FOREWORD

This repair manual has been prepared to provide information covering general service repairs for the chassis and body of the TOYOTA AVENSIS/CORONA.

This is Volume 1 of the AVENSIS/CORONA Manual. There are two volumes to this manual.

Applicable models:

AT220, 221 series	CT220 series
AZT220 series	ST220 series
CDT220 series	ZZT220, 221 series

For the service specifications and repair procedures of the above model other than those listed in this manual, refer to the following manuals.

Manual Name	Pub.No.
• 4A–FE Engine Repair Manual	RM296E
• 7A–FE Engine Repair Manual	RM325E
• 4A–FE Engine Repair Manual Supplement	RM397E
• 7A–FE Engine Repair Manual Supplement	RM435E
• 4A–FE, 7A–FE Engine Repair Manual Supplement	RM611E
• 3S–FE Engine Repair Manual	RM395E
• 3S–FE Engine Repair Manual Supplement	RM495E
• 3S–FE Engine Repair Manual Supplement	RM609E
• 1C, 2C, 2C–T Engine Repair Manual	RM025E
• 2C Engine Repair Manual Supplement	RM297E
• 2C–T Engine Repair Manual Supplement	RM494E
• 2C–T, 2C–TE Engine Repair Manual Supplement	RM612E
• A241L, A241E Automatic Transaxle Repair Manual	RM177E
• A245E Automatic Transaxle Repair Manual	RM350E
• AVENSIS/CORONA Electrical Wiring Diagram	EWD330Y
• AVENSIS/CORONA New Car Features	NCF145E

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.

TOYOTA MOTOR CORPORATION

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INTRODUCTION IN
PREPARATION PP
SERVICE SPECIFICATIONS SS
DIAGNOSTICS DI
CLUTCH CL
C50, C250 MANUAL TRANSAXLE MX
S50, S54 MANUAL TRANSAXLE MX
A241E AUTOMATIC TRANSAXLE AX
A245E, A246E AUTOMATIC TRANSAXLE AX
SUSPENSION AND AXLE SA
BRAKE BR
STEERING SR
SUPPLEMENTAL RESTRAINT SYSTEM RS
BODY ELECTRICAL BE
BODY BO
AIR CONDITIONING AC
ALPHABETICAL INDEX ID

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 good understanding 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.

INTRODUCTION

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HOW TO USE THIS MANUAL

IN00U–02

GENERAL INFORMATION

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

2. GENERAL DESCRIPTION

At the beginning of each section, a General Description is given that pertains to all repair operations contained in that section.

Read these precautions before starting any repair task.

3. TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on page IN–18.

Be sure to read this before performing troubleshooting.

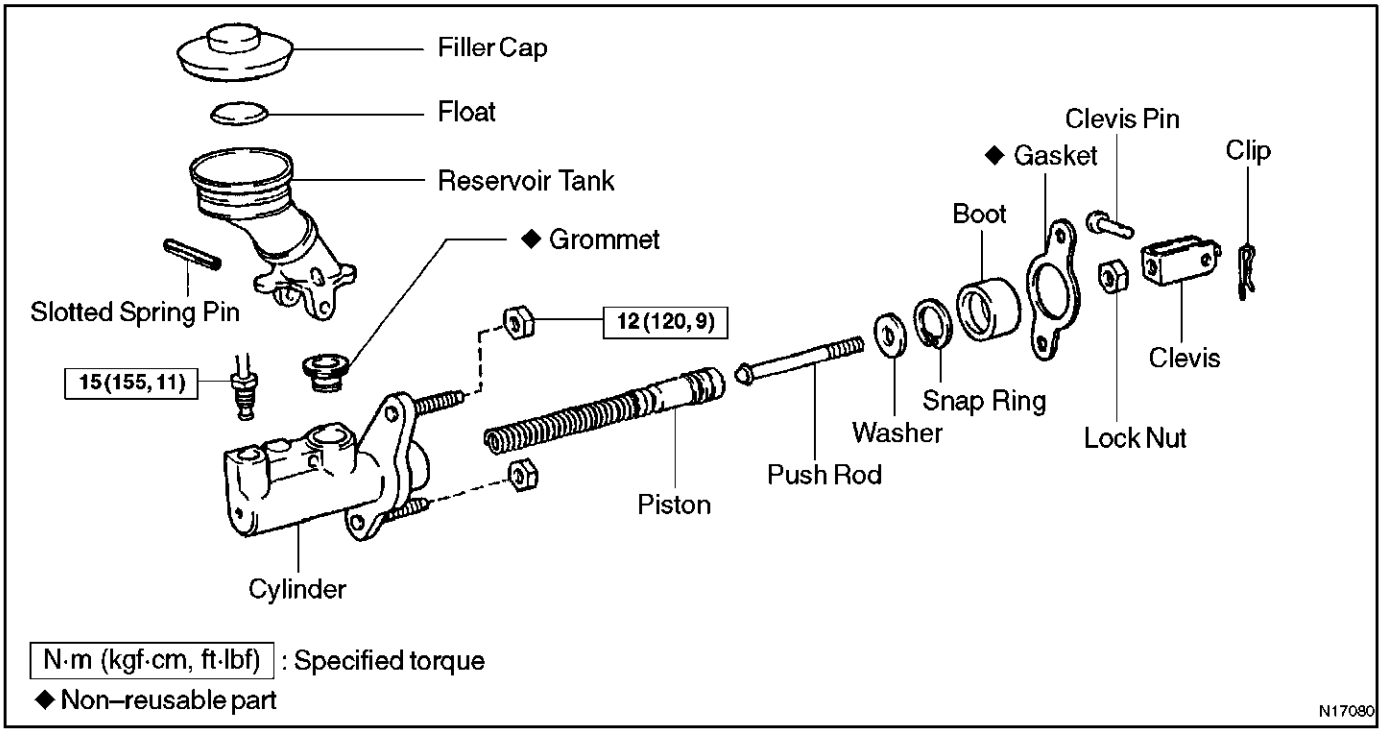
4. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

5. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

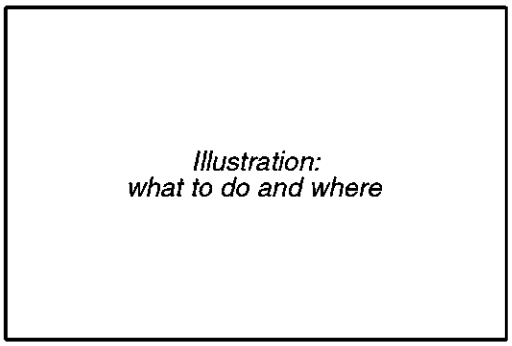
Example:



The procedures are presented in a step–by–step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example:



Task heading : what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the illustration.

SST 09350–30020 (09350–06120)

Set part No. *Component part No.*

Detailed text : how to do task

(b) Measure the stroke applying and releasing the compressed air (392 — 785 kPa, 4 — 8 kgf/cm^2 or 57 — 114 psi) as shown in the illustration.

Piston stroke: 1.40 — 1.70 mm (0.0551 — 0.0669 in.)

Specification

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

6. REFERENCES

References have been kept to a minimum. However, when they are required you are given the page to refer to.

7. SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in Service Specifications section, for quick reference.

8. CAUTIONS, NOTICES, HINTS:

- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

9. SI UNIT

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.

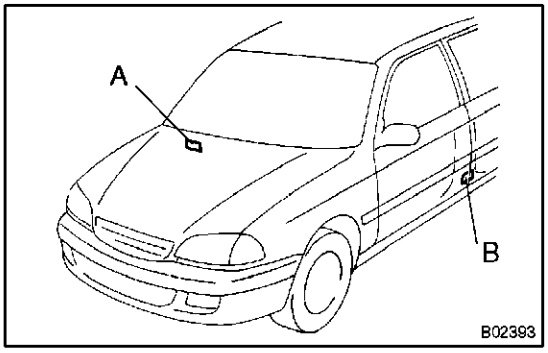
Example:

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

IDENTIFICATION INFORMATION

IN06B-01

VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER



1. VEHICLE IDENTIFICATION NUMBER

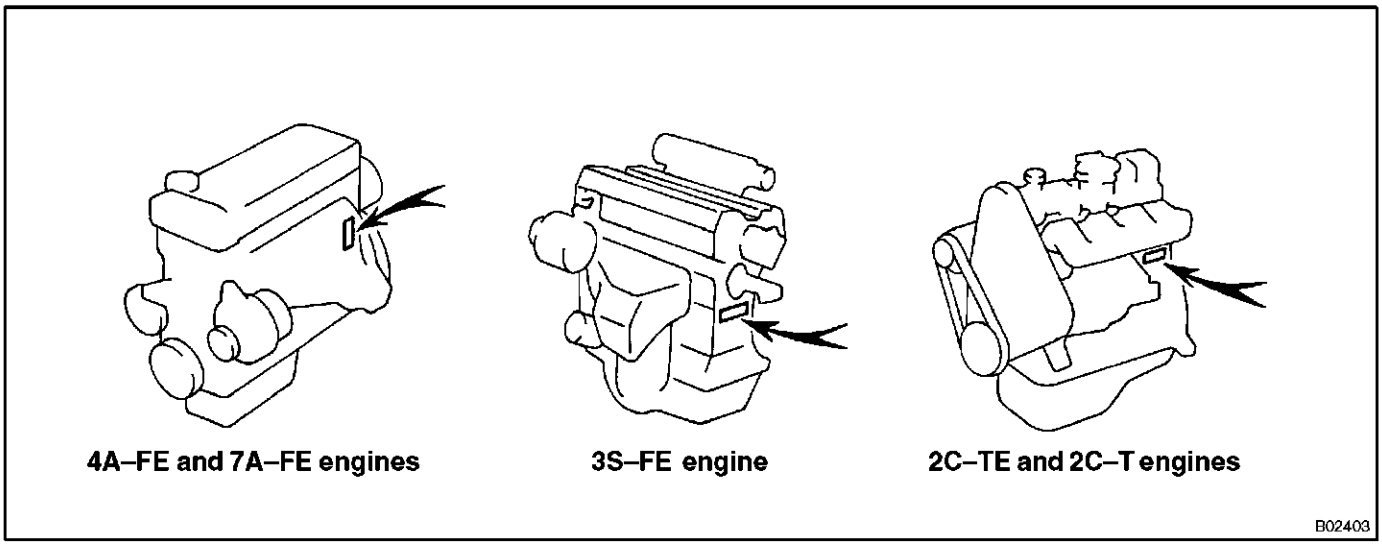
The vehicle identification number is stamped in the engine compartment. This number has also been stamped on the manufacturer's label.

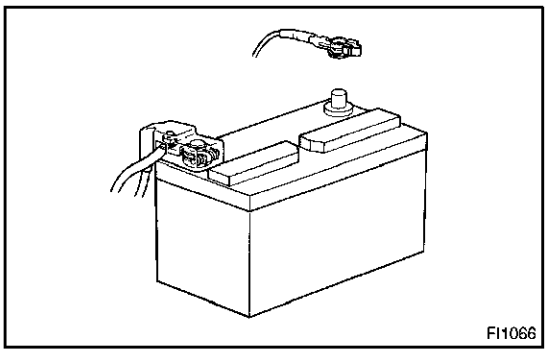
A: Vehicle Identification Number

B: Manufacturer's Label

2. ENGINE SERIAL NUMBER

The engine serial number is stamped on the engine block, as shown in the illustration.

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REPAIR INSTRUCTIONS

GENERAL INFORMATION

IN032-01

BASIC REPAIR HINT

(a) Use fender, seat and floor covers to keep the vehicle clean and prevent damage.

(b) During disassembly, keep parts in the appropriate order to facilitate reassembly.

(c) Installation and removal of battery terminal:
  (1) Before performing electrical work, disconnect the negative (–) terminal cable from the battery.
  (2) If it is necessary to disconnect the battery for inspection or repair, first disconnect the negative (–) terminal.
  (3) When disconnecting the terminal cable, to prevent damage to the battery terminal, loosen the cable nut and raise the cable straight up without twisting or prying it.
  (4) Clean the battery terminals and cable ends with a clean shop rag. Do not scrape them with a file or other abrasive objects.
  (5) Install the cable ends to the battery terminals after loosening the nut and tighten the nut after installation. Do not use a hammer to tap the cable ends onto the terminals.
  (6) Be sure the cover for the positive (+) terminal is properly in place.

(d) Check hose and wiring connectors to make sure that they are connected securely and correctly.

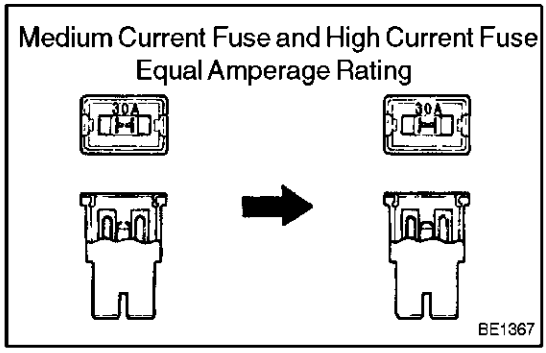
(e) Non–reusable parts
  (1) Always replace cotter pins, gaskets, O–rings and oil seals, etc. with new ones.
  (2) Non–reusable parts are indicated in the component illustrations by the "◆" symbol.

(f) Precoated parts
Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.
  (1) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.
  (2) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.
  (3) Precoated parts are indicated in the component illustrations by the "★" symbol.

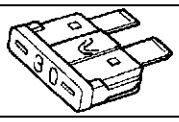
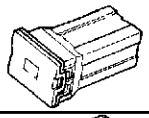
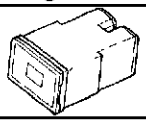
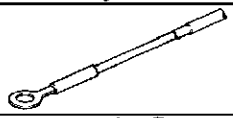
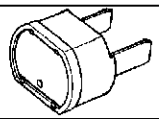
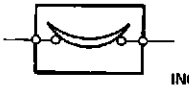
(g) When necessary, use a sealer on gaskets to prevent leaks.

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

(i) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in Preparation section in this manual.



(j) When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or 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
 BE5597	IN0367	FUSIBLE LINK	FL
 BE5598	 IN0368	CIRCUIT BREAKER	CB

V00076

(k) 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 IN–7).

(1) If the vehicle is to be jacked up only at the front or rear end, make sure to place the stopper under the wheels at the opposite end to block them in order to ensure safety.

(2) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.

(l) Observe the following precautions to avoid damage to the following 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 vacuum hoses, pull off the end, not the middle of the hose.

(3) To pull apart electrical connectors, pull on the connector itself, not the wires.

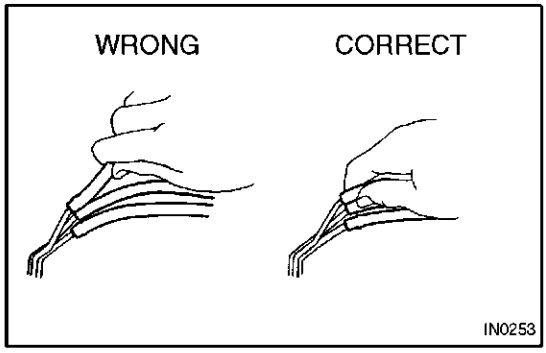
(4) Be careful not to drop electrical components, such as sensors or relays. If they are dropped on a hard floor, they should be replaced and not reused.

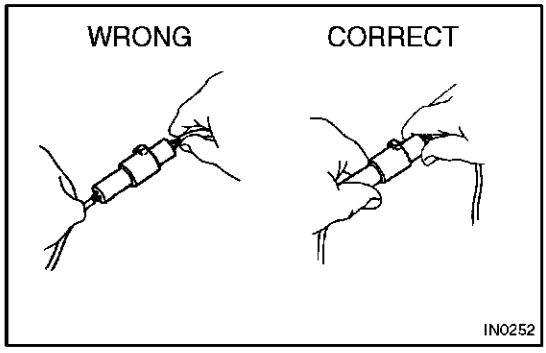
(5) When steam cleaning an engine, protect the electronic components, air filter and emission–related components from water.

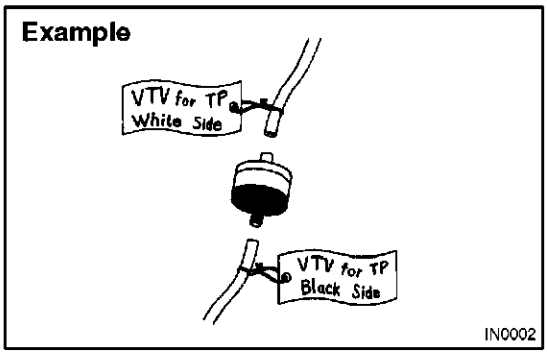
(6) Never use an impact wrench to remove or install temperature switches or temperature sensors.

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

(8) 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.







(m) Installation and removal of vacuum hose:

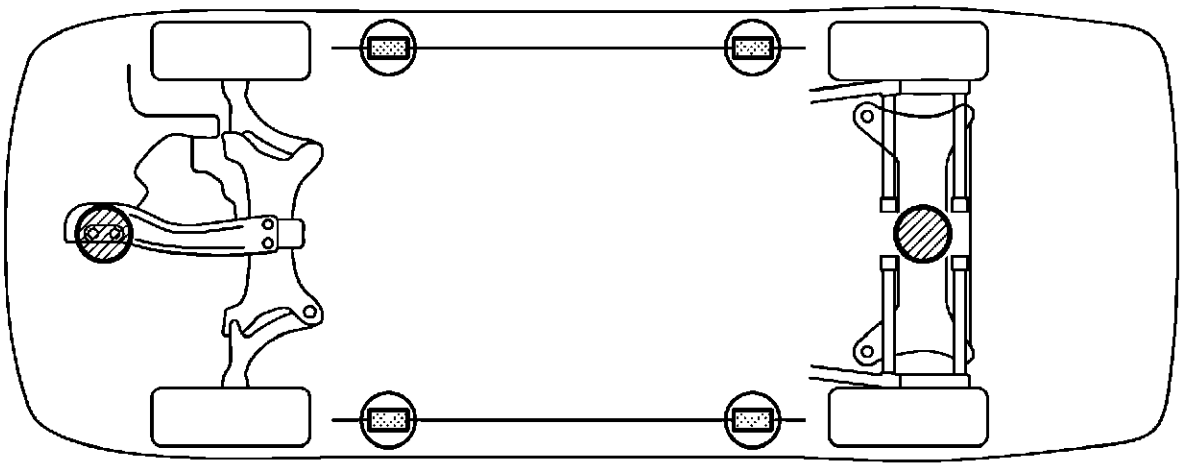
(1) When disconnecting vacuum hoses, use tags to identify where they should be reconnected to.

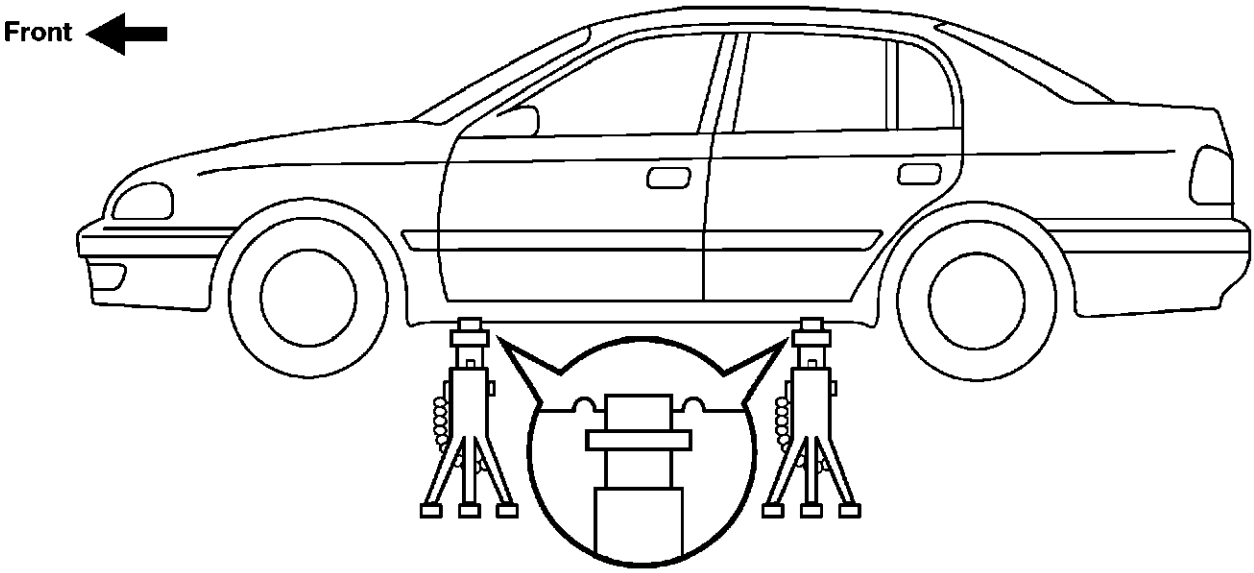
(2) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.

(n) Unless otherwise stated, all resistance is measured at an ambient temperature of 20°C (68°F). Because the resistance may be outside specifications if measured at high temperatures immediately after the vehicle has been running, measurement should be made when the engine has cooled down.

IN040–02

VEHICLE LIFT AND SUPPORT LOCATIONS





JACK POSITION

Front - - - - - - - - - - Front center member
Rear - - - - - - - - - - Rear suspension member

CAUTION : When jacking–up the rear and front, make sure the car is not carrying any extra weight.

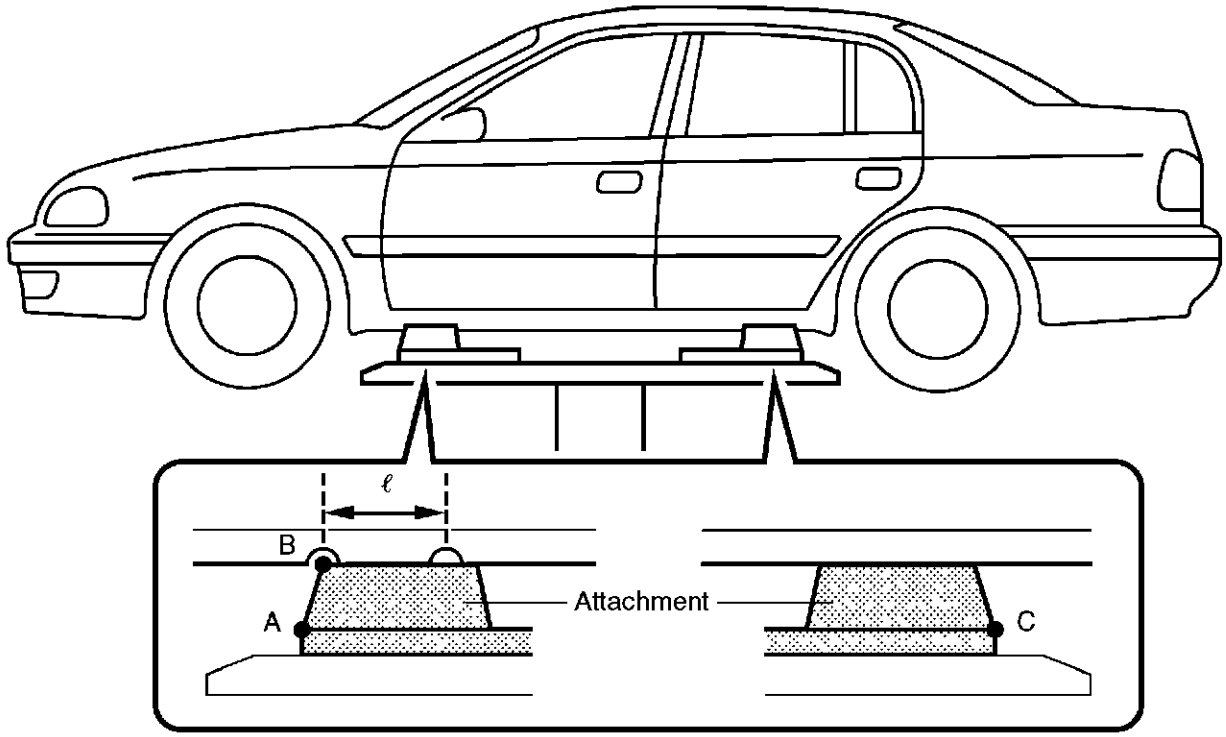
PANTOGRAPH JACK POSITION

SUPPORT POSITION

Safety stand and swing arm type lift -

B02394

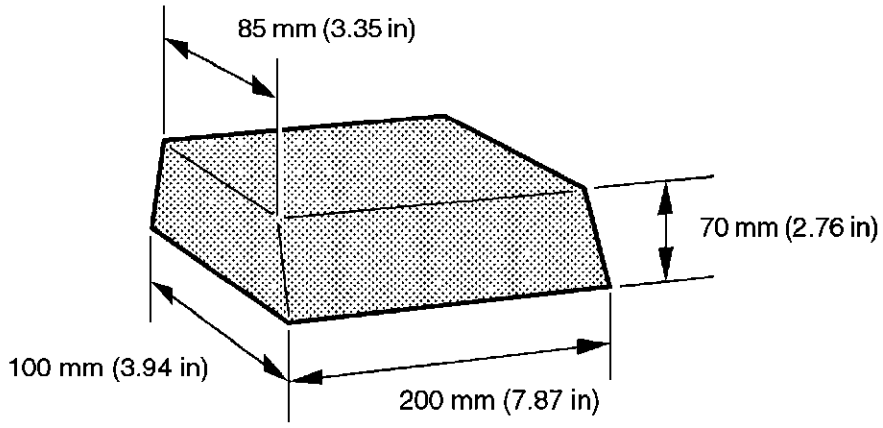
PLATE TYPE LIFT



HINT :

Left and right set position	Place the vehicle over the center of the lift.
Front and rear set position	• Align the cushion gum ends of the plate with the attachment lower ends (A, C). • Align the attachment upper end (B) with the front jack supporting point (ℓ).

Attachment dimensions



B02395

FOR ALL OF VEHICLES

PRECAUTION

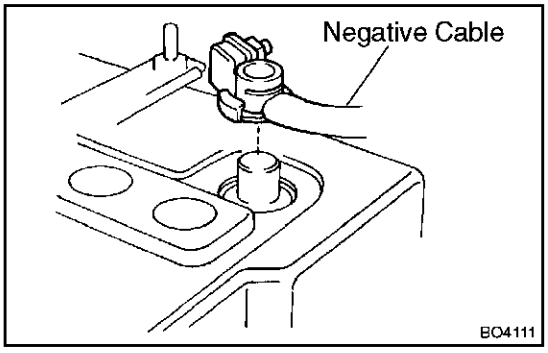
IN06C–01

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

(a) The AVENSIS/ CORONA is equipped with an SRS (Supplemental Restraint System), such as the driver airbag, front passenger airbag, side airbags and seat belt pretensioners.

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

Further, 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.



(b) 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 DI–152).

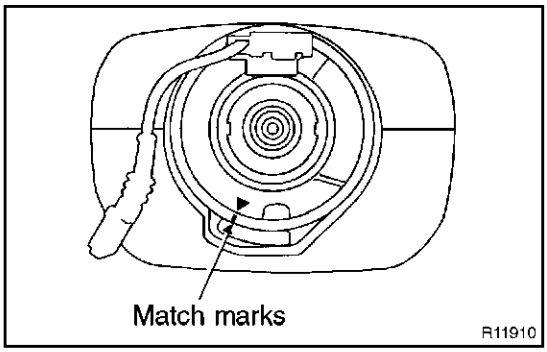
(2) Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (–) terminal cable is disconnected from the battery.

(The supplemental restraint system is equipped with a back–up power source so that if work is started within 90 seconds of 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 contents memorized by the each memory system. Then when work is finished, reset the clock and audio systems as before.

To avoid erasing the memory of each memory system, never use a back–up power supply from outside the vehicle.

(3) Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad, front passenger airbag assembly, side airbag assemblies and seat belt pretensioners should be inspected (See page RS–15, RS–28, RS–40 and BO–152).
(4) Never use SRS 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, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or seat belt pretensioner in order to reuse them.
(7) If the airbag sensor assembly, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or 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, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or seat belt pretensioner to hot air or flames.
(9) Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting of the electrical circuit.
(10) Information labels are attached to the periphery of 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 DI–152).



(c) SPIRAL CABLE (in Combination Switch)
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 result. Refer to SR–18 of this manual concerning correct steering wheel installation.

(d) STEERING WHEEL PAD (with Airbag)

(1) When removing the steering wheel pad or handling a new steering wheel pad, it should be placed with the pad top surface facing up.
Storing the pad with its metallic surface facing upward may lead to a serious accident if the airbag inflates for some reason. In addition do not store a steering wheel pad on top of another one.

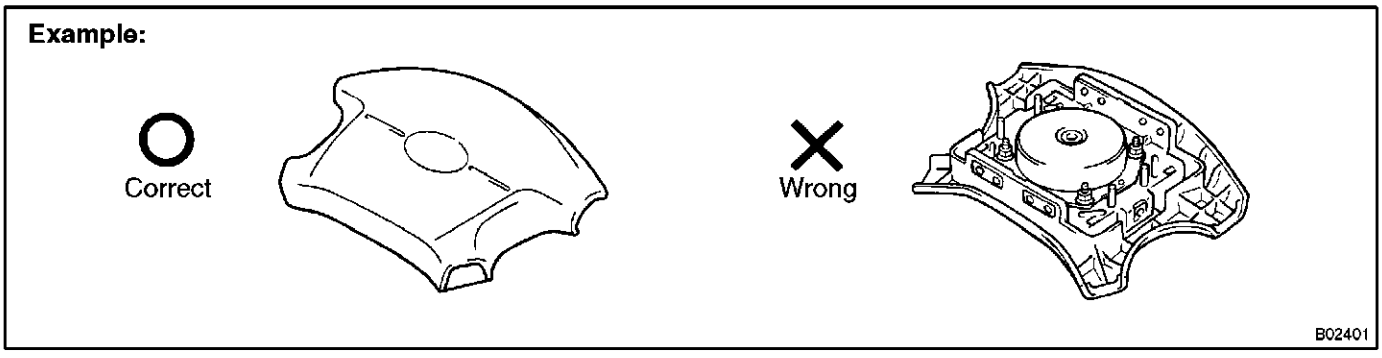
(2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)

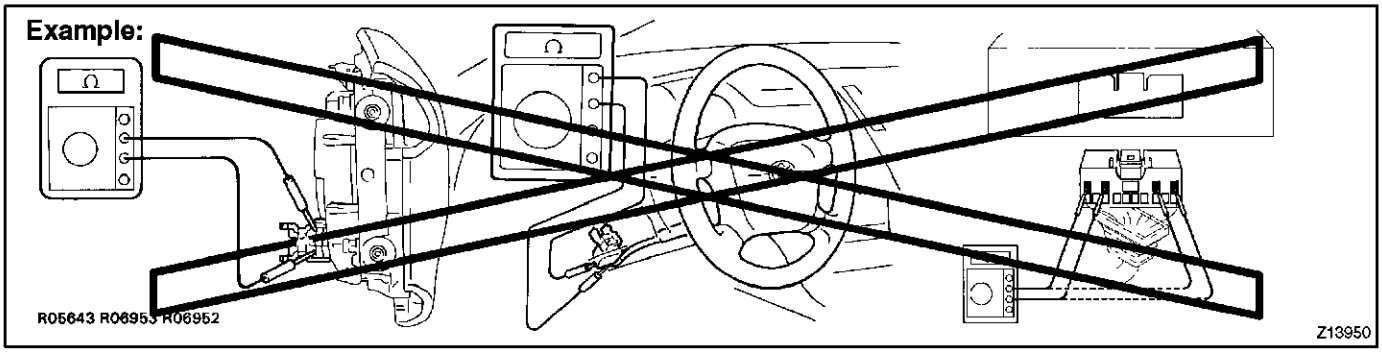
(3) Grease should not be applied to the steering wheel pad and the pad should not be cleaned with detergents of any kind.

(4) Store the steering wheel pad 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 (yellow color and 2 pins) under the steering column near the combination switch connector before starting work.

(6) When disposing of a vehicle or the steering wheel pad alone, the airbag should be deployed using an SST before disposal (See page RS–17).
Carry out the operation in a safe place away from electrical noise.





(e) FRONT PASSENGER AIRBAG ASSEMBLY

(1) Always store a removed or new front passenger airbag assembly with the airbag deployment direction facing up.
Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

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

(3) Grease should not be applied to the front 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.

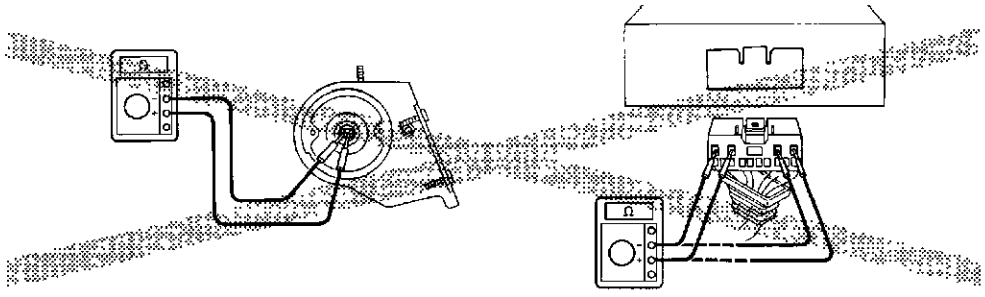
(5) When using electric welding, first disconnect the airbag connector (yellow color and 2 pins) installed on the assembly before starting work.

(6) When disposing of a vehicle or the airbag assembly alone, the airbag should be deployed using an SST before disposal (See page RS–30).
Perform the operation in a safe place away from electrical noise.

Example:

B02402

Example:



B02404

(f) SIDE AIRBAG ASSEMBLY

(1) Always store a removed or new side airbag assembly with the airbag deployment direction facing up. Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

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

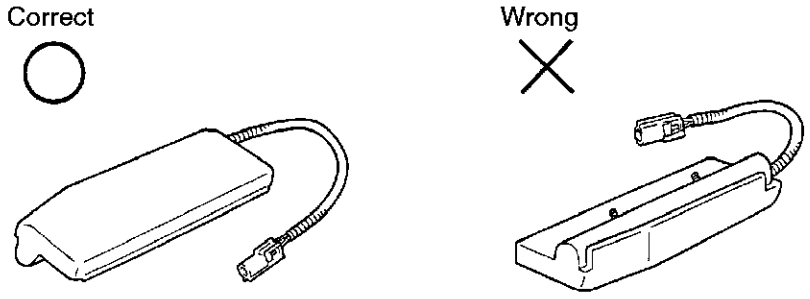
(3) Grease should not be applied to the side airbag assembly and the surface should not be cleaned with detergents of any kind.

(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 (yellow color and 2 pins) under the seat before starting work.

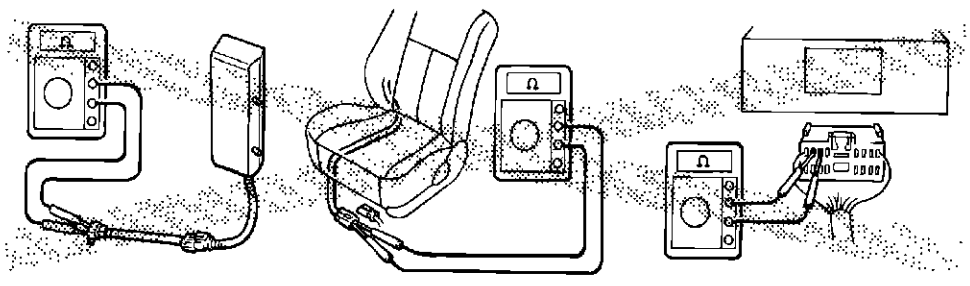
(6) When disposing of a vehicle or the side airbag assembly alone, the airbag should be deployed using an SST before disposal (See page RS–41). Perform the operation in a safe place away from electrical noise.

Example:



B02129

Example:



B01546

(g) SEAT BELT PRETENSIONER

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

(2) Oil or water should not be put on the front seat outer belt and the front seat outer belt should not be cleaned with detergents of any kind.

(3) Store the front seat outer belt where the ambient temperature remains below 80°C (176°F), without high humidity and away from electrical noise.

(4) When using electric welding, first disconnect the connector (yellow color and 2 pins) installed at the center pillar lower garnish before starting work.

(5) When disposing of a vehicle or a front seat outer belt alone, the seat belt pretensioner should be activated before disposal (See page BO–153). Perform the operation in a safe place away from electrical noise.

(h) AIRBAG SENSOR ASSEMBLY

(1) Never reuse the airbag sensor assembly involved in a collision when 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 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 loosing the set bolts of the airbag sensor assembly.

(i) WIRE HARNESS AND CONNECTOR

The SRS wire harness is integrated with the cowl wire harness assembly and floor wire harness assembly. The wires for the SRS wire harness are encased in a yellow corrugated tube. All the connectors for the system are also 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 as shown on page RS–65.

2. FOR VEHICLES EQUIPPED WITH A CATALYTIC CONVERTER

CAUTION:

If large amount of unburned gasoline flows into the converter, it may overheat and create a fire hazard. To prevent this, observe the following precautions and explain them to your customer.

(a) Use only unleaded gasoline.

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

(c) Avoid spark jump test.
(1) Perform spark jump test only when absolutely necessary. Perform this test as rapidly as possible.
(2) While testing, never race the engine.

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

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

(f) Avoid coasting with ignition turned off and prolonged braking.

(g) Do not dispose of used catalyst along with parts contaminated with gasoline or oil.

3. IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM

For vehicles with mobile communication systems such as two–way radios and cellular telephones, observe the following precautions.

(a) Install the antenna as far as possible away from the ECU and sensors of the vehicle's electronic system.

(b) Install the antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle's electronic systems. For details about ECU and sensors locations, refer to the section on the applicable component.

(c) Do not wind the antenna feeder together with the other wiring as much as possible, also avoid running the antenna feeder parallel with other wire harnesses.

(d) Check that the antenna and feeder are correctly adjusted.

(e) Do not install powerful mobile communications system.

4. FOR USING HAND–HELD TESTER

CAUTION:

Observe the following items for safety reasons:

- **Before using the hand–held tester, the hand–held tester's operator manual should be read thoroughly.**
- **Be sure to route all cables securely when driving with the hand–held tester connected to the vehicle. (i.e. Keep cables away from feet, pedals, steering wheel and shift lever.)**
- **Two persons are required when test driving with the hand–held tester, one person to drive the vehicle and the other person to operate the hand–held tester.**

5. FOR VEHICLES EQUIPPED WITH POWER WINDOW CONTROL SYSTEM

When the battery is disconnected or the power to the window regulator motor is cut, the power window control system does not operate. It is necessary to initialize the system in the following procedures. Otherwise window cannot be operated normally.

(1) Close window to the highest position.
(2) Keep holding the switch for 5 seconds.
(3) Check that automatic operation works. If not, repeat the above procedures.

6. FOR VEHICLES EQUIPPED WITH SLIDING ROOF SYSTEM

Sliding roof stop position might be required to be initialized when battery failures (such as battery disconnection, connector disconnection and the voltage drop) are detected while the system is in operation. This also occurs when rotating the motor with the battery disconnected. Sliding roof initialization can be done by the following procedures.

(1) Operate the roof up to the maximum tilt position.
(2) Release the switch, and push it again in the same direction. (After 10 seconds have elapsed, initialization begins.)
(3) The roof starts automatic operation if holding the switch, completes full one cycle (tilt down, slide open, slide close and tilt up) of travel. Do not release the switch until the roof stops.
(4) Check that the roof stops at the correct position.

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

IN00Z–06

GENERAL INFORMATION

A large number of ECU controlled systems are used in the AVENSIS/ CORONA. 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. However, the fact is 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 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. A241E Automatic Transaxle	DI–1
2. A245E, A246E Automatic Transaxle	DI–52
3. Anti–Lock Brake System	DI–113
4. Supplemental Restraint System	DI–150
5. Wireless Door Lock Control System	DI–299

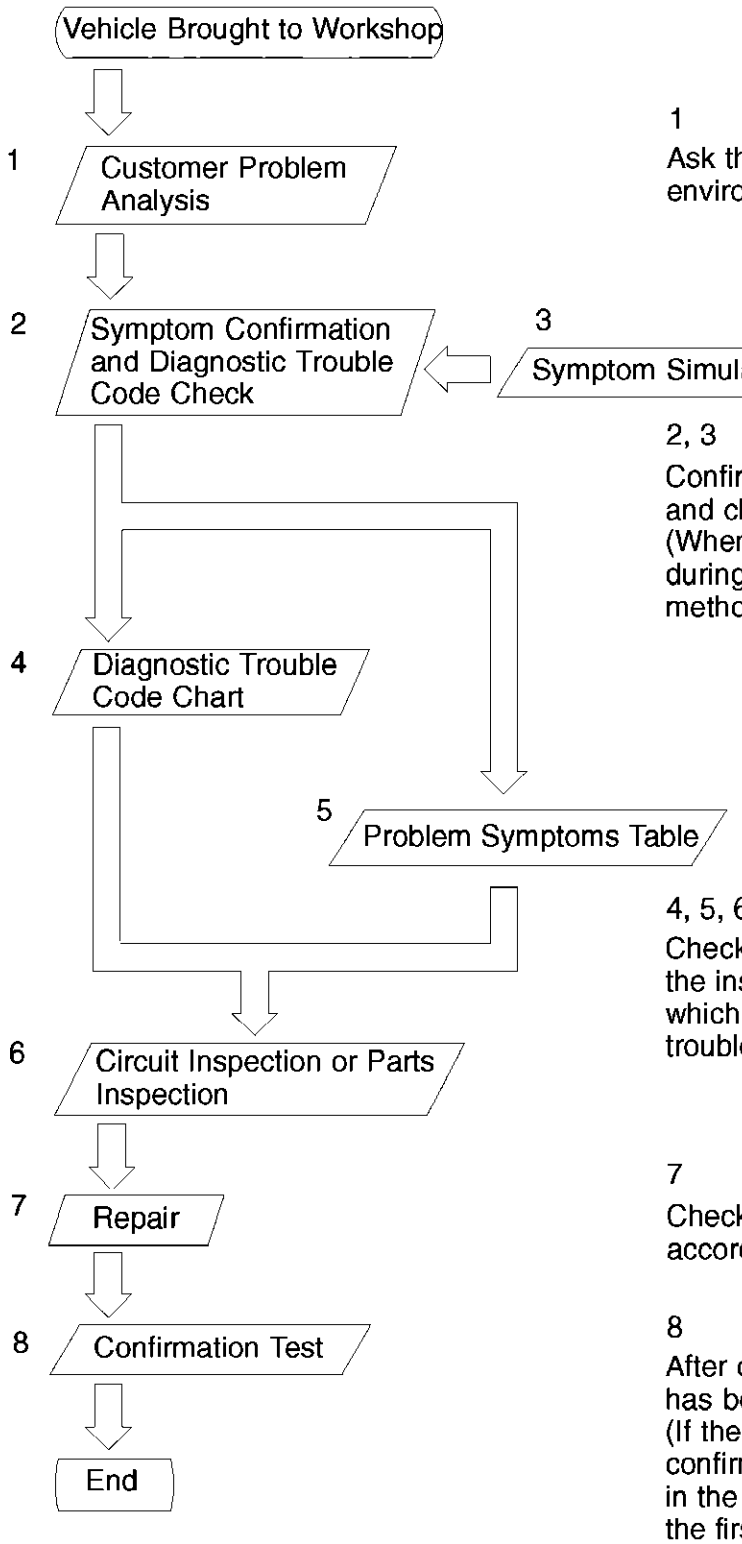
FOR USING HAND–HELD TESTER

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

IN06D–01

HOW TO PROCEED WITH TROUBLESHOOTING

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



1
Ask the customer about the conditions and the environment when the problem occurred.

2, 3
Confirm the symptoms and the problem conditions, and check the diagnostic trouble codes.
(When the problem symptoms do not appear during confirmation, use the symptom simulation method described later on.)

4, 5, 6
Check the results obtained in Step 2, then confirm the inspection procedure for the system or the part which should be checked using the diagnostic trouble code chart or the problem symptoms table.

7
Check and repair the affected system or part in accordance with the instructions in Step 6.

8
After completing repairs, confirm that the problem has been eliminated.
(If the problem is not reproduced, perform the confirmation test under the same conditions and in the same environment as when it occurred for the first time.)

1. CUSTOMER PROBLEM ANALYSIS

In troubleshooting, the problem symptoms must be confirmed accurately and all preconceptions must be cleared away in order to give an accurate judgement. To ascertain just what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time it occurred.

Important Point in the Problem Analysis:

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 reference in troubleshooting. A customer problem analysis table is provided in DI 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]

2. SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE CHECK

The diagnostic system in the AVENSIS/ CORONA fulfills various functions. The first function is the Diagnostic Trouble Code Check in which a malfunction in the signal circuits to the ECU is stored in code in the ECU memory at the time of occurrence, to be output by the technician during troubleshooting. 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, the problem areas can be narrowed down quickly and troubleshooting can be performed effectively. Diagnostic functions are incorporated in the following systems in the AVENSIS/ CORONA.

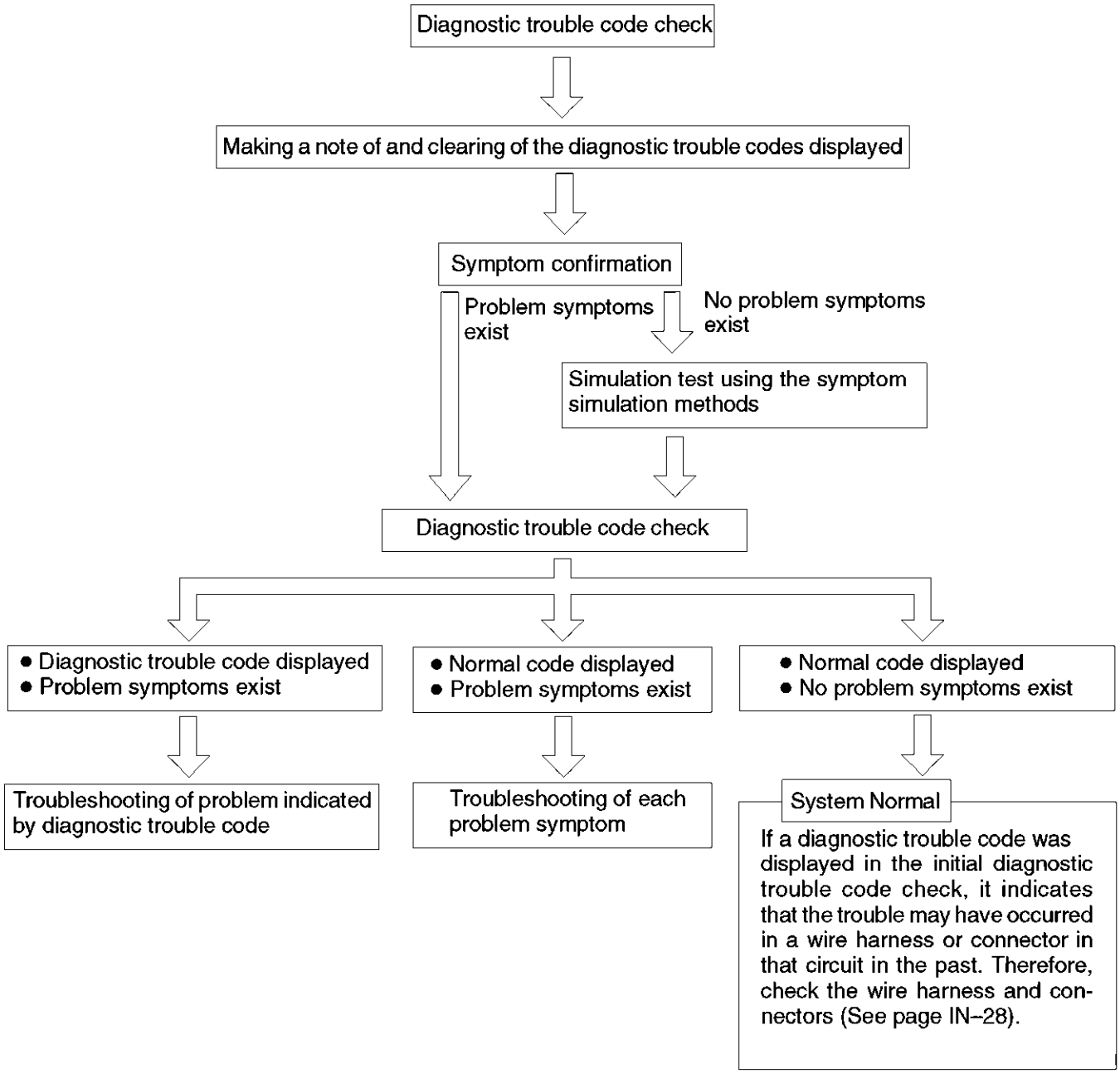
System	Diagnostic Trouble Code Check	Input Signal Check (Sensor Check)	Other Diagnosis Function
Automatic Transaxle (A241 E)	○(with Test Mode)	○	
Automatic Transaxle (A245 E, A246 E)	○(with Test Mode)	○	
Anti–Lock Brake System	○	○	
Supplemental Restraint System	○		

In diagnostic trouble code check, it is very important to determine whether the problem indicated by the diagnostic trouble code is still occurring or 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 diagnostic trouble code is directly related to the problem symptom or not. For this reason, the diagnostic trouble codes should be checked before and after the symptom confirmation to determine the current conditions, as shown in the table below. If this is not done, it may, depending on the case, result in unnecessary troubleshooting for normally operating systems, thus making it more difficult to locate the problem, or in repairs not pertinent to the problem. Therefore, always follow the procedure in correct order and perform the diagnostic trouble code check.

DIAGNOSTIC TROUBLE CODE CHECK PROCEDURE

Diagnostic Trouble Code Check (Make a note of and then clear)	**Confirmation of Symptoms**	**Diagnostic Trouble Code Check**	**Problem Condition**
Diagnostic Trouble Code Display	Problem symptoms exist	Same diagnostic trouble code is displayed	Problem is still occurring in the diagnostic circuit
⇨		Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit (The diagnostic trouble code displayed first is either for a past problem or it is a secondary problem)
⇨	No problem symptoms exist		The problem occurred in the diagnostic circuit in the past
Normal Code Display ⇨	Problem symptoms exist	Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit
⇨	No problem symptoms exist	Normal code is displayed	The problem occurred in a place other than in the diagnostic circuit in the past

Taking into account the above points, a flow chart showing how to proceed with troubleshooting using the diagnostic trouble code check is shown below. This flow chart shows how to utilize the diagnostic trouble code check effectively, then by carefully checking the results, indicates how to proceed either to diagnostic trouble code troubleshooting or to troubleshooting of problem symptoms.

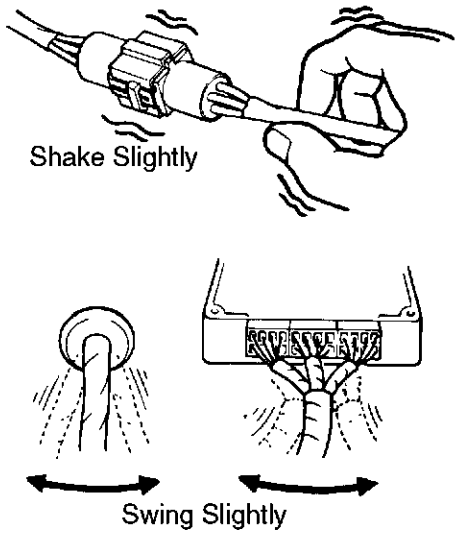
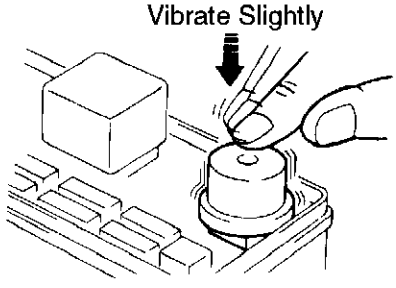


3. SYMPTOM SIMULATION

The most difficult case in troubleshooting is when there are no problem symptoms occurring. 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 or she may be, if he or she proceeds to troubleshoot without confirming the problem symptoms he or she 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 so long as the symptoms are confirmed with the engine hot condition or the vehicle at a standstill. Since vibration, heat or water penetration (moisture) is likely cause for problem which is difficult to reproduce, the symptom simulation tests introduced here are effective measures in that the external causes are applied to the vehicle in a stopped condition.

Important Points in the Symptom Simulation Test:

In the symptom simulation test, the problem symptoms should of course be confirmed, but the problem area or parts must also be found out. To do this, narrow down the possible problem circuits according to the symptoms before starting this test and connect a tester 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 for each system to narrow down the possible causes of the symptom.

1	**VIBRATION METHOD: When vibration seems to be the major cause.**
CONNECTORS Slightly shake the connector vertically and horizontally. **WIRE HARNESS** Slightly shake the wire harness vertically and horizontally. The connector joint, fulcrum of the vibration, and body through portion are the major areas to be checked thoroughly.	 FI2331 FI2332
PARTS AND SENSOR 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.	 FI2330

V07268

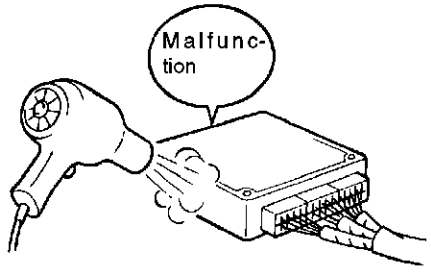
2	HEAT METHOD: When the problem seems to occur when the suspect area is heated.

Heat the component that is the likely cause of the malfunction with a hair dryer or similar object. Check to see if the malfunction occurs.

NOTICE:

(1) Do not heat to more than 60 °C (140 °F). (Temperature is limited not to damage the components.)

(2) Do not apply heat directly to parts in the ECU.



FI2334

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

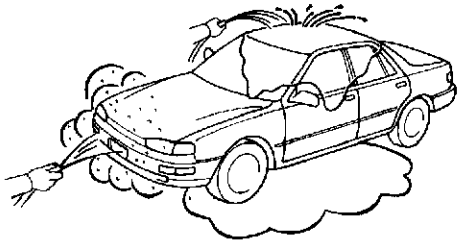
Sprinkle water onto the vehicle and check to see if the malfunction occurs.

NOTICE:

(1) Never sprinkle water directly into the engine compartment, but indirectly change the temperature and humidity by applying water spray onto the radiator front surface.

(2) Never apply water directly onto the electronic components.

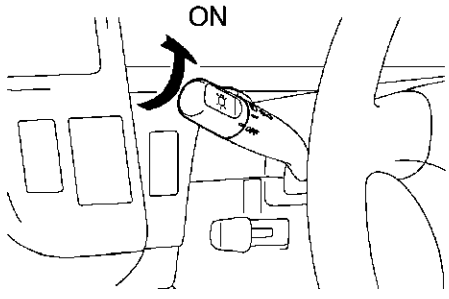
HINT:
If a vehicle is subject to water leakage, the leaked water may contaminate the ECU. When testing a vehicle with a water leakage problem, special caution must be taken.



FI6649

4	OTHER: When a malfunction seems to occur when electrical load is excessive.

Turn on all electrical loads including the heater blower, head lights, rear window defogger, etc. and check to see if the malfunction occurs.



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B02390

4. DIAGNOSTIC TROUBLE CODE CHART

The inspection procedure is shown in the table below. This table permits efficient and accurate troubleshooting 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.

- DTC No.
  Indicates the diagnostic trouble code.
- Page or Instructions
  Indicates the page where the inspection procedure for each circuit is to be found, or gives instructions for checking and repairs.

- Trouble Area
  Indicates the suspect area of the problem.

- 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 listed for that code in the table below. (Proceed to the page given for that circuit).

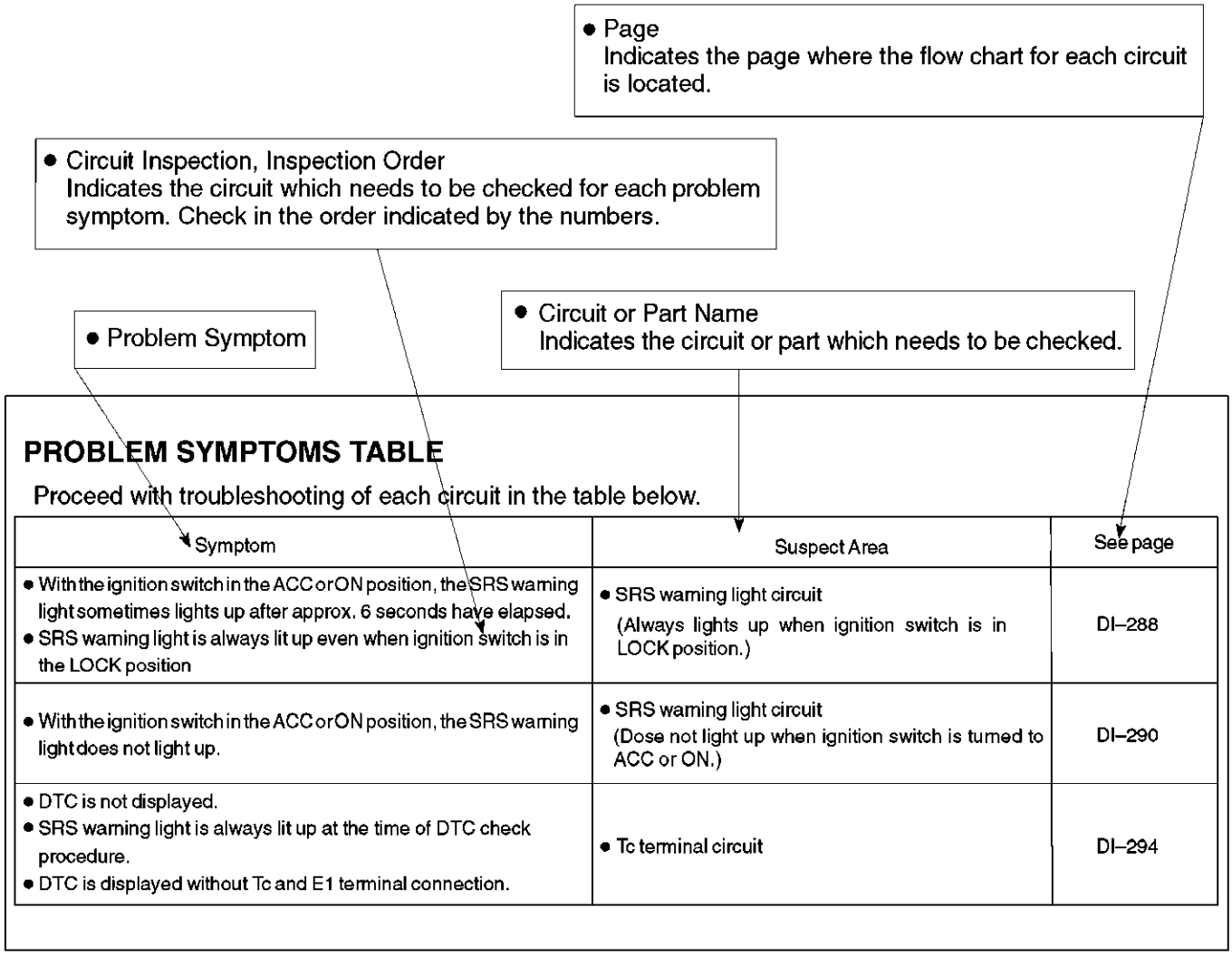
DTC No. (See page)	Detection Item	Trouble Area	SRS Warning Light
11 (DI–165)	Short in D squib circuit (to ground)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
12 (DI–170)	Short in D squib circuit (to B+)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
13 DI–174)	Short in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
14 (DI–178)	Open in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
15 (DI–178)	Front airbag sensor assembly (RH) malfunction	• Front airbag sensor assembly (RH) • Wire harness	ON
16	Front airbag sensor assembly (LH) malfunction	• Front airbag sensor assembly (LH) • Wire harness	
	ssembly malfunction	Airbag sensor assembly	
	it (to ground)	• Front passenger airbag sensor assembl • Airbag sensor assembl	

5. 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.



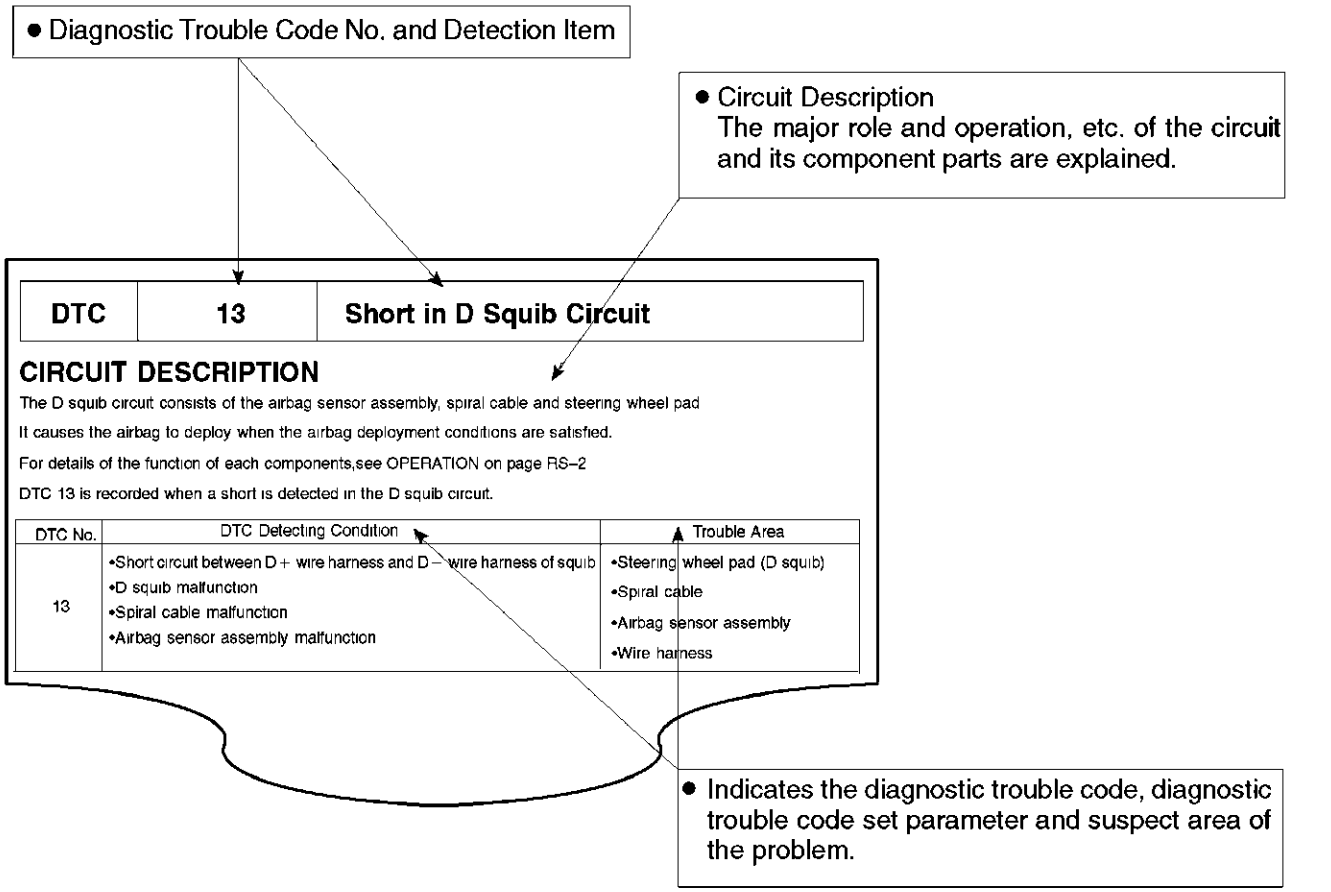
PROBLEM SYMPTOMS TABLE

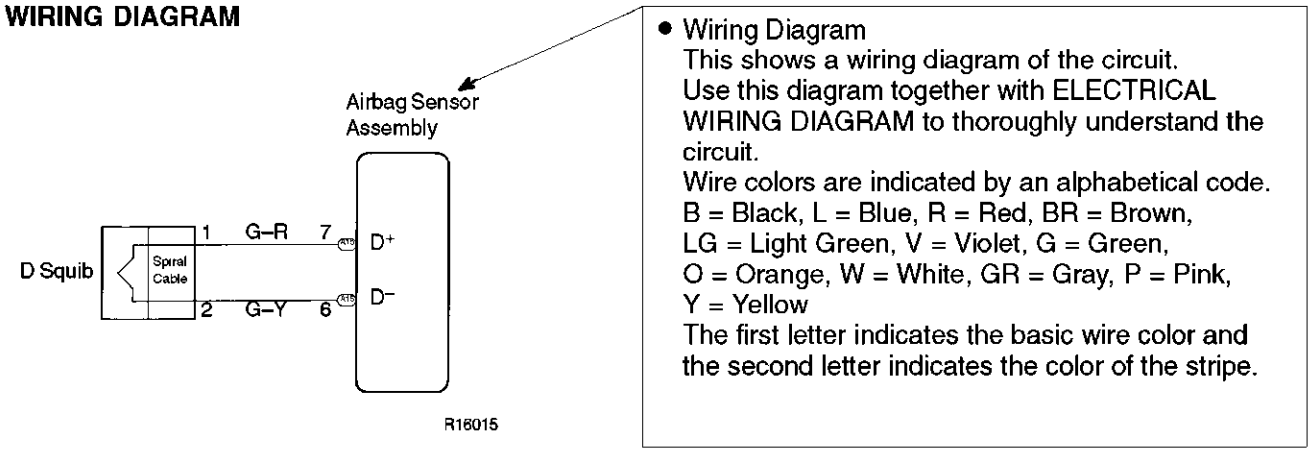
Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
● With the ignition switch in the ACC or ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed. ● SRS warning light is always lit up even when ignition switch is in the LOCK position	● SRS warning light circuit (Always lights up when ignition switch is in LOCK position.)	DI–288
● With the ignition switch in the ACC or ON position, the SRS warning light does not light up.	● SRS warning light circuit (Dose not light up when ignition switch is turned to ACC or ON.)	DI–290
● DTC is not displayed. ● SRS warning light is always lit up at the time of DTC check procedure. ● DTC is displayed without Tc and E1 terminal connection.	● Tc terminal circuit	DI–294

6. CIRCUIT INSPECTION

How to read and use each page is shown below.





B02407

● Indicates the position of the ignition switch during the check.

LOCK
Ignition Switch LOCK (OFF)

ON
Ignition Switch ON

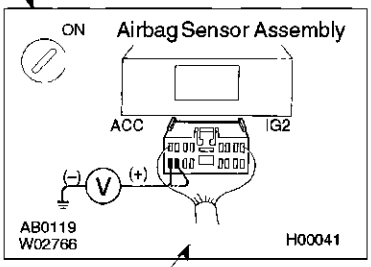
START
Ignition Switch START

ACC
Ignition Switch ACC

● 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.

INSPECTION PROCEDURE

2	**Check voltage at IG2 and ACC of airbag sensor assembly.**



PREPARATION:
Turn ignition switch ON.

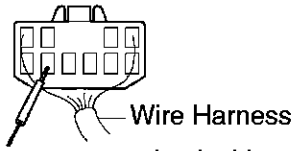
CHECK:
Measure voltage between terminals IG2 and ACC of airbag sensor assembly and body ground.

OK:
Voltage: Below 16V

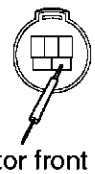
NG → **Check battery and charging system. (See charging system section)**

OK

● Indicates the place to check the voltage or resistance.
● Indicates the connector position to be checked, from the front or back side.

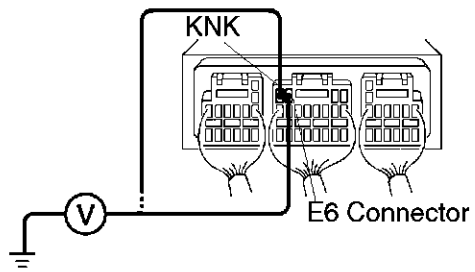


Check from the connector back side. (with harness)

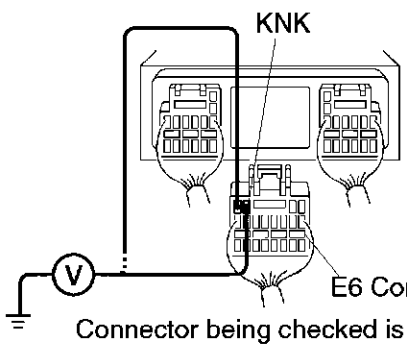


Check from the connector front side. (without harness)
In this case, care must be taken not to bend the terminals.

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



Connector being checked is connected.



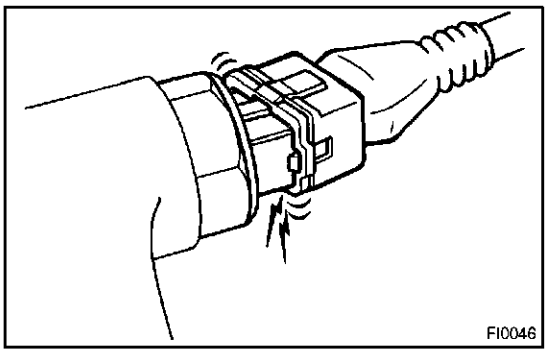
Connector being checked is disconnected.

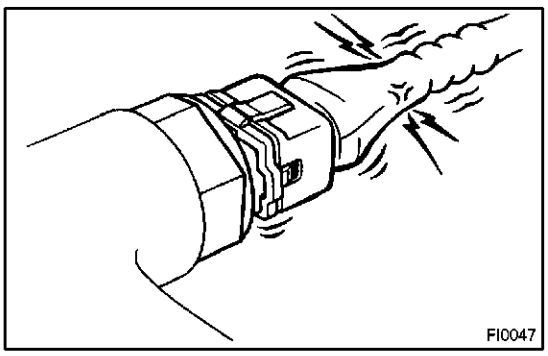
B00691

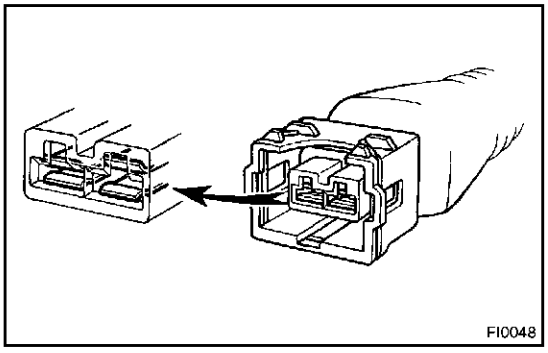
B00972

IN011-03

HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE


FI0046


FI0047


FI0048

1. CONNECTOR CONNECTION AND TERMINAL INSPECTION

- For troubleshooting, diagnostic trouble code charts or problem symptom charts are provided for each circuit with detailed inspection procedures on the following pages.
- When all the component parts, wire harnesses and connectors of each circuit except the ECU are found to be normal in troubleshooting, then it is determined that the problem is in the ECU. Accordingly, if diagnosis is performed without the problem symptoms occurring, refer to Step 8 to replace the ECU. So always confirm that the problem symptoms are occurring, or proceed with inspection while using the symptom simulation method.
- The instructions "Check wire harness and connector" and "Check and replace ECU" which appear in the inspection procedure, are common and applicable to all diagnostic trouble codes. Follow the procedure outlined below whenever these instructions appear.

OPEN CIRCUIT:

This could be due to a disconnected wire harness, faulty contact in the connector, and a connector terminal pulled out, etc.

HINT:

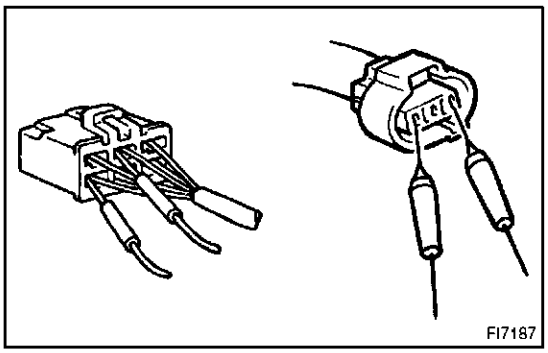
- It is rarely the case that a wire is broken in the middle of it. Most cases occur at the connector. In particular, carefully check the connectors of sensors and actuators
- Faulty contact could be due to rusting of the connector terminals, to foreign materials entering terminals or a deformation of connector terminals. Simply disconnecting and reconnecting the connectors once changes the condition of the connection and may result in a return to normal operation. Therefore, in troubleshooting, if no abnormality is found in the wire harness and connector check, but the problem disappears after the check, then the cause is considered to be in the wire harness or connectors.

SHORT CIRCUIT:

This could be due to a contact between wire harness and the body ground or to a short circuit occurred inside the switch, etc.

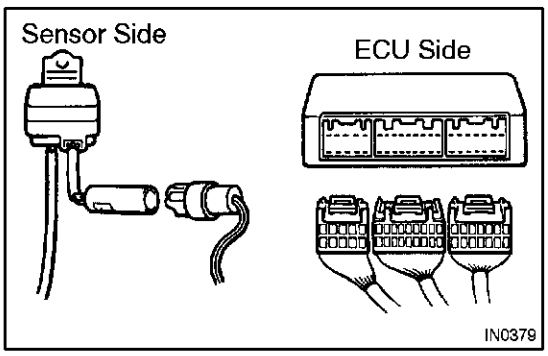
HINT:

When there is a short between the wire harness and body ground, check thoroughly whether the wire harness is caught in the body or is clamped properly.



2. CONNECTOR HANDLING

When inserting tester probes into a connector, insert them from the rear of the connector. When necessary, use mini test leads. For water resistant connectors which cannot be accessed from behind, take good care not to deform the connector terminals.



3. CONTINUITY CHECK (OPEN CIRCUIT CHECK)

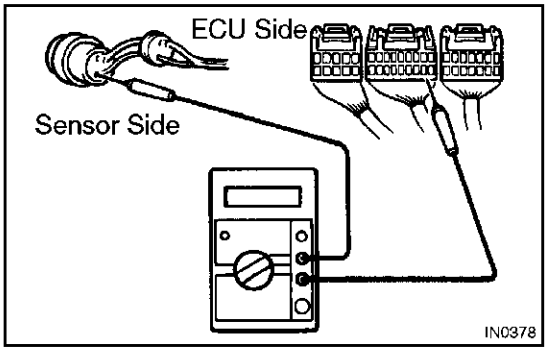
(a) Disconnect the connectors at both ECU and sensor sides.

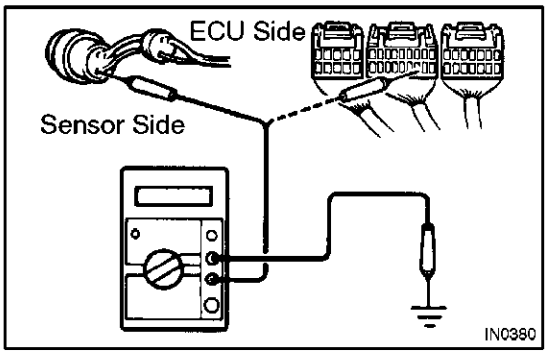
(b) Measure the resistance between the applicable terminals of the connectors.

Resistance: 1 Ω or less

HINT:

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





4. RESISTANCE CHECK (SHORT CIRCUIT CHECK)

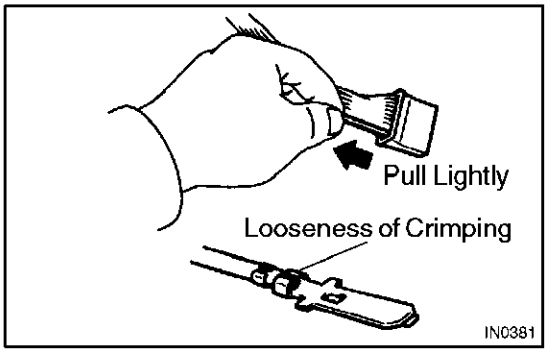
(a) Disconnect the connectors on both ends.

(b) Measure the resistance between the applicable terminals of the connectors and body ground. Be sure to carry out this check on the connectors on both ends.

Resistance: 1 MΩ or higher

HINT:

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



5. VISUAL CHECK AND CONTACT PRESSURE CHECK

(a) Disconnect the connectors at both ends.

(b) Check for rust or foreign material, etc. in the terminals of the connectors.

(c) Check crimped portions for looseness or damage and check that the terminals are secured in lock portion.

HINT:

The terminals should not come out when pulled lightly from the back.

(d) Prepare a test male terminal and insert it in the female terminal, then pull it out.

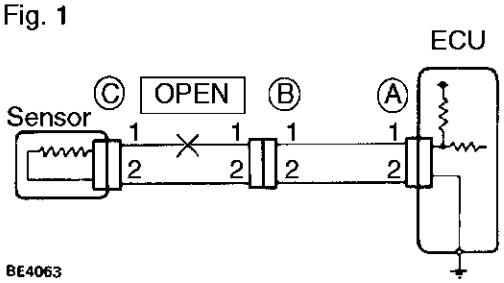
NOTICE:

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

HINT:

When the test terminal is pulled out more easily than others, there may be poor contact in that section.

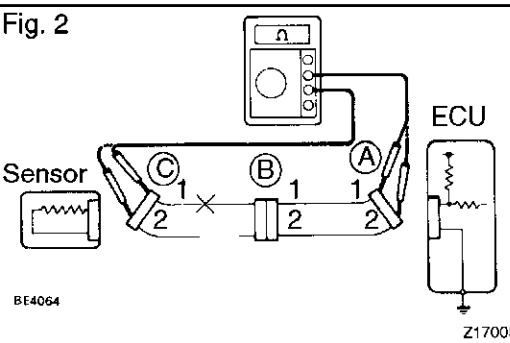
Fig. 1



6. CHECK OPEN CIRCUIT

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

Fig. 2



(a) Check the continuity.

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

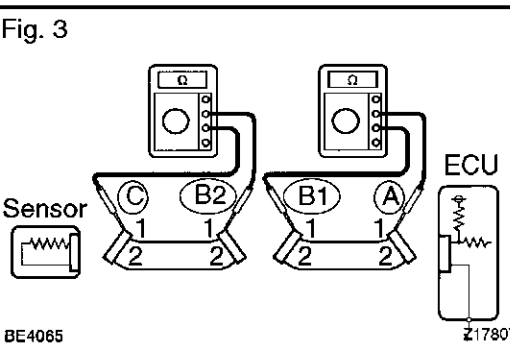
In the case of Fig. 2,

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 them.

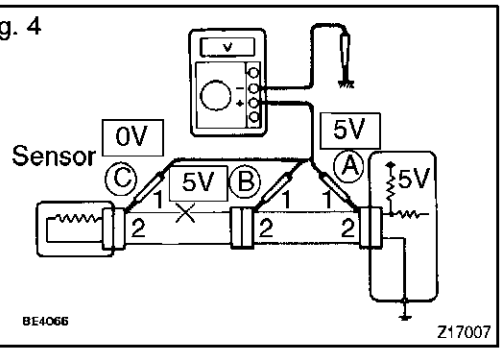
In the case of Fig. 3,

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



(b) Check the voltage.

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

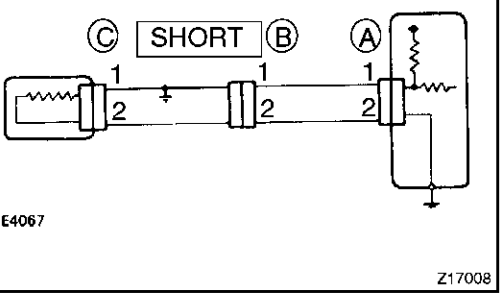
As shown in Fig. 4, with each connector still connected, measure the voltage between body ground and terminal 1 of connector "A" at the ECU 5V output terminal, terminal 1 of connector "B", and terminal 1 of connector "C", in that order.

If the results are:

5V: Between Terminal 1 of connector "A" and Body Ground
5V: Between Terminal 1 of connector "B" and Body Ground
0V: 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".

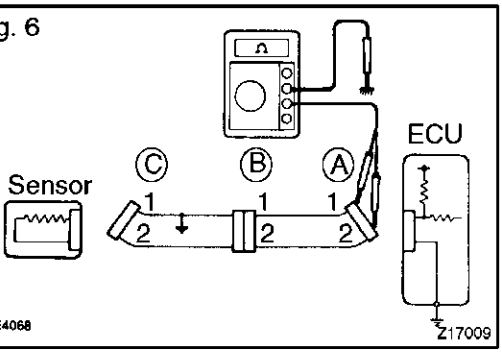
Fig. 5



7. CHECK SHORT CIRCUIT

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

Fig. 6



Check the continuity with ground.

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

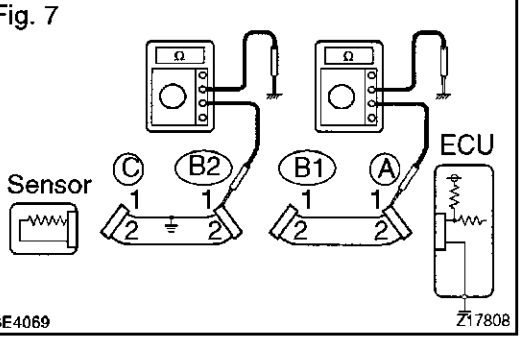
In the case of Fig. 6

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".

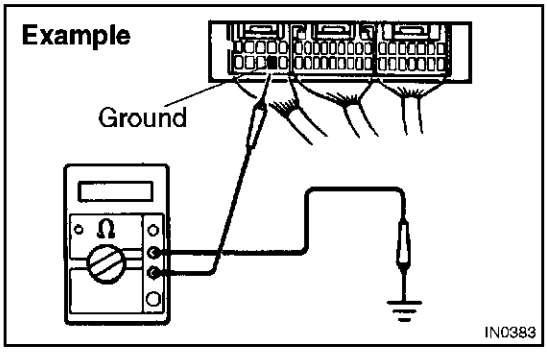
Fig. 7



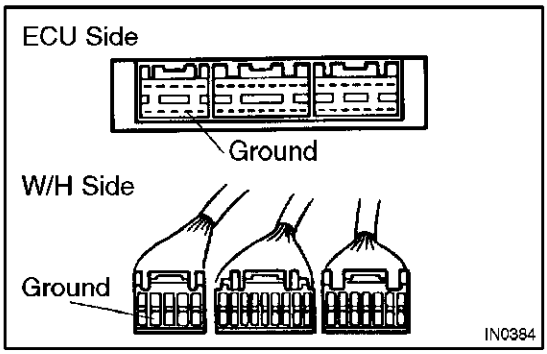
(2) Disconnect connector "B" and measure the resistance between terminal 1 of connector "A" and body ground, and terminal 1 of connector "B2" and body ground.
Between terminal 1 of connector "A" and body ground → No continuity
Between terminal 1 of connector "B2" and body ground → Continuity (short)
Therefore, it is found out that there is a short circuit between terminal 1 of connector "B2" and terminal 1 of connector "C".

8. CHECK AND REPLACE ECU

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

IN044–02

Abbreviations	Meaning
ABS	Anti–Lock Brake System
ALT	Automatic Locking Retractor
A/T	Automatic Transmission (Transaxle)
ATF	Automatic Transmission Fluid
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
CB	Circuit Breaker
CRS	Child Restraint System
DOHC	Double Over Head Cam
DP	Dash Pot
ECU	Electronic Control Unit
ELR	Emergency Locking Retractor
EPR	Evaporator Pressure Regulator
ESA	Electronic Spark Advance
FIPG	Formed in Place Gasket
FL	Fusible Link
FPU	Fuel Pressure Up
FR, Fr	Front
HAC	High Altitude Compensation
IG	Ignition
IN	Intake (Manifold, Valve)
INT	Intermittent
J/B	Junction Block
LED	Light Emitting Diode
LH	Left–Hand
LHD	Left–Hand Drive
LLC	Long Life Coolant (Year Around Coolant)
Max.	Maximum
Min.	Minimum
MP	Multipurpose
M/T	Manual Transmission (Transaxle)
O/D, OD	Overdrive
O/S	Oversize
PCV	Positive Crankcase Ventilation
PKB	Parking Brake
PS	Power Steering
RH	Right–Hand
RR, Rr	Rear
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard

SW	Switch
TDC	Top Dead Center
U/S	Undersize
VCV	Vacuum Control Valve
VSV	Vacuum Switching Valve
VTV	Vacuum Transmitting Valve
w/	With
w/o	Without

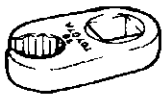
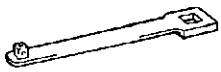
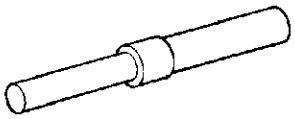
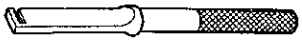
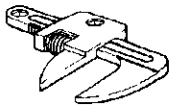
PREPARATION

CLUTCH PP–1
MANUAL TRANSAXLE (C50, C250) PP–4
MANUAL TRANSAXLE (S50, S54) PP–11
AUTOMATIC TRANSAXLE (A241E) PP–17
AUTOMATIC TRANSAXLE
(A245E, A246E) PP–22
SUSPENSION AND AXLE PP–27
BRAKE PP–33
STEERING PP–37
SUPPLEMENTAL RESTRAINT SYSTEM ... PP–42
BODY ELECTRICAL PP–45
BODY PP–49
AIR CONDITIONING PP–54

CLUTCH

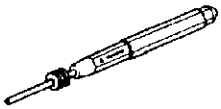
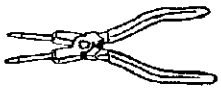
SST (Special Service Tools)

PP119–01

	09023–00100	Union Nut Wrench 10 mm	Clutch line
	09249–63010	Torque Wrench Adaptor	LHD Clutch line
	09301–00120	Clutch Guide Tool	
	09301–00210	Clutch Guide Tool	
	09333–00013	Clutch Diaphragm Spring Aligner	
	09922–10010	Variable Open Wrench	2C–TE RHD Clutch accumulator

PP11A–01

RECOMMENDED TOOLS

	09031–00030	Pin Punch .	Reservoir tank
	09905–00013	Snap Ring Pliers .	

PP04L–01

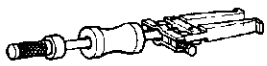
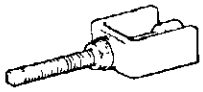
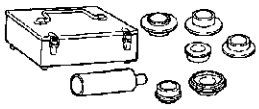
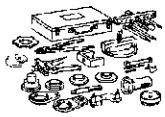
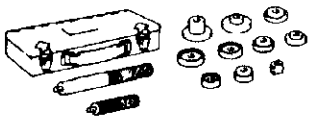
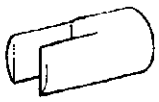
EQUIPMENT

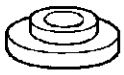
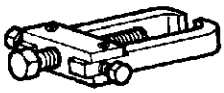
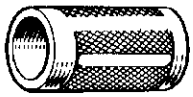
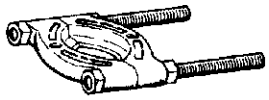
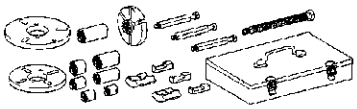
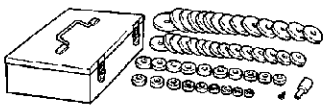
Calipers	
Dial indicator	
Torque wrench	

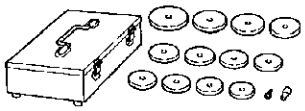
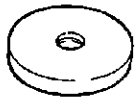
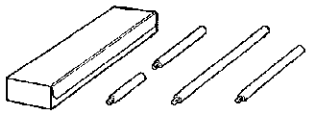
MANUAL TRANSAXLE (C50, C250)

PP11B-01

SST (Special Service Tools)

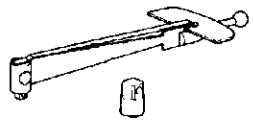
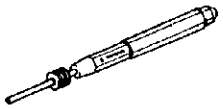
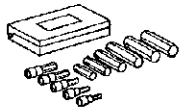
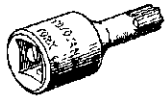
	09308–00010	Oil Seal Puller	Output shaft front bearing
	09309–12020	5th Driven Gear Replacer	
	09316–60011	Transmission & Transfer Bearing Replacer	Output shaft rear ball bearing
	(09316–00021)	Replacer "A"	
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32111)	Side Bearing Race Replacer	Differential case oil seal
	(09351–32130)	Handle	
	(09351–32150)	Oil Seal Replacer	Differential case oil seal
	09550–10012	Replacer Set "B"	Differential side bearing
	(09252–10010)	No. 1 Replacer Handle	
	(09556–10010)	Differential Drive Pinion Front Bearing Remover	
	09564–32011	Differential Preload Adaptor	

	09608–03071	Replacer	Input shaft rear ball bearing
	09612–65014	Steering Worm Bearing Puller	Input shaft front bearing Differential side bearing outer race
	09628–62011	Ball Joint Puller	5th driven gear
	09636–20010	Upper Ball Joint Dust Cover Replacer	No.3 hub sleeve assembly
	09950–00020	Bearing Remover	
	09950–00030	Bearing Remover Attachment	Differential side bearing
	09950–30010	Puller A Set	No.3 clutch hub
	09950–40011	Puller B Set	5th driven gear
	(09957–04010)	Attachment	
	09950–60010	Replacer Set	
	(09951–00230)	Replacer 23	5th driven gear
	(09951–00360)	Replacer 36	Differential side bearing
	(09951–00400)	Replacer 40	Input shaft front oil seal

	(09951–00460) Replacer 46	Input shaft front bearing Differential side bearing
	(09951–00620) Replacer 62	Output shaft front bearing
	09950–60020 Replacer Set No.2	
	(09951–00680) Replacer 68	Differential side bearing outer race (Transaxle case side)
	(09951–00710) Replacer 71	Differential side bearing outer race (Transmission case side)
	09950–70010 Handle Set	
	(09951–07150) Handle 150	

PP04O–02

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	Differential preload
	09031–00030	Pin Punch .	
	09040–00010	Hexagon Wrench Set .	
	09042–00010	Torx Socket T30 .	
	09905–00012	Snap Ring No.1 Expander .	

PP04Q–01

EQUIPMENT

Dial indicator with magnetic base	
Feelergauge	
Micrometer	
Torque wrench	
Magneticfinger	

PP04S–01

LUBRICANT

Item	Capacity	Classification
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

PP11C–01

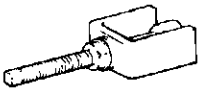
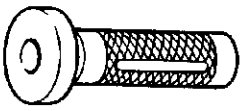
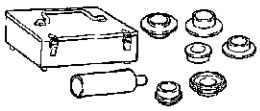
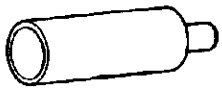
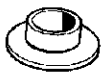
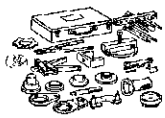
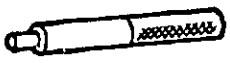
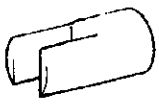
SSM (Special Service Materials)

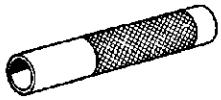
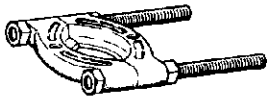
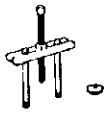
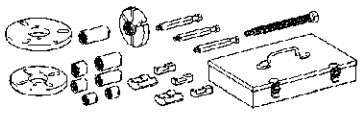
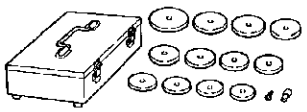
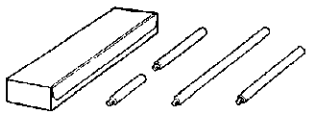
08826–00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transmission case x Transaxle case Transmission case x Case cover
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	Transmission case cover bolt Straight screw plug Control shaft cover bolt

MANUAL TRANSAXLE (S50, S54)

PP0H2–02

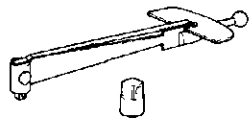
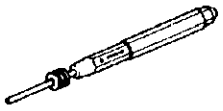
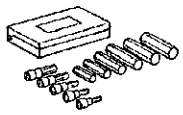
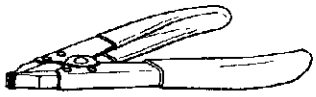
SST (Special Service Tools)

	09308–00010	Oil Seal Puller	Input shaft front bearing Output shaft front bearing
	09309–12020	5th Driven Gear Replacer	5th driven gear
	09310–35010	Countershaft Bearing Replacer	Input shaft front bearing Output shaft front bearing
	09316–60011	Transmission & Transfer Bearing Replacer	
	(09316–00011)	Replacer Pipe	3rd driven gear Differential side bearing
	(09316–00041)	Replacer "C"	Output shaft thrust washer
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32120)	Overdrive Bearing Replacer	Differential side bearing
	(09351–32130)	Handle	Differential side bearing retainer oil seal Differential case oil seal (Transaxle case side)
	(09351–32150)	Oil Seal Replacer	Differential side bearing retainer oil seal Differential case oil seal (Transaxle case side)
	09564–32011	Differential Preload Adaptor	
	09608–00071	Drive Pinion Rear Bearing Cone Replacer	Input shaft rear bearing

	09608–00081	Differential Side Bearing Cone Replacer	Input shaft front oil seal
	09612–22011	Tilt Handle Bearing Replacer	Output shaft rear bearing No.3 clutch hub
	09950–00020	Bearing Remover	
	09950–00030	Bearing Remover Attachment	
	09950–30010	Puller A Set	No.3 clutch hub
	09950–40011	Puller B Set	5th driven gear
	09950–60020	Replacer Set No.2	Differential side bearing retainer oil seal Differential side bearing outer race
	(09951–00680)	Replacer 68	
	09950–70010	Handle Set	
	(09951–07150)	Handle 150	

PP11D–01

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	Differential preload
	09031–00030	Pin Punch .	
	09040–00010	Hexagon Wrench Set .	
	09905–00012	Snap Ring No.1 Expander .	

PP0H4–01

EQUIPMENT

Dial indicator	
Torque wrench	
Feeler gauge	
Magnetic finger	
Micrometer	

PP0H5–02

LUBRICANT

Item	Capacity	Classification
Manual transaxle oil (w/ Differential oil)	2.2 liters (2.3 US qts, 1.9 Imp. qts)	API GL–4 or GL–5 SAE 75W–90

PP11E–01

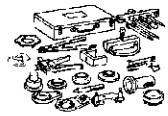
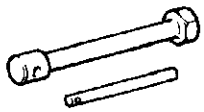
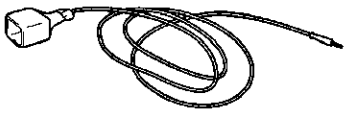
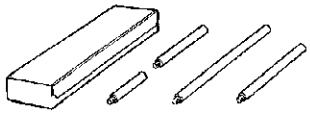
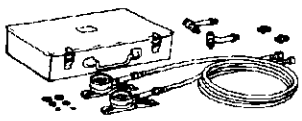
SSM (Special Service Materials)

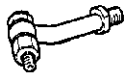
08826–00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transmission case x Transaxle case Transmission case x Case cover
08833–00070	Adhesive 1324, THREE BOND 1324 or equivalent	Rear bearing retainer set bolt
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	Straight screw plug Control shaft cover bolt Lock ball assembly

AUTOMATIC TRANSAXLE (A241E)

PP124–01

SST (Special Service Tools)

	09308–00010	Oil Seal Puller	Side gear shaft oil seal
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32010)	One–way Clutch Test Tool	
	(09351–32020)	Stator Stopper	
	(09351–32111)	Side Bearing Race Replacer	
	(09351–32150)	Oil Seal Replacer	
	09843–18020	Diagnosis Check Wire	
	09843–18030	Tacho–pulse Pickup Wire No.2	
	09843–18040	Diagnosis Check Wire No.2	
	09950–70010	Handle Set	
	(09951–07100)	Handle 100	
	09992–00095	Automatic Transmission Oil Pressure Gauge Set	Line pressure

	(09992–00231) Adaptor C	
	(09992–00271) Gauge Assy	

PP125–01

RECOMMENDED TOOLS

	09082–00040 TOYOTA Electrical Tester.	

PP126–01

EQUIPMENT

Straight edge	Torque converter
Scale	Torque converter
Dial indicator or dial indicator with magnetic base	Drive plate
Torque wrench	

PP127–01

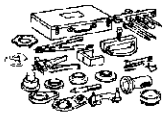
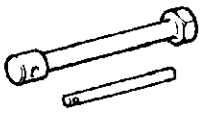
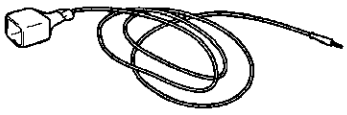
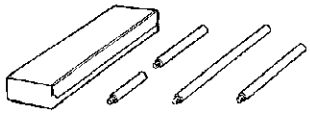
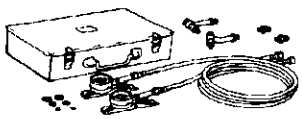
LUBRICANT

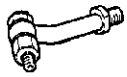
Item	Capacity	Classification
Automatic transaxle fluid		
Dry fill	8.0 liters (8.5 US qts, 7.0 Imp. qts)	ATF D–II or DEXRON III (DEXRON II)
Drain and refill	3.3 liters (3.5 US qts, 2.9 Imp. qts)	

AUTOMATIC TRANSAXLE (A245E, A246E)

PP113–01

SST (Special Service Tools)

	09308–00010	Oil Seal Puller	
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32010)	One–way Clutch Test Tool	
	(09351–32020)	Stator Stopper	
	(09351–32111)	Side Bearing Race Replacer	
	(09351–32150)	Oil Seal Replacer	
	09843–18020	Diagnosis Check Wire	
	09843–18030	Tacho–pulse Pickup Wire No.2	
	09843–18040	Diagnosis Check Wire No.2	
	09950–70010	Handle Set	
	(09951–07100)	Handle 100	
	09992–00095	Automatic Transmission Oil Pressure Gauge Set	

	(09992–00231) Adaptor C	
	(09992–00271) Gauge Assy	

PP114–01

RECOMMENDED TOOLS

	09082–00040 TOYOTA Electrical Tester.	

PP115–01

EQUIPMENT

Straight edge	Torque converter
Scale	Torque converter
Dial indicator or dial indicator with magnetic base	Drive plate
Torque wrench	

PP116–01

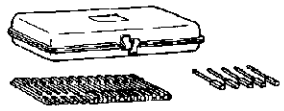
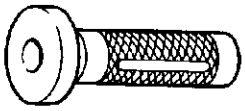
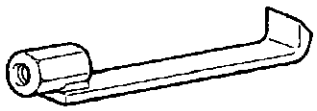
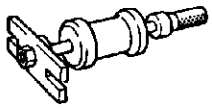
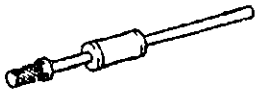
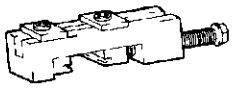
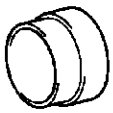
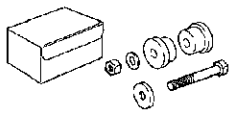
LUBRICANT

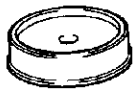
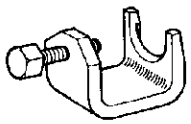
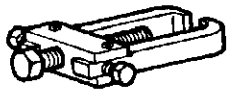
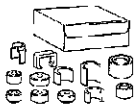
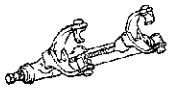
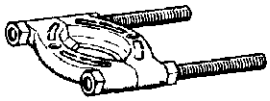
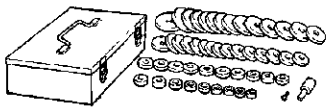
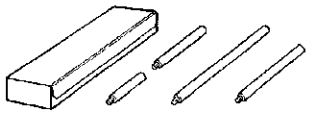
Item	Capacity	Classification
Automatic transaxle fluid		
Dry fill	7.6 liters (8.0 US qts, 6.7 Imp. qts)	ATF D–II or DEXRON®III (DEXRON®II)
Drain and refill	3.1 liters (3.3 US qts, 2.7 Imp. qts)	

SUSPENSION AND AXLE

SST (Special Service Tools)

PP11G–01

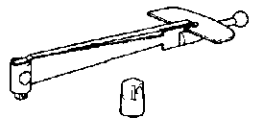
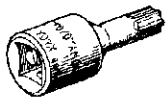
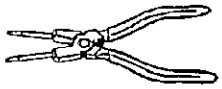
	09240–00020	Wire Gauge Set	Front drive shaft
	09310–35010	Countershaft Bearing Replacer	Front axle
	09506–35010	Differential Drive Pinion Rear Bearing Replacer	Front drive shaft
	09520–01010	Drive Shaft Remover Attachment	Front drive shaft
	09520–00031	Rear Axle Shaft Puller	Front axle
	09520–24010	Differential Side Gear Shaft Puller	Front drive shaft
	(09520–32040)	Shocker Set	
	09521–24010	Drive Shaft Boot Clamping Tool	Front drive shaft
	09527–17011	Rear Axle Shaft Bearing Remover	Front axle
	09608–16042	Front Hub Bearing Adjusting Tool	Front drive shaft
	(09608–02021)	Bolt & Nut	
	(09608–02041)	Retainer	

	09608–32010	Steering Knuckle Oil Seal Replacer	Front axle
	09628–10011	Ball Joint Puller	Front axle Rear axle
	09628–62011	Ball Joint Puller	Front axle Front suspension
	09710–30021	Suspension Bushing Tool Set	Front drive shaft
	(09710–03141)	Bushing Remover Base	
	09727–30021	Coil Spring Compressor	Front suspension Rear suspension
	09729–22031	Front Spring Upper Seat Holder	Front suspension
	09950–00020	Bearing Remover	Front axle Front drive shaft
	09950–60010	Replacer Set	
	(09951–00390)	Replacer 39	Front axle
	(09951–00640)	Replacer 64	Front axle Front drive shaft
	09950–70010	Handle Set	
	(09951–07100)	Handle 100	Front axle

	(09951–07150) Handle 150	Front axle Front drive shaft

PP11H–01

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	
	09042–00010	Torx Socket T30 .	
	09905–00012	Snap Ring No.1 Expander .	
	09905–00013	Snap Ring Pliers .	

PP11I–01

EQUIPMENT

Dial indicator	
Torque wrench	
drill	

PP11J–01

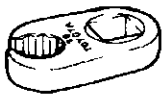
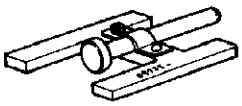
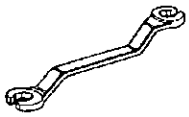
LUBRICANT

Item		Capacity	Application
2C–TE and 2C–T engine:			
Outboard joint grease	Color=Black	85 – 105 g (3.00 – 3.70 oz.)	
Inboard joint grease	Color=Yellow	120 – 130 g (4.23 – 4.59 oz.)	
Others:			
Outboard joint grease	Color=Black	85 – 105 g (3.00 – 3.70 oz.)	
Inboard joint grease	Color=Yellow	125.5 – 135.5 g (4.43 – 4.78 oz.)	

BRAKE

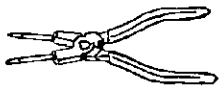
SST (Special Service Tools)

PP16B–01

	09023–00100	Union Nut Wrench 10 mm	
	09709–29018	LSPV Gauge Set	
	09737–00010	Brake Booster Push Rod Gauge	
	09751–36011	Brake Line Union Nut 10 x 12 mm Wrench	
	09843–18020	Diagnosis Check Wire	

PP0UA–02

RECOMMENDED TOOLS

	09042–00030	Torx Socket T20 .	
	09082–00040	TOYOTA Electrical Tester.	
	09905–00013	Snap Ring Pliers .	

PP0UB–01

EQUIPMENT

Torque wrench	
Micrometer	Brake disc
Dial indicator	Brake disc
Vernier calipers	Brake disc

PP0UC–01

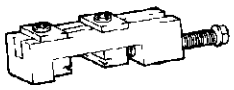
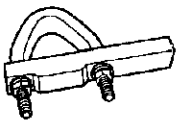
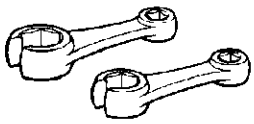
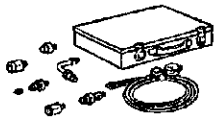
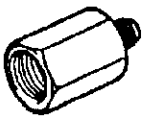
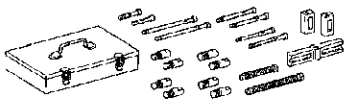
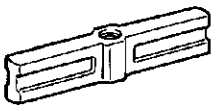
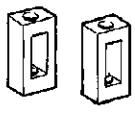
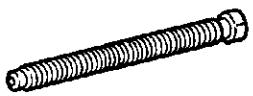
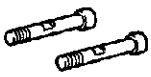
LUBRICANT

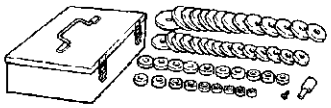
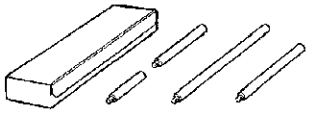
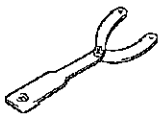
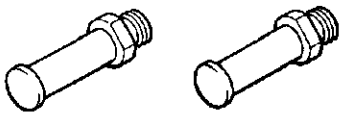
Item	Capacity	Classification
Brake fluid	–	SAE J1703 or FMVSS No.116 DOT3

STEERING

SST (Special Service Tools)

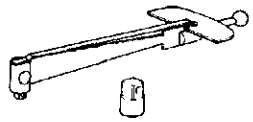
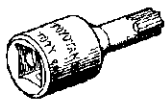
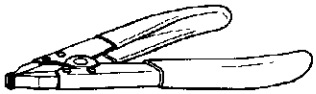
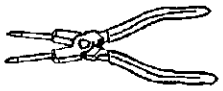
PP10A–01

	09521–24010	Drive Shaft Boot Clamping Tool	PS gear
	09612–00012	Rack & Pinion Steering Rack Housing Stand	PS gear
	09631–22020	Power Steering Hose Nut 14 x 17 mm Wrench Set	PS gear
	09640–10010	Power Steering Pressure Gauge Set	
	(09641–01010)	Gauge Assy	Power steering fluid
	(09641–01030)	Attachment B	Power steering fluid
	(09641–01060)	Attachment E	Power steering fluid
	09950–50010	Puller C Set	
	(09951–05010)	Hanger 150	Tilt steering column
	(09952–05010)	Slide Arm	Tilt steering column
	(09953–05020)	Center Bolt 150	Tilt steering column
	(09954–05020)	Claw No.2	Tilt steering column

	09950–60010	Replacer Set	
	(09951–00310)	Replacer 31	PS vane pump (2C–T, 2C–TE)
	09950–70010	Handle Set	
	(09951–07100)	Handle 100	PS vane pump (2C–T, 2C–TE)
	09960–10010	Variable Pin Wrench Set	
	(09962–01000)	Variable Pin Wrench Arm Assy	PS vane pump (2C–T, 2C–TE)
	(09963–01000)	Pin 10	PS vane pump (2C–T, 2C–TE)

PP10B–01

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	PS vane pump PS gear
	09042–00010	Torx Socket T30 .	Tilt steering column
	09216–00021	Belt Tension Gauge .	Drive belt
	09216–00030	Belt Tension Gauge Cable .	Drive belt
	09904–00010	Expander Set .	
	09905–00012	Snap Ring No.1 Expander .	
	09905–00013	Snap Ring Pliers .	

PP0DD–02

EQUIPMENT

Calipergauge	PS vane pump (2C–T, 2C–TE)
Calipers	PS vane pump (2C–T, 2C–TE)
Feelergauge	PS vane pump (2C–T, 2C–TE)
Micrometer	PS vane pump (2C–T, 2C–TE)
Torque wrench	

PP0DE–02

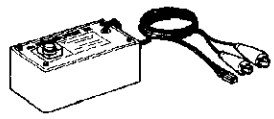
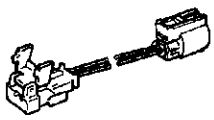
LUBRICANT

Item		Capacity	Classification
Power steering fluid	Total	0.8 liters (0.8 US qts, 0.7 Imp.qts)	ATF DEXRON® II or III

SUPPLEMENTAL RESTRAINT SYSTEM

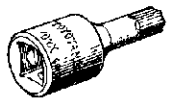
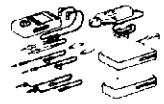
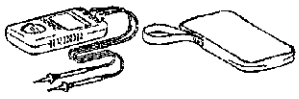
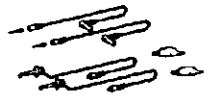
PP0MQ–06

SST (Special Service Tools)

	09082–00700	SRS Airbag Deployment Tool	
	09082–00720	SRS Airbag Deployment Wire	for Driver's and Front Passenger Airbag Assembly
	09082–00750	Airbag Deployment Wire Sub–harness No.3	for Side Airbag Assembly
	09843–18020	Diagnosis Check Wire	

PP16K–01

RECOMMENDED TOOLS

	09042–00020	Torx Socket T40 .	Airbag Sensor Assembly Seatback Assembly
	09082–00050	TOYOTA Electrical Tester Set.	
	09082–00040	TOYOTA Electrical Tester.	
	(09083–00150)	Test Lead Set	for Driver's and Front Passenger Air-bag Assembly

PP0MS–03

EQUIPMENT

Torque wrench	
Bolt: Length: 35 mm (1.38 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.: 360mm (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

BODY ELECTRICAL

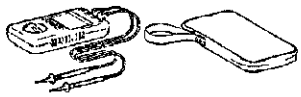
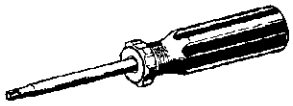
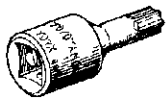
PP12H–01

SST (Special Service Tools)

	09843–18020 Diagnosis Check Wire	

PP12I–01

RECOMMENDED TOOLS

	09082–00040	TOYOTA Electrical Tester.	
	09041–00030	Torx Driver T30 .	For removing and installing steering wheel pad
	09042–00010	Torx Socket T30 .	For removing and installing steering wheel pad

PP12J-01

EQUIPMENT

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	
Syphon	Brake fluid level warning switch
Bulb (3.4 W)	Fuel sender gauge,
Bulb (21 W)	Turn signal flasher relay
Dry cell battery	Fuel sender gauge
Torque wrench	
Masking tape	Rear window defogger wire
Tin foil	Rear window defogger wire

PP12K–01

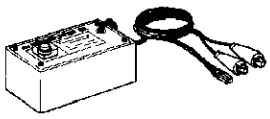
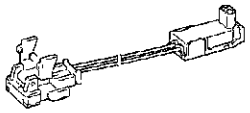
SSM (Special Service Materials)

	08888–88888	DuPont Paste No. 4817 or equivalent	Rear window defogger

BODY

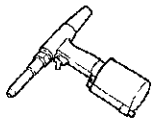
SST (Special Service Tools)

PP05Y–02

	09082–00700	SRS Airbag Deployment Tool	
	09082–00740	Airbag Deployment Wire Sub–harness No.2	
	09804–24010	Luggage Compartment Door Torsion Bar Tool	
	09806–30010	Windshield Moulding Remover	
	09812–00010	Door Hinge Set Bolt Wrench	

PP05Z–01

RECOMMENDED TOOLS

	09050–20010 Air Riveter.	
	(09050–02010) Dust Cap.	
	(09050–02040) Nose Piece No.3.	

PP060–01

EQUIPMENT

Clip remover	
Torque wrench	
Tape	To avoid surface damage
Adhesive tape	To avoid surface damage
Adhesive	
Cleaner	
Shop rag	
Knife	
Heat light	
Piano wire	
Rope (no projections, difficult to break)	Seat belt pretensioner
Tire Width: 185 mm (7.28 in.) Inner diam: 360 mm (14.17 in.)	Seat belt pretensioner
Tire with disk wheel Width: 185 mm (7.28 in.) Inner diam: 360 mm (14.17 in.)	Seat belt pretensioner
Vinyle bag	Seat belt pretensioner

PP061–01

LUBRICANT

Item	Capacity	Classification
MP grease	–	–

PP0TC–01

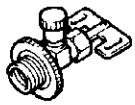
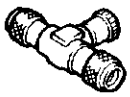
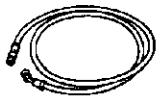
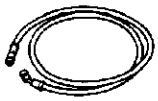
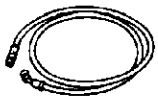
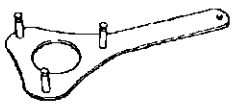
SSM (Special Service Materials)

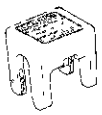
08833–00070	Adhesive 1324, THREE BOND 1324 or equivalent	
08833–00030	Three cement black or equivalent	
08850–00801	Windshield Glass Adhesive Set or equivalent	

AIR CONDITIONING

SST (Special Service Tools)

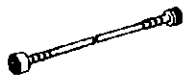
PP14L–01

	07110–58060	Air Conditioner Service Tool Set	
	(07117–58060)	Refrigerant Drain Service Valve	
	(07117–58070)	T–Joint	
	(07117–58080)	Quick Disconnect Adapter	High pressure side
	(07117–58090)	Quick Disconnect Adapter	Low pressure side
	(07117–88060)	Refrigerant Charging Hose	High pressure side (Color: Red)
	(07117–88070)	Refrigerant Charging Hose	Low pressure side (Color: Blue)
	(07117–88080)	Refrigerant Charging Hose	Utility (Color: Green)
	07112–15020	Seal Plate Remover	
	07112–66040	Magnetic Clutch Remover	
	07112–76060	Magnetic Clutch Stopper	
	07112–85010	Lip Seal Protector	

	07112–85030	Lip Seal Remover	
	07114–84010	Snap Ring Pliers	
	07114–84020	Snap Ring Pliers	
	07116–38360	Gas Leak Detector Assembly	
	09870–00015	A/C Quick Joint Puller No.1	Suction Tube
	09870–00025	A/C Quick Joint Puller No.2	Liquid Tube

PP094–02

RECOMMENDED TOOLS

	09082–00040	TOYOTA Electrical Tester.	
	09216–00021	Belt Tension Gauge .	
	09216–00030	Belt Tension Gauge Cable .	

PP095–03

EQUIPMENT

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	
Thermometer	Thermistor
Torque wrench	
Thickness gauge	Magnetic clutch
Plastic hammer	Magnetic clutch
Hexagon wrench	Expansion valve
Dry cell battery	Heater control assembly

PP096–01

LUBRICANT

Item	Capacity	Classification
Compressor oil	–	ND–OIL 8 or equivalent
When replacing receiver	20 cc (0.71 fl.oz.)	
When replacing condenser	40 cc (1.4 fl. oz.)	
When replacing evaporator	40 cc (1.4 fl. oz.)	

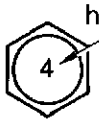
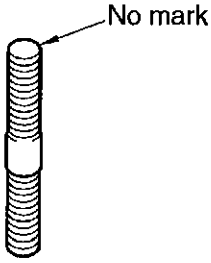
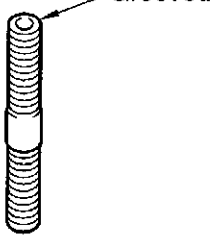
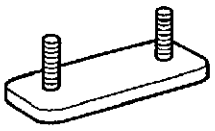
SERVICE SPECIFICATIONS

STANDARD BOLT SS–1
CLUTCH SS–3
MANUAL TRANSAXLE (C50, C250) SS–5
MANUAL TRANSAXLE (S50, S54) SS–8
AUTOMATIC TRANSAXLE (A241E) SS–12
AUTOMATIC TRANSAXLE
(A245E, A246E) SS–17
SUSPENSION AND AXLE SS–23
BRAKE SS–28
STEERING SS–30
SUPPLEMENTAL RESTRAINT SYSTEM ... SS–32
BODY ELECTRICAL SS–33
BODY SS–36
AIR CONDITIONING SS–39

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS00F–01

	Mark	Class		Mark	Class
Hexagon head bolt	 Bolt head No. 4– 5– 6– 7– 8– 9– 10– 11–	4T 5T 6T 7T 8T 9T 10T 11T	Hexagon flange bolt w/ washer hexagon bolt	4 Protruding lines	9T
	No mark	4T	Hexagon flange bolt w/ washer hexagon bolt	5 Protruding lines	10T
Hexagon flange bolt w/ washer hexagon bolt	No mark	4T	Hexagon flange bolt w/ washer hexagon bolt	6 Protruding lines	11T
Hexagon head bolt	2 Protruding lines	5T	Stud bolt	 No mark	4T
Hexagon flange bolt w/ washer hexagon bolt	2 Protruding lines	6T		 Grooved	6T
Hexagon head bolt	3 Protruding lines	7T	Welded bolt		4T
Hexagon head bolt	4 Protruding lines	8T			

V06821

SS00G–01

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	

V00079

CLUTCH

SERVICE DATA

SS02L–02

Pedal height from asphalt sheet	4A–FE, 7A–FE Engine LHD	139.7 – 149.7 mm (5.499 – 5.893 in.)
	RHD	148.7 – 158.7 mm (5.854 – 6.248 in.)
	3S–FE, 2C–TE, 2C–T Engine LHD	148.3 – 158.3 mm (5.838 – 6.232 in.)
	RHD	157.4 – 167.4 mm (6.196 – 6.590 in.)
Pedal freeplay		1.0 – 5.0 mm (0.039 – 0.197 in.)
Push rod play at pedal top		5.0 – 15.0 mm (0.197 – 0.591 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Slotted spring pin protrusion	RHD	1.5 – 3.5 mm (0.059 – 0.138 in.)
Disc rivet head depth	Min.	0.3 mm (0.012 in.)
Disc runout	Max.	0.8 mm (0.031 in.)
Flywheel runout	Max	0.1 mm (0.004 in.)
Diaphragm spring finger wear	Max. depth	0.5 mm (0.020 in.)
Diaphragm spring finger wear	Max. width	6.0 mm (0.236 in.)
Diaphragm spring tip non–alignment	Max.	0.5 mm (0.020 in.)

SS02M–02

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Clutch line union		15	155	11
Master cylinder installation nut		12	120	9
Master cylinder x Clutch accumulator	2C–TE Engine RHD	32 (44)	330 (450)	24 (33)
Bleeder plug		8.3	85	74 in.·lbf
Release cylinder installation bolt		12	120	9
No.1 and No.2 air tube assembly		25	250	18
Clutch cover x Flywheel		19	195	14
Release fork support	4A–FE, 7A–FE Engine	37	375	27
	3S–FE, 2C–TE, 2C–T Engine	39	400	29

( ): For use without SST

MANUAL TRANSAXLE (C50, C250)

SERVICE DATA

SS02P–02

Input shaft roller bearing journal diameter	Min.	24.970 mm (0.9831 in.)
Input shaft 3rd gear journal diameter	Min.	30.970 mm (1.2193 in.)
Input shaft 4th gear journal diameter	Min.	28.970 mm (1.1405 in.)
Input shaft 5th gear journal diameter	Min.	24.870 mm (0.9791 in.)
Input shaft runout	Max.	0.05 mm (0.0020 in.)
Output shaft roller bearing journal diameter	Min.	32.970 mm (1.2980 in.)
Output shaft 1st gear journal diameter	Min.	37.970 mm (1.4949 in.)
Output shaft 2nd gear journal diameter	Min.	31.970 mm (1.2587 in.)
Output shaft runout	Max.	0.05 mm (0.0020 in.)
Gear thrust clearance 1st	STD Max.	0.10 – 0.40 mm (0.0039 – 0.0157 in.) 0.45 mm (0.0177 in.)
Gear thrust clearance 2nd	STD Max.	0.10 – 0.45 mm (0.0039 – 0.0177 in.) 0.50 mm (0.0197 in.)
Gear thrust clearance 3rd	STD Max.	0.10 – 0.35 mm (0.0039 – 0.0138 in.) 0.40 mm (0.0157 in.)
Gear thrust clearance 4th	STD Max.	0.10 – 0.55 mm (0.0039 – 0.0217 in.) 0.60 mm (0.0236 in.)
Gear thrust clearance 5th	STD Max.	0.10 – 0.57 mm (0.0039 – 0.0244 in.) 0.65 mm (0.0256 in.)
Gear radial clearance 1st, 2nd, 3rd, 4th, and 5th	STD Max.	0.015 – 0.058 mm (0.0006 – 0.0023 in.) 0.070 mm (0.0028 in.)
Shift fork to hub sleeve clearance	Max.	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance	Min.	0.6 mm (0.024 in.)
Drive in depth		
Control shaft cover oil seal		1.0 – 2.0 mm (0.039 – 0.079 in.)
Transmission case oil seal		2.4 ± 0.3 mm (0.094 ± 0.012 in.)
Transaxle case oil seal		2.4 ± 0.3 mm (0.094 ± 0.012 in.)
Select inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.1 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.2 shift inner lever slotted spring pin		3.5 ± 0.5 mm (0.138 ± 0.020 in.)
Input shaft snap ring thickness		
No.2 clutch hub	Mark 0	2.30 mm (0.0906 in.)
	Mark 1	2.36 mm (0.0929 in.)
	Mark 2	2.42 mm (0.0953 in.)
	Mark 3	2.48 mm (0.0976 in.)
	Mark 4	2.54 mm (0.1000 in.)
	Mark 5	2.60 mm (0.1024 in.)
Rear bearing	Mark A	2.29 mm (0.0902 in.)
	Mark B	2.35 mm (0.0925 in.)
	Mark C	2.41 mm (0.0949 in.)
	Mark D	2.47 mm (0.0972 in.)
	Mark E	2.53 mm (0.0996 in.)
	Mark F	2.59 mm (0.1020 in.)

Output shaft snap ring thickness		
No.1 clutch hub	Mark A	2.50 mm (0.0984 in.)
	Mark B	2.56 mm (0.1008 in.)
	Mark C	2.62 mm (0.1031 in.)
	Mark D	2.68 mm (0.1055 in.)
	Mark E	2.74 mm (0.1079 in.)
	Mark F	2.80 mm (0.1102 in.)
No.3 clutch hub	Mark A	2.25 mm (0.0886 in.)
	Mark B	2.31 mm (0.0909 in.)
	Mark C	2.37 mm (0.0933 in.)
	Mark D	2.43 mm (0.0957 in.)
	Mark E	2.49 mm (0.0980 in.)
	Mark F	2.55 mm (0.1004 in.)
	Mark G	2.61 mm (0.1028 in.)
Differential side bearing preload (at starting)(For use with SST)		
	New bearing	0.8 –1.6 N·m 8 – 16 kgf·cm 6.9 – 13.9 in.·lbf
	Reused bearing	0.5 –1.0 N·m 5 – 10 kgf·cm 4.3 – 8.7 in.·lbf
Differential pinion to side gear backlash		0.05 mm – 0.20 mm (0.0020 – 0.0079 in.)
Differential side gear thrust washer thickness		0.95 mm (0.0374 in.)
		1.00 mm (0.0394 in.)
		1.05 mm (0.0413 in.)
		1.10 mm (0.0433 in.)
		1.15 mm (0.0453 in.)
		1.20 mm (0.0472 in.)
Differential side bearing adjusting shim thickness		
	Mark A	2.10 mm (0.0827 in.)
	Mark B	2.15 mm (0.0846 in.)
	Mark C	2.20 mm (0.0866 in.)
	Mark D	2.25 mm (0.0886 in.)
	Mark E	2.30 mm (0.0906 in.)
	Mark F	2.35 mm (0.0925 in.)
	Mark G	2.40 mm (0.0945 in.)
	Mark H	2.45 mm (0.0965 in.)
	Mark J	2.50 mm (0.0984 in.)
	Mark K	2.55 mm (0.1004 in.)
	Mark L	2.60 mm (0.1024 in.)
	Mark M	2.65 mm (0.1043 in.)
	Mark N	2.70 mm (0.1063 in.)
	Mark P	2.75 mm (0.1083 in.)
	Mark Q	2.80 mm (0.1102 in.)
	Mark R	2.85 mm (0.1122 in.)
	Mark S	2.90 mm (0.1142 in.)
	Mark T	2.95 mm (0.1161 in.)
	Mark U	3.00 mm (0.1181 in.)

SS02Q–02

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Clutch line bracket x Transaxle		12	120	9
Clutch release cylinder x Transaxle		12	120	9
Starter x Transaxle		39	400	29
Transaxle x Engine	17 mm head	64	650	47
	14 mm head	46	470	34
Rear end plate x Transaxle (7A–FE Engine)		43	440	32
Stiffener plate set bolt (4A–FE Engine)		43	440	32
Engine left mounting bracket x Transaxle		52	530	38
Engine left mounting bracket x Insulator		87	890	64
Front wheel		216	2,200	159
Filler and Drain plugs		39	400	29
Front exhaust pipe x Exhaust manifold		62	630	46
Center exhaust pipe x Tail exhaust pipe		43	430	32
Front transport hook x Engine mounting center member		39	400	29
Engine mounting center member (See page MX–3)	Bolt A	73	740	54
	Bolt B	72	730	53
Engine rear mounting bracket x Insulator		87	890	64
Shift lever assembly x Body		12	120	9
Shift cable grommet retainer x Body		4.9	50	43 in.·lbf
Transmission control cable bracket x Body		4.9	50	43 in.·lbf
Transmission case x Transaxle case		29	300	22
Transmission case x Transmission case cover		18	185	13
Output shaft front bearing lock plate		11	115	8
Straight screw plug (Reverse restrict pin)		13	130	9
Straight screw plug		25	250	18
Transaxle case receiver x Transaxle case		11	115	8
Differential case x Ring gear		77	790	57
Reverse shift arm bracket set bolt		17	175	13
No.1, No.2, No.3 shift forks and shift head set bolt		16	160	12
Lock ball assembly		39	400	29
Reverse idler gear shaft lock bolt		29	300	22
Rear bearing retainer x Transmission case		27	280	20
5th driven gear lock nut		118	1,200	87
Shift and select lever shaft assembly x Transmission case		20	200	14
Shift and select lever shaft assembly lock bolt		29	300	22
Front bearing retainer x Transaxle case		11	115	8
Control lever housing support bracket x Transaxle case		11	115	8
Oil receiver pipe set bolt		17	175	13
Selecting bellcrank assembly x Transmission case		25	250	18
Back–up light switch		40	410	30
Speed sensor lock plate set bolt		11	115	8
Clutch release fork support		37	375	27

MANUAL TRANSAXLE (S50, S54)

Gear thrust clearance	3rd	STD	0.10 – 0.25 mm (0.0039 – 0.098 in.)

SS09M–02

SERVICE DATA

Input shaft roller bearing journal diameter	Min.	29.970 mm (1.799 in.)
Input shaft 3rd gear journal diameter	Min.	33.090 mm (1.3028 in.)
Input shaft 4th gear journal diameter	Min.	32.470 mm (1.2783 in.)
Input shaft 5th gear journal diameter	Min.	26.970 mm (1.0618 in.)
Input shaft runout	Max.	0.05 mm (0.0020 in.)
Output shaft roller bearing journal diameter	Min.	31.970 mm (1.2587 in.)
Output shaft 1st gear journal diameter	Min.	37.970 mm (1.4949 in.)
Output shaft 2nd gear journal diameter	Min.	31.990 mm (1.2594 in.)
Output shaft runout	Max.	0.05 mm (0.0020 in.)
Gear thrust clearance 1st	STD Max.	0.10 – 0.29 mm (0.0039 – 0.0114 in.) 0.35 mm (0.0138 in.)
Gear thrust clearance 2nd	STD Max.	0.20 – 0.44 mm (0.0079 – 0.0173 in.) 0.50 mm (0.0197 in.)
Gear thrust clearance 4th	STD Max.	0.20 – 0.45 mm (0.0079 – 0.0177 in.) 0.50 mm (0.0197 in.)
Gear thrust clearance 5th	STD Max.	0.20 – 0.40 mm (0.0079 – 0.0157 in.) 0.45 mm (0.0177 in.)
Gear radial clearance 1st, 2nd, 3rd and 4th	STD Max.	0.009 – 0.053 mm (0.0004 – 0.0021 in.) 0.070 mm (0.0028 in.)
Gear radial clearance 5th	STD Max.	0.009 – 0.050 mm (0.0004 – 0.0020 in.) 0.070 mm (0.0028 in.)
Shift fork to hub sleeve clearance	Max.	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance 1st, 3rd and 4th	Min.	0.6 mm (0.024 in.)
Synchronizer ring to gear clearance 2nd	Min.	0.7 mm (0.028 in.)
Differential case side bearing preload (at starting)(For use with SST)		0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Differential pinion to side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Drive in depth Input shaft front oil seal Slotted spring pin for reverse restrict pin Shift and select lever shaft slotted spring pin		 0 – 0.5 mm (0 – 0.020 in.) 13.5 ± 0.5 mm (0.531 ± 0.020 in.) 23.5 ± 1.0 mm (0.925 ± 0.039 in.)
Differential side gear thrust washer thickness		0.95 mm (0.0374 in.) 1.00 mm (0.0394 in.) 1.05 mm (0.0413 in.) 1.10 mm (0.0433 in.) 1.15 mm (0.0453 in.) 1.20 mm (0.0472 in.)

Input shaft snap ring thickness		
No.2 clutch hub	Mark 1	1.95 – 2.00 mm (0.0768 – 0.0787 in.)
	Mark 2	2.00 – 2.05 mm (0.0787 – 0.0807 in.)
	Mark 3	2.05 – 2.10 mm (0.0807 – 0.0827 in.)
	Mark 4	2.10 – 2.15 mm (0.0827 – 0.0846 in.)
	Mark 5	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
	Mark 6	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
No.3 clutch hub	Mark 13	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
	Mark 14	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
	Mark 15	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
	Mark 16	2.35 – 2.40 mm (0.0925 – 0.0945 in.)
	Mark 17	2.40 – 2.45 mm (0.0945 – 0.0965 in.)
	Mark 18	2.45 – 2.50 mm (0.0965 – 0.0984 in.)
	Mark 19	2.50 – 2.55 mm (0.0984 – 0.01004 in.)
	Mark 20	2.55 – 2.60 mm (0.1004 – 0.01024 in.)
	Mark 21	2.60 – 2.65 mm (0.1024 – 0.01043 in.)
	Mark 22	2.65 – 2.70 mm (0.1043 – 0.01063 in.)
	Mark 23	2.70 – 2.75 mm (0.1063 – 0.01083 in.)
	Mark 24	2.75 – 2.80 mm (0.1083 – 0.01102 in.)
	Mark 25	2.80 – 2.85 mm (0.1102 – 0.01122 in.)
	Mark 26	2.85 – 2.90 mm (0.1122 – 0.01142 in.)
	Mark 27	2.90 – 2.95 mm (0.1142 – 0.01161 in.)
Rear bearing	Mark A	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
	Mark B	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
	Mark C	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
	Mark D	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
	Mark E	2.35 – 2.40 mm (0.0925 – 0.0945 in.)

Differential side bearing adjusting shim thickness		
	Mark 1	1.90 mm (0.0748 in.)
	Mark 2	1.95 mm (0.0768 in.)
	Mark 3	2.00 mm (0.0787 in.)
	Mark 4	2.05 mm (0.0807 in.)
	Mark 5	2.10 mm (0.0827 in.)
	Mark 6	2.15 mm (0.0846 in.)
	Mark 7	2.20 mm (0.0866 in.)
	Mark 8	2.25 mm (0.0886 in.)
	Mark 9	2.30 mm (0.0906 in.)
	Mark 10	2.35 mm (0.0925 in.)
	Mark 11	2.40 mm (0.0945 in.)
	Mark 12	2.45 mm (0.0965 in.)
	Mark 13	2.50 mm (0.0984 in.)
	Mark 14	2.55 mm (0.1004 in.)
	Mark 15	2.60 mm (0.1024 in.)
	Mark 16	2.65 mm (0.1043 in.)
	Mark 17	2.70 mm (0.1063 in.)
	Mark 18	2.75 mm (0.1083 in.)
	Mark 19	2.80 mm (0.1102 in.)

SS09N–02

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
No.1 and No.2 air tube assembly (Diesel Engine)		25	250	18
Starter x Transaxle		39	400	29
Clutch release cylinder x Transaxle		12	120	9
Clutch line bracket x Transaxle (See page MX–3, MX–9)	Bolt A	12	120	9
	Bolt B	4.9	50	43 in.·lbf
Engine left mounting bracket x Transaxle		52	530	38
Engine left mounting bracket x Insulator		87	890	64
Transaxle x Engine (Diesel Engine) (See page MX–3)	Upper bolt	64	650	47
	Bolt A	46	470	34
	Bolt B	29	300	22
	Bolt C	25	250	18
Transaxle x Engine (Gasoline Engine) (See page MX–9)	Upper bolt	64	650	47
		25	250	18
Stiffener plate x Transaxle (Gasoline Engine) (See page MX–9)	Bolt A	43	440	32
	Bolt B	21	210	15
Front wheel		216	2,200	159
Filler and Drain plugs		49	500	36
Front exhaust pipe x Exhaust manifold (Gasoline Engine)		62	630	46
Front exhaust pipe x Center exhaust pipe (Gasoline Engine)		43	440	32
Front transport hook x Engine Mounting Center Member		39	400	29
Engine Mounting Center Member (See page MX–3, MX–9)	Bolt A	73	740	54
	Bolt B	72	730	53
Engine rear mounting bracket x Insulator		87	890	64
Engine rear mounting bracket x Transaxle		64	650	47
Intake manifold stay (Gasoline Engine)		44	450	33
Shift lever assembly x Body		12	120	9
Shift cable grommet retainer x Body		4.9	50	43 in.·lbf
Transmission control cable bracket x Body		4.9	50	43 in.·lbf
Transmission case x Transaxle case		29	300	22
Transmission case x Case cover		29	300	22
Transmission case protector		18	185	13
Rear bearing retainer		42	430	31
Output shaft front bearing lock plate		18	185	13
Transaxle case receiver set bolt		7.4	75	65 in.·lbf
5th driven gear lock nut		123	1,250	90
No.3 shift fork x No.1 shift fork shaft		18	185	13
Reverse idler shaft lock bolt		29	300	22
Control shaft cover		37	375	27
Control shift lever x Lever shaft		6.4	65	56 in.·lbf
Ring gear x Differential case		83	850	61
Selecting bellcrank x Transmission case		37	380	27
Reverse shift arm bracket		18	185	13
No.3 shift fork x Shift fork shaft		18	185	13
Lock ball assembly		29	300	22
Back–up light switch		44	450	33

Differential side bearing retainer	18	185	13
Release bearing retainer	7.4	75	65 in.-lbf
Straight screw plug	13	130	9
Speed sensor lock plate set bolt	5.4	55	48 in.-lbf
Clutch release fork support	39	400	29

AUTOMATIC TRANSAXLE (A241E)

SERVICE DATA

SS0J9–01

Line pressure (Wheel locked)		
	Engine idling	
	D range	372 – 422 kPa (3.8 – 4.3 kgf/cm^2, 54 – 61 psi)
	R range	637 – 795 kPa (6.5 – 8.1 kgf/cm^2, 92 – 115 psi)
	AT stall (Throttle valve fully opened)	
	D range	715 – 863 kPa (7.3 – 8.8 kgf/cm^2, 103 – 125 psi)
	R range	1,333 – 1,579 kPa (13.6 – 16.1 kgf/cm^2, 194 – 229 psi)
Engine stall revolution	D and R ranges	2,050 – 2,500 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	750 ± 50 rpm
Throttle cable adjustment (Throttle valve fully opened)		Between boot end face and inner cable stopper 0 – 1 mm (0 – 0.04 in.)
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter runout	Max.	0.30 mm (0.0118 in.)
Torque converter installation distance		More than 12.75 mm (0.502 in.)
Differential oil seal drive in depth	LH side	5.2 ± 0.5 mm (0.205 ± 0.020 in.)
	RH side	0 ± 0.5 mm (0 ± 0.020 in.)
Tire size: 185/65R14		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	45 – 52 km/h (28 – 32 mph)
	2 → 3	84 – 91 km/h (52 – 57 mph)
	3 → O/D	122 – 133 km/h (76 – 83 mph)
	O/D → 3	115 – 125 km/h (71 – 78 mph)
	3 → 2	77 – 83 km/h (48 – 52 mph)
	2 → 1	40 – 46 km/h (25 – 29 mph)
(Throttle valve fully closed)	3 → O/D	30 – 35 km/h (19 – 22 mph)
	O/D → 3	17 – 22 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	40 – 46 km/h (25 – 29 mph)
L range		
(Throttle valve fully opened)	2 → 1	48 – 54 km/h (30 – 34 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	89 – 96 km/h (55 – 60 mph)
	3 → O/D	122 – 133 km/h (76 – 83 mph)
	O/D → 3	115 – 125 km/h (71 – 78 mph)
	3 → 2	82 – 89 km/h (51 – 55 mph)
	2 → 1	40 – 46 km/h (25 – 29 mph)
(Throttle valve fully closed)	3 → O/D	30 – 35 km/h (19 – 22 mph)
	O/D → 3	17 – 22 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	40 – 46 km/h (25 – 29 mph)
L range		
(Throttle valve fully opened)	2 → 1	48 – 54 km/h (30 – 34 mph)

Lock–up point (NORM mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	83 – 90 km/h (52 – 56 mph)
	Lock–up OFF	75 – 81 km/h (47 – 50 mph)
O/D gear	Lock–up ON	63 – 69 km/h (39 – 43 mph)
	Lock–up OFF	60 – 65 km/h (37 – 40 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	83 – 90 km/h (52 – 56 mph)
	Lock–up OFF	75 – 81 km/h (47 – 50 mph)
O/D gear	Lock–up ON	71 – 77 km/h (44 – 48 mph)
	Lock–up OFF	60 – 65 km/h (37 – 40 mph)
Tire size: 195/60R15 (LHD)		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	44 – 51 km/h (27 – 32 mph)
	2 → 3	85 – 92 km/h (53 – 57 mph)
	3 → O/D	118 – 129 km/h (73 – 80 mph)
	O/D → 3	97 – 104 km/h (60 – 65 mph)
	3 → 2	61 – 67 km/h (38 – 42 mph)
	2 → 1	28 – 33 km/h (17 – 21 mph)
(Throttle valve fully closed)	3 → O/D	31 – 36 km/h (19 – 22 mph)
	O/D → 3	18 – 23 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 57 km/h (31 – 35 mph)
	2 → 1	32 – 38 km/h (20 – 24 mph)
L range		
(Throttle valve fully opened)	2 → 1	50 – 56 km/h (31 – 35 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	50 – 57 km/h (31 – 35 mph)
	2 → 3	92 – 100 km/h (57 – 62 mph)
	3 → O/D	126 – 138 km/h (78 – 86 mph)
	O/D → 3	104 – 115 km/h (65 – 71 mph)
	3 → 2	71 – 78 km/h (44 – 48 mph)
	2 → 1	32 – 38 km/h (20 – 24 mph)
(Throttle valve fully closed)	3 → O/D	31 – 36 km/h (19 – 22 mph)
	O/D → 3	18 – 23 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 57 km/h (31 – 35 mph)
	2 → 1	32 – 38 km/h (20 – 24 mph)
L range		
(Throttle valve fully opened)	2 → 1	50 – 56 km/h (31 – 35 mph)
Shift point (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	85 – 92 km/h (53 – 57 mph)
	3 → O/D	118 – 129 km/h (73 – 80 mph)
	O/D → 3	97 – 104 km/h (60 – 65 mph)
	3 → 2	61 – 67 km/h (38 – 42 mph)
(Throttle valve fully closed)	3 → O/D	31 – 36 km/h (19 – 22 mph)
	O/D → 3	18 – 23 km/h (11 – 14 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	86 – 93 km/h (53 – 58 mph)
	Lock–up OFF	77 – 84 km/h (48 – 52 mph)
O/D gear	Lock–up ON	65 – 72 km/h (40 – 45 mph)
	Lock–up OFF	62 – 68 km/h (39 – 42 mph)

Lock–up point (PWR mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	94 – 102 km/h (58 – 63 mph)
	Lock–up OFF	77 – 84 km/h (48 – 52 mph)
O/D gear	Lock–up ON	74 – 80 km/h (46 – 50 mph)
	Lock–up OFF	62 – 68 km/h (39 – 42 mph)
Lock–up point (SNOW mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	86 – 93 km/h (53 – 58 mph)
	Lock–up OFF	77 – 84 km/h (48 – 52 mph)
O/D gear	Lock–up ON	65 – 72 km/h (40 – 45 mph)
	Lock–up OFF	62 – 68 km/h (39 – 42 mph)
Tire size: 195/60R15 (RHD)		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	47 – 54 km/h (29 – 34 mph)
	2 → 3	87 – 94 km/h (54 – 58 mph)
	3 → O/D	126 – 138 km/h (78 – 86 mph)
	O/D → 3	119 – 130 km/h (74 – 81 mph)
	3 → 2	80 – 87 km/h (50 – 54 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
(Throttle valve fully closed)	3 → O/D	31 – 36 km/h (19 – 22 mph)
	O/D → 3	18 – 23 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 57 km/h (31 – 35 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	50 – 56 km/h (31 – 35 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	50 – 57 km/h (31 – 35 mph)
	2 → 3	92 – 100 km/h (57 – 62 mph)
	3 → O/D	126 – 138 km/h (78 – 86 mph)
	O/D → 3	119 – 130 km/h (74 – 81 mph)
	3 → 2	85 – 92 km/h (53 – 57 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
(Throttle valve fully closed)	3 → O/D	31 – 36 km/h (19 – 22 mph)
	O/D → 3	18 – 23 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 57 km/h (31 – 35 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	50 – 56 km/h (31 – 35 mph)
Shift point (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	87 – 94 km/h (54 – 58 mph)
	3 → O/D	126 – 138 km/h (78 – 86 mph)
	O/D → 3	119 – 130 km/h (74 – 81 mph)
	3 → 2	80 – 87 km/h (50 – 54 mph)
(Throttle valve fully closed)	3 → O/D	31 – 36 km/h (19 – 22 mph)
	O/D → 3	18 – 23 km/h (11 – 14 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	86 – 93 km/h (53 – 58 mph)
	Lock–up OFF	77 – 84 km/h (48 – 52 mph)
O/D gear	Lock–up ON	65 – 72 km/h (40 – 45 mph)
	Lock–up OFF	62 – 68 km/h (39 – 42 mph)

Lock–up point (PWR mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	86 – 93 km/h (53 – 58 mph)
	Lock–up OFF	77 – 84 km/h (48 – 52 mph)
O/D gear	Lock–up ON	74 – 80 km/h (46 – 50 mph)
	Lock–up OFF	62 – 68 km/h (39 – 42 mph)
Lock–up point (SNOW mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	86 – 93 km/h (53 – 58 mph)
	Lock–up OFF	77 – 84 km/h (48 – 52 mph)
O/D gear	Lock–up ON	65 – 72 km/h (40 – 45 mph)
	Lock–up OFF	62 – 68 km/h (39 – 42 mph)

SS0JA–01

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Vehicle speed sensor installation bolt		16	160	12
Neutral start switch installation bolt		5.4	55	48 in.·lbf
Neutral start switch lock nut		6.9	70	61 in.·lbf
Control shaft x Control shaft lever		12	120	9
Shift control cable x Control shaft lever		12	120	9
Solenoid valve	A	6.4	65	56 in.·lbf
	B	10	100	7
Valve body x Transaxle case		10	100	7
Manual detent spring x Valve body		10	100	7
Wire clamp x Valve body		10	100	7
Oil pipe bracket x Valve body		10	100	7
Oil pipe clamp x Valve body		10	100	7
Oil strainer x Valve body		10	100	7
Oil pan		4.9	50	43 in.·lbf
Drain plug		17	175	13
Throttle cable x Transaxle case		10	100	7
Shift lever assembly x body		12	120	9
Starter mounting bolt		39	400	29
Ground cable installation bolt		18	185	13
Transaxle upper side mount		64	650	47
LH side engine mount x Body		52	530	38
LH side engine mount bracket x Engine mount		87	890	64
Exhaust front pipe x Exhaust manifold		62	630	46
Exhaust front pipe x Exhaust tailpipe		43	440	32
Front center member	A	73	740	54
	B	39	400	29
	C	72	740	53
Intake camber stay x Intake manifold		43	440	32
Intake camber stay x Rear end stiffener plate		43	440	32
Rear end stiffener plate bolt	A	21	210	15
	B	43	440	32
Engine rear mounting bolt		87	890	64
Engine rear mounting bracket x Transaxle		64	650	47
Torque converter mounting bolt		25	260	19
End plate x Transmission		25	250	18
Engine x Transmission		46	470	34
Drive plate x Crankshaft		64	650	47

AUTOMATIC TRANSAXLE (A245E, A246E)

SS0BC–02

SERVICE DATA

Line pressure (Wheel locked)		
	Engine idling	
	D range	373 – 441 kPa (3.8 – 4.5 kgf/cm^2, 54 – 64 psi)
	R range	598 – 715 kPa (6.1 – 7.3 kgf/cm^2, 87 – 103 psi)
	AT stall (Throttle valve fully opened)	
	D range	981 – 1,138 kPa (10.0 – 11.6 kgf/cm^2, 142 – 165 psi)
	R range	1,392 – 1,716 kPa (14.2 – 17.5 kgf/cm^2, 202 – 249 psi)
Engine stall revolution	D and R ranges	2,350 ± 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	750 ± 50 rpm
Throttle cable adjustment (Throttle valve fully opened)		Between boot end face and inner cable stopper 0 – 1 mm (0 – 0.04 in.)
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter runout	Max.	0.30 mm (0.0118 in.)
Torque converter installation distance		More than 22.8 mm (0.898 in.)
Differential oil seal drive in depth	LH side	5.3 ± 0.5 mm (0.209 ± 0.020 in.)
	RH side	3.1 ± 0.5 mm (0.122 ± 0.020 in.)
A245E		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 3	98 – 108 km/h (61 – 67 mph)
	3 → O/D	184 – 198 km/h (114 – 123 mph)
	O/D → 3	179 – 193 km/h (111 – 120 mph)
	3 → 2	93 – 104 km/h (58 – 65 mph)
	2 → 1	41 – 48 km/h (25 – 30 mph)
(Throttle valve fully closed)	3 → O/D	32 – 38 km/h (20 – 24 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	55 – 60 km/h (34 – 37 mph)
	2 → 1	41 – 48 km/h (25 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	48 – 54 km/h (30 – 34 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	55 – 60 km/h (34 – 37 mph)
	2 → 3	98 – 108 km/h (61 – 67 mph)
	3 → O/D	184 – 198 km/h (114 – 123 mph)
	O/D → 3	179 – 193 km/h (111 – 120 mph)
	3 → 2	93 – 104 km/h (58 – 65 mph)
	2 → 1	41 – 48 km/h (25 – 30 mph)
(Throttle valve fully closed)	3 → O/D	32 – 38 km/h (20 – 24 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	55 – 60 km/h (34 – 37 mph)
	2 → 1	41 – 48 km/h (25 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	48 – 54 km/h (30 – 34 mph)

Lock–up point (NORM mode)	(Throttle valve opening 3 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	53 – 60 km/h (33 – 37 mph)
	Lock–up OFF	51 – 57 km/h (32 – 35 mph)
O/D gear	Lock–up ON	53 – 60 km/h (33 – 37 mph)
	Lock–up OFF	51 – 57 km/h (32 – 35 mph)
Lock–up point (PWR mode)	(Throttle valve opening 3 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	56 – 63 km/h (35 – 39 mph)
	Lock–up OFF	53 – 60 km/h (33 – 37 mph)
O/D gear	Lock–up ON	62 – 70 km/h (39 – 43 mph)
	Lock–up OFF	60 – 67 km/h (37 – 42 mph)
A246E Tire size 185/65R14 (LHD)		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	141 – 153 km/h (88 – 95 mph)
	O/D → 3	130 – 141 km/h (81 – 88 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	141 – 153 km/h (88 – 95 mph)
	O/D → 3	128 – 139 km/h (80 – 86 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	141 – 153 km/h (88 – 95 mph)
	O/D → 3	130 – 141 km/h (81 – 88 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	50 – 57 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)
O/D gear	Lock–up ON	50 – 56 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)

Lock–up point (PWR mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	53 – 60 km/h (33 – 37 mph)
	Lock–up OFF	50 – 56 km/h (31 – 35 mph)
O/D gear	Lock–up ON	59 – 65 km/h (37 – 40 mph)
	Lock–up OFF	56 – 62 km/h (35 – 39 mph)
Tire size 185/65R14 (RHD)		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	146 – 158 km/h (91 – 98 mph)
	O/D → 3	141 – 153 km/h (88 – 95 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	146 – 158 km/h (91 – 98 mph)
	O/D → 3	141 – 153 km/h (88 – 95 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 44 km/h (24 – 27 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	146 – 158 km/h (91 – 98 mph)
	O/D → 3	141 – 153 km/h (88 – 95 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	50 – 57 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)
O/D gear	Lock–up ON	50 – 56 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	53 – 60 km/h (33 – 37 mph)
	Lock–up OFF	50 – 56 km/h (31 – 35 mph)
O/D gear	Lock–up ON	59 – 65 km/h (37 – 40 mph)
	Lock–up OFF	56 – 62 km/h (35 – 39 mph)

Tire size 195/60R15 (LHD)		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	141 – 154 km/h (88 – 96 mph)
	O/D → 3	130 – 142 km/h (81 – 88 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 45 km/h (24 – 28 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 45 km/h (24 – 28 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	141 – 154 km/h (88 – 96 mph)
	O/D → 3	128 – 140 km/h (80 – 87 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 45 km/h (24 – 27 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 45 km/h (24 – 28 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	141 – 154 km/h (88 – 96 mph)
	O/D → 3	129 – 142 km/h (80 – 88 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	50 – 57 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)
O/D gear	Lock–up ON	50 – 57 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	53 – 60 km/h (33 – 37 mph)
	Lock–up OFF	50 – 57 km/h (31 – 35 mph)
O/D gear	Lock–up ON	59 – 66 km/h (37 – 41 mph)
	Lock–up OFF	56 – 63 km/h (35 – 39 mph)

Tire size 195/60R15 (RHD)		
Shift point (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	146 – 159 km/h (91 – 99 mph)
	O/D → 3	141 – 154 km/h (88 – 96 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 45 km/h (24 – 28 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 45 km/h (24 – 28 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	146 – 159 km/h (91 – 99 mph)
	O/D → 3	141 – 154 km/h (88 – 96 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 → 1	39 – 45 km/h (24 – 28 mph)
(Throttle valve fully closed)	3 → O/D	30 – 36 km/h (19 – 22 mph)
	O/D → 3	14 – 19 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	48 – 55 km/h (30 – 34 mph)
	2 → 1	39 – 45 km/h (24 – 28 mph)
L range		
(Throttle valve fully opened)	2 → 1	43 – 49 km/h (27 – 30 mph)
Shift point (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	91 – 99 km/h (57 – 62 mph)
	3 → O/D	146 – 159 km/h (91 – 99 mph)
	O/D → 3	141 – 154 km/h (88 – 96 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	50 – 57 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)
O/D gear	Lock–up ON	50 – 57 km/h (31 – 35 mph)
	Lock–up OFF	48 – 54 km/h (30 – 34 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5 %)	
3rd gear (O/D main switch OFF)	Lock–up ON	53 – 60 km/h (33 – 37 mph)
	Lock–up OFF	50 – 57 km/h (31 – 35 mph)
O/D gear	Lock–up ON	59 – 66 km/h (37 – 41 mph)
	Lock–up OFF	56 – 63 km/h (35 – 39 mph)

SS0BP–02

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Vehicle speed sensor installation		16	160	12
Neutral start switch x Transmission case		5.4	55	48 in.·lbf
Neutral start switch lock nut		6.9	70	61 in.·lbf
Control shaft lever x Control shaft		12	120	9
Shife control cable x Control shaft lever		13	130	9
Valve body x Transmission case		10	100	7
Wire retainer x Valve body		6.4	65	56 in.·lbf
Manual detent spring x Valve body		10	100	7
Oil strainer x Valve body		10	100	7
Oil pan		5.3	55	48 in.·lbf
Drain plug		17	175	13
Throttle cable installation bolt		10	100	7
Shift lever assembly x Body		12	120	9
Gronud cable installation bolt		18	185	13
Wire harness clamp installation bolt		13	130	9
Transaxle mounting bolt	17 mm bolt	64	650	47
	14 mm bolt	46	470	34
Srarter mounting bolt	Upper side	46	470	34
	Lower side	39	400	29
LH side engine mounting bolt		52	530	38
Exhaust front pipe x Exhaust manifold		62	630	46
Exhaust front pipe x Exhaust tailpipe		43	440	32
Front center member x Body		73	740	54
Front center member x Suspension member		73	740	54
Front center member protector x Front center member		39	400	29
Front cente member x Engine front mount		72	740	53
Rear end stiffener plate		43	440	32
Engine rear mounting bolt		87	890	64
Engine rear mounting bracket x Transaxle		64	650	47
Torque converter mounting bolt		25	260	19
Drive plate x Crankshaft		64	650	47

SUSPENSION AND AXLE

SERVICE DATA

SS0IY–01

Cold tire inflation pressure (Standard inflation for all loads including full rated loads)	185/65R14 86H	Front*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Rear*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Front*2	260 kPa (2.6 kgf/cm^2, 38 psi)
		Rear*2	270 kPa (2.7 kgf/cm^2, 39 psi)
	195/60R15 88H	Front*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Rear*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Front*2	240 kPa (2.4 kgf/cm^2, 35 psi)
		Rear*2	260 kPa (2.6 kgf/cm^2, 38 psi)
Cold tire inflation pressure (Optional inflation for reduced loads (1 to 4 passengers))	185/65R14 86H	Front*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Rear*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Front*2	250 kPa (2.5 kgf/cm^2, 36 psi)
		Rear*2	260 kPa (2.6 kgf/cm^2, 38 psi)
	195/60R15 88H	Front*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Rear*1	220 kPa (2.2 kgf/cm^2, 32 psi)
		Front*2	230 kPa (2.3 kgf/cm^2, 33 psi)
		Rear*2	240 kPa (2.4 kgf/cm^2, 35 psi)
Front wheel alignment (Rough road package)	Vehicle height		
	SEDAN and LIFTBACK 185/65R14 86H	Front*3	206 mm (8.11 in.)
		Rear*4	269 mm (10.59 in.)
	195/60R15 88H	Front*3	216 mm (8.50 in.)
		Rear*4	279 mm (10.98 in.)
	WAGON 185/65R14 86H	Front*3	205 mm (8.07 in.)
		Rear*4	263 mm (10.35 in.)
	195/60R15 88H	Front*3	215 mm (8.46 in.)
		Rear*4	273 mm (10.75 in.)
	Camber		–0°50' ± 45' (–0.83° ± 0.75°)
		Left – right error	45' (0.75°) or less
	Caster		1°15' ± 45' (1.25° ± 0.75°)
		Left – right error	45' (0.75°) or less
	Steering axis inclination		14°14' ± 45' (14.23° ± 0.75°)
	Toe–in (Total)		0°06' ± 12' (0.1° ± 0.2°, 1 ± 2 mm, 0.04 ± 0.08 in.)
		Rack end length difference	1.5 mm (0.059 in.) or less
	Wheel angle		
		Inside wheel	36°48' ± 2° (36.80° ± 2°)
		Outside wheel <Reference>	31°19' (31.32°)

*1: For driving under 160 km/h (100 mph)

*2: For driving at 160 km/h (100 mph) or over

*3: Front measuring point

Measure the distance from the ground to the center of the front side lower suspension arm mounting bolt.

*4: Rear measuring point

Measure the distance from the ground to the center of the strut rod mounting bolt.

Front wheel alignment (Others)	Vehicle height		
	SEDAN and LIFTBACK	185/65R14 86H	Front*1 191 mm (7.52 in.)
			Rear*2 259 mm (10.20 in.)
		195/60R15 88H	Front*1 201 mm (7.91 in.)
			Rear*2 269 mm (10.59 in.)
	WAGON	185/65R14 86H	Front*1 190 mm (7.48 in.)
			Rear*2 261 mm (10.28 in.)
		195/60R15 88H	Front*1 200 mm (7.87 in.)
			Rear*2 271 mm (10.67 in.)
	Camber		–0°21' ± 45' (–0.35° ± 0.75°)
		Left – right error	45' (0.75°) or less
	Caster		
	SEDAN and LIFTBACK		1°20' ± 45' (1.33° ± 0.75°)
	WAGON		1°21' ± 45' (1.35° ± 0.75°)
		Left – right error	45' (0.75°) or less
	Steering axis inclination		13°22' ± 45' (13.37° ± 0.75°)
	Toe–in (Total)		0°06' ± 12' (0.1° ± 0.2°, 1 ± 2 mm, 0.04 ± 0.08 in.)
		Rack end length difference	1.5 mm (0.059 in.) or less
	Wheel angle		
		Inside wheel	37°52' ± 2° (37.87° ± 2°)
		Outside wheel <Reference>	32°05' (32.08°)

*1: Front measuring point
Measure the distance from the ground to the center of the front side lower suspension arm mounting bolt.
*2: Rear measuring point
Measure the distance from the ground to the center of the strut rod mounting bolt.

Rear wheel alignment	Camber (Rough road package)		
	SEDAN and LIFTBACK		–0°18' ± 30' (–0.30° ± 0.5°)
	WAGON		–0°25' ± 30' (–0.42° ± 0.5°)
		Left – right error	45' (0.75°) or less
	Camber (Others)		
	SEDAN and LIFTBACK		–0°31' ± 30' (–0.52° ± 0.5°)
	WAGON		–0°25' ± 30' (–0.42° ± 0.5°)
		Left – right error	45' (0.75°) or less
	Toe–in (Total)		0°12' ± 12' (0.2° ± 0.2°, 2 ± 2 mm, 0.08 ± 0.08 in.)
		No.2 lower suspension arm length difference	1.0 mm (0.039 in.) or less

Front axle	Axle bearing backlash	Maximum	0 mm (0 in.)
	Axle hub deviation	Maximum	0.05 mm (0.0020 in.)
Front drive shaft	Drive shaft standard length 4A–FE, 7A–FE engine	RH LH	859.30 ± 2.0 mm (33.83 ± 0.079 in.) 544.70 ± 2.0 mm (21.44 ± 0.079 in.)
	3S–FE engine	RH LH	840.70 ± 2.0 mm (33.10 ± 0.079 in.) 554.00 ± 2.0 mm (21.81 ± 0.079 in.)
	2C–TE, 2C–T engine	RH LH	844.25 ± 2.0 mm (33.24 ± 0.079 in.) 557.95 ± 2.0 mm (21.97 ± 0.079 in.)
Front suspension	Lower ball joint turning torque		1.0 – 3.4 N·m (10 – 35 kgf·cm, 8.7 – 30 in.·lbf)
	Stabilizer bar link ball joint turning torque		0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.·lbf)
Rear axle	Axle bearing backlash	Maximum	0 mm (0 in.)
	Axle hub deviation	Maximum	0.07 mm (0.0028 in.)
Rear suspension	No.2 lower suspension arm length		420 ± 1.5 mm (16.535 ± 0.059 in.)
	Stabilizer bar link ball joint turning torque		0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.·lbf)

SS0IZ–01

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
FRONT:			
Hub nut	103	1,050	76
Tie rod end lock nut	74	750	54
Steering knuckle x Shock absorber	255	2,600	188
Steering knuckle x Brake caliper	94	960	69
Steering knuckle x Tie rod end	49	500	36
Axle hub x Drive shaft	216	2,200	159
Lower ball joint x Lower suspension arm	127	1,300	94
Lower ball joint x Steering knuckle	103	1,050	76
Steering knuckle x Disc brake dust cover	8.4	86	74 in.·lbf
Drive shaft center bearing bracket set bolt	64	650	47
Suspension support x Body	80	820	59
Suspension support x Piston rod	47	475	34
ABS speed sensor set bolt	8.0	82	71 in.·lbf
ABS speed sensor wire harness clamp x Shock absorber	5.5	55	48 in.·lbf
Flexible hose x Shock absorber bracket	29	300	22
Lower suspension arm front side set bolt	127	1,300	94
Lower suspension arm rear side set bolt	145	1,479	107
Assist link x Lower suspension arm	84	860	62
Center member protector x Center member	39	400	29
Center member x Body	73	740	54
Engine front mounting x Center member	72	740	53
Center member x Front suspension member	73	740	54
Engine rear mounting x Front suspension member	72	740	53
Front suspension member front side set bolt	206	2,100	152
Sub–frame brace x Front suspension member	206	2,100	152
Sub–frame brace x Body	146	1,490	108
Exhaust front pipe x Exhaust manifold	62	630	46
Exhaust front pipe support bracket x Front suspension member	12	125	9
Exhaust front pipe x Exhaust center pipe – Gasoline engine	43	440	32
Exhaust front pipe x Exhaust center pipe – Diesel engine	44	440	32
Stabilizer bar bracket x Suspension member	19	195	14
Stabilizer bar link set bolt	44	450	33
REAR:			
Hub nut	103	1,050	76
ABS speed sensor set bolt	8.0	82	71 in.·lbf
Axle hub set bolt	80	820	59
Flexible hose x Shock absorber bracket	19	192	14
Strut rod x Rear axle carrier	113	1,150	83
Shock absorber x Rear axle carrier	255	2,600	188
Rear side seatback set bolt	37	378	27
Seat belt set bolt	65	665	48
Suspension support x Piston rod	49	500	36

Suspension support x Body	39	400	29
ABS speed sensor wire harness x Shock absorber	5.5	55	48 in.·lbf
Strut rod x Body	113	1,150	83
Parking brake cable bracket set bolt	5.5	55	48 in.·lbf
No.1, No.2 Lower suspension arm x Rear Suspension member	118	1,200	87
No.1, No.2 Lower suspension arm x Rear axle carrier	118	1,200	87
No.2 lower suspension arm adjusting tube lock nut	56	570	41
Rear suspension brace x Body	5.0	51	44 in.·lbf
Rear suspension brace x Rear suspension member	64	660	48
Rear suspension frame x Rear suspension member	65	660	48
Rear suspension frame x Body	56	570	41
Stabilizer bar bracket x Body	19	195	14
Stabilizer bar link set bolt	44	450	33
Fuel tank band set bolt	35	360	26

BRAKE

SERVICE DATA

SS0FS–02

Brake pedal height (from asphalt sheet)	LHD	139.8 – 149.8 mm (5.504 – 5.598 in.)
	RHD	149.5 – 159.5 mm (85.886 – 6.280 in.)
Brake pedal freeplay		1 – 6 mm (0.04 – 0.24 in.)
Brake pedal reserve distance at 490 N (50 kgf, 110.2 lbf)		
	LHD Gasoline engine (w/o ABS)	More than 75 mm (2.95 in.)
	LHD Others	More than 70 mm (2.76 in.)
	RHD Gasoline engine (w/o ABS)	More than 85 mm (3.35 in.)
	RHD Others	More than 80 mm (3.15 in.)
Front brake pad thickness	STD	12.0 mm (0.472 in.)
	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness	STD	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 shoe thickness	STD	4.0 mm (0.157 in.)
	Minimum	1.0 mm (0.039 in.)
Rear brake drum inside diameter	STD	228.6 mm (9.000 in.)
	Maximum	229.6 mm (9.036 in.)
Rear brake drum to shoe clearance		0.6 mm (0.024 in.)
Parking brake pedal travel at 294 N (30 kgf, 66 lbf)		4 – 7 clicks

SS0FT–03

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Master cylinder x Reservoir	2.3	23	20 in.·lbf
Master cylinder x Brake booster	25	255	18
Brake line union nut	15	155	11
Brake booster clevis lock nut (RHD)	25	260	19
Brake booster x Pedal bracket	13	130	9
Vacuum pump x Engine	19	195	14
Bleeder plug	8.3	85	74 in.·lbf
Front brake torque plate x Steering knuckle	94	960	69
Front brake caliper x Flexible hose	30	310	22
Rear brake wheel cylinder x Backing plate	12	125	9
ABS actuator bracket x Body	19	195	14
Actuator bracket No.1 x Actuator bracket No.2 (LHD)	13	130	9
ABS actuator x ABS actuator bracket	13	130	9
ABS actuator x ECU	3.0	31	27 in.·lbf
Front speed sensor installation bolt	8.0	82	71 in.·lbf
Rear speed sensor installation bolt	8.0	82	71 in.·lbf
ABS speed sensor harness clamp bolt	5.5	55	48 in.·lbf

STEERING

SERVICE DATA

SS01F–01

DRIVE BELT		
4A–FE, 7A–FE Engines:		
Drive belt deflection	New belt	5 – 6 mm (0.20 – 0.24 in.)
Drive belt deflection	Used belt	6 – 8 mm (0.24 – 0.31 in.)
*Drive belt tension	New belt	441 – 539 N (45 –55 kgf)
*Drive belt tension	Used belt	245 – 392 N (25 – 40 kgf)
3S–FE Engine:		
Drive belt deflection	New belt	8 – 10 mm (0.31 – 0.39 in.)
Drive belt deflection	Used belt	10 – 13 mm (0.39 – 0.51 in.)
* Drive belt tension	New belt	441 – 539 N (45 – 55 kgf)
* Drive belt tension	Used belt	245 – 392 N (25 – 40 kgf)
2C, 2C–TE Engines:		
Drive belt deflection	New belt	11 – 14 mm (0.43 – 0.55 in.)
Drive belt deflection	Used belt	15 – 18 mm (0.59 – 0.71 in.)
* Drive belt tension	New belt	539 – 637 N (55 – 65 kgf)
* Drive belt tension	Used belt	245 – 392 N (25 – 40 kgf)
POWER STEERING FLUID		
Oil level rise	Maximum	5 mm (0.20 in.)
4A–FE, 7A–FE Engines:		
Oil pressure at idle speed with valve closed	Minimum	8,238 kPa (84 kgf/cm^2, 1,195 psi)
3S–FE Engine:		
Oil pressure at idle speed with valve closed	Minimum	9,022 kPa (92 kgf/cm^2, 1,309 psi)
2C, 2C–TE Engines:		
Oil pressure at idle speed with valve closed	Minimum	8,826 kPa (90 kgf/cm^2, 1,280 psi)
STEERING WHEEL		
Steering wheel free play	Maximum	30 mm (1.18 in.)
Steering effort at idle speed	Reference	7.8 N·m (80 kgf·cm, 69 in.·lbf)
PS VANE PUMP (2C, 2C–TE Engines)		
Pump rotating torque	Maximum	0.3 N·m (2.8 kgf·cm, 2.4 in.·lbf)
Pump shaft and front housing bushing oil clearance	STD	0.01 – 0.03 mm (0.0004 – 0.0012 in.)
	Maximum	0.07 mm (0.0028 in.)
Vane plate height	Minimum	8.1 mm (0.319 in.)
Vane plate thickness	Minimum	1.797 mm (0.0708 in.)
Vane plate length	Minimum	14.988 mm (0.5901 in.)
Vane plate and pump rotor groove clearance	Maximum	0.03 mm (0.0012 in.)
Vane plate length	Pump rotor and cam ring mark	
	None	14.996 – 14.998 mm (0.59039 – 0.59047 in.)
	1	14.994 – 14.996 mm (0.59032 – 0.59039 in.)
	2	14.992 – 14.994 mm (0.59024 – 0.59032 in.)
	3	14.990 – 14.992 mm (0.59016 – 0.59024 in.)
	4	14.988 – 14.990 mm (0.59008 – 0.59016 in.)
Flow control valve spring length	Minimum	36.0 mm (1.417 in.)

*: For use with belt tension gauge

SS0IG–01

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
TILT STEERING COLUMN				
Steering column assembly set bolt and nut		25.5	260	19
Control valve shaft x Yoke		35	360	26
Steering wheel set nut		34	350	25
Steering wheel pad set screw (Torx screw)		8.8	90	78 in.·lbf
PS VANE PUMP (4A–FE, 7A–FE)				
Union bolt x Pressure feed tube		52	525	38
PS vane pump assembly set bolt	Bolt A	39	400	29
	Bolt B	62	630	46
Pump bracket set bolt	12 mm bolt	19	195	14
	14 mm bolt	39	400	29
Oil pressure switch x PS vane pump assembly		25	250	18
PS VANE PUMP (3S–FE)				
Union bolt x Pressure feed tube		52	525	38
PS vane pump assembly set bolt	Bolt A	62	630	46
	Bolt B	43	440	32
Oil pressure switch x PS vane pump assembly		25	250	18
PS VANE PUMP (2C, 2C–TE)				
Idler pulley set nut		38	390	28
PS vane pump pulley set nut		43	440	32
Union bolt x Pressure feed tube		54	550	40
PS vane pump assembly set bolt		39	400	29
Pulley cover x PS vane pump assembly		39	400	29
Suction port union set bolt		13	130	9
Pressure port union x Front housing		69	700	51
POWER STEERING GEAR				
Exhaust front pipe x Exhaust manifold		44	440	32
Exhaust front pipe support bracket set bolt		12	125	9
Exhaust front pipe x Exhaust center pipe		62	630	46
Tube clamp set bolt		13	130	9
Pressure feed and return tube set union bolt	LHD	52	525	38
Pressure feed tube x Control valve housing	RHD	36 (44)	365 (450)	26 (33)
PS gear assembly set bolt		78	800	58
Return tube No.1 sub–assembly x Control valve housing	RHD	36 (44)	365 (450)	26 (33)
Tie rod end lock nut		74	750	54

( ): For use without SST

SUPPLEMENTAL RESTRAINT SYSTEM

TORQUE SPECIFICATION

SS061–10

Part tightened		N·m	kgf·cm	ft·lbf
Steering wheel		35	360	26
Steering wheel pad		8.8	90	78 in.·lbf
Front passenger airbag assembly x Instrument panel reinforcement		21	210	15
Side airbag assembly x Seatback frame		5.4	55	48 in.·lbf
Seatback frame set bolt		25	255	18
Front seat installation bolt		37	375	27
Front seat belt lap outer ancher set bolt		44	450	32
Airbag sensor assembly		21	210	15
Front airbag sensor		20	205	15
Side airbag sensor assembly		21	210	15
Front seat outer belt retractor	Upper bolt	5.0	51	44 in.·lbf
	Lower bolt	44	450	32

BODY ELECTRICAL

SERVICE DATA

SS0JK–01

INTEGRATION RELAY (Wire harness side)	
A1 – Ground (Constant)	Battery Voltage
A7 – Ground (Ignition switch LOCK or ACC)	No Voltage
A7 – Ground (Ignition switch ON)	Battery Voltage
A11 – Ground (Ignition switch LOCK)	No Voltage
A11 – Ground (Ignition switch ACC or ON)	Battery Voltage
DAYTIME RUNNING LIGHT MAIN RELAY (Wire harness side)	
1 – Ground (Ignition switch LOCK or ACC)	No Voltage
1 – Ground (Ignition switch ON or START)	Battery Voltage
3 – Ground (Constant)	Battery Voltage
5 – Ground (Constant)	Battery Voltage
8 – Ground (Engine stop)	No Voltage
8 – Ground (Engine running)	Battery Voltage
9 – Ground (Constant)	No Voltage
9 – Ground (Ground terminal 3)	Battery Voltage
11 – Ground (Constant)	No Voltage
11 – Ground (Ground terminal 3)	Battery Voltage
12 – Ground (Constant)	Battery Voltage
14 – Ground (Constant)	No Voltage
14 – Ground (Ground terminal 5)	Battery Voltage
HEADLIGHT BEAM LEVEL CONTROL SWITCH	
Switch position :	Resistance (kΩ):
0	1.4 – 1.6
1	1.6 – 1.8
2	1.8 – 2.0
3	2.0 – 2.3
4	2.4 – 2.7
5	2.8 – 3.2
HEADLIGHT BEAM LEVEL CONTROL ACTUATOR (Wire harness side)	
3 – Ground	Battery Voltage
SPEEDOMETER (ON–VEHICLE)	
EUROPE MODELS :	
Standard indication (mph)	Allowable range (mph)
20	20 – 24.5
40	40 – 46.5
60	60 – 68.5
80	80 – 90.5
100	100 – 112.5
Standard indication (km/h)	Allowable range (km/h)

20	20 – 26
40	40 – 48
60	60 – 70
80	80 – 92
100	100 – 114
120	120 – 136
140	140 – 158
160	160 – 180
GENERAL COUNTRIES :	
Standard indication (mph)	Allowable range (mph)
20	21 – 23.5
40	41.5 – 44
60	625 – 66
80	83 – 87
100	104 – 108.5
Standard indication (km/h)	Allowable range (km/h)
20	21 – 25
40	41.5 – 46
60	62.5 – 67
80	83 – 88
100	104 – 109
120	125 – 130.5
140	145.5 – 151.5
160	166 – 173
TACHOMETER (ON–VEHICLE) / DC13.5V 25˚C at (77˚F)	
Standard indication	Allowable range
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
FUEL SENDER GAUGE	
Float position mm (in.)	Resistance (Ω)
F : Approx.19.76 (0.78) ±3 (0.12)	Approx.4.0 ±1.0
E : Approx. 92.7 (3.65) ±3 (0.12)	Approx.107.0 ±1.0
ENGINE COOLANT TEMPERATURE SENDER GAUGE	
Temperature ˚C (˚F)	Resistance (Ω)
50 (122.0)	160 – 240
120 (248.0)	17.1 – 21.2

DEICER TIMER SWITCH (Wire harness side)	
1 – Ground (Ignition switch LOCK or ACC)	No Voltage
1 – Ground (Ignition switch LOCK)	Battery Voltage
6 – Ground (Ignition switch LOCK or ACC)	No Voltage
6 – Ground (Ignition switch ON)	Battery Voltage
DEFOGGER TIMER SWITCH (Wire harness side)	
4 – Ground (Ignition switch LOCK or ACC)	No Voltage
4 – Ground (Ignition switch ON)	Battery Voltage
5 – Ground (Ignition switch LOCK or ACC)	No Voltage
5 – Ground (Ignition switch ON)	Battery Voltage
SLIDING ROOF CONTROL ASSEMBLY (Wire harness side)	
2 – Ground (Ignition switch ON, slide roof control switch (SLIDE) OFF or CLOSE)	No Voltage
2 – Ground (Ignition switch ON, slide roof control switch (SLIDE) OPEN)	Battery Voltage
1 – Ground (Ignition switch ON, slide roof control switch (SLIDE) OFF or OPEN)	No Voltage
1 – Ground (Ignition switch ON, slide roof control switch (SLIDE) CLOSE)	Battery Voltage
1 – Ground (Ignition switch ON, slide roof control switch (TILT) OFF or DOWN)	No Voltage
1 – Ground (Ignition switch ON, slide roof control switch (TILT) UP)	No Voltage
2 – Ground (Ignition switch ON, slide roof control switch (TILT) OFF or UP)	No Voltage
2 – Ground (Ignition switch ON, slide roof control switch (TILT) DOWN)	Battery Voltage
5 – Ground (Ignition switch LOCK or ACC)	No Voltage
5 – Ground (Ignition switch ON)	Battery Voltage
4 – Ground (Constant)	Battery Voltage
TRANSPONDER KEY ECU	
1 – Ground (Constant)	Battery Voltage
2 – Ground (Ignition switch ON)	Battery Voltage

BODY

TORQUE SPECIFICATION

SS0K4–01

Part tightened		N·m	kgf·cm	ft·lbf
FRONT BUMPER		–	–	–
Reinforcement x Body	Bolt:	20	205	15
	Nut:	20	205	15
HOOD		–	–	–
Hood x Hood hinge		12	122	9
Hood lock x Body		11	112	8
FRONT DOOR		–	–	–
Door hinge x Body		26	265	19
Door hinge x Door panel		26	265	19
Outside handle x Door panel		5.5	56	49 in.·lbf
Window regulator x Door panel		7.5	76	65 in.·lbf
Door glass x Window regulator		5.0	51	44 in.·lbf
Outside rear view mirror x Door panel		8.0	82	71 in.·lbf
REAR DOOR		–	–	–
Door hinge x Body		26	265	19
Door hinge x Door panel		26	265	19
Door lock striker x Body		23	230	17
Window regulator x Door panel		7.5	76	66 in.·lbf
Door lock x Door panel		5.0	51	44 in.·lbf
Outside handle x Door panel		5.5	56	49 in.·lbf
BACK DOOR (Liftback)		–	–	–
Back door lock x Door panel		8.0	82	71 in.·lbf
Back door hinge x Body		11.5	117	8.5
Back door hinge x Door panel		20	204	15
Door lock striker x Body		11.5	117	8.5
Door lock cylinder x Door panel		5.5	56	49 in.·lbf
BACK DOOR (Wagon)		–	–	–
Door lock cylinder x Door panel		5.5	56	49 in.·lbf
Door lock x Door panel		8.0	82	71 in.·lbf
Back door hinge x Door panel		11.5	117	8.5
Back door hinge x Body		20	204	15
Door lock striker x Body		11.5	117	8.5
BACK DOOR STAY		–	–	–
Back door stay x Body	Liftback:	18	184	13
	Wagon:	18	184	13
Back door x Back door stay	Liftback:	18	184	13
	Wagon:	18	184	13
LUGGAGE COMPARTMENT DOOR AND HINGE		–	–	–
Door hinge x Door panel		7.0	71	62 in.·lbf
Door lock x Door panel		5.0	51	44 in.·lbf
Door lock striker x Body		23	230	17

FRONT WIPER AND WASHER	–	–	–
Wiper motor and link assembly x Body	5.4	55	48 in.·lbf
Wiper arm x Wiper link	20	205	15
REAR WIPER AND WASHER (Liftback)	–	–	–
Wiper motor x Door panel	5.4	55	48 in.·lbf
Wiper arm x Door panel	18	184	13
REAR WIPER AND WASHER (Wagon)	–	–	–
Wiper motor x Door panel	5.4	55	48 in.·lbf
Wiper arm x Door panel	18	184	13
INSTRUMENT PANEL	–	–	–
Steering wheel set nut	34	350	25
Passenger airbag assembly x Reinforcement	18	185	13
FRONT SEAT	–	–	–
Seat cushion assembly x Seat adjuster	18	185	13
Side airbag assembly x Seatback frame	5.4	55	48 in.·lbf
Seatback frame x Seat cushion frame	25	260	19
Front seat assembly x Body	37	375	27
REAR SEAT (Sedan)	–	–	–
Seatback frame x Seatback lock	17.5	178	13
Side hinge x Seatback assembly	21	214	15
Seatback assembly x Body	21	214	15
Side seatback x Body	21	214	15
REAR SEAT (Except Sedan)	–	–	–
Seat cushion hinge x Body	37	378	27
Seatback frame x Seat belt	65	663	481
Seatback lock x Seatback frame	18	184	13
Seatback assembly x Side hinge	21	214	15
Seatback assembly x Body	21	214	15
Seatback assembly x Side hinge	21	214	15
Side seatback x Body	21	214	15
Seat cushion assembly x Body	21	214	15
Seatback frame x Retainer Nut	8.0	82	71 in.·lbf
Screw	8.0	82	71 in.·lbf
SEAT BELT	–	–	–
Front Seat Belt :			
Shoulder anchor adjuster x Body	42	430	31
Shoulder anchor x Body	42	430	31
Retractor x Body Upper Bolt :	5.0	51	44 in.·lbf
Lower bolt :	42	430	31
Outer belt x Seat	42	430	31
Inner belt x Seat	42	430	31
Rear Seat Belt :			
Outer belt x Body	65	665	48
Floor anchor x Body	65	665	48
Side seatback x Body	37	378	27
Inner belt x Body	65	665	48

FUEL TANK AND LINE	–	–	–
Fuel tank band x Body	35	360	26
Tail exhaust pipe x Front exhaust pipe	43	440	32
Tail exhaust pipe x Body	12	125	9.0

AIR CONDITIONING

SERVICE DATA

SS038-03

Refrigerantvolume		450 ± 50 g (15.87 ±1.76 oz.)
Drive belt deflection (apply load of 9.8N)		–
4A–FE and 7A–FE	New belt	6.0 – 7.0 mm (0.24 – 0.28 in.)
	Used belt	8.5 – 9.5 mm (0.33 – 0.37 in.)
3S–FE	New belt	6.0 – 9.0 mm (0.24 – 0.35 in.)
	Used belt	9.0 – 11.0 mm (0.35 – 0.43 in.)
2C–T and 2C–TE	New belt	11.0 – 13.0 mm (0.43 – 0.51 in.)
	Used belt	15.0 –18.0 mm (0.59 – 0.71 in.)
Drive belt tension		–
4A–FE and 7A–FE	New belt	520 – 755 N (53 – 77 kgf)
	Used belt	196 – 392 N (20 – 40 kgf)
3S–FE	New belt	618 – 853 N (63 – 87 kgf)
	Used belt	441 – 539 N (45 – 55 kgf)
2C–T and 2C–TE	New belt	520 – 755 N (53 – 77 kgf)
	Used belt	196 – 392 N (20 – 40 kgf)
Magnetic Clutch clearance		0.5 ± 0.15 mm (0.020 ±0.0059 in.)

SS050–03

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Compressor bracket	25	250	18
Idle pulley lock nut (Except 3S–FE)	39	400	29
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Pressure plate x Compressor	13.2	135	9
Front housing x Cylinder block	25	250	18
Discharge cover x Cylinder block	25	250	18
Expansion valve x Liquid tube	14	140	10
Expansion valve x Evaporator	22	225	16
Condenser x Liquid tube	10	100	7
Condenser x Discharge hose	5.4	55	48 in.·lbf
Pressure switch x Liquied tube	10	100	7
Adjusting lock bolt (3S–FE)	18	185	13
Pivot bolt (3S–FE)	52	530	38

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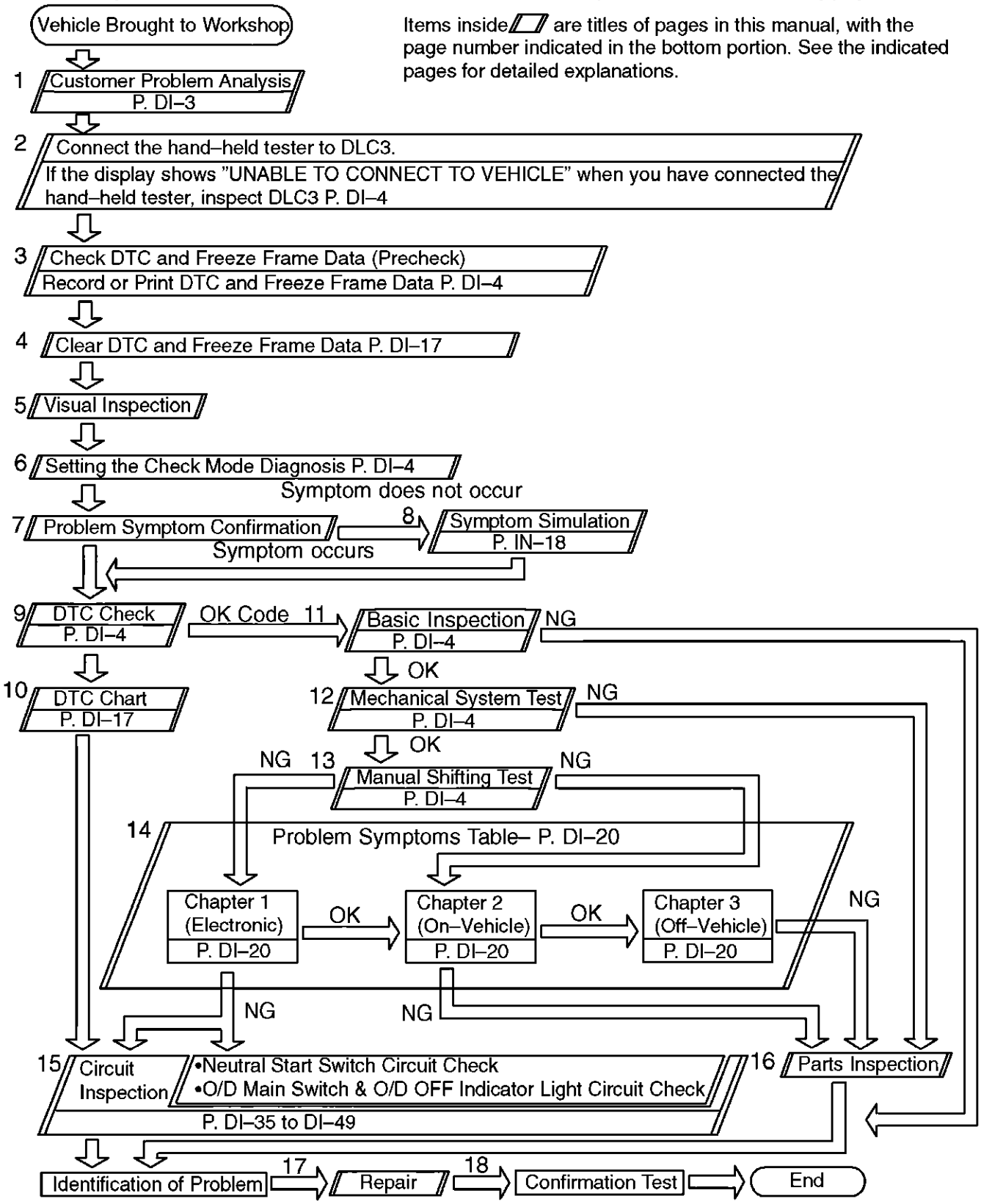
AUTOMATIC TRANSAXLE (A241E)

HOW TO PROCEED WITH TROUBLESHOOTING

DI0SL–09

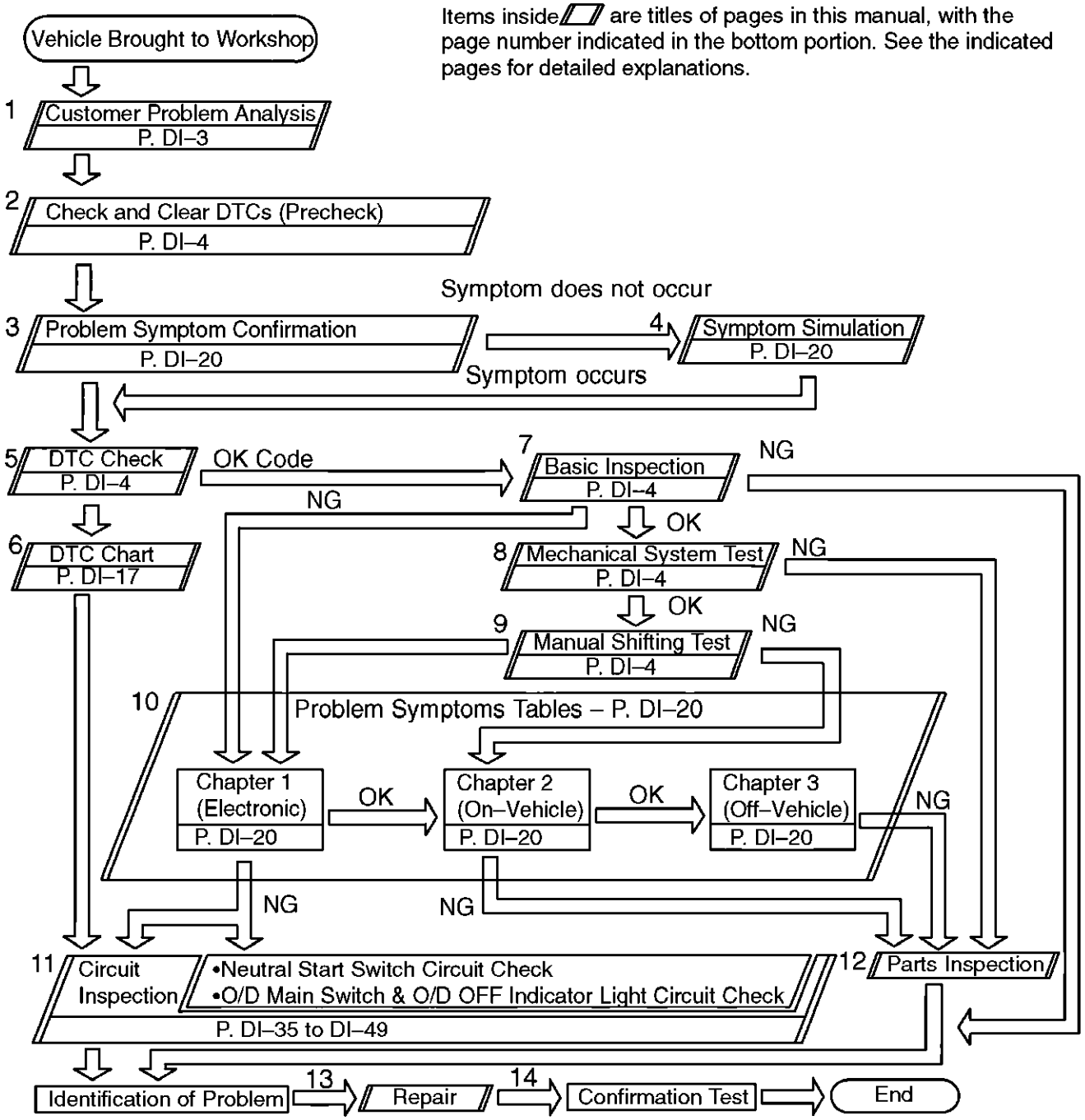
When using hand–held tester, troubleshoot in accordance with the procedure on the following pages.

Items inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



When not using hand–held tester, troubleshoot in accordance with the procedure on the following pages.

Items inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



DI1FQ–02

CUSTOMER PROBLEM ANALYSIS CHECK

Transaxle Control System Check Sheet	Inspector's Name :

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

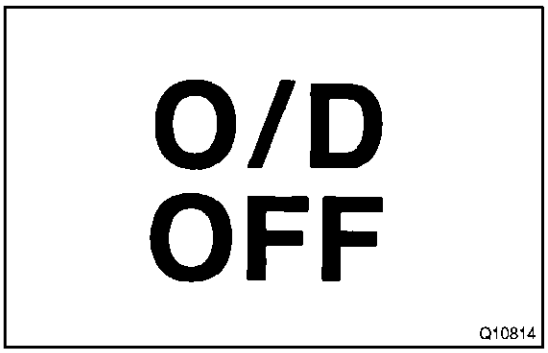
Date Problem Occurred	/ /
Frequency Problem Occurs?	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Vehicle does not move (☐ Any range ☐ Particular range)
	☐ No up–shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → O/D)
	☐ No down–shift (☐ O/D → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)
	☐ Lock–up malfunction
	☐ Shift point too high or too low
	☐ Harsh engagement (☐ N → D ☐ Lock–up ☐ Any drive range)
	☐ Slip or shudder
	☐ No kick–down
	☐ Others ( )

Check Item	Malfunction Indicator Lamp	☐ Normal	☐ Remains ON

DTC Check	1st Time	☐ Normal	☐ Malfunction code (Code)
	2nd Time	☐ Normal	☐ Malfunction code (Code)

DI32S–01

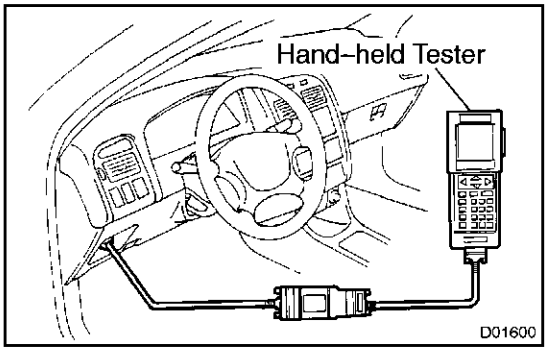


PRE–CHECK

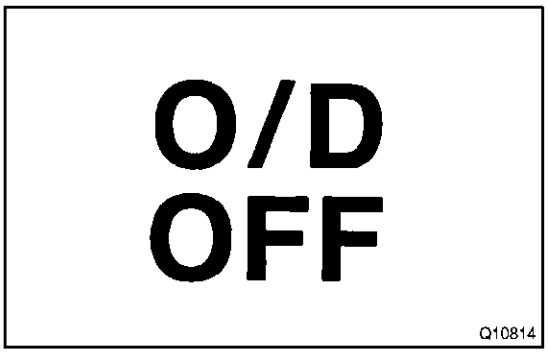
1. DIAGNOSIS SYSTEM

Description

- 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 Engine and ECT ECU.
  The vehicle's on– board computer lights up the O/D OFF Indicator Light on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to the O/D OFF indicator light lighting up when a malfunction is detected, the applicable DTCs are recorded in the Engine and ECT ECU memory
  (See page DI–17).
  If the malfunction only occurs in 3 trips, the O/D OFF indicator light goes off but the DTCs remain recorded in the Engine and ECT ECU memory.



- To check the DTCs, connect a hand–held tester to DLC3 on the vehicle or read the number of blinks of the O/D OFF indicator 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 freeze frame data and various forms of engine data (For instruction book).
- 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 Engine and ECT ECU to check (test) mode using hand–held tester when troubleshooting, the technician can cause the O/D OFF indicator light to light up for a malfunction that is only detected once or momentarily.
- *2–trip detection logic:
  When a logic malfunction is first detected, the malfunction is temporarily stored in the Engine and ECT ECU memory.
  If the same malfunction is detected again during the 2nd test drive, this 2nd detection causes the O/D OFF indicator light to light up.



2. INSPECT DIAGNOSIS (NORMAL MODE)

(a) Check the O/D OFF indicator light.

(1) Turn the ignition switch to ON.

(2) Check that the O/D OFF indicator lights light up when the O/D main switch is pushed out to OFF and goes off when the O/D main switch is pushed in to ON.

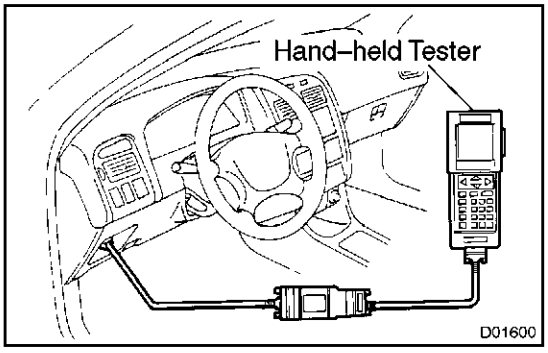
HINT:

- If the O/D OFF indicator light does not light up or stay on all the time, carry out the check for "O/D OFF Indicator Light Circuit" on page DI–42.
- If the O/D OFF indicator light blinks, a malfunction code is stored in the ECU memory.

(b) Check the DTC (Using hand–held tester).

NOTICE:

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.



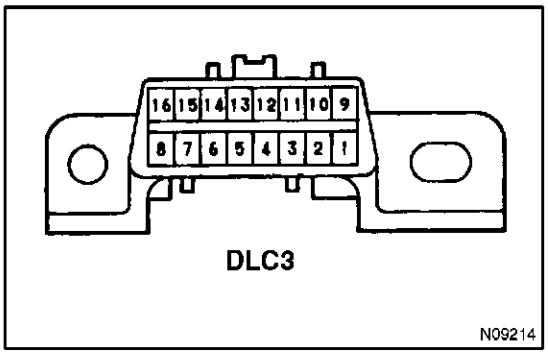
(1) Prepare hand–held tester.

(2) Connect the hand–held tester to DLC3 at the lower of the instrument panel.

(3) Turn the ignition switch ON and turn the hand–held tester switch ON.

(4) Use the hand–held tester to check the DTCs and instructions, see the hand–held tester instruction book.

(5) See page DI–4 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.

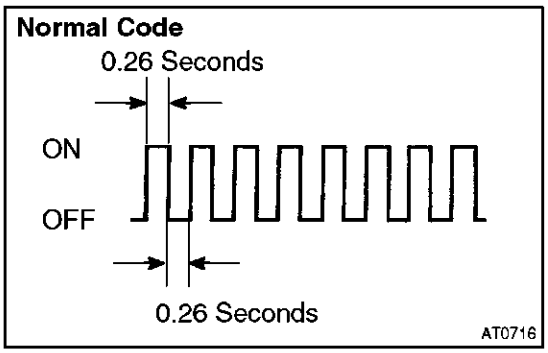
(2) Push in the O/D main switch to ON.

HINT:

Warning and DTCs can be read only when the O/D main switch is ON. If it is OFF, the O/D OFF indicator light will light up continuously and will not blink.

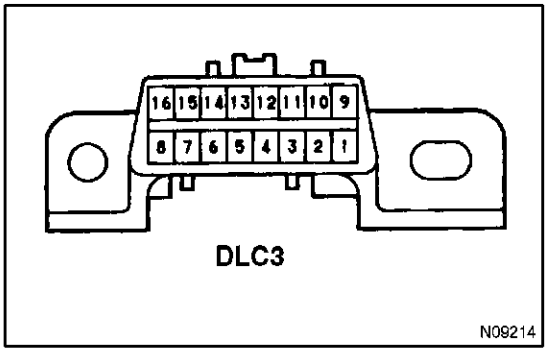
(3) Using SST, connect terminals 13 (TC) and 4 (CG) of DLC3.

SST 09843–18040



(4) Read the DTC indicated by the number of times the O/D OFF indicator light blinks.

HINT:
If the system is operating normally, the light will blink 2 times per second.

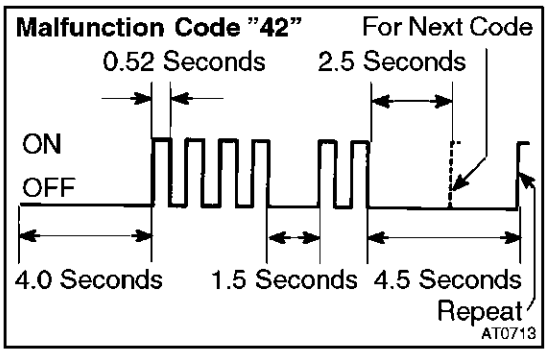


(d) Inspect the DLC3.
(1) The vehicle's Engine and ECT ECU uses ISO 14230 for communication. The terminal arrangement of DLC3 complies with SAE J1962 and matches the ISO 14230 format.

Terminal No.	Connection	Voltage or Resistance	Condition
7	Bus ⊕ Line	Pulsegeneration	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)

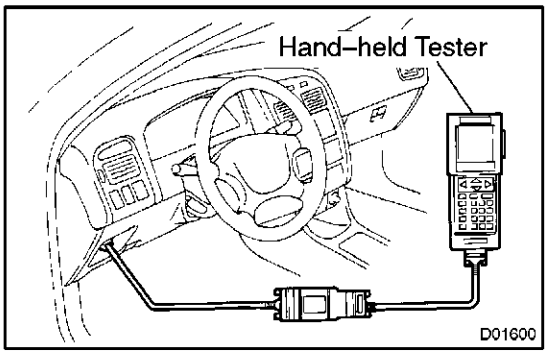
HINT:
Hand–held tester only: Compared to the normal mode, the check mode has high sensing ability to detect malfunctions. Furthermore, the same diagnostic items which are detected in Normal mode can also be detected in check mode.

(a) Check DTC.

(1) Check the initial conditions.
- Battery positive voltage 11 V or more
- Throttle valve fully closed
- Transmission in P range
- Air conditioning switched OFF

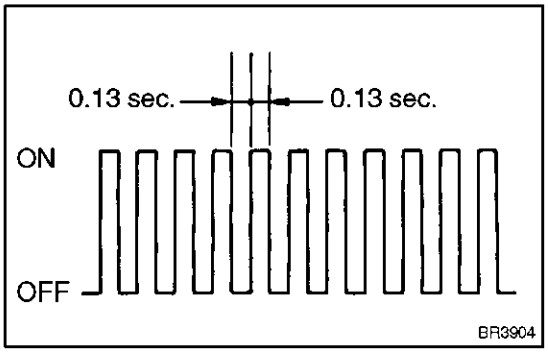
(2) Turn the ignition switch OFF.

(3) Prepare a hand–held tester.



(4) Connect the hand–held tester to DLC3 at the lower part of the instrument panel.

(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 O/D OFF indicator light flashes).

(7) Start the engine (O/D OFF indicator light 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.

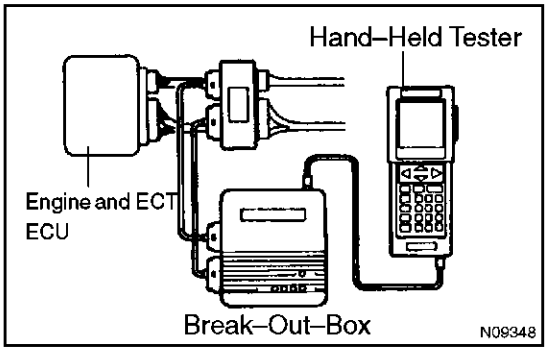
(9) After simulating the malfunction conditions, use the hand–held tester diagnosis selector to check the DTCs and freeze frame data, etc.

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 J/B for 10 seconds or more.



4. ENGINE and ECT ECU STANDARD VALUES MEASUREMENT USING BREAK–OUT–BOX AND HAND–HELD TESTER

(a) Hook up the break–out–box and hand–held tester to the vehicle.

(b) Read the Engine and ECT ECU input/output values by following the prompts on the tester screen.

HINT:
Hand–held tester has "Snapshot" function. This records the measured values and is effective in the diagnosis of intermittent problems. Please refer to the hand–held tester/break–out–box operator's manual for further details.

5. PROBLEM SYMPTOM CONFIRMATION

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.

6. 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 SS–12).

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 SS–12).

(5) Check 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 SS–12).

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.

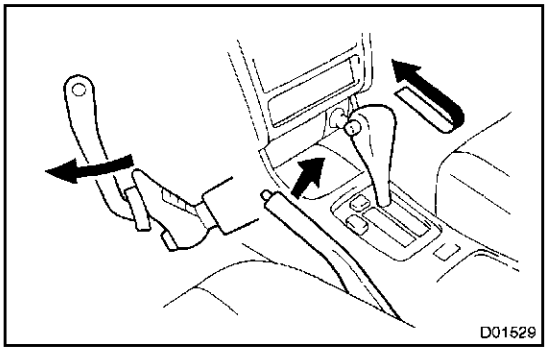
(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(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.

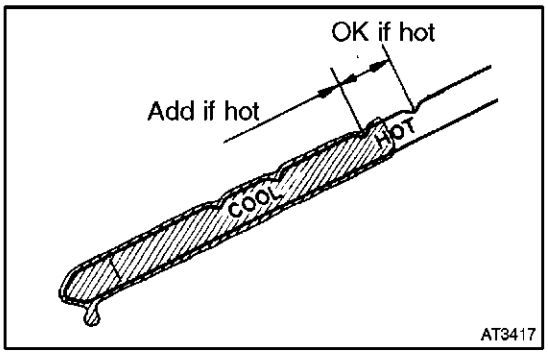

D01529

7. BASIC INSPECTION

(a) 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)



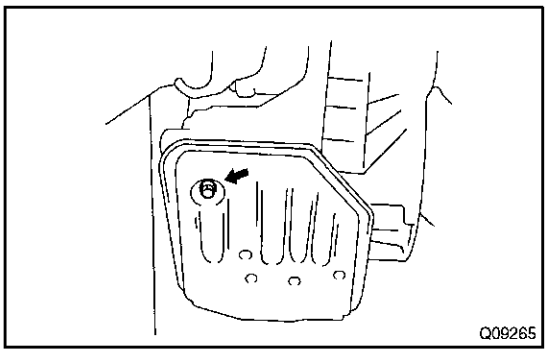
AT3417

(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.

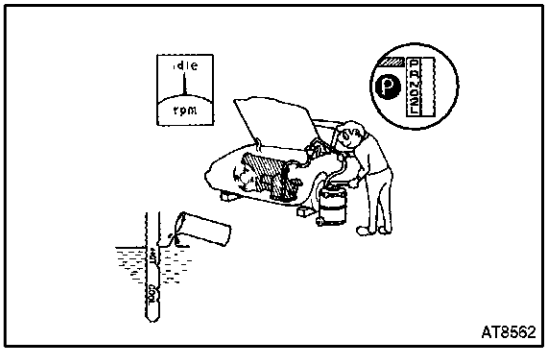
If the level is not within the range, add new fluid.
Fluid type: ATF D–II or DEXRON®III (DEXRON®II)

NOTICE:
Do not overfill.

(b) Check the fluid condition.
If the fluid smells burnt or is black, replace it.

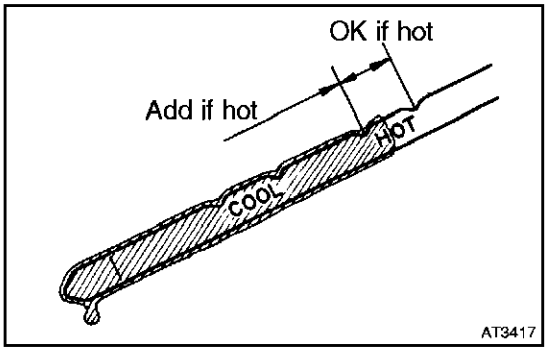

Q09265

(c) Replace the ATF.
(1) Remove the drain plug and drain the fluid.
(2) Reinstall the drain plug securely.



AT8562

(3) With the engine OFF add new fluid through the oil filler pipe.
Fluid type: ATF D–II or DEXRON®III (DEXRON®II)
Capacity: 3.3 liters (3.5 US qts, 2.9 Imp.qts)
(4) Start the engine and shift the shift lever into all ranges from P to L range and then shift into P range.



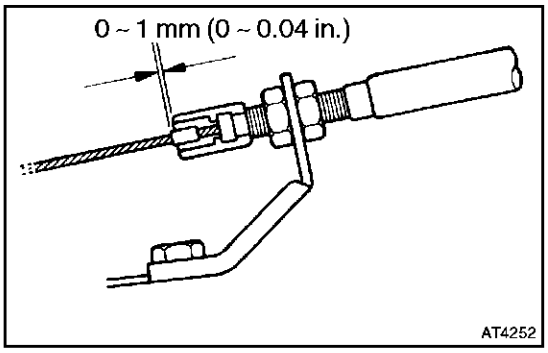
AT3417

(5) With the engine idling, check the fluid level. Add fluid up to the COOL level on the dipstick.
(6) Check the fluid level at the normal operating temperature, 70 – 80 °C (158 – 176 °F), and add as necessary.

NOTICE:
Do not overfill.

(d) Check the fluid leaks.
Check for leaks in the transaxle.

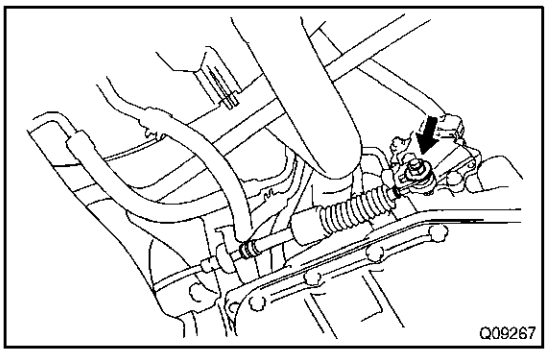
If there are leaks, it is necessary to repair or replace O–rings, FIPGs, oil seals, plugs or other parts.

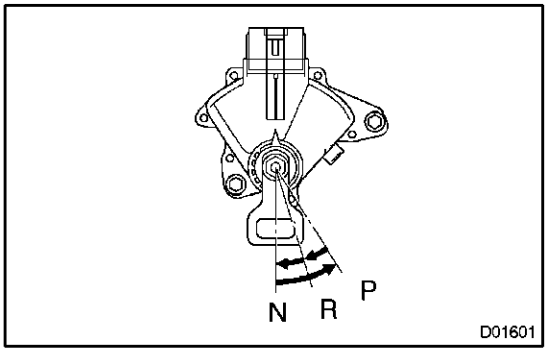


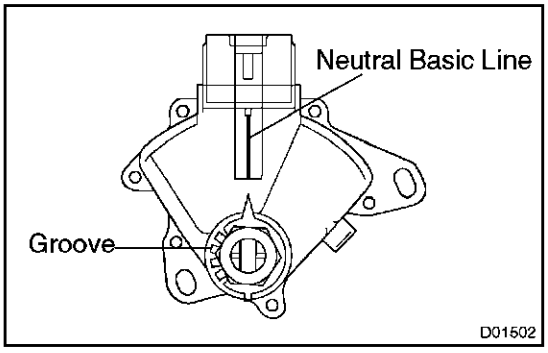
AT4252

(e) Inspect and adjust the throttle cable.
(1) Check the accelerator pedal is fully released.
(2) Check that the inner cable is not slack.
(3) Measure the distance between the outer cable end and stopper on the cable.
Standard distance: 0 ~ 1 mm (0 ~ 0.04 in.)

If the distance is not the standard, adjust the cable by rotating the adjusting nuts.







(f) Inspect and adjust the shift lever position.

- When shifting the shift lever from the N range to other ranges, check that the lever can be shifted smoothly and accurately to each range and that the position indicator is aligned with the correct position.

If the indicator is not aligned with the correct position, carry out the following adjustment procedures.

- Loosen the nut on the shift lever.
- Push the control shaft fully rearward.
- Return the control shaft lever 2 notches to N range.
- Set the shift lever to N range.
- While holding the shift lever lightly toward the R range side, tighten the shift lever nut.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

- 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.

(g) Inspect and adjust the neutral start switch.

Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If it is not as stated above, carry out the following adjustment procedures.

- Loosen the neutral start switch bolt and set the shift lever to the N range.
- Align the groove and neutral basic line.
- Hold the switch in position and tighten the bolt.

Torque: 13 N·m (130 kgf·cm, 10 ft·lbf)

- For continuity inspection of the neutral start switch, see page DI–35.

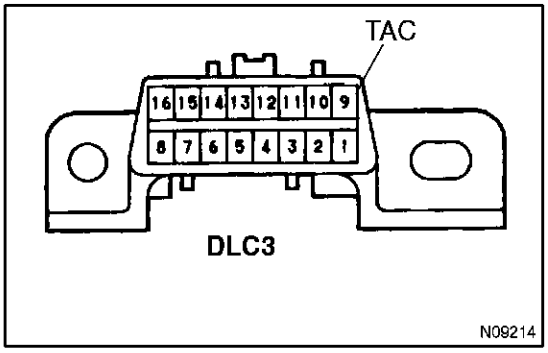
8. MECHANICAL SYSTEM TESTS

(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.**



- Chock the 2 wheels.
- Connect a hand–held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843–18030

- Fully apply the parking brake.
- Keep your left foot pressing firmly on the brake pedal.
- Start the engine.
- Shift into the D range. Press all the way down on the accelerator pedal with your right foot.
- Quickly read the stall speed at this time.

Stall speed: 2,050 – 2,500 rpm

- Do the same test in the R range.

Stall speed: 2,050 – 2,500 rpm

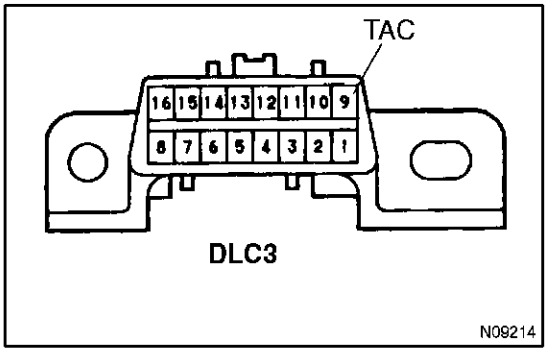
Evaluation:

Problem	Possible cause
(a) Stall speed low in D and R ranges	• Engine output may be insufficient • Stator one–way clutch is 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 • No.2 one–way clutch not operating properly • U/D one–way clutch not operating properly
(c) Stall speed high in R range	• Line pressure too low • Direct clutch slipping • 1st & reverse brake slipping • U/D one–way clutch not operating properly
(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.
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.**



- Chock the 4 wheels.
- Connect a hand–held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843–18030

- Start engine and check idle speed.

Idle speed: 750 ± 50 rpm (In N range and A/C OFF)

- 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

- 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 • Direct clutch worn • 1st & reverse brake worn • U/D one–way clutch not operating properly

9. 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 right side of the transaxle case and connect SST.
(See page AX–30 for the location to connect SST)

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(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.

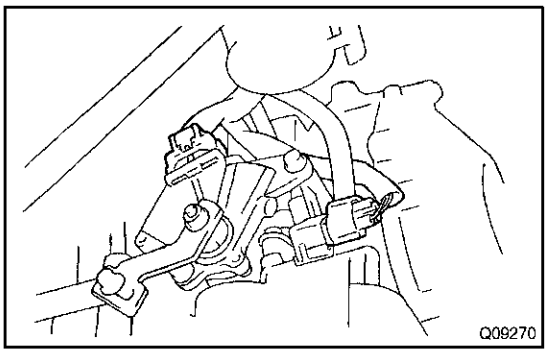
Specified line pressure:

Condition	D range kPa (kgf / cm^2, psi)	R range kPa (kgf / cm^2, psi)
Idling	372 – 422 (3.8 – 4.3, 54 – 61)	637 – 795 (6.5 – 8.1, 92 – 115)
Stall	715 – 863 (7.3 – 8.8, 103 – 125)	1333 – 1579 (13.6 – 16.1, 194 – 229)

If the measured pressure is not up to the specified value, recheck the throttle cable adjustment and retest.

Evaluation:

Problem	Possible cause
If the measured values at all ranges are higher	• Throttle cable out of adjustment • Throttle valve defective • Regulator valve detective
If the measured values at all ranges are lower	• Throttle cable out of adjustment • Throttle valve defective • Regulator valve defective • Oil pump defective • U/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 & reverse brake defective



10. 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 solenoid wire.

(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 solenoid wire.

(d) Cancel out DTC.

DI1FQ–02

DIAGNOSTIC TROUBLE CODE CHART

If a DTC is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the page given.

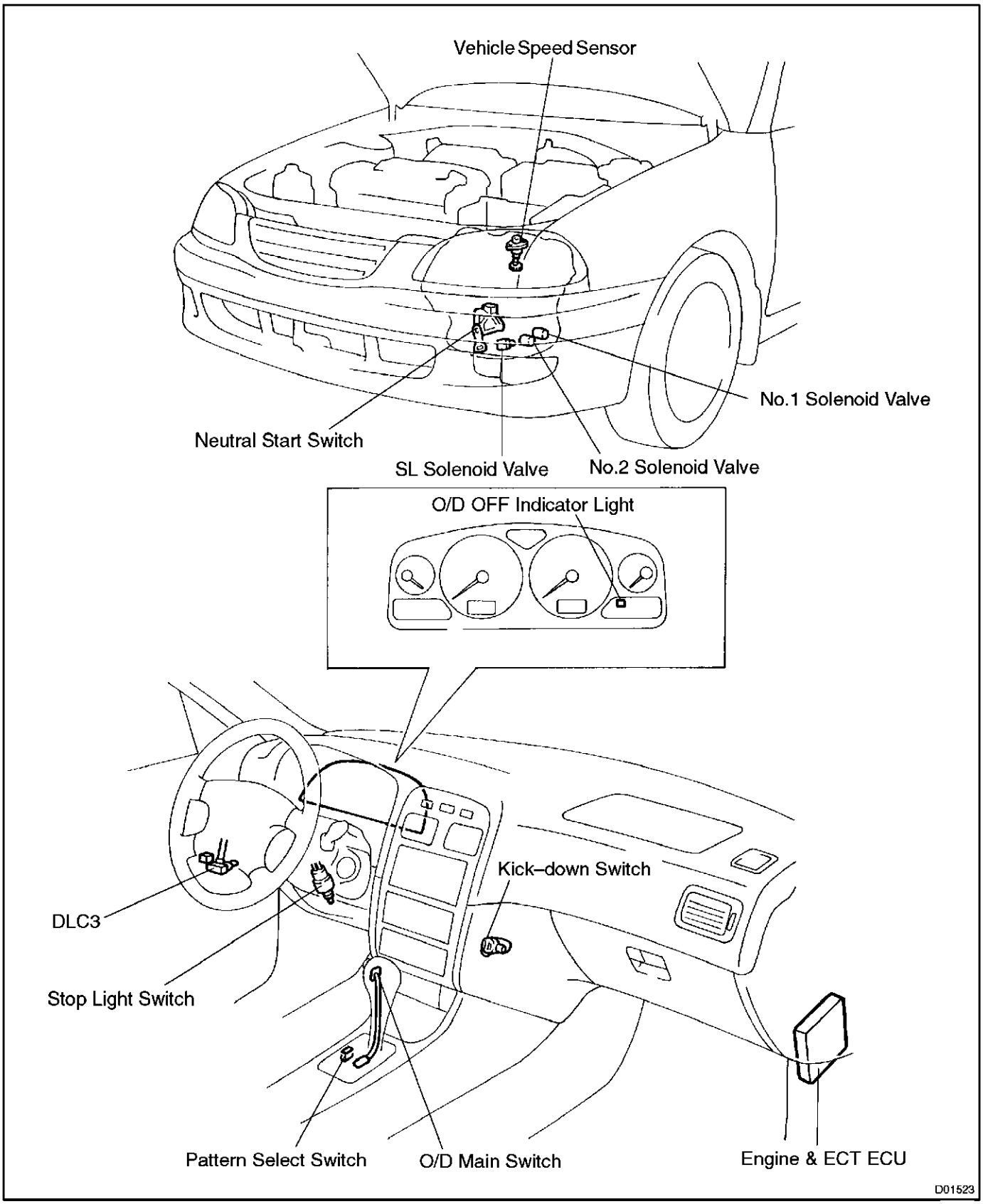
DTC No. (See Page)	Detection Item	Trouble Area	O/D OFF Indicator Light Blink*1	Memory*2
P0500/42 (DI–25)	Vehicle speed sensor malfunction (Vehicle Speed Sensor)	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine and ECT ECU	○	○
P0753/62 (DI–28)	Shift solenoid "A" electrical malfunction (No.1 solenoid valve)	• Open or short in No.1 solenoid valve circuit • No.1 solenoid valve • Engine and ECT ECU	○	○
P0758/63 (DI–28)	Shift solenoid "B" electrical malfunction (No.2 solenoid valve)	• Open or short in No.2 solenoid valve circuit • No.2 solenoid valve • Engine and ECT ECU	○	○
P0773/64 (DI–32)	Shift solenoid "E" electrical malfunction (SL solenoid valve)	• Open or short in SL solenoid valve circuit • SL solenoid valve • Engine and ECT ECU	X	○

*1: "○" mark means O/D OFF indicator light blinks once every 2 seconds.
"X" mark means O/D OFF indicator light never blinks.

*2: "○" mark means the Engine and ECT ECU memorizes the malfunction code if the Engine and ECT ECU detects the DTC detection condition.

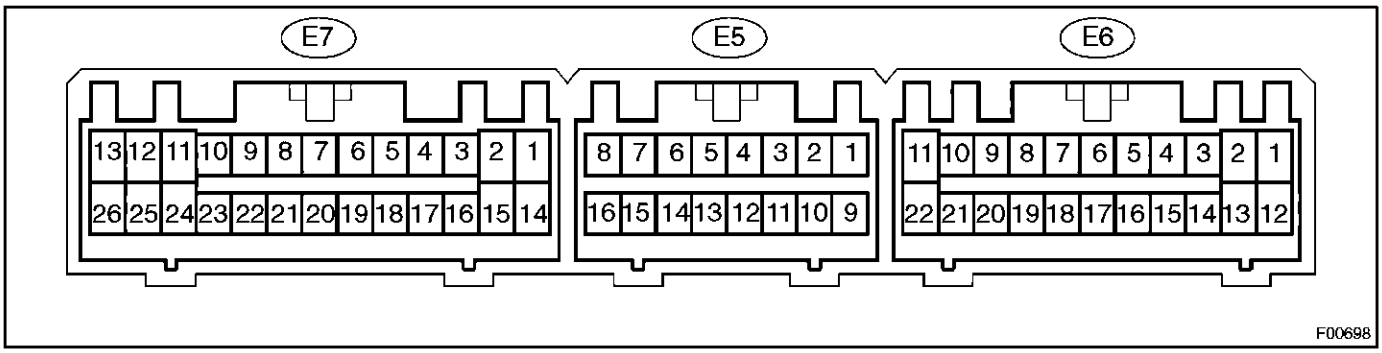
DI32T–01

PARTS LOCATION



DI32U–01

TERMINALS OF ECU



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
S1 (E7 – 23) – E1 (E7 – 14)	LG–R ↔ BR	IG ON	9 – 14
		1st or 2nd gear	9 – 14
		3rd or O/D gear	Below 1.5
S2 (E7 – 22) – E1 (E7 – 14)	V–W ↔ BR	IG ON	Below 1.5
		2nd or 3rd gear	9 – 14
		1st or O/D gear	Below 1.5
SL (E7 – 21) – E1 (E7 – 14)	G ↔ BR	IG ON	Below 1.5
		Vehicle driving under lock–up position	9 – 14
NSW (E7 – 1) – E1 (E7 – 14)	B–W ↔ BR	IG ON and shift lever P or N range	Below 3
		IG ON and shift lever other than P or N range	9 – 14
OD2 (E6 – 22) – E1 (E7 – 14)	L ↔ BR	IG ON and O/D main switch ON (O/D OFF)	9 – 14
		IG ON and O/D main switch OFF (O/D ON)	Below 3
SPD (E6 – 9) – E1 (E7 – 14)	G ↔ BR	IG ON and vehicle stationary	Below 1.5
		IG ON and turn one front wheel slowly	Pulse signal is output Below 1.5 ↔ 4 – 6
L (E6 – 19) – E1 (E7 – 14)	Y–G ↔ BR	IG ON and shift lever L range	9 – 14
		IG ON and shift lever other than L range	Below 1.5
2 (E6 – 18) – E1 (E7 – 14)	O ↔ BR	IG ON and shift lever 2 range	9 – 14
		IG ON and shift lever other than 2 range	Below 1.5
B/K (E6 – 4) – E1 (E7 – 14)	G–W ↔ BR	IG ON and brake pedal is depressed	9 – 14
		IG ON and brake pedal is released	Below 1.5
KD (E6 – 17) – E1 (E7 – 14)	Y ↔ BR	IG ON and accelerator pedal is fully depressed	Below 1.5
		IG ON and accelerator pedal is released	9 –14
P (E7 – 3) – E1 (E7 – 14)	P ↔ BR	IG ON and pattern select switch: PWR	9 – 14
		IG ON and pattern select switch: NORM	Below 1.5
SNOWI (E7 – 18) – E1 (E7 – 14)	P–B ↔ BR	IG ON and SNOW mode switch: ON	9 – 14
		IG ON and SNOW mode switch: OFF	Below 1.5

DI1FT–02

PROBLEM SYMPTOMS TABLE

If a normal code is displayed during the DTC 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 trouble-shooting.

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 in 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 Engine and ECT ECU.

1. 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)	Engine and ECT ECU	IN–28
No up–shift (3rd → O/D)	1. O/D main switch and O/D OFF indicator light circuit 3. Engine and ECT ECU	DI–42 IN–28
No down–shift (A particular gear, from 1st to 3rd gear, is not up–shifted)	Engine and ECT ECU	IN–28
No down–shift (O/D → 3rd)	1. O/D main switch and O/D OFF indicator light circuit 3. Engine and ECT ECU	DI–42 IN–28
No lock–up	Engine and ECT ECU	IN–28
No lock–up OFF	Engine and ECT ECU	IN–28
Shift point too high or too low	Engine and ECT ECU	IN–28
Up–shift to O/D from 3rd while O/D main switch is OFF	1. O/D main switch and O/D OFF indicator light circuit 2. Engine and ECT ECU	DI–42 IN–28
Up–shift to O/D from 3rd while engine is cold	Engine and ECT ECU	IN–28
No kick–down	1. Kick–down switch 2. Engine and ECT ECU	IN–28 DI–49
Engine stalls when starting off or stopping	Engine and ECT ECU	IN–28

2. Chapter 2: On–vehicle Repair (★ : A241L, A241E AUTOMATIC TRANSAXLE Repair Manual Pub. No. RM177E)

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 ranges	1. Primary regulator valve 2. Manual valve 3. Throttle valve 4. Off–vehicle matrix chart	★ ★ ★ –
No–up shift (1st → 2nd)	1. 1 – 2 shift valve 2. Off–vehicle matrix chart	★ –
No–up shift (2nd → 3rd)	1. 2 – 3 shift valve 2. Off–vehicle matrix chart	★ –
No–up shift (3rd → O/D)	1. 3 – 4 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (O/D → 3rd)	1. 3 – 4 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (3rd → 2nd)	1. 2 – 3 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (2nd → 1st)	1. 1 – 2 shift valve 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → R)	1. C_2 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → D)	1. C_1 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → L)	1. C_1 accumulator 2. Low coast modulator valve 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (1st → 2nd "D" range)	1. Accumulator control valve 2. B_2 accumulator 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (1st → 2nd "2" range)	1. B_2 accumulator 2. Accumulator control valve 3. 2nd coast modulator control 4. Off–vehicle matrix chart	★ ★ ★ –
Harsh engagement (1st → 2nd → 3rd → O/D)	1. Throttle valve 2. Primary regulator valve	★ ★
Harsh engagement (2nd → 3rd)	1. C_2 accumulator 2. Accumulator control valve 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (3rd → O/D)	1. B_2 accumulator 2. C_3 accumulator 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (O/D → 3rd)	1. B_4 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (3rd → 2nd)	1. C_2 accumulator 2. Off–vehicle matrix chart	★ –
Slip (Forward and Reverse)	1. Primary regulator valve 2. Oil strainer 3. Off–vehicle matrix chart	★ ★ –
Slip ("R" range, 1st, 2nd, 3rd, O/D)	Off–vehicle matrix chart	–

Symptom	Suspect Area	See page
No engine braking (1st "L" range)	1. Low coast modulator valve 2. Off–vehicle matrix chart	★ –
No engine braking (2nd "2" range)	1. 2nd coast modulator valve 2. Off–vehicle matrix chart	★ –
No kick down	1. 1 – 2 shift valve 2. 2 – 3 shift valve 3. 3 – 4 shift valve	★ ★ ★
Poor acceleration	1. Primary regulator valve 2. Off–vehicle matrix chart	★ –
No lock–up	1. Lock–up relay valve 2. Off–vehicle matrix chart	★ –

3. Chapter 3: Off–vehicle Repair (★ : A241L, A241E AUTOMATIC TRANSAXLE Repair Manual Pub. No. RM177E)

Symptom	Suspect Area	See page
Does not move in any forward ranges	Forward clutch (C_1)	★
Does not move in reverse range	1. Direct clutch (C_2) 2. 1st & reverse brake (B_3) 3. U/D brake (B_4)	★ ★ ★
Does not move in any ranges	1. Torque converter 2. Oil pump 3. U/D one–way clutch (F_3) 4. Front planetary gear 5. Rear planetary gear	AX–36 ★ ★ ★ ★
No–up shift (1st → 2nd)	1. 2nd brake (B_2) 2. No.1 one–way clutch (F_1)	★ ★
No–up shift (2nd → 3rd)	Direct clutch (C_2)	★
No–up shift (3rd → O/D)	U/D clutch (C_3)	★
No–down shift (O/D → 3rd)	1. U/D brake (B_4) 2. U/D one–way clutch (F_3)	★ ★
No–down shift (3rd → 2nd)	No.1 one–way clutch (F_1)	★
No–down shift (2nd → 1st)	No.2 one–way clutch (F_2)	★
Harsh engagement (N → R)	1. Direct clutch (C_2) 2. 1st & reverse brake (B_3)	★ ★
Harsh engagement (N → D)	Forward clutch (C_1)	★
Harsh engagement (N → L)	Forward clutch (C_1)	★
Harsh engagement (1st → 2nd "D" range)	1. 2nd brake (B_2) 2. No.1 one–way clutch (F_1)	★ ★
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)	★ ★ ★
Harsh engagement (2nd → 3rd)	Direct clutch (C_2)	★
Harsh engagement (3rd → O/D)	U/D clutch (C_3)	★
Harsh engagement (O/D → 3rd)	U/D brake (B_4)	★
Harsh engagement (3rd → 2nd)	Direct clutch (C_2)	★
Slip (Forward and Reverse)	1. Torque converter 2. Oil pump 3. On–vehicle matrix chart	AX–36 ★ –
Slip ("R" range)	1. Direct clutch (C_2) 2. 1st & reverse brake (B_3)	★ ★
Slip (1st)	1. Forward clutch (C_1) 2. No.2 one–way clutch (F_2) 3. U/D one–way clutch (F_3)	★ ★ ★

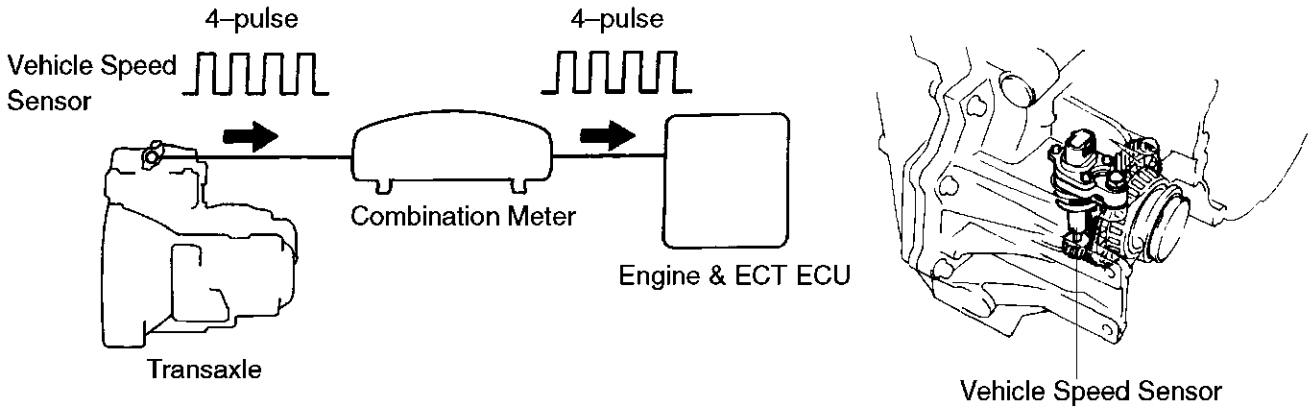
Slip (2nd)	1. Forward clutch (C_1) 2. 2nd brake (B_2) 3. No.1 one–way clutch (F_1) 4. U/D one–way clutch (F_3)	★ ★ ★ ★
Slip (3rd)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D one–way clutch (F_3)	★ ★ ★
Slip (O/D)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D clutch (C_3)	★ ★ ★
No engine braking (1st "L" range)	1st & reverse brake (B_3)	★
No engine braking (2nd "2" range)	2nd coast brake (B_1)	★
Poor acceleration	1. Torque converter 2. Forward clutch (C_1)	AX–36 ★
No lock–up	Torque converter	AX–36
Engine stalls when starting off or stopping	Torque converter	AX–36

DI32V-01

CIRCUIT INSPECTION

DTC	P0500/42	Vehicle Speed Sensor Malfunction

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 & ECT ECU. The Engine & ECT ECU determines the vehicle speed sensor based on the frequency of these pulse signals.



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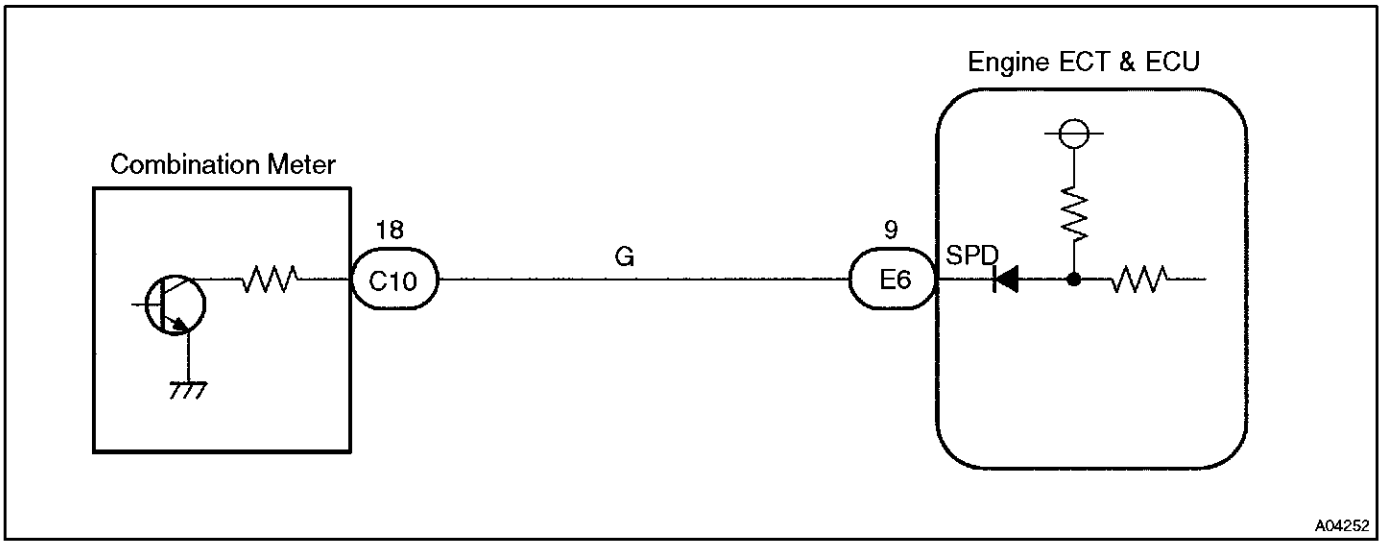
DTC No.	DTC Detecting Condition	Trouble Area
P0500/42	• No vehicle speed sensor signal to Engine & ECT ECU under conditions (a) and (b): (1–trip detection logic) (a) Neutral start switch OFF (b) Vehicle is being driven • Clutch or brake slips or gear is broken. (1–trip detection logic)	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine & ECT ECU • Automatic transaxle (clutch, brake or gear etc.)

WIRING DIAGRAM



A04252

INSPECTION PROCEDURE

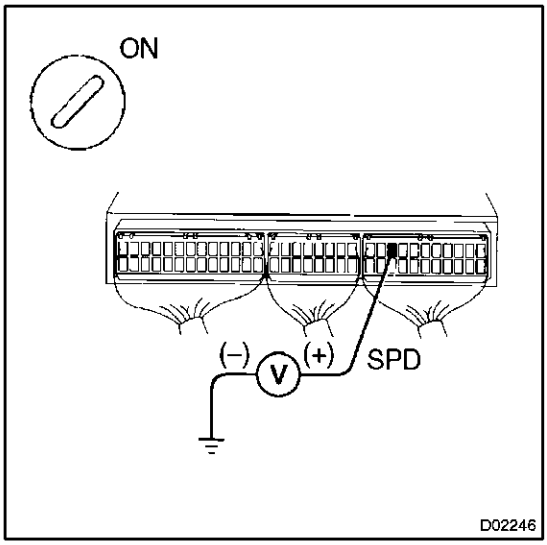
1	**Check operation of speedometer.**

CHECK:
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. See combination meter troubleshooting. (See page BE–63)**

OK

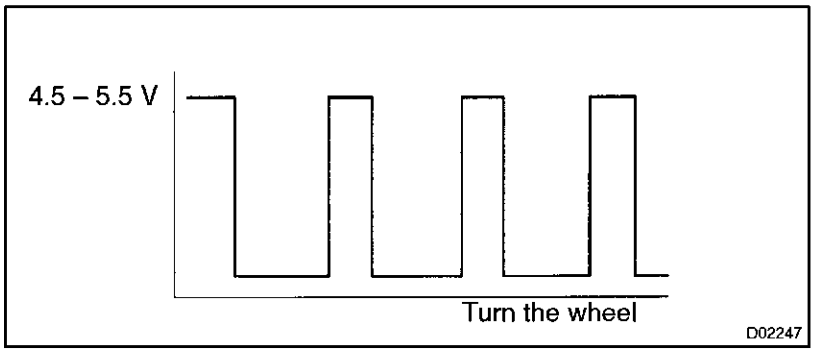
2	**Check voltage between terminal SPD of Engine & ECT ECU connector and body ground.**



PREPARATION:
(a) Turn up the floor mat on the passenger side.
(b) Remove the 2 bolts for Engine & ECT ECU.
(c) Shift the shift lever to N range or neutral.
(d) Jack up one of the front wheels.
(e) Turn ignition switch ON.

CHECK:
Measure voltage between terminal SPD of Engine & ECT ECU connector and body ground when the wheel is turned slowly.

OK:
Voltage is generated intermittently.



NG → **Check and repair harness and connector between combination meter and Engine & ECT ECU. (See page IN–28)**

OK

3	**Check Engine & ECT ECU (See page IN–28).**

NG → **Replace Engine & ECT ECU.**

OK

Check repair transaxle (clutch, brake or gear etc.).

DTC	P0753/62,P0758/63	Shift Solenoid A/B Electrical Malfunction (No.1/No.2 Solenoid Valve)

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 Engine & ECT ECU. If an open or short circuit occurs in either of the solenoid valves, the Engine & ECT ECU controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

Range	NORMAL			NO.1 SOLENOID MALFUNCTIONING			NO.2 SOLENOID MALFUNCTIONING			BOTH SOLENOIDS MALFUNCTIONING
	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear	Gear when shift selector is manually operated
	No.1	No.2		No.1	No.2		No.1	No.2		
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 No.1 solenoid valve when DTC P0753/62 is output and check the No.2 solenoid valve when DTC P0758/63 is output.

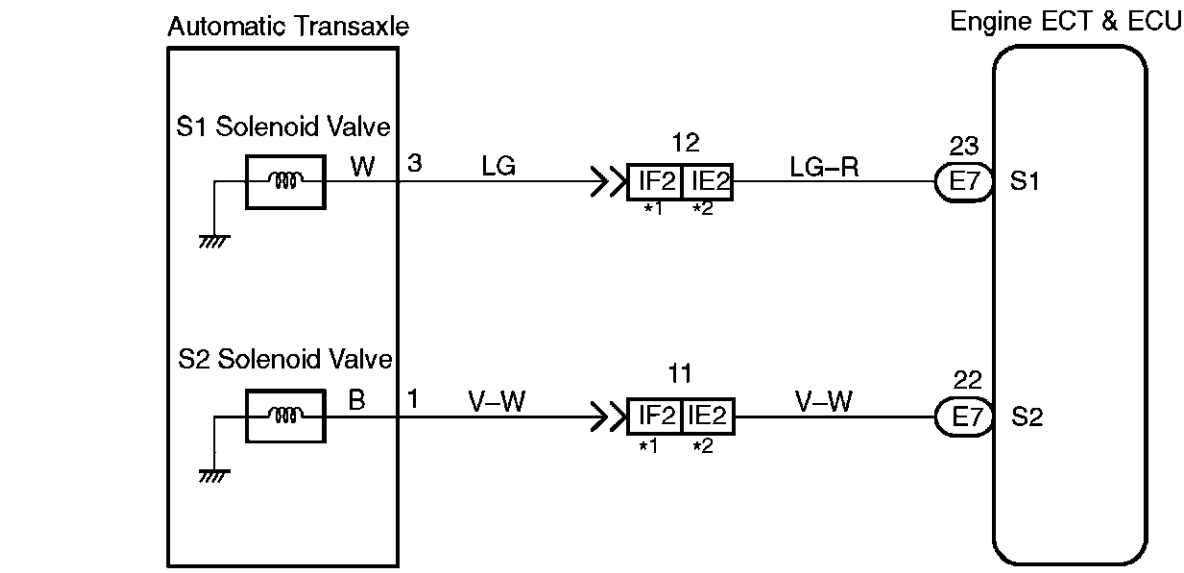
DTC No.	DTC Detecting Condition	Trouble Area
P0753/62 P0758/63	The Engine & ECT ECU checks for an open or short circuit in the No.1 or No.2 solenoid valve circuit when it changes. The Engine & ECT ECU records DTC P0753/62 or P0758/63 if condition (a) or (b) is detected once, but it does not blink the O/D OFF indicator light. After Engine & ECT ECU detects condition (a) or (b) continuously 8 times or more in one–trip, it causes the O/D OFF indicator light to light up until condition (a) or (b) disappears. After that, if the Engine & ECT ECU detects condition (a) or (b) once, it starts lighting up O/D OFF indicator light again. (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.	• Open or short in No.1/No.2 solenoid valve circuit • No.1/No.2 solenoid valve • Engine & ECT ECU

Fail Safe Function:

If either of the solenoid valve circuits develops an open or short, the Engine & ECT ECU turns the other solenoid valve ON and OFF to shift to the gear positions shown in the table above. The Engine & ECT ECU also turns the SL solenoid valve OFF at the same time. If both solenoids malfunction, hydraulic control cannot be performed electronically and must be done manually.

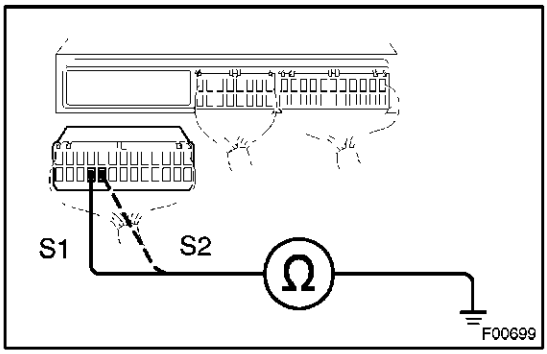
Manual shifting as shown in the above table must be done (In the case of a short circuit, the Engine & ECT ECU stops sending current to the short circuited solenoid).

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal S1 or S2 of Engine & ECT ECU and body ground.**

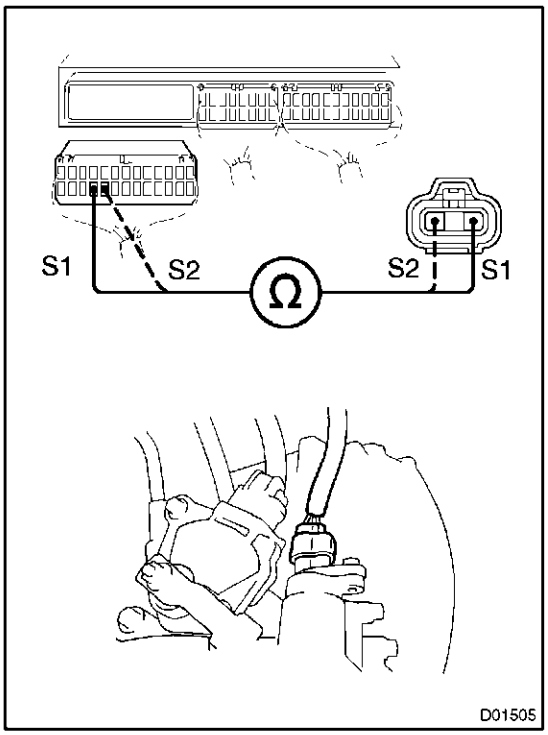


PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminal S1 or S2 of Engine & ECT ECU and body ground.
OK:
Resistance: 11 ~ 15 Ω at 20 °C (68 °F)

OK	**Check and replace the Engine & ECT ECU (See page IN–28).**

NG

2	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**



PREPARATION:
Disconnect the solenoid connector from the automatic transmission.

CHECK:
Check the harness and connector between terminal S1 or S2 of Engine & ECT ECU and terminal S1 or S2 of solenoid connector.

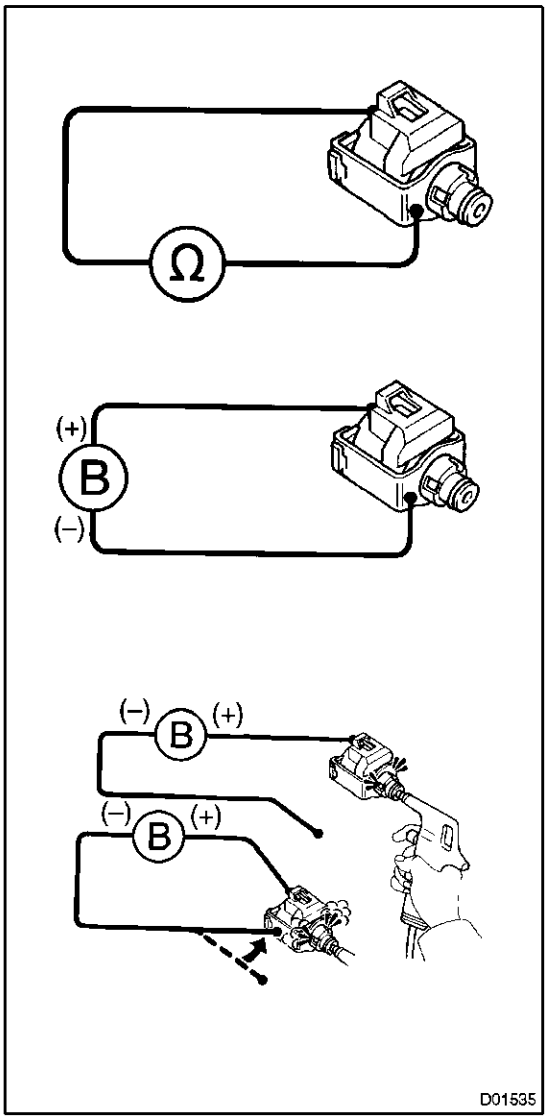
OK:

There is no open and short circuit.

NG → **Repair or replace the harness or connector (See page IN–28).**

OK

3	Check No.1 or No.2 solenoid valve.



Electrical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the No.1 or No.2 solenoid valve.

CHECK:

(a) Measure resistance between solenoid connector and body ground.
(b) Connect positive ⊕ lead of the battery to terminal of solenoid connector, negative ⊖ lead of the battery to solenoid body.

OK:

(a) Resistance: 11 ~ 15 Ω at 20 °C (68 °F)
(b) The solenoid makes an operating noise

Mechanical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the No.1 or No.2 solenoid valve.

CHECK:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(b) When battery positive voltage is supplied to the solenoid valve, check that the valve opens.

OK:

(a) Solenoid valve does not leak air
(b) Solenoid valve opens

NG → **Replace the solenoid valve.**

OK

Repair or replace the solenoid wire.

DI32X-01

DTC	P0773/64	Shift Solenoid E Electrical Malfunction (SL Solenoid Valve)

CIRCUIT DESCRIPTION

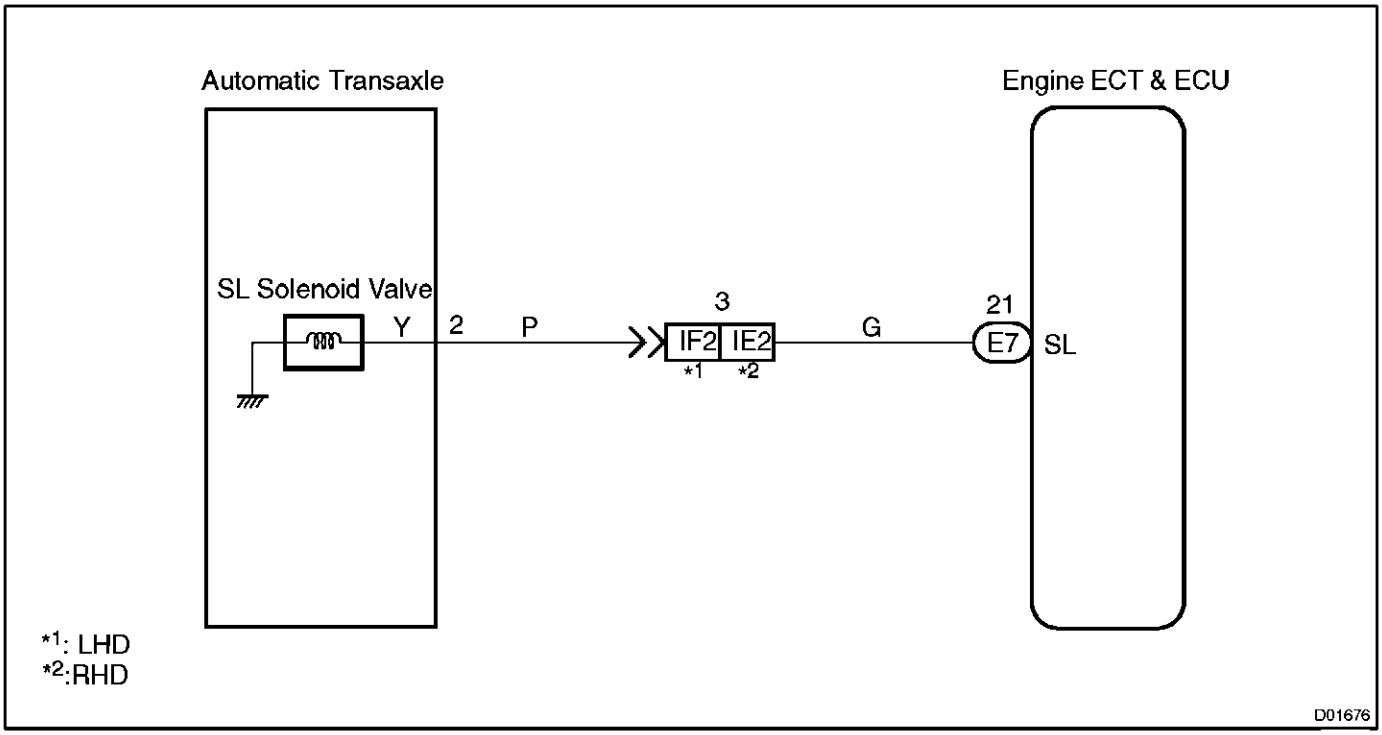
The SL solenoid valve is turned ON and OFF by signals from the Engine & ECT ECU to control the hydraulic pressure acting on the lock–up relay valve, which then controls operation of the lock–up clutch.

DTC No.	DTC Detecting Condition	Trouble Area
P0773/64	Either (a) or (b) is detected 1 time. (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.	• Open or short in SL solenoid valve circuit • SL solenoid valve • Engine & ECT ECU

Fail safe function

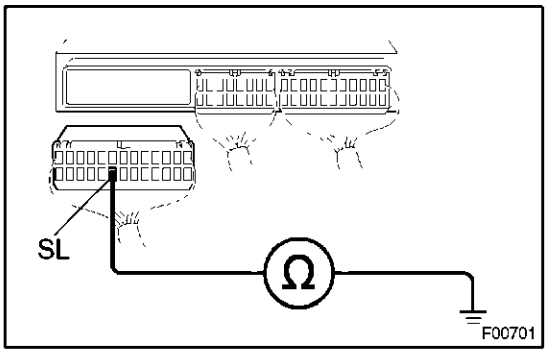
If the Engine & ECT ECU detects a malfunction, it turns the SL solenoid valve OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal SL of Engine & ECT ECU and body ground.**

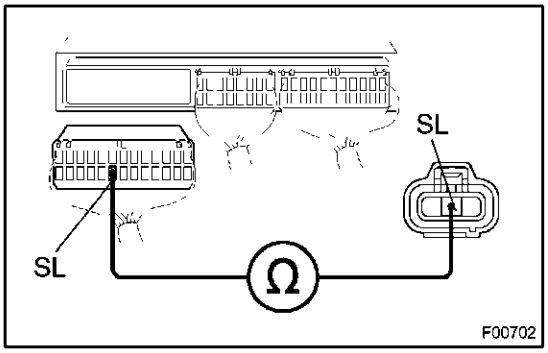


PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminal SL of Engine & ECT ECU and body ground.
OK:
Resistance: 11 ~ 15 Ω at 20 °C (68 °F)

OK → **Check and replace the Engine & ECT ECU (See page IN–28).**

NG

2	**Check harness and connector between Engine & ECT ECU and automatic transaxle solenoid connector.**

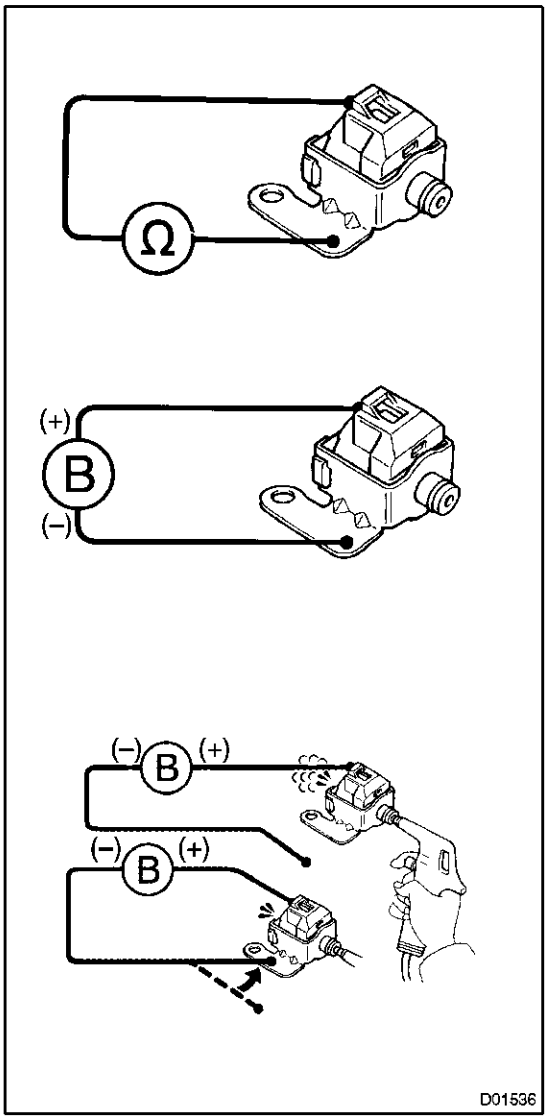


PREPARATION:
Disconnect the solenoid connector from the transaxle.
CHECK:
Check the harness between terminal SL of Engine & ECT ECU and terminal SL of transaxle solenoid connector.
OK:
There is no open or short circuit.

NG → **Repair or replace the harness or connector.**

OK

3	Check SL solenoid valve.



Electrical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the SL solenoid valve.

CHECK:

(a) Measure resistance between terminal SL of solenoid valve and solenoid body.
(b) Connect positive ⊕ lead of the battery to terminal of solenoid connector, negative ⊖ lead of the battery to solenoid body.

OK:

(a) Resistance: 11 ~ 15 Ω at 20 °C (68 °F)
(b) The SL solenoid valve makes operating noise

Mechanical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the SL solenoid valve.

CHECK:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(b) When battery positive voltage is supplied to the solenoid valve, check that the solenoid valve opens.

OK:

(a) Solenoid valve does not leak air
(b) Solenoid valve opens

NG → **Replace the SL solenoid valve.**

OK

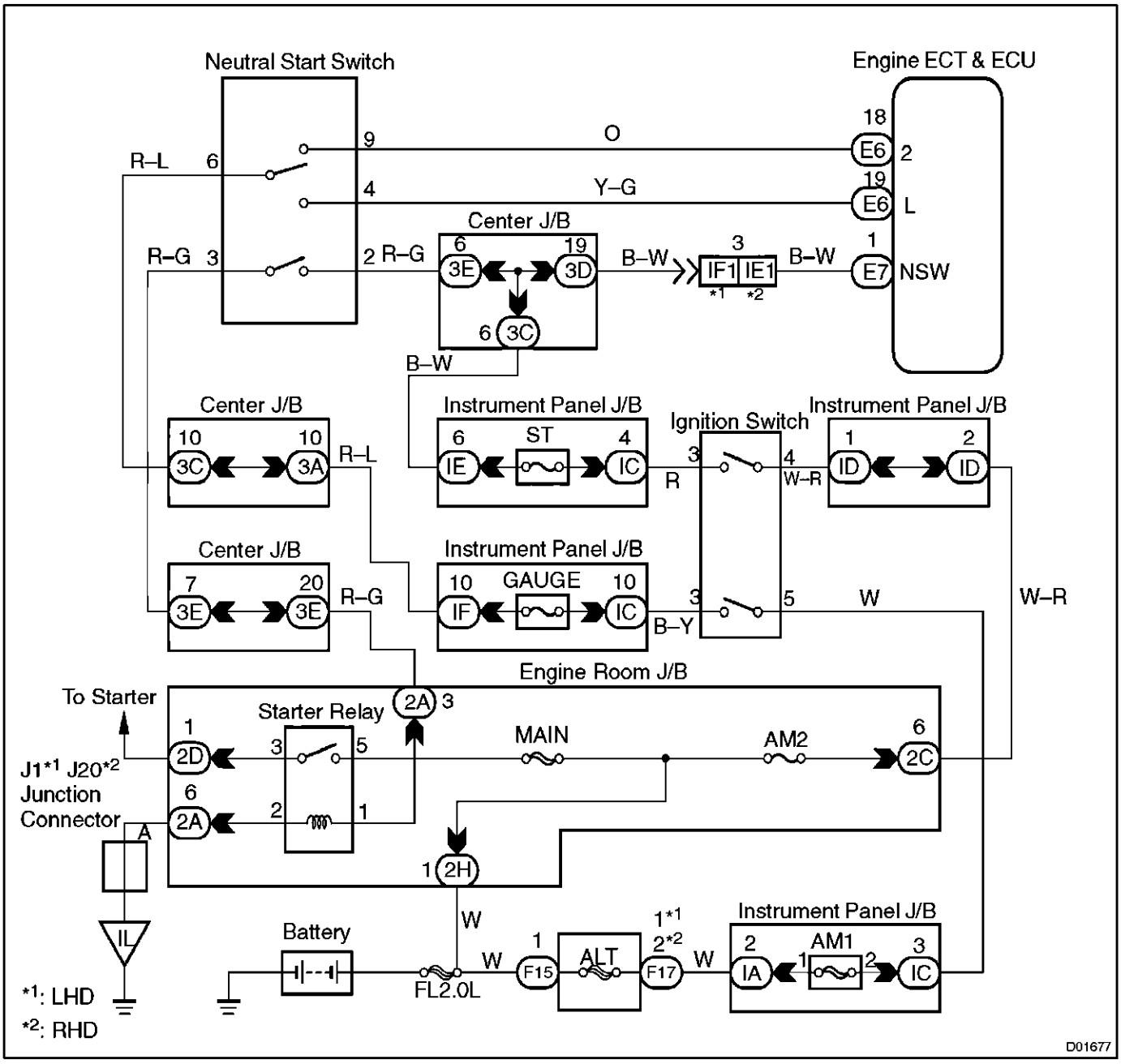
Repair or replace the solenoid wire.

Neutral Start Switch Malfunction

CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever position and sends signals to the Engine & ECT ECU. The Engine & ECT ECU receives signals (NSW, R, 2 and L) from the neutral start switch. When the signal is not sent to the Engine & ECT ECU from the neutral start switch, the Engine & ECT ECU judges that the shift lever is in D range.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Read PNP SW, REVERSE, 2ND and LOW signals.**

When using hand–held tester:

PREPARATION:

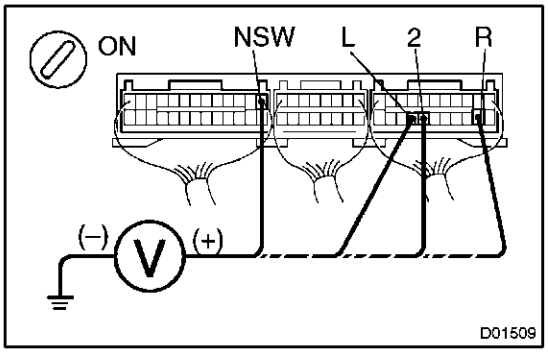
(a) Remove the DLC3 cover.
(b) Connect hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Shift lever into the P, R, N, 2 and L ranges, and read the PNP SW, REVERSE, 2ND and LOW signals on the hand–held tester.

OK:

Shift Range	Signal
2	2ND: OFF → ON
L	LOW: OFF → ON
R	REVERSE: OFF → ON
P, N	PNP SW: OFF → ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between each of terminals NSW, 2, L and R of Engine & ECT ECU and body ground when the shift lever is shifted to the following ranges.

OK:

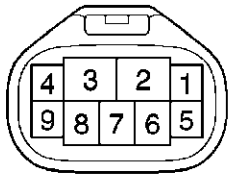
Range	NSW–Body ground	R–Body ground	2–Body ground	L–Body ground
P, N	0 V	0 V	0 V	0 V
R	9 ~ 14 V*	9 ~ 14 V*	0 V	0 V
D	9 ~ 14 V	0 V	0 V	0 V
2	9 ~ 14 V	0 V	9 ~ 14 V	0 V
L	9 ~ 14 V	0 V	0 V	9 ~ 14 V

HINT: The voltage will drop slightly due to lighting up of the back up light.

OK → **Check and replace the Engine & ECT ECU (See page IN–28).**

NG

2	Check neutral start switch.



D01546

PREPARATION:

(a) Jack up the vehicle.

(b) Disconnect the neutral start switch connector.

CHECK:

Check continuity between each terminal shown below when the shift lever is moved to each position.

OK:

Shift Range	Terminal No. to continuity	Terminal No. to continuity
P	6 – 1	2 – 3
R	6 – 5	–
N	6 – 7	2 – 3
D	6 – 8	–
2	6 – 9	–
L	6 – 4	–

NG → **Replace the neutral start switch.**

OK →

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine & ECT ECU (See page IN–28).

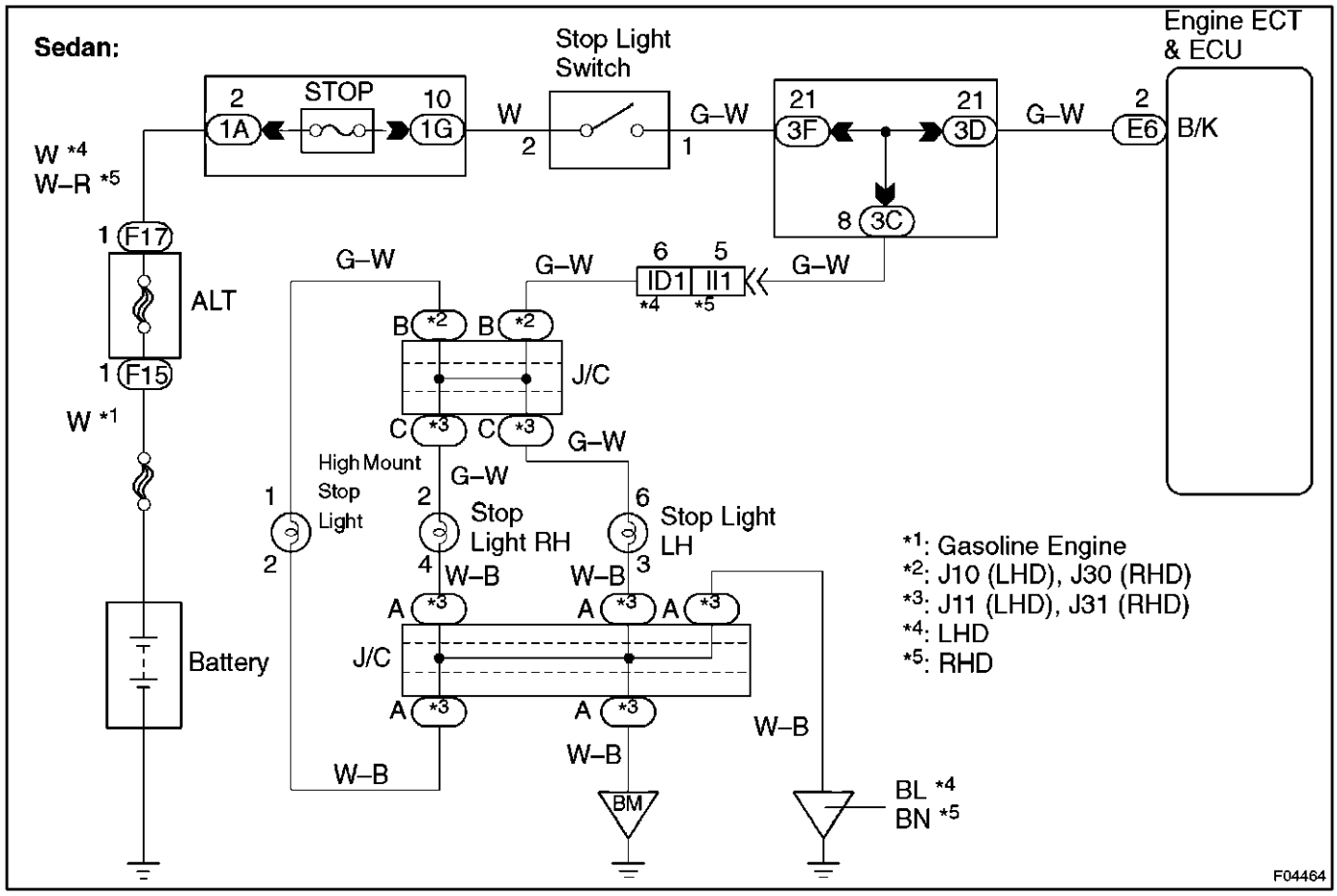
DI334–01

Stop Light Switch Signal Malfunction

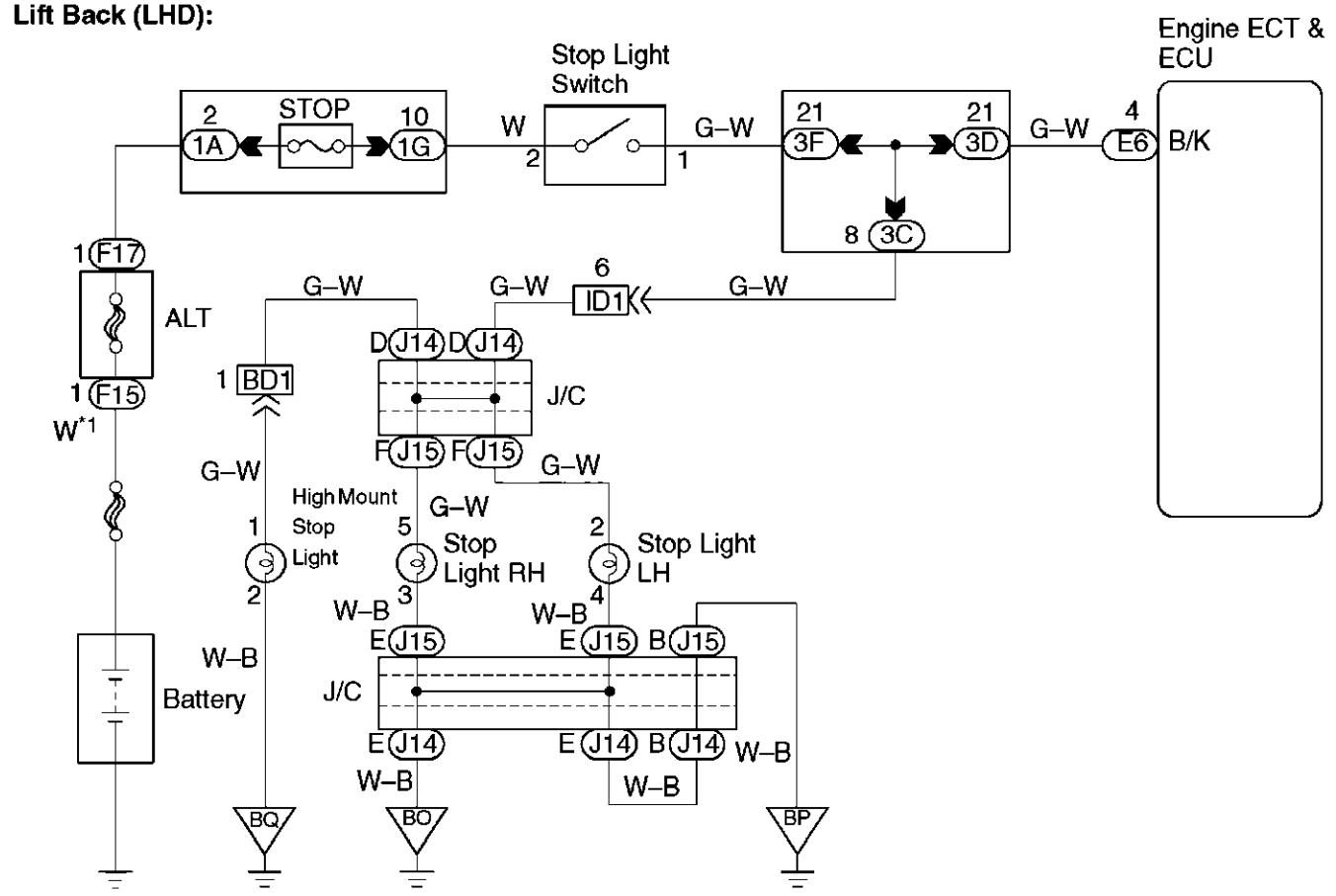
CIRCUIT DESCRIPTION

The object 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 operated, this switch sends a signal to Engine & ECT ECU. Then the Engine & ECT ECU cancels operation of the lock–up clutch while braking is in progress.

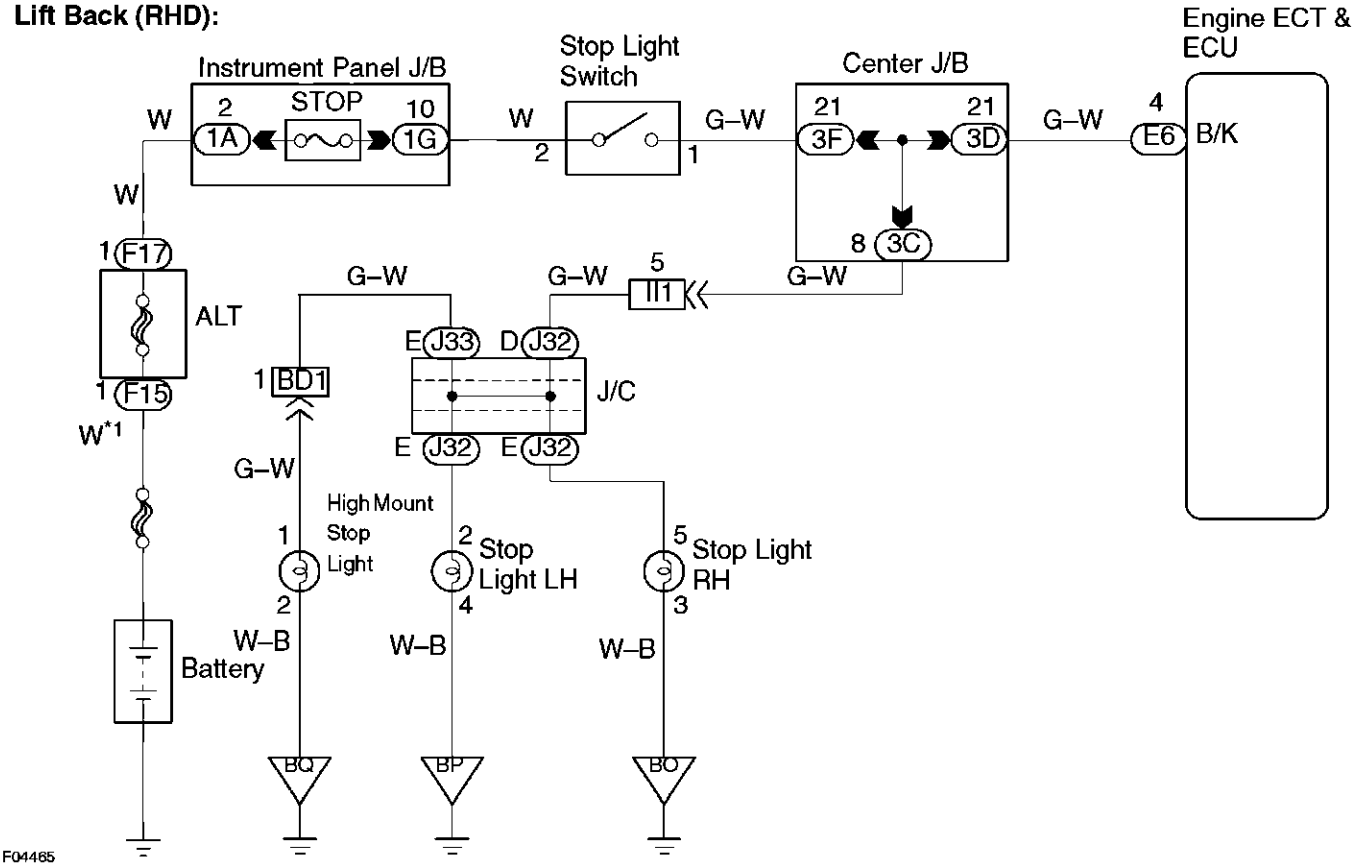
WIRING DIAGRAM



Lift Back (LHD):



Lift Back (RHD):



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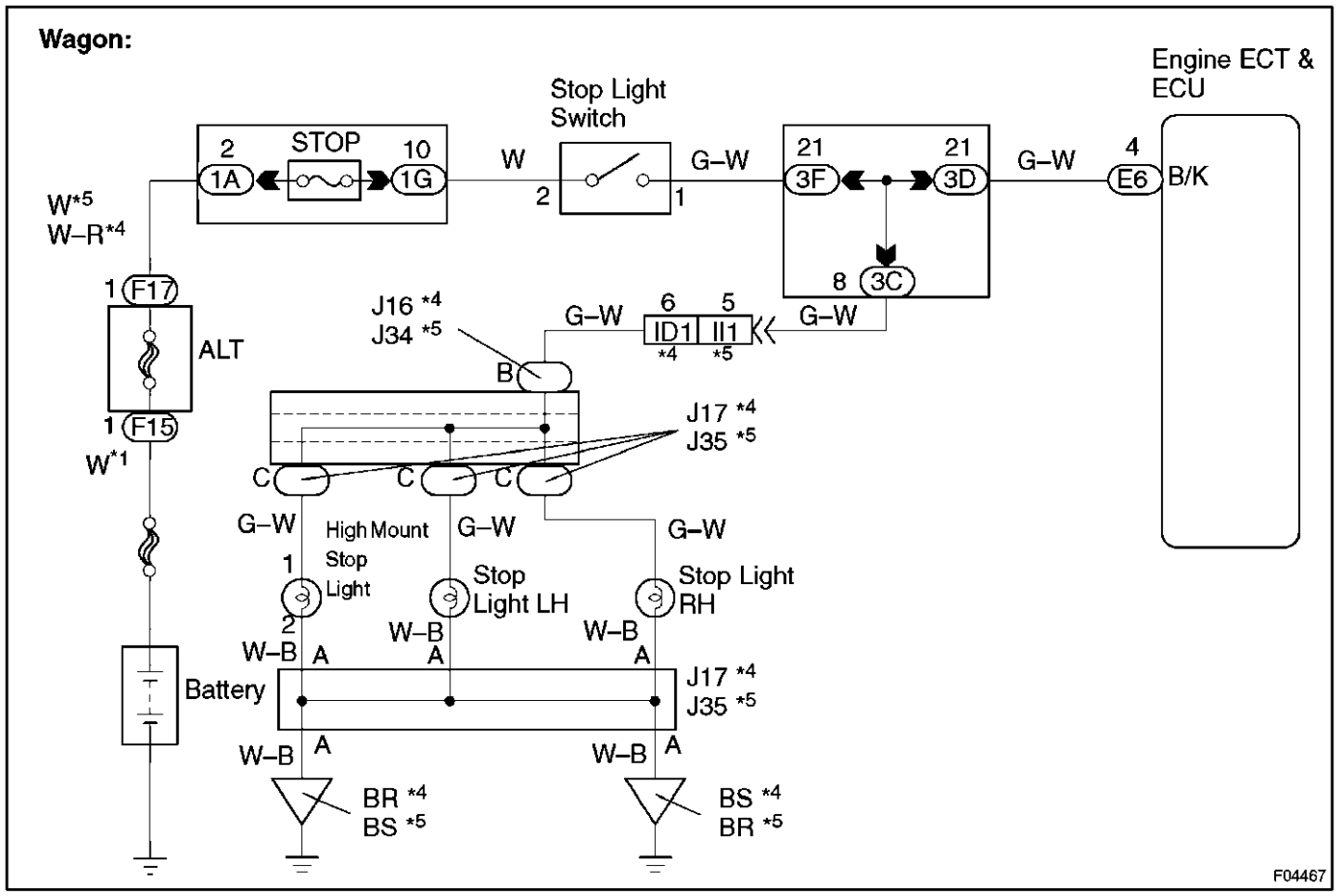
F04466

F05531



INSPECTION PROCEDURE

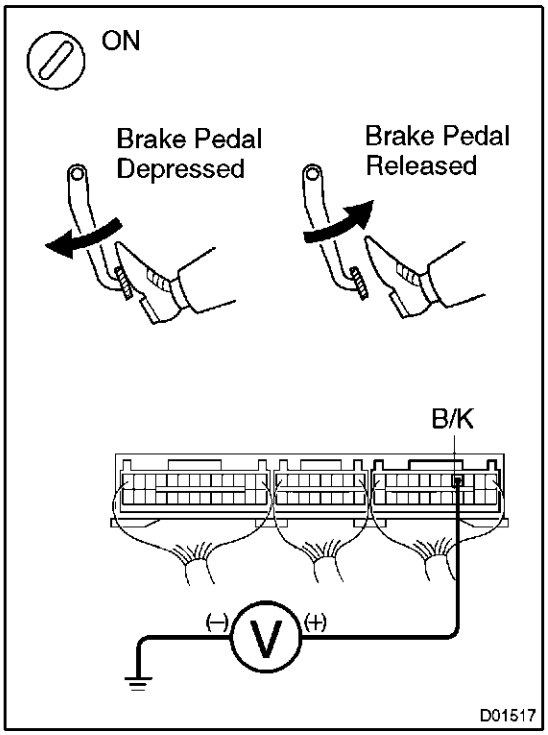
1	**Check operation of stop light.**

CHECK:
Check if the stop lights go on and off normally when the brake pedal is depressed and released.

NG → **Check and repair stop light circuit.**

OK

2	Check STP signal.



When using hand –held tester:

PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) Turn the ignition switch ON and turn the hand–held tester main switch ON.

CHECK:

Read the STP signal on the hand–held tester.

OK:

Brake pedal is depressed: STP....ON

Brake pedal is released: STP....OFF

When not using hand –held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal B/K of Engine & ECT ECU and body ground.

OK:

Brake pedal	Voltage
Depressed	7.5–14 V
Released	Below 1.5 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–20).**

NG

3	Check harness and connector between Engine & ECT ECU and stop light switch (See page IN–28).

NG → **Repair or replace harness or connector.**

OK

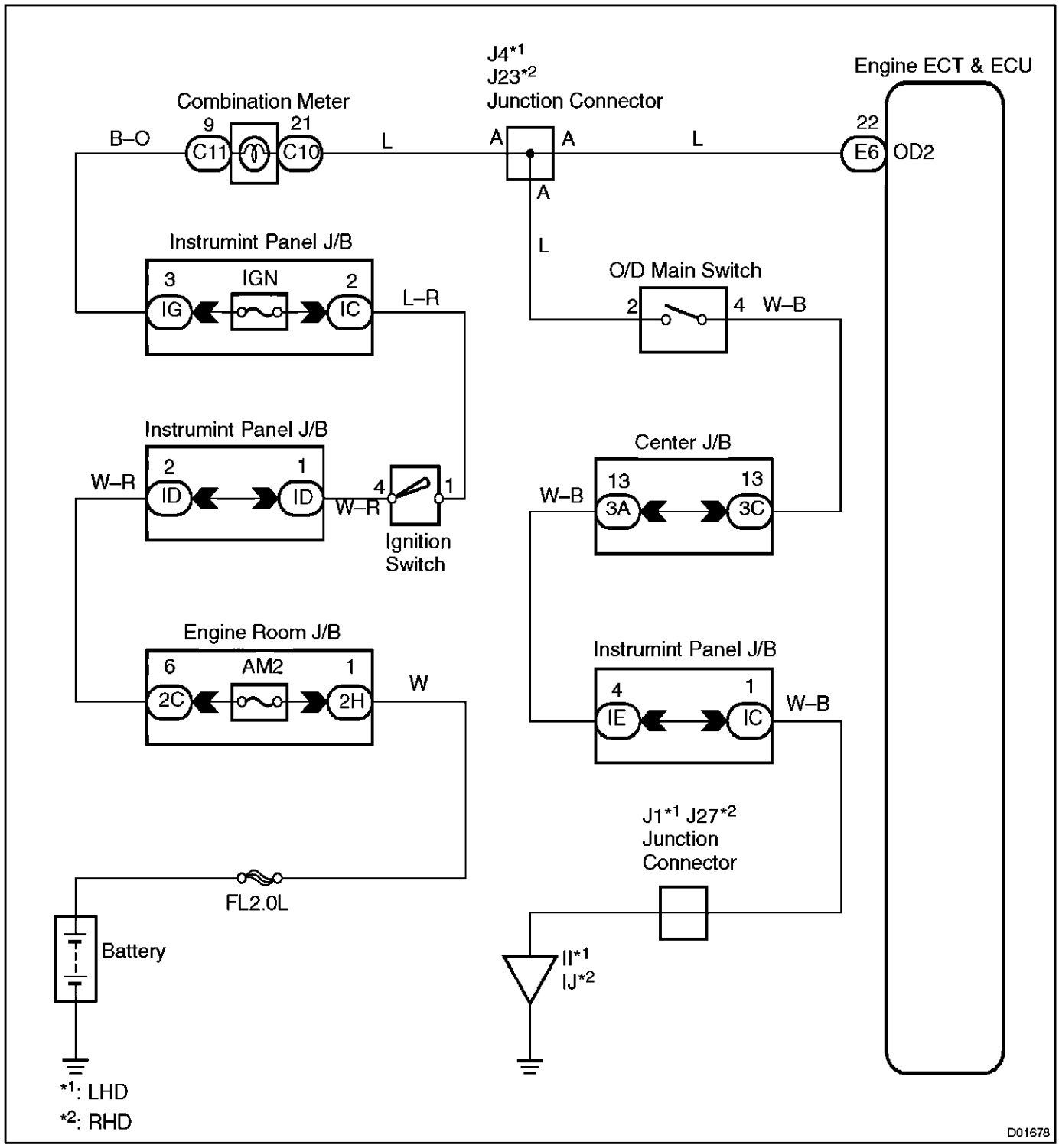
Check and replace Engine & ECT ECU (See page IN–28).

O/D Main Switch & O/D OFF Indicator Light Circuit

CIRCUIT DESCRIPTION

The O/D main switch contacts go open when the switch is pushed in and go closed when it is pushed out. When O/D main switch is in OFF position, the O/D OFF indicator light lights up, and the Engine & ECT ECU prohibits shifting O/D.

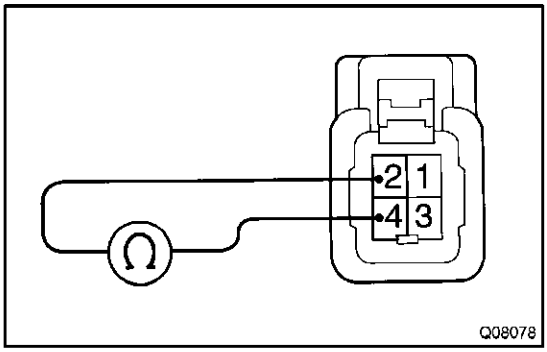
WIRING DIAGRAM



INSPECTION PROCEDURE

O/D OFF indicator light does not light up

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity between terminals 2 and 4 of O/D main switch connector.
OK:

O/D main switch	Specified condition
ON	No continuity
OFF	Continuity

NG → **Replace the O/D main switch.**

OK

2	**Check and replace combination meter (See page BE–63).**

NG → **Replace the combination meter.**

OK

3	Check OVRDRIVE CUT SW2 signal.

When using hand–held tester:

PREPARATION:

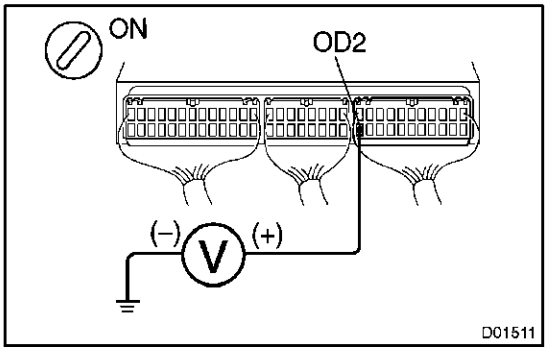
(a) Remove the DLC3 cover.
(b) Connect hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the OVRDRIVE CUT SW2 signal on the hand–held tester.

OK:

O/D main switch condition	OVRDRIVE CUT SW2 signal
O/D ON (Pushed in)	OFF
O/D OFF (Pushed once again)	ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal OD2 of Engine & ECT ECU and body ground.

OK:

O/D main switch condition	Voltage
O/D ON (Pushed in)	9 – 14
O/D OFF (Pushed once again)	Below 3 V

OK → **Check and replace the Engine & ECT ECU (See page IN–28).**

NG

4	Check harness and connector between O/D OFF indicator light and Engine & ECT ECU (See page IN–28).

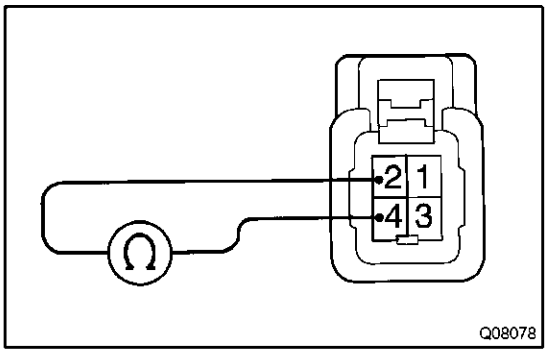
NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–28).

O/D OFF indicator light remains ON

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity between the terminals 2 and 4 of O/D main switch connector.
OK:

O/D main switch	Specified condition
ON	No continuity
OFF	Continuity

NG → **Replace the O/D main switch.**

OK

2	**Check harness and connector between O/D OFF indicator light and O/D main switch, O/D OFF indicator light and Engine & ECT ECU (See page IN–28).**

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–28).

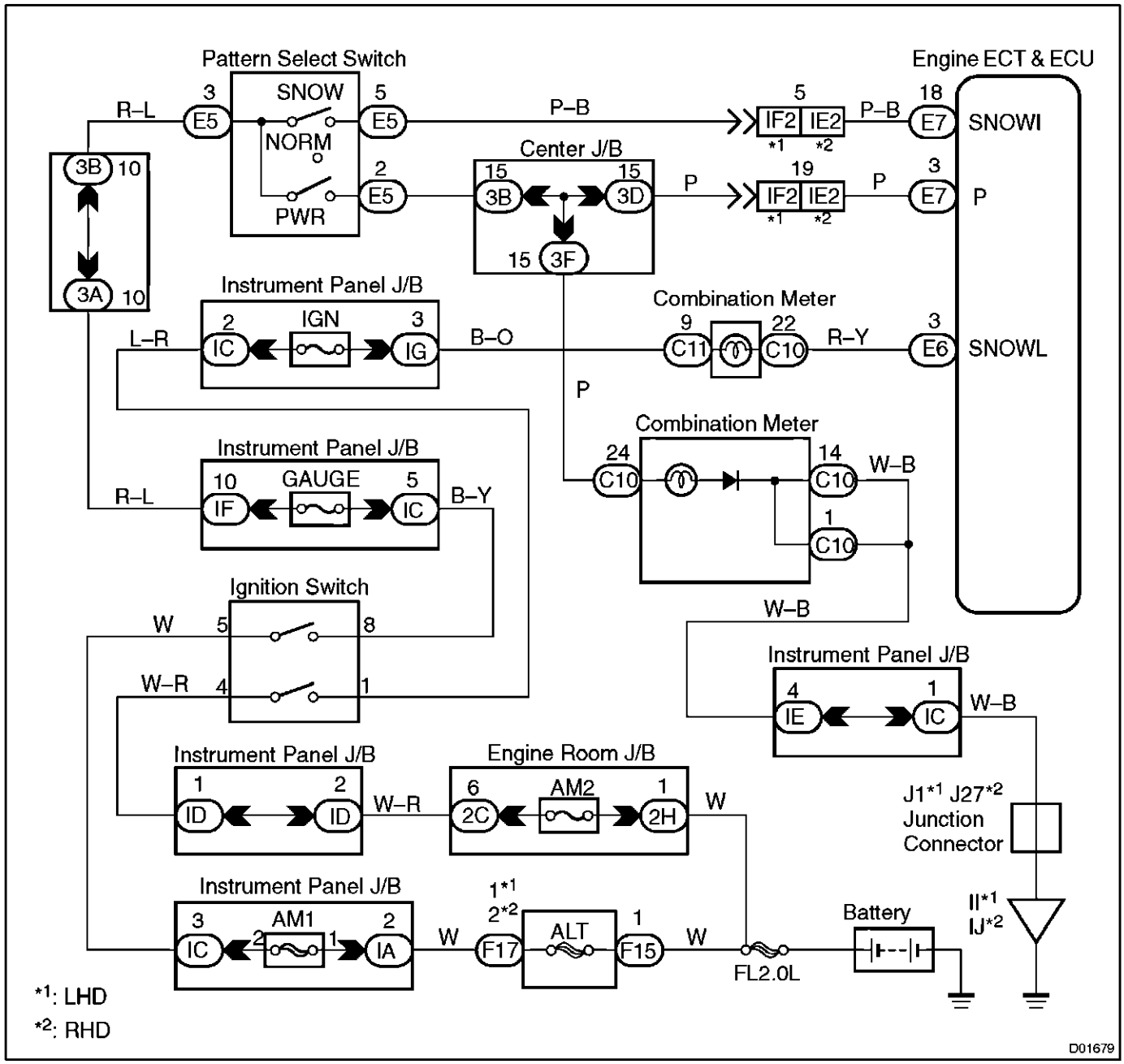
DI336–01

Pattern Select Switch Circuit

CIRCUIT DESCRIPTION

The Engine & ECT ECU memory contains the shift programs for the NORMAL, POWER and SNOW (w/ SNOW mode) patterns, 2 range, L range and the lock–up patterns. By following the programs corresponding to the signals from the pattern select switch, the neutral start switch and other various sensors, the Engine & ECT ECT switches the solenoid valves ON and OFF, and controls the transaxle gear change and the lock–up clutch operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check PATTERN SEL SW signal.**

When using hand–held tester:

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

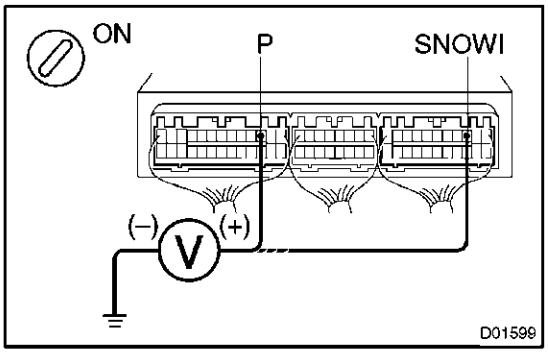
CHECK:

Read the PATTERN SEL SW signal on the hand–held tester.

OK:

Pattern select switch	PATTERN SEL SW signal
POWER	ON
NORM	OFF
SNOW (w/SONW mode)	OFF

When not using hand–held tester:



PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal each of P, SNOWI of Engine & ECT ECU and body ground when the pattern select switch is set to the PWR (POWER), NORM (NORMAL) or SNOW (w/ SNOW mode) position.

OK:

Switch position	Tester connection	Specified condition
PWR	P – Body ground	9 – 14 V
	SNOWI – Body ground	Below 1.5 V
NORM	P – Body ground	Below 1.5 V
	SNOWI – Body ground	Below 1.5 V
SNOW	P – Body ground	Below 1.5 V
	SNOWI – Body ground	9 – 14 V

HINT:

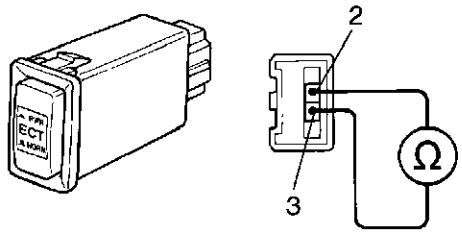
The Engine & ECT ECU uses the normal pattern signal if the P and SNOW1 signals are not input.

OK → **Proceed to next circuit inspection shown in symptom problems table (See page DI–20).**

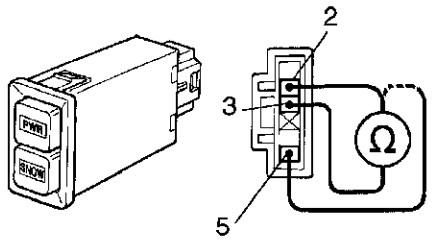
NG

2	Check pattern select switch

w/o SNOW MODE:



w/ SNOW MODE:



D01534

w/o SNOW mode:

PREPARATION:

Disconnect the pattern select switch connector.

CHECK:

Check continuity between terminals 2 and 3 of pattern select switch connector when the select switch is set to PWR or NORM position.

OK:

Switch position	Tester connection	Specified condition
PWR	2 – 3	Continuity
NORM	2 – 3	No continuity

w/ SNOW mode:

PREPARATION:

Disconnect the pattern select switch connector.

CHECK:

Check continuity between terminals 2 and 3 (PWR, NORM), 3 and 5 (SNOW) of pattern select switch connector when the select switch is set to PWR, NORM or SNOW position.

OK:

Switch position	Tester connection	Specified condition
PWR	2 – 3	Continuity
NORM	2 – 3, 3 – 5	No continuity
SNOW	3 – 5	Continuity

NG → **Replace the pattern select switch.**

OK

3	Check harness and connector between battery and pattern select switch, pattern select switch and Engine & ECT ECU (See page IN–28).

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–28).

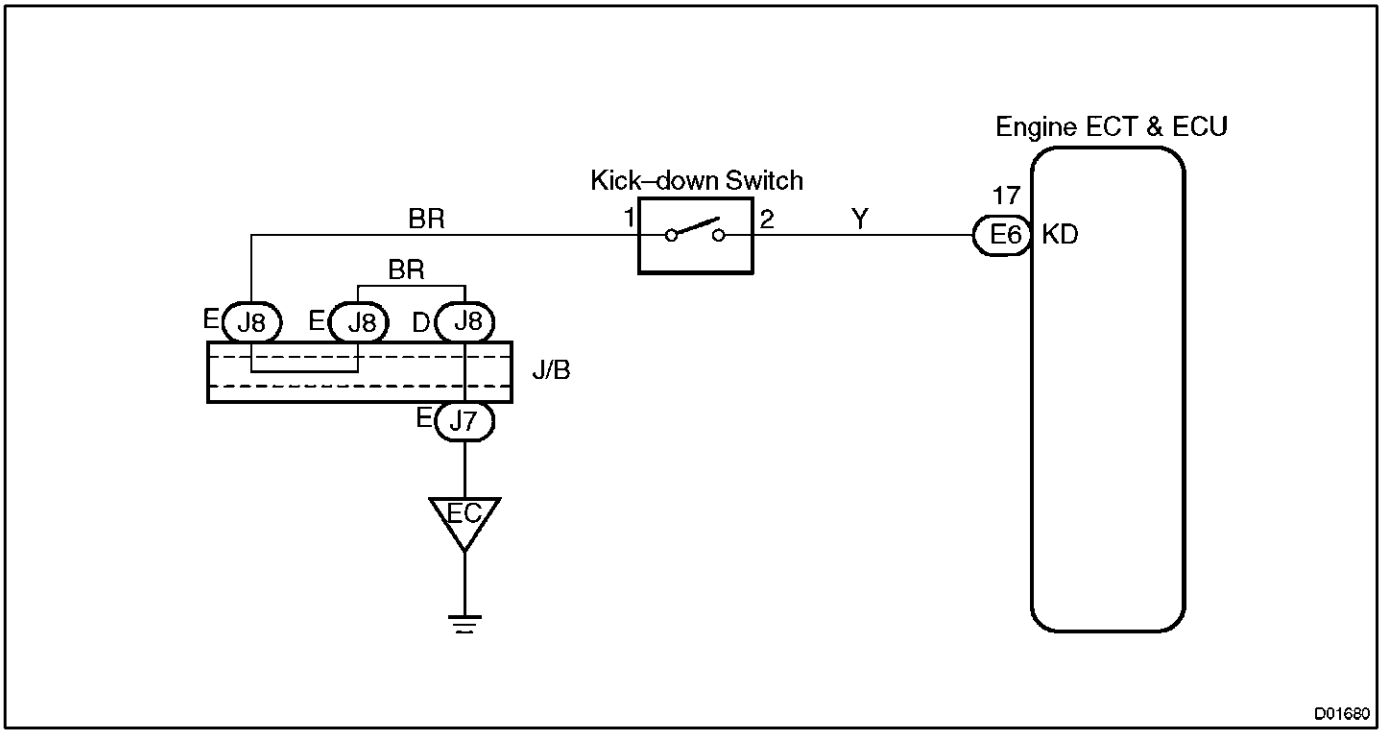
DI32Y–01

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 Engine & ECT ECU.
When the kick–down switch is turned ON, the Engine & ECT ECU controls gear shifting according to the programmed shift diagrams.
If a short circuit develops in the kick–down switch, the Engine & ECT ECU disregards the kick–down signals and controls shifting at the normal shift points.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check KICK DOWN SW signal.

When using hannd–held tester:

PREPARATION:

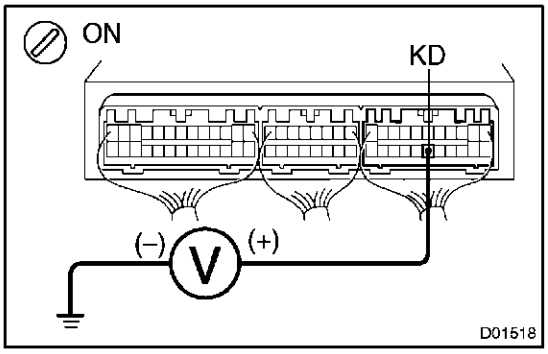
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the KICK DOWN SW signal on the hand–held tester.

OK:

Accelerator Pedal	KICK DOWN SW signal
Fully depressed (kick–down SW is ON)	ON
Released (kick–down SW is OFF)	OFF



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal KD of Engine & ECT ECU connector and body ground when accelerator pedal is fully depressed or not.

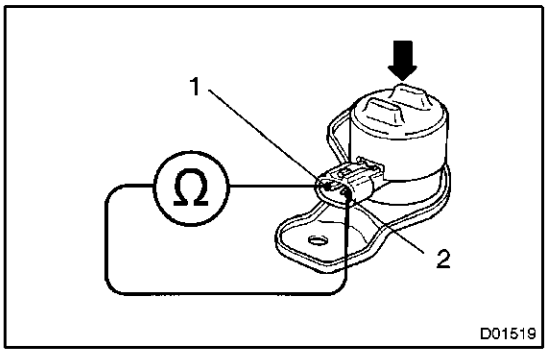
OK:

Accelerator Pedal	Voltage
Fully depressed (kick–down SW is ON)	Below 1 V
Released (kick–down SW is OFF)	10 – 14 V

OK → **Proceed to next circuit inspection shown in problem symproms table (See page DI–20).**

NG

2	Check kick–down switch.



PREPARATION:
Disconnect the kick–down switch connector.
CHECK:
Check continuity at each terminal of kick–down switch connector.
OK:

Kick–down Switch	Specified condition
ON	No continuity
OFF	Continuity

NG → Replace kick–down switch

OK

3	Check harness and connector between Engine & ECT ECU and kick–down switch, kick–down switch and body ground (See page IN–28).

NG → Repair or replace the harness or connector.

OK

Check and replace Engine & ECT ECU (See page IN–28).

