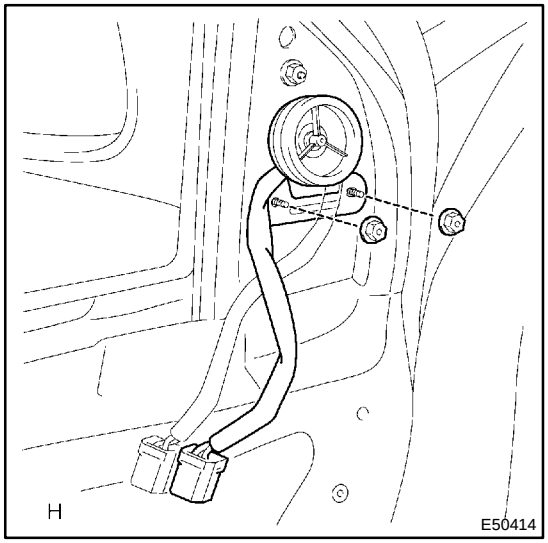
REPLACEMENT

67016-03

HINT:

COMPONENTS: See page 67-1

1. **REMOVE FRONT ARMREST ASSY LH**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
2. **REMOVE POWER WINDOW REGULATOR MASTER SWITCH ASSY (W/ POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
   (3 DOOR HATCH BACK: See page 75-16)
3. **REMOVE FRONT ARMREST BASE PANEL UPPER LH (W/O POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
4. **REMOVE FRONT DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
   (3 DOOR HATCH BACK: See page 75-16)
5. **REMOVE FRONT DOOR TRIM BOARD SUB-ASSY LH**
   (SEDAN/STATION WAGON: See page 75-6)
   (5 DOOR HATCH BACK: See page 75-24)
   (3 DOOR HATCH BACK: See page 75-16)
6. **REMOVE FRONT DOOR LOWER FRAME BRACKET GARNISH LH**
   (SEDAN/STATION WAGON: See page 75-7)
   (5 DOOR HATCH BACK: See page 75-25)
   (3 DOOR HATCH BACK: See page 75-17)



7. **REMOVE FRONT NO.2 SPEAKER ASSY**

(a) Open the part of service hole cover, then disconnect the connector.
(b) Remove the 2 nuts and front No. 2 speaker assy.

8. **INSTALL FRONT DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (SEDAN/STATION WAGON: See page 75-10)
   (5 DOOR HATCH BACK: See page 75-28)
   (3 DOOR HATCH BACK: See page 75-16)

REAR SPEAKER ASSY (SEDAN/STATION WAGON)

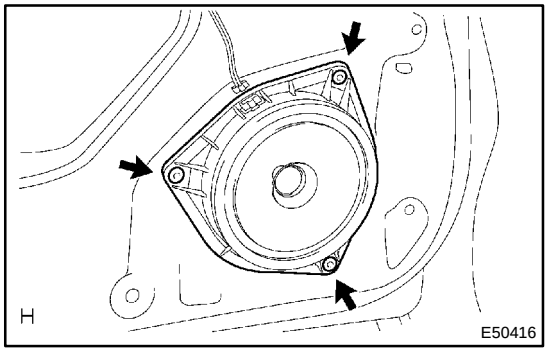
67017-03

REPLACEMENT

HINT:

COMPONENTS: See page 67-1

1. **REMOVE REAR ARMREST ASSY LH**
   (See page 75-36)
2. **REMOVE POWER WINDOW REGULATOR SWITCH ASSY REAR (W/ POWER WINDOW)**
   (See page 75-36)
3. **REMOVE REAR DOOR ARMREST BASE PANEL UPPER LH (W/O POWER WINDOW)**
   (See page 75-36)
4. **REMOVE REAR DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (See page 75-36)
5. **REMOVE REAR DOOR TRIM BOARD SUB-ASSY LH**
   (See page 75-36)



6. **REMOVE REAR SPEAKER ASSY**

(a) Disconnect the connector.
(b) Using a drill, remove the 3 rivets and rear speaker assy.

7. **INSTALL REAR SPEAKER ASSY**

(a) Using an air riveter, install the rear speaker assy with the 3 rivets.
(b) Connect the connector.

8. **INSTALL REAR DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (See page 75-40)

REAR SPEAKER ASSY (5-DOOR HATCHBACK)

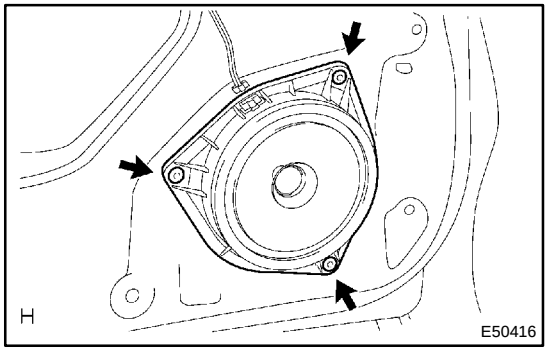
670BL-01

REPLACEMENT

HINT:

COMPONENTS: See page 67-1

1. **REMOVE REAR ARMREST ASSY LH**
   (See page 75-44)
2. **REMOVE POWER WINDOW REGULATOR SWITCH ASSY (W/ POWER WINDOW)**
   (See page 75-44)
3. **REMOVE REAR DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (See page 75-44)
4. **REMOVE REAR DOOR TRIM BOARD SUB-ASSY LH**
   (See page 75-44)



5. **REMOVE REAR SPEAKER ASSY**

(a) Disconnect the connector.
(b) Using a drill, remove the 3 rivets and rear speaker assy.

6. **INSTALL REAR SPEAKER ASSY**

(a) Using an air riveter, install the rear speaker assy with the 3 rivets.
(b) Connect the connector.

7. **INSTALL REAR DOOR WINDOW REGULATOR HANDLE ASSY (W/O POWER WINDOW)**
   (See page 75-47)

REAR SPEAKER ASSY (3-DOOR HATCHBACK)

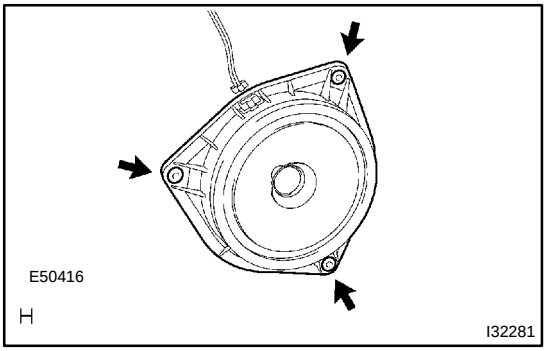
670BK-01

REPLACEMENT

HINT:

COMPONENTS: See page 67-1

1. **REMOVE FRONT DOOR SCUFF PLATE LH**
   (See page 76-48)
2. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH**
   (See page 76-48)
3. **REMOVE REAR SEAT BACK ASSY LH (See page 76-48)**
4. **REMOVE QUARTER TRIM PANEL ASSY FRONT LH**
   (See page 76-49)



5. **REMOVE REAR SPEAKER ASSY**

(a) Disconnect the connector.
(b) Using a drill, remove the 3 rivets and rear speaker assy.

6. **INSTALL REAR SPEAKER ASSY**

(a) Using an air riveter, install the rear speaker assy with the 3 rivets.
(b) Connect the connector.

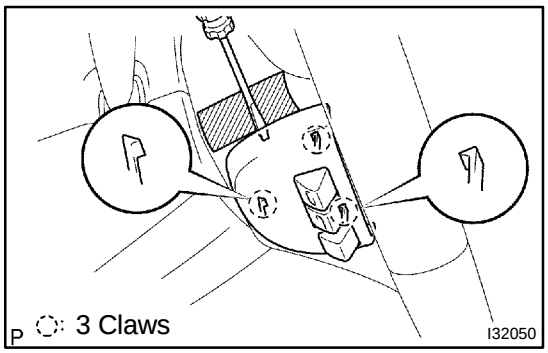
STEREO COMPONENT CONTROLLER ASSY

REPLACEMENT

670BF-01

HINT:

COMPONENTS: See page 67-1



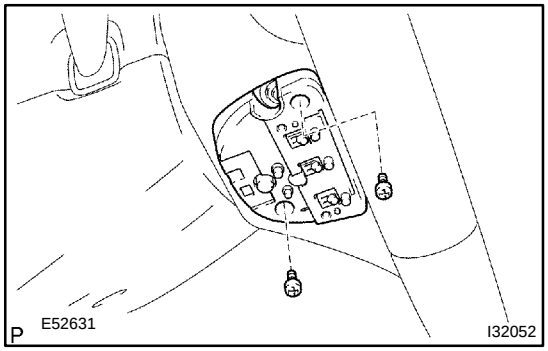
1. REMOVE STEREO COMPONENT CONTROLLER ASSY

(a) Apply protective tape to the steering wheel cover lower as shown in the illustration.

(b) Using a screwdriver, disengage the 3 claws and remove the switch & volume case.

HINT:

Tape the screwdriver tip before use.



(c) Remove the 2 screws.

(d) Remove the stereo component controller assy, then disconnect the connector.

ANTENNA CORD SUB-ASSY

REPLACEMENT

670BM-01

HINT:

COMPONENTS: See page 67-1

1. **REMOVE INSTRUMENT PANEL SUB-ASSY UPPER**
   (See page 71-18 or 71-27)

HINT:

- Refer to the procedure until the step, "REMOVE INSTRUMENT PANEL SUB-ASSY UPPER" of INSTRUMENT PANEL SUB-ASSY LOWER.
- Remove the related parts as long as the antenna cord sub-assy can be removed.

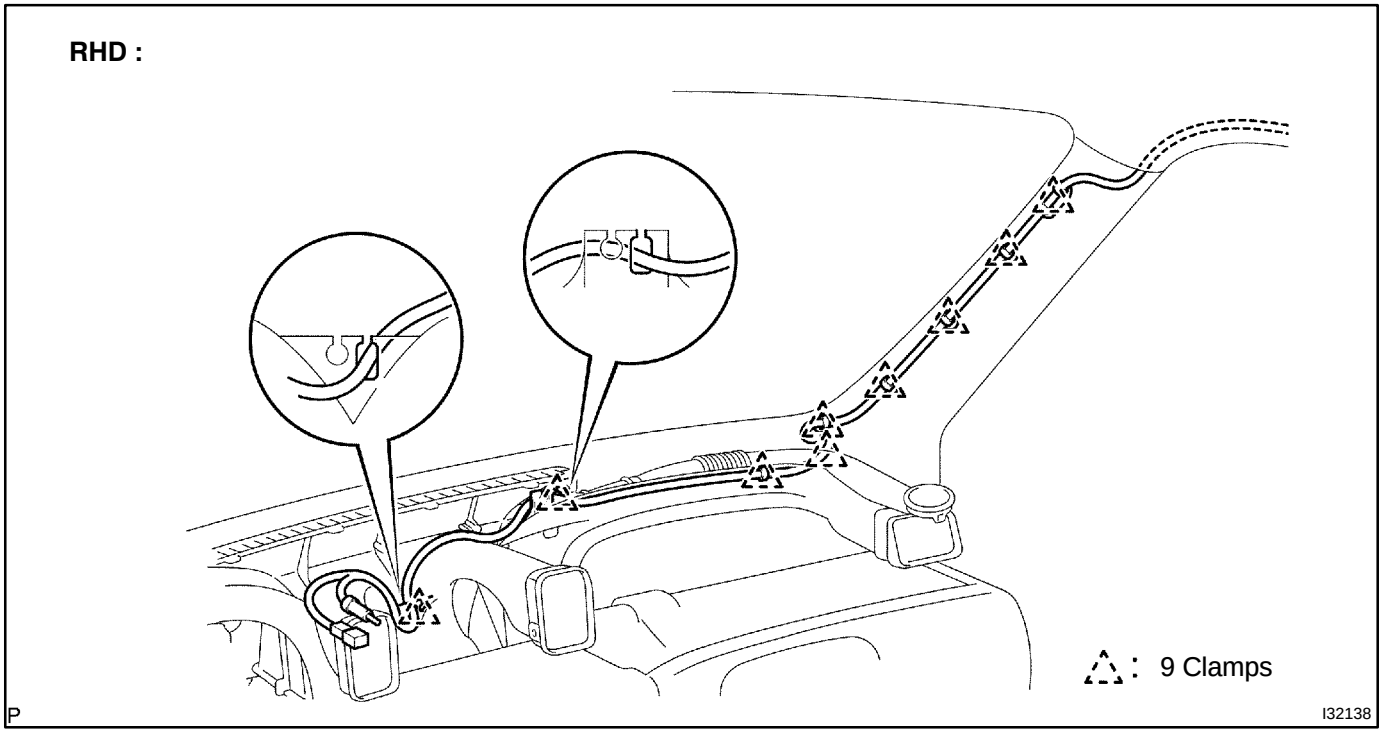
2. **REMOVE VISOR HOLDER**
   (STATION WAGON: See page 76-44)
   (5 DOOR HATCH BACK: See page 76-60)
   (3 DOOR HATCH BACK: See page 76-52)

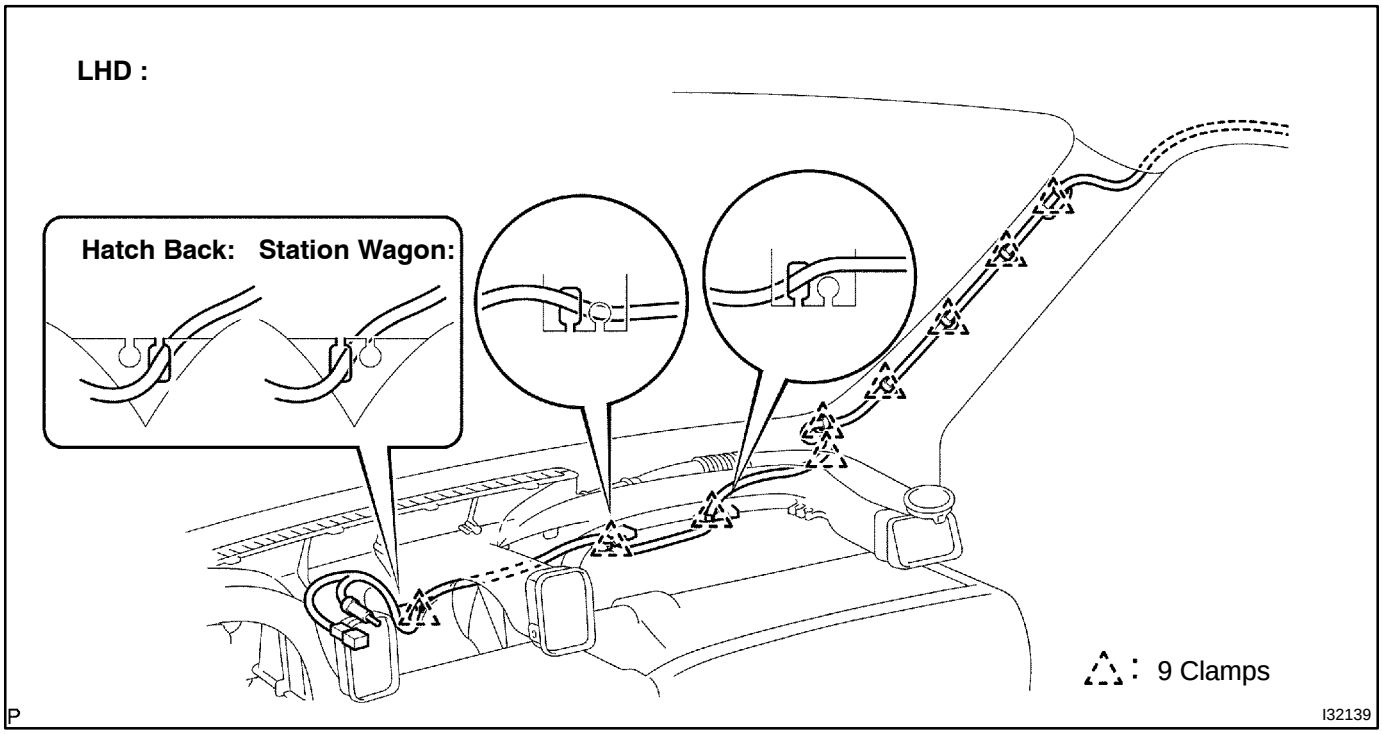
HINT:

- Refer to the procedure until the step, "REMOVE VISOR HOLDER" of ROOF HEADLINING ASSY .
- Remove the parts related to the roof headlining assy in the range that antenna cord can be cut off.

3. DISCONNECT ANTENNA CORD SUB-ASSY

(a) Remove the 9 clamps at the front side of antenna cord.





(b) Disconnect the connector and antenna cord plug at the rear side of antenna cord.
(c) STATION WAGON:
Remove the clamp at the rear side of antenna cord.

4. REMOVE ROOF HEADLINING ASSY
(STATION WAGON: See page 76-45)
(5 DOOR HATCH BACK: See page 76-61)
(3 DOOR HATCH BACK: See page 76-52)

HINT:
Refer to the procedures from the step, "REMOVE VISOR HOLDER" to the step "REMOVE ROOF HEADLINING ASSY" of ROOF HEADLINING ASSY.

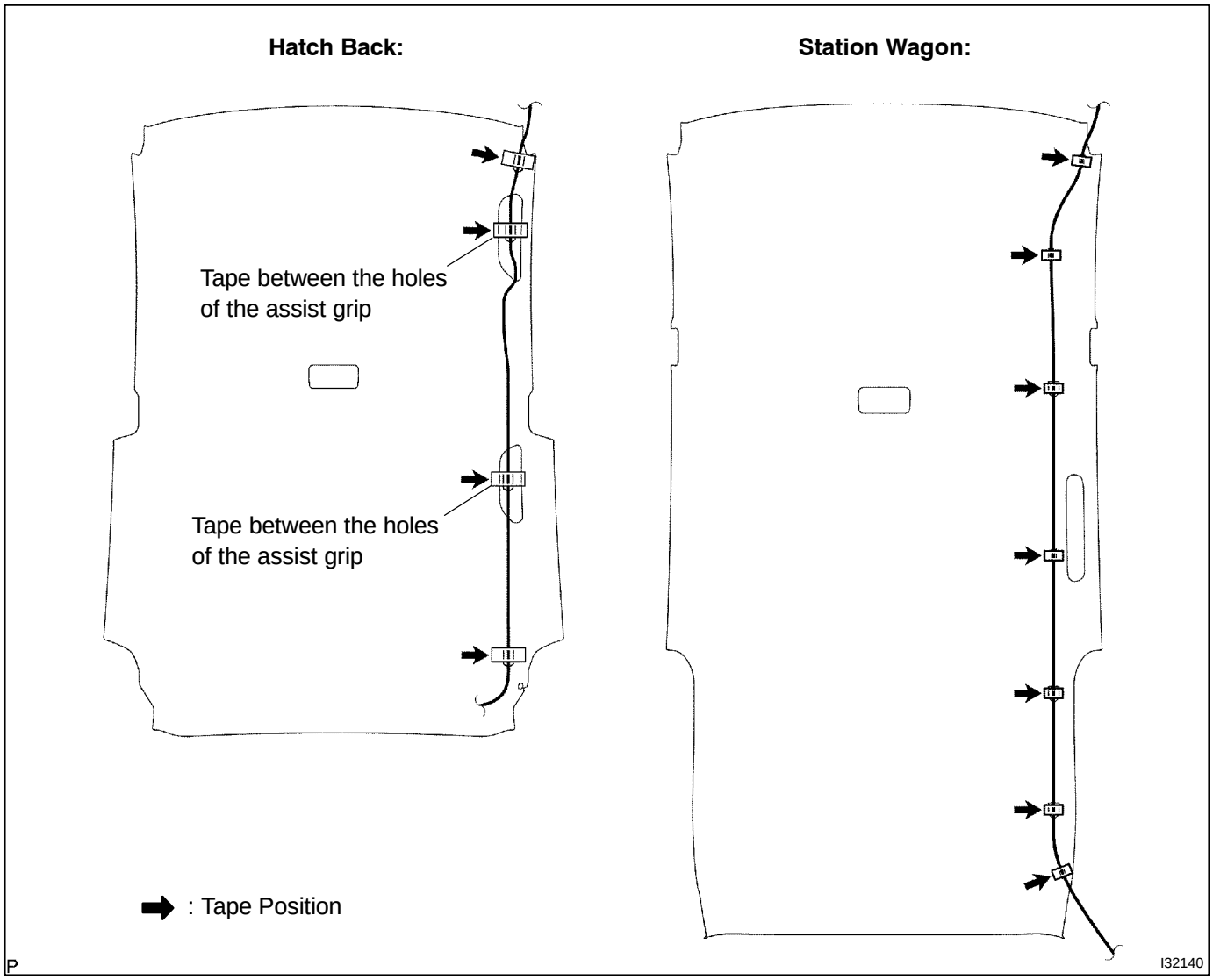
5. REMOVE ANTENNA CORD SUB-ASSY

(a) Remove the antenna cord sub-assy from the roof headlining.

6. INSTALL ANTENNA CORD SUB-ASSY

(a) Tape the antenna cord sub-assy at the position of the roof headlining shown in the illustration.

NOTICE:
- **The antenna cord sub-assy should come to the center of the tape (100 mm(3.94 in.) x 25 mm(0.98 in.)) when taped.**
- **Try not to touch the adhesive side of the tape when taping.**



(b) Engage the 9 clamps at the front side of antenna cord.
(c) Connect the connector and antenna cord plug at the rear side of antenna cord.
(d) STATION WAGON:
Engage the clamp at the rear side of antenna cord.

7. INSTALL ROOF HEADLINING ASSY
(STATION WAGON: See page 76-45)
(5 DOOR HATCH BACK: See page 76-61)
(3 DOOR HATCH BACK: See page 76-53)

HINT:
Refer to the procedure from "INSTALL ROOF HEADLINING ASSY" of ROOF HEADLINING ASSY.

8. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER
(See page 71-21 or 71-30)

HINT:
Refer to the procedure until the step, "INSTALL INSTRUMENT PANEL SUB-ASSY UPPER" of INSTRUMENT PANEL SUB-ASSY LOWER.

W/HOLDER ANTENNA ASSY

670BO-01

REPLACEMENT

HINT:

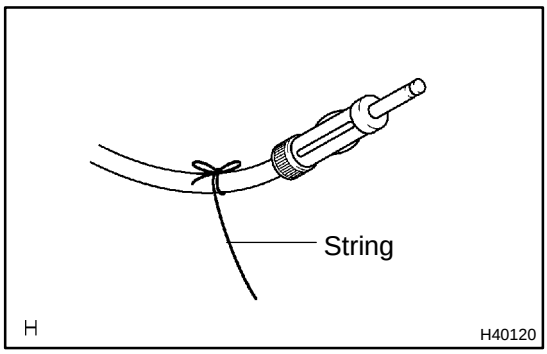
COMPONENTS: See page 67-1

1. REMOVE INSTRUMENT PANEL SUB-ASSY UPPER

(See page 71-18)

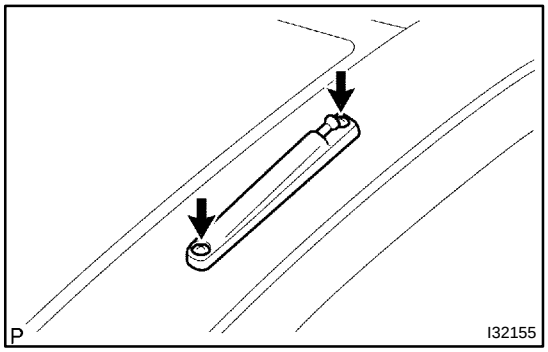
HINT:

Refer to the procedure until the step, "REMOVE INSTRUMENT PANEL SUB-ASSY UPPER" of INSTRUMENT PANEL SUB-ASSY LOWER (SEDAN/STATION WAGON).

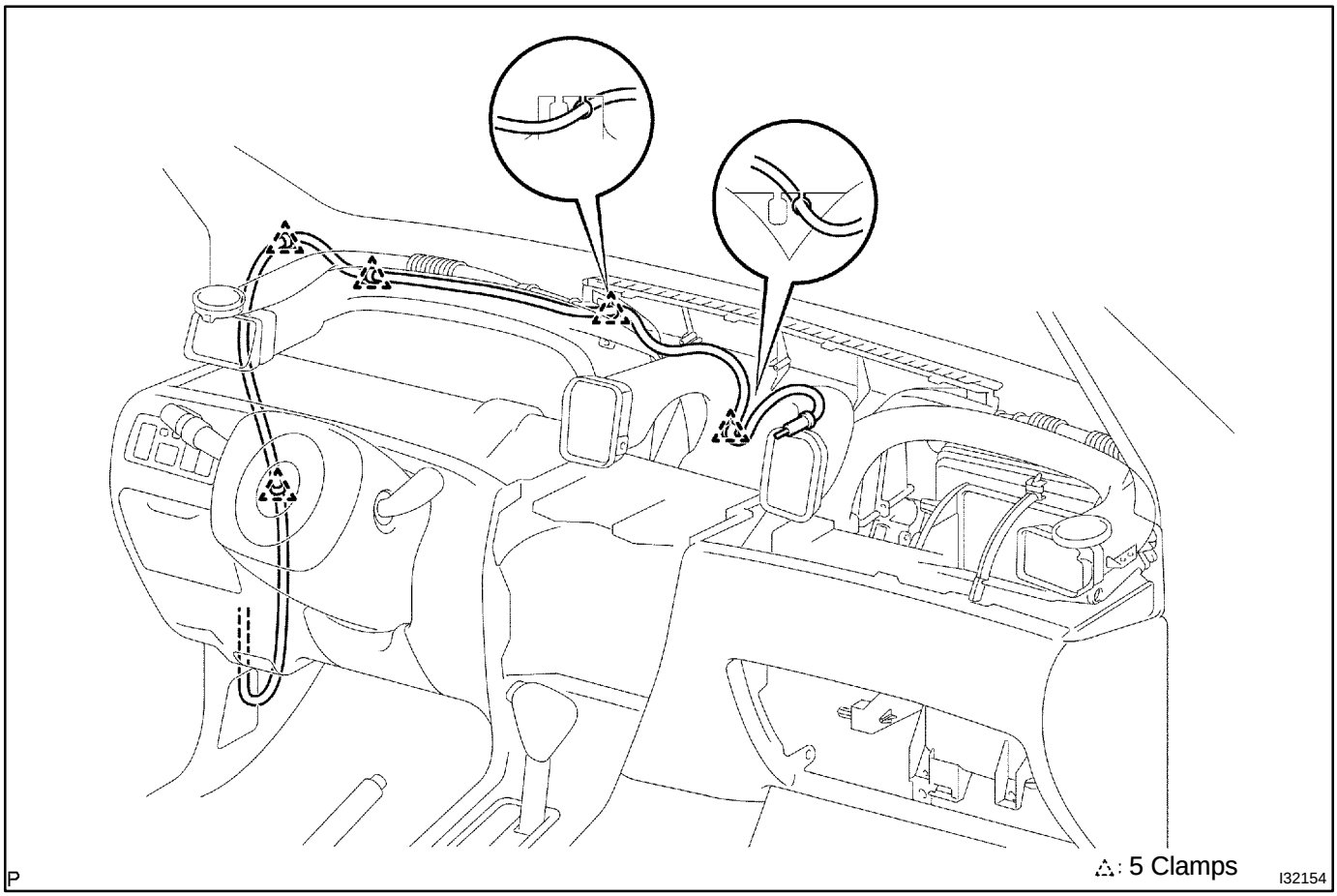


2. REMOVE W/HOLDER ANTENNA ASSY

(a) Tie the string at the tip of the cable of the w/ holder antenna assy.



(b) Remove the 2 screws.
(c) Disengage the 5 clamps and remove the w/ holder antenna assy.



3. INSTALL W/HOLDER ANTENNA ASSY

(a) Use the string to put the cable of the w/ holder antenna assy.
(b) Engage the 5 clamps and install the w/ holder antenna assy with the 2 screws.

4. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER

(See page 71-21)

HINT:
Refer to the procedure until the step, "INSTALL INSTRUMENT PANEL SUB-ASSY UPPER" of INSTRUMENT PANEL SUB-ASSY LOWER (SEDAN/STATION WAGON).

AMPLIFIER ANTENNA ASSY

REPLACEMENT

670BN-01

HINT:

COMPONENTS: See page 67-1

1. REMOVE ROOF HEADLINING ASSY
(STATION WAGON: See page 76-45)
(5 DOOR HATCH BACK: See page 76-61)
(3 DOOR HATCH BACK: See page 76-52)

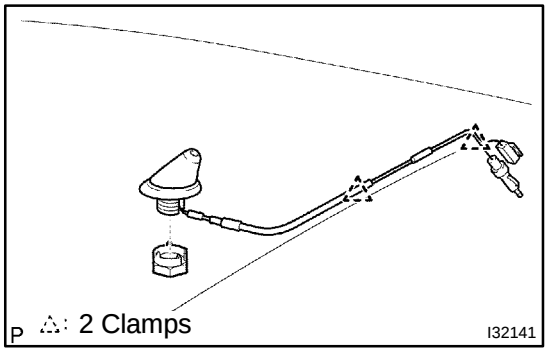
NOTICE:

Do not bend the roof headlining assy.

HINT:

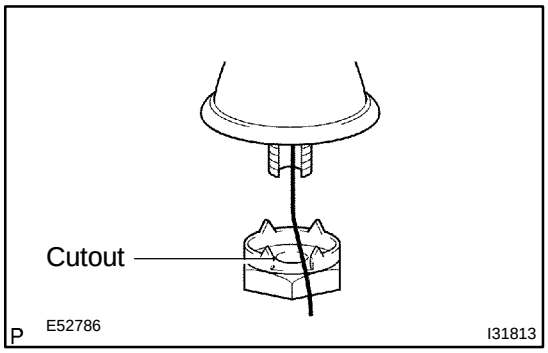
- Refer to the procedure from "REMOVE ROOF HEADLINING ASSY" of ROOF HEADLINING ASSY.
- Remove the related parts as long as the amplifier antenna assy can be removed.

2. REMOVE ROOF ANTENNA POLE SUB-ASSY
(See page 67-21)



3. REMOVE AMPLIFIER ANTENNA ASSY

(a) Disconnect the connector and antenna cord plug.
(b) Remove the 2 clamps.
(c) Remove the antenna nut and amplifier antenna assy.



4. INSTALL AMPLIFIER ANTENNA ASSY

(a) Set the amplifier antenna assy to the hole on the roof, and place the antenna cord on the cutout on the antenna nut.
(b) Install the amplifier antenna assy with the antenna nut.
Torque: 4.5 N·m (46 kgf·cm, 40 in.·lbf)

5. INSTALL ROOF HEADLINING ASSY
(STATION WAGON: See page 76-45)
(5 DOOR HATCH BACK: See page 76-61)
(3 DOOR HATCH BACK: See page 76-53)

HINT:

Refer to the procedure from "INSTALL ROOF HEADLINING ASSY" of ROOF HEADLINING ASSY.

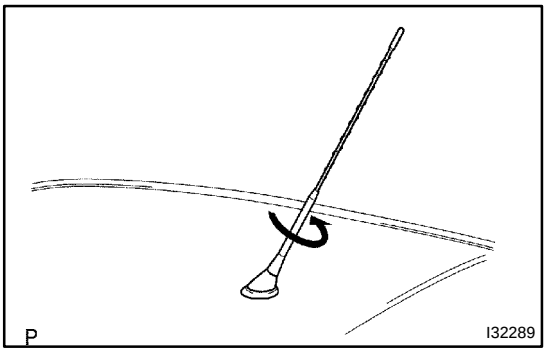
ROOF ANTENNA POLE SUB-ASSY

670BG-01

REPLACEMENT

HINT:

COMPONENTS: See page 67-1



1. REMOVE ROOF ANTENNA POLE SUB-ASSY

(a) Remove the roof antenna pole sub-assy by turning it in the arrow direction in the illustration.

NAVIGATION ECU

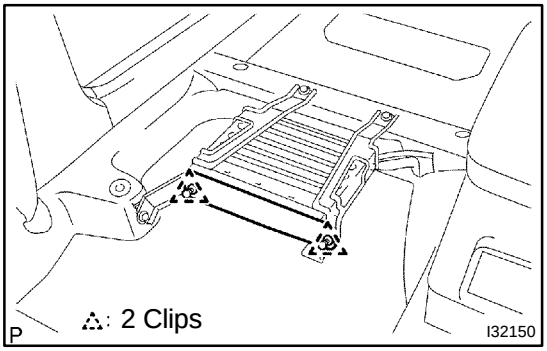
REPLACEMENT

670BH-01

HINT:

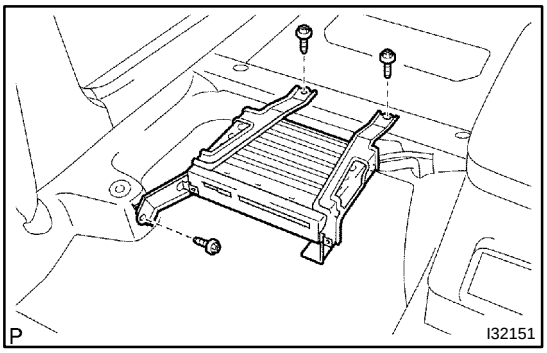
COMPONENTS: See page 67-1

1. **REMOVE FRONT SEAT ASSEMBLY LH**
   (SEDAN/STATION WAGON: See page 72-2)
   (HATCH BACK: See page 72-8)



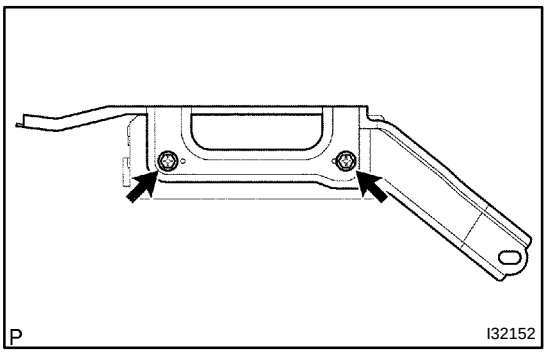
2. **REMOVE NAVIGATION ECU COVER**

(a) Disengage the 2 clips, then remove the navigation ECU cover.



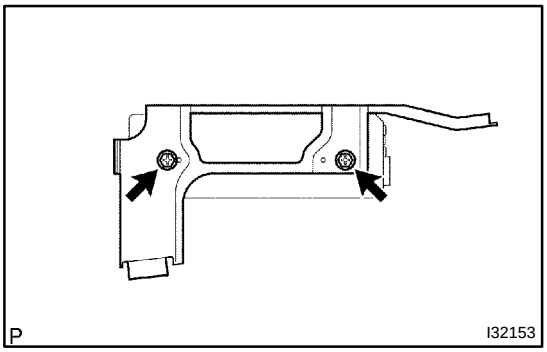
3. **REMOVE NAVIGATION ECU**

(a) Remove the 3 bolts.
(b) Disconnect the connectors, then remove the navigation ECU.



4. **REMOVE DISC PLAYER BRACKET**

(a) Remove the 2 screws and disc player bracket.



5. **REMOVE DISC PLAYER BRACKET NO.2**

(a) Remove the 2 screws and disc player bracket No. 2.

6. INSTALL FRONT SEAT ASSEMBLY LH
(SEDAN/STATION WAGON: See page 72-6)
(HATCH BACK: See page 72-10)

NAVIGATION ANTENNA ASSY

REPLACEMENT

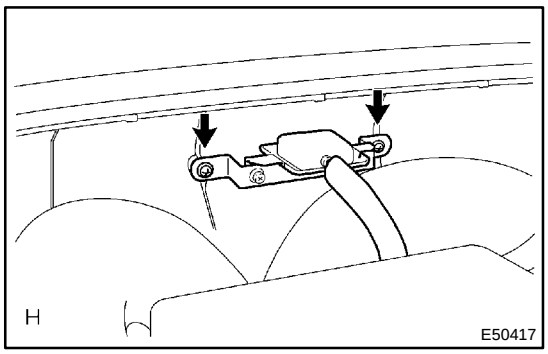
670BI-01

HINT:

COMPONENTS: See page 67-1

1. **REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY**

2. **REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE)**
   (See page 71-16 or 71-25)
3. **REMOVE CONSOLE PANEL UPPER**
   (See page 71-16 or 71-25)
4. **REMOVE INSTRUMENT CLUSTER FINISH PANEL**
   (See page 71-16 or 71-25)
5. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER**
   (See page 71-17 or 71-26)



6. **REMOVE NAVIGATION ANTENNA ASSY**

(a) Disconnect the connector.
(b) Remove the 2 screws and navigation antenna assy.

CIGARETTE LIGHTER ASSY

REPLACEMENT

670BJ-01

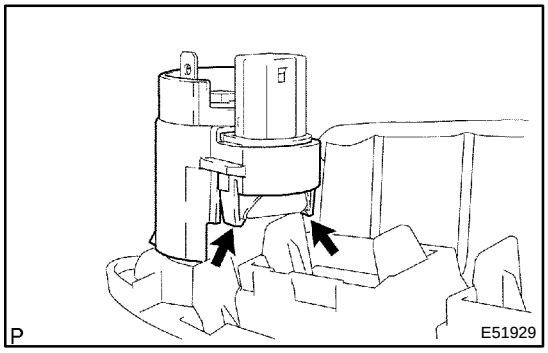
HINT:

COMPONENTS: See page 67-1

1. REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY

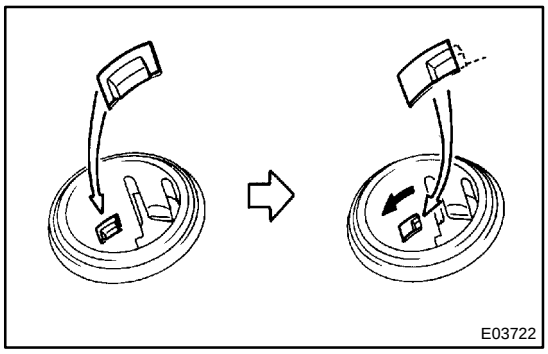
2. REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE)
(See page 71-16 or 71-25)

3. REMOVE CONSOLE PANEL UPPER
(See page 71-16 or 71-25)



4. REMOVE CIGARETTE LIGHTER COVER (SEDAN/STATION WAGON BODY TYPE)

(a) Disengage the 2 claws and remove the cigarette lighter cover.



5. REMOVE CIGARETTE LIGHTER ASSY

(a) Turn the socket in the circumference direction as shown in the illustration, disengage the claw between the socket and the cigarette lighter bezel stay, and push out the socket to the room side.

(b) Align the socket with the notch on the cigarette lighter bezel stay, remove the cigarette lighter assy to the room side.

6. INSTALL CIGARETTE LIGHTER ASSY

(a) Align the socket with the notch on the cigarette lighter bezel stay, push the cigarette lighter assy into as hard as possible and install it.

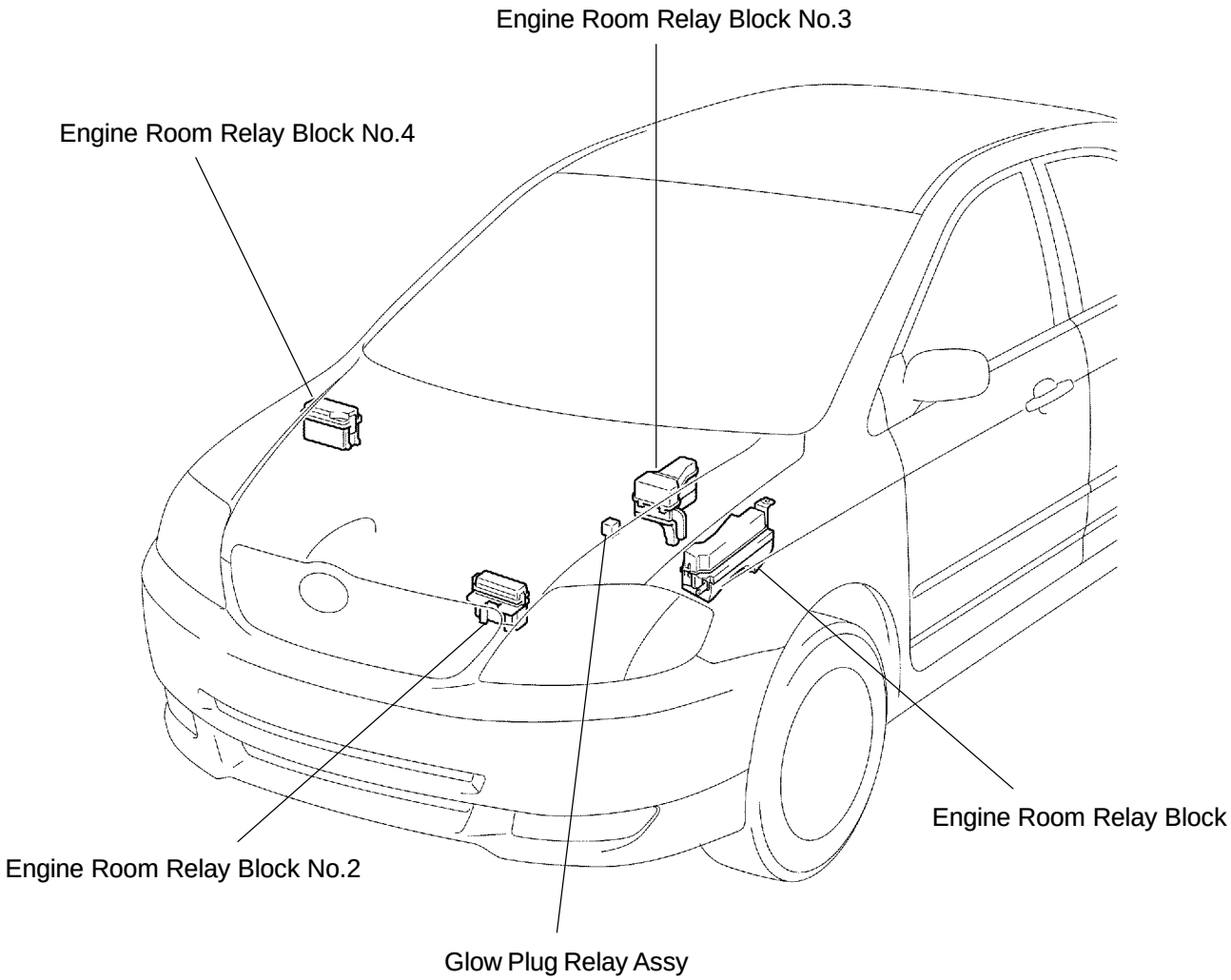
WIRING

POWER SOURCE 68-1
LOCATION 68-1/8

POWER SOURCE

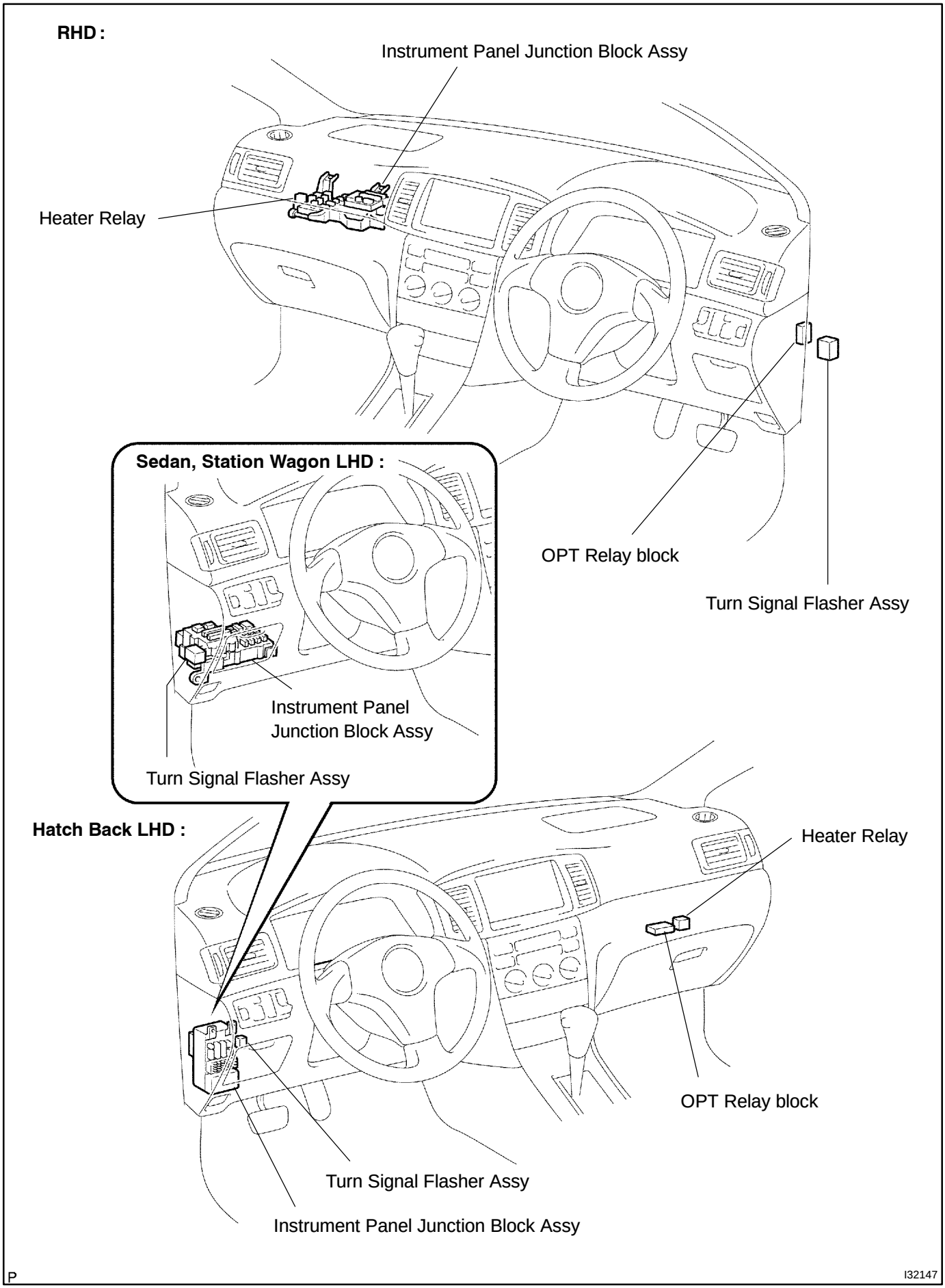
LOCATION

6802N-01

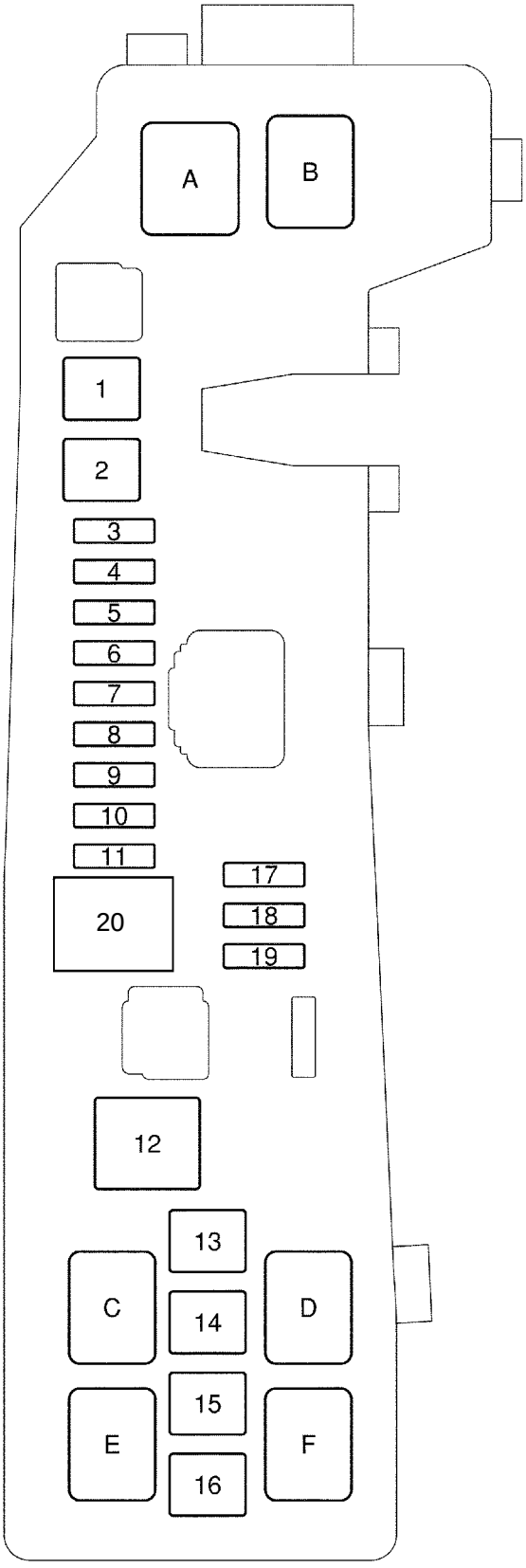


P

I32145


RHD :
Instrument Panel Junction Block Assy
Heater Relay
OPT Relay block
Turn Signal Flasher Assy
Sedan, Station Wagon LHD :
Instrument Panel
Junction Block Assy
Turn Signal Flasher Assy
Hatch Back LHD :
Heater Relay
OPT Relay block
Turn Signal Flasher Assy
Instrument Panel Junction Block Assy
P
I32147

Engine Room Relay Block
4ZZ-FE, 3ZZ-FE, 2ZZ-GE :



FUSE

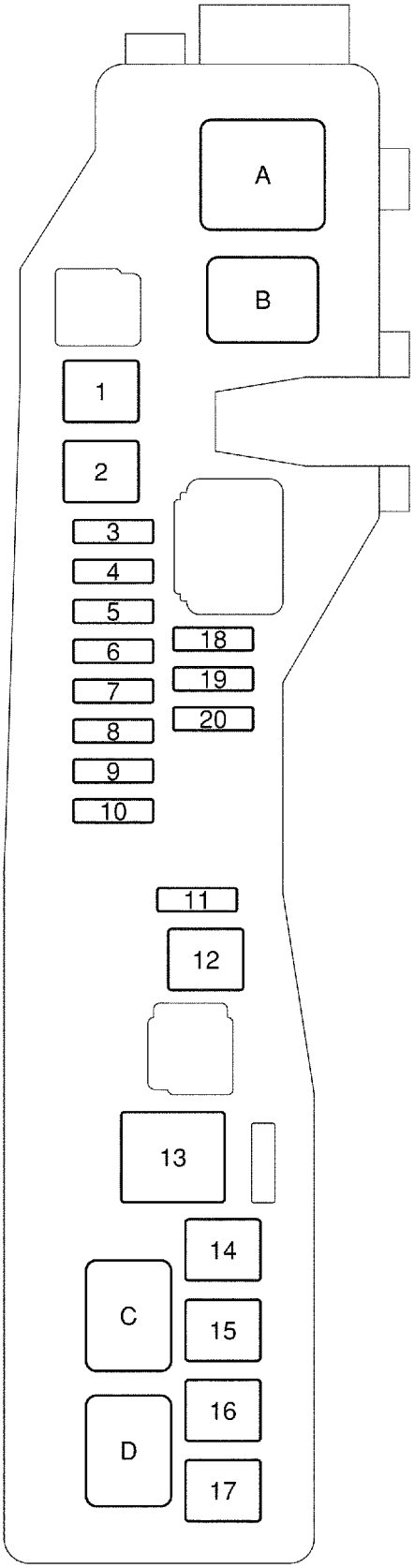
1. EMPS	50 A
2. HEAD MAIN	40 A
3. HEAD RH	15 A
4. HEAD LH	15 A
5. HORN	10 A
6. HAZARD	10 A
7. ALT-S	5 A
8. -	
9. EFI	15 A
10. DOME	15 A
11. AM 2	30 A
12. ALT	100 A
13. H-LP CLN	30 A
14. RDI FAN	30 A
15. ABS No. 1	30 A (Sedan, Station Wagon) 50 A (Hatch Back)
16. ABS No. 2	40 A (Sedan, Station Wagon) 30 A (Hatch Back)
17. SPARE	5 A
18. SPARE	10 A
19. SPARE	15A
20. A/PUMP	50 A

RELAY

A. EMPS	D. FAN No. 2
B. MG CLT	E. EFI
C. HORN	F. FAN No. 1

P I32044 I32282

Engine Room Relay Block
1CD-FTV :



FUSE

1. EMPS	50 A
2. HEAD MAIN	40 A
3. HEAD RH	15 A
4. HEAD LH	15 A
5. HORN	10 A
6. HAZARD	10 A
7. ALT-S	5 A
8. EDU	15 A
9. DOME	15 A
10. AM 2	30 A
11. HTR SUB	30 A
12. CDS FAN	30 A
13. ALT	120 A
14. RDI FAN	40 A (*1)
H-LP CLN	30 A (*2,*3)
15. ABS No. 1	30 A (*1)
RDI FAN	40 A (*2,*3)
16. ABS No. 2	40 A (*1)
ABS No. 1	30 A (*2)
ABS No. 1	50 A (*3)
17. AM 1	50 A (*1,*3)
ABS No. 2	40 A(*2)
18. SPARE	5A
19. SPARE	10 A
20. SPARE	15 A

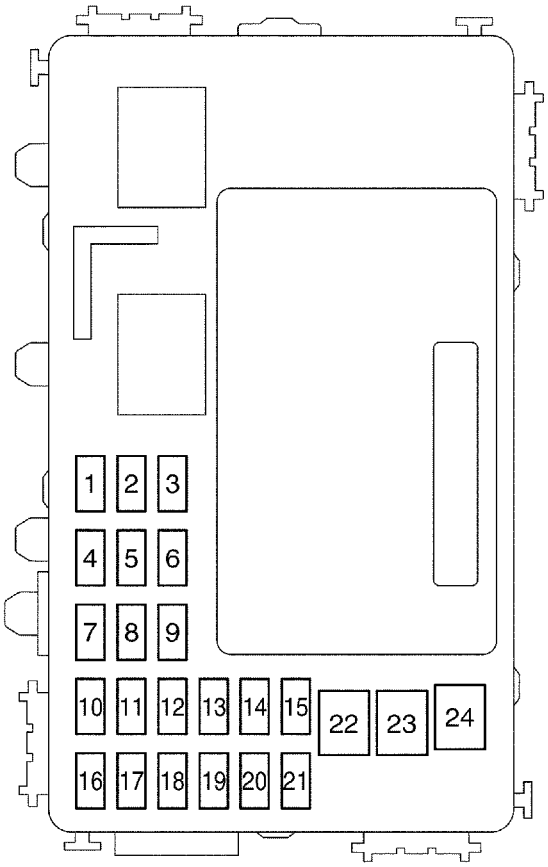
RELAY

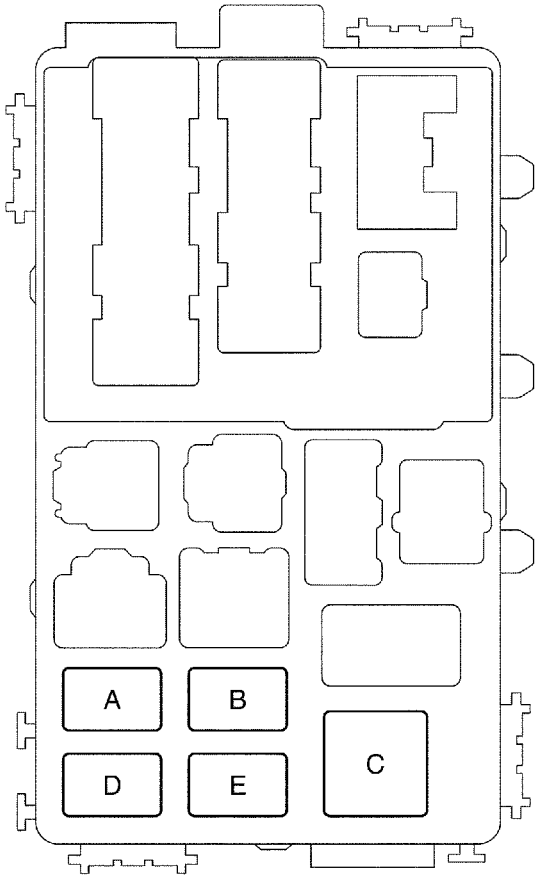
A. EMPS	C. HORN
B. MG CLT	D. EDU

*1 : Sedan, Station Wagon Power Heater (Electrical Type)
*2 : Sedan, Station Wagon Power Heater (Combustion Type)
*3 : Hatch Back

P
I32045

Instrument Panel Junction Block Assy
Except Hatch Back LHD :





FUSE

1. DEF I/P	10 A	13. DOOR	25 A
2. -		14. P/W	30 A
3. CIG	15 A	15. OBD-2	7.5 A
4. ST	7.5 A	16. WASH	15 A
5. A/C	10 A	17. ECU-IG	10 A
6. IG 2	15 A	18. GAUGE	10 A
7. AM 1	25 A	19. DOOR DL	15 A
8. ECU-B	10 A	20. P. POINT	15 A
9. FOG	15 A	21. FUEL HTR	25 A
10. WIP	25 A	22. POWER	30 A
11. TAIL	15 A	23. DEFOG	30 A
12. STOP	15 A	24. HTR	40 A

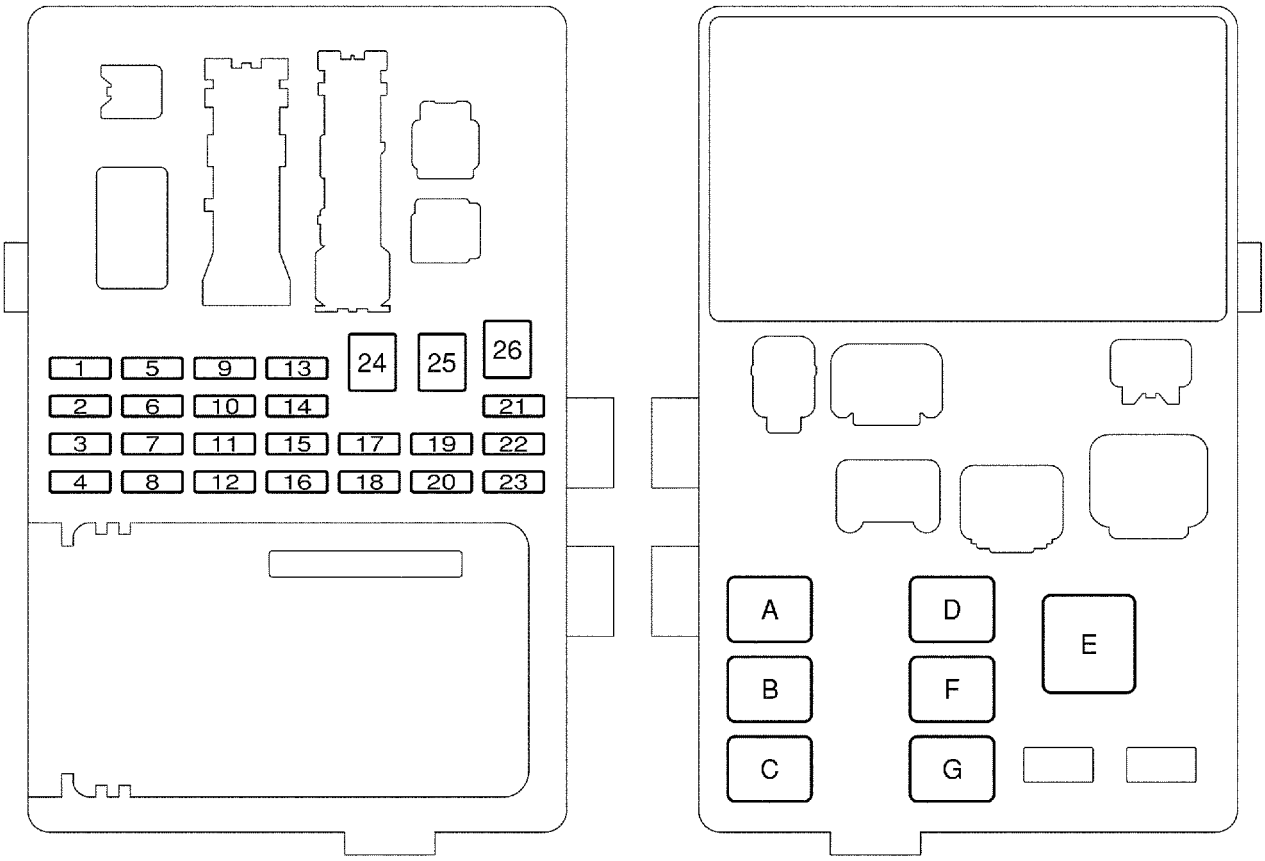
RELAY

A. DEF
B. Short Pin
C. ST (Sedan, Station Wagon A/T)
Short Pin (Sedan, Station Wagon M/T)
D. IG 1
E. C/OPN

P

I32046

Instrument Panel Junction Block Assy
Hatch Back LHD :



FUSE

1. -		14. FOG	15 A
2. -		15. DOOR	25 A
3. -		16. -	
4. FUEL HTR	25 A	17. A/C	10 A
5. CIG	15 A	18. OBD	7.5 A
6. IG 2	15 A	19. GAUGE	10 A
7. (*1)	10 A	20. S-HTR	15 A
8. ST	7.5 A	21. WASH	15 A
9. ECU-B	10 A	22. ECU-IG	10 A
10. AM 1	25 A	23. WIPER	25 A
11. TAIL	15 A	24. DEFOG	30 A
12. P/W	20 A	25. POWER	30 A
13. STOP	15 A	26. HEATER	40 A

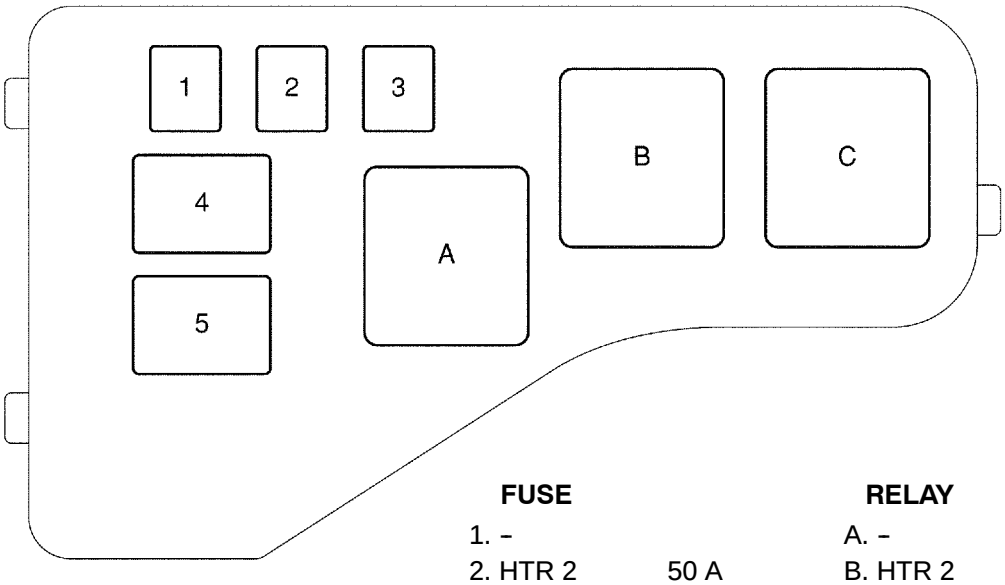
RELAY

A. DEF
B. C/OPN
C. IG 1
D. Short Pin
E. -
F. -
G. FUEL HTR

*1 : MIR-HTR/DEF I-UP

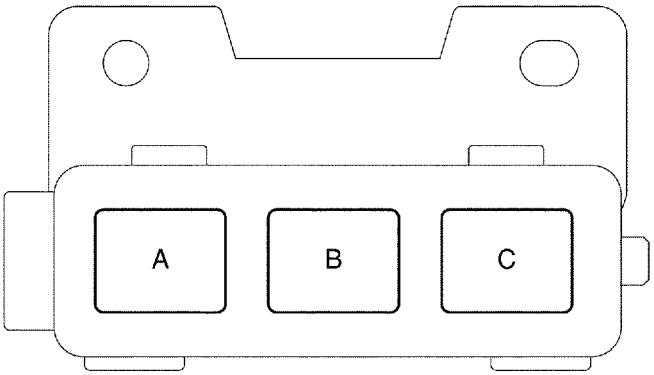
P
I32149

Engine Room Relay Block No.3



FUSE		RELAY
1. -		A. -
2. HTR 2	50 A	B. HTR 2
3. HTR 1	50 A	C. HTR 1
4. GLOW	80 A	
5. ALT	140 A	

Engine Room Relay Block No.2

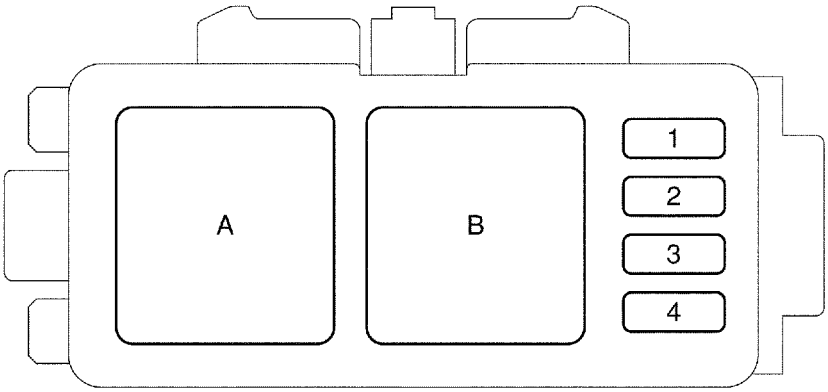


RELAY

A. FAN No. 1
B. FAN No. 3
C. FAN No. 2

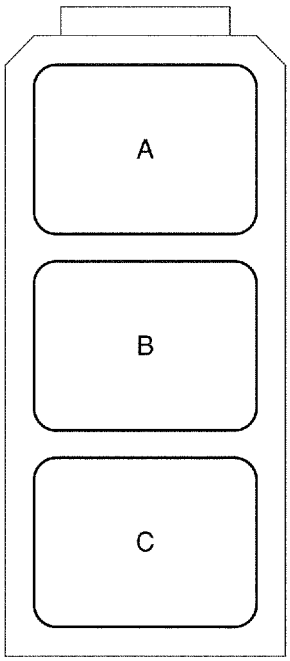
P I32048

Engine Room Relay Block No.4



FUSE		RELAY
1. LO RH	10 A	A. HEAD
2. LO LH	10 A	B. DIM
3. HI RH	10 A	
4. HI LH	10 A	

OPT Relay Block



RELAY

A. T-LP
B. FOG-LP
C. ST (Hatch Back)
FUEL HTR (Sedan, Station Wagon)

P I32148

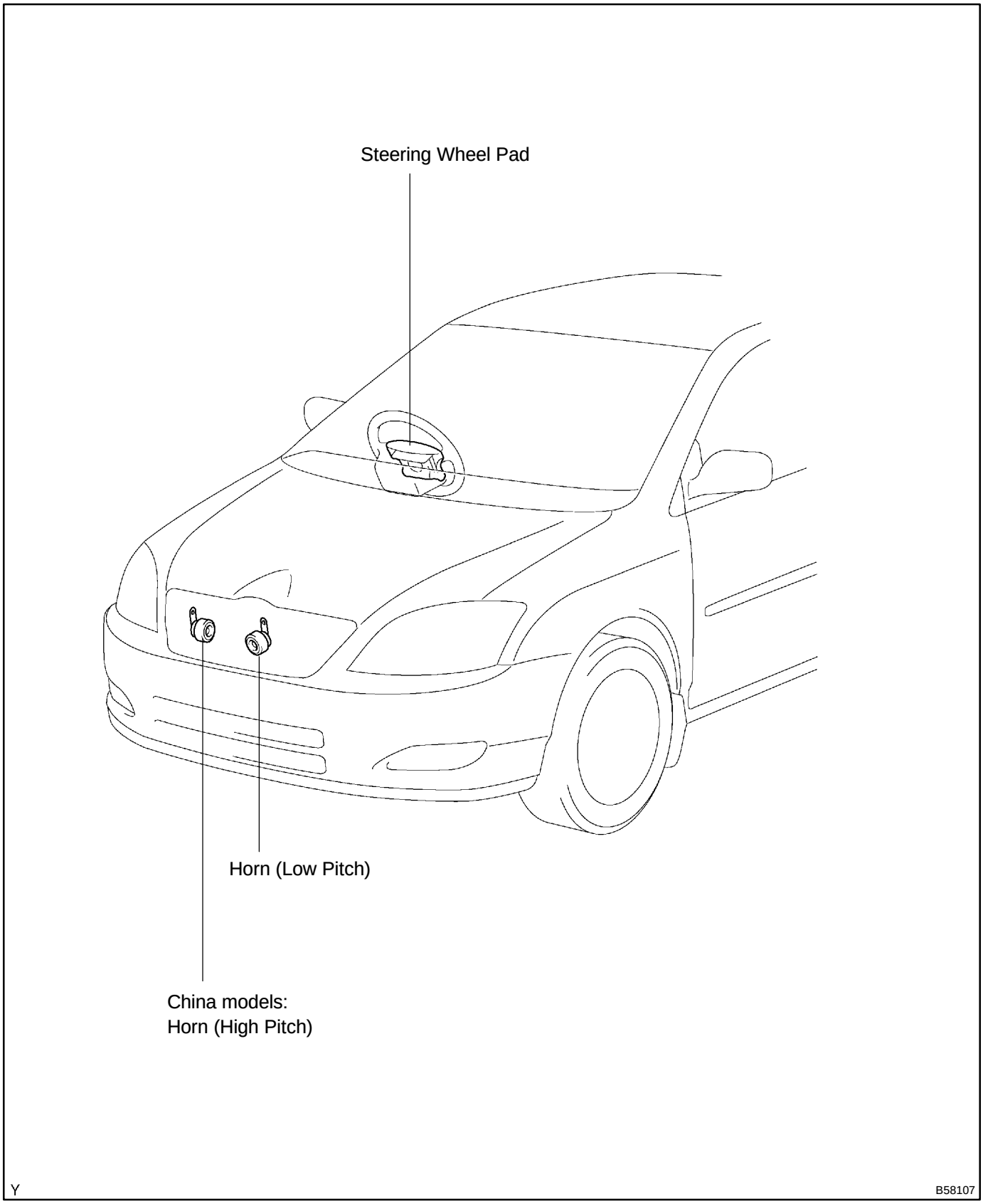
COMMUNICATION SYSTEM

HORN SYSTEM 69-1
LOCATION 69-1
PROBLEM SYMPTOMS TABLE 69-2
INSPECTION 69-3
HORN 69-4
REPLACEMENT 69-4

HORN SYSTEM

LOCATION

6903I-01



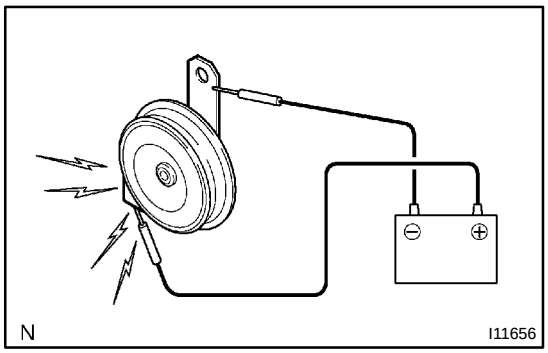
6903J-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Horn does not sound	2. Horn button switch	-
	3. High pitched horn (China models)	69-3
	4. Low pitched horn	69-3
	5. HORN relay	69-3
	6. Wire harness	-

6903K-01

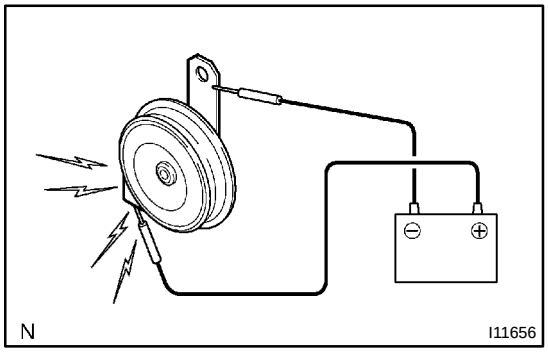
INSPECTION



1. INSPECT LOW PITCHED HORN ASSY

(a) Connect the positive (+) lead from the battery to the terminal and the negative (–) lead to the horn body and check that the horn blows.

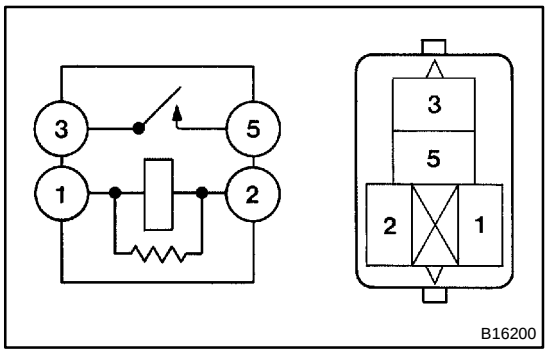
If the operation is not as specified, replace the horn.



2. INSPECT HIGH PITCHED HORN ASSY (CHINA MODELS)

(a) Connect the positive (+) lead from the battery to the terminal and the negative (–) lead to the horn body and check that the horn blows.

If the operation is not as specified, replace the horn.



3. INSPECT HORN RELAY ASSY

(a) Inspect the horn relay (Marking: HORN) continuity.

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If the continuity is not as specified, replace the relay.

HORN

REPLACEMENT

6903L-01

1. REMOVE HIGH PITCHED HORN ASSY (CHINA MODELS)

(a) Disconnect the connector.
(b) Remove the bolt and the horn assembly.

2. REMOVE LOW PITCHED HORN ASSY

(a) Disconnect the connector.
(b) Remove the bolt and the horn assembly.

3. INSTALL HIGH PITCHED HORN ASSY (CHINA MODELS)

(a) Place the stay onto the baffle part in the hood lock support brace, and then install the low pitched horn assembly with the bolt.
(b) Connect the connector.

4. INSTALL LOW PITCHED HORN ASSY

(a) Place the stay onto the baffle part in the radiator support upper, and then install the low pitched horn assembly with the bolt.
(b) Connect the connector.

WINDSHIELD/WINDOWGLASS/MIRROR

POWER WINDOW CONTROL SYSTEM (TMC MADE) 70-1
ON-VEHICLE INSPECTION 70-1/2
INSPECTION 70-3/6
POWER WINDOW CONTROL SYSTEM (TMUK MADE) 70-7
LOCATION 70-7
ON-VEHICLE INSPECTION 70-8
PROBLEM SYMPTOMS TABLE 70-9
INSPECTION 70-10/15
WINDSHIELD GLASS 70-16
COMPONENTS 70-16/17
REPLACEMENT 70-18/22
BACK WINDOW GLASS (SEDAN) 70-23
COMPONENTS 70-23
REPLACEMENT 70-24/28
QUARTER WINDOW ASSY LH (STATION WAGON) 70-29
COMPONENTS 70-29
REPLACEMENT 70-30/33
BACK DOOR GLASS (STATION WAGON) 70-34
COMPONENTS 70-34
REPLACEMENT 70-35/38
BACK DOOR GLASS (HATCHBACK) 70-39
COMPONENTS 70-39
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QUARTER WINDOW GLASS LH (3-DOOR HATCHBACK) 70-44
COMPONENTS 70-44
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WINDOW DEFOGGER SYSTEM 70-49
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PROBLEM SYMPTOMS TABLE 70-50
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POWER MIRROR CONTROL SYSTEM 70-52
LOCATION 70-52
PROBLEM SYMPTOMS TABLE 70-53
INSPECTION 70-54/56
OUTER MIRROR COVER LH (TMC MADE) 70-57
REPLACEMENT 70-57
OUTER MIRROR COVER LH (TMUK MADE) 70-58
REPLACEMENT 70-58/59

POWER WINDOW CONTROL SYSTEM (TMC MADE)

700E2-01

ON-VEHICLE INSPECTION

1. CHECK BASIC FUNCTION (MANUAL OPERATION FUNCTION)

(a) Turn the ignition switch ON.

(1) Check that the door glass moves up when each window switch of the regulator master switch assembly is turned UP and moves down when each window switch is turned DOWN.

(2) Check that the door glass moves up when the window switch of each regulator switch assembly is turned UP and moves down when the window switch is turned DOWN.

(3) Check that the other door glasses than the driver's door glass do not operate when the window lock switch is turned LOCK.

NOTICE:

Initial condition that the customizing function is not chosen by hand-held tester is shown.

2. CHECK AUTOMATIC OPERATION FUNCTION

(a) Turn the ignition switch ON.

(1) Check that the AUTO UP operates and the door glass is fully closed when each window switch of the regulator master switch assembly is turned UP by double-shift.

(2) Check that the AUTO DOWN operates and the door glass is fully opened when each window switch of the regulator master switch assembly is turned DOWN by double-shift.

(3) Check that the AUTO UP operates and the door glass is fully closed when the window switch of each regulator switch assembly is turned UP by double-shift.

(4) Check that the AUTO DOWN operates and the door glass is fully opened when the window switch of each regulator switch assembly is turned DOWN by double-shift.

(5) Check that the door glass stops when the applicable switch is turned UP during the AUTO DOWN operation. (However, if the switch is kept in the UP side, it will transfer to the manual operation.)

(6) Check that the door glass stops when the applicable switch is turned DOWN during the AUTO UP operation. (However, if the switch is kept in the DOWN side, it will transfer to the manual operation.)

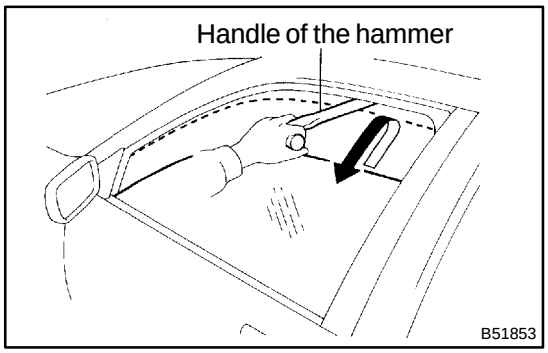
3. CHECK JAM PROTECTION FUNCTION

NOTICE:

- **Never check it with any part of your body, such as hand, caught between the glass and the vehicle's body. Also, pay thorough attention not to get caught in there during the operation.**
- **In case of resetting the power window regulator motor assembly, check should be carried out after repeating to raise and lower the door glass several times by the AUTO operation.**

HINT:

Jam protection function works during the following UP operation.



(a) Open the door glass fully.

(b) Set the handle of the hammer near the fully closed position.

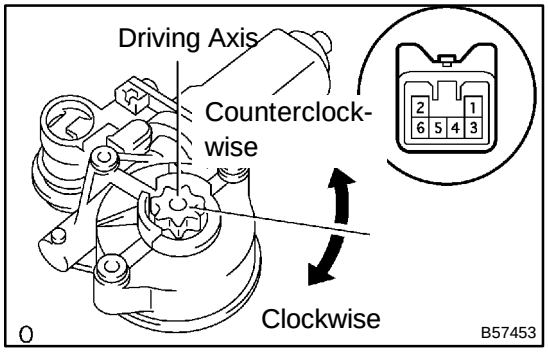
(c) When fully closing the door glass with AUTO UP, check that it moves down without the hammer handle getting caught and will go down by about 200 mm (7.87 in.) and stop there.

HINT:

The window goes down by about 50 mm or for 1 second. In case of that the opening value is below 200 mm, the window goes down by 200 mm or keeps going down for 5 seconds, and stops then.

(d) During the DOWN operation, check that the door glass does not move up even with an input of the applicable window switch.

INSPECTION



1. INSPECT POWER WINDOW REGULATOR MOTOR ASSY LH

(a) Inspect the front LH power window regulator motor assembly operation.

NOTICE:

- **Do not apply the battery voltage, because the pulse sensor and limit switch could be damaged if the battery voltage is applied to terminals 2, 3 and 6 of the power window regulator motor connector.**
- **Be sure to reset the power window regulator motor (initial position setting of limit switch) when the driver's side power window regulator motor is installed to the regulator.**

(1) Check that the motor operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Standard:

Measuring condition	Operational direction
Battery positive – Terminal 4 Battery negative – Terminal 5	Clockwise toward driving axis
Battery positive – Terminal 5 Battery nagative – Terminal 4	Counterclockwise toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Inspection should be done with the power window regulator and door glass installed to the vehicle.

(1) Set a DC 400 A probe of TOYOTA electrical tester in the wire harness of terminal 4 or 5.

NOTICE:

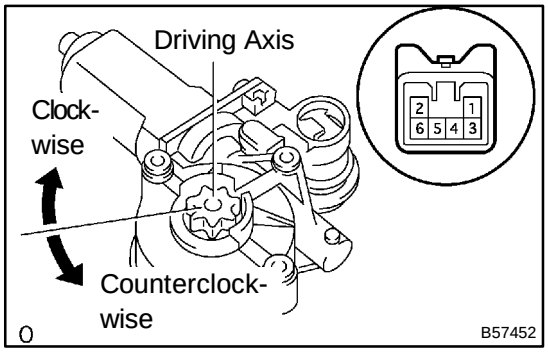
Match the arrow mark of the probe with the current direction.

(2) Set the door glass in the fully closed position.

(3) When 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from approximately 16 – 34 A into 1 A or less when the power window switch is turned UP once again.

Standard: Approximately 4 – 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut–off, check that the door glass goes down when the power window regulator switch is turned DOWN.



2. INSPECT POWER WINDOW REGULATOR MOTOR ASSY RH

(a) Inspect the front RH power window regulator motor assembly operation.

NOTICE:

- **Do not apply the battery voltage, because the pulse sensor and limit switch could be damaged if the battery voltage is applied to terminals 1, 3 and 6 of the power window regulator motor connector.**
- **Be sure to reset the power window regulator motor (initial position setting of limit switch) when the driver's side power window regulator motor is installed to the regulator.**

(1) Check that the motor operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Standard:

Measuring condition	Operational direction
Battery positive – Terminal 5 Battery negative – Terminal 4	Clockwise toward driving axis
Battery positive – Terminal 4 Battery nagative – Terminal 5	Counterclockwise toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Inspection should be done with the power window regulator and door glass installed to the vehicle.

(1) Set a DC 400 A probe of TOYOTA electrical tester in the wire harness of terminal 4 or 5.

NOTICE:

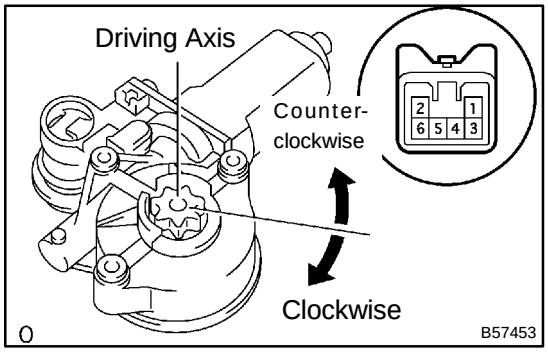
Match the arrow mark of the probe with the current direction.

(2) Set the door glass in the fully closed position.

(3) When 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from approximately 16 – 34 A into 1 A or less when the power window switch is turned UP once again.

Standard: Approximately 4 – 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut–off, check that the door glass goes down when the power window regulator switch is turned DOWN.



3. INSPECT POWER WINDOW REGULATOR MOTOR ASSY LH

(a) Inspect the rear RH power window regulator motor assembly operation.

NOTICE:

- **Do not apply the battery voltage, because the pulse sensor and limit switch could be damaged if the battery voltage is applied to terminals 1, 3 and 6 of the power window regulator motor connector.**

S **Be sure to reset the power window regulator motor (initial position setting of limit switch) when the driver's side power window regulator motor is installed to the regulator.**

(1) Check that the motor operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Standard:

Measuring condition	Operational direction
Battery positive – Terminal 5 Battery negative – Terminal 4	Clockwise toward driving axis
Battery positive – Terminal 4 Battery nagative – Terminal 5	Counterclockwise toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Inspection should be done with the power window regulator and door glass installed to the vehicle.

(1) Set a DC 400 A probe of TOYOTA electrical tester in the wire harness of terminal 4 or 5.

NOTICE:

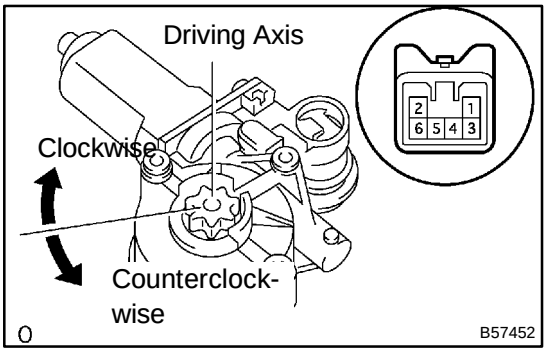
Match the arrow mark of the probe with the current direction.

(2) Set the door glass in the fully closed position.

(3) When 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from approximately 16 – 34 A into 1 A or less when the power window switch is turned UP once again.

Standard: Approximately 4 – 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut–off, check that the door glass goes down when the power window regulator switch is turned DOWN.



4. INSPECT POWER WINDOW REGULATOR MOTOR ASSY RH

(a) Inspect the rear LH power window regulator motor assembly operation.

NOTICE:

S **Do not apply the battery voltage, because the pulse sensor and limit switch could be damaged if the battery voltage is applied to terminals 2, 3 and 6 of the power window regulator motor connector.**

S **Be sure to reset the power window regulator motor (initial position setting of limit switch) when the driver's side power window regulator motor is installed to the regulator.**

(1) Check that the motor operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Standard:

Measuring condition	Operational direction
Battery positive - Terminal 4 Battery negative - Terminal 5	Clockwise toward driving axis
Battery positive - Terminal 5 Battery nagative - Terminal 4	Counterclockwise toward driving axis

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Inspection should be done with the power window regulator and door glass installed to the vehicle.

(1) Set a DC 400 A probe of TOYOTA electrical tester in the wire harness of terminal 4 or 5.

NOTICE:

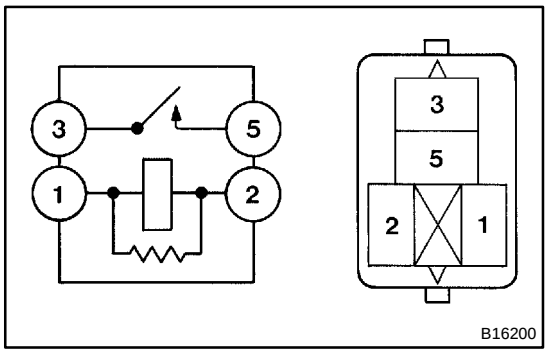
Match the arrow mark of the probe with the current direction.

(2) Set the door glass in the fully closed position.

(3) When 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from approximately 16 - 34 A into 1 A or less when the power window switch is turned UP once again.

Standard: Approximately 4 - 90 seconds

(4) When approximately 60 seconds have elapsed after the inspection of the current cut-off, check that the door glass goes down when the power window regulator switch is turned DOWN.



5. INSPECT RELAY

(a) Remove the power control relay (IG1 relay) from the instrumental J/B.

(b) Inspect the power control relay.

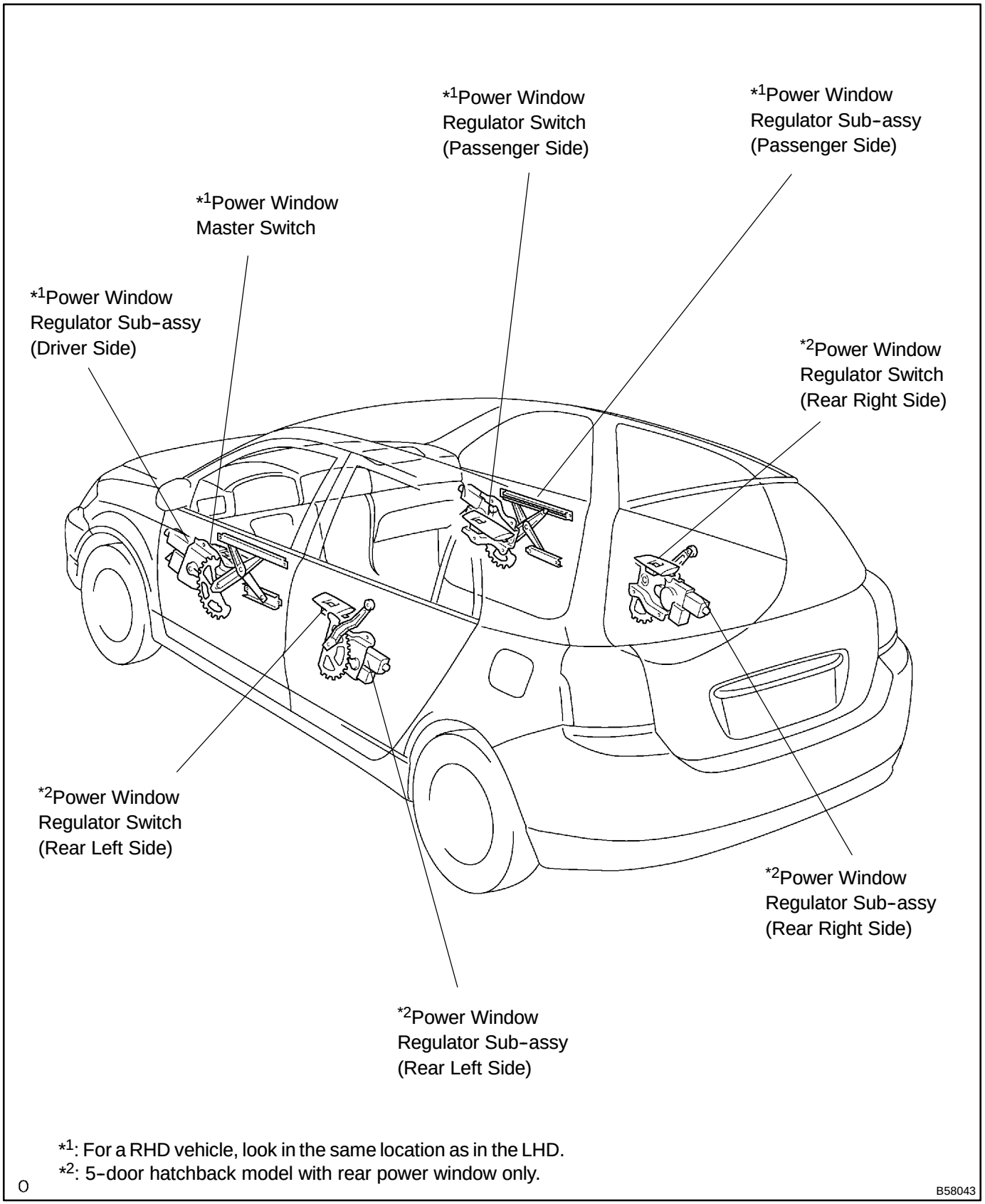
Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between Terminals 1 and 2	3 - 5	Continuity

If the continuity is not as specified, replace the relay.

POWER WINDOW CONTROL SYSTEM (TMUK MADE)

LOCATION

700E4-01



*1: For a RHD vehicle, look in the same location as in the LHD.
*2: 5-door hatchback model with rear power window only.

B58043

700E5–01

ON–VEHICLE INSPECTION

1. CHECK BASIC FUNCTION (MANUAL OPERATION FUNCTION)

(a) Turn the ignition switch ON.

(1) Check that the door glass moves up when each window switch of the regulator master switch assembly is turned UP and moves down when each window switch is turned DOWN.

(2) Check that the door glass moves up when the window switch of each regulator switch assembly is turned UP and moves down when the window switch is turned DOWN.

(3) Check that the other door glasses than the driver's door glass do not operate when the window lock switch is turned LOCK.

NOTICE:

Initial condition that the customizing function is not chosen by hand–held tester is shown.

2. CHECK AUTOMATIC OPERATION FUNCTION

(a) Turn the ignition switch ON.

(1) Check that the AUTO UP operates and the door glass is fully closed when each window switch of the regulator master switch assembly is turned UP by double–shift.

(2) Check that the AUTO DOWN operates and the door glass is fully opened when each window switch of the regulator master switch assembly is turned DOWN by double–shift.

(3) Check that the AUTO UP operates and the door glass is fully closed when the window switch of each regulator switch assembly is turned UP by double–shift.

(4) Check that the AUTO DOWN operates and the door glass is fully opened when the window switch of each regulator switch assembly is turned DOWN by double–shift.

(5) Check that the door glass stops when the applicable switch is turned UP during the AUTO DOWN operation. (However, if the switch is kept in the UP side, it will transfer to the manual operation.)

(6) Check that the door glass stops when the applicable switch is turned DOWN during the AUTO UP operation. (However, if the switch is kept in the DOWN side, it will transfer to the manual operation.)

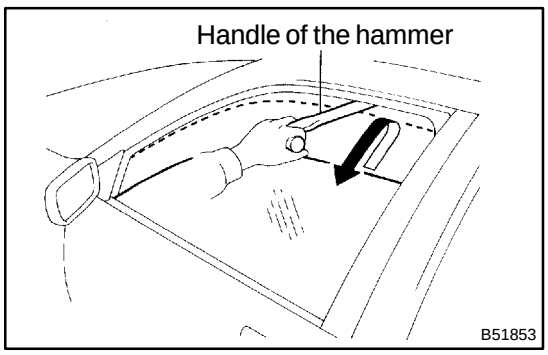
3. CHECK JAM PROTECTION FUNCTION

NOTICE:

- **Never check it with any part of your body such as hand caught between the glass and the vehicle's body. Also, pay thorough attention not to get caught in there during the operation.**
- **In case of resetting the power window regulator motor assembly, check should be carried out after repeating to raise and lower the door glass several times by the AUTO operation.**

HINT:

Jam protection function works during the following up operation.



(a) Open the door glass fully.

(b) Set the handle of the hammer near the fully–closed position.

(c) When fully closing the door glass with AUTO UP, check that it moves down without the hammer handle getting caught and will go down by about 200 mm (7.87 in.) and stop there.

HINT:

The window goes down by about 50 mm or for 1 second. In case of that the opening value is below 200 mm, the window goes down by 200 mm or keeps going down for 5 seconds, and stops then.

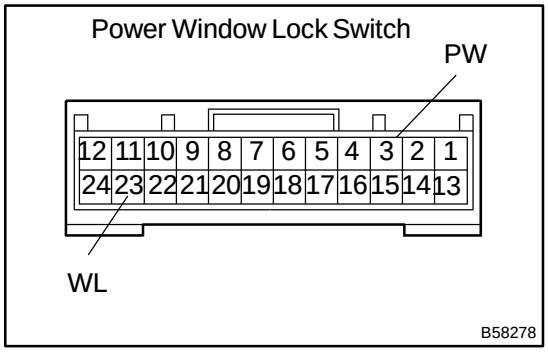
(d) During the down operation, check that the door glass does not move up even with an input of the applicable window switch.

700E6-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Power window does not operate (ALL) (Power door lock does not operate)	1. P/W fuse 2. IG1 relay 3. Gauge fuse 4. Wire harness	- 70-10 - -
Power window does not operate (ALL) (Power door lock is normal)	1. Ignition switch 2. Power window master switch 3. Wire harness 4. Power window motor	80-2 80-4 70-10 - 70-10
"One Touch Power Window System" does not operate	1. Power window master switch 2. Power window motor	70-10 70-10
Only one window glass does not move	1. Power window master switch 2. Power window regulator switch 3. Power window motor 4. Wire harness	70-10 70-10 70-10 -
"Window Lock System" does not operate	1. Power window master switch	70-10

INSPECTION

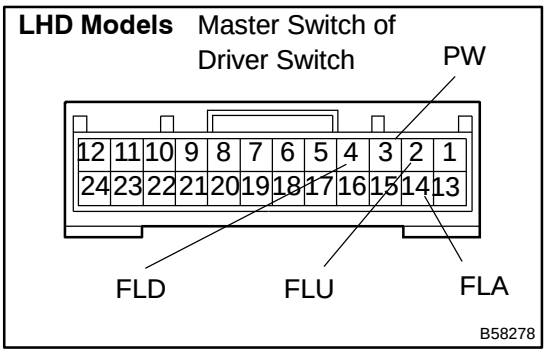


1. INSPECT POWER WINDOW REGULATOR MASTER SWITCH ASSY

(a) Remove the master switch.
(b) Inspect the master switch continuity.

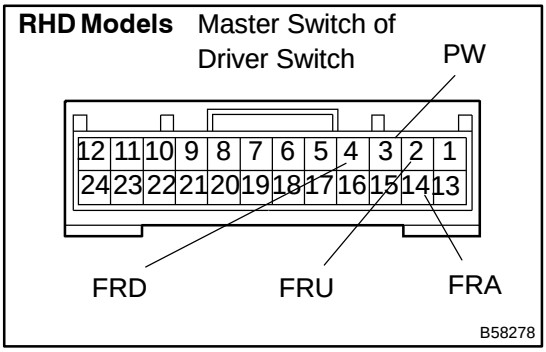
[Power window lock switch]
Standard:

Switch position	Tester connection	Specified condition
Normal	PW (3) ⇔ WL (23)	Continuity
Lock		No continuity



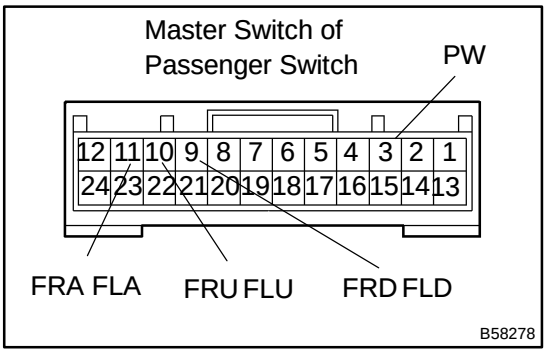
[Master switch of driver switch (LHD models)]
Standard:

Switch position	Tester connection	Specified condition
UP-AUTO	PW (3) ⇔ FLU (2)	Continuity
	PW (3) ⇔ FLA (14)	
UP-MANUAL	PW (3) ⇔ FLU (2)	Continuity
OFF	-	-
DOWN-MANUAL	PW (3) ⇔ FLD (4)	Continuity
DOWN-AUTO	PW (3) ⇔ FLD (4)	Continuity
	PW (3) ⇔ FLA (14)	



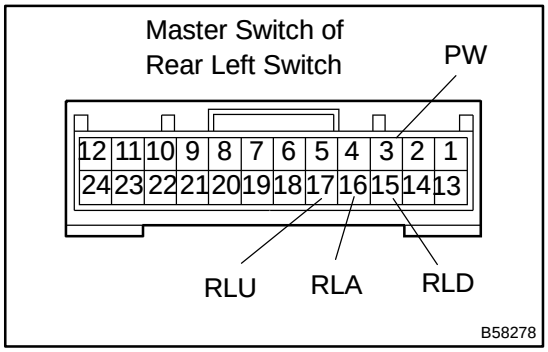
[Master switch of driver switch (RHD models)]
Standard:

Switch position	Tester connection	Specified condition
UP-AUTO	PW (3) ⇔ FRU (2)	Continuity
	PW (3) ⇔ FRA (14)	
UP-MANUAL	PW (3) ⇔ FRU (2)	Continuity
OFF	-	-
DOWN-MANUAL	PW (3) ⇔ FRD (4)	Continuity
DOWN-AUTO	PW (3) ⇔ FRD (4)	Continuity
	PW (3) ⇔ FRA (14)	



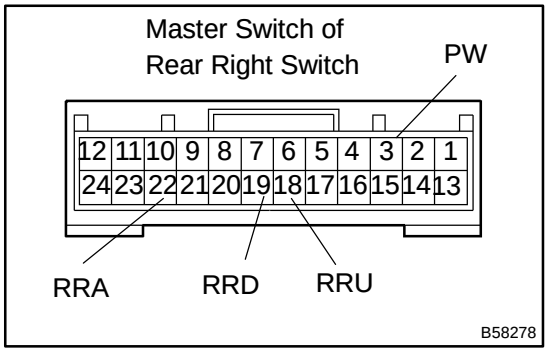
[Master switch of passenger switch]
Standard:

Switch position	Tester connection	Specified condition
UP-AUTO	PW (3) ⇔ FRU FLU (10)	Continuity
	PW (3) ⇔ FRA FLA (11)	
UP-MANUAL	PW (3) ⇔ FRU FLU (10)	Continuity
OFF	-	-
DOWN-MANUAL	PW (3) ⇔ FRD FLD (9)	Continuity
DOWN-AUTO	PW (3) ⇔ FRD FLD (9)	Continuity
	PW (3) ⇔ FRA FLA (11)	



(w/ rear power window)
[Master switch of rear left switch]
Standard:

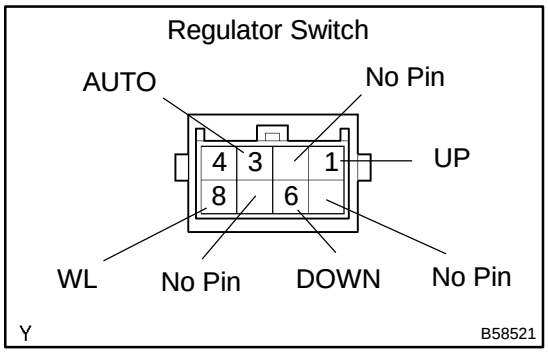
Switch position	Tester connection	Specified condition
UP-AUTO	PW (3) ⇔ RLU (17)	Continuity
	PW (3) ⇔ RLA (16)	
UP-MANUAL	PW (3) ⇔ RLU (17)	Continuity
OFF	-	-
DOWN-MANUAL	PW (3) ⇔ RLD (15)	Continuity
DOWN-AUTO	PW (3) ⇔ RLD (15)	Continuity
	PW (3) ⇔ RLA (16)	



(w/ rear power window)
[Master switch of rear right switch]
Standard:

Switch position	Tester connection	Specified condition
UP-AUTO	PW (3) ⇔ RRU (18)	Continuity
	PW (3) ⇔ RRA (22)	
UP-MANUAL	PW (3) ⇔ RRU (18)	Continuity
OFF	-	-
DOWN-MANUAL	PW (3) ⇔ RRD (19)	Continuity
DOWN-AUTO	PW (3) ⇔ RRD (19)	Continuity
	PW (3) ⇔ RRA (22)	

If the continuity is not as specified, replace the master switch.



2. INSPECT POWER WINDOW REGULATOR SWITCH ASSY

HINT:
For the passenger, rear left and rear right regulator switches, work in the same procedure.

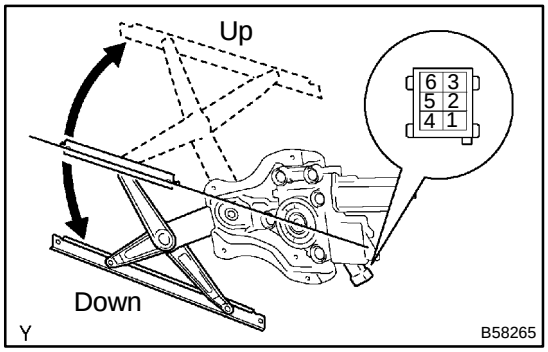
(a) Remove the regulator switch.

(b) Inspect the regulator switch continuity.

[Master switch of driver switch]
Standard:

Switch position	Tester connection	Specified condition
UP-AUTO	WL (8) ⇔ UP (1)	Continuity
	WL (8) ⇔ AUTO (3)	
UP-MANUAL	WL (8) ⇔ UP (1)	Continuity
OFF	-	-
DOWN-MANUAL	WL (8) ⇔ DOWN (6)	Continuity
DOWN-AUTO	PW (3) ⇔ AUTO (3)	Continuity
	PW (3) ⇔ DOWN (6)	

If the continuity is not as specified, replace the regulator switch.



3. INSPECT FRONT DOOR WINDOW REGULATOR SUB-ASSY LH

(a) Inspect the front LH power window regulator motor assembly operation.

(1) Check that the regulator sub assembly operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Standard:

Measuring condition		Specified condition
Battery positive (+) Terminal – 6 Battery negative (–) Terminal – 4	Battery positive (+) Terminal – 2	Moving upward
Battery positive (+) Terminal – 6 Battery negative (–) Terminal – 4	Battery positive (+) Terminal – 1	Moving downward

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 6.

NOTICE:

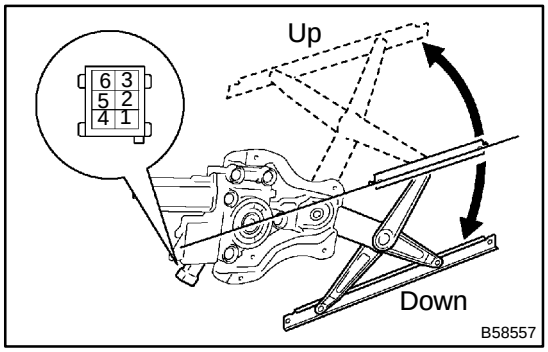
Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from 16 – 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut–off).

Standard: Less than 1 second

(4) Check that the door glass goes down when the power window regulator switch is turned DOWN.



4. INSPECT FRONT DOOR WINDOW REGULATOR SUB-ASSY RH

(a) Inspect the front RH power window regulator motor assembly operation.

(1) Check that the regulator sub assembly operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Standard:

Measuring condition		Specified condition
Battery positive (+) Terminal - 6 Battery negative (-) Terminal - 4	Battery positive (+) Terminal - 2	Moving upward
Battery positive (+) Terminal - 6 Battery negative (-) Terminal - 4	Battery positive (+) Terminal - 1	Moving downward

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 6.

NOTICE:

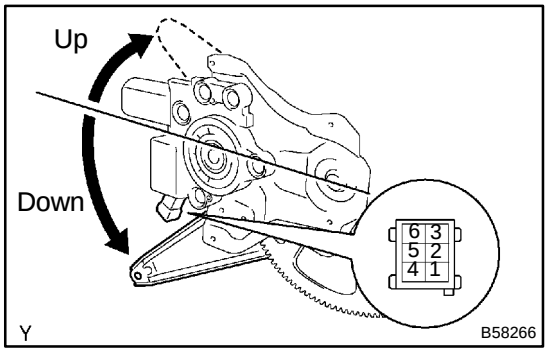
Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from 16 - 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut-off).

Standard: Less than 1 second

(4) Check that the door glass goes down when the power window regulator switch is turned DOWN.



5. INSPECT REAR DOOR WINDOW REGULATOR SUB–ASSY LH(5 DOOR HATCH BACK BODY TYPE)

(a) Inspect the rear LH power window regulator motor assembly operation.

(1) Check that the regulator sub assembly operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Standard:

Measuring condition		Specified condition
Battery positive (+) Terminal – 6 Battery negative (–) Terminal – 4	Battery positive (+) Terminal – 2	Moving upward
Battery positive (+) Terminal – 6 Battery negative (–) Terminal – 4	Battery positive (+) Terminal – 1	Moving downward

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 6.

NOTICE:

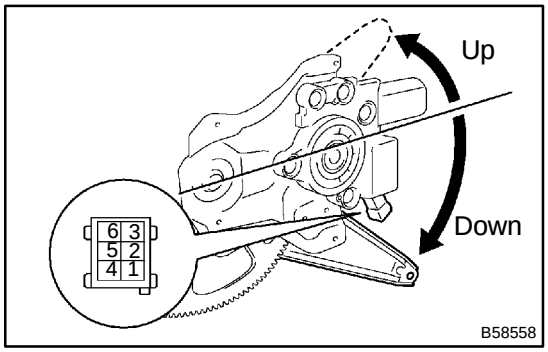
Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from 16 – 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut–off).

Standard: Less than 1 second

(4) Check that the door glass goes down when the power window regulator switch is turned DOWN.



6. INSPECT REAR DOOR WINDOW REGULATOR SUB-ASSY RH(5 DOOR HATCH BACK BODY TYPE)

(a) Inspect the rear RH power window regulator motor assembly operation.

(1) Check that the regulator sub assembly operates smoothly when the battery positive voltage is applied to each terminal of the connector.

Measuring condition		Specified condition
Battery positive (+) Terminal – 6 Battery negative (–) Terminal – 4	Battery positive (+) Terminal – 2	Moving upward
Battery positive (+) Terminal – 6 Battery negative (–) Terminal – 4	Battery positive (+) Terminal – 1	Moving downward

(b) Inspect the PTC operation inside the power window regulator motor.

NOTICE:

Work must be done with the power window regulator and door glass installed to the vehicle.

(1) Set a TOYOTA electrical tester DC400A probe to the wire harness of terminal 4 or 6.

NOTICE:

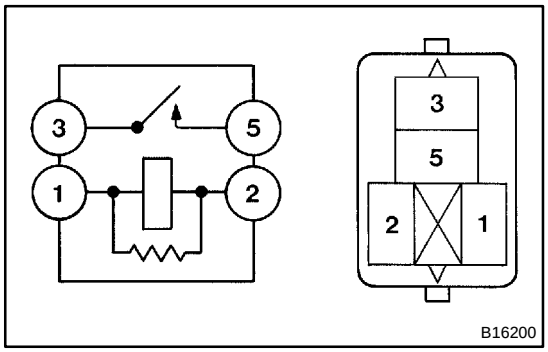
Match the arrow mark of the probe with the current direction.

(2) Close the door glass fully.

(3) When approximately 60 seconds have elapsed after the door glass is fully closed, check how long the current takes to change from 16 – 34 A into 1 A, when the power window regulator switch is turned UP once again (inspection of current cut–off).

Standard: Less than 1 second

(4) Check that the door glass goes down when the power window regulator switch is turned DOWN.



7. INSPECT RELAY

(a) Remove the power control relay (IG1 relay) from the instrumental J/B.

(b) Inspect the power control relay.

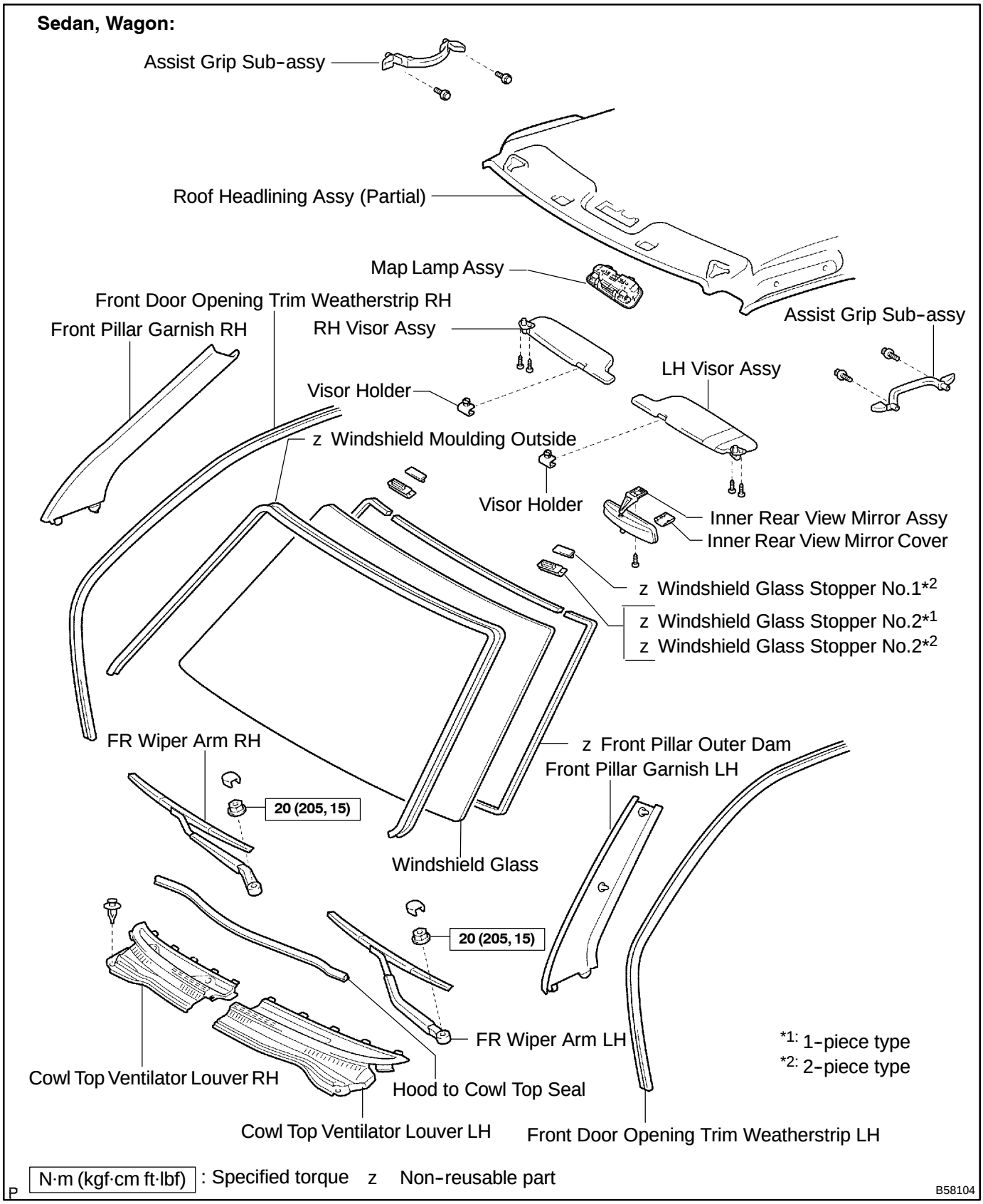
Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between Terminals 1 and 2	3 – 5	Continuity

If the continuity is not as specified, replace the relay.