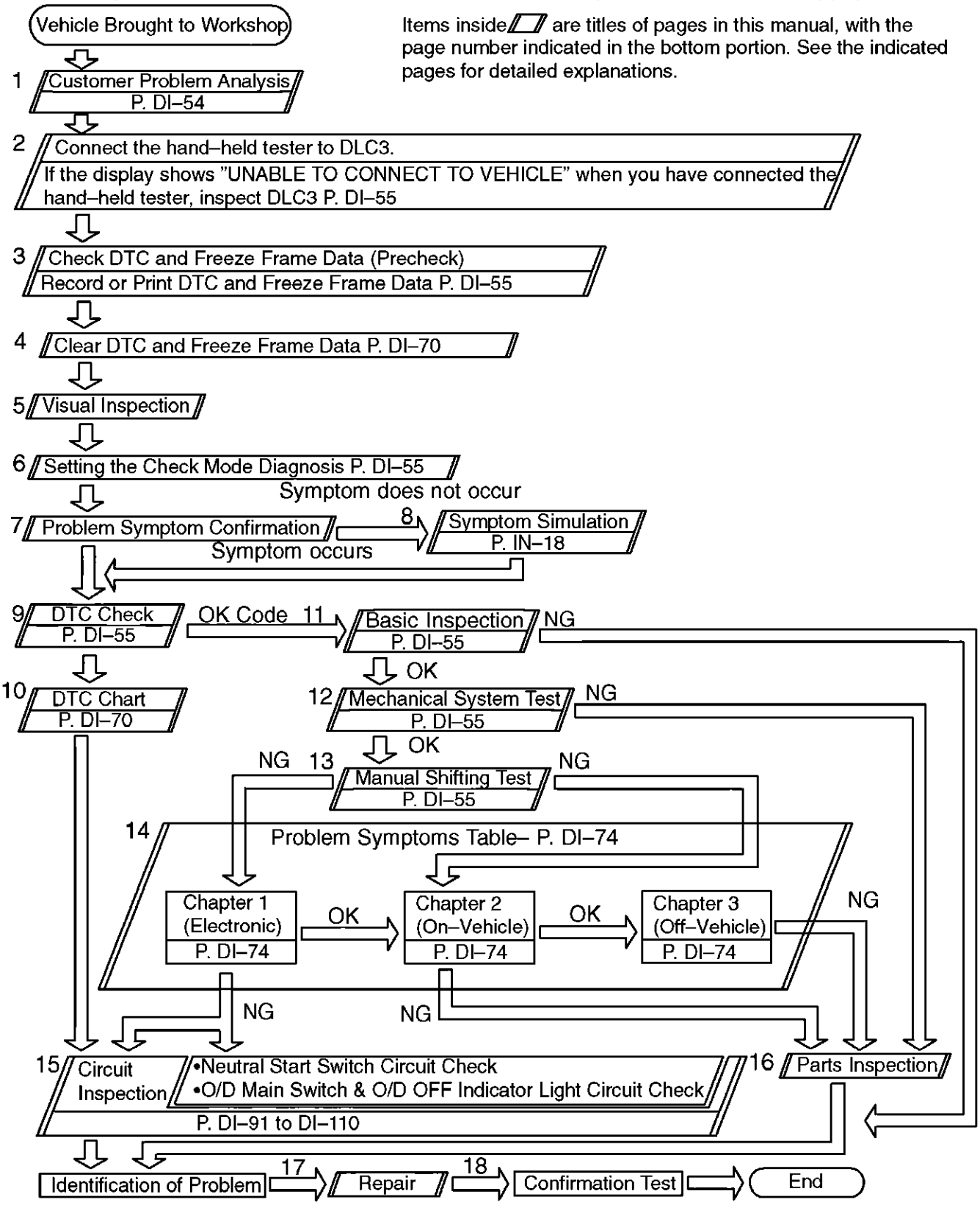
AUTOMATIC TRANSAXLE (A245E, A246E)

HOW TO PROCEED WITH TROUBLESHOOTING

DI0SL–10

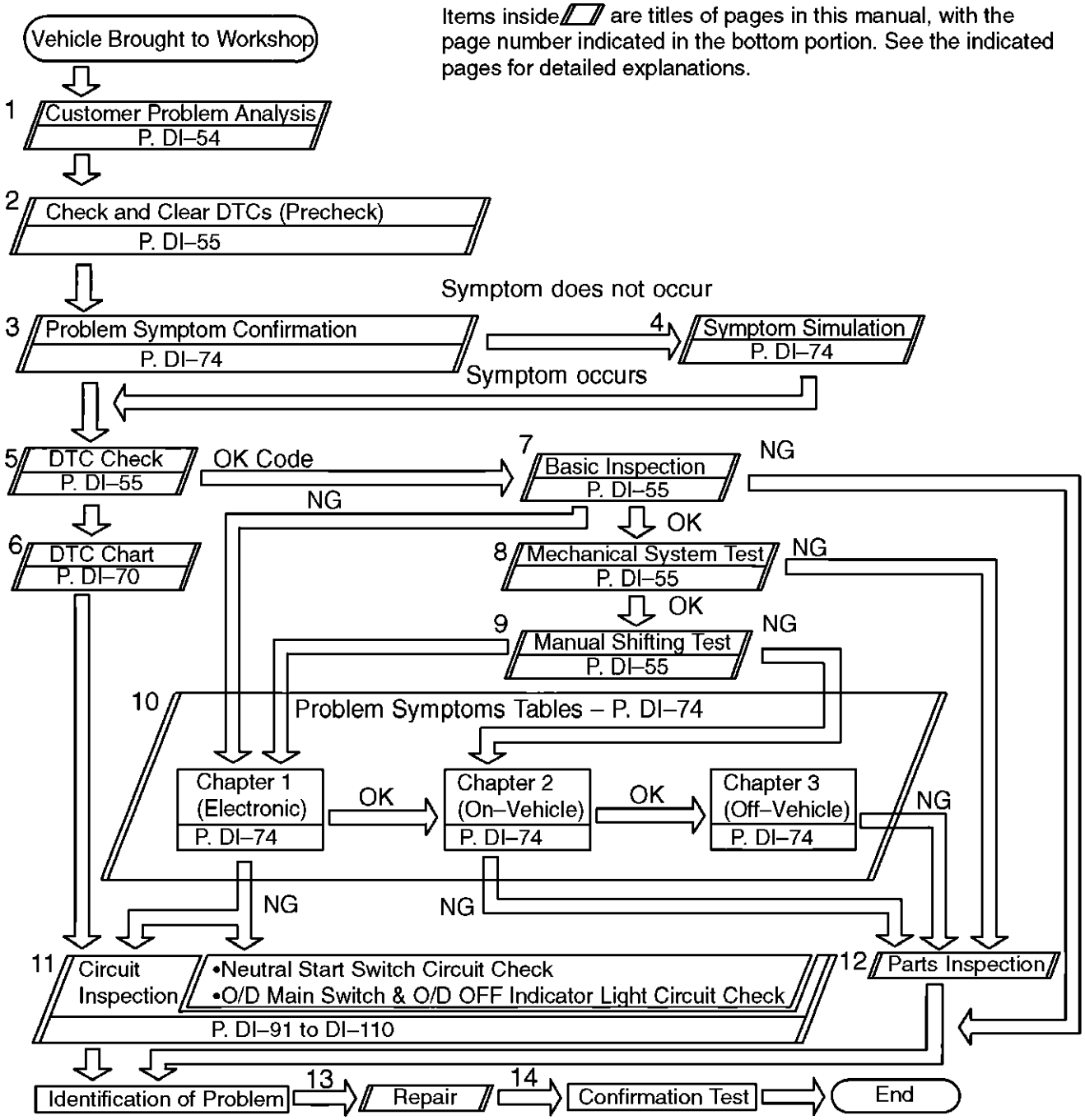
When using hand–held tester, troubleshoot in accordance with the procedure on the following pages.

Items inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



When not using hand–held tester, troubleshoot in accordance with the procedure on the following pages.

Items inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



DI0SM–08

CUSTOMER PROBLEM ANALYSIS CHECK

Transaxle Control System Check Sheet	Inspector's Name :

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

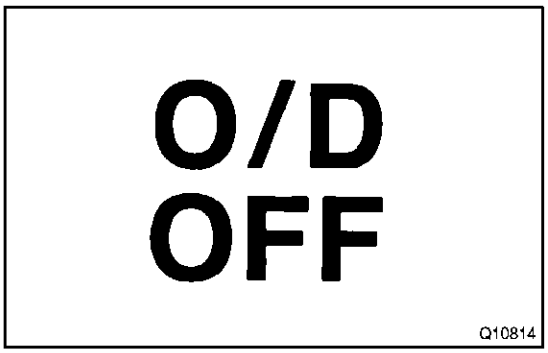
Date Problem Occurred	/ /
Frequency Problem occurs?	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Vehicle does not move (☐ Any range ☐ Particular range)
	☐ No up–shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → O/D)
	☐ No down–shift (☐ O/D → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)
	☐ Lock–up malfunction
	☐ Shift point too high or too low
	☐ Harsh engagement (☐ N → D ☐ Lock–up ☐ Any drive range)
	☐ Slip or shudder
	☐ No kick–down
	☐ Others ( )

Check Item	Malfunction Indicator Lamp	☐ Normal	☐ Remains ON

DTC Check	1st Time	☐ Normal code	☐ Malfunction code (Code)
	2nd Time	☐ Normal code	☐ Malfunction code (Code)

DI3ZZ–01



PRE–CHECK

1. A245E:

DIAGNOSIS SYSTEM

The automatic transaxle has built–in silt–diagnostic functions. If a malfunction occurs in the system, the Engine and ECT ECU stores the trouble code in memory and the O/D OFF Indicator light blinks to inform the driver. The DTC stored in memory can be read out by the following procedure.

HINT:

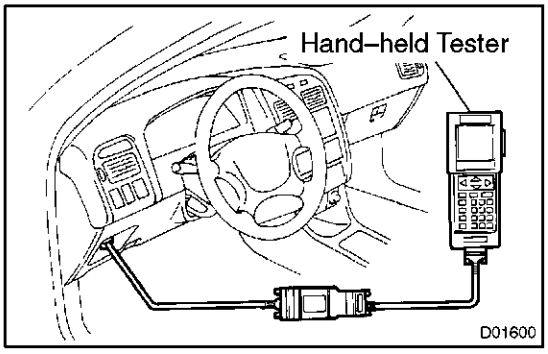
Warning and DTC can be read only when the O/D main switch is ON. If OFF, the O/D OFF Indicator light will light up continuous and will not blink.

2. A246E:

DIAGNOSIS SYSTEM

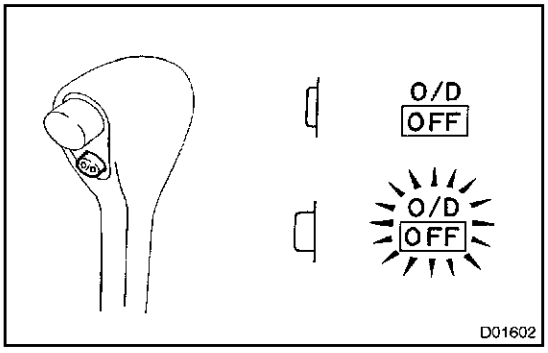
Description

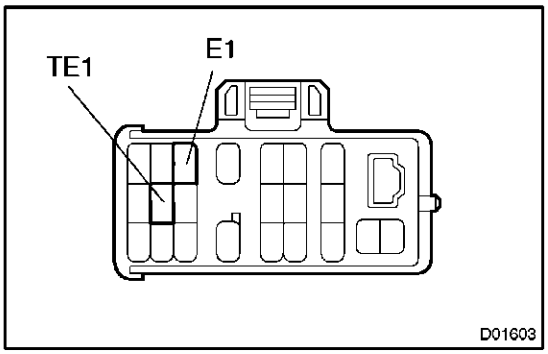
- When troubleshooting Multiplex (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the hand–held tester to the vehicle, and read off various data output from the vehicle's Engine and ECT ECU.
  The vehicle's on– board computer lights up the O/D OFF Indicator Light on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to the O/D OFF indicator light lighting up when a malfunction is detected, the applicable DTCs are recorded in the Engine and ECT ECU memory
  (See page DI–70).
  If the malfunction only occurs in 3 trips, the O/D OFF indicator light goes off but the DTCs remain recorded in the Engine and ECT ECU memory.



- To check the DTCs, connect a hand–held tester to DLC3 on the vehicle or read the number of blinks of the O/D OFF indicator 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 freeze frame data and various forms of engine data (For instruction book).

- 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 Engine and ECT ECU to check (test) mode using hand–held tester when troubleshooting, the technician can cause the O/D OFF indicator light to light up for a malfunction that is only detected once or momentarily.
- *2 trip detection logic:
  When a logic malfunction is first detected, the malfunction is temporarily stored in the Engine and ECT ECU memory.
  If the same malfunction is detected again during the 2nd test drive, this 2nd detection causes the O/D OFF indicator light to light up.





3. A245E:

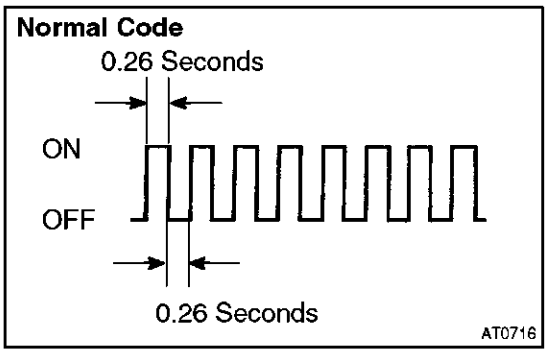
INSPECT DIAGNOSIS

(a) Check the O/D OFF indicator light.
  (1) Turn the ignition switch ON.
  (2) Check if the O/D OFF indicator light to lights up when the O/D main switch is pushed in to ON.

HINT:
If the O/D OFF indicator light does not light up or stay on all the time, carry out the check for "O/D OFF Indicator Light Circuit" on page DI–100

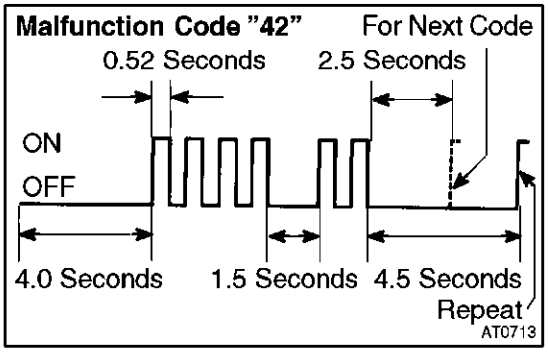
(b) Check the DTC (Not using hand–held tester).
  (1) Turn the ignition switch ON, but do not start the engine.
  (2) Push in the O/D main switch to ON.

HINT:
Warning and DTCs can be read only when the O/D main switch is On. If it is OFF, the O/D OFF indicator light up will light continuously and will not blink.
  (3) Using SST, connect terminals TE1 and E1 of the check connector.
  SST 09843–18020



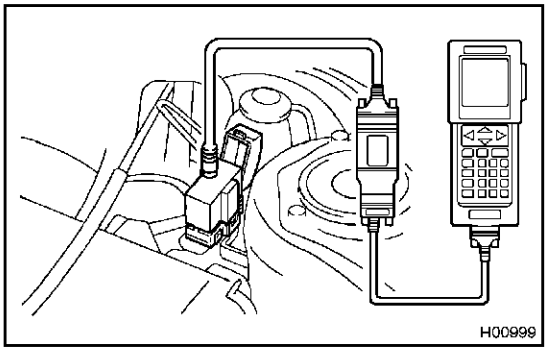
(4) Read the DTC indicated by the number of times the O/D OFF indicator light blinks.

HINT:
If the system is operating normally, the light will blink 2 times per second.



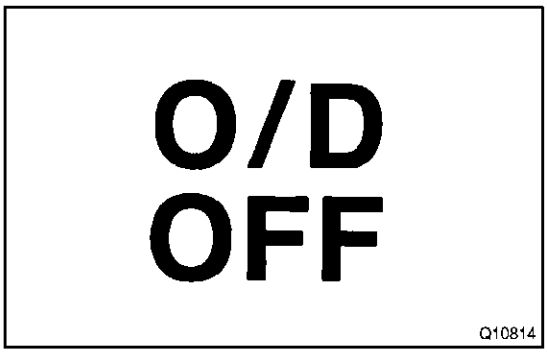
(5) The DTC is indicated as shown in the illustration at left (DTC "42" is shown as an example).

HINT:
When 2 or more DTCs are stored in memory, the lower numbered code is displayed first.
If on DTC is output, or if a DTC is output even though no DTC output operation is performed, check the TE1 terminal circuit on page DI–100.



(c) Check the DTC (Using hand–held tester).
  (1) Hook up the hand–held tester to the check connector.
  (2) Read the DTCs by following the prompts on the tester screen.
  (3) Please refer to the hand–held tester operator's manual for further details.

(d) Clearance the DTC.
  (1) After repairing of the trouble area, the DTc retained in the Engine and ECT ECU memory must be canceled out by removing the EFI fuse for 10 seconds or more, with the ignition switch OFF.
  (2) Check that the normal code is output after connecting the fuse.



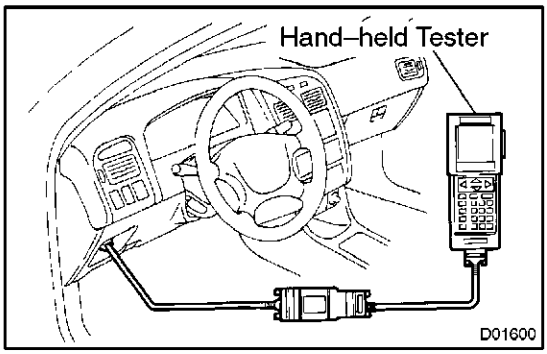
4. A246E:
INSPECT DIAGNOSIS (NORMAL MODE)

(a) Check the O/D OFF indicator light.
  (1) Turn the ignition switch ON.
  (2) Check that the O/D OFF indicator lights light up when the O/D main switch is pushed out to OFF and goes off when the O/D main switch is pushed in to ON.

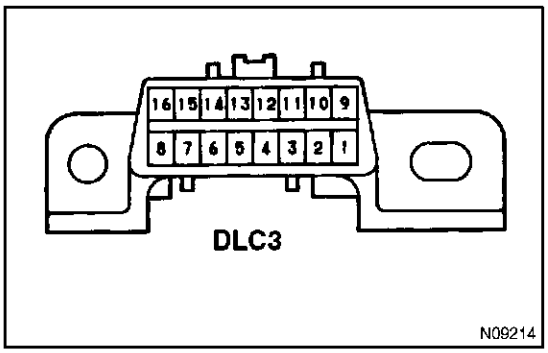
HINT:
- If the O/D OFF indicator light does not light up or stay on all the time, carry out the check for "O/D OFF Indicator Light Circuit" on page DI–100.
- If the O/D OFF indicator light blinks, a malfunction code is stored in the ECU memory.

(b) Check the DTC (Using hand–held tester).

NOTICE:
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.



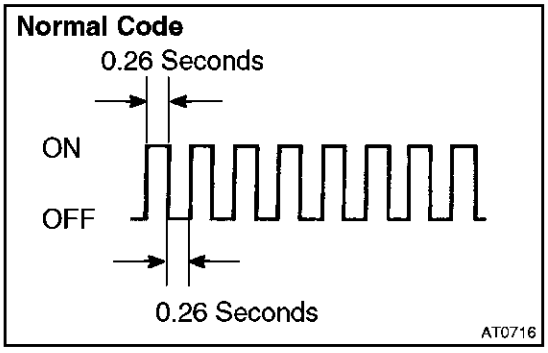
(1) Prepare hand–held tester.
(2) Connect the hand–held tester to DLC3 at the lower part of the instrument panel.
(3) Turn the ignition switch ON and turn the hand–held tester switch ON.
(4) Use the hand–held tester to check the DTCs and instructions, see the hand–held tester instruction book.
(5) See page DI–55 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) Push in the O/D main switch to ON.

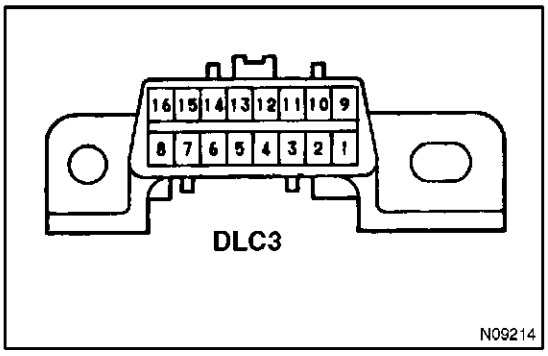
HINT:
Warning and DTCs can be read only when the O/D main switch is ON. If it is OFF, the O/D OFF indicator light will light up continuously and will not blink.

(3) Using SST, connect terminals 13 (TC) and 4 (CG) of DLC3.
SST 09843–18040



(4) Read the DTC indicated by the number of times the O/D OFF indicator light blinks.

HINT:
If the system is operating normally, the light will blink 2 times per second.

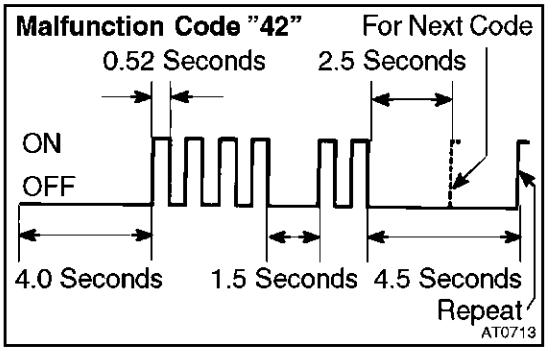


(d) Inspect the DLC3.
(1) The vehicle's Engine and ECT ECU uses ISO 14230 for communication. The terminal arrangement of DLC3 complies with SAE J1962 and matches the ISO 14230 format.

Terminal No.	Connection	Voltage or Resistance	Condition
7	Bus ⊕ Line	Pulse generation	During 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 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).

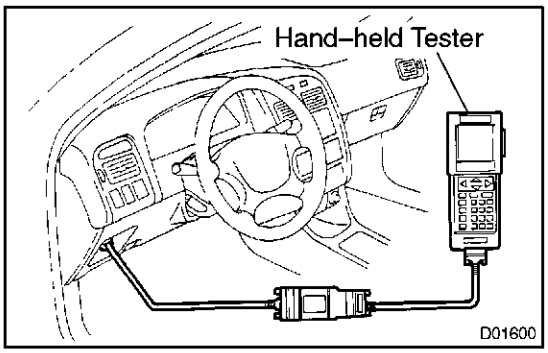
HINT:
When 2 or more malfunction codes are stored in memory, the lower–numbered code is displayed first.

5. A246E:
INSPECT DIAGNOSIS (CHECK MODE)

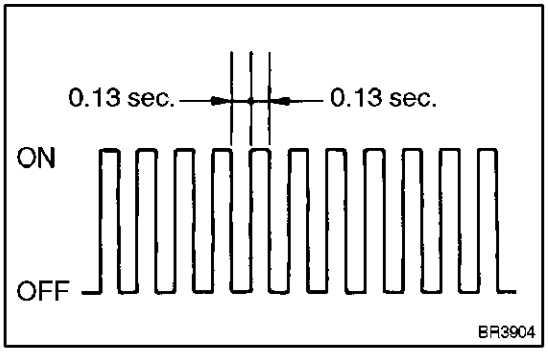
HINT:
Hand–held tester only: Compared to the Normal mode, the Check mode has high sensing ability to detect malfunctions. Furthermore, the same diagnostic items which are detected in normal mode can also be detected in Check mode.

(a) Check DTC.
(1) Check the initial conditions.
- Battery positive voltage 11 V or more
- Throttle valve fully closed
- Transmission 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 at the lower part of the instrument panel.
(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 O/D OFF indicator light flashes).
(7) Start the engine (O/D OFF indicator light 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.

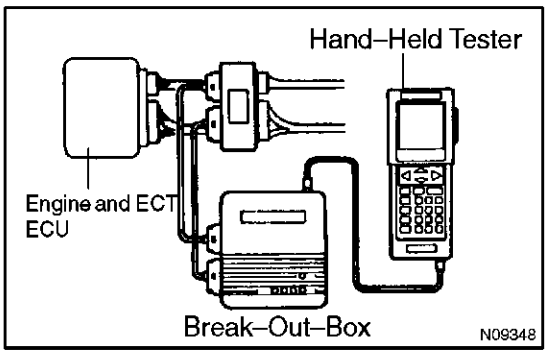
(9) After simulating the malfunction conditions, use the hand–held tester diagnosis selector to check the DTCs and freeze frame data, etc.

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 actions 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 J/B for 10 seconds or more.



6. ENGINE and ECT ECU STANDARD VALUES MEASUREMENT USING BREAK–OUT–BOX AND HAND–HELD TESTER

(a) Hook up the break–out–box and hand–held tester to the vehicle.
(b) Read the Engine and ECT ECU input/output values by following the prompts on the tester screen.

HINT:
Hand–held tester has "Snapshot" function. This records the measured values and is effective in the diagnosis of intermittent problems. Please refer to the hand–held tester/break–out–box operator's manual for further details.

7. PROBLEM SYMPTOM CONFIRMATION

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.

8. ROAD TEST

NOTICE:

Perform 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 SS–17).

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.

Drive 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 due 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 SS–17).

(5) Check 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 SS–17).

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.

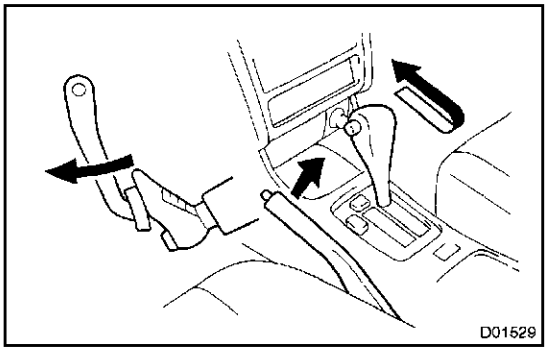
(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(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.

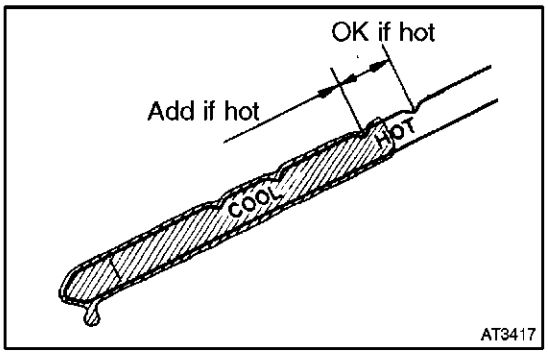
(e) P range test.
Stop the vehicle on a grade (more than 5°) and after shifting into the P range, release the parking brake. Then, check to see that the parking lock pawl holds the vehicle in place.


D01529

9. BASIC INSPECTION

(a) 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)



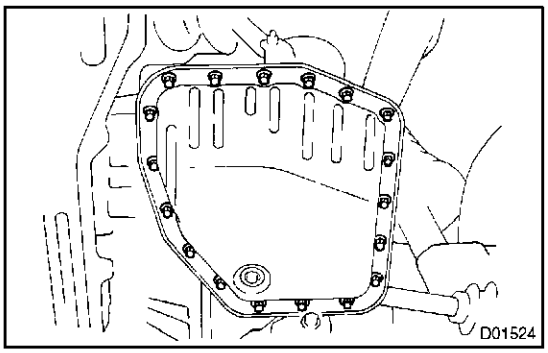
AT3417

(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.

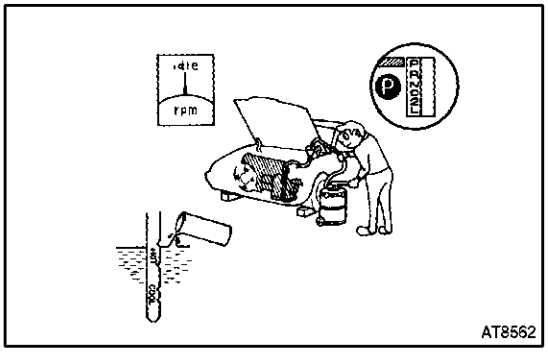
If the level is not within the range, add new fluid.
Fluid type: ATF D–II or DEXRON®III (DEXRON®II)

NOTICE:
Do not overfill.

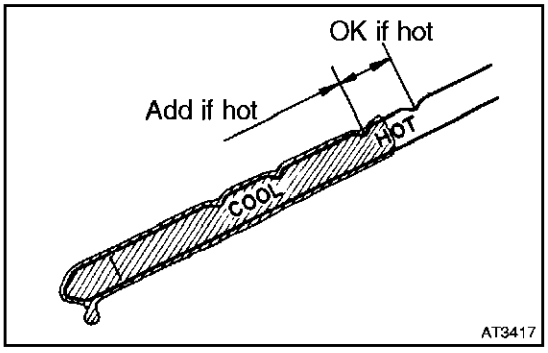
(b) Check the fluid condition.
If the fluid smells burnt or is black, replace it.



(c) Replace the ATF.
(1) Remove the drain plug and drain the fluid.
(2) Reinstall the drain plug securely.



(3) With the engine OFF add new fluid through the oil filler pipe.
Fluid type: ATF D–II or DEXRON®III (DEXRON®II)
Capacity: 3.1 liters (3.3 US qts, 2.7 Imp.qts)
(4) Start the engine and shift the shift lever into all ranges from P to L range and then shift into P range.

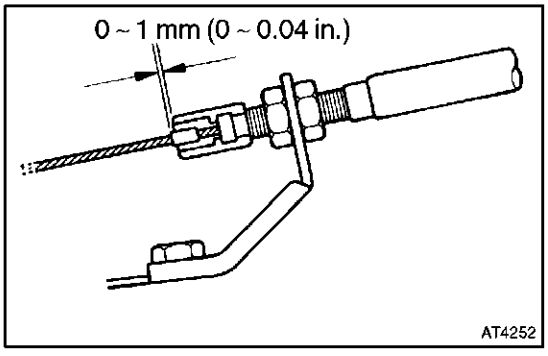


(5) With the engine idling, check the fluid level. Add fluid up to the COOL level on the dipstick.
(6) Check the fluid level at the normal operating temperature, 70 – 80 °C (158 – 176 °F), and add as necessary.

NOTICE:
Do not overfill.

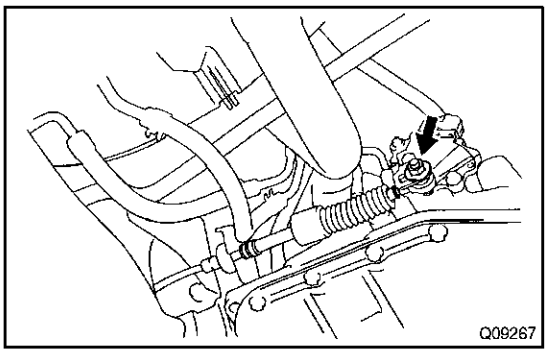
(d) Check the fluid leaks.
Check for leaks in the transaxle.

If there are leaks, it is necessary to repair or replace O–rings, gasket, oil seals, plugs or other parts.



(e) Inspect and adjust the throttle cable.
(1) Check the accelerator pedal is fully released.
(2) Check that the inner cable is not slack.
(3) Measure the distance between the outer cable end and stopper on the cable.
Standard distance: 0 ~ 1 mm (0 ~ 0.04 in.)

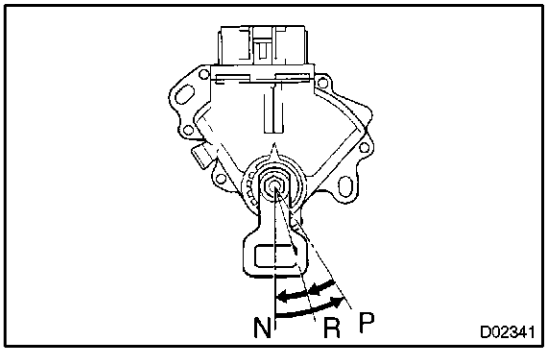
If the distance is not the standard, adjust the cable by rotating the adjusting nuts.



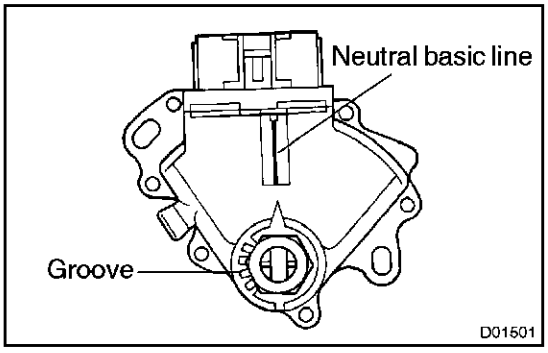
(f) Inspect and adjust the shift lever position.
When shifting the shift lever from the N range to other ranges, check that the lever can be shifted smoothly and accurately to each range and that the position indicator is aligned with the correct position.

If the indicator is not aligned with the correct position, carry out the following adjustment procedures.

(1) Loosen the nut on the shift lever.
(2) Push the control shaft fully rearward.



(3) Return the control shaft lever 2 notches to N range.
(4) Set the shift lever to N range.
(5) While holding the shift lever lightly toward the R range side, tighten the shift lever nut.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)
(6) 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.



(g) Inspect and adjust the neutral start switch.
Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If it is not as stated above, carry out the following adjustment procedures.

(1) Loosen the neutral start switch bolt and set the shift lever to the N range.
(2) Align the groove with neutral basic line.
(3) Hold the switch in position and tighten the bolt.
Torque: 13 N·m (130 kgf·cm, 10 ft·lbf)

For continuity inspection of the neutral start switch, see page DI–74.

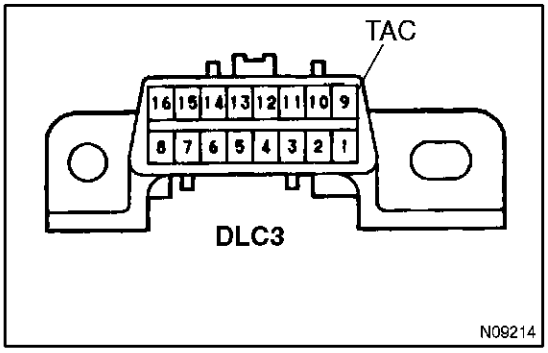
10. MECHANICAL SYSTEM TESTS

(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 2 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 depressing firmly on the brake pedal.

(5) Start the engine.

(6) Shift into the D range. Depress all the way down on the accelerator pedal with your right foot.
Quickly read the stall speed at this time.

Stall speed: 2,350 ± 150 rpm

(7) Do the same test in the R range.

Stall speed: 2,350 ± 150 rpm

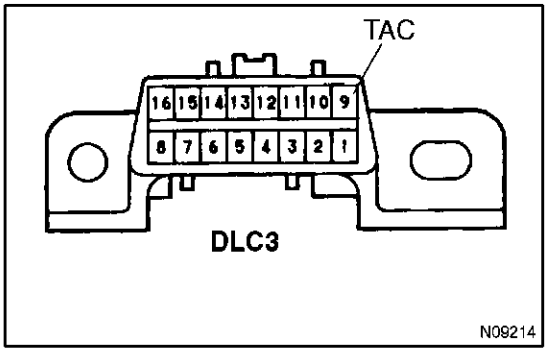
Evaluation:

Problem	Possible cause
(a) Stall speed low in D and R ranges	• Engine output may be insufficient • Stator one–way clutch is 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 • No.2 one–way clutch not operating properly • U/D one–way clutch not operating properly
(c) Stall speed high in R range	• Line pressure too low • Direct clutch slipping • 1st & reverse brake slipping • U/D one–way clutch not operating properly
(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.
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 & 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.**



(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) Start engine and check idle speed.
Idle speed: 750 ± 50 rpm (In N range and A/C OFF)
(4) 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
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 • Direct clutch worn • 1st & reverse brake worn • U/D one–way clutch not operating properly

11. 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 right side of the transaxle case and connect SST.
(See page AX–28 for the location to 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 depressing 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.

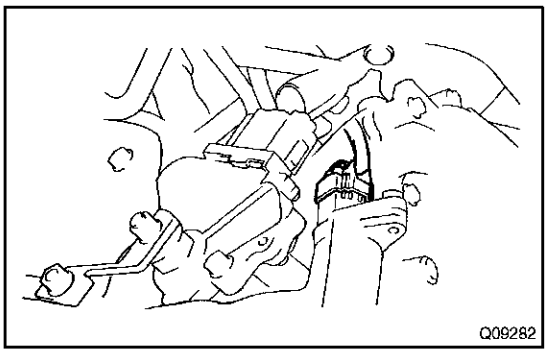
Specified line pressure:

Condition	D range kPa (kgf / cm^2, psi)	R range kPa (kgf / cm^2, psi)
Idling	373 – 441 (3.8 – 4.5, 54 – 64)	598 – 715 (6.1 – 7.3, 87 – 103)
Stall	981 –1,138 (10.6 – 11.6, 143 – 165)	1,392 – 1,716 (14.2 – 17.5, 202 – 249)

If the measured pressure is not up to the specified value, recheck the throttle cable adjustment and retest.

Evaluation

Problem	Possible cause
If the measured values at all ranges are higher	• Throttle cable out of adjustment • Throttle valve defect • Regulator valve detective
If the measured values at all ranges are lower	• Throttle cable out of adjustment • Throttle valve defect • Regulator valve defect • Oil pump defect • U/D direct clutch defect
If pressure is low in the D range only	• D range circuit fluid leakage • Forward clutch defect
If pressure is low in the R range only	• R range circuit fluid leakage • Direct clutch defect • 1st & reverse brake defect



12. 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 solenoid wire.

(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 ifself.

(c) Connect the solenoid wire.

(d) Cancel out DTC.

DI1G9–02

DIAGNOSTIC TROUBLE CODE CHART

If a DTC is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the page given.

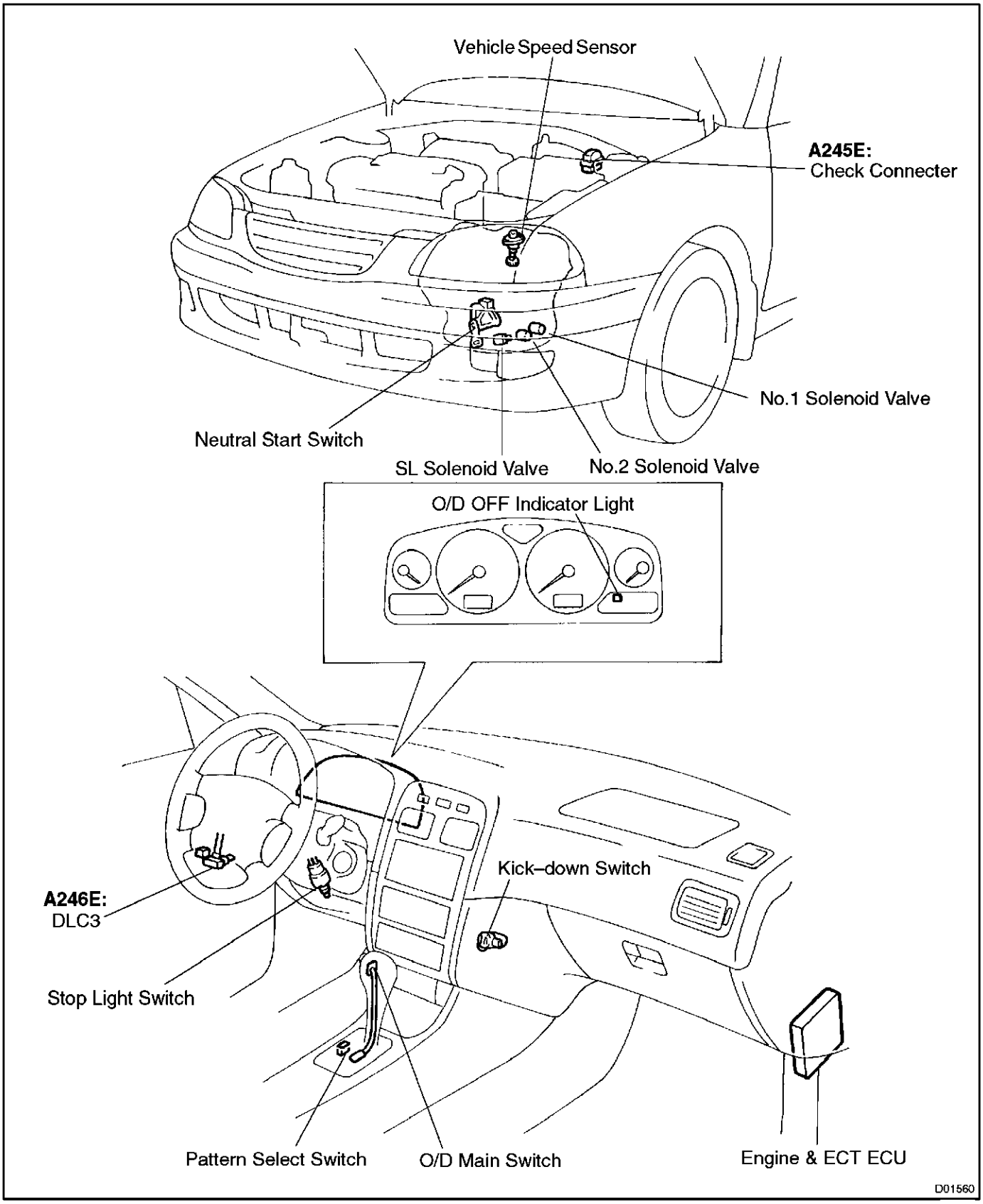
DTC No. (See Page)	Detection Item	Trouble Area	O/D OFF Indicator Light Blink *1	Memory *2
P0500/42 (DI–79)	Vehicle Speed Sensor Malfunction (Vehicle Speed Sensor)	• Open or short in vehicle speed sensor circuit • No.1 vehicle speed sensor • Combination meter • Engine and ECT ECU	○	○
P0753/62 (DI–82)	Shift Solenoid A Electrical Malfunction (No.1 Solenoid Valve)	• Open or short in shift solenoid valve No.1 circuit • No.1 solenoid valve • Engine and ECT ECU	○	○
P0758/63 (DI–82)	Shift Solenoid B Electrical Malfunction (No.2 Solenoid Valve)	• Open or short in shift solenoid valve No.2 circuit • No.2 solenoid valve • Engine and ECT ECU	○	○
P0773/64 (DI–87)	Shift Solenoid E Electrical Malfunction (SL Solenoid Valve)	• Open or short in shift solenoid valve SL circuit • SL solenoid valve • Engine and ECT ECU	X	○

*1: "○" mark means O/F OFF indicator light blinks once every 2 seconds.
"X" mark means O/F OFF indicator light never blinks.

*2: "○" mark means the Engine and ECT ECU memorizes the malfunction code if the Engine and ECT ECU detects the DTC detection condition.

DI330–01

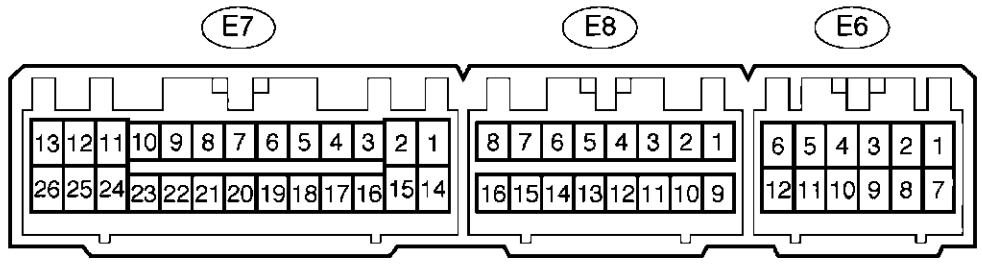
PARTS LOCATION



DI331–01

TERMINALS OF ECU

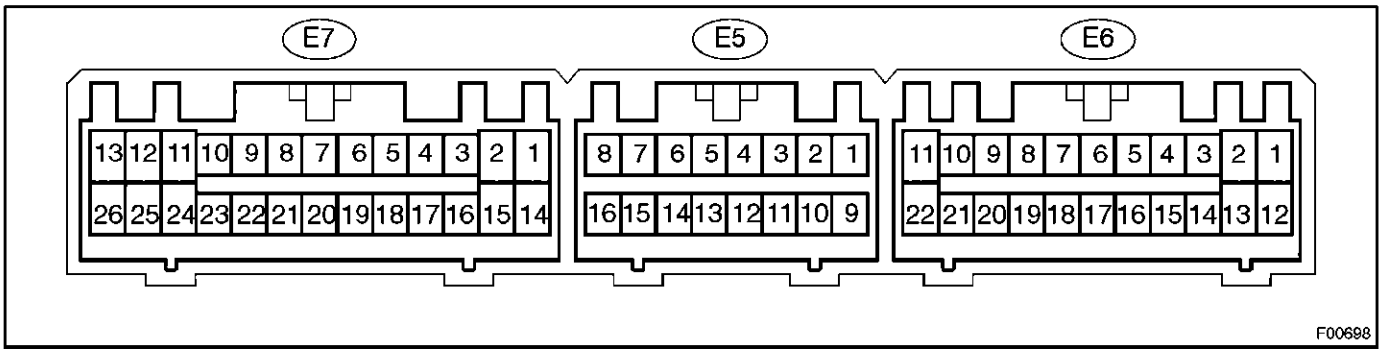
A245E:



D01532

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
S1 (E7 – 21) – E1 (E7 – 24)	LG ↔ BR	IG ON	9 – 14
		1st or 2nd gear	9 – 14
		3rd or O/D gear	Below 1.5
S2 (E7 – 8) – E1 (E7 – 24)	V–W ↔ BR	IG ON	Below 1.5
		2nd or 3rd gear	9 – 14
		1st or O/D gear	Below 1.5
SL (E7 – 7) – E1 (E7 – 24)	P ↔ BR	IG ON	Below 1.5
		Vehicle driving under lock–up position	9 – 14
NSW (E7 – 15) – E1 (E7 – 24)	B–W ↔ BR	IG ON and shift lever P or N range	Below 3
		IG ON and shift lever other than P or N range	9 – 14
OD2 (E7 – 1) – E1 (E7 – 24)	L ↔ BR	IG ON and O/D main switch ON (O/D OFF)	Below 3
		IG ON and O/D main switch OFF (O/D ON)	9 – 14
SPD (E6 – 11) – E1 (E7 – 24)	G ↔ BR	IG ON and vehicle stationary	Below 1.5
		IG ON and turn one rear wheel slowly	Pulse signal is output Below 1.5 ↔ 4 – 6
L (E7 – 6) – E1 (E7 – 24)	Y–G ↔ BR	IG ON and shift lever L range	9 – 14
		IG ON and shift lever other than L range	Below 1.5
2 (E7 – 20) – E1 (E7 – 24)	O ↔ BR	IG ON and shift lever 2 range	9 – 14
		IG ON and shift lever other than 2 range	Below 1.5
R (E7 – 19) – E1 (E7 – 24)	R–B ↔ BR	IG ON and shift lever R range	9 – 14
		IG ON and shift lever other than R range	Below 1.5
B/K (E6 – 1) – E1 (E7 – 24)	G–W ↔ BR	IG ON and brake pedal is depressed	9 – 14
		IG ON and brake pedal is released	Below 1.5
P (E8 – 5) – E1 (E7 – 24)	P ↔ BR	IG ON and pattern select switch: PWR	9 – 14
		IG ON and pattern select switch: NORM	Below 1.5

A246E:



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
S1 (E7 – 8) – E1 (E7 – 14)	LG ↔ BR	IG ON	9 – 14
		1st or 2nd gear	9 – 14
		3rd or O/D gear	Below 1.5
S2 (E7 – 7) – E1 (E7 – 14)	V–W ↔ BR	IG ON	Below 1.5
		2nd or 3rd gear	9 – 14
		1st or O/D gear	Below 1.5
SL (E7 – 6) – E1 (E7 – 14)	P ↔ BR	IG ON	Below 1.5
		Vehicle driving under lock–up position	9 – 14
NSW (E6 – 22) – E1 (E7 – 14)	B–W ↔ BR	IG ON and shift lever P or N range	Below 3
		IG ON and shift lever other than P or N range	9 – 14
OD2 (E6 – 7) – E1 (E7 – 14)	L ↔ BR	IG ON and O/D main switch ON (O/D OFF)	Below 3
		IG ON and O/D main switch OFF (O/D ON)	9 – 14
SPD (E6 – 4) – E1 (E7 – 14)	G ↔ BR	IG ON and vehicle stationary	Below 1.5
		IG ON and turn one rear wheel slowly	Pulse signal is output Below 1.5 ↔ 4 – 6
L (E6 – 19) – E1 (E7 – 14)	Y–G ↔ BR	IG ON and shift lever L range	9 – 14
		IG ON and shift lever other than L range	Below 1.5
2 (E6 – 18) – E1 (E7 – 14)	O ↔ BR	IG ON and shift lever 2 range	9 – 14
		IG ON and shift lever other than 2 range	Below 1.5
R (E6 – 20) – E1 (E7 – 14)	R–B ↔ BR	IG ON and shift lever R range	9 – 14
		IG ON and shift lever other than R range	Below 1.5
STP (E6 – 4) – E1 (E7 – 14)	G–W ↔ BR	IG ON and brake pedal is depressed	9 – 14
		IG ON and brake pedal is released	Below 1.5
KD (E6 – 3) – E1 (E7 – 14)	Y ↔ BR	IG ON and Accelerator pedal is fully dipressed	Below 1.5
		IG ON and Accelerator pedal is released	9 – 14
P (E6 – 6) – E1 (E7 – 14)	P ↔ BR	IG ON and pattern select switch: PWR	9 – 14
		IG ON and pattern select switch: NORM	Below 1.5
SNOWI (E6 – 17) – E1 (E7 – 14)	P–B ↔ BR	IG ON and SNOW mode switch: ON	9 – 14
		IG ON and SNOW mode switch: OFF	Below 1.5

DI1FT–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 in matrix chart" is given in the flow chart for eaxh 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 Engine and ECT ECU.

1. 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)	Engine and ECT ECU	IN–28
No up–shift (3rd → O/D)	1. O/D main switch & O/D OFF indicator light circuit 3. Engine and ECT ECU	DI–100 IN–28
No down–shift (A particular gear, from 1st to 3rd gear, is not down–shifted)	Engine and ECT ECU	IN–28
No down–shift (O/D → 3rd)	1. O/D main switch & O/D OFF indicator light circuit 3. Engine and ECT ECU	DI–100 IN–28
No lock–up	Engine and ECT ECU	IN–28
No lock–up OFF	Engine and ECT ECU	IN–28
Shift point too high or too low	Engine and ECT ECU	IN–28
Up–shift to O/D from 3rd while O/D main switch is OFF	1. O/D main switch & O/D OFF indicator light circuit 2. Engine and ECT ECU	DI–100 IN–28
Up–shift to O/D from 3rd while engine is cold	Engine and ECT ECU	IN–28
No kick–down	1. Kick–down switch circuit 2. Engine and ECT ECU	DI–110 IN–28
Engine stalls when starting off or stopping	Engine and ECT ECU	IN–28

2. Chapter 2: On–vehicle Repair (★ : A245E AUTOMATIC TRASAXLE Repair Manual Pub. No. RM350E)

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 ranges	1. Primary regulator valve 2. Manual valve 3. Throttle valve 4. Off–vehicle matrix chart	★ ★ ★ –
No–up shift (1st → 2nd)	1. 1 – 2 shift valve 2. Off–vehicle matrix chart	★ –
No–up shift (2nd → 3rd)	1. 2 – 3 shift valve 2. Off–vehicle matrix chart	★ –
No–up shift (3rd → O/D)	1. 3 – 4 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (O/D → 3rd)	1. 3 – 4 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (3rd → 2nd)	1. 2 – 3 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (2nd → 1st)	1. 1 – 2 shift valve 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → R)	1. C2 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → D)	1. C1 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → L)	1. C1 accumulator 2. Low coast modulator valve 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (1st → 2nd "D" range)	1. Accumulator control valve 2. B2 accumulator 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (1st → 2nd "2" range)	1. B2 accumulator 2. Accumulator control valve 3. 2nd coast modulator control 4. Off–vehicle matrix chart	★ ★ ★ –
Harsh engagement (1st → 2nd → 3rd → O/D)	1. Throttle valve 2. Primary regulator valve	★ ★
Harsh engagement (2nd → 3rd)	1. C2 accumulator 2. Accumulator control valve 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (3rd → O/D)	1. B2 accumulator 2. C3 accumulator 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (O/D → 3rd)	1. B4 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (3rd → 2nd)	1. C2 accumulator 2. Off–vehicle matrix chart	★ –
Slip (Forward & Reverse)	1. Primary regulator valve 2. Oil strainer 3. Off–vehicle matrix chart	★ ★ –
Slip ("R" range, 1st, 2nd, 3rd, O/D)	Off–vehicle matrix chart	–

Symptom	Suspect Area	See page
No engine braking (1st "L" range)	1. Low coast modulator valve 2. Off–vehicle matrix chart	★ –
No engine braking (2nd "2" range)	1. 2nd coast modulator valve 2. Off–vehicle matrix chart	★ –
No kick down	1. 1 – 2 shift valve 2. 2 – 3 shift valve 3. 3 – 4 shift valve	★ ★ ★
Poor acceleration	1. Primary regulator valve 2. Off–vehicle matrix chart	★ –
No lock–up	1. Lock–up relay valve 2. Off–vehicle matrix chart	★ –

3. Chapter 3: Off–vehicle Repair (★ : A245E AUTOMATIC TRASAXLE Repair Manual Pub. No. RM350E)

Symptom	Suspect Area	See page
Does not move in any forward ranges	Forward clutch (C_1)	★
Does not move in reverse range	1. Direct clutch (C_2) 2. 1st & reverse brake (B_3) 3. U/D brake (B_4)	★ ★ ★
Does not move in any ranges	1. Torque converter 2. Oil pump 3. U/D one–way clutch (F_3) 4. Front planetary gear 5. Rear planetary gear	AX–36 ★ ★ ★ ★
No–up shift (1st → 2nd)	1. 2nd brake (B_2) 2. No.1 one–way clutch (F_1)	★ ★
No–up shift (2nd → 3rd)	Direct clutch (C_2)	★
No–up shift (3rd → O/D)	U/D clutch (C_3)	★
No–down shift (O/D → 3rd)	1. U/D brake (B_4) 2. U/D one–way clutch (F_3)	★ ★
No–down shift (3rd → 2nd)	No.1 one–way clutch (F_1)	★
No–down shift (2nd → 1st)	No.2 one–way clutch (F_2)	★
Harsh engagement (N → R)	1. Direct clutch (C_2) 2. 1st & reversebrake (B_3)	★ ★
Harsh engagement (N → D)	Forward clutch (C_1)	★
Harsh engagement (N → L)	Forward clutch (C_1)	★
Harsh engagement (1st → 2nd "D" range)	1. 2nd brake (B_2) 2. No.1 one–way clutch (F_1)	★ ★
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)	★ ★ ★
Harsh engagement (2nd → 3rd)	Direct clutch (C_2)	★
Harsh engagement (3rd → O/D)	U/D clutch (C_3)	★
Harsh engagement (O/D → 3rd)	U/D brake (B_4)	★
Harsh engagement (3rd → 2nd)	Direct clutch (C_2)	★
Slip (Forward & Reverse)	1. Torque converter 2. Oil pump	AX–36 ★
Slip ("R" range)	1. Direct clutch (C_2) 2. 1st & reverse brake (B_3)	★ ★
Slip (1st)	1. Forward clutch (C_1) 2. No.2 one–way clutch (F_2) 3. U/D one–way clutch (F_3)	★ ★ ★

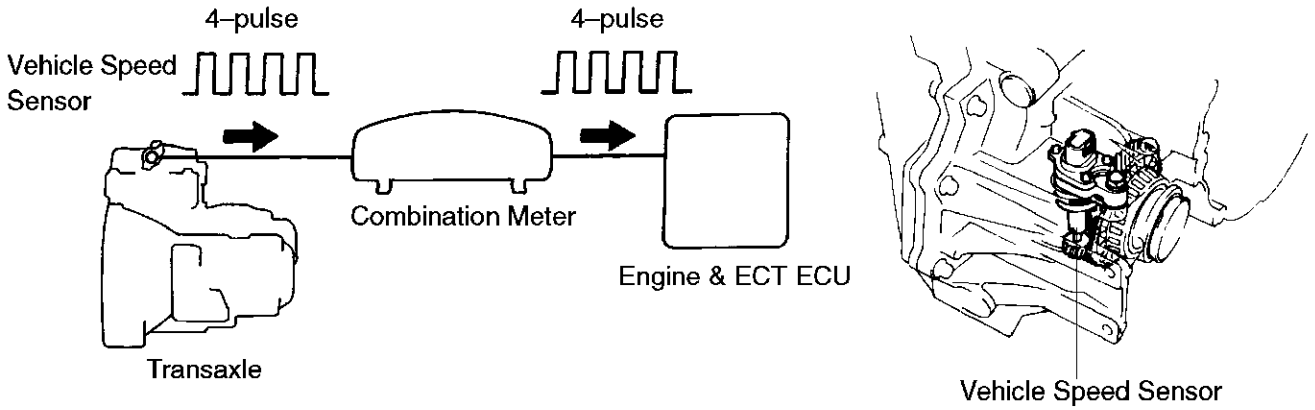
Slip (2nd)	1. Forward clutch (C_1) 2. 2nd brake (B_2) 3. No.1 one–way clutch (F_1) 4. U/D one–way clutch (F_3)	★ ★ ★ ★
Slip (3rd)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D one–way clutch (F_3)	★ ★ ★
Slip (O/D)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D clutch (C_3)	★ ★ ★
No engine braking (1st "L" range)	1st & reversebrake (B_3)	★
No engine braking (2nd "2" range)	2nd coast brake (B_1)	★
Poor acceleration	1. Torque converter 2. Forward clutch (C_1)	AX–36 ★
No lock–up	Torque converter	AX–36
Engine stalls when starting off or stopping	Torque converter	AX–36

DI332–01

CIRCUIT INSPECTION

DTC	P0500/43	Vehicle Speed Sensor Malfunction

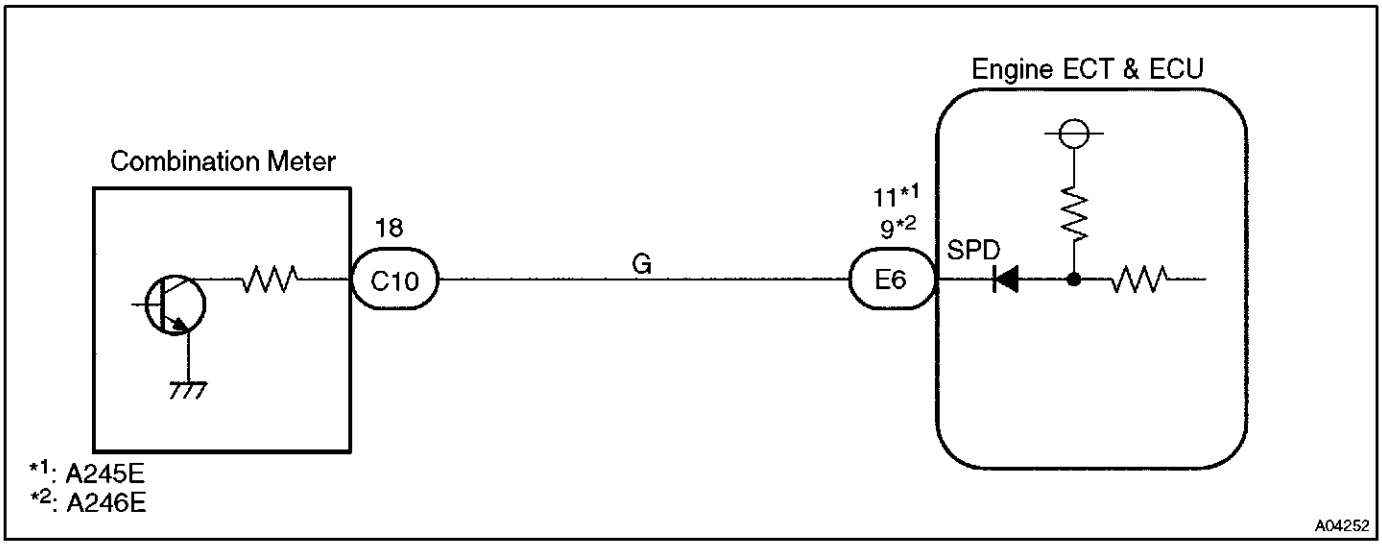
The vehicle speed sensor outputs a 4–pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular wave form by the wave form shaping circuit inside the combination meter, it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



D02245

DTC No.	DTC Detecting Condition	Trouble Area
P0500/43	• No vehicle speed sensor signal to Engine & ECT ECU under conditions (a) and (b): (1–trip detection logic) (a) Neutral start switch OFF (b) Vehicle is being driven • Clutch or brake slips or gear is broken. (1–trip detection logic)	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine & ECT ECU • Automatic transaxle (clutch, brake or gear etc.)

WIRING DIAGRAM



A04252

INSPECTION PROCEDURE

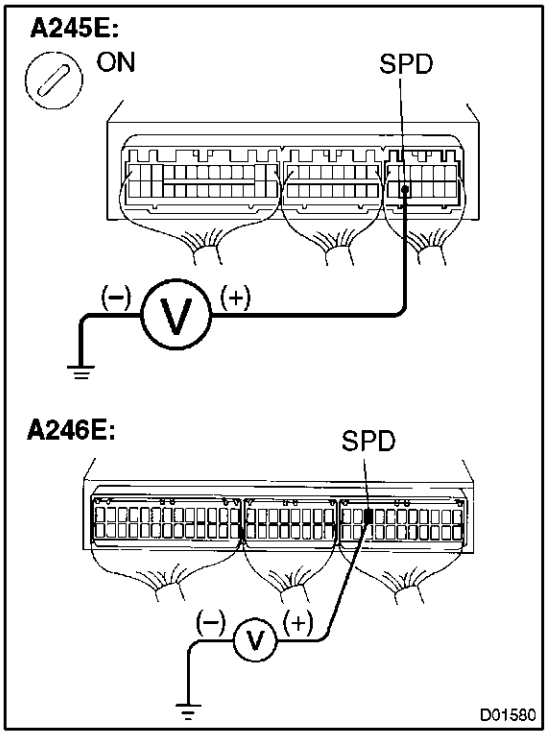
1	Check operation of speedometer.

CHECK:
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. See combination meter troubleshooting (See page BE–63).**

OK

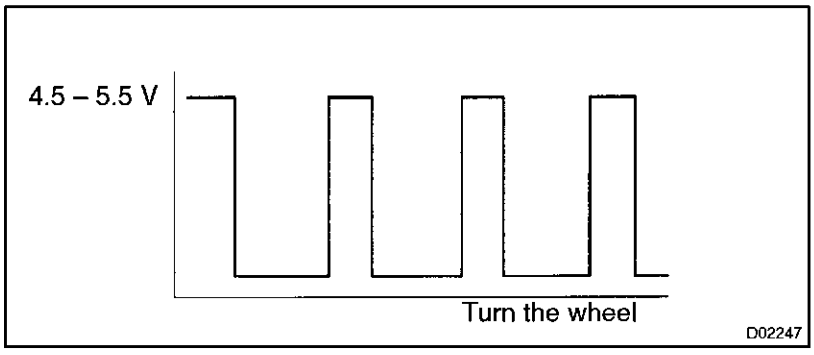
2	Check voltage between terminal SPD of Engine & ECT ECU connector and body ground.



PREPARATION:
(a) Turn up the floor mat on the passenger side.
(b) Remove the 2 bolts for Engine & ECT ECU.
(c) Shift the shift lever to N range or neutral.
(d) Jack up one of the front wheels.
(e) Turn ignition switch ON.

CHECK:
Measure voltage between terminal SPD of Engine & ECT ECU connector and body ground when the wheel is turned slowly.

OK:
Voltage is generated intermittently.



NG → **Check and repair harness and connector between combination meter and Engine & ECT ECU.**

OK

3	Check Engine & ECT ECU (See page IN–28).

NG → Replace Engine & ECT ECU

OK

Check repair transaxle (clutch, brake or gear etc.).

DTC	P0753/62,P0758/63	Shift Solenoid A/B Electrical Malfunction (No.1/No.2 Solenoid Valve)

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 Engine & ECT ECU. If an open or short circuit occurs in either of the solenoid valves, the Engine & ECT ECU controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

Range	NORMAL			NO.1 SOLENOID MALFUNCTIONING			NO.2 SOLENOID MALFUNCTIONING			BOTH SOLENOIDS MALFUNCTIONING
	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear	Gear when shift selector is manually operated
	No.1	No.2		No.1	No.2		No.1	No.2		
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 No.1 solenoid valve when DTC P0753/62 is output and check the No.2 solenoid valve when DTC P0758/63 is output.

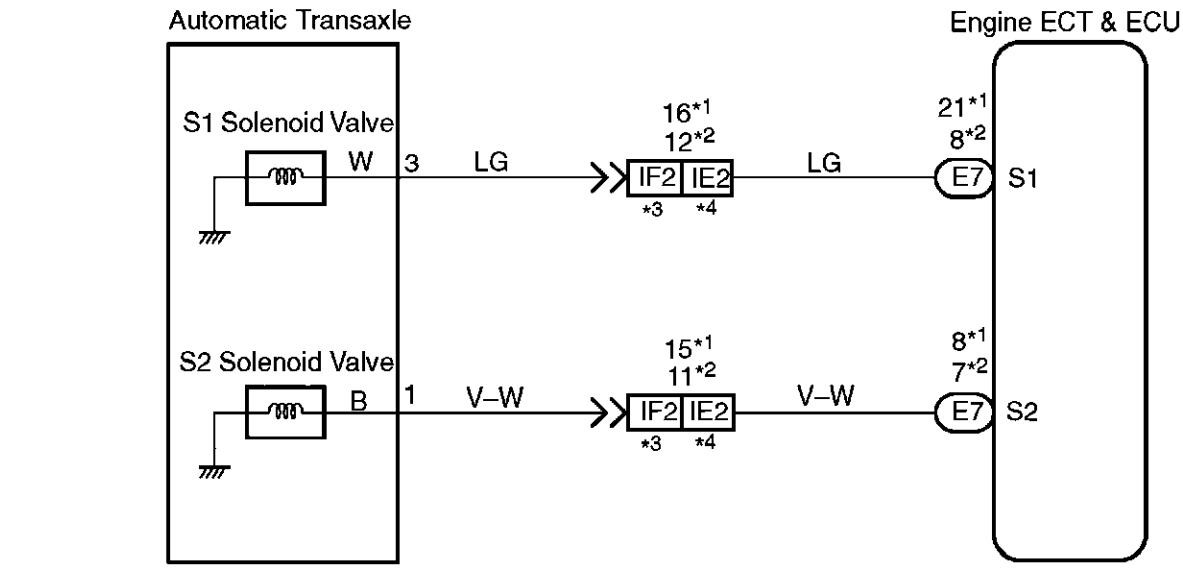
DTC No.	DTC Detecting Condition	Trouble Area
P0753/62 P0758/63	The Engine & ECT ECU checks for an open or short circuit in the No.1 or No.2 solenoid valve circuit when it changes. The Engine & ECT ECU records DTC P0753/62 or P0758/63 if condition (a) or (b) is detected once, but it does not blink the O/D OFF indicator light. After Engine & ECT ECU detects condition (a) or (b) continuously 8 times or more in one trip, it causes the O/D OFF indicator light to light up until condition (a) or (b) disappears. After that, if the Engine & ECT ECU detects condition (a) or (b) once, it starts lighting up O/D OFF indicator light again. (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.	• Open or short in No.1/No.2 solenoid valve circuit • No.1/No.2 solenoid valve • Engine & ECT ECU

Fail Safe Function:

If either of the solenoid valve circuits develops an open or short, the Engine & ECT ECU turns the other solenoid valve ON and OFF to shift to the gear positions shown in the table above. The Engine & ECT ECU also turns the SL 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 Engine & ECT ECU stops sending current to the short circuited solenoid).

WIRING DIAGRAM

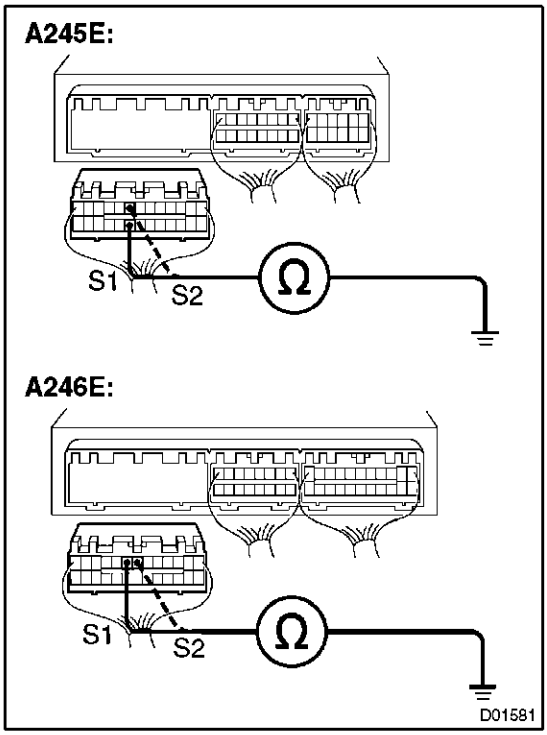


*1: A245E *3: LHD
*2: A246E *4: RHD

D01675

INSPECTION PROCEDURE

1	**Measure resistance between terminal S1 or S2 of Engine & ECT ECU and body ground.**



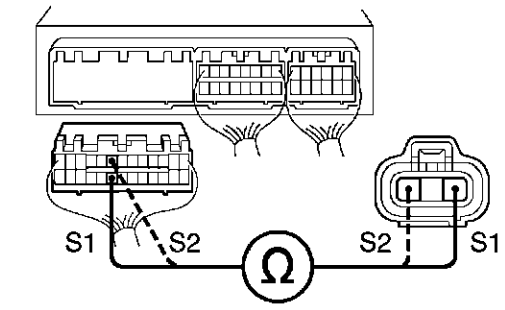
PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminal S1 or S2 of Engine & ECT ECU and body ground.
OK:
Resistance: 11 ~ 15 Ω at 20 °C (68 °F)

OK	**Check and replace the Engine & ECT ECU (See page IN–28).**

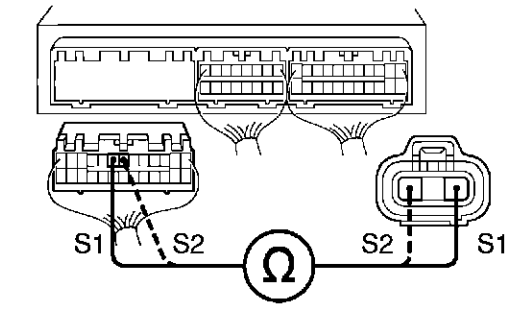
NG

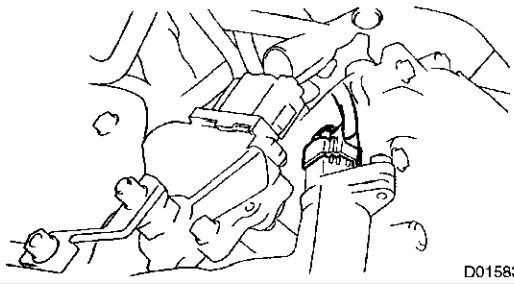
2	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**

A245E:



A246E:





PREPARATION:

Disconnect the solenoid connector from the automatic transaxle.

CHECK:

Check the harness and connector between terminal S1 or S2 of Engine & ECT ECU and terminal S1 or S2 of solenoid connector.

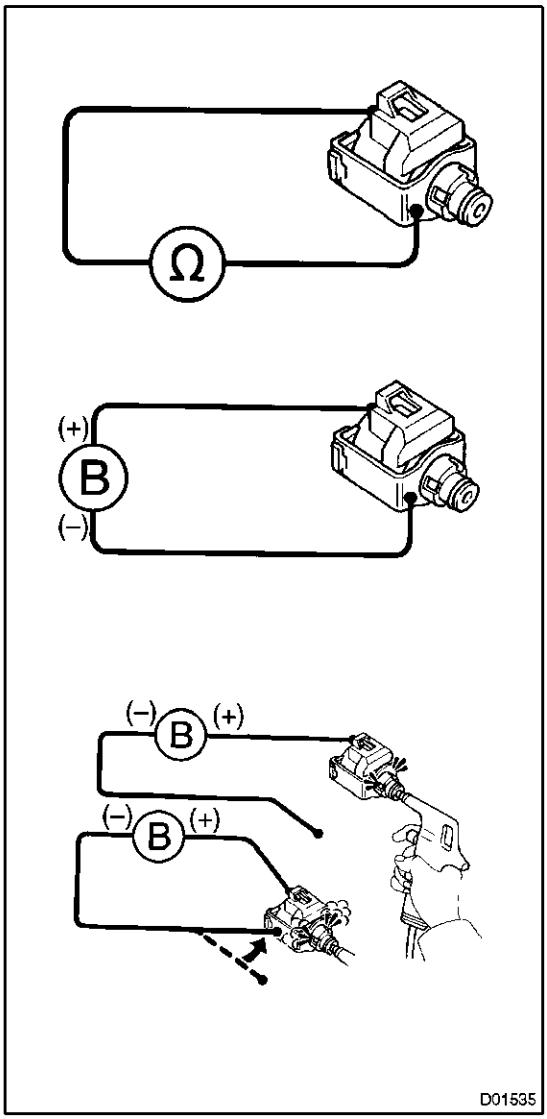
OK:

There is no open and short circuit.

NG → **Repair or replace the harness or connector (See page IN–28).**

OK

3	Check No.1 or No.2 solenoid valve.



Electrical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the No.1 or No.2 solenoid valve.

CHECK:

(a) Measure resistance between solenoid connector and body ground.
(b) Connect positive ⊕ lead of the battery to terminal of solenoid connector, negative ⊖ lead of the battery to solenoid body.

OK:

(a) Resistance: 11 ~ 15 Ω at 20 °C (68 °F)
(b) The solenoid makes an operating noise

Mechanical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the No.1 or No.2 solenoid valve.

CHECK:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(b) When battery positive voltage is supplied to the solenoid valve, check that the valve opens.

OK:

(a) Solenoid valve does not leak air.
(b) Solenoid valve opens.

NG → **Replace the solenoid valve.**

OK

Repair or replace the solenoid wire.

DTC	P0773/64	Shift Solenoid E Electrical Malfunction (SL Solenoid Valve)

CIRCUIT DESCRIPTION

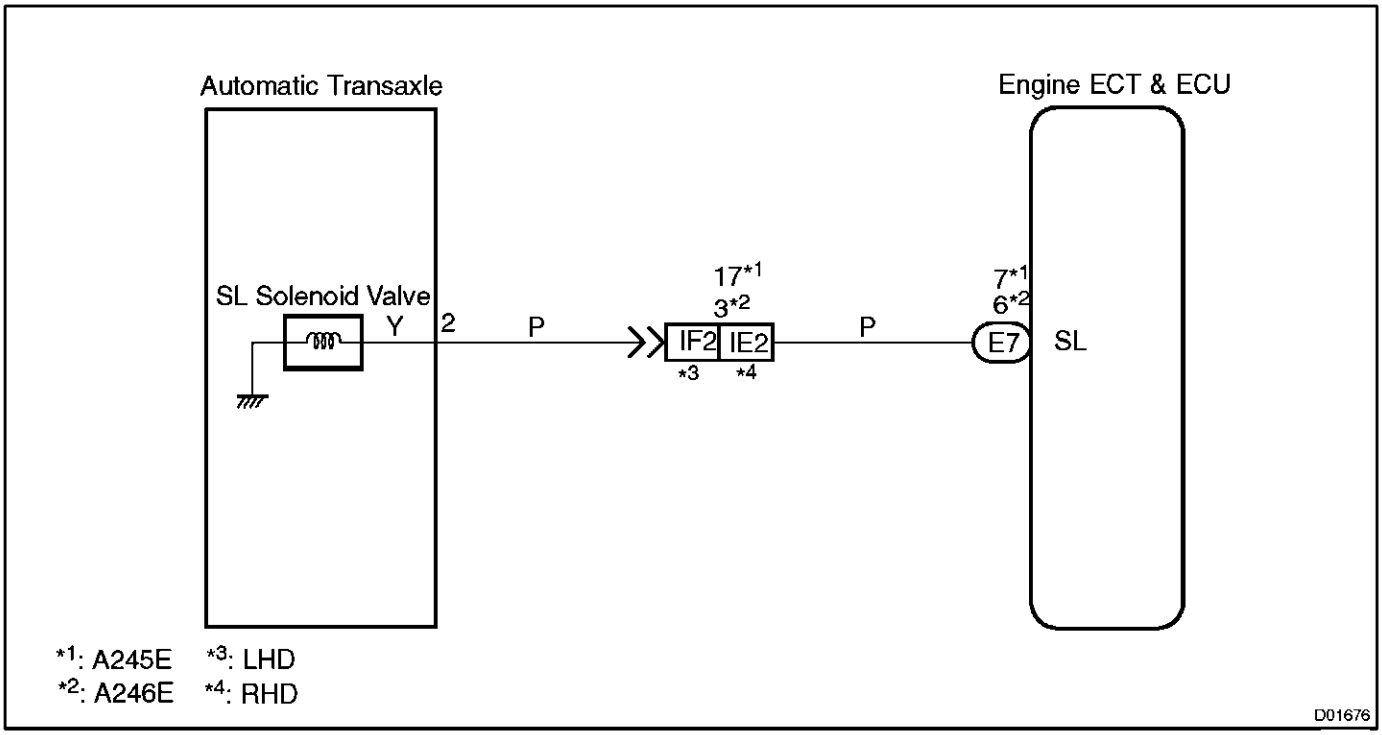
The SL solenoid valve is turned ON and OFF by signals from the Engine & ECT ECU to control the hydraulic pressure acting on the lock–up relay valve, which then controls operation of the lock–up clutch.

DTC No.	DTC Detecting Condition	Trouble Area
P0773/64	Either (a) or (b) is detected 1 time. (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.	• Open or short in SL solenoid valve circuit • SL solenoid valve • Engine & ECT ECU

Fail safe function

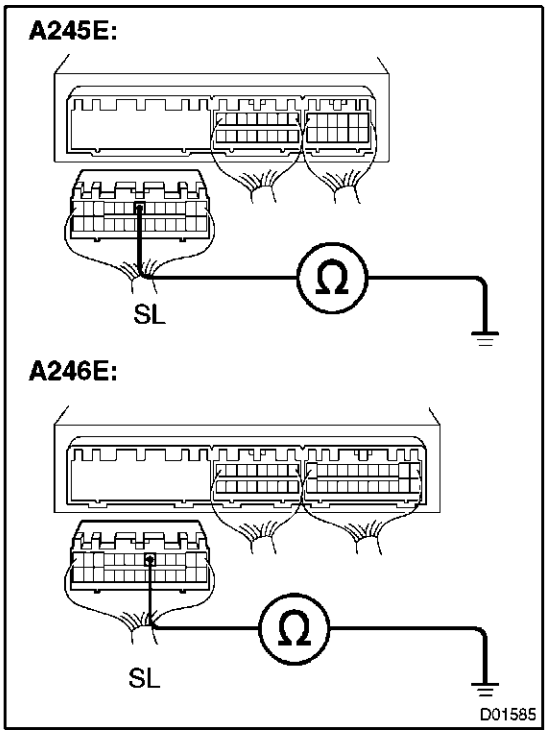
If the Engine & ECT ECU detects a malfunction, it turns the SL solenoid valve OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal SL of Engine & ECT ECU and body ground.**



PREPARATION:
Disconnect the connector from Engine & ECT ECU.

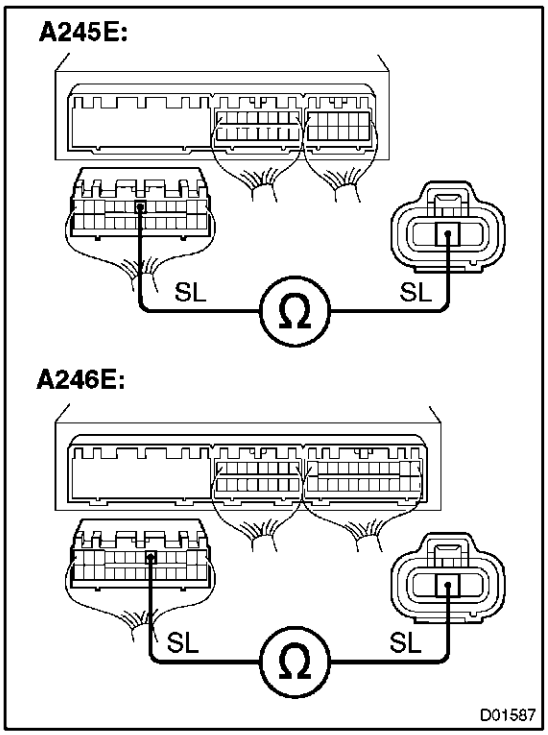
CHECK:
Measure resistance between terminal SL of Engine & ECT ECU and body ground.

OK:
Resistance: 11 ~ 15 Ω at 20 °C (68 °F)

OK → **Check and replace the Engine & ECT ECU (See page IN–28).**

NG

2	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**



PREPARATION:
Disconnect the solenoid connector from the transmission.

CHECK:
Check the harness between terminal SL of Engine & ECT ECU and terminal SL of transmission solenoid connector.

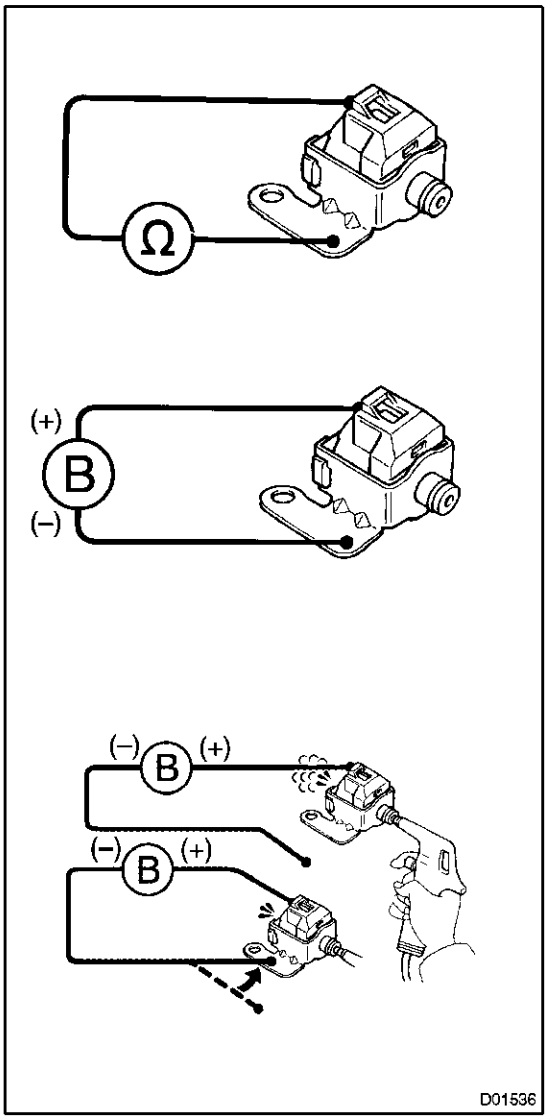
OK:

There is no open or short circuit.

NG → **Repair or replace the harness or connector.**

OK

3	Check SL solenoid valve.



Electrical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the SL solenoid valve.

CHECK:

(a) Measure resistance between terminal SL of solenoid valve and solenoid body.
(b) Connect positive ⊕ lead of the battery to terminal of solenoid connector, negative ⊖ lead of the battery to solenoid body.

OK:

(a) Resistance: 11 ~ 15 Ω at 20 °C (68 °F)
(b) The SL solenoid valve makes operating noise.

Mechanical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the SL solenoid valve.

CHECK:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(b) When battery positive voltage is supplied to the solenoid valve, check that the solenoid valve opens.

OK:

(a) Solenoid valve does not leak air.
(b) Solenoid valve opens

NG → **Replace the SL solenoid valve.**

OK

Repair or replace the solenoid wire.

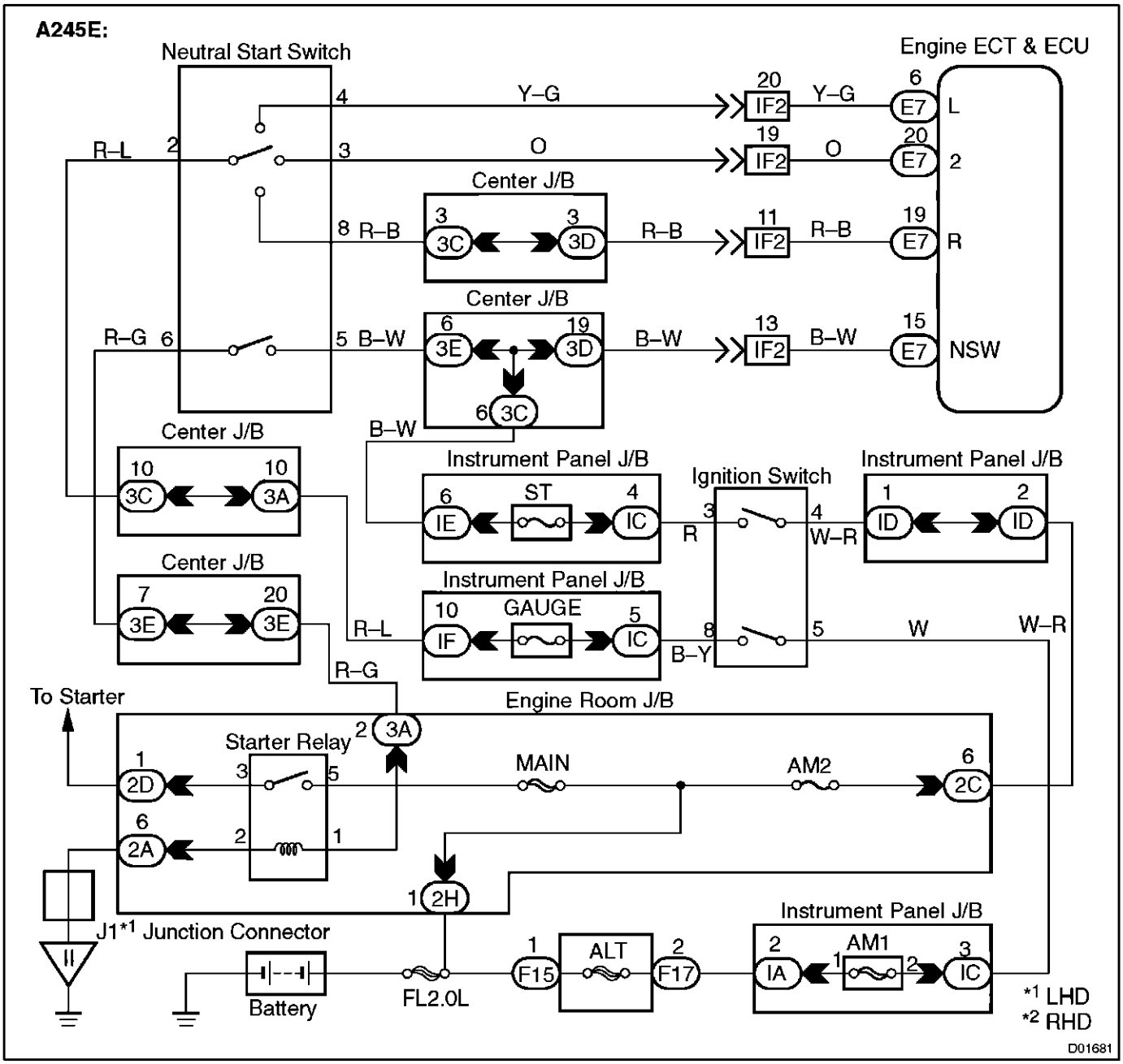
DI337-01

Neutral Start Switch Malfunction

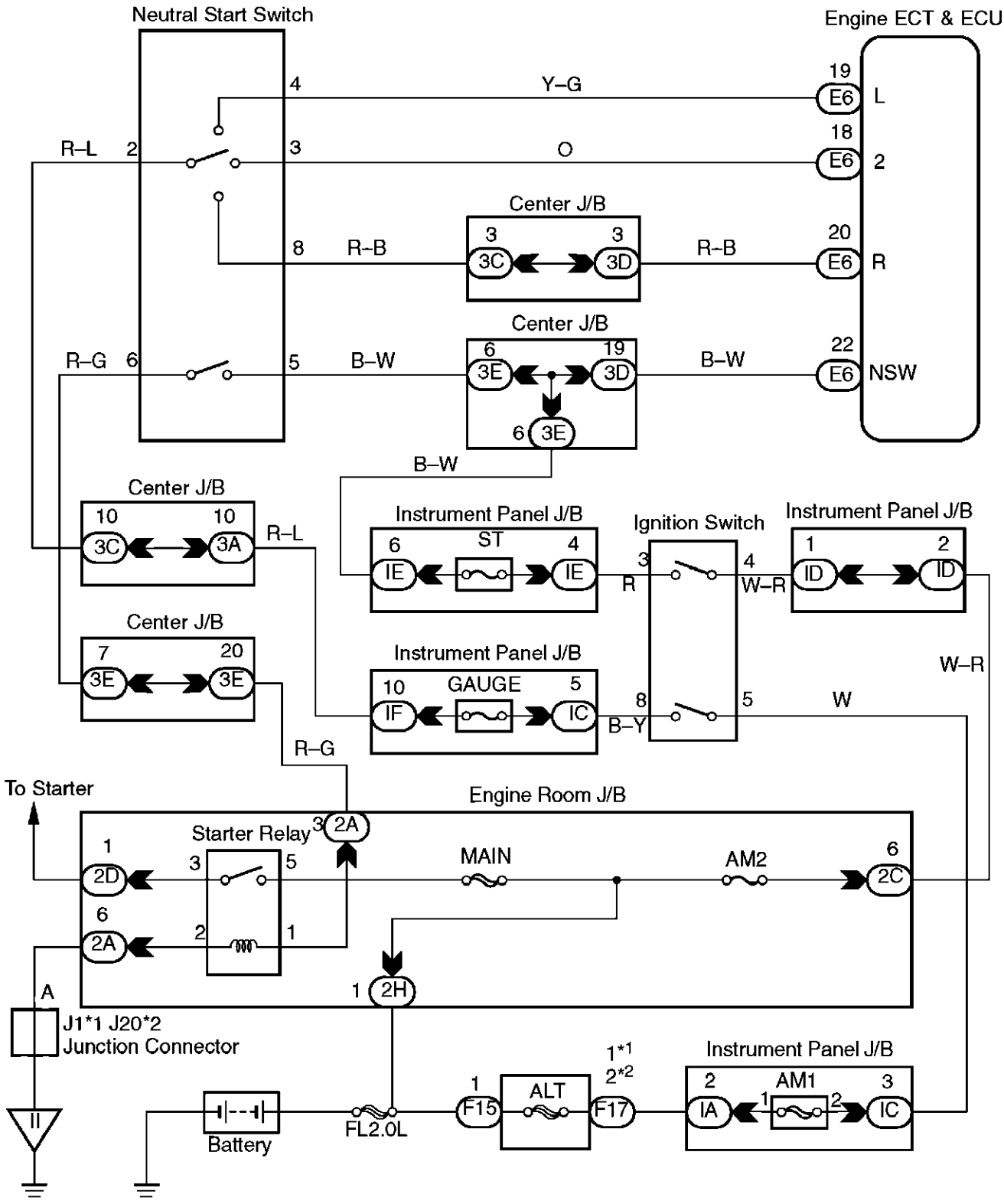
CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever position and sends signals to the Engine & ECT ECU. The Engine & ECT ECU receives signals (NSW, R, 2 and L) from the neutral start switch. When the signal is not sent to the Engine & ECT ECU from the neutral start switch, the Engine & ECT ECU judges that the shift lever is in D range.

WIRING DIAGRAM



A246E:


Neutral Start Switch
Engine ECT & ECU
Y–G
R–L
O
R–B
R–B
R–G
B–W
B–W
B–W
R–L
R–G
W–R
W
B–Y
W–R
Center J/B
Instrument Panel J/B
Ignition Switch
Instrument Panel J/B
Center J/B
Center J/B
Instrument Panel J/B
To Starter
Engine Room J/B
Starter Relay
MAIN
AM2
J1*1 J20*2
Junction Connector
Battery
FL2.0L
ALT
Instrument Panel J/B
AM1
*1: LHD
*2 RHD
D01684

INSPECTION PROCEDURE

1	**Read PNP SW, REVERSE, 2ND and LOW signals.**

When using hand–held tester:

PREPARATION:

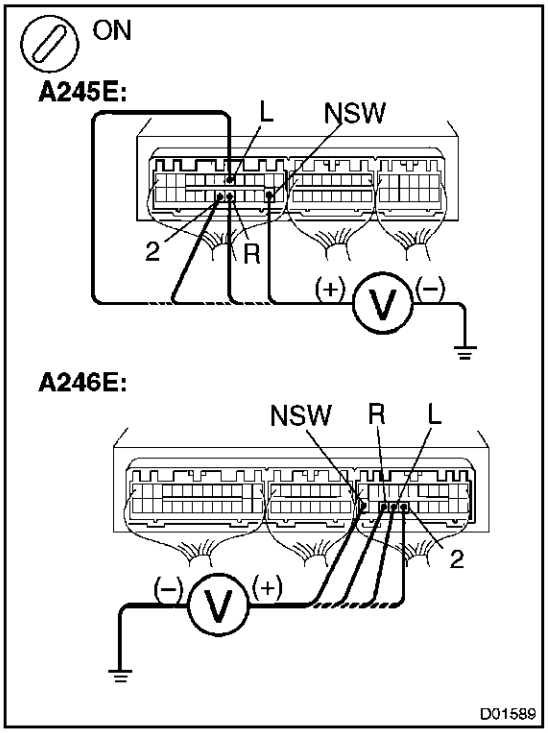
(a) Remove the DLC3 cover.
(b) Connect hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Shift lever into the P, R, N, 2 and L ranges, and read the PNP SW, REVERSE, 2ND and LOW signals on the hand–held tester.

OK:

Shift Range	Signal
2	2ND: OFF → ON
L	LOW: OFF → ON
R	REVERSE: OFF → ON
P, N	PNP SW: OFF → ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminals NSW, 2, L and R of Engine & ECT ECU and body ground when the shift lever is shifted to the following ranges.

OK:

Range	NSW–Body ground	R–Body ground	2–Body ground	L–Body ground
P, N	0 V	0 V	0 V	0 V
R	9 ~ 14 V*	9 ~ 14 V*	0 V	0 V
D	9 ~ 14 V	0 V	0 V	0 V
2	9 ~ 14 V	0 V	9 ~ 14 V	0 V
L	9 ~ 14 V	0 V	0 V	9 ~ 14 V

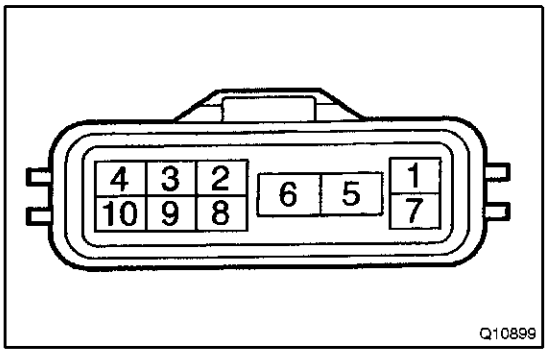
HINT:

The voltage will drop slightly due to lighting up the back up light.

OK → **Check and replace the Engine & ECT ECU (See page IN–28).**

NG

2	Check neutral start switch.



PREPARATION:

(a) Jack up the vehicle.

(b) Remove the neutral start switch.

CHECK:

Check continuity between each terminal shown below when the shift lever is moved to each position.

OK:

Shift Range	Terminal No. to continuity	Terminal No. to continuity
P	2 – 7	5 – 6
R	2 – 8	–
N	2 – 9	5 – 6
D	2 – 10	–
2	2 – 3	–
L	2 – 4	–

NG → **Replace the neutral start switch.**

OK →

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine & ECT ECU (See page IN–28).

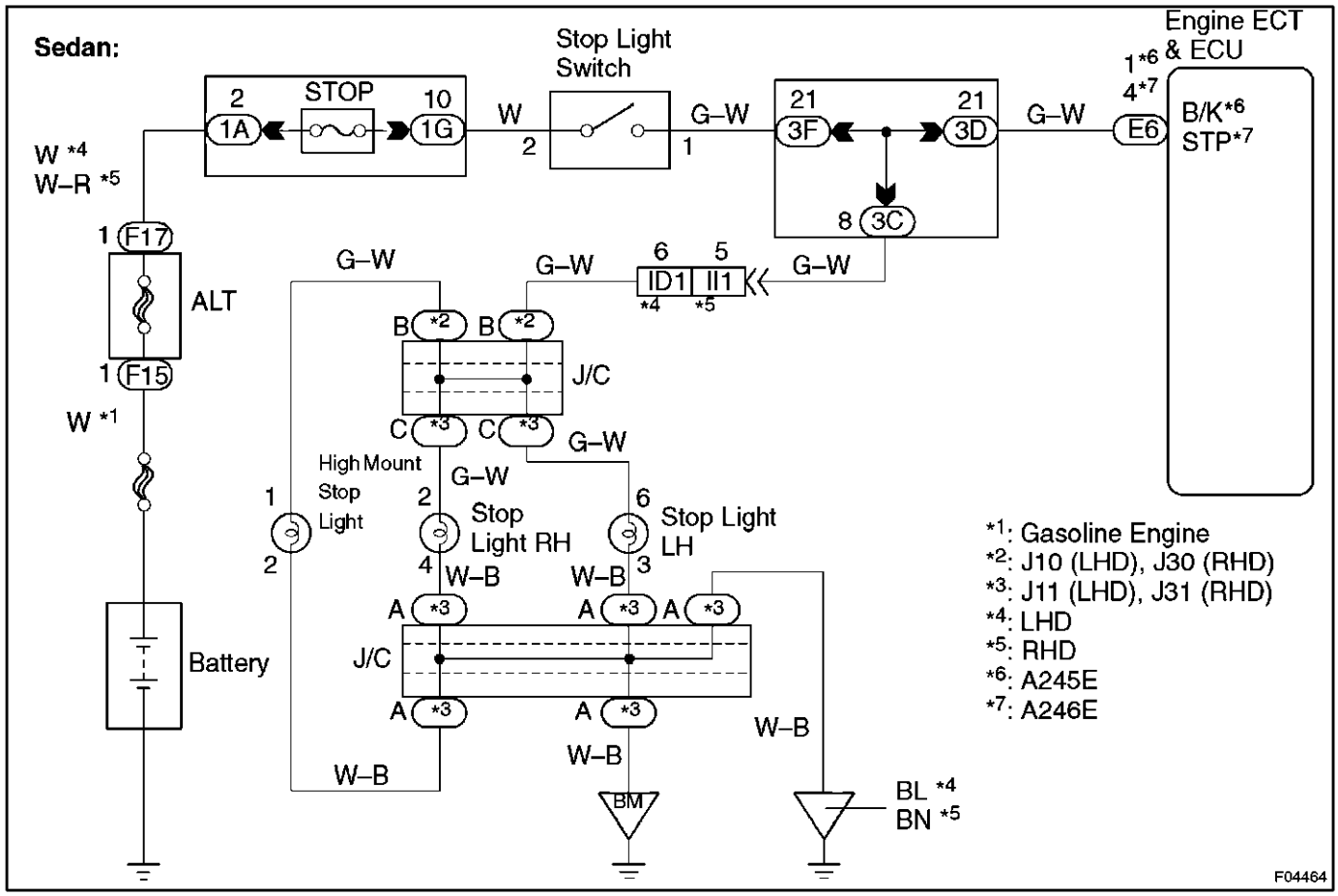
DI335–01

Stop Light Switch Signal Malfunction

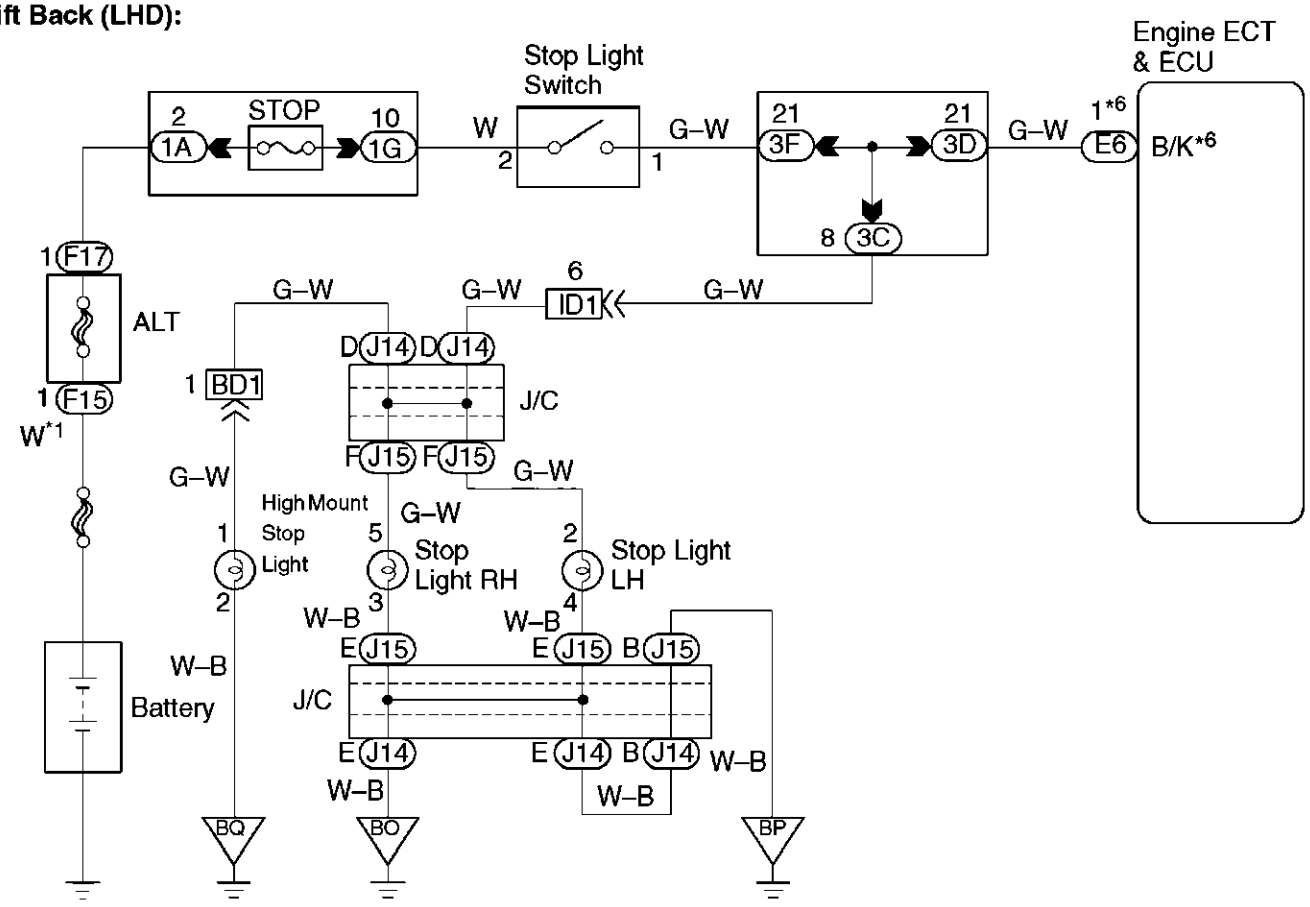
CIRCUIT DESCRIPTION

The object 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 operated, this switch sends a signal to Engine & ECT ECU. Then the Engine & ECT ECU cancels operation of the lock–up clutch while braking is in progress.

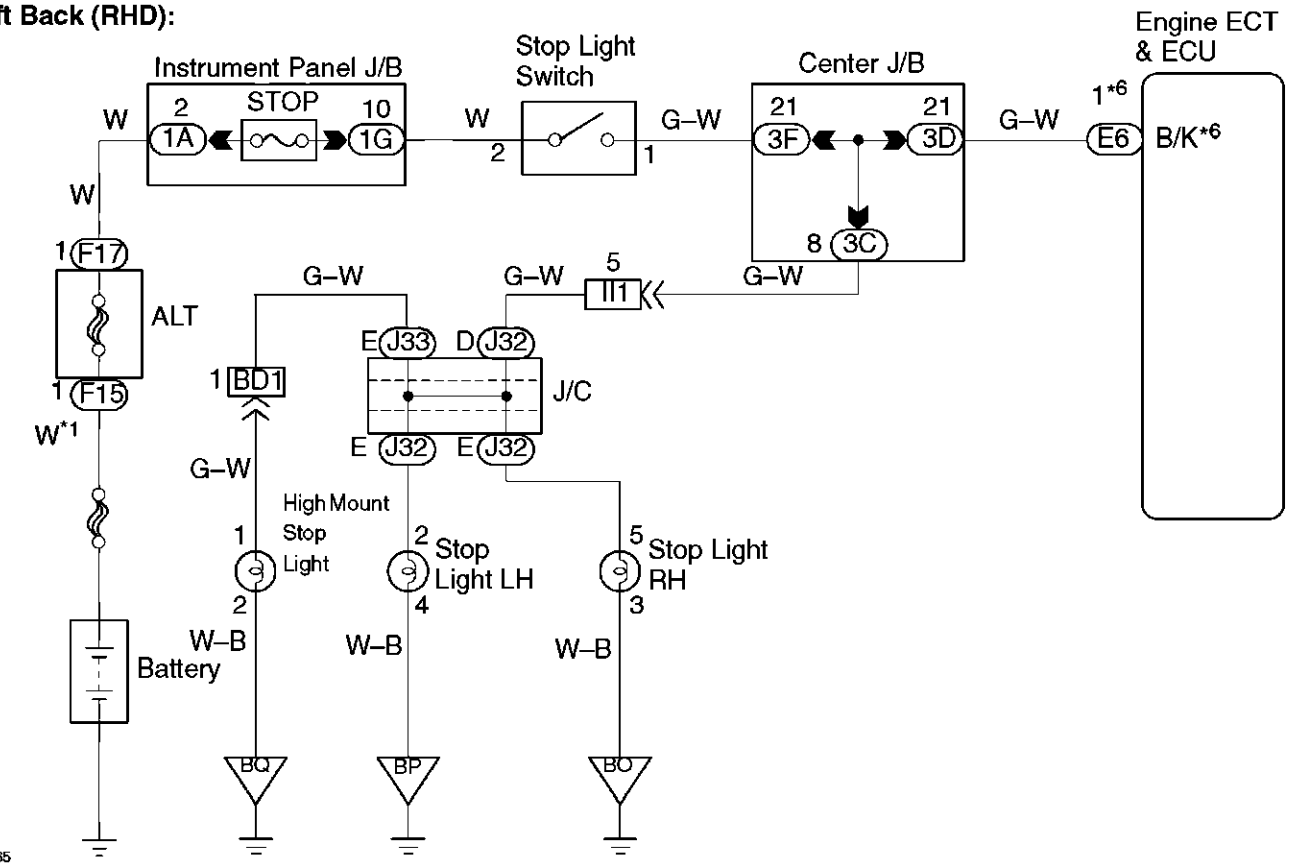
WIRING DIAGRAM



Lift Back (LHD):



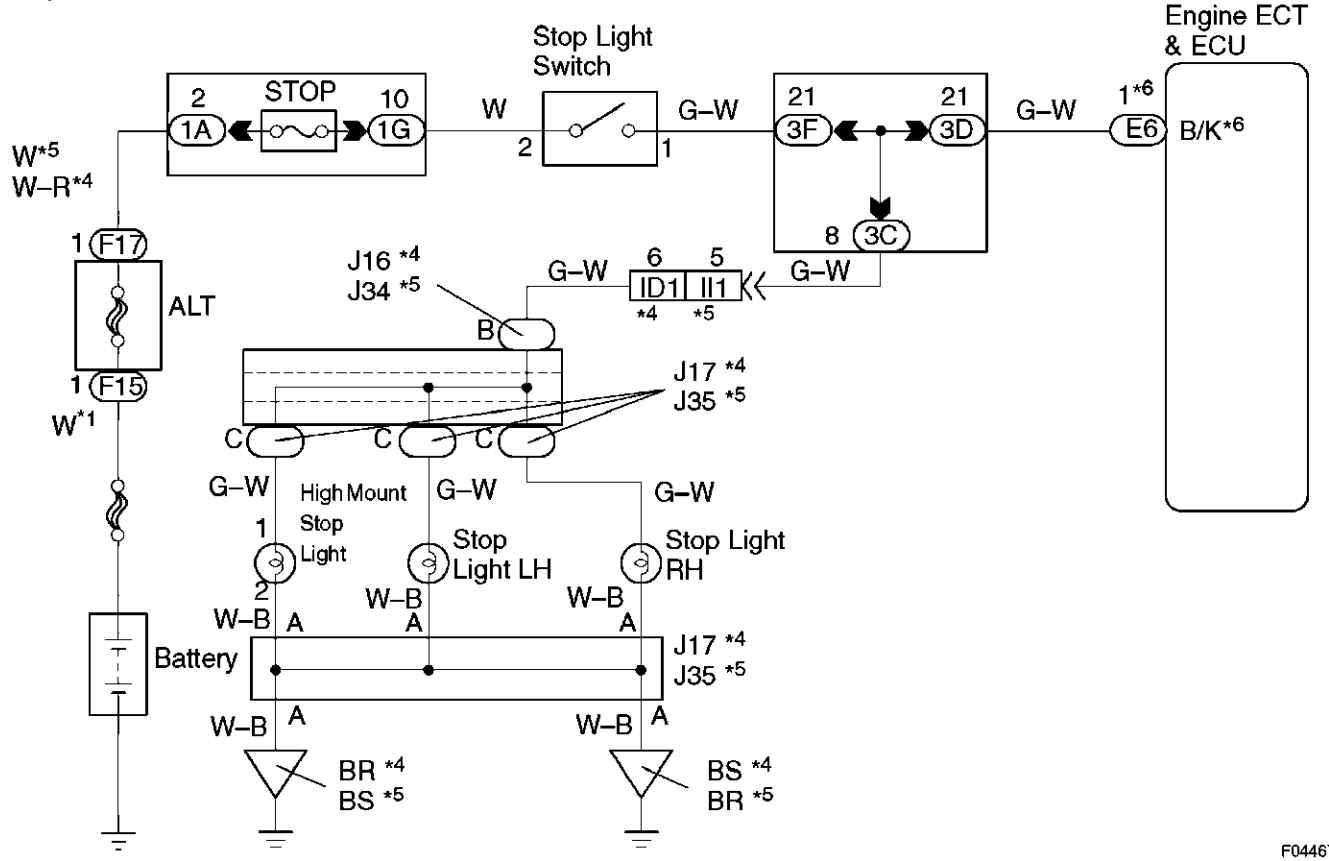
Lift Back (RHD):



F04465
F04466

F05531

Wagon:


Stop Light Switch
Engine ECT & ECU
STOP
2
10
1A
1G
W
G–W
21
21
3F
3D
1*6
E6
B/K*6
W*5
W–R*4
8
3C
1
F17
ALT
1
F15
W*1
J16 *4
J34 *5
6
5
ID1
II1
*4
*5
B
J17 *4
J35 *5
C
C
C
G–W
High Mount Stop Light
Stop Light LH
Stop Light RH
1
2
W–B
A
Battery
BR *4
BS *5
BS *4
BR *5
F04467

INSPECTION PROCEDURE

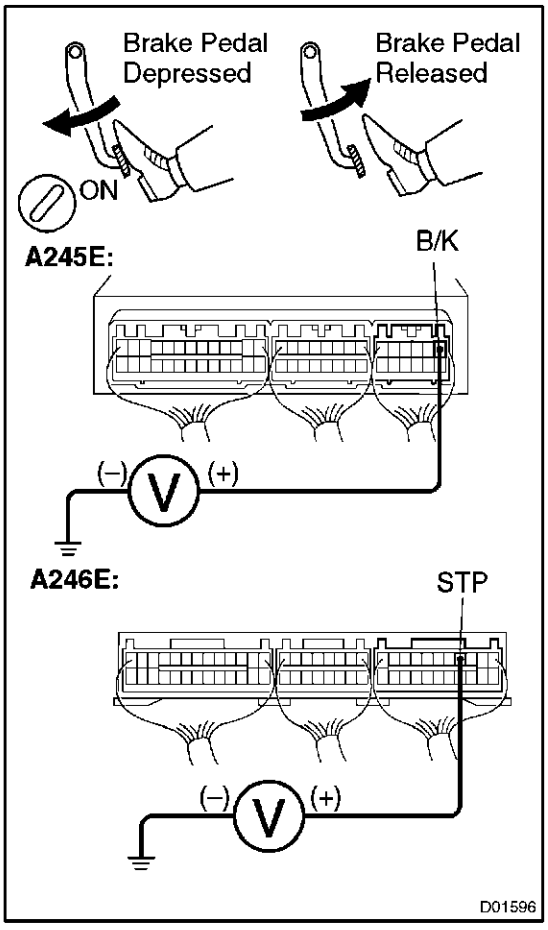
1	**Check operation of stop light.**

CHECK:
Check if the stop lights go on and off normally when the brake pedal is depressed and released.

NG → **Check and repair stop light circuit.**

OK

2	**Check STP signal.**



When using hand –held tester:
PREPARATION:
(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and turn the hand–held tester main switch ON.
CHECK:
Read the STP signal on the hand–held tester.
OK:
Brake pedal is depressed: STP....ON
Brake pedal is released: STP....OFF
When not using hand –held tester:
PREPARATION:
Turn the ignition switch ON.
CHECK:
Check voltage between terminal B/K (A245E) or STP (A246E) of Engine & ECT ECU and body ground.
OK:

Brake pedal	Voltage
Depressed	7.5–14 V
Released	Below 1.5 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–74).**

NG

3	**Check harness and connector between Engine & ECT ECU and stop light switch (See page IN–28).**

NG → **Repair or replace harness or connector.**

OK →

Check and replace Engine & ECT ECU (See page IN–28).

DI339–01

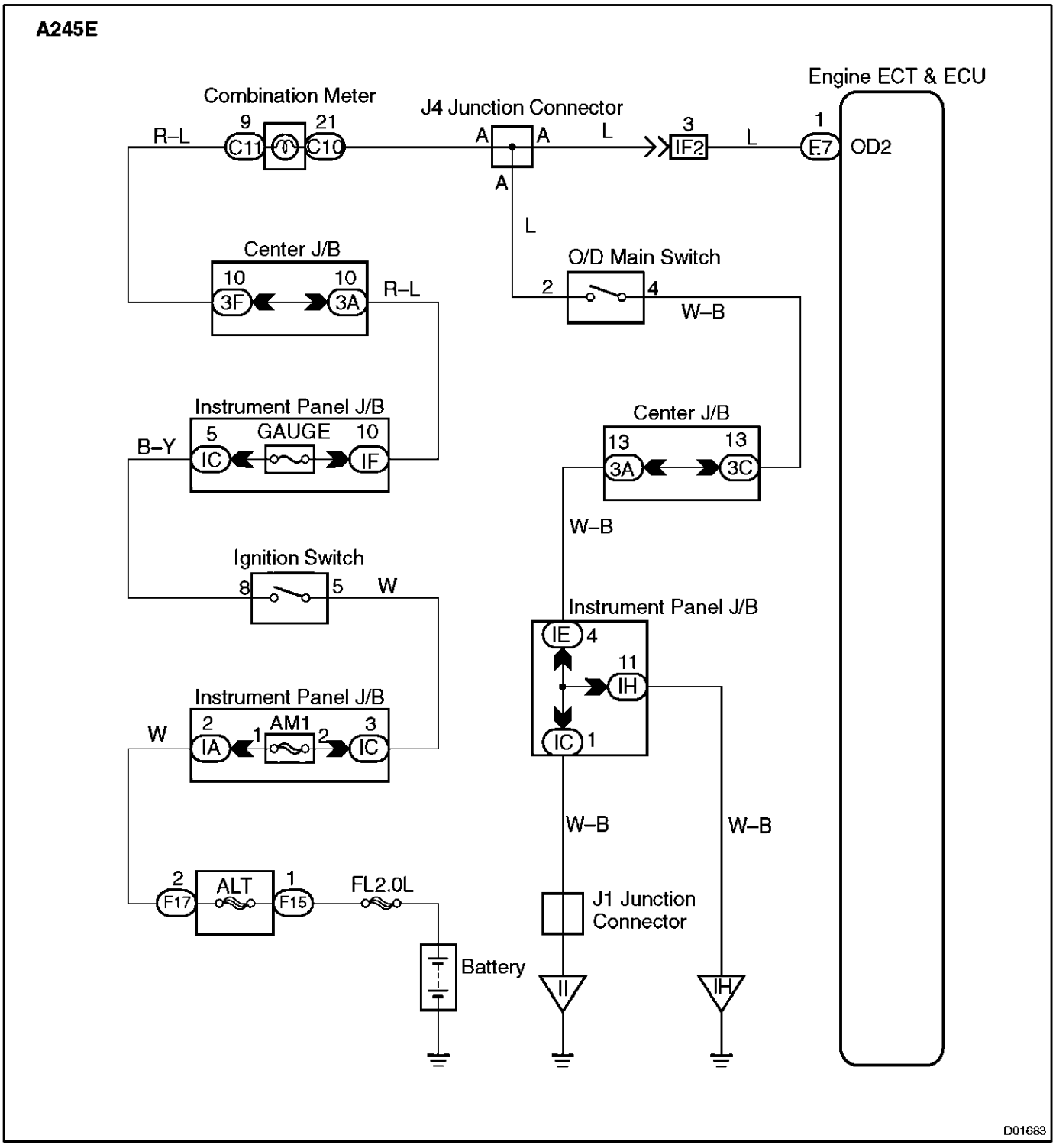
O/D Main Switch & O/D OFF Indicator Light Circuit

CIRCUIT DESCRIPTION

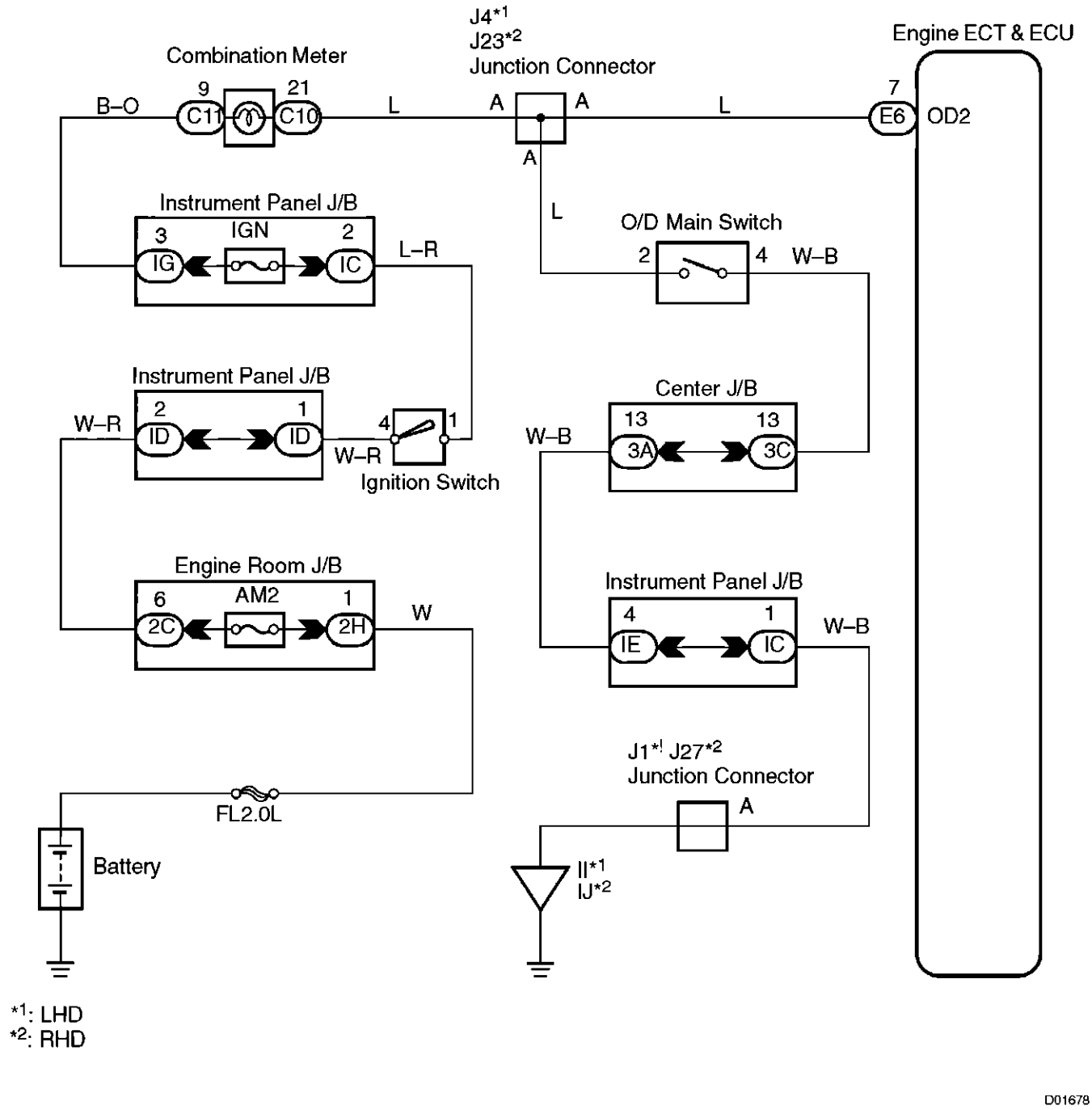
The O/D main switch contacts go open when the switch is pushed in and go closed when it is pushed out. When O/D main switch is in OFF position, the O/D OFF indicator light lights up, and the Engine & ECT ECU prohibits shifting O/D.

WIRING DIAGRAM

A245E



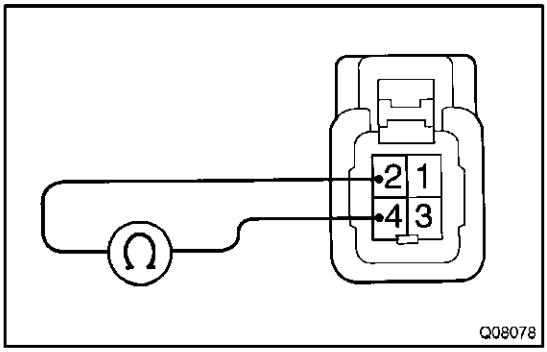
A246E:


J4*1
J23*2
Junction Connector
Engine ECT & ECU
Combination Meter
9
21
B–O
C11
C10
L
A
A
L
7
E6
OD2
A
Instrument Panel J/B
3
IGN
2
IG
IC
L–R
L
O/D Main Switch
2
4
W–B
Instrument Panel J/B
2
1
W–R
ID
ID
4
1
W–R
Ignition Switch
Center J/B
13
13
W–B
3A
3C
Engine Room J/B
6
AM2
1
2C
2H
W
Instrument Panel J/B
4
1
IE
IC
W–B
J1*! J27*2
Junction Connector
A
FL2.0L
Battery
II*1
IJ*2
*1: LHD
*2: RHD
D01678

INSPECTION PROCEDURE

O/D OFF indicator light does not light up

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity at each terminal of O/D main switch connector.
OK:

O/D main switch	Specified condition
ON	No continuity
OFF	Continuity

NG → **Replace the O/D main switch.**

OK

2	**Check and replace combination meter (See page BE–63).**

NG → **Replace the combination meter.**

OK

3	Check OVRDRIVE CUT SW2 signal.

When using hand–held tester:

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the OVRDRIVE CUT SW2 signal on the hand–held tester.

OK:

O/D main switch condition	OVRDRIVE CUT SW2 signal
O/D ON (Pushed in)	OFF
O/D OFF (Pushed once again)	ON

When not using hand–held tester:

PREPARATION:

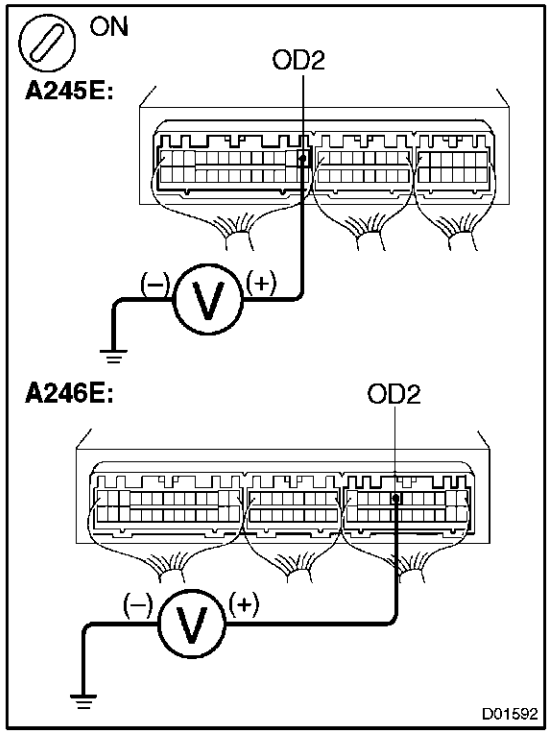
Turn the ignition switch ON.

CHECK:

Check voltage between terminal OD2 of Engine & ECT ECU and body ground.

OK:

O/D main switch condition	Voltage
O/D ON (Pushed in)	9 – 14
O/D OFF (Pushed once again)	Below 3 V



NG

OK → **Check and replace the Engine & ECT ECU (See page IN–28).**

4	Check harness and connector between O/D OFF indicator light and Engine & ECT ECU (See page IN–28).

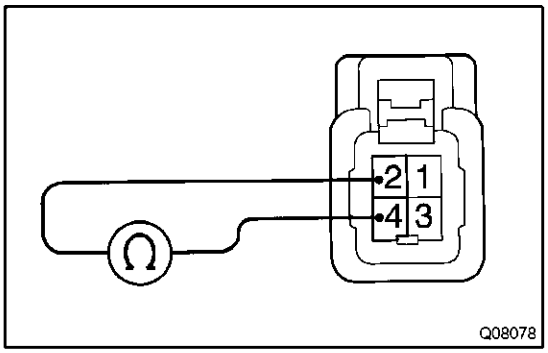
NG → Repair or replace the harness or connector.

OK ↓

Check and replace the Engine & ECT ECU (See page IN–28).

O/D OFF indicator light remains ON

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity at each terminal of O/D main switch connector.
OK:

O/D main switch	Specified condition
ON	No continuity
OFF	Continuity

NG → **Replace the O/D main switch.**

OK ↓

2	**Check harness and connector between O/D OFF indicator light and O/D main switch, O/D OFF indicator light and Engine & ECT ECU (See page IN–28).**

NG → **Repair or replace the harness or connector.**

OK ↓

Check and replace the Engine & ECT ECU (See page IN–28).

DI339–01

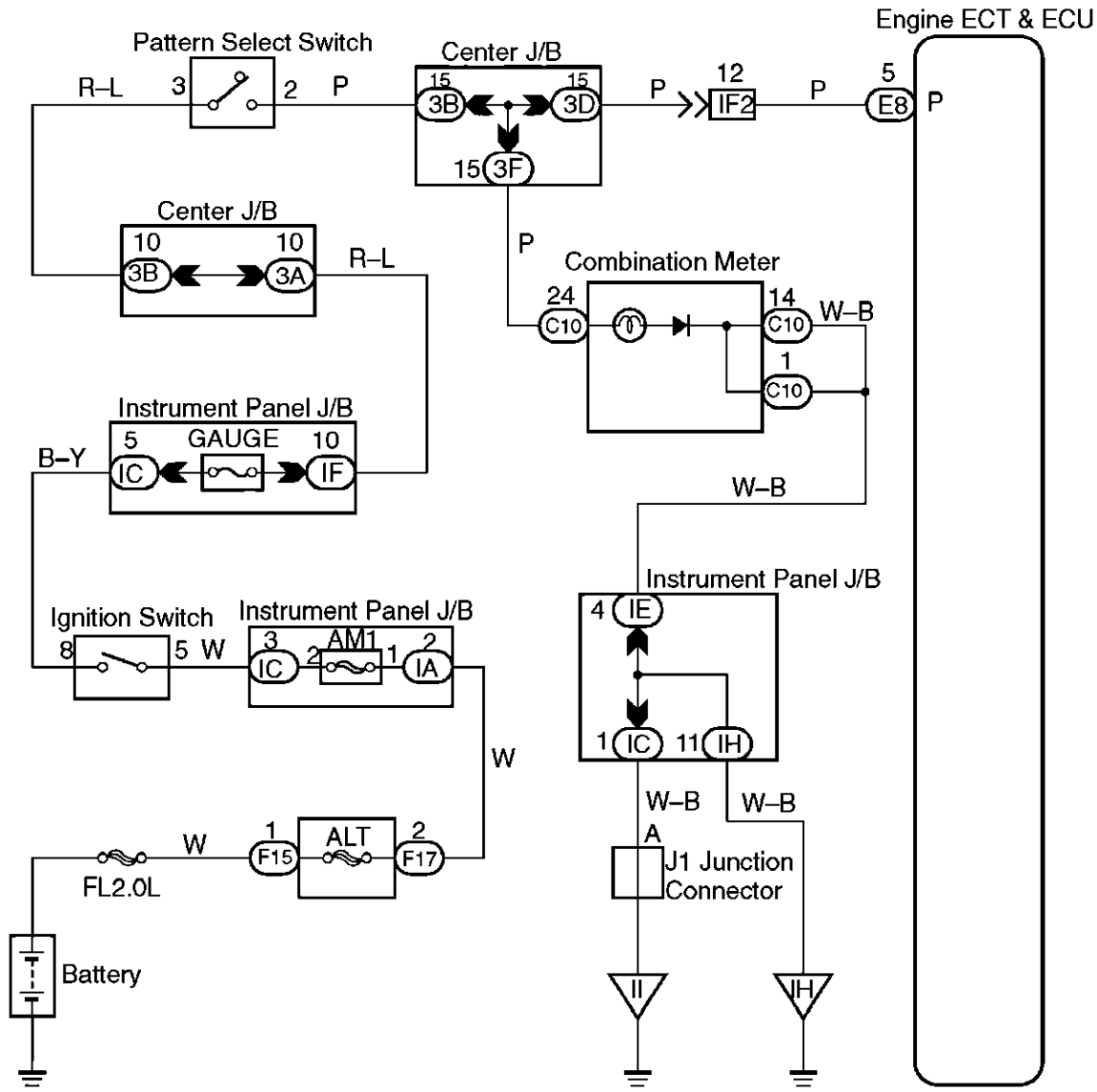
Pattern Select Switch Circuit

CIRCUIT DESCRIPTION

The Engine & ECT ECU memory contains the shift programs for the NORMAL, POWER and SNOW (w/ SNOW MODE) patterns, 2 range, L range and the lock–up patterns. By following the programs corresponding to the signals from the pattern select switch, the neutral start switch and other various sensors, the Engine & ECT ECU switches the solenoid valves ON and OFF, and controls the transmission gear change and the lock–up clutch operation.

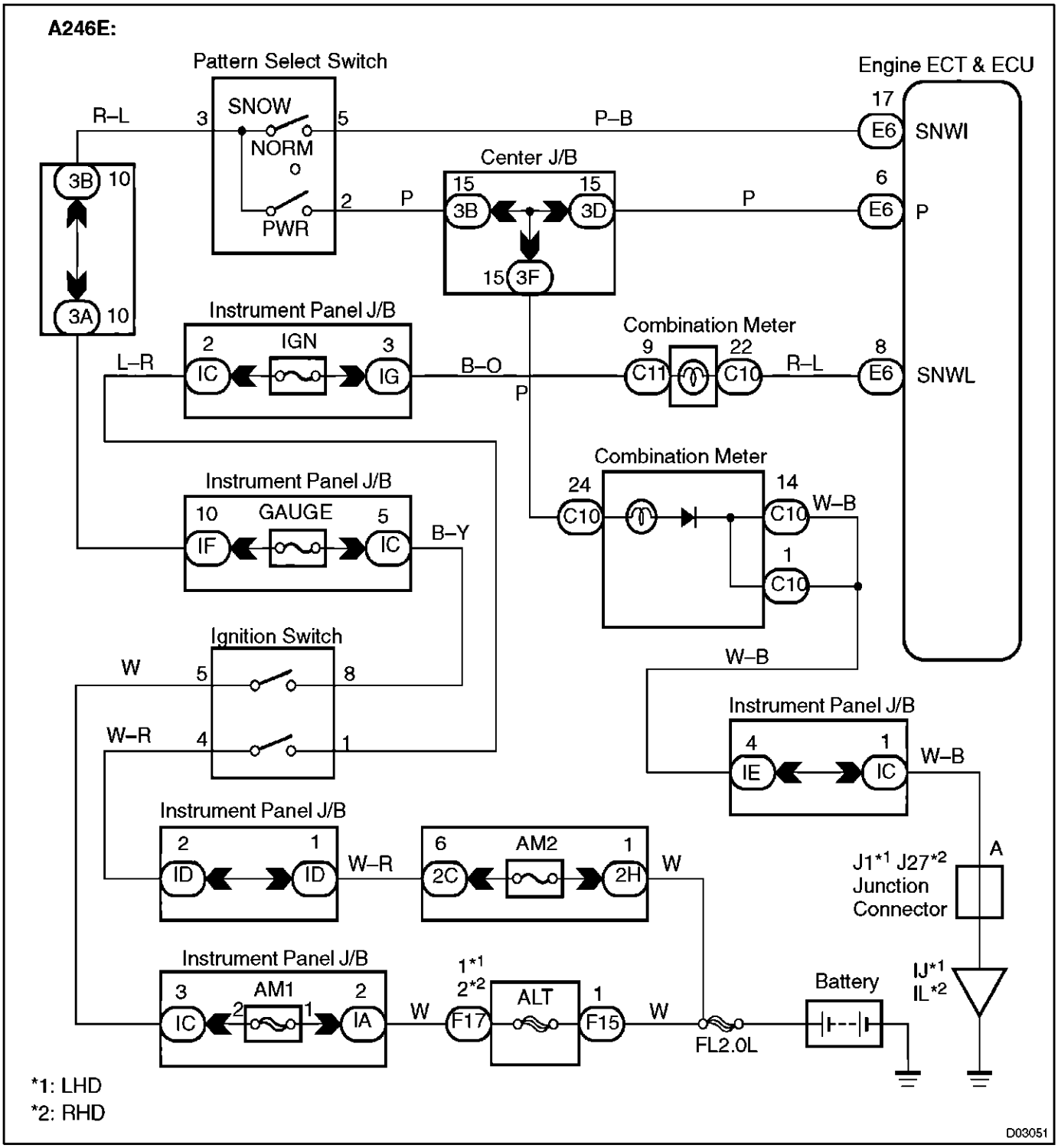
WIRING DIAGRAM

A245E:



D01682

A246E:


Pattern Select Switch
SNOW
NORM
PWR
R–L
P–B
P
Center J/B
Engine ECT & ECU
SNWI
SNWL
Instrument Panel J/B
IGN
GAUGE
Combination Meter
L–R
B–O
R–L
B–Y
W–B
W
W–R
Ignition Switch
AM1
AM2
ALT
Battery
FL2.0L
J1*1 J27*2
Junction
Connector
IJ*1
IL*2
*1: LHD
*2: RHD
D03051

INSPECTION PROCEDURE

1	**Check PATTERN SEL SW signal.**

PREPARATION:

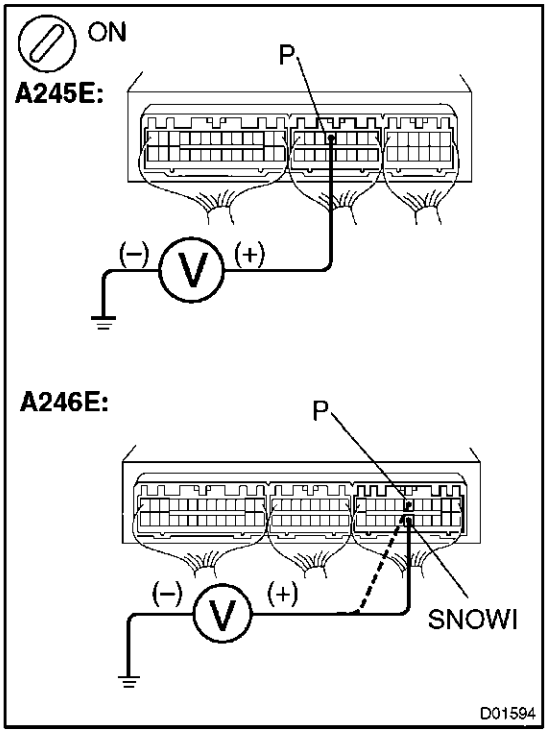
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the PATTERN SEL SW signal on the hand–held tester.

OK:

Pattern select switch	PATTERN SEL SW signal
POWER	ON
NORM	OFF
SNOW (w/ SNOW MODE)	OFF



PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal each of P, SNOW1 of Engine & ECT ECU and body ground when the pattern select switch is set to the PWR (POWER), NORM (NORMAL) and SNOW (w/ SNOW MODE) positions.

OK:

Switch position	Tester connection	Specified condition
PWR	P – Body ground	9 – 14 V
	SNOWI – Body ground	Below 1.5 V
NORM	P – Body ground	Below 1.5 V
	SNOWI – Body ground	Below 1.5 V
SNOW	P – Body ground	Below 1.5 V
	SNOWI – Body ground	9 – 14 V

HINT:

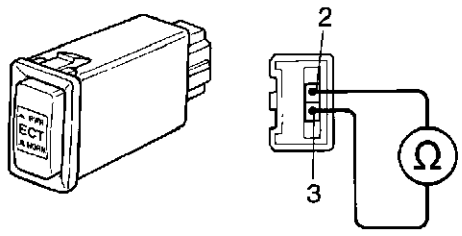
The Engine & ECT ECU uses the normal pattern signal if the P and SNOW1 signals are not input.

OK → **Proceed to next circuit inspection shown in symptom preblems table (See page DI–74).**

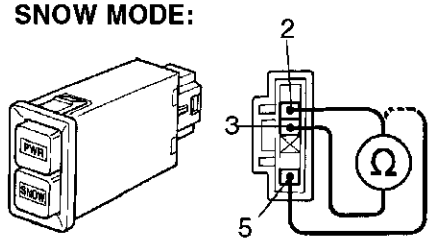
NG

2	Check pattern select switch

w/o SNOW MODE:



w/ SNOW MODE:



D01534

w/o SNOW MODE:

PREPARATION:

Disconnect the pattern select switch connector.

CHECK:

Check continuity between terminals 2 and 3 of pattern select switch connector when the select switch is set to PWR and NORM positions.

OK:

Switch position	Tester connection	Specified condition
PWR	2 – 3	Continuity
NORM	2 – 3	No continuity

w/ SNOW MODE:

PREPARATION:

Disconnect the pattern select switch connector.

CHECK:

Check continuity between terminals 2 and 3 (PWR, NORM), 3 and 5 (SNOW) of pattern select switch connector when the select switch is set to PWR, NORM and SNOW positions.

OK:

Switch position	Tester connection	Specified condition
PWR	2 – 3	Continuity
NORM	2 – 3, 3 – 5	No continuity
SNOW	3 – 5	Continuity

NG → **Replace the pattern select switch.**

OK

3	Check harness and connector between battery and pattern select switch, pattern select switch and Engine & ECT ECU (See page IN–28).

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–28).

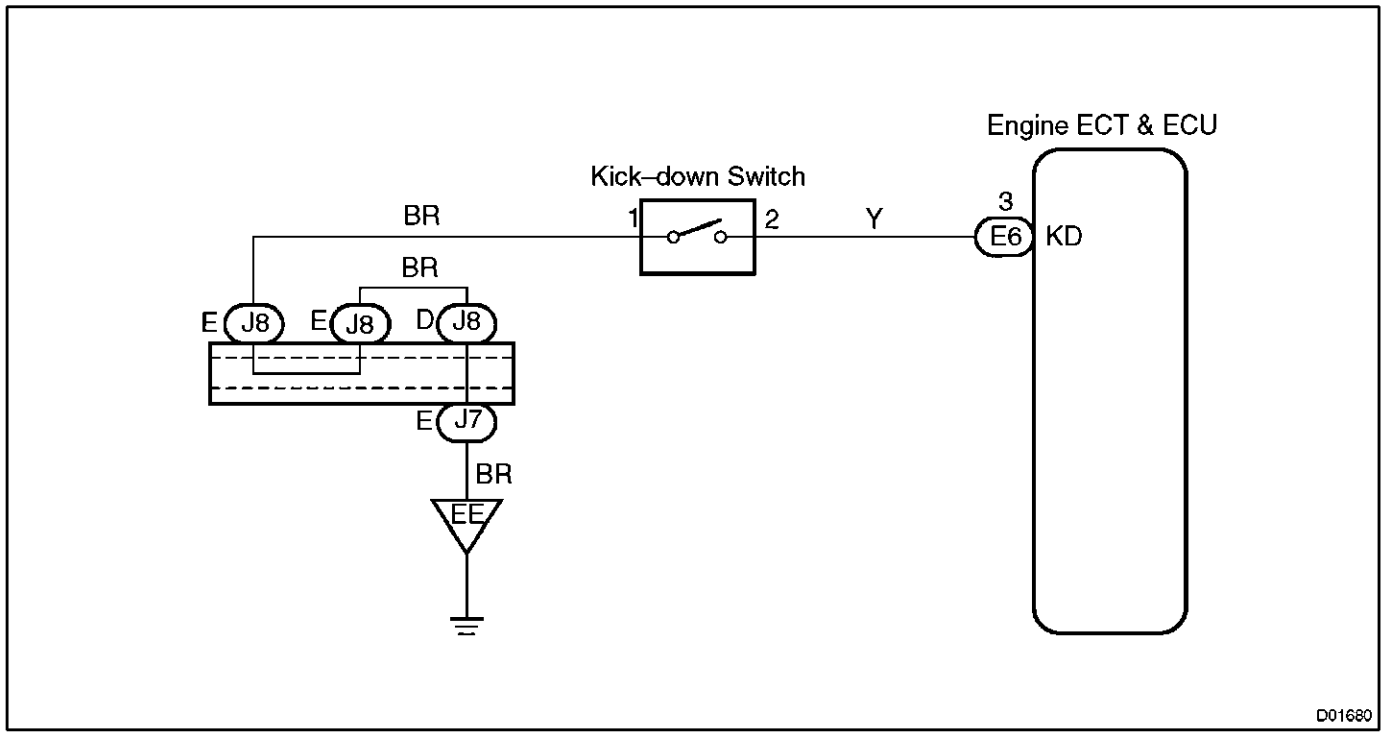
DI333–01

Kick–down Switch Circuit (A246E)

CIRCUIT DESCRIPTION

The kick–down switch is turned ON when the accelerator pedal is depressed beyond the full throttle opening and sends signals to Engine & ECT ECU.
When the kick–down switch is turned ON, the Engine & ECT ECU controls gear shifting according to the programmed shift diagrams.
If a short circuit develops in the kick–down switch, the Engine & ECT ECU disregards the kick–down signals and controls shifting at the normal shift points.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check KICK DOWN SW signal.**

When using hand–held tester:

PREPARATION:

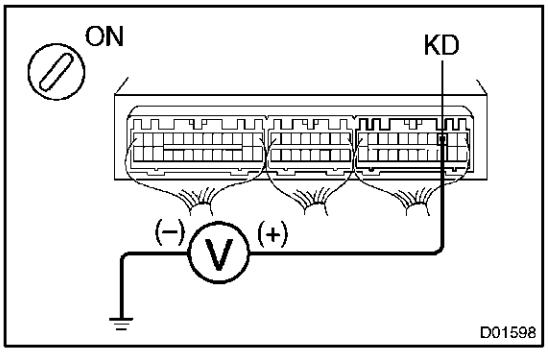
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the KICK DOWN SW signal on the hand–held tester.

OK:

Accelerator Pedal	KICK DOWN SW signal
Fully depressed (kick–down SW is ON)	ON
Released (kick–down SW is OFF)	OFF



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal KD of Engine & ECT ECU connector and body ground when accelerator pedal is fully depressed or not.

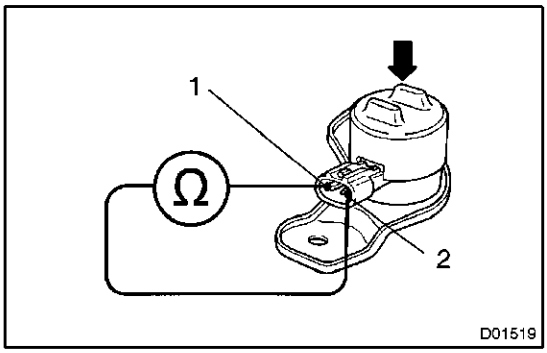
OK:

Accelerator Pedal	Voltage
Fully depressed (kick–down SW is on)	Below 1 V
Released (kick–down SW is OFF)	10 – 14 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–74)**

NG

2	Check kick–down switch.



PREPARATION:
Disconnect the kick–down switch connector.
CHECK:
Check continuity at each terminal of kick–down switch connector.
OK:

Kick–down Switch	Specified continuity
ON	Continuity
OFF	No continuity

NG → **Replace kick–down switch**

OK

3	Check harness and connector between Engine & ECT ECU and kick–down switch, kick–down switch and body ground (See page IN–28).

NG → **Repair or replace the harness or connector.**

OK

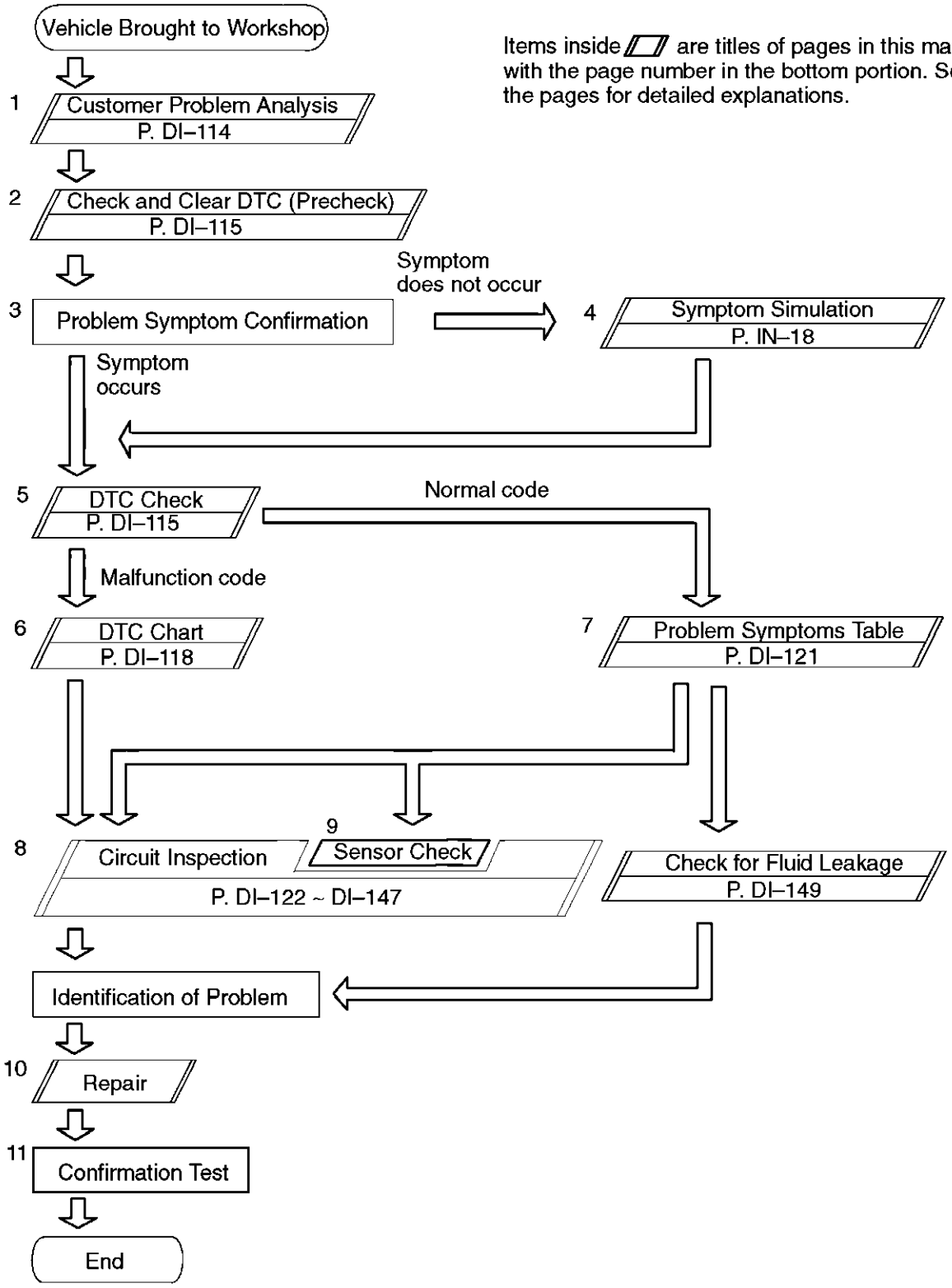
Check and replace Engine & ECT ECU (See page IN–28).

ANTI–LOCK BRAKE SYSTEM

DI24X–03

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshooot in accordance with the procedure on the following pages.



DI24Y–02

CUSTOMER PROBLEM ANALYSIS CHECK

ABS Check Sheet

Inspector's Name :

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

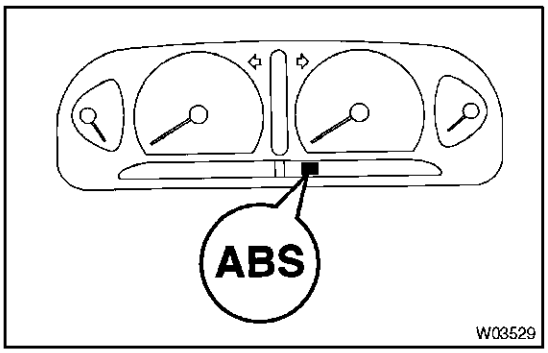
Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuously ☐ Intermittently (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate intermittently.	
	ABS 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)

DI32P–01

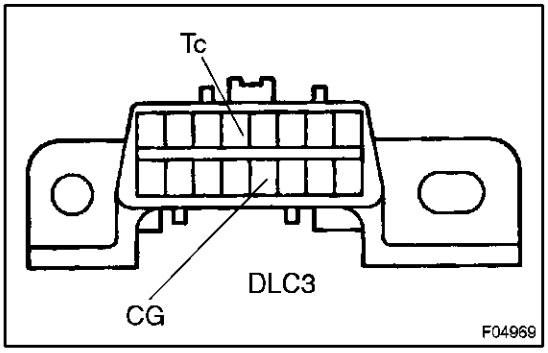
PRE–CHECK



1. DIAGNOSIS SYSTEM

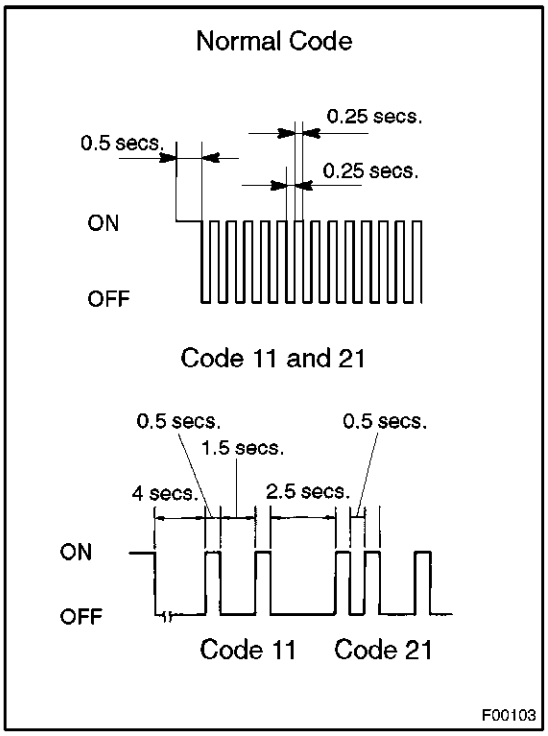
(a) Check the indicator.
When the ignition switch is turned ON, check that the ABS warning light goes on for 2 seconds.

HINT:
If the indicator check result is not normal, proceed to trouble-shooting for the ABS warning light circuit (See page DI–143).



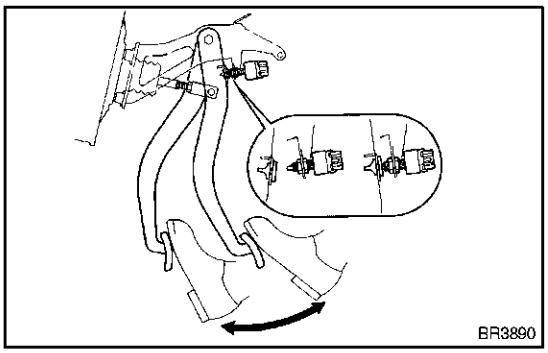
(b) Check the DTC
(1) Using SST, connect terminals Tc and CG of DLC3.
SST 09843 –18020
(2) Turn the ignition switch ON.
(3) Read the DTC from the ABS warning light on the combination meter.

HINT:
- If no code appears, inspect the diagnostic circuit or ABS warning light circuit (See page DI–145 or DI–143).



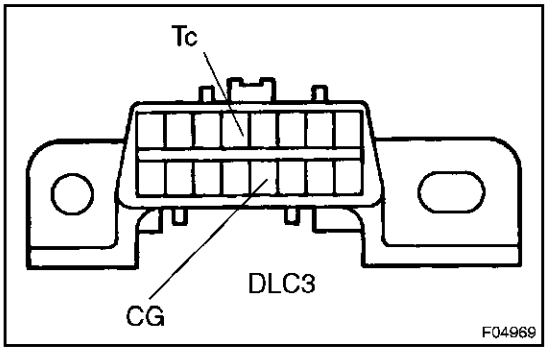
- As an example, the blinking patterns for normal code and codes 11 and 21 are shown on the left.
(4) Codes are explained in the code table on page DI–118.
(5) After completing the check, disconnect terminals Tc and CG, and turn off the display.

If 2 or more malfunctions are indicated at the same time the lowest numbered DTC will be displayed 1st.



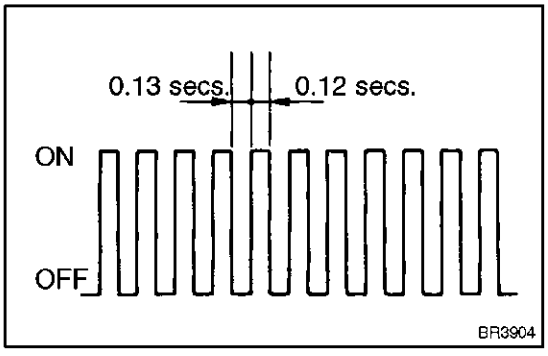
(c) Clear the DTC.
(1) Using SST, connect terminals Tc and CG of DLC3.
SST 09843 – 18020
(2) Turn the ignition switch ON.
(3) Clear the DTC stored in ECU by depressing the brake pedal 8 or more times within 3 seconds.
(4) Check that the warning light shows the normal code.
(5) Remove the SST from the terminals of DLC3.
SST 09843 – 18020

HINT:
Cancellation cannot be done by removing the battery cable or ECU–B fuse.



2. SPEED SENSOR SIGNAL

(a) Check the speed sensor signal.
(1) When the ignition switch is turned ON, check that the ABS warning light goes on for 2 seconds.
(2) Turn the ignition switch OFF.
(3) Using SST, connect terminals Ts and CG of DLC3.
SST 09843 – 18020
(4) Start the engine.



(5) Check that the ABS warning light blinks.

HINT:
If the ABS warning light does not blink, inspect the ABS warning light circuit (See page DI–143).

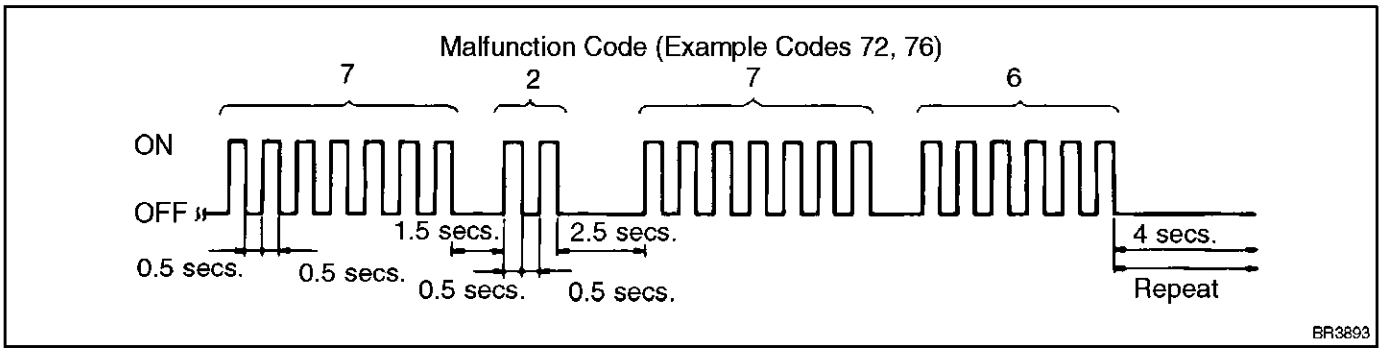
(6) Drive vehicle straight forward.

HINT:
- Drive vehicle at 45 – 55 km/h (28 – 34 mph) for several seconds.
- If the brake is applied during the check, the check routine must be started again.

(7) Stop the vehicle.
(8) Turn the ignition switch OFF.
(9) Disconnect the SST from terminals Ts and CG, and connect the SST to terminals Tc and CG of DLC3.
SST 09843 – 18020
(10) Turn the ignition switch ON.
(11) Read the number of blinks of the ABS warning light.

HINT:

- See the list of DTC shown below.
- If every sensor is normal, a normal code is output (A cycle of 0.25 secs. ON and 0.25 secs. OFF is repeated).
- If 2 or more malfunctions are indicated at the same time, the lowest numbered code will be displayed 1st.



(12) After doing the check, disconnect the SST from terminals Tc and CG of DLC3 and turn ignition switch OFF.
SST 09843 –18020

DTC of the speed sensor check function.

Code No.	Diagnosis	Trouble Area
71	Low output voltage of right front speed sensor	• Right front speed sensor • Sensorinstallation • Right front speed sensor rotor
72	Low output voltage of left front speed sensor	• Left front speed sensor • Sensorinstallation • Left front speed sensor rotor
73	Low output voltage of right rear speed sensor	• Right rear speed sensor • Sensorinstallation • Right rear speed sensor rotor
74	Low output voltage of left rear speed sensor	• Left rear speed sensor • Sensorinstallation • Left rear speed sensor rotor
75	Abnormal change in output voltage of right front speed sensor	• Right front speed sensor rotor
76	Abnormal change in output voltage of left front speed sensor	• Left front speed sensor rotor
77	Abnormal change in output voltage of right rear speed sensor	• Right rear speed sensor rotor
78	Abnormal change in output voltage of left rear speed sensor	• Left rear speed sensor rotor

DI250–02

DIAGNOSTIC TROUBLE CODE CHART

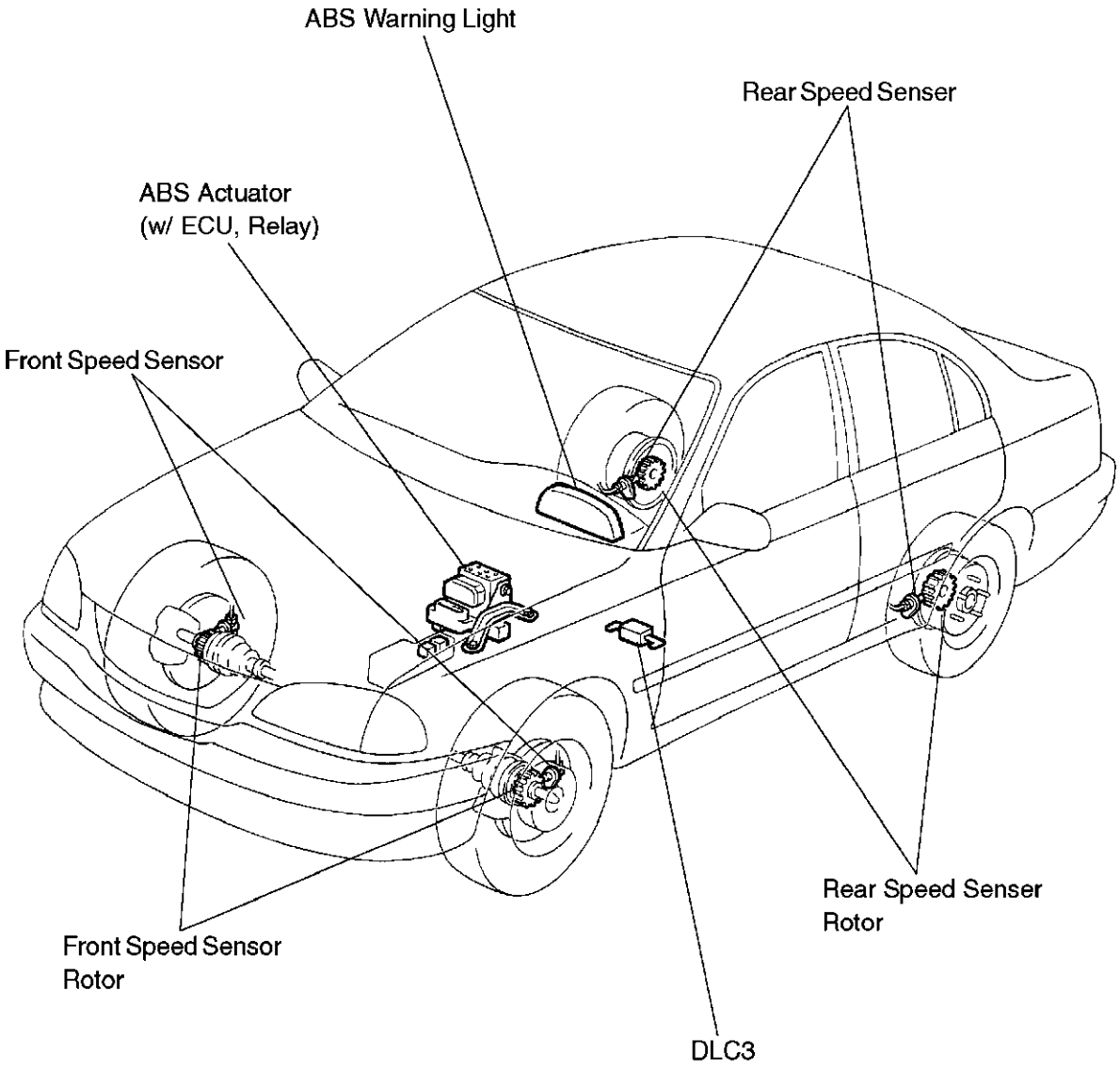
HINT:

- Using SST 09843 –18020, connect the terminals Tc and CG.
- If a malfunction code is displayed during the DTC check, check the circuit listed for 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.

DTC No. (See Page)	Detection Item	Trouble Area
11 (DI–122)	ABS solenoid valve relay faulty	• ABS solenoid valve relay • Valve supply voltage • ECU
13 (DI–124)	ABS pump motor faulty	• ABS motor relay • Pump motor voltage • Pump motor lead disconnected • ECU
21 (DI–126)	Right front solenoid valves faulty	• ABS actuator (right front inlet or outlet solenoid valve)
22 (DI–126)	Left front solenoid valves faulty	• ABS actuator (left front inlet or outlet solenoid valve)
23 (DI–126)	Right rear solenoid valves faulty	• ABS actuator (right rear inlet or outlet solenoid valve)
24 (DI–126)	Left rear solenoid valves faulty	• ABS actuator (left rear inlet or outlet solenoid valve)
31 (DI–128)	Right front wheel speed sensor signal malfunction	• Right front, left front, right rear and left rear speed sensor • Each speed sensor circuit • Sensor installation • ECU
32 (DI–128)	Left front wheel speed sensor signal malfunction	
33 (DI–128)	Right rear wheel speed sensor signal malfunction	
34 (DI–128)	Left rear wheel speed sensor signal malfunction	
35 (DI–128)	Open circuit in right front wheel speed sensor circuit	• Right front, left front speed sensor • Each speed sensor circuit • ECU
36 (DI–128)	Open circuit in left front wheel speed sensor circuit	
37 (DI–133)	Speed sensor rotor is wrong number of teeth on one of the 4 wheels	• Speed sensor • Sensor rotor • ECU
38 (DI–128)	Open circuit in right rear wheel speed sensor circuit	• Right rear, left rear speed sensor • Each speed sensor circuit • ECU
39 (DI–128)	Open circuit in left rear wheel speed sensor circuit	
41 (DI–134)	Low battery voltage	• Battery • IC regulator • Power source circuit • ECU
58 (DI–137)	Open circuit in stop light switch circuit	• Stop light switch • Stop light switch circuit • ECU
62 (DI–141)	Malfunction in ECU	• ECU

DI32Q–01

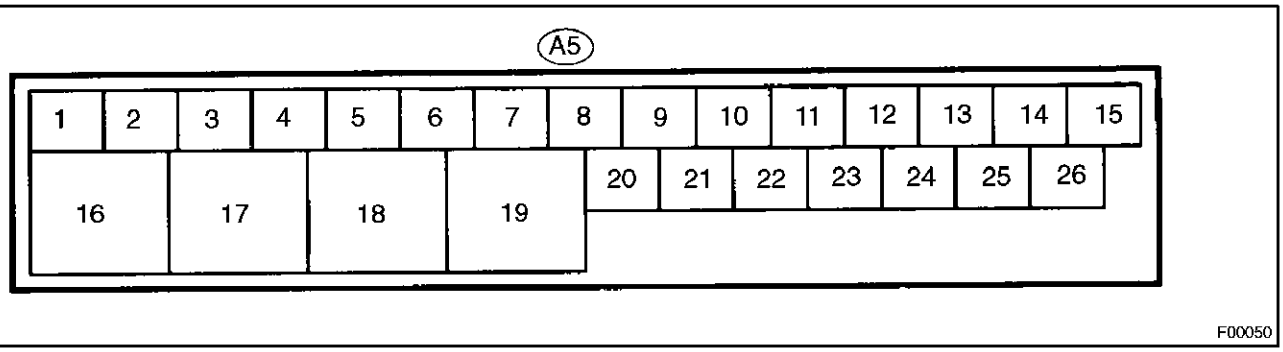
PARTS LOCATION



F04286

DI252–02

TERMINALS OF ECU



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
+B (A5 – 17, 18) – GND (A5 – 16, 19)	L ↔ W–B	Constant	10 – 14
IG1(A5 – 15) – GND (A5 – 16, 19)	B–R ↔ W–B	IG switch ON	10 – 14
WA (A5 – 21) – GND (A5 – 16, 19)	R–Y ↔ W–B	IG switch ON, ABS warning light ON	Below 2.6
		IG switch ON, ABS warning light OFF	10 – 14
STP (A5 – 14) – GND (A5 – 16, 19)	G–W ↔ W–B	Stop light switch OFF	Below 1.5
		Stop light switch ON	5 – 14
Tc (A5 – 12) – GND (A5 – 16, 19)	LG–R ↔ W–B	IG switch ON	5.7 – 8.1
Ts (A5 – 11) – GND (A5 – 16, 19)	LG–B ↔ W–B	IG switch ON	5.7 – 8.1
FR+ (A5 – 5) – FR– (A5 – 4)	B–R ↔ BR	IG switch ON Slowly turn right front wheel	AC generation
FL+ (A5 – 7) – FL– (A5 – 6)	L ↔ B–W	IG switch ON Slowly turn left front wheel	AC generation
RR+ (A5 – 3) – RR– (A5 – 1)	G ↔ R	IG switch ON Slowly turn right rear wheel	AC generation
RL+ (A5 – 9) – RL– (A5 – 8)	W ↔ B	IG switch ON Slowly turn left rear wheel	AC generation

DI253–02

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.

Symptoms	Inspection Circuit	See page
ABS does not operate.	Only when 1. ~ 4. are all normal and the problem is still occurring, replace the ABS ECU. 1. Check the DTC reconfirming that the normal code is output. 2. Power source circuit. 3. Speed sensor circuit. 4. Check the hydraulic circuit for leakage.	 DI–115 DI–134 DI–128 DI–149
ABS does not operate intermittently.	Only when 1. ~ 4. are all normal and the problem is still occurring, replace the ABS ECU. 1. Check the DTC reconfirming that the normal code is output. 2. Speed sensor circuit. 3. Stop light switch circuit. 4. Check the hydraulic circuit for leakage.	 DI–115 DI–128 DI–137 DI–149
ABS warning light abnormal.	1. ABS warning light circuit. 2. ABS ECU.	DI–143
DTC check cannot be done.	Only when 1. and 2. are all normal and the problem is still occurring, replace the ABS ECU. 1. ABS warning light circuit. 2. Tc terminal circuit.	 DI–143 DI–145
Speed sensor signal check cannot be done.	1. Ts terminal circuit. 2. ABS ECU.	DI–147

DI254–02

CIRCUIT INSPECTION

DTC	11	ABS Solenoid Valve Relay Circuit

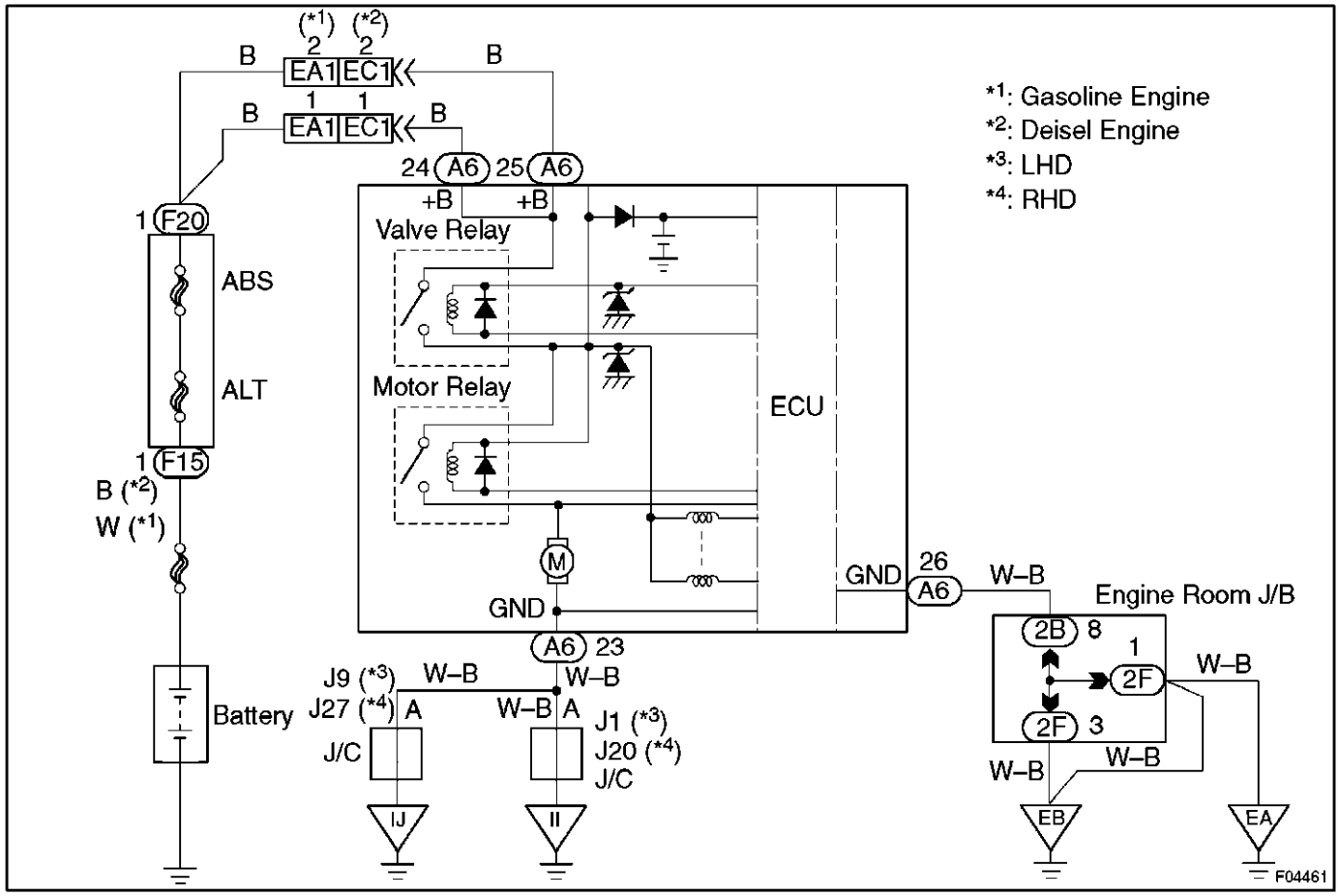
CIRCUIT DESCRIPTION

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
11	Detection of any conditions from (1) through (3): (1) 3 or more solenoid valves are detected faulty in response and at the same time valve supply voltage is detected faulty. (2) Solenoid valve relay will not be switched OFF. (3) Valve relay is stuck in spite of its high valve relay supply voltage.	• ABS solenoid valve relay • Valve supply voltage • ECU

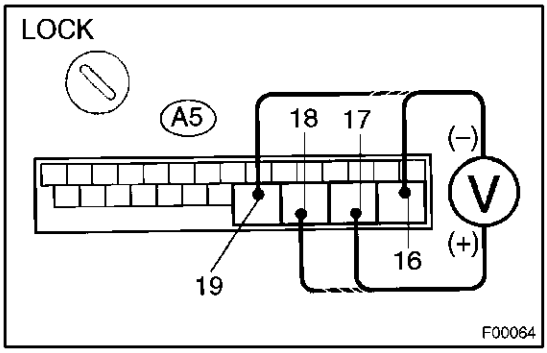
Fail safe function:
If trouble occurs in the ABS solenoid valve relay circuit, the ECU cuts off current to the ABS solenoid valve relay and prohibits ABS control.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals A5 – 17, 18 and A5 – 16, 19 of ABS actuator connector.**



PREPARATION:
Disconnect the ABS actuator connector.
CHECK:
Measure the voltage between terminals A5 – 17, 18 and A5 – 16, 19 of ABS actuator harness side connector.
OK:
Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Check and repair harness or connector.

OK

If the same code is still output after the DTC is deleted, check the contact condition of each connection. If the connections are normal, the ECU may be defective.

DI255–02

DTC	13	Pump Motor Circuit

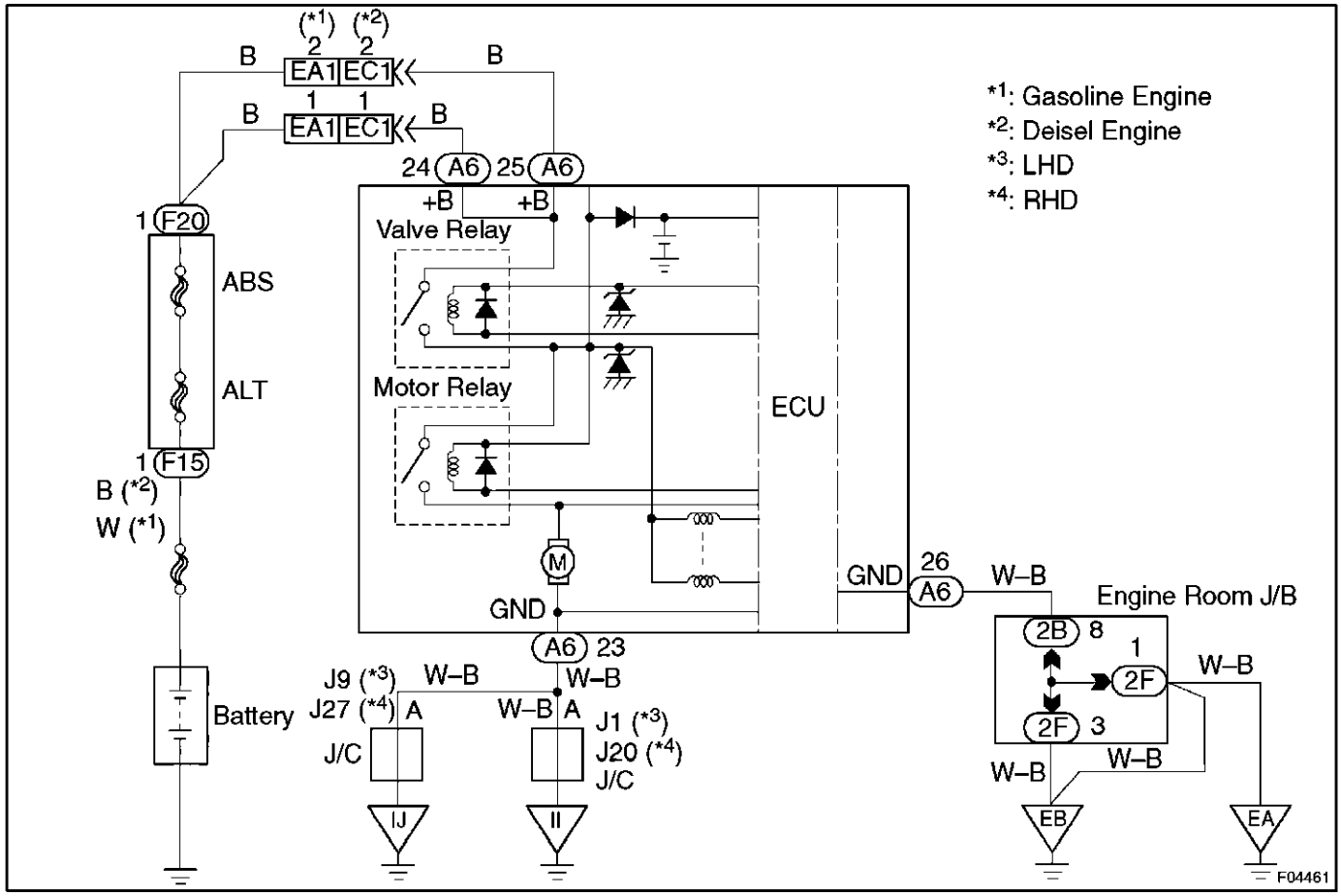
CIRCUIT DESCRIPTION

The ABS motor relay supplies power to the ABS pump motor. While the ABS is activated, the ECU switches the ABS motor relay ON and operates the ABS pump motor.

DTC No.	DTC Detecting Condition	Trouble Area
13	Detection of any conditions from (1) through (3): (1) After actuating the motor relay, voltage will not be supplied to the pump motor within 0.4 secs. (2) Although the voltage supplied to the pump motor is in a high level, motor relay will not actuate for 2.5 secs, or more. (3) The voltage supplied to the pump motor keeps low level for louger than 0.4 secs. and the pump repeats activating for 7 secs. 3times maximally. After the last activation, the pump motor has been gone dead because of short circuit.	• ABS motor relay • Pump motor voltage • Pump motor lead disconnected • ECU

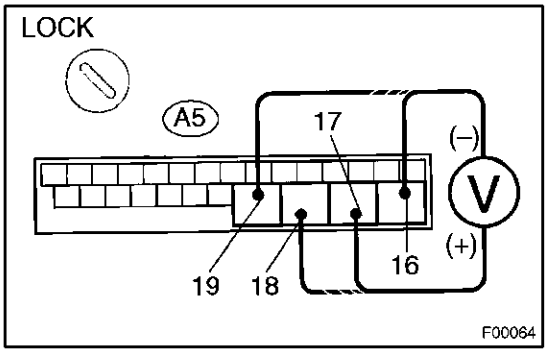
Fail safe function:
If trouble occurs in the ABS motor relay circuit, the ECU cuts off current to the ABS solenoid relay and prohibits ABS control.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals A5 – 17, 18 and A5 – 16, 19 of ABS actuator connector.**



PREPARATION:
Disconnect the ABS actuator connector.
CHECK:
Measure the voltage between terminals A5 – 17, 18 and A5 – 16, 19 of ABS actuator harness side connector.
OK:
Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Check and repair harness or connector.

OK

If the same code is still output after the DTC is deleted, check the contact condition of each connection. If the connections are normal, the ECU may be defective.

DI256–02

DTC	21, 22, 23, 24	ABS Solenoid Valve Circuit

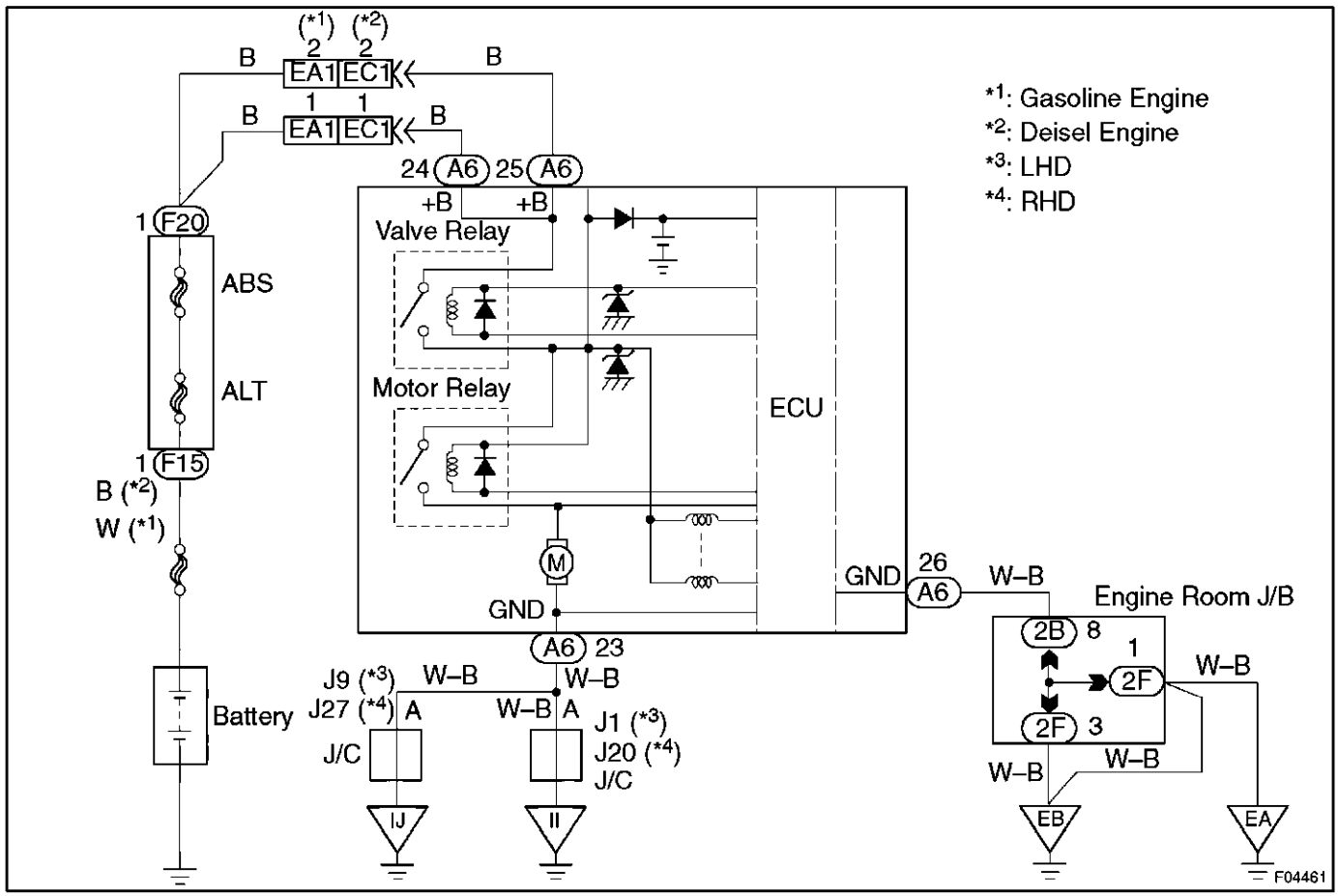
CIRCUIT DESCRIPTION

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
21, 22, 23, 24	Solenoid valve signal does not match for the check result.	• Each solenoid valve

Fail safe function:
If trouble occurs in the actuator solenoid valve circuit, the ECU cuts off current to the ABS solenoid valve relay and prohibits ABS control.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check the DTC once more.**

PREPARATION:
(a) Clear the DTC (See page DI–115).
(b) Turn the ignition switch OFF.

CHECK:
Turn the ignition switch ON, and check if the same DTC is stored in the memory.

NO → **No problem.**

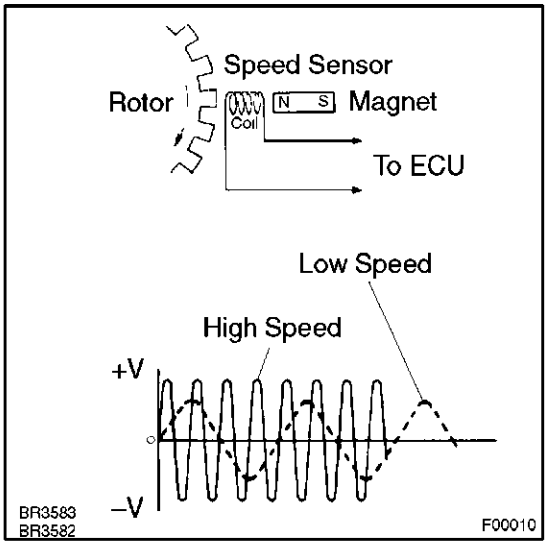
YES

Replace ABS ECU.

DI257–02

DTC	31, 32, 33, 34, 35, 36, 38, 39	Speed Sensor Circuit

CIRCUIT DESCRIPTION



The speed sensor detects wheel speed and sends the appropriate signals to the ECU. These signals are used to control the ABS system. The front and rear rotors each have 48 serrations.

When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates 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
31, 32, 33, 34	Detection of any of conditions from (1) through (3): (1) Vehicle speed is more than 40 km/h (25 mph), pulses are not input for 0.01 secs. (2) After the initial start or restart and when the vehicle speed has reached 12 km/h (7 mph), the wheel with 0 km/h (0 mph) of wheel speed was detected. (3) After the initial start or restart and when the vehicle speed has reached 70 km/h (44 mph), front wheel with 0 km/h (0 mph) of wheel speed was detected.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • Sensorinstallation • ECU
35, 36, 38, 39	Detecting abnormality in the resistance value of each speed sensor.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • ECU

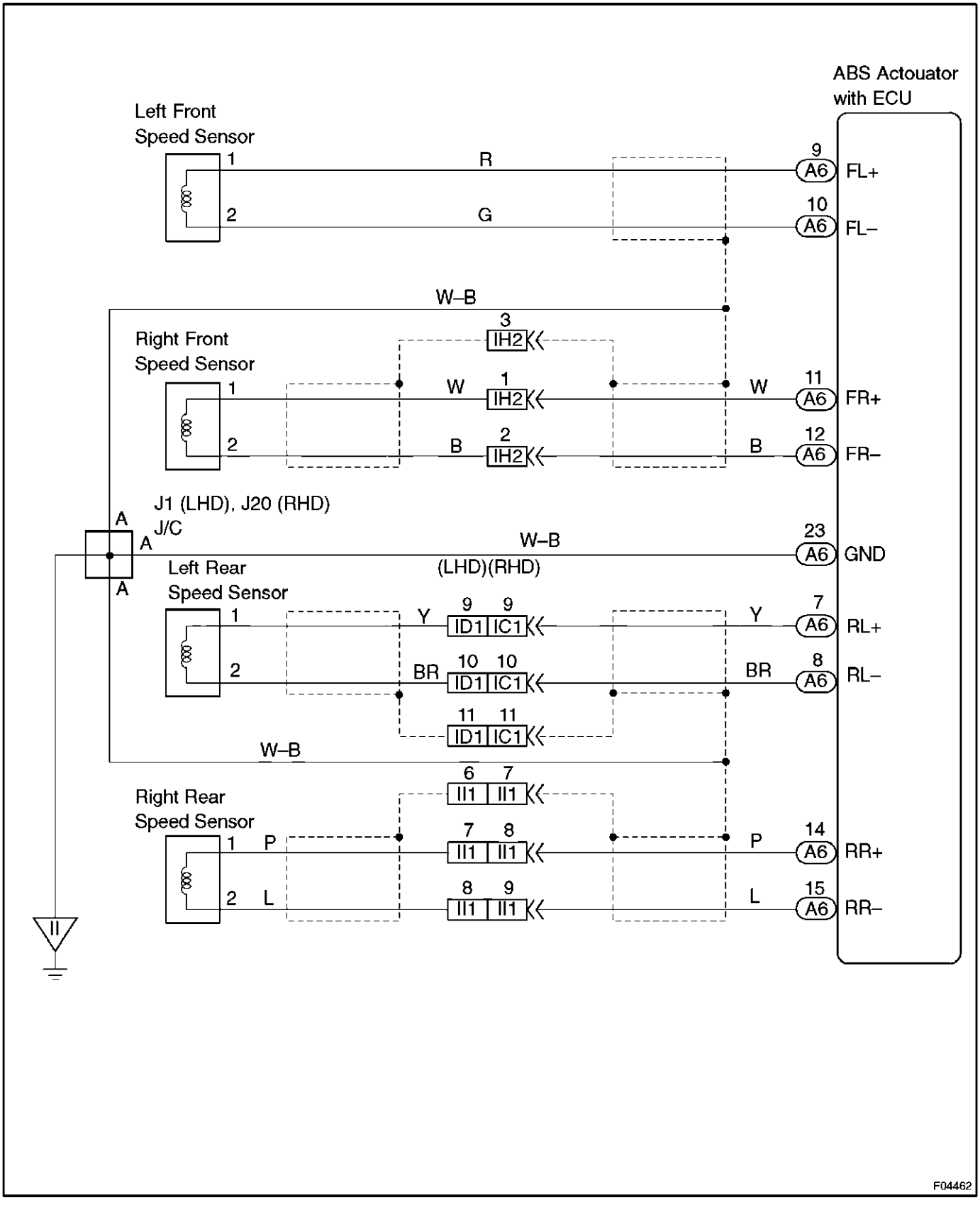
HINT:

- DTC Nos. 31 and 35 are for the right front speed sensor.
- DTC Nos. 32 and 36 are for the left front speed sensor.
- DTC Nos. 33 and 38 are for the right rear speed sensor.
- DTC Nos. 34 and 39 are for the left rear speed sensor.

Fail safe function:

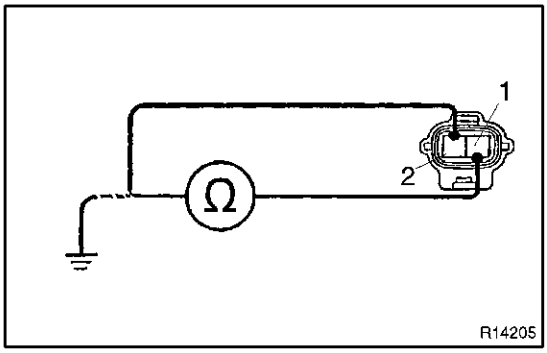
If trouble occurs in the speed sensor circuit, the ECU cuts off current to the ABS solenoid valve relay and prohibits ABS control.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check speed sensor.



Front

PREPARATION:

(a) Remove the front fender liner.

(b) Disconnect the speed sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector.

OK:

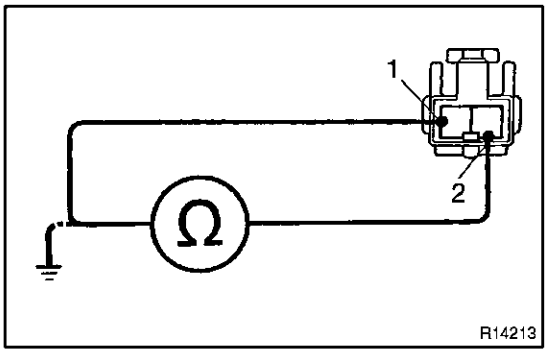
Resistance: 0.6 – 2.5 kΩ (1.6 ± 0.2 kΩ at 20 °C)

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector and body ground.

OK:

Resistance: 1 MΩ or higher



Rear

PREPARATION:

(a) Remove the seat cushion and side seatback.

(b) Disconnect the speed sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector.

OK:

Resistance: 1.2 – 2.3 kΩ (1.6 ± 0.1 kΩ at 20 °C)

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector and body ground.

OK:

Resistance: 1 MΩ or higher

NG	Replace speed sensor.

NOTICE:

Check the speed sensor signal last (See page DI–115).

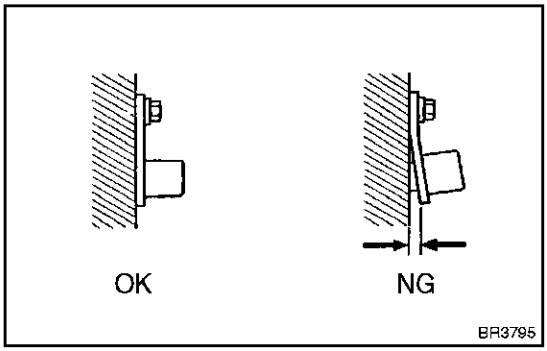
OK

2	Check for open and short in harness and connector between each speed sensor and ECU (See page IN–28).

NG → Repair or replace harness or connector.

OK

3	Check speed sensor installation.



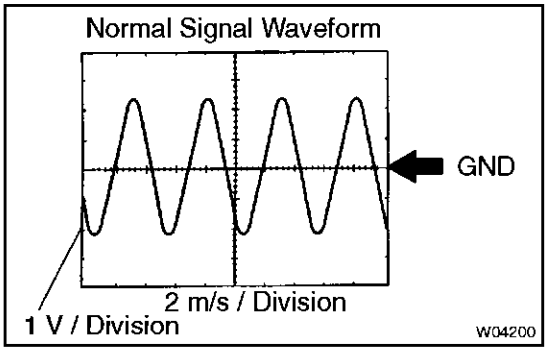
CHECK:
Check the speed sensor installation.
OK:
The installation bolt is tightened properly and there is no clearance between the sensor and front steering knuckle or rear axle carrier.

NG → Replace speed sensor.

NOTICE:
Check the speed sensor signal last (See page DI–115).

OK

4	Check speed sensor and sensor rotor serrations.

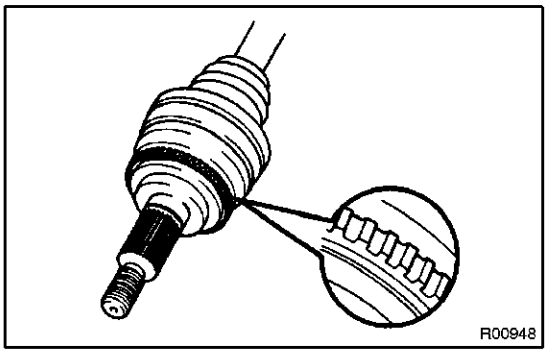


REFERENCE: INSPECTION USING OSCILLOSCOPE
PREPARATION:
(a) Remove the ABS ECU.
(b) Connect the oscilloscope to the terminals FR+, FL+, RR+ or RL+ and GND of the ABS ECU.
CHECK:
Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

OK → Check and replace ABS ECU.

NG

5	Check sensor rotor and sensor tip.



Front

PREPARATION:

Remove the front drive shaft (See page SA–19).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches or missing teeth or foreign objects.

PREPARATION:

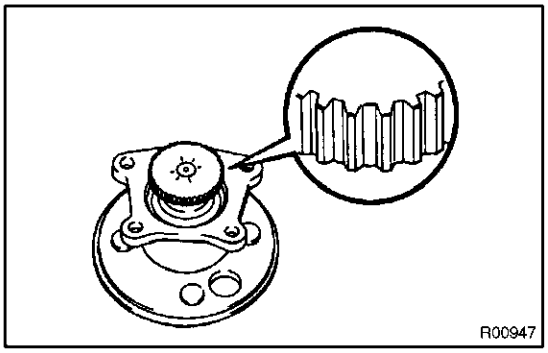
Remove the front speed sensor (See page BR–42).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.



Rear

PREPARATION:

Remove the axle hub (See page SA–51).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches or missing teeth or foreign objects.

PREPARATION:

Remove the rear speed sensor (See page BR–45).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.

NG → **Replace sensor rotor or speed sensor.**

NOTICE:

Check the speed sensor signal last (See page DI–115).

OK

Check and replace ABS ECU.

DI259–03

DTC	37	Speed Sensor Rotor Faulty

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
37	Detection of any of conditions from (1) through (3): (1) Occurrence of differential to some degree in the wheel speed between the front and rear wheels of either left or right side of the vehicle and the front left and right wheels. (Detection of differential in mini tire size, spinning wheel and decelerating wheel.) (2) Continuous ABS control for 60 secs. or more. (3) Interference on 1 or more wheels for 20 secs. with the brake pedal depressed, or for 5 secs. when the brake pedal is not depressed.	• Speed sensor • Sensor rotor • ECU

INSPECTION PROCEDURE

1	Check sensor rotor (See page DI–128).

NG → Replace sensor rotor.

OK

2	Check speed sensor (See page DI–128).

NG → Replace speed sensor.

OK

3	Check for open or short circuit in harness and connector between speed sensor and ECU (See page IN–28).

NG → Repair or replace harness and connector.

OK

Check and replace ABS ECU.

DI259–02

DTC	41	Power Source Circuit

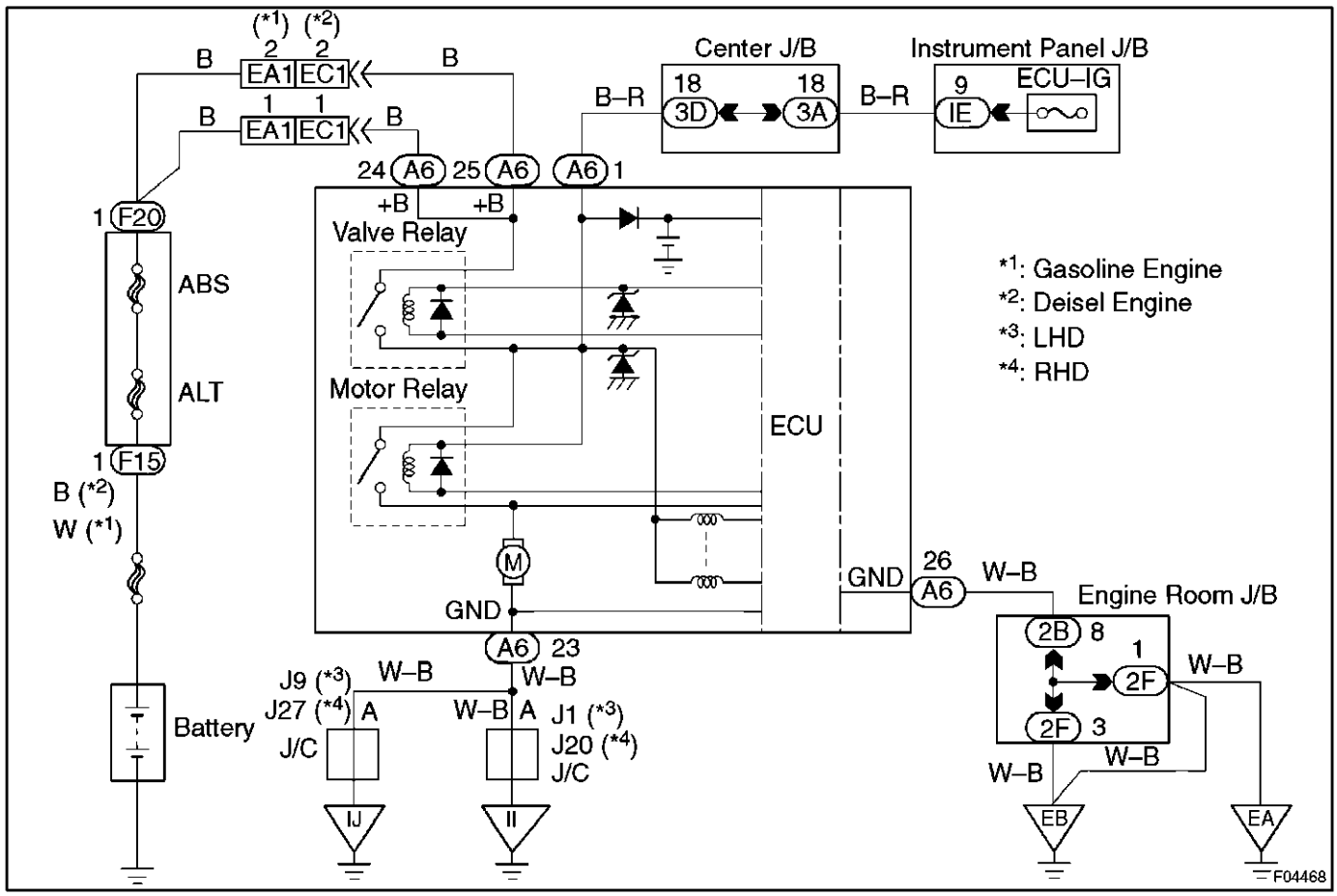
CIRCUIT DESCRIPTION

This circuit is the power source for the ECU, hence the actuators.

DTC No.	DTC Detecting Condition	Trouble Area
41	When the vehicle speed is at aprox. 6 km/h (4 mph), low battery voltage is 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 is more than 17.4 V.	• Battery • IC regulator • Power source circuit • ECU

Fail safe function:
If trouble occurs in the power source circuit, the ECU cuts off current to the ABS solenoid valve relay and prohibits ABS control.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check battery voltage.**

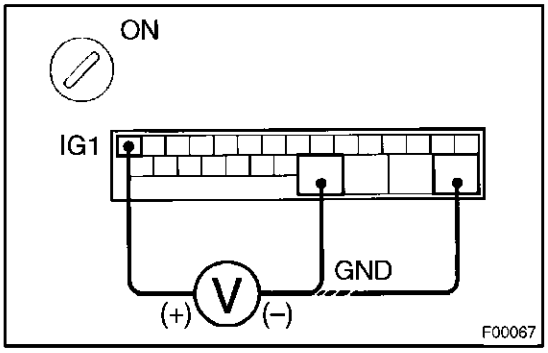
OK:

Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Check and repair the charging system.

OK

2	**Check voltage between terminals IG1 and GND of ABS actuator connector.**



PREPARATION:

Disconnect ABS actuator connector.

CHECK:

(a) Turn the ignition switch ON.

(b) Measure voltage between terminals IG1 and GND of ABS actuator harness side connector.

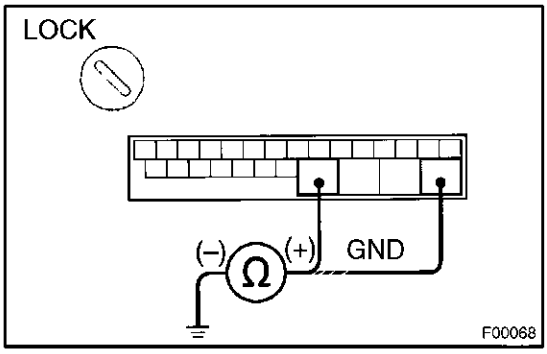
OK:

Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Repair or replace harness or connector.

OK

3	Check continuity between terminals GND of ABS actuator connector and body ground.

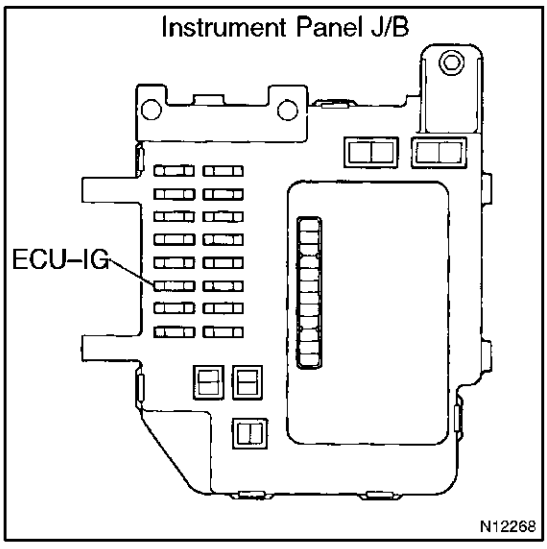


CHECK:
Measure resistance between terminals GND of ABS actuator harness side connector and body ground.
OK:
Resistance: 1 Ω or less

NG → **Repair or replace harness or connector.**

OK

4	Check ECU–IG fuse.



PREPARATION:
Remove ECU–IG fuse from Instrument Panel J/B.
CHECK:
Check continuity of ECU–IG fuse.
OK:
Continuity

NG → **Check for short in all the harness and components connected to ECU–IG fuse (See attached wiring diagram.**

OK

Check and replace ABS ECU.

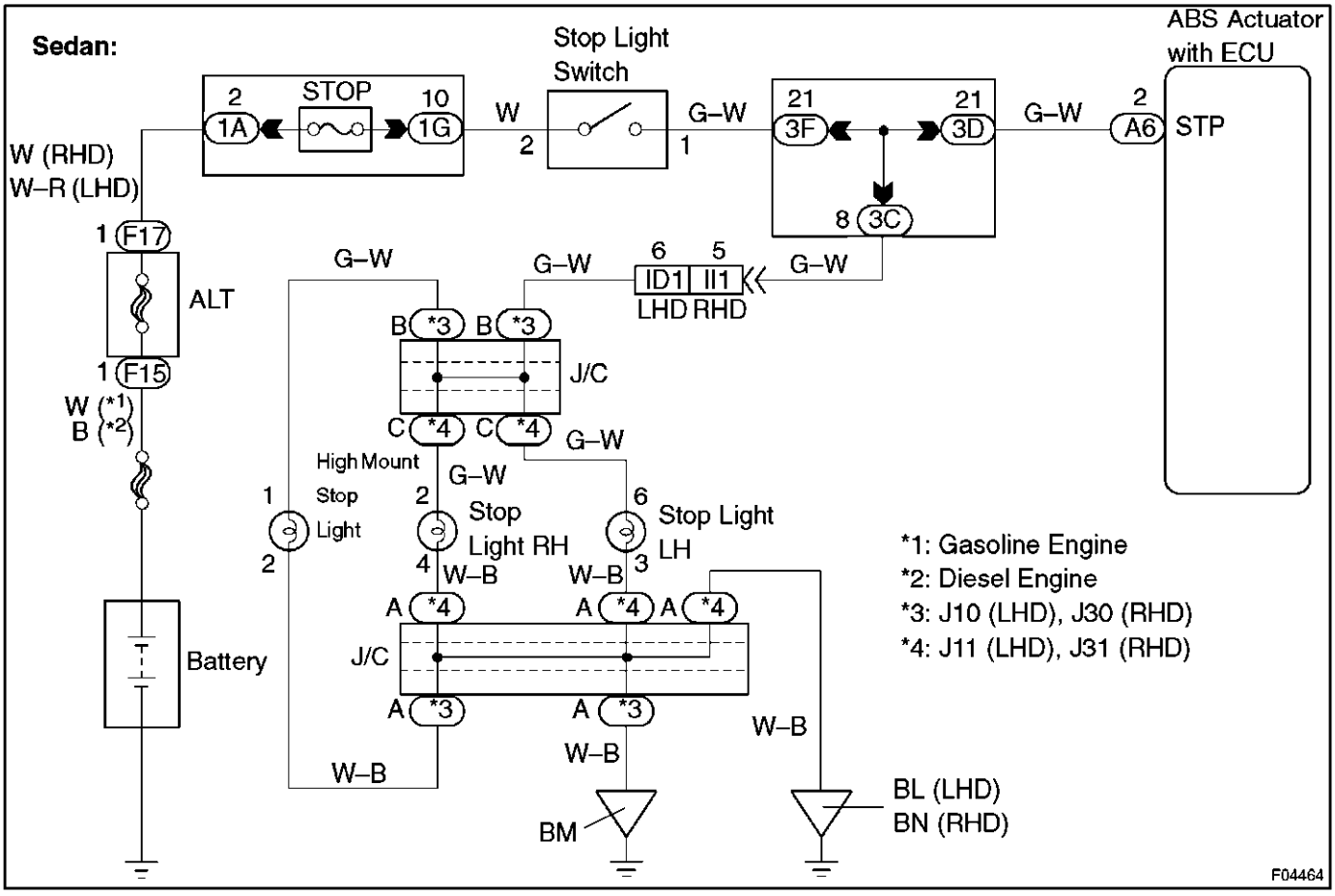
DI32R–01

DTC	58	Stop Light Switch Circuit

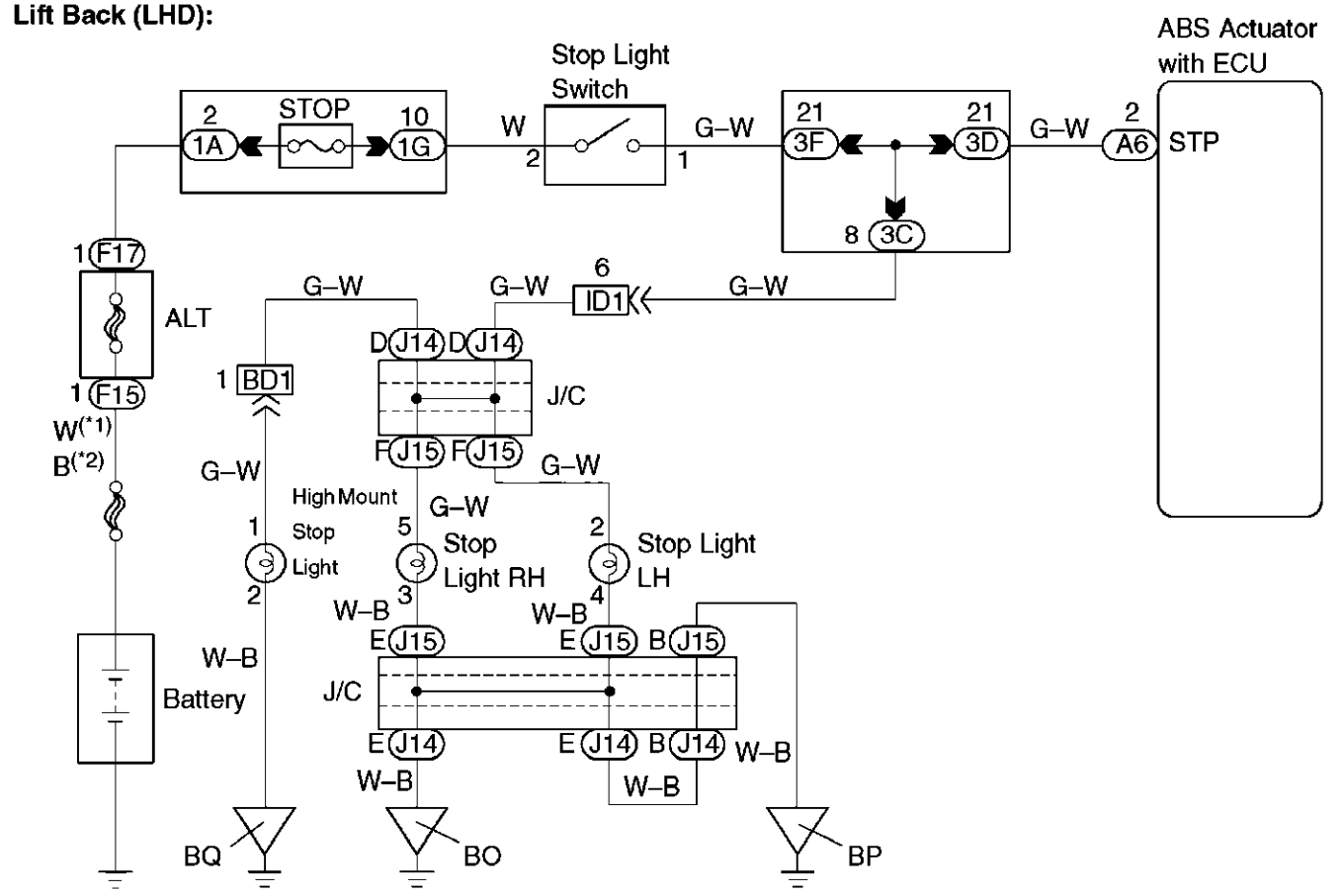
CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
58	Stop light switch circuit is open circuit, and stop light switch voltage is in the level between 65 % or more and less than 93 % of the battery voltage.	• Stop light switch • Stop light switch circuit • ECU

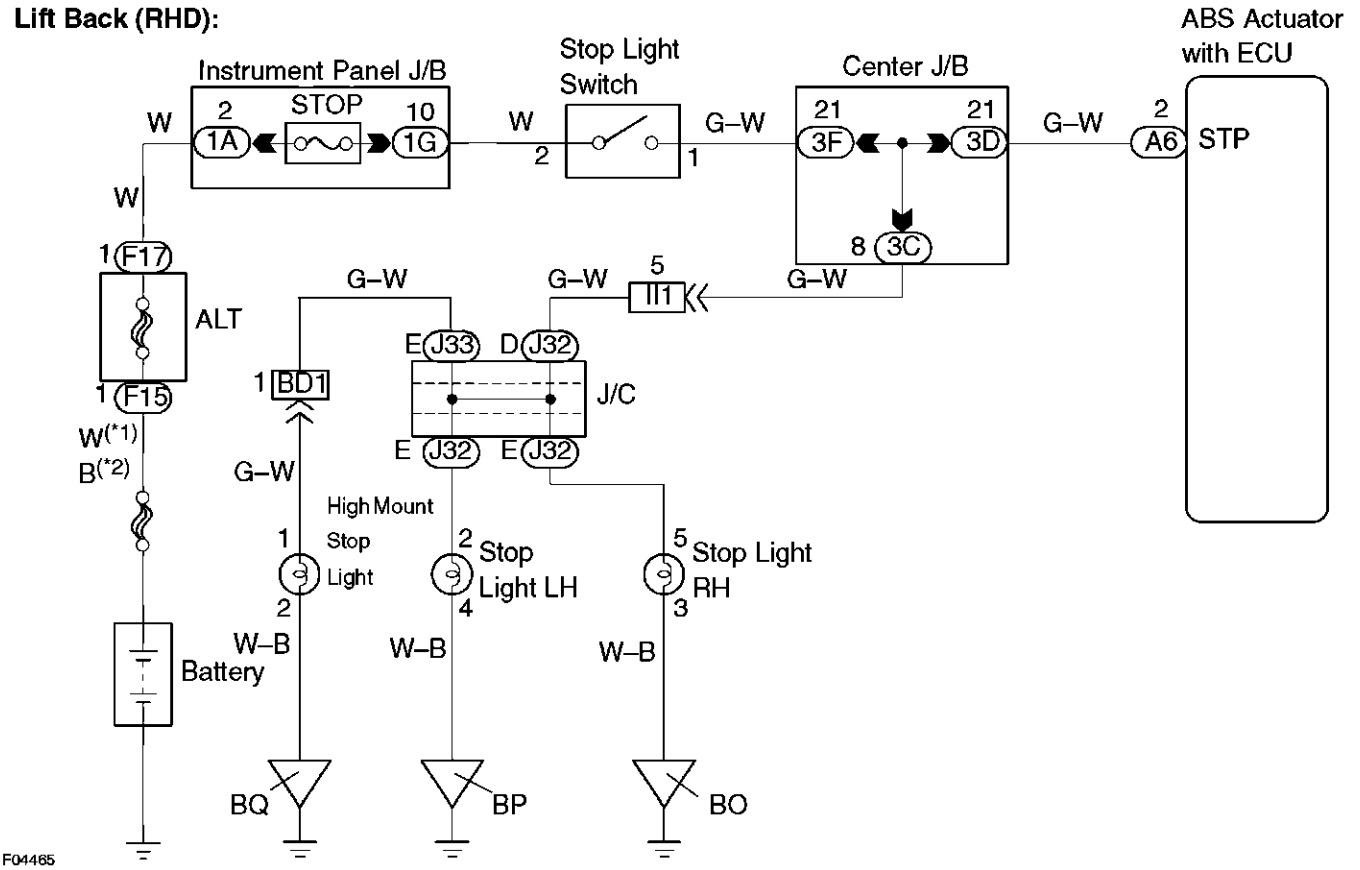
WIRING DIAGRAM



Lift Back (LHD):



Lift Back (RHD):



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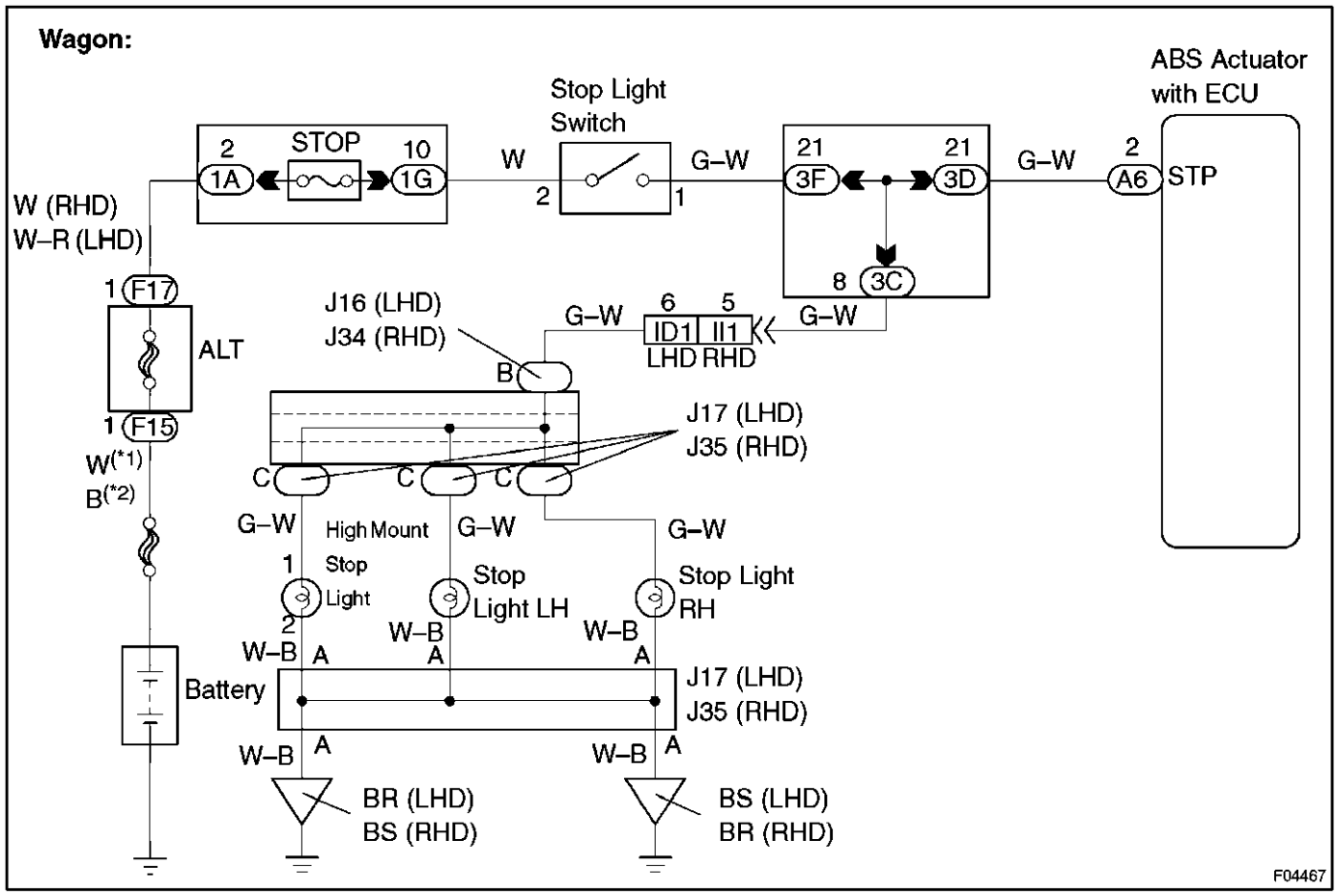
F04466

F05531



INSPECTION PROCEDURE

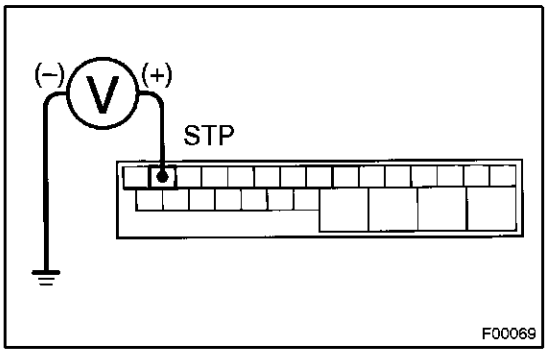
1	**Check operation of stop light.**

CHECK:
Check that stop light lights up when brake pedal is depressed and turns off when brake pedal is released.

NG → **Repair stop light circuit (See page BE–47).**

OK

2	Check voltage between terminal STP of ABS actuator and body ground.



PREPARATION:
Disconnect ABS actuator connector.
CHECK:
Measure voltage between terminal STP of ABS actuator harness side connector and body ground when brake pedal is depressed.
OK:
Voltage: 8 – 14 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–121).**

NG

3	Check for open circuit in harness and connector between ABS ECU and stop light switch (See page IN–28).

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS ECU.

DI25B–02

DTC	62	ABS ECU Malfunction

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
62	ABS ECU continuously detected the inproper operation of ABS.	• Battery • ECU

Fail safe function:
If trouble occurs in the power source circuit, the ECU cuts off current to the ABS solenoid valve relay and prohibits ABS control.

INSPECTION PROCEDURE

1	Is DTC output?

Check DTC on page DI–115.

YES → Repair circuit indicated by the output code.

NO

2	Is normal code displayed?

YES → Check for short circuit in harness and connector between check connector and ABS ECU (See page IN–28).

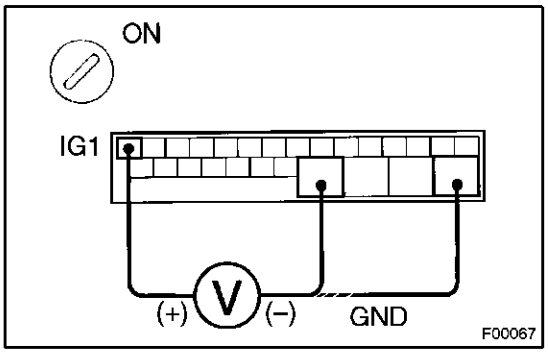
NO

3	Does ABS warning light go off?

YES → Check open and short circuit of the harness and connector in the Tc circuit between ECU and check connector.

NO

4	Check voltage between terminals IG1 and GND of ABS actuator connector.



PREPARATION:
Disconnect ABS actuator connector.
CHECK:
(a) Turn the ignition switch ON.
(b) Measure voltage between terminals IG1 and GND of ABS actuator harness side connector.
OK:
Voltage: 10 – 14 V

YES → **Check for open or short circuit in harness and connector between ECU–IG fuse and ABS actuator (See page IN–28).**

OK

5	Check connection of ABS actuator connector.

CHECK:
(a) Check the connection of the ABS actuator connector.
(b) Check the ABS warning light goes off.

OK → **Check and replace ABS ECU.**

NG

Repair or replace harness or connector.

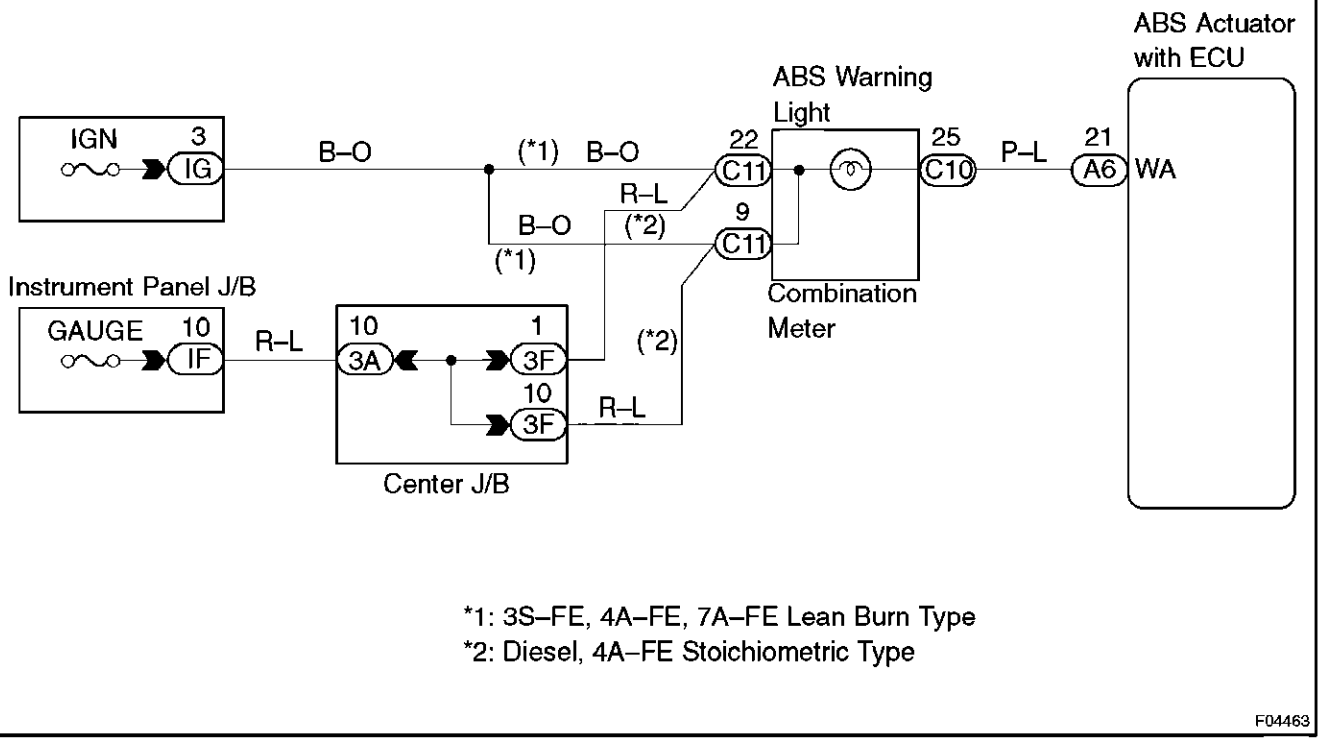
DI25C–02

ABS Warning Light Circuit

CIRCUIT DESCRIPTION

If the ECU detects trouble, it lights the ABS warning light while at the same time prohibiting ABS control. At this time, the ECU records a DTC in memory.
Connecting terminals Tc and CG of the DLC3 makes the ABS warning light blink and output the DTC.

WIRING DIAGRAM



*1: 3S–FE, 4A–FE, 7A–FE Lean Burn Type
*2: Diesel, 4A–FE Stoichiometric Type

F04463

INSPECTION PROCEDURE

Troubleshoot in accordance with the chart below for each trouble symptom.

ABS warning light does not light up	Go to step 1
ABS warning light remains ON	Go to step 2

1	**Check ABS warning light.**

See Combination Meter Troubleshooting on page BE–2.

NG → **Repair bulb or combination meter assembly.**

OK

Check for open circuit in harness and connector between GAUGE fuse and ABS ECU (See page IN–28).

2	**Is DTC output?**

Check DTC on page DI–115.

YES → **Repair circuit indicated by the output code.**

NO

Check for short circuit in harness and connector between ABS warning light, DLC3 and ECU (See page IN–28).

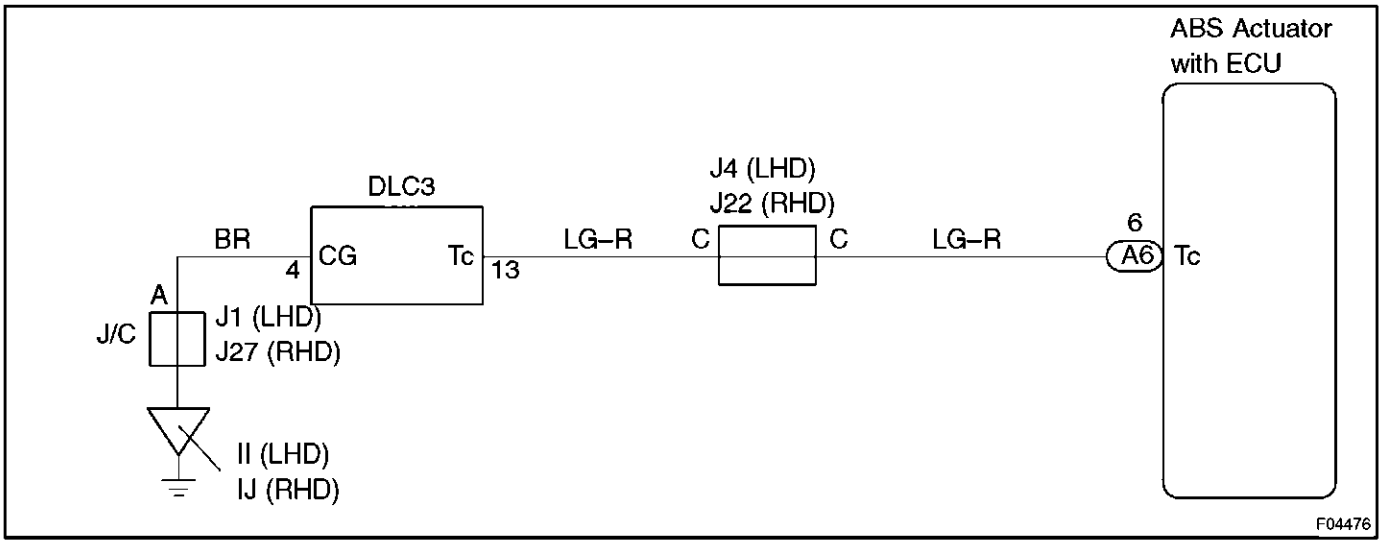
DI25D-02

Tc Terminal Circuit

CIRCUIT DESCRIPTION

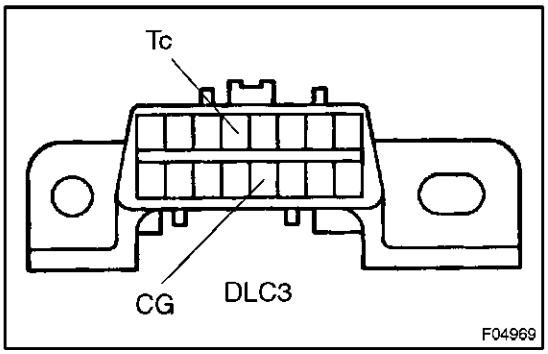
Connecting between terminals Tc and E_1 of the DLC3 causes the ECU to display the DTC by flashing the ABS warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Tc and E_1 of check connector or DLC3.**



CHECK:

(a) Turn the ignition switch ON.

(b) Measure voltage between terminals Tc and CG of DLC3.

OK:

Voltage: 10 – 14 V

OK	**If ABS warning light does not blink even after Tc and E_1 are connected, the ECU may be defective.**

NG

2	**Check for open and short circuit in harness and connector between ABS ECU and DLC3, DLC3 and body ground (See page IN–28).**

NG → **Repair or replace harness or connector.**

OK ↓

Check and replace ABS ECU.

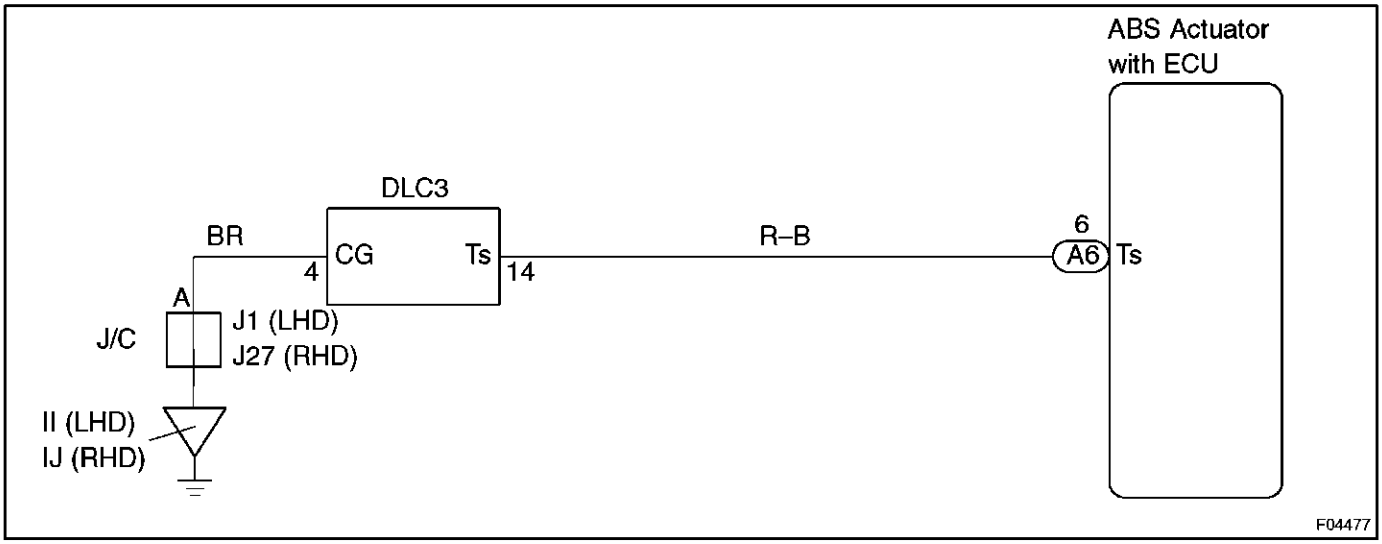
DI25E-02

Ts Terminal Circuit

CIRCUIT DESCRIPTION

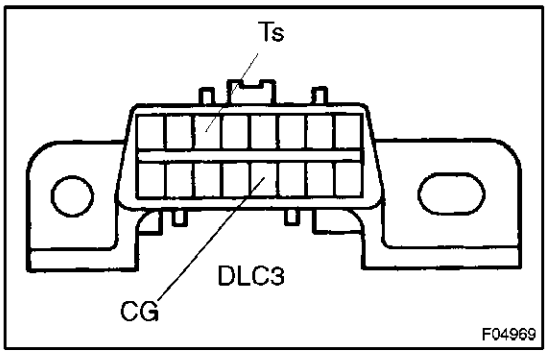
The sensor check circuit detects abnormalities in the speed sensor signal which cannot be detected with the DTC check.
Connecting terminals Ts and CG of the DLC3 in the engine compartment starts the check.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Ts and E_1 of DLC3.**



CHECK:

(a) Turn the ignition switch ON.

(b) Measure voltage between terminals Ts and CG of DLC3.

OK:

Voltage: 10 – 14 V

OK → **If ABS warning light does not blink even after Ts and E_1 are connected, the ECU may be defective.**

NG

2	Check for open and short in harness and connector between ABS ECU and DLC3 and body ground (See page IN–28).

NG → Repair or replace harness or connector.

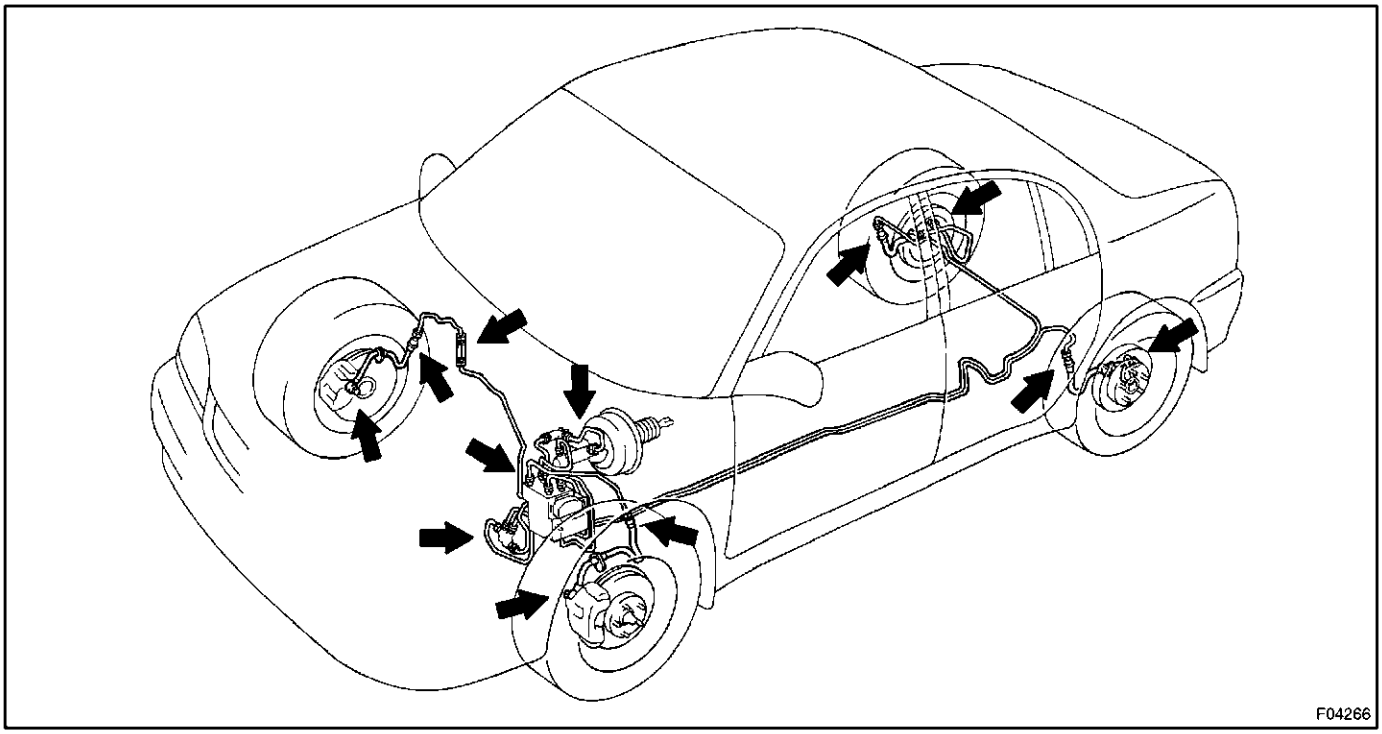
OK →

Check and replace ABS ECU.

DI25F–02

Check for Fluid Leakage

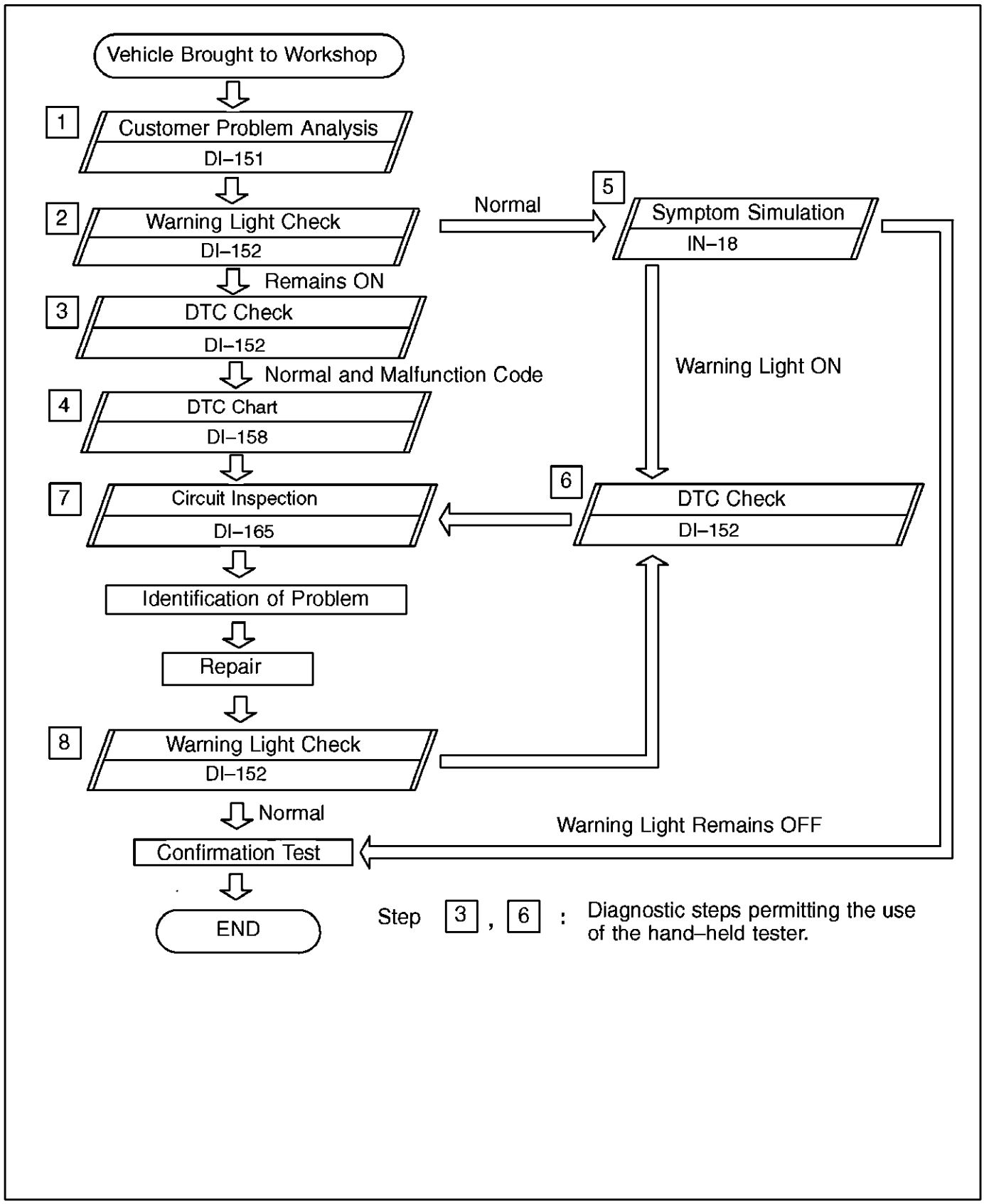
Check for fluid leakage from actuator or hydraulic lines.



SUPPLEMENTAL RESTRAINT SYSTEM

DI1MX–05

HOW TO PROCEED WITH TROUBLESHOOTING



DI15Z–04

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 Conditions	
Details Of Problem	

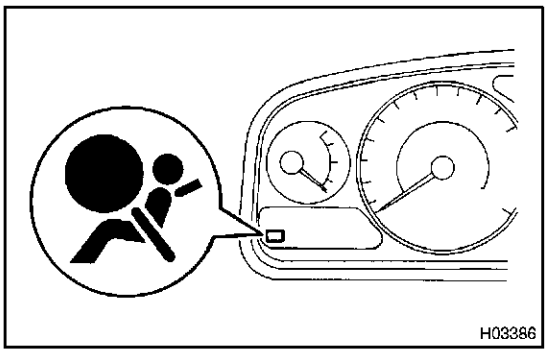
Vehicle Inspection and Repair History Prior to Occurrence of Malfunction (Including Supplemental Restraint System)	

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.]

DI1MZ–05

PRE–CHECK


H03386

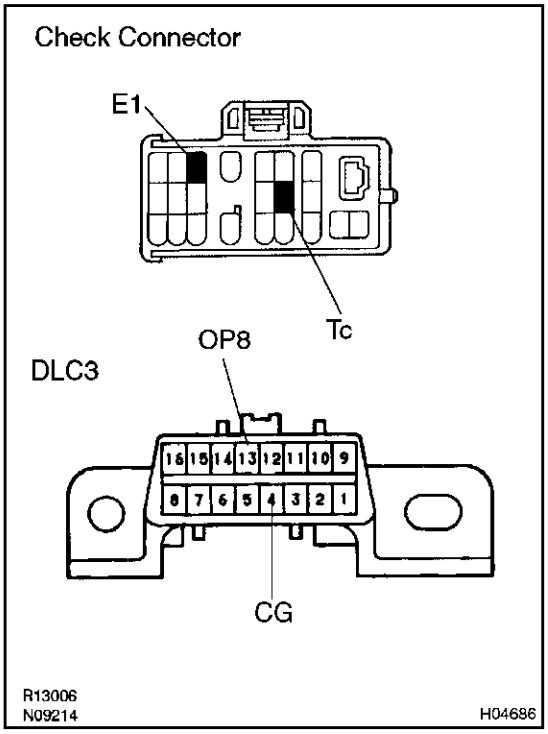
1. SRS WARNING LIGHT CHECK

(a) Turn the ignition switch to the ACC or 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 ACC or ON and the SRS warning light remains on or flashes, the airbag sensor assembly has detected a malfunction code.
- If, after approx. 6 seconds 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 DI–288, DI–290.



2. DTC CHECK (Using diagnosis check wire)

(a) Present Trouble Codes:

Output the DTC.

(1) Turn the ignition switch to the ACC or ON position and wait for approx. 20 seconds.

(2) Using SST, connect terminals Tc and E1 of the check connector or OP8 and CG of the DLC3.

SST 09843–18020

NOTICE:

Pay due attention to the terminal connecting position to avoid a malfunction.

(b) Past Trouble Codes:

Output the DTC.

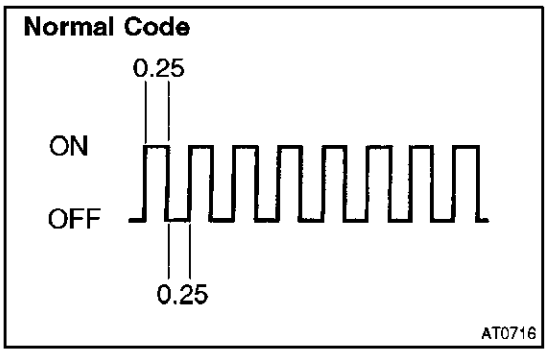
(1) Using SST, connect terminals Tc and E1 of the check connector.

SST 09843–18020

(2) Turn the ignition switch to the ACC or ON position and wait for approx. 20 seconds.

NOTICE:

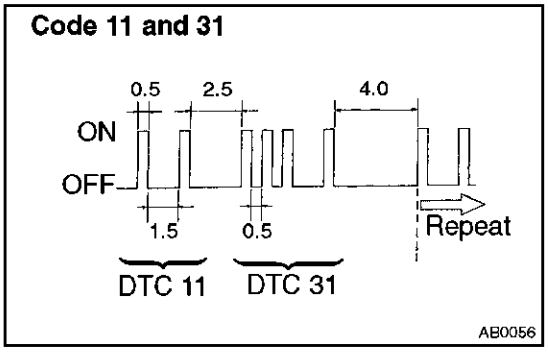
Pay due attention to the terminal connecting position to avoid a malfunction.

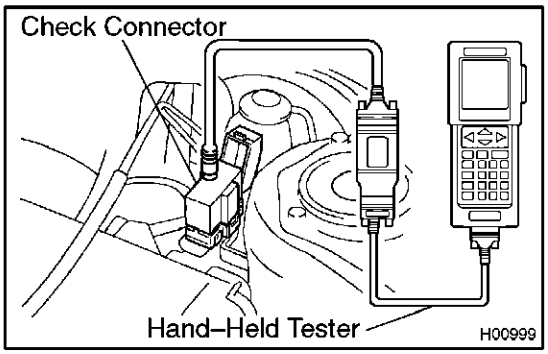


(c) READ DTC

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
  The light will blink 2 times per 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 connection, proceed to the Tc terminal circuit inspection on page DI–294.

3. DTC CHECK (Using hand–held tester)

(a) Hook up the hand–held tester to the check connector.

(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)

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) Connect the 2 service wires to terminal Tc or OP8 and AB of the check connector or the DLC3.

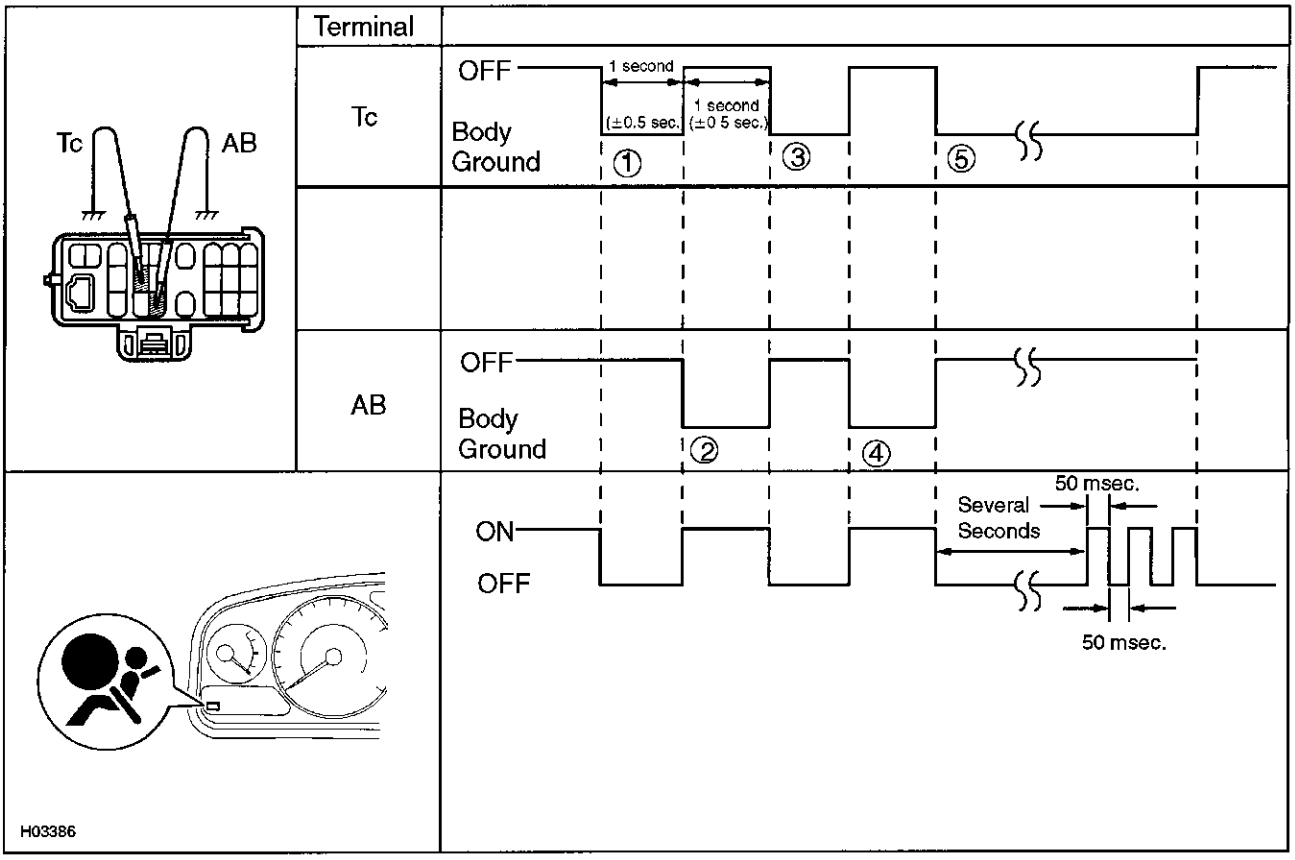
(b) Turn the ignition switch to ACC or ON and wait for approx. 6 seconds.

(c) Starting with the Tc terminal, ground alternately terminal Tc and terminal AB twice each in cycles of 1.0 second. Make sure that the terminals are grounded. Ensure the terminal Tc remains grounded.

HINT:

When alternately grounding terminals Tc and AB, release ground from one terminal and immediately ground the other terminal within an interval of 0.2 seconds.

If DTCs are not cleared, repeat the above procedure until the codes are cleared.



H01461

H04557

(d) Several seconds after doing the clearing procedure, the SRS warning light will blink in a 50 msec. cycle to indicate the codes which have been cleared.

6. **Past Trouble Codes:**
   DTC CLEARANCE
   (See step 5.)

7. RELEASE METHOD OF AIRBAG ACTIVATION PREVENTION MECHANISM

An airbag activation prevention mechanism is built into the connector for the squib circuit of the SRS.

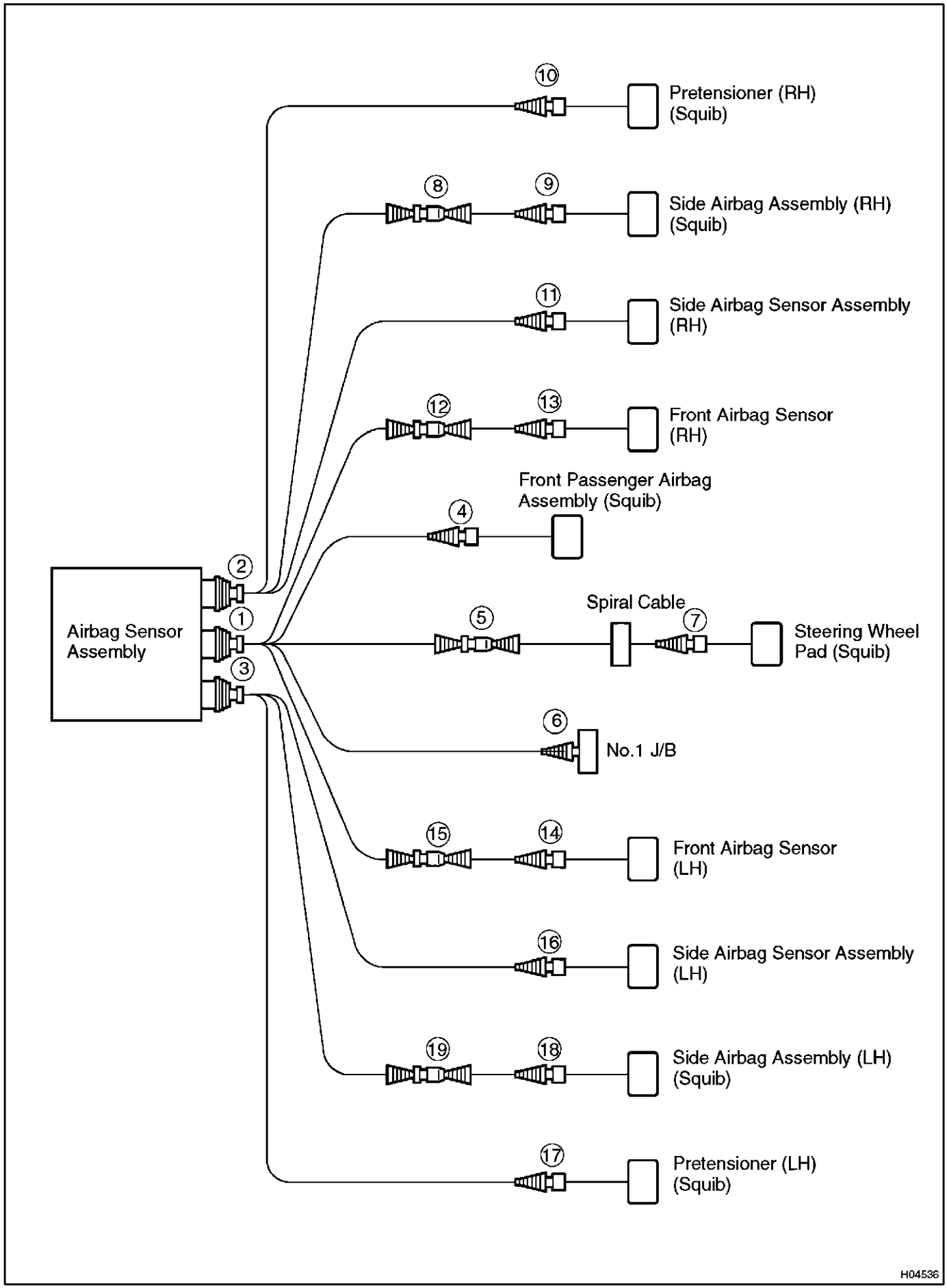
When release of the airbag activation prevention mechanism is directed in the troubleshooting procedure, as shown in the illustration on the following pages, insert paper which has the same thickness as the male terminal, between the terminal and the short spring.

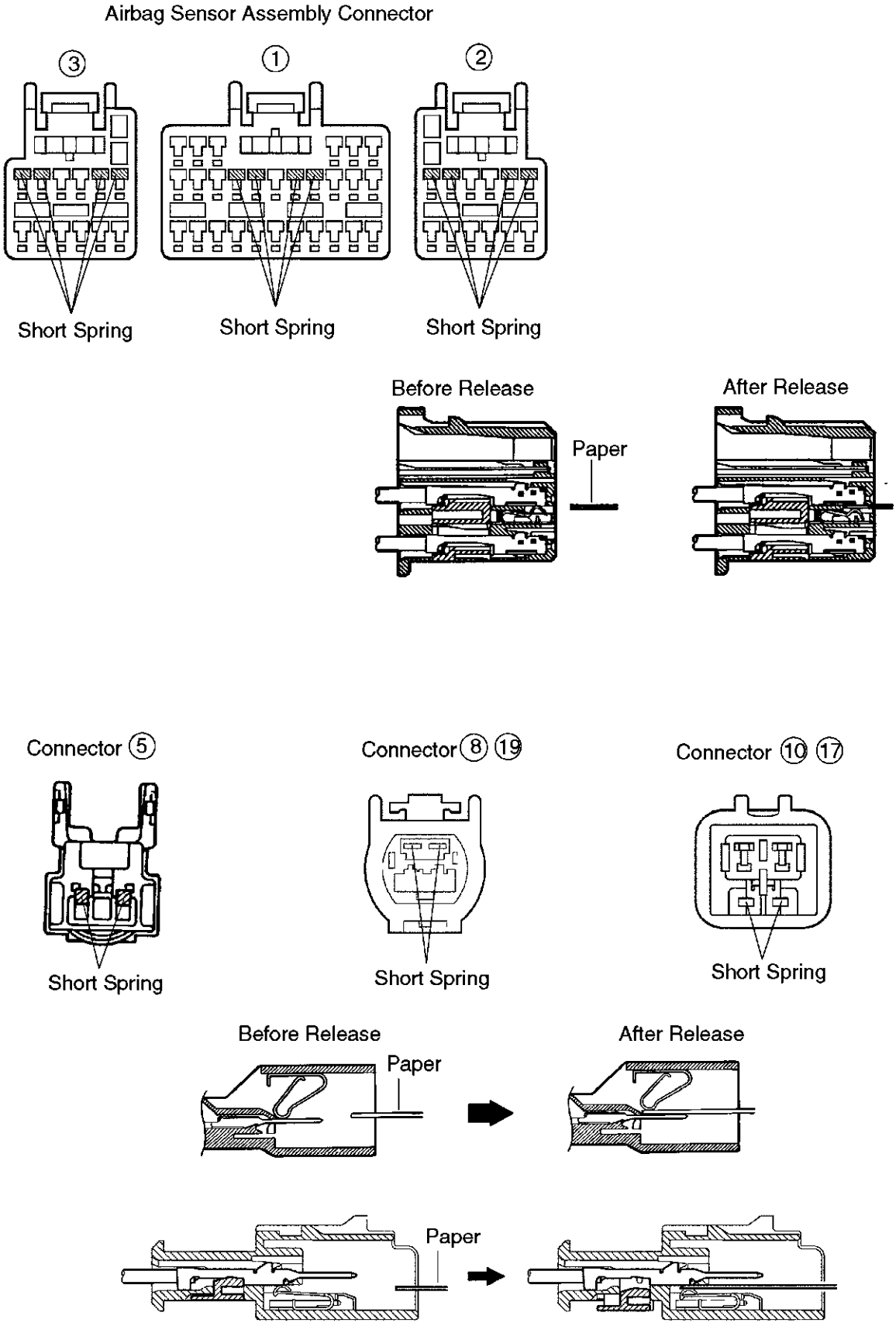
CAUTION:

Never release the airbag activation prevention mechanism on the steering wheel pad 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 Assembly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Pretensioner (RH) (Squib)
Side Airbag Assembly (RH) (Squib)
Side Airbag Sensor Assembly (RH)
Front Airbag Sensor (RH)
Front Passenger Airbag Assembly (Squib)
Spiral Cable
Steering Wheel Pad (Squib)
No.1 J/B
Front Airbag Sensor (LH)
Side Airbag Sensor Assembly (LH)
Side Airbag Assembly (LH) (Squib)
Pretensioner (LH) (Squib)
H04536



H01356
H01233
AB0130 H00992
AB0045 AB0046
H02249 H02248

H01358

DI161-09

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 (Proceed to the page given for that circuit.).

DTC No. (See Page)	Detection Item	Trouble Area	SRS Warning Light
11 (DI–165)	Short in D squib circuit (to ground)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
12 (DI–170)	Short in D squib circuit (to B+)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
13 (DI–174)	Short in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
14 (DI–178)	Open in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
15 (DI–182)	Front airbag sensor assembly (RH) malufunction	• Front airbag sensor assembly (RH) • Wire harness • Sub wire harness	ON
16 (DI–190)	Front airbag sensor assembly (LH) malufunction	• Front airbag sensor assembly (LH) • Wire harness • Sub wire harness	ON
31 (DI–198)	Airbag sensor assembly malfunction	Airbag sensor assembly	ON
32 (DI–200)	Side airbag sensor assembly (RH) malfunction	• Side airbag sensor assembly (RH) • Wire harness	Blink
33 (DI–206)	Side airbag sensor assembly (LH) malfunction	• Side airbag sensor assembly (LH) • Wire harness	Blink
41 (DI–212)	Short in side squib (RH) circuit (to ground)	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness • Sub wire harness	Blink
42 (DI–217)	Short in side squib (RH) circuit (to B+)	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
43 (DI–221)	Short in side squib (RH) circuit	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness • Sub wire harness	Blink
44 (DI–225)	Open in side squib (RH) circuit	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness • Sub wire harness	Blink
45 (DI–229)	Short in side squib (LH) circuit (to ground)	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness • Sub wire harness	Blink

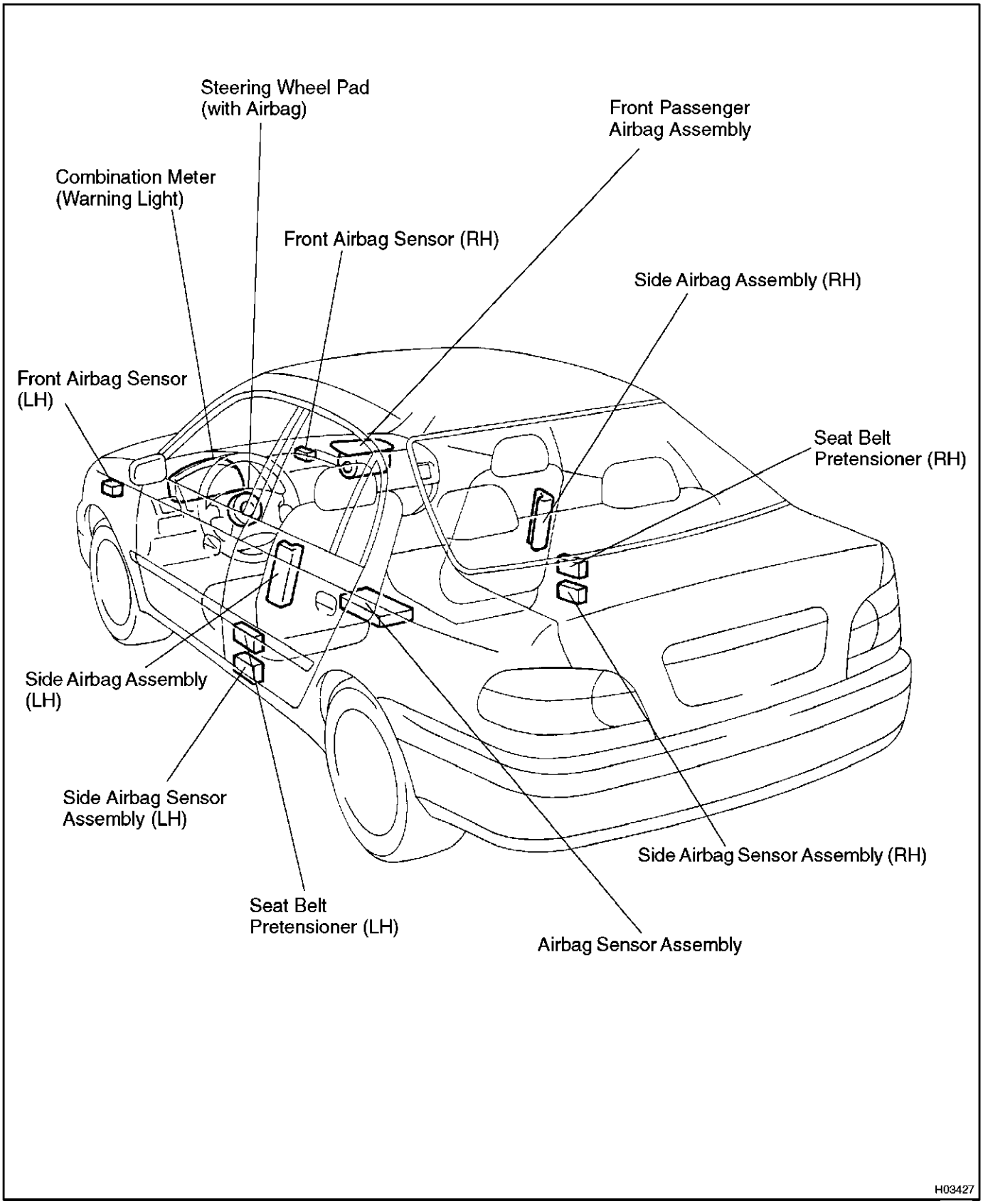
DTC No. (See Page)	Detection Item	Trouble Area	SRS Warning Light
46 (DI–234)	Short in side squib (LH) circuit (to B+)	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness • Sub wire harness	Blink
47 (DI–238)	Short in side squib (LH) circuit	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness • Sub wire harness	Blink
48 (DI–242)	Open in side squib (LH) circuit	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness • Sub wire harness	Blink
51 (DI–246)	Short in P squib circuit (to ground)	• Passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
52 (DI–250)	Short in P squib circuit (to B+)	• Passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
53 (DI–253)	Short in P squib circuit	• Passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
54 (DI–256)	Open in P squib circuit	• Passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
61 (DI–259)	Short in P/T squib (RH) circuit (to ground)	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
62 (DI–263)	Short in P/T squib (RH) circuit (to B+)	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
63 (DI–266)	Short in P/T squib (RH) circuit	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
64 (DI–269)	Open in P/T squib (RH) circuit	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
71 (DI–272)	Short in P/T squib (LH) circuit (to ground)	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
72 (DI–276)	Short in P/T squib (LH) circuit (to B+)	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
73 (DI–279)	Short in P/T squib (LH) circuit	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
74 (DI–282)	Open in P/T squib (LH) circuit	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
Normal (DI–285)	System normal	–	OFF
	Voltage source drop	• Battery • Airbag sensor assembly	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 assembly 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 assembly is faulty.

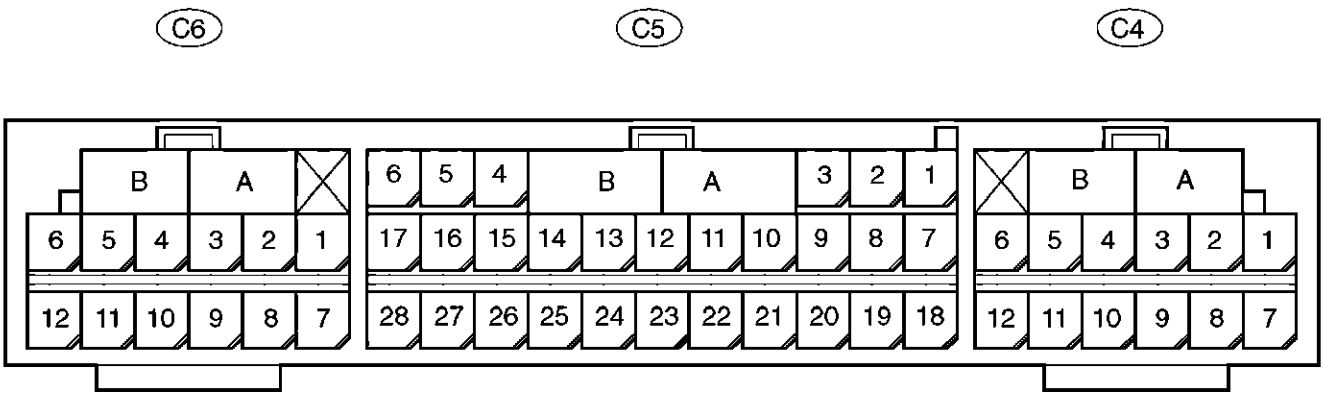
DI1N1-05

PARTS LOCATION



DI1N2–05

TERMINALS OF ECU



H01357

No.	Symbol	Terminal Name
A	–	Electrical Connector Check Mechanism
B	–	Electrical Connector Check Mechanism
C5 – 3	LA	SRS Warning Light
C5 – 5	IG2	Power Source (IGN Fuse)
C5 – 6	ACC	Power Source (CIG Fuse)
C5 – 9	SR+	Front Airbag Sensor (RH)
C5 – 10	P+	Squib (Passenger)
C5 – 11	P–	Squib (Passenger)
C5 – 12	SIL	Diagnosis
C5 – 13	D–	Squib (Driver)
C5 – 14	D+	Squib (Driver)
C5 – 15	SL+	Front Airbag Sensor (LH)
C5 – 19	Tc	Diagnosis
C5 – 20	SR–	Front Airbag Sensor (RH)
C5 – 26	SL–	Front Airbag Sensor (LH)
C5 – 27	E1	Ground
C5 – 28	E2	Ground
C4 – 1	SFL–	Squib (Side, LH)
C4 – 2	SFL+	Squib (Side, LH)
C4 – 5	PL+	Squib (Seat Belt Pretensioner, LH)
C4 – 6	PL–	Squib (Seat Belt Pretensioner, LH)
C4 – 7	ESL	Side Airbag Sensor (LH)
C4 – 9	FSL	Side Airbag Sensor (LH)
C4 – 10	SSL+	Side Airbag Sensor (LH)
C4 – 12	VUPL	Side Airbag Sensor (LH)

No.	Symbol	Terminal Name
C6 – 1	PR–	Squib (Seat Belt Pretensioner, RH)
C6 – 2	PR+	Squib (Seat Belt Pretensioner, RH)
C6 – 5	SFR+	Squib (Side, RH)
C6 – 6	SFR–	Squib (Side, RH)
C6 – 7	VUPR	Side Airbag Sensor (RH)
C6 – 9	SSR+	Side Airbag Sensor (RH)
C6 – 10	FSR	Side Airbag Sensor (RH)
C6 – 12	ESR	Side Airbag Sensor (RH)

DI164–07

PROBLEM SYMPTOMS TABLE

Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
• With the ignition switch in ACC or ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed. • SRS warning light is always lit up even when ignition switch is in the LOCK position.	• SRS warning light circuit (Always lights up when ignition switch is in LOCK position.)	DI–288
• With the ignition switch in ACC or ON position, the SRS warning light does not light up.	• SRS warning light circuit (Does not light up when ignition switch is turned to ACC or ON.)	DI–290
• DTC is not displayed. • SRS warning light is always lit up at the time of DTC check procedure. • DTC is displayed without Tc and E1 terminal connection.	• Tc terminal circuit	DI–294

DI33A–01

CIRCUIT INSPECTION

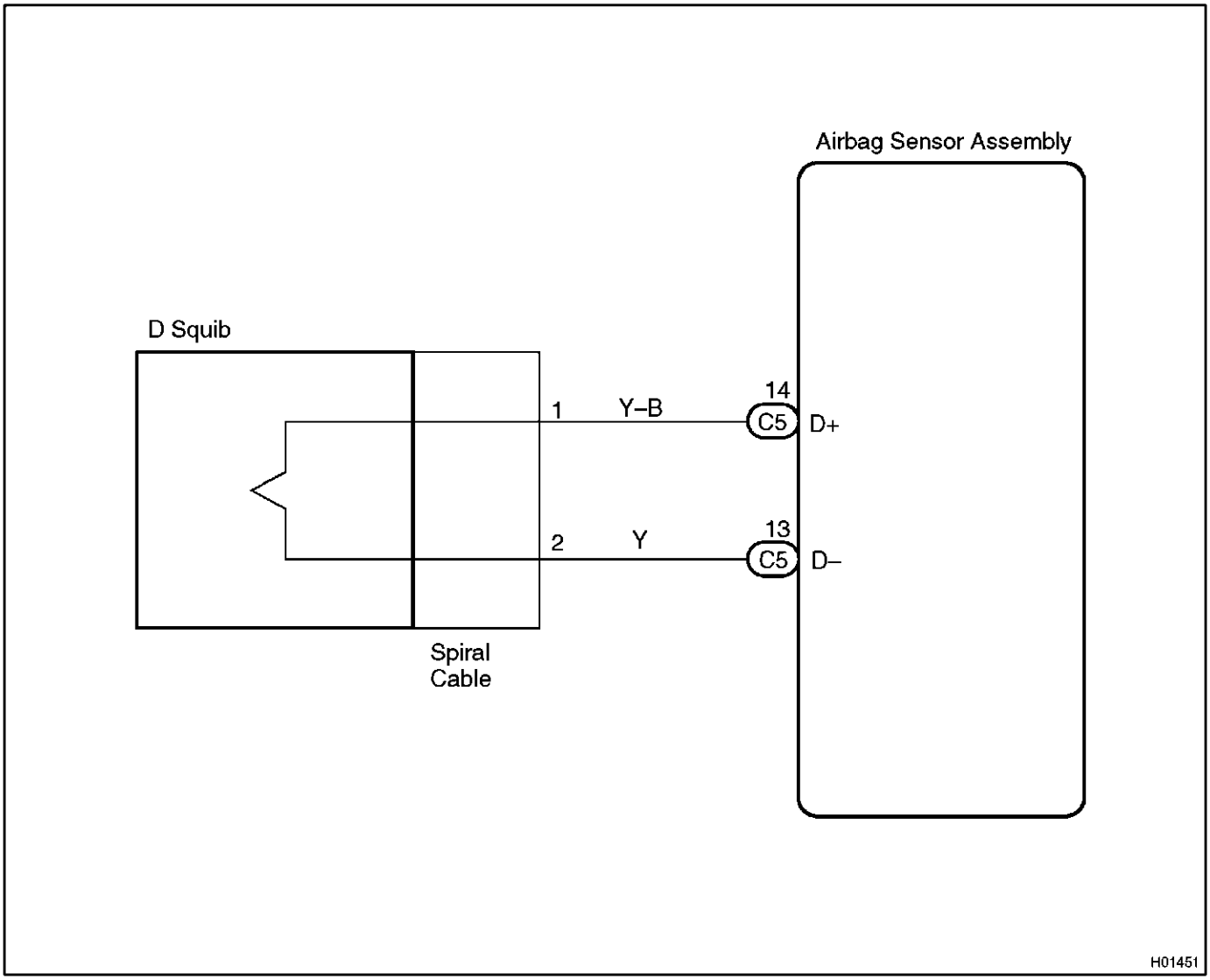
DTC	11	Short in D Squib Circuit (to Ground)

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 11 is recorded when a ground short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
11	• Short circuit in D squib wire harness (to ground) • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

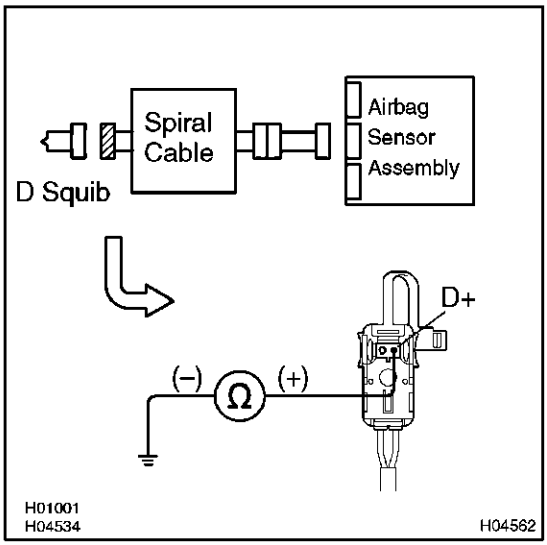
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check D squib circuit.**



CHECK:

For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and body ground.

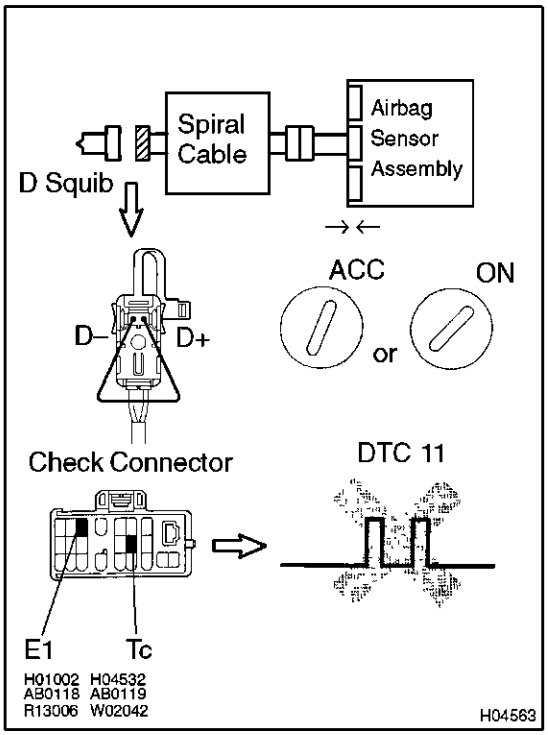
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect D+ and D– of the connector (on the spiral cable side) between the spiral cable and the steering wheel pad.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

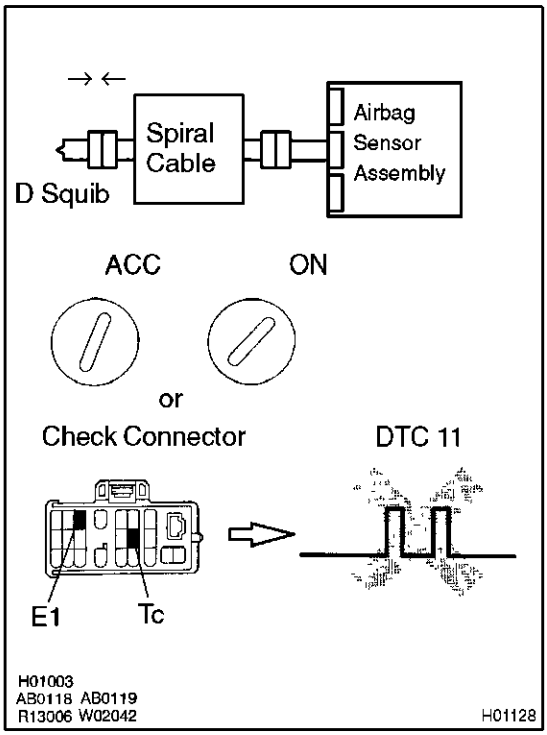
DTC 11 is not output.

HINT:
Codes other than code 11 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

4	Check D squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 11 is not output.

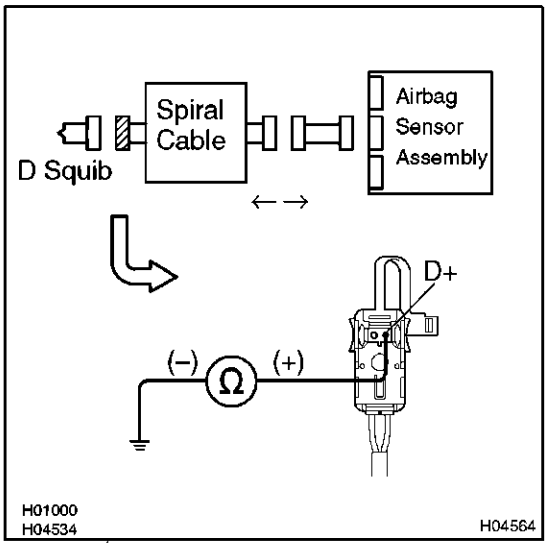
HINT:
Codes other than code 11 may be output at this time, but they are not relevant to this check.

NG → **Replace steering wheel pad.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

5	Check spiral cable.



PREPARATION:

Disconnect the connector between the airbag sensor assembly and the spiral cable.

CHECK:

For the connector (on the spiral cable side) between the steering wheel pad and the spiral cable, measure the resistance between D+ and body ground.

OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace spiral cable.**

OK →

Repair or replace harness or connector between airbag sensor assembly and spiral cable.

DI33B-01

DTC	12	Short in D Squib Circuit (to B+)

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see page OPERATION on page RS–2.
DTC 12 is recorded when a B+ short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
12	• Short circuit in D squib wire harness (to B+) • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

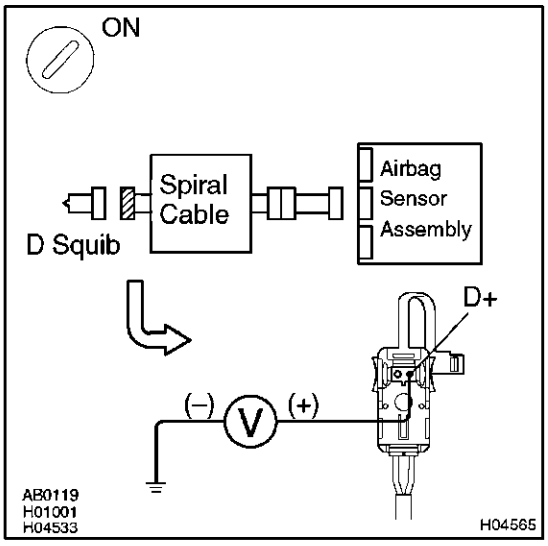
WIRING DIAGRAM

See page DI–165.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check D squib circuit.



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the voltage between D+ and body ground.

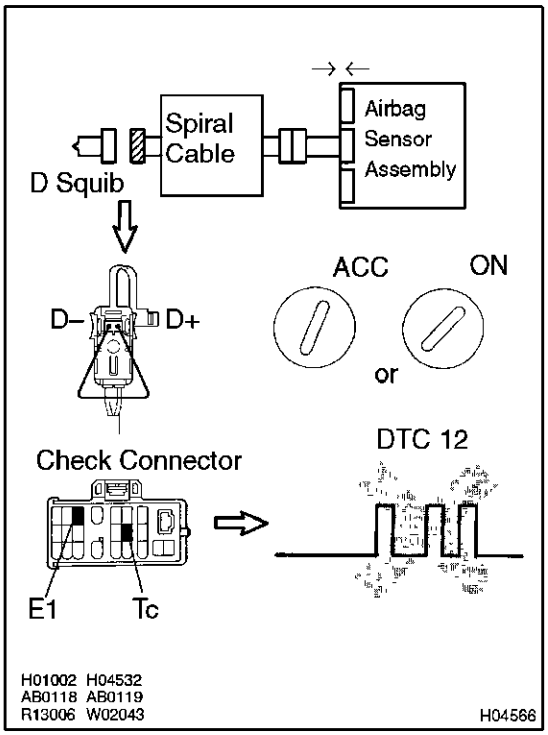
OK:

Voltage: 0 V

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect D+ and D– of the connector (on the spiral cable side) between the spiral cable and the steering wheel pad.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

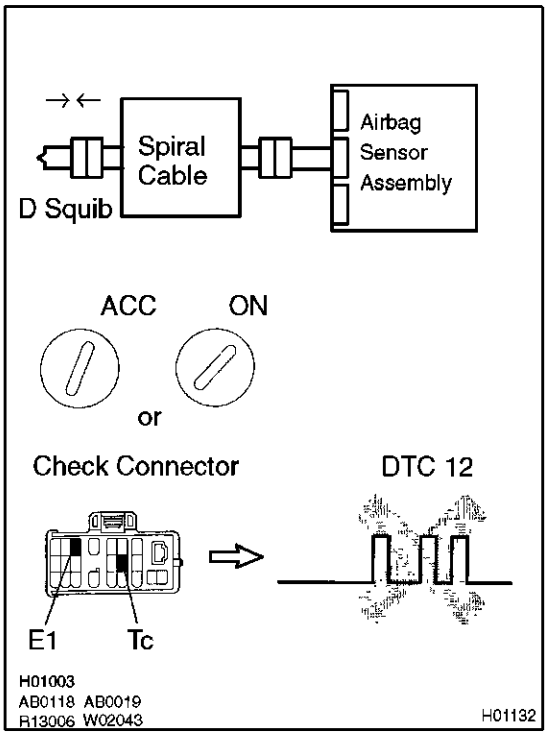
DTC 12 is not output.

HINT:
Codes other than code 12 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check D squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 12 is not output.

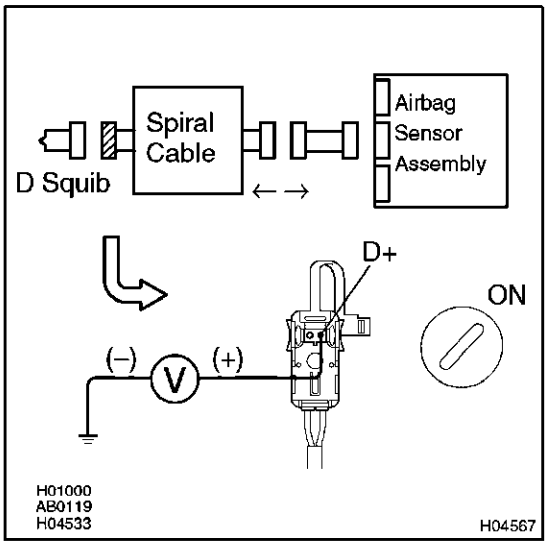
HINT:
Codes other than code 12 may be output at this time, but they are not relevant to this check.

NG → **Replace steering wheel pad.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctining part can not be detected by the simulation method, replace all SRS components including wire harness.

5	Check spiral cable.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect the connector between the airbag sensor assembly and the spiral cable.
(c) Turn ignition switch ON.

CHECK:

For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the voltage between D+ and body ground.

OK:

Voltage: 0 V

NG → **Repair or replace spiral cable.**

OK →

Repair or replace harness or connector between airbag sensor assembly and spiral cable.

DI33C–01

DTC	13	Short in D Squib Circuit

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the airbag to deploy when the airbag deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 13 is recorded when a short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
13	• Short circuit between D+ wire harness and D– wire harness of squib • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

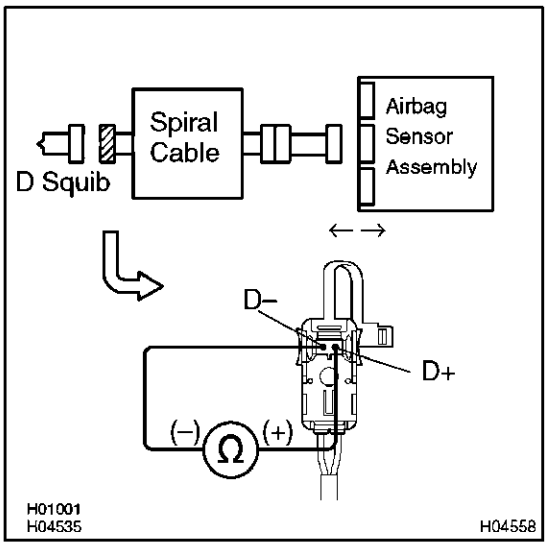
WIRING DIAGRAM

See page DI–165.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check D squib circuit.



PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the spiral cable.
(See page DI–152)

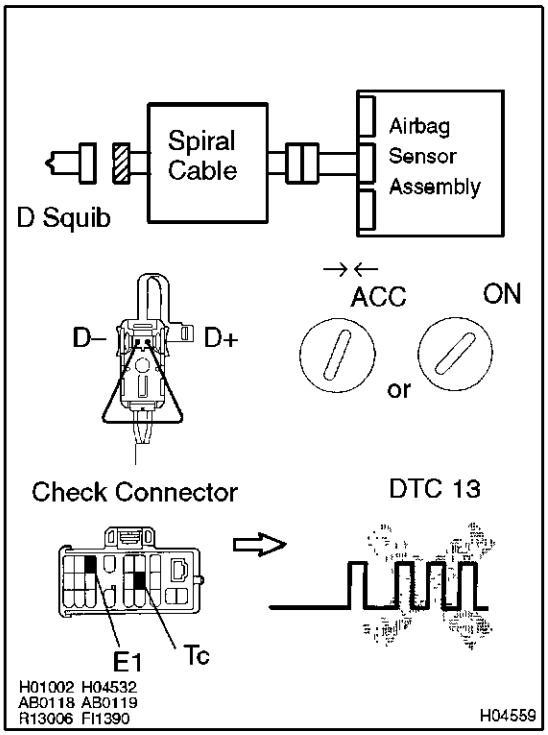
CHECK:
For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.

OK:
Resistance: 1 MΩ or Higher

NG	Go to step 5.

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 13 is not output.

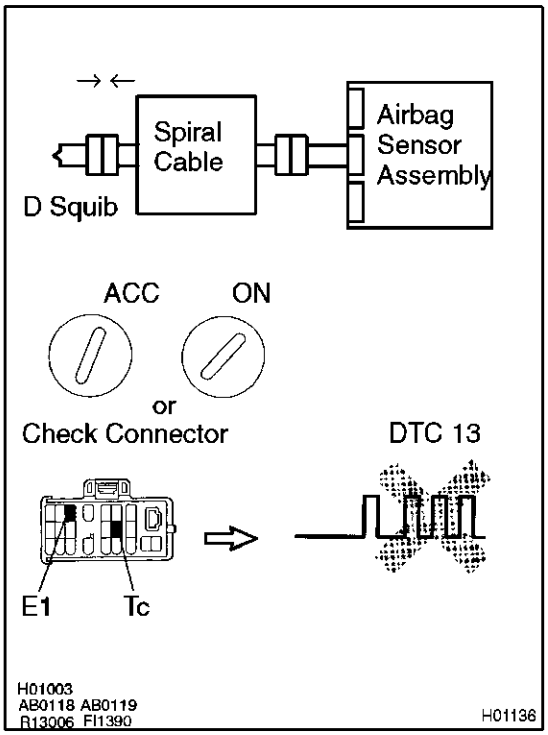
HINT:

Codes other than code 13 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check D squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–152)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152)

OK:

DTC 13 is not output.

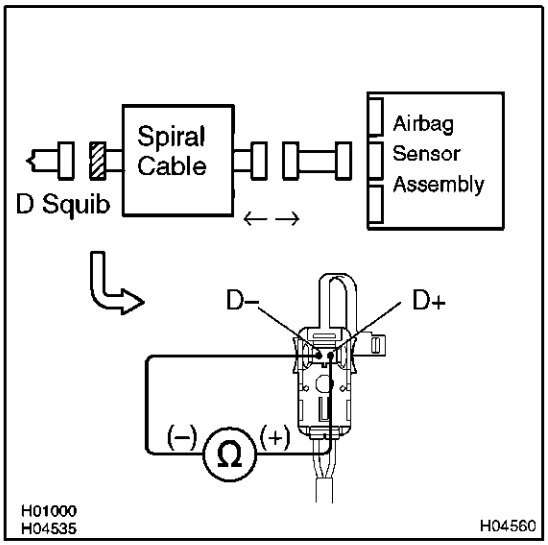
HINT:
Codes other than code 13 may be output at this time, but they are not relevant to this check.

NG → **Replace steering wheel pad.**

OK →

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check spiral cable.



PREPARATION:

(a) Disconnect the connector between the airbag sensor assembly and the spiral cable.

(b) Release airbag activation prevention mechanism of the spiral cable connector on the airbag sensor assembly side. (See page DI–152)

CHECK:

For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.

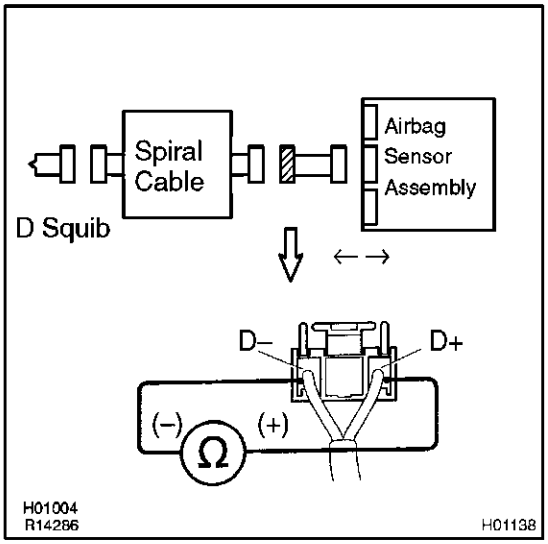
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace spiral cable.**

OK ↓

6	Check harness between airbag sensor assembly and spiral cable.



PREPARATION:

Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the spiral cable. (See page DI–152)

CHECK:

For the connector (on the spiral cable side) between the airbag sensor assembly and the spiral cable, measure the resistance between D+ and D–.

OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between airbag sensor assembly and spiral cable.**

OK ↓

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33D-01

DTC	14	Open in D Squib Circuit

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the airbag to deploy when the airbag deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 14 is recorded when an open is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
14	• Open circuit in D+ wire harness or D– wire harness of squib • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

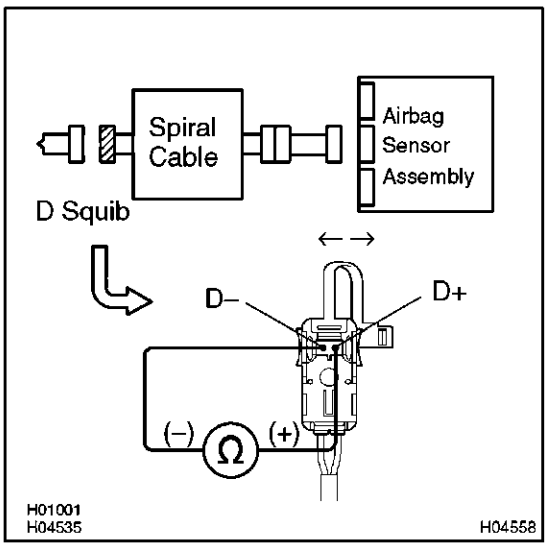
WIRING DIAGRAM

See page DI–165.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check D squib circuit.

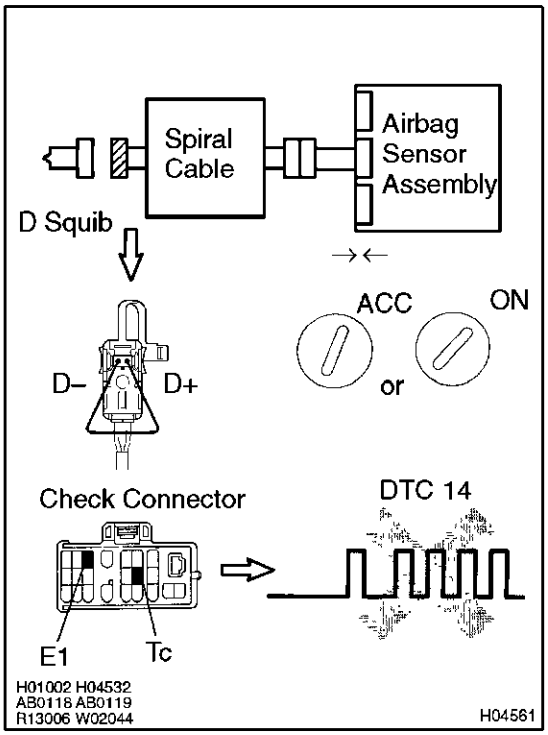


CHECK:
For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.
OK:
Resistance: Below 1 Ω

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect D+ and D– of the connector (on the spiral cable side) between the spiral cable and the steering wheel pad.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

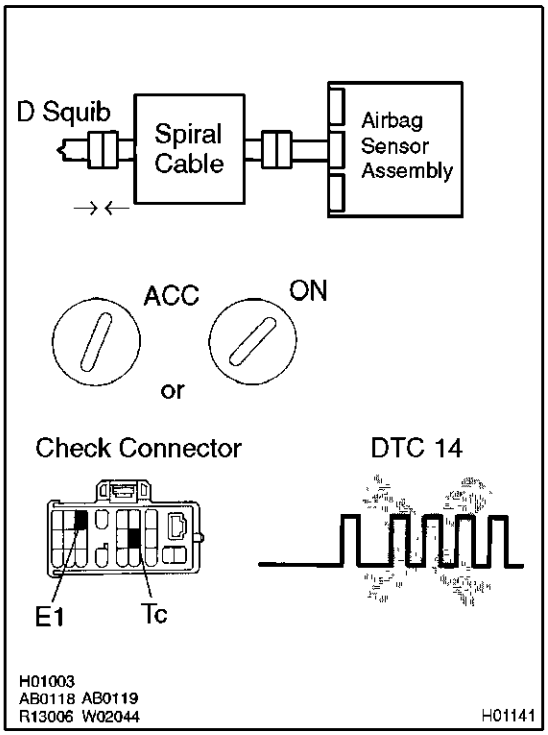
DTC 14 is not output.

HINT:
Codes other than code 14 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check D squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 14 is not output.

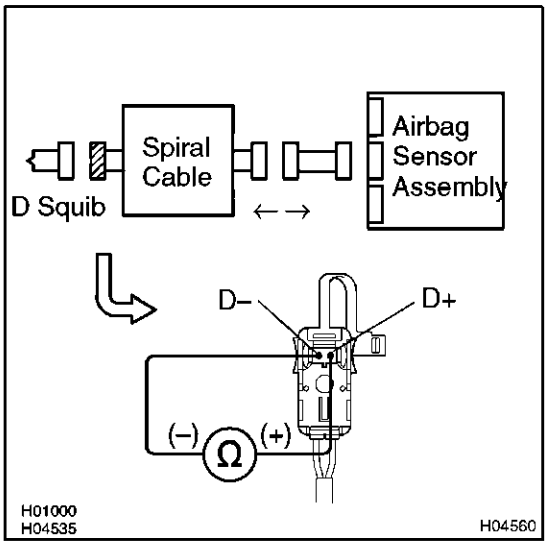
HINT:
Codes other than code 14 may be output at this time, but they are not relevant to this check.

NG → **Replace steering wheel pad.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check spiral cable.



PREPARATION:
Disconnect the connector between the airbag sensor assembly and the spiral cable.

CHECK:
For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.

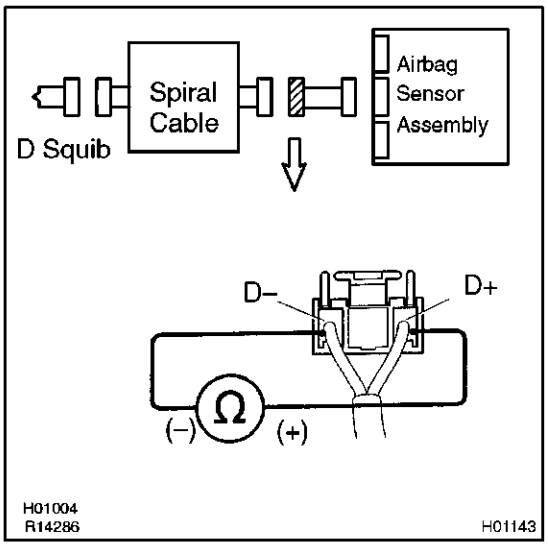
OK:

Resistance: Below 1 Ω

NG	Repair or replace spiral cable.

OK

6	Check harness between airbag sensor assembly and spiral cable.



CHECK:
For the connector (on the spiral cable side) between the airbag sensor assembly and the spiral cable, measure the resistance between D+ and D–.

OK:

Resistance: Below 1 Ω

NG	Repair or replace harness or connector between airbag sensor assembly and spiral cable.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33E-01

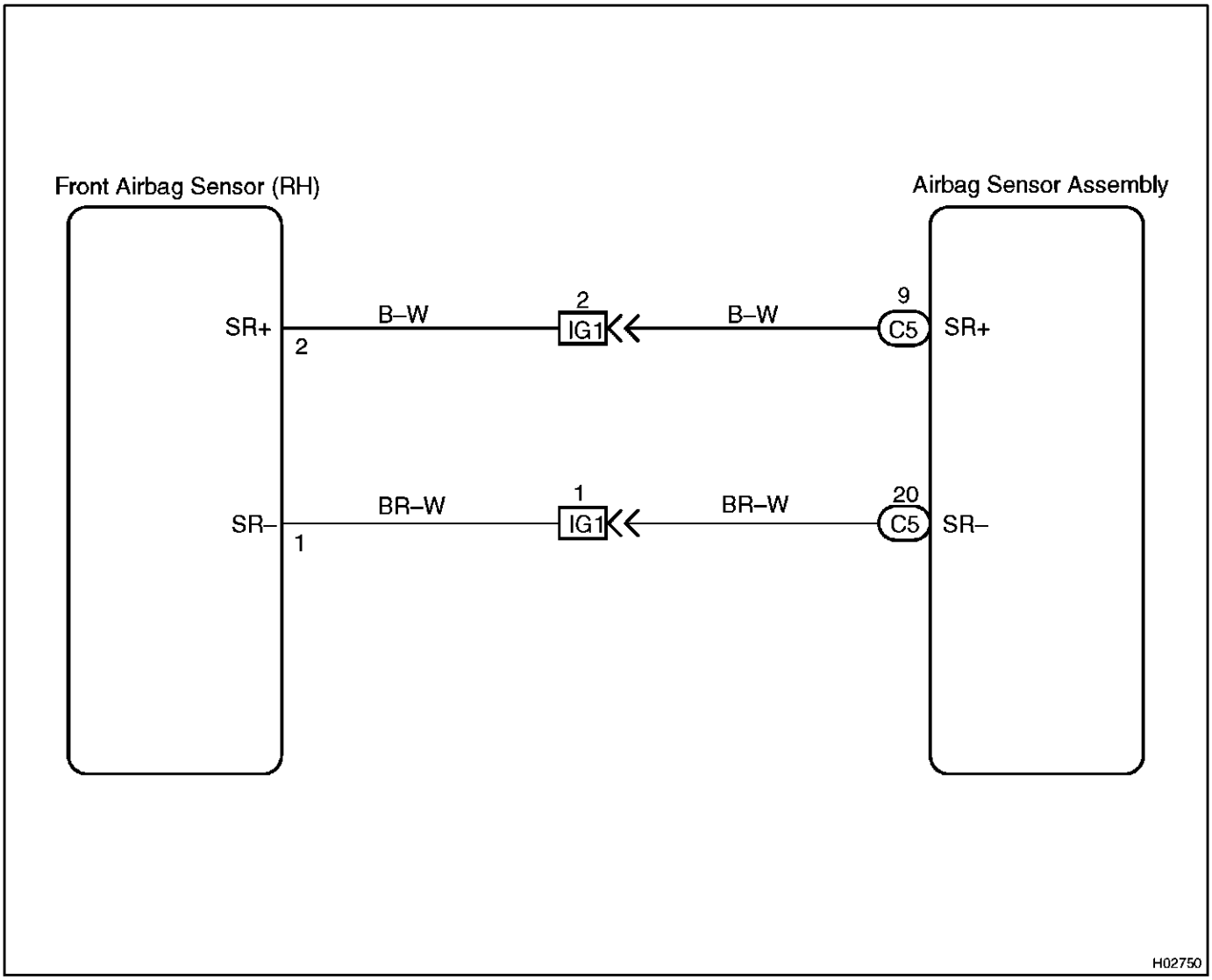
DTC	15	Front Airbag Sensor (RH) Malfunction

CIRCUIT DESCRIPTION

The front airbag sensor (RH) circuit consists of the airbag sensor assembly and front airbag sensor (RH).
For details of the function of each component, see OPERATION on page RS–2.
DTC 15 is recorded when malfunction is detected in the front airbag sensor (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
15	• Front airbag sensor (RH) malfunction	• Front airbag sensor (RH) • Wire harness • Relay harness

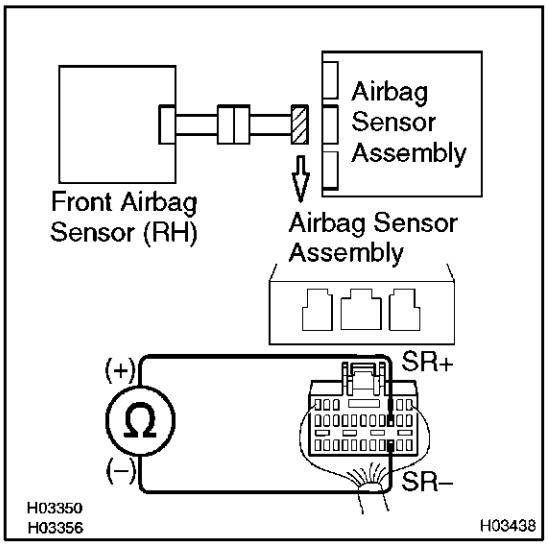
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check front airbag sensor (RH) circuit.**



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between SR+ and SR–.