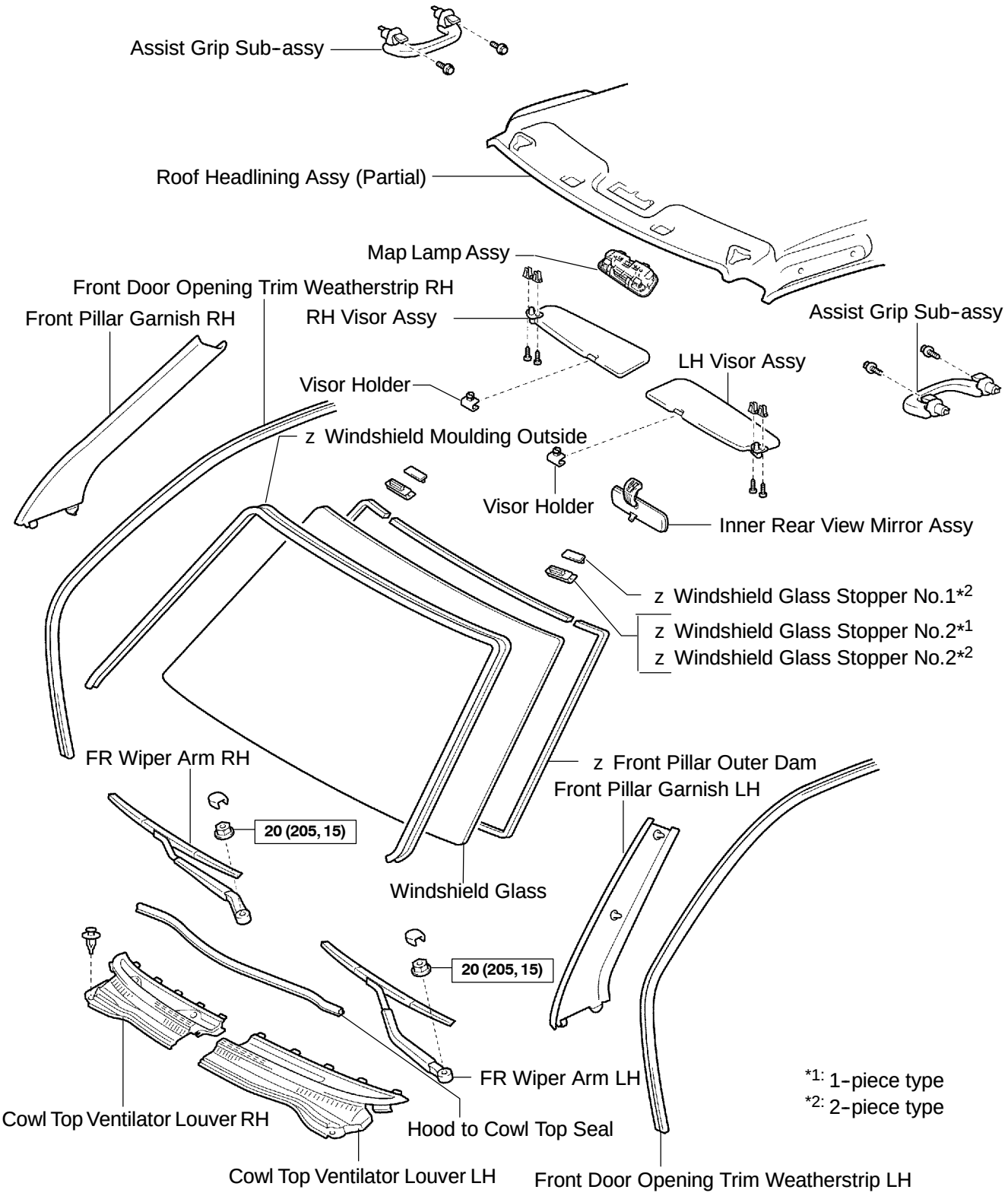
WINDSHIELD GLASS

COMPONENTS

700EA-01



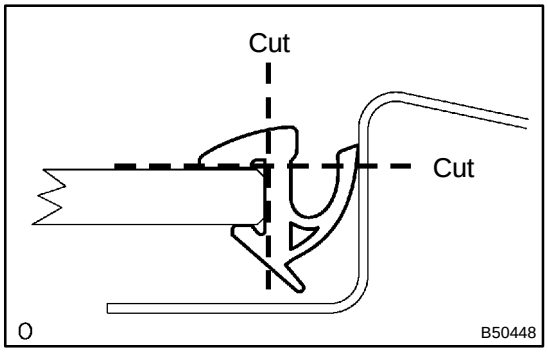
Hatchback:


Assist Grip Sub-assy
Roof Headlining Assy (Partial)
Map Lamp Assy
Front Door Opening Trim Weatherstrip RH
Front Pillar Garnish RH
RH Visor Assy
Assist Grip Sub-assy
LH Visor Assy
Visor Holder
z Windshield Moulding Outside
Visor Holder
Inner Rear View Mirror Assy
z Windshield Glass Stopper No.1*2
z Windshield Glass Stopper No.2*1
z Windshield Glass Stopper No.2*2
FR Wiper Arm RH
20 (205, 15)
z Front Pillar Outer Dam
Front Pillar Garnish LH
Windshield Glass
20 (205, 15)
FR Wiper Arm LH
Cowl Top Ventilator Louver RH
Hood to Cowl Top Seal
Cowl Top Ventilator Louver LH
Front Door Opening Trim Weatherstrip LH
*1: 1-piece type
*2: 2-piece type
N·m (kgf·cm ft·lbf) : Specified torque z Non-reusable part
P
B58950

700EB-01

REPLACEMENT

1. REMOVE FR WIPER ARM RH
(See page 66-10)
2. REMOVE FR WIPER ARM LH
(See page 66-10)
3. REMOVE HOOD TO COWL TOP SEAL
(See page 66-10)
4. REMOVE COWL TOP VENTILATOR LOUVER LH
(See page 66-10)
5. REMOVE COWL TOP VENTILATOR LOUVER RH
(See page 66-10)
6. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH
(See page 76-33, 76-40, 76-48, 76-56)
7. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH
(See page 76-33, 76-40, 76-48, 76-56)
8. REMOVE FRONT PILLAR GARNISH RH
(See page 76-35, 76-43, 76-50, 76-59)
9. REMOVE FRONT PILLAR GARNISH LH
(See page 76-35, 76-43, 76-50, 76-59)
10. REMOVE INNER REAR VIEW MIRROR ASSY
(See page 76-35, 76-43, 76-50, 76-59)
11. REMOVE RH VISOR ASSY
(See page 76-35, 76-43, 76-50, 76-59)
12. REMOVE LH VISOR ASSY
(See page 76-35, 76-43, 76-50, 76-59)
13. REMOVE MAP LAMP ASSY
(See page 76-35, 76-43, 76-51, 76-59)
14. REMOVE ASSIST GRIP SUB-ASSY
(See page 76-36, 76-44, 76-51, 76-60)
15. REMOVE VISOR HOLDER
(See page 76-36, 76-44, 76-52, 76-60)
16. REMOVE ROOF HEADLINING ASSY
(See page 76-36, 76-45, 76-52, 76-61)
17. REMOVE ROOF DRIP SIDE FINISH MOULDING CENTER RH
(See page 76-28, 76-29, 76-30)
18. REMOVE ROOF DRIP SIDE FINISH MOULDING CENTER LH
(See page 76-28, 76-29, 76-30)



19. REMOVE WINDSHIELD MOULDING OUTSIDE

(a) Using a knife, cut off the moulding as shown in the illustration.

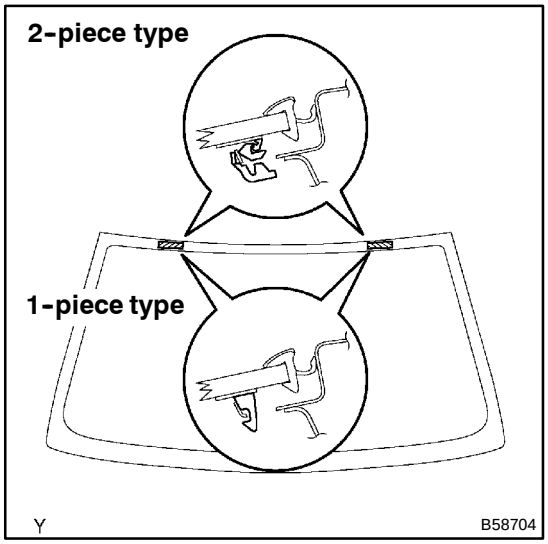
NOTICE:

Do not damage the body with the knife.

(b) Remove the remaining moulding.

HINT:

When removing, make a cut partly, pull and remove it by hand.

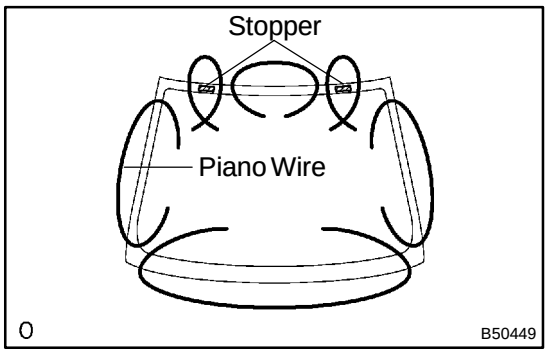


20. REMOVE WINDSHIELD GLASS

HINT:
Depending on a vehicle type, either a 1-piece type or a 2-piece type of stopper is installed.

(a) Push a piano wire through between the body and glass from the interior.

(b) Apply protective tape to the outer surface to keep the surface from being scratched.



(c) Tie both wire ends to wooden blocks or similar objects.

NOTICE:

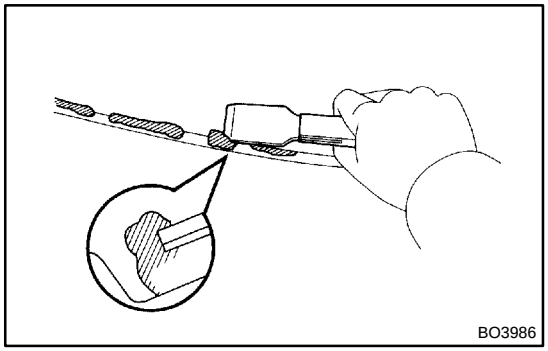
- **When separating the glass, take care not to damage the paint and interior/exterior ornaments.**
- **To prevent the piano wire to be cut, do not cross it.**

(d) Cut the adhesive by pulling the piano wire around it.

(e) Using a suction rubber, remove the glass.

NOTICE:

Leave as much adhesive on the body as possible when cutting off the glass.



21. CLEAN WINDSHIELD GLASS

(a) Using a scraper, remove the damaged stoppers, dam and adhesive sticking to the glass.

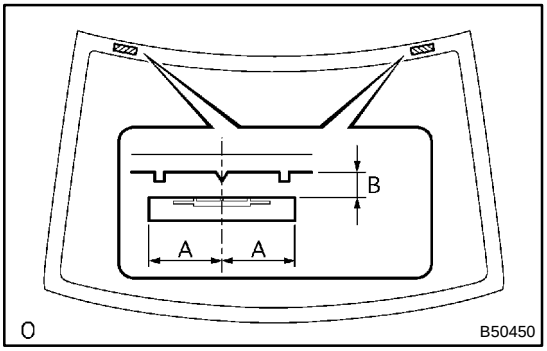
(b) Clean the outer circumference of the glass with white gasoline.

NOTICE:

- **Do not touch the glass after cleaning it.**
- **Be careful not to damage the body.**

22. INSTALL WINDSHIELD GLASS STOPPER NO.1

(a) Install 2 new windshield glass stoppers No.1 to the body.



23. INSTALL WINDSHIELD GLASS STOPPER NO.2

(a) Coat the installation part of the stopper with Primer G.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(b) Install 2 new windshield glass stoppers No.2 onto the glass as shown in the illustration.

A: 40 mm (1.575 in.)
B: 7.7 mm (0.303 in.)

24. INSTALL FRONT PILLAR OUTER DAM

(a) Coat the installation part of the front pillar outer dam with Primer G.

NOTICE:

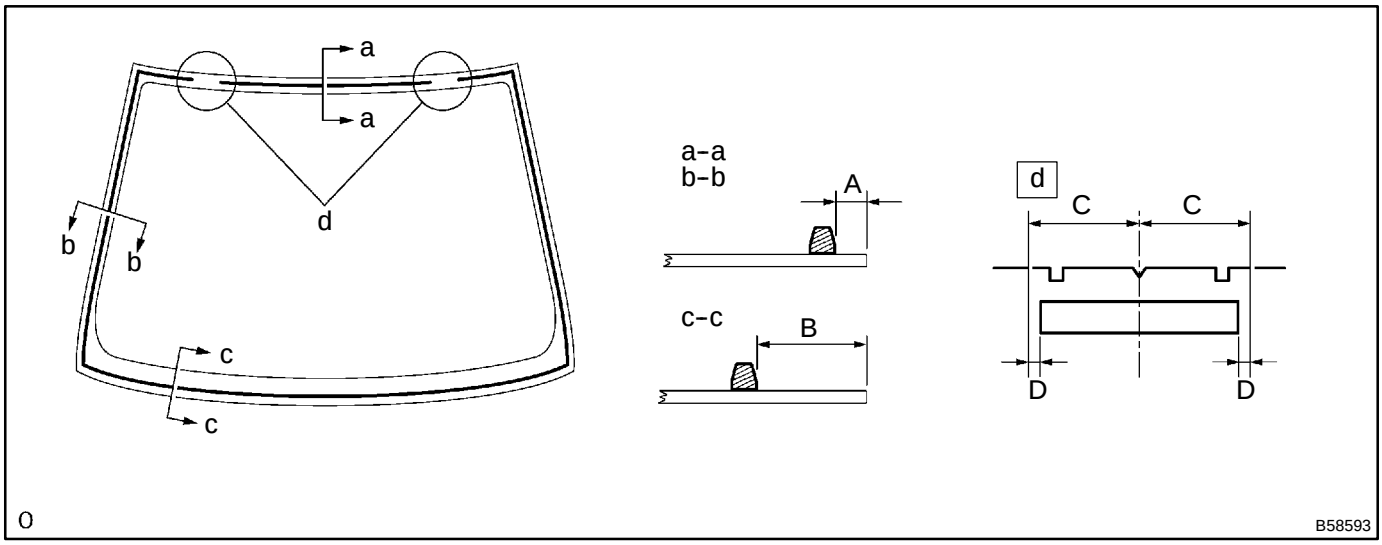
- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

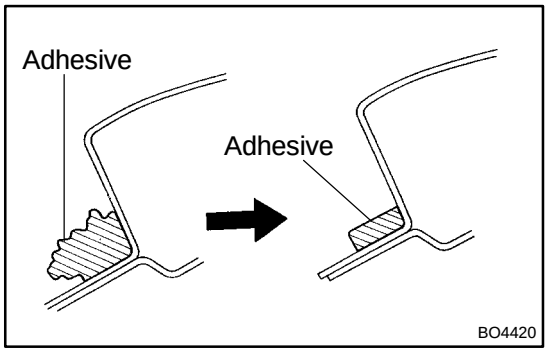
(b) Install 2 new front pillar outer dams with double-stick tape as shown in the illustration.

NOTICE:

Do not touch the glass face after cleaning it.

A: 7 mm (0.28 in.)
B: 22.5 mm (0.886 in.)
C: 45 mm (1.772 in.)
D: 5 mm (0.197 in.)





25. INSTALL WINDSHIELD GLASS

(a) Clean and shape the contact surface of the vehicle's body.

(1) Using a knife, cut away any rough areas of the body.

HINT:

Leave as much adhesive on the body as possible.

(2) Clean the cut surface of the adhesive with a piece of shop rag saturated in cleaner.

(b) Position the glass.

(1) Using a suction rubber, place the glass in the correct position.
(2) Check that all the contacting parts of the glass rim are perfectly even.
(3) Place reference marks between the glass and body.

NOTICE:

Check that the stoppers are attached to the body correctly.

HINT:

When reusing the glass, check and correct the reference mark's positions.

(4) Remove the glass.

(c) Coat the contact surface of the body panel with Primer M.

(1) Using a bursh, coat the exposed part of the contact surface on the vehicle side with Primer M.

NOTICE:

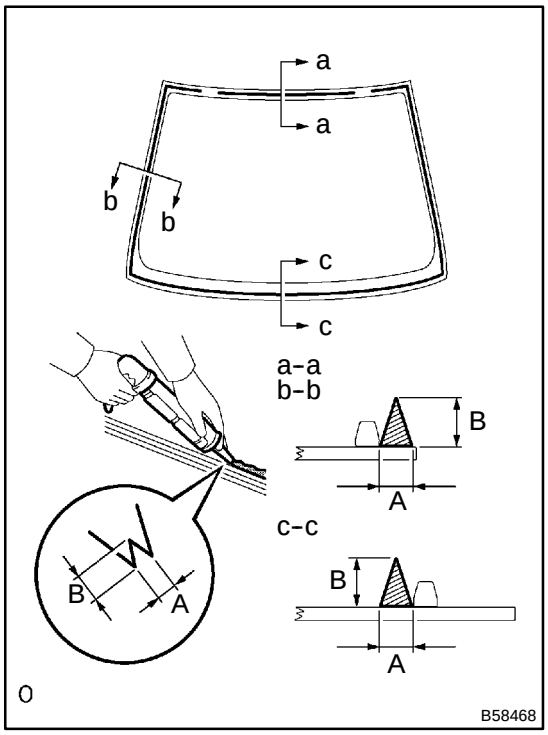
- **Dry the primer coating for 3 minutes or more.**
- **Do not coat the adhesive with Primer M.**
- **Do not apply too much Primer.**

(d) Coat the contact surface of the glass with Primer G.

(1) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**



(e) Apply adhesive.

(1) Cut off the tip of the cartridge nozzle as shown in the illustration.

HINT:

After cutting off the tip, use all adhesive within the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	15 minute
20_C (68_F)	100 minute
5_C (41_F)	8 hour

(2) Load the sealer gun with the cartridge.

(3) Coat the glass with adhesive, as shown in the illustration.

A: 8.0 mm (0.315 in.)

B: 12.5 mm (0.492 in.)

(f) Install the glass.

(1) Using a suction rubber, position the glass so that the reference marks are aligned, and press it in gently along the rim.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Check that the stoppers are attached to the body correctly.**
- **Check the clearance between the body and glass.**

(2) Lightly press the glass front surface for close contact.

(3) Using a scraper remove any excess or protruding adhesive.

HINT:

Apply adhesive on the glass rim.

26. INSTALL WINDSHIELD MOULDING OUTSIDE

(a) Install a new windshield moulding to the windshield glass before the adhesive has hardened.

(b) Hold the windshield glass in place securely with protective tape or equivalent until the adhesive has completely hardened.

(c) Using a scraper, remove any excess or protruding adhesive before the adhesive has hardened.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	1.5 hour
20_C (68_F)	5 hour
5_C (41_F)	24 hour

27. INSPECT FOR LEAK AND REPAIR

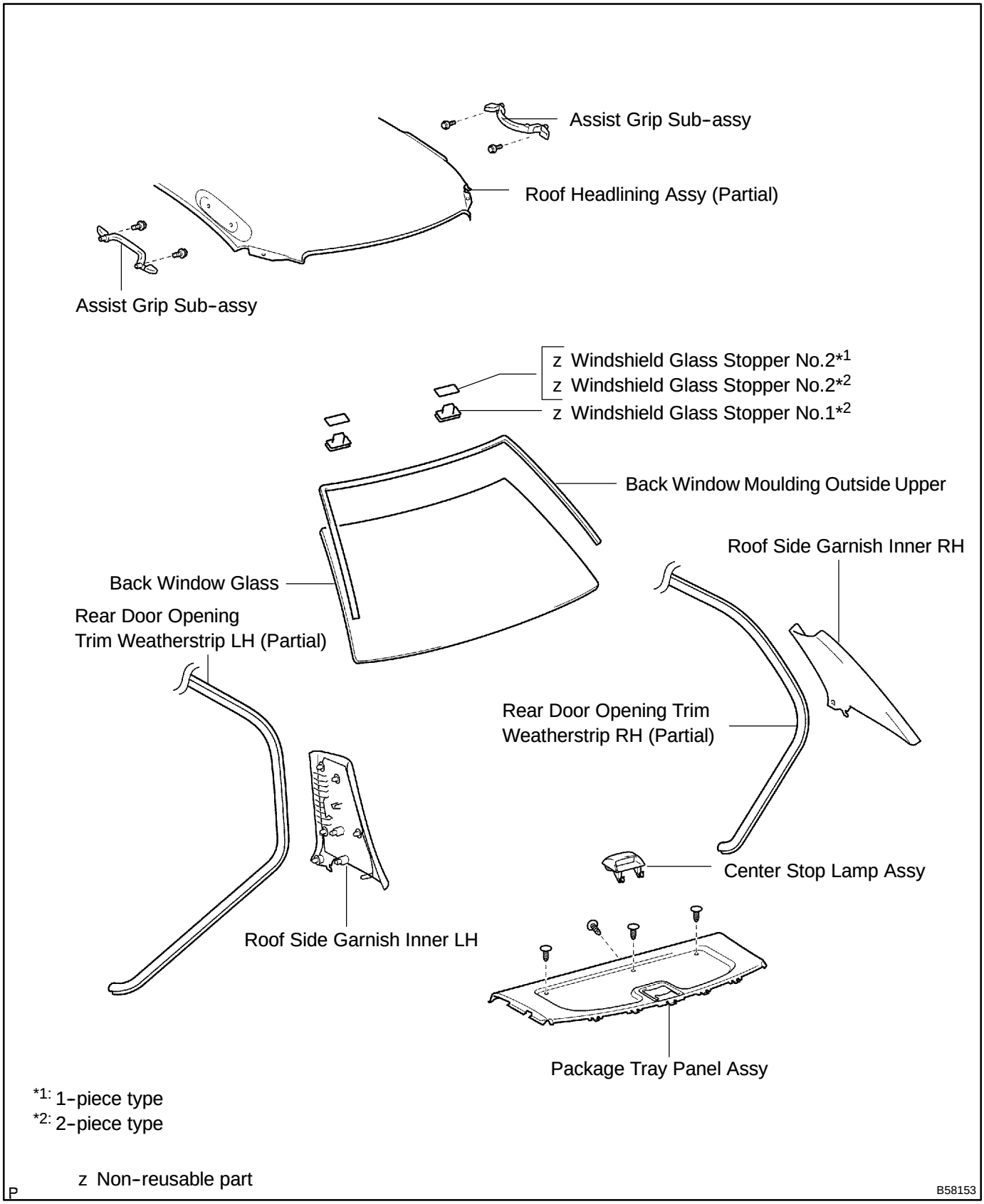
(a) Conduct a leak test after the adhesive has completely hardened.

(b) Seal any leak with sealant.

BACK WINDOW GLASS (SEDAN)

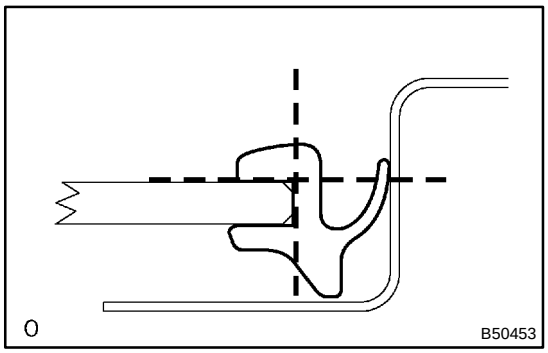
COMPONENTS

700EC-01



REPLACEMENT

1. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH
(See page 76-33)
2. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH
(See page 76-33)
3. REMOVE REAR SEAT CUSHION ASSY (See page 72-12, 72-16)
4. REMOVE REAR SEAT BACK ASSY (FIXED TYPE REAR SEAT) (See page 72-16)
5. REMOVE REAR SIDE SEAT BACK ASSY RH (SEPARATED TYPE REAR SEAT)
(See page 72-13)
6. REMOVE REAR SIDE SEAT BACK ASSY LH (SEPARATED TYPE REAR SEAT)
(See page 72-13)
7. REMOVE ROOF SIDE GARNISH INNER RH
(See page 76-34)
8. REMOVE ROOF SIDE GARNISH INNER LH
(See page 76-34)
9. REMOVE CENTER STOP LAMP ASSY
(See page 65-33)
10. REMOVE PACKAGE TRAY TRIM PANEL ASSY
(See page 61-17)



11. REMOVE BACK WINDOW MOULDING OUTSIDE UPPER

(a) Using a knife, cut off the moulding as shown in the illustration.

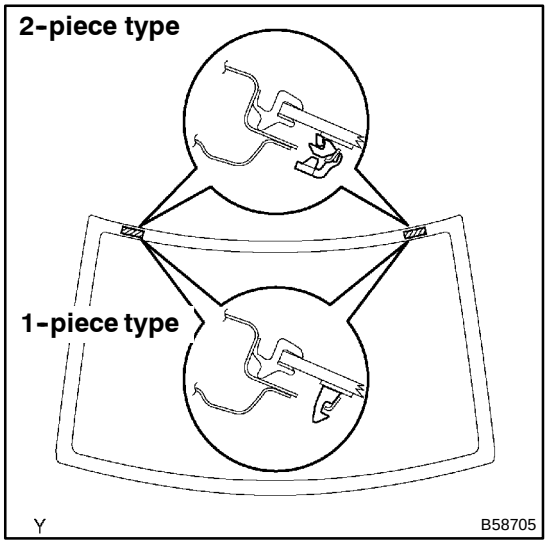
NOTICE:

Do not damage the body with the knife.

(b) Remove the remaining moulding.

HINT:

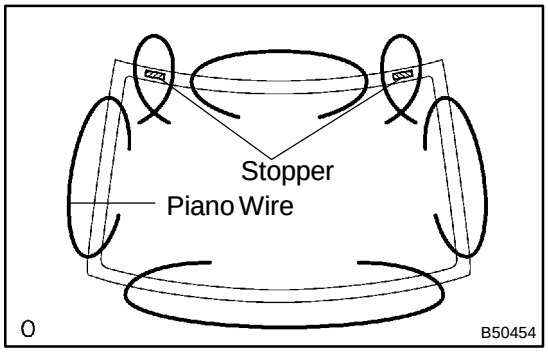
When removing, make a cut partly, pull and remove it by hand.



12. REMOVE BACK WINDOW GLASS

HINT:

Depending on a vehicle type, either a 1-piece type or a 2-piece type of stopper is installed.



(a) Push a piano wire through between the body and glass from the interior.
(b) Apply protective tape to the outer surface to keep the surface from being scratched.
(c) Tie both wire ends to wooden blocks or similar objects.

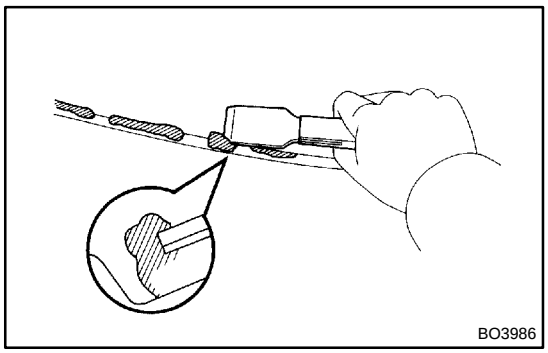
NOTICE:

- **When separating the glass, take care not to damage the paint and interior/exterior ornaments.**
- **To prevent the piano wire to be cut, do not cross it.**

(d) Cut the adhesive by pulling the piano wire around it.
(e) Using a suction rubber, remove the glass.

NOTICE:

Leave as much adhesive on the body as possible when cutting off the glass.



13. CLEAN BACK WINDOW GLASS

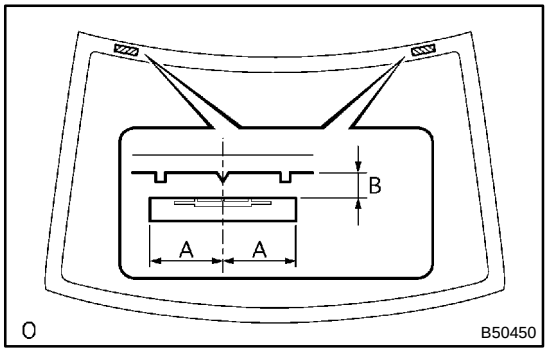
(a) Using a scraper, remove the damaged stoppers, dam and adhesive sticking to the glass.
(b) Clean the outer circumference of the glass with white gasoline.

NOTICE:

- **Do not touch the glass after cleaning it.**
- **Be careful not to damage the body.**

14. INSTALL BACK WINDOW GLASS STOPPER NO.1

(a) Install the 2 new back wind glass stoppers No.1 to the body.



15. INSTALL BACK WINDOW GLASS STOPPER NO.2

(a) Coat the installation part of the stopper with Primer G.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(b) Install 2 new back wind glass stoppers No.2 onto the glass as shown in the illustration.
A: 40 mm (1.575 in.)
B: 11.3 mm (0.445 in.)

16. INSTALL BACK WINDOW GLASS ADHESIVE DAM

(a) Coat the installation part of the window glass adhesive dam with Primer G.

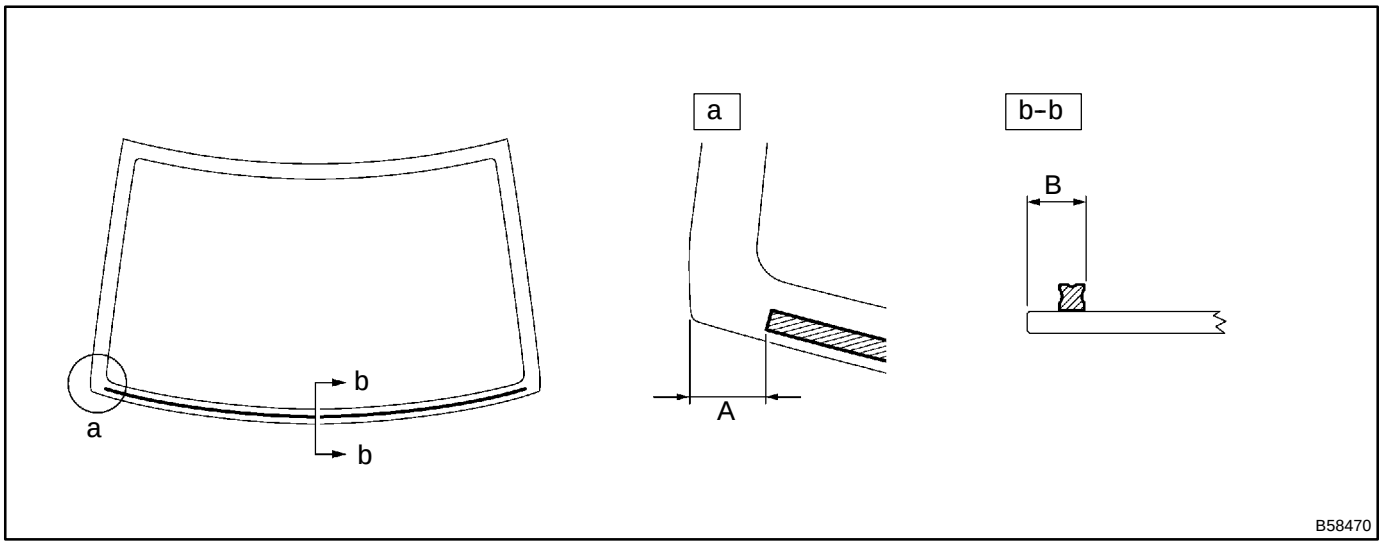
NOTICE:

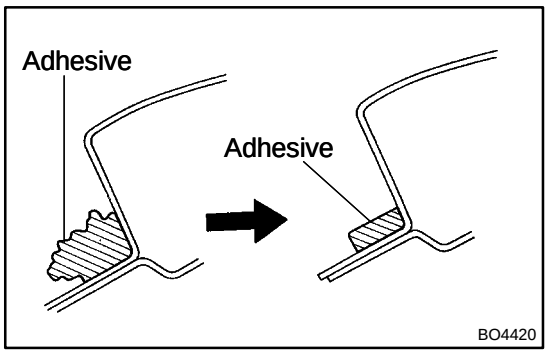
- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(b) Install a new window glass adhesive dam as shown in the illustration.

A: 25 mm (0.984 in.)

B: 9 mm (0.354 in.)





17. INSTALL BACK WINDOW GLASS

(a) Clean and shape the contact surface of the vehicle's body

(1) Using a knife, cut away any rough areas of the body.

HINT:

Leave as much adhesive on the body as possible.

(2) Clean the cut surface of the adhesive with a piece of shop rag saturated in cleaner.

(b) Position the glass.

(1) Using a suction rubber, place the glass in the correct position.

(2) Check that all the contacting parts of the glass rim are perfectly even.

(3) Place reference marks between the glass and body.

NOTICE:

Check that the stoppers are attached to the body correctly.

HINT:

When reusing the glass, check and correct the reference mark's positions.

(4) Remove the glass.

(c) Coat the contact surface of the body panel with Primer M.

(1) Using a bursh, coat the exposed part of the contact surface on the vehicle side with Primer M.

NOTICE:

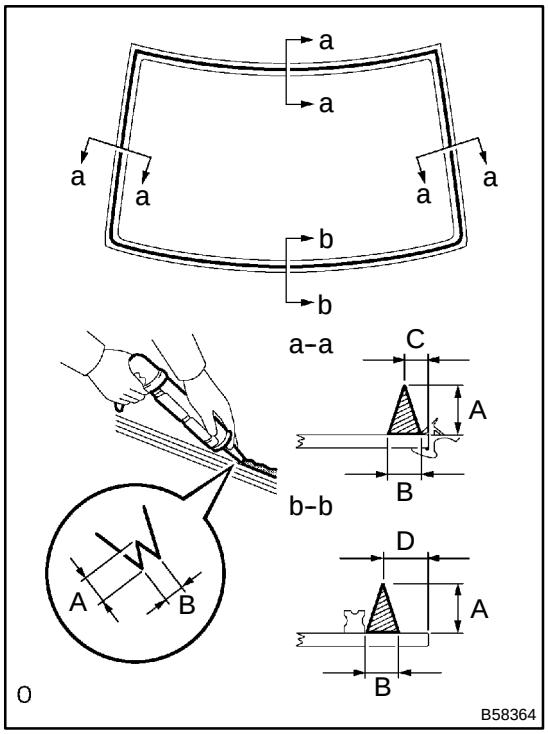
- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(d) Coat the contact surface of the glass with Primer G.

(1) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**



(e) Apply adhesive.

(1) Cut off the tip of the cartridge nozzle as shown in the illustration.

HINT:

After cutting off the tip, use all adhesive within the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	15 minute
20_C (68_F)	100 minute
5_C (41_F)	8 hour

(2) Load the sealer gun with the cartridge.

(3) Coat the glass with adhesive as shown in the illustration.

A: 12.5 mm (0.492 in.)
B: 8 mm (0.315 in.)
C: 6.5 mm (0.256 in.)
D: 13 mm (0.512 in.)

(f) Install the glass.

(1) Using a suction rubber, position the glass so that the reference marks are aligned, and press it in gently along the rim.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Check that the stoppers are attached to the body correctly.**
- **Check the clearance between the body and glass.**

(2) Lightly press the glass front surface for close contact.

(3) Using a scraper, remove any excess or protruding adhesive.

HINT:

Apply adhesive on the glass rim.

18. INSTALL BACK WINDOW MOULDING OUTSIDE UPPER

(a) Install a new back wind moulding to the back wind glass before the adhesive has hardened.

(b) Hold the back wind glass in place securely with protective tape or equivalent until the adhesive has completely hardened.

(c) Using a scraper, remove any excess or protruding adhesive before the adhesive has hardened.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	1.5 hour
20_C (68_F)	5 hour
5_C (41_F)	24 hour

19. INSPECT FOR LEAK AND REPAIR

(a) Conduct a leak test after the adhesive has completely hardened.

(b) Seal any leak with sealant.

20. INSTALL REAR SEAT BACK ASSY (FIXED TYPE REAR SEAT) **(See page 72-17)**

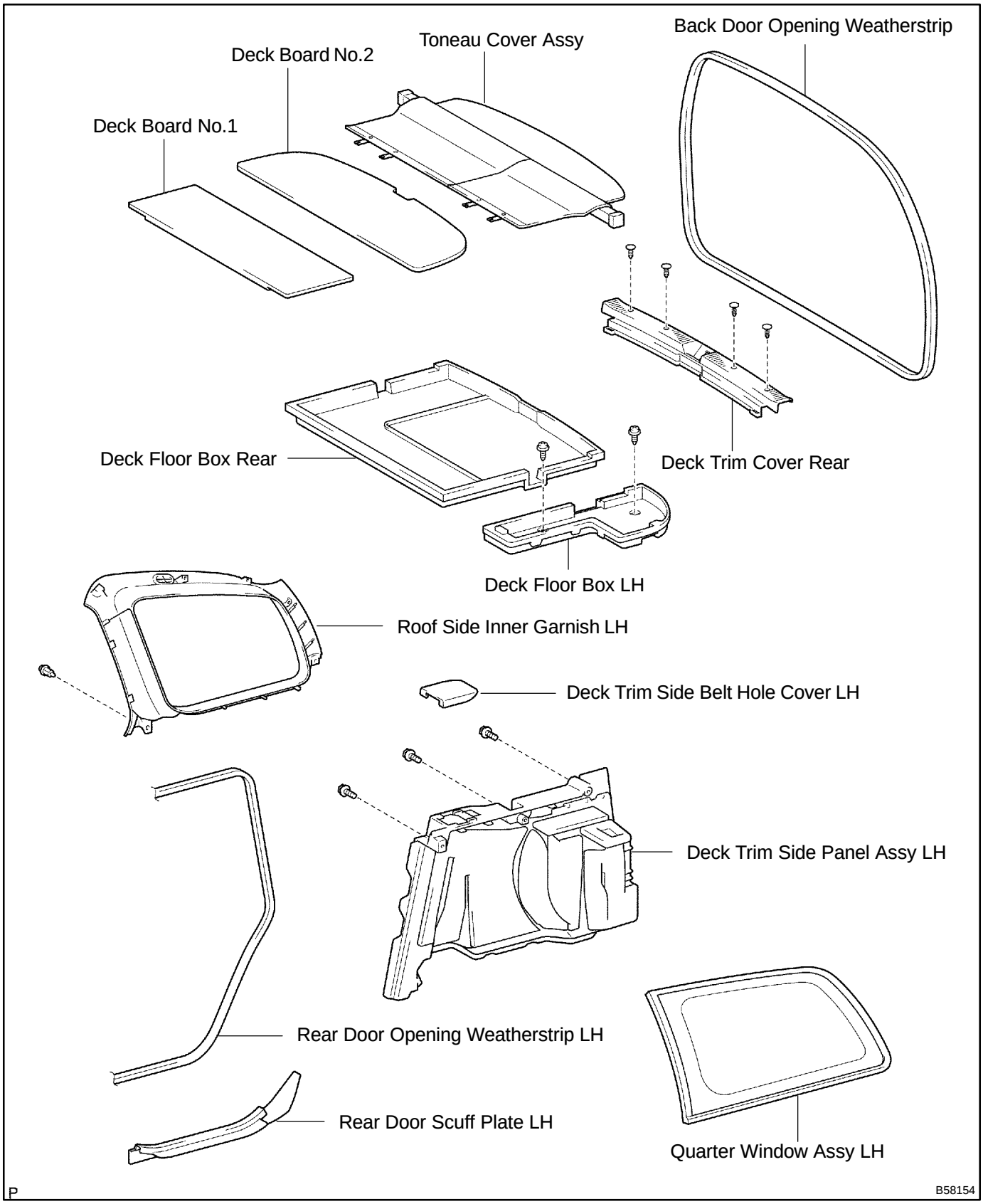
21. INSTALL REAR SIDE SEAT BACK ASSY RH (SEPARATED TYPE REAR SEAT) **(See page 72-14)**

22. INSTALL REAR SIDE SEAT BACK ASSY LH (SEPARATED TYPE REAR SEAT) **(See page 72-14)**

QUARTER WINDOW ASSY LH (STATION WAGON)

COMPONENTS

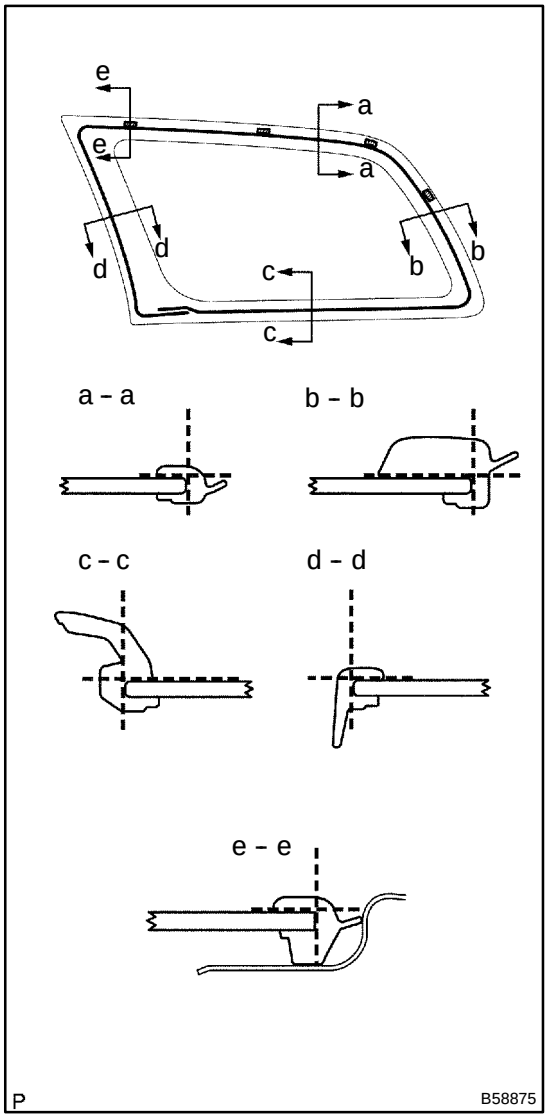
700EE-01



700EF-01

REPLACEMENT

1. REMOVE REAR DOOR SCUFF PLATE LH
(See page 76-40)
2. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH
(See page 76-40)
3. REMOVE REAR SIDE SEAT BACK ASSY LH
(See page 72-22)
4. REMOVE TONNEAU COVER ASSY
(See page 76-41)
5. REMOVE DECK BOARD NO.1
(See page 76-41)
6. REMOVE DECK BOARD NO.2
(See page 76-41)
7. REMOVE DECK FLOOR BOX REAR
(See page 76-41)
8. REMOVE DECK FLOOR BOX LH
(See page 76-41)
9. REMOVE DECK TRIM COVER REAR
(See page 76-42)
10. REMOVE DECK TRIM SIDE BELT HOLE COVER LH
(See page 76-42)
11. REMOVE DECK TRIM SIDE PANEL ASSY LH
(See page 76-42)
12. REMOVE ROOF SIDE GARNISH INNER LH
(See page 76-42)

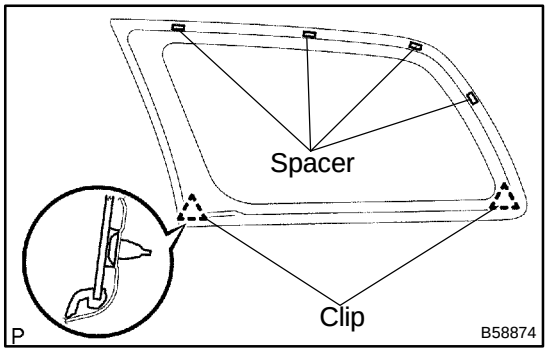


13. REMOVE QUARTER WINDOW ASSY LH

(a) Using a knife, cut off the moulding as shown in the illustration.

NOTICE:

Do not damage the body with the knife.



(b) Push a piano wire through between the body and glass from the interior.

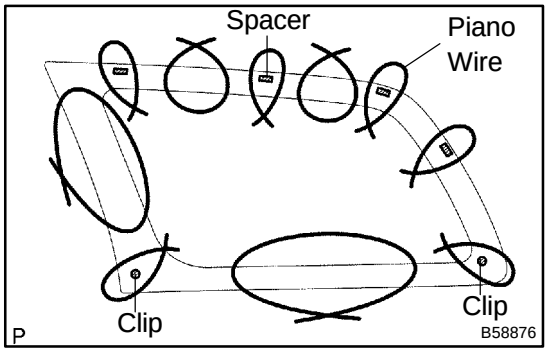
(c) Tie both wire ends to wooden blocks or similar objects.

HINT:

Apply protective tape to the outer surface to keep it from being scratched.

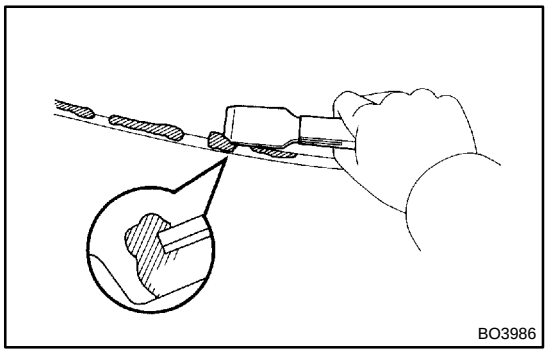
NOTICE:

- **When separating the glass, take care not to damage the paint and interior/exterior ornaments.**
- **To prevent the piano wire to be cut, do not cross it.**



(d) Cut the adhesive by pulling the piano wire around it.
(e) Disengage the spacers and clips.
(f) Using a suction rubber, remove the quarter window assembly LH.

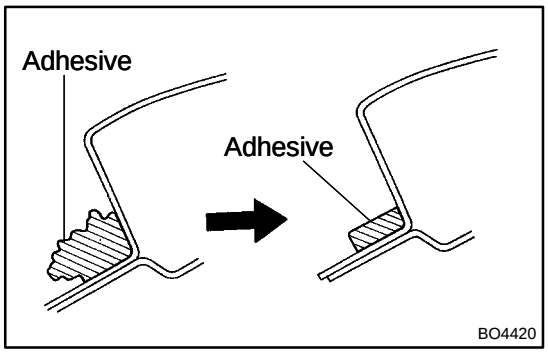
NOTICE:
Leave as much adhesive on the body as possible when cutting off the glass.



14. CLEAN QUARTER WINDOW ASSY LH

(a) Using a scraper, remove the damaged spacers and clips, and adhesive sticking to the glass.
(b) Clean the outer circumference of the glass with white gasoline.

NOTICE:
- **Do not touch the glass after cleaning it.**
- **Be careful not to damage the body.**



15. INSTALL QUARTER WINDOW ASSY LH

(a) Clean and shape the contact surface of the body panel.
  (1) Using a knife, cut away any rough areas on the body panel.

HINT:
Leave as much adhesive on the body panel as possible.

  (2) Clean the cut surface of the adhesive with a piece of shop rag saturated in cleaner.
(b) Coat the contact surface of the body panel with Primer M.
  (1) Using a brush, coat the exposed part of the contact surface on the vehicle side with Primer M.

NOTICE:
- **Dry the primer coating for 3 minutes or more.**
- **Do not keep any of the opened Primer M for later use.**
- **Do not apply too much primer.**
- **Pay special attention in coating joints of panels and welded parts.**

(c) Coat the contact surface of the glass with Primer G.
  (1) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.
  (2) When the primer is coated wrongly to the area other than the specified, wipe it off with a clean shop rag before the primer dries.

NOTICE:
- **Dry the primer coating for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**
- **Do not apply too much primer.**

(d) Apply adhesive.

(1) Cut off the tip of the cartridge nozzle.

HINT:

After cutting off the tip, use all adhesive within the time described in the table below.

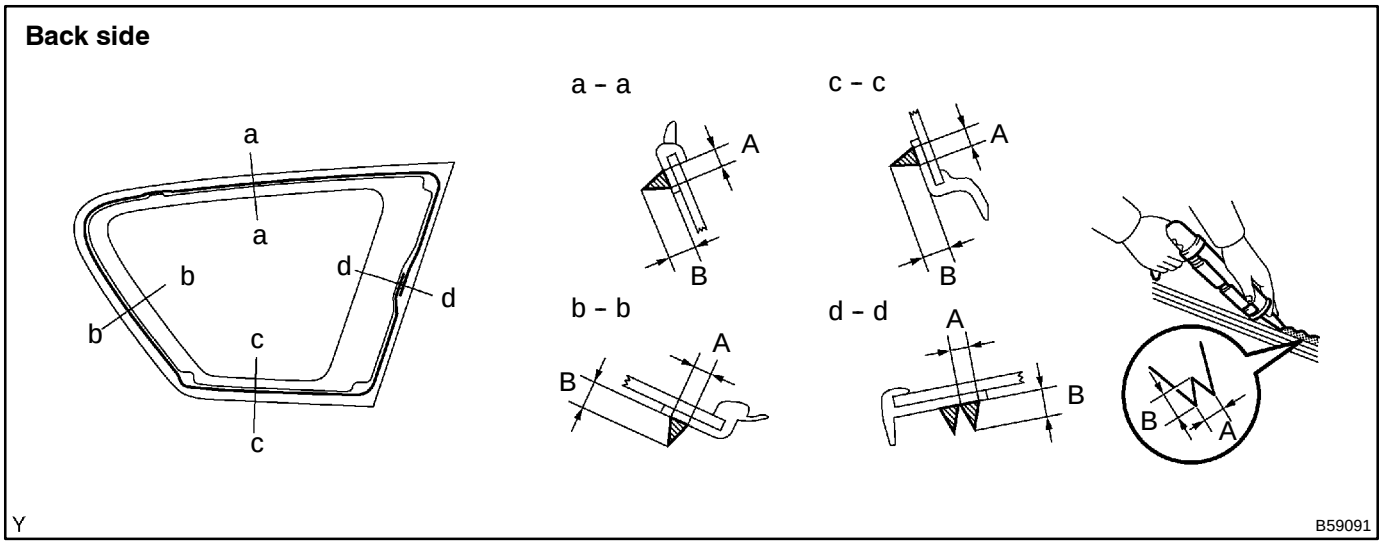
Temperature	Tackfree time
35_C (95_F)	1.5 hour
20_C (68_F)	5 hour
5_C (41_F)	24 hour

(2) Load the sealer gun with the cartridge.

(3) Coat the glass with adhesive as shown in the illustration

A: 8 mm (0.315 in.)

B: 12 mm (0.472 in.)



(e) Install the quarter window assembly LH.

(1) Using a suction rubber, install the quarter window assembly.

NOTICE:

- **Install the glass after the primer on the vehicle's body has completely dried.**
- **Check that the spacers are attached to the body correctly.**

(2) Lightly press the glass front surface for close contact.

(3) Hold the glass in place securely with a protective tape or equivalent until the adhesive has completely hardened.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	1.5 hour
20_C (68_F)	5 hour
5_C (41_F)	24 hour

16. INSPECT FOR LEAK AND REPAIR

(a) Conduct a leak test after the adhesive has completely hardened.

(b) Seal any leak with sealant.

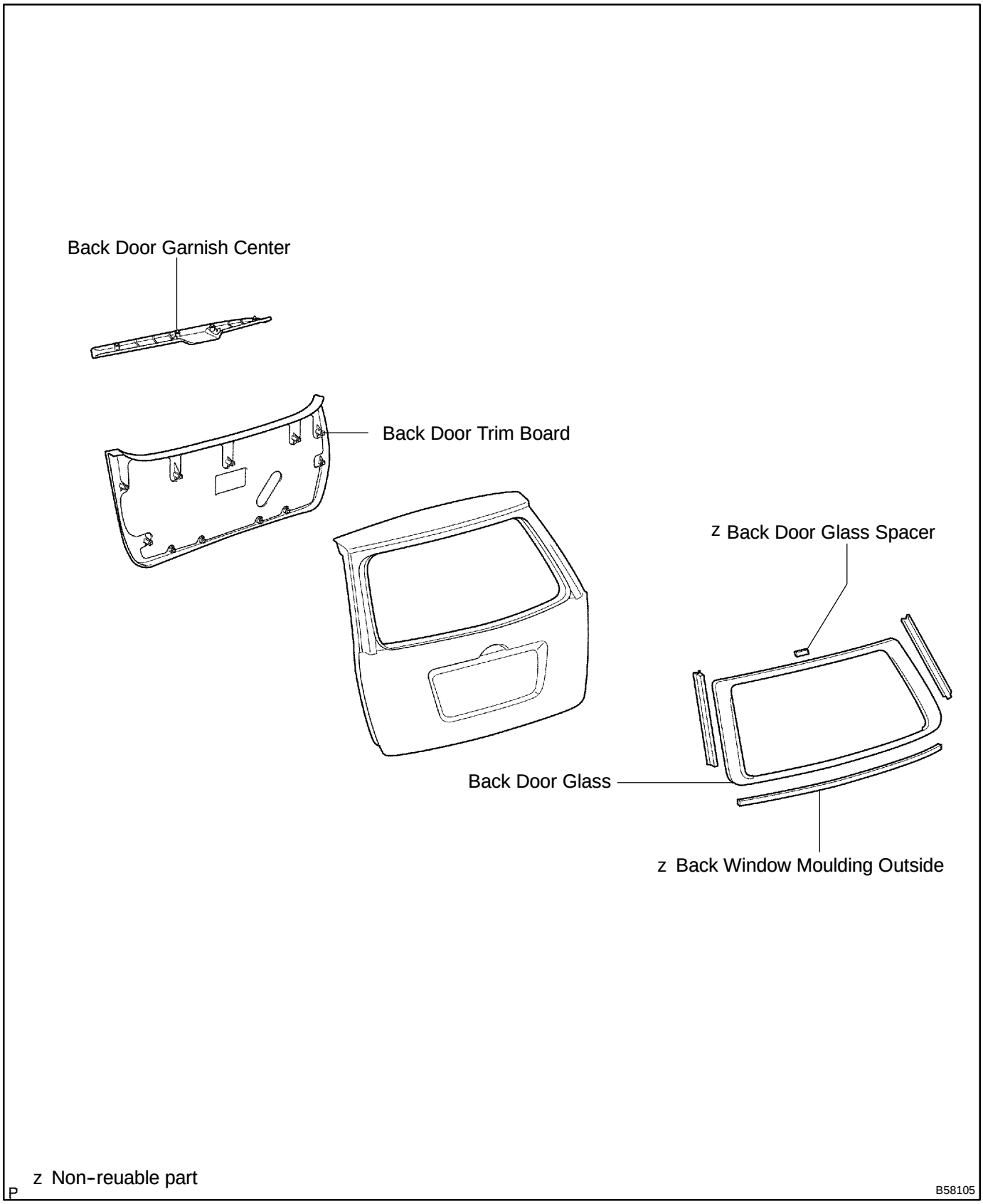
17. INSTALL REAR SIDE SEAT BACK ASSY LH

(See page 72-23)

BACK DOOR GLASS (STATION WAGON)

COMPONENTS

700EG–01

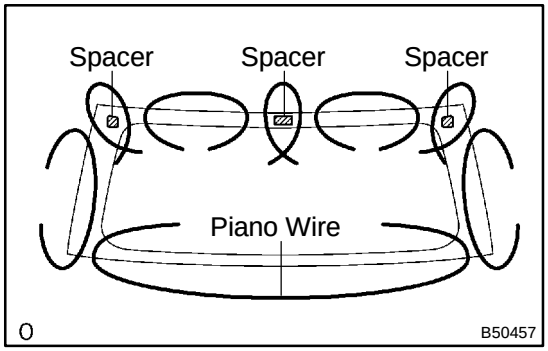


P z Non–reuable part

B58105

REPLACEMENT

1. REMOVE BACK DOOR TRIM BOARD ASSY
(See page 75-55)
2. REMOVE BACK DOOR GARNISH CENTER
(See page 75-55)
3. REMOVE CENTER STOP LAMP ASSY
(See page 75-55)



4. REMOVE BACK DOOR GLASS

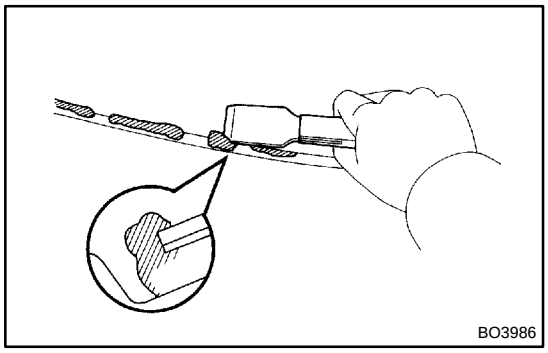
(a) Push a piano wire through between the back door and glass from the interior.
(b) Tie both wire ends to wooden blocks or similar objects.

HINT:
Apply protective tape to the outer surface of the glass to keep it from being scratched.

NOTICE:
- **When separating the glass, take care not to damage the paint and interior/exterior ornaments.**
- **To prevent the piano wire to be cut, do not cross it.**

(c) Disengage the spacers.
(d) Using a suction rubber, remove the glass.
(e) Cut the adhesive by pulling the piano wire around it.
(f) Remove the glass.

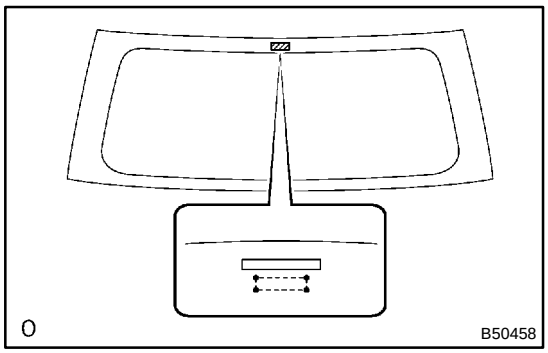
NOTICE:
Leave as much adhesive on the body as possible when cutting off the glass.



5. CLEAN BACK DOOR GLASS

(a) Using a scraper, remove the damaged spacers, dam and adhesive sticking to the glass.
(b) Clean the glass with cleaner.

NOTICE:
- **Do not touch the glass after cleaning it.**
- **Be careful not to damage the body.**



6. INSTALL BACK DOOR GLASS SPACER

(a) Coat the spacer installation part with Primer G.

NOTICE:
- **Do not apply too much primer.**
- **Install a spacer after the primer has dried.**

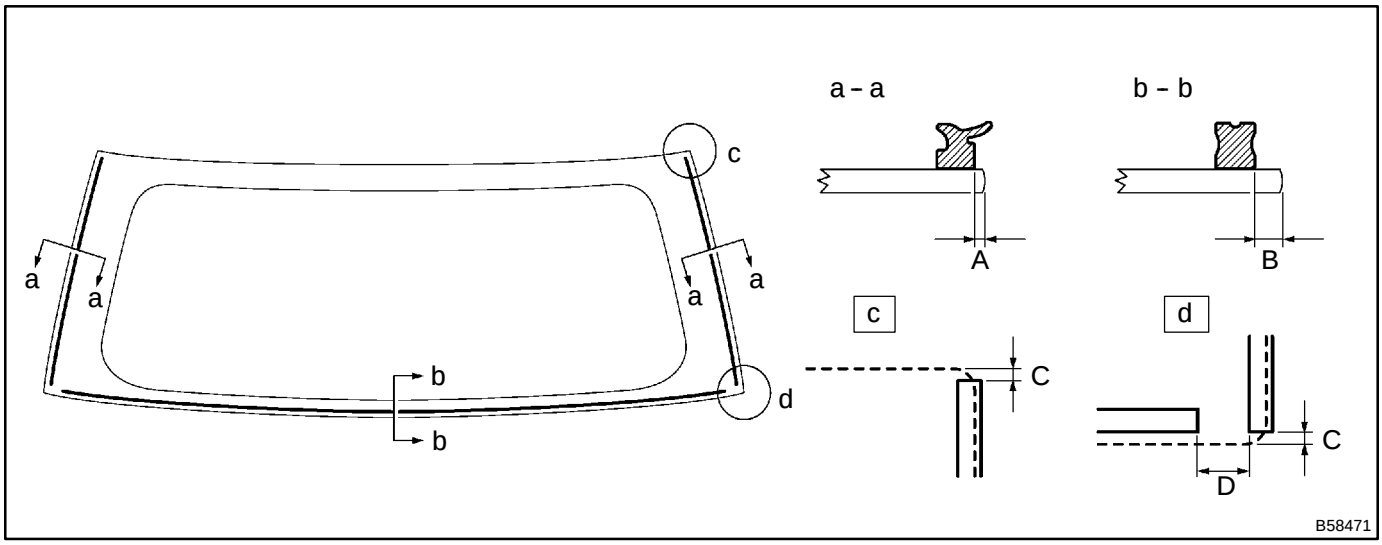
(b) Install a new spacer onto the glass as shown in the illustration.

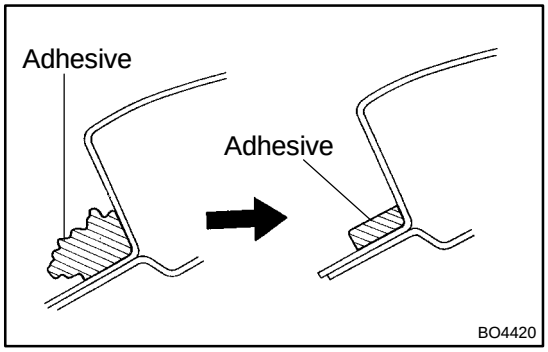
7. INSTALL BACK WINDOW MOULDING OUTSIDE

(a) Install 3 new back window moulding outsides as shown in the illustration.

A: 1.7 mm (0.067 in.)
B: 3.5 mm (0.138 in.)
C: 5 mm (0.197 in.)
D: 25 mm (0.984 in.)

NOTICE:
Do not touch the glass face after cleaning it.





8. INSTALL BACK DOOR GLASS

(a) Clean and shape the contact surface of the vehicle's body
(1) Using a knife, cut away any rough areas of the body.

HINT:
Leave as much adhesive on the body as possible.

(2) Clean the cut surface of the adhesive with a piece of shop rag saturated in cleaner.

(b) Position the glass.
(1) Using a suction rubber, place the glass in the correct position.
(2) Check that all the contacting parts of the glass rim are perfectly even.
(3) Place reference marks between the glass and body.

NOTICE:
Check that the spacer are attached to the body correctly.

HINT:
When reusing the glass, check and correct the reference mark's positions.

(4) Remove the glass.

(c) Coat the contact surface of the body panel with Primer M.
(d) Using a bursh, coat the exposed part of the contact surface on the vehicle side with Primer M.

NOTICE:
- **Dry the primer coating for 3 minutes or more.**
- **Do not coat the adhesive with Primer M.**
- **Do not apply too much primer.**

(e) Coat the contact surface of the glass with Primer G.

(1) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(f) Apply adhesive.

(1) Cut off the tip of the cartridge nozzle as shown in the illustration.

HINT:

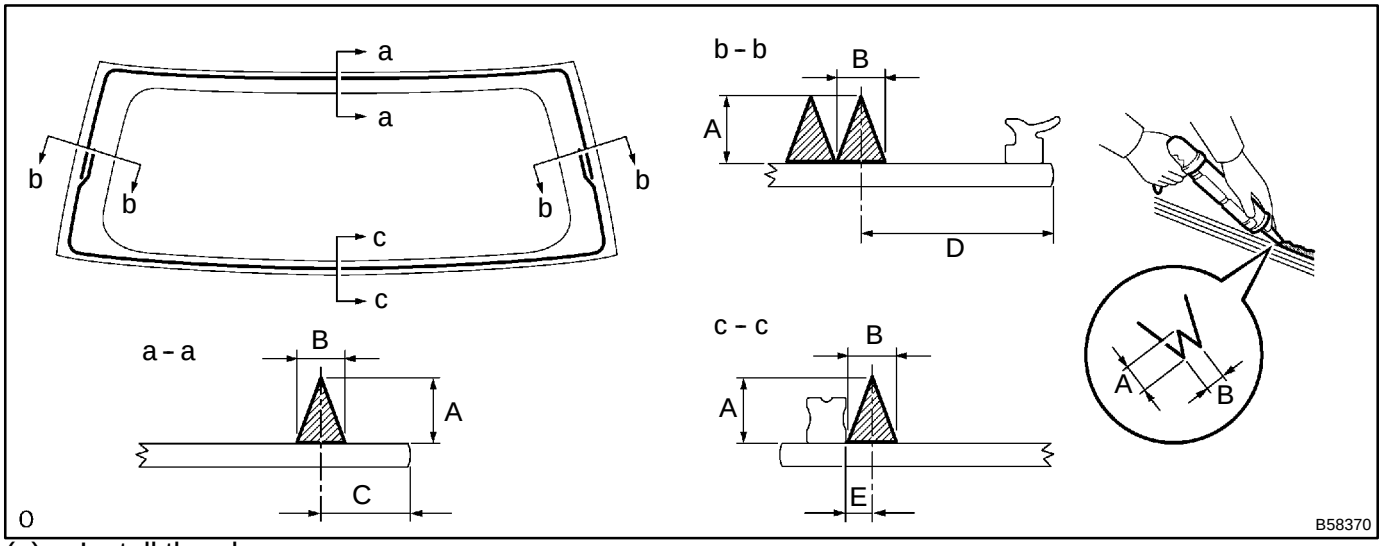
After cutting off the tip, use all adhesive within the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	15 minute
20_C (68_F)	100 minute
5_C (41_F)	8 hour

(2) Load the sealer gun with the cartridge.

(3) Coat the glass with adhesive as shown in the illustration.

A: 12 mm (0.472 in.)
B: 8 mm (0.315 in.)
C: 13 mm (0.512 in.)
D: 31 mm (1.220 in.)
E: 4 mm (0.157 in.)



(g) Install the glass.

(1) Using a suction rubber, position the glass so that the reference marks are aligned, and press it in gently along the rim.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Check that the spacer are attached to the body correctly.**
- **Check the clearance between the body and glass.**

(2) Lightly press the glass front surface for close contact.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	1.5 hour
20_C (68_F)	5 hour
5_C (41_F)	24 hour

(3) Using a scraper, remove any excess or protruding adhesive.

HINT:

Apply adhesive on the glass rim.

9. INSPECT FOR LEAK AND REPAIR

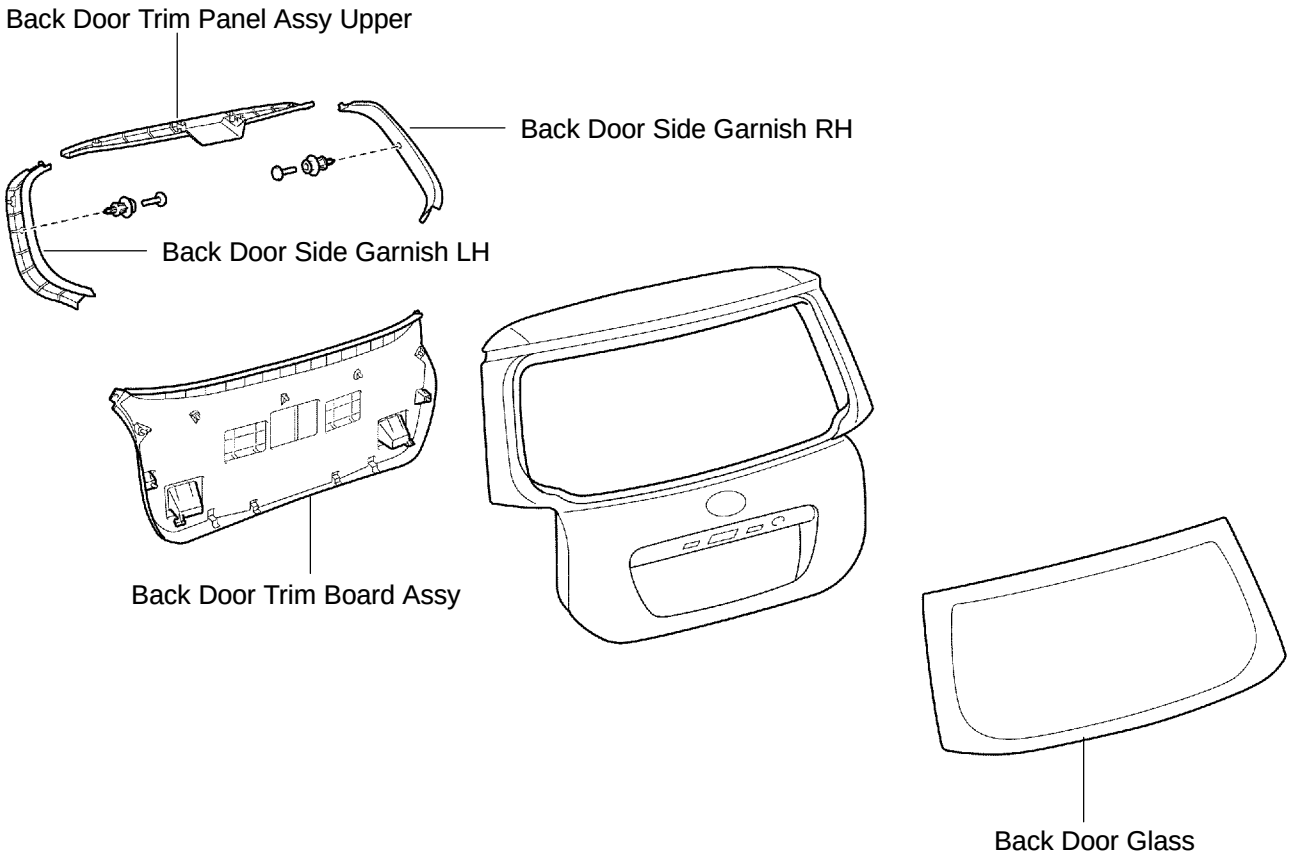
(a) Conduct a leak test after the adhesive has completely hardened.

(b) Seal any leak with sealant.

BACK DOOR GLASS (HATCHBACK)

COMPONENTS

700EI-01

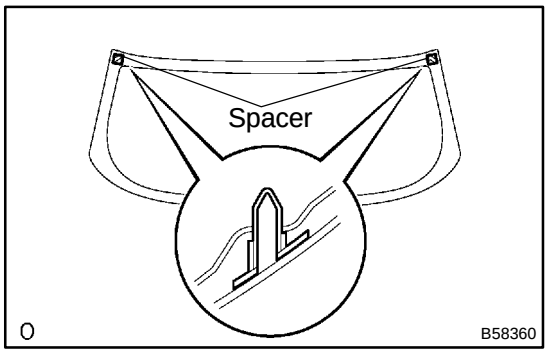


P

B58106

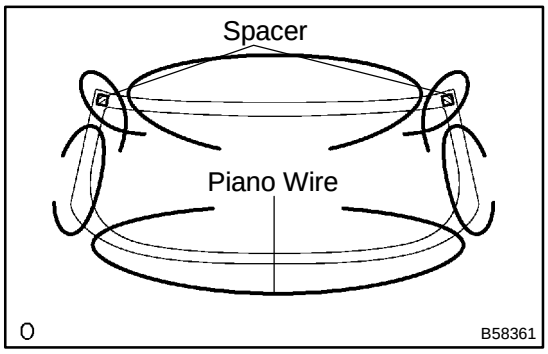
REPLACEMENT

1. REMOVE BACK DOOR TRIM PANEL ASSY UPPER
(See page 75-58)
2. REMOVE BACK DOOR SIDE GARNISH RH
(See page 75-58)
3. REMOVE BACK DOOR SIDE GARNISH LH
(See page 75-58)
4. REMOVE BACK DOOR TRIM BOARD ASSY
(See page 75-58)
5. REMOVE CENTER STOP LAMP ASSY
(See page 65-35)



6. REMOVE BACK DOOR GLASS

(a) Push a piano wire through between the back door and glass from the interior.



(b) Tie both wire ends to wooden blocks or similar objects.

HINT:

Apply protective tape to the outer surface of the glass to keep it from being scratched.

NOTICE:

- **When separating the glass, take care not to damage the paint and interior/exterior ornaments.**
- **To prevent the piano wire to be cut, do not cross it.**

(c) Disengage the spacers.

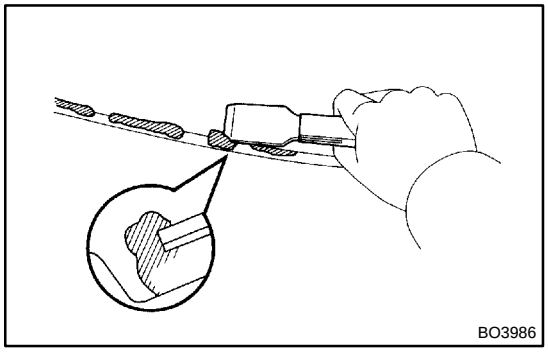
(d) Using a suction rubber, remove the glass.

(e) Cut the adhesive by pulling the piano wire around it.

(f) Remove the glass.

NOTICE:

Leave as much adhesive on the body as possible when cutting off the glass.



7. CLEAN BACK DOOR GLASS

(a) Using a scraper, remove the damaged spacers, moulding and adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

- **Do not touch the glass after cleaning it.**
- **Be careful not to damage the body.**

8. INSTALL BACK DOOR WINDOW MOULDIMG

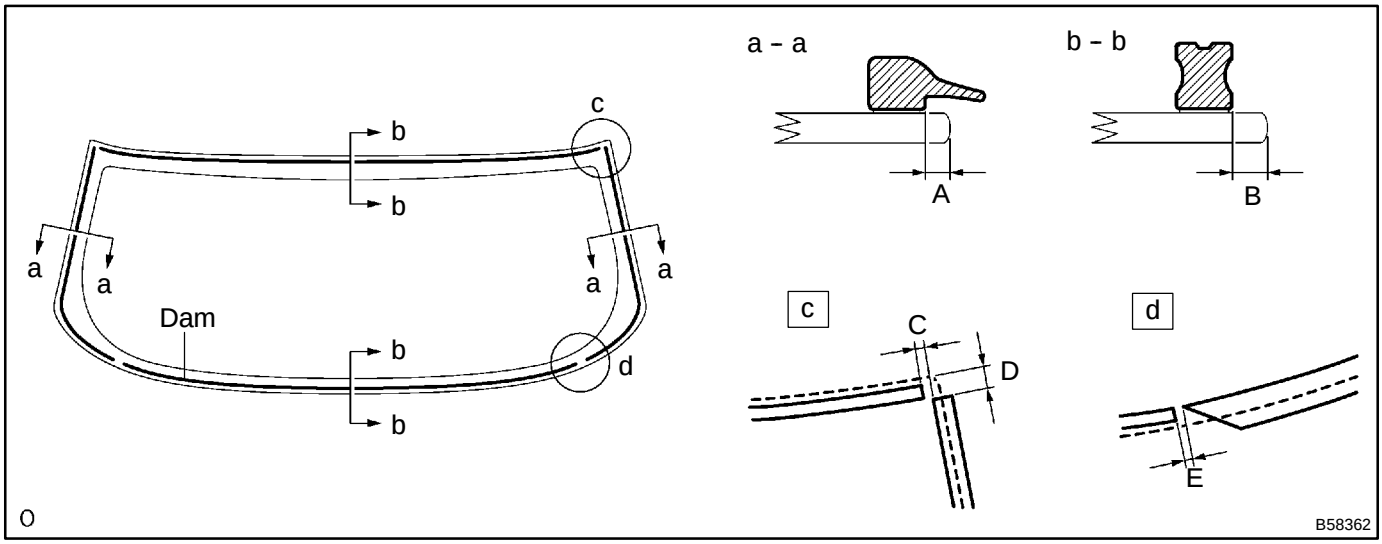
(a) Coat the installation part of the back door window moulding with Primer G.

NOTICE:

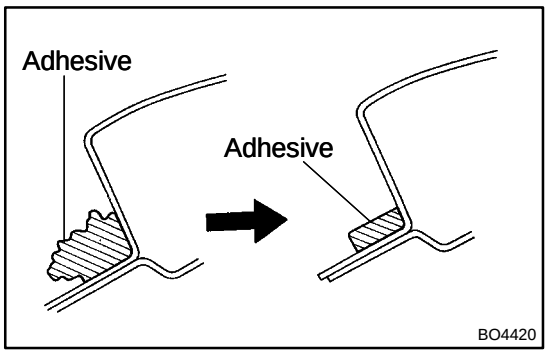
- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(b) Install 4 new window glass adhesive dams as shown in the illustration.

A: 2.7 mm (0.106 in.)
B: 3.5 mm (0.138 in.)
C: 3 mm (0.118 in.)
D: 5 mm (0.197 in.)
E: 3 mm (0.118 in.)



NOTICE:
Do not touch the glass face after cleaning it.



9. INSTALL BACK DOOR GLASS

(a) Clean and shape the contact surface of the vehicle's body
(1) Using a knife, cut away any rough areas of the body.

HINT:
Leave as much adhesive on the body as possible.

(2) Clean the cut surface of the adhesive with a piece of shop rag saturated in cleaner.

(b) Position the glass.
(1) Using a suction rubber, place the glass in the correct position.
(2) Check that all the contacting parts of the glass rim are perfectly even.
(3) Place reference marks between the glass and body.

NOTICE:
Check that the spacers are attached to the body correctly.

HINT:
When reusing the glass, check and correct the reference mark's positions.

(4) Remove the glass.

(c) Coat the contact surface of the body panel with Primer M.

(1) Using a bursh, coat the exposed part of the contact surface on the vehicle side with Primer M.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(d) Coat the contact surface of the glass with Primer G.

(1) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Do not apply too much primer.**

(e) Apply adhesive.

(1) Cut off the tip of the cartridge nozzle as shown in the illustration.

HINT:

After cutting off the tip, use all adhesive within the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	15 minute
20_C (68_F)	100 minute
5_C (41_F)	8 hour

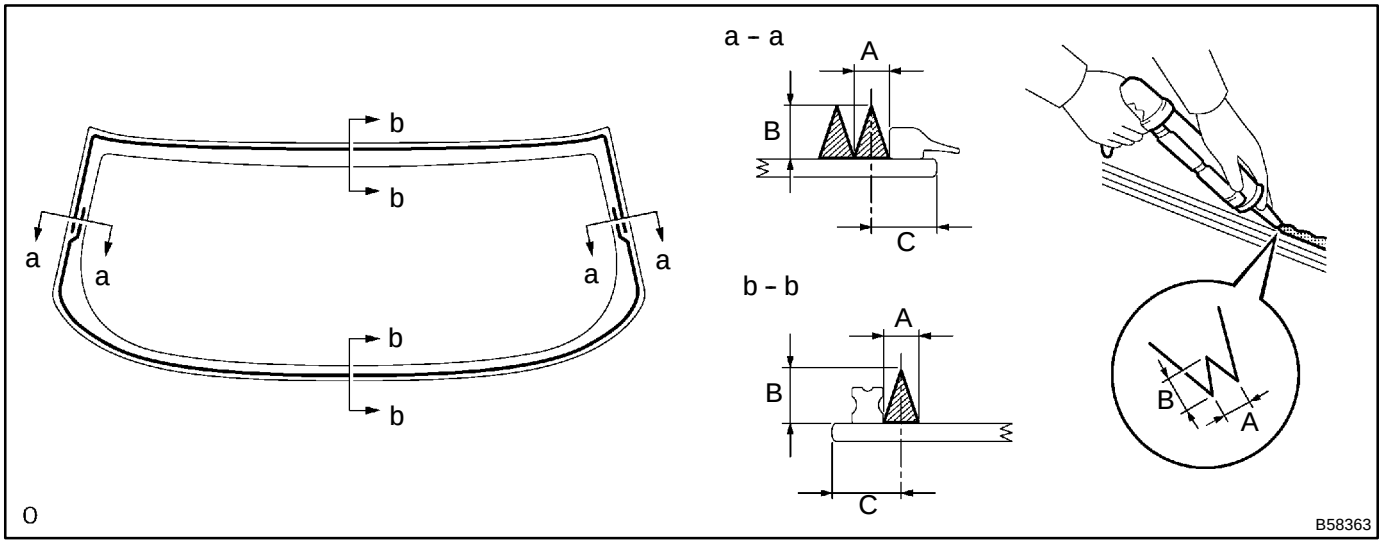
(2) Load the sealer gun with the cartridge.

(3) Coat the glass with adhesive as shown in the illustration.

A: 8 mm (0.315 in.)

B: 12.5 mm (0.492 in.)

C: 12.7 mm (0.500 in.)



(f) Install the glass.

(1) Using a suction rubber, position the glass so that the reference marks are aligned, and press it in gently along the rim.

NOTICE:

- **Dry the primer coating for 3 minutes or more.**
- **Check that the spacers are attached to the body correctly.**
- **Check the clearance between the body and glass.**

(2) Lightly press the glass front surface for close contact.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Tackfree time
35_C (95_F)	1.5 hour
20_C (68_F)	5 hour
5_C (41_F)	24 hour

(3) Using a scraper, remove any excess or protruding adhesive.

HINT:

Apply adhesive on the glass rim.

10. WATER-LEAK CHECK AND REPAIREMENT

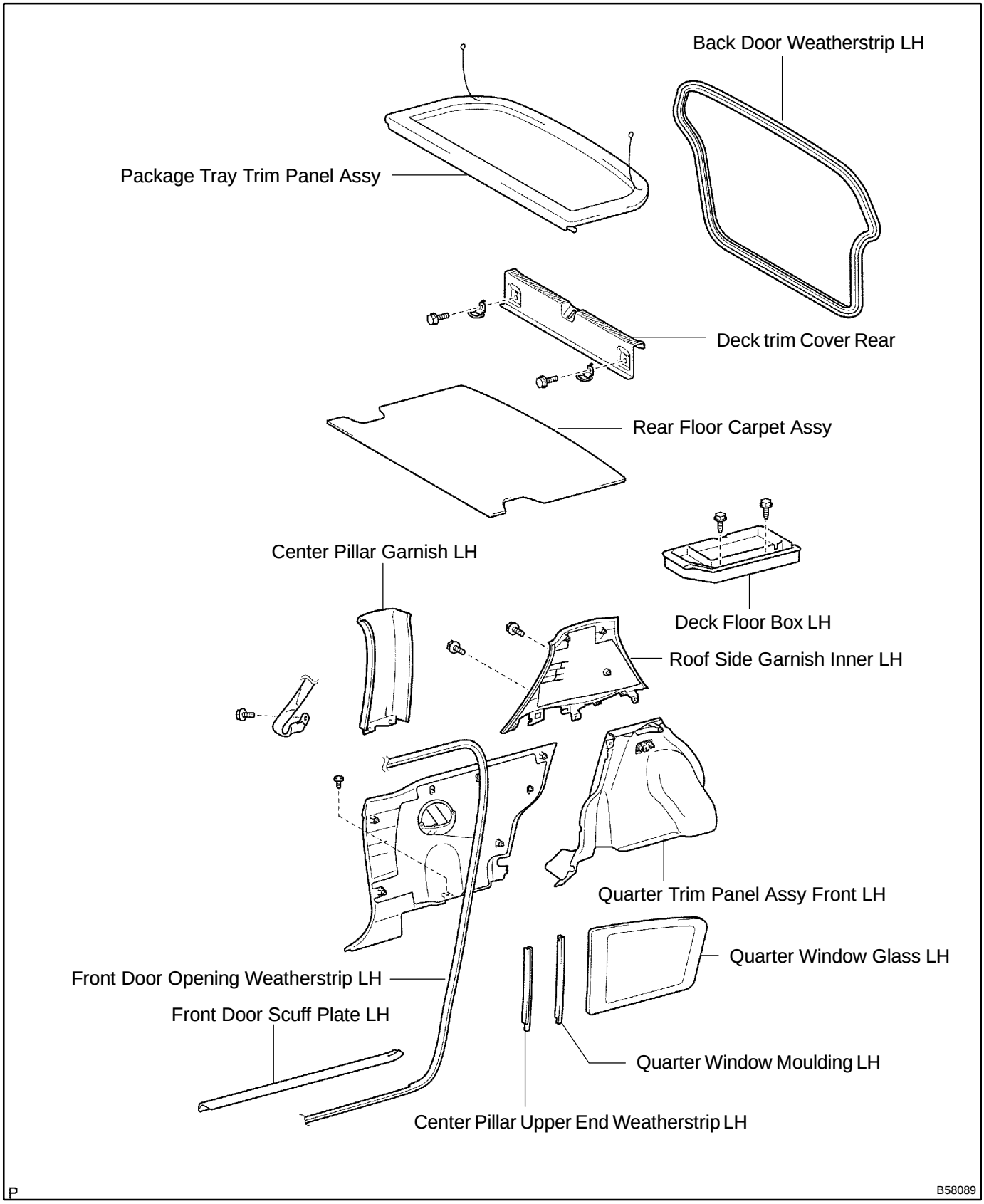
(a) Conduct a leak test after the adhesive has completely hardened.

(b) Seal any leak with sealant.

QUARTER WINDOW GLASS LH (3-DOOR HATCHBACK)

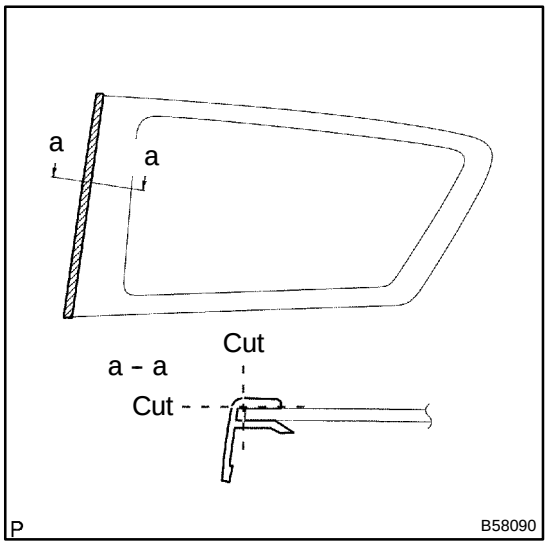
COMPONENTS

700EK-01



REPLACEMENT

1. REMOVE FRONT DOOR SCUFF PLATE LH
(See page 76-48)
2. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH
(See page 76-48)
3. REMOVE BACK DOOR WEATHERSTRIP
(See page 76-48)
4. REMOVE REAR SEAT BACK ASSY LH (See page 72-26)
5. REMOVE REAR FLOOR CARPET ASSY
(See page 76-48)
6. REMOVE PACKAGE TRAY TRIM PANEL ASSY
(See page 76-48)
7. REMOVE DECK FLOOR BOX LH
(See page 76-48)
8. REMOVE DECK TRIM COVER REAR
(See page 76-49)
9. REMOVE QUARTER TRIM PANEL ASSY FRONT LH
(See page 76-49)
10. REMOVE DECK TRIM SIDE BOARD LH
(See page 76-49)
11. REMOVE CENTER PILLAR GARNISH LH
(See page 76-49)
12. REMOVE ROOF SIDE GARNISH INNER LH
(See page 76-50)

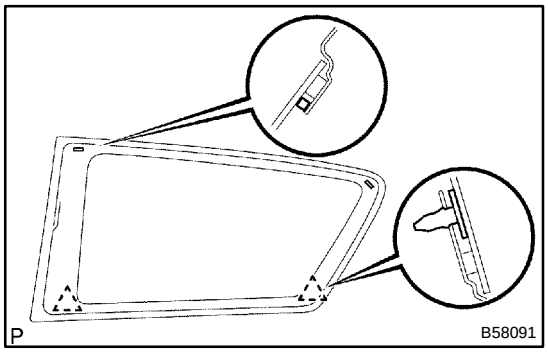


13. REMOVE QUARTER WINDOW MOULDING LH

(a) Using a knife, cut off the moulding as shown in the illustration.

NOTICE:

Do not damage the body with the knife.



14. REMOVE QUARTER WINDOW GLASS LH

(a) Push a piano wire through between the body and glass from the interior.

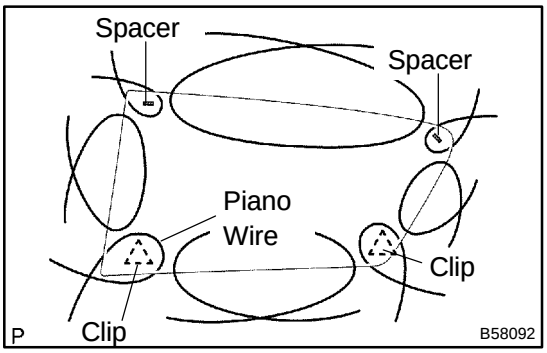
(b) Tie both wire ends to wooden blocks or similar objects.

HINT:

Apply protective tape to the outer surface to keep it from being scratched.

NOTICE:

- **When separating the glass, take care not to damage the paint and interior/exterior ornaments.**
- **To prevent the piano wire to be cut, do not cross it.**

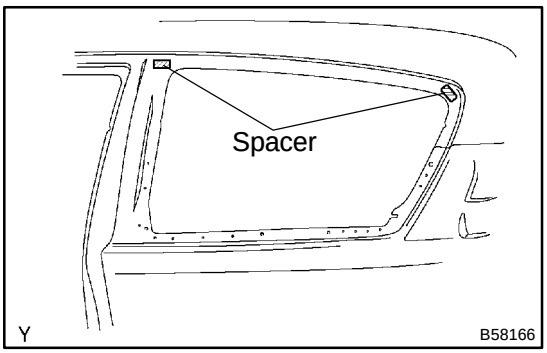


(c) Cut the adhesive by pulling the piano wire around it.
(d) Disengage the spacers and clips.
(e) Using a suction rubber, remove the quarter window assembly LH.

NOTICE:
Leave as much adhesive on the body as possible when cutting off the glass.

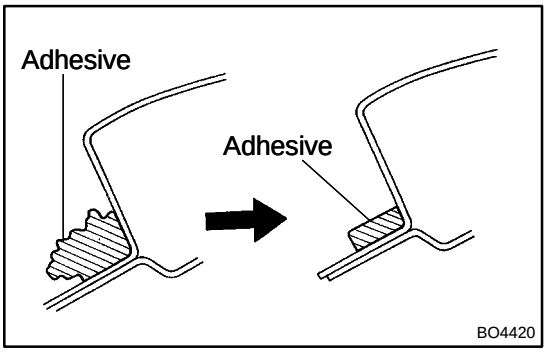
15. CLEAN QUARTER WINDOW GLASS LH

(a) Clean the outer circumference of a new glass with cleaner.



16. INSTALL QUARTER WINDOW GLASS LH SPACER

(a) Install the quarter window glass LH spacer as shown in the illustration.



17. INSTALL QUARTER WINDOW GLASS LH

(a) Clean and shape the contact surface of the body panel.
  (1) Using a knife, cut away any rough areas on the body panel.

HINT:
Leave as much adhesive on the body panel as possible.

  (2) Clean the cut surface of the adhesive with a piece of shop rag saturated in cleaner.

(b) Coat the contact surface of the body panel with Primer M.
  (1) Using a brush, coat the exposed part of the contact surface on the vehicle side with Primer M.

NOTICE:

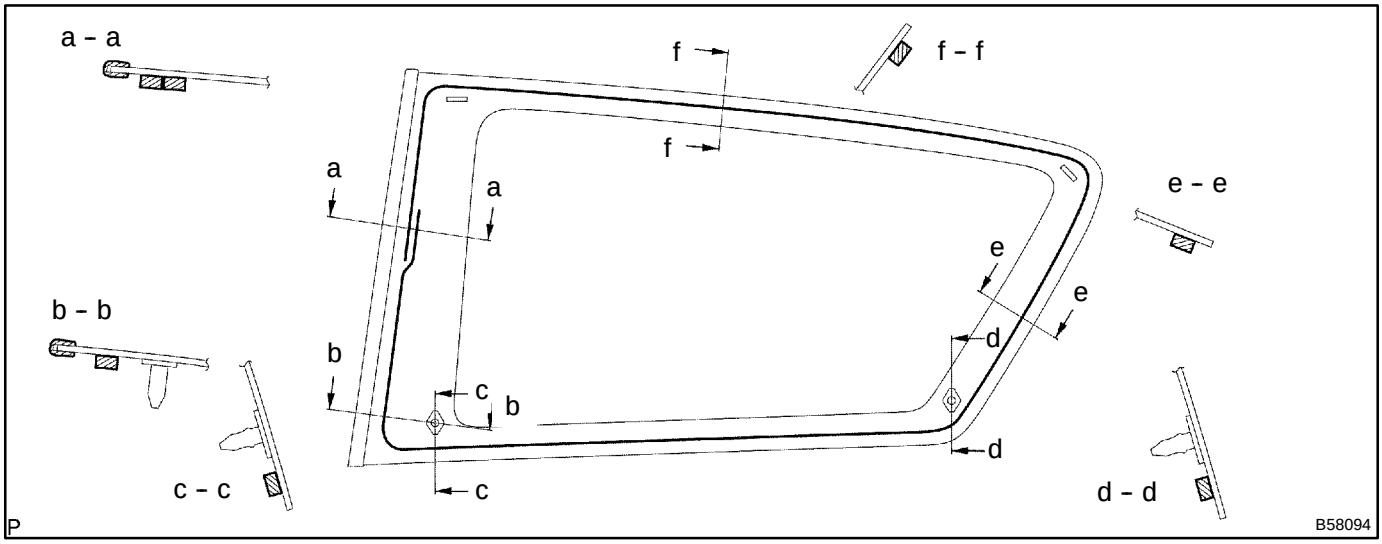
- **Dry the primer coating for 3 minutes or more.**
- **Do not coat the adhesive with Primer M.**

- **Do not keep any of the opened Primer M for later use.**
- **Do not apply too much primer.**
- **Pay special attention in coating joints of panels and welded parts.**

(c) Coat the contact surface of the glass with Primer G as shown in the illustration.

(1) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

(2) When the primer is coated wrongly to the area other than the specified, wipe it off with a clean shop rag before the primer dries.



NOTICE:

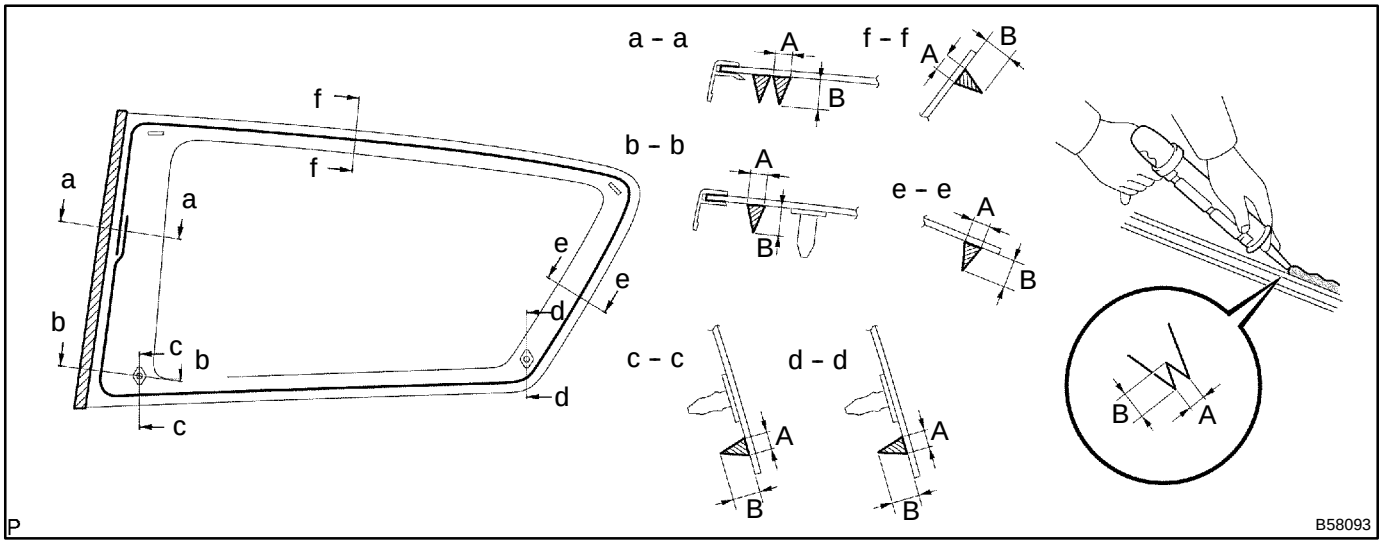
- **Dry the primer coating for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**
- **Do not apply too much primer.**

(d) Apply adhesive.

(1) Cut off the tip of the cartridge nozzle.

(2) Load the sealer gun with the cartridge.

(3) Coat the glass with adhesive as shown in the illustration.



A: 8 mm (0.315 in.)

B: 12 mm (0.472 in.)

(e) Install the quarter window moulding LH.
(f) Install the center pillar upper end weatherstrip LH.
(g) Install the quarter window assembly LH.
(1) Using a suction rubber, install the quarter window assembly.

NOTICE:

- **Install the glass after the primer on the vehicle's body has completely dried.**
- **Check that the spacers are attached to the body correctly.**

(2) Lightly press the glass front surface for close contact.
(3) Hold the glass in place securely with a protective tape or equivalent until the adhesive has completely hardened.

18. INSTALL REAR SEAT BACK ASSY LH **(See page 72-28)**

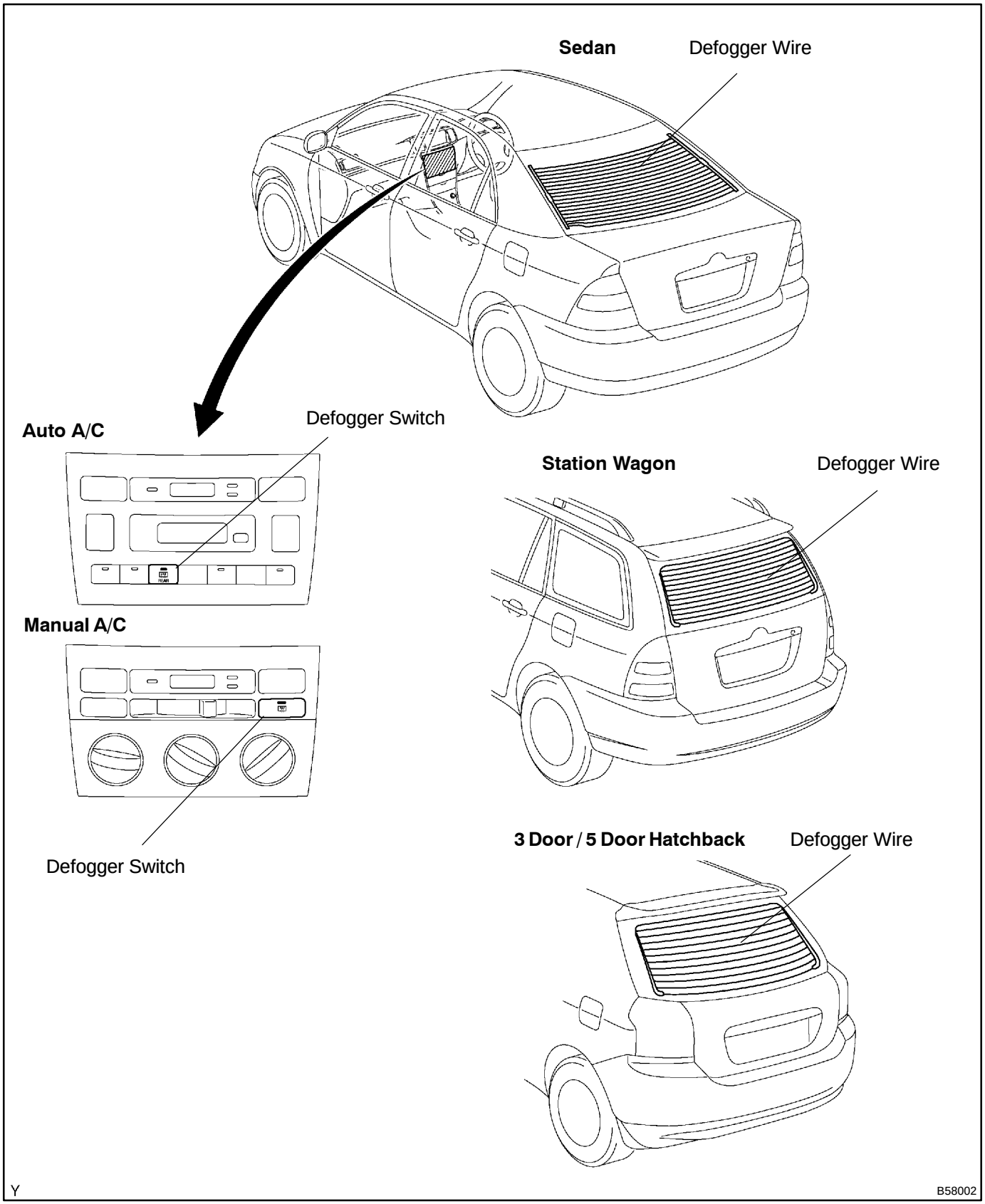
19. WATER-LEAK CHECK AND REPAIREMENT

(a) Conduct a leak test after the adhesive has completely hardened.
(b) Seal any leak with sealant.

WINDOW DEFOGGER SYSTEM

LOCATION

700DW-01



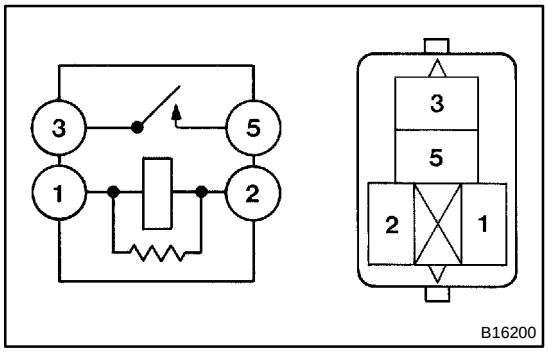
700DX-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Rear window defogger does not operate (Indicator lamp on)	1. Communication function check 2. M-HTR/DEF IUP (LHD TMUK made) 3. DEF fuse (except LHD TMUK made) 4. DEF relay 5. Rear window defogger wire 6. Wire harness 7. Engine ECU	- 70-51 - -
Rear window defogger does not operate (Indicator lamp off)	1. GAUGE fuse 2. Defogger switch (A/C panel switch) 3. Air control assembly 4. Wire harness	 55-40 -

700DY-01

INSPECTION



1. INSPECT RELAY

(a) Inspect the defogger relay (marking: DEF) continuity.

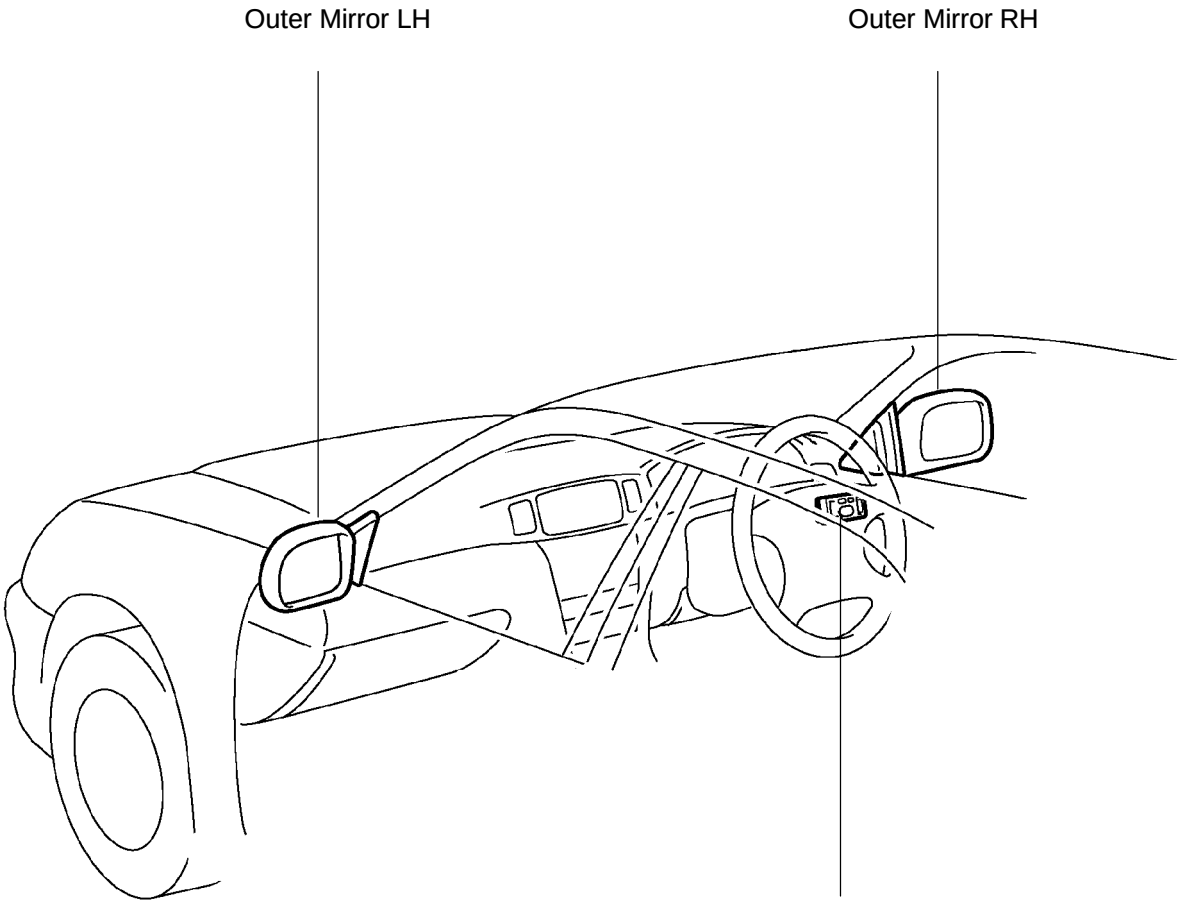
Condition	Tester connection	Specified condition
Constant	1 ⇔ 2	Continuity
Apply B+ between terminals 1 and 2	3 ⇔ 5	Continuity

If the continuity is not as specified, replace the relay.

POWER MIRROR CONTROL SYSTEM

LOCATION

700DZ-01



*: For a RHD vehicle, look in the same location as in the LHD.

B58283

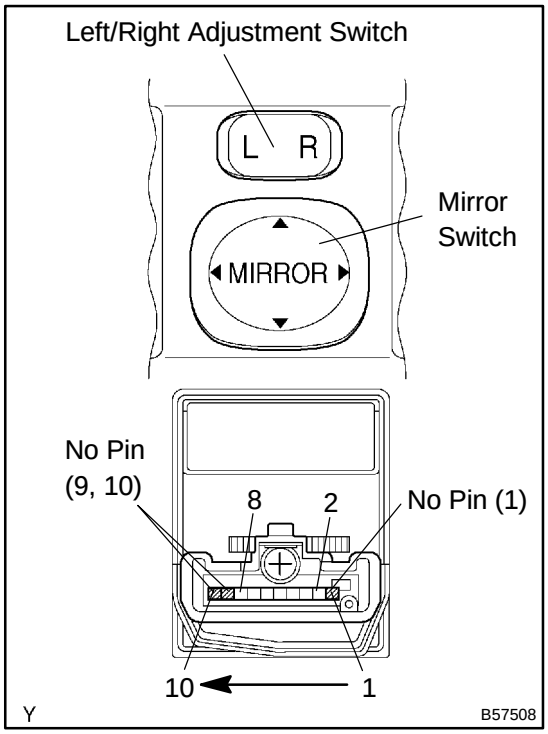
700E0-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Outer mirror does not operate	1. ACC fuse (D-J/B)	-
	2. Mirror switch	70-54
	3. Mirror motor	70-54
	4. Wire harness	-
Outer mirror operates abnormally	1. Mirror switch	70-54
	2. Mirror motor	70-54
	3. Wire harness	-

700E1-01

INSPECTION



1. INSPECT OUTER MIRROR SWITCH ASSY

(a) Inspect the mirror switch continuity.

(1) Left side for left/right adjustment switch:
Inspect the left side mirror switch continuity.

Standard:

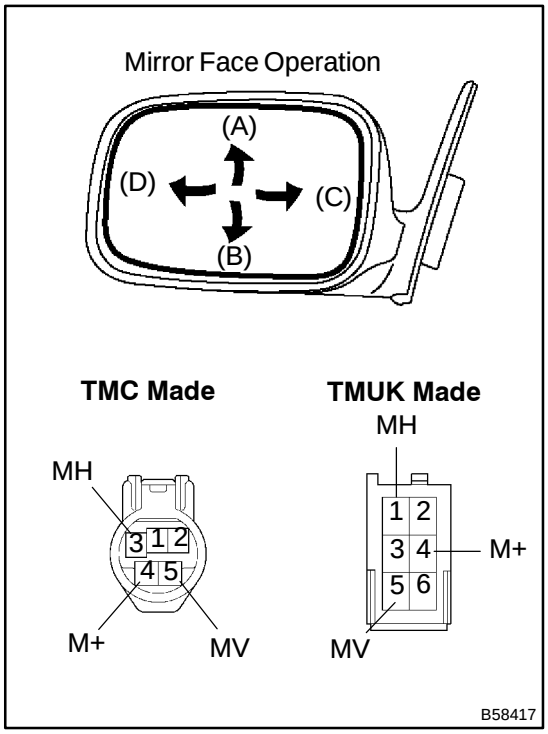
Switch position	Tester connection	Specified condition
OFF	-	No continuity
UP	4 ⇔ 8 6 ⇔ 7	Continuity
DOWN	4 ⇔ 7 6 ⇔ 8	Continuity
LEFT	5 ⇔ 8 6 ⇔ 7	Continuity
RIGHT	5 ⇔ 7 6 ⇔ 8	Continuity

If the continuity is not as specified, replace the switch.

(2) Right side for left/right adjustment switch:
Inspect the right side mirror switch continuity.

Standard:

Switch position	Tester connection	Specified condition
OFF	-	No continuity
UP	3 ⇔ 8 6 ⇔ 7	Continuity
DOWN	3 ⇔ 7 6 ⇔ 8	Continuity
LEFT	2 ⇔ 8 6 ⇔ 7	Continuity
RIGHT	2 ⇔ 7 6 ⇔ 8	Continuity



2. INSPECT OUTER REAR VIEW MIRROR ASSY LH

(a) Disconnect the outer rear view mirror assembly LH connector.

(b) Inspect the mirror motor operation.

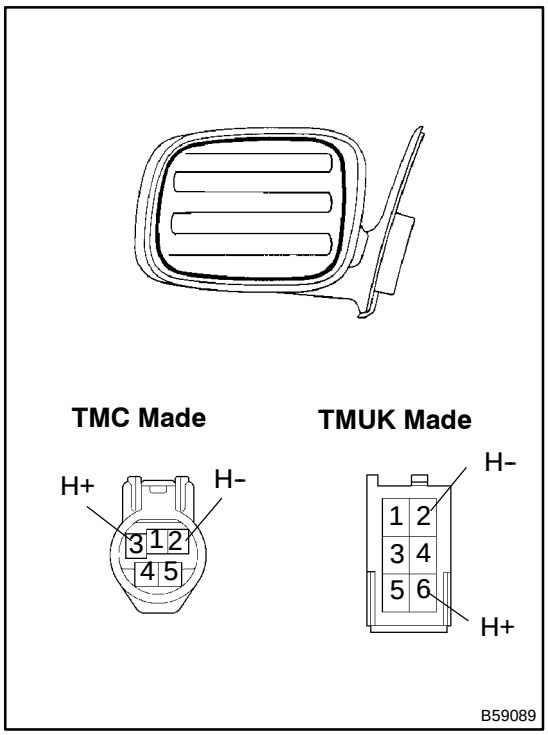
(1) Apply battery voltage as shown in the table.

[TMC Made] Standard:

Battery connection	Mirror position
Positive (+) ⇔ MV (5) Negative (-) ⇔ M+ (4)	Turn upward (A)
Positive (+) ⇔ M+ (4) Negative (-) ⇔ MV (5)	Turn downward (B)
Positive (+) ⇔ M+ (4) Negative (-) ⇔ MH (3)	Turn left (C)
Positive (+) ⇔ MH (3) Negative (-) ⇔ M+ (4)	Turn right (D)

[TMUK Made] Standard:

Battery connection	Mirror position
Positive (+) ⇔ MV (5) Negative (-) ⇔ M+ (3)	Turn upward (A)
Positive (+) ⇔ M+ (3) Negative (-) ⇔ MV (5)	Turn downward (B)
Positive (+) ⇔ M+ (3) Negative (-) ⇔ MH (1)	Turn left (C)
Positive (+) ⇔ MH (1) Negative (-) ⇔ M+ (3)	Turn right (D)



(c) Inspect the mirror heater operation.

(1) Check the resistance of each terminals the mirror assembly.