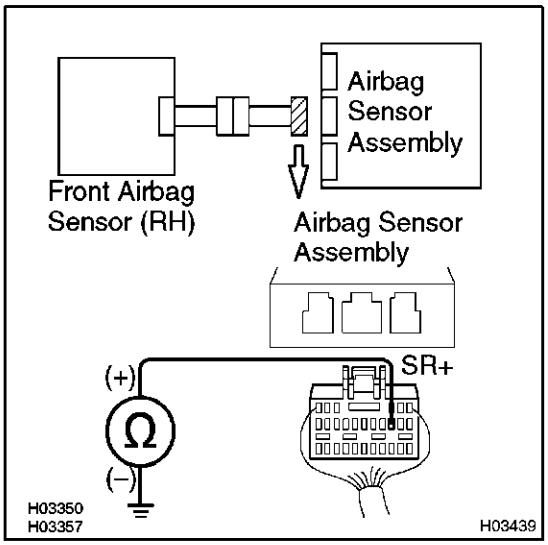
OK:

Resistance: 754 – 886 Ω

NG → **Go to step 6.**

OK

3	Check front airbag sensor (RH) circuit (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between SR+ and body ground.

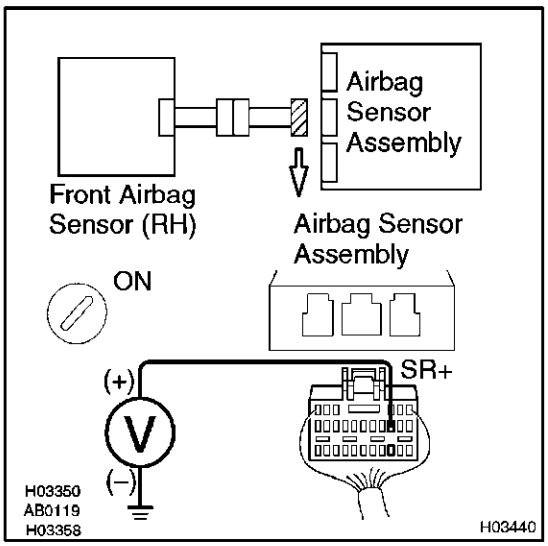
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 9.**

OK

4	Check front airbag sensor (RH) circuit (to B+).



PREPARATION:

(a) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

(b) Turn ignition switch to ON.

CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the voltage between SR+ and body ground.

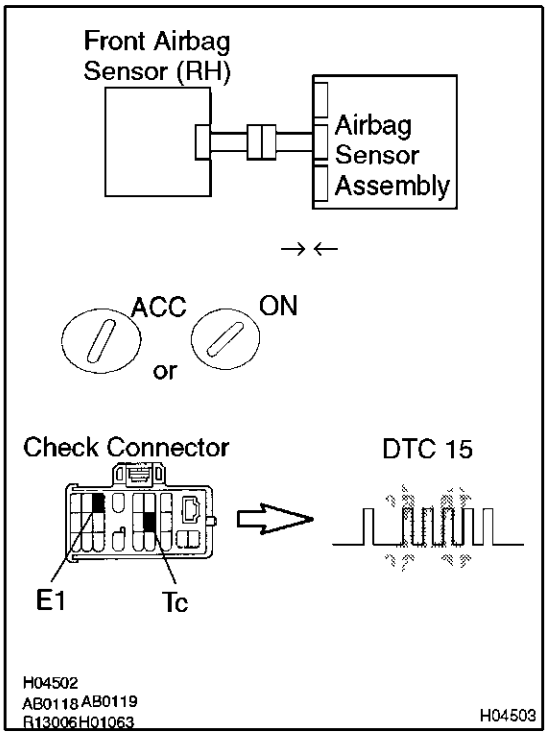
OK:

Voltage: Below 1 V

NG → **Go to step 11.**

OK

5	**Check airbag sensor assembly.**



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front airbag sensor (RH) connector and airbag sensor assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 15 is not output.

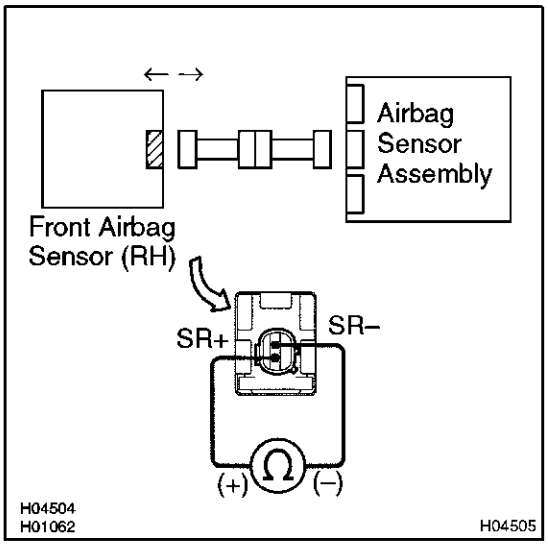
HINT:
Codes other than DTC 15 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

6	Check front airbag sensor (RH).

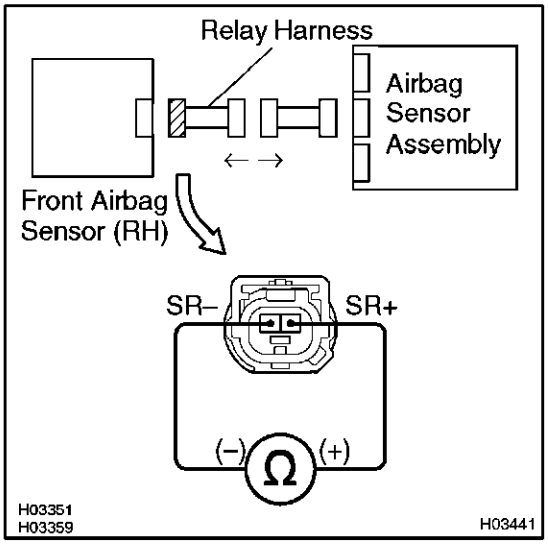


PREPARATION:
Disconnect the front airbag sensor connector (RH).
CHECK:
For the connector (on the front airbag sensor side), measure the resistance between SR+ and SR–.
OK:
Resistance: 754 – 886 Ω

NG → **Replace front airbag sensor (RH).**

OK

7	Check relay harness.

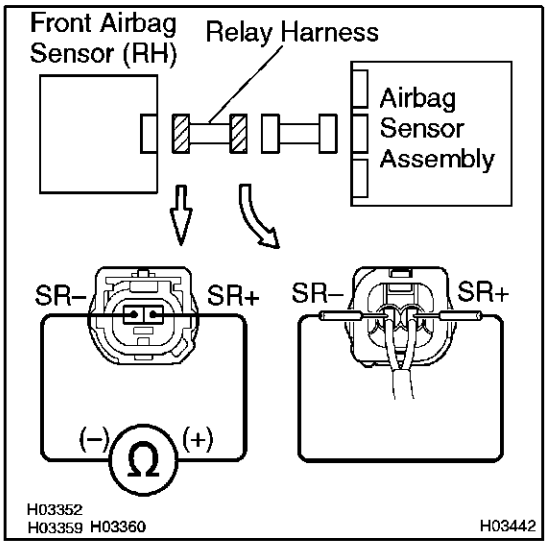


PREPARATION:
Disconnect the relay harness connector on the airbag sensor assembly side.
CHECK:
For the connector (on the relay harness side) between the front airbag sensor (RH) and the relay harness, measure the resistance between SR+ and SR–.
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace relay harness.**

OK

8	Check relay harness.



PREPARATION:

Using service wire, connect SR+ and SR– of the connector (on the relay harness side), between the airbag sensor assembly and the relay harness.

CHECK:

For the connector (on the relay harness side) between the front airbag sensor (RH) and the relay harness, measure the resistance between SR+ and SR–.

OK:

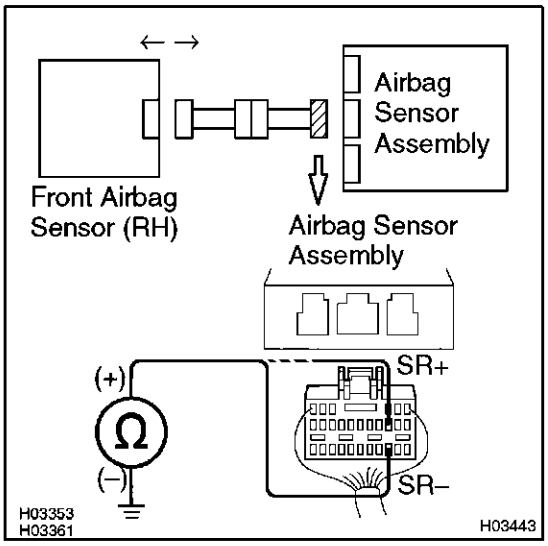
Resistance: Below 1 Ω

NG → **Repair or replace relay harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and relay harness.

9	Check wire harness (to ground).

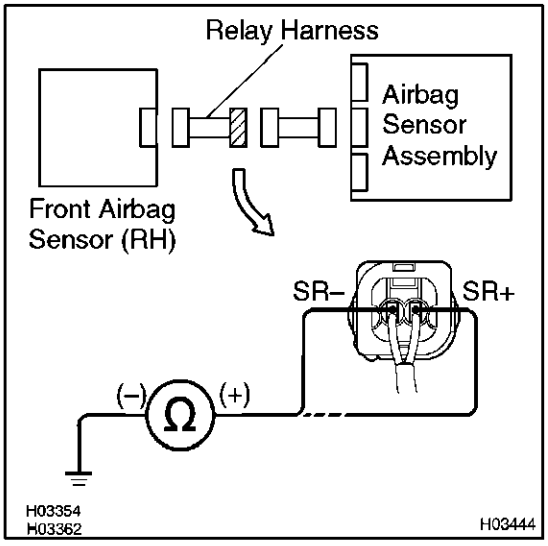


PREPARATION:
Disconnect the front airbag sensor connector (RH).
CHECK:
For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between body ground and each of SR+ and SR–.
OK:
Resistance: 1 MΩ or Higher

OK	Replace front airbag sensor (RH).

NG

10	Check relay harness (to ground).



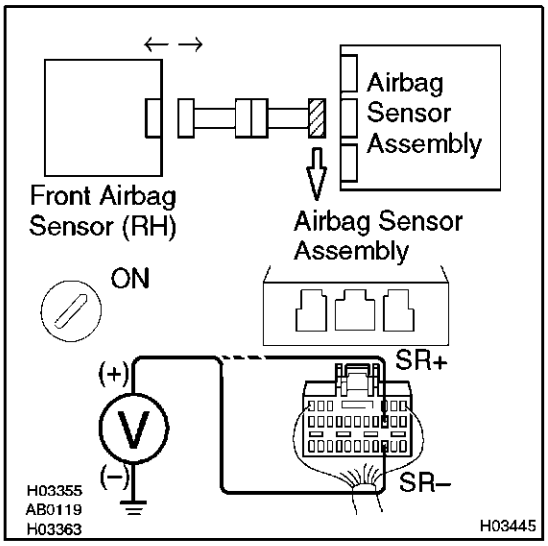
PREPARATION:
Disconnect the relay harness connector on the airbag sensor assembly side.
CHECK:
For the connector (on the relay harness side) between the front airbag sensor (RH) and the relay harness, measure the resistance between body ground and each of SR+ and SR–.
OK:
Resistance: Below 1 MΩ or Higher

NG	Repair or replace relay harness.

OK

Repair or replace harness or connector between airbag sensor assembly and relay harness.

11	Check wire harness (to B+).



PREPARATION:

(a) Disconnect the front airbag sensor connector (RH).

(b) Turn ignition switch to ON.

CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the voltage between body ground and each of SR+ and SR–.

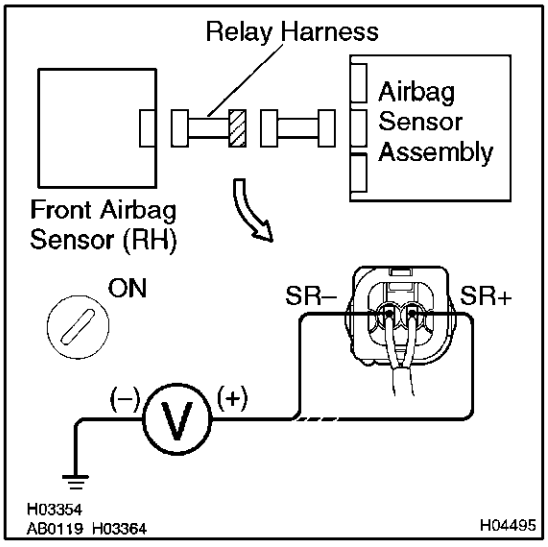
OK:

Voltage: Below 1 V

OK	Replace front airbag sensor (RH).

NG

12	Check relay harness (to B+).



PREPARATION:

Disconnect the relay harness connector on the airbag sensor assembly side.

CHECK:

For the connector (on the relay harness side) between the front airbag sensor (RH) and the relay harness, measure the voltage between body ground and each of SR+ and SR–.

OK:

Voltage: Below 1 V

NG	Repair or replace relay harness.

OK

Repair or replace harness or connector between airbag sensor assembly and relay harness.

DI33F-01

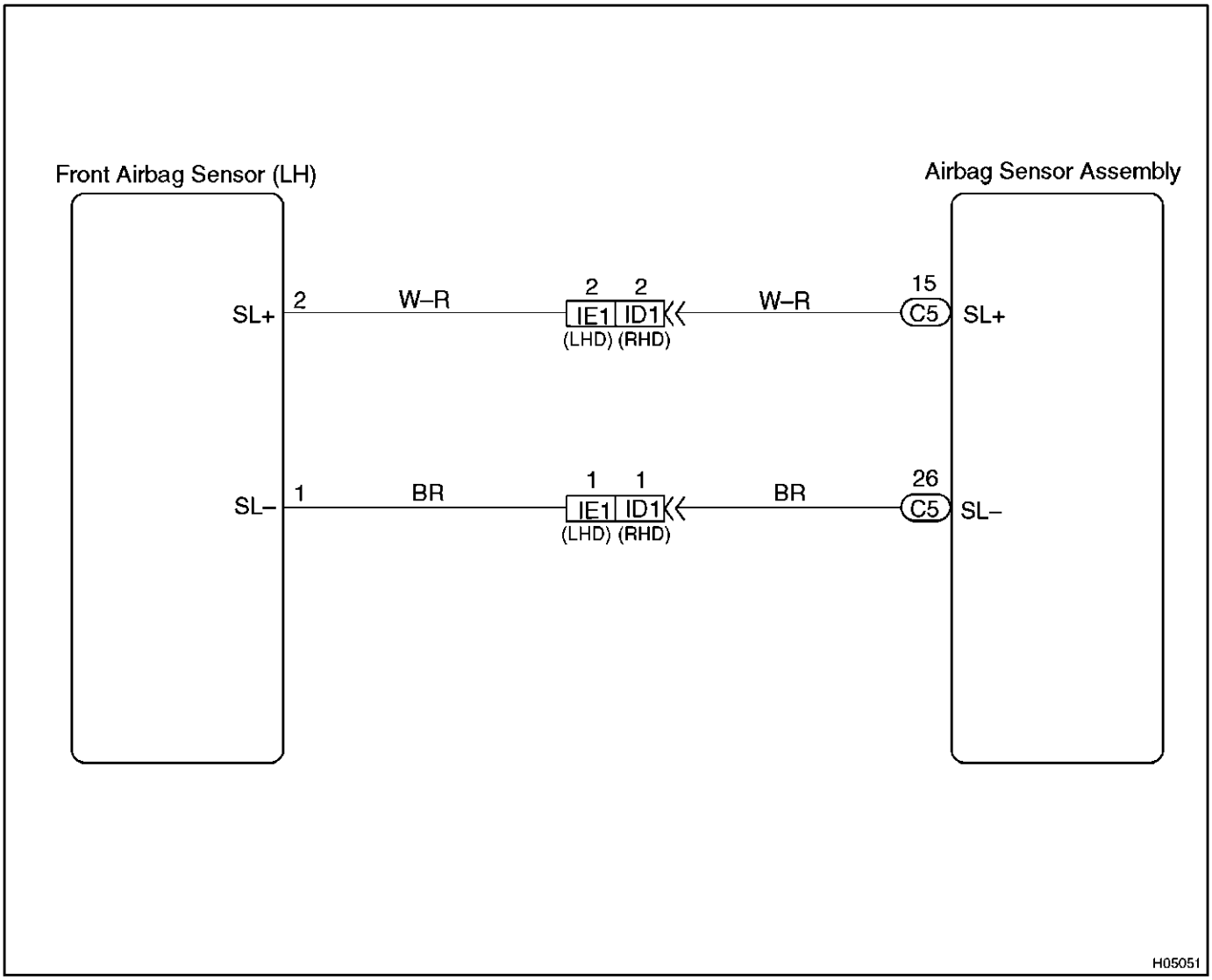
DTC	16	Front Airbag Sensor (LH) Malfunction

CIRCUIT DESCRIPTION

The front airbag sensor (LH) circuit consists of the airbag sensor assembly and front airbag sensor (LH).
For details of the function of each component, see OPERATION on page RS–2.
DTC 16 is recorded when malfunction is detected in the front airbag sensor (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
16	• Front airbag sensor (LH) malfunction	• Front airbag sensor (LH) • Wire harness • Relay harness

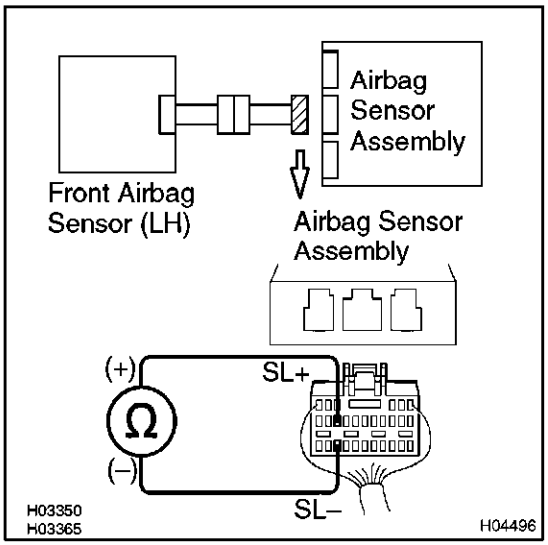
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check front airbag sensor (LH) circuit.**



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between SL+ and SL–.

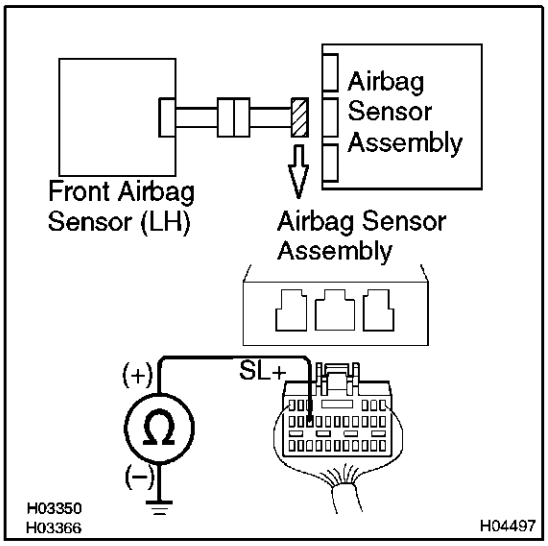
OK:

Resistance: 754 – 886 Ω

NG	**Go to step 6.**

OK

3	Check front airbag sensor (LH) circuit (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between SL+ and body ground.

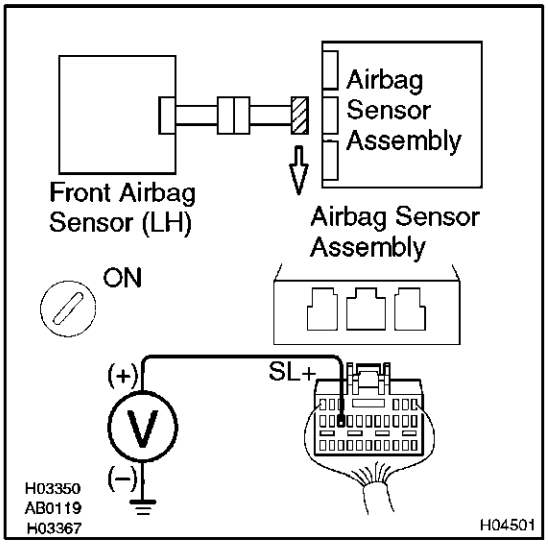
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 9.**

OK

4	Check front airbag sensor (LH) circuit (to B+).



PREPARATION:

(a) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

(b) Turn ignition switch to ON.

CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the voltage between SL+ and body ground.

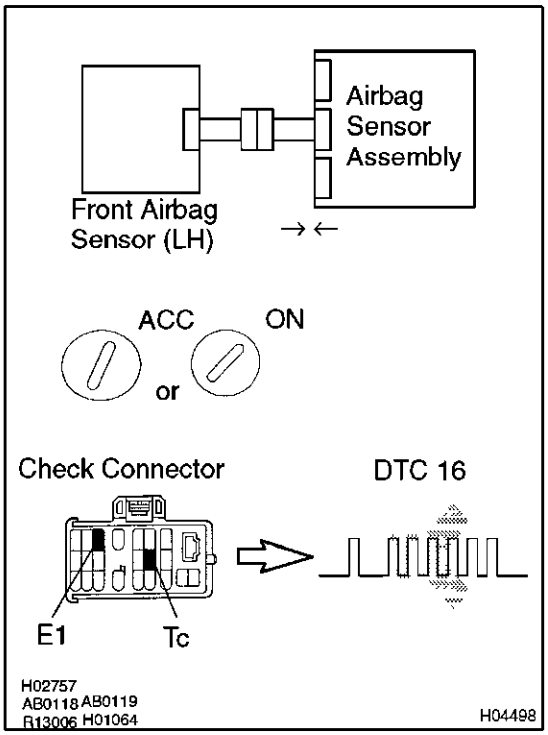
OK:

Voltage: Below 1 V

NG → **Go to step 11.**

OK

5	Check airbag sensor assembly.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front airbag sensor (LH) connector and airbag sensor assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 16 is not output.

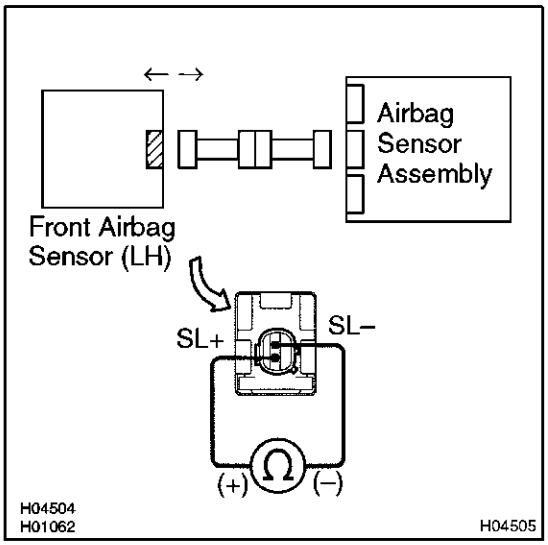
HINT:
Codes other than DTC 16 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

6	Check front airbag sensor (LH).

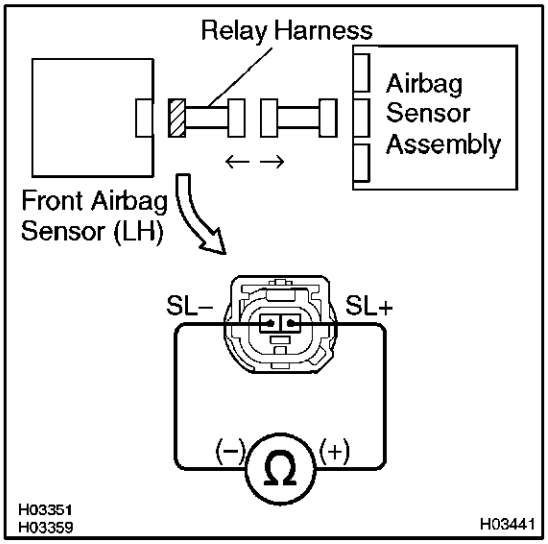


PREPARATION:
Disconnect the front airbag sensor connector (LH).
CHECK:
For the connector (on the front airbag sensor side), measure the resistance between SL+ and SL–.
OK:
Resistance: 754 – 886 Ω

NG → **Replace front airbag sensor (LH).**

OK

7	Check relay harness.

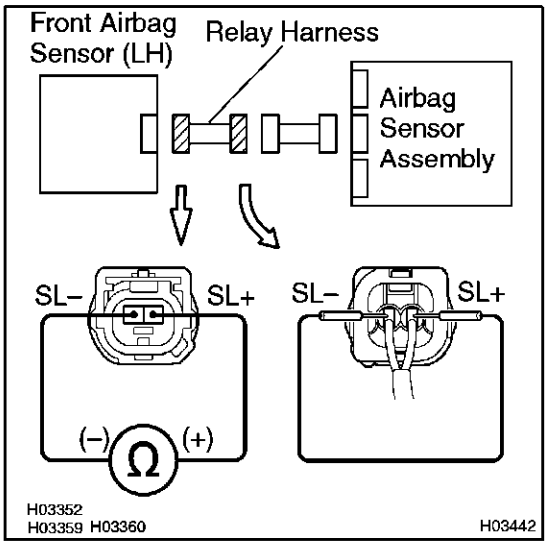


PREPARATION:
Disconnect the relay harness connector on the airbag sensor assembly side.
CHECK:
For the connector (on the relay harness side) between the front airbag sensor (LH) and the relay harness, measure the resistance between SL+ and SL–.
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace relay harness.**

OK

8	Check relay harness.



PREPARATION:

Using service wire, connect SL+ and SL– of the connector (on the relay harness side), between the airbag sensor assembly and the relay harness.

CHECK:

For the connector (on the relay harness side) between the front airbag sensor (LH) and the relay harness, measure the resistance between SL+ and SL–.

OK:

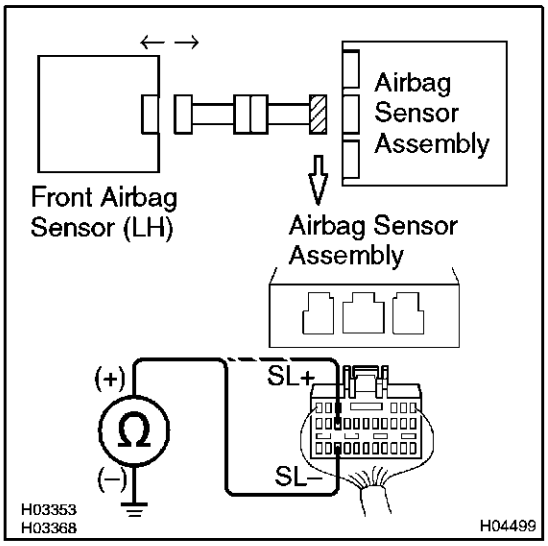
Resistance: Below 1 Ω

NG → **Repair or replace relay harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and relay harness.

9	Check wire harness (to ground).

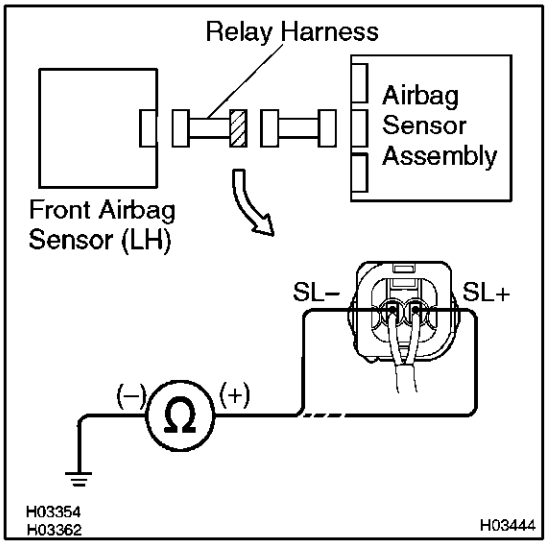


PREPARATION:
Disconnect the front airbag sensor connector (LH).
CHECK:
For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between body ground and each of SL+ and SL–.
OK:
Resistance: 1 MΩ or Higher

OK	Replace front airbag sensor (LH).

NG

10	Check relay harness (to ground).



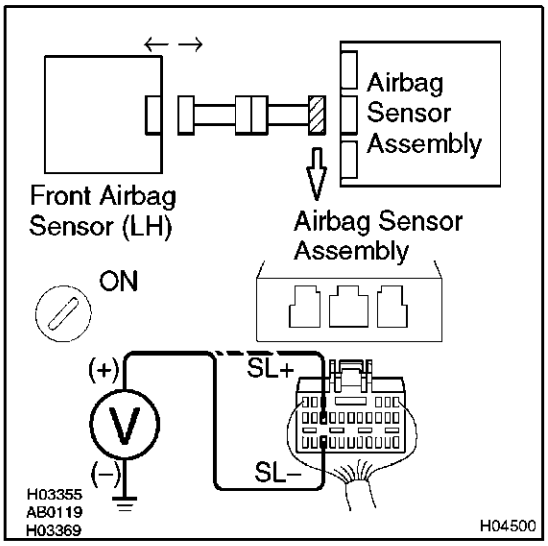
PREPARATION:
Disconnect the relay harness connector on the airbag sensor assembly side.
CHECK:
For the connector (on the relay harness side) between the front airbag sensor (LH) and the relay harness, measure the resistance between body ground and each of SL+ and SL–.
OK:
Resistance: Below 1 MΩ or Higher

NG	Repair or replace relay harness.

OK

Repair or replace harness or connector between airbag sensor assembly and relay harness.

11	Check wire harness (to B+).

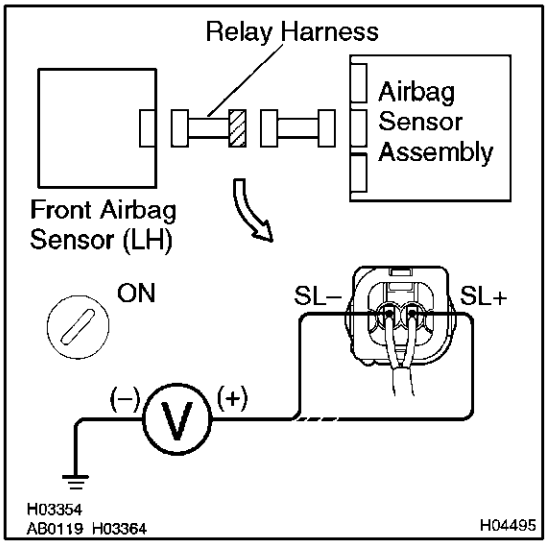


PREPARATION:
Disconnect the front airbag sensor connector (LH).
CHECK:
For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the voltage between body ground and each of SL+ and SL–.
OK:
Voltage: Below 1 V

NG → **Replace front airbag sensor (LH).**

OK

12	Check relay harness (to B+).



PREPARATION:
Disconnect the relay harness connector on the airbag sensor assembly side.
CHECK:
For the connector (on the relay harness side) between the front airbag sensor (LH) and the relay harness, measure the voltage between body ground and each of SL+ and SL–.
OK:
Voltage: Below 1 V

NG → **Repair or replace relay harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and relay harness.

DI33G–01

DTC	31	Airbag Sensor Assembly Malfunction

CIRCUIT DESCRIPTION

The airbag sensor assembly consists of a airbag sensor, 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 31 is recorded when occurrence of a malfunction in the airbag sensor assembly is detected.

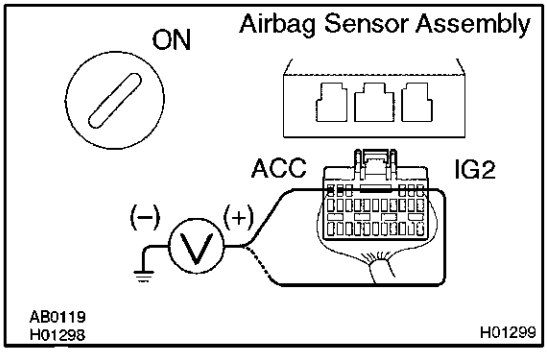
DTC No.	DTC Detecting Condition	Trouble Area
31	• Airbag sensor assembly malfunction	• Airbag sensor assembly

INSPECTION PROCEDURE

HINT:
When a malfunction code other than code 31 is displayed at the same time, first repair the malfunction indicated by the malfunction code other than code 31.

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check voltage at IG2 and ACC of airbag sensor assembly.**

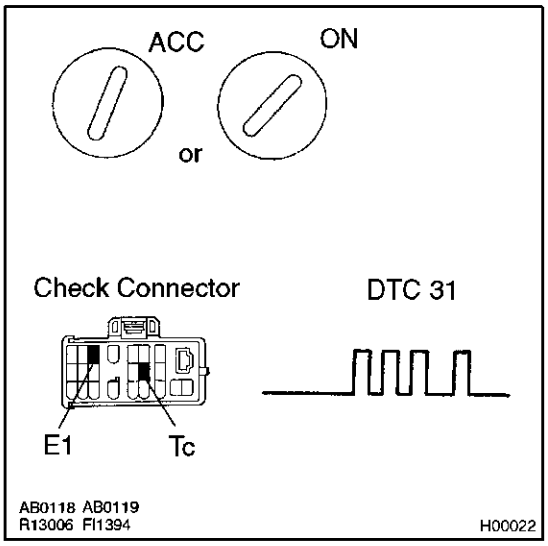


PREPARATION:
Turn ignition switch ON.
CHECK:
Measure the voltage between body ground and each of terminals IG2 and ACC of the airbag sensor assembly connector.
OK:
Voltage: Below 16 V

NG → **Check that an abnormality occurs on the battery and charging system.**

OK

3	Is DTC 31 output again?



PREPARATION:
Clear DTC.
(See step 5 on page DI–152)
CHECK:
(a) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Repeat operation in step (a) and (b) at least 5 times.
(d) Check DTC.
(See page DI–152)

NO → **Using simulation method, reproduce malfunction symptoms. (See page IN–18)**

YES

Replace airbag sensor assembly.

DI33H–01

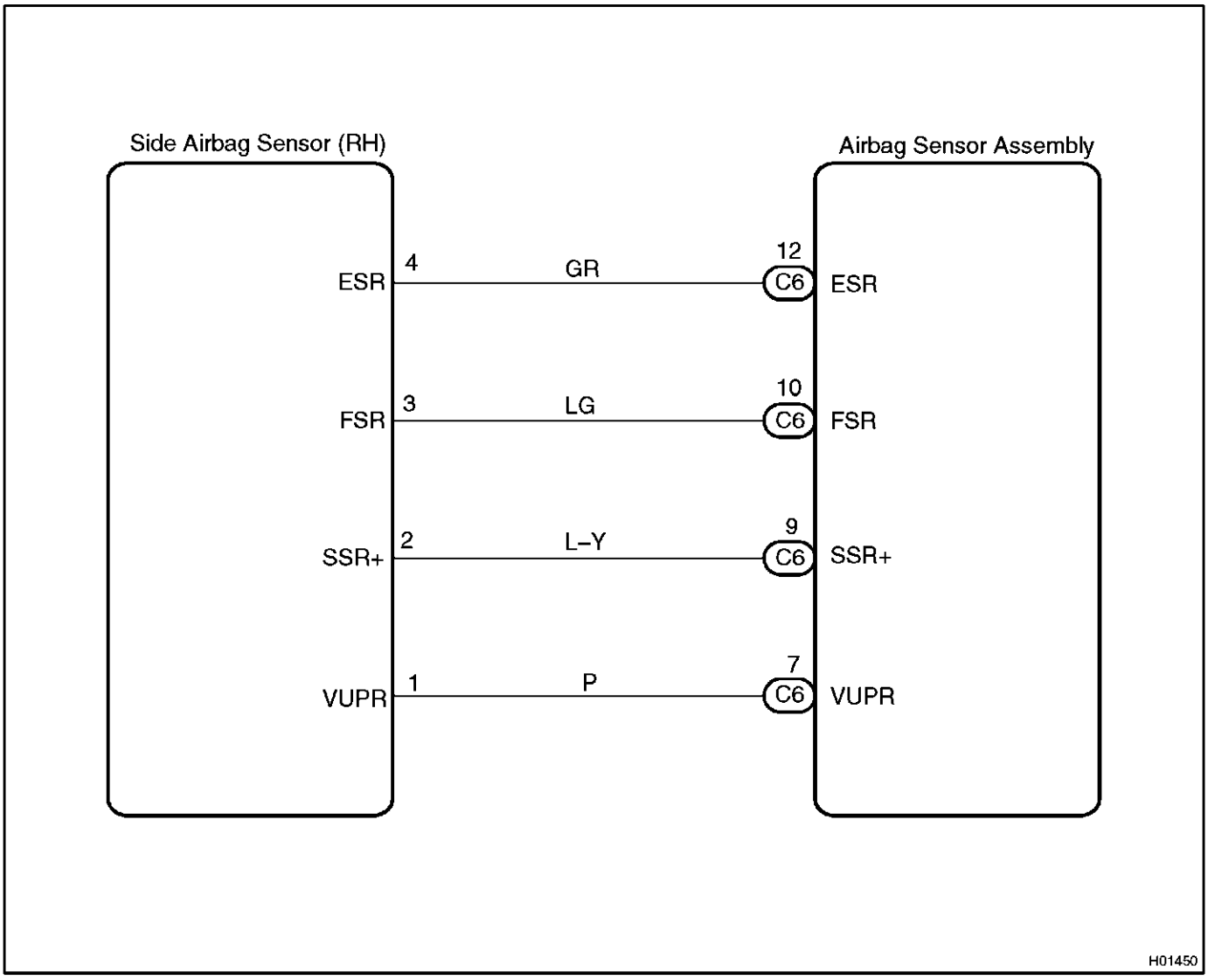
DTC	32	Side Airbag Sensor Assembly (RH) Malfunction

CIRCUIT DESCRIPTION

The side airbag sensor assembly (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 diagnosis system malfunction.
DTC 32 is recorded when occurrence of a malfunction in the side airbag sensor assembly (RH) is detected.

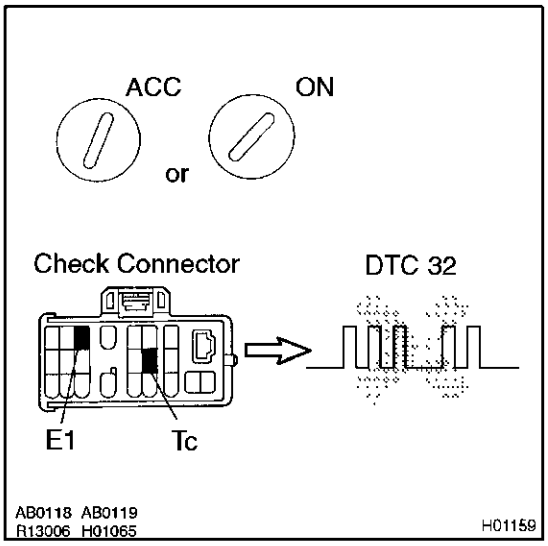
DTC No.	DTC Detecting Condition	Trouble Area
32	• Side airbag sensor assembly (RH) malfunction	• Side airbag sensor assembly (RH) • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Is DTC 32 out put?



CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

HINT:
Codes other than code 32 may be output at this time, but they are not relevant to this check.

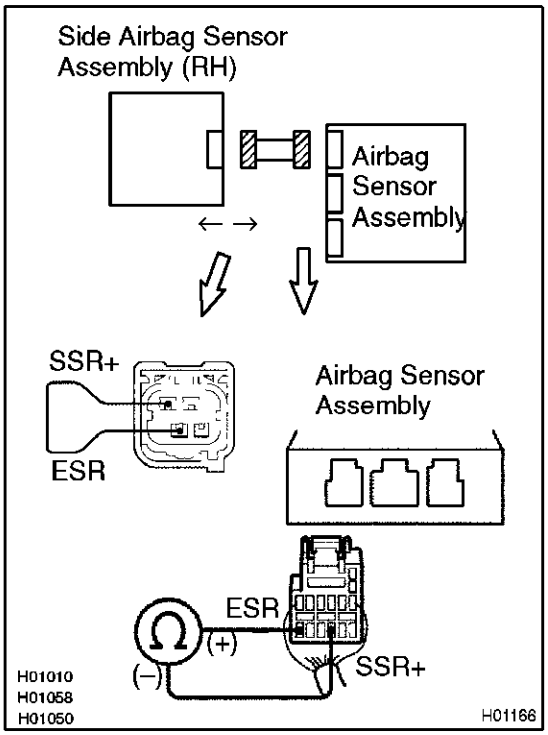
YES → **Go to step 8.**

NO

2	Is connector of side airbag sensor assembly (RH) properly connected?

3	Prepare for inspection. (See step 1 on page DI–285)

4	Check wire harness.



PREPARATION:

(a) Disconnect the side airbag sensor assembly (RH).

(b) Using a service wire, connect SSR+ and ESR of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side)between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the resistance between SSR+ and ESR.

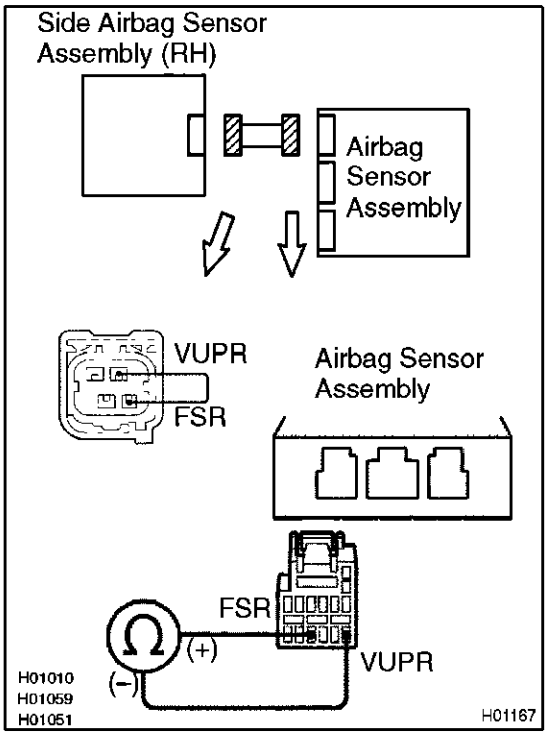
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.**

OK

5	**Check wire harness.**



PREPARATION:

Using a service wire, connect VUPR and FSR of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the resistance between VUPR and FSR.

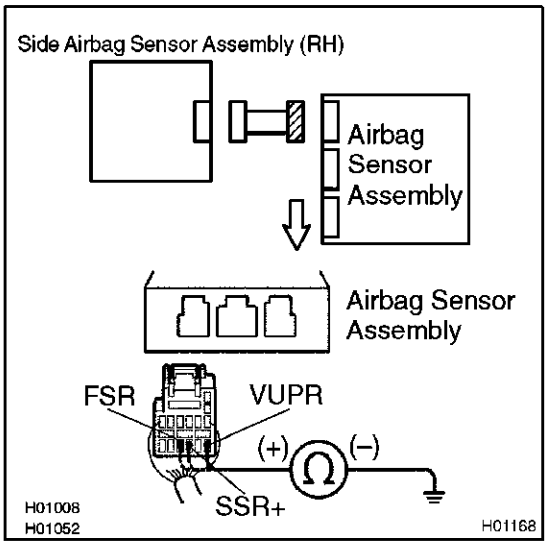
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.**

OK

6	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the resistance between body ground and each of SSR+, VUPR and FSR.

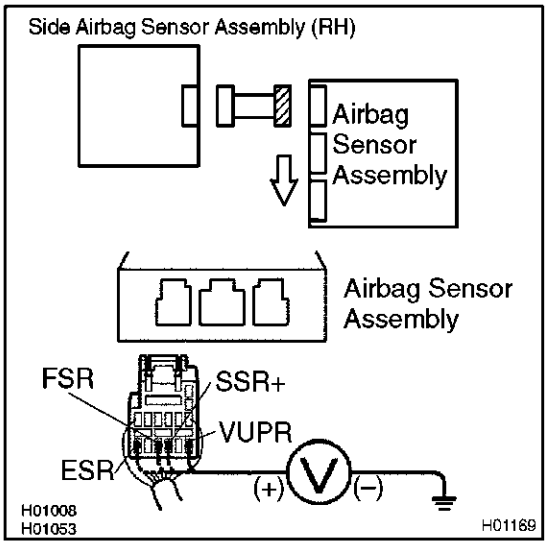
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.**

OK

7	Check wire harness (to B+).



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the voltage between body ground and each of SSR+, VUPR, ESR and FSR.

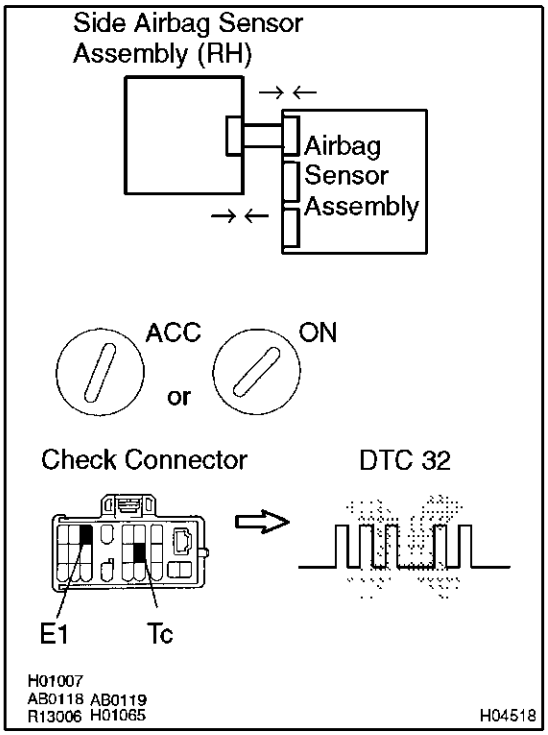
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.**

OK

8	Is DTC 32 out put again?



PREPARATION:

(a) Connect the connector to the side airbag sensor assembly (RH).
(b) Connect the connector to the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

HINT:
Codes other than code 32 may be output at this time, but they are not relevant to this check.

NO → **Replace side airbag sensor assembly (RH).**

YES

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33I–01

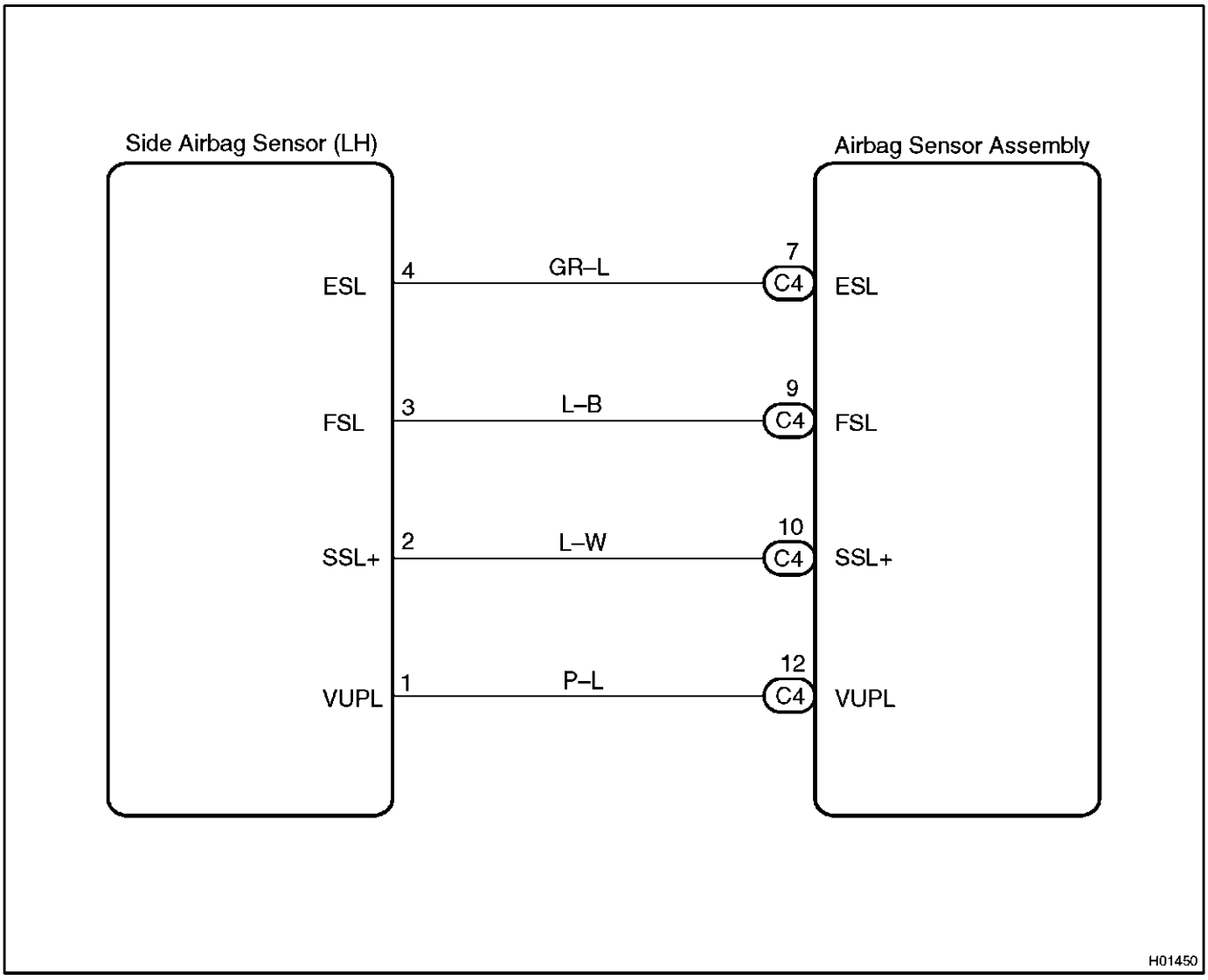
DTC	33	Side Airbag Sensor Assembly (LH) Malfunction

CIRCUIT DESCRIPTION

The side airbag sensor assembly (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 diagnosis system malfunction.
DTC 33 is recorded when occurrence of a malfunction in the side airbag sensor assembly (LH) is detected.

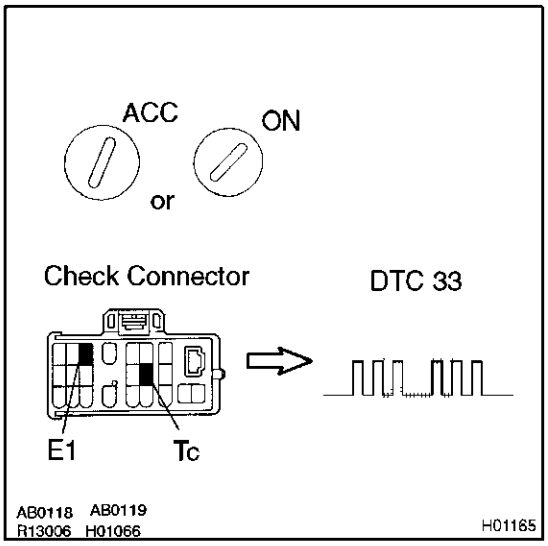
DTC No.	DTC Detecting Condition	Trouble Area
33	• Side airbag sensor assembly (LH) malfunction	• Side airbag sensor assembly (LH) • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Is DTC 33 out put?



CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

HINT:
Codes other than code 33 may be output at this time, but they are not relevant to this check.

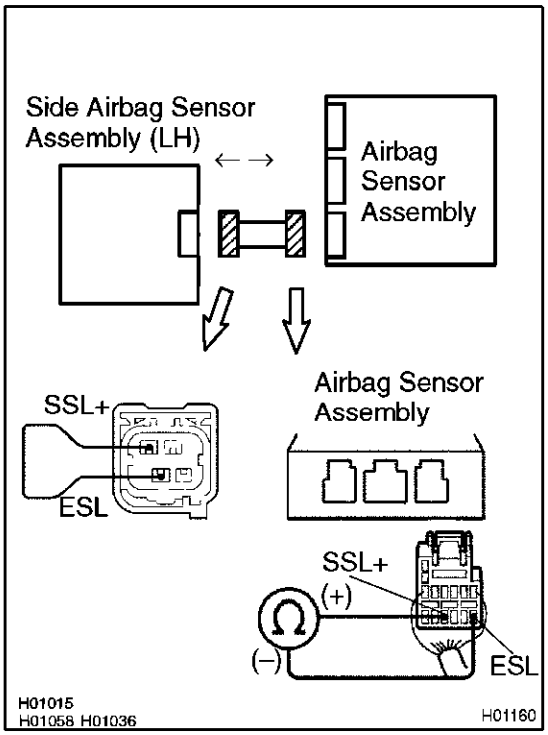
YES → **Go to step 8.**

NO

2	Are connector of side airbag sensor assembly (LH) properly connected?

3	Prepare for inspection. (See step 1 on page DI–285)

4	Check wire harness.



PREPARATION:

(a) Disconnect the side airbag sensor assembly (LH).

(b) Using a service wire, connect SSL+ and ESL of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the resistance between SSL+ and ESL.

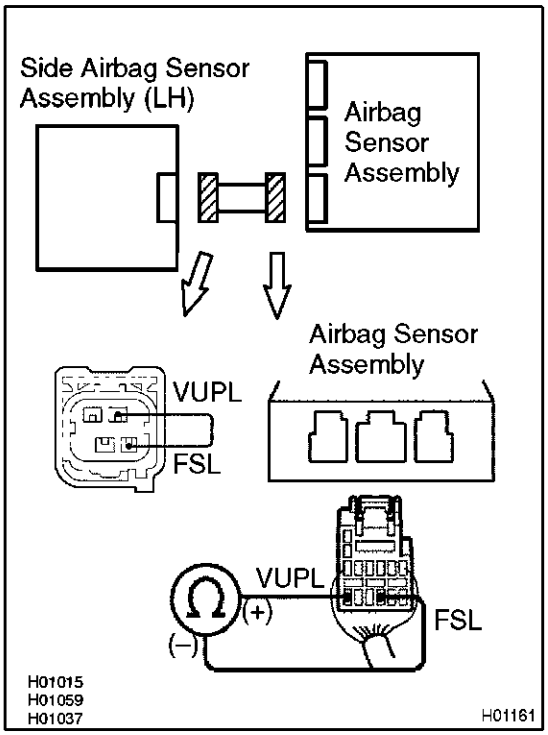
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

5	Check wire harness.



PREPARATION:

Using a service wire, connect VUPL and FSL of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the resistance between VUPL and FSL.

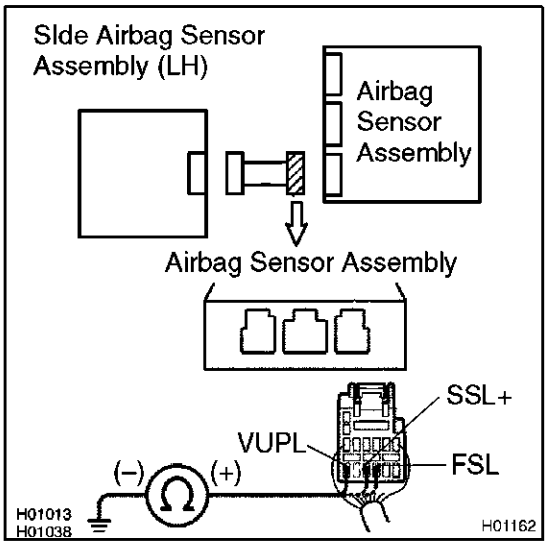
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

6	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the resistance between body ground and each of SSL+, VUPL and FSL.

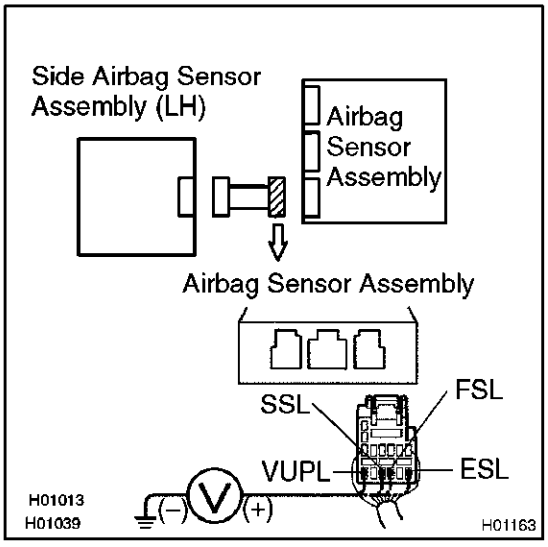
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

7	Check wire harness (to B+).



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the voltage between body ground and each of SSL+, ESL, VUPL and FSL.

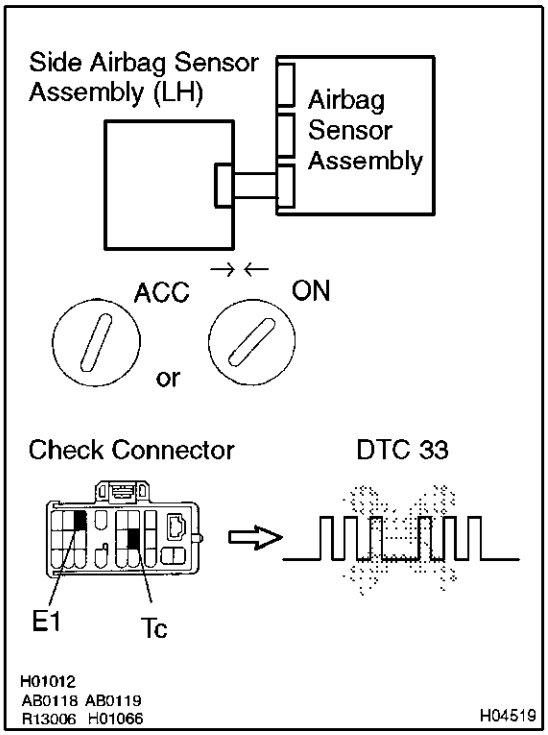
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

8	Is DTC 33 out put again?



PREPARATION:

(a) Connect the connector to the side airbag sensor assembly (LH).
(b) Connect the connector to the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

HINT:
Codes other than code 33 may be output at this time, but they are not relevant to this check.

NO → **Replace side airbag sensor assembly (LH).**

YES

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33J–01

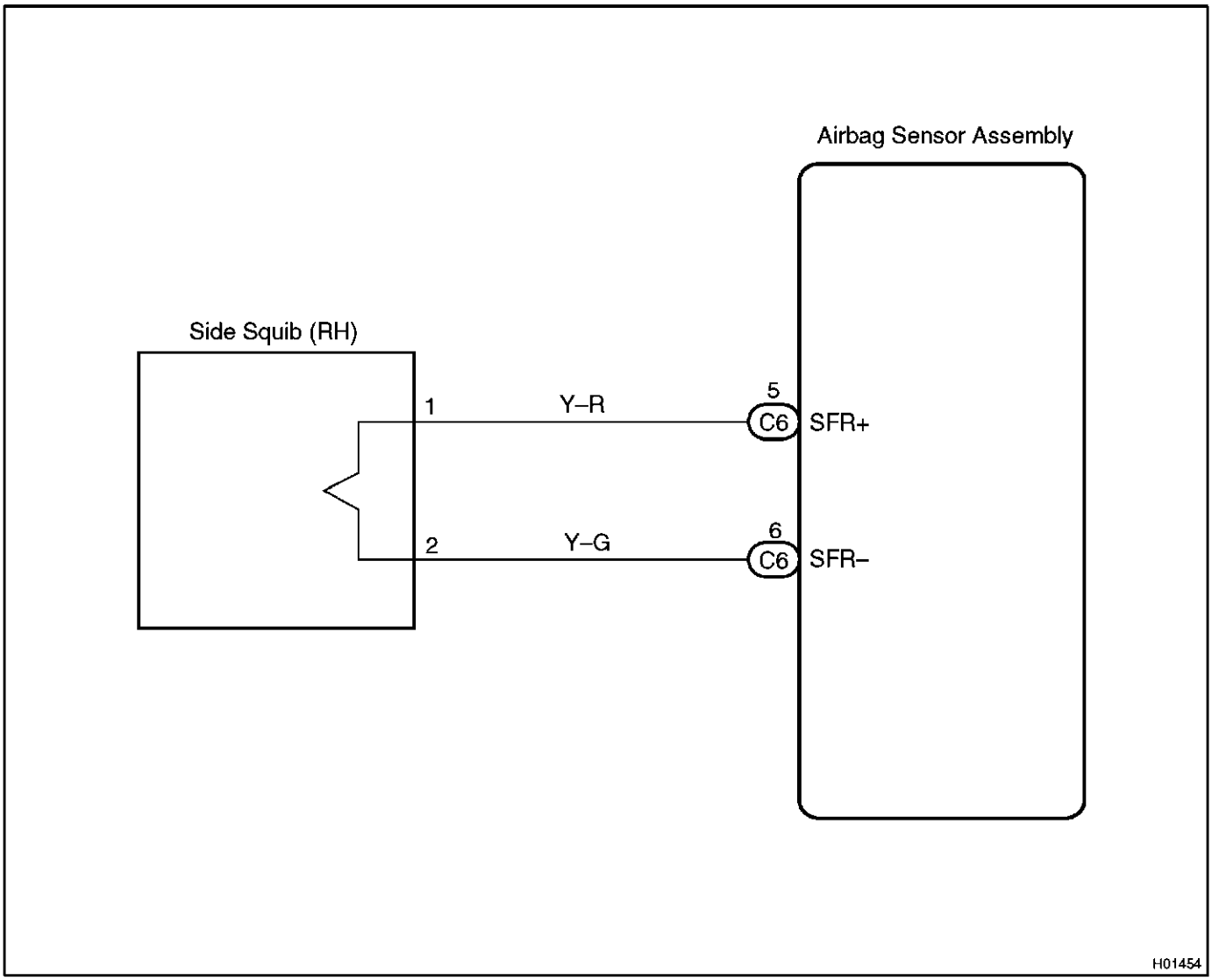
DTC	41	Short in Side Squib (RH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The side squib circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 41 is recorded when ground short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
41	• Short circuit in side squib (RH) wire harness (to ground) • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

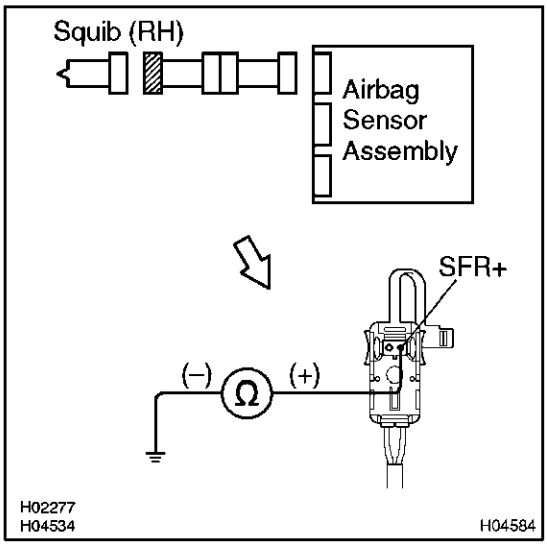
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check side squib (RH) circuit.**



CHECK:

For the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the resistance between SFR+ and body ground.

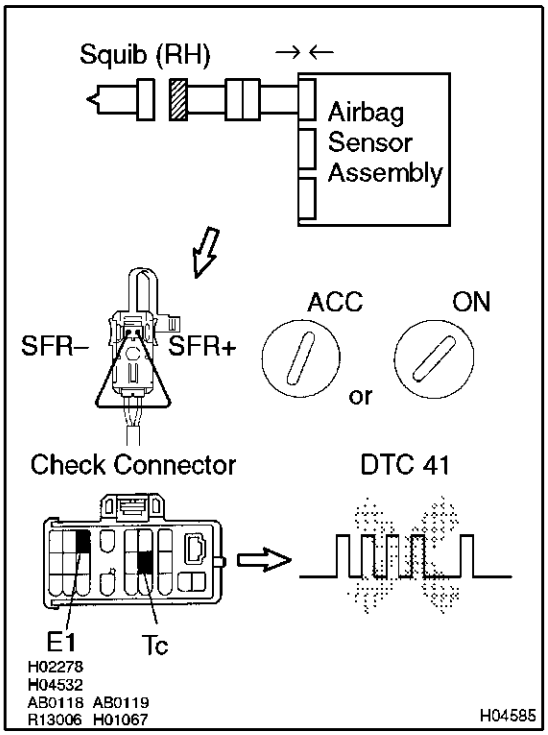
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 5.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFR+ and SFR– of the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–152)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152)

OK:

DTC 41 is not output.

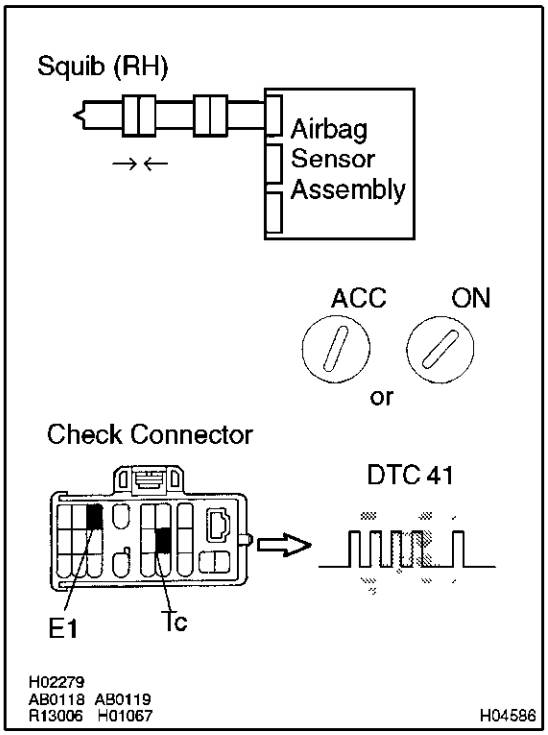
HINT:

Codes other than code 41 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 41 is not output.

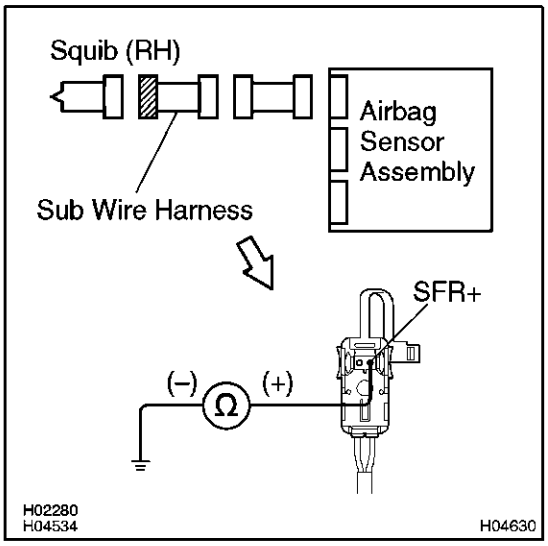
HINT:
Codes other than code 41 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

5	Check sub wire harness.



PREPARATION:
Disconnect the sub wire harness connector on the airbag sensor assembly side.

CHECK:
For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the resistance between SFR+ and body ground.

OK:

Resistance: 1MΩ or Higher

NG → **Repair or replace sub wire harness.**

OK →

Repair or replace harness or connector between airbag sensor assembly and sub wire harness.

DI33K-01

DTC	42	Short in Side Squib (RH) Circuit (to B+)

CIRCUIT DESCRIPTION

The side squib circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 42 is recorded when a B+ short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
42	• Short circuit in side squib (RH) wire harness (to B+) • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

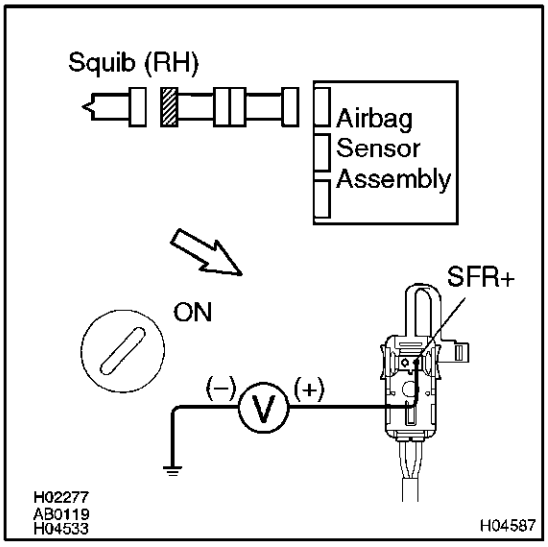
WIRING DIAGRAM

See page DI–212.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check side squib (RH) circuit.



CHECK:

(a) Turn ignition switch to ON

(b) For the connector (on the airbag sensor assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the voltage between the SFR+ and body ground.

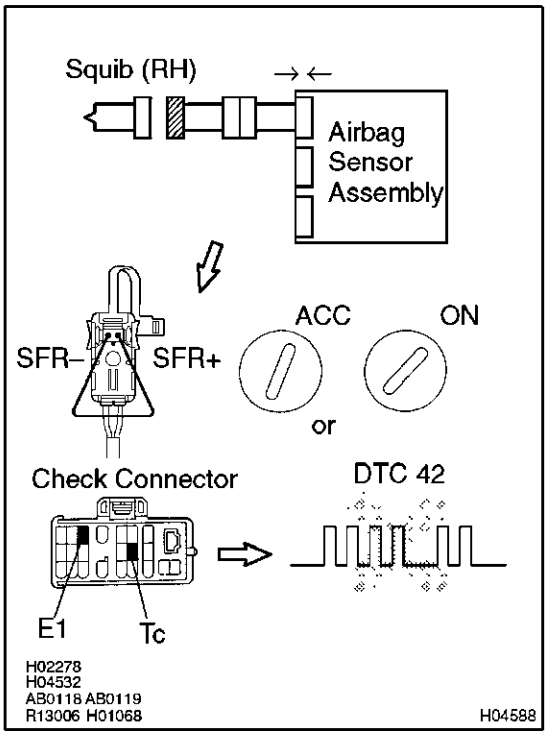
OK:

Voltage: 0 V

NG → **Go to step 5.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFR+ and SFR– of the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–152)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152)

OK:

DTC 42 is not output.

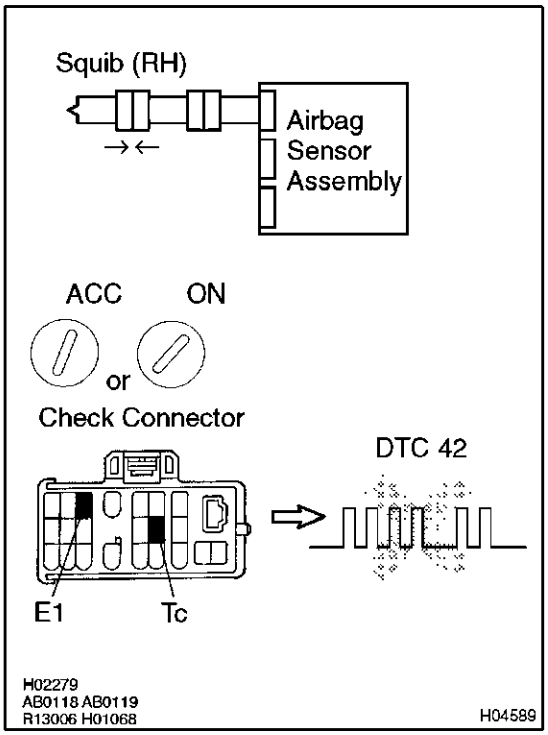
HINT:

Codes other than code 42 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 42 is not output.

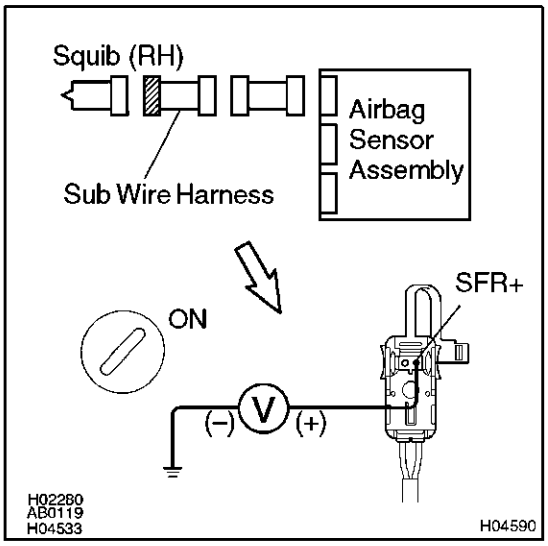
HINT:
Codes other than code 42 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

5	Check sub wire harness.



PREPARATION:
Disconnect the sub wire harness connector on the airbag sensor assembly side.

CHECK:
For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the voltage between SFR+ and body ground.

OK:

Voltage: 0 V

NG → **Repair or replace sub wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and sub wire harness.

DI33L-01

DTC	43	Short in Side Squib (RH) Circuit

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 43 is recorded when a short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
43	• Short circuit between SFR+ wire harness and SFR– wire harness of squib • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

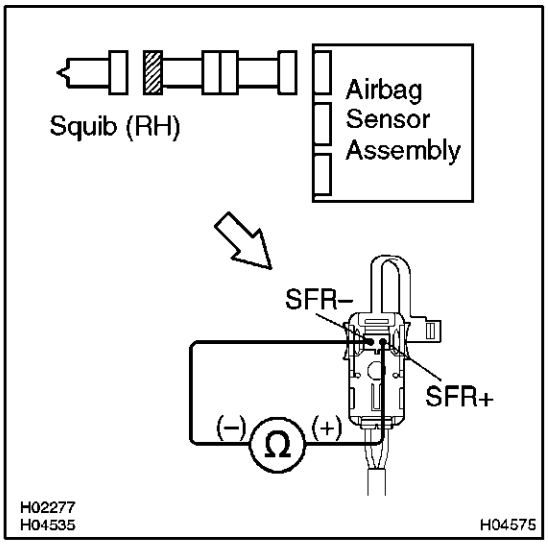
WIRING DIAGRAM

See page DI–212.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check side squib (RH) circuit.



PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the side airbag assembly (RH).
(See page DI–152)

CHECK:
For the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the resistance between SFR+ and SFR–.

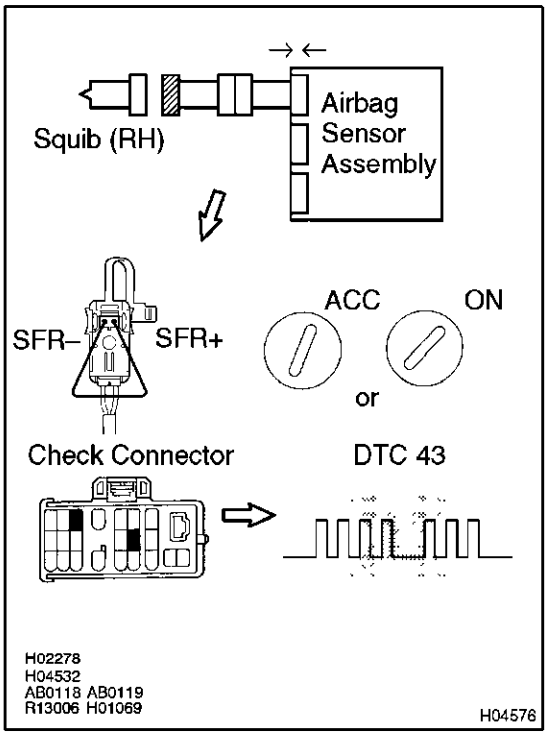
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect SFR+ and SFR– of the connector (on the side airbag assembly side) between the airbag sensor assembly and the side airbag assembly (RH).
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

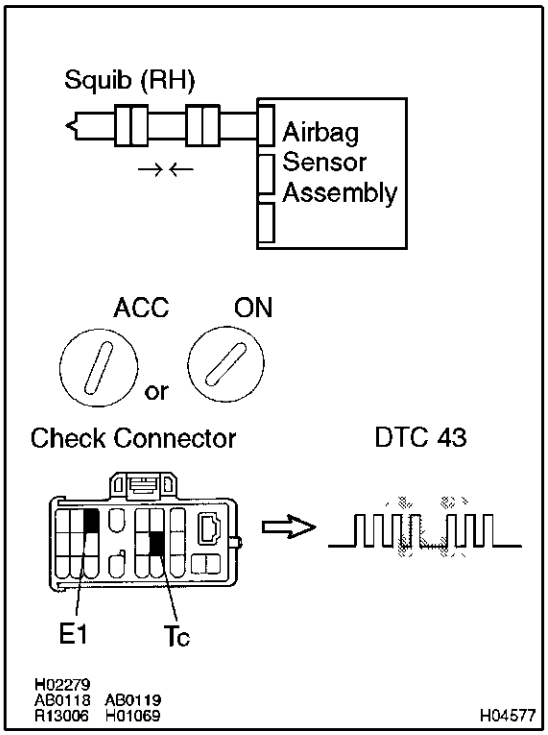
DTC 43 is not output.

HINT:
Codes other than code 43 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOOK, and wait at least for 20 second.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–152)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152)

OK:

DTC 43 is not output.

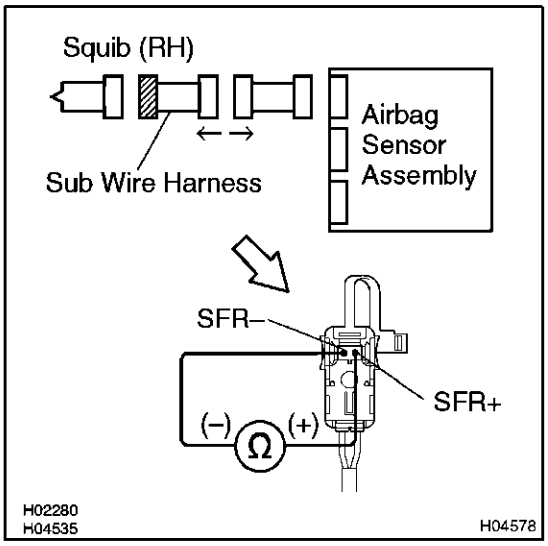
HINT:
Codes other than code 43 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check sub wire harness.



PREPARATION:

(a) Disconnect sub wire harness connector on the airbag sensor assembly side.

(b) Release airbag activation prevention mechanism of the sub wire harness connector on the airbag sensor assembly side. (See page DI–152)

CHECK:

For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the resistance between SFR+ and SFR–.

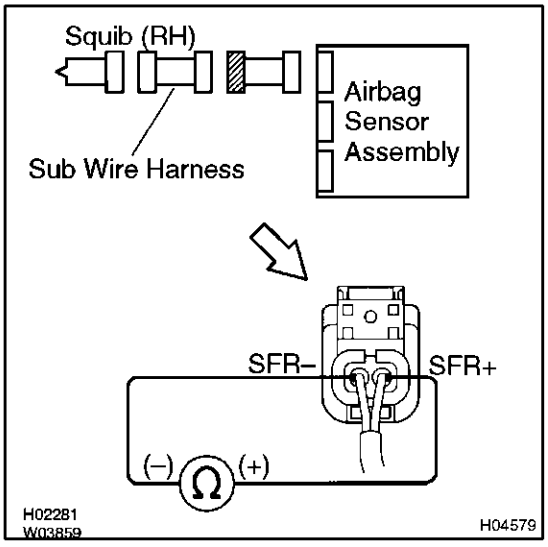
OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace sub wire harness.

OK

6	Check harness between airbag sensor assembly and sub wire harness.



PREPARATION:

Release airbag activation prevention mechanism of the airbag sensor assembly connector. (See page DI–152)

CHECK:

For the connector (on the sub wire harness side) between the airbag sensor assembly and sub wire harness, measure the resistance between SFR+ and SFR–.

OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace harness or connector between airbag sensor assembly and sub wire harness.

OK

For the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33M–01

DTC	44	Open in Side Squib (RH) Circuit

CIRCUIT DESCRIPTION

The side squib circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 44 is recorded when an open is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
44	• Open circuit in SFR+ wire harness or SFR– wire harness of squib • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

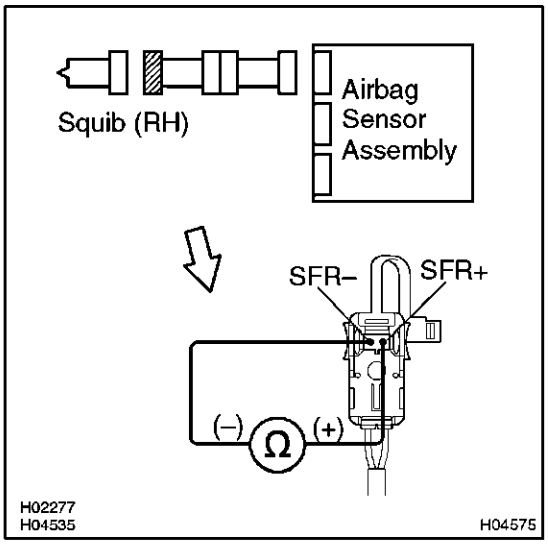
WIRING DIAGRAM

See page DI–212.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check side squib (RH) circuit.



CHECK:
For the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the resistance between SFR+ and SFR–.

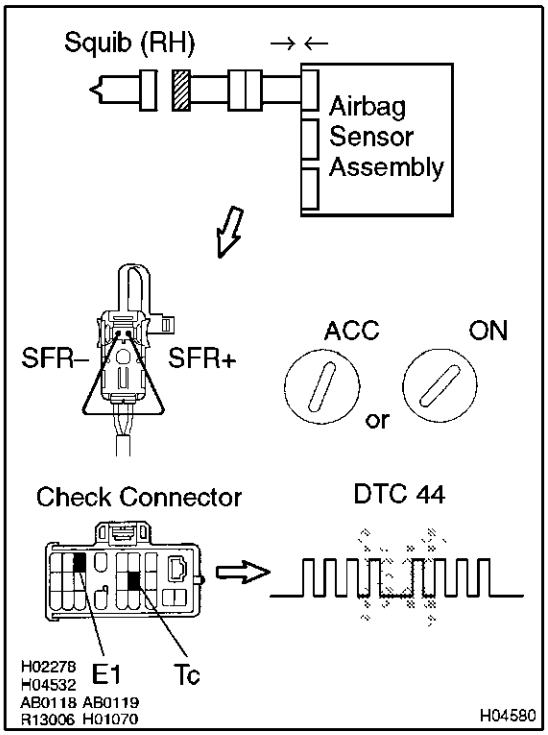
OK:

Resistance: Below 1 Ω

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect SFR+ and SFR– of the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

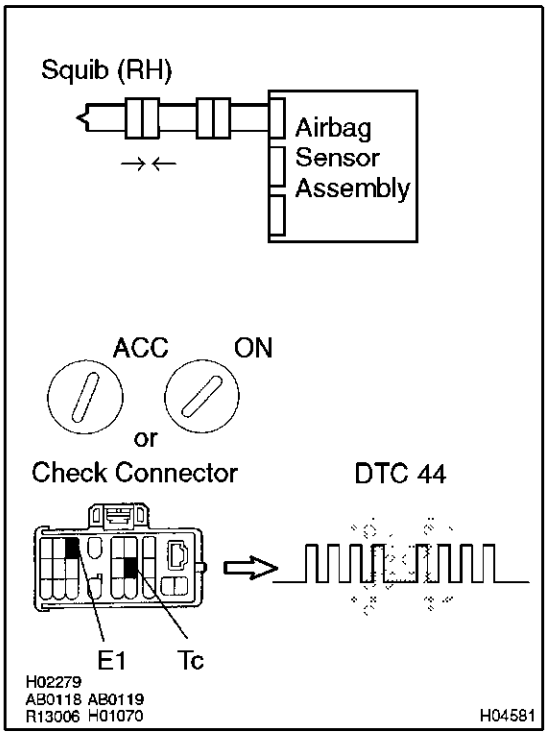
DTC 44 is not output.

HINT:
Codes other than code 44 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 44 is not output.

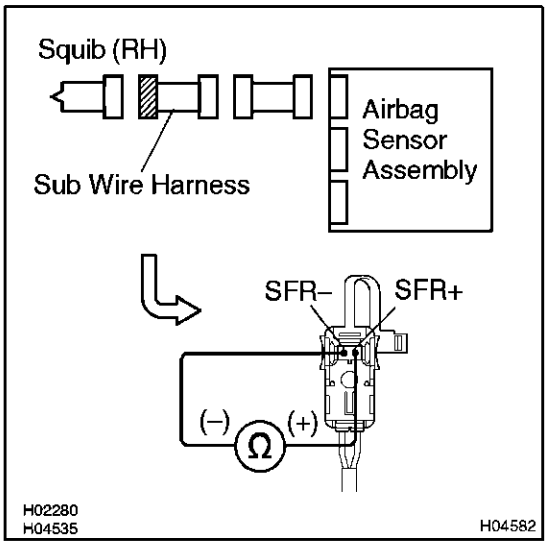
HINT:
Codes other than code 44 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check sub wire harness.



PREPARATION:
Disconnect the sub wire harness connector on the airbag sensor assembly side.

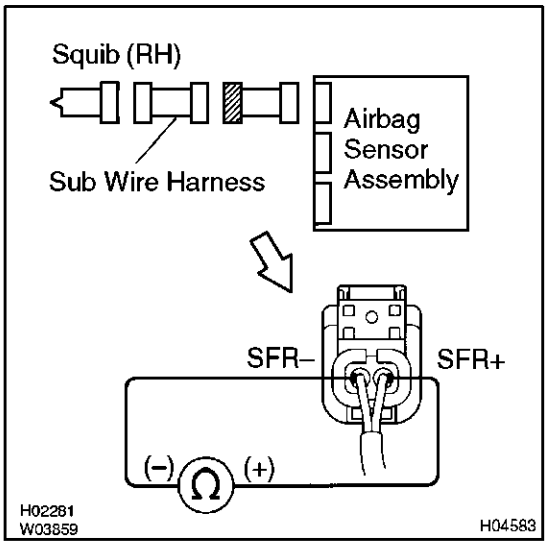
CHECK:
For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the resistance between SFR+ and SFR–.

OK:
Resistance: Below 1 Ω

NG	Repair or replace sub wire harness.

OK

6	Check harness between airbag sensor assembly and sub wire harness.



CHECK:
For the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the sub wire harness, measure the resistance SFR+ and SFR–.

OK:
Resistance: Below 1 Ω

NG	Repair or replace harness or connector between airbag sensor assembly and sub wire harness.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33N–01

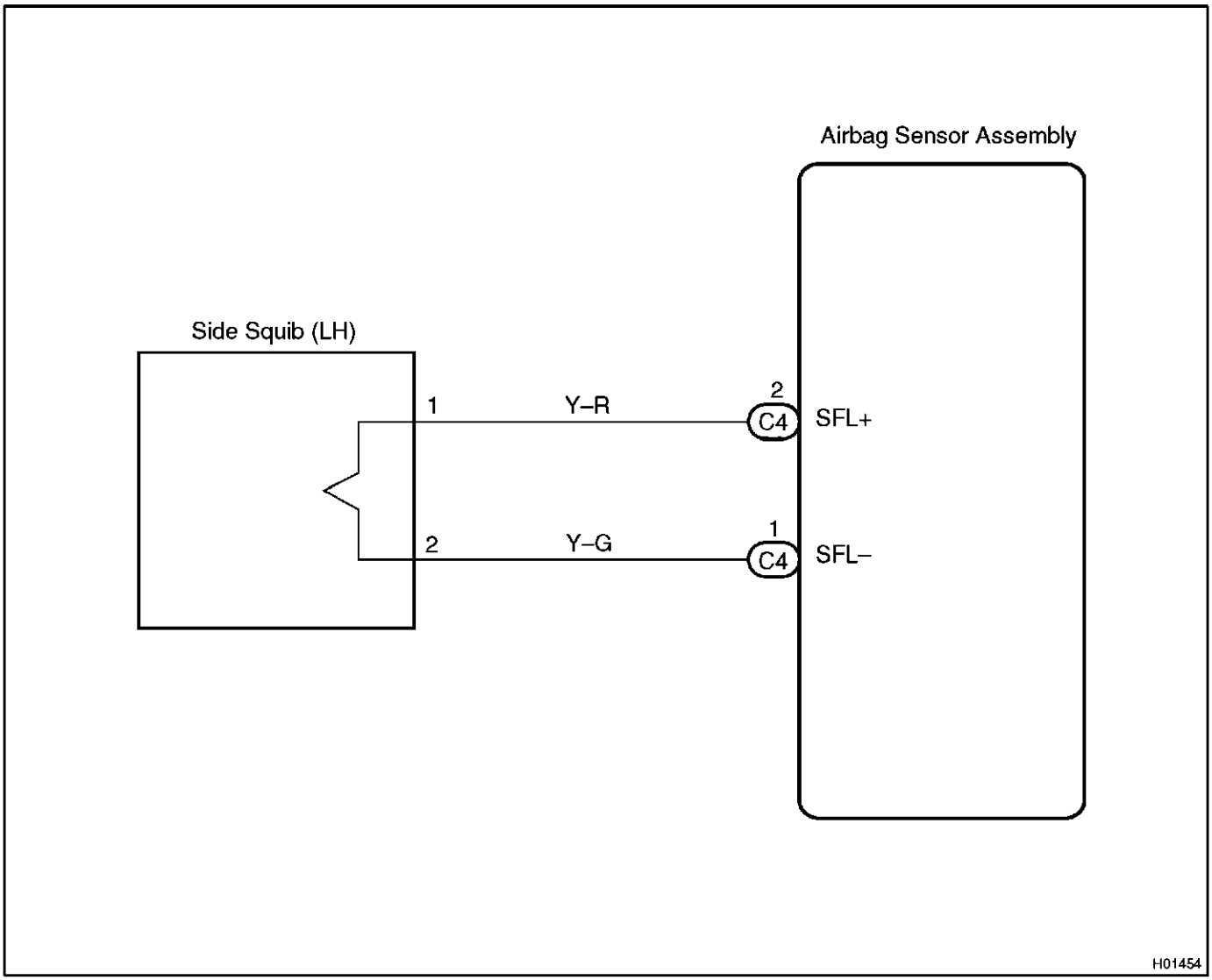
DTC	45	Short in Side Squib (LH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The side squib circuit consists of the airbag sensor assembly and side airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 45 is recorded when ground short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
45	• Short circuit in side squib (LH) wire harness (to ground) • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

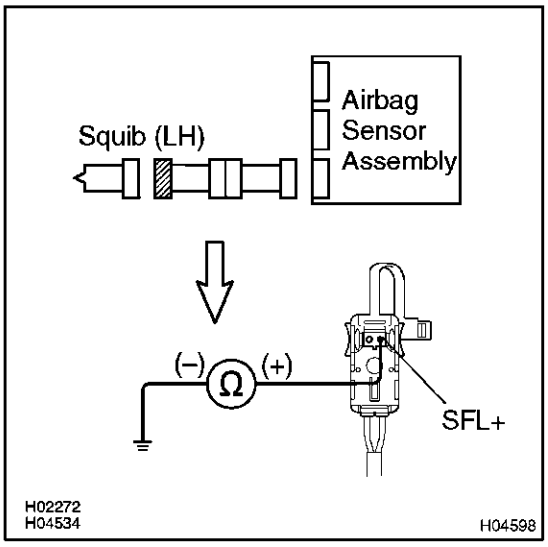
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check side squib (LH) circuit.**



CHECK:

For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the resistance between SFL+ and body ground.

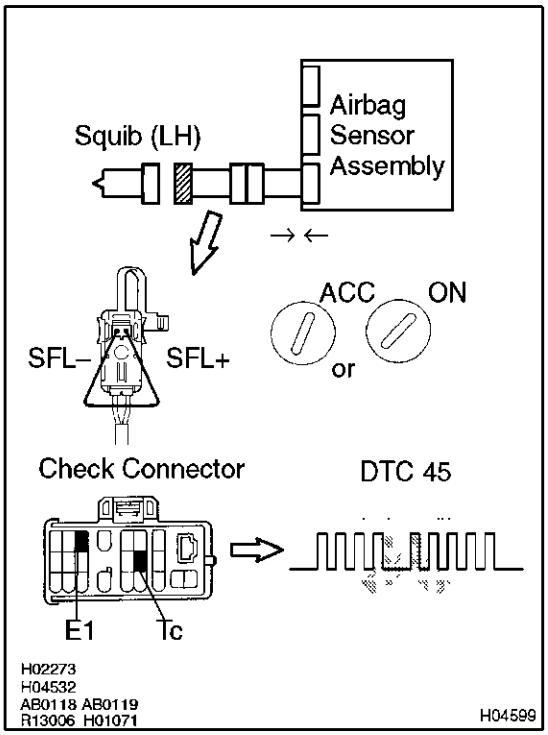
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side airbag assembly (LH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFL+ and SFL– of the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–152)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152)

OK:

DTC 45 is not output.

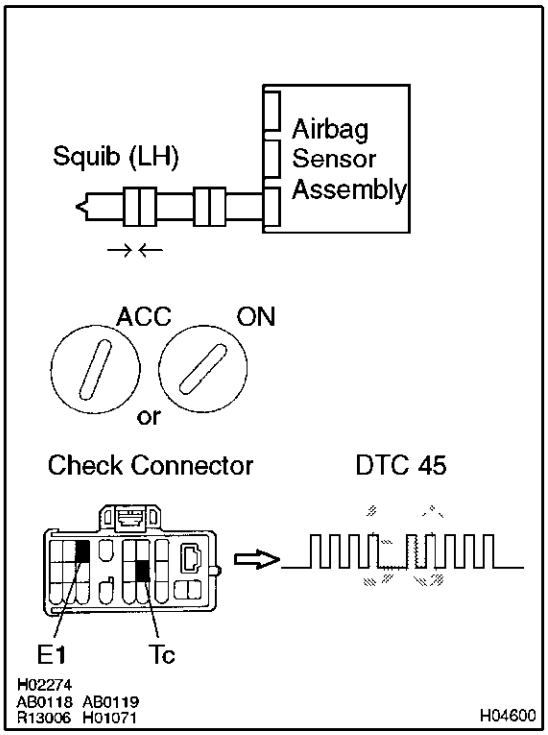
HINT:

Codes other than code 45 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 45 is not output.

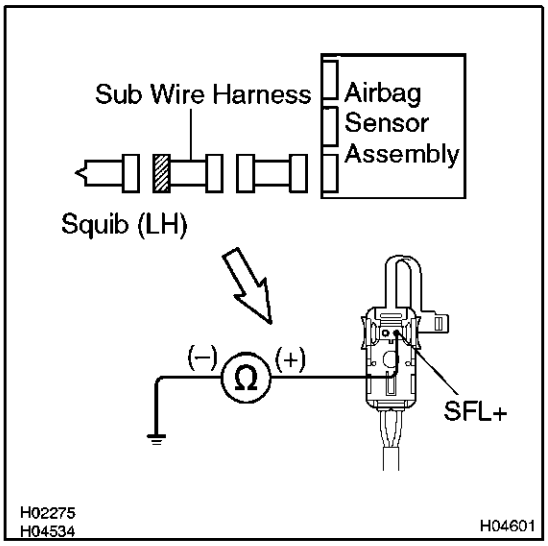
HINT:
Codes other than code 45 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

5	Check sub wire harness.



PREPARATION:

Disconnect the sub wire harness connector on the airbag sensor assembly side.

CHECK:

For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the resistance between SFL+ and body ground.

OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace sub wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and sub wire harness.

DI33O–01

DTC	46	Short in Side Squib (LH) Circuit (to B+)

CIRCUIT DESCRIPTION

The side squib circuit consists of the airbag sensor assembly and side airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 46 is recorded when a B+ short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
46	• Short circuit in side squib (LH) wire harness (to B+) • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

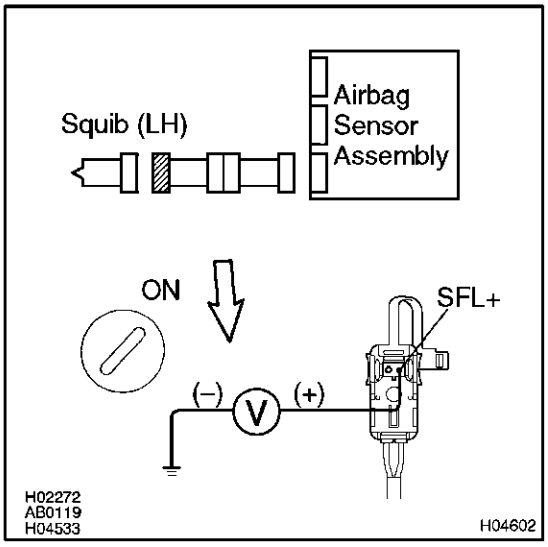
WIRING DIAGRAM

See page DI–229.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check side squib (LH) circuit.



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the voltage between SFL+ and body ground.

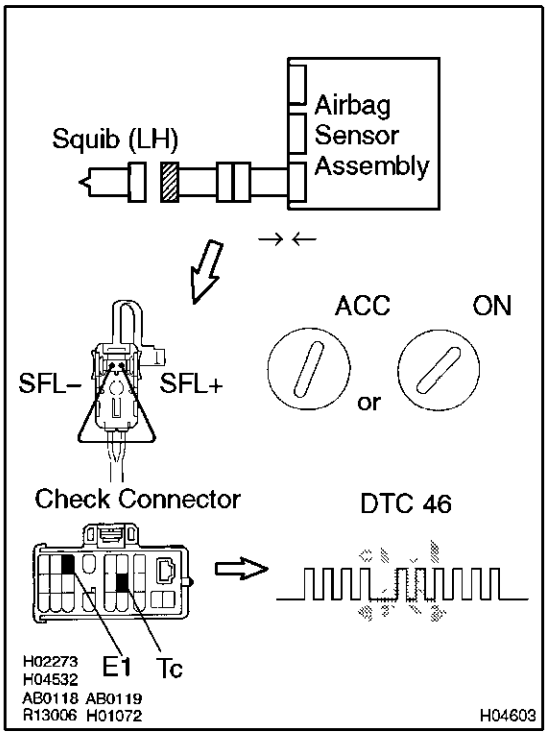
OK:

Voltage: 0 V

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFL+ and SFL– of the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–152)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152)

OK:

DTC 46 is not output.

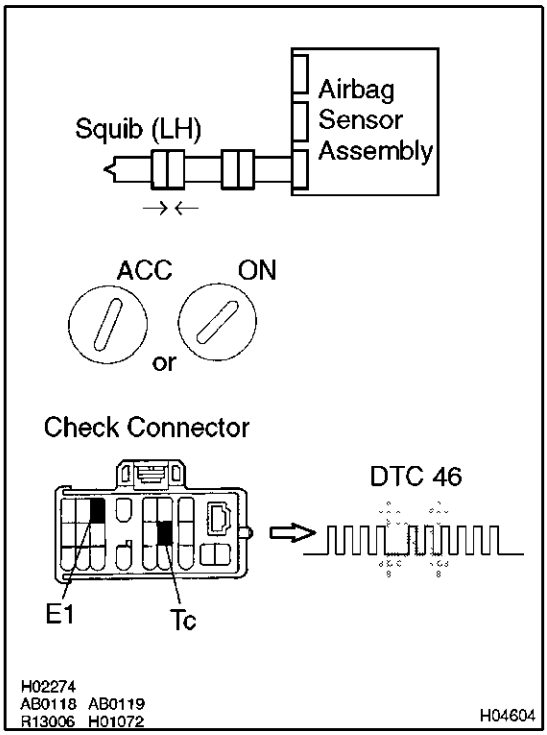
HINT:

Codes other than code 46 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 46 is not output.

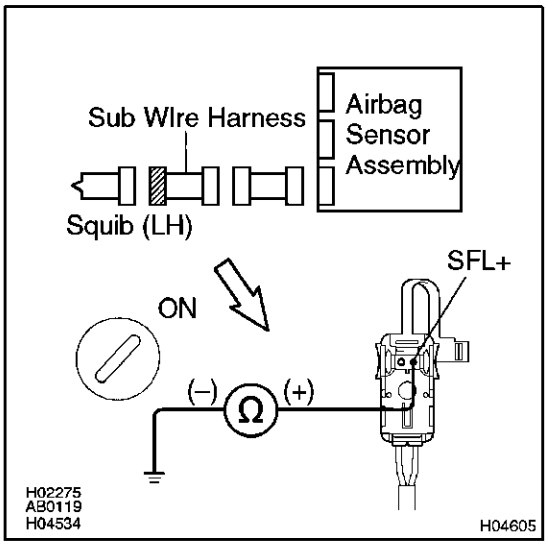
HINT:
Codes other than code 46 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

5	Check sub wire harness.



PREPARATION:

Disconnect the sub wire harness connector on the airbag sensor assembly side.

CHECK:

For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the resistance between SFL+ and body ground.

OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace sub wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and sub wire harness.

DI33P–01

DTC	47	Short in Side Squib (LH) Circuit

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assembly and side airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 47 is recorded when a short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
47	• Short circuit between SFL+ wire harness and SFL– wire harness of squib • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

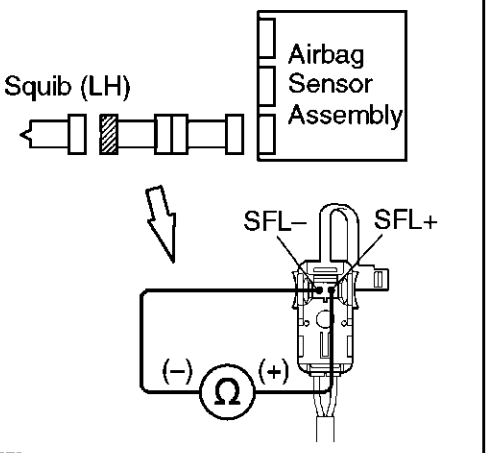
WIRING DIAGRAM

See page DI–229.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check side squib (LH) circuit.



PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the side airbag assembly (LH).
(See page DI–152)

CHECK:
For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the resistance between SFL+ and SFL–.

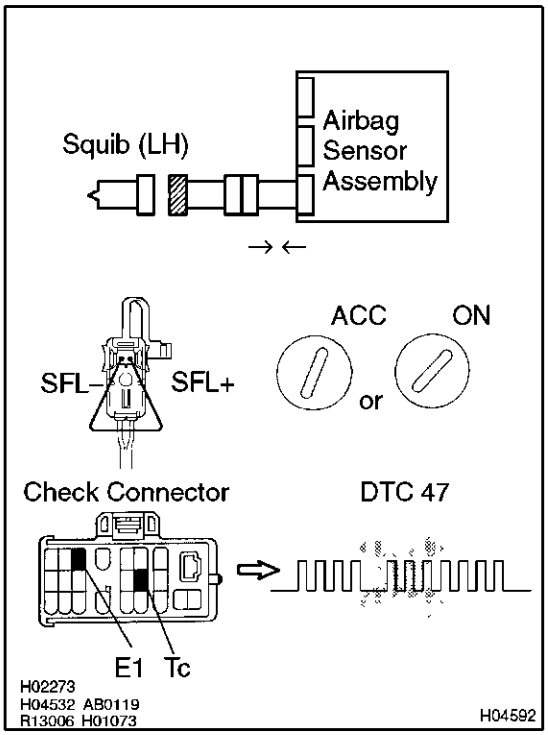
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect SFL+ and SFL– of the connector (on the side airbag assembly side) between the airbag sensor assembly and the side airbag assembly (LH).
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

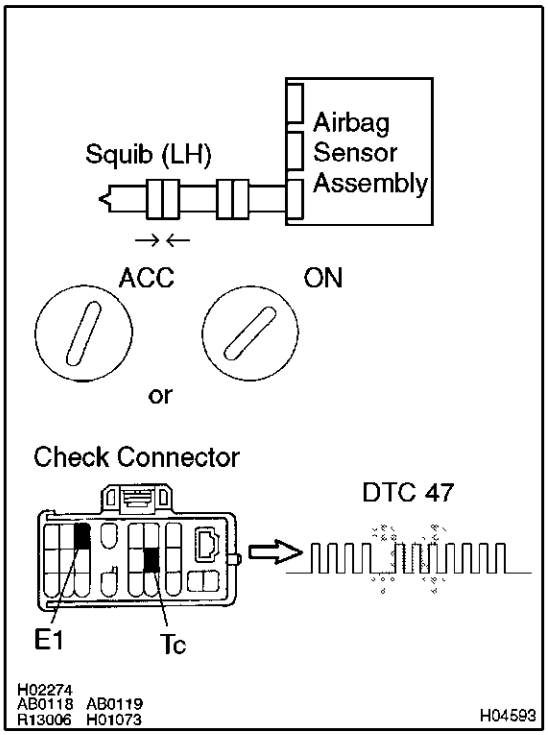
DTC 47 is not output.

HINT:
Codes other than code 47 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOOK, and wait at least for 20 second.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–152)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152)

OK:

DTC 47 is not output.

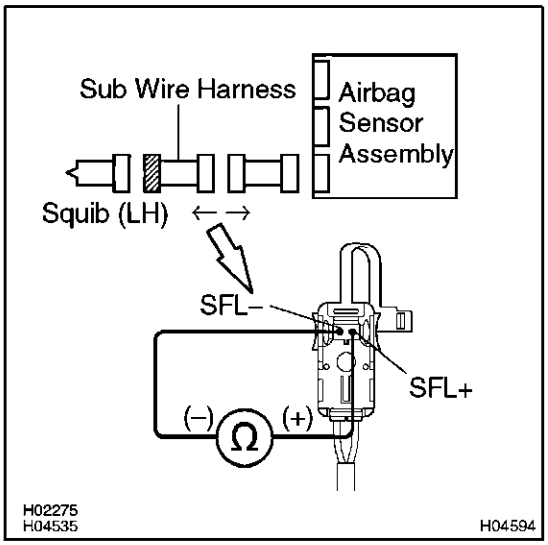
HINT:
Codes other than code 47 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check sub wire harness.



PREPARATION:

(a) Disconnect sub wire harness connector on the airbag sensor assembly side.

(b) Release airbag activation prevention mechanism of the sub wire harness connector on the airbag sensor assembly side. (See page DI–152)

CHECK:

For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the resistance between SFL+ and SFL–.

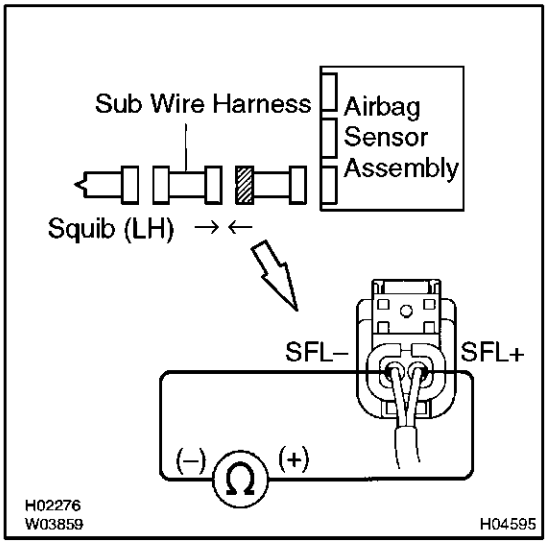
OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace sub wire harness.

OK

6	Check harness between airbag sensor assembly and sub wire harness.



PREPARATION:

Release airbag activation prevention mechanism of the airbag sensor assembly connector. (See page DI–152)

CHECK:

For the connector (on the sub wire harness side) between the airbag sensor assembly and sub wire harness, measure the resistance between SFL+ and SFL–.

OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace harness or connector between airbag sensor assembly and sub wire harness.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33Q–01

DTC	48	Open in Side Squib (LH) Circuit

CIRCUIT DESCRIPTION

The side squib circuit consists of the airbag sensor assembly and side airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page DI–152.
DTC 48 is recorded when an open is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
48	• Open circuit in SFL+ wire harness or SFL– wire harness of squib • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

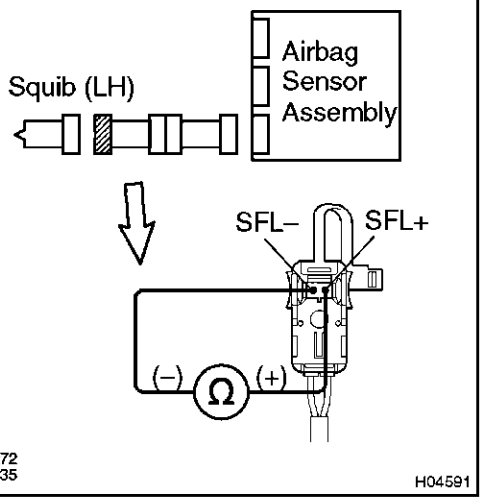
WIRING DIAGRAM

See page DI–229.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check side squib (LH) circuit.

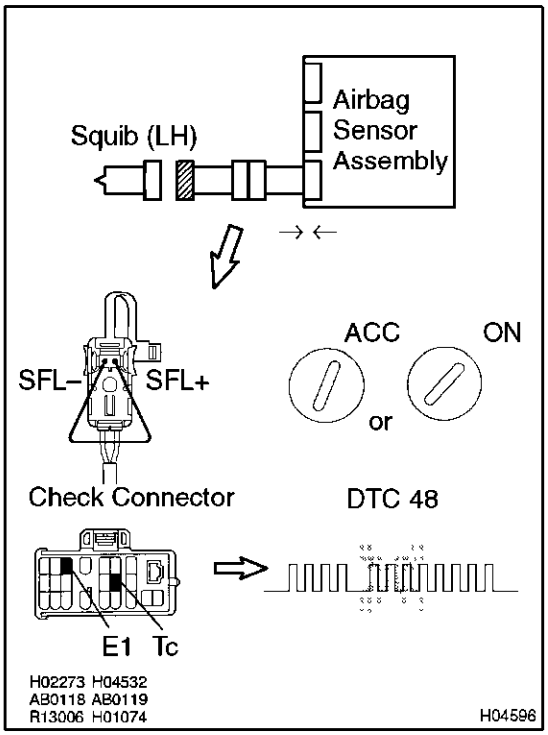


CHECK:
For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the resistance between SFL+ and SFL–.
OK:
Resistance: Below 1 Ω

NG → **Go to step 5.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFL+ and SFL– of the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See page DI–152)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152)

OK:

DTC 48 is not output.

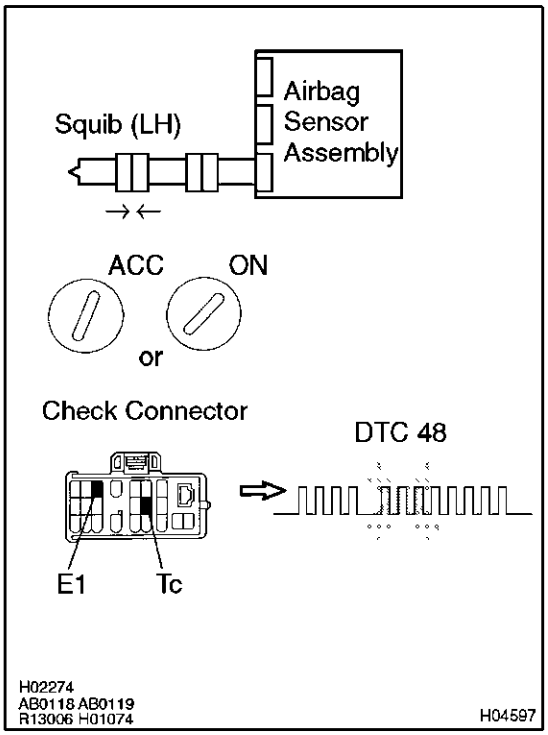
HINT:

Codes other than code 48 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 48 is not output.

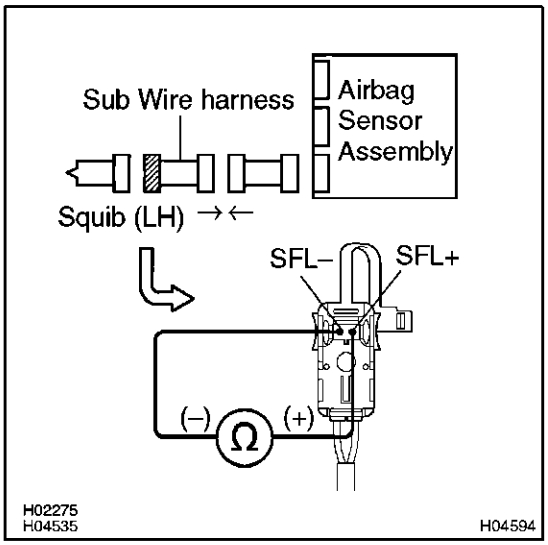
HINT:
Codes other than code 48 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check sub wire harness.



PREPARATION:
Disconnect the sub wire harness connector on the airbag sensor assembly side.

CHECK:
For the connector (on the sub wire harness side) between the side airbag assembly and the sub wire harness, measure the resistance between SFL+ and SFL–.

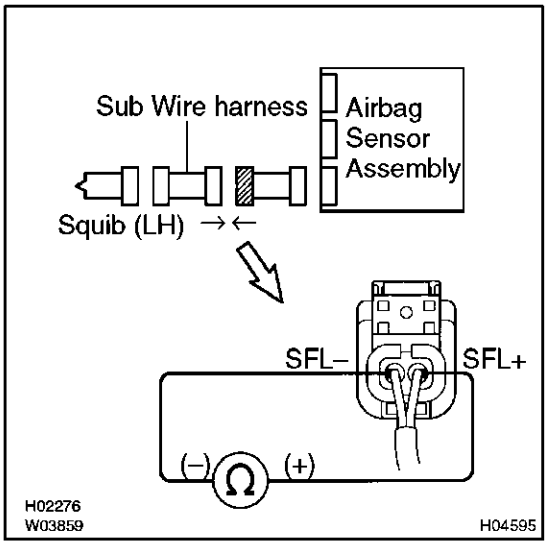
OK:

Resistance: Below 1 Ω

NG → **Repair or replace sub wire harness.**

OK

6	Check harness between airbag sensor assembly and sub wire harness.



CHECK:
For the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the sub wire harness, measure the resistance between SFL+ and SFL–.

OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between airbag sensor assembly and sub wire harness.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33R–01

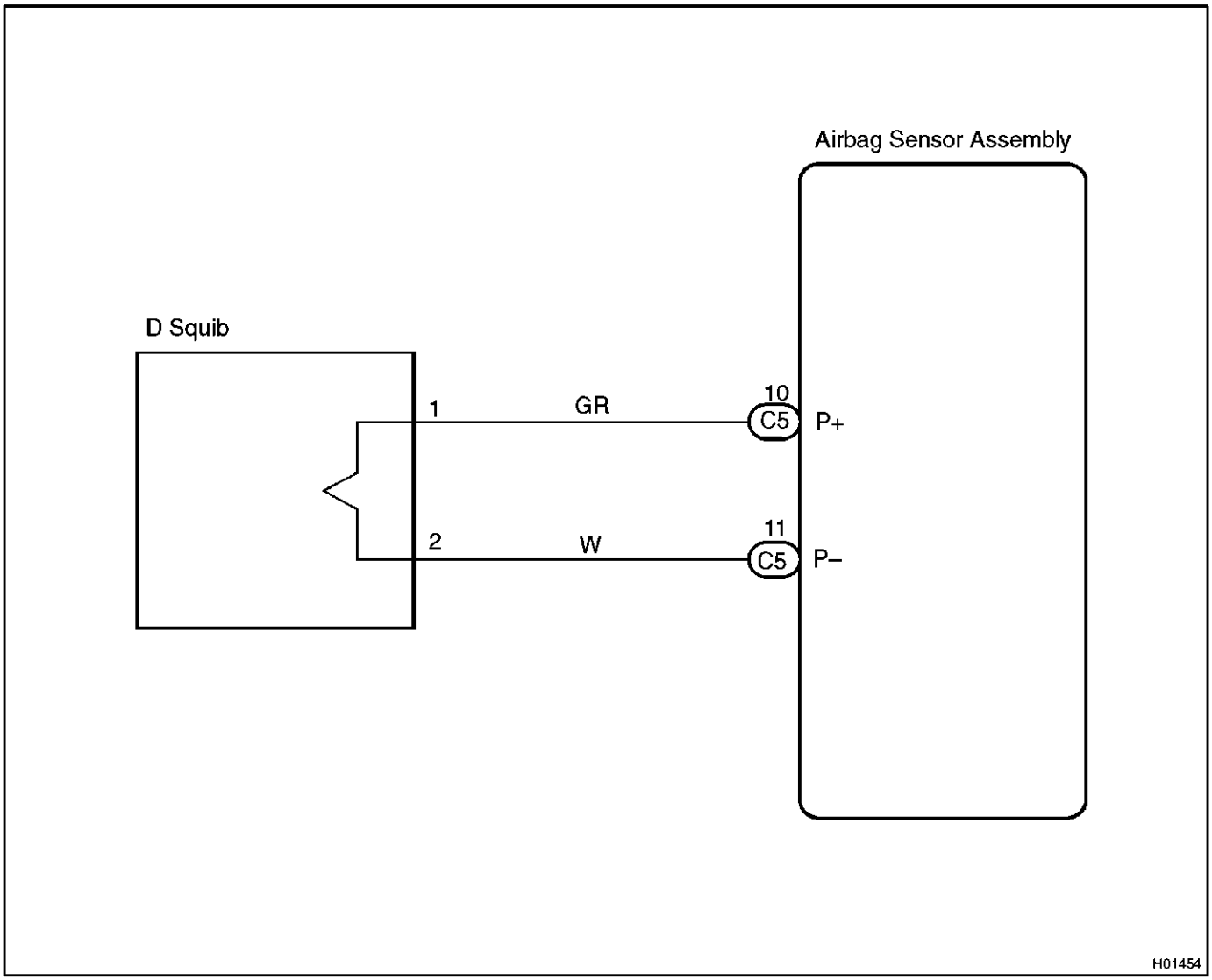
DTC	51	Short in P Squib Circuit (to Ground)

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 51 is recorded when ground short is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
51	• Short circuit in P squib wire harness (to ground) • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

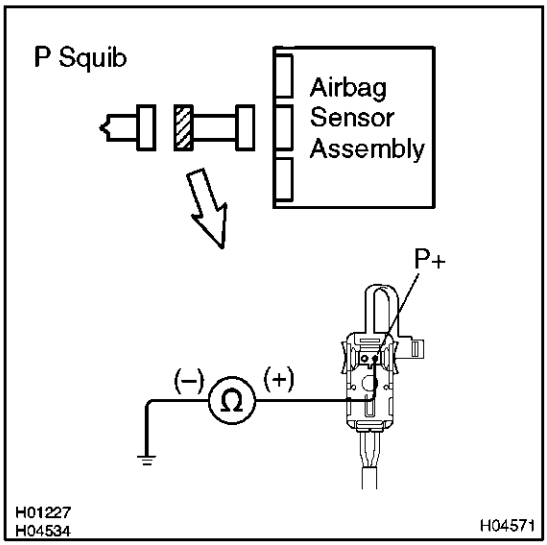
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check P squib circuit.**



CHECK:

For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly, measure the resistance between P+ and body ground.

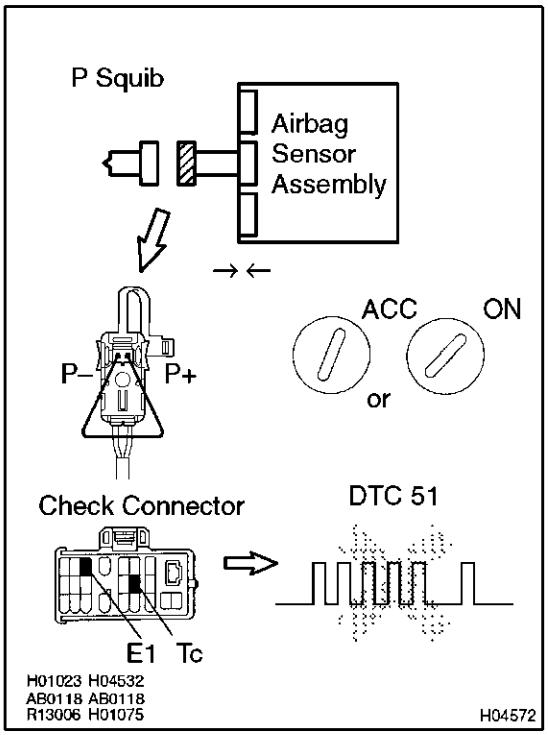
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect P+ and P– of the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–152)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152)

OK:

DTC 51 is not output.

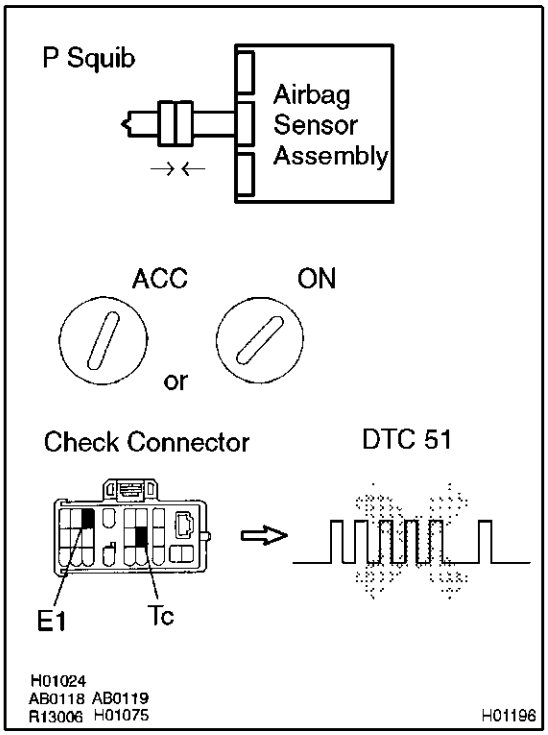
HINT:

Codes other than code 51 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See stpe 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 51 is not output.

HINT:
Codes other than code 51 may be output at this time, but they are not relevant to this check.

NG → **Replace front passenger airbag assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI33S-01

DTC	52	Short in P Squib Circuit (to B+)

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 52 is recorded when a B+ short is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
52	• Short circuit in P squib wire harness (to B+) • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

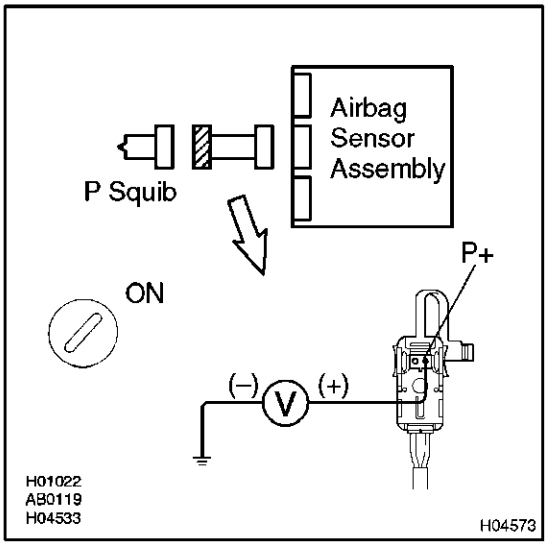
WIRING DIAGRAM

See page DI–246.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P squib circuit.



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly, measure the voltage between P+ and body ground.

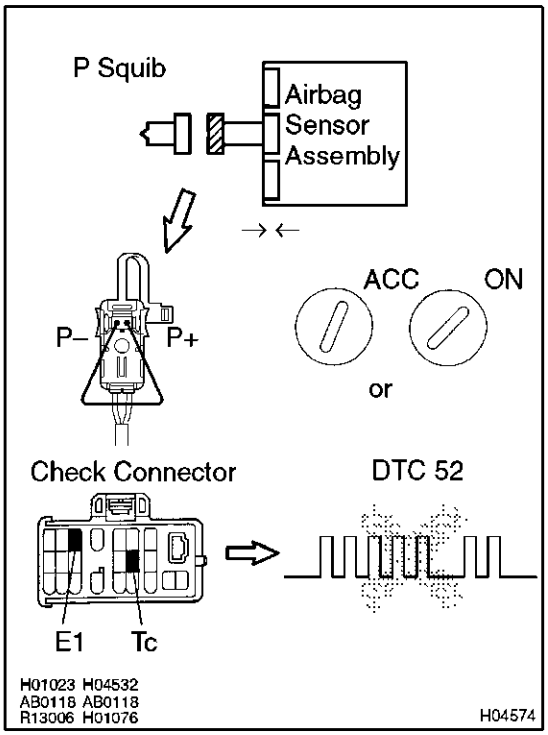
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect P+ and P– of the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

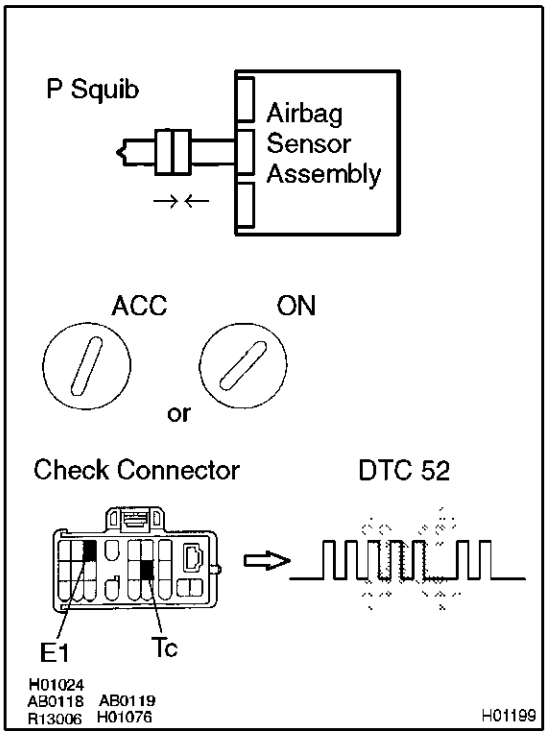
DTC 52 is not output.

HINT:
Codes other than code 52 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 52 is not output.

HINT:
Codes other than code 52 may be output at this time, but they are not relevant to this check.

NG → **Replace front passenger airbag assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI33T-01

DTC	53	Short in P Squib Circuit

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 53 is recorded when a short is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
53	• Short circuit in P squib wire harness • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

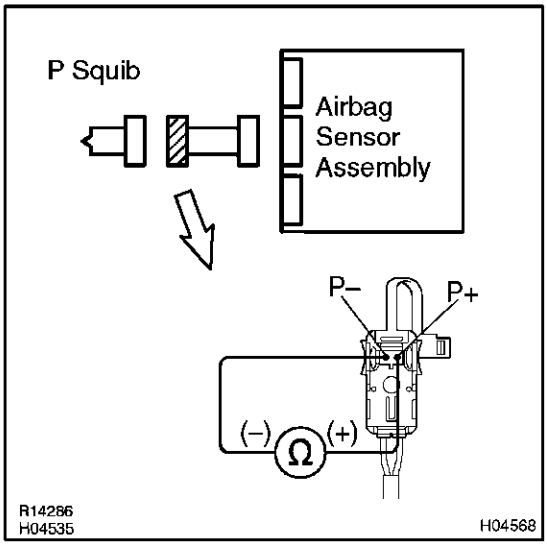
WIRING DIAGRAM

See page DI–246.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P squib circuit.



PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the front passenger airbag assembly and the airbag sensor assembly. (See page DI–152)

CHECK:
For the connector (on the front passenger airbag assembly side) between the airbag sensor assembly and the front passenger airbag assembly, measure the resistance between P+ and P–.

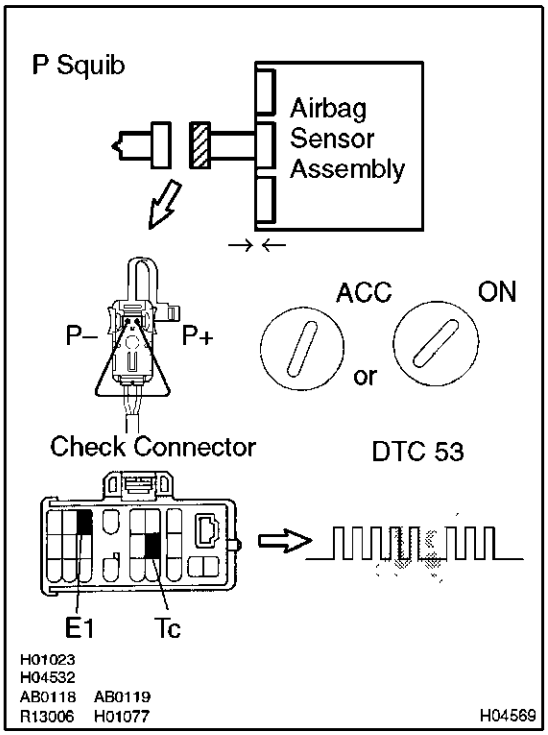
OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect P+ and P– of the connector (on the front passenger airbag assembly side) between the airbag sensor assembly and the front passenger airbag assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

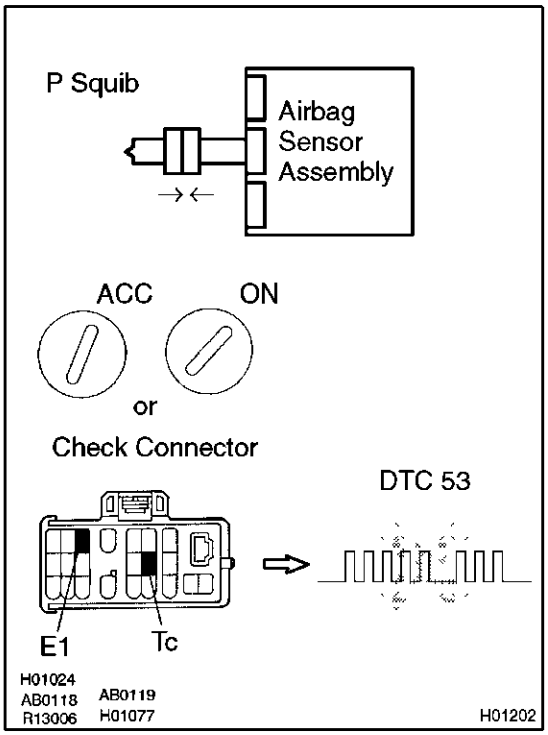
DTC 53 is not output.

HINT:
Codes other than code 53 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOOK, and wait at least for 20 seconds.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–152)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152)

OK:

DTC 53 is not output.

HINT:

Codes other than code 53 may be output at this time, but they are not relevant to this check.

NG → **Replace front passenger airbag assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33U-01

DTC	54	Open in P Squib Circuit

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 54 is recorded when an open is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
54	• Open circuit in P squib wire harness or P– wire harness of squib • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

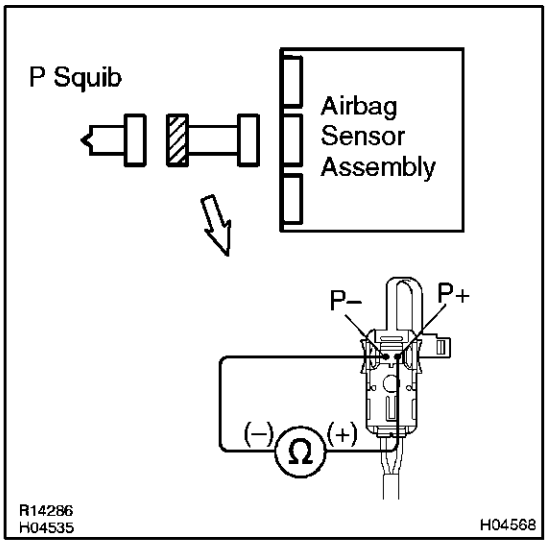
WIRING DIAGRAM

See page DI–246.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P squib circuit.



CHECK:
For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly, measure the resistance between P+ and P–.

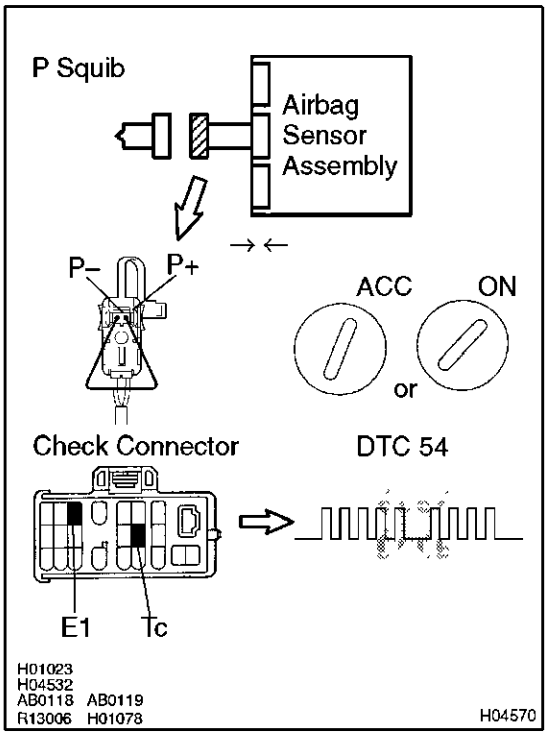
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect P+ and P– of the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

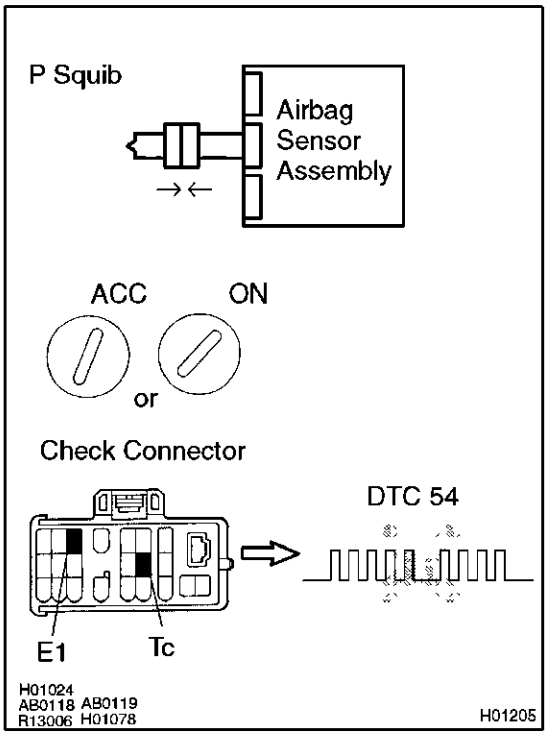
DTC 54 is not output.

HINT:
Codes other than code 54 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P squib.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 54 is not output.

HINT:
Codes other than code 54 may be output at this time, but they are not relevant to this check.

NG → **Replace front passenger airbag assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33V–01

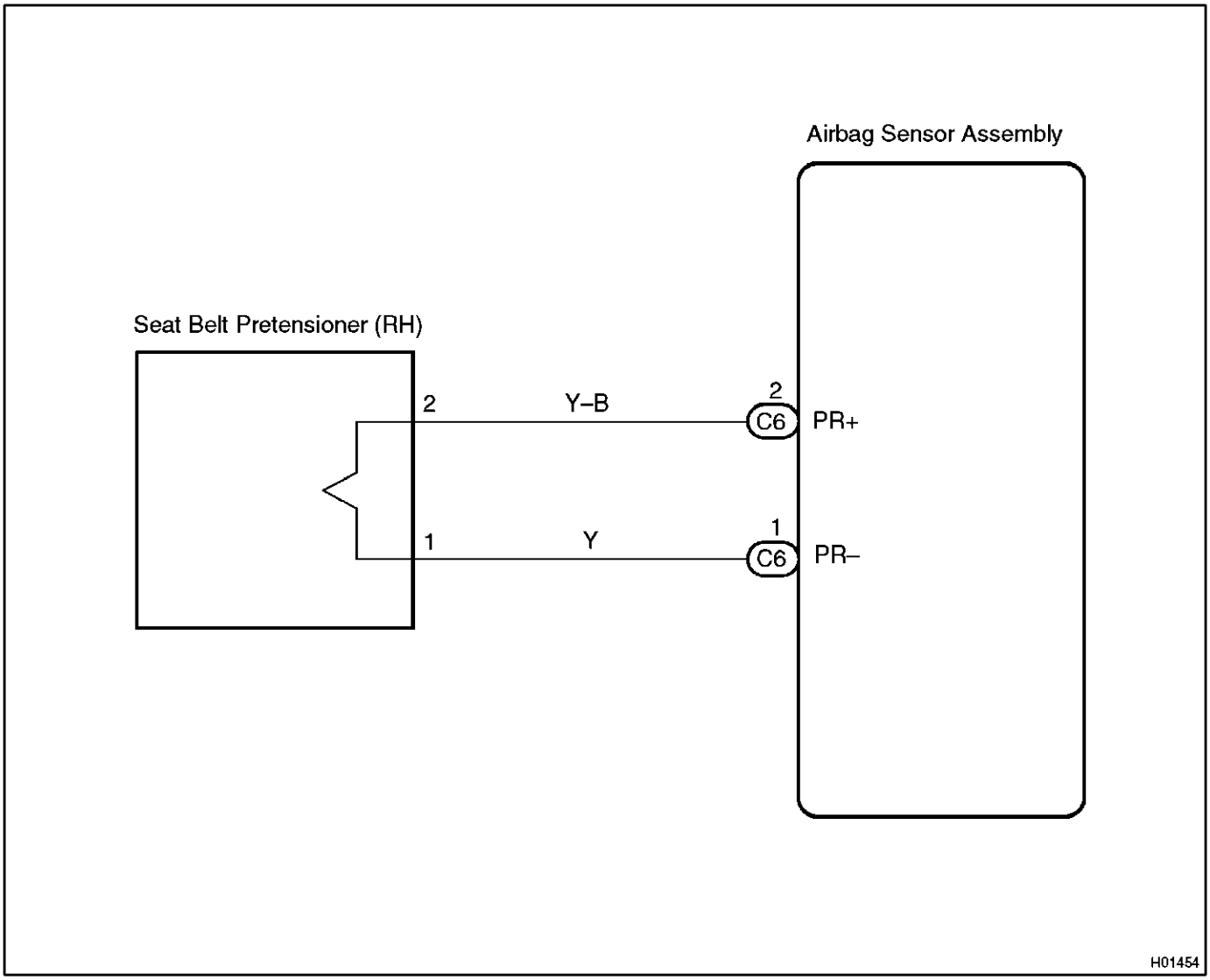
DTC	61	Short in P/T Squib (RH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the seat belt pretensioner (RH) to activate when the seat belt pretensioner (RH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 61 is recorded when ground short is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
61	• Short circuit in P/T squib (RH) wire harness (to ground) • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

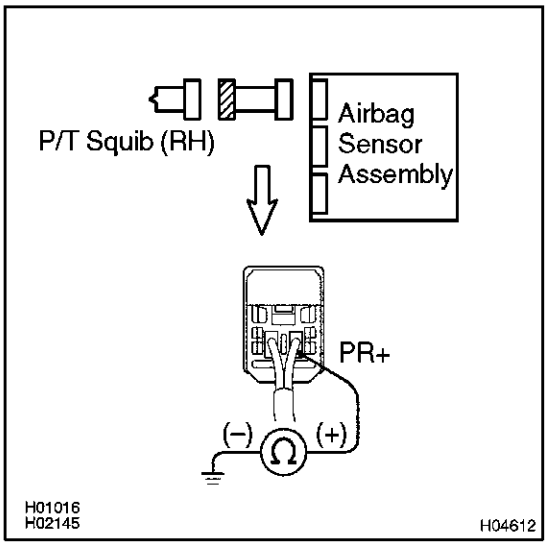
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check P/T squib (RH) circuit.**



CHECK:

For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the resistance between PR+ and body ground.

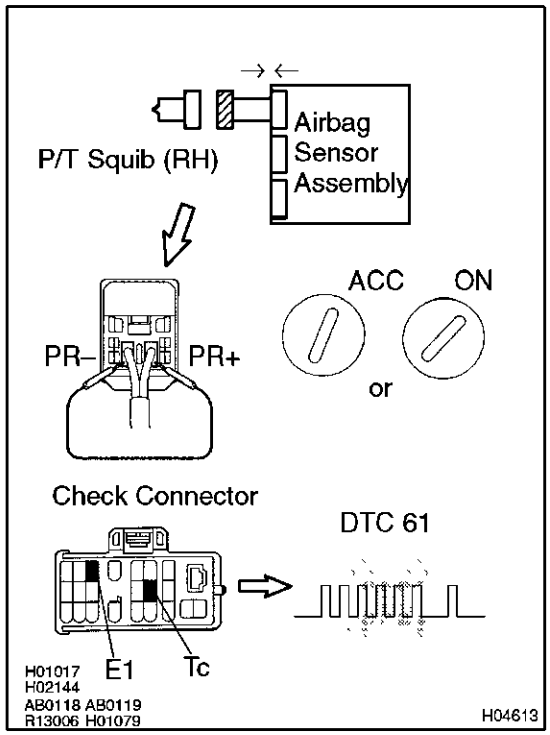
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(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 assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

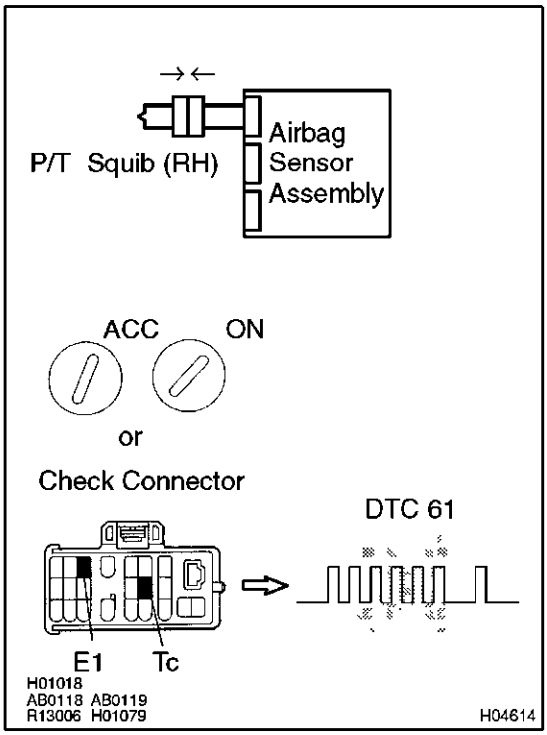
DTC 61 is not output.

HINT:
Codes other than code 61 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 61 is not output.

HINT:
Codes other than code 61 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI33W–01

DTC	62	Short in P/T Squib (RH) Circuit (to B+)

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the seat belt pretensioner (RH) to activate when the seat belt pretensioner (RH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 62 is recorded when a B+ short is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
62	• Short circuit in seat belt pretensioner (RH) wire harness (to B+) • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

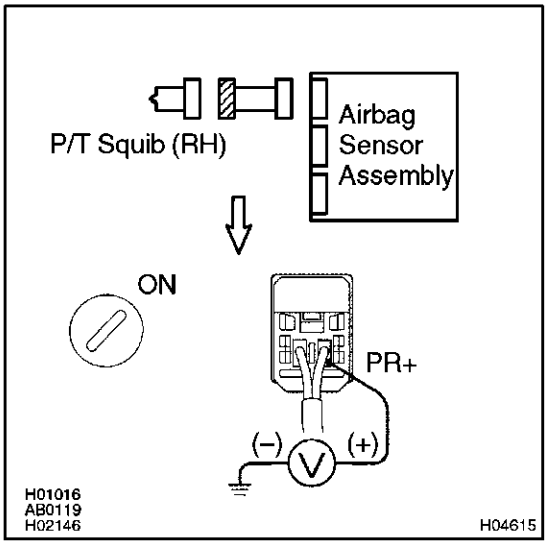
WIRING DIAGRAM

See page DI–259.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P/T squib (RH) circuit.



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the voltage between PR+ and body ground.

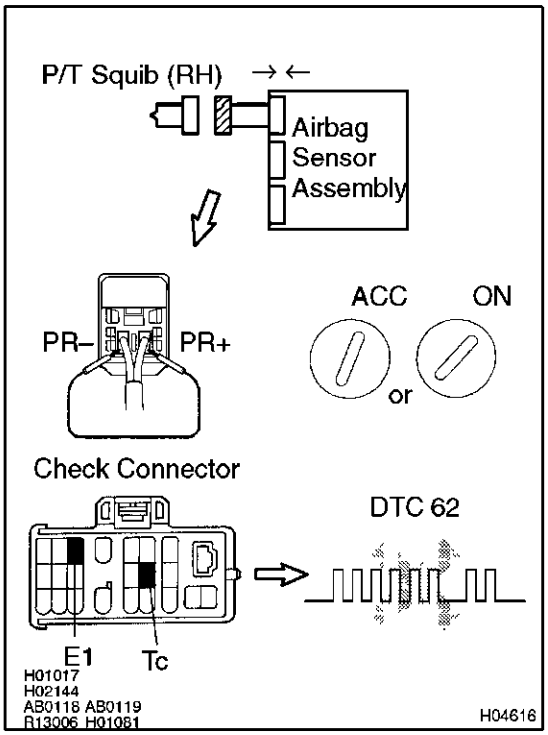
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(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 assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

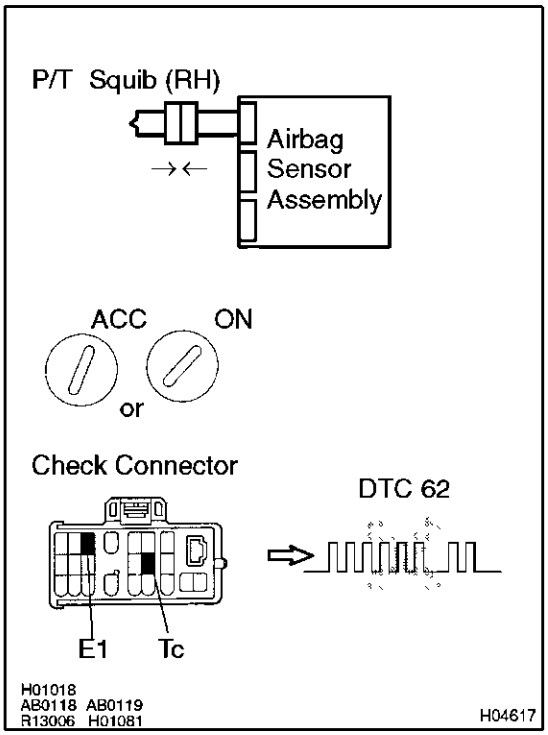
DTC 62 is not output.

HINT:
Codes other than code 62 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 62 is not output.

HINT:
Codes other than code 62 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI33X-01

DTC	63	Short in P/T Squib (RH) Circuit

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the seat belt pretensioner (RH) to activate when the seat belt pretensioner (RH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 63 is recorded when a short is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
63	• Short circuit between PR+ wire harness and PR– wire harness of squib • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

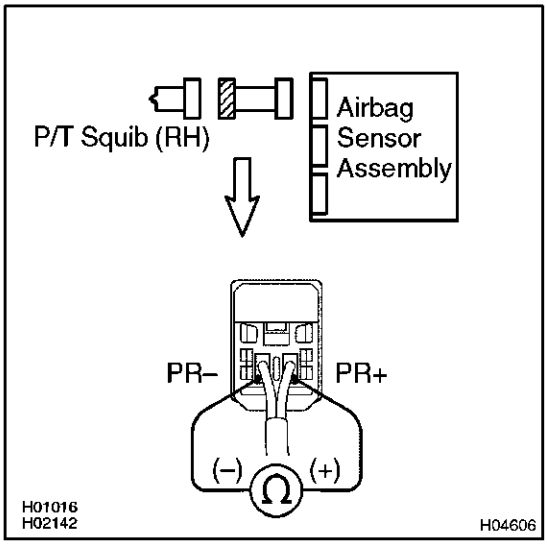
WIRING DIAGRAM

See page DI–259.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P/T squib (RH) circuit.



PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the seat belt pretensioner (RH).
(See page DI–152)

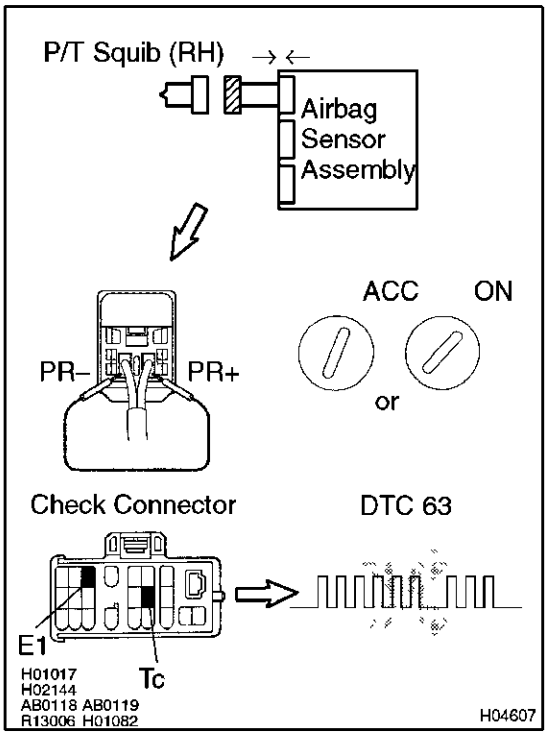
CHECK:
For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the resistance between PR+ and PR–.

OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect PR+ and PR– of the connector (on the seat belt pretensioner side) between the airbag sensor assembly and the seat belt pretensioner (RH).
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

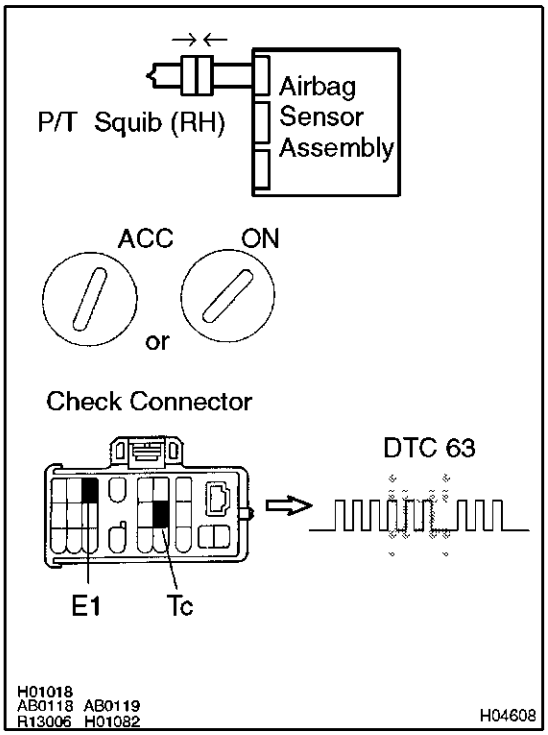
DTC 63 is not output.

HINT:
Codes other than code 63 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOOK, and wait at least for 20 second.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–152)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152)

OK:

DTC 63 is not output.

HINT:
Codes other than code 63 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33Y-01

DTC	64	Open in P/T Squib (RH) Circuit

CIRCUIT DESCRIPTION

The P/T squib circuit (RH) consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the seat belt pretensioner (RH) to activate when the seat belt pretensioner (RH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 64 is recorded when an open is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
64	• Open circuit in PR+ wire harness or PR– wire harness of squib • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

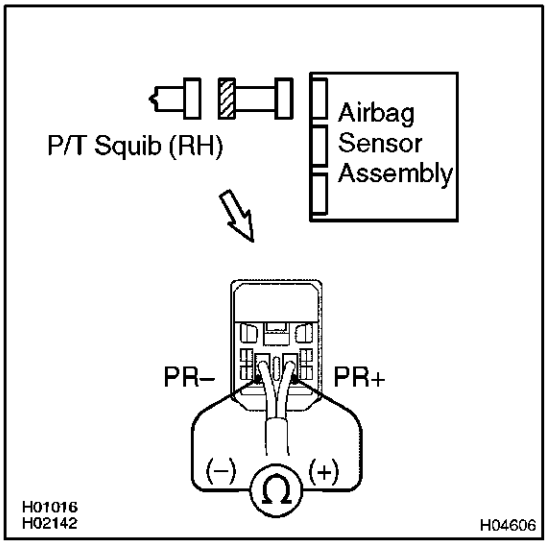
WIRING DIAGRAM

See page DI–259.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P/T squib (RH) circuit.

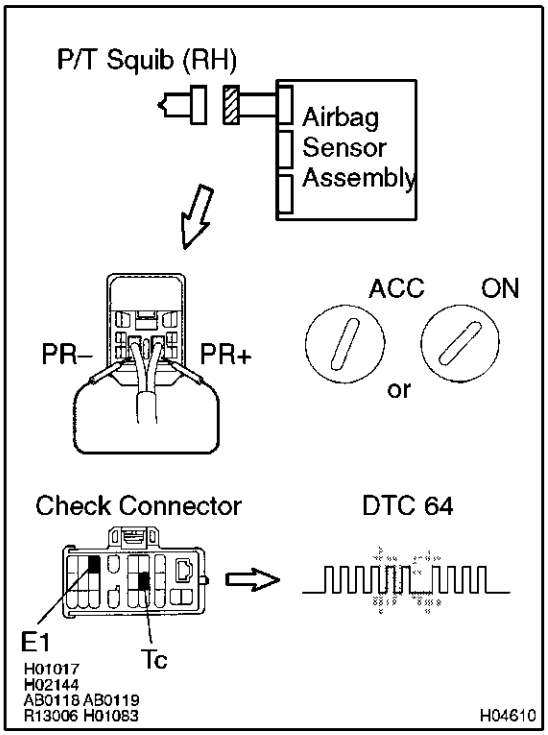


CHECK:
For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the resistance between PR+ and PR–.
OK:
Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(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 assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

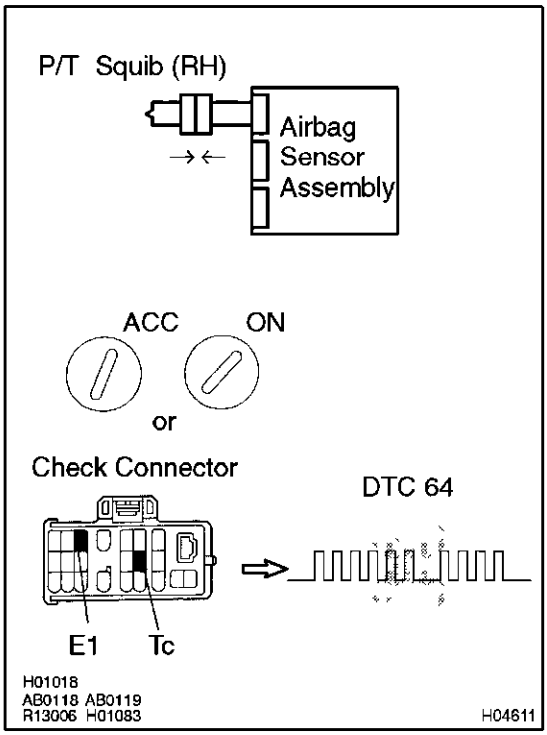
DTC 64 is not output.

HINT:
Codes other than code 64 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 64 is not output.

HINT:
Codes other than code 64 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI33Z–01

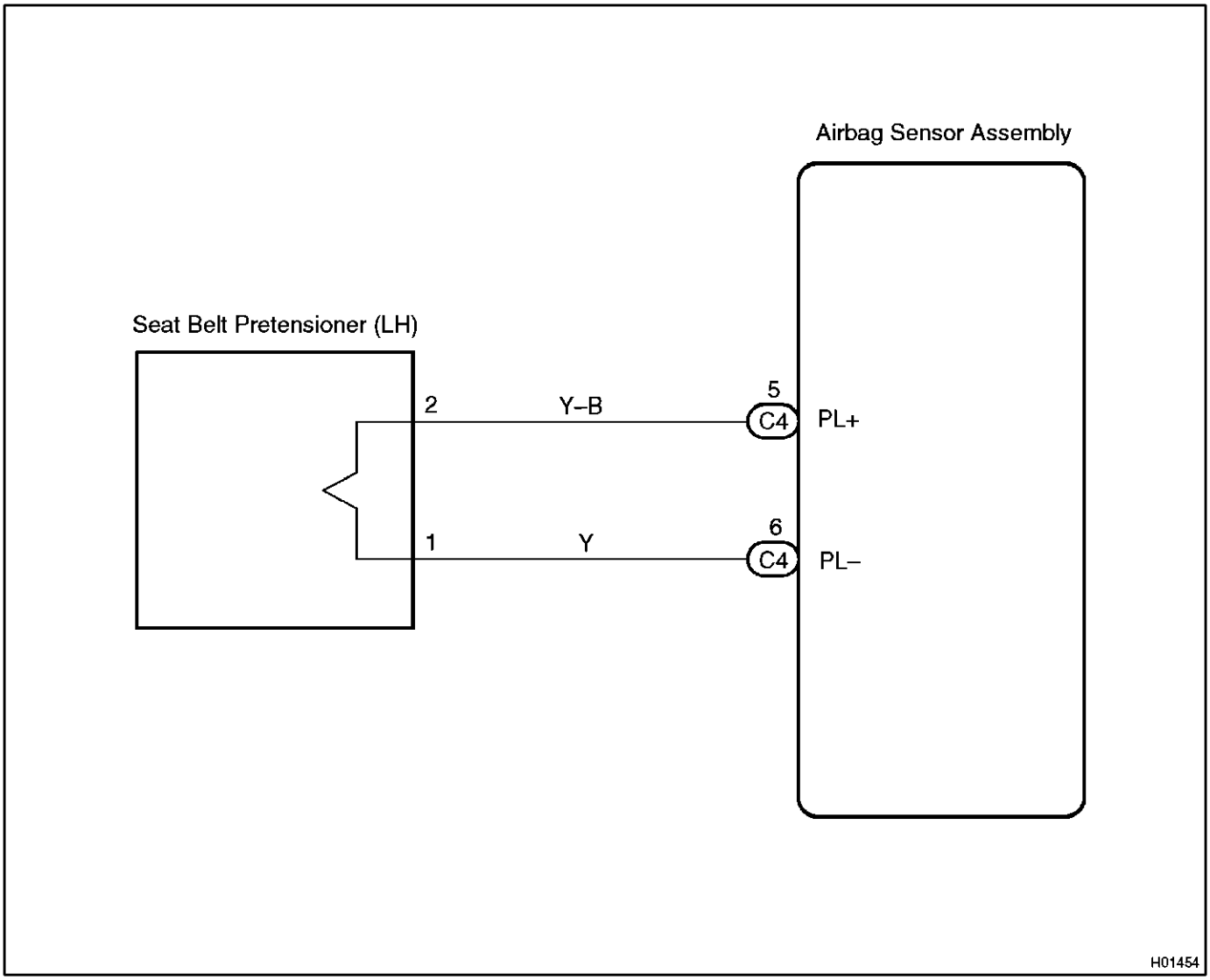
DTC	71	Short in P/T Squib (LH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the seat belt pretensioner (LH) to activate when the seat belt pretensioner (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 71 is recorded when ground short is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
71	• Short circuit in P/T squib (LH) wire harness (to ground) • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

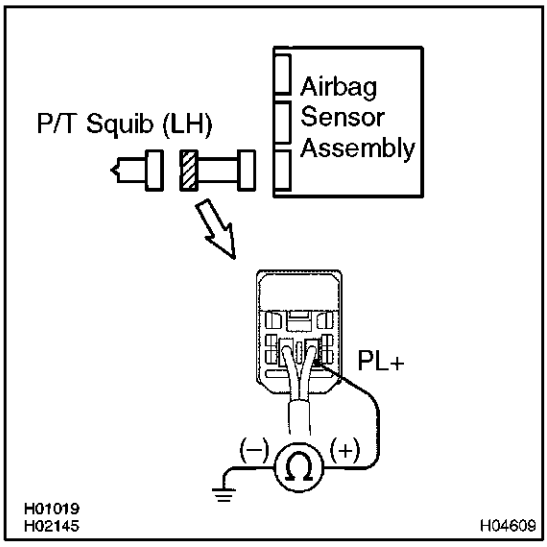
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Check P/T squib (LH) circuit.**



CHECK:

For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the resistance between PL+ and body ground.

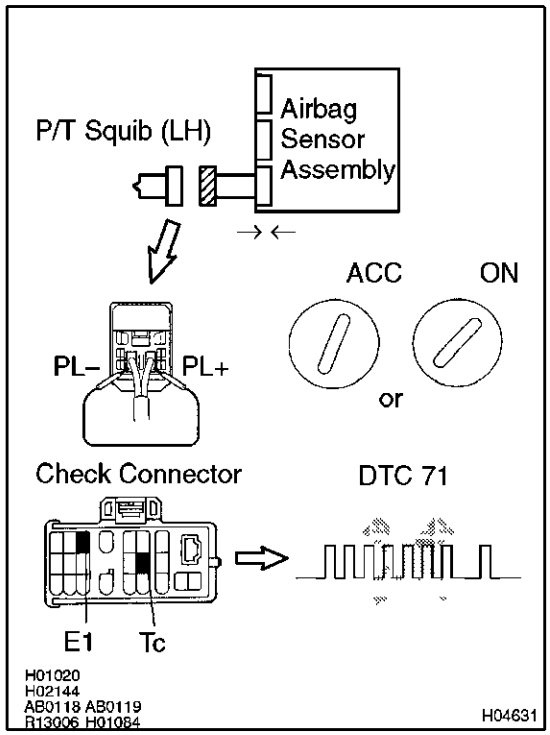
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(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 assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

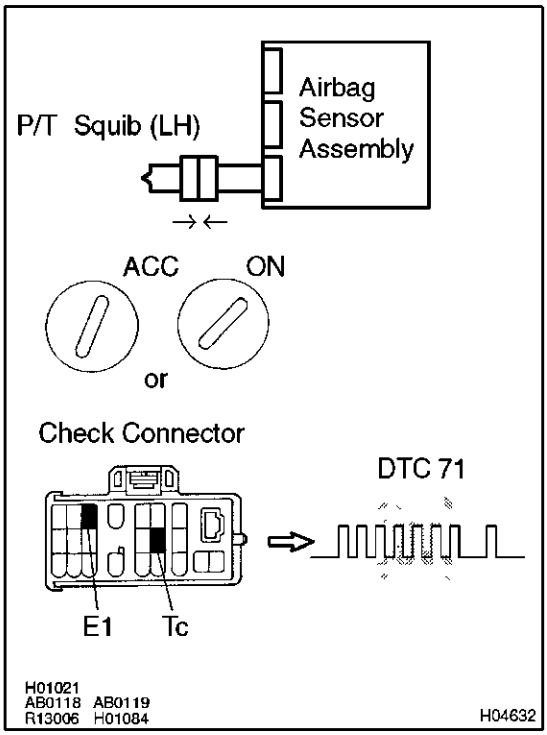
DTC 71 is not output.

HINT:
Codes other than code 71 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 71 is not output.

HINT:
Codes other than code 71 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI340-01

DTC	72	Short in P/T Squib (LH) Circuit (to B+)

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the seat belt pretensioner (LH) to activate when the seat belt pretensioner (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 72 is recorded when the B+ short is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
72	• Short circuit in seat belt pretensioner (LH) wire harness (to B+) • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

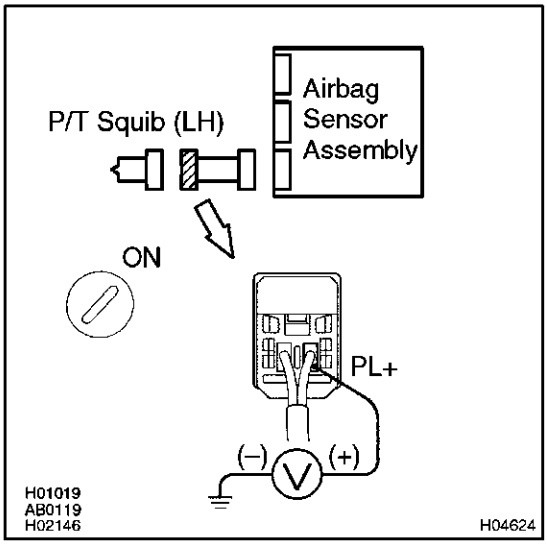
WIRING DIAGRAM

See page DI–272.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P/T squib (LH) circuit.



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the voltage between PL+ and body ground.

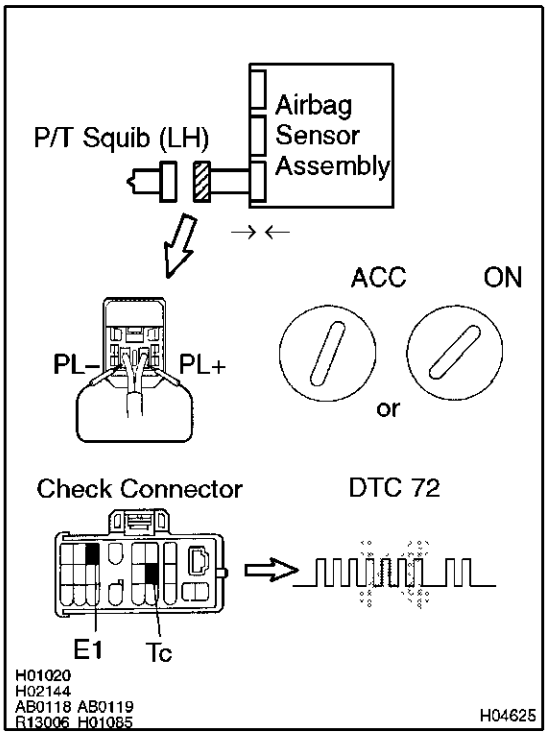
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(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 assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

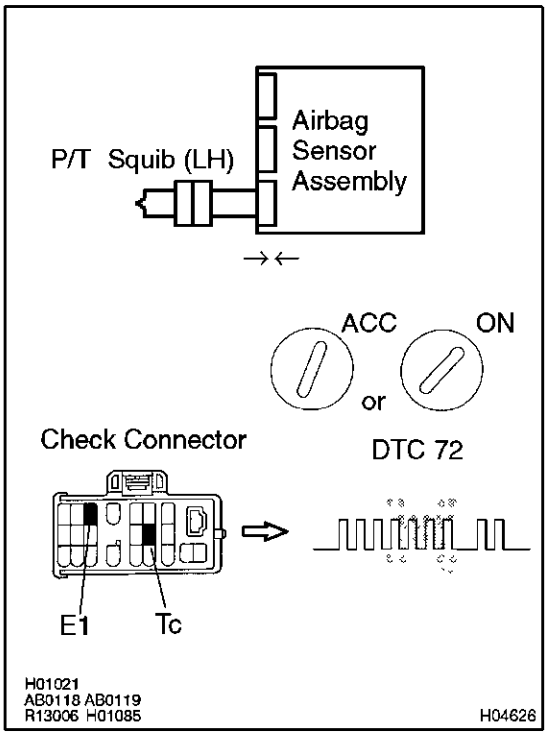
DTC 72 is not output.

HINT:
Codes other than code 72 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 72 is not output.

HINT:
Codes other than code 72 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI341-01

DTC	73	Short in P/T Squib (LH) Circuit

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the seat belt pretensioner (LH) to activate when the seat belt pretensioner (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 73 is recorded when a short is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
73	• Short circuit between PL+ wire harness and PL– wire harness of squib • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

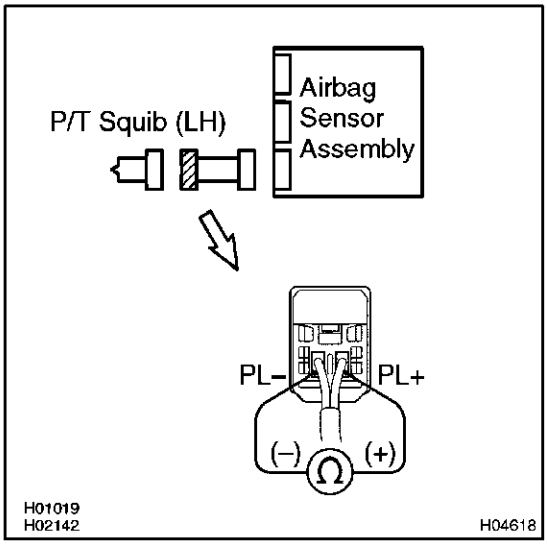
WIRING DIAGRAM

See page DI–272.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P/T squib (LH) circuit.

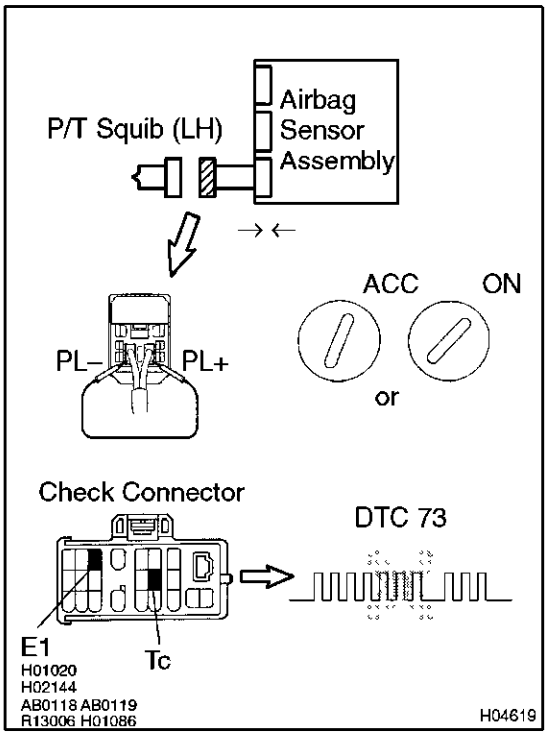


PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the seat belt pretensioner (LH).
(See page DI–152)
CHECK:
For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the resistance between PL+ and PL–.
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect PL+ and PL– of the connector (on the seat belt pretensioner side) between the airbag sensor assembly and the seat belt pretensioner (LH).
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

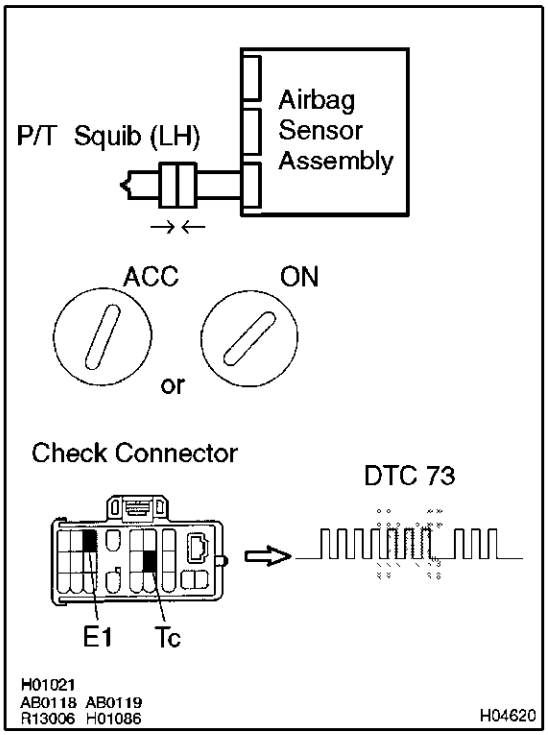
DTC 73 is not output.

HINT:
Codes other than code 73 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOOK, and wait at least for 20 second.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–152)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152)

OK:

DTC 73 is not output.

HINT:
Codes other than code 73 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI342–01

DTC	74	Open in P/T Squib (LH) Circuit

CIRCUIT DESCRIPTION

The P/T squib circuit (LH) consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the seat belt pretensioner (LH) to activate when the seat belt pretensioner (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 74 is recorded when an open is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
74	• Open circuit in PL+ wire harness or PL– wire harness of squib • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

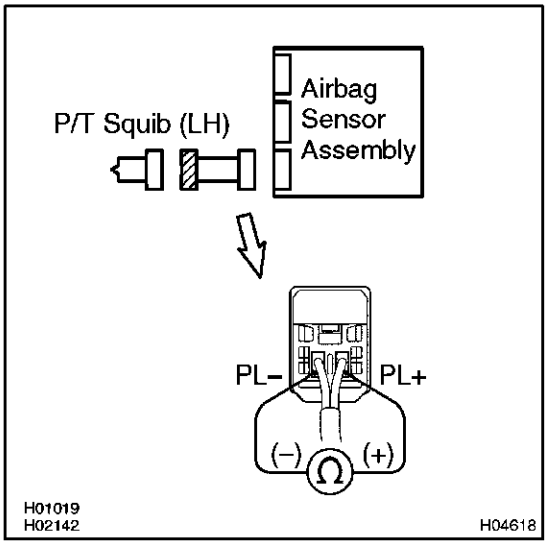
WIRING DIAGRAM

See page DI–272.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–285)

2	Check P/T squib (LH) circuit.

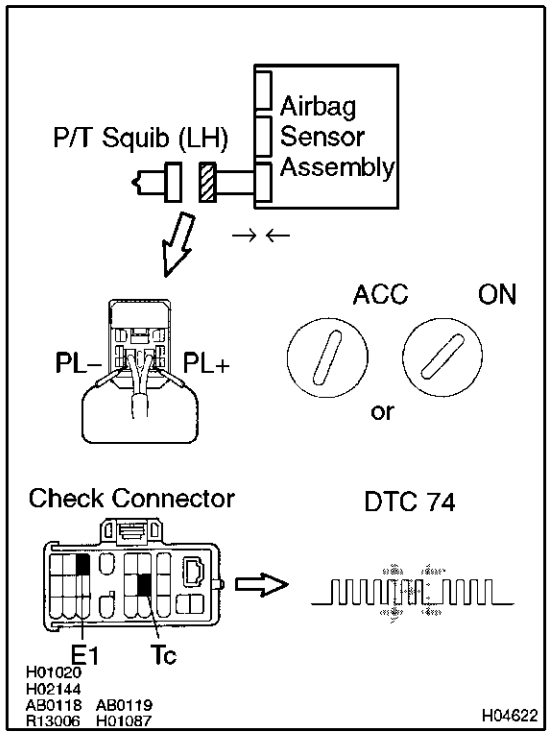


CHECK:
For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the resistance between PL+ and PL–.
OK:
Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(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 assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

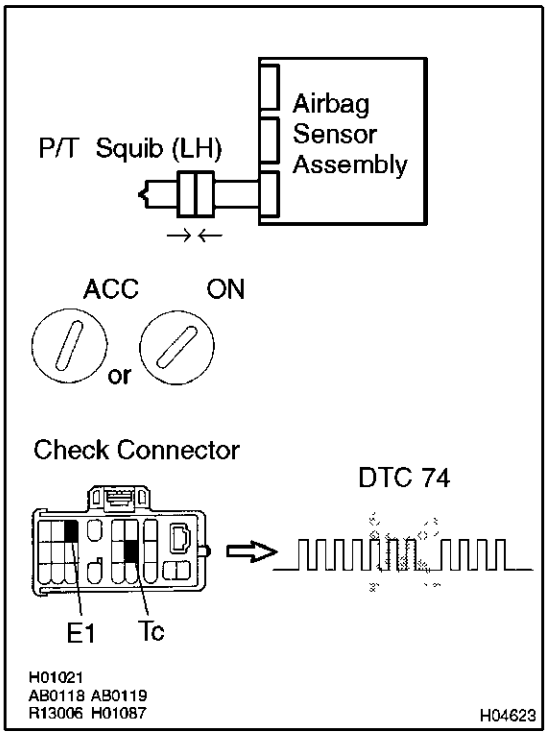
DTC 74 is not output.

HINT:
Codes other than code 74 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–152)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152)

OK:

DTC 74 is not output.

HINT:
Codes other than code 74 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI1NV-05

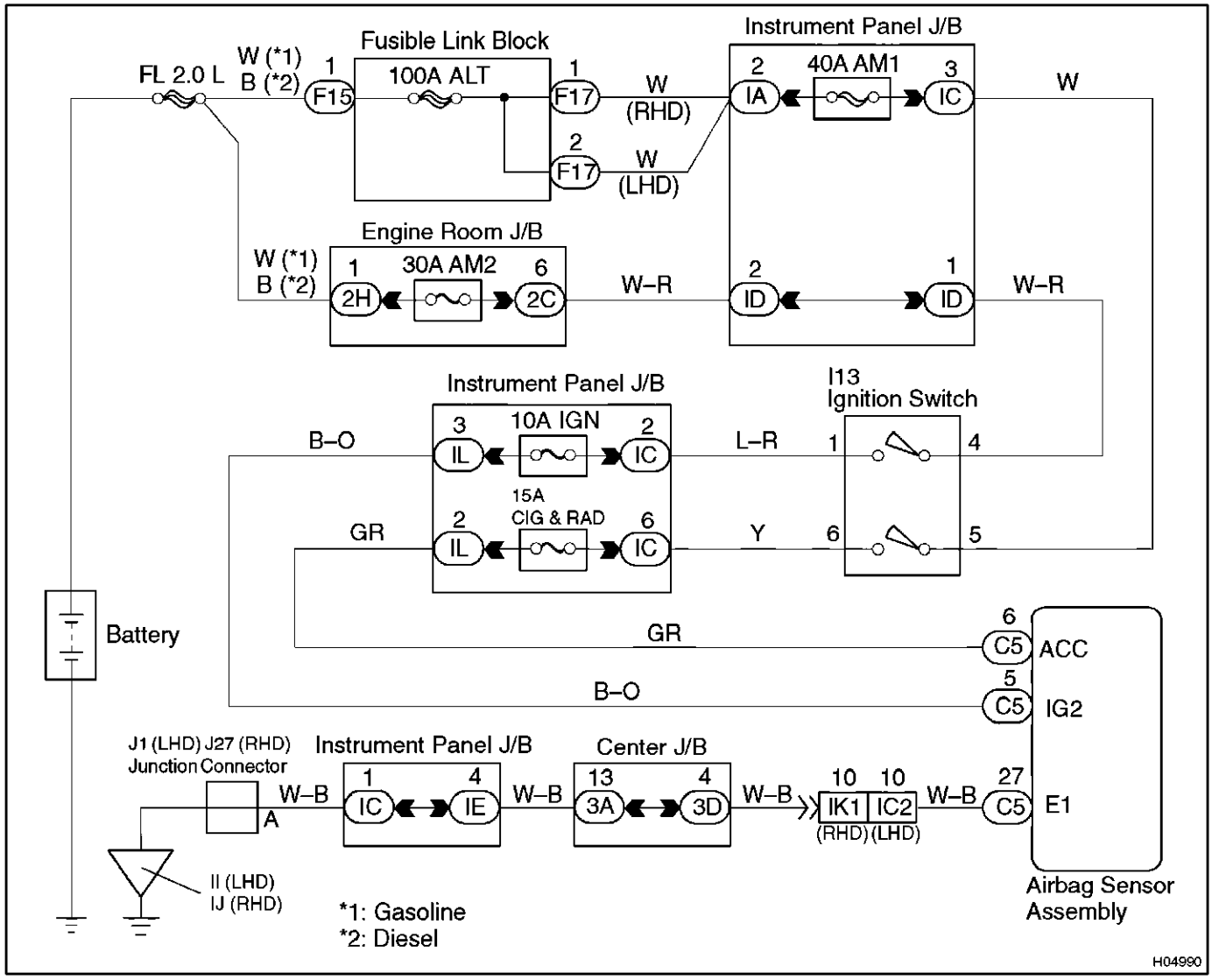
DTC	Normal	Source Voltage Drop

CIRCUIT DESCRIPTION

The SRS is equipped with a voltage–increase circuit (DC–DC converter) in the airbag sensor assembly 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 assembly, and the source voltage returns to normal, the SRS warning light automatically goes off.

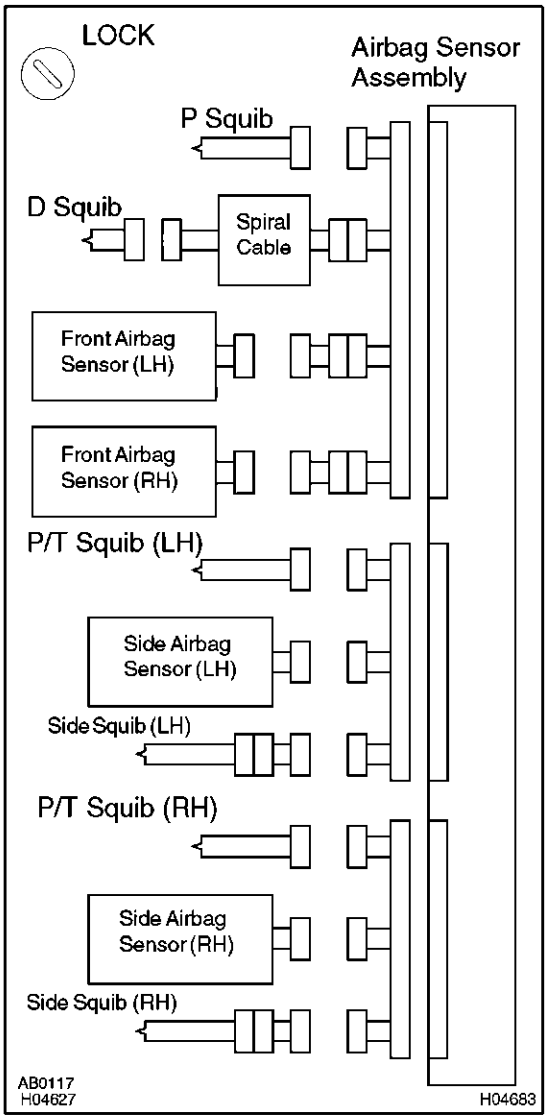
DTC No.	Diagnosis
(Normal)	Source voltage drop

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection.



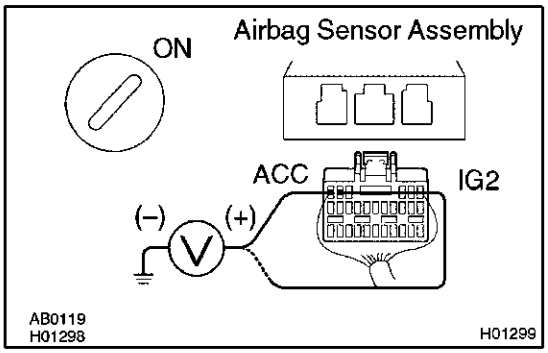
PREPARATION:

(a) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(b) Remove the steering wheel pad. (See page SR–13)
(c) Disconnect the connector of the front passenger airbag assembly. (See page RS–27)
(d) Disconnect the connector of the airbag sensor assembly. (See page RS–51)
(e) Disconnect the connector of the front airbag sensor RH and LH. (See page RS–56)
(f) Disconnect the connector of the seat belt pretensioner RH and LH. (See page BO–151)
(g) Disconnect the connector of the side airbag assembly RH and LH. (See page RS–38)
(h) Disconnect the connector of the side airbag sensor assembly RH and LH. (See page RS–61)

CAUTION:

Store the steering wheel pad with the front surface facing upward.

2	Check source voltage.



PREPARATION:

(a) Connect negative (–) terminal cable to the battery.

(b) Turn ignition switch ON.

CHECK:

Operating the electric system (defogger, wiper, headlight, heater blower, etc.), measure the voltage between each of IG2 and ACC of the sensor and body ground.

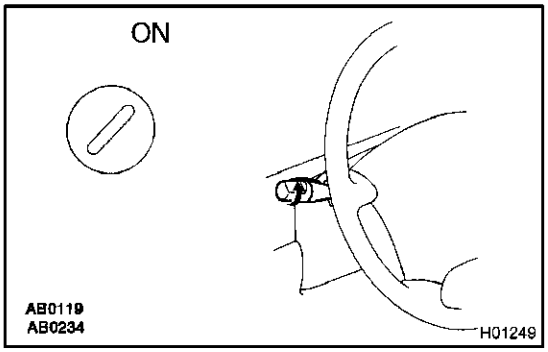
OK:

Voltage: 10 – 14 V

NG → **Check harness between battery and airbag sensor assembly, and check battery and charging system.**

OK

3	Does SRS warning light turn OFF?



PREPARATION:

(a) Turn ignition switch to LOCK.

(b) Connect the steering wheel pad connector.

(c) Connect the front passenger airbag assembly connector.

(d) Connect the airbag sensor assembly connectors.

(e) Connect the front airbag sensor connectors.

(f) Connect the side airbag assembly connectors.

(g) Connect the seat belt pretensioner connectors.

(h) Connect the side airbag sensor assembly connectors.

(i) Turn ignition switch ON.

CHECK:

Operate electric system (defogger, wiper, headlight, heater blower, etc.) and check that SRS warning light goes off.

NO → **Check for DTCs. If a DTC is output, perform troubleshooting for the DTC. If a normal code is output, replace airbag sensor assembly.**

YES

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

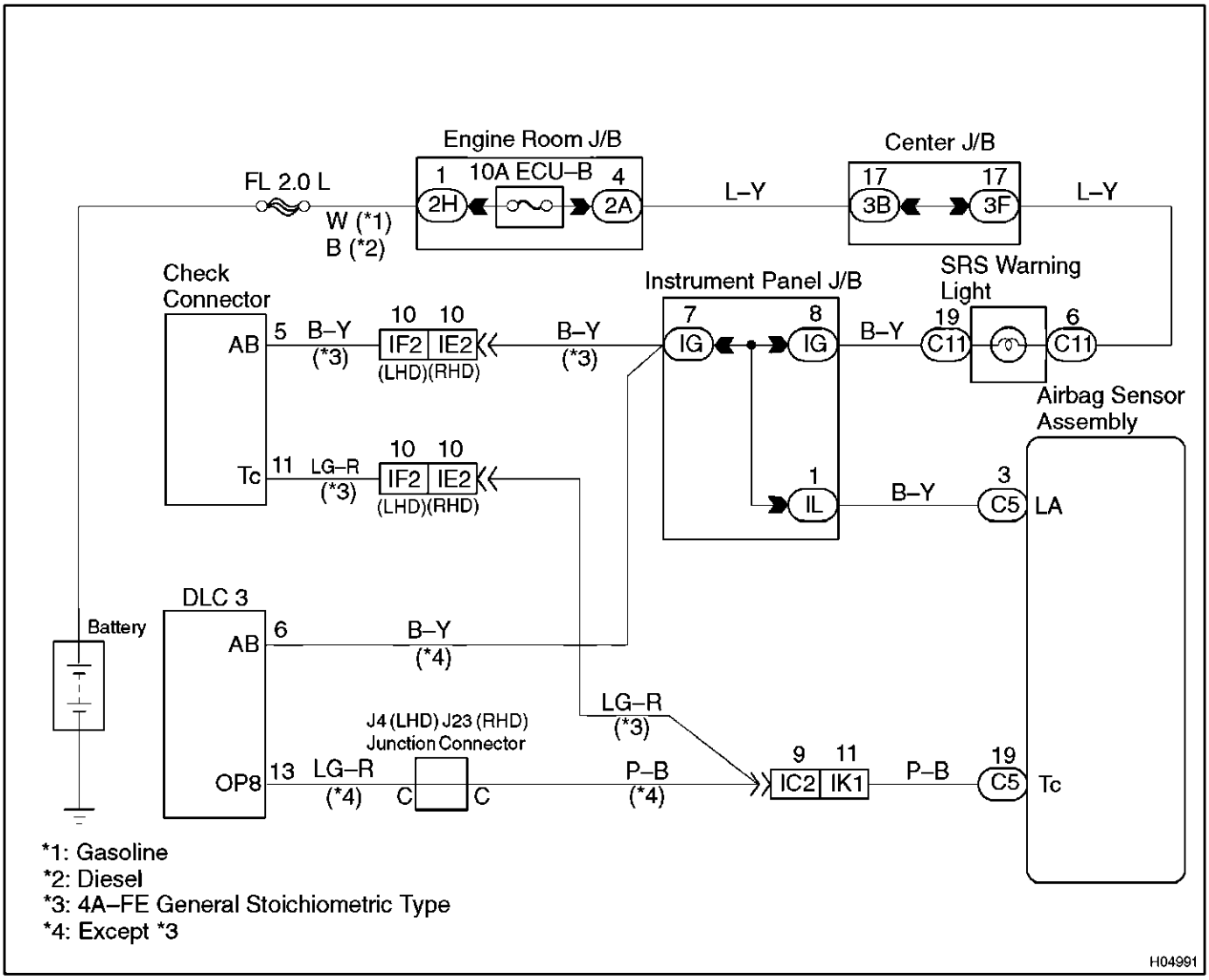
DI1NW–05

SRS Warning Light Circuit Malfunction (Always lights up, when ignition switch is in 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 ACC or 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 E1 of the check connector are connected, the DTC is displayed by blinking the SRS warning light.

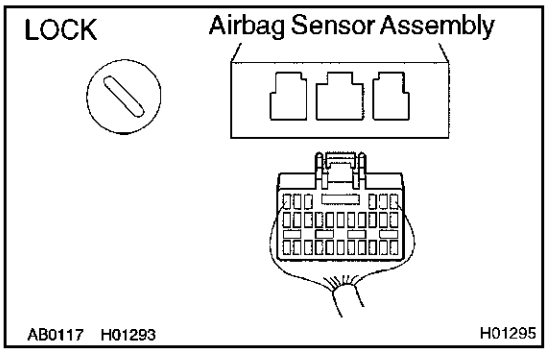
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285)**

2	**Does SRS warning light turn OFF?**



PREPARATION:

(a) Turn 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.

CHECK:

Check operation of SRS warning light.

NO → **Check SRS warning light circuit or terminal AB circuit of check connector or DLC3.**

YES →

Replace airbag sensor assembly.

SRS Warning Light Circuit Malfunction (Does not light up, when ignition switch is turned to ACC or ON.)

CIRCUIT DESCRIPTION

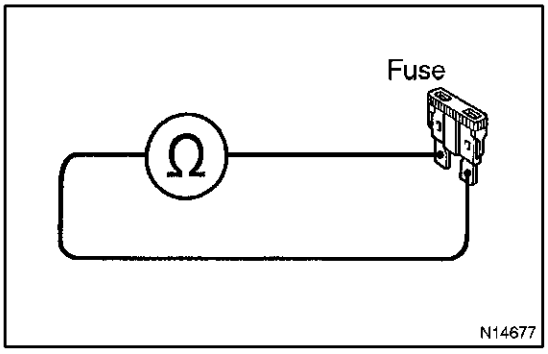
The SRS warning light is located on the combination meter.
When the SRS is normal, the SRS warning light lights up for approx. 6 seconds after the ignition switch is turned from LOCK position to ACC or ON position, and then turns OFF automatically.
If there is a malfunction in the SRS, the SRS warning light lights up to inform the driver of the abnormality When terminals Tc and E1 of the check connector are connected, the DTC is displayed by blinking the SRS warning light.

WIRING DIAGRAM

See page DI–288.

INSPECTION PROCEDURE

1	**Check ECU–B fuse.**



PREPARATION:
Remove ECU–B fuse.
CHECK:
Check continuity of ECU–B fuse.
OK:

Continuity

HINT:

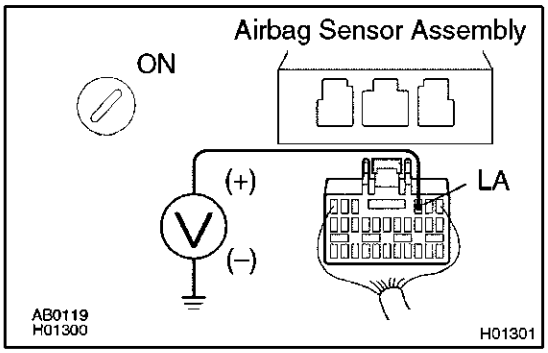
- Fuse may be burnt out even if it appears to be OK during visual inspection.
- If fuse is OK, install it.

NG	**Go to step 5 .**

OK

2	**Prepare for inspection. (See step 1 on page DI–285)**

3	**Check SRS warning light circuit.**



PREPARATION:

(a) Connect negative (–) terminal cable to the battery.

(b) Turn ignition switch to ACC or ON.

CHECK:

Measure the voltage LA terminal of the harness side connector of the airbag sensor assembly.

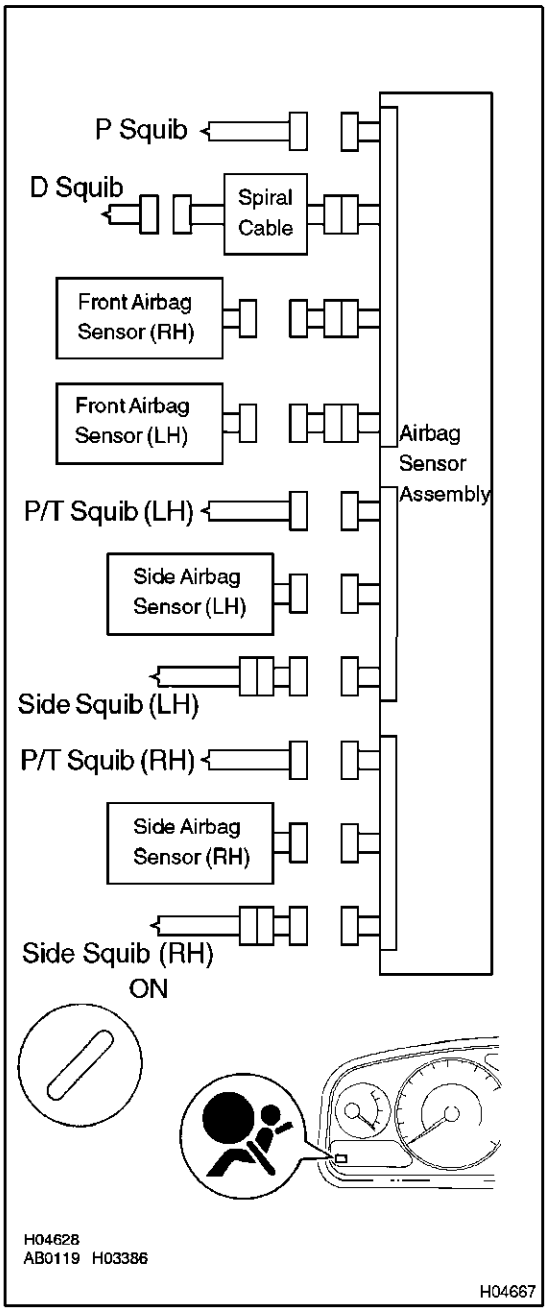
OK:

Voltage: 10 – 14 V

NG → **Check SRS warning light bulb or repair SRS warning light circuit.**

OK

4	Does SRS warning light come on?



PREPARATION:

(a) Disconnect negative (–) terminal cable from the battery.
(b) Connect the airbag sensor assembly connector.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn ignition switch to ACC or ON.

CHECK:

Check operation of SRS warning light.

NO → **Check terminal LA of airbag sensor assembly. If normal, replace airbag sensor assembly.**

YES

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use simulation method to check.

5	**Is new ECU–B fuse burnt out again?**

NO → **Using simulation method, reproduce malfunction symptoms. (See page IN–18)**

YES

Check harness between ECU–B fuse and SRS warning light.

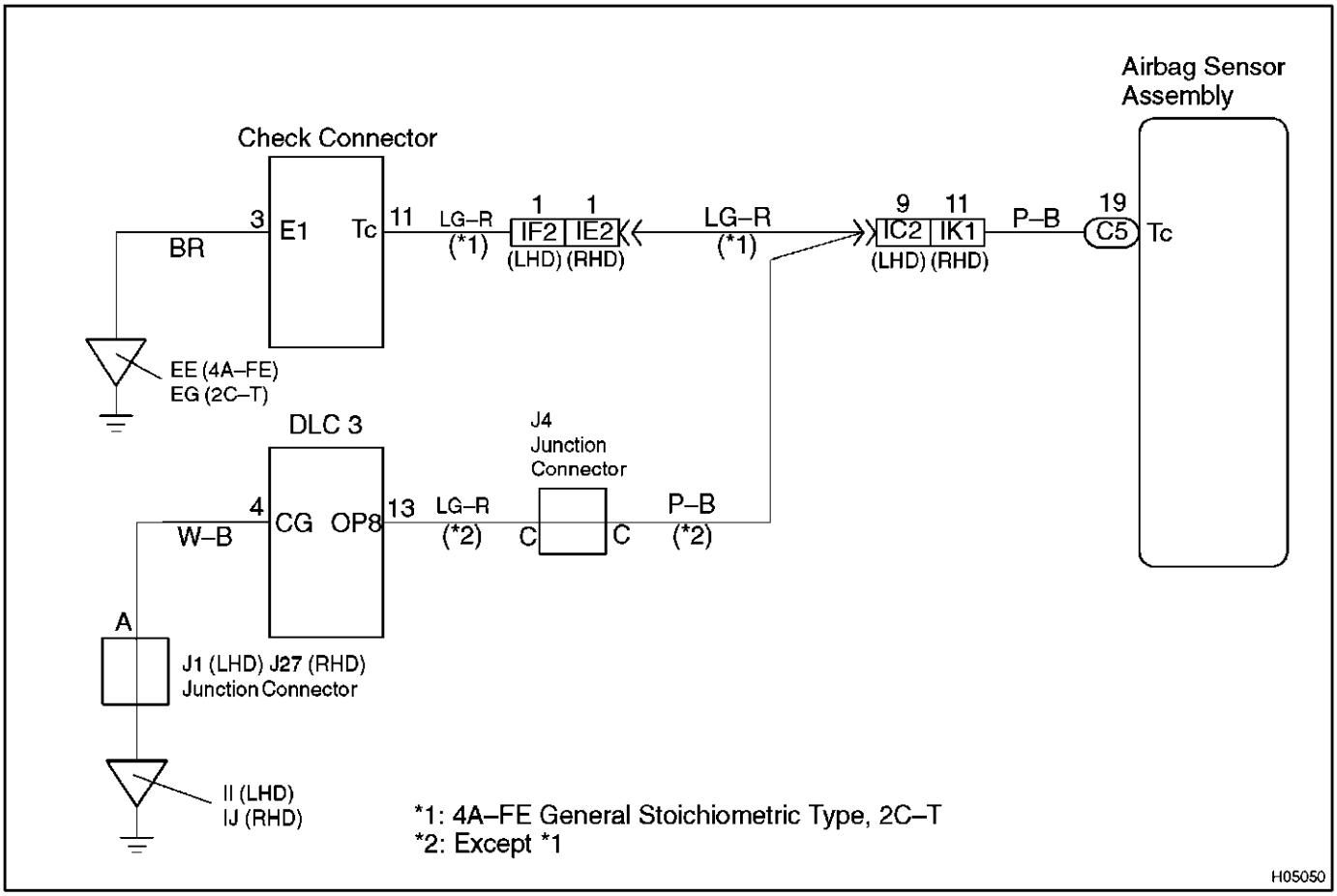
DI1NY–05

Tc Terminal Circuit

CIRCUIT DESCRIPTION

By connecting terminals Tc or OP8 and E1 or CG of the check connector or DLC3 the airbag sensor assembly is set in the DTC output mode. The DTCs are displayed by blinking the SRS warning light.

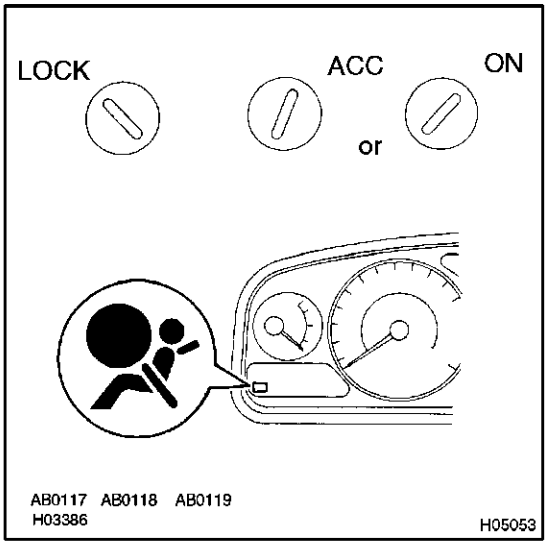
WIRING DIAGRAM



INSPECTION PROCEDURE

If the DTC is not displayed, do the following troubleshooting.

1	**Does SRS warning light light up for approx. 6 seconds?**

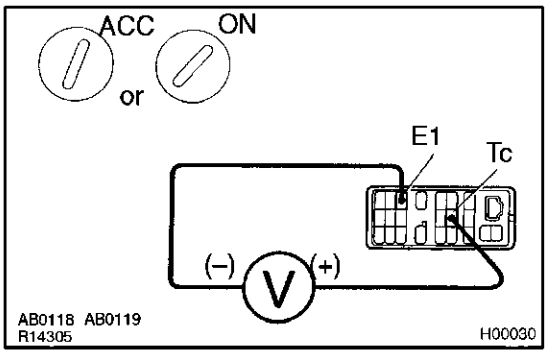


PREPARATION:
Check operation of the SRS warning light after ignition switch is turned from LOCK position to ACC or ON position.

NO → **Check SRS warning light system. (See page DI–152)**

YES

2	Check voltage between terminals Tc or OP8 and E1 or CG of check connector or DLC3.

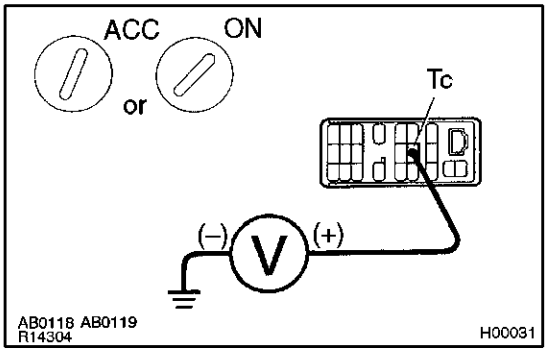


PREPARATION:
Turn ignition switch to ACC or ON.
CHECK:
Measure the voltage between terminals Tc or OP8 and E1 or CG of check connector or DLC3.
OK:
Voltage: 10 – 14 V

OK	Go to step 4.

NG

3	Check voltage between terminals Tc or OP8 of check connector or DLC3 and body ground

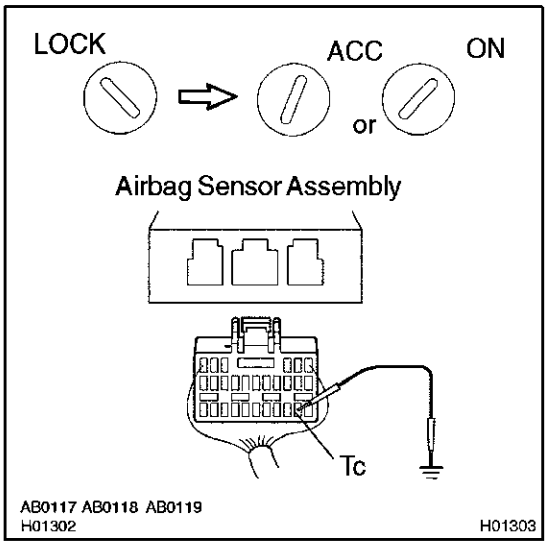


CHECK:
Measure the voltage between terminal Tc or OP8 of check connector or DLC3 and body ground.
OK:
Voltage: 10 – 14 V

OK	Check harness between terminal E1 or CG of check connector or DLC3 and body ground.

NG

4	Check airbag sensor assembly.



PREPARATION:

(a) Turn 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) Insert service wire into terminal Tc from back side as shown in the illustration.
(e) Connect the airbag sensor assembly connector with service wire.
(f) Connect negative (–) terminal cable to the battery.
(g) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(h) Connect service wire of terminal Tc to body ground.

CHECK:

Check operation of SRS warning light.

OK:

SRS waning light comes on.

NOTICE:

Pay due attention to the terminal connecting position to avoid a malfunction.

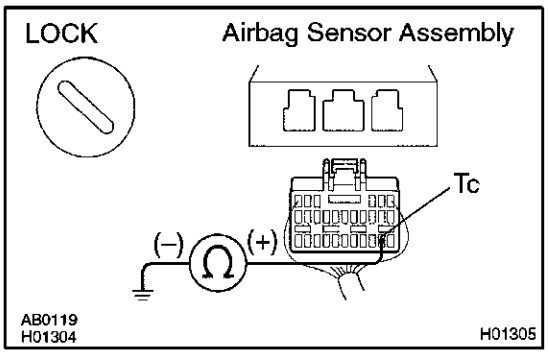
OK → **Check harness between the airbag sensor assembly and check connector or DLC3.**

NG

Replace airbag sensor assembly.

If the DTC is displayed without a DTC check procedure, perform the following troubleshooting.

1	**Check resistance between terminal Tc of airbag sensor assembly and body ground.**



PREPARATION:

(a) Turn 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.

CHECK:

Check resistance between terminal Tc of the airbag sensor assembly connector and body ground.

OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector.**

OK

Replace airbag sensor assembly.

WIRELESS DOOR LOCK CONTROL SYSTEM

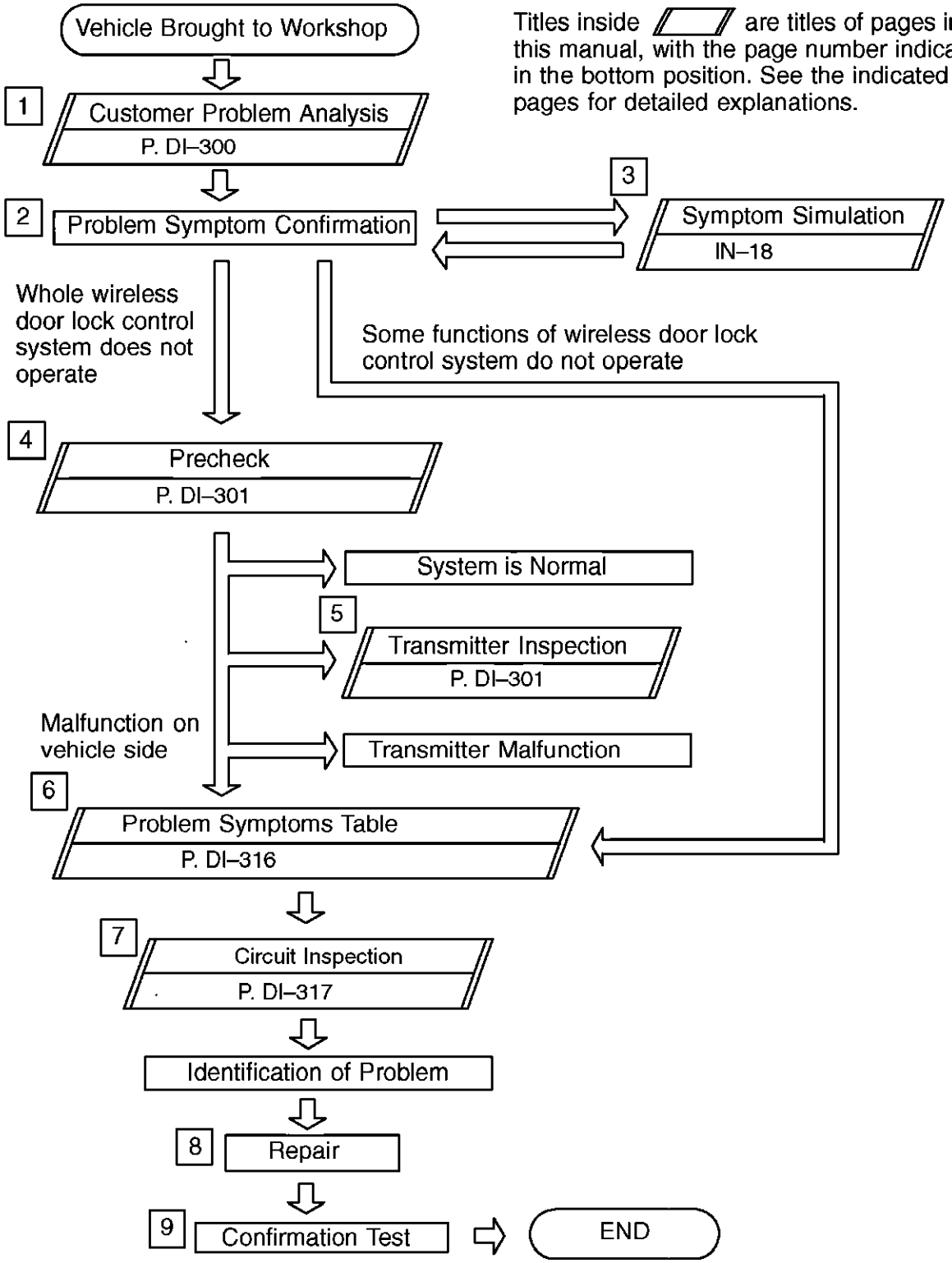
HOW TO PROCEED WITH TROUBLESHOOTING

DI14X–01

HINT:

Troubleshooting of the wireless door lock control system is based on the premise that the door lock control system is operating normally. Accordingly, before troubleshooting the wireless door lock control system, first make certain that the door lock control system is operating normally.

Perform troubleshooting in accordance with procedure on the following page.



DI14Y–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 not operate.	
	☐ Only door unlock operation is not possible.	
	☐ Only door lock operation is not possible.	
	☐ Only key confinement prevention function is not possible.	
	☐ Wireless door lock function operates even each door is opened.	
	☐ Only PANIC operation is not possible.	
	☐ Wireless door lock function incorrectly. (Although one door is unlocked, when the transmitter switch is pressed, all doors unlock.)	☐ When Front RH door is unlocked ☐ When Front LH door is unlocked ☐ When Rear RH door is unlocked ☐ When Rear LH door is unlocked
	☐ Others	

DI14Z–03

PRE–CHECK

Wireless function (Remote control) will not operate.

To make the vehicle be in the initialized condition.
Initialized condition is the condition when the following conditions are satisfied.
(1) Key plate has not been inserted in the ignition key cylinder.
(2) All the doors are closed. (Door warning light is off.)
(3) All the doors are locked.

Basic function check
With a standard operation, when repeating the operations of UNLOCK switch and LOCK switch three times or more alternately, check the operation of UNLOCK – LOCK from 3rd time onward.
● Following procedures are standard operation.
(1) Depart about 1 M to the right direction from the outside handle of a driver's seat.
(2) Point the transmitter toward the vehicle and press either of transmitter switch for about 1 sec.
<Reference>
As of the security function, even the wireless function is normal, there may be the case that only UNLOCK operation will not work.

No

Does only UNLOCK function operate?

No

Yes

Yes

Normal
<Reference>
● Operative distance may differ depends on the operator, the way of holding or the position.
● Because of the use of weak electric wave, in case of strong wave or noise in the frequency used, there may be the case that operative distance gets shorter.

Resynchronize (see step 5) or register (see step 4).

NG

Check terminal "L" of receiver.

OK

Out of synchronization

No

Transmitter battery check:
Charge the transmitter battery to a new or normal one, check UNLOCK operation of the transmitter with the standard operation.
<Reference>
- New or normal battery is necessary.
- Battery quality can be judged by checking the remnant volume of the battery.

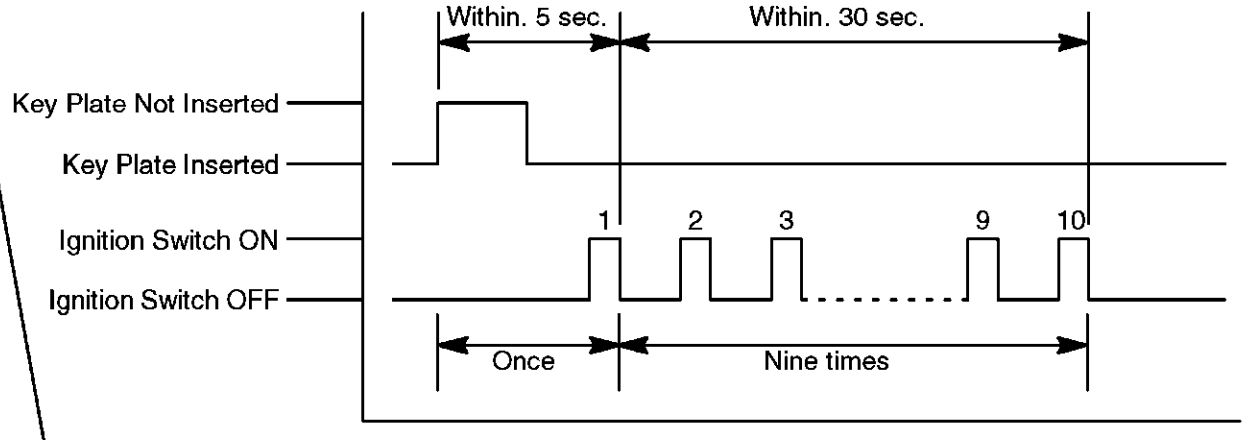
Yes → Battery faulty.

No

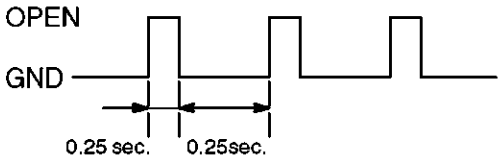
Operation before self diagnostic mode check.
Connect the electrical tester to between terminal 1 of the connector and body ground in the condition that the connector is connected to the wireless door lock ECU.
HINT: Diagnostic terminal output refers to the voltage output between terminal 1 and body ground hereafter.

To make the vehicle be in the initialized condition.

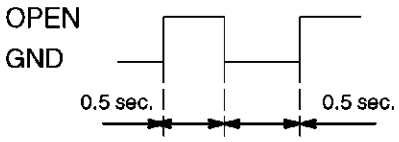
Enter diagnostic mode:
If operation the wireless door lock ECU in the order of 1 through 2, the mode turns to diagnostic mode.
(1) Insert the key plate into the ignition key cylinder and pull out, then insert it again and turn the ignition switch OFF → ON → OFF 1 time.
(2) After completing the procedure (1) and within 30 seconds, turn the ignition switch OFF to ON to OFF nine times.
HINT: In the case that either one of (1) and (2) conditions is not satisfied, transfer to normal mode.
<Reference>
When completing self diagnosis mode, turn the ignition switch ON.
LOCK and UNLOCK operations are not performed under the self diagnosis mode.



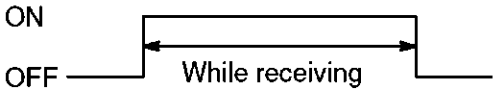
Confirmation of diagnostic mode:
Check diagnostic terminal output when pressing each transmitter switch.
(1) Received normal wave of LOCK switch.



(2) Received normal wave of UNLOCK switch.



(3) Compatibility of the recognition code or out from synchronization of rolling code.*.



<Reference>
When turning the ignition switch ON in the self diagnosis mode, the mode returns to normal mode.
Check the voltage output on the bar graph.

No diagnostic terminal output

Key unlock warning switch check.
Check the voltage between terminal 10 of the wireless door lock ECU on the wire harness side of vehicle and body ground by inserting the key plate into the ignition key cylinder or pulling out.Check that the voltage is 0 to 10 V.

Yes

No

Yes

Key unlock warning switch faulty

In case of outputs (1) or (2)

In case of outputs of (3)
(Output while the transmitter switch is pressed.)

Check of the recognition code registration function:
Check if it can set to rewrite mode or add mode of the recognition code registration.

Yes

After registering the code, check the operation and it is good of the operation is normal.
(The rolling code has not been synchronized.)

No

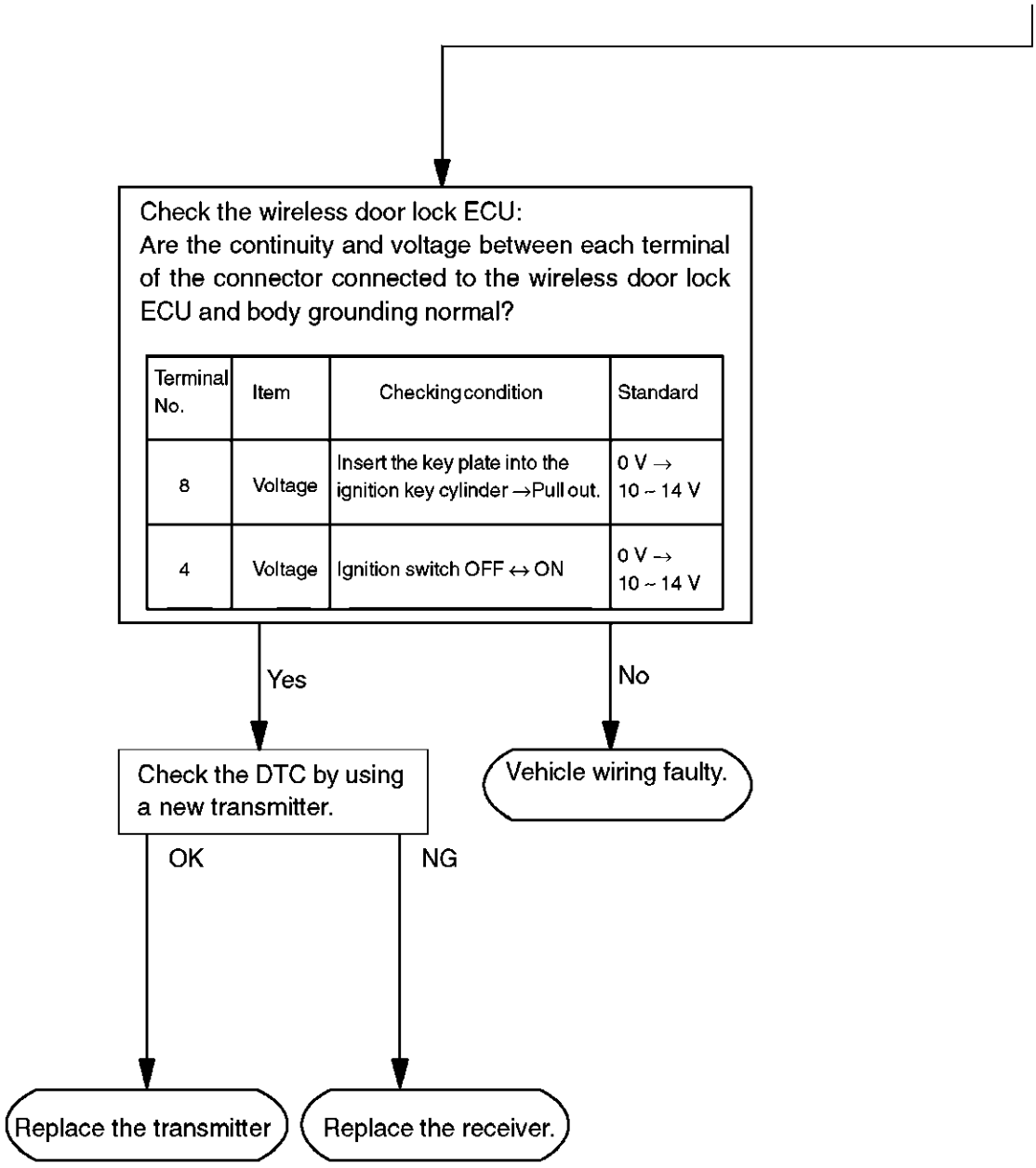
Check the terminal voltage of wireless door lock ECU:
Check each following terminal.
- L
- UL
- IG
- CTY

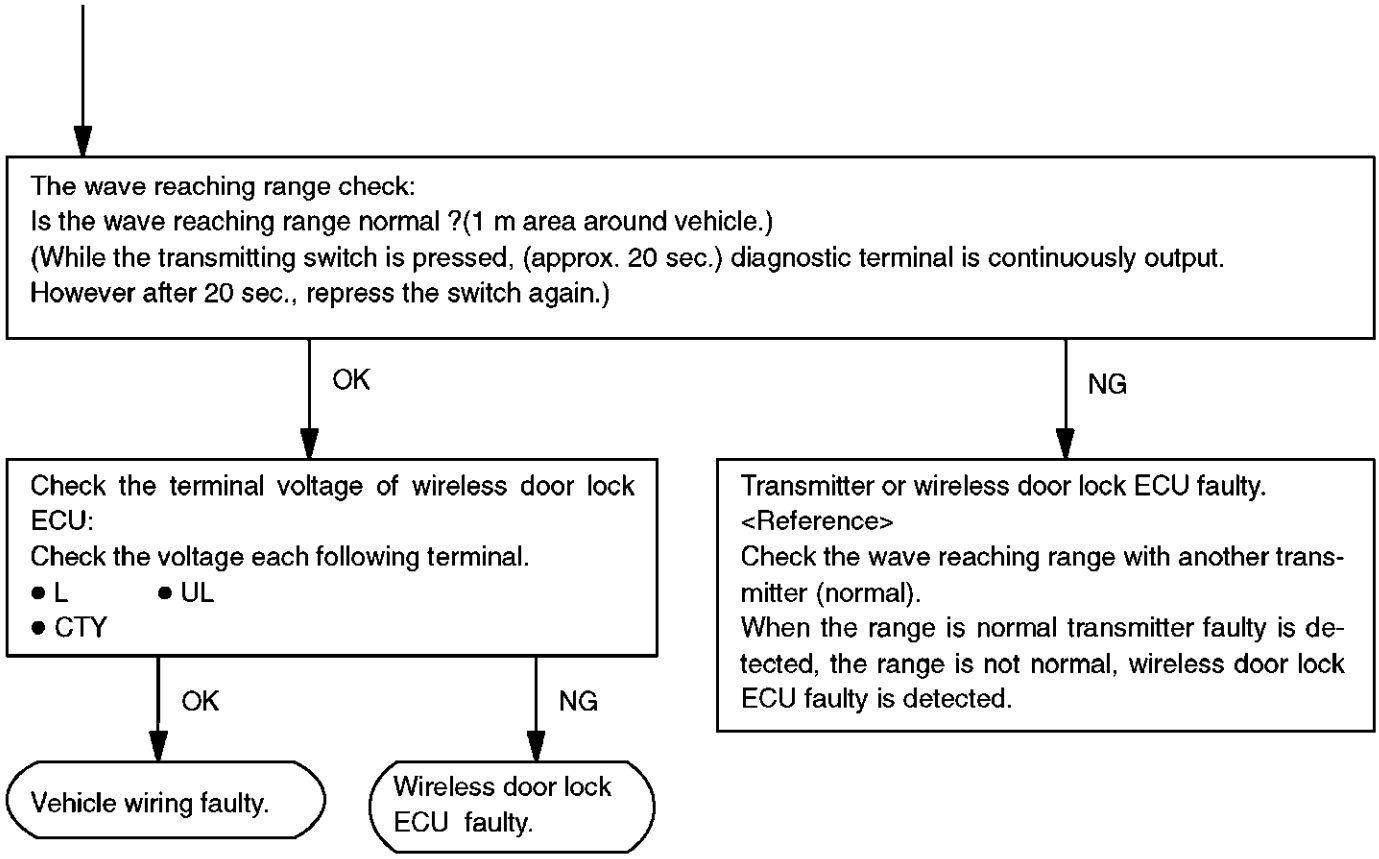
OK

Vehicle wiring faulty.

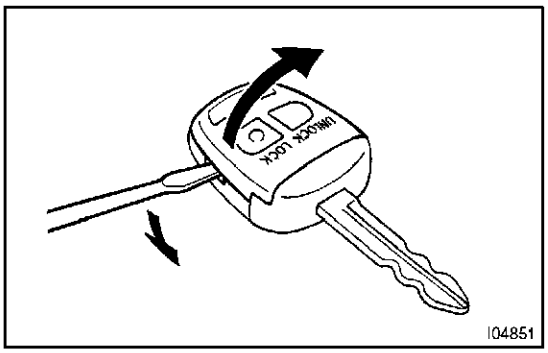
NG

Wireless door lock ECU faulty.


Check the wireless door lock ECU:
Are the continuity and voltage between each terminal of the connector connected to the wireless door lock ECU and body grounding normal?
Terminal No.
Item
Checking condition
Standard
8
Voltage
Insert the key plate into the ignition key cylinder →Pull out.
0 V → 10 ~ 14 V
4
Voltage
Ignition switch OFF ↔ ON
0 V → 10 ~ 14 V
Yes
No
Check the DTC by using a new transmitter.
Vehicle wiring faulty.
OK
NG
Replace the transmitter
Replace the receiver.

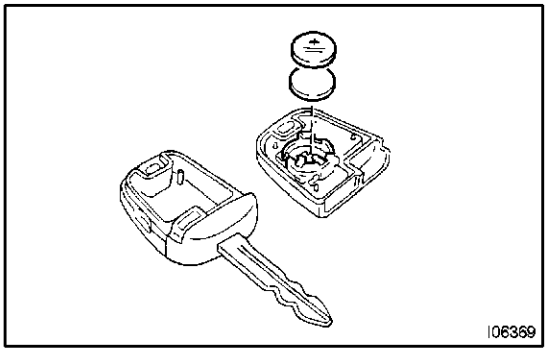


HINT:
The rolling code is the code changing at each time when the wave is transmitted from the transmitter and is changing synchronized between transmitter side and ECU side.
When the rolling code is not synchronized between the transmitter and ECU, a symptom of "Only LOCK operation is available."appears.
In this case, it goes back to normal by synchronizing the rolling code.
(The method to synchronize it is the same as of the registration of the recognition code.)



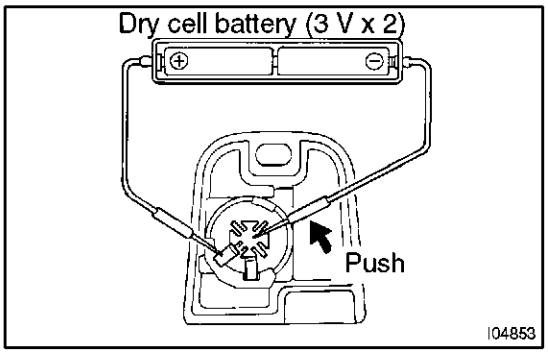
1. REPLACE BATTERY OF TRANSMITTER

(a) Using a screwdriver, pry outward the cover.



(b) Remove the battery.
(c) Set a new battery into the transmitter.
(d) Install the cover to the transmitter.

HINT:
After replacing the battery, if only LOCK function operates, perform resynchronization.

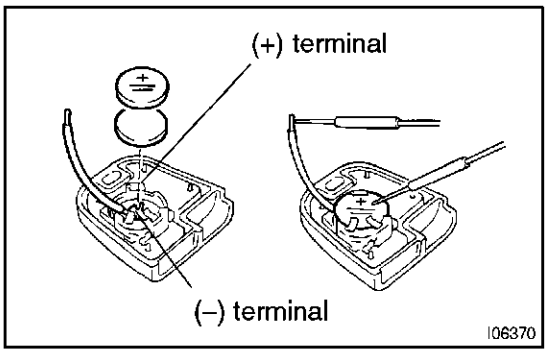


2. INSPECT TRANSMITTER OPERATION

HINT:
This inspection is not directly for the purpose of checking the capacity of the transmitter battery, but is performed when remote control operation becomes difficult or impossible, in order to ascertain if this is caused by low battery capacity.

(a) Using a screwdriver, pry outward the cover.
(b) Remove the battery.
(c) Connect 2 new 3 V dry–cell batteries in series. Connect the battery ⊕ terminal to the battery receptacle side terminal and the battery ⊖ terminal to the bottom terminal to provide 6 V to the transmitter.
(d) Push the wireless door lock remote control switch on the side of the transmitter body and operate the door lock by remote control.
(e) Check remote control operation possible.

If operation is not as specified, replace the transmitter.



3. CHECK BATTERY CAPACITY

HINT:

On the lithium dry cell battery used for the transmitter, the voltage more than 2.5 V with the dry cell battery unloaded is shown on the tester until the energy is completely consumed.

Accordingly when inspecting the energy amount left in the dry cell battery, it is necessary to measure the voltage when the dry cell battery is loaded (1.2 kΩ).

The procedures for inspection of the energy amount left in the dry cell battery by using the loaded inside the transmitter with lead are shown below.

(a) Remove the cover using a ⊖ driver .

(b) Remove the dry cell battery (lithium dry cell battery) from the transmitter.

(c) Connect the lead to the (–) terminal of the transmitter and install the battery.

(d) Connect the (+) tester to the (+) dry cell battery (lithium dry cell battery), and (–) tester to the lead respectively.

(e) Press either of the transmitting switches on the transmitter for about 1 second.

HINT:

Repeat pressing it more than twice.

(f) Press the transmitting switch on the transmitter again to check the voltage.

Voltage: 2.1 V or more (per battery)

HINT:

- When the temperature of the battery is low, the judge can not be made correctly. When the outcome of the test is less than 2.1 V, conduct the test again after leaving the battery in the place at 18 °C for more than 30 minutes.
- By auto power off function, the voltage becomes no load voltage (more than 2.5V) condition after 10 seconds from the switch was pressed. Be sure to read the voltage before of it.
- High voltage might be shown 1 – 2 times after leaving the dry cell battery, judge should be made with the voltage shown at the 3rd time or later.

(g) Disconnect the lead.

(h) Set the dry cell battery (lithium dry cell battery) in the transmitter.

(i) Install the cover.

4. REGISTRATION OF RECOGNITION CODE

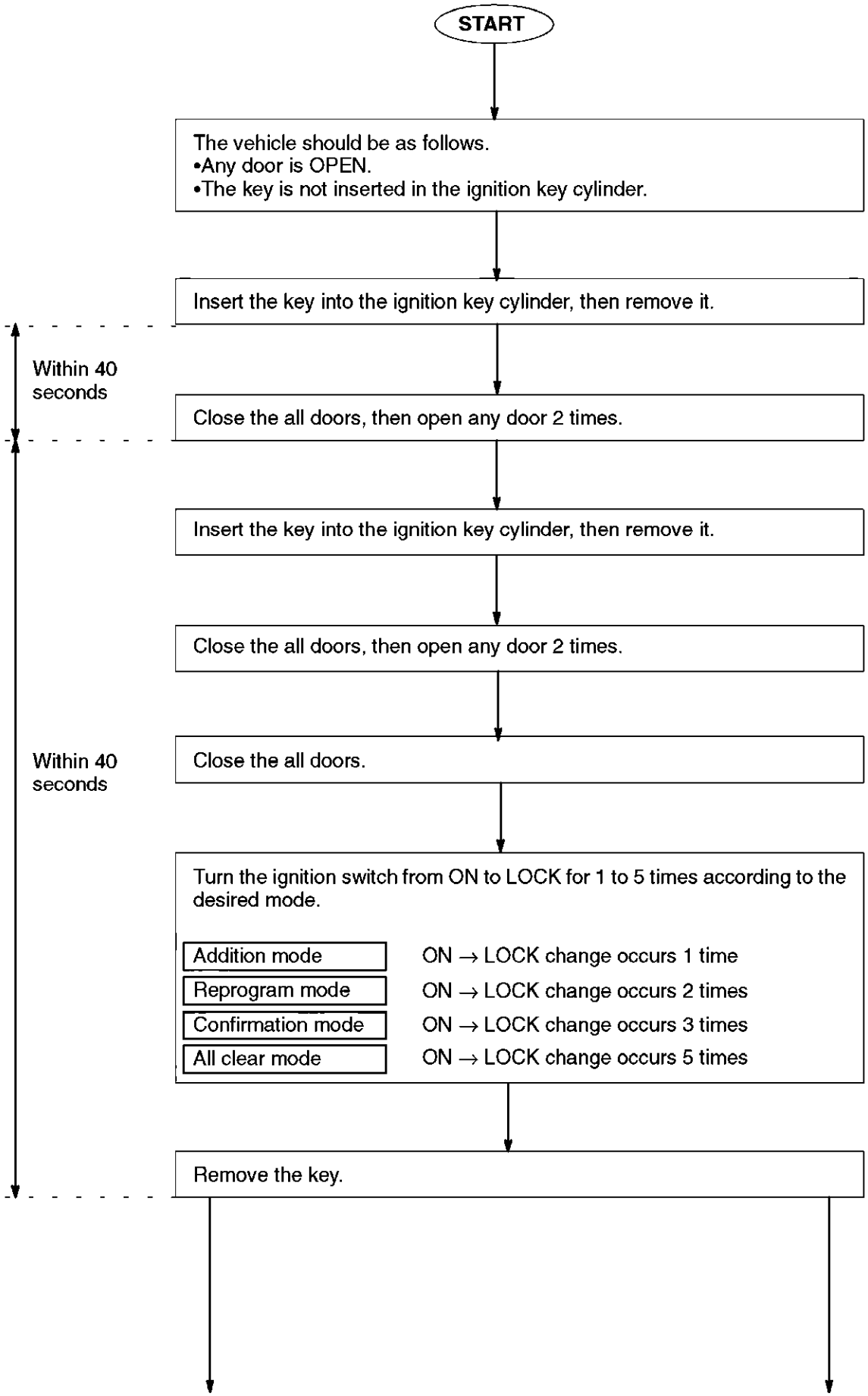
Follow the flow chart on the following page to register the transmitter recognition code with the wireless door lock ECU.

HINT:

- If the prescribed conditions are not entered while registering the transmitter code, the wireless door lock ECU returns to normal operation.
- There are 4 modes: additional mode, reprogram mode, confirmation mode and all clear mode; the mode to use is decided after the recognition code is registered.
- If maximum of 4 recognition codes can be registered.

REFERENCE:

- The additional mode is used to retain codes already registered while you register new recognition codes.
  However, if the number of registered codes exceeds 4 codes, previous registered codes are correspondingly erased in order, starting from the first registered code.
- The reprogram mode is used to erased all previous registered codes before registering new recognition codes. This mode before registering new transmitter or wireless door lock ECU.
- The confirmation mode is for confirming how many recognition codes are already registered before you register additioned recognition codes.
- The all clear mode is used to erase all registered modes and cancels the wireless door lock operates. Use this mode when the transmitter is lost.


START
The vehicle should be as follows.
•Any door is OPEN.
•The key is not inserted in the ignition key cylinder.
Insert the key into the ignition key cylinder, then remove it.
Within 40 seconds
Close the all doors, then open any door 2 times.
Insert the key into the ignition key cylinder, then remove it.
Close the all doors, then open any door 2 times.
Within 40 seconds
Close the all doors.
Turn the ignition switch from ON to LOCK for 1 to 5 times according to the desired mode.
Addition mode
ON → LOCK change occurs 1 time
Reprogram mode
ON → LOCK change occurs 2 times
Confirmation mode
ON → LOCK change occurs 3 times
All clear mode
ON → LOCK change occurs 5 times
Remove the key.

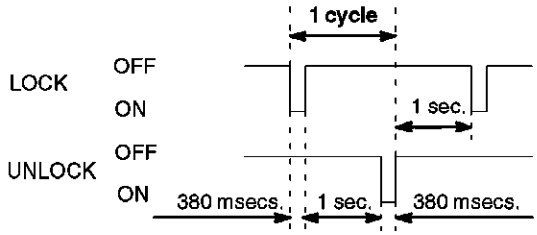
When addition mode, reprogram mode or all clear mode is selected.

When confirmation mode is selected.

Wireless door lock ECU automatically performs the LOCK – UNLOCK operation 1, 2 or 5 cycles.

LOCK – UNLOCK occurs 1 cycle

Indicates that addition mode has been selected.



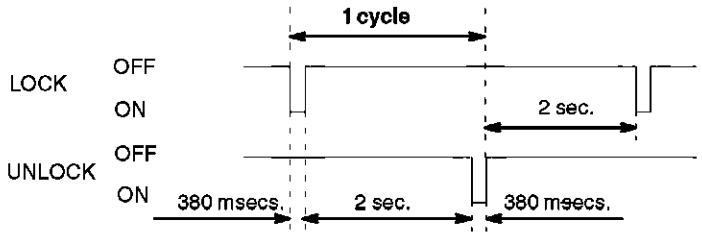
LOCK – UNLOCK occurs 2 cycles

Indicates that reprogram mode has been selected.

LOCK – UNLOCK occurs 5 cycles

Indicates that all clear mode has been selected.

Wireless door lock ECU automatically performs the LOCK – UNLOCK operation 0 to 4 cycles.
The number of cycle is the number of stored keys.



END

All clear mode

*1 Receiver waits for new key code transmission.

*2 Has code been sent using the transmitter?

No

Has receiver waited for 25 seconds?

No

Yes

END

Yes

New key code has stored.

The wireless door lock ECU automatically performs the LOCK–UNLOCK operation once.

The vehicle is in END conditions?

END condition : One of the following conditions
•Any door is OPEN.
•Ignition key is inserted in the ignition key cylinder.
•4 different codes are received.

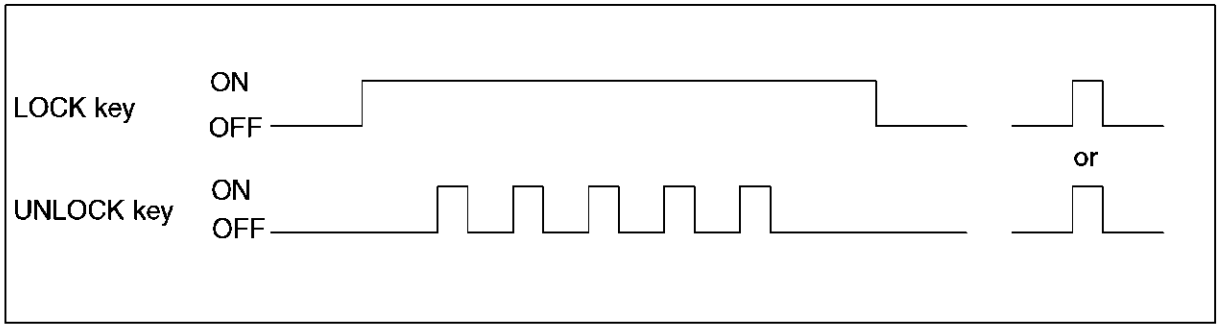
No

Yes

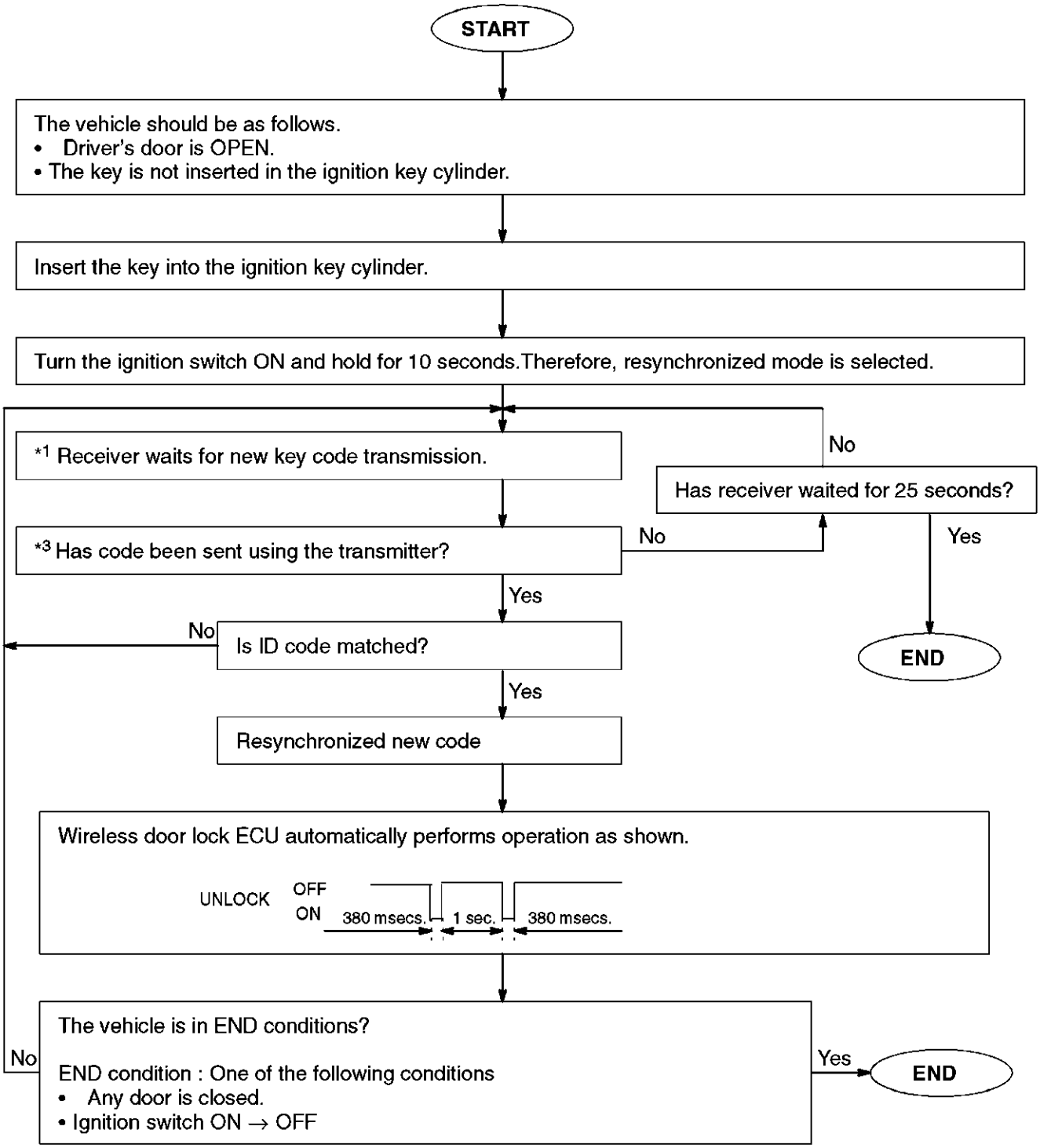
END

*1 While the receiver waits for new key code transmission, the receiver must end the programing mode if end condition is met.

*2 Method to send a code

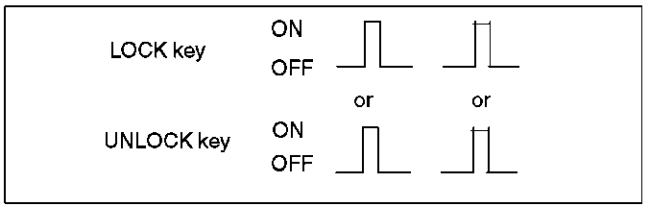


5. THE METHOD OF RESYNCHRONIZATION



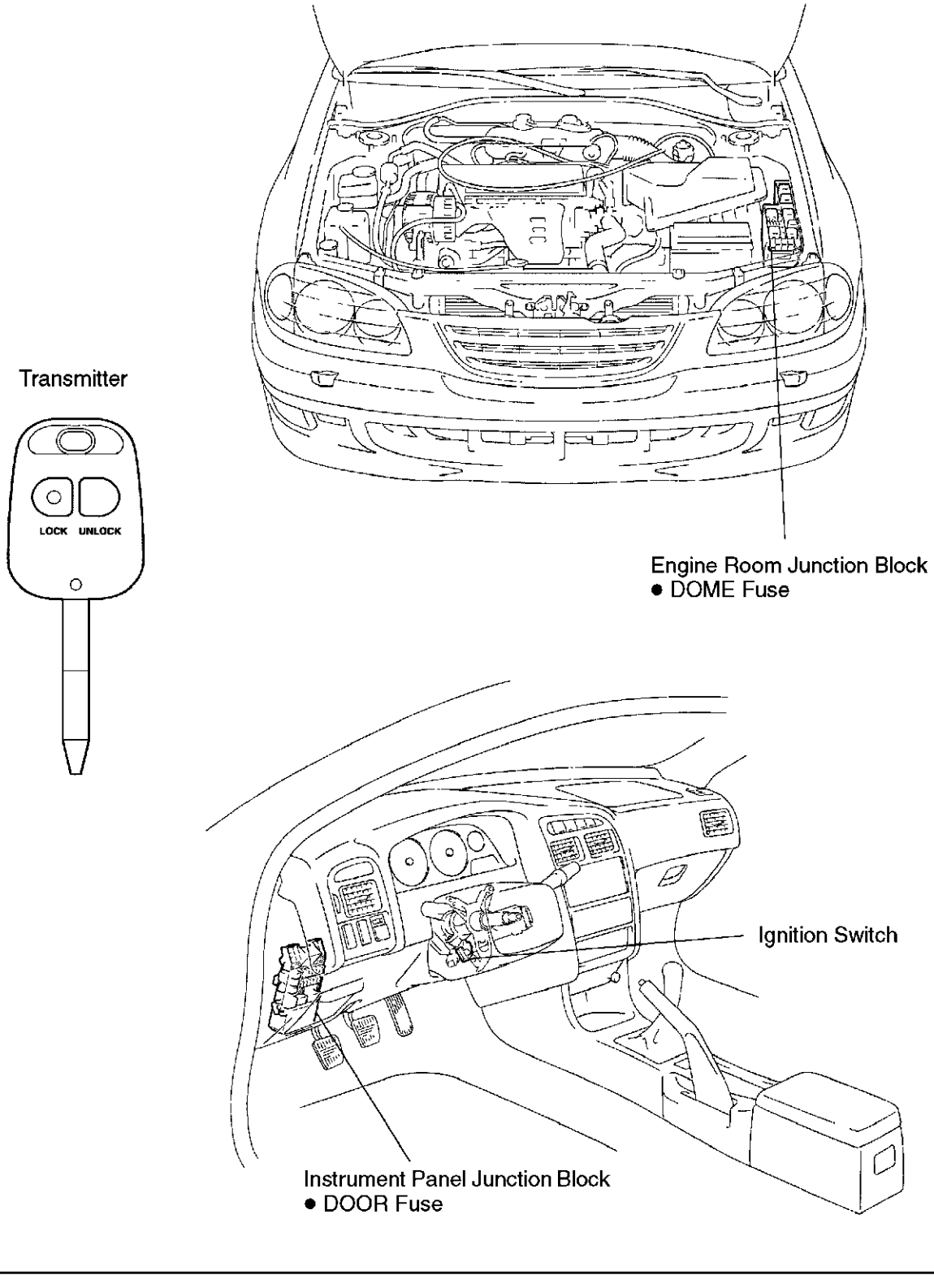
*1 While the receiver waits for new key code transmission, the receiver must end the programing mode if end condition is met.

*3 Method to send a code

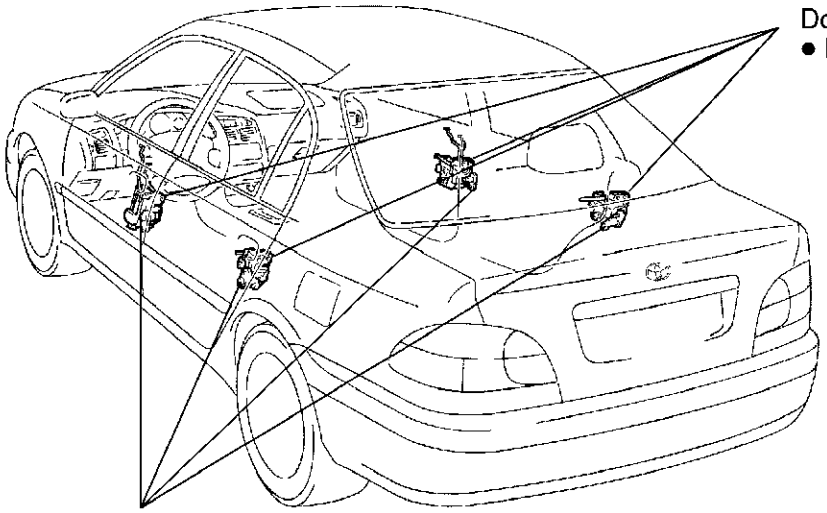


DI343–01

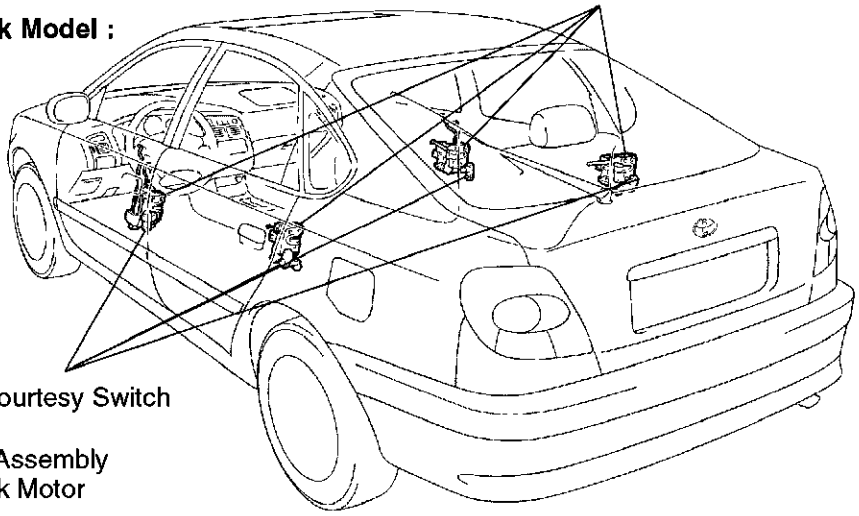
PARTS LOCATION



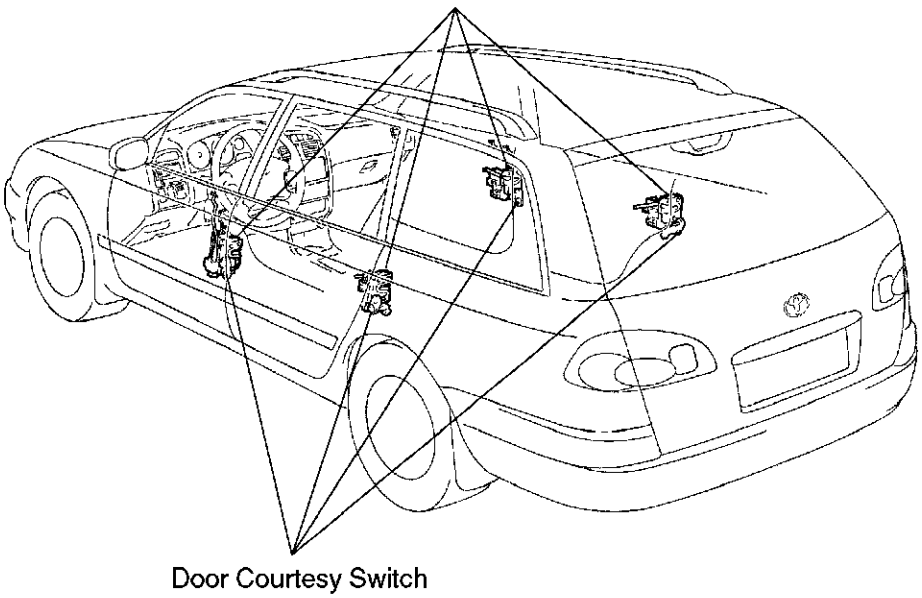
Sedan Model :



Liftback Model :



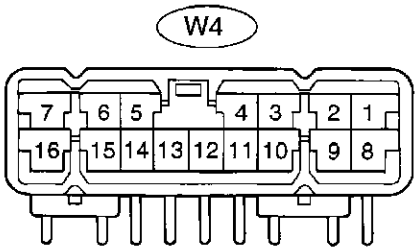
Wagon Model :



I04875

DI344–01

TERMINALS OF ECU



I05453

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
E – Ground (W4 – 7 ↔ Ground)	W – B	Always.	Below 1 V
UL – Ground (W4 – 11 ↔ Ground)	L – O	Door key lock and unlock switch "UNLOCK". (Driver's Door)	Below 1.5 V
		Door key lock and unlock switch "OFF" or "LOCK". (Driver's Door)	8 – 10 V
+B – E (W – 6 ↔ W – 7)	W – B	Always.	10 – 14 V
KSW – Ground (W4 – 8 ↔ Ground)	Y	Key unlock warning switch "ON". (Key is inserted into key cylinder)	Below 1 V
		Key unlock warning switch "OFF".	10 – 14 V
IG – Ground (W4 – 4 ↔ Ground)	R – L	Ignition switch "OFF"	Below 1 V
		Ignition switch "ON"	10 – 14 V
CTY – Ground (W4 – 3 ↔ Ground)	R – W	Door courtesy switch "ON"	Below 1 V
		Door courtesy switch "OFF"	10 – 14 V
L – Ground (W4 – 16 ↔ Ground)	L	Door key lock and unlock switch "LOCK"	Below 1 V
		Door key lock and unlock switch "OFF" or "UNLOCK"	8 – 10 V
TVSS – Ground (W4 – 5 ↔ Ground)	G	Theft deterrent system is operating.	10 – 14 V

DI152-04

PROBLEM SYMPTOMS TABLE

Perform troubleshooting of the circuit for the applicable problem symptom in the order given in the chart below. Proceed to the page located for each circuit.

HINT:

- Troubleshooting of the wireless door lock control system is based on the premise that the door lock control system and theft deterrent system are operating normally. Accordingly, before troubleshooting the wireless door lock control system, first make certain that the door lock control system are operating normally.
- 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 reappears even through there are no abnormalities in any of the other circuits, check and replace the Wireless Door Lock ECU as the last step.

Symptom	Suspect Area	See page
All function of wireless door lock control system do no operate.	1. ECU Power Source Circuit. 2. Ignition Switch Circuit. 3. Door Courtesy Switch Circuit. 4. Door Key Lock and Unlock Switch Circuit. (Unlock Side) 5. Door Key Lock and Unlock Switch Circuit. (Lock Side) 6. Key Unlock Warning Switch Circuit. 7. Wireless Door Lock ECU	DI–317 DI–320 DI–329 DI–323 DI–325 DI–327 IN–28
Only door unlock operation is not possible (Lock operation is possible).	1. Door Key Lock and Unlock Switch Circuit (Unlock Side) 2. Wireless Door Lock ECU	DI–323 IN–28
Only door lock operation is not possible (Unlock operation is possible).	1. Door Key Lock and Unlock Switch Circuit (Lock Side) 2. Wireless Door Lock ECU	DI–325 IN–28
Only key confinement prevention function is not possible.	1. Key Unlock Warning Switch Circuit 2. Wireless Door Lock ECU	DI–327 IN–28
• Wireless door lock function operates even when each door is opened. • Automatic lock function operates even if any door is opened within 30 seconds after all doors are unlocked by wireless door lock control system.	1. Door Courtesy Switch Circuit 2. Wireless Door Lock ECU	DI–329 IN–28

DI153–04

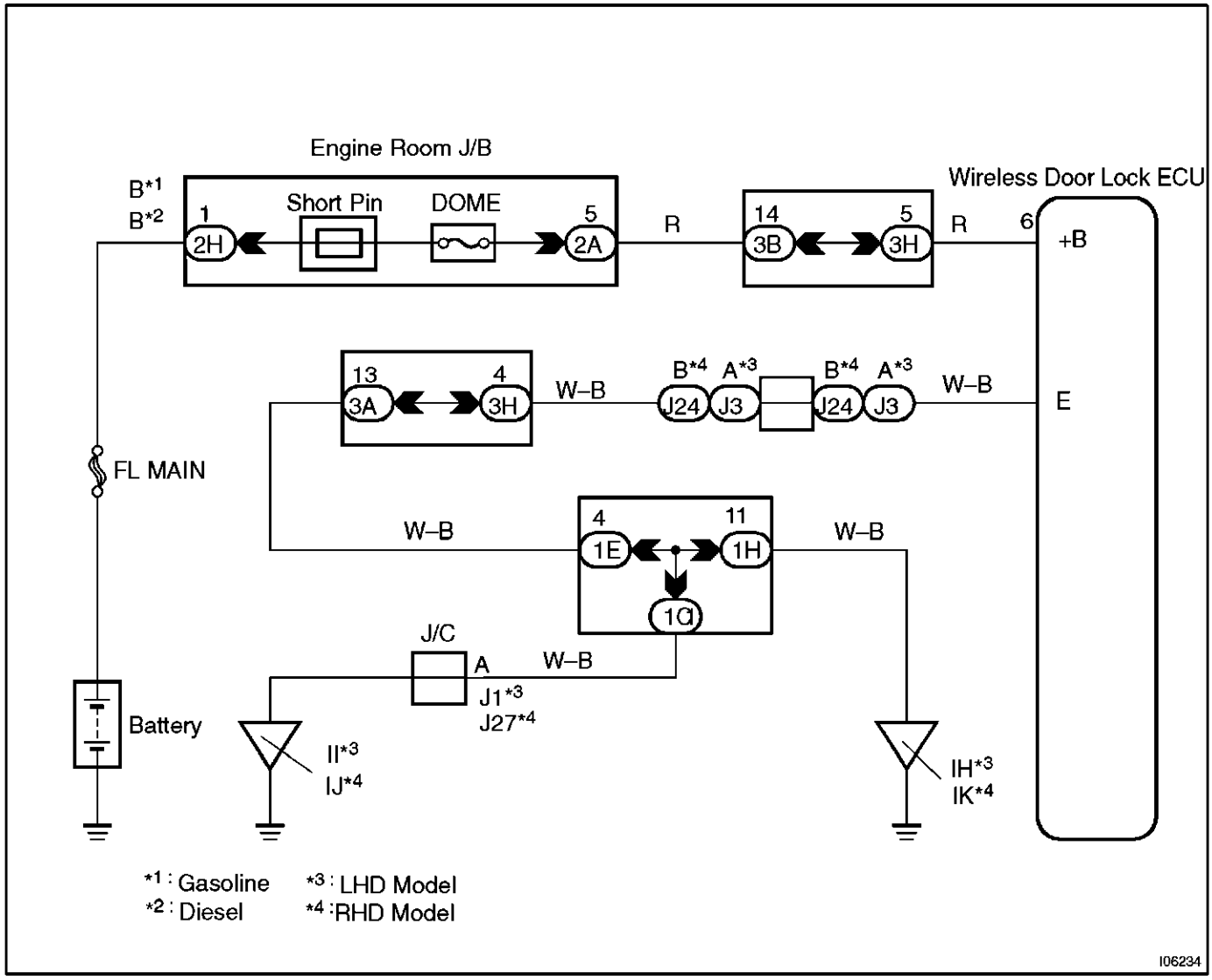
CIRCUIT INSPECTION

ECU Power Source Circuit

CIRCUIT DESCRIPTION

Battery voltage is always applied the terminal +B of the wireless door lock ECU.

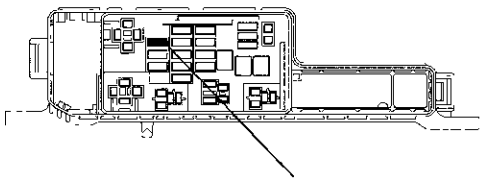
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check DOME fuse.

Engine Room Junction Block

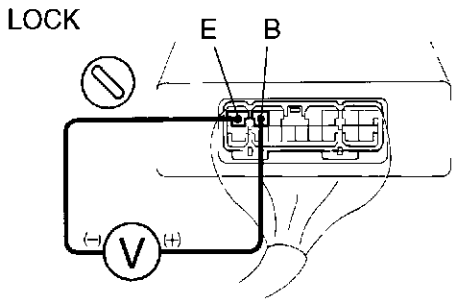


PREPARATION:
Remove DOME fuse from engine room junction block.
CHECK:
Check continuity of DOME fuse.
OK:
Below 1.0 Ω or continuity

NG → **Check for short in all the harness and components connected to DOME fuse. (See attached wiring diagram.)**

OK ↓

2	Check voltage between terminals +B and E of wireless door lock ECU connector.



PREPARATION:
Remove the wireless door lock ECU from No.1 instrument panel brace.
CHECK:
Measure voltage between terminals +B and E of wireless door lock ECU.
OK:
Voltage: 10 – 14 V

OK → **Proceed to next circuit inspection shown on matrix chart (See page DI–316).**

NG ↓

3	Check for open in harness and connector between terminal GND of wireless door lock ECU and body ground (See page IN–28).

NG → Repair or replace harness or connector.

OK

Check and repair harness and connector between wireless door lock control ECU and battery.

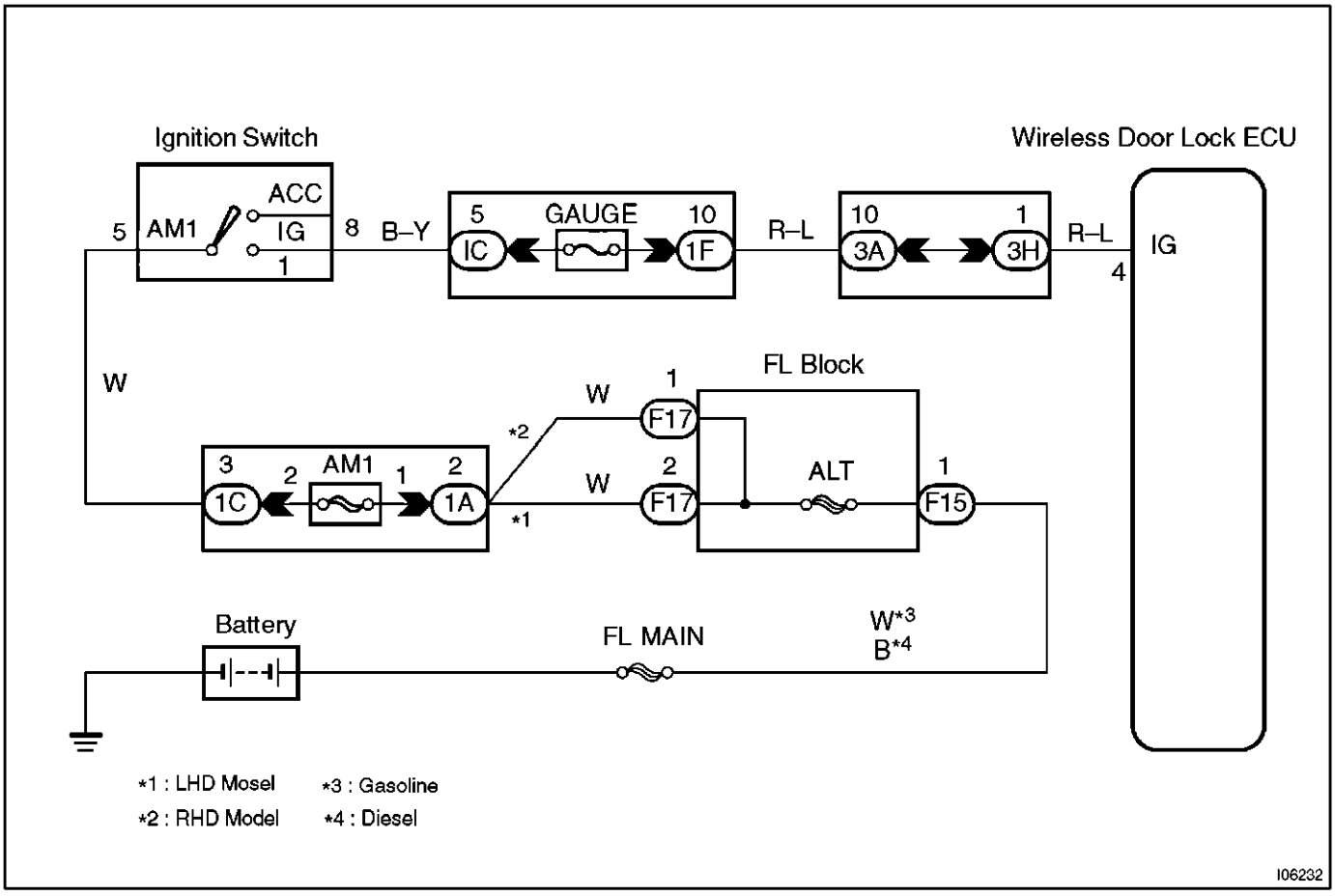
DI154-03

Ignition Switch Circuit

CIRCUIT DESCRIPTION

When the ignition switch is turned to the ON position, battery positive voltage is applied to the terminal IG of the ECU.

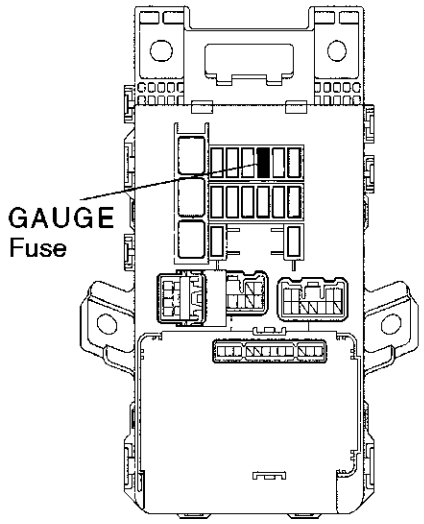
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check GAUGE fuse.**

Instrument Panel Junction Block



PREPARATION:

(a) Remove the fuse box opening cover.

(b) Remove GAUGE fuse from instrument panel junction block.

CHECK:

Check continuity of GAUGE fuse.

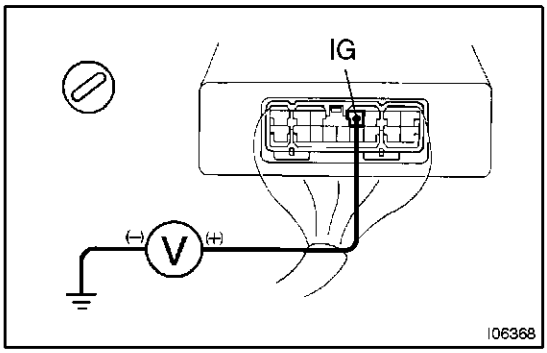
OK:

Continuity

NG → **Check for short in all the harness and components connected to the GAUGE fuse (See attached wiring diagram).**

OK

2	Check voltage between terminals IG of ECU and body ground.



PREPARATION:

(a) Disconnect the wireless door lock ECU connectors.

(b) Turn ignition switch ON.

CHECK:

Measure voltage between terminals IG of wireless door lock ECU connector and body ground.

OK:

Voltage: 10~14V

NG → **Check and repair harness and connector between wireless door lock ECU and battery (See page IN–28).**

OK →

Check and replace wireless door lock ECU.

DI159-04

Door Key Lock and Unlock Switch Circuit (Unlock Side)

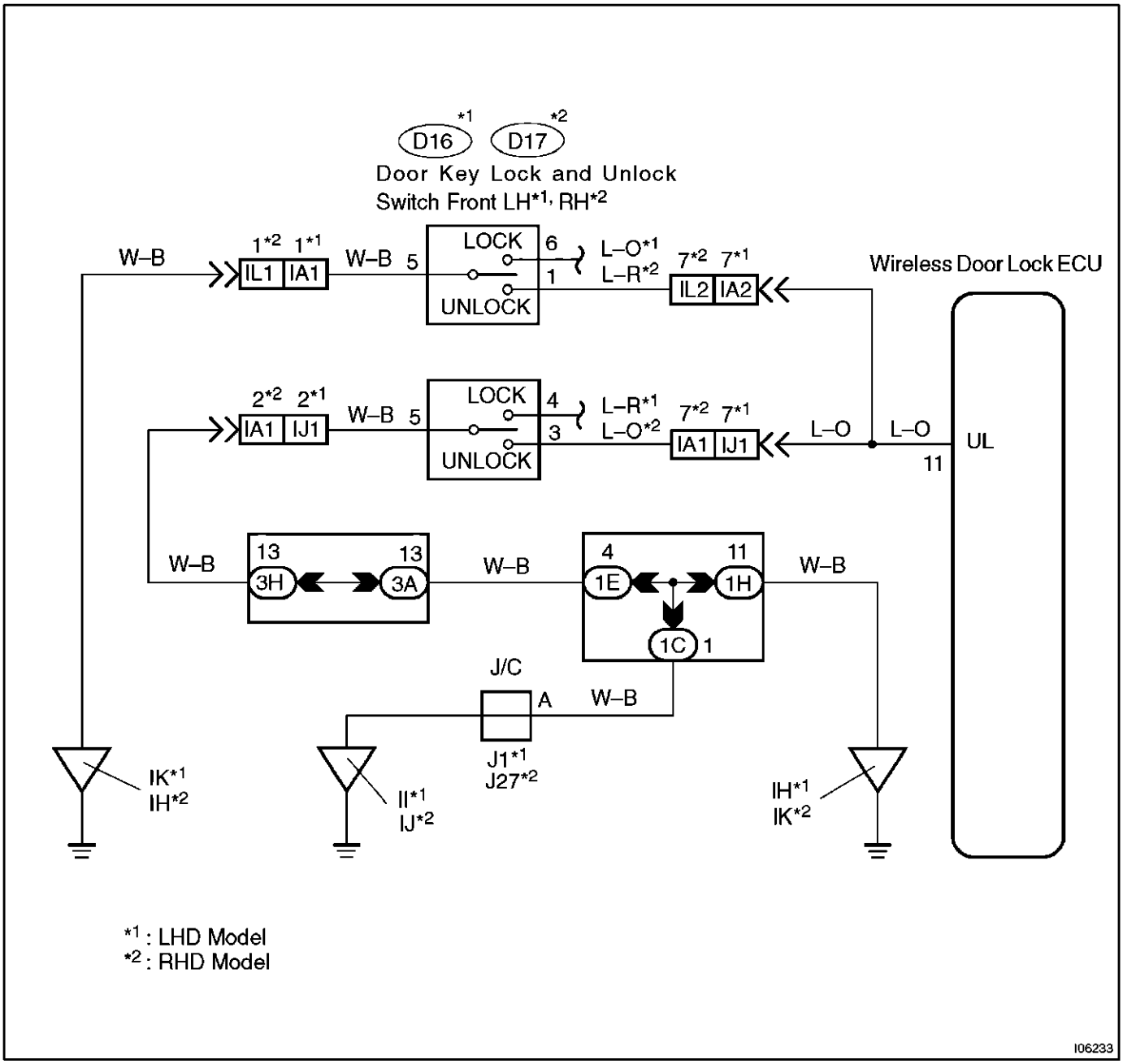
CIRCUIT DESCRIPTION

The key operated switch is built into the door key cylinder. When the key is turned to the lock side, the lock terminal of the switch is grounded, and when the key is turned to the unlock side the unlock terminal is grounded.

Furthermore, the door key lock and unlock switch circuit has terminal +B connected inside the integration relay, when neither the lock or unlock terminal of the key lock and unlock switch are grounded, battery positive voltage is applied to the door key lock and unlock switch circuit of the wireless door lock ECU.

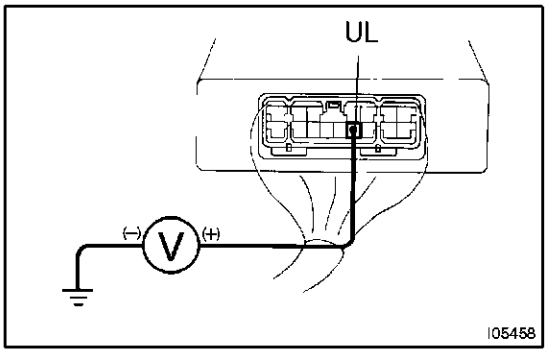
(Tr inside the ECU coming ON causes the wireless door lock ECU to output a signal to unlock all the doors.)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals UL of wireless door lock ECU connector and body ground.**



PREPARATION:
Remove the wireless door lock ECU from No.1 instrument panel brace.

CHECK:
Measure voltage between terminal UL of wireless door lock ECU connector and body ground.

OK:

Voltage: 10 – 14V

OK	**Proceed to next circuit inspection shown on matrix chart (See page DI–316).**

NG

Check and repair harness and connector between wireless door lock ECU and door key lock and unlock switch.

DI157-04

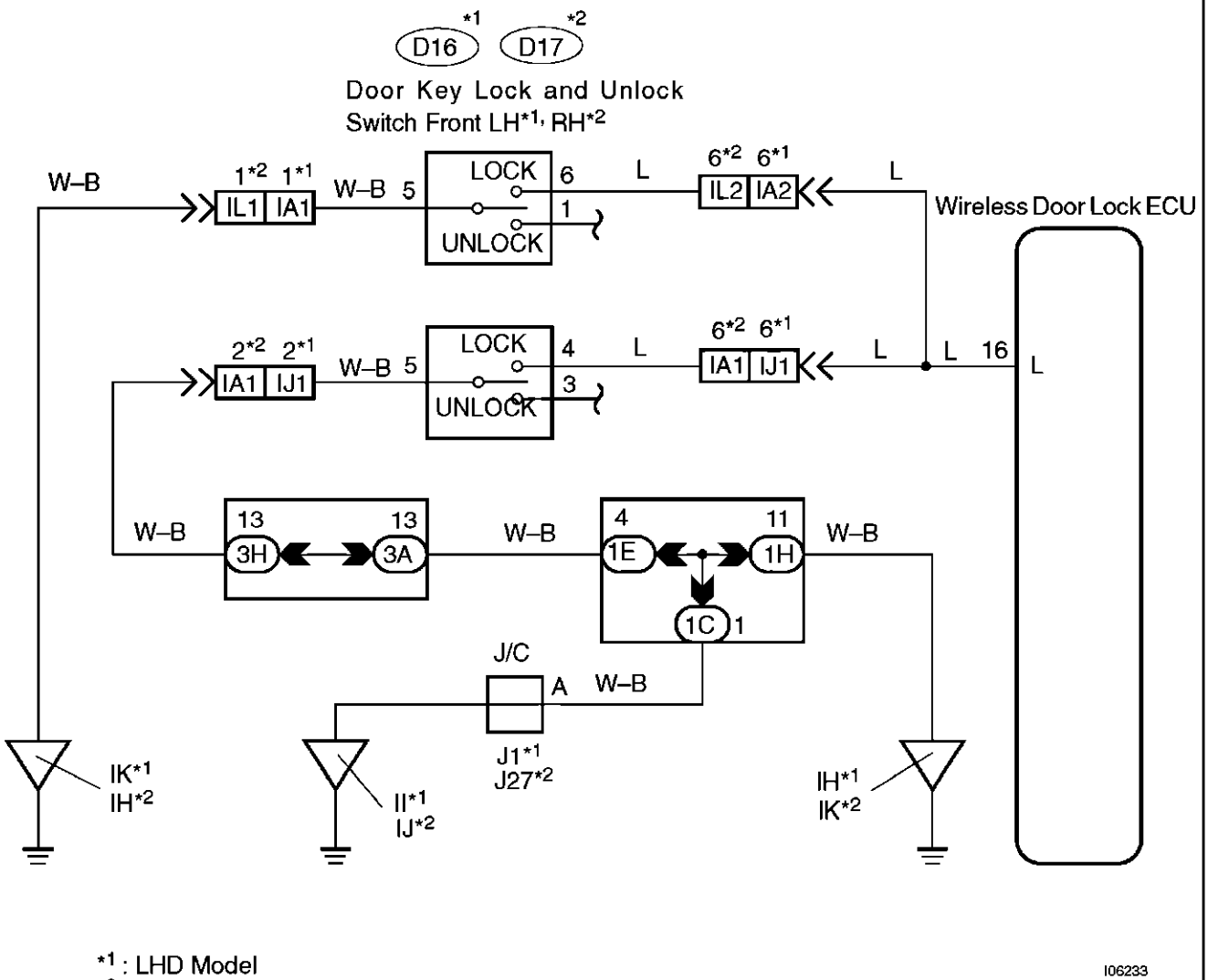
Door Key Lock and Unlock Switch Circuit (Lock Side)

CIRCUIT DESCRIPTION

Refer to page DI–323.

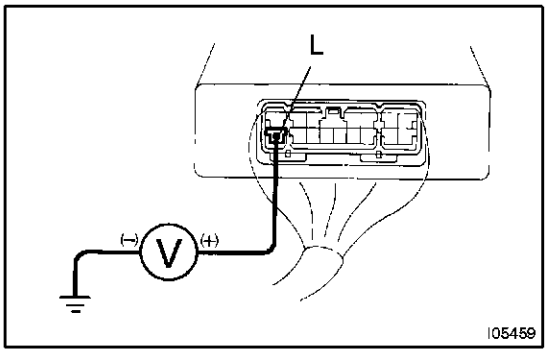
Tr inside the wireless door lock ECU coming ON causes the integration relay to output a signal to lock all the doors.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminal L of wireless door lock ECU connector and body ground.**



PREPARATION:
Remove the wireless door lock ECU from No.1 instrument panel brace.

CHECK:
Measure voltage between terminal L of wireless door lock ECU connector and body ground.

OK:

Voltage 10 – 14 V

OK → **Proceed to next circuit inspection shown on matrix chart (See page DI–316).**

NG

Check and repair harness and connector between wireless door lock ECU and door key lock and unlock switch.

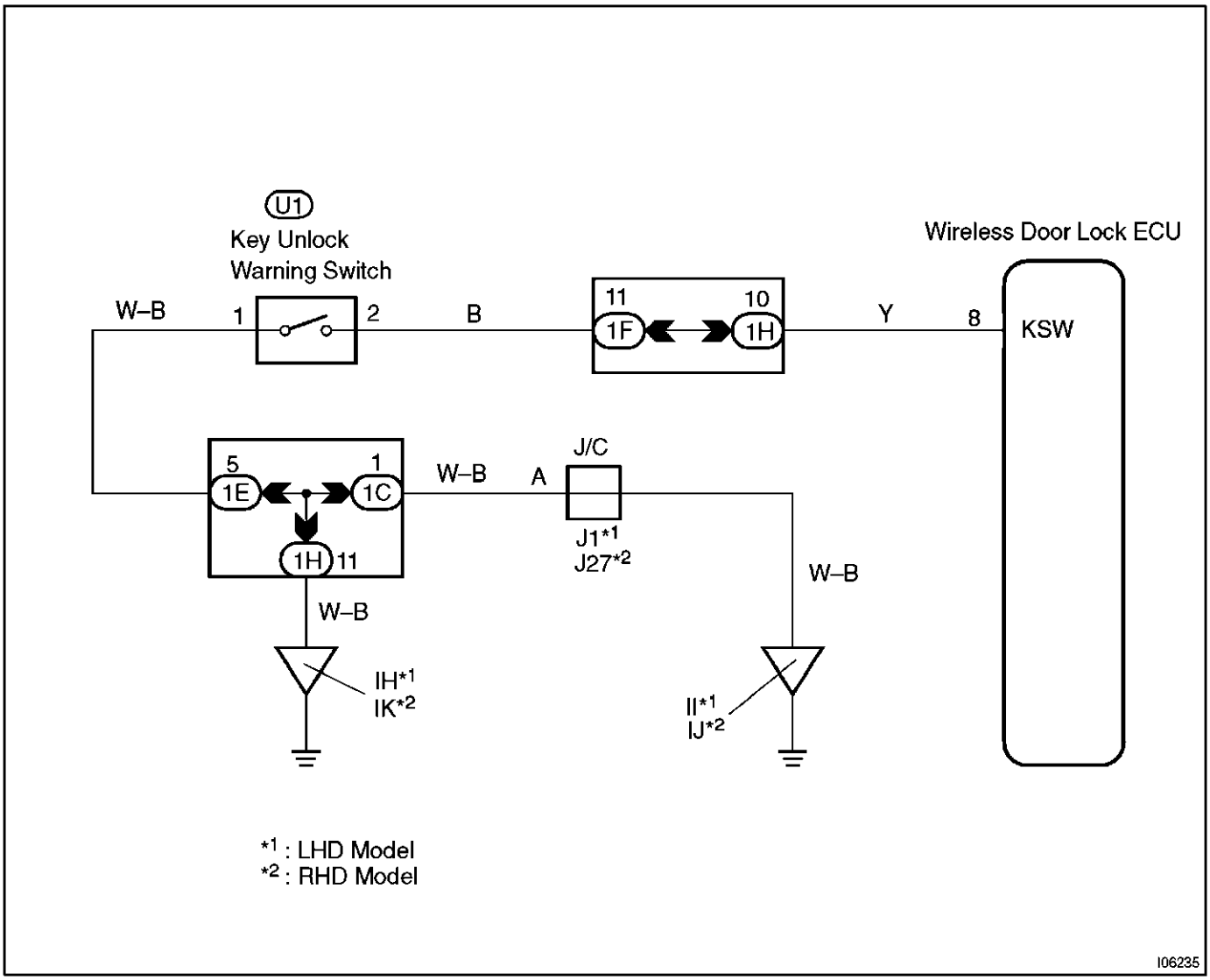
DI159-04

Key Unlock Warning Switch Circuit

CIRCUIT DESCRIPTION

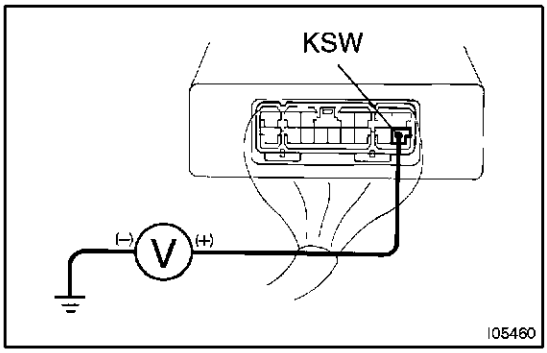
When the key is inserted in the ignition key cylinder, the key unlock warning switch comes ON, and when the key is not inserted the switch is OFF.
When the key unlock warning switch is ON, the ECU operates the transmitter misoperation prevention function.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminal KSW of wireless door lock ECU connector and body ground.**



PREPARATION:
Remove the wireless door lock ECU from No.1 instrument panel brace.

CHECK:
Measure voltage between terminal KSW of wireless door lock ECU connector and body ground, when key plate is not inserted in the key cylinder.

OK:

Voltage: 10 – 14 V

OK → **Proceed to next circuit inspection shown on matrix chart (See page DI–316).**

NG

Check and repair harness and connector between wireless door lock ECU and key unlock warning switch.

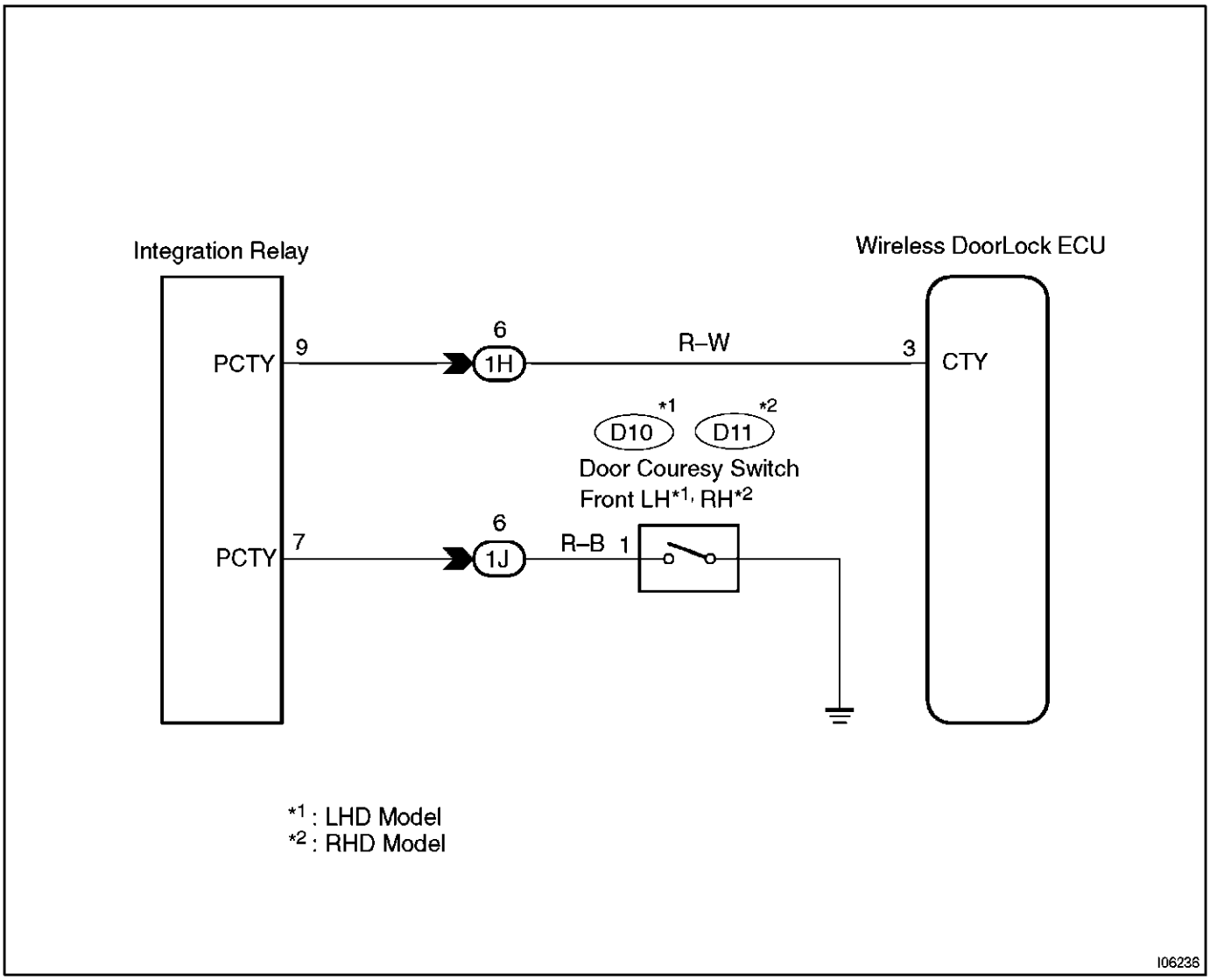
DI345-01

Door Courtesy Switch Circuit

CIRCUIT DESCRIPTION

The door courtesy switch comes ON when the door is opened and goes OFF when door is closed. Furthermore. the door courtesy switch circuit has terminal +B connected inside the integration relay. Battery positive voltage is applied to terminal DSWD of the theft deterrent ECU when all doors are closed, i.e., when the door courtesy switch of all doors are OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

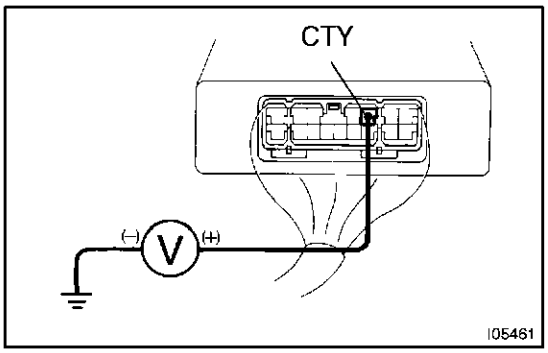
1	**Check operation of open door warning light.**

CHECK:
Check that open door warning light comes on when each door is opened, and goes off when all doors are closed.

NG → **Check open door warning light circuit**

OK

2	**Check voltage between terminal CTY of wireless door lock ECU connector and body ground.**



PREPARATION:
Remove the wireless door lock ECU from No.1 instrument panel brace.
CHECK:
Measure voltage between terminal CTY of wireless door lock ECU connector and body ground, when all doors are closed.
OK:
Voltage: 10 – 14 V

OK → **Proceed to next circuit inspection shown on matrix chart (See page DI–316).**

NG

Check and repair harness and connector between wireless door lock ECU and door courtesy switch.

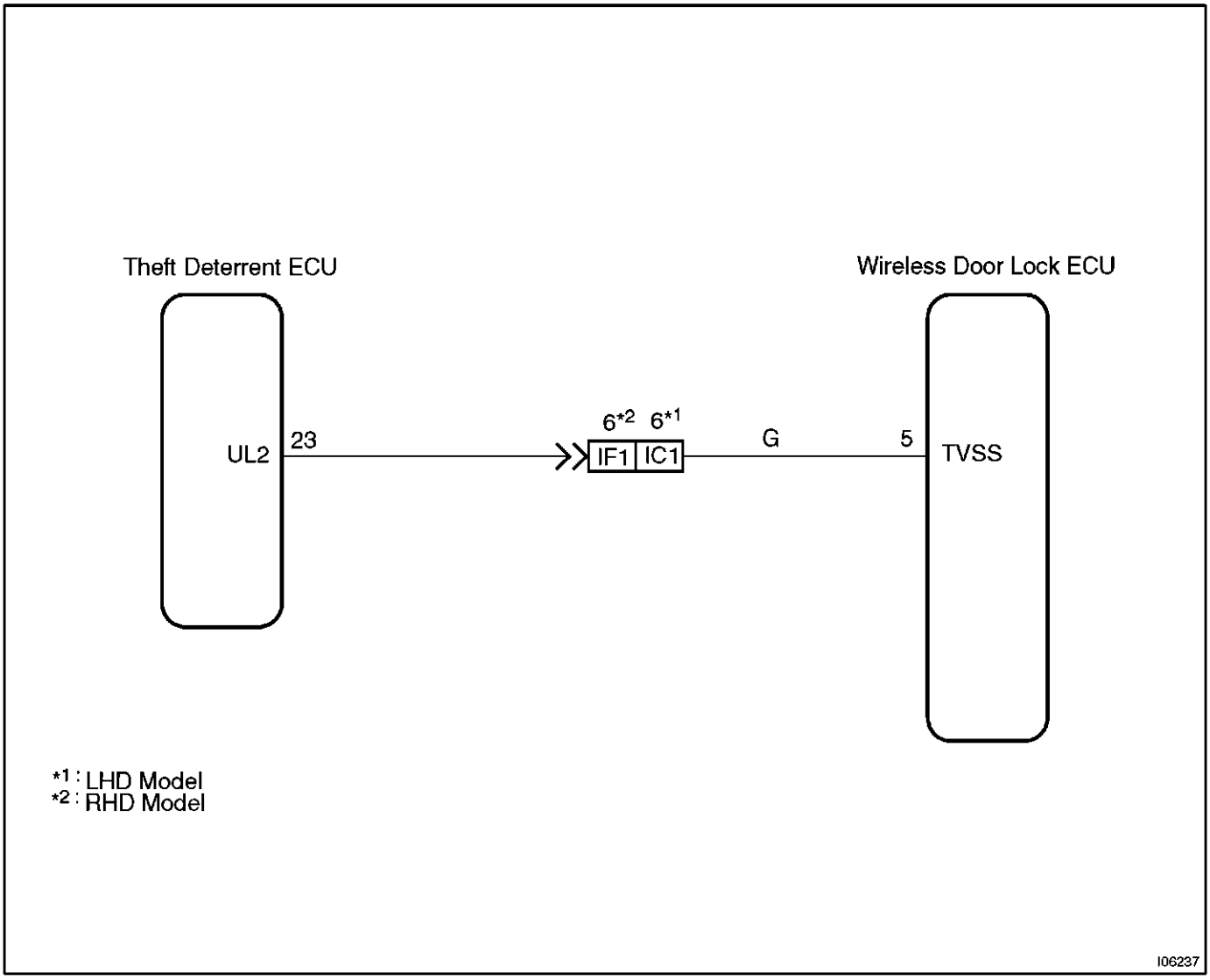
DI346-01

TVSS ECU Communication Circuit

CIRCUIT DESCRIPTION

Sygnals are sent from TVSS ECU to wireless door lock control ECU.

WIRING DIAGRAM



CLUTCH

TROUBLESHOOTING CL–1
CLUTCH PEDAL CL–2
CLUTCH MASTER CYLINDER CL–4
CLUTCH RELEASE CYLINDER CL–10
CLUTCH UNIT CL–15

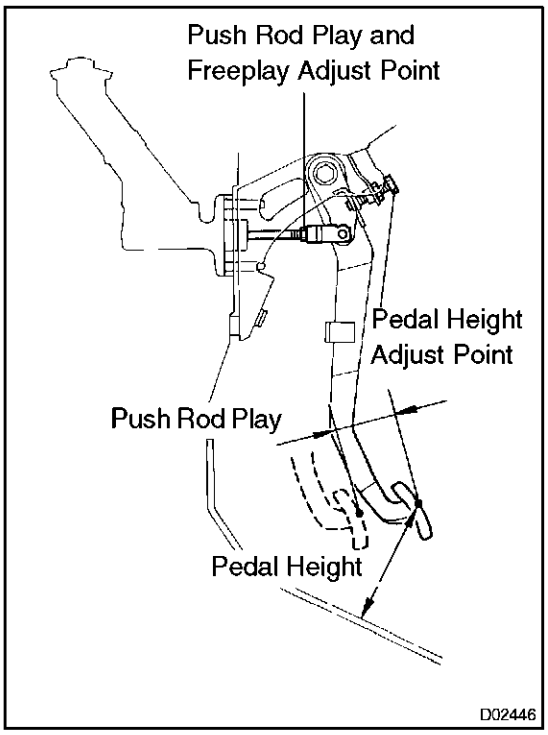
TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

CL014–02

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	1. Engine mounting (Loosen)	–
	2. Clutch disc (Runout is excessive)	CL–15
	3. Clutch disc (Oily)	CL–15
	4. Clutch disc (Worn out)	CL–15
	5. Clutch disc torsion rubber (Damaged)	CL–15
	6. Clutch disc (Glazed)	CL–15
	7. Diaphragm spring (Out of tip alignment)	CL–15
Clutch pedal spongy	1. Clutch line (Air in line)	–
	2. Master cylinder cup (Damaged)	CL–4
	3. Release cylinder cup (Damaged)	CL–10
Clutch noisy	1. Release bearing (Worn, dirty, or damaged)	CL–15
	2. Clutch disc torsion rubber (Damaged)	CL–15
Clutch slips	1. Clutch pedal (Free play out of adjustment)	CL–2
	2. Clutch disc (Oily)	CL–15
	3. Clutch disc (Worn out)	CL–15
	4. Diaphragm spring (Damaged)	CL–15
	5. Pressure plate (Distortion)	CL–15
	6. Flywheel (Distortion)	–
Clutch does not disengage	1. Clutch pedal (Free play out of adjustment)	CL–2
	2. Clutch line (Air in line)	–
	3. Master cylinder cup (Damaged)	CL–4
	4. Release cylinder cup (Damaged)	CL–10
	5. Clutch disc (Out of true)	CL–15
	6 Clutch disc (Runout is excessive)	CL–15
	7. Clutch disc (Lining broken)	CL–15
	8. Clutch disc (Dirty or burned)	CL–15
	9. Clutch disc (Oily)	CL–15
	10. Clutch disc (Lack of spline grease)	CL–18
	11. Diaphragm spring (Damaged)	CL–15
	12. Diaphragm spring (Out of tip alignment)	CL–18
	13. Pressure plate (Distortion)	CL–15



CLUTCH PEDAL

CL015-02

INSPECTION

1. **CHECK PEDAL HEIGHT**

Pedal height from asphalt sheet:
LHD:
4A–FE, 7A–FE ENGINE:
139.7 – 149.7 mm (5.499 – 5.893 in.)
3S–FE, 2C–TE, 2C–T ENGINE:
148.3 – 158.3 mm (5.838 – 6.232 in.)
RHD:
4A–FE, 7A–FE ENGINE:
148.7 – 158.7 mm (5.854 – 6.248 in.)
3S–FE, 2C–TE, 2C–T ENGINE:
157.4 – 167.4 mm (6.196 – 6.590 in.)

2. **IF NECESSARY, ADJUST PEDAL HEIGHT**

Loosen the lock nut and turn the stopper bolt until the height is correct. Tighten the lock nut.

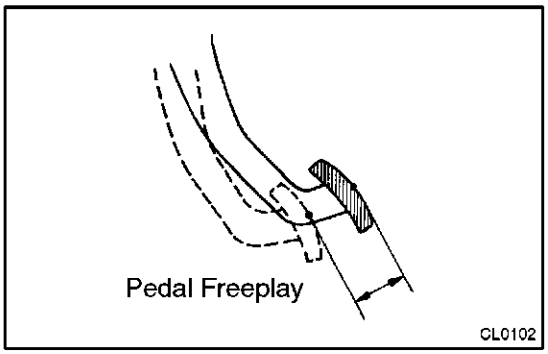
3. **CHECK PEDAL FREEPLAY AND PUSH ROD PLAY**

Depress pedal until clutch resistance begins to be felt.

Pedal freeplay:
1.0 – 5.0 mm (0.039 – 0.197 in.)

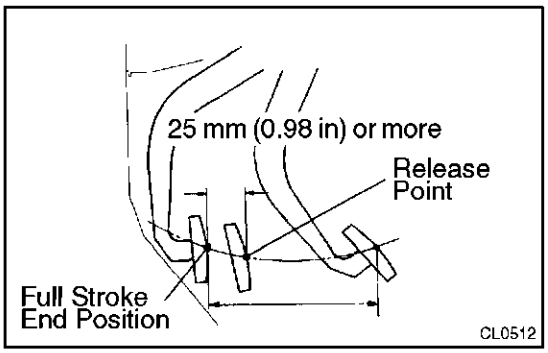
Gently push on the pedal until the resistance begins to increase a little.

Push rod play at pedal top:
5.0 – 15.0 mm (0.197 – 0.591 in.)



4. **IF NECESSARY, ADJUST PEDAL FREEPLAY AND PUSH ROD PLAY**

(a) Remove the air duct and the lower finish panel (See page BO–113).
(b) Loosen the lock nut and turn the push rod until the free-play and push rod play are correct.
(c) Tighten the lock nut.
(d) After adjusting the pedal freeplay, check the pedal height.
(e) Connect the air duct and install the lower finish panel.



5. CHECK CLUTCH RELEASE POINT

(a) Pull the parking brake lever and install wheel stopper.

(b) Start the engine and idle the engine.

(c) Without depressing the clutch pedal, slowly shift the shift lever into reverse position until the gears make contact.

(d) Gradually depress the clutch pedal and measure the stroke distance from the point the gear noise stops (release point) 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.

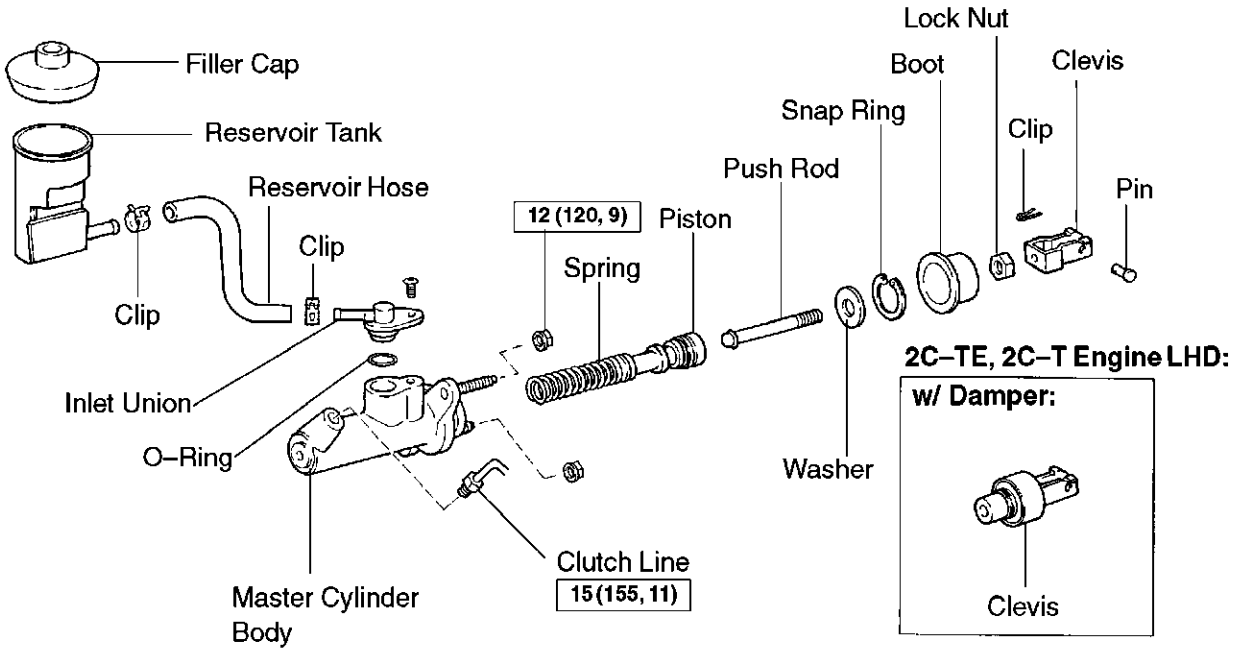
- Inspect pedal height.
- Inspect push rod play and pedal freeplay.
- Bleed the clutch line.
- Inspect the clutch cover and disc.

CLUTCH MASTER CYLINDER

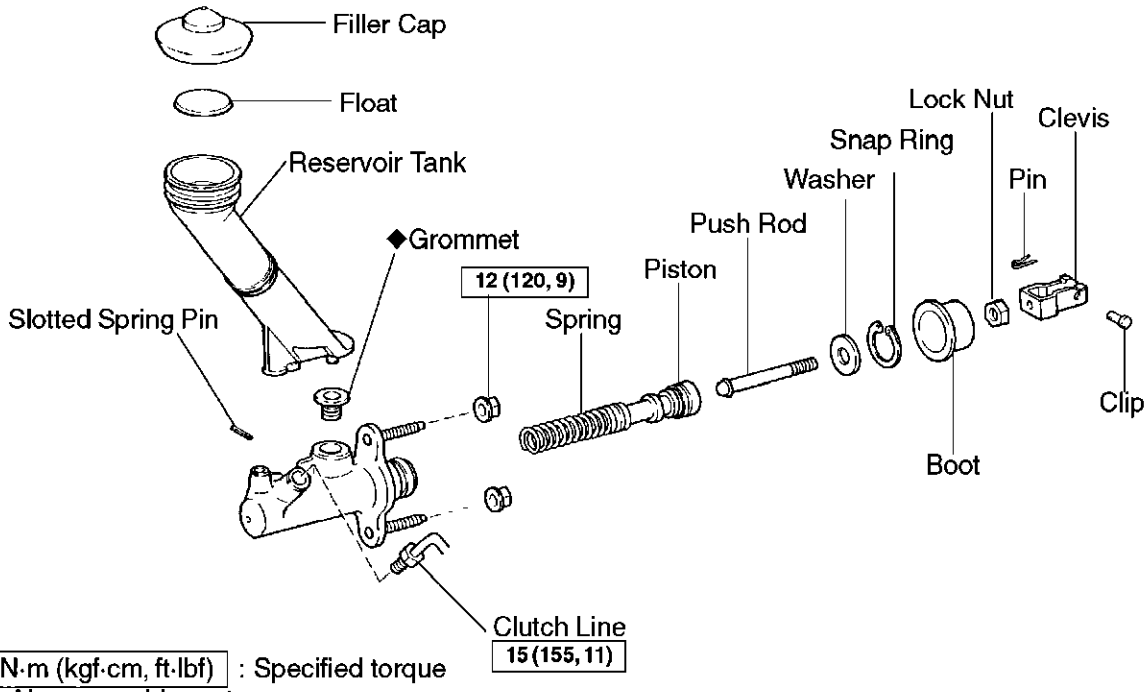
COMPONENTS

CL016–02

LHD:



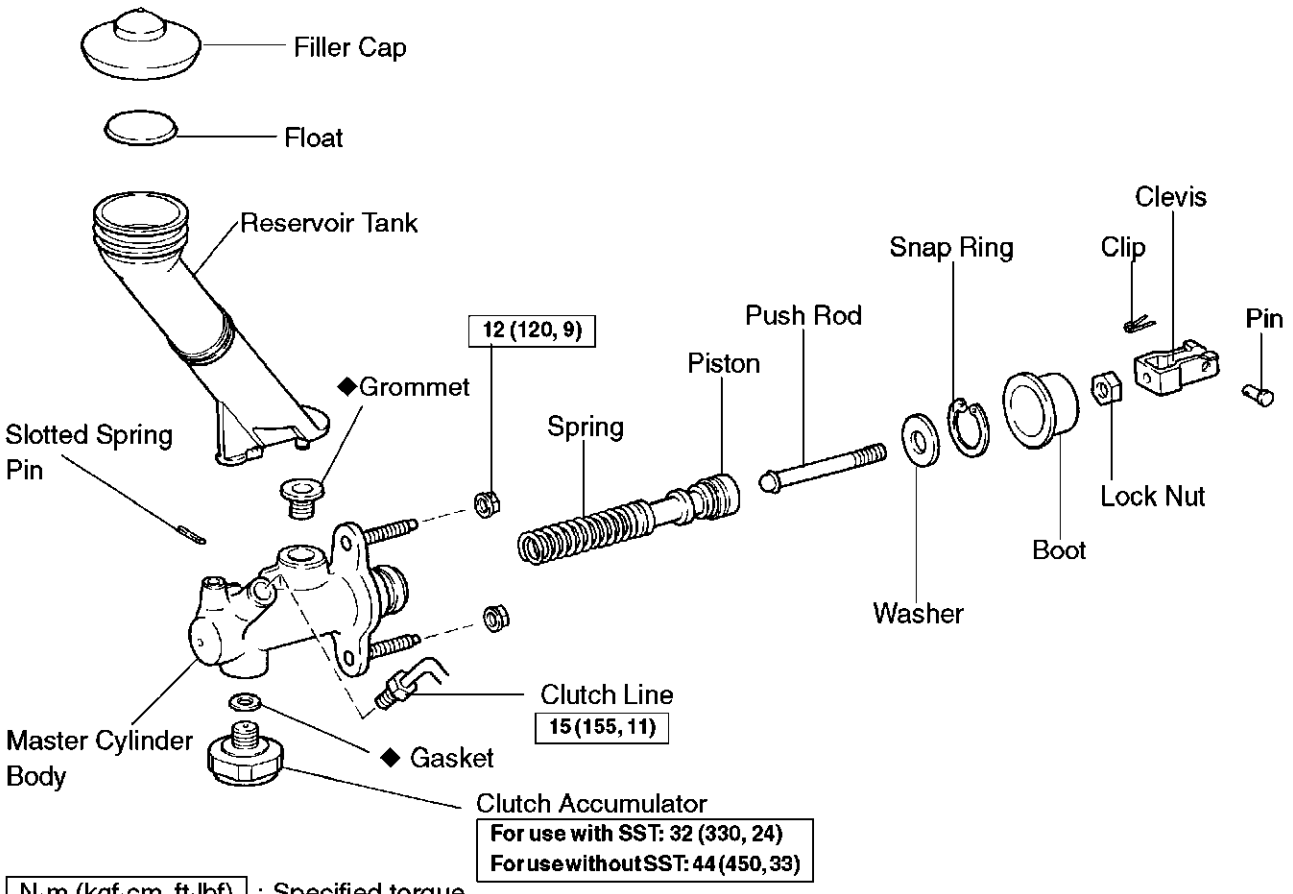
4A–FE, 7A–FE, 3S–FE Engine RHD:



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02178

2C–TE Engine RHD:



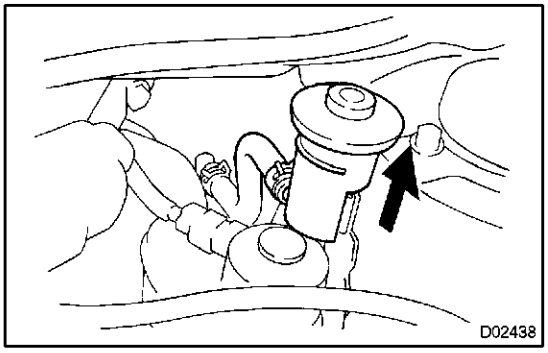
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02437

CL017–02

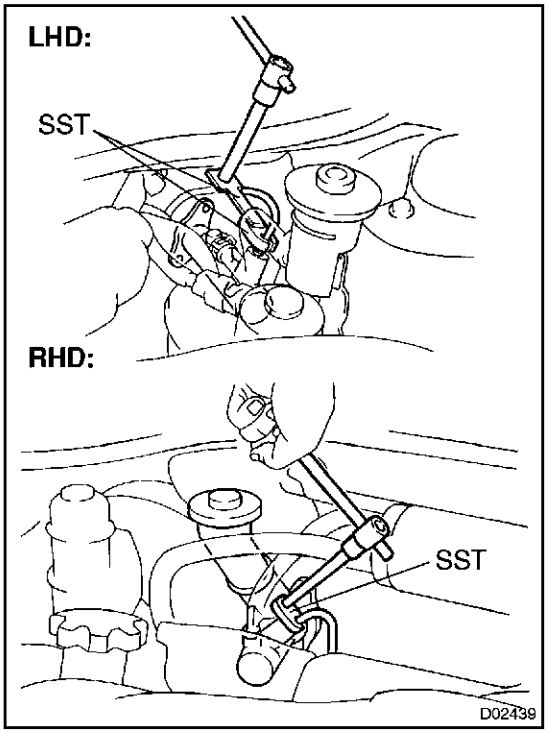
REMOVAL

1. DRAW OUT FLUID WITH SYRINGE



2. LHD:
   DISCONNECT RESERVOIR TANK

Disconnect reservoir tank from reservoir tank bracket.



3. LHD:
   DISCONNECT CLUTCH LINE

Using SST, disconnect the clutch line. Use a container to catch the fluid.

SST 09023–00100, 09249–63010

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

4. RHD:
   DISCONNECT CLUTCH LINE

Using SST, disconnect the clutch line. Use a container to catch the fluid.

SST 09023–00100

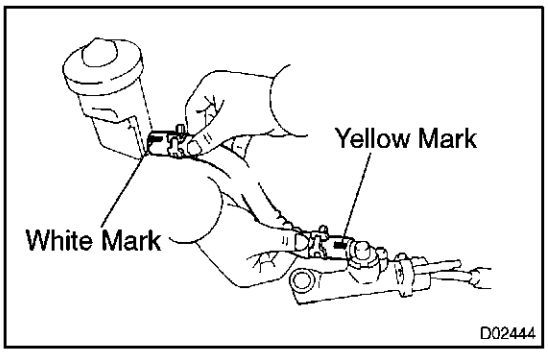
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

5. REMOVE CLIP AND PIN
6. REMOVE 2 MOUNTING NUTS AND PULL OUT MASTER CYLINDER AND GASKET

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

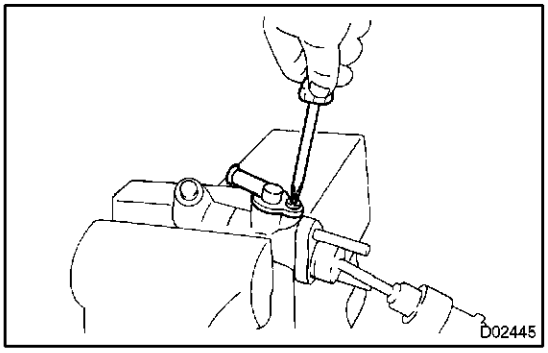
CL051–01

DISASSEMBLY

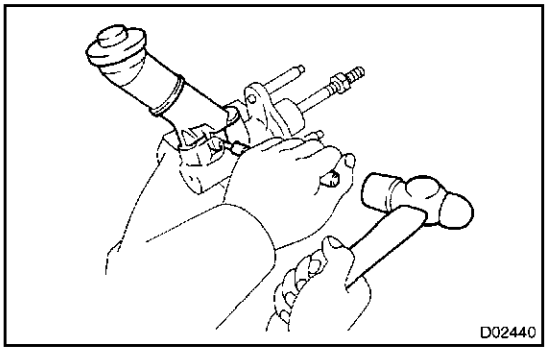


1. LHD:
REMOVE RESERVOIR TANK

(a) Using a pliers, disconnect the 2 clips.
(b) Remove the reservoir tank from reservoir hose.
(c) Remove the reservoir hose from inlet union.

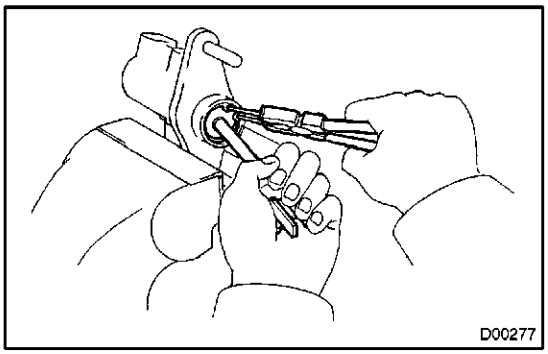


(d) Remove the inlet union.



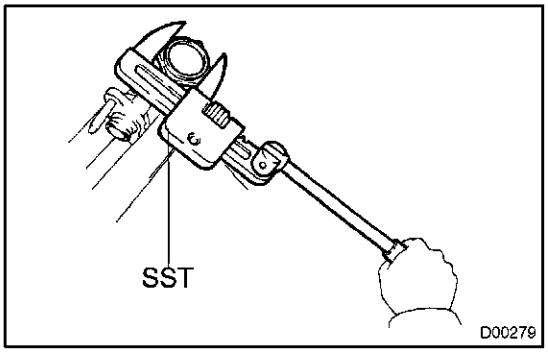
2. RHD:
REMOVE RESERVOIR TANK

(a) Using a pin punch and hammer, drive out the slotted spring pin.
(b) Remove the reservoir tank and grommet.



3. REMOVE PUSH ROD

(a) Pull back the boot and remove the snap ring with snap ring pliers.
(b) Pull out the push rod and washer.
(c) Remove the piston from the cylinder.

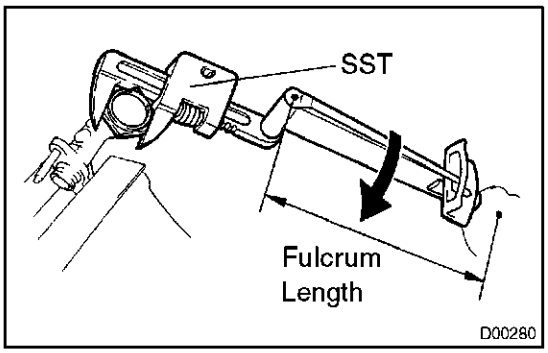


4. 2C–TE ENGINE RHD:
REMOVE CLUTCH ACCUMULATOR

Using SST, remove the accumulator and gasket.
SST 09922–10010

CL052–01

REASSEMBLY



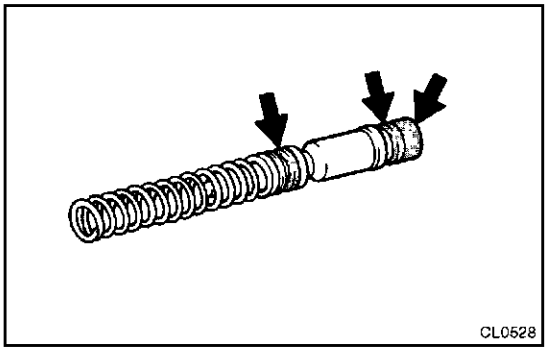
1. 2C–TE ENGINE RHD:
INSTALL CLUTCH ACCUMULATOR

Using SST, install the accumulator with a new gasket.

SST 09922–10010

Torque:
For use with SST:
32 N·m (330 kgf·cm, 24 ft·lbf)
For use without SST
44 N·m (450 kgf·cm, 33 ft·lbf)

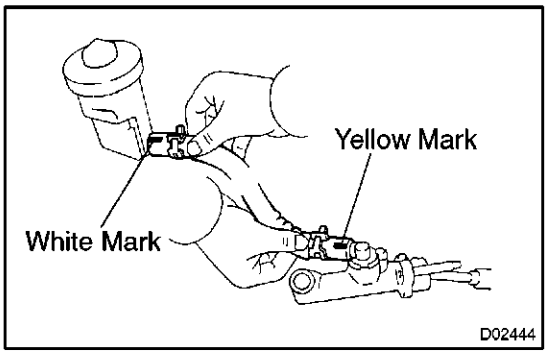
HINT:
Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).



2. COAT PARTS WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN IN ILLUSTRATION

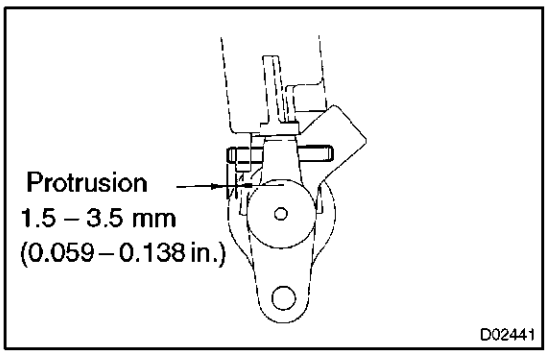
3. INSERT PISTON INTO CYLINDER

4. INSTALL PUSH ROD ASSEMBLY WITH NEW GASKET AND NEW PISTON STOP PLATE



5. LHD:
INSTALL RESERVOIR TANK

(a) Install the O–ring and inlet union.
(b) Facing the white mark upwards, install the reservoir hose to the reservoir tank.
(c) Facing the yellow mark upwards, install the reservoir hose to the cylinder.
(d) Using a pliers, connect the 2 clips.



6. RHD:
INSTALL RESERVOIR TANK

(a) Install the reservoir tank and a new grommet.
(b) Using a pin punch and hammer, drive in the slotted spring pin.

CL01A–02

INSTALLATION

Installation is in the reverse order of removal (See page CL–6).

HINT:

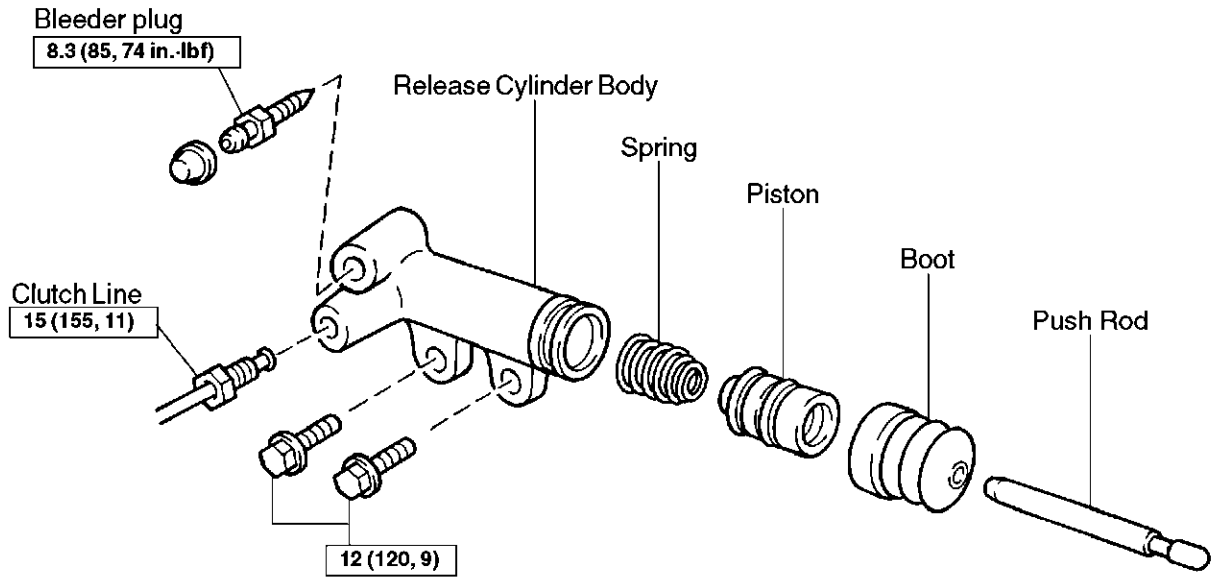
After installation, bleed the clutch system and adjust the clutch pedal.

CLUTCH RELEASE CYLINDER

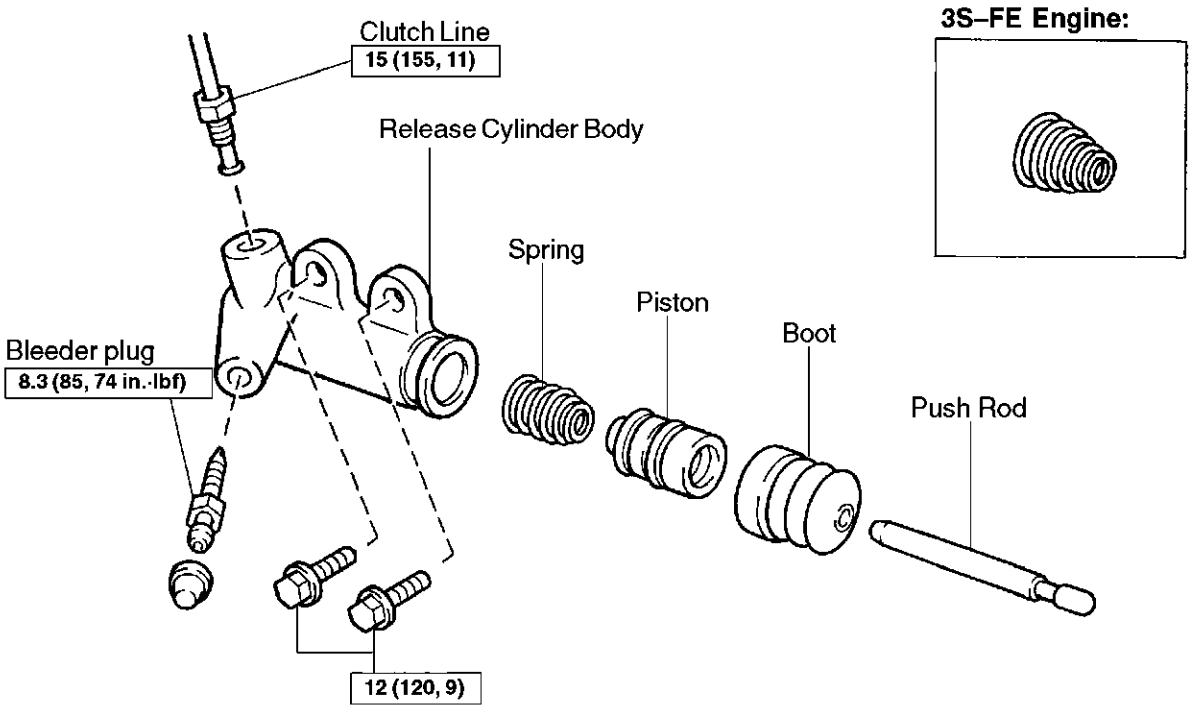
COMPONENTS

CL01B–02

4E–FE, 7A–FE Engine:



3S–FE, 2C–TE, 2C–T Engine:



3S–FE Engine:

N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02447

CL053–01

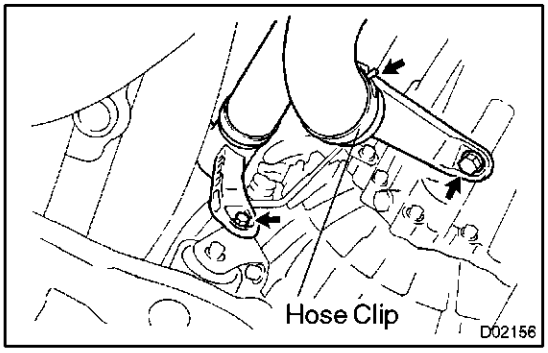
REMOVAL

1. 2C–TE, 2C–T ENGINE:
REMOVE NO.1 AND NO.2 AIR TUBE ASSEMBLY

(a) Raise the vehicle.

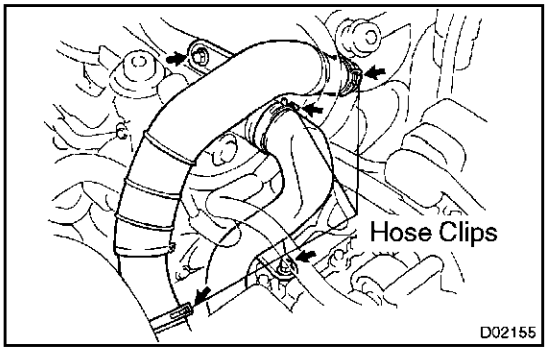
NOTICE:
Make sure that the vehicle is securely supported.

(b) Remove LH and RH under covers.

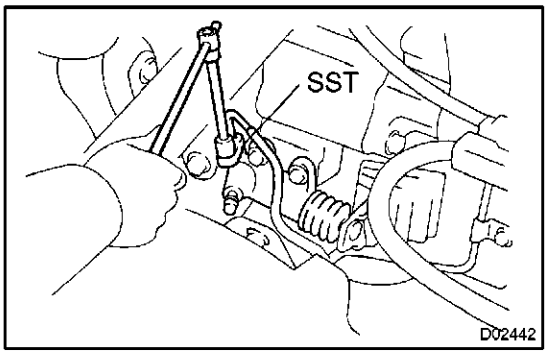


(c) Remove 2 lower side bolts of the No.1 and No.2 air tube assembly and disconnect the hose clip.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(d) Lower the vehicle.



(e) Remove the 2 upper side bolts of the No.1 and No.2 air tube assembly and disconnect 3 hose clips.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



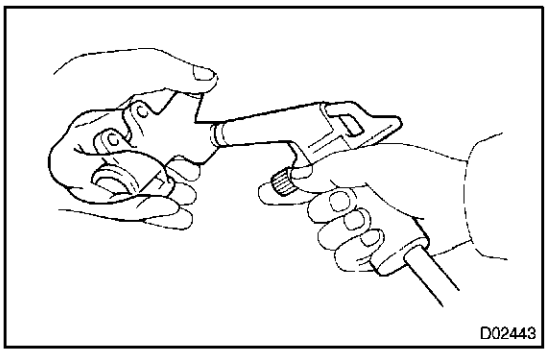
2. DISCONNECT CLUTCH LINE

Using SST, disconnect the clutch line. Use a container to catch the fluid.

SST 09023–00100
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

3. REMOVE 2 BOLTS AND PULL OUT RELEASE CYLINDER
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

CL01D–02

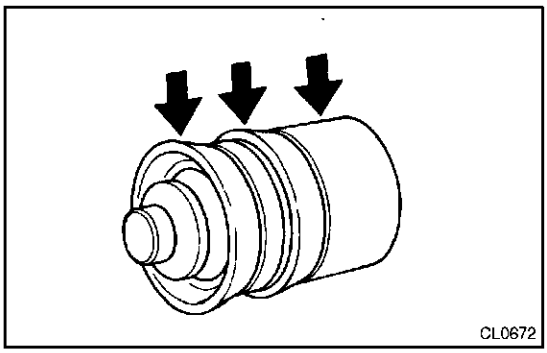


DISASSEMBLY

1. **REMOVE BLEEDER PLUG**
2. **PULL OUT BOOT WITH PUSH ROD**
3. **REMOVE PISTON**

Using compressed air, remove the piston and spring from the cylinder.

CL01E–02



REASSEMBLY

1. COAT PISTON WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN IN ILLUSTRATION
2. INSTALL PISTON WITH SPRING INTO CYLINDER
3. INSTALL BOOT WITH PUSH ROD TO CYLINDER
4. INSTALL BLEEDER PLUG
   Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)

CL01F–02

INSTALLATION

Installation is in the reverse order of removal (See page CL–11).

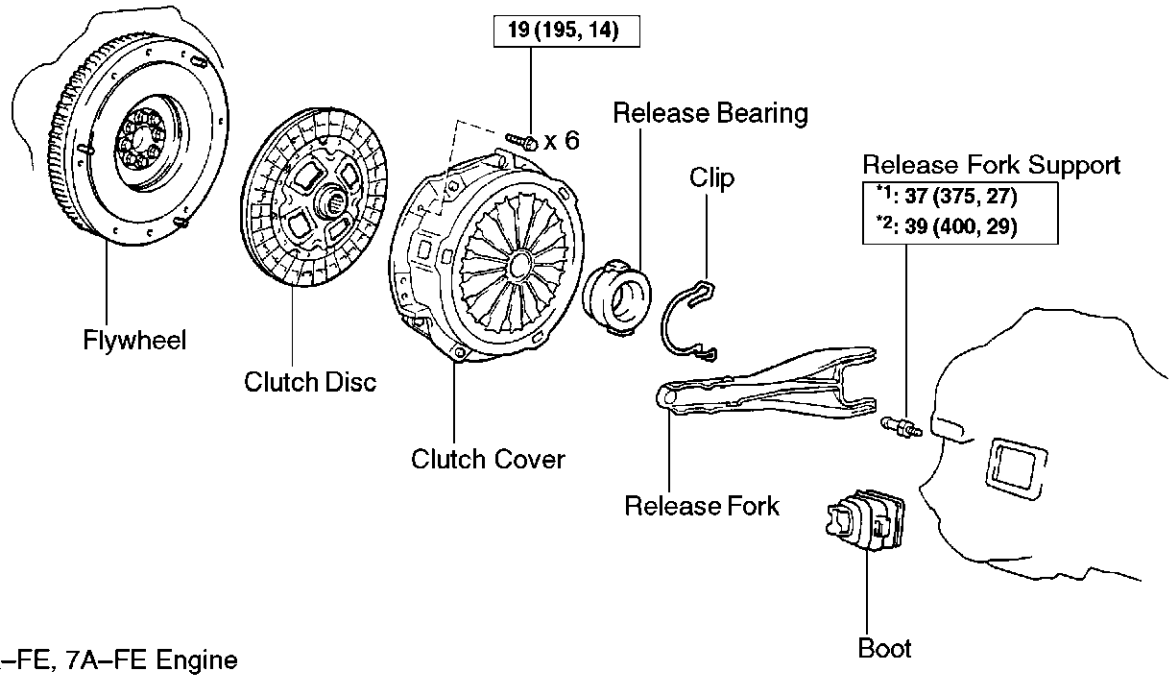
HINT:

After installation, bleed the clutch system.

CLUTCH UNIT

COMPONENTS

CL01J–02



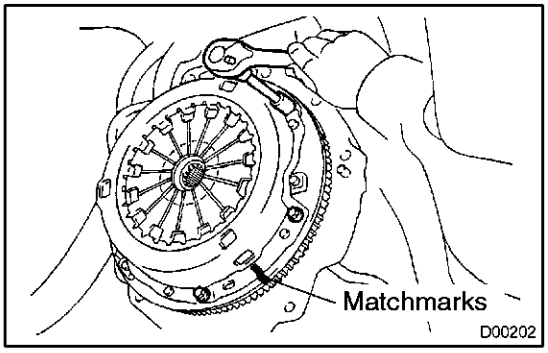
*1: 4A–FE, 7A–FE Engine
*2: 3S–FE, 2C–TE, 2C–T Engine
N·m (kgf·cm, ft·lbf) : Specified torque

D00201

CL01K–02

REMOVAL

1. **REMOVE TRANSAXLE FROM ENGINE**
   C50, C250 M/T: See page MX–2
   S50, S54 M/T: See page MX–2, MX–8



2. **REMOVE CLUTCH COVER AND DISC**

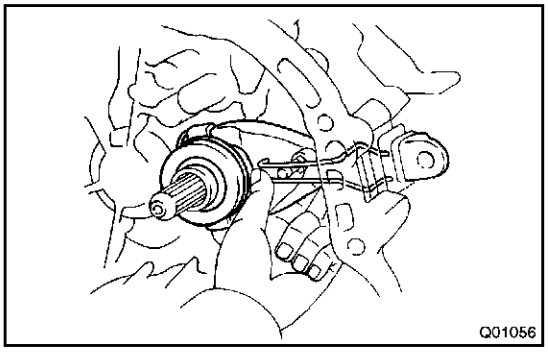
(a) Place matchmarks on the flywheel and clutch cover.

(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 with the clutch disc.

NOTICE:

Do not drop the clutch disc.

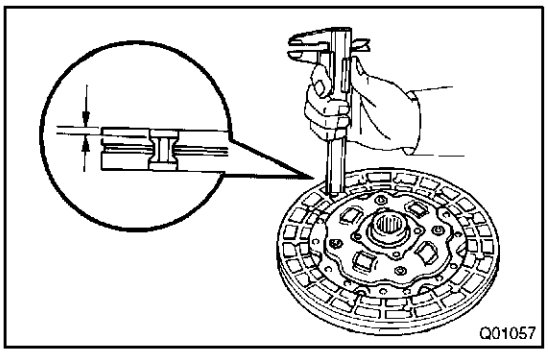


3. **REMOVE RELEASE BEARING AND FORK FROM TRANSAXLE**

Remove the release bearing with the fork together and then separate them.

CL01L–02

INSPECTION

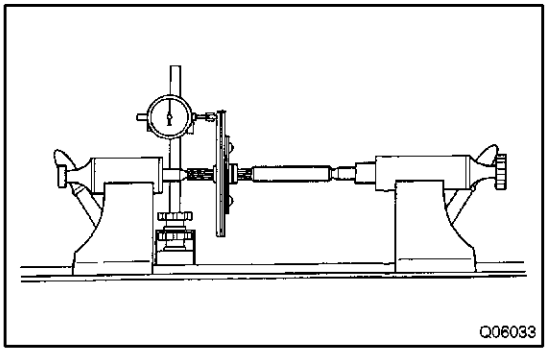


1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using calipers, measure the rivet head depth.

Minimum rivet depth:
0.3 mm (0.012in.)

If necessary, replace the clutch disc.

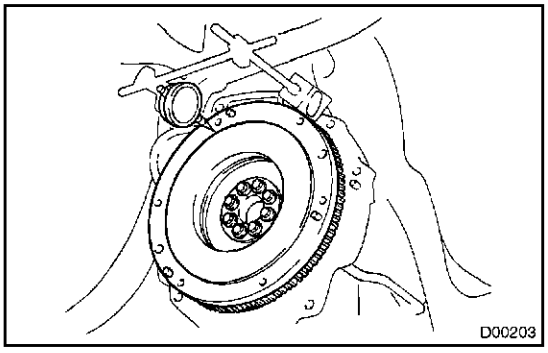


2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator, check the disc.

Maximum runout:
0.8 mm (0.031 in.)

If necessary, replace the clutch disc runout.

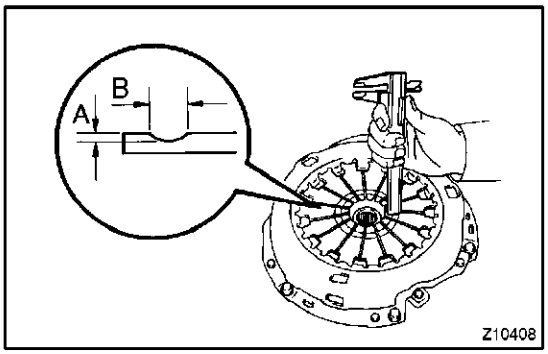


3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator, check the flywheel runout.

Maximum runout:
0.1 mm (0.004 in.)

If necessary, replace the flywheel.

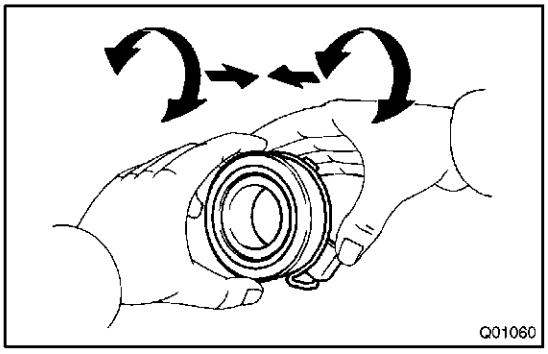


4. INSPECT DIAPHRAGM SPRING FOR WEAR

Using calipers, measure the diaphragm spring for depth and width of wear.

Maximum runout:
A (Depth): 0.5 mm (0.020 in.)
B (Width): 6.0 mm (0.236 in.)

If necessary, replace the clutch cover.



5. INSPECT RELEASE BEARING

Turn the bearing by hand while applying force in the axial direction.

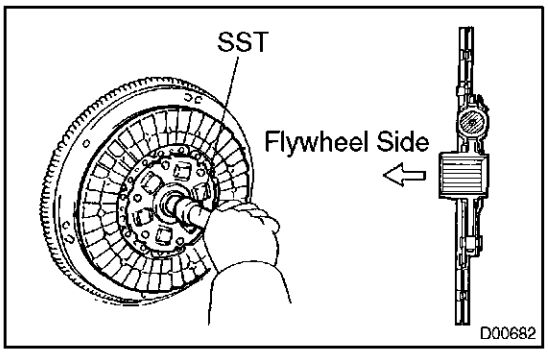
HINT:

The bearing is permanently lubricated and requires no cleaning or lubrication.

If necessary, replace the release bearing.

CL01M–02

INSTALLATION



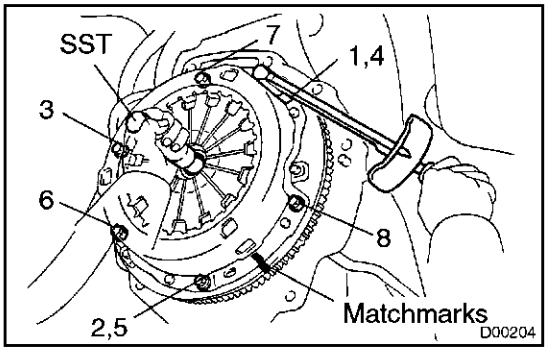
1. INSTALL CLUTCH DISC AND CLUTCH COVER ON FLYWHEEL

(a) 2C–TE, 2C–T Engine:
Insert SST in the clutch disc, and then insert them in the flywheel.
SST 09301–00210

HINT:
Take care not to insert clutch disc in the wrong direction.

(b) Others:
Insert SST in the clutch disc, and then insert them in the flywheel.
SST 09301–00120

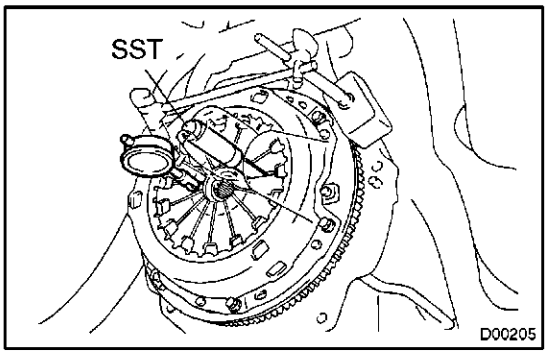
HINT:
Take care not to insert clutch disc in the wrong direction.



(c) Align the matchmark on the clutch cover with the one on the flywheel.

(d) Torque the bolts on the clutch cover in the order shown in the illustration.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

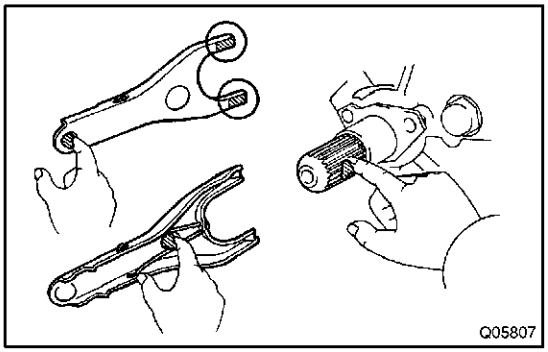
HINT:
Temporarily tighten the No.1 and No.2 bolts.



2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT

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



3. APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO.2)

(a) Apply release hub grease to the following parts.
- Release fork and hub contact point
- Release fork and push rod contact point
- Release fork pivot point

(b) Apply clutch spline grease.
- Clutch disc spline

HINT:
Recommended grease part number 08887–01706 (100g).

4. INSTALL RELEASE BEARING AND FORK TO TRANSAXLE

Install the bearing to the release fork, and then install them to the transaxle.

5. INSTALL TRANSAXLE TO ENGINE

C50, C250 M/T: See page MX–2

S50, S54 M/T: See page MX–2, MX–8

MANUAL TRANSAXLE (C50, C250)

TROUBLESHOOTING MX–1
MANUAL TRANSAXLE UNIT MX–2
MANUAL TRANSAXLE ASSEMBLY MX–8
INPUT SHAFT MX–21
OUTPUT SHAFT MX–28
SHIFT AND SELECT LEVER SHAFT MX–35
DIFFERENTIAL CASE MX–36
SHIFT LEVER AND CONTROL CABLE MX–43

TROUBLESHOOTING

MX002–02

PROBLEM SYMPTOMS TABLE

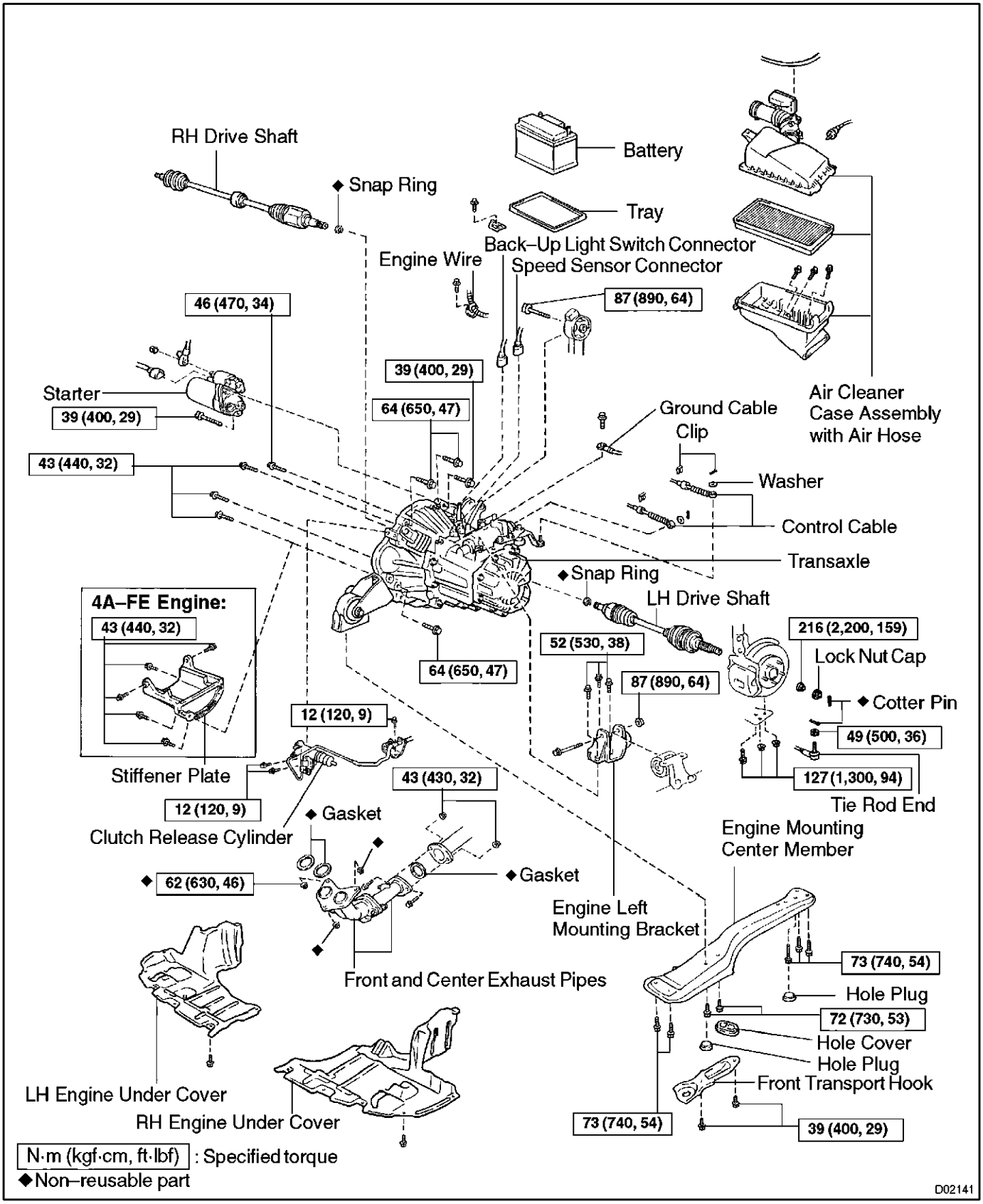
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace parts.

Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–3
	2. Oil (Wrong)	MX–3
	3. Gear (Worn or damaged)	MX–8
	4. Bearing (Worn or damaged)	MX–8
Oil leakage	1. Oil (Level too high)	MX–3
	2. Gasket (Damaged)	MX–8
	3. Oil seal (Worn or damaged)	MX–8
	4. O–Ring (Worn or damaged)	MX–8
Hard to shift or will not shift	1. Control cable (Faulty)	MX–43
	2. Synchronizer ring (Worn or damaged)	MX–8 MX–21 MX–28
	3. Shift key spring (Damaged)	MX–8 MX–21 MX–28
Jumps out of gear	1. Locking ball spring (Damaged)	MX–8
	2. Shift fork (Worn)	MX–8
	3. Gear (Worn or damaged)	MX–8
	4. Bearing (Worn or damaged)	MX–8

MANUAL TRANSAXLE UNIT

COMPONENTS

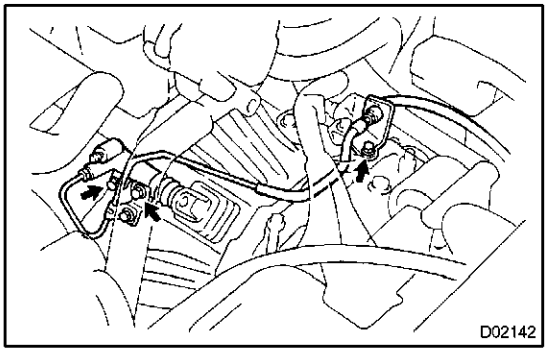
MX06E–01



MX06F–01

REMOVAL

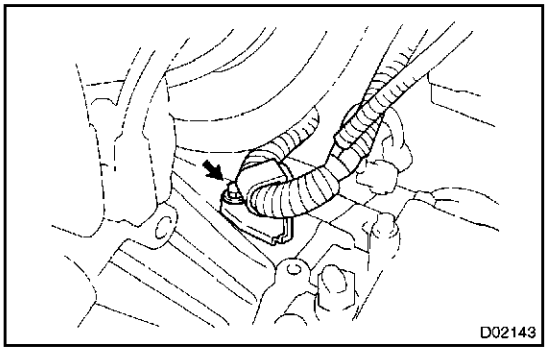
1. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE



2. DISCONNECT CLUTCH RELEASE CYLINDER AND LINE

(a) Remove the set bolt of the clutch line bracket.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

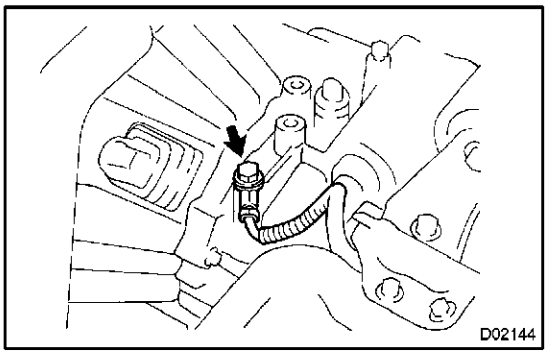
(b) Remove the 2 bolts and disconnect the clutch release cylinder and line.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



3. DISCONNECT ENGINE WIRE FROM CLAMP

Remove the bolt and engine wire clamp from the transaxle.

4. DISCONNECT BACK–UP LIGHT SWITCH AND SPEED SENSOR CONNECTORS

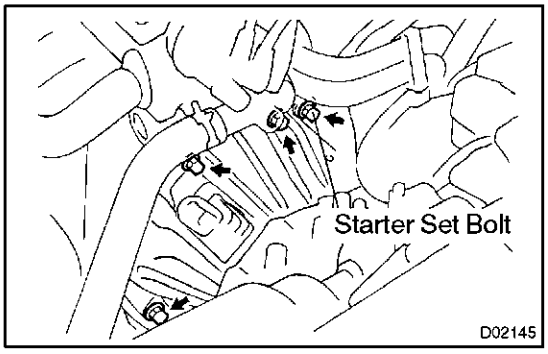


5. DISCONNECT GROUND CABLE

Remove the set bolt and disconnect the ground cable from the transaxle.

6. DISCONNECT CONTROL CABLE

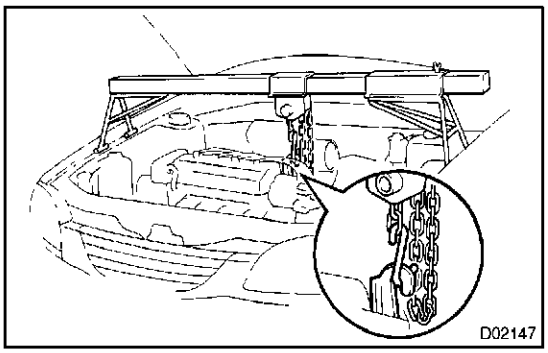
(a) Remove the 2 clips and washers.
(b) Remove the 2 clips from the cables.
(c) Disconnect the 2 control cables from the transaxle.



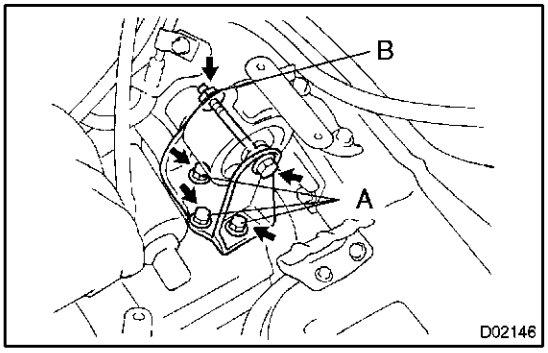
7. REMOVE STARTER SET BOLT

Remove the set bolt of the starter from the transaxle upper side.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

8. REMOVE 3 TRANSAXLE UPPER SIDE MOUNTING BOLTS
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



9. INSTALL ENGINE SUPPORT FIXTURE



10. REMOVE ENGINE LEFT MOUNTING BRACKET

Remove the 4 bolts, nut and bracket.

Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B : 87 N·m (890 kgf·cm, 64 ft·lbf)

11. REMOVE FRONT WHEEL

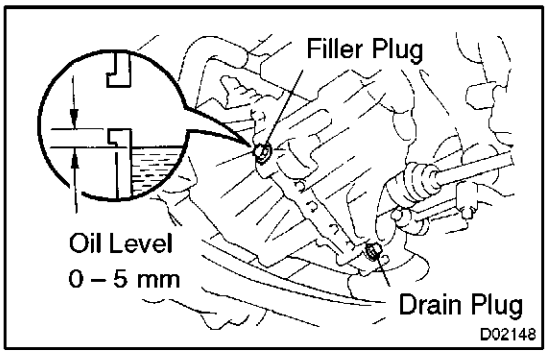
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)

12. RAISE VEHICLE

NOTICE:

Make sure that the vehicle is securely supported.

13. REMOVE LH AND RH ENGINE UNDER COVERS

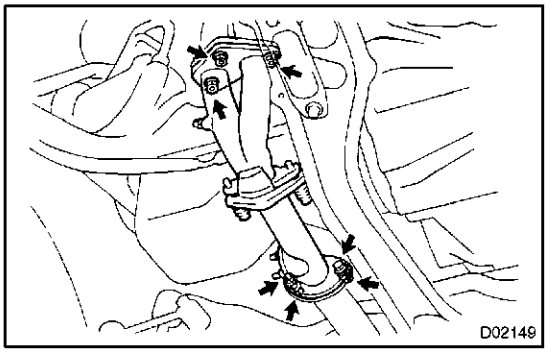


14. DRAIN TRANSAXLE OIL

Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 1.9 liters (2.0 US qts, 1.7 Imp. qts)
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

15. REMOVE LH AND RH DRIVE SHAFTS

(See page SA–17)



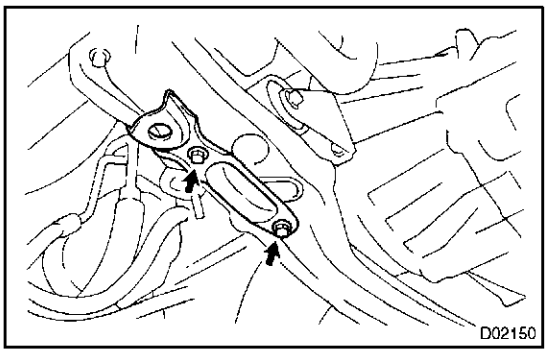
16. REMOVE FRONT AND CENTER EXHAUST PIPES

(a) Remove the 3 nuts and 2 gaskets from the exhaust manifold.

Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

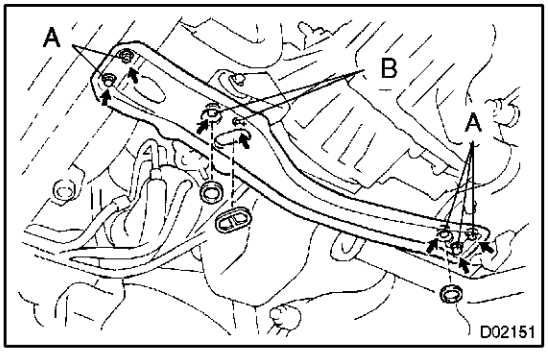
(b) Remove the 2 bolts, nuts, gasket and front and center exhaust pipes.

Torque: 43 N·m (430 kgf·cm, 32 ft·lbf)

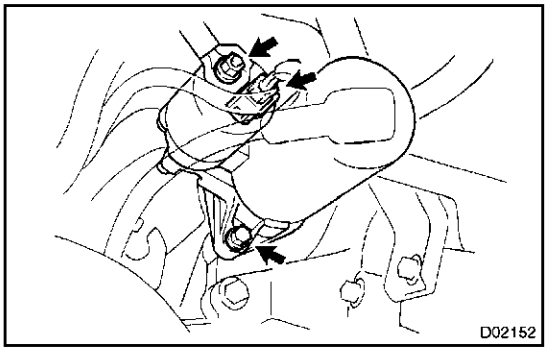


17. REMOVE ENGINE MOUNTING CENTER MEMBER

(a) Remove the 2 bolts and front transport hook.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



(b) Remove the 2 hole plugs and hole cover.
(c) Remove the 7 bolts and center member.
Torque:
Bolt A: 73 N·m (740 kgf·cm, 54 ft·lbf)
Bolt B: 72 N·m (730 kgf·cm, 53 ft·lbf)

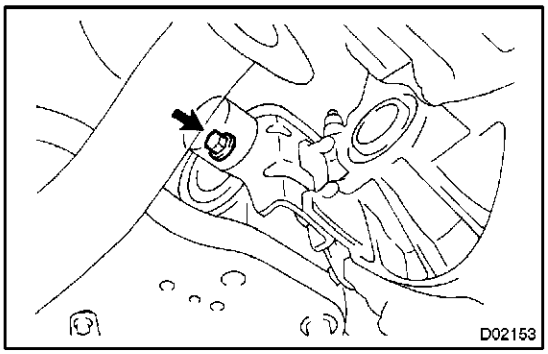


18. REMOVE STARTER

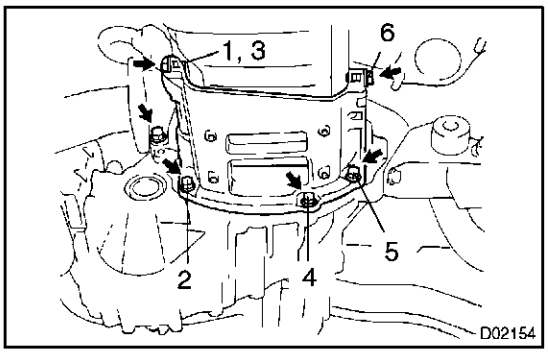
(a) Disconnect the connector and wire from the starter.
(b) Remove the set bolt of the starter from the lower side.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
(c) Remove the starter.

19. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



20. REMOVE ENGINE REAR MOUNTING BOLT
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)

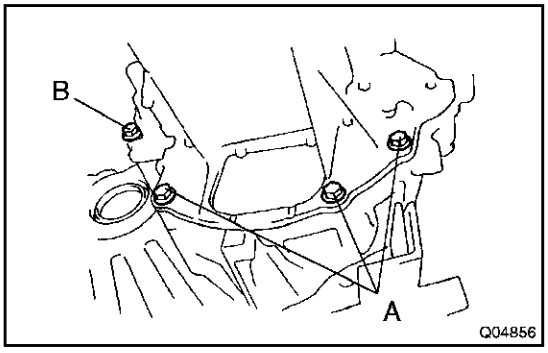


21. 4A–FE Engine:
REMOVE STIFFENER PLATE AND TRANSAXLE LOWER SIDE MOUNTING BOLT

(a) Remove the 5 bolts and stiffener plate.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

HINT:
At the time of installation, please refer to the following items.
- Install the stiffener plate and 5 bolts, temporarily tighten the No.1 bolt.
- Torque the 5 bolts in order shown.

(b) Remove the bolt of transaxle lower side.
Torque: 46 N·m (470 kgf·cm, 34 ft·lbf)



22. 7A–FE Engine:
REMOVE TRANSAXLE LOWER SIDE MOUNTING BOLT

Remove the 4 bolts.
Torque:
Bolt A: 43 N·m (440 kgf·cm, 32 ft·lbf)
Bolt B: 46 N·m (470 kgf·cm, 34 ft·lbf)

23. REMOVE TRANSAXLE

Lower the engine left side and remove the transaxle from the engine.

HINT:
At the time of installation, please refer to the following items.
- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

MX005–02

INSTALLATION

Installation is in the reverse order of removal (See page MX–3).

HINT:

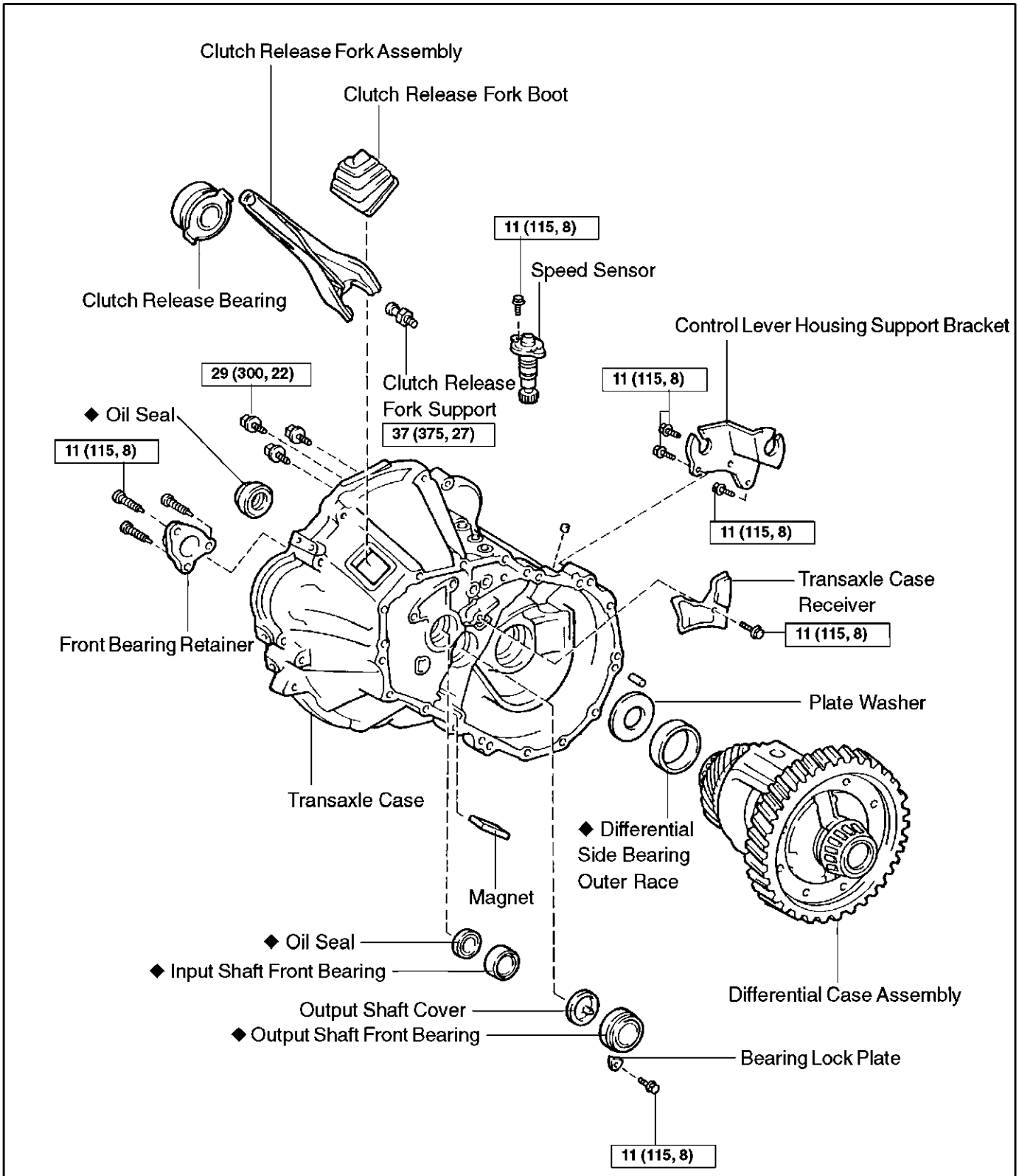
After installation, check and inspect items as follows.

- Front wheel alignment (See page SA–4).
- Do the road test.

MANUAL TRANSAXLE ASSEMBLY

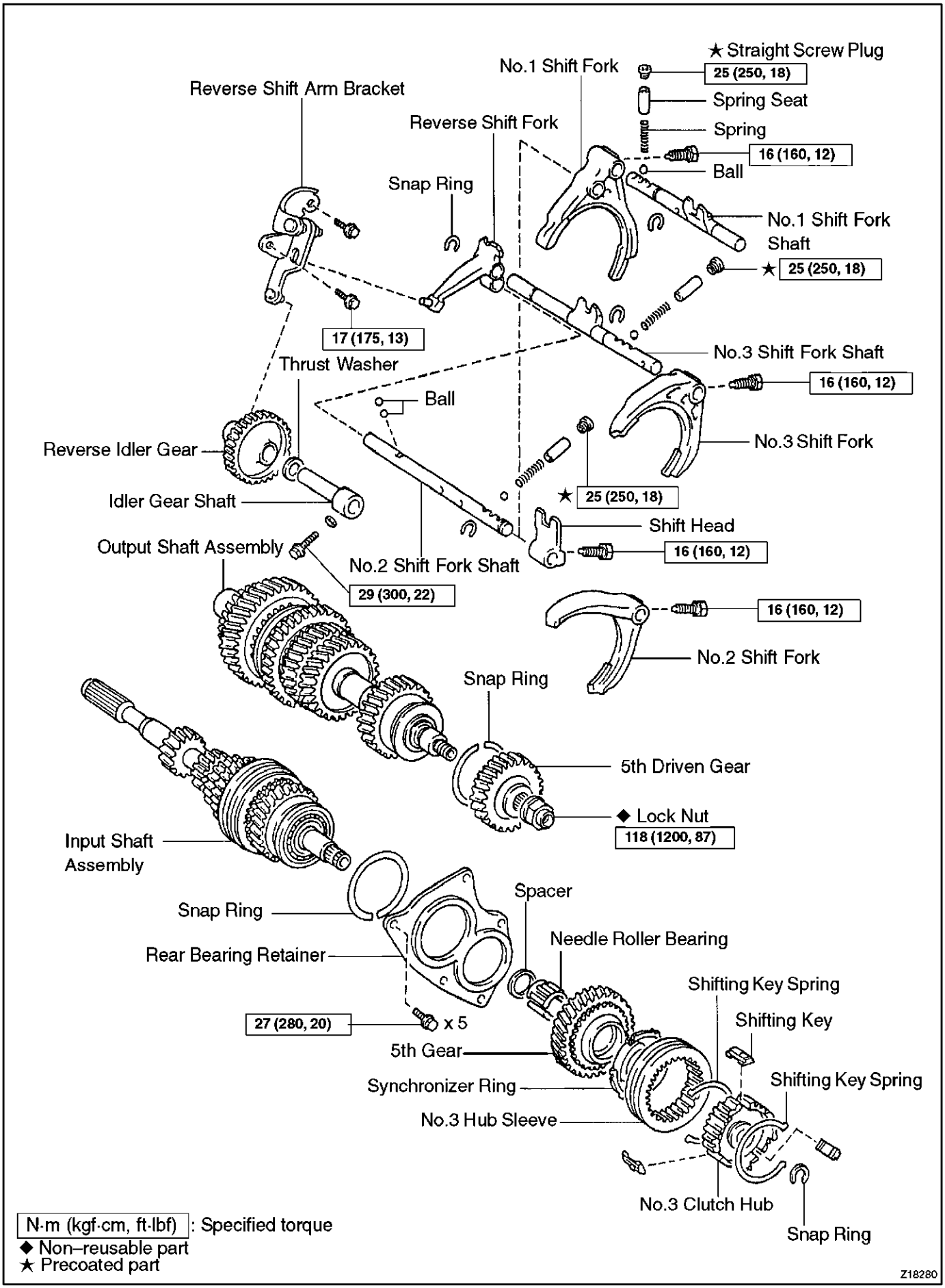
COMPONENTS

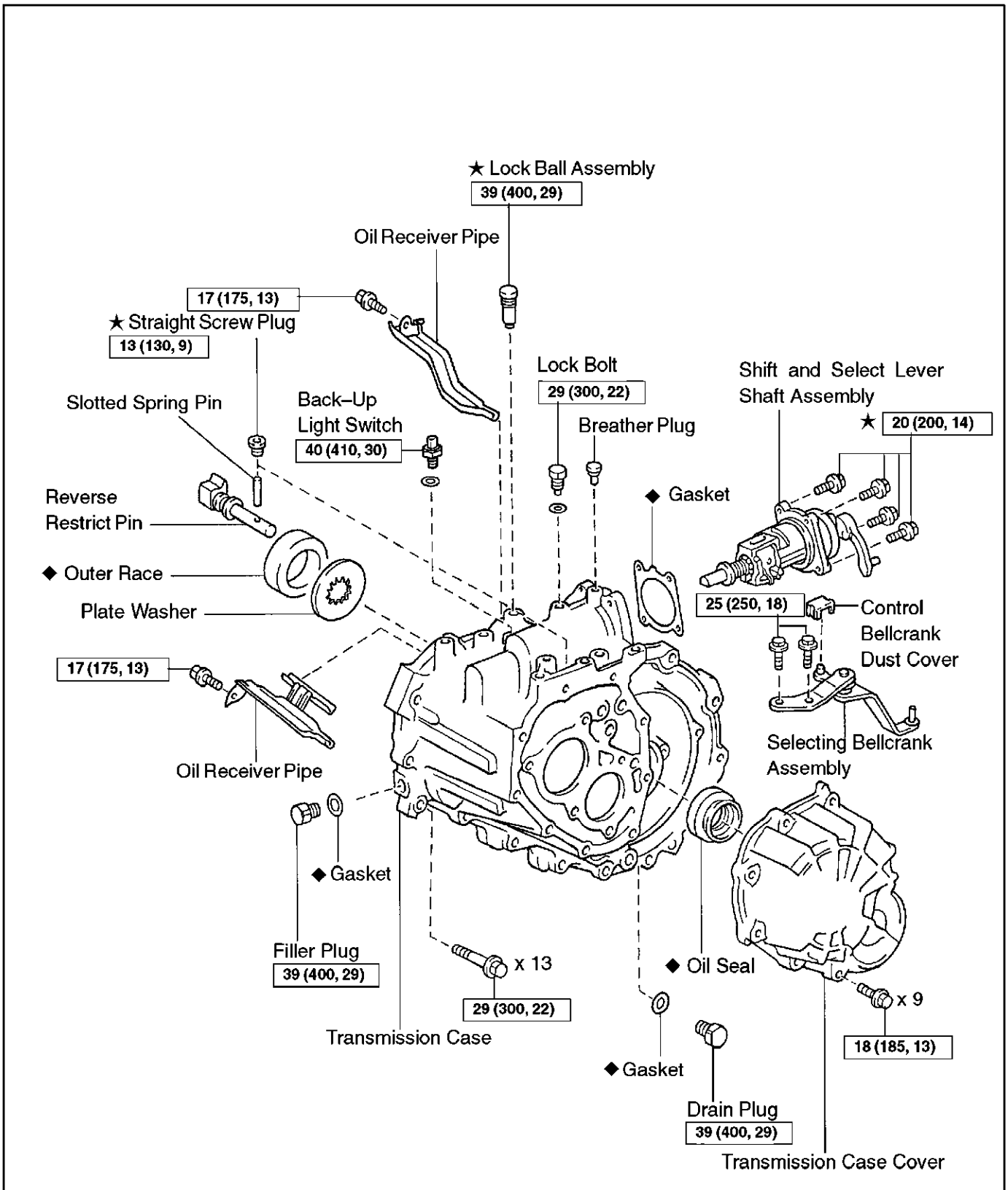
MX006–02



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02462


★ Straight Screw Plug
25 (250, 18)
No.1 Shift Fork
Spring Seat
Spring
16 (160, 12)
Ball
Reverse Shift Arm Bracket
Reverse Shift Fork
Snap Ring
No.1 Shift Fork Shaft
★ 25 (250, 18)
17 (175, 13)
No.3 Shift Fork Shaft
Thrust Washer
16 (160, 12)
Ball
Reverse Idler Gear
No.3 Shift Fork
★ 25 (250, 18)
Idler Gear Shaft
Shift Head
16 (160, 12)
Output Shaft Assembly
No.2 Shift Fork Shaft
29 (300, 22)
16 (160, 12)
No.2 Shift Fork
Snap Ring
5th Driven Gear
◆ Lock Nut
118 (1200, 87)
Input Shaft Assembly
Spacer
Snap Ring
Needle Roller Bearing
Rear Bearing Retainer
Shifting Key Spring
Shifting Key
27 (280, 20) x 5
5th Gear
Synchronizer Ring
Shifting Key Spring
No.3 Hub Sleeve
No.3 Clutch Hub
Snap Ring
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
Z18280



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part

Z18281

MX007–02

DISASSEMBLY

1. REMOVE RELEASE FORK AND BEARING

HINT:

At the time of reassembly, please refer to the following item.

Apply molybdenum disulphide lithium base grease.

(See page CL–18)

2. REMOVE BOLT AND SPEED SENSOR

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

3. REMOVE BACK–UP LIGHT SWITCH

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

4. REMOVE SELECTING BELLCRANK ASSEMBLY

(a) Remove 2 bolts and selecting bellcrank assembly.

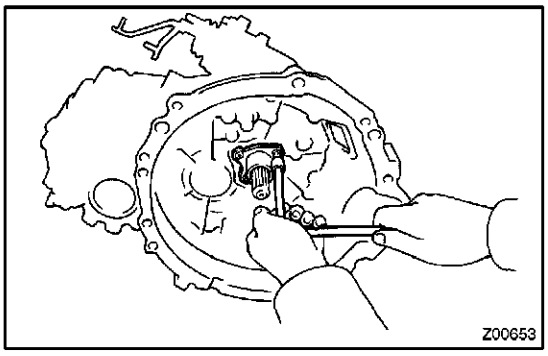
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Remove the control bellcrank dust cover from the selecting bellcrank assembly.

5. REMOVE CONTROL LEVER HOUSING SUPPORT BRACKET

Remove the 3 bolts and bracket.

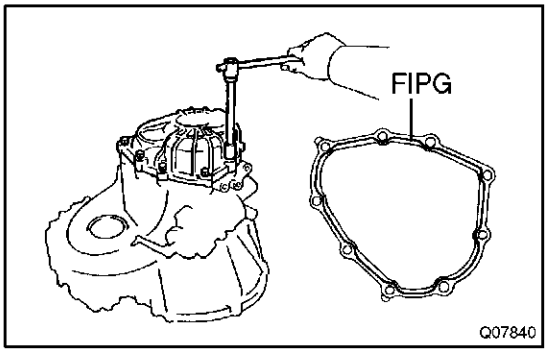
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)



6. REMOVE FRONT BEARING RETAINER

Using a torx wrench (T30), remove the 3 torx screws and retainer.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)



7. REMOVE TRANSMISSION CASE COVER

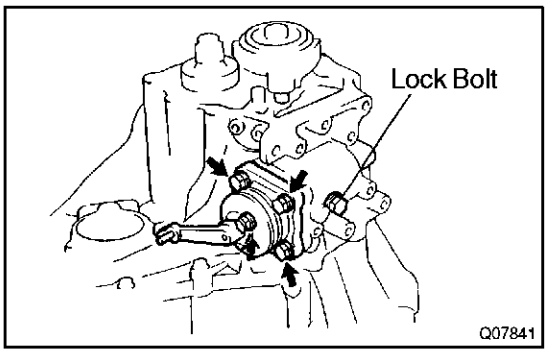
(a) Remove the 9 bolts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(b) Using a brass bar and hammer, carefully tap the projection of the transmission case cover to remove the transmission case cover from the transmission case.

FIPG:

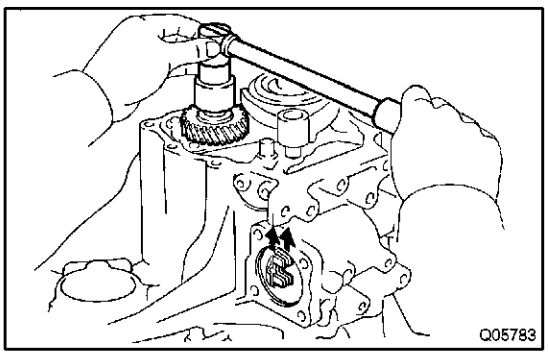
Part No. 08826–00090, THREE BOND 1281 or equivalent



8. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY

(a) Remove the lock bolt.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Remove the 4 bolts and pull out the shift and select lever shaft assembly with the gasket.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



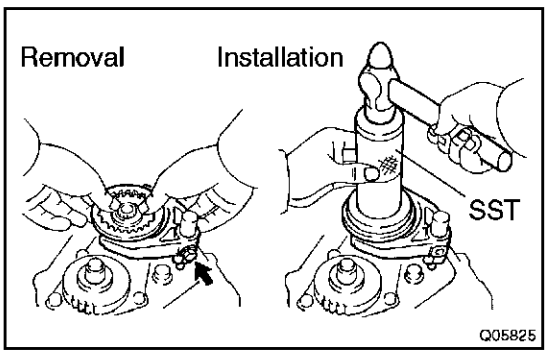
9. REMOVE LOCK NUT

(a) Engage the gear to the double meshing.

(b) Using a chisel and hammer, loosen the staked part of the nut.

(c) Remove the lock nut.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

(d) Disengage the gear double meshing.



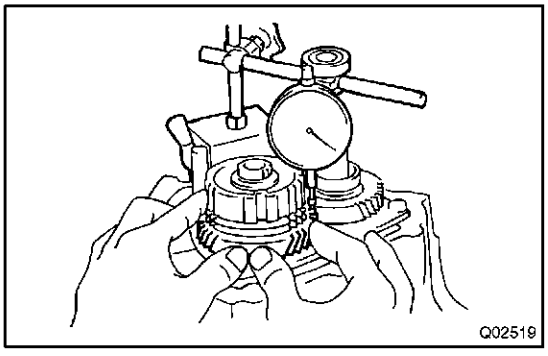
10. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

(a) Remove the bolt from the No.3 shift fork.
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

(b) Remove the No.3 hub sleeve with the shift fork.

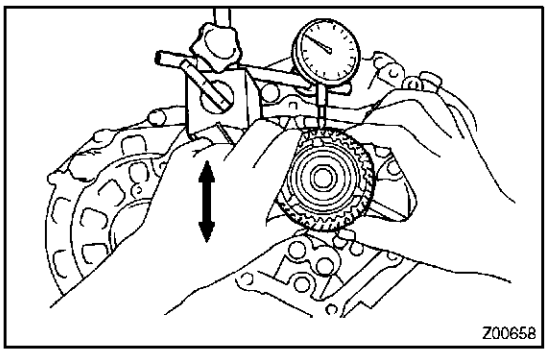
HINT:
At the time of reassembly, please refer to the following item.
Using SST and a hammer, drive in the No.3 hub sleeve with the shift fork.
SST 09636–20010

NOTICE:
At the time of installation, please refer to the following item.
Align the synchronizer ring slots with the shifting keys.



11. INSPECT 5TH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.
Standard clearance:
0.10–0.57 mm (0.0039–0.0024 in.)
Maximum clearance:
0.65 mm (0.0256 in.)

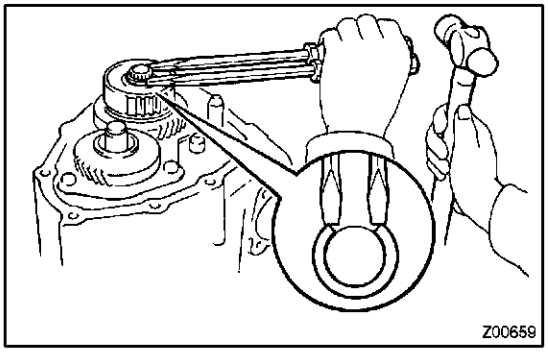


12. INSPECT 5TH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance.

Standard clearance:
0.015–0.058 mm (0.0006–0.0023 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



13. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

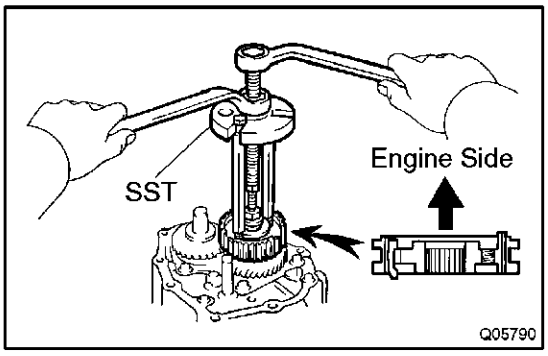
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

At the time of reassembly, please refer to the following item.
Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.25 (0.0886)	E	2.49 (0.0980)
B	2.31 (0.0909)	F	2.55 (0.1004)
C	2.37 (0.0933)	G	2.61 (0.1028)
D	2.43 (0.0957)	–	–

(b) Using a screwdriver, remove the key spring.

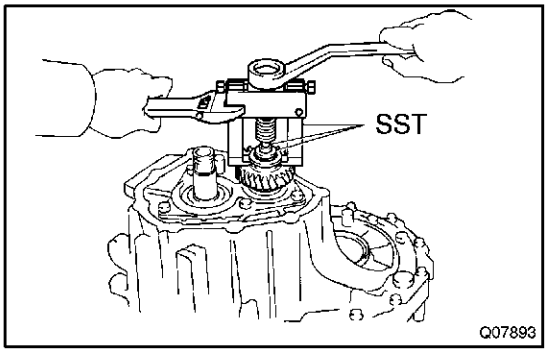


(c) Install a bolt and washer to the tip of the input shaft and using SST, remove the No.3 clutch hub.
SST 09950–30010

NOTICE:

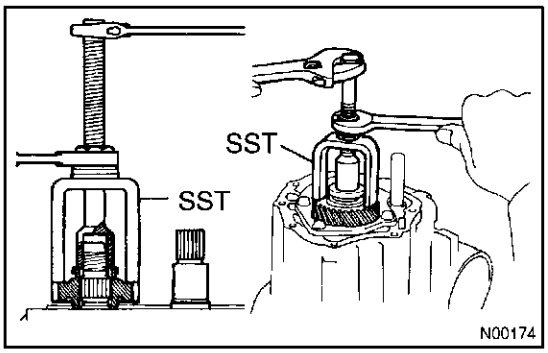
Select a bolt whose outer diameter is smaller than the screw hole of the input shaft so that it can be turned easily.

(d) Remove the synchronizer ring, 5th gear and needle roller bearing.

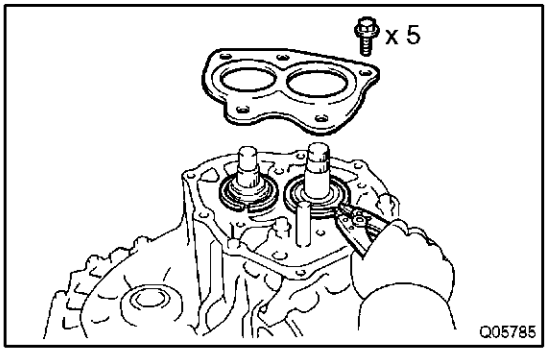


14. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.
SST 09628–62011, 09950–40011 (09957–04010), 09950–60010 (09951–00230)

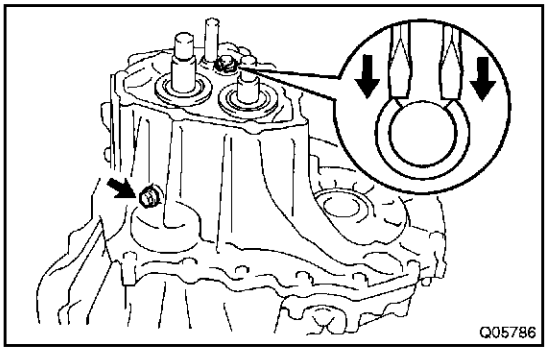


HINT:
At the time of reassembly, please refer to the following item.
Using SST, install the 5th driven gear.
SST 09309–12020



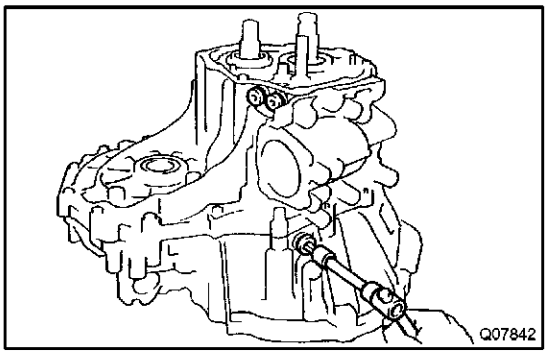
15. REMOVE REAR BEARING RETAINER
Remove the 5 bolts and retainer.
Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)

16. REMOVE BEARING SNAP RING
Using a snap ring expander, remove the 2 snap rings.
HINT:
If it is difficult to remove and install the snap rings, pull up the shafts.

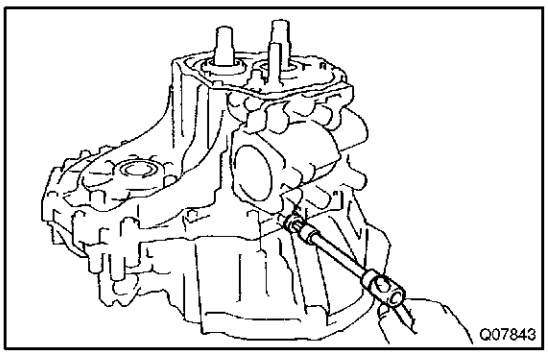


17. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

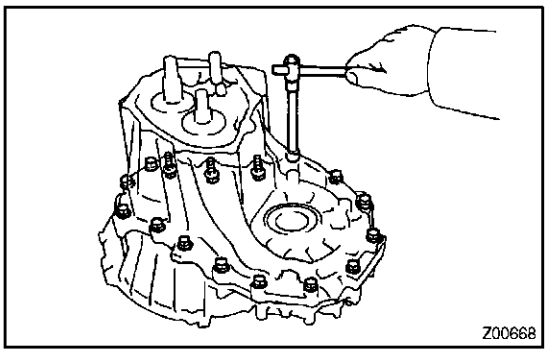
18. REMOVE SNAP RING FROM NO.2 SHIFT FORK SHAFT
Using 2 screwdrivers and a hammer, tap out the snap ring.



19. REMOVE PLUG, SEAT, SPRING AND BALL
(a) Using a hexagon wrench, remove the 3 plugs.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)
(b) Using a magnetic finger, remove the 3 seats, springs and balls.



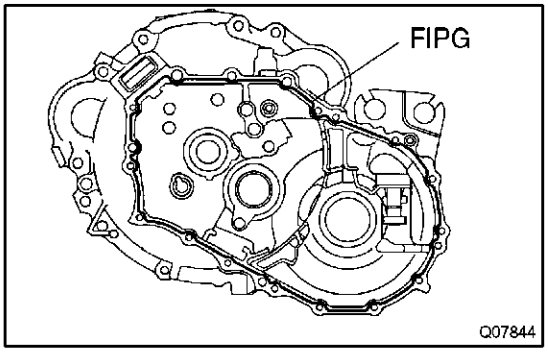
20. REMOVE LOCK BALL ASSEMBLY
Using a hexagon wrench, remove the lock ball assembly.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



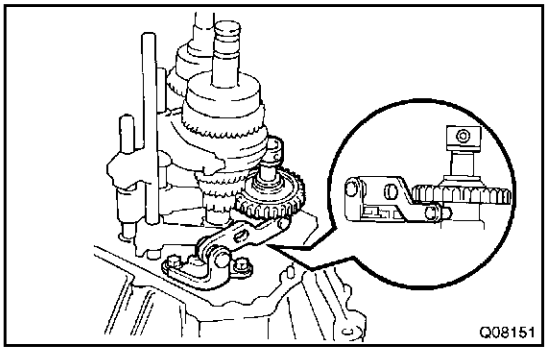
21. REMOVE TRANSMISSION CASE

(a) Remove the 16 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Using a plastic hammer, carefully tap the projection of the transmission case to remove the transmission case from the transaxle case.



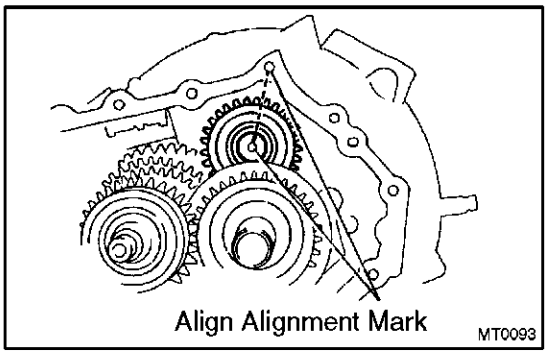
FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent



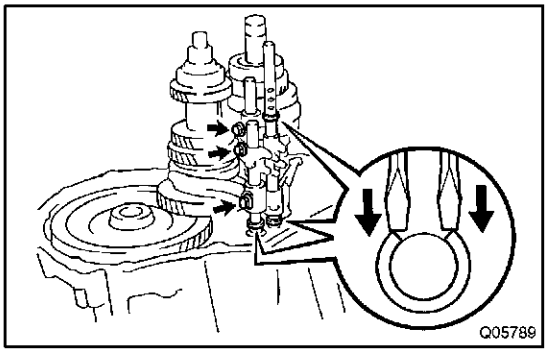
22. REMOVE REVERSE IDLER GEAR, THRUST WASHER AND SHAFT

23. REMOVE REVERSE SHIFT ARM BRACKET

Remove the 2 bolts and bracket.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)



HINT:
At the time of reassembly, please refer to the following item.
Install the reverse idler gear, thrust washer and shaft, as shown in the illustration.

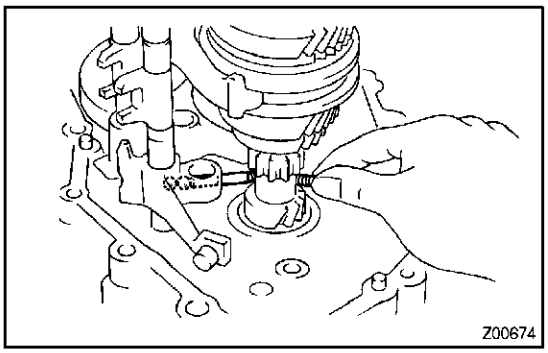


24. REMOVE SHIFT FORK AND SHIFT FORK SHAFT

(a) Using 2 screwdrivers and a hammer, tap out the 3 snap rings.

(b) Remove the 3 set bolts.
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

(c) Pull up the No.3 shift fork shaft, remove the No.2 shift fork shaft and shift head.



(d) Using a magnetic finger, remove the 2 balls from the reverse shift fork.
(e) Remove the No.3 shift fork shaft and reverse shift fork.
(f) Pull out the No.1 shift fork shaft.
(g) Remove the No.1 and No.2 shift forks.

25. REMOVE INPUT AND OUTPUT SHAFTS TOGETHER FROM TRANSAXLE CASE

26. REMOVE DIFFERENTIAL CASE ASSEMBLY

HINT:

At the time of reassembly, please refer to the following item.

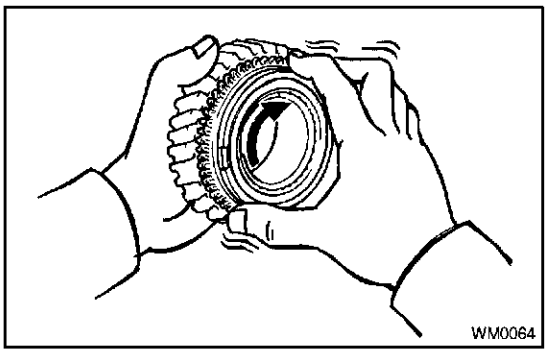
Before reassembly, inspect the differential side bearing preload.

27. REMOVE MAGNET FROM TRANSAXLE CASE

28. REMOVE NO.3 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.3 CLUTCH HUB

Using a screwdriver, remove the 3 shifting keys and 2 springs from the No.3 clutch hub.

MX06G–01



INSPECTION

1. INSPECT 5TH GEAR SYNCHRONIZER RING

(a) Check wear or damage.

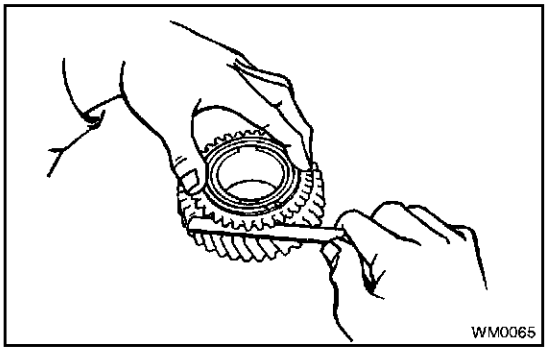
(b) Check the braking effect of the synchronizer ring.
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

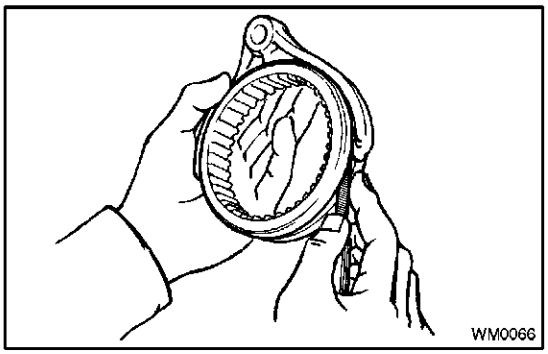


(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.



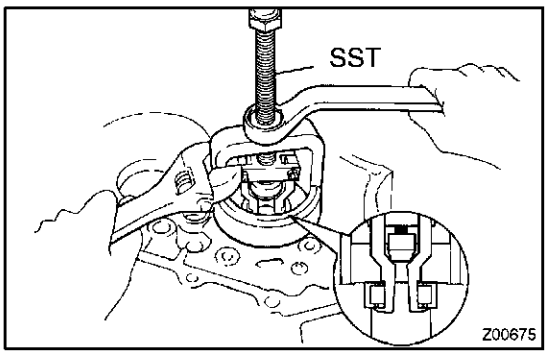
2. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.
Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

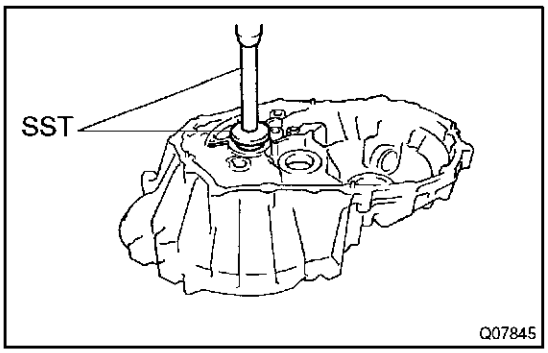
3. REMOVE TRANSAXLE CASE RECEIVER

Remove the bolt and transaxle case receiver.

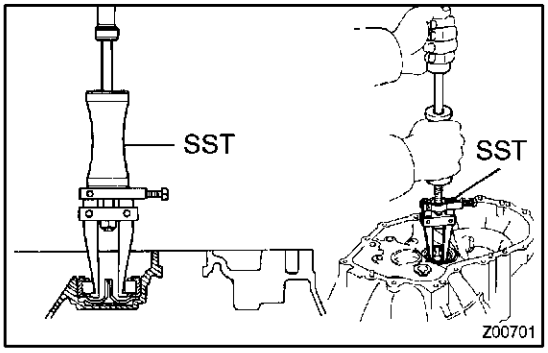


4. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING

(a) Using SST, pull out the bearing.
SST 09612–65014

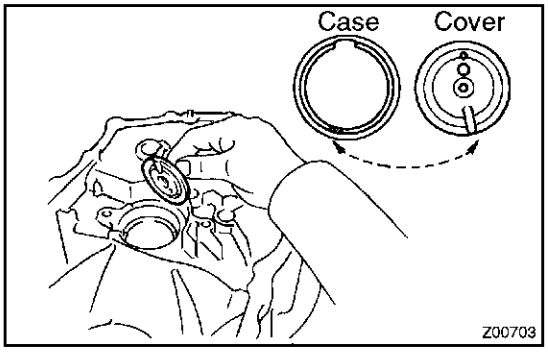


(b) Using SST and a press, install a new bearing.
SST 09950–60010 (09951–00460), 09950–70010 (09951–07150)

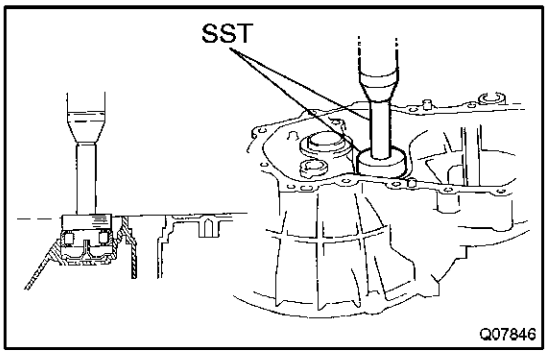


5. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING

(a) Remove the bolt and bearing lock plate.
(b) Using SST, pull out the bearing.
SST 09308–00010
(c) Remove the output shaft front cover.



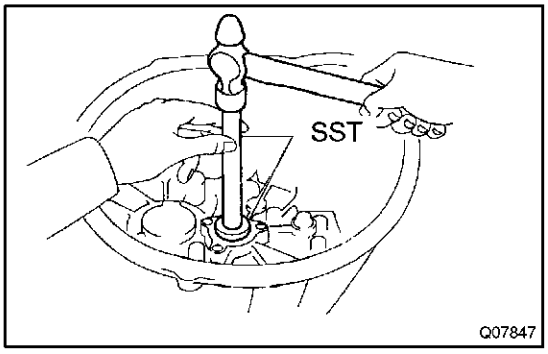
(d) Install the output shaft front cover.
HINT:
Set the projection of the cover into the hollow in the case.



(e) Using SST and a press, install a new bearing.
SST 09950–60010 (09951–00620), 09950–70010 (09951–07150)
(f) Install the bearing lock plate and torque the bolt.
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

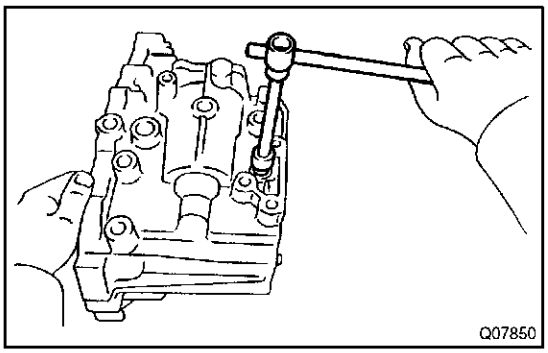
6. INSTALL TRANSAXLE CASE RECEIVER

Install the transaxle case receiver and torque the bolt.
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)



7. IF NECESSARY, REPLACE INPUT SHAFT FRONT OIL SEAL

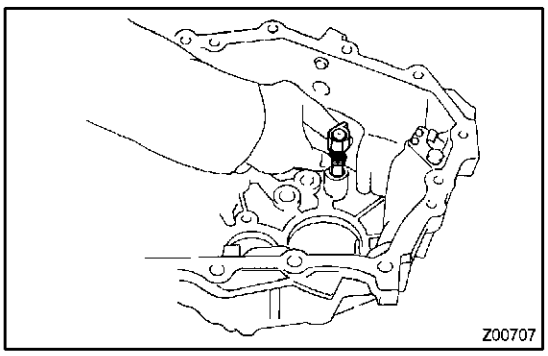
(a) Using a screwdriver, pry out the oil seal.
(b) Using SST, drive in a new oil seal until its surface is flush with the transaxle case.
SST 09950–60010 (09951–00400), 09950–70010 (09951–07150)
(c) Coat the lip of the oil seal with MP grease.



8. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench, remove the straight screw plug.

(b) Using a pin punch and hammer, drive out the slotted spring pin.



(c) Replace the reverse restrict pin.

(d) Using a pin punch and hammer, drive in the slotted spring pin.

(e) Apply sealant to the screw plug threads.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(f) Using a hexagon wrench, install the straight screw plug.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX009–02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page MX–11).

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

NOTICE:

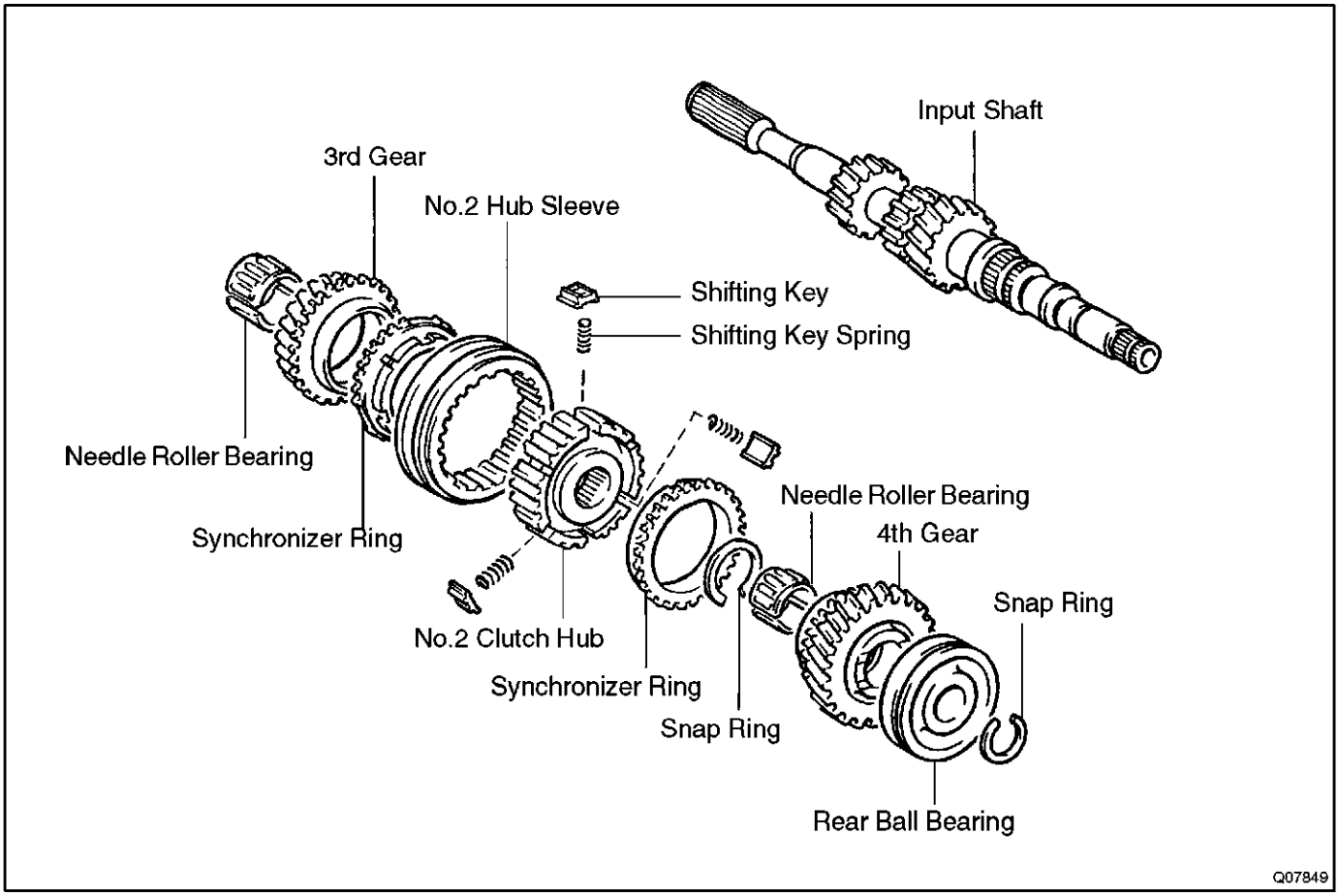
When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non–residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

INPUT SHAFT

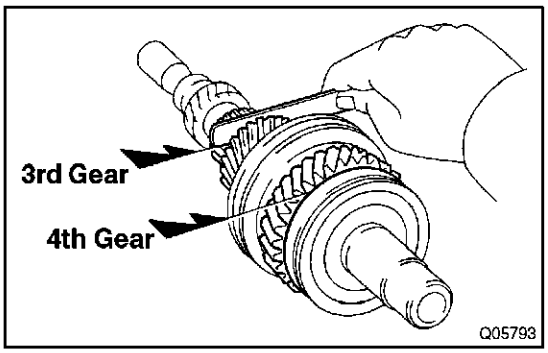
COMPONENTS

MX00A–02



MX00B–02

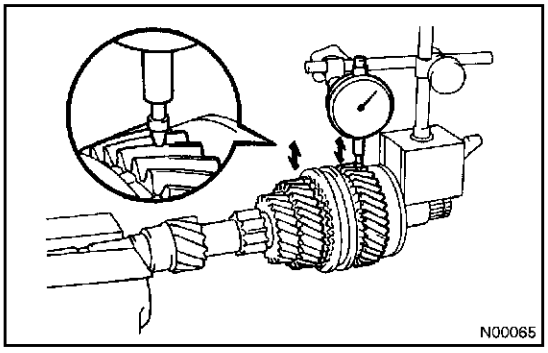
DISASSEMBLY



1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:
3rd gear: 0.10–0.35 mm (0.0039–0.0138 in.)
4th gear: 0.10–0.55 mm (0.0039–0.0217 in.)
Maximum clearance:
3rd gear: 0.40 mm (0.0157 in.)
4th gear: 0.60 mm (0.0236 in.)



2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCE

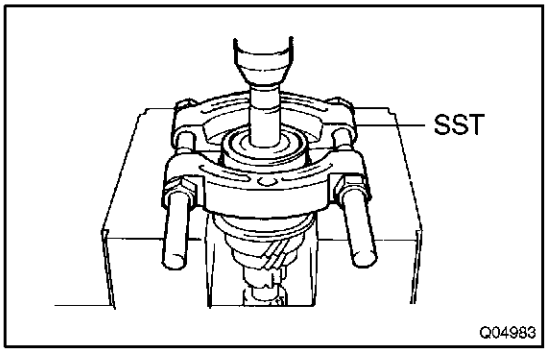
Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
0.015–0.058 mm (0.0006–0.0023 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing and shaft.

3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.



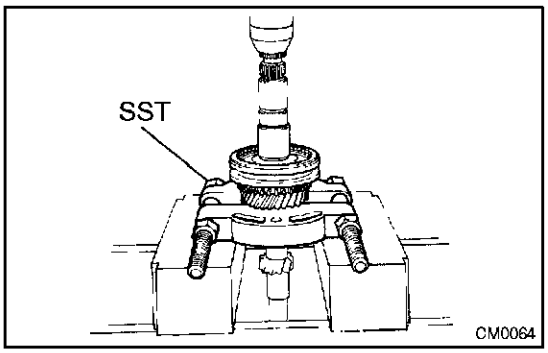
4. REMOVE REAR BALL BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING FROM INPUT SHAFT

(a) Using SST and a press, remove the rear ball bearing.
SST 09950–00020

(b) Remove the 4th gear, needle roller bearings, spacer and synchronizer ring.

5. REMOVE SNAP RING

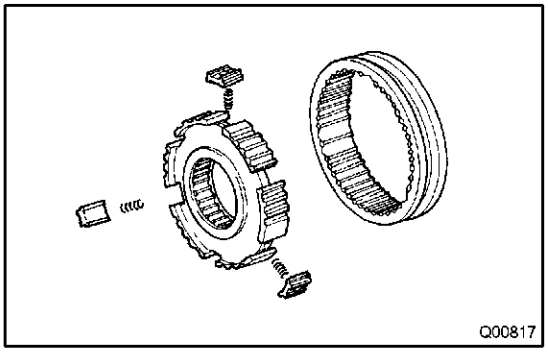
Using 2 screwdrivers and a hammer, tap out the snap ring.



6. REMOVE NO.2 HUB SLEEVE ASSEMBLY, 3RD GEAR, SYNCHRONIZER RING AND NEEDLE ROLLER BEARING

Using SST and a press, remove the No.2 hub sleeve assembly, 3rd gear, synchronizer ring and needle roller bearings.

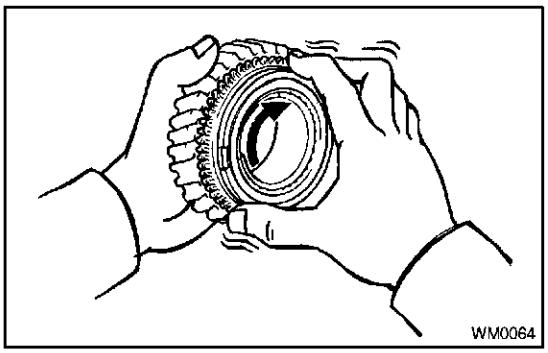
SST 09950–00020



7. REMOVE NO.2 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.2 CLUTCH HUB

Remove the 3 shifting keys, springs and No.2 hub sleeve from the No.2 clutch hub.

MX00C–02



INSPECTION

1. INSPECT SYNCHRONIZER RING

(a) Check wear or damage.

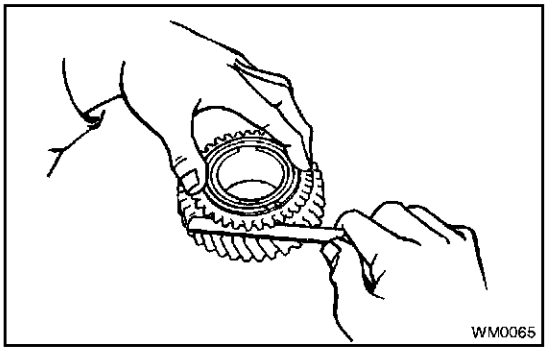
(b) Check the braking effect of the synchronizer ring.
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

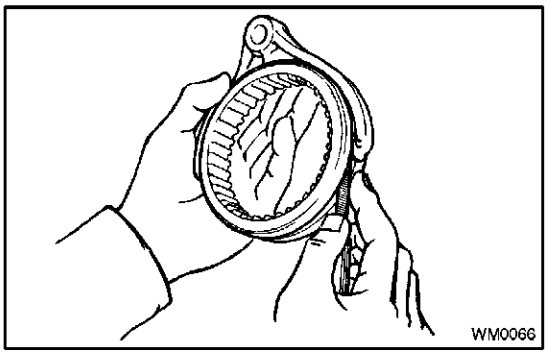


(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

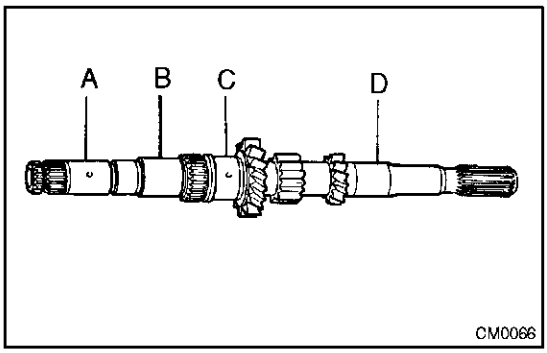


2. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



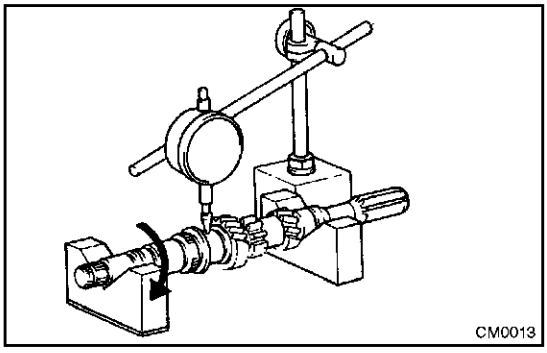
3. INSPECT INPUT SHAFT

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

Minimum outer diameter:
Part A: 24.870 mm (0.9791 in.)
Part B: 28.970 mm (1.1405 in.)
Part C: 30.970 mm (1.2193 in.)
Part D: 24.970 mm (0.9831 in.)

If the outer diameter is less than the minimum, replace the input shaft.



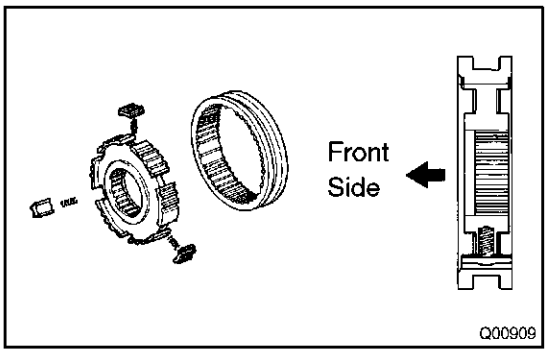
(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.05 mm (0.0020 in.)

If the runout exceeds the maximum, replace the input shaft.

MX00D–02

REASSEMBLY



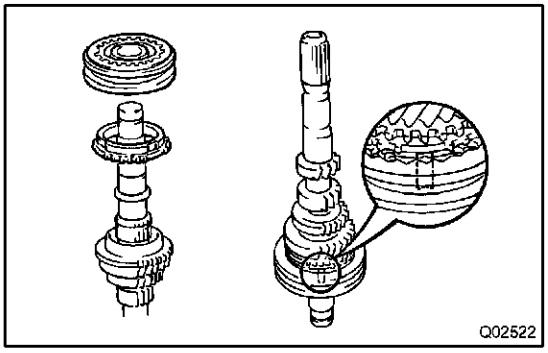
HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.2 CLUTCH HUB INTO NO.2 HUB SLEEVE

(a) Install the 3 springs and shifting keys to the No.2 clutch hub.

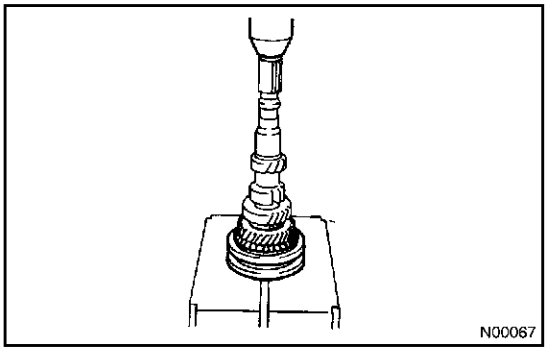
(b) Install the No.2 hub sleeve to the No. 2 clutch hub.



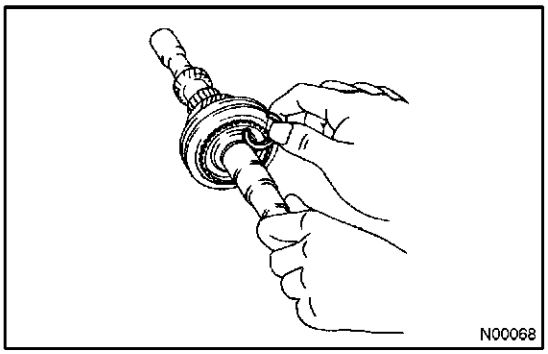
2. INSTALL 3RD GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO. 2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply gear oil to the needle roller bearings.

(b) Place the synchronizer ring on the gear and align the ring slots with shifting keys.



(c) Using a press, install the 3rd gear and No.2 hub sleeve assembly.



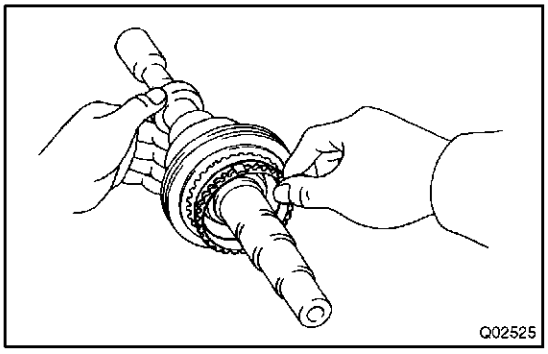
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.30 (0.0906)	3	2.48 (0.0976)
1	2.36 (0.0929)	4	2.54 (0.1000)
2	2.42 (0.0953)	5	2.60 (0.1024)

(b) Using a screwdriver and hammer, tap in the snap ring.

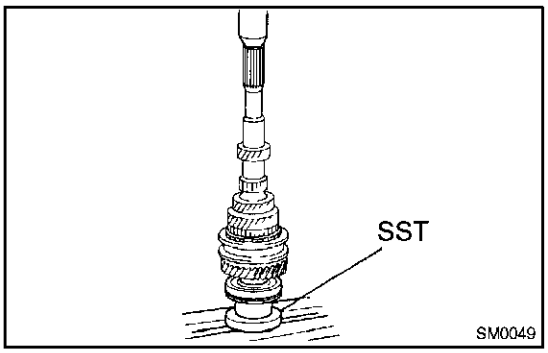
4. INSPECT 3RD GEAR THRUST CLEARANCE
(See page MX–22)



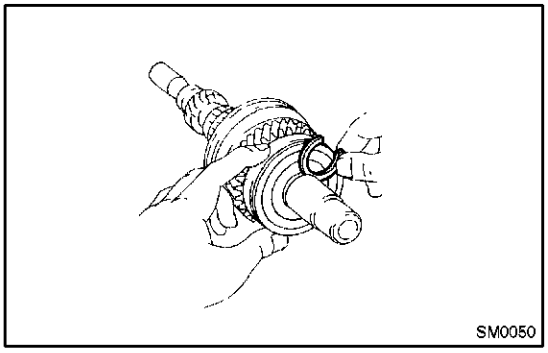
5. INSPECT SYNCHRONIZER RING, NEEDLE ROLLER BEARING, SPACER, 4TH GEAR AND REAR BALL BEARING

(a) Apply gear oil to the needle roller bearings.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



(c) Using SST and a press, install the rear ball bearing.
SST 09608–03071



6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.29 (0.0902)	D	2.47 (0.0972)
B	2.35 (0.0925)	E	2.53 (0.0996)
C	2.41 (0.0949)	F	2.59 (0.1020)

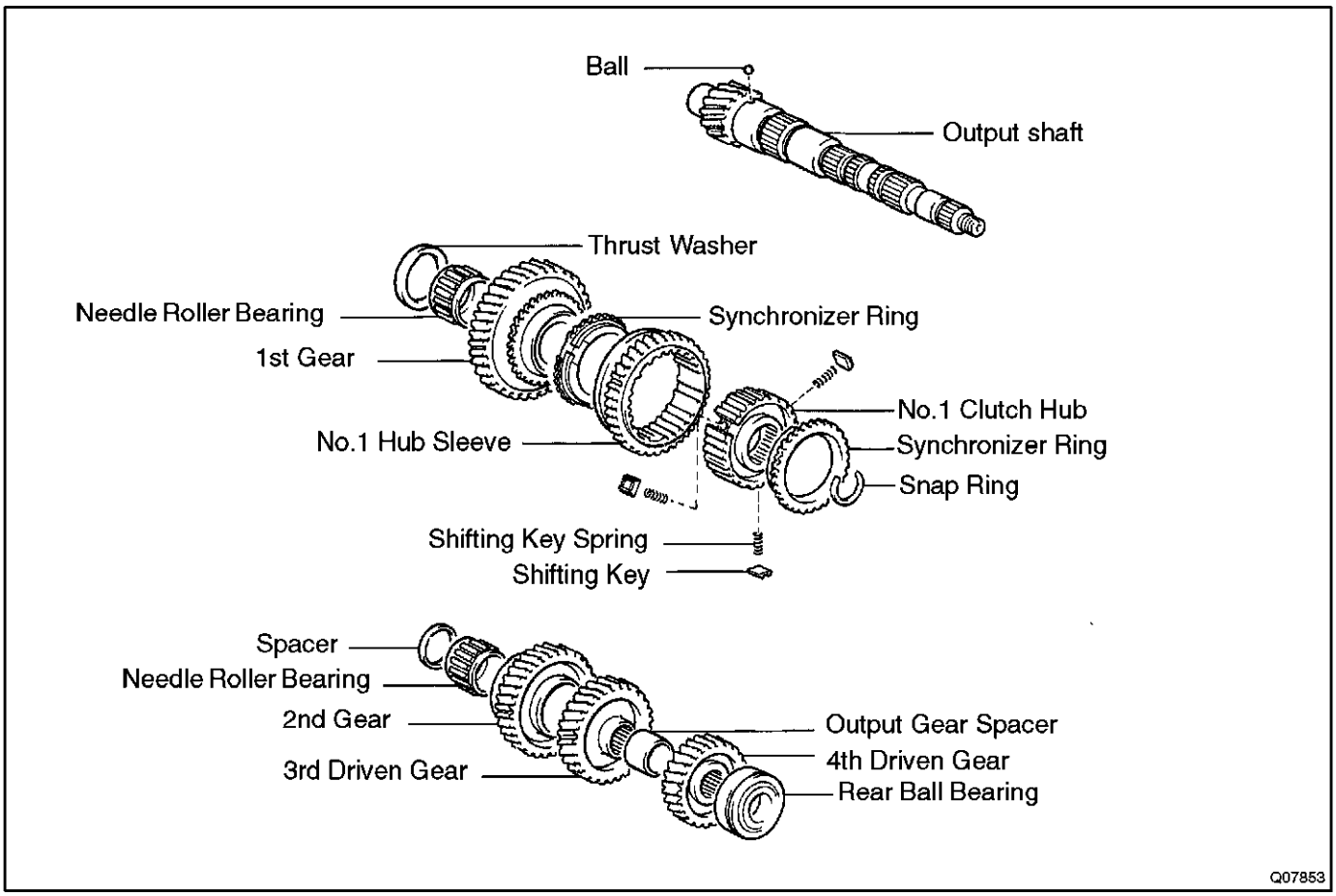
(b) Using a screwdriver and hammer, tap in the snap ring.

7. INSPECT 4TH GEAR THRUST CLEARANCE
(See page MX–22)

OUTPUT SHAFT

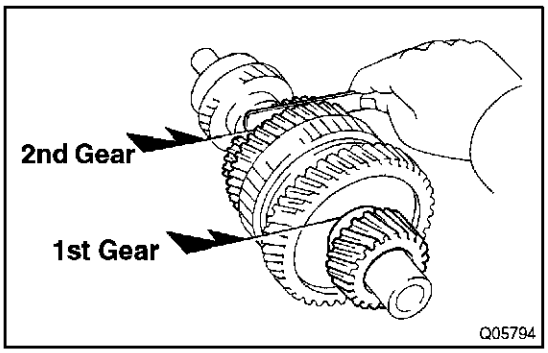
COMPONENTS

MX00E–02



MX00F–02

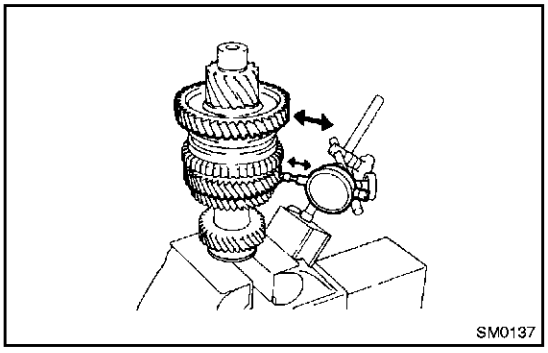
DISASSEMBLY



1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCES

Using a feeler gauge, measure each thrust clearance.

Standard clearance:
1st gear: 0.10–0.40 mm (0.0039–0.0157 in.)
2nd gear: 0.10–0.45 mm (0.0039–0.0177 in.)
Maximum clearance:
1st gear: 0.45 mm (0.0177 in.)
2nd gear: 0.50 mm (0.0197 in.)

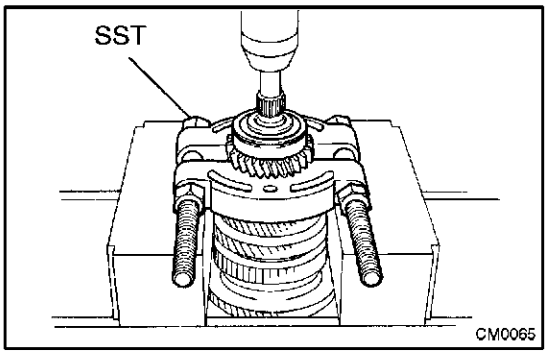


2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
0.015–0.058 mm (0.0006–0.0023 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

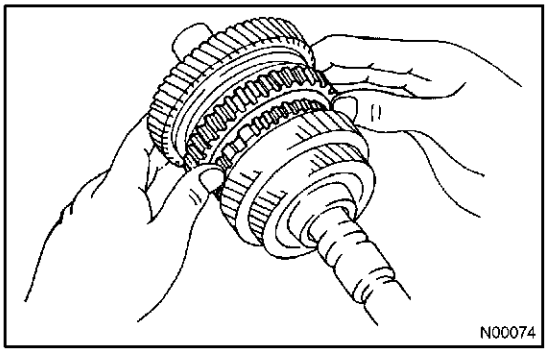
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE REAR BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER FROM OUTPUT SHAFT

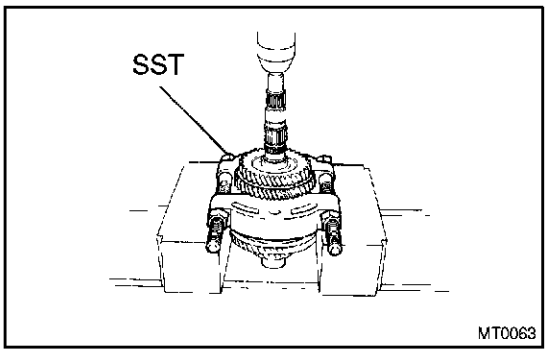
(a) Using SST and a press, remove the ball bearing and 4th driven gear.
SST 09950–00020

(b) Remove the output spacer.



4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND SPACER

(a) Shift the No.1 hub sleeve into the 1st gear.

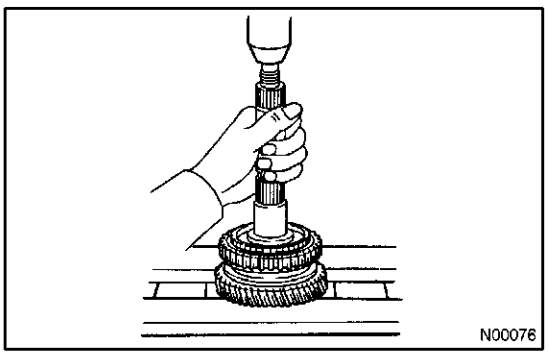


(b) Using SST and a press, remove the 3rd driven gear.
SST 09950–00020

(c) Remove the 2nd gear, needle roller bearing, synchronizer ring and spacer.

5. REMOVE SNAP RING

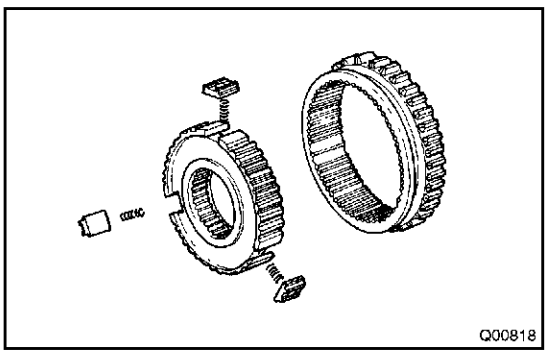
Using 2 screwdrivers and a hammer, tap out the snap ring.



6. REMOVE NO.1 HUB SLEEVE ASSEMBLY 1ST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, THRUST WASHER AND BALL

(a) Using a press, remove the No.1 hub sleeve assembly, 1st gear and synchronizer ring.

(b) Remove the needle roller bearing, thrust washer and ball.

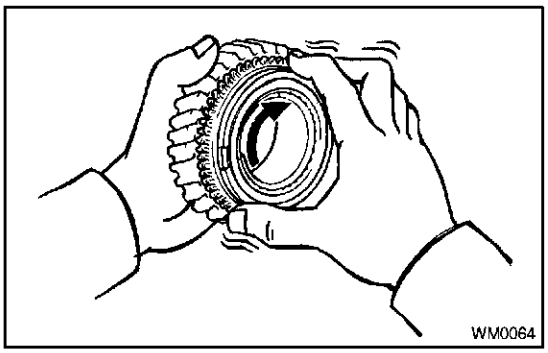


7. REMOVE NO.1 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.1 CLUTCH HUB

Remove the 3 shifting keys, springs and No.1 hub sleeve from the No.1 clutch hub.

MX00G–02

INSPECTION



1. INSPECT SYNCHRONIZER RING

(a) Check wear or damage.

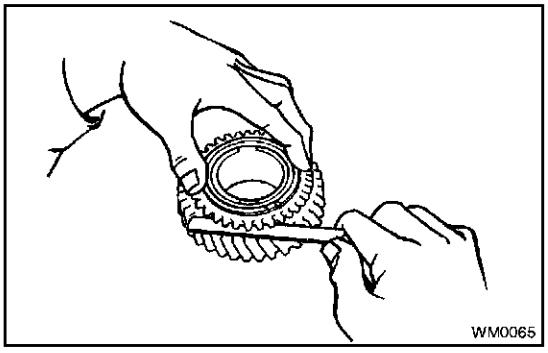
(b) Check the braking effect of the synchronizer ring.
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

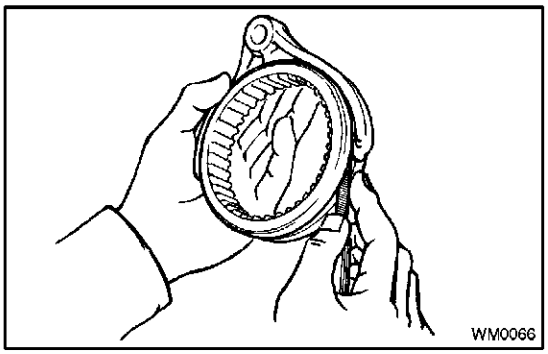


(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance:0.6 mm (0.024 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

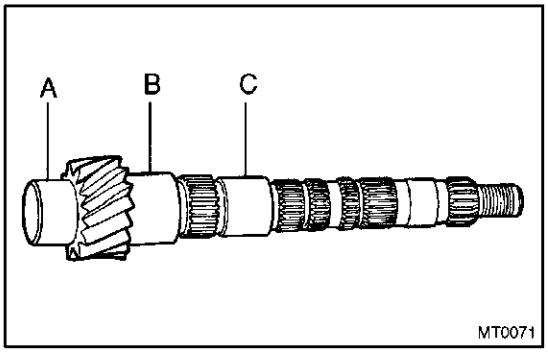
Ensure the fine lapping compound is completely washed off after rubbing.



2. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.
Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

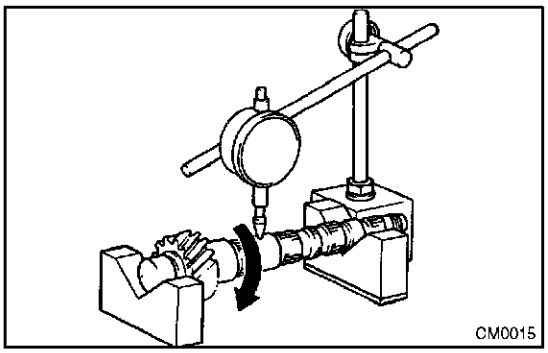


3. INSPECT OUTPUT SHAFT

(a) Check the output shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal surface.
Minimum outer diameter:
Part A: 32.970 mm (1.2980 in.)
Part B: 37.970 mm (1.4949 in.)
Part C: 31.970 mm (1.2587 in.)

If the outer diameter is less than the minimum, replace the output shaft.

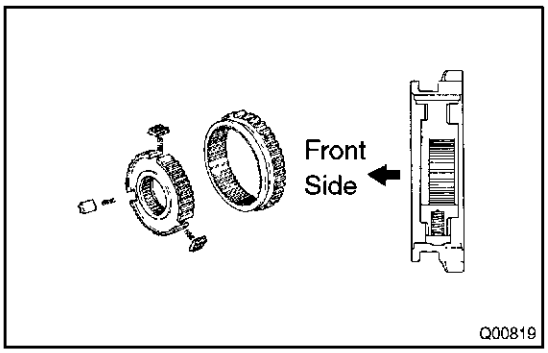


(c) Using a dial indicator, check the shaft runout.
Maximum runout: 0.05 mm (0.0020 in.)

If the runout exceeds the maximum, replace the output shaft.

MX00H–02

REASSEMBLY

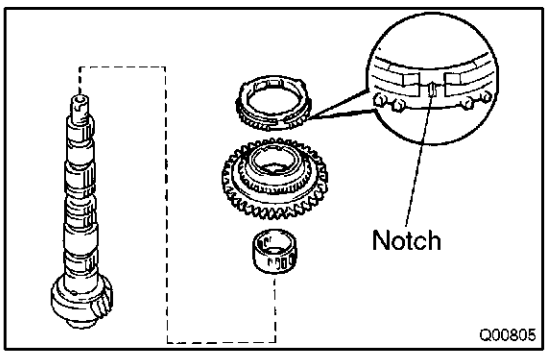


HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.1 CLUTCH HUB INTO NO.1 HUB SLEEVE

(a) Install the 3 springs and shifting keys to the No.1 clutch hub.

(b) Install the No.1 clutch hub to the No.1 hub sleeve.



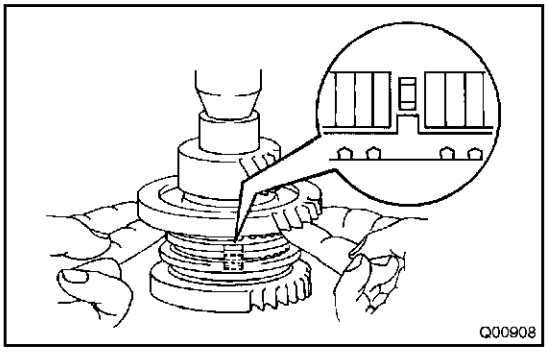
2. INSTALL BALL, THRUST WASHER, 1ST GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.1 HUB SLEEVE ASSEMBLY TO OUTPUT SHAFT

(a) Install the ball to the shaft.

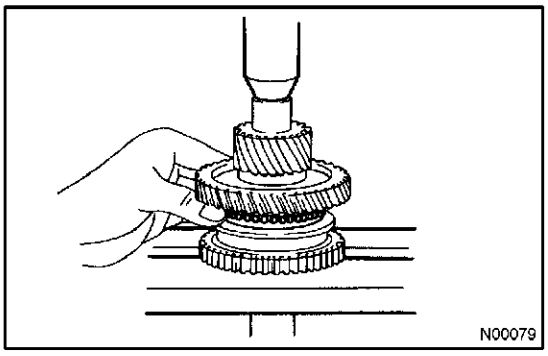
(b) Fit the thrust washer groove securely over the locking ball when installing the thrust on the shaft.

(c) Apply gear oil to the needle roller bearing.

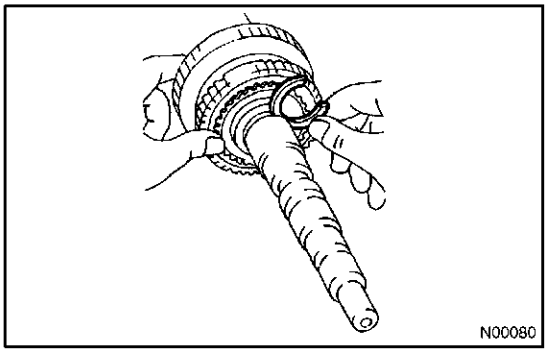
(d) Install the needle roller bearing, 1st gear and synchronizer ring.



(e) Place the synchronizer ring on the gear and align the clutch hub grooves with the projections on the synchronizer ring.



(f) Using a press, install the 1st gear and No.1 hub sleeve.



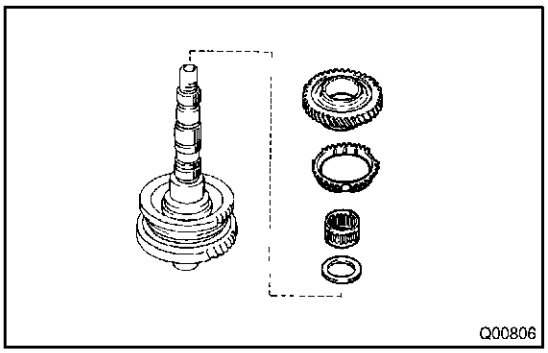
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.50 (0.0984)	D	2.68 (0.1055)
B	2.56 (0.1008)	E	2.74 (0.1079)
C	2.62 (0.1031)	F	2.80 (0.1102)

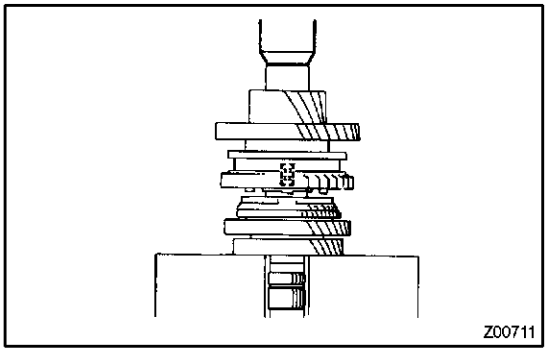
(b) Using a screwdriver and hammer, tap in the snap ring.

4. INSPECT 1ST GEAR THRUST CLEARANCE
(See page MX–29)


Q00806

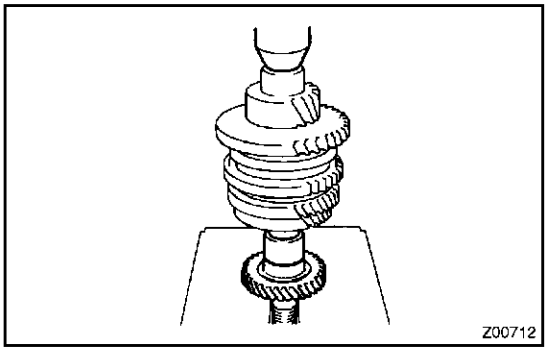
5. INSTALL SYNCHRONIZER RING, SPACER, NEEDLE ROLLER BEARING, 2ND GEAR AND 3RD DRIVEN GEAR

(a) Place the synchronizer ring on the gear and align the clutch hub grooves with the projections on the synchronizer ring.
(b) Install the spacer.
(c) Apply gear oil to the needle roller bearing.
(d) Install the 2nd gear.


Z00711

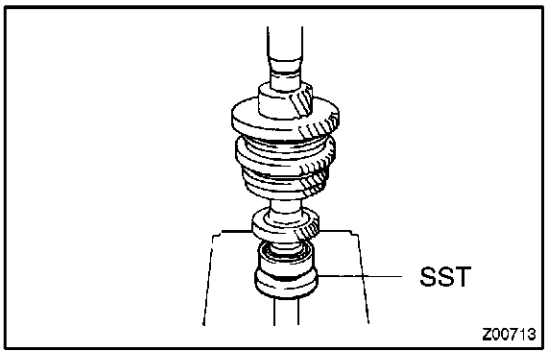
(e) Using a press, install the 3rd driven gear.

6. INSPECT 2ND GEAR THRUST CLEARANCE
(See page MX–29)


Z00712

7. INSTALL OUTPUT GEAR SPACER AND 4TH DRIVEN GEAR

(a) Install the output gear spacer.
(b) Using a press, install the 4th driven gear.



Z00713

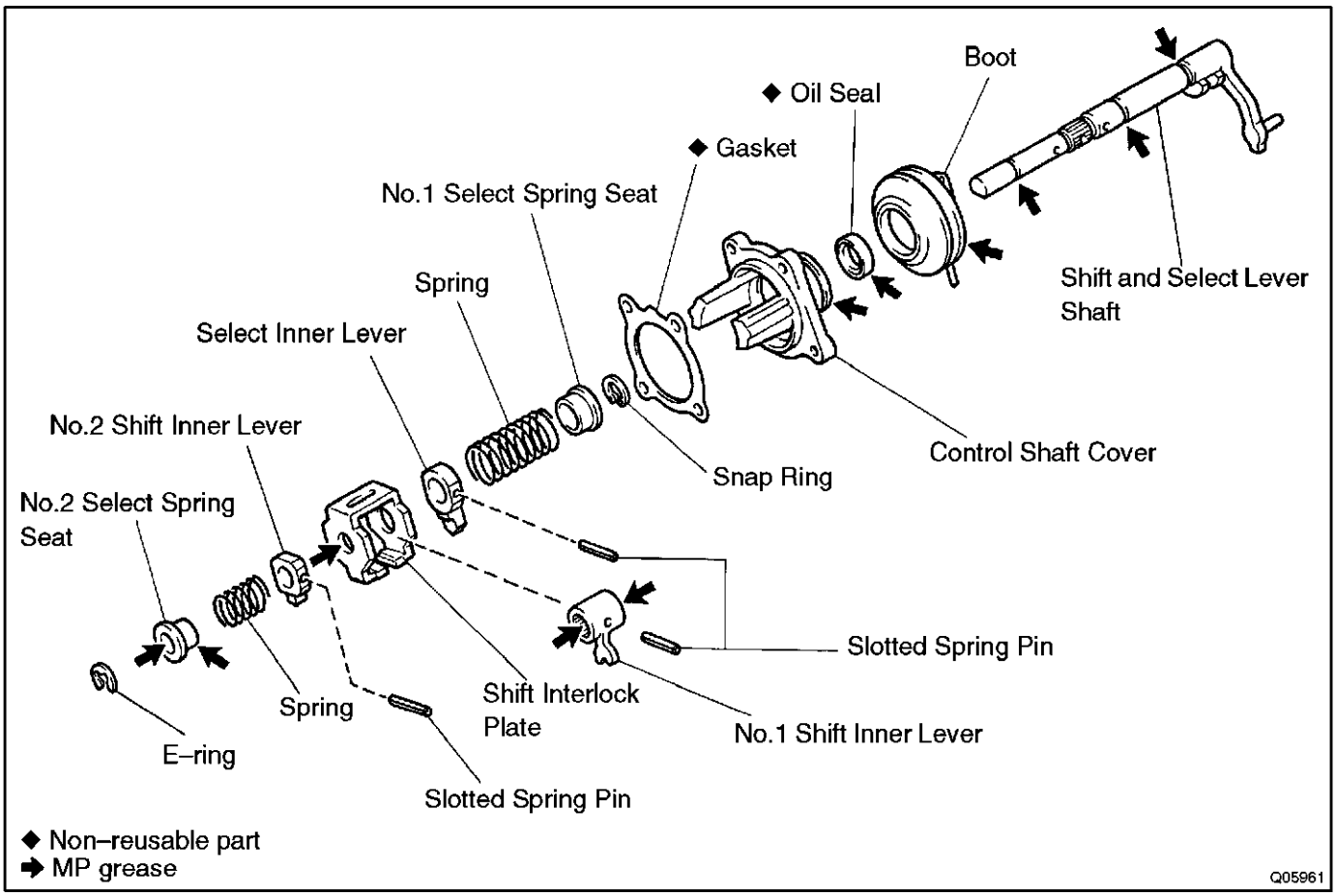
8. INSTALL REAR BALL BEARING

Using SST and a press, install the rear ball bearing.
SST 09316–60011 (09316–00021)

SHIFT AND SELECT LEVER SHAFT

COMPONENTS

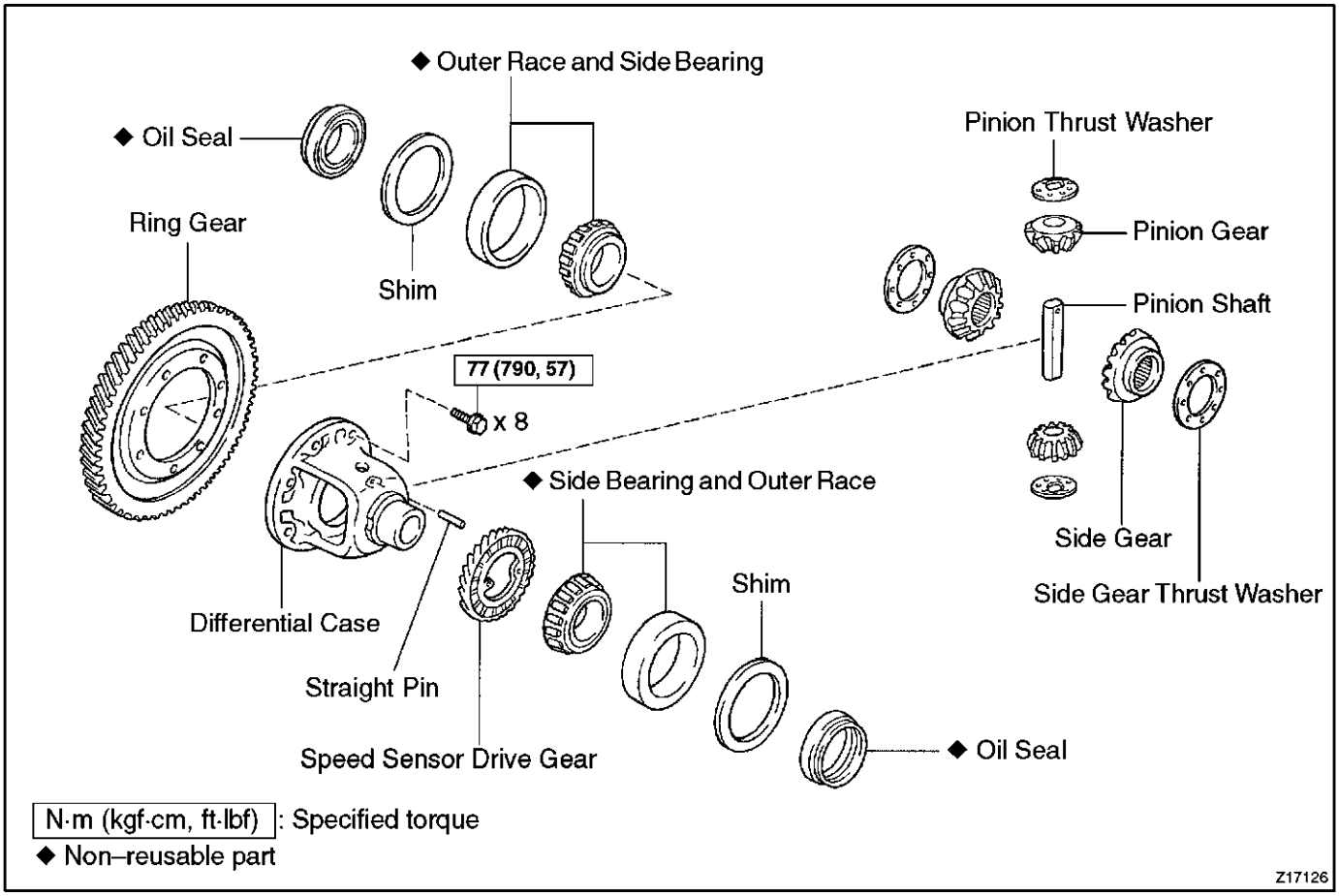
MX001–02



DIFFERENTIAL CASE

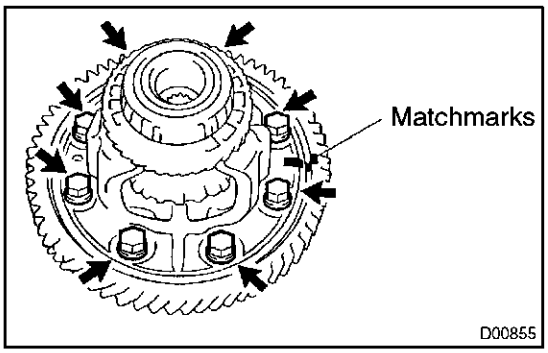
MX00J–02

COMPONENTS



MX00K–02

DISASSEMBLY

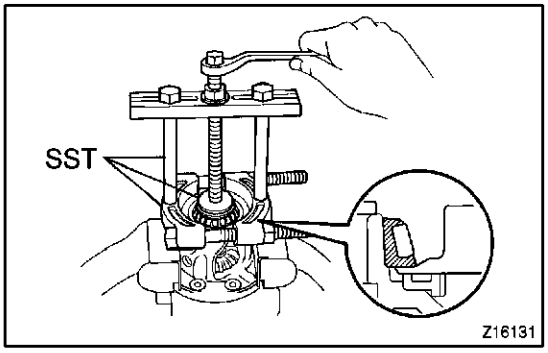


1. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and case.

(b) Remove the 8 bolts.

(c) Using a copper hammer, tap on the ring gear to remove it from the case.



2. Speed Sensor Drive Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

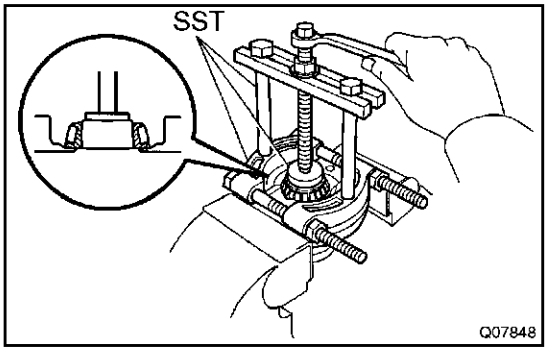
(a) Using SST, remove the side bearing.

SST 09950–00020, 09950–00030, 09950–60010 (09951–00360)

HINT:

Set the claw of SST to the bearing inner race at the position where the speed sensor drive gear is indented.

(b) Remove the speed sensor drive gear.



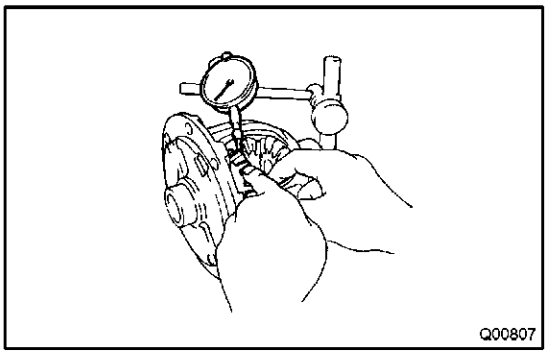
3. Ring Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

Using SST, remove the side bearing.

SST 09950–00020, 09950–00030, 09950–60010 (09951–00360)

HINT:

Set the claw of SST to the bearing inner race at the position where the differential case is indented.



4. INSPECT SIDE GEAR BACKLASH

Using a dial indicator, measure the backlash of one side gear while holding one pinion toward the case.

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

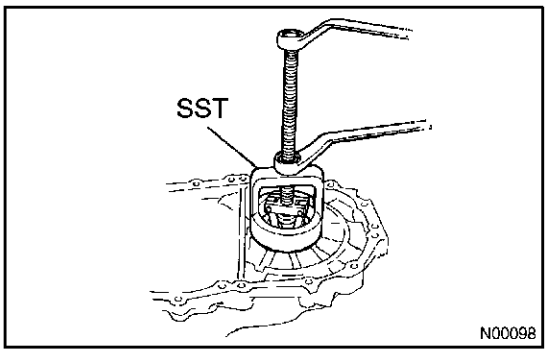
If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

(a) Using a pin punch and hammer, drive out the straight pin.

(b) Remove the pinion shaft from the case.

(c) Remove the 2 pinions and side gears with the 4 thrust washers from each gear.

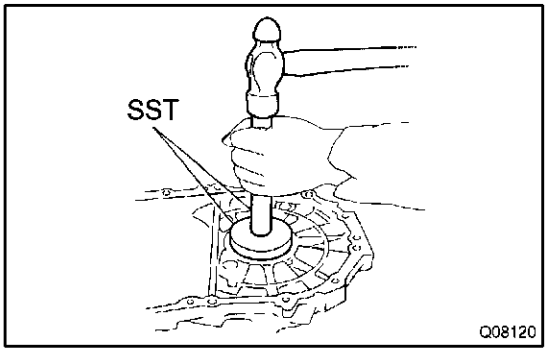


6. Transmission Case Side:
IF NECESSARY, REPLACE OIL SEAL AND SIDE BEARING OUTER RACE

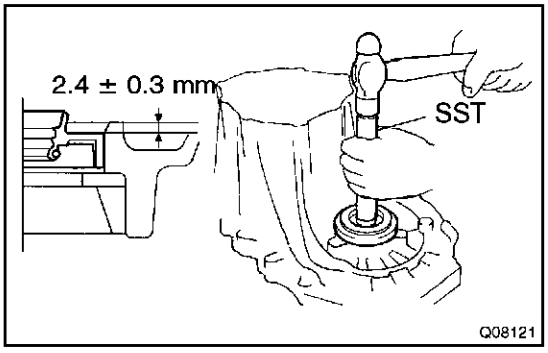
(a) Using a screwdriver and hammer, drive out the oil seal.

(b) Using SST, pull out the outer race and shim.
SST 09612–65014

(c) Place the shim into the case.

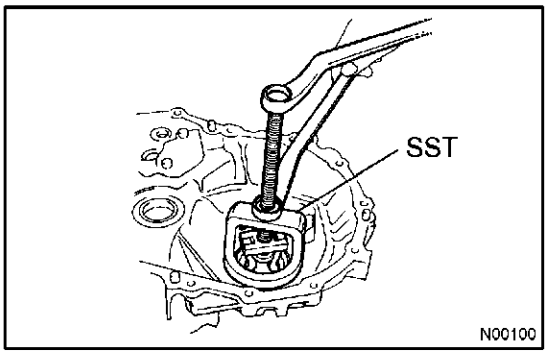


(d) Using SST and a hammer, drive in a new outer race.
SST 09950–60020 (09951–00710), 09950–70010 (09951–07150)



(e) Using SST and a hammer, drive in a new oil seal.
SST 09350–32014 (09351–32111, 09351–32130)
Drive in depth: 2.4 ± 0.3 mm (0.094 ± 0.012 in.)

(f) Coat the lip of the oil seal with MP grease.

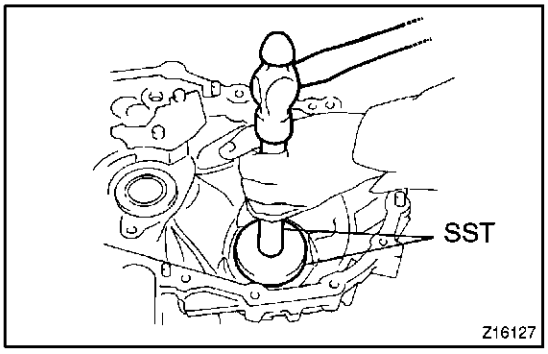


7. Transaxle Case Side:
IF NECESSARY, REPLACE OIL SEAL AND SIDE BEARING OUTER RACE

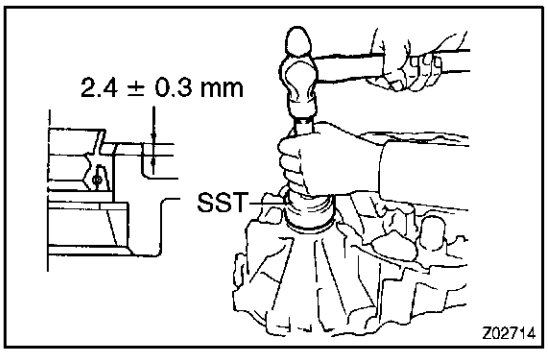
(a) Using a screwdriver and hammer, drive out the oil seal.

(b) Using SST, pull out the outer race and shim.
SST 09612–65014

(c) Place the shim into the case.



(d) Using SST and a hammer, drive in a new outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

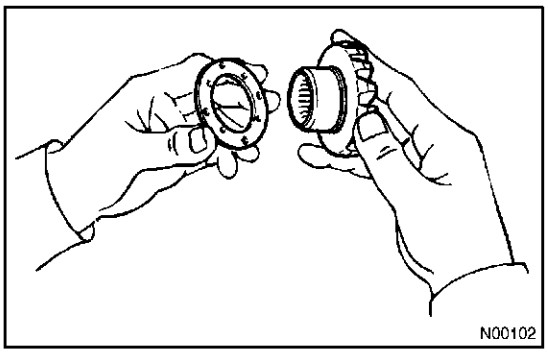


(e) Using SST and a hammer, drive in a new oil seal.
SST 09350–32014 (09351–32130, 09351–32150)
Drive in depth: 2.4 ± 0.3 mm (0.075 ± 0.012 in.)

(f) Coat the lip of the oil seal with MP grease.

MX00L–02

REASSEMBLY


N00102

1. ASSEMBLE DIFFERENTIAL CASE

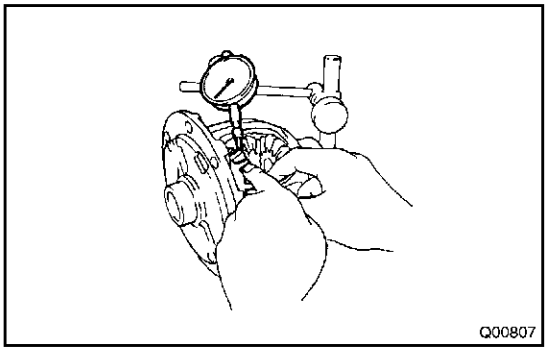
(a) Install the correct thrust washers and side gears. Refer to the table below, select thrust washers which will allow that the backlash is within the specification.

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

Thickness mm (in.)	Thickness mm (in.)
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

(b) Install the thrust washers and side gears in the differential case.

(c) Install the pinion shaft.


Q00807

(d) Using a dial indicator, check the side gear backlash. Measure the side gear backlash while holding one pinion gear toward the case.

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

If the backlash is not within the specification, install a thrust washer of different thickness.

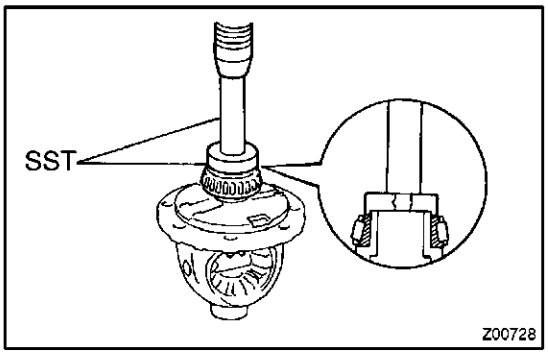
(e) Using a pin punch and hammer, drive in the straight pin through the case and hole in the pinion shaft.

(f) Stake the differential case.

2. Ring Gear Side: INSTALL SIDE BEARING

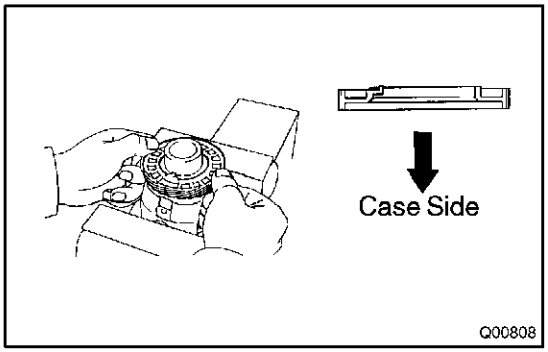
Using SST and a press, install a new side bearing.

SST 09550–10012 (09252–10010, 09556–10010)



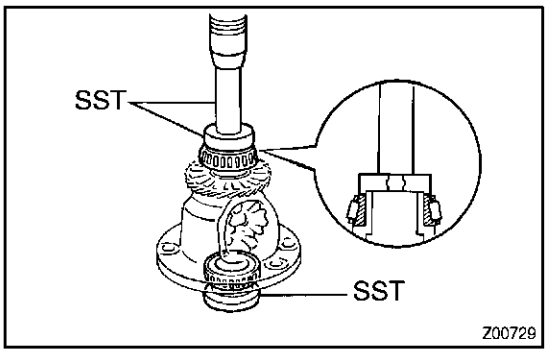
Z00728

3. Speed Sensor Drive Side: INSTALL SIDE BEARING



Q00808

(a) Install the speed sensor drive gear.

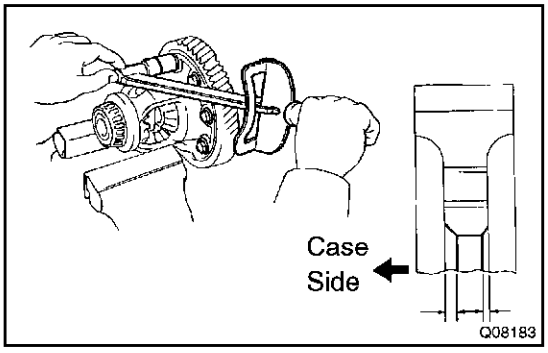


(b) Using SST and a press, install a new side bearing.
SST 09550–10012 (09556–10010), 09950–60010 (09951–00460), 09950–70010 (09951–07150)

4. INSTALL RING GEAR ON DIFFERENTIAL CASE

(a) Clean the contact surface of the differential case.
(b) Heat the ring gear in boiling water.
(c) Carefully take the ring gear out of the water.
(d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

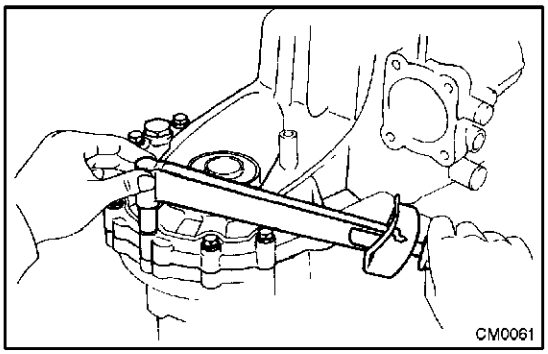
HINT:
Align the matchmarks on the differential case and contact the ring gear.



(e) Temporarily install the 8 set bolts.

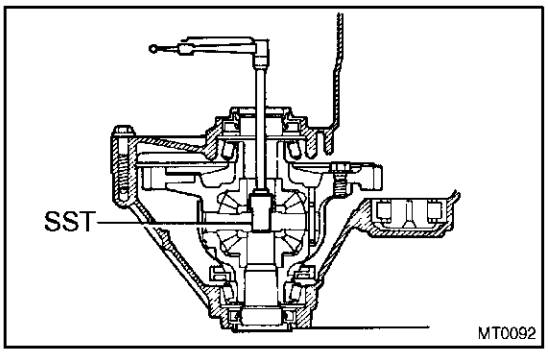
NOTICE:
The ring gear set bolts should not be tightened until the ring gear has cooled sufficiently.

(f) After the ring gear has cooled sufficiently, torque the ring gear set bolts uniformly at a time.
Torque: 77 N·m (790 kgf·cm, 57 ft·lbf)



5. INSPECT DIFFERENTIAL SIDE BEARING PRELOAD

(a) Install the differential case assembly to the transaxle case.
(b) Install the transmission case.
(c) Install and torque the case bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



(d) Using SST and a torque wrench, measure the preload.
SST 09564–32011
Preload (at starting):
New bearing
0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Reused bearing
0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

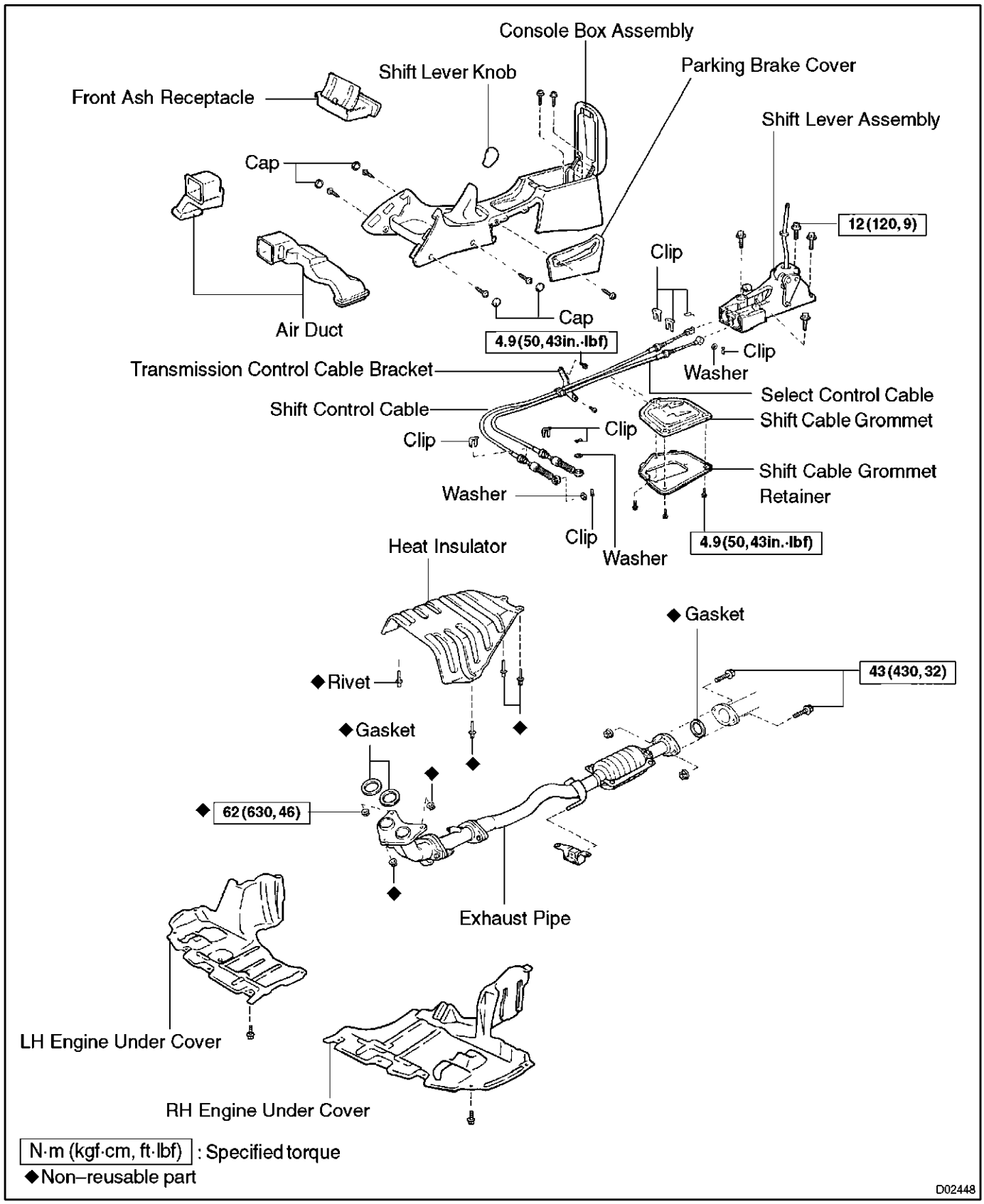
If the preload is not within the specification, remove the transmission case side outer race of the side bearing with SST. (See page MX–37)
Select another shim.
HINT:
The preload will change by about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 in.·lbf) with each 0.05 mm change in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.10 (0.0827)	L	2.60 (0.1024)
B	2.15 (0.0846)	M	2.65 (0.1043)
C	2.20 (0.0866)	N	2.70 (0.1063)
D	2.25 (0.0886)	P	2.75 (0.1083)
E	2.30 (0.0906)	Q	2.80 (0.1102)
F	2.35 (0.0925)	R	2.85 (0.1122)
G	2.40 (0.0945)	S	2.90 (0.1142)
H	2.45 (0.0965)	T	2.95 (0.1161)
J	2.50 (0.0984)	U	3.00 (0.1181)
K	2.55 (0.1004)	–	–

SHIFT LEVER AND CONTROL CABLE

COMPONENTS

MX06H–01



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02448

MANUAL TRANSAXLE (S50, S54)

TROUBLESHOOTING MX–1
MANUAL TRANSAXLE UNIT
(Diesel Engine) MX–2
MANUAL TRANSAXLE UNIT
(Gasoline Engine) MX–8
MANUAL TRANSAXLE ASSEMBLY MX–14
INPUT SHAFT MX–25
OUTPUT SHAFT MX–33
SHIFT AND SELECT LEVER SHAFT MX–40
DIFFERENTIAL CASE MX–41
SHIFT LEVER AND CONTROL CABLE MX–48

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

MX030–03

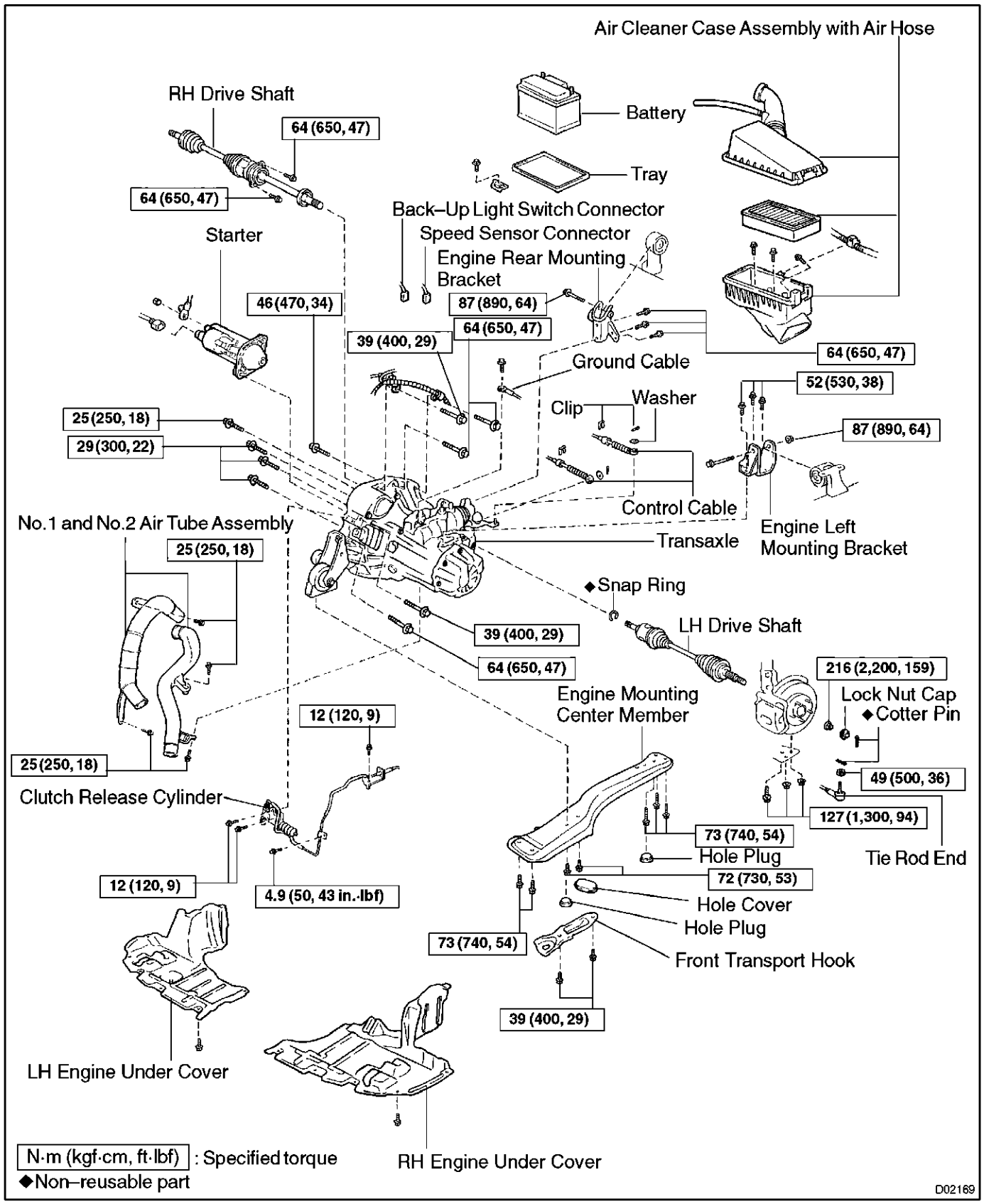
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace parts.

Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–3 MX–9
	2. Oil (Wrong)	MX–3 MX–9
	3. Gear (Worn or damaged)	MX–14
	4. Bearing (Worn or damaged)	MX–14
Oil leakage	1. Oil (Level too high)	MX–3 MX–9
	2. Gasket (Damaged)	MX–14
	3. Oil seal (Worn or damaged)	MX–14
	4. O–ring (Worn or damaged)	MX–14
Hard to shift or will not shift	1. Control cable (Faulty)	MX–48
	2. Synchronizer ring (Worn or damaged)	MX–14 MX–25 MX–33
	3. Shift key spring (Damaged)	MX–14 MX–25 MX–33
Jumps out of gear	1. Locking ball spring (Damaged)	MX–14
	2. Shift fork (Worn)	MX–14
	3. Gear (Worn or damaged)	MX–14
	4. Bearing (Worn or damaged)	MX–14

MANUAL TRANSAXLE UNIT (Diesel Engine)

COMPONENTS

MX06J–01



MX06K–01

REMOVAL

1. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE

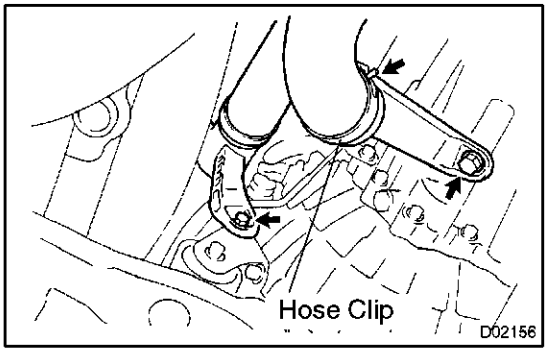
2. REMOVE NO.1 AND NO.2 AIR TUBE ASSEMBLY

(a) Raise the vehicle.

NOTICE:

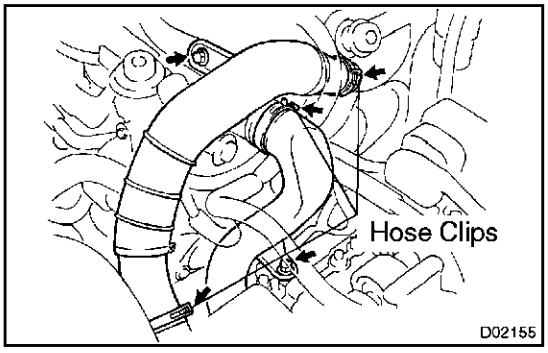
Make sure that the vehicle is securely supported.

(b) Remove LH and RH engine under covers.



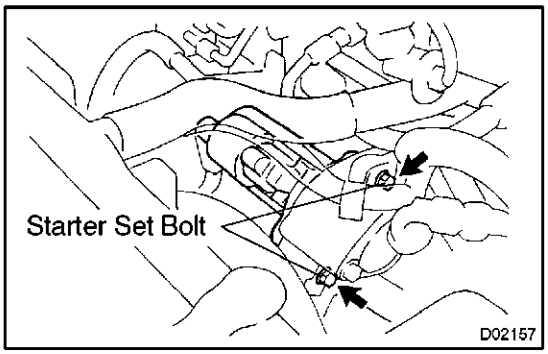
(c) Remove 2 lower side bolts of the No.1 and No.2 air tube assembly and disconnect the hose clip.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(d) Lower the vehicle.



(e) Remove the 2 upper side bolts of the No.1 and No.2 air tube assembly and disconnect 3 hose clips.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

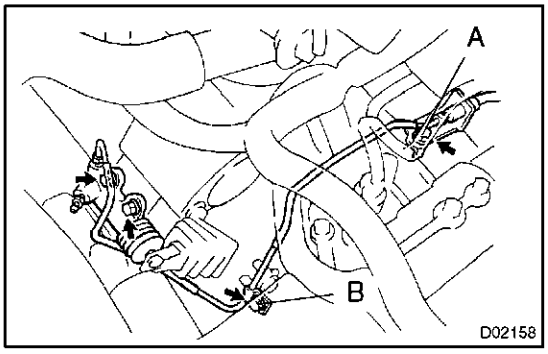
(f) Remove the No.1 and No.2 air tube assembly.



3. REMOVE STARTER

(a) Disconnect the connector and wire from the starter.

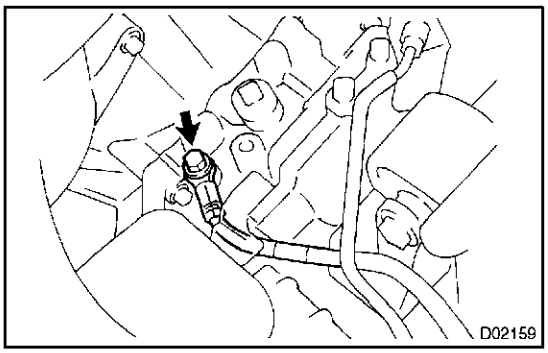
(b) Remove the 2 bolts and starter.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



4. DISCONNECT CLUTCH RELEASE CYLINDER AND LINE

(a) Remove the 2 set bolts of the clutch line bracket.
Torque:
Bolt A: 12 N·m (120 kgf·cm, 9 ft·lbf)
Bolt B: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

(b) Remove the 2 bolts and disconnect the clutch release cylinder and line.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



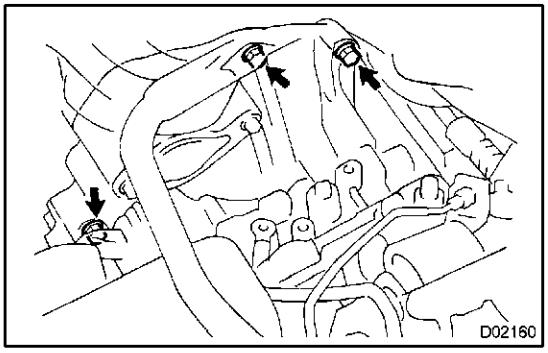
5. DISCONNECT GROUND CABLE

Remove the set bolt of the ground cable from the transaxle.

6. DISCONNECT CONTROL CABLE

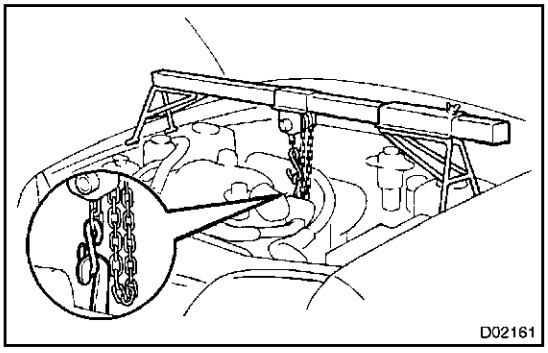
(a) Remove the 2 clips and washers.
(b) Remove the 2 clips from the cables.
(c) Disconnect the 2 control cables from the transaxle.

7. DISCONNECT BACK–UP LIGHT SWITCH AND SPEED SENSOR CONNECTORS

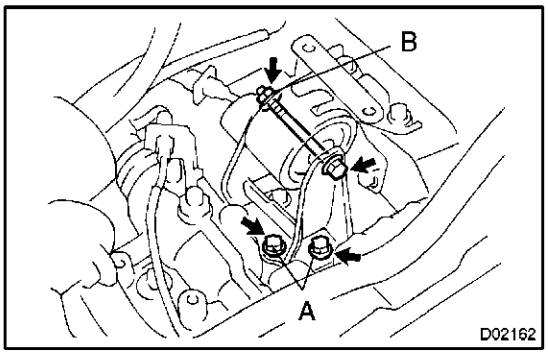


8. REMOVE 3 TRANSAXLE UPPER SIDE MOUNTING BOLTS

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

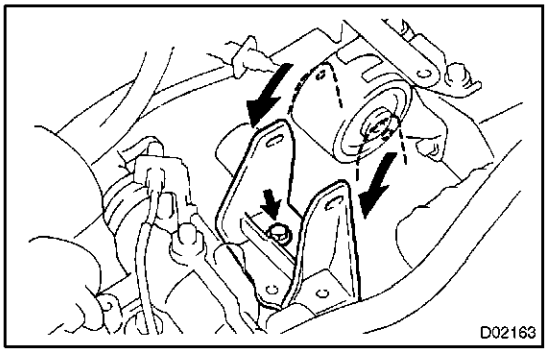


9. INSTALL ENGINE SUPPORT FIXTURE



10. REMOVE ENGINE LEFT MOUNTING BRACKET 3 SET BOLTS AND NUT

Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B: 87 N·m (890 kgf·cm, 64 ft·lbf)



11. REMOVE ENGINE LEFT MOUNTING BRACKET

Lower the transaxle side and remove the bolt and bracket.

Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

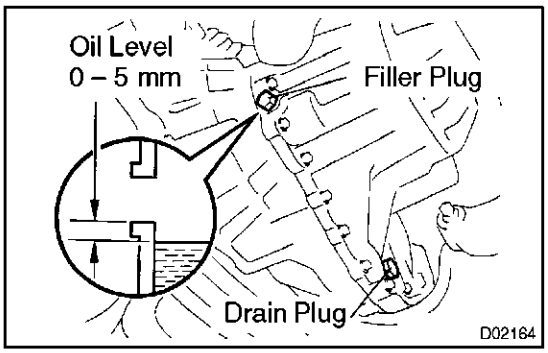
12. REMOVE FRONT WHEEL

Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)

13. RAISE VEHICLE

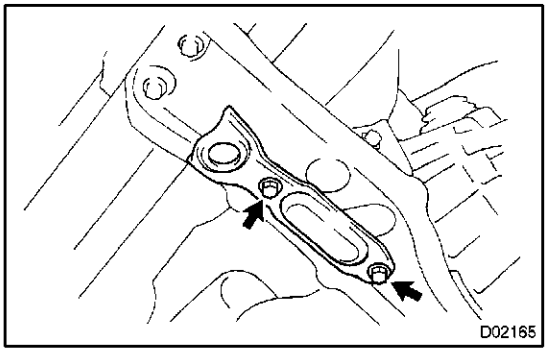
NOTICE:

Make sure that the vehicle is securely supported.

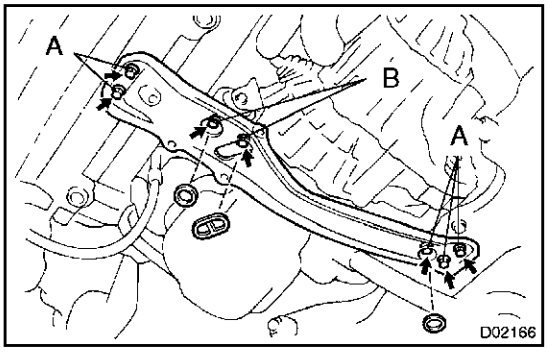


14. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 2.2 liters (2.3 US qts, 1.9 Imp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

15. REMOVE LH AND RH DRIVE SHAFTS
(See page SA–36)

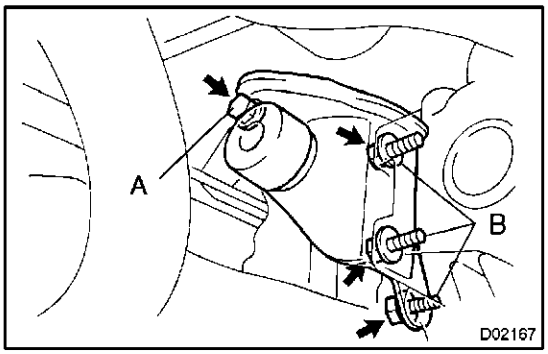


16. REMOVE ENGINE MOUNTING CENTER MEMBER
(a) Remove the 2 bolts and front transport hook.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
(b) Support the suspension crossmember with a jack.

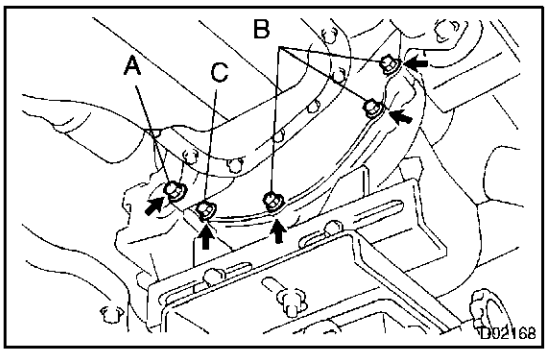


(c) Remove the 2 hole plugs and hole cover.
(d) Remove the 7 bolts and center member.
Torque:
Bolt A: 73 N·m (740 kgf·cm, 54 ft·lbf)
Bolt B: 72 N·m (730 kgf·cm, 53 ft·lbf)

17. JACK UP TRANSAXLE SLIGHTLY
Using a transmission jack, support the transaxle.



18. REMOVE ENGINE REAR MOUNTING BRACKET
Remove the 4 bolts and bracket.
Torque:
Bolt A: 87 N·m (890 kgf·cm, 64 ft·lbf)
Bolt B: 64 N·m (650 kgf·cm, 47 ft·lbf)



19. REMOVE TRANSAXLE LOWER SIDE MOUNTING BOLT

Remove the 5 bolts.

Torque:
Bolt A: 46 N·m (470 kgf·cm, 34 ft·lbf)
Bolt B: 29 N·m (300 kgf·cm, 22 ft·lbf)
Bolt C: 25 N·m (250 kgf·cm, 18 ft·lbf)

20. REMOVE TRANSAXLE

Lower engine left side and remove the transaxle from the engine.

HINT:

At the time of installation, please refer to the following items.

- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

MX06L–01

INSTALLATION

Installation is in the reverse order of removal (See page MX–3).

HINT:

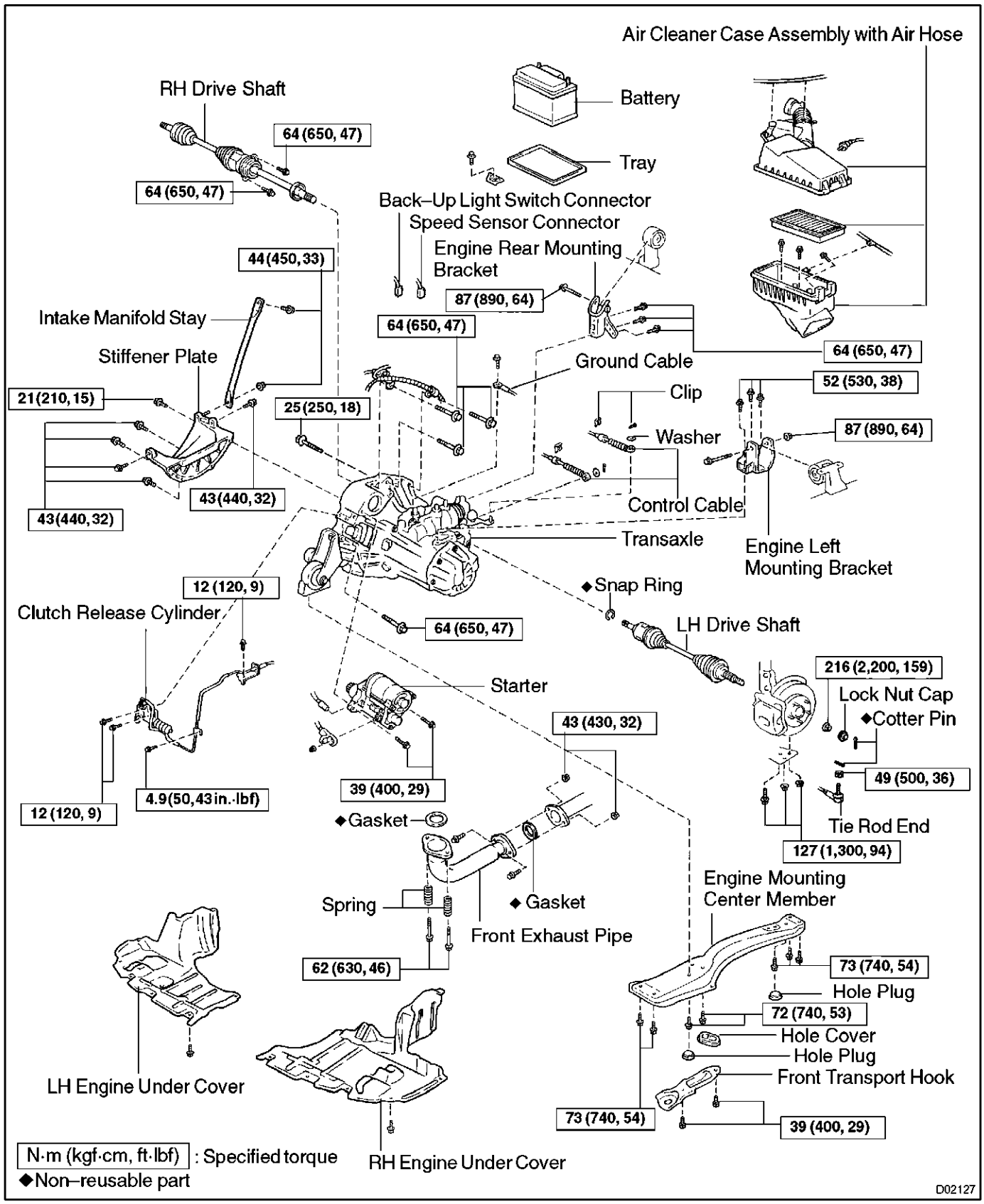
After installation, check and inspect items as follows.

- Front wheel alignment (See page SA–4).
- Do the road test.

MANUAL TRANSAXLE UNIT (Gasoline Engine)

COMPONENTS

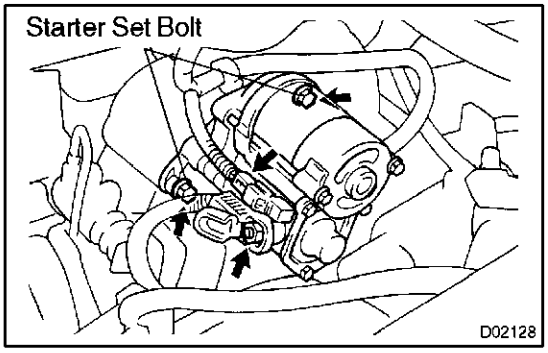
MX06M–01



MX06N–01

REMOVAL

1. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE

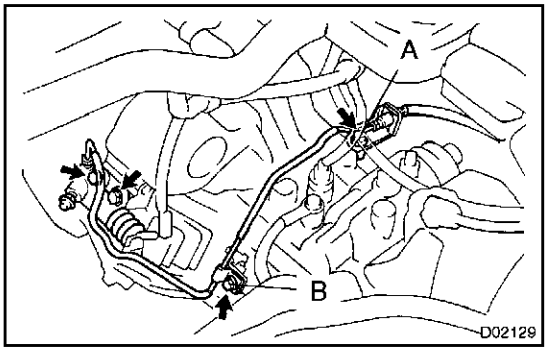


2. REMOVE STARTER

(a) Disconnect the connector and wire from the starter.

(b) Remove the 2 bolts and starter.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



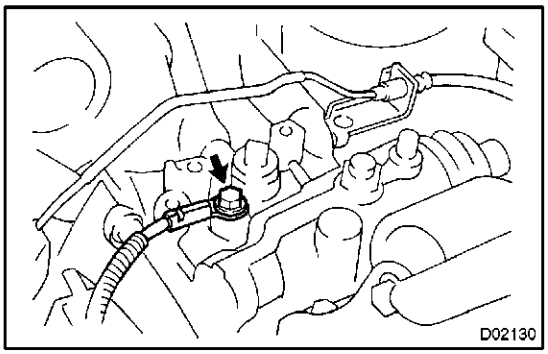
3. DISCONNECT CLUTCH RELEASE CYLINDER AND LINE

(a) Remove the 2 set bolts of the clutch line bracket.

Torque:
Bolt A: 12 N·m (120 kgf·cm, 9 ft·lbf)
Bolt B: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

(b) Remove the 2 bolts and disconnect the clutch release cylinder and line.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



4. DISCONNECT GROUND CABLE

Remove the set bolt of the ground cable from the transaxle.

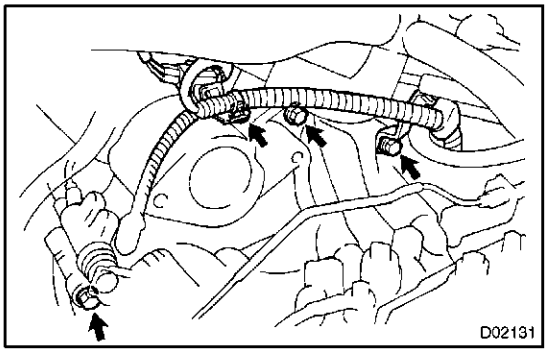
5. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips from the cables.

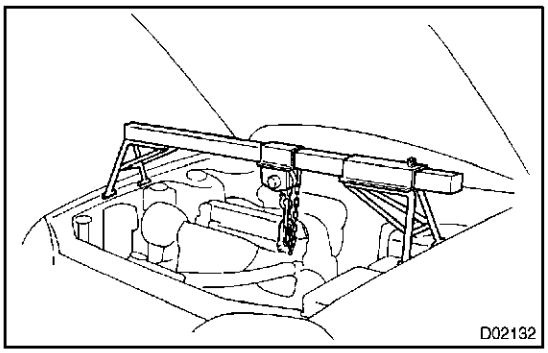
(c) Disconnect the 2 control cables from the transaxle.

6. DISCONNECT BACK–UP LIGHT SWITCH AND SPEED SENSOR CONNECTORS

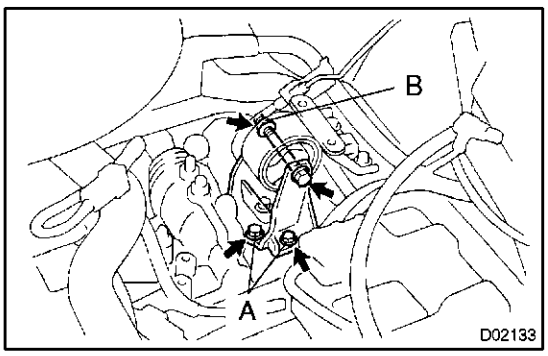


7. REMOVE 4 TRANSAXLE UPPER SIDE MOUNTING BOLTS

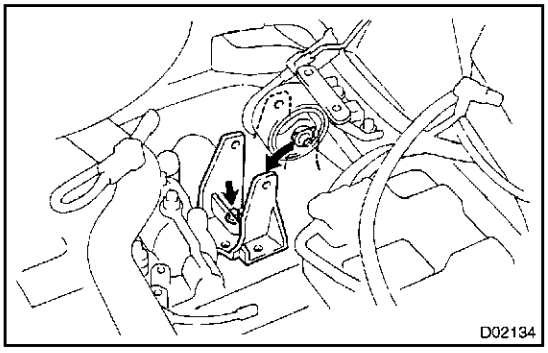
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



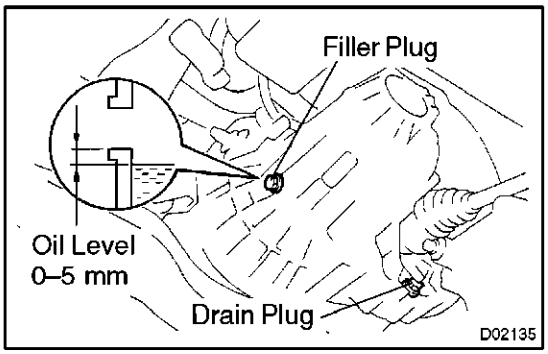
8. INSTALL ENGINE SUPPORT FIXTURE



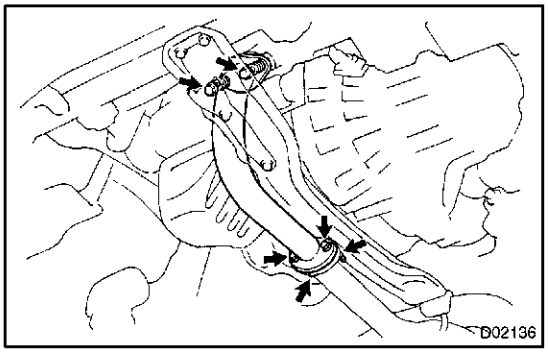
9. REMOVE ENGINE LEFT MOUNTING BRACKET 3 SET BOLTS AND NUT
Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B: 87 N·m (890 kgf·cm, 64 ft·lbf)



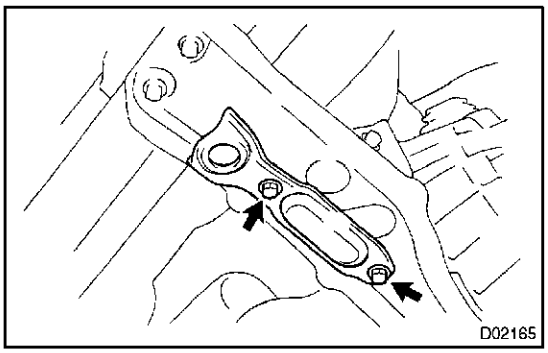
10. REMOVE ENGINE LEFT MOUNTING BRACKET
Lower the transaxle side and remove the bolt and bracket.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)
11. REMOVE FRONT WHEEL
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)
12. RAISE VEHICLE
NOTICE:
Make sure that the vehicle is securely supported.
13. REMOVE LH AND RH ENGINE UNDER COVERS



14. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 2.2 liters (2.3 US qts, 1.9 Imp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
15. REMOVE LH AND RH DRIVE SHAFTS
(See page SA–36)



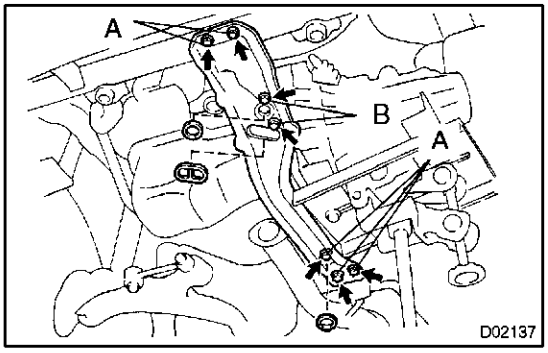
16. REMOVE FRONT EXHAUST PIPE
(a) Remove the 2 bolts, springs and gasket from the exhaust manifold.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)
(b) Remove the 2 bolts, nuts, gasket and front exhaust pipe.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



17. REMOVE ENGINE MOUNTING CENTER MEMBER

(a) Remove the 2 bolts and front transport hook.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(b) Support the suspension crossmember with a jack.

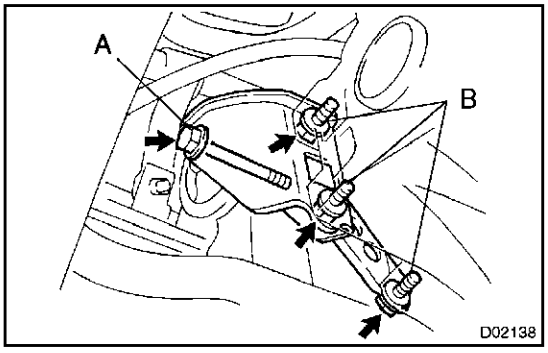


(c) Remove the 2 hole plugs and hole cover.

(d) Remove the 7 bolts and center member.
Torque:
Bolt A: 73 N·m (740 kgf·cm, 54 ft·lbf)
Bolt B: 72 N·m (730 kgf·cm, 53 ft·lbf)

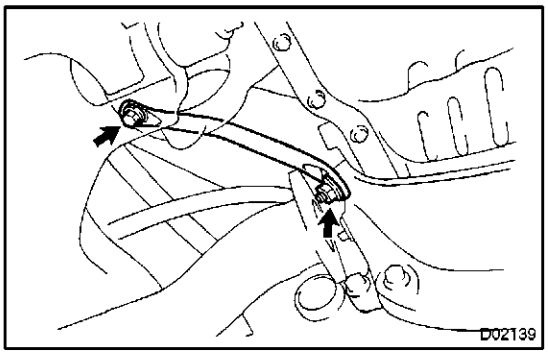
18. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



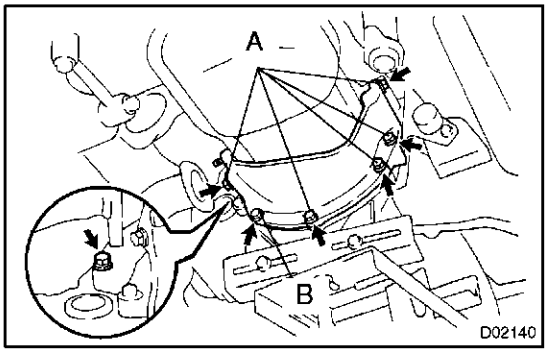
19. REMOVE ENGINE REAR MOUNTING BRACKET

Remove the 4 bolts and bracket.
Torque:
Bolt A: 87 N·m (890 kgf·cm, 64 ft·lbf)
Bolt B: 64 N·m (650 kgf·cm, 47 ft·lbf)



20. REMOVE INTAKE MANIFOLD STAY

Remove the bolt, nut and intake manifold stay.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)



21. REMOVE STIFFENER PLATE AND TRANSAXLE LOWER SIDE MOUNTING BOLT

(a) Remove the 6 bolts and stiffener plate.
Torque:
Bolt A: 43 N·m (440 kgf·cm, 32 ft·lbf)
Bolt B: 21 N·m (210 kgf·cm, 15 ft·lbf)

(b) Remove the bolt of transaxle lower side.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

22. REMOVE TRANSAXLE

Lower engine left side and remove the transaxle from the engine.

HINT:

At the time of installation, please refer to the following items.

- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

MX06D–01

INSTALLATION

Installation is in the reverse order of removal (See page MX–9).

HINT:

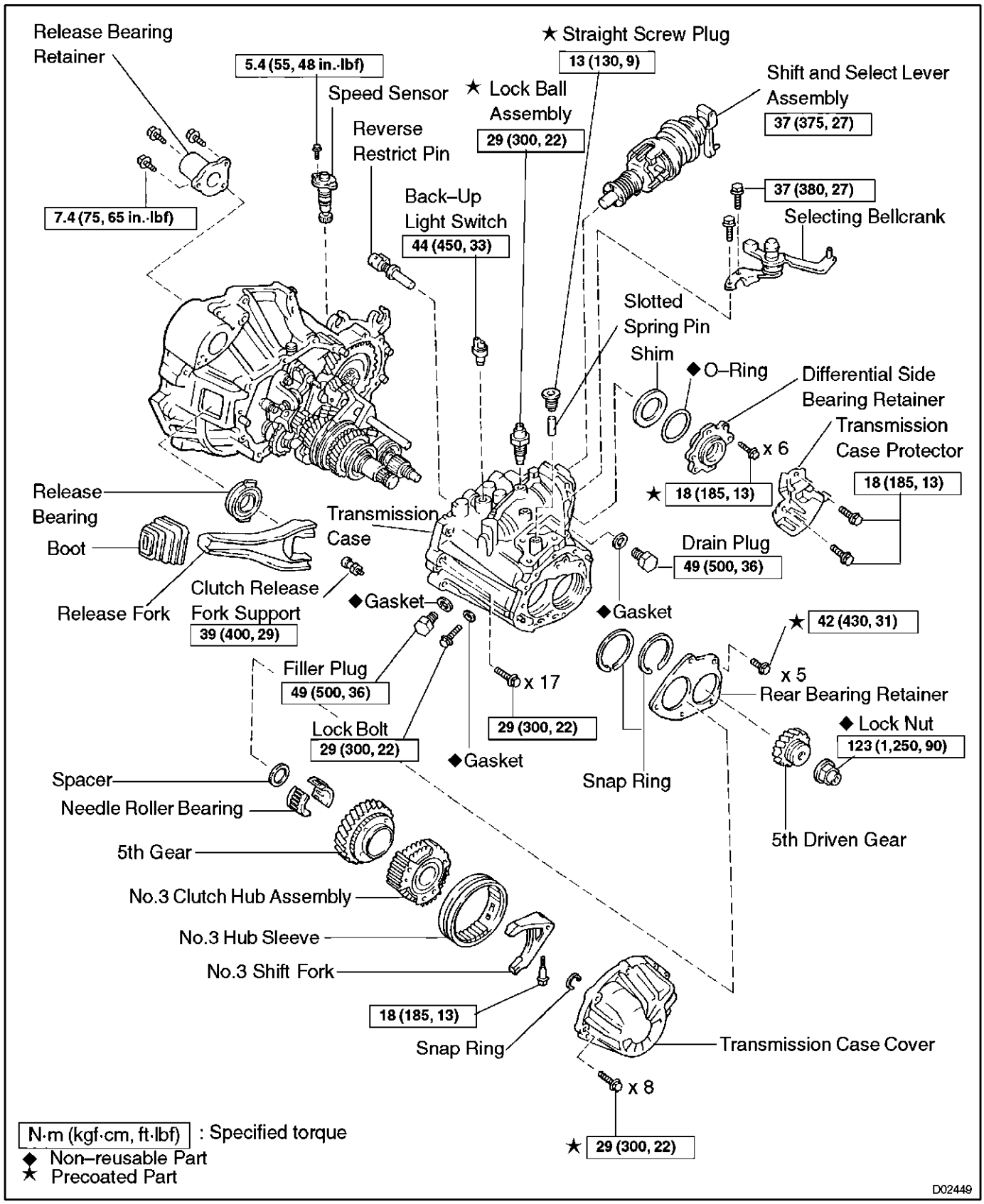
After installation, check and inspect items as follows.

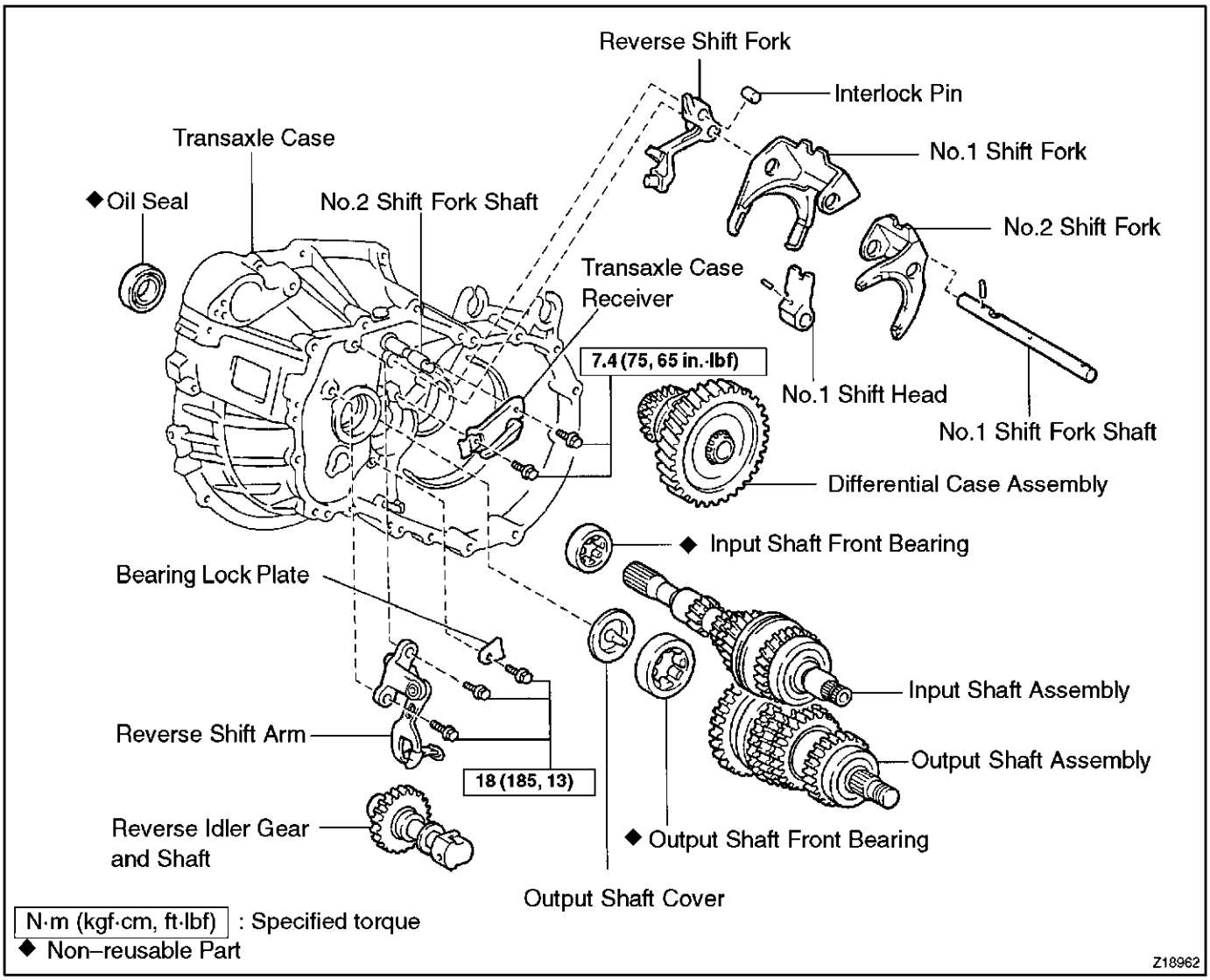
- Front wheel alignment (See page SA–4).
- Do the road test.

MANUAL TRANSAXLE ASSEMBLY

COMPONENTS

MX034–03




Reverse Shift Fork
Interlock Pin
Transaxle Case
No.1 Shift Fork
◆Oil Seal
No.2 Shift Fork Shaft
No.2 Shift Fork
Transaxle Case Receiver
7.4 (75, 65 in.-lbf)
No.1 Shift Head
No.1 Shift Fork Shaft
Differential Case Assembly
◆ Input Shaft Front Bearing
Bearing Lock Plate
Input Shaft Assembly
Output Shaft Assembly
Reverse Shift Arm
18 (185, 13)
Reverse Idler Gear and Shaft
◆ Output Shaft Front Bearing
Output Shaft Cover
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable Part
Z18962

MX035–03

DISASSEMBLY

1. **REMOVE RELEASE FORK AND BEARING**
2. **REMOVE BACK–UP LIGHT SWITCH**
   Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)
3. **REMOVE BOLT AND SPEED SENSOR**
   Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
4. **REMOVE RELEASE BEARING RETAINER**

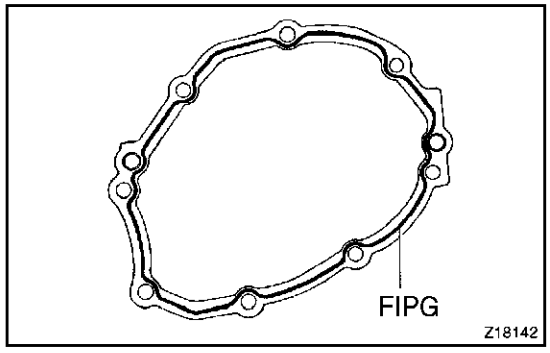
Remove the 3 bolts and retainer.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

5. **REMOVE SELECTING BELLCRANK**

Remove the 2 bolts and selecting bellcrank.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)



6. **REMOVE TRANSMISSION CASE COVER**

(a) Remove the 8 bolts.

Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Using a plastic hammer, tap the transmission case cover and remove it.

FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent

7. **REMOVE LOCK BALL ASSEMBLY**

Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

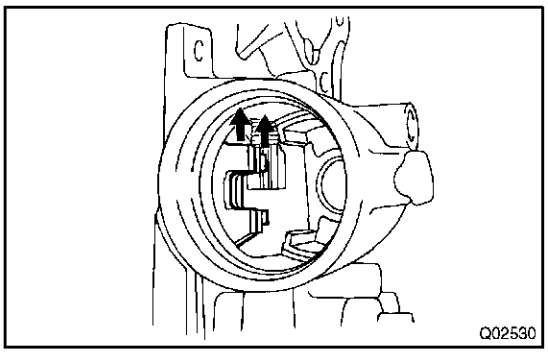
8. **REMOVE SHIFT AND SELECT LEVER ASSEMBLY**

HINT:

At the time of reassembly, please refer to the following item.

Apply FIPG to the underside of the flanged portion of the control shaft cover.

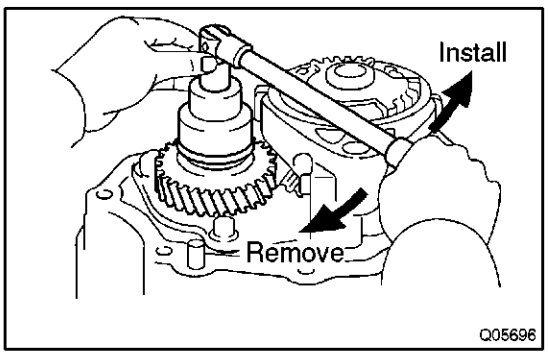
FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



9. REMOVE OUTPUT SHAFT LOCK NUT

(a) Unstake the nut.

(b) Engage the gear to the double meshing, with the gear into 1st and 3rd or 2nd and 4th.



(c) Remove the lock nut clockwise and remove it.
Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

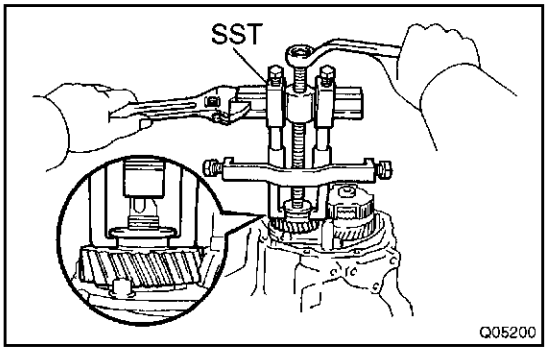
HINT:
The lock nut has LH threads.

(d) Disengage the double meshing of the gear.

10. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

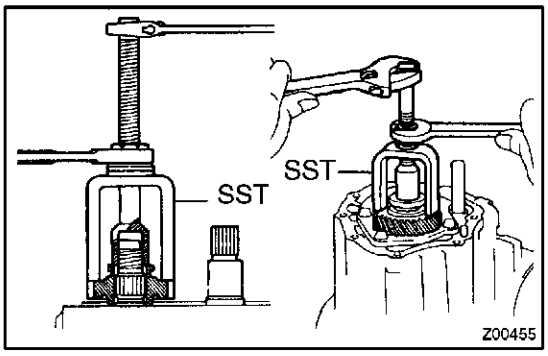
(a) Remove the No.3 shift fork set bolt.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(b) Remove the No.3 hub sleeve and No.3 shift fork.

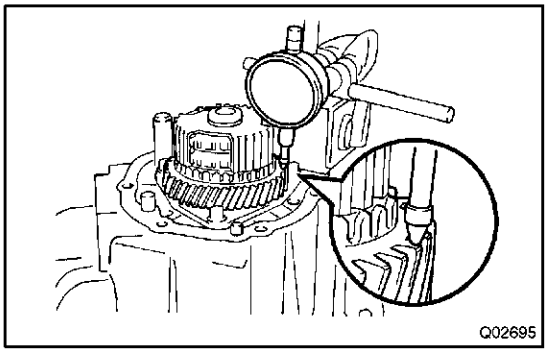


11. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.
SST 09950–40011

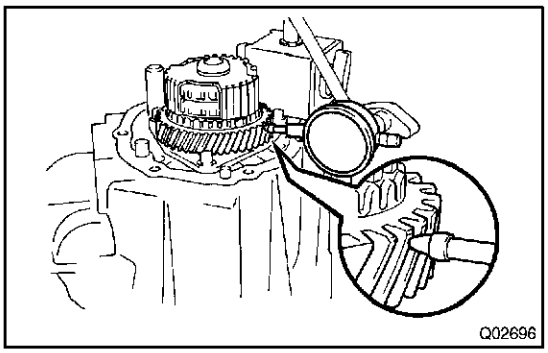


HINT:
At the time of installation, please refer to the following item.
Using SST, install the 5th driven gear.
SST 09309–12020



12. MEASURE 5TH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.
Standard clearance:
0.20–0.40 mm (0.0079–0.0157 in.)
Maximum clearance:
0.45 mm (0.0177 in.)


Q02696

13. MEASURE 5TH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance.

Standard clearance:
0.009–0.050 mm (0.0004–0.0020 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or input shaft.

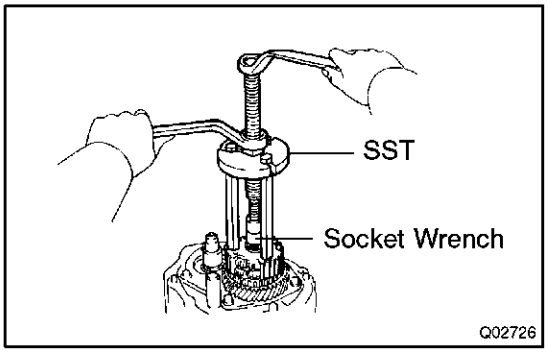
14. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

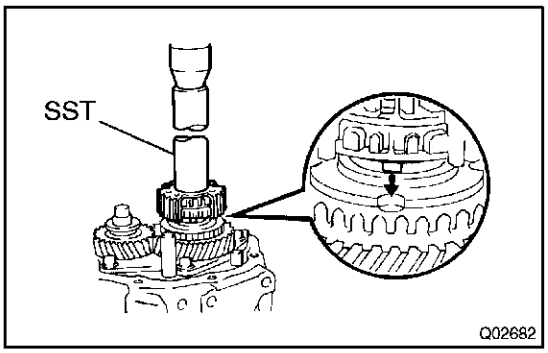
At the time of reassembly, please refer to the following item.
Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
13	2.20–2.25 (0.0866–0.0886)	21	2.60–2.65 (0.1024–0.1043)
14	2.25–2.30 (0.0886–0.0906)	22	2.65–2.70 (0.1043–0.1063)
15	2.30–2.35 (0.0906–0.0925)	23	2.70–2.75 (0.1063–0.1083)
16	2.35–2.40 (0.0925–0.0945)	24	2.75–2.80 (0.1083–0.1102)
17	2.40–2.45 (0.0945–0.0965)	25	2.80–2.85 (0.1102–0.1122)
18	2.45–2.50 (0.0965–0.0984)	26	2.85–2.90 (0.1122–0.1142)
19	2.50–2.55 (0.0984–0.1004)	27	2.90–2.95 (0.1142–0.1161)
20	2.55–2.60 (0.1004–0.1024)	–	–



Q02726

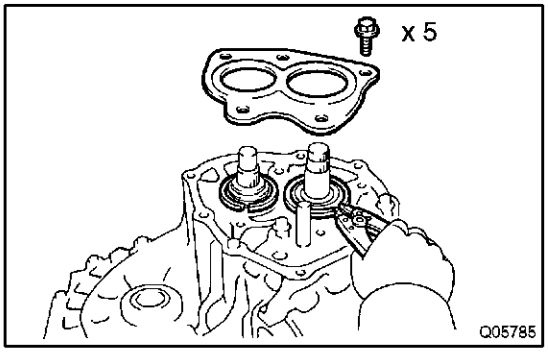
(b) Using SST and a socket wrench, remove the No.3 clutch hub with the synchronizer ring.
SST 09950–30010



HINT:
At the time of reassembly, please refer to the following item.
Using SST and a press, install the No.3 clutch hub assembly.
SST 09612–22011

(c) Remove the 5th gear.

15. REMOVE NEEDLE ROLLER BEARING



16. REMOVE REAR BEARING RETAINER

Remove the 5 bolts and retainer.

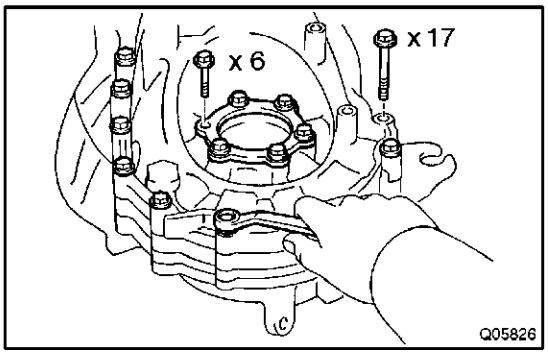
Sealant:
Part No.08833–00070, THREE BOND 1324 or equivalent
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

17. REMOVE SNAP RING

Using a snap ring expander, remove the 2 snap rings.

HINT:
If it is difficult to remove and install the snap rings, pull up the shafts.

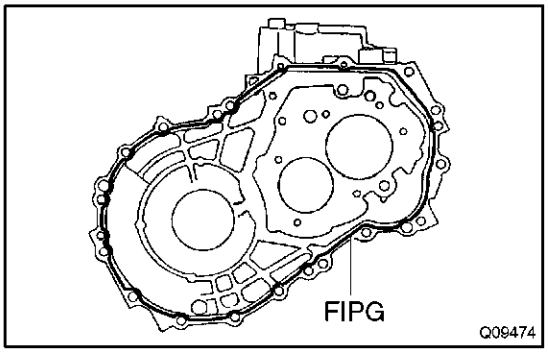
18. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND GASKET
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



19. REMOVE DIFFERENTIAL SIDE BEARING RETAINER AND SHIM

Remove the 6 bolts, retainer and shim.

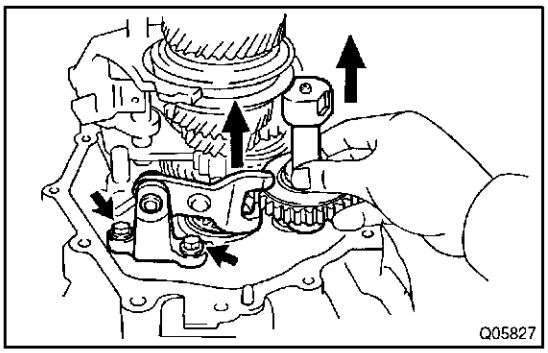
Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



20. REMOVE TRANSMISSION CASE

(a) Remove the 17 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Using a plastic hammer, tap the transmission case and remove it.
FIPG:
Part No. 08833–00090, THREE BOND 1281 or equivalent



21. REMOVE REVERSE IDLER GEAR AND SHAFT

(a) Pull out the shaft.

(b) Remove the idler gear and thrust washer.

22. REMOVE REVERSE SHIFT ARM

(a) Shift the fork shaft into reverse.

(b) Remove the 2 bolts and pull off the reverse shift arm.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

23. REMOVE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1 AND NO.2 SHIFT FORKS, REVERSE SHIFT FORK WITH INTERLOCK PIN, INPUT AND OUTPUT SHAFTS ASSEMBLY

24. REMOVE DIFFERENTIAL CASE ASSEMBLY

25. REMOVE MAGNET FROM TRANSAXLE CASE

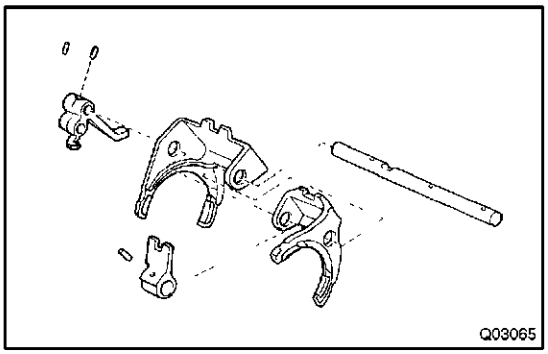
26. REMOVE NO.2 FORK SHAFT

(a) Using a hexagon wrench, remove the straight screw plug.

Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(b) Using a pin punch and hammer, drive out the slotted spring pin.

(c) Pull out the shaft.



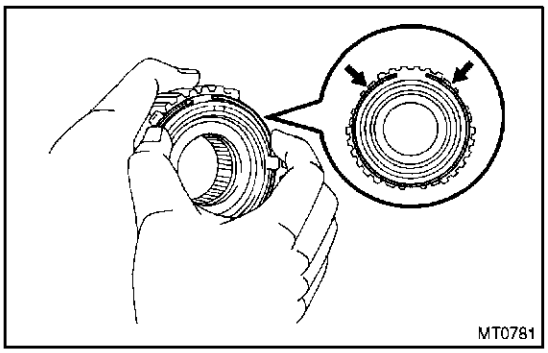
27. SEPARATE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1, NO.2 SHIFT FORKS AND REVERSE SHIFT FORK

(a) Mount the shift forks to the vise.

(b) Using a pin punch and hammer, drive out the slotted spring pin from the No.1 fork shaft.

(c) Using a pin punch and hammer, drive out the slotted spring pin from the No.1 fork shaft, as shown in the illustration.

(d) Separate the No.1 shift fork shaft, No.1 shift head, No.1 and No.2 shift forks and reverse shift fork.



28. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

(a) Remove the No.5 synchronizer ring with the key spring from the No.3 clutch hub.

(b) Using a screwdriver, remove the snap ring.

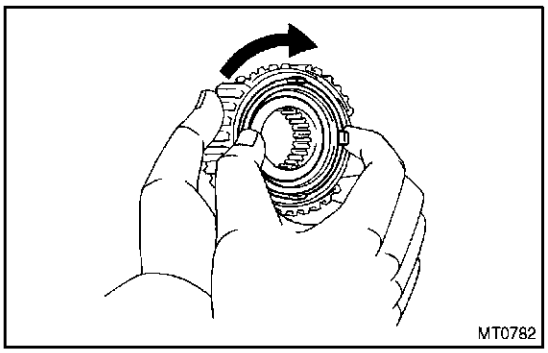
HINT:

Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

(c) Remove the synchronizer rings.

MX06P–01

INSPECTION



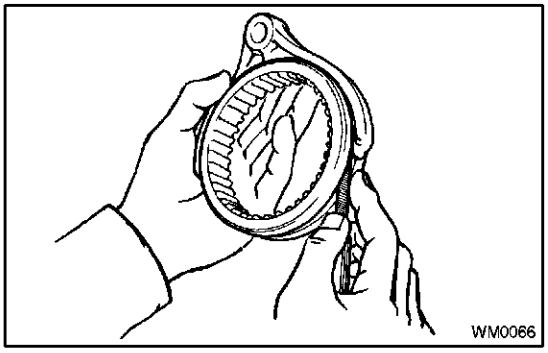
1. INSPECT NO.5 SYNCHRONIZER RING

(a) Check wear or damage.

(b) Check the braking effect of the synchronizer ring.

Turn the middle No.5 synchronizer ring in one direction while pushing it to the outer No.5 synchronizer ring. Check that the ring locks.

If the braking effect is insufficient, replace the synchronizer ring.

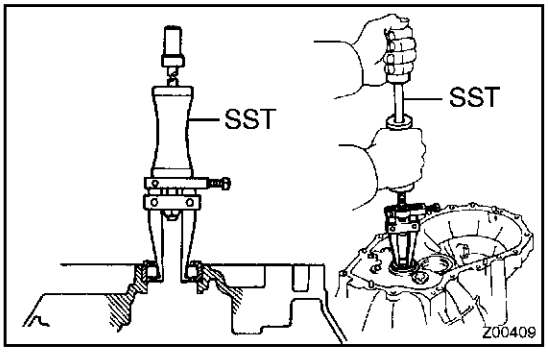


2. INSPECT NO.3 SHIFT FORK AND NO.3 HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

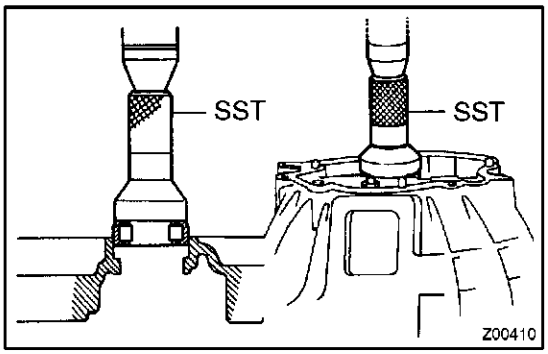
If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



3. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING

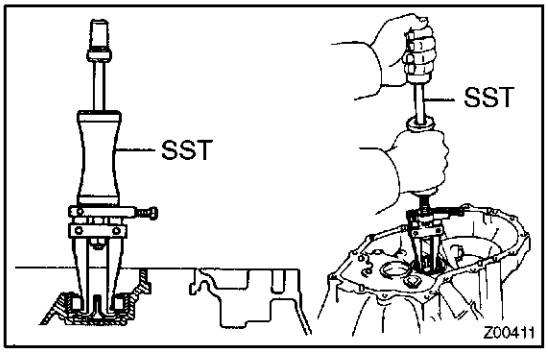
(a) Remove the 2 bolts and transaxle case receiver.

(b) Using SST, pull out the bearing.
SST 09308–00010



(c) Using SST and a press in a new bearing.
SST 09310–35010

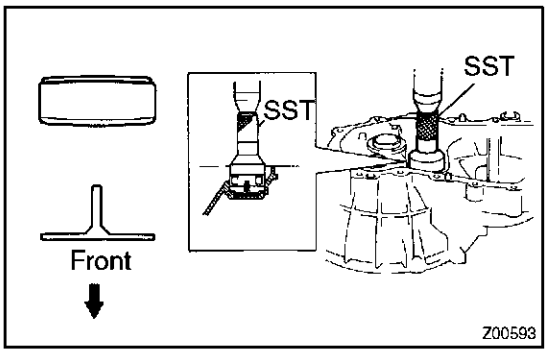
(d) Install the transaxle case receiver and torque the 2 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



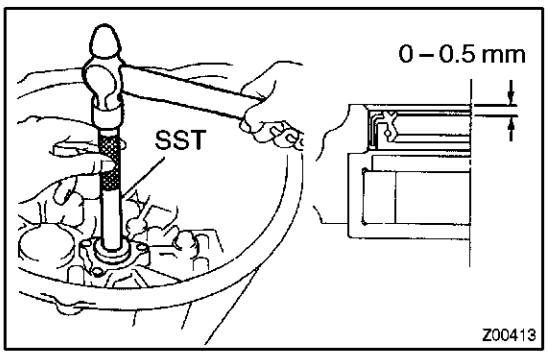
4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING

(a) Remove the bolt and bearing lock plate.

(b) Using SST, pull out the bearing.
SST 09308–00010

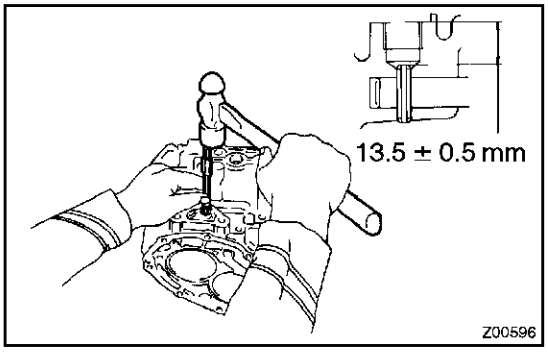


(c) Using SST and a press in a new bearing.
SST 09310–35010
(d) Install the bearing lock plate and torque the bolt.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



5. IF NECESSARY, REPLACE INPUT SHAFT FRONT OIL SEAL

(a) Using a screwdriver, pry out the oil seal.
(b) Using SST and a hammer, drive in a new oil seal.
SST 09608–00081, 09950–70010 (09951–07150)
Drive in depth: 0–0.5 mm (0–0.020 in.)
(c) Coat the lip of the oil seal with MP grease.



6. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench, remove the straight screw plug.
(b) Using a pin punch and hammer, drive out the slotted spring pin.
(c) Replace the reverse restrict pin.
(d) Using a pin punch and hammer, drive in the slotted spring pin.
Drive in depth: 13.5±0.5 mm (0.531±0.020 in.)
(e) Apply sealant to the plug threads.
Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
(f) Using a hexagon wrench, install and torque the straight screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX037–03

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page MX–16).

HINT:

Coat all of the sliding and rotating surfaces with gear oil before assembly.

NOTICE:

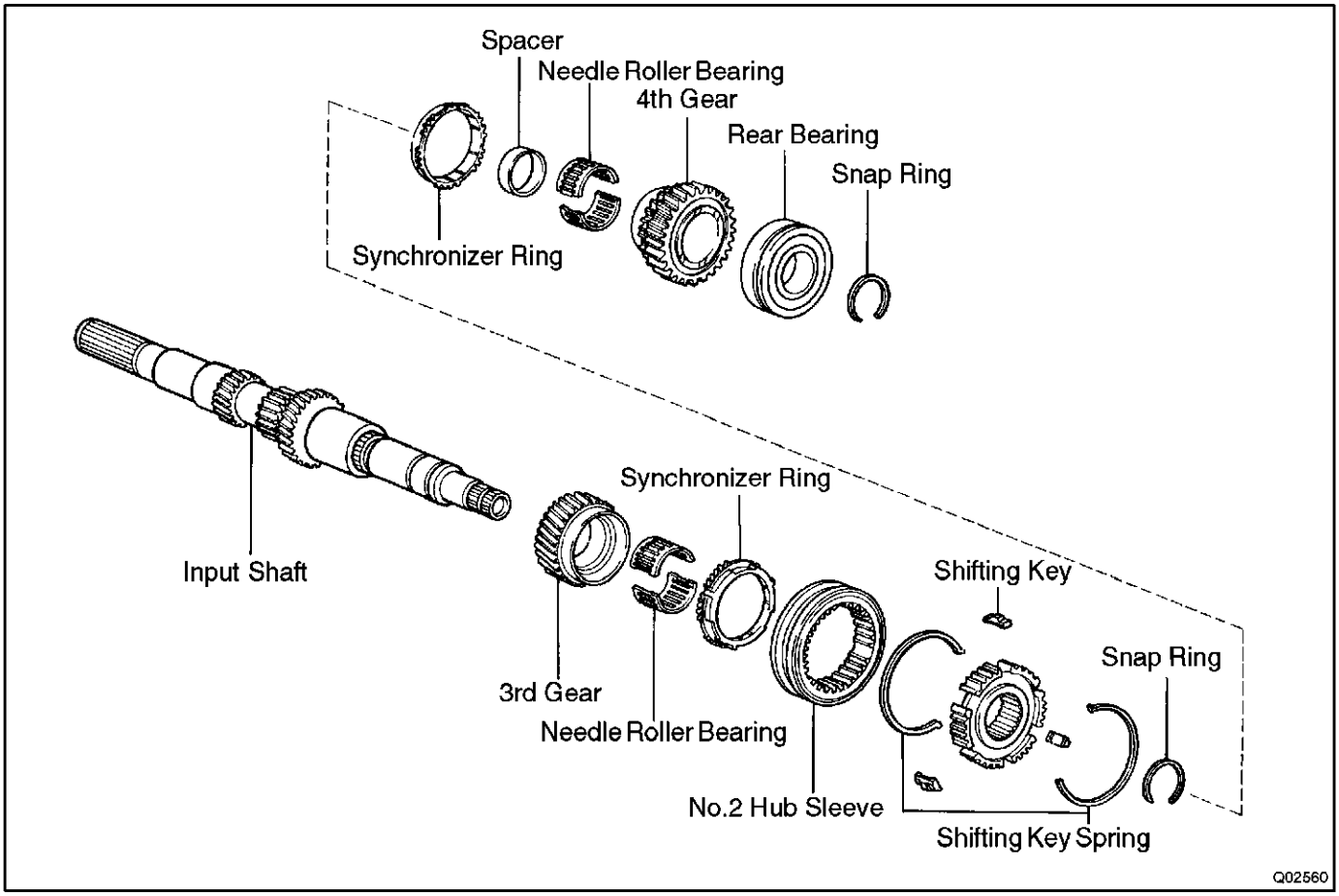
When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non–residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

INPUT SHAFT

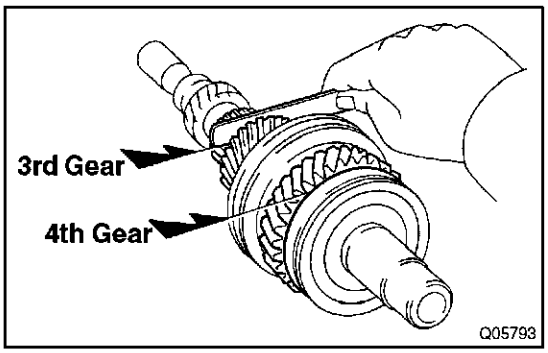
COMPONENTS

MX038–03



MX039–03

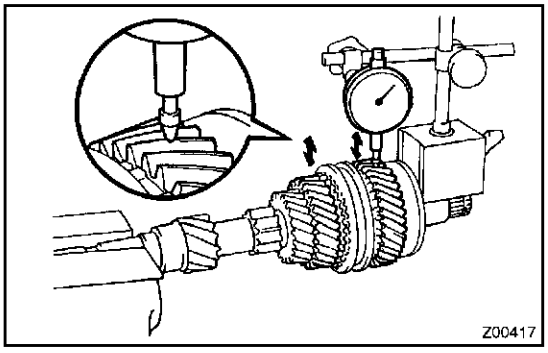
DISASSEMBLY



1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCES

Using a feeler gauge, measure each thrust clearance.

Standard clearance:
3rd gear: 0.10–0.25 mm (0.0039–0.0098 in.)
4th gear: 0.20–0.45 mm (0.0079–0.0177 in.)
Maximum clearance:
3rd gear: 0.30 mm (0.0118 in.)
4th gear: 0.50 mm (0.0197 in.)



2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCES

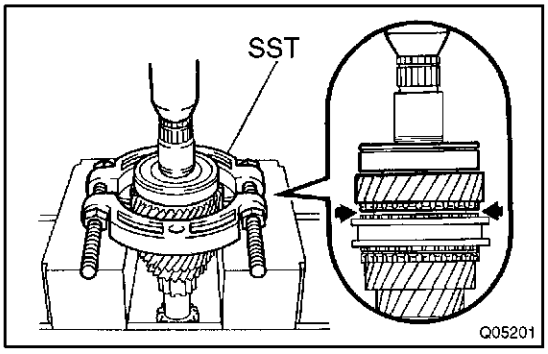
Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
0.009–0.053 mm (0.0004–0.0021 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.

3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.



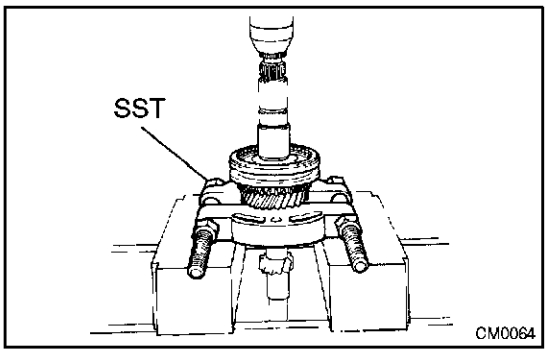
4. REMOVE REAR BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING FROM INPUT SHAFT

(a) Using SST and a press, remove the 4th gear and rear bearing.
SST 09950–00020

(b) Remove the needle roller bearings, spacer and synchronizer ring.

5. REMOVE SNAP RING

Using a snap ring expander, remove the snap ring.



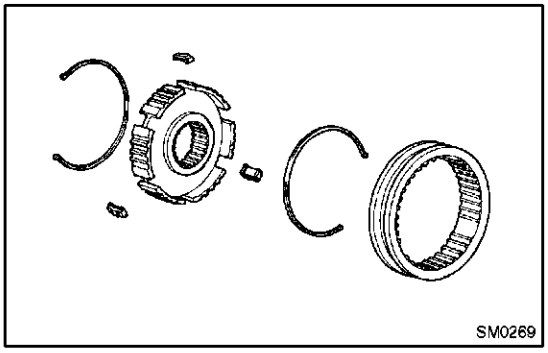
6. REMOVE NO.2 HUB SLEEVE ASSEMBLY, 3RD GEAR SYNCHRONIZER RING AND NEEDLE ROLLER BEARING

Using SST and a press, remove the No.2 hub sleeve, 3rd gear, synchronizer ring and needle roller bearings.

SST 09950–00020

NOTICE:

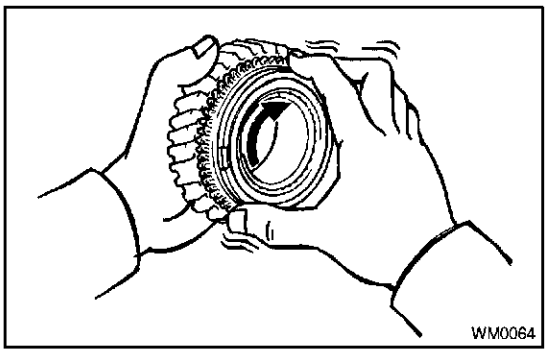
Be careful not to mistake the 3rd gear synchronizer ring for the 4th gear synchronizer ring.



7. REMOVE NO.2 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.2 CLUTCH HUB

Using a screwdriver, remove the 3 shifting keys and 2 springs from the No.2 clutch hub.

MX03A–03



INSPECTION

1. INSPECT SYNCHRONIZER RING

(a) Check wear or damage.

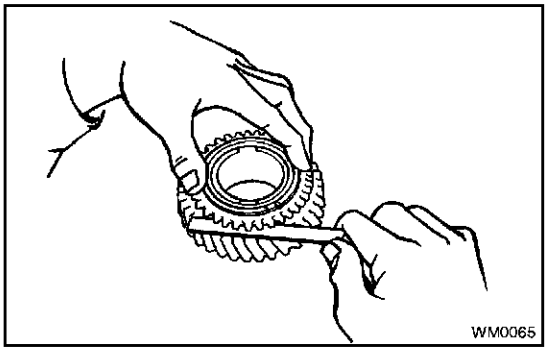
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



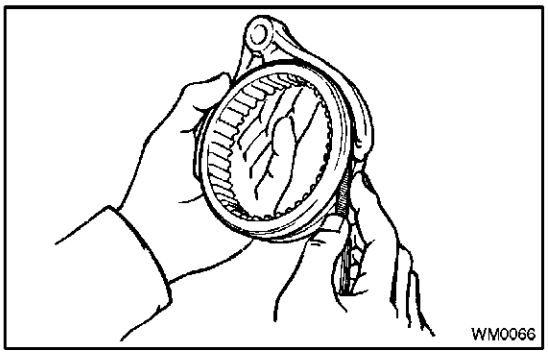
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

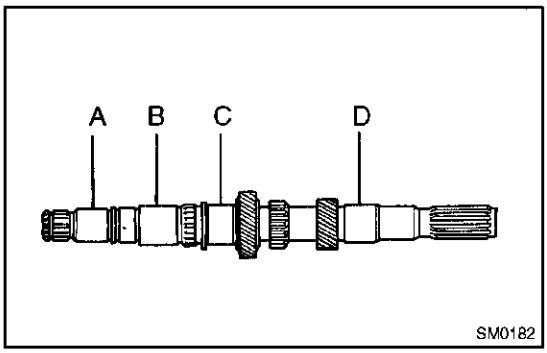


2. INSPECT NO.2 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



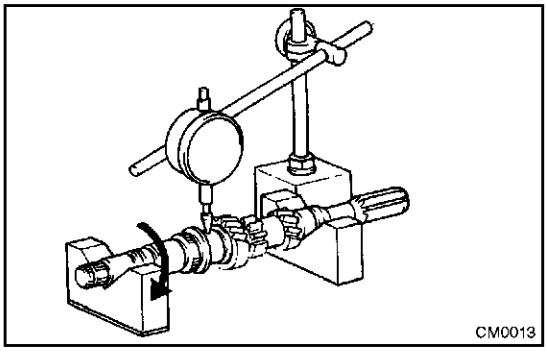
3. INSPECT INPUT SHAFT

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

Minimum outer diameter:
Part A: 26.970 mm (1.0618 in.)
Part B: 32.470 mm (1.2783 in.)
Part C: 33.090 mm (1.3028 in.)
Part D: 29.970 mm (1.1799 in.)

If the outer diameter is less than the minimum, replace the input shaft.



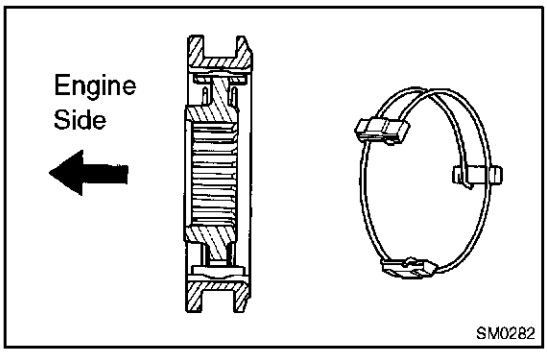
(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.05 mm (0.0020 in.)

If the runout exceeds the maximum, replace the input shaft.

MX03B–03

REASSEMBLY



HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

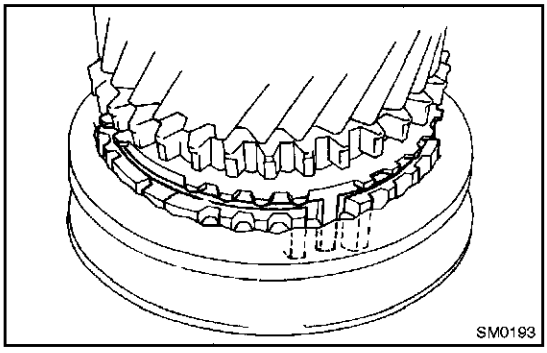
1. INSTALL NO.2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.

NOTICE:

Install the key springs positioned so that their end gaps are not in line.



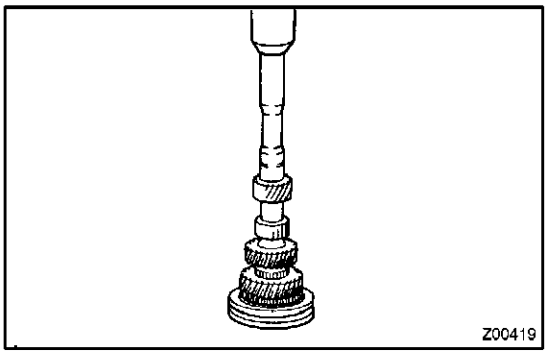
2. INSTALL 3RD GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply gear oil to the needle roller bearings.

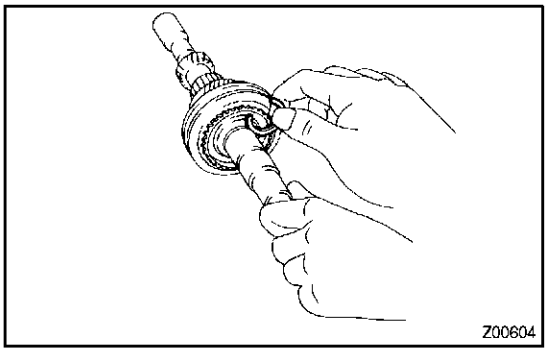
(b) Place the synchronizer ring (for the 3rd gear) on the gear and align the ring slots with the shifting keys.

NOTICE:

Do not install the synchronizer ring for 4th gear.



(c) Using a press, install the 3rd gear and No.2 hub sleeve.



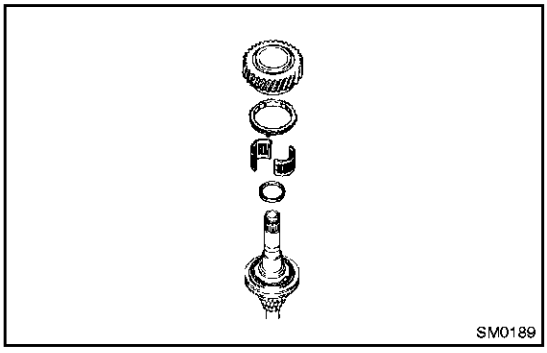
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
1	1.95–2.00 (0.0768–0.0787)
2	2.00–2.05 (0.0787–0.0807)
3	2.05–2.10 (0.0807–0.0827)
4	2.10–2.15 (0.0827–0.0846)
5	2.15–2.20 (0.0846–0.0866)
6	2.20–2.25 (0.0866–0.0886)

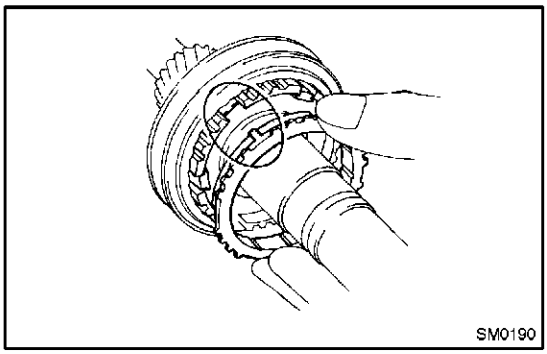
(b) Using a snap ring expander, install the snap ring.

4. INSPECT 3RD GEAR THRUST CLEARANCE
(See page MX–26)

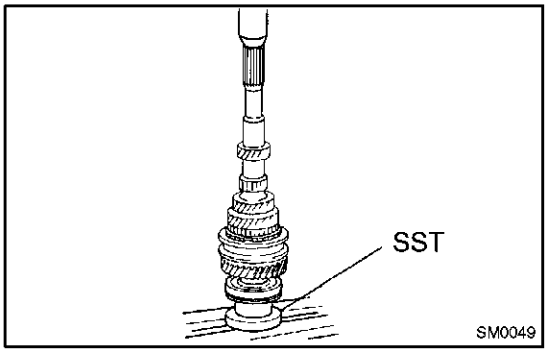


5. INSTALL SYNCHRONIZER RING, NEEDLE ROLLER BEARING, SPACER, 4TH GEAR AND REAR BALL BEARING

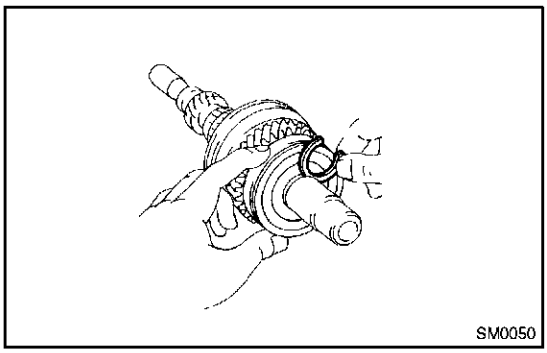
(a) Apply gear oil to the needle roller bearings.
(b) Install the spacer and needle roller bearings.
(c) Place the synchronizer ring on the gear.



HINT:
Align the ring slots with the shifting keys and the ring projections with the hub slots.



(d) Using SST and a press, install the rear ball bearing.
SST 09608–00071


SM0050

6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
A	2.15–2.20(0.0846–0.0866)
B	2.20–2.25(0.0866–0.0886)
C	2.25–2.30(0.0886–0.0906)
D	2.30–2.35(0.0906–0.0925)
E	2.35–2.40(0.0925–0.0945)

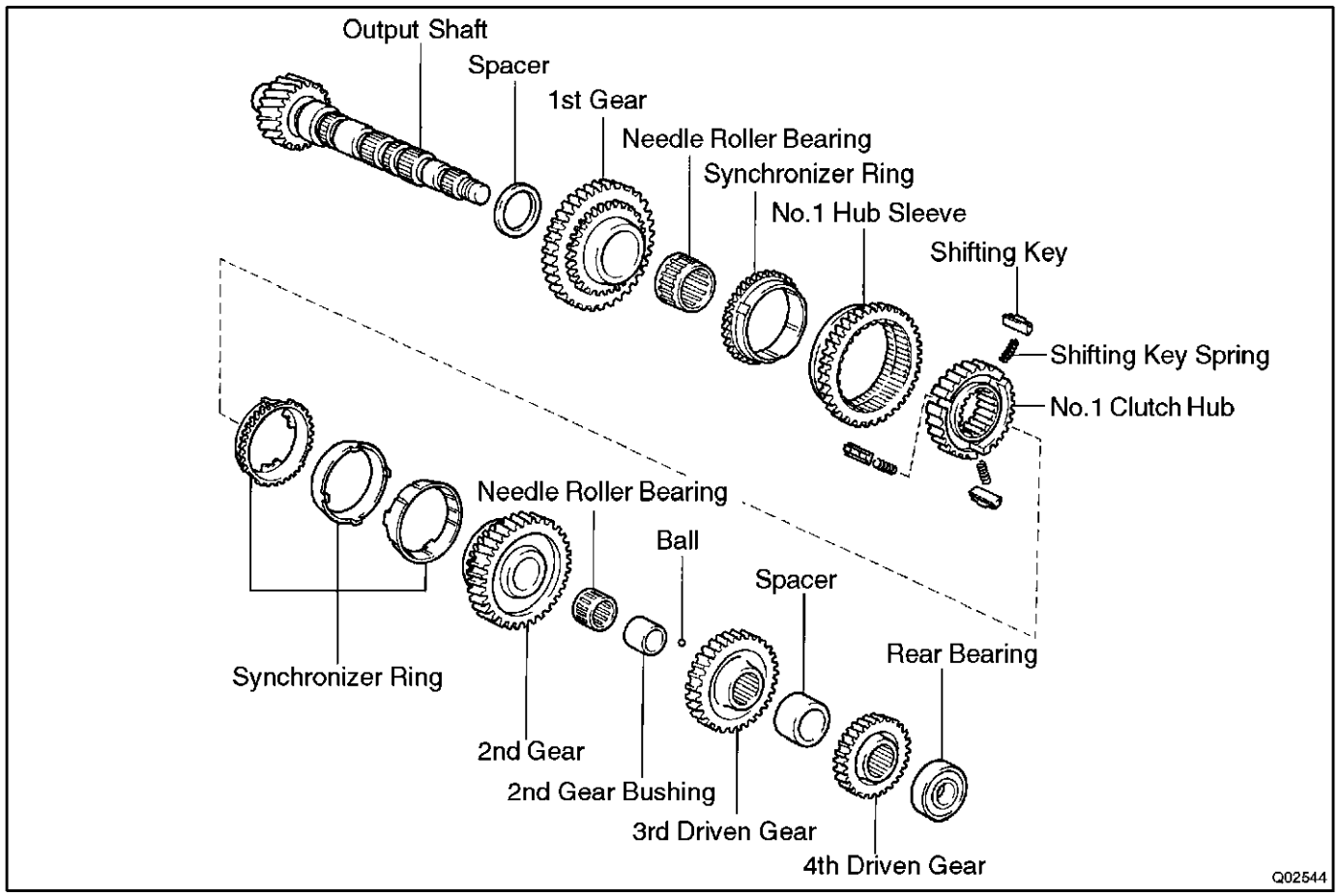
(b) Using a screwdriver and hammer, tap in the snap ring.

7. INSPECT 4TH GEAR THRUST CLEARANCE
(See page MX–26)

OUTPUT SHAFT

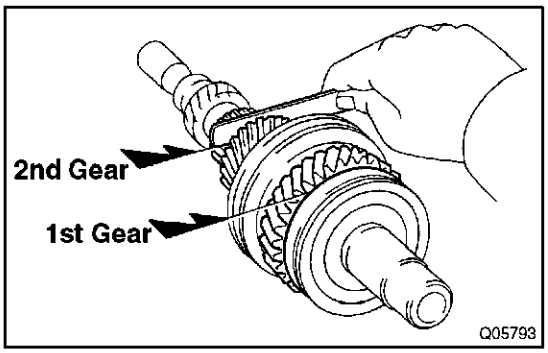
COMPONENTS

MX03C–03



MX03D–02

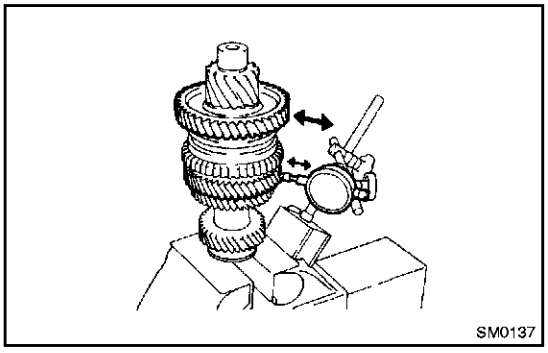
DISASSEMBLY



1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCES

Using a feeler gauge, measure each thrust clearance.

Standard clearance:
1st gear: 0.10–0.29 mm (0.0039–0.0114 in.)
2nd gear: 0.20–0.44 mm (0.0079–0.0173 in.)
Maximum clearance:
1st gear: 0.35 mm (0.0138 in.)
2nd gear: 0.50 mm (0.0197 in.)

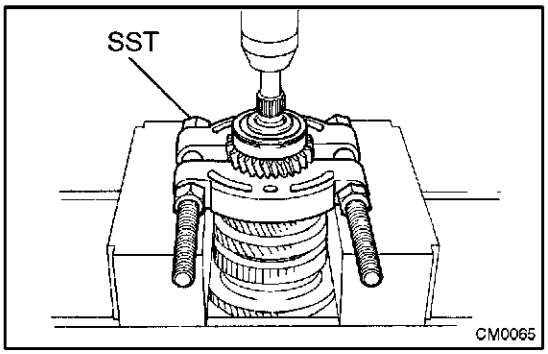


2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCES

Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
0.009–0.053 mm (0.0004–0.0021 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

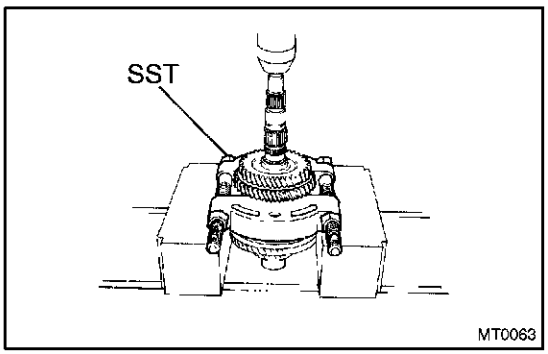
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE REAR BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER

(a) Using SST and a press, remove the rear ball bearing and 4th driven gear.
SST 09950–00020

(b) Remove the output gear spacer and ball.

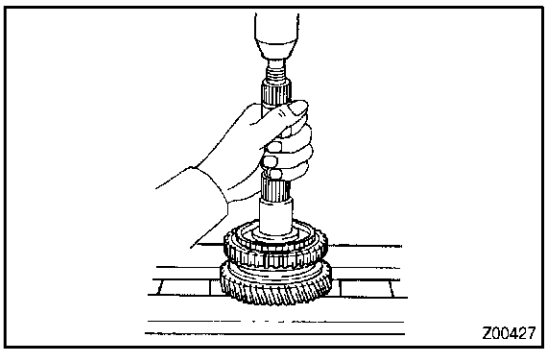


4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING AND SYNCHRONIZER RING

(a) Shift the No.1 hub sleeve into the 1st gear.

(b) Using SST and a press, remove the 3rd driven gear and 2nd gear.
SST 09950–00020

(c) Remove the needle roller bearing and synchronizer rings.

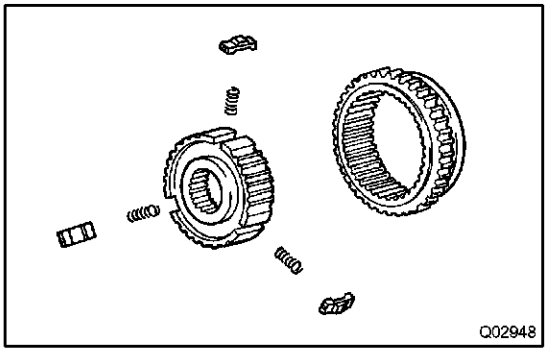


5. REMOVE NO.1 HUB SLEEVE ASSEMBLY, 1ST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, THRUST WASHER AND LOCKING BALL

(a) Using a press, remove the No.1 hub sleeve, 1st gear and synchronizer ring.

(b) Remove the needle roller bearing and locking ball.

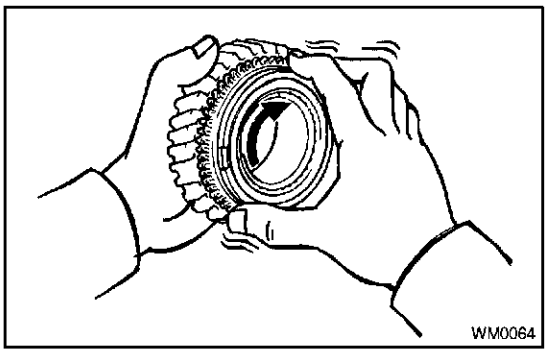
(c) Using a screwdriver and hammer, drive out the thrust washer.



6. REMOVE NO.1 HUB SLEEVE, 3 SHIFTING KEYS AND SPRINGS FROM NO.1 CLUTCH HUB

MX03E–03

INSPECTION



1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check wear or damage.

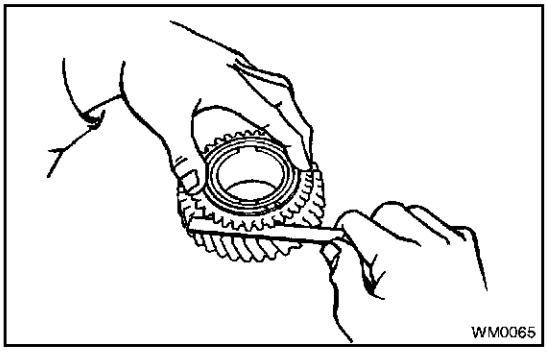
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



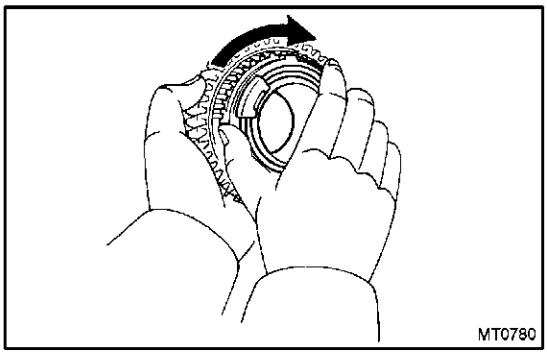
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and the gear spline end.

Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

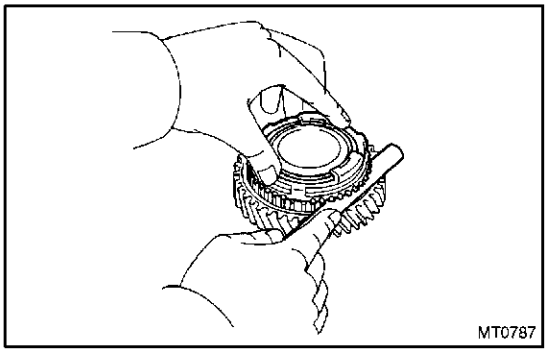


2. INSPECT 2ND GEAR SYNCHRONIZER RING

(a) Check wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

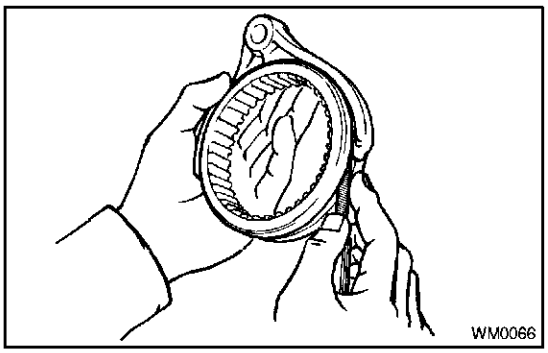
If the braking effect is insufficient, replace the synchronizer ring.



(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring.

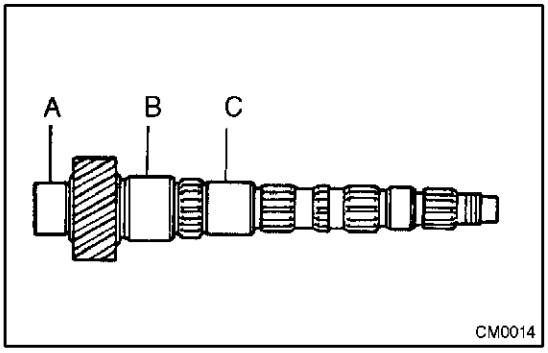


3. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

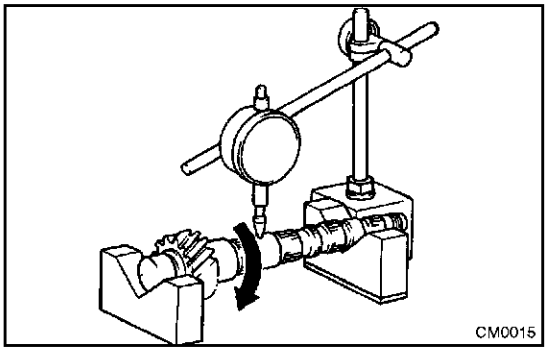


4. INSPECT OUTPUT SHAFT

(a) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:
Part A: 31.970 mm (1.2587 in.)
Part B: 37.970 mm (1.4949 in.)
Part C: 31.990 mm (1.2594 in.)

If the outer diameter is less than the minimum, replace the output shaft.



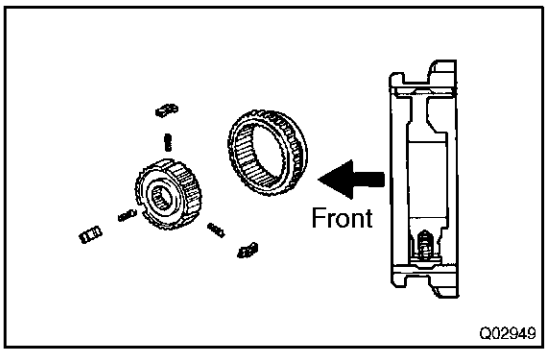
(b) Using a dial indicator, check the shaft runout.

Maximum runout: 0.05 mm (0.0020 in.)

If the runout exceeds the maximum, replace the output shaft.

MX03F–03

REASSEMBLY



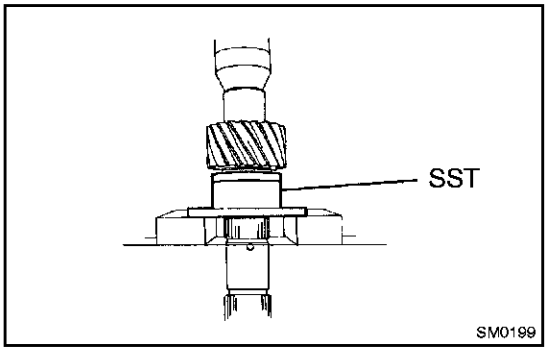
HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the 3 springs and shifting keys to the clutch hub.

(b) Install the hub sleeve to the clutch hub.

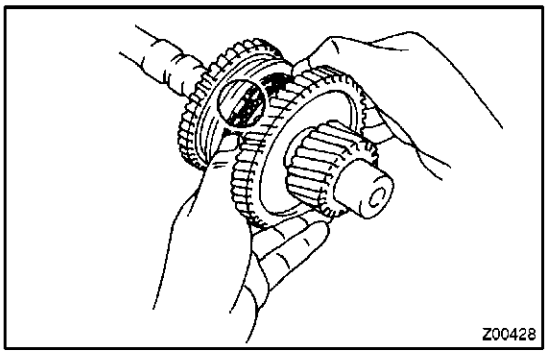
HINT:
Position the identification groove of the hub sleeve to the front of the transmission.



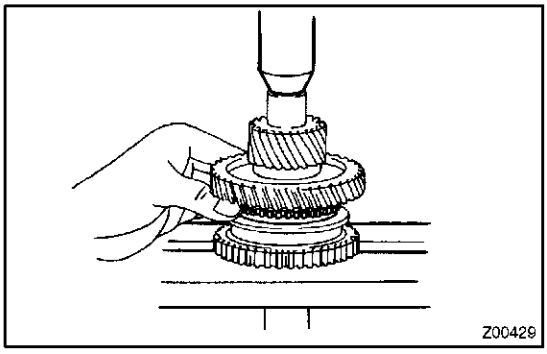
2. INSTALL THRUST WASHER, 1ST GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

(a) Using SST and a press, install the thrust washer.
SST 09316–60011 (09316–00041)

(b) Apply gear oil to the needle roller bearing.

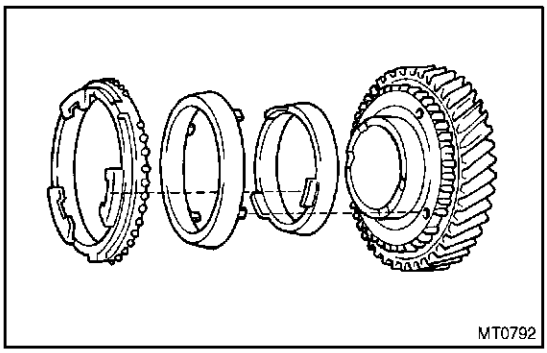


(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



(d) Using a press, install the 1st gear and No.1 hub sleeve.

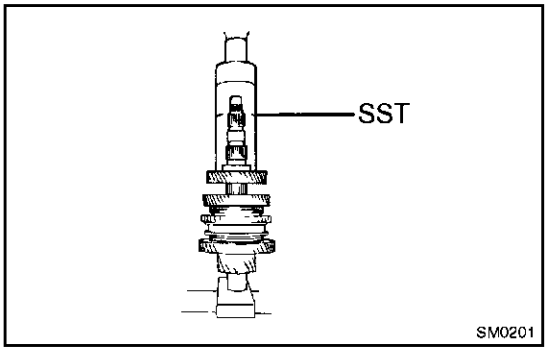
3. INSPECT 1ST GEAR THRUST CLEARANCE
(See page MX–34)



4. INSTALL SYNCHRONIZER RING, 2ND GEAR, NEEDLE ROLLER BEARING AND 3RD DRIVEN GEAR

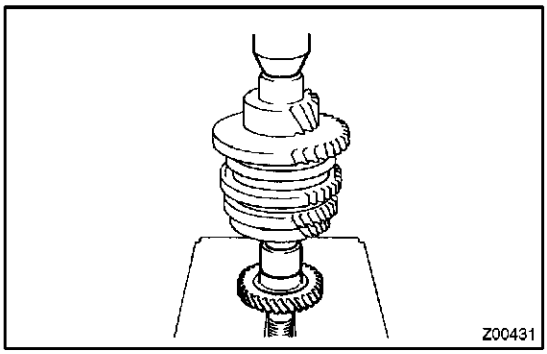
(a) Install the ball.
(b) Fit the 2nd gear bushing groove securely over the ball when installing the 2nd gear bushing on the shaft.
(c) Place the synchronizer rings on the 2nd gear.
(d) Apply gear oil to the needle roller bearing and install it.
(e) Install the 2nd gear.

NOTICE:
Align the clutch hub grooves with the projections on the synchronizer ring.



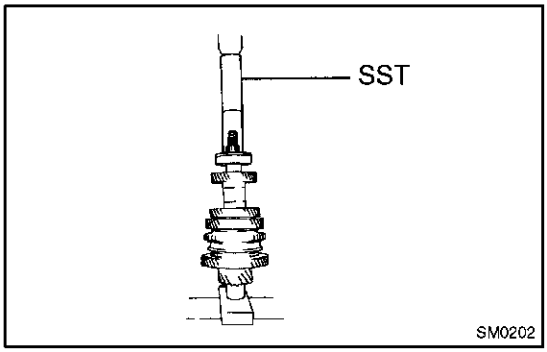
(f) Using SST and a press, install the 3rd driven gear.
SST 09316–60011 (09316–00011)

5. INSPECT 2ND GEAR THRUST CLEARANCE
(See page MX–34)



6. INSTALL OUTPUT GEAR SPACER, 4TH DRIVEN GEAR AND RADIAL BALL BEARING

(a) Install the outer gear spacer.
(b) Using a press, install the 4th driven gear and bearing.



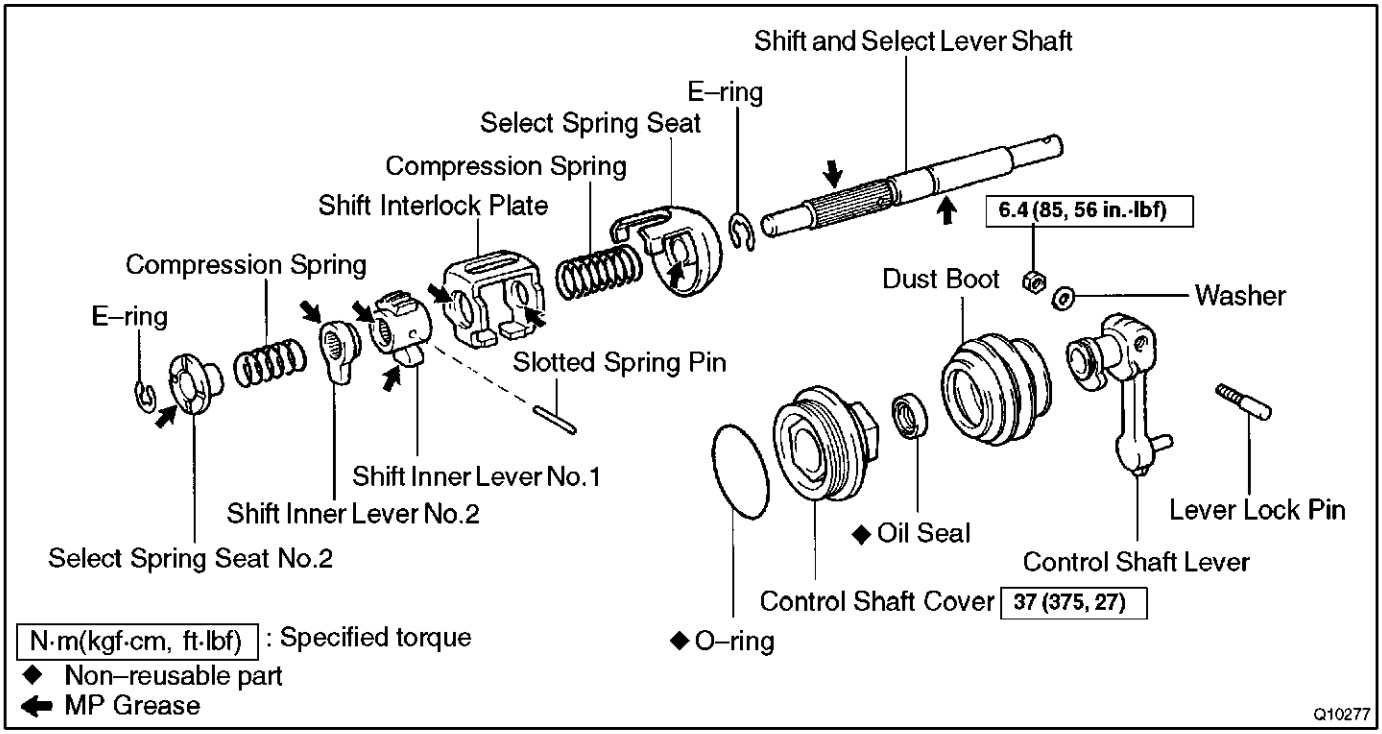
7. INSTALL REAR BEARING

Using SST and a press, install the rear bearing.
SST 09612–22011

SHIFT AND SELECT LEVER SHAFT

MX03G–03

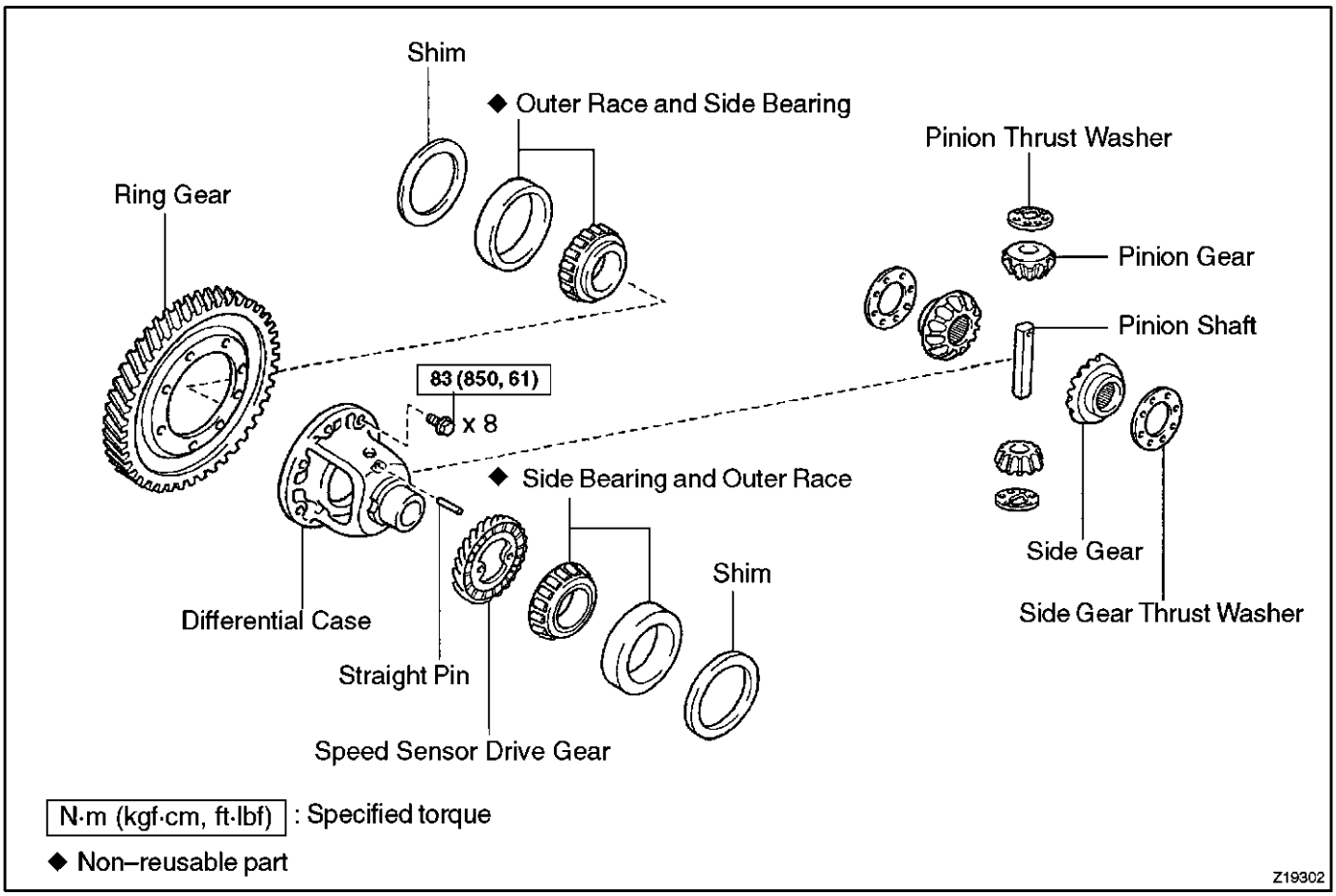
COMPONENTS



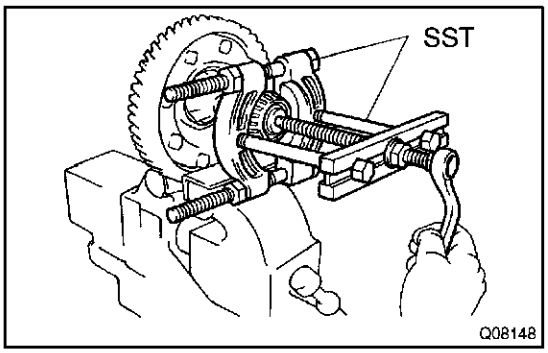
DIFFERENTIAL CASE

MX03H–03

COMPONENTS



MX03I–03



DISASSEMBLY

1. Speed Sensor Drive Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

(a) Using SST, remove the bearing from the drive gear side of the case.
SST 09950–00020, 09950–00030

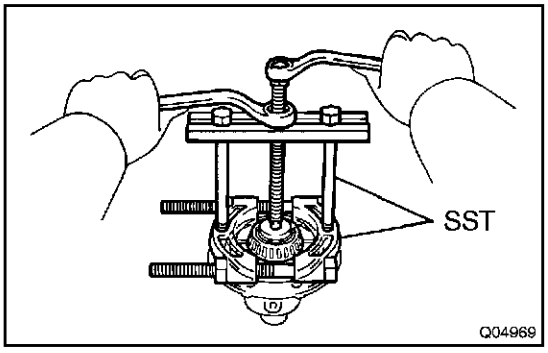
(b) Remove the speed sensor drive gear.

2. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and case.

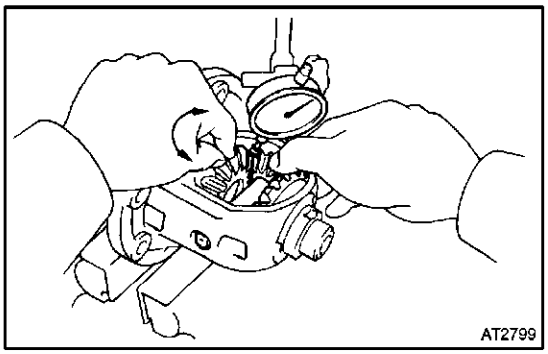
(b) Remove the 8 bolts.

(c) Using a copper hammer, tap on the ring gear to remove it from the case.



3. Ring Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

Using SST, remove the bearing from the ring gear side of the case.
SST 09950–00020, 09950–00030



4. INSPECT SIDE GEAR BACKLASH

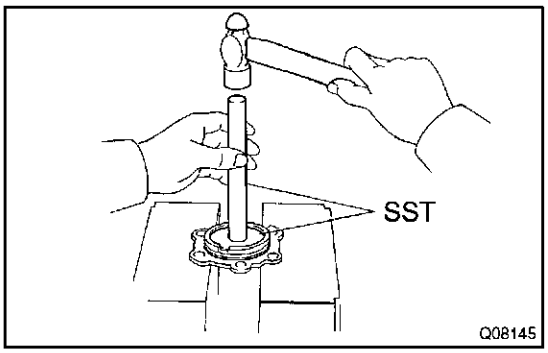
Using a dial indicator, measure the backlash of one side gear while holding one pinion toward the case.
Standard backlash: 0.05–0.20 mm (0.0020–0.0079 in.)
If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

(a) Using a pin punch and hammer, drive out the straight pin.

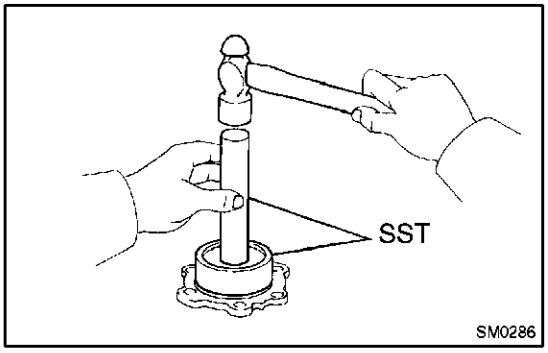
(b) Remove the pinion shaft from the case.

(c) Remove the 2 pinions and side gears with the 4 thrust washers from each gear.



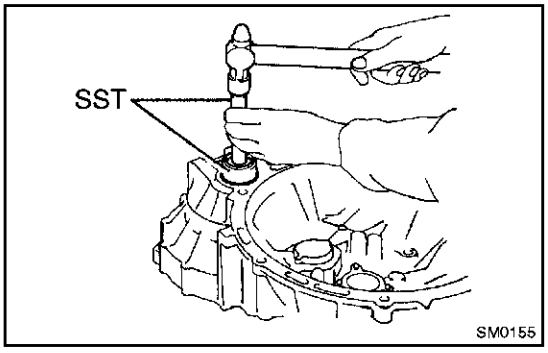
6. Transmission Case Side:
IF NECESSARY, REPLACE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL

(a) Using SST and a hammer, drive out the oil seal from the retainer.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)



(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)

(c) Coat the lip of oil seal with MP grease.

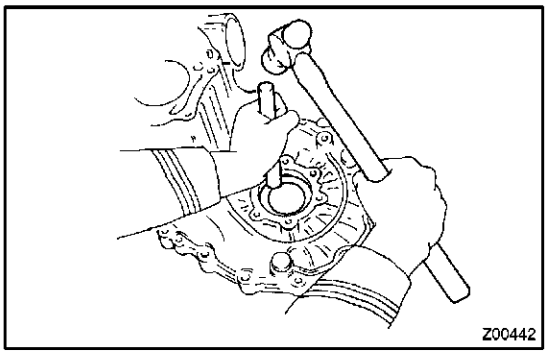


7. Transaxle Case Side:
IF NECESSARY, REPLACE SIDE OIL SEAL

(a) Using a screwdriver and hammer, drive out the oil seal.

(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)

(c) Coat the lip of oil seal with MP grease.



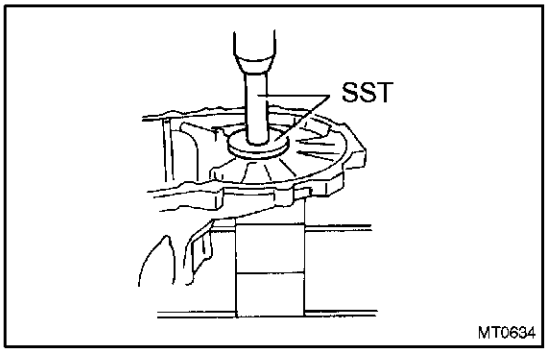
8. Transmission Case Side:
IF NECESSARY, REPLACE SIDE BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race.

(b) Install the bearing retainer without an O–ring.

(c) Install and torque the 6 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

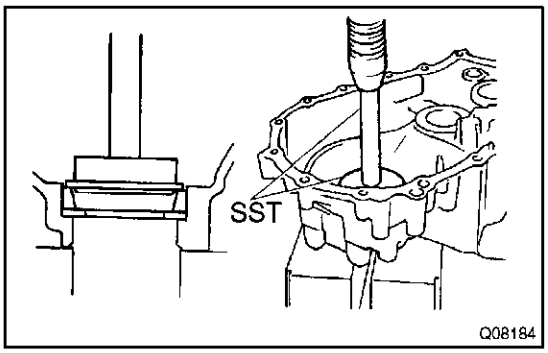
(d) Place the thinnest shim into the case.



(e) Using SST and a press, install a new bearing outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

(f) Remove the 6 bolts.

(g) Remove the bearing retainer and shim.



9. Transaxle Case Side:
IF NECESSARY, REPLACE SIDE BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race and shim.

(b) Place the shim into the case.

(c) Using SST and a press, install a new bearing outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

MX03J–03

REASSEMBLY

1. ASSEMBLE DIFFERENTIAL CASE

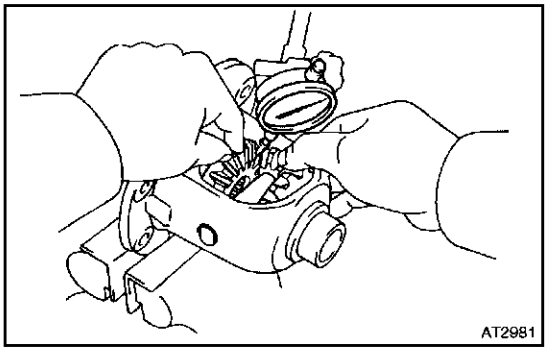
(a) Install the correct thrust washers and side gears. Refer to the table below, select thrust washers which will allow that the backlash is within the specification. Try to select washers of the same size for both sides.

Standard backlash: 0.05–0.20 mm (0.0020–0.0079 in.)

Thickness mm (in.)	Thickness mm (in.)
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

Install the thrust washers and side gears in the differential case.

(b) Install the pinion shaft.


AT2981

(c) Inspect the side gear backlash.

Using a dial indicator, measure the side gear backlash while holding one pinion gear toward the case.

Standard backlash: 0.05–0.20 mm (0.0020–0.0079 in.)

If the backlash is not within the specification, install a thrust washer of different thickness.

(d) Using a pin punch and hammer, drive in the straight pin through the case and hole in the pinion shaft.

(e) Stake the differential case.

2. INSTALL RING GEAR ON DIFFERENTIAL CASE

(a) Clean the contact surface of the differential case and the threads of the ring gear and differential case.

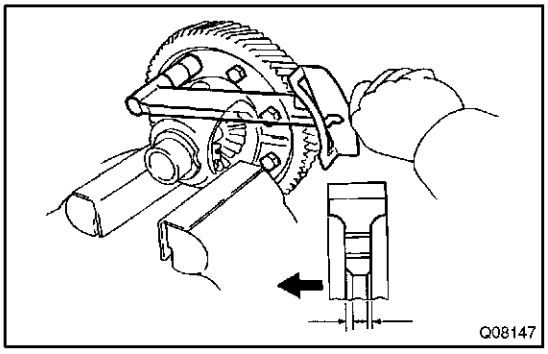
(b) Heat the ring gear in boiling water.

(c) Carefully remove the ring gear from the water.

(d) After moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

HINT:

Align the matchmark on the differential case with the one on the ring gear.


Q08147

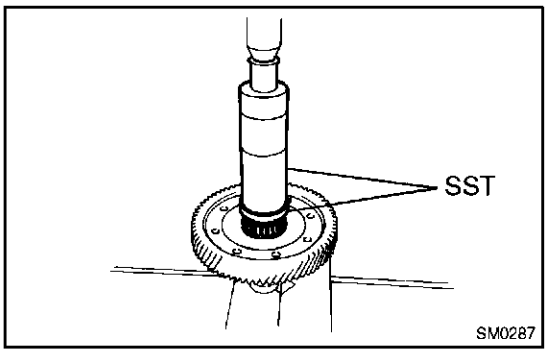
(e) Temporarily install the 8 bolts.

NOTICE:

The ring gear set bolts should not be torqued until the ring gear has cooled sufficiently.

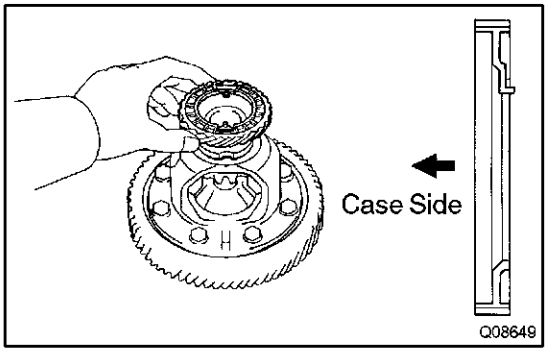
(f) After the ring gear has cooled sufficiently, torque the ring gear set bolts.

Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)

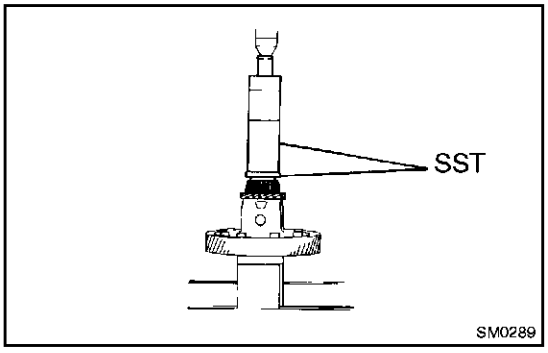


3. INSTALL SIDE BEARING TO DIFFERENTIAL CASE

(a) Using SST and a press, install a new side bearing to the transmission case side.
SST 09316–60011 (09316–00011), 09350–32014 (09351–32120)



(b) Install the speed sensor drive gear to the transaxle case side.

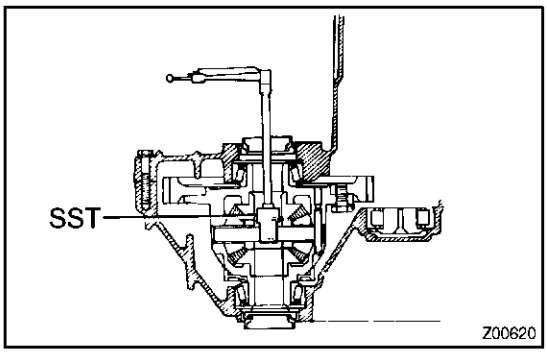


(c) Using SST and a press, install a new side bearing to the transaxle case side.
SST 09316–60011 (09316–00011), 09350–32014 (09351–32120)

NOTICE:
Install the black cage bearing on the speed sensor drive gear side.

4. ADJUST DIFFERENTIAL CASE SIDE BEARING PRE-LOAD

(a) Install the differential to the transaxle case.
(b) Install the transmission case.
(c) Install and torque the case bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
(d) Install the shim into the transmission case.
(e) Install the bearing retainer without an O–ring.
(f) Install and torque the 6 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



(g) Using SST and a torque wrench, measure the preload.
SST 09564–32011
Preload (at starting):
0.8–1.6 N·m (8–16 kgf·cm, 6.9–13.9 in.·lbf)

If the preload is not within the specification, remove the transmission case side bearing retainer. Select another shim.

HINT:

The preload will change by approx. 0.3–0.4 N·m (3–4 kgf·cm, 2.6–3.5 in.·lbf) corresponding to a change of 0.05 mm in shim thickness.

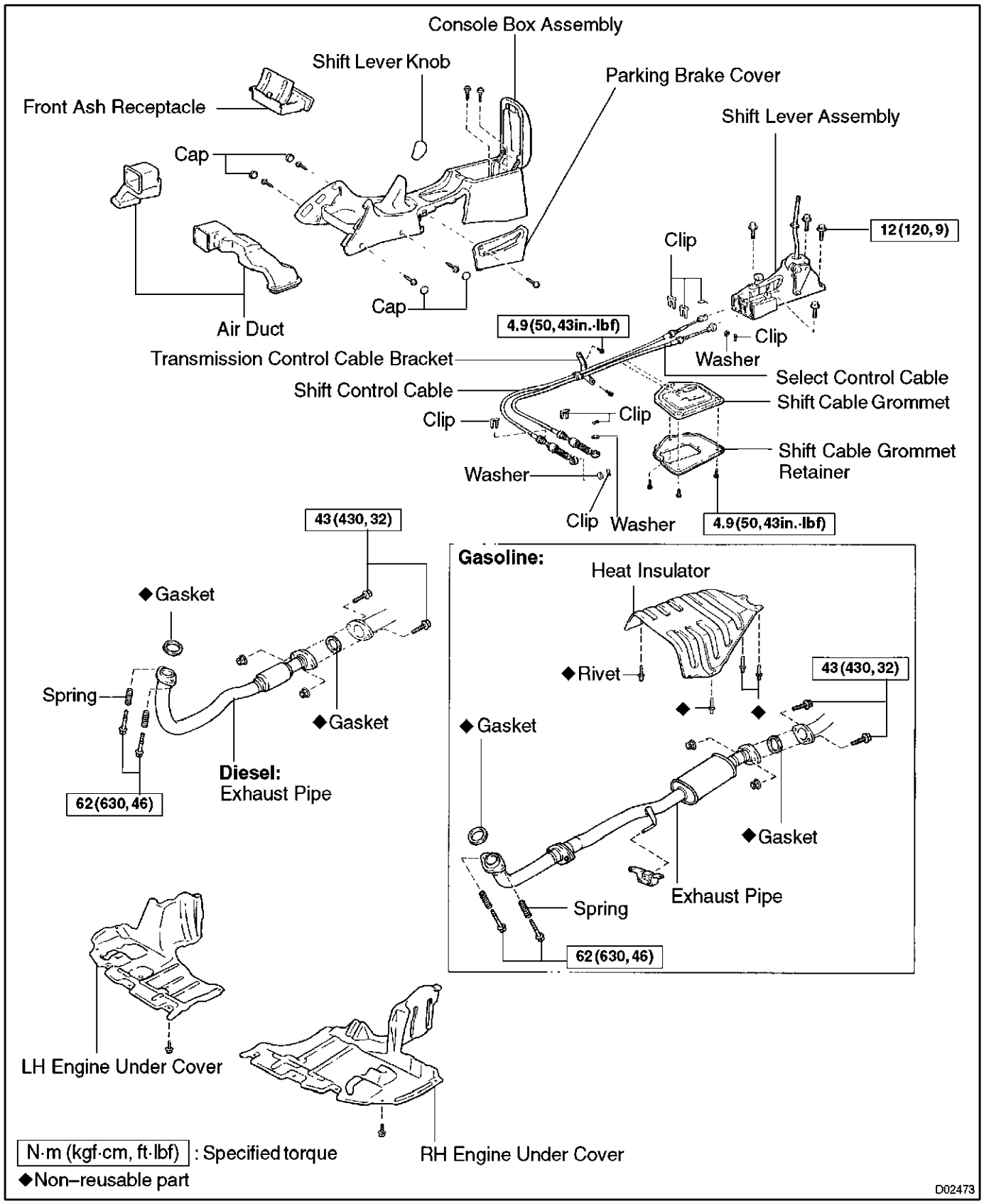
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	1.90 (0.0748)	11	2.40 (0.0945)
2	1.95 (0.0768)	12	2.45 (0.0965)
3	2.00 (0.0787)	13	2.50 (0.0984)
4	2.05 (0.0807)	14	2.55 (0.1004)
5	2.10 (0.0827)	15	2.60 (0.1024)
6	2.15 (0.0846)	16	2.65 (0.1043)
7	2.20 (0.0866)	17	2.70 (0.1063)
8	2.25 (0.0886)	18	2.75 (0.1083)
9	2.30 (0.0906)	19	2.80 (0.1102)
10	2.35 (0.0925)	–	–

(h) Remove the 6 bolts.
(i) Remove the bearing retainer and shim.
(j) Remove the 17 bolts.
(k) Remove the transmission case.

SHIFT LEVER AND CONTROL CABLE

MX09K–02

COMPONENTS



AUTOMATIC TRANSAXLE (A241E)

AUTOMATIC TRANSAXLE SYSTEM AX–1
VEHICLE SPEED SENSOR AX–3
NEUTRAL START SWITCH AX–4
KICK–DOWN SWITCH AX–5
VALVE BODY ASSEMBLY AX–6
THROTTLE CABLE AX–11
DIFFERENTIAL OIL SEAL AX–12
FLOOR SHIFT ASSEMBLY (LHD) AX–13
FLOOR SHIFT ASSEMBLY (RHD) AX–22
AUTOMATIC TRANSAXLE UNIT AX–30
TORQUE CONVERTER
AND DRIVE PLATE AX–36

AUTOMATIC TRANSAXLE SYSTEM

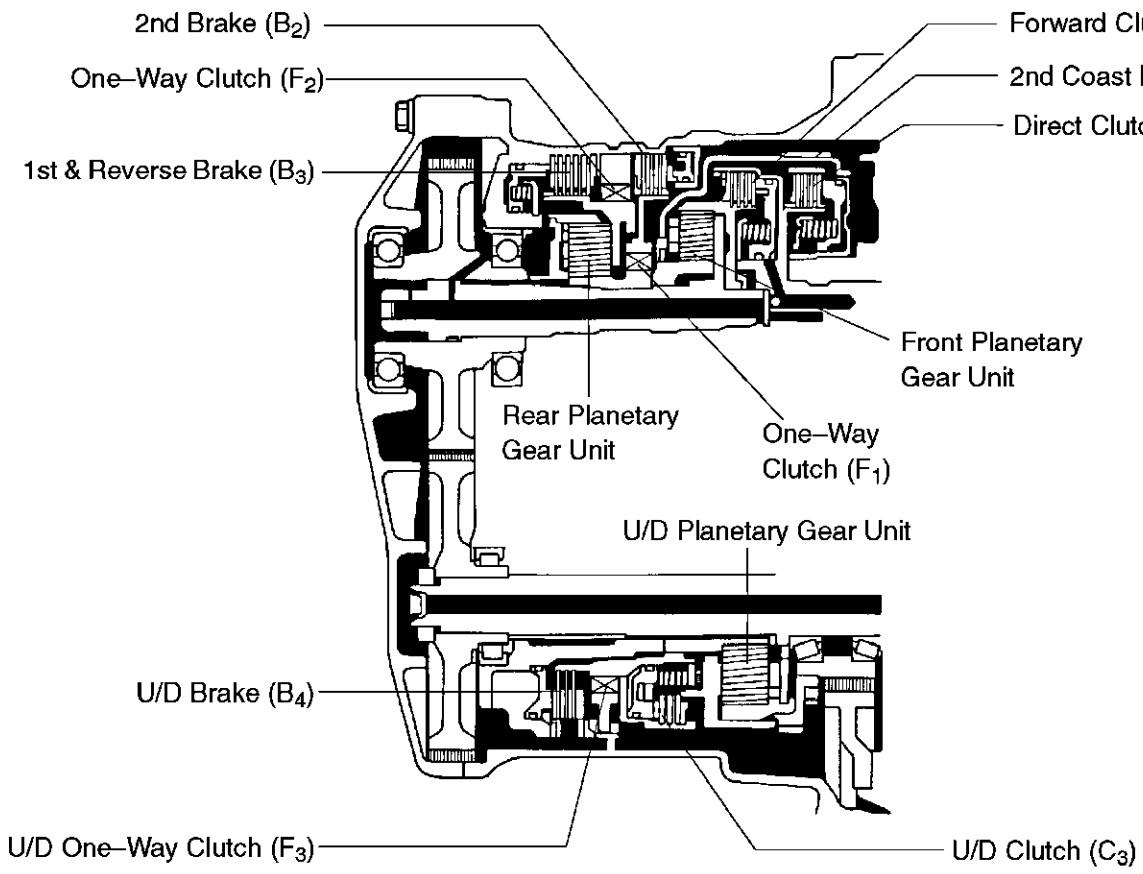
AX02L–03

PRECAUTION

If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

AX05X–01

OPERATION

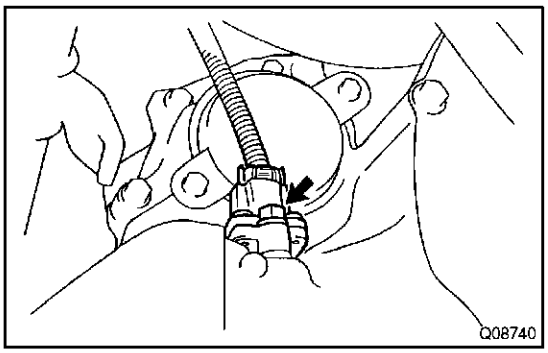


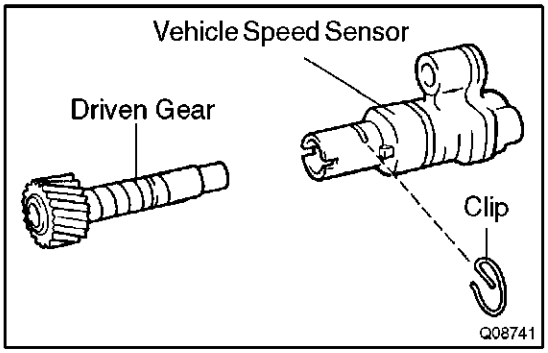
Shift Lever Range	Gear	No.1 Solenoid Valve	No.2 Solenoid Valve	C_1	C_2	C_3	B_1	B_2	B_3	B_4	F_1	F_2	F_3
P	Park	ON	OFF							●			
R	Reverse	ON	OFF		●				●	●			
N	Neutral	ON	OFF							●			
D	1st	ON	OFF	●						●		●	●
	2nd	ON	ON	●				●		●	●		●
	3nd	OFF	ON	●	●			●		●			●
	O/D	OFF	OFF	●	●	●		●					
2	1st	ON	OFF	●						●		●	●
	2nd	ON	ON	●			●	●		●	●		●
	3nd*	OFF	ON	●	●			●		●			●
L	1st	ON	OFF	●					●	●		●	●
	2nd*	ON	ON	●			●	●		●	●		●

● : Operating

* : Down–Shift only in the 3rd gear for the 2 range and 2nd gear for the L–range – no up–shift

D02530





VEHICLE SPEED SENSOR

AX05Y–01

ON–VEHICLE REPAIR

1. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR

2. REMOVE VEHICLE SPEED SENSOR ASSEMBLY

(a) Remove the bolt and the vehicle speed sensor assembly.

(b) Remove the clip and the speedometer driven gear from the vehicle speed sensor.

(c) Remove the O–ring from the vehicle speed sensor.

3. INSTALL VEHICLE SPEED SENSOR ASSEMBLY

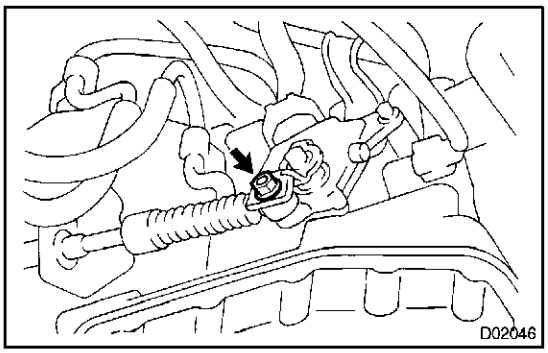
(a) Coat a new O–ring with ATF and install it to the vehicle speed sensor.

(b) Install the speedometer driven gear and clip to the vehicle speed sensor.

(c) Install the vehicle speed sensor assembly and tighten the bolts.

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

4. CONNECT VEHICLE SPEED SENSOR CONNECTOR

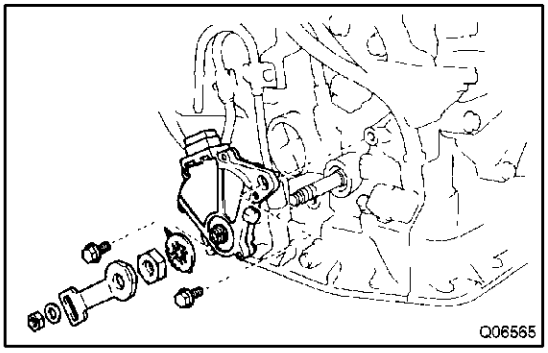


NEUTRAL START SWITCH

AX05Z–01

ON–VEHICLE REPAIR

1. **REMOVE LH ENGINE UNDER COVER**
2. **DISCONNECT SHIFT CONTROL CABLE FROM CONTROL SHAFT LEVER**
3. **DISCONNECT NEUTRAL START SWITCH CONNECTOR**

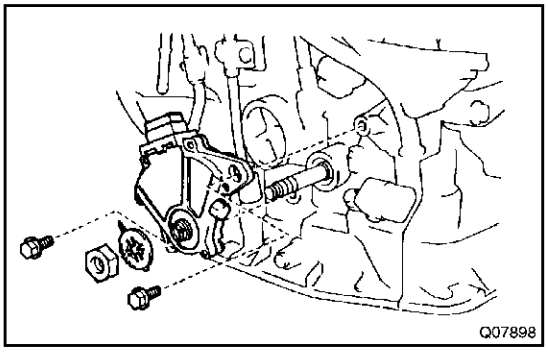


4. **REMOVE NEUTRAL START SWITCH**

(a) Remove the nut and control shaft lever.

(b) Pry out the lock washer and remove the control valve shaft nut.

(c) Remove the 2 bolts and pull out the neutral start switch.



5. **INSTALL NEUTRAL START SWITCH**

(a) Install the neutral start switch with the 2 bolts to the control valve shaft.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Install a new lock plate and tighten the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

(c) Stake the nut with lock plate.

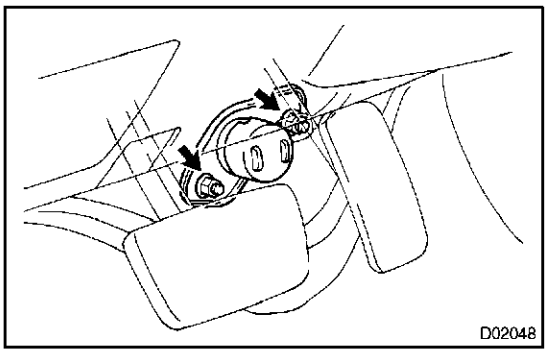
(d) Install the control shaft lever and nut.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

6. **CONNECT NEUTRAL START SWITCH CONNECTOR**
7. **CONNECT SHIFT CONTROL CABLE TO CONTROL SHAFT LEVER**
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)
8. **CHECK NEUTRAL START SWITCH OPERATION**

Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If not as stated above, carry out the adjustment procedure (See page DI–4).

9. **INSTALL LH ENGINE UNDER COVER**
10. **TEST DRIVE VEHICLE**



KICK–DOWN SWITCH

AX060–01

REPLACEMENT

1. TURN OVER FLOOR CARPET

2. REMOVE KICK–DOWN SWITCH

(a) Disconnect the kick–down switch connector.

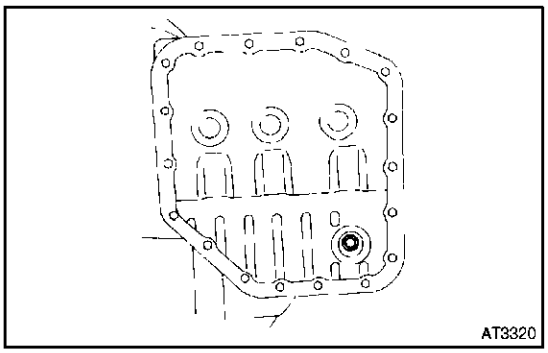
(b) Remove the 2 nuts and kick–down switch.

3. INSTALL KICK–DOWN SWITCH

(a) Install the kick–down switch with the 2 nuts.

(b) Connect the kick–down switch connector.

4. PLACE FLOOR CARPET


AT3320

VALVE BODY ASSEMBLY

AX061–01

ON–VEHICLE REPAIR

1. REMOVE DRAIN PLUG AND DRAIN ATF

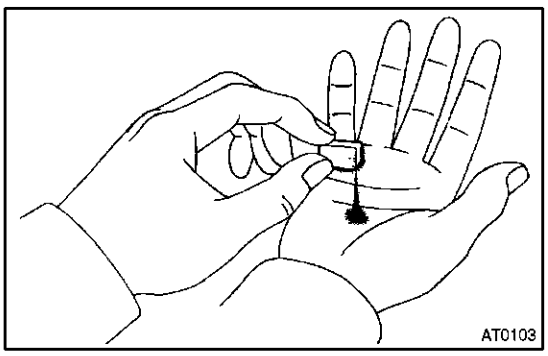
2. REMOVE OIL PAN AND GASKET

Remove the 18 bolts and oil pan.