[TMC Made] Standard:

Tester connection	Resistance
H+ (3) ⇔ H- (2)	3.3 - 4.5 Ω

[TMUK Made] Standard:

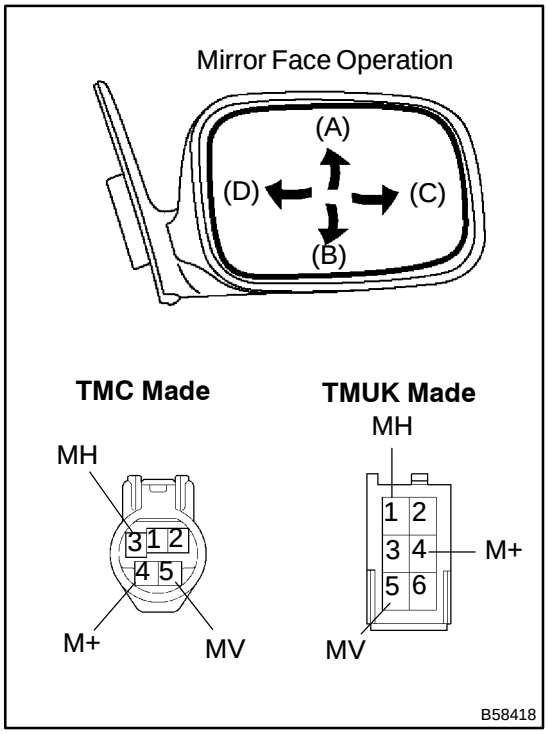
Tester connection	Resistance
H+ (6) ⇔ H- (2)	3.3 - 4.5 Ω

(2) TMC made:
Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead to terminal 2 of the connector.

(3) TMUK made:
Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead to terminal 2 of the connector.

(4) Check that the mirror becomes warm.

HINT:
It will take a short time for the mirror to become warm.
If the operation is not as specified, replace the mirror assembly.



3. INSPECT OUTER REAR VIEW MIRROR ASSY RH

(a) Disconnect the outer rear view mirror assembly LH connector.

(b) Inspect the mirror motor operation.

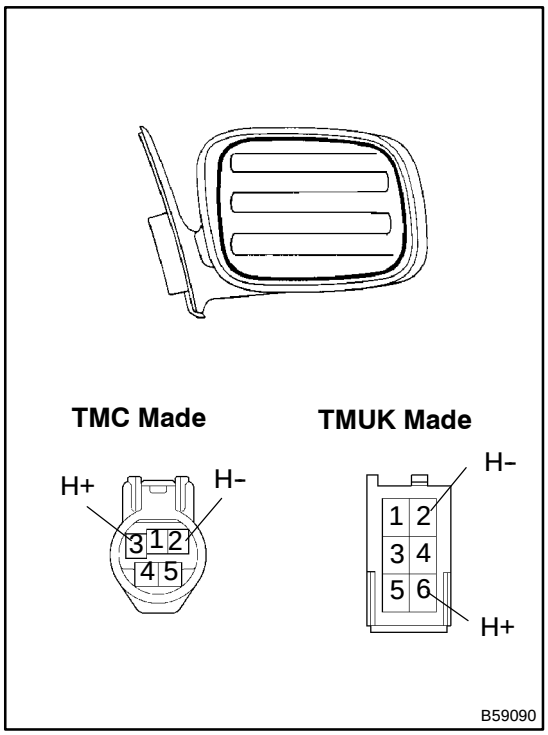
(1) Apply battery voltage as shown in the table.

[TMC Made] Standard:

Battery connection	Mirror position
Positive (+) ⇔ MV (5) Negative (-) ⇔ M+ (4)	Turn upward (A)
Positive (+) ⇔ M+ (4) Negative (-) ⇔ MV (5)	Turn downward (B)
Positive (+) ⇔ M+ (4) Negative (-) ⇔ MH (3)	Turn left (C)
Positive (+) ⇔ MH (3) Negative (-) ⇔ M+ (4)	Turn right (D)

[TMUK Made] Standard:

Battery connection	Mirror position
Positive (+) ⇔ MV (5) Negative (-) ⇔ M+ (3)	Turn upward (A)
Positive (+) ⇔ M+ (3) Negative (-) ⇔ MV (5)	Turn downward (B)
Positive (+) ⇔ M+ (4) Negative (-) ⇔ MH (1)	Turn left (C)
Positive (+) ⇔ MH (1) Negative (-) ⇔ M+ (4)	Turn right (D)



(c) Inspect the mirror heater operation.

(1) Check the resistance of each terminals the mirror assembly.

[TMC Made] Standard:

Tester connection	Resistance
H+ (3) ⇔ H- (2)	3.3 - 4.5 Ω

[TMUK Made] Standard:

Tester connection	Resistance
H+ (6) ⇔ H- (2)	3.3 - 4.5 Ω

(2) TMC made:
Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead to terminal 2 of the connector.

(3) TMUK made:
Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead to terminal 2 of the connector.

(4) Check that the mirror becomes warm.

HINT:
It will take a short time for the mirror to become warm.
If the operation is not as specified, replace the mirror assembly.

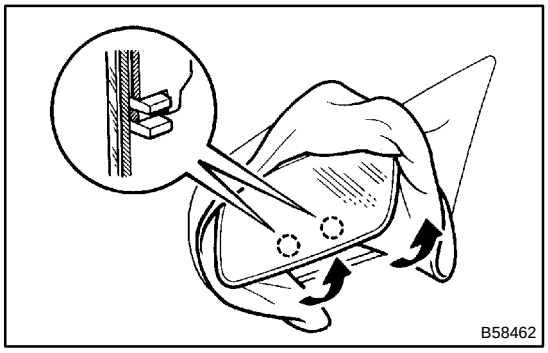
OUTER MIRROR COVER LH (TMC MADE)

700E8-01

REPLACEMENT

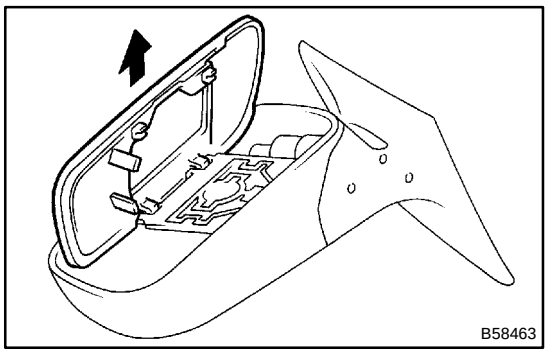
HINT:

In the LH side, work in the same procedure as in the RH side.

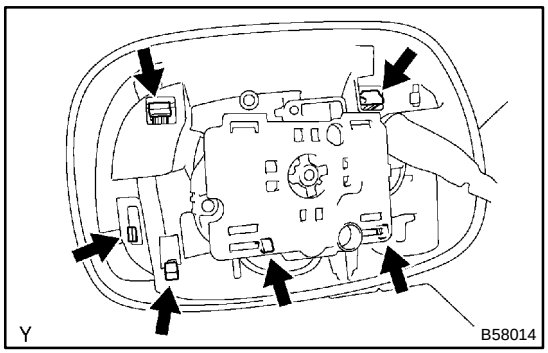


1. REMOVE OUTER MIRROR COVER LH

(a) Insert a shop rag between the mirror and the mirror body.
(b) Pull up the lower side of the shop rag to disconnect the mirror joint.



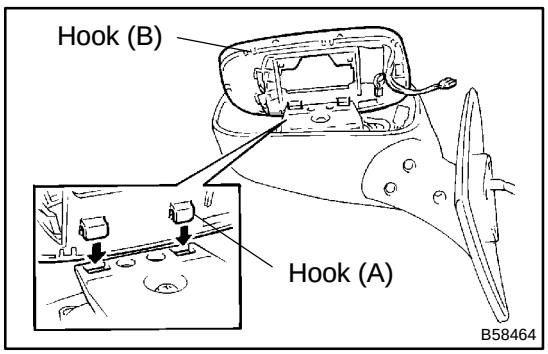
(c) Pull up the mirror and disconnect it.
(d) w/ Mirror heater:
Disconnect the connector.



(e) Disengage the hook and remove the outer mirror cover as shown in the illustration.

2. INSTALL OUTER MIRROR COVER LH

(a) Install the mirror cover to the mirror body.
(b) w/ Mirror heater:
Connect the connector.



(c) Engage the hook (A) and set the mirror to the mirror body.
(d) Push the mirror to engage the hook (B) and set it.

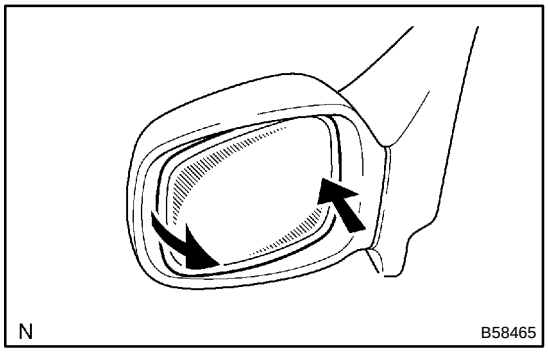
OUTER MIRROR COVER LH (TMUK MADE)

REPLACEMENT

700E9-01

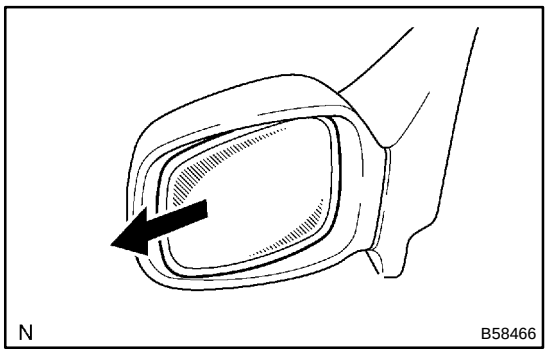
HINT:

In the LH side, work in the same procedure as in the RH side.

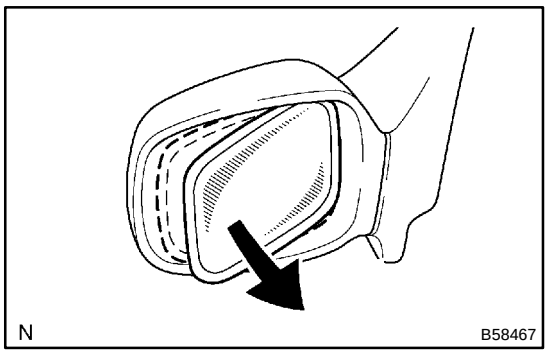


1. REMOVE OUTER REAR VIEW MIRROR SUB-ASSY LH

(a) Push in the inboard edge of the mirror towards the back of the mirror body so that you can place your fingers behind the mirror from the outboard edge.

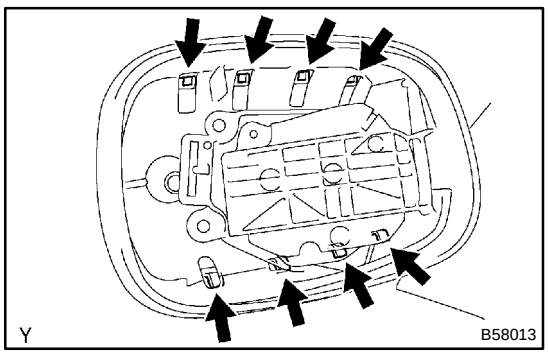


(b) Holding the outboard of the mirror glass, slide and pull it out until the mirror pops out.



(c) Remove the mirror.

(d) w/ Mirror heater:
Disconnect the connector.

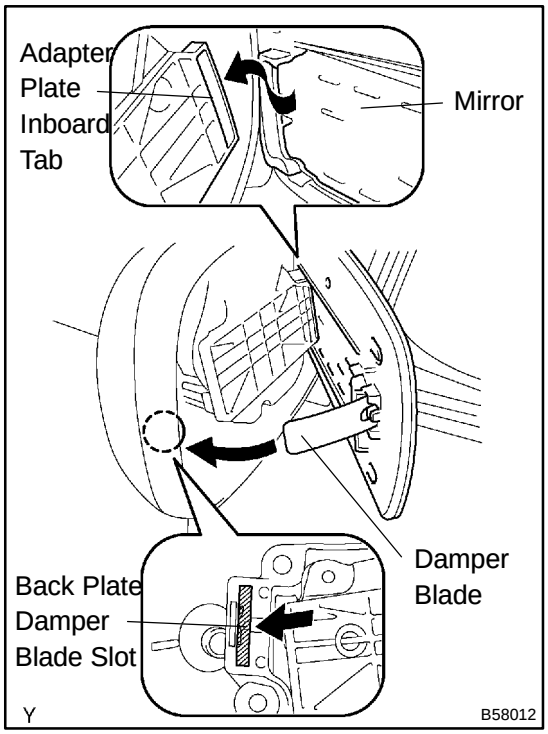


2. REMOVE OUTER MIRROR COVER LH

(a) Disengage the hooks and remove the outer mirror cover as shown in the illustration.

3. INSTALL OUTER MIRROR COVER LH

(a) Push the outboard edge of the adaptor plate towards the back of the mirror housing.



4. INSTALL OUTER REAR VIEW MIRROR SUB-ASSY LH

(a) w/ Mirror heater:
Connect the connector.

(b) Hook the mirror onto the adaptor plate inboard tab and lay the mirror across the adaptor plate. At this time, insert the damper blade into the back plate damper blade slot.

(c) Push the outboard edge of the mirror with your thumb towards the back of the mirror housing until it clips in.

INSTRUMENT PANEL/METER

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COMBINATION METER

PROBLEM SYMPTOMS TABLE

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Illumination:

Symptom	Suspect Area	See page
All illumination lights do not light up.	4. Wire Harness or Connector	01-30
	5. Combination Meter Assy	-
Only one illumination light does not light up.	1. Combination Meter Assy	-

Warning Lights:

Symptom	Suspect Area		See page
Check Engine warning light does not light up.	1. Wire Harness or Connector		01-30
	2. Engine ECM	2ZZ-GE	05-1
		3ZZ-FE	05-154
		4ZZ-FE	05-314
	3. Combination Meter Assy		-
Discharge warning light does not light up.	1. Wire Harness or Connector		01-30
	2. Engine ECM	2ZZ-GE	05-1
		3ZZ-FE	05-154
		4ZZ-FE	05-314
	3. Combination Meter Assy		-
Brake warning light does not light up.	1. Wire Harness or Connector		01-30
	2. Skid control ECU	TMC Made	05-558
		TMUK Made	05-611
		TMUK Made	05-662
	3. Combination Meter Assy		71-3
ABS warning light does not light up.	1. Wire Harness or Connector		01-30
	2. Skid control ECU	TMC Made	05-558
		TMUK Made	05-611
		TMUK Made	05-662
	3. Combination Meter Assy		71-3
SRS warning light does not light up.	1. Wire Harness or Connector		71-3
	2. Airbag Sensor Assy		05-942
	3. Combination Meter Assy		71-3
Open Door warning light does not light up.	1. Wire Harness or Connector		71-3
	2. Door Courtesy Switch		65-5
	3. Combination Meter Assy		-
Fuel Level warning light does not light up.	1. Wire Harness or Connector		71-3
	2. Fuel Level Warning Switch		71-3
	3. Combination Meter Assy		71-3
Low Oil Pressure warning light does not light up.	1. Wire Harness or Connector		71-3
	2. Low Oil Pressure Warning Switch		71-3
	3. Combination Meter Assy		71-3
Power Steering warning light does not light up.	1. Wire Harness or Connector		71-3
	2. EMPS ECU		05-812
	3. Combination Meter Assy		-

Indicator Lights:

Symptom	Suspect Area	See page
Shift indicator lights do not light up.	1. Wire Harness or Connector	71-3
	2. Neutral Start Switch	40-6
	3. Combination Meter Assy	71-3
Turn indicator light does not light up.	1. Wire Harness or Connector	71-3
	2. Turn Signal and Hazard Warning System	65-8
	3. Combination Meter Assy	71-3

High Beam indicator light does not light up.	1. Wire Harness or Connector 2. Headlight Dimmer Switch 3. Combination Meter Assy	71-3 65-8 -
O/D OFF indicator light does not light up.	1. Wire Harness or Connector 2. O/D OFF Switch 3. Engine ECM 4. Combination Meter Assy	71-3 - - -

Meter Gauges:

Symptom	Suspect Area	See page
Tachometer, Fuel Gauge and Water Temperature Gauge do not operate.	1. Wire Harness or Connector 2. GAUGE Fuse 3. Combination Meter Assy	71-3 68-1 71-3
Fuel Gauge does not operate or abnormal operation.	1. Wire Harness or Connector 2. Fuel Receiver Gauge 3. Combination Meter Assy	71-3 71-3 71-3

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ON-VEHICLE INSPECTION

1. INSPECT SPEEDOMETER

(a) Check the operation.

(1) Using a speedometer tester, inspect the speedometer fro allowable indication error and check the operation of the odometer.

Reference: km/h

Standard indication	Allowable range
20 km/h	21 - 25 km/h
40 km/h	41.5 - 46 km/h
60 km/h	62.5 - 67 km/h
80 km/h	83 - 88 km/h
100 km/h	104 - 109 km/h
120 km/h	125 - 130.5 km/h
140 km/h	145.5 - 151.5 km/h
160 km/h	166 - 173 km/h

Reference: mph

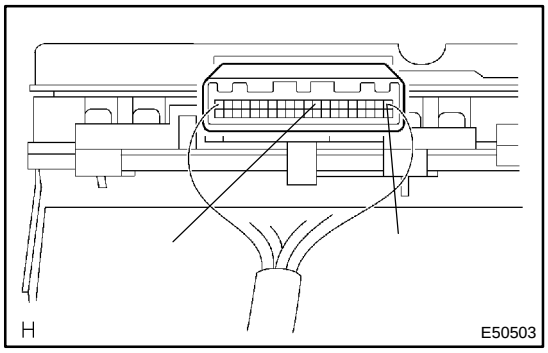
Standard indication	Allowable range
20 mph	21 - 23.5 mph
40 mph	41.5 - 44 mph
60 mph	62.5 - 66 mph
80 mph	83 - 87 mph
100 mph	104 - 108.5 mph

NOTICE:

Tire wear and tire over or under inflation will increase the indication error.

(2) Check the deflection width of the speed meter indicator.

Reference: Below 0.5 km/h / 0.3 mph



2. INSPECT OUTPUT SIGNAL OF VEHICLE SPEED

(a) Check for standard signal.

(1) While driving the vehicle at the speed of 10 km/h, check the voltage between the terminals C11-9 and C11-1 of the combination meter assy.

Standard: Fluctuation between 10 to 14 V or less is repeated 7 times within 1 sec.

NOTICE:

Check it with the ignition switch ON and the connector connected.

3. INSPECT TACHOMETER

(a) Check the operation

(1) Connect a tune-up test tachometer, and start the engine.

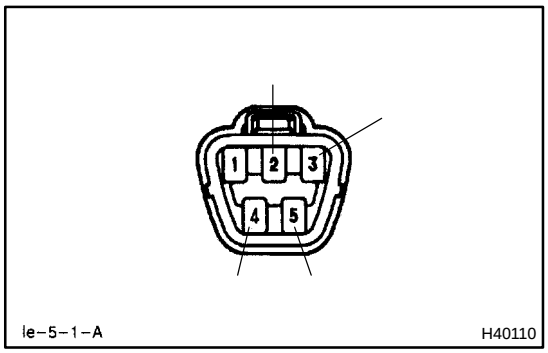
NOTICE:

- **Reversing the connection of the tachometer will damage the transistors and diodes inside.**
- **When removing or installing the tachometer, be careful not to drop or subject it to heavy shocks.**

(2) Compare the test and tachometer indications.

DC 13.5 V, 25 _C at (77 _F)

Standard indication (r/min)	Allowable range (r/min) Data in ( ) are for reference
700	630 - 770
1,000	(900 - 1,100)
2,000	(1,850 - 2,150)
3,000	2,800 - 3,200
4,000	(3,800 - 4,200)
5,000	4,800 - 5,200
6,000	(5,750 - 6,250)
7,000	6,700 - 7,300



4. INSPECT FUEL RECEIVER GAUGE

(a) Inspect the circuit.

(1) Disconnect the connector from the sender gauge.

(2) Turn the ignition switch ON, then check the position of the receiver gauge needle.

Needle position: EMPTY

(3) Connect terminals 2 and 3 on the wire harness side connector and Turn the ignition switch ON, then check the position of the receiver gauge needle.

Needle position: FULL

5. INSPECT FUEL LEVEL WARNING

(a) Inspect the circuit.

(1) Disconnect the connector from the sender gauge.

(2) Turn the ignition switch ON, check the fuel level needle indicates EMPTY and fuel level warning lights light on.

6. INSPECT WATER TEMPERATURE RECEIVER GAUGE WARNING LIGHT

(a) Inspect the circuit.

(1) Disconnect the connector from the sender gauge.

(2) Turn the ignition switch ON, check the position of the water temperature receiver gauge needle.

Needle position: COOL

(3) Ground terminal 2 on the wire harness side, then check the position of the water temperature receiver gauge needle.

Needle position: HOT

7. INSPECT LOW OIL PRESSURE WARNING LIGHT

(a) Inspect the circuit.

(1) Disconnect the connector from the low oil pressure switch.

(2) Turn the ignition switch ON.

(3) Connect the terminal of wire harness side connector and ground, then check the warning low oil pressure warning light.

Low oil pressure warning light: Light on

8. INSPECT BRAKE WARNING LIGHT

(a) Inspect the parking brake warning light.
  (1) Disconnect the connector from the parking brake switch and ground terminal on the wire harness side connector.
  (2) Turn the ignition switch ON and check that the warning light lights up.

(b) Inspect the brake fluid level warning light.
  (1) Disconnect the connector from the brake fluid level warning switch and connect terminals on the wire harness side connector.
  (2) Turn the ignition switch ON and check that the warning light lights up.

9. INSPECT BRAKE FLUID LEVEL WARNING SWITCH

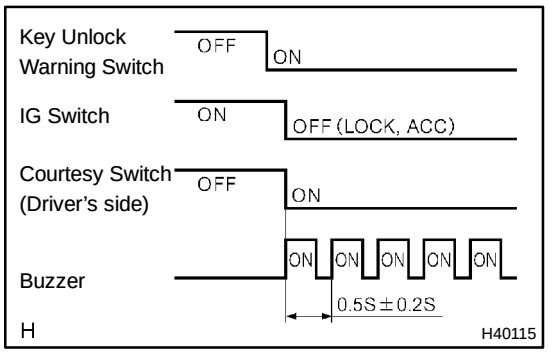
(a) Inspect the continuity.
  (1) Remove the reservoir tank cap and strainer.
  (2) Disconnect the connector.
  (3) Check that the continuity exists between the terminals.

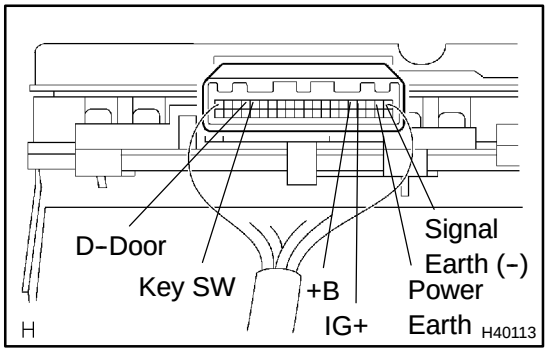
  Float up (switch off): No continuity

  (4) Use syphon, etc., to take fluid out of the reservoir tank.
  (5) Check that the continuity exists between the terminals.

  Float down (switch on): Continuity

  (6) Pour the fluid back in the reservoir tank.





10. INSPECT KEY UNLOCK WARNING BUZZER

(a) Check the operation.

HINT:

When the key unlock warning and light auto turn off warning is output simultaneously, the key unlock warning precedes the other.

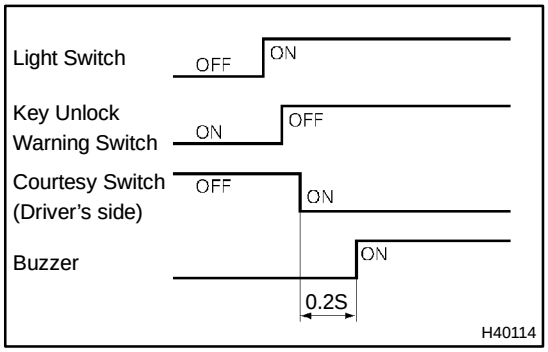
  (1) While the driver side door is open, insert the ignition key, set the ignition switch to OFF (LOCK or ACC) and check for the buzzer sound.

  Buzzer sound: Intermittent

(b) Check the function.
  (1) Remove the combination meter.
  (2) Connect the positive (+) lead from battery to terminal 5 and negative (-) lead to terminal 1 and 2.
  (3) Connect the negative (-) lead to terminal 16 and 17, check that the buzzer sound.

  Buzzer sound: Intermittent

  (4) While the buzzer is sounding, connect the battery positive terminal to terminal 4 and check that the buzzer sound is stopped.



11. INSPECT LIGHT AUTO TURN OFF BUZZER

(a) Check the operation.

HINT:

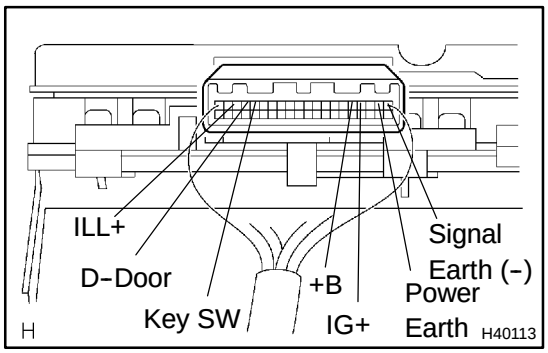
When the key unlock warning and light auto turn off warning is output simultaneously, the key unlock warning precedes the other.

(1) Remove the ignition key with the tail light switch ON and the driver side door open and check for the buzzer.

Buzzer sound: Continuous

(2) While the buzzer is sounding, perform any of the following and check that the buzzer sound is stopped.

- Turn the tail light switch OFF.
- Close the driver side door.
- Insert the ignition key into the key cylinder.



(b) Check the function.

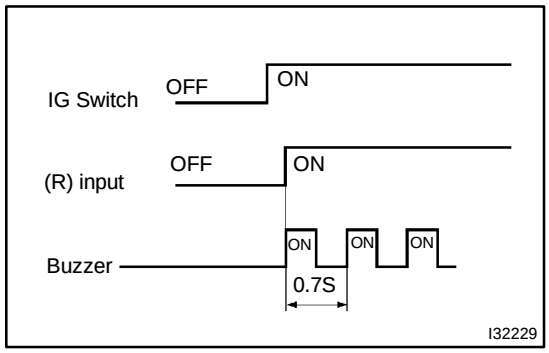
(1) Remove the combination meter.

(2) Connect the positive (+) lead from battery to terminal 5 and negative (-) lead to terminal 1 and 2.

(3) Connect the positive (+) lead from battery to terminal 18 and negative (-) lead to terminal 16 and 17, check that the buzzer sound.

Buzzer sound: Continuous

(4) While the buzzer is sounding, connect the battery positive terminal to terminal 4 and check that the buzzer sound is stopped.

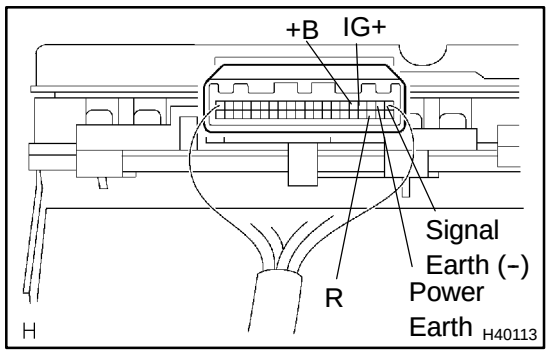


12. INSPECT REVERSE SHIFT WARNING BUZZER(6M/T)

(a) Check the operation.

(1) Turn the ignition switch ON and the shift position to R, check for the buzzer sound.

Buzzer sound: Intermittent



(b) Check the function.

(1) Remove the combination meter.

(2) Connect the positive (+) lead from battery to terminal 5 and 4, negative (-) lead to terminal 1 and 2.

(3) Connect the positive (+) lead from battery to terminal 23, check that the buzzer sound.

Buzzer sound: Intermittent

13. INSPECT VACUUM WARNING SWITCH

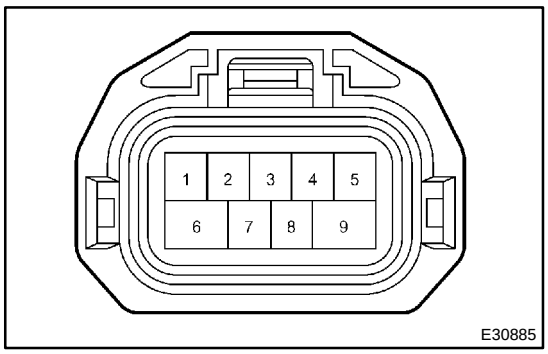
(a) Inspect the continuity.

(1) Disconnect the connector.

(2) Check that the continuity exists between the terminals.

Engine running: No continuity

Engine stopped at brake pedal press: Continuity



14. INSPECT SHIFT POSITION INDICATOR

(a) Inspect the circuit.

(1) Disconnect the connector from the neutral start switch.

(2) Turn the ignition switch ON.

(3) By connecting each terminal, short-circuit the wire harness side connector of the neutral start switch and check that the each shift position indicator light goes on.

Terminal No.	Terminal name	Indication position
1 - 3	PL - PB	P
2 - 3	RL - PB	R
5 - 3	NL - PB	N
7 - 3	DL - PB	D
4 - 3	2L - PB	2
8 - 3	LL - PB	L

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INSPECTION

1. LEVEL WARNING SWITCH

(a) Check the continuity.
(1) Check that continuity exists between the terminals.
Float up: Continuity
Float down: No continuity

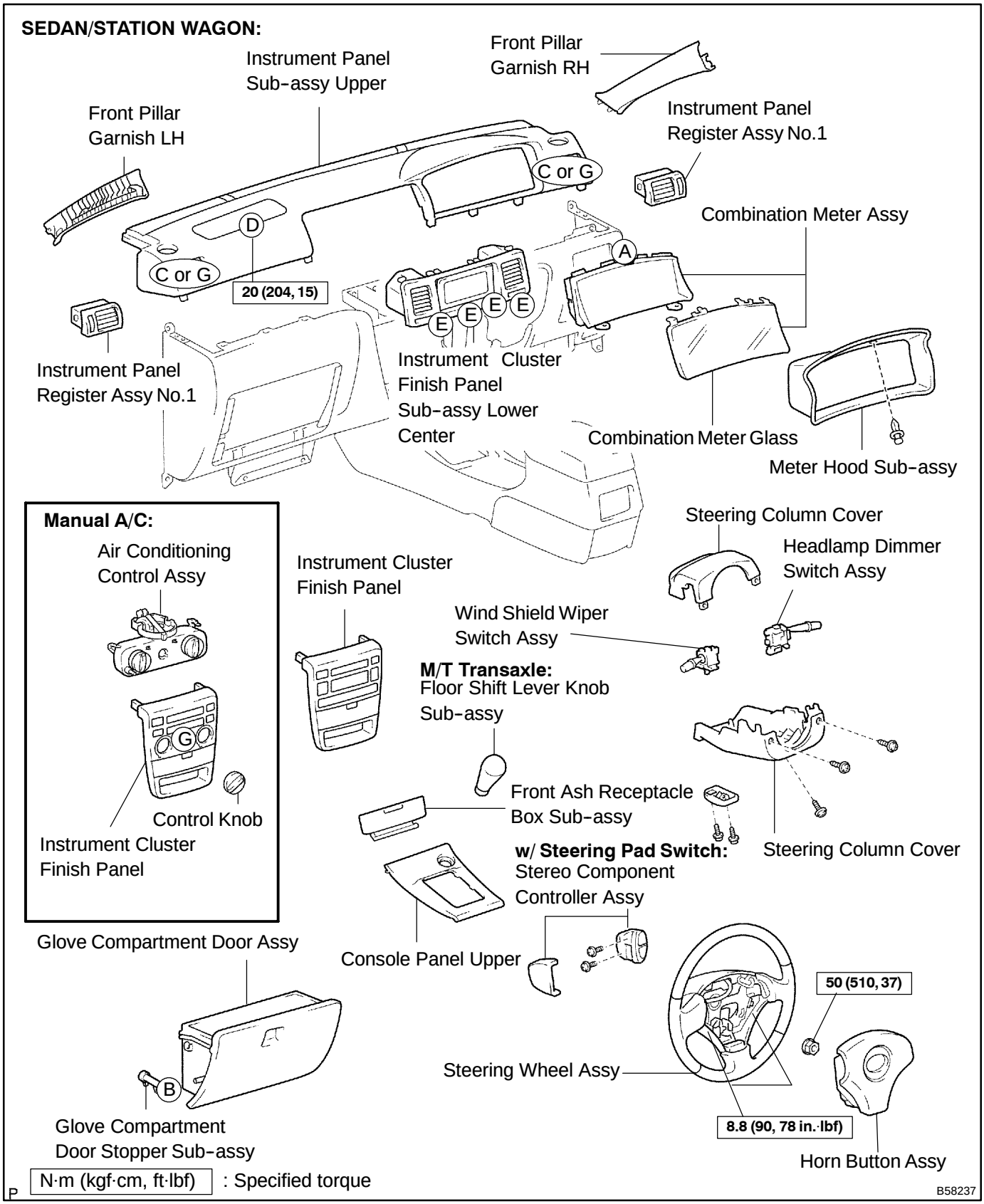
2. PARKING BRAKE SWITCH ASSY

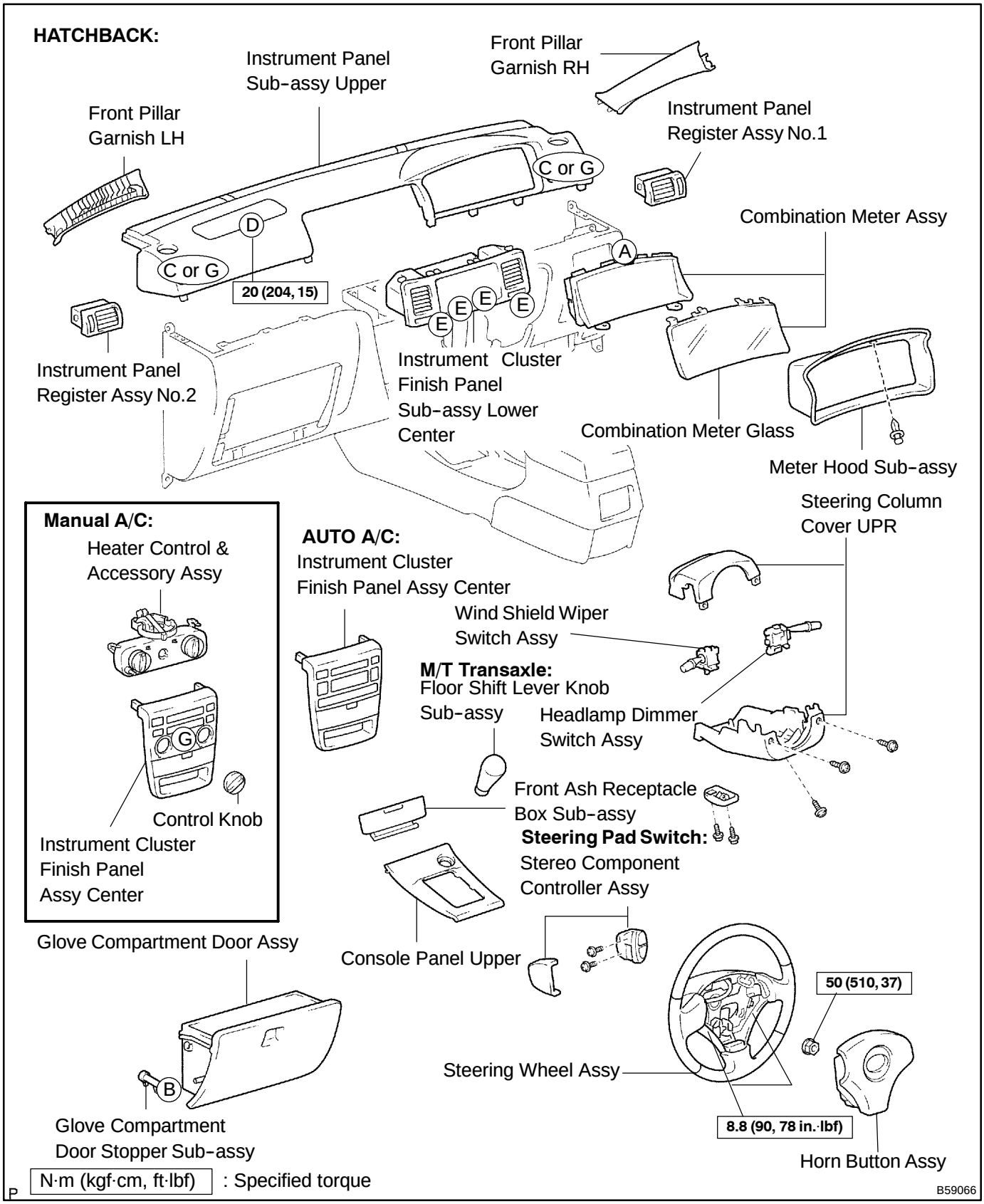
(a) Check the continuity.
(1) Check that continuity exists between the terminals.
Switch pin released: Continuity
Switch pin pushed in: No continuity

INSTRUMENT PANEL/METER

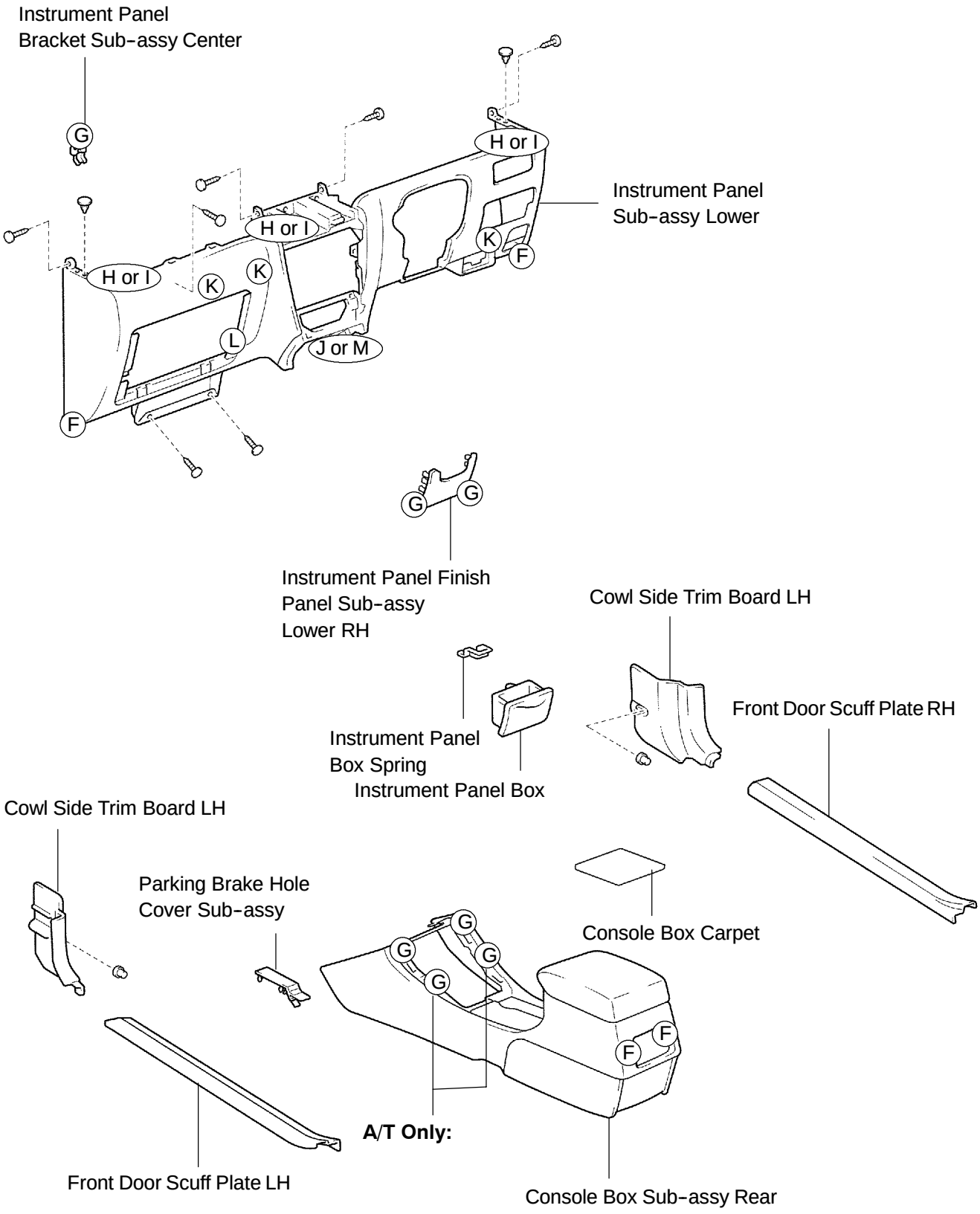
COMPONENTS

71071-01



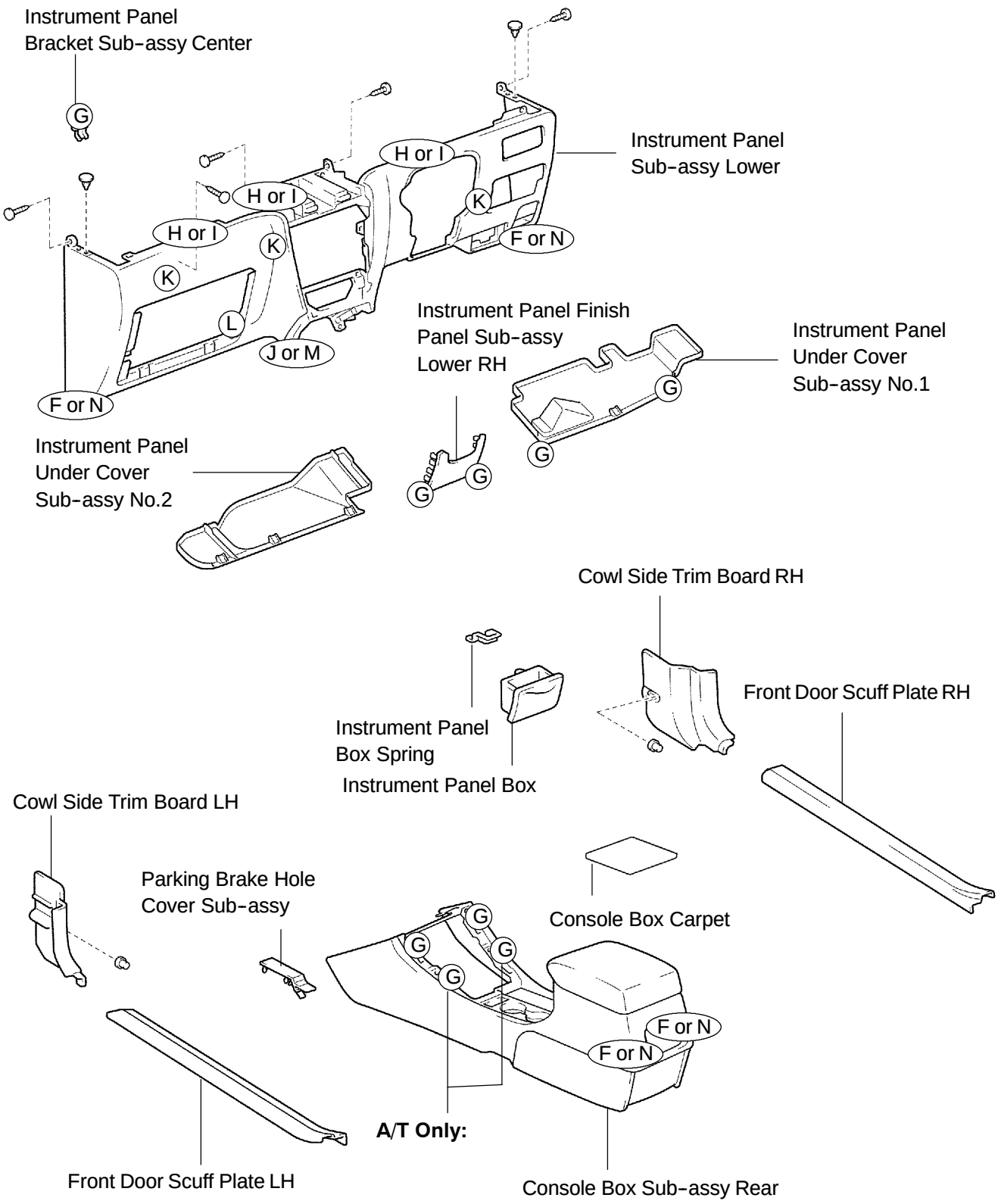

HATCHBACK:
Instrument Panel Sub-assy Upper
Front Pillar Garnish RH
Front Pillar Garnish LH
Instrument Panel Register Assy No.1
C or G
D
C or G
20 (204, 15)
A
Combination Meter Assy
E
E
E
E
Instrument Panel Register Assy No.2
Instrument Cluster Finish Panel Sub-assy Lower Center
Combination Meter Glass
Meter Hood Sub-assy
Steering Column Cover UPR
Manual A/C:
Heater Control & Accessory Assy
G
Control Knob
Instrument Cluster Finish Panel Assy Center
AUTO A/C:
Instrument Cluster Finish Panel Assy Center
Wind Shield Wiper Switch Assy
M/T Transaxle:
Floor Shift Lever Knob Sub-assy
Headlamp Dimmer Switch Assy
Front Ash Receptacle Box Sub-assy
Steering Pad Switch:
Stereo Component Controller Assy
Console Panel Upper
Glove Compartment Door Assy
B
Glove Compartment Door Stopper Sub-assy
Steering Wheel Assy
50 (510, 37)
8.8 (90, 78 in.·lbf)
Horn Button Assy
N·m (kgf·cm, ft·lbf) : Specified torque
P
B59066

SEDAN/STATION WAGON:



P B58238

HATCHBACK:



P B58539

INSTRUMENT PANEL SUB-ASSY LOWER

71072-01

PRECAUTION

1. PRECAUTION FOR VEHICLE WITH SRS AIRBAG AND SEAT BELT PRETENSIONER

(a) Some operations in this section may affect the SRS airbag. Before performing the corresponding operations, please read the NOTICE of the SRS airbag to perform the proper operations.

INSTRUMENT PANEL SUB-ASSY LOWER (SEDAN/STATION WAGON)

71073-01

REPLACEMENT

HINT:

COMPONENTS: See page 71-9

1. TABLE OF BOLT, SCREW AND NUT

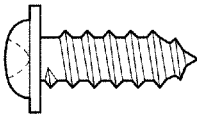
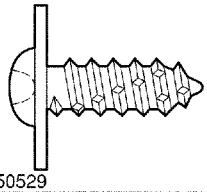
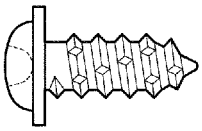
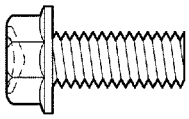
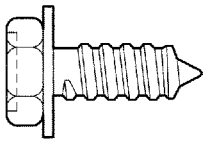
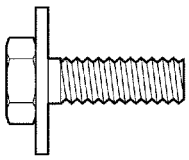
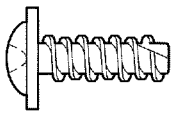
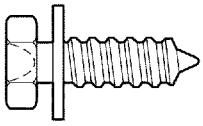
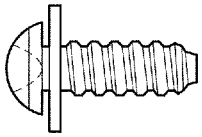
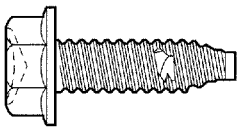
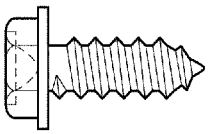
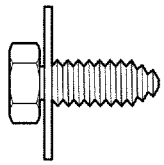
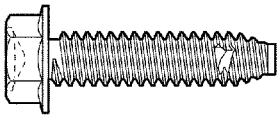
NOTICE:

Be sure to tape the tip of the screwdriver when using it to disengage the meshing of the clips and claws.

HINT:

Indicate the bolts, screws and nuts, which are necessary for installation and removal of the instrument panel, in the illustration and the text with alphabets.

mm (in.) (L = Length)

Code	Shape	Code	Shape	Code	Shape
〈A〉	 B50532 ϕ=5 (0.20) L=18 (0.71) 93567-55018	〈B〉	 B50529 ϕ=5 (0.20) L=14 (0.55) 90167-50022	〈C〉	 B35278 ϕ=5 (0.20) L=16 (0.63) 93568-55016
〈D〉	 B50533 ϕ=8 (0.31) L=16 (0.63) 91535-60816	〈E〉	 B50530 ϕ=5 (0.20) L=16 (0.63) 90159-50322	〈F〉	 B50534 ϕ=6 (0.24) L=16 (0.63) 91635-60616
〈G〉	 B32741 ϕ=5 (0.20) L=14 (0.55) 93568-55014	〈H〉	 E34410 ϕ=6 (0.24) L=20 (0.79) 90159-60546	〈I〉	 E34411 ϕ=7 (0.28) L=20 (0.79) 90159-70004
〈J〉	 B50531 ϕ=5 (0.20) L=30 (1.18) 55394-12010	〈K〉	 B50535 ϕ=5 (0.20) L=20 (0.79) 90159-50295	〈L〉	 B58167 ϕ=6 (0.24) L=20 (0.79) 90159-60125
〈M〉	 B58168 ϕ=7 (0.28) L=30 (1.18) 55394-12020				

P B58169

2. PRECAUTION

3. DISCONNECT BATTERY NEGATIVE TERMINAL **(See page 60-1)**

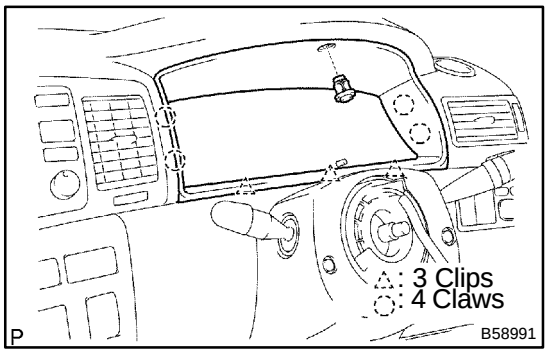
4. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

5. REMOVE STEREO COMPONENT CONTROLLER ASSY (W/ STEERING PAD SWITCH)
(See page 67-13)

6. REMOVE HORN BUTTON ASSY
(See page 60-13)

7. REMOVE STEERING WHEEL ASSY
(See page 60-22)

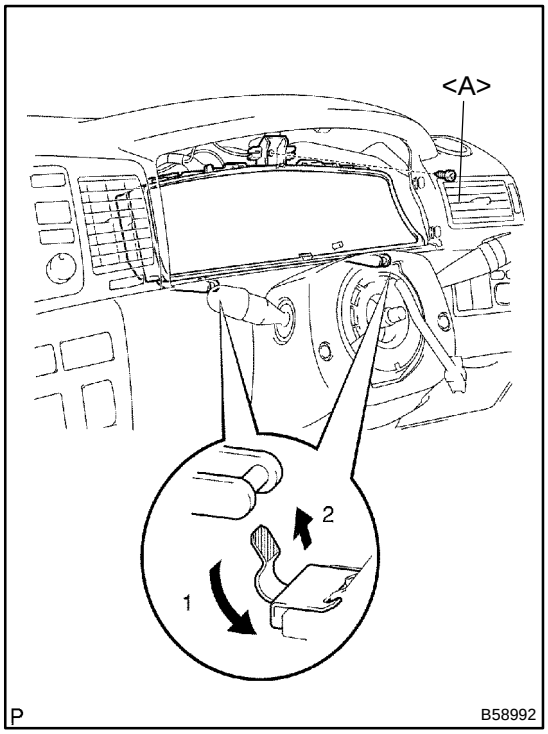
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)



8. REMOVE METER HOOD SUB-ASSY

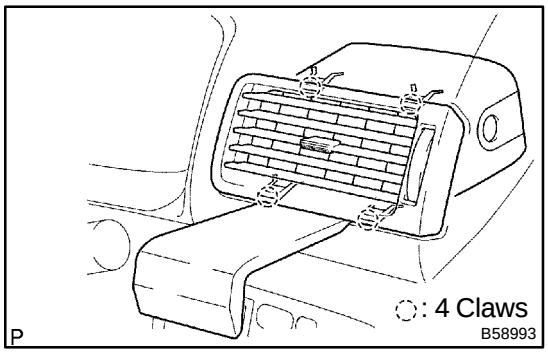
(a) Remove the clip.
(b) Using a screwdriver, disengage the 3 clips and 4 claws, then remove the meter hood sub-assy.

HINT:
Tape the screwdriver tip before use.



9. REMOVE COMBINATION METER ASSY

(a) Remove the screw<A>.
(b) Disengage the 2 claws as shown in the illustration.
(c) Disconnect the connector, then remove the combination meter assy.



10. REMOVE INSTRUMENT PANEL REGISTER ASSY NO.1

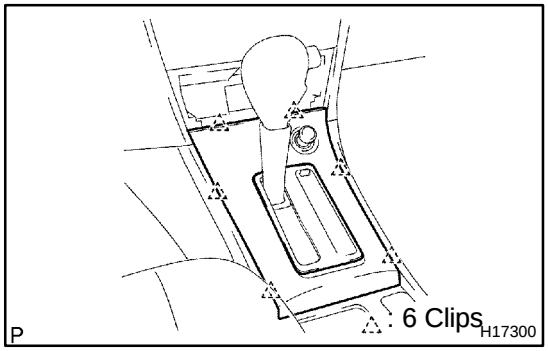
(a) Using a moulding remover, diseengage the 4 claws, then remove the instrument panel register assy No.1.

HINT:
Tape the moulding remover tip before use.

11. REMOVE INSTRUMENT PANEL REGISTER ASSY NO.1

12. REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY

13. REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE)



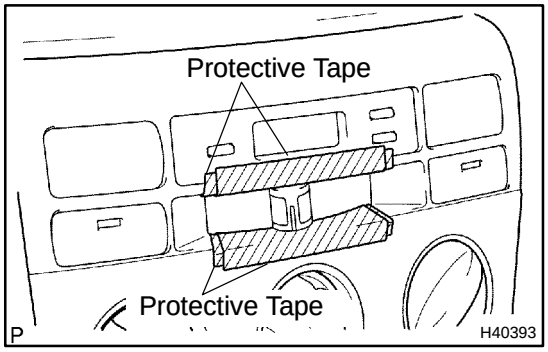
14. REMOVE CONSOLE PANEL UPPER

(a) Using a screwdriver, disengage the 6 clips.

HINT:

Tape the screwdriver tip before use.

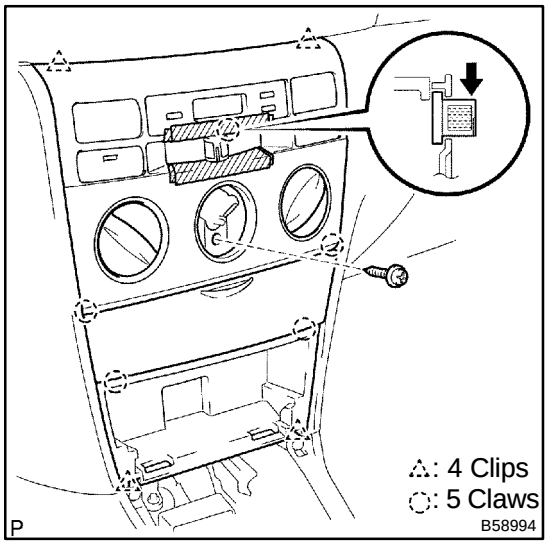
(b) Disconnect the connector, then remove the console panel upper.



15. REMOVE INSTRUMENT CLUSTER FINISH PANEL

(a) Manual A/C:
Center the control lever.

(b) Manual A/C:
Apply protective tape to the instrument cluster finish panel as shown in the illustration.



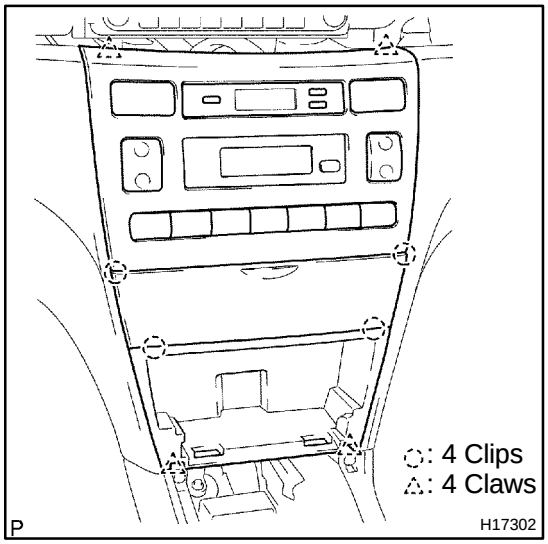
(c) Manual A/C:
Remove the control knob.

(d) Manual A/C:
Remove the screw<G>.

(e) Manual A/C:
Disengage the 4 clips and 5 claws with a screwdriver while pressing the control knob downward, disconnect each connector and remove the instrument cluster finish panel.

HINT:

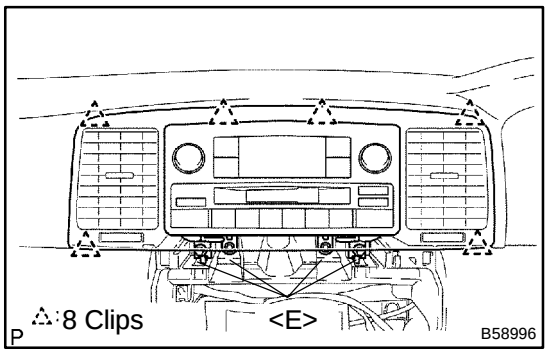
Tape the screwdriver tip before use.



(f) Auto A/C:
Using a screwdriver, disengage the 4 clips and 4 claws, then remove the instrument cluster finish panel.

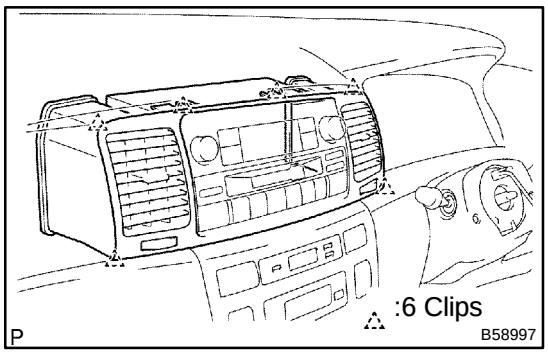
HINT:
Tape the screwdriver tip before use.

(g) Disconnect the connectors.



16. REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER

(a) Remove the 4 screws<E>.

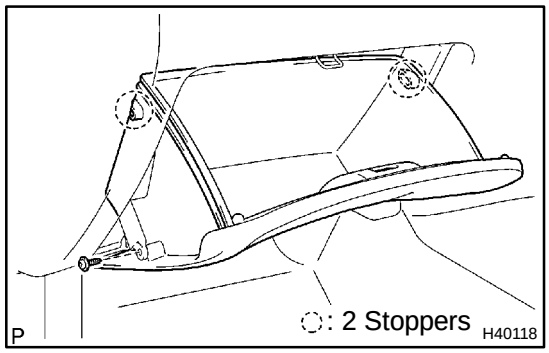


(b) w/o Radio receiver assy:
Using a screwdriver, disengage the 6 clips, then remove the instrument cluster finish panel sub-assy lower center with radio turner opening cover.

HINT:
Tape the screwdriver tip before use.

(c) w/ Radio receiver assy:
Using a screwdriver, disengage the 6 clips, then remove the instrument cluster finish panelsub-assy lower center with radio receiver assy.

(d) w/ Radio receiver assy:
Disconnect the connectors.

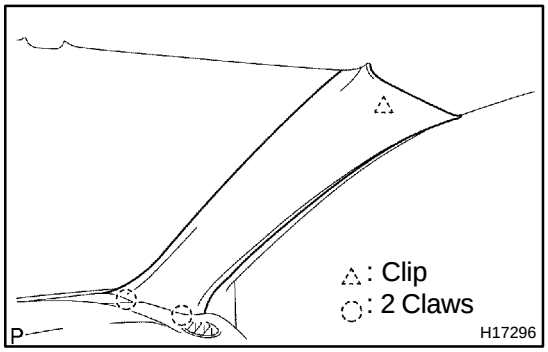


17. REMOVE GLOVE COMPARTMENT DOOR ASSY

(a) Remove the screw<B> and glove compartment door stopper sub-assy from the glove compartment door assy.

(b) Deform the upper part of the glove compartment door assy to release the stoppers.

(c) Pull the glove compartment door assy upward to remove it.



18. REMOVE FRONT PILLAR GARNISH RH

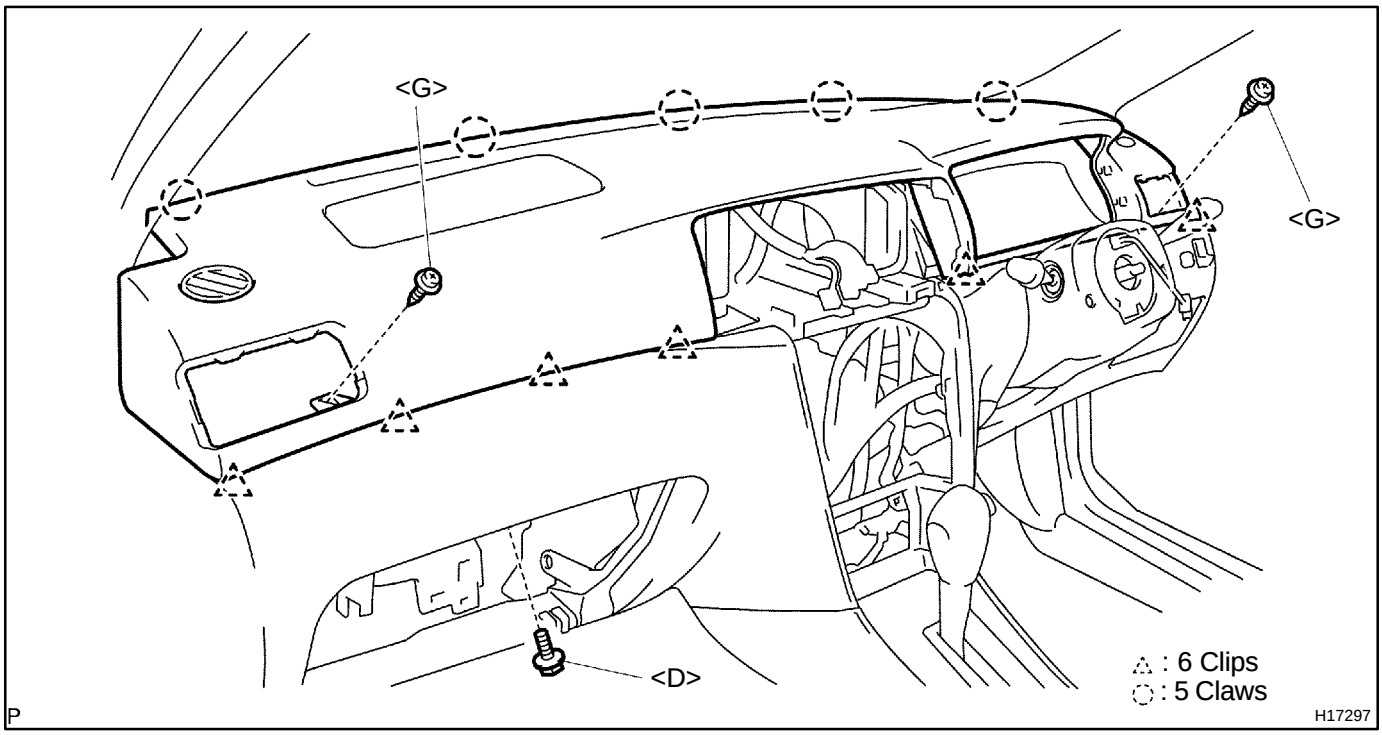
(a) Disengage the clip.
(b) Pull the front pillar garnish RH upward to remove it.

19. REMOVE FRONT PILLAR GARNISH LH

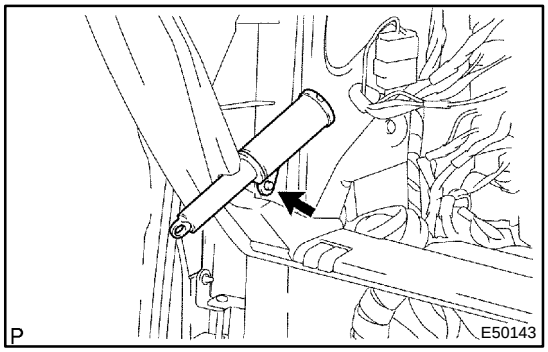
20. DISCONNECT PASSENGER AIRBAG CONNECTOR (See page 60-25)

21. REMOVE INSTRUMENT PANEL SUB-ASSY UPPER

(a) Remove the bolt<D> and 2 screws<G>.
(b) Using a moulding remover, disengage the 6 clips.
(c) Remove the instrument panel sub-assy upper.

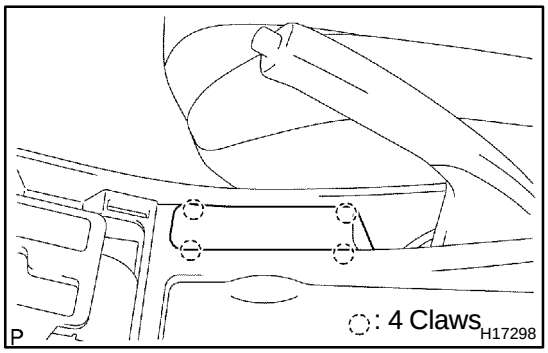


22. REMOVE AIR CONDITIONING CONTROL ASSY (MANUAL AIR CONDITIONER) (See page 55-36)
23. REMOVE STEERING COLUMN COVER (See page 50-8)
24. REMOVE HEADLAMP DIMMER SWITCH ASSY (See page 65-36)
25. REMOVE WINDSHIELD WIPER SWITCH ASSY (See page 66-19)



26. REMOVE GLOVE COMPARTMENT DOOR STOPPER SUB-ASSY

(a) Disengage the clip, then remove the glove compartment door stopper sub-assy.

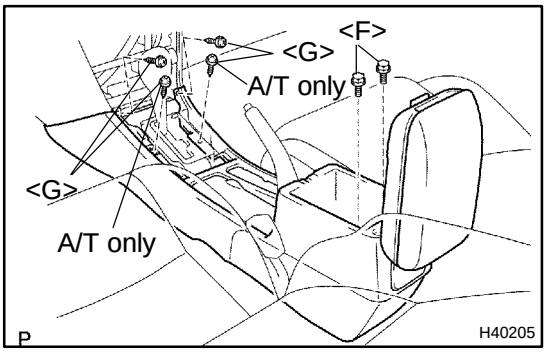


27. REMOVE PARKING BRAKE HOLE COVER SUB-ASSY

(a) Using a screwdriver, disengage the 4 claws, then remove the parking brake hole cover sub-assy.

HINT:
Tape the screwdriver tip before use.

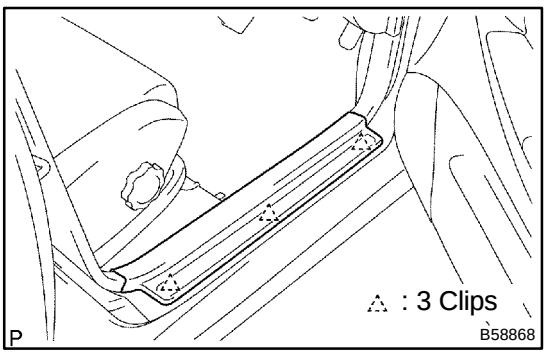
28. REMOVE CONSOLE BOX CARPET



29. REMOVE CONSOLE BOX SUB-ASSY REAR

(a) A/T:
Remove the 2 bolts<F>, 4 screws<G> and console box sub-assy rear.

(b) M/T:
Remove the 2 bolts<F>, 2 screws<G> and console box sub-assy rear.

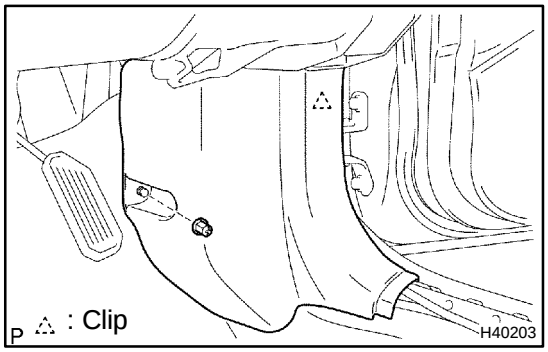


30. REMOVE FRONT DOOR SCUFF PLATE RH

(a) Using a screwdriver, disengage the 3 clips, then remove the front door scuff plate RH.

HINT:
Tape the screwdriver tip before use.

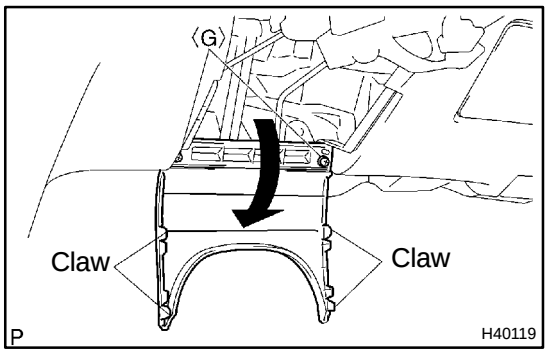
31. REMOVE FRONT DOOR SCUFF PLATE LH



32. REMOVE COWL SIDE TRIM BOARD RH

(a) Remove the clip.
(b) Disengage the clip, then remove the cowl side trim board RH as shown in the illustration.

33. REMOVE COWL SIDE TRIM BOARD LH



34. REMOVE INSTRUMENT PANEL FINISH PANEL SUB-ASSY LOWER RH

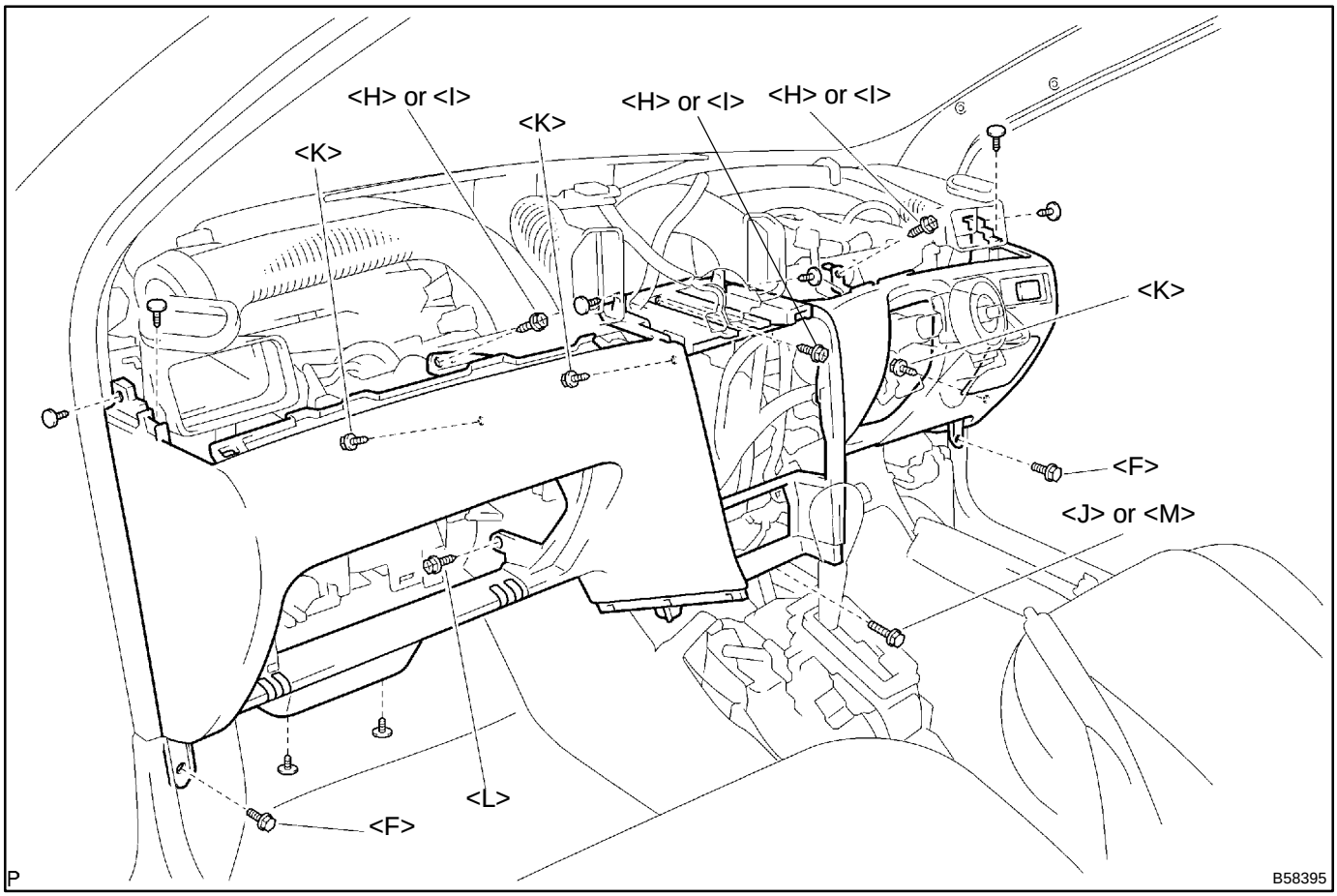
(a) Using a screwdriver, disengage the 4 claws, then open the instrument panel finish panel sub-assy lower RH.

HINT:
Tape the screwdriver tip before use.

(b) Remove the 2 screws<G> and instrument panel finish panel sub-assy lower RH.

35. REMOVE INSTRUMENT PANEL SUB-ASSY LOWER

(a) Disconnect the DLC3 connector.
(b) Remove the hood lock control lever.
(c) Remove the 2 bolts<F>.
(d) Remove the 3 bolts<H> or 3 screws<I>.
(e) Remove the bolt<J> or <M>.
(f) Remove the 3 screws<K> and screw<L>.
(g) Remove the 8 clips and instrument panel sub-assy lower.



36. REMOVE INSTRUMENT PANEL BRACKET SUB-ASSY CENTER

(a) Remove the screw<G> and instrument panel bracket sub-assy center.

37. REMOVE INSTRUMENT PANEL BOX

38. REMOVE INSTRUMENT PANEL BOX SPRING

39. INSTALL AIR CONDITIONING CONTROL ASSY (MANUAL AIR CONDITIONER)
(See page 55-37)

40. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER

(a) Install the instrument panel sub-assy upper with the bolt<D> and 2 screws<C>.
Torque:
Bolt <D>: 20 N·m (204 kgf·cm, 15 ft·lbf)

41. CENTER SPIRAL CABLE (See page 60-23)
42. INSTALL STEERING WHEEL ASSY (See page 60-23)
43. INSPECT STEERING WHEEL CENTER POINT
44. INSPECT HORN BUTTON ASSY (See page 60-13)
45. INSTALL HORN BUTTON ASSY (See page 60-13)
46. INSPECT SRS WARNING LIGHT (See page 05-942)

INSTRUMENT PANEL SUB-ASSY LOWER (HATCHBACK)

71074-01

REPLACEMENT

HINT:

COMPONENTS: See page 71-9

1. TABLE OF BOLT, SCREW AND NUT

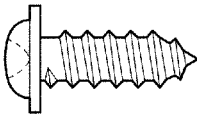
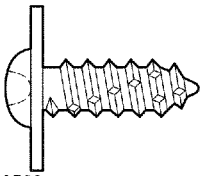
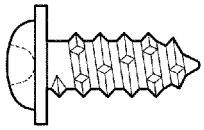
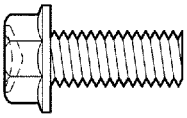
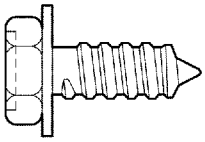
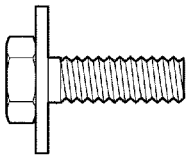
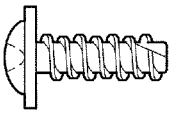
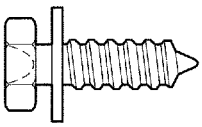
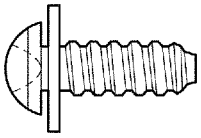
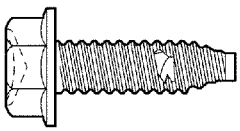
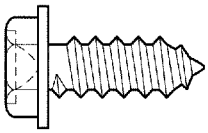
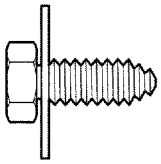
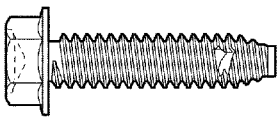
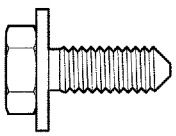
NOTICE:

Be sure to tape the tip of the screwdriver when using it to disengage the meshing of the clips and claws.

HINT:

Indicate the bolts, screws and nuts, which are necessary for installation and removal of the instrument panel, in the illustration and the text with alphabets.

mm (in.) (L = Length)

Code	Shape		Code	Shape		Code	Shape	
〈A〉	 B50532	ϕ=5 (0.20) L=18 (0.71) 93567-55018	〈B〉	 B50529	ϕ=5 (0.20) L=14 (0.55) 90167-50022	〈C〉	 B35278	ϕ=5 (0.20) L=16 (0.63) 93568-55016
〈D〉	 B50533	ϕ=8 (0.31) L=16 (0.63) 91535-60816	〈E〉	 B50530	ϕ=5 (0.20) L=16 (0.63) 90159-50322	〈F〉	 B50534	ϕ=6 (0.24) L=16 (0.63) 91635-60616
〈G〉	 B32741	ϕ=5 (0.20) L=14 (0.55) 93568-55014	〈H〉	 E34410	ϕ=6 (0.24) L=20 (0.79) 90159-60546	〈I〉	 E34411	ϕ=7 (0.28) L=20 (0.79) 90159-70004
〈J〉	 B50531	ϕ=5 (0.20) L=30 (1.18) 55394-12010	〈K〉	 B50535	ϕ=5 (0.20) L=20 (0.79) 90159-50295	〈L〉	 B58167	ϕ=6 (0.24) L=20 (0.79) 90159-60125
〈M〉	 B58168	ϕ=7 (0.28) L=30 (1.18) 55394-12020	〈N〉	 B59001	ϕ=6 (0.24) L=16 (0.63) 90080-11521			

P

B59001

2. PRECAUTION

3. SEPARATE BATTERY NEGATIVE TERMINAL (See page 60-1)

4. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

5. REMOVE STEREO COMPONENT CONTROLLER ASSY (W/ STEERING PAD SWITCH) (See page 67-13)

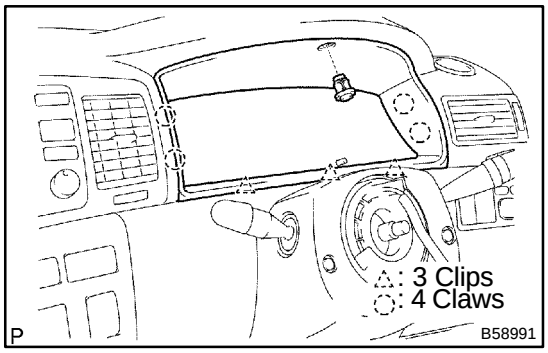
6. REMOVE HORN BUTTON ASSY

(See page 60-13)

7. REMOVE STEERING WHEEL ASSY

(See page 50-22)

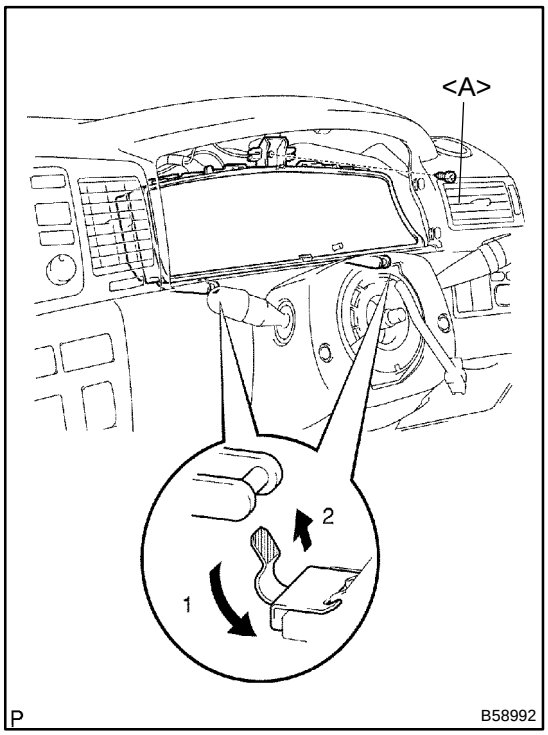
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)



8. REMOVE METER HOOD SUB-ASSY

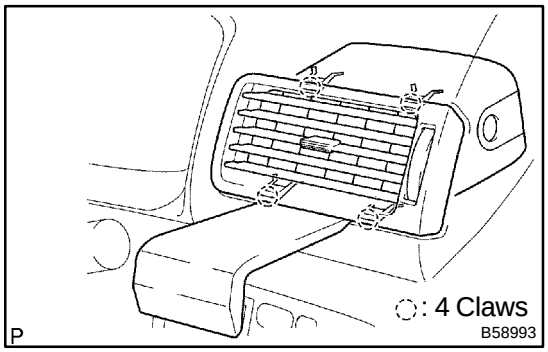
(a) Remove the clip.
(b) Using a screwdriver, disengage the 3 clips and 4 claws, then remove the meter hood sub-assy.

HINT:
Tape the screwdriver tip before use.



9. REMOVE COMBINATION METER ASSY

(a) Remove the screw<A>.
(b) Disengage the 2 claws as shown in the illustration.
(c) Disconnect the connector, then remove the combination meter assy.



10. REMOVE INSTRUMENT PANEL REGISTER ASSY NO.1

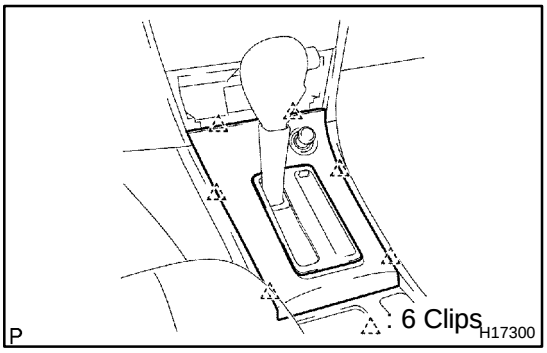
(a) Using a moulding remover, disengage the 4 claws, then remove the instrument panel register assy No.1.

HINT:
Tape the moulding remover tip before use.

11. REMOVE INSTRUMENT PANEL REGISTER ASSY NO.2

12. REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY

13. REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE)



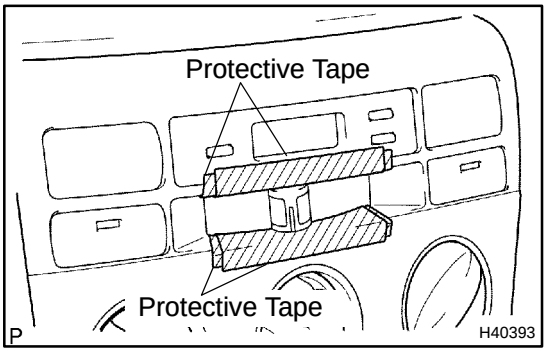
14. REMOVE CONSOLE PANEL UPPER

(a) Using a screwdriver, disengage the 6 clips.

HINT:

Tape the screwdriver tip before use.

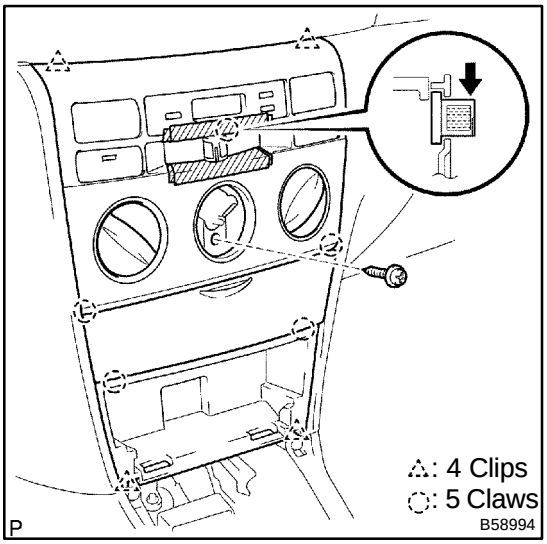
(b) Disconnect the connector, then remove the console panel upper.



15. REMOVE INSTRUMENT CLUSTER FINISH PANEL ASSY CENTER

(a) Manual A/C:
Center the control lever.

(b) Manual A/C:
Apply protective tape to the instrument cluster finish panel assy center as shown in the illustration.



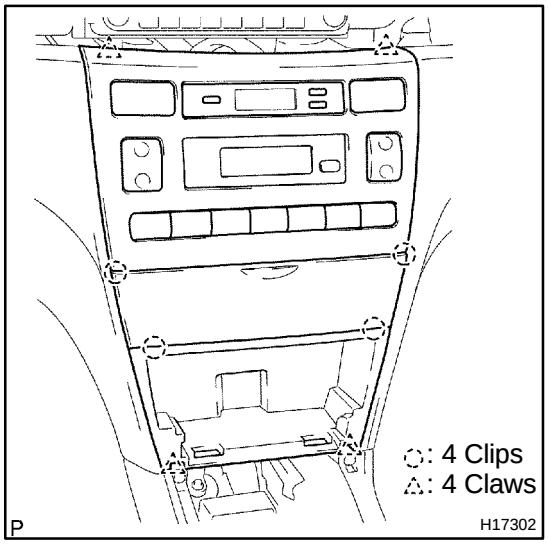
(c) Manual A/C:
Remove the control knob.

(d) Manual A/C:
Remove the screw<G>.

(e) Manual A/C:
Disengage the 4 clips and 5 claws with a screwdriver while pressing the control knob downward, disconnect each connector and remove the instrument cluster finish panel.

HINT:

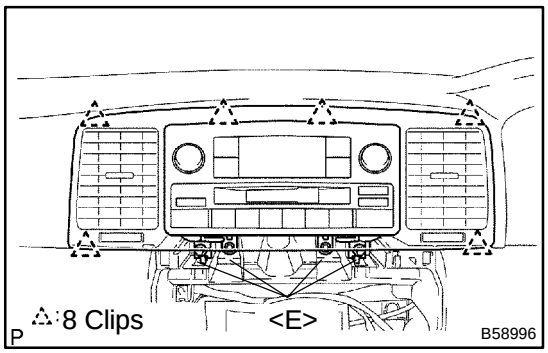
Tape the screwdriver tip before use.



(f) Auto A/C:
Using a screwdriver, disengage the 4 clips and 4 claws, then remove the instrument cluster finish panel assy center.

HINT:
Tape the screwdriver tip before use.

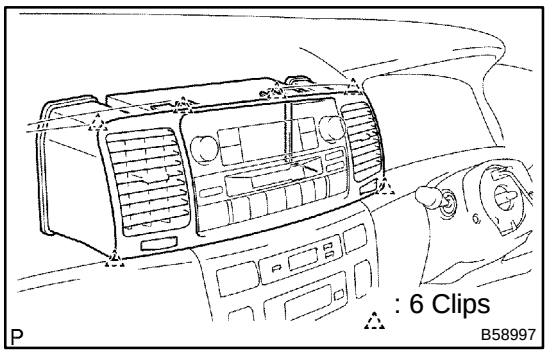
(g) Disconnect the connectors.



16. REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER

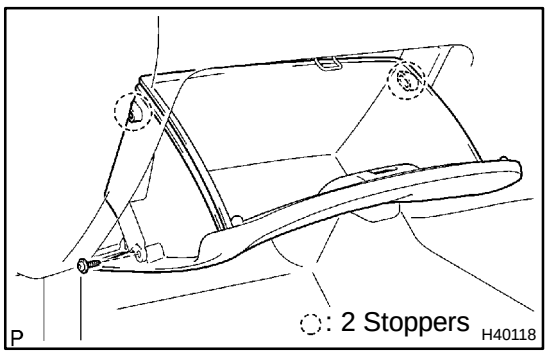
(a) Remove the 4 screws<E>.

HINT:
Tape the screwdriver tip before use.



(b) Using a screwdriver, disengage the 6 clips, then remove the instrument cluster finish panelsub-assy lower center with radio receiver assy.

(c) Disconnect the connectors.

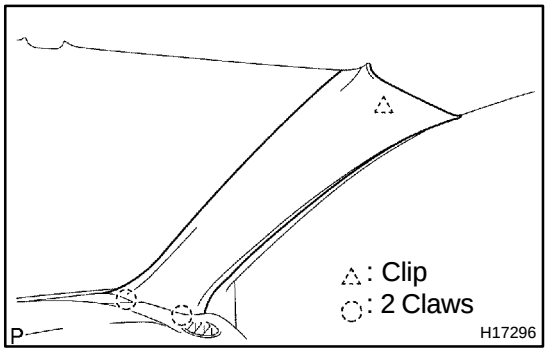


17. REMOVE GLOVE COMPARTMENT DOOR ASSY

(a) Remove the screw<B> and glove compartment door stopper sub-assy from the glove compartment door assy.

(b) Deform the upper part of the glove compartment door assy to release the stoppers.

(c) Pull the glove compartment door assy upward to remove it.



18. REMOVE FRONT PILLAR GARNISH RH

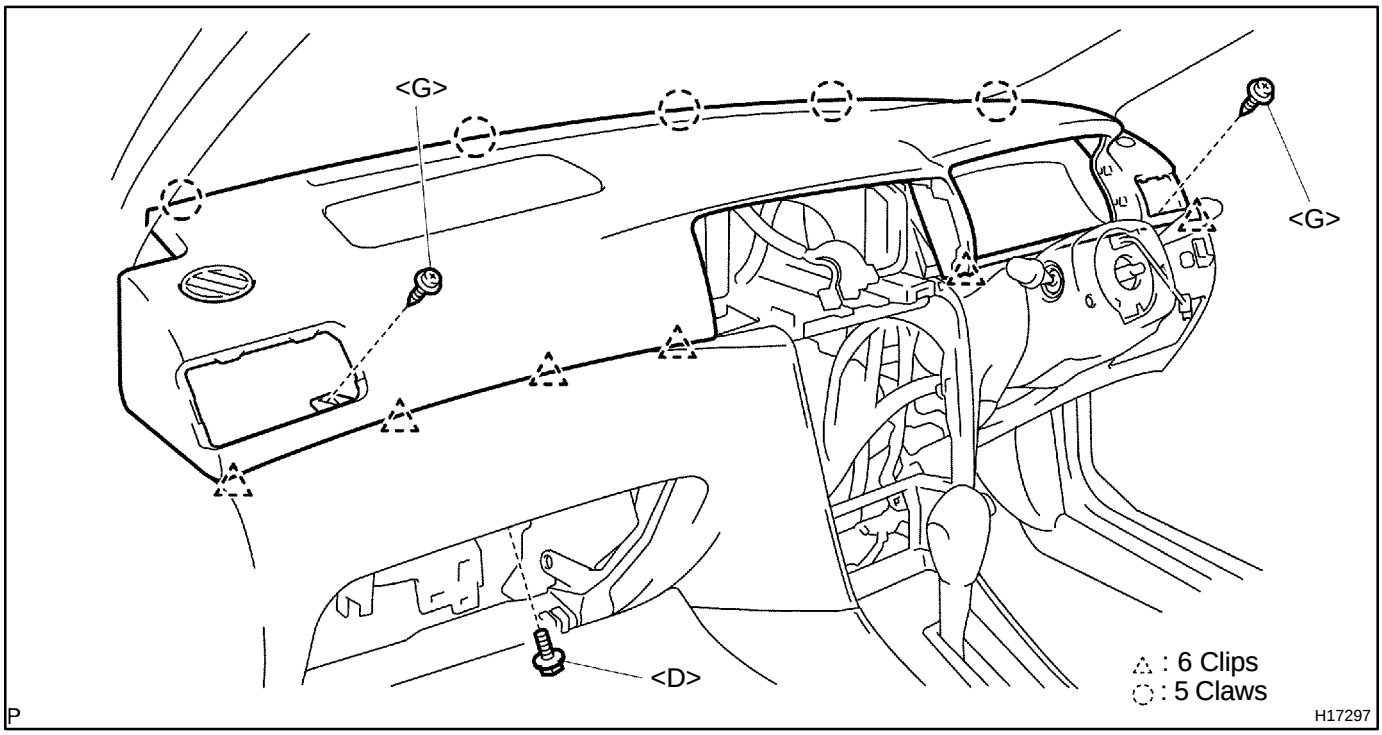
(a) Disengage the clip.
(b) Pull the front pillar garnish RH upward to remove it.

19. REMOVE FRONT PILLAR GARNISH LH

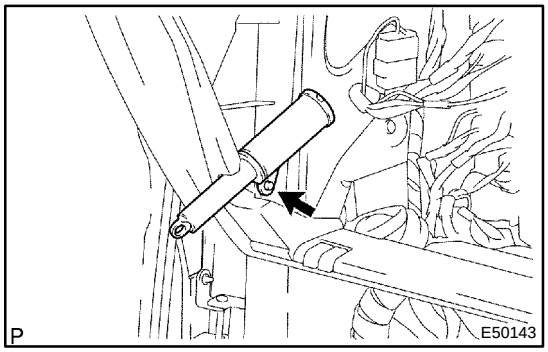
20. DISCONNECT PASSENGER AIRBAG CONNECTOR (See page 60-25)

21. REMOVE INSTRUMENT PANEL SUB-ASSY UPPER

(a) Remove the bolt<D> and 2 screws<G>.
(b) Using a moulding remover, disengage the 6 clips.
(c) Remove the instrument panel sub-assy upper.

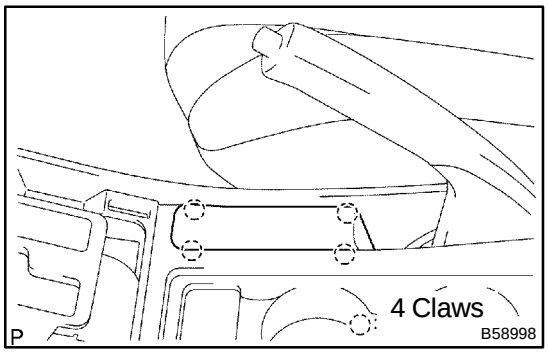


22. REMOVE HEATER CONTROL & ACCESSORY ASSY (MANUAL AIR CONDITIONER) (See page 55-36)
23. REMOVE STEERING COLUMN COVER UPR (See page 50-8)
24. REMOVE HEADLAMP DIMMER SWITCH ASSY (See page 65-36)
25. REMOVE WINDSHIELD WIPER SWITCH ASSY (See page 66-19)



26. REMOVE GLOVE COMPARTMENT DOOR STOPPER SUB-ASSY

(a) Disengage the clip, then remove the glove compartment door stopper sub-assy.

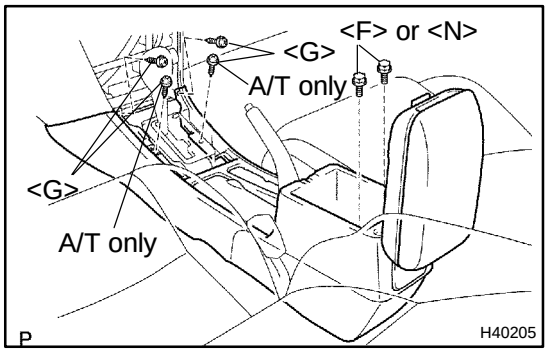


27. REMOVE PARKING BRAKE HOLE COVER SUB-ASSY

(a) Using a screwdriver, disengage the 4 claws, then remove the parking brake hole cover sub-assy.

HINT:
Tape the screwdriver tip before use.

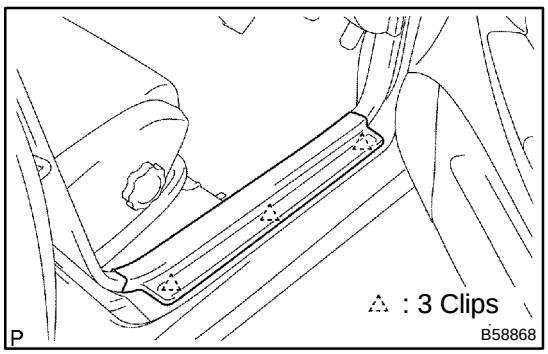
28. REMOVE CONSOLE BOX CARPET



29. REMOVE CONSOLE BOX SUB-ASSY REAR

(a) A/T:
Remove the 2 bolts<F> or <N>, 4 screws<G> and console box sub-assy rear.

(b) M/T:
Remove the 2 bolts<F> or <N>, 2 screws<G> and console box sub-assy rear.

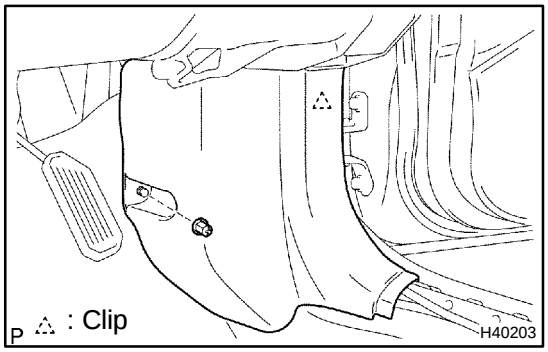


30. REMOVE FRONT DOOR SCUFF PLATE RH

(a) Using a screwdriver, disengage the 3 clips, then remove the front door scuff plate RH.

HINT:
Tape the screwdriver tip before use.

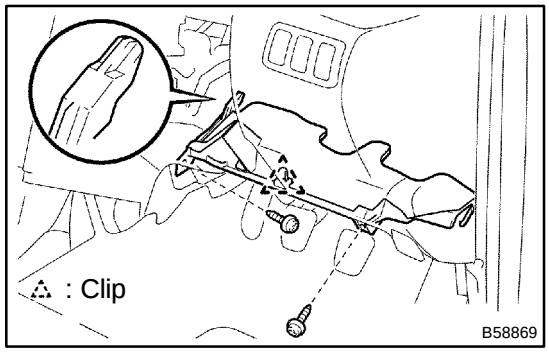
31. REMOVE FRONT DOOR SCUFF PLATE LH



32. REMOVE COWL SIDE TRIM BOARD RH

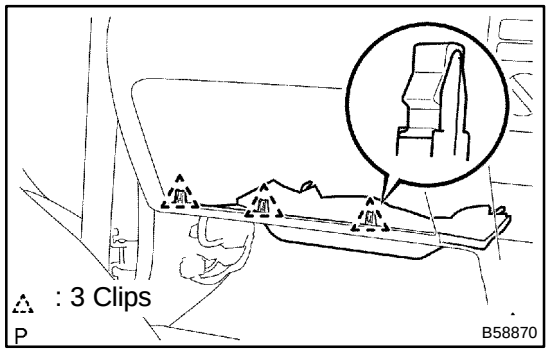
(a) Remove the clip.
(b) Disengage the clip, then remove the cowl side trim board RH as shown in the illustration.

33. REMOVE COWL SIDE TRIM BOARD LH



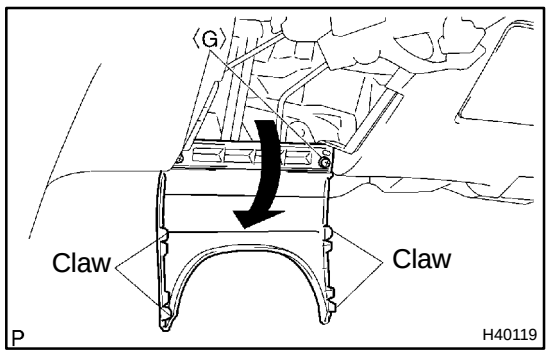
34. REMOVE INSTRUMENT PANEL UNDER COVER SUB-ASSY NO.1

(a) Remove the 2 screws<G>.
(b) Disengage the clip, then remove the instrument panel under cover sub-assy No.1.



35. REMOVE INSTRUMENT PANEL UNDER COVER SUB-ASSY NO.2

(a) Disengage the 3 clips, then remove the instrument panel under cover sub-assy No.2.



36. REMOVE INSTRUMENT PANEL FINISH PANEL SUB-ASSY LOWER RH

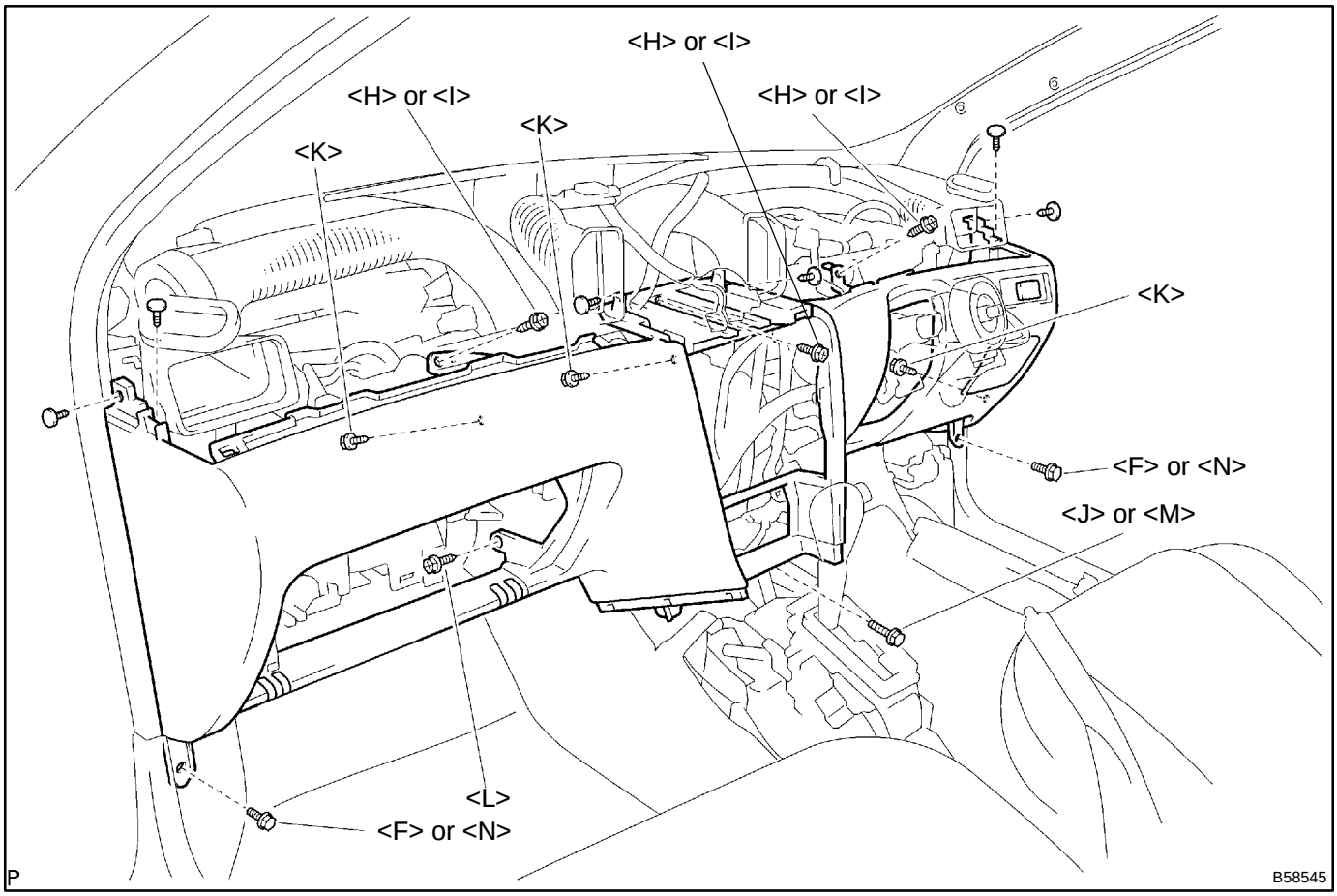
(a) Using a screwdriver, disengage the 4 claws, then open the instrument panel finish panel sub-assy lower RH.

HINT:
Tape the screwdriver tip before use.

(b) Remove the 2 screws<G> and instrument panel finish panel sub-assy lower RH.

37. REMOVE INSTRUMENT PANEL SUB-ASSY LOWER

(a) Disconnect the DLC3 connector.
(b) Remove the hood lock control lever.
(c) Remove the 2 bolts<F> or <N>.
(d) Remove the 3 bolts<H> or 3 screws<I>.
(e) Remove the bolt<J> or <M>.
(f) Remove the 3 screws<K>.
(g) Remove the 6 clips and instrument panel sub-assy lower.



38. REMOVE INSTRUMENT PANEL BRACKET SUB-ASSY CENTER

(a) Remove the screw<G> and instrument panel bracket sub-assy center.

39. REMOVE INSTRUMENT PANEL BOX

40. REMOVE INSTRUMENT PANEL BOX SPRING

41. INSTALL HEATER CONTROL & ACCESSORY ASSY (MANUAL AIR CONDITIONER)

(See page 55-109)

42. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER

(a) Install the instrument panel sub-assy upper with the bolt<D> and 2 screws<C>.
Torque:
Bolt <D>: 20 N·m (204 kgf·cm, 15 ft·lbf)

43. INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSY LOWER CENTER

44. CENTER SPIRAL CABLE (See page 60-26)
45. INSTALL STEERING WHEEL ASSY
(See page 50-15)
46. INSPECT STEERING WHEEL CENTER POINT
47. INSPECT HORN BUTTON ASSY
(See page 50-7)
48. INSTALL HORN BUTTON ASSY
(See page 50-15)
49. INSPECT SRS WARNING LIGHT

COMBINATION METER ASSY

OVERHAUL

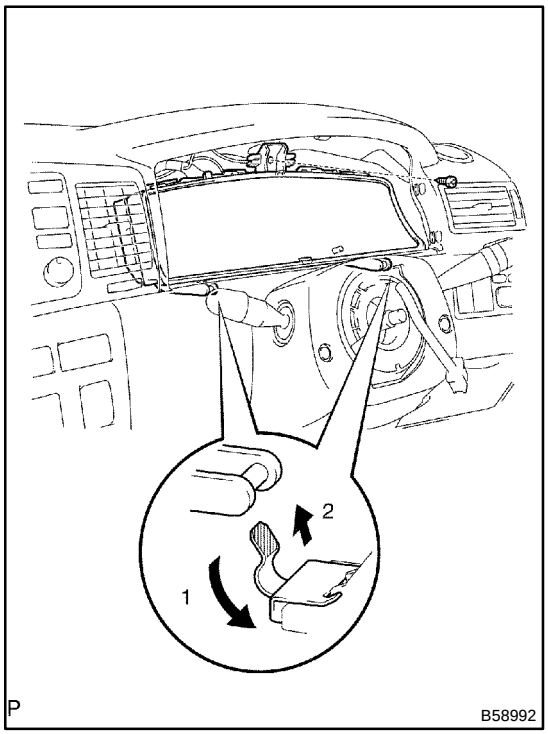
7100N-02

HINT:

COMPONENTS: See page 71-9

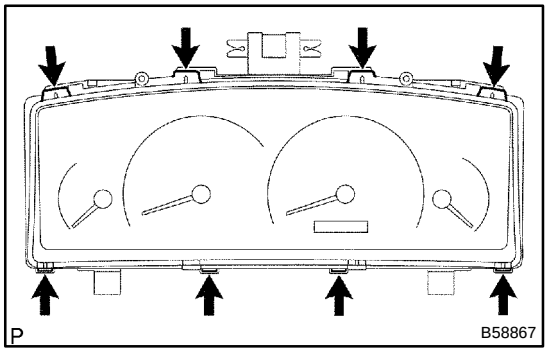
1. REMOVE METER HOOD SUB-ASSY

(a) Remove the clip.
(b) Disengage the 3 clips and 4 claws, then remove the meter hood sub-assy.



2. REMOVE COMBINATION METER ASSY

(a) Remove the screw<A>.
(b) Disengage the 2 claws as shown in the illustration.
(c) Disconnect the connector, then remove the combination meter assy.



3. REMOVE COMBINATION METER GLASS

(a) Disengage the 8 claws, then remove the combination meter glass.

CLOCK ASSY

REPLACEMENT

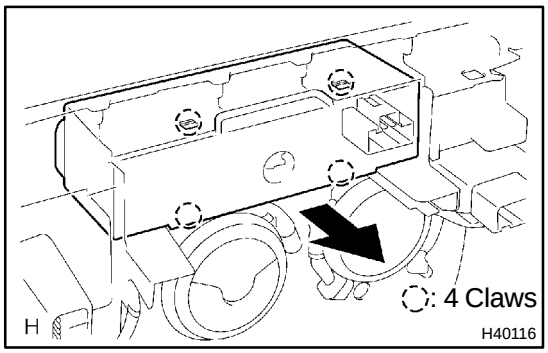
7100Q-02

1. REMOVE FRONT ASH RECEPTACLE BOX SUB-ASSY

2. REMOVE FLOOR SHIFT SHIFT LEVER KNOB SUB-ASSY (M/T TRANSAXLE)

3. REMOVE CONSOLE PANEL UPPER
(See page 71-16 or 71-25)

4. REMOVE INSTRUMENT CLUSTER FINISH PANEL
(See page 71-16 or 71-25)



5. REMOVE CLOCK ASSY

(a) Using a screwdriver, disengage the 4 claws, remove the clock as shown in the illustration.

HINT:
Tape the screwdriver tip before use.