NOTICE:

Some fluid will remain in the oil pan.

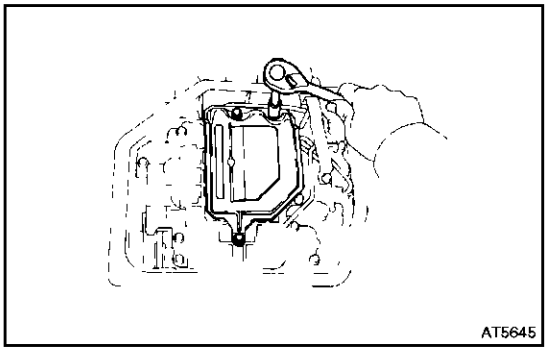
3. REMOVE 2 MAGNETS FROM OIL PAN


AT0103

4. EXAMINE PARTICLES IN PAN

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): bushing wear

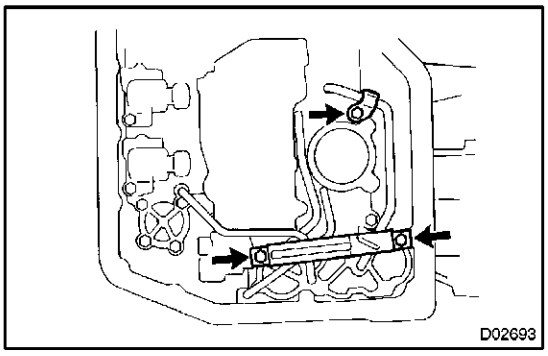

AT5645

5. REMOVE OIL STRAINER

Remove the 3 bolts, oil strainer and gasket.

NOTICE:

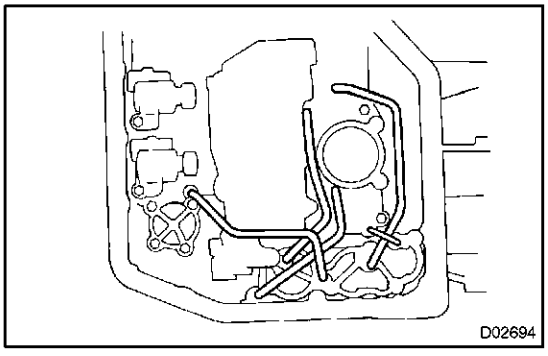
Be careful as some fluid will come out with the oil strainer.


D02693

6. REMOVE OIL PIPE BRACKET AND OIL PIPE CLAMP

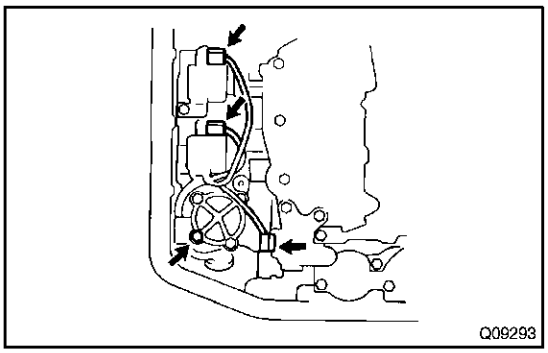
(a) Remove the 2 bolts and oil pipe bracket.

(b) Remove the bolt and oil pipe clamp.


D02694

7. REMOVE OIL PIPE

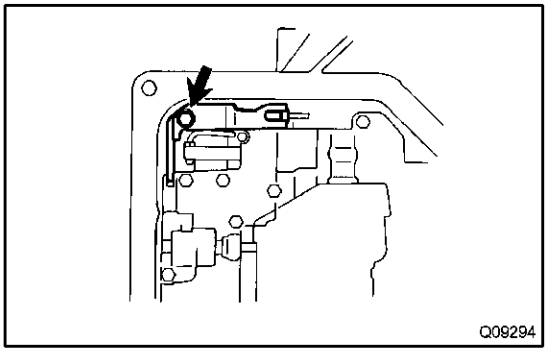
Pry up the both pipe ends with a large screwdriver and remove the 5 pipes.



8. DISCONNECT 3 SOLENOID CONNECTORS

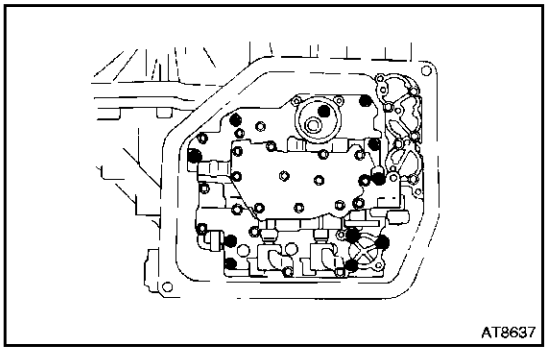
9. REMOVE WIRE CLAMP

Remove the bolt and clamp.



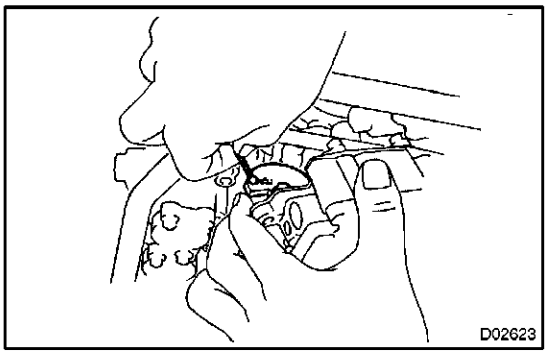
10. REMOVE MANUAL DETENT SPRING

Remove the bolt and manual detent spring.

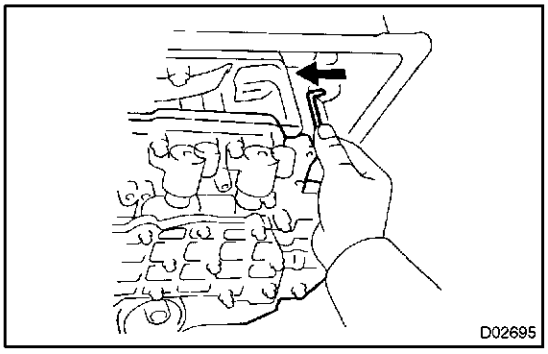


11. REMOVE VALVE BODY

(a) Remove the 11 bolts.

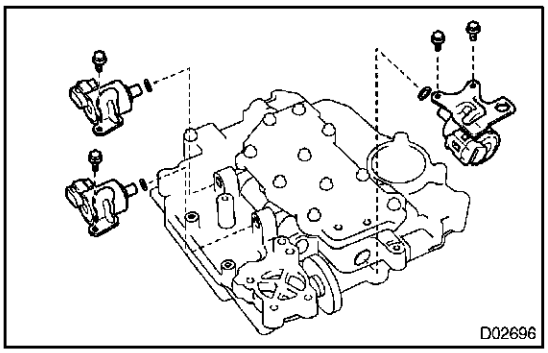


(b) Disconnect the throttle cable from the cam.



(c) Disconnect manual valve connecting rod.

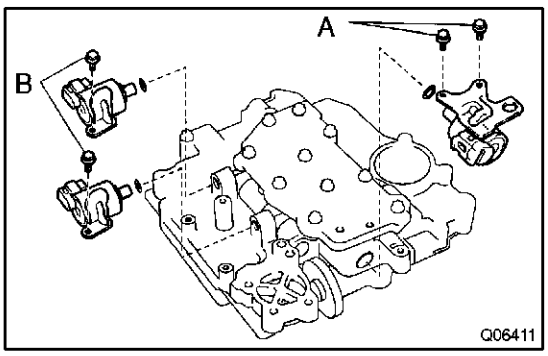
(d) Remove the valve body.



12. REMOVE SOLENOID VALVE

(a) Remove the 4 bolts and 3 solenoid valve.

(b) Remove the O–rings from each of the solenoid valves.

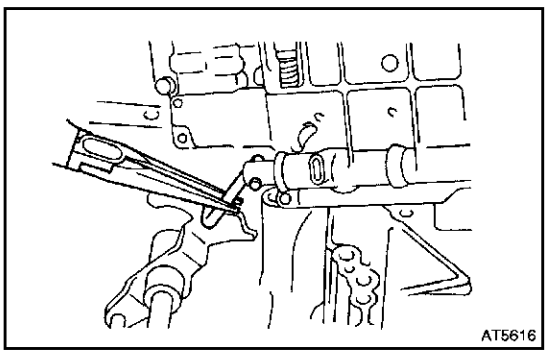


13. INSTALL SOLENOID VALVE

(a) Install 3 new O–rings to each of the solenoid valves.

(b) Install the 3 solenoid valves and 4 bolts.

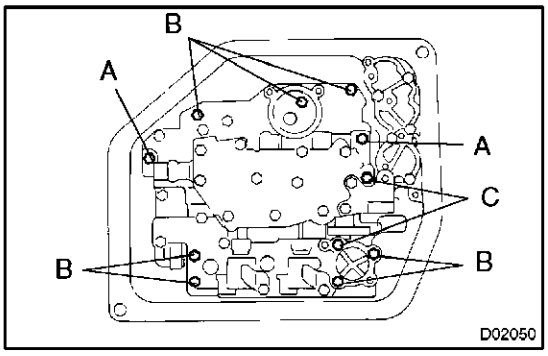
Torque:
A: 6.4 N·m (65 kgf·cm, 56 in.·lbf)
B: 10 N·m (100 kgf·cm, 7 ft·lbf)



14. INSTALL VALVE BODY

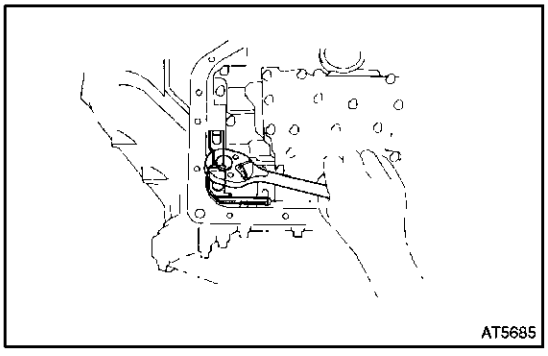
(a) Connect the connecting rod to the manual valve lever.

(b) Connect the throttle cable to the cam.



(c) Install the 11 bolts as shown in the illustration and hand–tighten all the bolts first. Then tighten them with a torque wrench.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
Bolt length:
A: 20 mm (0.79 in.)
B: 30 mm (1.18 in.)
C: 47 mm (1.85 in.)



15. INSTALL MANUAL DETENT SPRING

Install the detent spring and cover in place, and install the 16 mm (0.63 in.) long bolt.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

HINT:

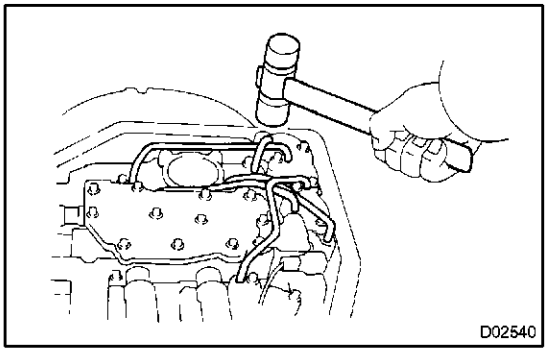
Check that the manual valve lever is in contact with the center of the roller at the tip of the detent spring.

16. INSTALL WIRE CLAMP

Install the clamp with the bolt.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

17. CONNECT 3 SOLENOID CONNECTORS

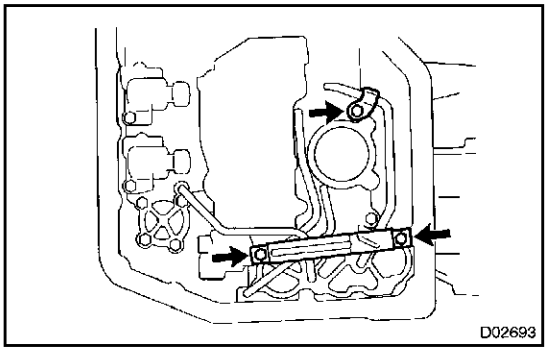


18. INSTALL OIL PIPES

Tap the pipes with a plastic hammer to install them into the positions indicated in the illustration.

NOTICE:

Be careful not to bend or damage the pipes.



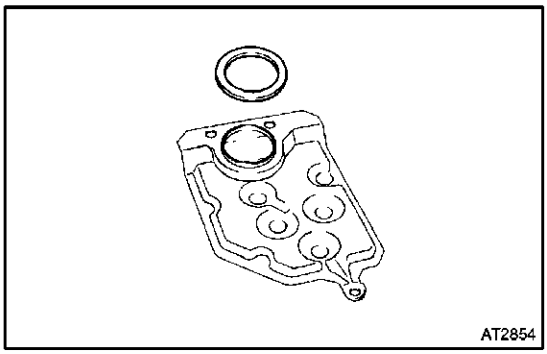
19. INSTALL OIL PIPE BRACKET AND OIL PIPE CLAMP

(a) Install the oil pipe bracket with the 2 bolts.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

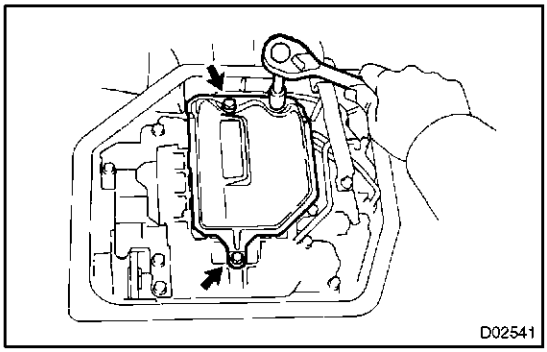
(b) Install the oil pipe clamp with the bolt.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



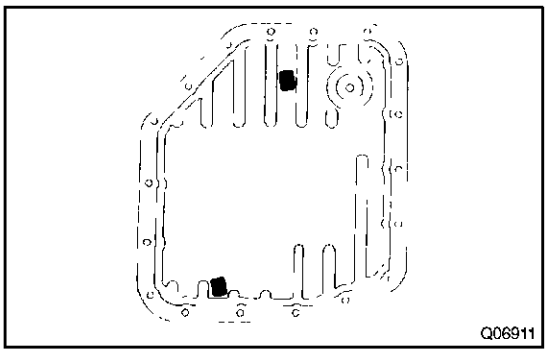
20. INSTALL OIL STRAINER

(a) Install a new gasket to the oil strainer.



(b) Install the oil strainer with the 3 bolts.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



21. INSTALL 2 MAGNETS IN OIL PAN

NOTICE:

Make sure that the magnets do not interfere with the oil pipes.

22. INSTALL OIL PAN AND GASKET

(a) Install a new gasket to the oil pan and install them to the transaxle.

(b) Install the 18 bolts.

Torque: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

23. INSTALL DRAIN PLUG

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

24. FILL ATF AND CHECK FLUID LEVEL

(See page DI–4)

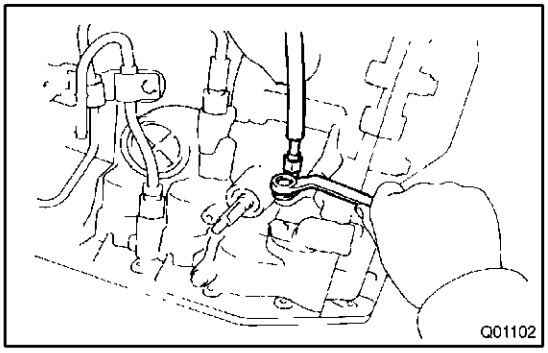
THROTTLE CABLE

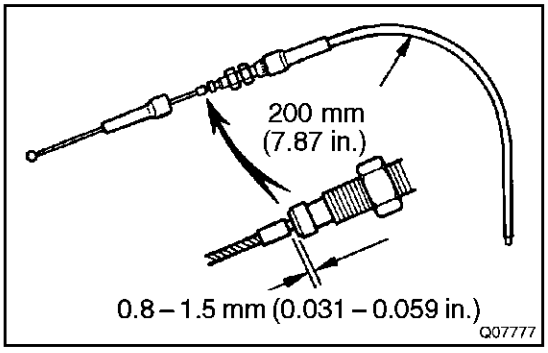
AX062–01

ON–VEHICLE REPAIR

1. DISCONNECT THROTTLE CABLE FROM ENGINE
2. DISCONNECT SHIFT CONTROL CABLE FROM CONTROL SHAFT LEVER
3. REMOVE NEUTRAL START SWITCH
   (See page AX–4)
4. REMOVE DRAIN PLUG AND DRAIN ATF
5. REMOVE VALVE BODY (See page AX–6)
6. REMOVE THROTTLE CABLE

Remove the retaining bolt and pull out the throttle cable.





7. INSTALL THROTTLE CABLE

If throttle cable is new, do the following operations (a) – (c).

(a) Bend the cable so there is a radius of about 200 mm (7.87 in.).
(b) Pull the inner cable lightly until slight resistance is felt, and hold it there.
(c) Stake the stopper, 0.8 – 1.5 mm (0.031 – 0.059 in.) from the end of the outer cable.
(d) Install a new O–ring to the throttle cable.
(e) Insert the throttle cable and install the retaining bolt.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

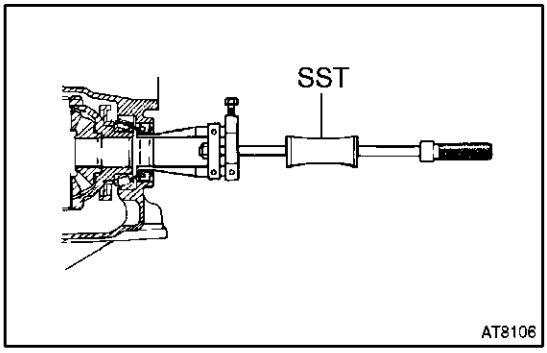
8. INSTALL VALVE BODY (See page AX–6)
9. INSTALL NEUTRAL START SWITCH
   (See page AX–4)
10. CONNECT SHIFT CONTROL CABLE TO CONTROL SHAFT LEVER
    Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)
11. CONNECT THROTTLE CABLE TO ENGINE
12. INSTALL DRAIN PLUG
    Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)
13. FILL ATF AND CHECK FLUID LEVEL
    (See page DI–4)
14. ADJUST THROTTLE CABLE (See page DI–4)
15. TEST DRIVE VEHICLE

DIFFERENTIAL OIL SEAL

AX063–01

ON–VEHICLE REPAIR

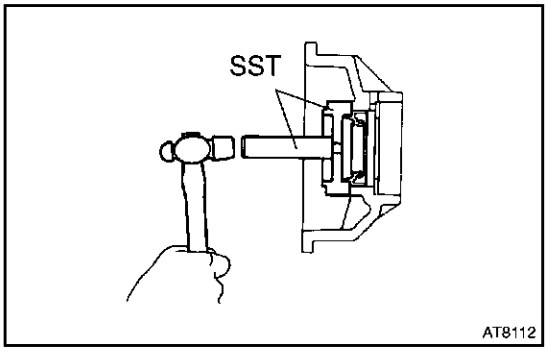
1. **REMOVE LH AND RH ENGINE UNDER COVERS**
2. **REMOVE LH AND RH DRIVE SHAFTS**
   (See page SA–19)



3. **REMOVE LH AND RH OIL SEALS**

Using SST, drive out the LH and RH oil seals.

SST 09308–00010



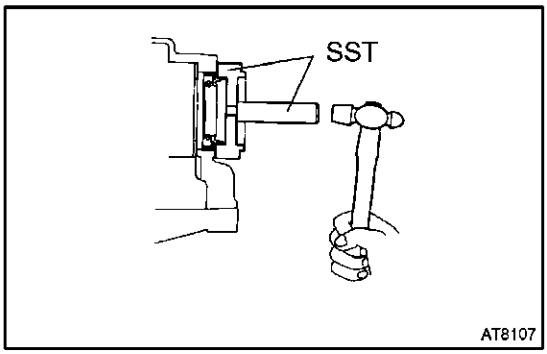
4. **INSTALL LH SIDE OIL SEAL**

(a) Using SST, drive in a new oil seal.

SST 09350–32014 (09351–32111),
09950–70010 (09951–07100)

Oil seal drive depth:
5.2 ± 0.5 mm (0.205 ± 0.020 in.)

(b) Coat the lip of oil seal with MP grease.



5. **INSTALL RH SIDE OIL SEAL**

(a) Using SST, drive in a new oil seal until SST makes contact with the case surface.

SST 09350–32014 (09351–32150),
09950–70010 (09951–07100)

Oil seal drive depth:
0 ± 0.5 mm (0 ± 0.020 in.)

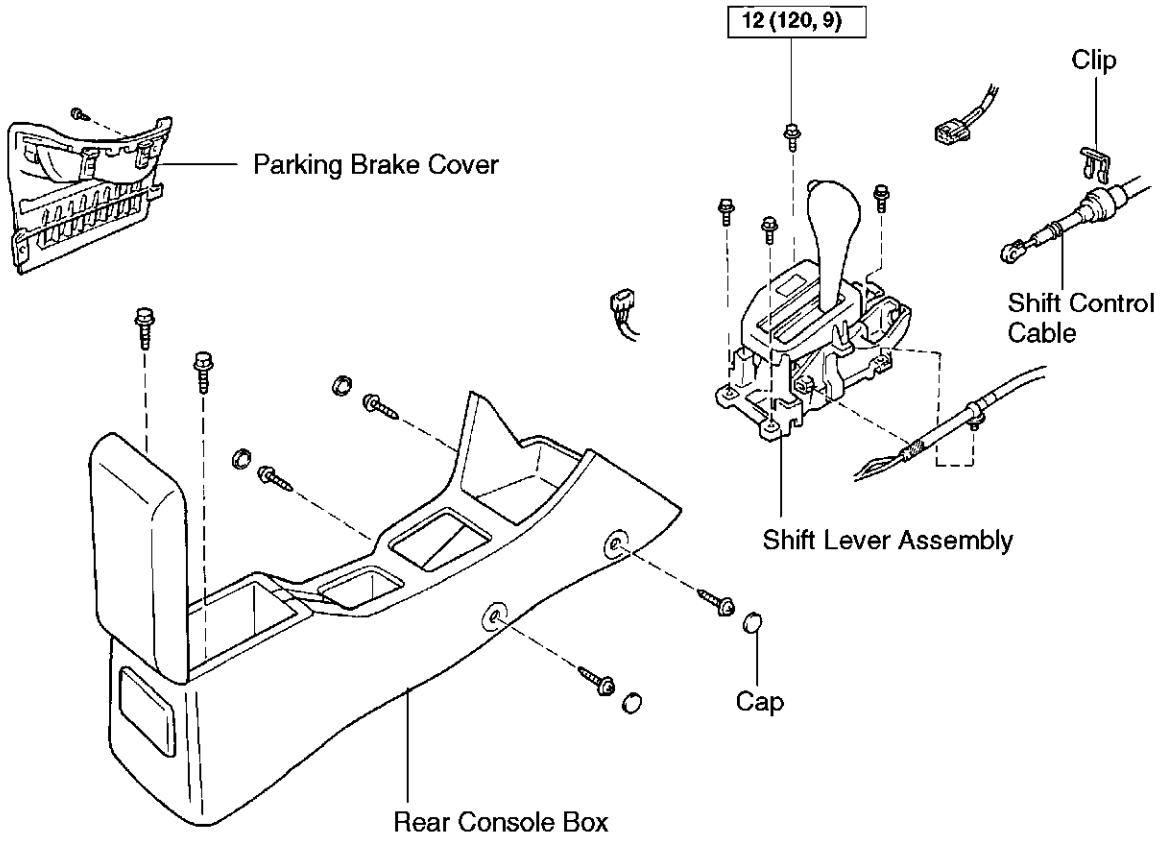
(b) Coat the lip of oil seal with MP grease.

6. **INSTALL LH AND RH DRIVE SHAFTS**
   (See page SA–28)
7. **FILL ATF AND CHECK FLUID LEVEL**
   (See page DI–4)
8. **INSTALL LH AND RH ENGINE UNDER COVERS**

FLOOR SHIFT ASSEMBLY (LHD)

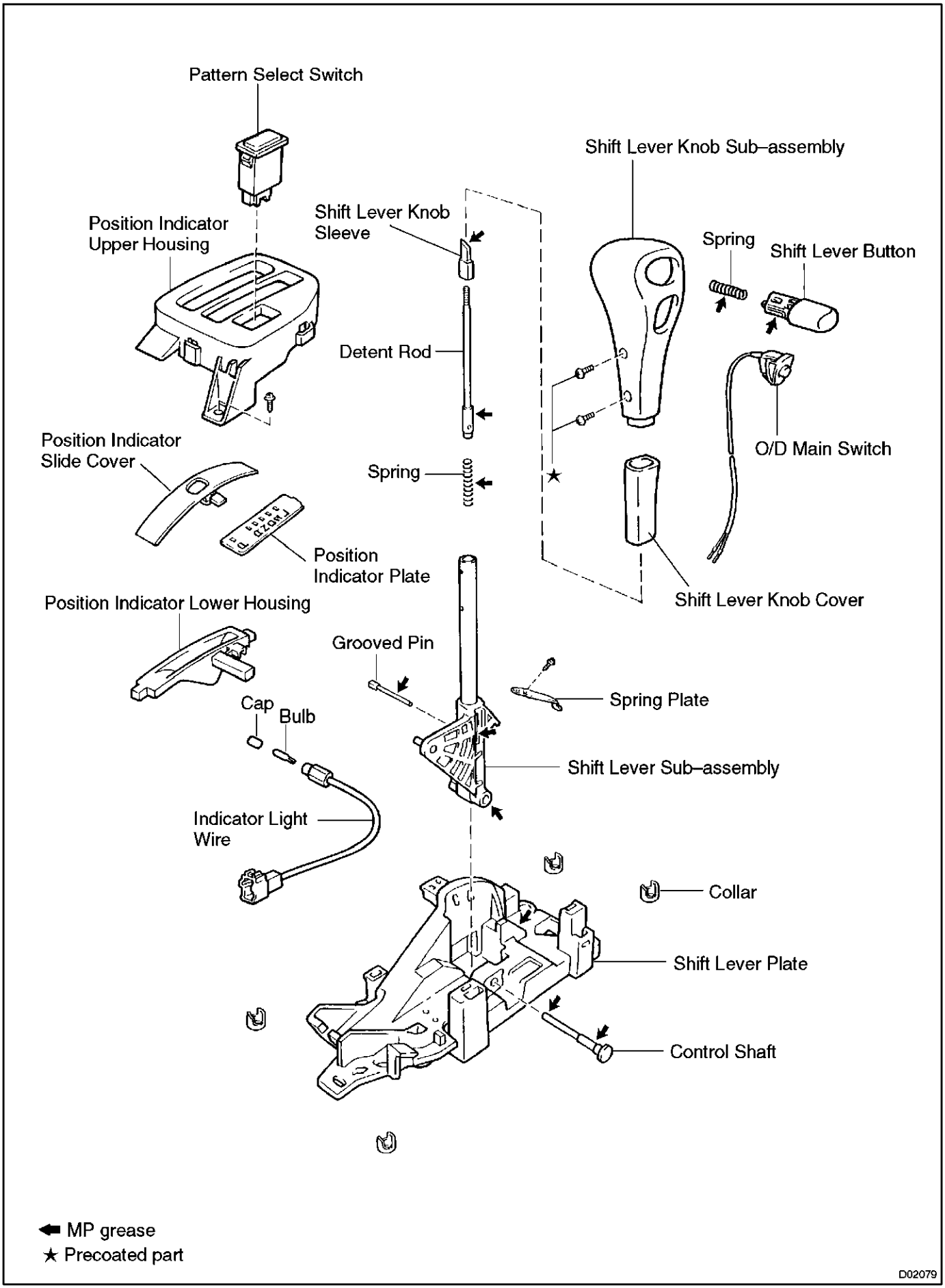
AX02U–03

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

D02056


Pattern Select Switch
Shift Lever Knob Sub–assembly
Position Indicator Upper Housing
Shift Lever Knob Sleeve
Spring
Shift Lever Button
Detent Rod
O/D Main Switch
Position Indicator Slide Cover
Spring
Position Indicator Plate
Shift Lever Knob Cover
Position Indicator Lower Housing
Grooved Pin
Spring Plate
Cap
Bulb
Shift Lever Sub–assembly
Indicator Light Wire
Collar
Shift Lever Plate
Control Shaft
MP grease
★ Precoated part
D02079

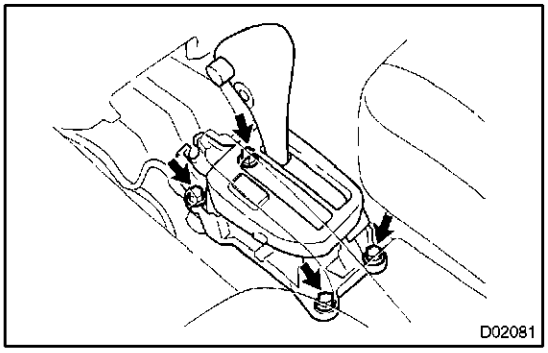
AX05L–02

REMOVAL

1. **REMOVE REAR CONSOLE (See page BO–113)**
2. **REMOVE SHIFT LEVER ASSEMBLY**

(a) Disconnect the 2 connectors and wire harness.

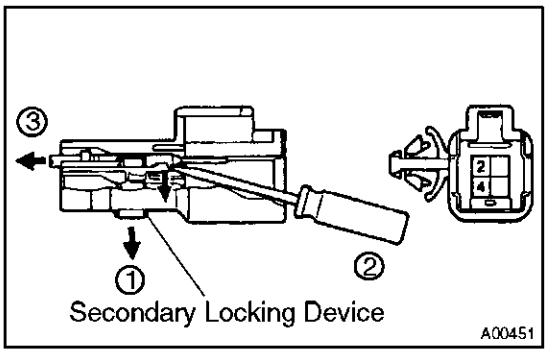
(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and floor shift assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX02W–03

DISASSEMBLY



1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove O/D main switch connector from the shift lever plate.

(b) Disengage the secondary locking device.

(c) Disengage the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to apply unnatural load onto O/D main switch wire harness.

(b) Remove these parts:

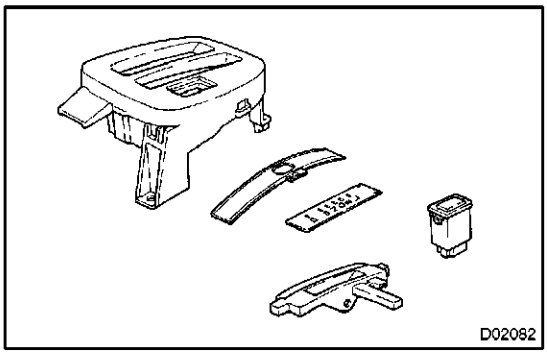
- Shift lever knob cover
- Shift lever button
- Spring
- O/D main switch

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE BULB AND CAP FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING SUB–ASSEMBLY

Remove the screw and an indicator housing sub–assembly.

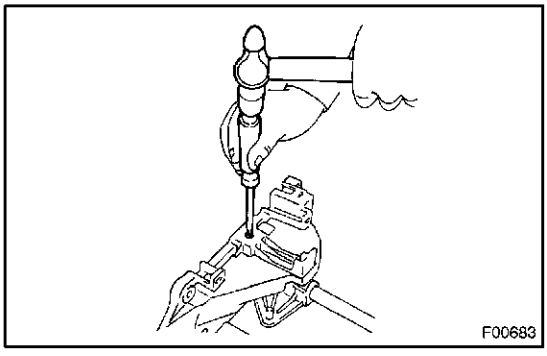


6. DISASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Remove these parts from the position indicator upper housing.

- Pattern select switch
- Position indicator lower housing
- Position indicator slide cover
- Position indicator plate

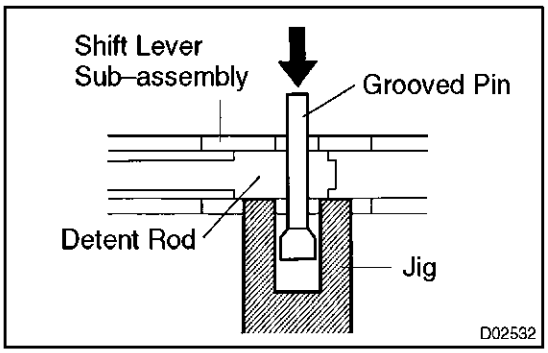
7. REMOVE SPRING PLATE



8. REMOVE SHIFT LEVER SUB–ASSEMBLY

(a) Using a screwdriver and a hammer, remove the control shaft.

(b) Remove the shift lever sub–assembly.



9. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

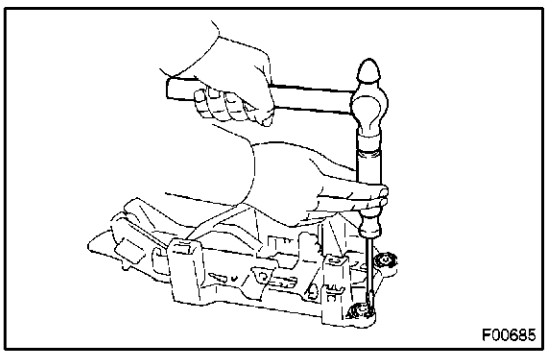
(a) Secure the room for the pin to be released by using a jig as shown in the illustration, and hit the grooved pin with a hammer and pull the grooved pin out.

NOTICE:

- **Hit and pull the pin out gradually.**
- **Do not damage the shift lever sub–assembly.**

(b) Remove the detent rod and compression spring.

(c) Remove the shift lever knob sleeve from the detent rod.



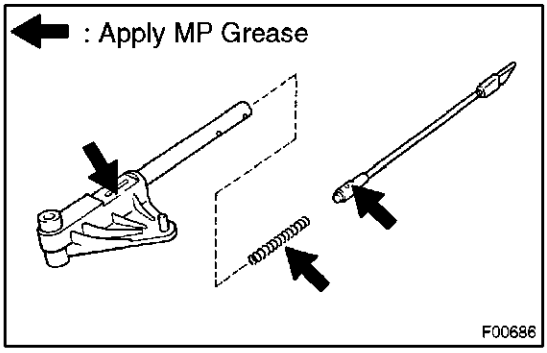
10. REMOVE COLLARS

Using a screwdriver and a hammer, remove the 4 collars.

AX05M–02

REASSEMBLY

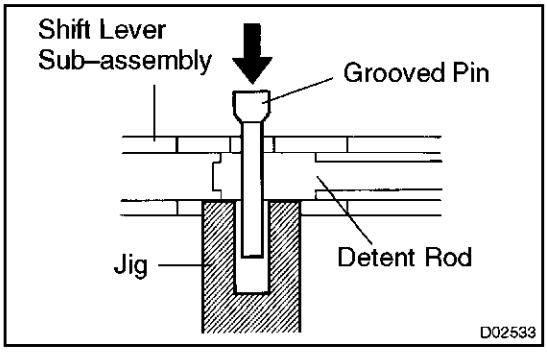
1. **INSTALL COLLARS**
2. **INSTALL SHIFT LEVER KNOB SLEEVE TO DETENT ROD**



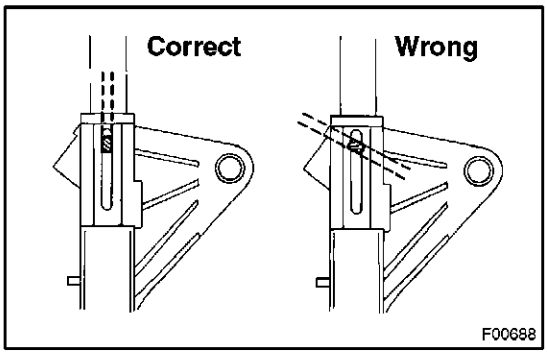
3. **ASSEMBLE SHIFT LEVER SUB–ASSEMBLY**

(a) Apply MP grease to the compression spring, the detent rod and the shift lever sub–assembly.

(b) Install the compression spring and the detent rod to shift lever sub–assembly.



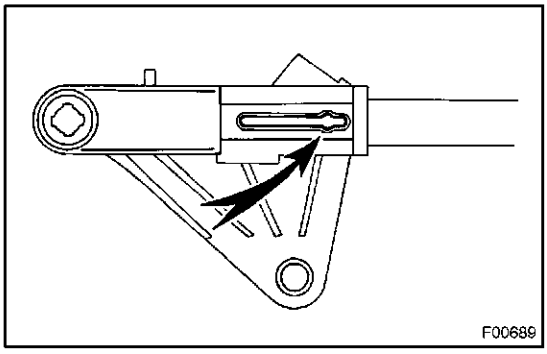
(c) Place the shift lever sub–assembly as shown in the illustration.



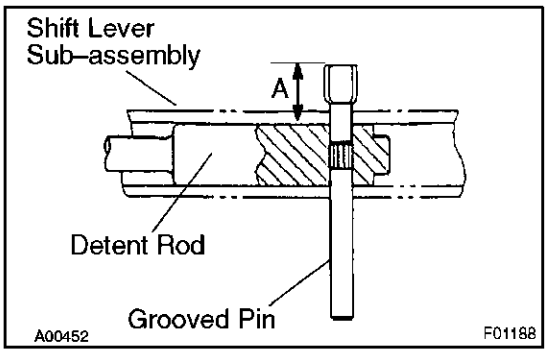
(d) Insert the grooved pin in the detent rod pin hole.

NOTICE:

- **Assemble the grooved pin so that it fits into the guide hole of the shift lever sub–assembly in parallel.**
- **Take care not to insert the pin in the wrong direction against the detent rod.**



(e) Meet the grooved pin with the notch of the guide hole.



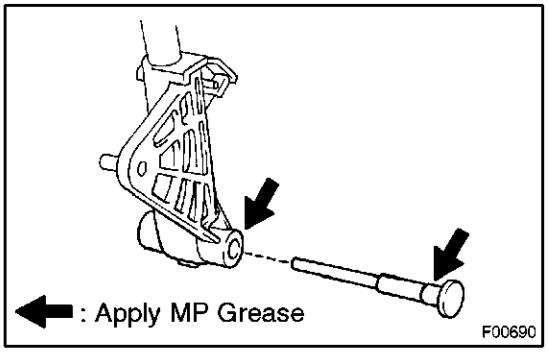
(f) Press the pin with a hammer.

A: 10.0 – 10.4 mm (0.39 – 0.41 in.)

NOTICE:

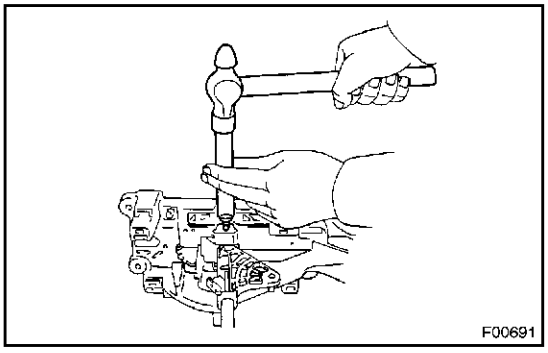
When pressing in the grooved pin, if doing it at the place other than the notch, the shift lever sub–assembly might be damaged.

4. CHECK DETENT ROD OPERATION



5. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease.



(b) Using a brass bar and a hammer, install the control shaft and the shift lever sub–assembly to the shift lever plate.

NOTICE:

Take care not to install them in the wrong direction against the shift lever sub–assembly.

6. INSTALL SPRING PLATE

7. ASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Install these parts to the position indicator upper housing.

- Position indicator plate
- Position indicator slide plate
- Position indicator lower housing
- Patter select switch

8. INSTALL INDICATOR HOUSING SUB–ASSEMBLY

Install the screw and an indicator housing.

9. INSTALL CAP AND BULB TO INDICATOR LIGHT WIRE

10. INSTALL INDICATOR LIGHT WIRE

11. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Install these parts:

HINT:

Apply MP grease to shift lever knob button.

- O/D main switch
- Spring
- Shift lever button
- Shift lever knob cover

(b) Install the shift lever knob sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

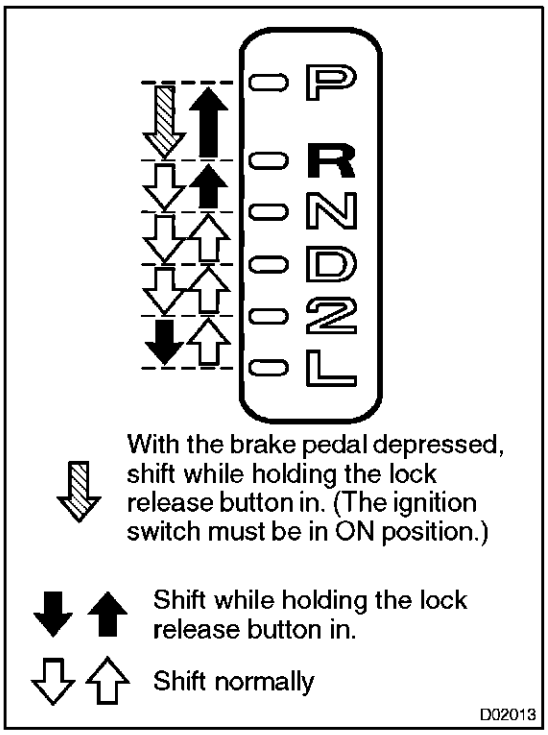
NOTICE:

Make sure not to catch O/D main switch wire harness.

(c) Install the O/D main switch wire harness securely and hang it on the hook of the shift lever sub–assembly.

12. INSTALL O/D MAIN SWITCH TERMINAL

AX02Y–03



INSTALLATION

Installation is in the reverse order of removal (See page AX–15).

HINT:

After installation, adjust shift lever ranges (See page DI–4) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

  Ranges which can be operated only with pressing the shift lever nob button

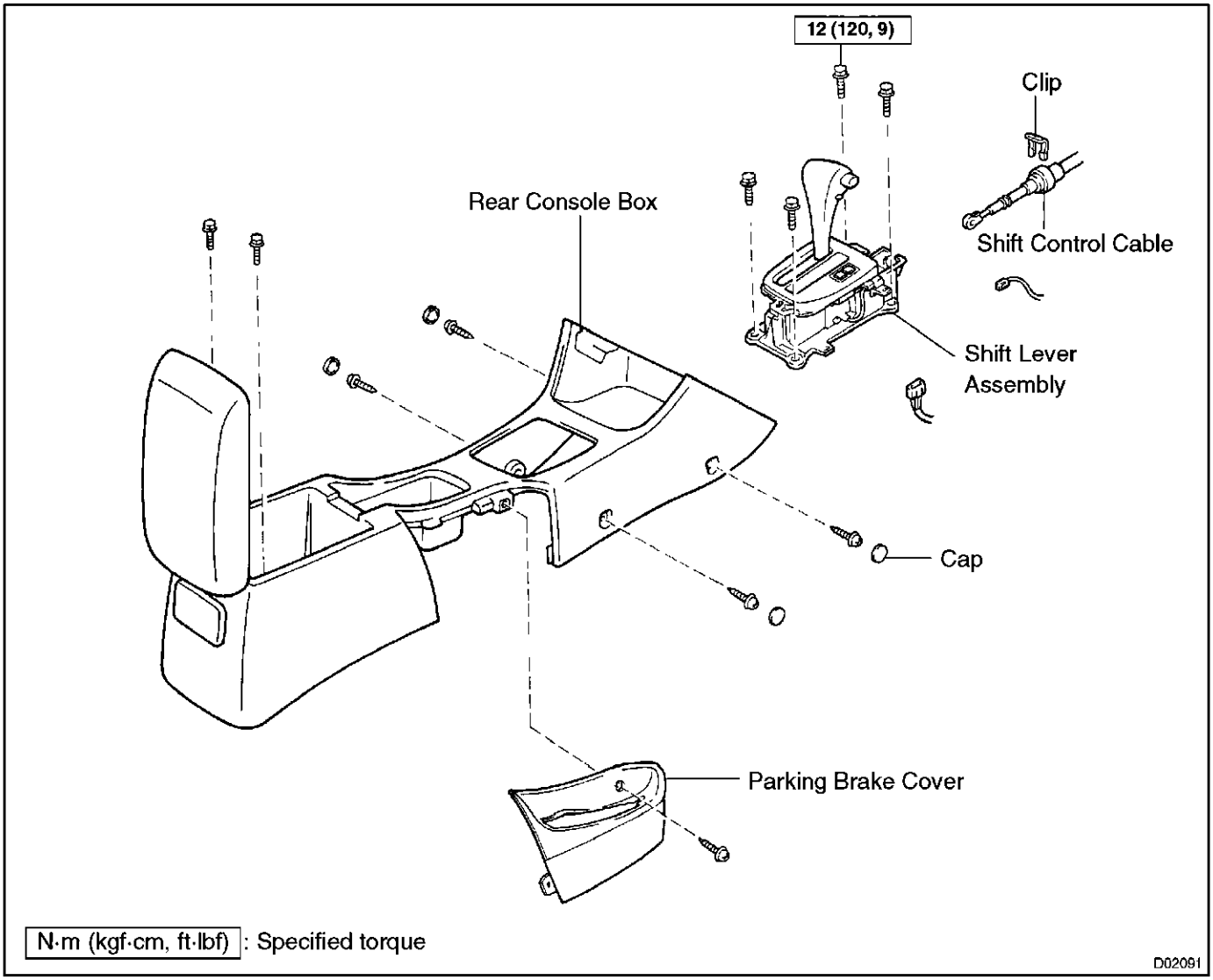
  P → R, 2 → L, N → R → P

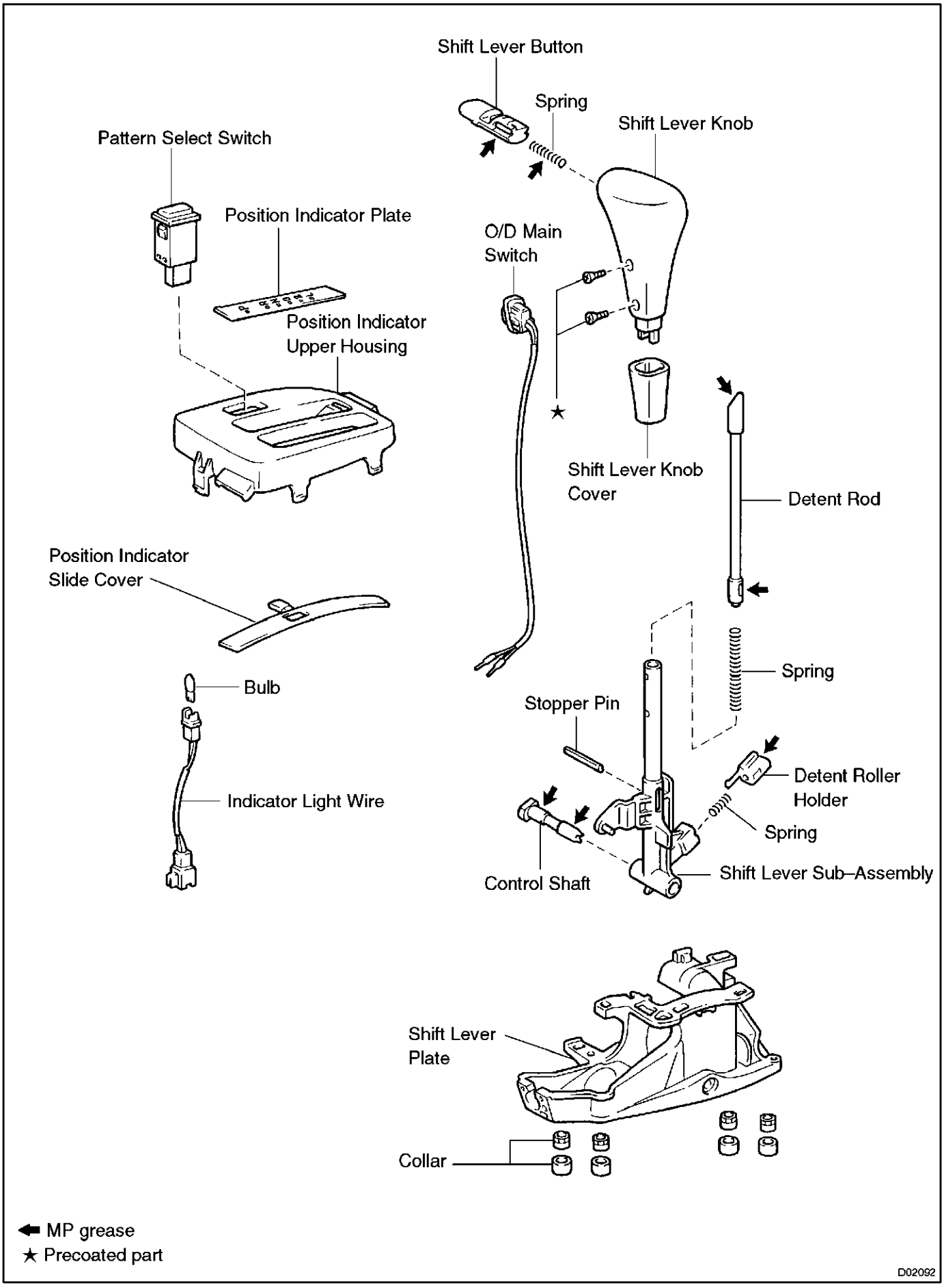
- When starting the engine, make sure that the vehicle moves forward when shifting from N to D range, and moves rearward when shifting to R range.

FLOOR SHIFT ASSEMBLY (RHD)

COMPONENTS

AX05N–01




Shift Lever Button
Spring
Shift Lever Knob
Pattern Select Switch
Position Indicator Plate
O/D Main Switch
Position Indicator Upper Housing
Shift Lever Knob Cover
Detent Rod
Position Indicator Slide Cover
Spring
Bulb
Stopper Pin
Detent Roller Holder
Indicator Light Wire
Spring
Control Shaft
Shift Lever Sub–Assembly
Shift Lever Plate
Collar
MP grease
★ Precoated part
D02092

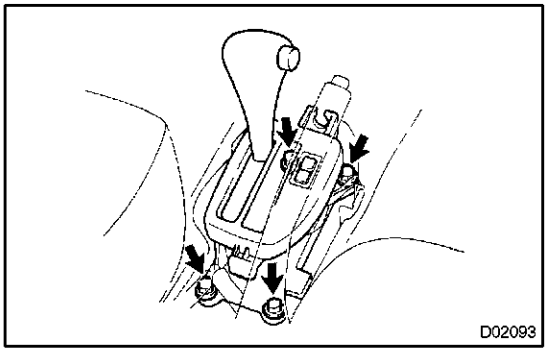
AX05O–01

REMOVAL

1. **REMOVE REAR CONSOLE (See page BO–113)**
2. **REMOVE FLOOR SHIFT ASSEMBLY**

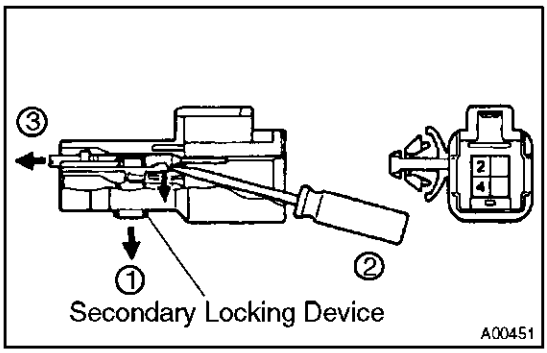
(a) Disconnect the connectors.

(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and shift lever assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX05P–01



DISASSEMBLY

1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove O/D main switch connector from the shift lever plate.

(b) Disengage the secondary locking device.

(c) Disengage the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to apply unnatural load onto O/D main switch wire harness.

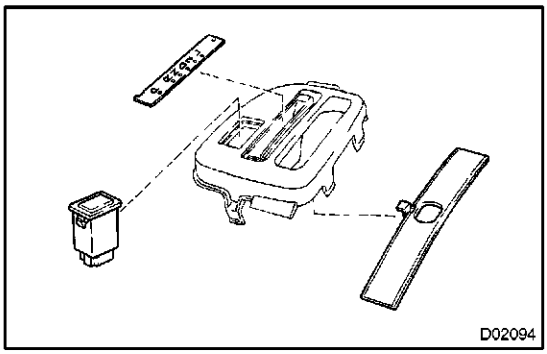
(b) Remove these parts:

- Shift lever knob cover
- Shift lever button
- Spring
- O/D main switch

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE BULB FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING SUB–ASSEMBLY

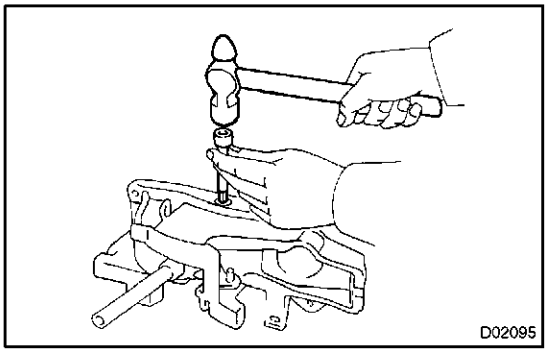


6. DISASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Remove these parts from the position indicator upper housing.

- Position indicator slide cover
- Position indicator plate
- Pattern select switch

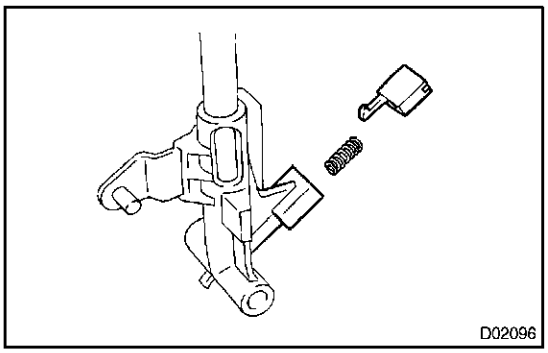
7. REMOVE STOPPER PIN, DETENT ROD AND COMPRESSION SPRING



8. REMOVE SHIFT LEVER SUB–ASSEMBLY

(a) Using an extension bar and hammer, remove the control shaft.

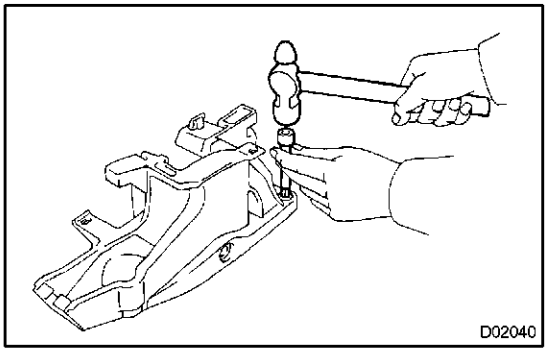
(b) Remove the shift lever sub–assembly.



9. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

Remove these part:

- Detent roller holder
- Compression spring



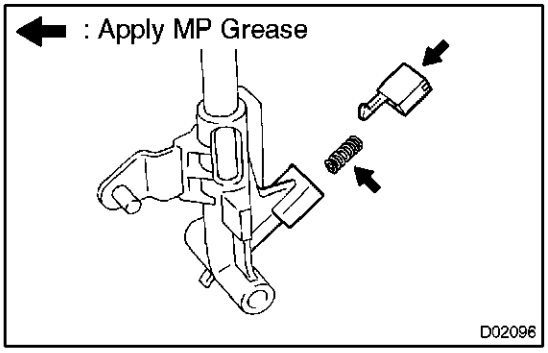
10. REMOVE COLLARS

Using an extension bar and hammer, remove the 4 collars.

AX05Q–01

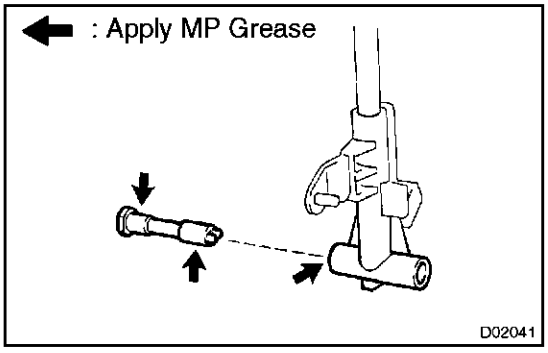
REASSEMBLY

1. INSTALL COLLARS



2. ASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the detent roller holder, compression spring and shift lever sub–assembly.
(b) Install the compression spring to the detent roller holder.
(c) Install the detent roller holder with the compression spring to the shift lever sub–assembly.



3. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the control shaft and shift lever sub–assembly.
(b) Using an extension bar and hammer, install the control shaft and shift lever sub–assembly to the shift lever plate.

4. INSTALL COMPRESSION SPRING, DETENT ROD AND STOPPER PIN

(a) Apply the MP grease to the detent rod and stopper pin.
(b) Install the compression spring and detent rod to the shift lever sub–assembly.
(c) Insert the stopper pin in the stopper pin hole.

NOTICE:

Take care not to insert the pin in the wrong direction against the detent rod.

5. CHECK SHIFT LEVER OPERATION

6. ASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Install these parts to the position indicator upper housing.

- Pattern select switch
- Position indicator plate
- Position indicator slide plate

7. INSTALL INDICATOR HOUSING SUB–ASSEMBLY

8. INSTALL BULB TO INDICATOR LIGHT WIRE

9. INSTALL INDICATOR LIGHT WIRE

10. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Install these parts:

HINT:

Apply MP grease to the shift lever knob button.

- O/D main switch
- Spring
- Shift lever button
- Shift lever knob cover

(b) Install the shift lever knob sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

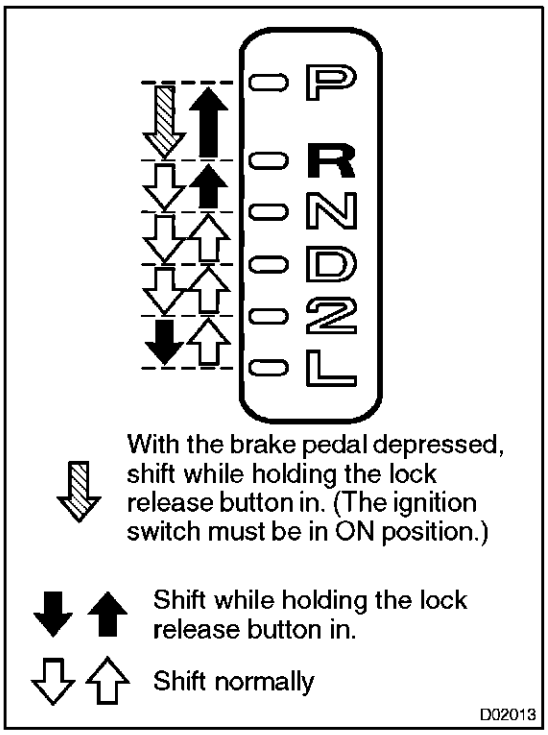
NOTICE:

Make sure not to catch O/D main switch wire harness.

(c) Install the O/D main switch wire harness securely and hang it on the hook of the shift lever sub–assembly.

11. INSTALL O/D MAIN SWITCH TERMINAL

AX05R–02



INSTALLATION

Installation is in the reverse order of removal (See page AX–24).

HINT:

After installation, adjust shift lever ranges (See page DI–4) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

  Ranges which can be operated only with pressing the shift lever nob button

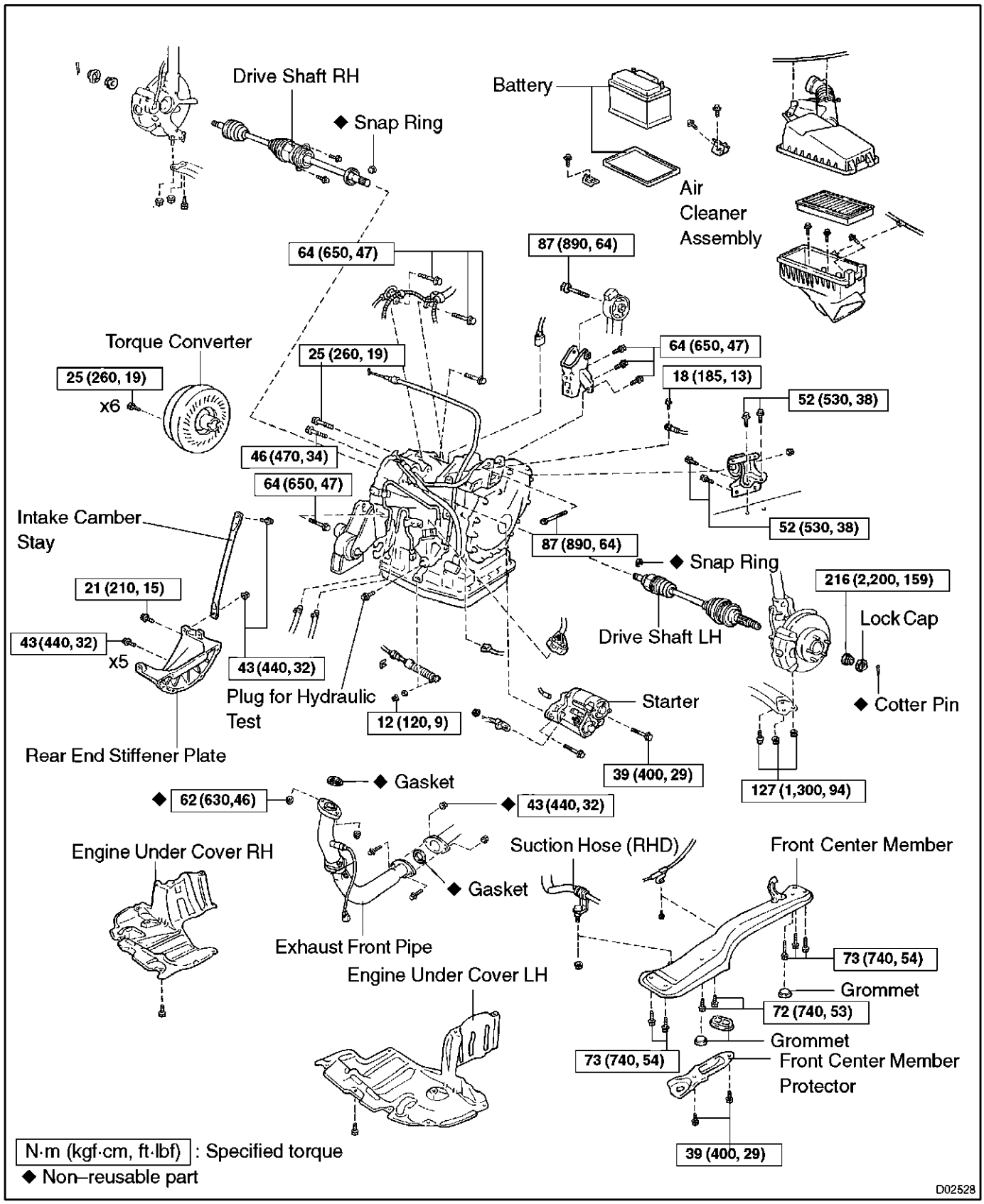
  P → R, 2 → L, N → R → P

- 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.

AUTOMATIC TRANSAXLE UNIT

COMPONENTS

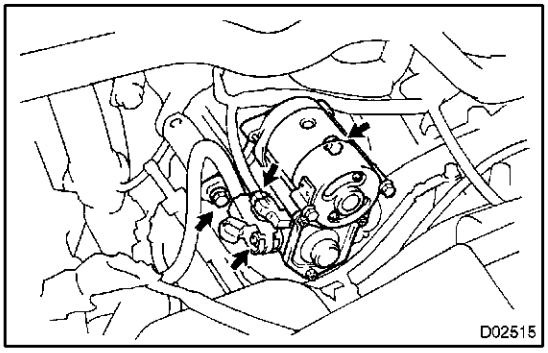
AX064–01



AX065–01

REMOVAL

1. REMOVE AIR CLEANER ASSEMBLY
2. REMOVE BATTERY
3. DISCONNECT THROTTLE CABLE



4. REMOVE STARTER

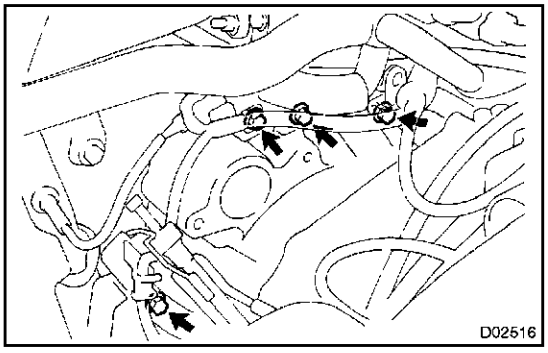
(a) Remove the nut and disconnect the connector.

(b) Remove the 2 bolts, bracket and starter.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

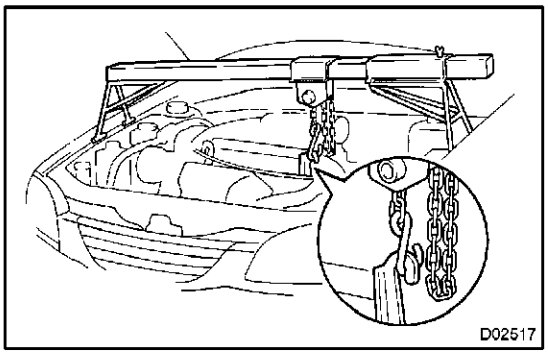
5. DISCONNECT GROUND CABLE

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

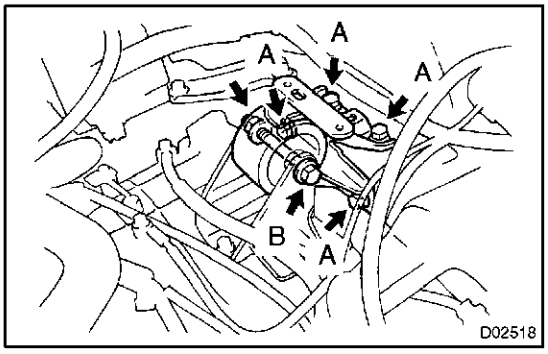


6. REMOVE 4 UPPER SIDE TRANSAXLE MOUNTING BOLTS

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



7. INSTALL ENGINE SUPPORT FIXTURE
8. REMOVE ENGINE UNDER COVERS



9. REMOVE LH SIDE ENGINE MOUNTING

Remove the 5 bolts, nut and LH engine mounting.

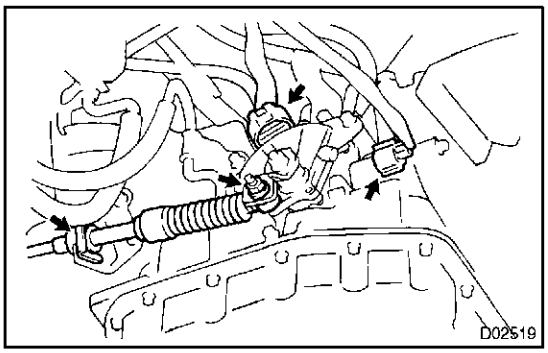
Torque:

A: 52 N·m (530 kgf·cm, 38 ft·lbf)

B: 87 N·m (890 kgf·cm, 64 ft·lbf)

10. REMOVE LH AND RH DRIVE SHAFTS

(See page SA–19)



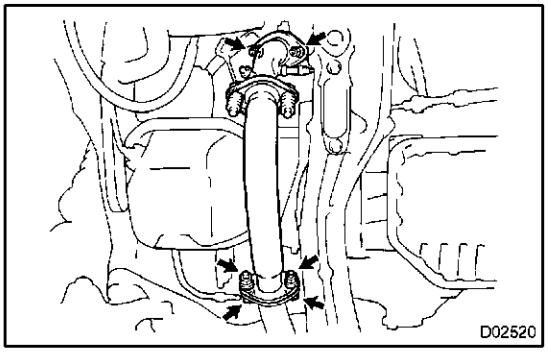
11. DISCONNECT SHIFT CONTROL CABLE

Remove the nut, clip and disconnect the shift control cable.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

12. DISCONNECT NEUTRAL START SWITCH CONNECTOR AND SOLENOID CONNECTOR

13. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR



14. REMOVE EXHAUST FRONT PIPE

(a) Disconnect the oxygen sensor connector.

(b) Remove the 2 nuts from the exhaust manifold.

Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

HINT:

At the time of installation, please refer to the following item.

Replace the used nuts with new ones.

(c) Remove the 2 bolts, nuts and exhaust front pipe with 2 gaskets.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

HINT:

At the time of installation, please refer to the following item.

Replace the used nuts with new ones.

(d) Remove the 2 gaskets from the exhaust front pipe.

HINT:

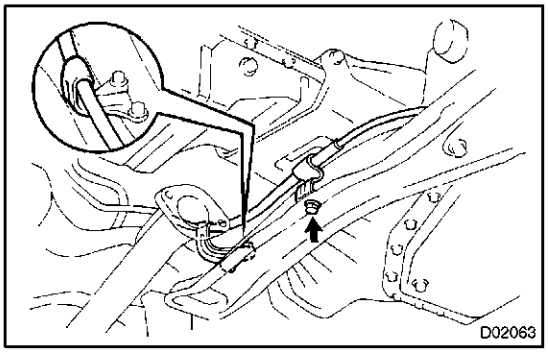
At the time of installation, please refer to the following item.

Replace the used gaskets with new ones.

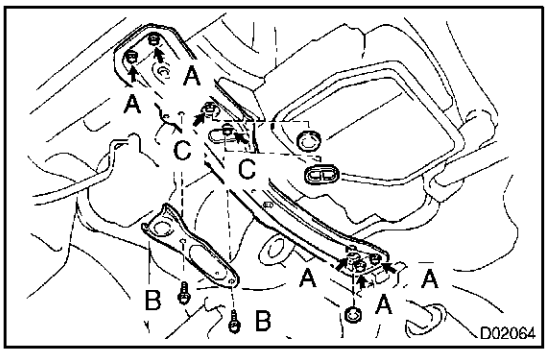
15. REMOVE FRONT CENTER MEMBER

(a) RHD:

Remove the nut and disconnect the suction hose from the front center member.

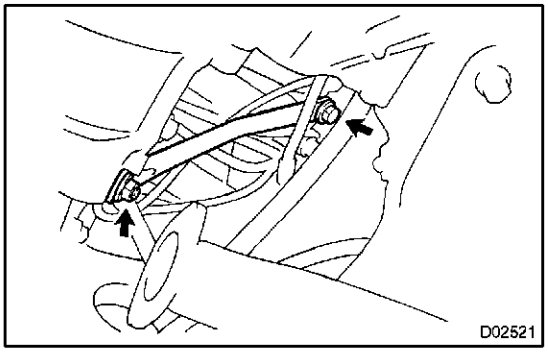


(b) Remove the bolt and disconnect the shift control cable from the bracket.



(c) Remove the 9 bolts, 3 grommets, front center member protector and front center member.

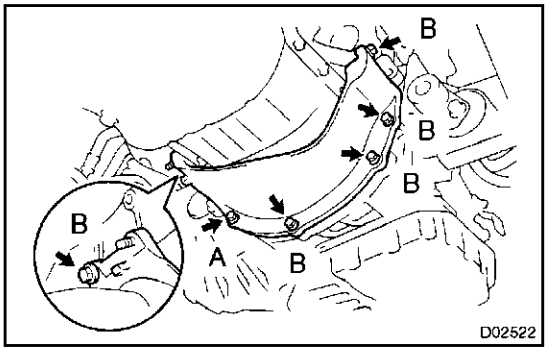
Torque:
A: 73 N·m (740 kgf·cm, 54 ft·lbf)
B: 39 N·m (400 kgf·cm, 29 ft·lbf)
C: 72 N·m (740 kgf·cm, 53 ft·lbf)



16. REMOVE INTAKE CAMBER STAY

Remove the bolt, nut and intake camber stay.

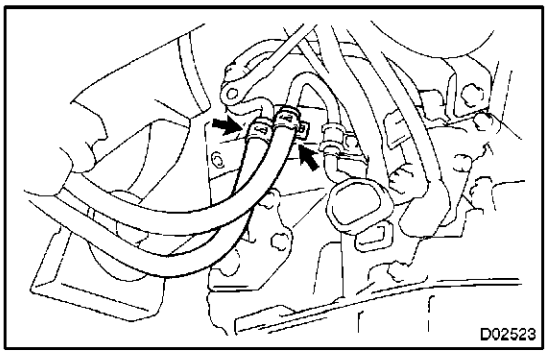
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



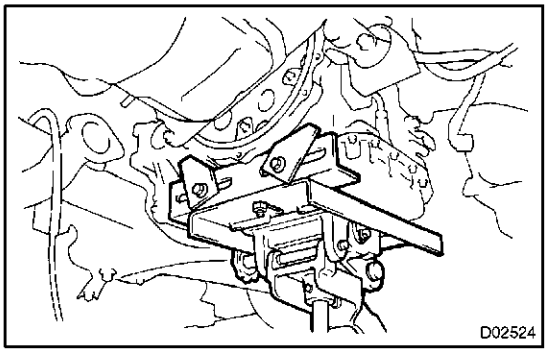
17. REMOVE REAR END STIFFENER PLATE

Remove the 6 bolts and rear end stiffener plate.

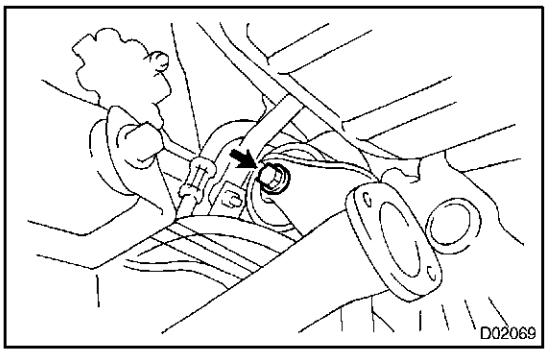
Torque:
A: 21 N·m (210 kgf·cm, 15 ft·lbf)
B: 43 N·m (440 kgf·cm, 32 ft·lbf)



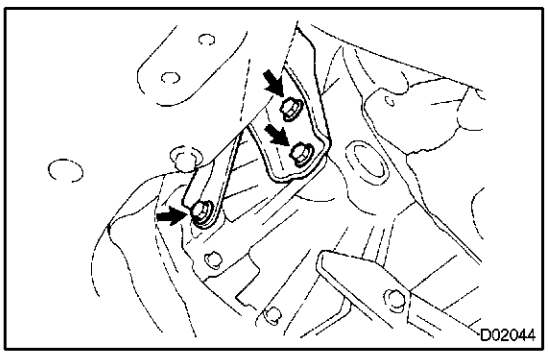
18. DISCONNECT OIL COOLER HOSES



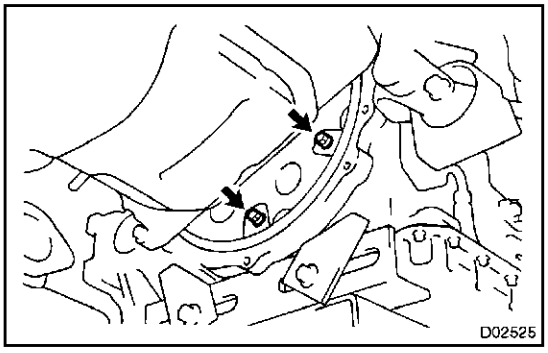
19. SUPPORT TRANSAXLE



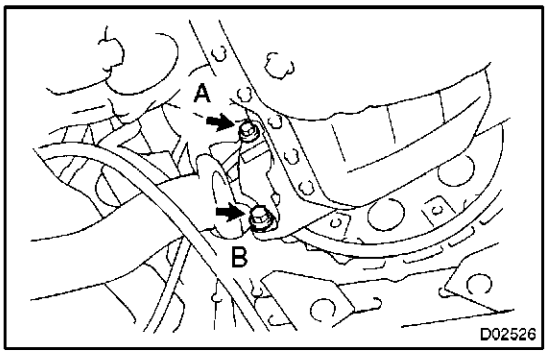
20. REMOVE ENGINE REAR MOUNTING BOLT
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)



21. REMOVE ENGINE REAR MOUNTING BRACKET
Remove the 3 bolts and engine rear mounting bracket.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

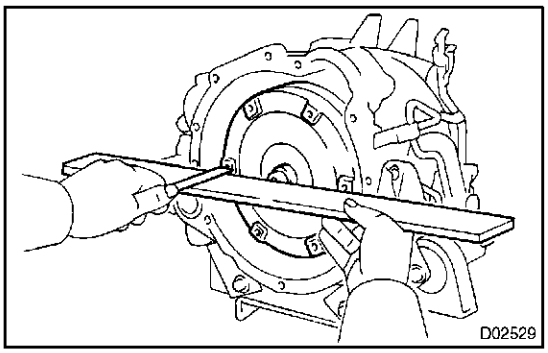


22. REMOVE TRANSAXLE
(a) Turn the crankshaft to gain access and remove the 6 bolts with holding the crankshaft pulley bolt by a wrench.
Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)
HINT:
At the time of installation, please refer to the following item.
First, install the gray bolt. Then install 5 black bolts.



(b) Remove the 2 bolts.
Torque:
A: 25 N·m (260 kgf·cm, 19 ft·lbf)
B: 46 N·m (470 kgf·cm, 34 ft·lbf)
(c) Lower the left side of the engine and remove the transaxle from the engine.
HINT:
At the time of installation, please refer to the following item.
Temporarily tighten the transaxle mounting bolts.

AX066–01



INSTALLATION

1. CHECK TORQUE CONVERTER INSTALLATION

Using a scale and a straight edge, measure the distance from the installation surface to the front surface of the transaxle housing.

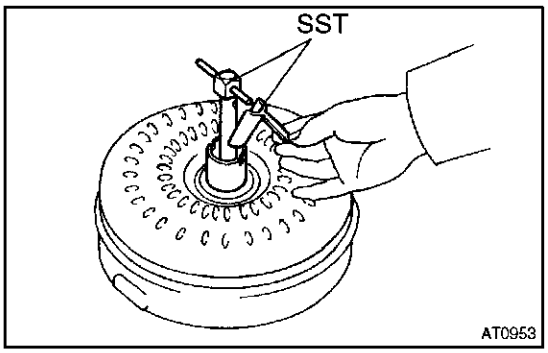
Correct distance: More than 12.75 mm (0.502 in.)

2. TRANSAXLE INSTALLATION

Installation is in the reverse order of removal (See page AX–31).

HINT:

- After installation, adjust the throttle cable, shift control cable and neutral start switch (See page DI–4).
- Fill ATF and check fluid level (See page DI–4).
- Test drive vehicle.



TORQUE CONVERTER AND DRIVE PLATE

INSPECTION

AX067–01

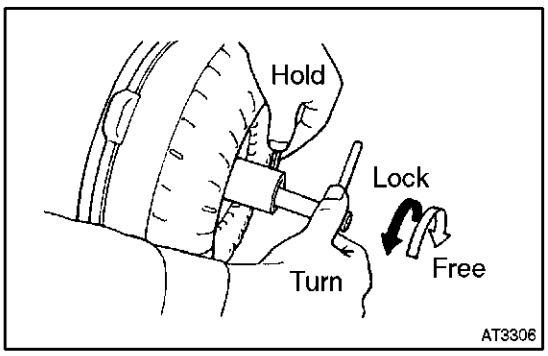
1. INSPECT ONE–WAY CLUTCH

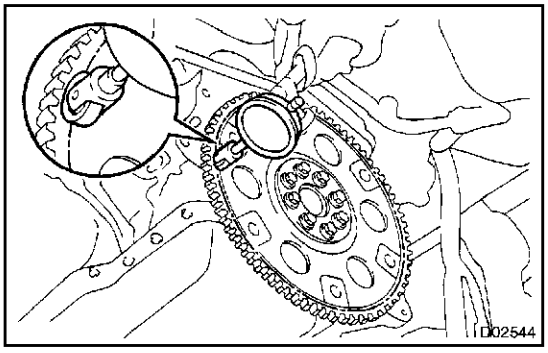
(a) Install SST into the inner race of the one–way clutch.
SST 09350–32014 (09351–32010)

(b) 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)

(c) With the torque converter set up on its side, check that the clutch locks when it is turned counterclockwise, and rotates smoothly clockwise.

If necessary, clean the converter and retest the clutch.
Replace the converter if the clutch still fails the test.



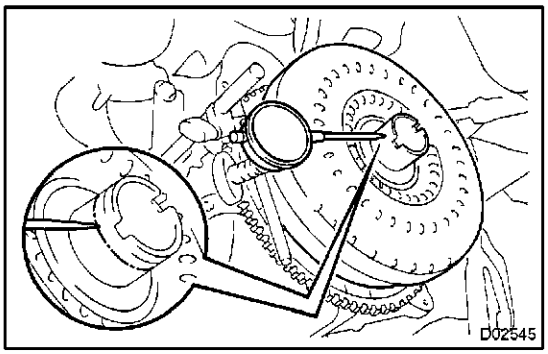


2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

(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.
Torque: 64 N·m (650 kgf·cm 47 ft·lbf)



3. MEASURE TORQUE CONVERTER SLEEVE RUNOUT

Temporarily mount the torque converter to the drive plate.
Set up a dial indicator and measure the torque converter sleeve runout.
Maximum runout: 0.30 mm (0.0118 in.)

If the runout is not within the specification, try to correct by reorienting the installation of the converter.

HINT:
Mark the position of the converter to ensure the correct installation.

AUTOMATIC TRANSAXLE (A245E, A246E)

AUTOMATIC TRANSAXLE SYSTEM AX–1
VEHICLE SPEED SENSOR AX–3
NEUTRAL START SWITCH AX–4
KICK–DOWN SWITCH AX–5
VALVE BODY ASSEMBLY AX–6
THROTTLE CABLE AX–9
DIFFERENTIAL OIL SEAL AX–10
FLOOR SHIFT ASSEMBLY (LHD) AX–11
FLOOR SHIFT ASSEMBLY (RHD) AX–20
AUTOMATIC TRANSAXLE UNIT AX–28
TORQUE CONVERTER
AND DRIVE PLATE AX–36

AUTOMATIC TRANSAXLE SYSTEM

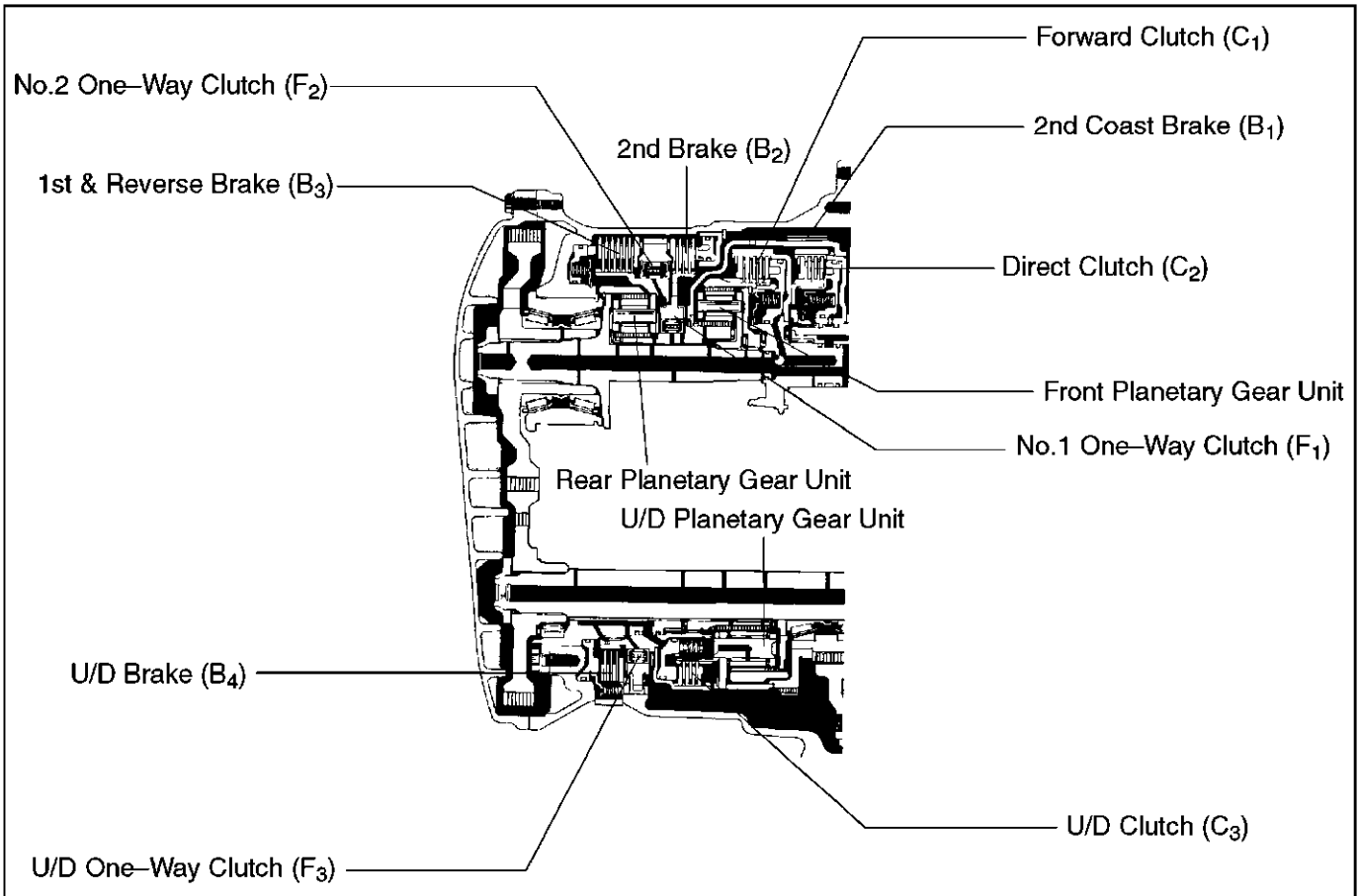
AX02L–02

PRECAUTION

If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

AX02M–02

OPERATION

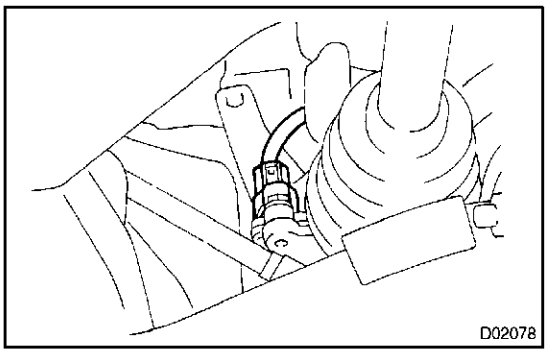


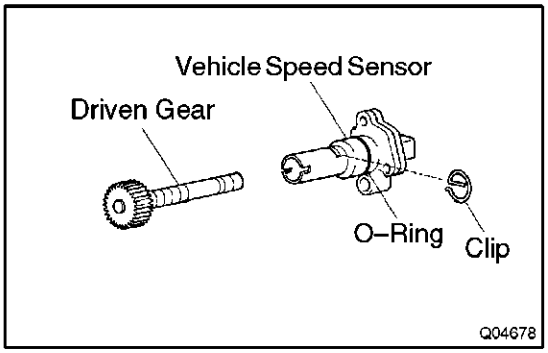
Shift Lever Range	Gear	Shift Solenoid Valve No.1	Shift Solenoid Valve No.2	C_1	C_2	C_3	B_1	B_2	B_3	B_4	F_1	F_2	F_3
P	Park	ON	OFF							●			
R	Reverse	ON	OFF		●				●	●			
N	Neutral	ON	OFF							●			
D	1st	ON	OFF	●						●		●	●
	2nd	ON	ON	●				●		●	●		●
	3rd	OFF	ON	●	●			●		●			●
	O/D	OFF	OFF	●	●	●		●					
2	1st	ON	OFF	●						●		●	●
	2nd	ON	ON	●			●	●		●	●		●
	3rd*	OFF	ON	●	●			●		●			●
L	1st	ON	OFF	●					●	●		●	●
	2nd*	ON	ON	●			●	●		●	●		●

● : Operating

*: Down–shift only in the 3rd gear for the 2 range and 2nd gear for the L range – no up–shift

F00484


D02078



Q04678

VEHICLE SPEED SENSOR

AX02N–02

ON–VEHICLE REPAIR

1. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR

2. REMOVE VEHICLE SPEED SENSOR ASSEMBLY

(a) Remove the bolt and vehicle speed sensor assembly.

(b) Remove the clip and speedometer driven gear from the vehicle speed sensor.

(c) Remove the O–ring from the vehicle speed sensor.

3. INSTALL VEHICLE SPEED SENSOR ASSEMBLY

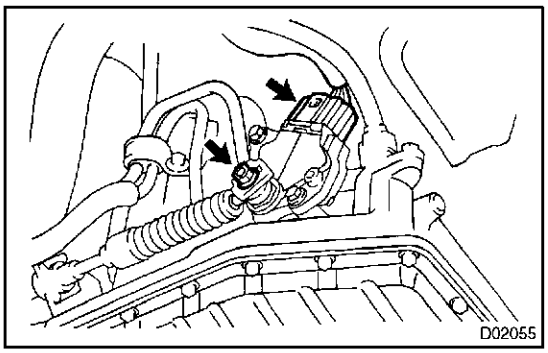
(a) Coat a new O–ring with ATF and install it to the vehicle speed sensor.

(b) Install the speedometer driven gear and clip to the vehicle speed sensor.

(c) Install the vehicle speed sensor assembly and tighten the bolts.

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

4. CONNECT VEHICLE SPEED SENSOR CONNECTOR

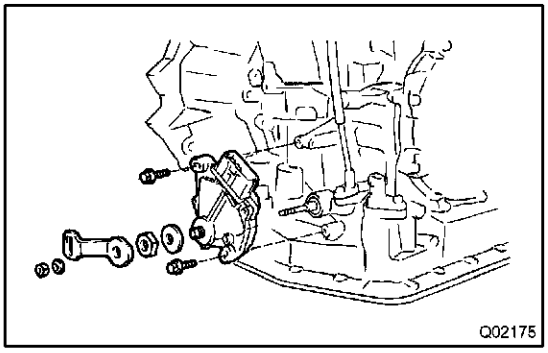


NEUTRAL START SWITCH

AX05H–01

ON–VEHICLE REPAIR

1. **REMOVE LH ENGINE UNDER COVER**
2. **DISCONNECT SHIFT CONTROL CABLE FROM CONTROL SHAFT LEVER**
3. **DISCONNECT NEUTRAL START SWITCH CONNECTOR**

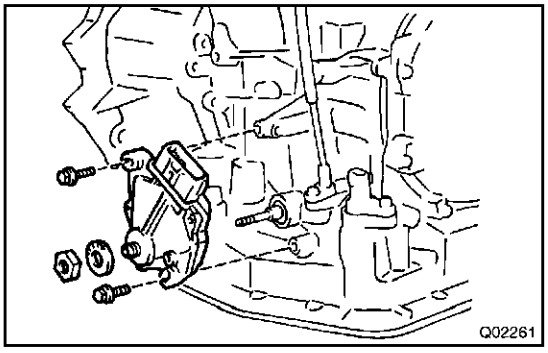


4. **REMOVE NEUTRAL START SWITCH**

(a) Remove the nut and control shaft lever.

(b) Pry out the lock washer and remove the control valve shaft nut.

(c) Remove the 2 bolts and pull out the neutral start switch.



5. **INSTALL NEUTRAL START SWITCH**

(a) Install the neutral start switch with 2 bolts to the control valve shaft.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Install a new lock plate and tighten the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

(c) Stake the nut with lock plate.

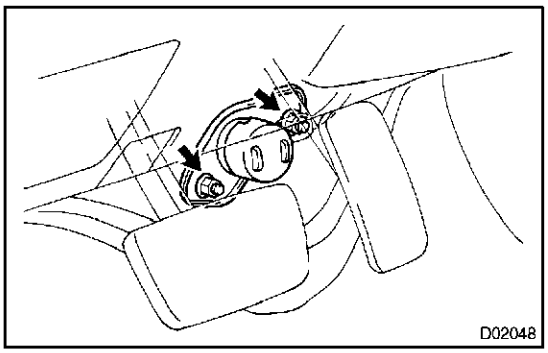
(d) Install the control shaft lever and nut.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

6. **CONNECT NEUTRAL START SWITCH CONNECTOR**
7. **CONNECT SHIFT CONTROL CABLE TO CONTROL SHAFT LEVER**
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)
8. **CHECK NEUTRAL START SWITCH OPERATION**

Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If not as stated above, carry out the adjustment procedure (See page DI–55).

9. **INSTALL LH ENGINE UNDER COVER**
10. **TEST DRIVE VEHICLE**



KICK–DOWN SWITCH

AX051–01

REPLACEMENT

1. TURN OVER FLOOR CARPET

2. REMOVE KICK–DOWN SWITCH

(a) Disconnect the kick–down switch connector.

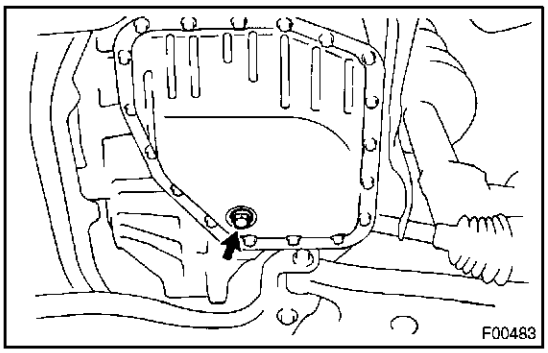
(b) Remove the 2 nuts and kick–down switch.

3. INSTALL KICK–DOWN SWITCH

(a) Install the kick–down switch with the 2 nuts.

(b) Connect the kick–down switch connector.

4. PLACE FLOOR CARPET



VALVE BODY ASSEMBLY

AX05J-01

ON–VEHICLE REPAIR

1. REMOVE DRAIN PLUG AND DRAIN ATF

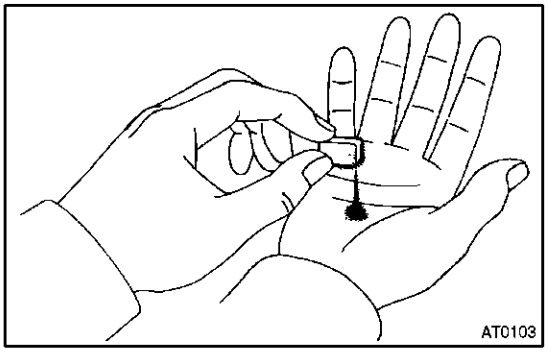
2. REMOVE OIL PAN AND GASKET

Remove the 18 bolts and oil pan.

NOTICE:

Some fluid will remain in the oil pan.

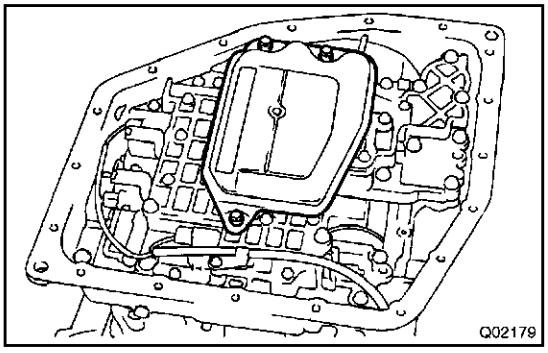
3. REMOVE 2 MAGNETS FROM OIL PAN



4. EXAMINE PARTICLES IN PAN

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): bushing wear

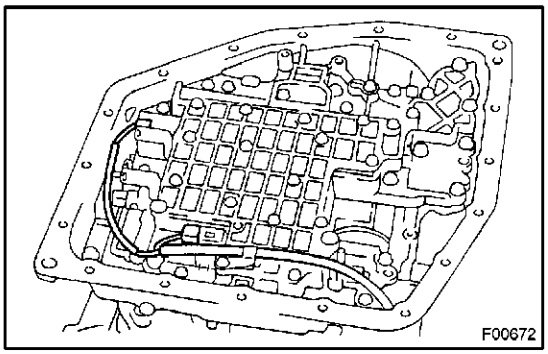


5. REMOVE OIL STRAINER

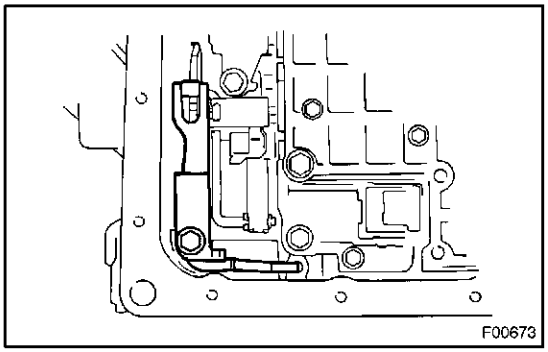
Remove the 3 bolts, oil strainer and gasket.

NOTICE:

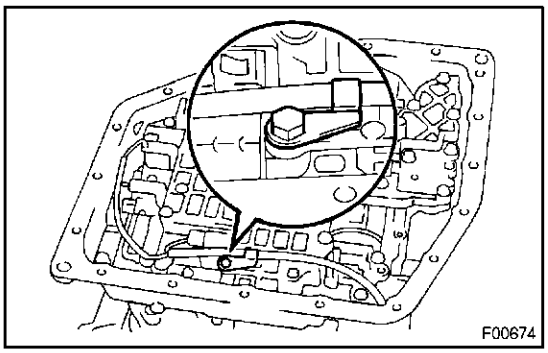
Be careful as some fluid will come out with the oil strainer.



6. DISCONNECT 3 SOLENOID CONNECTORS

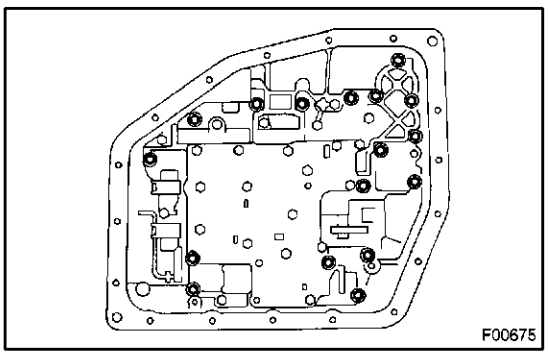


7. REMOVE MANUAL DETENT SPRING

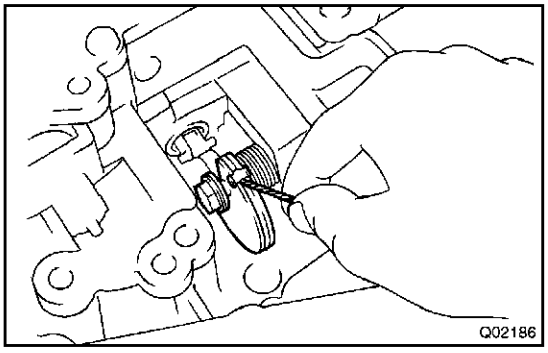


8. REMOVE VALVE BODY

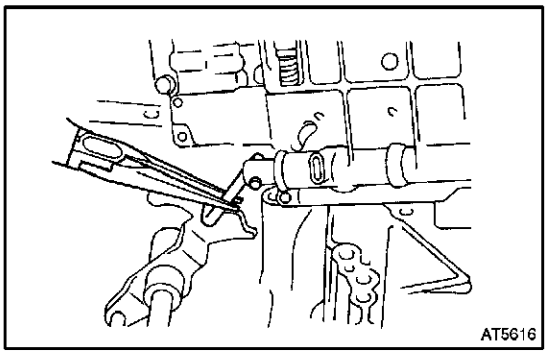
(a) Remove the wire retainer.



(b) Remove the 17 bolts.



(c) Disconnect the throttle cable from the cam.

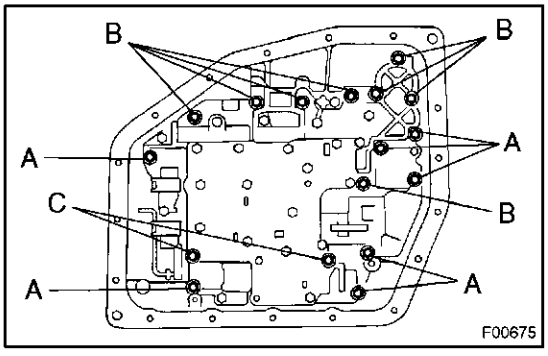


(d) While disconnecting the manual valve connecting rod from the manual valve lever, remove the valve body with the manual valve together.

9. INSTALL VALVE BODY

(a) While connecting the manual valve connecting rod to the manual valve lever, install the valve body with the manual valve together.

(b) Connect the throttle cable to the cam.



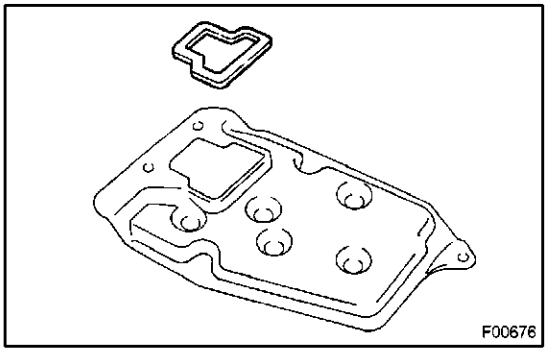
(c) Install the 17 bolts.
Bolt length:
A: 20 mm (0.79 in.)
B: 28 mm (1.10 in.)
C: 50 mm (1.97 in.)
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

(d) Install the wire retainer.
Torque: 6.4 N·m (65 kgf·cm, 56 in.·lbf)

10. REMOVE MANUAL DETENT SPRING
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

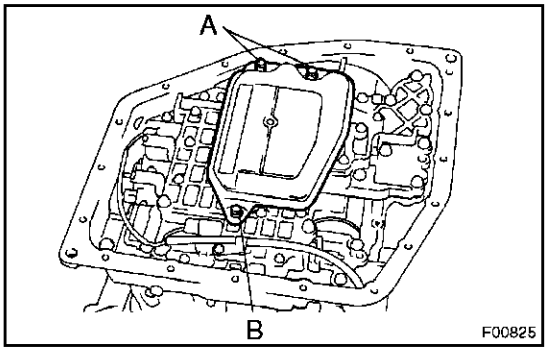
HINT:
The bolt length is 16 mm (0.63 in.).

11. CONNECT 3 SOLENOID CONNECTORS

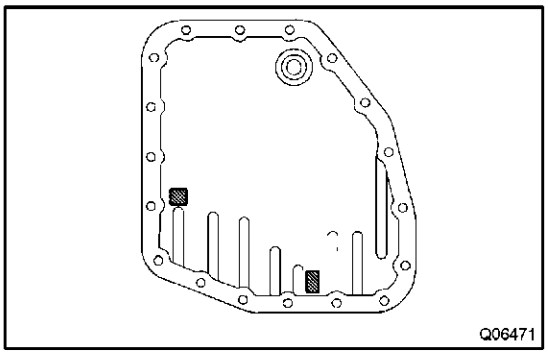


12. INSTALL OIL STRAINER

(a) Install a new gasket to the oil strainer.



(b) 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)



13. INSTALL 2 MAGNETS IN OIL PAN

14. INSTALL OIL PAN AND GASKET

(a) Install a new gasket to the oil pan and install them to the transaxle.

(b) Install the 18 bolts.
Torque: 5.3 N·m (55 kgf·cm, 48 in.·lbf)

15. INSTALL DRAIN PLUG
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

16. FILL ATF AND CHECK FLUID LEVEL
(See page DI–55)

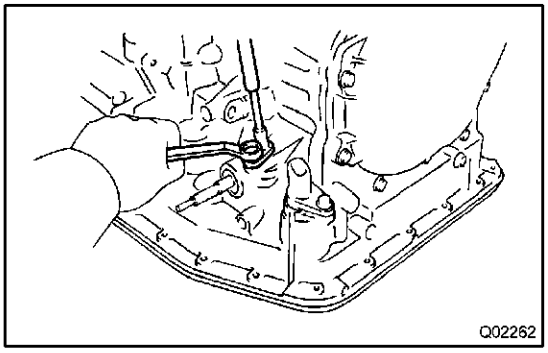
THROTTLE CABLE

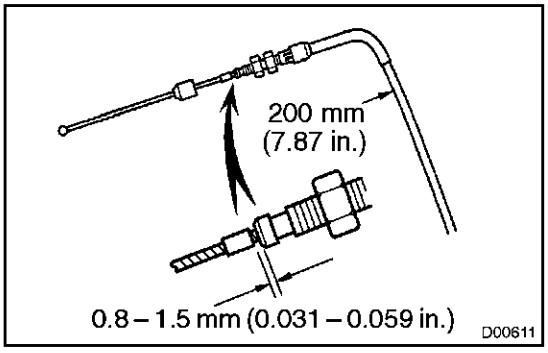
AX05K–01

ON–VEHICLE REPAIR

1. DISCONNECT THROTTLE CABLE FROM ENGINE
2. DISCONNECT SHIFT CONTROL CABLE FROM CONTROL SHAFT LEVER
3. REMOVE NEUTRAL START SWITCH
   (See page AX–4)
4. REMOVE DRAIN PLUG AND DRAIN ATF
5. REMOVE VALVE BODY (See page AX–6)
6. REMOVE THROTTLE CABLE

Remove the retaining bolt and pull out the throttle cable.





7. INSTALL THROTTLE CABLE

If throttle cable is new, do the following operations (a) – (c).

(a) Bend the cable so there is a radius of about 200 mm (7.87 in.).
(b) Pull the inner cable lightly until slight resistance is felt, and hold it there.
(c) Stake the stopper, 0.8 – 1.5 mm (0.031 – 0.059 in.) from the end of the outer cable.
(d) Install a new O–ring to the throttle cable.
(e) Insert the throttle cable and install the retaining bolt.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

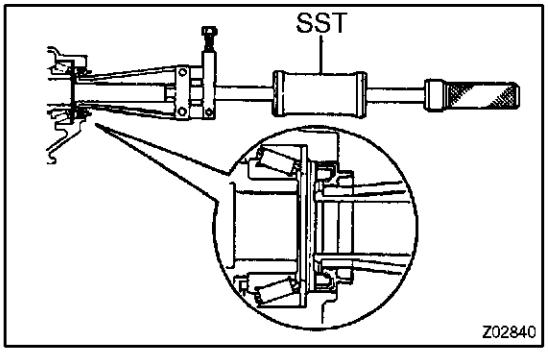
8. INSTALL VALVE BODY (See page AX–6)
9. INSTALL NEUTRAL START SWITCH
   (See page AX–4)
10. CONNECT SHIFT CONTROL CABLE TO CONTROL SHAFT LEVER
    Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)
11. CONNECT THROTTLE CABLE TO ENGINE
12. INSTALL DRAIN PLUG
    Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)
13. FILL ATF AND CHECK FLUID LEVEL
    (See page DI–55)
14. ADJUST THROTTLE CABLE (See page DI–55)
15. TEST DRIVE VEHICLE

DIFFERENTIAL OIL SEAL

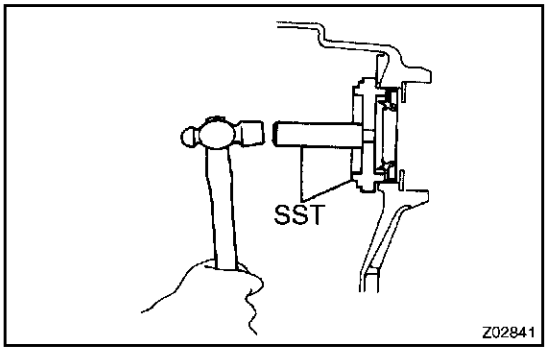
AX02R–02

ON–VEHICLE REPAIR

1. **REMOVE LH AND RH ENGINE UNDER COVERS**
2. **REMOVE LH AND RH DRIVE SHAFTS**
   (See page SA–19)



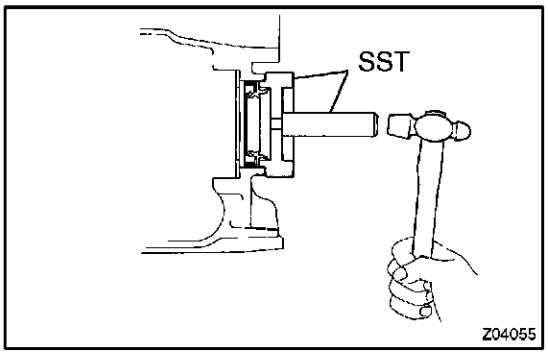
3. **REMOVE LH AND RH OIL SEALS**
   Using SST, drive out the LH and RH oil seals.
   SST 09308–00010



4. **INSTALL LH SIDE OIL SEAL**

(a) Using SST, drive in a new oil seal.
   SST 09350–32014 (09351–32111),
   09950–70010 (09951–07100)
   Oil seal drive depth:
   5.3 ± 0.5 mm (0.209 ± 0.020 in.)

(b) Coat the lip of oil seal with MP grease.



5. **INSTALL RH SIDE OIL SEAL**

(a) Using SST, drive in a new oil seal until SST makes contact with the case surface.
   SST 09350–32014 (09351–32150),
   09950–70010 (09951–07100)
   Oil seal drive depth:
   3.1 ± 0.5 mm (0.122 ± 0.020 in.)

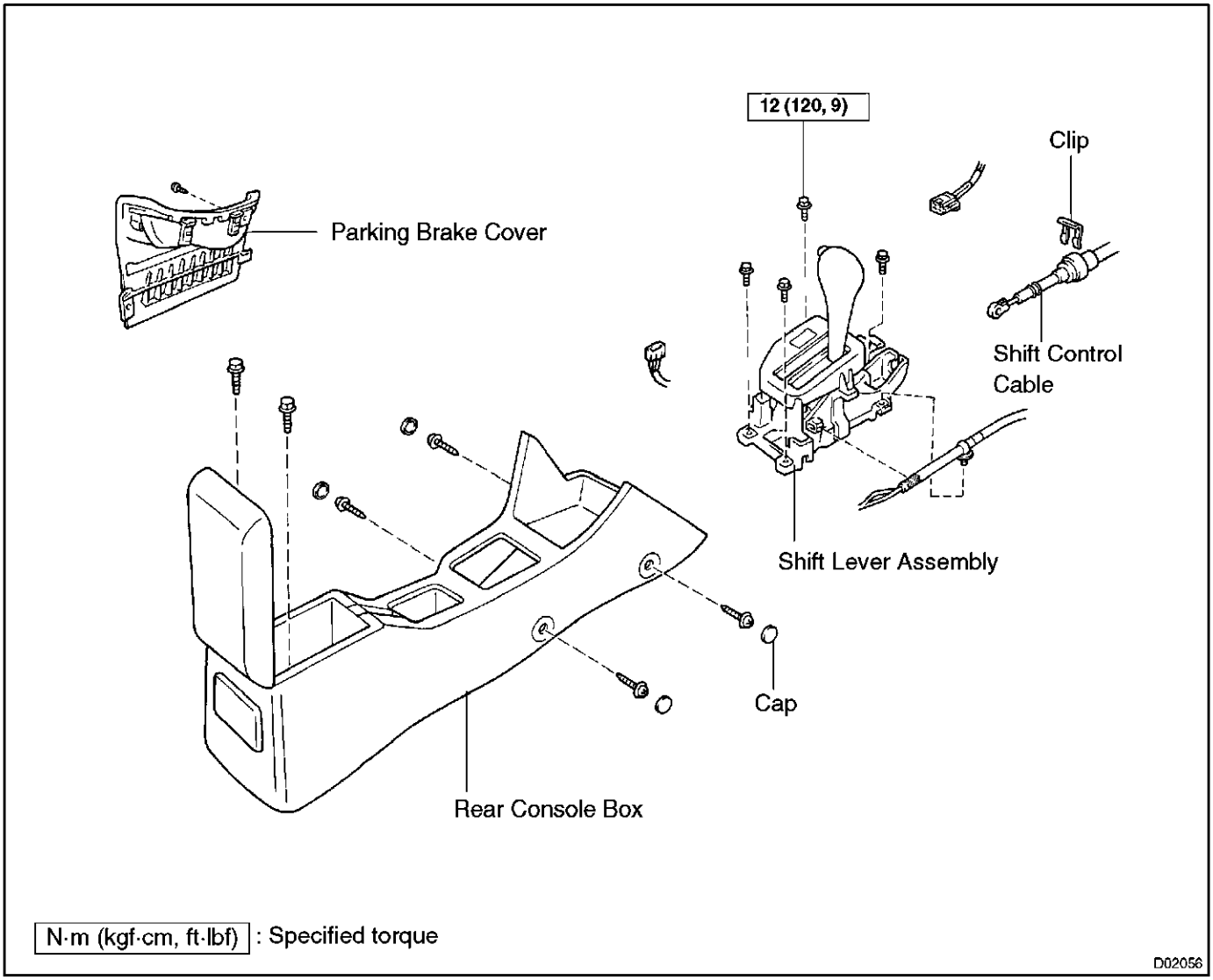
(b) Coat the lip of the oil seal with MP grease.

6. **INSTALL LH AND RH DRIVE SHAFTS**
   (See page SA–28)
7. **FILL ATF AND CHECK FLUID LEVEL**
   (See page DI–55)
8. **INSTALL LH AND RH ENGINE UNDER COVERS**

FLOOR SHIFT ASSEMBLY (LHD)

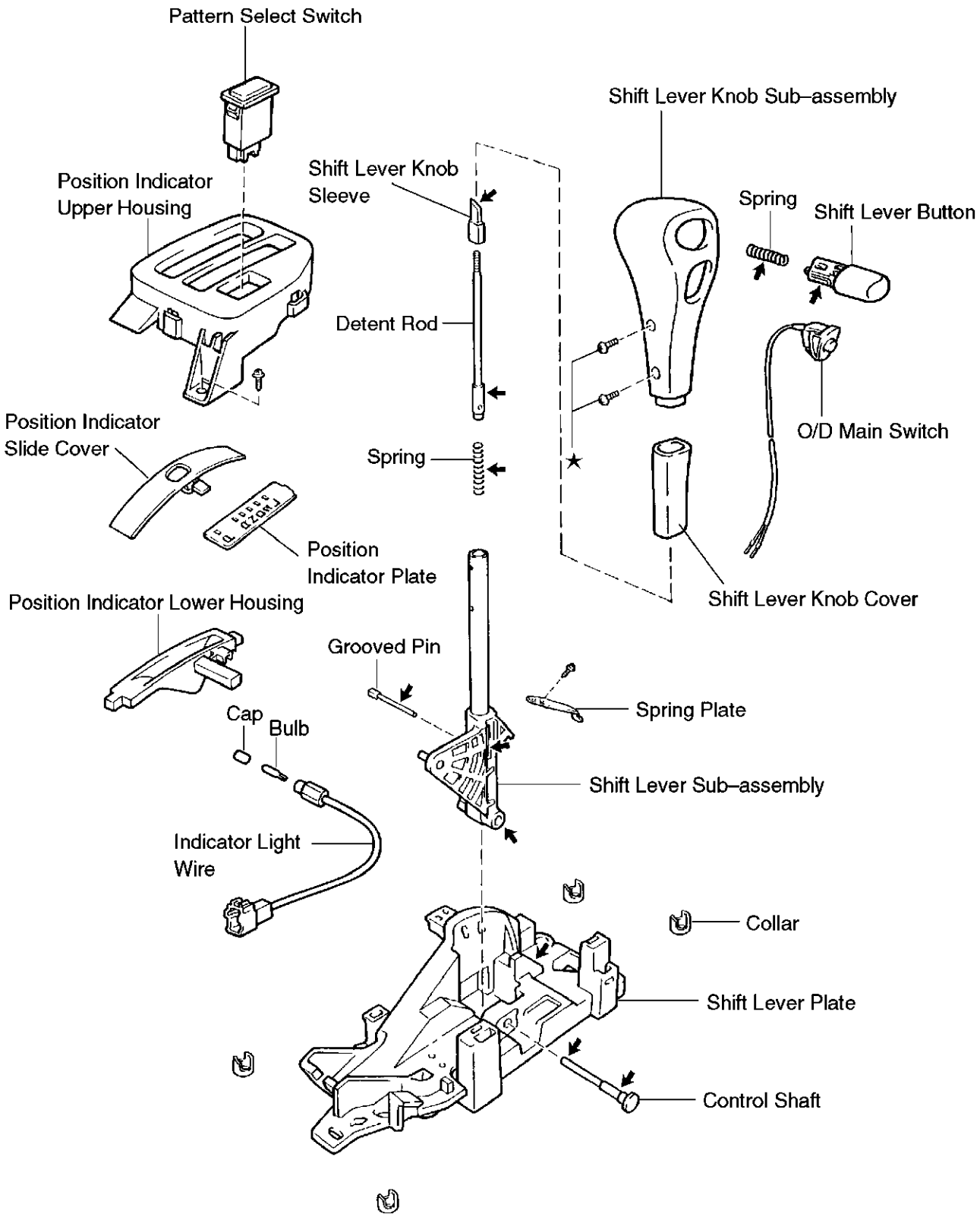
COMPONENTS

AX02U–02



N·m (kgf·cm, ft·lbf) : Specified torque

D02056


Pattern Select Switch
Shift Lever Knob Sub–assembly
Position Indicator Upper Housing
Shift Lever Knob Sleeve
Spring
Shift Lever Button
Detent Rod
O/D Main Switch
Position Indicator Slide Cover
Spring
Position Indicator Plate
Shift Lever Knob Cover
Position Indicator Lower Housing
Grooved Pin
Spring Plate
Cap
Bulb
Shift Lever Sub–assembly
Indicator Light Wire
Collar
Shift Lever Plate
Control Shaft
MP grease
★ Precoated part
D02079

AX05L–01

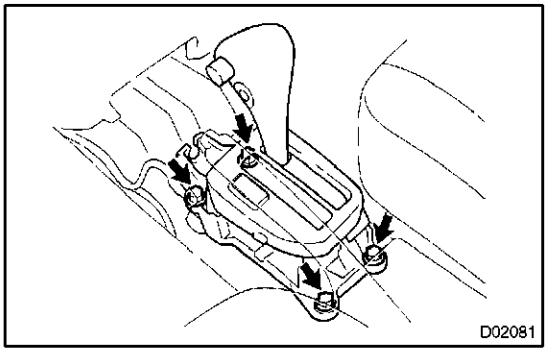
REMOVAL

1. REMOVE REAR CONSOLE (See page BO–113)

2. REMOVE SHIFT LEVER ASSEMBLY

(a) Disconnect the 2 connectors and wire harness.

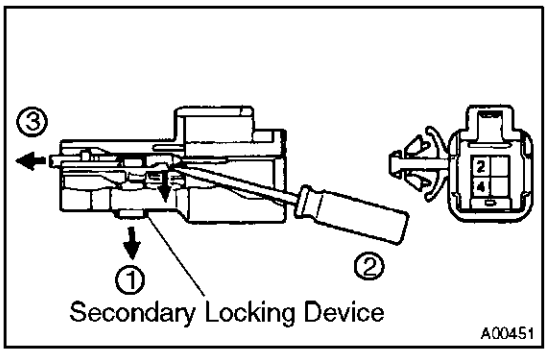
(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and floor shift assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX02W–02

DISASSEMBLY



1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove O/D main switch connector from the shift lever plate.

(b) Disengage the secondary locking device.

(c) Disengage the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to apply unnatural load onto O/D main switch wire harness.

(b) Remove these parts:

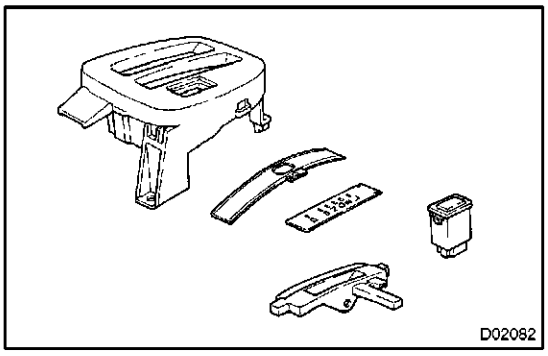
- Shift lever knob cover
- Shift lever button
- Spring
- O/D main switch

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE BULB AND CAP FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING SUB–ASSEMBLY

Remove the screw and an indicator housing sub–assembly.

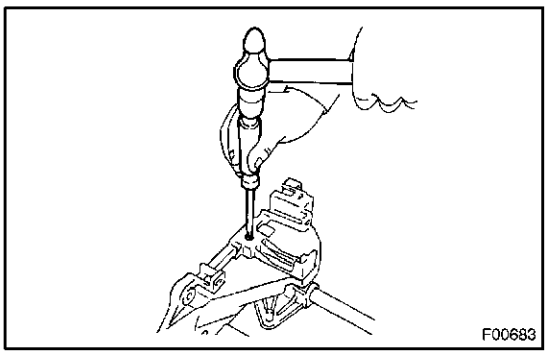


6. DISASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Remove these parts from the position indicator upper housing.

- Pattern select switch
- Position indicator lower housing
- Position indicator slide cover
- Position indicator plate

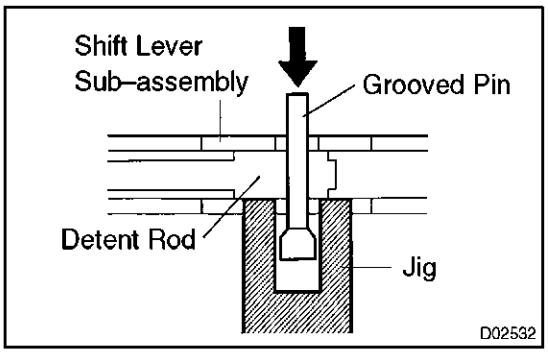
7. REMOVE SPRING PLATE



8. REMOVE SHIFT LEVER SUB–ASSEMBLY

(a) Using a screwdriver and a hammer, remove the control shaft.

(b) Remove the shift lever sub–assembly.



9. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

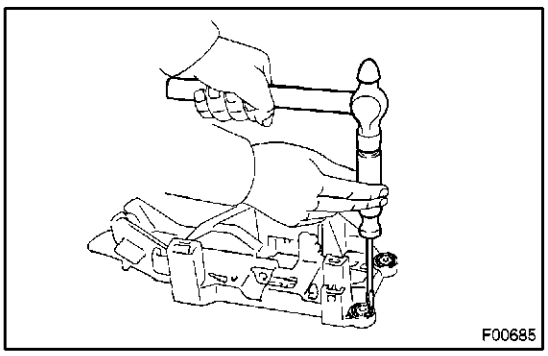
(a) Secure the room for the pin to be released by using a jig as shown in the illustration, and hit the grooved pin with a hammer and pull the grooved pin out.

NOTICE:

- **Hit and pull the pin out gradually.**
- **Do not damage the shift lever sub–assembly.**

(b) Remove the detent rod and compression spring.

(c) Remove the shift lever knob sleeve from the detent rod.



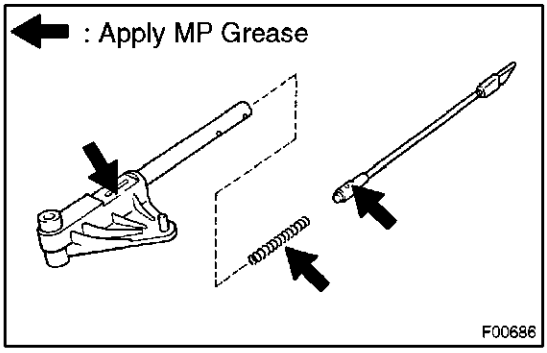
10. REMOVE COLLARS

Using a screwdriver and a hammer, remove the 4 collars.

AX05M–01

REASSEMBLY

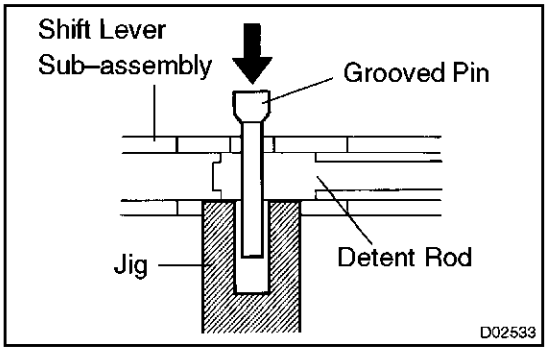
1. **INSTALL COLLARS**
2. **INSTALL SHIFT LEVER KNOB SLEEVE TO DETENT ROD**



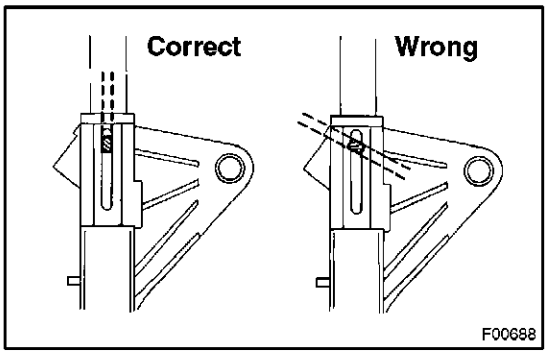
3. **ASSEMBLE SHIFT LEVER SUB–ASSEMBLY**

(a) Apply MP grease to the compression spring, the detent rod and the shift lever sub–assembly.

(b) Install the compression spring and the detent rod to shift lever sub–assembly.



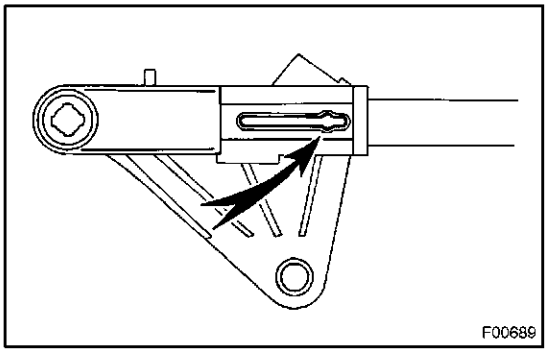
(c) Place the shift lever sub–assembly as shown in the illustration.



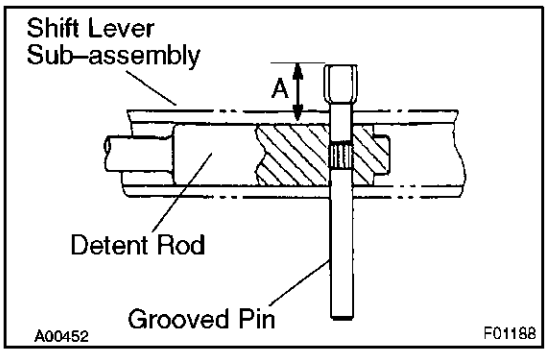
(d) Insert the grooved pin in the detent rod pin hole.

NOTICE:

- **Assemble the grooved pin so that it fits into the guide hole of the shift lever sub–assembly in parallel.**
- **Take care not to insert the pin in the wrong direction against the detent rod.**



(e) Meet the grooved pin with the notch of the guide hole.



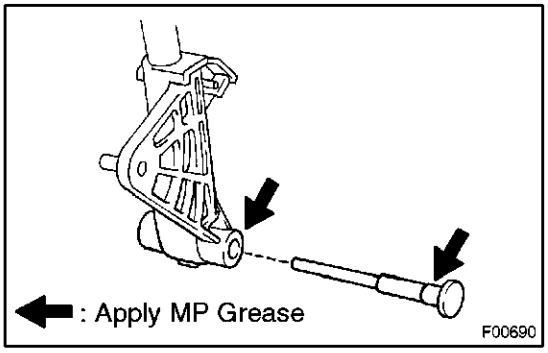
(f) Press the pin with a hammer.

A: 10.0 – 10.4 mm (0.39 – 0.41 in.)

NOTICE:

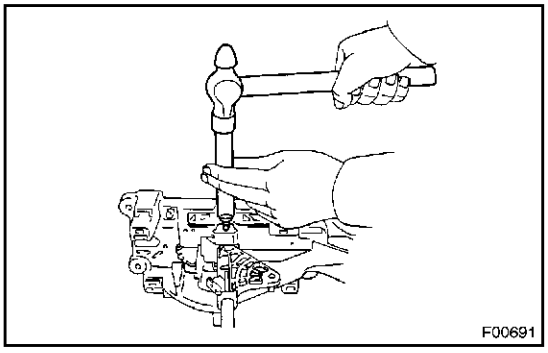
When pressing in the grooved pin, if doing it at the place other than the notch, the shift lever sub–assembly might be damaged.

4. CHECK DETENT ROD OPERATION



5. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease.



(b) Using a brass bar and a hammer, install the control shaft and the shift lever sub–assembly to the shift lever plate.

NOTICE:

Take care not to install them in the wrong direction against the shift lever sub–assembly.

6. INSTALL SPRING PLATE

7. ASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Install these parts to the position indicator upper housing.

- Position indicator plate
- Position indicator slide plate
- Position indicator lower housing
- Patter select switch

8. INSTALL INDICATOR HOUSING SUB–ASSEMBLY

Install the screw and an indicator housing.

9. INSTALL CAP AND BULB TO INDICATOR LIGHT WIRE

10. INSTALL INDICATOR LIGHT WIRE

11. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Install these parts:

HINT:

Apply MP grease to shift lever knob button.

- O/D main switch
- Spring
- Shift lever button
- Shift lever knob cover

(b) Install the shift lever knob sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

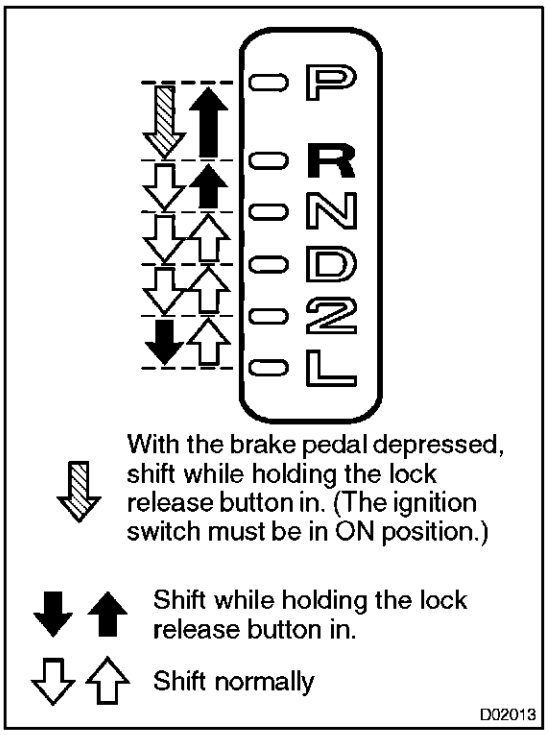
NOTICE:

Make sure not to catch O/D main switch wire harness.

(c) Install the O/D main switch wire harness securely and hang it on the hook of the shift lever sub–assembly.

12. INSTALL O/D MAIN SWITCH TERMINAL

AX02Y–02



INSTALLATION

Installation is in the reverse order of removal (See page AX–13).

HINT:

After installation, adjust shift lever ranges (See page DI–55) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

  Ranges which can be operated only with pressing the shift lever nob button

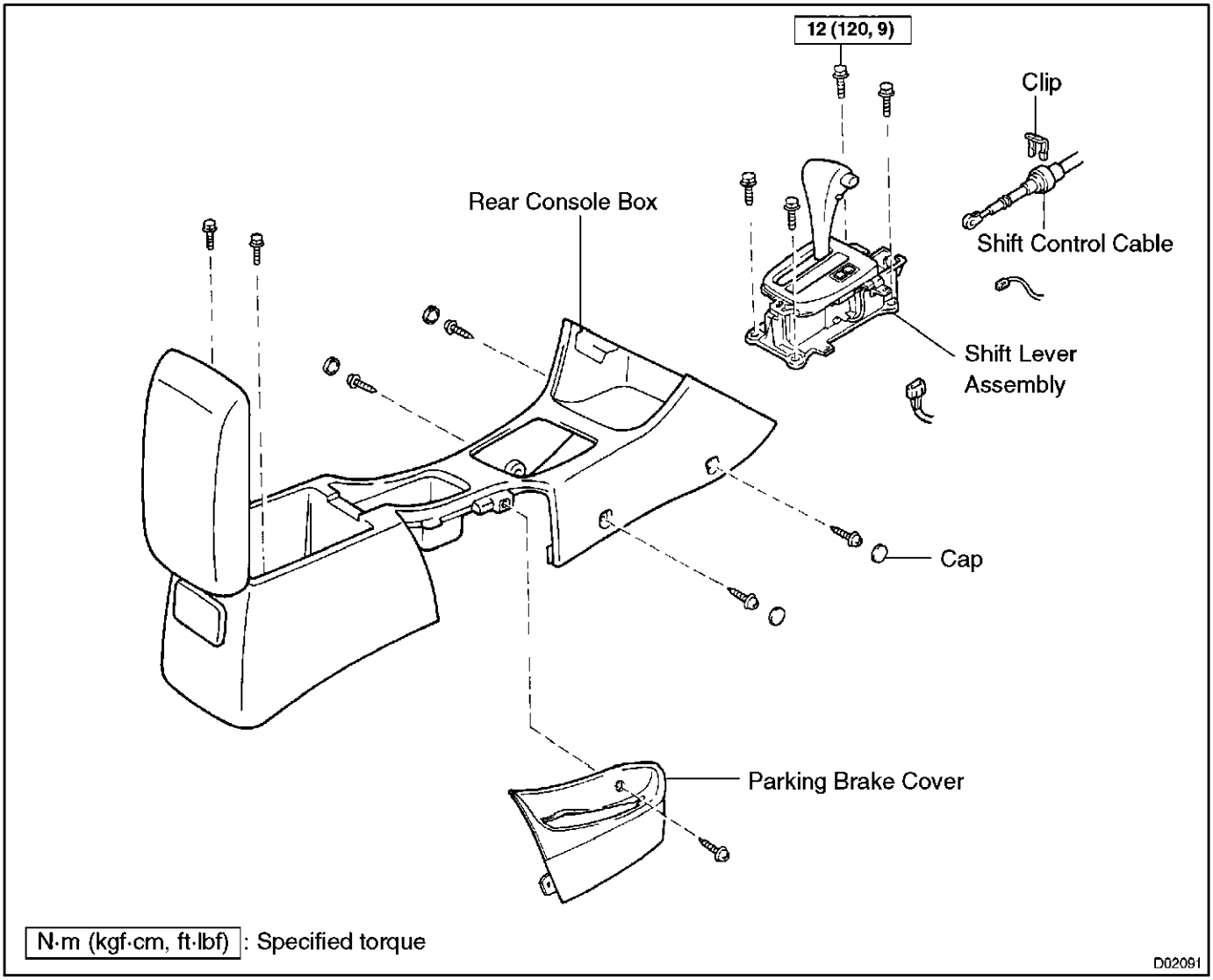
  P → R, 2 → L, N → R → P

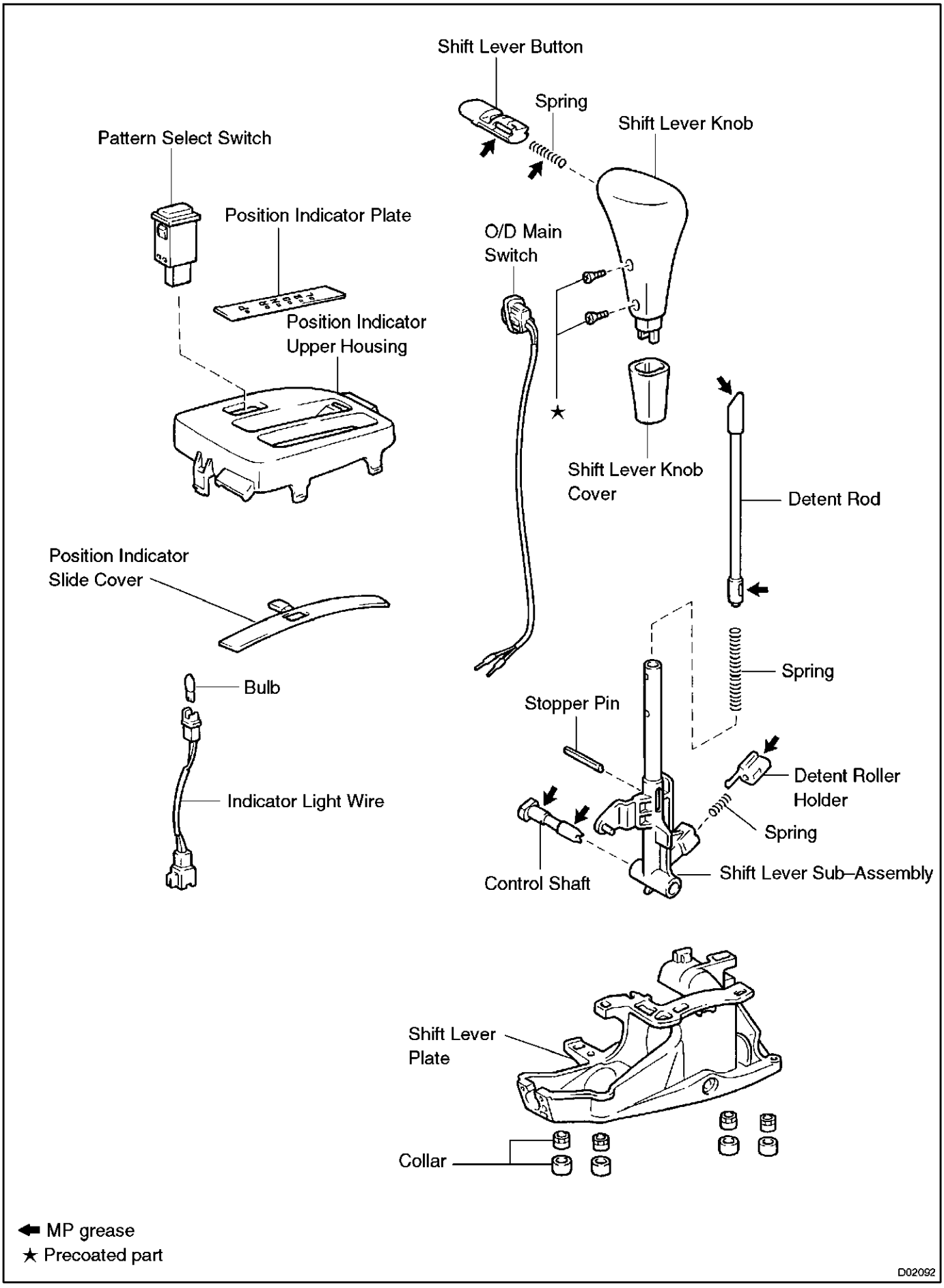
- When starting the engine, make sure that the vehicle moves forward when shifting from N to D range, and moves rearward when shifting to R range.

FLOOR SHIFT ASSEMBLY (RHD)

COMPONENTS

AX05N–01




Shift Lever Button
Spring
Shift Lever Knob
Pattern Select Switch
Position Indicator Plate
O/D Main Switch
Position Indicator Upper Housing
Shift Lever Knob Cover
Detent Rod
Position Indicator Slide Cover
Bulb
Spring
Stopper Pin
Detent Roller Holder
Indicator Light Wire
Spring
Control Shaft
Shift Lever Sub–Assembly
Shift Lever Plate
Collar
MP grease
★ Precoated part
D02092

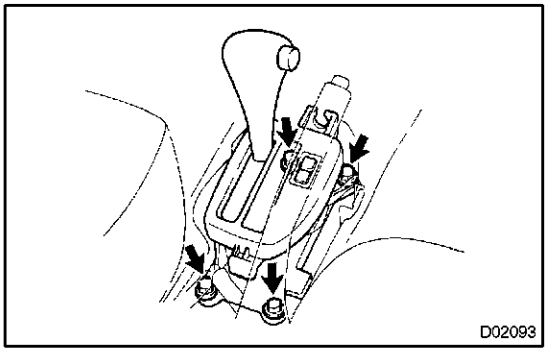
AX05O–01

REMOVAL

1. **REMOVE REAR CONSOLE (See page BO–113)**
2. **REMOVE FLOOR SHIFT ASSEMBLY**

(a) Disconnect the connectors.

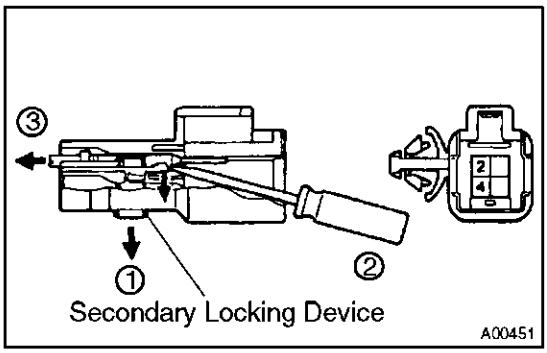
(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and shift lever assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX05P–01

DISASSEMBLY



1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove O/D main switch connector from the shift lever plate.

(b) Disengage the secondary locking device.

(c) Disengage the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to apply unnatural load onto O/D main switch wire harness.

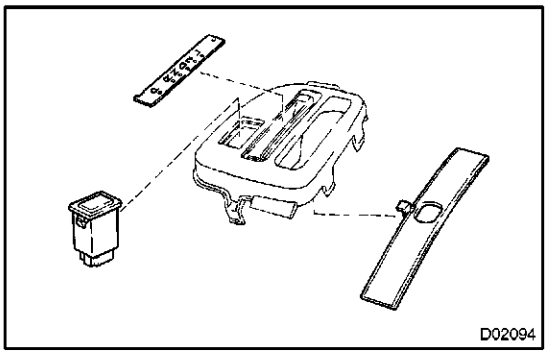
(b) Remove these parts:

- Shift lever knob cover
- Shift lever button
- Spring
- O/D main switch

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE BULB FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING SUB–ASSEMBLY

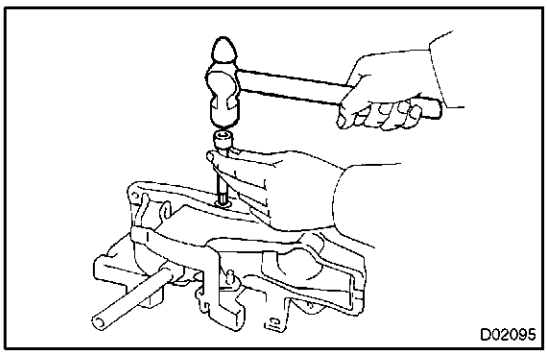


6. DISASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Remove these parts from the position indicator upper housing.

- Position indicator slide cover
- Position indicator plate
- Pattern select switch

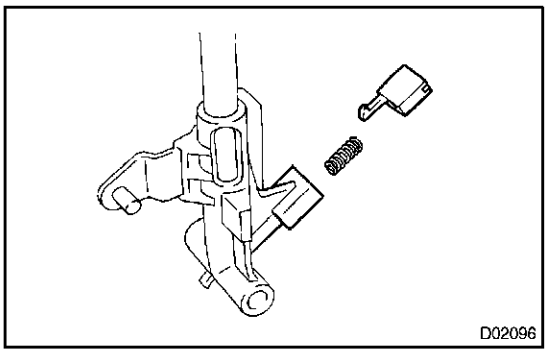
7. REMOVE STOPPER PIN, DETENT ROD AND COMPRESSION SPRING



8. REMOVE SHIFT LEVER SUB–ASSEMBLY

(a) Using an extension bar and hammer, remove the control shaft.

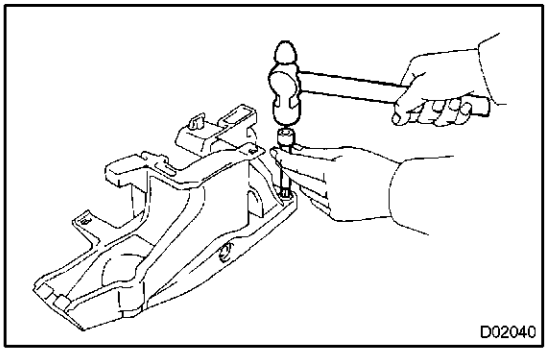
(b) Remove the shift lever sub–assembly.



9. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

Remove these part:

- Detent roller holder
- Compression spring



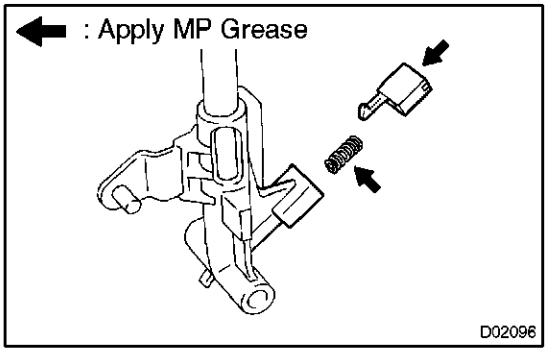
10. REMOVE COLLARS

Using an extension bar and hammer, remove the 4 collars.

AX05Q–01

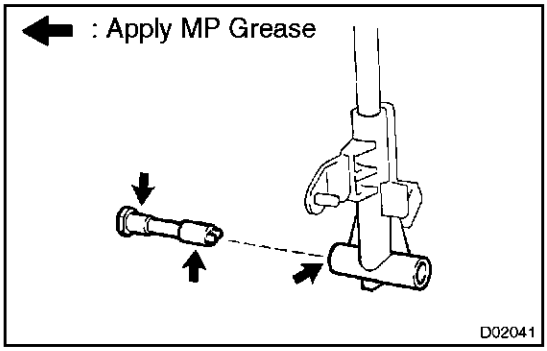
REASSEMBLY

1. INSTALL COLLARS



2. ASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the detent roller holder, compression spring and shift lever sub–assembly.
(b) Install the compression spring to the detent roller holder.
(c) Install the detent roller holder with the compression spring to the shift lever sub–assembly.



3. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the control shaft and shift lever sub–assembly.
(b) Using an extension bar and hammer, install the control shaft and shift lever sub–assembly to the shift lever plate.

4. INSTALL COMPRESSION SPRING, DETENT ROD AND STOPPER PIN

(a) Apply the MP grease to the detent rod and stopper pin.
(b) Install the compression spring and detent rod to the shift lever sub–assembly.
(c) Insert the stopper pin in the stopper pin hole.

NOTICE:

Take care not to insert the pin in the wrong direction against the detent rod.

5. CHECK SHIFT LEVER OPERATION

6. ASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

Install these parts to the position indicator upper housing.

- Pattern select switch
- Position indicator plate
- Position indicator slide plate

7. INSTALL INDICATOR HOUSING SUB–ASSEMBLY

8. INSTALL BULB TO INDICATOR LIGHT WIRE

9. INSTALL INDICATOR LIGHT WIRE

10. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Install these parts:

HINT:

Apply MP grease to the shift lever knob button.

- O/D main switch
- Spring
- Shift lever button
- Shift lever knob cover

(b) Install the shift lever knob sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

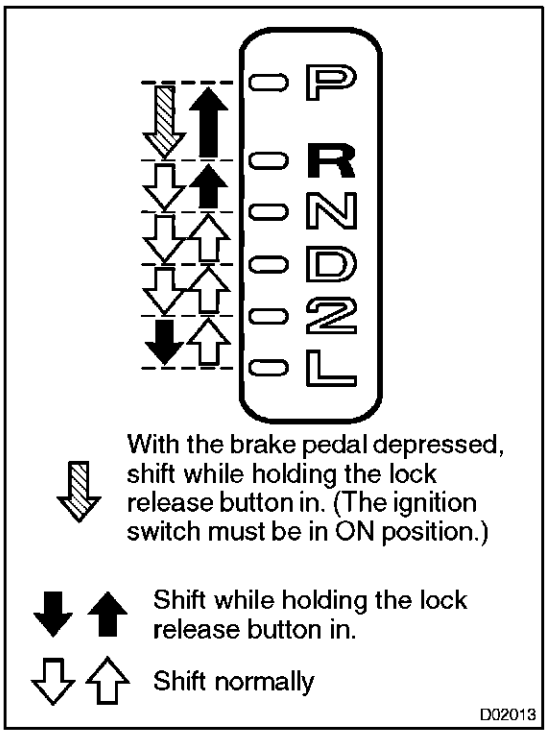
NOTICE:

Make sure not to catch O/D main switch wire harness.

(c) Install the O/D main switch wire harness securely and hang it on the hook of the shift lever sub–assembly.

11. INSTALL O/D MAIN SWITCH TERMINAL

AX05R–01



INSTALLATION

Installation is in the reverse order of removal (See page AX–22).

HINT:

After installation, adjust shift lever ranges (See page DI–55) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

  Ranges which can be operated only with pressing the shift lever nob button

  P → R, 2 → L, N → R → P

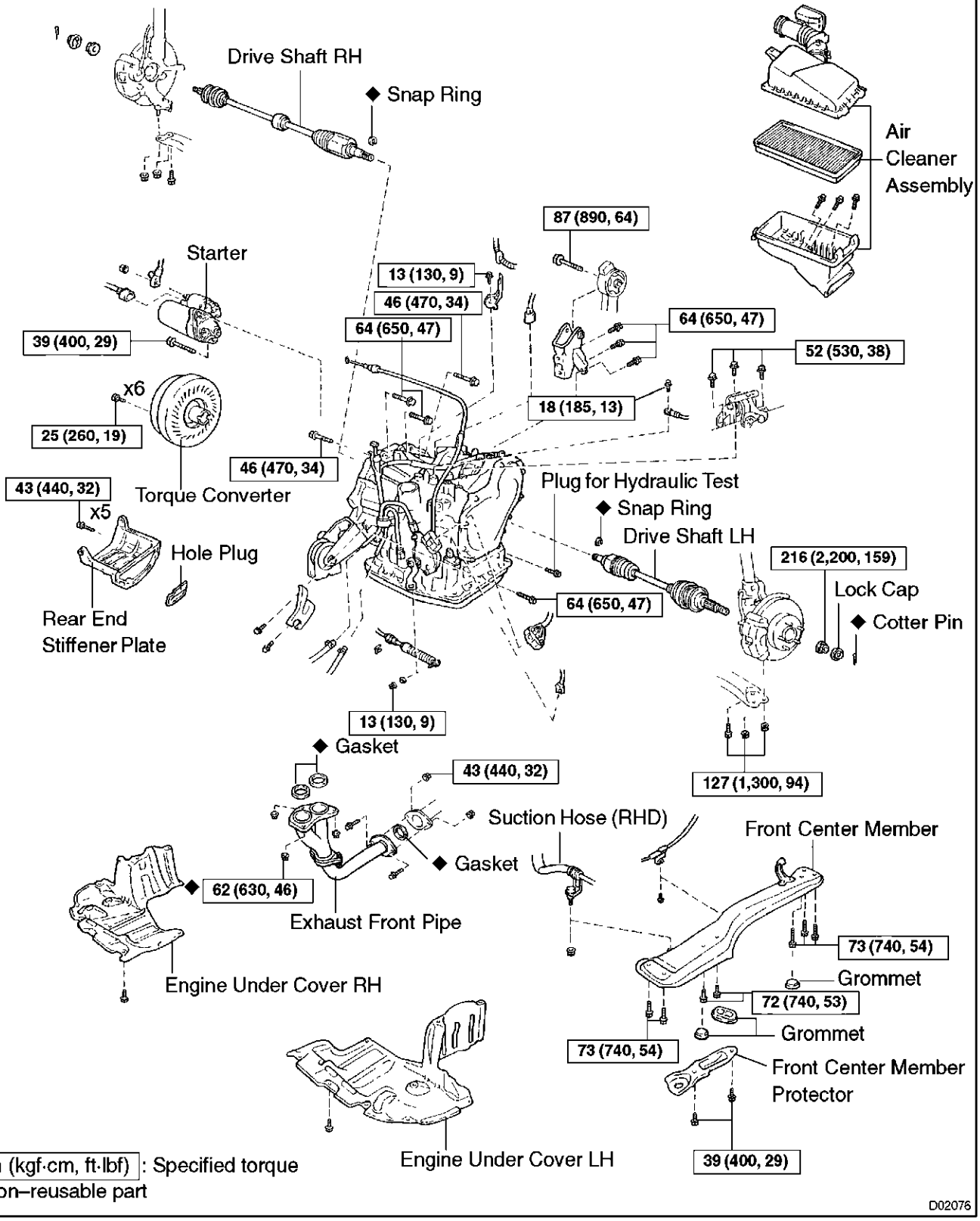
- When starting the engine, make sure that the vehicle moves forward when shifting from N to D range, and moves rearward when shifting to R range.

AUTOMATIC TRANSAXLE UNIT

COMPONENTS

AX05S–01

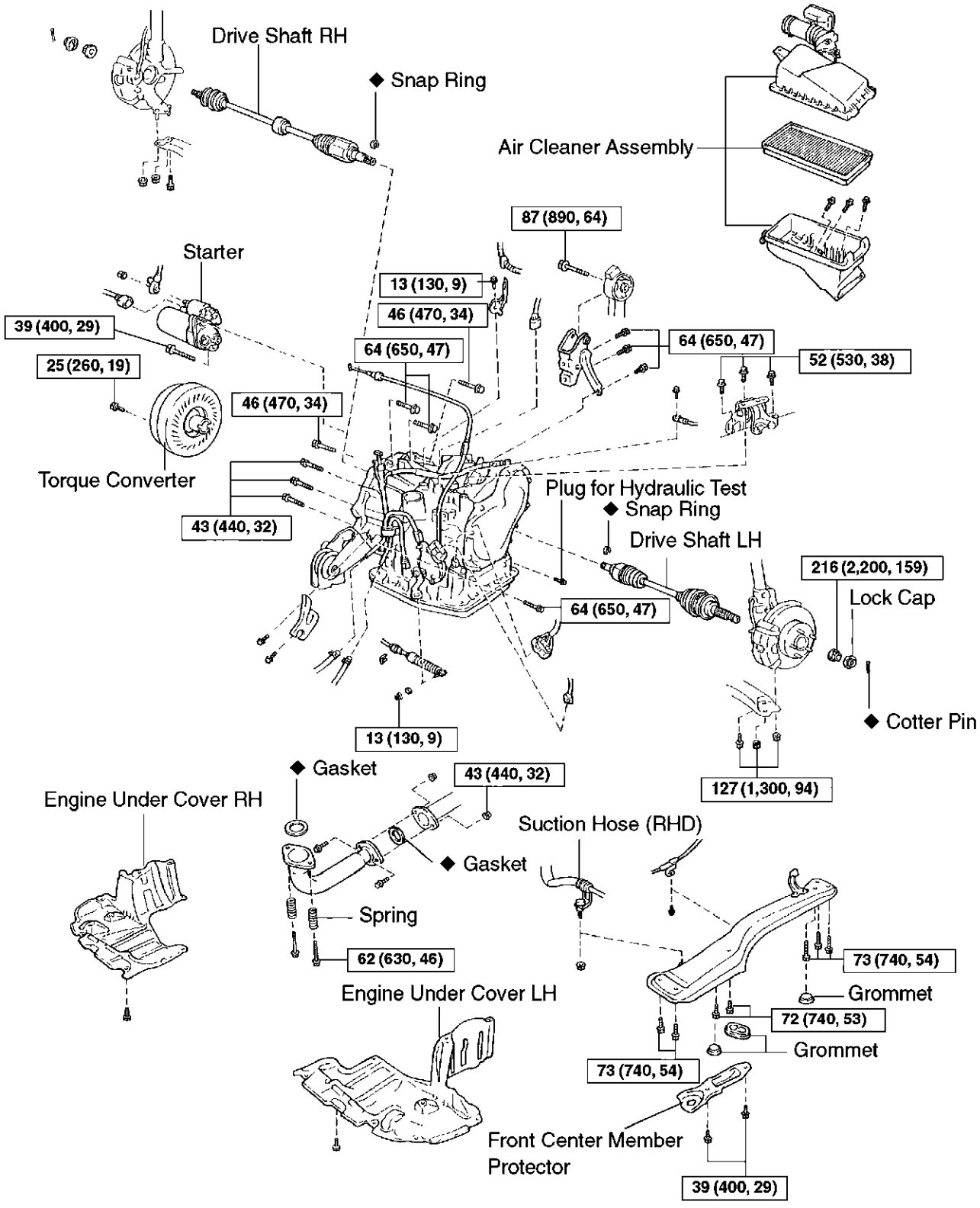
A245E



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02076

A246E



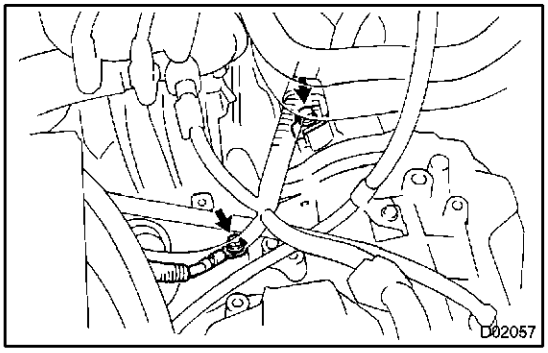
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02527

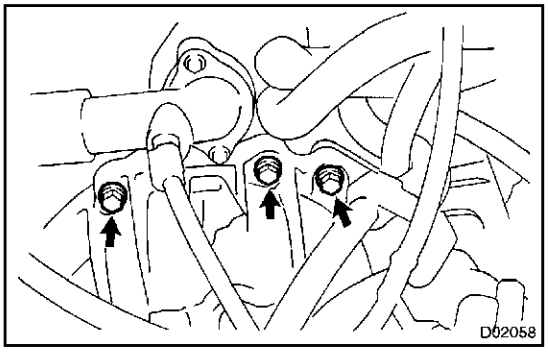
AX05T–01

REMOVAL

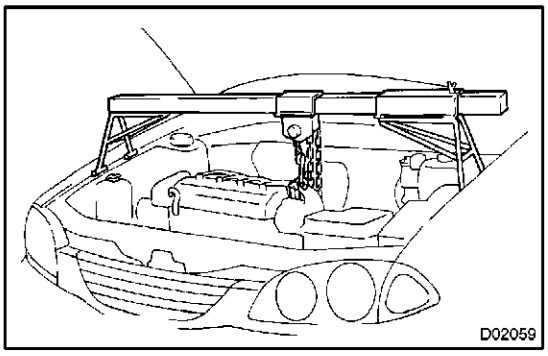
1. DISCONNECT THROTTLE CABLE
2. REMOVE AIR CLEANER ASSEMBLY



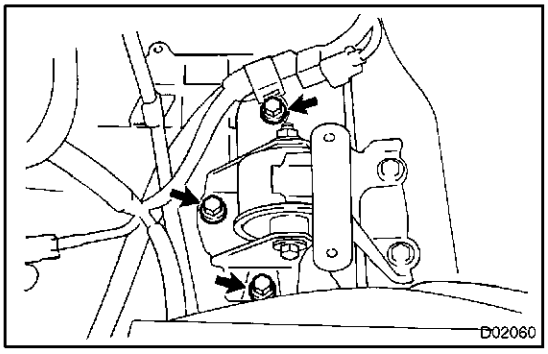
3. DISCONNECT GROUND CABLE
   Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)
4. REMOVE WIRE HARNESS CLAMP
   Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



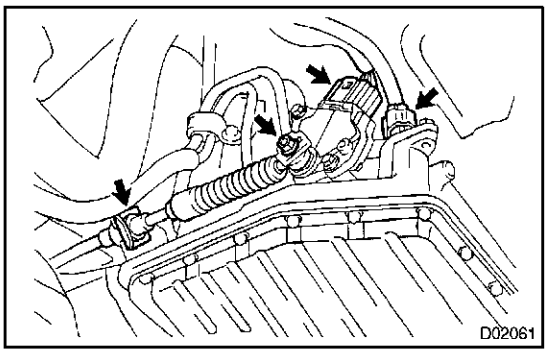
5. REMOVE 2 UPPER SIDE TRANSAXLE MOUNTING BOLTS
   Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)
6. REMOVE UPPER SIDE STARTER MOUNTING BOLT
   Torque: 46 N·m (470 kgf·cm, 34 ft·lbf)
7. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR



8. INSTALL ENGINE SUPPORT FIXTURE



9. REMOVE LH ENGINE MOUNTING 3 BOLTS
   Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)
10. REMOVE ENGINE UNDER COVERS
11. REMOVE LH AND RH DRIVE SHAFTS
    (See page SA–19)

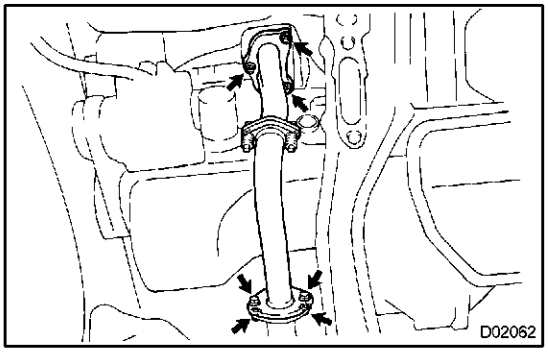


12. DISCONNECT SHIFT CONTROL CABLE

Remove the nut, clip and disconnect the shift control cable.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

13. DISCONNECT NEUTRAL START SWITCH CONNECTOR AND SOLENOID CONNECTOR



14. A245E:

REMOVE EXHAUST FRONT PIPE

(a) Remove the 3 nuts from the exhaust manifold.

Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

HINT:

At the time of installation, please refer to the following item.

Replace the used nuts with new ones.

(b) Remove the 2 bolts, nuts and exhaust front pipe with the 3 gaskets.

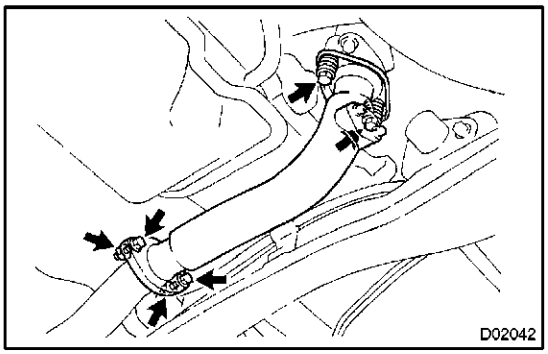
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

(c) Remove the 3 gaskets from the exhaust front pipe.

HINT:

At the time of installation, please refer to the following item.

Replace the used gaskets with new ones.



15. A246E:

REMOVE EXHAUST FRONT PIPE

(a) Remove the 2 bolts and springs from the exhaust manifold.

Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

(b) Remove the 2 bolts, nuts and exhaust front pipe with the 2 gaskets.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

(c) Remove the 2 gaskets from the exhaust front pipe.

HINT:

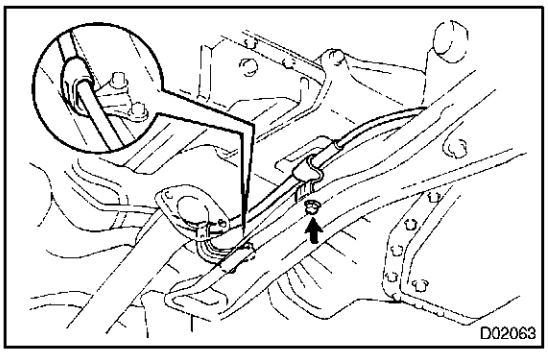
At the time of installation, please refer to the following item.

Replace the used gaskets with new ones.

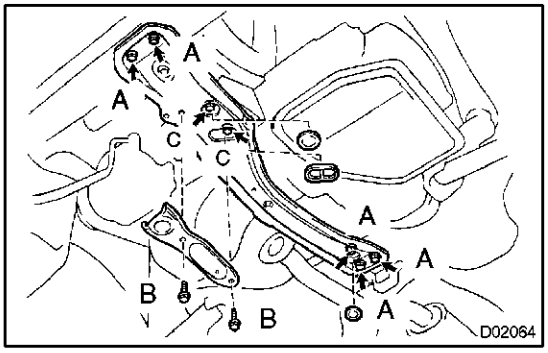
16. REMOVE FRONT CENTER MEMBER

(a) RHD:

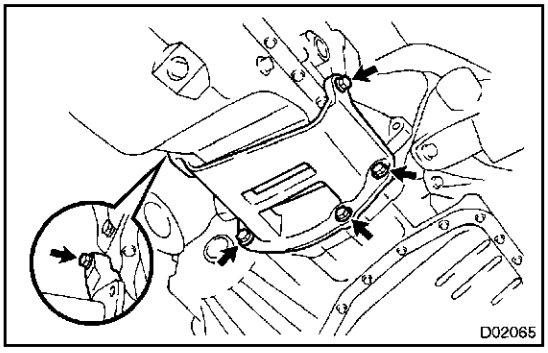
Remove the nut and disconnect the suction hose from the front center member.



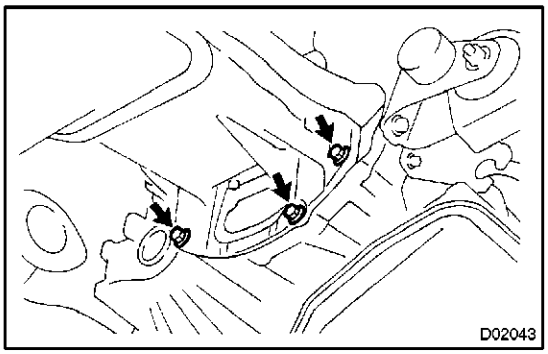
(b) Remove the bolt and disconnect the shift control cable from the bracket.



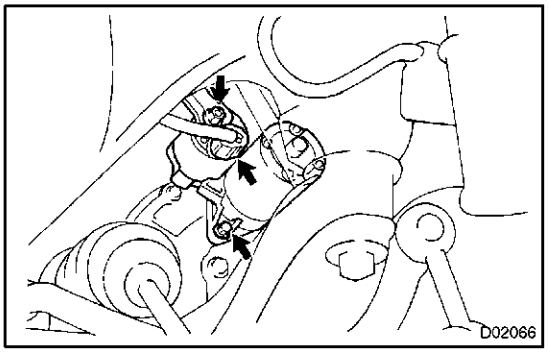
(c) Remove the 9 bolts, 3 grommets, front center member protector and front center member.
Torque:
A : 73 N·m (740 kgf·cm, 54 ft·lbf)
B : 39 N·m (400 kgf·cm, 29 ft·lbf)
C : 72 N·m (740 kgf·cm, 53 ft·lbf)



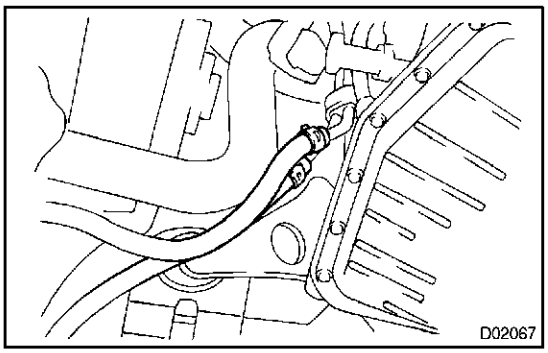
17. A245E:
REMOVE REAR END STIFFENER PLATE
Remove the 5 bolts and rear end stiffener plate.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



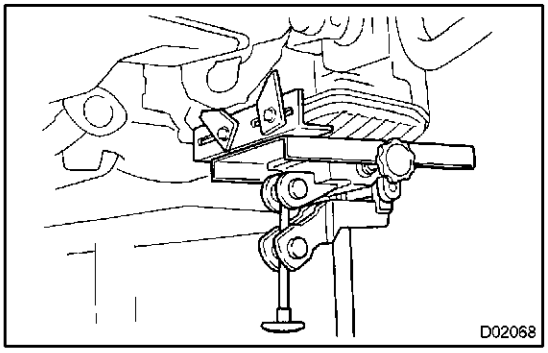
18. A246E:
REMOVE REAR END STIFFENER PLATE BOLT
Remove the 3 bolts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



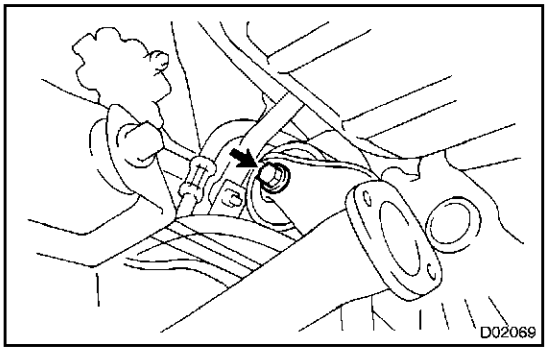
19. REMOVE STARTER
(a) Remove the nut and disconnect the connector.
(b) Remove the bolt and starter.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



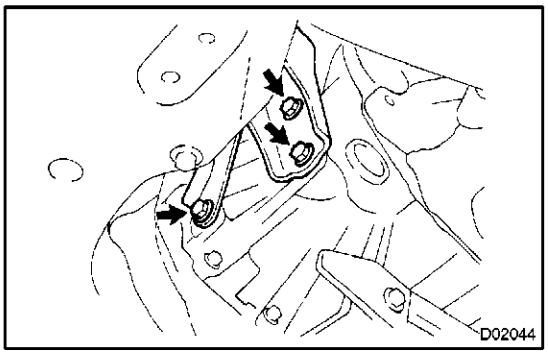
20. DISCONNECT OIL COOLER HOSES



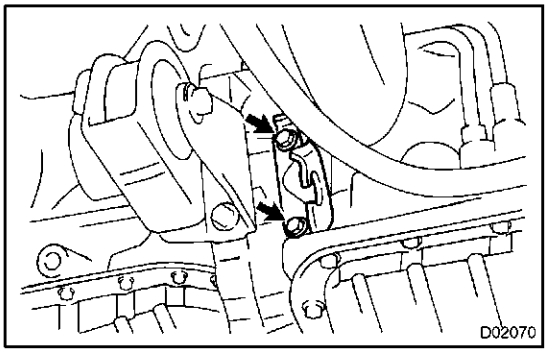
21. SUPPORT TRANSAXLE



22. REMOVE ENGINE REAR MOUNTING BOLT
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)

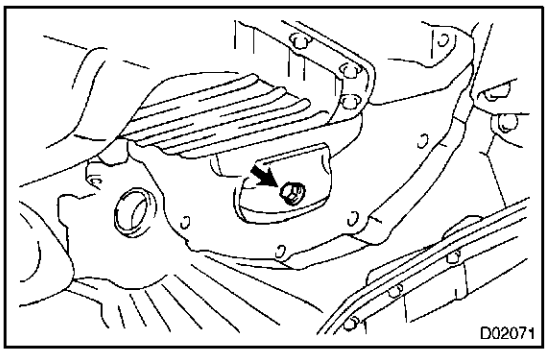


23. REMOVE ENGINE REAR MOUNTING BRACKET
Remove the 3 bolts and engine rear mounting bracket.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



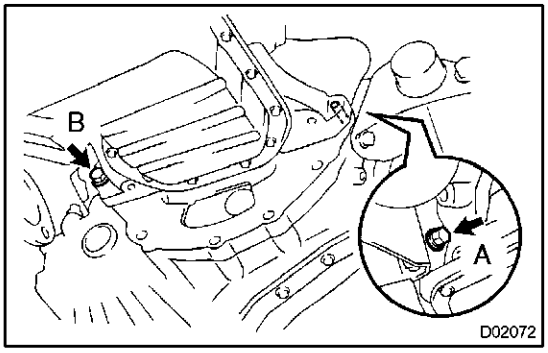
24. REMOVE SHIFT CONTROL CABLE BRACKET
Remove the 2 bolts and shift control cable bracket.

25. REMOVE TRANSAXLE
(a) Remove the hole plug.



(b) Turn the crankshaft to gain access and remove the 6 bolts with holding the crankshaft pulley bolt by a wrench.
Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

HINT:
At the time of installation, please refer to the following item.
First, install the gray bolt. Then install 5 black bolts.

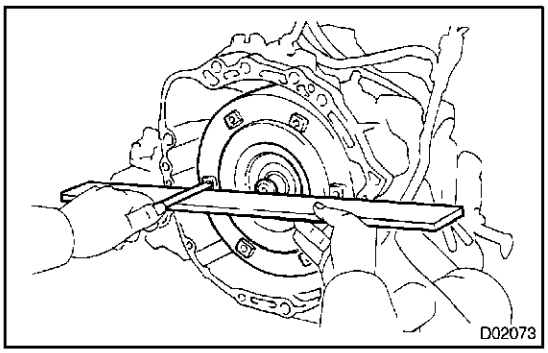


(c) Remove the 2 bolts,
Torque:
A: 64 N·m (650 kgf·cm, 47 ft·lbf)
B: 46 N·m (470 kgf·cm, 34 ft·lbf)

(d) Lower the left side of engine and remove the transaxle from the engine.

HINT:
At the time of installation, please refer to the following item.
Temporarily tighten the transaxle mounting bolts.

AX05U–01



INSTALLATION

1. CHECK TORQUE CONVERTER INSTALLATION

Using a scale and straight edge, measure the distance from the installation surface to the front surface of the transaxle housing.

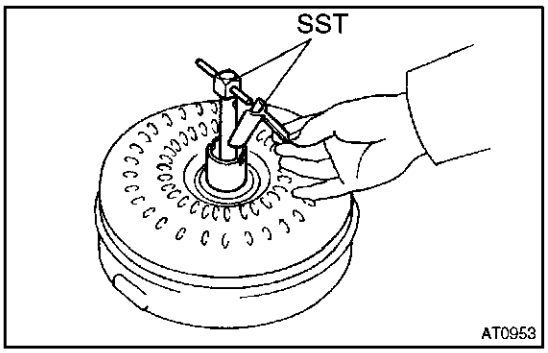
Correct distance: More than 22.8 mm (0.898 in.)

2. TRANSAXLE INSTALLATION

Installation is in the reverse order of removal (See page AX–30).

HINT:

- After installation, adjust the throttle cable, shift control cable and neutral start switch (See page DI–55).
- Fill ATF and check fluid level (See page DI–55).
- Test drive vehicle.



TORQUE CONVERTER AND DRIVE PLATE

AX05V–01

INSPECTION

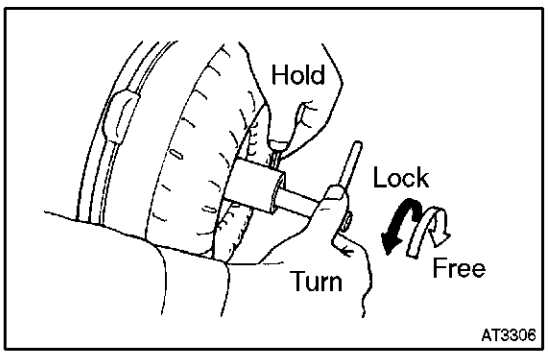
1. INSPECT ONE–WAY CLUTCH

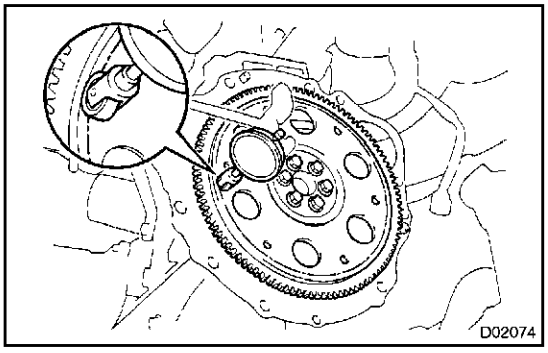
(a) Install SST into the inner race of the one–way clutch.
SST 09350–32014 (09351–32010)

(b) 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)

(c) With the torque converter set up on its side, check that the clutch locks when it is turned counterclockwise, and rotates smoothly clockwise.

If necessary, clean the converter and retest the clutch.
Replace the converter if the clutch still fails the test.



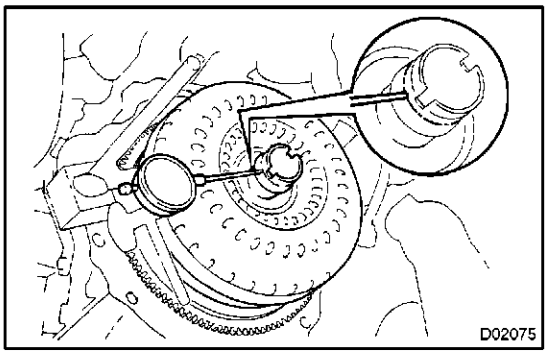


2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

(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.
Torque: 64 N·m (650 kgf·cm 47 ft·lbf)



3. MEASURE TORQUE CONVERTER SLEEVE RUNOUT

Temporarily mount the torque converter to the drive plate.
Set up a dial indicator and measure the torque converter sleeve runout.
Maximum runout: 0.30 mm (0.0118 in.)

If the runout is not within the specification, try to correct by reorienting the installation of the converter.
HINT:
Mark the position of the converter to ensure the correct installation.

SUSPENSION AND AXLE

TROUBLESHOOTING SA–1
TIRE AND WHEEL SA–2
FRONT WHEEL ALIGNMENT SA–4
REAR WHEEL ALIGNMENT SA–8
FRONT AXLE HUB SA–10
FRONT WHEEL HUB BOLT SA–16
FRONT DRIVE SHAFT SA–17
FRONT SHOCK ABSORBER SA–29
FRONT LOWER SUSPENSION ARM SA–36
FRONT LOWER BALL JOINT SA–42
FRONT STABILIZER BAR SA–46
REAR AXLE HUB SA–50
REAR WHEEL HUB BOLT SA–54
REAR SHOCK ABSORBER SA–55
REAR LOWER SUSPENSION ARM AND STRUT ROD SA–63
REAR STABILIZER BAR SA–69

TROUBLESHOOTING

SA077–03

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.

Symptom	Suspect Area	See page
Wanders/pulls	1. Tire (Worn or improperly inflated)	SA–2
	2. Wheel alignment (Incorrect)	SA–4 SA–8
	3. Steering linkage (Loosen or worn)	–
	4. Hub bearing (Worn)	SA–11 SA–51
	5. Steering gear (Out of adjustment or broken)	–
	6. Suspension parts (Worn)	–
Bottoming	1. Vehicle (Overloaded)	–
	2. Spring (Weak)	SA–29 SA–55
	3. Shock absorber (Worn)	SA–29 SA–55
Sways/pitches	1. Tire (Worn or improperly inflated)	SA–2
	2. Stabilizer bar (Bent or broken)	SA–46 SA–69
	3. Shock absorber (Worn)	SA–29 SA–55
Front wheel shimmy	1. Tire (Worn or improperly inflated)	SA–2
	2. Wheel (Out of balance)	SA–2
	3. Shock absorber (Worn)	SA–29
	4. Wheel alignment (Incorrect)	SA–4
	5. Ball joint (Worn)	SA–42
	6. Hub bearing (Worn)	SA–11
	7. Steering linkage (Loosen or worn)	–
	8. Steering gear (Out of adjustment or broken)	–
Abnormal tire wear	1. Tire (Improperly inflated)	SA–2
	2. Wheel alignment (Incorrect)	SA–4 SA–8
	3. Suspension parts (Worn)	–
	4. Shock absorber (Worn)	SA–29 SA–55

TIRE AND WHEEL

SA078-03

INSPECTION

1. INSPECT TIRE

(a) Check the tires for wear and proper inflation pressure.

Cold inflation pressure

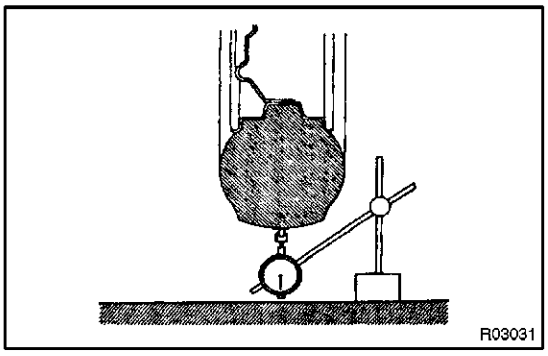
For driving under 160 km/h (100 mph)

Tire size	Front kPa (kgf/cm^2, psi)	Rear kPa (kgf/cm^2, psi)
185/65R14 86H	220 (2.2, 32)	220 (2.2, 32)
195/60R15 88H	220 (2.2, 32)	220 (2.2, 32)

For driving at 160 km/h (100 mph) or over

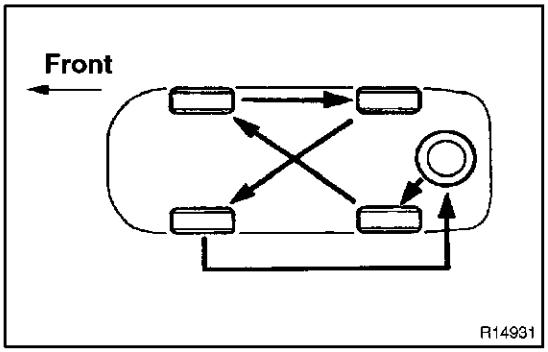
Tire size	Front kPa (kgf/cm^2, psi)	Rear kPa (kgf/cm^2, psi)
185/65R14 86H	*1 260 (2.6, 38) *2 250 (2.5, 36)	*1 270 (2.7, 39) *2 260 (2.6, 38)
195/60R15 88H	*1 240 (2.4, 35) *2 230 (2.3, 33)	*1 260 (2.6, 38) *2 240 (2.4, 35)

*1: Standard inflation for all loads including full rated loads.
*2: Optional inflation for reduced loads (1 to 4 passengers).



(b) Check the tire runout.

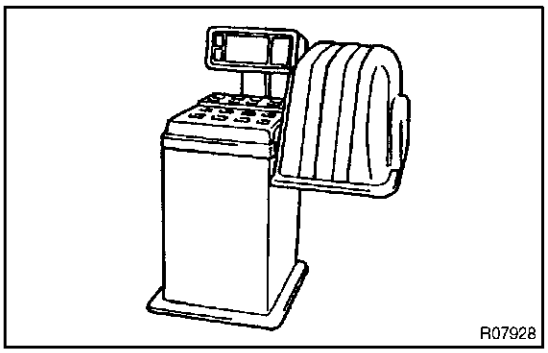
Tire runout: 1.0 mm (0.039 in.) or less



2. ROTATING TIRES

HINT:

See the illustration for where to rotate each tire.

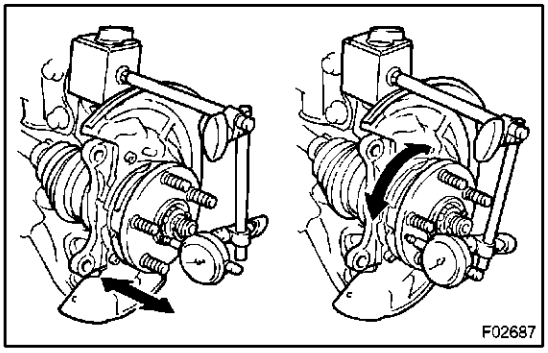


3. INSPECT WHEEL BALANCE

(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



4. CHECK WHEEL BEARING LOOSENESS

(a) Check the backlash in the bearing shaft direction.

Maximum: 0 mm (0 in.)

(b) Check the axle hub deviation.

Maximum: 0.05 mm (0.0020 in.)

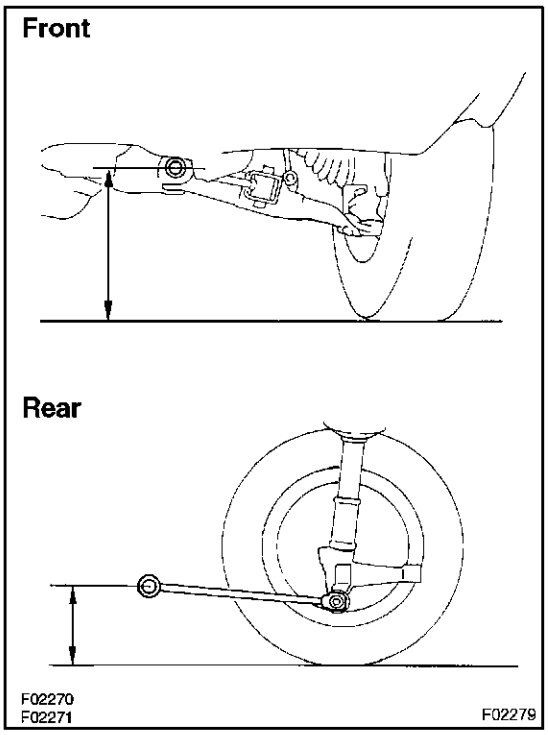
5. CHECK FRONT SUSPENSION FOR LOOSENESS

6. CHECK STEERING LINKAGE FOR LOOSENESS

7. CHECK BALL JOINT FOR LOOSENESS

8. CHECK SHOCK ABSORBER WORKS PROPERLY

- Check for oil leaks
- Check mounting bushings for wear
- Bounce front and rear of the vehicle



FRONT WHEEL ALIGNMENT

SA107–01

INSPECTION

1. MEASURE VEHICLE HEIGHT

Rough Road Package

Items	*1 Front	*2 Rear
SEDAN and LIFTBACK		
185/65R14 86H	206 mm (8.11 in.)	269 mm (10.59 in.)
195/60R15 88H	216 mm (8.50 in.)	279 mm (10.98 in.)
WAGON		
185/65R14 86H	205 mm (8.07 in.)	263 mm (10.35 in.)
195/60R15 88H	215 mm (8.46 in.)	273 mm (10.75 in.)

Others

Items	*1 Front	*2 Rear
SEDAN and LIFTBACK		
185/65R14 86H	191 mm (7.52 in.)	259 (10.20 in.)
195/60R15 88H	201 mm (7.91 in.)	269 (10.59 in.)
WAGON		
185/65R14 86H	190 mm (7.48 in.)	261 (10.28 in.)
195/60R15 88H	200 mm (7.87 in.)	271 (10.67 in.)

***1: Front measuring point**

Measure the distance from the ground to the center of the front side lower suspension arm mounting bolt.

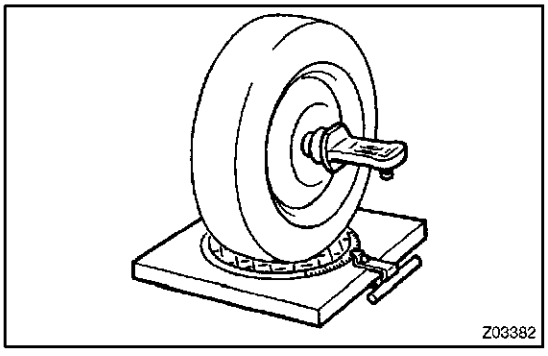
***2: Rear measuring point**

Measure the distance from the ground to the center of the strut rod mounting bolt.

NOTICE:

Before inspecting the wheel alignment, adjust the vehicle height to the specification.

If the vehicle height is not within the specification, try to adjust it by pushing down on or lifting the body.



2. INSTALL CAMBER–CASTER–KINGPIN GAUGE OR POSITION VEHICLE ON WHEEL ALIGNMENT TESTER

Follow the specific instructions of the equipment manufacturer.

3. INSPECT CAMBER, CASTER AND STEERING AXIS INCLINATION

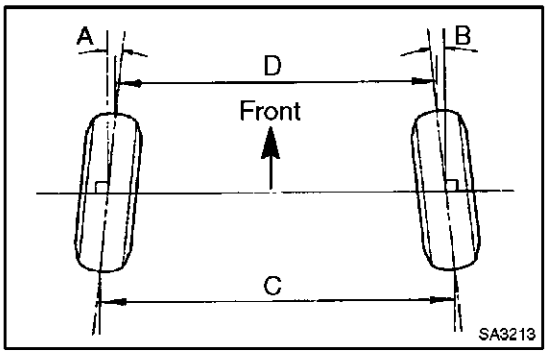
Rough Road Package

Camber Left–right error	–0°50' ± 45' (–0.83° ± 0.75°) 45' (0.75°) or less
Caster Left–right error	1°15' ± 45' (1.25° ± 0.75°) 45' (0.75°) or less
Steering axis inclination	14°14' ± 45' (14.23° ± 0.75°)

Others

Camber Left–right error	–0°21' ± 45' (–0.35° ± 0.75°) 45' (0.75°) or less
Caster SEDAN and LIFTBACK WAGON Left–right error	 1°20' ± 45' (1.33° ± 0.75°) 1°21' ± 45' (1.35° ± 0.75°) 45' (0.75°) or less
Steering axis inclination	13°22' ± 45' (13.37° ± 0.75°)

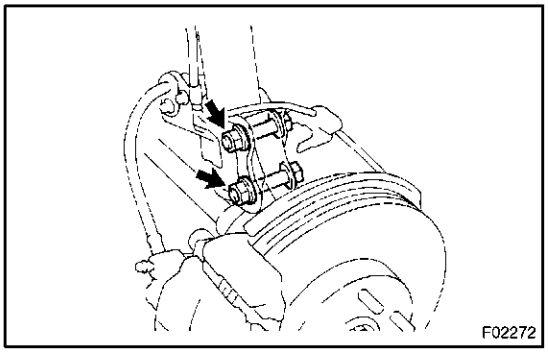
HINT:
If the caster and steering axis inclination are not within the specification, after the camber has been correctly adjusted, recheck the suspension parts for damaged and/or worn out parts.



4. INSPECT TOE–IN

Toe–in (Total)	A + B: 0°06' ± 12' (0.1° ± 0.2°) C – D: 1 ± 2 mm (0.04 ± 0.08 in.)

If the toe–in is not within the specification, adjust it at the rack ends.

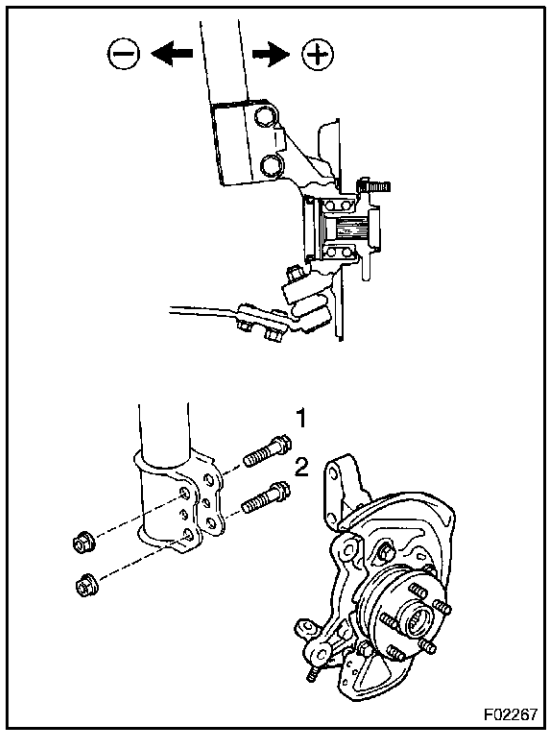


5. ADJUST CAMBER

NOTICE:

After the camber has been adjusted, inspect the toe–in.

(a) Remove the front wheels and ABS speed sensor clamp.
(b) Remove the 2 nuts on the lower side of the shock absorber.
(c) Coat the threads of the nuts with engine oil.
(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: 255 N·m (2,600 kgf·cm, 188 ft·lbf)

(g) Install the front wheels.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(h) Check the camber.

HINT:

- Try to adjust the camber to the center value.
- Adjusting value for the set bolts is 6' – 30' (0.1° – 0.5°).

If the camber is not within the specification, using the table below, estimate for how much additional camber adjustment will be required, and select the camber adjusting bolt.

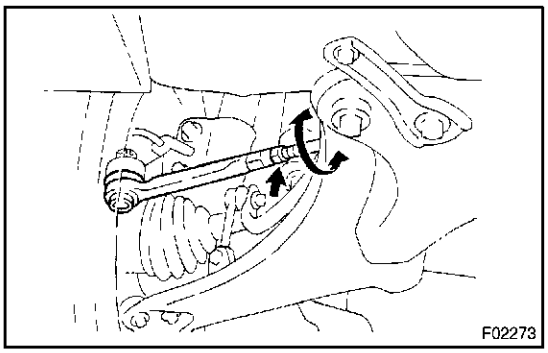
Bolt / Adjusting Value	Set Bolt		Adjusting Bolt					
	90105–15001		90105–15004		90105–15005		90105–15006	
			1 Dot		2 Dots		3 Dots	
	1	2	1	2	1	2	1	2
15'	●			●				
30'	●					●		
45'	●							●
1°00'			●					●
1°15'					●			●
1°30'							●	●

F01195

(i) Follow the above mentioned steps again. Between step (b) and (c), exchange 1 or 2 selected bolts.

HINT:

When exchanging the 2 bolts, exchange 1 bolt for each time.



6. ADJUST TOE–IN

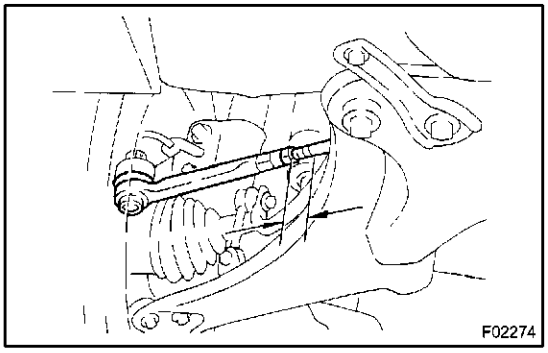
(a) Remove the boot clamps.

(b) Loosen the tie rod end lock nuts.

(c) Turn the left and right rack ends an equal amount to adjust the toe–in.

HINT:

- Try to adjust the toe–in to the center value.



- Make sure that the lengths of the left and right rack ends are the same.

  Rack end length difference: 1.5 mm (0.059 in.) or less

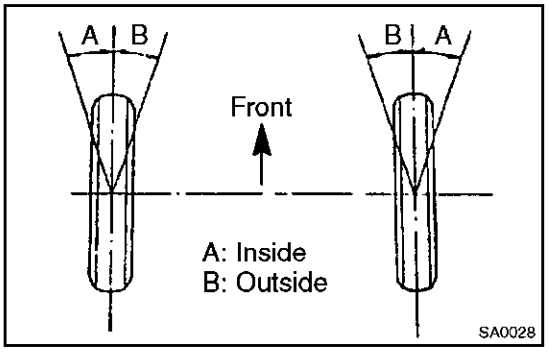
(d) Torque the tie rod end lock nuts.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

(e) Place the boot on the seat and install the clip to it.

HINT:

Make sure that the boots are not twisted.



7. INSPECT WHEEL ANGLE

Turn the steering wheel fully, and measure the turning angle.

	Inside wheel	Outside wheel < Reference >
Rough road package	36°48' ± 2° (36.80° ± 2°)	31°19' (31.32°)
Others	37°52' ± 2° (37.87° ± 2°)	32°05' (32.08°)

If the wheel angles differ from the specification, check the length of the left and right rack ends.

REAR WHEEL ALIGNMENT

SA07A–02

INSPECTION

1. **MEASURE VEHICLE HEIGHT (See page SA–4)**
2. **INSTALL CAMBER–CASTER–KINGPIN GAUGE OR POSITION VEHICLE ON WHEEL ALIGNMENT TESTER**

Follow the specific instructions of the equipment manufacturer.

3. **INSPECT CAMBER**

Rough Road Package

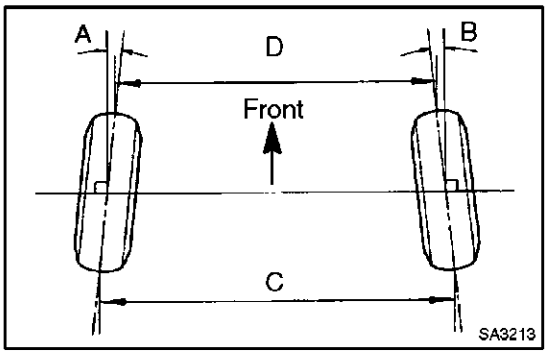
Camber	
SEDAN and LIFTBACK	–0°18' ± 30' (–0.30° ± 0.5°)
WAGON	–0°25' ± 30' (–0.42° ± 0.5°)
Left–righterror	45' (0.75°) or less

Others

Camber	
SEDAN and LIFTBACK	–0°31' ± 30' (–0.52° ± 0.5°)
WAGON	–0°25' ± 30' (–0.42° ± 0.5°)
Left–righterror	45' (0.75°) or less

HINT:

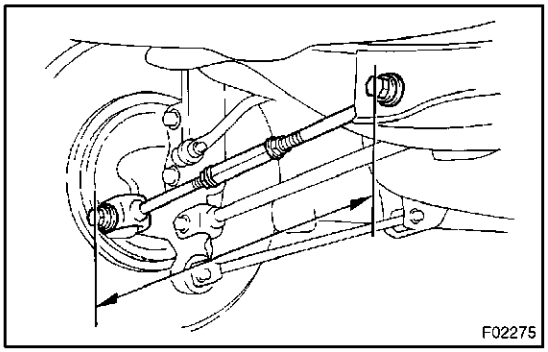
Camber is not adjustable, if measurement is not within the specifications, inspect the suspension parts for damaged and/or worn–out parts and replace them as necessary.



4. **INSPECT TOE–IN**

Toe–in (Total)	A + B: 0°12' ± 12' (0.2° ± 0.2°) C – D: 2 ± 2 mm (0.08 ± 0.08 in.)

If the toe–in is not within the specification, adjust it at the No.2 lower suspension arm.

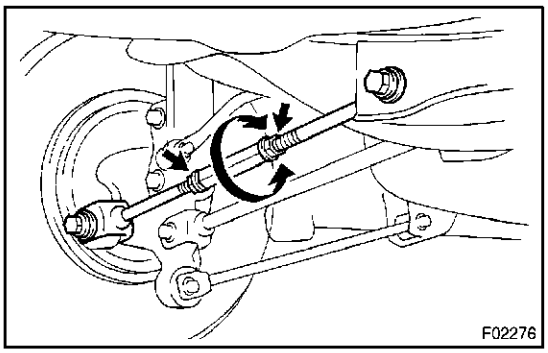


5. **ADJUST TOE–IN**

(a) Measure the lengths of the left and right No.2 lower suspension arms.

No.2 lower suspension arm length difference:
1.0 mm (0.039 in.) or less

If the left–right difference is larger than the specification, adjust the length.



(b) Loosen the lock nuts.
(c) Turn the left and right adjusting tubes an equal amount to adjust toe–in.

HINT:

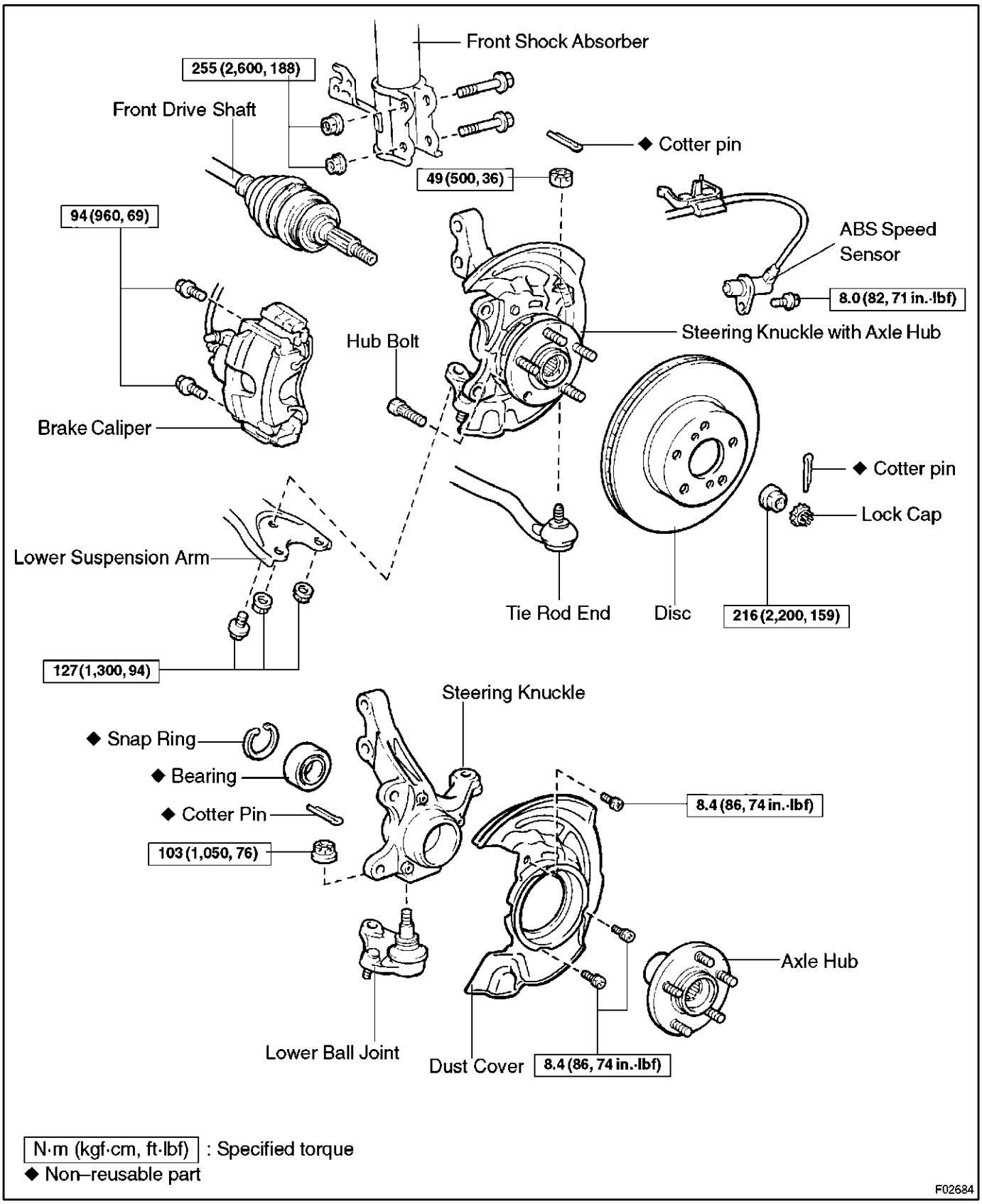
- Try to adjust the toe–in to the center value.
- One turn of the each adjusting tube will adjust the toe–in by about 53' (0.9°, 8.9 mm, 0.350 in.).

(d) Torque the lock nuts.
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)

FRONT AXLE HUB

COMPONENTS

SA07B–03



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

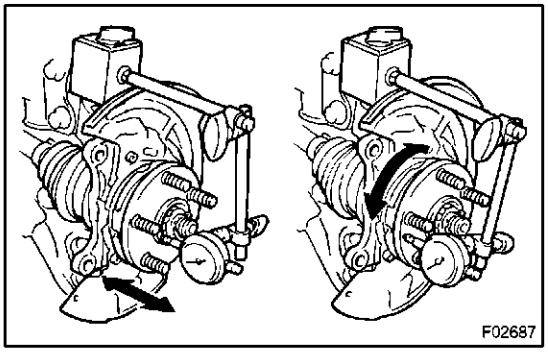
F02684

SA0QS–02

REMOVAL

1. **REMOVE FRONT WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
2. **CHECK BEARING BACKLASH AND AXLE HUB DEVIATION**

(a) Remove the 2 bolts, brake caliper and disc.
(b) Support the brake caliper securely.



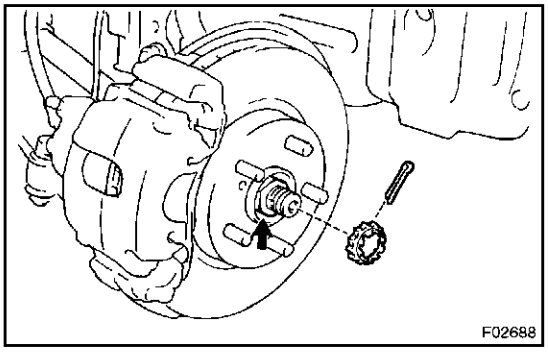
(c) Using a dial indicator, check the backlash near the center of the axle hub.
Maximum: 0 mm (0 in.)

If the backlash exceeds the maximum, replace the bearing.

(d) 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 deviation exceeds the maximum, replace the bearing.

(e) Install the disc, 2 bolts and brake caliper.
Torque: 94 N·m (960 kgf·cm, 69 ft·lbf)

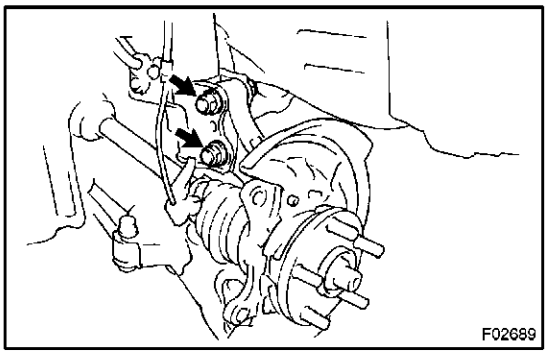


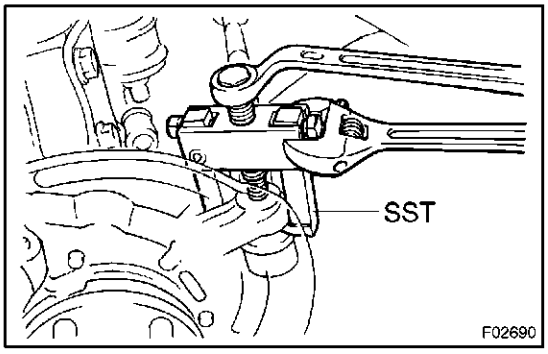
3. **REMOVE DRIVE SHAFT LOCK NUT**

(a) Remove the cotter pin and lock cap.
(b) While applying the brakes, remove the nut.
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)
(c) Remove the brake caliper and disc.
(d) Support the brake caliper securely.

4. **w/ ABS:**
   REMOVE ABS SPEED SENSOR AND WIRE HARNESS CLAMP
   Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
5. **LOOSEN 2 NUTS ON LOWER SIDE OF SHOCK ABSORBER**
   Torque: 255 N·m (2,600 kgf·cm, 188 ft·lbf)

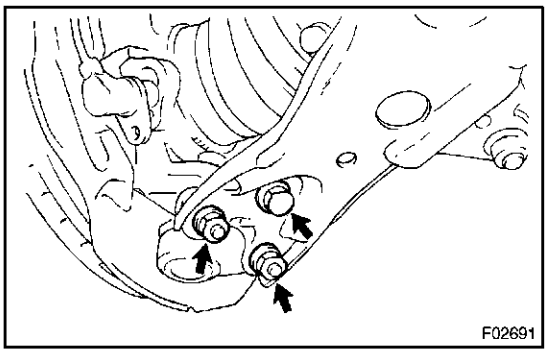
HINT:
Do not remove the 2 bolts and nuts.





6. **DISCONNECT TIE ROD END FROM STEERING KNUCKLE**

(a) Remove the cotter pin and nut.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
(b) Using SST, disconnect the tie rod end from the steering knuckle.
SST 09628–62011



7. DISCONNECT LOWER BALL JOINT FROM LOWER SUSPENSION ARM

Remove the 2 nuts and bolt.

Torque: 127 N·m (1,300 kgf·cm, 94 ft·lbf)

8. REMOVE STEERING KNUCKLE WITH AXLE HUB

(a) Remove the 2 bolts and nuts on the lower side of the shock absorber.

(b) Remove the steering knuckle with the axle hub.

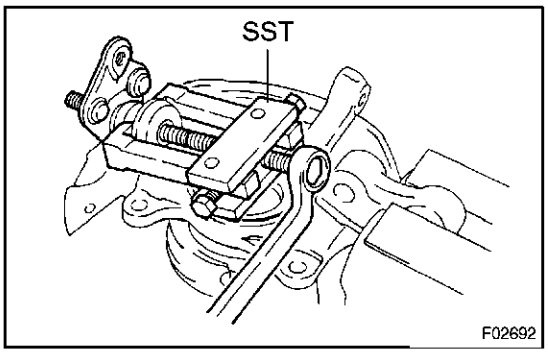
NOTICE:

Be careful not to damage the boot and ABS speed sensor rotor.

HINT:

At the time of installation, coat the nut's thread with engine oil.

SA07D–03

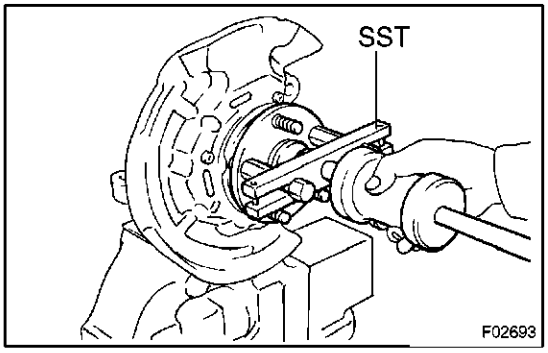


DISASSEMBLY

1. REMOVE LOWER BALL JOINT

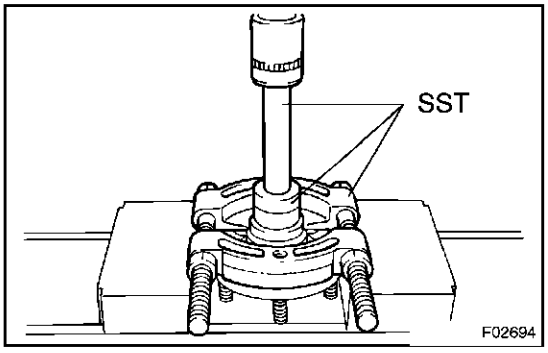
(a) Remove the cotter pin and nut.

(b) Using SST, remove the lower ball joint.
SST 09628–62011



2. REMOVE AXLE HUB

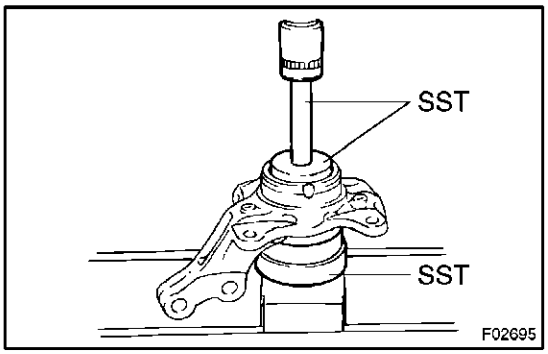
(a) Using SST, remove the axle hub.
SST 09520–00031



(b) Using SST and a press, remove the inner race (outside) from the axle hub.
SST 09950–00020, 09950–60010 (09951–00390), 09950–70010 (09951–07100)

3. REMOVE DUST COVER

Using a torx socket (T30), remove the 3 bolts and dust cover.



4. REMOVE BEARING FROM STEERING KNUCKLE

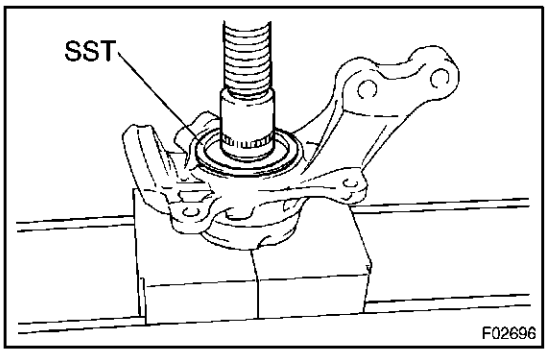
(a) Using snap ring pliers, remove the snap ring.

(b) Place the inner race on the outside of the bearing.

(c) Using SST and a press, remove the bearing.
SST 09527–17011, 09950–60010 (09951–00640), 09950–70010 (09951–07150)

SA108–01

REASSEMBLY



1. INSTALL BEARING

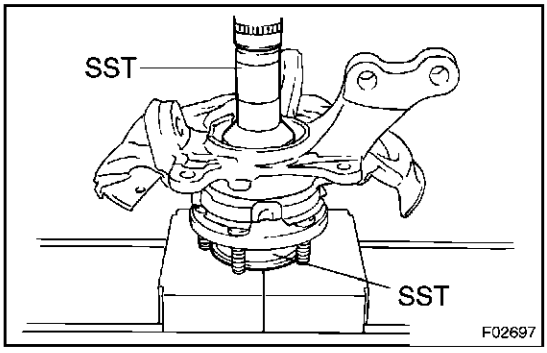
(a) Using SST and a press, install a new bearing to the steering knuckle.
SST 09608–32010

(b) Using snap ring pliers, install a new snap ring.

2. INSTALL DUST COVER

Place the dust cover and using a torx socket (T30), torque the 3 bolts.

Torque: 8.4 N·m (86 kgf·cm, 74 in.·lbf)



3. INSTALL FRONT AXLE HUB

Using SST and a press, install the axle hub.
SST 09310–35010, 09608–32010

4. INSTALL LOWER BALL JOINT

(a) Install the lower ball joint and tighten the nut.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Install a new cotter pin.

SA07F–03

INSTALLATION

Installation is in the reverse order of removal (See page SA–11).

AFTER INSTALLATION, CHECK ABS SPEED SENSOR SIGNAL (See page DI–115) AND FRONT WHEEL ALIGNMENT (See page SA–4)

FRONT WHEEL HUB BOLT

SA07G–03

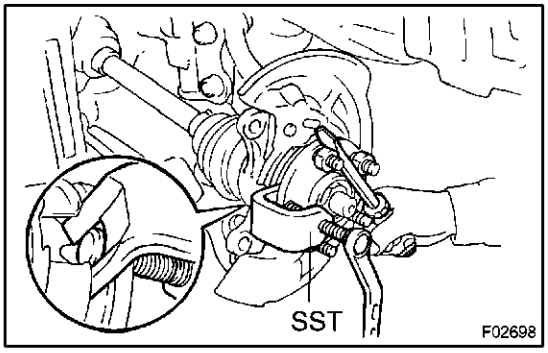
REPLACEMENT

1. REMOVE FRONT WHEEL

2. REMOVE BRAKE CALIPER AND DISC

(a) Remove the 2 bolts, brake caliper and disc.

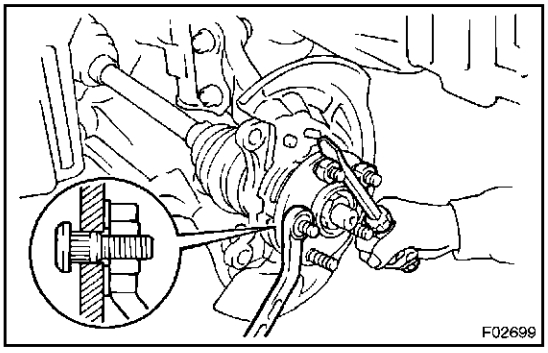
(b) Support the brake caliper securely.



3. REMOVE HUB BOLT

Using SST, remove the hub bolt.

SST 09628–10011



4. INSTALL HUB BOLT

(a) Install a washer and nut to the hub bolt, as shown in the illustration.

(b) Install the hub bolt by torquing the nut.

5. INSTALL BRAKE DISC AND CALIPER

Install the disc, 2 bolts and brake caliper.

Torque: 94 N·m (960 kgf·cm, 69 ft·lbf)

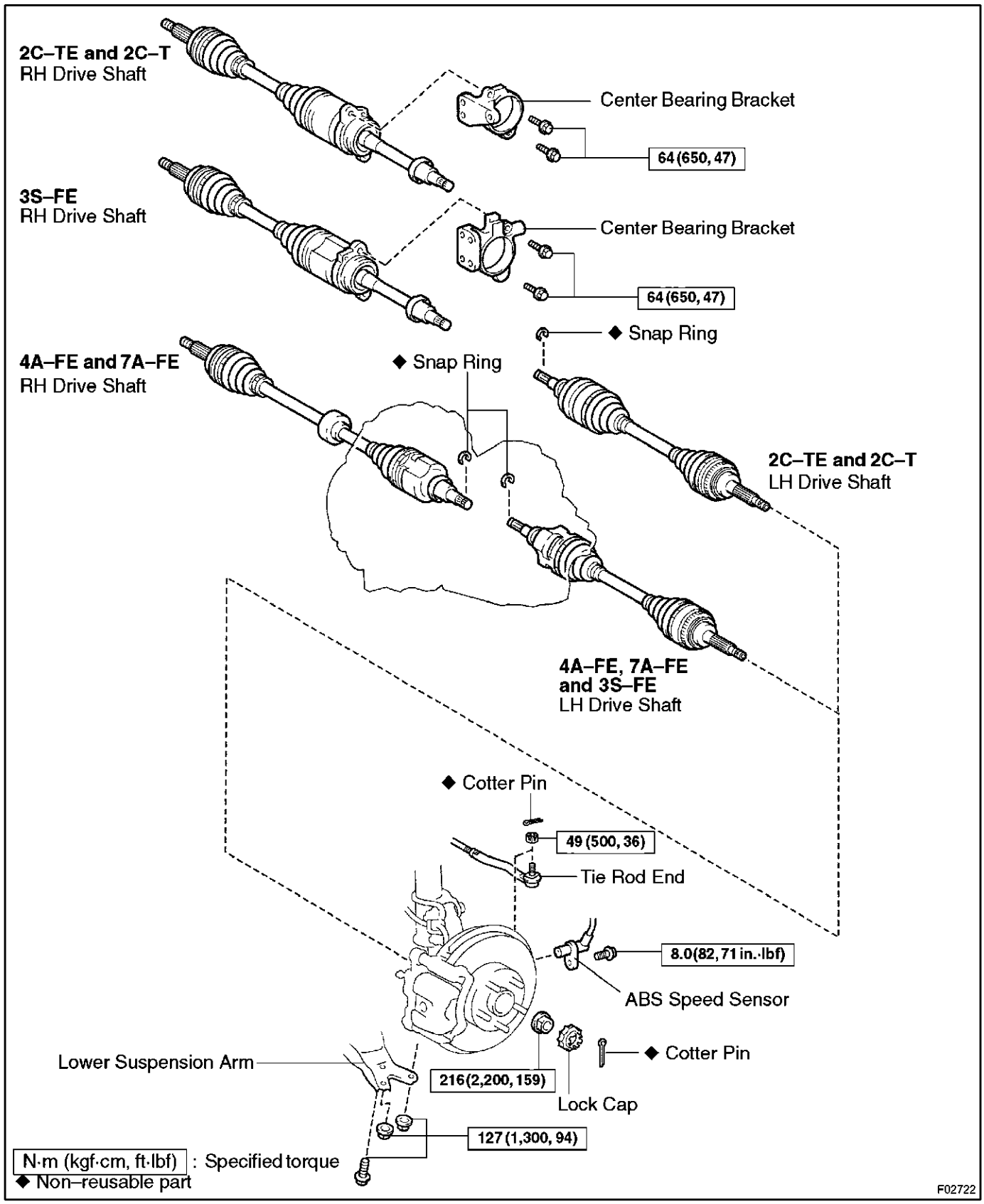
6. INSTALL FRONT WHEEL

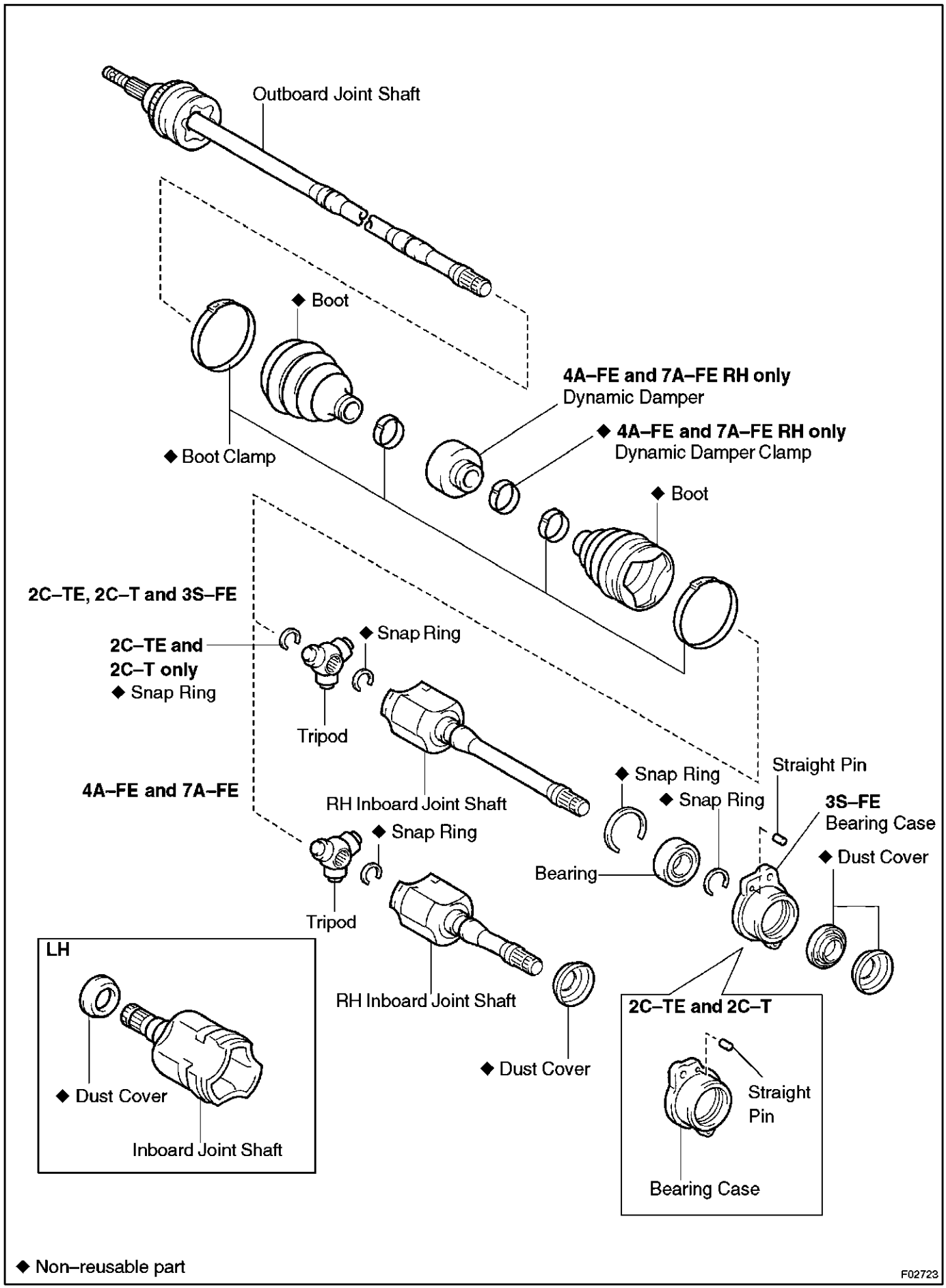
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

FRONT DRIVE SHAFT

COMPONENTS

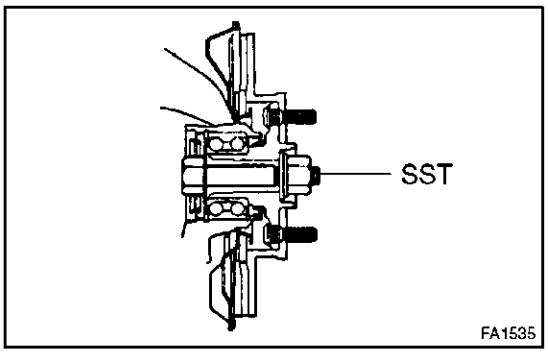
SA109–01




Outboard Joint Shaft
◆ Boot
◆ Boot Clamp
4A–FE and 7A–FE RH only
Dynamic Damper
◆ 4A–FE and 7A–FE RH only
Dynamic Damper Clamp
◆ Boot
2C–TE, 2C–T and 3S–FE
2C–TE and
2C–T only
◆ Snap Ring
◆ Snap Ring
Tripod
RH Inboard Joint Shaft
4A–FE and 7A–FE
◆ Snap Ring
◆ Snap Ring
Tripod
RH Inboard Joint Shaft
◆ Dust Cover
Straight Pin
3S–FE
Bearing Case
◆ Dust Cover
Bearing
LH
◆ Dust Cover
Inboard Joint Shaft
2C–TE and 2C–T
Straight
Pin
Bearing Case
◆ Non–reusable part
F02723

SA10A–01

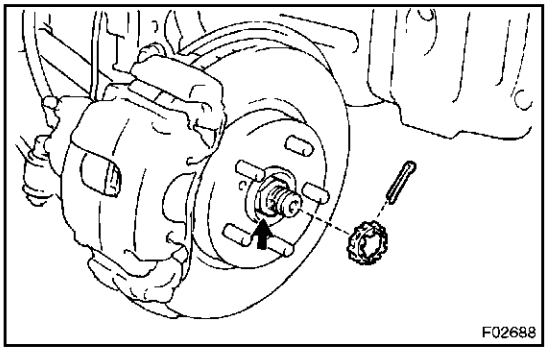
REMOVAL



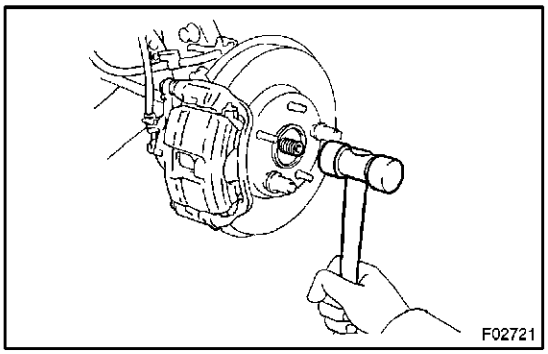
NOTICE:

- **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 the SST.
  SST 09608–16042 (09608–02021, 09608–02041)
- **w/ ABS:**
  After disconnecting the drive shaft from the axle hub, work carefully so as not to damage the ABS speed sensor rotor serration on the drive shaft.

1. **REMOVE FRONT WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
2. **DRAIN OUT GEAR OIL (M/T) OR ATF (A/T)**
3. **w/ ABS:**
   REMOVE BOLT AND ABS SPEED SENSOR
   Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)



4. **REMOVE DRIVE SHAFT LOCK NUT**
   (a) Remove the cotter pin and lock cap.
   (b) While applying the brakes, remove the nut.
   Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)
5. **DISCONNECT TIE ROD END FROM STEERING KNUCKLE (See page SA–11)**
6. **DISCONNECT LOWER BALL JOINT FROM LOWER SUSPENSION ARM (See page SA–11)**

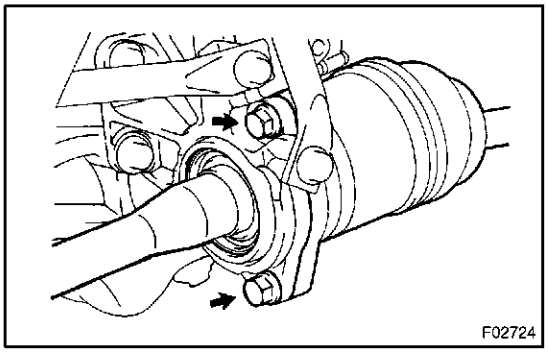


7. **DISCONNECT DRIVE SHAFT FROM AXLE HUB**
   (a) Using a plastic hammer, disconnect the drive shaft from the axle hub.

NOTICE:

Cover the drive shaft boot and ABS speed sensor rotor with cloth to protect it from being damaged.

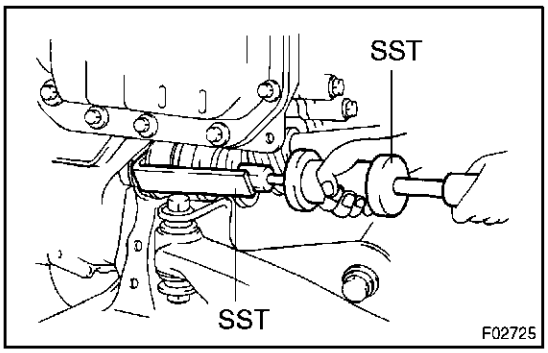
(b) Push the front axle hub toward the outside of the vehicle to separate the drive shaft from the axle hub.



8. **REMOVE DRIVE SHAFT**
   (a) RH drive shaft of 3S–FE, 2C–TE and 2C–T engine:
   Remove the 2 bolts and pull out the drive shaft together with the center bearing bracket.
   Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

HINT:

At the time of installation, coat gear oil to the inboard joint shaft and differential case sliding surface.



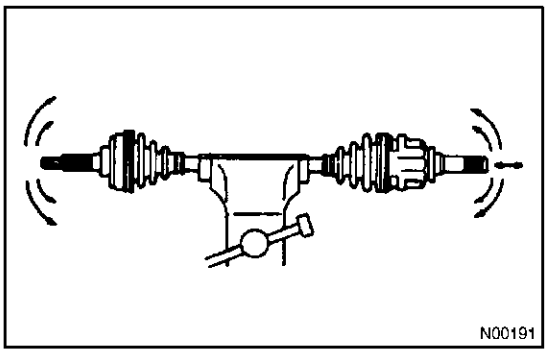
(b) Others:
(1) Using SST, remove the drive shaft.
SST 09520–01010, 09520–24010 (09520–32040)
(2) Using a screwdriver, remove the snap ring.

HINT:
At the time of installation, please refer to the following items.

- Apply gear oil to the inboard joint shaft and differential case sliding surface.
- Before installing the drive shaft, set the snap ring with its opening side facing downward.
- Whether inboard joint shaft is in contact with pinion shaft or not can be known from the sound or feeling.
- After installation, check that there is 2 – 3 mm (0.08 – 0.12 in.) of play in the axial direction.
- After installation, check that the drive shaft cannot be removed by hand.

SA10B–01

DISASSEMBLY



1. CHECK DRIVE SHAFT

(a) Check to see that there is no obvious play in the outboard joint.

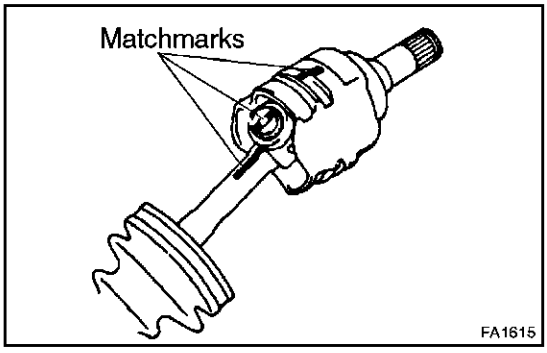
(b) Check to see that the inboard joint slides smoothly in the thrust direction.

(c) Check to see that there is no obvious play in the radial direction of the inboard joint.

(d) Check the boots for damage.

2. REMOVE INBOARD AND OUTBOARD JOINT BOOT CLAMPS

Using a side cutter, cut the 4 boots clamps and remove them.



3. REMOVE INBOARD JOINT SHAFT

(a) Place matchmarks on the tripod, inboard and outboard joint shafts.

NOTICE:

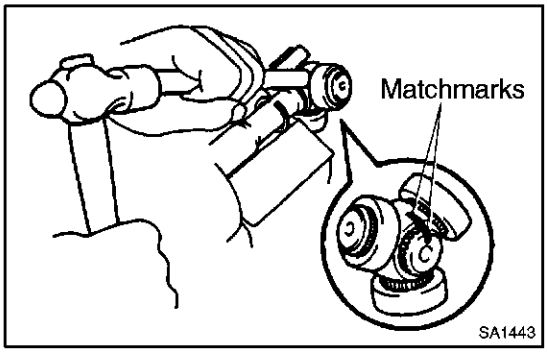
Do not punch the marks.

(b) Remove the inboard joint shaft from the outboard joint shaft.

4. REMOVE TRIPOD

(a) Using a snap ring expander, remove the snap ring.

(b) 2C–TE and 2C–T engine:
Using a snap ring expander, temporarily slide the snap ring toward the outboard joint shaft side.



(c) Place matchmarks on the outboard joint shaft and tripod.

NOTICE:

Do not punch the marks.

(d) Using a brass bar and hammer, remove the tripod from the drive shaft.

NOTICE:

Do not tap the roller.

(e) 2C–TE and 2C–T engine:
Using a snap ring expander, remove the snap ring.

5. REMOVE INBOARD JOINT BOOT

6. RH drive shaft of 4A–FE and 7A–FE engine: REMOVE DYNAMIC DAMPER

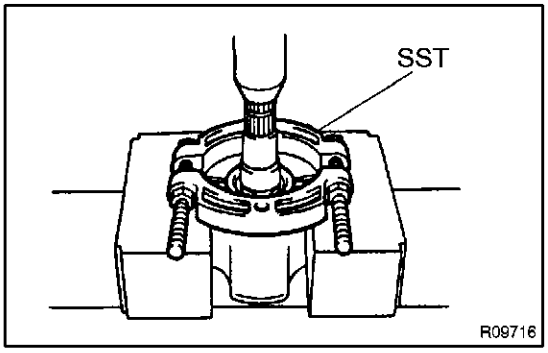
(a) Using a side cutter, cut the dynamic damper clamp and remove it.

(b) Remove the dynamic damper.

7. REMOVE OUTBOARD JOINT BOOT

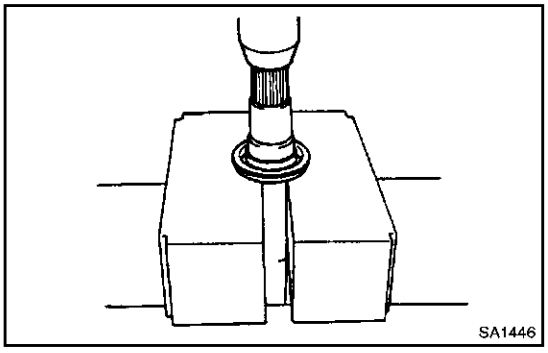
NOTICE:

Do not disassemble the outboard joint.

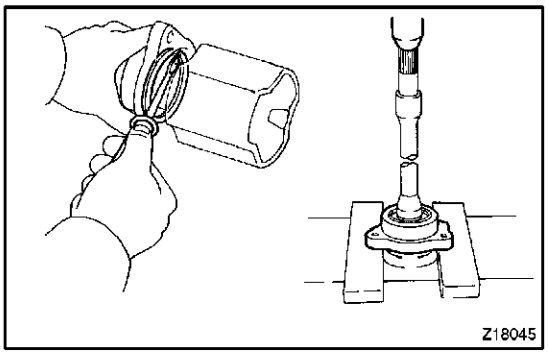


8. REMOVE DUST COVER

(a) RH drive shaft of 4A–FE and 7A–FE engine and LH drive shaft:
Using SST and a press, remove the dust cover from the inboard joint shaft.
SST 09950–00020



(b) Others:
Using a press, remove the dust cover from the inboard joint shaft.

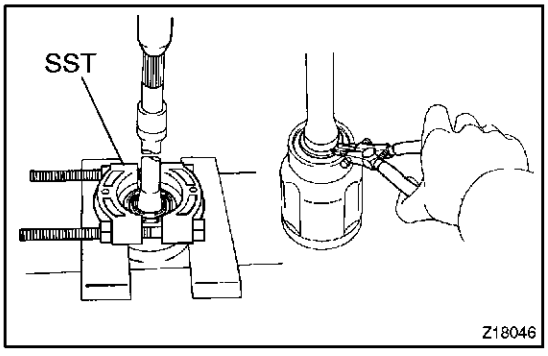


9. RH drive shaft of 3S–FE, 2C–TE and 2C–T engine: DISASSEMBLE INBOARD JOINT SHAFT

(a) Using a screwdriver, remove the snap ring.

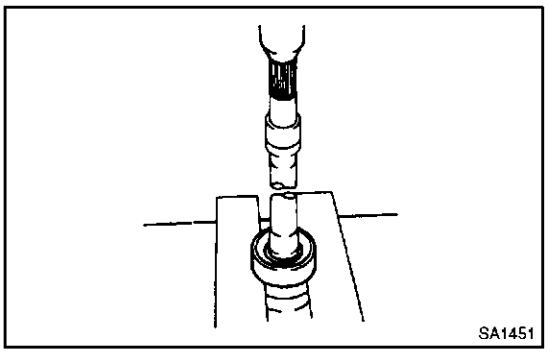
(b) Using a press, remove the bearing case.

(c) Using a pin punch and hammer, remove the straight pin from the bearing case.



(d) Using SST and a press, remove the dust cover.
SST 09950–00020

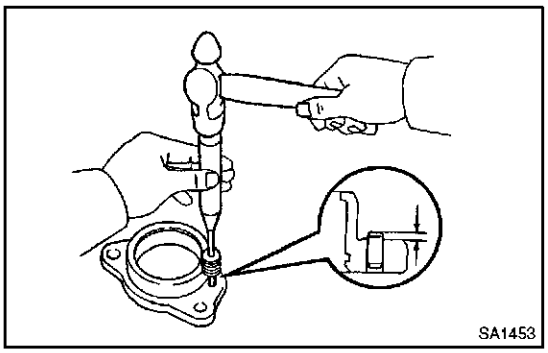
(e) Using a snap ring expander, remove the snap ring.



(f) Using a press, remove the bearing.

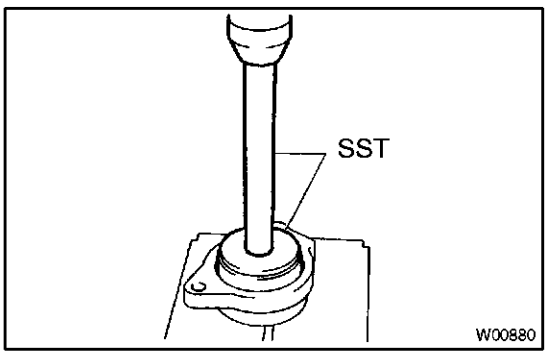
SA10C–01

REASSEMBLY



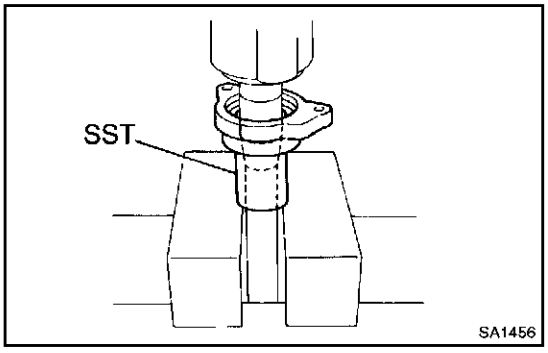
1. RH drive shaft of 3S–FE, 2C–TE and 2C–T engine: ASSEMBLE INBOARD JOINT SHAFT

(a) Using a pin punch and hammer, install the straight pin into the bearing case.



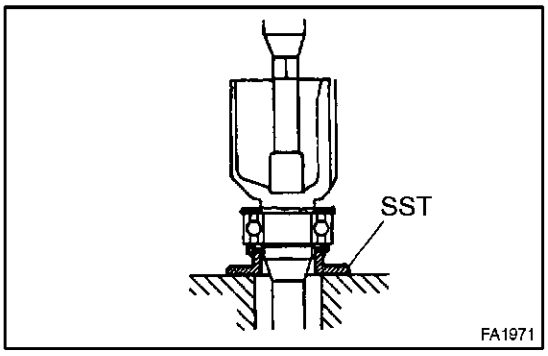
(b) Using SST and a press, install a new bearing into the bearing case.
SST 09950–60010 (09951–00640), 09950–70010 (09951–07150)

(c) Using a screwdriver, install a new snap ring.

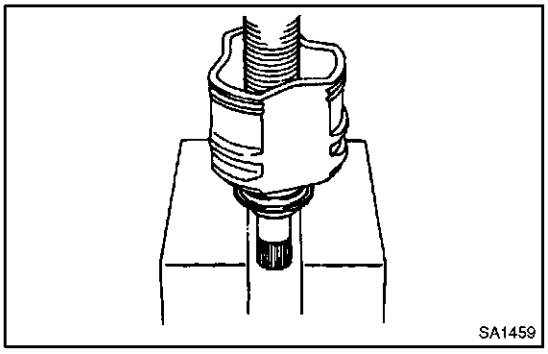


(d) Using SST and a press, install the bearing case assembly to the inboard joint shaft.
SST 09710–30021 (09710–03141)

(e) Using a snap ring expander, install a new snap ring.

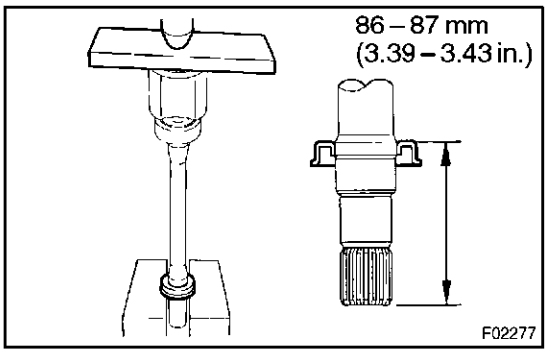


(f) Using SST, an extension bar and press, install a new dust cover.
SST 09506–35010

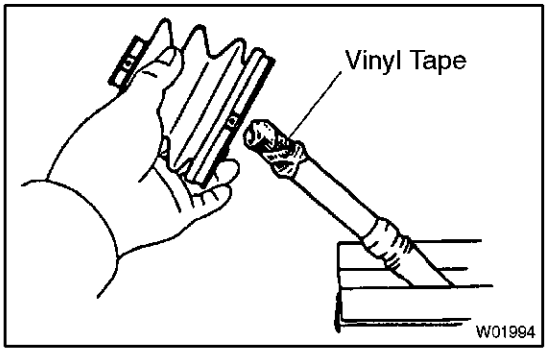


2. INSTALL NEW DUST COVER

(a) RH drive shaft of 4A–FE and 7A–FE engine and LH drive shaft:
Using a press, install a new dust cover.



(b) Others:
Using a steel plate and 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.



3. TEMPORARILY INSTALL NEW OUTBOARD AND INBOARD JOINT BOOTS WITH NEW BOOT CLAMPS

HINT:

- Before installing the boots (and dynamic damper), wrap the spline of the outboard joint shaft with vinyl tape to prevent them from being damaged.
- Before installing the boots (and dynamic damper), place new clamps to each of them and then install boots to drive shaft.

(a) Temporarily install a new outboard joint boot with 2 clamps to the drive shaft.

(b) w/ Dynamic damper:
Temporarily install the dynamic damper with clamp to the drive shaft.

(c) Temporarily install a new inboard joint boot with 2 clamps to the drive shaft.

4. INSTALL TRIPOD

(a) 2C–TE and 2C–T engine:
Using a snap ring expander, install a new snap ring.

(b) Place the beveled side of the tripod axial spline toward the outboard joint.

(c) Align the matchmarks placed before removal.

(d) Using a brass bar and hammer, tap in the tripod to the drive shaft.

NOTICE:

Do not tap the roller.

(e) Using a snap ring expander, install a new snap ring.

5. INSTALL BOOT TO OUTBOARD JOINT

Before assembling the boot, pack the outboard joint shaft and boot with grease in the boot kit.

Grease capacity: (Color = Black)
85 – 105 g (3.00 – 3.70 oz.)

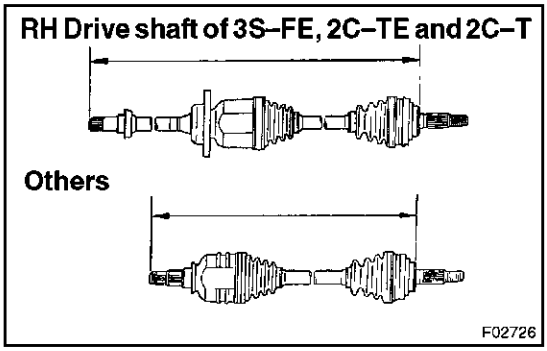
6. INSTALL INBOARD JOINT SHAFT TO OUTBOARD JOINT SHAFT

(a) Pack the inboard joint shaft and boot with grease in the boot kit.
Grease capacity: (Color = Yellow)
2C–TE and 2C–T engine:
120 – 130 g (4.23 – 4.59 oz.)
Others:
125.5 – 135.5 g (4.43 – 4.78 oz.)

(b) Align the matchmarks placed before removal.

(c) Install the inboard joint shaft to the outboard joint shaft.

(d) Temporarily install the boot to the inboard joint shaft.



7. ASSEMBLE BOOT CLAMPS TO BOTH BOOTS

(a) Make sure that the 2 boots are on the shaft groove.

(b) Make sure that the 2 boots are not stretched or contracted when the drive shaft is at standard length.
Drive shaft standard length:
4A–FE and 7A–FE engine:

RH	859.30 ± 2.0 mm (33.83 ± 0.079 in.)
LH	544.70 ± 2.0 mm (21.44 ± 0.079 in.)

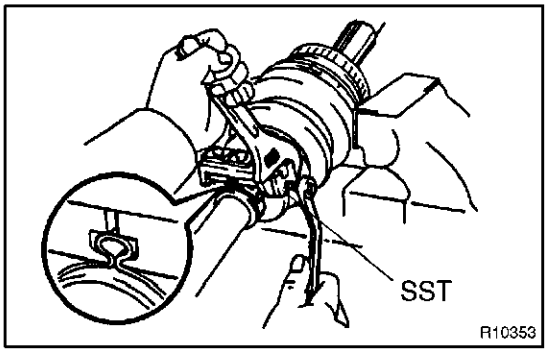
3S–FE and 7A–FE engine:

RH	840.70 ± 2.0 mm (33.10 ± 0.079 in.)
LH	554.00 ± 2.0 mm (21.81 ± 0.079 in.)

2C–TE and 2C–T engine:

RH	844.25 ± 2.0 mm (33.24 ± 0.079 in.)
LH	557.95 ± 2.0 mm (21.97 ± 0.079 in.)

(c) Secure the clamps onto the boot.

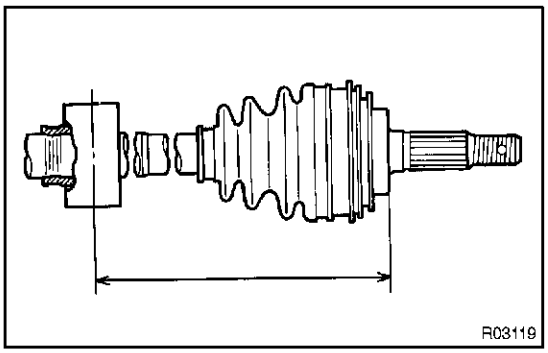


(d) Place SST onto the clamps.
SST 09521–24010

(e) Tighten the SST so that the clamps are pinched.

NOTICE:
Do not overtighten the SST.

(f) Using SST, adjust the clearance of the clamps.
SST 09240–00020
Clearance: 1.9 mm (0.075 in.) or less

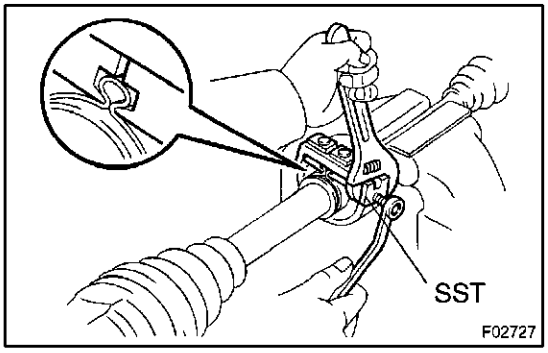


8. RH drive shaft of 4A–FE and 7A–FE engine: ASSEMBLE DAMPER CLAMP

(a) Make sure that the dynamic damper is on the shaft groove.

(b) Set the distance, as described below.
Distance: 432.1 ± 2.0 mm (17.012 ± 0.079 in.)

(c) Secure the clamp onto the damper.



(d) Place SST onto the clamps.
SST 09521–24010

(e) Tighten the SST so that the clamps are pinched.

NOTICE:

Do not overtighten the SST.

(f) Using SST, adjust the clearance of the clamps.
SST 09240–00020
Clearance: 1.9 mm (0.075 in.) or less

9. CHECK DRIVE SHAFT (See page SA–21)

SA02Z–02

INSTALLATION

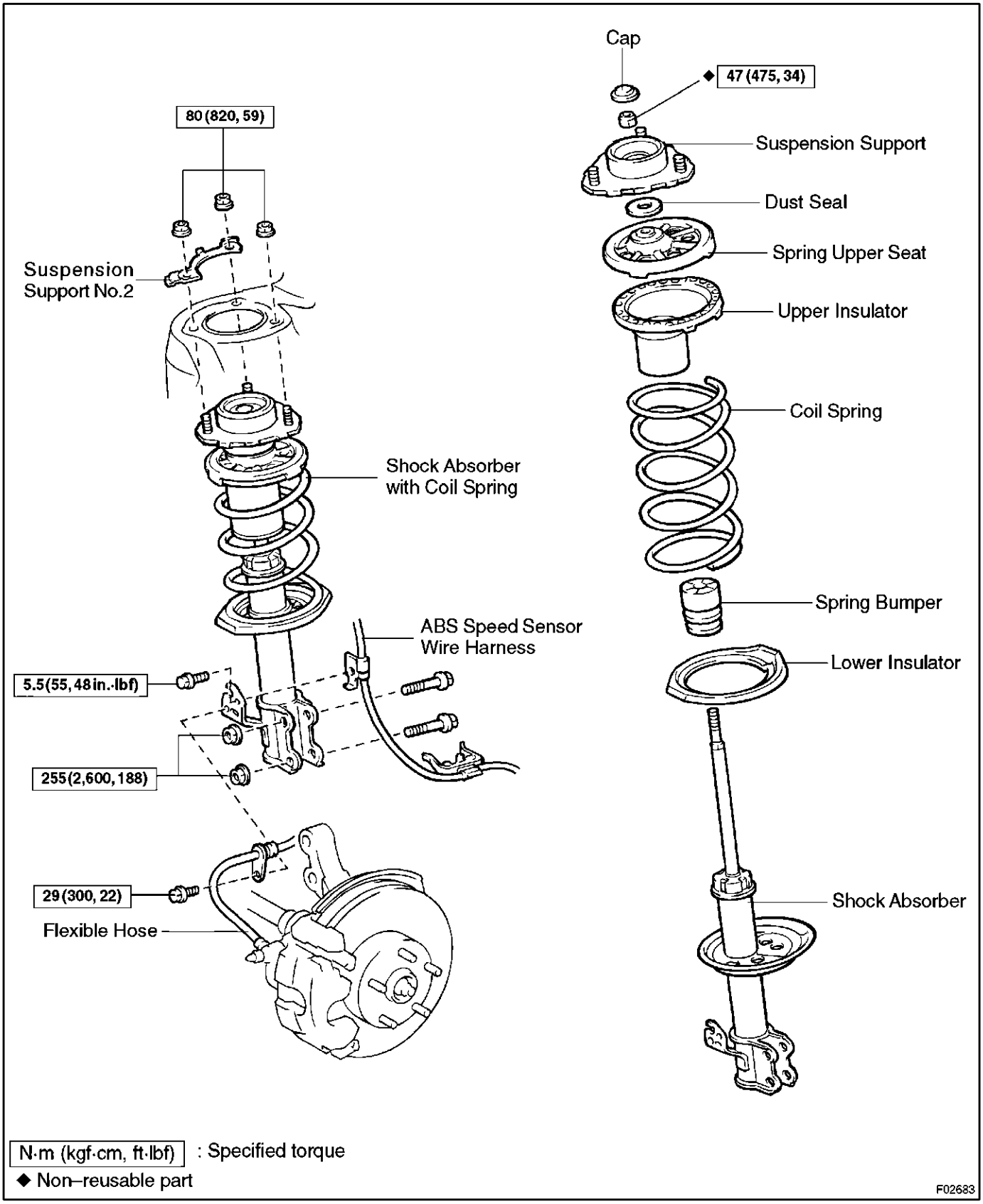
Installation is in the reverse order of removal (See page SA–19).

AFTER INSTALLATION, CHECK ABS SPEED SENSOR SIGNAL (See page DI–115) AND FRONT WHEEL ALIGNMENT (See page SA–4)

FRONT SHOCK ABSORBER

SA10J–01

COMPONENTS



SA10K–01

REMOVAL

1. REMOVE FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. DISCONNECT ABS SPEED SENSOR WIRE HARNESS CLAMPS FROM SHOCK ABSORBER

Remove the bolt and disconnect the ABS speed sensor wire harness clamps.

Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

3. DISCONNECT FLEXIBLE HOSE

Remove the bolt and disconnect the flexible hose from the shock absorber bracket.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

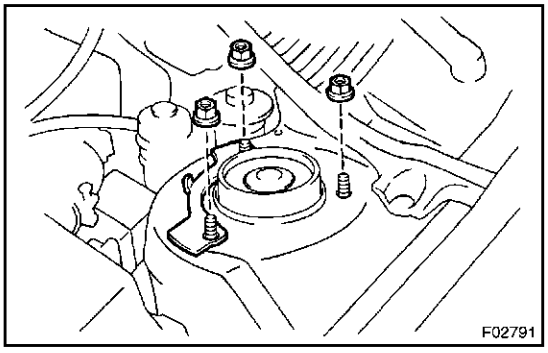
4. REMOVE SHOCK ABSORBER WITH COIL SPRING

(a) Loosen the 2 nuts on the lower side of shock absorber.

Torque: 255 N·m (2,600 kgf·cm, 188 ft·lbf)

HINT:

Do not remove the 2 bolts.



(b) Remove the 3 nuts and suspension support No.2 on the upper side of the shock absorber.

Torque: 80 N·m (820 kgf·cm, 59 ft·lbf)

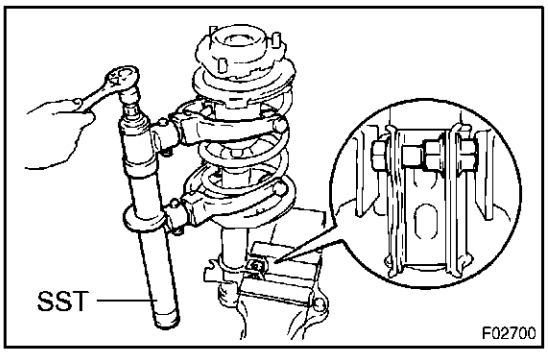
(c) Remove the 2 nuts and bolts on the lower side of shock absorber.

HINT:

At the time of installation, coat the nut's thread with engine oil.

(d) Remove the shock absorber with coil spring.

SA10L–01



DISASSEMBLY

REMOVE COIL SPRING

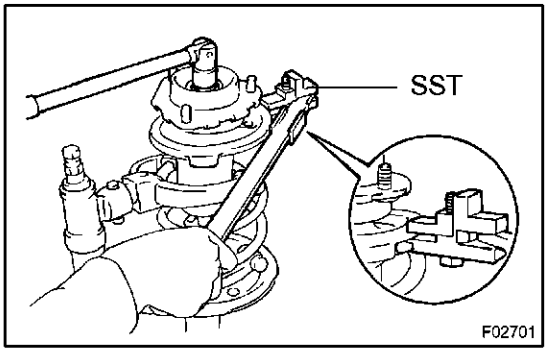
(a) Install 2 nuts and a bolt to the bracket at the lower side of the shock absorber and secure it in a vise.

(b) Using SST, compress the coil spring.
SST 09727–30021

NOTICE:

Do not use an impact wrench. It will damage the SST.

(c) Remove the cap from the suspension support.

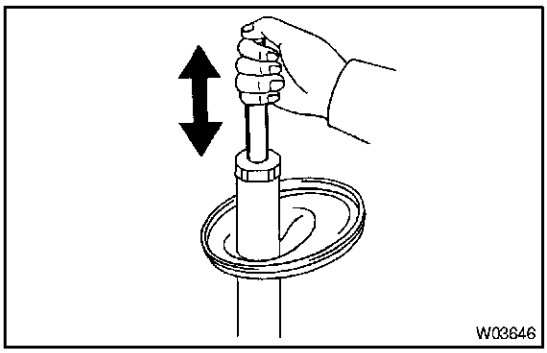


(d) Using SST to hold the spring upper seat, remove the nut.
SST 09729–22031

(e) Remove these parts from the shock absorber:

- Suspension support
- Dust seal
- Spring upper seat
- Upper insulator
- Coil spring
- Spring bumper
- Lower insulator

SA10M–01



INSPECTION

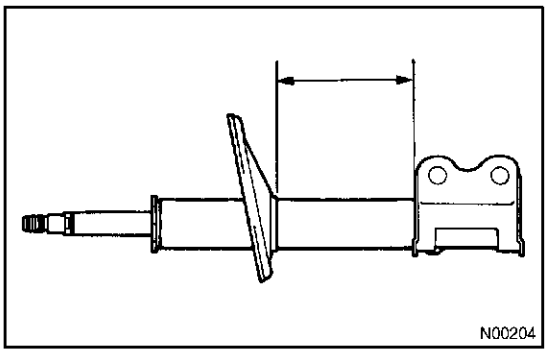
INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual operation sound.
If there is any abnormality, replace the shock absorber with a new one.

NOTICE:

When disposing of the shock absorber, see DISPOSAL on page SA–33.

SA10N–01



DISPOSAL

1. FULLY EXTEND SHOCK ABSORBER ROD

2. DRILL HOLE TO DISCHARGE GAS FROM CYLINDER

Using a drill, make a hole in the cylinder, as shown in the illustration to discharge the gas inside.

CAUTION:

The discharging gas is harmless, but be careful of chips which may fly up when drilling.

SA10O–01

REASSEMBLY

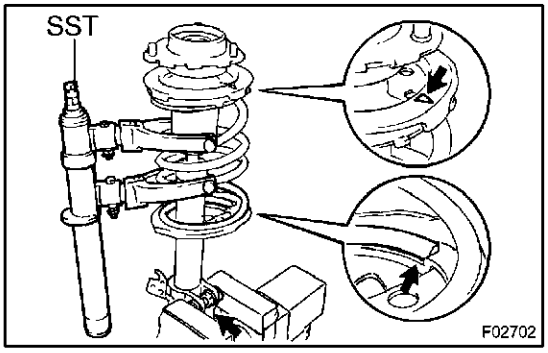
1. INSTALL LOWER INSULATOR ONTO SHOCK ABSORBER

2. INSTALL SPRING BUMPER TO PISTON ROD

3. INSTALL COIL SPRING

(a) Using SST, compress the coil spring.
SST 09727–30021

NOTICE:
Do not use an impact wrench. It will damage the SST.



(b) 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.

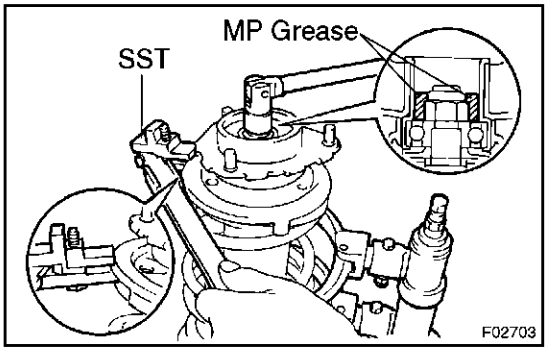
4. INSTALL UPPER INSULATOR AND SPRING UPPER SEAT

(a) Install the upper insulator.

(b) Install the spring upper seat to the shock absorber with the mark facing to the outside of the vehicle.

(c) Install the dust seal and suspension support.

(d) Using SST to hold the spring upper seat, install a new nut.
SST 09729–22031
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)



(e) Remove the SST from the coil spring.
SST 09727–30021

(f) Pack MP grease into the suspension support.

(g) Install the cap.

SA10P–01

INSTALLATION

Installation is in the reverse order of removal (See page SA–30).

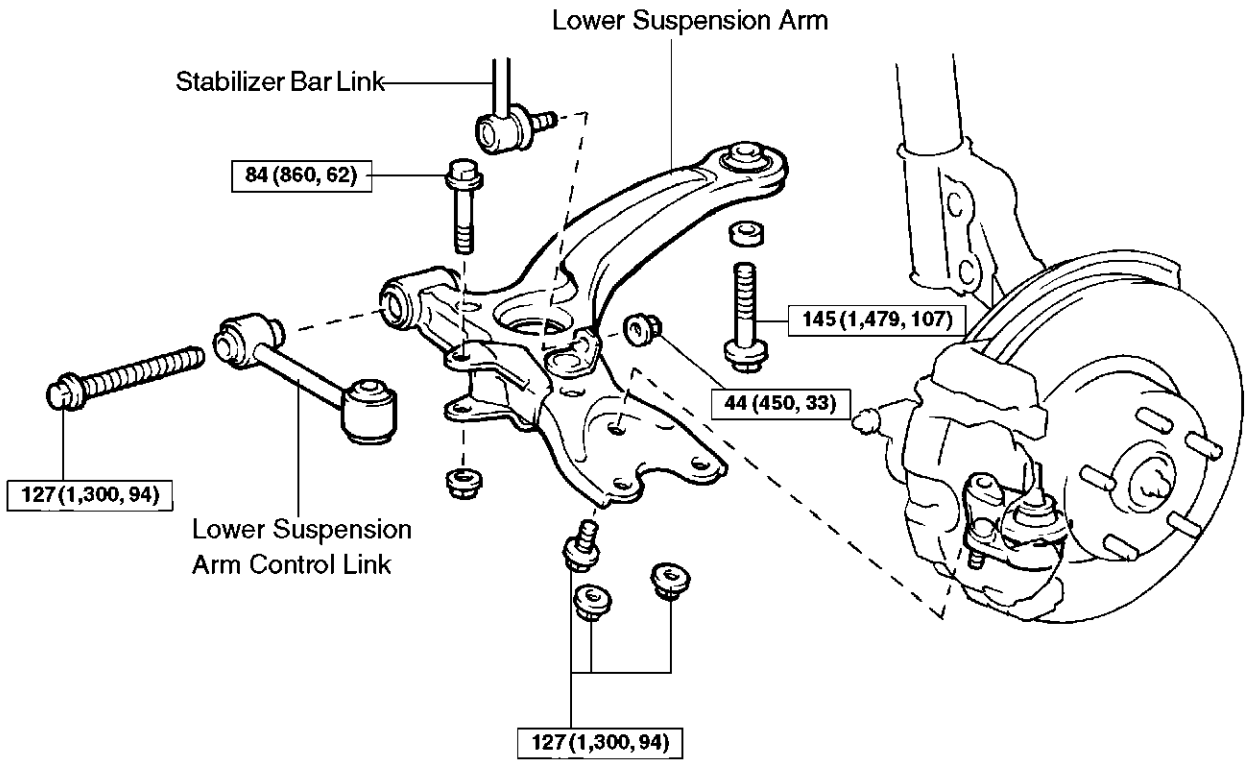
AFTER INSTALLATION, CHECK FRONT WHEEL ALIGNMENT (See page SA–4)

FRONT LOWER SUSPENSION ARM

SA04K–02

COMPONENTS

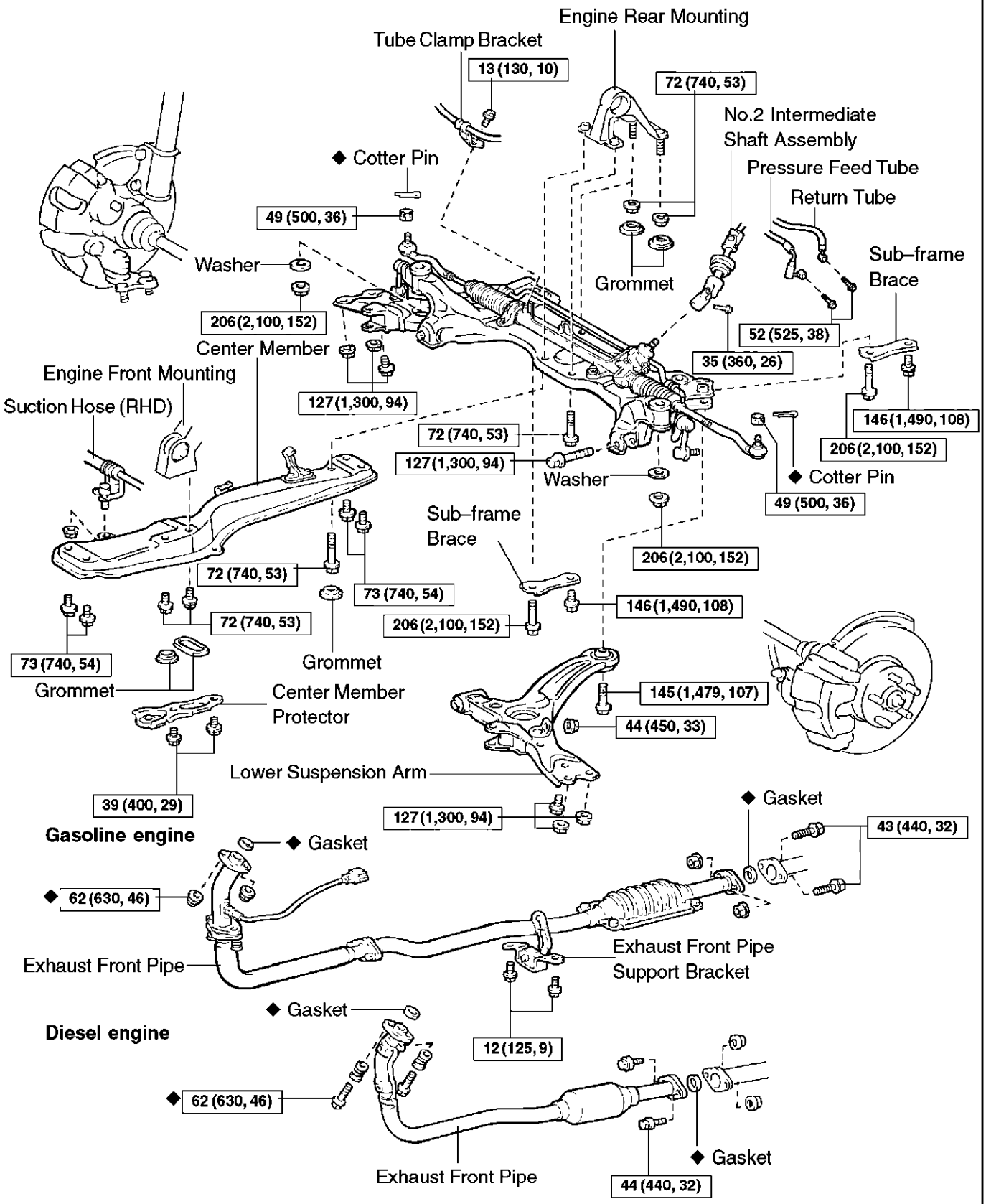
M/T and A/T RH Side



N·m (kgf·cm, ft·lbf) : Specified torque

F02686

A/T LH Side



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

F02681

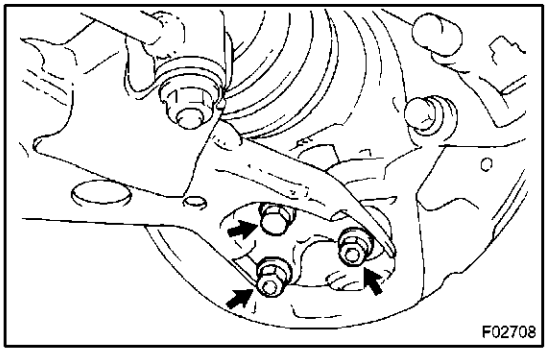
SA10E–01

REMOVAL

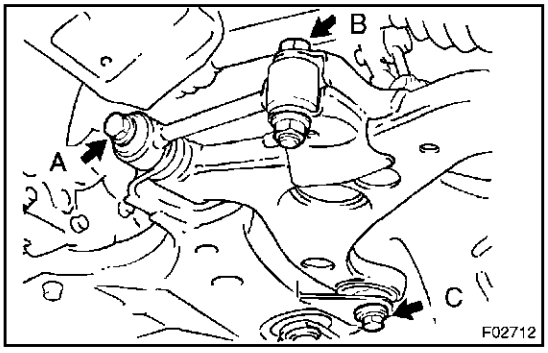
1. **M/T and A/T RH Side:**
REMOVE LOWER SUSPENSION ARM

(a) Remove the front wheel.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Disconnect the stabilizer bar link from the lower suspension arm (See page SA–47).



(c) Remove the bolt and 2 nuts, and disconnect the lower ball joint.
Torque: 127 N·m (1,300 kgf·cm, 94 ft·lbf)



(d) Remove the lower suspension arm control link and lower suspension arm.

(1) Remove the 2 bolts, nut and lower suspension arm control link from the lower suspension arm.
Torque:
A: 127 N·m (1,300 kgf·cm, 94 ft·lbf)
B: 84 N·m (860 kgf·cm, 62 ft·lbf)

(2) Remove the bolt and lower suspension arm.
Torque:
C: 145 N·m (1,479 kgf·cm, 107 ft·lbf)

2. **A/T LH Side:**
REMOVE LOWER SUSPENSION ARM

(a) Remove the front wheels.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Remove the engine under cover.

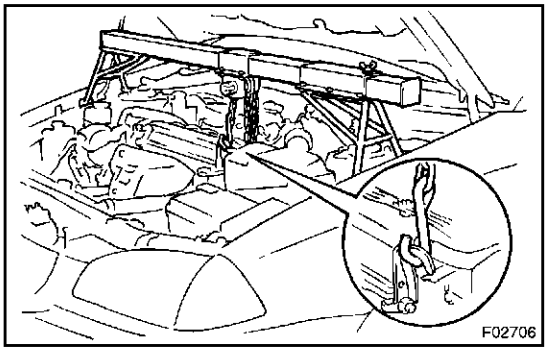
(c) Remove the exhaust front pipe.
Torque:
Gasoline engine:
Exhaust front pipe x Exhaust manifold:
62 N·m (630 kgf·cm, 46 ft·lbf)
Exhaust front pipe support bracket x Suspension member:
12 N·m (125 kgf·cm, 9 ft·lbf)
Exhaust front pipe x Exhaust center pipe:
43 N·m (440 kgf·cm, 32 ft·lbf)
Diesel engine:
Exhaust front pipe x Exhaust manifold:
62 N·m (630 kgf·cm, 46 ft·lbf)
Exhaust front pipe x Exhaust center pipe:
44 N·m (440 kgf·cm, 32 ft·lbf)

(d) Disconnect the left and right tie rod ends from the steering knuckles (See page SA–11).

(e) Disconnect the stabilizer bar link from the lower suspension arm (See page SA–47).

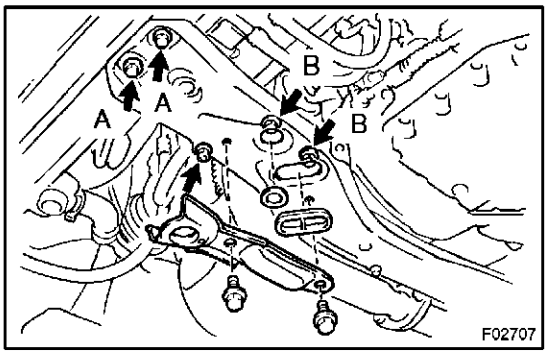
(f) Disconnect the left and right lower suspension arms from the lower ball joints.
Remove the bolt and 2 nuts, and disconnect the lower ball joints.
Torque: 127 N·m (1,300 kgf·cm, 94 ft·lbf)

(g) Disconnect these parts: (See page SR–38)
- No.2 intermediate shaft assembly
- Pressure feed tube
- Return tube
- Tube clamp bracket



(h) Support the engine.
Using an engine support fixture, support the engine.

(i) Remove the center member and front suspension member.

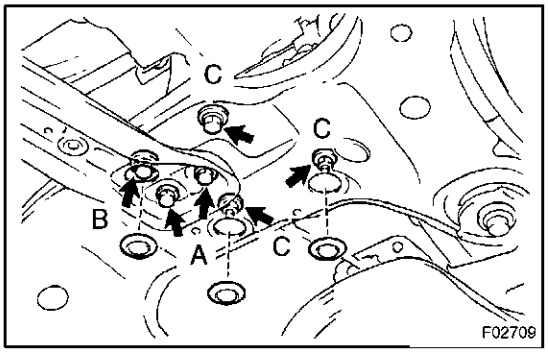


(1) Remove the 2 bolts and center member protector.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(2) Remove the 2 grommets.

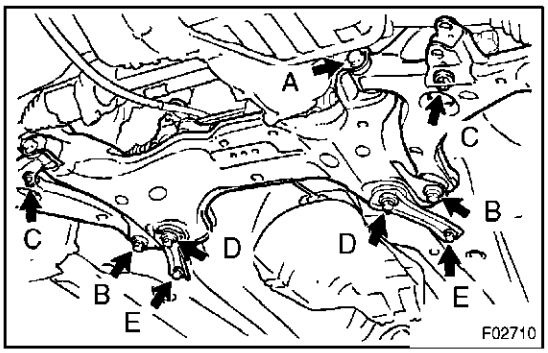
(3) Remove the 4 bolts.
Torque:
A: 73 N·m (740 kgf·cm, 54 ft·lbf)
B: 72 N·m (740 kgf·cm, 53 ft·lbf)

(4) RHD model:
Remove the nut.



(5) Remove the grommet, 3 bolts and center member.
Torque:
A: 73 N·m (740 kgf·cm, 54 ft·lbf)
B: 72 N·m (740 kgf·cm, 53 ft·lbf)

(6) Remove the 2 grommets, bolt and 2 nuts.
Torque:
C: 72 N·m (740 kgf·cm, 53 ft·lbf)



(7) Loosen the bolt on front side of lower suspension arm.

Torque:

A: 127 N·m (1,300 kgf·cm, 94 ft·lbf)

HINT:

- Do not remove the bolt.
- At the time of installation, after stabilizing the suspension, torque the bolt.

(8) Loosen the bolt of the lower suspension arm.

Torque:

B: 145 N·m (1,479 kgf·cm, 107 ft·lbf)

HINT:

- Do not remove the bolt.
- At the time of installation, after stabilizing the suspension, torque the bolt.

(9) Support the front suspension member.

(10) Remove the 2 nuts and washers.

Torque:

C: 206 N·m (2,100 kgf·cm, 152 ft·lbf)

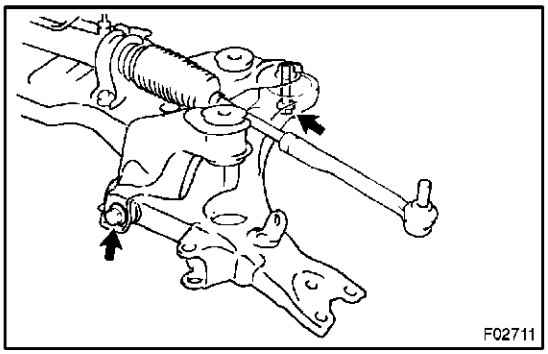
(11) Remove the 4 bolts and 2 sub–frame braces.

Torque:

D: 206 N·m (2,100 kgf·cm, 152 ft·lbf)

E: 146 N·m (1,490 kgf·cm, 108 ft·lbf)

(12) Lower the jack.



(13) Remove the 2 bolts and lower suspension arm.

SA04M–02

INSTALLATION

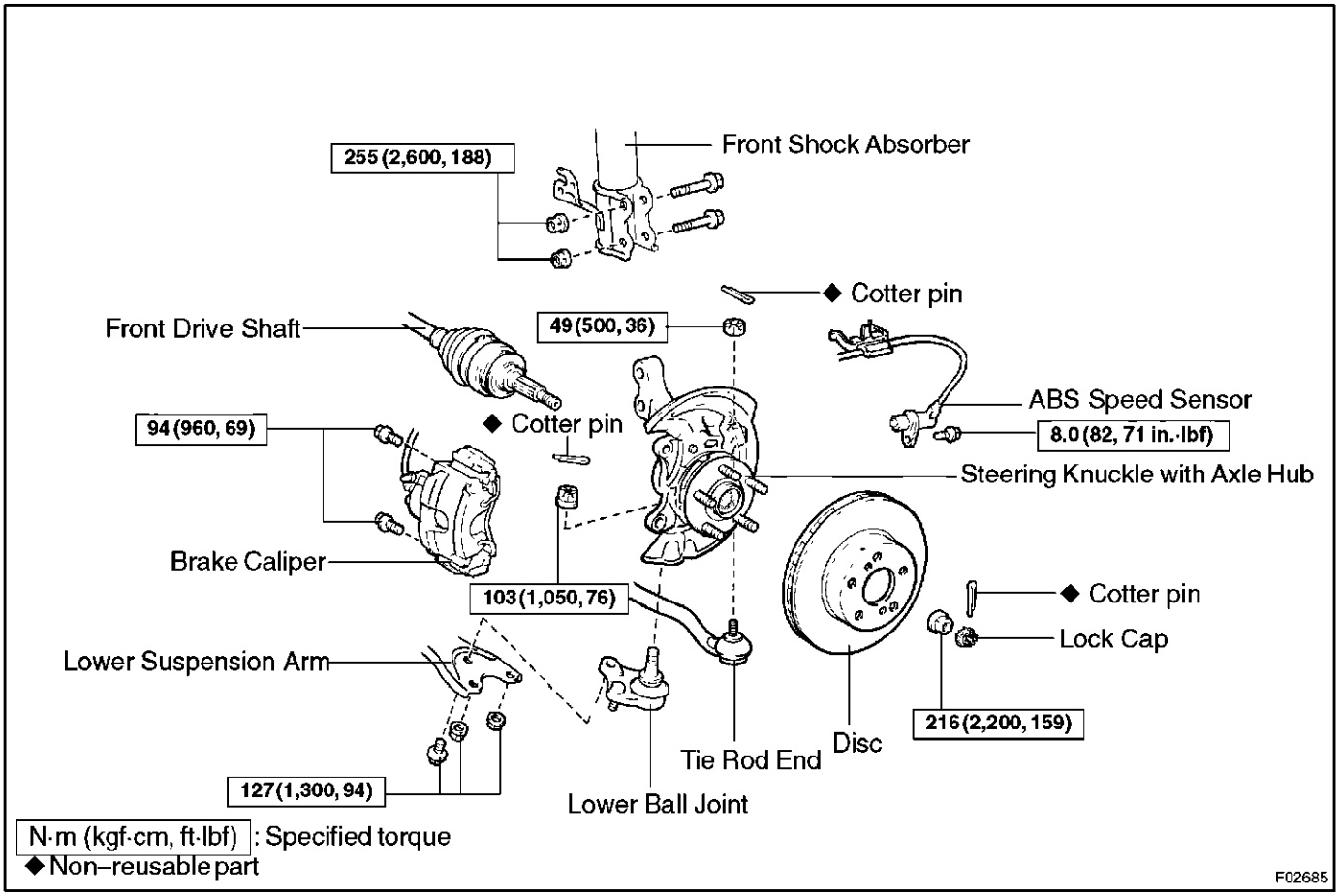
Installation is in the reverse order of removal (See page SA–38).

AFTER INSTALLATION, CHECK FRONT WHEEL ALIGNMENT (See page SA–4)

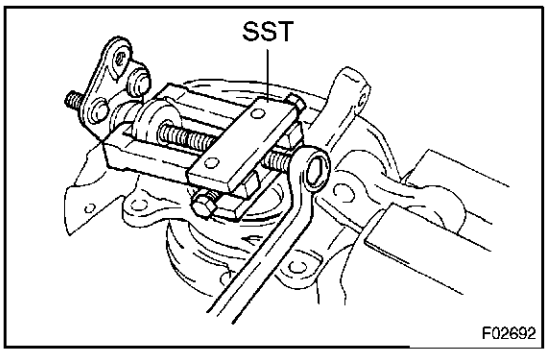
FRONT LOWER BALL JOINT

COMPONENTS

SA07X–03



SA07Y–03



REMOVAL

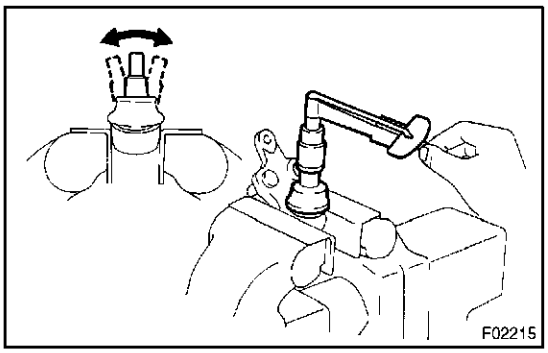
1. REMOVE STEERING KNUCKLE WITH AXLE HUB
(See page SA–11)

2. REMOVE LOWER BALL JOINT

(a) Remove the cotter pin and nut.

(b) Using SST, remove the lower ball joint.
SST 09628–62011

SA07Z–03



INSPECTION

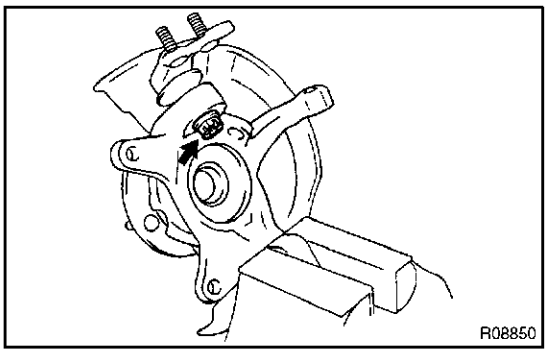
INSPECT LOWER BALL JOINT FOR ROTATION CONDITION

(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 one turn per 2 – 4 seconds and take the torque reading on the 5th turn.

Turning torque:
1.0 – 3.4 N·m (10 – 35 kgf·cm, 8.7 – 30 in.·lbf)

SA10F–01



INSTALLATION

1. **INSTALL LOWER BALL JOINT**

(a) Install the lower ball joint and tighten the nut.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Install a new cotter pin.

2. **INSTALL STEERING KNUCKLE WITH AXLE HUB**
(See page SA–15)

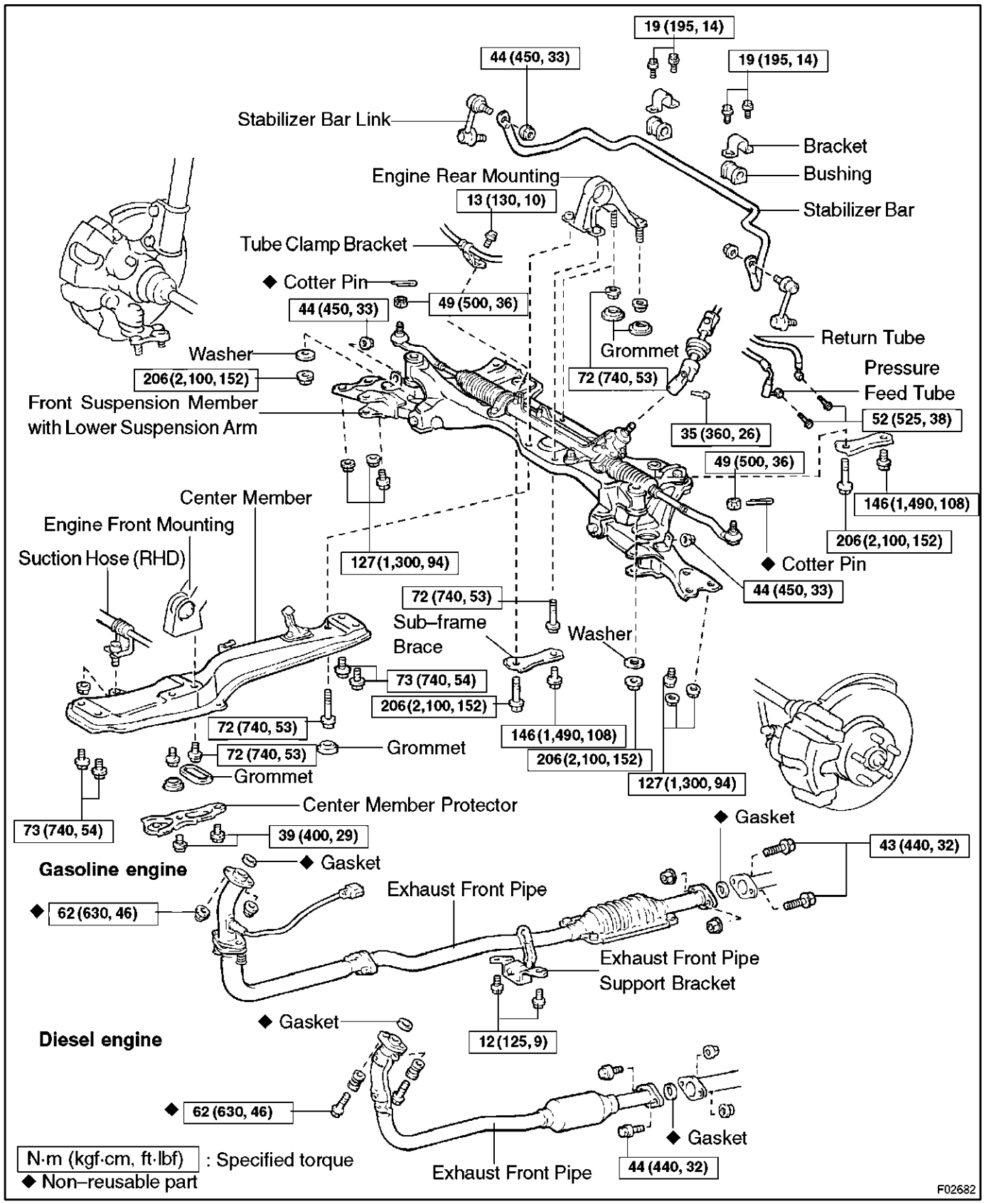
3. **CHECK ABS SPEED SENSOR SIGNAL**
(See page DI–115)

4. **CHECK FRONT WHEEL ALIGNMENT**
(See page SA–4)

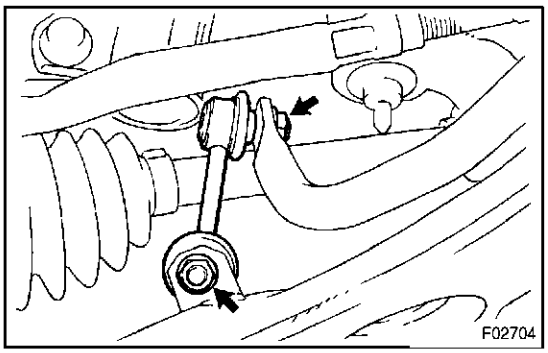
FRONT STABILIZER BAR

COMPONENTS

SA10H–01



SA10I–01



REMOVAL

1. REMOVE STABILIZER BAR LINKS

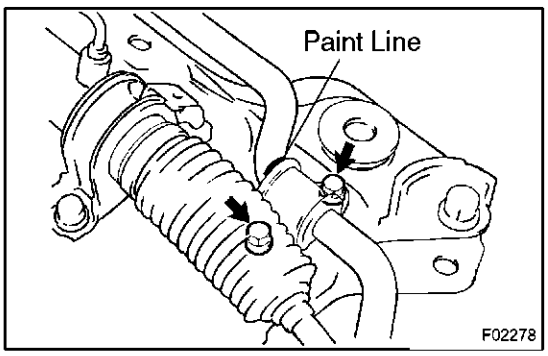
Remove the 4 nuts and 2 stabilizer bar links.

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

HINT:

If the ball joint turns together with the nut, use a 5 mm hexagon wrench to hold the stud.

2. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM (See page SA–38)



3. REMOVE STABILIZER BAR

(a) Remove the 4 bolts, 2 brackets and bushings.

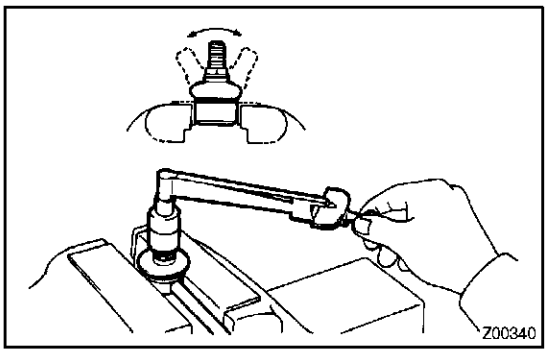
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

HINT:

At the time of installation, install the bushing to the outside of the paint line.

(b) Remove the stabilizer bar from the left hand side.

SA04P–02



INSPECTION

INSPECT STABILIZER BAR LINK BALL JOINT FOR ROTATION CONDITION

(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 one turn per 2 – 4 seconds and take the torque reading on the 5th turn.

Turning torque:
0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.·lbf)

SA04Q–02

INSTALLATION

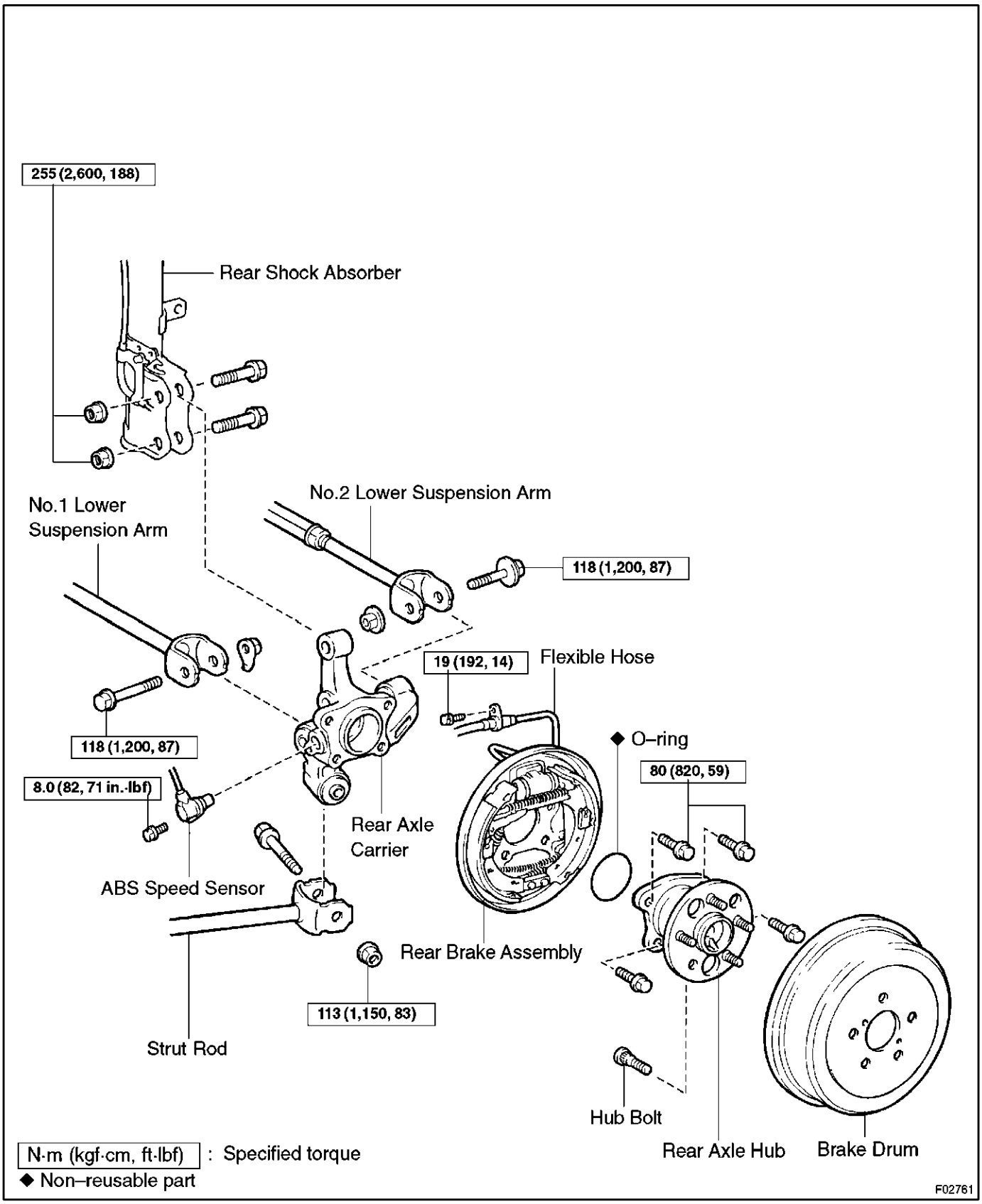
Installation is in the reverse order of removal (See page SA–47).

AFTER INSTALLATION, CHECK FRONT WHEEL ALIGNMENT (See page SA–4)

REAR AXLE HUB

COMPONENTS

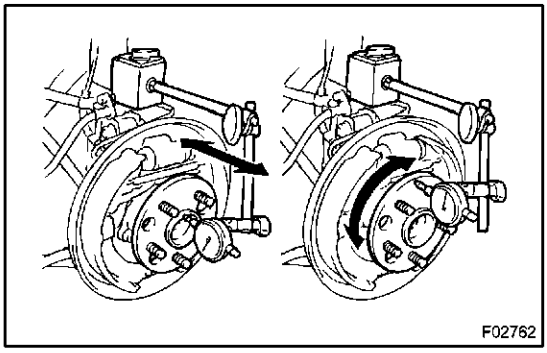
SA03B–02



SA03C–02

REMOVAL

1. **REMOVE REAR WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
2. **REMOVE BRAKE DRUM**


F02762

3. **CHECK BEARING BACKLASH AND AXLE HUB DEVIATION**

(a) Using a dial indicator, check the backlash near the center of the axle hub.
Maximum: 0 mm (0 in.)

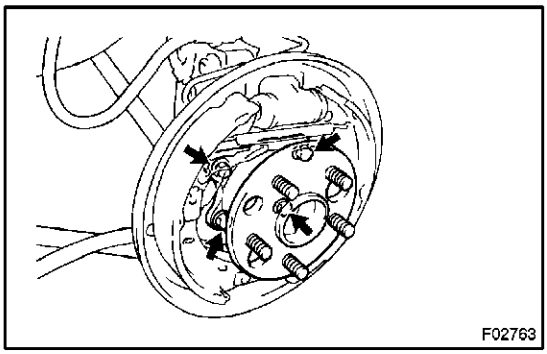
If the backlash exceeds the maximum, replace the axle hub with a bearing.

(b) 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 deviation exceeds the maximum, replace the axle hub with a bearing.

4. **w/ ABS:**
   REMOVE ABS SPEED SENSOR

Remove the bolt and speed sensor.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)


F02763

5. **REMOVE REAR AXLE HUB**

(a) Remove the 4 bolts and rear axle hub.
Torque: 80 N·m (820 kgf·cm, 59 ft·lbf)

(b) Remove the O–ring.

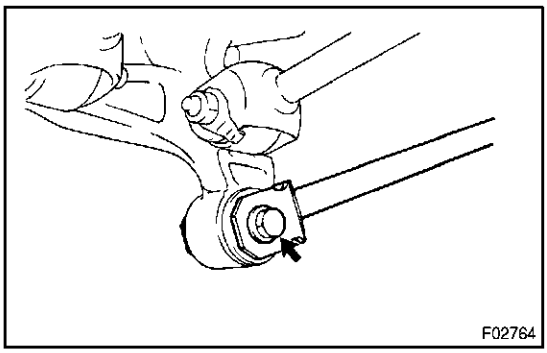
HINT:
At the time of installation, coat the O–ring with MP grease.

6. **DISCONNECT FLEXIBLE HOSE FROM SHOCK ABSORBER**

Remove the bolt, and disconnect the flexible hose from the shock absorber bracket.
Torque: 19 N·m (192 kgf·cm, 14 ft·lbf)

7. **REMOVE REAR BRAKE ASSEMBLY FROM REAR AXLE CARRIER**

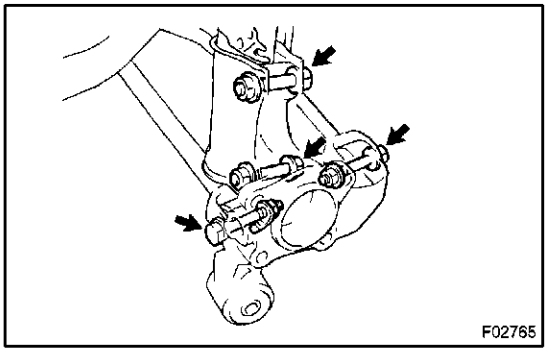
HINT:
Support the rear brake assembly securely.



8. REMOVE REAR AXLE CARRIER

(a) Remove the bolt and nut, and disconnect the strut rod.
Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)

HINT:
At the time of installation, after stabilizing the suspension, torque the bolt.



(b) Loosen the 2 nuts on the lower side of the shock absorber.

HINT:
Do not remove the 2 nuts and bolts.
Torque: 255 N·m (2,600 kgf·cm, 188 ft·lbf)

(c) Remove the 2 bolts and nuts, and disconnect the No.1 and No.2 lower suspension arms.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

HINT:
At the time of installation, after stabilizing the suspension, torque the bolt.

(d) Remove the 2 nuts and bolts on the lower side of the shock absorber.

(e) Remove the rear axle carrier.

SA03D–02

INSTALLATION

Installation is in the reverse order of removal (See page SA–51).

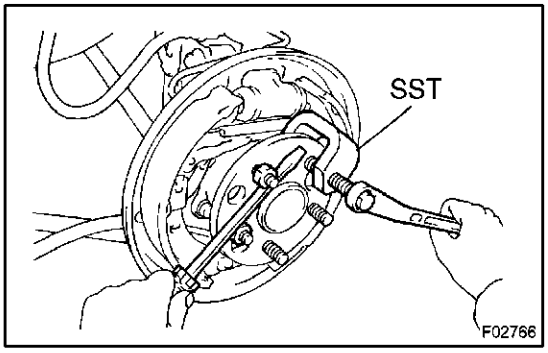
AFTER INSTALLATION, CHECK ABS SPEED SENSOR SIGNAL (See page DI–115) AND REAR WHEEL ALIGNMENT (See page SA–8)

REAR WHEEL HUB BOLT

SA03J–02

REPLACEMENT

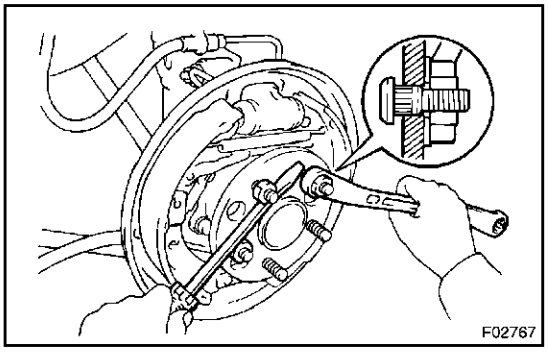
1. **REMOVE REAR WHEEL**
2. **REMOVE REAR BRAKE DRUM**



3. **REMOVE HUB BOLT**

Using SST, remove the hub bolt.

SST 09628–10011



4. **INSTALL HUB BOLT**

(a) Install a washer and nut to the hub bolt, as shown in the illustration.

(b) Install the hub bolt by torquing the nut.

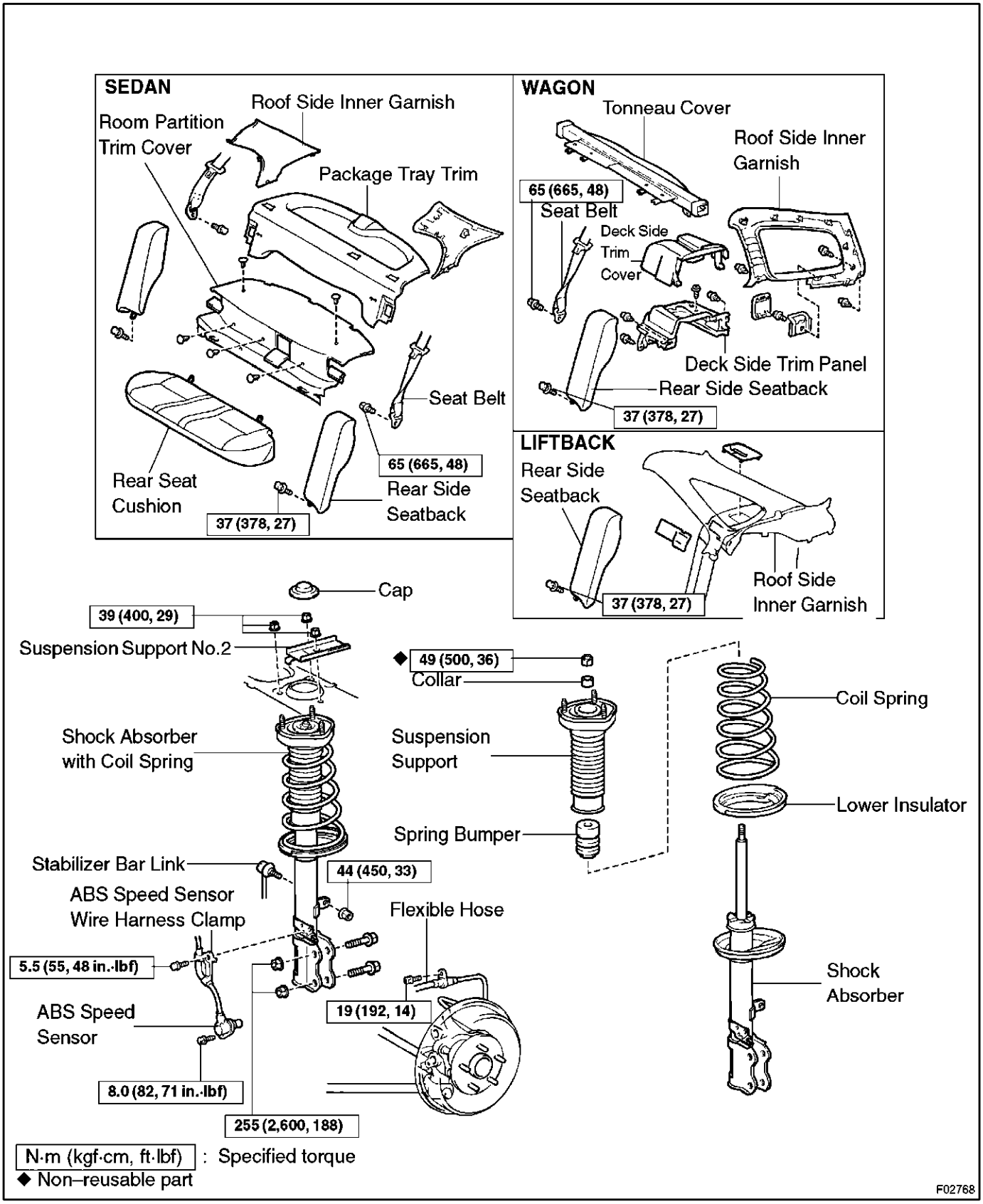
5. **INSTALL REAR BRAKE DRUM**
6. **INSTALL REAR WHEEL**

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR SHOCK ABSORBER

COMPONENTS

SA03V–02



SA10D–01

REMOVAL

1. REMOVE THESE PARTS:

(a) Sedan:
- Rear seat cushion
- Room partition trim cover
- Package tray trim
- 2 roof side inner garnishes
- 2 rear side seatbacks

Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)
- 2 seat belts

Torque: 65 N·m (665 kgf·cm, 48 ft·lbf)

(b) Wagon:
- Tonneau cover
- Roof side inner garnish
- Deck side trim cover
- Deck side trim panel
- Rear side seatback

Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)
- Seat belt

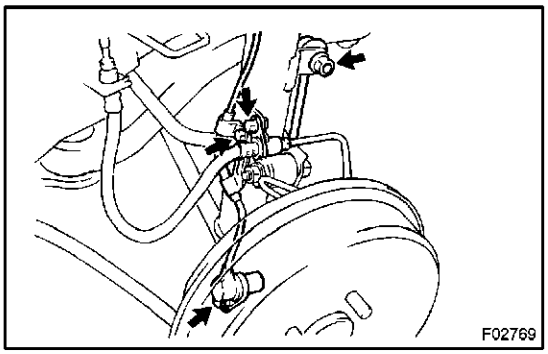
Torque: 65 N·m (665 kgf·cm, 48 ft·lbf)

(c) Liftback:
- Roof side inner garnish
- Rear side seatback

Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)

2. REMOVE REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



3. w/ ABS:
DISCONNECT ABS SPEED SENSOR AND HARNESS CLAMP

Remove the 2 bolts and ABS speed sensor from the axle carrier and shock absorber.