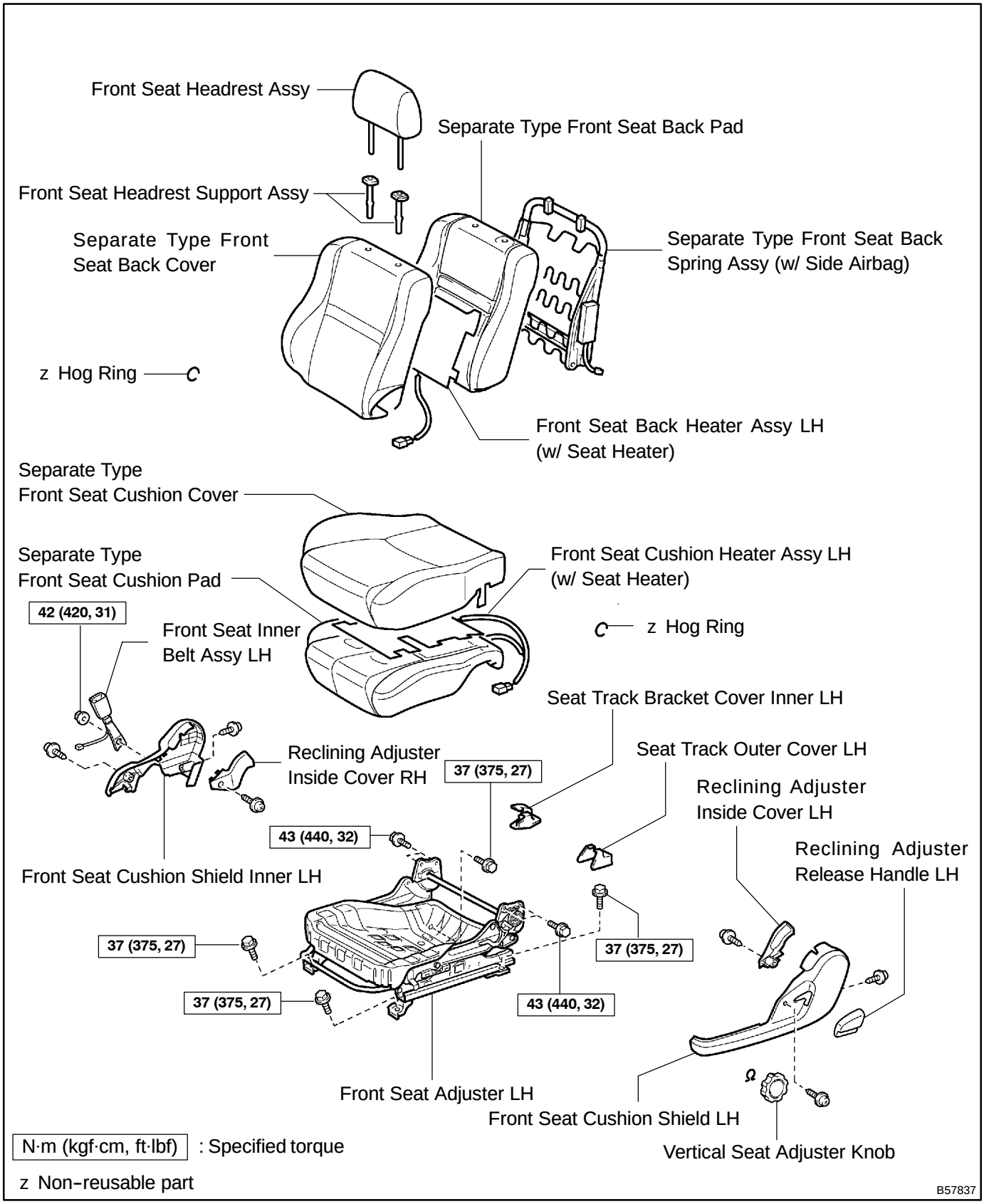
SEAT

FRONT SEAT
(SEDAN/STATION WAGON) 72-1
COMPONENTS 72-1
OVERHAUL 72-2/6
FRONT SEAT (HATCHBACK) 72-7
COMPONENTS 72-7
OVERHAUL 72-8/10
REAR SEAT ASSY
(SEDAN WITH SEPARATE TYPE) 72-11
COMPONENTS 72-11
OVERHAUL 72-12/14
REAR SEAT ASSY
(SEDAN WITH BENCH TYPE) 72-15
COMPONENTS 72-15
OVERHAUL 72-16/17
REAR SEAT ASSY
(STATION WAGON) 72-18
COMPONENTS 72-18/19
OVERHAUL 72-20/23
REAR SEAT ASSY (HATCHBACK) 72-24
COMPONENTS 72-24/25
OVERHAUL 72-26/28
SEAT HEATER SYSTEM 72-29
LOCATION 72-29
PROBLEM SYMPTOMS TABLE 72-30
INSPECTION 72-31/32

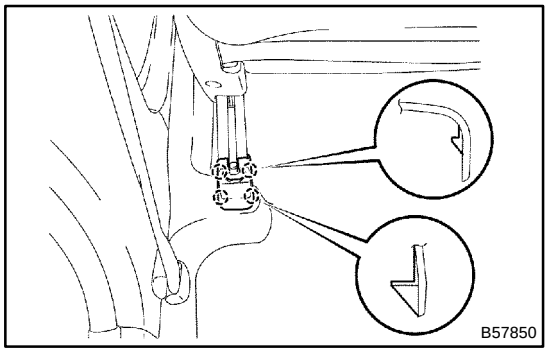
FRONT SEAT (SEDAN/STATION WAGON)

COMPONENTS

7208Q-01



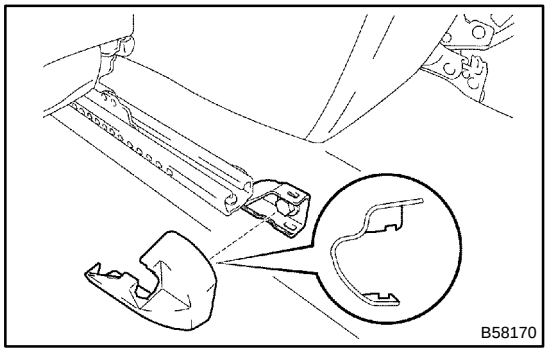
OVERHAUL



1. REMOVE FRONT SEAT ASSEMBLY LH

(a) Using a screwdriver, remove the seat track outer cover LH.

HINT:
Tape the screwdriver tip before use.



(b) Using a screwdriver, remove the seat track bracket cover inner LH.

HINT:
Tape the screwdriver tip before use.

(c) Disconnect the connector.

(d) Remove the 4 bolts and front seat.

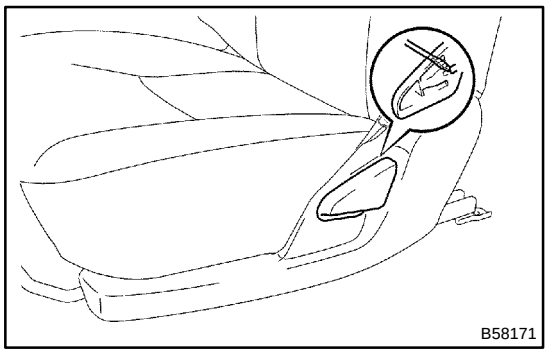
NOTICE:
Be careful not to damage the body.

2. REMOVE FRONT SEAT HEADREST ASSY

3. REMOVE VERTICAL SEAT ADJUSTER KNOB

(a) Using a screwdriver, remove the clip and vertical seat adjuster knob.

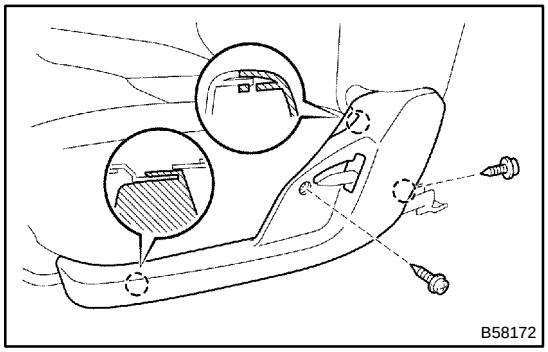
HINT:
Tape the screwdriver tip before use.



4. REMOVE RECLINING ADJUSTER RELEASE HANDLE LH

(a) Using a screwdriver, remove the reclining adjuster release handle LH.

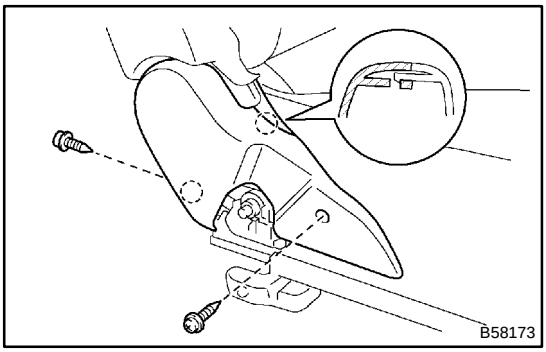
HINT:
Tape the screwdriver tip before use.



5. REMOVE FRONT SEAT CUSHION SHIELD LH

(a) Remove the 2 screws and front seat cushion shield LH.

6. REMOVE FRONT SEAT INNER BELT ASSY LH
(See page 61-2)



7. REMOVE FRONT SEAT CUSHION SHIELD INNER LH

(a) Remove the 2 screws and front seat cushion shield inner LH.

8. REMOVE SEPARATE TYPE FRONT SEAT BACK ASSY

(a) Remove the hog rings.
(b) Remove the 4 bolts and the seat back assembly.

9. REMOVE SEPARATE TYPE FRONT SEAT BACK COVER

(a) Remove the 2 headrest supports.
(b) Remove the hog rings and seat back cover.

10. REMOVE FRONT SEAT BACK HEATER ASSY LH(W/ SEAT HEATER)

(a) Cut the tack pins which are fastened to the seat heater, and then remove the seat heater.

11. REMOVE SEPARATE TYPE FRONT SEAT BACK SPRING ASSY

(a) Remove the pad from the seat back spring assembly.

12. REMOVE SEPARATE TYPE FRONT SEAT CUSHION COVER

(a) Disengage the seat cushion cover hook.
(b) Remove the hog rings and front seat cushion cover with pad from the seat cushion frame.
(c) Remove the hog rings and seat cushion pad from the seat cushion cover.

13. REMOVE FRONT SEAT CUSHION HEATER ASSY LH(W/ SEAT HEATER)

(a) Cut the tack pins which are fastened to the seat heater, and then remove the seat heater.

14. REMOVE RECLINING ADJUSTER INSIDE COVER RH

(a) Remove the screw and reclining adjuster inside cover RH.

15. REMOVE RECLINING ADJUSTER INSIDE COVER LH

16. INSTALL FRONT SEAT CUSHION HEATER ASSY LH(W/ SEAT HEATER)

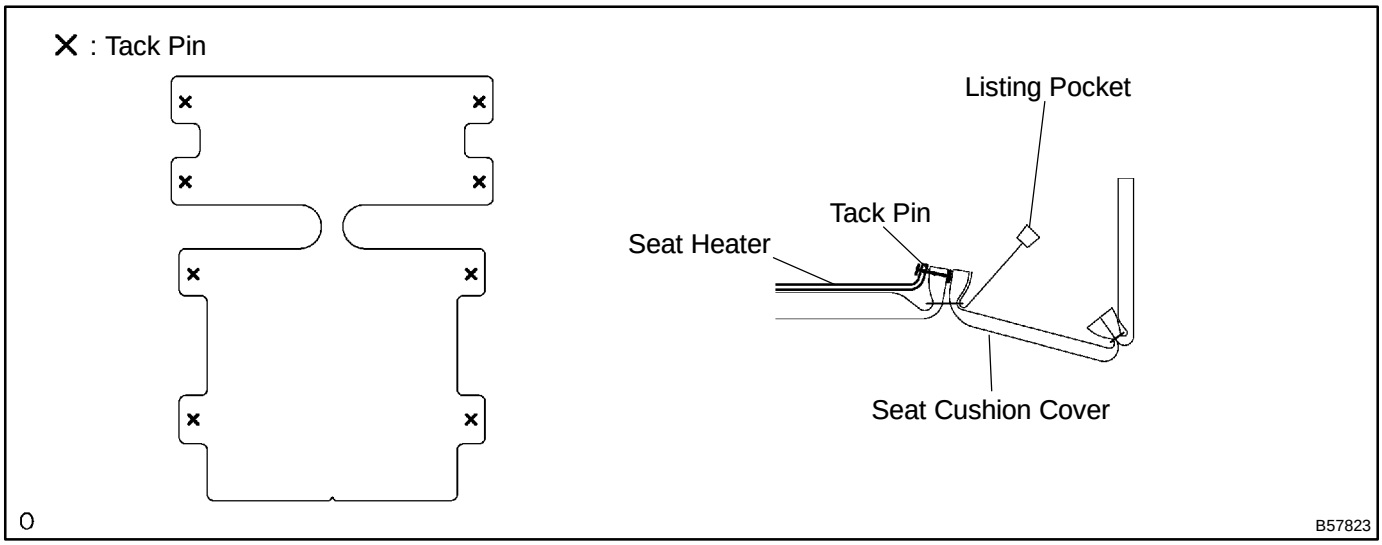
(a) Using a tacker, install the front seat cushion heater to the front seat cushion cover with tack pins.

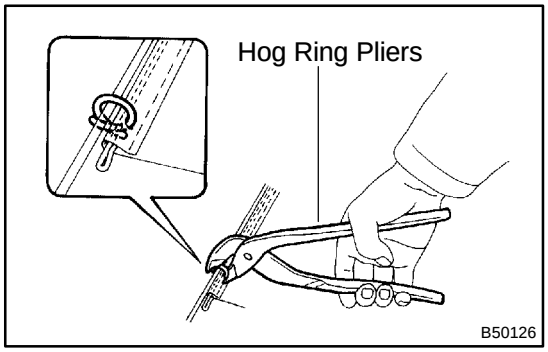
NOTICE:

- **Do not substitute other metal parts for tack pins.**
- **In suffice distance between the heater and cover may result in damage to the heater.**

HINT:

- Attach tack pins on the seam side so that the wire can be threaded through the hole from the fold side.
- Sewing thread can be substituted for tack pins.





17. INSTALL SEPARATE TYPE FRONT SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the seat cushion pad.

(b) Install the seat cushion cover with pad to the seat cushion frame with new hog rings.

HINT:

- Do not damage the seat cushion cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

18. INSTALL FRONT SEAT BACK HEATER ASSY LH(W/ SEAT HEATER)

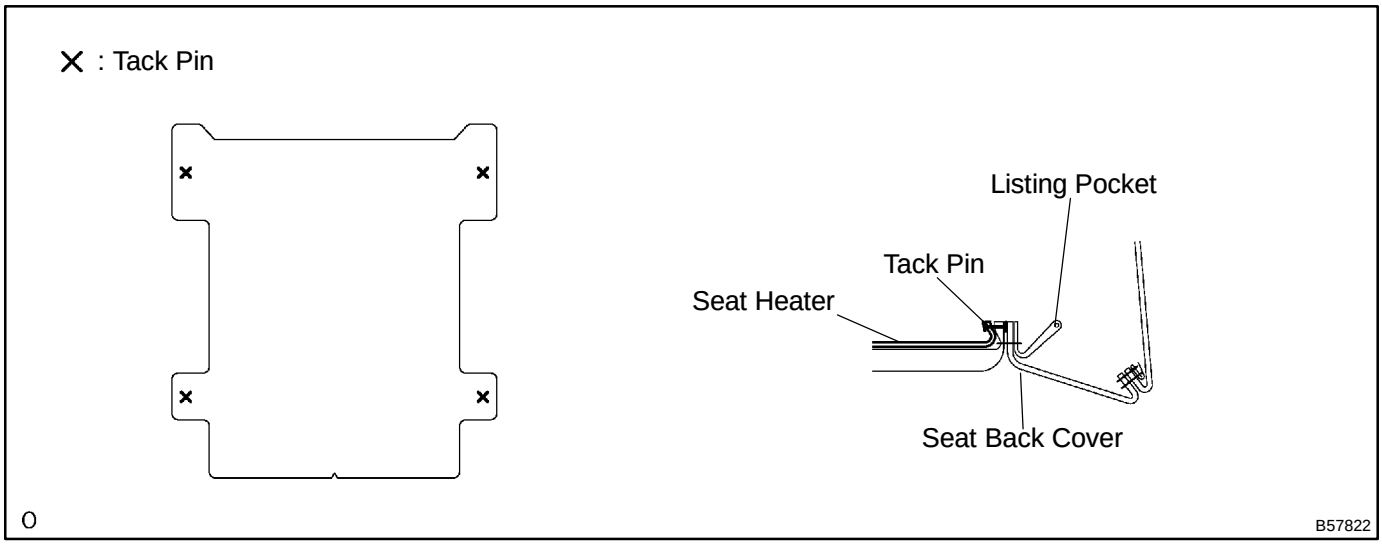
(a) Using a tacker, install the front seat back heater to the front seat back cover with tack pins.

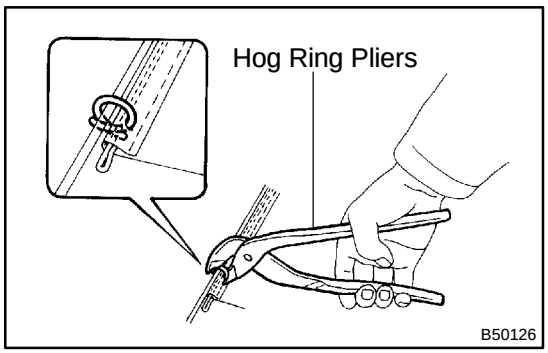
NOTICE:

- **Do not substitute other metal parts for tack pins.**
- **In suffice distance between the heater and cover may result in damage to the heater.**

HINT:

- Attach tack pins on the seam side so that the wire can be threaded through the hole from the fold side.
- Sewing thread can be substituted for tack pins.





19. INSTALL SEPARATE TYPE FRONT SEAT BACK COVER

(a) Install the seat back cover with new hog rings to the seat cushion pad.

(b) Install the seat back cover with pad to the seat back frame with new hog rings.

HINT:

- Do not damage the seat back cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

20. INSTALL SEPARATE TYPE FRONT SEAT BACK ASSY

(a) Install the front seat back assembly with the 4 bolts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

(b) Install the hog rings and turn down the seat back cover.

(c) Install the hog rings.

21. INSTALL FRONT SEAT INNER BELT ASSY LH

(See page 61-2)

22. INSTALL FRONT SEAT ASSEMBLY LH

(a) Mount the front seat to the vehicle.

NOTICE:

Be careful not to damage the body.

(b) Connect the connectors.

(c) Slide the front seat to the most rear position.

(d) Tighten the bolts on the front side temporarily, but from the bolts on the inner side tighten them completely.

(e) Slide the front seat to the most front position.

(f) Tighten the bolts on the rear side temporarily, but from the bolts on the inner side tighten them completely.

Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

23. CHECK SEAT SLIDE ADJUSTER LOCKS

(a) When sliding the seat, inspect that the outer and inner tracks are locked at the same time.

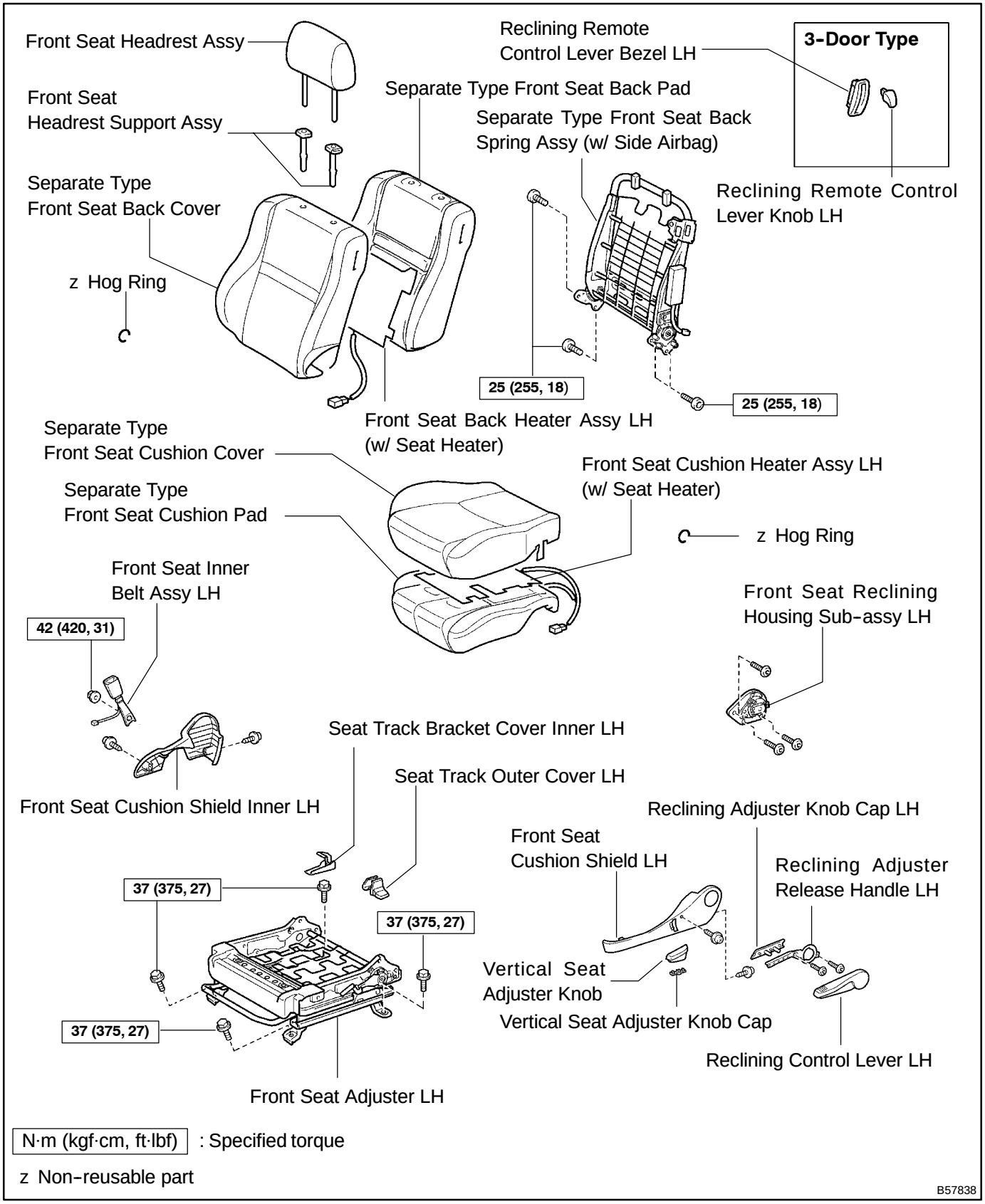
HINT:

When sliding lock positions slip off, loosen the bolts to adjust the position.

FRONT SEAT (HATCHBACK)

COMPONENTS

7208S-01



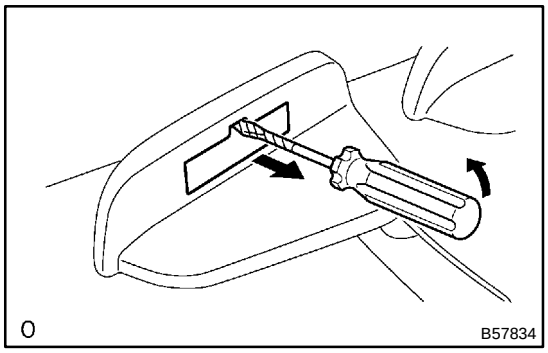
N·m (kgf·cm, ft·lbf) : Specified torque

z Non-reusable part

B57838

OVERHAUL

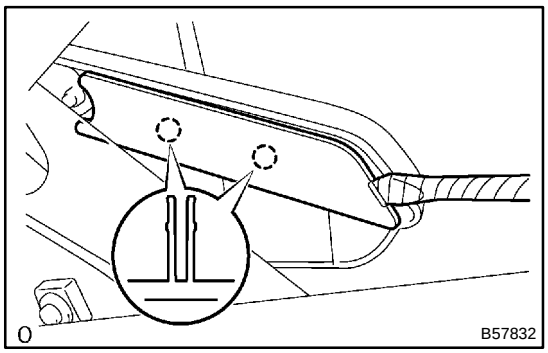
1. REMOVE FRONT SEAT ASSEMBLY LH (See page 72-2)
2. REMOVE FRONT SEAT HEADREST ASSY



3. REMOVE VERTICAL SEAT ADJUSTER KNOB

(a) Using a screwdriver, remove the vertical seat adjuster knob cap and vertical seat adjuster knob.

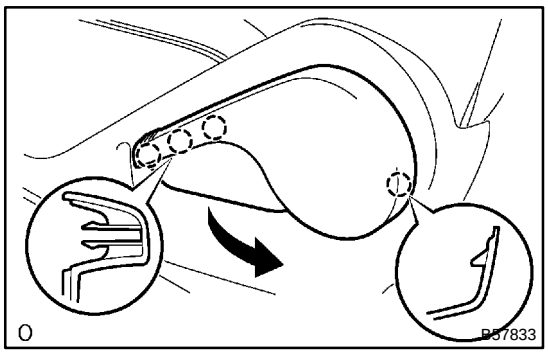
HINT:
Tape the screwdriver tip before use.



4. REMOVE RECLINING ADJUSTER RELEASE HANDLE LH

(a) Held up the reclining adjuster release handle.
(b) Using a screwdriver, remove the hooks and reclining adjuster knob cap.

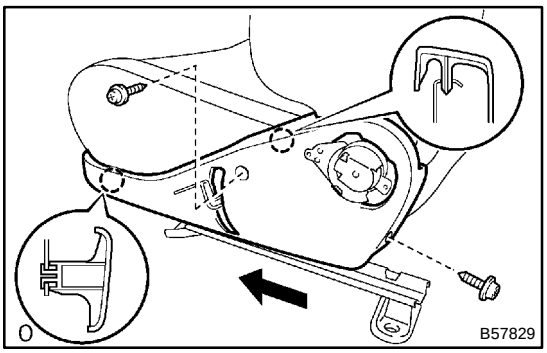
HINT:
Tape the screwdriver tip before use.



(c) Using a screwdriver, remove the hooks and reclining adjuster release handle LH.

5. REMOVE RECLINING CONTROL LEVER LH

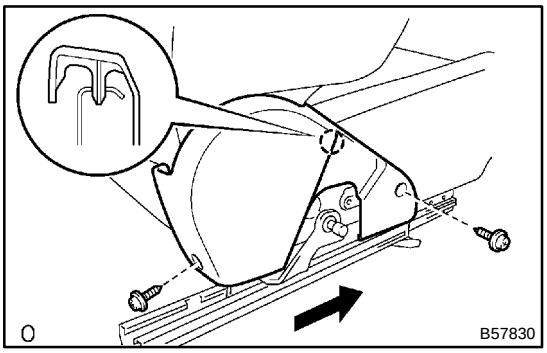
(a) Using a hexagon wrench, remove the 2 bolts and reclining control lever LH.



6. REMOVE FRONT SEAT CUSHION SHIELD LH

7. REMOVE FRONT SEAT INNER BELT ASSY LH

(See page 61-9)



8. REMOVE FRONT SEAT CUSHION SHIELD INNER LH

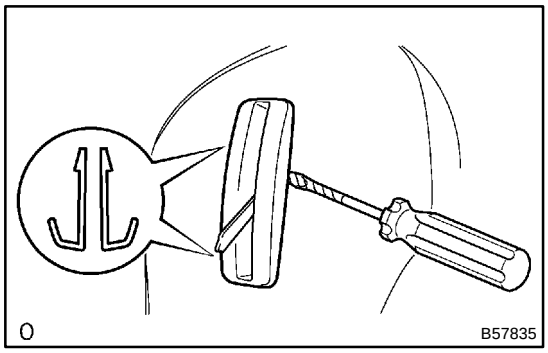
(a) Remove the 2 screws and front seat cushion shield inner LH.

9. REMOVE FRONT SEAT RECLINING HOUSING SUB-ASSY LH

(a) Using a hexagon wrench, remove the 3 bolts and front seat reclining housing LH.

10. REMOVE SEPARATE TYPE FRONT SEAT BACK ASSY

(a) Using a hexagon wrench, remove the 4 bolts and the separate type front seat back assembly.



11. REMOVE RECLINING REMOTE CONTROL LEVER BEZEL LH(3DOOR BODY TYPE)

(a) Remove the reclining remote control lever knob LH.
(b) Using a screwdriver, remove the reclining remote control lever bezel LH.

HINT:
Tape the screwdriver tip before use.

12. REMOVE SEPARATE TYPE FRONT SEAT BACK COVER

(a) Disengage the seat back cover hook.
(b) Remove the 2 headrest supports.
(c) Remove the hog rings and seat back cover.

13. REMOVE FRONT SEAT BACK HEATER ASSY LH(W/ SEAT HEATER)

(See page 72-2)

14. REMOVE SEPARATE TYPE FRONT SEAT BACK SPRING ASSY

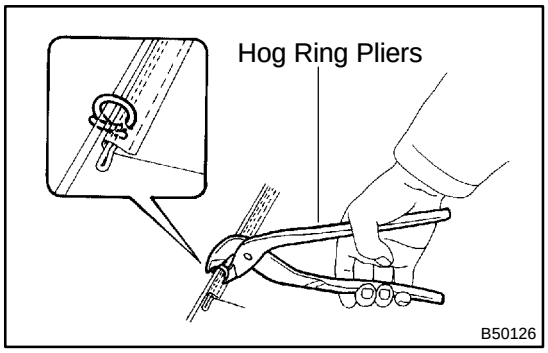
(a) Remove the pad from the seat back spring assembly.

15. REMOVE SEPARATE TYPE FRONT SEAT CUSHION COVER

(a) Disengage the seat cushion cover hook.
(b) Remove the hog rings and front seat cushion cover with pad from the seat cushion frame.
(c) Remove the hog rings and seat cushion pad from the seat cushion cover.

16. REMOVE FRONT SEAT CUSHION HEATER ASSY LH(W/ SEAT HEATER)
(See page 72-3)

17. INSTALL FRONT SEAT CUSHION HEATER ASSY LH(W/ SEAT HEATER)
(See page 72-4)

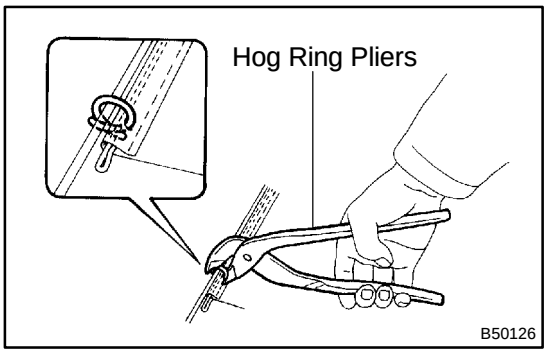


18. INSTALL SEPARATE TYPE FRONT SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the seat cushion pad.
(b) Install the seat cushion cover with pad to the seat cushion frame with new hog rings.

HINT:
- Do not damage the seat cushion cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

19. INSTALL FRONT SEAT BACK HEATER ASSY LH(W/ SEAT HEATER)
(See page 72-5)



20. INSTALL SEPARATE TYPE FRONT SEAT BACK COVER

(a) Install the seat back cover with new hog rings to the seat cushion pad.
(b) Install the seat back cover with pad to the seat back frame with new hog rings.

HINT:
- Do not damage the seat back cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

21. INSTALL SEPARATE TYPE FRONT SEAT BACK ASSY

(a) Using a hexagon wrench, Install the front seat back assembly with the 4 bolts.

22. INSTALL FRONT SEAT INNER BELT ASSY LH
(See page 61-9)

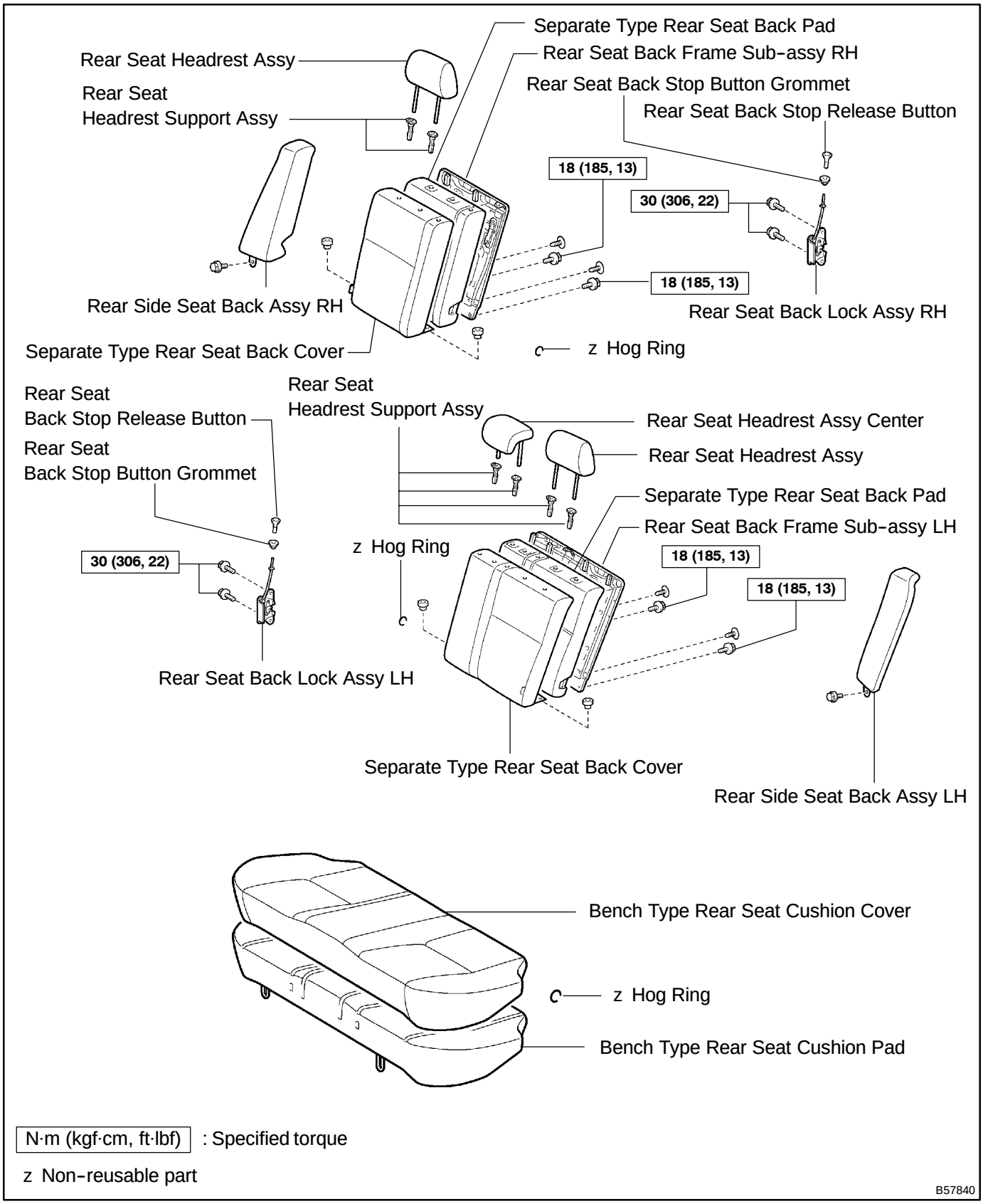
23. INSTALL FRONT SEAT ASSEMBLY LH (See page 72-6)

24. CHECK SEAT SLIDE ADJUSTER LOCKS (See page 72-6)

REAR SEAT ASSY (SEDAN WITH SEPARATE TYPE)

COMPONENTS

7208V-01



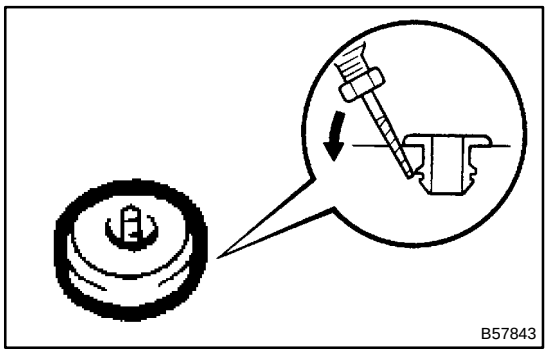
7208W-01

OVERHAUL

1. **REMOVE REAR SEAT CUSHION ASSY** **(See page 72-16)**
2. **REMOVE BENCH TYPE REAR SEAT CUSHION COVER** **(See page 72-16)**
3. **REMOVE REAR SEAT BACK ASSY RH**

(a) Lean the seat back forward and remove the 2 clips engaged with the floor.
(b) Remove the 2 bolts and the rear seat back assembly RH.

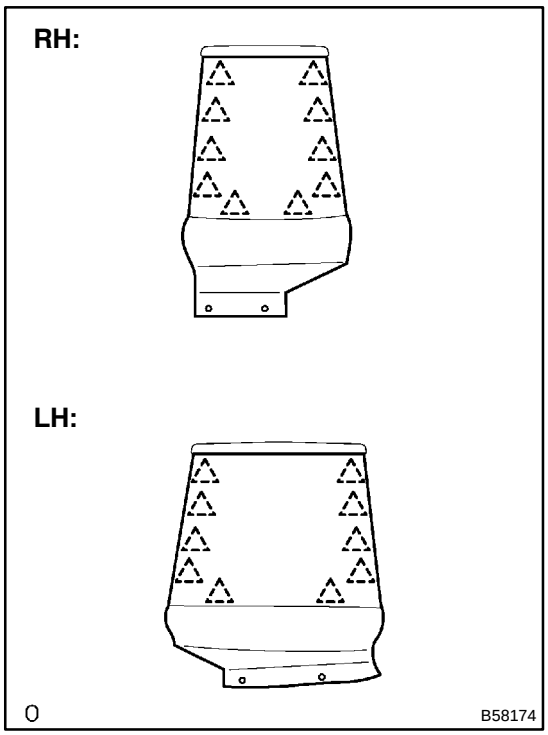
4. **REMOVE REAR SEAT BACK ASSY LH**
5. **REMOVE REAR SEAT HEADREST ASSY**
6. **REMOVE REAR SEAT HEADREST ASSY CENTER**
7. **REMOVE REAR SEAT BACK STOP RELEASE BUTTON**



8. **REMOVE REAR SEAT BACK STOP BUTTON GROMMET**

(a) Using a screwdriver, remove the rear seat back stop button grommet.

HINT:
Tape the screwdriver tip before use.



9. **REMOVE SEPARATE TYPE REAR SEAT BACK COVER**

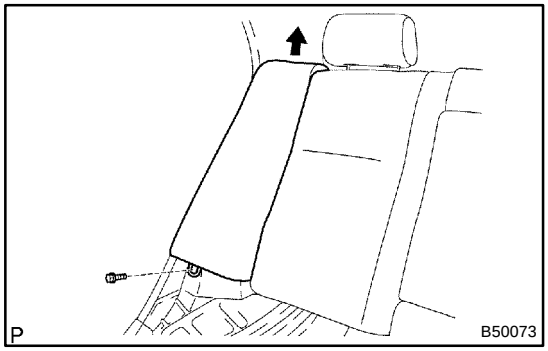
(a) Disengage the clips, turn up rear seat back carpet.
(b) Remove the 2 headrest supports.
(c) Remove the hog rings and separate type rear seat back cover.

10. **REMOVE SEPARATE TYPE REAR SEAT BACK COVER**
11. **REMOVE REAR SEAT BACK FRAME SUB-ASSY RH**
12. **REMOVE REAR SEAT BACK FRAME SUB-ASSY LH**

13. REMOVE REAR SEAT BACK LOCK ASSY RH

(a) Remove the 2 bolt and the rear seat back lock assembly RH.
(b) Remove the rear seat back stop release button.

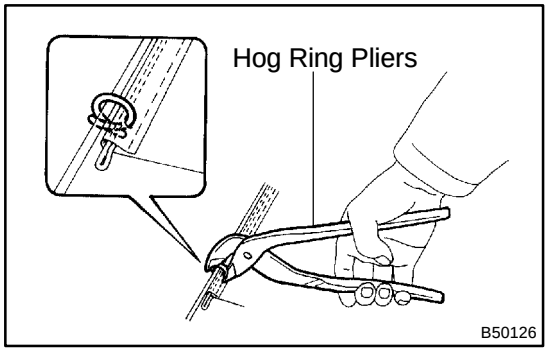
14. REMOVE REAR SEAT BACK LOCK ASSY LH



15. REMOVE REAR SIDE SEAT BACK ASSY RH

(a) Remove the bolt and the rear side seat back assembly.

16. REMOVE REAR SIDE SEAT BACK ASSY LH



17. INSTALL BENCH TYPE REAR SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the seat cushion pad.
(b) Install the rear seat cushion cover with new hog rings to the rear seat cushion pad.

HINT:

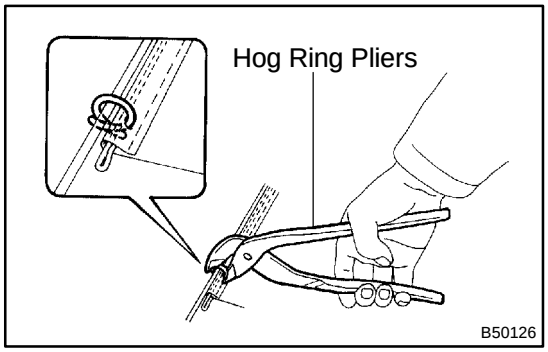
- Do not damage the seat cushion cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

18. INSTALL REAR SEAT BACK LOCK ASSY RH

(a) Install the rear seat back lock assembly RH with the 2 bolts.
Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

19. INSTALL REAR SEAT BACK LOCK ASSY LH

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)



20. INSTALL SEPARATE TYPE REAR SEAT BACK COVER

(a) Install the seat back cover with new hog rings to the seat cushion pad.
(b) Install the rear seat back cover with new hog rings to the rear seat back pad.

HINT:
- Do not damage the seat back cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

21. INSTALL SEPARATE TYPE REAR SEAT BACK COVER

22. INSTALL REAR SIDE SEAT BACK ASSY RH

(a) Install the rear side seat back assembly RH with the bolt.

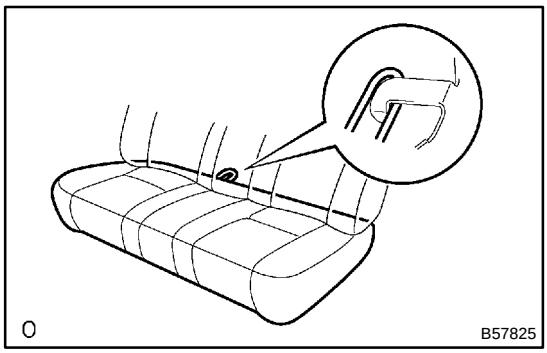
NOTICE:
Insert side seat hook into the hole of body.

23. INSTALL REAR SIDE SEAT BACK ASSY LH

24. INSTALL REAR SEAT BACK ASSY RH

(a) Install the rear seat back assembly RH with the 2 bolts.
(b) Tighten the bolts securely in the order of center hinge side-outer hinge side.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

25. INSTALL REAR SEAT BACK ASSY LH
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



26. INSTALL REAR SEAT CUSHION ASSY

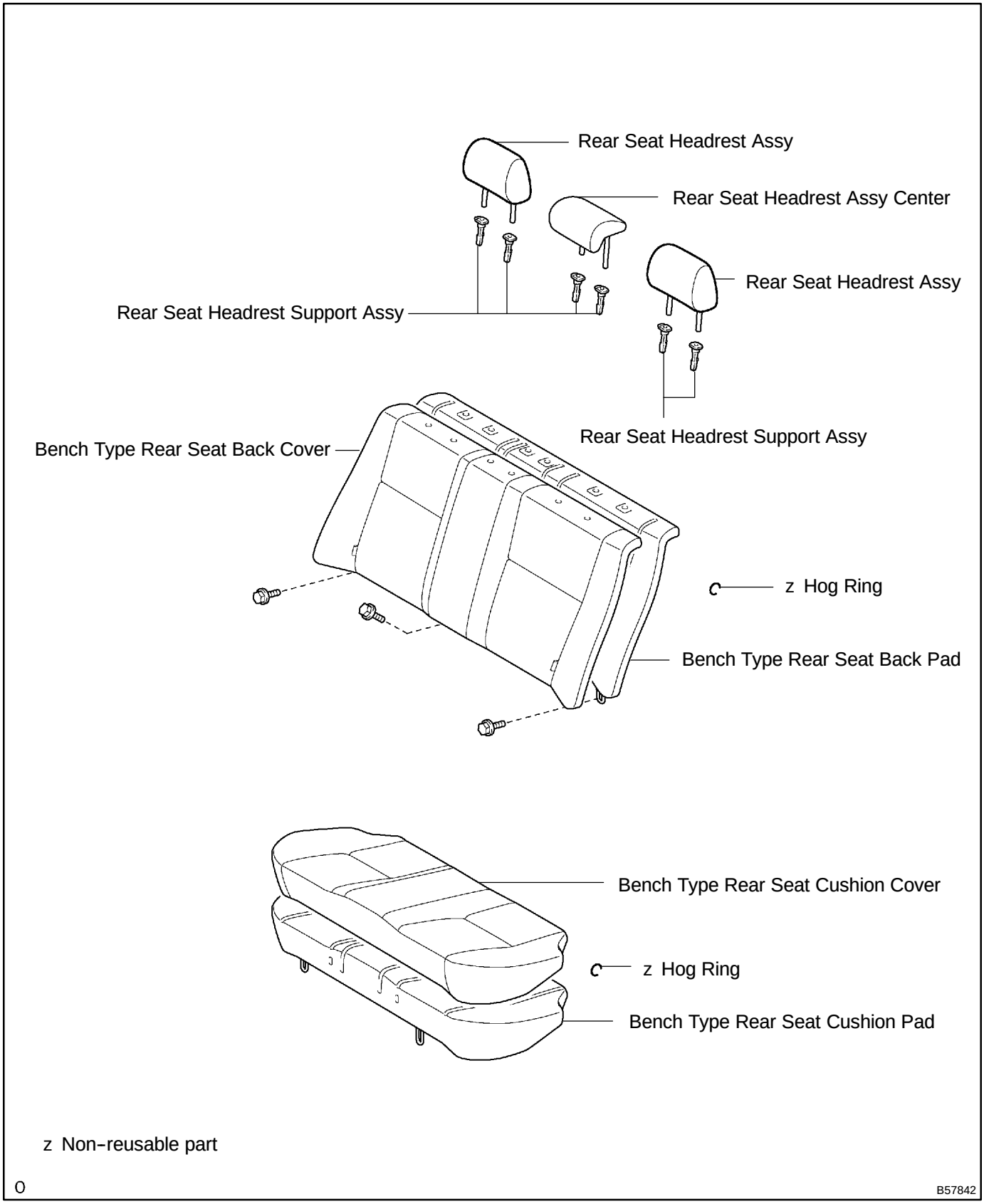
(a) Place the 3 hooks in the body firmly.
(b) Insert the frame into the hook.

NOTICE:
Hang cushion wire on hook of hinge bracket.

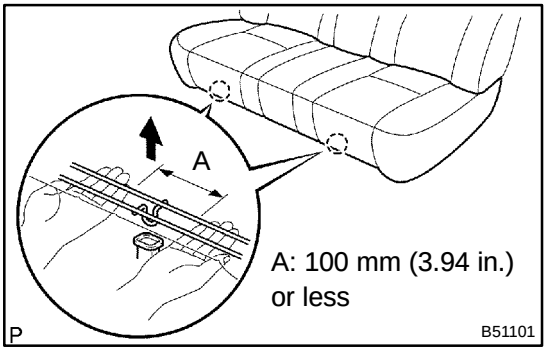
REAR SEAT ASSY (SEDAN WITH BENCH TYPE)

COMPONENTS

7208T-01



OVERHAUL



1. REMOVE REAR SEAT CUSHION ASSY

(a) Pull up the front portion of the seat cushion assembly, then remove it.

NOTICE:

In the case, hold the base of the clip up to prevent the cushion frame from being distorted.

2. REMOVE BENCH TYPE REAR SEAT CUSHION COVER

(a) Remove the hog rings and rear seat cushion cover.

3. REMOVE REAR SEAT BACK ASSY

(a) Remove the 3 bolts and the rear seat back assembly.

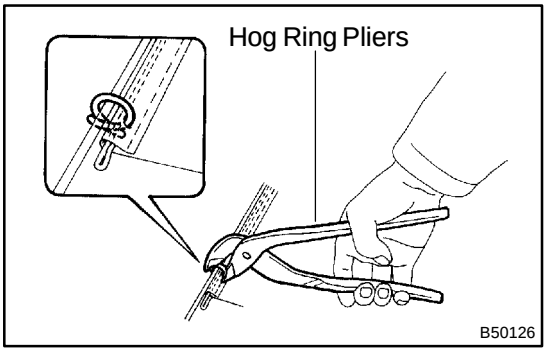
4. REMOVE REAR SEAT HEADREST ASSY

5. REMOVE REAR SEAT HEADREST ASSY CENTER

6. REMOVE BENCH TYPE REAR SEAT BACK COVER

(a) Remove the 6 headrest supports.

(b) Remove the hog rings and rear seat back cover.

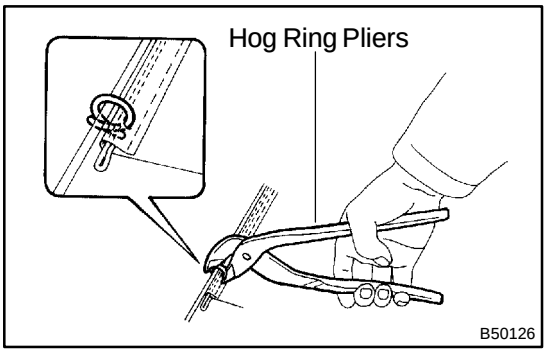


7. INSTALL BENCH TYPE REAR SEAT BACK COVER

(a) Install the rear seat back cover with new hog rings to the rear seat back pad.

HINT:

- Do not damage the seat cushion cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.



8. INSTALL BENCH TYPE REAR SEAT CUSHION COVER

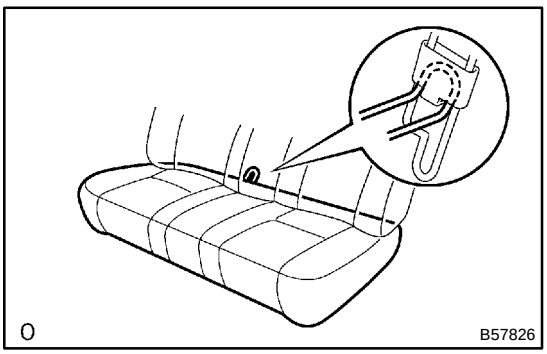
(a) Install the rear seat cushion cover with new hog rings to the rear seat cushion pad.

HINT:

- Do not damage the seat back cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

9. INSTALL REAR SEAT BACK ASSY

(a) Install the rear seat back assembly with the 3 bolts.
Torque: 7.9 N·m (80 kgf·cm, 70 in.·lbf)



10. INSTALL REAR SEAT CUSHION ASSY

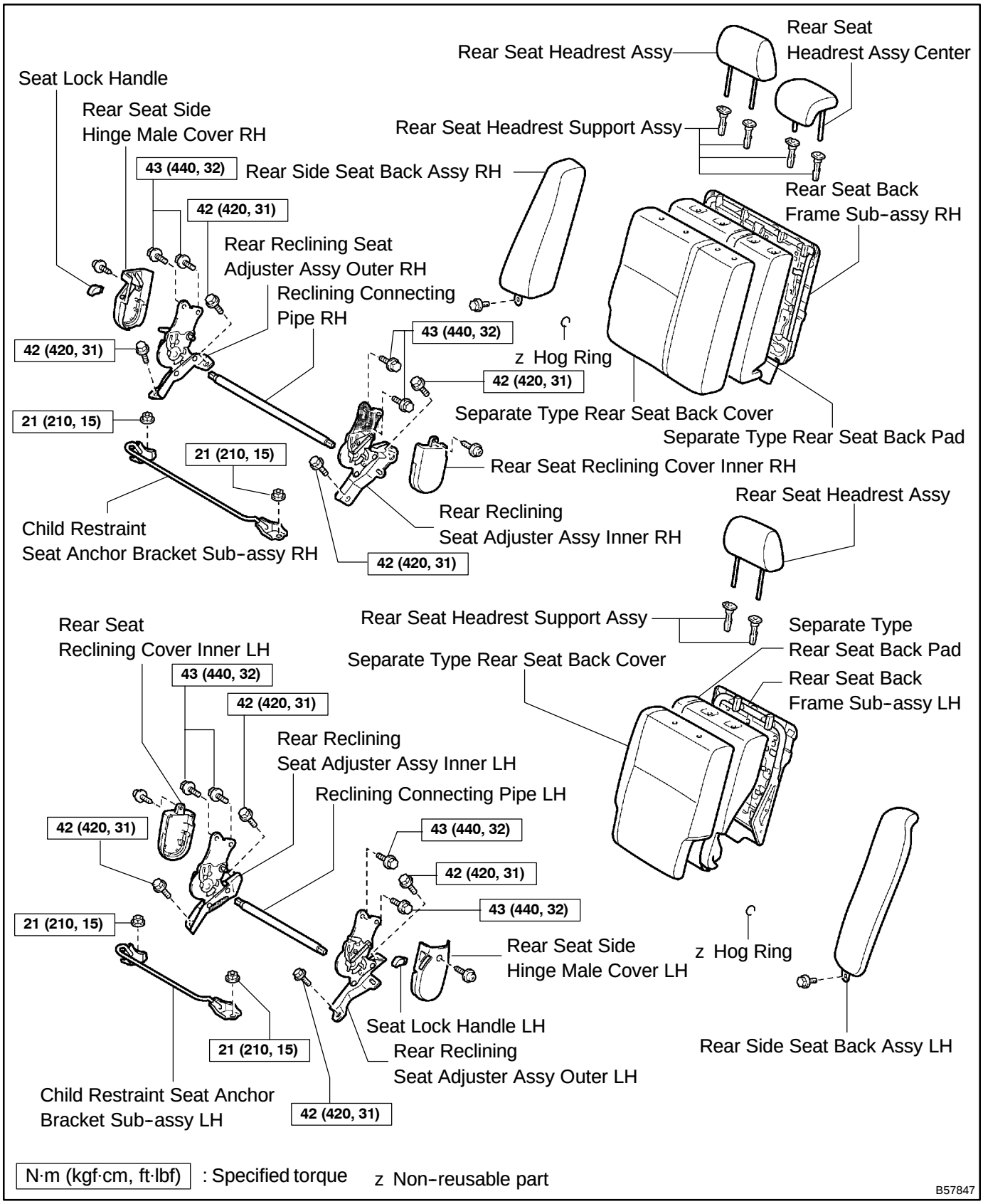
(a) Place the 3 hooks in the body firmly.
(b) Insert the frame into the hook.

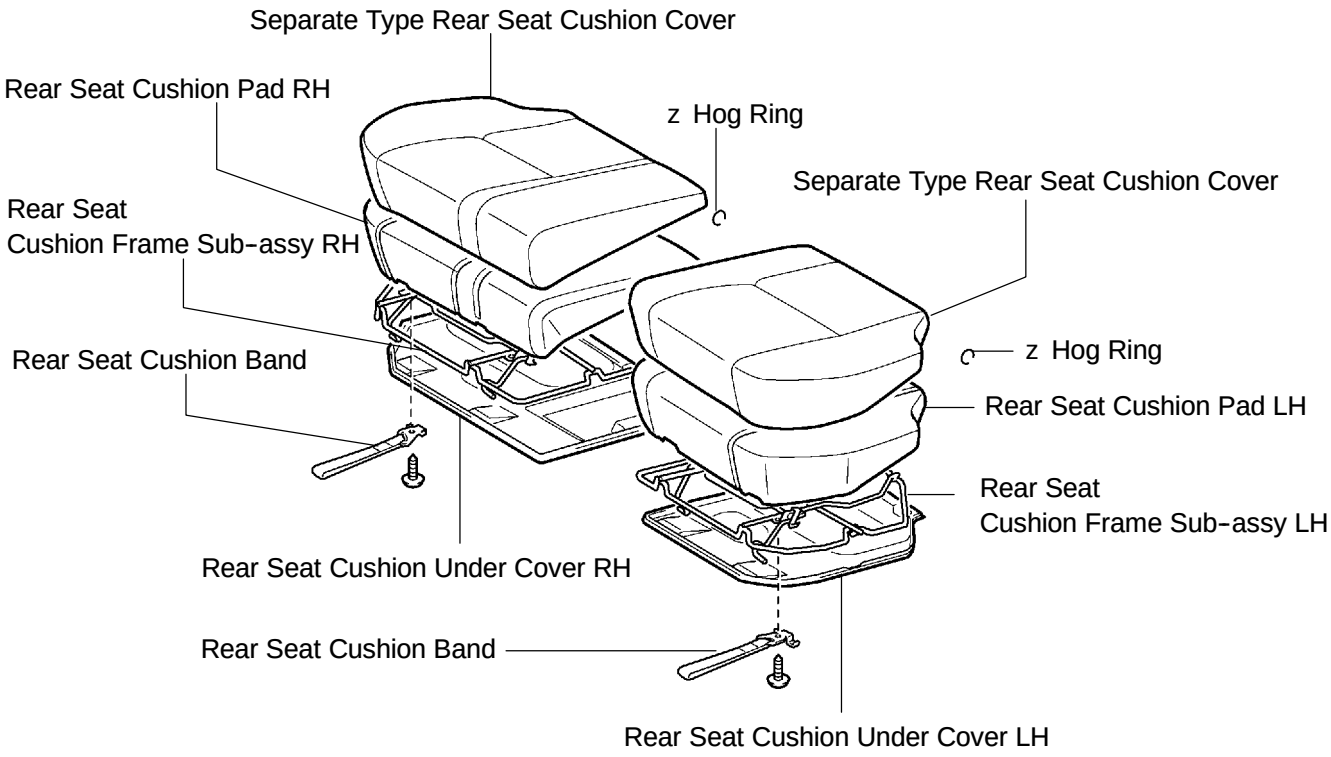
NOTICE:
Insert frame into wire for rear seat back assembly.

REAR SEAT ASSY (STATION WAGON)

COMPONENTS

7208X-01



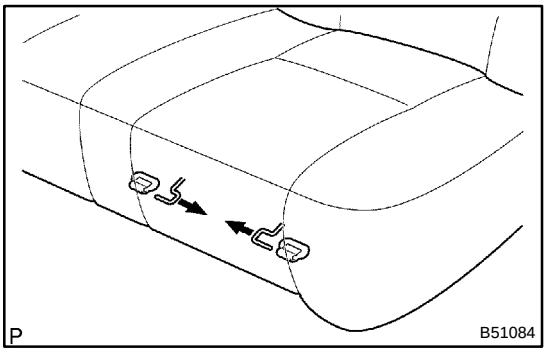


z Non-reusable part

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7208Y-01

OVERHAUL



1. REMOVE REAR SEAT CUSHION ASSY RH

(a) Remove the rear seat cushions by pulling the rear seats up and pushing the cushion wires of the installation part with the body in the inside direction.

2. REMOVE REAR SEAT CUSHION ASSY LH

3. REMOVE SEPARATE TYPE REAR SEAT CUSHION COVER

(a) Disengage the J-hook, remove the rear seat cushion cover with pad from the seat cushion frame.

(b) Remove the hog rings and seat back cover from the seat back pad.

4. REMOVE SEPARATE TYPE REAR SEAT CUSHION COVER

5. REMOVE REAR SEAT CUSHION FRAME SUB-ASSY RH

(a) Remove the rear seat cushion under cover RH.

6. REMOVE REAR SEAT CUSHION FRAME SUB-ASSY LH

7. REMOVE REAR SEAT CUSHION BAND

(a) Remove the screw and rear seat cushion band.

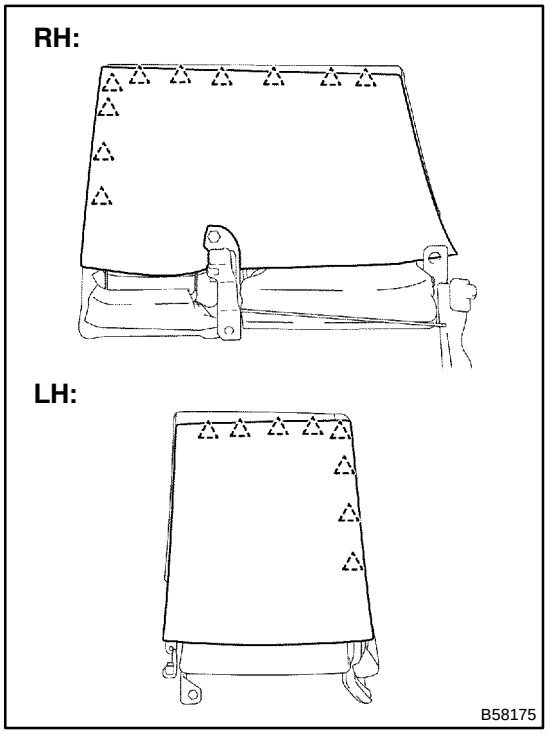
8. REMOVE REAR SEAT BACK ASSY RH

(a) Remove the 4 bolts and the rear seat back assembly RH.

9. REMOVE REAR SEAT BACK ASSY LH

10. REMOVE REAR SEAT HEADREST ASSY

11. REMOVE REAR SEAT HEADREST ASSY CENTER



12. REMOVE SEPARATE TYPE REAR SEAT BACK COVER

(a) Remove the hog rings.
(b) Disengage the clip, turn up rear seat back carpet.
(c) Remove the 4 headrest supports.
(d) Remove the rear seat back cover.

13. REMOVE SEPARATE TYPE REAR SEAT BACK COVER

14. REMOVE REAR SEAT SIDE HINGE MALE COVER RH

(a) Remove the screw and rear seat rear seat side hinge male cover RH.

15. REMOVE REAR SEAT SIDE HINGE MALE COVER LH

16. REMOVE REAR SEAT RECLINING COVER INNER RH

(a) Remove the screw and rear seat rear seat reclining cover inner RH.

17. REMOVE REAR SEAT RECLINING COVER INNER LH

18. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

(a) Remove the 2 nuts and child restraint seat anchor bracket RH.

19. REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH

20. REMOVE REAR RECLINING SEAT ADJUSTER ASSY OUTER RH

(a) Remove the 2 bolts and the rear reclining seat adjuster assembly outer RH.

21. REMOVE REAR RECLINING SEAT ADJUSTER ASSY OUTER LH

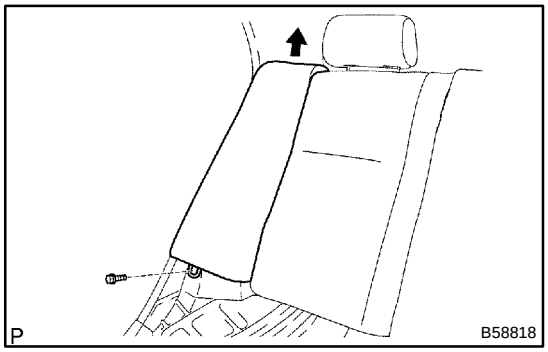
22. REMOVE RECLINING CONNECTING PIPE RH

23. REMOVE REAR RECLINING SEAT ADJUSTER ASSY INNER RH

(a) Remove the 3 bolts and the rear reclining seat adjuster assembly inner RH.

24. REMOVE REAR RECLINING SEAT ADJUSTER ASSY INNER LH

(a) Remove the 2 bolts and the rear reclining seat adjuster assembly inner LH.



25. REMOVE REAR SIDE SEAT BACK ASSY RH

(a) Remove the bolt and rear side seat back.

26. REMOVE REAR SIDE SEAT BACK ASSY LH

27. INSTALL REAR RECLINING SEAT ADJUSTER ASSY OUTER RH

(a) Install the rear reclining seat adjuster assy outer RH with the 2 bolts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

28. INSTALL REAR RECLINING SEAT ADJUSTER ASSY OUTER LH

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

29. INSTALL REAR RECLINING SEAT ADJUSTER ASSY INNER RH

(a) Install the reclining connecting pipe RH.
(b) Install the rear reclining seat adjuster assy inner RH with the 3 bolts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

30. INSTALL REAR RECLINING SEAT ADJUSTER ASSY INNER LH

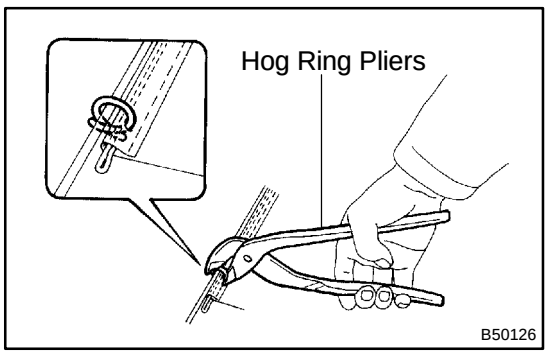
(a) Install the reclining connecting pipe LH.
(b) Install the rear reclining seat adjuster assy inner LH with the 2 bolts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

31. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY RH

(a) Install the child restraint seat anchor bracket RH with the 2 nuts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

32. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSY LH

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)



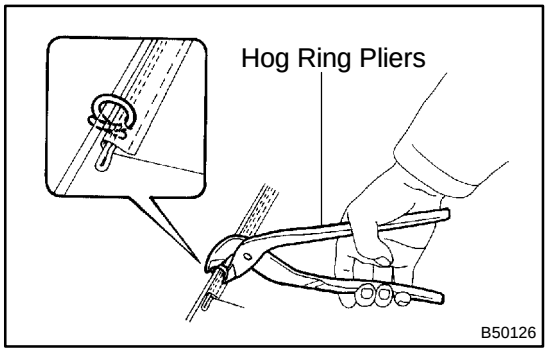
33. INSTALL SEPARATE TYPE REAR SEAT BACK COVER

(a) Install the seat back cover with the new hog rings to the seat back pad.
(b) Install the rear seat back cover with pad to the seat back frame with the new hog ring.

HINT:

- Do not damage the seat back cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as little as possible.

34. INSTALL SEPARATE TYPE REAR SEAT BACK COVER



35. INSTALL SEPARATE TYPE REAR SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the seat cushion pad.

(b) Install the rear seat cushion cover with pad to the seat cushion frame with new hog ring.

HINT:

- Do not damage the seat cushion cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as little as possible.

36. INSTALL SEPARATE TYPE REAR SEAT CUSHION COVER

37. INSTALL REAR SEAT BACK ASSY RH

(a) Set the outer bracket through the stud bolt on the body.

(b) Tighten the bolt on the rear inner side temporarily, and then tighten the bolt on the rear outer side tighten them completely.

Torque: 42 N·m (420 kgf·cm, 31 ft·lbf)

(c) Tighten the 2 bolts on the front side temporarily.

Torque: 42 N·m (420 kgf·cm, 31 ft·lbf)

38. INSTALL REAR SEAT BACK ASSY LH

Torque: 42 N·m (420 kgf·cm, 31 ft·lbf)

39. INSTALL REAR SIDE SEAT BACK ASSY RH

(a) Install the rear side seat back assembly RH with the bolt.

NOTICE:

Insert side seat hook into the hole of body.

40. INSTALL REAR SIDE SEAT BACK ASSY LH

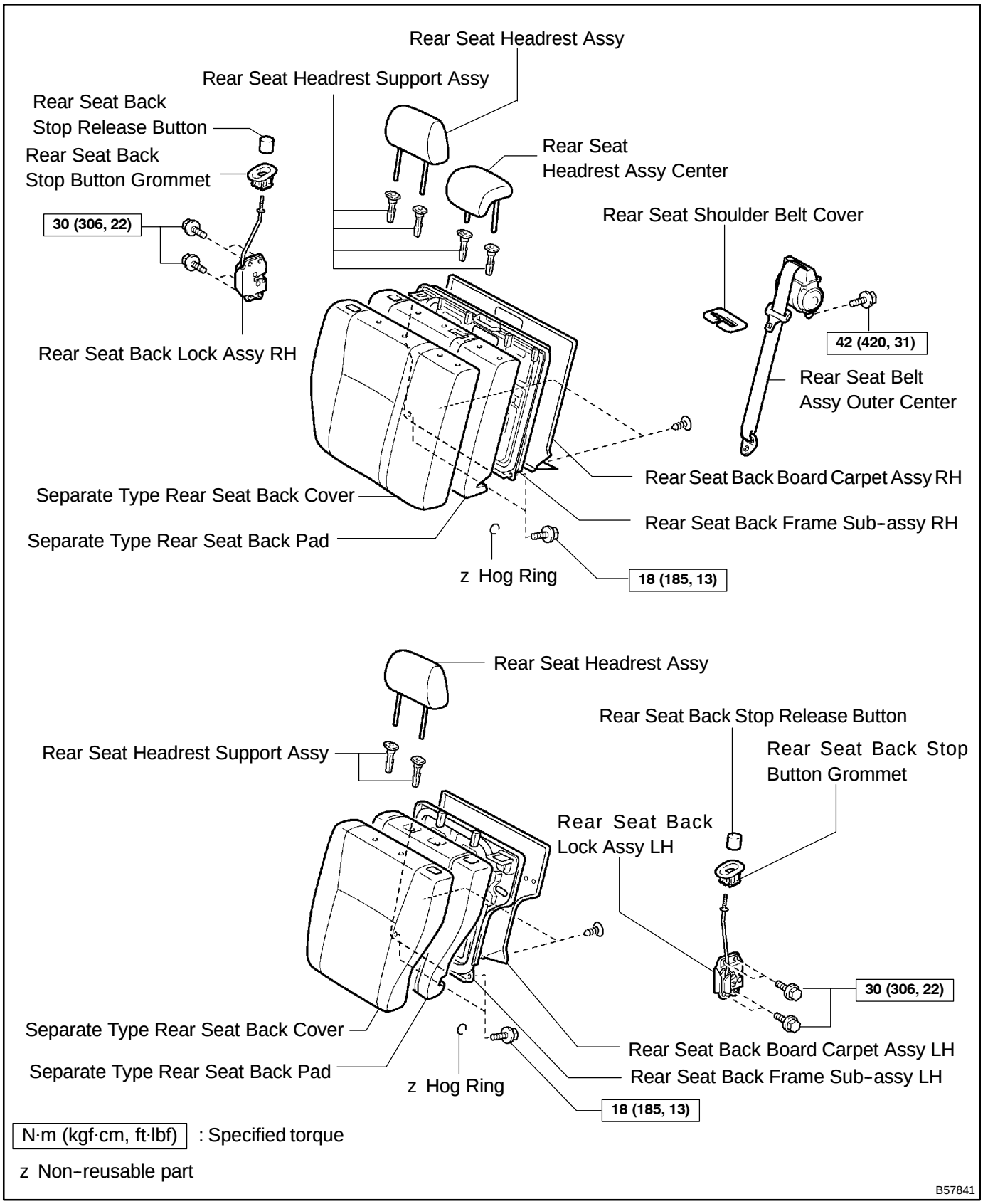
41. INSTALL REAR SEAT CUSHION ASSY RH

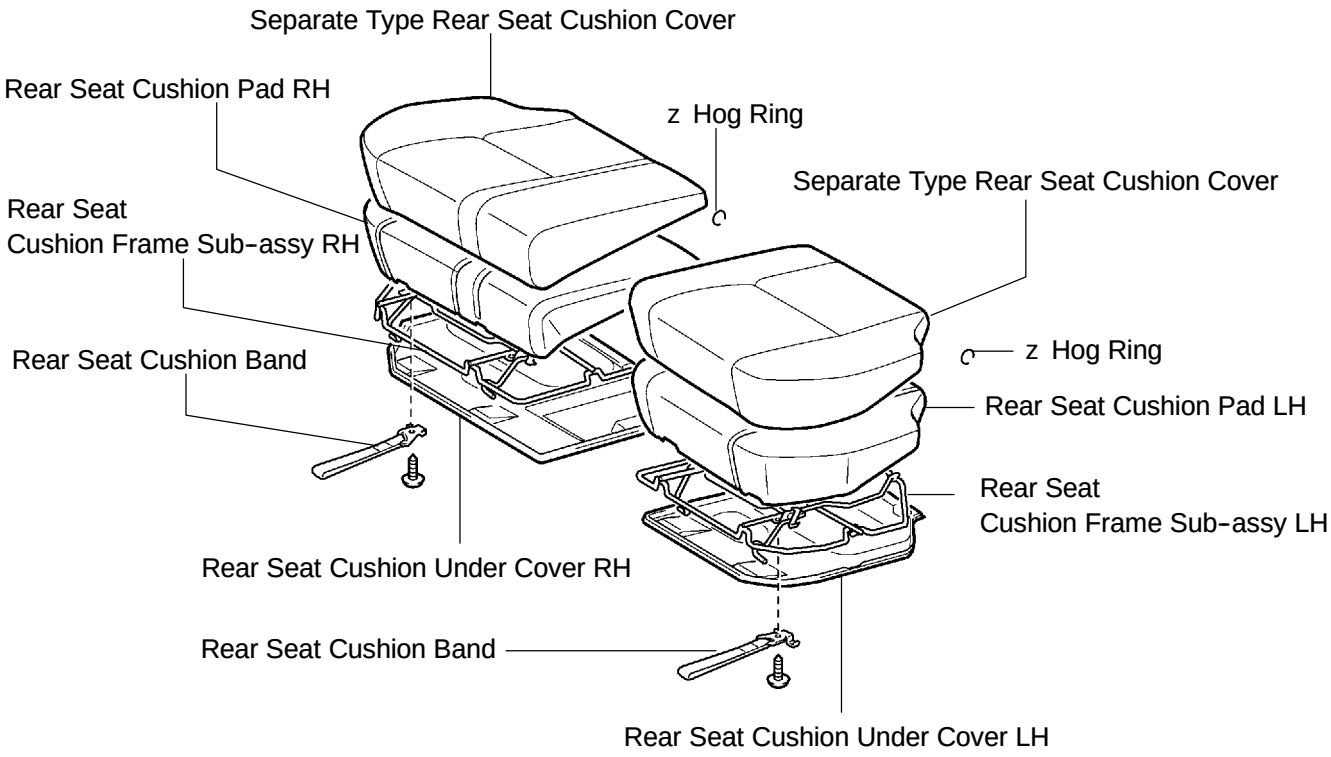
42. INSTALL REAR SEAT CUSHION ASSY LH

REAR SEAT ASSY (HATCHBACK)

COMPONENTS

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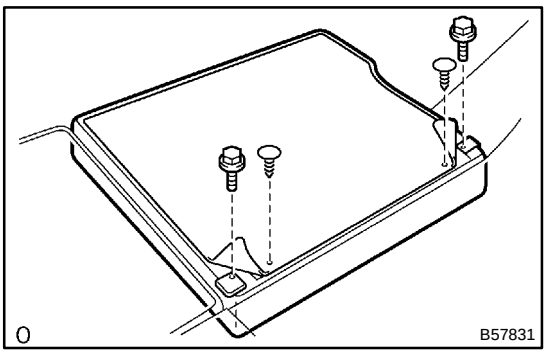


z Non-reusable part

B57839

OVERHAUL

1. REMOVE REAR SEAT CUSHION ASSY RH (See page 72-20)
2. REMOVE REAR SEAT CUSHION ASSY LH (See page 72-20)
3. REMOVE SEPARATE TYPE REAR SEAT CUSHION COVER (See page 72-20)
4. REMOVE SEPARATE TYPE REAR SEAT CUSHION COVER (See page 72-20)
5. REMOVE REAR SEAT CUSHION FRAME SUB-ASSY RH (See page 72-20)
6. REMOVE REAR SEAT CUSHION FRAME SUB-ASSY LH (See page 72-20)
7. REMOVE REAR SEAT CUSHION BAND RH (See page 72-20)
8. REMOVE REAR SEAT CUSHION BAND LH (See page 72-20)



9. REMOVE REAR SEAT BACK ASSY RH
(a) Using a clip remover, remove the 2 clips.
(b) Remove the 2 bolts and the rear seat back assembly RH.
10. REMOVE REAR SEAT BACK ASSY LH

11. REMOVE REAR SEAT HEADREST ASSY

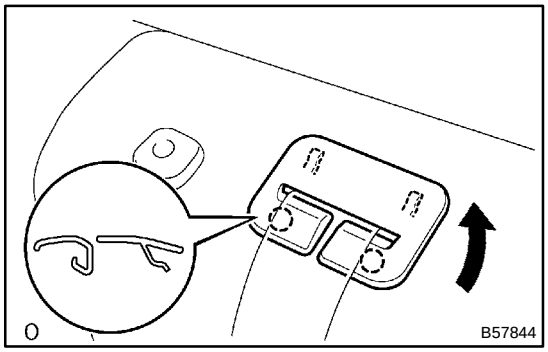
12. REMOVE REAR SEAT HEADREST ASSY CENTER

13. REMOVE REAR SEAT BACK STOP BUTTON GROMMET

(a) Using a screwdriver, remove the rear seat back stop button grommet.

HINT:
Tape the screwdriver tip before use.

14. REMOVE REAR SEAT BACK STOP BUTTON GROMMET



15. REMOVE REAR SEAT SHOULDER BELT COVER

(a) Disengage the hook, remove the rear seat shoulder belt cover from the seat belt.

16. REMOVE SEPARATE TYPE REAR SEAT BACK COVER

(a) Disengage the back cover side J-hook.
(b) Remove the 4 headrest supports.
(c) Remove the hog rings and separate type rear seat back cover.

17. REMOVE SEPARATE TYPE REAR SEAT BACK COVER

18. REMOVE REAR SEAT BACK FRAME SUB-ASSY RH

19. REMOVE REAR SEAT BACK FRAME SUB-ASSY LH

20. REMOVE REAR SEAT BELT ASSY OUTER CENTER
(See page 61-28)

21. REMOVE REAR SEAT BACK LOCK ASSY RH

(a) Remove the seat back stop release button.
(b) Remove the 2 bolts and the rear seat back lock assembly RH.

22. REMOVE REAR SEAT BACK LOCK ASSY LH

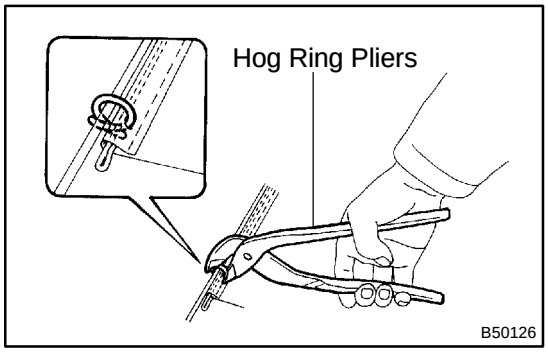
23. INSTALL REAR SEAT BACK LOCK ASSY RH

(a) Install the rear seat back lock assembly RH with the 2 bolts.
Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

24. INSTALL REAR SEAT BACK LOCK ASSY LH

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

25. INSTALL REAR SEAT BELT ASSY OUTER CENTER
(See page 61-29)

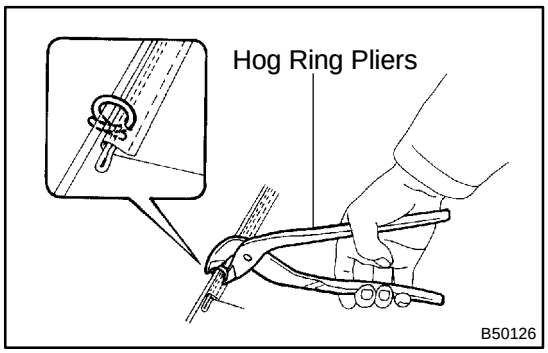


26. INSTALL SEPARATE TYPE REAR SEAT BACK COVER

(a) Install the seat back cover with new hog rings to the seat cushion pad.
(b) Install the rear seat back cover with new hog rings to the rear seat back pad.

HINT:
- Do not damage the seat back cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

27. INSTALL SEPARATE TYPE REAR SEAT BACK COVER



28. INSTALL SEPARATE TYPE REAR SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the seat cushion pad.
(b) Install the rear seat cushion cover with new hog rings to the rear seat cushion pad.

HINT:
- Do not damage the seat cushion cover nor make it dirty.
- When installing the hog rings, take care to prevent wrinkles as much as possible.

29. INSTALL SEPARATE TYPE REAR SEAT CUSHION COVER

30. INSTALL REAR SEAT BACK ASSY RH

(a) Install the rear seat back assembly RH with the 2 bolts.
(b) Tighten the bolts securely in the order of center hinge side-outer hinge side.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

31. INSTALL REAR SEAT BACK ASSY LH
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

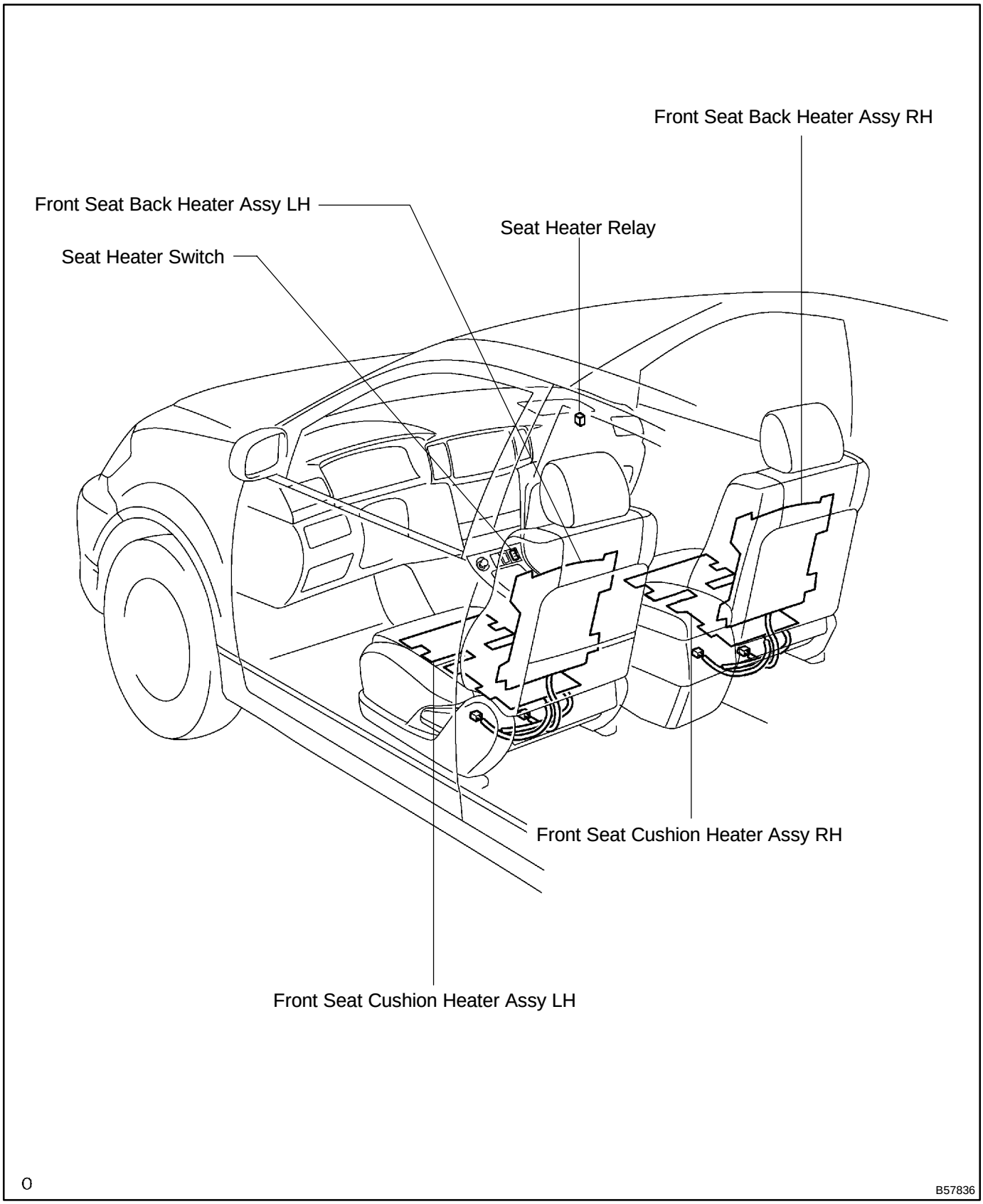
32. INSTALL REAR SEAT CUSHION ASSY RH

33. INSTALL REAR SEAT CUSHION ASSY LH

SEAT HEATER SYSTEM

LOCATION

72091-01

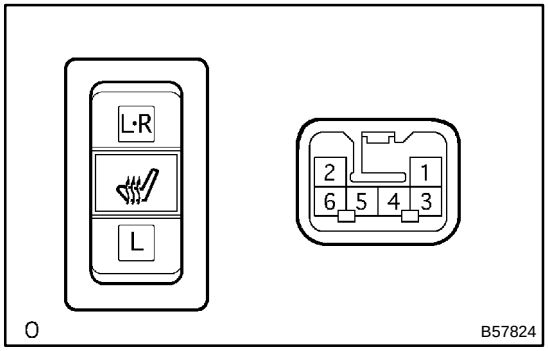


72092-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Seat heaters do not operate	1. DOOR DL / S-HTR fuse	68-1
	2. Seat heater relay	72-31
	3. Front seat cushion heater assembly LH	72-31
	4. Front seat cushion heater assembly RH	72-31
	5. Front seat back heater assembly LH	72-31
	6. Front seat back heater assembly RH	72-31
	7. Seat heater switch	72-31
	8. Wire harness	

INSPECTION



1. INSPECT SEAT HEATER SWITCH

(a) Inspect the seat heater switch continuity.

Condition	Tester connection	Specified condition
L R	2 - 3 - 4 4 - 6	Continuity
L	3 - 4 4 - 6	Continuity
Illumination	1 - 5	Continuity (always)

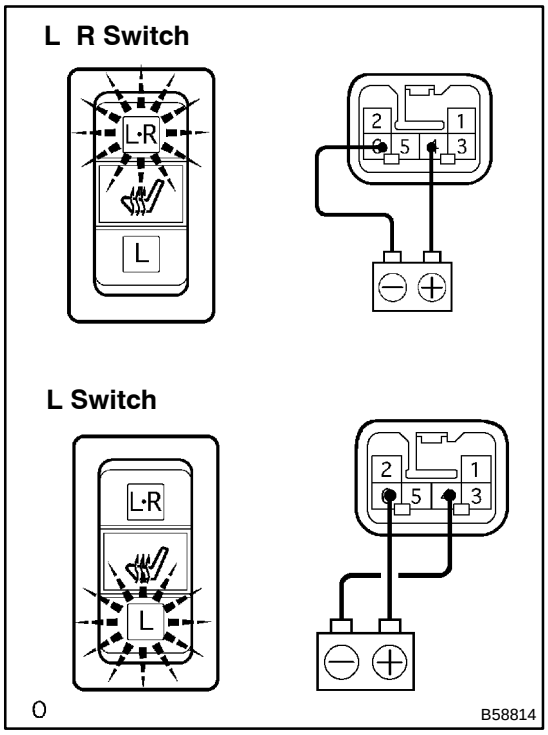
If continuity is not as specified, replace the switch.

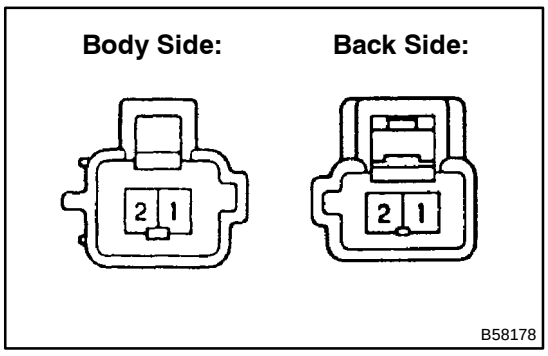
(b) Inspect the swat heater indicator light operation.

(1) Connect the possitive (+) lead from the battery to terminal 4 and the negatove (-) lead to terminl 6.

(2) Push the seat heater switch L R or L and check that the indicator light lights up.

If operation is not as specified, replace the switch and inspect the circuits connected to other parts.

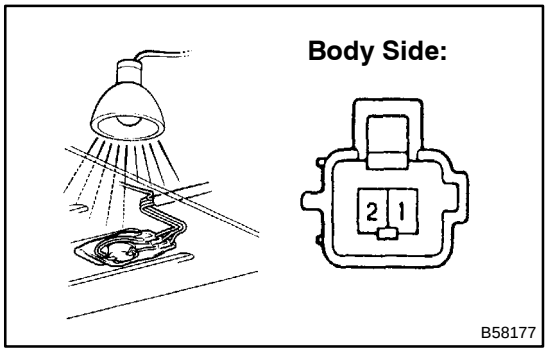




2. INSPECT FRONT SEAT CUSHION HEATER ASSY LH

(a) Inspect the seat cushion heater assembly LH continuity.

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity

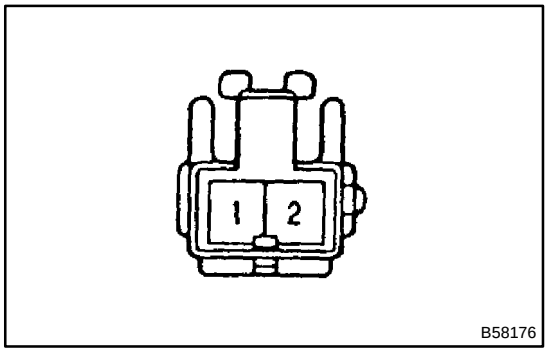


(b) Inspect the seat cushion thermostat continuity.
(1) Disconnect the seat cushion heater from the seat cushion heater.
(2) Heat the thermostat with a light.
(3) Inspect the seat cushion heater continuity between terminals, as shown.

Tester connection	Condition	Specified condition
1 - 2	Seat heater temp. below 25 - 35_C (77 - 95_F)	Continuity
	Seat heater temp. 36 - 44_C (97 - 111_F)	No continuity

If continuity is not as specified, replace the seat cushion heater.

3. INSPECT FRONT SEAT CUSHION HEATER ASSY RH



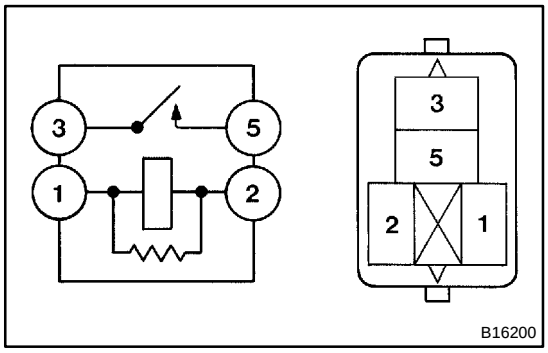
4. INSPECT FRONT SEAT BACK HEATER ASSY LH

(a) Inspect the seat back heater assembly LH continuity.

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity

If continuity is not as specified, replace the seat back heater.

5. INSPECT FRONT SEAT BACK HEATER ASSY RH



6. INSPECT SEAT HEATER RELAY

(a) Inspect the seat heater relay continuity.

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Applay B + between terminals 1 and 2	3 - 5	Continuity

If continuity is not as specified, replace the relay.

THEFT DETERRENT & DOOR LOCK

POWER DOOR LOCK
CONTROL SYSTEM 73-1
ON-VEHICLE INSPECTION 73-1/2
INSPECTION 73-3/15
WIRELESS DOOR LOCK
CONTROL SYSTEM 73-16
ON-VEHICLE INSPECTION 73-16/17
TRANSMITTER BATTERY (TMC MADE) 73-18
REPLACEMENT 73-18
TRANSMITTER BATTERY
(TMUK MADE) 73-19
REPLACEMENT 73-19
TRANSMITTER SUB-ASSY
MODULE SET DOOR CONTROL 73-20
REPLACEMENT 73-20/23
THEFT DETERRENT SYSTEM
(TMUK MADE) 73-24
ON-VEHICLE INSPECTION 73-24/28

POWER DOOR LOCK CONTROL SYSTEM

7309W-01

ON-VEHICLE INSPECTION

1. INSPECT FOR ELECTRICAL DOOR LOCK OPERATION

(a) Check the basic function.

(1) Check that all doors will lock when the door control switch (for manual operation) is turned to the lock side and all doors will unlock when turned to the unlock side.

(2) Check all doors will lock when the driver's door is operated to be lock and all doors will unlock when operated to be unlock, by the key operation outside the vehicle.

(b) Check the key confinement prevention function.

NOTICE:

In order to prevent the key from being confined, the inspection should be made with the driver's door glass open.

(1) Insert the ignition key into the ignition key cylinder.

(2) With the driver's door open, check all doors will immediately unlock when the door lock knob for the driver's door is turned to the lock side.

(3) With the driver's door open, check all doors will immediately unlock when the door control switch (for manual operation) is turned to the lock side.

(4) With the driver's door open, lock the driver's door by holding the driver's door lock knob in the lock side for 2 seconds or more and then close the driver's door, then check that all doors will unlock.

(c) Check the security function.

(1) Close all doors with the driver's door glass open so that the door control switch can be operated outside the vehicle

(2) Pull out the ignition key, open the driver's door, and close and lock the door without a key operation. Under this condition, check that all doors will not unlock when the door control switch (for manual operation) is turned to the unlock outside the vehicle.

(3) Pull out the ignition key, close and lock the driver's door by the key operation. Under this condition, check that all doors will not unlock when the door control switch (for manual operation) is turned to the unlock outside the vehicle.

(4) Pull out the ignition key, close the driver's door and lock the door by the wireless door lock operation. Under this condition, check that all doors will not unlock when the door control switch (for manual operation) is turned to the unlock outside the vehicle.

HINT:

Under the conditions below, check that the security function will cancel.

- Ignition switch turned ON.
- Driver's door unlocked by the key operation.
- Door control switch (for manual operation) turned to the unlock side after unlocking the door control knob manually.
- Doors unlocked by the wireless operation (w/ wireless door lock models).

(d) Check the illumination function.

(1) Set the map light switch in the DOOR position.

(2) Check that the map light will be on simultaneously with all doors' unlocking operation when only the driver's door out of all the locking doors is turned unlock by the key operation.

(3) Map light will be off in approximately 15 seconds if a door has not been opened for a while.

2. INSPECT DOUBLE LOCKING SYSTEM FUNCTION

HINT:

- In case of performing the following inspection, one of the door windows must be opened.
- In order to set the double locking, turn the ignition switch ON to OFF, open the driver's door and close it, then lock the door with the transmitter.

(a) Check that the double locking is set.
  (1) Lock the doors with the wireless transmitter from the inside of the vehicle.
  (2) Check that the doors will not open from the inside of the vehicle even operating the door lock knob and inside door handle

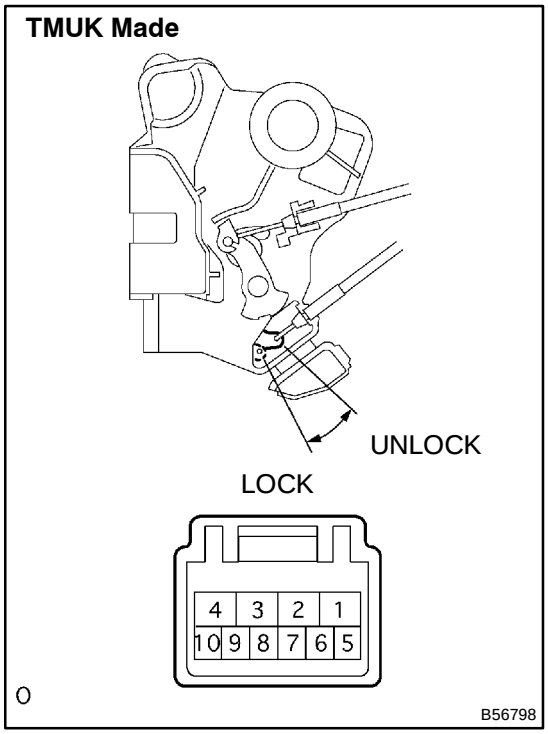
(b) Check that the double locking is released (Case 1).
  (1) Unlock with the wireless transmitter from the inside of the vehicle.
  (2) Check the doors that the doors will open from the inside of the vehicle by operating the door lock knob and inside door handle.

(c) Check that the double locking is released (Case 2).
  (1) Lock the doors with the wireless transmitter from the inside of the vehicle.
  (2) Under this condition, insert the key into the ignition key cylinder, turn the ignition switch to ON and check that the doors will open.

If you find any abnormal symptom in the check items of (a),(b) and (c), perform a troubleshooting according to the Problem Symptom Table (See page 05–1365).

7309X-01

INSPECTION



1. INSPECT DRIVER'S DOOR LOCK

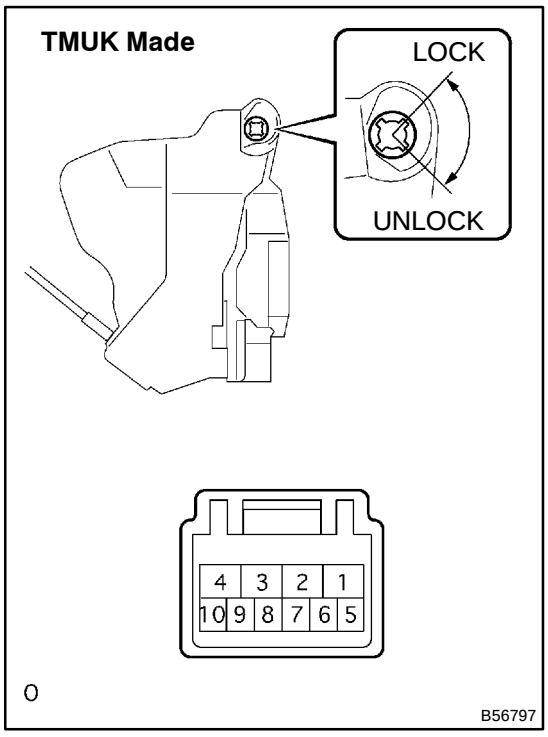
(a) Inspect the door lock motor operation.

[TMUK made (w/o double lock)]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 4 Battery negative (-)- Terminal - 1	Lock
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 4	Unlock

If the operation is not as specified, replace the door lock assembly.



(b) Inspect the door lock and unlock switch continuity.

[TMUK made LHD models]

Standard:

Door lock position	Tester connection	Specified condition
Lock	9 ⇔ 7	Continuity
OFF	-	-
Unlock	10 ⇔ 7	Continuity

[TMUK made RHD models (w/o double lock)]

Standard:

Door lock position	Tester connection	Specified condition
Lock	6 ⇔ 8	Continuity
OFF	-	-
Unlock	5 ⇔ 8	Continuity

If the operation is not as specified, replace the door lock assembly.

(c) Inspect the position switch continuity.

[TMUK made LHD models]

Standard:

Door lock position	Tester connection	Specified condition
Lock	8 ⇔ 7	No continuity
OFF	-	-
Unlock	8 ⇔ 7	Continuity

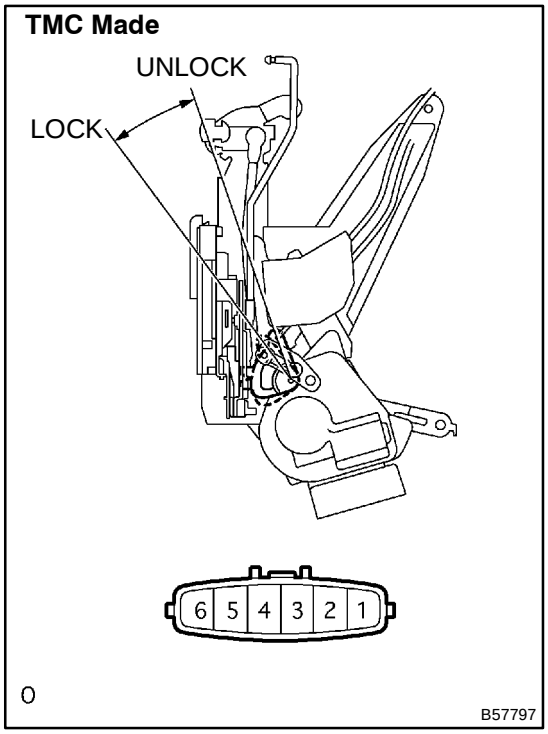
[TMUK made RHD models (w/o double lock)]

Standard:

Door lock position	Tester connection	Specified condition
Lock	7 ⇔ 8	No continuity
OFF	-	-
Unlock	7 ⇔ 8	Continuity

If the operation is not as specified, replace the door lock assembly.

TMC Made



(d) Inspect the door lock motor operation.

[TMC made LHD models]

Standard:

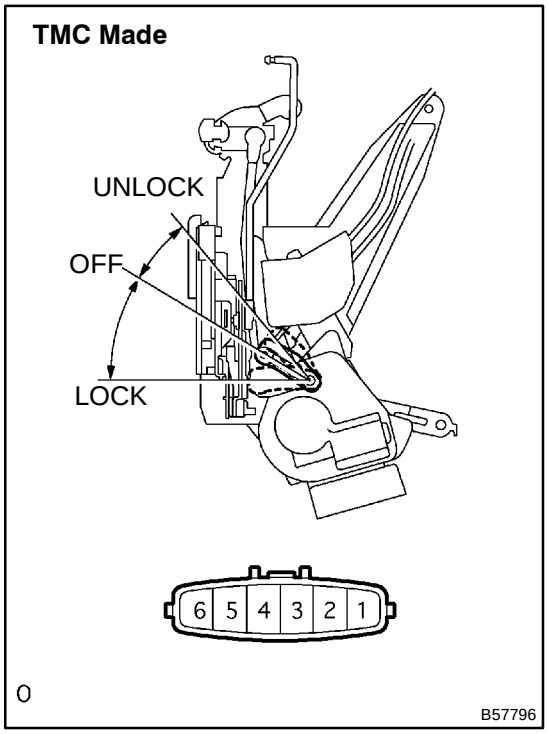
Measuring condition	Operation
Battery positive (+) Terminal - 5 Battery negative (-) Terminal - 6	LOCK
Battery positive (+) Terminal - 6 Battery negative (-) Terminal - 5	UNLOCK

[TMC made RHD models (w/o double lock)]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 2	LOCK
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 1	UNLOCK

If the operation is not as specified, replace the door lock assembly.



(e) Inspect the lock and unlock position switch continuity.

[TMC made LHD models]

Standard:

Switch position	Tester connection	Specified condition
Lock	4 ⇔ 2	Continuity
OFF	-	-
Unlock	3 ⇔ 2	Continuity

[TMC made RHD models (w/o double lock)]

Standard:

Switch position	Tester connection	Specified condition
LOCK	3 ⇔ 5	Continuity
OFF	-	-
UNLOCK	4 ⇔ 5	Continuity

If the operation is not as specified, replace the door lock assembly.

(f) Inspect the position switch continuity.

[TMC made LHD models]

Standard:

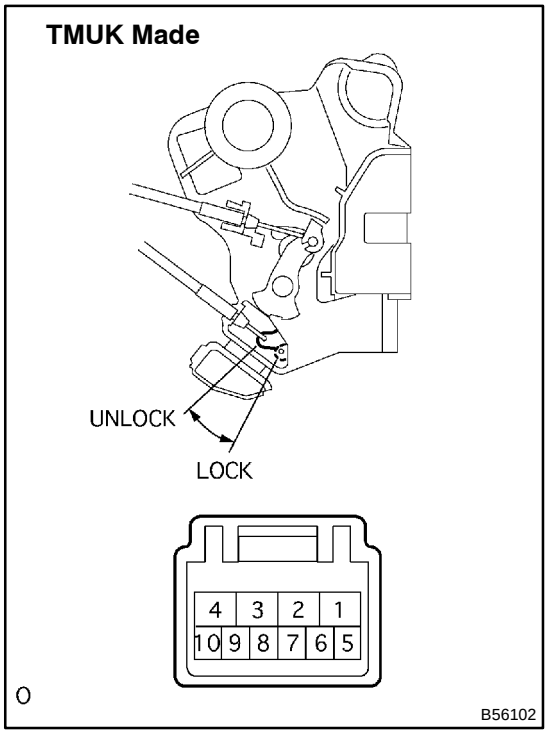
Door lock position	Tester connection	Specified condition
Lock	1 ⇔ 2	No continuity
OFF	-	-
Unlock	1 ⇔ 2	Continuity

[TMC made RHD models (w/o double lock)]

Standard:

Door lock position	Tester connection	Specified condition
Lock	6 ⇔ 5	No continuity
OFF	-	-
Unlock	6 ⇔ 5	Continuity

If the operation is not as specified, replace the door lock assembly.



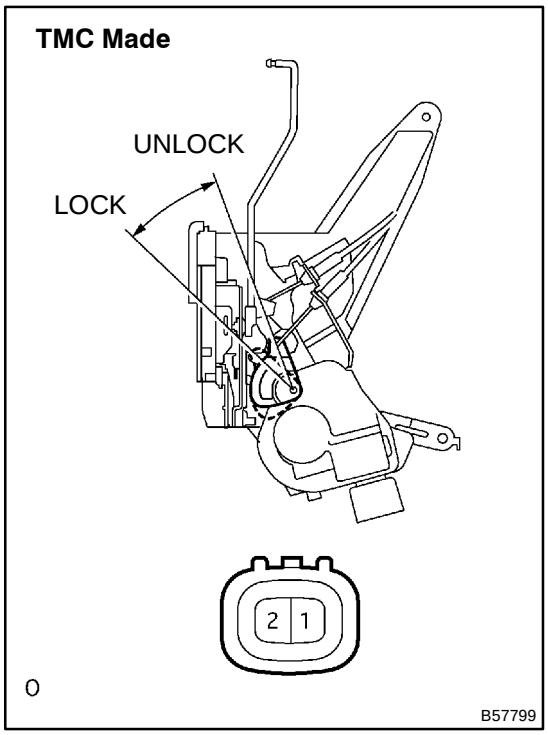
2. INSPECT PASSENGER'S DOOR LOCK

(a) Inspect the door lock motor operation.

[TMUK made (w/o double lock)]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 4 Battery negative (-) Terminal - 1	Lock
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 4	Unlock

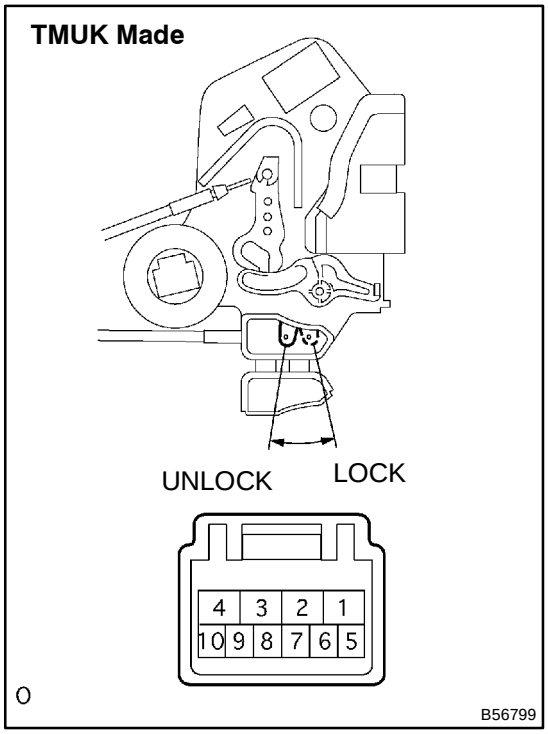


[TMC made (w/o double lock)]

Standard:

Measuring condition	Operation
Battery positive (+) - Terminal - 1 Battery negative (-) - Terminal - 2	Lock
Battery positive (+) - Terminal - 2 Battery negative (-) - Terminal - 1	Unlock

If the operation is not as specified, replace the door lock assembly.



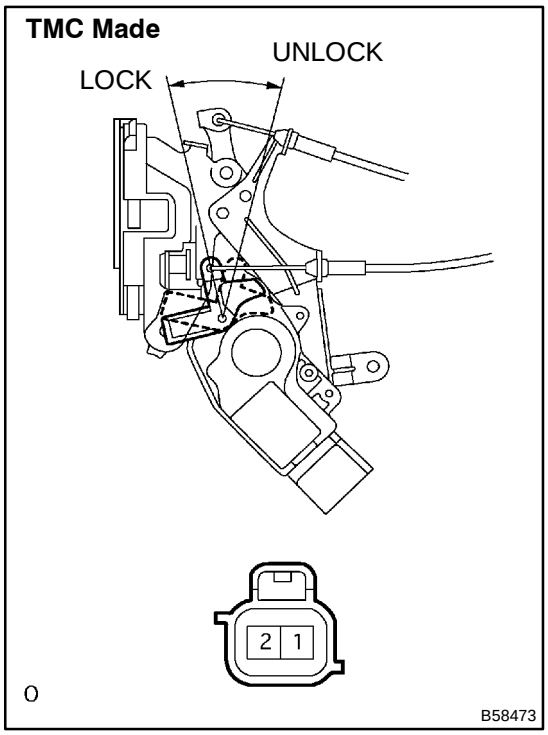
3. INSPECT REAR DOOR LOCK ASSY RH

(a) Inspect the door lock motor operation.

[TMUK made models (w/o double lock)]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 4 Battery negative (-) Terminal - 1	Lock
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 4	Unlock

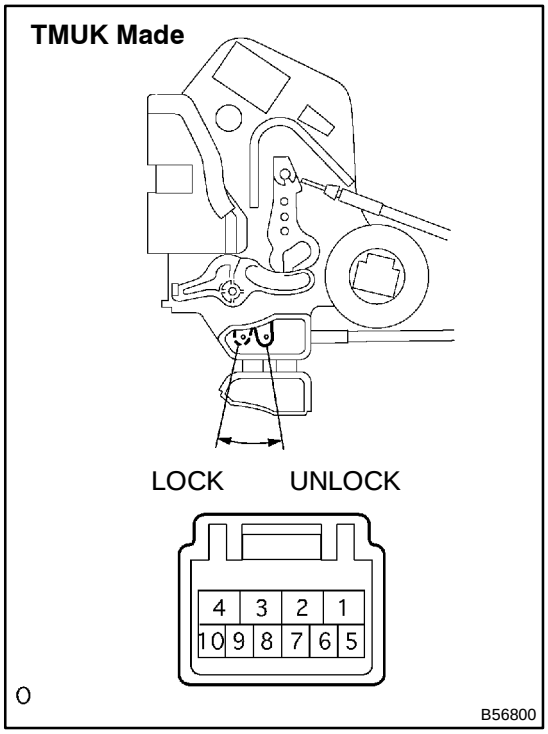


[TMC made (w/o double lock)]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 2	Lock
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 1	Unlock

If the operation is not as specified, replace the door lock assembly.

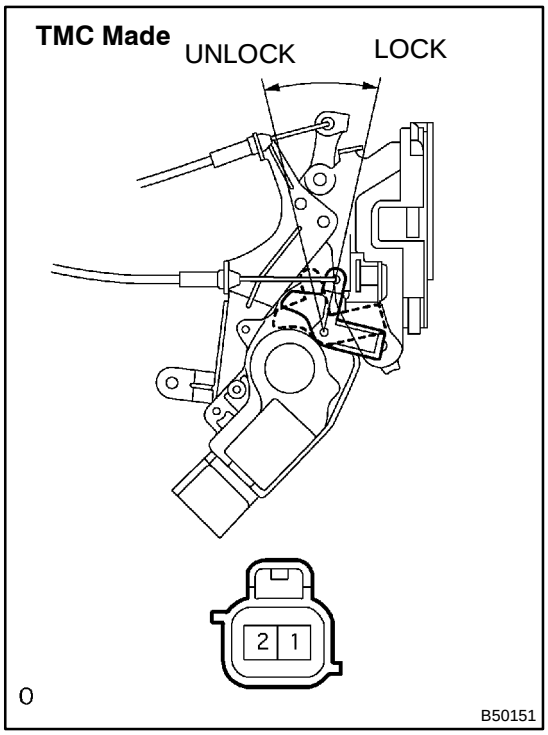


4. INSPECT REAR DOOR LOCK ASSY LH

(a) Inspect the door lock motor operation.
[TMUK made models (w/o double lock)]
Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 4 Battery negative (-) Terminal - 1	Lock
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 4	Unlock

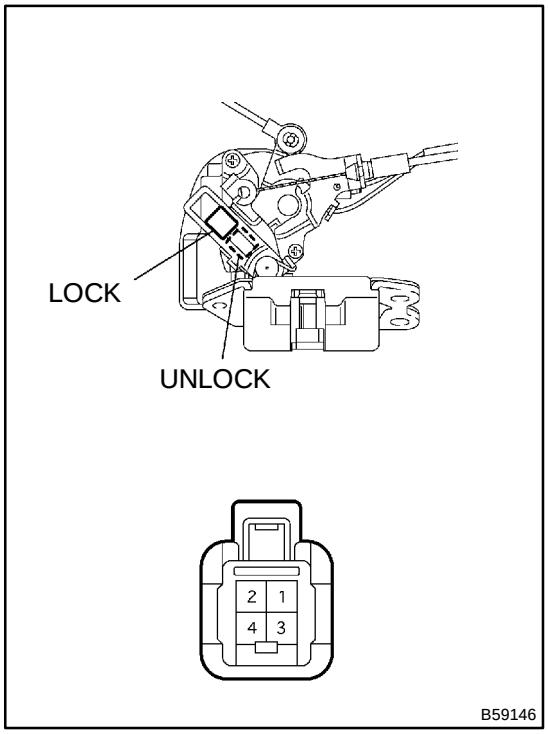
If the operation is not as specified, replace the door lock assembly.



(b) Inspect the door lock motor operation.
[TMC made (w/o double lock)]
Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 2	Lock
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 1	Unlock

If the operation is not as specified, replace the door lock assembly.



5. INSPECT BACK DOOR LOCK ASSY

(a) Inspect the door lock motor operation.

Standard:

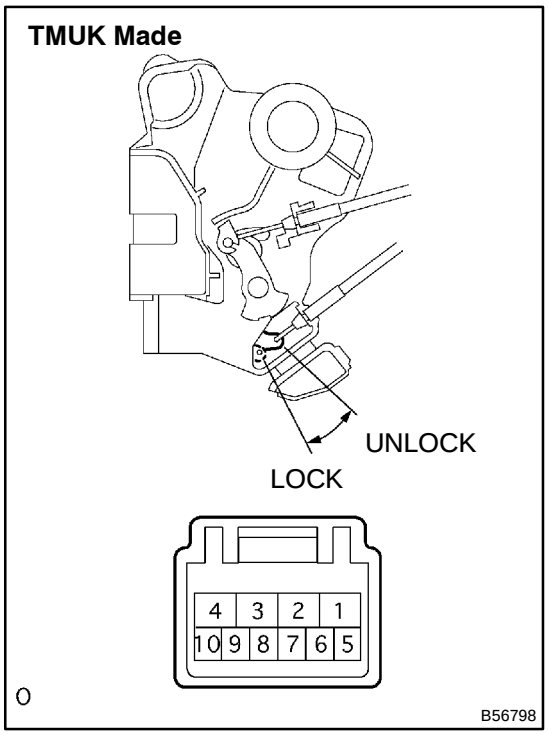
Measuring condition	Operation
Battery positive (+) Terminal - 4 Battery negative (-) Terminal - 3	Lock
Battery positive (+) Terminal - 3 Battery negative (-) Terminal - 4	Unlock

If the operation is not as specified, replace the door lock assembly.

(b) Inspect the back door courtesy switch.

Door lock atchet position	Specified condition
Open or Half Lock	Continuity
Closed	No continuity

If the operation is not as specified, replace the door lock assembly.