Torque:
ABS speed sensor set bolt:
8.0 N·m (82 kgf·cm, 71 in.·lbf)
ABS speed sensor wire harness clamp set bolt:
5.5 N·m (55 kgf·cm, 48 in.·lbf)

4. REMOVE FLEXIBLE HOSE FROM SHOCK ABSORBER

Remove the bolt, and disconnect the flexible hose from the shock absorber bracket.

Torque: 19 N·m (192 kgf·cm, 14 ft·lbf)

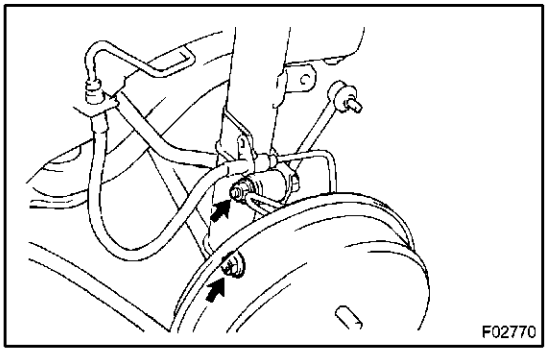
5. DISCONNECT STABILIZER BAR LINK FROM SHOCK ABSORBER

Remove the nut and disconnect the stabilizer bar link from the shock absorber.

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

HINT:

If the ball joint turns together with the nut, use a 5 mm hexagon wrench to hold the stud.



6. REMOVE SHOCK ABSORBER WITH COIL SPRING

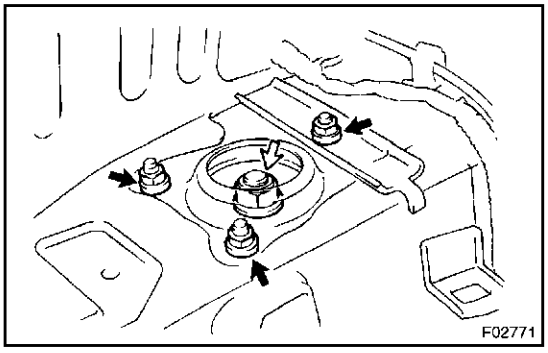
(a) Loosen the 2 nuts on the lower side of the shock absorber.

HINT:

Do not remove the 2 nuts.

Torque: 255 N·m (2,600 kgf·cm, 188 ft·lbf)

(b) Support the rear axle carrier with a jack.



(c) Remove the cap from the suspension support.

(d) Loosen the suspension support center nut.

NOTICE:

Do not remove the nut.

HINT:

If not disassembling the rear shock absorber, it is not necessary to loosen the nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(e) Remove the 3 nuts of the suspension support.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(f) Remove the suspension support No.2 from the suspension support.

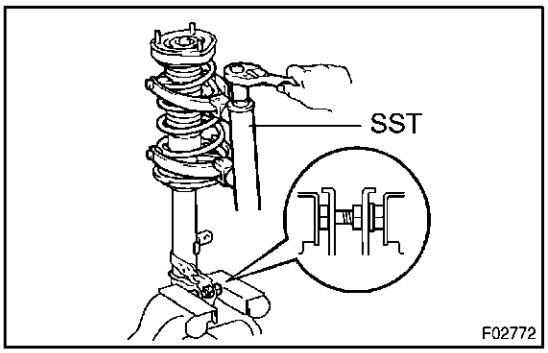
(g) Lower the rear axle carrier and remove the 2 nuts and bolts on the lower side of the shock absorber.

HINT:

At the time of installation, coat the nut's threads with engine oil.

(h) Remove the shock absorber with the coil spring.

SA03X–02



DISASSEMBLY

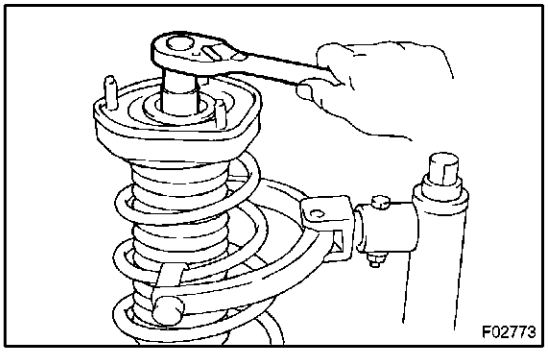
REMOVE COIL SPRING

(a) Install 2 nuts and a bolt to the bracket at the lower part of the shock absorber, and secure it in a vise.

(b) Using SST, compress the coil spring.
SST 09727–30021

NOTICE:

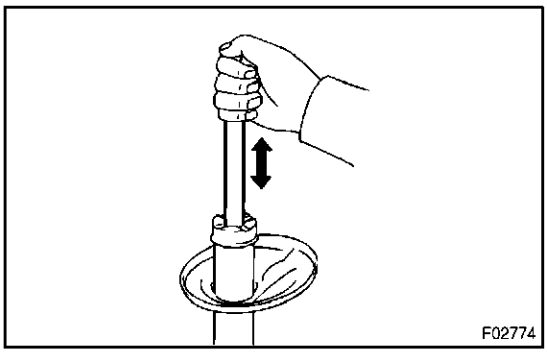
Do not use an impact wrench. It will damage the SST.



(c) Remove the nut.

(d) Remove these parts from the shock absorber:
- Collar
- Suspension support
- Coil spring
- Spring bumper
- Lower insulator

SA03Y–02



INSPECTION

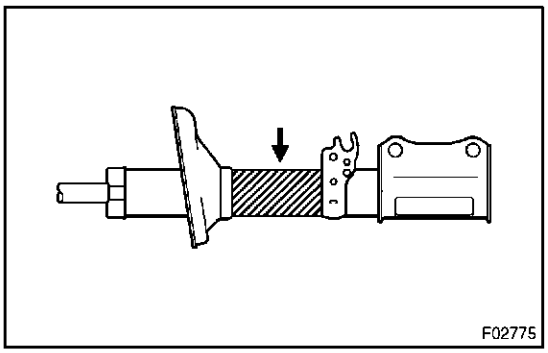
INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod, and check that there is no abnormal resistance or unusual operation sound.
If there is any abnormality, replace the shock absorber with a new one.

NOTICE:

When disposing of the shock absorber, see DISPOSAL on page SA–60.

SA03Z–02



DISPOSAL

1. FULLY EXTEND SHOCK ABSORBER ROD

2. DRILL HOLE TO REMOVE GAS FROM CYLINDER

Using a drill, make a hole in the cylinder, as shown in the illustration to discharge the gas inside.

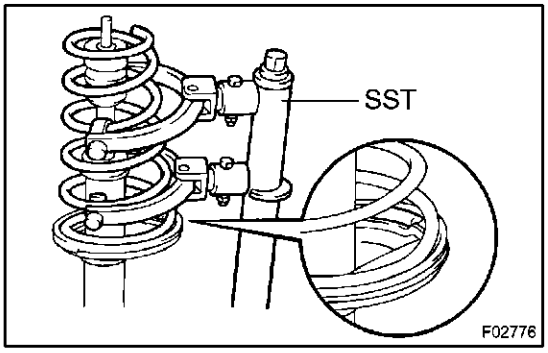
CAUTION:

The discharging gas is harmless, but be careful of chips which may fly up when drilling.

SA040–02

REASSEMBLY

1. INSTALL LOWER INSULATOR
2. INSTALL SPRING BUMPER TO PISTON ROD



3. INSTALL COIL SPRING

(a) Using SST, compress the coil spring.
SST 09727–30021

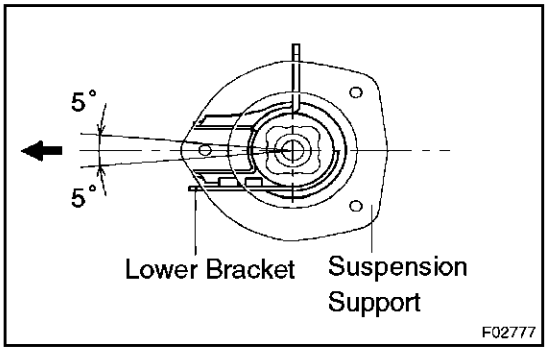
NOTICE:

Do not use an impact wrench. It will damage the SST.

(b) Install the coil spring to the shock absorber.

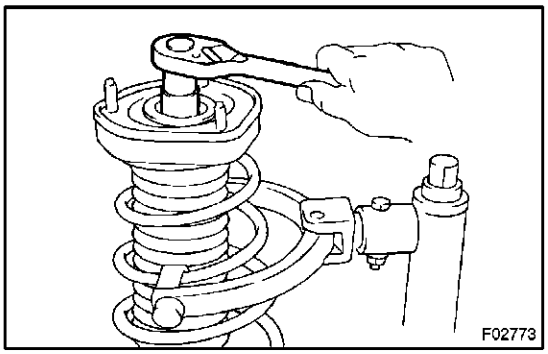
HINT:

Fit the lower end of the coil spring into the gap of the lower seat.



4. INSTALL SUSPENSION SUPPORT

(a) Align the suspension support with the shock absorber lower bracket, as shown in the illustration.



(b) Install the collar to the piston rod.

(c) Temporarily install a new nut.

(d) Remove the SST.
SST 09727–30021

HINT:

After removing SST, recheck the direction of the suspension support.

SA041–02

INSTALLATION

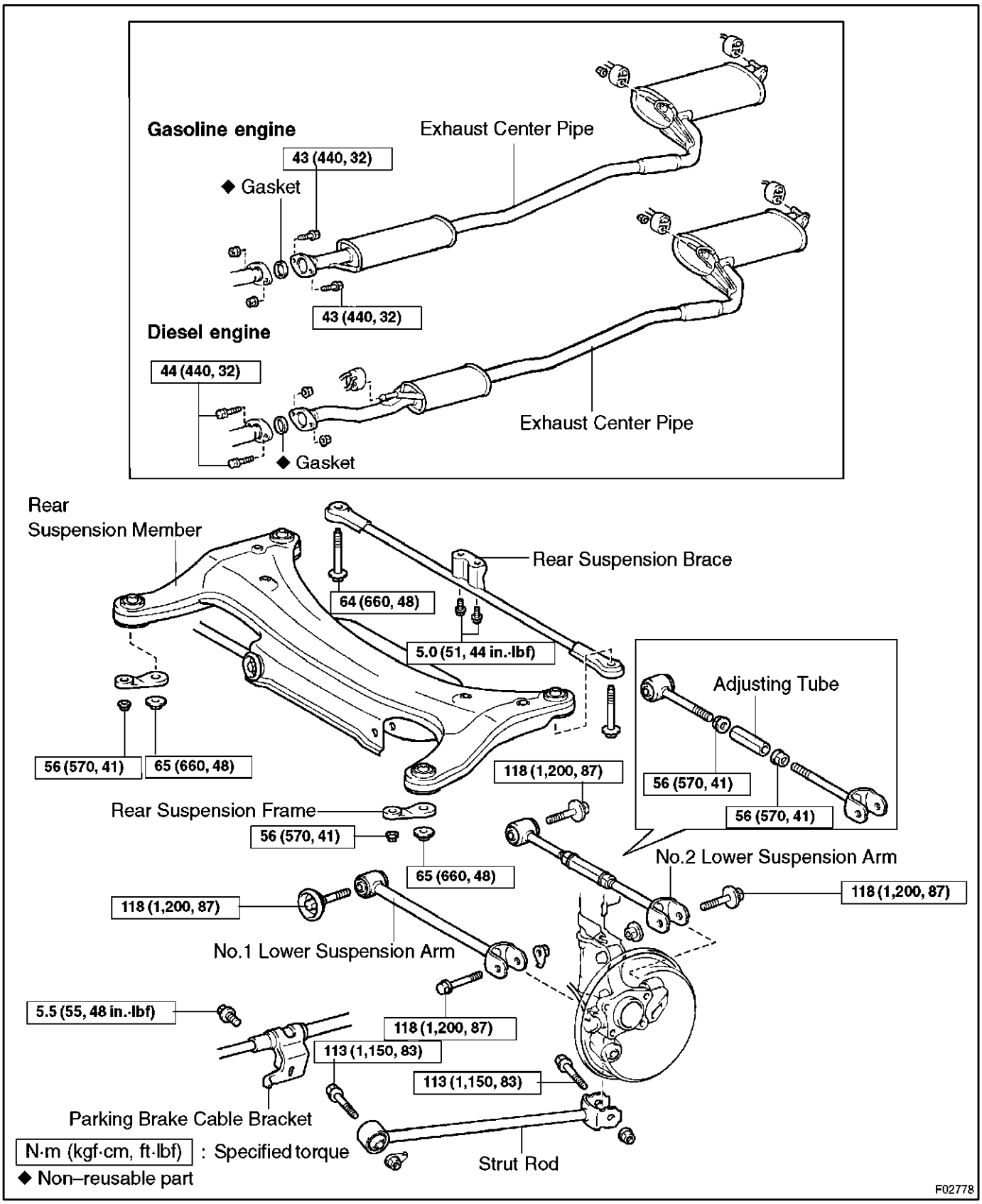
Installation is in the reverse order of removal (See page SA–56).

AFTER INSTALLATION, CHECK ABS SPEED SENSOR SIGNAL (See page DI–115) AND REAR WHEEL ALIGNMENT (See page SA–8)

REAR LOWER SUSPENSION ARM AND STRUT ROD

COMPONENTS

SA042–02

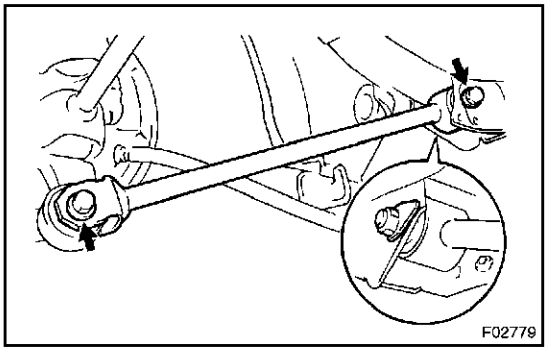


SA10CI–01

REMOVAL

1. **REMOVE REAR WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
2. **DISCONNECT EXHAUST CENTER PIPE**
   Torque:
   Gasoline Engine: 43 N·m (440 kgf·cm, 32 ft·lbf)
   Diesel Engine: 44 N·m (440 kgf·cm, 32 ft·lbf)
3. **DISCONNECT PARKING BRAKE CABLE BRACKET**

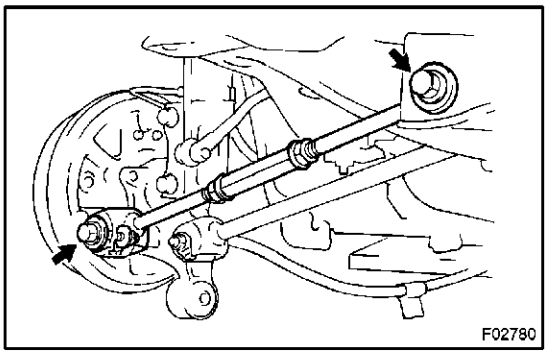
Remove the bolt and disconnect the parking brake bracket.
Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)


F02779

4. **REMOVE STRUT ROD**

Remove the 2 bolts, nuts and strut rod.
Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)

HINT:
At the time of installation, after stabilizing the suspension, torque the bolt.


F02780

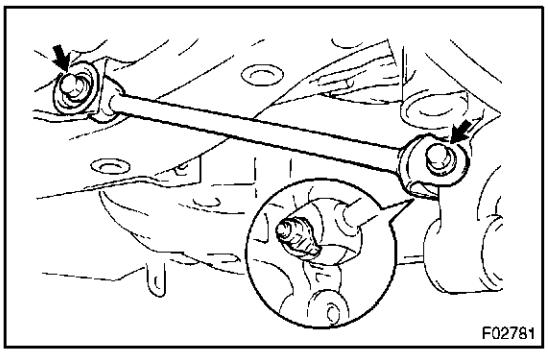
5. **REMOVE NO.2 LOWER SUSPENSION ARM**

(a) Remove the bolt and disconnect the No.2 lower suspension arm from the rear suspension member.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

HINT:
At the time of installation, after stabilizing the suspension, torque the bolt.

(b) Remove the bolt, nut and No.2 lower suspension arm from the axle carrier.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

HINT:
At the time of installation, after stabilizing the suspension, torque the bolt.



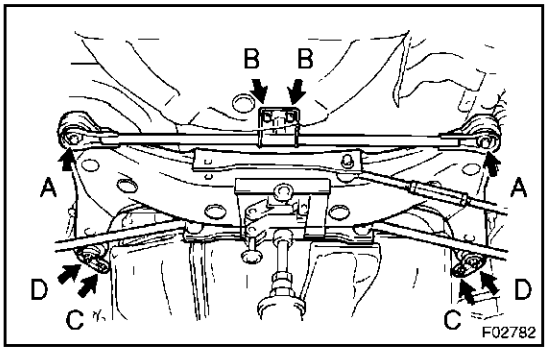
6. REMOVE NO.1 LOWER SUSPENSION ARM

(a) Remove the bolt and nut, and disconnect the No.1 lower suspension arm from the axle carrier.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

HINT:
At the time of installation, after stabilizing the suspension, torque the bolt.

(b) Loosen the bolt on the rear suspension member side of the No.1 lower suspension arm.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

HINT:
- Do not remove the bolt.
- At the time of installation, after stabilizing the suspension, torque the bolt.



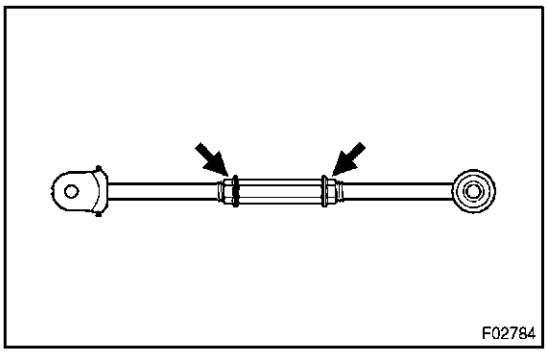
(c) Support the rear suspension member with a jack.

(d) Remove the 4 bolts and rear suspension brace.
Torque:
A: 64 N·m (660 kgf·cm, 48 ft·lbf)
B: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

(e) Remove the 4 nuts, 2 rear suspension frames and rear suspension member.
Torque:
C: 56 N·m (570 kgf·cm, 41 ft·lbf)
D: 65 N·m (660 kgf·cm, 48 ft·lbf)

(f) Lower the rear suspension member, remove the bolt and No.1 lower suspension arm.

SA044–02



DISASSEMBLY

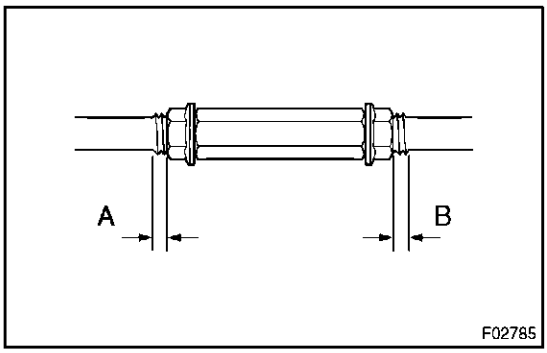
DISASSEMBLE NO.2 LOWER SUSPENSION ARM

(a) Loosen the 2 lock nuts.
(b) Turn the adjusting tube and disassemble the No.2 lower suspension arm.
(c) Remove the 2 lock nuts from the arms.

SA045–02

REASSEMBLY

ASSEMBLE NO.2 LOWER SUSPENSION ARM



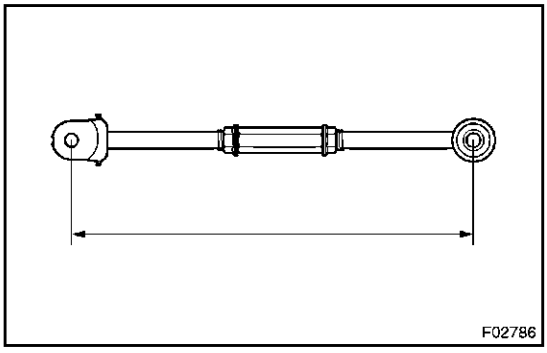
(a) Install the 2 lock nuts to the arms.

(b) Turn the adjusting tube and assemble the No.2 lower suspension arm.

HINT:

When assembling the No.2 lower suspension arm, try to make sure that the lengths of A and B shown in the illustration are the same.

Maximum difference: 3 mm (0.12 in.)



(c) Adjust the No.2 lower suspension arm length by turning the adjusting tube.

Arm length: 420 ± 1.5 mm (16.535 ± 0.059 in.)

(d) Temporarily tighten the 2 lock nuts.

HINT:

After adjusting the rear wheel alignment, torque the lock nuts (See page SA–8).

Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)

SA046–02

INSTALLATION

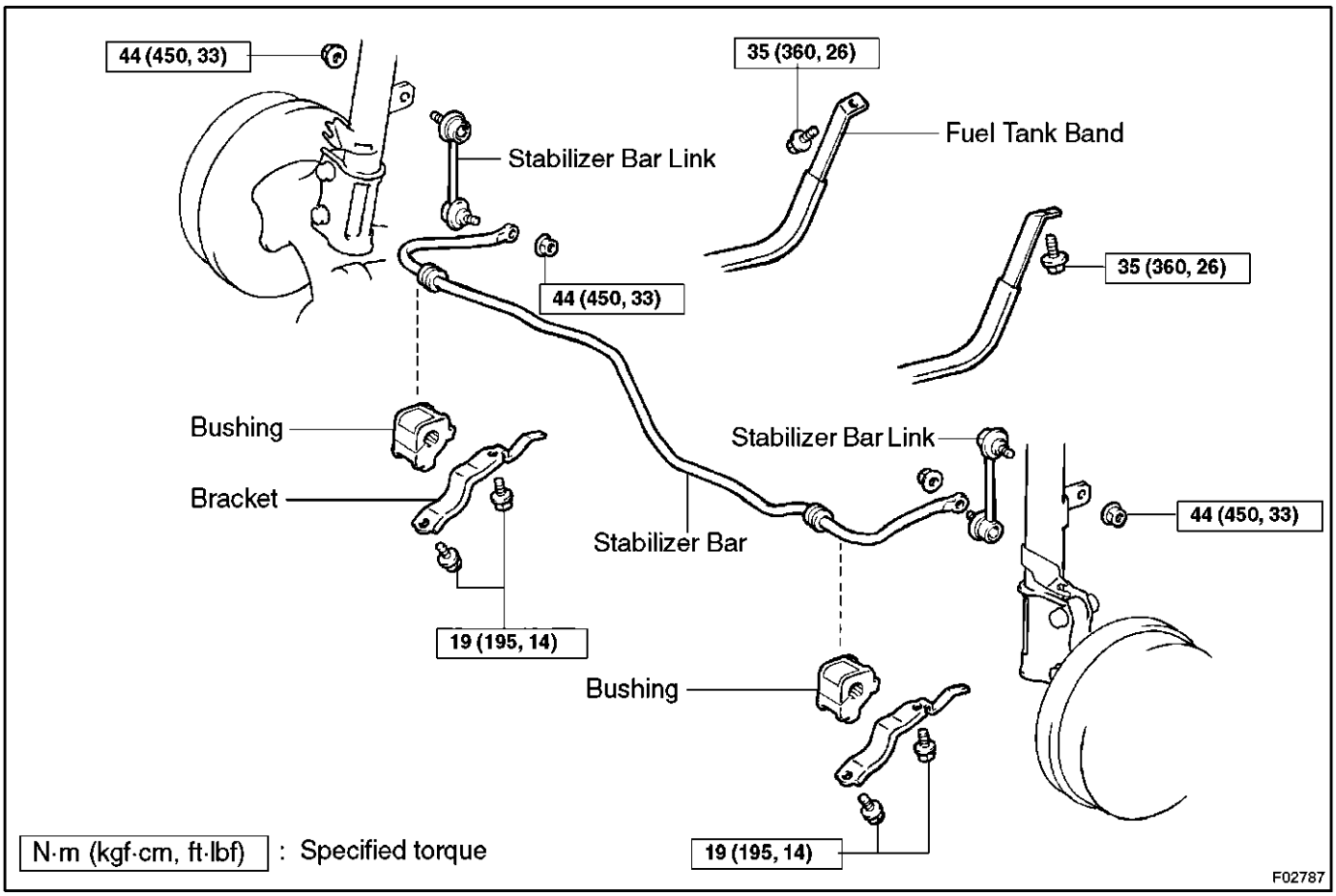
Installation is in the reverse order of removal (See page SA–64).

AFTER INSTALLATION, CHECK REAR WHEEL ALIGNMENT (See page SA–8)

REAR STABILIZER BAR

COMPONENTS

SA04A–02

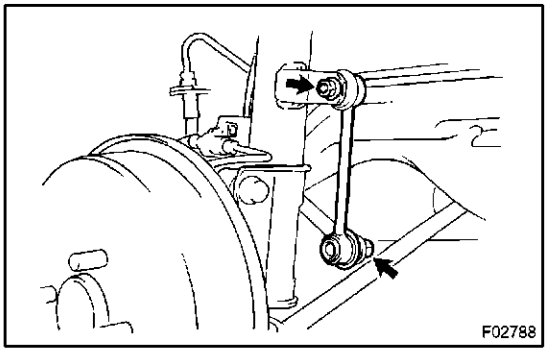


SA10R–01

REMOVAL

1. REMOVE REAR WHEELS

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



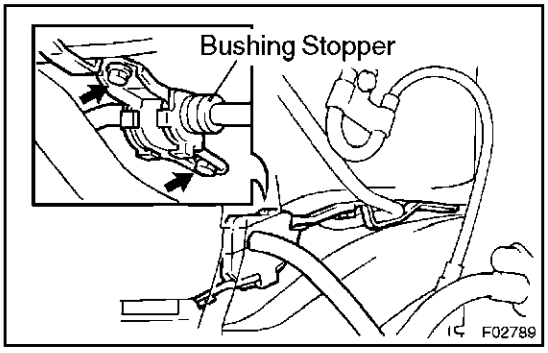
2. REMOVE LEFT AND RIGHT STABILIZER BAR LINKS

Remove the 4 nuts and 2 stabilizer bar links.

HINT:

If the ball joint turns together with the nut, use a 5 mm hexagon wrench to hold the stud.

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)



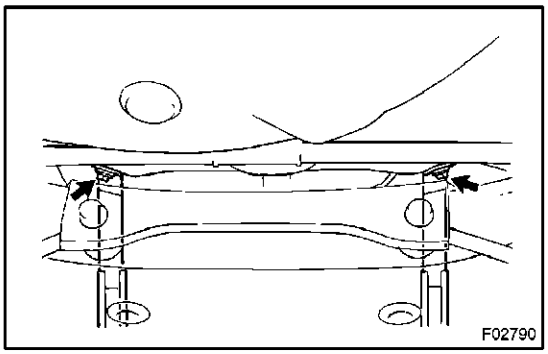
3. REMOVE LEFT AND RIGHT STABILIZER BAR BRACKETS AND BUSHINGS

Remove the 4 bolts, 2 brackets and bushings from the stabilizer bar.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

HINT:

At the time of installation, install the bushing to the portion outside of the bushing stopper.



4. DISCONNECT FUEL TANK BAND FROM BODY

(a) Support the fuel tank with a jack.

(b) Remove the 2 bolts and disconnect the LH and RH fuel tank bands.

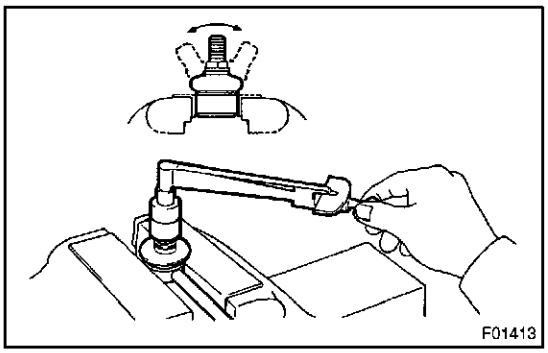
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

(c) Lower the jack.

5. REMOVE STABILIZER BAR

Remove the stabilizer bar from the LH side.

SA04C–02



INSPECTION

INSPECT STABILIZER BAR LINK BALL JOINT FOR ROTATION CONDITION

(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 one turn per 2 – 4 seconds and take the torque reading on the 5th turn.

Turning torque:
0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.·lbf)

SA04D–02

INSTALLATION

Installation is in the reverse order of removal (See page SA–70).

BRAKE

BRAKE SYSTEM BR–1
TROUBLESHOOTING BR–2
BRAKE FLUID BR–3
BRAKE PEDAL BR–5
PARKING BRAKE LEVER BR–7
BRAKE MASTER CYLINDER BR–8
BRAKE BOOSTER ASSEMBLY BR–15
VACUUM PUMP BR–19
FRONT BRAKE PAD BR–22
FRONT BRAKE CALIPER BR–24
REAR DRUM BRAKE BR–30
PROPORTIONING VALVE (P VALVE) BR–35
BRAKE ACTUATOR BR–36
FRONT SPEED SENSOR BR–41
REAR SPEED SENSOR BR–44

BRAKE SYSTEM

BR0KF–01

GENERAL DESCRIPTION

1. 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 of the same part number or equivalent.
2. It is very important to keep parts and the area clean when repairing the brake system.
3. If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

BR0KG–03

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
Lower pedal or spongy pedal	1. Fluid leaks for brake system	–
	2. Air in brake system	–
	3. Piston seals (Worn or damaged)	BR–24
		BR–30
	4. Master cylinder (Faulty)	BR–8
Brake drag	1. Brake pedal freeplay (Minimal)	BR–5
	2. Parking brake pedal travel (Out of adjustment)	BR–7
	3. Parking brake wire (Sticking)	–
	4. Rear brake shoe clearance (Out of adjustment)	BR–34
	5. Pad or lining (Cracked or distorted)	BR–27
		BR–30
	6. Piston (Stuck)	BR–24
		BR–30
	7. Piston (Frozen)	BR–24
		BR–30
	8. Tension or return spring (Faulty)	BR–30
	9. Vacuum leaks for booster system	BR–15
	10. Master cylinder (Faulty)	BR–8
Brake pull	1. Piston (Stuck)	BR–24
		BR–30
	2. Pad or lining (Oily)	BR–24
		BR–30
	3. Piston (Frozen)	BR–24
		BR–30
	4. Disc (Scored)	BR–24
	5. Pad or lining (Cracked or distorted)	BR–24
		BR–30
Hard pedal but brake inefficient	1. Fluid leaks for brake system	–
	2. Air in brake system	–
	3. Piston (Stuck)	BR–24
		BR–30
	4. Pad or lining (Cracked or distorted)	BR–24
		BR–30
	5. Pad or lining (Oily)	BR–24
		BR–30
	6. Pad or lining (Glazed)	BR–24
		BR–30
	7. Disc (Scored)	BR–24
	8. Vacuum leaks for booster system	BR–15
Noise from brake	1. Pad or lining (Cracked or distorted)	BR–24
		BR–30
	2. Installation bolt (Loosened)	BR–24
	3. Disc (scored)	BR–24
	4. Pad or lining (Dirty)	BR–24
		BR–30
	5. Pad or lining (Glazed)	BR–24
		BR–30
	6. Tension or return spring (Faulty)	BR–30
	7. Hold–down spring (Damage)	BR–30

BRAKE FLUID

BR0KH–02

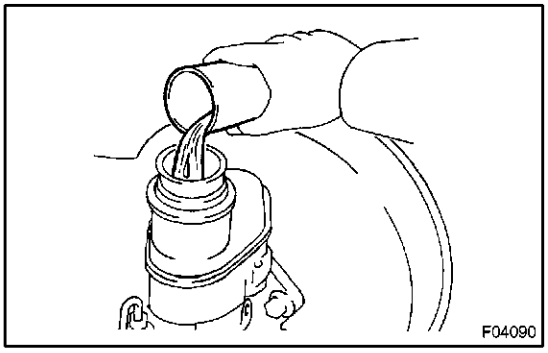
BLEEDING

HINT:

If any work is done on the brake system or if air in the brake lines is suspected, bleed the system of air.

NOTICE:

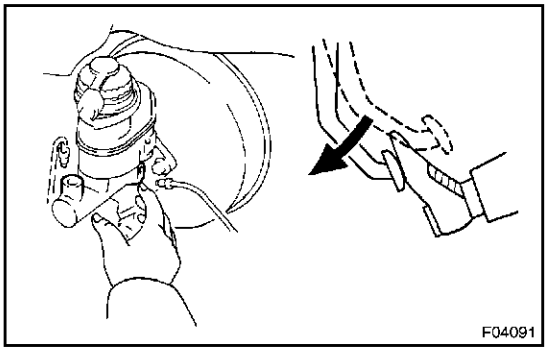
Do not let brake fluid remain on a painted surface. Wash it off immediately.



1. FILL BRAKE RESERVOIR WITH BRAKE FLUID

Check the fluid level in the reservoir after bleeding each wheel. Add fluid, if necessary.

Fluid: SAE J1703 or FMVSS No.116 DOT3



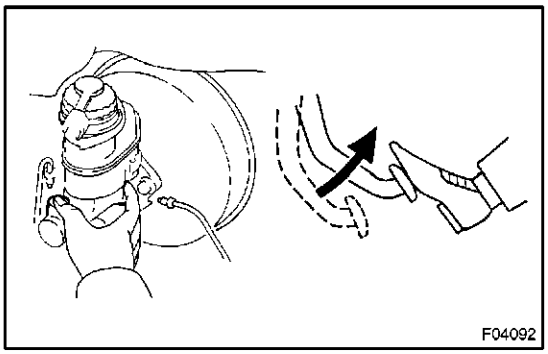
2. BLEED MASTER CYLINDER

HINT:

If the master cylinder has been disassembled or if the reservoir becomes empty, bleed the air from the master cylinder.

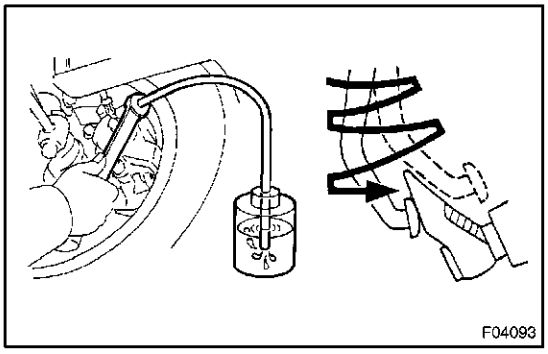
(a) Disconnect the brake lines from the master cylinder.

(b) Slowly depress the brake pedal and hold it.



(c) Block off the outlet plugs with your fingers, and release the brake pedal.

(d) Repeat (b) and (c) 3 or 4 times.



3. CONNECT VINYL TUBE TO BRAKE CALIPER BLEEDER PLUG

Insert the other end of the tube in a half–full container of brake fluid.

NOTICE:

Bleed air of the rear brake first. If front brake is bled first, rear brake air cannot be bled.

4. BLEED BRAKE LINE

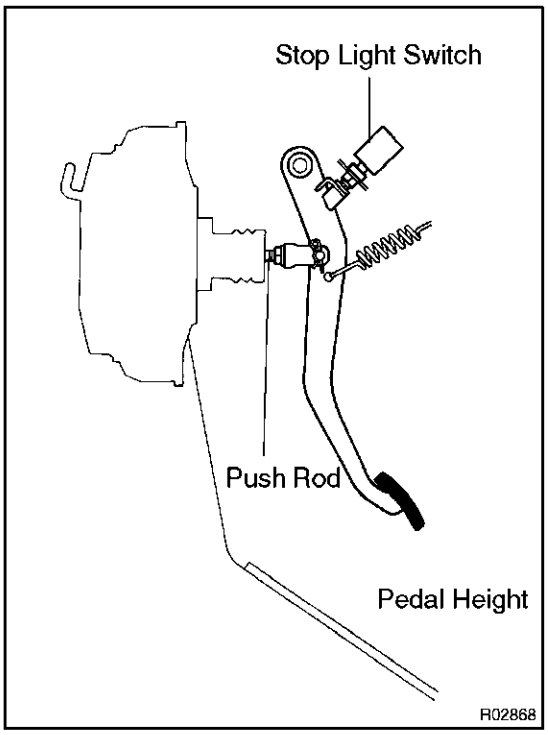
(a) Slowly depress the brake pedal several times.

(b) While an assistant depresses the pedal, loosen the bleeder plug until fluid starts to run out. Then tighten the bleeder plug.

(c) Repeat this procedure until there are no more air bubbles in the fluid.

Bleeder plug tightening torque:
8.3 N·m (85 kgf·cm, 74 in.·lbf)

5. REPEAT PROCEDURE FOR EACH WHEEL



BRAKE PEDAL

BR0KI-02

ON–VEHICLE INSPECTION

1. **CHECK PEDAL HEIGHT**

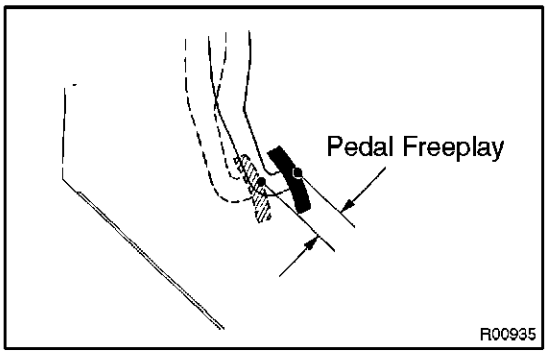
Pedal height from asphalt sheet:
(LHD)
139.8 – 149.8 mm (5.504 – 5.598 in.)
(RHD)
149.5 – 159.5 mm (5.886 – 6.280 in.)

If the pedal height is incorrect, adjust it.

2. **RHD:**

IF NECESSARY, ADJUST PEDAL HEIGHT

(a) Disconnect the connector from the stop light switch.
(b) Loosen the stop light switch lock nut and remove the stop light switch.
(c) Loosen the push rod lock nut.
(d) Adjust the pedal height by turning the pedal push rod.
(e) Tighten the push rod lock nut.
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)
(f) Install the stop light switch.
(g) Push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), turn the stop light switch and lock the nut in the position where the stop light goes off.
(h) Connect the connector to the stop light switch.
(i) After installation, push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), check that stop light lights up.
(j) After adjusting the pedal height, check the pedal freeplay.

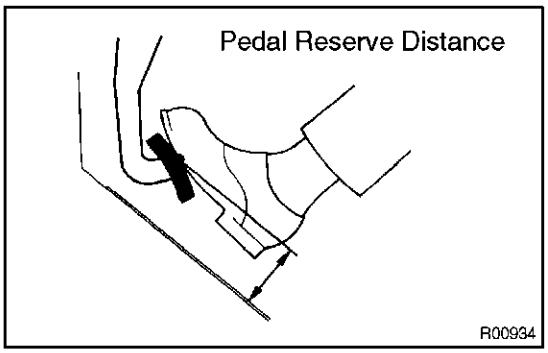


3. **CHECK PEDAL FREEPLAY**

(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 by hand until the resistance begins to be felt, then measure the distance.
Pedal freeplay: 1 – 6 mm (0.04 – 0.24 in.)

HINT:
The freeplay to the 1st resistance is due to the play between the clevis and pin. This is magnified up to 1 – 3 mm (0.04 – 0.12 in.) at the pedal.

- If incorrect, check the stop light switch clearance.
- If the clearance is OK, then troubleshoot the brake system.

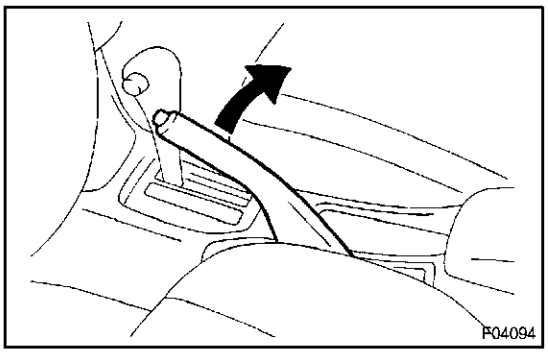


4. CHECK PEDAL RESERVE DISTANCE

Release the parking brake. With the 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):
LHD Gasoline engine (w/o ABS)
More than 75 mm (2.95 in.)
LHD others
More than 70 mm (2.76 in.)
RHD Gasoline engine (w/o ABS)
More than 85 mm (3.35 in.)
RHD others
More than 80 mm (3.15 in.)

If the reserve distance is incorrect, troubleshoot the brake system.



PARKING BRAKE LEVER

BR0PA–01

ON–VEHICLE INSPECTION

1. CHECK PARKING BRAKE LEVER TRAVEL

Pull the parking brake lever all the way up, and count the number of clicks.

Parking brake lever travel at 196 N (20 kgf, 44.1 lbf): 4 – 7 clicks

If incorrect, adjust the parking brake.

2. IF NECESSARY, ADJUST PARKING BRAKE

HINT:

Before adjusting the parking brake, make sure that the rear brake shoe clearance has been adjusted.

For shoe clearance adjustment, see step 2 on page BR–34.

(a) Remove the rear console box.

(b) Loosen the lock nut and turn the adjusting nut until the lever travel is correct.

(c) Tighten the lock nut.

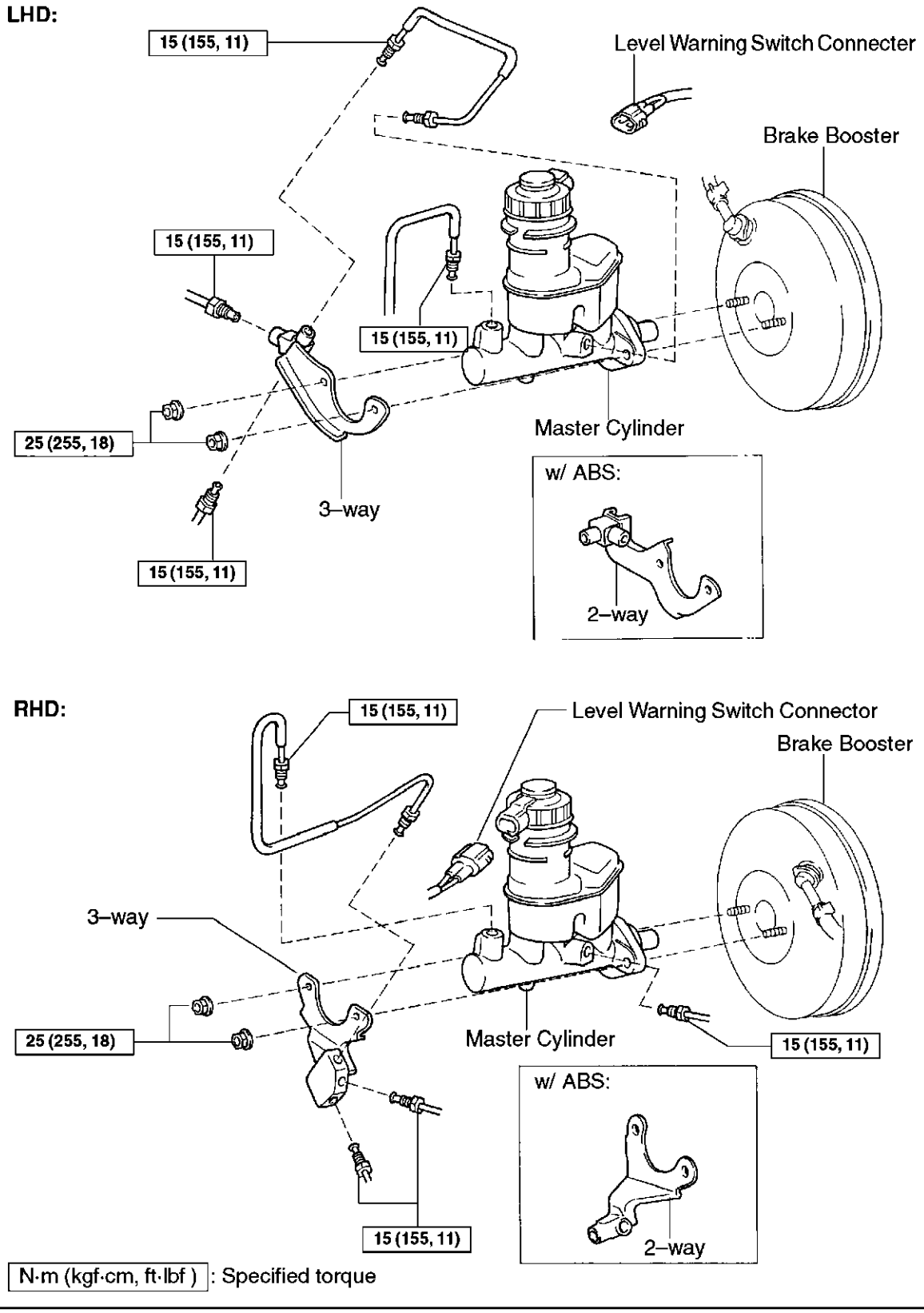
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

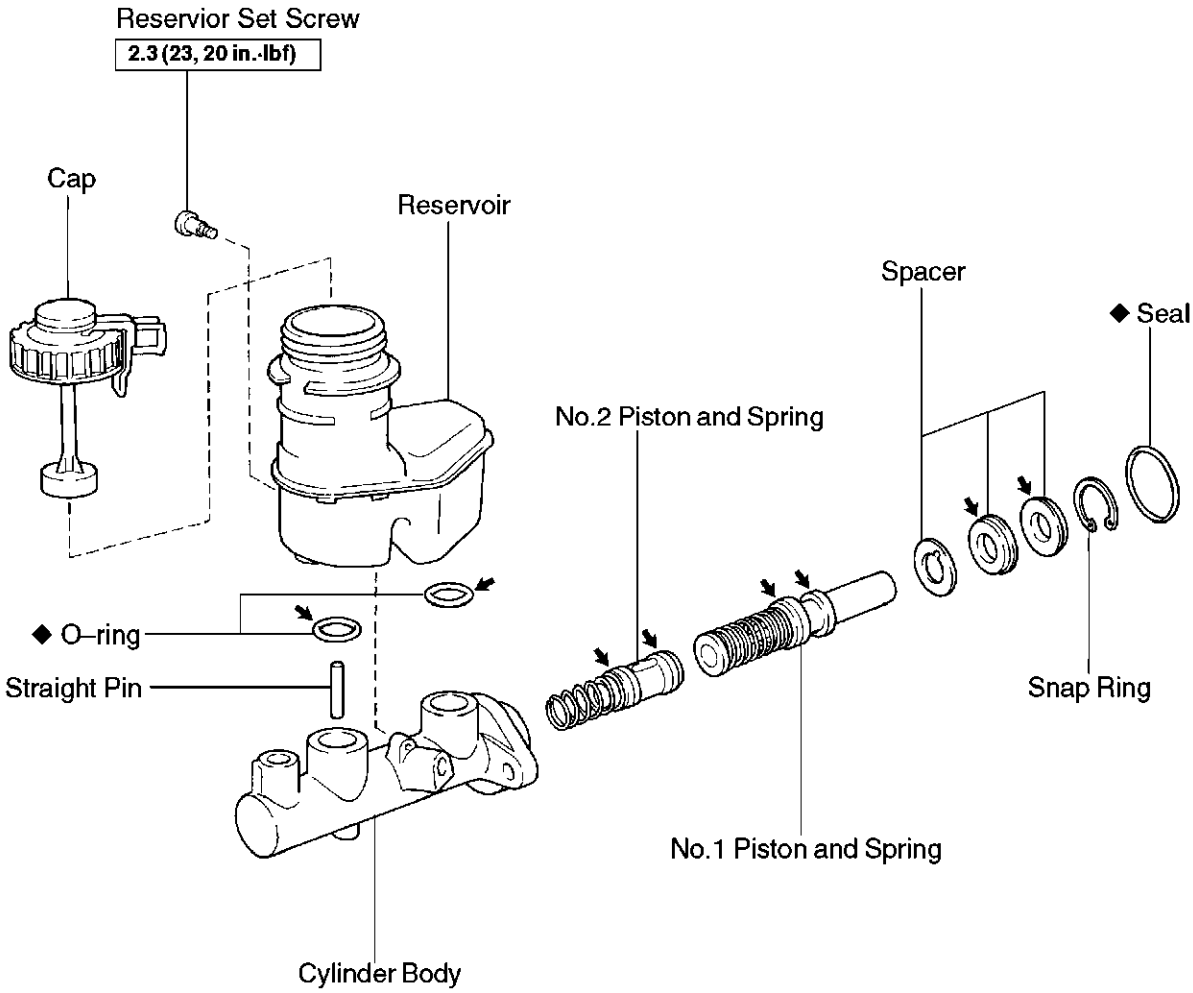
(d) Install the rear console box.

BRAKE MASTER CYLINDER

COMPONENTS

BR0PB–01



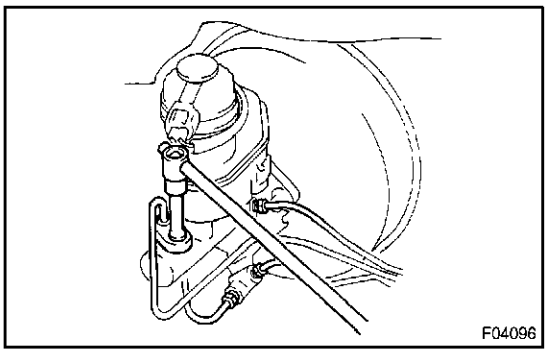


N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non reusable part
➡ Lithium soap bose qlycol grease

F04098

BR0PC–01

REMOVAL


F04096

1. DISCONNECT LEVEL WARNING SWITCH CONNECTOR

2. TAKE OUT FLUID WITH SYRINGE

NOTICE:

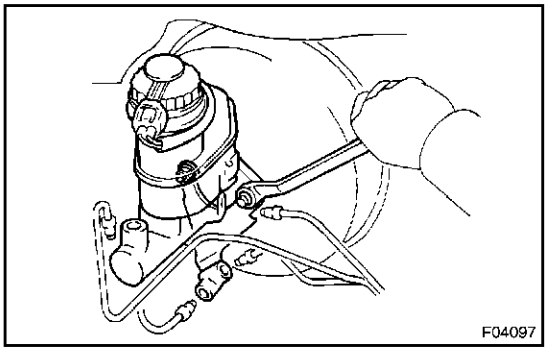
Do not let brake fluid remain on a painted surface. Wash it off immediately.

3. DISCONNECT BRAKE LINES

Using SST, disconnect the brake lines from the master cylinder.

SST 09023–00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)


F04097

4. REMOVE MASTER CYLINDER

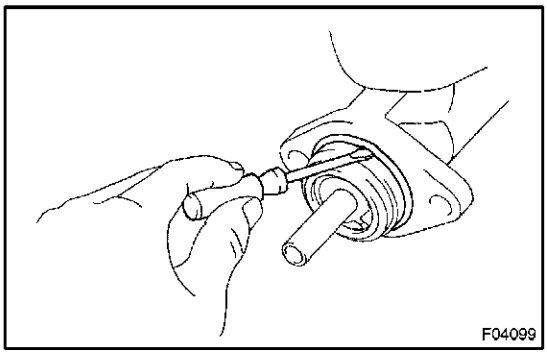
w/o ABS:

Remove the 2 mounting nuts and pull out the master cylinder, 3–way and gasket.

w/ ABS:

Remove the 2 mounting nuts and pull out the master cylinder, 2–way and gasket.

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)


F04099

5. REMOVE SEAL

Using a screwdriver, remove the seal.

BR0PD–01

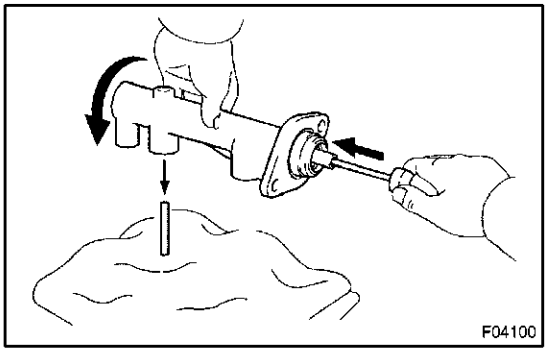
DISASSEMBLY

1. REMOVE RESERVOIR

(a) Remove the set screw and pull out the reservoir.
Torque: 2.3 N·m (23 kgf·cm, 20 in.·lbf)

(b) Remove the cap from the reservoir.

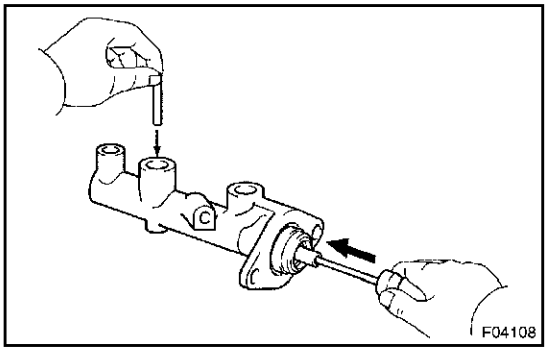
2. REMOVE 2 O–RINGS



3. REMOVE 2 PISTONS

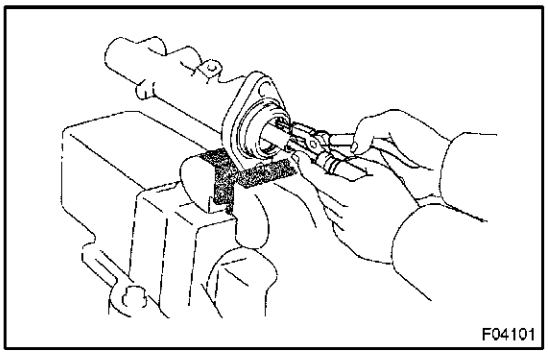
(a) Push in the piston with a screwdriver, and remove the straight pin by turning over the cylinder body.

HINT:
Tape the screwdriver tip before use.



NOTICE:
At the time of reassembly, be careful not to damage the rubber lips on the pistons.

HINT:
At the time of reassembly, insert the piston with elliptic hole facing vertically.

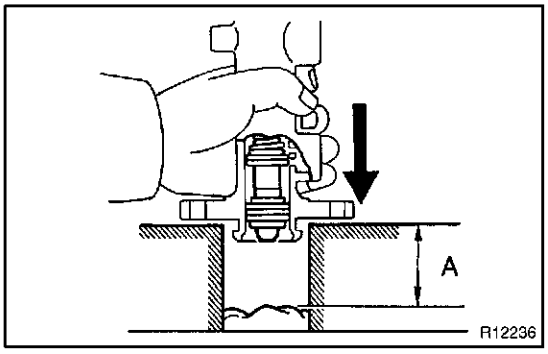


(b) Push in the piston with a screwdriver, and remove the snap ring with snap ring pliers.

(c) Remove the 3 spacers.

(d) Remove the 2 pistons and springs by hand, pulling straight out, not at an angle.

NOTICE:
If pulled out and installed at an angle, there is a possibility that the cylinder bore could be damaged.



(e) Place a rag and 2 wooden blocks on the work table and lightly tap the cylinder flange against the blocks until the No.2 piston and spring drop out of the cylinder.

HINT:
Make sure the distance (A) from the rag to the top of the blocks is at least 100 mm (3.94 in.).

BR0KT–01

INSPECTION

HINT:

Clean the disassembled parts with compressed air.

1. INSPECT CYLINDER BORE FOR RUST OR SCORING

2. INSPECT CYLINDER FOR WEAR OR DAMAGE

If necessary, clean or replace the cylinder.

BR0KU–02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See–page BR–11).

NOTICE:

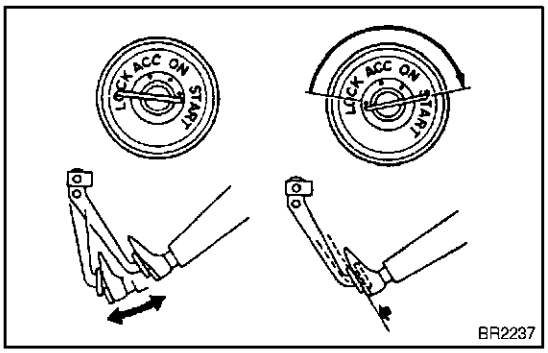
Apply lithium soap base glycol grease to the rubber parts indicated by the arrows (See page BR–8).

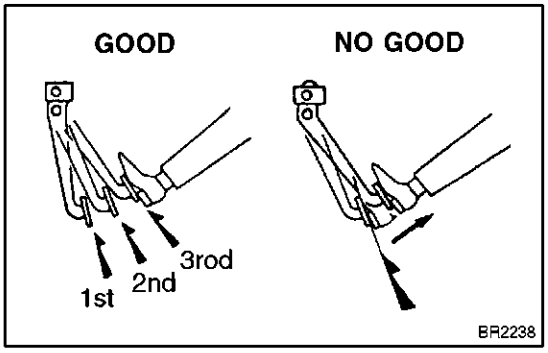
BR0KV–02

INSTALLATION

Installation is in the reverse order of removal (See page BR–10).

1. **AFTER INSTALLATION, FILL BRAKE RESERVOIR WITH BRAKE FLUID, BLEED BRAKE SYSTEM (See page BR–3), CHECK FOR LEAKS**
2. **CHECK AND ADJUST BRAKE PEDAL (See page BR–5)**





BRAKE BOOSTER ASSEMBLY

BR0KW–02

ON–VEHICLE INSPECTION

1. OPERATING CHECK

(a) Depress the brake pedal several times with the engine off and check that there is no change in the pedal reserve distance.

(b) Depress the brake pedal and start the engine. If the pedal goes down slightly, operation is normal.

2. AIR TIGHTNESS CHECK

(a) Start the engine and stop it after 1 or 2 minutes. Depress the brake pedal several times slowly.

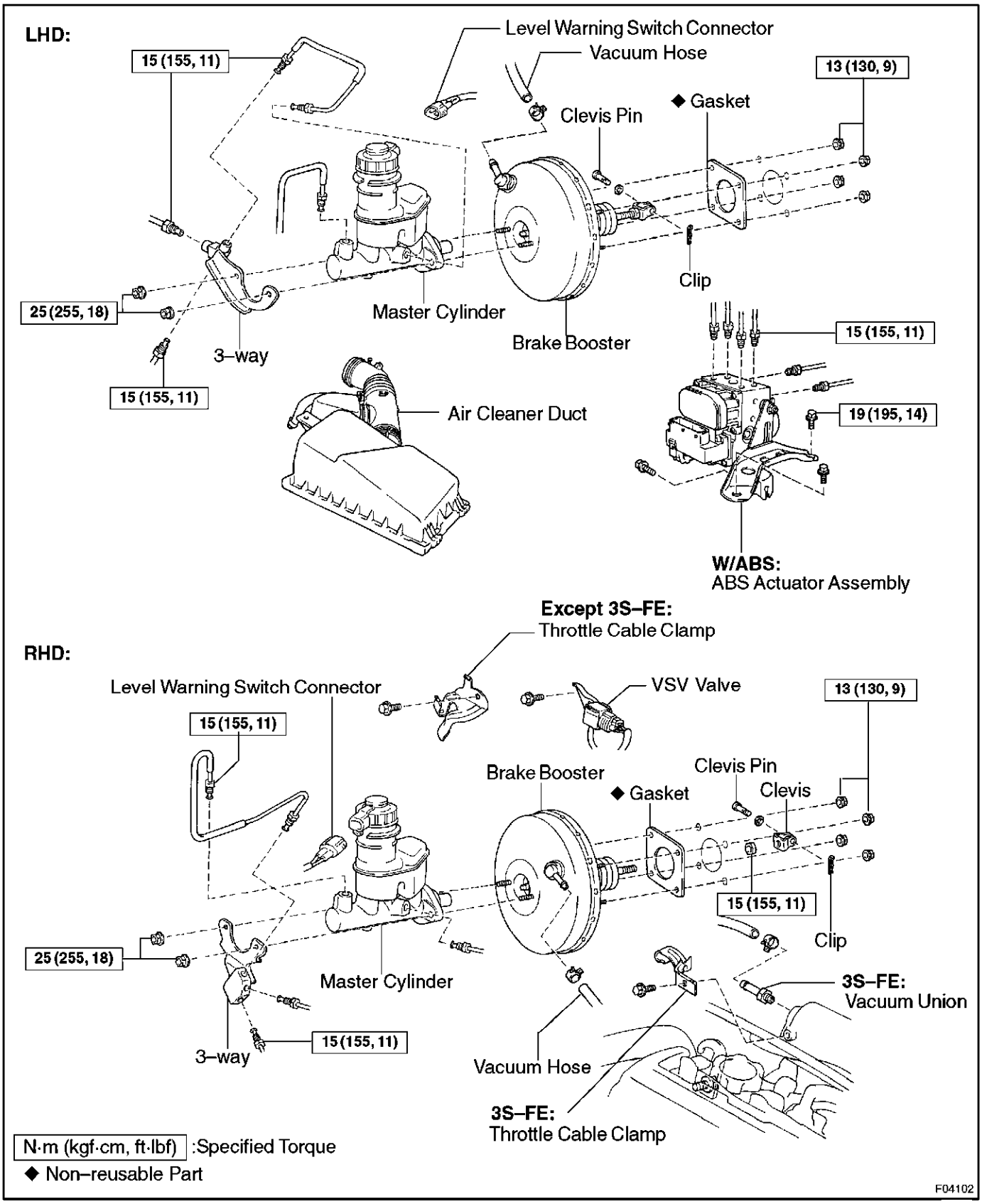
If the pedal goes down farthest the 1st time, but gradually rises after the 2nd or 3rd time, the booster is air–tight.

(b) Depress the brake pedal while the engine is running, and stop the engine with the pedal depressed.

If there is no change in the pedal reverse travel after holding the pedal for 30 seconds, the booster is air–tight.

BR0PE–01

COMPONENTS



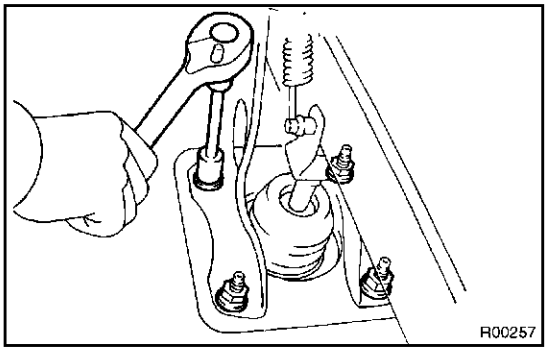
BR0KY–02

REMOVAL

1. **REMOVE MASTER CYLINDER (See page BR–10)**
2. **LHD:**
   REMOVE AIR CLEANER DUCT
3. **LHD w/ ABS:**
   REMOVE ABS ACTUATOR ASSEMBLY (See page BR–37)
4. **RHD M/T:**
   REMOVE CLUTCH MASTER CYLINDER (See page CL–6)
5. **RHD**
   REMOVE THESE PARTS

(a) Vacuum union (3S–FE)
(b) Throttle cable clamp
(c) Engine hanger

6. **DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER**
7. **REMOVE PEDAL RETURN SPRING**
8. **REMOVE CLIP AND CLEVIS PIN**



9. **REMOVE BRAKE BOOSTER, GASKET AND CLEVIS**

(a) Remove the 4 nuts and clevis.
(b) Pull out the brake booster and gasket.

BR0PF–01

INSTALLATION

1. INSTALL BRAKE BOOSTER

(a) Install the booster and a new gasket.

(b) Install the clevis to the operating rod.

(c) Install and torque the booster installation nuts.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

(d) Install the clevis pin into the clevis and brake pedal, and install the clip to the clevis pin.

(e) Install the pedal return spring.

2. LHD:
INSTALL AIR CLEANER DUCT

3. LHD w/ ABS:
INSTALL ABS ACTUATOR ASSEMBLY (See page BR–40)

4. RHD M/T:
INSTALL CLUTCH MASTER CYLINDER (See page CL–9)

5. RHD 3S–FE Engine:
INSTALL THESE PARTS

(a) Vacuum union

(b) Throttle cable clamp

(c) Engine hanger

6. INSTALL MASTER CYLINDER (See page BR–14)

7. CONNECT VACUUM HOSE TO BRAKE BOOSTER

8. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR–3)

9. CHECK FOR LEAKS

10. CHECK AND ADJUST BRAKE PEDAL
(See page BR–5)
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

11. DO OPERATIONAL CHECK (See page BR–15)

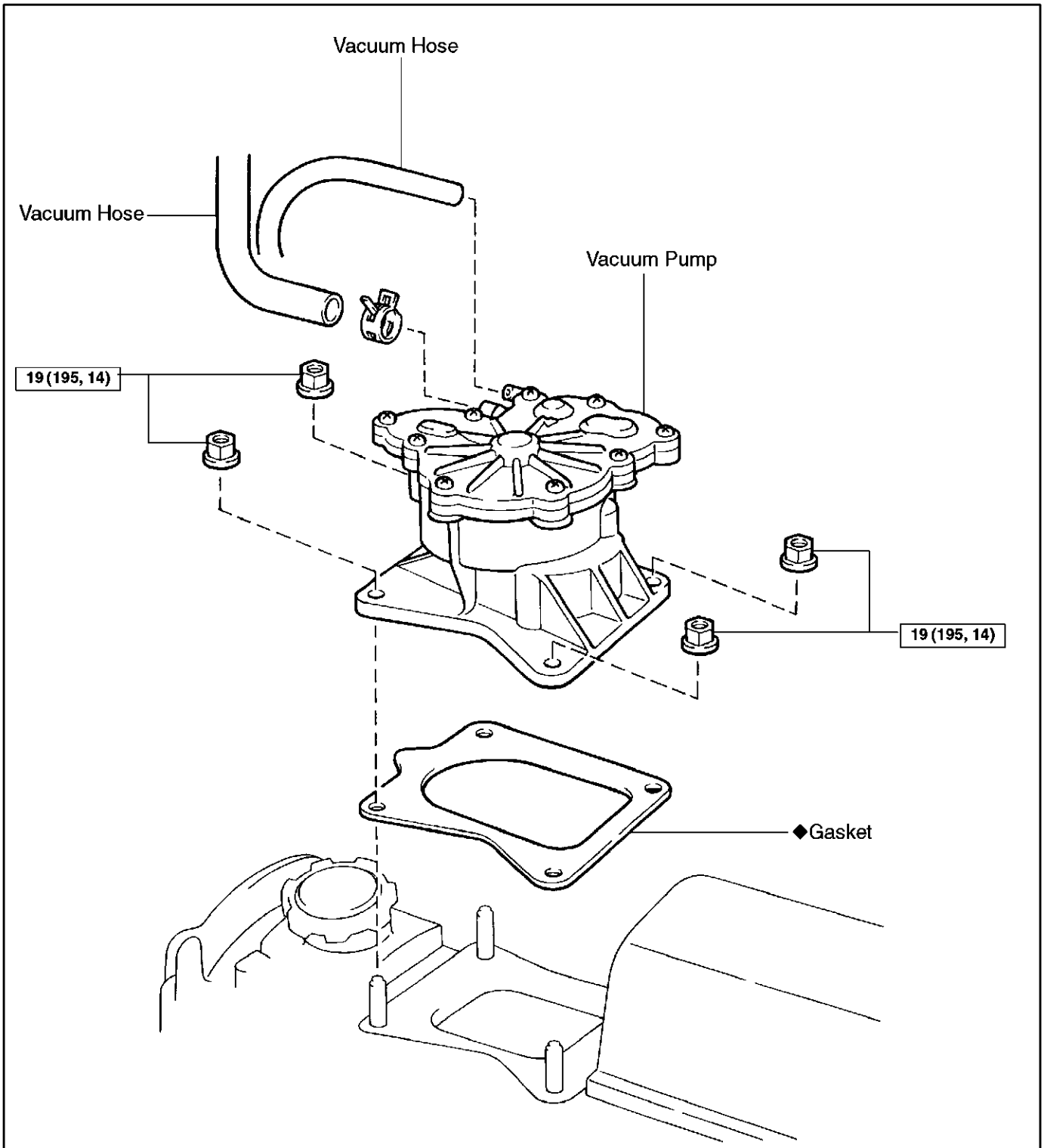
VACUUM PUMP

BR0PG–01

COMPONENTS

NOTICE:

Do not disassemble the vacuum pump.



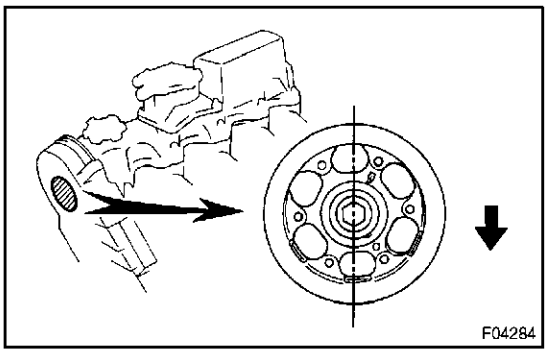
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

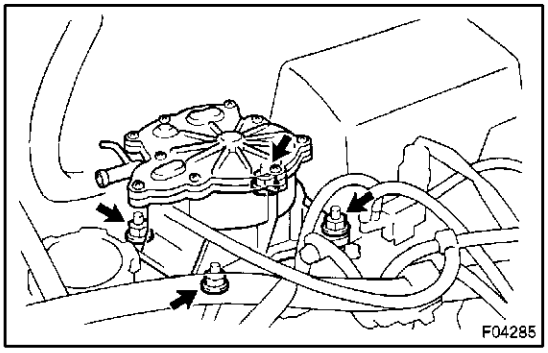
F04283

BR0PH–01

REMOVAL



1. **REMOVE PLUG FROM NO.2 TIMING BELT COVER**
2. **TURN NOTCH ON CAMSHAFT TIMING PULLEY DOWN BY TURNING CRANKSHAFT PULLEY**
3. **DISCONNECT VACUUM HOSES FROM PUMP**



4. **REMOVE VACUUM PUMP**

(a) Remove the 4 set nuts.

(b) Remove the vacuum pump and gasket.

BR0PI–01

INSTALLATION

1. **MAKE SURE THAT VACUUM PUMP CAM LOBE IS AT BOTTOM DEAD CENTER**
2. **INSTALL VACUUM PUMP**

Install the vacuum pump with a new gasket.

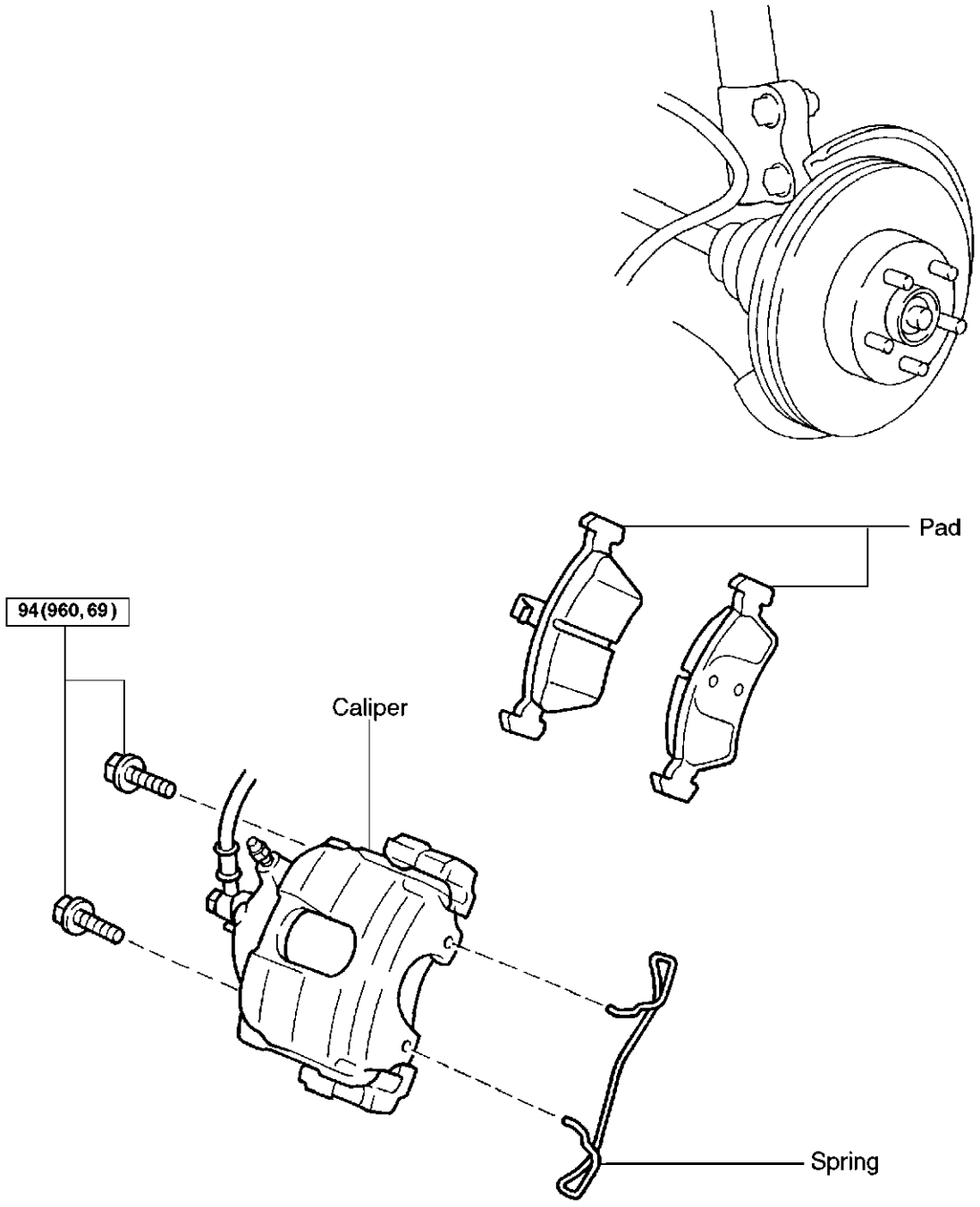
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

3. **CONNECT VACUUM HOSES**
4. **INSTALL PLUG TO NO.2 TIMING BELT COVER**

FRONT BRAKE PAD

COMPONENTS

BR0PJ–01

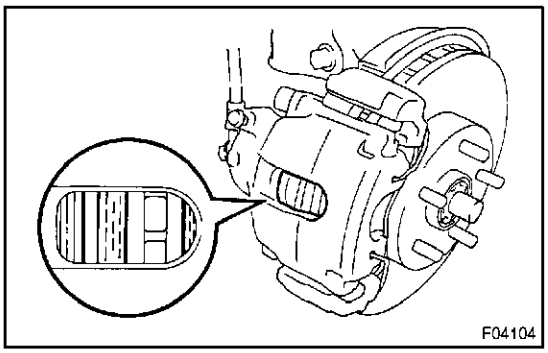


N·m (kgf·cm, ft·lbf) : Specified torque

F04280

BR0PK–01

REPLACEMENT



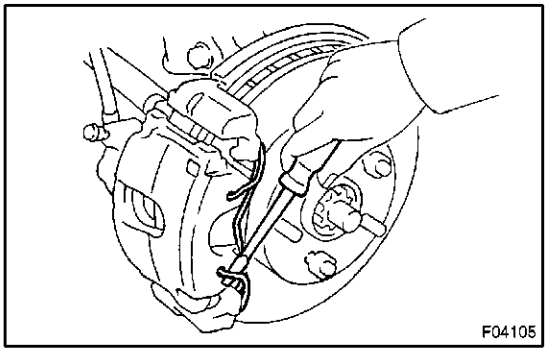
1. REMOVE FRONT WHEEL

Remove the wheel and temporarily fasten the disc with hub nuts.

2. INSPECT PAD LINING THICKNESS

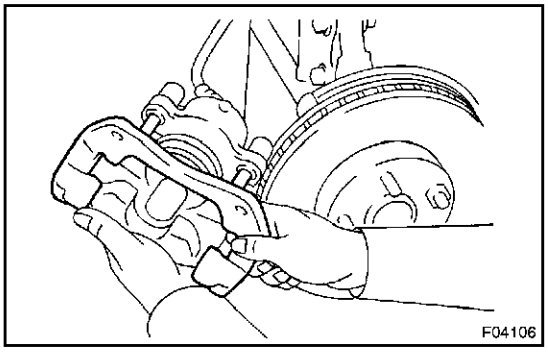
Check the pad thickness through the caliper inspection hole and replace the pads if it is not within the specification.

Minimum thickness: 1.0 mm (0.039 in.)



3. REMOVE SPRING

Using a screwdriver, remove the spring from the caliper.



4. REMOVE BRAKE CALIPER ASSEMBLY

Remove the 2 bolts and caliper assembly.

HINT:

Do not disconnect the flexible hose from the caliper.

5. REMOVE 2 PADS

6. CHECK DISC THICKNESS AND RUNOUT

(See page BR–27)

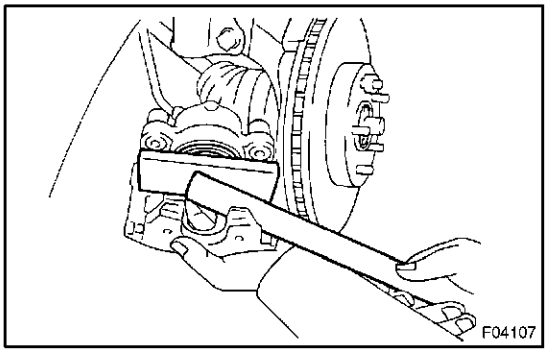
7. INSTALL NEW PADS

NOTICE:

There should be no oil or grease adhering to the friction surfaces of the pads or the disc.

8. INSTALL CALIPER

(a) Draw out a small amount of brake fluid from the reservoir.



(b) Press in the piston with a hammer handle and wooden plate or similar implement.

HINT:

If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

(c) Install the caliper assembly with 2 bolts.

Torque: 94 N·m (960 kgf·cm, 69 ft·lbf)

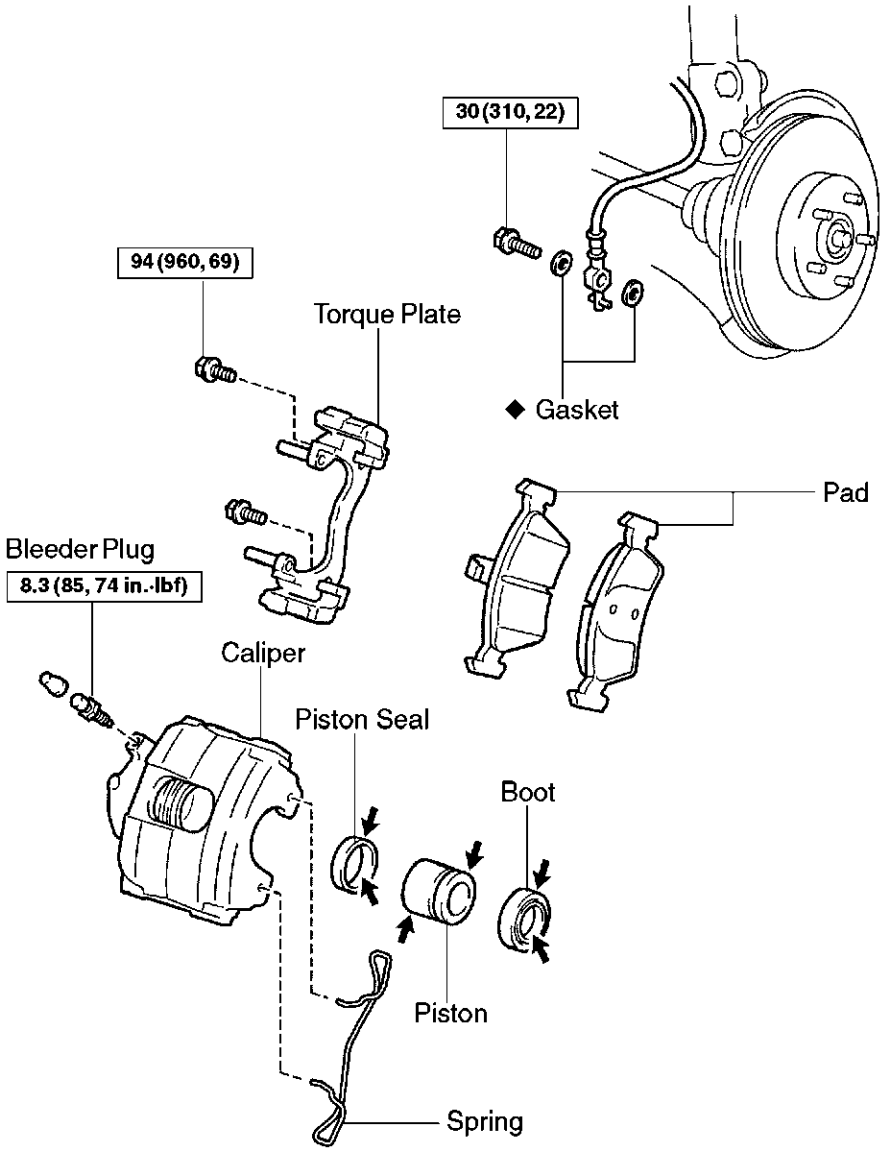
9. INSTALL FRONT WHEEL

10. CHECK THAT FLUID LEVEL IS AT MAX LINE

FRONT BRAKE CALIPER

COMPONENTS

BR0PL–01

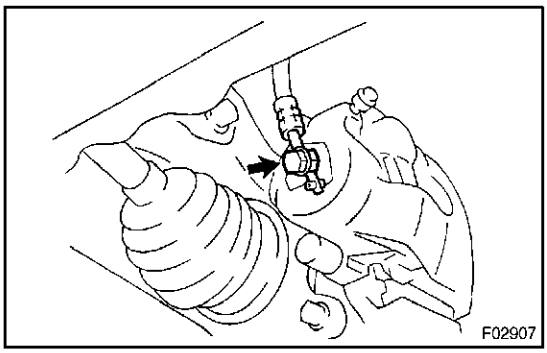


N·m (kgf·cm, ft·lbf) : Specified Torque
◆ Non–reusable Part
➡ Lithium soap bose glycol grease

F04103

BR0PM–01

REMOVAL



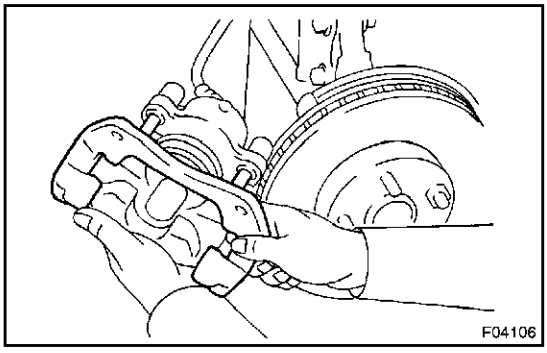
1. REMOVE FRONT WHEEL

2. DISCONNECT FLEXIBLE HOSE

(a) Remove the union bolt and 2 gaskets from the caliper, then disconnect the flexible hose from the caliper.
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:
At the time of installation, install the flexible hose lock securely in the lock hole in the caliper.

(b) Use a container to catch the brake fluid as it drains out.



3. REMOVE CALIPER

(a) Remove the 2 installation bolts.
Torque: 94 N·m (960 kgf·cm, 69 ft·lbf)

(b) Remove the 2 pads.

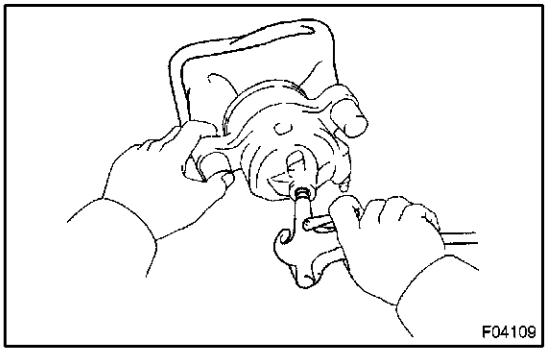
(c) Remove the caliper from the torque plate.

BR0PN–01

DISASSEMBLY

1. REMOVE CYLINDER BOOT

Using a screwdriver, remove the cylinder boot from the caliper.



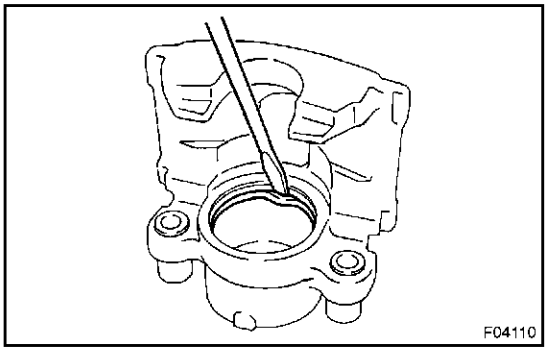
2. REMOVE PISTON

(a) Place a piece of cloth, or similar, between the piston and the caliper.

(b) Use compressed air to remove the piston from the cylinder.

CAUTION:

Do not place your fingers in front of the piston when using compressed air.

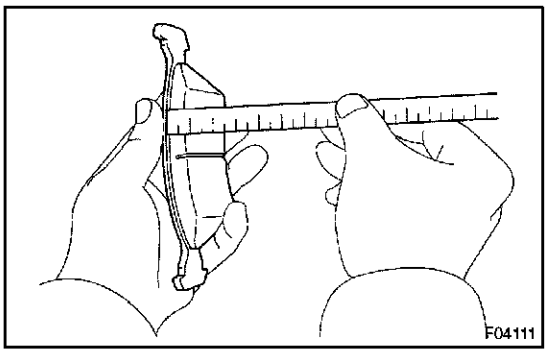


3. REMOVE PISTON SEAL

Using a screwdriver, remove the piston seals from the cylinder.

BR0PO–01

INSPECTION



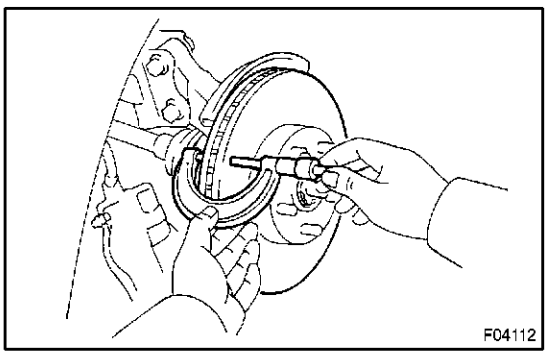
1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness: 12.0 mm (0.472 in.)

Minimum thickness: 2.0 mm (0.079 in.)

Replace the pad if the pad's thickness is at the minimum thickness or less, or if the pad has severe and uneven wear.



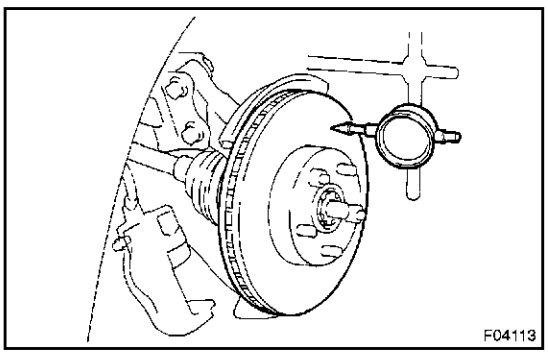
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 25.0 mm (0.984 in.)

Minimum thickness: 23.0 mm (0.906 in.)

Replace the disc if the disc's thickness is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is badly scored or worn unevenly.



3. MEASURE DISC RUNOUT

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.)

If the disc's runout is at the maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page SA–11). If the bearing play and axle hub runout are not abnormal, adjust the disc runout or grind it on a "On–Car" brake lathe.

4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the hub nuts and the disc. Reinstall the disc rotating 1/5 of a turn from its original position on the hub. Install and torque the hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

(b) Repeat (a) until the disc has been installed on the 3 remaining hub positions.

(c) If the minimum runout recorded in (a) and (b) is less than 0.05 mm (0.0020 in.), install the disc in that position.

(d) If the minimum runout recorded in (a) and (b) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.

BR0L6–02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–26).

NOTICE:

Apply lithium soap base glycol grease to the parts indicated by arrows (See page BR–24).

BR0LF–02

INSTALLATION

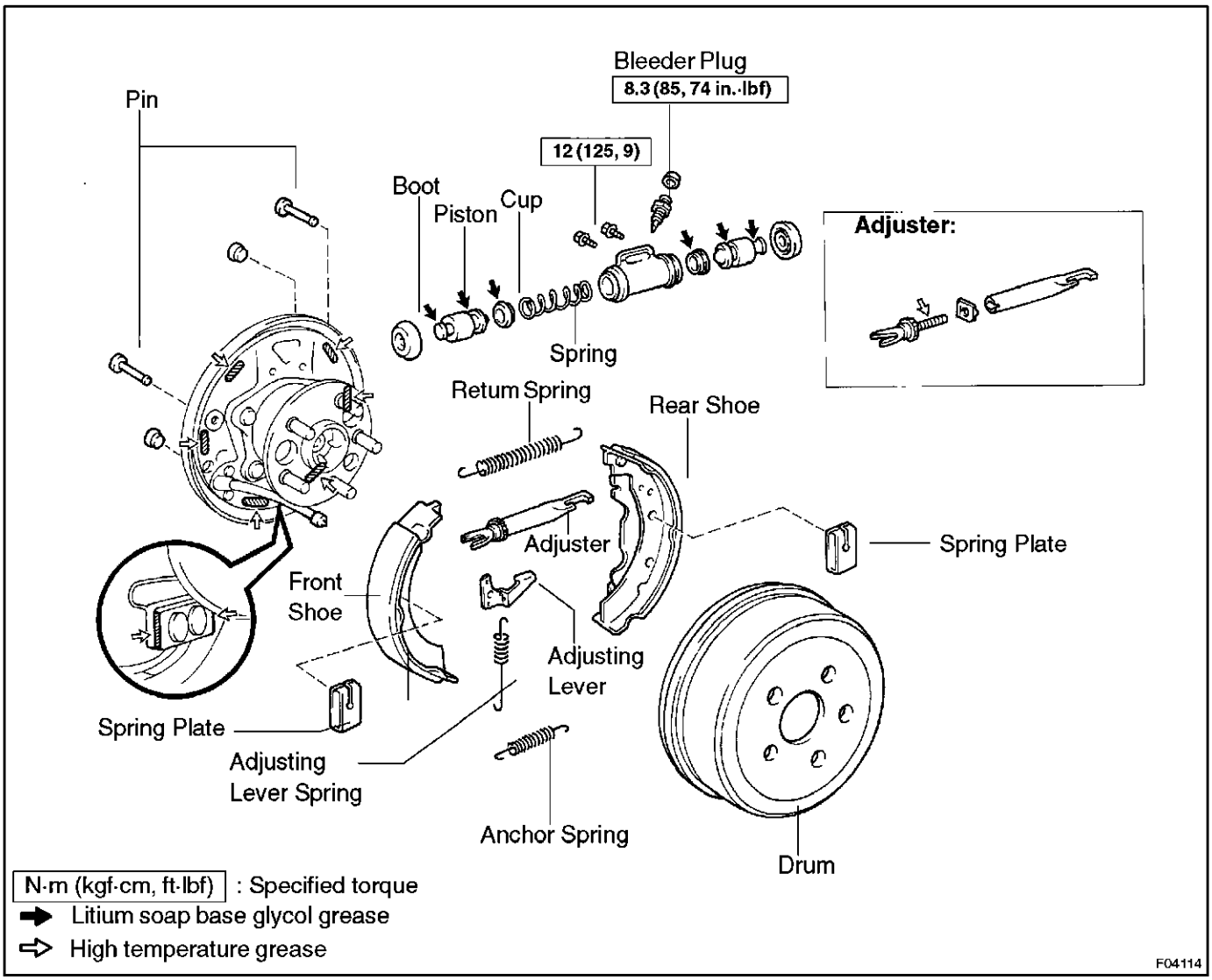
Installation is in the reverse order of removal (See page BR–25).

AFTER INSTALLATION, FILL BRAKE RESERVOIR WITH BRAKE FLUID, BLEED BRAKE SYSTEM (See page BR–3) AND CHECK FOR LEAKS

REAR DRUM BRAKE

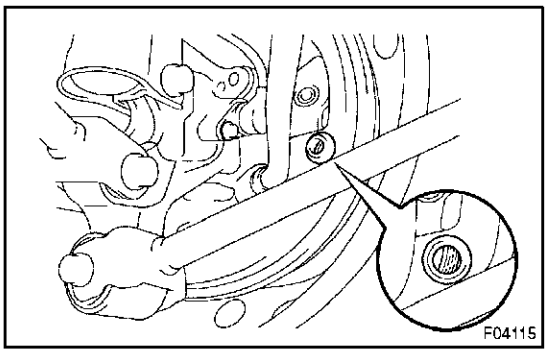
COMPONENTS

BR0PP–01



BR0PO–01

REMOVAL



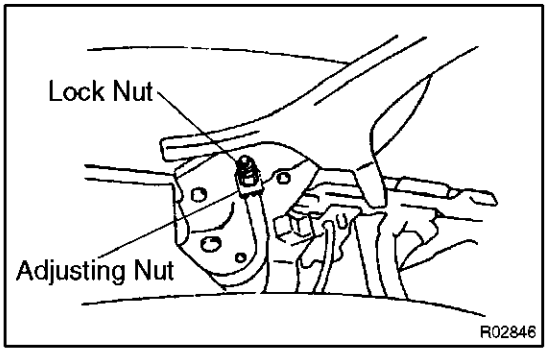
1. INSPECT SHOE LINING THICKNESS

Remove the inspection hole plug, and check the shoe lining thickness through the hole.

If less than minimum, replace the shoes.

Minimum thickness: 1.0 mm (0.039 in.)

2. REMOVE REAR WHEEL

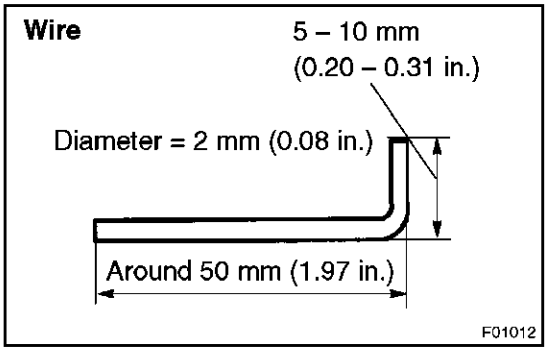


3. RELEASE PARKING BRAKE CABLE TENSION

(a) Remove the console box.

(b) Loosen the lock nut.

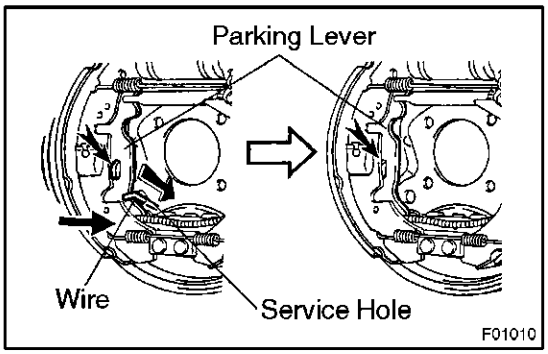
(c) Loosen the adjusting nut until the tension of the parking brake cable is released.



4. REMOVE REAR BRAKE DRUM

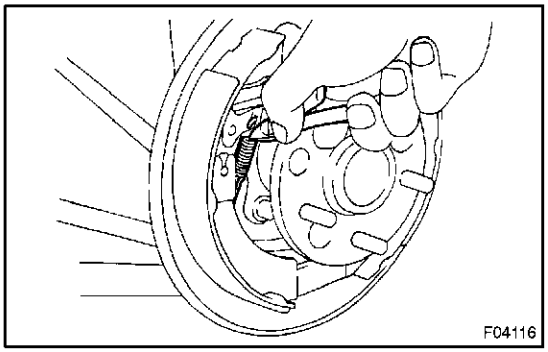
(a) Prepare a bent wire as shown in the illustration.

(b) Remove the service hole plug from the rear brake backing plate.



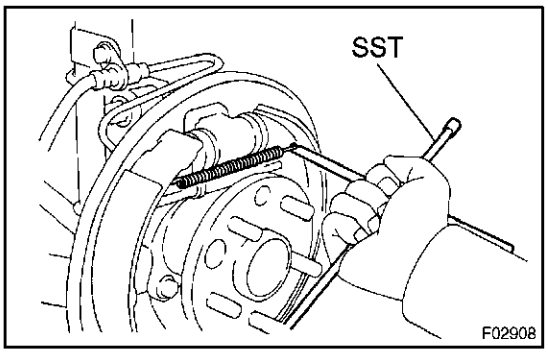
(c) Using the wire, pull the parking lever through vice hole to disengage the claw from the rear shoe.

(d) Remove the rear brake drum.

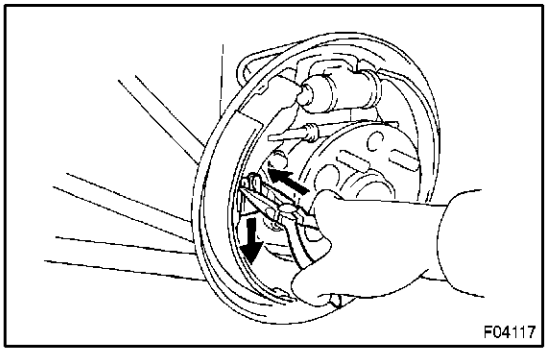


5. REMOVE FRONT SHOE

(a) Using needle–nose pliers, remove the adjusting lever spring.



(b) Using SST, remove the shoe return spring.
SST 09703–30010

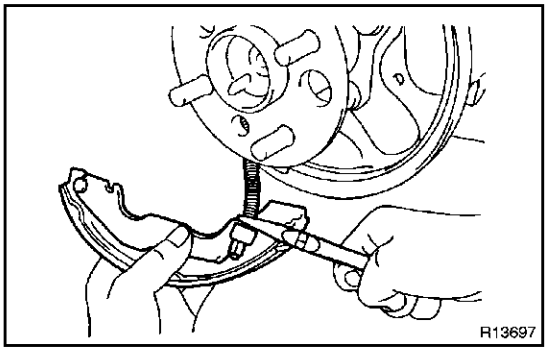


(c) Using needle–nose pliers, remove the spring plate and pin.
(d) Using needle–nose pliers, remove the anchor spring and front shoe.

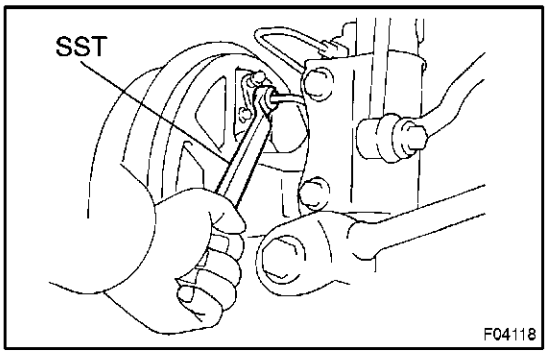
6. REMOVE ADJUSTER

7. REMOVE REAR SHOE

(a) Using needle–nose pliers, remove the spring plate and pin.



(b) Using needle–nose pliers, disconnect the parking brake cable from the lever and remove the rear shoe.



8. REMOVE WHEEL CYLINDER

(a) Using SST, disconnect the brake line. Use a container to catch the brake fluid.
SST 09751–36011
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

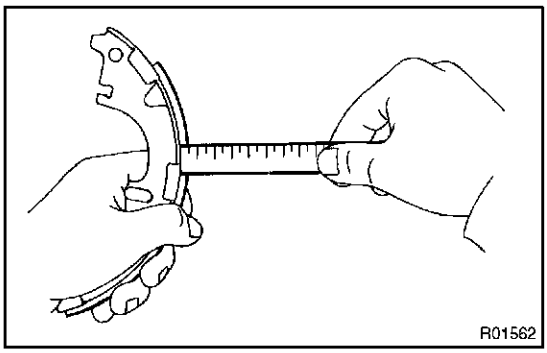
(b) Remove the bolt and the wheel cylinder.
Torque: 12 N·m (125 kgf·cm, 9 ft·lbf)

9. DISASSEMBLE WHEEL CYLINDER

Remove these parts from the wheel cylinder.

- 2 boots
- 2 pistons
- 2 piston cups
- Spring

BR0PR–01



INSPECTION

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.

2. MEASURE BRAKE SHOE LINING THICKNESS

Using a ruler, measure the shoe lining thickness.

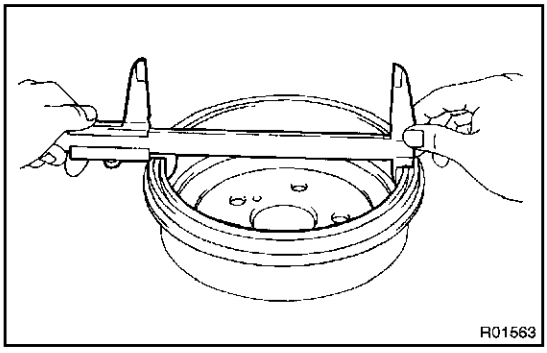
Standard thickness: 4.0 mm (0.157 in.)

Minimum thickness: 1.0 mm (0.039 in.)

If the thickness is less than the minimum or the shoe lining shows signs of uneven wear, replace the brake shoes.

HINT:

If a brake shoe needs replacing, the brake shoes must be replaced as a set.



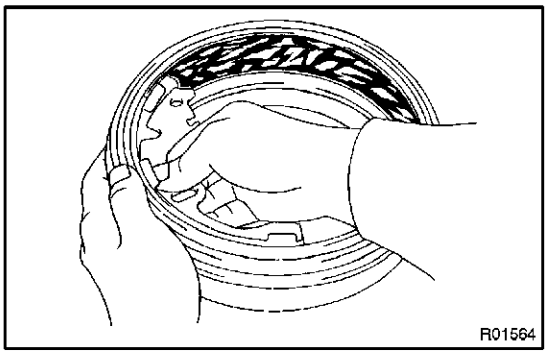
3. MEASURE BRAKE DRUM INSIDE DIAMETER

Using vernier calipers, measure the inside diameter of the drum.

Standard inside diameter: 228.6 mm (9.000 in.)

Maximum inside diameter: 229.6 mm (9.039 in.)

If the drum is scored or worn, the brake drum may be lathed to the maximum inside diameter.



4. INSPECT REAR BRAKE LINING AND DRUM FOR PROPER CONTACT

If the contact between the brake lining and drum is improper, repair the lining with a brake shoe grinder, or replace the brake shoe assembly.

BR0PS–01

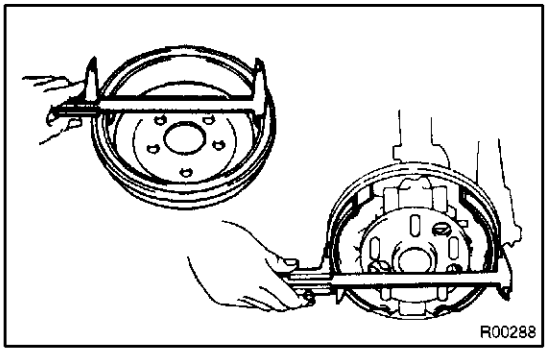
INSTALLATION

Installation is in the reverse order of removal (See page BR–31).

NOTICE:

Apply lithium soap base glycol grease and high temperature grease to the parts indicated by the arrows (See page BR–30).

1. PUT BACK PARKING BRAKE LEVER TO ORIGINAL POSITION



2. CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM

(a) Remove the brake drum.

(b) Hook the claw of the parking lever on the rear shoe.

(c) Measure the brake drum inside diameter and diameter of the brake shoes. Check that the difference between the diameters is the correct shoe clearance.

Shoe clearance: 0.6 mm (0.024 in.)

If incorrect, check the parking brake system.

3. FILL BRAKE RESERVOIR WITH BRAKE FLUID

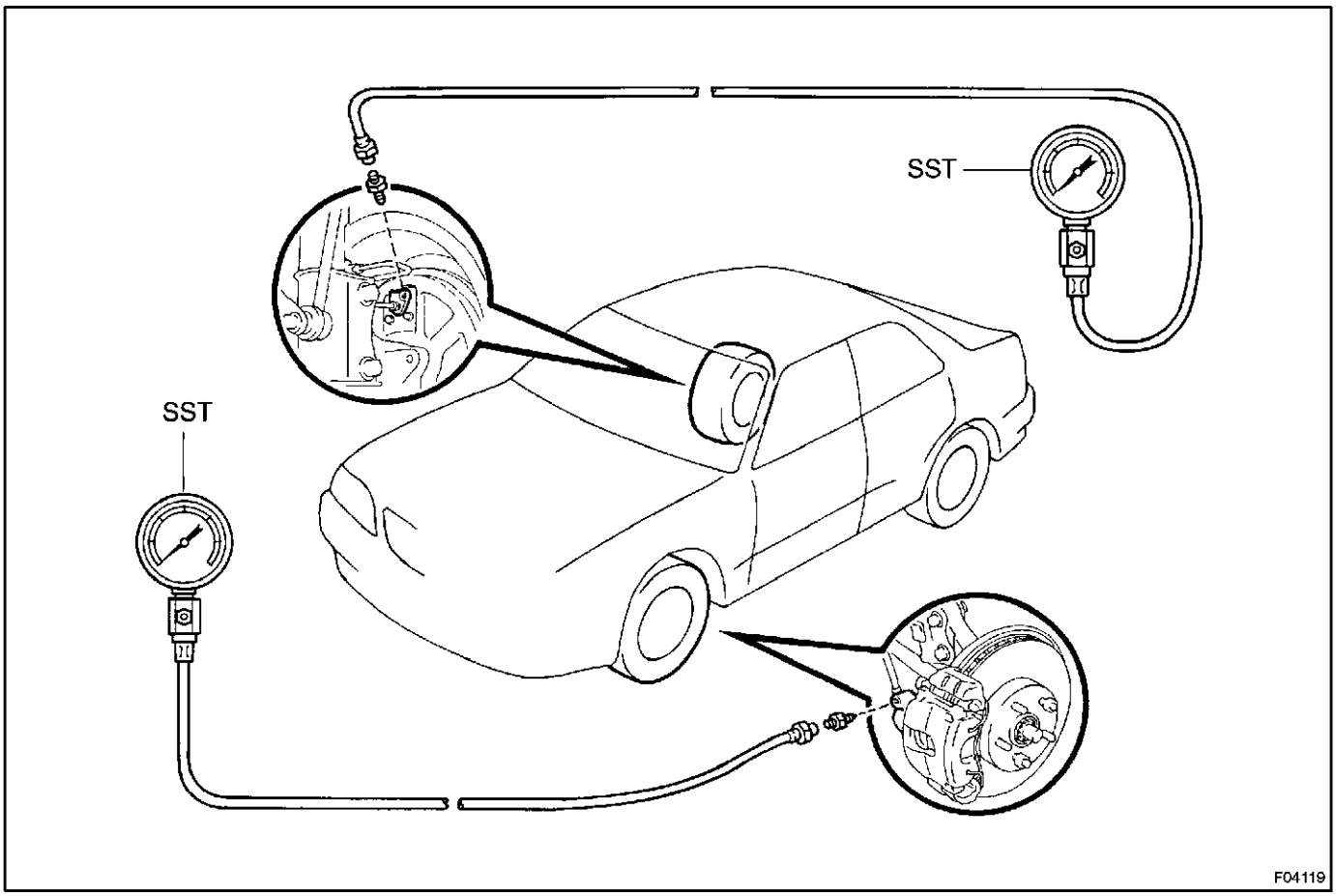
4. BLEED BRAKE SYSTEM (See page BR–3)

5. CHECK FOR LEAKS

PROPORTIONING VALVE (P VALVE)

ON–VEHICLE INSPECTION

BR0LK–03



1. **INSTALL LSPV GAUGE (SST) AND BLEED AIR**
   SST 09709–29018
2. **RAISE MASTER CYLINDER PRESSURE AND CHECK REAR WHEEL CYLINDER PRESSURE**
   w/o ABS:

Master cylinder fluid pressure	Rear wheel cylinder fluid pressure
3,432 kPa (35 kgf/cm^2, 498 psi)	3,432 kPa (35 kgf/cm^2, 498 psi)
7,845 kPa (80 kgf/cm^2, 1,138 psi)	4,540 kPa (46.3 kgf/cm^2, 659 psi)

   w/ ABS:

Master cylinder fluid pressure	Rear brake caliper fluid pressure
2,942 kPa (30 kgf/cm^2, 426 psi)	2,942 kPa (30 kgf/cm^2, 426 psi)
7,845 kPa (80 kgf/cm^2, 1,138 psi)	6,982 kPa (61 kgf/cm^2, 868 psi)

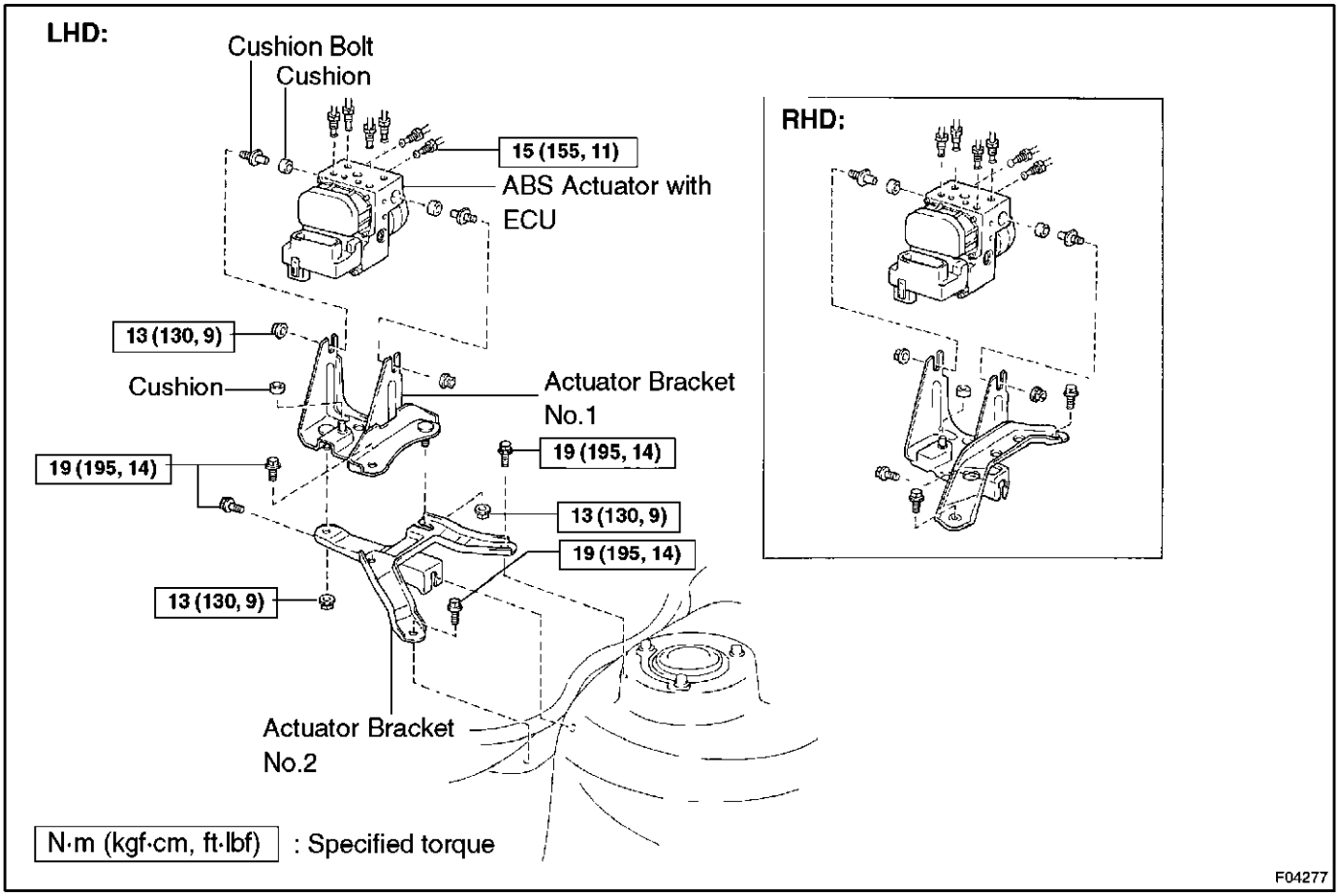
When inspecting the fluid pressure, inspect the left front and right rear together, and the right front and left rear together.
If the rear wheel cylinder pressure is incorrect, replace the P valve assembly.

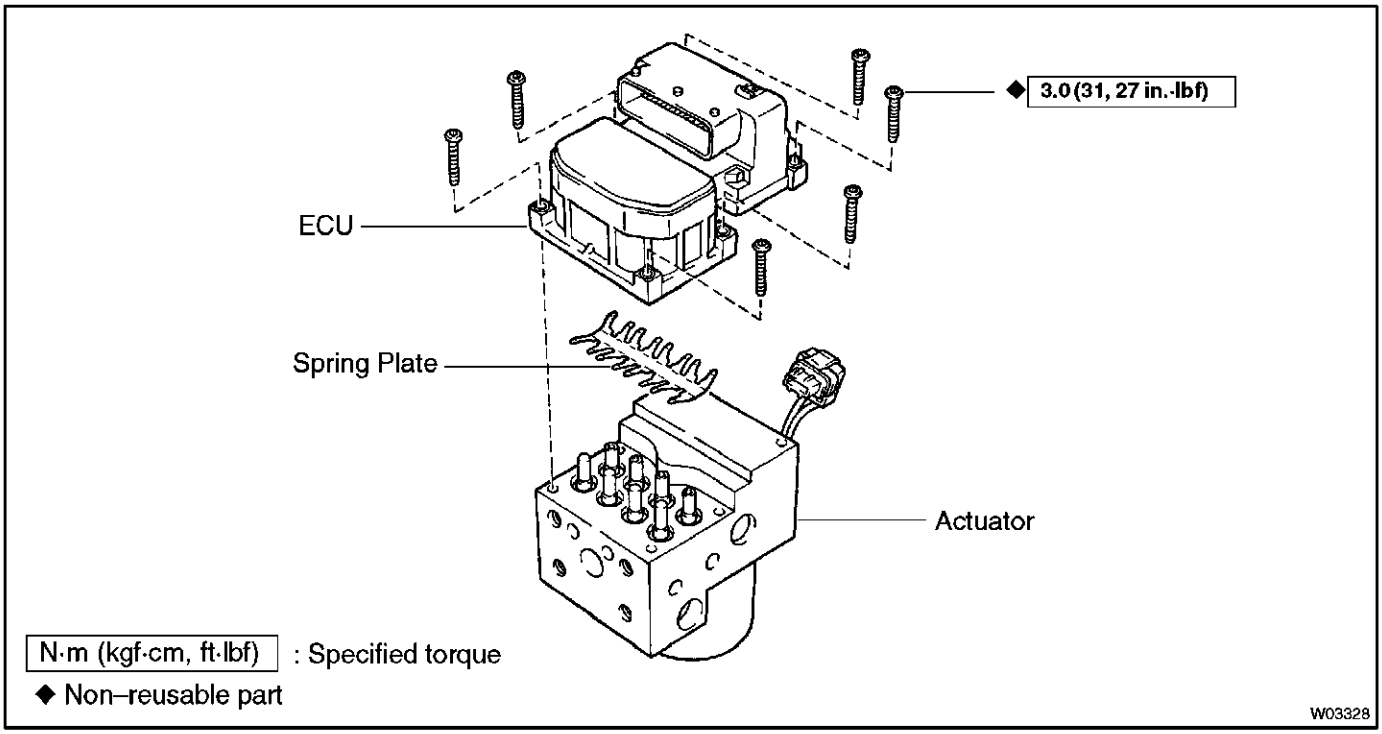
3. **BLEED BRAKE SYSTEM (See page BR–3)**
4. **CHECK FOR LEAKS**

BRAKE ACTUATOR

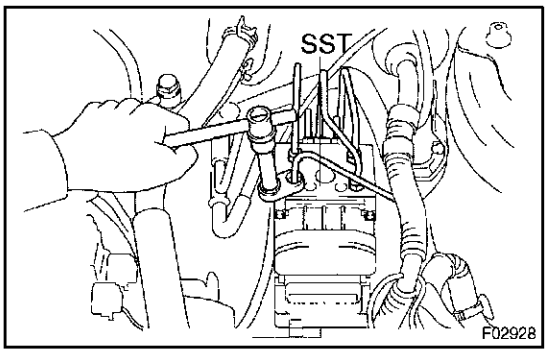
COMPONENTS

BR0LL–02





BR0LM–02



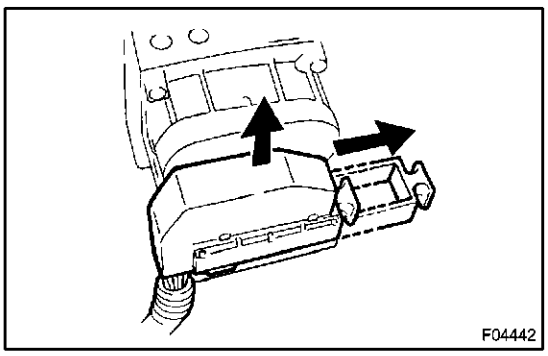
REMOVAL

1. DISCONNECT BRAKE LINES

Using SST, disconnect the 6 brake lines from the ABS actuator.

SST 09023–00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)



2. DISCONNECT CONNECTOR

Pull out the release bar, and disconnect the connector.

3. REMOVE ABS ACTUATOR ASSEMBLY

Remove the 3 bolts and ABS actuator assembly.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

4. REMOVE ABS ACTUATOR

(a) Remove the 2 nuts and ABS actuator.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(b) Remove the 2 cushion bolts and 3 cushions from the ABS actuator.

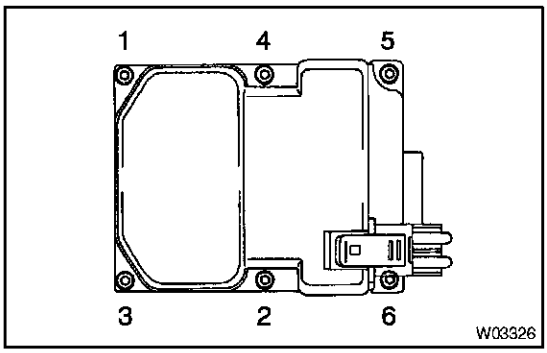
5. LHD:

SEPARATE ACTUATOR BRACKET

Remove the 2 nuts and bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

BR0LN–02



DISASSEMBLY

1. DISCONNECT CONNECTOR
2. REMOVE ECU

(a) Using a T20 torx wrench, loosen the 6 screws.

Torque: 3.0 N·m (31 kgf·cm, 27 in.·lbf)

NOTICE:

At the time of reassembly, tighten the screws according to the order shown on the left.

(b) Remove the ECU and spring plate from the actuator.

NOTICE:

Protect the actuator in order to prevent sealing surface from getting dirty and causing damage on the valve body. If the dirt and the like is stuck to the sealing surface, use plastic tools or soft objects to remove the dirt. Do not use chemical solvents.

BR0LO–02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–38).

BR0LP–02

INSTALLATION

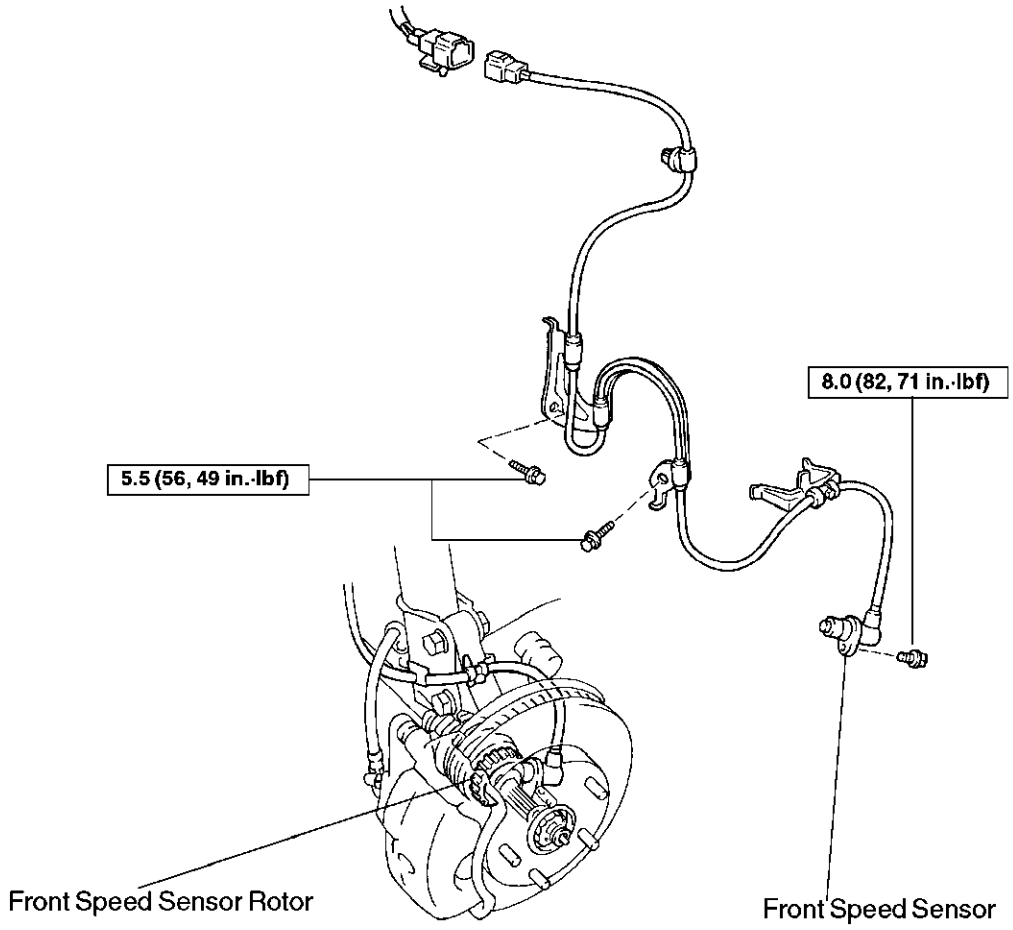
Installation is in the reverse order of removal (See page BR–37).

AFTER INSTALLATION, FILL BRAKE RESERVOIR WITH BRAKE FLUID, BLEED BRAKE SYSTEM (See page BR–3) AND CHECK FOR LEAKS

FRONT SPEED SENSOR

COMPONENTS

BR0PT–01

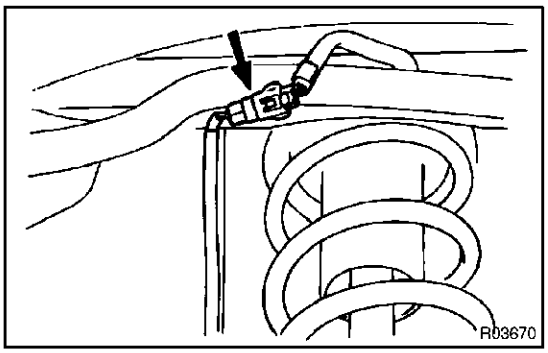


N·m (kgf·cm, ft·lbf) : Specified torque

F04460

BR0LV–02

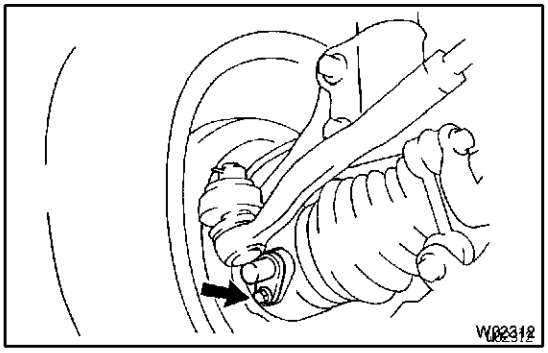
REMOVAL



1. DISCONNECT SPEED SENSOR CONNECTOR

(a) Remove the fender liner.

(b) Disconnect the speed sensor connector.



2. REMOVE SPEED SENSOR

(a) Remove the 3 clamp bolts holding the sensor harness to the body and shock absorber.

Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

(b) Remove the bolt and speed sensor from the steering knuckle.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

BR0LW–01

INSTALLATION

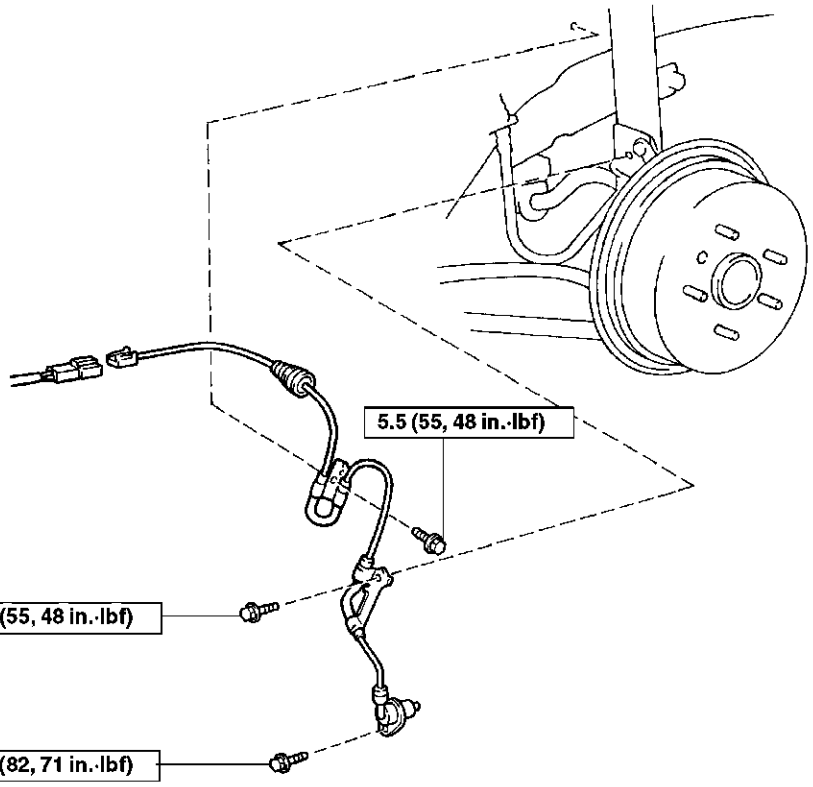
Installation is in the reverse order of removal (See page BR–42).

AFTER INSTALLATION, CHECK SPEED SENSOR SIGNAL (See page DI–115)

REAR SPEED SENSOR

COMPONENTS

BR0PU–01

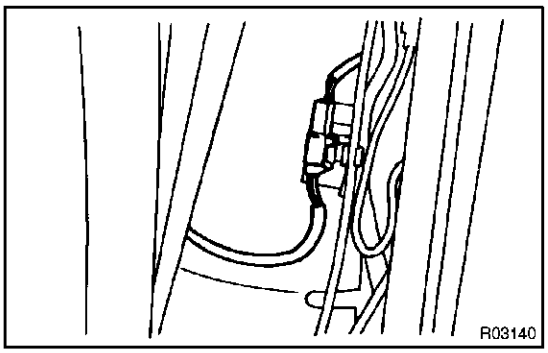


N·m (kgf·cm, ft·lbf) : Specified torque

F04475

BR0LY–02

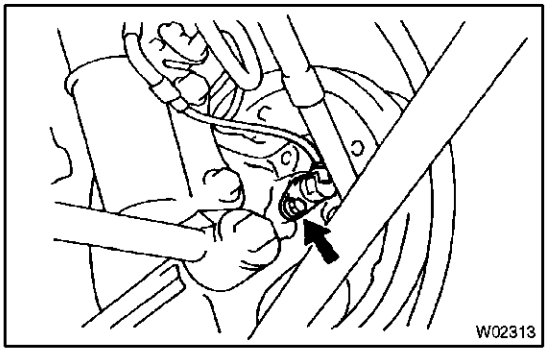
REMOVAL



1. DISCONNECT SPEED SENSOR CONNECTOR

(a) Remove the seat cushion and seat back.

(b) Disconnect the speed sensor connector, and pull out the sensor wire harness with the grommet.



2. REMOVE SPEED SENSOR

(a) Remove the bolt and speed sensor from the axle carrier.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Remove the 2 clamp bolts holding the sensor wire harness to the body and shock absorber.
Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

BR0LZ–02

INSTALLATION

Installation is in the reverse order of removal (See page BR–45).

AFTER INSTALLATION, CHECK SPEED SENSOR SIGNAL (See page DI–115)

STEERING

STEERING SYSTEM SR–1
TROUBLESHOOTING SR–2
DRIVE BELT SR–3
POWER STEERING FLUID SR–5
AIR CONTROL VALVE SR–9
STEERING WHEEL SR–10
TILT STEERING COLUMN SR–11
POWER STEERING VANE PUMP
(4A–FE, 7A–FE) SR–20
POWER STEERING VANE PUMP
(3S–FE) SR–23
POWER STEERING VANE PUMP
(2C–T, 2C–TE) SR–26
POWER STEERING GEAR SR–36

STEERING SYSTEM

PRECAUTION

SR014–01

- Care must be taken to replace parts properly because they could affect the performance of the steering system and result in a driving hazard.
- The AVENSIS/CORONA 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 RS section.

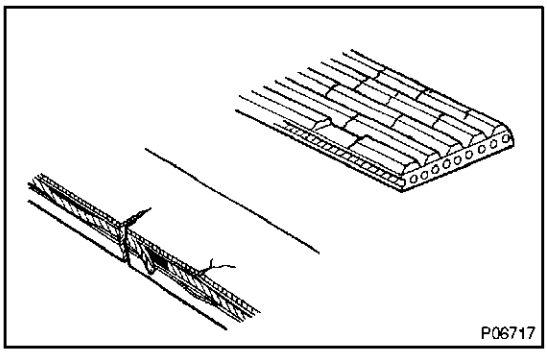
TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

SR015-01

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)	SA–2
	2. Power steering fluid level (Low)	SR–6
	3. Drive belt (Loose)	SR–3
	4. Front wheel alignment (Incorrect)	SA–4
	5. Steering system joints (Worn)	–
	6. Suspension arm ball joints (Worn)	SA–44
	7. Steering column (Binding)	–
	8. Power steering vane pump	SR–20 SR–23 SR–26
	9. Power steering gear	SR–36
Poor return	1. Tires (Improperly inflated)	SA–2
	2. Front wheel alignment (Incorrect)	SA–4
	3. Steering column (Binding)	–
	4. Power steering gear	SR–36
Excessive play	1. Steering system joints (Worn)	–
	2. Suspension arm ball joints (Worn)	SA–44
	3. Intermediate shaft, Sliding yoke (Worn)	–
	4. Front wheel bearing (Worn)	SA–11
	5. Power steering gear	SR–36
Abnormal noise	1. Power steering fluid level (Low)	SR–6
	2. Steering system joints (Worn)	–
	3. Power steering vane pump	SR–20 SR–23 SR–26
	4. Power steering gear	SR–36



DRIVE BELT

SR016-01

INSPECTION

1. INSPECT DRIVE BELT

Visually check the 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 belt are considered acceptable. If the missing chunks from the ribs are found on the belt, it should be replaced.

2. CHECK DRIVE BELT TENSION

Measure the drive belt deflection.

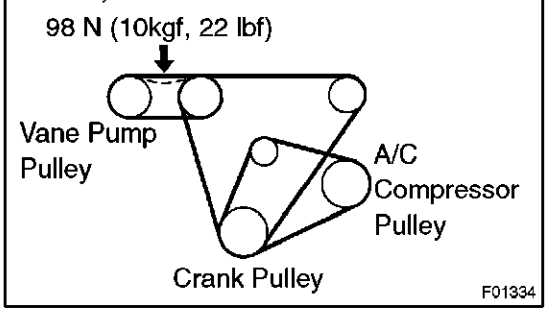
Drive belt tension: at 98 N (10 kgf, 22 lbf)

4A–FE, 7A–FE Engines:

New Belt: 5 – 6 mm (0.20 – 0.24 in.)

Used Belt: 6 – 8 mm (0.24 – 0.31 in.)

4A–FE, 7A–FE:

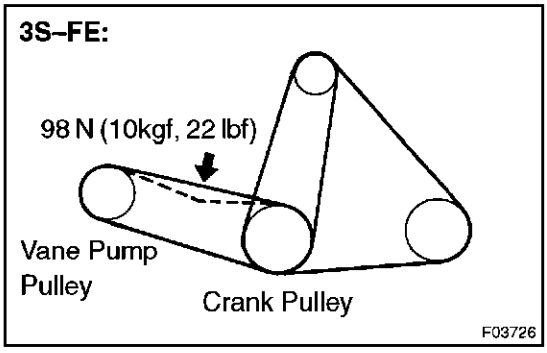


3S–FE Engine:

New Belt: 8 – 10 mm (0.31 – 0.39 in.)

Used Belt: 10 – 13 mm (0.39 – 0.51 in.)

3S–FE:

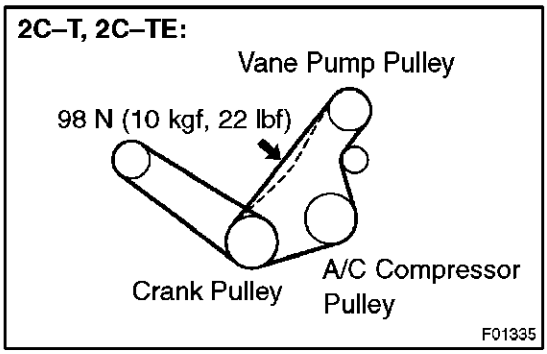


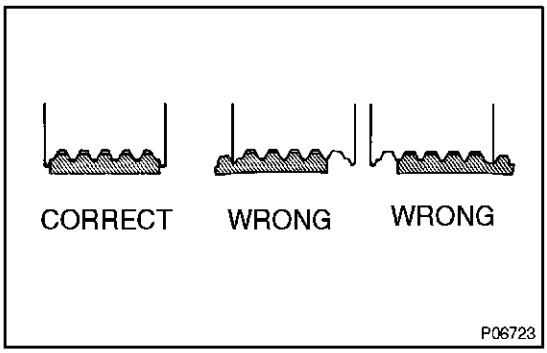
2C–T, 2C–TE Engines:

New Belt: 11 – 14 mm (0.43 – 0.55 in.)

Used Belt: 15 – 18 mm (0.59 – 0.71 in.)

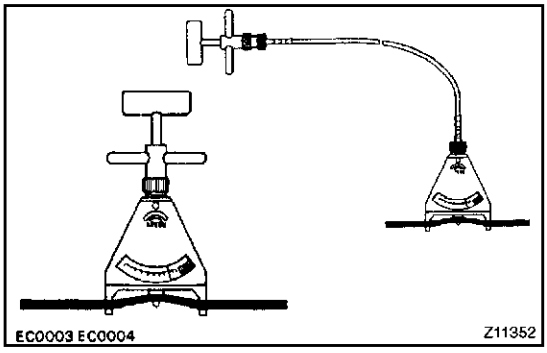
2C–T, 2C–TE:





HINT:

- "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing a belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.



(Reference)

- Using a belt tension gauge, measure the drive belt tension.

  Drive belt tension:
  4A–FE, 7A–FE, 3S–FE Engines:
  New Belt: 441 – 539 N (45 – 55 kgf)
  Used Belt: 245 – 392 N (25 – 40 kgf)
  2C–T, 2C–TE Engines:
  New Belt: 539 – 637 N (55 – 65 kgf)
  Used Belt: 245 – 392 N (25 – 40 kgf)

If the belt tension is not as specified, adjust it.

POWER STEERING FLUID

SR017-01

BLEEDING

1. **CHECK FLUID LEVEL**
   (See page SR–6)
2. **JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS**
3. **TURN STEERING WHEEL**

With the engine stopped, turn the wheel slowly from lock to lock several times.

4. **LOWER VEHICLE**
5. **START ENGINE**

Run the engine at idle for a few minutes.

6. **TURN STEERING WHEEL**

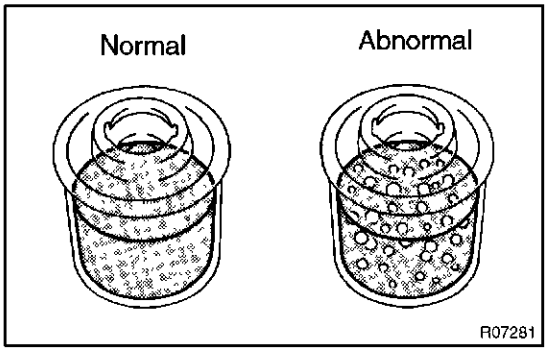
(a) With the engine idling, turn the wheel to left or right full lock position and keep it there for 2–3 seconds, then turn the wheel to the opposite full lock position and keep it there for 2–3 seconds.

(b) Repeat (a) several times.

7. **STOP ENGINE**
8. **CHECK FOR FOAMING OR EMULSIFICATION**

If the system has to be bled twice specifically because of foaming or emulsification, check for fluid leaks in the system.

9. **CHECK FLUID LEVEL**
   (See page SR–6)



SR0I6–01

INSPECTION

1. CHECK FLUID LEVEL

(a) Keep the vehicle level.

(b) With the engine stopped, check the fluid level in the oil reservoir.

If necessary, add fluid.

Fluid: ATF DEXRON II or III

HINT:

Check that the fluid level is within the HOT LEVEL range on the reservoir / reservoir cap dipstick.

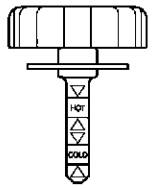
If the fluid is cold, check that it is within the COLD LEVEL range.

(c) Start the engine and run it at idle.

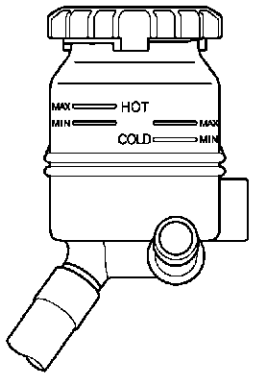
(d) Turn the steering wheel from lock to lock several times to boost fluid temperature.

Fluid temperature: 80°C (176°F)

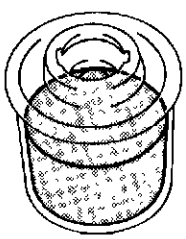
4A–FE, 7A–FE Engines:

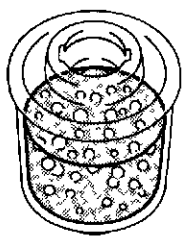


2C–T, 2C–TE, 3S–FE Engines:



F03737



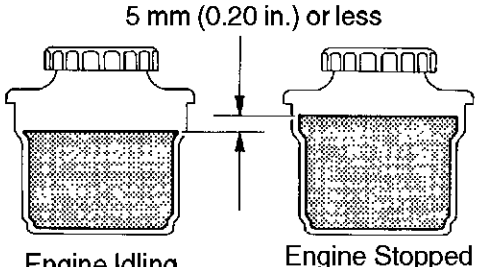


R07281

(e) Check for foaming or emulsification.

If there is foaming or emulsification, bleed power steering system.

(See page SR–5)



R10552

(f) With the engine idling, measure the fluid level in the oil reservoir.

(g) Stop the engine.

(h) Wait a few minutes and remeasure the fluid level in the oil reservoir.

Maximum fluid level rise: 5 mm (0.20 in.)

If a problem is found, bleed power steering system.

(See page SR–5)

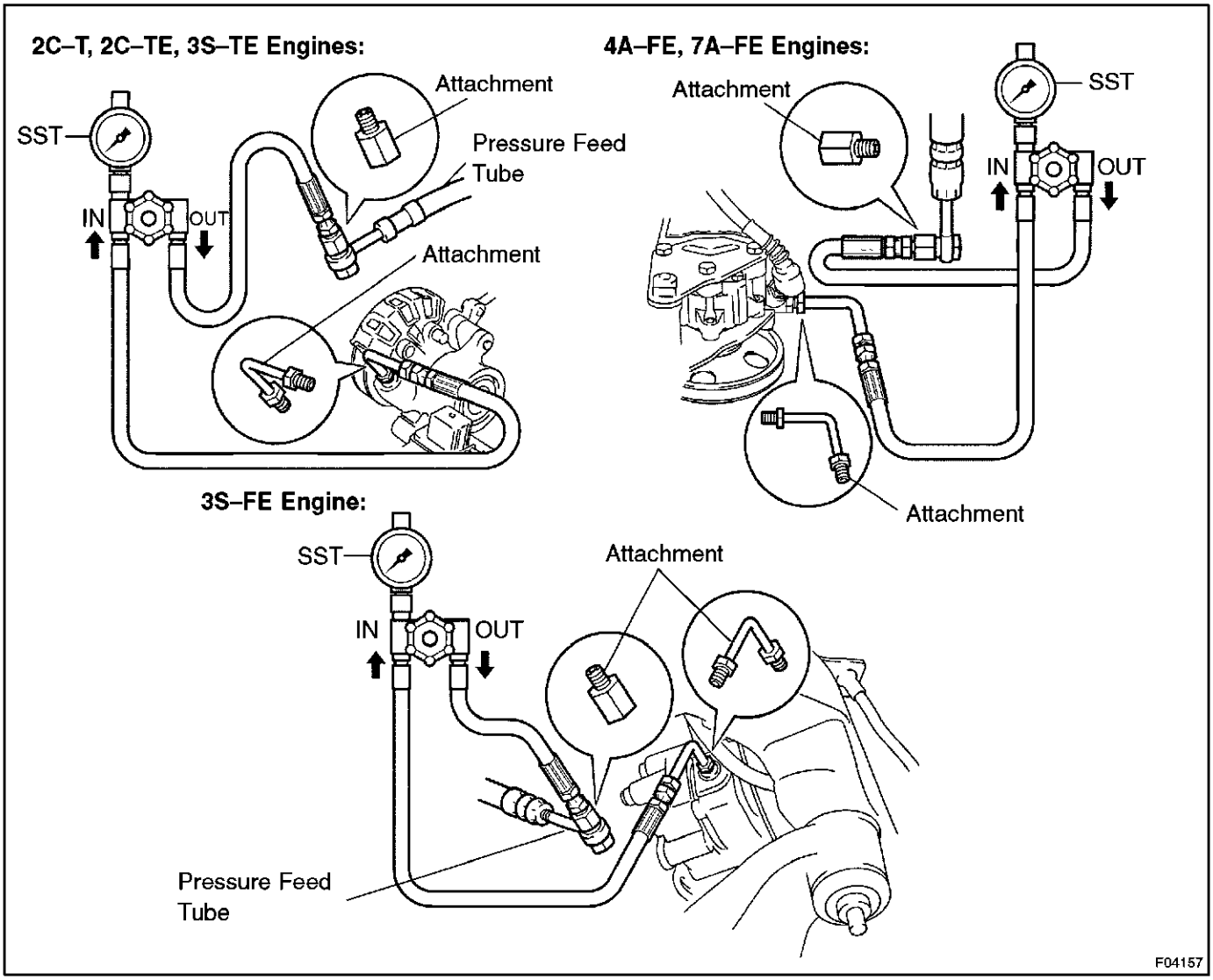
(i) Check the fluid level.

2. CHECK STEERING FLUID PRESSURE

(a) Disconnect the pressure feed tube from the PS vane pump.
(4A–FE, 7A–FE Engines: See page SR–21)
(3S–FE Engine: See page SR–24)
(2C–T, 2C–TE Engines: See page SR–28)

(b) Connect SST, as shown in the illustration below.
SST 09640–10010 (09641–01010, 09641–01030, 09641–01060)

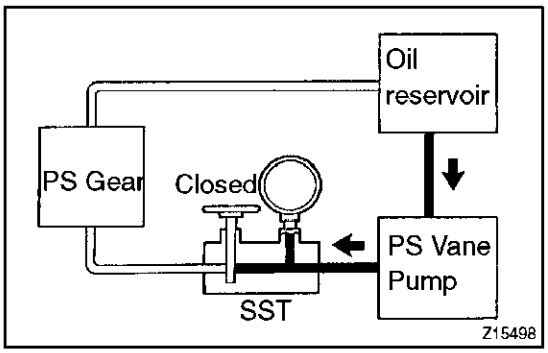
NOTICE:
Check that the valve of the SST is in the open position.



(c) Bleed the power steering system.
(See page SR–5)

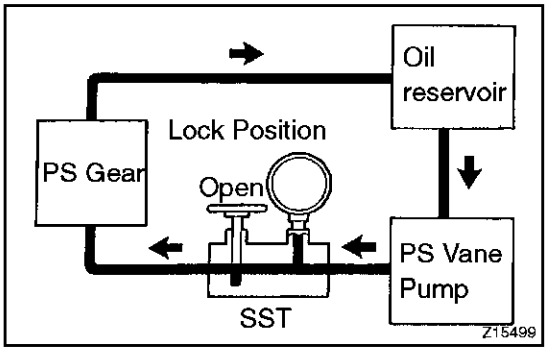
(d) Start the engine and run it at idle.

(e) Turn the steering wheel from lock to lock several times to boost fluid temperature.
Fluid temperature: 80°C (176°F)



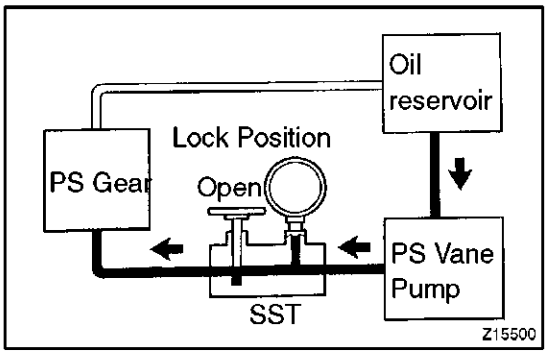
(f) With the engine idling, close the valve of the SST and observe the reading on the SST.
Minimum fluid pressure:
4A–FE, 7A–FE Engines:
8,238 kPa (84 kgf/cm², 1,195 psi)
3S–FE Engine:
9,022 kPa (92 kgf/cm², 1,309 psi)
2C–T, 2C–TE Engines:
8,826 kPa (90 kgf/cm², 1,280 psi)

NOTICE:
- **Do not keep the valve closed for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**



(g) With the engine idling, open the valve fully.
(h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.
Difference fluid pressure:
490 kPa (5 kgf/cm², 71 psi) or less

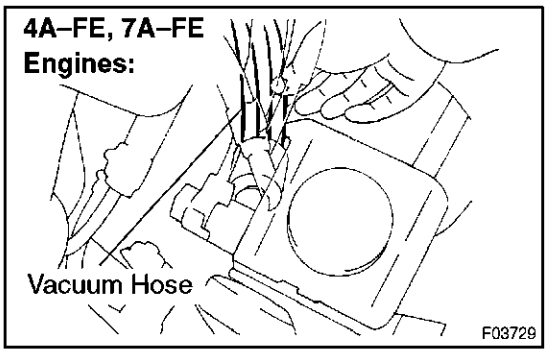
NOTICE:
Do not turn the steering wheel.



(i) With the engine idling and valve fully opened, turn the steering wheel to full lock.
Minimum fluid pressure:
4A–FE, 7A–FE Engines:
8,238 kPa (84 kgf/cm², 1,195 psi)
3S–FE Engine:
9,022 kPa (92 kgf/cm², 1,309 psi)
2C–T, 2C–TE Engines:
8,826 kPa (90 kgf/cm², 1,280 psi)

NOTICE:
- **Do not maintain lock position for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**

(j) Disconnect the SST.
(k) Connect the pressure feed tube to PS vane pump.
(4A–FE, 7A–FE Engines: See page SR–22)
(3S–FE Engine: See page SR–25)
(2C–T, 2C–TE Engines: See page SR–35)
(l) Bleed the power steering system.
(See page SR–5)



AIR CONTROL VALVE

SR0I9–01

INSPECTION

1. TURN AIR CONDITIONING SWITCH OFF

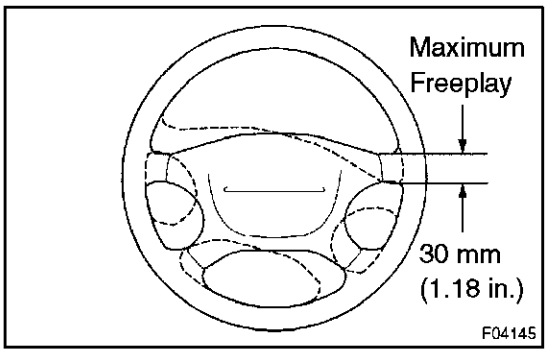
2. CHECK IDLE–UP

(a) Start the engine and run it at idle.

(b) Fully turn the steering wheel.

(c) Check that the engine rpm decreases when the vacuum hose of the air control valve is pinched.

(d) Check that the engine rpm increases when the hose is released.



STEERING WHEEL

INSPECTION

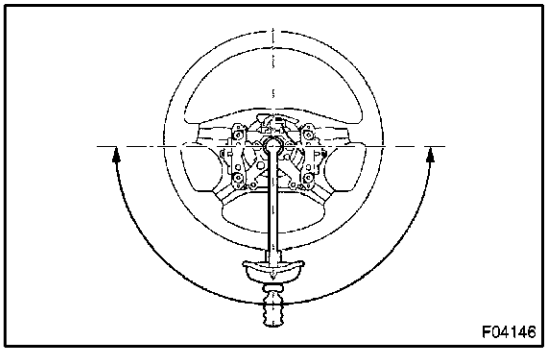
SR0IA–01

1. CHECK STEERING WHEEL FREEPLAY

With the vehicle stopped and tires facing straight ahead, rock the steering wheel gently back and forth with light finger pressure.

Freeplay should not exceed the maximum.

Maximum freeplay: 30 mm (1.18 in.)



2. CHECK STEERING EFFORT

(a) Center the steering wheel.

(b) Remove the steering wheel pad.
(See page SR–13)

(c) Start the engine and run it at idle.

(d) Measure the steering effort in both directions.
Reference: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

HINT:

Take the tire type, pressure and contact surface into consideration before making your diagnosis.

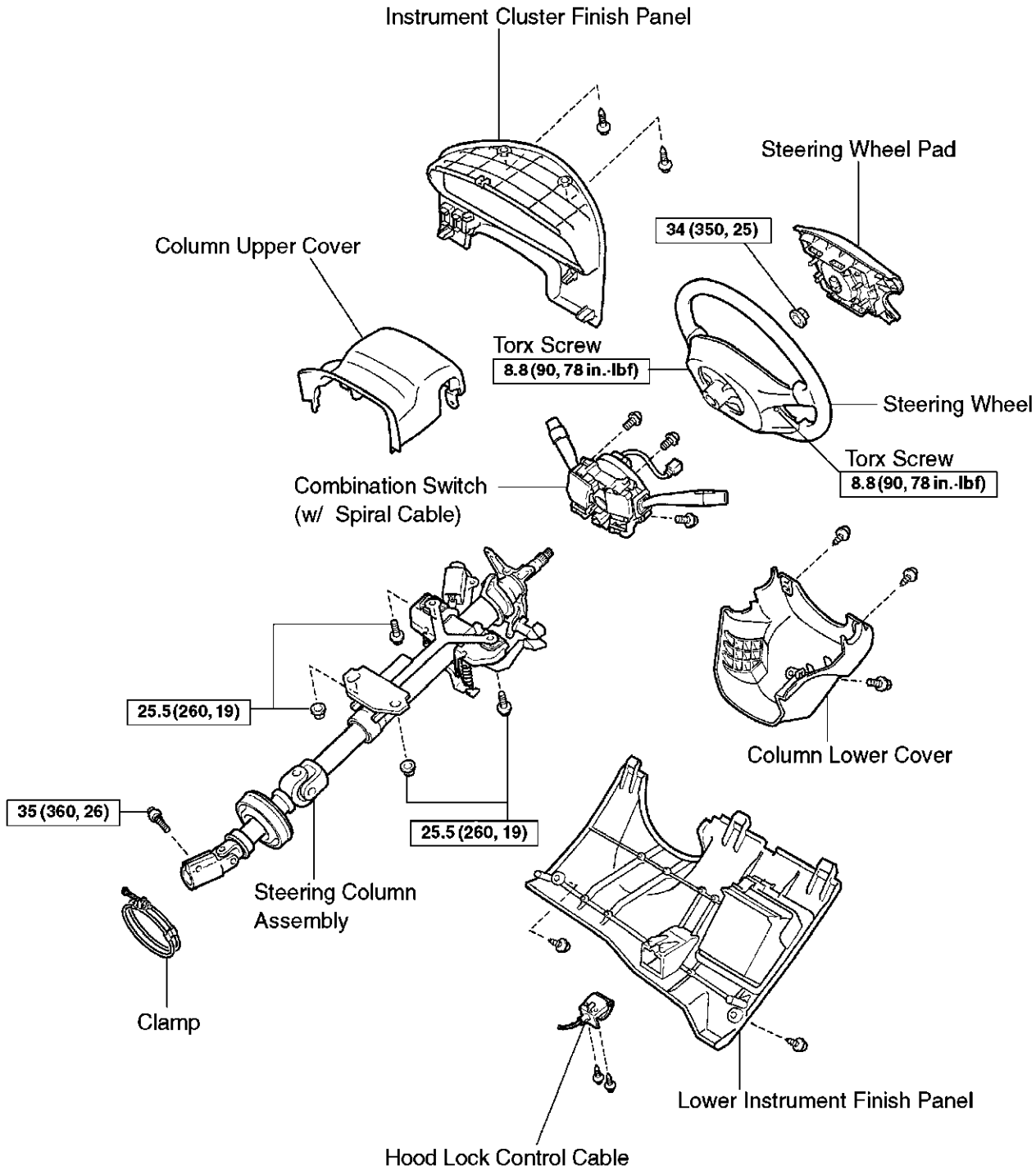
(e) Torque the steering wheel set nut.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(f) Install the steering wheel pad.
(See page SR–18)

TILT STEERING COLUMN

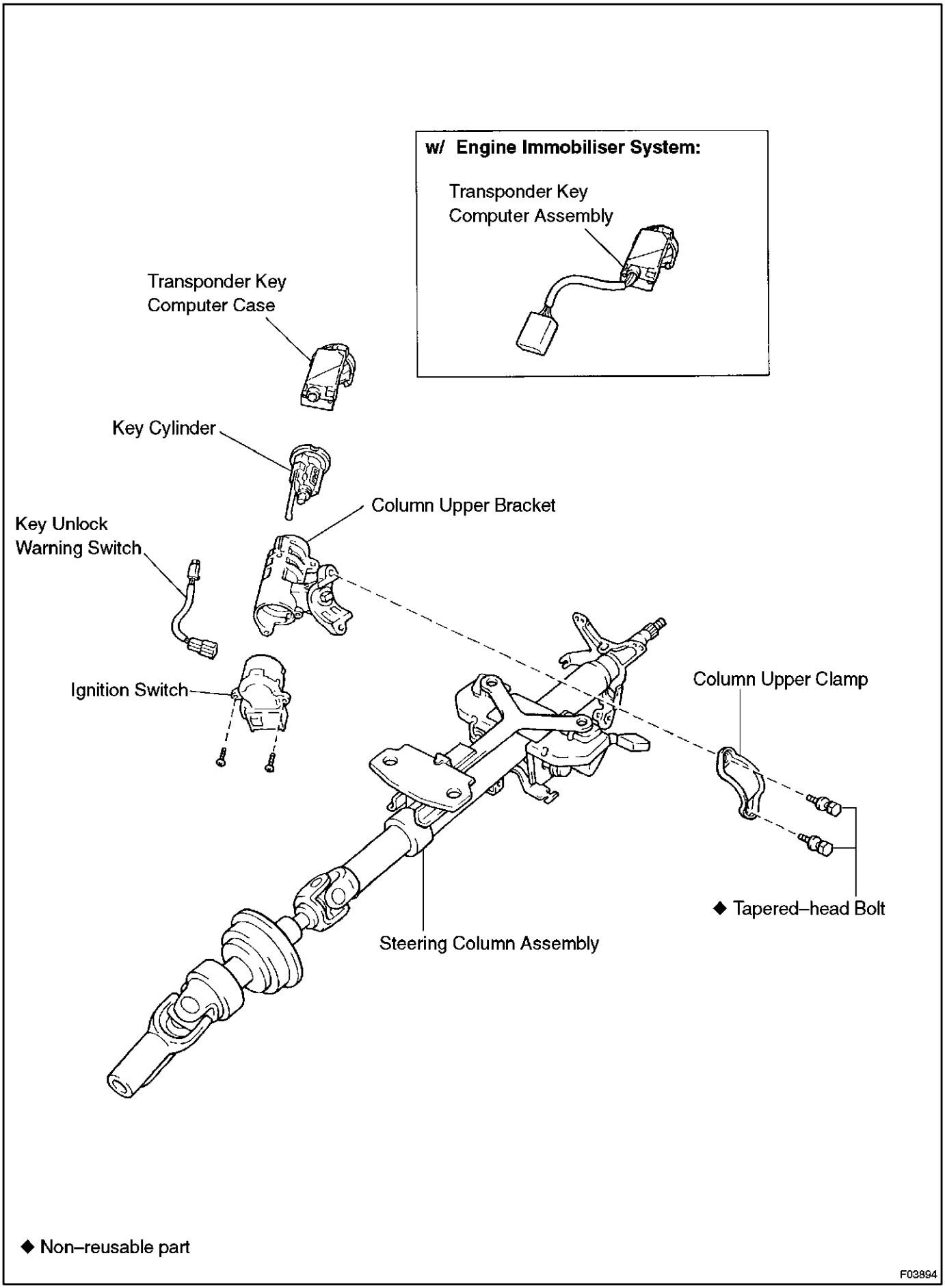
COMPONENTS

SR0IB–01

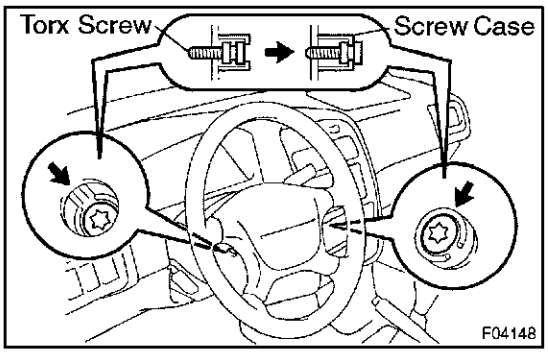


N·m (kgf·cm, ft·lbf) : Specified torque

F04147


w/ Engine Immobiliser System:
Transponder Key Computer Assembly
Transponder Key Computer Case
Key Cylinder
Column Upper Bracket
Key Unlock Warning Switch
Ignition Switch
Column Upper Clamp
◆ Tapered–head Bolt
Steering Column Assembly
◆ Non–reusable part
F03894

SR0IC–01



REMOVAL

1. REMOVE STEERING WHEEL PAD

NOTICE:

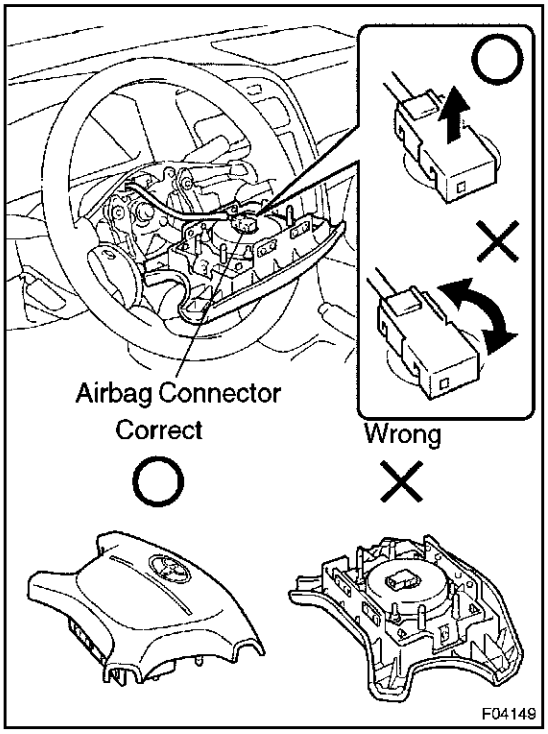
- **If the airbag connector is disconnected with the ignition switch at ON or ACC, DTCs will be recorded.**
- **Never use airbag parts from another vehicle. When replacing parts, replace with new ones.**

(a) Place the front wheels facing straight ahead.

(b) Using a torx socket wrench, loosen the 2 torx screws.

HINT:

Loosen the 2 screws until the groove along the screw circumference catches on the screw case.



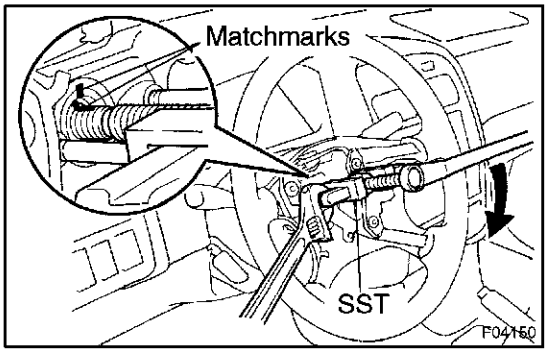
(c) Pull out the wheel pad from the steering wheel and disconnect the airbag connector.

CAUTION:

- **When storing the wheel pad, keep the upper surface of the pad facing upward.**
- **Never disassemble the wheel pad.**

NOTICE:

When removing the wheel pad, take care not to pull the airbag wire harness.



2. REMOVE STEERING WHEEL

(a) Disconnect the connector.

(b) Remove the steering wheel set nut.

(c) Place matchmarks on the steering wheel and main shaft assembly.

(d) Using SST, remove the wheel.

SST 09950–50010 (09951–05010, 09952–05010, 09953–05020, 09954–05020)

3. REMOVE LOWER INSTRUMENT FINISH PANEL

(a) Remove the 2 screws and disconnect the hood lock control cable.

(b) Remove the 2 screws.

4. REMOVE INSTRUMENT CLUSTER FINISH PANEL

Remove the 2 screws.

5. REMOVE UPPER AND LOWER COLUMN COVERS

(a) Remove the 3 screws from the lower cover.

(b) Remove the screw from the upper cover.

6. REMOVE COMBINATION SWITCH WITH SPIRAL CABLE

(a) Disconnect the connectors.

(b) Disconnect the airbag connector.

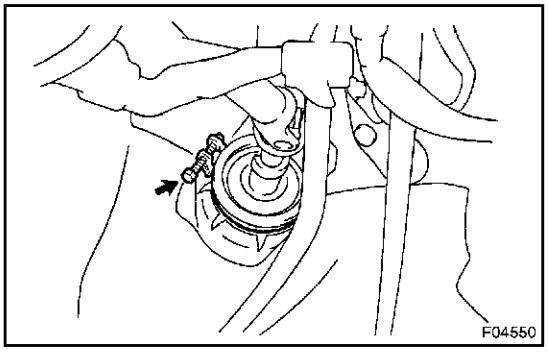
(c) Remove the 3 screws.

7. REMOVE SPIRAL CABLE

(See page BE–22)

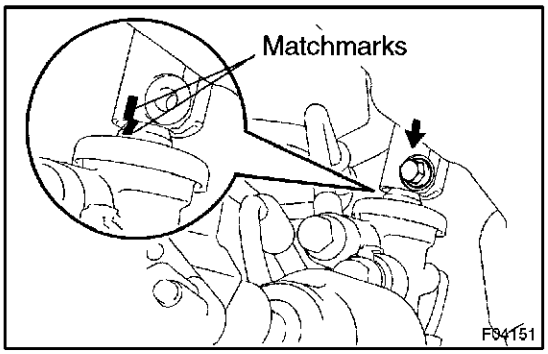
NOTICE:

Do not disassemble the cable or apply oil to it.



8. DISCONNECT YOKE

(a) Loosen the column hole cover clamp.



(b) Place matchmarks on the yoke and control valve shaft.

(c) Remove the bolt, and slide out the yoke.

9. REMOVE STEERING COLUMN ASSEMBLY

(a) Disconnect the connectors.

(b) Remove the 2 column assembly set bolts and nuts.

SR0ID–01

DISASSEMBLY

NOTICE:

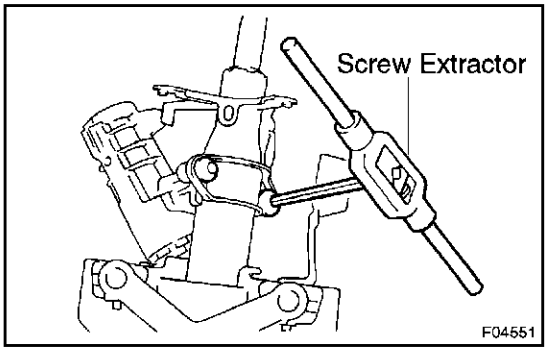
When using a vise, do not overtighten it.

1. **w/o Engine Immobiliser System:**
   REMOVE TRANSPONDER KEY COMPUTER CASE

Slide the case out of the column upper bracket.

2. **w/ Engine Immobiliser System:**
   REMOVE TRANSPONDER KEY COMPUTER ASSEMBLY

Slide the computer assembly out of the column upper bracket.



3. **REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP**

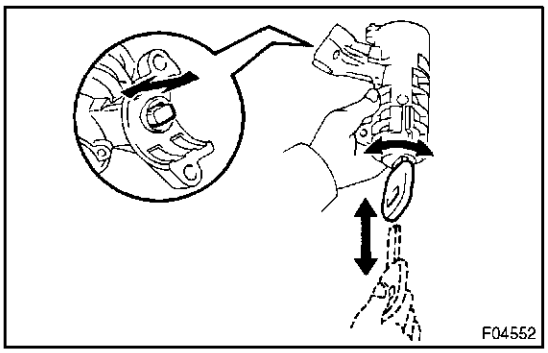
(a) Using a centering punch, mark the center of the 2 tapered–head bolts.

(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.

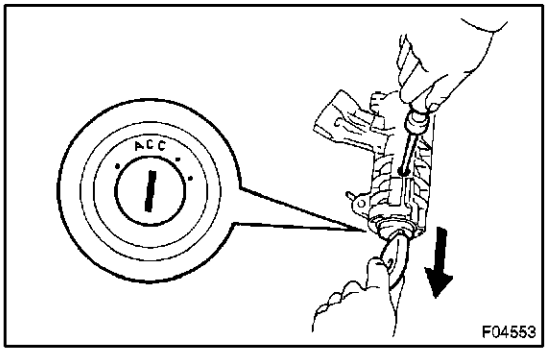
SR0IE–01

INSPECTION



1. INSPECT STEERING LOCK OPERATION

Check that the steering lock mechanism operates properly.



2. IF NECESSARY, REPLACE KEY CYLINDER

(a) Place the ignition key at the ACC position.

(b) Push down the stop pin with a screwdriver, and pull out the cylinder.

(c) Install a new cylinder.

HINT:

Make sure the key is at the ACC position.

3. INSPECT IGNITION SWITCH

(See page BE–19)

4. IF NECESSARY, REPLACE IGNITION SWITCH

(a) Remove the 2 screws and switch from the upper bracket.

(b) Install a new switch with the 2 screws.

5. INSPECT KEY UNLOCK WARNING SWITCH

(See page BE–19)

6. IF NECESSARY, REPLACE KEY UNLOCK WARNING SWITCH

(a) Slide out the switch.

(b) Slide in a new switch.

7. w/ Engine Immobiliser System:

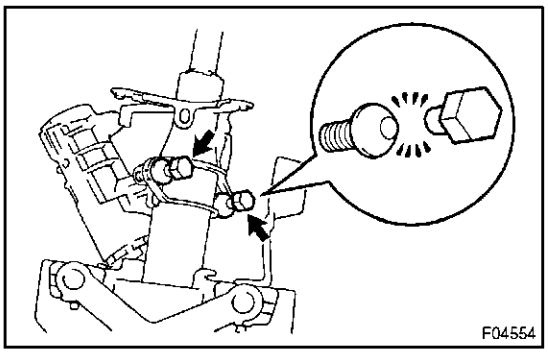
INSPECT TRANSPONDER KEY COMPUTER ASSEMBLY

(See page BE–139)

8. w/ Engine Immobiliser System:

IF NECESSARY, REPLACE TRANSPONDER KEY COMPUTER ASSEMBLY

SR0IF–01



REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP**

Tighten the 2 new tapered–head bolts until the bolt heads break off.

2. **w/o Engine Immobiliser System: INSTALL TRANSPONDER KEY COMPUTER CASE**

Slide the case in the column upper bracket.

3. **w/ Engine Immobiliser System: INSTALL TRANSPONDER KEY COMPUTER ASSEMBLY**

Slide the computer assembly in the column upper bracket.

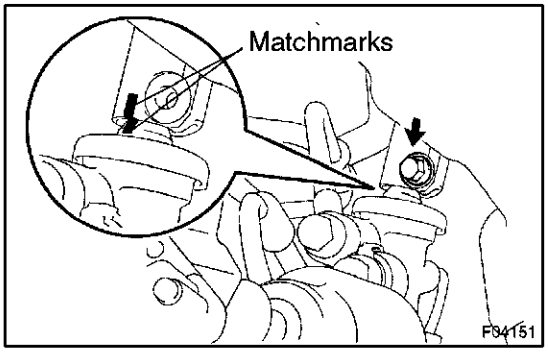
SR0IG–01

INSTALLATION

1. INSTALL STEERING COLUMN ASSEMBLY

(a) Torque the 2 column assembly set bolts and nuts.
Torque: 25.5 N·m (260 kgf·cm, 19 ft·lbf)

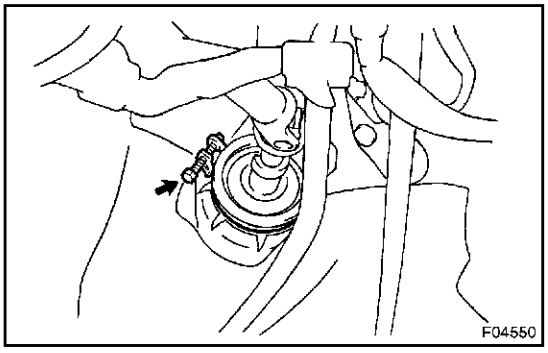
(b) Connect the connectors.



2. CONNECT YOKE

(a) Align the matchmarks on the yoke and control valve shaft, and slide in the yoke.

(b) Torque the bolt.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)



(c) Tighten the column hole cover clamp.

3. INSTALL SPIRAL CABLE
(See page BE–22)

4. INSTALL COMBINATION SWITCH WITH SPIRAL CABLE

(a) Tighten the 3 screws.

(b) Connect the airbag connector.

(c) Connect the connectors.

5. INSTALL UPPER AND LOWER COLUMN COVERS

(a) Tighten the screw to the upper cover.

(b) Tighten the 3 screws to the lower cover.

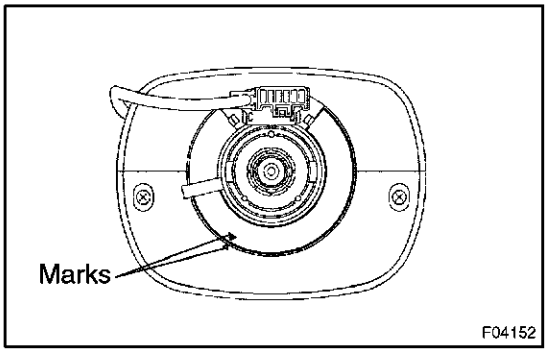
6. INSTALL INSTRUMENT CLUSTER FINISH PANEL

Tighten the 2 screws.

7. INSTALL LOWER INSTRUMENT FINISH PANEL

(a) Connect the hood lock control cable with the 2 screws.

(b) Tighten the 2 screws.



8. 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 the cable.

(c) 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.

9. INSTALL STEERING WHEEL

(a) Align the matchmarks on the steering wheel and main shaft assembly.

(b) Torque the steering wheel set nut.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

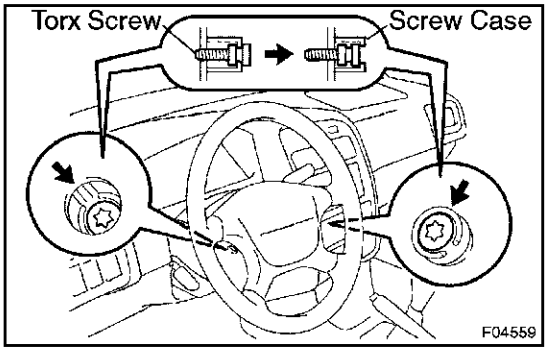
(c) Connect the connector.

10. INSTALL STEERING WHEEL PAD

NOTICE:

- **Make sure the wheel pad is installed with the specified torque.**
- **If the wheel pad has been dropped, or if there are cracks, dents or other defects in the case or connector, replace the wheel pad with a new one.**
- **When installing the wheel pad, take care that the wirings do not interfere with other parts and that they are not pinched between other parts.**

(a) Connect the airbag connector.



(b) Install the wheel pad after confirming that the circumference groove of the torx screws are caught on the screw case.

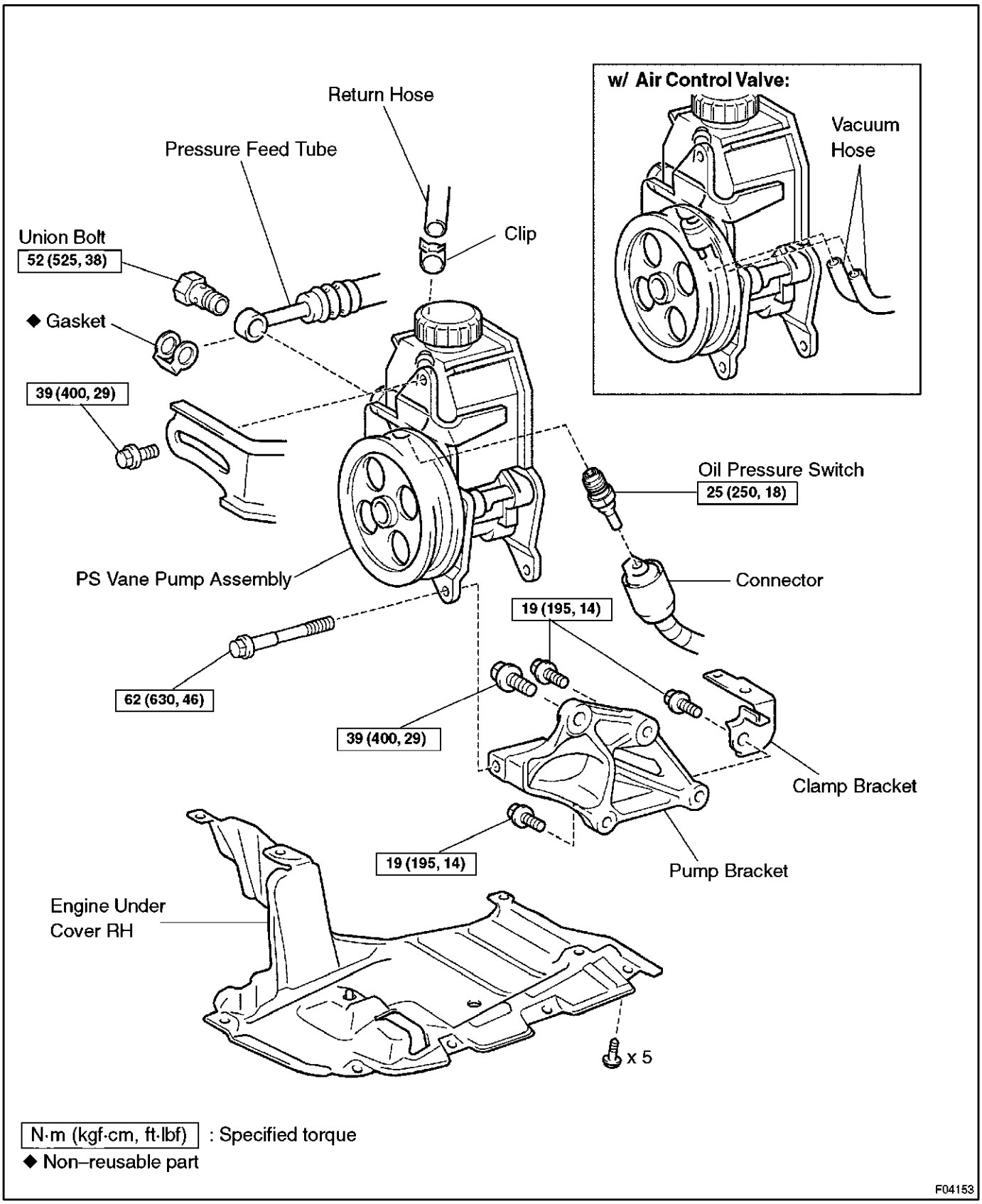
(c) Using a torx socket wrench, torque the 2 screws.
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

11. CHECK STEERING WHEEL CENTER POINT

POWER STEERING VANE PUMP (4A–FE, 7A–FE)

SR0IH–01

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

F04153

SR0II–01

REMOVAL

1. REMOVE ENGINE UNDER COVER RH

Remove the 5 bolts.

2. DISCONNECT RETURN HOSE

Remove the clip and disconnect the hose.

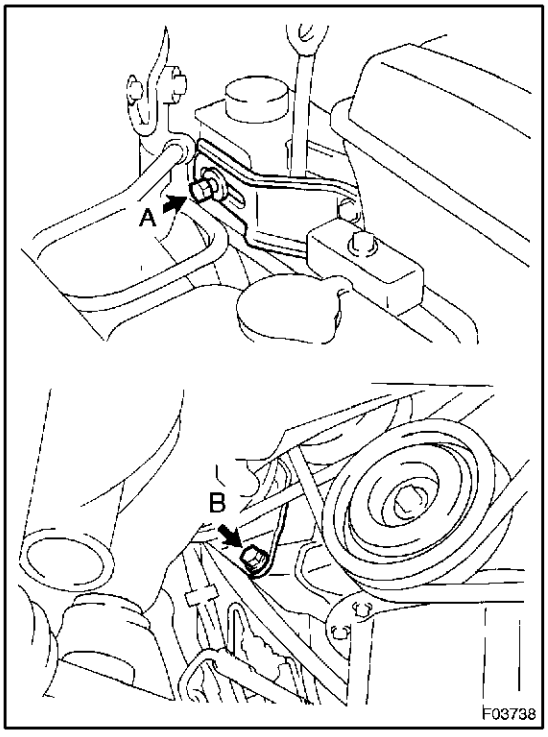
NOTICE:

Take care not to spill fluid on the drive belt.

3. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket.

4. w/ Air control valve:
DISCONNECT 2 VACUUM HOSES



5. REMOVE DRIVE BELT

Remove the bolt A and loosen the bolt B.

6. REMOVE PS VANE PUMP ASSEMBLY

(a) w/o Air control valve:
Disconnect the connector.

(b) Remove the 4 pump bracket set bolts and clamp bracket.

(c) Remove the bolt and pump bracket from the pump assembly.

(d) w/o Air control valve:
Remove the oil pressure switch from the pump assembly.

SR0IJ–01

INSTALLATION

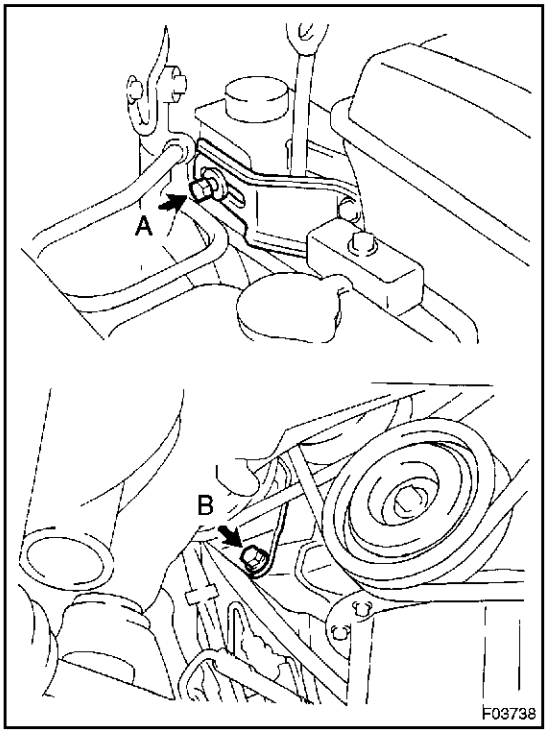
1. INSTALL PS VANE PUMP ASSEMBLY

(a) w/o Air control valve:
Install the oil pressure switch to the pump assembly.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Temporarily install the pump bracket and bolt to the pump assembly.

(c) Torque the 4 pump bracket set bolts and clamp bracket.
Torque:
12 mm head bolts
19 N·m (195 kgf·cm, 14 ft·lbf)
14 mm head bolt
39 N·m (400 kgf·cm, 29 ft·lbf)

(d) w/o Air control valve:
Connect the connector.



2. INSTALL DRIVE BELT

(a) Adjust the drive belt tension.
(See page SR–3)

(b) Torque the bolt A.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(c) Torque the bolt B.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

3. w/ Air control valve:
CONNECT 2 VACUUM HOSES

4. CONNECT PRESSURE FEED TUBE

Torque the union bolt with a new gasket.
Torque: 52 N·m (525 kgf·cm, 38 ft·lbf)

5. CONNECT RETURN HOSE

Connect the hose with the clip.

6. INSTALL ENGINE UNDER COVER RH

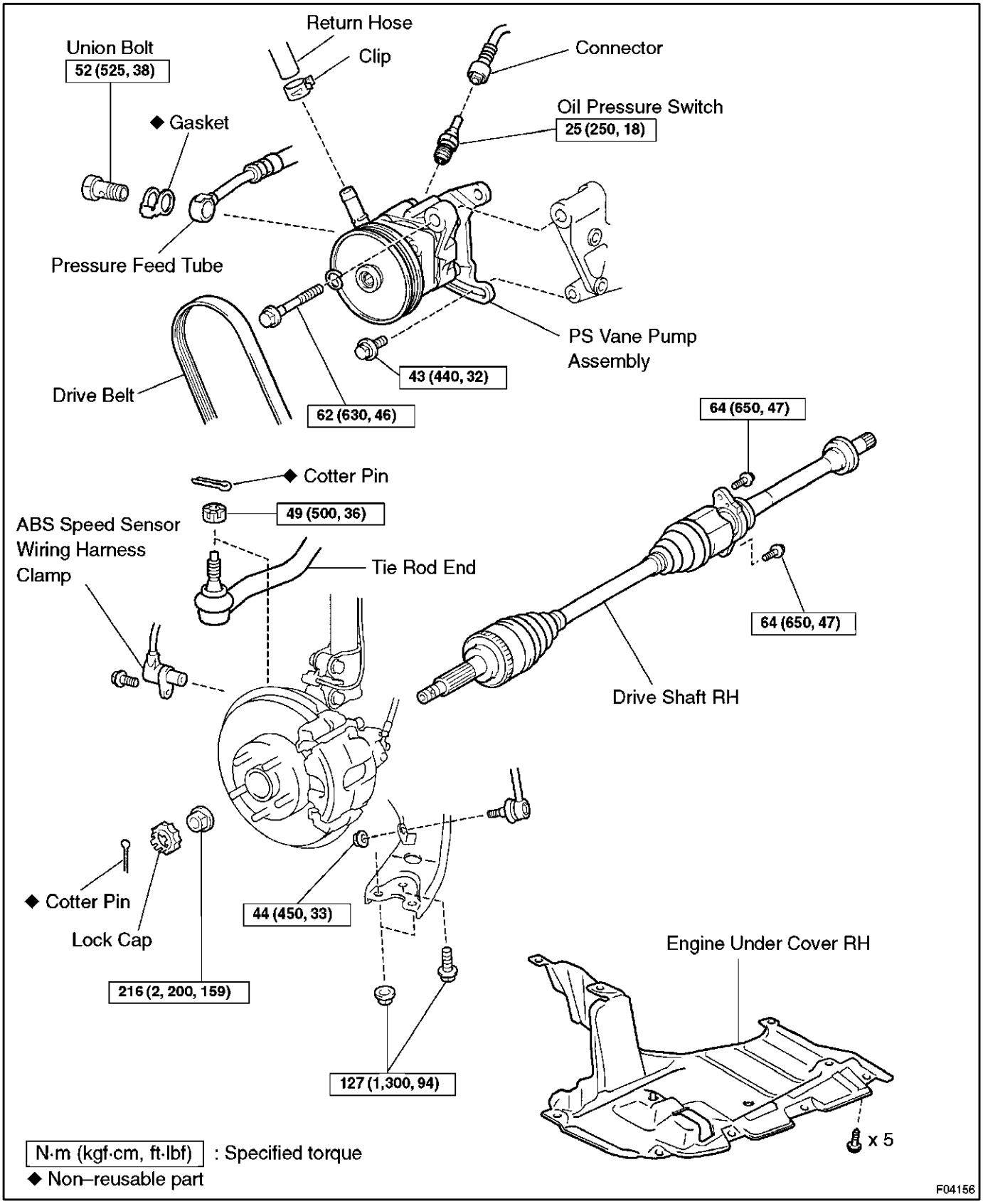
Tighten the 5 bolts.

7. BLEED POWER STEERING SYSTEM
(See page SR–5)

POWER STEERING VANE PUMP (3S–FE)

SR0IK-01

COMPONENTS



SR0IL–01

REMOVAL

1. REMOVE ENGINE UNDER COVER RH

Remove the 5 bolts.

2. w/ ABS:

DISCONNECT ABS SPEED SENSOR WIRING HARNESS CLAMP

Remove the bolt.

3. REMOVE DRIVE SHAFT RH

(See page SA–19)

4. DISCONNECT RETURN HOSE

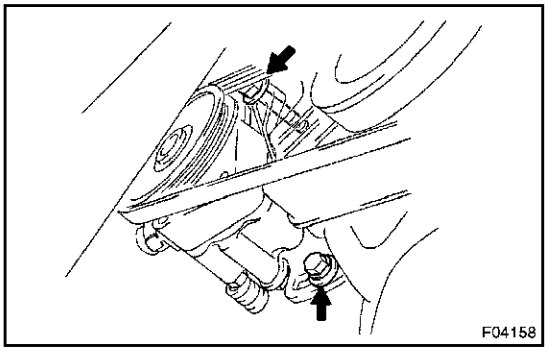
Remove the clip and disconnect the hose.

NOTICE:

Take care not to spill fluid on the drive belt.

5. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket.



6. REMOVE DRIVE BELT

Loosen the 2 bolts.

7. REMOVE PS VANE PUMP ASSEMBLY

(a) Disconnect the connector.

(b) Remove the 2 pump assembly set bolts.

(c) Remove the oil pressure switch from the pump assembly.

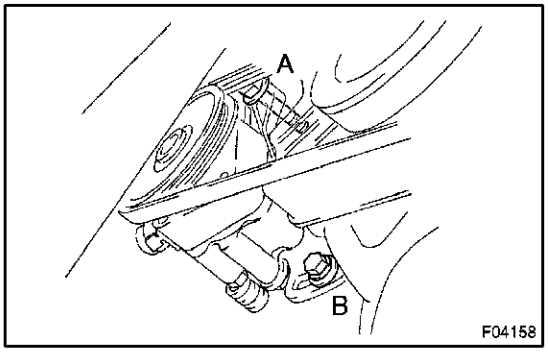
SR0IM–01

INSTALLATION

1. INSTALL PS VANE PUMP ASSEMBLY

(a) Install the oil pressure switch to the pump assembly.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Temporarily install the 2 pump assembly set bolts.

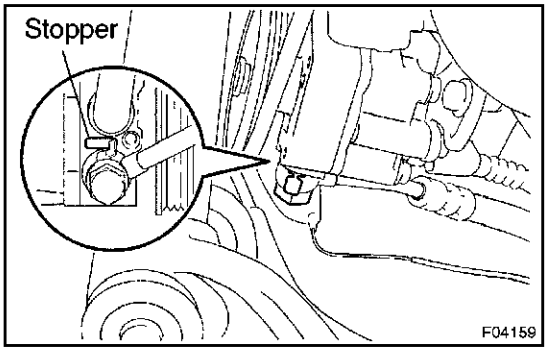


2. INSTALL DRIVE BELT

(a) Adjust the drive belt tension.
(See page SR–3)

(b) Torque the bolt A.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

(c) Torque the bolt B.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



3. CONNECT PRESSURE FEED TUBE

Torque the union bolt with a new gasket.

HINT:

Make sure that the tube touches the stopper of the PS vane pump assembly as shown in the illustration, then torque the union bolt.

Torque: 52 N·m (525 kgf·cm, 38 ft·lbf)

4. CONNECT RETURN HOSE

Connect the hose with the clip.

5. INSTALL DRIVE SHAFT RH
(See page SA–19)

6. w/ ABS:
CONNECT ABS SPED SENSOR WIRING HARNESS CLAMP

Tighten the bolt.

7. INSTALL ENGINE UNDER COVER RH

Tighten the 5 bolts.

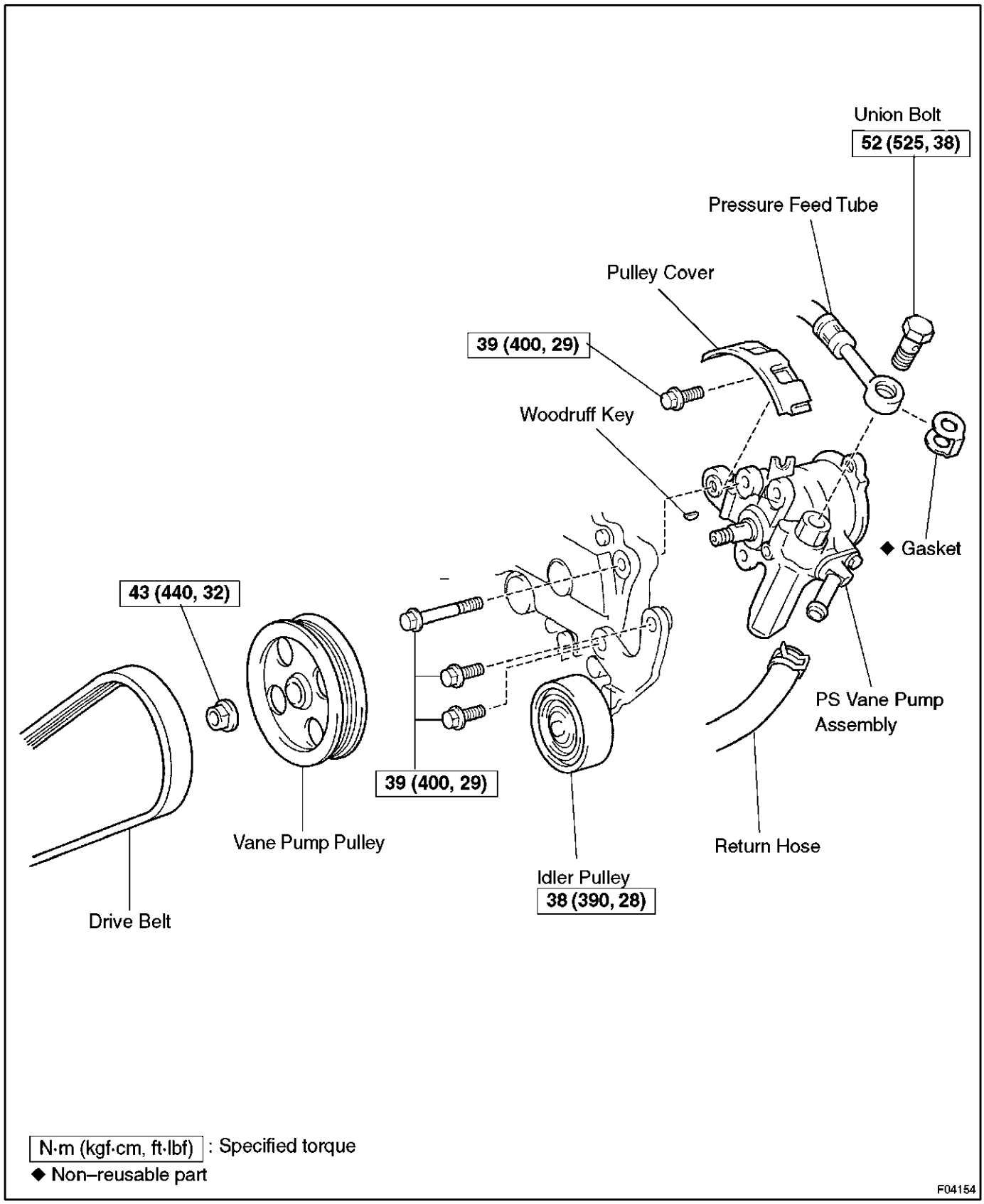
8. BLEED POWER STEERING SYSTEM
(See page SR–5)

9. w/ ABS:
CHECK ABS SPED SENSOR SIGNAL
(See page DI–113)

POWER STEERING VANE PUMP (2C–T, 2C–TE)

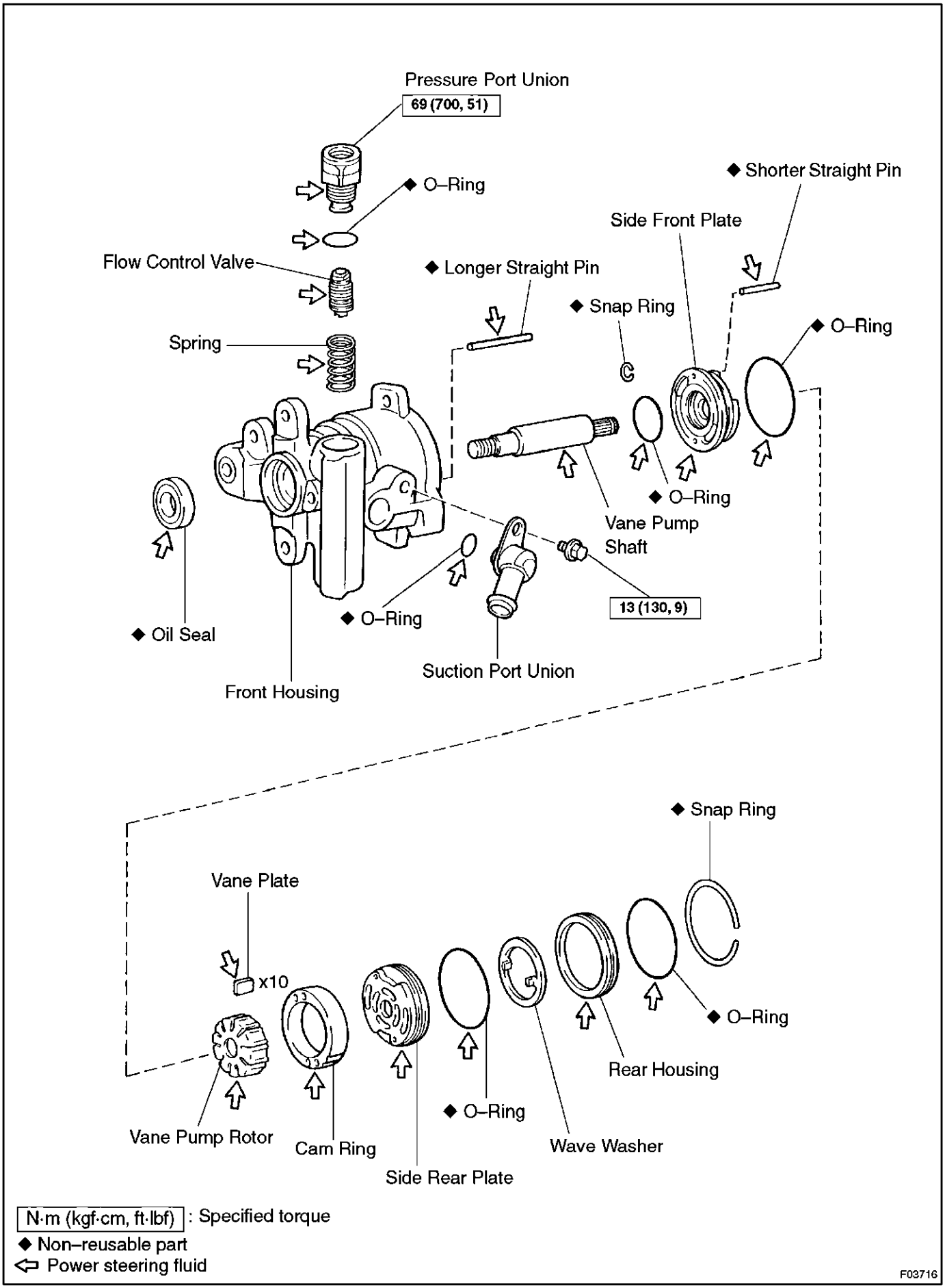
COMPONENTS

SR0IN–01



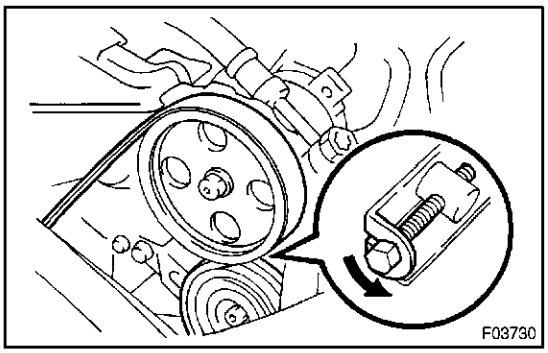
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

F04154


Pressure Port Union
69 (700, 51)
◆ O–Ring
Flow Control Valve
◆ Longer Straight Pin
◆ Shorter Straight Pin
Side Front Plate
◆ Snap Ring
◆ O–Ring
Spring
◆ O–Ring
Vane Pump Shaft
13 (130, 9)
◆ Oil Seal
◆ O–Ring
Suction Port Union
Front Housing
◆ Snap Ring
Vane Plate
x10
◆ O–Ring
Rear Housing
◆ O–Ring
Vane Pump Rotor
Cam Ring
Wave Washer
Side Rear Plate
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
⇦ Power steering fluid
F03716

SR0IO–01

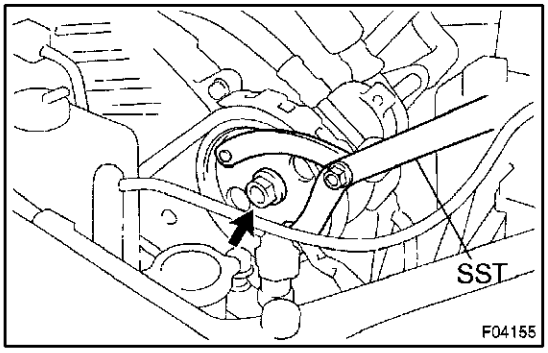
REMOVAL



1. REMOVE DRIVE BELT

(a) Loosen the idler pulley set nut.

(b) Loosen the belt tension adjusting bolt, and remove the drive belt.



2. REMOVE VANE PUMP PULLEY

(a) Using SST to stop the pulley rotating, remove the pulley set nut.

SST 09960–10010 (09962–01000, 09963–01000)

(b) Remove the woodruff key from the vane pump shaft.

3. DISCONNECT RETURN HOSE

Remove the clip and disconnect the hose.

4. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket.

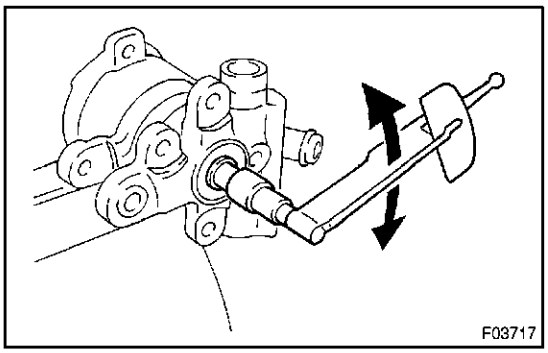
5. REMOVE PS VANE PUMP ASSEMBLY

Remove the 3 bolts.

6. REMOVE PULLEY COVER

Remove the bolt.

SR0IP–01



DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. MEASURE PS VANE PUMP ROTATING TORQUE

(a) Check that the pump rotates smoothly without abnormal noise.

(b) Temporarily install the vane pump pulley set nut.

(c) Using a torque wrench, check the pump rotating torque.

Rotating torque:

0.3 N·m (2.8 kgf·cm, 2.4 in.·lbf) or less

2. REMOVE SUCTION PORT UNION

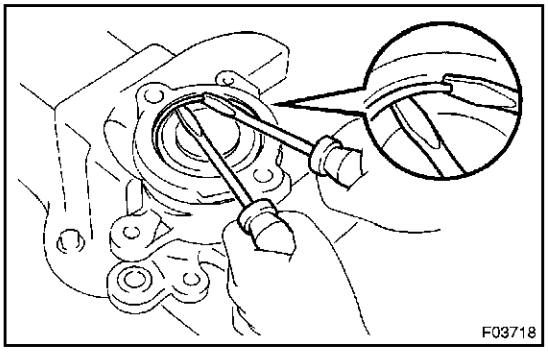
(a) Remove the bolt.

(b) Remove the O–ring from the union.

3. REMOVE PRESSURE PORT UNION

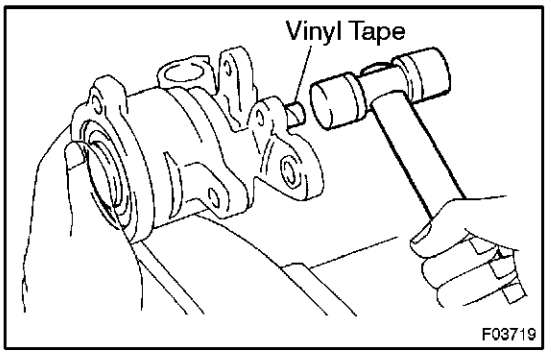
Remove the O–ring from the union.

4. REMOVE FLOW CONTROL VALVE AND SPRING



5. REMOVE REAR HOUSING, WAVE WASHER AND SIDE REAR PLATE

(a) Using 2 screwdrivers, remove the snap ring.



(b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the vane pump shaft.

(c) Using a plastic hammer, tap out the housing, washer and plate.

(d) Remove the O–ring from the housing.

(e) Remove the O–ring from the plate.

6. REMOVE CAM RING AND 10 VANE PLATES

NOTICE:

Be careful not to drop the plate.

7. REMOVE VANE PUMP SHAFT WITH VANE PUMP ROTOR AND SIDE FRONT PLATE

8. REMOVE VANE PUMP ROTOR AND SIDE FRONT PLATE

(a) Using a screwdriver, remove the snap ring from the vane pump shaft.

(b) Remove the 2 O–rings from the plate.

9. REMOVE SHORTER STRAIGHT PIN

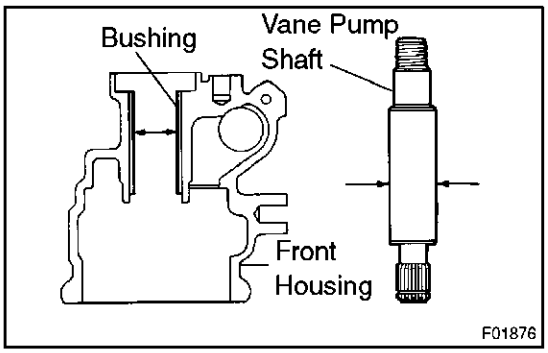
Using pliers, remove the pin from the side front plate.

10. REMOVE LONGER STRAIGHT PIN

Using pliers, remove the pin from the front housing.

SR0IQ–01

INSPECTION



NOTICE:

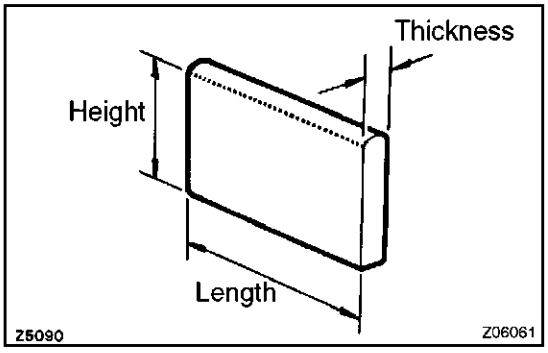
When using a vise, do not overtighten it.

1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

Using a micrometer and caliper gauge, measure the oil clearance.

Standard clearance:
0.01 – 0.03 mm (0.0004 – 0.0012 in.)
Maximum clearance: 0.07 mm (0.0028 in.)

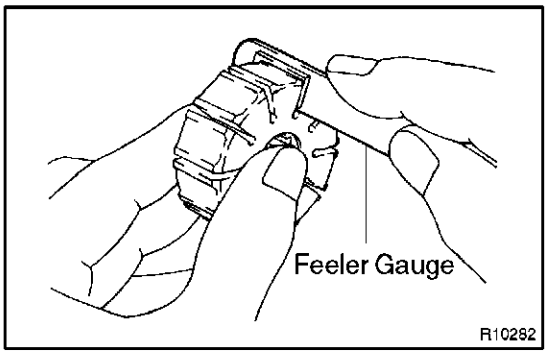
If it is more than the maximum, replace the front housing and vane pump shaft.



2. INSPECT VANE PUMP ROTOR AND VANE PLATES

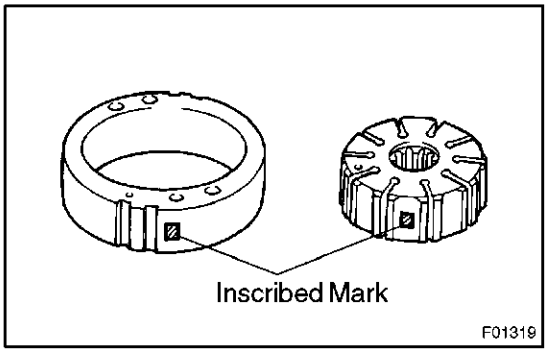
(a) Using a micrometer, measure the height, thickness and length of the 10 plates.

Minimum height: 8.1 mm (0.319 in.)
Minimum thickness: 1.797 mm (0.0708 in.)
Minimum length: 14.988 mm (0.5901 in.)



(b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

Maximum clearance: 0.03 mm (0.0012 in.)

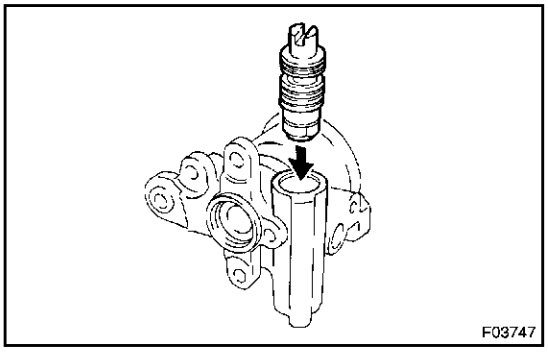


If it is more than the maximum, replace the plate and/or rotor with the one having the same mark stamped on the cam ring.

Inscribed mark: 1, 2, 3, 4 or None

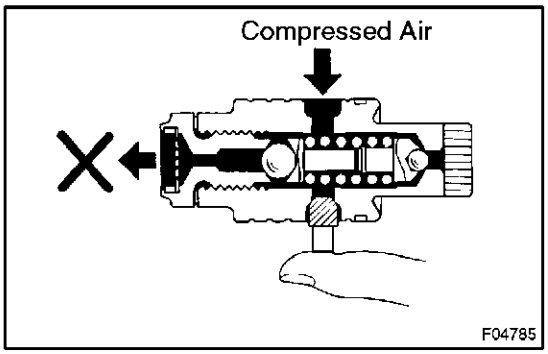
HINT:
There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345–12010	14.996 – 14.998 (0.59039 – 0.59047)
1	44345–12020	14.994 – 14.996 (0.59032 – 0.59039)
2	44345–12030	14.992 – 14.994 (0.59024 – 0.59032)
3	44345–12040	14.990 – 14.992 (0.59016 – 0.59024)
4	44345–12050	14.988 – 14.990 (0.59008 – 0.59016)

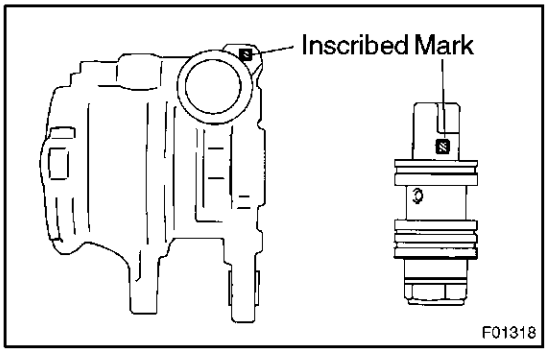


3. INSPECT FLOW CONTROL VALVE

(a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.

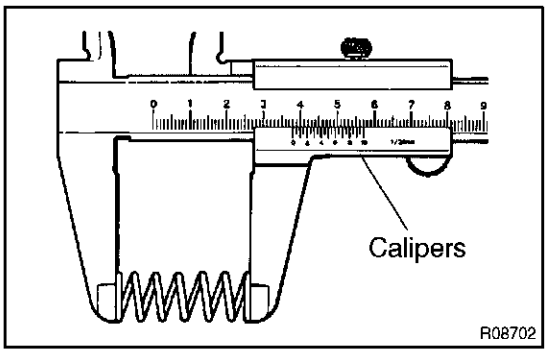


(b) Check the flow control valve for leakage. Close one of the holes and apply compressed air 392 – 490 kPa (4 – 5 kgf/cm^2, 57 – 71 psi) into the opposite side hole, and confirm that air does not come out from the end hole.



If necessary, replace the valve with the one having the same letter as inscribed on the front housing.

Inscribed mark: A, B, C, D, E or F

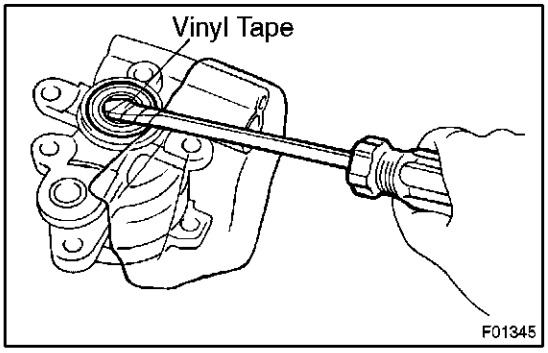


4. INSPECT SPRING

Using calipers, measure the free length of the spring.

Minimum free length: 36.0 mm (1.417 in.)

If it is not within the specification, replace the spring.

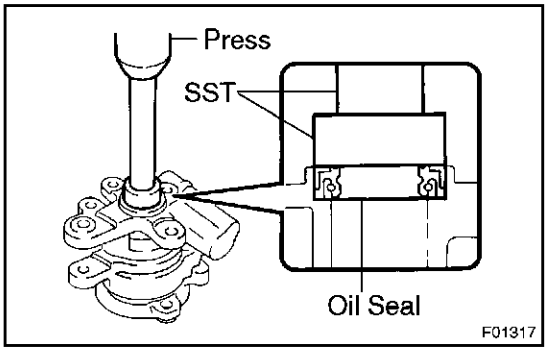


5. IF NECESSARY, REPLACE OIL SEAL

(a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal.

NOTICE:

Be careful not to damage the front housing.



(b) Coat a new oil seal lip with power steering fluid.

(c) Using SST and a press, press in the oil seal.

SST 09950–60010 (09951–00310),
09950–70010 (09951–07100)

NOTICE:

Make sure to install the oil seal facing the correct direction.

SR0IR–01

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT WITH POWER STEERING FLUID

(See page SR–26)

2. INSTALL LONGER STRAIGHT PIN

Using a plastic hammer, tap in a new pin to the front housing.

NOTICE:

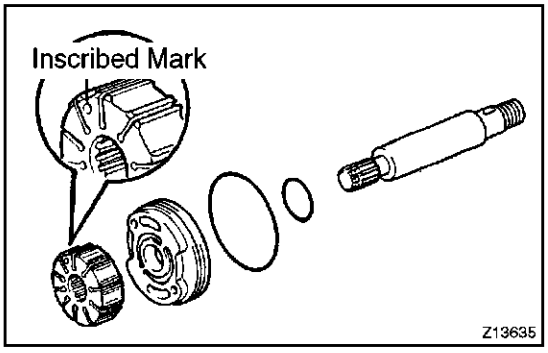
Be careful not to damage the pin.

3. INSTALL SHORTER STRAIGHT PIN

Install a new pin to the side front plate.

NOTICE:

Be careful not to damage the pin.



4. INSTALL SIDE FRONT PLATE AND VANE PUMP ROTOR

(a) Coat 2 new O–rings with power steering fluid and install them to the plate.

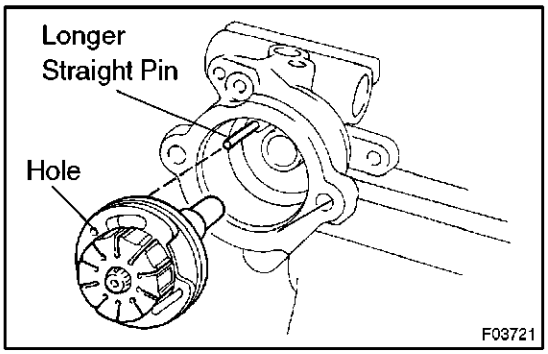
(b) Install the plate to the pump shaft.

NOTICE:

Make sure to install the plate facing the correct direction.

(c) Install the rotor to the pump shaft with the inscribed mark facing outward.

(d) Install a new snap ring to the vane pump shaft.

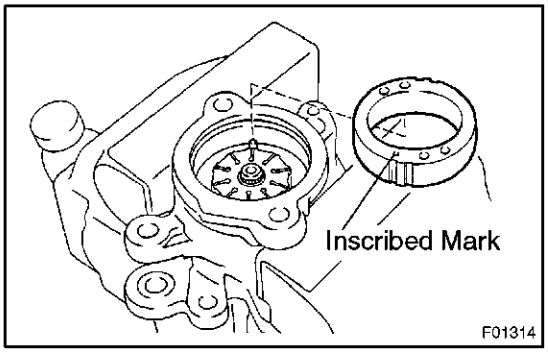


5. INSTALL VANE PUMP SHAFT WITH VANE PUMP ROTOR AND SIDE FRONT PLATE

Align the hole of the plate and longer straight pin, and tap in the shaft with a plastic hammer.

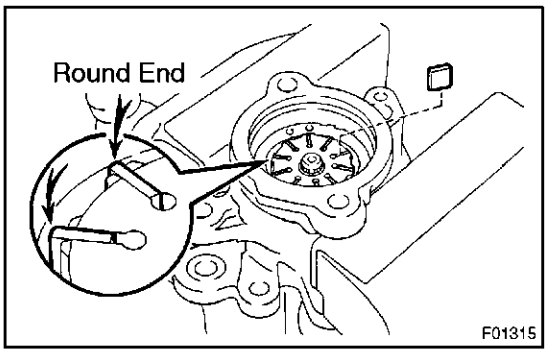
NOTICE:

Be careful not to damage the oil seal and O–rings.



6. INSTALL CAM RING

Align the holes of the cam ring and 2 straight pins and install the ring with the inscribed mark facing outward.



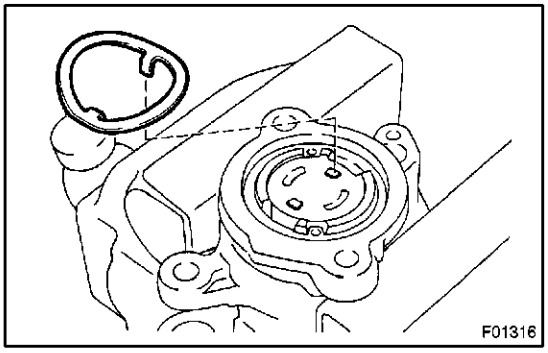
7. INSTALL VANE PLATES

Install the 10 plates with the round end facing outward.

8. INSTALL SIDE REAR PLATE

(a) Coat a new O–ring with power steering fluid and install it to the plate.

(b) Align the holes of the plate and 2 straight pins, and install the plate.

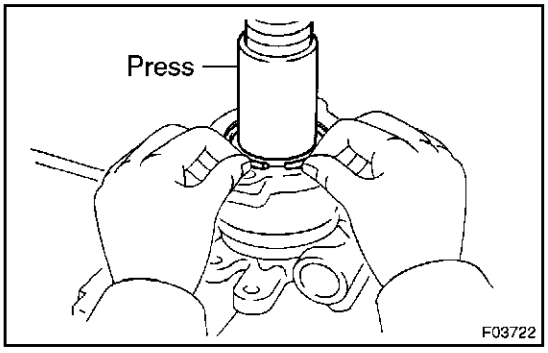


9. INSTALL WAVE WASHER

Install the washer so that its protrusions fit into the slots in the side rear plate.

10. INSTALL REAR HOUSING

(a) Coat a new O–ring with power steering fluid and install it to the housing.



(b) Install the housing and use a press to push down on the wave washer hard enough to compress it.

NOTICE:

- **Do not apply too much pressure.**
- **Be careful not to damage the O–ring.**

(c) Install a new snap ring.

11. INSTALL SPRING AND FLOW CONTROL VALVE

Install the valve facing the correct direction.

(See page SR–26)

12. INSTALL PRESSURE PORT UNION

(a) Coat a new O–ring with power steering fluid and install it to the union.

(b) Torque the union.

Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

13. INSTALL SUCTION PORT UNION

(a) Coat a new O–ring with power steering fluid and install it to the union.

(b) Torque the bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

14. MEASURE PS VANE PUMP ROTATING TORQUE

(See page SR–29)

SR0IS–01

INSTALLATION

1. INSTALL PULLEY COVER

Torque the bolt.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

2. INSTALL PS VANE PUMP ASSEMBLY

Torque the 3 bolts.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

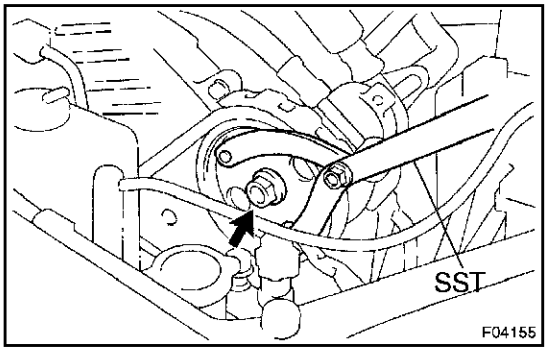
3. CONNECT PRESSURE FEED TUBE

Torque the union bolt with a new gasket.

Torque: 52 N·m (525 kgf·cm, 38 ft·lbf)

4. CONNECT RETURN HOSE

Connect the hose with the clip.



5. INSTALL VANE PUMP PULLEY

(a) Install the woodruff key to the vane pump shaft.

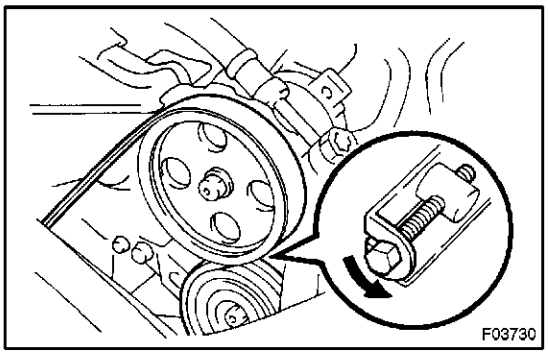
(b) Using SST to stop the pulley rotating, torque the nut.

SST 09960–10010 (09962–01000, 09963–01000)

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

6. INSTALL DRIVE BELT

(a) Install the drive belt to the pulley.



(b) Adjust drive belt tension with the belt tension adjusting bolt.

(See page SR–3)

(c) Torque the idler pulley set nut.

Torque: 38 N·m (390 kgf·cm, 28 ft·lbf)

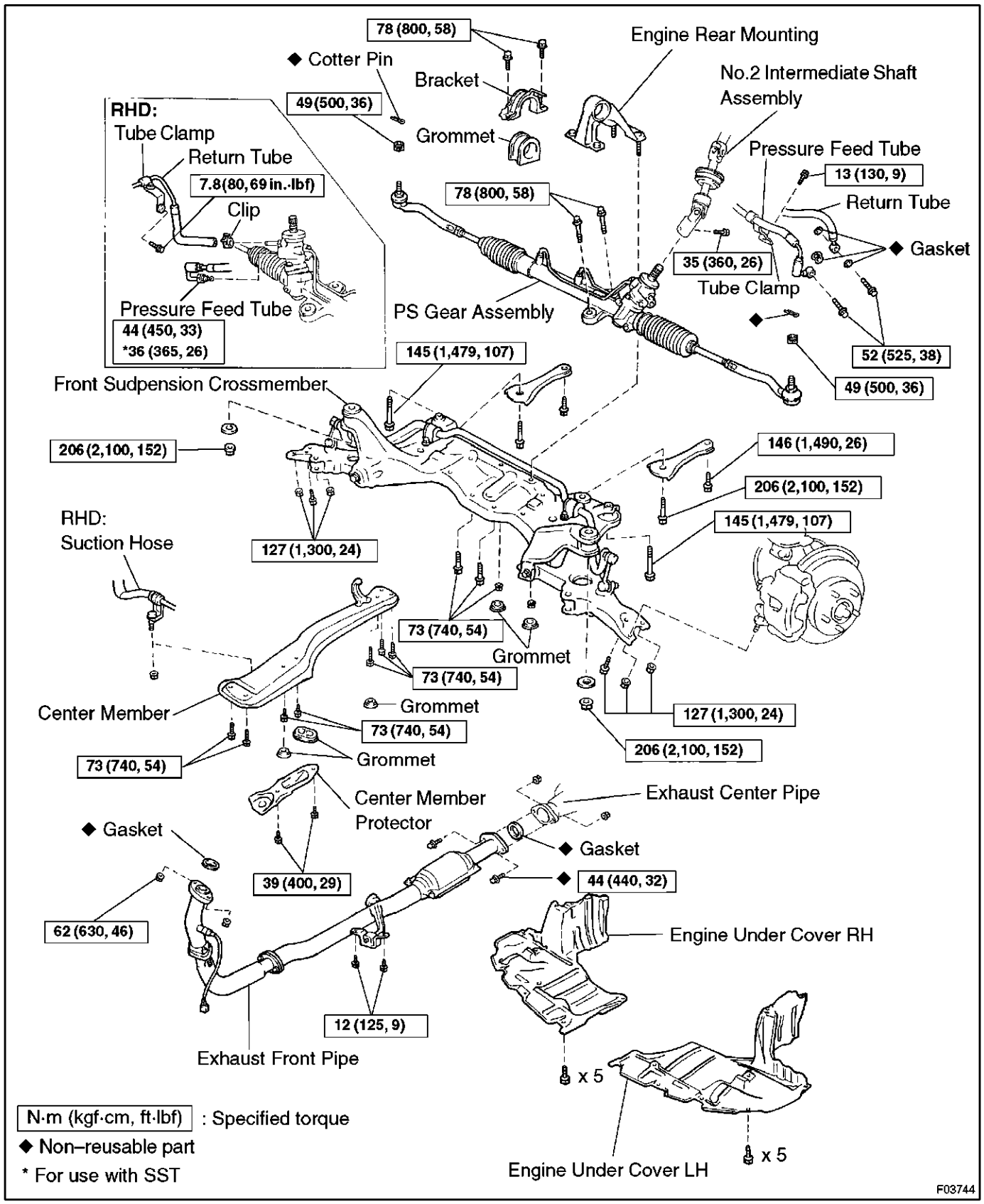
7. BLEED POWER STEERING SYSTEM

(See page SR–5)

POWER STEERING GEAR

COMPONENTS

SR01T–01

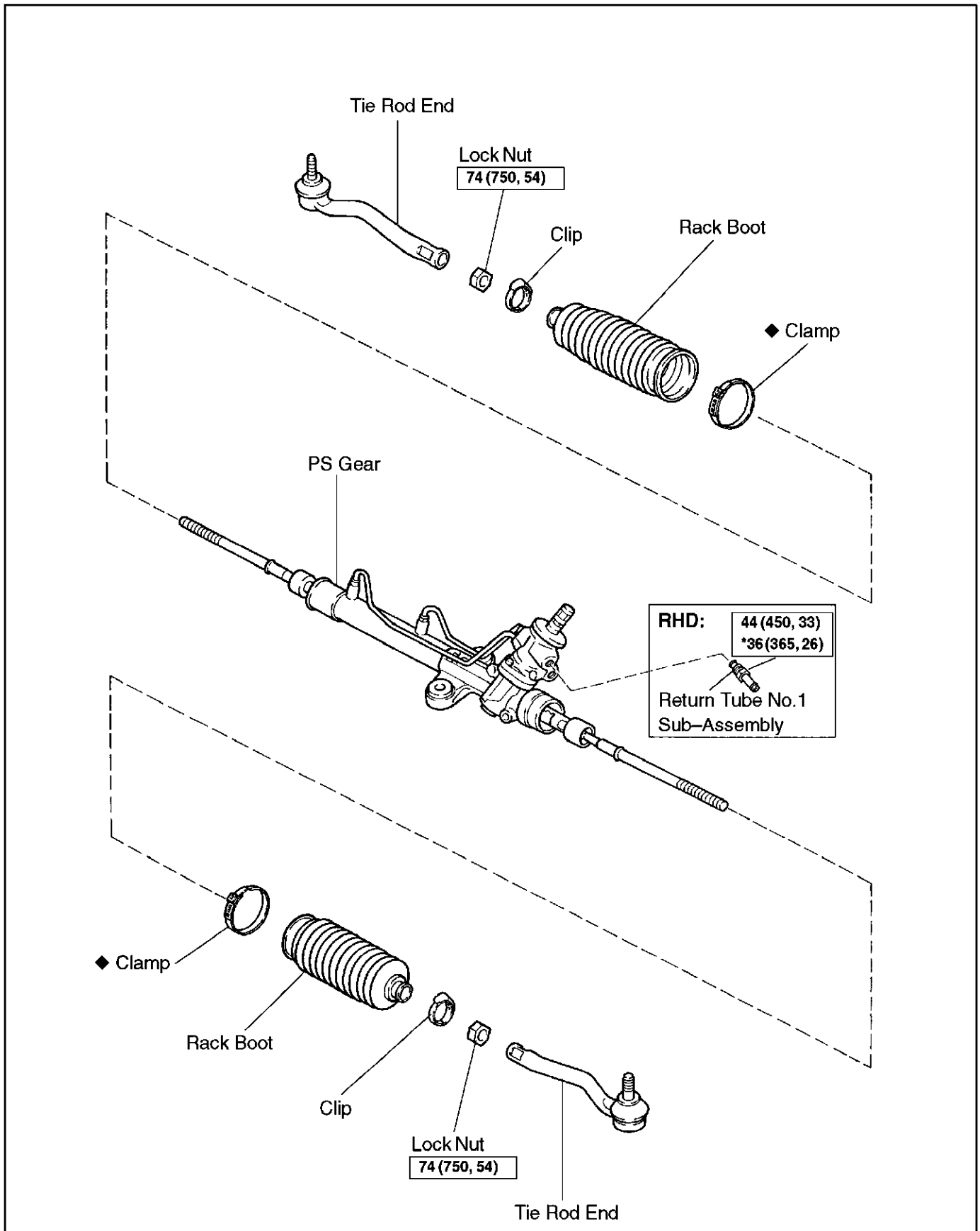


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

* For use with SST

F03744



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
* For use with SST

F03739

SR0IU–01

REMOVAL

1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

2. REMOVE STEERING WHEEL PAD
(See page SR–13)

3. REMOVE STEERING WHEEL
(See page SR–13)

4. REMOVE RH AND LH ENGINE UNDER COVERS

Remove 10 bolts.

5. DISCONNECT RH AND LH TIE ROD ENDS
(See page SA–11)

6. REMOVE EXHAUST FRONT PIPE

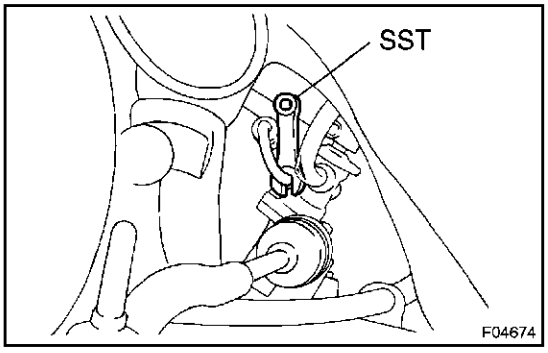
(a) Disconnect the oxygen sensor connector.

(b) Remove the 2 nut and gasket.

(c) Remove the 2 bolts with the exhaust front pipe support bracket.

(d) Remove the 2 bolts, 2 nuts, gasket and exhaust front pipe.

7. DISCONNECT YOKE
(See page SR–13)



8. LHD:
DISCONNECT PRESSURE FEED AND RETURN TUBES

(a) Pressure feed tube:
Remove the union bolt and gasket.

(b) Return tube:
Remove the union bolt and 2 gaskets.

9. RHD:
DISCONNECT PRESSURE FEED TUBE

Using SST, disconnect the tube.

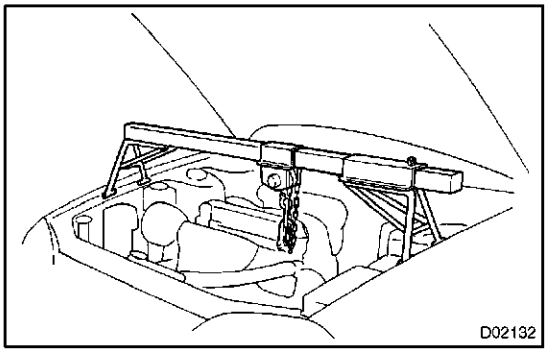
SST 09631–22020

10. RHD:
DISCONNECT RETURN TUBE

Remove the clip and disconnect the hose.

11. DISCONNECT TUBE CLAMP BRACKET

Remove the bolt.



12. SUPPORT ENGINE

Using an engine support fixture, support the engine.

13. DISCONNECT RH AND LH LOWER SUSPENSION ARM FROM LOWER BALL JOINT
(See page SA–38)

14. REMOVE CENTER MEMBER AND FRONT SUSPENSION CROSSMEMBER
(See page SA–38)

15. REMOVE PS GEAR ASSEMBLY

Remove 4 gear assembly set bolts and washers from the front suspension crossmember.

16. REMOVE BRACKET AND GROMMET

SR0IV–01

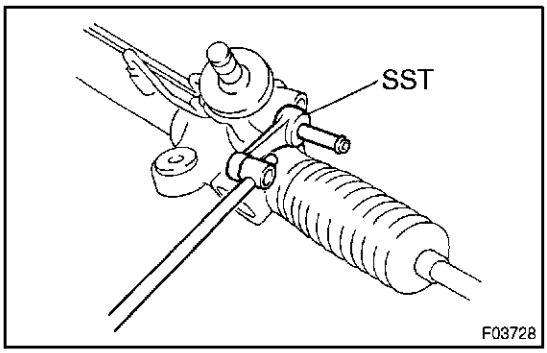
DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. RHD:

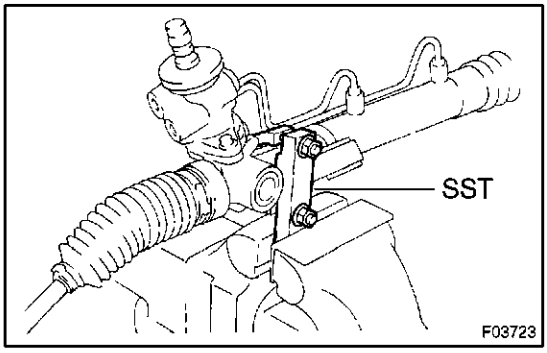
REMOVE RETURN TUBE NO.1 SUB–ASSEMBLY



Using SST, remove the tube.

SST 09631–22020

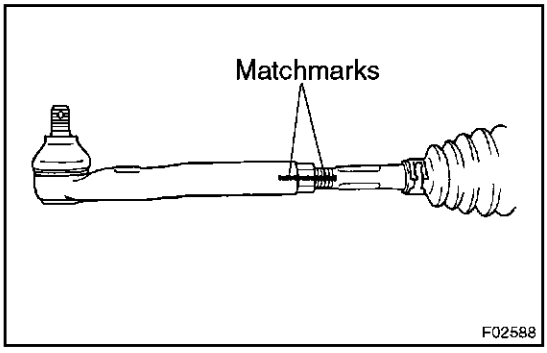
2. SECURE PS GEAR ASSEMBLY IN VISE



Using SST, secure the gear assembly in a vise, as shown in the illustration.

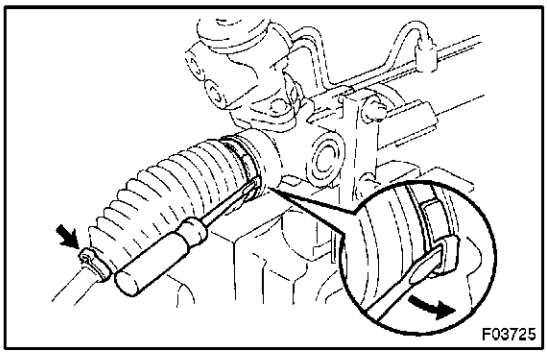
SST 09612–00012

3. REMOVE RH AND LH TIE ROD ENDS AND LOCK NUTS



Place matchmarks on the tie rod end and rack end.

4. REMOVE RH AND LH CLIPS, RACK BOOTS AND CLAMPS



Using a screwdriver, loosen the clamp, as shown in the illustration.

NOTICE:

- **Be careful not to damage the boot.**
- **Mark the RH and LH boots.**

SR0IW–01

REASSEMBLY

NOTICE:

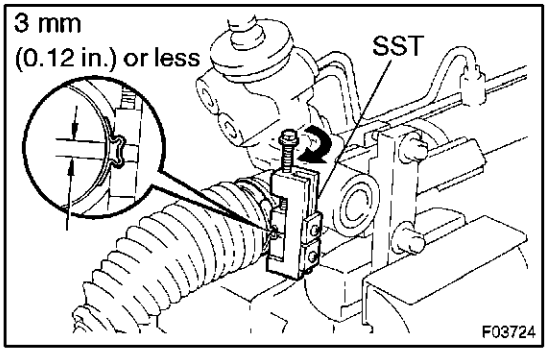
When using a vise, do not overtighten it.

1. INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS

(a) Install the boot.

NOTICE:

Be careful not to damage or twist the boot.



(b) Using SST tighten a new clamp, as shown in the illustration.

SST 09521–24010

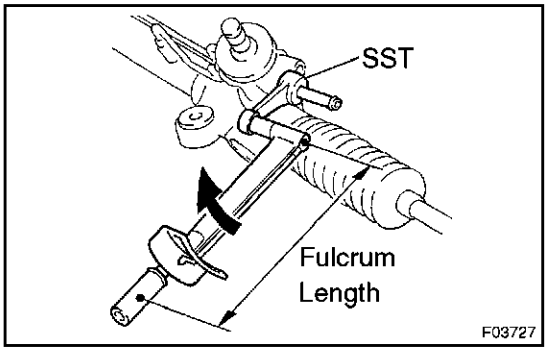
2. INSTALL RH AND LH TIE ROD ENDS AND LOCK NUTS

(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 SA–4)

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



3. RHD:

INSTALL RETURN TUBE NO.1 SUB–ASSEMBLY

(a) Using SST install the tube.

SST 09631–22020

Torque: 36 N·m (365 kgf·cm, 26 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

SR0IX–01

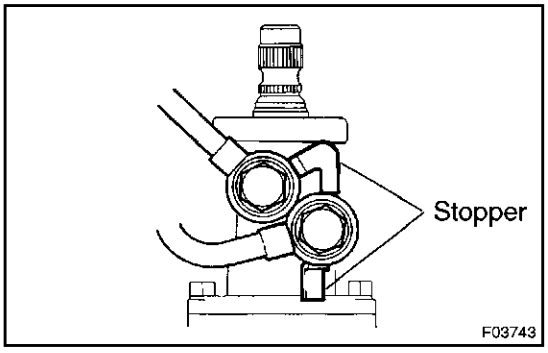
INSTALLATION

1. **INSTALL BRACKET AND GROMMET**
2. **INSTALL PS GEAR ASSEMBLY**

Torque the 4 gear assembly set bolts and washers to the front suspension cross member.

Torque: 78 N·m (800 kgf·cm, 58 ft·lbf)

3. **INSTALL CENTER MEMBER AND FRONT SUSPENSION CROSSMEMBER**
(See page SA–38)
4. **CONNECT RH AND LH LOWER SUSPENSION ARM TO LOWER BALL JOINT**
(See page SA–38)

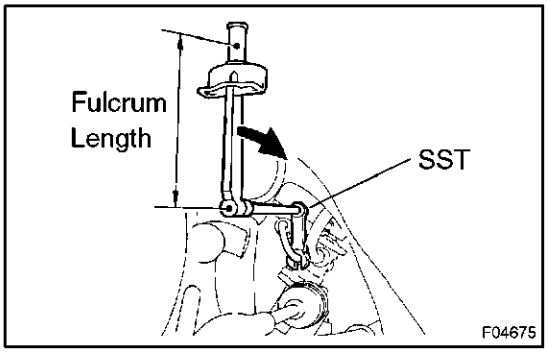


5. **LHD:**
CONNECT PRESSURE FEED AND RETURN TUBES

(a) Pressure feed tube:
Torque the union bolt with a new gasket.
Torque: 52 N·m (525 kgf·cm, 38 ft·lbf)

(b) Return tube:
Torque the union bolt with a new gasket on each side of the tube.
Torque: 52 N·m (525 kgf·cm, 38 ft·lbf)

HINT:
Make sure that the tube touches the stopper of the PS gear as shown in the illustration, then torque the union bolt.



6. **RHD:**
CONNECT PRESSURE FEED TUBE

Using SST, connect the tube.
SST 09631–22020
Torque: 36 N·m (365 kgf·cm, 26 ft·lbf)

HINT:
- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

7. RHD:
CONNECT RETURN TUBE

Connect the hose with the clip.

8. CONNECT TUBE CLAMP BRACKET

Torque the bolt.

LHD:
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)
RHD:
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

9. CONNECT YOKE
(See page SR–18)

10. INSTALL EXHAUST FRONT PIPE

(a) Install the 2 nuts with a new gasket.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

(b) Install the 2 bolts with the exhaust front pipe support bracket.
Torque: 12 N·m (125 kgf·cm, 9 ft·lbf)

(c) Install the 2 bolts, 2 new nuts with a new gasket.
Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

(d) Connect the oxygen sensor connector.

11. CONNECT RH AND LH TIE ROD ENDS
(See page SA–11)

12. INSTALL RH AND LH ENGINE UNDER COVERS

Tighten the 10 bolts.

13. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

14. CENTER SPIRAL CABLE
(See page SR–18)

15. INSTALL STEERING WHEEL

(a) Align the matchmarks on the wheel and steering column main shaft.

(b) Temporarily tighten the wheel set nut.

(c) Connect the connector.

16. BLEED POWER STEERING SYSTEM
(See page SR–5)

17. CHECK STEERING WHEEL CENTER POINT

18. TORQUE STEERING WHEEL SET NUT
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

19. INSTALL STEERING WHEEL PAD
(See page SR–18)

20. CHECK FRONT WHEEL ALIGNMENT
(See page SA–4)

SUPPLEMENTAL RESTRAINT SYSTEM

SRS AIRBAG RS–1
STEERING WHEEL PAD AND SPIRAL CABLE RS–13
FRONT PASSENGER AIRBAG ASSEMBLY RS–26
SIDE AIRBAG ASSEMBLY RS–37
AIRBAG SENSOR ASSEMBLY RS–50
FRONT AIRBAG SENSOR RS–55
SIDE AIRBAG SENSOR ASSEMBLY RS–60
WIRE HARNESS AND CONNECTOR RS–65

SRS AIRBAG

RS01Y–14

PRECAUTION

NOTICE:

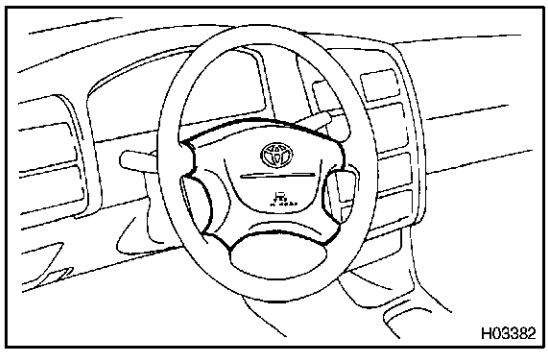
- The AVENSIS / CORONA is equipped with SRS, which comprises a driver airbag, front passenger airbag and side airbag. Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Further, if a mistake 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.
- 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 steering wheel pad, front passenger airbag assembly, side airbag assembly, airbag sensor assembly, front airbag sensor and side airbag sensor assembly should be inspected (See page RS–15, RS–28, RS–40 , RS–52, RS–57 and RS–62).
- Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.
- Never disassemble and repair the steering wheel pad, front passenger airbag assembly, side airbag assembly, airbag sensor assembly or side airbag sensor assembly in order to reuse it.
- If the steering wheel pad, front passenger airbag assembly, side airbag assembly, airbag sensor assembly, front airbag sensor or side airbag sensor assembly has been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace it with 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 DI–152).
- If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

CAUTION:

- 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.)
- 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.
- Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.
- Do not expose the steering wheel pad, front passenger airbag assembly, side airbag assembly, airbag sensor assembly, front airbag sensor or side airbag sensor assembly directly to hot air or flames.

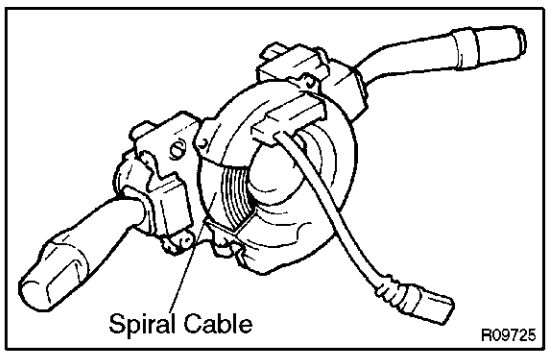
RS0AS–01

OPERATION



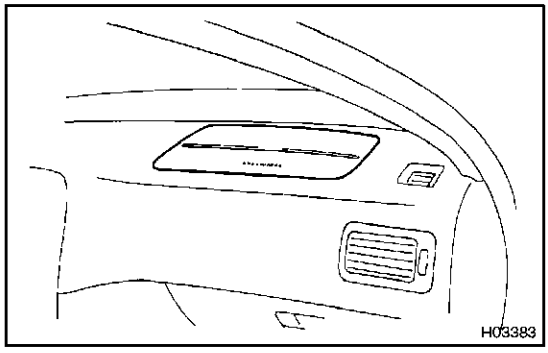
1. STEERING WHEEL PAD (with AIRBAG)

The inflater and bag of the SRS are stored in the steering wheel pad and cannot be disassembled. The inflater contains a squib, igniter charge and gas generant, etc., and inflates the bag when instructed by the airbag sensor assembly.



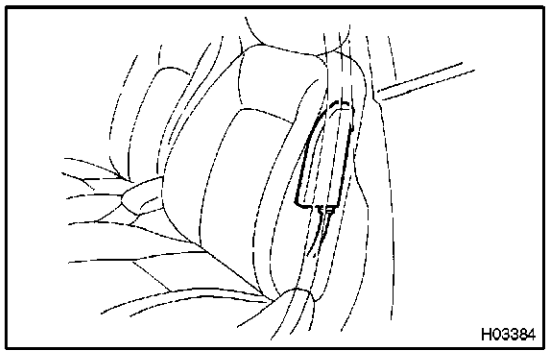
2. SPIRAL CABLE (in COMBINATION SWITCH)

A spiral cable is used as an electrical joint from the vehicle body side to the steering wheel.



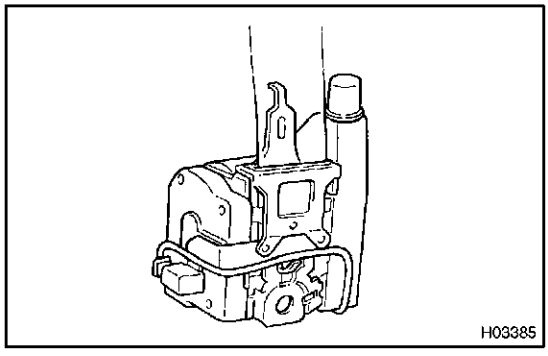
3. FRONT PASSENGER AIRBAG ASSEMBLY

The inflater and bag of the SRS are stored in the front passenger airbag assembly and cannot be disassembled. The inflater contains a squib, igniter charge, and gas generant, etc., and inflates the bag when instructed by the airbag sensor assembly.



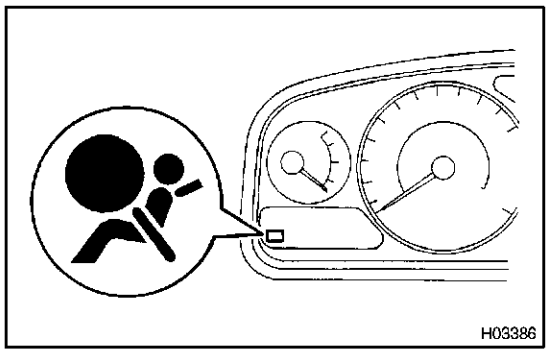
4. SIDE AIRBAG ASSEMBLY

The inflater and bag of the SRS side airbag are stored in the side airbag assembly and cannot be disassembled. The inflater contains a squib, igniter charge and gas generant, etc., and inflates the bag when instructed by the side airbag sensor assembly.



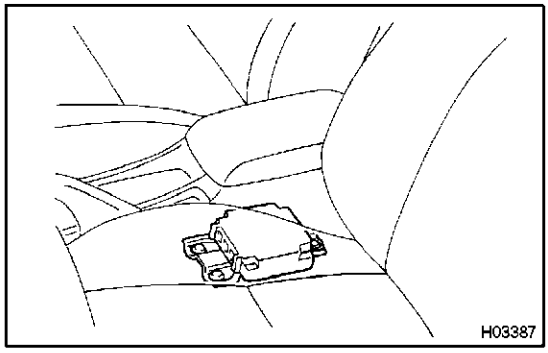
5. SEAT BELT PRETENSIONER

The seat belt pretensioner system is a component of the front seat outer belt. The pretensioner contains a squib, gas generant, wire, piston, etc., and operates in the event of a frontal collision.



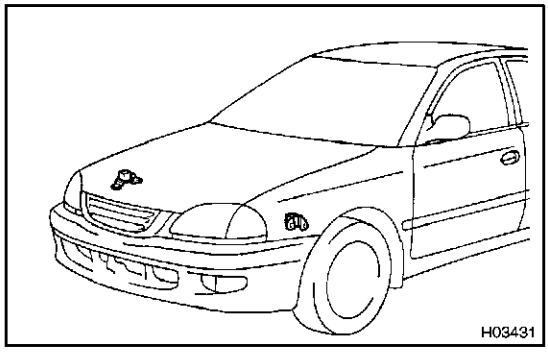
6. SRS WARNING LIGHT

The SRS warning light is located on the combination meter. It goes on to alert the driver of trouble in the system when a malfunction is detected in the airbag sensor assembly. In normal operation conditions when the ignition switch is turned to the ACC or ON position, the light goes on for about 6 seconds and then goes off.



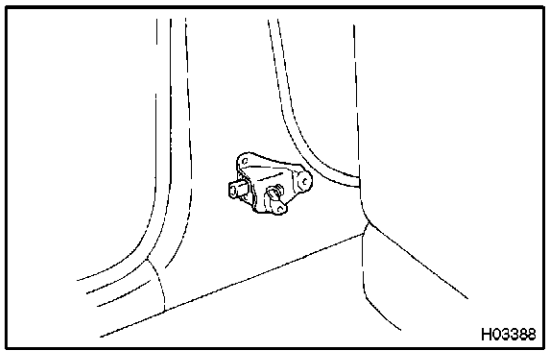
7. AIRBAG SENSOR ASSEMBLY

The airbag sensor assembly is mounted on the floor inside the lower center finish panel. The airbag sensor assembly consists of an airbag sensor, safing sensor, diagnosis circuit ignition control and drive circuit, etc. It receives signals from the airbag sensor, front airbag sensor and side airbag sensor and judges whether the SRS must be activated or not.



8. FRONT AIRBAG SENSOR

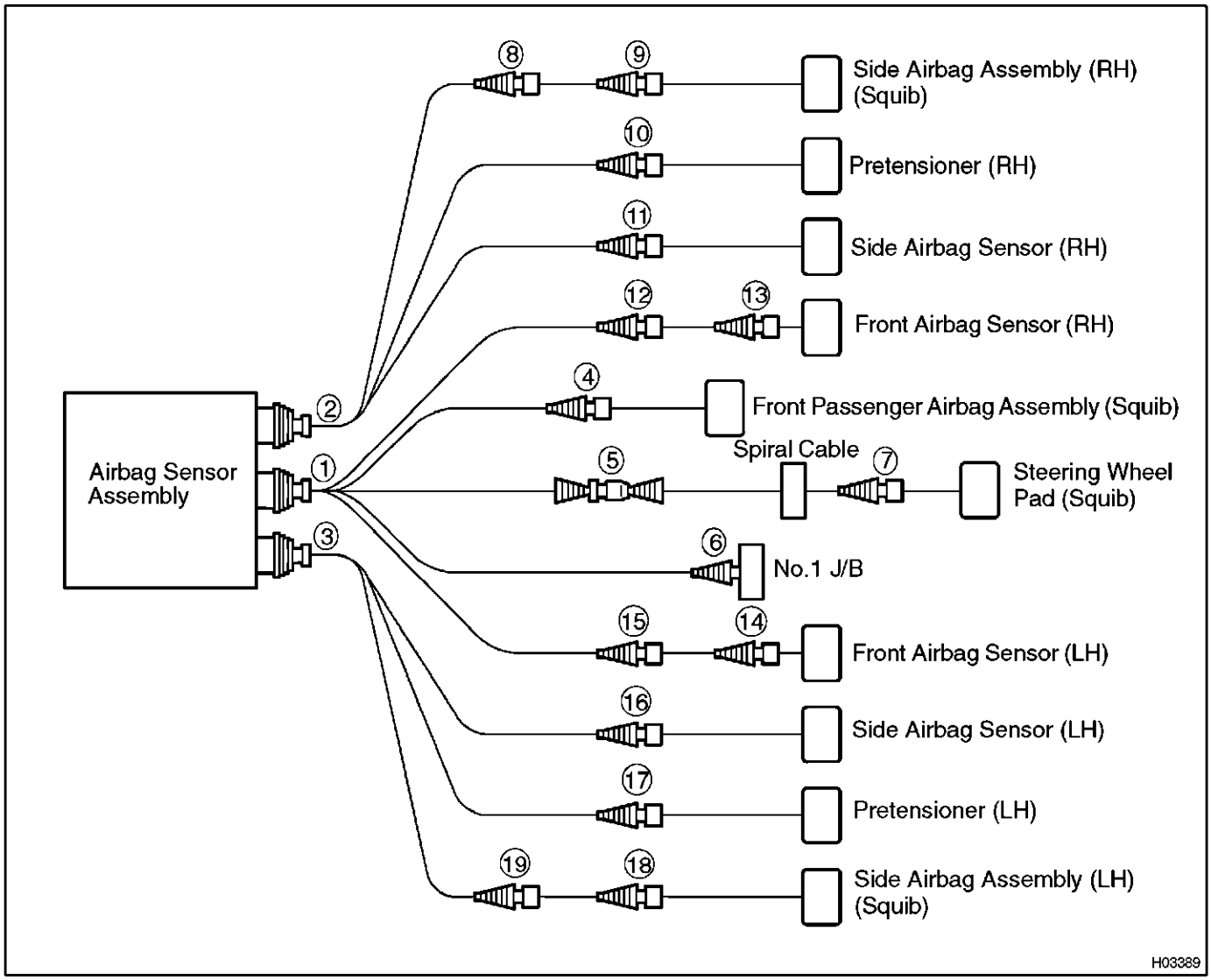
The front airbag sensor is mounted inside each of the side members. The sensor unit is a mechanical type. When the sensor detects deceleration force above a predetermined limit, contact is made in the sensor, sending a signal to the airbag sensor assembly. The sensor cannot be disassembled.



9. SIDE AIRBAG SENSOR ASSEMBLY

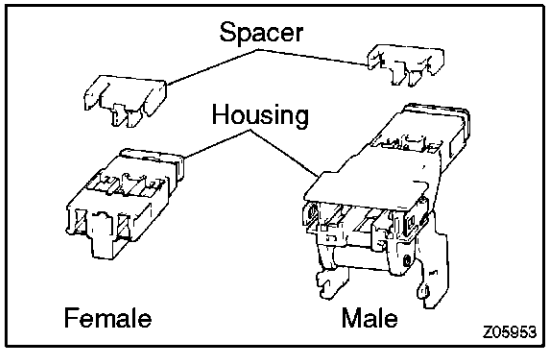
The side airbag sensor assembly is mounted in the LH and RH center pillars. The side airbag sensor assembly consists of a side airbag, sensor, safing sensor and diagnosis circuit, etc. It sends signals to the airbag sensor assembly to judges whether the SRS side airbag must be activated or not.

10. SRS CONNECTORS



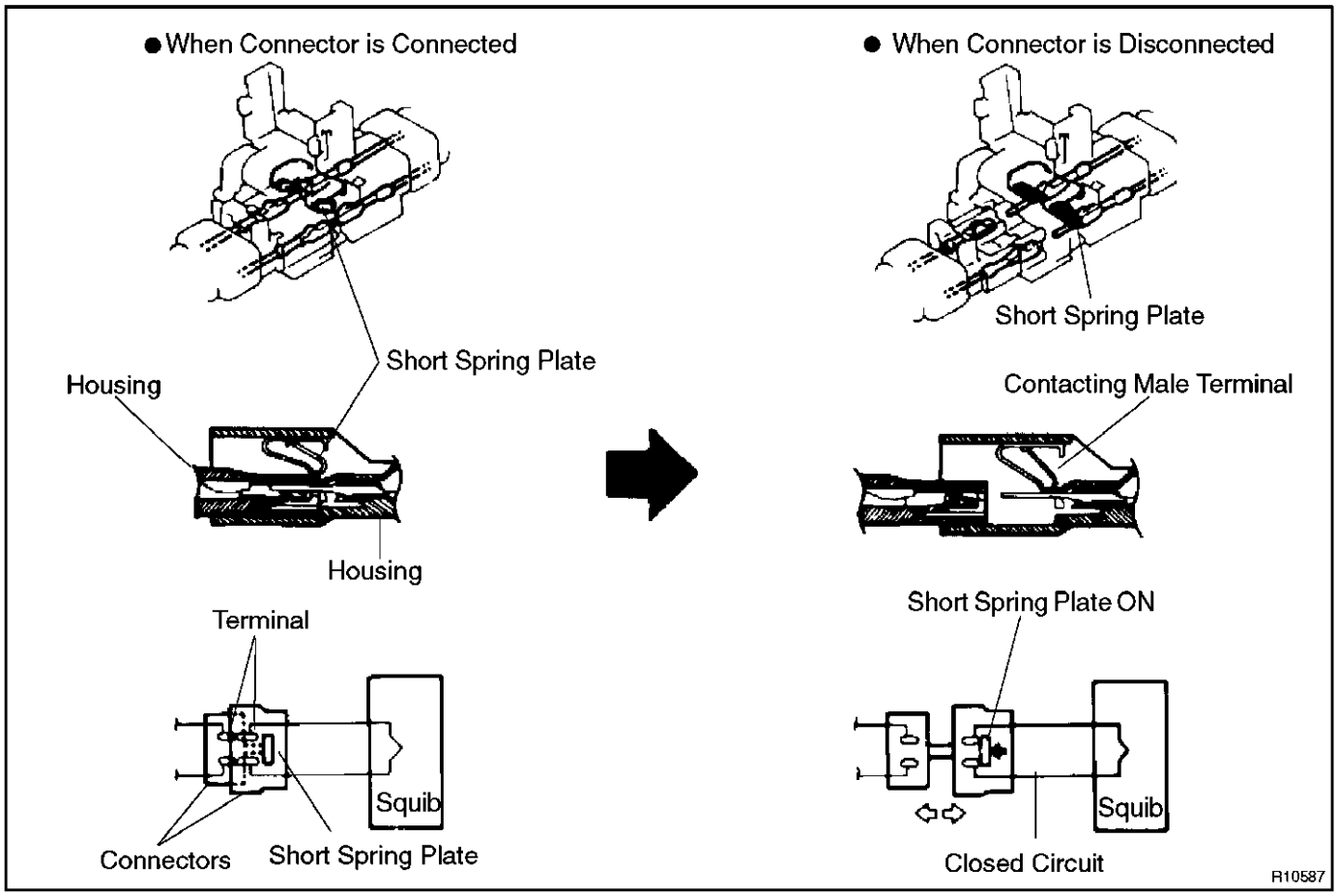
No.	Item	Application
(1)	Terminal Twin–Lock Mechanism	Connectors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
(2)	Airbag Activation Prevention Mechanism	Connectors 1, 2, 3, 4, 5, 7, 8, 9, 10, 17, 18, 19
(3)	Electrical Connection Check Mechanism	Connectors 1, 2, 3
(4)	Connector Twin–Lock Mechanism	Connectors 5, 6

(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.

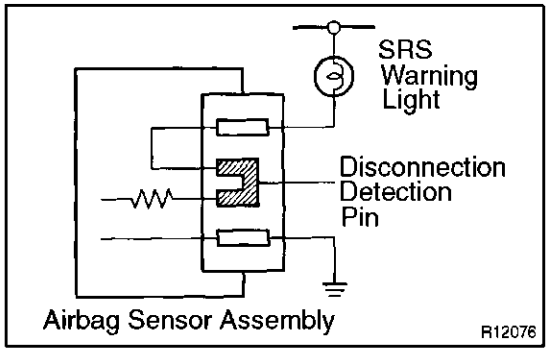


(1) Terminal Twin–Lock Mechanism
Each connector has a two–piece component consisting of a housing and a spacer. This design enables the terminal to be locked securely by two locking devices (the retainer and the lance) to prevent terminals from coming out.

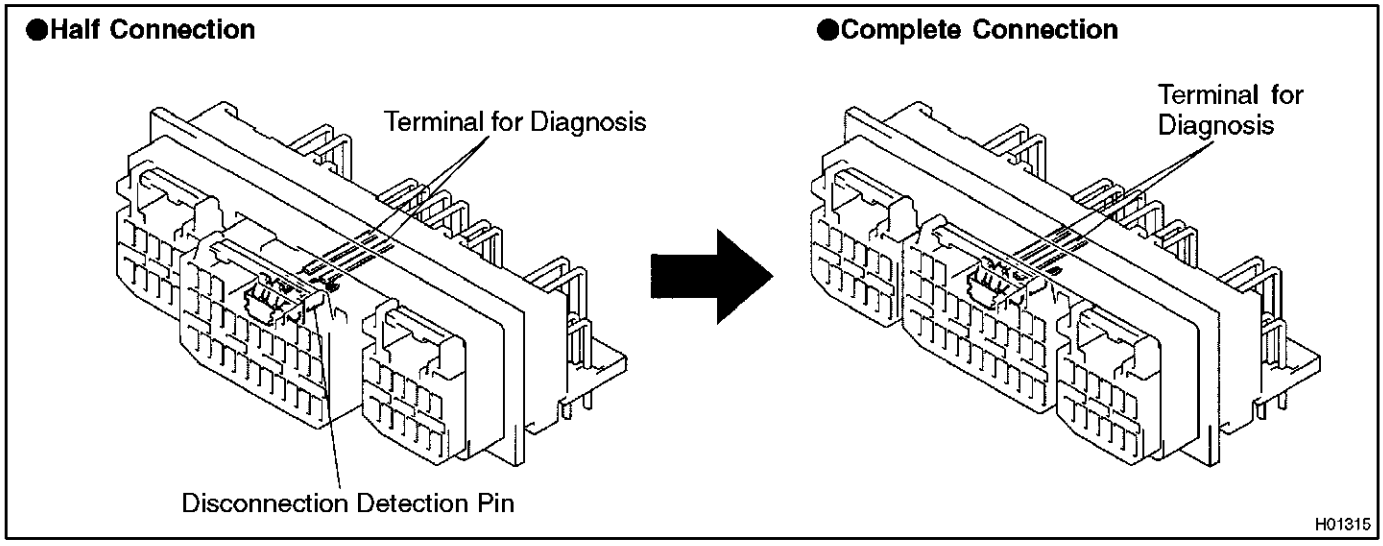
(2) Airbag Activation Prevention Mechanism
Each connector contains a short spring plate. When the connector is disconnected, the short spring plate automatically connects positive (+) terminal and negative (–) terminal of the squib.



HINT:
The type of connector is shown in the diagram on the previous page.

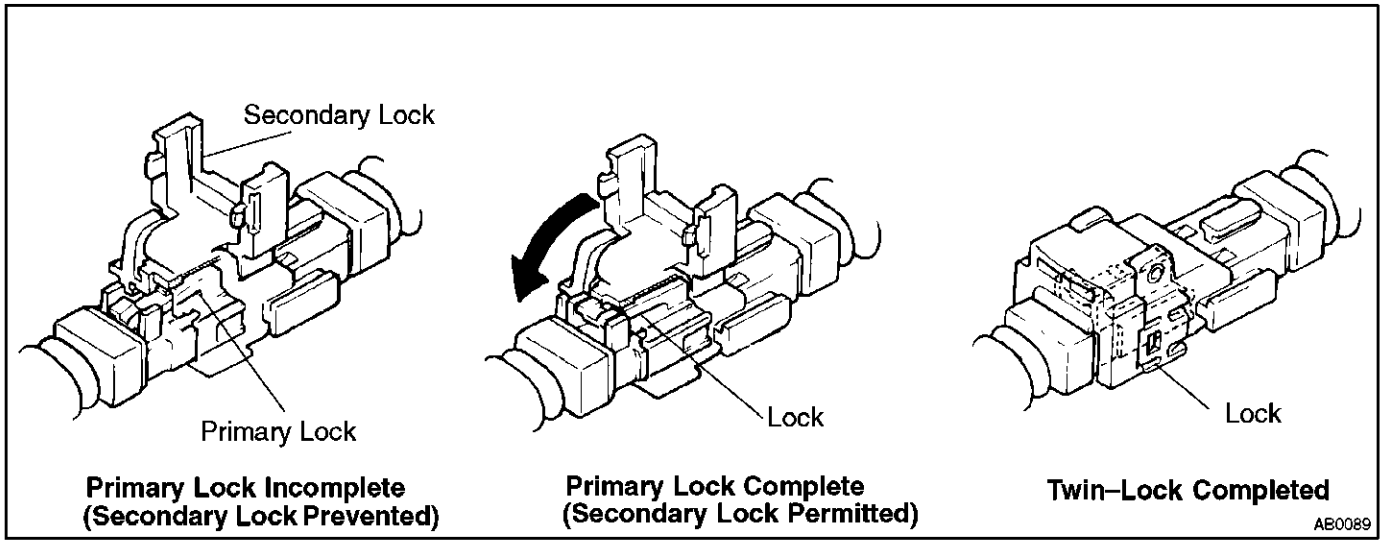


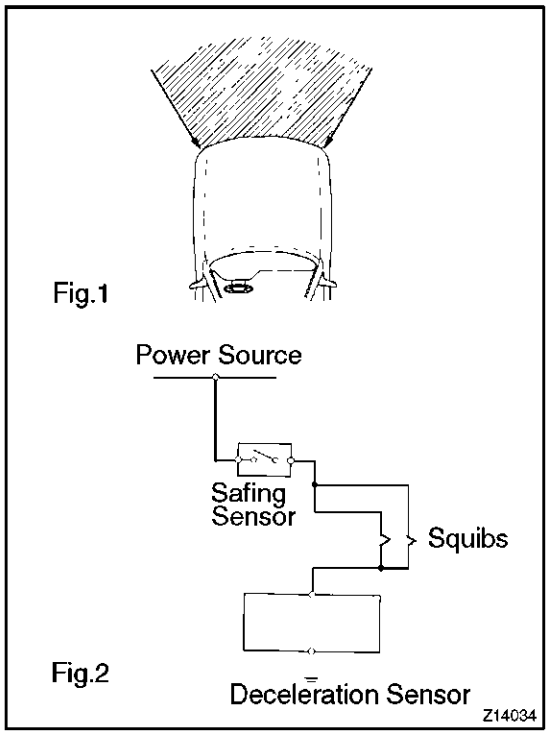
(3) Electrical Connection Check Mechanism
This mechanism electrically checks that connectors are connected correctly and completely. The electrical connection check mechanism is designed so that the disconnection detection pin connects with the diagnosis terminals when the connector housing lock is locked.



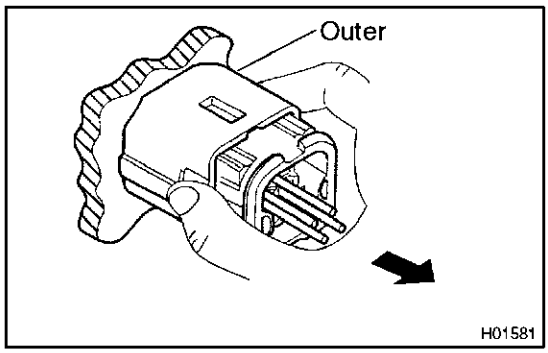
HINT:
The connectors shown in this illustration are connectors "1", "2" and "3" in step 10.

(4) Connector Twin–Lock Mechanism
With this mechanism connectors (male and female connectors) are locked by 2 locking devices to increase the connection reliability. If the primary lock is incomplete, ribs interfere and prevent the secondary lock.





(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 steering wheel pad and instrument panel door. Bag inflation then ends, and the bags deflate as the gas is discharged through discharge holes at the bag's rear or side.



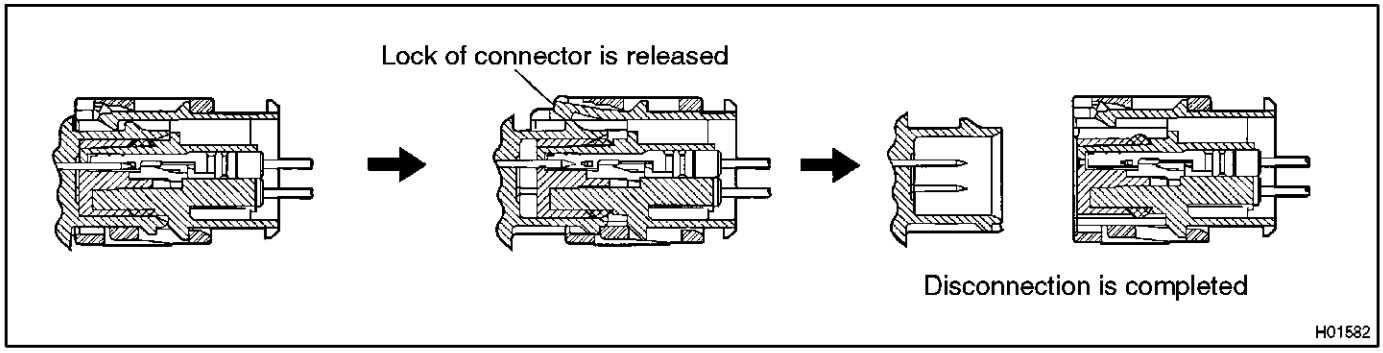
11. DISCONNECTION OF SIDE AIRBAG SENSOR CONNECTOR

(a) With 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:

Make sure to hold both flank sides of the outer. If holding the top and bottom sides, it will obstruct disconnection.



12. CONNECTION OF SIDE AIRBAG SENSOR CONNECTOR

(a) Align the male connector (of the side of sensor) and female connector in the same direction as shown in the illustration and fit in them without rubbing.

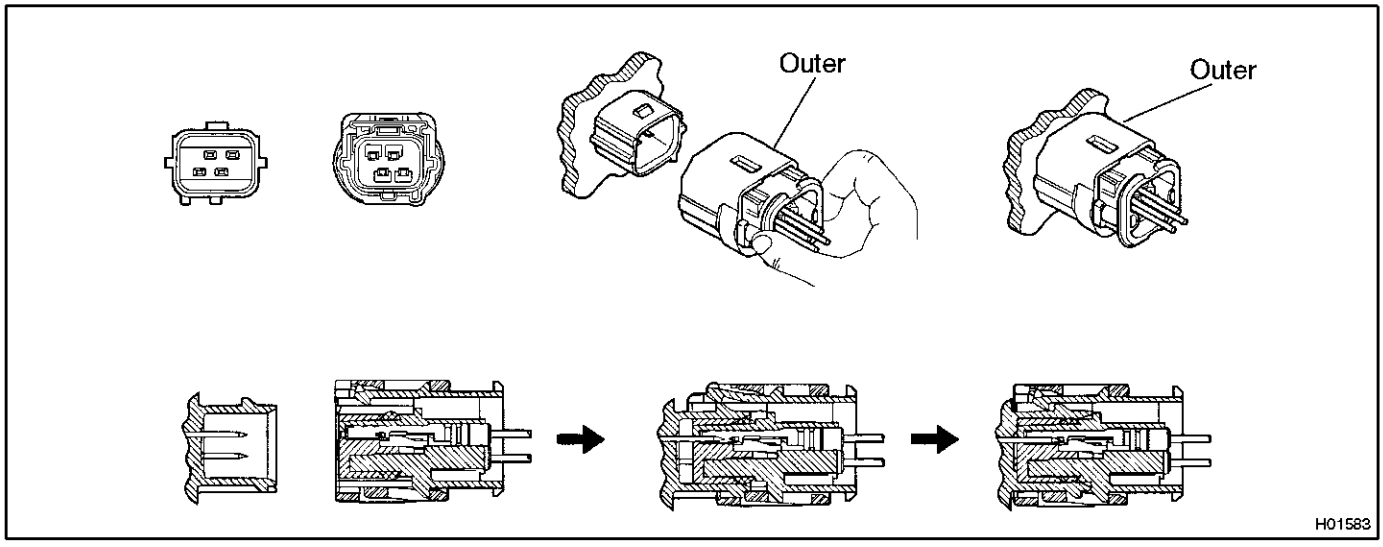
(b) As they are fitted in, the outer slides rearward. Press it until the outer returns to its original position again.

If fitting stops half way, connectors will separate.

(c) Make 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.)

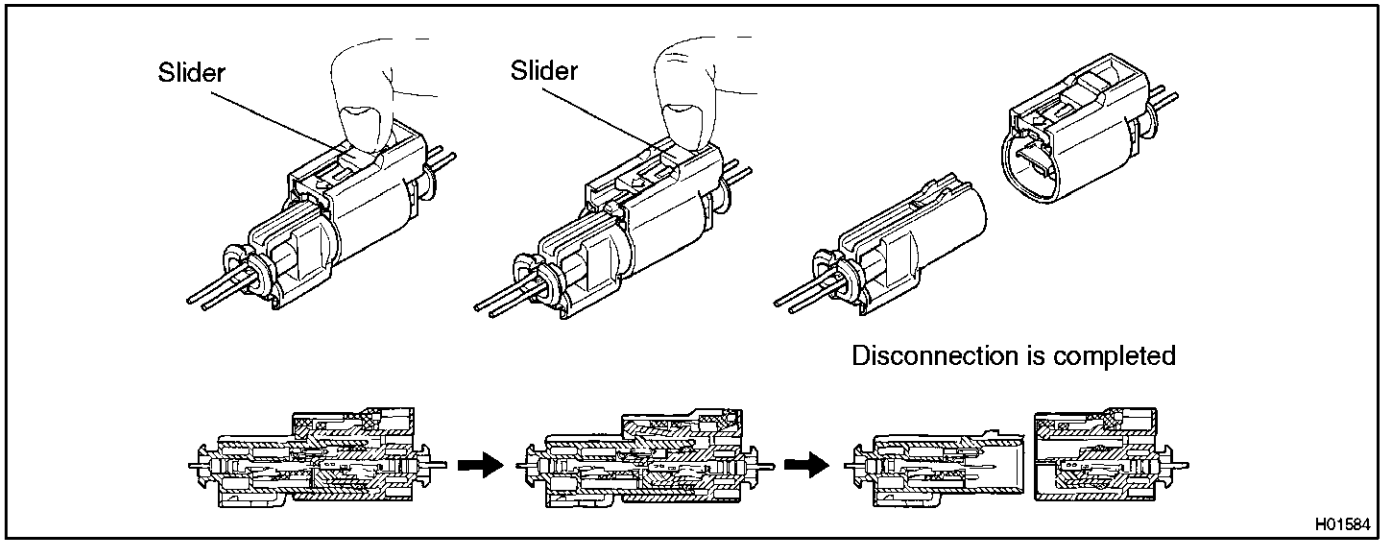
HINT:

- Do not fit in while holding the outer.
- When fitting in, the outer slides. Do not touch it.



13. DISCONNECTION OF SIDE AIRBAG CONNECTOR

(a) Place a finger on the slider.
(b) Slide the slider to release lock.
(c) Disconnect the connector.



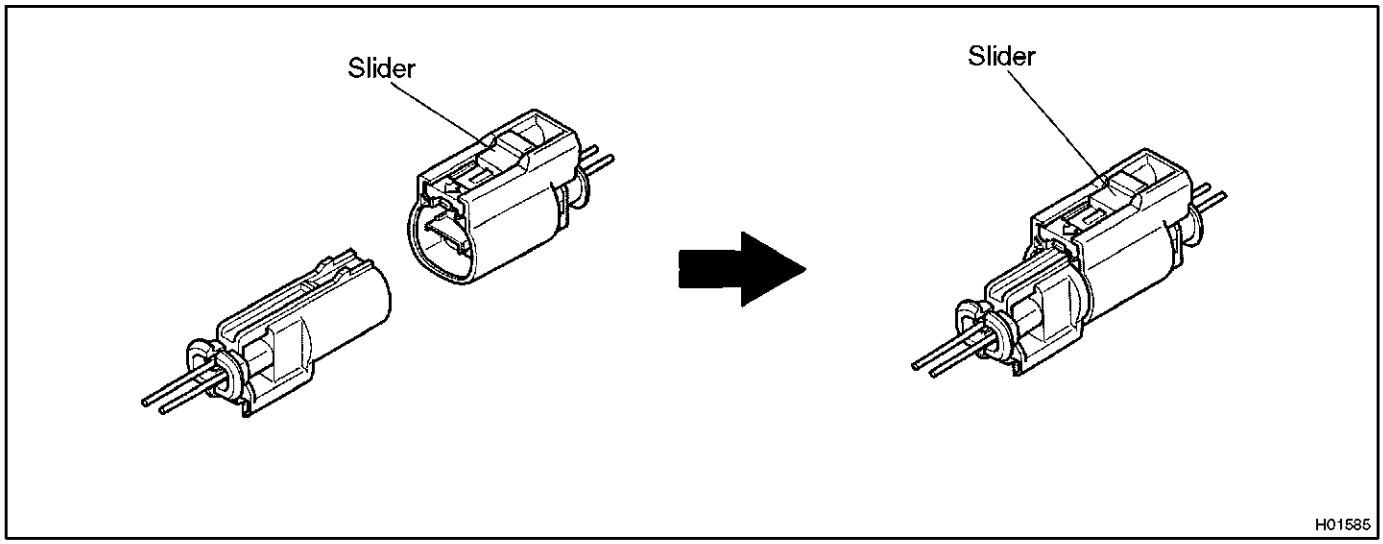
14. CONNECTION OF SIDE AIRBAG CONNECTOR

(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) Make 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.)

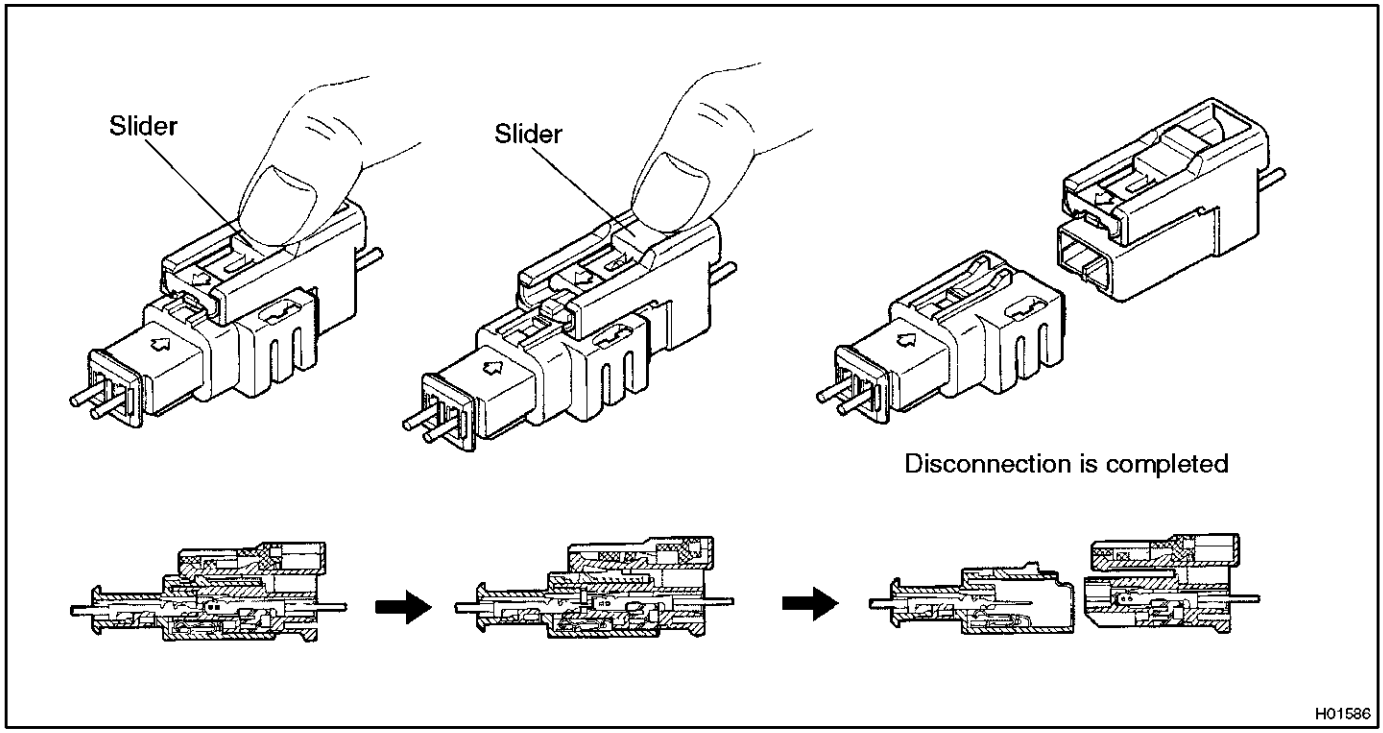
HINT:

- 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.



15. DISCONNECTION OF CONNECTORS FOR SEAT BELT PRETENSIONER

(a) Place a finger on the slider.
(b) Slide the slider to release lock.
(c) Disconnect the connector.



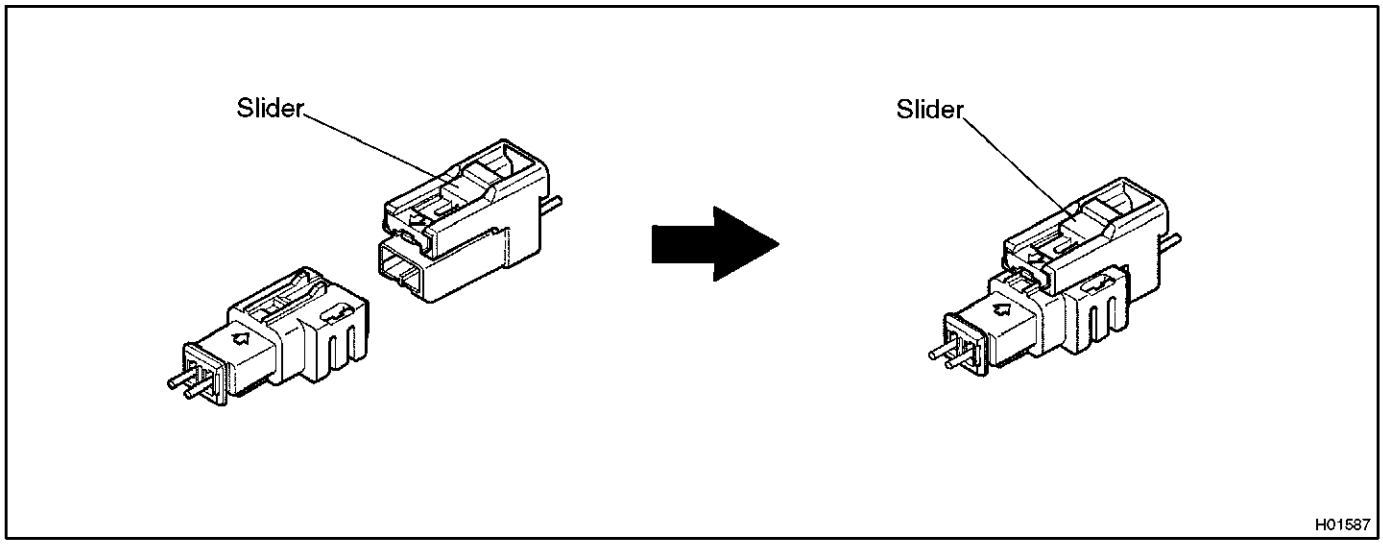
16. CONNECTION OF CONNECTORS FOR SEAT BELT PRETENSIONER

(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) Make 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:

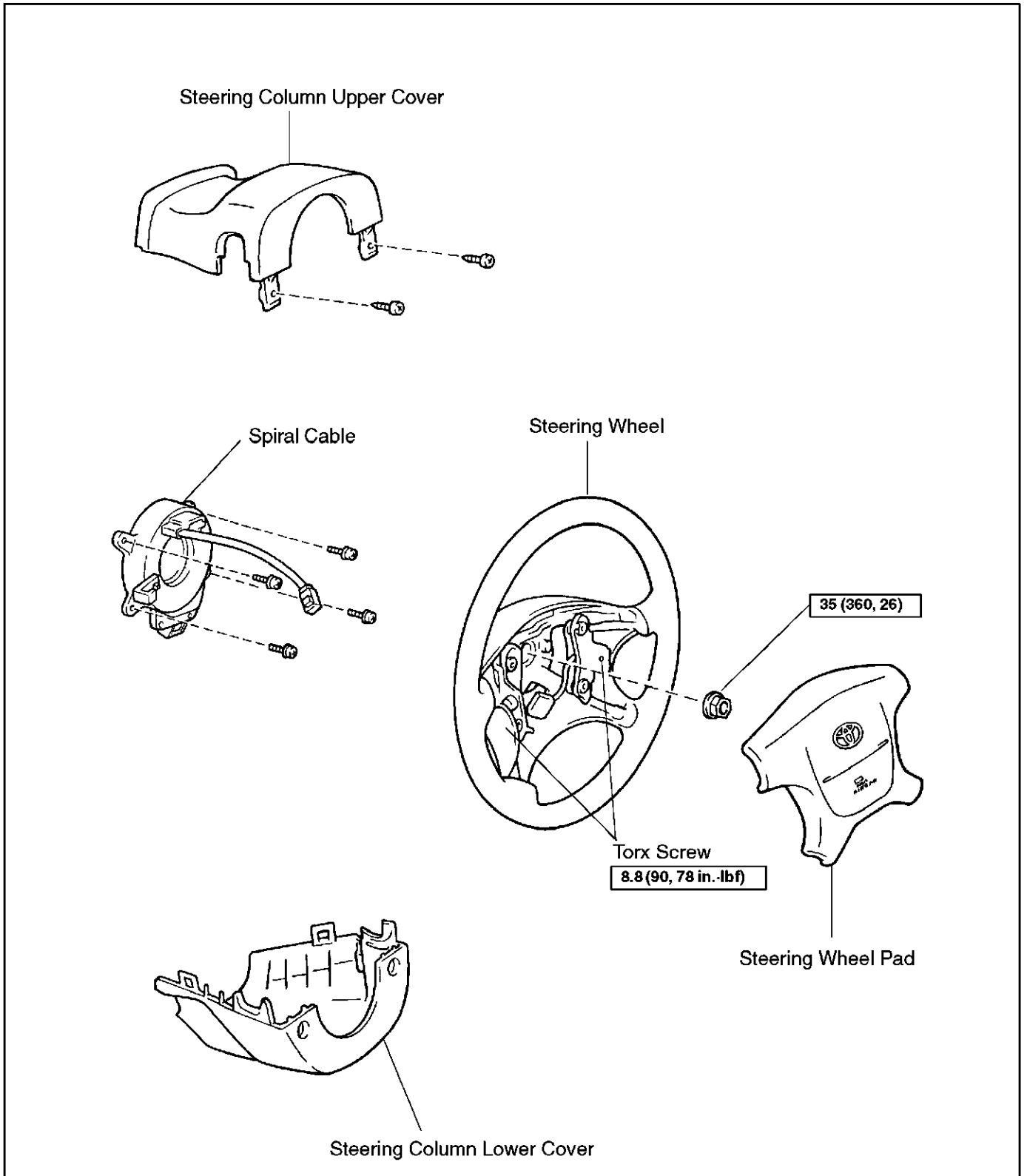
- As the slider slides, do not touch it.
- Be careful not to deform the release board. If the release board is deformed, replace it with a new one.



STEERING WHEEL PAD AND SPIRAL CABLE

COMPONENTS

RS00Y–11



N·m (kgf·cm, ft·lbf) : Specified torque

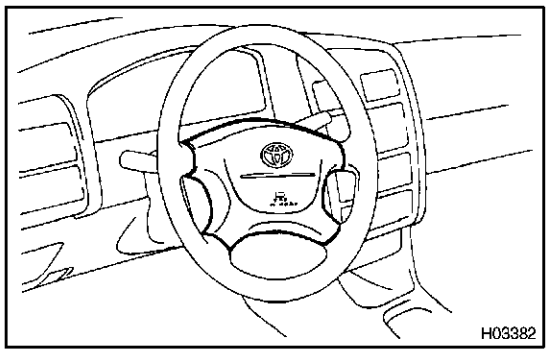
H03390

RS00Z–06

REMOVAL

(See page SR–13)

RS010–11

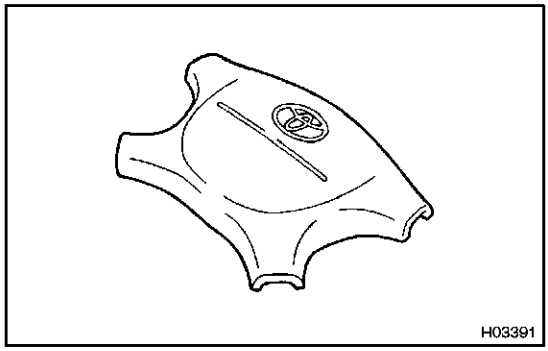


INSPECTION

1. VEHICLES NOT INVOLVED IN COLLISION

(a) Do a diagnostic system check.
(See page DI–152)

(b) Do a visual check which includes the following items with the steering wheel pad (with airbag) installed in the vehicle.
Check cuts, minute cracks or marked discoloration on the steering wheel pad top surface and in the grooved portion.

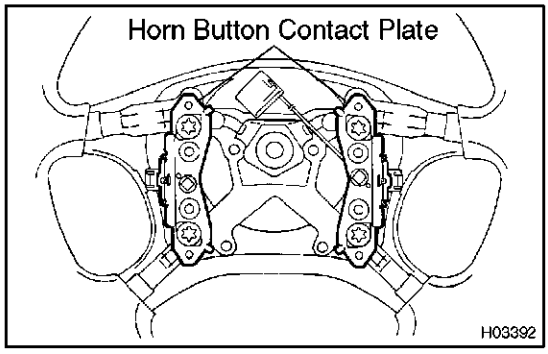


2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

(a) Do a diagnostic system check.
(See page DI–152)

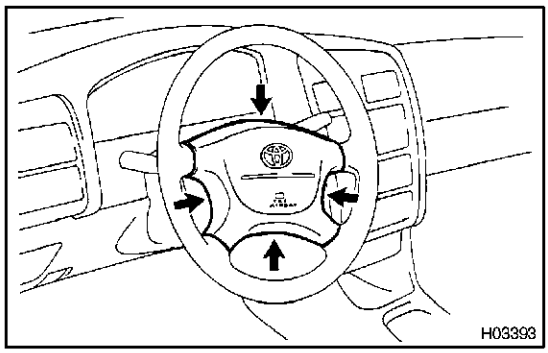
(b) Do a visual check which includes the following items with the steering wheel pad (with airbag) removed from the vehicle.

- Check cuts, minute cracks or marked discoloration on the steering wheel pad top surface and in the grooved portion.
- Check cuts and cracks in wire harnesses, and chipping in connectors.
- Check the deformation of the horn button contact plate of the steering wheel.



HINT:

- If the horn button contact plate of the steering wheel is deformed, never repair it. Always replace the steering wheel assembly with a new one.



- There should be no interference between the steering wheel pad and steering wheel, and the clearance should be uniform all the way around when the new steering wheel pad is installed on the steering wheel.

CAUTION:
For removal and installation of the steering wheel pad, see page SR–13 and SR–18, and be sure to follow the correct procedure.

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

(a) Do a diagnostic system check.
(See page DI–152)

(b) Do a visual check which includes the following items with the steering wheel pad (with airbag) removed from the vehicle.
- Check the deformation on the horn button contact plate of the steering wheel.
- Check the damage on the spiral cable connector and wire harness.

HINT:
- If the horn button contact plate of the steering wheel is deformed, never repair it. Always replace the steering wheel assembly with a new one.
- There should be no interference between the steering wheel pad and steering wheel, and the clearance should be uniform all the way around when the new steering wheel pad is installed on the steering wheel.

RS011–11

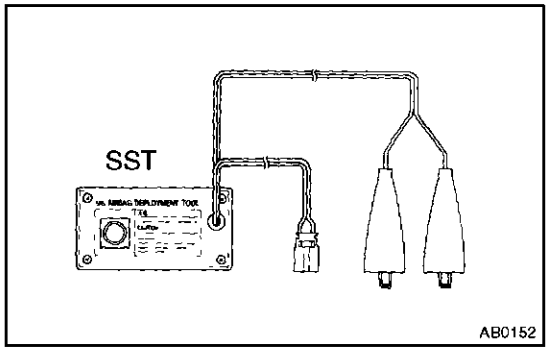
DISPOSAL

HINT:

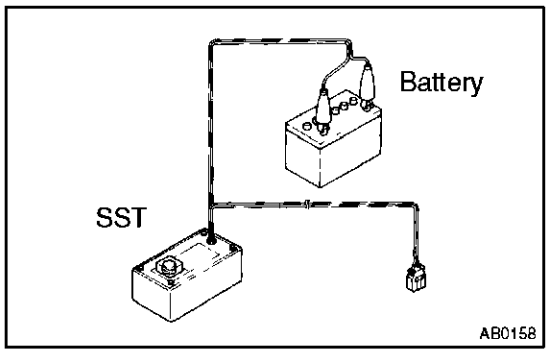
When scrapping vehicle equipped with an SRS or disposing of a steering wheel pad (with airbag), always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of the DISTRIBUTOR. When disposing of a steering wheel pad with an airbag deployed in a collision, follow the same procedure given in step 1–(d) in "DISPOSAL".

CAUTION:

- **Never dispose of a steering wheel pad 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.**

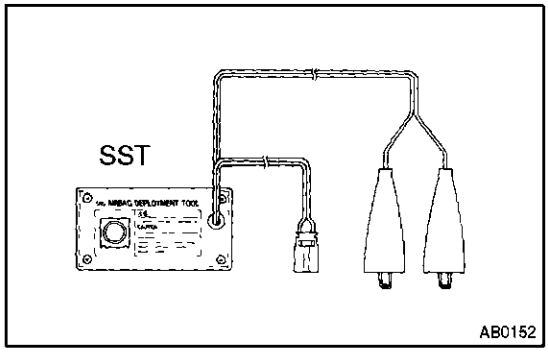


- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool). Perform the operation in a place away from electrical noise.**
  SST 09082–00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the steering wheel pad.**
- **The steering wheel pad 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 steering wheel pad with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a steering wheel pad with the deployed airbag.**



1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

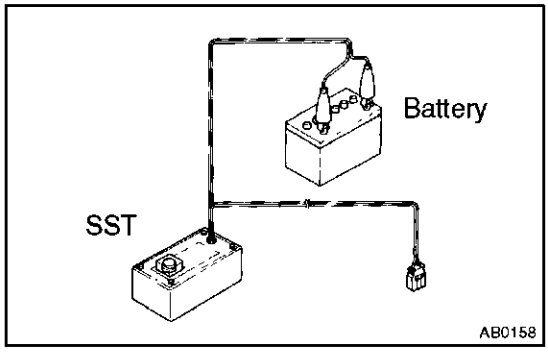
HINT:
Have a battery ready as the power source to deploy the airbag.



(a) Check functioning of the SST.

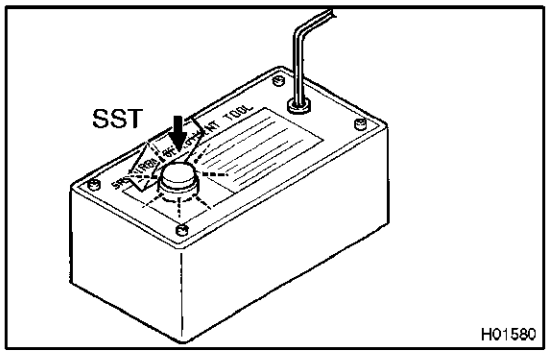
CAUTION:
When deploying the airbag, always use the specified SST: SRS Airbag Deployment Tool.

SST 09082–00700



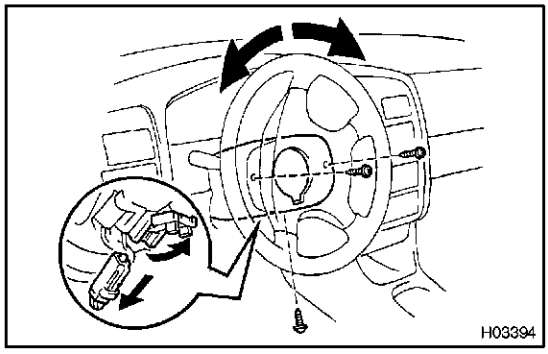
(1) Connect the SST to the battery.
Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the battery negative (–) terminal.

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.

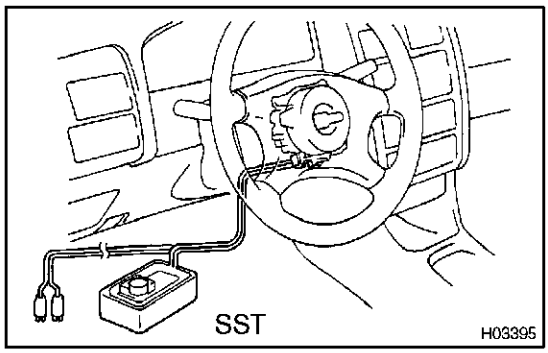
CAUTION:
If the LED lights up when the activation switch is not being pressed, SST malfunction is probable, so definitely do not use the SST.



(b) Install the SST.

CAUTION:
Check that there is no looseness in the steering wheel and steering wheel pad.

(1) Remove the under cover No.1.
(2) Disconnect the airbag connector of the spiral cable.

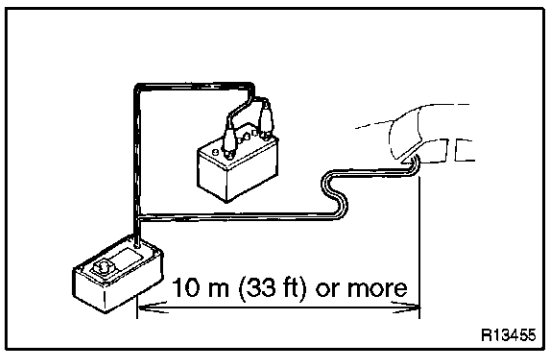


(3) Connect the SST connector to the airbag connector of the spiral cable.

SST 09082–00700

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock



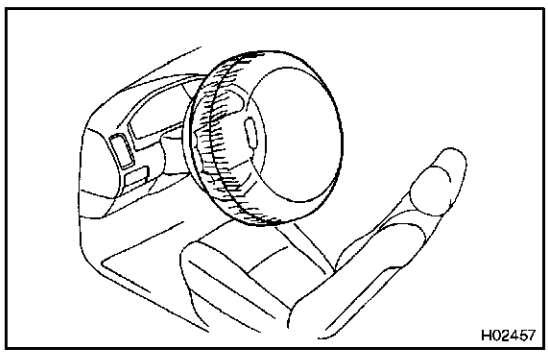
(4) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(5) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(6) Connect the SST red clip 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 of steering wheel pad (with airbag).

CAUTION:

- **The steering wheel pad 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 steering wheel pad with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a steering wheel pad with the deployed airbag.**

(1) When scrapping a vehicle, deploy the airbag and scrap the vehicle with the steering wheel pad still installed.

(2) When moving a vehicle for scrapping which has a steering wheel pad with deployed airbag, use gloves and safety glasses.

2. DEPLOYMENT WHEN DISPOSING OF STEERING WHEEL PAD ONLY

NOTICE:

- **When disposing of the steering wheel pad (with airbag) only, never use the customers vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

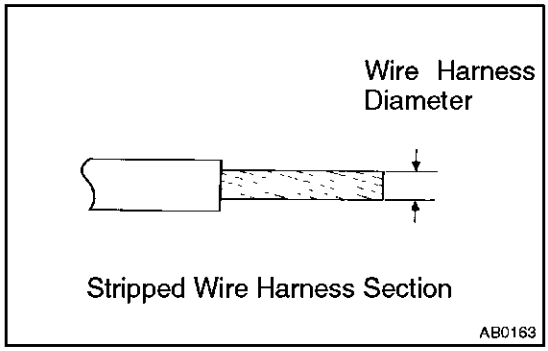
HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Remove the steering wheel pad.
(See page SR–13)

CAUTION:

When storing the steering wheel pad, keep the upper surface of the pad facing upward.



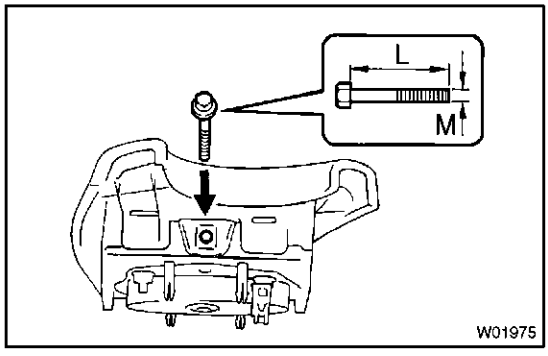
(b) Using a service–purpose wire harness, tie down the steering wheel pad to the disc wheel.
Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2. or more).

HINT:

To calculate the square of the stripped wire harness section:
Square = 3.14 x (Diameter)^2 divided by 4

CAUTION:

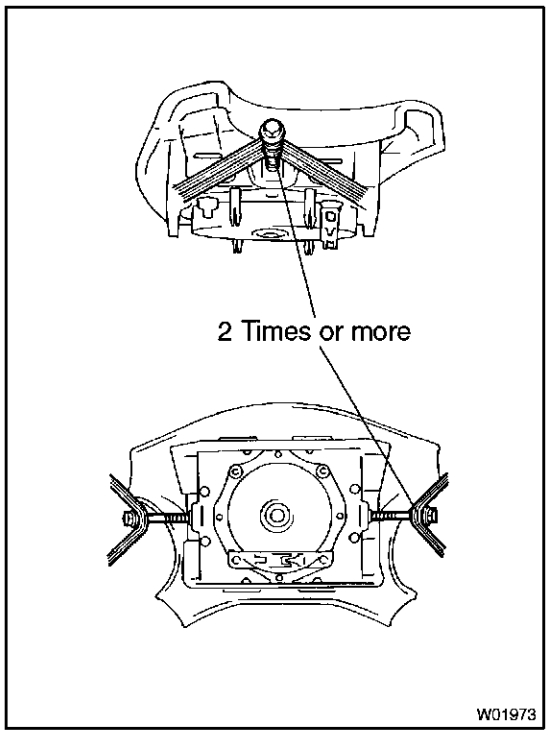
If a wire harness which is too thin or some other thing is used to tie down the steering wheel pad, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2).



(1) Install the 2 bolts with washers in the 2 bolt holes on the steering wheel pad.
Bolt:
L: 35. mm (1.387 in.)
M: 6.0 mm (0.236 in.)
Pitch: 1.0 mm (0.039 in.)

NOTICE:

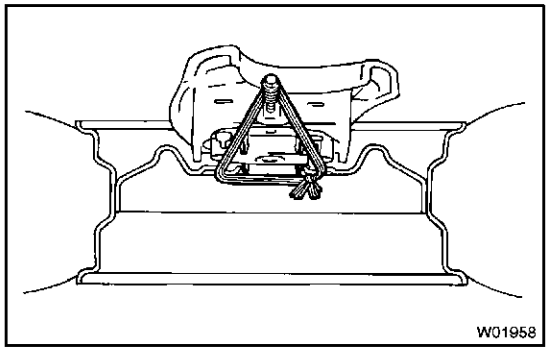
- **Tighten the bolts by hand until the bolts become difficult to turn.**
- **Do not tighten the bolts too much.**



(2) Using 3 wire harnesses, wind the wire harness at least 2 times each around the bolts installed on the left and right sides of the steering wheel pad.

CAUTION:

- **Tightly wind the wire harness around the bolts so that there is no slack.**
- **If there is slackness in the wire harness, the steering wheel pad may come loose due to the shock when the airbag is deployed. This is highly dangerous.**



(3) Face the upper surface of the steering wheel pad upward. Separately tie the left and right sides of the steering wheel pad to the disc wheel through the hub nut holes. Position the steering wheel pad connector so that it hangs downward through a hub hole in the disc wheel.