6. INSPECT DRIVER'S DOOR LOCK(W/ DOUBLE DOOR LOCK)

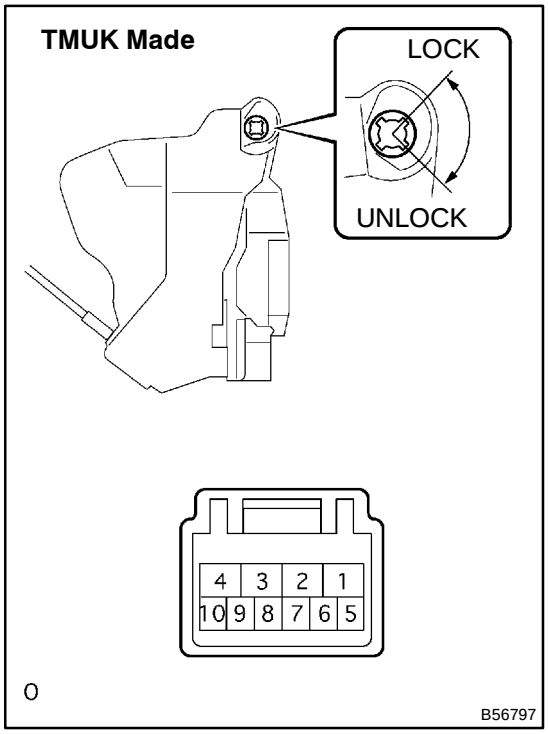
(a) Inspect the door lock motor operation.

[TMUK made]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 1	Lock
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 2	Unlock

If the operation is not as specified, replace the door lock assembly.



(b) Inspect the door lock and unlock switch continuity.

[TMUK made]

Standard:

Door lock position	Tester connection	Specified condition
Lock	6 ⇔ 8	Continuity
OFF	-	-
Unlock	5 ⇔ 8	Continuity

If the operation is not as specified, replace the door lock assembly.

(c) Inspect the position switch continuity.

[TMUK made]

Standard:

Door lock position	Tester connection	Specified condition
Lock	7 ⇔ 8	No continuity
OFF	-	-
Unlock	7 ⇔ 8	Continuity

If the operation is not as specified, replace the door lock assembly.

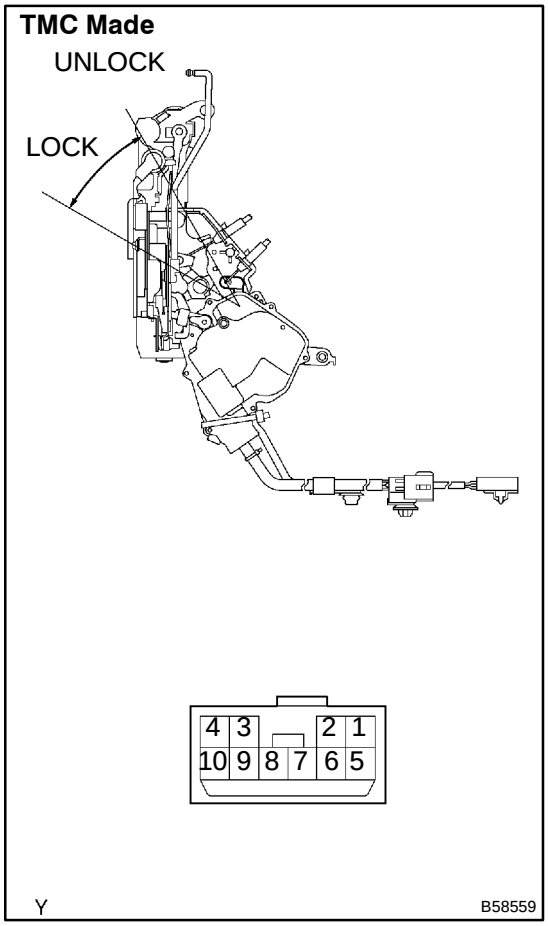
(d) Inspect the double lock position switch continuity.

[TMUK made]

Standard:

Double door lock position	Tester connection	Specified condition
Lock	9 ⇔ 10	Continuity
OFF	-	-
Unlock	9 ⇔ 10	No continuity

If the operation is not as specified, replace the door lock assembly.



(e) Inspect the door lock motor operation.

[TMC made]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 3	Lock
Battery positive (+) Terminal - 3 Battery negative (-) Terminal - 2	Unlock

If the operation is not as specified, replace the door lock assembly.

(f) Inspect the door lock switch continuity.

[TMC made]

Standard:

Door lock position	Tester connection	Specified condition
Lock	10 ⇔ 4	Continuity

If the operation is not as specified, replace the door lock assembly.

(g) Inspect the position switch continuity.

[TMC made]

Standard:

Door lock position	Tester connection	Specified condition
Lock	6 ⇔ 1	No continuity
OFF	-	-
Unlock	6 ⇔ 1	Continuity

If the operation is not as specified, replace the door lock assembly.

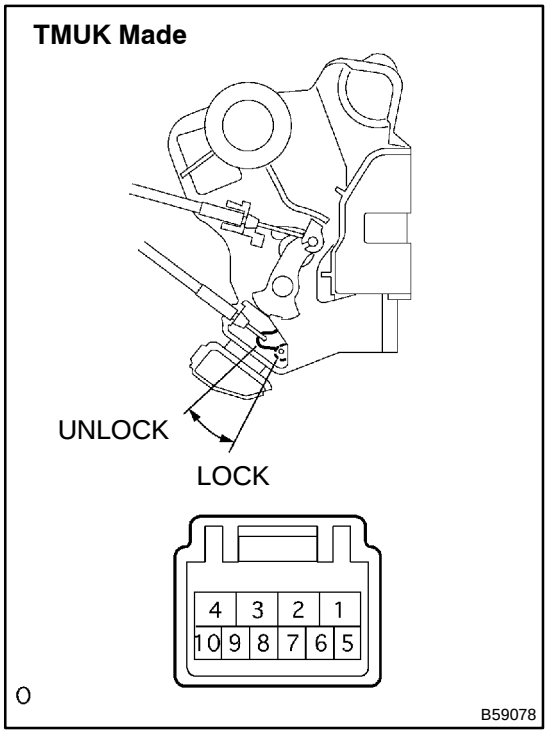
(h) Inspect the double lock position switch continuity.

[TMC made]

Standard:

Double door lock position	Tester connection	Specified condition
Lock	5 ⇔ 8	Continuity
OFF	-	-
Unlock	5 ⇔ 8	No continuity

If the operation is not as specified, replace the door lock assembly.



7. INSPECT PASSENGER'S DOOR LOCK(W/ DOUBLE DOOR LOCK)

(a) Inspect the door lock motor operation.

[TMUK made]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 4 Battery negative (-) Terminal - 3	Lock
Battery positive (+) Terminal - 3 Battery negative (-) Terminal - 4	Unlock

If the operation is not as specified, replace the door lock assembly.

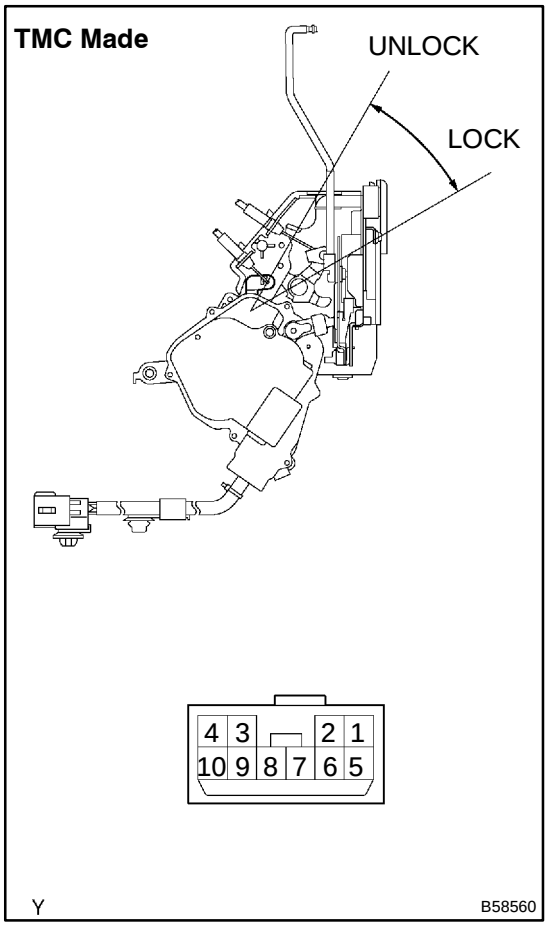
(b) Inspect the double lock position switch continuity.

[TMUK made]

Standard:

Double door lock position	Tester connection	Specified condition
Lock	6 ⇔ 5	Continuity
OFF	-	-
Unlock	6 ⇔ 5	No continuity

If the operation is not as specified, replace the door lock assembly.



(c) Inspect the door lock motor operation.

[TMC made]

Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 3	Lock
Battery positive (+) Terminal - 3 Battery negative (-) Terminal - 2	Unlock

If operation is not as specified, replace the door lock assembly.

(d) Inspect the double lock position switch continuity.

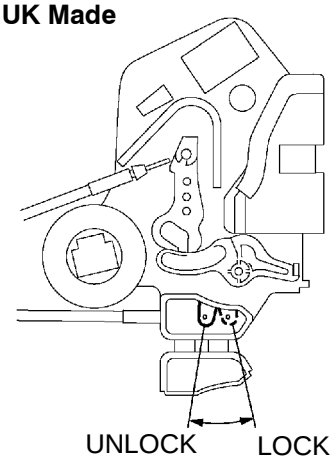
[TMC made]

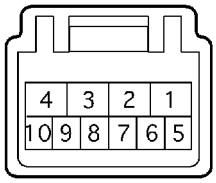
Standard:

Double door lock position	Tester connection	Specified condition
Lock	5 ⇔ 8	Continuity
OFF	-	-
Unlock	5 ⇔ 8	No continuity

If the operation is not as specified, replace the door lock assembly.

TMUK Made





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B56799

8. INSPECT REAR DOOR LOCK ASSY RH(W/ DOUBLE DOOR LOCK)

(a) Inspect the door lock motor operation.
[TMUK made]
Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 4 Battery negative (-) Terminal - 3	Lock
Battery positive (+) Terminal - 3 Battery negative (-) Terminal - 4	Unlock

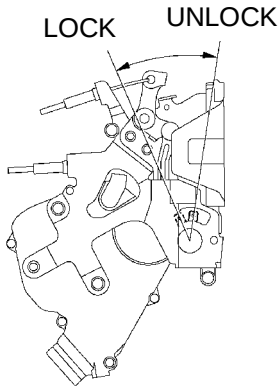
If the operation is not as specified, replace the door lock assembly.

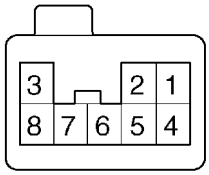
(b) Inspect the double lock position switch continuity.
[TMUK made]
Standard:

Double door lock position	Tester connection	Specified condition
Lock	5 ⇔ 6	Continuity
OFF	-	-
Unlock	5 ⇔ 6	No continuity

If the operation is not as specified, replace the door lock assembly.

TMC Made





B58561

(c) Inspect the door lock motor operation.
[TMC made]
Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 3	Lock
Battery positive (+) Terminal - 3 Battery negative (-) Terminal - 2	Unlock

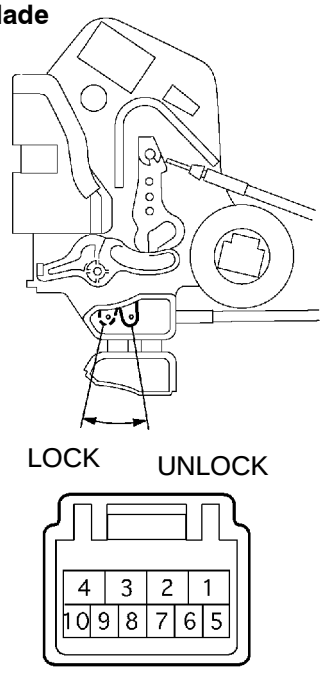
If the operation is not as specified, replace the door lock assembly.

(d) Inspect the double lock position switch continuity.
[TMC made]
Standard:

Double door lock position	Tester connection	Specified condition
Lock	4 ⇔ 6	Continuity
OFF	-	-
Unlock	4 ⇔ 6	No continuity

If the operation is not as specified, replace the door lock assembly.

TMUK Made



9. INSPECT REAR DOOR LOCK ASSY LH(W/ DOUBLE DOOR LOCK)

(a) Inspect the door lock motor operation.
[TMUK made]
Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 1	Lock
Battery positive (+) Terminal - 1 Battery negative (-) Terminal - 2	Unlock

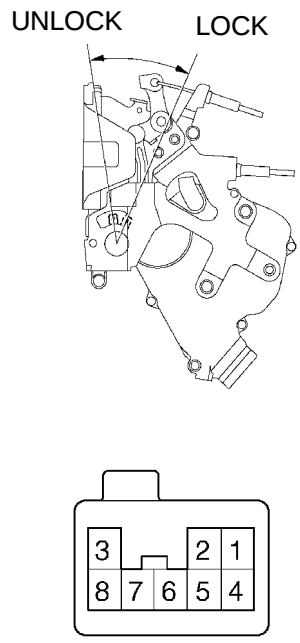
If the operation is not as specified, replace the door lock assembly.

(b) Inspect the double lock position switch continuity.
[TMUK made]
Standard:

Double door lock position	Tester connection	Specified condition
Lock	9 ⇔ 6	Continuity
OFF	-	-
Unlock	9 ⇔ 6	No continuity

If the operation is not as specified, replace the door lock assembly.

TMC Made



(c) Inspect the door lock motor operation.
[TMC made]
Standard:

Measuring condition	Operation
Battery positive (+) Terminal - 2 Battery negative (-) Terminal - 3	Lock
Battery positive (+) Terminal - 3 Battery negative (-) Terminal - 2	Unlock

If the operation is not as specified, replace the door lock assembly.

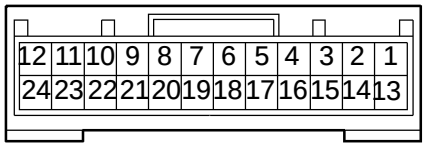
(d) Inspect the double lock position switch continuity.
[TMC made]
Standard:

Double door lock position	Tester connection	Specified condition
Lock	4 ⇔ 6	Continuity
OFF	-	-
Unlock	4 ⇔ 6	No continuity

If the operation is not as specified, replace the door lock assembly.

TMUK Made

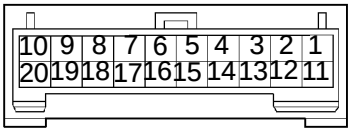
Master Switch



B58278

TMC Made

Master Switch



Y

B58006

10. POWER WINDOW REGULATOR MASTER SWITCH ASSY(W/ POWER WINDOW)

(a) Inspect the door lock control switch continuity.

[TMUK made]

Standard:

Switch position	Tester connection	Specified condition
Lock	8 ⇔ 7	Continuity
Unlock	5 ⇔ 7	Continuity

[TMC made]

Standard:

Switch position	Tester connection	Specified condition
Lock	3 ⇔ 2	Continuity
Unlock	16 ⇔ 2	Continuity

If the continuity is not as specified, replace the switch.

WIRELESS DOOR LOCK CONTROL SYSTEM

7309Y-01

ON-VEHICLE INSPECTION

1. INSPECT WIRELESS DOOR LOCK CONTROL FUNCTION

NOTICE:

Initial condition that the customizing function by hand-held tester is not chosen is shown.

HINT:

The switch described in this text is a switch for transmitting (LOCK switch and UNLOCK switch), built in the door control transmitter.

(a) Vehicle's initial condition (condition of wireless control possible)
- No key in the ignition key cylinder
- All doors closed (door open indicator off)
- All doors locked

(b) Check the basic function.
(1) Check whether the LED lights up 3 times when each switch is pressed 3 times.

HINT:

In case that the LED does not light up when the switch has been pressed 3 times or more, it may be caused by the dead battery.

(2) In the remote control operational area, check that all the doors will lock or unlock when the switch has been pressed for approximately 1 second. It is, however, not the case where the key is in the ignition key cylinder or any of the doors is open.

HINT:

The UNLOCK operation is possible even when any of the doors is open.

(c) Check the chattering prevention function.
(1) Check that the corresponding operation will be done only once but not repeat continuously when the switch has been kept pressing. However, if the operations are carried out by approximately 1 second interval, from the time to release the switch till the time to press it again, check that a corresponding operation to the switch that will be pressed next will be carried out.

(d) Check the automatic locking function.
(1) Check that all doors will automatically lock as long as any of the doors has not been opened or all doors have not been locked within approximately 30 seconds after all doors are unlocked by pressing the switch.
(2) Under the above condition, the automatic locking function will not work if any of the doors has been opened or all doors have been locked within approximately 30 seconds.

(e) Check the switch operation fail-safe function.
(1) Check that doors are not locked or unlocked by the switch while the key is in the ignition key cylinder. However, the time of the discrimination code registration mode is excepted.

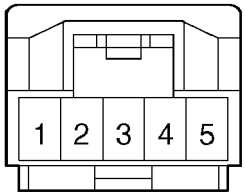
(f) Check the repeat function.
(1) Check that the all doors will automatically lock once again in 1 second after the lock switch has been pressed while the move of the driver's door control knob, which is in unlocking state, is being blocked forcibly.

(g) Check the operation stop function when a door is open or not completely close.
(1) Check that doors are not locked or unlocked by the switch while any of the doors is open or not completely close.

(h) Check the hazard flashing function (answer back).
(1) Check that the hazard lights will flash once (when locked) or twice (when unlocked) simultaneously with all doors' locking or unlocking operation, when the switch is pressed.

(i) Check the room light ON function.
(1) Make the room light switch in the DOOR position.
(2) Check that the room light will be on simultaneously with the unlocking operation when the switch has been pressed for 1 second.
(3) Check that the room light will be off in approximately 15 seconds if doors have not been opened after the unlocking operation.

Wire Harness Side



B59092

2. CHECK WIRELESS CONTROL RECEIVER

(a) Disconnect the receiver connector and check the connector on the wire harness side.

Continuity and Voltage:

Tester connection	Condition	Specified condition
1 - Body ground	Constant	Continuity
5 - Body ground	Constant	10 - 14 V

HINT:
If the value is not as specified, the vehicle's side may be defective.

(b) Connect the receiver connector and check the voltage, using an oscilloscope.

Voltage:

Tester connection	Condition	Specified condition
2 - Body ground	All door closed → Door control transmitter ON	0 V → 6 V → 0 V

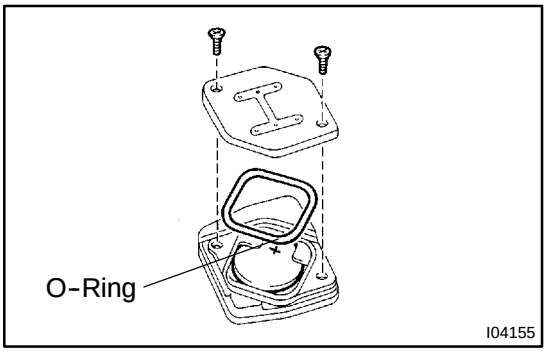
HINT:
If the value is not as specified, the vehicle's side may be defective.

TRANSMITTER BATTERY (TMC MADE)

7309Z-01

REPLACEMENT

1. REMOVE TRANSMITTER SUB-ASSY MODULE SET DOOR CONTROL
(See page 73-20)

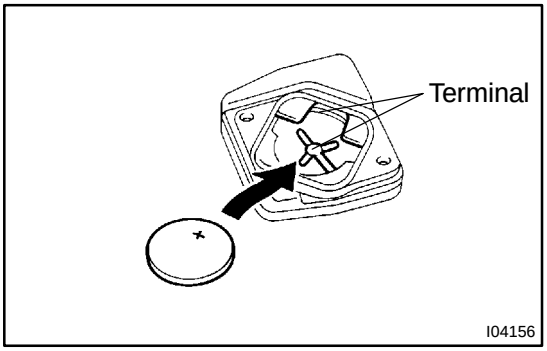


2. REPLACE TRANSMITTER BATTERY

(a) Using a screwdriver, remove the 2 screws and cover.
(b) Remove the transmitter battery (lithium battery).

NOTICE:

- **Do not push the terminals with a finger.**
- **If prying up the battery (lithium battery) forcibly to remove it, the terminals are deformed.**



(c) Install the transmitter battery (lithium battery) as shown in the illustration.

NOTICE:

Face the battery upward, and take care not to deform the terminals.

(d) Check that the O-ring is not distorted or slipped off, and then install the cover.
(e) Using a screwdriver, tighten the 2 screws.

NOTICE:

When the screws are tightened loosely, it might cause faulty contact of the battery (lithium battery) and terminals.

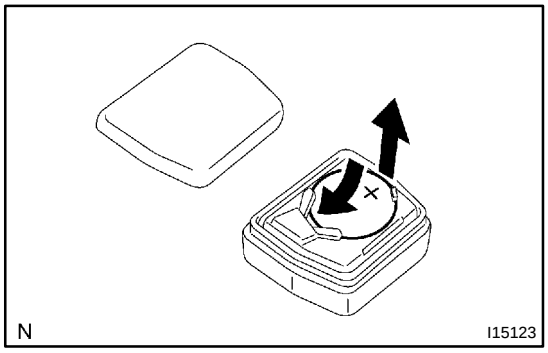
TRANSMITTER BATTERY (TMUK MADE)

730A0-01

REPLACEMENT

1. REMOVE TRANSMITTER SUB-ASSY MODULE SET DOOR CONTROL

(See page 73-20)



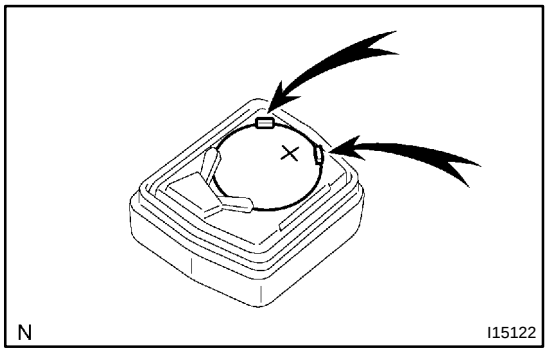
2. REPLACE TRANSMITTER BATTERY

(a) Remove the cover.

(b) Remove the transmitter battery (lithium battery).

NOTICE:

- **Do not push the terminals with a finger.**
- **If prying up the battery (lithium battery) forcibly to remove it, the terminals are deformed.**



(c) Install the transmitter battery (lithium battery) as shown in the illustration.

NOTICE:

Face the battery upward, and take care not to deform the terminals.

(d) Install the cover.

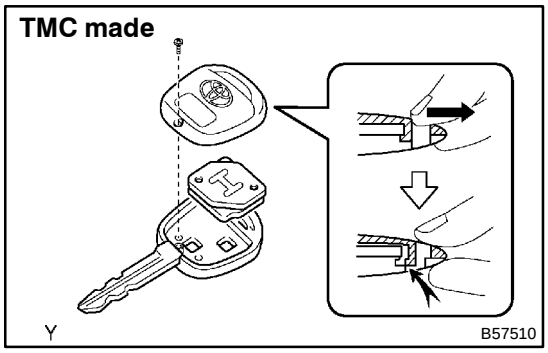
NOTICE:

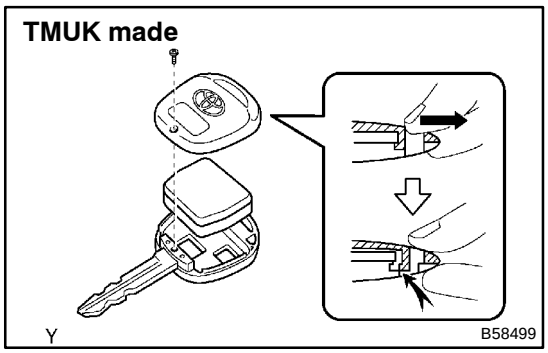
When the screws are tightened loosely, it might cause faulty contact of the battery (lithium battery) and terminals.

TRANSMITTER SUB-ASSY MODULE SET DOOR CONTROL

730A1-01

REPLACEMENT





1. **REPLACE TRANSMITTER SUB-ASSY MODULE SET DOOR CONTROL**

CAUTION:
Special caution should be taken for handling each component as they are precise electronic components.

(a) Using a screwdriver, remove the screw and cover.

CAUTION:
Do not pry out the cover forcibly.

HINT:
Push the cover with a finger as shown in the illustration, so that there becomes clearance, then pry out the cover from that clearance.

2. **REGISTRATION OF RECOGNITION CODE**

HINT:

- The add mode is used to retain the already registered codes while registering a new recognition code. This mode is used when adding a transmitter. If the number of the registered codes exceeds 4, the previously registered code will be correspondingly erased in order, starting from the first registered code.
- The rewrite mode is used to erase all the previously registered codes and register only new recognition codes. This mode is used when exchanging the transmitter or the door control receiver for new one.
- The prohibition mode is used to erase all the registered codes and cancel the wireless door lock function. Use this mode when the transmitter is lost.
- The confirmation mode is to confirm how many recognition codes have already been registered before an additional registration of a recognition code.
- All the following registration procedures must be performed in order continuously.

(a) The vehicle should be in the following conditions.
  (1) The key is not inserted in the ignition key cylinder.
  (2) Driver's door is OPENED. (The other doors are CLOSED)
  (3) Driver's door is UNLOCKED.

(b) Perform the following operations to select the desired mode.

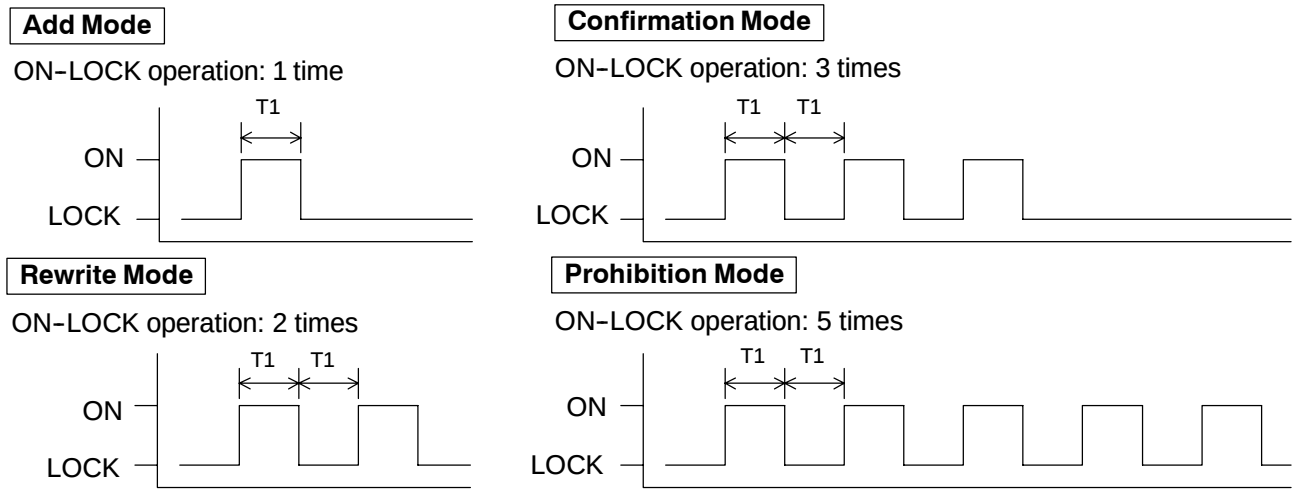
(1) Insert and remove the key from the ignition switch twice within 5 seconds.

(2) After the above operations, close and open the driver door twice within 40 seconds. Then insert the key into the ignition key cylinder and remove it.

(3) After the above operations, close and open the driver door twice within 40 seconds. Then insert the key into the ignition key cylinder and close the door.

(4) Turn the ignition switch from LOCK to ON and back to LOCK at approximately 1 second interval 1 to 5 times to select a mode (see the table below). Then remove the key from the ignition key cylinder.

Number of ON-LOCK operation of ignition switch:



T1: Approx. 1 sec.

B58899

NOTICE:

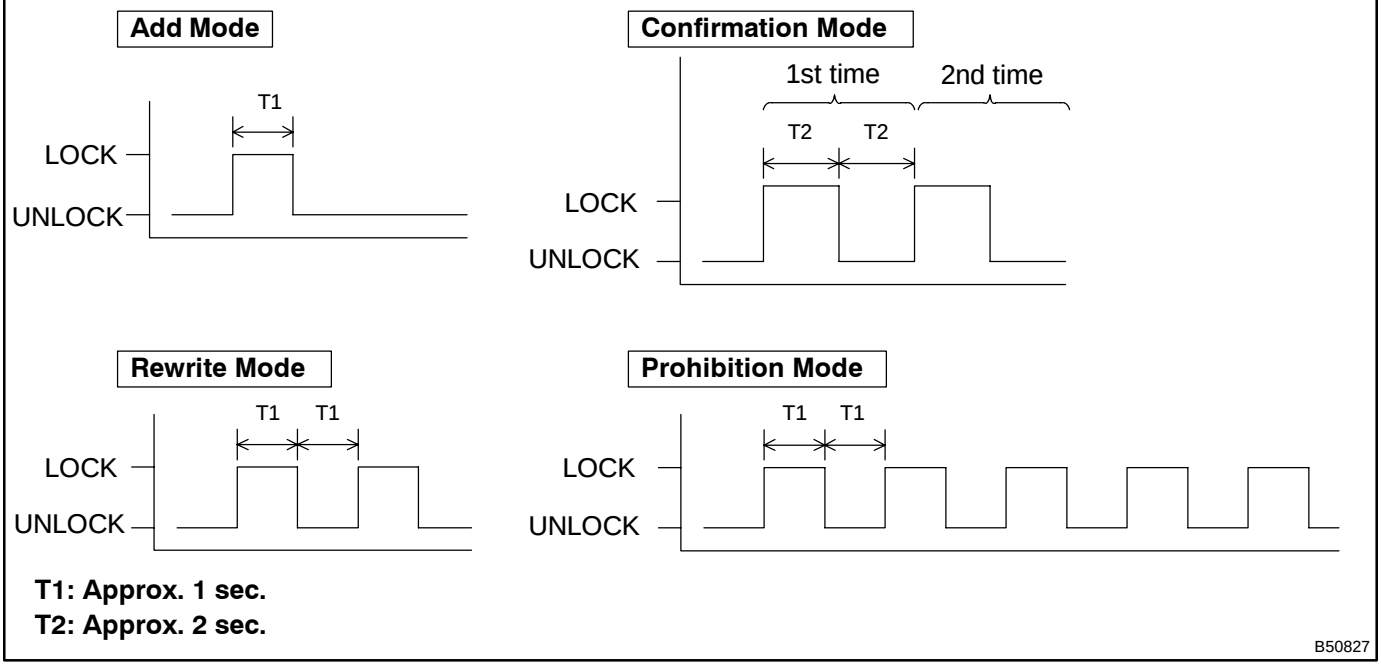
If the number of the ON-LOCK operation of the ignition switch is 0, 4 or 6 or more, there will be no response (power door lock and unlock operation) to inform which mode has been selected.

(5) After selecting a mode, the integration relay automatically performs the power door LOCK-UNLOCK operation within 3 seconds to inform the selected mode (see the table below).

HINT:

- In the confirmation mode, when the operation is performed twice, it directs that 2 types of recognition codes have been registered.
- In the confirmation mode, If the number of the registration code is 0, the LOCK-UNLOCK operation is automatically performed 5 times.
- If the prohibition mode or confirmation mode is selected, registration procedure is completed.

Response of selected mode (Power door lock operation):



(c) Register the new recognition codes (Add mode or Rewrite mode):

(1) TMC made:
Within 40 seconds after the add mode or the rewrite mode has been selected, press the LOCK and UNLOCK switches on the transmitter switch simultaneously for 1.0 – 1.5 seconds.
Within 3 seconds after the previous operation, press either one of the switches for more than 1.0 seconds.

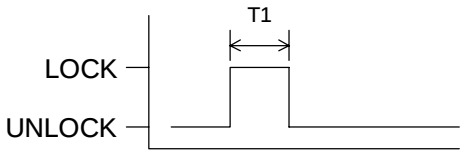
(2) TMUK made:
Within 40 seconds after the add mode or the rewrite mode has been selected, press either switch of the LOCK or UNLOCK on the transmitter switch once. And press the same switch again.

(3) Within 3 seconds after the transmitter switch has been turned OFF, the LOCK-UNLOCK operation will be automatically performed once if the registration of the recognition code of the transmitter is completed correctly. In case the LOCK-UNLOCK operation is performed twice, the registration of recognition code has failed. Perform the registration procedure from the beginning once again.

Response for registration completion:

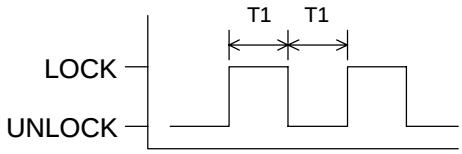
LOCK-UNLOCK Occurs Once

Registration of recognition code has been completed.



LOCK-UNLOCK Occurs Twice

Registration of recognition code has failed.



T1: Approx. 1 sec.

B58900

(4) If the multiple transmitter to be registered, repeat step (c) within 40 seconds after the previous registration.

HINT:

- 4 types of recognition codes can be registered at one time.
- If even one of the following conditions is satisfied, the registration mode will finish.
  - 40 seconds have elapsed while an input of each mode is ready.
  - Any of the doors is opened
  - The key plate is inserted in the ignition key cylinder.
  - 4 types of recognition codes are registered at once.

THEFT DETERRENT SYSTEM (TMUK MADE)

730A2-01

ON-VEHICLE INSPECTION

1. OUT LINE OF THEFT DETERRENT SYSTEM

(a) When the theft deterrent system detects any theft, the system sounds the horns and flashes the lights to alert the people around the vehicle to the theft.

HINT:
There are 4 conditions in this system; disarmed state, arming preparation state, armed state, alarm sounding state.

(1) Disarmed state:
- The alarming function does not operate.
- The theft deterrent function does not operate.

(2) Arming preparation state:
- Time for transferring to the armed state.
- The theft deterrent function does not operate.

(3) Armed state:
- The theft deterrent function operates.

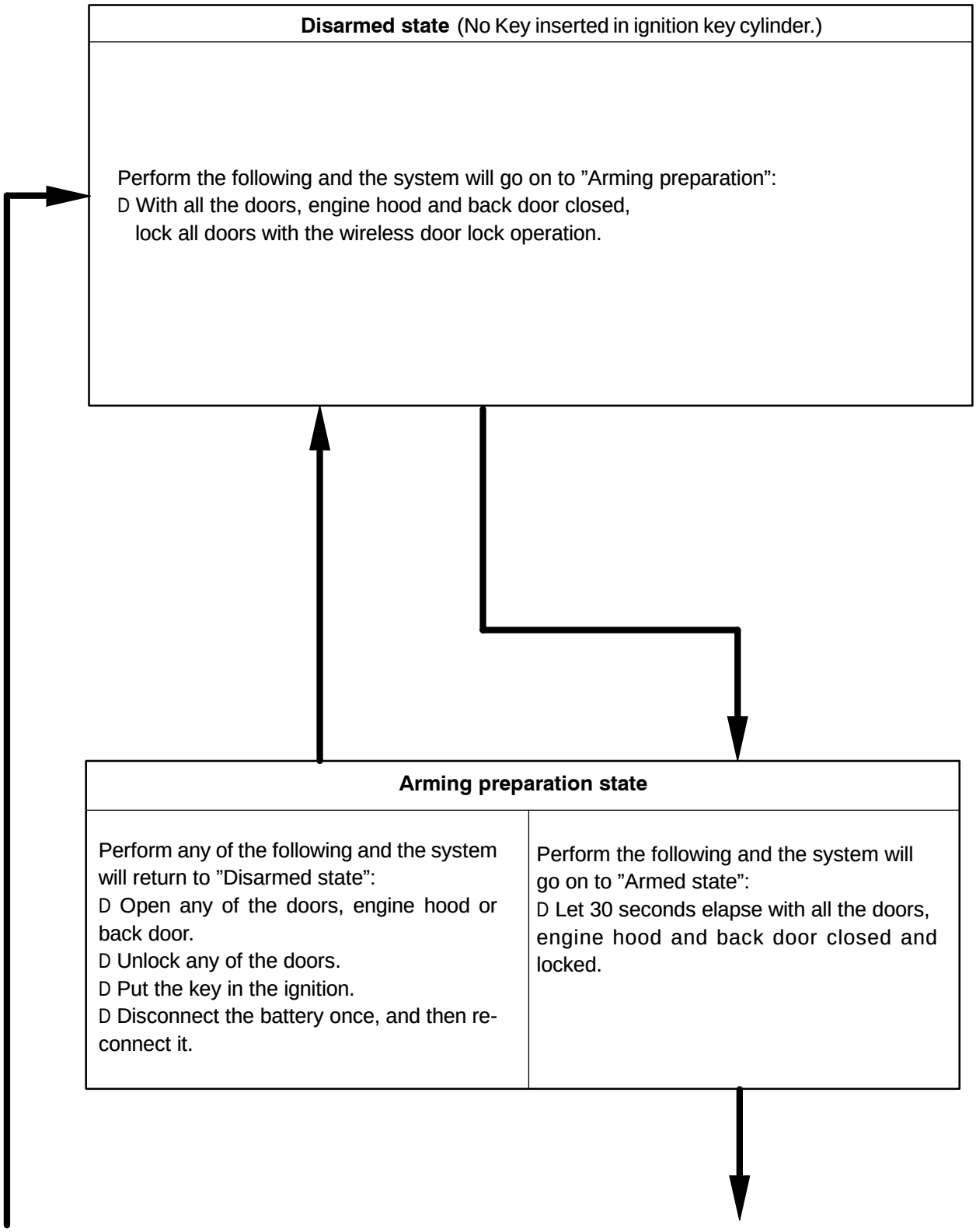
HINT:
In the armed state, if the vehicle remains in a condition to raise an alarm (any door remains open, engine hood remains open, back door remains open, ignition remains directly connected), an alarm is repeated maximum 10 times for every one of the above specified condition.
(Alarming period: 27.5 sec. + Interval period: 5 sec.) x 10

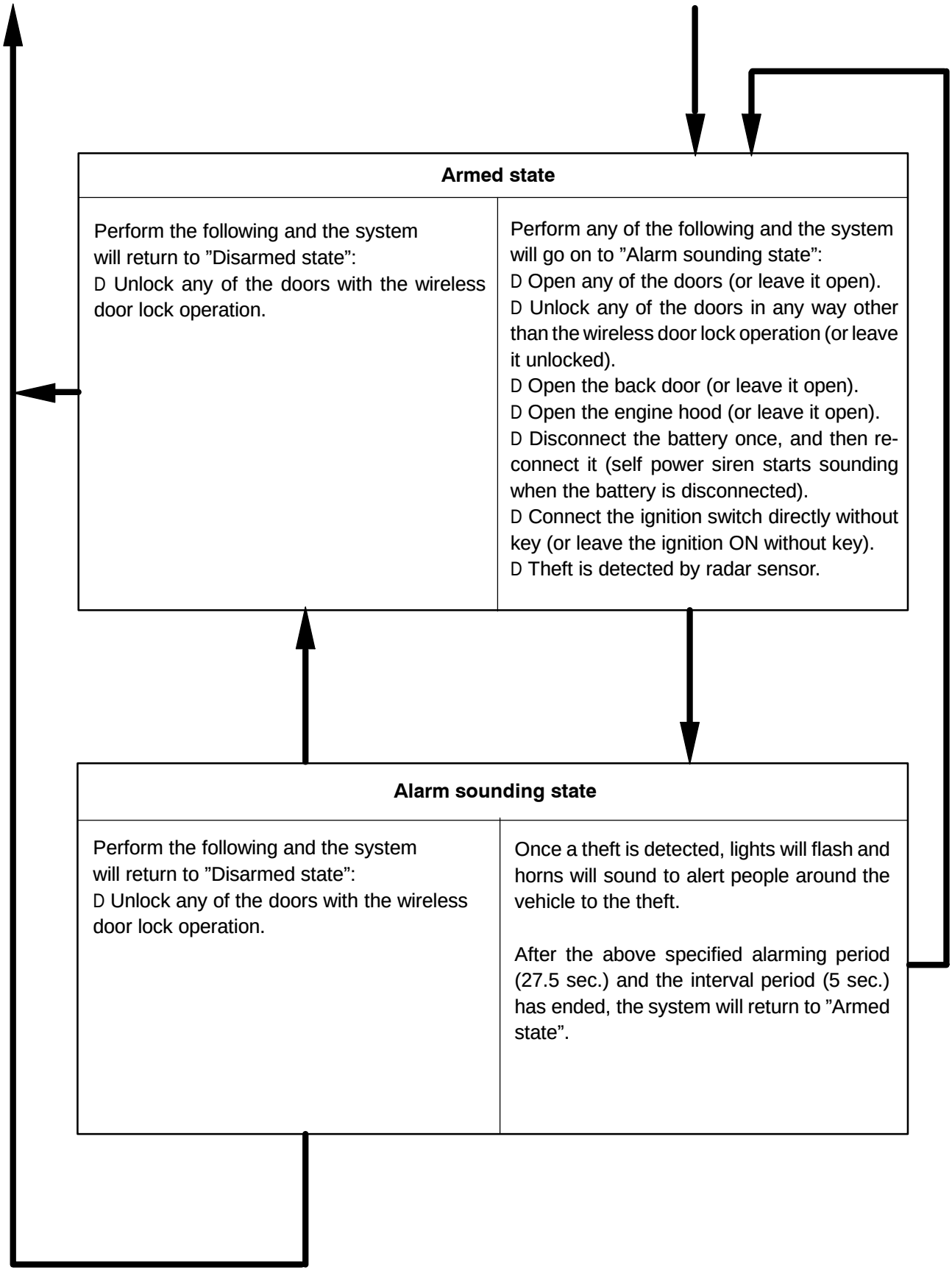
(4) Alarm sounding state:
Once a theft is detected in the armed state, the system sounds the horns and flashes the lights to alert the people around the vehicle to the theft.
Refer to the table for the alarming method or time.

Alarming method	Room Light	Illuminating
	Headlight	-
	Taillight	-
	Hazard	Flashing at a cycle of flasher relay
	Vehicle Horn	Sounding at a approx. 0.4 sec. cycle
	Theft Deterrent Horn	-
	Self Power Siren	Sounding at a cycle of self power siren itself
Alarming period	27.5 sec.	
Interval period	5 sec.	

HINT:
Under the armed state, when either of doors is unlocked and no key is inserted in the ignition key cylinder, force lock signal is output.

2. ACTIVE ARMING MODE




Armed state
Perform the following and the system will return to "Disarmed state":
D Unlock any of the doors with the wireless door lock operation.
Perform any of the following and the system will go on to "Alarm sounding state":
D Open any of the doors (or leave it open).
D Unlock any of the doors in any way other than the wireless door lock operation (or leave it unlocked).
D Open the back door (or leave it open).
D Open the engine hood (or leave it open).
D Disconnect the battery once, and then re-connect it (self power siren starts sounding when the battery is disconnected).
D Connect the ignition switch directly without key (or leave the ignition ON without key).
D Theft is detected by radar sensor.
Alarm sounding state
Perform the following and the system will return to "Disarmed state":
D Unlock any of the doors with the wireless door lock operation.
Once a theft is detected, lights will flash and horns will sound to alert people around the vehicle to the theft.
After the above specified alarming period (27.5 sec.) and the interval period (5 sec.) has ended, the system will return to "Armed state".

3. INDICATOR LIGHT OUTPUT

	Indicator Light	
Condition	Signal output from theft deterrent ECU	Lighting condition
Disarmed state	OFF	OFF or Blinking
Arming preparation state	ON	ON
Armed state	OFF	Blinking
Alarm sounding state	ON	ON

HINT:
Because of a signal output from the immobilizer system, there is a case that the indicator light blinks even in the disarmed state. And also, the indicator light always blinks at any time in the armed state, receiving a signal from the immobilizer system.

Flashing frequency	Indicator light
0.2 sec.	ON
1.8 sec.	OFF

(a) Answer back:
The hazard lights flash as answer back under the following conditions.
(1) When the system is set.
- When the system is transferred to the arming preparation state from the disarmed state using the wireless door lock, the hazard lights flash once.

(2) When the system is canceled.
- When the system is transferred to the disarmed state from either arming preparation state, armed state or alarm sounding state using the wireless door lock, the hazard lights flash twice.

4. FORCED DOOR LOCK CONTROL

(a) Forced door lock is a control that prevents intrusion into vehicles. When a door is unlocked (when an alarm is started), instantaneously forced door lock will be executed.
(1) Condition for starting the forced door lock:
Detecting any of the following conditions activates the forced door lock.
- Theft deterrent system is in alarm status in active mode (except for the case that the key unlock/back door unlock switch is turned on).
- No key is in the ignition key cylinder.
- Any of the doors is unlocked.
- Since the start of the last forced lock, 0.4 sec. or more have been elapsed.
- All double lock position switches are OFF (double lock is unset).

(2) Conditions for stopping the forced door lock:
Detecting any of the following conditions stops the forced door lock.
- All doors are locked.
- An alarm is finished.
- A key is inserted into the key cylinder.

5. RADAR SENSOR

(a) The radar sensor provided in the room light raises alarm as soon as the radar senses any moving object inside the vehicle by sending out wave of 2.45 GHz. When the theft deterrent system transfers to the arming preparation state, it provides +B to the radar sensor at the same time. Because of this, if the radar sensor detects a theft in the armed state, the system will raise an alarm.
This helps the system performance effectively if an attempt is made to enter the vehicle by breaking a window glass.

HINT:
With the radar sensor switched OFF, the theft deterrent system can be set (transferred to the arming preparation state). This can be used when something moving, such as a pet, is left in the vehicle.

(1) Switch the radar sensor OFF:
When the vehicle is in the disarmed state and no key is inserted in the ignition key cylinder, open the driver's door and repeat LOCK and UNLOCK operation 3 times or more with the manual switch inside the vehicle. And then, the indicator light will blink in 0.1 second interval for maximum 5 minutes. If all the doors is closed and locked by the wireless door lock operation during this blinking, the theft deterrent system can be set while the radar sensor is being OFF. However, the radar sensor always returns ON (initial setting state) every time wireless UNLOCK operation occurs.

6. SELF POWER SIREN

(a) The self power siren has an internal battery. If any of the vehicle's battery or communication line is opened, the self power siren detects it by itself and sounds. Although the self power siren sounds by receiving a signal from the theft deterrent ECU usually, the self power siren can sound by its internal battery in case that the vehicle's battery is opened.

(b) The theft deterrent ECU sends an arming signal to the self power siren while transferring to the armed state, and it also sends a disarming signal to the siren while transferring to the disarmed state. Besides, the theft deterrent ECU can sound the self power siren by sending an alarming signal in the alarm sounding state.

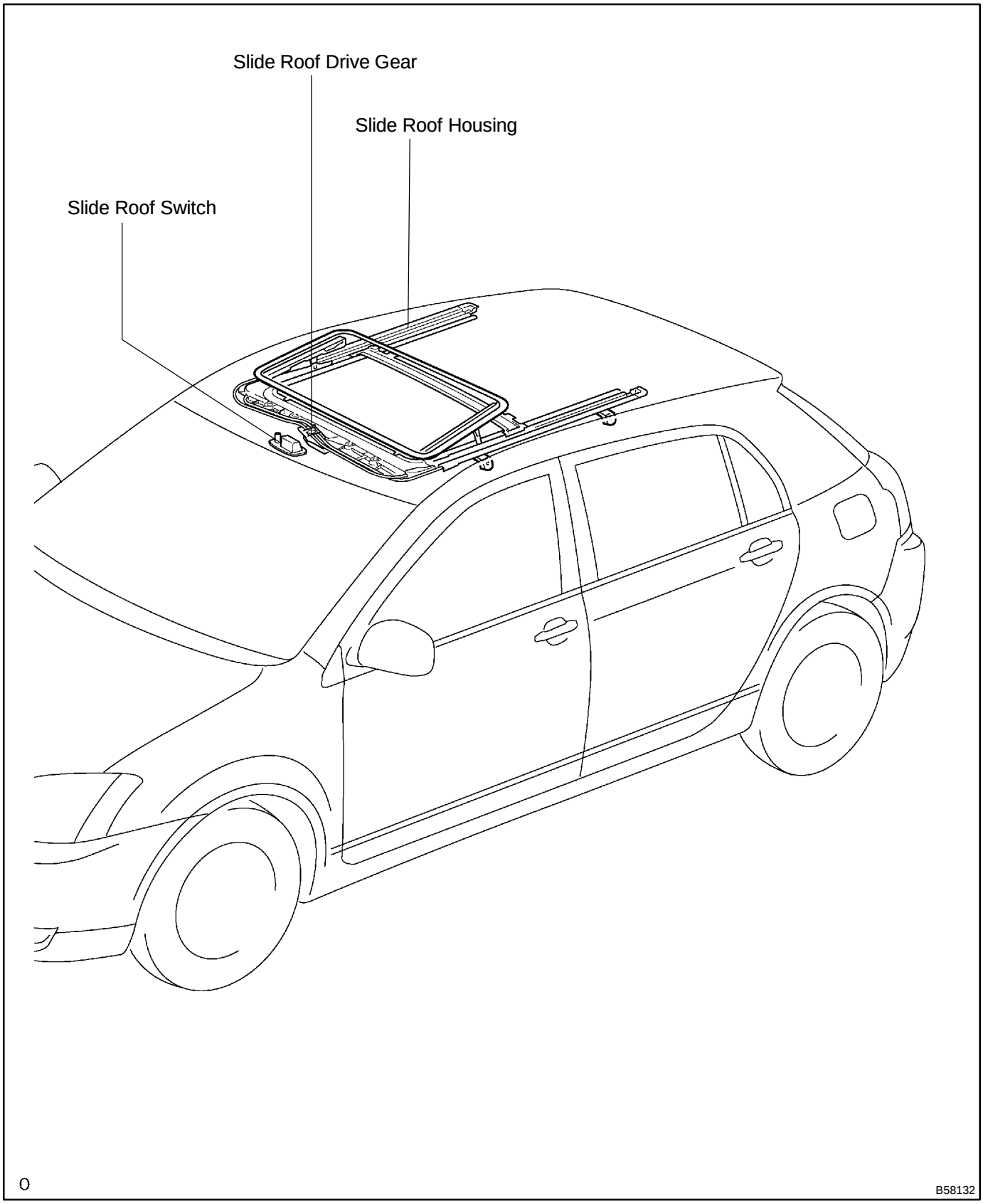
SLIDING ROOF/CONVERTIBLE

SLIDING ROOF SYSTEM (TMUK MADE) . . . 74-1
LOCATION 74-1
ON-VEHICLE INSPECTION 74-2
PROBLEM SYMPTOMS TABLE 74-3
INSPECTION 74-4
SLIDING ROOF HOUSING SUB-ASSY (TMUK MADE) 74-5
COMPONENTS 74-5
REPLACEMENT 74-6/11

SLIDING ROOF SYSTEM (TMUK MADE)

LOCATION

74055-01



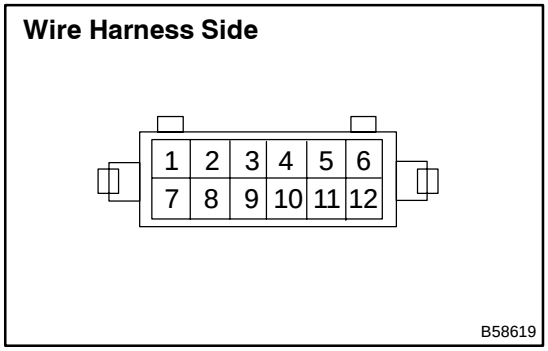
74056-01

ON-VEHICLE INSPECTION

1. INSPECT SLIDING ROOF FUNCTION

(a) Check the slide opening operation (Manual).
  (1) Turn the ignition switch ON.
  (2) When keeping operating the sliding roof switch to OPEN side, check that the roof glass will slide and be fully open.
  (3) When locking the window lock switch of the power window regulator master switch assembly, check that the roof glass will not operate.

(b) Check the slide closing operation (Manual).
  (1) Turn the ignition switch ON.
  (2) When keeping operating the slide roof switch to CLOSE side, check that the roof glass will slide and be fully closed.
  (3) When locking the window lock switch of the power window regulator master switch assembly, check that the roof glass will not operate.



2. INSPECT SLIDING ROOF DRIVE GEAR

(a) Inspect the sliding roof drive gear operation.
  (1) Disconnect the connector from the drive gear and inspect the connector on the vehicle's side.

Tester connection	Condition	Specified condition
11 ⇔ Ground	Constant	Continuity
9 ⇔ 11	Constant	10 – 14 V
7 ⇔ 11	Ignition switch OFF → ON	0 V → 10 – 14 V
12 ⇔ 11	Sliding roof switch → OPEN or DOWN	No continuity → Continuity
5 ⇔ 11	Sliding roof switch → CLOSE or UP	No continuity → Continuity

If the circuit is not as specified, inspect the circuits connected to other parts.

(b) Connect the wire harness side connector to the drive gear and inspect the connector from the back side.

Tester connection	Condition	Specified condition
12 ⇔ 11	Ignition switch OFF → ON Sliding roof switch → OPEN or DOWN	10 – 14 V → 0 V
5 ⇔ 11	Ignition switch OFF → ON Sliding roof switch → CLOSE or UP	10 – 14 V → 0 V

If the circuit is not as specified, inspect the circuits connected to other parts.

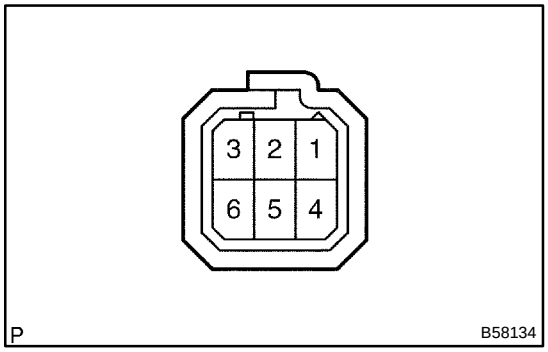
74057-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Sliding roof system does not operate	1. POWER fuse	68-1
	2. GAUGE fuse	68-1
	3. IG1 relay	68-1
	4. Sliding roof motor switch	74-4
	5. Sliding roof dive gear	74-4
	6. Faulty sliding of sliding roof	-
	7. Wire harness	-
Sliding roof system stops operation half way (No foreign object is in the motor)	1. Sliding roof motor switch	74-4
	2. Sliding roof dive gear	74-4
	3. IG1 relay	68-1
	4. Wire harness	-

74058-01

INSPECTION



1. INSPECT SLIDING ROOF SWITCH ASSY

(a) Inspect the slide roof motor switch continuity.

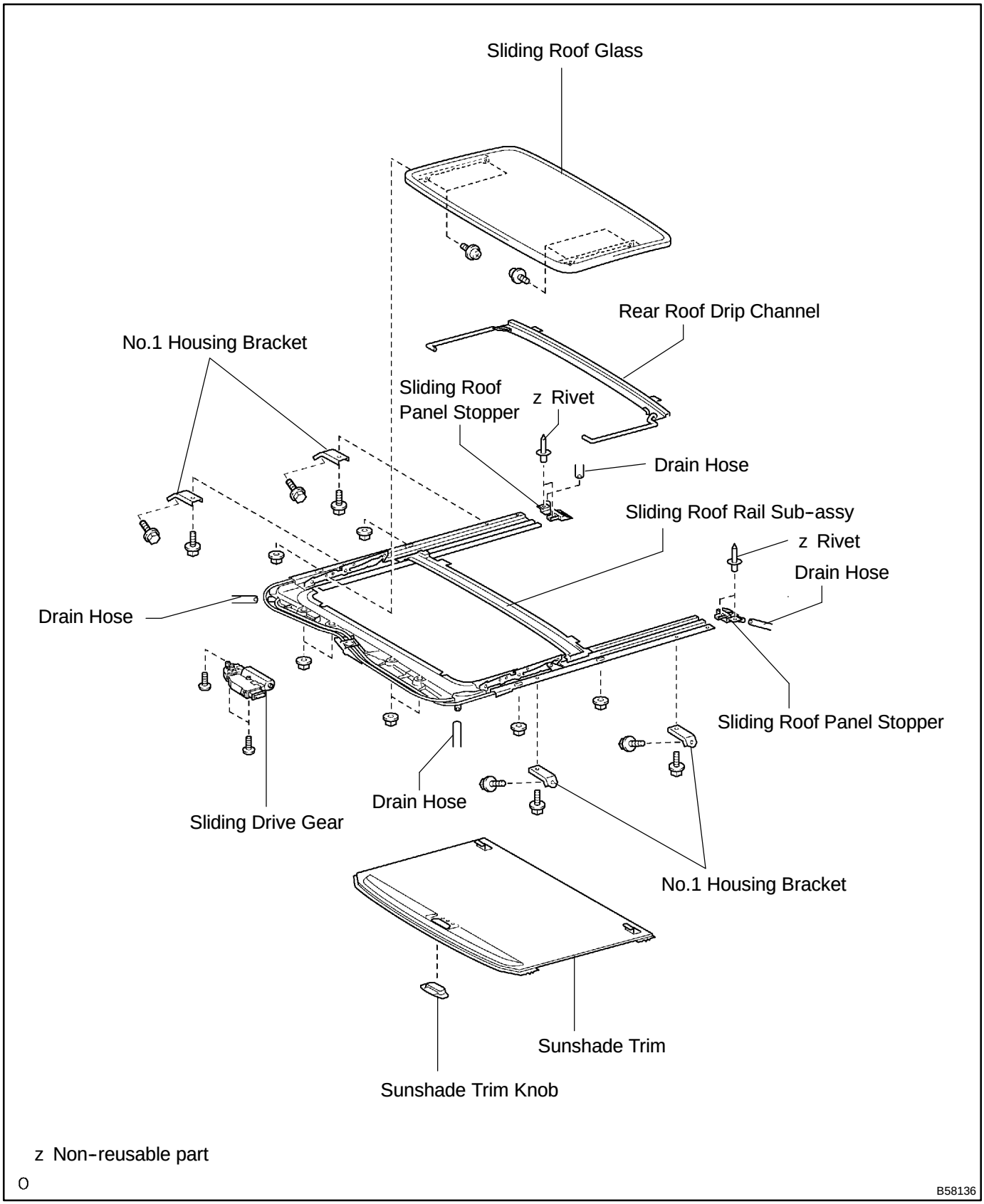
Switch position	Tester connection	Specified condition
CLOSE/UP	1 ⇔ 5 3 ⇔ 4	Continuity
OPEN/DOWN	1 ⇔ 3 4 ⇔ 5	Continuity

If the continuity is not as specified, replace the switch.

SLIDING ROOF HOUSING SUB-ASSY (TMUK MADE)

COMPONENTS

74059-01



z Non-reusable part

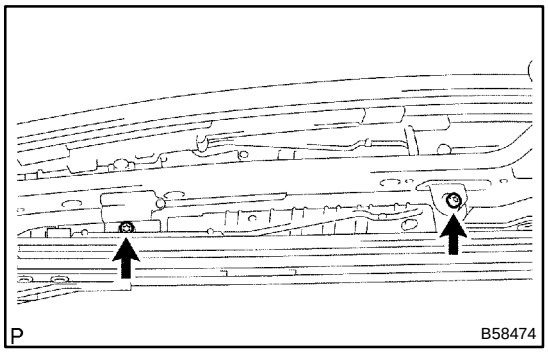
B58136

7405A-01

REPLACEMENT

1. REMOVE ROOF HEADLINING ASSY

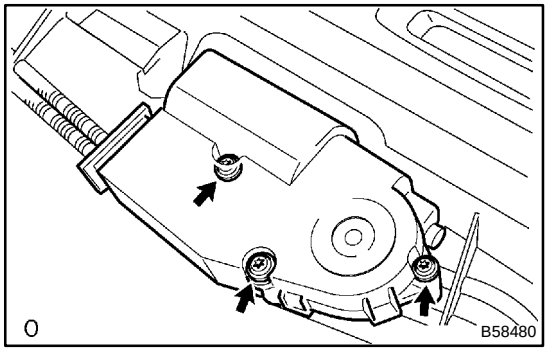
(See page 76-52 and 76-61)



2. REMOVE SLIDING ROOF GLASS SUB-ASSY

(a) Using a torx wrench (T25), remove the 4 screws and sliding roof glass.

3. REMOVE SLIDING ROOF WEATHERSTRIP

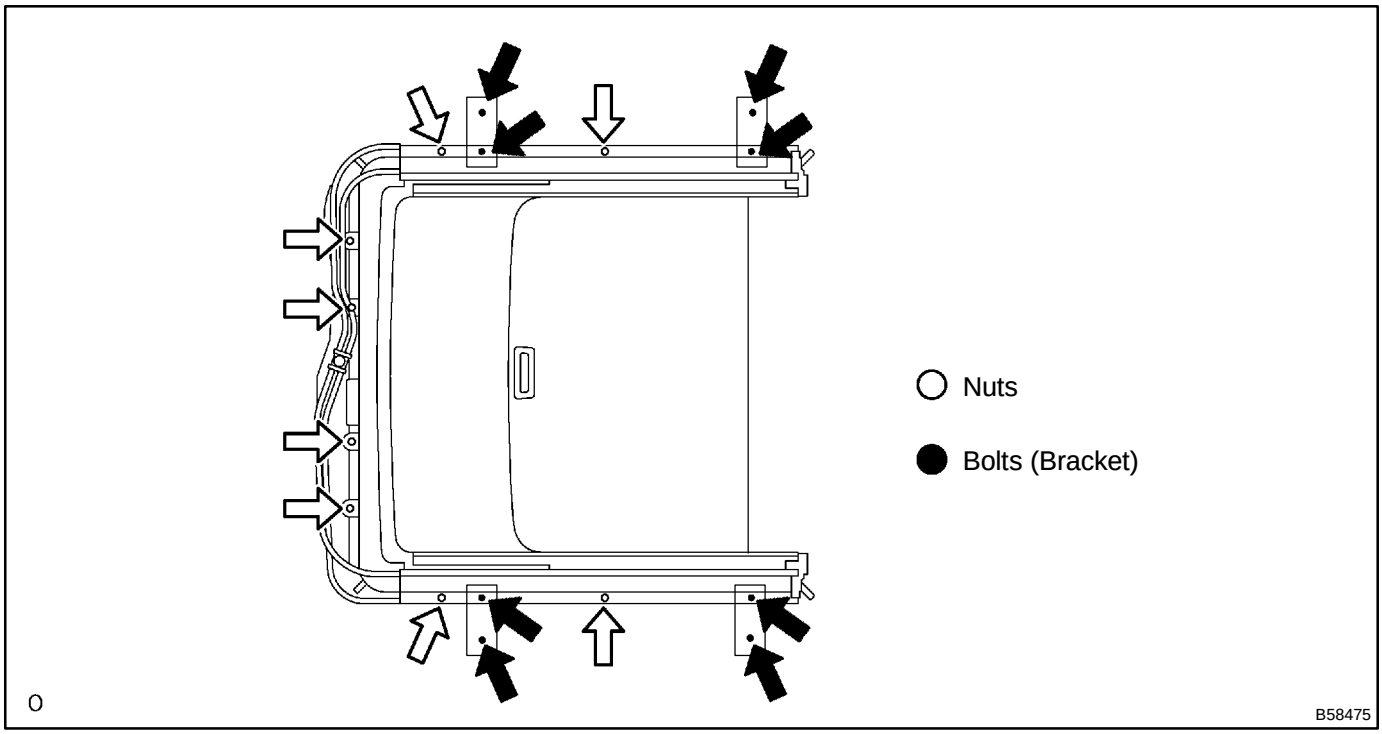


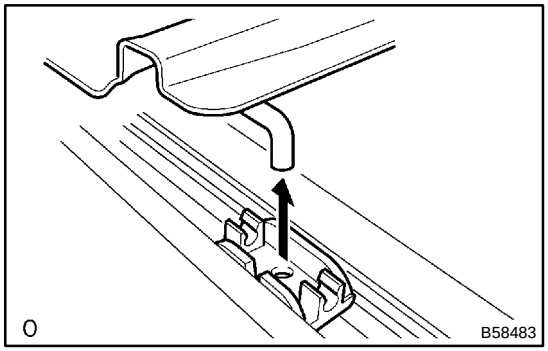
4. REMOVE SLIDING ROOF DRIVE GEAR SUB-ASSY

(a) Disconnect the sliding roof drive gear connector.
(b) Using a torx wrench (T20), remove the 3 screws and sliding roof drive gear.

5. REMOVE SLIDE ROOF RAIL SUB-ASSY

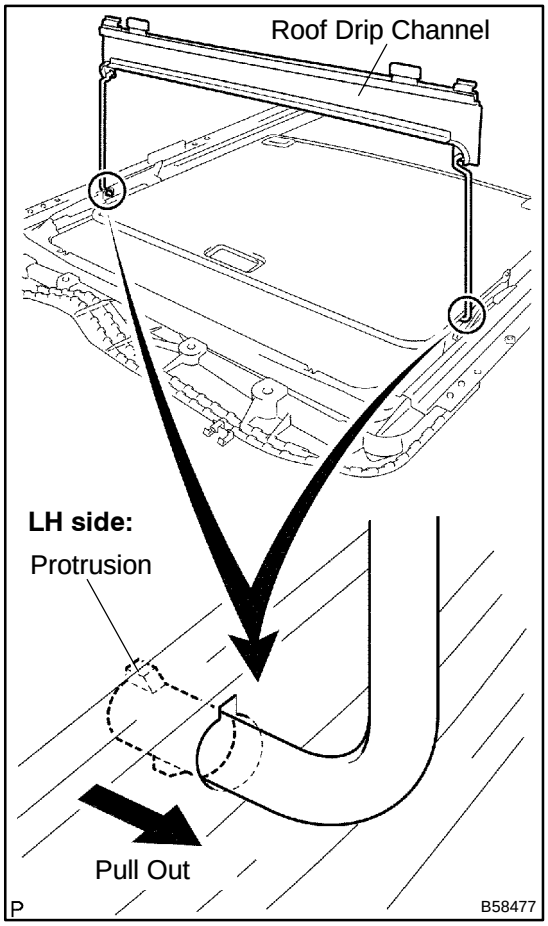
(a) Disconnect the 4 drain hoses from the roof rail.
(b) Remove the 8 nuts and 8 bolts, then remove the roof rail and 4 brackets as shown in the illustration.





6. REMOVE ROOF DRIP CHANNEL REAR

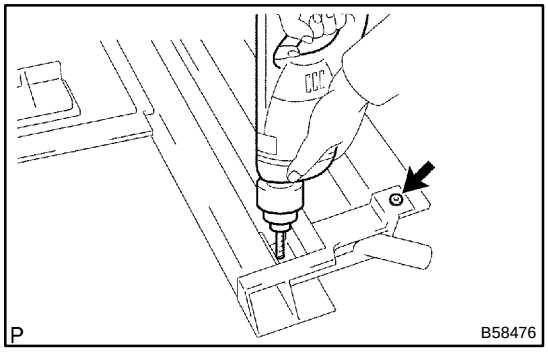
(a) Disconnect the roof drip channel from the roof rail as show in the illustration



(b) Set the roof drip channel upright, as shown in the illustration.

(c) Fit the protrusion part on the tip of the roof drip channel with the hole of the roof rail to pull out the tip of the roof drip channel smoothly from the roof rail.

(d) Remove the roof drip channel.



7. REMOVE SUNSHADE TRIM SUB-ASSY

(a) Remove the 2 sliding roof panel stoppers from the slide roof.

(1) Using a drill of less than ø 3 mm (0.12 in.), drill out the rivet heads and remove the stopper.

(2) Gently and vertically put the drill onto the rivet, and cut the rivet flanges.

NOTICE:

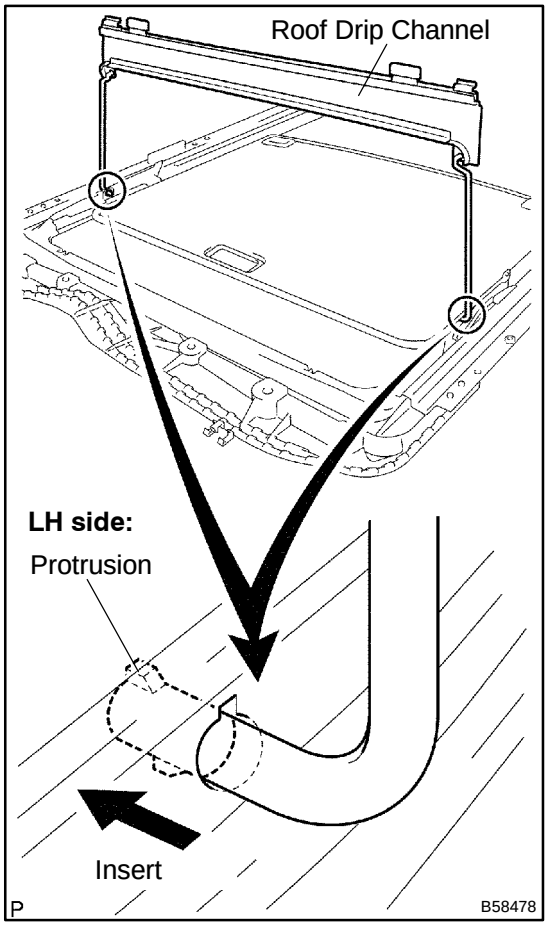
- **Prizing the hole with a drill can lead to damage to the rivet hole or breaking the drill.**
- **Be careful with the cut rivet, because it is hot.**

(b) Even if the flange is taken off, continue drilling and push out the remaining fragments with the drill.

(c) Using a vacuum cleaner, remove the drilled rivet and dust from the inside of the door.

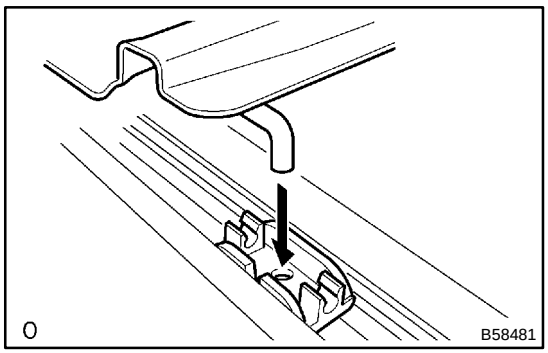
(d) Remove the sunshade trim from the slide roof.

8. REMOVE SUNSHADE TRIM KNOB

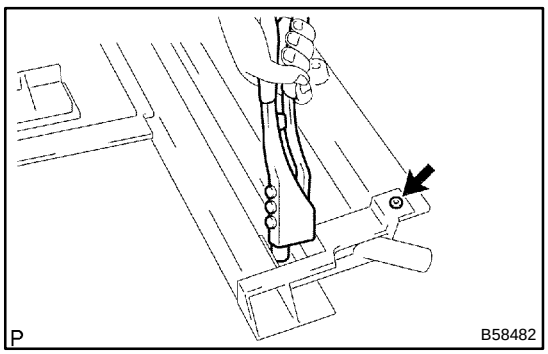


9. INSTALL ROOF DRIP CHANNEL REAR

(a) Set the roof drip channel upright, as shown in the illustration.
(b) Fit the protrusion part on the tip of the roof drip channel with the hole of the roof rail to insert the tip of the roof drip channel smoothly into the hole of the roof rail.
(c) Install the roof drip channel.

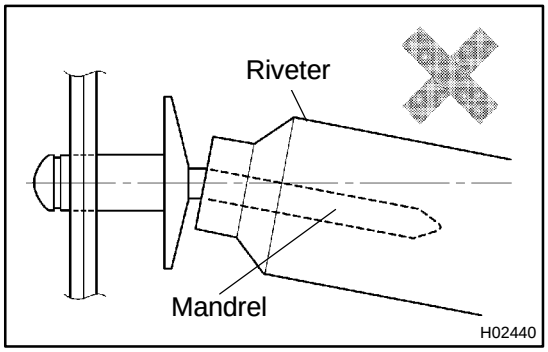


(d) Connect the roof drip channel from the roof rail as show in the illustration



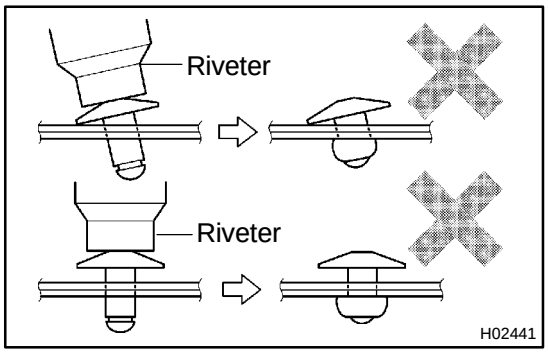
10. INSTALL SUNSHADE TRIM SUB-ASSY

(a) Install the sunshade trim to the slide roof.
(b) Using an air riveter or hand riveter, install the stopper to the slide roof.

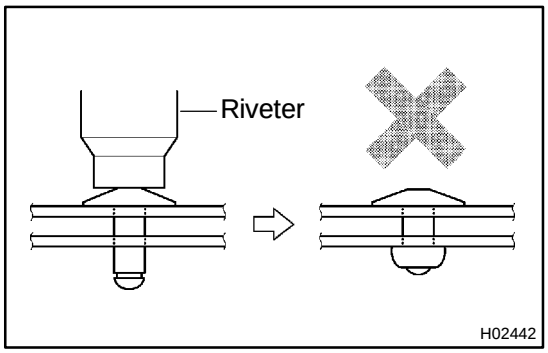


NOTICE:

- **Do not prize a riveter, because the riveter will be damaged, and the mandrel will be bent.**



- **Do not tilt the riveter when removing the rivet, because the materials will not be tightened firmly.**



- **Install the rivet while attaching the materials, because they will not be tightened firmly.**

11. INSTALL SLIDE ROOF RAIL SUB-ASSY

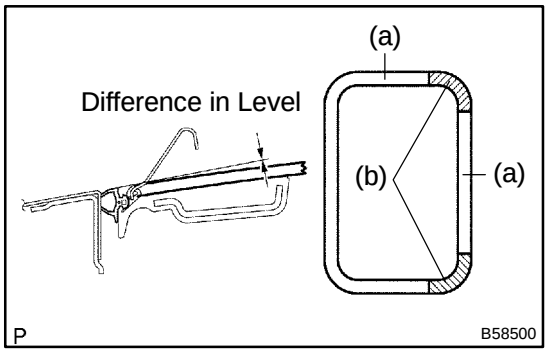
(a) Install the 8 nuts and 8 bolts with the roof rail and 4 brackets.
Torque:
Nuts: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
Bolts: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

(b) Connect the 4 drain hoses to the roof rail.

12. INSTALL SLIDING ROOF GLASS SUB-ASSY

(a) Using a torx wrench (T25), install the 4 screws and sliding roof glass.
Torque: 4.0 N·m (41 kgf·cm, 35 in.·lbf)

(b) Check for a difference in level between the sliding roof (weatherstrip) and roof panel.



Location	Except corners of rear side (a) mm (in.)	Corners of rear side (b) mm (in.)
Difference in level	0±1.5 (0±0.059)	0+1.5 (0+0.059) 0-1.0 (0-0.039)

13. INSPECT FOR LEAK

(a) Adjusting the sliding roof, check there is no water leak.

(b) In case of water leak, readjust the sliding roof.

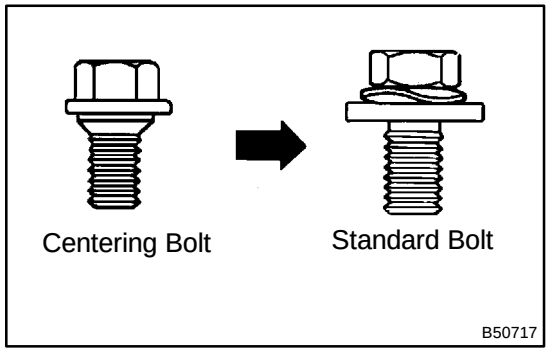
ENGINE HOOD/DOOR

HOOD 75-1
ADJUSTMENT 75-1/3
FRONT DOOR
(SEDAN/STATION WAGON) 75-4
COMPONENTS 75-4/5
OVERHAUL 75-6/11
ADJUSTMENT 75-12/13
FRONT DOOR (3-DOOR HATCHBACK) 75-14
COMPONENTS 75-14/15
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(SEDAN/STATION WAGON) 75-32
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LUGGAGE COMPARTMENT DOOR
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BACK DOOR (STATION WAGON) 75-54
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BACK DOOR (HATCHBACK) 75-57
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OVERHAUL 75-58/59
BACK DOOR 75-60
ADJUSTMENT 75-60/61
BACK DOOR STAY ASSY LH
(STATION WAGON/HATCHBACK) 75-62
REPLACEMENT 75-62
DISPOSAL 75-63

HOOD

ADJUSTMENT

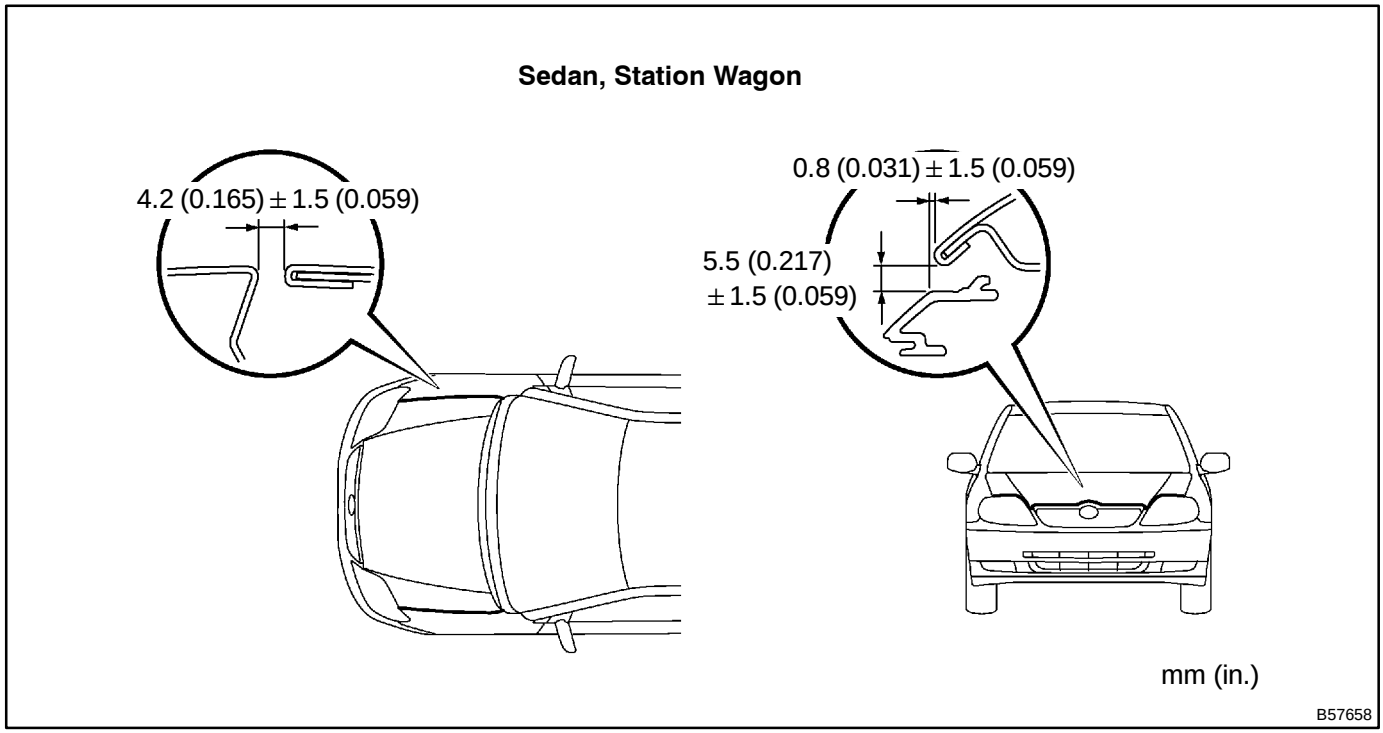
750B5-01

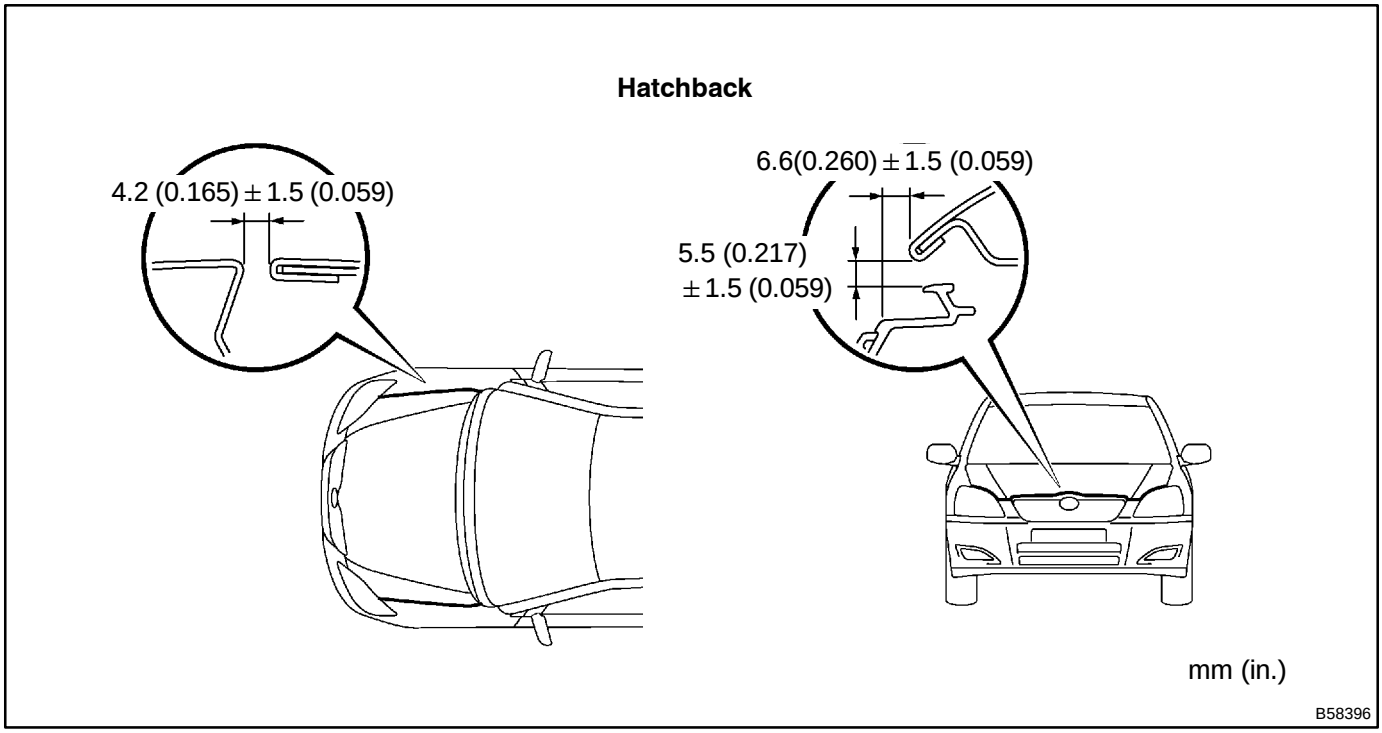


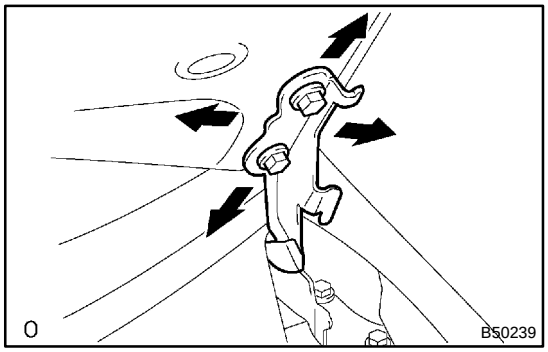
HINT:
Since the centering bolt is used as a hood hinge and hood lock set bolt, the hood and hood lock can not be adjusted with it on. Substitute a bolt with washer for the centering bolt.

1. INSPECT HOOD SUB-ASSY

(a) Check that the clearance is within the standard value.

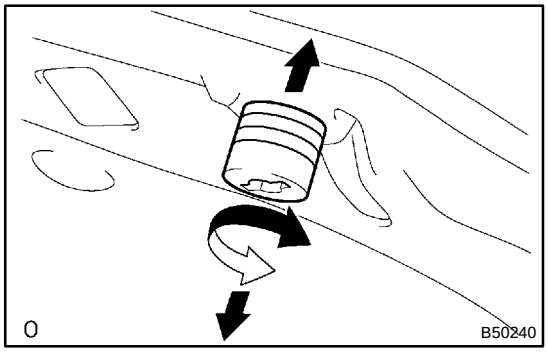




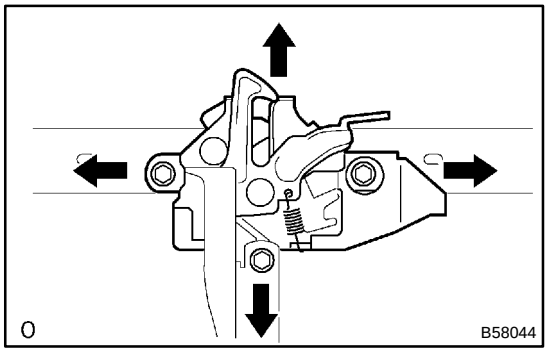


2. ADJUST HOOD SUB-ASSY

(a) Adjust the hood by loosening the hood side hinge bolts.
Torque: 13 N·m (130 kgf·cm, 10 ft·lbf)



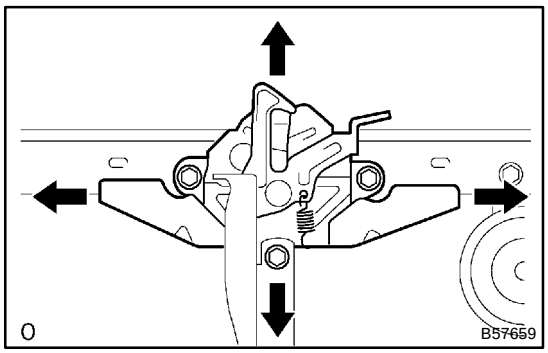
(b) Adjust the hood by turning the cushions.



(c) Sedan and Station wagon:
Adjust the lock by loosening the 3 bolts.

(d) Hatchback:
Remove the radiator support opening cover (See page 76-5).

(e) Hatchback:
Remove the radiator grille (See page 76-5).

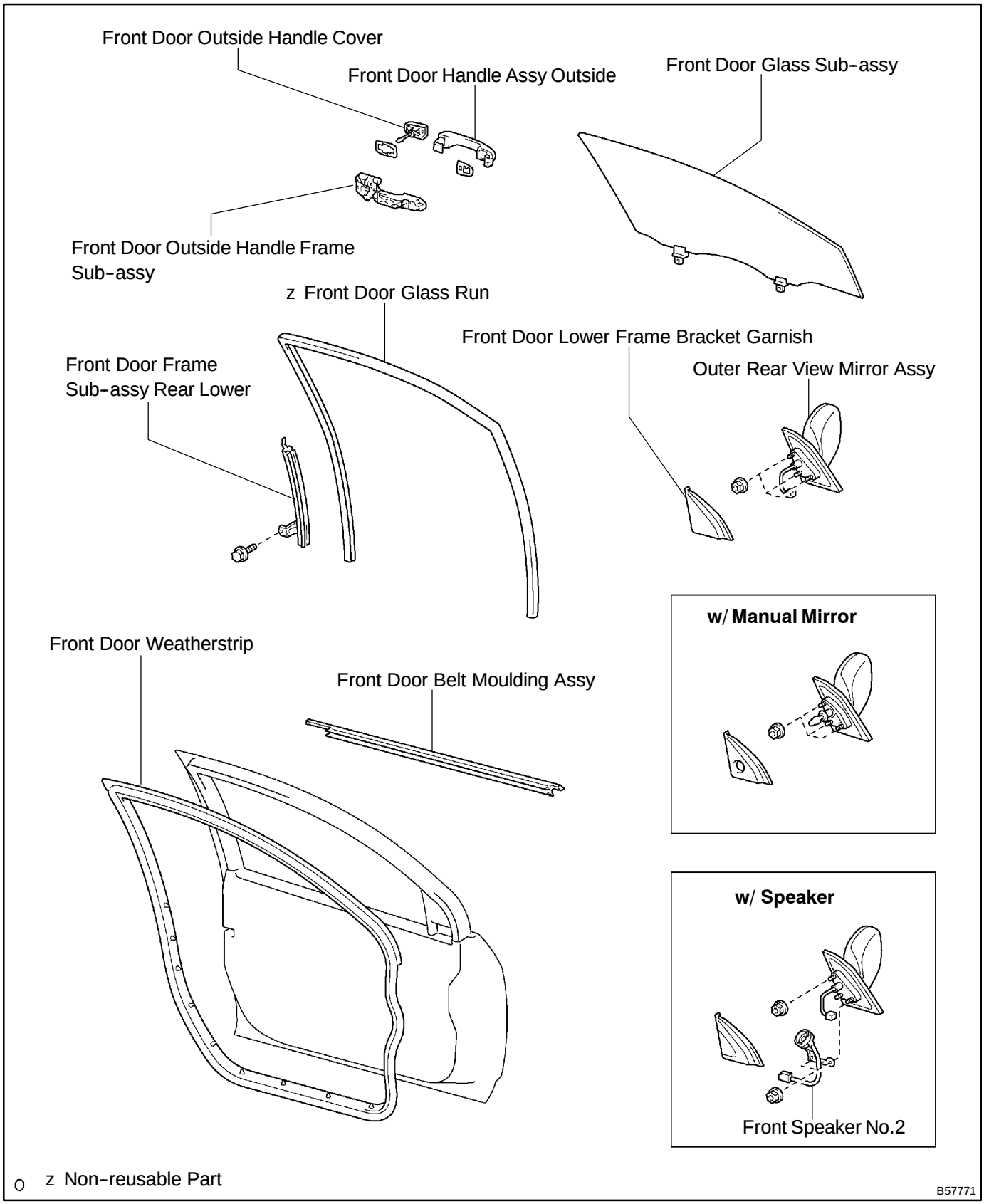


(f) Hatchback:
Adjust the lock by loosening the 3 bolts.

FRONT DOOR (SEDAN/STATION WAGON)

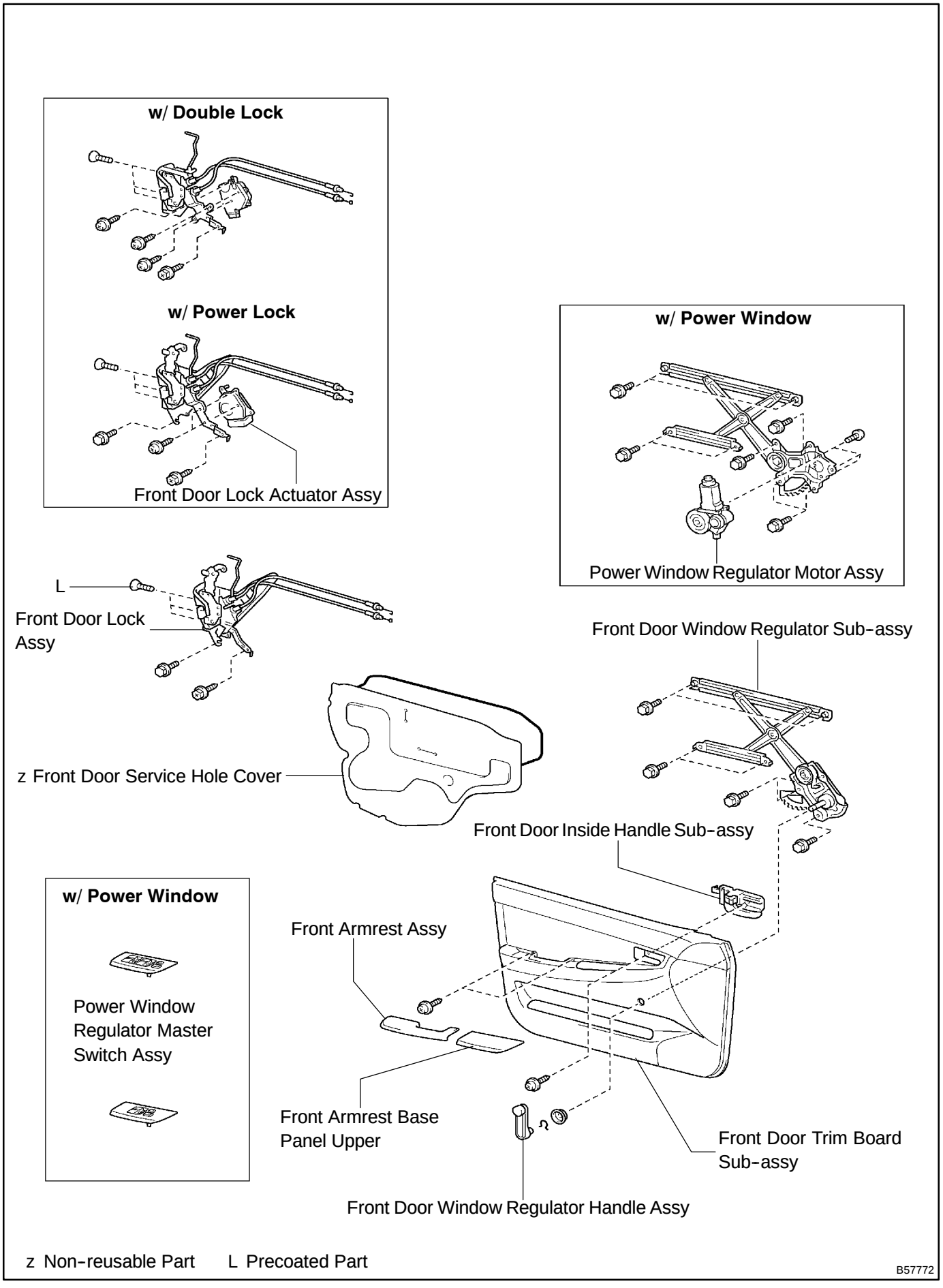
COMPONENTS

750B6-01



o z Non-reusable Part

B57771

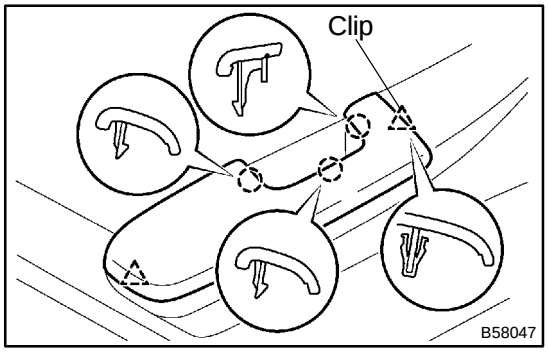

w/ Double Lock
w/ Power Lock
Front Door Lock Actuator Assy
w/ Power Window
Power Window Regulator Motor Assy
L
Front Door Lock Assy
Front Door Window Regulator Sub-assy
z Front Door Service Hole Cover
Front Door Inside Handle Sub-assy
w/ Power Window
Power Window Regulator Master Switch Assy
Front Armrest Assy
Front Armrest Base Panel Upper
Front Door Trim Board Sub-assy
Front Door Window Regulator Handle Assy
z Non-reusable Part
L Precoated Part
B57772

750B7-01

OVERHAUL

HINT:

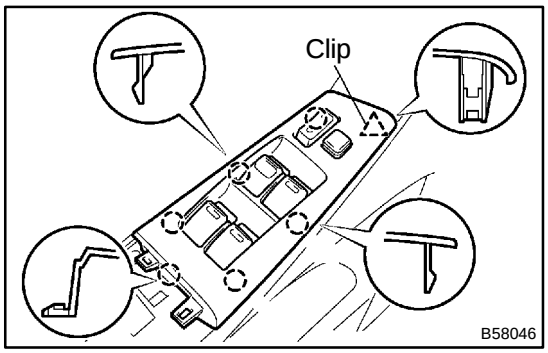
- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.



1. REMOVE FRONT ARMREST ASSY LH

(a) Using a screwdriver, remove the front armrest assembly.

HINT:
Tape the screwdriver tip before use.

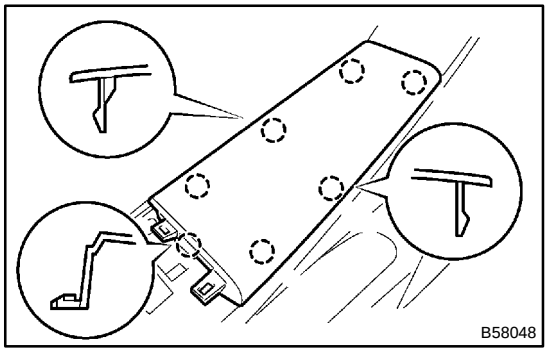


2. REMOVE POWER WINDOW REGULATOR MASTER SWITCH ASSY(W/ POWER WINDOW)

(a) Using a screwdriver, remove the power window regulator master switch assembly.

HINT:
Tape the screwdriver tip before use.

(b) Disconnect the connectors.



3. REMOVE FRONT ARMREST BASE PANEL UPPER LH(W/O POWER WINDOW)

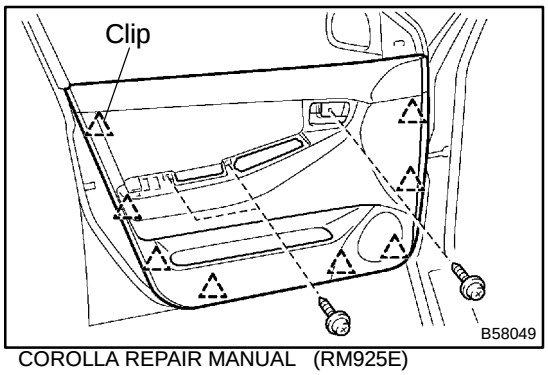
(a) Using a screwdriver, remove the front armrest base panel upper.

HINT:
Tape the screwdriver tip before use.

4. REMOVE FRONT DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Using a shop rag, remove the snap ring.

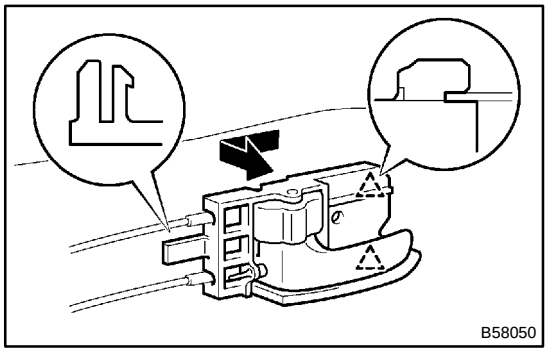
(b) Remove the front door window regulator handle assembly and plate.



5. REMOVE FRONT DOOR TRIM BOARD SUB-ASSY LH

(a) Remove the 3 screws.

(b) Disengage the clips, and then pull the trim upward to remove it.



6. REMOVE FRONT DOOR INSIDE HANDLE SUB-ASSY LH

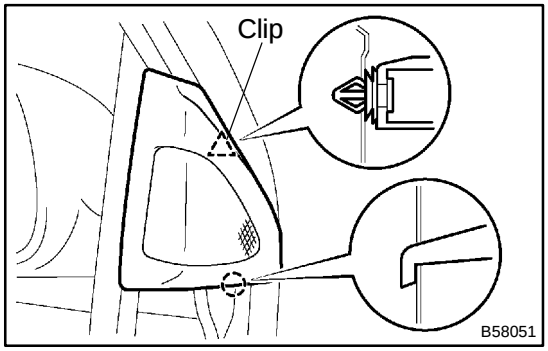
(a) Remove the inside handle, and then disconnect the 2 cables from the inside handle.

7. REMOVE FRONT DOOR SERVICE HOLE COVER LH

(a) Disconnect each connector, and remove the front door service hole cover.

NOTICE:

Remove the remaining tape on the body side.



8. REMOVE FRONT DOOR LOWER FRAME BRACKET GARNISH LH

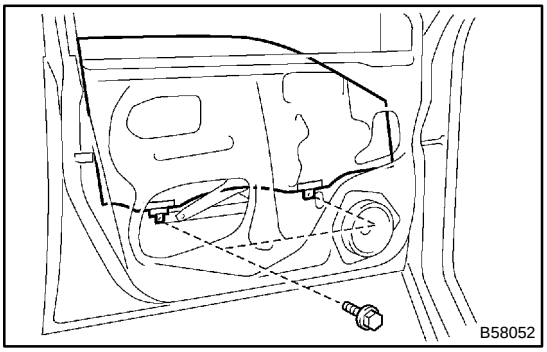
(a) Remove the lower frame bracket garnish.

9. REMOVE OUTER REAR VIEW MIRROR ASSY LH

(a) Disconnect the connector.
(b) Remove the 3 nuts and the outer rear view mirror assembly.

10. REMOVE FRONT DOOR BELT MOULDING ASSY LH

(See page 76-23)



11. REMOVE FRONT DOOR GLASS SUB-ASSY LH

HINT:
Insert a shop rag inside the door panel to prevent scratching the glass.

(a) Open the door glass until the bolts appear in the service hole.
(b) Remove the 2 bolts and door glass.

NOTICE:

Do not damage the door glass.

HINT:
Pull the glass upward to remove it.

12. REMOVE FRONT DOOR GLASS RUN LH

(a) Remove the front door glass run.

13. REMOVE FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Remove the 5 bolts and front door window regulator.

14. REMOVE FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Disconnect the connector.
(b) Loosen the temporarily installed bolt.

NOTICE:
When the temporarily installed bolt is removed, the front door window regulator might drop and be deformed.

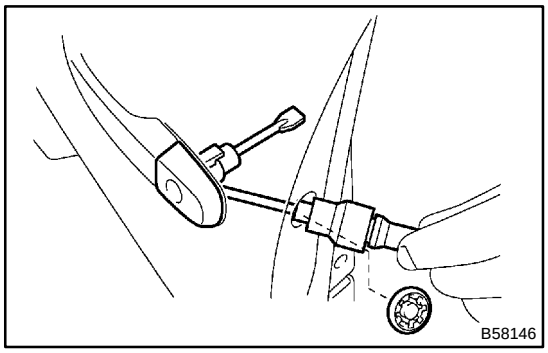
(c) Remove the 5 bolts and front door window regulator.

15. REMOVE POWER WINDOW REGULATOR MOTOR ASSY LH(W/ POWER WINDOW)

(a) Using a torx wrench (T25), remove the 3 screws and the power window regulator motor assembly.

16. REMOVE FRONT DOOR FRAME SUB-ASSY REAR LOWER LH

(a) Remove the bolt and front door frame rear lower.



17. REMOVE FRONT DOOR OUTSIDE HANDLE COVER

(a) Remove the hole plug.
(b) Using a torx wrench (T30), loosen the screw and remove the front door outside handle cover with the door lock key cylinder installed.

18. REMOVE FRONT DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

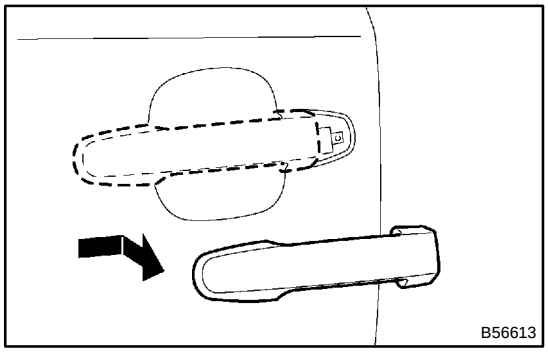
(a) Disconnect the links from the outside handle.
(b) Remove the 2 screws.
(c) Using a torx wrench (T30), remove the 3 screws and the front door lock assembly.

19. REMOVE FRONT DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

(a) Disconnect the connector.
(b) Disconnect the links from the outside handle.
(c) Remove the 2 screws.
(d) Using a torx wrench (T30), remove the 3 screws and the front door lock assembly.

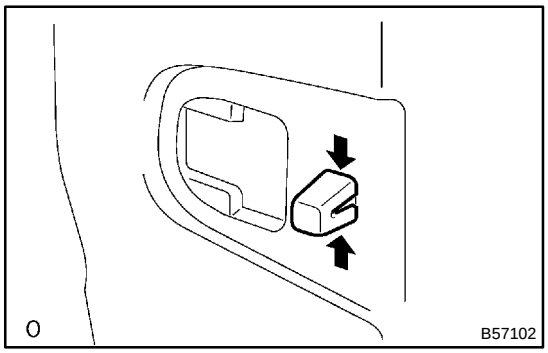
20. REMOVE FRONT DOOR LOCK ACTUATOR ASSY LH(W/ POWER DOOR LOCK)

(a) Remove the 3 screws and the front door lock actuator assembly.



21. REMOVE FRONT DOOR HANDLE ASSY OUTSIDE LH

(a) Pushing the outside handle in the arrow mark direction as shown in the illustration, remove the front door outside handle.



22. REMOVE FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), loosen the screw.
(b) Using a plier, disengage the clips and remove the front door outside handle, as shown in the illustration.

NOTICE:
Be sure to remove the outside handle together with the clips, because the clips will be damaged if the clips remain attached to the door panel.

23. REMOVE FRONT DOOR WEATHERSTRIP LH

(a) Using a screwdriver, remove the front door weatherstrip.

HINT:
Tape the screwdriver tip before use.

24. INSTALL FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

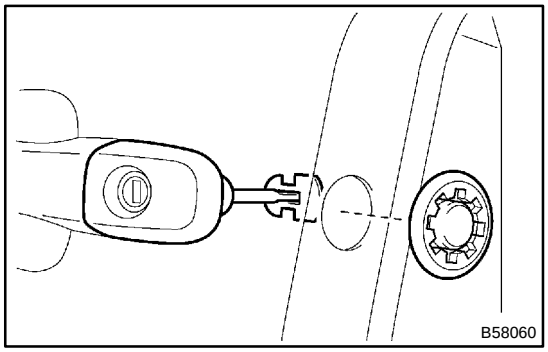
(a) Using a torx wrench (T30), install the front door outside handle frame.

25. INSTALL FRONT DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Using a torx wrench (T30), install the front door lock assembly with the 3 screws.
(b) Install the 2 screws.

26. INSTALL FRONT DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

(a) Apply MP grease to the sliding and rotating parts of the door lock.
(b) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(c) Using a torx wrench (T30), install the front door lock assembly with the 3 screws.
(d) Install the 2 screws.
(e) Connect the connector.



27. INSTALL FRONT DOOR OUTSIDE HANDLE COVER

(a) Using a torx wrench (T30), install the front door outside handle cover with the screw.

28. INSTALL FRONT DOOR GLASS RUN LH

(a) Install a new front door glass run to the door panel.

29. INSTALL POWER WINDOW REGULATOR MOTOR ASSY LH(W/ POWER WINDOW)

(a) If the jam protection dose not function properly, perform the following procedure.

HINT:

It is necessary to reset the power window motor (in the initial position for the limit switch) when separating the window regulator from the power window motor or operating the window regulator with the door glass not installed.

(1) Remove the power window motor.

HINT:

Place the matchmarks on the power window motor and window regulator gear.

(2) Connect the power window motor and power window switch to the wire harness of the vehicle.

(3) Turn the ignition switch ON and operate the power window switch to idle the power window motor in the up side direction for more than 6 rotations or less than 10 rotations (4 seconds or more).

(4) Assemble the power window motor and regulator.

HINT:

- The motor should be installed when the regulator arm is in the middle, not around the upper end (more than 50 mm clearance is necessary from the upper end).
- Align the matchmarks on the power window motor and window regulator gear when installing the power window motor.

(5) Assemble the power window regulator and door glass.

HINT:

Never rotate the motor to the down direction until the installation of the window glass is completed.

30. INSTALL FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the temporarily installed bolt securely.

(c) Install the temporarily installed bolt to the window regulator to the front door panel, and install the front door window regulator temporarily.

(d) Tighten the 5 bolts and the temporarily installed bolt.

(e) Disconnect the connector.

31. INSTALL FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the front door window regulator with the 5 bolts.

32. INSTALL FRONT DOOR GLASS SUB-ASSY LH(W/ POWER WINDOW)

(a) Install the front door glass with the 2 bolts.

HINT:

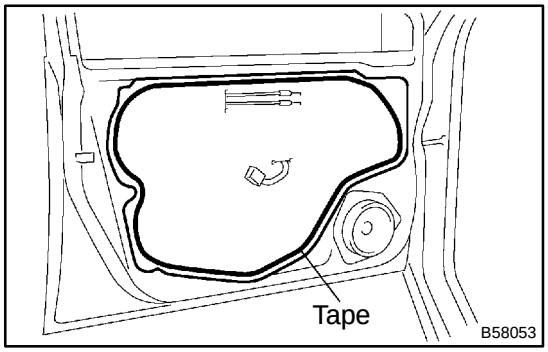
When the installation point of the front door glass does not match, adjust the regulator position by manual operation.

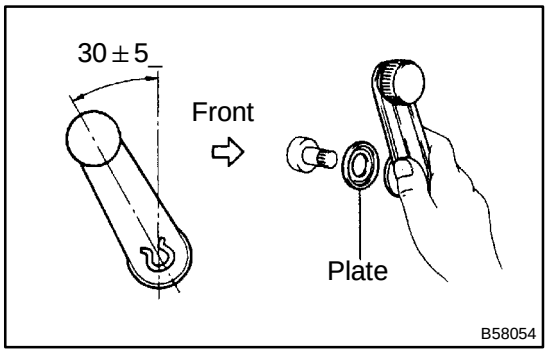
(1) Connect the power window switch to the wire harness and turn the ignition switch ON.
(2) Repeat UP and DOWN operation several times in the manual operation.
(3) Check if AUTO UP →AUTO DOWN operates in the automatic operation.

HINT:

- Note that the jam protection function does not operate just after resetting.
- Reset the regulator again when performing the reverse operation after closing the window fully by AUTO UP operation.

33. INSPECT POWER WINDOW FUNCTION(W/ POWER DOOR LOCK) **(See page 70-1)**





34. INSTALL FRONT DOOR SERVICE HOLE COVER LH

(a) Install a new service hole cover to the door panel.

HINT:

- When installing the service hole cover, pull out the links and connectors through the service hole cover.
- There should be no wrinkles or folds after attaching the service hole cover.
- After attaching the service hole cover, sealing condition should be confirmed.

35. INSTALL FRONT DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Install the regulator handle assembly with a snap ring.

HINT:

With the door window fully closed, install the plate and the regulator handle with a snap ring as shown in the illustration.

750B8-01

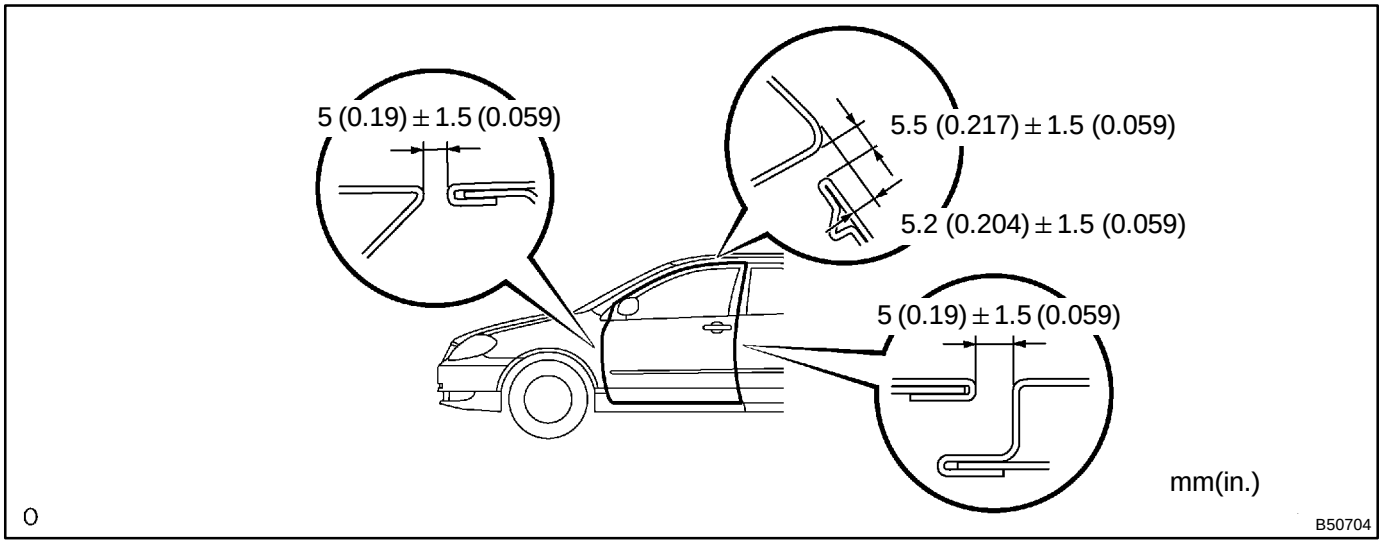
ADJUSTMENT

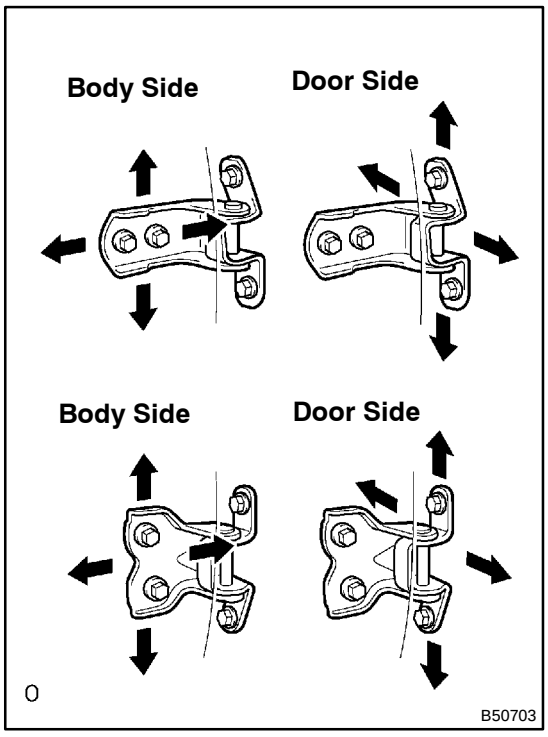
HINT:

- In the RH side, work in the same procedure as in the LH side.

1. INSPECT FRONT DOOR PANEL SUB-ASSY LH

(a) Check that the clearance is within the standard value.



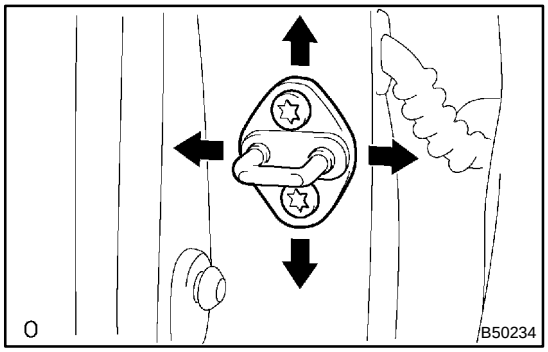


2. ADJUST FRONT DOOR PANEL SUB-ASSY LH

SST 09812-00010

(a) Using SST, adjust the door by loosening the body side hinge bolts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

(b) Adjust the door by loosening the door side hinge bolts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)



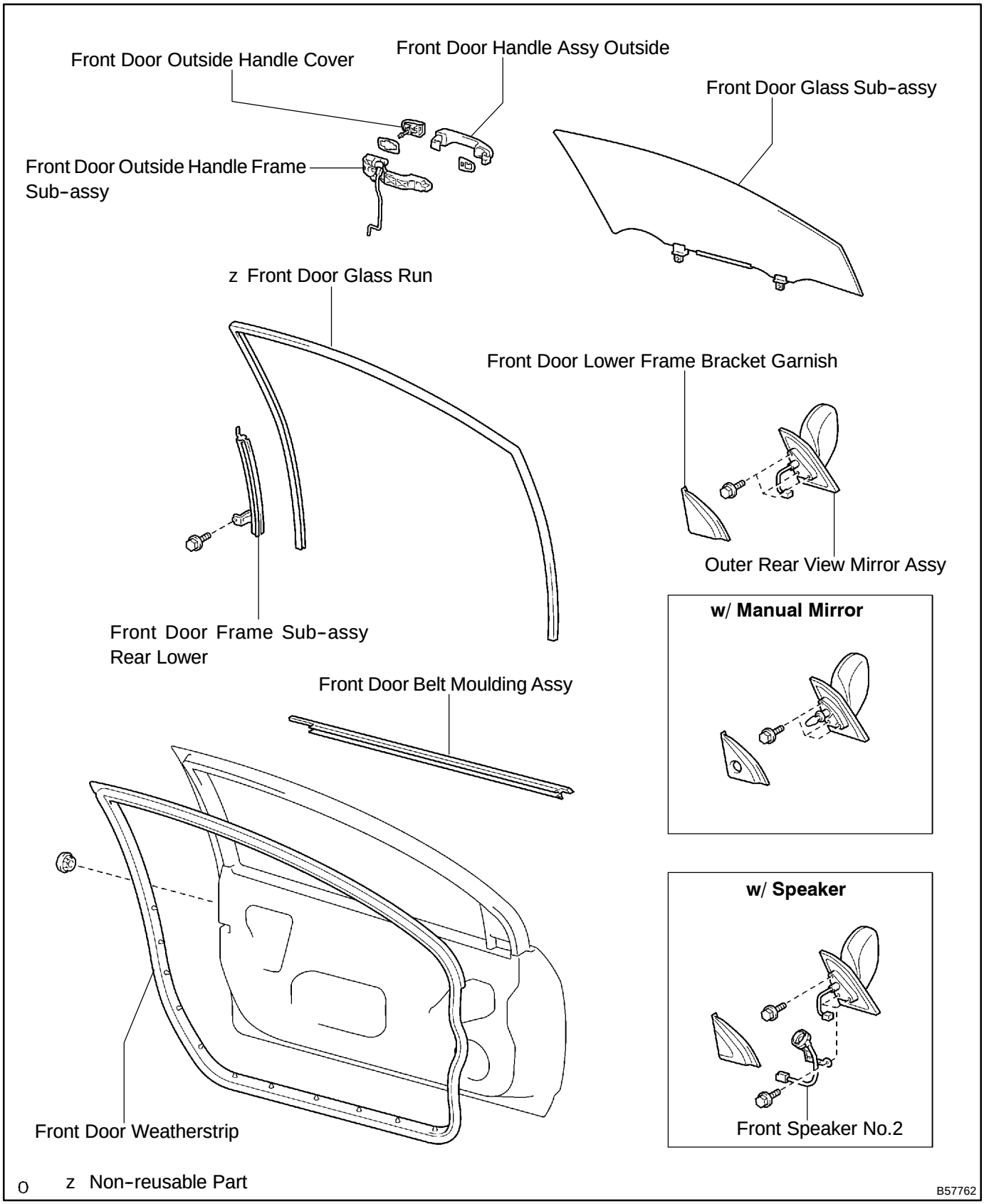
(c) Adjust the striker position by slightly loosening the striker mounting screws, and hitting the striker with a plastic hammer.

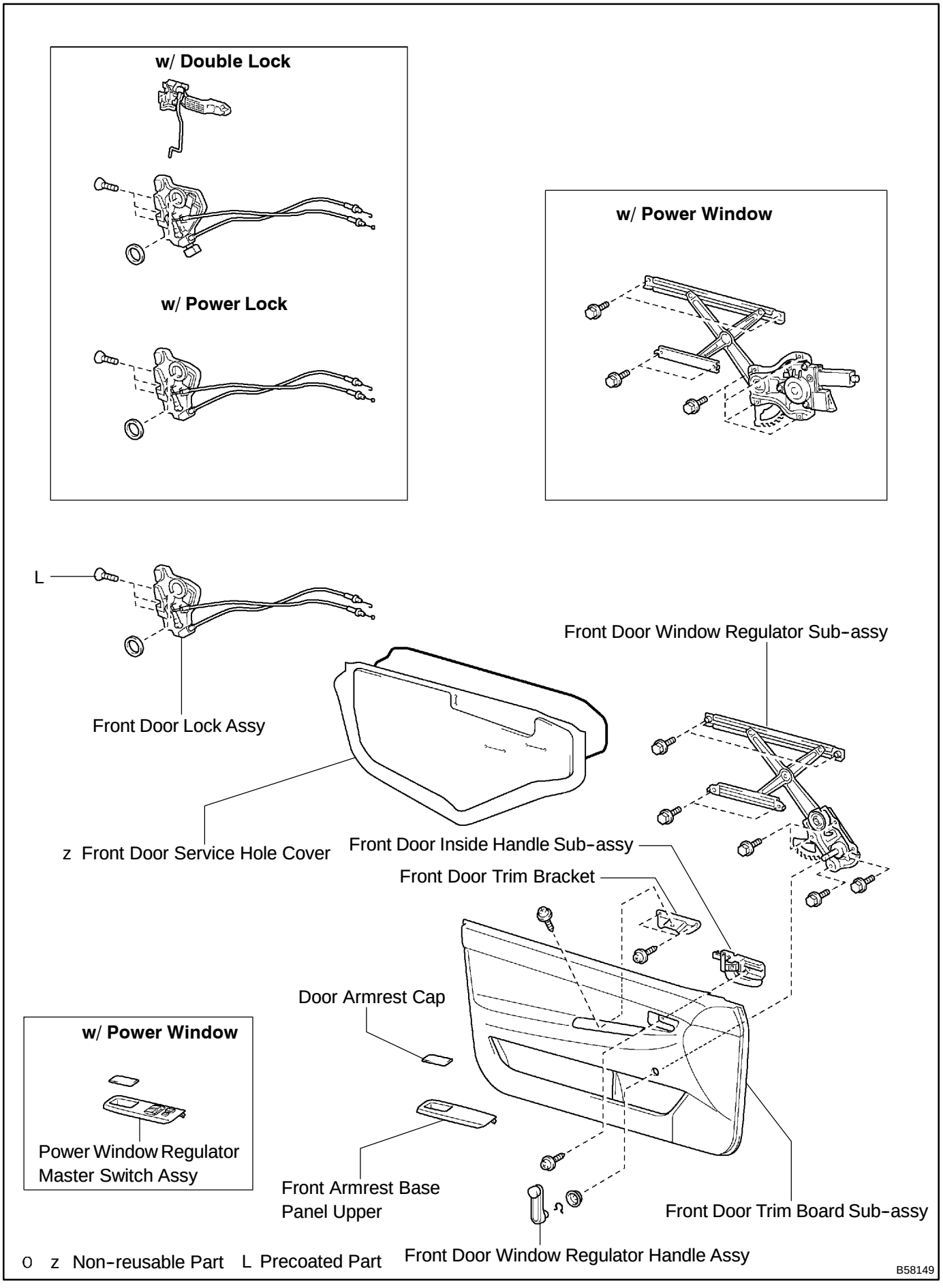
(d) Tighten the striker mounting screws again.
Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

FRONT DOOR (3-DOOR HATCHBACK)

COMPONENTS

750B9-01



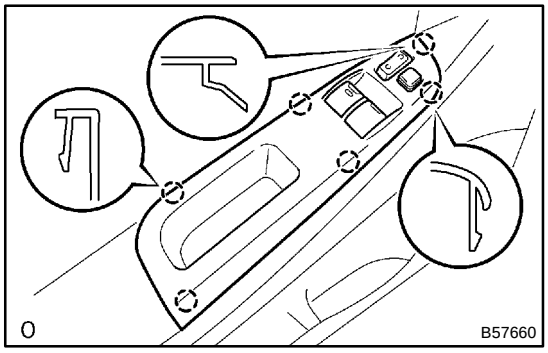

w/ Double Lock
w/ Power Lock
w/ Power Window
L
Front Door Lock Assy
Front Door Window Regulator Sub-assy
z Front Door Service Hole Cover
Front Door Inside Handle Sub-assy
Front Door Trim Bracket
Door Armrest Cap
w/ Power Window
Power Window Regulator Master Switch Assy
Front Armrest Base Panel Upper
Front Door Trim Board Sub-assy
Front Door Window Regulator Handle Assy
o z Non-reusable Part L Precoated Part
B58149

750BA-01

OVERHAUL

HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.



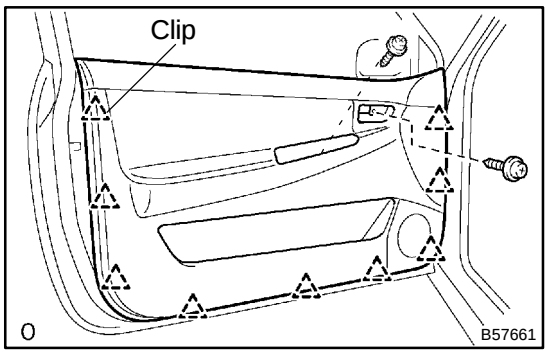
1. REMOVE POWER WINDOW REGULATOR MASTER SWITCH ASSY(W/ POWER WINDOW)

(a) Remove the door armrest cap.
(b) Remove the screw.
(c) Using a screwdriver, remove the power window regulator master switch, and then disconnect the connector.

HINT:
Tape the screwdriver tip before use.

2. REMOVE FRONT DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

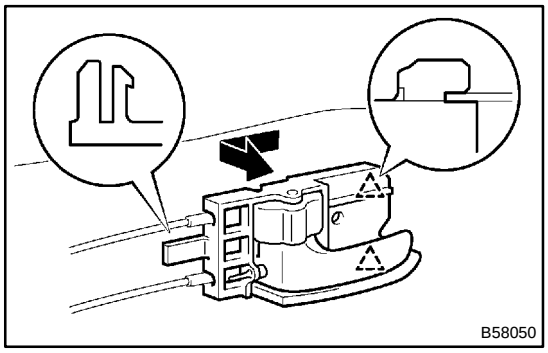
(a) Using a shop rag, remove the snap ring.
(b) Remove the front door window regulator handle assembly and plate.



3. REMOVE FRONT DOOR TRIM BOARD SUB-ASSY LH

(a) Remove the 2 screws.
(b) Using a screwdriver, remove the front door trim board.

HINT:
Tape the screwdriver tip before use.



4. REMOVE FRONT DOOR INSIDE HANDLE SUB-ASSY LH

(a) Remove the inside handle, and then disconnect the 2 cables from the inside handle.

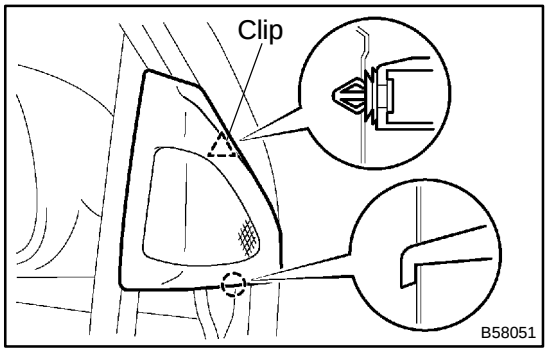
5. REMOVE FRONT DOOR TRIM BRACKET LH

(a) Remove the 2 screws and front door trim bracket.

6. REMOVE FRONT DOOR SERVICE HOLE COVER LH

(a) Disconnect each connector and remove the front door service hole cover.

NOTICE:
Remove the remaining tape on the body side.



7. REMOVE FRONT DOOR LOWER FRAME BRACKET GARNISH LH

(a) Remove the lower frame bracket garnish.

8. REMOVE OUTER REAR VIEW MIRROR ASSY LH

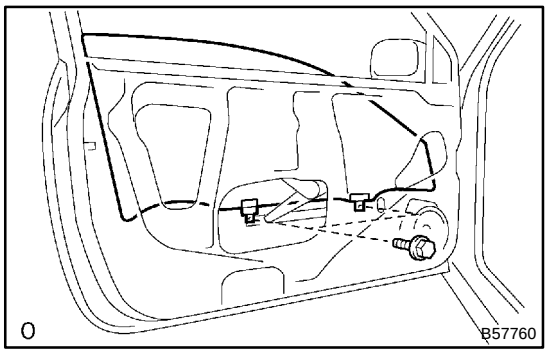
(a) Disconnect the power mirror connector.
(b) Remove the 3 bolts and the outer rear view mirror assembly.

9. REMOVE FRONT DOOR BELT MOULDING ASSY LH

(See page 76-23)

10. REMOVE FRONT DOOR WEATHERSTRIP LH

(a) Using a screwdriver, remove the front door weatherstrip.



11. REMOVE FRONT DOOR GLASS SUB-ASSY LH

HINT:
Insert a shop rag inside the door panel to prevent scratching the glass.

(a) Open the door glass until the bolts appear in the service hole.
(b) Remove the 2 bolts and door glass.

NOTICE:
Do not damage the door glass.

HINT:
Pull the glass upward to remove it.

12. REMOVE FRONT DOOR GLASS RUN LH

(a) Remove the front door glass run.

HINT:
Tape the screwdriver tip before use.

13. REMOVE FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Remove the 6 bolts and front door window regulator.

14. REMOVE FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

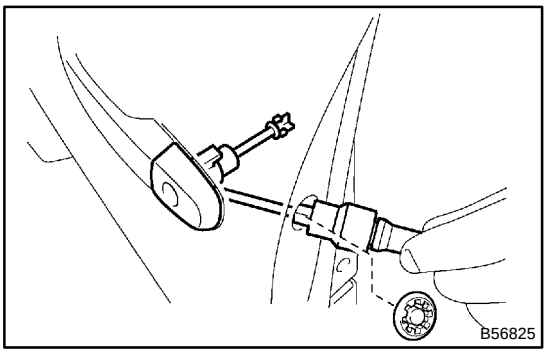
(a) Disconnect the connector.
(b) Loosen the temporarily installed bolt.

NOTICE:
When the temporarily installed bolt is removed, the front door window regulator might drop and be deformed.

(c) Remove the 5 bolts and front door window regulator.

15. REMOVE FRONT DOOR FRAME SUB-ASSY REAR LOWER LH

(a) Remove the bolt and front door frame rear lower.



16. REMOVE FRONT DOOR OUTSIDE HANDLE COVER

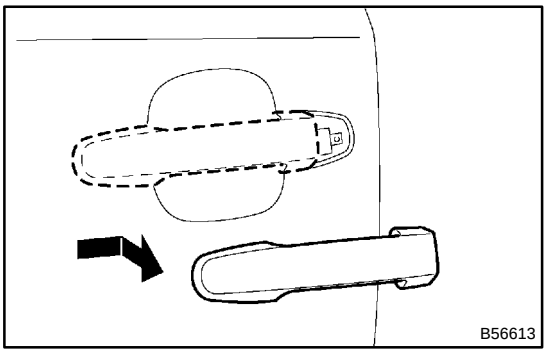
(a) Remove the hole plug.
(b) Using a torx wrench (T30), loosen the screw and remove the front door outside handle cover with the door lock key cylinder installed.

17. REMOVE FRONT DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Using a torx wrench (T30), remove the 3 screws and the front door lock assembly.

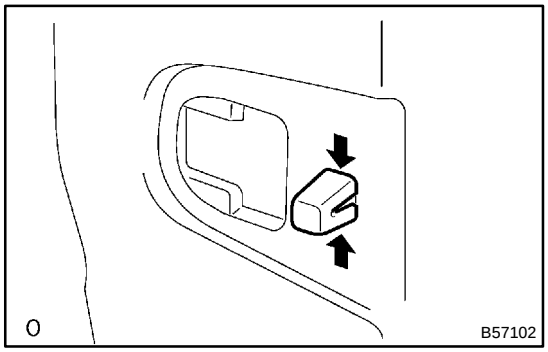
18. REMOVE FRONT DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

(a) Disconnect the connector.
(b) Using a torx wrench (T30), remove the 3 screws and the front door lock assembly.



19. REMOVE FRONT DOOR HANDLE ASSY OUTSIDE LH

(a) Pushing the outside handle in the arrow mark direction as shown in the illustration, remove the front door outside handle.



20. REMOVE FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), loosen the screw.
(b) Using pliers, disengage the clips and remove the front door outside handle, as shown in the illustration.

NOTICE:
Be sure to remove the outside handle together with the clips, because the clips will be damaged if the clips remain attached to the door panel.

21. INSTALL FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), install the front door outside handle frame.

22. INSTALL FRONT DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Apply MP grease to the sliding and rotating parts of the door lock.
(b) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(c) Using a torx wrench (T30), install the front door lock assembly with the 3 screws.

23. INSTALL FRONT DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

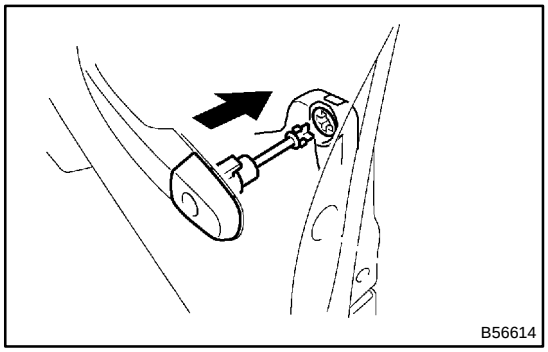
(a) Install a new door lock wire harness packing.

NOTICE:
- **If reusing the removed lock with front door motor, the packing in the connecting part should be replaced with a new one.**
- **Be careful that grease and dirt will not stick to the packing surface in the connecting part.**
- **Reusing the removed packing or using a damaged packing will cause water to penetrate through the connecting part, and it will result in a malfunction of the door lock.**

(b) Insert the outside handle link into the lock assembly with front door motor, and then set it to the door panel.

NOTICE:
Make sure that the outside handle link is securely engaged with the lock assembly.

(c) Apply MP grease to the sliding and rotating parts of the door lock.
(d) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(e) Using a torx wrench (T30), install the front door lock assembly with the 3 screws.



24. INSTALL FRONT DOOR OUTSIDE HANDLE COVER

(a) Using a torx wrench (T30), install the front door outside handle cover with the screw.

25. INSTALL FRONT DOOR GLASS RUN LH

(a) Install a new front door glass run to the door panel.

26. INSTALL FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the front door window regulator with the 6 bolts.

27. INSTALL FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the temporarily installed bolt securely.

(c) Install the temporarily installed bolt to the window regulator to the front door panel, and install the front door window regulator temporarily.

(d) Tighten the 5 bolts and the temporarily installed bolt.

(e) Disconnect the connector.

28. INSTALL FRONT DOOR GLASS SUB-ASSY LH

(a) Install the front door glass with the 2 bolts.

HINT:

When the installation point of the front door glass does not match, adjust the regulator position by manual operation.

(1) Connect the power window switch to the wire harness and turn the ignition switch ON.

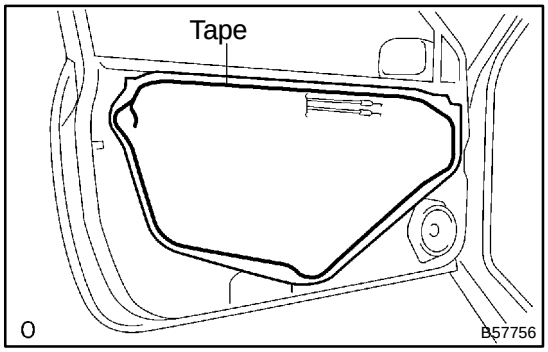
(2) Repeat UP and DOWN operation several times in the manual operation.

(3) Check if AUTO UP →AUTO DOWN operates in the automatic operation.

HINT:

- Note that the jam protection function does not operate just after resetting.
- Reset the regulator again when performing the reverse operation after closing the window fully by AUTO UP operation.

29. INSPECT POWER WINDOW FUNCTION **(See page 70-8)**

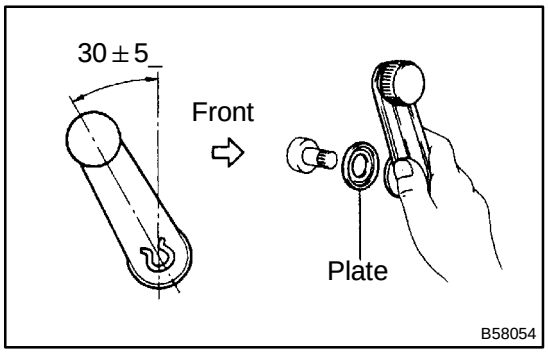


30. INSTALL FRONT DOOR SERVICE HOLE COVER LH

(a) Install a new service hole cover to the door panel.

HINT:

- When installing the service hole cover, pull out the links and connectors through the service hole cover.
- There should be no wrinkles or folds after attaching the service hole cover.
- After attaching the service hole cover, sealing condition should be confirmed.



31. INSTALL FRONT DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Install the regulator handle assembly with the snap ring.

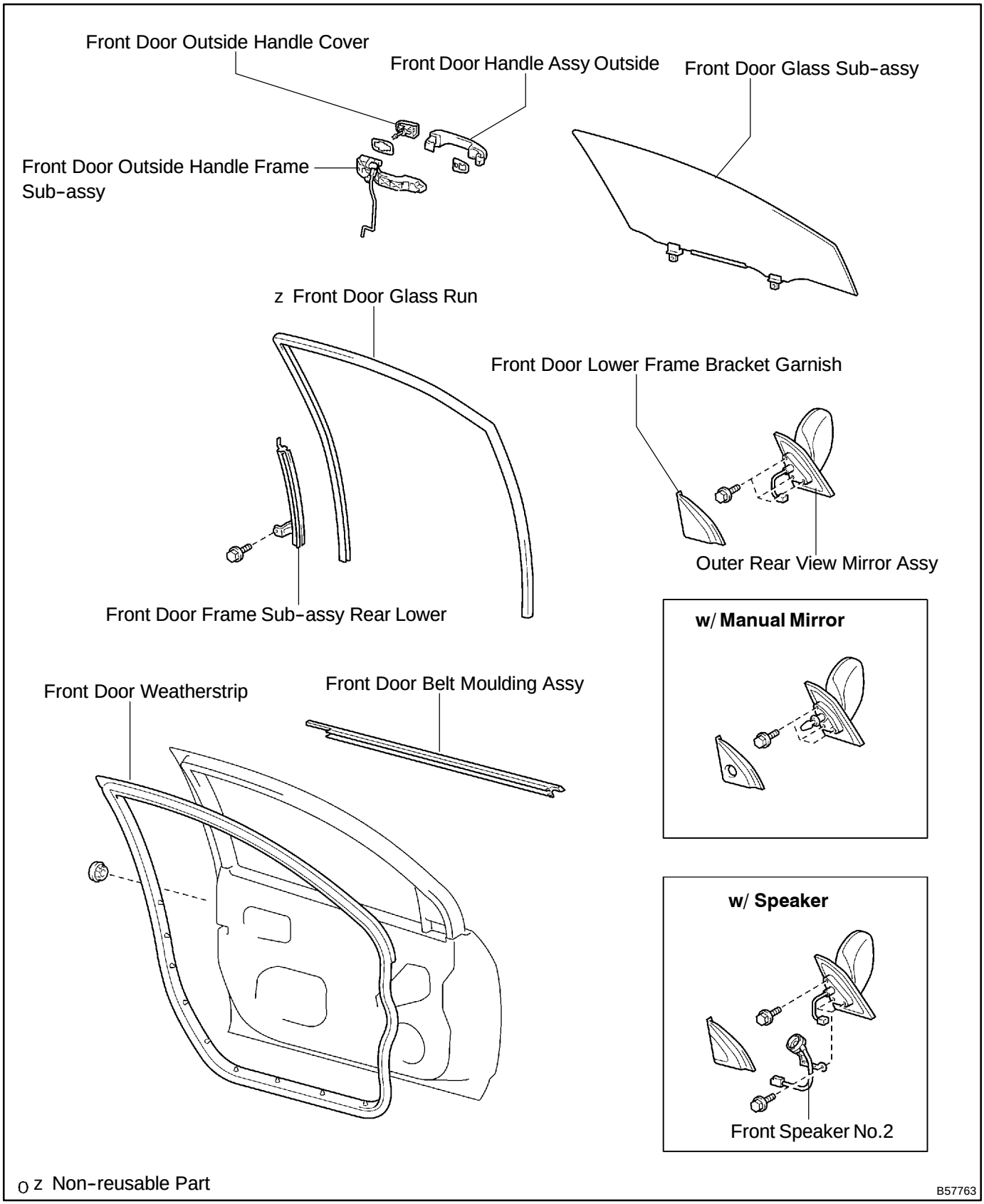
HINT:

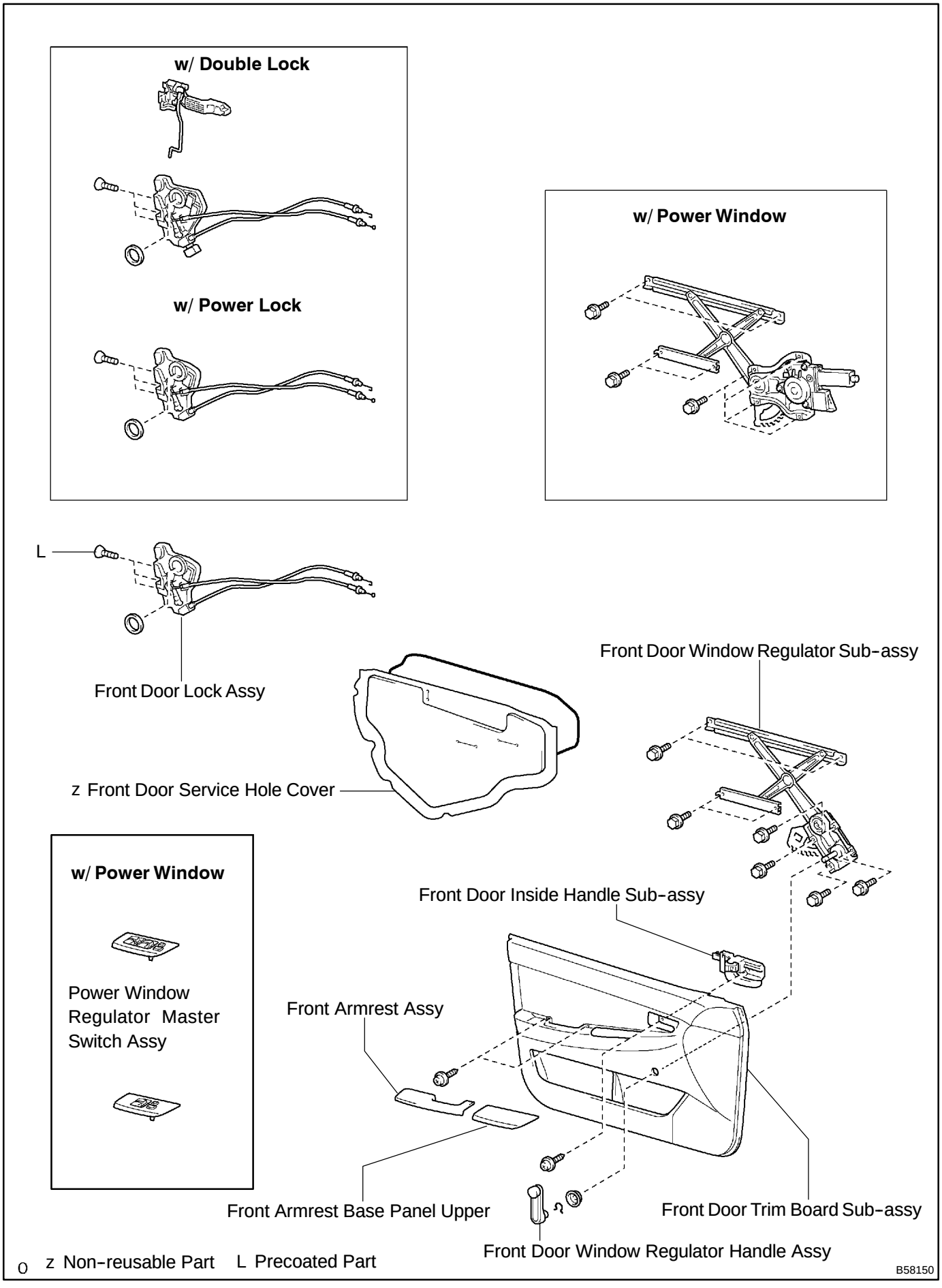
With the door window fully closed, install the plate and the regulator handle assembly with the snap ring as shown in the illustration.

FRONT DOOR (5-DOOR HATCHBACK)

COMPONENTS

750BB-01



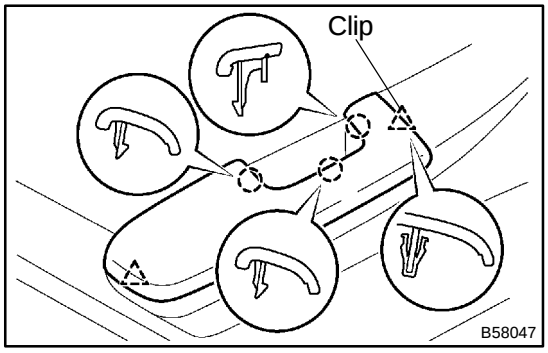

w/ Double Lock
w/ Power Lock
w/ Power Window
L
Front Door Lock Assy
z Front Door Service Hole Cover
Front Door Window Regulator Sub-assy
w/ Power Window
Power Window Regulator Master Switch Assy
Front Door Inside Handle Sub-assy
Front Armrest Assy
Front Armrest Base Panel Upper
Front Door Trim Board Sub-assy
Front Door Window Regulator Handle Assy
o z Non-reusable Part L Precoated Part
B58150

750BC-01

OVERHAUL

HINT:

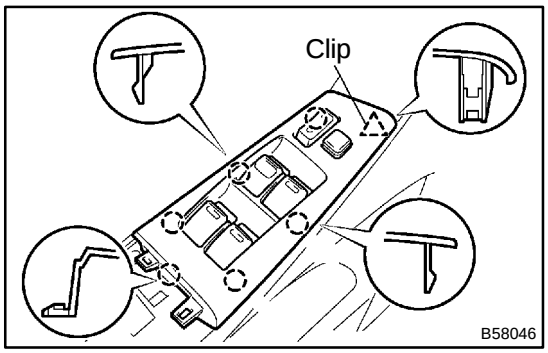
- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.



1. REMOVE FRONT ARMREST ASSY LH

(a) Using a screwdriver, remove the front armrest assembly.

HINT:
Tape the screwdriver tip before use.

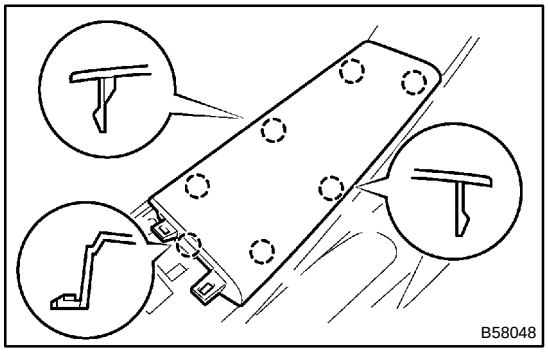


2. REMOVE POWER WINDOW REGULATOR MASTER SWITCH ASSY(W/ POWER WINDOW)

(a) Using a screwdriver, remove the power window regulator master switch assembly.

HINT:
Tape the screwdriver tip before use.

(b) Disconnect the connectors.



3. REMOVE FRONT ARMREST BASE PANEL UPPER LH(W/O POWER WINDOW)

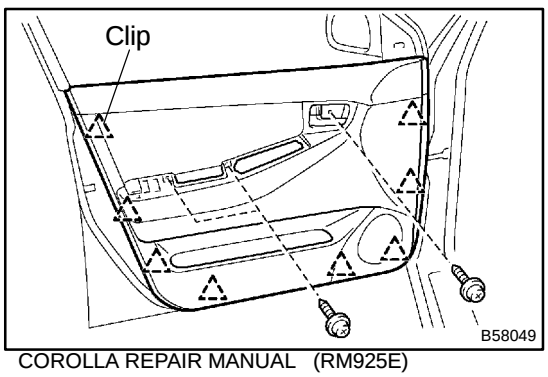
(a) Using a screwdriver, remove the front armrest base panel upper.

HINT:
Tape the screwdriver tip before use.

4. REMOVE FRONT DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Using a shop rag, remove the snap ring.

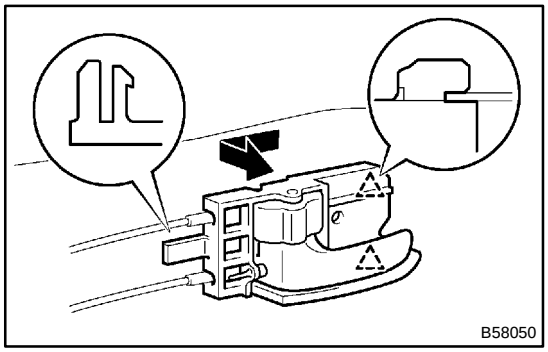
(b) Remove the front door window regulator handle assembly and plate.



5. REMOVE FRONT DOOR TRIM BOARD SUB-ASSY LH

(a) Remove the 3 screws.

(b) Disengage the clips, and then pull the trim upward to remove it.



6. REMOVE FRONT DOOR INSIDE HANDLE SUB-ASSY LH

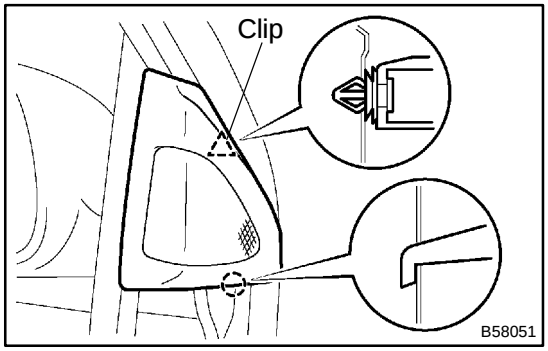
(a) Remove the inside handle, and then disconnect the 2 cables from the inside handle.

7. REMOVE FRONT DOOR SERVICE HOLE COVER LH

(a) Disconnect each connector, and remove the front door service hole cover.

NOTICE:

Remove the remained tape on the body side.



8. REMOVE FRONT DOOR LOWER FRAME BRACKET GARNISH LH

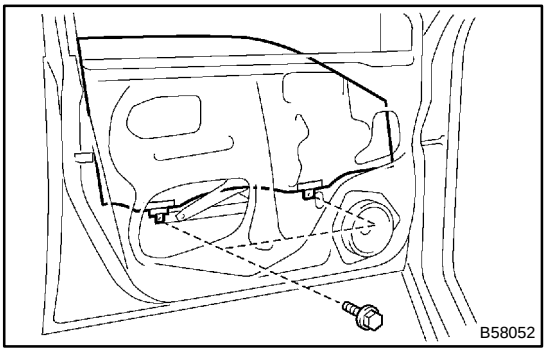
(a) Remove the lower frame bracket garnish.

9. REMOVE OUTER REAR VIEW MIRROR ASSY LH

(a) Disconnect the power mirror connector.
(b) Remove the 3 bolts and the outer rear view mirror assembly.

10. REMOVE FRONT DOOR BELT MOULDING ASSY LH

(See page 76-23)



11. REMOVE FRONT DOOR GLASS SUB-ASSY LH

HINT:
Insert a shop rag inside the door panel to prevent scratching the glass.

(a) Open the door glass until the bolts appear in the service hole.
(b) Remove the 2 bolts and door glass.

NOTICE:

Do not damage the door glass.

HINT:
Pull the glass upward to remove it.

12. REMOVE FRONT DOOR GLASS RUN LH

(a) Remove the front door glass run.

13. REMOVE FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Remove the 6 bolts and front door window regulator.

14. REMOVE FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

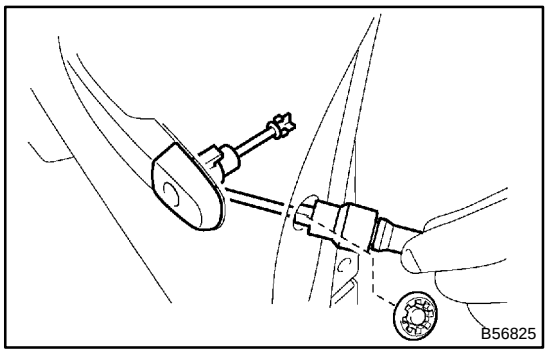
(a) Disconnect the connector.
(b) Loosen the temporarily installed bolt.

NOTICE:
When the temporarily installed bolt is removed, the front door window regulator might drop and be deformed.

(c) Remove the 5 bolts and front door window regulator.

15. REMOVE FRONT DOOR FRAME SUB-ASSY REAR LOWER LH

(a) Remove the bolt and front door frame rear lower.



16. REMOVE FRONT DOOR OUTSIDE HANDLE COVER

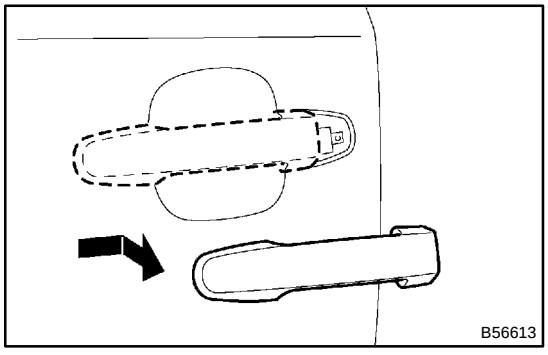
(a) Remove the hole plug.
(b) Using a torx wrench (T30), loosen the screw and remove the front door outside handle cover with the door lock key cylinder installed.

17. REMOVE FRONT DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Using a torx wrench (T30), remove the 3 screws and the front door lock assembly.

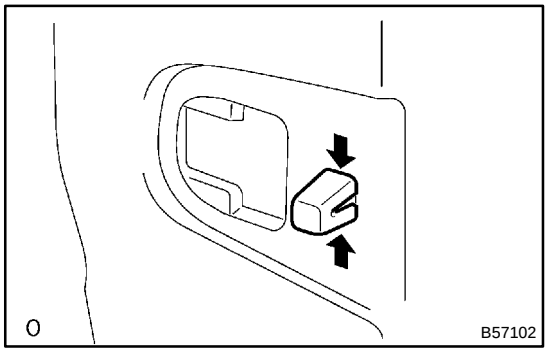
18. REMOVE FRONT DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

(a) Disconnect the connector.
(b) Using a torx wrench (T30), remove the 3 screws and the front door lock assembly.



19. REMOVE FRONT DOOR HANDLE ASSY OUTSIDE LH

(a) Pushing the outside handle in the arrow mark direction in the illustration, remove the front door outside handle assembly.



20. REMOVE FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), loosen the screw.
(b) Using pliers, disengage the clips and remove the front door outside handle frame, as shown in the illustration.

NOTICE:
Be sure to remove the outside handle together with the clips, because the clips will be damaged if the clips remain attached to the door panel.

21. REMOVE FRONT DOOR WEATHERSTRIP LH

(a) Using a screwdriver, remove the front door weatherstrip.

HINT:
Tape the screwdriver tip before use.

22. INSTALL FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), install the front door outside handle.

23. INSTALL FRONT DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Apply MP grease to the sliding and rotating parts of the door lock.
(b) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(c) Using a torx wrench (T30), install the front door lock assembly with the 3 screws.

24. INSTALL FRONT DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

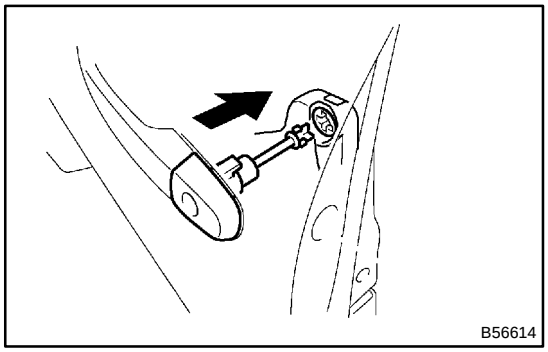
(a) Install a new door lock wire harness packing.

NOTICE:
- **If reusing the removed lock with front door motor, the packing in the connecting part should be replaced with a new one.**
- **Be careful that grease and dirt will not stick to the packing surface in the connecting part.**
- **Reusing the removed packing or using a damaged packing will cause water to penetrate through the connecting part, and it will result in a malfunction of the door lock.**

(b) Insert the outside handle link into the lock assembly with front door motor, and then set it to the door panel.

NOTICE:
Make sure that the outside handle link is securely engaged with the lock assembly.

(c) Apply MP grease to the sliding and rotating parts of the door lock.
(d) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(e) Using a torx wrench (T30), install the front door lock assembly with the 3 screws.



25. INSTALL FRONT DOOR OUTSIDE HANDLE COVER

(a) Using a torx wrench (T30), install the front door outside handle cover with the screw.

26. INSTALL FRONT DOOR GLASS RUN LH

(a) Install a new front door glass run to the door panel.

27. INSTALL FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the front door window regulator with the 6 bolts.

28. INSTALL FRONT DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the temporarily installed bolt securely.

(c) Install the temporarily installed bolt to the window regulator to the front door panel, and install the front door window regulator temporarily.

(d) Tighten the 5 bolts and the temporarily installed bolt.

(e) Disconnect the connector.

29. INSTALL FRONT DOOR GLASS SUB-ASSY LH(W/ POWER WINDOW)

(a) Install the front door glass with the 2 bolts.

HINT:

When the installation point of the front door glass does not match, adjust the regulator position by manual operation.

(1) Connect the power window switch to the wire harness and turn the ignition switch ON.

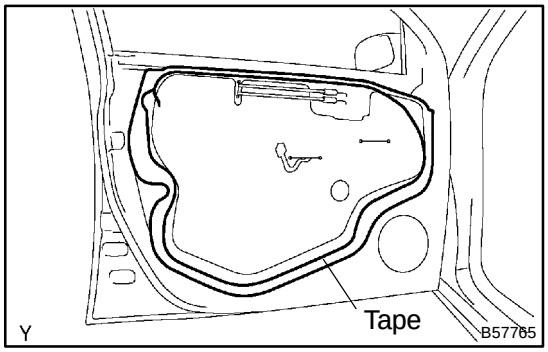
(2) Repeat UP and DOWN operation several times in the manual operation.

(3) Check if AUTO UP →AUTO DOWN operates in the automatic operation.

HINT:

- Note that the jam protection function does not operate just after resetting.
- Reset the regulator again when performing the reverse operation after closing the window fully by AUTO UP operation.

30. INSPECT POWER WINDOW FUNCTION **(See page 70-8)**

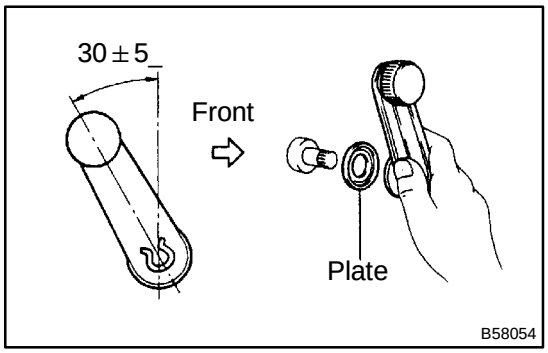


31. INSTALL FRONT DOOR SERVICE HOLE COVER LH

(a) Install a new service hole cover to the door panel.

HINT:

- When installing the service hole cover, pull out the links and connectors through the service hole cover.
- There should be no wrinkles or folds after attaching the service hole cover.
- After attaching the service hole cover, sealing condition should be confirmed.



32. INSTALL FRONT DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Install the regulator handle assembly with the snap ring.

HINT:

With the door window fully closed, install the plate and the regulator handle with the snap ring as shown in the illustration.

FRONT DOOR (HATCHBACK)

750BD-01

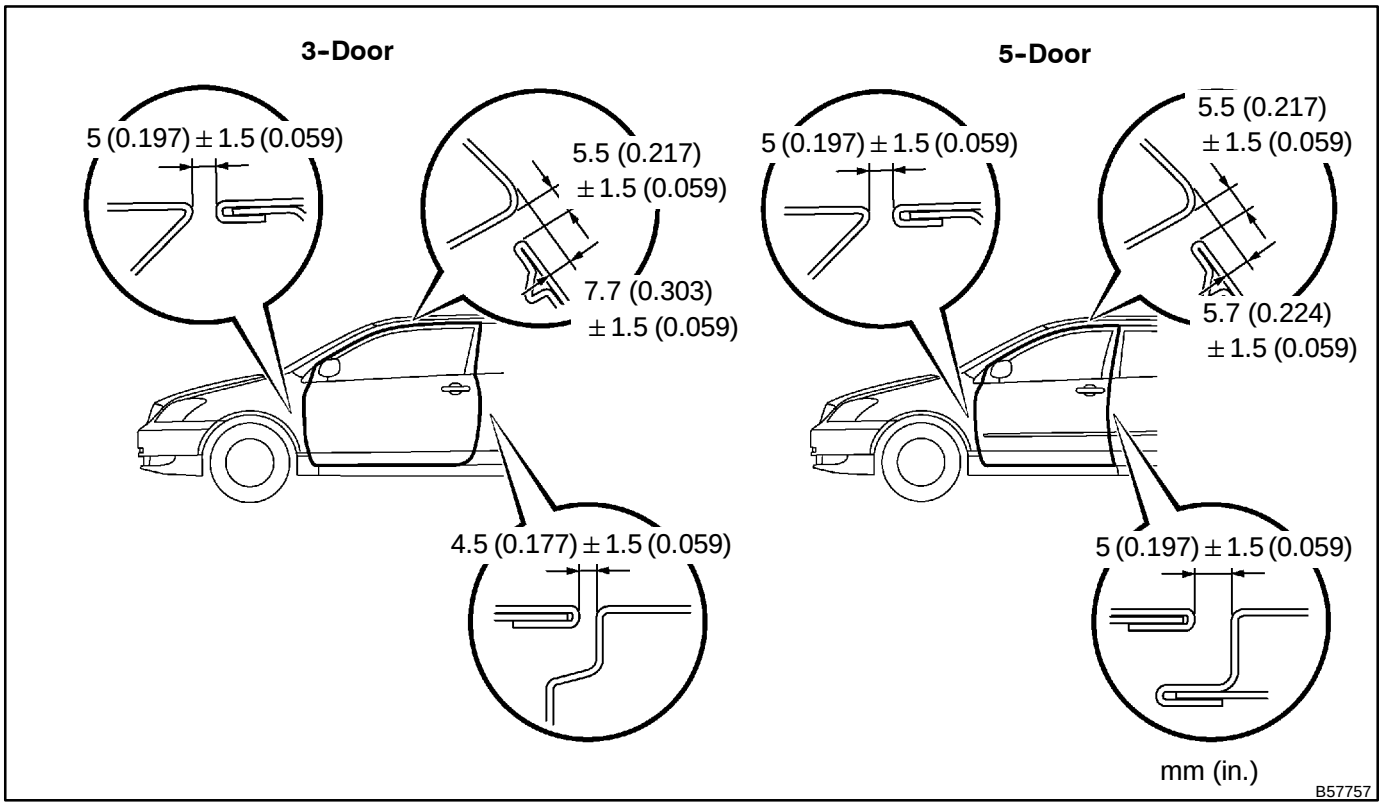
ADJUSTMENT

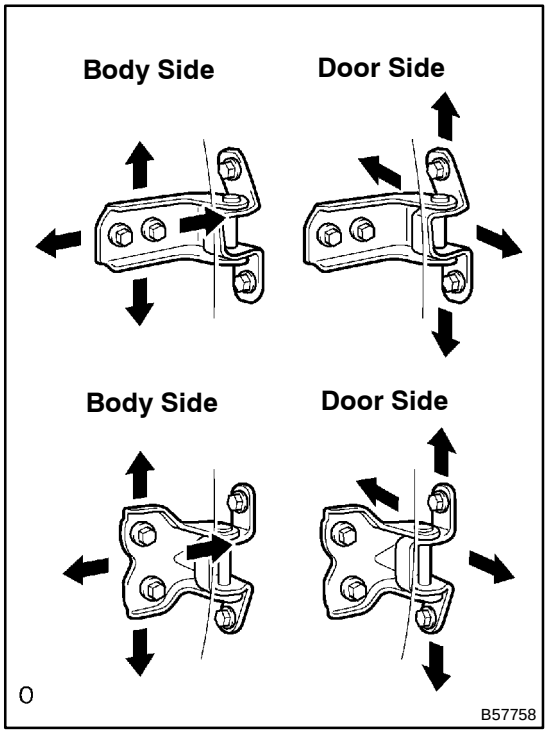
HINT:

In the RH side, work in the same procedure as in the LH side.

1. INSPECT FRONT DOOR PANEL SUB-ASSY LH

(a) Check that the clearance is within the standard value.



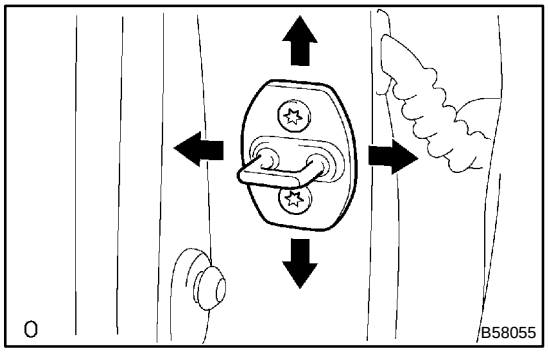


2. ADJUST FRONT DOOR PANEL SUB-ASSY LH

SST 09812-00010

(a) Using SST, adjust the door by loosening the body side hinge bolts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

(b) Adjust the door by loosening the door side hinge bolts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)



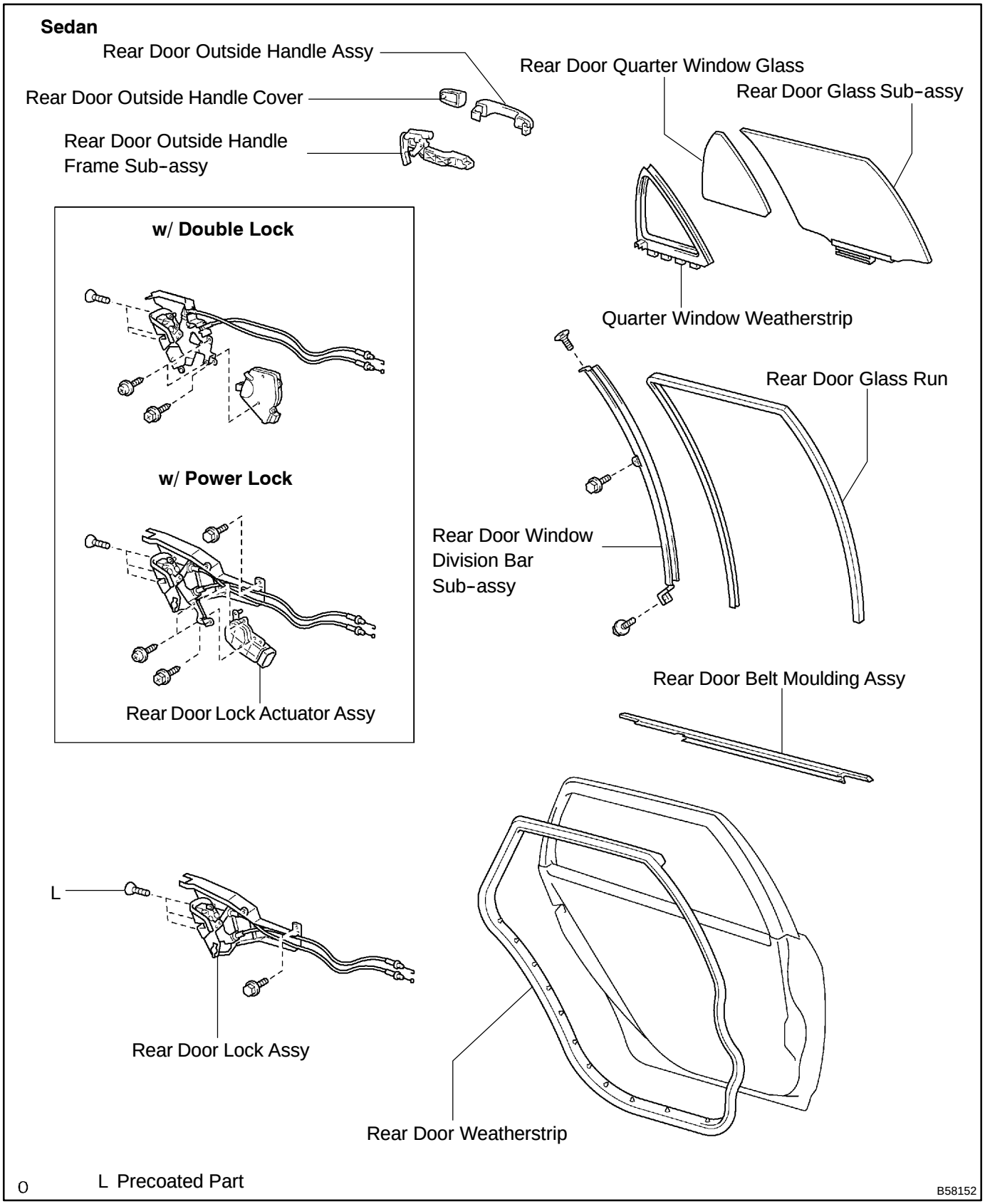
(c) Adjust the striker position by slightly loosening the striker mounting screws, and hitting the striker with a plastic hammer.

(d) Tighten the striker mounting screws again.
Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

REAR DOOR (SEDAN/STATION WAGON)

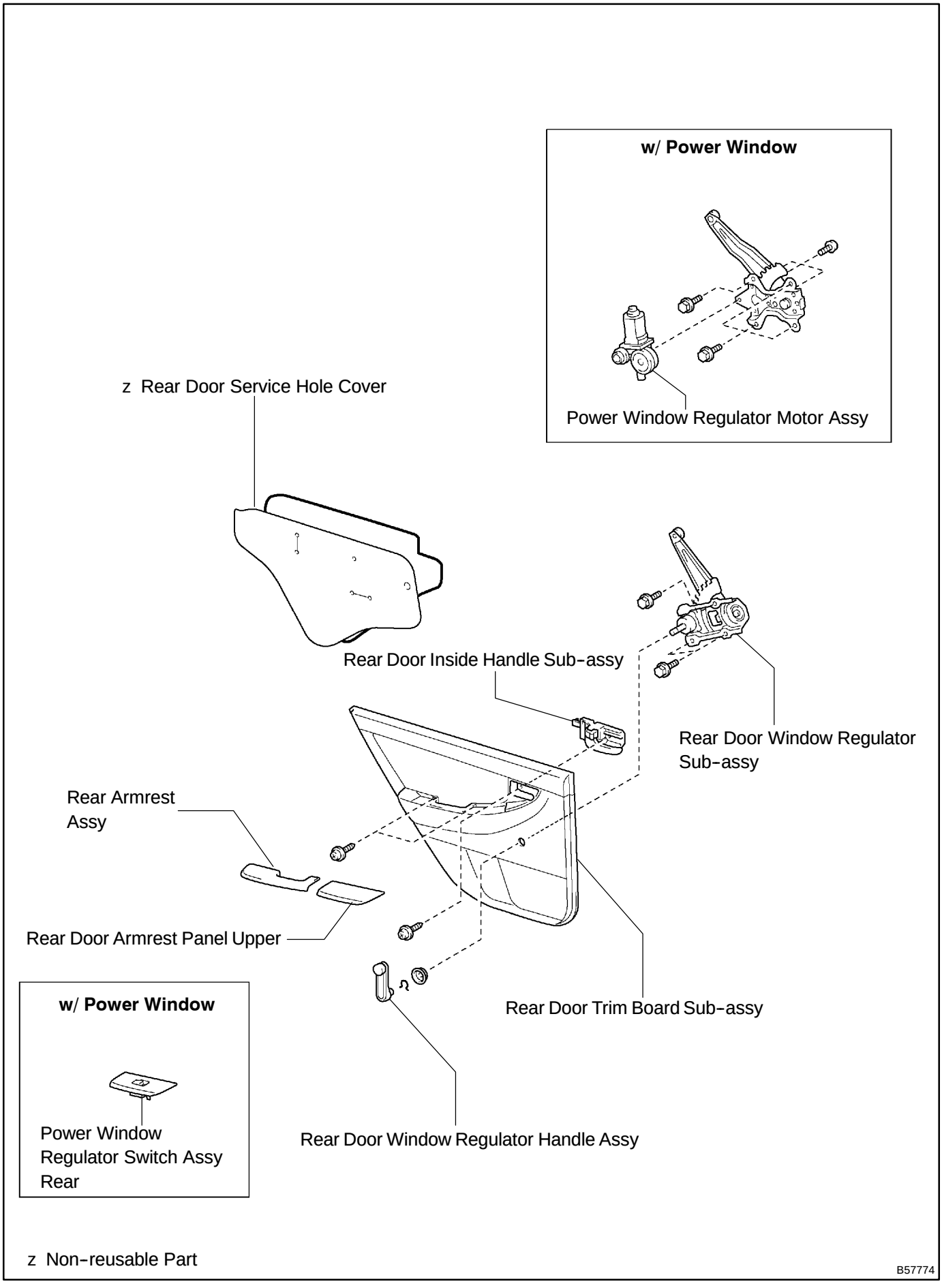
COMPONENTS

750BE-01

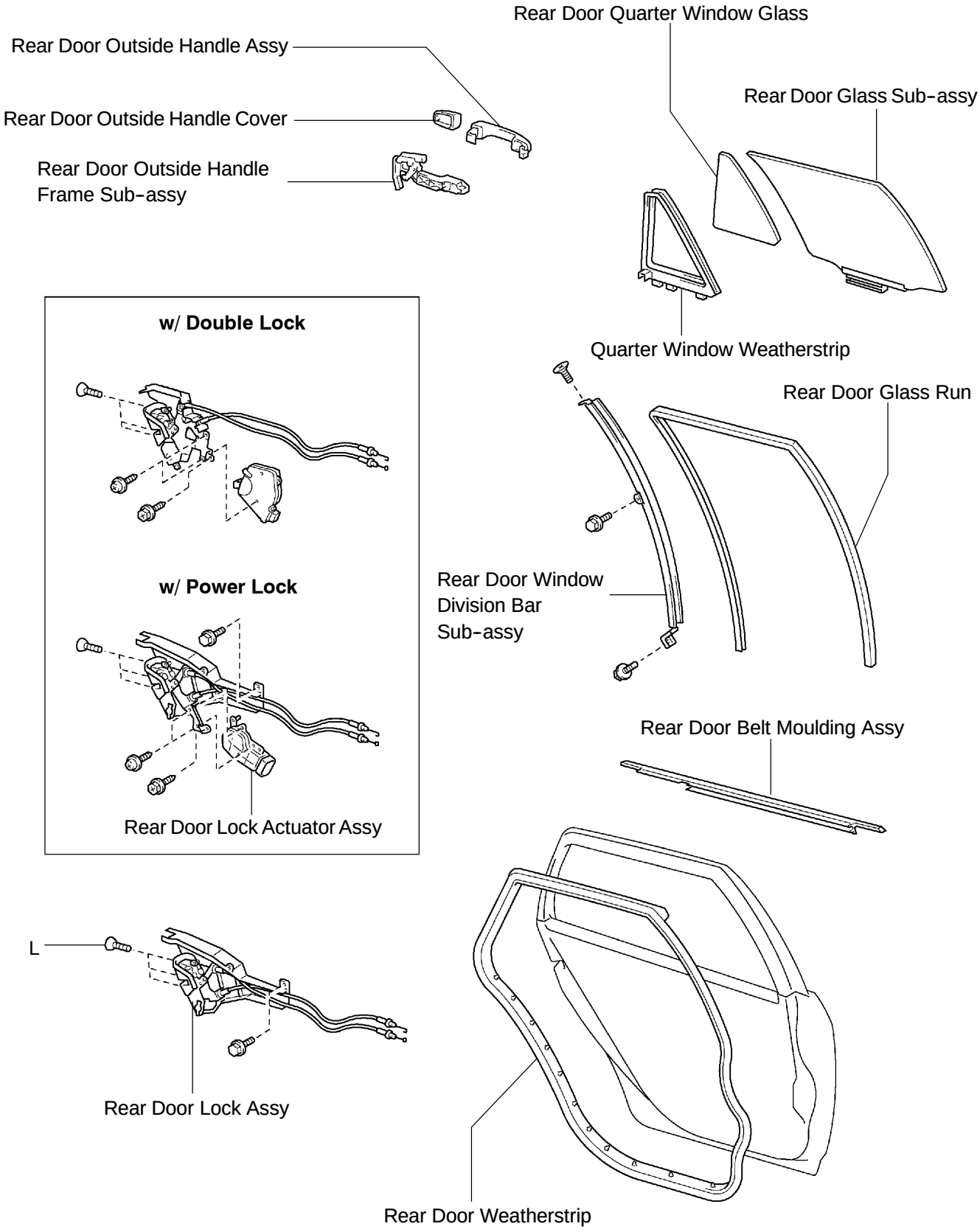


o L Precoated Part

B58152

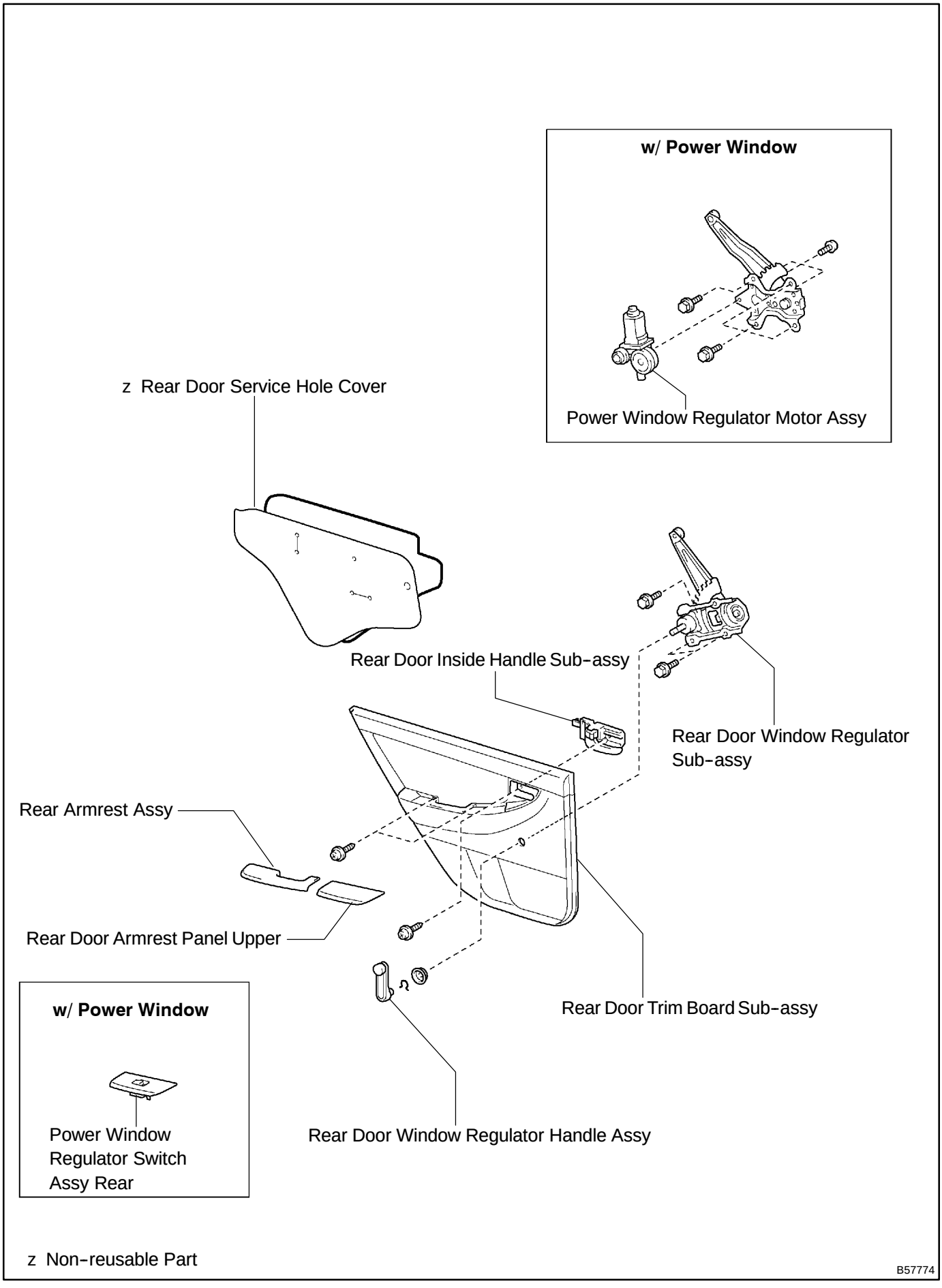

w/ Power Window
Power Window Regulator Motor Assy
z Rear Door Service Hole Cover
Rear Door Inside Handle Sub-assy
Rear Door Window Regulator Sub-assy
Rear Armrest Assy
Rear Door Armrest Panel Upper
Rear Door Trim Board Sub-assy
w/ Power Window
Power Window Regulator Switch Assy Rear
Rear Door Window Regulator Handle Assy
z Non-reusable Part
B57774

Station Wagon



L Precoated Part

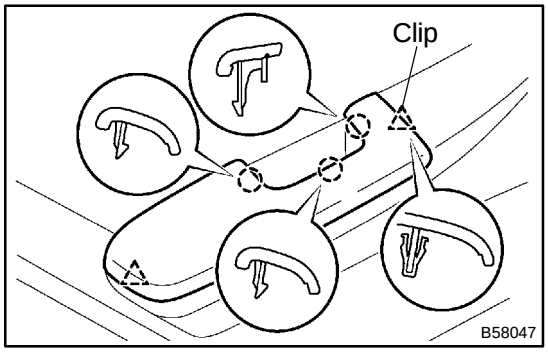
B57773


w/ Power Window
Power Window Regulator Motor Assy
z Rear Door Service Hole Cover
Rear Door Inside Handle Sub-assy
Rear Door Window Regulator Sub-assy
Rear Armrest Assy
Rear Door Armrest Panel Upper
Rear Door Trim Board Sub-assy
w/ Power Window
Power Window Regulator Switch Assy Rear
Rear Door Window Regulator Handle Assy
z Non-reusable Part
B57774

OVERHAUL

HINT:

- Installation is in the reveres order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.

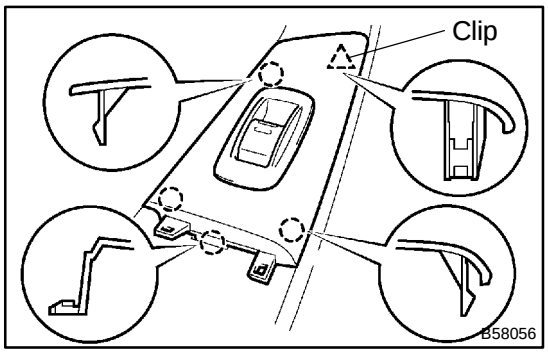


1. REMOVE REAR ARMREST ASSY LH

(a) Using a screwdriver, remove the rear armrest assembly.

HINT:

Tape the screwdriver tip before use.



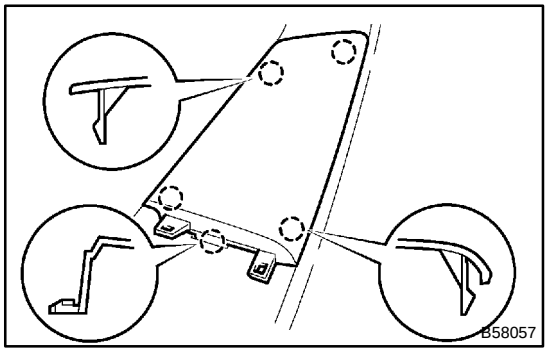
2. REMOVE POWER WINDOW REGULATOR SWITCH ASSY REAR(W/ POWER WINDOW)

(a) Using a screwdriver, remove the power window regulator switch assembly.

HINT:

Tape the screwdriver tip before use.

(b) Disconnect the connectors.



3. REMOVE REAR DOOR ARMREST BASE PANEL UPPER LH(W/O POWER WINDOW)

(a) Using a screwdriver, remove the rear door armrest base panel upper.

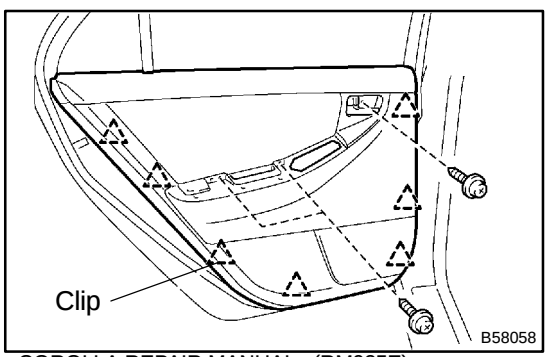
HINT:

Tape the screwdriver tip before use.

4. REMOVE REAR DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Using a shop rag, remove the snap ring.

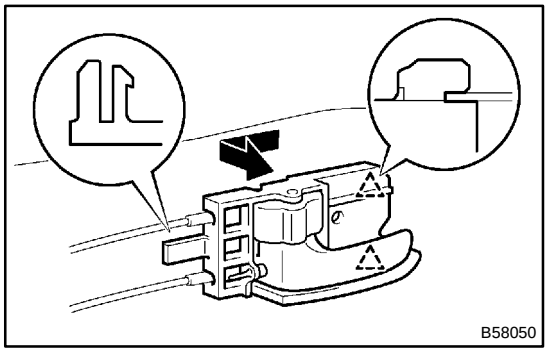
(b) Remove the rear door window regulator handle assembly and plate.



5. REMOVE REAR DOOR TRIM BOARD SUB-ASSY LH

(a) Remove the 3 screws.

(b) Disengage the clips, then pull the trim upward to remove it.



6. REMOVE REAR DOOR INSIDE HANDLE SUB-ASSY LH

(a) Remove the inside handle, and disconnect the 2 cables from the inside handle.

7. REMOVE REAR DOOR SERVICE HOLE COVER LH

(a) Disconnect each connector, and remove the rear door service hole cover.

NOTICE:

Remove the remained tape on the body side.

8. REMOVE REAR DOOR BELT MOULDING ASSY LH

(See page 76-24)

9. REMOVE REAR DOOR GLASS RUN LH

(a) Remove the rear door glass run.

10. REMOVE REAR DOOR WEATHERSTRIP LH

(a) Using a screwdriver, remove the rear door weatherstrip.

HINT:

Tape the screwdriver tip before use.

11. REMOVE REAR DOOR WINDOW DIVISION BAR SUB-ASSY LH

(a) Remove the 2 bolts, screw and rear door window division bar.

12. REMOVE REAR DOOR QUARTER WINDOW GLASS LH

(a) Remove the rear door quarter window glass.

NOTICE:

Do not damage the glass.

(b) Remove the quarter window weatherstrip from the glass.

13. REMOVE REAR DOOR GLASS SUB-ASSY LH

HINT:

Insert a shop rag inside the door panel to prevent scratching the glass.

(a) Open the door glass.

(b) Tilt the door glass and disconnect the roller of the regulator from the channel to remove the door glass.

NOTICE:

Do not damage the door glass.

HINT:

Pull the glass upward to remove it.

14. REMOVE REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Remove the 3 bolts and rear door window regulator.

15. REMOVE REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Disconnect the connector.
(b) Loosen the temporarily installed bolt.

NOTICE:
When the temporarily installed bolt is removed, the rear door window regulator might drop and be deformed.

(c) Remove the 3 bolts and rear door window regulator.

16. REMOVE POWER WINDOW REGULATOR MOTOR ASSY LH(W/ POWER WINDOW)

(a) Using a torx wrench (T25), remove the 3 screws and the motor assembly.

17. REMOVE REAR DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Remove the screw.
(b) Using a torx wrench (T30), remove the 3 screws and the rear door lock assembly.

18. REMOVE REAR DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

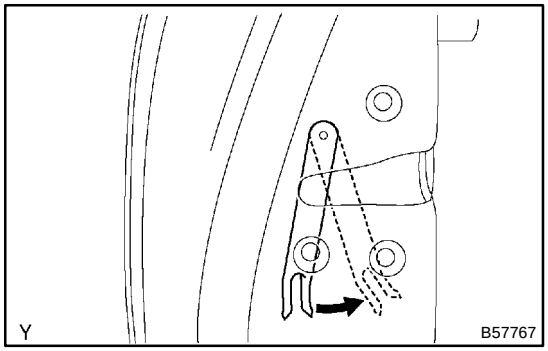
(a) Disconnect the connector.
(b) Remove the screw.
(c) Using a torx wrench (T30), remove the 3 screws and the rear door lock assembly.

19. REMOVE REAR DOOR LOCK ACTUATOR ASSY LH(W/ POWER WINDOW)

(a) Remove the 2 screws and rear door lock actuator assembly.

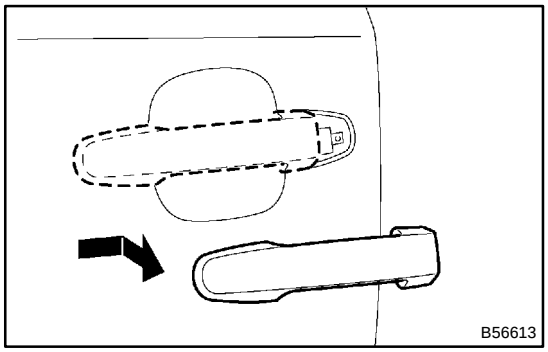
20. REMOVE REAR DOOR OUTSIDE HANDLE COVER RH

(a) Using a torx wrench (T30), loosen the screw and rear door outside handle cover.



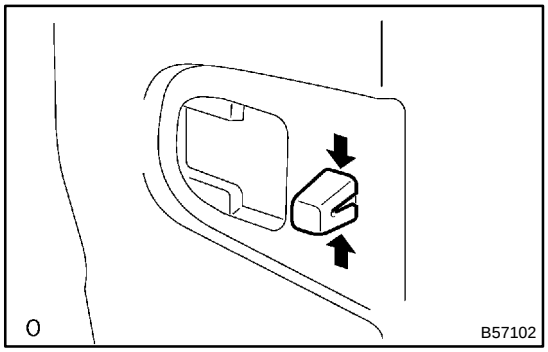
21. REMOVE REAR DOOR OUTSIDE HANDLE ASSY LH

(a) Pull and hold the release plate of the outside handle frame, as shown in the illustration.



(b) Pushing the outside handle in the arrow mark direction as shown in the illustration, remove the rear door outside handle assembly.

NOTICE:
If the release plate is not pulled and held when removing the outside handle assembly, then the release pate will interfere with the outside handle and it will damage the release plate.



22. REMOVE REAR DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), loosen the screw.
(b) Using pliers, disengage the clips and remove the rear door outside handle frame, as shown in the illustration.

NOTICE:
Be sure to remove the outside handle together with the clips, because the clips will be damaged if the clips remain attached to the door panel.

23. INSTALL REAR DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), install the rear door outside handle frame with the screw.

24. INSTALL REAR DOOR OUTSIDE HANDLE COVER RH

(a) Using a torx wrench (T30), install the rear door outside handle cover with the screw.

25. INSTALL REAR DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Apply MP grease to the sliding and rotating parts of the door lock.
(b) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(c) Using a torx wrench (T30), install the rear door lock assembly with the 3 screws.
(d) Install the screw.

26. INSTALL REAR DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

(a) Apply MP grease to the sliding and rotating parts of the door lock.
(b) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(c) Using a torx wrench (T30), install the rear door lock assembly with the 3 screws.
(d) Install the screw.
(e) Connect the connector.

27. INSTALL POWER WINDOW REGULATOR MOTOR ASSY LH(W/ POWER WINDOW)

(a) If the jam protection dose not function properly, perform the following procedure.

HINT:
It is necessary to reset the power window motor (in the initial position for the limit switch) when separating the window regulator from the power window motor or operating the window regulator with the door glass not installed.

(1) Remove the power window motor.

HINT:
Place the matchmarks on the power window motor and window regulator gear.

(2) Connect the power window motor and power window switch to the wire harness of the vehicle.
(3) Turn the ignition switch ON and operate the power window switch to idle the power window motor in the up side direction for more than 6 rotations or less than 10 rotations (4 seconds or more).
(4) Assemble the power window motor and regulator.

HINT:
- The motor should be installed when the regulator arm is in the middle, not around the upper end (more than 50 mm clearance is necessary from the upper end).
- Align the matchmarks on the power window motor and window regulator gear when installing the power window motor.

(5) Assemble the power window regulator and door glass.

HINT:

Never rotate the motor to the down direction until the installation of the window glass is completed.

28. INSTALL REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the temporarily installed bolt securely.

(c) Install the temporarily installed bolt to the window regulator to the rear door panel, and install the rear door window regulator temporarily.

(d) Tighten the 3 bolts and the temporarily installed bolt.

(e) Connect the connector.

29. INSTALL REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:

Do not apply grease to the spring of the window regulator.

(b) Install the rear door window regulator with the 3 bolts.

30. INSTALL REAR DOOR GLASS SUB-ASSY LH(W/ POWER WINDOW)

(a) Install the rear door glass.

(1) Connect the power window switch to the wire harness and turn the ignition switch ON.

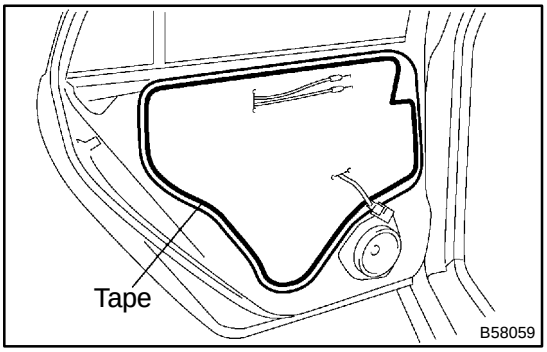
(2) Repeat UP and DOWN operation several times in the manual operation.

(3) Check if AUTO UP →AUTO DOWN operates in the automatic operation.

HINT:

- Note that the jam protection function does not operate just after resetting.
- Reset the regulator again when performing the reverse operation after closing the window fully by AUTO UP operation.

31. INSPECT POWER WINDOW FUNCTION (W/ POWER WINDOW) **(See page 70-1)**

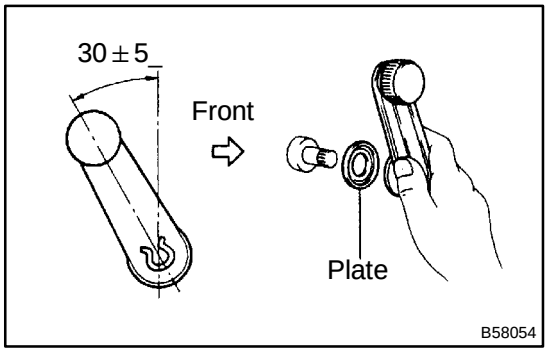


32. INSTALL REAR DOOR SERVICE HOLE COVER LH

(a) Install a new service hole cover to the door panel.

HINT:

- When installing the service hole cover, pull out the links and connectors through the service hole cover.
- There should be no wrinkles or folds after attaching the service hole cover.
- After attaching the service hole cover, sealing condition should be confirmed.



33. INSTALL REAR DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Install the regulator handle assembly with the snap ring.

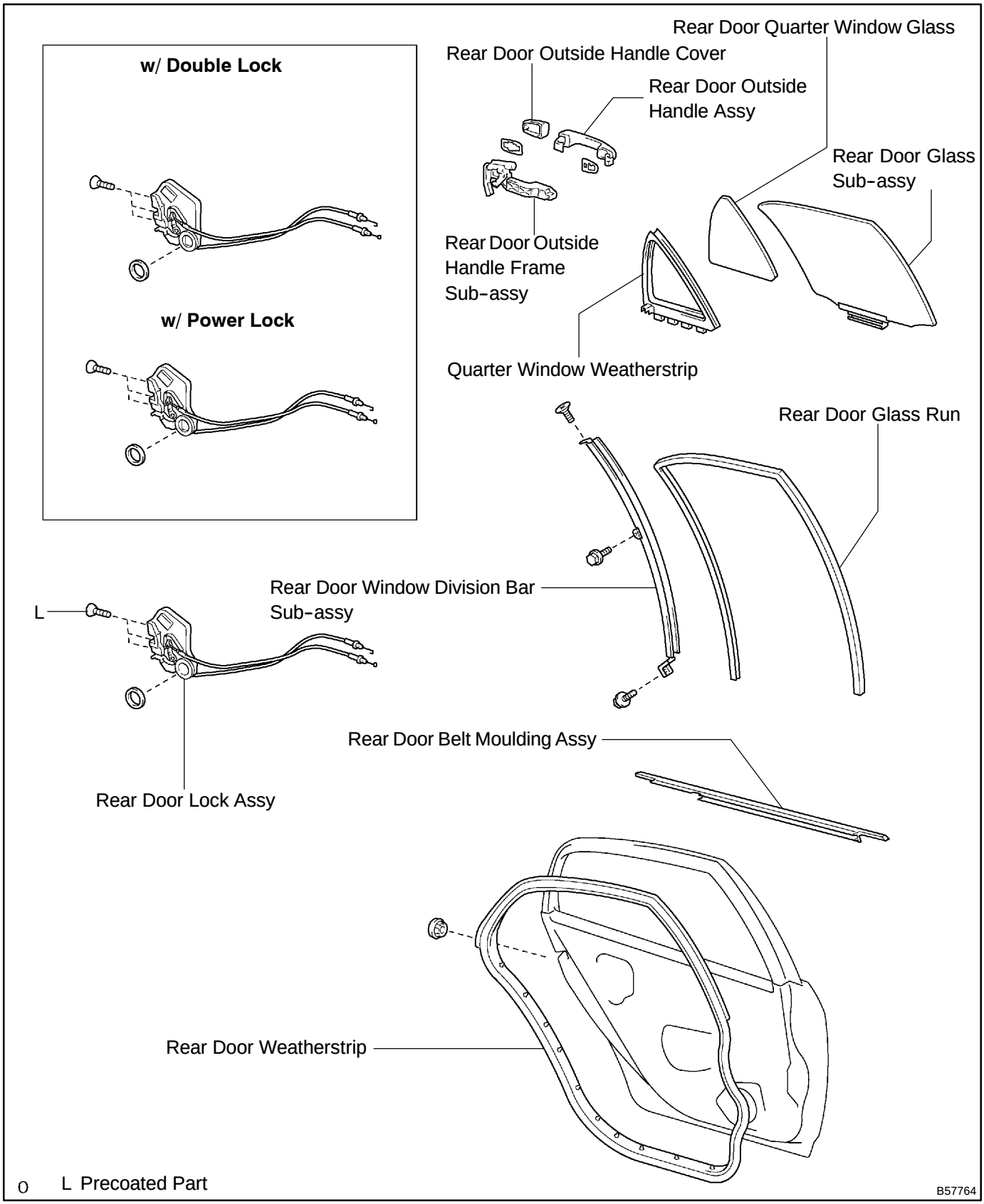
HINT:

With the door window fully closed, install the plate and the regulator handle assembly with the snap ring as shown in the illustration.

REAR DOOR (5-DOOR HATCHBACK)

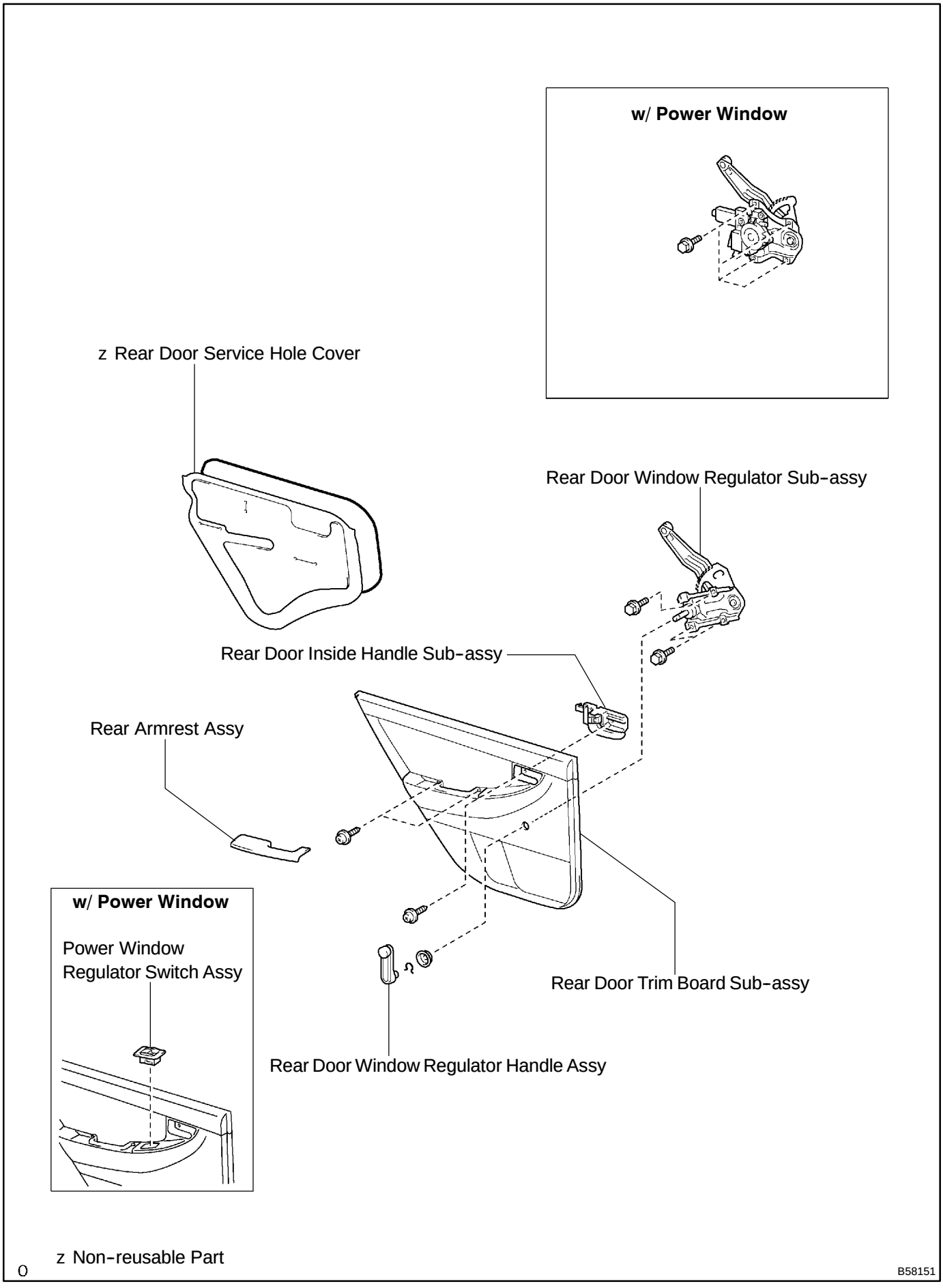
COMPONENTS

750BG-01



o L Precoated Part

B57764

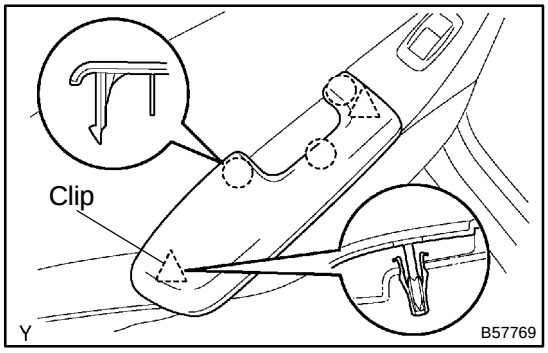

w/ Power Window
z Rear Door Service Hole Cover
Rear Door Window Regulator Sub-assy
Rear Door Inside Handle Sub-assy
Rear Armrest Assy
w/ Power Window
Power Window Regulator Switch Assy
Rear Door Trim Board Sub-assy
Rear Door Window Regulator Handle Assy
z Non-reusable Part
B58151

750BH-01

OVERHAUL

HINT:

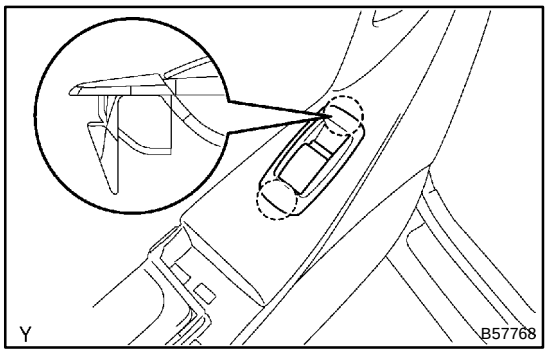
- Installation is in the reveres order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.



1. REMOVE REAR ARMREST ASSY LH

(a) Using a screwdriver, remove the rear armrest assembly.

HINT:
Tape the screwdriver tip before use.



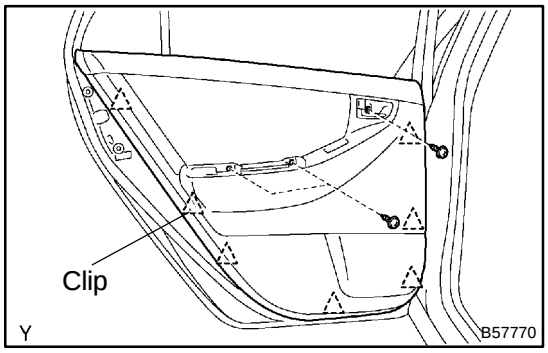
2. REMOVE POWER WINDOW REGULATOR SWITCH ASSY(W/ POWER WINDOW)

(a) Using a screwdriver, remove the power window regulator switch assembly.

HINT:
Tape the screwdriver tip before use.

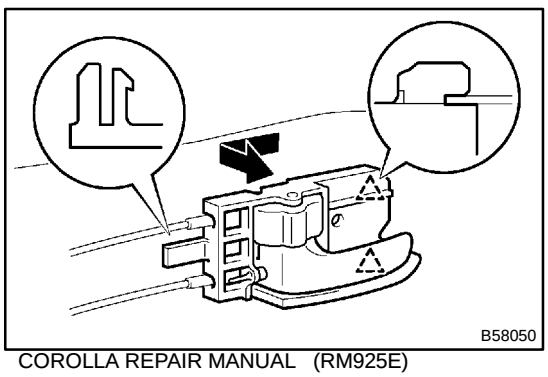
3. REMOVE REAR DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Using a shop rag, remove the snap ring.
(b) Remove the rear door window regulator handle assembly and plate.



4. REMOVE REAR DOOR TRIM BOARD SUB-ASSY LH

(a) Remove the 3 screws.
(b) Disengage the clips, then pull the trim upward to remove it.



5. REMOVE REAR DOOR INSIDE HANDLE SUB-ASSY LH

(a) Remove the inside handle and then disconnect the 2 cables from the inside handle.

6. REMOVE REAR DOOR SERVICE HOLE COVER LH

(a) Disconnect each connector and remove the rear door service hole cover.

NOTICE:

Remove the remaining tape on the body side.

7. REMOVE REAR DOOR BELT MOULDING ASSY LH

(See page 76-24)

8. REMOVE REAR DOOR GLASS RUN LH

(a) Remove the rear door glass run.

9. REMOVE REAR DOOR WEATHERSTRIP LH

(a) Using a screwdriver, remove the rear door weatherstrip.

HINT:

Tape the screwdriver tip before use.

10. REMOVE REAR DOOR WINDOW DIVISION BAR SUB-ASSY LH

(a) Remove the 2 bolts, screw and rear door window division bar.

11. REMOVE REAR DOOR QUARTER WINDOW GLASS LH

(a) Remove the rear door quarter window glass.

NOTICE:

Do not damage the glass.

(b) Remove the quarter window weatherstrip from the glass.

12. REMOVE REAR DOOR GLASS SUB-ASSY LH

HINT:

Insert a shop rag inside the door panel to prevent scratching the glass.

(a) Open the door glass.

(b) Tilt the door glass and disconnect the roller of the regulator from the channel to remove the door glass.

NOTICE:

Do not damage the door glass.

HINT:

Pull the glass upward to remove it.

13. REMOVE REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Remove the 3 bolts and rear door window regulator.

14. REMOVE REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Disconnect the connector.

(b) Loosen the temporarily installed bolt.

NOTICE:

When the temporarily installed bolt is removed, the rear door window regulator might drop and be deformed.

(c) Remove the 3 bolts and rear door window regulator.

15. REMOVE REAR DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

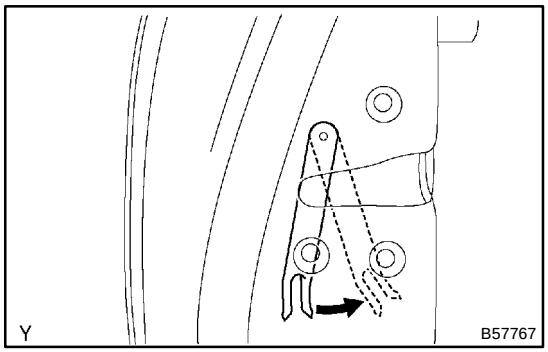
(a) Using a torx wrench (T30), remove the 3 screws and the rear door lock assembly.

16. REMOVE REAR DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

(a) Disconnect the connector.
(b) Using a torx wrench (T30), remove the 3 screws and the rear door lock assembly.

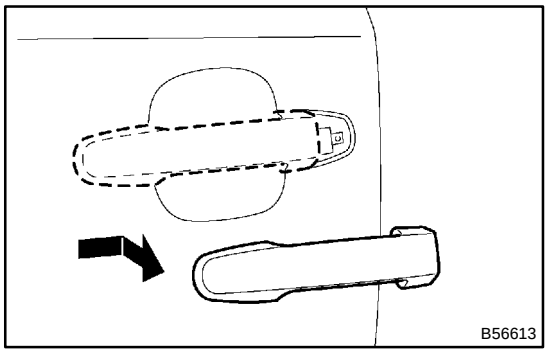
17. REMOVE RR DOOR OUTSIDE HANDLE COVER

(a) Using a torx wrench (T30), loosen the screw and rear door outside handle cover.



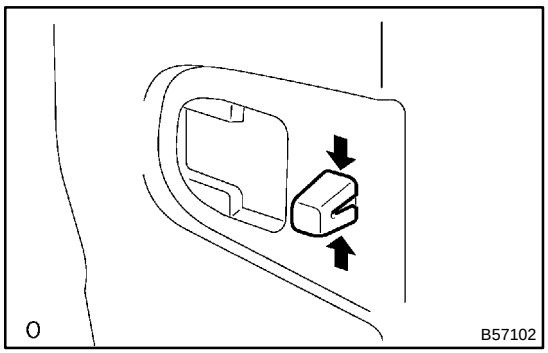
18. REMOVE REAR DOOR OUTSIDE HANDLE ASSY LH

(a) Pull and hold the release plate of the outside handle frame, as shown in the illustration.



(b) Pushing the outside handle in the arrow mark direction as shown in the illustration, remove the rear door outside handle assembly.

NOTICE:
If the release plate is not pulled and held when removing the outside handle assembly, then the release pate will interfere with the outside handle and it will damage the release plate.



19. REMOVE REAR DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), loosen the screw.
(b) Using pliers, disengage the clips and remove the rear door outside handle frame, as shown in the illustration.

NOTICE:
Be sure to remove the outside handle together with the clips, because the clips will be damaged if the clips remain attached to the door panel.

20. INSTALL REAR DOOR OUTSIDE HANDLE FRAME SUB-ASSY LH

(a) Using a torx wrench (T30), install the rear door outside handle frame with the screw.

21. INSTALL RR DOOR OUTSIDE HANDLE COVER

(a) Using a torx wrench (T30), install the rear door outside handle cover with the screw.

22. INSTALL REAR DOOR LOCK ASSY LH(W/O POWER DOOR LOCK)

(a) Apply MP grease to the sliding and rotating parts of the door lock.
(b) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(c) Using a torx wrench (T30), install the rear door lock assembly with the 3 screws.

23. INSTALL REAR DOOR LOCK ASSY LH(W/ POWER DOOR LOCK)

(a) Install a new door lock wire harness packing.

NOTICE:

- **If reusing the removed lock with rear door motor, the packing in the connecting part should be replaced with a new one.**
- **Be careful that grease and dirt will not stick to the packing surface in the connecting part.**
- **Reusing the removed packing or using a damaged packing will cause water to penetrate through the connecting part, and it will result in a malfunction of the door lock.**

(b) Engage the lock assembly with rear door motor with the release plate of the outside handle, and then set it to the door panel.

NOTICE:
Make sure that the release plate of the outside handle frame is securely engaged with the lock assembly.

(c) Apply MP grease to the sliding and rotating parts of the door lock.
(d) Apply adhesive to 3 screws.
Part No.08833-00070, THREE BOND 1324 or equivalent.
(e) Using a torx wrench (T30), install the rear door lock assembly with the 3 screws and bolt.

24. INSTALL REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/O POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:
Do not apply grease to the spring of the window regulator.

(b) Install the rear door window regulator with the 3 bolts.

25. INSTALL REAR DOOR WINDOW REGULATOR SUB-ASSY LH(W/ POWER WINDOW)

(a) Apply MP grease to the sliding and rotating parts of the window regulator.

NOTICE:
Do not apply grease to the spring of the window regulator.

(b) Install the temporarily installed bolt securely.
(c) Install the temporarily installed bolt to the window regulator to the rear door panel, and install the rear door window regulator temporarily.
(d) Tighten the 3 bolts and the temporarily installed bolt.
(e) Connect the connector.

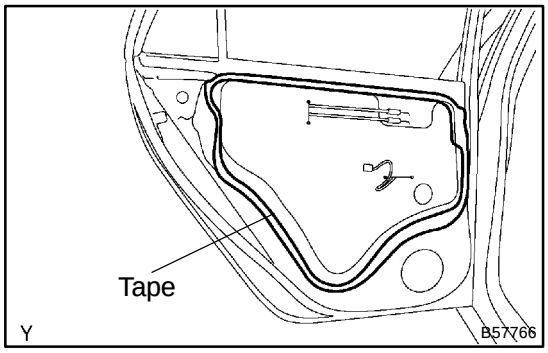
26. INSTALL REAR DOOR GLASS SUB-ASSY LH(W/ POWER WINDOW)

(a) Install the rear door glass.
  (1) Connect the power window switch to the wire harness and turn the ignition switch ON.
  (2) Repeat UP and DOWN operation several times in the manual operation.
  (3) Check if AUTO UP →AUTO DOWN operates in the automatic operation.

HINT:

- Note that the jam protection function does not operate just after resetting.
- Reset the regulator again when performing the reverse operation after closing the window fully by AUTO UP operation.

27. INSPECT POWER WINDOW FUNCTION **(See page 70-8)**

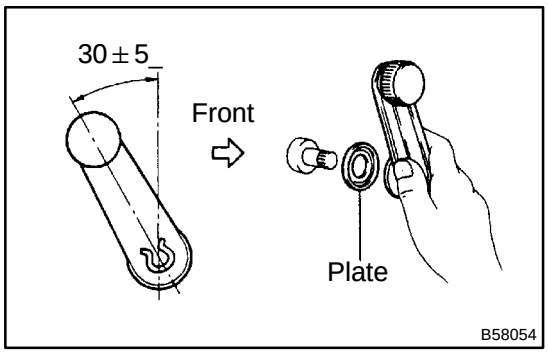


28. INSTALL REAR DOOR SERVICE HOLE COVER LH

(a) Install a new service hole cover to the door panel.

HINT:

- When installing the service hole cover, pull out the links and connectors through the service hole cover.
- There should be no wrinkles or folds after attaching the service hole cover.
- After attaching the service hole cover, sealing condition should be confirmed.



29. INSTALL REAR DOOR WINDOW REGULATOR HANDLE ASSY(W/O POWER WINDOW)

(a) Install the regulator handle assembly with the snap ring.

HINT:

With the door window fully closed, install the plate and the regulator handle with the snap ring as shown in the illustration.

REAR DOOR

ADJUSTMENT

750BI-01

HINT:

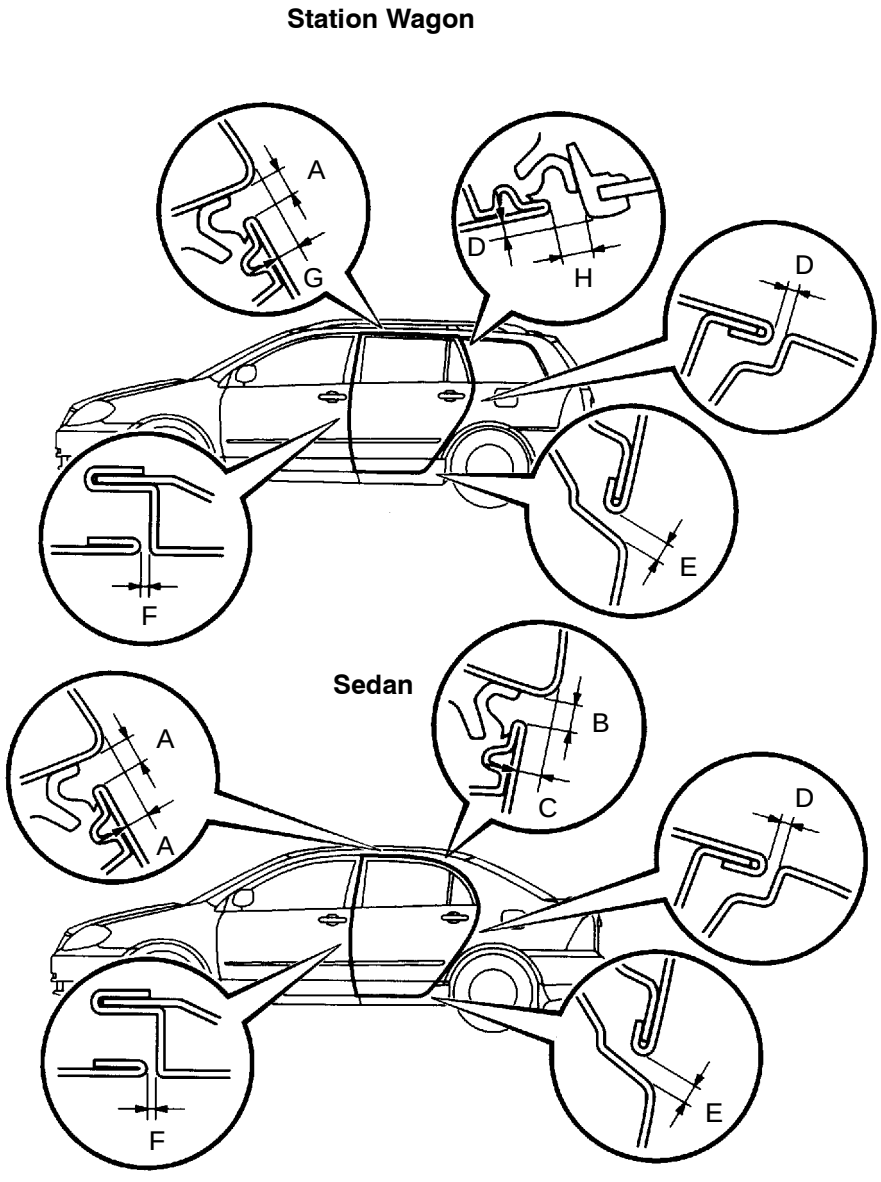
In the RH side, work in the same procedure as in the LH side.

1. INSPECT REAR DOOR PANEL SUB-ASSY LH

(a) Check that the clearance is within the standard value.

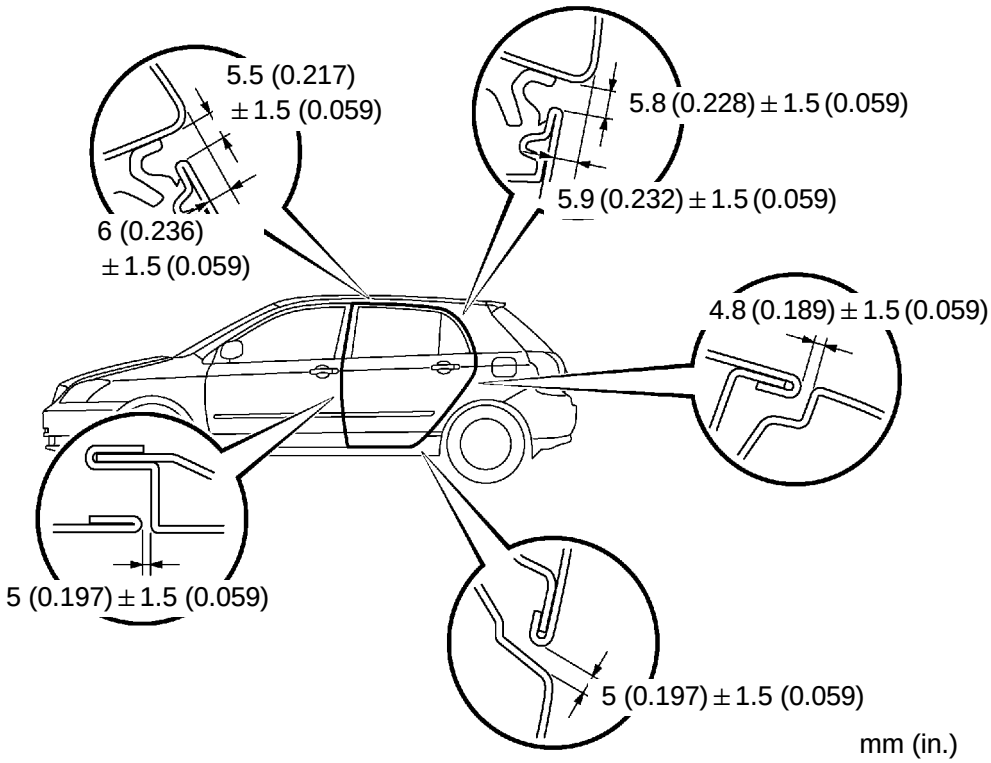
A: 5.5 (0.217) ± 1.5 (0.059)
B: 5.6 (0.220) ± 1.5 (0.059)
C: 5.4 (0.212) ± 1.5 (0.059)
D: 4.8 (0.189) ± 1.5 (0.059)
E: 6 (0.23) ± 1.5 (0.059)
F: 5 (0.197) ± 1.5 (0.059)
G: 5.3 (0.209) ± 1.5 (0.059)
H: 6.5 (0.256) ± 1.5 (0.059)

mm (in.)

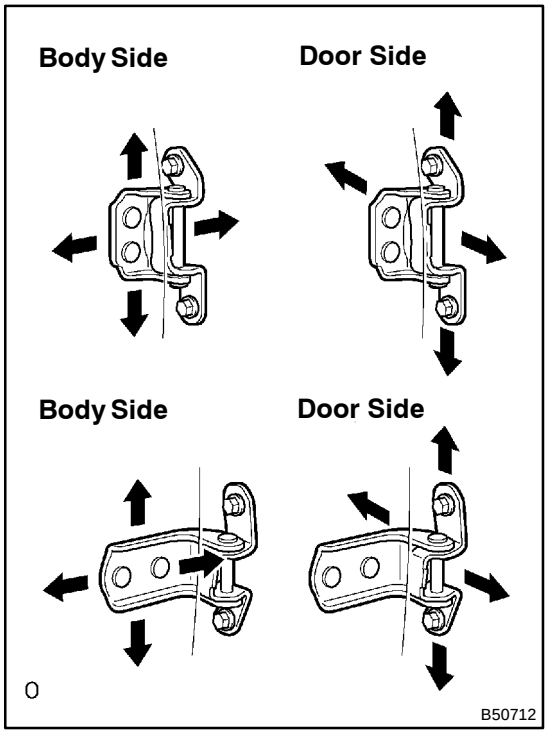


B58061

Hatchback



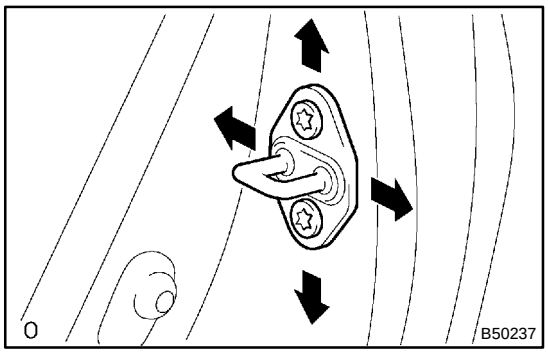
2. **REMOVE FRONT DOOR SCUFF PLATE LH**
   (SDN, See page 76-33) (WGN, See page 76-40) (5H/B, See page 76-56)
3. **REMOVE REAR DOOR SCUFF PLATE LH**
   (SDN, See page 76-33) (WGN, See page 76-40) (5H/B, See page 76-56)
4. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH**
   (SDN, See page 76-33) (WGN, See page 76-40) (5H/B, See page 76-56)
5. **REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH**
   (SDN, See page 76-33) (WGN, See page 76-40) (5H/B, See page 76-56)
6. **REMOVE CENTER PILLAR GARNISH LOWER LH**
   (SDN, See page 76-34) (WGN, See page 76-41) (5H/B, See page 76-57)



7. ADJUST REAR DOOR PANEL SUB-ASSY LH

(a) Adjust the door by loosening the body side hinge nuts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

(b) Adjust the door by loosening the door side hinge bolts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)



(c) Adjust the striker position by slightly loosening the striker mounting screws, and hitting the striker with a plastic hammer.