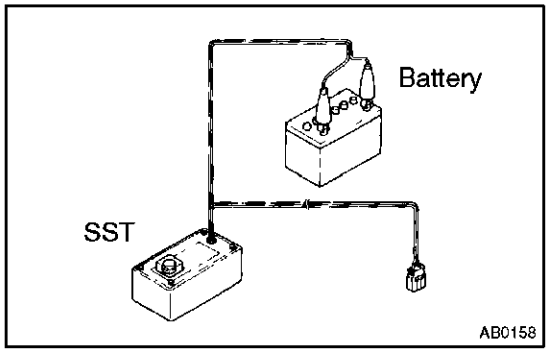
CAUTION:

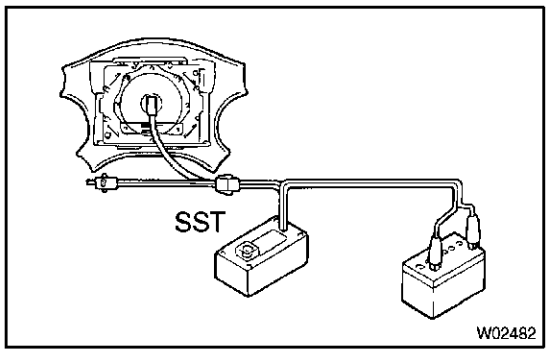
- **Make sure that the wire harness is tight. It is very dangerous when looseness in the wire harness results in the steering wheel pad coming free through the shock from the airbag deploying.**
- **Always tie down the steering wheel pad with the pad side facing upward. It is very dangerous if the steering wheel pad 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 steering wheel pad 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.
SST 09082–00700





(d) Install the SST.

CAUTION:

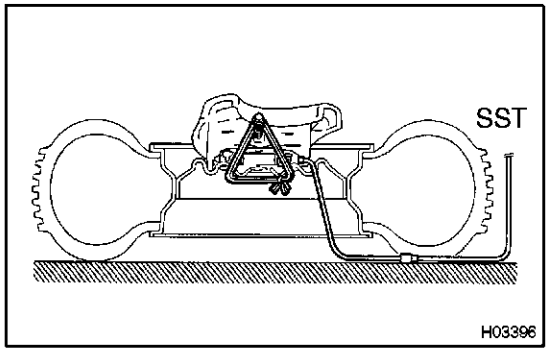
Place the disc wheel on the level ground.

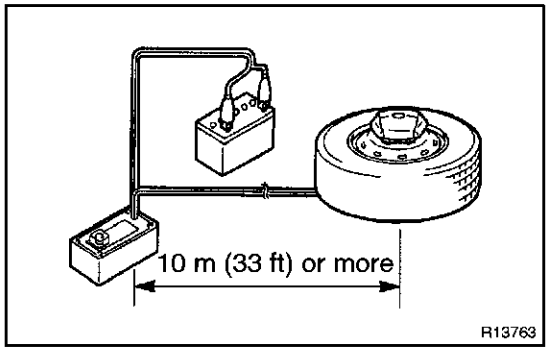
(1) Connect the connector of 2 SST to the steering wheel pad connector.

SST 09082–00700, 09082–00720

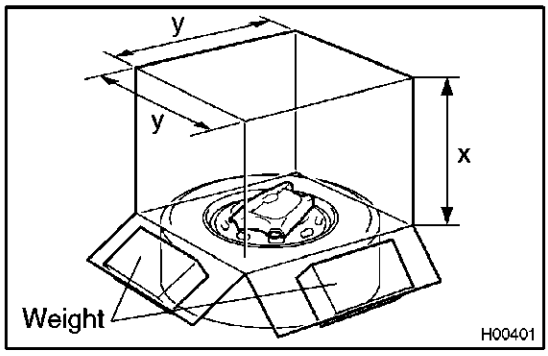
NOTICE:

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.





(2) Move the SST to at least 10 m (33 ft) away from the steering wheel pad tied down on the disc wheel.



(e) Cover the steering wheel pad with cardboard box or tires.

- Covering method using cardboard box:
  Cover the steering wheel pad 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.)

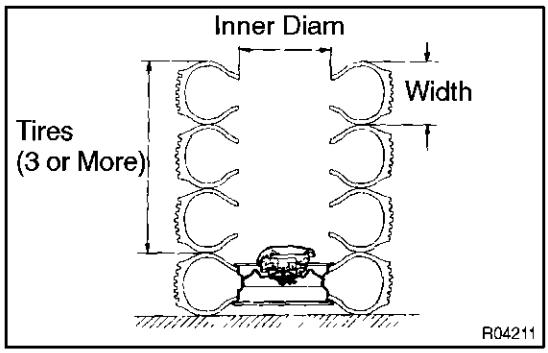
When dimension of the cardboard box exceeds the diameter of the disc wheel with tire to which the steering wheel pad is tied

x=460 mm (18.11 in.) + width of tire

y= 650 mm (25.59 in.)

NOTICE:

If a cardboard box smaller than the specified size is used, the cardboard box will be broken by the shock from the airbag deployment.



- Covering method using tires:
  Place at least 3 tires without disc wheel on top of the disc wheel with tire to which the steering wheel pad is tied.

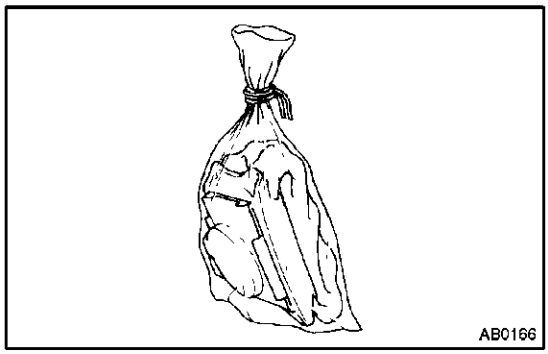
Tire size: Must exceed the following dimensions–
Width: 185 mm (7.87 in.)
Inner diameter: 360 mm (14.17 in.)

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 steering wheel pad 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 steering wheel pad (with airbag).

CAUTION:
- **The steering wheel pad 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 steering wheel pad with deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a steering wheel pad with deployed airbag.**
  (1) Remove the steering wheel pad from the disc wheel.
  (2) Place the steering wheel pad in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS012–11

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the steering wheel pad, steering wheel or spiral cable.

Case	Replacing part
If the airbag has been deployed.	Steering wheel pad
If the steering wheel pad has been found to be faulty in troubleshooting.	Steering wheel pad
If the spiral cable has been found to be faulty in troubleshooting.	Spiral cable
If the steering wheel pad has been found to be faulty during checking items. (See page RS–15)	Steering wheel pad
If the steering wheel has been found to be faulty during checking items. (See page RS–15)	Steering wheel
If the spiral cable has been found to be faulty during checking items. (See page RS–15)	Spiral cable
If the steering wheel pad has been dropped.	Steering wheel pad

CAUTION:

For removal and installation of the steering wheel pad, see page SR–13 and SR–18, and be sure to follow the correct procedure.

RS013–06

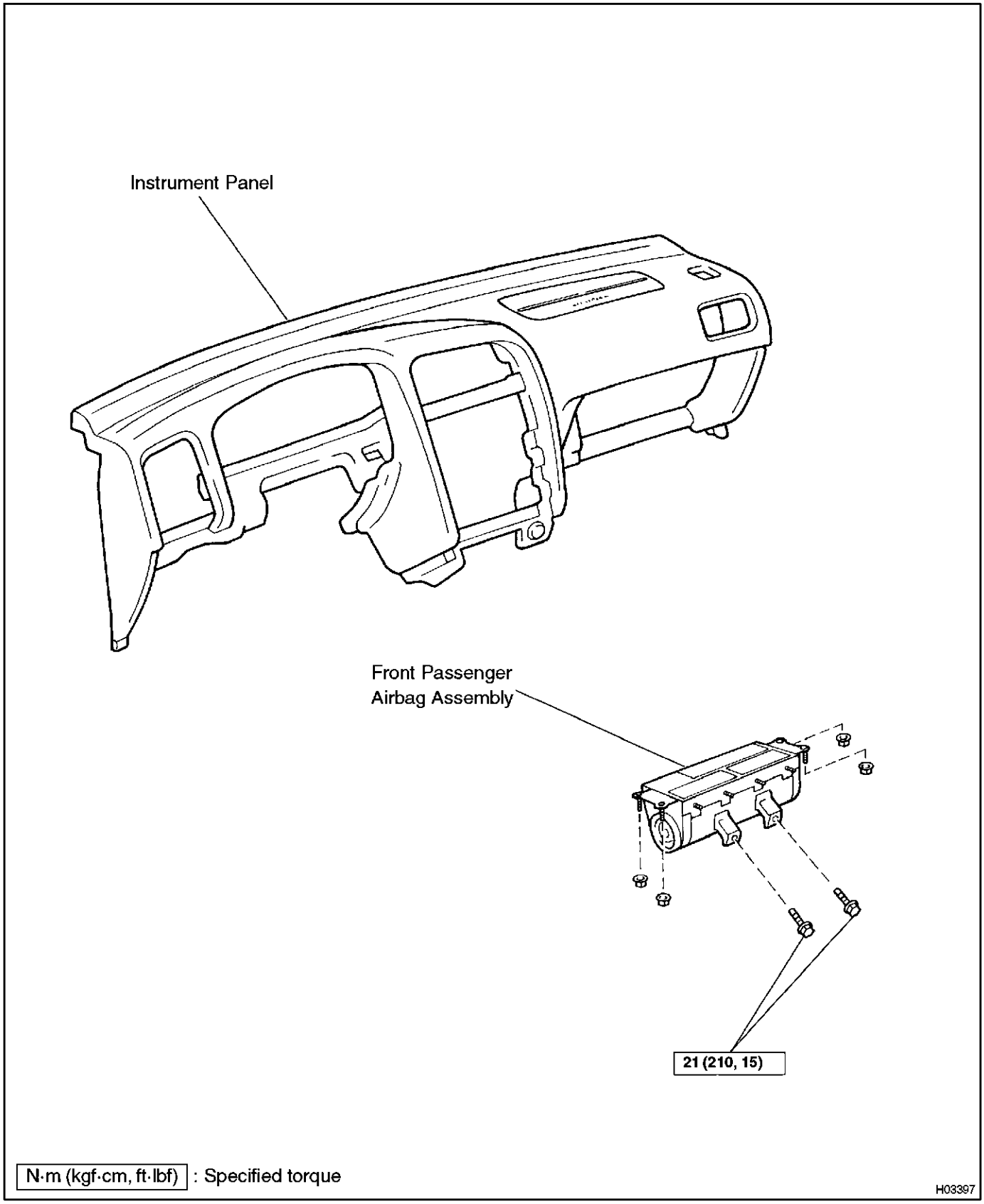
INSTALLATION

(See page SR–18)

FRONT PASSENGER AIRBAG ASSEMBLY

RS014–12

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

H03397

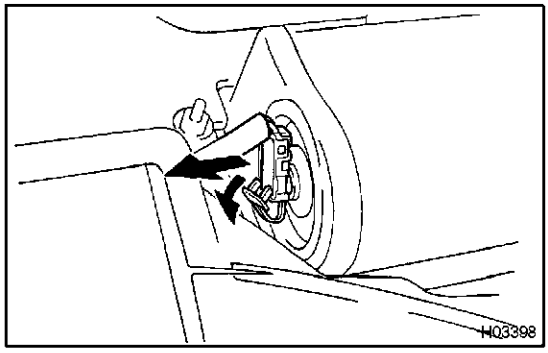
RS08E-03

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is at ON or ACC position, DTCs will be recorded.**
- **Never use the airbag parts from another vehicle. When replacing parts, replace with new parts.**

1. REMOVE INSTRUMENT PANEL
(See page BO–113)

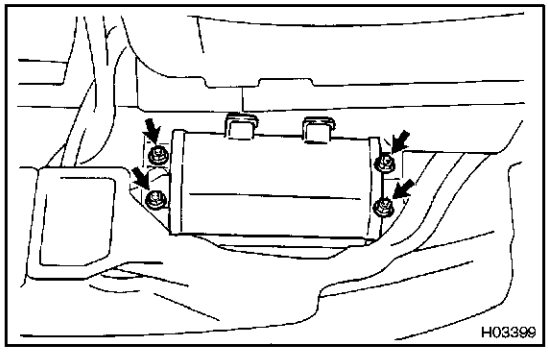


2. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY

(a) Release the lock of connector, then disconnect the connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



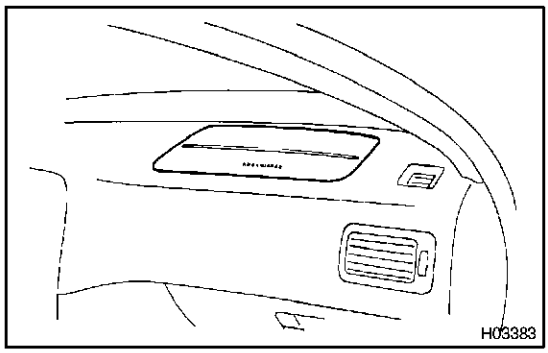
(b) Remove the 4 nuts, then remove the front passenger airbag assembly.

CAUTION:

- **Do not store the front passenger airbag assembly with the airbag deployment side facing downward.**
- **Never disassemble the front passenger airbag assembly.**

RS05Z–05

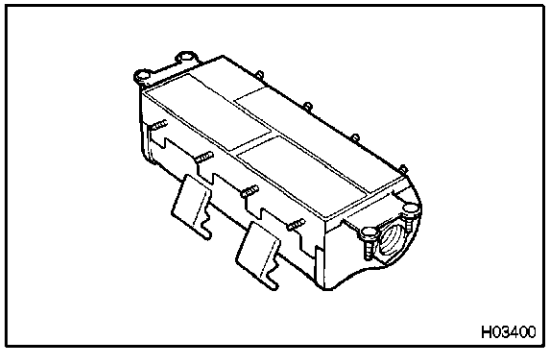
INSPECTION



1. VEHICLES NOT INVOLVED IN COLLISION

(a) Do a diagnostic system check.
(See page DI–152)

(b) Do a visual check which includes the following items with the front passenger airbag assembly installed in the vehicle.
Check cuts, minute cracks or marked discoloration on the front passenger airbag assembly and instrument panel.

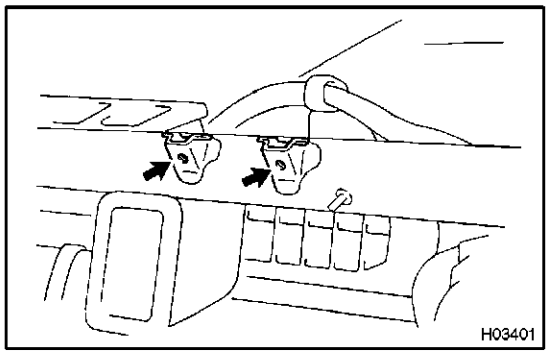


2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

(a) Do a diagnostic system check.
(See page DI–152)

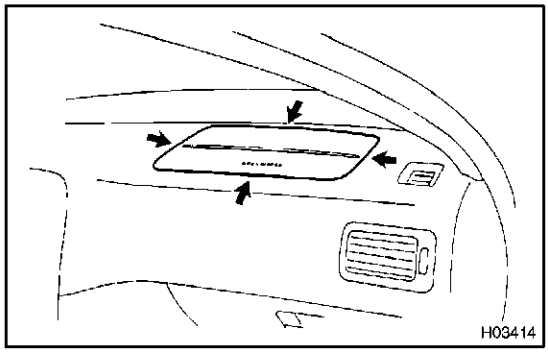
(b) Do a visual check which includes the following items with the front passenger airbag assembly removed from the vehicle.

- Check cuts, minute cracks or marked discoloration on the front passenger airbag assembly.
- Check cuts and cracks in wire harnesses, and for chipping in connectors.
- 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.



- There should be no interference between the instrument panel and the front passenger airbag assembly.

CAUTION:

For removal and installation of the front passenger airbag assembly, see page RS–27 and RS–36 and be sure to follow the correct procedure.

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

(a) Do a diagnostic system check.
(See page DI–152)

(b) Do a visual check which includes the following items with the front passenger airbag assembly removed from the vehicle.
- Check the deformation or cracks on the instrument panel and instrument panel reinforcement.
- 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.

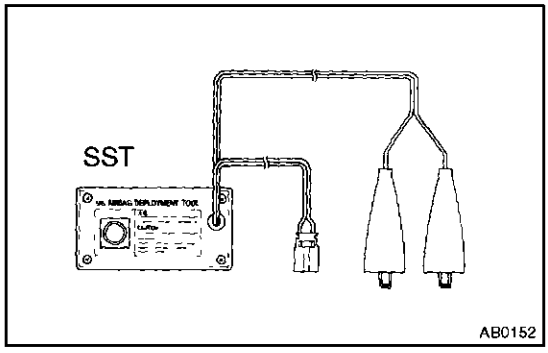
RS0AT–01

DISPOSAL

HINT:

When scrapping vehicle equipped with an SRS or disposing of a front passenger airbag assembly, 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.

When disposing of a front passenger airbag assembly with an airbag deployed in a collision, follow the same procedure given in step (g) in "DISPOSAL".



CAUTION:

- **Never dispose of a front passenger airbag assembly 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.**
  SST 09082–00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the front passenger airbag assembly.**
- **The front passenger airbag assembly 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 passenger airbag assembly with deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with deployed airbag.**

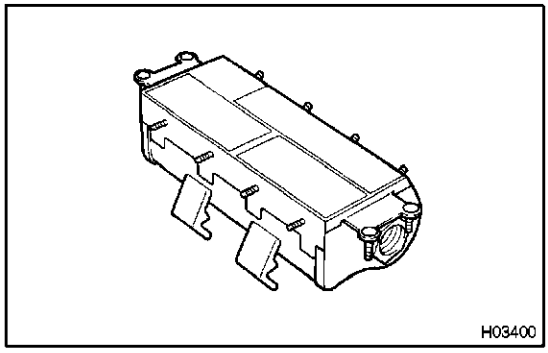
DEPLOYMENT WHEN DISPOSING OF FRONT PASSENGER AIRBAG ASSEMBLY ONLY

NOTICE:

- **When disposing of the front passenger airbag assembly only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

HINT:

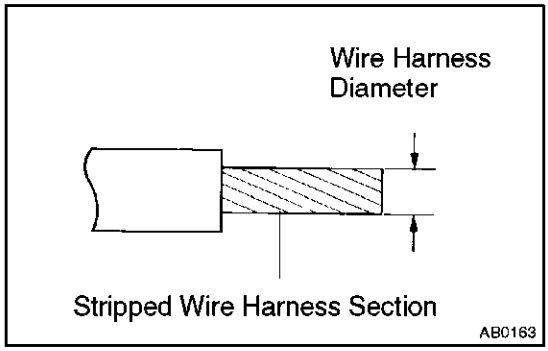
Have a battery ready as the power source to deploy the airbag.



(a) Remove the front passenger airbag assembly.
(See page RS–27)

CAUTION:

- **When removing the front passenger airbag assembly, 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 front passenger airbag assembly with the airbag deployment side facing upward.**



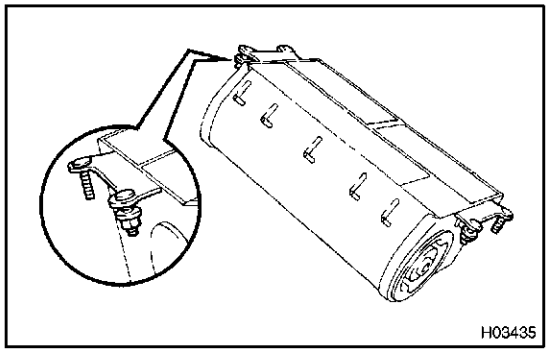
(b) Using a service–purpose wire harness for the vehicle, tie down the front passenger airbag assembly to the tire.
Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 $in.^2$ or more)

CAUTION:

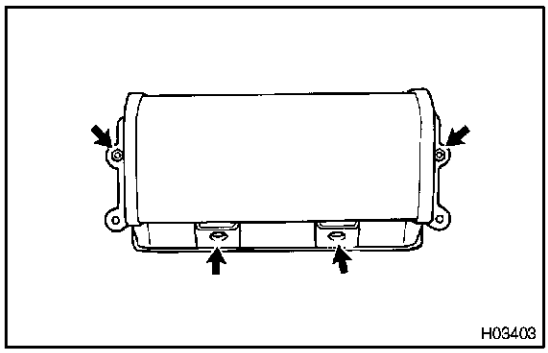
If the front passenger airbag assembly is tied down with too thin wire harness, it may snap. This is highly dangerous. Always use a wire harness which is at least 1.25 mm^2 (0.0019 $in.^2$).

HINT:

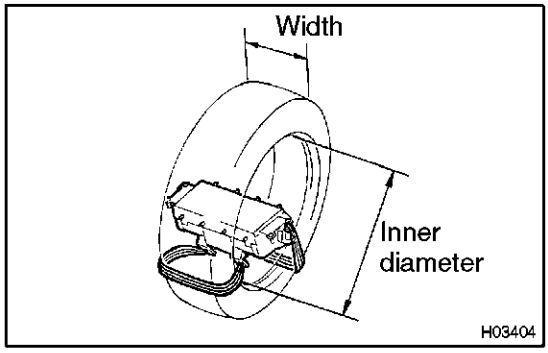
To calculate the square of the stripped wire harness section:
Square = 3.14 X $(Diameter)^2$ divided by 4



(1) Install the 2 nuts on the front passenger airbag assembly.



(2) Pass the wire harness through the holes and wind it around the bolts.



(3) Position the front passenger airbag assembly inside the tire with the airbag deployment side facing inside.

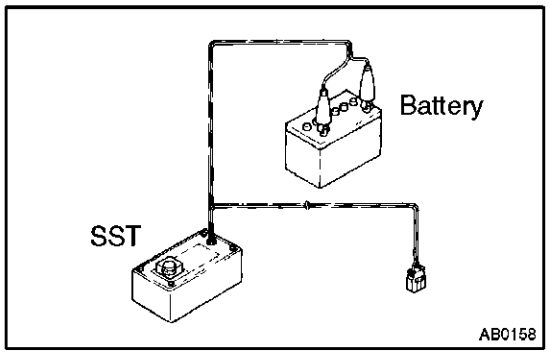
Tire size: Must exceed the following dimensions–
Width: 185 mm (7.28 in.)
Inner diameter: 360 mm (14.17 in.)

CAUTION:

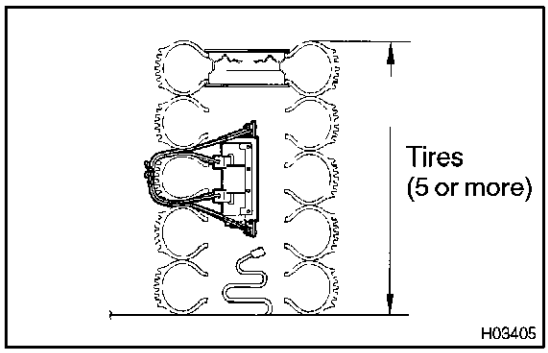
- **Make sure that the wire harness is tight. It is very dangerous if looseness in the wire harness results in the front passenger airbag assembly coming free due to the shock from the airbag deploying.**
- **Always tie down the front passenger airbag assembly with the airbag door facing inside.**

NOTICE:

The tire will be marked by the airbag deployment, so use a redundant tire.



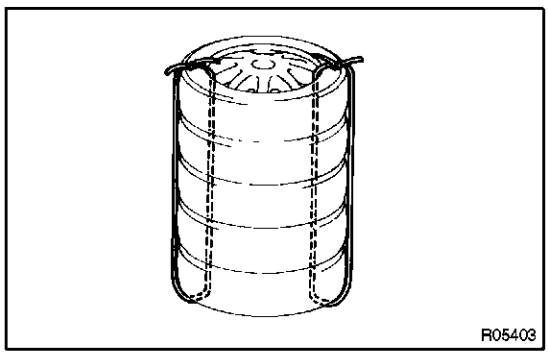
(c) Check functioning of the SST.
SST 09082–00700

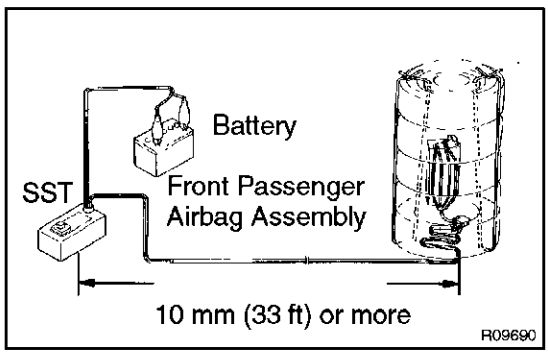


(d) Place tires.
(1) Place at least 2 tires under the tire to which the front passenger airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the front passenger airbag assembly is tied. The top tire should have the wheel installed.
(3) Tie the tires together with 2 wire harnesses.

CAUTION:
Make sure that the wire harnesses are tight. It is very dangerous if loose wire harnesses result in the tires coming free due to the shock from the airbag deploying.

HINT:
Place the SST connector and wire harness inside tires. Provide at least 1 m (3 ft) of slack for the wire harness.



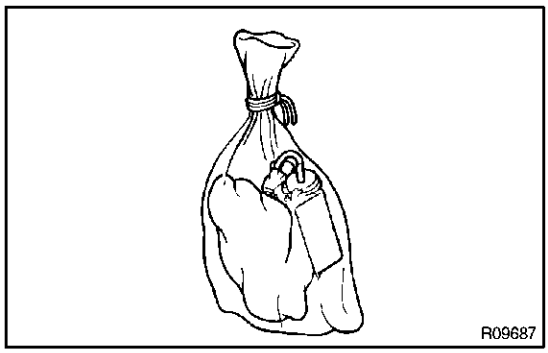


(e) Install the SST.
Connect the connector of 2 SST to the front passenger airbag assembly connector.
SST 09082–00700, 09082–00720

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) Confirm that no one is within 10 m (33 ft) area around the tire which the front passenger airbag assembly 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 passenger airbag assembly.

CAUTION:

- **The front passenger airbag assembly 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 passenger airbag assembly with deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with deployed airbag.**

(1) Remove the front passenger airbag assembly from the tire.

(2) Place the front passenger airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS018-10

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the front passenger airbag assembly, instrument panel or instrument panel reinforcement.

Case	Replacing part
If the airbag has been deployed.	Front passenger airbag assembly
If the front passenger airbag assembly has been found to be faulty in trouble-shooting.	Front passenger airbag assembly
If the front passenger airbag assembly has been found to be faulty during checking items. (See page RS–28)	Front passenger airbag assembly
If the instrument panel has been found to be faulty during checking items. (See page RS–28)	Instrument panel
If the instrument panel reinforcement has been found to be faulty during checking items. (See page RS–28)	Instrument panel reinforcement
If the front passenger airbag assembly has been dropped.	Front passenger airbag assembly

CAUTION:

For replacement of the front passenger airbag assembly, see page RS–27 and RS–36.
Be sure to follow the correct procedure.

RS08G–03

INSTALLATION

NOTICE:

Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.

1. INSTALL FRONT PASSENGER AIRBAG ASSEMBLY

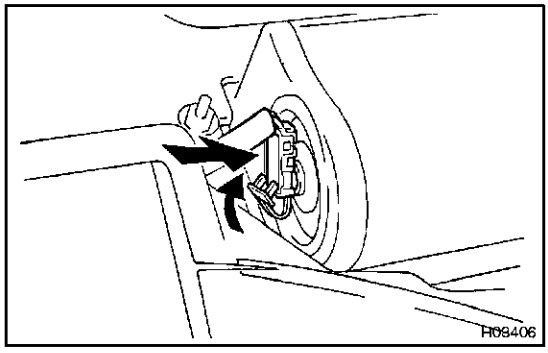
(a) Install the front passenger airbag assembly to the instrument panel.

CAUTION:

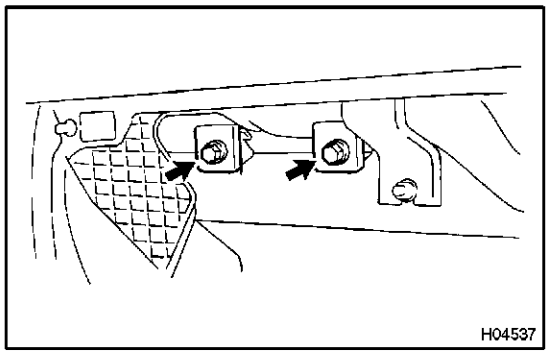
- **Make sure that no foreign objects are trapped between the airbag bag, and within the module.**
- **Do not damage the strap when installing the module.**

NOTICE:

If the front passenger airbag assembly has been dropped, or there are cracks, dents or other defects in the case or connector, replace the front passenger airbag assembly with a new one.



(b) Connect the connector then lock it.



2. INSTALL INSTRUMENT PANEL
(See page BO–117)

(a) Install the 2 bolts to instrument panel reinforcement.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

NOTICE:

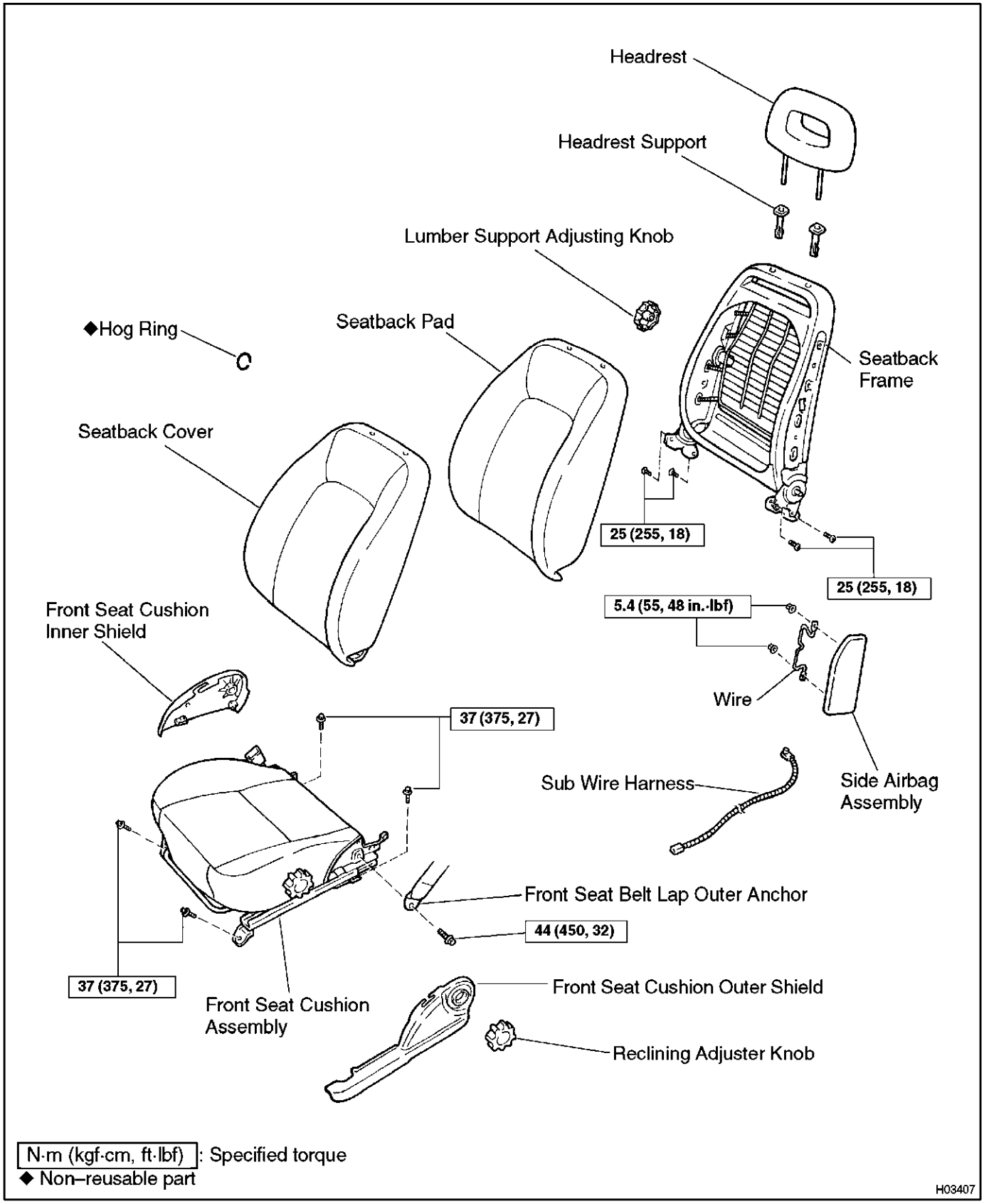
- **Make sure the front passenger airbag assembly is installed with the specified torque.**
- **When installing the instrument panel, take care that the airbag wire harness does not interfere with other parts and is not pinched between other parts.**
- **When installing the instrument panel box, carefully put out the airbag wire harness from the glove compartment upper hole.**

(b) Install the glove compartment door.

SIDE AIRBAG ASSEMBLY

COMPONENTS

RS01A–05



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

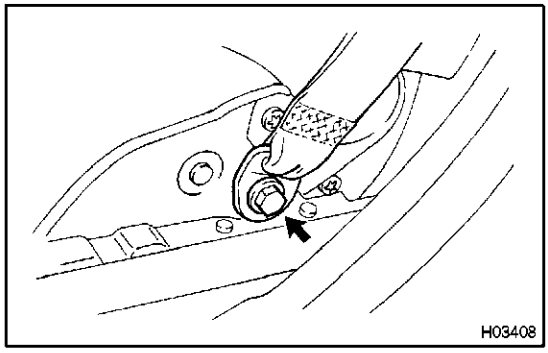
H03407

RS0AU–01

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is at ON or ACC position, DTCs will be recorded.**
- **Never use the airbag parts from another vehicle. When replacing parts, replace them with new parts.**



1. REMOVE FRONT SEAT

(a) Remove the reclining adjuster knob and front seat cushion outer shield.
(b) Remove the front seat belt lap outer anchor.
(c) Remove the 2 seat track covers and 4 bolts.
(d) Disconnect the side airbag connector.

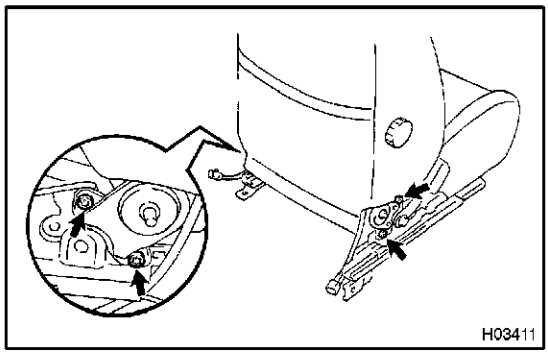
NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

(e) Remove the front seat.

2. REMOVE THESE PARTS:

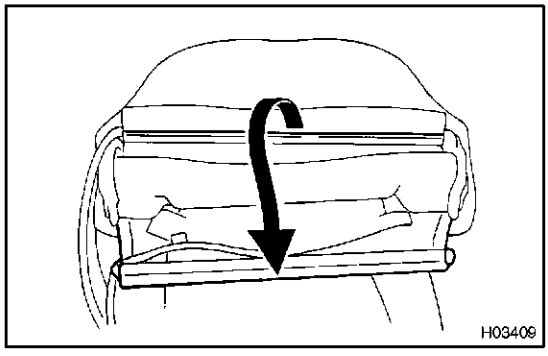
(a) Headrest
(b) 2 headrest supports
(c) Lumber support adjusting knob
(d) Front seat inner shield



3. REMOVE SEATBACK ASSEMBLY

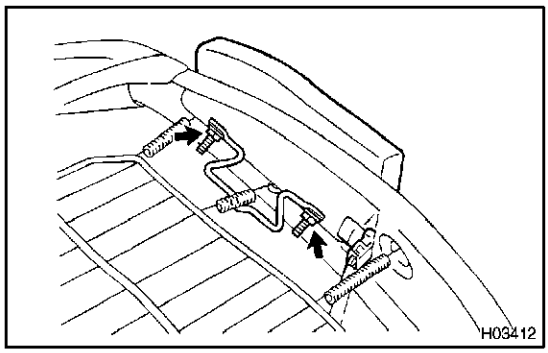
Using a torx wrench, remove the 4 screws and seatback assembly.

Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)



4. REMOVE SIDE AIRBAG ASSEMBLY

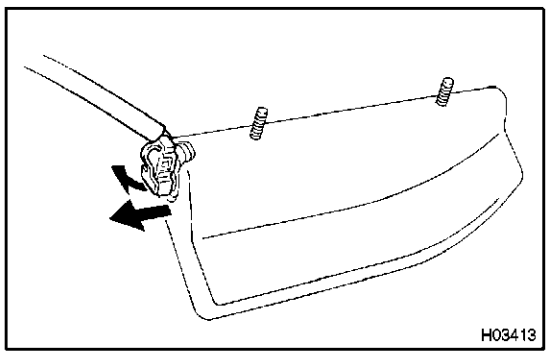
(a) Disengage the hook of the seatback cover.
(b) Remove the hog rings and seatback cover.
(c) Remove the seatback pad.



(d) Remove the 2 nuts, wire and side airbag assembly.

CAUTION:

- **Do not store the side airbag assembly with the airbag deployment direction facing down.**
- **Never disassemble the side airbag assembly.**



(e) Release the lock of connector, then disconnect the connector of side airbag sub wire harness.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness

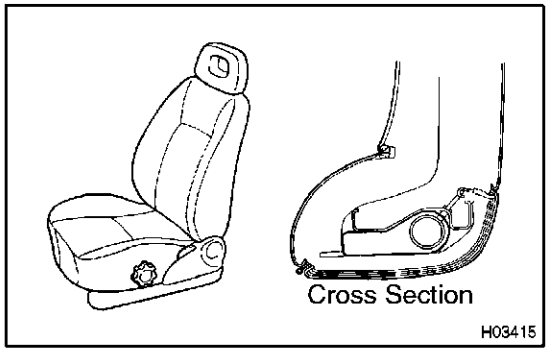
RS01O–05

INSPECTION

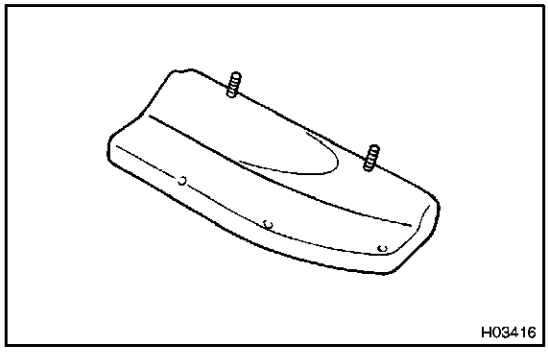
1. VEHICLES NOT INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See page DI–152)

(b) Do a visual check which includes the following items with the side airbag assembly installed in the vehicle.



Check that there are no cuts or the frayed on seams and seatback cover.



2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

(a) Do a diagnostic system check. (See page DI–152)

(b) Do a visual check which includes the following items with the side airbag assembly removed from the vehicle.

- Check cuts and cracks, or marked discoloration of the side airbag assembly.
- Check cuts and cracks in wire harnesses, and chipping in connectors.

CAUTION:

For removal and installation of the side airbag assembly, see page RS–38 and RS–48. Be sure to follow the correct procedure.

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

(a) Do a diagnostic system check.
(See page DI–152)

(b) Do a visual check which includes the following items with the side airbag assembly removed from the vehicle.

- Check the side airbag installation part of the seat frame.
- Check the damage to the connector and wire harness.

HINT:

If the seat frame is deformed, never repair it. Always replace it with a new one.

RS08I–04

DISPOSAL

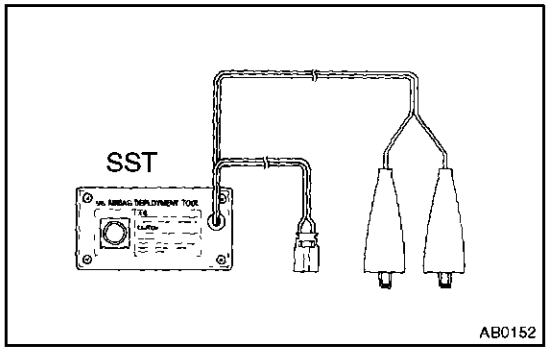
HINT:

When scrapping vehicles equipped with an SRS or disposing of the side airbag assembly 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.

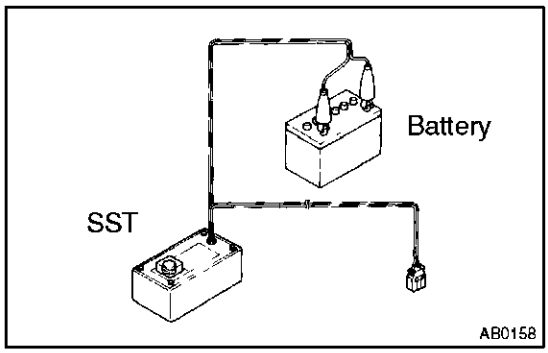
When disposing of a side airbag assembly with an airbag deployed in a collision, follow the same procedure given in step 1–(e) in "DISPOSAL".

CAUTION:

- **Never dispose of a side airbag assembly 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.**
  SST 09082–00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the airbag assembly.**
- **The side airbag assembly 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 side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a side airbag assembly with the deployed airbag.**

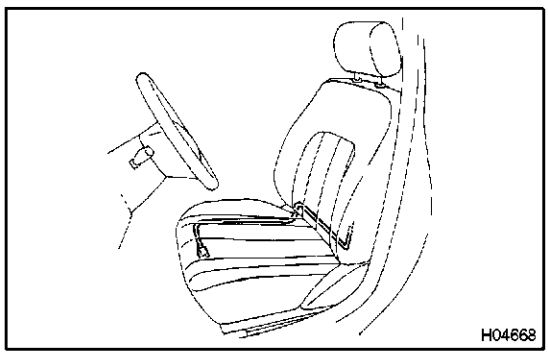


1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

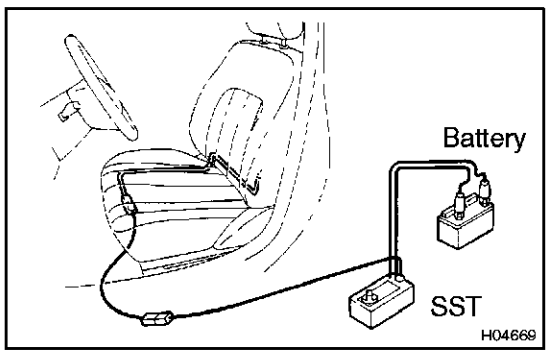
(a) Check functioning of the SST. (See page RS–17)
SST 09082–00700



(b) Disconnect the side airbag connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

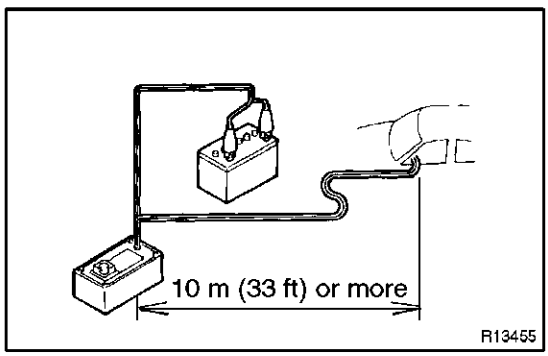


(c) Install the SST.

(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.



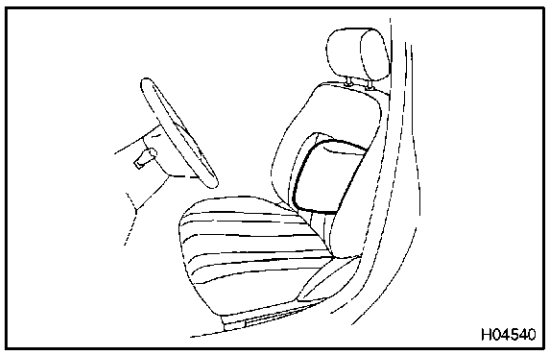
(2) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(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 side airbag assembly.

CAUTION:

- **The side airbag assembly 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 side airbag assembly with the deployed airbag.**
- **Do not apply water, etc. to a side airbag assembly 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 side airbag assembly still installed.

2. DEPLOYMENT WHEN DISPOSING OF SIDE AIRBAG ASSEMBLY

NOTICE:

- **When disposing of the side airbag assembly only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

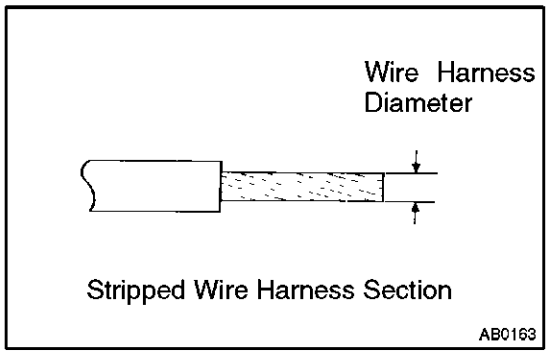
HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Remove the side airbag assembly.

CAUTION:

Store the side airbag assembly with the airbag deployment side facing upward.



(b) Using a service–purpose wire harness, tie down the side airbag assembly.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2 or more)

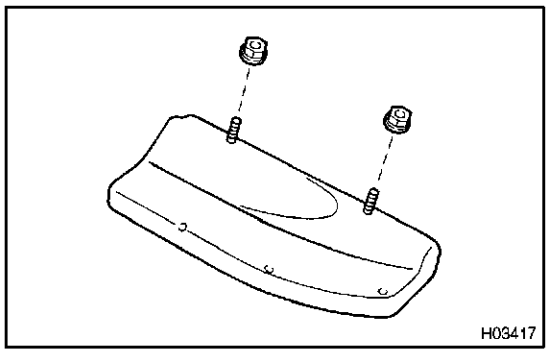
HINT:

To calculate the square of the stripped wire harness section :

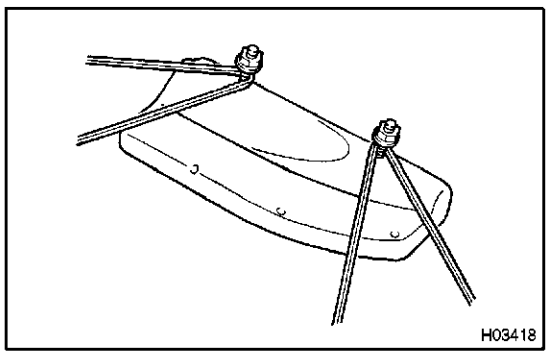
Square = 3.14 x $(Diameter)^2$ divided by 4

CAUTION:

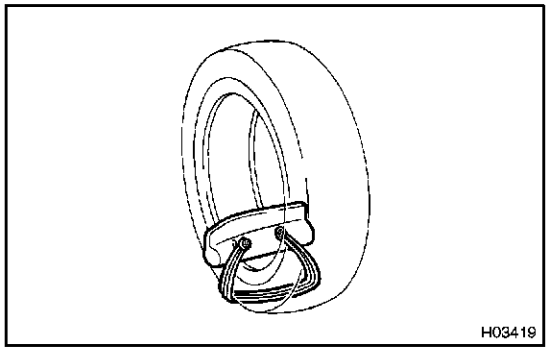
If a wire harness which is too thin or some other thing is used to tie down the side airbag assembly, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2).



(1) Install the 2 nuts in the side airbag assembly.



(2) Wind the wire harness around the stud bolts of the side airbag assembly as shown in the illustration.



(3) Position the side airbag assembly inside the tire with the airbag deployment direction facing inside.

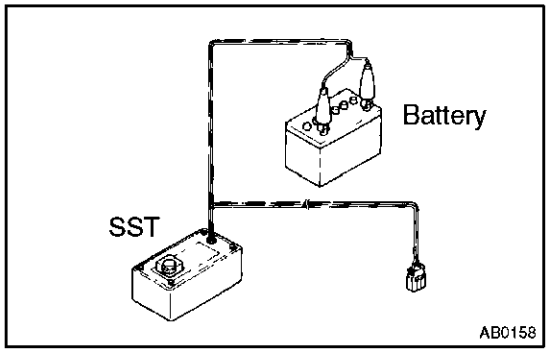
Tire size : Must exceed the following dimensions:–
Width 185 mm (7.28 in.)
Inner diameter 360 mm (14.17 in.)

CAUTION:

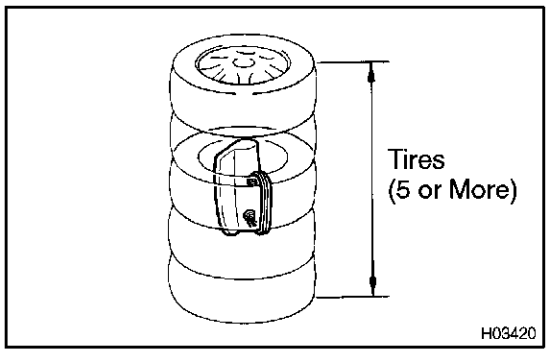
- **Make sure the wire harness is tight. It is very dangerous when a loose wire harness results in the side airbag assembly coming free due to the shock from the airbag deploying.**
- **Always tie down the side airbag assembly with the airbag door facing inside.**

NOTICE:

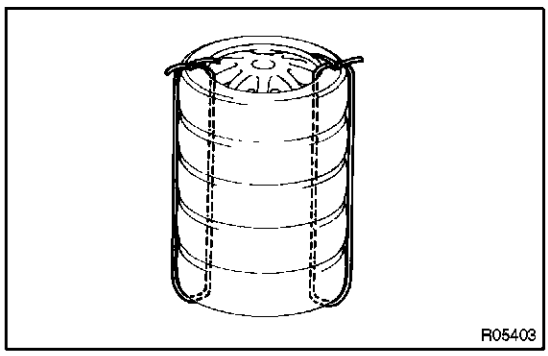
The tire will be marked by the airbag deployment, so use the redundant tire.



(c) Check functioning of the SST.
SST 09082–00700, 09082–00750



(d) Place the tires.
(1) Place at least 2 tires under the tire to which the side airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the side airbag assembly is tied. The top tire should have the wheel installed.



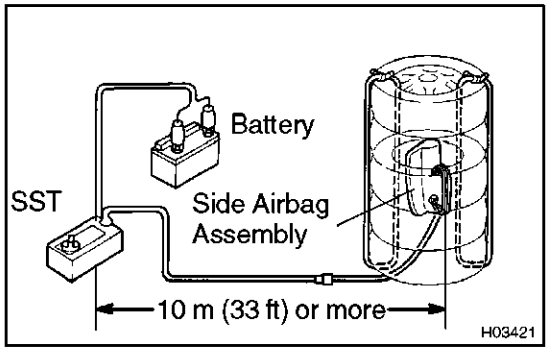
(3) Tie the tires together with 2 wire harnesses.

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 side airbag assembly connector.
SST 09082–00700, 09082–00750

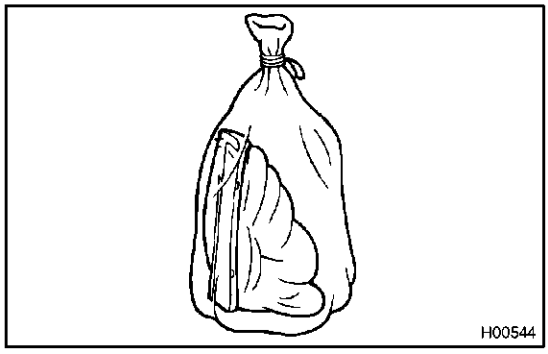
NOTICE:

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 side airbag assembly 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 side airbag assembly.

CAUTION:

- **The side airbag assembly 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 side airbag assembly with the deployed airbag.**
- **Do not apply water etc. to a side airbag assembly with the deployed airbag.**

- **Always wash your hands with water after completing the operation.**
  (1) Remove the side airbag assembly from the tire.
  (2) Place the side airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS01E–04

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the side airbag assembly or seatback cover.

Case	Replacing part
If the side airbag has been deployed.	Side airbag assembly
If the side airbag has been found to be faulty in troubleshooting.	Side airbag assembly
If the side airbag assembly has cuts during checking items. (See page RS–40)	Side airbag assembly
If the seatback cover has cuts and frayed seams during checking items. (See page RS–40)	Seatback cover
If the side airbag assembly has been found to be faulty during checking items. (See page RS–40)	Side airbag assembly
If the seatback cover has been found to be faulty during checking items. (See page RS–40)	Seatback cover
If the seatback frame assembly has been dropped.	Side airbag assembly

CAUTION:

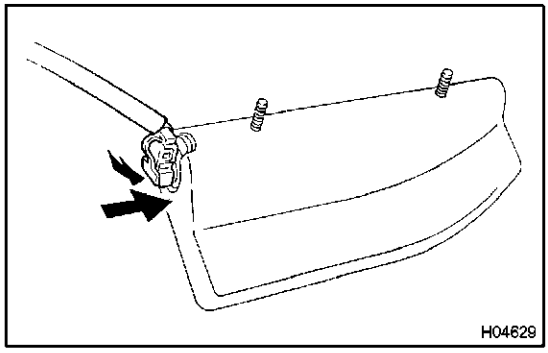
For removal and installation of the side airbag assembly, see page RS–38 and RS–48. Be sure to follow the correct procedure.

RS01F–05

INSTALLATION

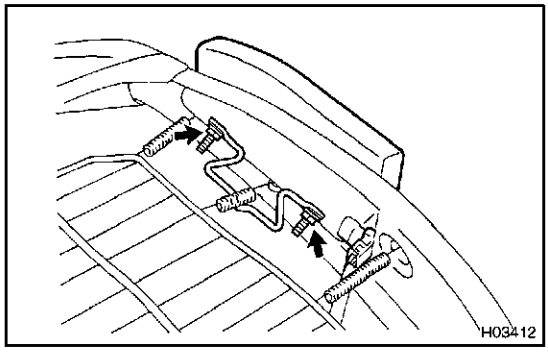
NOTICE:

Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.



1. INSTALL SIDE AIRBAG ASSEMBLY

(a) Connect the connector of the side airbag sub wire harness then lock it.



(b) Install the 2 nuts, wire and side airbag assembly.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

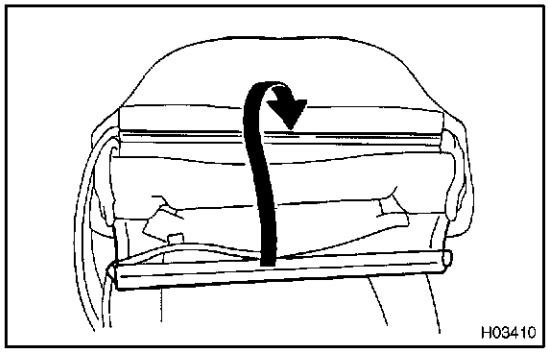
NOTICE:

- **Make sure that the side airbag assembly is installed with the specified torque.**
- **If the side airbag assembly has been dropped, or there are cracks, dents or other defects in the case or connector, replace the side airbag assembly with a new one.**
- **When installing the side airbag assembly, take care it is not pinched between other parts.**

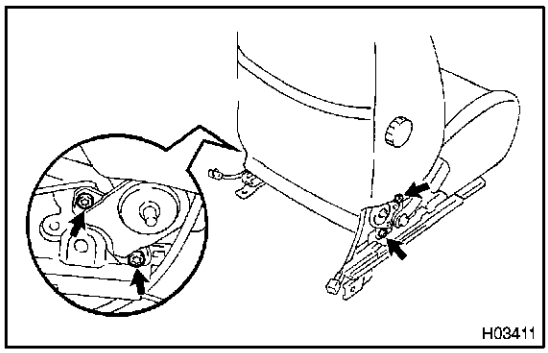
(c) Install the seatback pad and seatback cover to seatback frame with new hog rings.

CAUTION:

When installing the seatback pad and seatback cover, take care to hang the hook securely and install a new hog ring to the original position. Otherwise the seat cover slides, it might care incorrect deploying.



(d) Hang the hook of the seatback cover.



2. INSTALL SEATBACK ASSEMBLY

Using a torx wrench, install the 4 screws and seatback assembly.

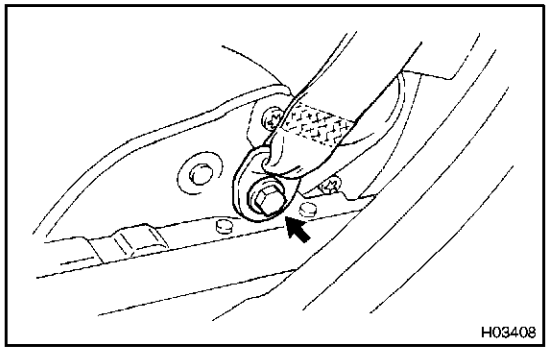
Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

3. INSTALL THESE PARTS:

(a) 2 headrest supports
(b) Head rest
(c) Lumber support adjusting knob
(d) Front seat inner shield

4. INSTALL FRONT SEAT

(a) Mount the seat to the vehicle.
(b) Connect the side airbag connector.
(c) Install the outer bolt and inner bolt on the front side after sliding the seat to the rearmost position.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)
(d) Tighten the bolts on the rear side temporarily, tighten them completely starting from the bolt on the inner side.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

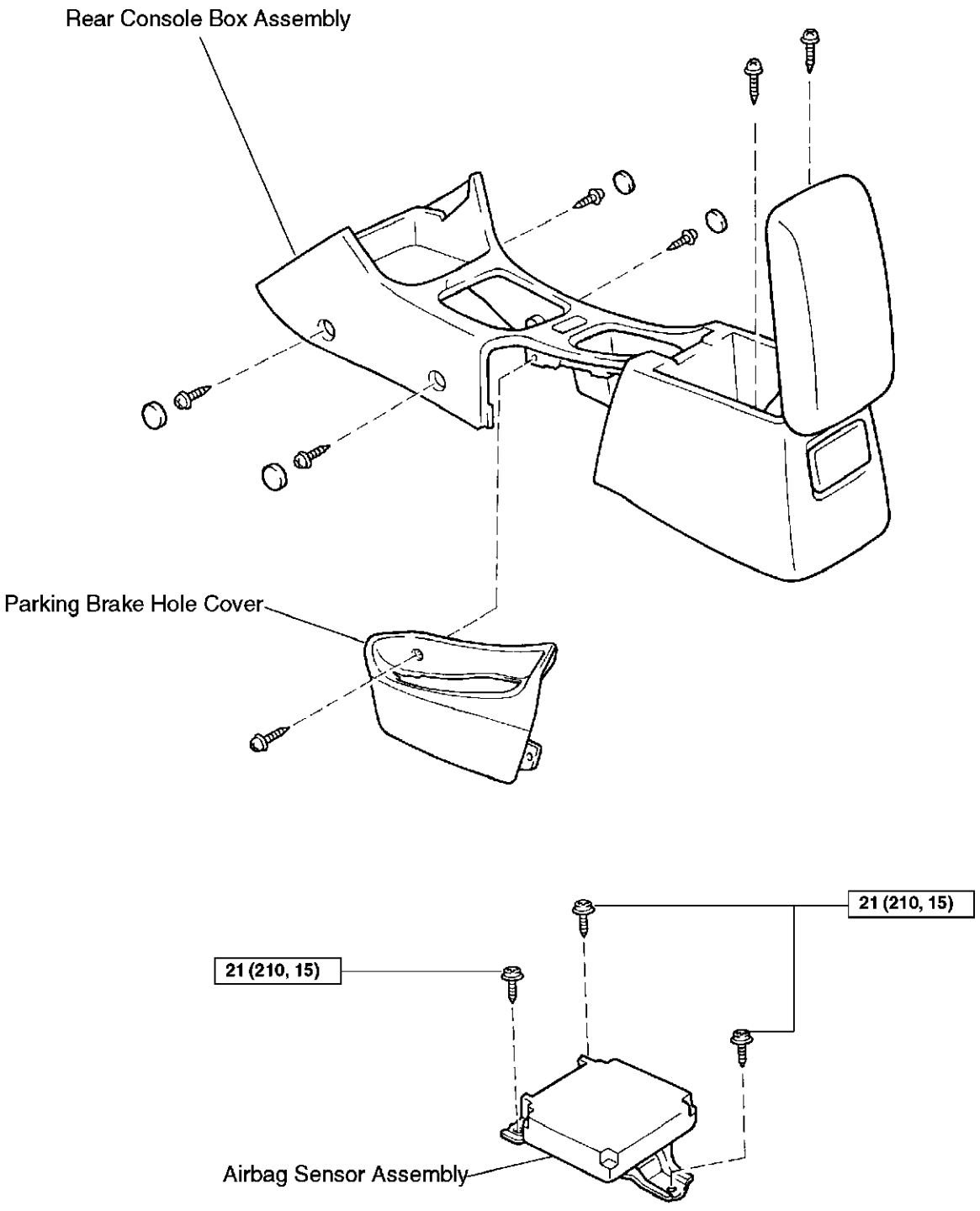


(e) Install the front seat belt lap outer anchor.
Torque: 44 N·m (450 kgf·cm, 32 ft·lbf)
(f) Install the front seat cushion outer shield and reclining adjuster knob.

AIRBAG SENSOR ASSEMBLY

COMPONENTS

RS067–03



N·m (kgf·cm, ft·lbf) : Specified torque

H03422

RS068-03

REMOVAL

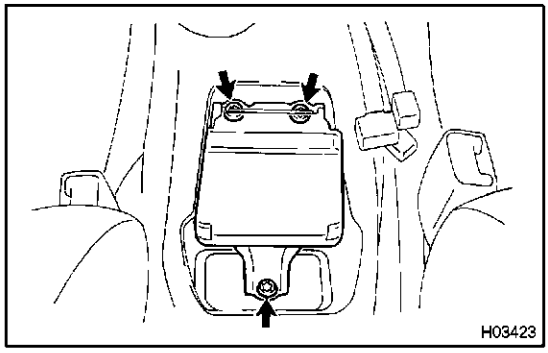
NOTICE:

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

1. REMOVE THESE PARTS:

(a) Rear Console box assembly

(b) Parking brake hole cover



2. REMOVE AIRBAG SENSOR ASSEMBLY

(a) Disconnect the airbag sensor connectors.

NOTICE:

Remove the connectors with the airbag sensor assembly installed.

(b) Using a torx wrench, remove the 3 screws and airbag sensor assembly.

Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)

RS069–01

INSPECTION

1. VEHICLE NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See page DI–152)

2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

Do a diagnostic system check. (See page DI–152)

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

Replace the airbag sensor assembly. (See page RS–50)

RS06A–03

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the airbag sensor assembly.

- If the SRS has been deployed in a collision.
- If the airbag sensor assembly has been found to be faulty in troubleshooting.
- If the airbag sensor assembly has been dropped.

CAUTION:

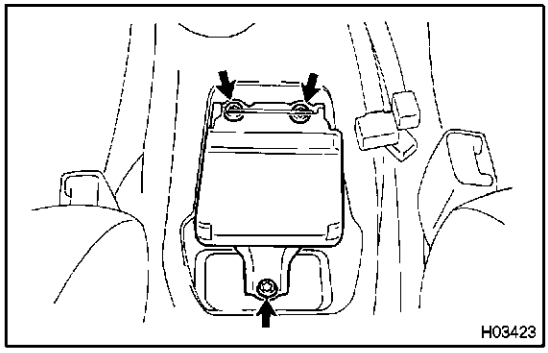
For removal and installation of the airbag sensor assembly, see page RS–51 and RS–54. Be sure to follow the correct procedure.

RS06B–03

INSTALLATION

NOTICE:

- **Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.**
- **Never reuse the airbag sensor assembly involved in a collision when the airbag has deployed.**
- **Never repair a sensor in order to reuse it.**



1. INSTALL AIRBAG SENSOR ASSEMBLY

(a) Using a torx wrench, install the airbag sensor assembly with 3 screws.

Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(b) Connect the airbag sensor connectors.

NOTICE:

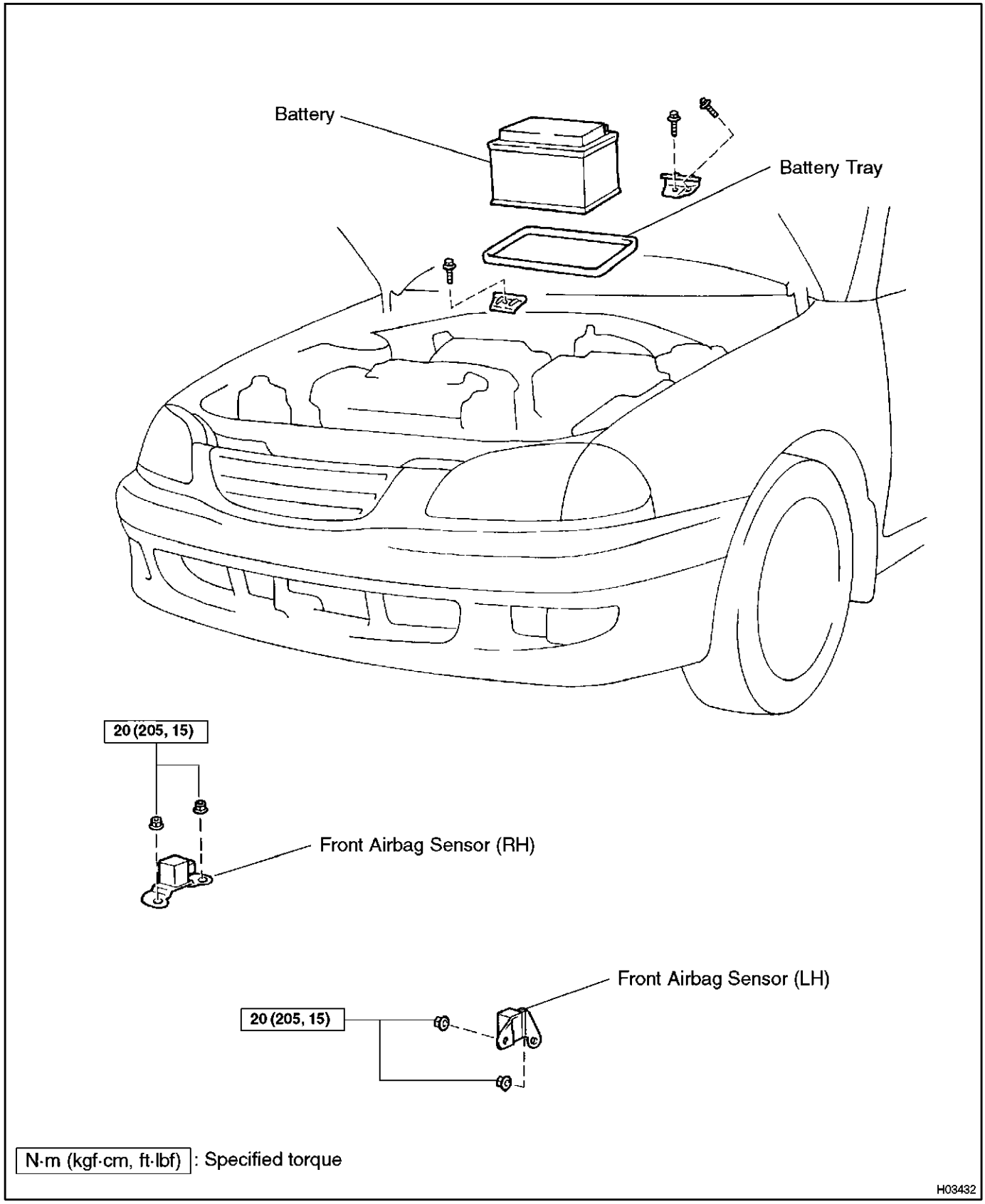
- **Installation of the connector is done after the sensor assembly has been installed.**
- **Make sure the sensor assembly is installed with the specified torque.**
- **If the sensor assembly has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assembly with a new one.**
- **When installing the senor assembly, take care that the SRS wiring does not interfere with other parts and is not pinched between other parts.**
- **After installing, shake the sensor assembly to check that there is no looseness.**

2. INSTALL REMOVED PARTS

FRONT AIRBAG SENSOR

COMPONENTS

RS01L–06



N·m (kgf·cm, ft·lbf) : Specified torque

H03432

RS01M–06

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected with the ignition switch at ON or ACC position, DTCs will be recorded.**
- **Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.**
- **Never reuse the sensor involved in a collision when the SRS has deployed.**
- **Never repair a sensor in order to reuse it.**

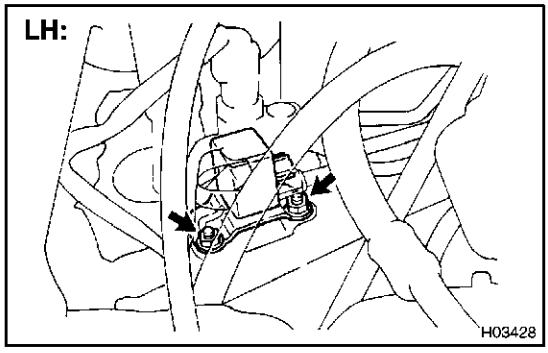
1. LH:

REMOVE FRONT AIRBAG SENSOR

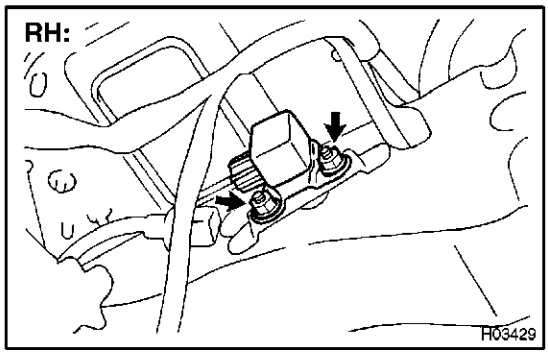
(a) Disconnect the front airbag sensor connector.

NOTICE:

Disconnect the connector with sensor assembly installed.



(b) Remove the 2 nuts and remove the front airbag sensor.



2. RH:

REMOVE FRONT AIRBAG SENSOR

(a) Remove the battery and battery tray.

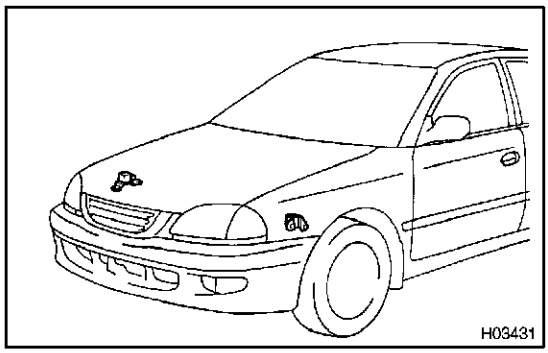
(b) Disconnect the front airbag sensor connector.

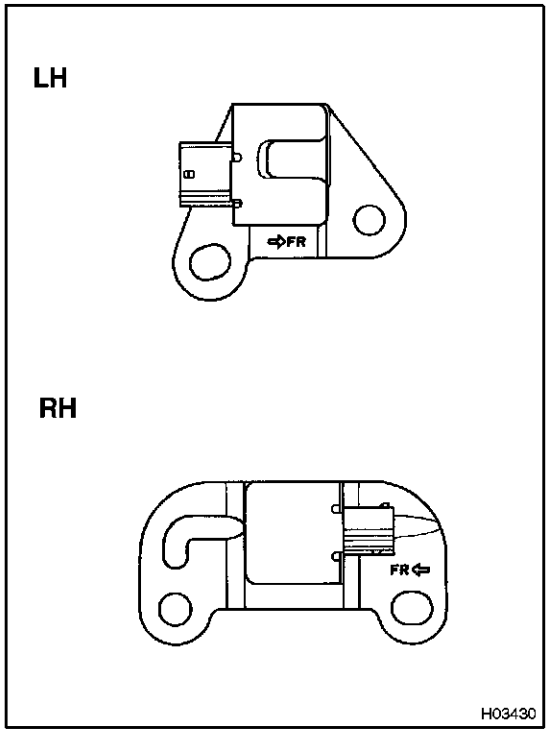
NOTICE:

Disconnect the connector with sensor assembly installed.

(c) Remove the 2 nuts and remove the front airbag sensor.

RS01N–07





INSPECTION

1. VEHICLES NOT INVOLVED IN COLLISION

Do a diagnostic system check.
(See page DI–152)

2. VEHICLES INVOLVED IN COLLISION

(a) Do a diagnostic system check.
(See page DI–152)

(b) If the front fender of the car or its periphery is damaged, do a visual check for damage to the front airbag sensor, which includes the following items even if the airbag was not deployed:

- Bracket deformation
- Paint peeling off the bracket
- 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

RS01O–06

REPLACEMENT

REPLACEMENT REQUIREMENTS

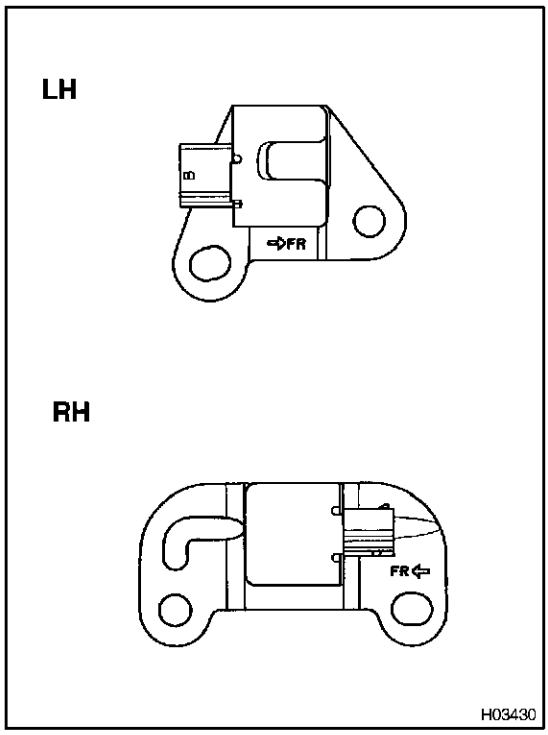
In the following cases, replace the front airbag sensor.

- If the SRS has been deployed in a collision. (Replace both the left and right airbag sensors.)
- If the front airbag sensor has been found to be faulty in troubleshooting.
- If the front airbag sensor has been found to be faulty during checking items.
  (See page RS–57)
- If the front airbag sensor has been dropped.

CAUTION:

For removal and installation of the front airbag sensor, see page RS–56 and RS–59.
Be sure to follow the correct procedure.

RS01P–06



INSTALLATION

1. INSTALL FRONT AIRBAG SENSOR

(a) Install the front airbag sensor with the arrow on the sensor facing toward the front of the vehicle.

Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

NOTICE:

- **Make sure the sensor is installed with the specified torque.**
- **If the sensor has been dropped, or there are cracks, dents or other defects in the case, brackets or connector, replace the removed sensor, always replace the set bolts with new ones.**
- **The sensor set bolts have been anti–rust treated. When the sensor is removed.**
- **The front sensor is equipped with an electrical connection check mechanism. Be sure to lock this mechanism securely when connecting the connector. If the connector is not securely locked, a malfunction code will be detected by the diagnostic system.**

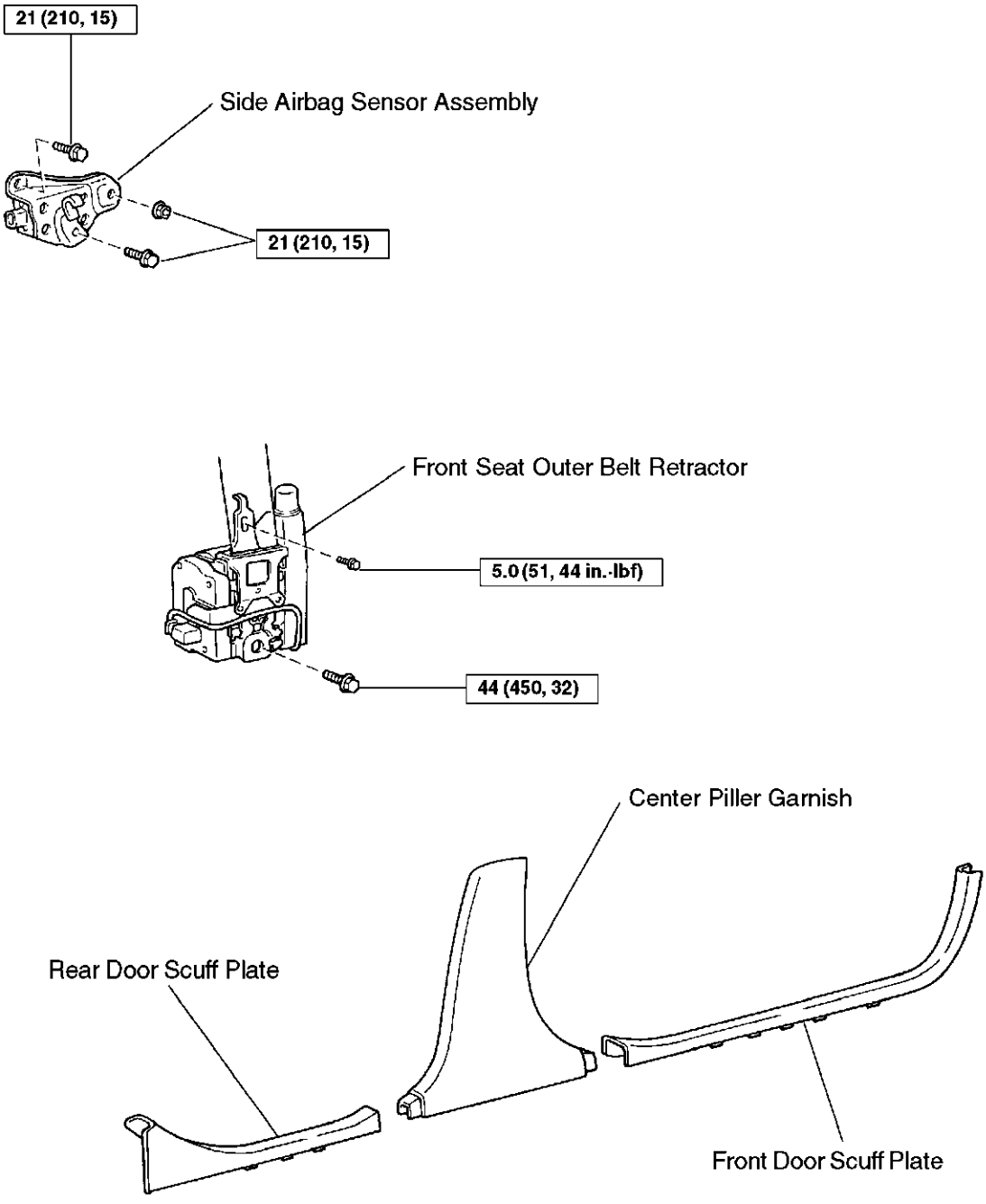
(b) Connect the front airbag sensor connector.

2. INSTALL REMOVED PARTS

SIDE AIRBAG SENSOR ASSEMBLY

RS06C–05

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

H03424

RS06D–05

REMOVAL

NOTICE:

Do not open the cover or the case of the ECU and various electrical devices unless absolutely necessary.

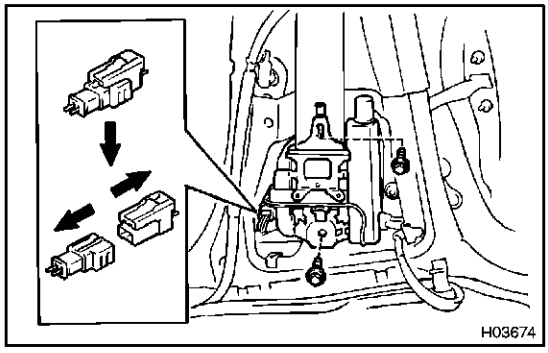
(If the IC terminals are touched, the IC may be destroyed by static electricity.)

1. REMOVE THESE PARTS:

(a) Front door scuff plate

(b) Rear door scuff plate

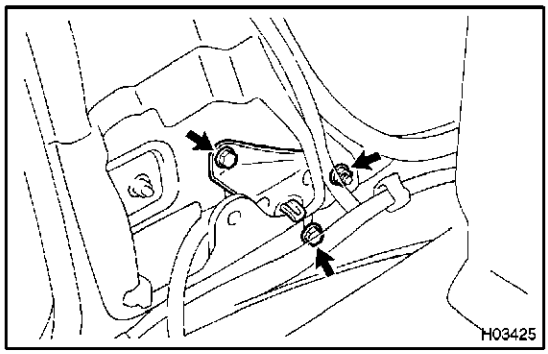
(c) Center pillar lower garnish



2. REMOVE FRONT SEAT OUTER BELT RETRACTOR (See page BO–151)

(a) Disconnect the pretensioner connector.

(b) Remove the 2 bolts and retractor.



3. REMOVE SIDE AIRBAG SENSOR ASSEMBLY

(a) Disconnect the connector.

NOTICE:

Remove the connector with the sensor assembly installed.

(b) Remove the 3 screws and side airbag sensor assembly.

RS06E–05

INSPECTION

1. VEHICLES NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See page DI–152)

2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

Do a diagnostic system check. (See page DI–152)

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

Replace the side airbag sensor assembly. (See page RS–60)

RS06F–02

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the side airbag sensor assembly.

- If the side airbag assembly has been deployed in a collision.
- If the side airbag sensor assembly has been found to be faulty in troubleshooting.
- If the side airbag sensor assembly has been dropped.

CAUTION:

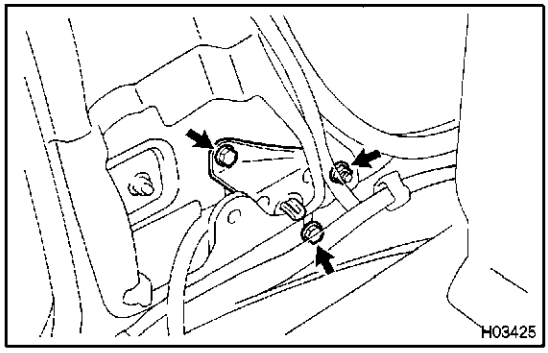
For removal and installation of the side airbag sensor assembly, see page RS–61 and RS–64. Be sure to follow the correct procedure.

RS08T–03

INSTALLATION

NOTICE:

- **Never use SRS parts from another vehicle. When replacing parts, replace them with new ones.**
- **Never reuse the side airbag sensor assembly involved in a collision when the airbag has deployed.**
- **Never repair a sensor in order to reuse it.**



1. INSTALL SIDE AIRBAG SENSOR

(a) Install the side airbag assembly with 3 screws.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

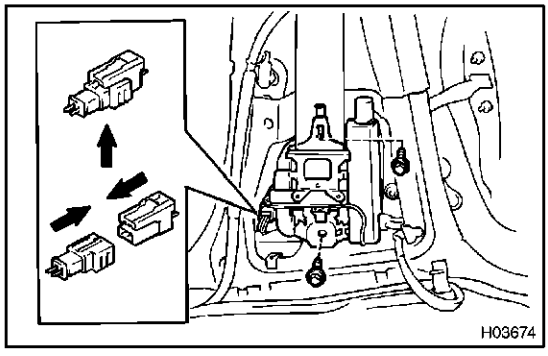
(b) Connect the side airbag sensor connector.

NOTICE:

- **Installation of the connector is done with the sensor assembly installed. Make sure the sensor assembly is installed with the specified torque.**
- **If the sensor assembly has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assembly with a new one.**
- **When installing the sensor assembly, take care that the SRS wiring does not interfere with other parts and is not pinched between other parts.**
- **After installation, shake the sensor assembly to check that there is no looseness.**

2. INSTALL FRONT SEAT OUTER BELT RETRACTOR (See page BO–159)

(a) Install the retractor with 2 bolts.
Torque:
Upper bolt: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Lower bolt: 44 N·m (450 kgf·cm, 32 ft·lbf)



(b) Connect the pretensioner connector.

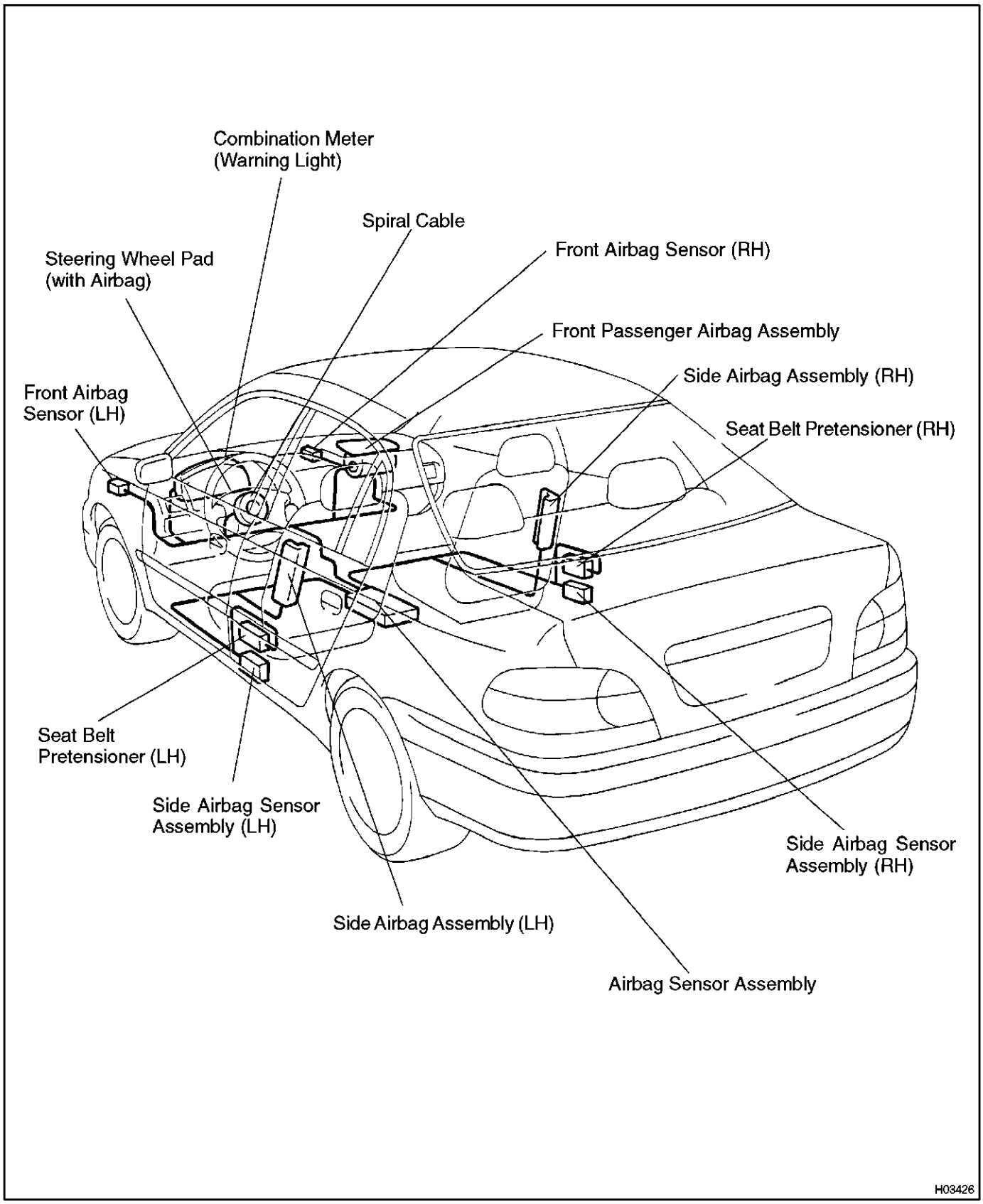
3. INSTALL THESE PARTS:

(a) Center pillar lower garnish
(b) Front door scuff plate
(c) Rear door scuff plate

WIRE HARNESS AND CONNECTOR

RS06H–05

LOCATION



RS061–02

INSPECTION

HINT:

The SRS wire harness is integrated with the instrument panel wire harness assembly. The wires for the SRS wire harness are encased in a yellow corrugated tube and all the connectors in the system are a standard yellow color.

1. VEHICLES NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See page DI–152)

2. VEHICLES INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See page DI–152)

(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.

RS06J–02

REPLACEMENT

In the following cases,replace the wire harness or connector.

- If any part of the SRS wire harness or any connector has been found to be faulty in troubleshooting.
- If any part of the SRS wire harness or any connector has been found to be faulty during checking items. (See page RS–66)

CAUTION:

If the wire harness used in the SRS is damaged, replace the whole wire harness assembly.

BODY ELECTRICAL

BODY ELECTRICAL SYSTEM BE–1
POWER SOURCE BE–12
IGNITION SWITCH AND KEY UNLOCK WARNING SWITCH BE–19
HEADLIGHT AND TAILLIGHT SYSTEM BE–23
HEADLIGHT BEAM LEVEL CONTROL SYSTEM BE–33
FOG LIGHT SYSTEM BE–35
TURN SIGNAL AND HAZARD WARNING SYSTEM BE–40
INTERIOR LIGHT SYSTEM BE–46
BACK–UP LIGHT SYSTEM BE–52
STOP LIGHT SYSTEM BE–56
HEADLIGHT CLEANER SYSTEM BE–60
WIPER AND WASHER SYSTEM BE–62
COMBINATION METER BE–75
DEFOGGER SYSTEM BE–94
POWER WINDOW CONTROL SYSTEM BE–103
POWER DOOR LOCK CONTROL SYSTEM . BE–129
SLIDING ROOF SYSTEM BE–140
POWER MIRROR CONTROL SYSTEM BE–146
SEAT HEATER SYSTEM BE–150
AUDIO SYSTEM BE–154
CLOCK BE–173
ENGINE IMMOBILISER SYSTEM BE–175

BE011-04

PRECAUTION

HINT:

Take care to observe the following precautions when performing inspections or removal and replacement of body electrical related parts.

1. HEADLIGHT SYSTEM

Halogen bulbs have pressurized gas inside and require special handling. They can burst if scratched or dropped. Hold a bulb only by its plastic or metal case. Don't touch the glass part of a bulb with bare hands.

2. SRS (SUPPLEMENTAL RESTRAINT SYSTEM)

The CARINA/AVENSIS is equipped with an 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 RS section.

3. AUDIO SYSTEM

If the negative (–) terminal cable is disconnected from the battery, the preset AM, FM 1 and FM 2 stations stored in memory are erased, so be sure to note the stations and reset them after the negative (–) terminal cable is reconnected to the battery.

4. MOBILE COMMUNICATION SYSTEM

If the vehicle is equipped with a mobile communication system, refer to precautions in the IN section.

BE01J–06

PROBLEM SYMPTOMS TABLE

1. HEADLIGHT AND TAILLIGHT SYSTEM

Headlight: (w/o Daytime Running Light System)

Symptom	Suspect Area	See page
Headlight does not light. (Taillight is normal)	1. HEAD–(LH, RH) Fuse (E/G Room J/B) 2. Headlight Bulb 3. Wire Harness	– – –
Headlight does not light. (Taillight does not light up)	1. HEAD–(LH, RH) Fuse (E/G Room J/B) 2. Headlight Control Relay (E/G Room J/B) 3. Headlight Bulb 4. Wire Harness	– BE–23 – –
Only one side light does not light.	1. HEAD–(LH, RH) Fuse (E/G Room J/B) 2. Headlight Bulb 3. Wire Harness	– – –
"Lo–Beam" does not light.	1. Headlight Bulb 2. Light Control Switch 3. Wire Harness	– BE–23 –
"Hi–Beam" does not light.	1. Headlight Dimmer Switch 2. Light Control Switch 3. Wire Harness	BE–23 BE–23 –
"Flash" does not light.	1. Headlight Dimmer Switch 2. Wire Harness	BE–23 –
"Light–On Warning System" does not operate.	1. GAUGE Fuse (I/P J/B) 2. DOME Fuse (E/G Room J/B) 3. Integration Relay (I/P J/B) 4. Door Courtesy Switch (Driver's) 5. Ignition Switch 6. Wire Harness	– – BE–23 BE–39 BE–19 –

Taillight: (w/o Daytime Running Light System)

Symptom	Suspect Area	See page
Taillight does not light. (Headlight does not light)	1. Light Control Switch 2. Integration Relay (I/P J/B) 3. Wire Harness	BE–23 BE–19 –
Taillight does not light. (Headlight is normal)	1. TAIL Fuse (I/P J/B) 2. Taillight Control Relay (I/P J/B) 3. Light Control Switch 4. Integration Relay (I/P J/B) 5. Wire Harness	BE–12 BE–23 BE–23 BE–23 –
Only one side light does not light.	1. Bulb 2. Wire Harness	– –
Rear Combination light does not light.	1. Bulb 2. Wire Harness	– –
"Light–On Warning System" does not operate.	1. GAUGE Fuse (I/P J/B) 2. Integration Relay (I/P J/B) 3. Door Courtesy Switch (Driver's) 4. Wire Harness	– BE–23 BE–39 –

Headlight (w/ Daytime Running Light System)

Symptom	Suspect Area	See page
Headlight does not light. (Taillight is normal)	1. Wire Harness	–
Headlight does not light. (Taillight does not light up)	1. Wire Harness	–
Only one side light does not light.	1. Headlight Bulb 2. HEAD LO (LH, RH) Fuse (E/G Room J/B) 3. Wire Harness	– – –
"Lo–Beam" does not light.	1. Headlight Bulb 2. HEAD LO (LH, RH) Fuse (E/G Room J/B) 3. Headlight Control Relay (E/G Room J/B) 4. Integration Relay (I/P J/B) 5. Light Control Switch 6. Wire Harness	– – BE–23 BE–23 BE–23 –
"Hi–Beam" does not light.	1. Headlight Bulb 2. ECU–B Fuse (E/G Room J/B) 3. HEAD LH Fuse (E/G Room J/B) 4. HEAD RH Fuse(E/G Room J/B) 5. HEAD HI (LH, RH) Fuse (Relay Block No.7) 6. Headlight Dimmer Relay (Relay Block No.7) (E/G Room No.5 R/B) 7. Daytime Running Light Main Relay 8. Headlight Dimmer Switch 9. Wire Harness	– – – – – BE–23 – BE–23 BE–23 –
"Flash" does not light.	1. Headlight Bulb 2. ECU–B Fuse (E/G Room J/B) 3. HEAD LH Fuse (E/G Room J/B) 4. HEAD RH Fuse(E/G Room J/B) 5. HEAD HI (LH, RH) Fuse (Relay Block No.7) 6. Headlight Dimmer Relay (E/G Room J/B) 7. Daytime Running Light Main Relay 8. Headlight Dimmer Switch 9. Wire Harness	– – – – – BE–23 BE–23 BE–23 –
"Light–On Warning System" does not operate.	1. GAUGE Fuse (I/P J/B) 2. DOME Fuse (E/G Room J/B) 3. Integration Relay (I/P J/B) 4. Door Courtesy Switch (Driver's) 5. Ignition Switch 6. Wire Harness	– – BE–23 BE–39 BE–19 –
Headlight does not light with engine running and light control SW in OFF.	1. Headlight Bulb 2. ECU–B Fuse (E/G Room J/B) 3. GAUGE Fuse (E/G Room J/B) 4. HEAD LH Fuse (E/G Room J/B) 5. HEAD RH Fuse(E/G Room J/B) 6. HEAD HI (LH, RH) Fuse (Relay Block No.7) 7. Daytime Running Light Main Relay 8. Wire Harness 9. Other Parts*	– – – – – – BE–23 – –

*Terminal L of Alternator and Parking Brake Switch

Taillight: (w/ Daytime Running Light System)

Symptom	Suspect Area	See page
Taillight does not light. (Headlight does not light)	1. Integration Relay (I/P J/B) 2. Light Control Switch 3. Wire Harness	BE–23 BE–23 –
Taillight does not light. (Headlight is normal)	1. TAIL Fuse (I/P J/B) 2. Taillight Control Relay (I/P J/B) 3. Integration Relay (I/P J/B) 4. Light Control Switch 5. Wire Harness	– BE–23 BE–23 BE–23 –
Only one side light does not light.	1. Bulb 2. Wire Harness	– –
Rear Combination light does not light.	1. Bulb 2. Wire Harness	– –
"Light–On Warning System" does not operate.	1. GAUGE Fuse (I/P J/B) 2. Integration Relay (I/P J/B) 3. Door Courtesy Switch (Driver's) 4. Wire Harness	– BE–23 BE–39 –

2. HEADLIGHT BEAM LEVEL CONTROL SYSTEM

Symptom	Suspect Area	See page
Headlight beam level control system does not operate. (All)	1. HEAD (RH) Fuse (E/G J/B) 2. Headlight beam level control Switch 3. Headlight beam level control Actuator 4. Wire Harness	– BE–29 BE–29 –
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	BE–29 BE–29 –
Abnormal operation. (All)	1. Headlight beam level control Switch 2. Headlight beam level control Actuator 3. Wire Harness	BE–29 BE–29 –
Abnormal operation. (One side)	1. Headlight beam level control Switch 2. Headlight beam level control Actuator 3. Wire Harness	BE–29 BE–29 –

3. FOG LIGHT SYSTEM

Symptom	Suspect Area	See page
Front fog light does not light with light control switch TAIL or HEAD. (Headlight is normal.)	1. Bulb 2. FR FOG Fuse (I/P J/B) 3. Front fog light switch 4. Wire Harness	– – BE–32 –
Front fog light does not light with light control switch TAIL or HEAD. (Headlight does not light.)	1. Inspect Headlight and Taillight System 2. Wire Harness	BE–2 –
Only one front fog light does not light.	1. Bulb 2. Wire Harness	– –
Rear fog light does not light with light control switch TAIL or HEAD. (Headlight is normal.)	1. Bulb 2. DOME Fuse (E/G J/B) 3. Rear fog light switch 4. Wire Harness	– – BE–32 –
Rear fog light does not light with light control switch TAIL or HEAD. (Headlight does not light.)	1. Inspect Headlight and Taillight System 2. Wire Harness	BE–2 –
Only one rear fog light does not light.	1. Bulb 2. Wire Harness	– –

4. TURN SIGNAL AND HAZARD WARNING SYSTEM

Symptom	Suspect Area	See page
"Hazard" and "Turn" do not light up.	1. Hazard Warning Switch 2. Turn Signal Flasher 3. Wire Harness	BE–36 BE–36 –
The flashing frequency is abnormal.	1. Bulb 2. Turn Signal Switch 3. Wire Harness	– BE–36 –
Hazard warning light does not light up. (Turn is normal.)	1. HORN Fuse (E/G Room J/B) 2. Wire Harness	– –
Hazard warning light does not light up in one direction.	1. Hazard Warning Switch 2. Wire Harness	BE–36 –
*1Turn signal does not light up.	1. Ignition Switch 2. TURN Fuse (I/P J/B) 3. Turn Signal Switch 4. Wire Harness	BE–19 – BE–36 –
*2Turn signal does not light up.	1. TURN Fuse (I/P J/B) 2. Turn Signal Switch 3. Wire Harness	– BE–36 –
Turn signal does not light up in one direction.	1. Turn Signal Switch 2. Wire Harness	BE–36 –
Only one bulb does not light up.	1. Bulb 2. Wire Harness	– –

*1: Combination Meter, Wiper and Washer do not operate.
*2: Combination Meter, Wiper and Washer are normal.

5. INTERIOR LIGHT SYSTEM

Symptom	Suspect Area	See page
Only one interior light does not light up.	1. Bulb 2. Wire Harness	– –
Interior light does not light up (All).	1. DOME Fuse (E/G Room J/B) 2. Wire Harness	– –
Room light does not light up.	1. Bulb 2. Room Light 3. Wire Harness	– BE–39 –
Front Personal light does not light up.	1. Bulb 2. Front Personal Light 3. Wire Harness	– BE–39 –
Luggage compartment light does not light up.	1. Bulb 2. Luggage compartment door courtesy switch 3. Wire Harness	– BE–39 –
Rear Room light does not light up.	1. Bulb 2. Rear Room Light 3. Wire Harness	– BE–39 –
Illuminated entry system does not operate	1. Integration Relay (I/P J/B) 2. Room Light 3. Wire Harness	BE–23 – –

6. BACK–UP LIGHT SYSTEM

Symptom	Suspect Area	See page
Back–Up Light does not light up.	1. GAUGE Fuse (I/P J/B) 2. Ignition Switch 3. Wire Harness 4. Bulb	– BE–19 – –
Back–Up Light remains always on.	1. Back–Up Light Switch (M/X) 2. Neutral Start Switch (A/X) (A245E, A246E) 2. Neutral Start Switch (A/X) (A241E) 3. Wire Harness	BE–44 DI–91 DI–35 –
Only one light does not light up.	1. Bulb 2. Wire Harness	– –

7. STOP LIGHT SYSTEM

Symptom	Suspect Area	See page
Stop light does not light up.	1. STOP Fuse (I/P J/B) 2. Stop Light Switch 3. Wire Harness	– BE–47 –
Only one light always lights up.	1. Wire Harness	–
Only one light does not light.	1. Bulb 2. Wire Harness	– –

8. HEADLIGHT CLEANER SYSTEM

Symptom	Suspect Area	See page
Headlight cleaner system does not operate.	1. Ignition Switch 2. Headlight Cleaner Switch 3. Headlight Cleaner Relay 4. Headlight Cleaner Motor 5. Wire Harness	BE–19 BE–49 BE–49 BE–49 –

9. WIPER AND WASHER SYSTEM

Symptom	Suspect Area	See page
Front wiper and washers do not operate.	1. WIPER Fuse (I/P J/B) 2. Front Wiper Switch 3. Front Wiper Motor 4. Wire Harness	– BE–52 BE–52 –
Front wipers do not operate in LO or HI.	1. Front Wiper Switch 2. Front Wiper Motor 3. Wire Harness	BE–52 BE–52 –
Front wipers do not operate in INT.	1. Front Wiper Switch 2. Front Wiper Motor 3. Wire Harness	BE–52 BE–52 –
Front Washer motor does not operate.	1. Front Washer Switch 2. Front Washer Motor 3. Wire Harness	BE–52 BE–52 –
Front Wipers do not operate when washer switch in ON.	1. Front Washer Motor 2. Wire Harness	BE–52 –
Rear wiper and washers do not operate.	1. WIPER Fuse (I/P J/B) 2. Rear Wiper Switch 3. Rear Wiper Relay 4. Rear Wiper Motor 5. Wire Harness	– BE–52 BE–52 BE–52 –

Rear wipers do not operate in INT.	1. Rear Wiper Switch 2. Rear Wiper Relay 3. Rear Wiper Motor 4. Wire Harness	BE–52 BE–52 BE–52 –
Rear washer motor does not operate.	1. Rear Washer Switch 2. Rear Washer Motor 3. Wire Harness	BE–52 BE–52 –
Rear wipers do not operate when washer switch in ON.	1. Rear Washer Motor 2. Wire Harness	BE–52 –
Washer fluid does not operate.	1. Washer Hose and Nozzle	–
• At wiper switch HI position, the wiper blade is in contact with the body. • When the wiper switch is OFF, the wiper blade does not retract or the retract position wrong.	1. *1Wiper Switch 2. Wire Harness	BE–52 –

*1: Inspect wiper arm and blade set position

10. COMBINATION METER

Meter, Gauges and Illumination:

Symptom	Suspect Area	See page
Tachometer, Fuel Gauge and Engine Coolant Temperature Gauge does not operate.	1. GAUGE Fuse (I/P J/B) 2. Meter Circuit Plate 3. Wire Harness	BE–12 BE–57 –
Speedometer does not operate.	1. Vehicle Speed Sensor 2. Meter Circuit Plate 3. Wire Harness	BE–63 BE–60 BE–57
Tachometer does not operate.	1. Igniter 2. Pick–up Sensor (Diesel Engine) 3. Meter Circuit Plate 4. Wire Harness	– BE–63 BE–60 –
Fuel Gauge does not operate or abnormal operation.	1. Fuel Receiver Gauge 2. Fuel Sender Gauge 3. Meter Circuit Plate 4. Wire Harness	BE–63 BE–63 BE–60 –
Engine Coolant Temperature Gauge does not operate or abnormal operation.	1. Engine Coolant Temperature Receiver Gauge 2. Engine Coolant Temperature Sender Gauge 3. Meter Circuit Plate 4. Wire Harness	BE–63 BE–63 BE–60 –
All illumination lights do not light up.	1. TAIL Fuse (I/P J/B) 2. Light Control Rheostat 3. Wire Harness	– – –
Brightness does not change even when rheostat turned.	1. Bulb 2. Wire Harness	– –
Only one illumination light does not light up.	1. Bulb 2. Wire Harness	– –

Warning Lights:

Symptom	Suspect Area	See page
Warning light do not light up. (Except Discharge, Open Door and SRS)	1. GAUGE Fuse (I/P J/B) 2. Meter Circuit Plate 3. Wire Harness	– BE–60 –
Fuel Filter warning light does not light up.	1. Bulb 2. Fuel Filter Warning Switch 3. Meter Circuit Plate 4. Wire Harness	– BE–63 BE–60 –
Low Oil Pressure warning light does not light up.	1. Bulb 2. Low Oil Pressure Warning Switch 3. Meter Circuit Plate 4. Wire Harness	– BE–63 BE–60 –
ABS warning light does not light up.	1. Bulb 2. ABS ECU 3. Wire Harness	– DI–113 –
Discharge warning light does not light up.	1. IGN Fuse (I/P J/B) 2. Bulb 3. Wire Harness 4. Alternator	– – – –
Brake warning light does not light up.	1. Bulb 2. Parking Brake Switch 3. Brake Fluid Level Warning Switch 4. Vacuum Switch (Diesel Engine) 5. Meter Circuit Plate 6. Wire Harness	– BE–63 BE–63 BE–63 BE–60 –
SRS Warning light does not light up.	1. ECU–B Fuse (E/G Room J/B) 2. Bulb 3. Airbag Sensor Assembly (RS section) 4. Meter Circuit Plate 5. Wire Harness	– – DI–150 BE–60 –
Open Door warning light does not light up.	1. DOME Fuse (E/G Room J/B) 2. Bulb 3. Door Courtesy Switch 4. Meter Circuit Plate 5. Wire Harness	– – BE–39 BE–60 –
Check Engine Warning light does not light up.	1. Bulb 2. Engine and ECT ECU 3. Meter Circuit Plate 4. Wire Harness	– – BE–60 –

Indicator Lights:

Symptom	Suspect Area	See page
O/D OFF indicator light does not light up.	1. Bulb 2. O/D OFF Switch (A245E, A246E) 3. O/D OFF Switch (A241E) 3. Meter Circuit Plate 4. Wire Harness	– DI–100 DI–42 BE–60 –
Glow Plug indicator light does not light up.	1. Bulb 2. Glow Plug Timer 3. Meter Circuit Plate 4. Wire Harness	– – BE–60 –
Rear Fog Light indicator light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. Fog Light System	– BE–60 – BE–32
High beam indicator light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. Headlight System	– BE–60 – BE–23
Turn indicator light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. Turn Signal and Hazard Warning System	– BE–60 – BE–36
Shift indicator lights do not light up.	1. Bulb 2. Meter Circuit Plate 3. Neutral Start Switch (A245E, A246E) 3. Neutral Start Switch (A241E) 4. Wire Harness	– BE–60 DI–91 DI–35 –
Only one shift indicator does not light up.	1. Bulb 2. Meter Circuit Plate	– –
Indicator lights do not light up. (Except Turn, Hi–beam and security)	1. GAUGE Fuse (I/P J/B) 2. Wire Harness	– –

11. DEFOGGER SYSTEM

Symptom	Suspect Area	See page
All defogger systems do not operate.	1. RR DEF M–Fuse (I/P J/B) 2. Defogger Relay (I/P J/B) 3. Defogger Switch 4. Wire Harness	– BE–71 BE–71 –
Rear window defogger does not operate.	1. Defogger Wire 2. Choke Coil 3. Wire Harness	BE–71 – –
Mirror defogger does not operate.	1. Mirror Defogger 2. Wire Harness	BE–71 –

12. POWER WINDOW CONTROL SYSTEM

Symptom	Suspect Area	See page
Power window does not operate (ALL). (Power Door Lock does not operate)	1. POWER M–Fuse (I/P J/B) 2. Power Main Relay (I/P J/B) 3. Wire Harness	– BE–81 –
Power window does not operate (ALL). (Power Door Lock is normal)	1. Ignition Switch 2. Power Window Master Switch 3. Wire Harness	BE–19 BE–81 –
Only one window glass does not move.	1. Power Window Master Switch 2. Power Window Switch 3. Power Window Motor 4. Wire Harness	BE–81 BE–81 BE–81 –
"Window Lock System" does not operate.	1. Power Window Master Switch	BE–81
Automatic operation for the driver's door does not operate.	1. TROUBLESHOOTING No.1	BE–74
The down operation starts at the almost–closed position while the up operation.	1. TROUBLESHOOTING No.2	BE–74
The down operation starts at other position than the almost–closed position while the up operation.	1. TROUBLESHOOTING No.3	BE–74
The down operation does not work though some other objects are caught into the window glass.	1. TROUBLESHOOTING No.4	BE–74

13. POWER DOOR LOCK CONTROL SYSTEM

Symptom	Suspect Area	See page
"Door lock system" does not operate at all.	1. POWER M–Fuse (I/P J/B) 2. CIG Fuse (I/P J/B) 3. DOOR Fuse (I/P J/B) 4. Integration Relay (I/P J/B) 5. Wire Harness	– – – BE–94 –
Door lock system does not operate by manual switch.	1. Power Window Master Switch 2. Door Lock Manual Switch 3. Integration Relay (I/P J/B) 4. Wire Harness	BE–81 BE–81 BE–94 –
Door lock system does not operate by door key.	1. Door Key Lock and Unlock Switch 2. Integration Relay (I/P J/B) 3. Wire Harness 4. Door Lock Link Disconnected	BE–81 BE–94 – –
Fault in 2–Operation unlock function of Driver's side door key lock and unlock switch.	1. Door Key Lock and Unlock Switch 2. Integration Relay (I/P J/B) 3. Wire Harness	BE–81 BE–94 –
Fault in key confine prevention operate.	1. Integration Relay (I/P J/B) 2. Key Unlock Warning Switch 3. Door Courtesy Switch 4. Wire Harness	BE–94 BE–19 BE–39 –
Only one door lock does not operate.	1. Door Lock Motor 2. Wire Harness	BE–81 –

14. SLIDING ROOF SYSTEM

Symptom	Suspect Area	See page
Sliding roof system does not operate. (Door Lock does not operate)	1. POWER M–Fuse (I/P J/B) 2. Power Main Relay (I/P J/B) 3. Wire Harness	– BE–81 –
Sliding roof system does not operate. (Door Lock is normal)	1. Ignition Switch 2. Sliding Roof Control Assembly and Switch 3. Wire Harness	BE–19 BE–104 –
Sliding roof system operates abnormally.	1. Sliding Roof Control Assenbly and Switch 2. Wire Harness	BE–104 –
Sliding roof system stops operation half way. (Stones of foreign material trapped in motor assembly)	1. Sliding Roof Control Assenbly and Switch 3. Wire Harness	BE–104 BE–104

15. SEAT HEATER SYSTEM

Symptom	Suspect Area	See page
Seat heaters do not operate. (Driver's and Passenger's)	1. SEAT–HTR Fuse (I/P J/B) 2. Wire Harness	– –
Driver's seat heater do not operate.	1. Seat Heater Switch 2. Seat Heater 3. Wire Harness	BE–112 BE–112 –
Passenger's seat heater do not operate.	1. Seat Heater Switch 2. Seat Heater 3. Wire Harness	BE–112 BE–112 –
Seat heater temperature is too high.	1. Seat Heater	BE–112

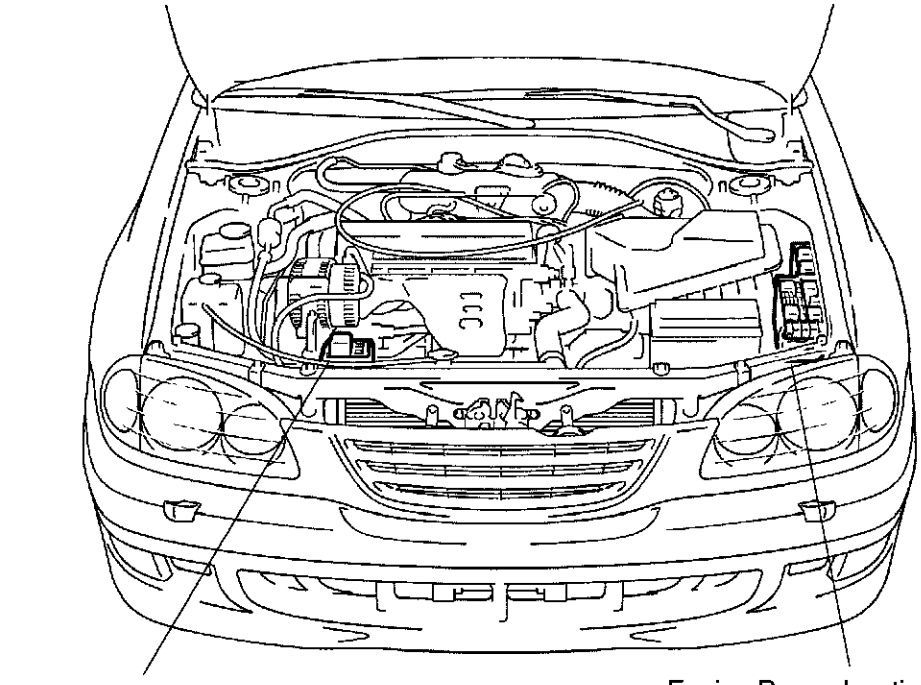
16. POWER MIRROR CONTROL SYSTEM

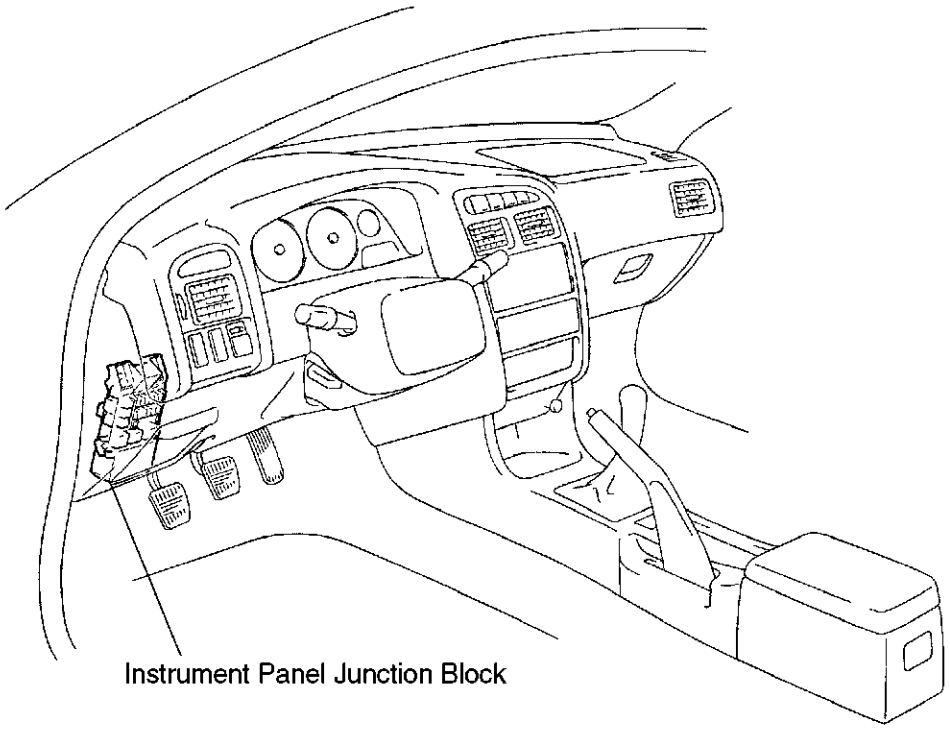
Symptom	Suspect Area	See page
Mirror does not operate.	1. CIG Fuse (I/P J/B) 2. Mirror Switch 3. Mirror Motor 4. Wire Harness	– BE–108 BE–108 –
Mirror operates abnormally.	1. Mirror Switch 2. Mirror Motor 3. Wire Harness	BE–108 BE–108 –

POWER SOURCE

LOCATION

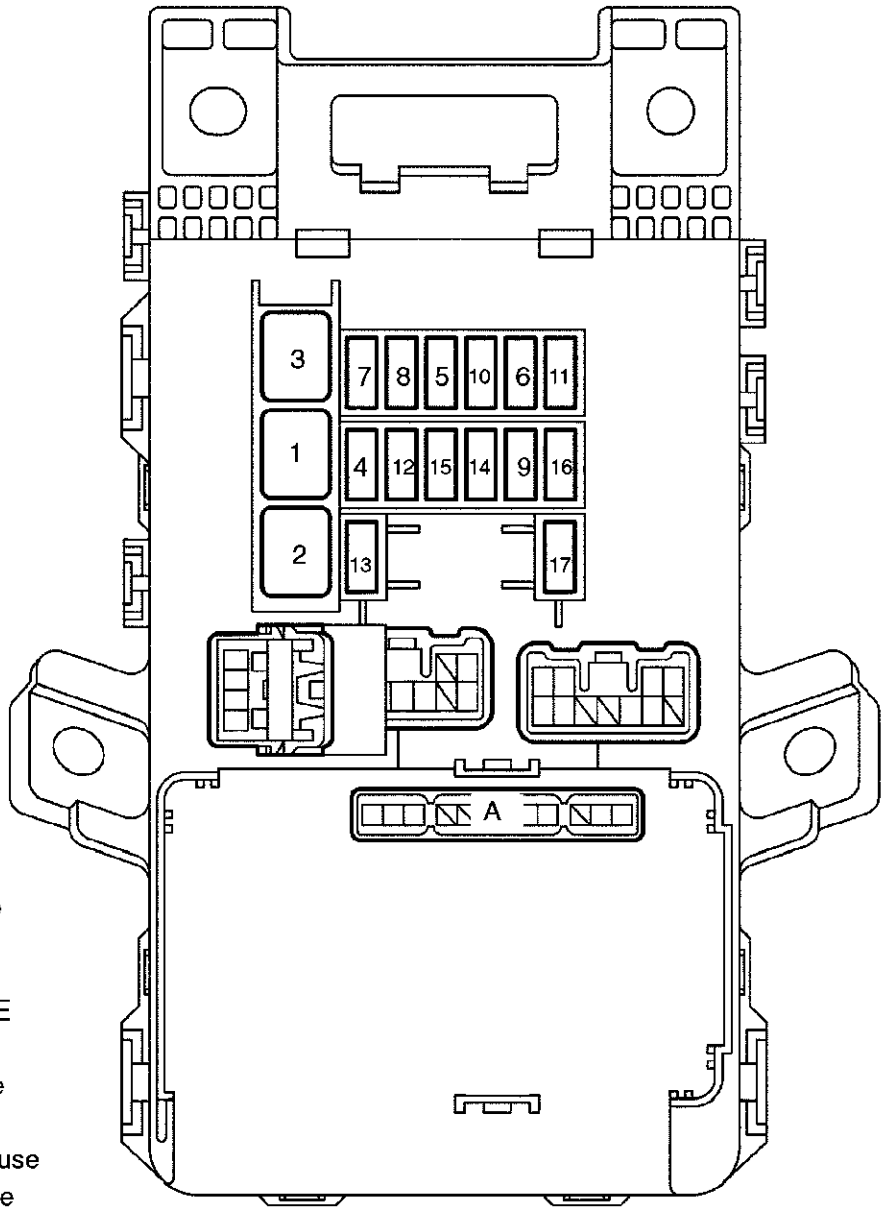
BE0NM–01





I04782

• **Instrument Panel Junction Block (Surface Side)**



Fuses:

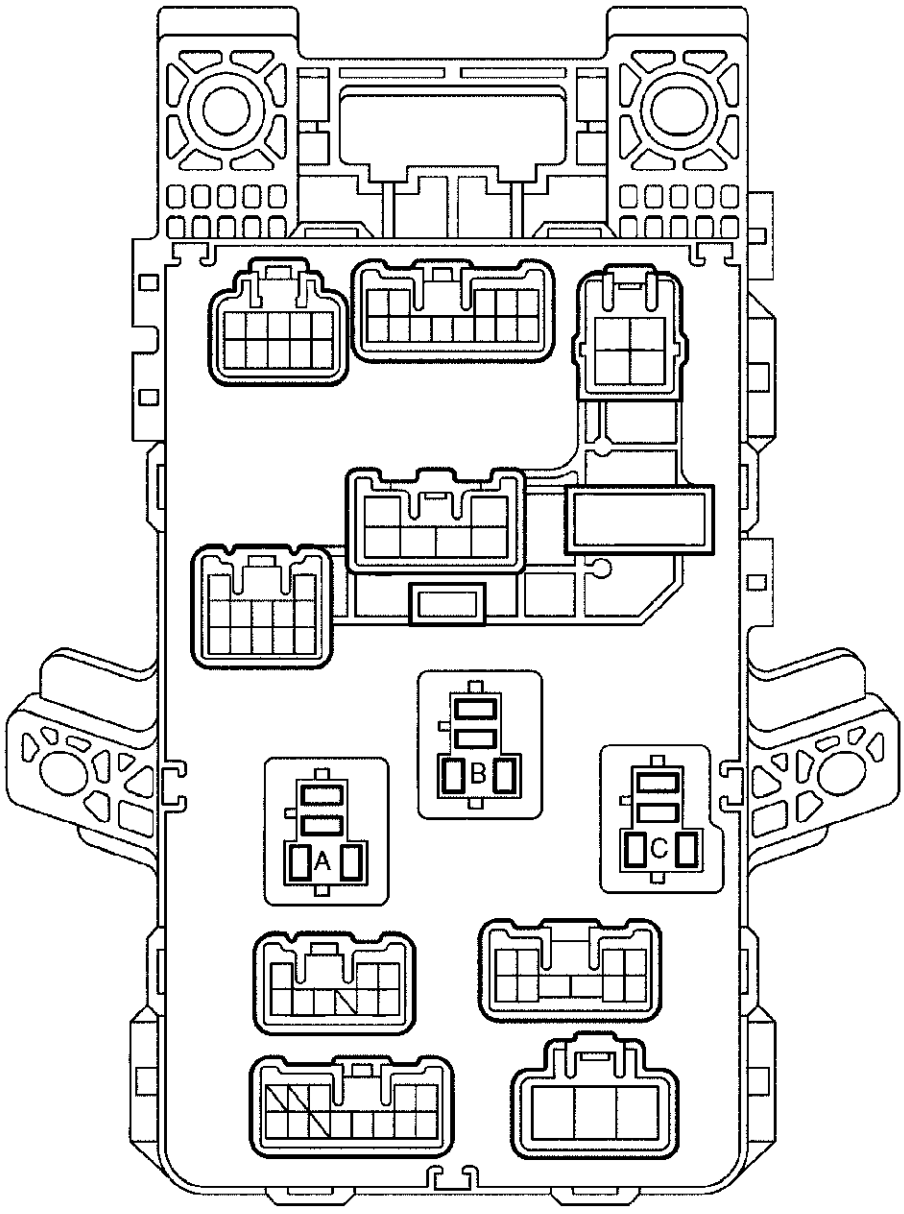
1. AM1 Fuse
2. RR DEF Fuse
3. PWR Fuse
4. DOOR Fuse
5. FR DEF FUSE
6. WIP Fuse
7. FR FOG Fuse
8. S/HTR Fuse
9. RAD & CIG Fuse
10. GAUGE Fuse
11. IGN Fuse
12. TAIL Fuse
13. STOP Fuse
14. TURN Fuse
15. ST Fuse
16. ECU–IG Fuse
17. RR DEF I/UP Fuse

Relay:

A. Integration Relay

I04783

● **Instrument Panel Junction Block (Back Side)**

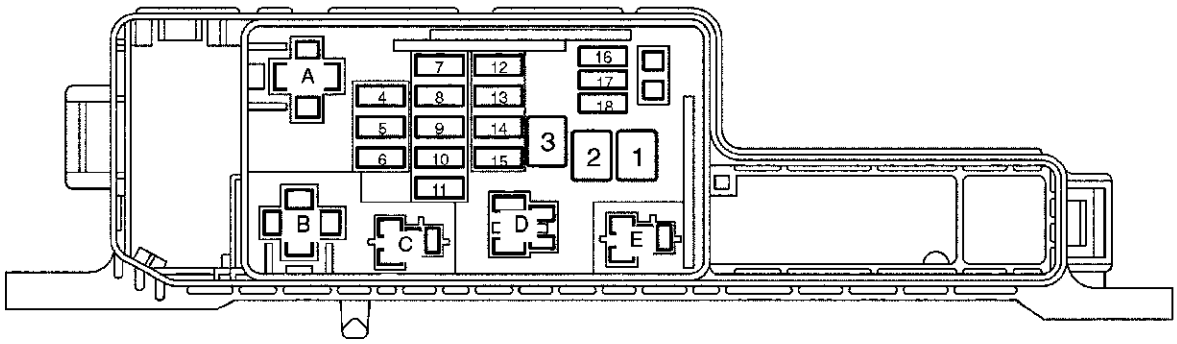


Relays:

A. Rear Defogger Realy
B. Power Relay
C. Tail Relay

I04784

● **Engine Room Junction Block (Surface Side)**



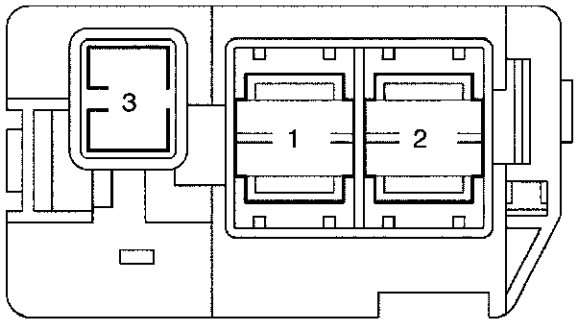
Fuses:

1. MAIN
2. FAN MAIN
3. FAN SUB
4. DOME Fuse
5. HLP–RH Fuse
6. ECU–B Fuse
7. AM2 Fuse
8. RAD Fuse
9. SHORT PIN
10. HLP–LH Fuse
11. HORN Fuse
12. ALT–S Fuse
13. HLP–CLN Fuse
14. HAZ Fuse
15. EFI Fuse
16. SPARE
17. SPARE
18. SPARE

Relays:

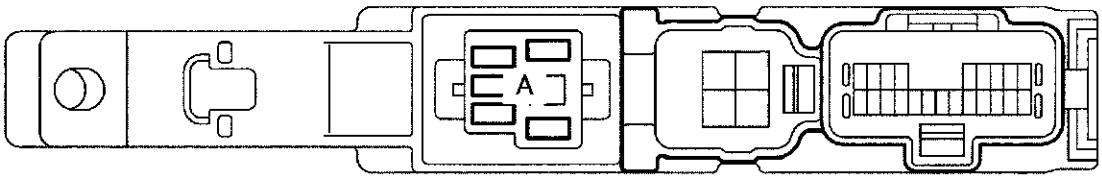
A. Fan No.1 Relay
B. Starter Relay
C. Horn Relay
D. Headlight Relay
E. EFI Relay

● **Fusible Link Block**



Fuses:
1. ALT Fuse
2. ABS Fuse
3. HTR Fuse

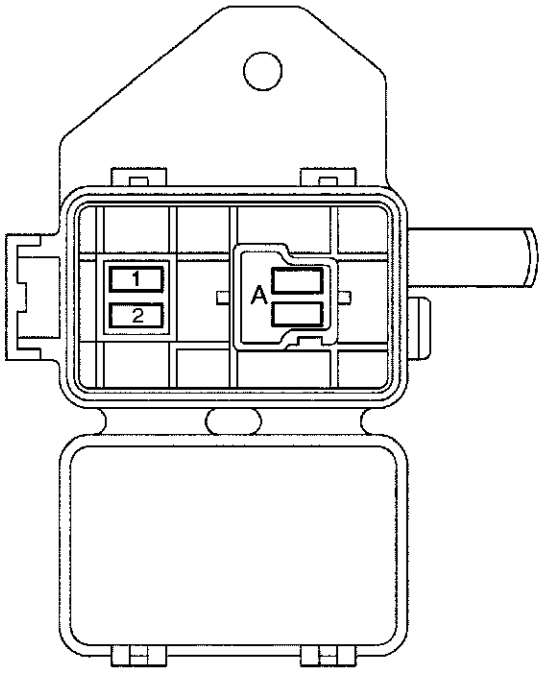
● **Passenger Side Relay Block (No.4 Relay Block)**



Relay:
A. Heater Relay

I04786

● **Relay Block No.7**



Fuses:
1. H–LP RH HI Fuse
2. H–LP LH HI Fuse

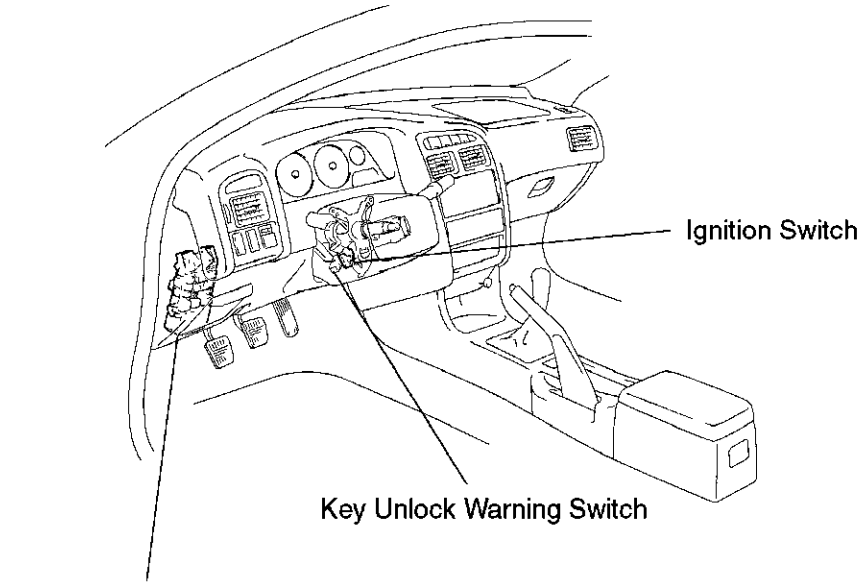
Relay:
A. DIMMER Relay

I04787

IGNITION SWITCH AND KEY UNLOCK WARNING SWITCH

BE01L–04

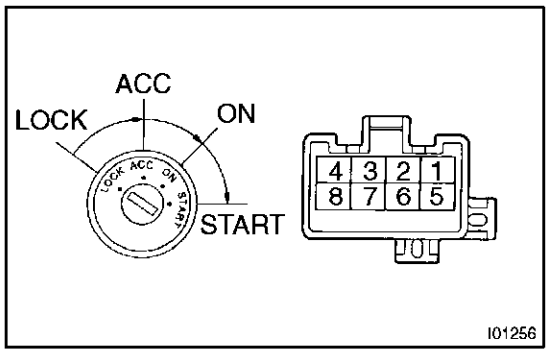
LOCATION



Instrument Panel Junction Block
- GAUGE Fuse

I04788

BE0NN–01

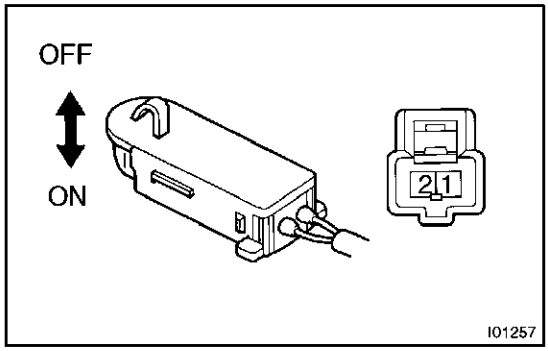


INSPECTION

1. INSPECT IGNITION SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	–	No continuity
ACC	2 – 3	Continuity
ON	2 – 3 – 4 6 – 7	Continuity
START	1 – 2 – 4 6 – 7 – 8	Continuity

If continuity is not as specified, replace the switch.



2. INSPECT KEY UNLOCK WARNING SWITCH CONTINUITY

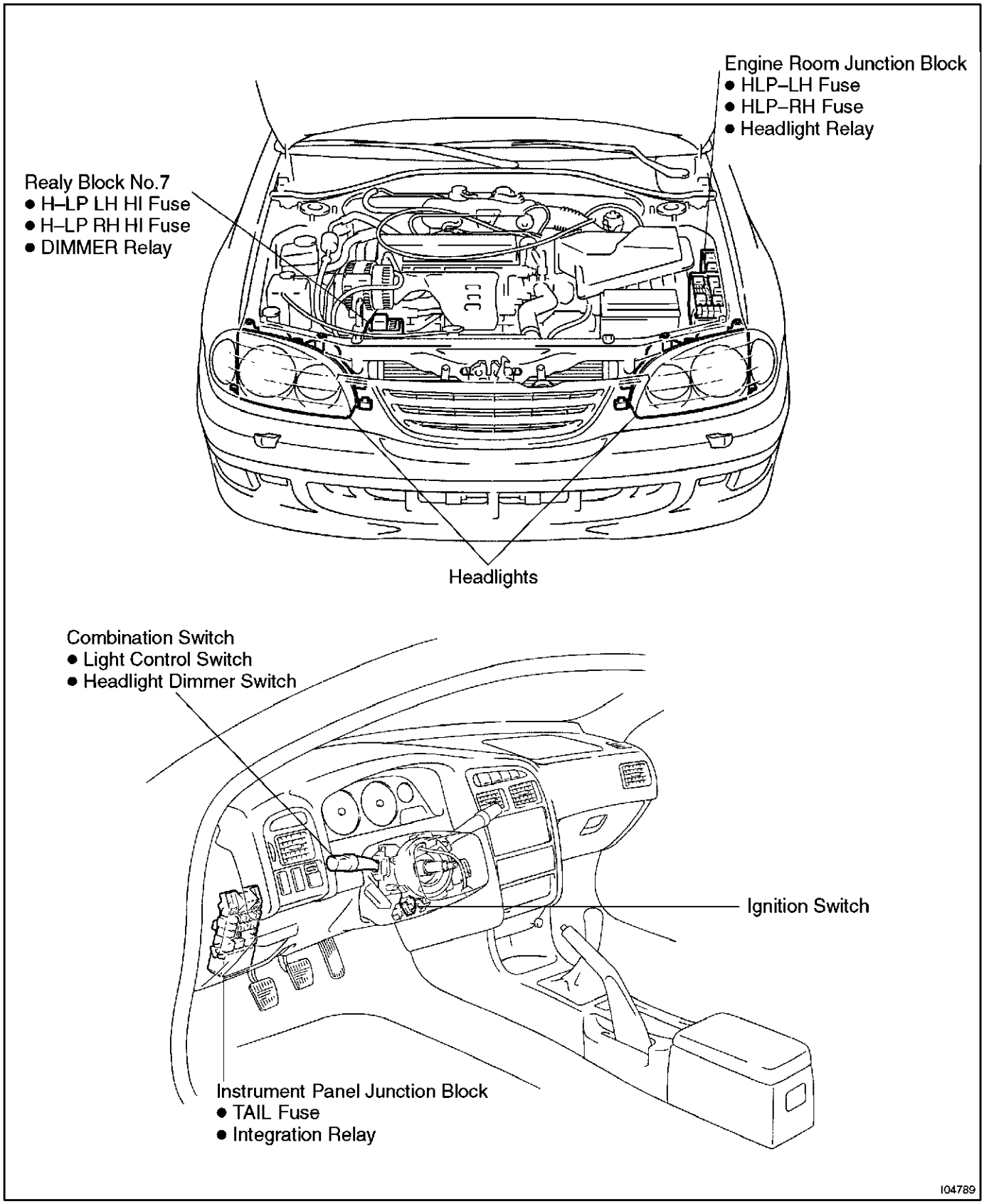
Switch position	Tester connection	Specified condition
OFF (Key removed)	–	No continuity
ON (Key set)	1 – 2	Continuity

If continuity is not as specified, replace the switch.

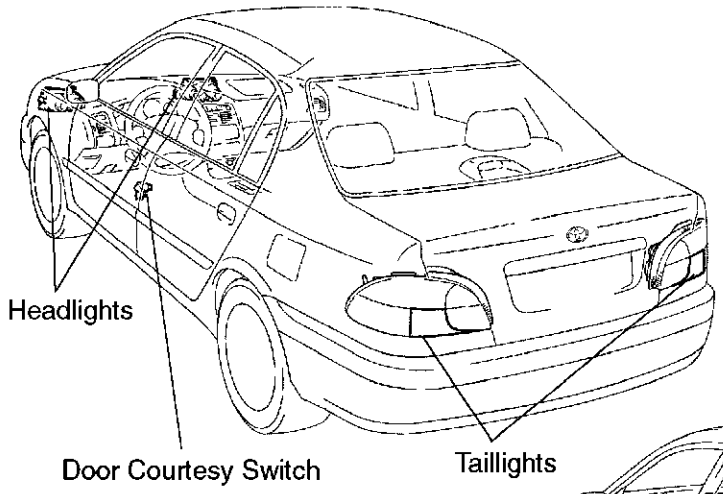
HEADLIGHT AND TAILLIGHT SYSTEM

BE0NO-01

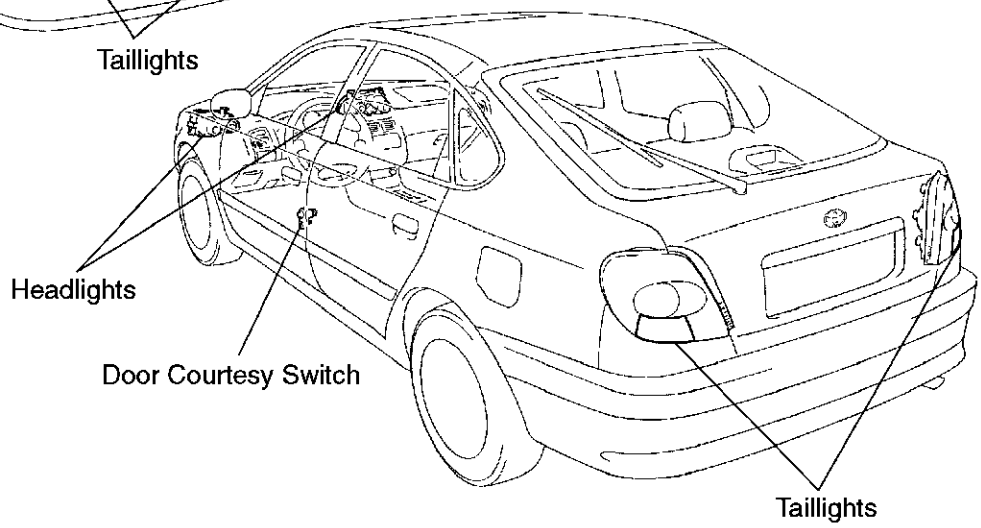
LOCATION



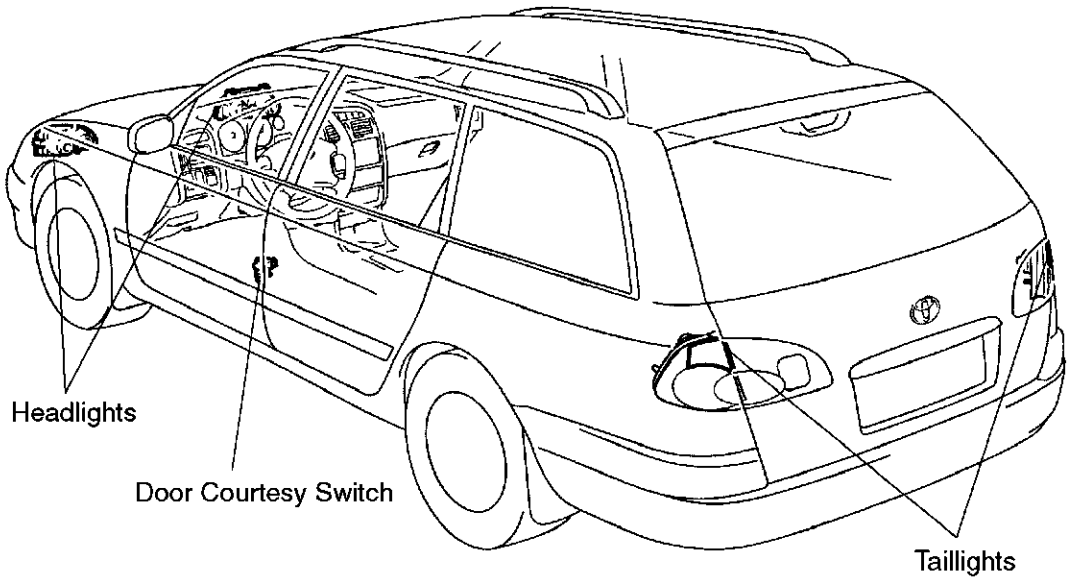
Sedan Model:



Liftback Model:



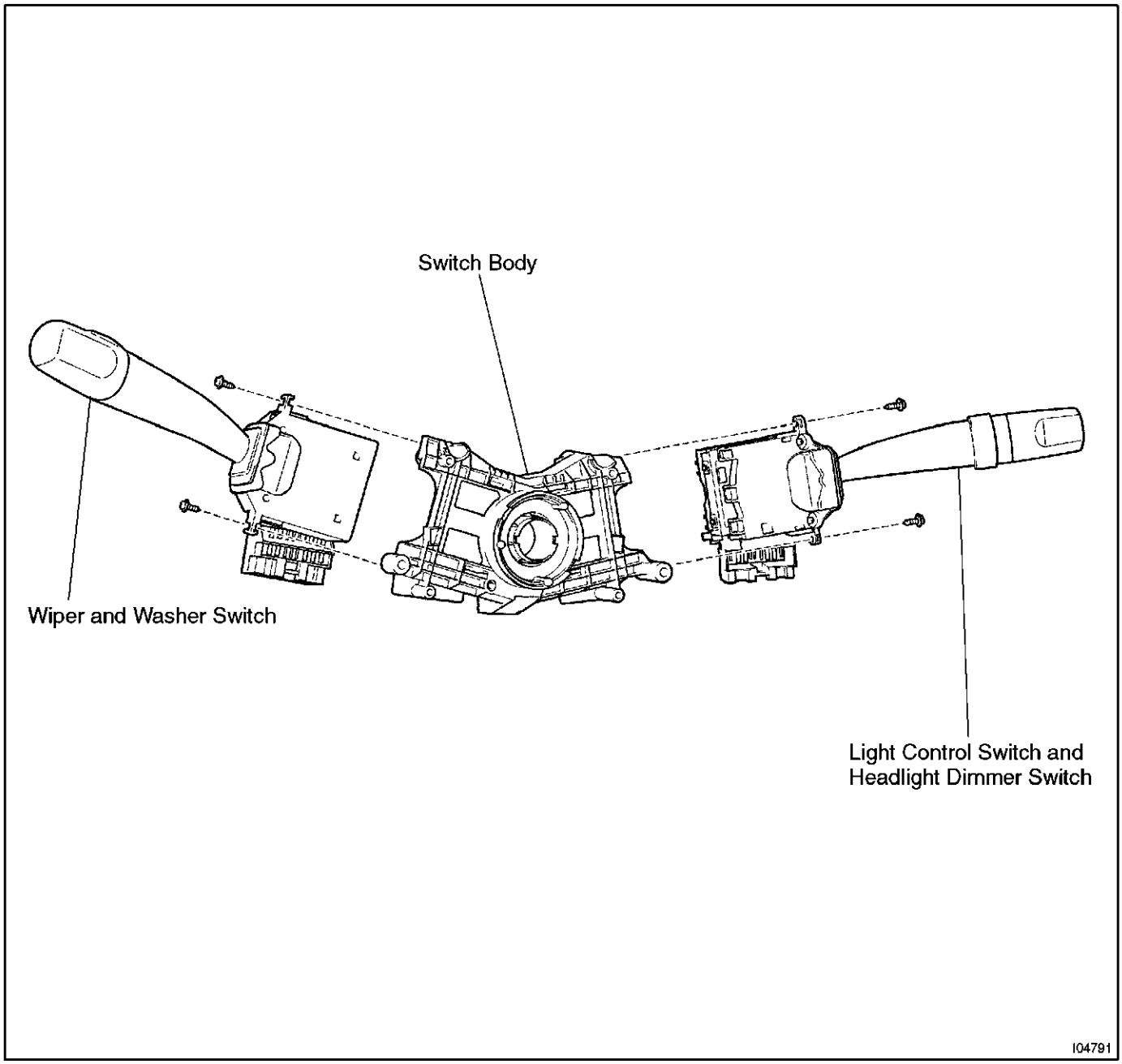
Wagon Model:



I04790

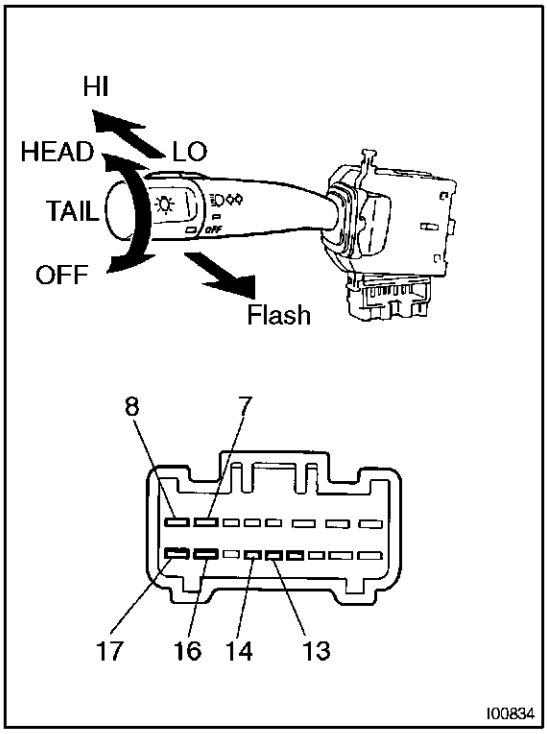
BE01O–02

COMPONENTS



BE01P–02

INSPECTION



1. LHD Models:
INSPECT LIGHT CONTROL SWITCH CONTINUITY

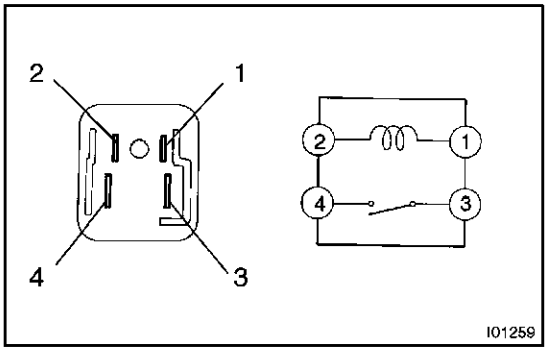
Switch position	Tester connection	Specified condition
OFF	–	No continuity
TAIL	14 – 16	Continuity
HEAD	13 – 14 – 16	Continuity

If continuity is not as specified, replace the switch.

2. LHD Models:
INSPECT HEADLIGHT DIMMER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Low beam	16 – 17	Continuity
High beam	7 – 16	Continuity
Flash	7 – 8 – 16	Continuity

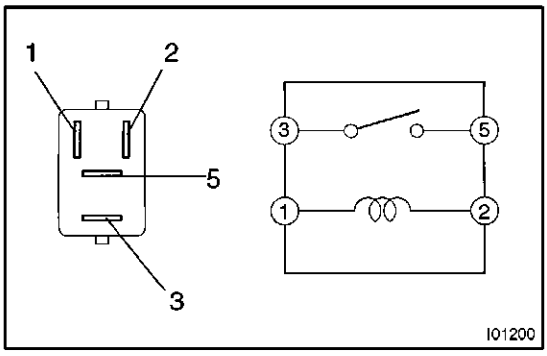
If continuity is not as specified, replace the switch.



3. INSPECT HEADLIGHT CONTROL RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminal 1 and 2.	3 – 4	Continuity

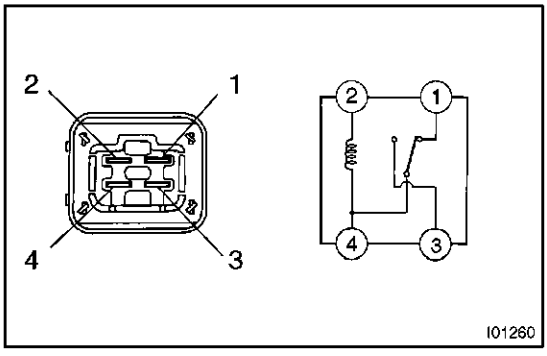
If continuity is not as specified, replace the relay.



4. INSPECT TAILLIGHT CONTROL RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminal 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.

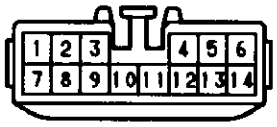


5. INSPECT HEADLIGHT DIMMER RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 4 2 – 4	Continuity
Apply B+ between terminal 2 and 4.	1 – 3 – 4	Continuity

If continuity is not as specified, replace the relay.

Wire Harness Side



e–14–1–A

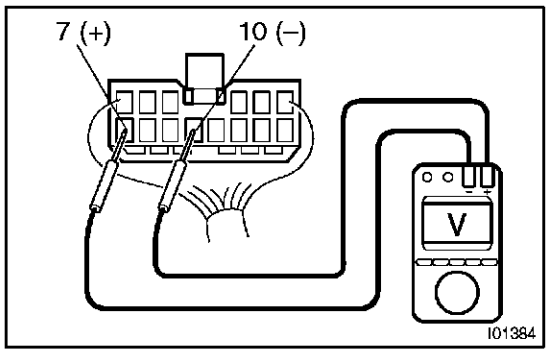
I01326

6. INSPECT DAYTIME RUNNING LIGHT MAIN RELAY CIRCUIT

Disconnect the connector from the relay and inspect the connector on the wire harness side.

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 LOW beam or HIGH beam	No continuity
6 – Ground	Headlight dimmer switch FLASH	Continuity
7 – Ground	Constant	Continuity
10 – Ground	Constant	Continuity
13 – Ground	Headlight dimmer switch LOW beam	No continuity
13 – Ground	Headlight dimmer switch HIGH beam or FLASH	Continuity
1 – Ground	Ignition switch LOCK or ACC	No voltage
1 – Ground	Ignition switch ON or START	Battery voltage
3 – Ground	Constant	Battery voltage
5 – Ground	Constant	Battery voltage
8 – Ground	Engine Stop	No voltage
8 – Ground	Engine Running	Battery voltage
9 – Ground	Constant	No voltage
9 – Ground	Ground terminal 3	Battery voltage
11 – Ground	Constant	No voltage
11 – Ground	Ground terminal 3	Battery voltage
12 – Ground	Constant	Battery voltage
14 – Ground	Constant	No voltage
14 – Ground	Ground terminal 5	Battery voltage

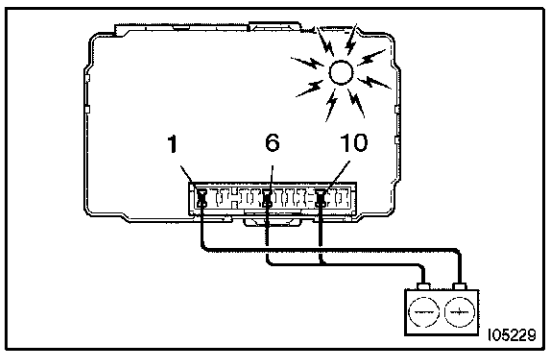
If circuit is specified, try replacing the relay with a new one.
If circuit is not as specified, inspect the circuits connected to other parts.



7. INSPECT DAYTIME RUNNING LIGHT MAIN RELAY OPERATION

(a) Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (–) lead to terminal 10.

(b) Check that there is battery voltage with the light control switch turned to ON.



8. INSPECT LIGHT–ON WARNING SYSTEM (INSPECT INTEGRATION RELAY OPERATION)

(a) Connect the positive (+) lead from the battery to terminal 1.

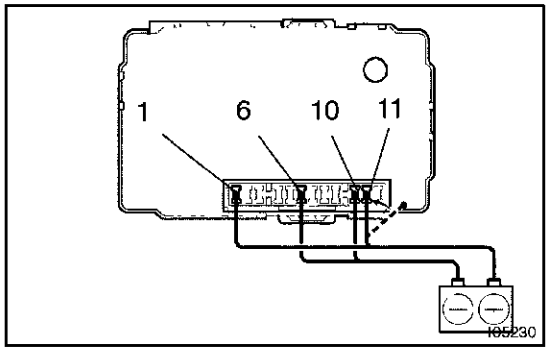
(b) Connect the negative (–) lead from the battery to terminals 6 and 10.

(c) Check that the bulb lights and the buzzer sounds for **4 – 8** seconds.

(d) Return to step (a), and operate sounding the buzzer again.

(e) Connect the positive (+) lead from the battery to terminal 11.

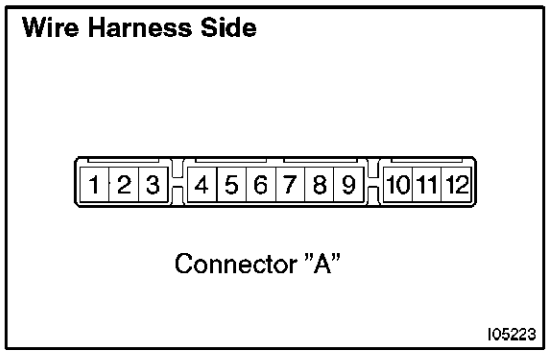
(f) Check that the buzzer stops sounding.



HINT:

Check the buzzer sounds within a period of 4 to 8 seconds.

If operation is as specified, replace the relay.



9. INSPECT INTEGRATION RELAY CIRCUIT

Wire harness side :

Disconnect the connector from the integration relay and inspect the connectors on the wire harness side.

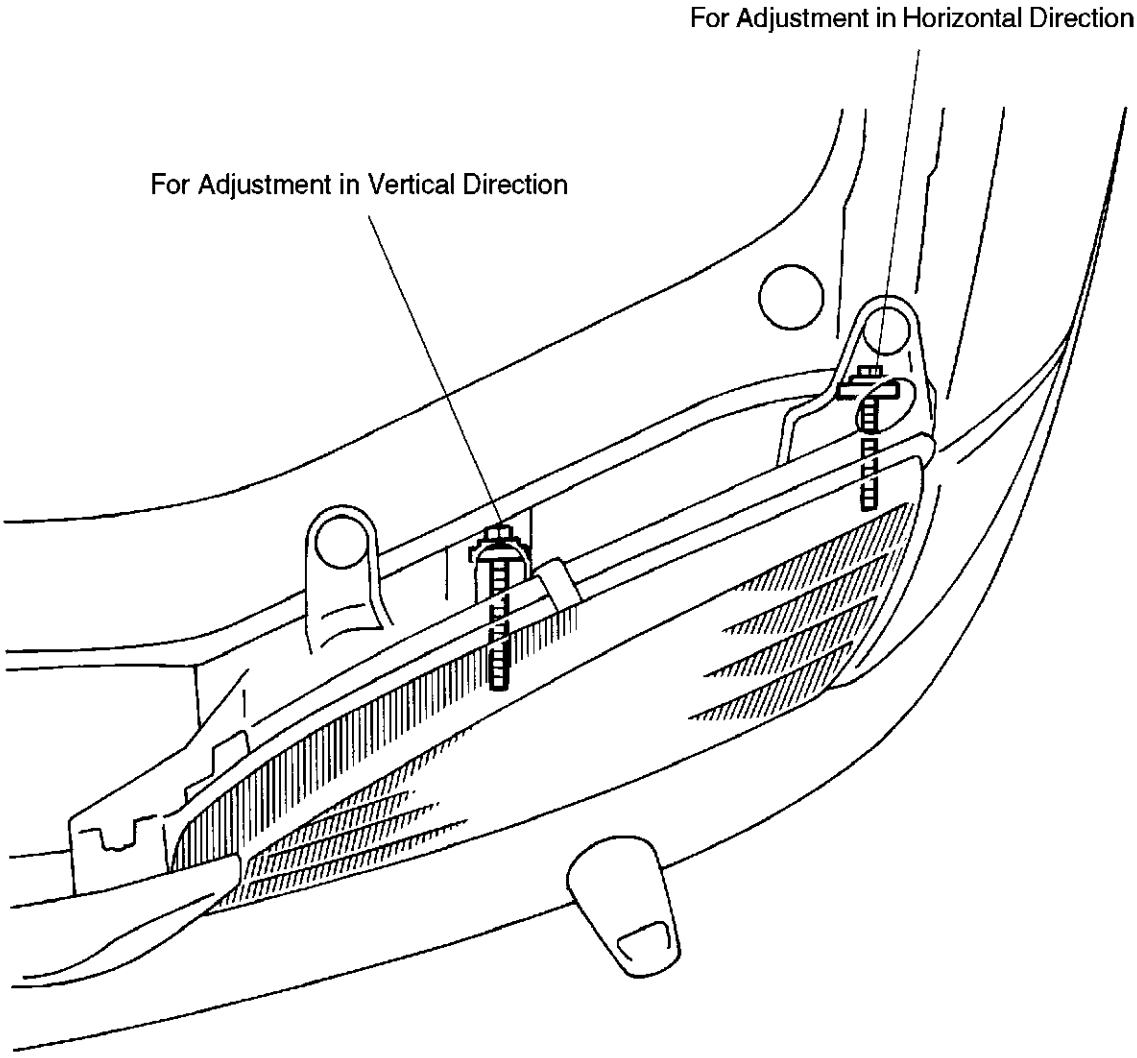
Tester connection	Condition	Specifiedcondition
A4 – Ground	Front passenger's door and rear door courtesy switch OFF	No continuity
A4 – Ground	Front passenger's door and rear door courtesy switch ON	Cntinuity
A6 – Ground	Driver's door courtesy switch OFF	No continuity
A6 – Ground	Driver's door courtesy switch ON	Continuity
A10 – Ground	Constant	Continuity
A1 – Ground	Constant	Battry Voltage

A7 – Ground	Ignition switch LOCK or ACC	No voltage
A7 – Ground	Ignition switch ON	Battery voltage
A11 – Ground	Ignition switch LOCK	No voltage
A11 – Ground	Ignition switch ACC or ON	Battery voltage
A12 – Ground	Light control switch OFF	No voltage
A12 – Ground	Light control switch TAIL or HEAD	Battery voltage
A2 – Ground	Interior light OFF	No voltage
A2 – Ground	Interior light ON	Battery voltage

If the circuit is not as specified, inspect the circuits connected to other parts.

BE01Q–02

ADJUSTMENT

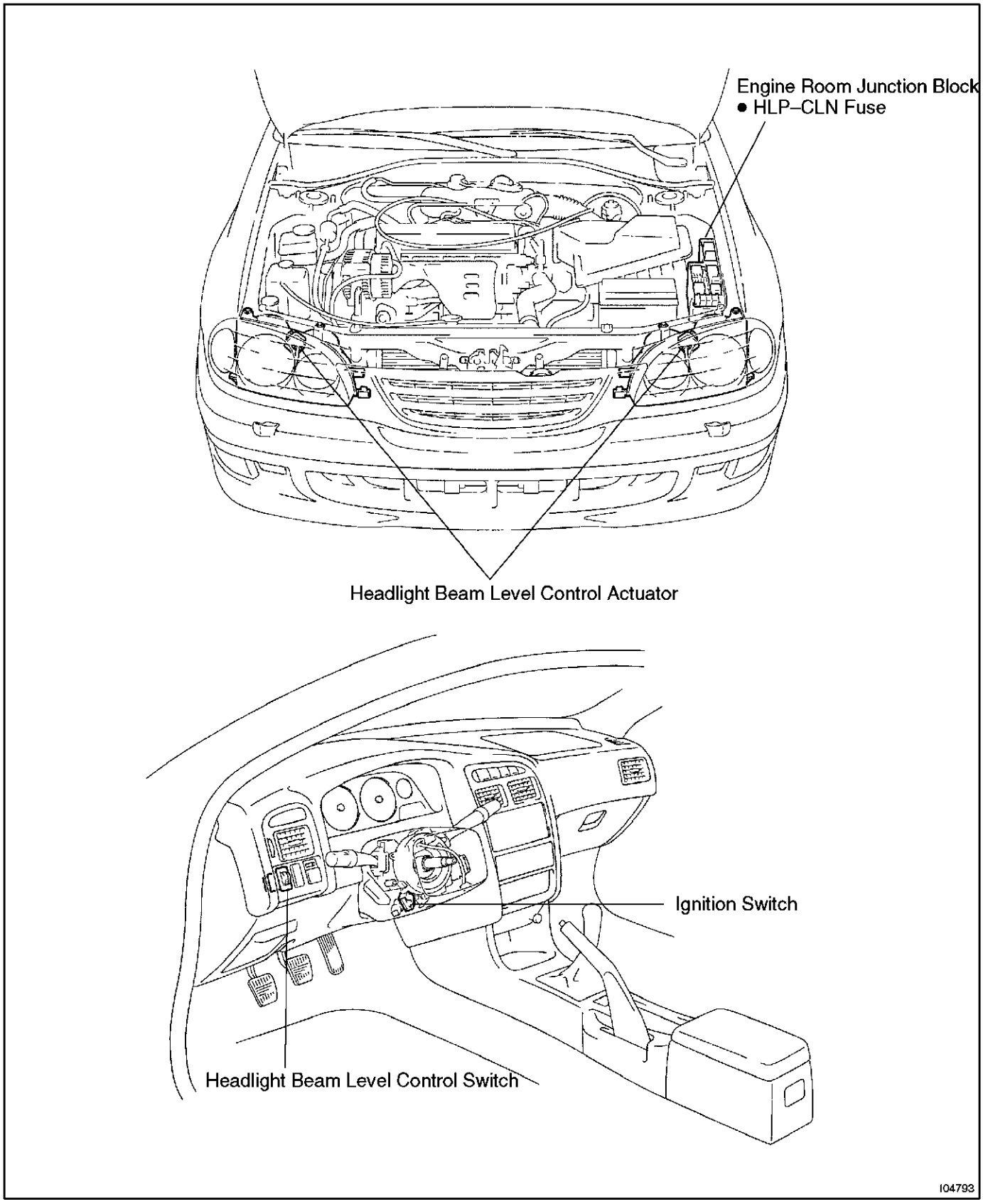


I04792

HEADLIGHT BEAM LEVEL CONTROL SYSTEM

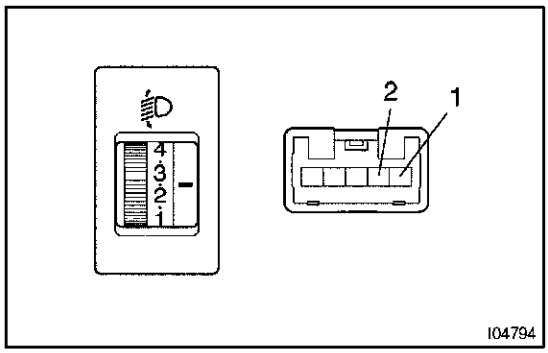
BE01R–04

LOCATION



BE01S–02

INSPECTION

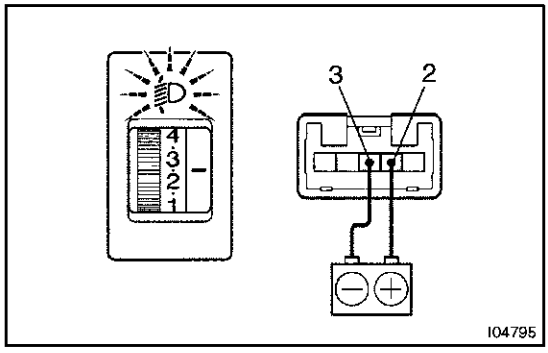


1. INSPECT HEADLIGHT BEAM LEVEL CONTROL SWITCH RESISTANCE

Measure the resistance between terminals 1 and 2.

Switch position	Resistance (kΩ)
0	1.4 – 1.6
1	1.6 – 1.8
2	1.8 – 2.0
3	2.0 – 2.3
4	2.4 – 2.7
5	2.8 – 3.2

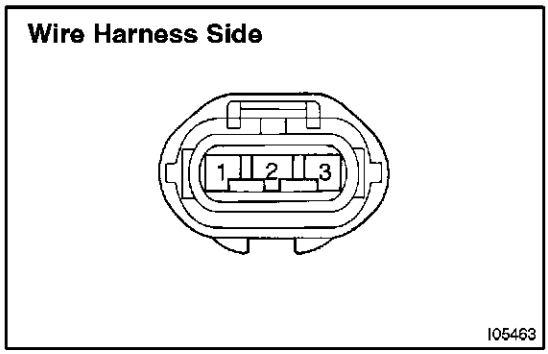
If resistance value is not as specified, replace the switch.



2. INSPECT HEADLIGHT BEAM LEVEL CONTROL SWITCH ILLUMINATION

Connect the positive (+) lead from the battery to terminal 3 and negative (–) lead to terminal 6 and check that the illumination light lights up.

If operation is not as specified, replace the switch.



3. INSPECT HEADLIGHT BEAM LEVEL CONTROL ACTUATOR CIRCUIT

Disconnect the connector from the switch and inspect the connector on wire harness side, as shown in the trable below.

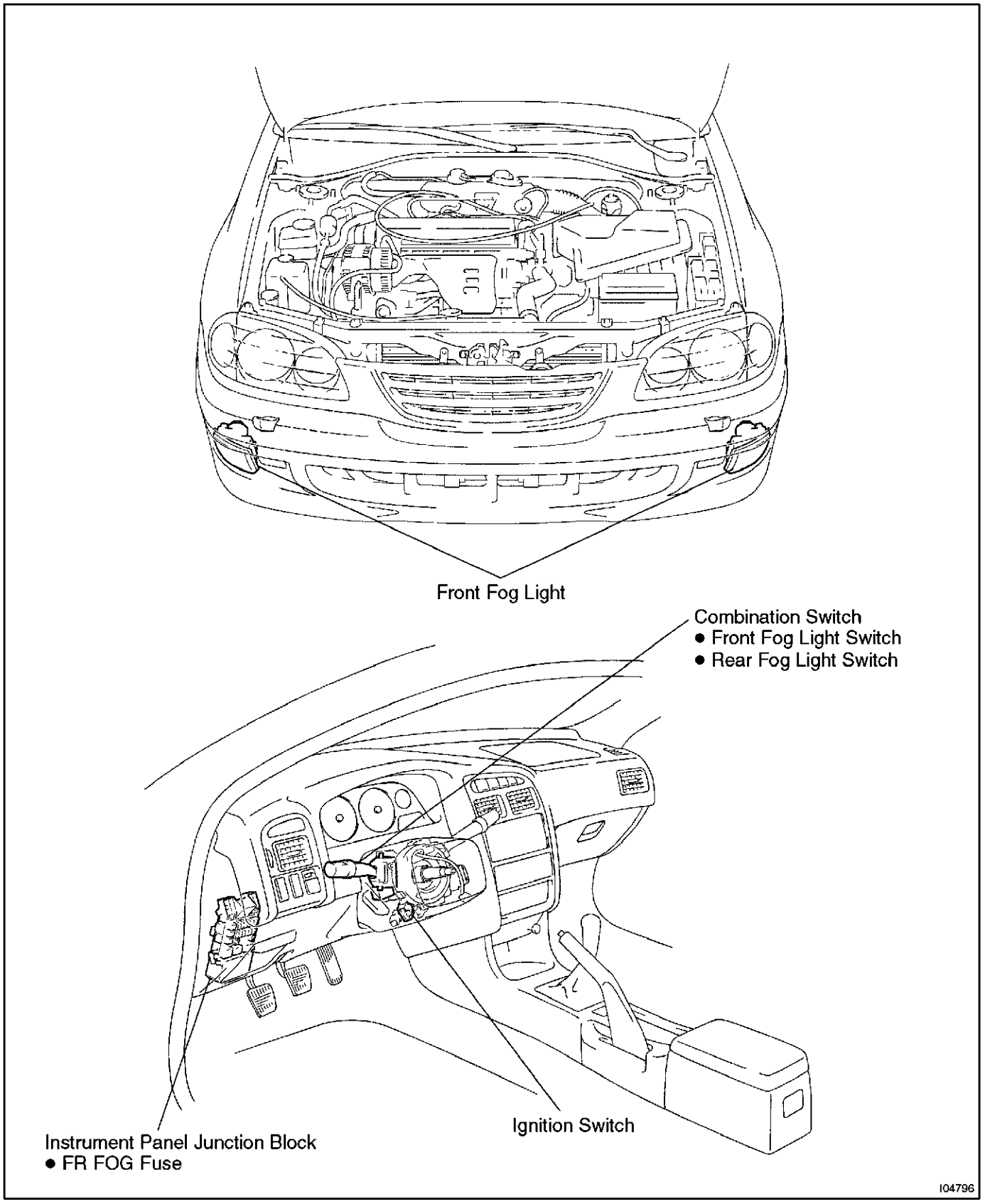
Tester connection	Condition	Specifiedcondition
1 – Ground	Constant	Continuity
3 – Ground	Constant	Battery voltage

If the circuit is not as specified, replace the actuator.

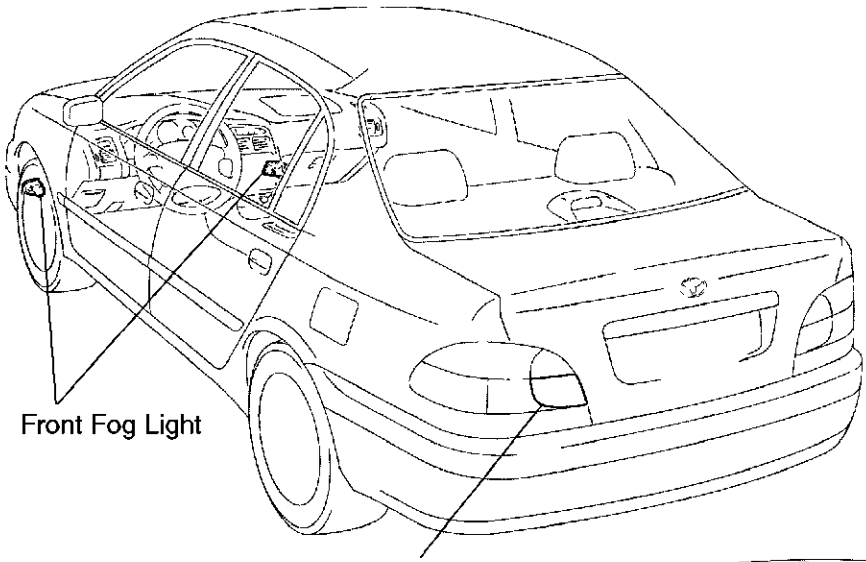
FOG LIGHT SYSTEM

LOCATION

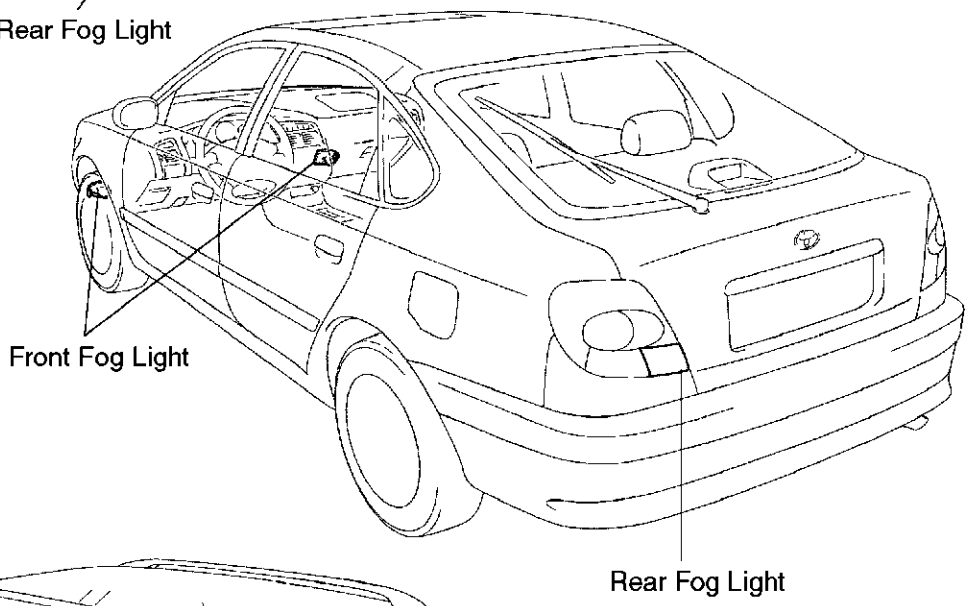
BE0NP–01



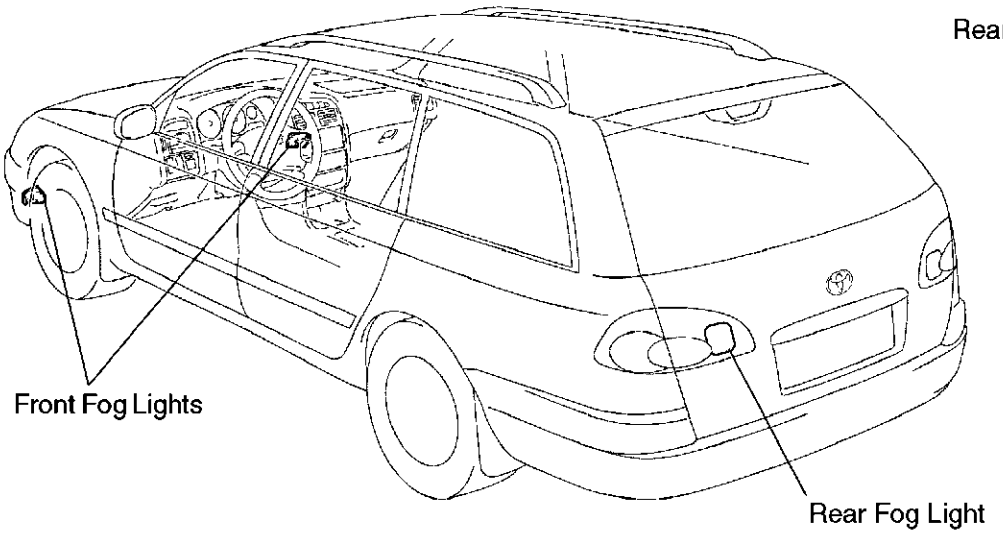
Sedan Model:



Liftback Model:



Wagon Model:

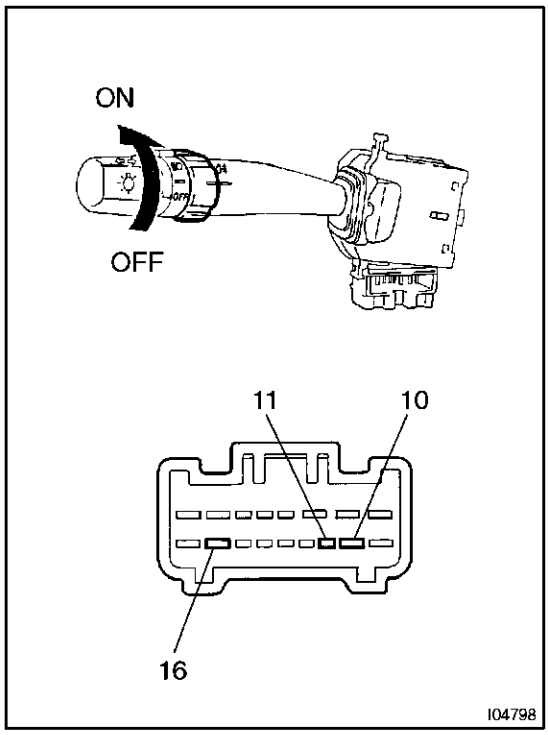


I04797

BE0NQ-01

INSPECTION

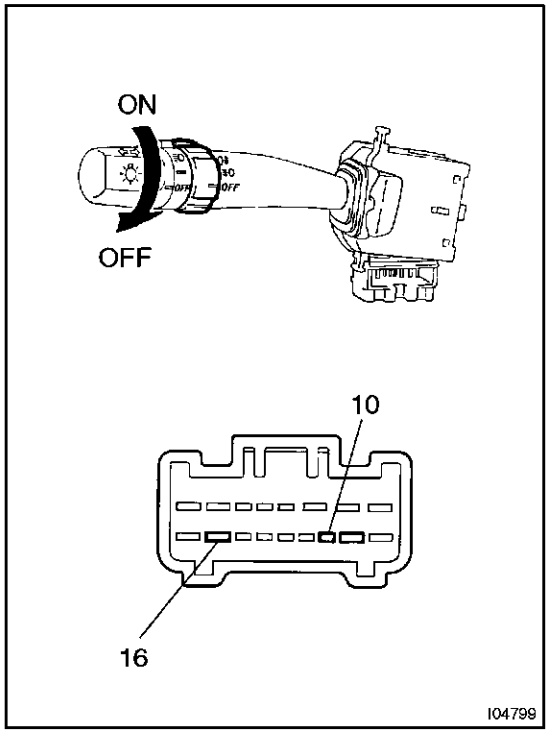
1. INSPECT FRONT/REAR FOG LIGHT SWITCH CONTINUITY



Switch position	Tester connection	Specified condition
OFF	–	No continuity
ON (FRONT)	11 – 16	Continuity
ON (FRONT/REAR)	10 – 11 – 16	Continuity

If continuity is not as specified, replace the switch.

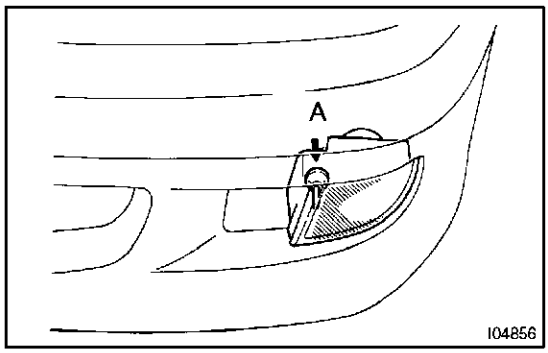
2. INSPECT REAR FOG LIGHT SWITCH CONTINUITY



Switch position	Tester connection	Specified condition
OFF	–	No continuity
ON	10 – 16	Continuity

If continuity is not as specified, replace the switch.

BE0NR–01



ADJUSTMENT

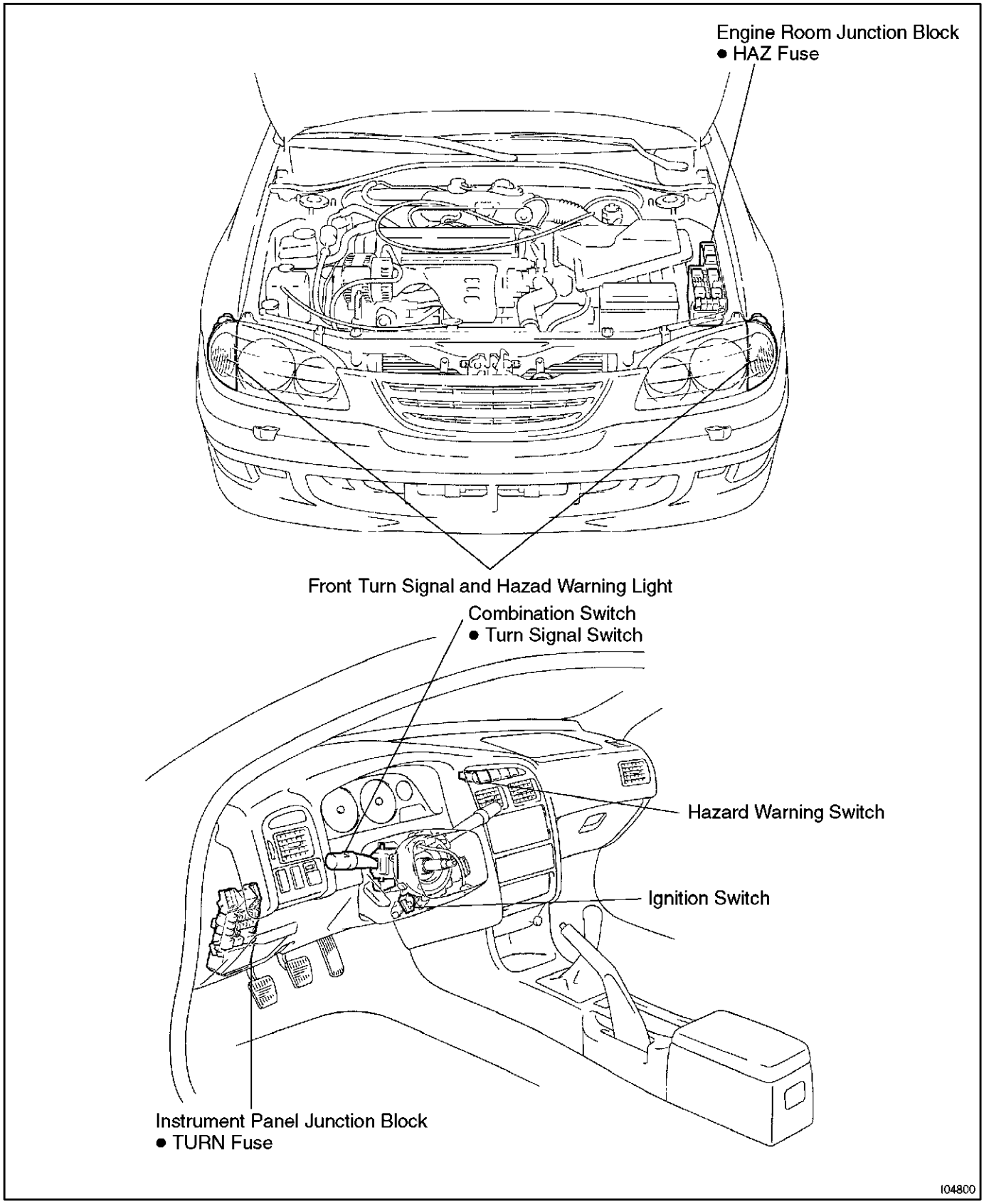
ADJUST FOG LIGHT AIM

The fog light aim can be adjusted by moving the A–bolt in the vertical direction.

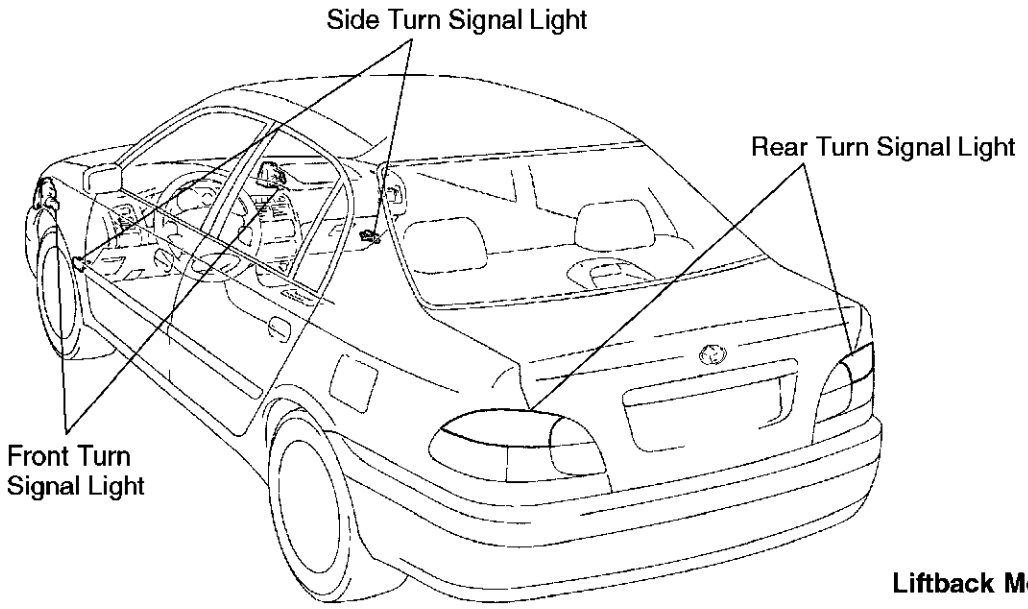
TURN SIGNAL AND HAZARD WARNING SYSTEM

BE0NS–01

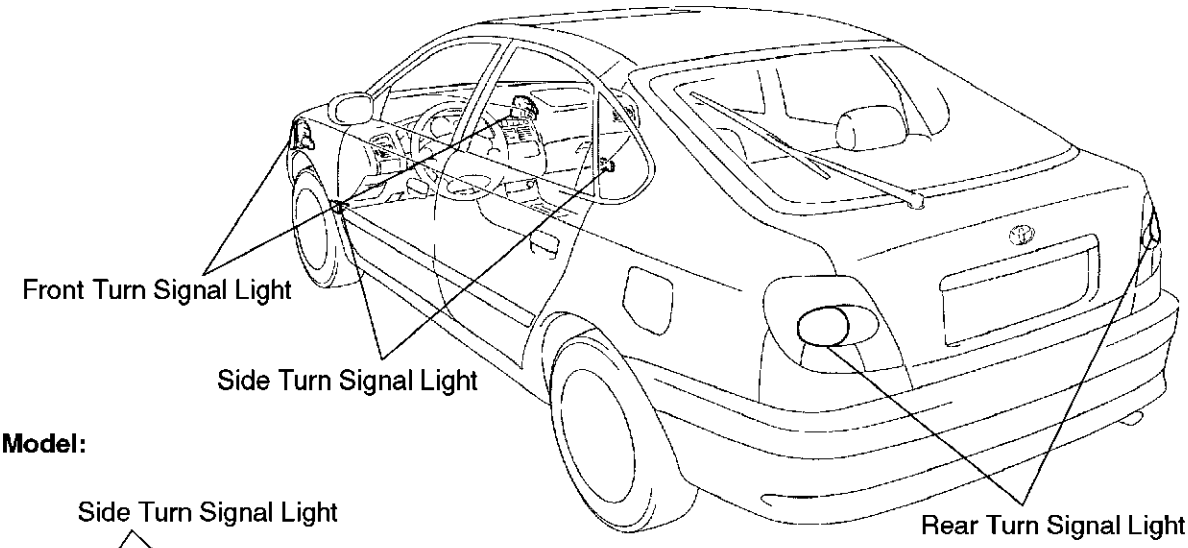
LOCATION



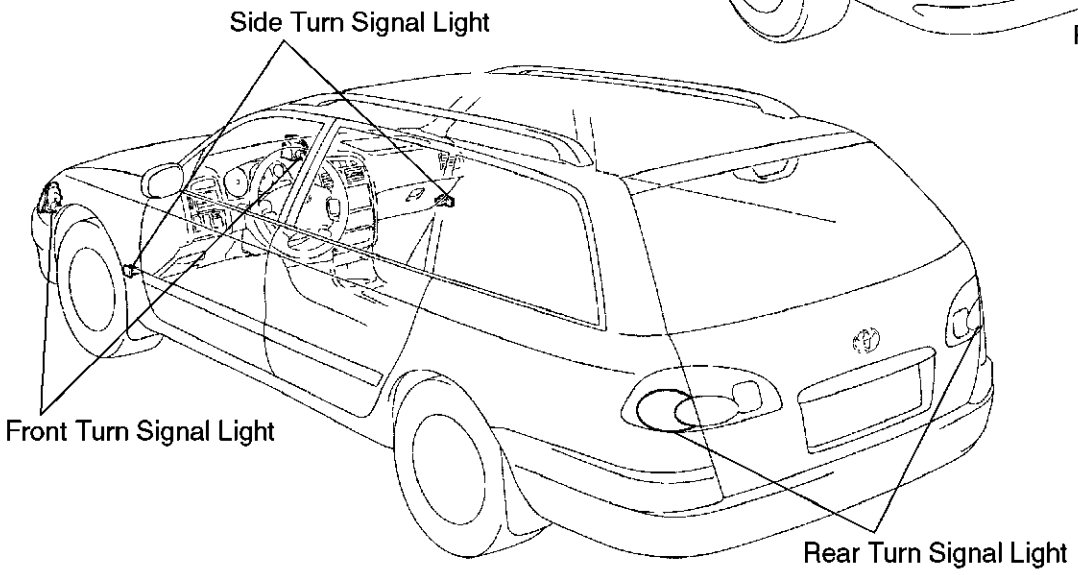
Sedan Model:



Liftback Model:



Wagon Model:

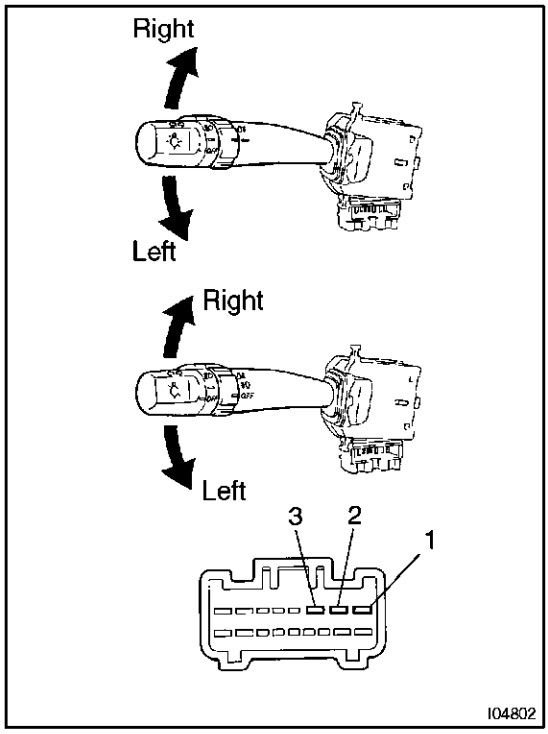


I04801

BE0NT–01

INSPECTION

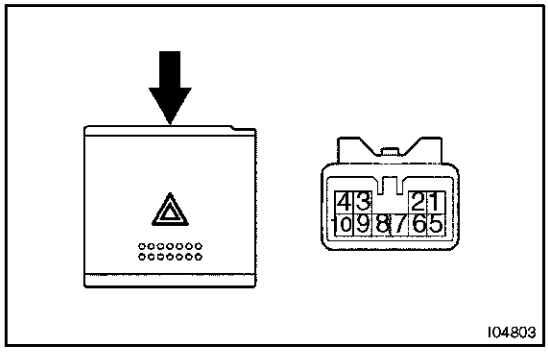
1. INSPECT TURN SIGNAL SWITCH CONTINUITY



Switch position	Tester connection	Specified condition
Left turn	1 – 2	Continuity
Neutral	–	No continuity
Right turn	2 – 3	Continuity

If continuity is not as specified, replace the switch.

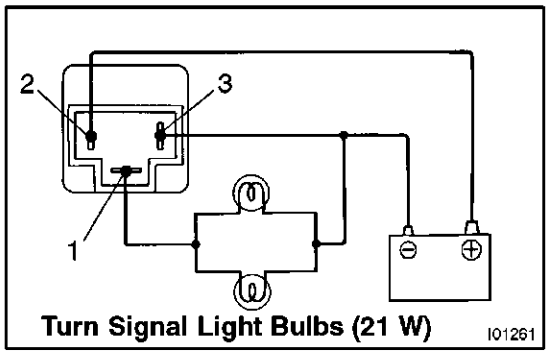
2. INSPECT HAZARD WARNING SWITCH CONTINUITY



Switch position	Tester connection	Specified condition
Switch OFF	7 – 10	Continuity
Switch ON	5 – 6 – 9 7 – 8	Continuity
Illumination circuit	2 – 3	Continuity

If continuity is not as specified, replace the switch.

3. INSPECT TURN SIGNAL FLASHER OPERATION



(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 3.

(b) Connect the 2 turn signal light bulbs in parallel to each other to terminals 1 and 3, check that the bulbs flash.

HINT:

The turn signal lights should flash 60 to 120 times per minute.

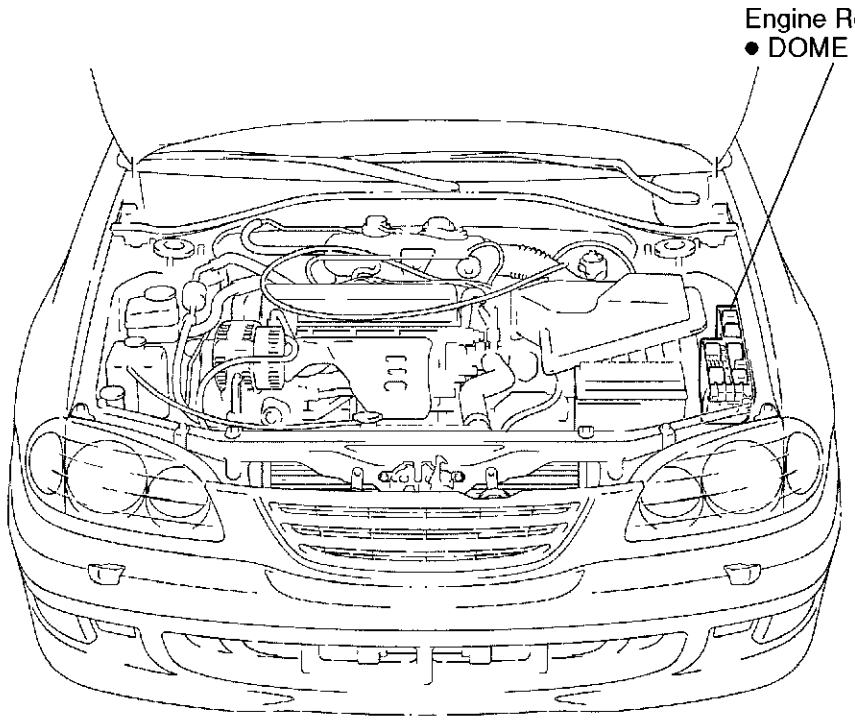
If one of the front or rear turn signal lights has an open circuit, the number of flashes will be more than 140 per minute.

If operation is not as specified, replace the flasher.

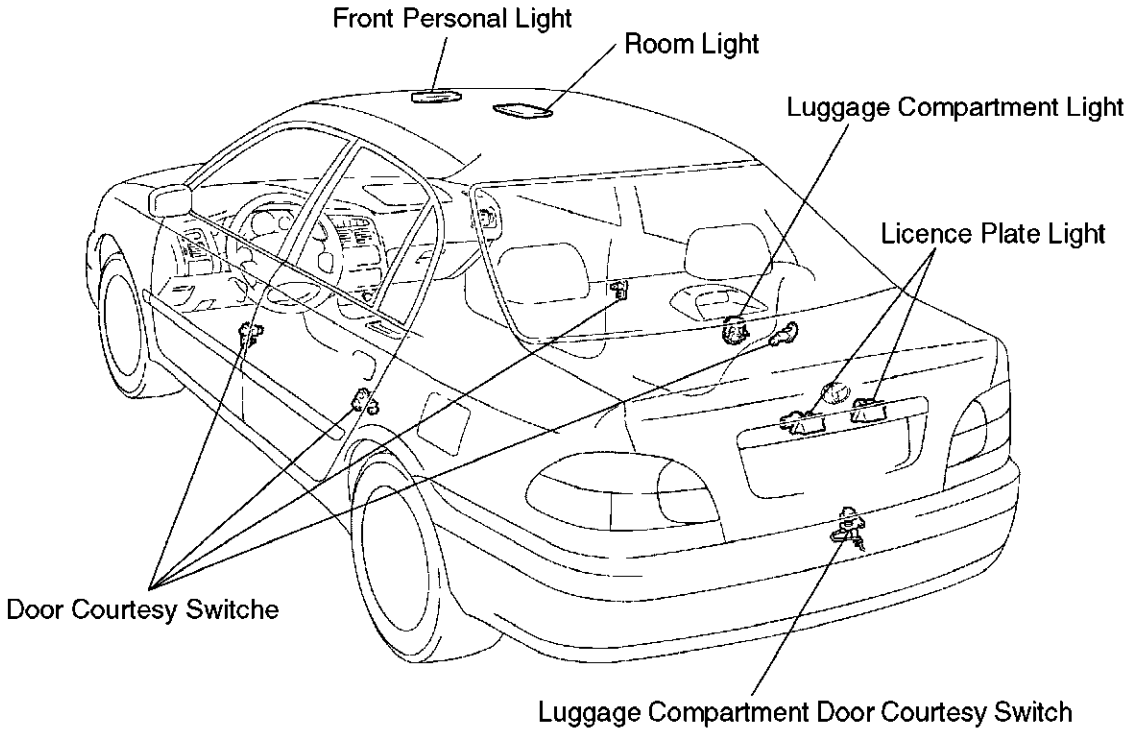
INTERIOR LIGHT SYSTEM

LOCATION

BE0NU–01

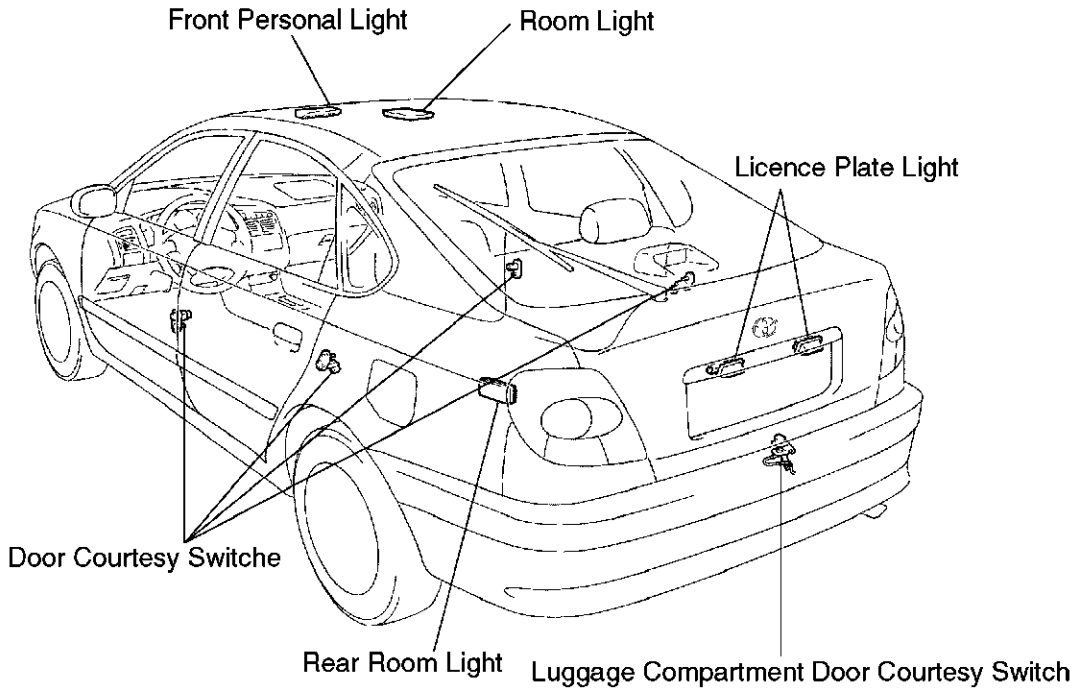


Sedan Model:

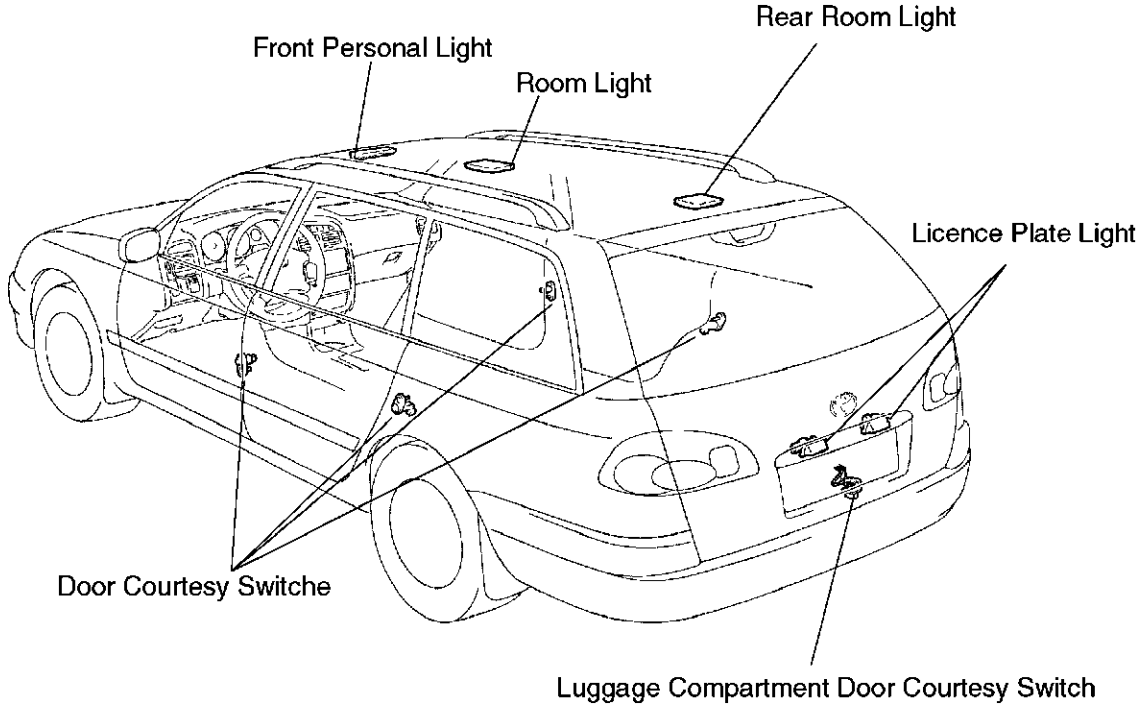


I04804

Liftback Model:



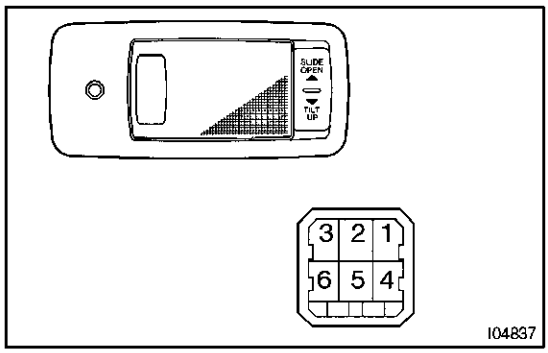
Wagon Model:



I04805

BE0NV–01

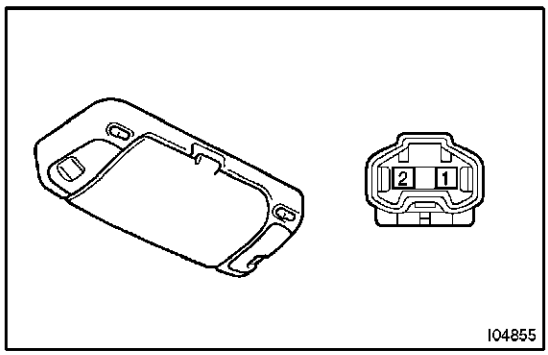
INSPECTION



1. w/ Sliding Roof:
INSPECT FRONT PERSONAL LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
ON	2 – 6	Continuity

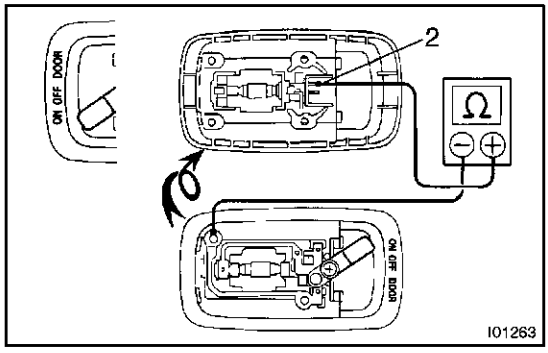
If continuity is not as specified, replace the light assembly or bulb.



2. w/o Sliding Roof:
INSPECT FRONT PERSONAL LIGHT SWITCH CONTINUITY

Using the ohmmeter, check that continuity exists between terminals.

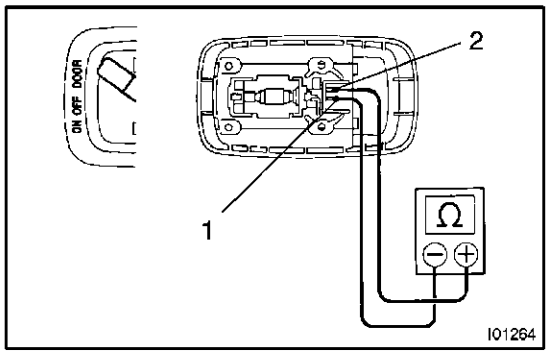
If continuity is not as specified, replace the light assembly or bulb.



3. INSPECT ROOM LIGHT CONTINUITY

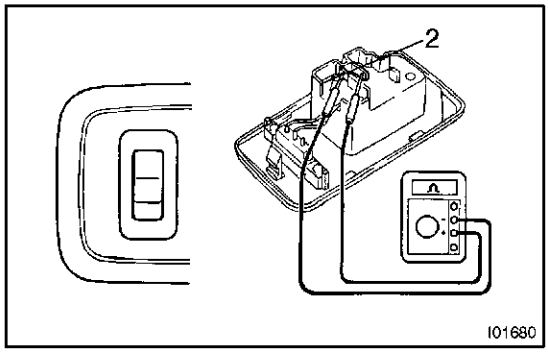
(a) Disconnect the connector from the room light.

(b) Turn the room light switch ON, check that continuity exists between terminal 2 and body ground.



(c) Turn the room light switch DOOR, check that continuity exists between terminals 1 and 2.

If continuity is not as specified, replace the light assembly or bulb.

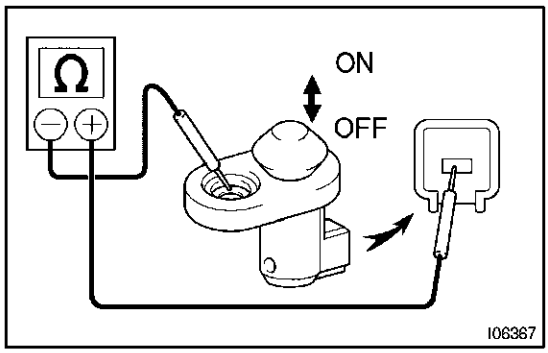


4. Liftback Type:
INSPECT REAR ROOM LIGHT CONTINUITY

(a) Disconnect the connector from the room light.

(b) Turn the room light switch ON, check that continuity exists between terminals 1 and 2.

If continuity is not as specified, replace the light assembly or bulb.

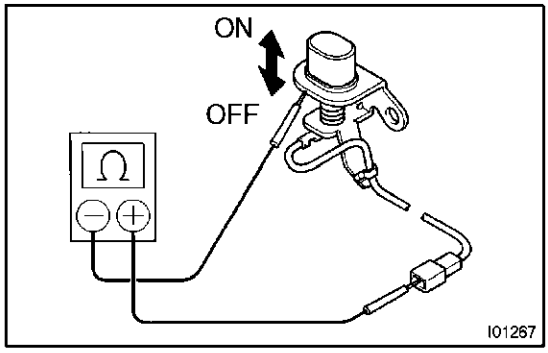


5. INSPECT FRONT DOOR AND REAR SOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminal and the switch body with the switch ON (switch pin released: open doors).

(b) Check that no continuity exists between terminal and the switch body with the switch OFF (switch pin pushed in: closed doors).

If operation is not as specified, replace the switch.

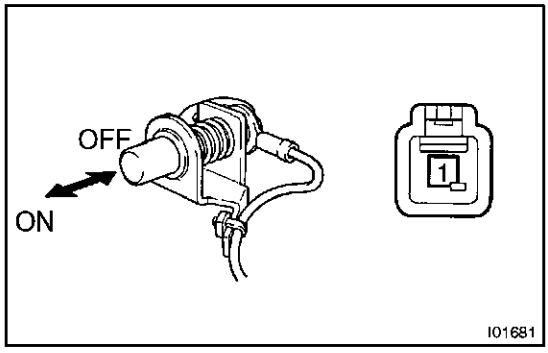


6. Sedan Type:
INSPECT LUGGAGE COMPARTMENT DOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminal and the switch body with the switch ON (switch pin released: open doors).

(b) Check that no continuity exists between terminal and the switch body with the switch OFF (switch pin pushed in: closed doors).

If operation is not as specified, replace the switch.

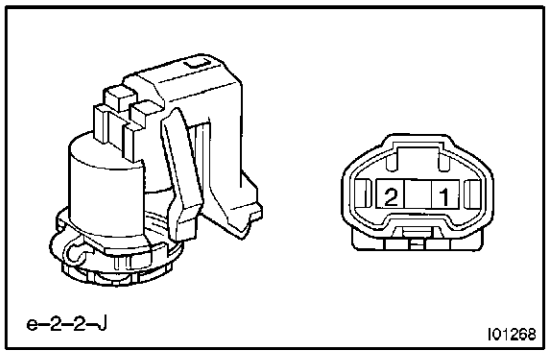


7. Liftback Type and Hatchback Type:
INSPECT LUGGAGE COMPARTMENT DOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminals and the switch body with the switch ON (switch pin released: open doors).

(b) Check that there is no continuity between terminals and the switch body with the switch OFF (switch pin pushed in: closed doors).

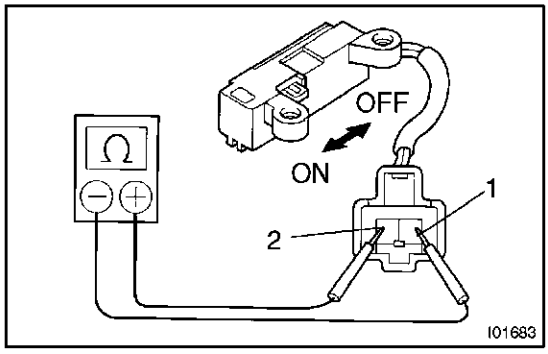
If operation is not as specified, replace the switch.



8. INSPECT LUGGAGE COMPARTMENT LIGHT CONTINUITY

Using an ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the light assembly or bulb.

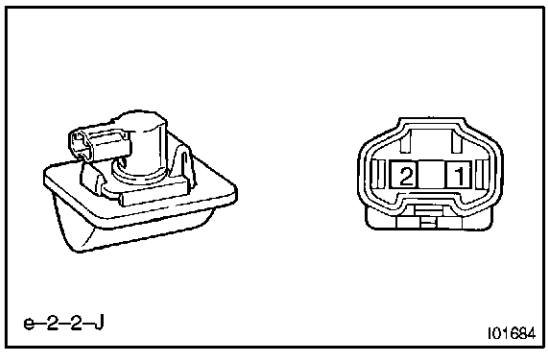


9. Wagon:
INSPECT BACK DOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminals and the switch body with the switch ON (switch pin released: open door).

(b) Check that no continuity exists between terminals and the switch body with the switch OFF (switch pin pushed in: closed doors).

If operation is not as specified, replace the switch.



10. INSPECT LICENCE PLATE LIGHT CONTINUITY

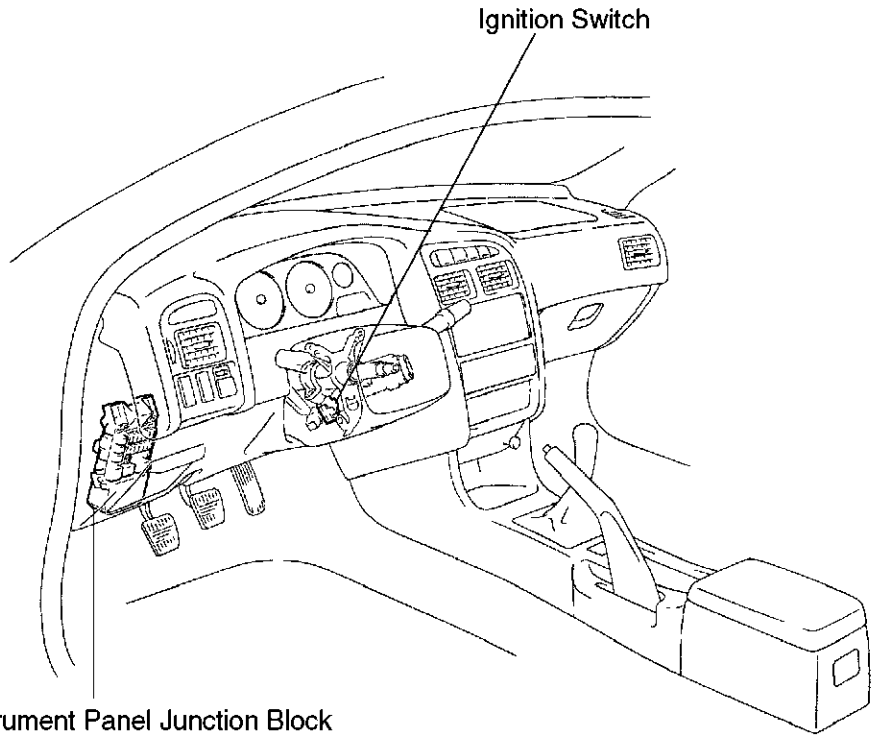
Using an ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the light assembly or bulb.

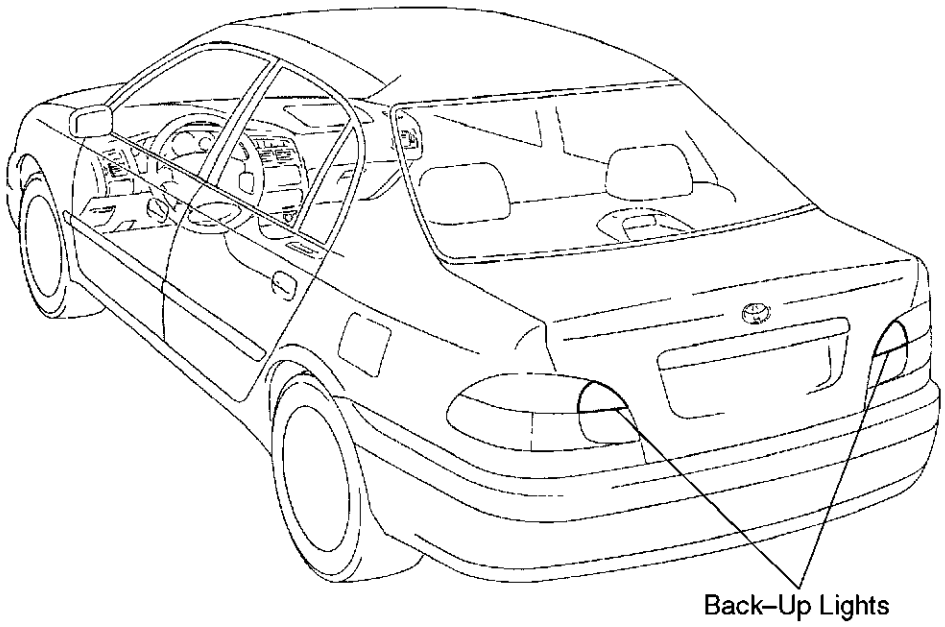
BACK–UP LIGHT SYSTEM

LOCATION

BE0NW–01

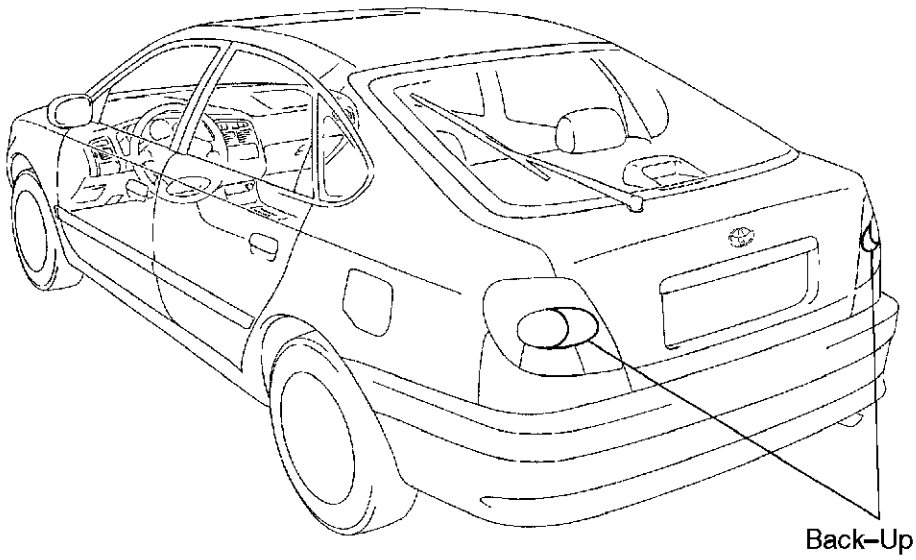


Sedan Model:

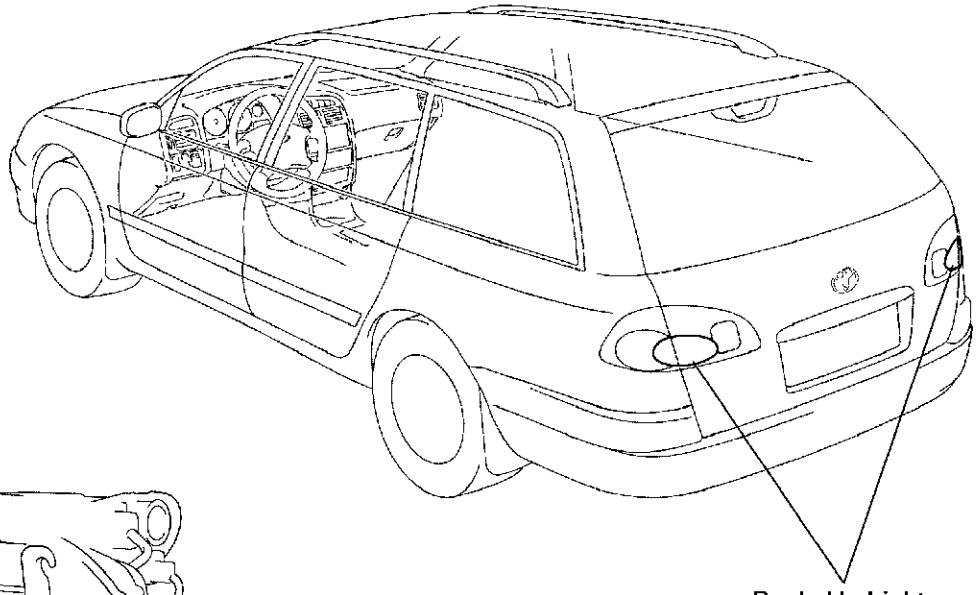


I04806

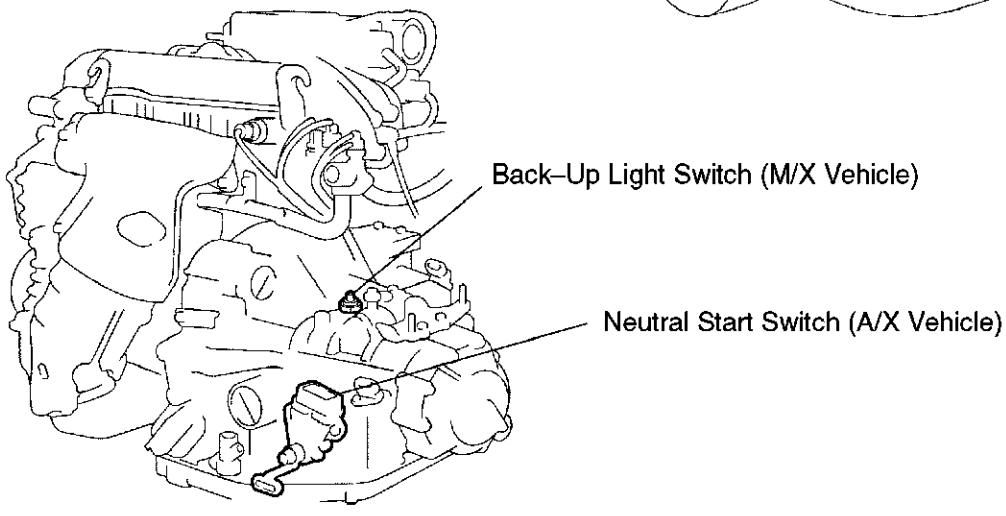
Liftback Model:



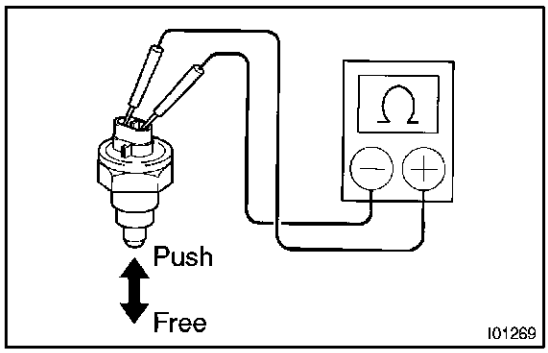
Wagon Model:



ex. 3S–FE Engine:



I04807



BE020–02

INSPECTION

1. INSPECT BACK–UP LIGHT SWITCH CONTINUITY

Switch position	Specified condition
Push	Continuity
Free	No continuity

If continuity is not as specified, replace the switch.

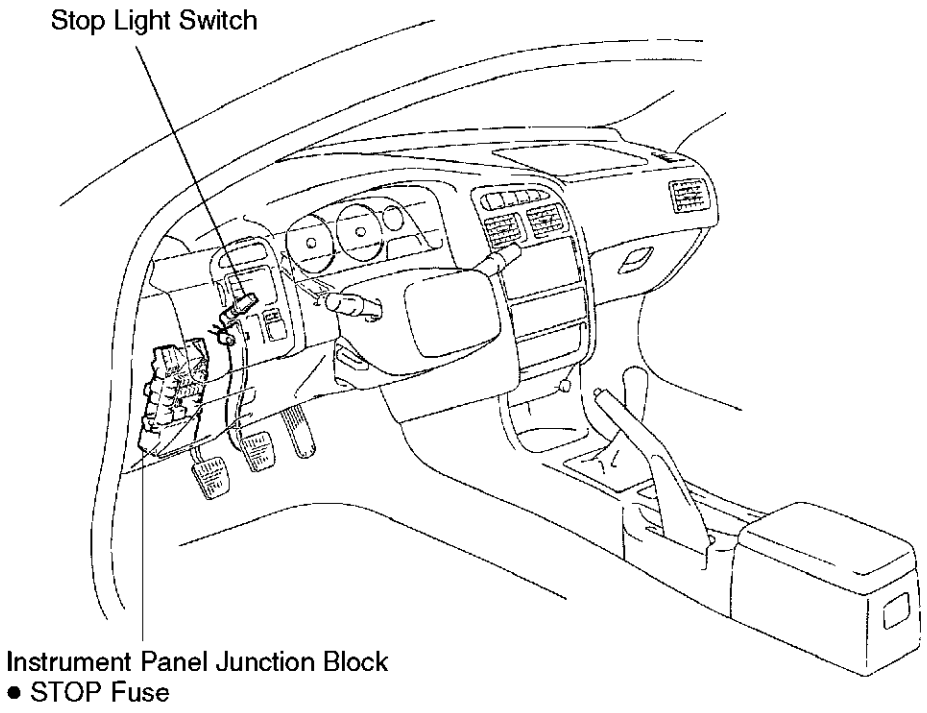
2. INSPECT NEUTRAL START SWITCH CONTINUITY

See page DI–35, DI–91

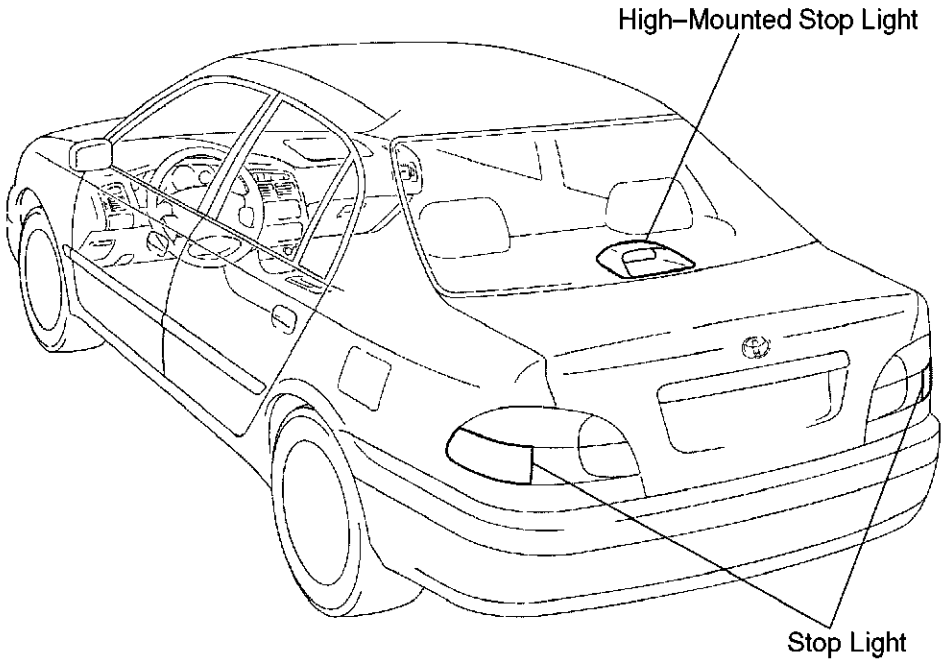
STOP LIGHT SYSTEM

LOCATION

BE0NX–01

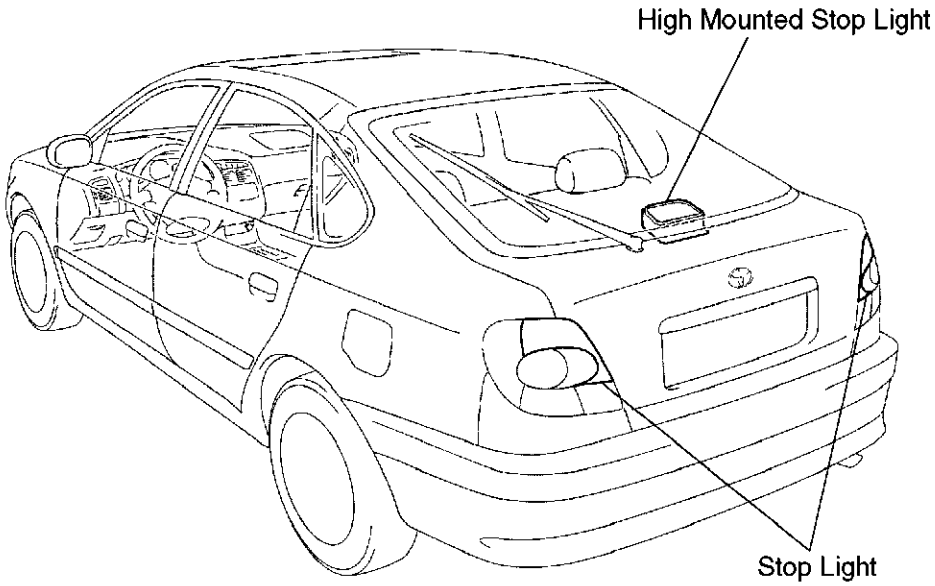


Sedan Model:

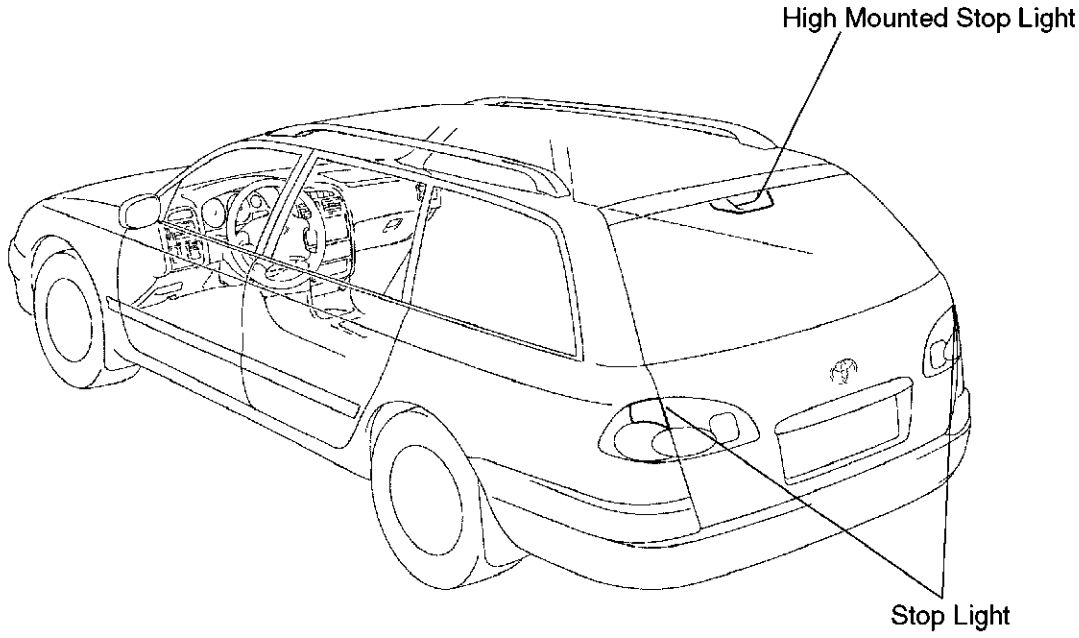


I04808

Liftback Model:



Wagon Model:

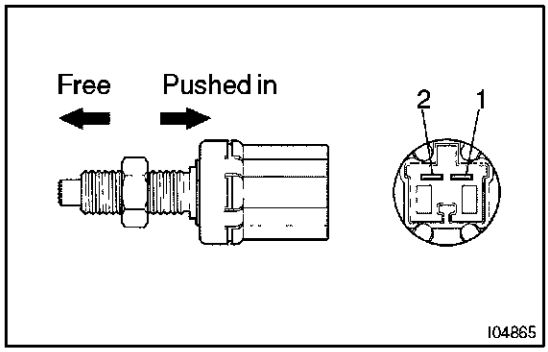


I04809

BE0NY–01

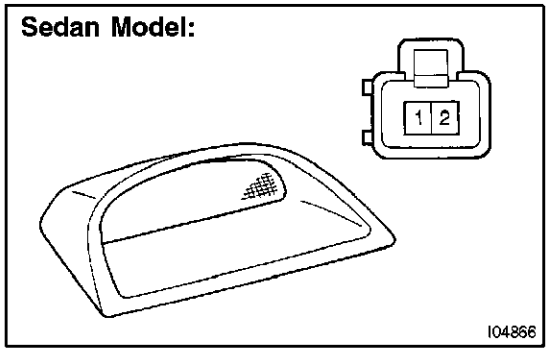
INSPECTION

1. INSPECT STOP LIGHT SWITCH CONTINUITY



Switch position	Tester connection	Specified condition
Switch pin pushed in (Pedal released)	–	No continuity
Switch pin free (Pedal depressed)	1 – 2	Continuity

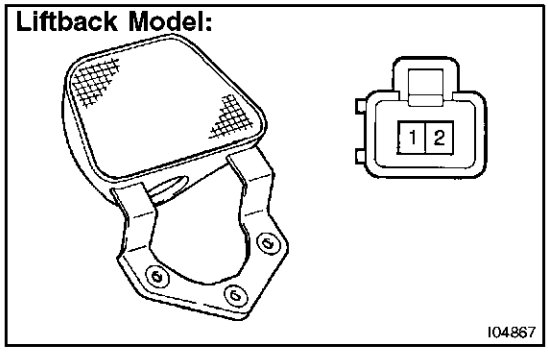
If continuity is not as specified, replace the switch.



2. Sedan Model: INSPECT HI–MOUNTED STOP LIGHT CONTINUITY

Using an ohmmeter, check that continuity exists between terminals.

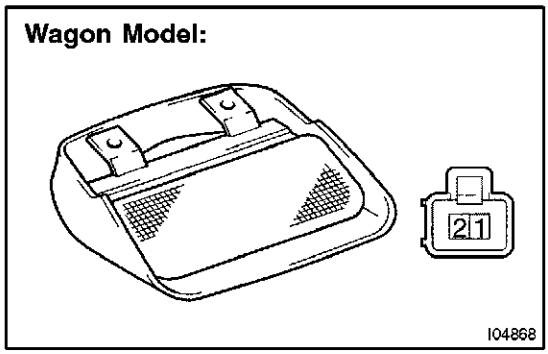
If continuity is not as specified, replace the light assembly or bulb.



3. Liftback Model: INSPECT HI–MOUNTED STOP LIGHT CONTINUITY

Using an ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the light assembly or bulb.



4. Wagon Model: INSPECT HI–MOUNTED STOP LIGHT CONTINUITY

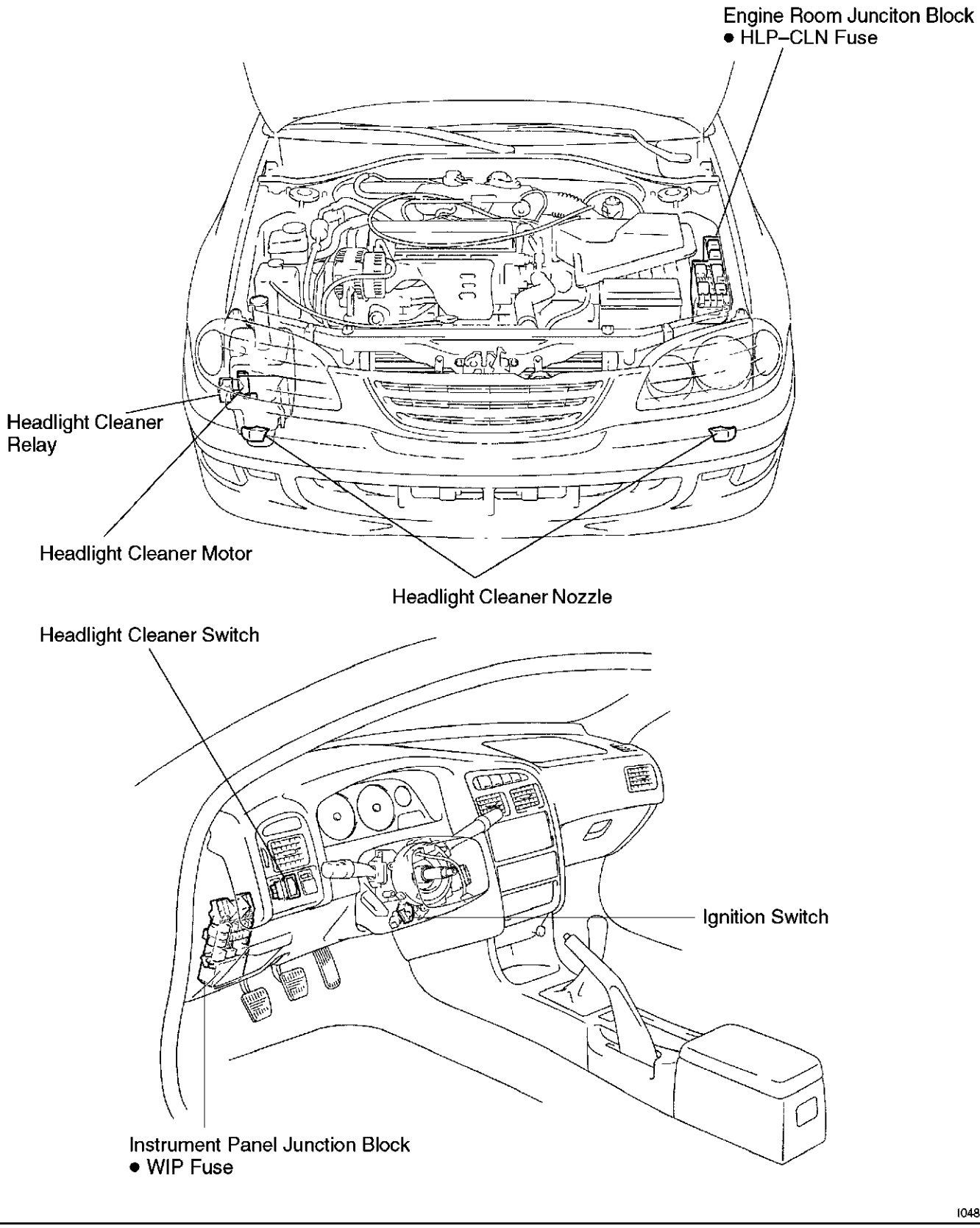
Using an ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the light assembly or bulb.

HEADLIGHT CLEANER SYSTEM

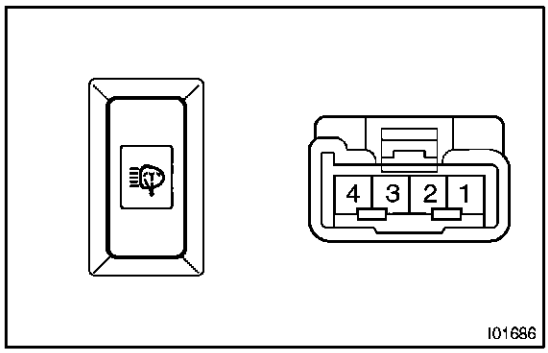
BE023–04

LOCATION



BE024-02

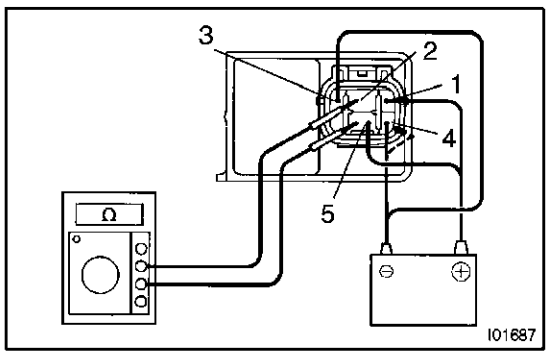
INSPECTION



1. INSPECT HEADLIGHT CLEANER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
ON	1 – 4	Continuity
Illumination circuit	2 – 3	Continuity

If continuity is not as specified, replace the switch.



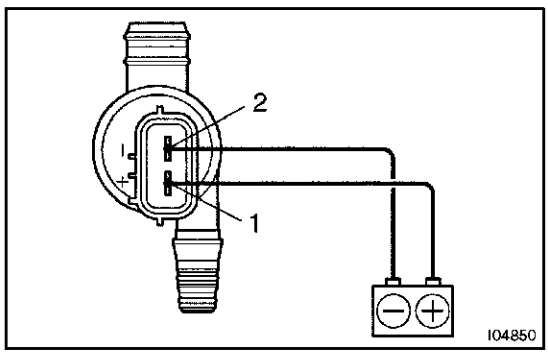
2. INSPECT HEADLIGHT CLEANER RELAY OPERATION

(a) Check that there is no continuity between terminals 2 and 5.

(b) Connect the positive (+) lead from the battery to terminals 1 and 5, and the negative (–) lead to terminal 3.

(c) Connect the negative (–) lead from the battery to terminal 4, and check that continuity exists between terminals 2 and 5 for 0.4 – 0.6 seconds, then there is no continuity.

If operation is not as specified, replace the motor.



3. INSPECT HEADLIGHT CLEANER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, check that the motor operates.

NOTICE:

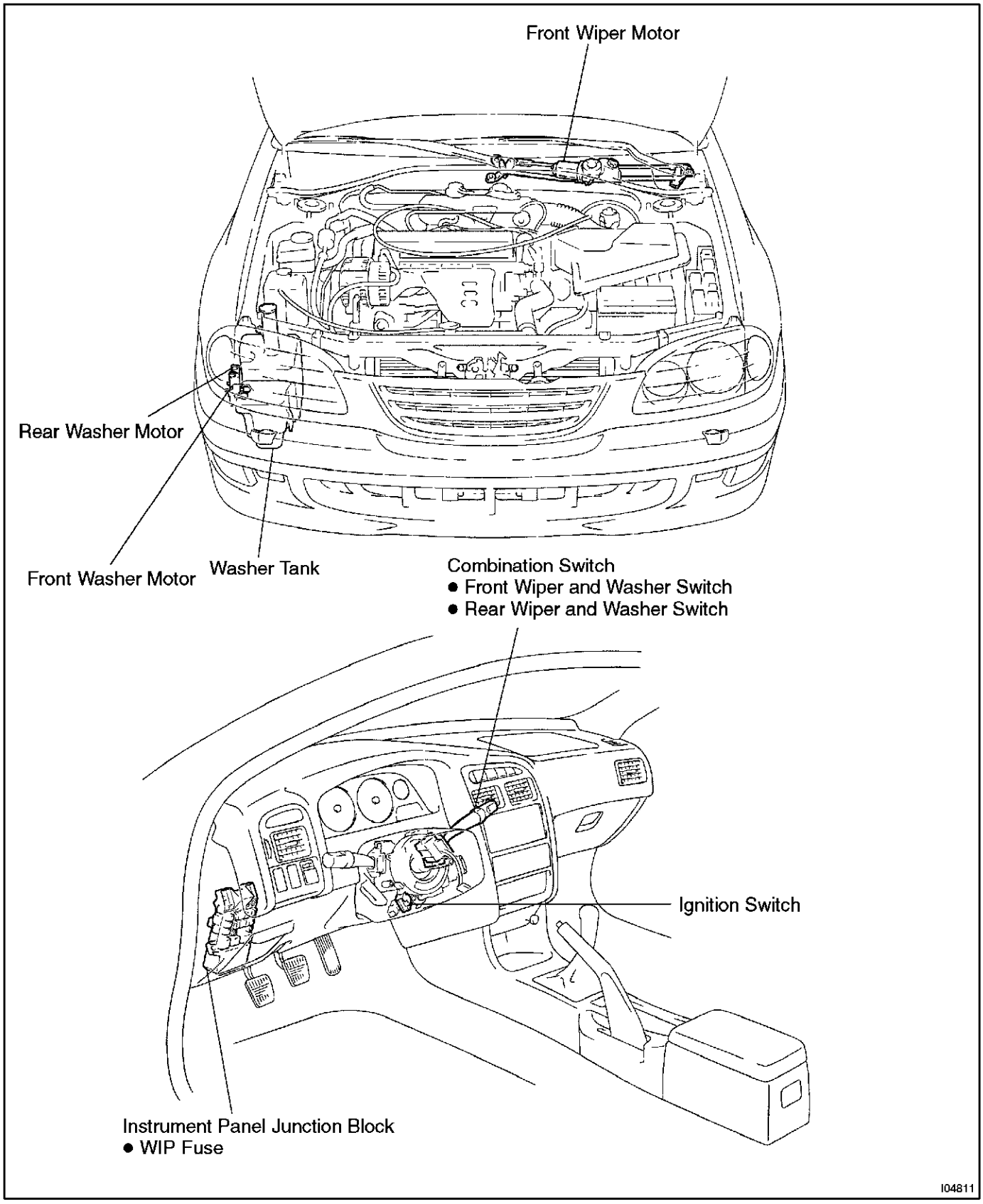
These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

If operation is not as specified, replace the motor.

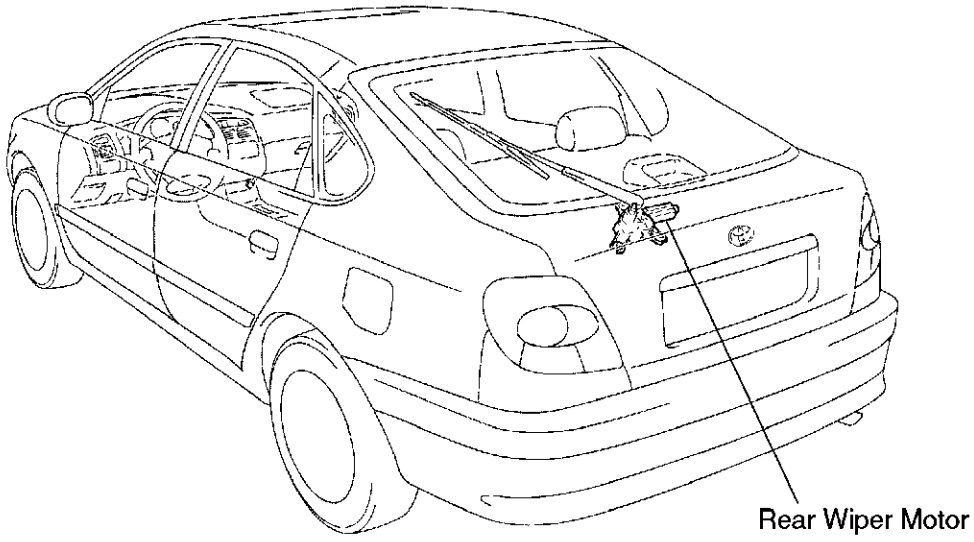
WIPER AND WASHER SYSTEM

LOCATION

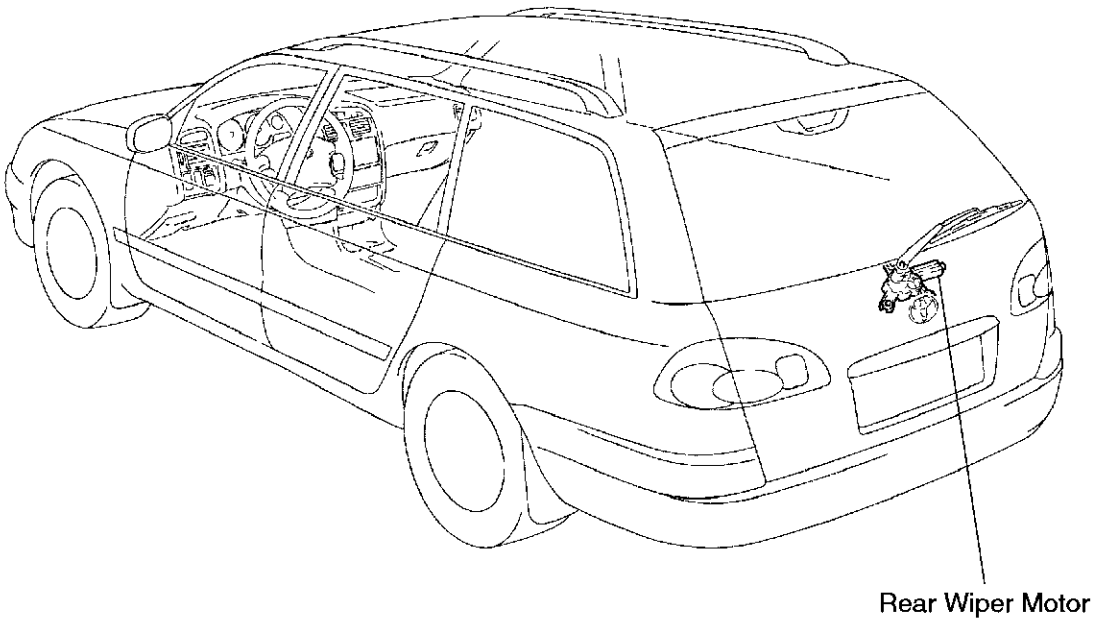
BE0NZ–01



Liftback Model:



Wagon Model:

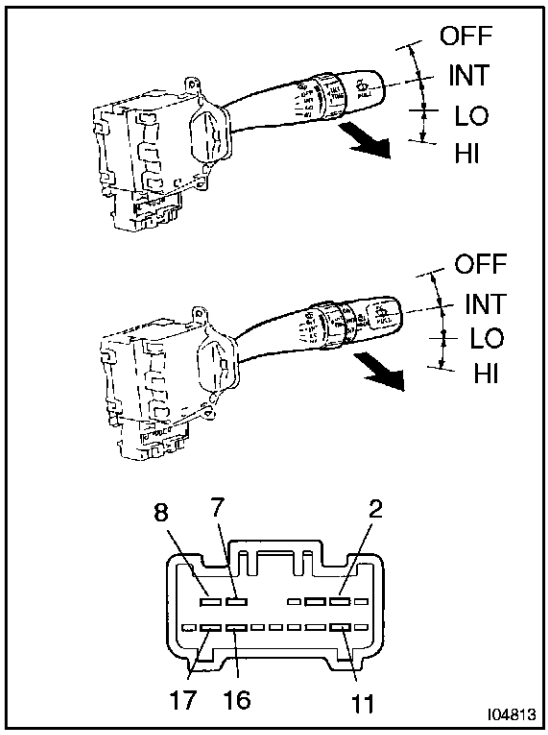


I04812

BE0O0–01

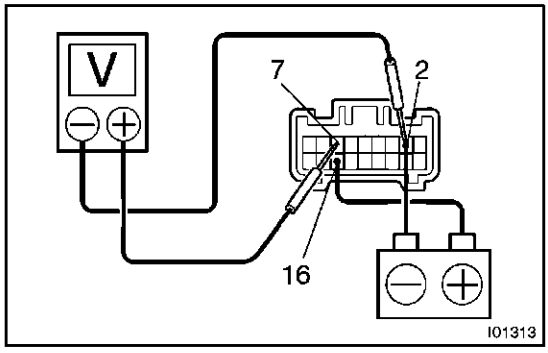
INSPECTION

1. INSPECT FRONT WIPER AND WASHER SWITCH CONTINUITY



Switch position	Tester connection	Specified condition
OFF	7 – 16	Continuity
INT (w/ Intermittent wiper)	7 – 16	Continuity
LO	7 – 17	Continuity
HI	8 – 17	Continuity
Washer ON	2 – 11	Continuity

If continuity is not as specified, replace the switch.



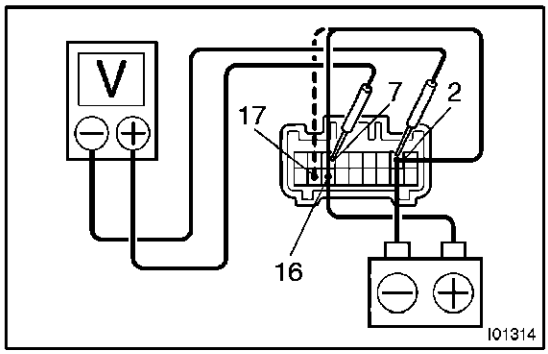
2. INSPECT FRONT WIPER INTERMITTENT OPERATION

(a) Turn the wiper switch to INT position.

(b) Turn the intermittent time control switch to FAST position.

(c) Connect the positive (+) lead from the battery to terminal 16 and the negative (–) lead to terminal 2.

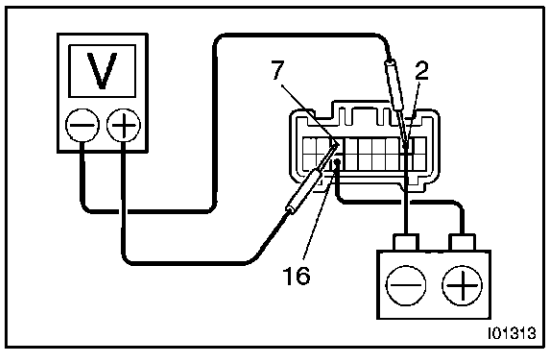
(d) Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (–) lead to terminal 2, check that the meter needle indicates battery voltage.



(e) After connecting terminal 16 to terminal 17, connect terminal 2 to terminal 17, check the voltage rises from 0 volts to battery voltage within the time, as shown in the table.

INT time control switch position	Voltage
FAST	Approx. 1 ~ 3 sec. ←Battery voltage ←0 Volt
SLOW	Approx. 10 ~ 15 secs. ←Battery voltage ←0 Volt

If operation is not as specified, replace the wiper and washer switch.

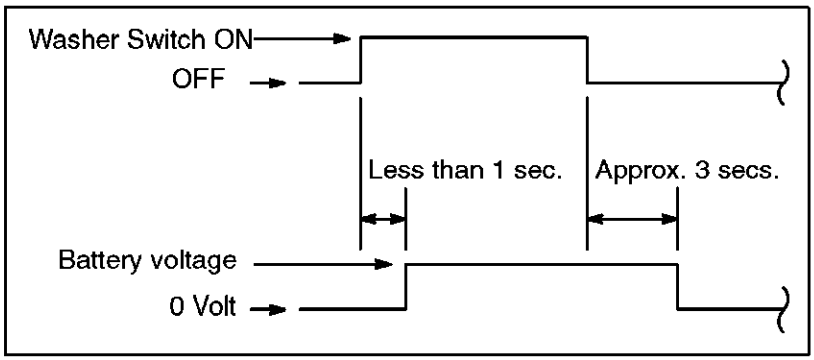


3. INSPECT FRONT WASHER LINKED OPERATION

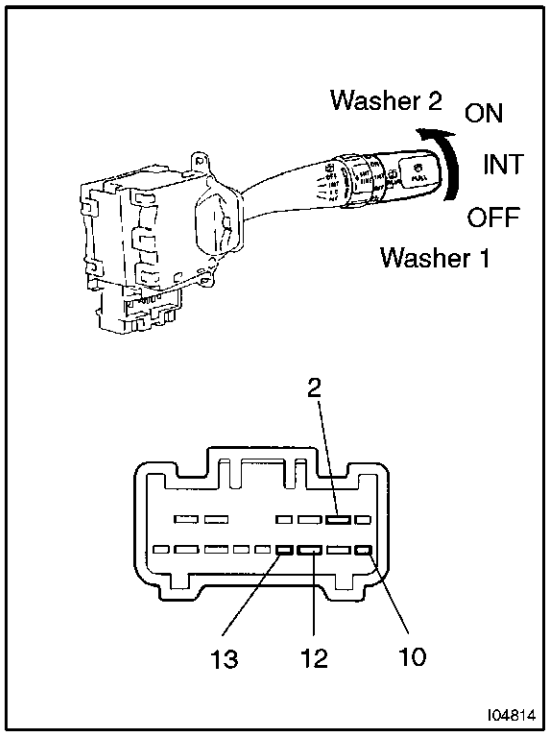
(a) Connect the positive (+) lead from the battery to terminal 16 and the negative (–) lead to terminal 2.

(b) Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (–) lead to terminal 2.

(c) Push in the washer switch, and check that the voltage changes, as shown in the table.



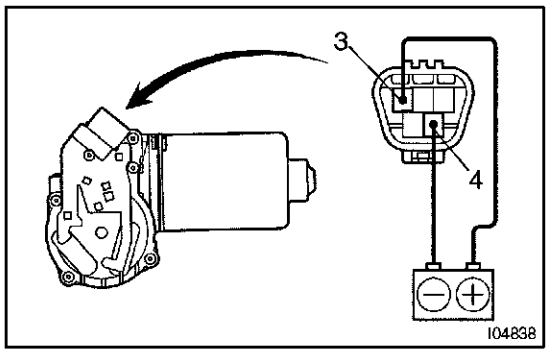
If operation is not as specified, replace the wiper and washer switch.



4. INSPECT REAR WIPER AND WASHER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Washer 1	2 – 12	Continuity
OFF	–	No continuity
INT	2 – 13	Continuity
ON	2 – 10	Continuity
Washer 2	2 – 10 – 12	Continuity

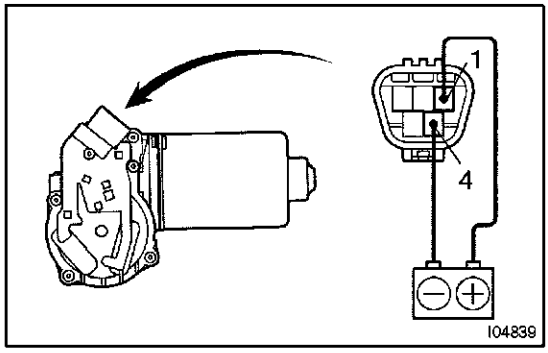
If continuity is not as specified, replace the switch.



5. LHD Models:
INSPECT FRONT WIPER MOTOR OPERATION
Low Speed:

Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 4, check that the motor operates at low speed.

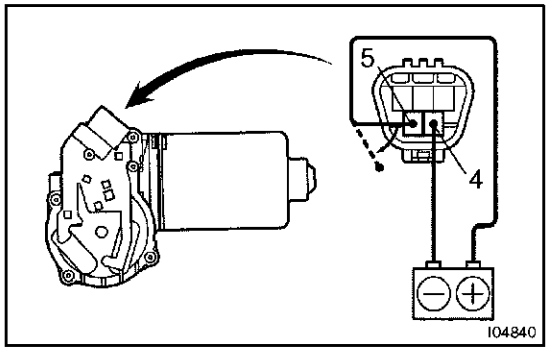
If operation is not as specified, replace the motor.



6. LHD Models:
INSPECT FRONT WIPER MOTOR OPERATION
High Speed:

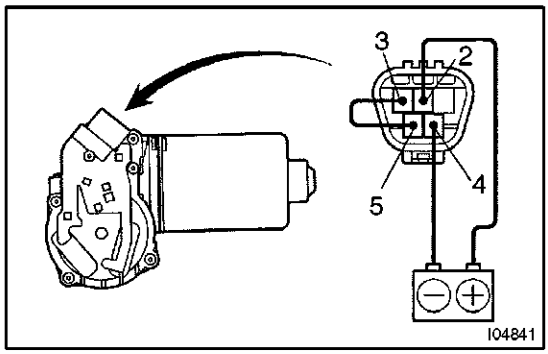
Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 4, check that the motor operates at high speed.

If operation is not as specified, replace the motor.



7. LHD Models:
INSPECT FRONT WIPER MOTOR OPERATION
Stop at Stop Position:

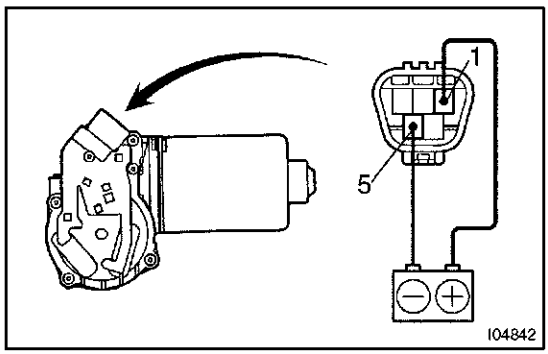
(a) Operate the motor at low speed and stop the motor operation anywhere except at the stop position by disconnecting positive (+) lead from terminal 5.



(b) Connect terminals 3 and 5.

(c) Connect the positive (+) lead from the battery to terminal 2 and negative (–) lead to terminal 4, check that the motor stops running at the stop position after the motor operates again.

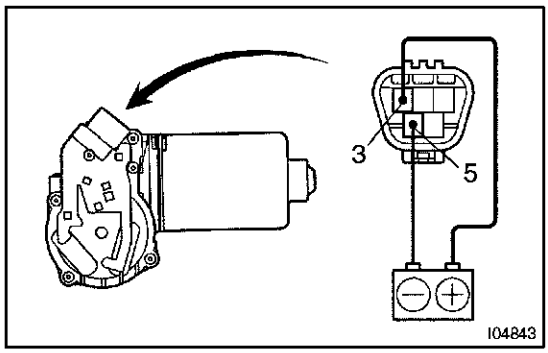
If operation is not as specified, replace the motor.



8. RHD Models:
INSPECT FRONT WIPER MOTOR OPERATION
Low Speed:

Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 5, check that the motor operates at low speed.

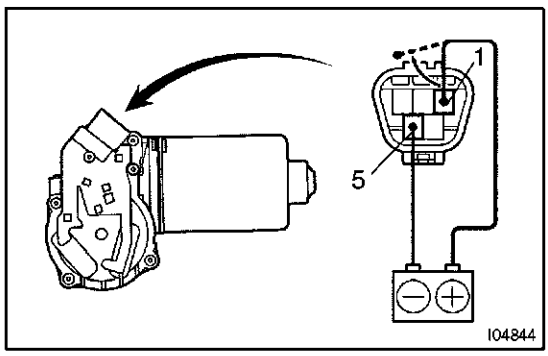
If operation is not as specified, replace the motor.



9. RHD Models:
INSPECT FRONT WIPER MOTOR OPERATION
High Speed:

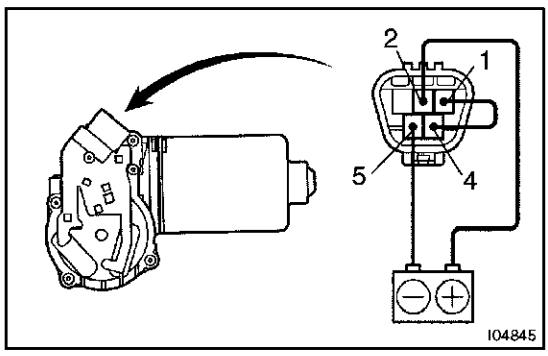
Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 5, check that the motor operates at high speed.

If operation is not as specified, replace the motor.



10. RHD Models:
INSPECT FRONT WIPER MOTOR OPERATION
Stop at Stop Position:

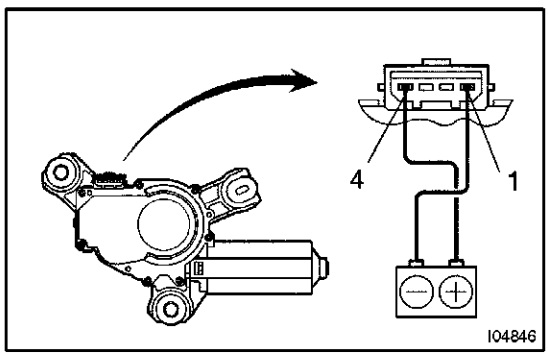
(a) Operate the motor at low speed and stop the motor operation anywhere except at the stop position by disconnecting positive (+) lead from terminal 1.



(b) Connect terminals 1 and 4.

(c) Connect the positive (+) lead from the battery to terminal 2 and negative (–) lead to terminal 5, check that the motor stops running at the stop position after the motor has operated again.

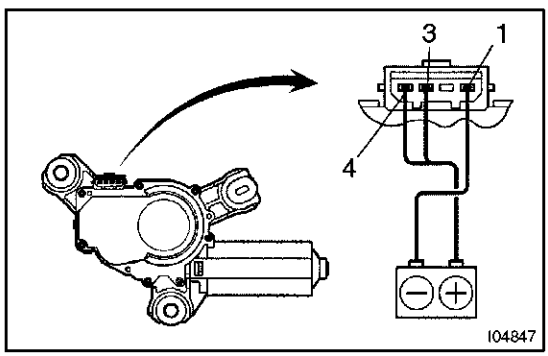
If operation is not as specified, replace the motor.



11. INSPECT REAR WIPER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 1, check that the motor operates.

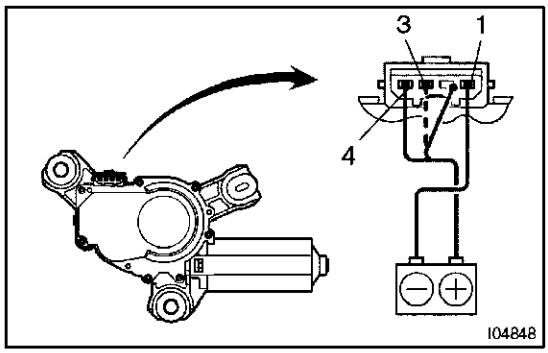
If operation is not as specified, replace the motor.



12. INSPECT REAR WIPER MOTOR AND RELAY INTERMITTENT OPERATION

Connect the positive (+) lead from the battery to terminal 3 and 4, and the negative (–) lead to terminal 1, and check that the motor operates intermittently for 9 – 15 seconds.

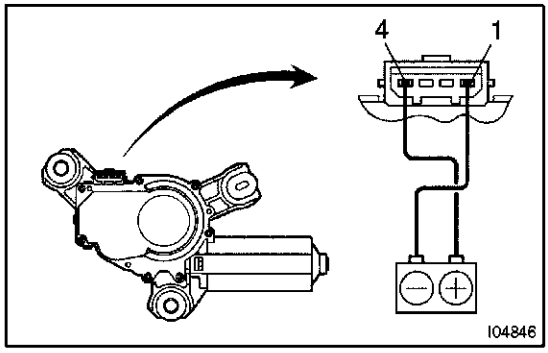
If operation is not as specified, replace the motor and relay.



13. INSPECT REAR WIPER MOTOR OPERATION

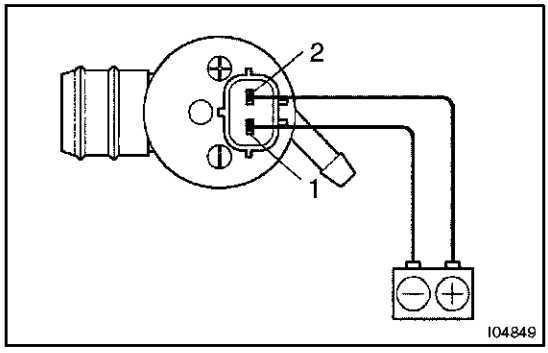
Stop at Stop Position:

(a) Operate the motor at low speed and stop the motor operation anywhere except at the stop position by disconnecting positive (+) lead from terminal 3.



(b) Connect the positive (+) lead from the battery to terminal 4 and negative (–) lead to terminal 1, check that the motor stops running at the stop position after the motor has operated again.

If operation is not as specified, replace the motor.



14. INSPECT WASHER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, check that the motor operates.

NOTICE:

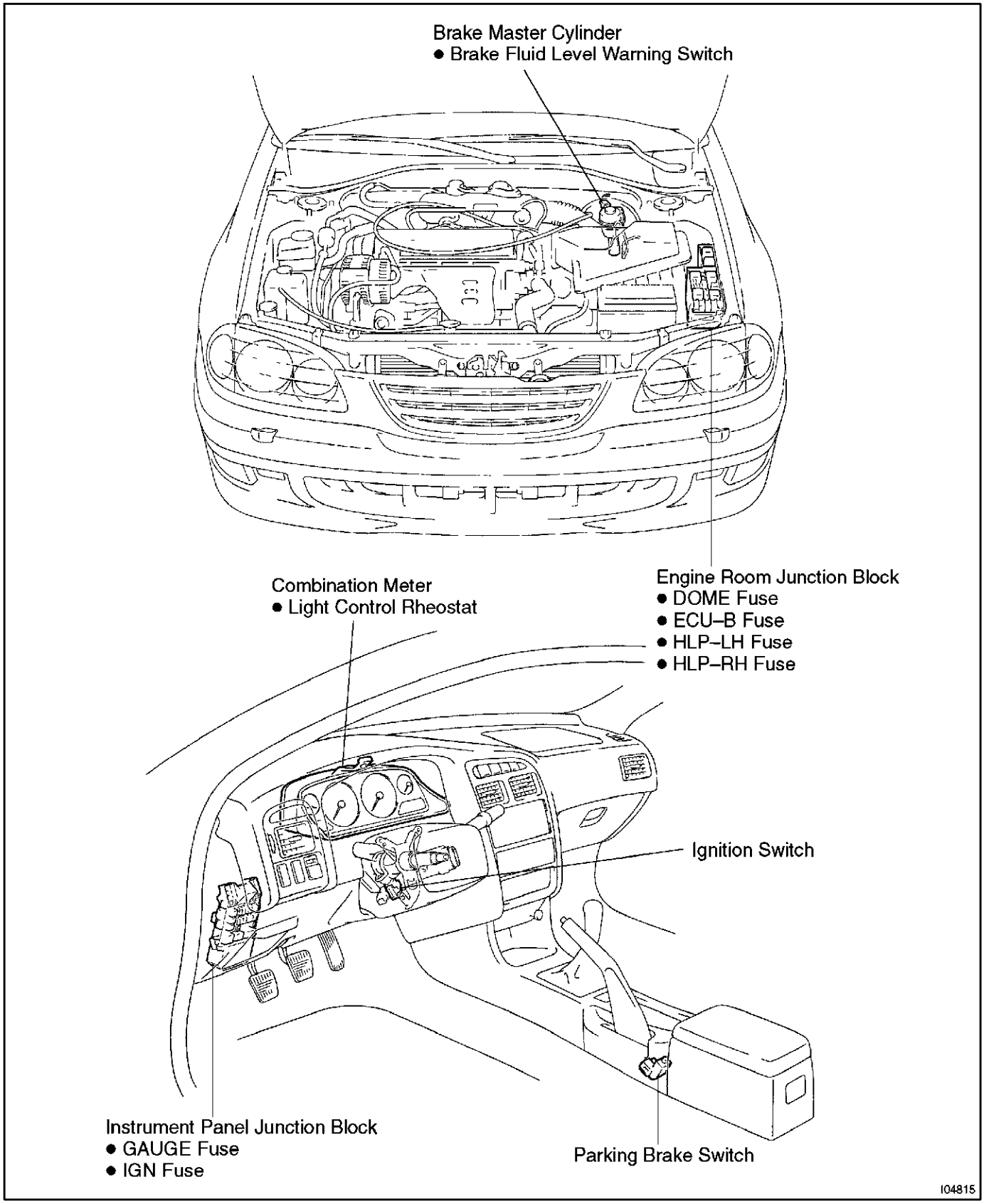
These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

If operation is not as specified, replace the motor.

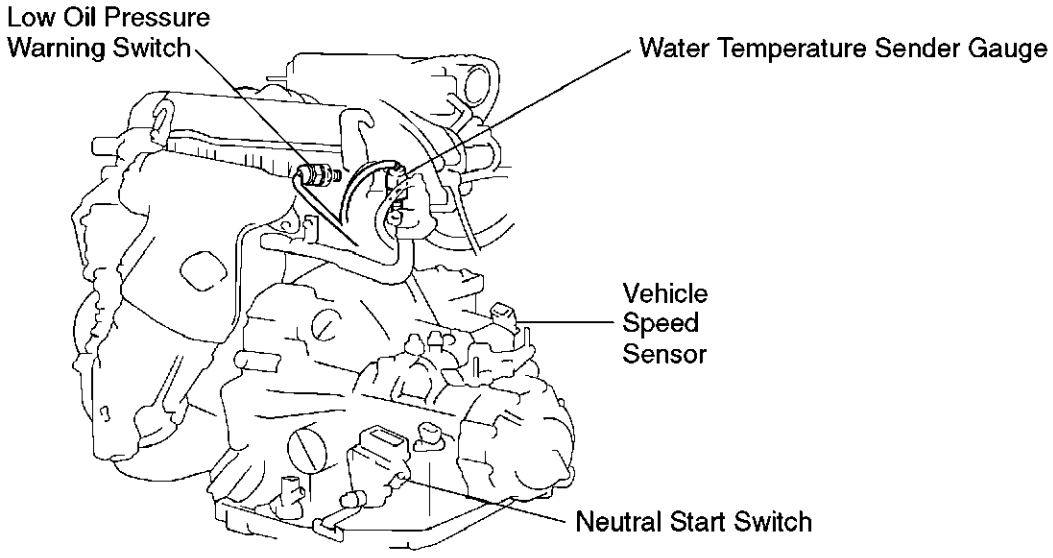
COMBINATION METER

LOCATION

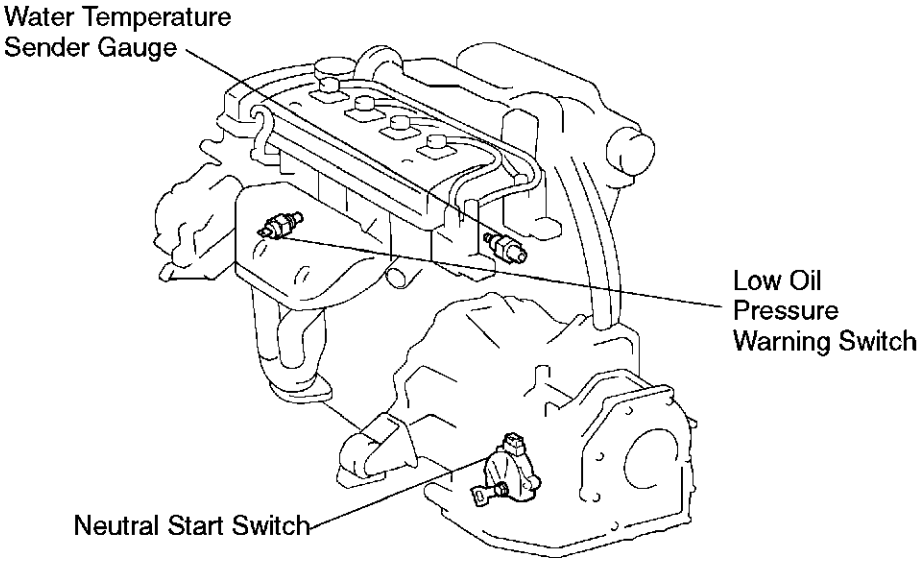
BE0O1–01



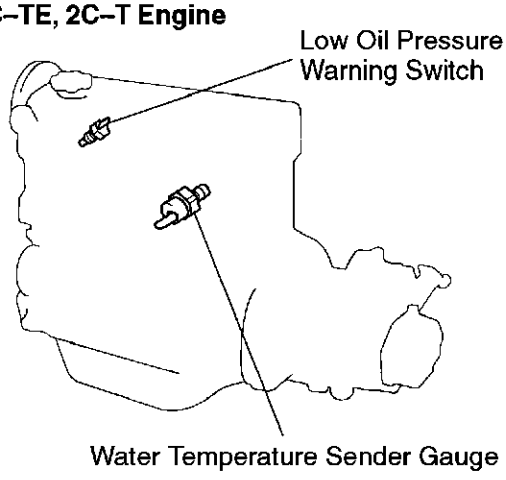
3S–FE Engine



7A–FE, 4A–FE Engine

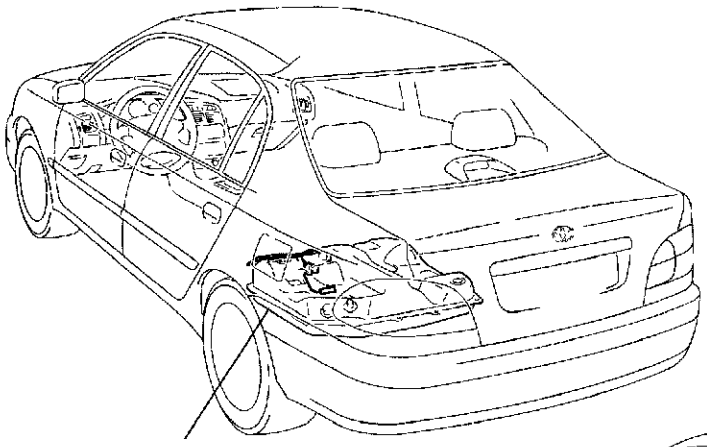


2C–TE, 2C–T Engine



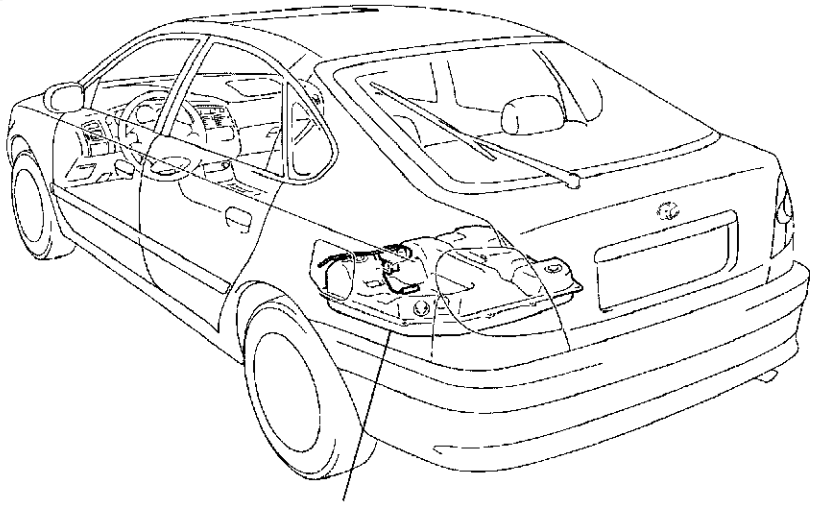
I04816

Sedan Model:



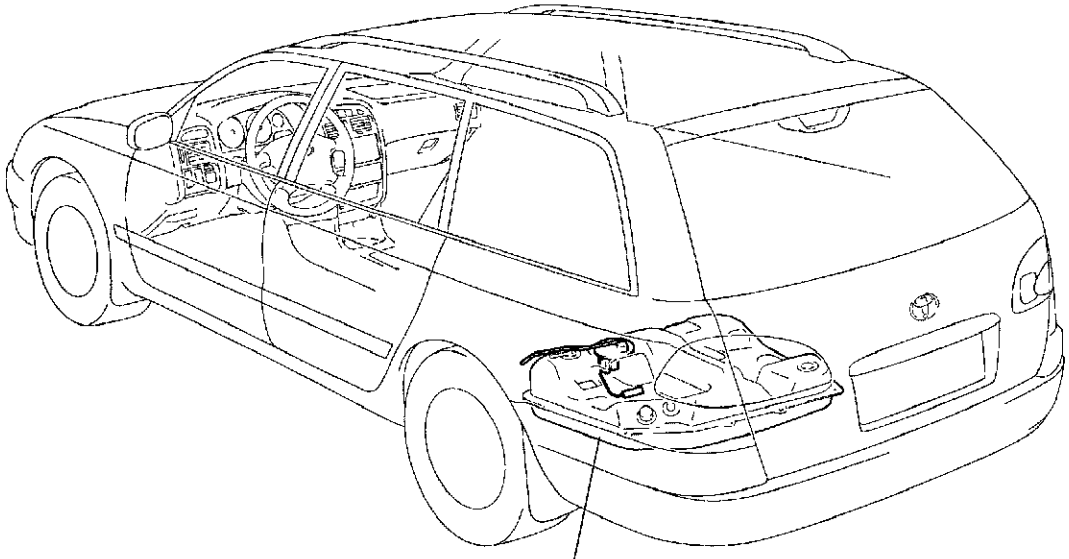
Fuel Tank
● Fuel Sender Gauge

Liftback Model:



Fuel Tank
● Fuel Sender Gauge

Wagon Model:

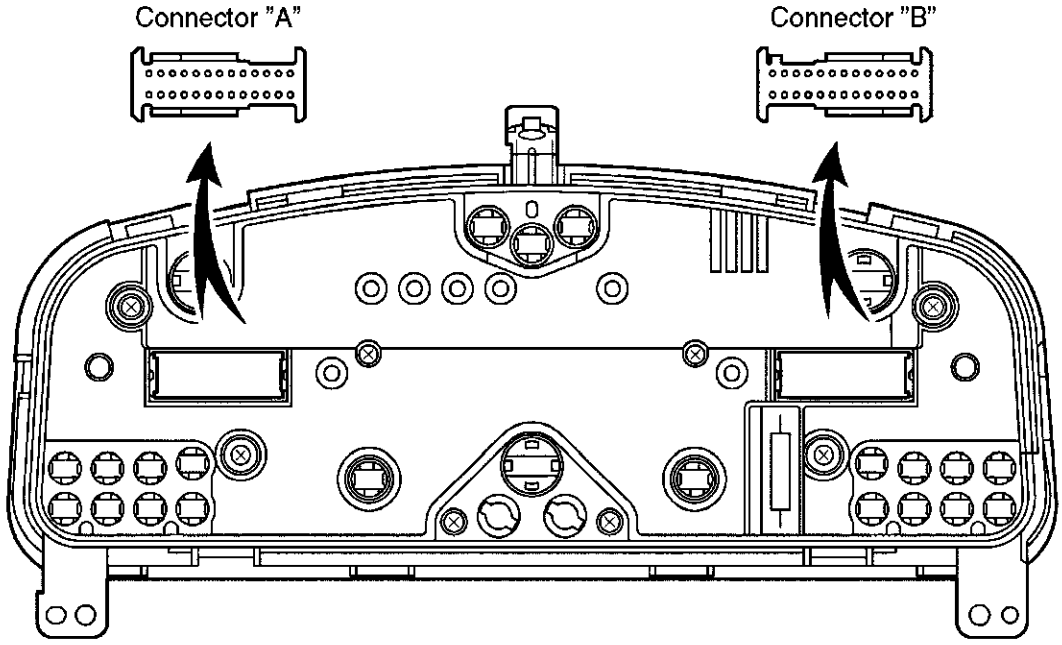


Fuel Tank
● Fuel Sender Gauge

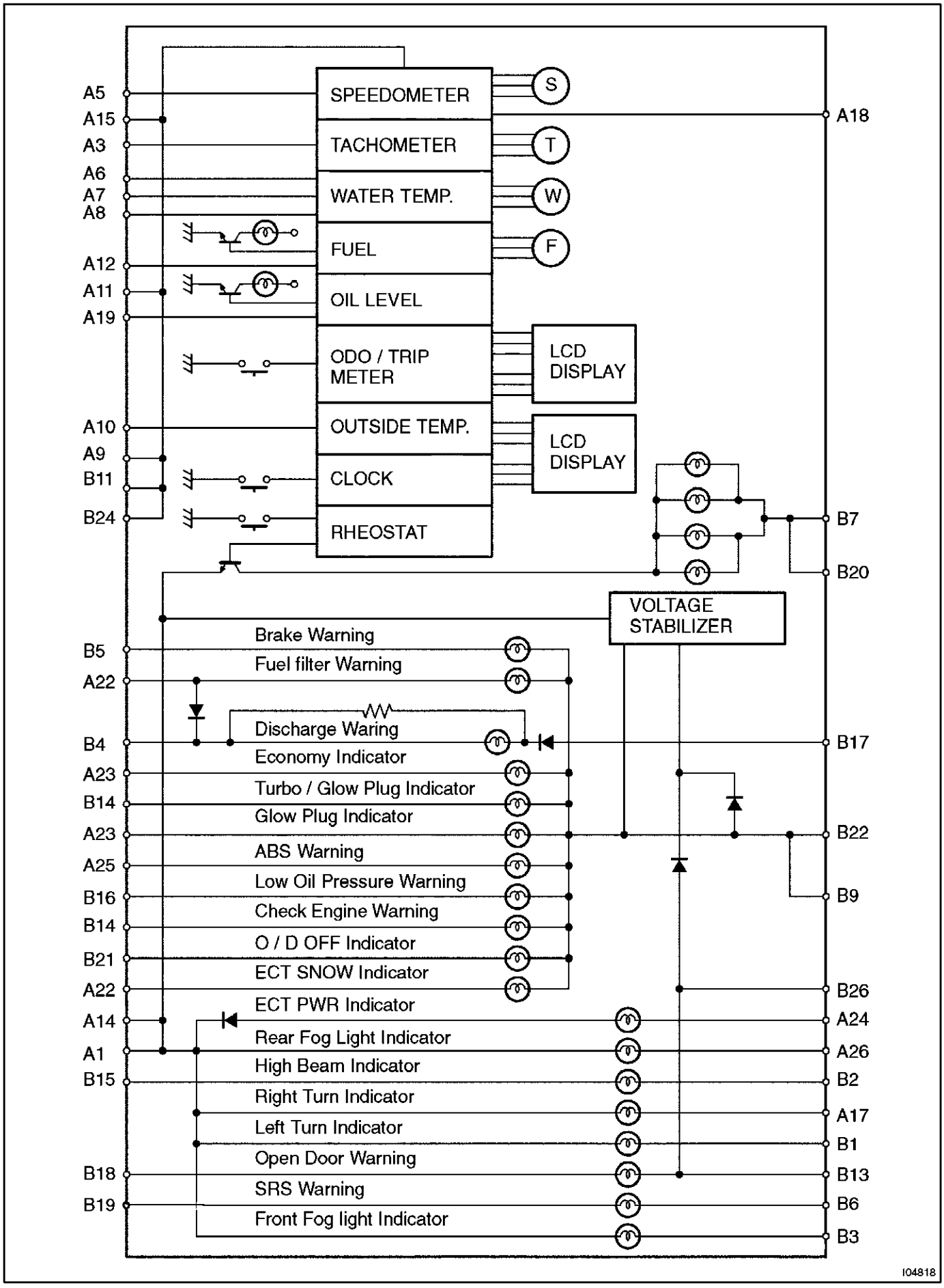
I04857

BE028-02

CIRCUIT



I04817


A5
A15
A3
A6
A7
A8
A12
A11
A19
A10
A9
B11
B24
SPEEDOMETER
TACHOMETER
WATER TEMP.
FUEL
OIL LEVEL
ODO / TRIP METER
OUTSIDE TEMP.
CLOCK
RHEOSTAT
S
T
W
F
LCD DISPLAY
LCD DISPLAY
A18
B7
B20
VOLTAGE STABILIZER
B5
A22
B4
A23
B14
A23
A25
B16
B14
B21
A22
A14
A1
B15
B18
B19
Brake Warning
Fuel filter Warning
Discharge Waring
Economy Indicator
Turbo / Glow Plug Indicator
Glow Plug Indicator
ABS Warning
Low Oil Pressure Warning
Check Engine Warning
O / D OFF Indicator
ECT SNOW Indicator
ECT PWR Indicator
Rear Fog Light Indicator
High Beam Indicator
Right Turn Indicator
Left Turn Indicator
Open Door Warning
SRS Warning
Front Fog light Indicator
B17
B22
B9
B26
A24
A26
B2
A17
B1
B13
B6
B3
104818

No.		Wire Harness Side
A	1	Ground (Power)
	3	Tacho Pick–UP Sensor EFI ECU (3S–FE, 2C–TE Engine) EGR (2C–T Engine)
	5	Vehicle Speed Sensor
	6	EFI ECU
	7	Water Temperature Sender Gauge (2C–T Engine)
	8	Ground (Engine)
	9	Ground
	10	Outside Temperature Sender Gauge
	11	Ground (Fuel)
	12	Fuel Sender Gauge
	14	Ground (Power)
	15	Ground (Speed)
	17	Turn Signal Switch (Right)
	18	Other Parts
	19	Oil Level Warning Switch
	21	O/D OFF Switch
	22	ECT ECU (Gasoline Engine) Fuel Filter Warning Switch (Diesel Engine)
	23	Glow Plug Timer (Diesel Engine) EFI ECU (Gasoline Engine)
	24	ECT Pattern Select Switch
	25	ABS ECU
	26	Rear Fog Light Switch
B	1	Turn Signal Switch (Left)
	2	H–LP Fuse
	3	Front Fog Light Switch
	4	Alternator L Terminal
	5	Brake Fluid Level Warning Switch Parking Brake Switch
	6	ECU+B Fuse
	7	Taillight Relay
	9	GAUGE Fuse
	11	Ground (Signal)
	13	DOOR Fuse
	14	EFI ECU (Gasoline Engine) EGR ECU (Diesel Engine)
	15	Headlight Dimmer Switch
	16	Low Oil Pressure Warning Switch
	17	IGN Fuse
	18	Door Courtesy Switch
	19	Airbag ECU
	20	Taillight Relay
	22	GAUGE Fuse
	24	Ground (Signal)
	26	DOOR Fuse

BE0O2–01

INSPECTION

1. INSPECT SPEEDOMETER ON–VEHICLE

Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.

HINT:

Tire wear and tire over or under inflation will increase the indication error.

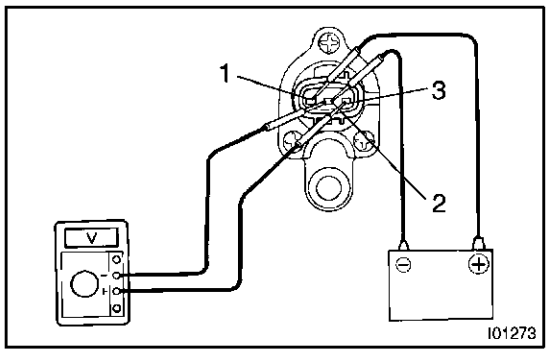
Europe Models

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	20 – 24.5	20	20 – 26
40	40 – 46.5	40	40 – 48
60	60 – 68.5	60	60 – 70
80	80 – 90.5	80	80 – 92
100	100 – 112.5	100	100 – 114
		120	120 – 136
		140	140 – 158
		160	160 – 180

General Countries

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	21 – 23.5	20	21 – 25
40	41.5 – 44	40	41.5 – 46
60	62.5 – 66	60	62.5 – 67
80	83 – 87	80	83 – 88
100	104 – 108.5	100	104 – 109
		120	125 – 130.5
		140	145.5 – 151..5
		160	166 – 173

If error is excessive, replace the speedometer.



2. w/o Speedometer cable:
INSPECT VEHICLE SPEED SENSOR OPERATION

(a) Connect the positive (+) lead from battery to terminal 1 and negative (–) lead to terminal 2.
(b) Connect the positive (+) lead from tester to terminal 3 and the negative (–) lead to terminal 2.
(c) Rotate the shaft.
(d) Check that the voltage changes from approx. 0 V to 11 V or more between terminals 2 and 3.

HINT:
The voltage changes be 4 times every revolution of the speed sensor shaft.
If operation is not as specified, replace the sensor.

3. INSPECT TACHOMETER/ ON–VEHICLE

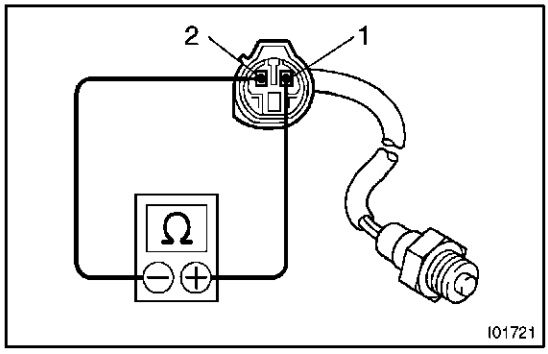
(a) Connect a tune–up test tachometer, and start the engine.

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.**

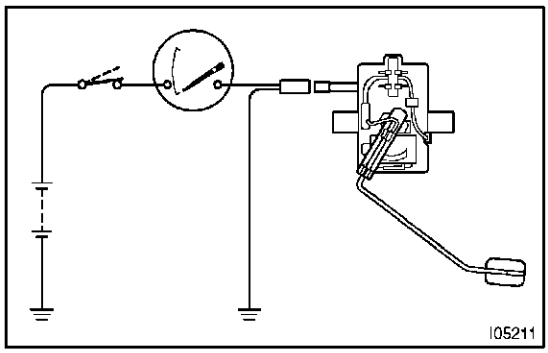
(b) Compare the tester and tachometer indications.
DC 13.5 V 25 °C at (77°F)

Standard indication	Allowable range
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. Diesel Engine Models:
INSPECT PICK–UP SENSOR

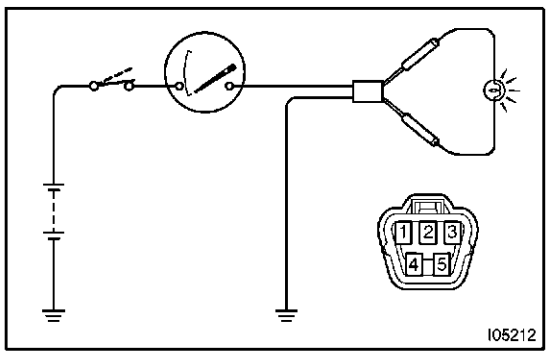
Measure the resistance between terminals 1 and 2.
Resistance: Approx. 810 Ω at 20 °C
If resistance value is not as specified, replace the sensor.



5. INSPECT FUEL RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge.

(b) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.



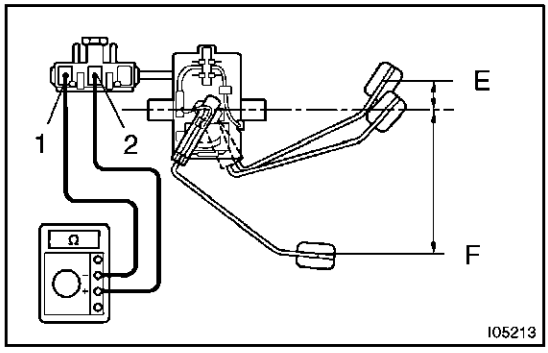
(c) Connect terminals 2 and 3 on the wire harness side connector through a 3.4 W test bulb.

(d) Turn the ignition switch ON, check that the bulb lights up and the receiver gauge needle moves towards the full side.

HINT:

Because of the silicon oil in the gauge, it will take a short time for needle to stabilize.

If operation is not as specified, inspect the receiver gauge resistance.

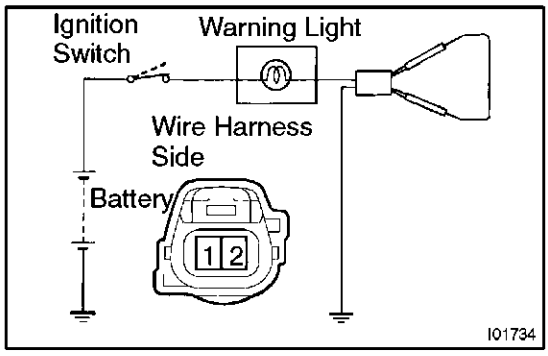


6. INSPECT FUEL SENDER GAUGE RESISTANCE

Measure the resistance between terminals 1 and 2 for each float position.

Float position mm (in.)	Resistance (Ω)
F: Approx. 19.76 (0.78) ± 3 (0.12)	Approx. 4.0 ± 1.0
E: Approx. 92.7 (3.65) ± 3 (0.12)	Approx. 107.0 ± 1.0

If resistance value is not as specified, replace the sender gauge.



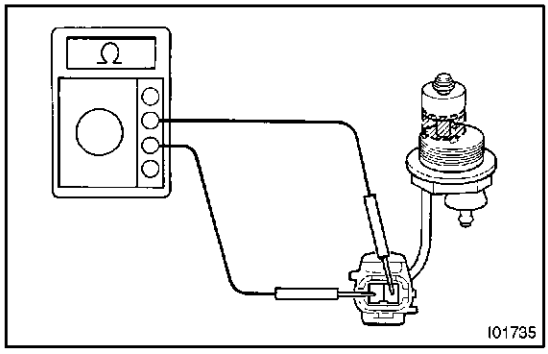
7. INSPECT FUEL FILTER WARNING LIGHT

(a) Disconnect the connector from the warning switch and connect terminals on the wire harness side connector.

(b) Remove the CHARGE fuse and turn the ignition switch ON.

(c) Check that the warning light lights up and the warning buzzer sounds.

If the warning light does not light up, test the bulb or wire harness.

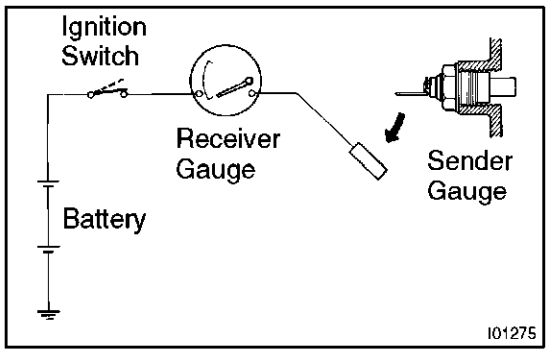


8. INSPECT FUEL FILTER WARNING SWITCH CONTINUITY

(a) Check that no continuity exists between the terminals with the switch OFF (float down).

(b) Check that continuity exists between the terminals with the switch ON (float up)

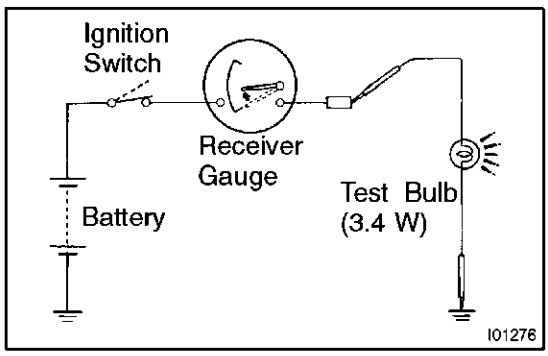
If operation is not as specified, replace the switch.



9. INSPECT ENGINE COOLANT TEMPERATURE RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge.

(b) Turn the ignition switch ON and check that the receiver gauge needle indicates COOL.



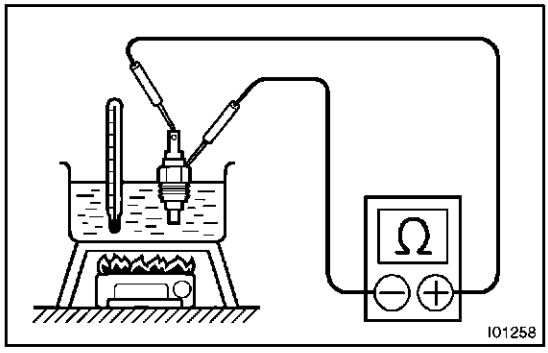
(c) Ground terminal on the wire harness side connector through a 3.4 W test bulb.

(d) Turn the ignition switch ON, and check that the bulb lights up and the receiver gauge needle moves to the hot side.

If operation is as specified, replace the sender gauge.

Then recheck the system.

If operation is not as specified, measure the receiver gauge resistance.

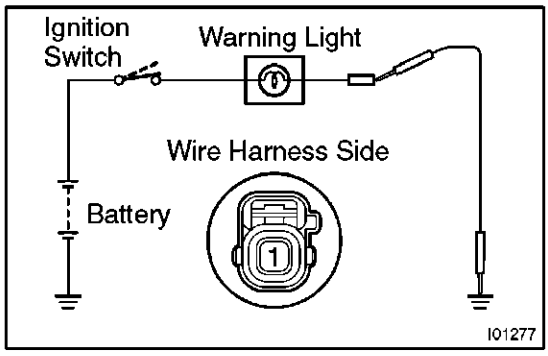


10. INSPECT ENGINE COOLANT TEMPERATURE SENDER GAUGE RESISTANCE

Measure the resistance between the terminal and gauge body.

Temperature °C(°F)	Resistance (Ω)
50 (122.0)	160 – 240
120 (248.0)	17.1 – 21.2

If resistance value is not as specified, replace the engine coolant temperature sender gauge.

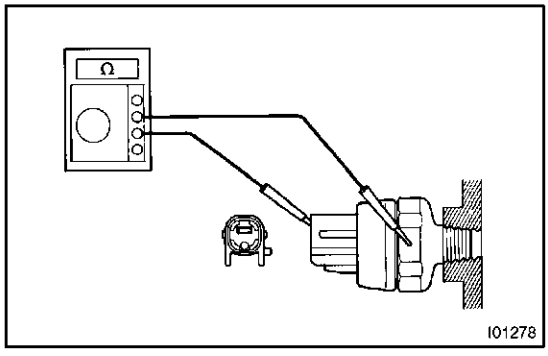


11. INSPECT LOW OIL PRESSURE WARNING LIGHT

(a) Disconnect the connector from the warning switch and ground terminal on the wire harness side connector.

(b) Turn the ignition switch ON and check that the warning light lights up.

If the warning light does not light up, test the bulb.



12. INSPECT LOW OIL PRESSURE SWITCH CONTINUITY

(a) Disconnect the connector from the switch.

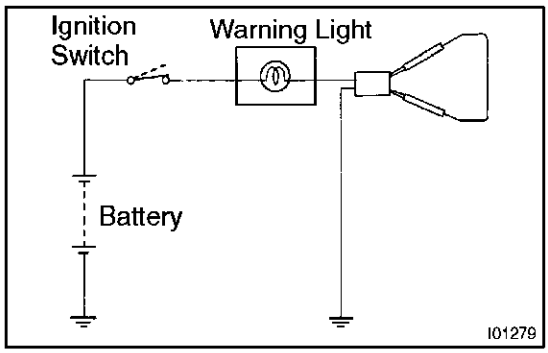
(b) Check that continuity exists between terminal and ground with the engine stopped.

(c) Check that no continuity exists between terminal and ground with the engine running.

HINT:

Oil pressure should be over 24.5 kPa (0.25 kgf/cm^2, 3.55 psi).

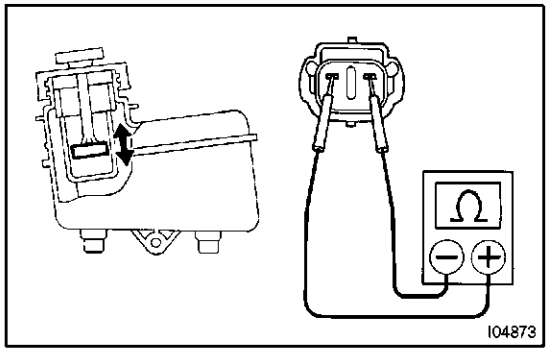
If operation is not as specified, replace the switch.



13. Gasoline Engine:
INSPECT BRAKE WARNING LIGHT

(a) Disconnect the connector from the brake fluid warning switch.
(b) Release the parking brake pedal.
(c) Connect the terminals on the wire harness side of the level warning switch connector.
(d) Start the engine, check that the warning light lights up.

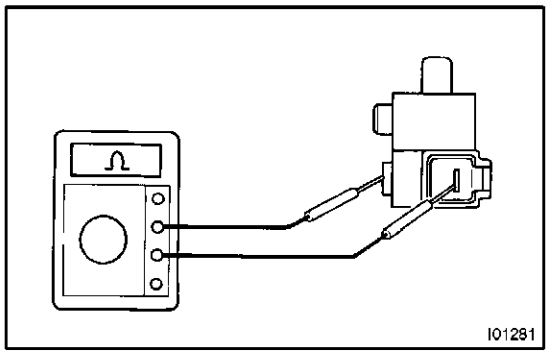
If the warning light does not light up, test the bulb or wire harness.



14. Gasoline Engine:
INSPECT BRAKE FLUID LEVEL WARNING SWITCH CONTINUITY

(a) Remove the reservoir tank cap and strainer.
(b) Disconnect the connector.
(c) Check that no continuity exists between the terminals with the switch OFF (float up).
(d) Use syphon, etc. to take fluid out of the reservoir tank.
(e) Check that continuity exists between the terminals with the switch ON (float down)
(f) Pour the fluid back in the reservoir tank.

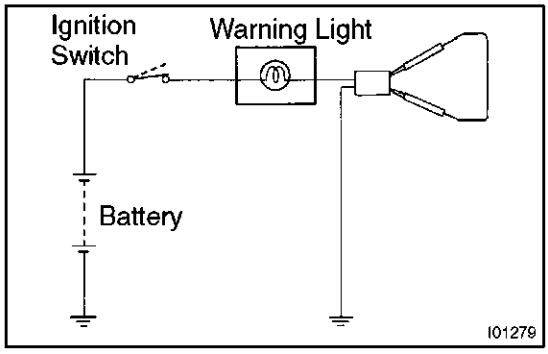
If operation is not as specified, replace the switch.



15. Gasoline Engine:
INSPECT PARKING BRAKE SWITCH CONTINUITY

(a) Check that continuity exists between the terminal and switch body with the switch ON (switch pin released).
(b) Check that no continuity exists between the terminal and switch body with the switch OFF (switch pin pushed in).