(d) Tighten the striker mounting screws again.
Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

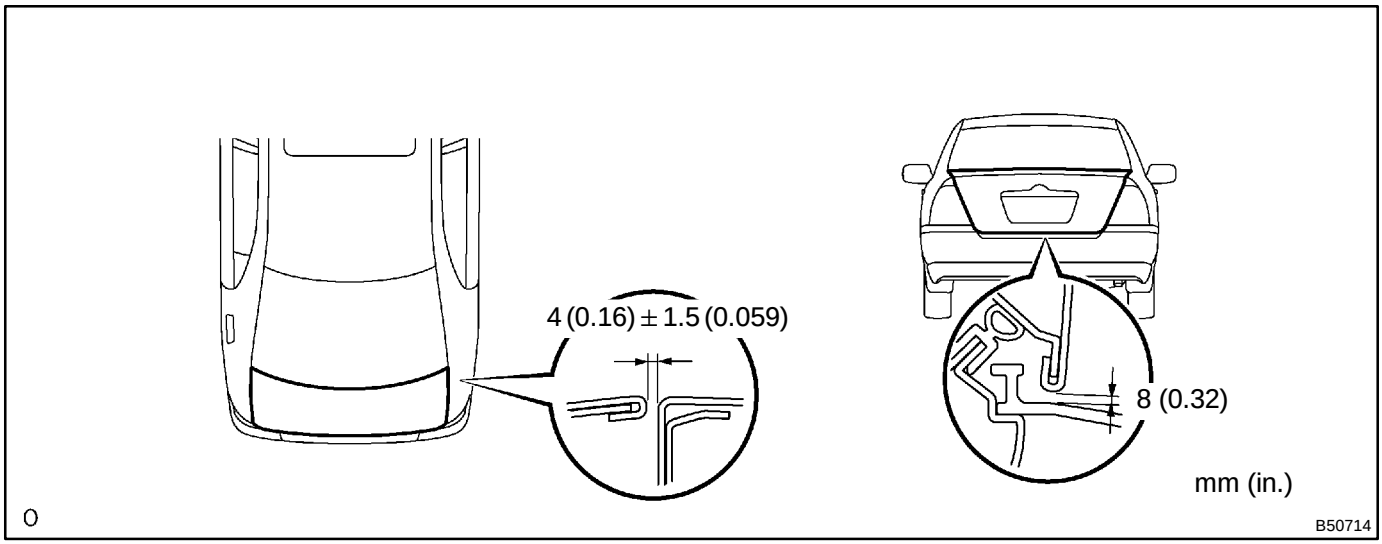
LUGGAGE COMPARTMENT DOOR (SEDAN)

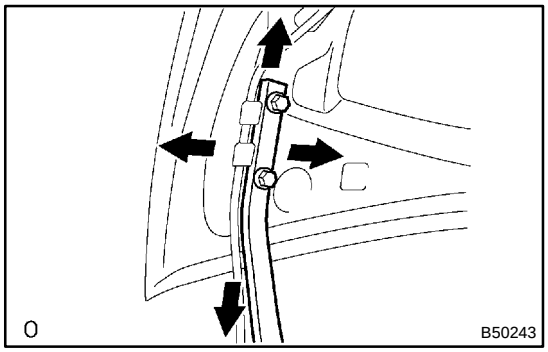
750BJ-01

ADJUSTMENT

1. INSPECT LUGGAGE COMPARTMENT DOOR PANEL SUB-ASSY

(a) Check that the clearance is within the standard value.





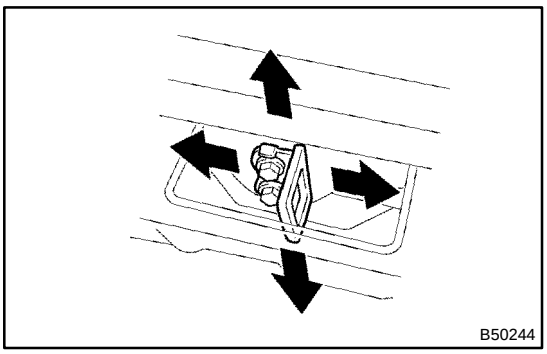
2. ADJUST LUGGAGE COMPARTMENT DOOR PANEL SUB-ASSY

(a) For forward/rearward and right/left adjustments, loosen the bolts.

(b) For a vertical adjustment of the door front end, increase or decrease the number of washers between the hinge and door.

(c) Remove the spare wheel cover (See page 76-8).

(d) Remove the rear floor finish plate (See page 76-8).



(e) Using a hammer and a brass bar, tap the striker to adjust it.

LUGGAGE DOOR HINGE TORSION BAR RH (SEDAN)

750BK-01

REPLACEMENT

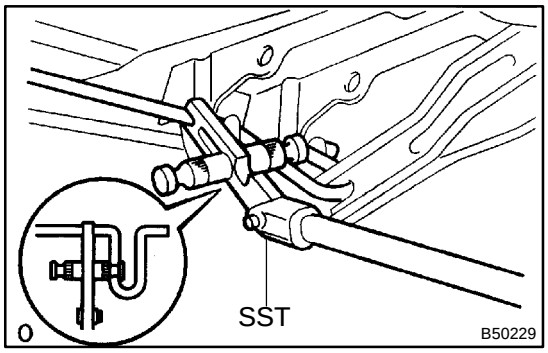
HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the LH side, work in the same procedure as in the RH side.
- Since the removal of the torsion bar will cause no tension, operation of opening and closing the door should be carried out holding the door by hand in order to prevent the door from closing without any resistance.
- RH side torsion bar is in the upper side and LH side torsion bar is in the lower side, thus the installation should be done in the order of RH to LH, and the removal should be done in the order of LH to RH.

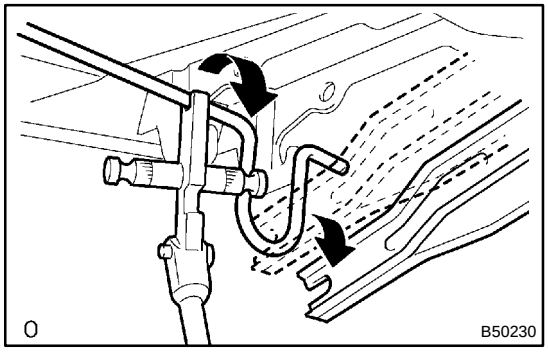
1. REMOVE LUGGAGE DOOR HINGE TORSION BAR RH

SST 09804-24010

(a) Remove the torsion bars from the center bracket.

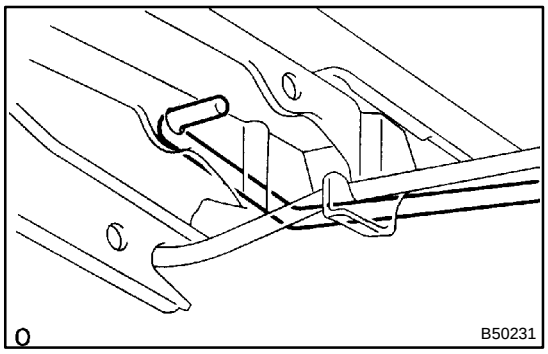


(b) Install SST to the torsion bar on the hinge side.



(c) Push down the SST, and pull the luggage compartment door hinge from the torsion bar.

(d) Slowly lift the SST, and remove the torsion bar from the torsion bar bracket with SST.



(e) Disconnect the torsion bar from the bracket.

(f) Employ the same manner described above to the other side.

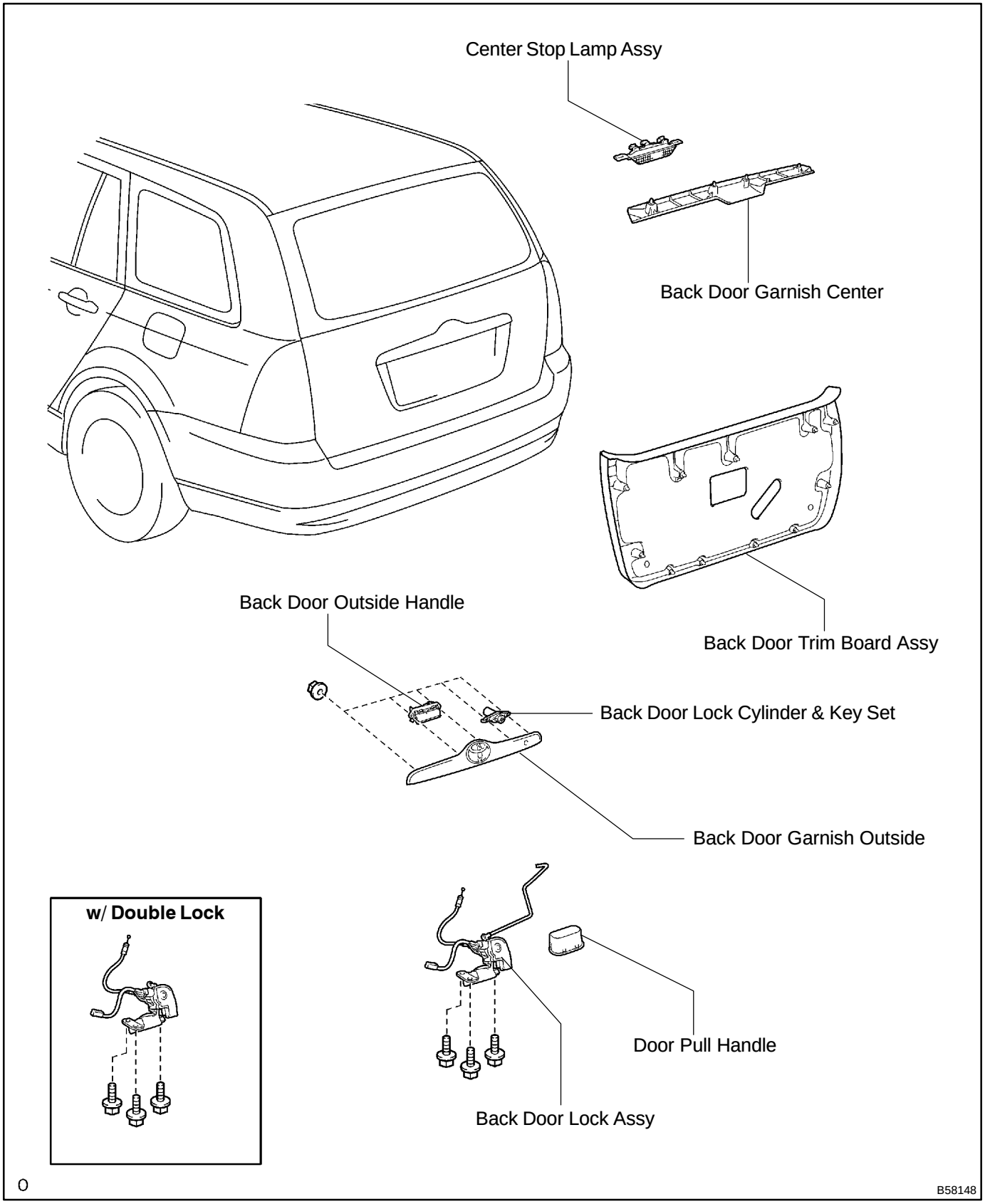
2. INSTALL LUGGAGE DOOR HINGE TORSION BAR RH

(a) When installing the torsion bar, be sure to install it to the clamp securely.

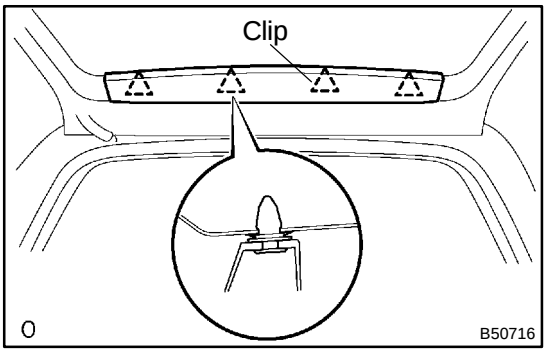
BACK DOOR (STATION WAGON)

COMPONENTS

750BL-01



OVERHAUL

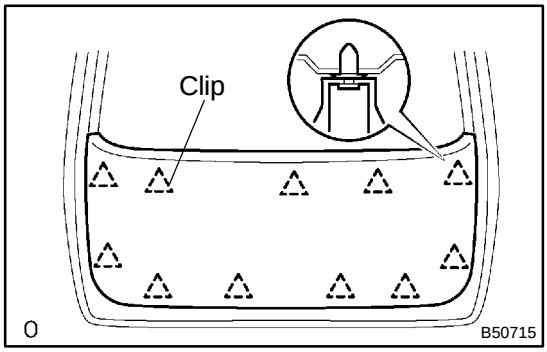


1. REMOVE BACK DOOR GARNISH CENTER

(a) Insert a screwdriver between the back door panel and back door garnish center to pry the panel.

HINT:
Tape the screwdriver tip before use.

2. REMOVE CENTER STOP LAMP ASSY
(See page 65-34)



3. REMOVE BACK DOOR TRIM BOARD ASSY

(a) Using a screwdriver, remove the back door trim board.

NOTICE:
Be careful not to damage the door and door trim.

HINT:
Tape the screwdriver tip before use.

4. REMOVE BACK DOOR LOCK ASSY

(a) Disconnect the link from the outside handle.
(b) Disconnect the connector and cable.
(c) Remove the 3 bolts and the back door lock control assembly.

HINT:
- At the trim of reassembly, please refer to the following item.
- Apply MP grease to the sliding surface of the back door lock control.

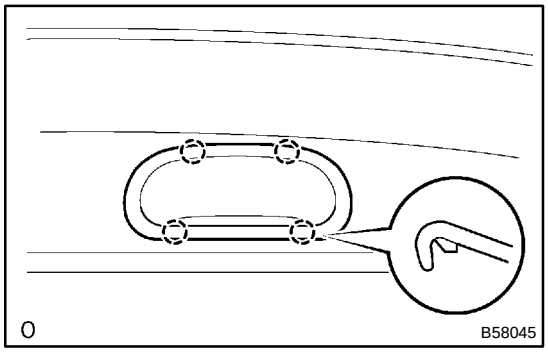
5. REMOVE BACK DOOR OUTSIDE HANDLE

(a) Remove the 2 nuts and back door outside handle.

6. REMOVE BACK DOOR LOCK CYLINDER & KEY SET

(a) Remove the 2 nuts and back door lock cylinder.

7. REMOVE BACK DOOR GARNISH OUTSIDE
(See page 76-26)



8. REMOVE DOOR PULL HANDLE

(a) Using a screwdriver, remove the door pull handle.

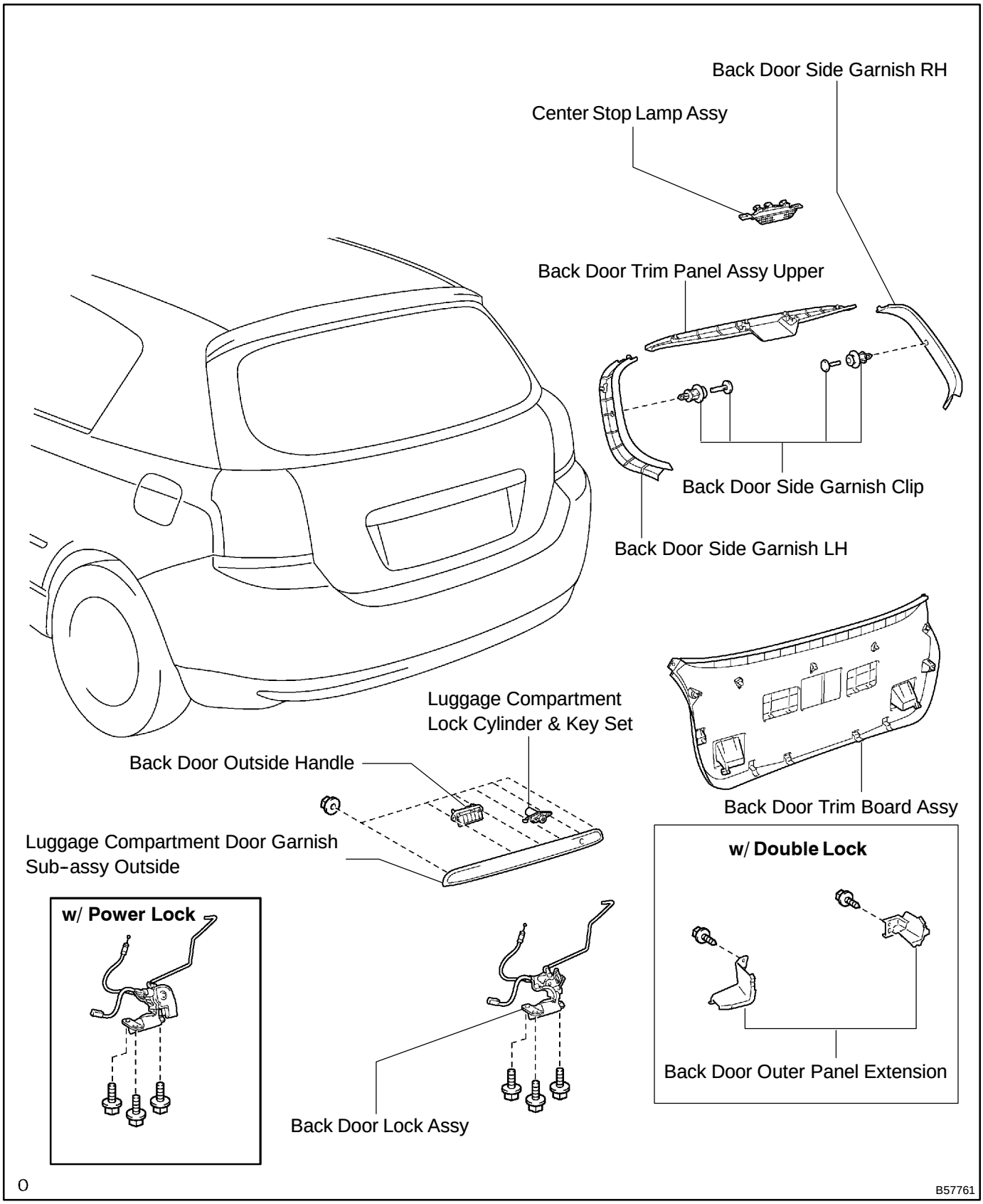
HINT:

Tape the screwdriver tip before use.

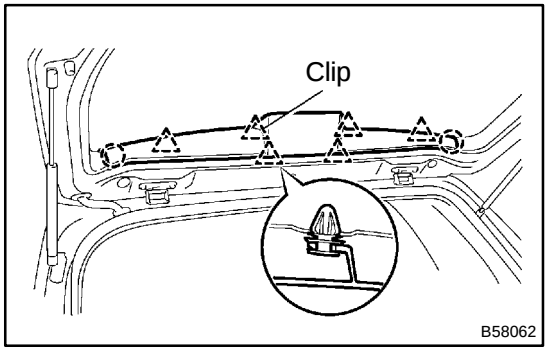
BACK DOOR (HATCHBACK)

COMPONENTS

750BN-01



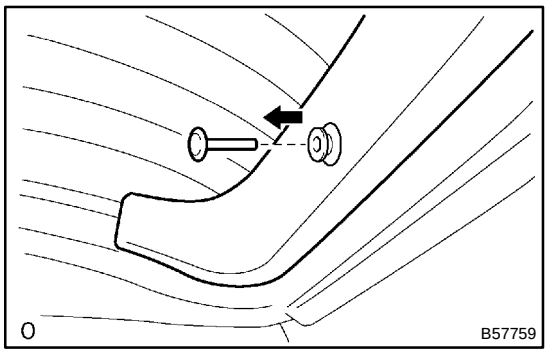
OVERHAUL



1. REMOVE BACK DOOR TRIM PANEL ASSY UPPER

(a) Using a screwdriver, remove the back door trim panel assembly upper.

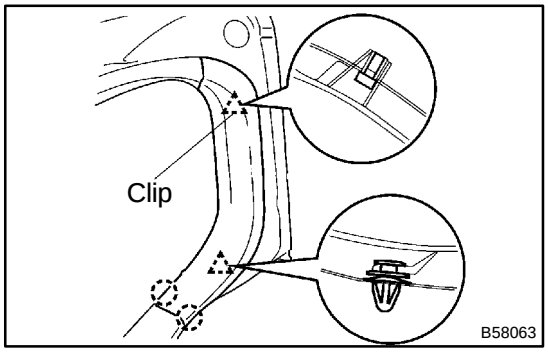
HINT:
Tape the screwdriver tip before use.



2. REMOVE BACK DOOR SIDE GARNISH CLIP

(a) Using a screwdriver, remove the pin.
(b) Using a screwdriver, remove the back door side garnish clip.

HINT:
Tape the screwdriver tip before use.

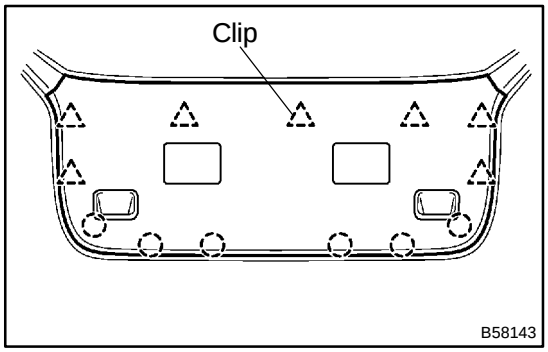


3. REMOVE BACK DOOR SIDE GARNISH RH

(a) Using a screwdriver, remove the back door side garnish.

HINT:
Tape the screwdriver tip before use.

4. REMOVE BACK DOOR SIDE GARNISH LH



5. REMOVE BACK DOOR TRIM BOARD ASSY

(a) Using a screwdriver, remove the back door trim board assembly.

HINT:
Tape the screwdriver tip before use.

6. REMOVE CENTER STOP LAMP ASSY
(See page 65-35)

7. REMOVE EXTENSION, BACK DOOR OUTER PANEL, RH(W/ DOUBLE LOCK)

(a) Remove the 2 screws and the back door outer panel extension RH.

8. REMOVE EXTENSION, BACK DOOR OUTER PANEL, LH(W/ DOUBLE LOCK)

(a) Remove the 2 screws and the back door outer panel extension LH.

9. REMOVE BACK DOOR LOCK ASSY

(a) Disconnect the link from the outside handle.
(b) Disconnect the connector and cable.
(c) Remove the 3 bolts and the back door lock control assembly.

HINT:

- At the trim of reassembly, please refer to the following item.
- Apply MP grease to the sliding surface of the back door lock control.

10. REMOVE BACK DOOR OUTSIDE HANDLE

(a) Remove the 2 nuts and back door outside handle.

11. REMOVE LUGGAGE COMPARTMENT LOCK CYLINDER & KEY SET

(a) Remove the 2 nuts and luggage compartment lock cylinder.

12. REMOVE LUGGAGE COMPARTMENT DOOR GARNISH SUB-ASSY OUTSIDE

(See page 76-27)

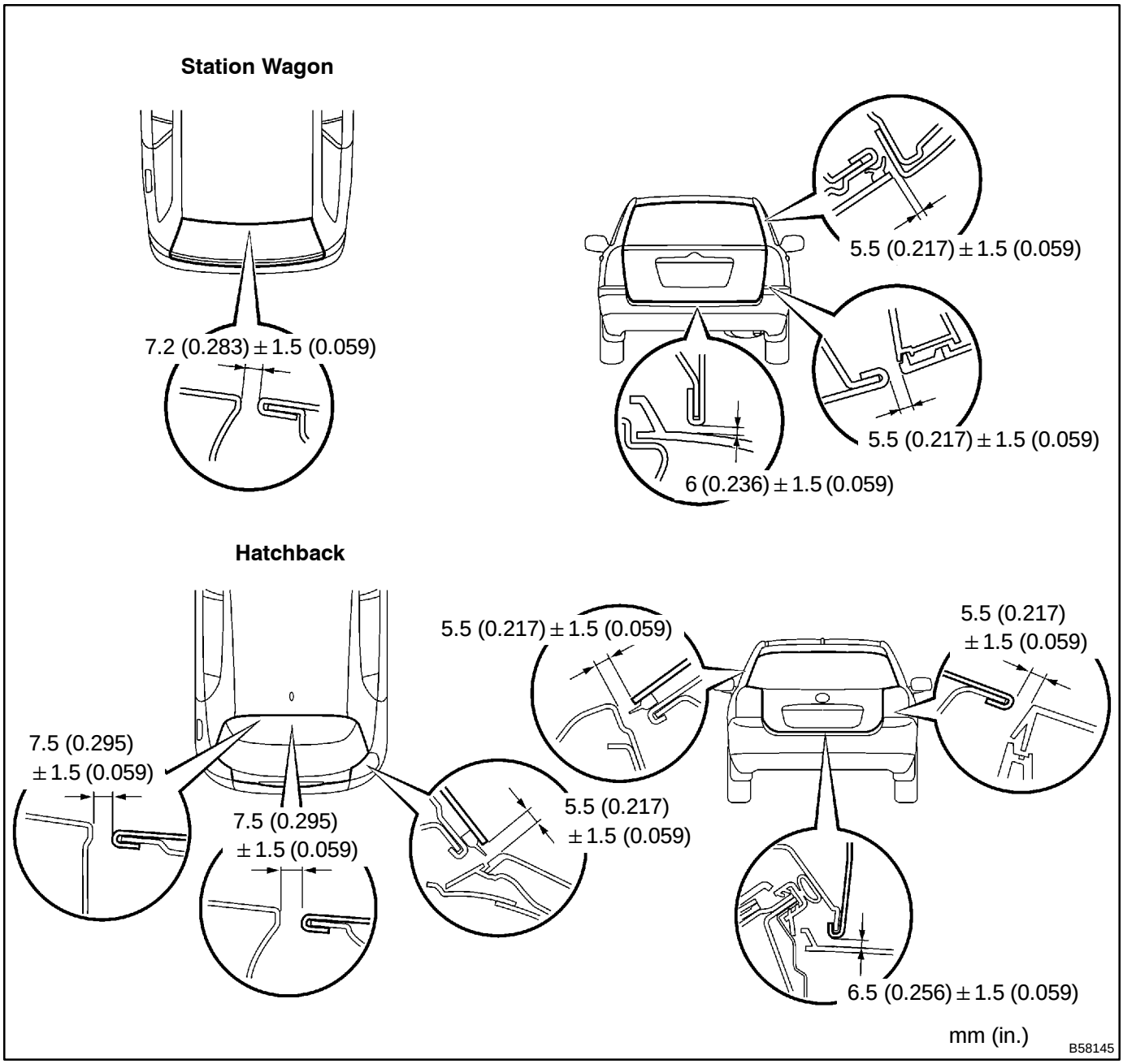
BACK DOOR

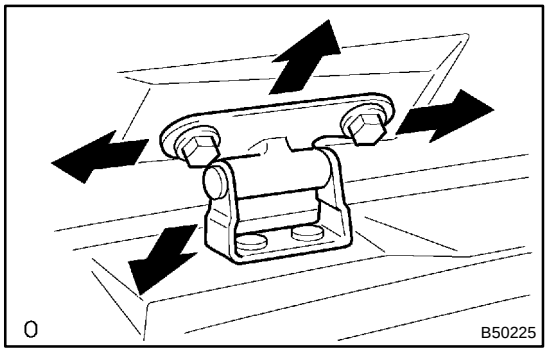
ADJUSTMENT

750BP-01

1. INSPECT BACK DOOR PANEL SUB-ASSY

(a) Check that the clearance is within the standard value.

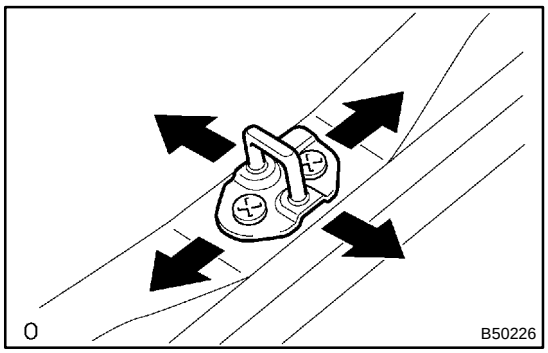




2. ADJUST BACK DOOR PANEL SUB-ASSY

(a) Adjust the door by loosening the door side hinge bolts.
(b) Adjust the door by loosening the body side hinge nuts.
Torque: 19.5 N·m (199 kgf·cm, 14 ft·lbf)

(c) Remove the rear floor finish plate (WGN: See page 76-40) (3H/B: See page 76-48) (5H/B: See page 76-56).



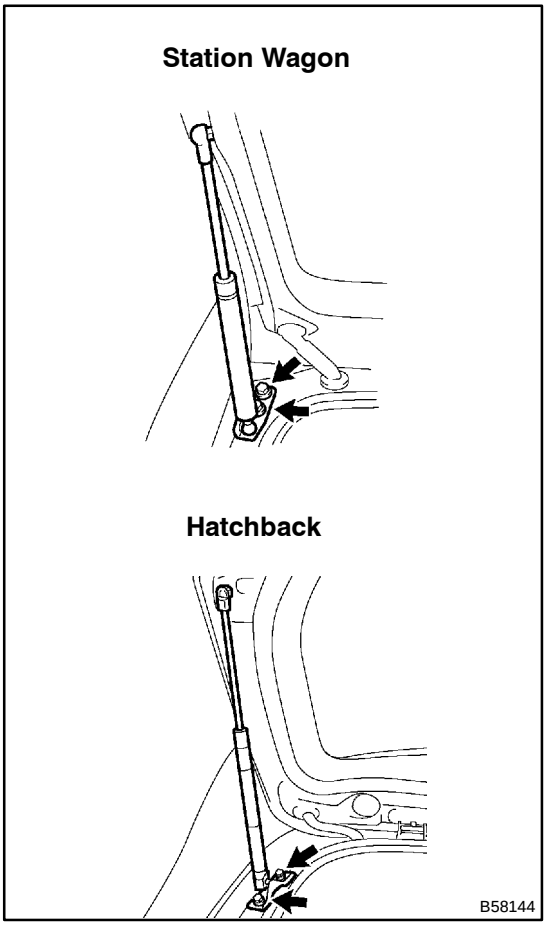
(d) Check that the door fit and door linkage are adjusted correctly.
(e) Adjust the striker by loosening the striker mounting screws.
Torque: 11.5 N·m (117 kgf·cm, 8.5 ft·lbf)
(f) Using a plastic hammer, tap the striker for adjustment.

BACK DOOR STAY ASSY LH (STATION WAGON/HATCHBACK)

750BQ-01

REPLACEMENT

HINT:
In the RH side, work in the same procedure as in the LH side.



1. REMOVE BACK DOOR STAY ASSY LH

(a) Remove the bolt and back door stay from the back door panel.

HINT:
While supporting the back door by hand, remove the back door stay.

(b) Remove the 2 bolts and back door stay from the body.

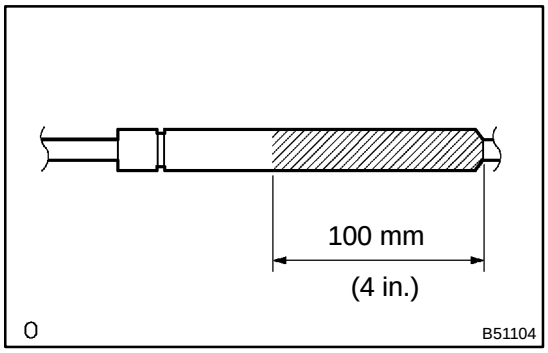
2. INSTALL BACK DOOR STAY ASSY LH

(a) Install the back door stay with the 3 bolts.

For back door side

Torque: 22 N·m (224 kgf·cm, 16 ft·lbf)

DISPOSAL



1. DISPOSE BACK DOOR STAY ASSY LH

(a) Fix the hood stay assembly, with the piston-rod pulled out, on a vise.

(b) With protection glasses on, cut a part between A and B, as shown in the illustration, with a metal saw to release the gas.

NOTICE:

Although the gas inside the hood stay assembly is colorless, odorless and harmless, there is a possibility that cutting tips of the metal saw would jump around, therefore cover it with clothes or something.

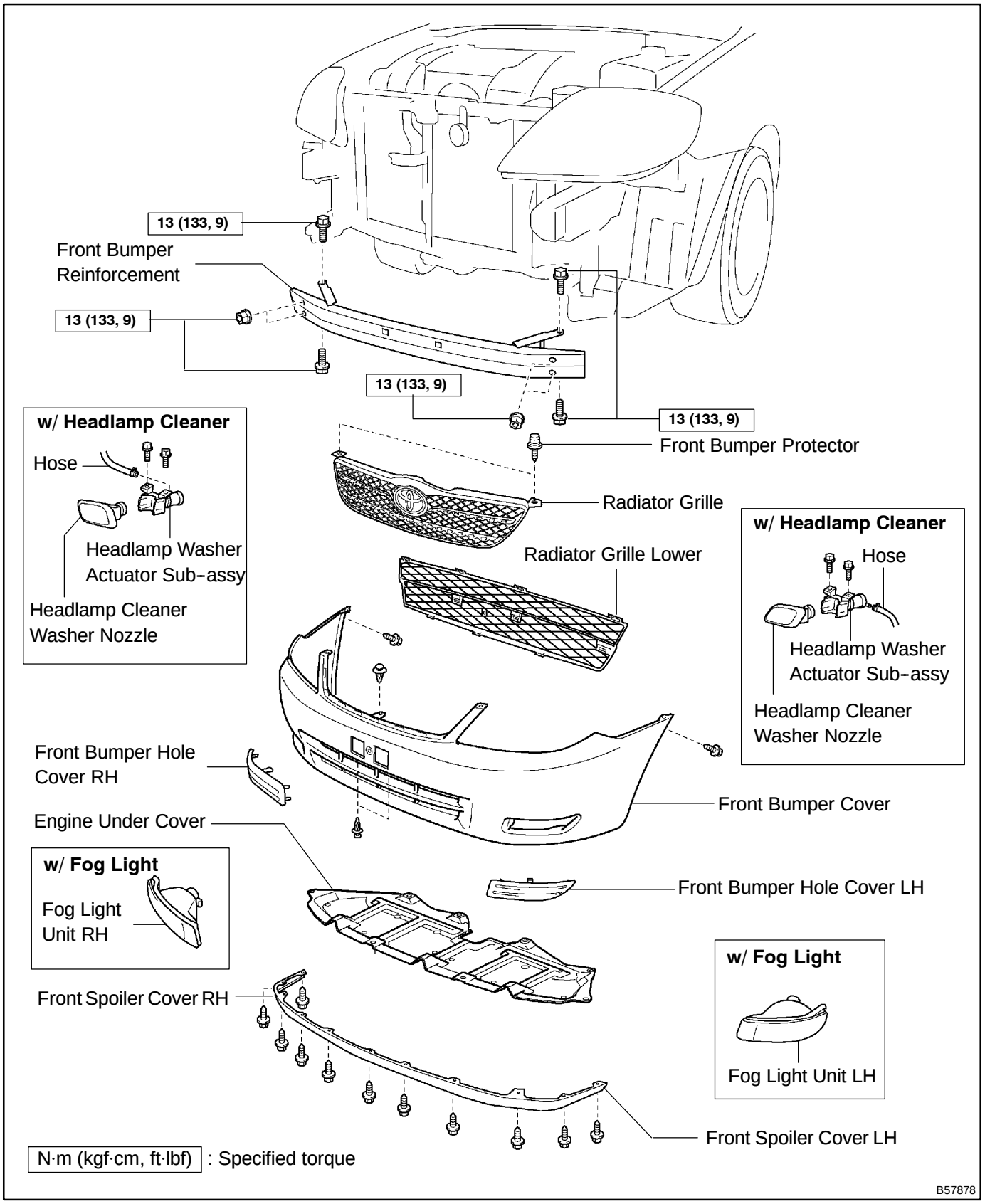
EXTERIOR/INTERIOR TRIM

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REPLACEMENT 76-62

FRONT BUMPER COVER (SEDAN/STATION WAGON)

COMPONENTS

760EP-01



760EQ-01

REPLACEMENT

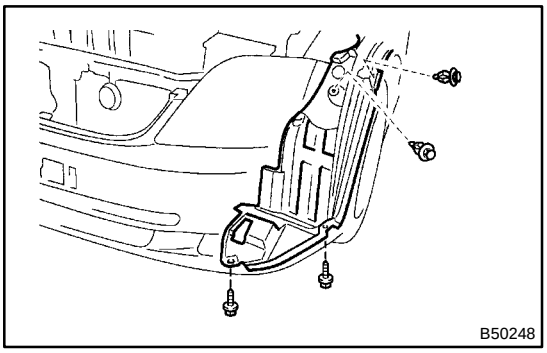
HINT:
Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. REMOVE RADIATOR GRILLE

(a) Using a clip remover, remove the clip.
(b) Remove the 2 front bumper protectors and radiator grille.

2. REMOVE ENGINE UNDER COVER

(a) Using a clip remover, remove the 4 clips.
(b) Remove the 4 bolts and engine under cover.

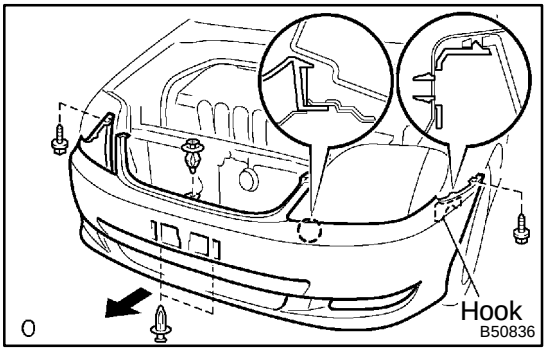


3. REMOVE FRONT FENDER LINER LH

(a) Using a clip remover, remove the 2 clips.
(b) Remove the screw and a part of the front fender liner LH.

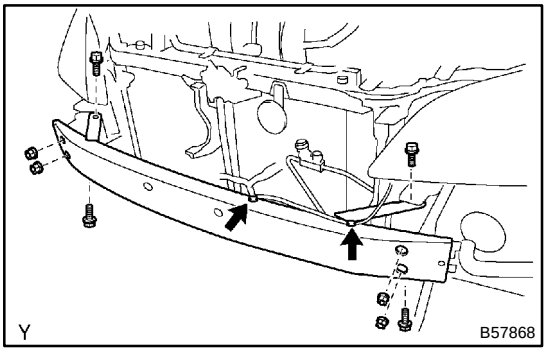
HINT:
Remove the screw, clip and the front fender liner LH within the range that the front bumper cover can be removed.

4. REMOVE FRONT FENDER LINER RH



5. REMOVE FRONT BUMPER COVER

(a) Remove the 2 screws and 3 clips.
(b) Disengage the hook and front bumper cover.
(c) w/ fog light:
Disconnect the fog light connector.
(d) w/ headlamp cleaner:
Disconnect the headlamp washer hoses.



6. REMOVE FRONT BUMPER REINFORCEMENT

(a) Disconnect the 2 wire harness clips.
(b) Remove the 4 bolts.
(c) Remove the 4 nuts and front bumper reinforcement.

7. REMOVE FRONT SPOILER COVER RH
(See page 76-14)

8. REMOVE FRONT SPOILER COVER LH
(See page 76-14)

9. REMOVE RADIATOR GRILLE LOWER

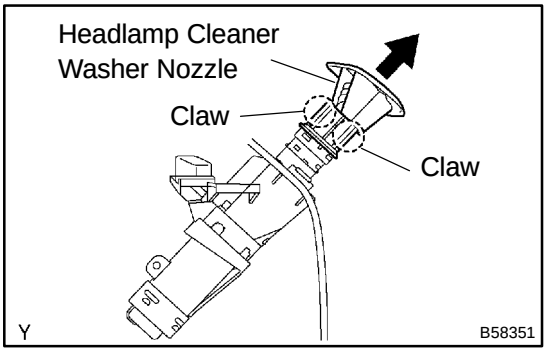
10. REMOVE FOG LIGHT UNIT LH(W/ FOG LIGHT)

(a) Remove the hook and fog light unit LH.

11. REMOVE FOG LIGHT UNIT RH(W/ FOG LIGHT)

12. REMOVE FRONT BUMPER HOLE COVER LH(W/O FOG LIGHT)

13. REMOVE FRONT BUMPER HOLE COVER RH(W/O FOG LIGHT)



14. REMOVE HEADLAMP WASHER ACTUATOR SUB-ASSY LH(W/ HEADLAMP CLEANER)

(a) Pull out the headlamp cleaner washer nozzle.

(b) Disengage the claw, remove the headlamp cleaner washer nozzle.

(c) Remove the 2 bolts and the headlamp washer actuator sub-assy LH.

15. REMOVE HEADLAMP WASHER ACTUATOR SUB-ASSY RH(W/ HEADLAMP CLEANER)

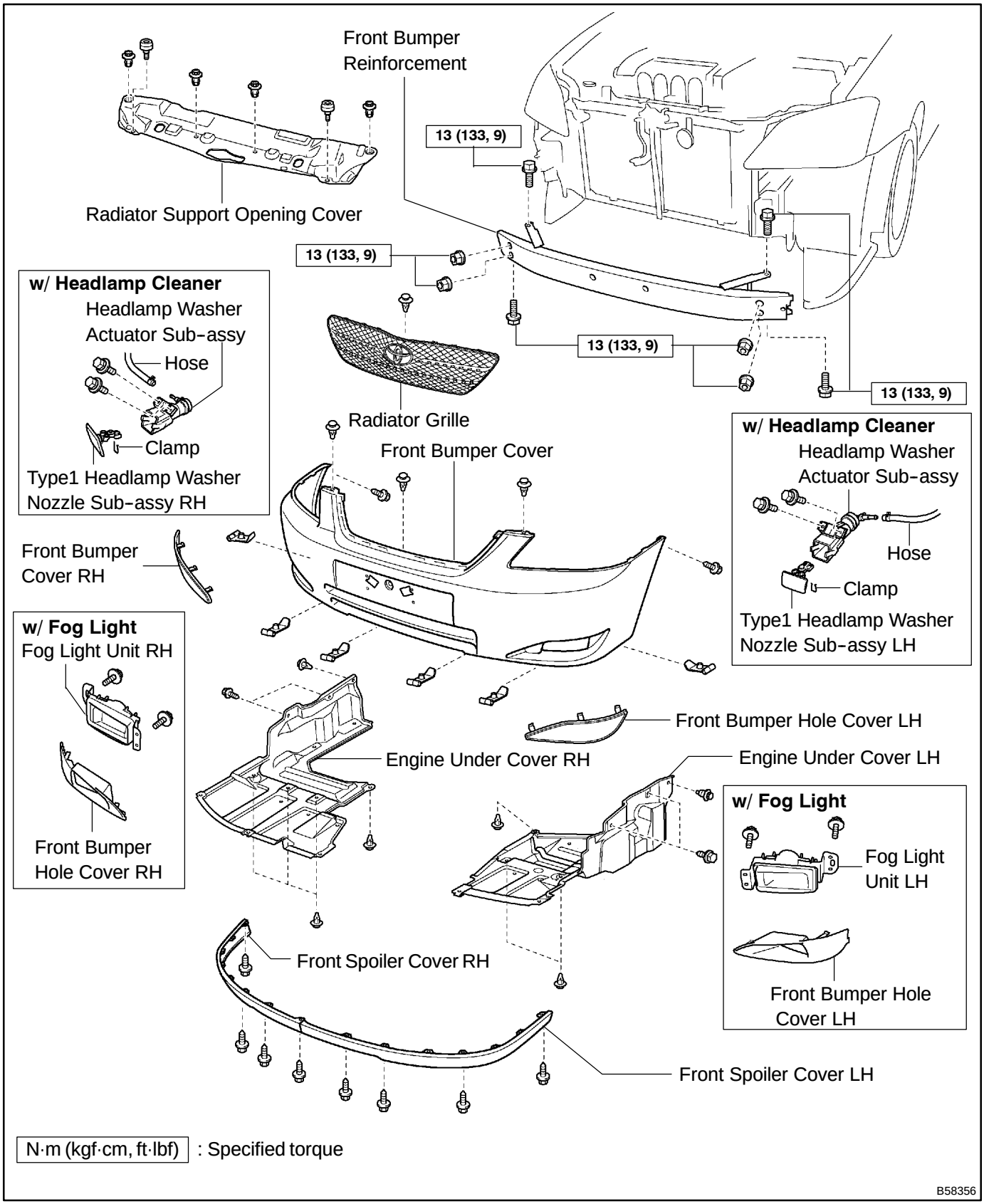
16. INSTALL FRONT BUMPER REINFORCEMENT

(a) Install the front bumper reinforcement with the 4 bolts and 4 nuts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

FRONT BUMPER COVER (HATCHBACK)

COMPONENTS

760ER-01



REPLACEMENT

HINT:

Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. REMOVE RADIATOR SUPPORT OPENING COVER

(a) Using a clip remover, remove the 4 clips.
(b) Remove the 2 food stoppers and radiator support opening cover.

2. REMOVE RADIATOR GRILLE

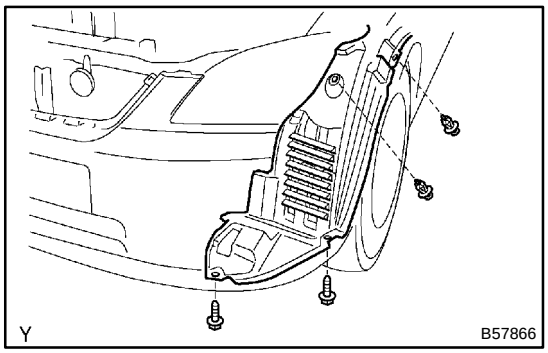
(a) Using a clip remover, remove the clip.
(b) Disengage the claws and remove the radiator grille.

3. REMOVE ENGINE UNDER COVER RH

(a) Using a clip remover, remove the 6 clips.
(b) Remove the 5 bolts and engine under cover RH.

4. REMOVE ENGINE UNDER COVER LH

(a) Using a clip remover, remove the 5 clips.
(b) Remove the 4 bolts and engine under cover LH.



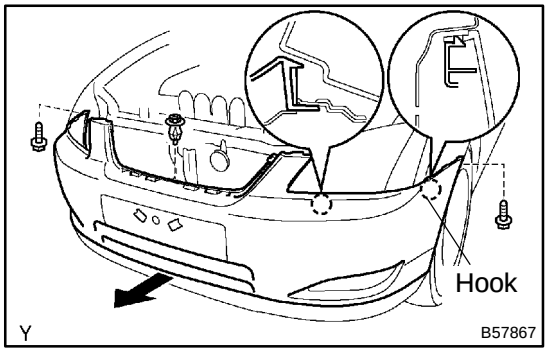
5. REMOVE FRONT FENDER LINER LH

(a) Using a clip remover, remove the 2 clips.
(b) Remove the screw and a part of the front fender liner LH.

HINT:

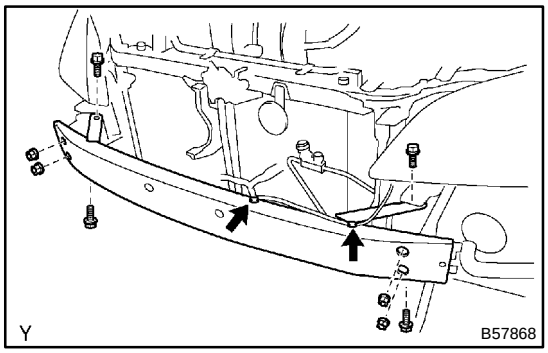
Remove the screw, clip and the front fender liner LH within the range that the front bumper cover can be removed.

6. REMOVE FRONT FENDER LINER RH



7. REMOVE FRONT BUMPER COVER

(a) Remove the 2 screws and 3 clips.
(b) Disengage the hook and front bumper cover.
(c) w/ fog light:
Disconnect the fog light connector.
(d) w/ headlamp cleaner:
Disconnect the headlamp washer hoses.



8. REMOVE FRONT BUMPER REINFORCEMENT

(a) Disconnect the 2 wire harness clips.
(b) Remove the 4 bolts.
(c) Remove the 4 nuts and front bumper reinforcement.

9. REMOVE FRONT SPOILER COVER LH

(See page 76-15)

10. REMOVE FRONT SPOILER COVER RH

(See page 76-15)

11. REMOVE FOG LIGHT UNIT LH (W/ FOG LIGHT)

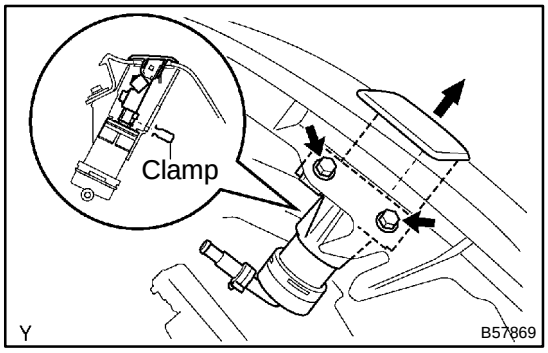
(a) Remove the 2 bolts and the fog light unit LH.

(b) Remove the front bumper hole cover LH.

12. REMOVE FOG LIGHT UNIT RH (W/ FOG LIGHT)

13. REMOVE FRONT BUMPER HOLE COVER LH (W/O FOG LIGHT)

14. REMOVE FRONT BUMPER HOLE COVER RH (W/O FOG LIGHT)



15. REMOVE HEADLAMP WASHER ACTUATOR SUB-ASSY LH (W/ HEADLAMP CLEANER)

(a) Remove the clamp, pull out the type1 headlamp washer nozzle sub-assy LH.

(b) Remove the 2 bolts and the headlamp washer actuator sub-assy LH.

16. REMOVE HEADLAMP WASHER ACTUATOR SUB-ASSY RH (W/ HEADLAMP CLEANER)

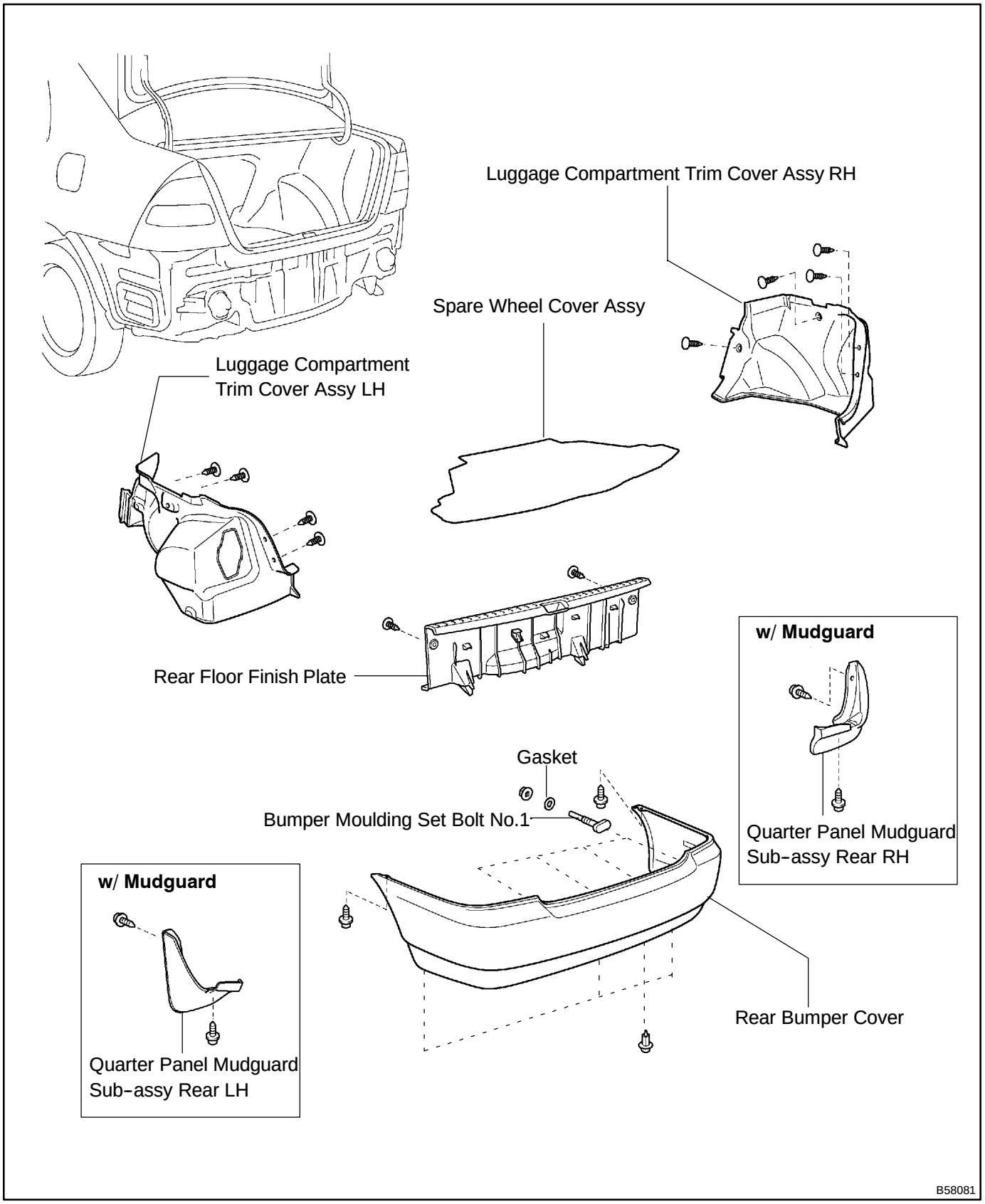
17. INSTALL FRONT BUMPER REINFORCEMENT

(a) Install the front bumper reinforcement with the 4 bolts and 4 nuts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

REAR BUMPER COVER (SEDAN)

COMPONENTS

760ET-01



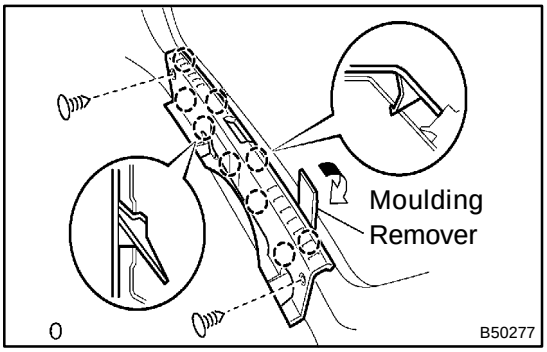
760EU-01

REPLACEMENT

HINT:

Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. REMOVE SPARE WHEEL COVER ASSY



2. REMOVE REAR FLOOR FINISH PLATE

(a) Remove the 2 clips.
(b) Using a moulding remover, remove the rear floor finish plate.

3. REMOVE LUGGAGE COMPARTMENT TRIM COVER ASSY LH

(a) Using a clip remover, remove the clip and a part of the luggage compartment trim cover assembly LH.

HINT:

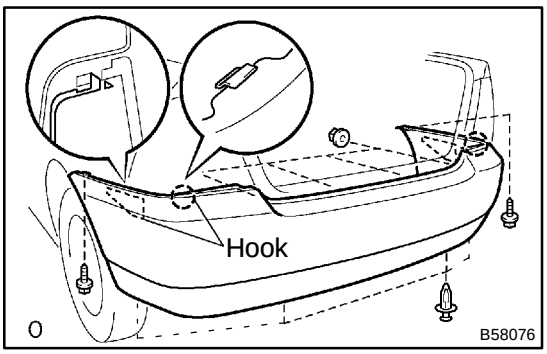
Remove the clip and the luggage compartment trim cover assembly LH within the range that the nut holding the rear bumper cover in the luggage can be removed.

4. REMOVE LUGGAGE COMPARTMENT TRIM COVER ASSY RH

5. REMOVE QUARTER PANEL MUDGUARD SUB-ASSY REAR LH(W/ MUDGUARD)

(a) Remove the 2 screws and quarter panel mudguard rear LH.

6. REMOVE QUARTER PANEL MUDGUARD SUB-ASSY REAR RH(W/ MUDGUARD)



7. REMOVE REAR BUMPER COVER

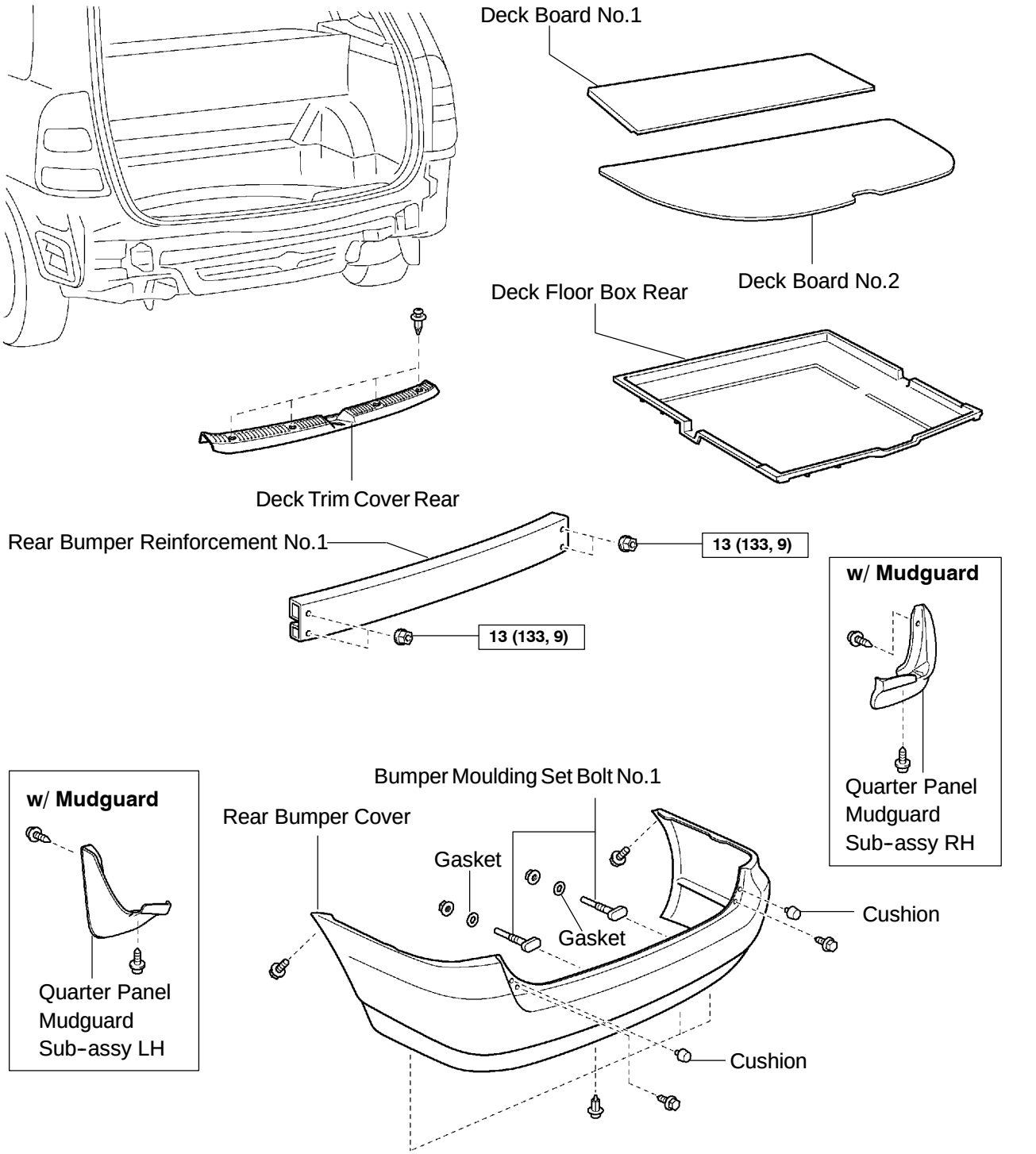
(a) Using a screwdriver, remove the 4 clips.
(b) Remove the 4 nuts and 4 screws.
(c) Remove the hook and rear bumper cover.

8. REMOVE BUMPER MOULDING SET BOLT NO.1

REAR BUMPER COVER (STATION WAGON)

COMPONENTS

760EW-01



N·m (kgf·cm, ft·lbf) : Specified torque

B58080

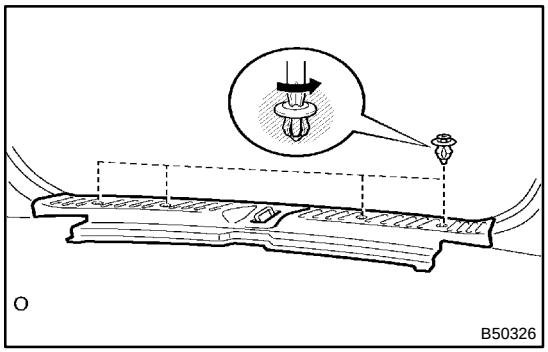
REPLACEMENT

HINT:
Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. REMOVE DECK BOARD NO.1

2. REMOVE DECK BOARD NO.2

3. REMOVE DECK FLOOR BOX REAR



4. REMOVE DECK TRIM COVER REAR

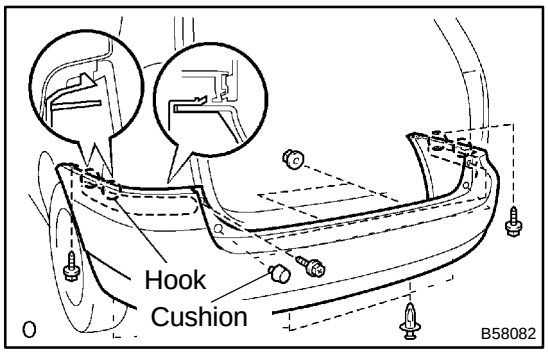
(a) Using a screwdriver, turn the center of each 4 clips by 90 degrees counterclockwise and then remove them.
(b) Remove the deck trim cover rear.

HINT:
The clips returns to normal, when the clips is turned by over 90 degrees.

5. REMOVE QUARTER PANEL MUDGUARD SUB-ASSY REAR LH(W/ MUDGUARD)

(a) Remove the 2 screws and quarter panel mudguard rear LH.

6. REMOVE QUARTER PANEL MUDGUARD SUB-ASSY REAR RH(W/ MUDGUARD)



7. REMOVE REAR BUMPER COVER

(a) Remove the 2 cushions.
(b) Using a screwdriver, remove the 4 clips.
(c) Remove the 2 nuts and 4 screws.
(d) Remove the hook and rear bumper cover.

8. REMOVE BUMPER MOULDING SET BOLT NO.1

9. REMOVE REAR BUMPER REINFORCEMENT NO.1

(a) Remove the 4 nuts and rear bumper reinforcement No.1.

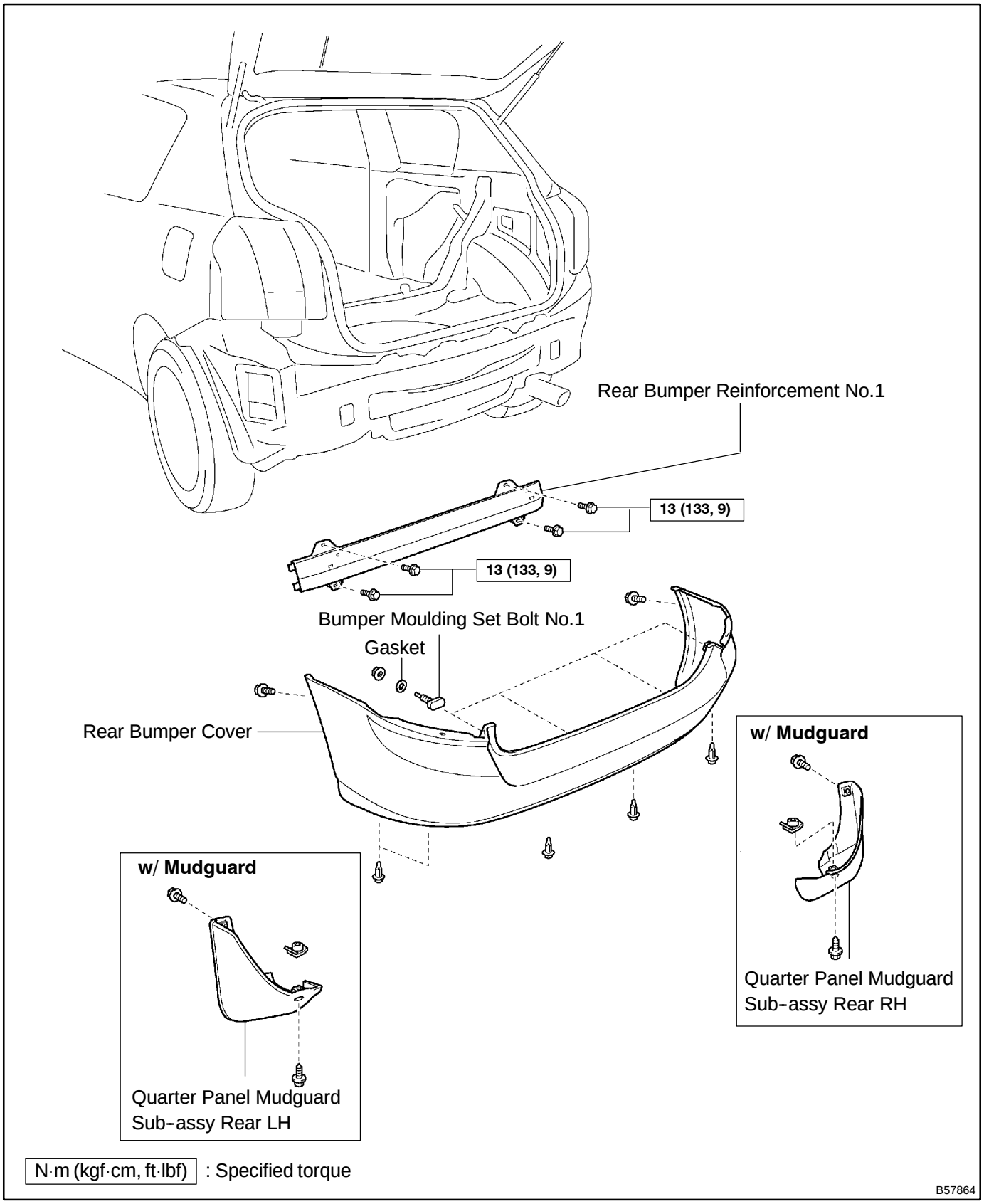
10. INSTALL REAR BUMPER REINFORCEMENT NO.1

(a) Install the rear bumper reinforcement No.1 with the 4 nuts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

REAR BUMPER COVER (HATCHBACK)

COMPONENTS

760EX-01



760EY-01

REPLACEMENT

HINT:

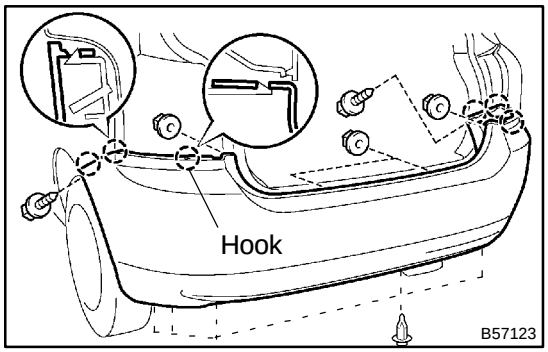
Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. REMOVE FRONT DOOR SCUFF PLATE RH (3 DOOR HATCH BACK BODY TYPE) (See page 76-48)
2. REMOVE FRONT DOOR SCUFF PLATE LH (3 DOOR HATCH BACK BODY TYPE) (See page 76-48)
3. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH (3 DOOR HATCH BACK BODY TYPE) (See page 76-56)
4. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH (3 DOOR HATCH BACK BODY TYPE) (See page 76-56)
5. REMOVE REAR DOOR SCUFF PLATE RH (5 DOOR HATCH BACK BODY TYPE) (See page 76-56)
6. REMOVE REAR DOOR SCUFF PLATE LH (5 DOOR HATCH BACK BODY TYPE) (See page 76-56)
7. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH (5 DOOR HATCH BACK BODY TYPE) (See page 76-56)
8. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH (5 DOOR HATCH BACK BODY TYPE) (See page 76-56)
9. REMOVE REAR SEAT BACK ASSY LH (See page 72-26)
10. REMOVE REAR SEAT BACK ASSY RH (See page 72-26)
11. REMOVE REAR FLOOR CARPET ASSY
12. REMOVE PACKAGE TRAY TRIM PANEL ASSY
13. REMOVE DECK FLOOR BOX RH
    (3H/B, See page 76-48) (5H/B, See page 76-57)
14. REMOVE DECK FLOOR BOX LH
    (3H/B, See page 76-48) (5H/B, See page 76-57)
15. REMOVE DECK TRIM COVER REAR
    (3H/B, See page 76-49) (5H/B, See page 76-58)
16. REMOVE QUARTER TRIM PANEL ASSY FRONT RH (3 DOOR HATCH BACK BODY TYPE) (See page 76-49)
17. REMOVE QUARTER TRIM PANEL ASSY FRONT LH (3 DOOR HATCH BACK BODY TYPE) (See page 76-49)
18. REMOVE REAR SEAT SIDE COVER RH (5 DOOR HATCH BACK BODY TYPE) (See page 76-58)
19. REMOVE REAR SEAT SIDE COVER LH (5 DOOR HATCH BACK BODY TYPE) (See page 76-58)
20. REMOVE DECK TRIM SIDE PANEL ASSY RH
    (3H/B, See page 76-49) (5H/B, See page 76-58)
21. REMOVE DECK TRIM SIDE BOARD LH
    (3H/B, See page 76-48) (5H/B, See page 76-58)

22. REMOVE QUARTER PANEL MUDGUARD SUB-ASSY REAR LH (W/ MUDGUARD)

(a) Remove the 2 screws and the quarter panel mudguard sub-assy rear LH.

23. REMOVE QUARTER PANEL MUDGUARD SUB-ASSY REAR RH (W/ MUDGUARD)



24. REMOVE REAR BUMPER COVER

(a) Using a clip remover, remove the 6 clips.
(b) Remove the 4 nuts and 2 screws.
(c) Remove the hook and rear bumper cover.

25. REMOVE REAR BUMPER REINFORCEMENT NO.1

(a) Remove the 4 bolts and rear bumper reinforcement No.1.

26. REMOVE BUMPER MOULDING SET BOLT NO.1

27. INSTALL REAR BUMPER REINFORCEMENT NO.1

(a) Install the rear bumper reinforcement No.1 with the 4 bolts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

28. INSTALL REAR SEAT BACK ASSY RH **(See page 72-28)**

29. INSTALL REAR SEAT BACK ASSY LH **(See page 72-28)**

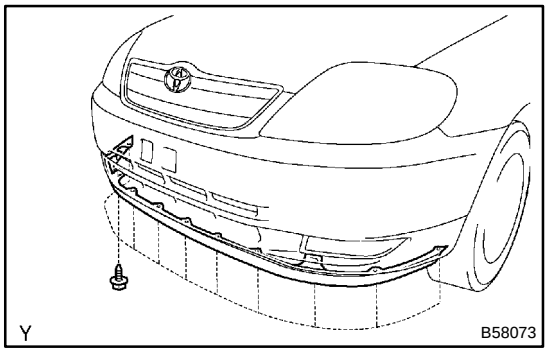
FRONT SPOILER COVER (SEDAN/STATION WAGON)

760EZ-01

REPLACEMENT

HINT:

Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.



1. REMOVE FRONT SPOILER COVER LH

(a) Remove the 6 bolts.

(b) Remove a part of the front fender liner LH.

HINT:

Remove the front fender liner LH within the range that the front spoiler cover can be removed.

(c) Remove the front spoiler cover LH.

2. REMOVE FRONT SPOILER COVER RH

FRONT SPOILER COVER (HATCHBACK)

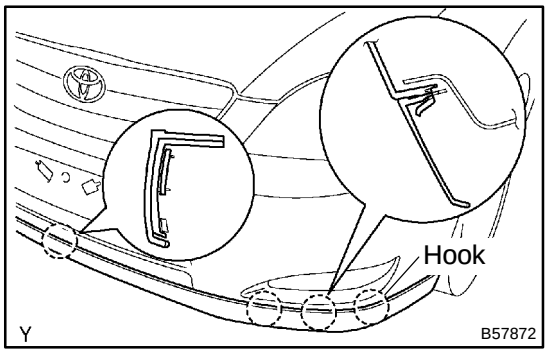
760F0-01

REPLACEMENT

HINT:

Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. **REMOVE ENGINE UNDER COVER LH**
   (See page 76-5)
2. **REMOVE ENGINE UNDER COVER RH**
   (See page 76-5)



3. **REMOVE FRONT SPOILER COVER LH**

(a) Disengage the hook and front spoiler cover LH.

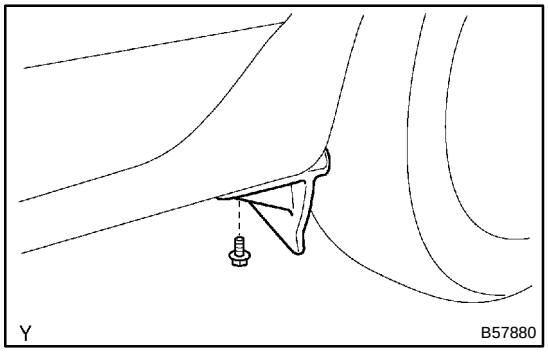
4. **REMOVE FRONT SPOILER COVER RH**

REAR WHEEL HOUSE PLATE FRONT LH (STATION WAGON/HATCHBACK)

760F1-01

REPLACEMENT

HINT:
Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.



1. REMOVE REAR WHEEL HOUSE PLATE FRONT LH

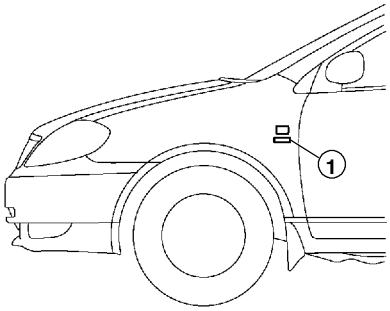
(a) Remove the bolt and the rear wheel house plate front LH.

NAME PLATE

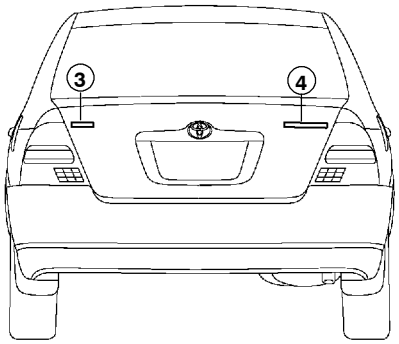
REPLACEMENT

760F2-01

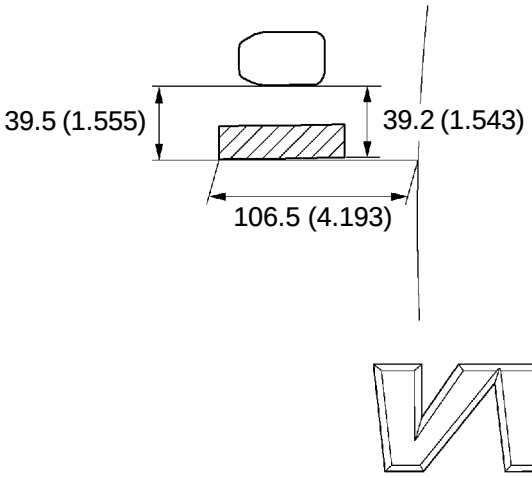
SDN Models:

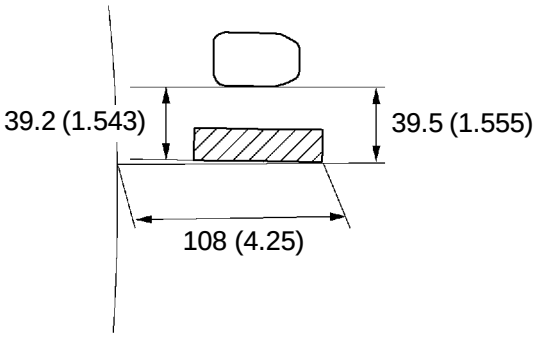


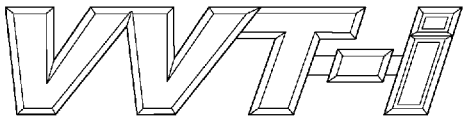
①Front Fender Emblem (Left)



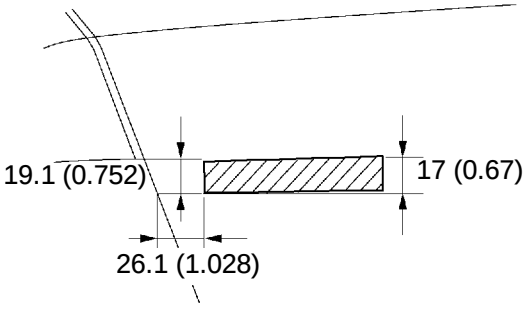
①Front Fender Emblem (Right)





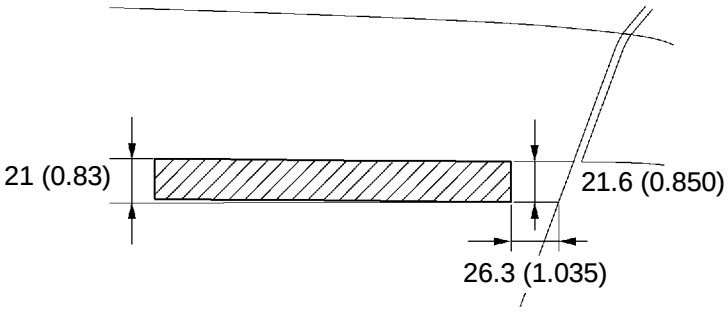


③Luggage Compartment Door Name Plate





④Luggage Compartment Door Name Plate No.2



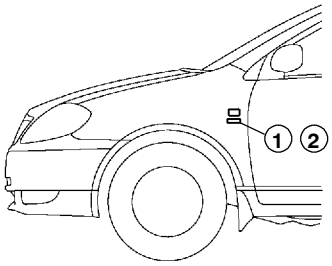


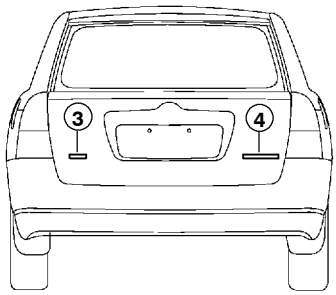
mm (in.)

Y

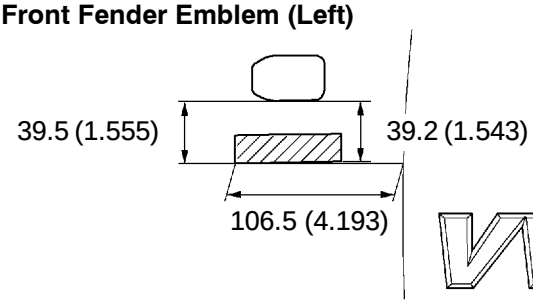
B58070

WGN Models:

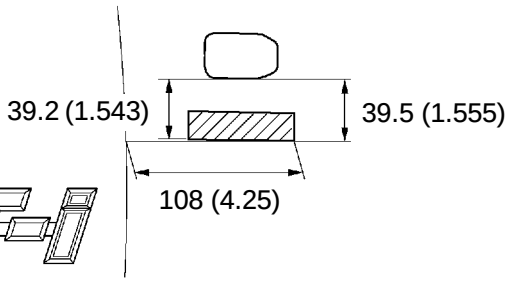




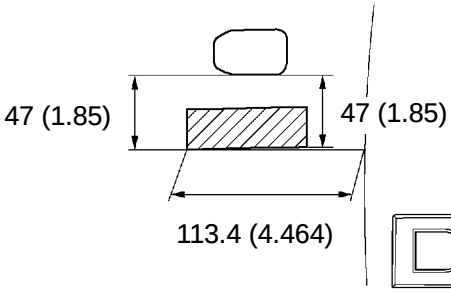
① Front Fender Emblem (Left)



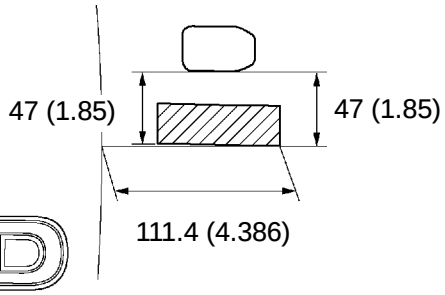
① Front Fender Emblem (Right)



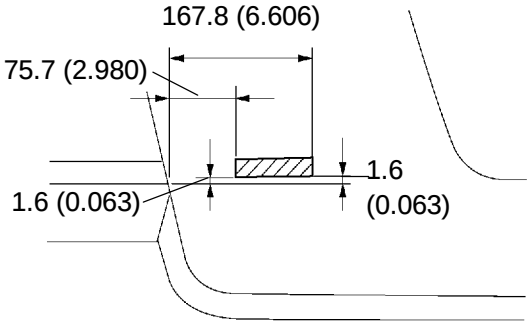
② Front Fender Emblem (Left)



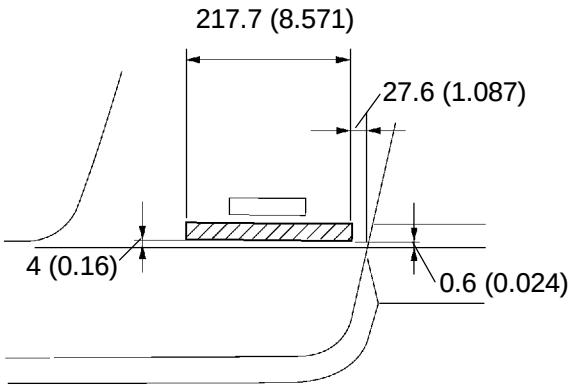
② Front Fender Emblem (Right)



③ Back Door Name Plate



④ Back Door Name Plate No.2

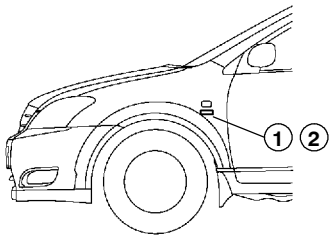


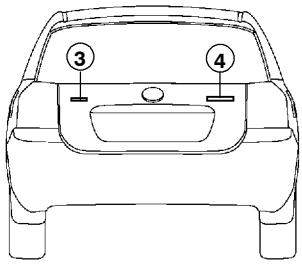
TOYOTA COROLLA

mm (in.)

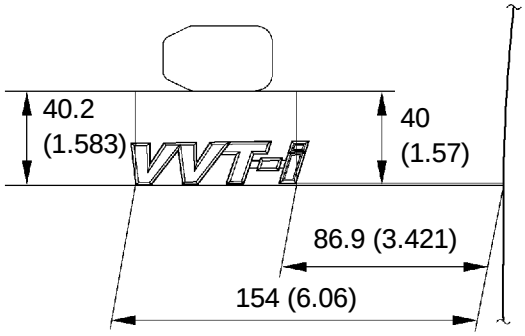
Y B58071

3H/B and 5H/B Models:

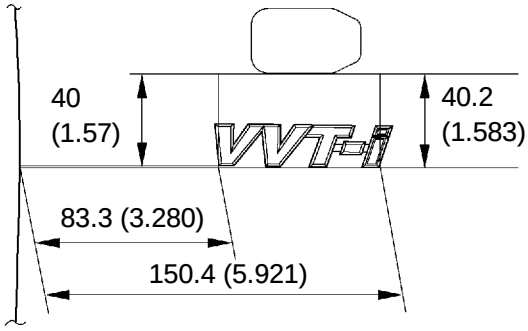




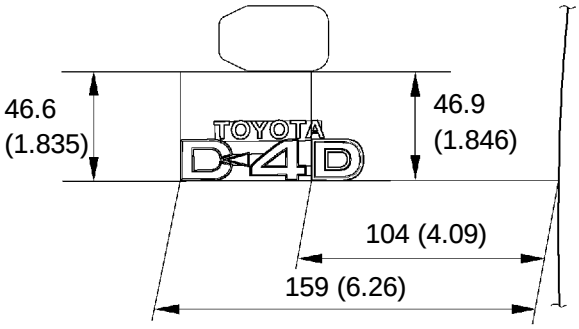
① Front Fender Emblem (Left)



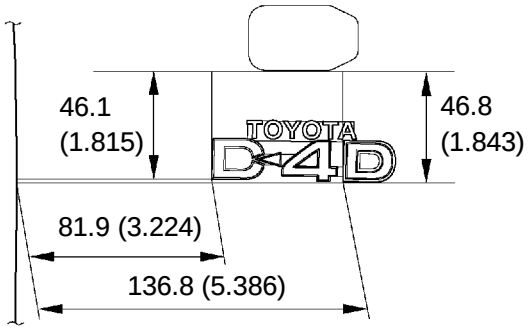
① Front Fender Emblem (Right)



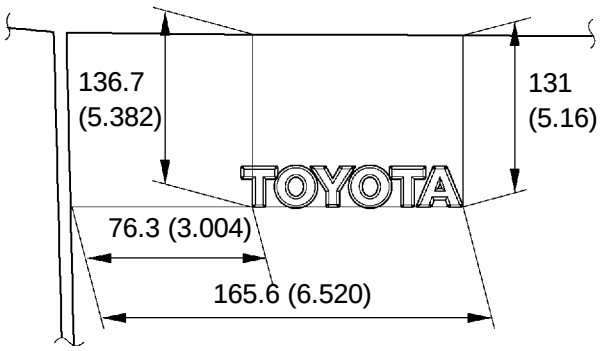
② Front Fender Emblem (Left)



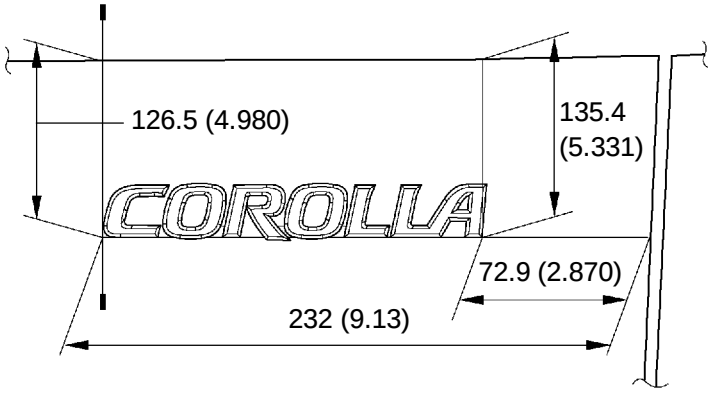
② Front Fender Emblem (Right)



③ Luggage Compartment Door Name Plate



④ Luggage Compartment Door Name Plate No.2



mm (in.)

B57865

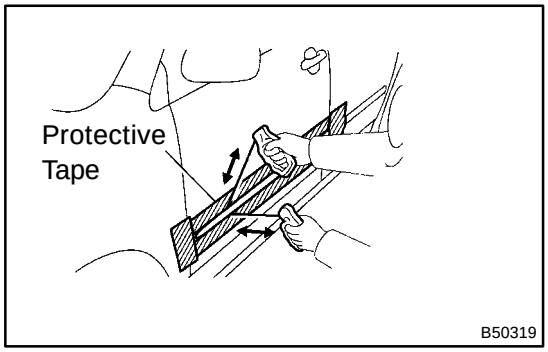
OUT SIDE MOULDING

REPLACEMENT

760F3-01

HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.



1. REMOVE OUTSIDE MOULDING

(a) Using a heat light, heat the body moulding to 40 – 60_C (104 – 140_F).

NOTICE:

Do not heat the moulding excessively.

(b) Tie both the piano wire ends to a wooden block or a similar object.

(c) Scrape the adhesive tape off by pulling the piano wire.

NOTICE:

- **If reusing the moulding, take care not to damage the moulding.**
- **Do not damage the body.**

(d) Remove the moulding.

2. INSTALL OUTSIDE MOULDING

(a) Using a heat light, heat the body mounting surface to 40 – 60_C (104 – 140_F).

NOTICE:

Do not heat the body excessively.

(b) Remove the protective tape from the body.

(c) Wipe off the stains with cleaner.

(d) Clean the moulding (if reusing the moulding).

(1) Using a heat light, heat the body moulding to 20 – 30_C (68 – 86_F).

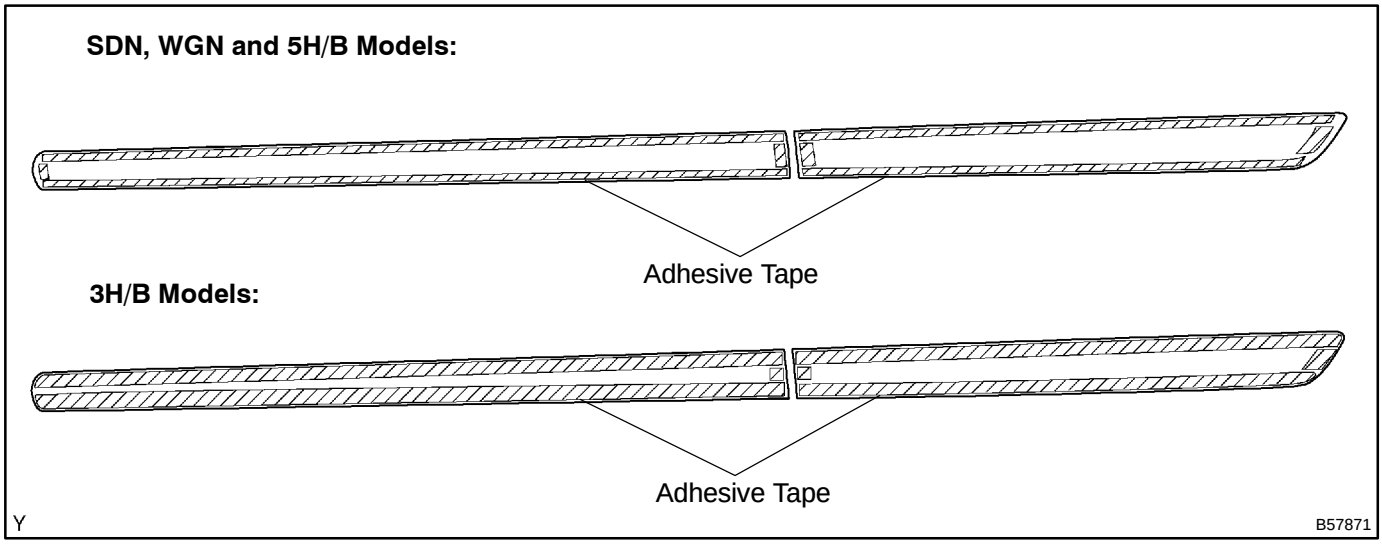
NOTICE:

Do not heat the body excessively.

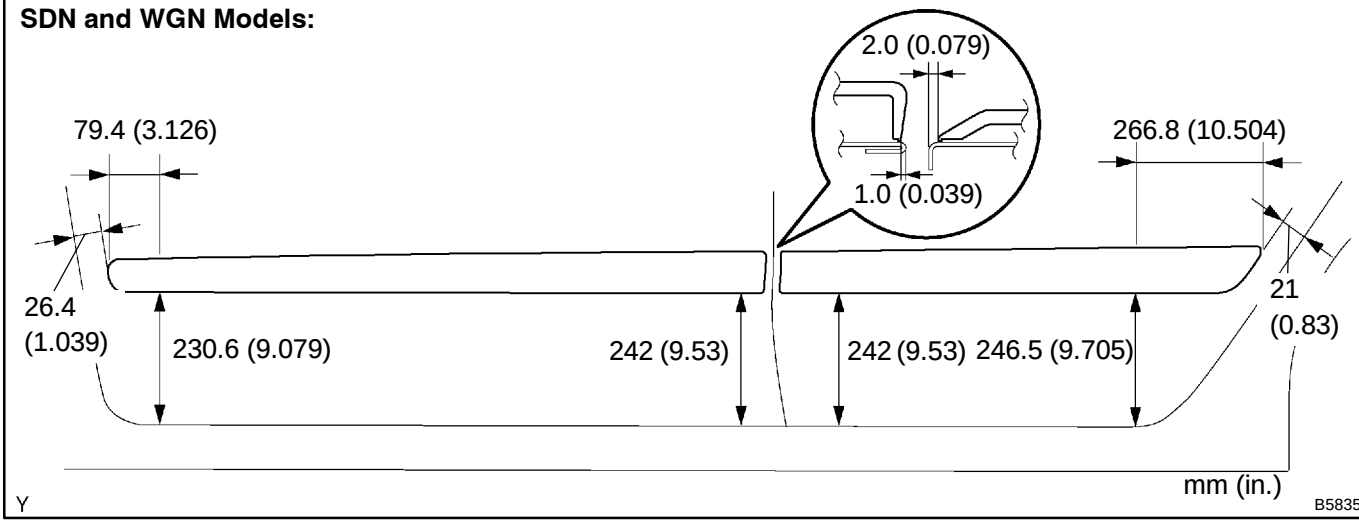
(2) Remove the adhesive tape from the moulding.

(3) Wipe off the stains with cleaner.

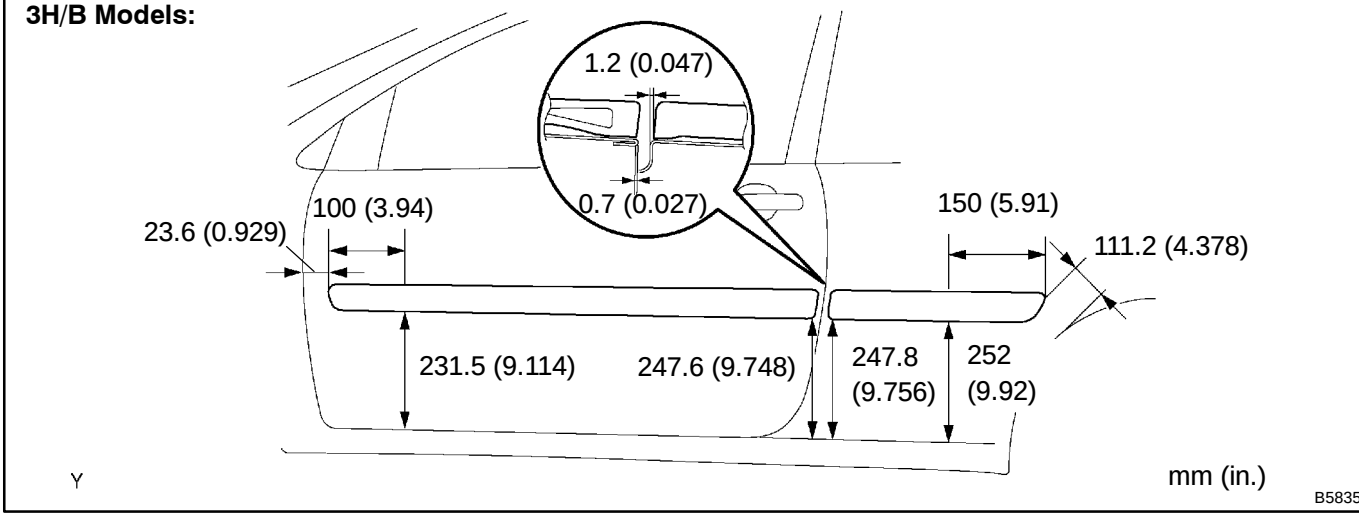
(4) Apply new adhesive tape to the moulding as shown in the illustration.



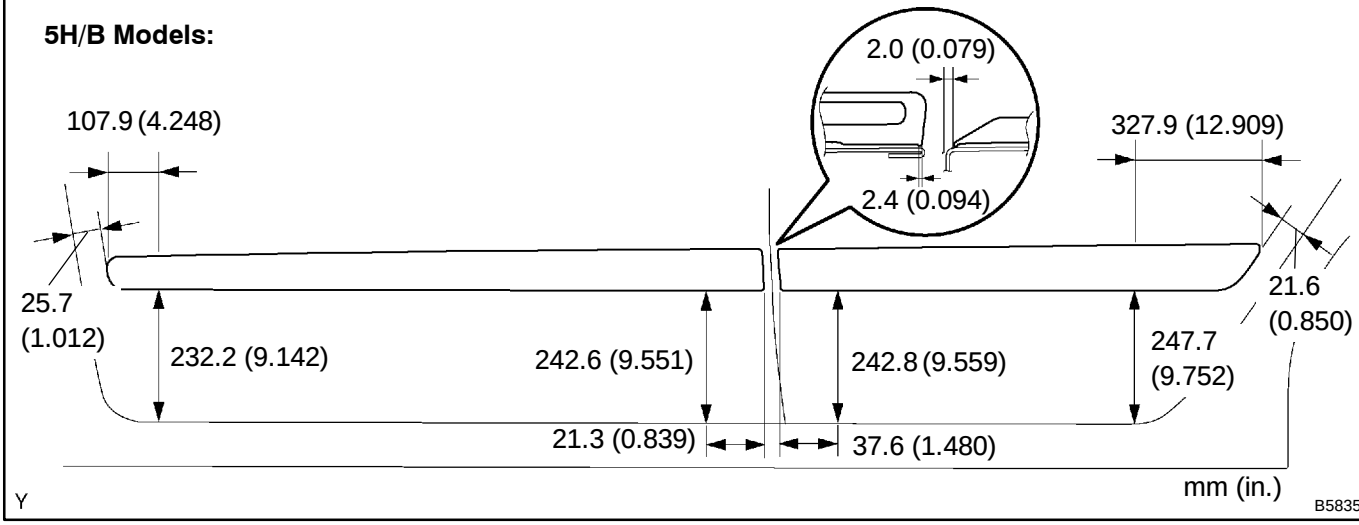
SDN and WGN Models:



3H/B Models:



5H/B Models:



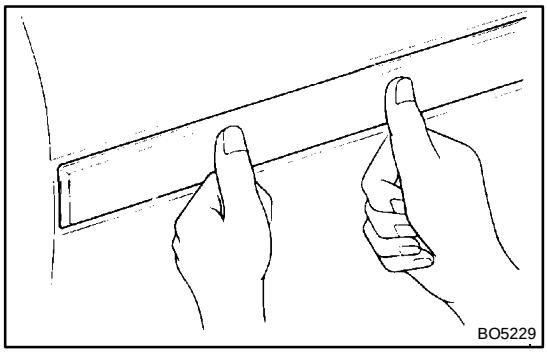
(e) Using a heat light, heat the body and moulding.

HINT:

- Body: 40 – 60_C (104 – 140_F)
- Moulding: 20 – 30_C (68 – 86_F)

NOTICE:

Do not heat the body and moulding excessively.



(f) Remove the moulding release sheet from the moulding face.

NOTICE:

- **When the moulding release sheet is removed, take care that no dirt or no dust can get onto the uncoated area.**
- **Do not apply excessive force onto the moulding, but steady pressure with your thumbs.**

FRONT DOOR BELT MOULDING ASSY LH

760F4-01

REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.

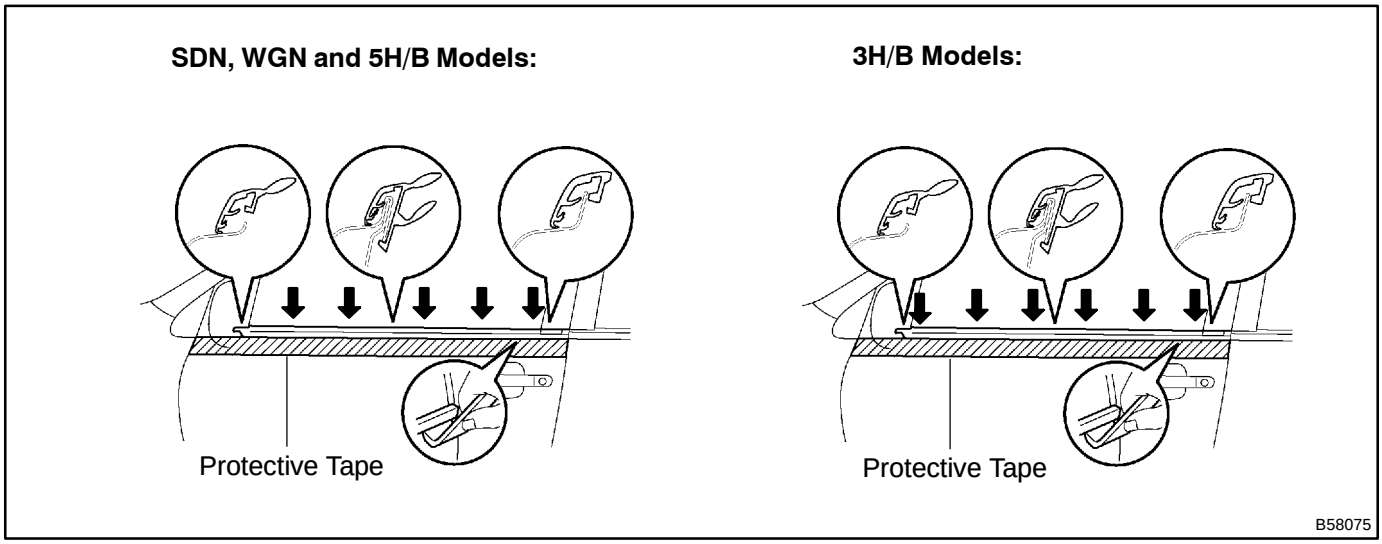
1. REMOVE FRONT DOOR BELT MOULDING ASSY LH

(a) Put protective tape under the front door belt moulding assembly LH.

(b) Using a moulding remover or scraper, remove the front door belt moulding assembly LH.

HINT:

Tape the scraper tip before use.



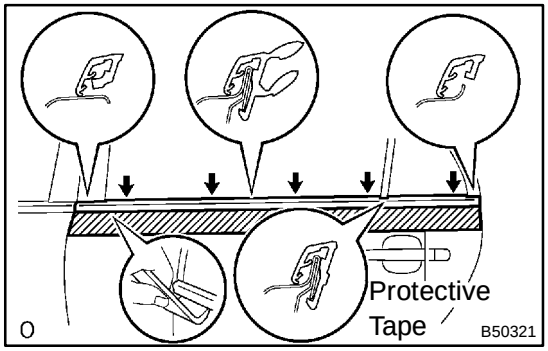
REAR DOOR BELT MOULDING ASSY LH

760F5-01

REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.



1. REMOVE REAR DOOR BELT MOULDING ASSY LH

(a) Put protective tape under the rear door belt moulding assembly LH.

(b) Using a moulding remover or scraper, remove the rear door belt moulding assembly LH.

HINT:

Tape the scraper tip before use.

LUGGAGE COMPARTMENT DOOR GARNISH OUTSIDE (SEDAN)

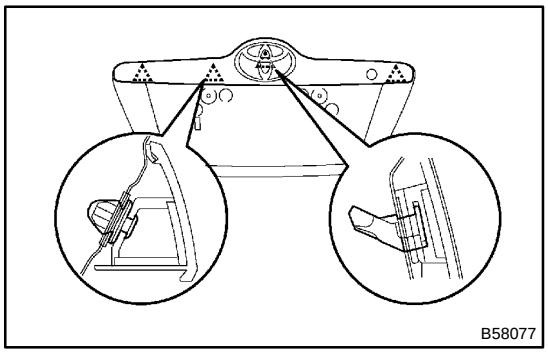
760F6-01

REPLACEMENT

HINT:
Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. REMOVE LUGGAGE COMPARTMENT LOCK CYLINDER & KEY SET

(a) Remove the 2 nuts and luggage compartment lock cylinder.



2. REMOVE LUGGAGE COMPARTMENT DOOR GARNISH OUTSIDE

(a) Remove the nut.
(b) Remove the 4 clips and luggage compartment door garnish outside.

3. INSTALL SYMBOL EMBLEM

(a) Using white gasoline, clean the garnish installation surface.
(b) Using a heat light, heat the garnish and emblem to 20 – 30_C (68 – 86_F).
(c) Install the emblem.

NOTICE:
Do not heat the garnish excessively.

BACK DOOR GARNISH OUTSIDE (STATION WAGON)

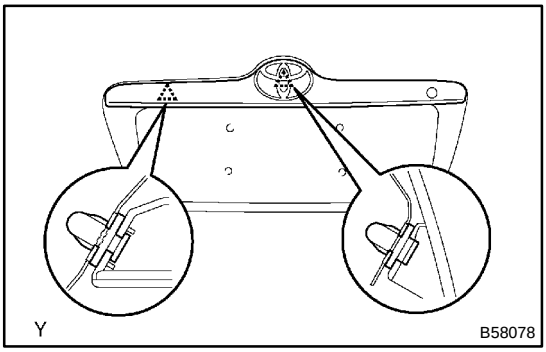
760F7-01

REPLACEMENT

HINT:

Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. **REMOVE BACK DOOR TRIM BOARD ASSY**
   (See page 75-55)
2. **REMOVE BACK DOOR OUTSIDE HANDLE**
   (See page 75-55)
3. **REMOVE BACK DOOR LOCK CYLINDER & KEY SET**
   (See page 75-55)



4. **REMOVE BACK DOOR GARNISH OUTSIDE**

(a) Remove the nut and 2 clips, and remove the garnish outside.

5. **INSTALL SYMBOL EMBLEM**

(a) Using white gasoline, clean the garnish installation surface.
(b) Using a heat light, heat the garnish and emblem to 20 – 30_C (68 – 86_F).
(c) Install the emblem.

NOTICE:

Do not heat the garnish and emblem excessively.

LUGGAGE COMPARTMENT DOOR GARNISH SUB-ASSY OUTSIDE (HATCHBACK)

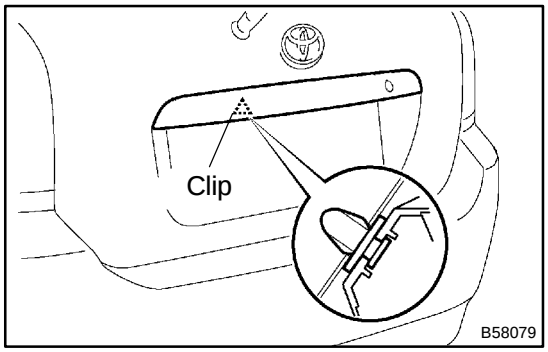
760F8-01

REPLACEMENT

HINT:

Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.

1. **REMOVE BACK DOOR TRIM PANEL ASSY UPPER**
   (See page 75-58)
2. **REMOVE BACK DOOR SIDE GARNISH CLIP**
   (See page 75-58)
3. **REMOVE BACK DOOR SIDE GARNISH RH**
   (See page 75-58)
4. **REMOVE BACK DOOR SIDE GARNISH LH**
   (See page 75-58)
5. **REMOVE BACK DOOR TRIM BOARD ASSY**
   (See page 75-58)
6. **REMOVE BACK DOOR OUTSIDE HANDLE**
   (See page 75-59)
7. **REMOVE LUGGAGE COMPARTMENT LOCK CYLINDER & KEY SET**
   (See page 75-59)



8. **REMOVE LUGGAGE COMPARTMENT DOOR GARNISH SUB-ASSY OUTSIDE**

(a) Remove the 2 nuts.

(b) Using a screwdriver, remove the luggage compartment door garnish outside.

HINT:

Tape the screwdriver tip before use.

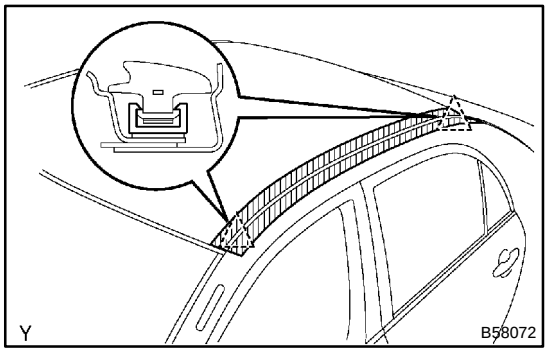
ROOF DRIP SIDE FINISH MOULDING CENTER LH (SEDAN)

760F9-01

REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.



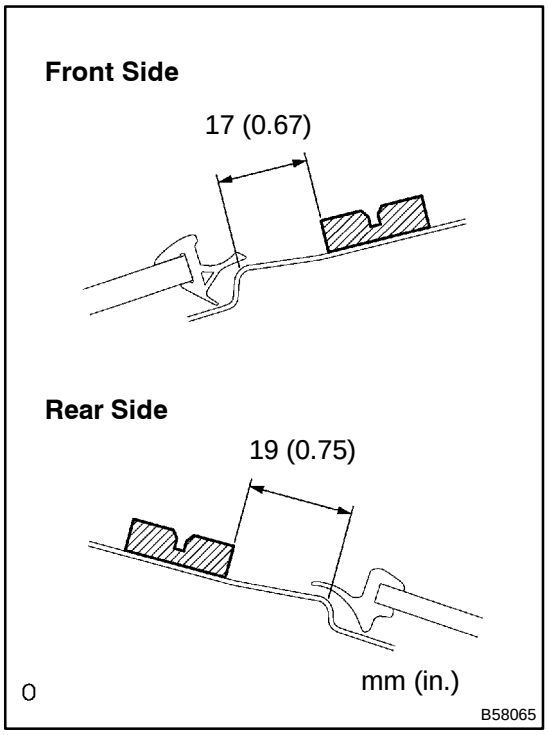
1. REMOVE ROOF DRIP SIDE FINISH MOULDING CENTER LH

(a) Tape the circumference of the moulding for protection.

(b) By using a remover for the roof moulding, release the engagements of the clips both in the front and rear ends of the moulding, and then remove the roof drip side finish moulding.

NOTICE:

- **Do not remove the clips.**
- **In case that the clips are damaged or removed accidentally, exchange them for the supplied ones.**



2. INSTALL ROOF DRIP SIDE FINISH MOULDING CLIP NO.1

NOTICE:

Only when exchanging the clips.

(a) Remove the adhesive tape that remains on the mounting surface of the body, and then clean the surface with white gasoline.

(b) Heat up the clip installation surfaces of the body and clips with a heat light.

Body: 40 - 60_C (104 - 140_F)

Clips: 20 - 30_C (68 - 86_F)

NOTICE:

Do not heat the body and clips excessively.

(c) Set the supplied clips into the positions as shown in the illustration, and press-fit those clips by hand to install them.

(d) Install the moulding 30 minutes or more after press-fitting the clips.

HINT:

- Initial hardening time: 30 minutes
- Perfect hardening time: 24 hours

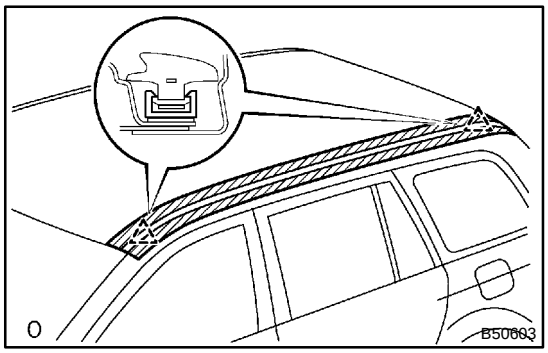
ROOF DRIP SIDE FINISH MOULDING CENTER LH (STATION WAGON)

760FA-01

REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.

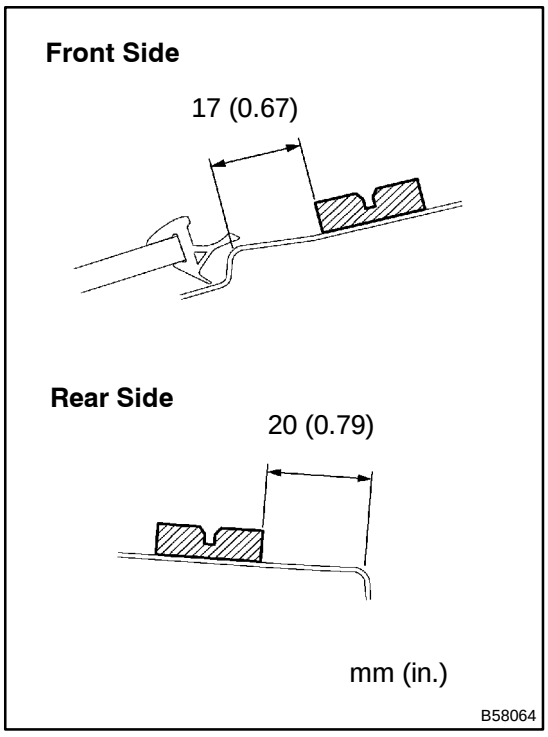


1. REMOVE ROOF DRIP SIDE FINISH MOULDING CENTER LH

(a) Tape the circumference of the moulding for protection.
(b) By using a remover for the roof moulding, release the engagements of the clips both in the front and rear ends of the moulding, and then remove the roof drip side finish moulding.

NOTICE:

- **Do not remove the clips.**
- **In case that the clips are damaged or removed accidentally, exchange them for the supplied ones.**



2. INSTALL ROOF DRIP SIDE FINISH MOULDING CLIP NO.1

NOTICE:
Only when exchanging the clips.

(a) Remove the adhesive tape that remains on the mounting surface of the body, and then clean the surface with white gasoline.
(b) Heat up the clip installation surfaces of the body and clips with a heat light.
Body: 40 – 60_C (104 – 140_F)
Clips: 20 – 30_C (68 – 86_F)

NOTICE:
Do not heat the body and clips excessively.

(c) Set the supplied clips into the positions as shown in the illustration, and press–fit those clips by hand to install them.
(d) Install the moulding 30 minutes or more after press–fitting the clips.

HINT:

- Initial hardening time: 30 minutes
- Perfect hardening time: 24 hours

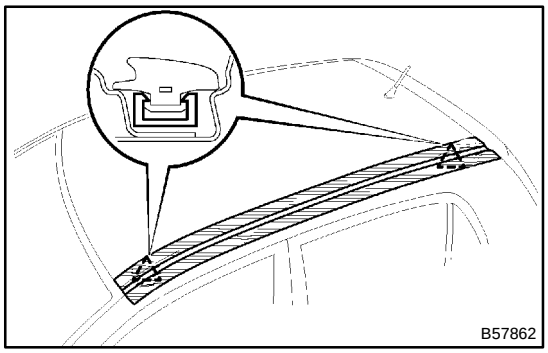
ROOF DRIP SIDE FINISH MOULDING CENTER LH (HATCHBACK)

760FB-01

REPLACEMENT

HINT:

- Installation is in the reverse order of the removal. But the installation is indicated only when it has a point.
- In the RH side, work in the same procedure as in the LH side.

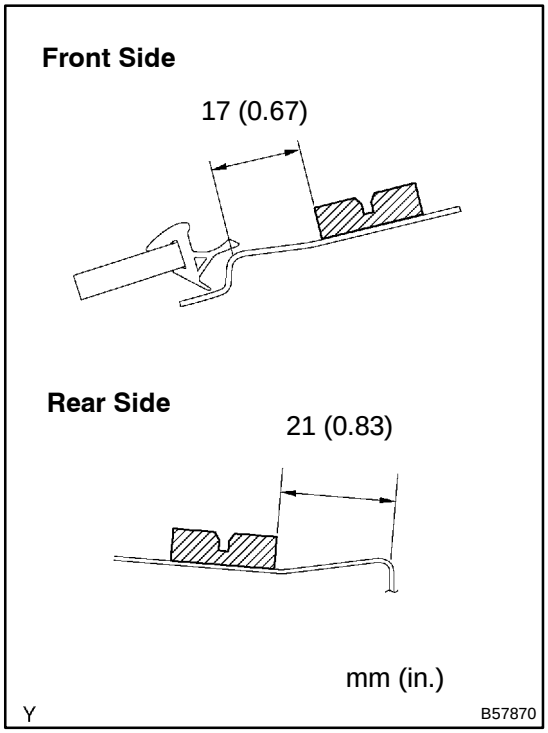


1. REMOVE ROOF DRIP SIDE FINISH MOULDING CENTER LH

(a) Tape the circumference of the moulding for protection.
(b) Using a remover for the roof moulding, release the engagements of the clips both in the front and rear ends of the moulding, and then remove the roof drip side finish moulding.

NOTICE:

- **Do not remove the clips.**
- **In case that the clips are damaged or removed accidentally, exchange them for the supplied ones.**



2. INSTALL ROOF DRIP SIDE FINISH MOULDING CLIP NO.1

NOTICE:
Only when exchanging the clips.

(a) Remove the adhesive tape that remains on the mounting surface of the body, and then clean the surface with white gasoline.
(b) Heat up the clip installation surfaces of the body and clips with a heat light.
Body: 40 - 60_C (104 - 140_F)
Clips: 20 - 30_C (68 - 86_F)

NOTICE:
Do not heat the moulding excessively.

(c) Set the supplied clips into the positions as shown in the illustration, and press-fit those clips by hand to install them.
(d) Install the moulding 30 minutes or more after press-fitting the clips.

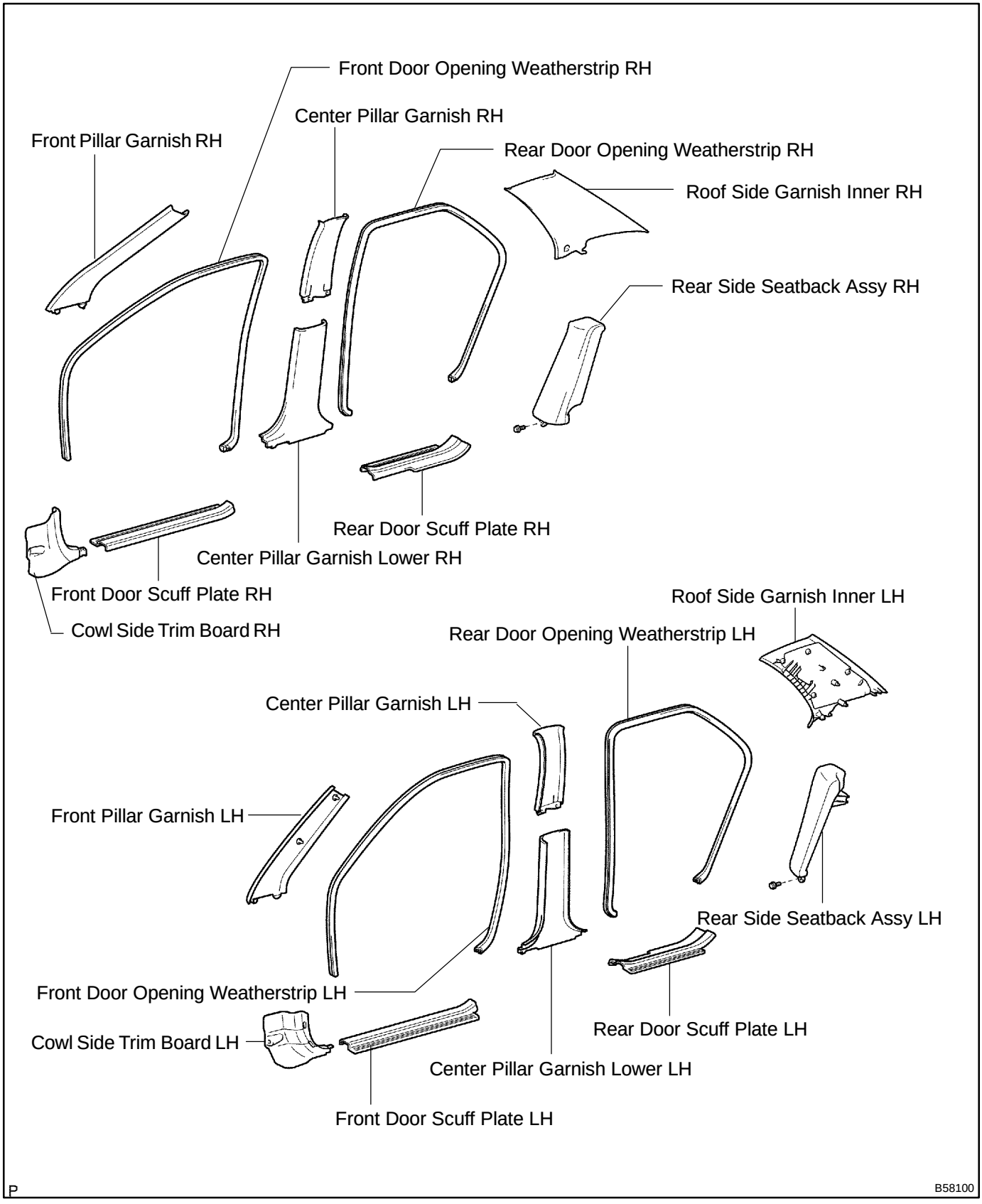
HINT:

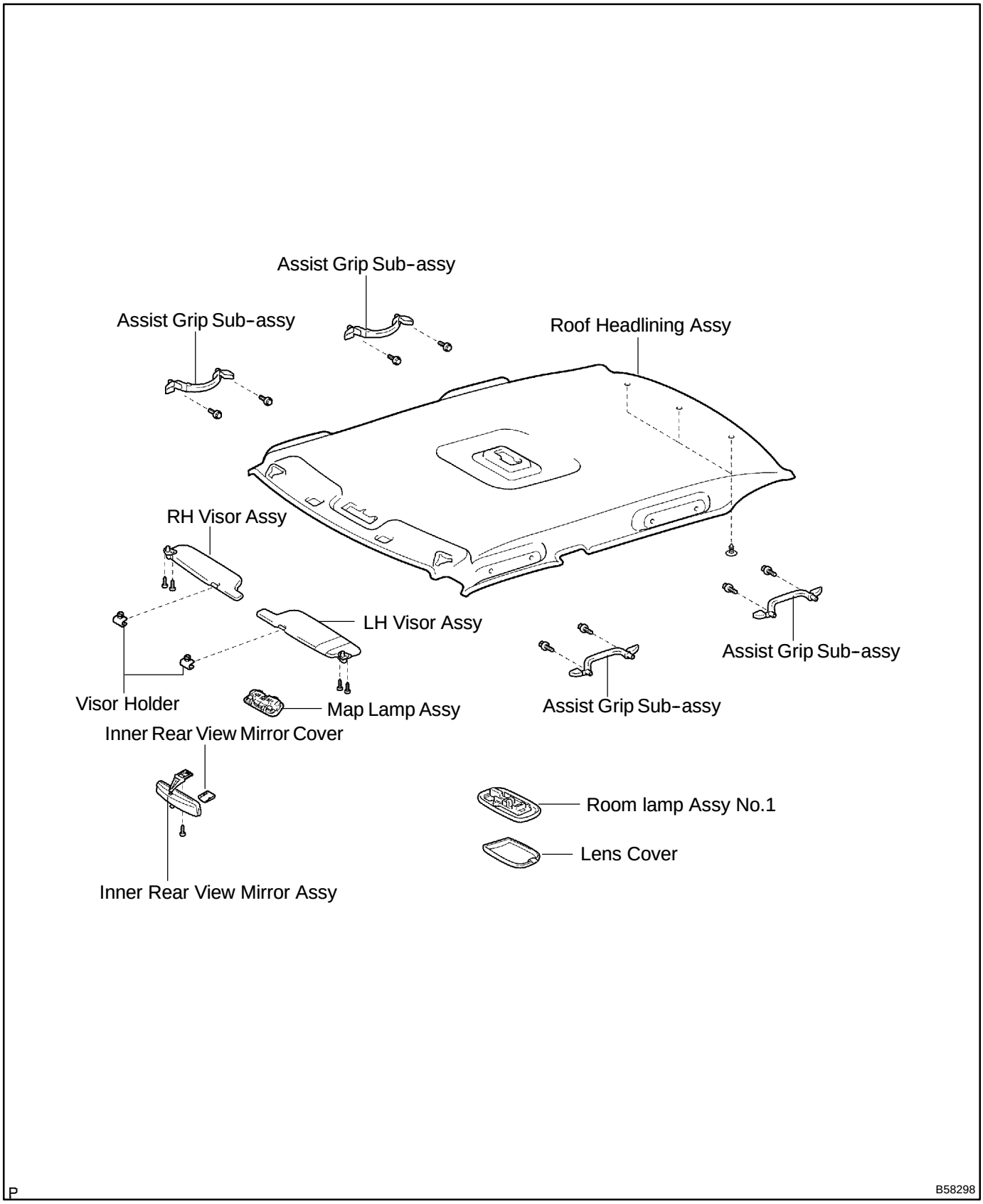
- Initial hardening time: 30 minutes
- Perfect hardening time: 24 hours

ROOF HEADLINING ASSY (SEDAN)

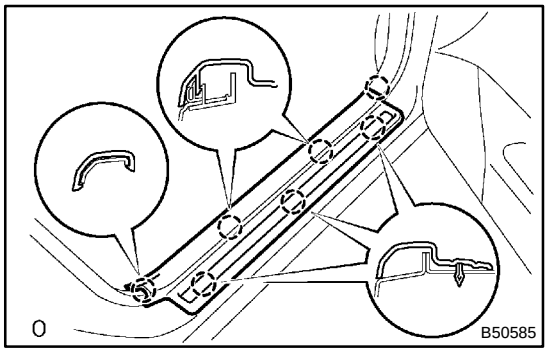
COMPONENTS

760FD-01




Assist Grip Sub-assy
Assist Grip Sub-assy
Roof Headlining Assy
RH Visor Assy
LH Visor Assy
Assist Grip Sub-assy
Visor Holder
Map Lamp Assy
Assist Grip Sub-assy
Inner Rear View Mirror Cover
Room lamp Assy No.1
Lens Cover
Inner Rear View Mirror Assy
P
B58298

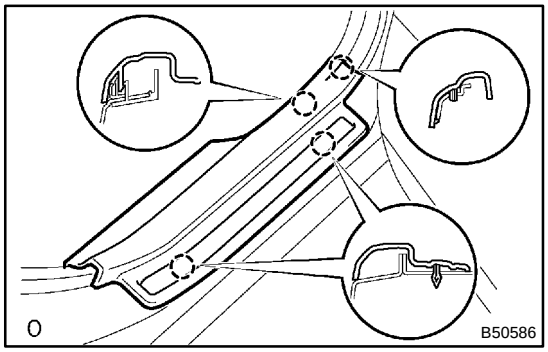
REPLACEMENT



1. REMOVE FRONT DOOR SCUFF PLATE RH

(a) Using a screwdriver, remove the front door scuff plate RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

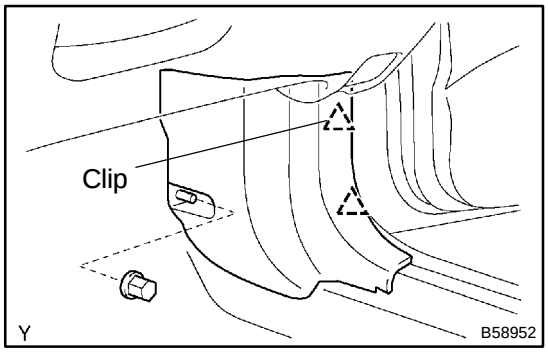
2. REMOVE FRONT DOOR SCUFF PLATE LH



3. REMOVE REAR DOOR SCUFF PLATE RH

(a) Using a screwdriver, remove the rear door scuff plate RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

4. REMOVE REAR DOOR SCUFF PLATE LH



5. REMOVE COWL SIDE TRIM BOARD RH

(a) Remove the clip.
(b) Using a screwdriver, remove the cowl side trim board RH.
HINT:
Tape the screwdriver tip before use.
(c) Employ the same manner described above to the other side.

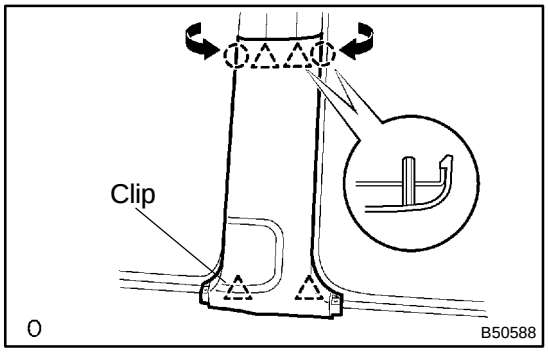
6. REMOVE COWL SIDE TRIM BOARD LH

7. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH

8. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH

9. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH

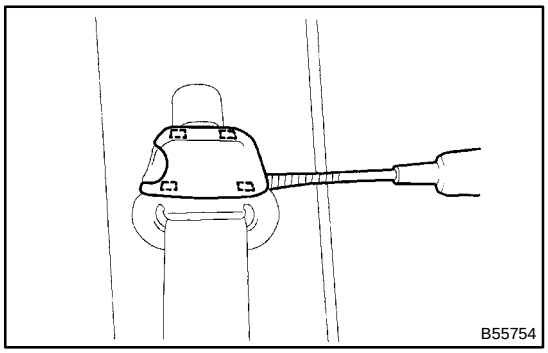
10. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH



11. REMOVE CENTER PILLAR GARNISH LOWER RH

(a) Pull the center pillar garnish lower RH upward to remove it.
(b) Employ the same manner described above to the other side.

12. REMOVE CENTER PILLAR GARNISH LOWER LH

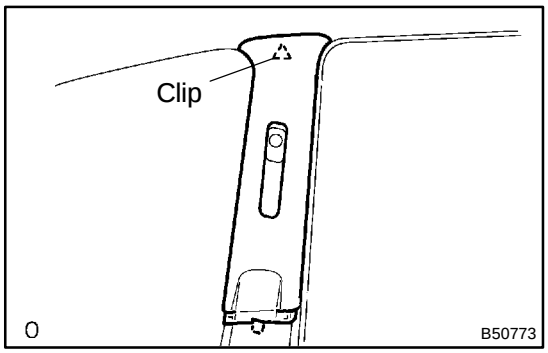


13. REMOVE CENTER PILLAR GARNISH RH

(a) Using a screwdriver, remove the shoulder anchor cover cap.

HINT:
Tape the screwdriver tip before use.

(b) Remove the bolt and front seat outer belt shoulder anchor.
(c) Remove the bolt and front seat outer belt floor anchor.



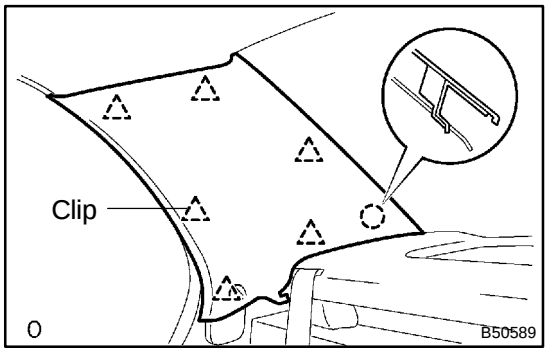
(d) Using a screwdriver, remove the center pillar upper garnish RH.

HINT:
Tape the screwdriver tip before use.

(e) Employ the same manner described above to the other side.

14. REMOVE CENTER PILLAR GARNISH LH

15. REMOVE REAR SEAT CUSHION ASSEMBLY **(See page 72-12, 72-16)**
16. REMOVE REAR SEAT BACK ASSY(FIXED TYPE REAR SEAT) **(See page 72-16)**
17. REMOVE REAR SIDE SEAT BACK ASSY RH(SEPARATED TYPE REAR SEAT) **(See page 72-13)**
18. REMOVE REAR SIDE SEAT BACK ASSY LH(SEPARATED TYPE REAR SEAT) **(See page 72-13)**



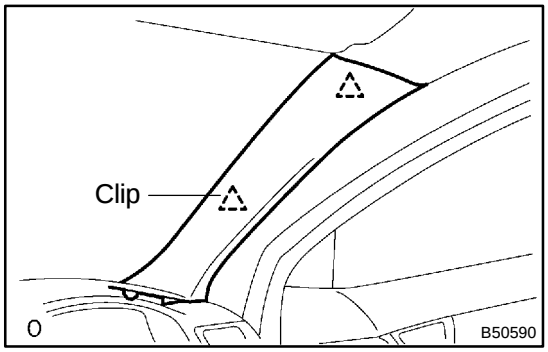
19. REMOVE ROOF SIDE GARNISH INNER RH

(a) Using a screwdriver, remove the roof side garnish inner RH.

HINT:
Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

20. REMOVE ROOF SIDE GARNISH INNER LH



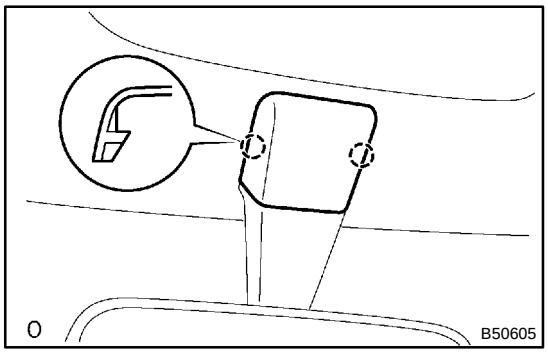
21. REMOVE FRONT PILLAR GARNISH RH

(a) Using a screwdriver, remove the front pillar garnish RH.

HINT:
Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

22. REMOVE FRONT PILLAR GARNISH LH

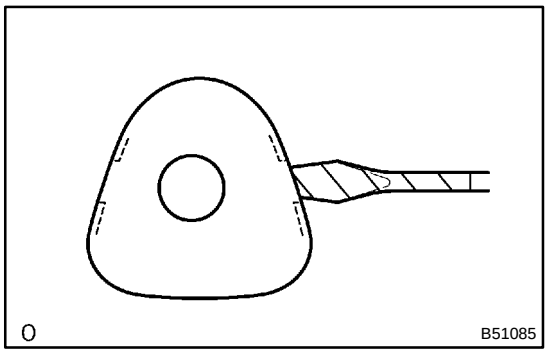


23. REMOVE INNER REAR VIEW MIRROR ASSY

(a) Using a screwdriver, remove the inner rear view mirror cover.

HINT:
Tape the screwdriver tip before use.

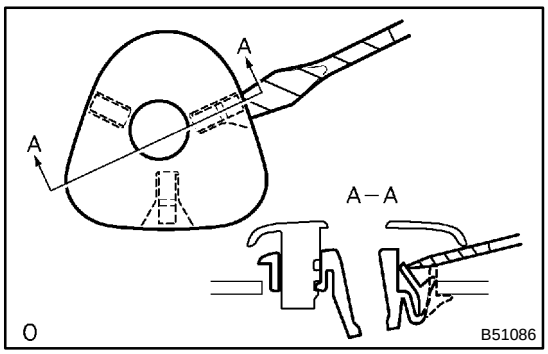
(b) Remove the 2 screws and the inner rear view mirror assembly.



24. REMOVE RH VISOR ASSY

(a) Using a screwdriver, pry up the cover in the illustrated part, and then pull the cover downward.

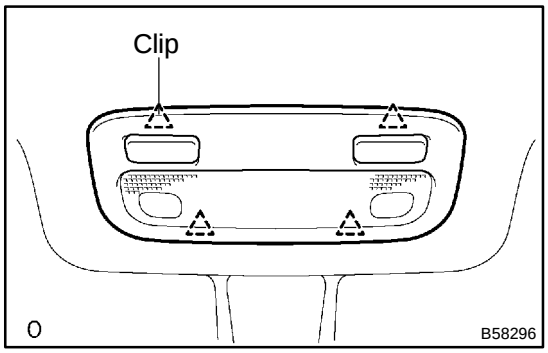
HINT:
Tape the screwdriver tip before use.



(b) Using a screwdriver, remove the sun visor assembly as shown in the illustration.

(c) Employ the same manner described above to the other side.

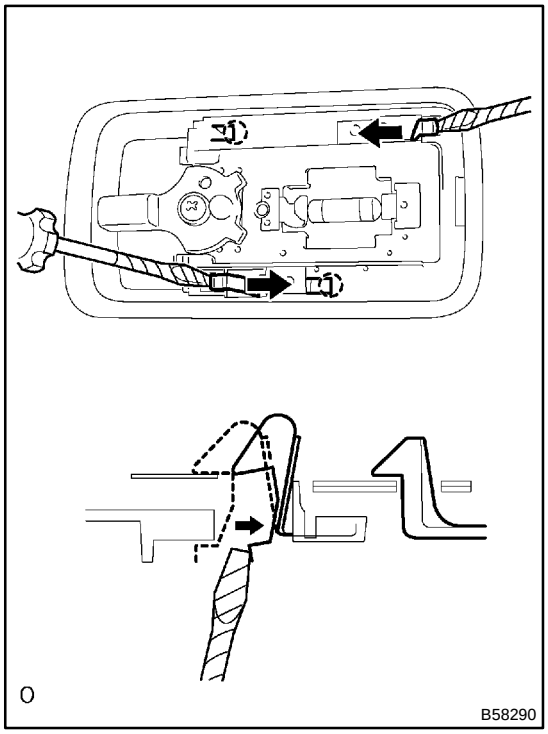
25. REMOVE LH VISOR ASSY



26. REMOVE MAP LAMP ASSY

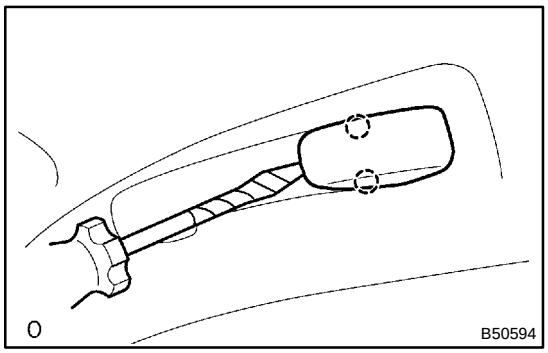
(a) Using a screwdriver, remove the map lamp, and then disconnect the connector.

HINT:
Tape the screwdriver tip before use.



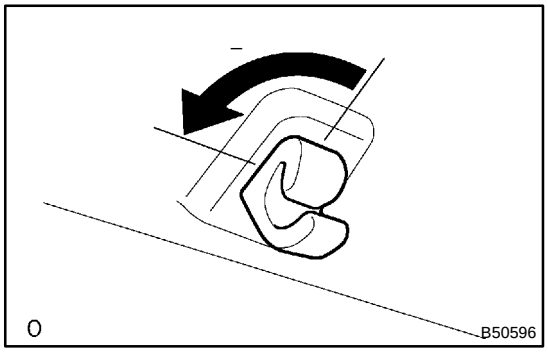
27. REMOVE ROOM LAMP ASSY NO.1

(a) Using a screwdriver, remove the lens cover.
(b) Using a screwdriver, remove the room lamp assembly No.1 as shown in the illustration.



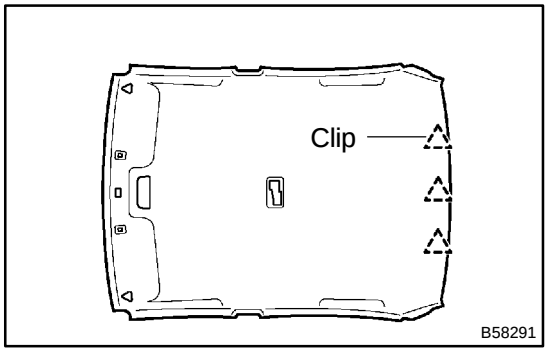
28. REMOVE ASSIST GRIP SUB-ASSY

(a) Using a screwdriver, remove the 2 assist grip covers.
(b) Remove the 2 screws and assist grip.



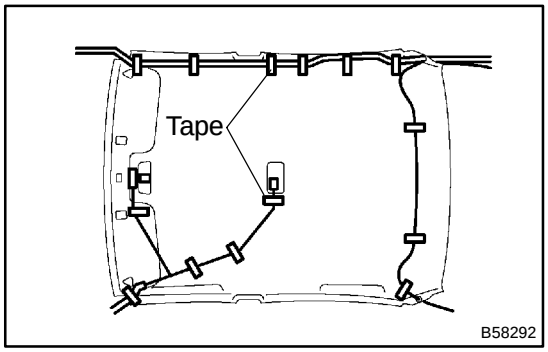
29. REMOVE VISOR HOLDER

(a) Remove the holder of the sun visor by turning it counter-clockwise.



30. REMOVE ROOF HEADLINING ASSY

(a) Remove the 3 clips and the roof headlining assembly.



31. INSTALL ROOF HEADLINING ASSY

(a) Align the markings, and then install the wire harness with tape.

HINT:

Be careful for dirt or foreign objects not to stick to the adhered part when peeling off the double-stick tape.

(b) Attach the roof wire harness across the adhered part.

NOTICE:

Roof wire harness should be attached securely.

(c) Install the 3 clips.

32. INSTALL REAR SIDE SEAT BACK ASSY LH(SEPARATED TYPE REAR SEAT) **(See page 72-14)**

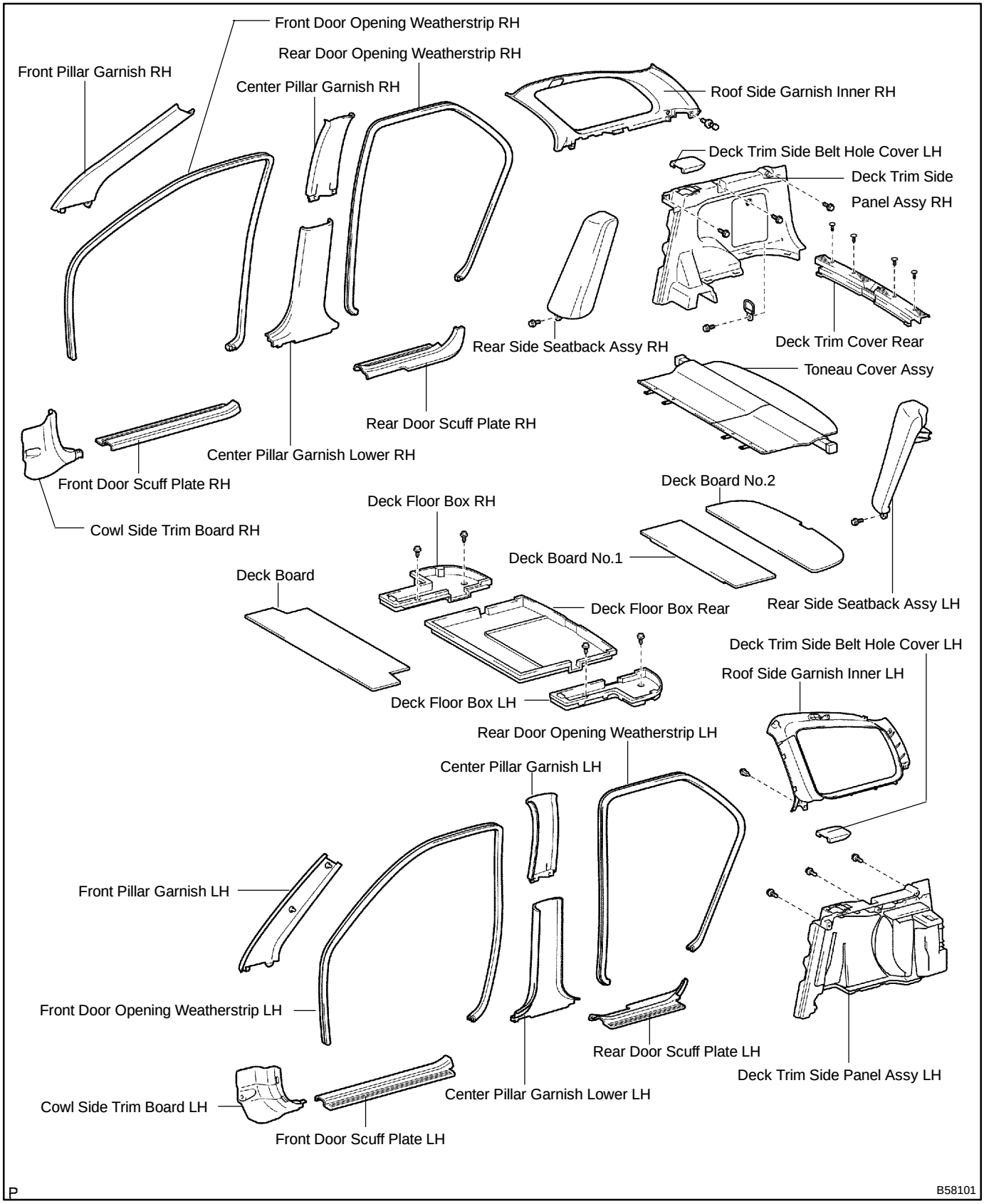
33. INSTALL REAR SIDE SEAT BACK ASSY RH(SEPARATED TYPE REAR SEAT) **(See page 72-14)**

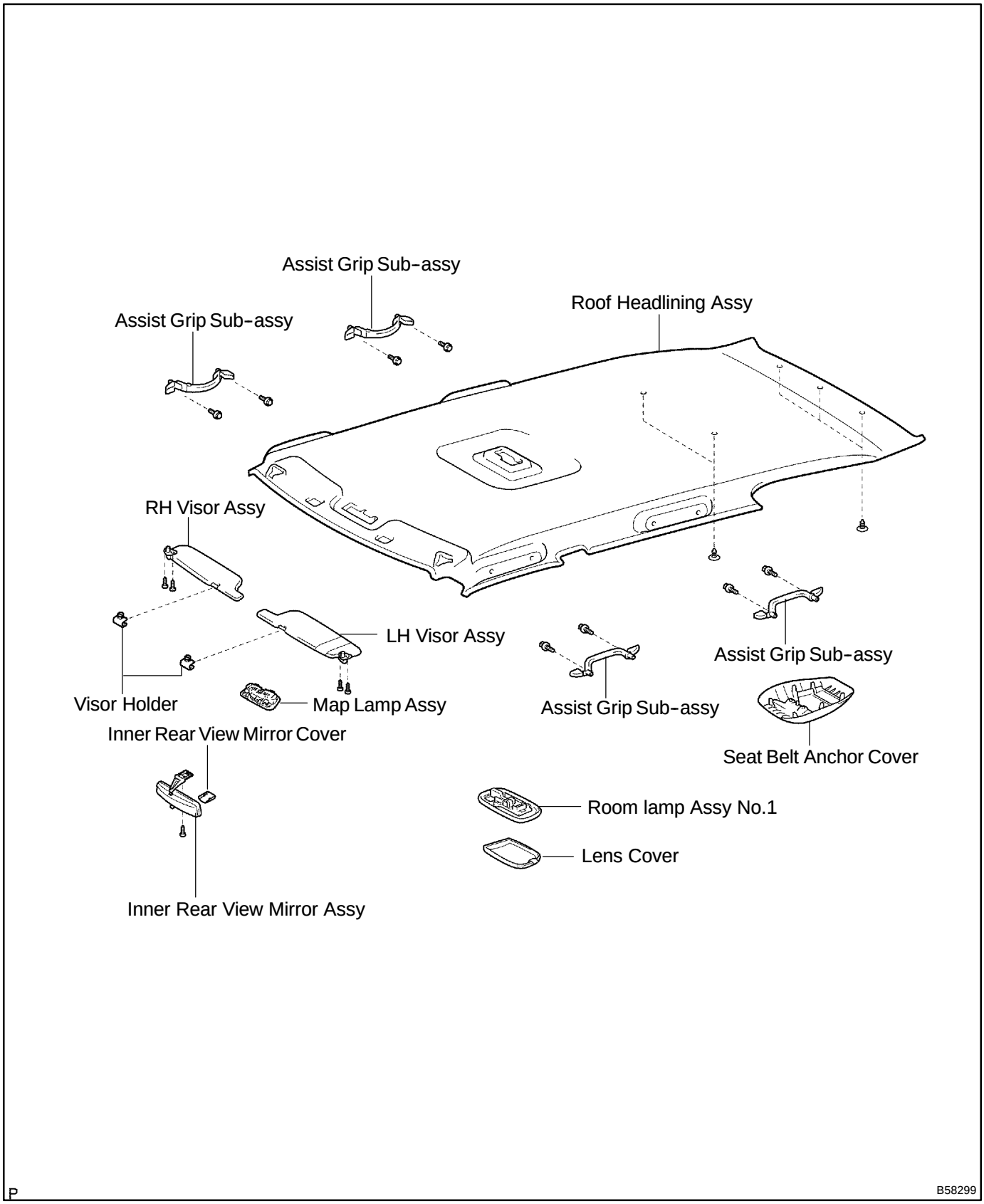
34. INSTALL REAR SEAT BACK ASSY(FIXED TYPE REAR SEAT) **(See page 72-17)**

ROOF HEADLINING ASSY (STATION WAGON)

COMPONENTS

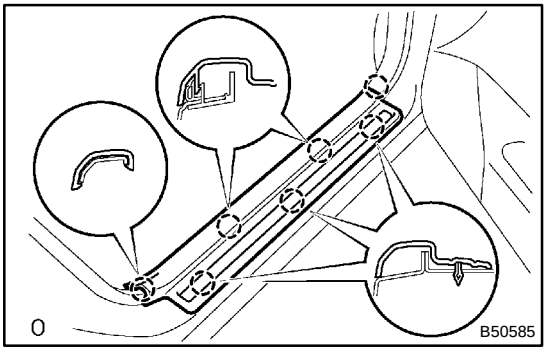
760FF-01




Assist Grip Sub-assy
Assist Grip Sub-assy
Roof Headlining Assy
RH Visor Assy
LH Visor Assy
Visor Holder
Map Lamp Assy
Inner Rear View Mirror Cover
Inner Rear View Mirror Assy
Assist Grip Sub-assy
Assist Grip Sub-assy
Seat Belt Anchor Cover
Room lamp Assy No.1
Lens Cover
P
B58299

760FG-01

REPLACEMENT



1. REMOVE FRONT DOOR SCUFF PLATE RH

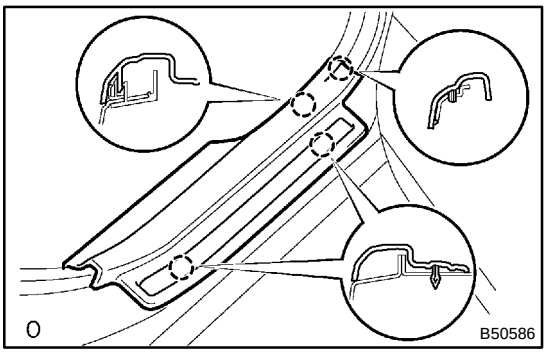
(a) Using a screwdriver, remove the front door scuff plate RH.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

2. REMOVE FRONT DOOR SCUFF PLATE LH



3. REMOVE REAR DOOR SCUFF PLATE RH

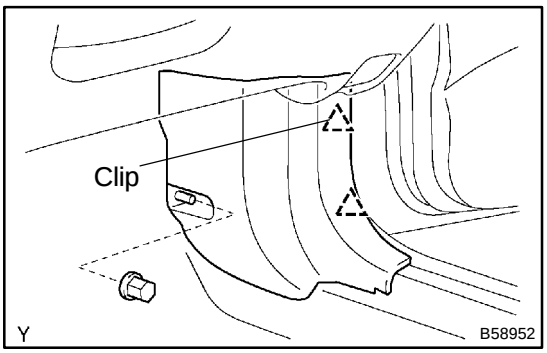
(a) Using a screwdriver, remove the rear door scuff plate RH.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

4. REMOVE REAR DOOR SCUFF PLATE LH



5. REMOVE COWL SIDE TRIM BOARD RH

(a) Remove the clip.

(b) Using a screwdriver, remove the cowl side trim board RH.

HINT:

Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other side.

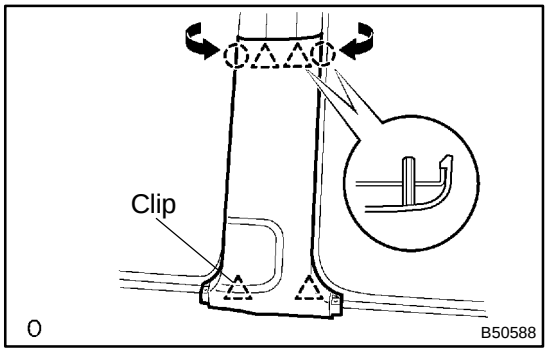
6. REMOVE COWL SIDE TRIM BOARD LH

7. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH

8. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH

9. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH

10. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH

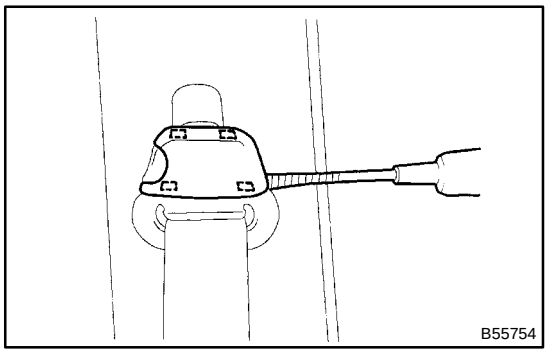


11. REMOVE CENTER PILLAR GARNISH LOWER RH

(a) Pull the center pillar garnish lower RH upward to remove it.

(b) Employ the same manner described above to the other side.

12. REMOVE CENTER PILLAR GARNISH LOWER LH



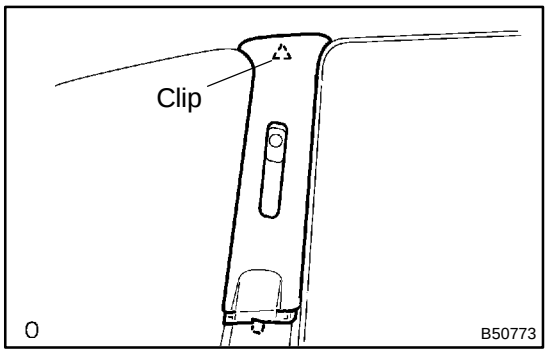
13. REMOVE CENTER PILLAR GARNISH RH

(a) Using a screwdriver, remove the shoulder anchor cover cap.

HINT:
Tape the screwdriver tip before use.

(b) Remove the bolt and front seat outer belt shoulder anchor.

(c) Remove the bolt and front seat outer belt floor anchor.



(d) Using a screwdriver, remove the center pillar upper garnish RH.

HINT:
Tape the screwdriver tip before use.

(e) Employ the same manner described above to the other side.

14. REMOVE CENTER PILLAR GARNISH LH

15. REMOVE REAR SIDE SEAT BACK ASSY RH
(See page 72-22)

16. REMOVE REAR SIDE SEAT BACK ASSY LH
(See page 72-22)

17. REMOVE TONNEAU COVER ASSY

18. REMOVE DECK BOARD NO.1

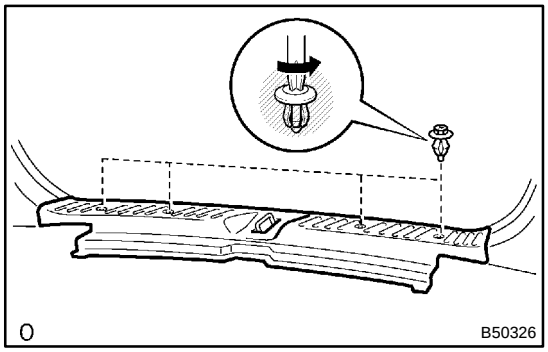
19. REMOVE DECK BOARD NO.2

20. REMOVE DECK BOARD SUB-ASSY

21. REMOVE DECK FLOOR BOX REAR

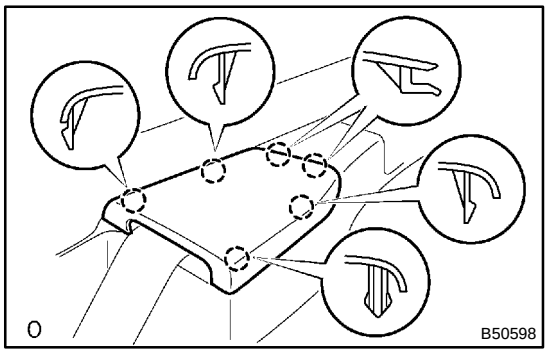
22. REMOVE DECK FLOOR BOX RH

23. REMOVE DECK FLOOR BOX LH



24. REMOVE DECK TRIM COVER REAR

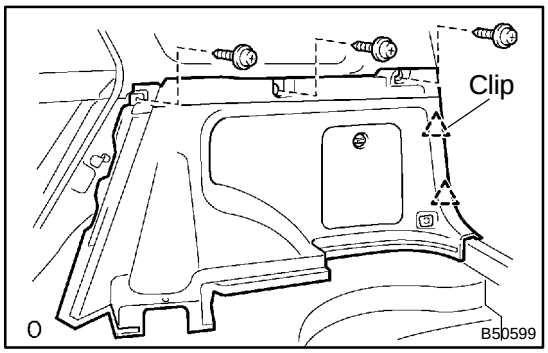
(a) Remove the 4 clips.
(b) Using a screwdriver, remove the deck trim cover rear.
HINT:
Tape the screwdriver tip before use.



25. REMOVE DECK TRIM SIDE BELT HOLE COVER RH

(a) Using a screwdriver, remove the deck trim side belt hole cover RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

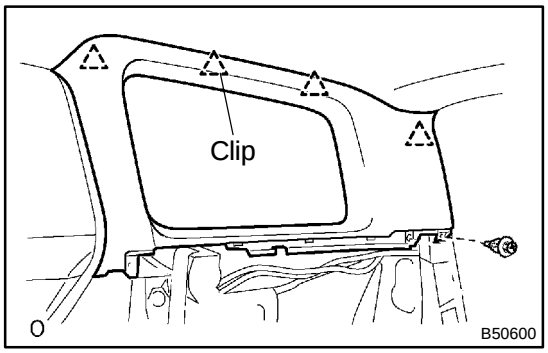
26. REMOVE DECK TRIM SIDE BELT HOLE COVER LH



27. REMOVE DECK TRIM SIDE PANEL ASSY RH

(a) Remove the 3 screws.
(b) Using a screwdriver, remove the deck trim side panel assembly RH.
HINT:
Tape the screwdriver tip before use.
(c) Employ the same manner described above to the other side.

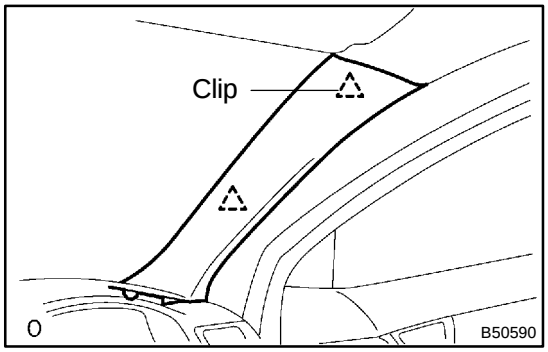
28. REMOVE DECK TRIM SIDE PANEL ASSY LH



29. REMOVE ROOF SIDE GARNISH INNER RH

(a) Using a screwdriver, remove the roof side garnish inner RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

30. REMOVE ROOF SIDE GARNISH INNER LH



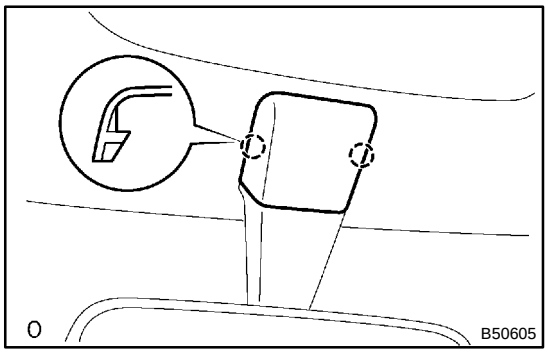
31. REMOVE FRONT PILLAR GARNISH RH

(a) Using a screwdriver, remove the front pillar garnish RH.

HINT:
Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

32. REMOVE FRONT PILLAR GARNISH LH

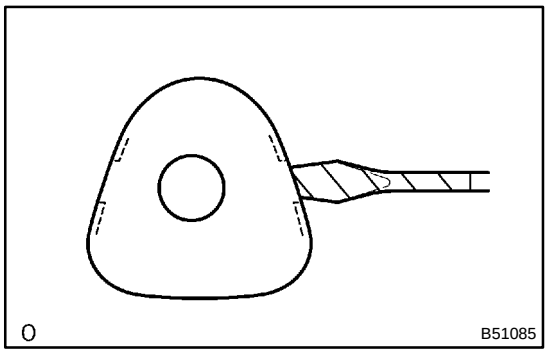


33. REMOVE INNER REAR VIEW MIRROR ASSY

(a) Using a screwdriver, remove the inner rear view mirror cover.

HINT:
Tape the screwdriver tip before use.

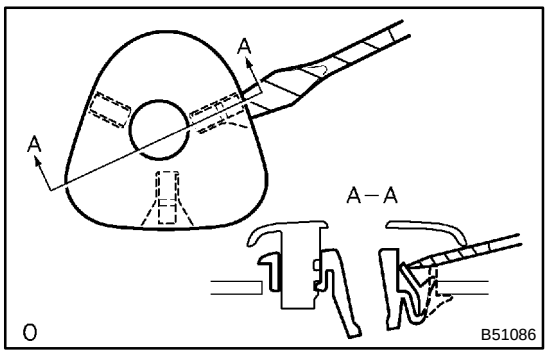
(b) Remove the 2 screws and the inner rear view mirror assembly.



34. REMOVE RH VISOR ASSY

(a) Using a screwdriver, pry up the cover in the illustrated part, and then pulling the cover downward.

HINT:
Tape the screwdriver tip before use.

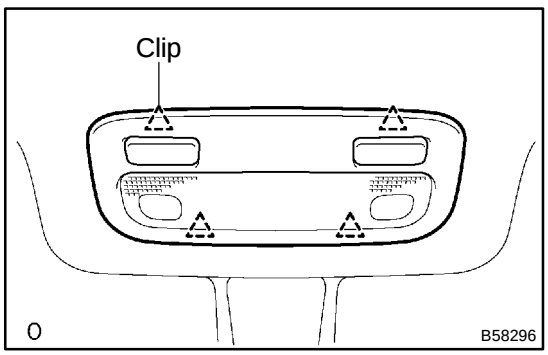


(b) Using a screwdriver, remove the sun visor assembly as shown in the illustration.

HINT:
Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other side.

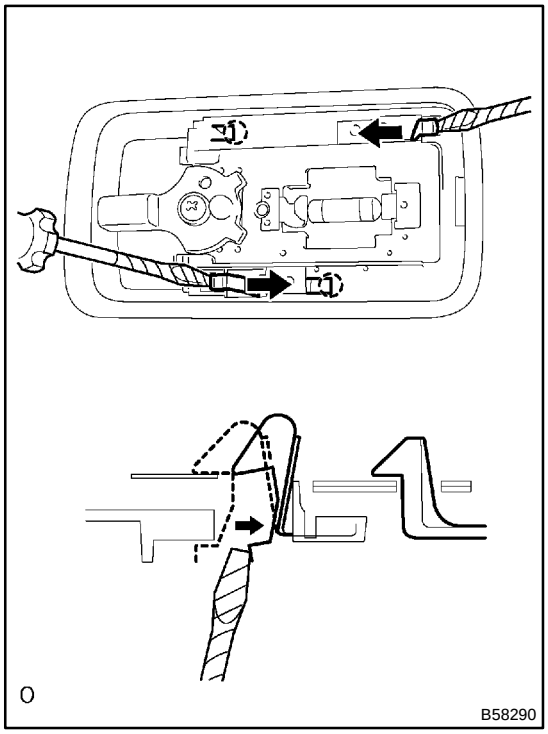
35. REMOVE LH VISOR ASSY



36. REMOVE MAP LAMP ASSY

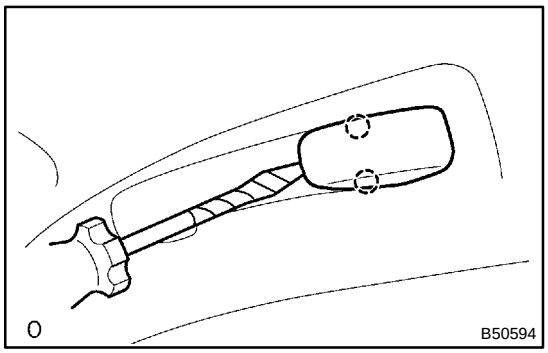
(a) Using a screwdriver, remove the map lamp, and then disconnect the connector.

HINT:
Tape the screwdriver tip before use.



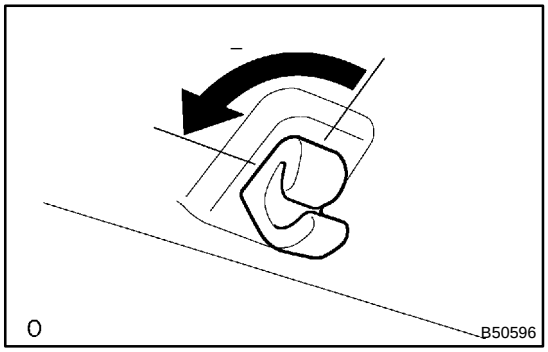
37. REMOVE ROOM LAMP ASSY NO.1

(a) Using a screwdriver, remove the lens cover.
HINT:
Tape the screwdriver tip before use.
(b) Using a screwdriver, remove the room lamp assembly No.1 as shown in the illustration.
HINT:
Tape the screwdriver tip before use.



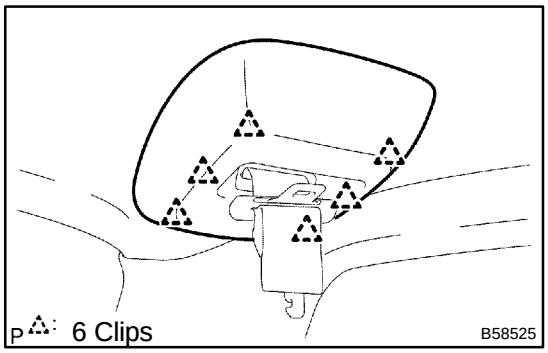
38. REMOVE ASSIST GRIP SUB-ASSY

(a) Using a screwdriver, remove the 2 assist grip covers.
HINT:
Tape the screwdriver tip before use.
(b) Remove the 2 screws and assist grip.



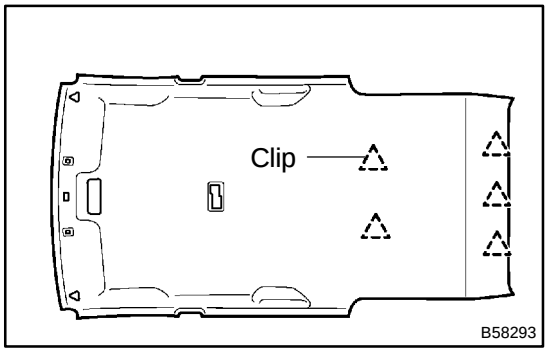
39. REMOVE VISOR HOLDER

(a) Remove the holder of the sun visor by turning it counter-clockwise.



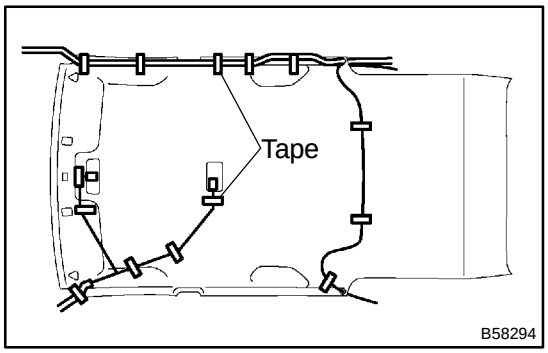
40. REMOVE SEAT BELT ANCHOR COVER

(a) Using a screwdriver, remove the seat belt anchor cover.
HINT:
Tape the screwdriver tip before use.



41. REMOVE ROOF HEADLINING ASSY

(a) Remove the 5 clips and the roof headlining assembly.



42. INSTALL ROOF HEADLINING ASSY

(a) Align the markings, and then install the wire harness with tape.

HINT:

Be careful for dirt or foreign objects not to stick to the adhered part when peeling off the double-stick tape.

(b) Attach the roof wire harness across the adhered part.

NOTICE:

Roof wire harness should be attached securely.

(c) Install the 5 clips.

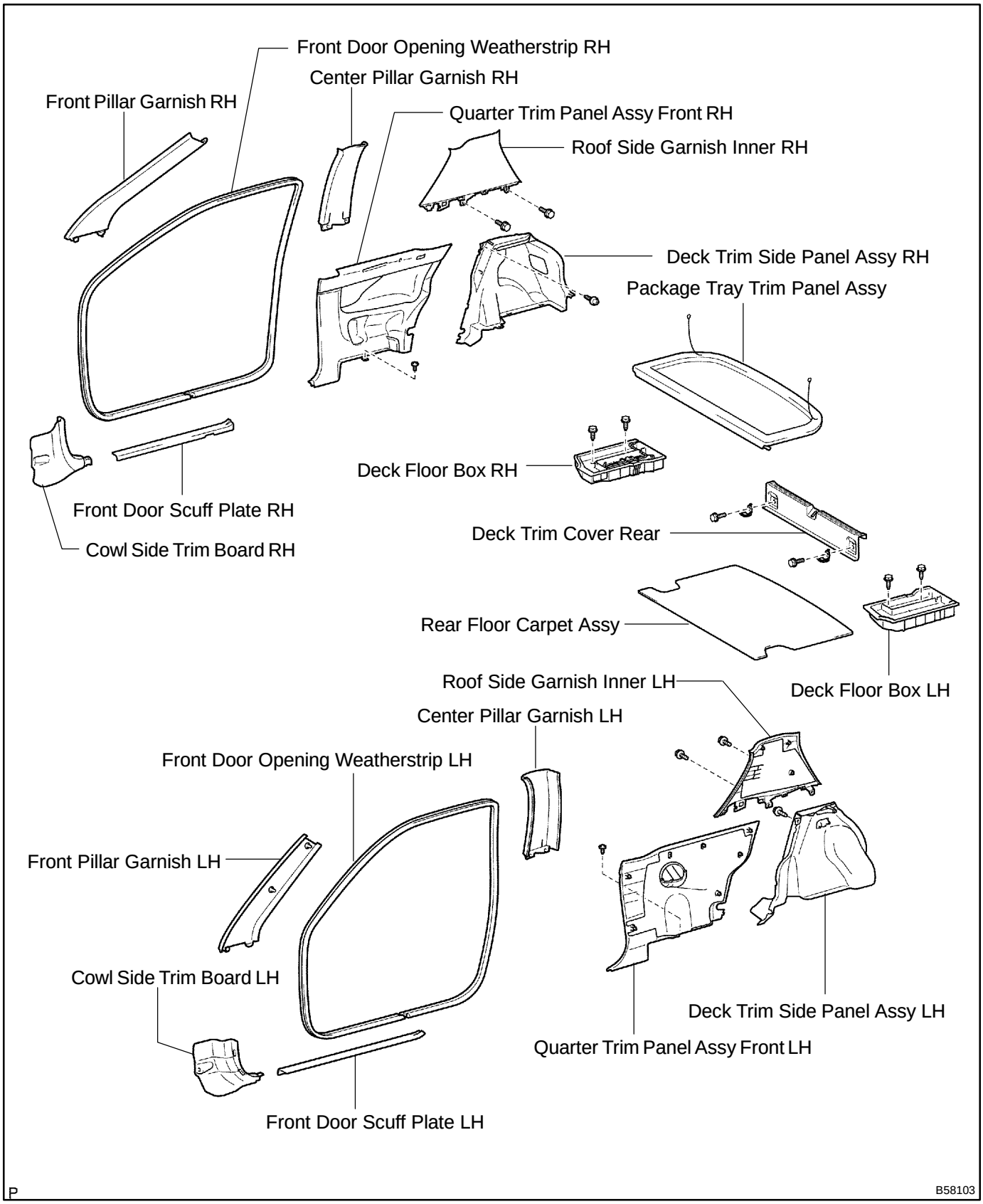
43. INSTALL REAR SIDE SEAT BACK ASSY LH
(See page 72-23)

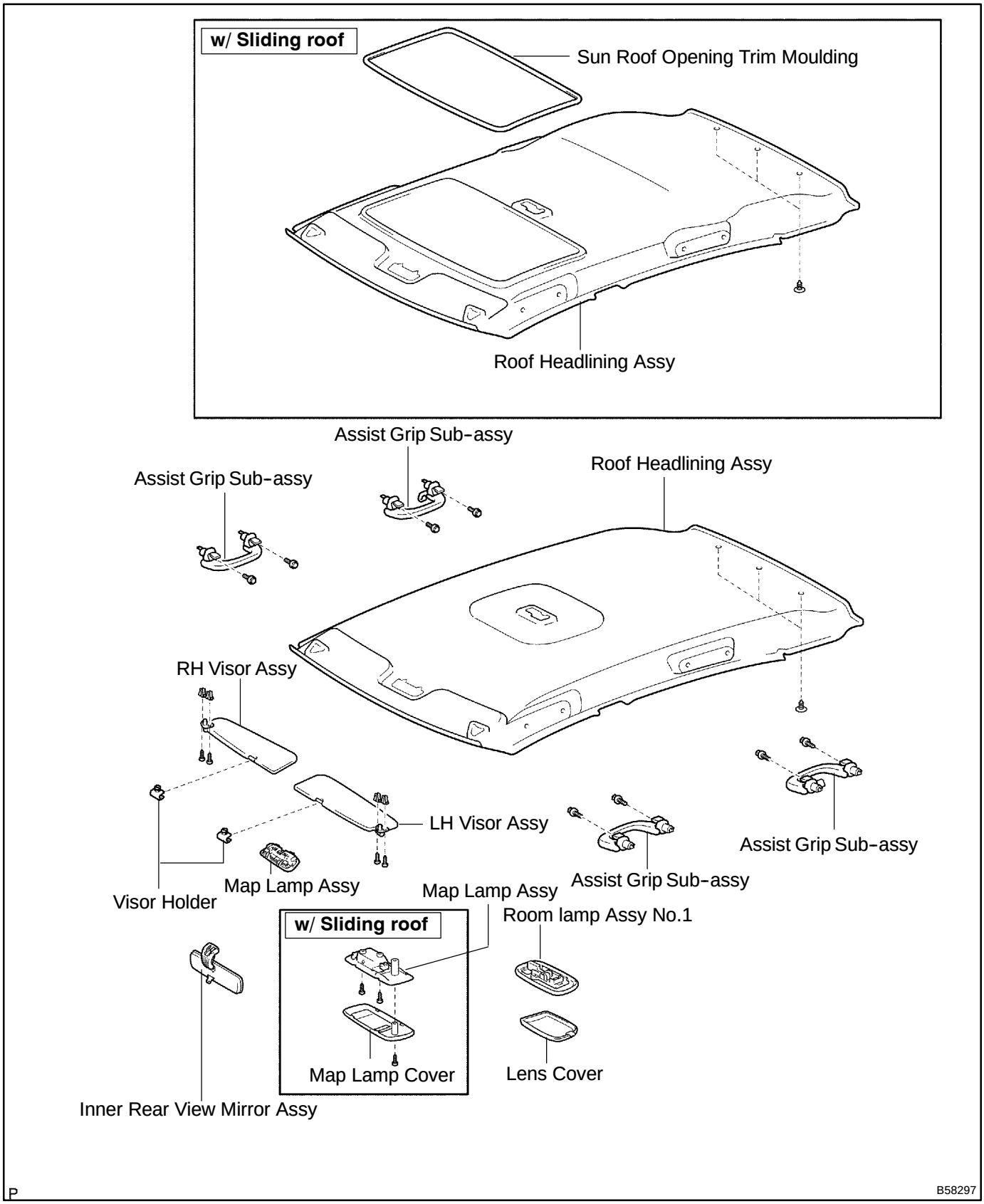
44. INSTALL REAR SIDE SEAT BACK ASSY RH
(See page 72-23)

ROOF HEADLINING ASSY (3-DOOR HATCHBACK)

760FH-01

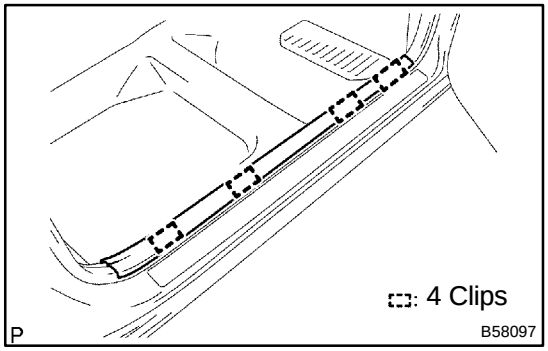
COMPONENTS




w/ Sliding roof
Sun Roof Opening Trim Moulding
Roof Headlining Assy
Assist Grip Sub-assy
Assist Grip Sub-assy
Roof Headlining Assy
RH Visor Assy
LH Visor Assy
Assist Grip Sub-assy
Assist Grip Sub-assy
Visor Holder
Map Lamp Assy
Map Lamp Assy
Room lamp Assy No.1
w/ Sliding roof
Map Lamp Cover
Lens Cover
Inner Rear View Mirror Assy
P
B58297

760FI-01

REPLACEMENT



1. REMOVE FRONT DOOR SCUFF PLATE RH

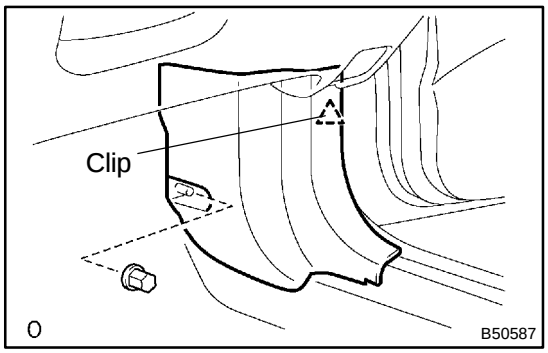
(a) Using a screwdriver, remove the front door scuff plate RH.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

2. REMOVE FRONT DOOR SCUFF PLATE LH



3. REMOVE COWL SIDE TRIM BOARD RH

(a) Remove the clip.

(b) Using a screwdriver, remove the cowl side trim board RH.

HINT:

Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other side.

4. REMOVE COWL SIDE TRIM BOARD LH

5. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH

6. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH

7. REMOVE BACK DOOR WEATHERSTRIP

8. REMOVE REAR SEAT BACK ASSY RH **(See page 72-26)**

9. REMOVE REAR SEAT BACK ASSY LH **(See page 72-26)**

10. REMOVE REAR FLOOR CARPET ASSY

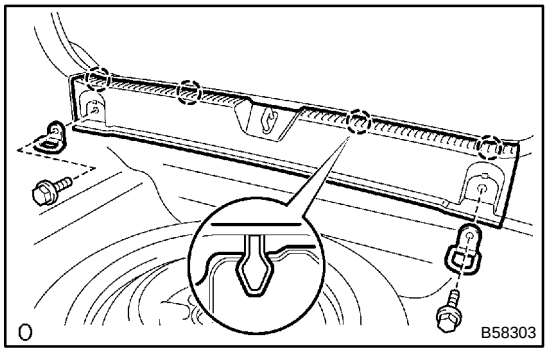
11. REMOVE PACKAGE TRAY TRIM PANEL ASSY

12. REMOVE DECK FLOOR BOX RH

(a) Remove the 2 screws and deck floor box RH.

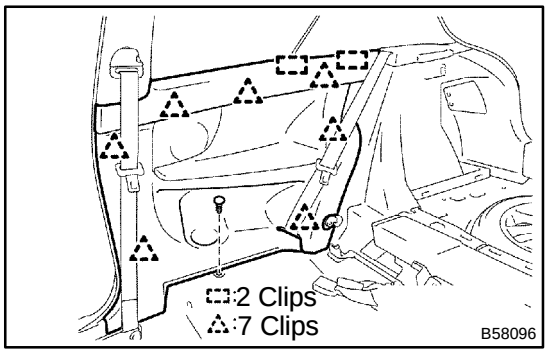
(b) Employ the same manner described above to the other side.

13. REMOVE DECK FLOOR BOX LH



14. REMOVE DECK TRIM COVER REAR

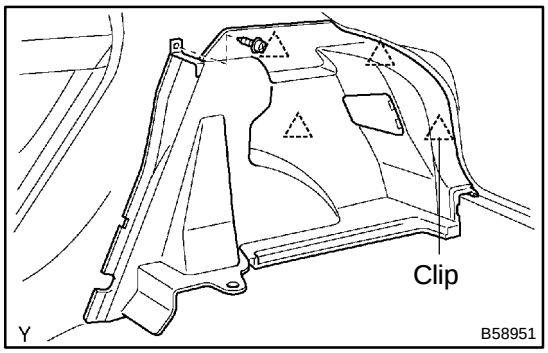
(a) Remove the 2 roop hooks.
(b) Using a screwdriver, remove the deck trim cover rear.
HINT:
Tape the screwdriver tip before use.



15. REMOVE QUARTER TRIM PANEL ASSY FRONT RH

(a) Using a screwdriver, remove the quarter trim panel assembly front RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

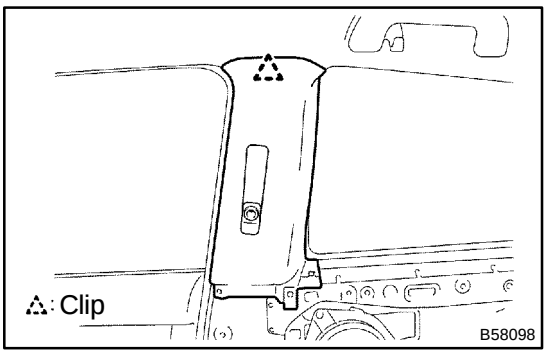
16. REMOVE QUARTER TRIM PANEL ASSY FRONT LH



17. REMOVE DECK TRIM SIDE PANEL ASSY RH

(a) Remove the screw.
(b) Using a screwdriver, remove the deck trim side panel assembly RH.
HINT:
Tape the screwdriver tip before use.
(c) Employ the same manner described above to the other side.

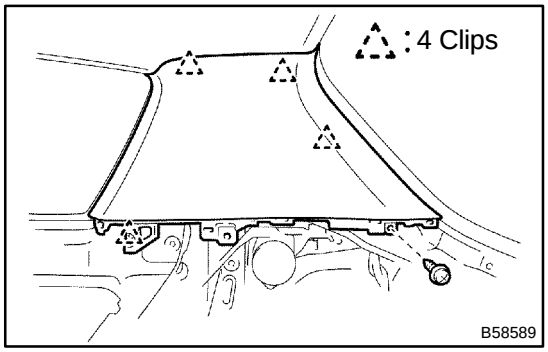
18. REMOVE DECK TRIM SIDE PANEL ASSY LH



19. REMOVE CENTER PILLAR GARNISH RH

(a) Using a screwdriver, remove the center pillar garnish RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

20. REMOVE CENTER PILLAR GARNISH LH



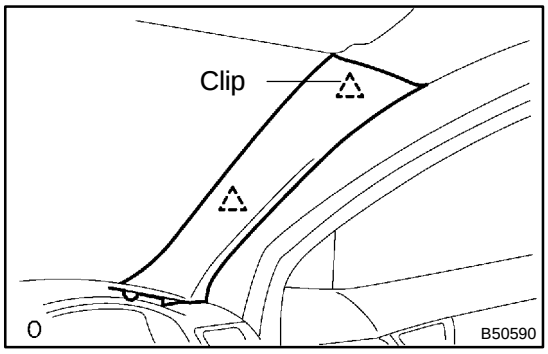
21. REMOVE ROOF SIDE GARNISH INNER RH

(a) Remove the screw.
(b) Using a screwdriver, remove the roof side garnish inner RH.

HINT:
Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other side.

22. REMOVE ROOF SIDE GARNISH INNER LH



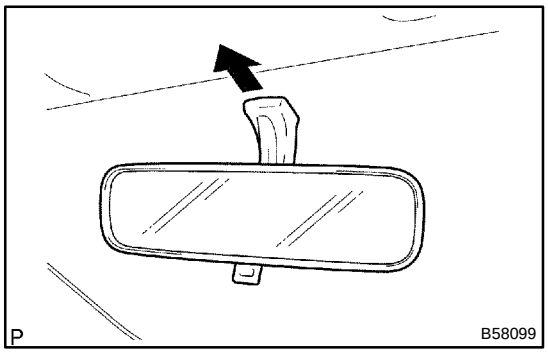
23. REMOVE FRONT PILLAR GARNISH RH

(a) Using a screwdriver, remove the front pillar garnish RH.

HINT:
Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

24. REMOVE FRONT PILLAR GARNISH LH



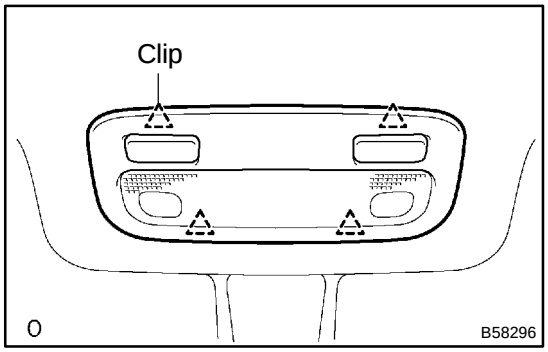
25. REMOVE INNER REAR VIEW MIRROR ASSY

(a) Remove the inner rear view mirror assembly as shown in the illustration.

26. REMOVE RH VISOR ASSY

(a) Remove the 2 screws and the visor assembly.
(b) Employ the same manner described above to the other side.

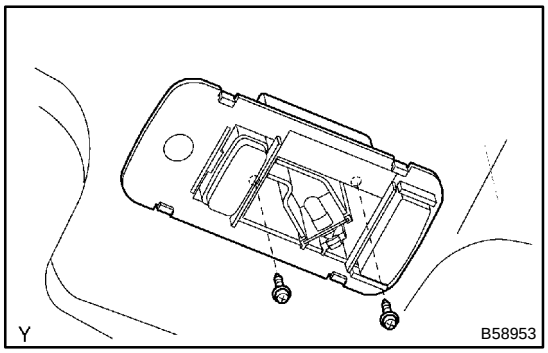
27. REMOVE LH VISOR ASSY



28. REMOVE MAP LAMP ASSY(W/O SLIDING ROOF)

(a) Using a screwdriver, remove the map lamp assembly, and then disconnect the connector.

HINT:
Tape the screwdriver tip before use.

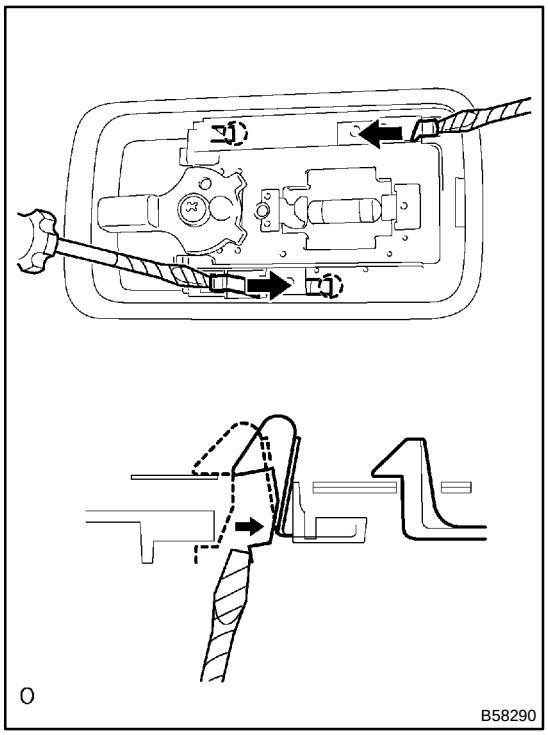


29. REMOVE MAP LAMP ASSY(W/ SLIDING ROOF)

(a) Using a screwdriver, remove the map lamp cover.

HINT:
Tape the screwdriver tip before use.

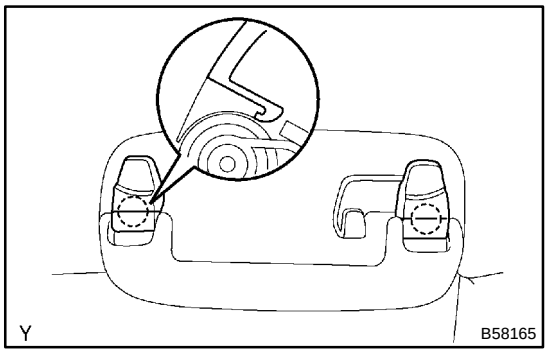
(b) Remove the 2 screws and the map lamp assembly, and then disconnect the connector.



30. REMOVE ROOM LAMP ASSY NO.1

(a) Using a screwdriver, remove the lens cover.

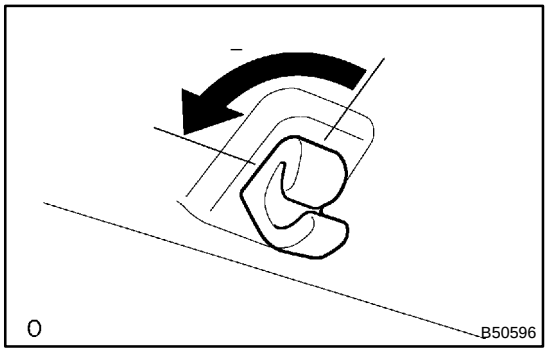
(b) Using a screwdriver, remove the room lamp assembly No.1 as shown in the illustration.



31. REMOVE ASSIST GRIP SUB-ASSY

(a) Using a screwdriver, remove the 2 assist grip covers.

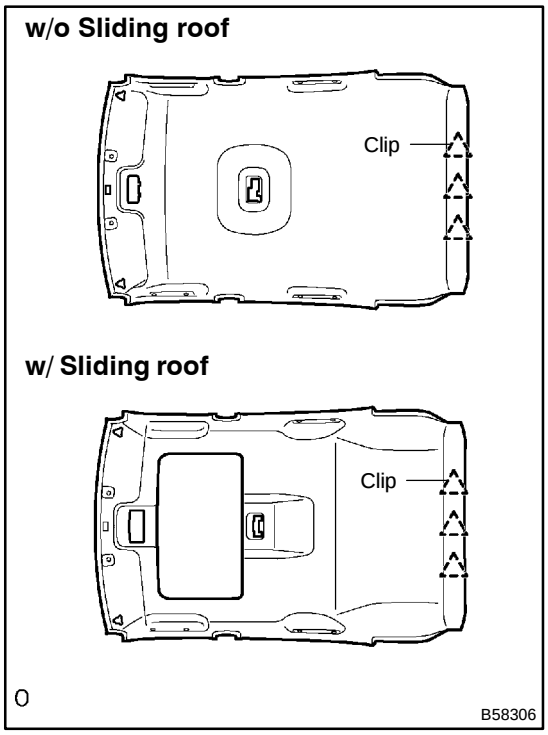
(b) Remove the 2 screws and assist grip.



32. REMOVE VISOR HOLDER

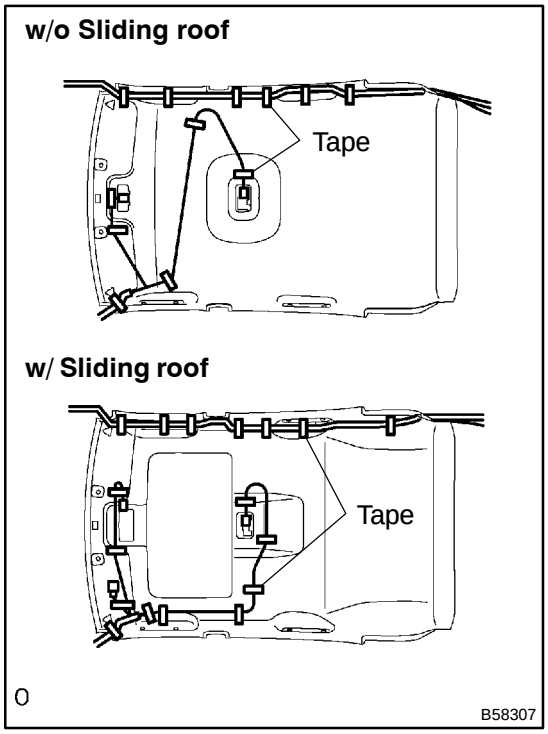
(a) Remove the holder of the sun visor by turning it counter-clockwise.

33. REMOVE SUN ROOF OPENING TRIM MOULDING(W/ SLIDING ROOF)



34. REMOVE ROOF HEADLINING ASSY

(a) Remove the 3 clips and the roof headlining assembly.



35. INSTALL ROOF HEADLINING ASSY

(a) Align the markings, and then install the wire harness with tape.

HINT:

Be careful for dirt or foreign objects not to stick to the adhered part when peeling off the double-stick tape.

(b) Attach the roof wire harness across the adhered part.

NOTICE:

Roof wire harness should be attached securely.

(c) Install the 3 clips.

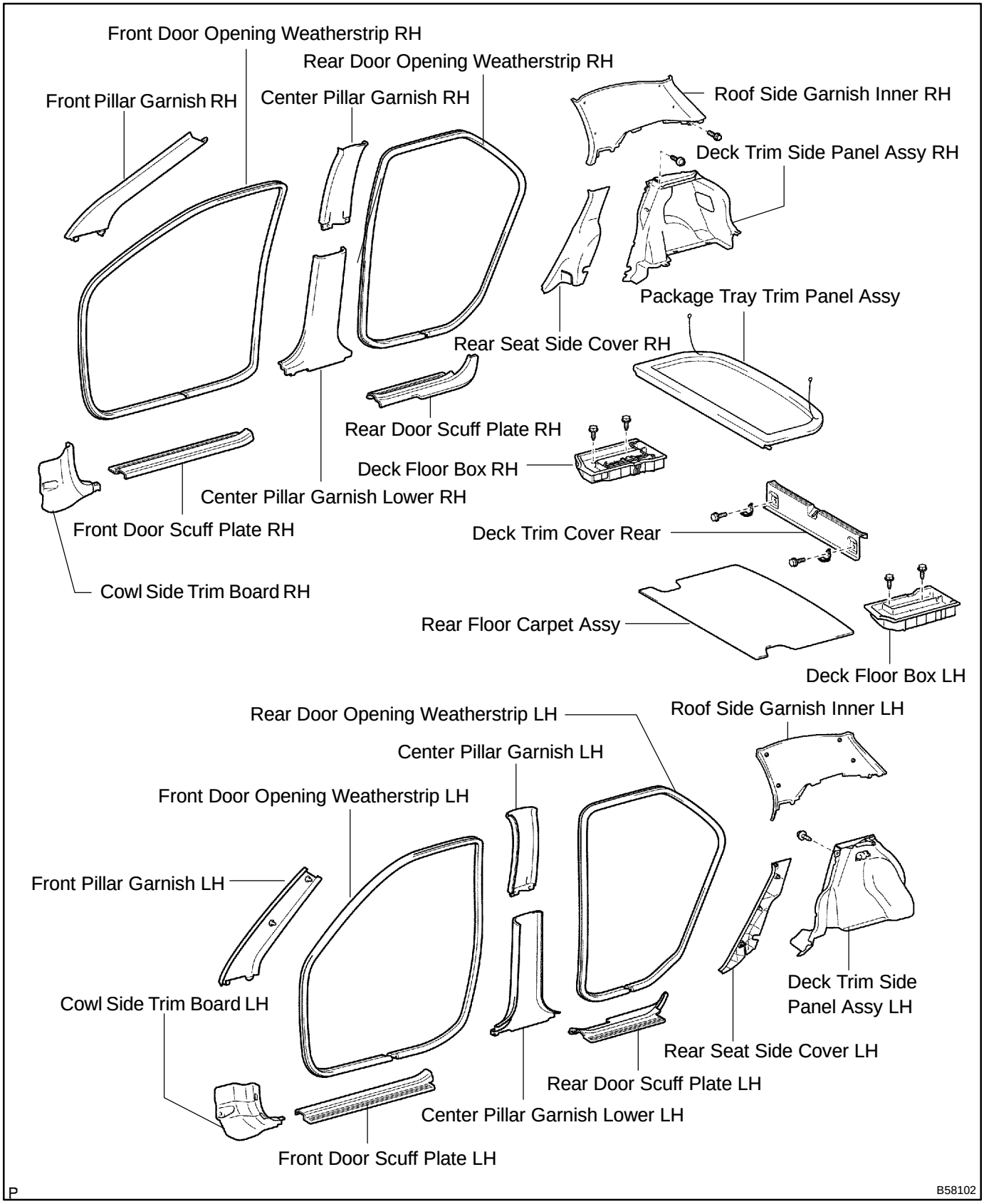
36. INSTALL REAR SEAT BACK ASSY LH (See page 72-28)

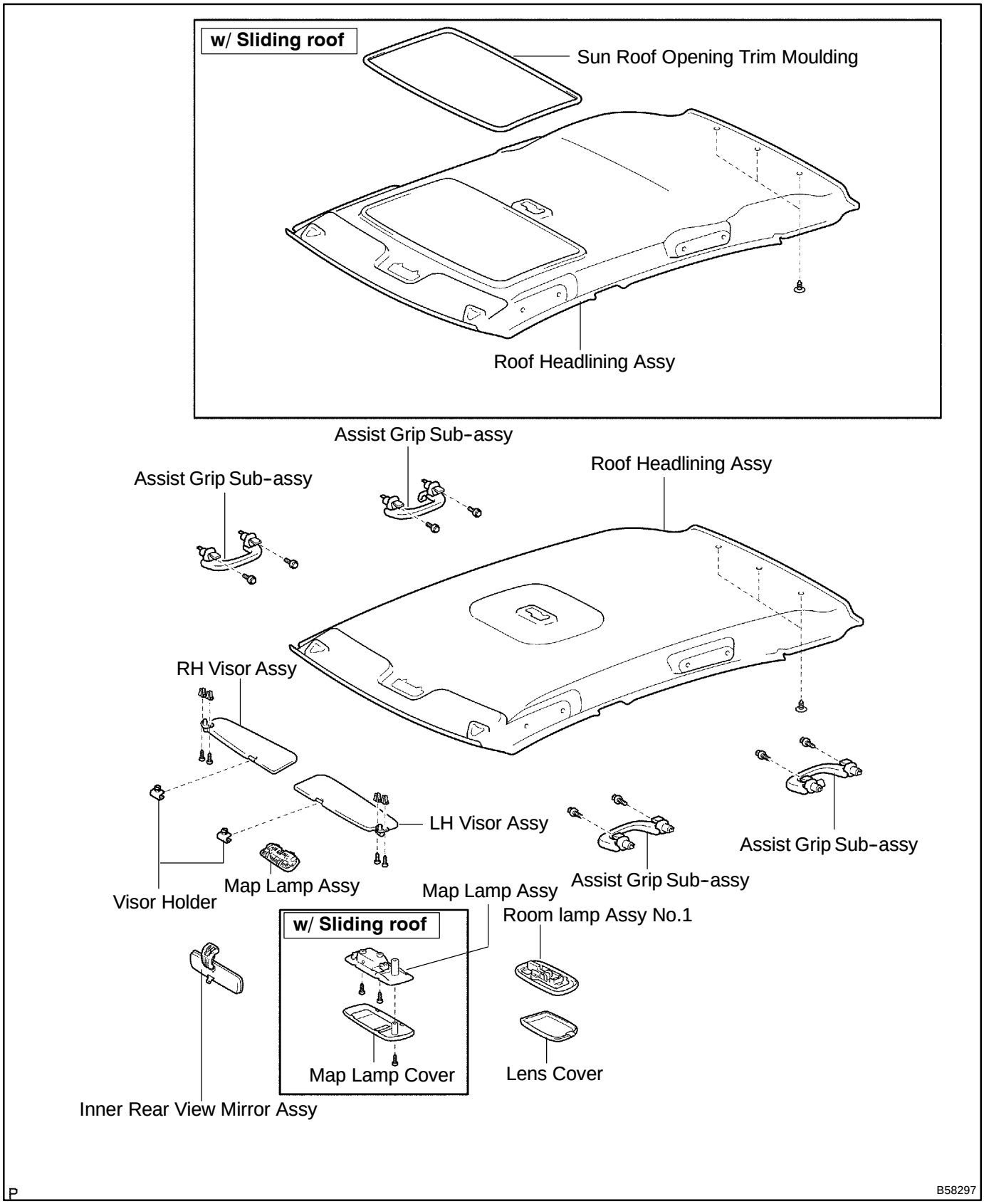
37. INSTALL REAR SEAT BACK ASSY RH (See page 72-28)

ROOF HEADLINING ASSY (5-DOOR HATCHBACK)

COMPONENTS

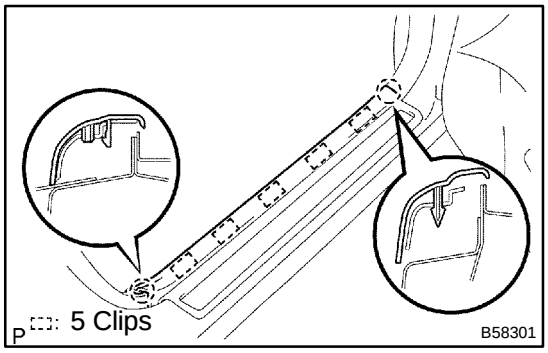
760FJ-01




w/ Sliding roof
Sun Roof Opening Trim Moulding
Roof Headlining Assy
Assist Grip Sub-assy
Assist Grip Sub-assy
Roof Headlining Assy
RH Visor Assy
LH Visor Assy
Assist Grip Sub-assy
Assist Grip Sub-assy
Visor Holder
Map Lamp Assy
Map Lamp Assy
Room lamp Assy No.1
w/ Sliding roof
Map Lamp Cover
Lens Cover
Inner Rear View Mirror Assy
P
B58297

760FK-01

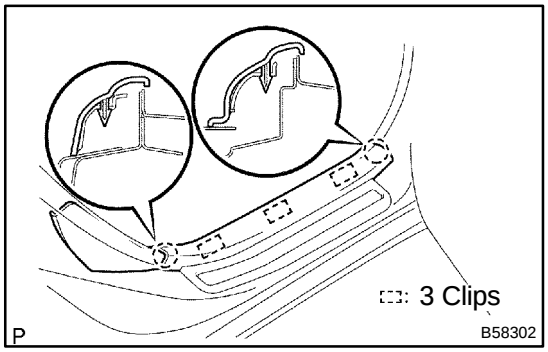
REPLACEMENT



1. REMOVE FRONT DOOR SCUFF PLATE RH

(a) Using a screwdriver, remove the front door scuff plate RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

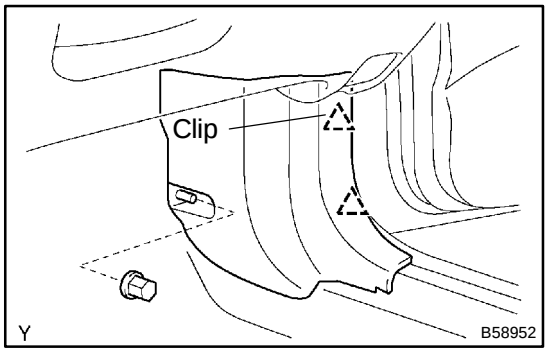
2. REMOVE FRONT DOOR SCUFF PLATE LH



3. REMOVE REAR DOOR SCUFF PLATE RH

(a) Using a screwdriver, remove the rear door scuff plate RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

4. REMOVE REAR DOOR SCUFF PLATE LH



5. REMOVE COWL SIDE TRIM BOARD RH

(a) Remove the clip.
(b) Using a screwdriver, remove the cowl side trim board RH.
HINT:
Tape the screwdriver tip before use.
(c) Employ the same manner described above to the other side.

6. REMOVE COWL SIDE TRIM BOARD LH

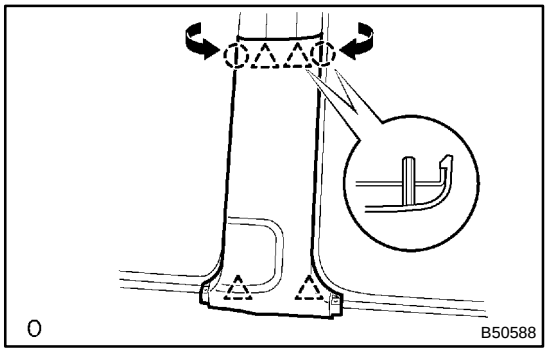
7. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH

8. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH

9. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH

10. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH

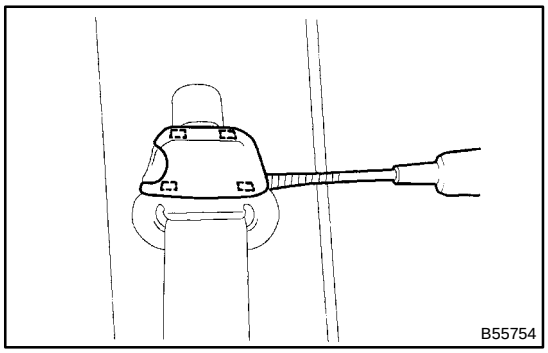
11. REMOVE BACK DOOR WEATHERSTRIP



12. REMOVE CENTER PILLAR GARNISH LOWER RH

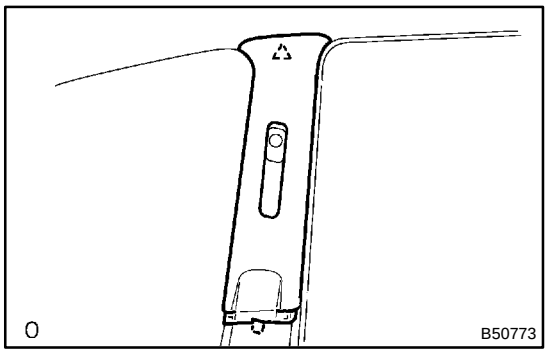
(a) Pull the center pillar lower garnish RH upward to remove it.
(b) Employ the same manner described above to the other side.

13. REMOVE CENTER PILLAR GARNISH LOWER LH



14. REMOVE CENTER PILLAR GARNISH RH

(a) Using a screwdriver, remove the shoulder anchor cover cap.
(b) Remove the bolt and front seat outer belt shoulder anchor.
(c) Remove the bolt and front seat outer belt floor anchor.



(d) Using a screwdriver, remove the center pillar upper garnish RH.

HINT:
Tape the screwdriver tip before use.

(e) Employ the same manner described above to the other side.

15. REMOVE CENTER PILLAR GARNISH LH

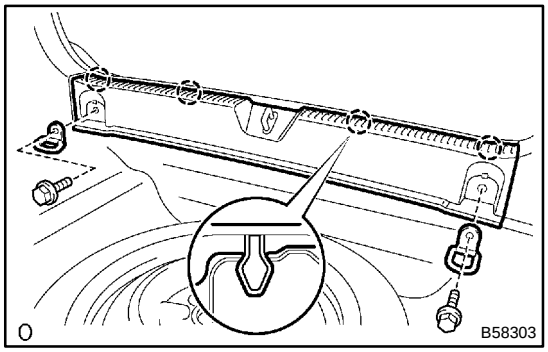
16. REMOVE REAR SEAT BACK ASSY RH **(See page 72-26)**
17. REMOVE REAR SEAT BACK ASSY LH **(See page 72-26)**
18. REMOVE REAR FLOOR CARPET ASSY

19. REMOVE PACKAGE TRAY TRIM PANEL ASSY

20. REMOVE DECK FLOOR BOX RH

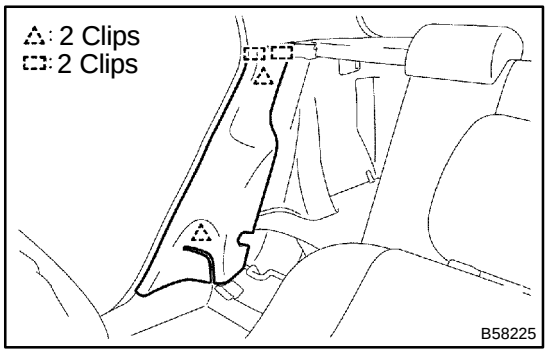
(a) Remove the 2 screws and deck floor box RH.
(b) Employ the same manner described above to the other side.

21. REMOVE DECK FLOOR BOX LH



22. REMOVE DECK TRIM COVER REAR

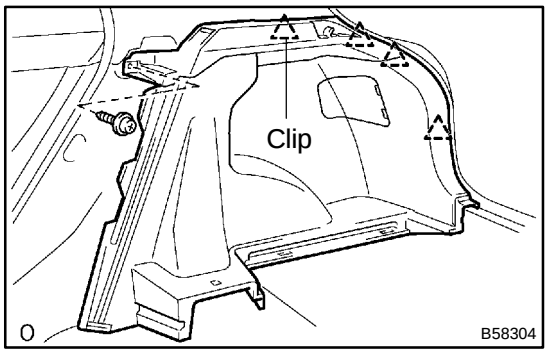
(a) Remove the 2 bolts and 2 rope hooks.
(b) Using a screwdriver, remove the deck trim cover rear.
HINT:
Tape the screwdriver tip before use.



23. REMOVE REAR SEAT SIDE COVER RH

(a) Using a screwdriver, remove the rear seat side cover RH.
HINT:
Tape the screwdriver tip before use.
(b) Employ the same manner described above to the other side.

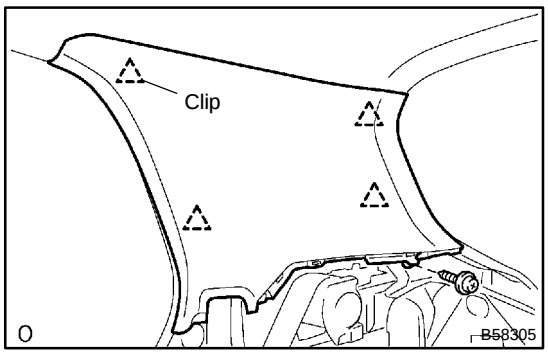
24. REMOVE REAR SEAT SIDE COVER LH



25. REMOVE DECK TRIM SIDE PANEL ASSY RH

(a) Remove the screw.
(b) Using a screwdriver, remove the deck trim side panel assembly RH.
HINT:
Tape the screwdriver tip before use.
(c) Employ the same manner described above to the other side.

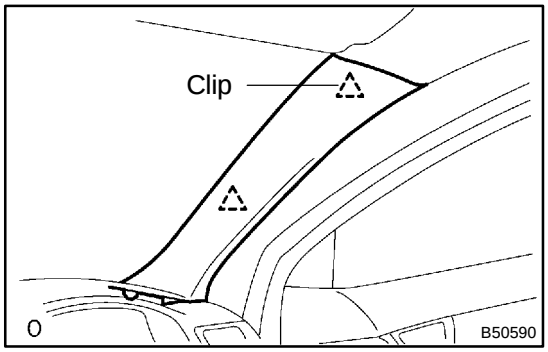
26. REMOVE DECK TRIM SIDE BOARD LH



27. REMOVE ROOF SIDE GARNISH INNER RH

(a) Remove the screw.
(b) Using a screwdriver, remove the roof side garnish inner RH.
HINT:
Tape the screwdriver tip before use.
(c) Employ the same manner described above to the other side.

28. REMOVE ROOF SIDE GARNISH INNER LH



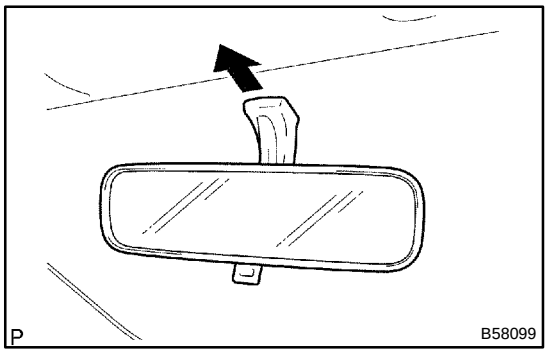
29. REMOVE FRONT PILLAR GARNISH RH

(a) Using a screwdriver, remove the front pillar garnish RH.

HINT:
Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

30. REMOVE FRONT PILLAR GARNISH LH



31. REMOVE INNER REAR VIEW MIRROR ASSY

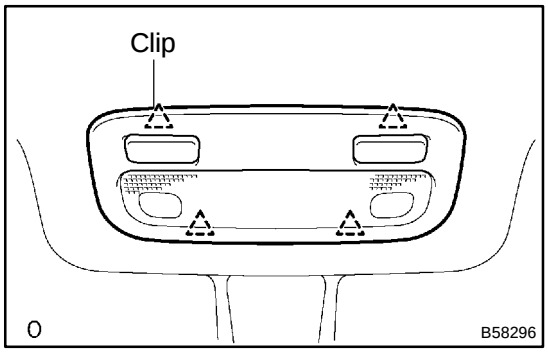
(a) Remove the inner rear view mirror assembly as shown in the illustration.

32. REMOVE RH VISOR ASSY

(a) Remove the 2 screws and the visor assembly.

(b) Employ the same manner described above to the other side.

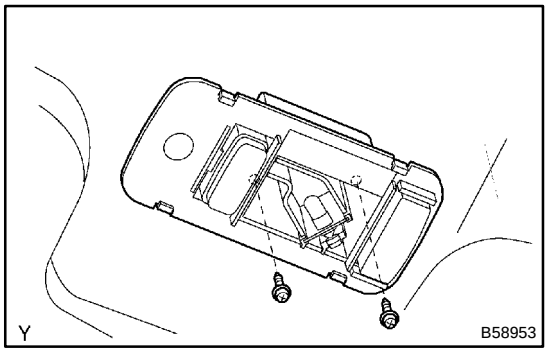
33. REMOVE LH VISOR ASSY



34. REMOVE MAP LAMP ASSY(W/O SLIDING ROOF)

(a) Using a screwdriver, remove the map lamp assembly, and then disconnect the connector.

HINT:
Tape the screwdriver tip before use.

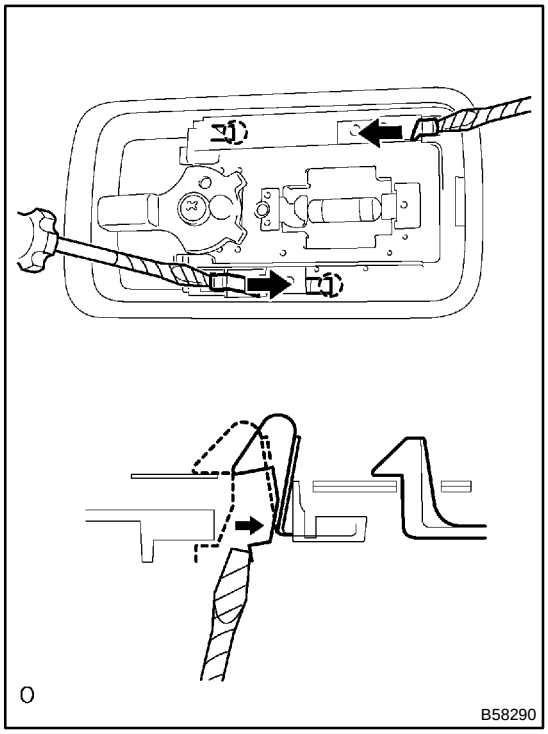


35. REMOVE MAP LAMP ASSY(W/ SLIDING ROOF)

(a) Using a screwdriver, remove the map lamp cover.

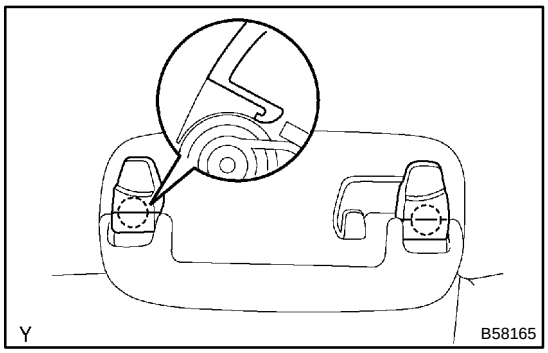
HINT:
Tape the screwdriver tip before use.

(b) Remove the 2 screws and map lamp assembly, and then disconnect the connector.



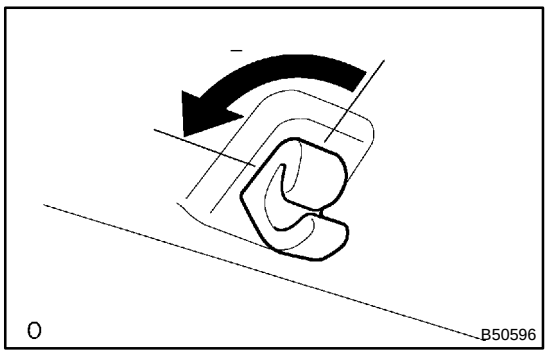
36. REMOVE ROOM LAMP ASSY NO.1

(a) Using a screwdriver, remove the lens cover.
(b) Using a screwdriver, remove the room lamp assembly No.1 as shown in the illustration.



37. REMOVE ASSIST GRIP SUB-ASSY

(a) Using a screwdriver, remove the 2 assist grip covers.
(b) Remove the 2 screws and assist grip.

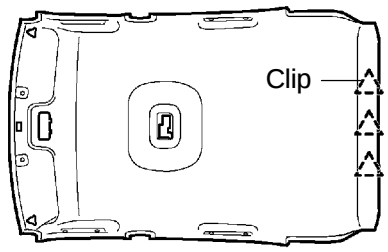


38. REMOVE VISOR HOLDER

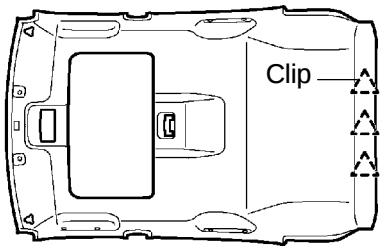
(a) Remove the holder of the sun visor by turning it counter-clockwise.

39. REMOVE SUN ROOF OPENING TRIM MOULDING(W/ SLIDING ROOF)

w/o Sliding roof



w/ Sliding roof



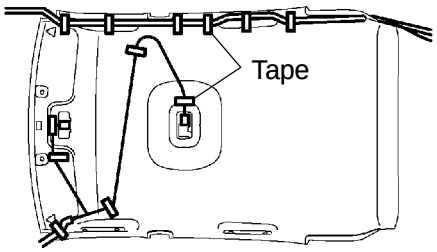
O

B58306

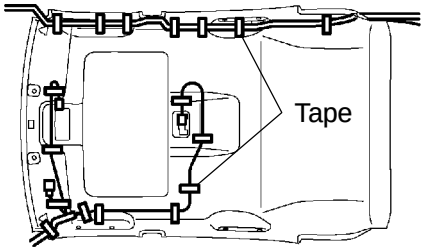
40. REMOVE ROOF HEADLINING ASSY

(a) Remove the 3 clips and the roof headlining assembly.

w/o Sliding roof



w/ Sliding roof



O

B58307

41. INSTALL ROOF HEADLINING ASSY

(a) Align the markings, and then install the wire harness with tape.

HINT:

Be careful for dirt or foreign objects not to stick to the adhered part when peeling off the double-stick tape.

(b) Attach the roof wire harness across the adhered part

NOTICE:

Roof wire harness should be attached securely.

(c) Install the 3 clips.

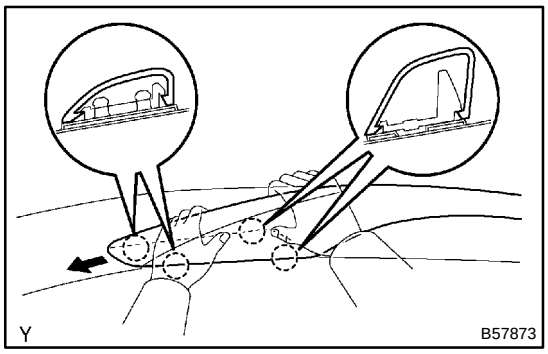
42. INSTALL REAR SEAT BACK ASSY LH (See page 72-28)

43. INSTALL REAR SEAT BACK ASSY RH (See page 72-28)

ROOF RACK ASSY LH (STATION WAGON)

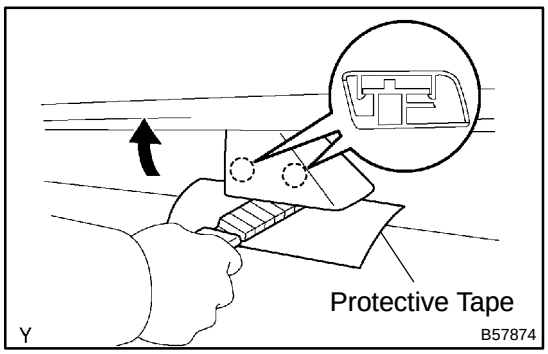
REPLACEMENT

760FC-01



1. REMOVE ROOF RACK LEG COVER FRONT LH

(a) Disengage the claw.
(b) Slide the roof rack leg cover front LH to the vehicle's front to disengage the clips, and then remove it.

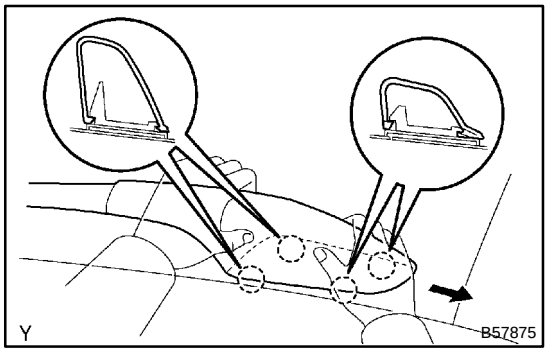


2. REMOVE ROOF RACK LEG COVER CENTER LH

(a) Using a scraper, disengage the claw and remove the roof rack leg cover center LH.

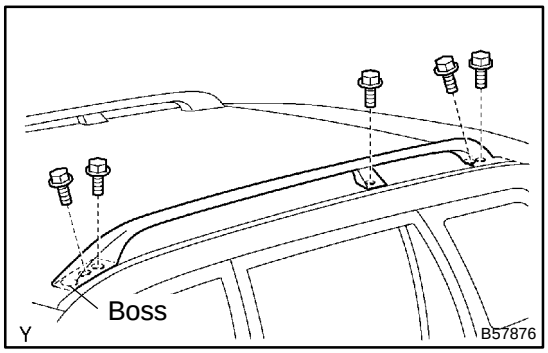
NOTICE:

- **Tape the scraper tip before use.**
- **Put protective tape around the roof rack leg cover center LH.**



3. REMOVE ROOF RACK LEG COVER REAR LH

(a) Disengage the claw.
(b) Slide the roof rack leg cover front LH to the vehicle's rear to disengage the clips, and then remove it.



4. REMOVE ROOF RACK ASSY LH

(a) Remove the 5 bolts.
(b) Disengage the boss and remove the roof rack assembly.

5. INSTALL ROOF RACK ASSY LH

(a) Using white gasoline, clean the bolt and thread.
(b) Apply adhesive 1324 to the thread.
(c) Install the roof rack assembly with the 5 bolts.

VEHICLE CONTROL SYSTEM

IGNITION SWITCH (TMC MADE) 80-1
REPLACEMENT 80-1
INSPECTION 80-2
IGNITION SWITCH (TMUK MADE) 80-3
REPLACEMENT 80-3
INSPECTION 80-4

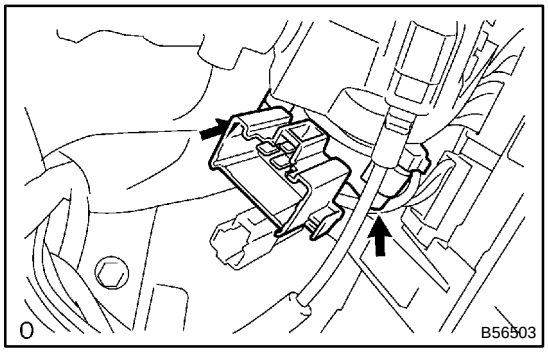
IGNITION SWITCH (TMC MADE)

8002A-01

REPLACEMENT

1. REMOVE INSTRUMENT PANEL SUB-ASSY LOWER

(See page 71-21)

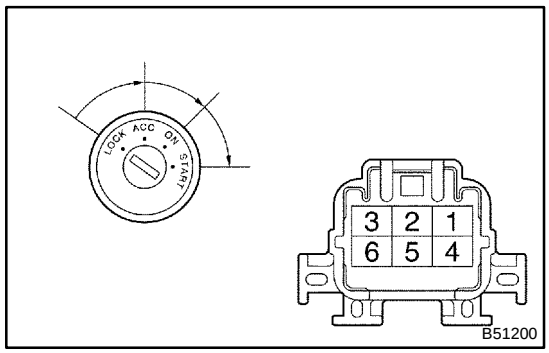


2. REMOVE IGNITION OR STARTER SWITCH ASSY

(a) Disconnect the ignition switch connector and unlock warning switch connector.
(b) Remove the clamp.
(c) Remove the 2 screws and ignition switch.

8002B-01

INSPECTION



1. INSPECT IGNITION OR STARTER SWITCH ASSY

Switch position	Tester connection	Specified condition
LOCK	-	No continuity
ACC	1 ⇔ 3	Continuity
ON	1 ⇔ 2 ⇔ 3 5 ⇔ 6	Continuity
START	1 ⇔ 2 4 ⇔ 5 ⇔ 6	Continuity

If the continuity is not as specified, replace the switch.

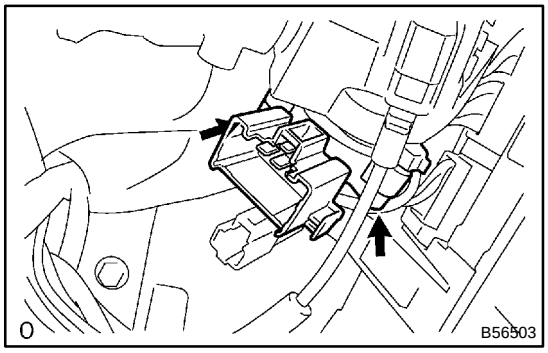
IGNITION SWITCH (TMUK MADE)

8002C-01

REPLACEMENT

1. REMOVE INSTRUMENT PANEL SUB-ASSY LOWER

(See page 71-30)

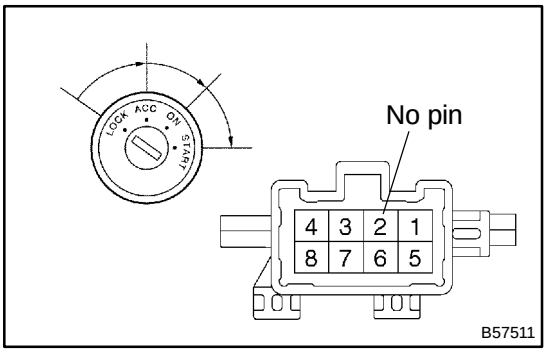


2. INSPECT IGNITION OR STARTER SWITCH ASSY

(a) Disconnect the ignition switch connector and unlock warning switch connector.
(b) Remove the clamp.
(c) Remove the 2 screws and ignition switch.

8002D-01

INSPECTION



1. INSPECT IGNITION OR STARTER SWITCH ASSY

Switch position	Tester connection	Specified condition
LOCK	-	No continuity
ACC	5 ⇔ 6	Continuity
ON	1 ⇔ 4 5 ⇔ 6 ⇔ 8	Continuity
START	1 ⇔ 3 ⇔ 4 5 ⇔ 7 ⇔ 8	Continuity

If the continuity is not as specified, replace the switch.

”

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