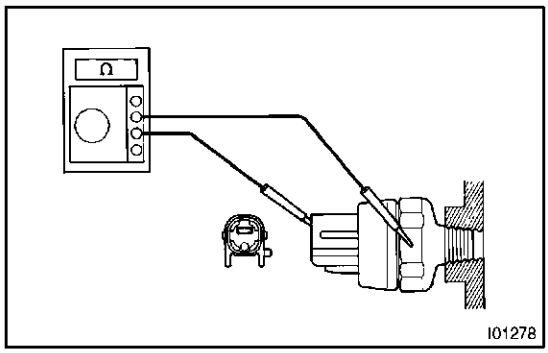
If operation is not as specified, replace the switch or inspect ground point.

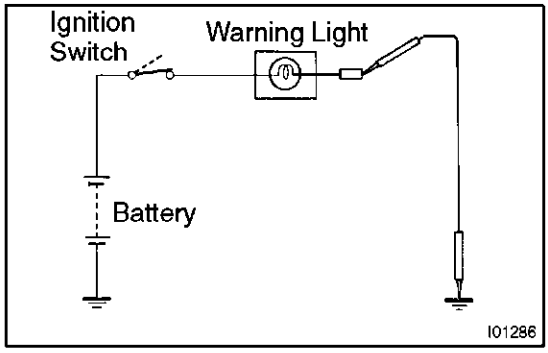


16. Diesel Engine:
INSPECT BRAKE WARNING LIGHT

(a) Disconnect the connector from the vacuum switch and ground terminal on the wire harness side connector.
(b) Turn the ignition switch ON, and check that the warning light lights up.

If the warning light does not light up, test the bulb or wire harness.





17. Diesel Engine:
INSPECT VACUUM SWITCH CONTINUITY

(a) Check that there is no continuity between the terminal and ground with the engine stopped.

(b) Check that continuity exists between the terminal and ground with the engine running.

HINT:

Oil pressure should be over 13.3 kPa (100 mmHg, 3.94 in.Hg)

If operation is not as specified, replace the switch or inspect ground point.

18. INSPECT OPEN DOOR WARNING LIGHT

Disconnect the connector from the door courtesy switch and ground terminal 1 on the wire harness side, and check that the warning light lights up.

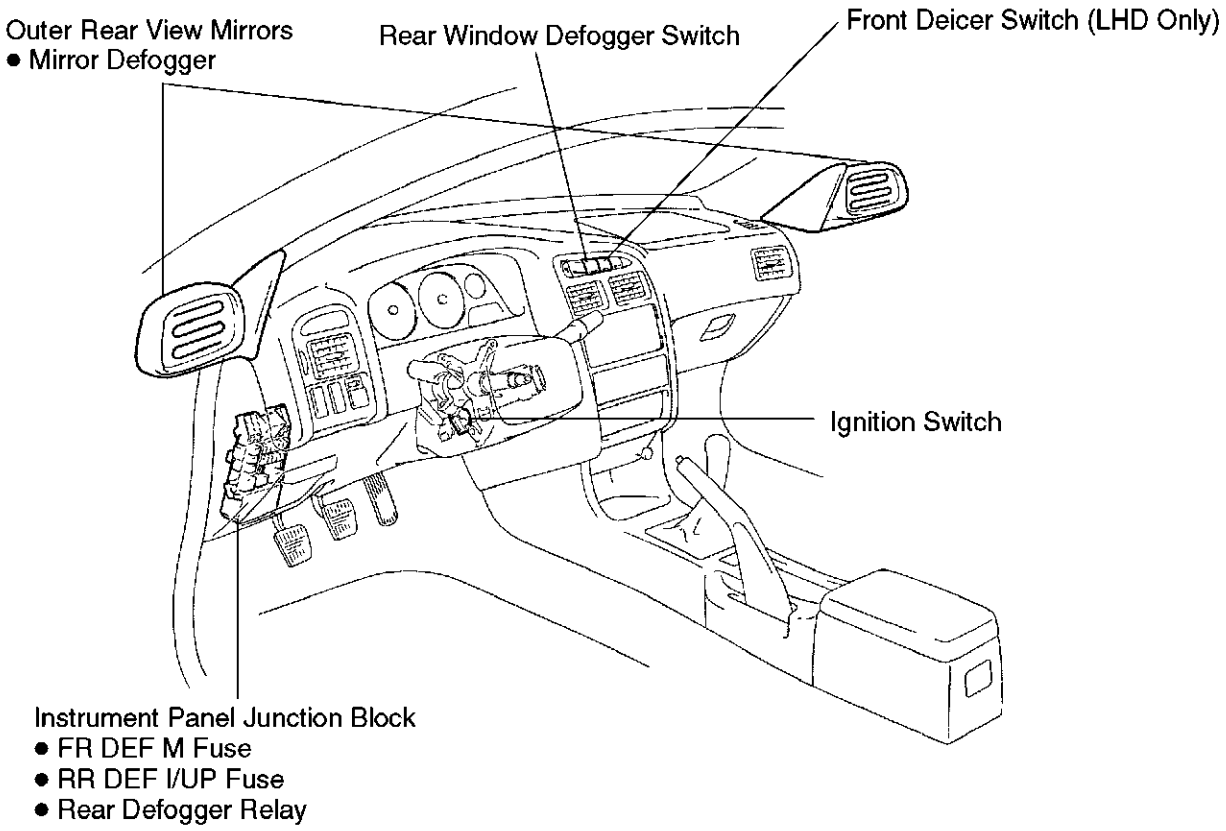
If the warning light does not light up, inspect the bulb or wire harness.

19. INSPECT DOOR COURTESY SWITCH CONTINUITY
(See page BE–39)

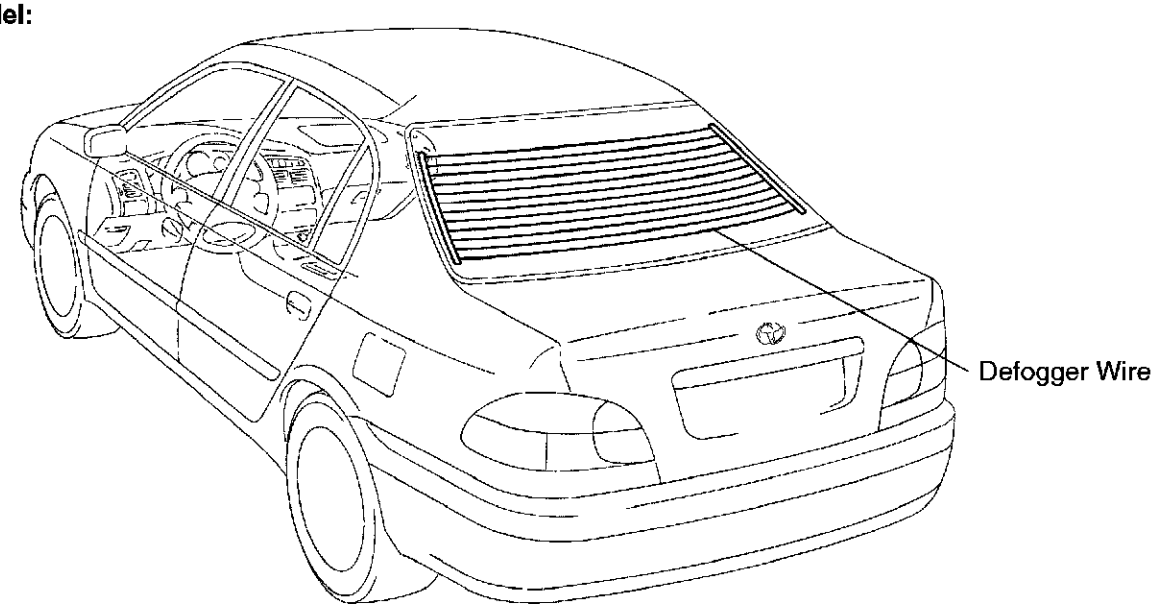
DEFOGGER SYSTEM

LOCATION

BE0O3–01

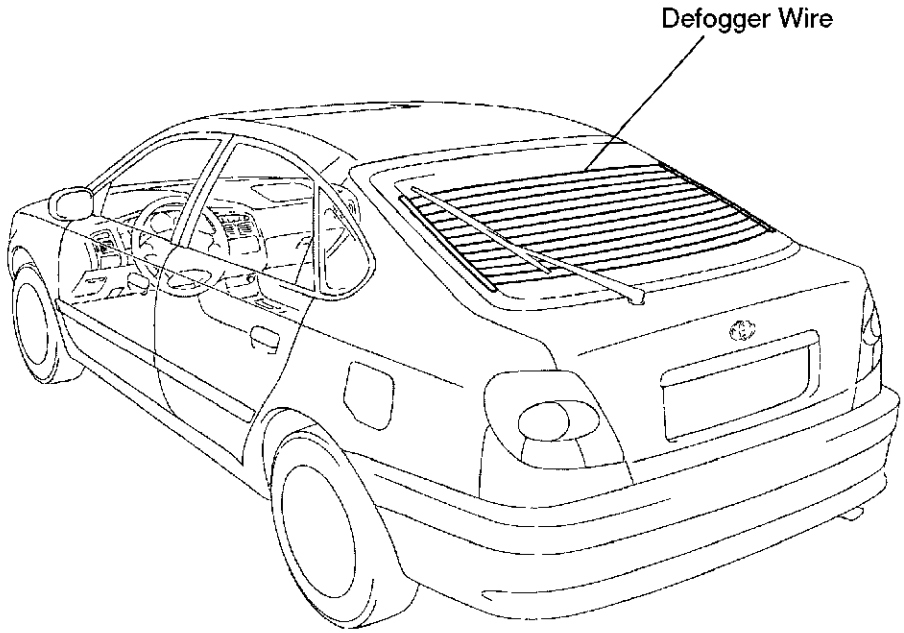


Sedan Model:

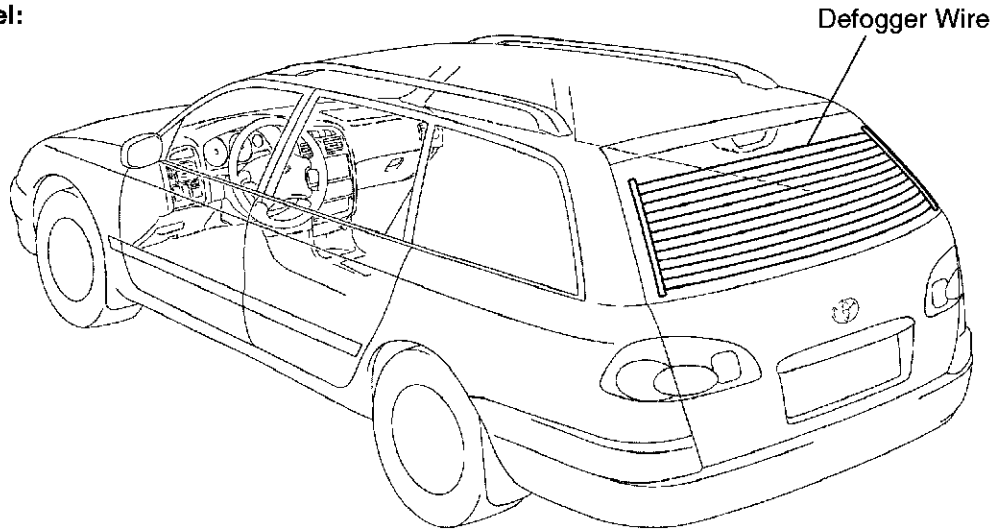


I04819

Liftback Model:



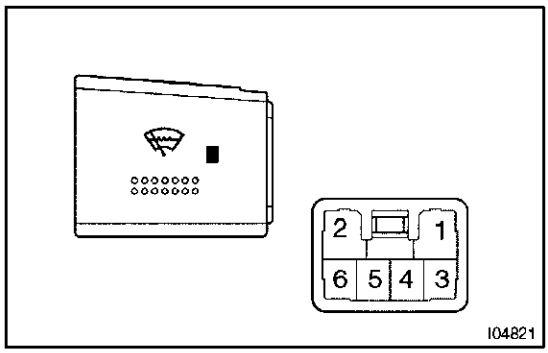
Wagon Model:



I04820

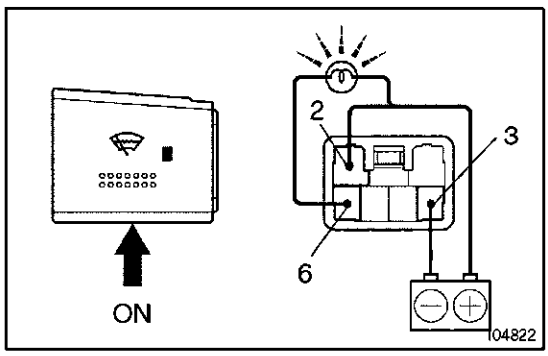
BE0O4–01

INSPECTION



1. INSPECT FRONT DEICER SWITCH CONTINUITY

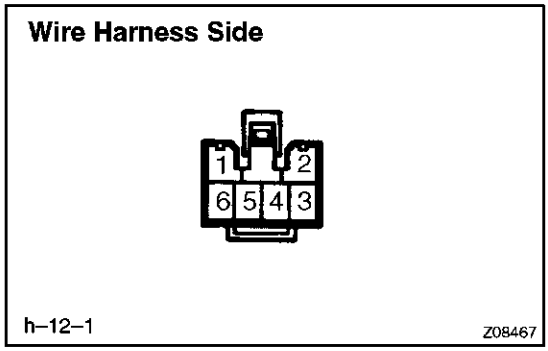
Check that continuity exists between terminals 1 and 4.
If continuity is not as specified, replace the bulb.



2. INSPECT DEICER TIMER OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and negative (–) lead to terminal 3.
(b) Connect the positive (+) lead from the battery to terminal 4 through a 3.4 W test bulb.
(c) Push the defogger switch ON, check that the indicator light and test bulb light up for 12 for 18 minutes, then the indicator light and test bulb lights go out.

If operation is not as specified, replace the switch.



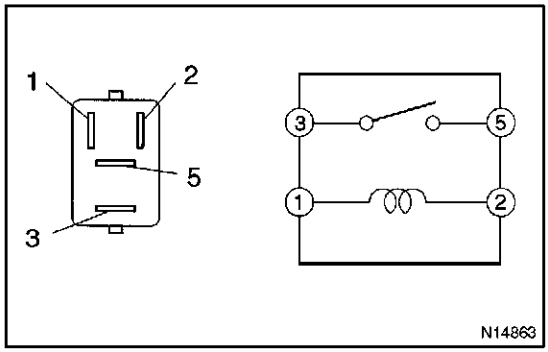
3. INSPECT DEICER TIMER CIRCUIT

Connector disconnected:

Disconnect the connector from the switch and inspect the connector on wire harness side, as shown in the table below.

Tester connection	Condition	Specified condition
3 – Ground	Constant	Continuity
1 – Ground	Ignition switch LOCK or ACC	No voltage
1 – Ground	Ignition switch LOCK	Battery voltage
6 – Ground	Ignition switch LOCK or ACC	No voltage
6 – Ground	Ignition switch ON	Battery voltage
–	Connect terminals 1 and 3	Defogger system operation is normal

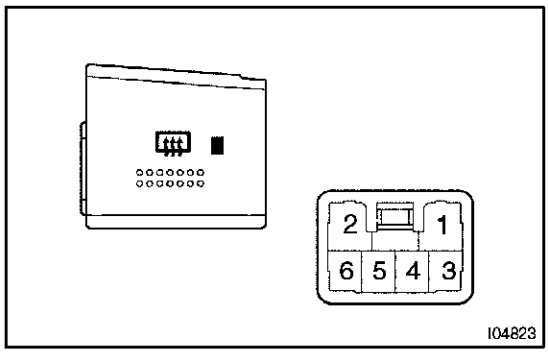
If the circuit is not as specified, replace the switch.



4. INSPECT DEICER RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

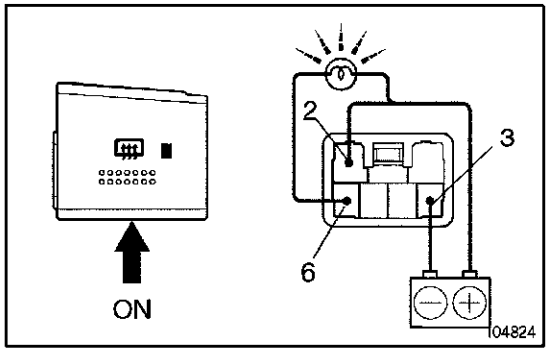
If continuity is not as specified, replace the relay.



5. INSPECT REAR DEFOGGER SWITCH CONTINUITY

Check that continuity exists between terminals 1 and 4.

If continuity is not as specified, replace the bulb.



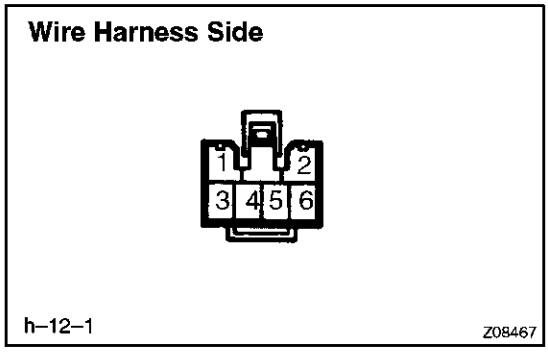
6. INSPECT DEFOGGER TIMER OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and negative (–) lead to terminal 3.

(b) Connect the positive (+) lead from the battery to terminal 4 through a 3.4 W test bulb.

(c) Push the defogger switch ON, check that the indicator light and test bulb light up for 12 for 18 minutes, then the indicator light and test bulb lights go out.

If operation is not as specified, replace the switch.



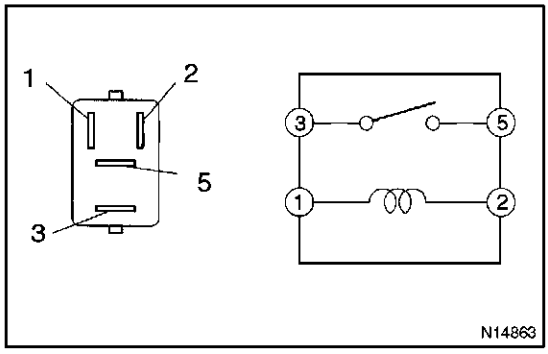
7. INSPECT DEFOGGER TIMER CIRCUIT

Connector disconnected:

Disconnect the connector from the switch and inspect the connector on wire harness side, as shown in the chart.

Tester connection	Condition	Specified condition
3 – Ground	Constant	Continuity
4 – Ground	Ignition switch LOCK or ACC	No voltage
4 – Ground	Ignition switch ON	Battery voltage
5 – Ground	Ignition switch LOCK or ACC	No voltage
5 – Ground	Ignition switch ON	Battery voltage
–	Connect terminals 3 and 5	Defogger system operation is normal

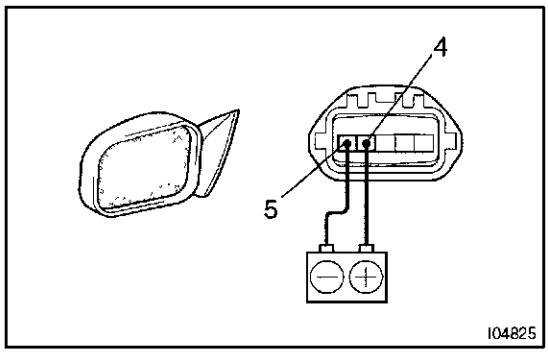
If the circuit is not as specified, replace the switch.



8. INSPECT DEFOGGER RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.



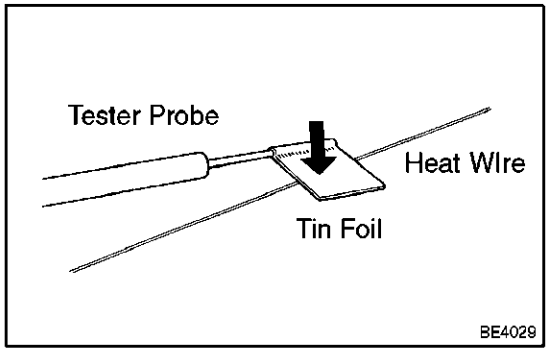
9. w/ Heater:
INSPECT MIRROR DEFOGGER

(a) Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5.

(b) Check that the mirror becomes warm.

HINT:

It will take a short time for the mirror to become warm.



10. INSPECT DEFOGGER WIRE

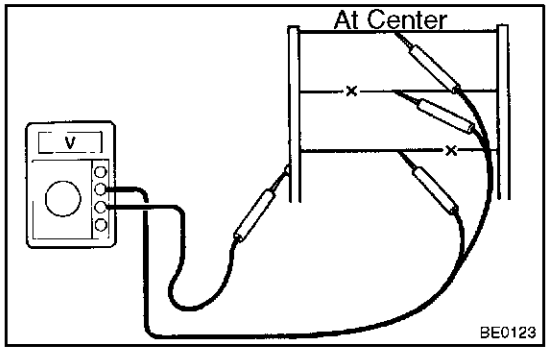
NOTICE:

- **When cleaning the glass, use a soft, dry cloth, and wipe the glass in the direction of the wire. Take care not to damage the wires.**
- **Do not use detergents or glass cleaners with abrasive ingredients.**
- **When measuring voltage, wrap a piece of tin foil around the top of the negative probe and press the foil against the wire with your finger, as shown.**

(a) Turn the ignition switch ON.

(b) Turn the defogger switch ON.

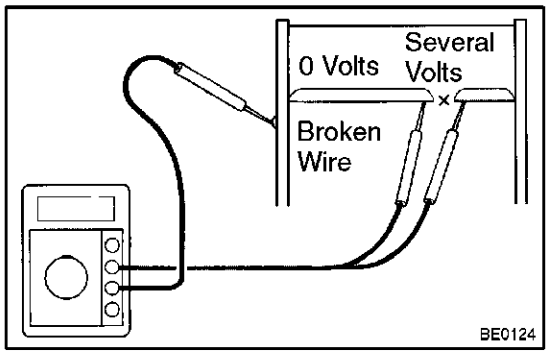
(c) Inspect the voltage at the center of each heat wire, as shown.



Voltage	Criteria
Approx. 5V	Okay (No break in wire)
Approx. 10V or 0V	Broken wire

HINT:

If the voltage is approx. 10V the wire is broken between the center of the wire and the positive (+) end. If there is no voltage, the wire is broken between the center of the wire and ground.



(d) Place the voltmeter positive (+) lead against the defogger positive (+) terminal.

(e) Place the voltmeter negative (–) lead with the foil strip against the heat wire at the positive (+) terminal end and slide it toward the negative (–) terminal end.

(f) The point where the voltmeter deflects from zero to several V is the place where the heat wire is broken.

HINT:

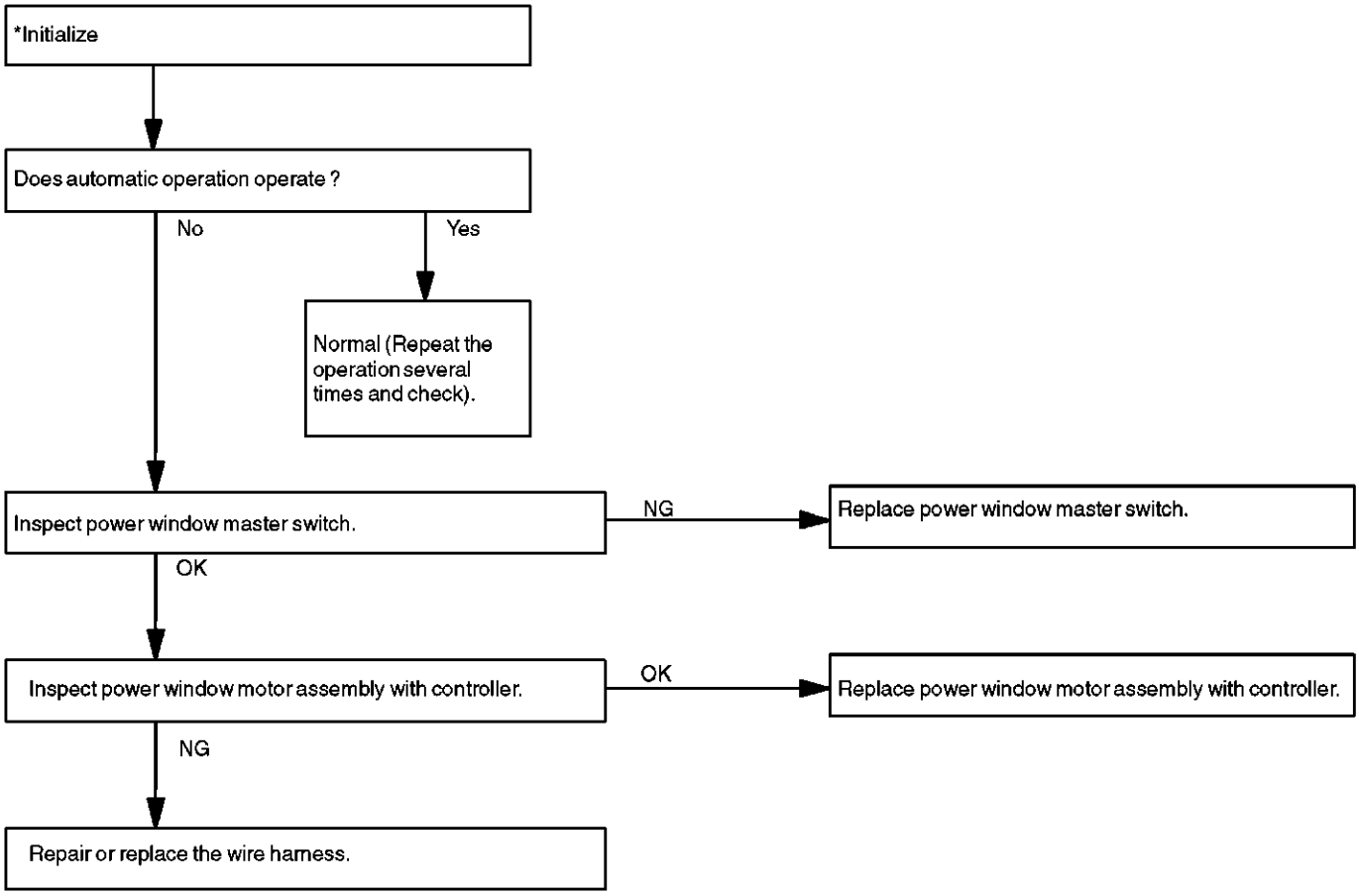
If the heat wire is not broken, the voltmeter indicates 0 V at the positive (+) end of the heat wire but gradually the voltage increases to about 12 V as the meter probe is moved to the other end.

POWER WINDOW CONTROL SYSTEM

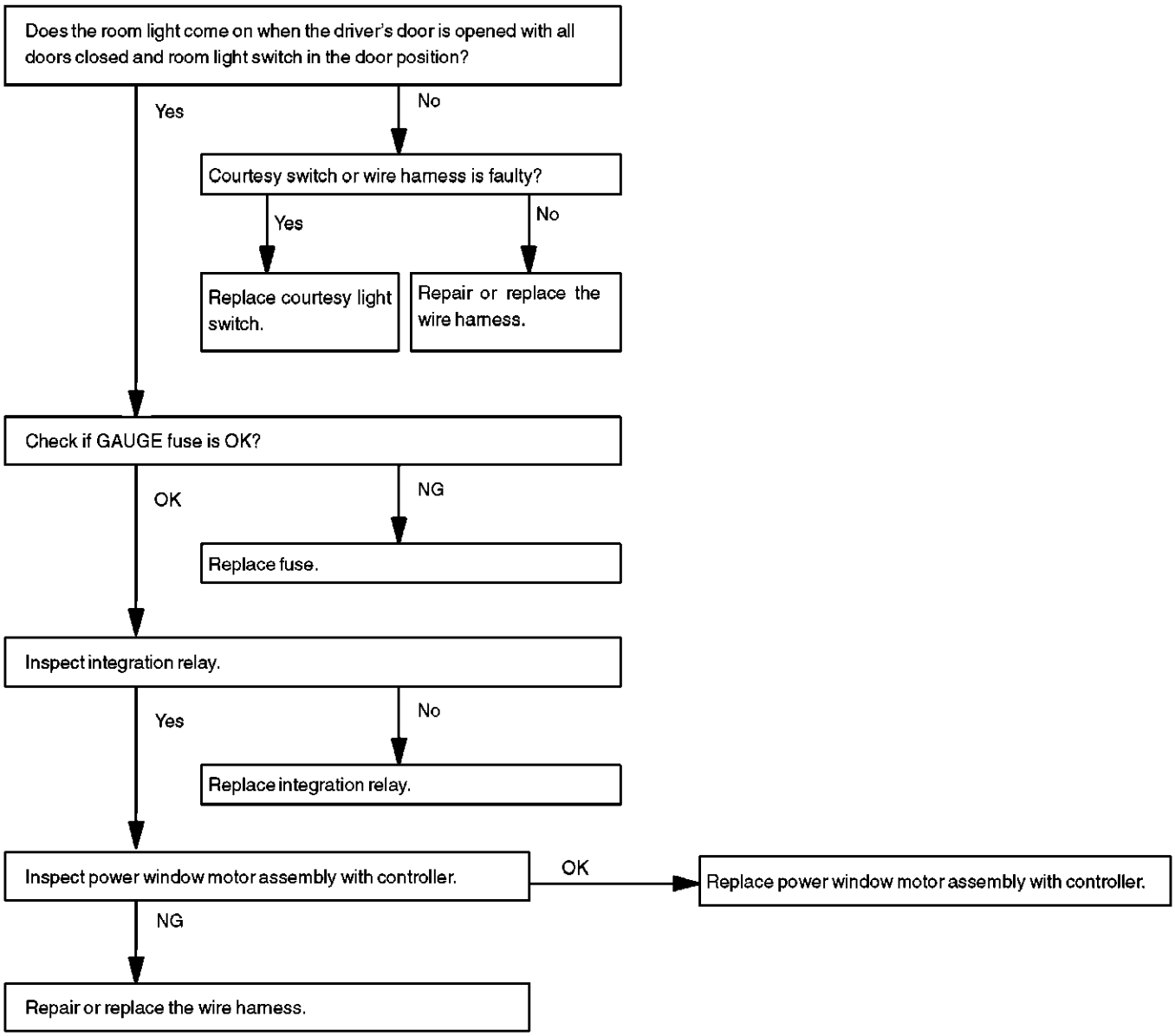
TROUBLESHOOTING

BE02C–05

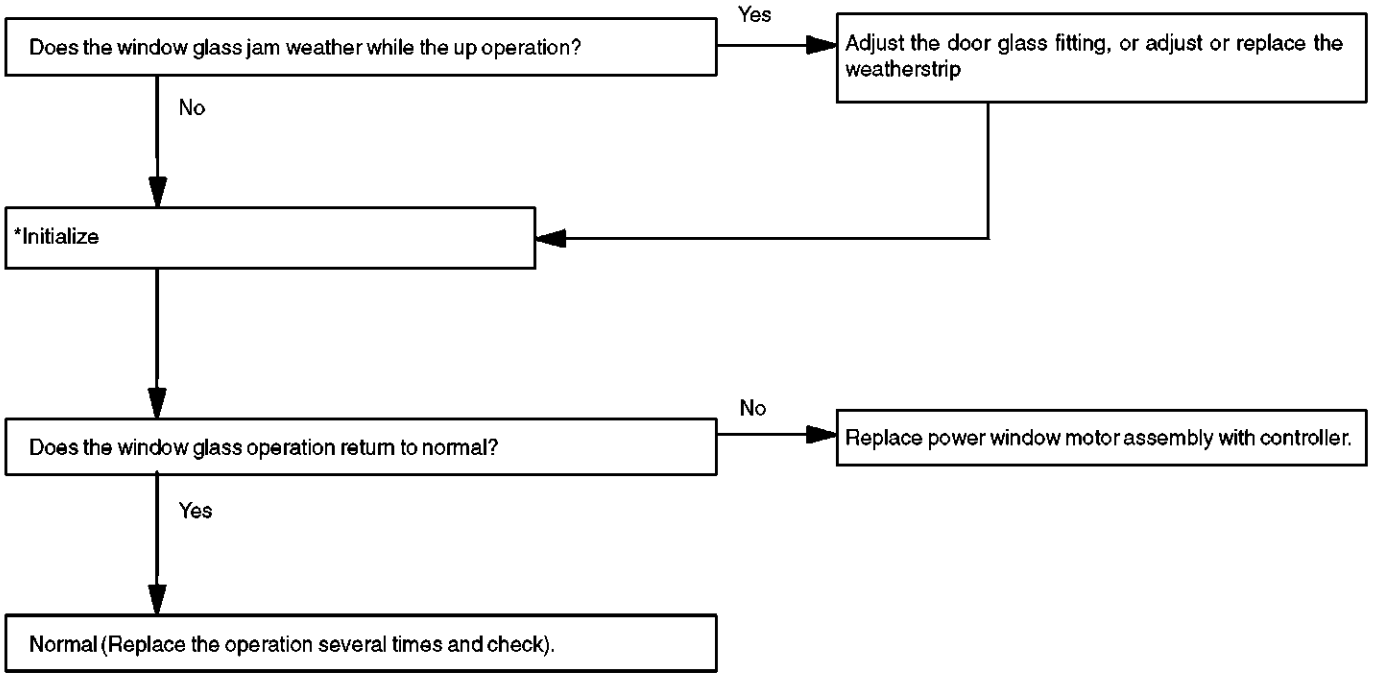
1	Automatic operation for the driver's door does not operate.



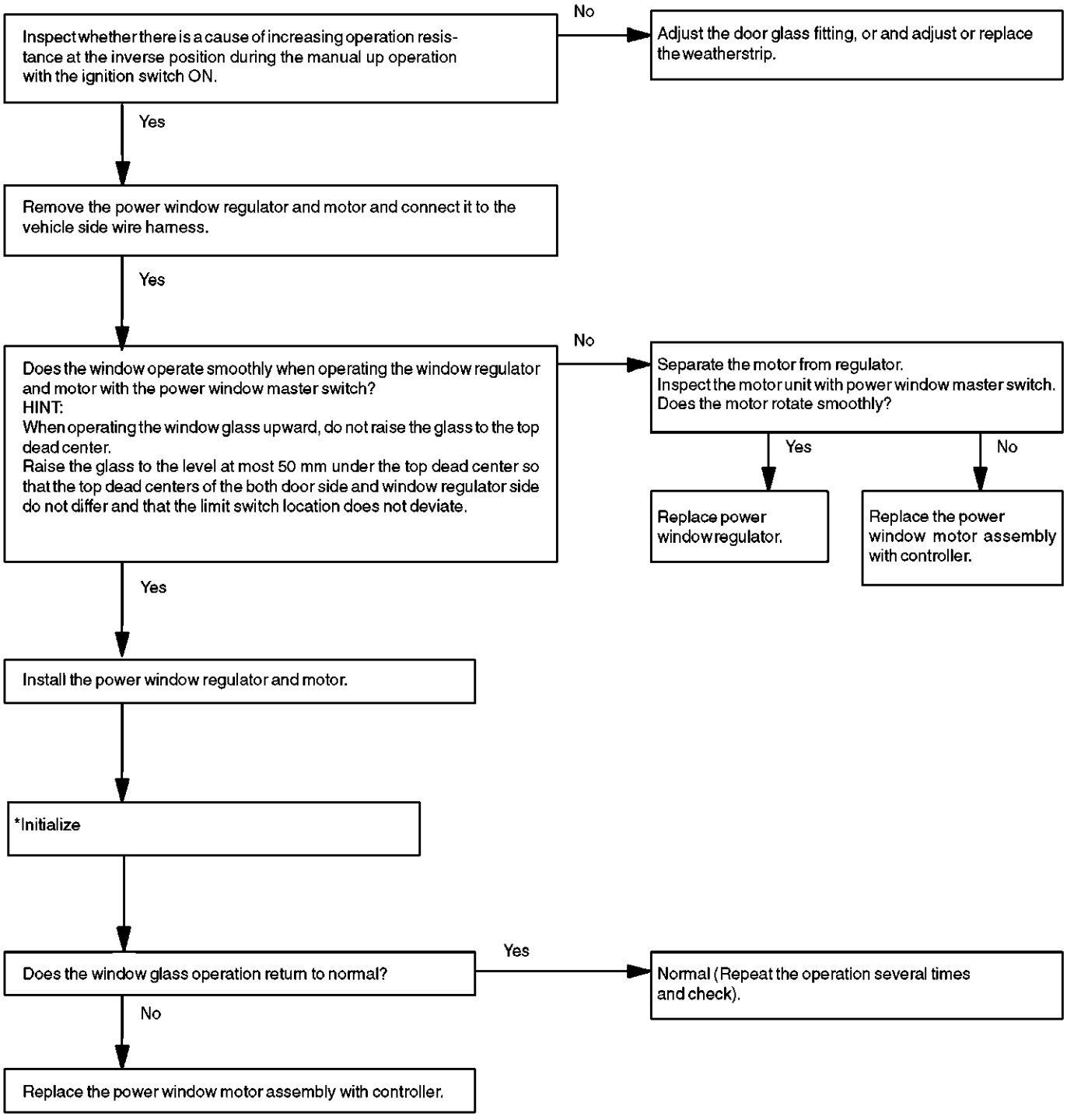
2	**The key–off operation does not operate.**



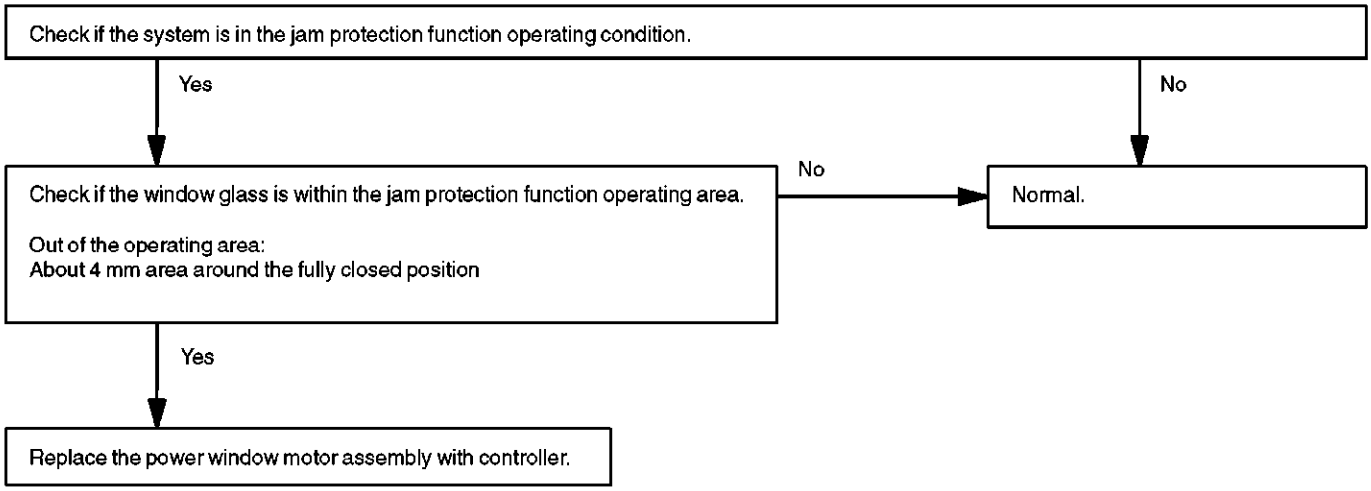
3	**The down operation starts at the almost–closed position while the up operation.**



4 The down operation starts at other positions than the almost–closed position during the up operation.



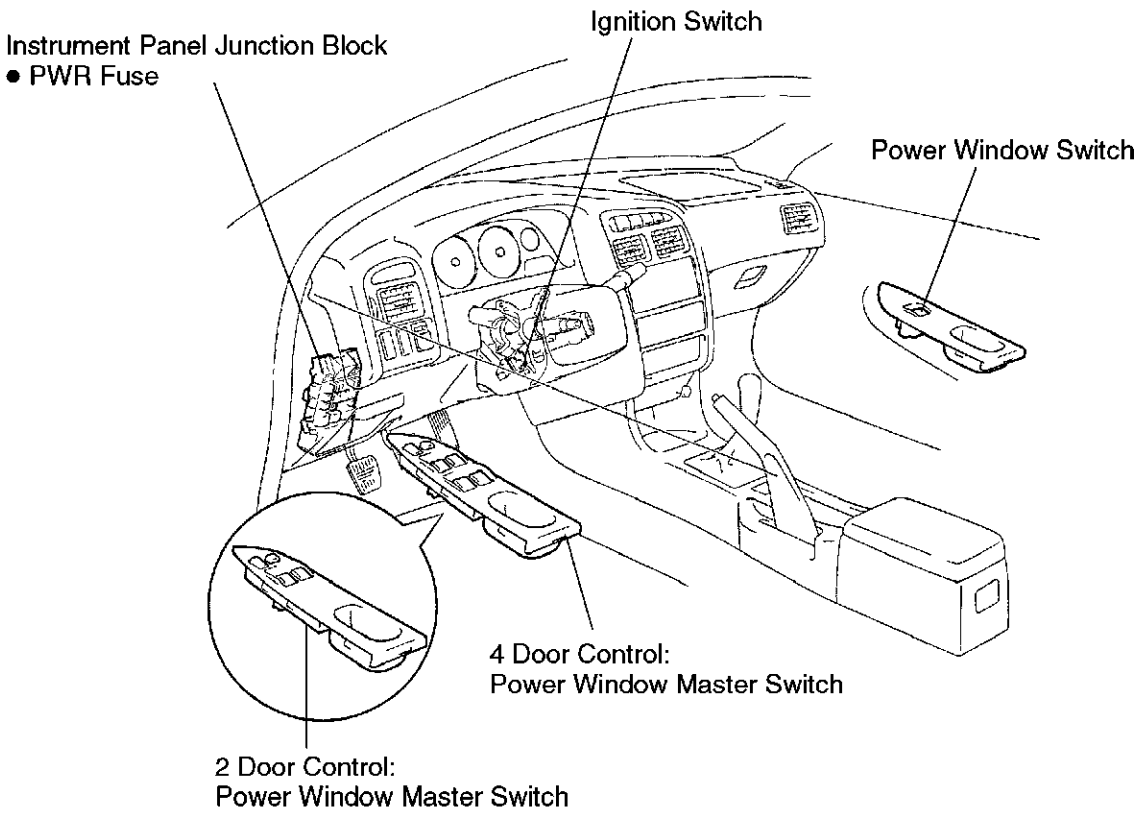
5	**The down operation does not work though some other objects are caught into the window glass.**



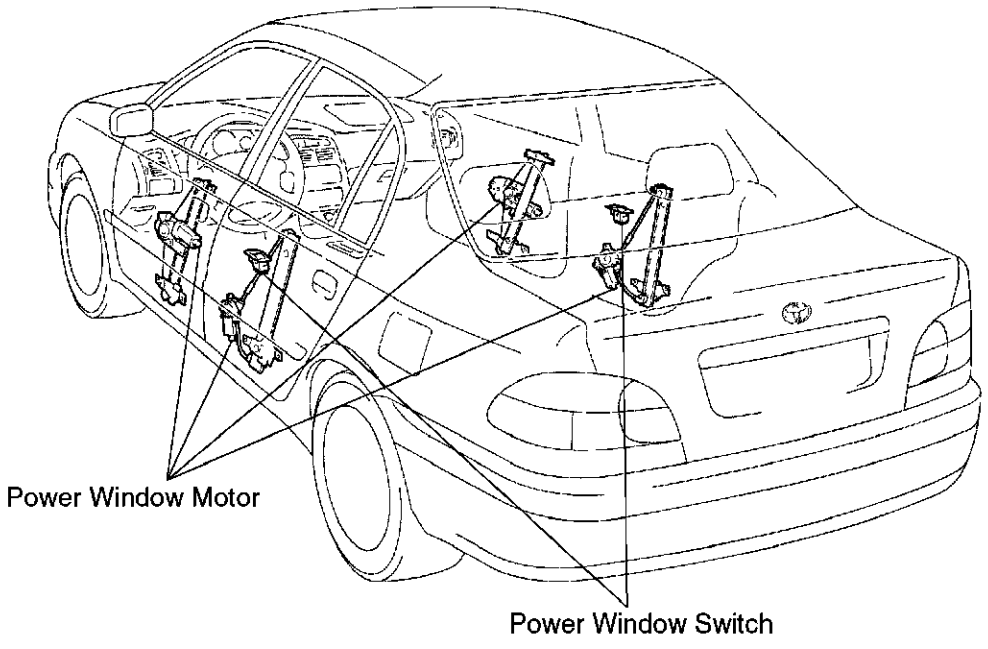
*Initializing method
Move up the door glass to the fully closed position and hold the switch for 5 secs.

BE0O5–01

LOCATION

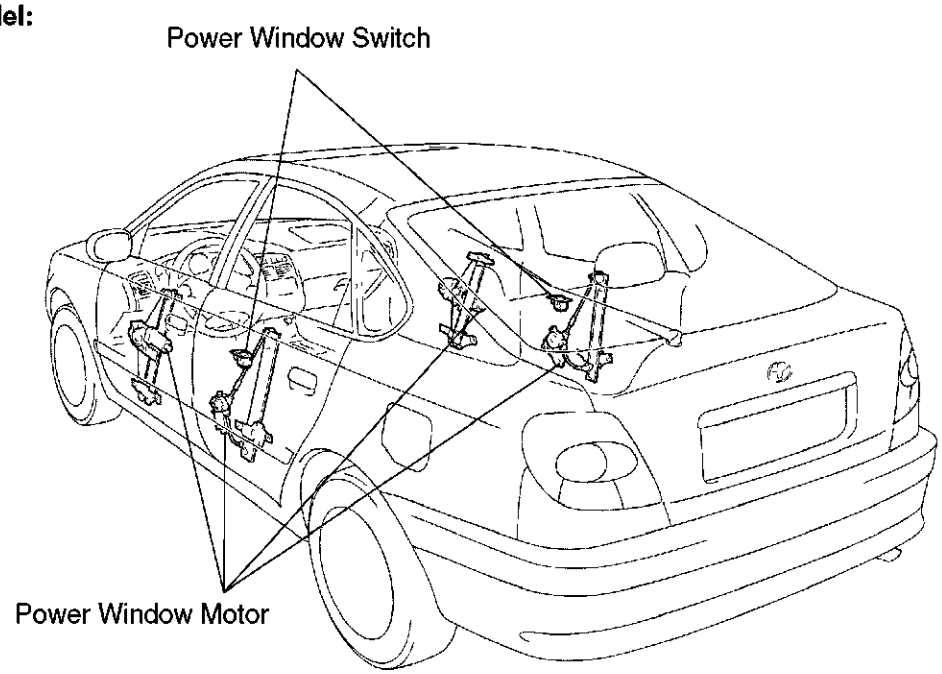


Sedan Model:

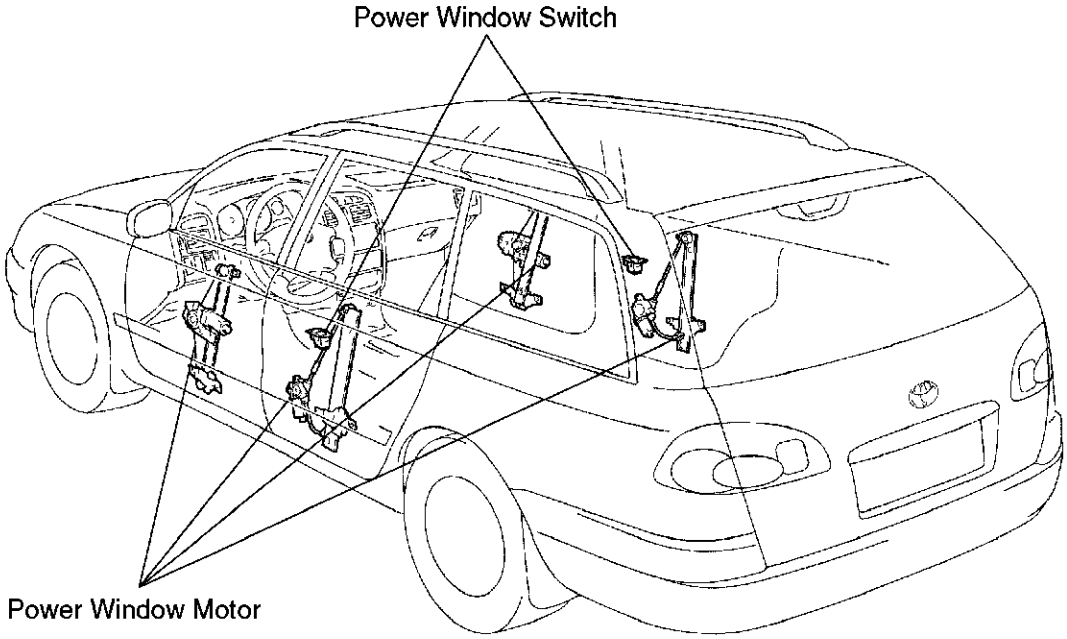


I04862

Liftback Model:



Wagon Model:



I04863

BE0O6–01

INSPECTION

NOTICE:

If battery voltage to the window regulator motor is cut off by disconnecting the connector of jam protection window regulator or the battery, AUTO UP operation does not function.

In this case, initialize the system again.

HINT:

Initializing method

Move up the door glass to the fully closed position and hold the switch for 5 secs.

1. 4–Door Control Power Window:

INSPECT POWER WINDOW MASTER SWITCH CONTINUITY AND VOLTAGE

Connect the battery positive (+) lead to terminals 3 and 10, and battery negative (–) lead to terminals 4 and 5.

Front Driver's Switch (Window unlock and lock):

Switch position	Tester connection	Specified condition
UP	1 – 2	Battery voltage
UP	1 – 3 2 – 4 – 5	Continuity
OFF	1 – 2 – 4 – 5	Continuity
DOWN	1 – 2	Battery voltage
DOWN	1 – 4 – 5 2 – 3	Continuity

Front Passenger's Switch (Window unlock):

Switch position	Tester connection	Specified condition
UP	7 – 8	Battery voltage
UP	4 – 5 – 8 7 – 10	Continuity
OFF	4 – 5 – 7 – 8	Continuity
DOWN	7 – 8	Battery voltage
DOWN	4 – 5 – 7 8 – 10	Continuity

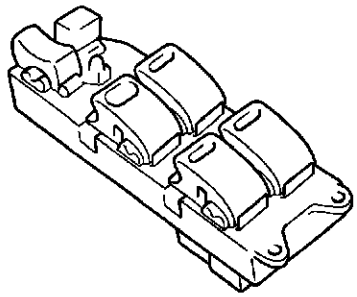
Front Passenger's Switch (Window lock):

Switch position	Tester connection	Specified condition
UP	7 – 8	Battery voltage
UP	7 – 10	Continuity
OFF	7 – 8	Continuity
DOWN	7 – 8	Battery voltage
DOWN	8 – 10	Continuity

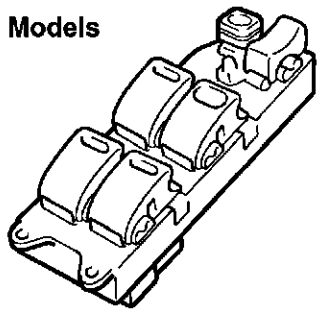
Rear Left Switch (Window unlock):

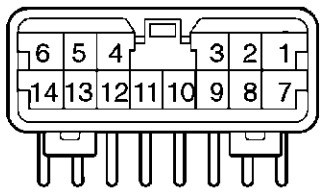
Switch position	Tester connection	Specified condition
UP	9 – 11	Battery voltage
UP	4 – 5 – 11 9 – 10	Continuity
OFF	4 – 5 – 9 – 11	Continuity

LHD Models



RHD Models





e–14–2–F

I01754

DOWN	9 – 11	Battery voltage
DOWN	4 – 5 – 9 10 – 11	Continuity

Rear Left Switch (Window lock):

Switch position	Tester connection	Specified condition
UP	9 – 11	Battery voltage
UP	9 – 10	Continuity
OFF	9 – 11	Continuity
DOWN	9 – 11	Battery voltage
DOWN	10 – 11	Continuity

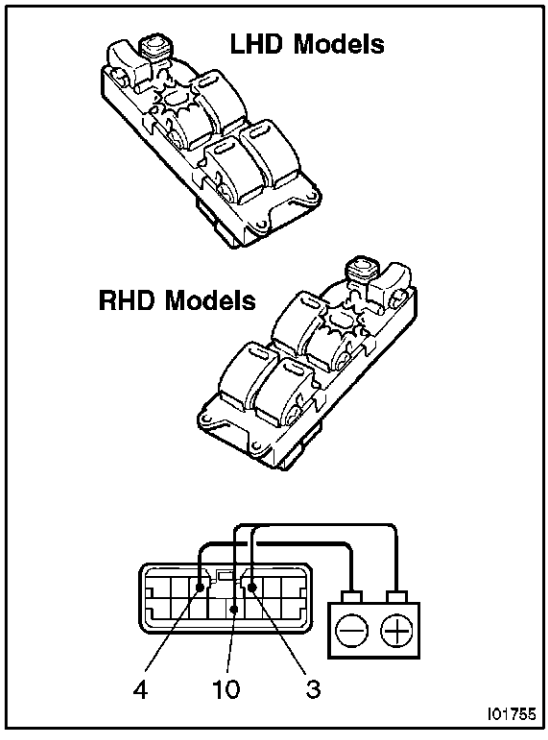
Rear Right Switch (Window unlock):

Switch position	Tester connection	Specified condition
UP	13 – 14	Battery voltage
UP	4 – 5 – 14 10 – 13	Continuity
OFF	4 – 5 – 13 – 14	Continuity
DOWN	13 – 14	Battery voltage
DOWN	4 – 5 – 13 10 – 14	Continuity

Rear Right Switch (Window lock):

Switch position	Tester connection	Specified condition
UP	13 – 14	Battery voltage
UP	10 – 13	Continuity
OFF	13 – 14	Continuity
DOWN	13 – 14	Battery voltage
DOWN	10 – 14	Continuity

If continuity and voltage are not as specified, replace the master switch.

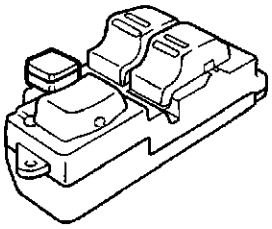


2. 4–Door Lock Control Power Window:
INSPECT POWER WINDOW MASTER SWITCH ILLUMINATION

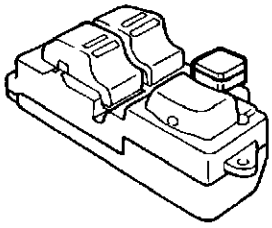
Connect the positive (+) lead from the battery to terminal 3 and 10, and the negative (–) lead to terminal 4, and check that all the illuminations light up.

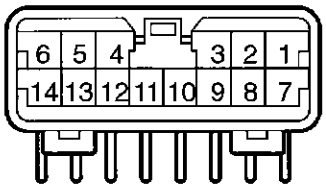
If operation is not as specified, replace the master switch.

LHD Models



RHD Models





e–14–2–F

I01828

3. 2–Door Lock Control Power Window: INSPECT POWER WINDOW MASTER SWITCH CONTINUITY AND VOLTAGE

Connect the battery positive (+) lead to terminals 3 and 9, and battery negative (–) lead to terminal 10.

Switch position	Tester connection	Specified condition
UP	1 – 2	Battery voltage
UP	1 – 3 2 – 10	Continuity
OFF	1 – 2 – 10	Continuity
DOWN	1 – 2	Battery voltage
DOWN	1 – 10 2 – 3	Continuity

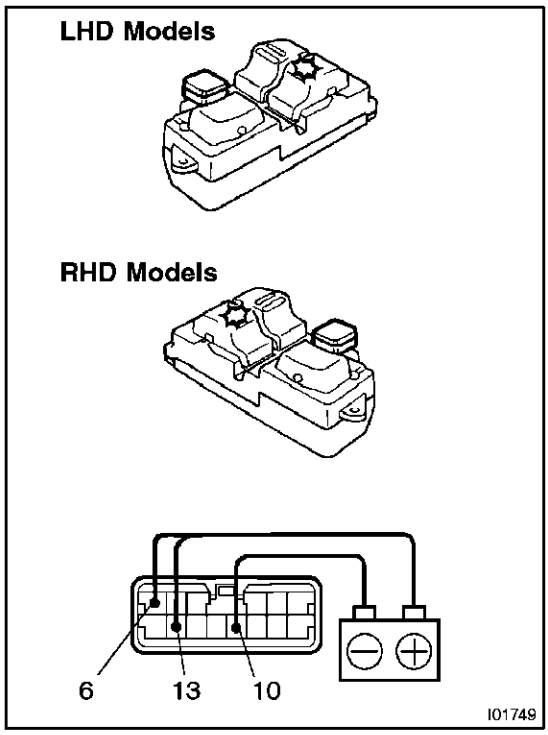
Front Passenger's Switch (Window unlock):

Switch position	Tester connection	Specified condition
UP	7 – 8	Battery voltage
UP	8 – 10 7 – 9	Continuity
OFF	7 – 8 – 10	Continuity
DOWN	7 – 8	Battery voltage
DOWN	7 – 10 8 – 9	Continuity

Front Passenger's Switch (Window lock):

Switch position	Tester connection	Specified condition
UP	7 – 8	Battery voltage
UP	7 – 9	Continuity
OFF	7 – 8	Continuity
DOWN	7 – 8	Battery voltage
DOWN	8 – 9	Continuity

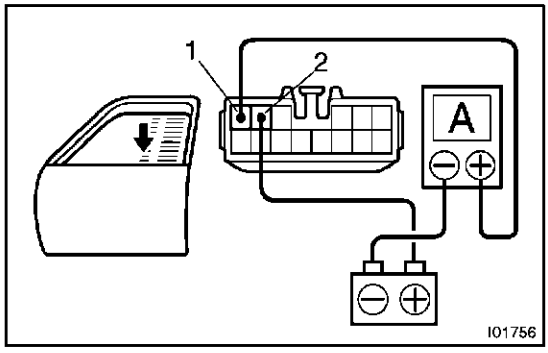
If continuity and voltage are not as specified, replace the master switch.



4. 2–Door Lock Control Power Window: INSPECT POWER WINDOW MASTER SWITCH ILLUMINATION

Connect the positive (+) lead from the battery to terminals 6 and 13, and the negative (–) lead to terminal 10, and check that all the illuminations light up.

If operation is not as specified, replace the master switch.



5. INSPECT ONE TOUCH POWER WINDOW SYSTEM/ CURRENT OF CIRCUIT

Using an ammeter:

(a) Disconnect the connector from the master switch.

(b) Connect the positive (+) lead from the ammeter to terminal 1 on the wire harness side connector and the negative (–) lead to negative (–) terminal of the battery.

(c) Connect the positive (+) lead from the battery to terminal 2 on the wire harness side connector.

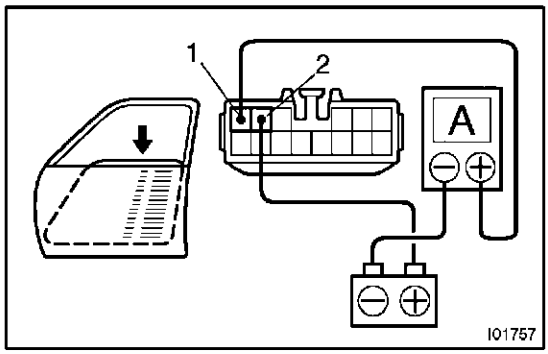
(d) As the window goes down, check that the current flow is approximately 7 A.

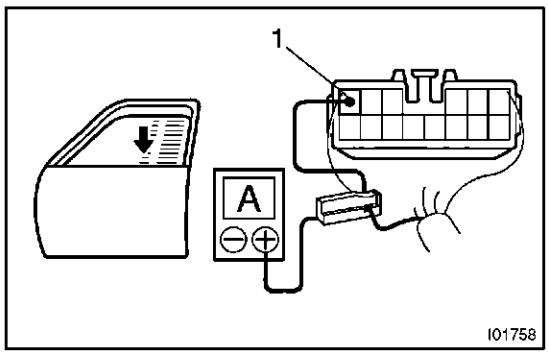
(e) Check that the current increases up to approximately 14.5 A or more when the window stops going down.

HINT:

The circuit breaker opens for some 4 to 40 seconds after the window stops going down, so that check must be made before the circuit breaker operates.

If the operation is as specified, replace the master switch.





6. INSPECT ONE TOUCH POWER WINDOW SYSTEM/ CURRENT OF CIRCUIT

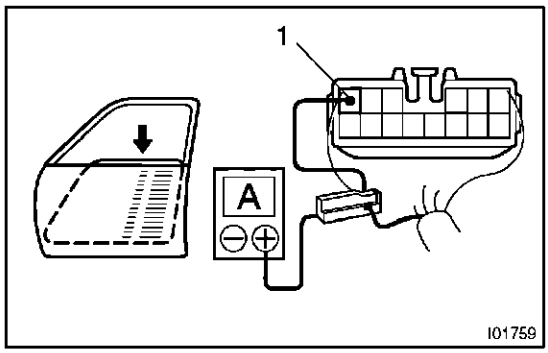
Using an ammeter with a current–measuring probe:

(a) Remove the master switch with connector connected.

(b) Attach a current–measuring probe to terminal 1 of the wire harness.

(c) Turn the ignition switch ON and set the power window switch to the down position.

(d) As the window goes down, check that the current flow is approximately 7 A.

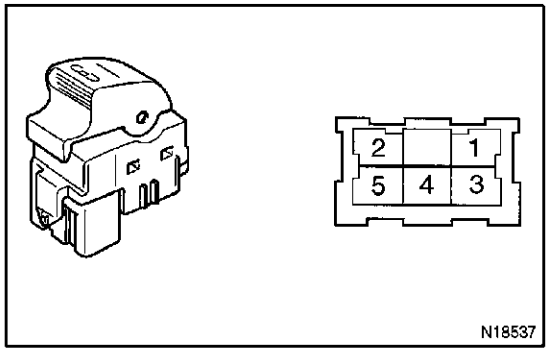


(e) Check that the current increases up to approximately 14.5 A or more when the window stops going down.

HINT:

The circuit breaker opens for some 4 to 40 seconds after the window stops going down, so that check must be made before the circuit breaker operates.

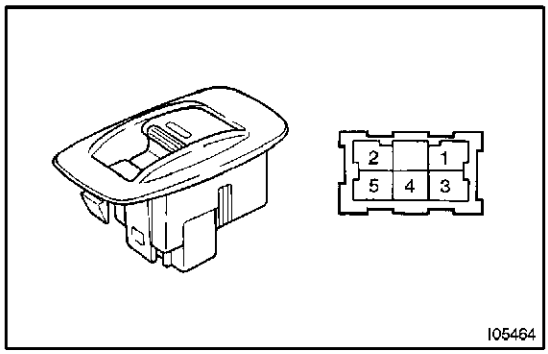
If operation is as specified, replace the master switch.



7. INSPECT PASSENGER'S POWER WINDOW SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
UP	1 – 5 3 – 4	Continuity
OFF	1 – 2 3 – 4	Continuity
DOWN	1 – 2 4 – 5	Continuity

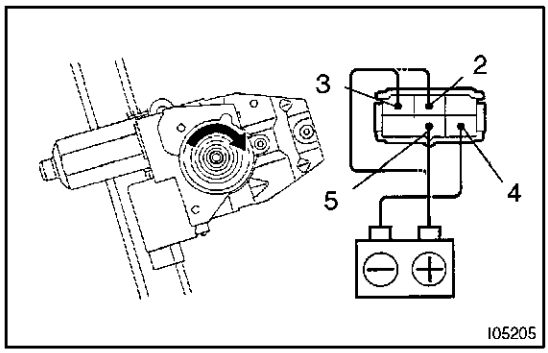
If continuity is not as specified, replace the switch.



8. INSPECT REAR DOOR POWER WINDOW SWITCH CONTINUITY

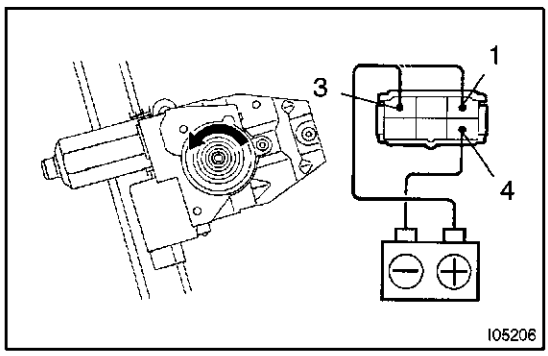
Switch position	Tester connection	Specified condition
UP	1 – 5 3 – 4	Continuity
OFF	1 – 2 3 – 4	Continuity
DOWN	1 – 2 4 – 5	Continuity

If continuity is not as specified, replace the switch.



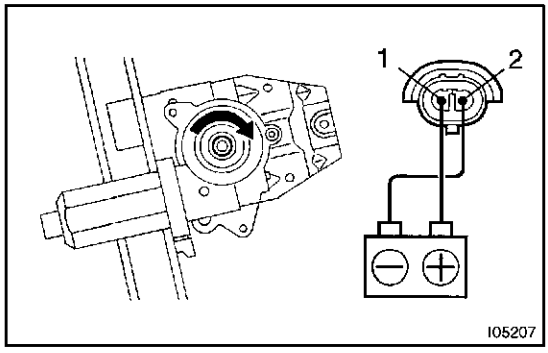
9. LHD Models Driver's Door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to each of terminals 2, 3 and 5 and the negative (–) lead to terminal 4, and check that the motor turns clockwise.



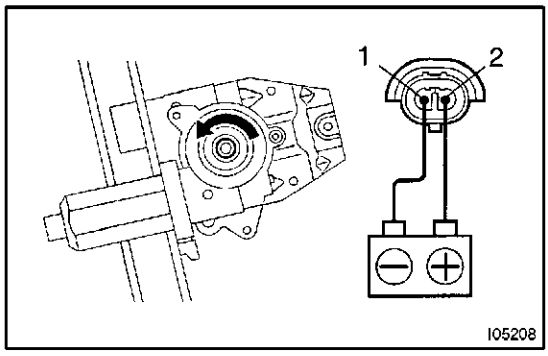
(b) Connect the positive (+) lead from the battery to each of terminals 1 and 3 and the negative (–) lead to terminal 4, and check that the motor turns counterclockwise.

If operation is not as specified, replace the motor.



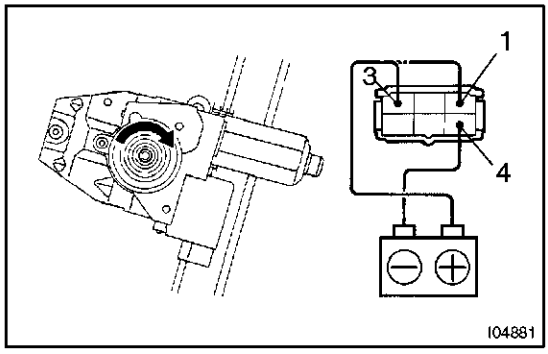
10. LHD Models Front passenger's Door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the motor turns clockwise.



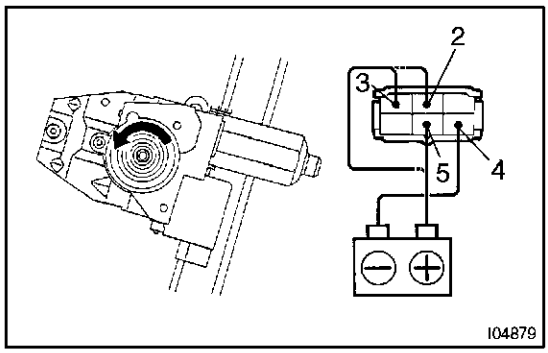
(b) Reverse the polarity, check that the motor turns counterclockwise.

If operation is not as specified, replace the motor.



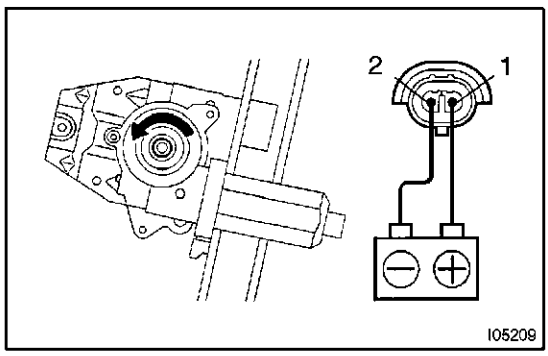
11. RHD Models Driver's Door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the motor turns clockwise.



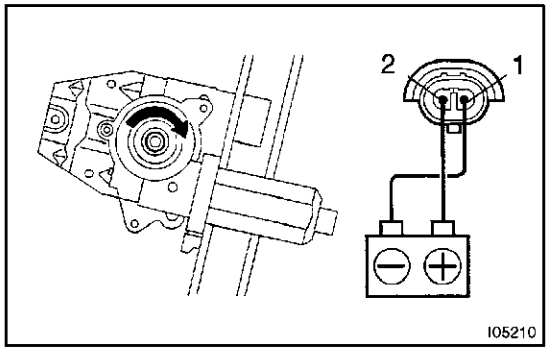
(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.



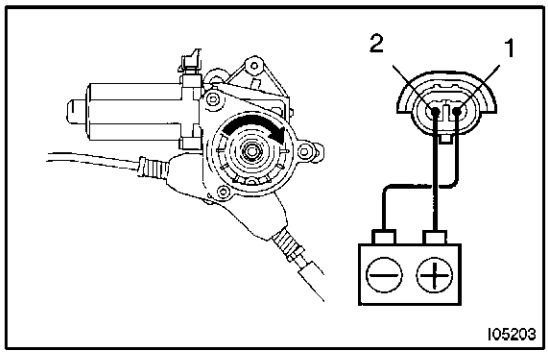
12. RHD Models Front Passenger's Door: INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the motor turns clockwise.



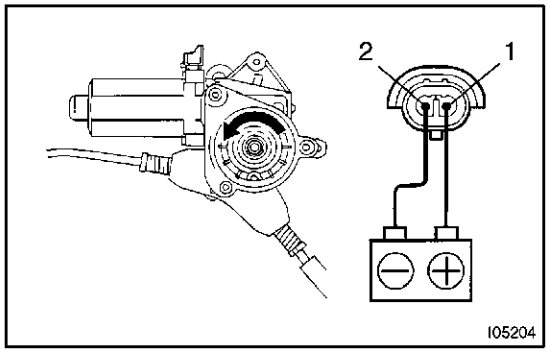
(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.



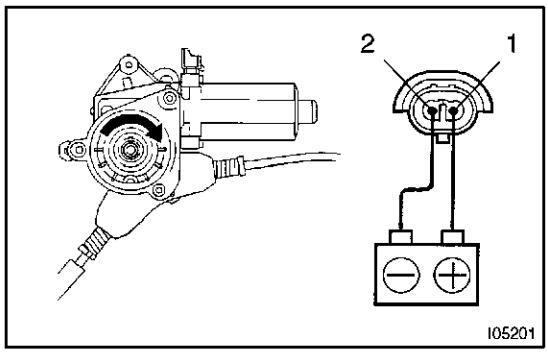
13. Rear Left Side Door: INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the motor turns clockwise.



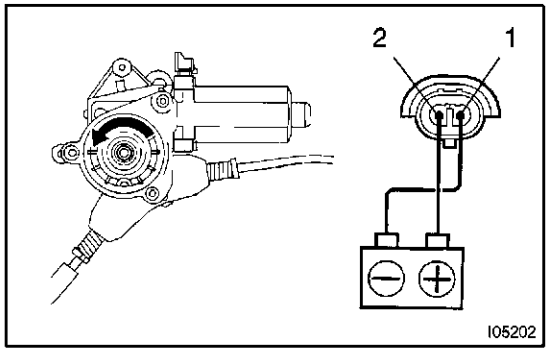
(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.



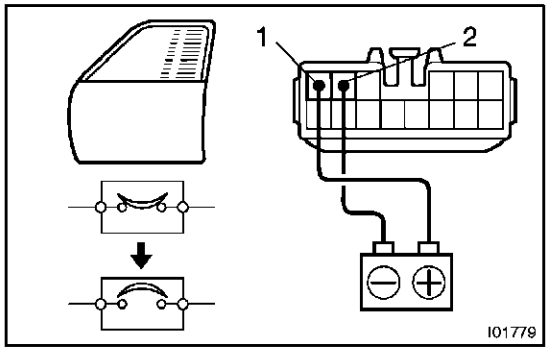
14. Rear Right Side Door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the motor turns clockwise.



(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.

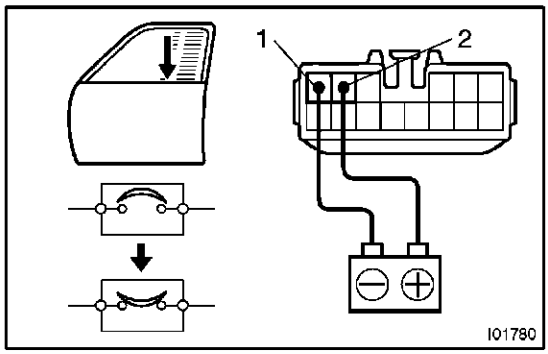


15. INSPECT POWER WINDOW MOTOR CIRCUIT BREAKER OPERATION

(a) Disconnect the connector from the master switch.

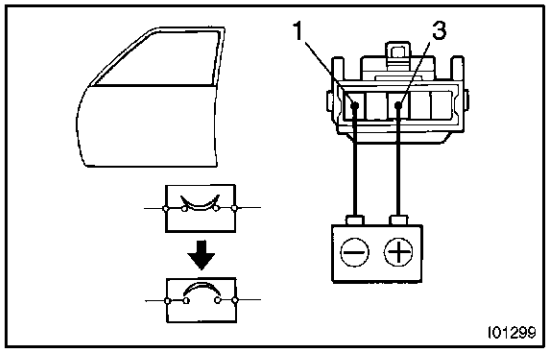
(b) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2 on the wire harness side connector and raise the window to fully closed position.

(c) Continue to supply voltage, check that there is a circuit breaker operation noise within approximately 4 to 40 seconds.



(d) Reverse the polarity, check that the window begins to descend within approximately 60 seconds.

If operation is not as specified, replace the motor.

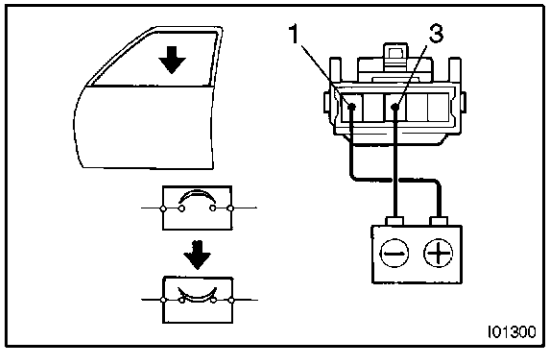


16. Front Passenger's Door:
INSPECT POWER WINDOW MOTOR CIRCUIT BREAKER OPERATION

(a) Disconnect the connector from the power window switch.

(b) Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 1 on the wire harness side connector, and raise the window to full closed position.

(c) Continue to apply voltage, check that there is a circuit breaker operation noise within approximately 4 to 40 seconds.



(d) Reverse the polarity, check that the window begins to descend within approximately 60 seconds.

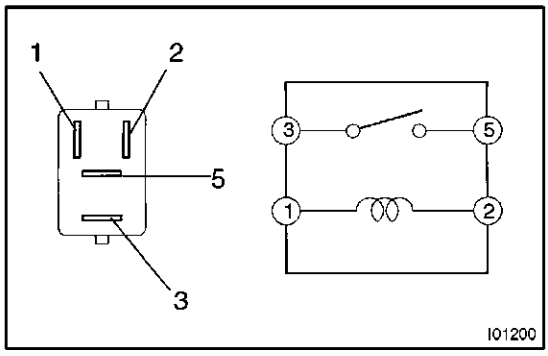
If operation is not as specified, replace the motor.

17. Rear Left Side Door:
INSPECT POWER WINDOW MOTOR CIRCUIT BREAKER OPERATION

See step of Front Passenger Door Motor on previous page.

18. Rear Right Side Door:
INSPECT POWER WINDOW MOTOR CIRCUIT BREAKER OPERATION

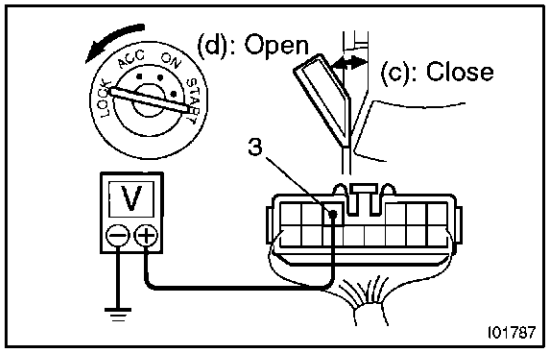
See step of Front Passenger Door Motor on previous page.



19. INSPECT POWER MAIN RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Supply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.



20. INSPECT INTEGRATION RELAY OPERATION
Key–Off Power Window Signal:

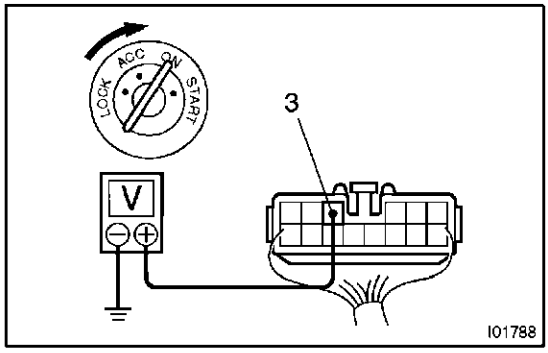
HINT:

When the relay circuit is as specified, inspect the key–off power window signal.

(a) Connect the positive (+) lead from the voltmeter to terminal 3 and the negative (–) lead to body ground.

(b) Close the door with ignition switch turned to LOCK or ACC, and check that the meter needle indicates battery voltage.

(c) Open the door and check that the meter needle indicates 0 V.



(d) Turn the ignition switch ON and check that the meter needle indicates battery voltage again.

If operation is not as specified, replace the relay.

21. INSPECT INTEGRATION RELAY CIRCUIT(See page BE–23)

22. JAM PROTECTION FUNCTION CHECK

NOTICE:

- **Pay due attention not to be caught any part of your body while checking.**
- **When adjusting the detection switches, perform it after moving the door glass up and down several times by AUTO operation.**

(a) Check the following items with jam protection function operating.
  (1) AUTO UP operation with ignition switch ON
  (2) UP operation using the key
  (3) UP operation using the wireless function
  (4) AUTO UP and UP operation using the key OFF function

(b) Move the door glass to the fully closed position.

(c) Place the handle of a hammer at around the fully closed position.

(d) Check the door glass starts going DOWN without jamming the handle of the hammer and stops after moving down approx. 200mm when closing the door glass with the jam protection function operating.

(e) While the door glass is moving down, check that the door glass does not move up by any inputs from master switch,key, and multi–function remote control.During inputting operation, DOWN operation stops.

HINT:

A detection switch is installed in the power window motor, which detects the fully closed position.When the position in the switch does not match the fully closed position, error will occur.Therefore adjustment of the switch is necessary.

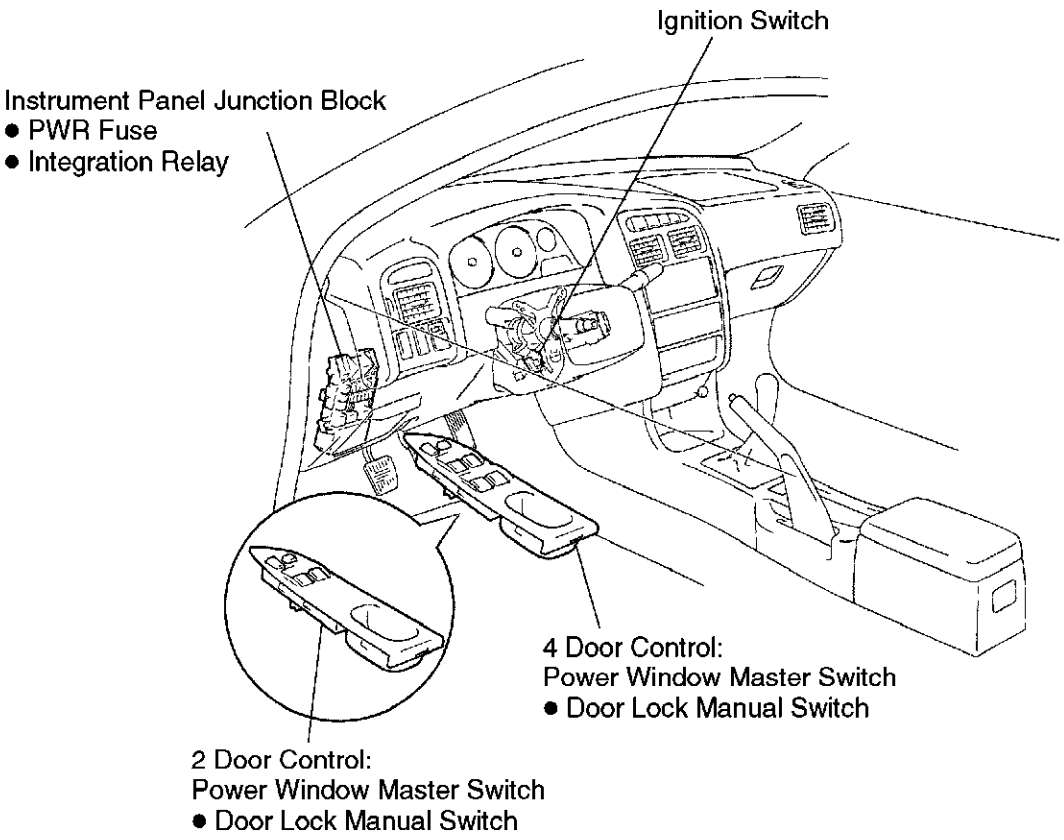
The operation necessary to adjust the detection switch are as follows.

- Door glass removal, installation and adjustment
- Door installation adjustment
- Roof side weather strip removal and installation
- Roof drip moulding removal and installation

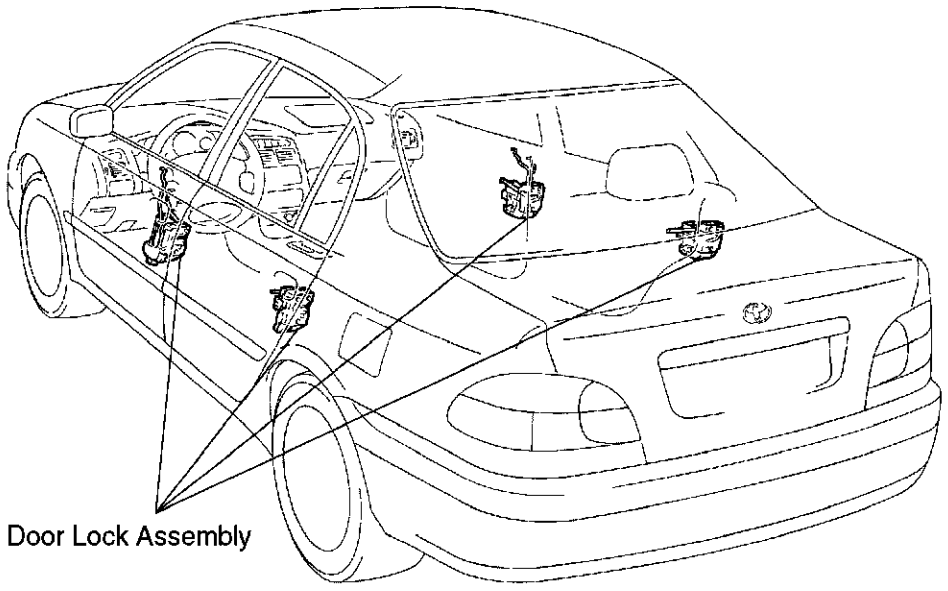
POWER DOOR LOCK CONTROL SYSTEM

LOCATION

BE0O7–01

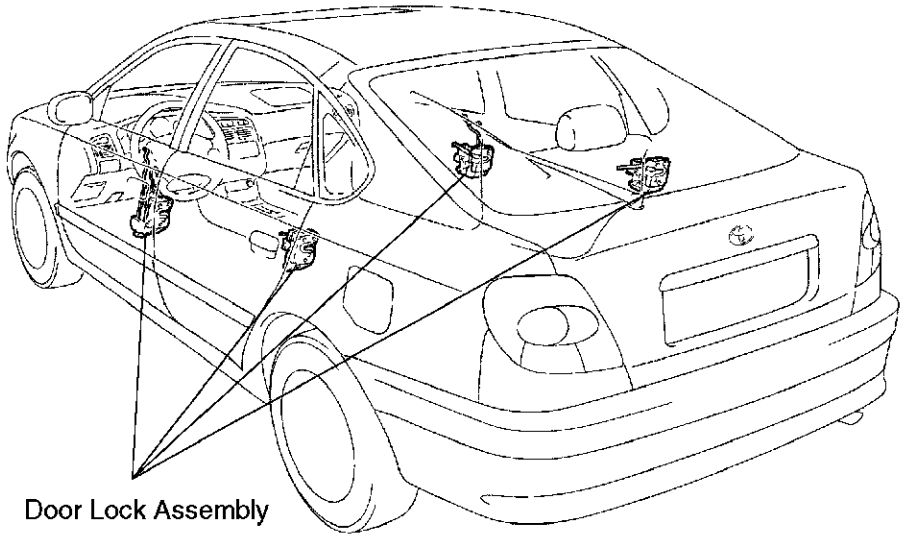


Sedan Model:

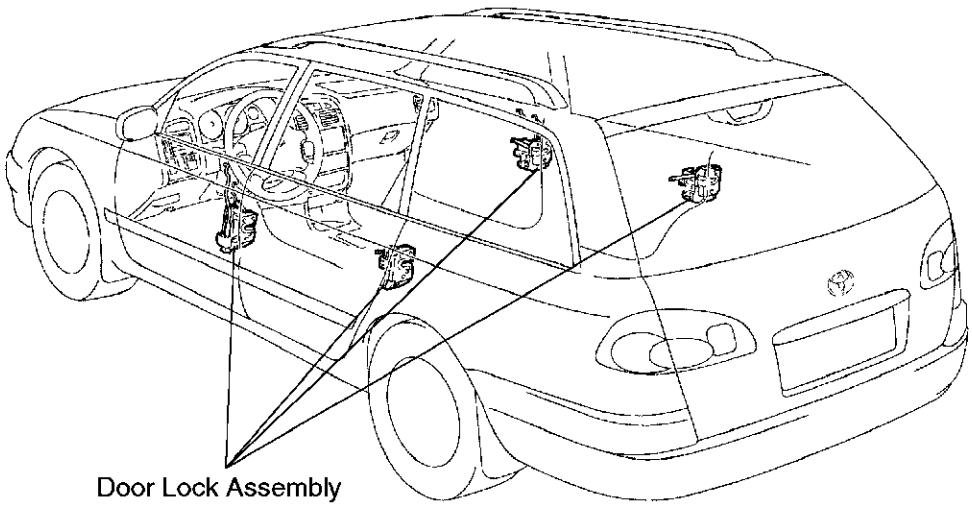


I04860

Liftback Model:



Wagon Model:



I04861

BE0C8–01

INSPECTION

1. 4–Door Control Power Window:

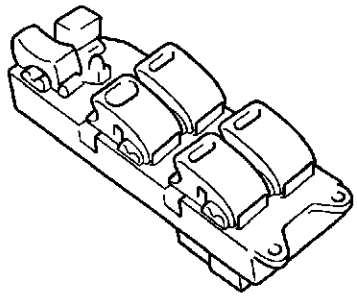
INSPECT DOOR LOCK CONTROL SWITCH CONTINUITY

Master Switch:

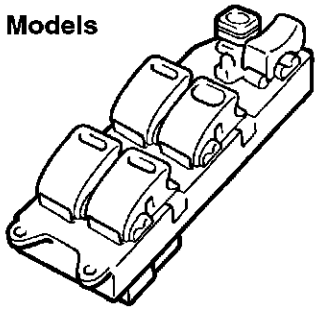
Switch position	Tester connection	Specified condition
LOCK	4 – 6	Continuity
OFF	–	No continuity
UNLOCK	4 – 12	Continuity

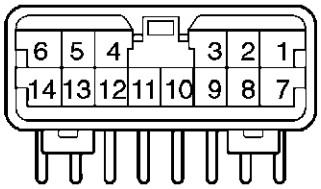
If continuity is not as specified, replace the switch.

LHD Models



RHD Models

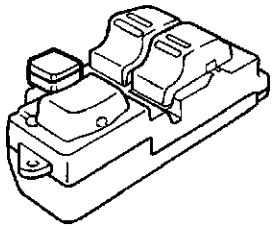




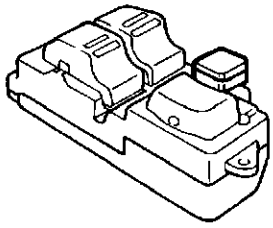
e–14–2–F

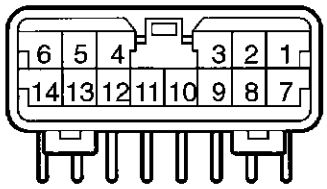
I01754

LHD Models



RHD Models





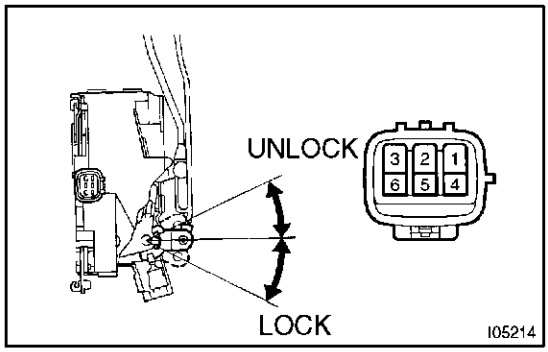
e–14–2–F

I01828

2. Front 2–Door Control Power Window:
INSPECT DOOR LOCK CONTROL SWITCH CONTINUITY
Master Switch:

Switch position	Tester connection	Specified condition
LOCK	6 – 10	Continuity
OFF	–	No continuity
UNLOCK	5 – 10	Continuity

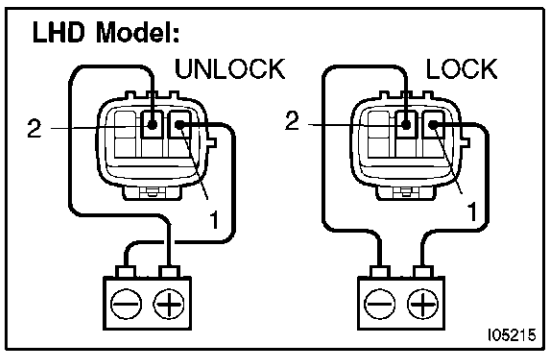
If continuity is not as specified, replace the switch.



3. INSPECT DOOR KEY LOCK AND UNLOCK SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	2 – 3	Continuity
OFF	–	No continuity
UNLOCK	1 – 3	Continuity

If continuity is not as specified, replace the switch.



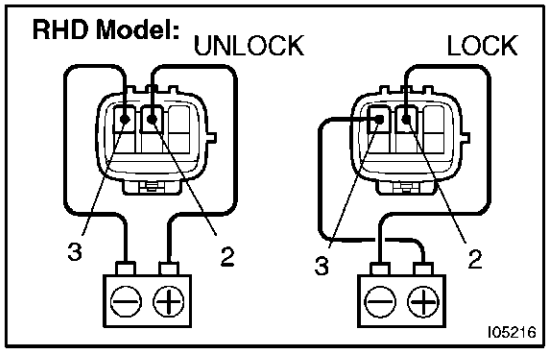
4. INSPECT DOOR LOCK MOTOR OPERATION

LHD Model:

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, and check that the door lock link moves to UNLOCK position.

(b) Reverse the polarity and check that the door lock link moves to LOCK position.

If operation is not as specified, replace the door lock assembly.



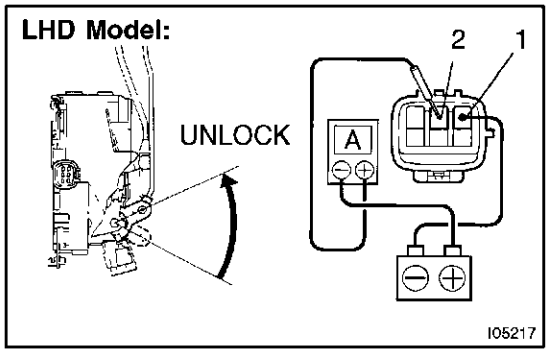
5. INSPECT DOOR LOCK MOTOR OPERATION

RHD Model:

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 3, and check that the door lock link moves to UNLOCK position.

(b) Reverse the polarity and check that the door lock link moves to LOCK position.

If operation is not as specified, replace the door lock assembly.



6. INSPECT DOOR LOCK MOTOR PTC THERMISTOR OPERATION

LHD Model:

Using an ammeter:

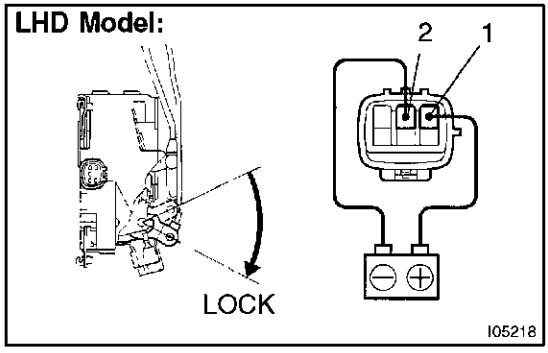
(a) Connect the negative (–) lead from the battery to terminal 1.

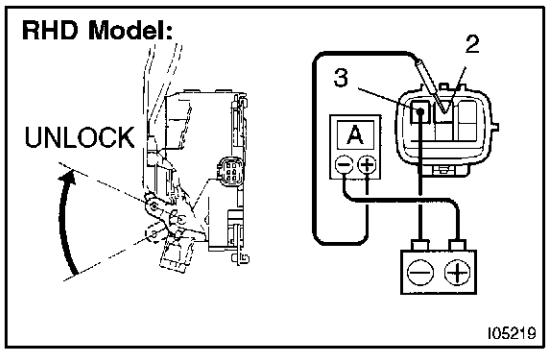
(b) Connect the positive (+) lead from the ammeter to terminal 2 and the negative (–) lead to battery positive (+) terminal, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.

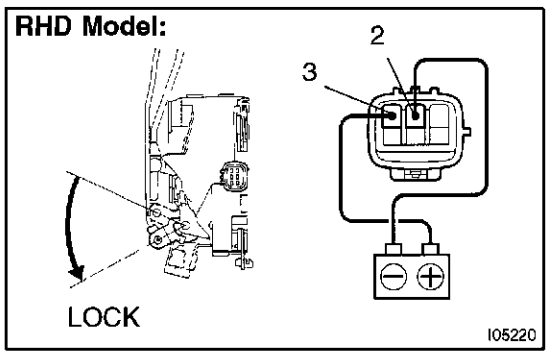
(c) Disconnect the leads from terminals.

(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the door lock moves to the LOCK position.

If operation is not as specified, replace the door lock assembly.







7. INSPECT DOOR LOCK MOTOR PTC THERMISTOR OPERATION

RHD Model:

Using an ammeter:

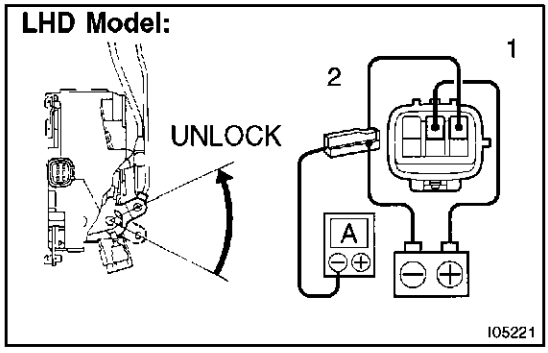
(a) Connect the negative (–) lead from the battery to terminal 3.

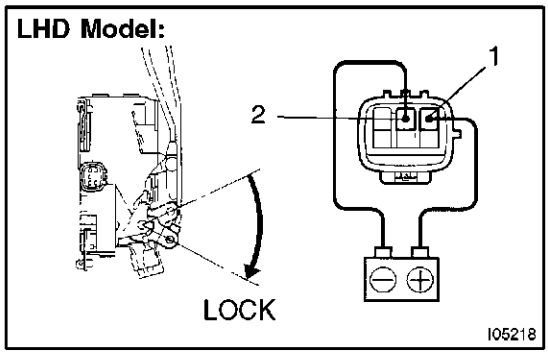
(b) Connect the positive (+) lead from the ammeter to terminal 3 and the negative (–) lead to battery positive (+) terminal, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.

(c) Disconnect the leads from terminals.

(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 2, and check that the door lock moves to the LOCK position.

If operation is not as specified, replace the door lock assembly.





8. INSPECT DOOR LOCK MOTOR PTC THERMISTOR OPERATION

LHD Model:

Using an ammeter with a current–measuring probe:

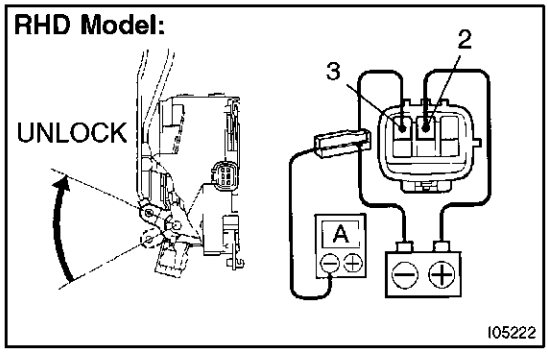
(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2.

(b) Attach a current–measuring probe to either the positive (+) lead or the negative (–) lead, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.

(c) Disconnect the leads from terminals.

(d) Approximately 60 seconds later, reverse the polarity, and check that the door lock moves to the LOCK position.

If operation is not as specified, replace the door lock assembly.



9. INSPECT DOOR LOCK MOTOR PTC THERMISTOR OPERATION

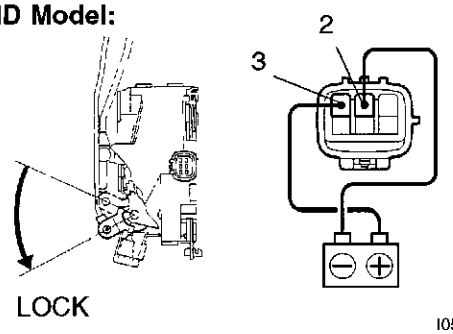
RHD Model:

Using an ammeter with a current–measuring probe:

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 3.

(b) Attach a current–measuring probe to either the positive (+) lead or the negative (–) lead, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.

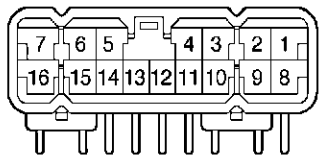
RHD Model:



(c) Disconnect the leads from terminals.
(d) Approximately 60 seconds later, reverse the polarity, and check that the door lock moves to the LOCK position.

If operation is not as specified, replace the door lock assembly.

Junction block side



Connector "B"

e–14–1–A

I05224

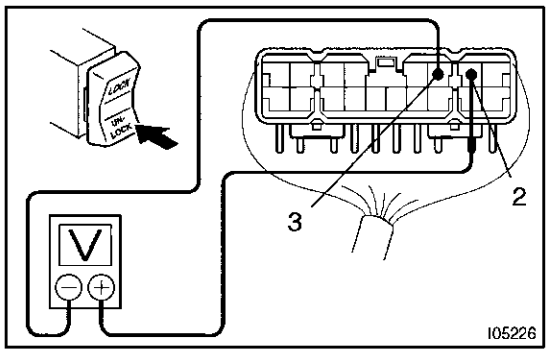
10. INSPECT INTEGRATION RELAY CIRCUIT

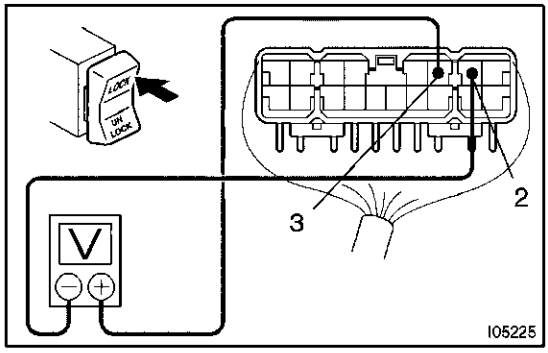
Junction block side :

Disconnect the connector from the integration relay and inspect the connector on the junction block side, as shown in the chart.

Tester connection	Condition	Specified condition
B4 – Ground	Door key lock and unlock switch UNLOCK or OFF	No continuity
B4 – Ground	Door key lock and unlock switch LOCK	Continuity
B5 – Ground	Door lock assembly is locked	No continuity
B5 – Ground	Door lock assembly is unlocked	Continuity
B7 – Ground	Door key lock and unlock switch LOCK or OFF	No continuity
B7 – Ground	Door key lock and unlock switch UNLOCK	Continuity
B9 – Ground	Driver's door lock manual switch UNLOCK or OFF	No continuity
B9 – Ground	Driver's door lock manual switch LOCK	Continuity
B10 – Ground	Driver's door lock manual switch LOCK or OFF	No continuity
B10 – Ground	Driver's door lock manual switch UNLOCK	Continuity
B14 – Ground	Back door key lock and unlock switch LOCK or OFF	No continuity
B14 – Ground	Back door key lock and unlock switch UNLOCK	Continuity
B15 – Ground	Constant	Continuity
B13 – Ground	Constant	Battery positive voltage

If the circuit is not as specified, inspect the circuits connected to other parts.





11. INSPECT DOOR LOCK CONTROL RELAY (INTEGRATION RELAY) OPERATION

LHD Model:

Door Lock Signal:

HINT:

When the relay circuit is as specified, inspect the door lock signal.

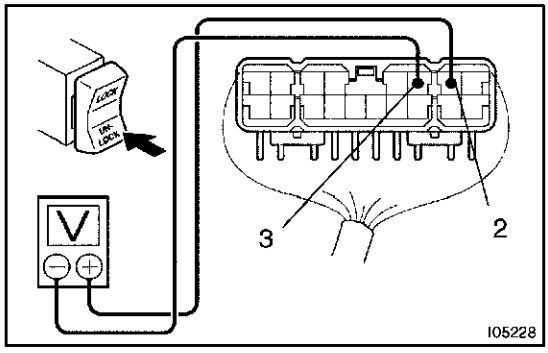
(a) Connect the positive (+) lead from the voltmeter to terminal 2 and the negative (–) lead to terminal 3.

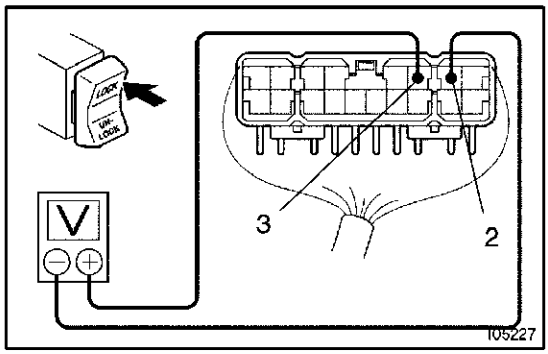
(b) Set the door lock control switch to UNLOCK and check that the voltage rises from 0 V to battery voltage for approximately 0.5 seconds.

(c) Reverse the polarity of the voltmeter leads.

(d) Set the door lock control switch to LOCK and check that the voltage rises from 0 V to battery voltage for approximately 0.5 seconds.

If operation is not as specified, replace the relay.





12. INSPECT DOOR LOCK CONTROL RELAY (INTEGRATION RELAY) OPERATION

RHD Model:

Door Lock Signal:

HINT:

When the relay circuit is as specified, inspect the door lock signal.

(a) Connect the positive (+) lead from the voltmeter to terminal 2 and the negative (–) lead to terminal 3.

(b) Set the door lock control switch to UNLOCK and check that the voltage rises from 0 V to battery voltage for approximately 0.5 seconds.

(c) Reverse the polarity of the voltmeter leads.

(d) Set the door lock control switch to LOCK and check that the voltage rises from 0 V to battery voltage for approximately 0.5 seconds.

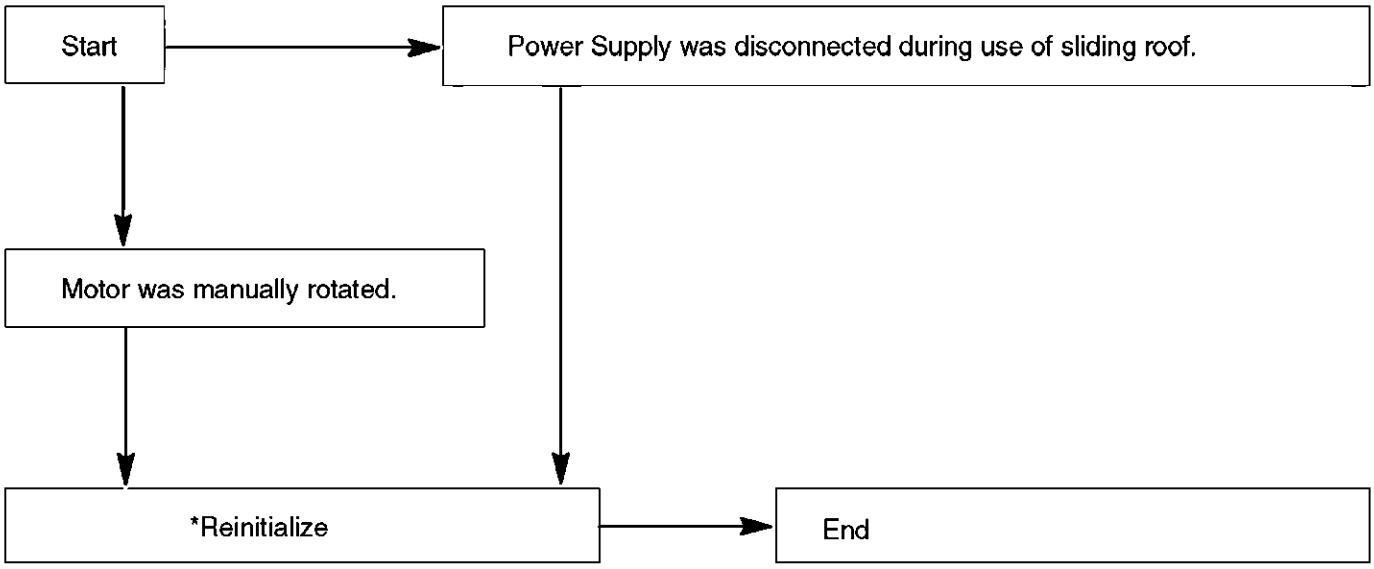
If operation is not as specified, replace the relay.

SLIDING ROOF SYSTEM

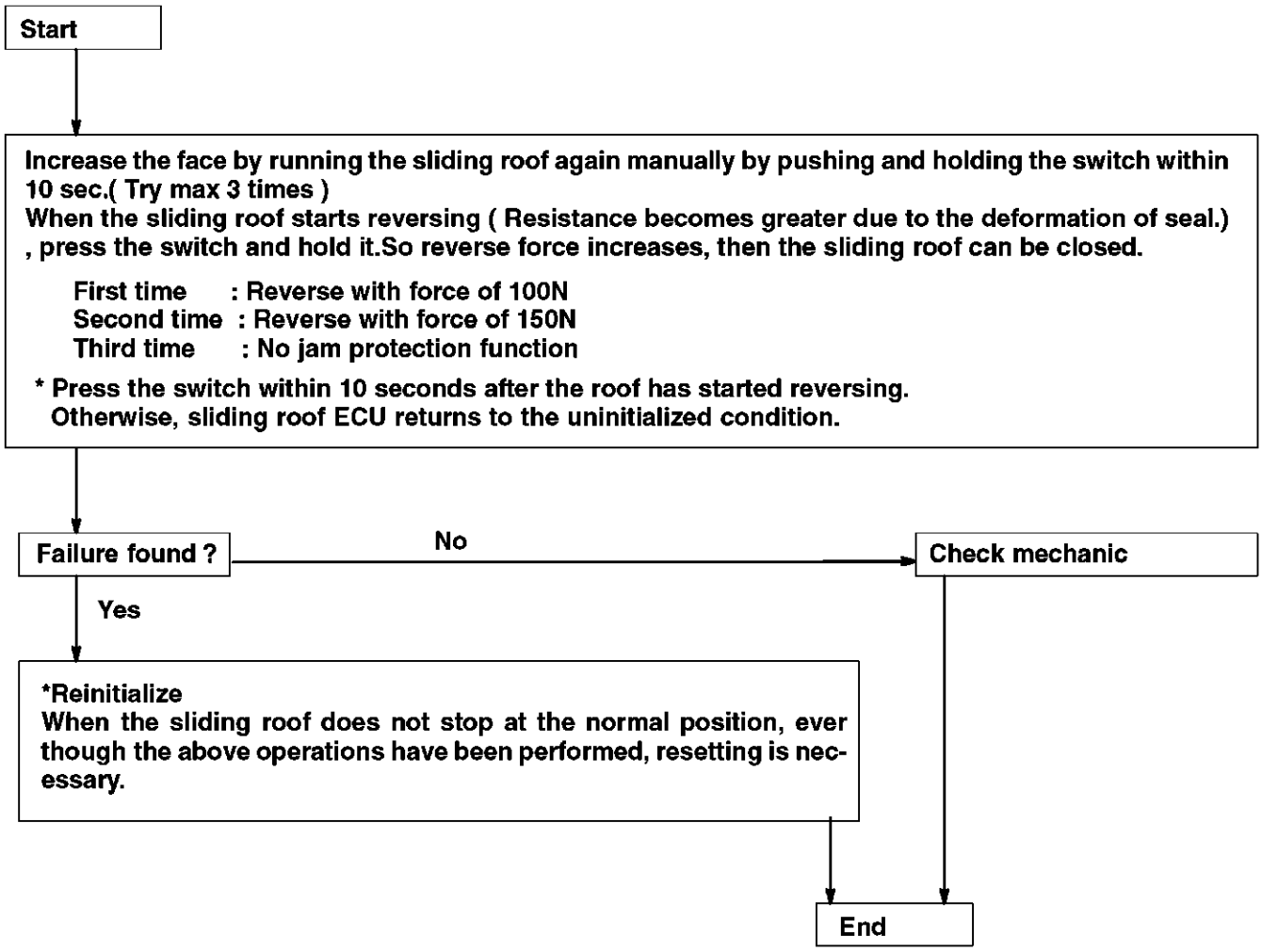
TROUBLESHOOTING

BE0G9–01

1	Sliding Roof does not stop at correct position.



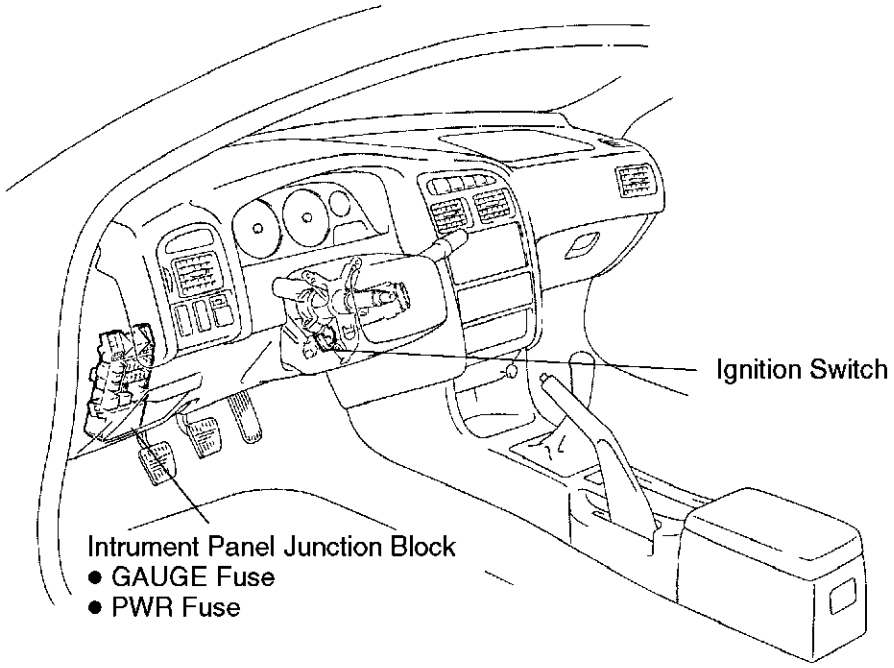
2	Sliding Roof always reopens (anti trap function).



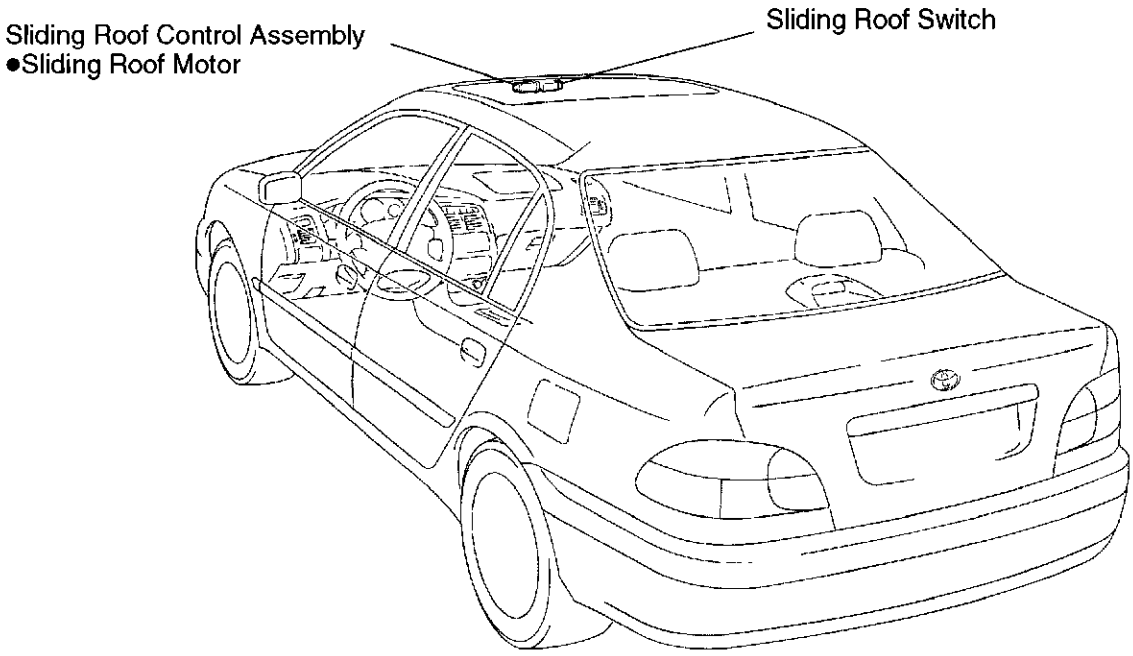
*Reinitializing method
(a) Move the sliding roof to the maximum tilted position.
(b) Release the switch, press the switch again and hold it for 10 secs.
(c) The sliding roof operates in a cycle of TILT DOWN → SLIDE OPEN → SLIDE CLOSE → TILT UP.
THis completes reinitializing.

BE0O4–01

LOCATION

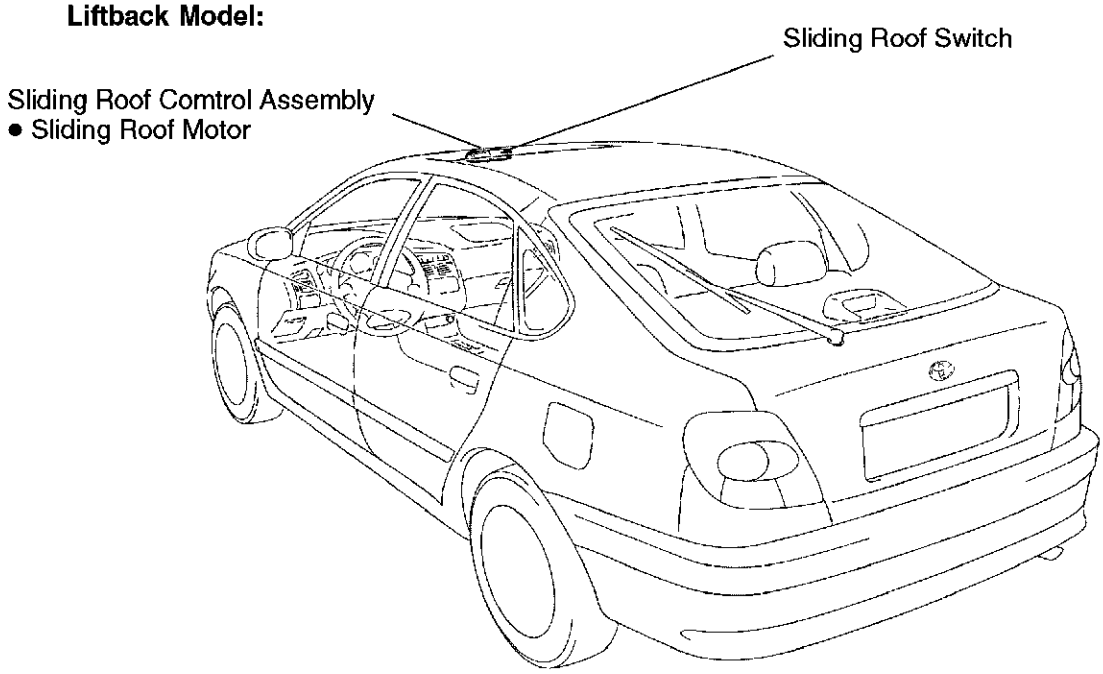


Sedan Model:

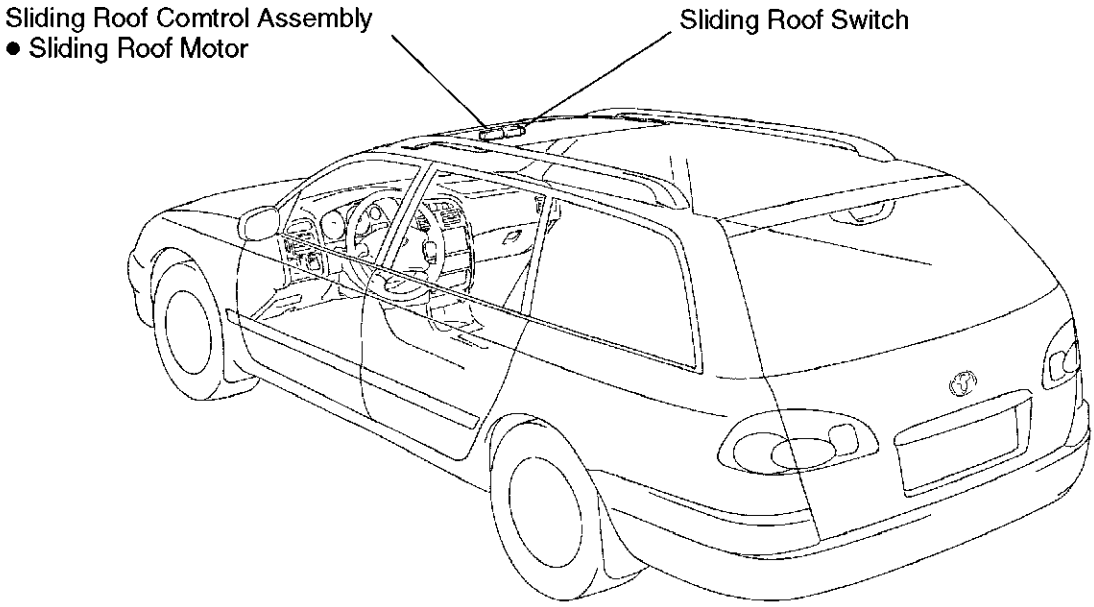


I04836

Liftback Model:



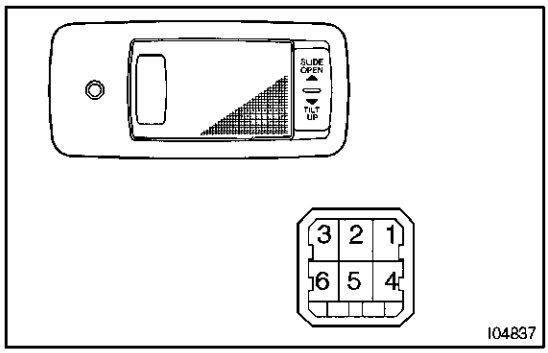
Wagon Model:



I04876

BE0OB–01

INSPECTION



NOTICE:

While the sliding roof is in operation when an abnormality is found in power source system, the roof does not stop at correct position.In this case, it is necessary to reinitialize the system.

1. REINITIALIZING METHOD

(a) Move the sliding roof to the maximum tilted position.

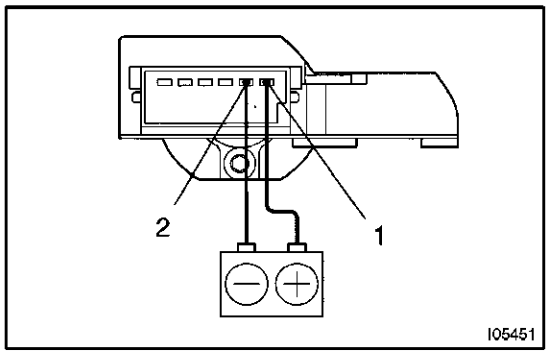
(b) Release the switch, press the switch again and hold it for 10 secs.

(c) The sliding roof operates in a cycle of TILT DOWN → SLIDE OPEN → SLIDE CLOSE → TILT UP.THis completes reinitializing.

2. INSPECT SLIDING ROOF SWITCH CONTINUITY

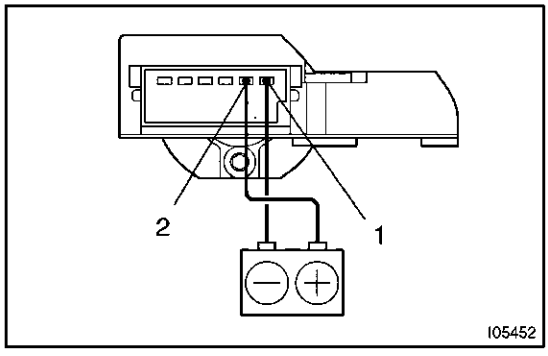
Switch position	Tester connection	Specified condition
SLIDE OPEN	1 – 3, 4 – 5	Continuity
SLIDE OFF	1 – 4 – 5	Continuity
SLIDE CLOSE	1 – 5, 3 – 4	Continuity
TILT DOWN	1 – 3, 4 – 5	Continuity
TILT OFF	1 – 4 – 5	Continuity
TILT UP	1 – 5, 3 – 4	Continuity

If continuity is not as specified, replace the switch.



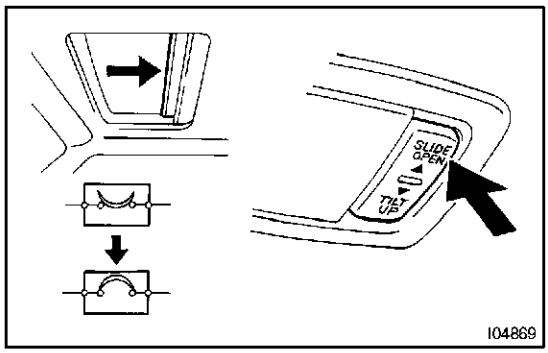
3. INSPECT SLIDING ROOF CONTROL ASSEMBLY OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, check that the motor turns counterclockwise (moves to the close and up side).



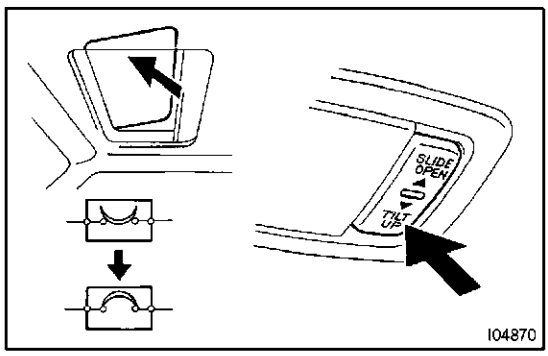
(b) Reverse the polarity, check that the motor turns clockwise. (moves to the open and down side).

If operation is not as specified, replace the sliding roof control assembly.



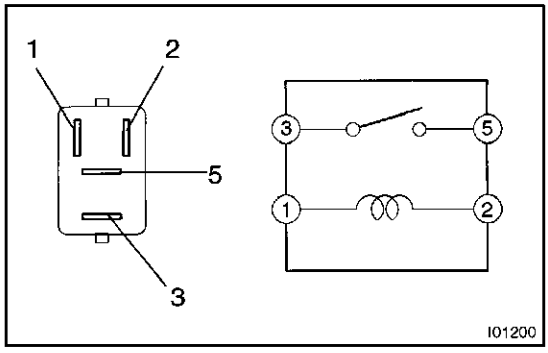
4. INSPECT SLIDING ROOF CONTROL ASSEMBLY CIRCUIT BREAKER OPERATION

(a) With the sliding roof in the fully opened position, hold the sliding roof switch in "OPEN" position and check that a circuit breaker operation noise can be heard within 10 to 60 seconds.



(b) With the sliding roof in the fully opened position, hold the sliding roof switch in "TILT UP" position and check that the sliding roof begins to close within 60 seconds.

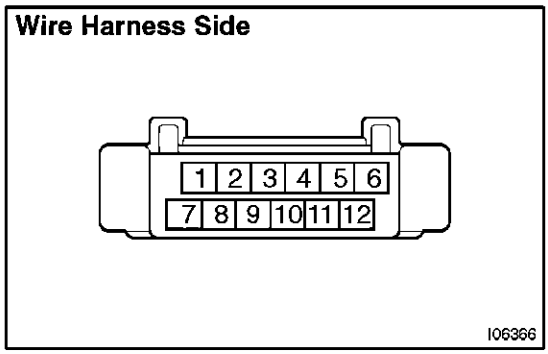
If operation is not as specified, replace the sliding roof control assembly.



5. INSPECT POWER MAIN RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.



6. INSPECT SLIDING ROOF CONTROL ASSEMBLY CIRCUIT

Disconnect the connector from the sliding roof control assembly and inspect the connector on the wire harness side, as shown in the table below.

Tester connection	Condition	Specified condition
2 – Ground	Ignition switch ON, slide roof control switch (SLIDE) OFF or CLOSE	No voltage
2 – Ground	Ignition switch ON, slide roof control switch (SLIDE) OPEN	Battery voltage
1 – Ground	Ignition switch ON, slide roof control switch (SLIDE) OFF or OPEN	No voltage

1 – Ground	Ignition switch ON, slide roof control switch (SLIDE) CLOSE	Battery voltage
1 – Ground	Ignition switch ON, slide roof control switch (TILT) OFF or DOWN	No voltage
1 – Ground	Ignition switch ON, slide roof control switch (TILT) UP	Battery voltage
2 – Ground	Ignition switch ON, slide roof control switch (TILT) OFF or UP	No voltage
2 – Ground	Ignition switch ON, slide roof control switch (TILT) DOWN	Battery voltage
6 – Ground	Constant	Continuity
5 – Ground	Ignition switch LOCK or ACC	*No voltage
5 – Ground	Ignition switch ON	Battery voltage
4 – Ground	Constant	Battery voltage

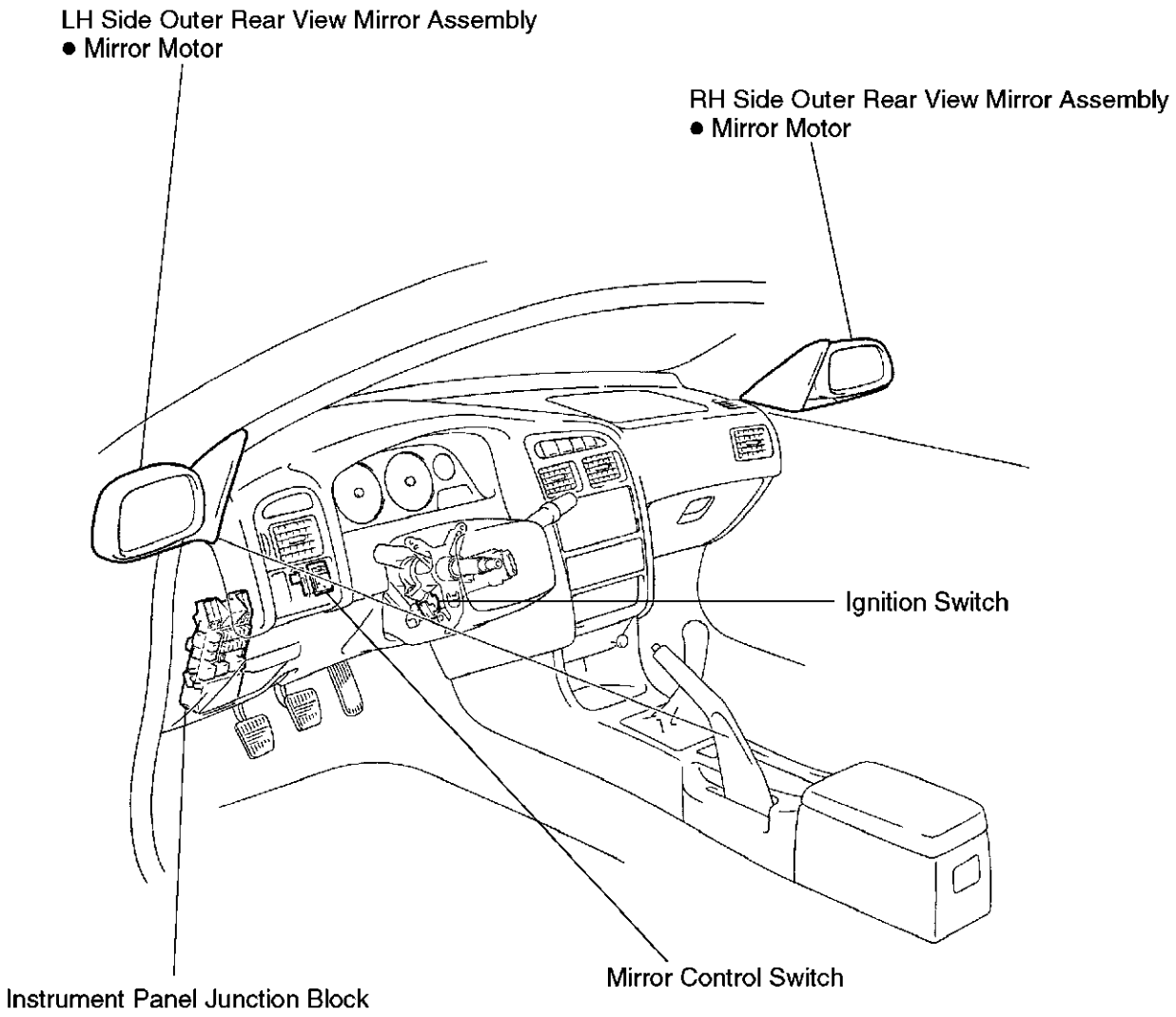
*Exceptions: For 60 seconds after the ignition switch is turned from ON to OFF (ACC) or until driver or passenger door is opened after the ignition switch is turned from ON to OFF (ACC).

If the circuit is as specified, replace the relay.

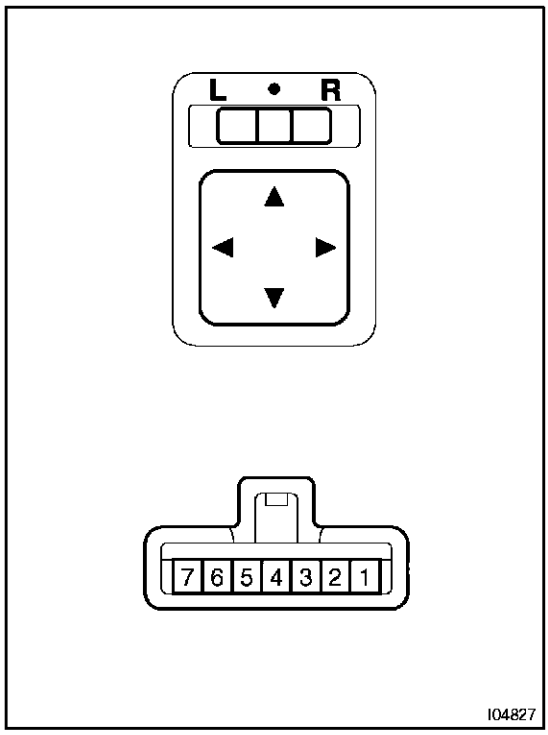
POWER MIRROR CONTROL SYSTEM

LOCATION

BE02J–04



I04826



BE0CC-01

INSPECTION

1. INSPECT MIRROR SWITCH CONTINUITY

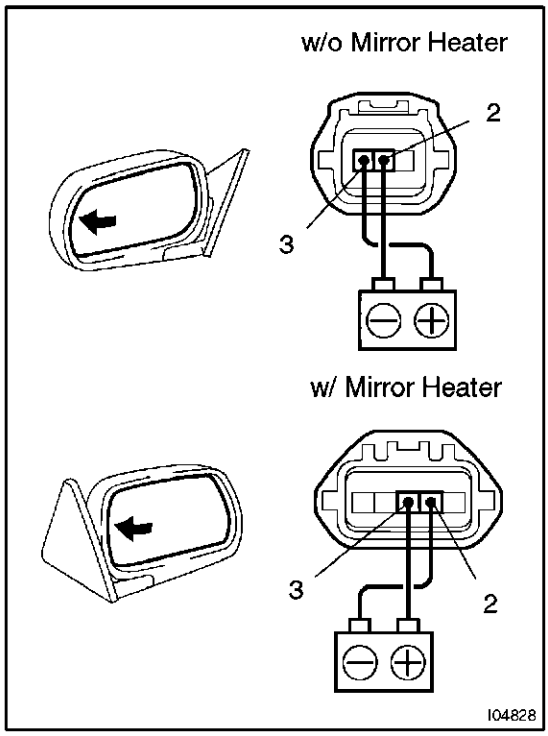
Left Side for Left/Right Adjustment Switch

Switch position	Tester connection	Specified condition
OFF	–	No continuity
UP	1 – 9 6 – 10	Continuity
DOWN	1 – 10 6 – 9	Continuity
LEFT	5 – 9 6 – 10	Continuity
RIGHT	5 – 10 6 – 9	Continuity

Right Side for Left/Right Adjustment Switch

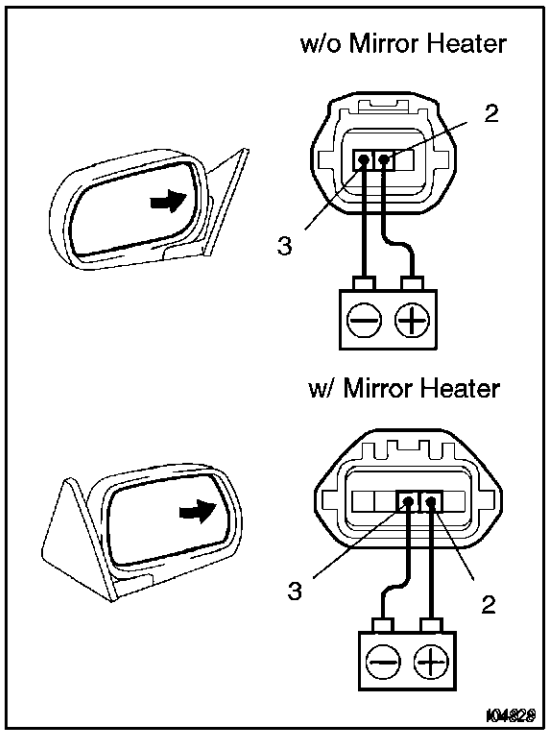
Switch position	Tester connection	Specified condition
OFF	–	No continuity
UP	6 – 10 7 – 9	Continuity
DOWN	6 – 9 7 – 10	Continuity
LEFT	6 – 10 8 – 9	Continuity
RIGHT	6 – 9 8 – 10	Continuity

If continuity is not as specified, replace the switch.

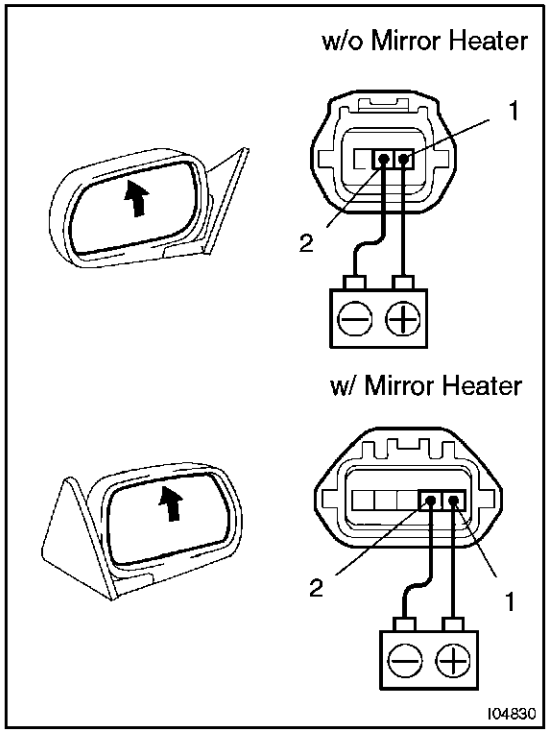


2. INSPECT MIRROR MOTOR

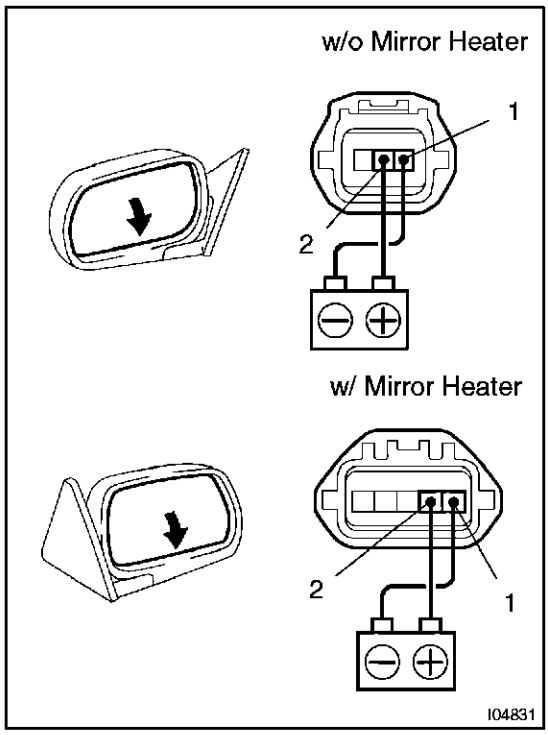
(a) Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 2, check that the mirror turns left side.



(b) Reverse the polarity, and check that the mirror turns to right side.



(c) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the mirror turns upward.



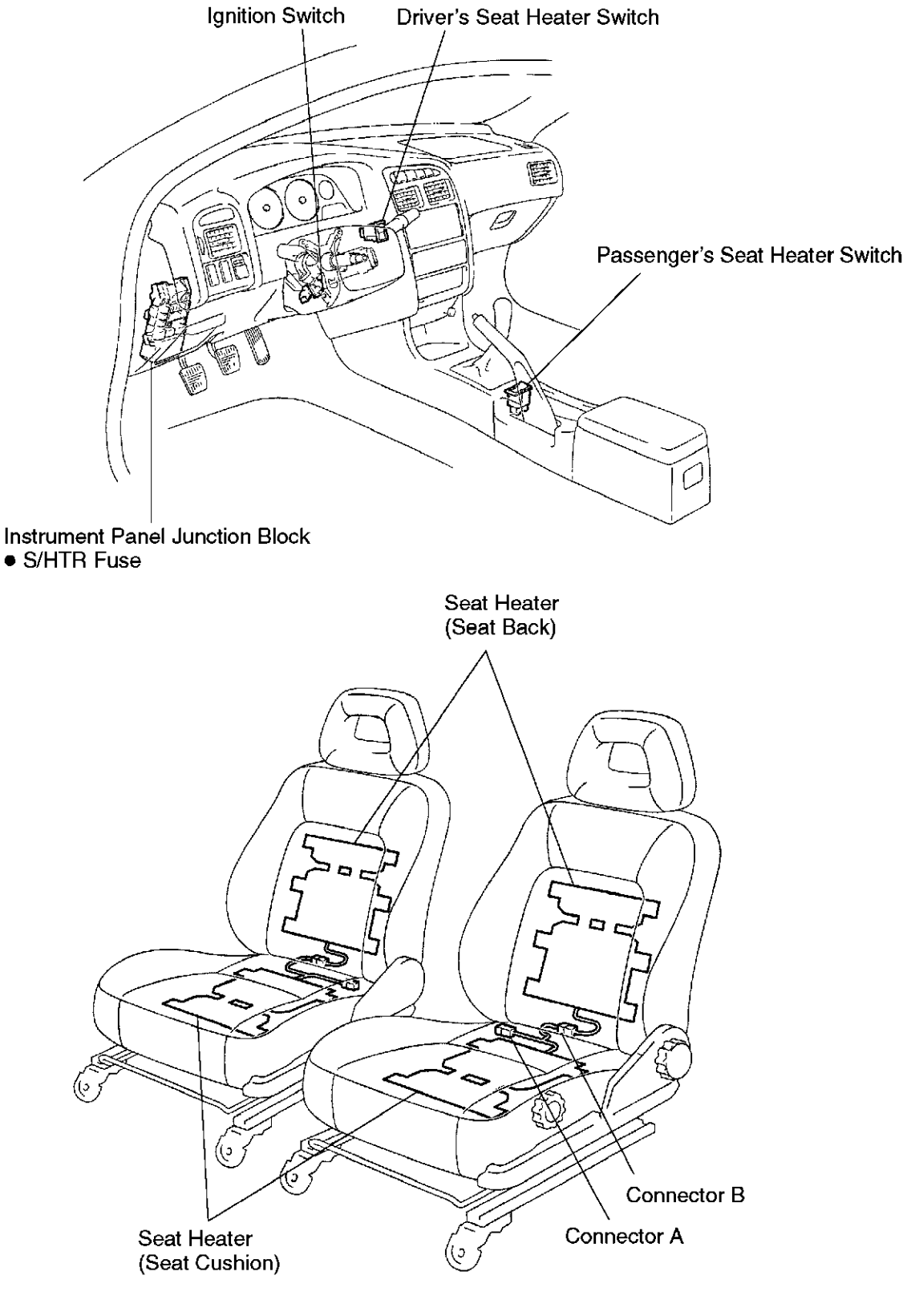
(d) Reverse the polarity, and check that the mirror turns downward.

If the operation is not as specified, replace the mirror assembly.

SEAT HEATER SYSTEM

LOCATION

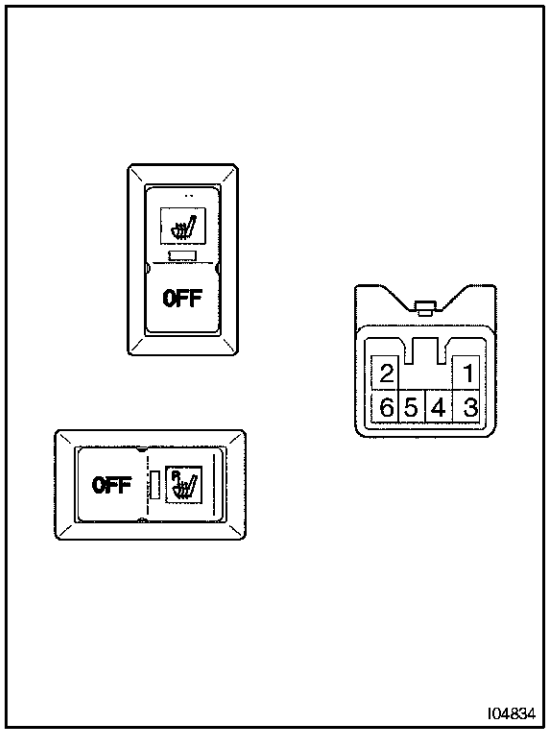
BE0OD-01



BE02U–03

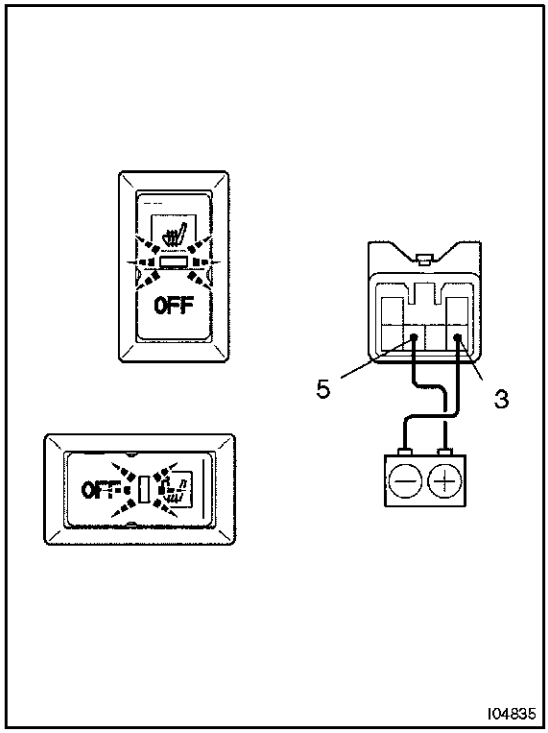
INSPECTION

1. INSPECT SEAT HEATER SWITCH CONTINUITY



Condition	Tester connection	Specified condition
OFF	1 – 3	Continuity
ON	1 – 3 – 5	Continuity
Illumination circuit	2 – 6	Continuity

If continuity is not as specified, replace the switch or bulb..

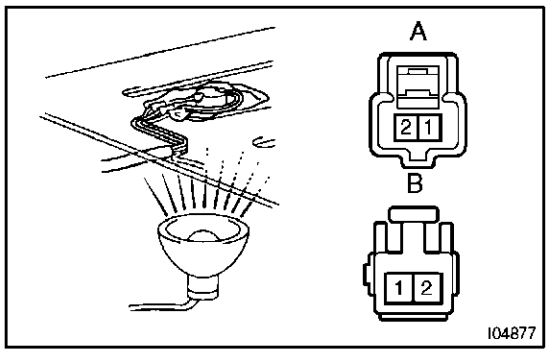


2. INSPECT SEAT HEATER SWITCH INDICATOR

(a) Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 3.

(b) Push the switches, check that the indicator light lights up.

If operation is not as specified, replace the switch and inspect the circuits connected to other parts.



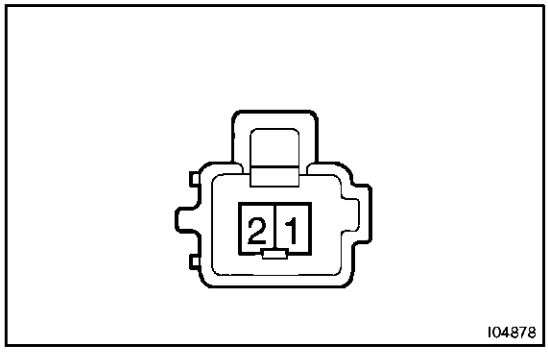
3. INSPECT SEAT HEATER CUSHION CONTINUITY

(a) Heat the thermostat with a light.

(b) Inspect the seat heater continuity between terminals, as shown.

Tester connection	Condition	Specified condition
A2 – B2	Constant	Continuity
A1 – B1	Seat heater temperature below 29 °C (84.2 °F)	Continuity

If continuity is not as specified, replace the seat cushion pad.



4. INSPECT SEAT BACK CONTINUITY

Inspect the seat back continuity between terminals, as shown.

Tester connection	Condition	Specified condition
1 – 2	Constant	Continuity

If continuity is not as specified, replace the seat back pad.

AUDIO SYSTEM

DESCRIPTION

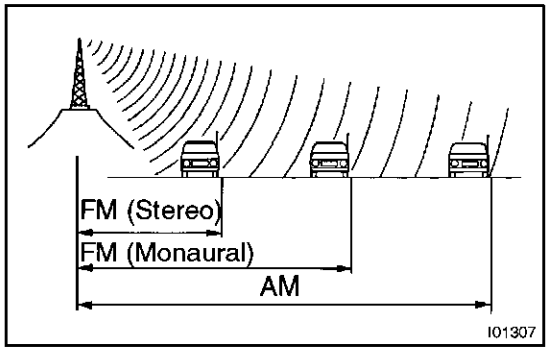
BE02L–02

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	LW ⟷	AM (MW) ⟷	SW ⟷	FM (UKW) ⟷	
Modulation	Amplitube modulation			Frequency modulation	

LF: Low Frequency
MF: Medium Frequency
HF: High Frequency
VHF: Very High Frequency
HINT:
In this section, the term "AM" includes LW, MW and SW, and the term "FM" includes "UKW".

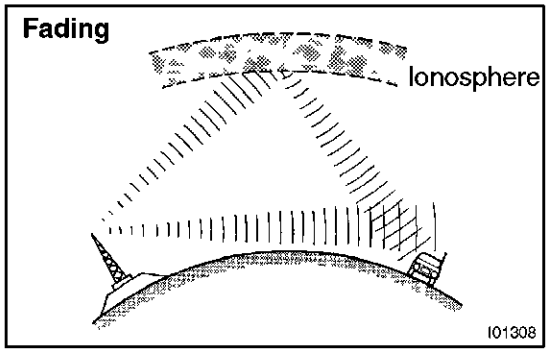


2. SERVICE AREA

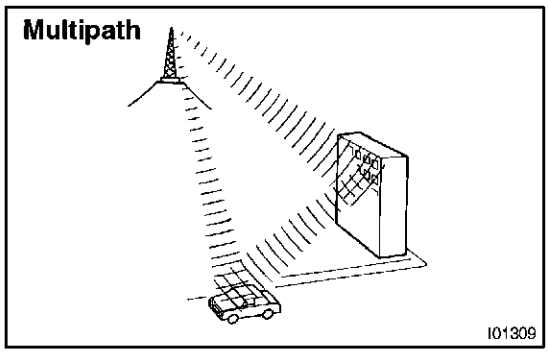
There are great differences in the size of the service area for AM and FM monaural. Sometimes FM stereo broadcasts cannot be received even though AM comes in very clearly.
Not only does FM stereo have the smallest service area, but it also picks up static and other types of interference ("noise") easily.

3. RECEPTION PROBLEMS

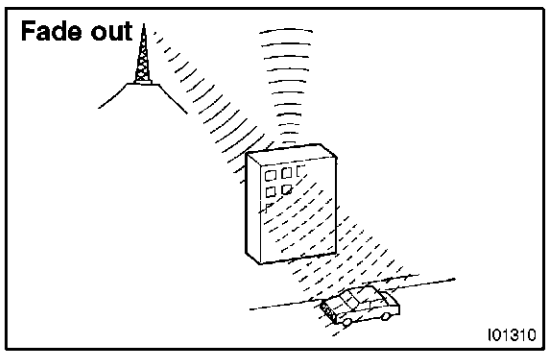
HINT:
Besides the problem of static, there are also the problems called "fading", "multipath" and "fade out". These problems are caused not by electrical noise but by the nature of the radio waves themselves.



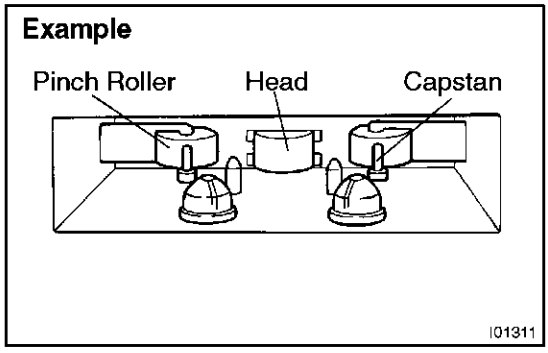
(a) Fading
Besides electrical interference, AM broadcasts are also susceptible to other types of interference, especially at night. This is because AM radio waves bounce off the ionosphere at night. These radio waves then interfere with the signals from the same transmitter that reach the vehicle's antenna directly. This type of interference is called "fading".



(b) Multipath
One type of interference caused by the bouncing of radio waves off of obstructions is called "multipath". Multipath occurs when a signal from the broadcast transmitter antenna bounces off buildings and mountains and interferes with the signal that is received directly.



(c) Fade Out
Because FM radio waves are of higher frequencies than AM radio waves, they bounce off buildings, mountains, and other obstructions. For this reason, FM signals often seem to gradually disappear or fade away as the vehicle goes behind a building or other obstruction. This is called "fade out".



4. MAINTENANCE

Tape Player/ Head Cleaning

(a) Raise the cassette door with your finger.
Next, using a pencil or like object, push in the guide.

(b) Using a cleaning pen or cotton applicator soaked in cleaner, clean the head surface, pinch rollers and capstans.

BE02M–02

TROUBLESHOOTING

NOTICE:

When replacing the internal mechanism (computer part) of the audio system, be careful that no part of your body or clothing comes in contact with the terminals of the leads from the IC, etc. of the replacement part (spare part).

HINT:

This inspection procedure is a simple troubleshooting which should be carried out on the vehicle during system operation and was prepared on the assumption of system component troubles (except for the wires and connectors, etc.).

Always inspect the trouble taking the following items into consideration.

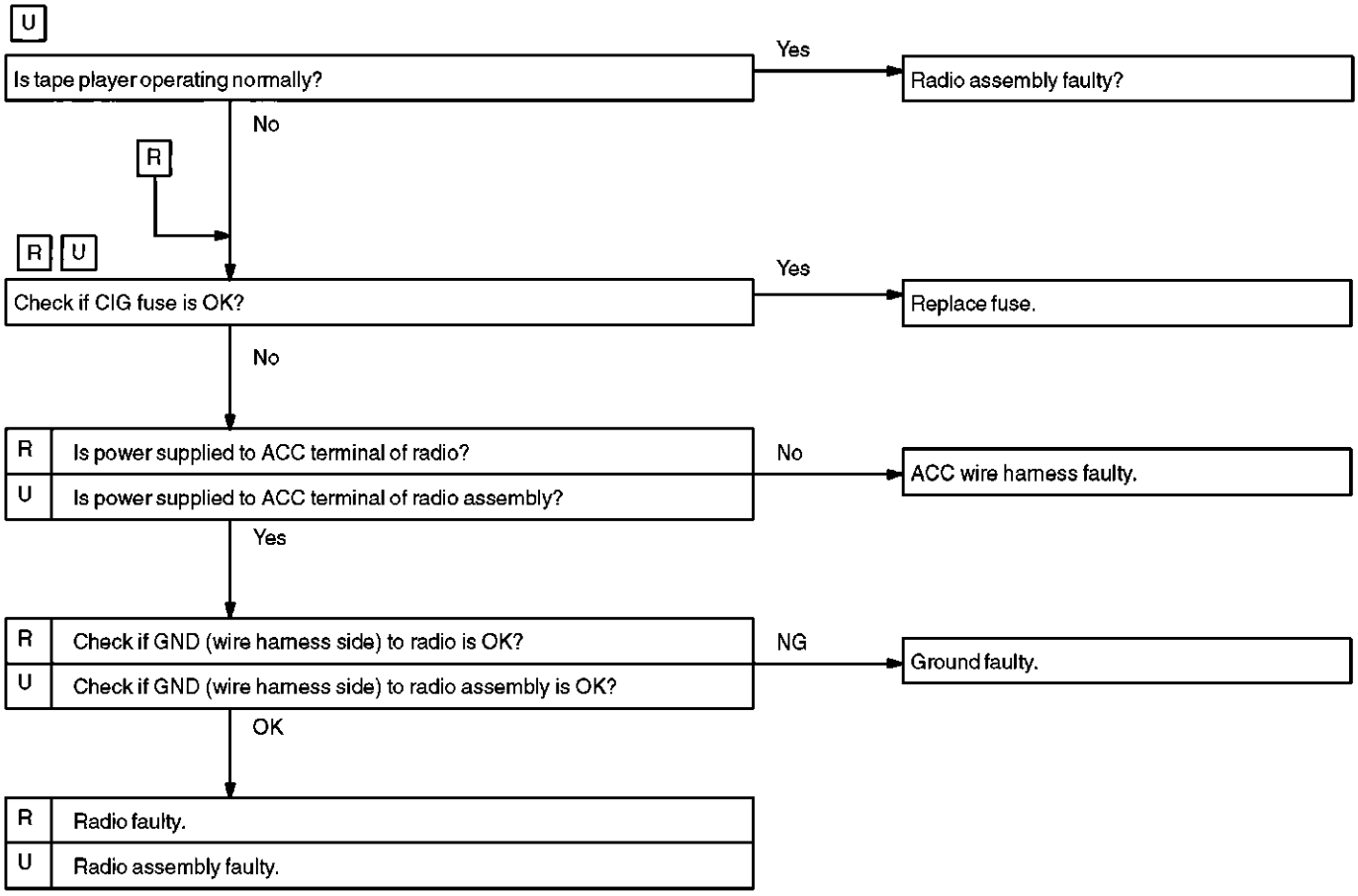
- Open or short circuit of the wire harness
- Connector or terminal connection fault

	Problem	No.
Radio	Radio not operating when power switch turned to 'ON'.	1
	Display indicates when power switch turned to 'ON', but no sound (including 'noise') is produced.	2
	Noise present, but AM – FM not operating.	3
	Either speaker does not work.	4
	Either AM or FM does not work.	5
	Reception poor.	5
	Few preset turning bands.	5
	Sound quality poor.	6
	Preset memory disappears.	7
	Cannot set station select button, preset memory disappears.	7
Tape Player	Cassette tape cannot be inserted.	8
	Cassette tape inserted, but no power.	9
	Power coming in, but tape player not operating.	10
	Either speaker does not work.	11
	Sound quality poor.	12
	Tape jammed, malfunction with tape speed or auto–reverse.	13
	APS, SKIP, RPT buttons not operating	14
	Cassette tape will not be ejected.	15
Antenna	Antenna related.	16
Noise	Noise produced by vibration or shock while driving.	17
	Noise produced when engine starts.	18

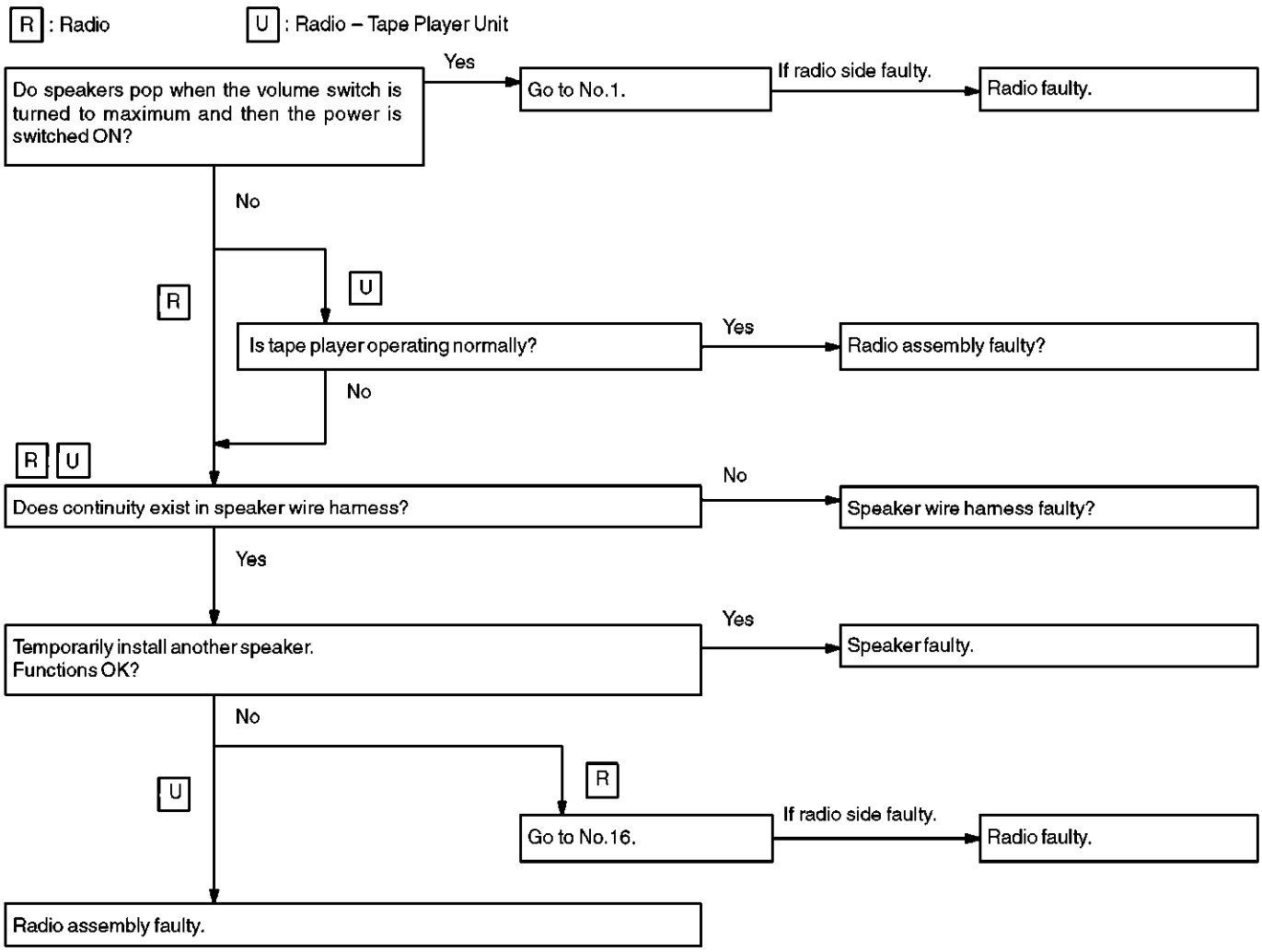
The term "AM" includes LW,MW and SW, and the term "FW" includes UKW.

1	Radio	RADIO NOT OPERATING WHEN POWER SWITCH TURNED TO 'ON'

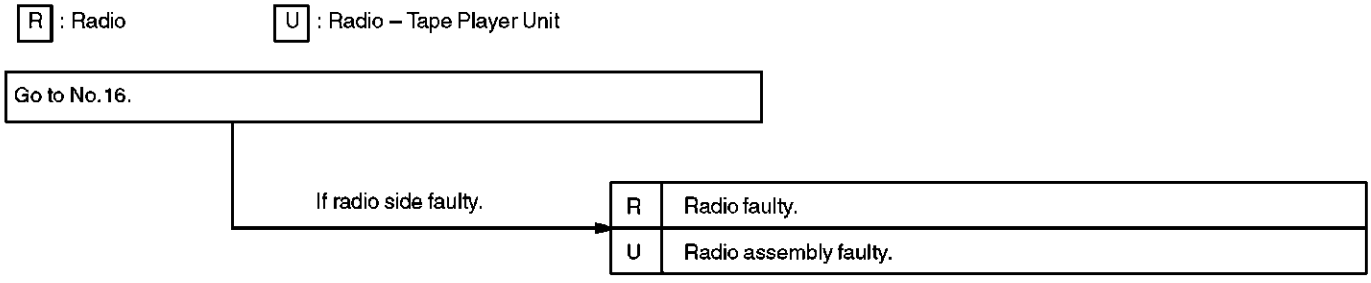
[R] : Radio [U] : Radio – Tape Player Unit



2	Radio	DISPLAY INDICATES WHEN POWER SWITCH TURNED TO 'ON', BUT NO SOUND (INCLUDING 'NOISE') IS PRODUSED

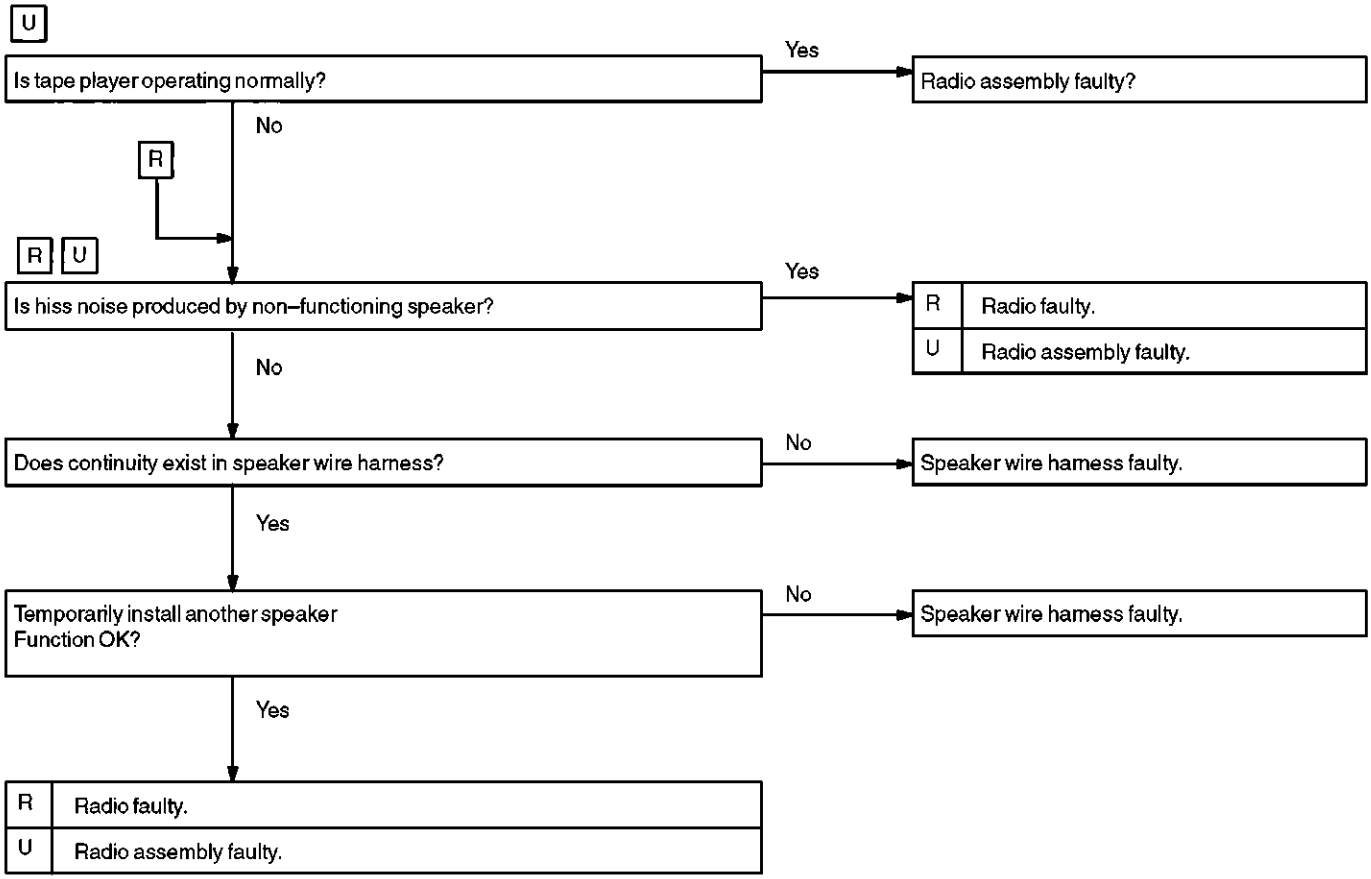


3	Radio	NOISE PRESENT, BUT AM–FM NOT OPERATING

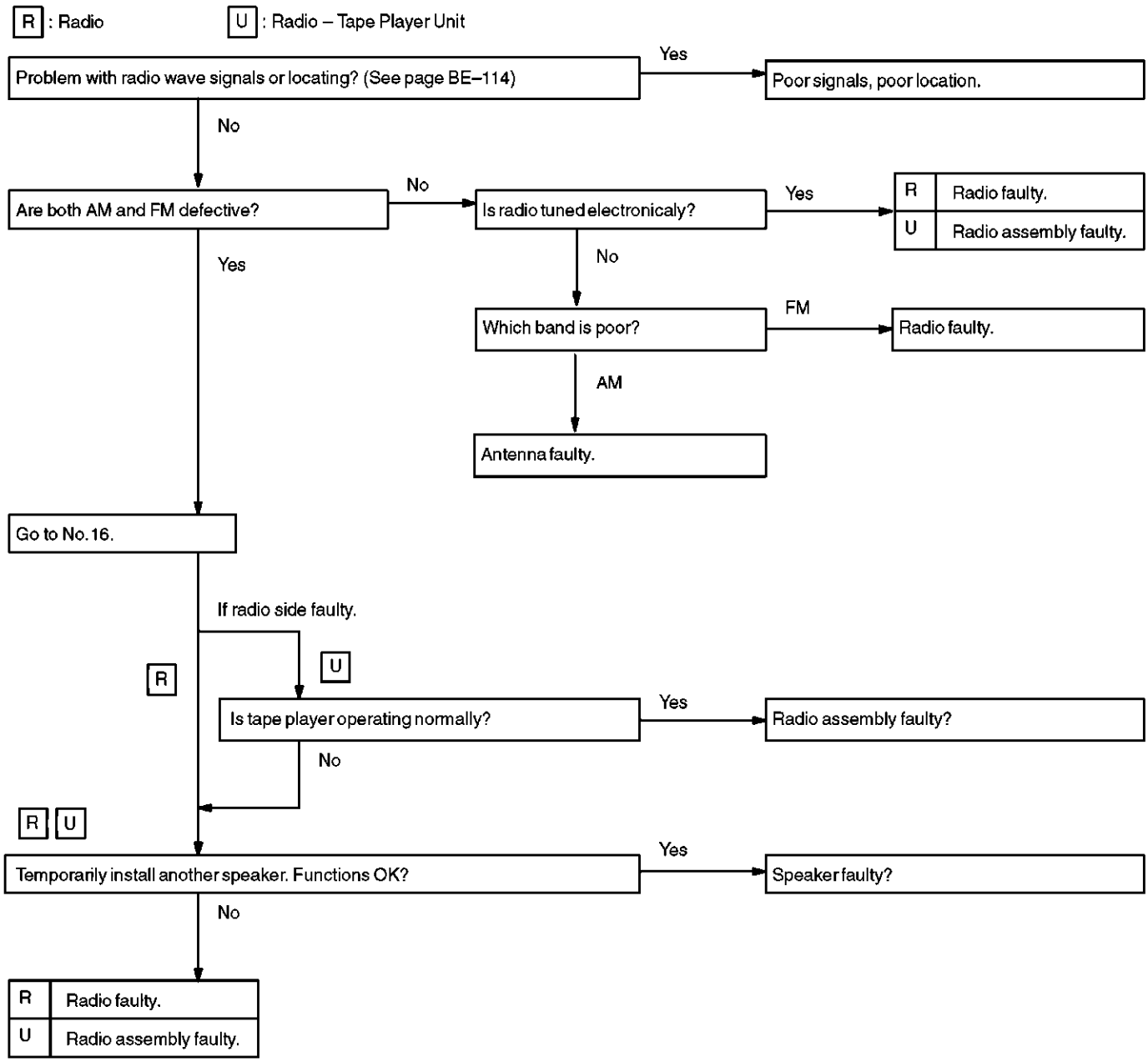


4	Radio	EITHER SPEAKER DOES NOT WORK

[R] : Radio [U] : Radio – Tape Player Unit

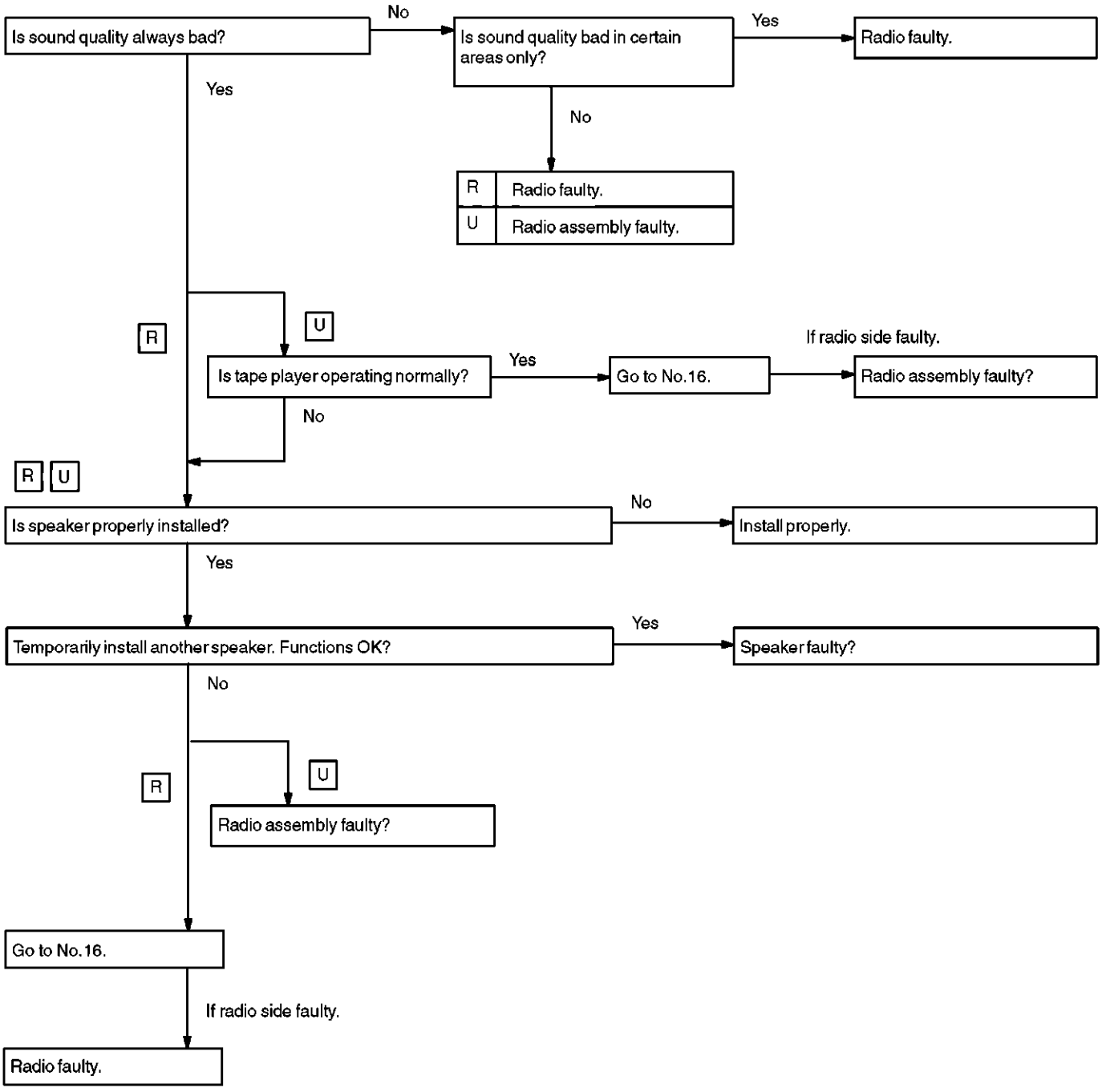


5	Radio	EITHER AM OR FM DOES NOT WORK, RECEPTION POOR (VOLUME FAINT), FEW PRESET TUNING BANDS

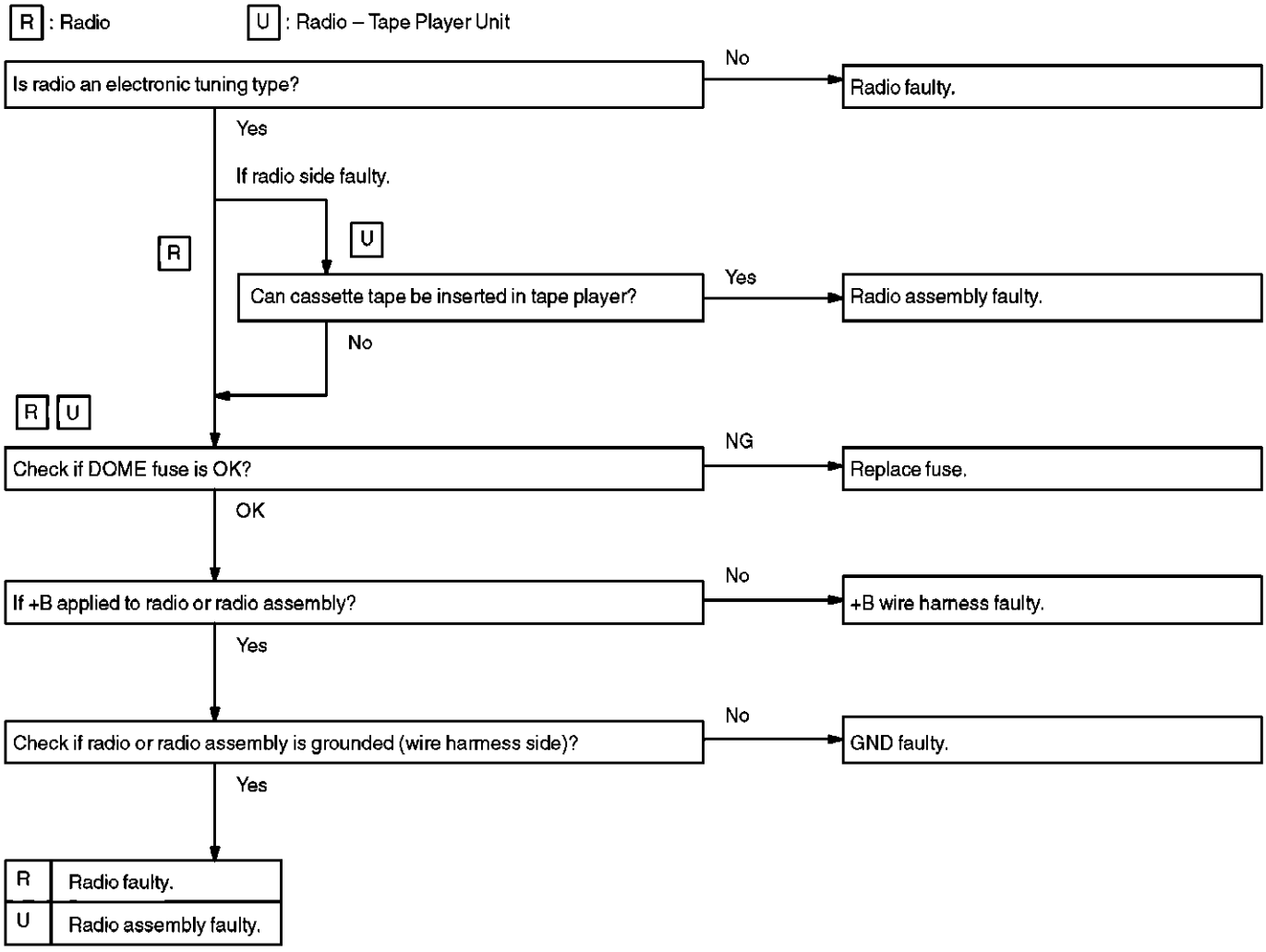


6	Radio	SOUND QUALITY POOR

[R] : Radio [U] : Radio – Tape Player Unit

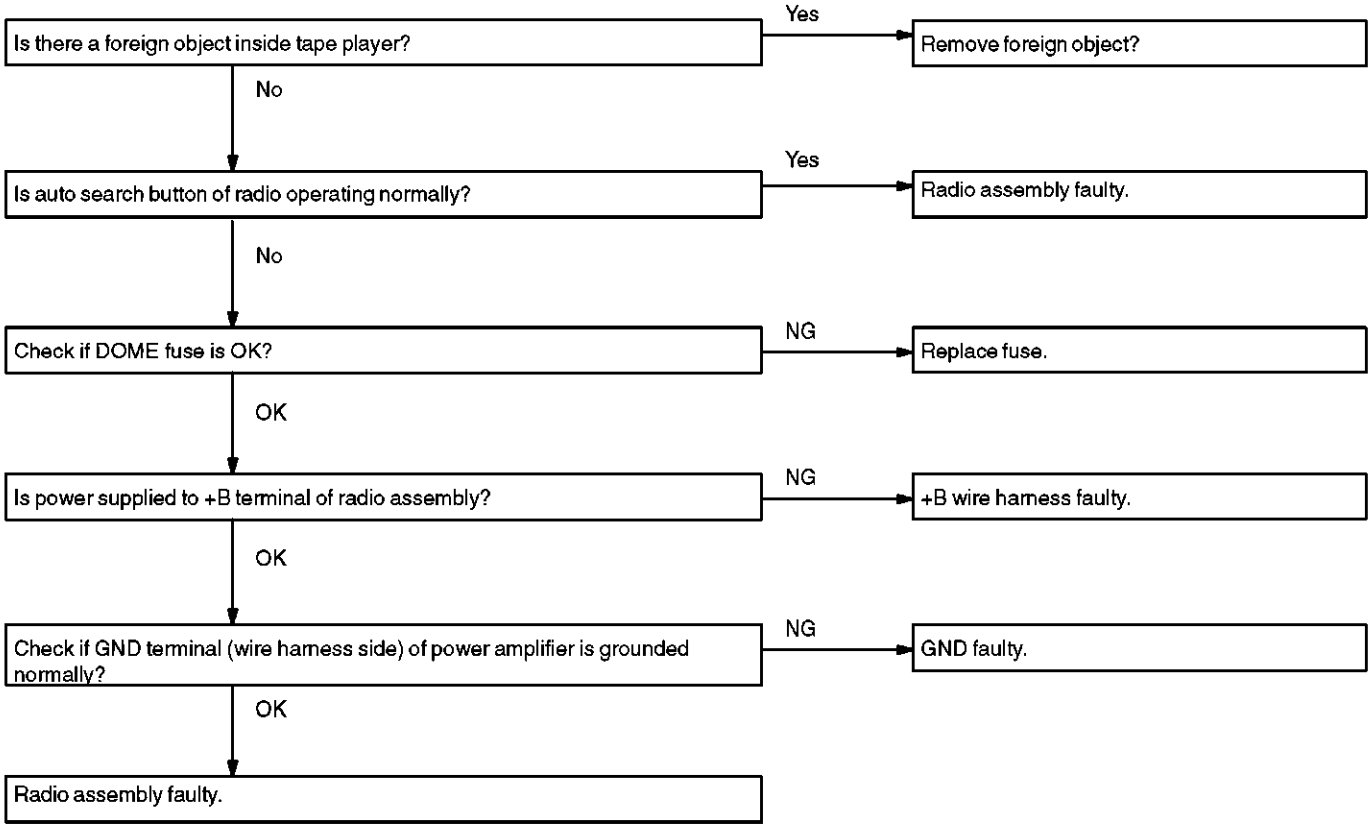


7	Radio	CANNOT SET STATION SELECT BUTTON, PRESET MEMORY DISAPPEARS



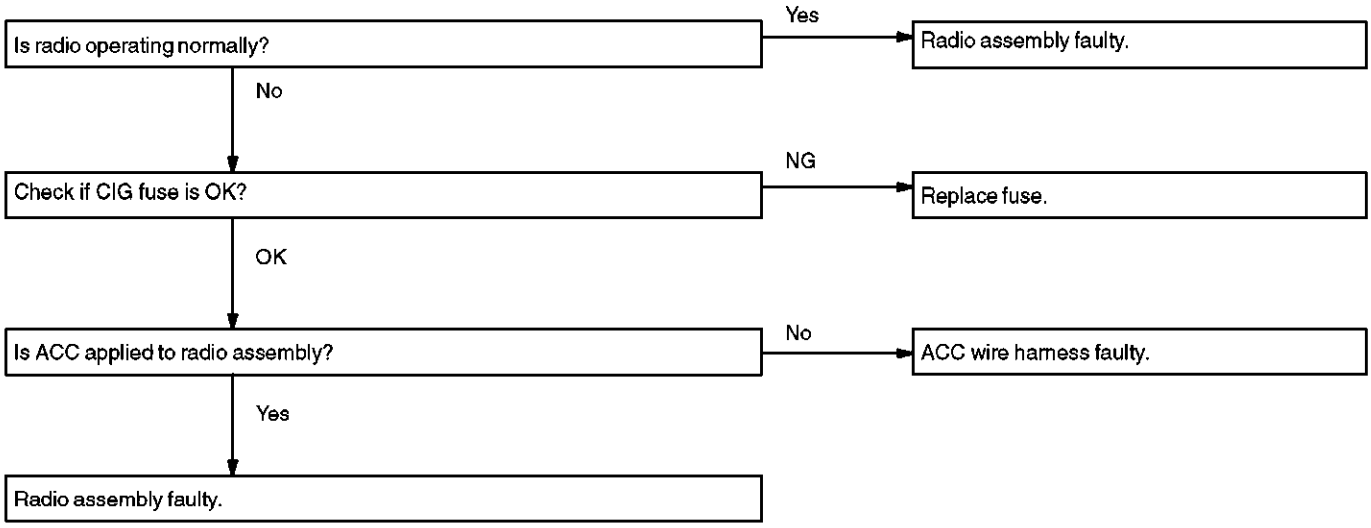
8	Tape Player	CASSETTE TAPE CANNOT BE INSERTED

U : Radio – Tape Player Unit



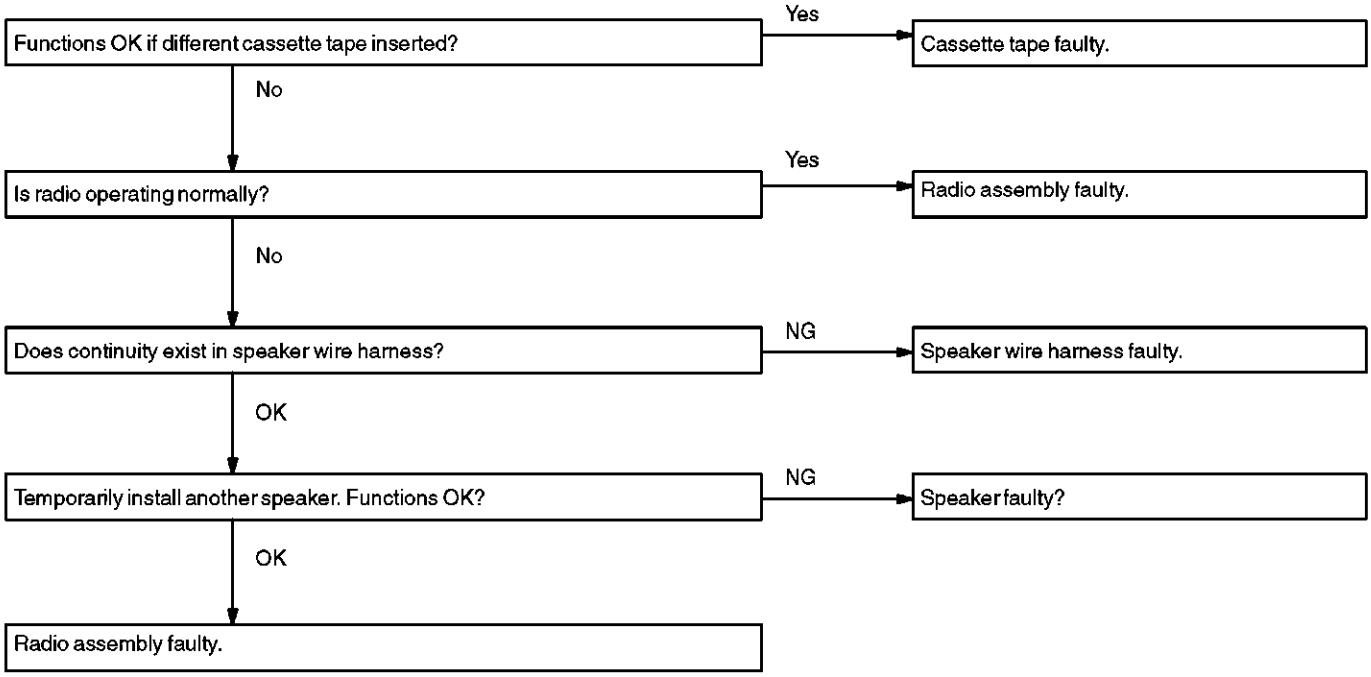
9	Tape Player	CASSETTE TAPE INSERTED, BUT NO POWER

U : Radio – Tape Player Unit



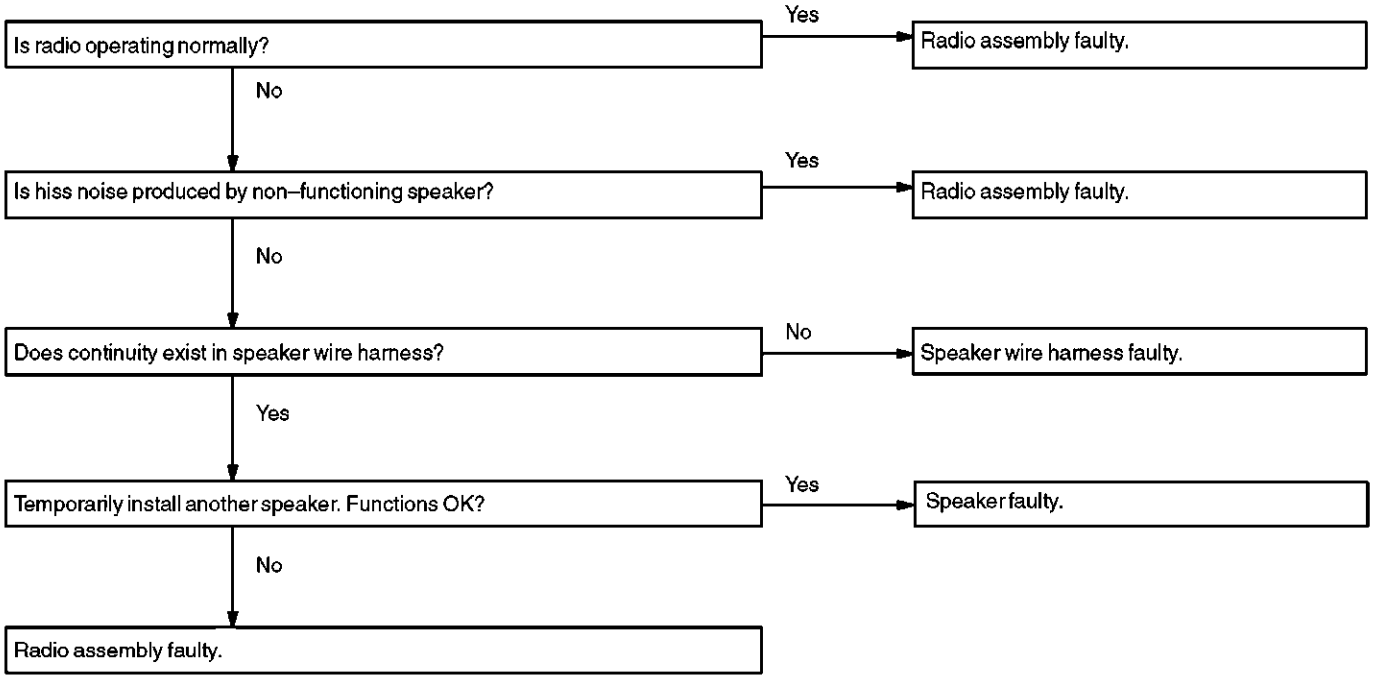
10	Tape Player	POWER COMING IN, BUT TAPE PLAYER NOT OPERATING

U : Radio – Tape Player Unit



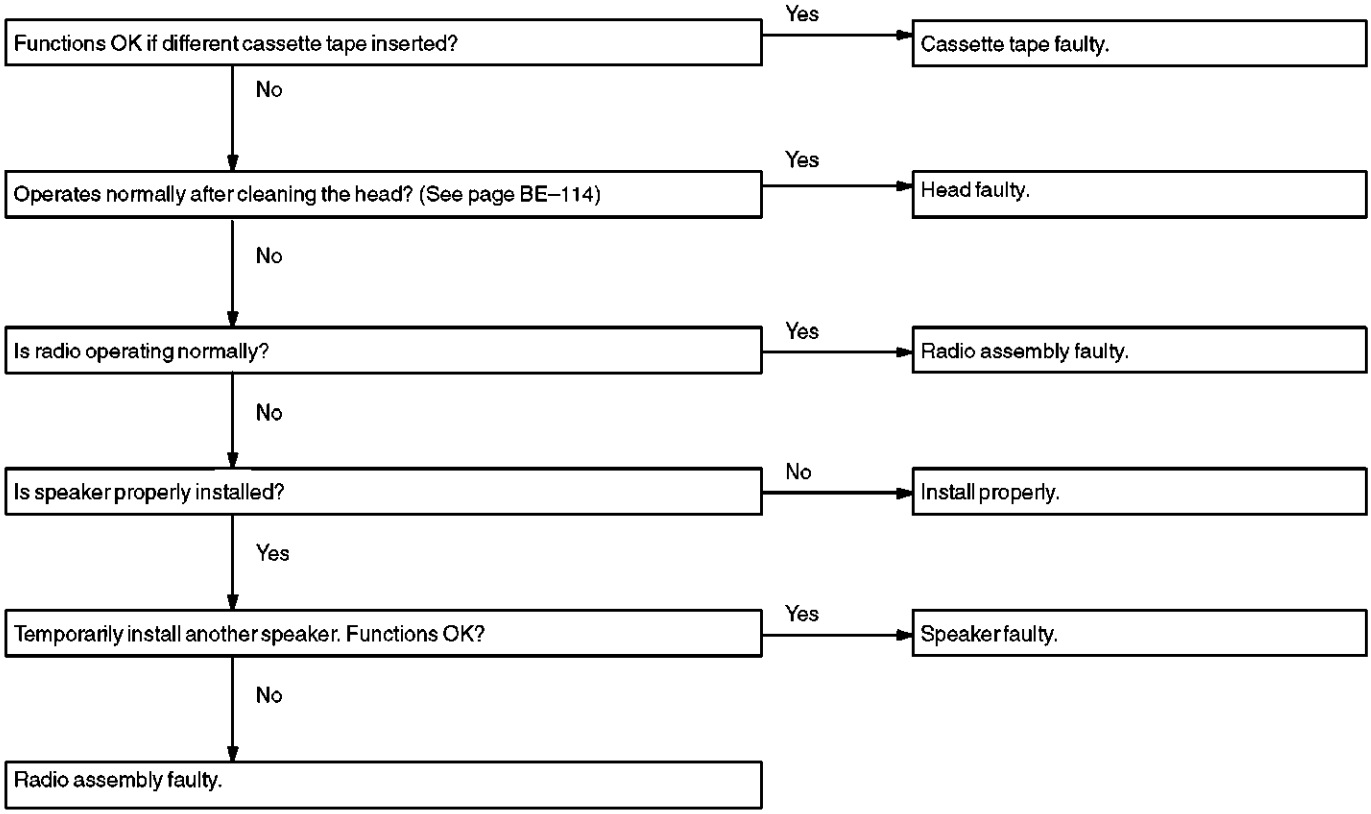
11	Tape Player	EITHER SPEAKER DOES NOT WORK

U : Radio – Tape Player Unit



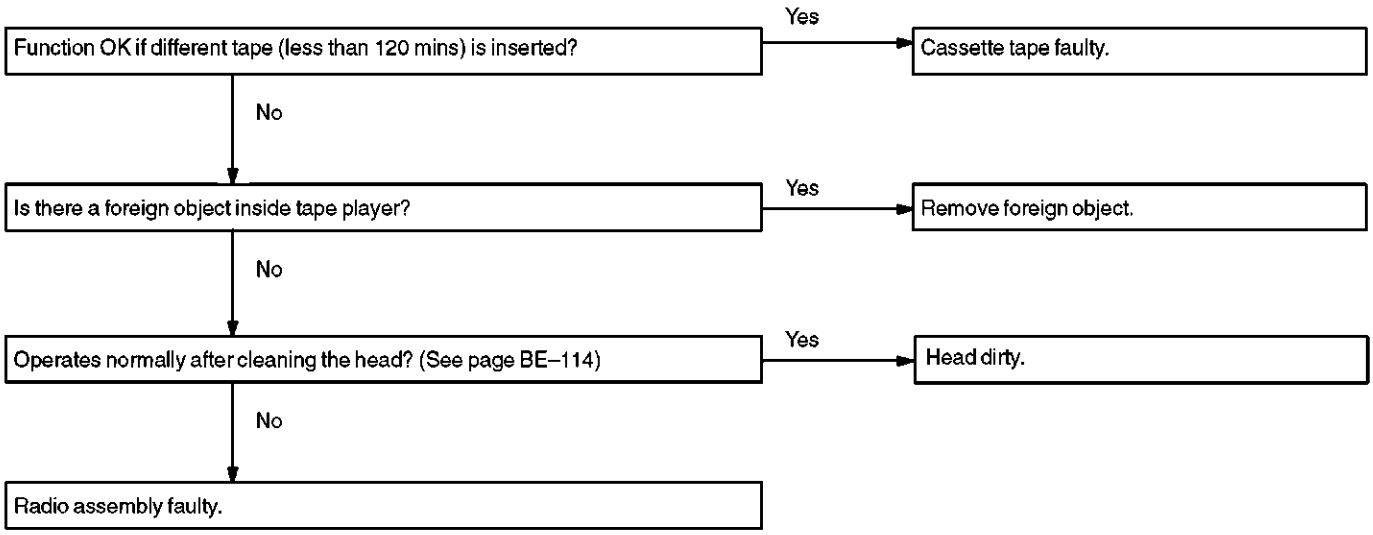
12	Tape Player	SOUND QUALITY POOR (VOLUME FAINT)

U : Radio – Tape Player Unit

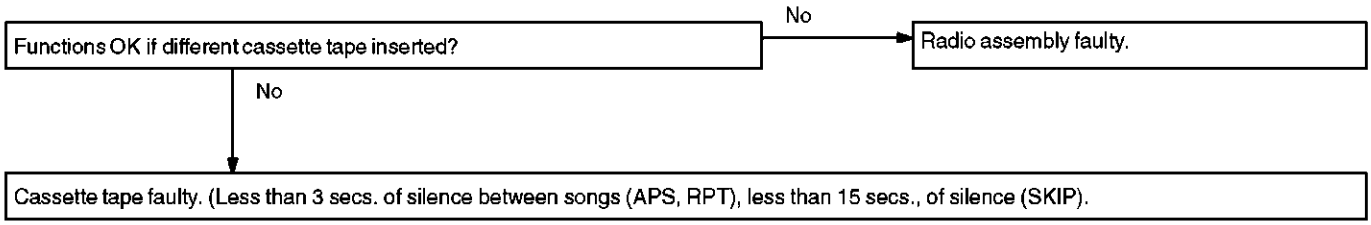


13	Tape Player	TAPE JAMMED, MALFUNCTION WITH TAPE SPEED OR AUTO–REVERSE

U : Radio – Tape Player Unit

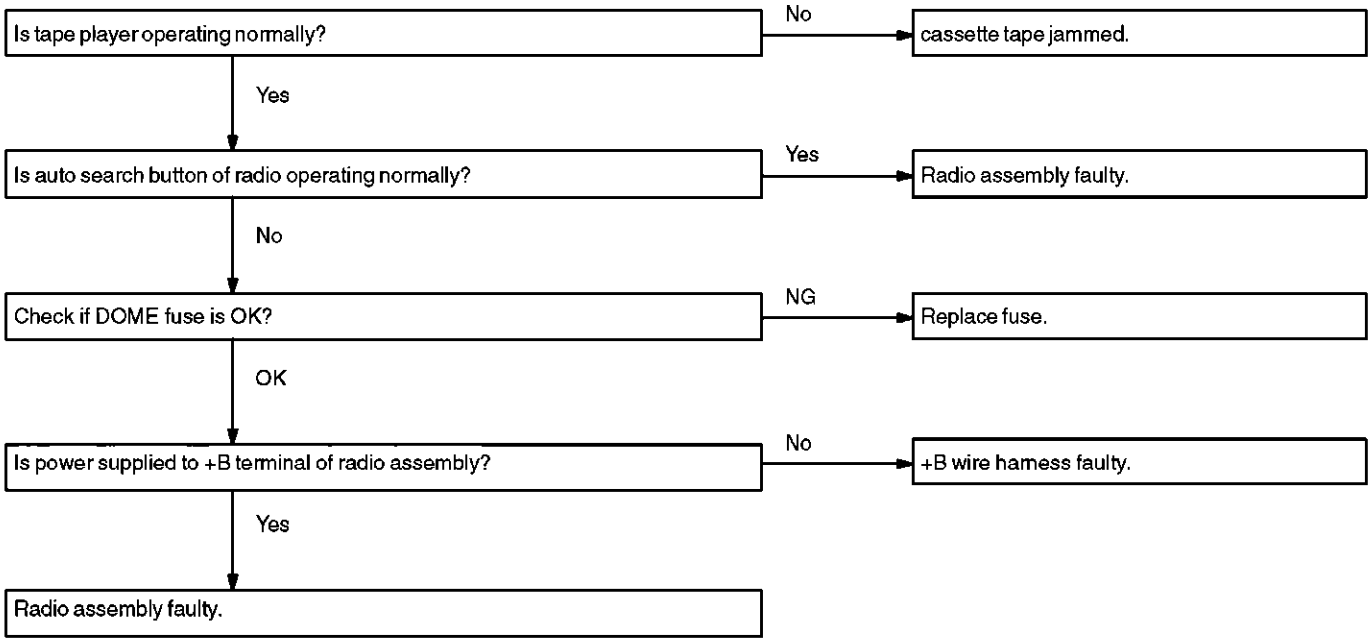


14	Tape Player	APS, SKIP, RPT BUTTONS NOT OPERATING

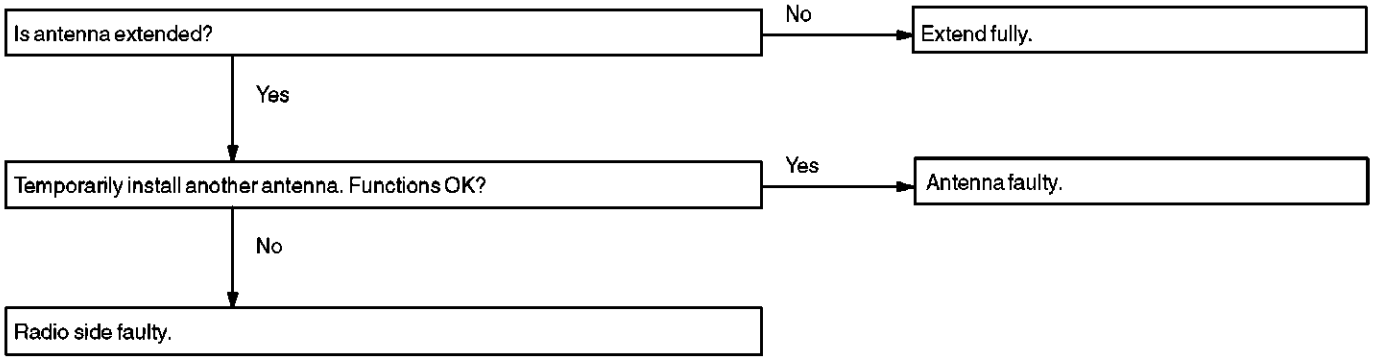


15	Tape Player	CASSETTE TAPE WILL NOT BE EJECTED

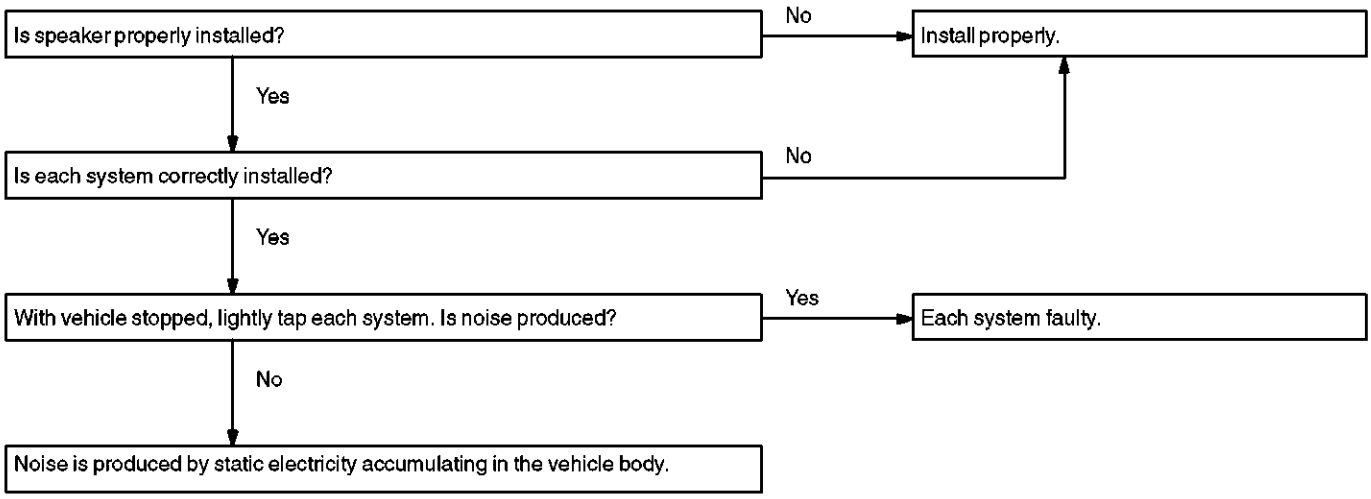
U : Radio – Tape Player Unit



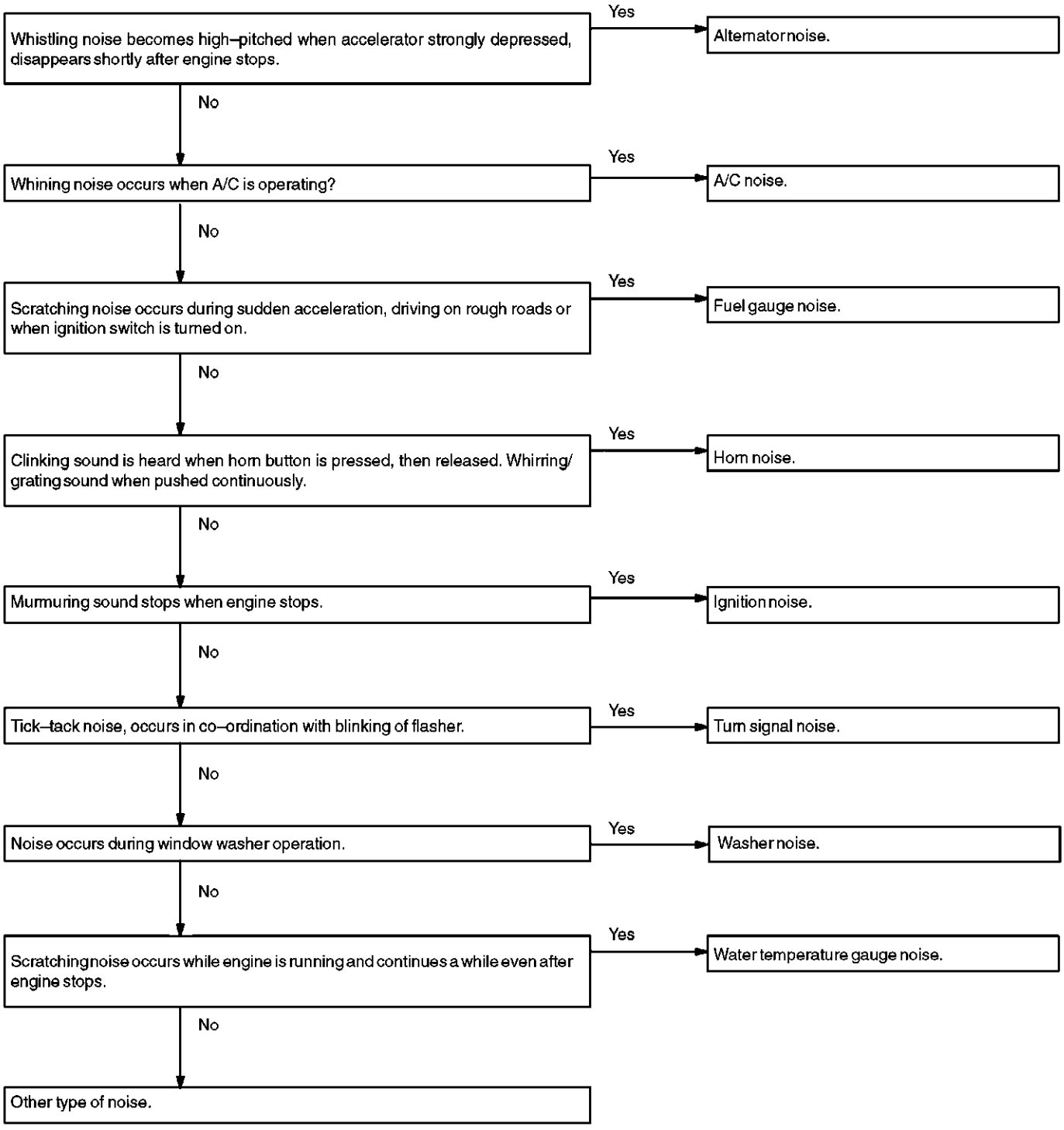
16	Antenna	ANTENNA–RELATED



17	Noise	NOISE PRODUCED BY VIBRATION OR SHOCK WHILE DRIVING

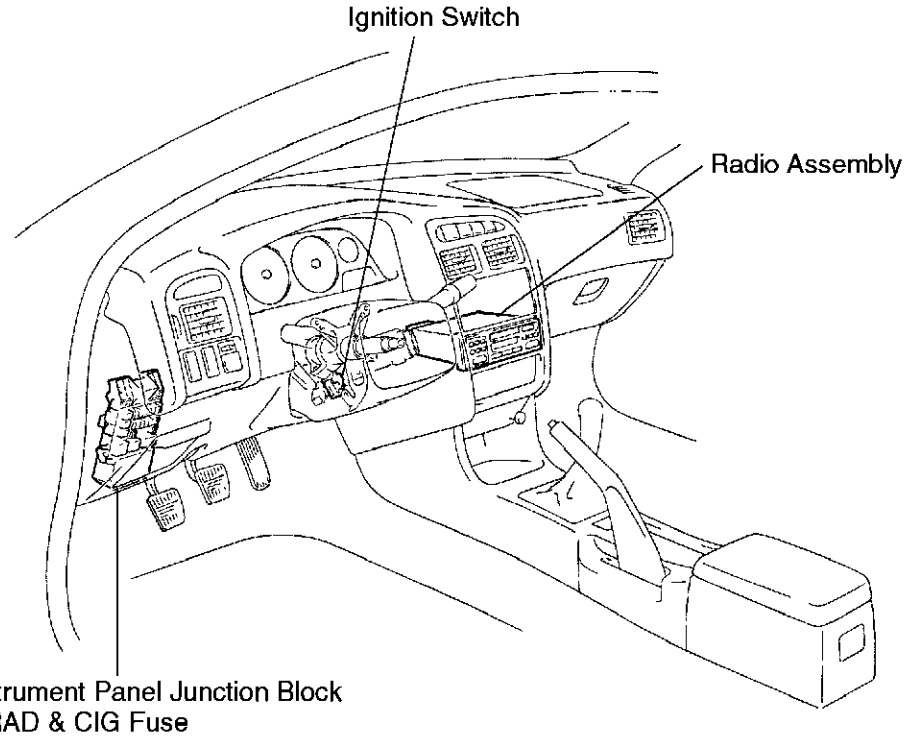


18	Noise	NOISE PRODUCED WHEN ENGINE STARTS

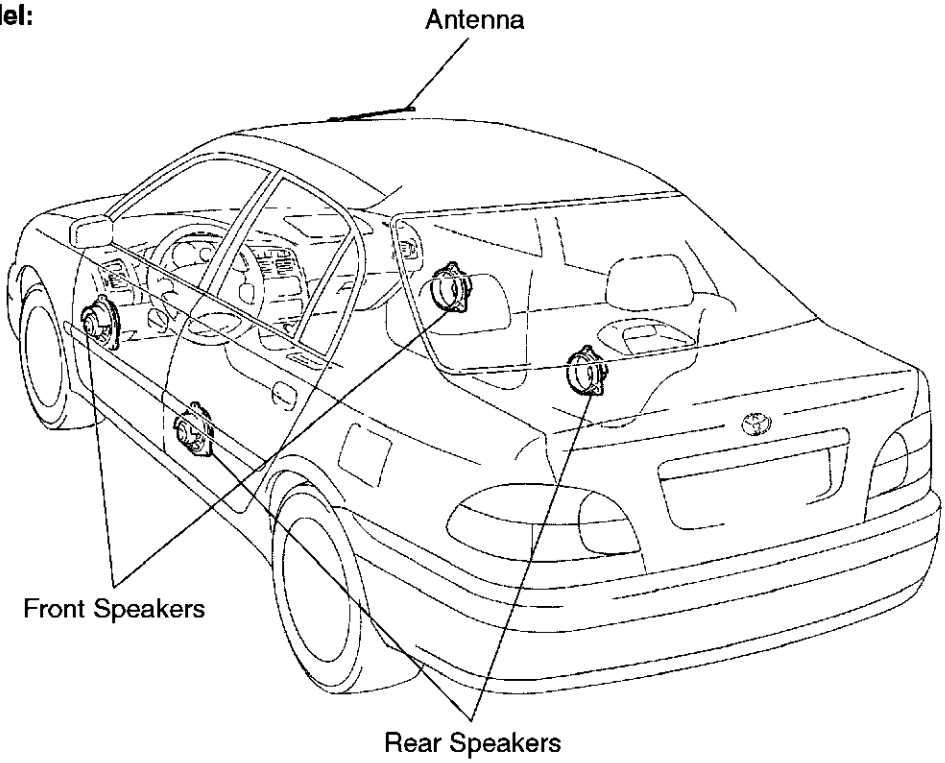


BE0OE–01

LOCATION

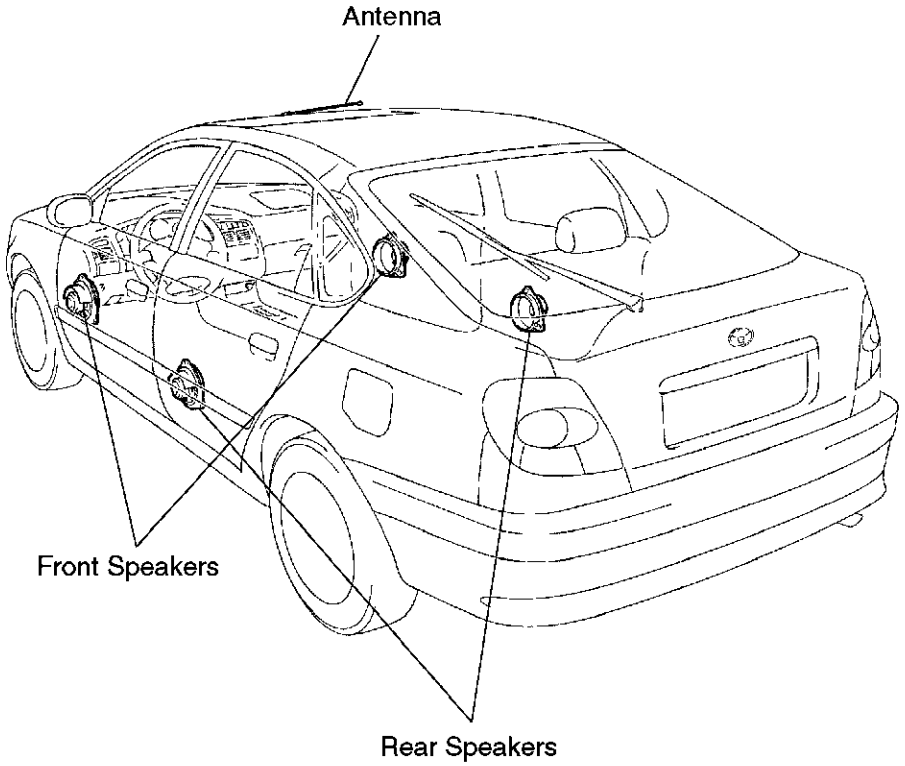


Sedan Model:

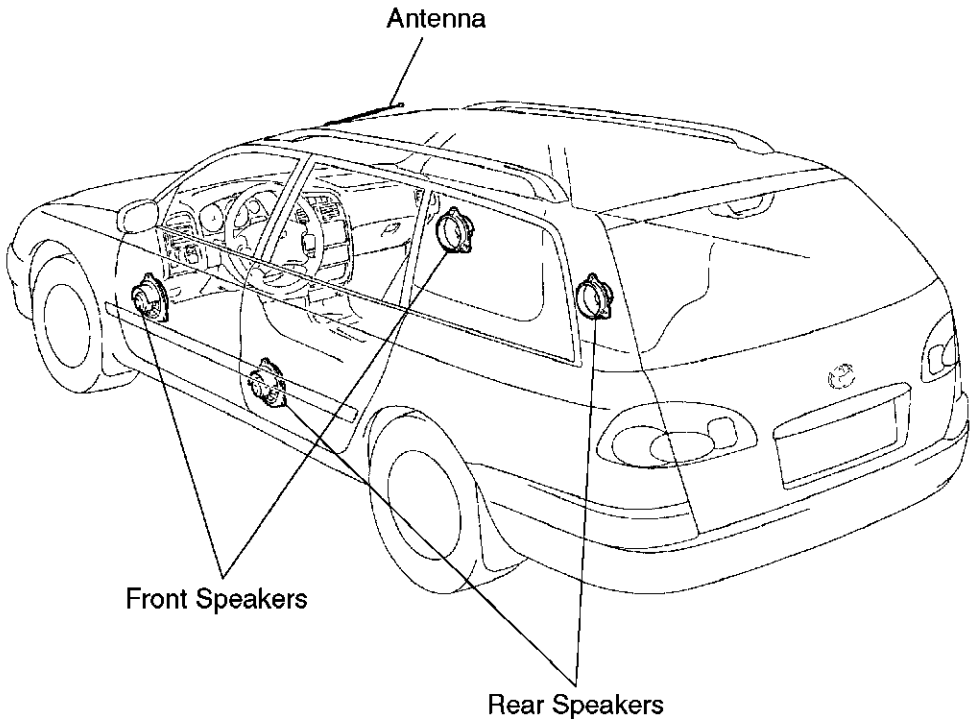


I04858

Liftback Model:



Wagon Model:



I04859

CLOCK

TROUBLESHOOTING

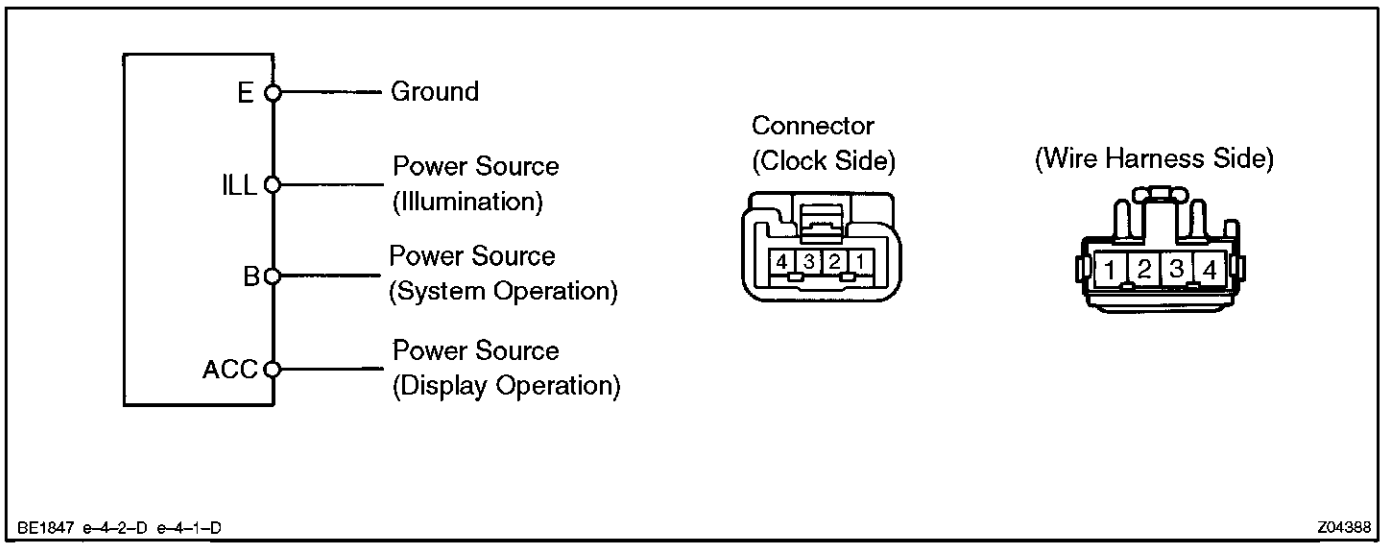
BE0OG–01

HINT:

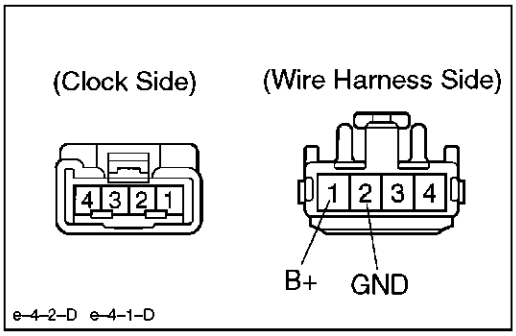
Troubleshoot the clock according to the table below.

Clock will not operate	1
Clock loses or gains time	2

± 1.5 seconds / day



1	CLOCK WILL NOT OPERATE



(a) Check that the battery positive voltage is 10 – 16 V.
If voltage is not as specified, replace the battery.

(b) Check that the DOME fuse is not blown.
If the fuse is blown, replace the fuse and check for short circuit.

(c) Troubleshoot the clock as follows.
HINT: Inspect the connector on the wire harness side.

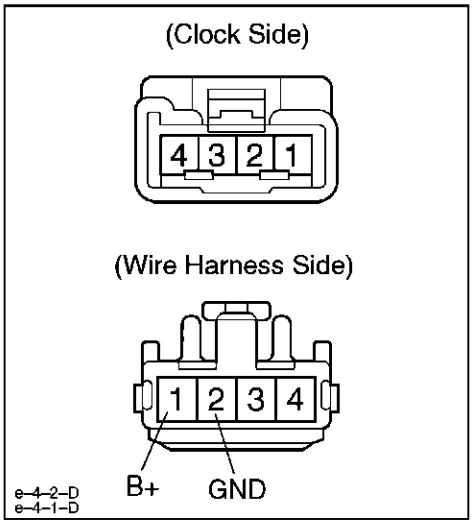
Is there battery positive voltage between terminal B+ and body ground?
- No → Open or short circuit in wire harness between terminal GND and body ground.
- Yes ↓

Does continuity exist between terminal GND and body ground.
- No → Open circuit in wire harness between terminal GND and body ground.
- Yes ↓

Replace clock.

V04421

2	CLOCK LOSES OR GAINS TIME



(a) Check that the battery positive voltage is 10 – 16 V.

If voltage is not as specified, replace the battery.

(b) Inspect the error of the clock.

Allowable error (per day): ± 1.5 seconds

If the error exceeds the allowable error, replace the clock.

(c) Check that the clock adjusting button is caught in position, and does not return.

If the button is not returned, repair or replace the clock.

(d) Troubleshoot the clock as follows.

HINT: Inspect the connector on the wire harness side.

Is there 10 – 16 V between terminal B+ and body ground?

Below 10 V → Locate cause and repair, or recharge battery.

Yes

Adjust or replace clock.

V04422

ENGINE IMMOBILISER SYSTEM

BE02P–02

TROUBLESHOOTING

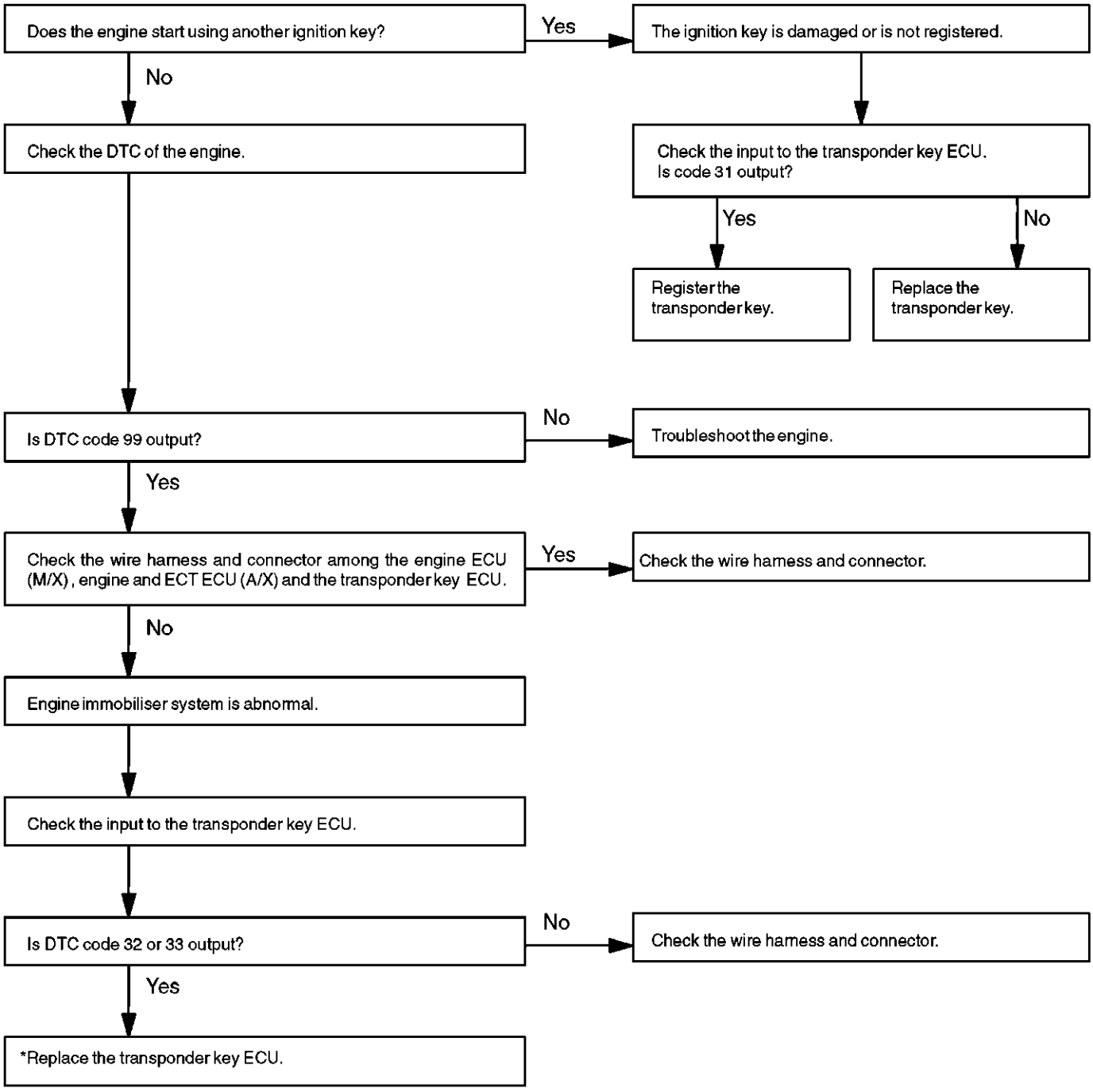
HINT:

If a malfunction occurs in the engine immobiliser system, either of the following symptoms occurs:

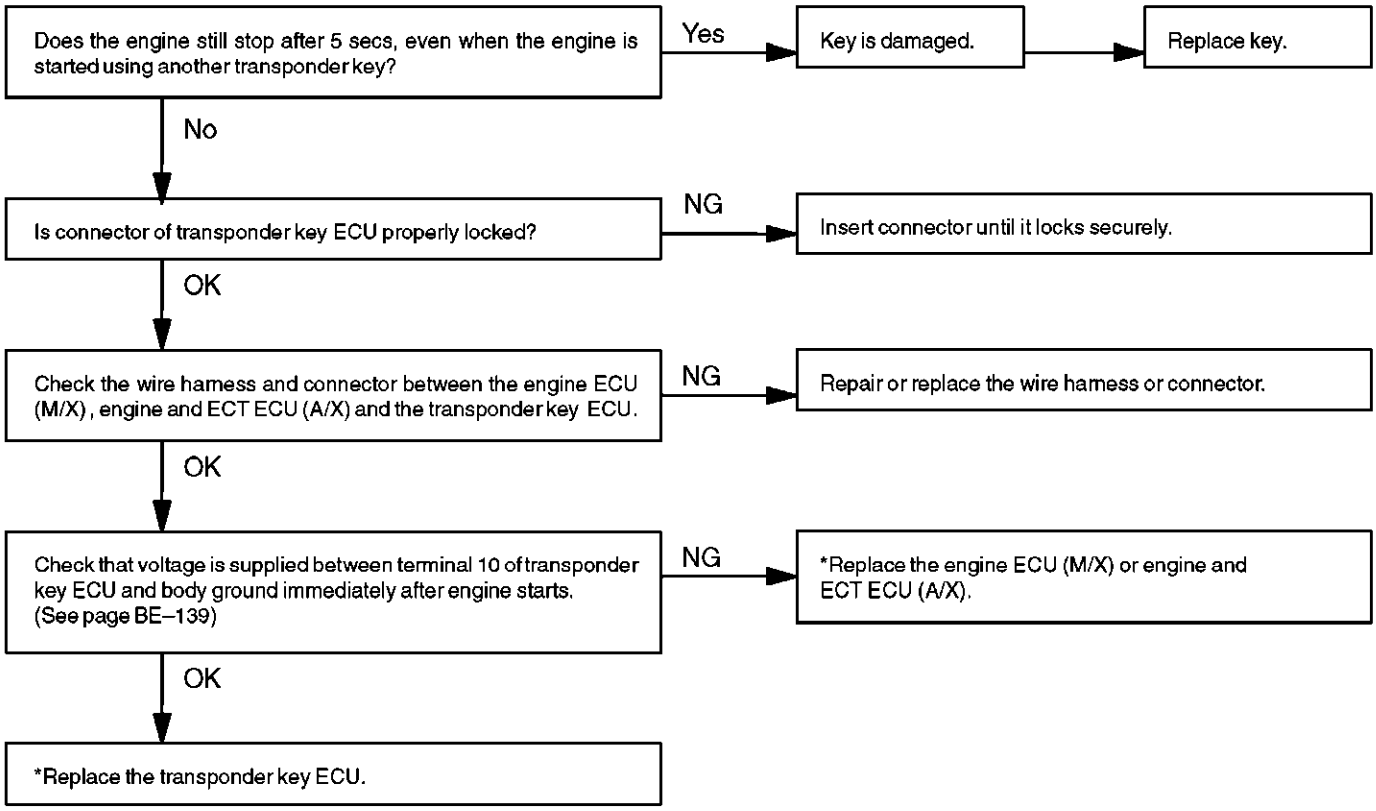
- Cranking occurs, but the engine does not start.
- The engine starts, but stops after 5 seconds.

If either or these symptoms occurs, troubleshoot in accordance with the following flow chart.

1. CRANKING OCCURS, BUT THE ENGINE DOES NOT START



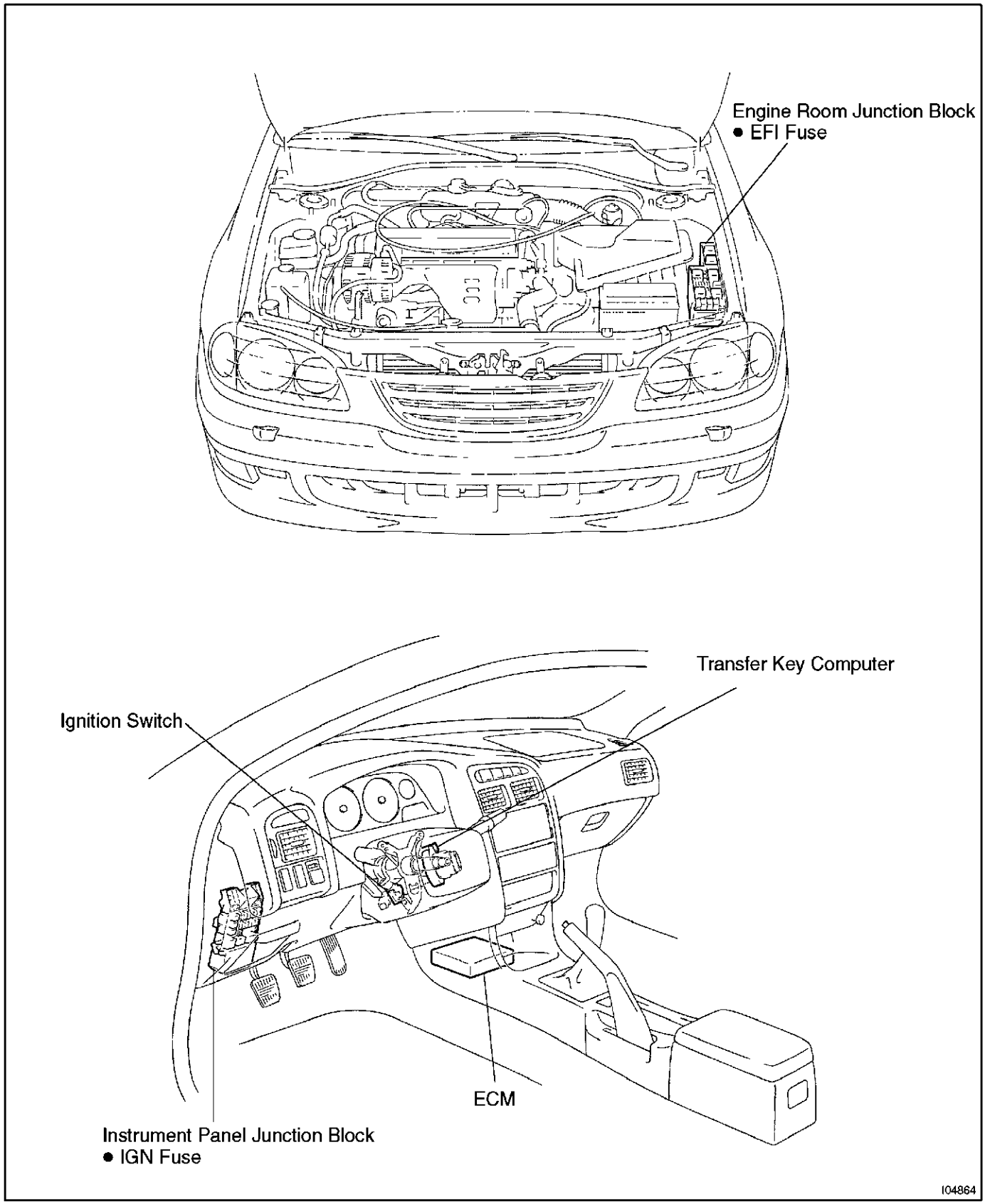
2. ENGINE STARTS, BUT STOPS AFTER 5 SECONDS



* When starting the engine after replacement of tansponder key ECU or engine ECU, do it 30 minutes after the replacenent.

BE02Q–04

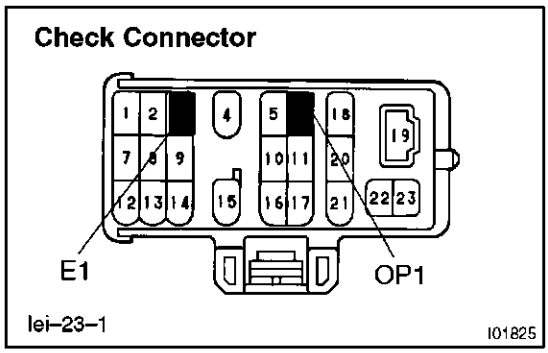
LOCATION



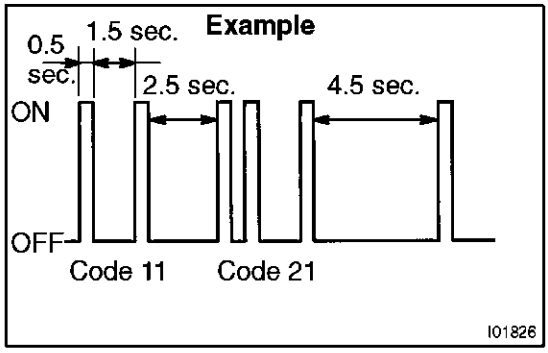
BE02R–02

PRE–CHECK

1. TRANSPONDER KEY ECU INPUT CONDITION DISPLAY READ CODE



(a) Connect the positive (+) lead from the volt meter (Analog Type) to OP3 of the check connector and the negative (–) lead to E1 of the check connector.



(b) Insert the ignition key in the key cylinder.

(c) Read the code from the movement of the tester probe.

If no code is output, turn the ignition switch ON.

If a code is not output, check if the DOME fuse is blown.

HINT:

- The code can be read using a luminous diode (Recommend activation current is 0 to 20 mA) instead of a tester.
- A digital tester can also be used.

Display condition:

- When there are multiple codes, they are output in order stating from the lowest code.
- After all the codes are output, Lo is displayed for 4.5 secs., then all the code are output again starting from the lowest code.
- If the situation changes during code output, Lo is output for 4.5 secs. after output of the current code ceases, then the codes are output again starting from the lowest code. E.g. while 11 (out of 11 and 21) is being output, conditions change and 12 is added. So after 11 is output, Lo is output for 4.5 secs., then 11, 12 and 21 are output.

2. TRANSPONDER KEY ECU INPUT CONDITION DISPLAY CODE LIST

Code	Outputcondition
11	Key unlock warning switch ON (Ignition key inserted)
12	Any door is open. (Door courtesy switch ON)
13	Ignition switch at ON position
21	Master key is inserted in key cylinder and the immobiliser system is OFF.
22	Sub key is inserted in key cylinder and immobiliser system is OFF.
31	Key code recorded in transponder key ECU differs from code of key inserted in key cylinder.
32	Transponder key code cannot be read.
33	Key code cannot be read because format of chip inside key is wrong.
34	Transponder key ECU has no memory space to register key code.

3. TRANSPONDER KEY ECU INPUT CONDITION DISPLAY MALFUNCTION LIST

Symptom	Cause
No code is output.	1. DOME Fuse 2. Wire harness or connector 3. Transponder key ECU
Even when key is inserted in key cylinder, Code 11 is not output.	1. Key unlock warning switch 2. Wire harness or connector 3. Transponder key ECU
Code 12 is not output when the door is open.	1. Door courtesy switch 2. Wire harness or connector 3. Transponder key ECU
Code 13 is not output when ignition switch is ON.	1. IGN Fuse 2. Wire harness or connector 3. Transponder key ECU
Code 31 is output when key is inserted in key cylinder.	Key code is not registered.
Code 32 is output.	1. Transponder key ECU 2. Wire harness or connector
Code 33 is output.	1. Transponder key ECU
Code 34 is output.	Transponder key ECU has no memory space to register key code.

BE0CF–01

INSPECTION

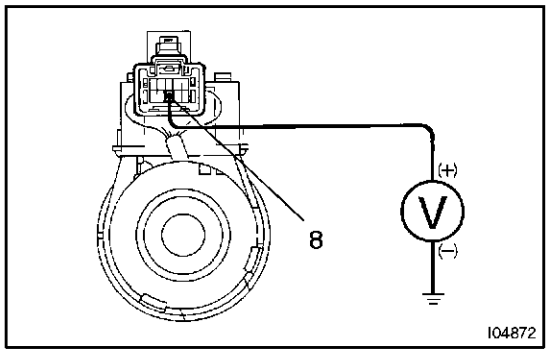
1. INSPECT TRANSPONDER KEY ECU CIRCUIT

Disconnect the connector from the ECU and inspect the connector on the wire harness side, as shown in the table below.

Tester connection	Condition	Specified condition
1 – Ground	Constant	Battery voltage
2 – Ground	Ignition switch ON	Battery voltage
7 – Ground	All doors closed	No continuity
7 – Ground	All doors open	Continuity
6 – Ground	Key unlock warning switch OFF (key removed)	No continuity
6 – Ground	Key unlock warning switch ON (key inserted)	Continuity
10 – Ground	Constant	Continuity

If the circuit is not as specified, try replacing the ECU with a new one.

If the circuit is not as specified, inspect the circuits connected to other parts.



2. INSPECT TRANSPONDER KEY ECU

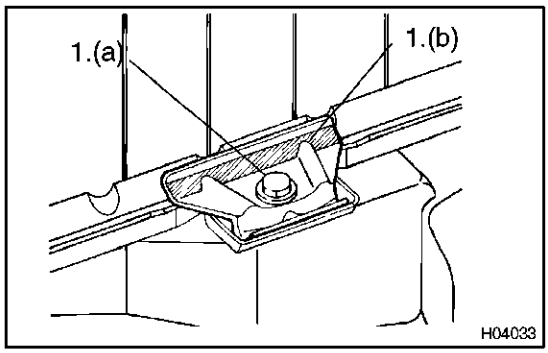
(a) With the connector connected, connect the positive (+) lead from the analog type tester to terminal 8 and the negative (–) lead to the body ground.

(b) Check that there is battery voltage when the ignition switch turned ON.

(c) Check that the tester needle swings strongly for approx. 1 sec. when the engine is started using the ignition key.

BODY

BATTERY BO–1
CLIP BO–3
SRS AIRBAG BO–5
FRONT BUMPER BO–6
REAR BUMPER BO–7
HOOD BO–10
FRONT DOOR BO–11
REAR DOOR BO–18
BACK DOOR (Liftback) BO–24
BACK DOOR (Wagon) BO–29
BACK DOOR STAY BO–34
OUTSIDE REAR VIEW MIRROR BO–35
LUGGAGE COMPARTMENT
DOOR AND HINGE BO–39
FRONT WIPER AND WASHER BO–46
REAR WIPER AND WASHER (Liftback) BO–51
REAR WIPER AND WASHER (Wagon) BO–56
BODY OUTSIDE MOULDING BO–61
ROOF DRIP SIDE FINISH MOULDING BO–65
WINDSHIELD BO–69
QUARTER WINDOW GLASS (Liftback) BO–75
QUARTER WINDOW GLASS (Wagon) BO–79
BACK WINDOW GLASS (Sedan) BO–85
BACK DOOR GLASS (Liftback) BO–91
BACK DOOR GLASS
AND MOULDING (Wagon) BO–96
SLIDING ROOF BO–102
INSTRUMENT PANEL BO–110
ROOF HEADLINING (Sedan) BO–118
ROOF HEADLINING (Liftback) BO–121
ROOF HEADLINING (Wagon) BO–124
FRONT SEAT BO–128
REAR SEAT (Sedan) BO–135
REAR SEAT (Except Sedan) BO–140
SEAT BELT BO–145
SEAT BELT PRETENSIONER BO–151
ROOF RAIL BO–160
FUEL TANK AND LINE BO–163



BATTERY

BO19F–01

REMOVAL

1. REMOVE CLAMP

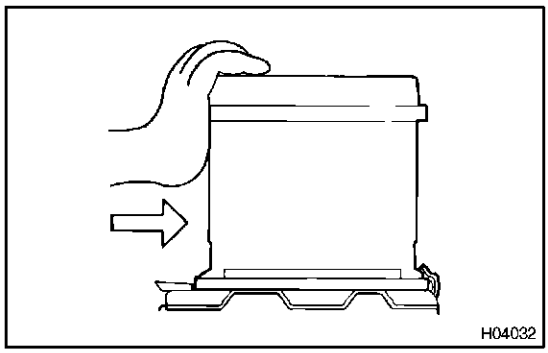
(a) Remove the bolt.

(b) Remove the clamp.

2. REMOVE BATTERY

Push the battery forward to remove it from the tray.

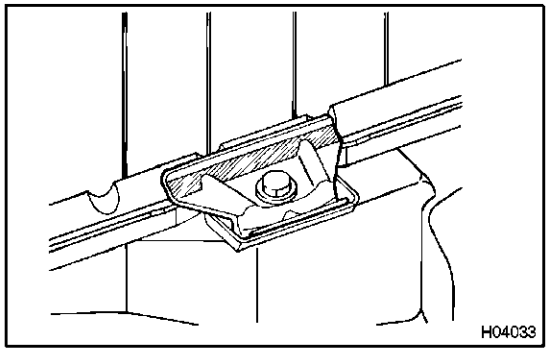
BO19G–01



INSTALLATION

1. INSTALL BATTERY

Set the battery on to the tray, and push it backward.



2. INSTALL CLAMP

Install the clamp with bolt.

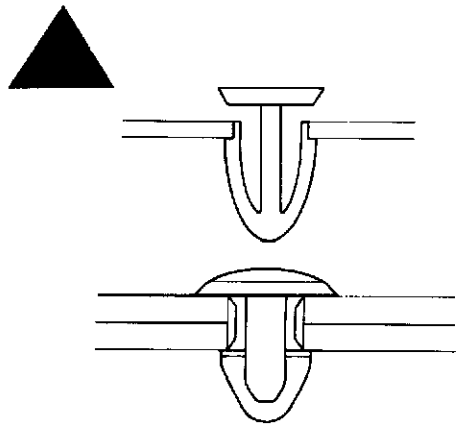
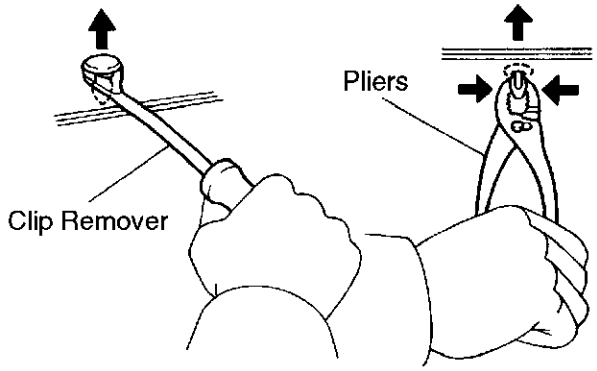
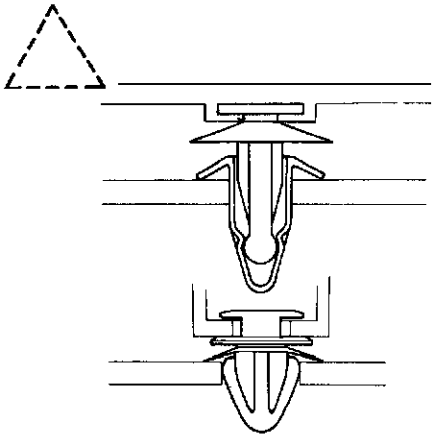
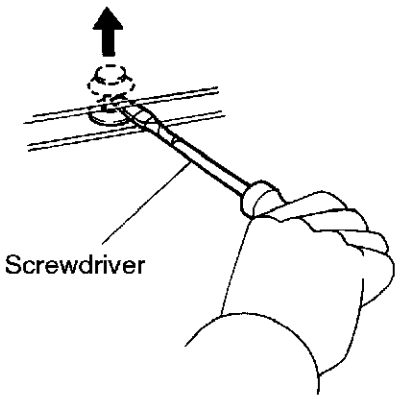
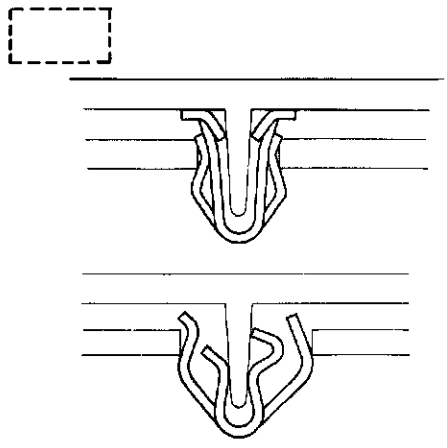
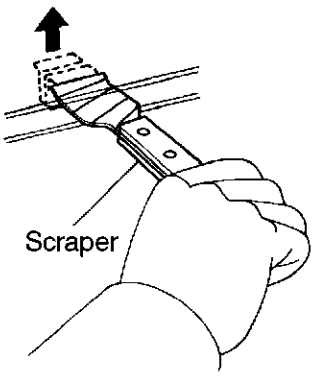
Torque: 15 N·m(153 kgf·cm, 11 ft·lbf)

CLIP

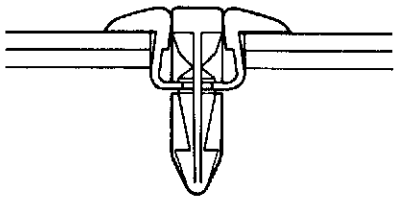
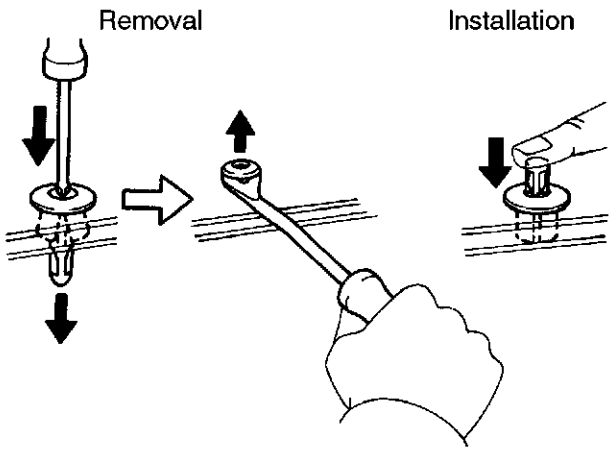
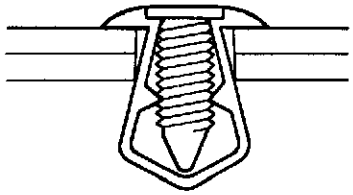
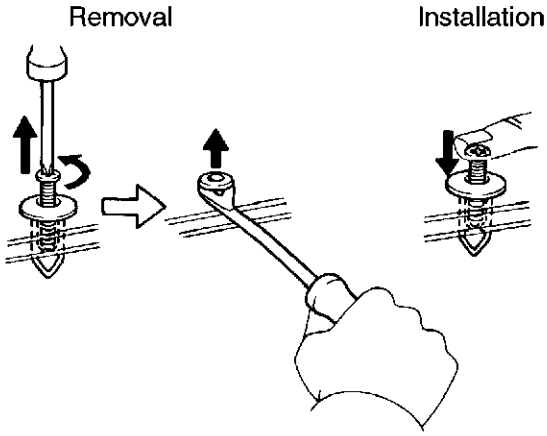
REPLACEMENT

BO19D–01

The removal and installation 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
	
	
	

V00005

Shape (Example)	Removal/Installation
	
	

V00012

SRS AIRBAG

PRECAUTION

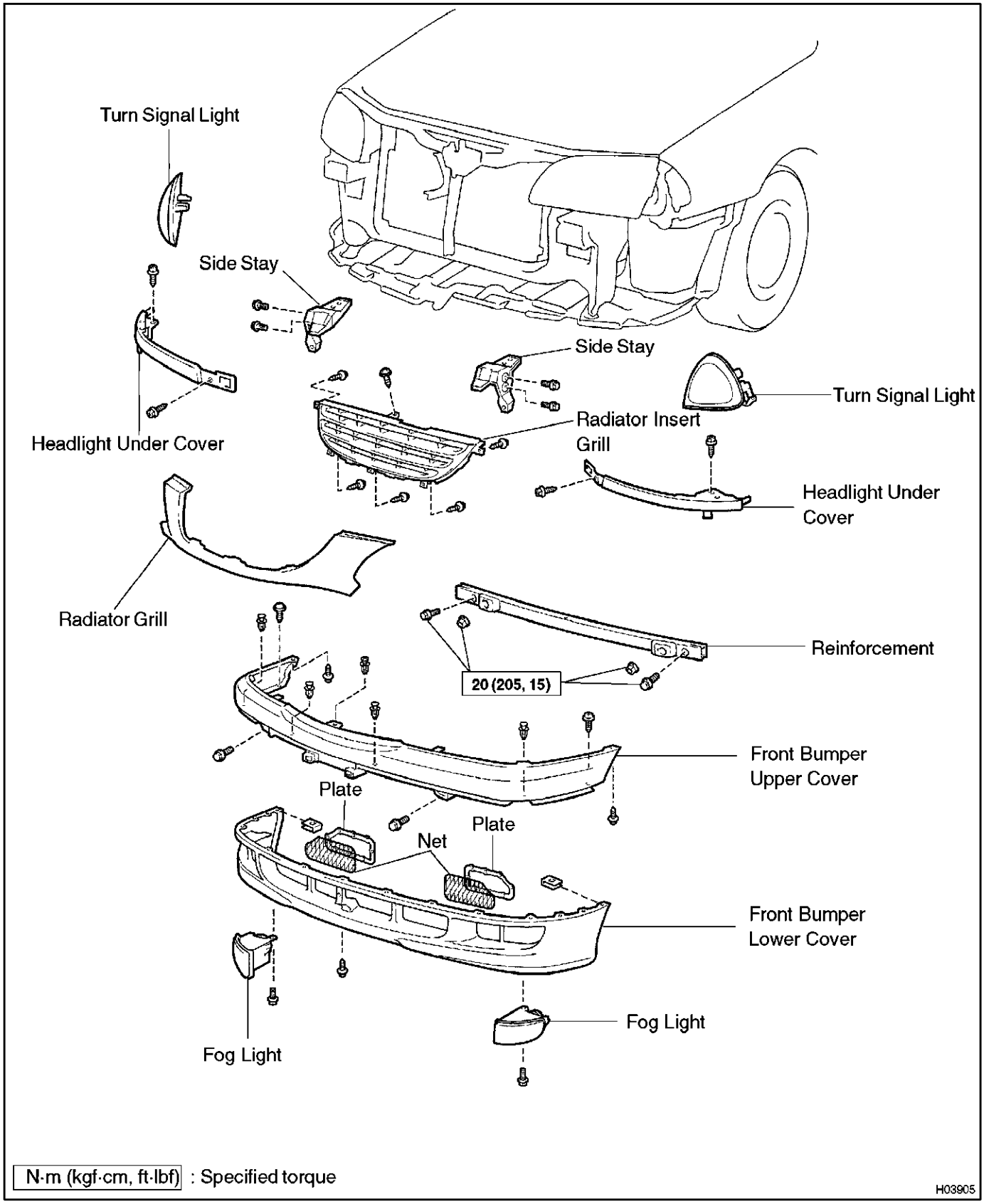
BO19E–01

The TOYOTA AVENSIS/CORONA is equipped with an SRS (Supplemental Restraint System) such as the driver airbag, front passenger airbag and side 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 RS section.

FRONT BUMPER

COMPONENTS

BO18F–01



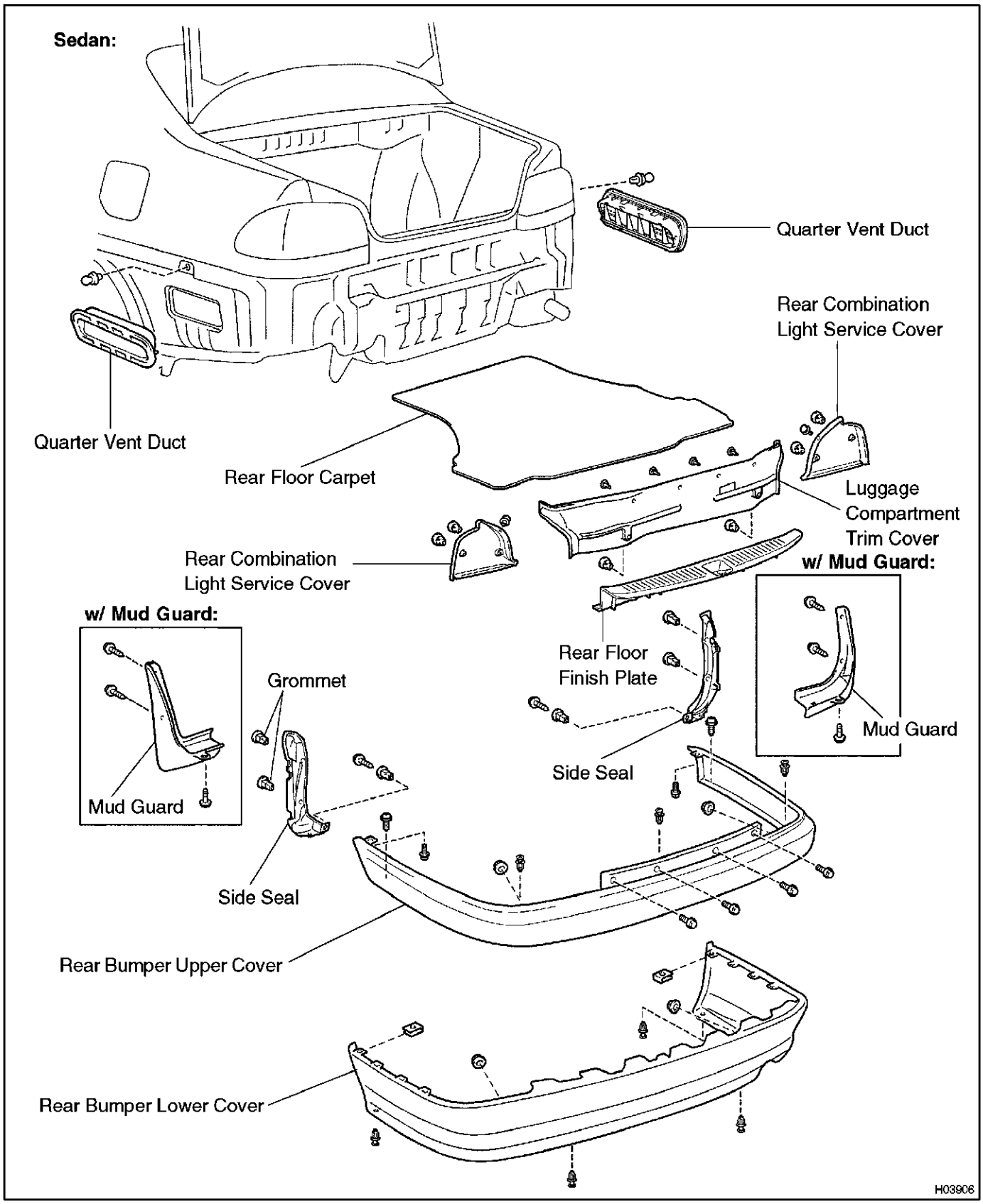
N·m (kgf·cm, ft·lbf) : Specified torque

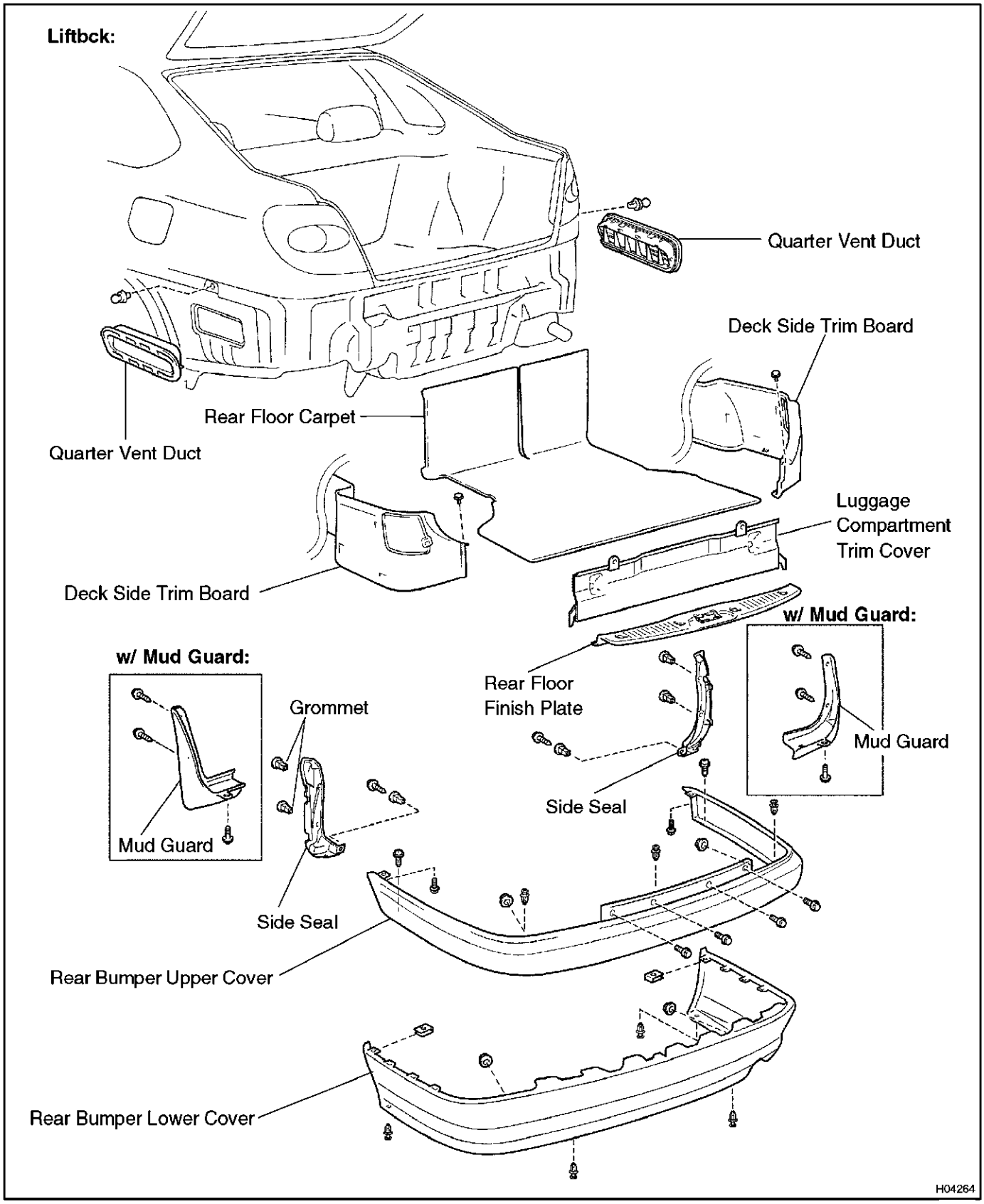
H03905

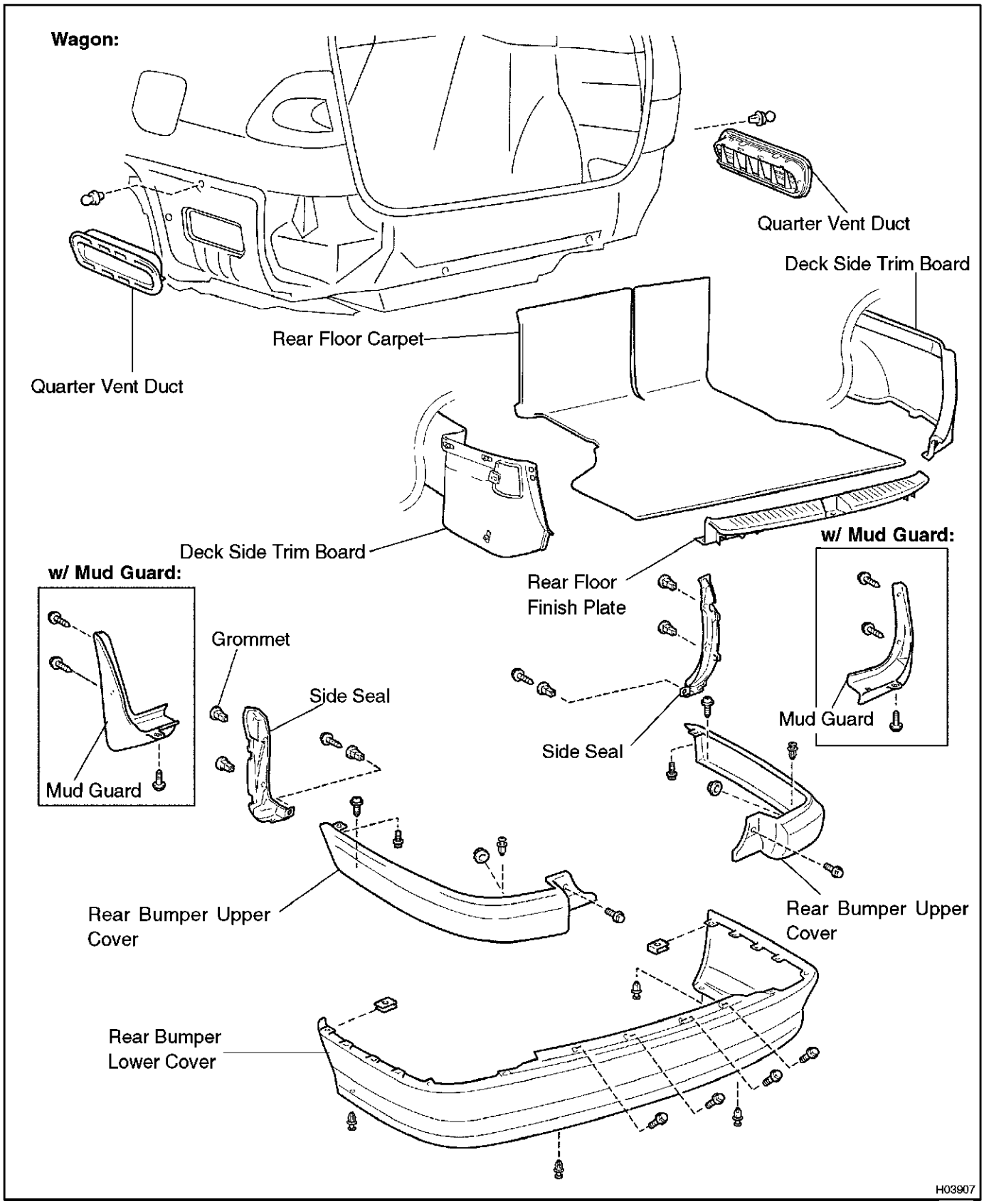
REAR BUMPER

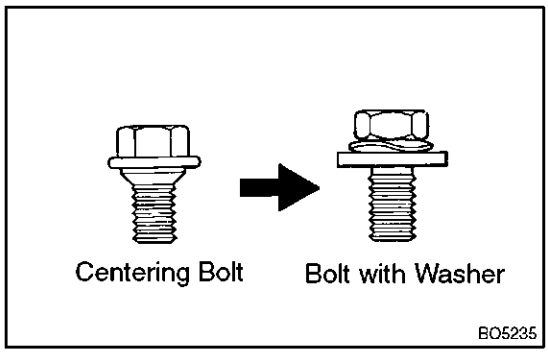
COMPONENTS

BO18G–01




Liftbck:
Quarter Vent Duct
Deck Side Trim Board
Rear Floor Carpet
Quarter Vent Duct
Luggage Compartment Trim Cover
Deck Side Trim Board
w/ Mud Guard:
w/ Mud Guard:
Rear Floor Finish Plate
Grommet
Mud Guard
Mud Guard
Side Seal
Side Seal
Rear Bumper Upper Cover
Rear Bumper Lower Cover
H04264


Wagon:
Quarter Vent Duct
Deck Side Trim Board
Rear Floor Carpet
Quarter Vent Duct
Deck Side Trim Board
w/ Mud Guard:
w/ Mud Guard:
Rear Floor
Finish Plate
Grommet
Side Seal
Mud Guard
Side Seal
Mud Guard
Rear Bumper Upper
Cover
Rear Bumper Upper
Cover
Rear Bumper
Lower Cover
H03907

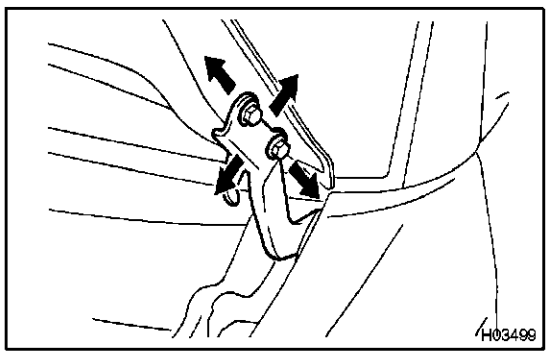


HOOD

ADJUSTMENT

BO027-02

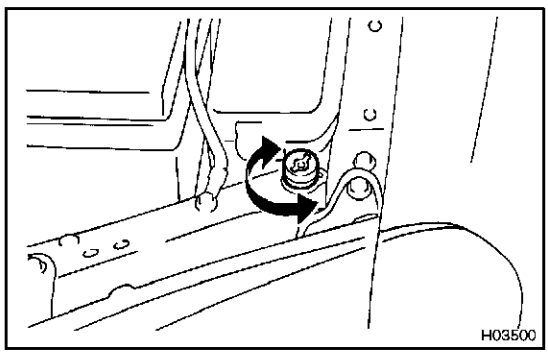
HINT:
Since the centering bolt is used as a hood hinge set bolt, the hood cannot be adjusted with it on. Substitute the bolt with washer for the centering bolt.



1. ADJUST HOOD IN FORWARD/REARWARD AND LEFT/RIGHT DIRECTIONS

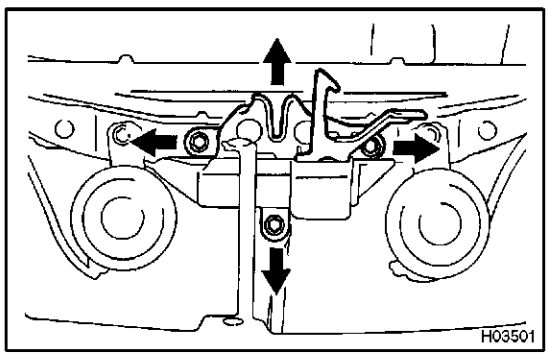
Adjust the hood by loosening the hood side hinge bolts.

Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)



2. ADJUST FRONT EDGE OF HOOD IN VERTICAL DIRECTION

Adjust the hood by turning the cushions.



3. ADJUST HOOD LOCK

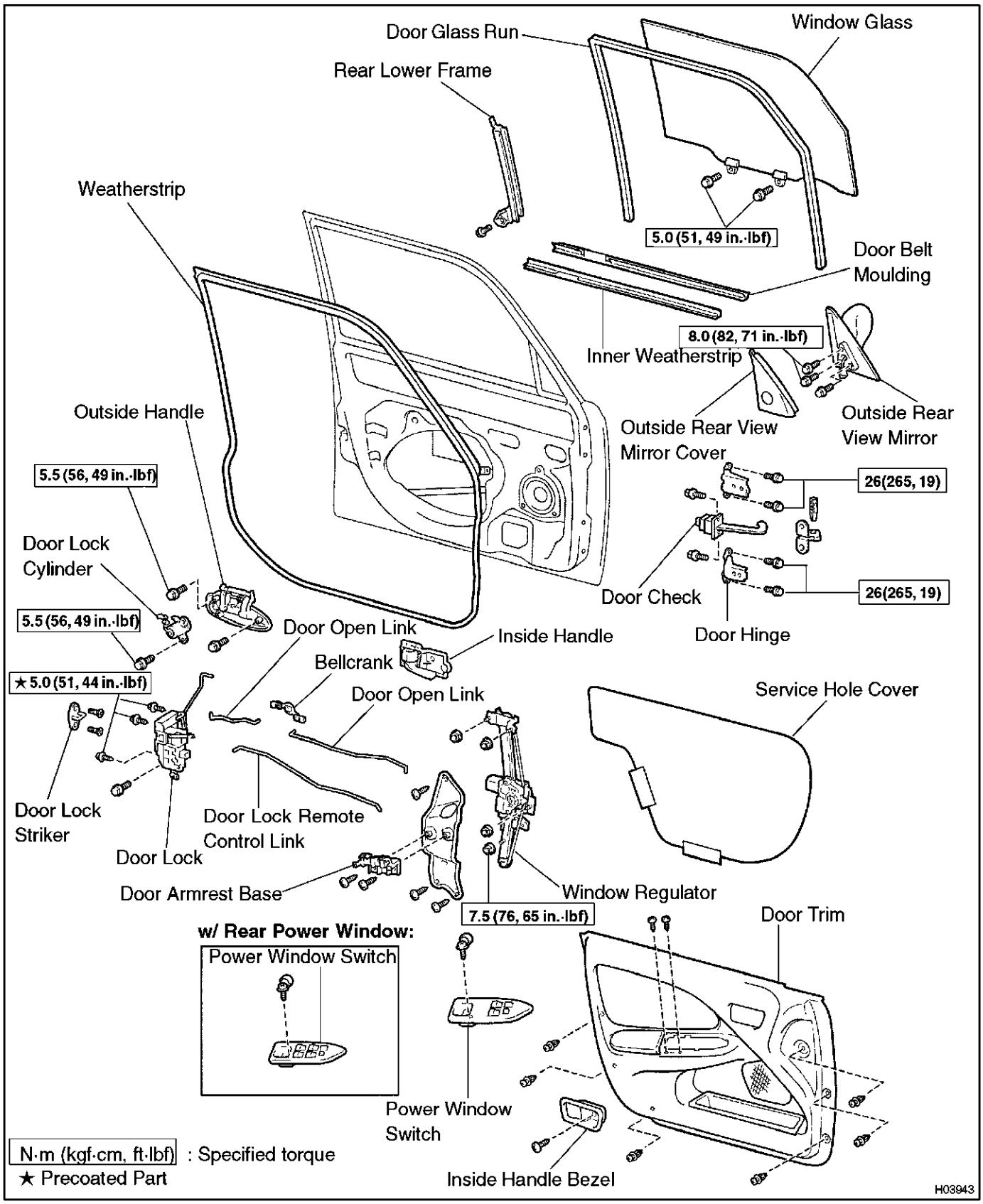
Adjust the lock by loosening the bolts.

Torque: 11 N·m (112 kgf·cm, 8 ft·lbf)

FRONT DOOR

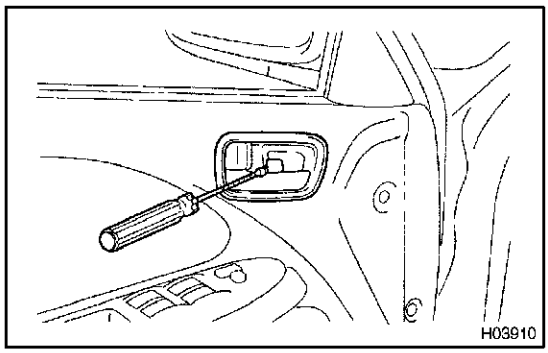
COMPONENTS

BO18H–01



BO1BI-01

DISASSEMBLY



1. REMOVE INSIDE HANDLE BEZEL

(a) Using a screwdriver, raise up the plug.

HINT:

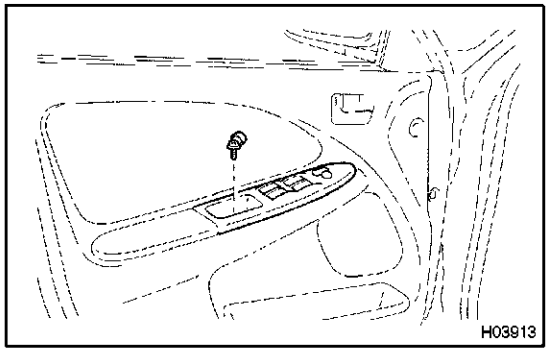
Tape the screwdriver tip before use.

(b) Remove the screw.

(c) Using a screwdriver, pry out the bezel.

HINT:

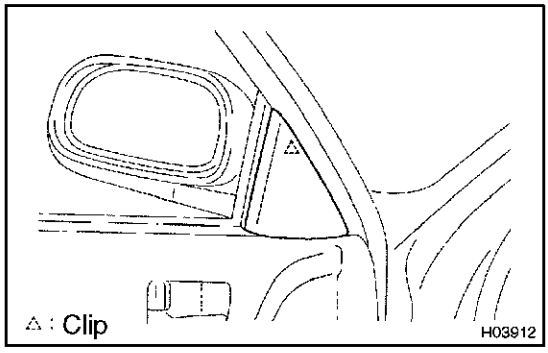
Tape the screwdriver tip before use.



2. REMOVE POWER WINDOW SWITCH

(a) Remove the screw.

(b) Pull the power window switch rearward to remove it, then disconnect the connector.

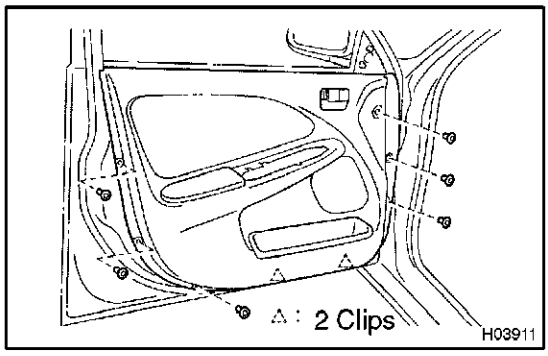


3. REMOVE MIRROR COVER

Using a screwdriver, remove the mirror cover.

HINT:

Tape the screwdriver tip before use.



4. REMOVE DOOR TRIM

(a) Remove the 2 screws and 6 clips.

(b) Pull the door trim upward to remove it.

5. REMOVE INSIDE HANDLE

(a) Disconnect the locking link and inside handle open link from the inside handle.

(b) Remove the inside handle.

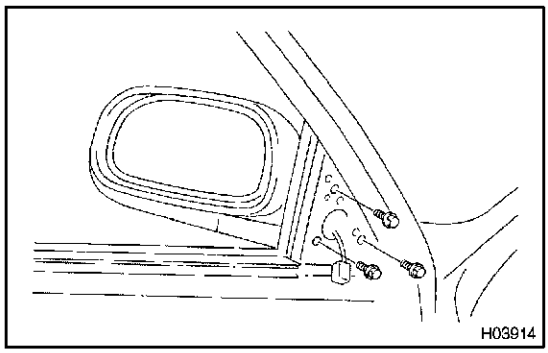
6. REMOVE THESE PARTS:

(a) Door armrest base

(b) Service hole cover

(c) Door armrest No.1 plate

(d) Inner weatherstrip



7. REMOVE OUTSIDE REAR VIEW MIRROR

(a) Remove the 2 nuts.

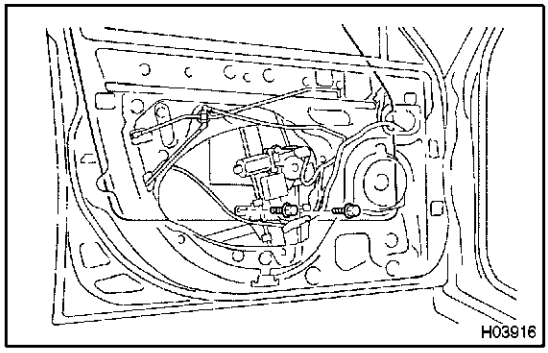
(b) Remove the outside rear view mirror, then disconnect the connector.

8. REMOVE DOOR BELT MOULDING

Using a screwdriver, remove the door belt moulding.

HINT:

Tape the screwdriver tip before use.



9. REMOVE DOOR GLASS

(a) Open the door glass until the bolts appears in the service hole.

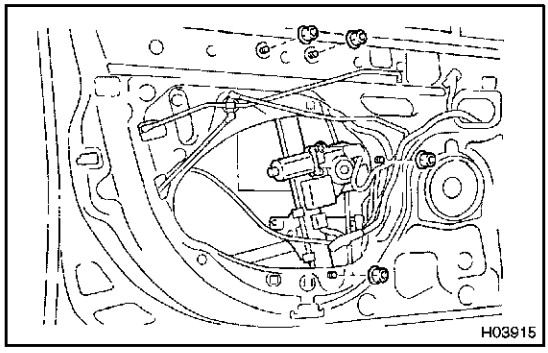
(b) Remove the 2 bolts.

NOTICE:

Be careful not to drop the door glass.

(c) Pull up the door glass upward to remove it.

10. REMOVE DOOR GLASS RUN



11. REMOVE WINDOW REGULATOR

(a) Disconnect the connector.

(b) Remove the 4 nuts.

(c) Remove the window regulator through the service hole.

12. REMOVE REAR LOWER FRAME

Remove the bolt and rear lower frame.

13. REMOVE DOOR LOCK

(a) Disconnect the connector from the door lock.

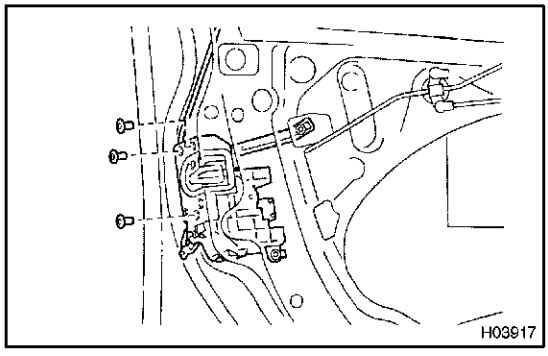
(b) Disconnect the links from the bellcrank.

(c) Using a screwdriver, remove the bellcrank.

HINT:

Tape the screwdriver tip before use.

(d) Disconnect the locking link and inside handle open link from the door lock.



(e) Remove the 3 torx screws and door lock.

14. REMOVE OUTSIDE HANDLE

Remove the 3 bolts and outside handle.

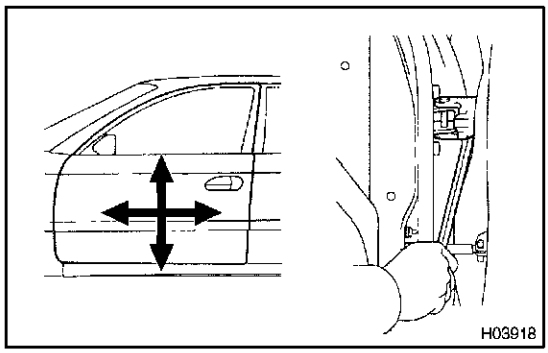
15. REMOVE DOOR LOCK CYLINDER

Remove the bolt and door lock cylinder from the outside handle.

16. REMOVE WEATHERSTRIP

BO16J–01

ADJUSTMENT

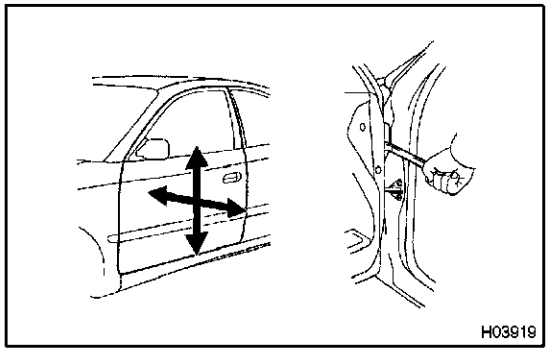


1. ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTIONS

Using SST, adjust the door by loosening the body side hinge bolts.

SST 09812–00020

Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)



2. ADJUST DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS

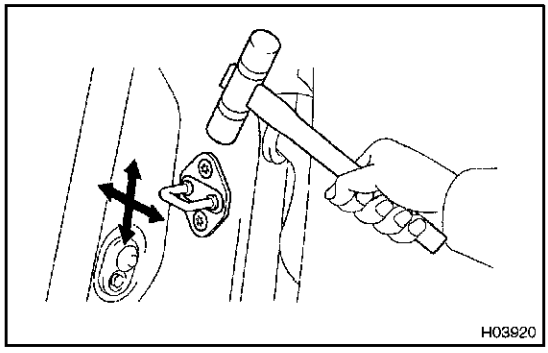
Loosen the door side hinge bolts to adjust

HINT:

Substitute the standard bolt for the centering bolt.

(See page BO–10)

Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)



3. ADJUST DOOR LOCK STRIKER

(a) Check that the door fits and door lock linkages are adjusted correctly.

(b) Loosen the striker mounting screws to adjust.

(c) Using a plastic hammer, tap the striker to adjust it. Tighten the striker mounting screws again.

Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

CAUTION:

When adjustment the door lock striker, make sure you have cancelled the safety lock release lever of the seat belt pretensioner.

BO16K–01

REASSEMBLY

1. INSTALL WEATHERSTRIP

2. INSTALL DOOR LOCK CYLINDER

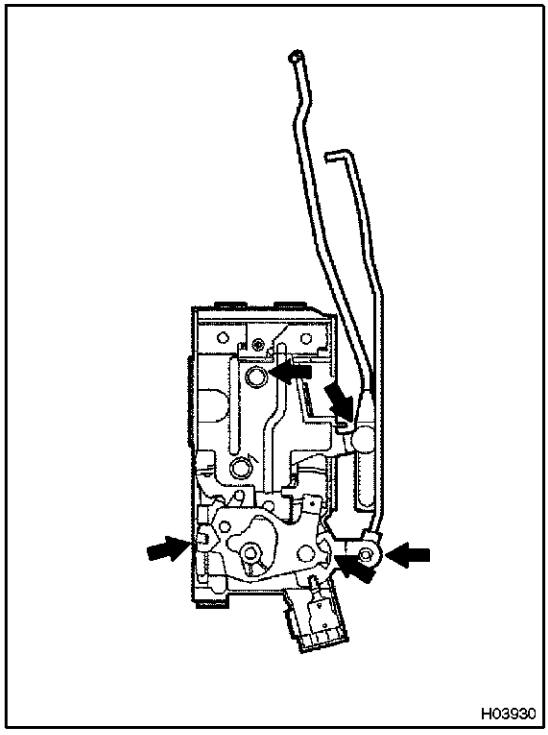
Install the door lock cylinder with the bolt to the outside handle.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

3. INSTALL OUTSIDE HANDLE

Install the outside handle with the 2 bolts to the door panel.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

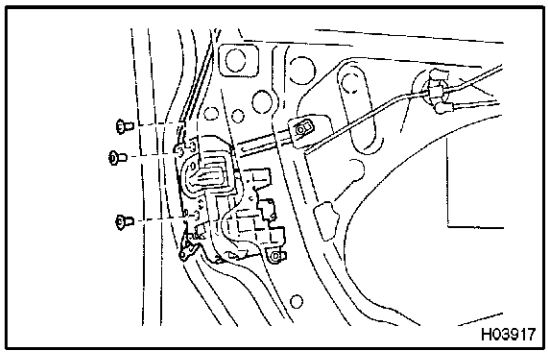


4. INSTALL DOOR LOCK

HINT:

Apply MP grease to the sliding surface or the door lock.

(a) Install the door lock through the service hole.



(b) Install the 3 torx screws.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

HINT:

Apply adhesive to the 3 torx screws.

Part No. 08833–00070, THREE BOND 1324 or equivalent.

(c) Connect the locking link, inside handle open link and bellcrank assembly to the door lock.

(d) Install the bellcrank assembly from the door panel.

(e) Connect the link to the bellcrank.

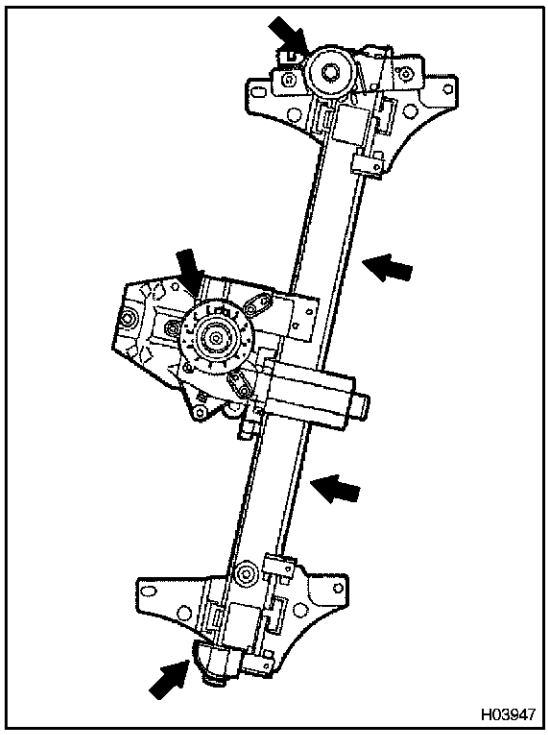
(f) Connect the connector to the door lock.

5. INSTALL PROTECTOR

Install the protector to the door panel.

6. INSTALL REAR LOWER FRAME

Install the rear lower frame with the bolt.

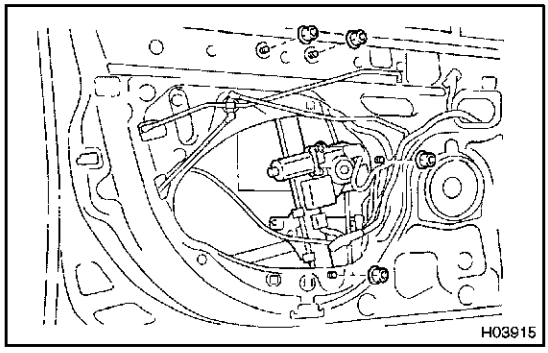


7. INSTALL WINDOW REGULATOR

HINT:

Apply MP grease to the window regulator rollers.

(a) Install the window regulator through the service hole.



(b) Install the window regulator with the 4 nuts.

Torque: 7.5 N·m (76 kgf·cm, 65 in.·lbf)

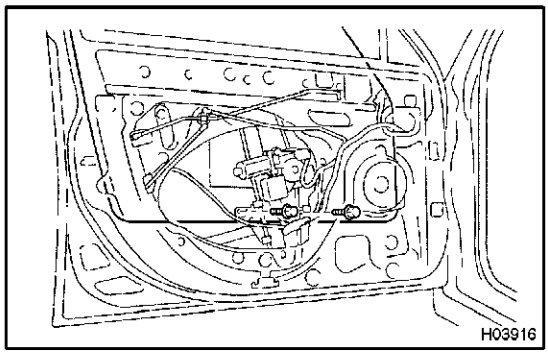
(c) Connect the connector.

HINT:

After installing the window regulator, window regulator need to be re–initialized.

Refer to BE–81.

8. INSTALL DOOR GLASS RUN



9. INSTALL DOOR GLASS

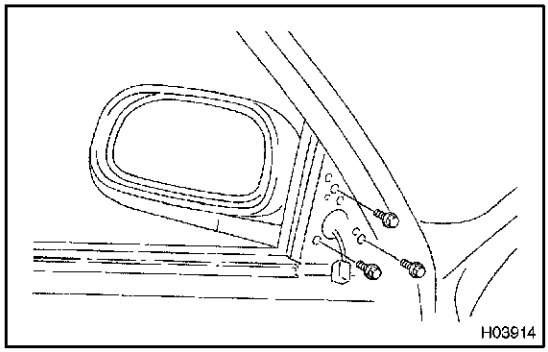
Install the door glass with the 2 bolts.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

NOTICE:

Be careful not to drop the door glass.

10. INSTALL DOOR BELT MOULDING



11. INSTALL OUTSIDE REAR VIEW MIRROR

(a) Install the outside rear view mirror with the 3 bolts.

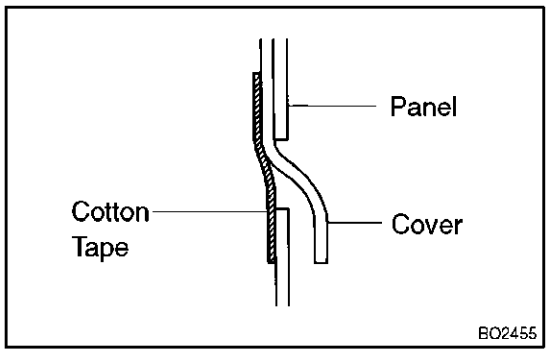
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Connect the connector.

12. INSTALL THESE PARTS:

(a) Inner weatherstrip

(b) Door armrest No.1 plate



(c) Service hole cover

HINT:

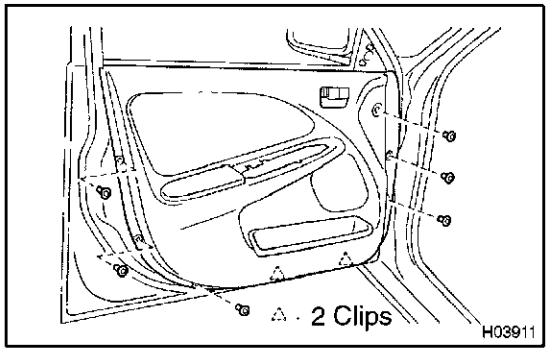
Bring out the links through the service hole cover.

(d) Door armrest base

13. INSTALL INSIDE HANDLE

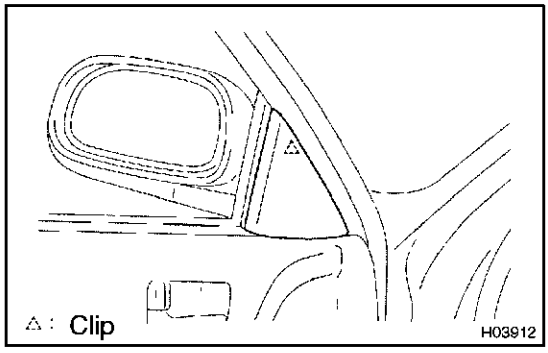
(a) Install the inside handle.

(b) Connect the 2 link to the inside handle.



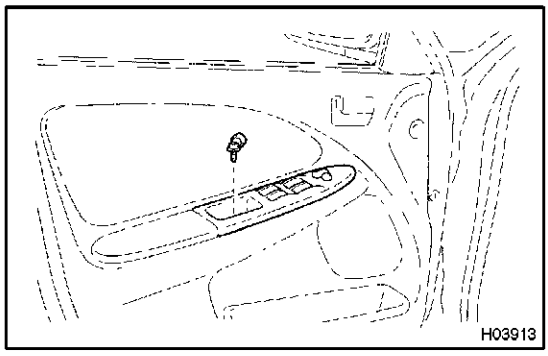
14. INSTALL DOOR TRIM

Install the door trim with the 2 screws and 6 clips.



15. INSTALL MIRROR COVER

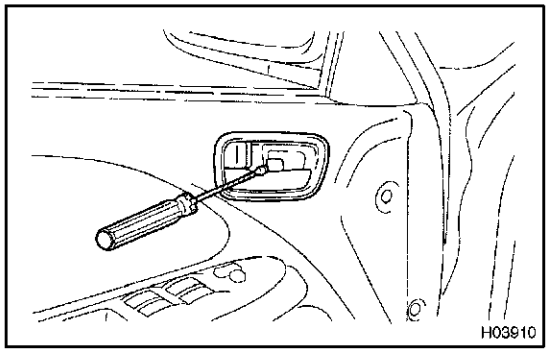
Install the mirror cover.



16. POWER WINDOW SWITCH

(a) Connect the connector.

(b) Set the claw, install the power window switch with the screw.



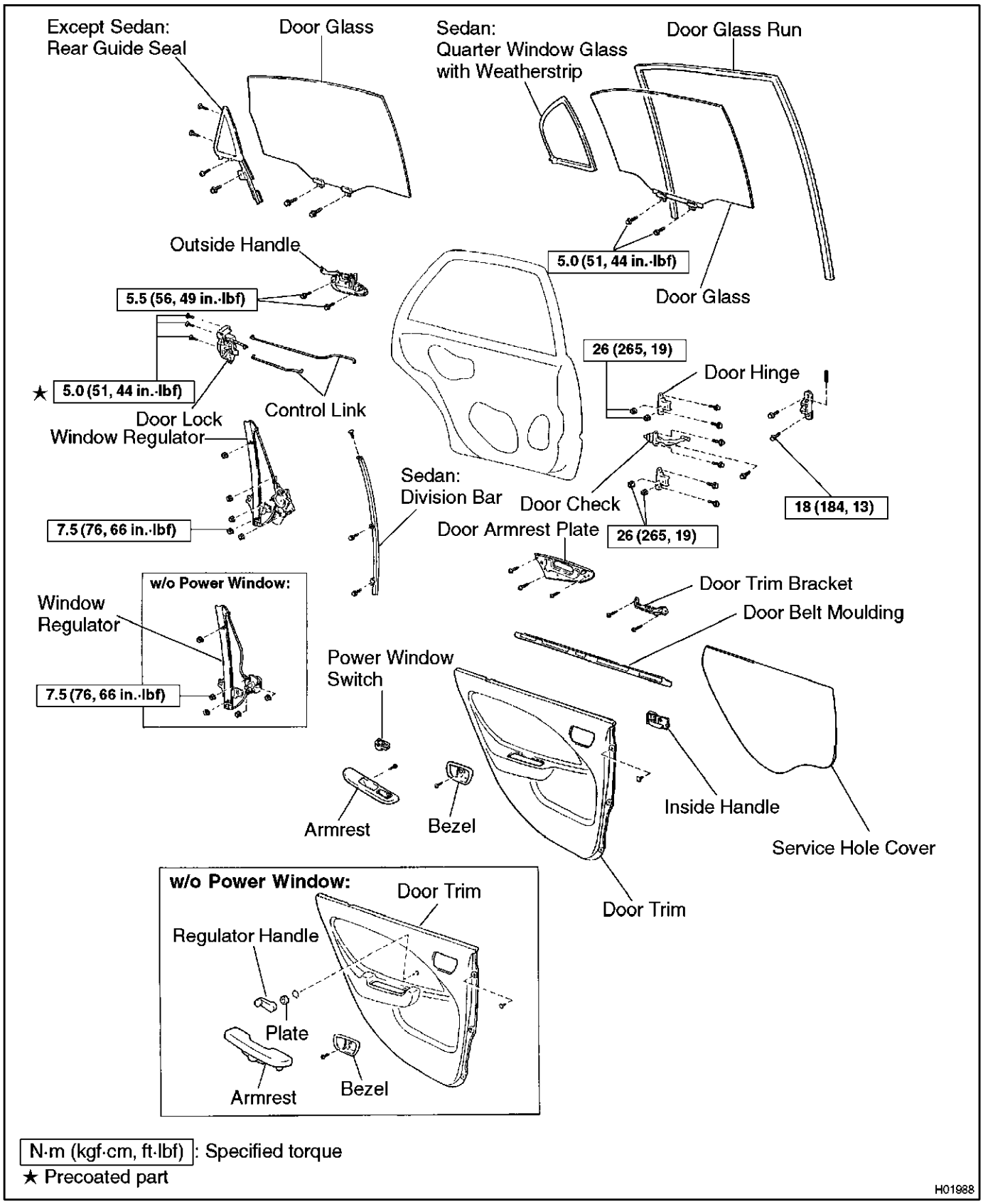
17. INSTALL INSIDE HANDLE BEZEL

Install the inside handle bezel with the screw and cover it by cap.

REAR DOOR

COMPONENTS

BO1B6–01

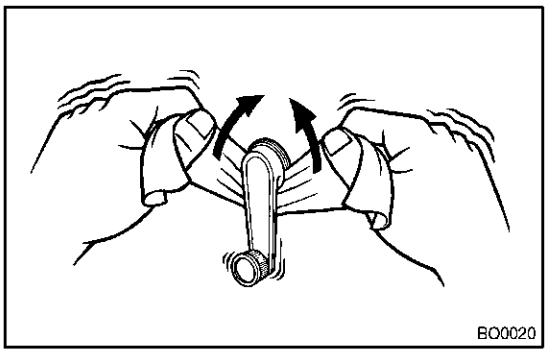


N·m (kgf·cm, ft·lbf) : Specified torque
★ Precoated part

H01988

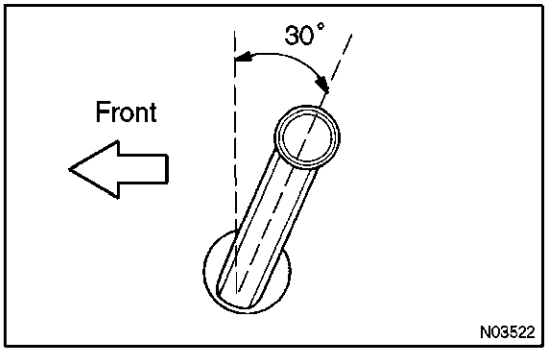
BO1B7–01

DISASSEMBLY



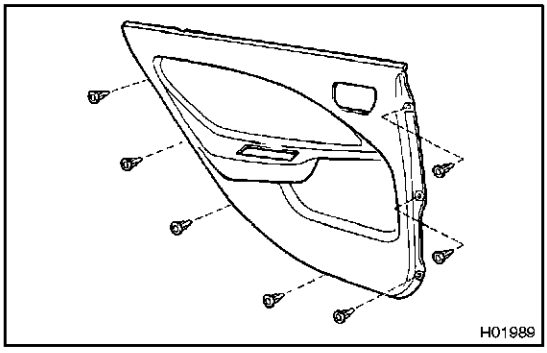
1. w/o Power Window:
REMOVE REGULATOR HANDLE

Pull off the snap ring with a shop rag and remove the regulator handle and plate.



HINT:
At the time of reassembly, please refer to the following item.
With door window fully closed, install the plate and the regulator handle with the snap ring, as shown in the illustration.

2. REMOVE THESE PARTS:
(a) w/ Power Window:
Power window switch
(b) Armrest



3. REMOVE DOOR TRIM
(a) Remove 7 clips.
(b) Insert a screwdriver between the door and door trim to pry out.

NOTICE:
Be careful not to damage the door and door trim.

HINT:
Tape the screwdriver tip before use.
(c) Pull the trim upward to remove it.

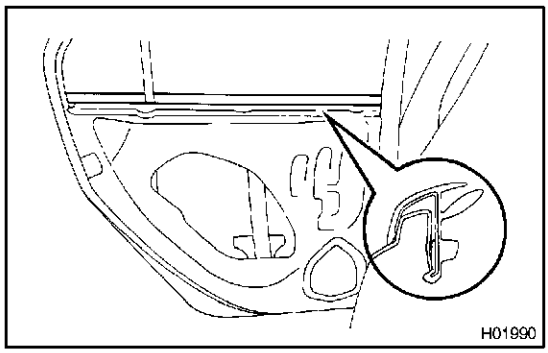
4. REMOVE THESE PARTS:
(a) Door trim bracket
(b) Inside handle

5. REMOVE SERVICE HOLE COVER
Remove the service hole cover.

NOTICE:
At the time of reassembly, please refer to the following item.
Do not block the trim clips sealing with the service hole cover.

HINT:
At the time of reassembly, please refer to the following item.
Bring out the links through the service hole cover.

6. REMOVE THESE PARTS:
(a) Door Armrest plate
(b) Door glass run

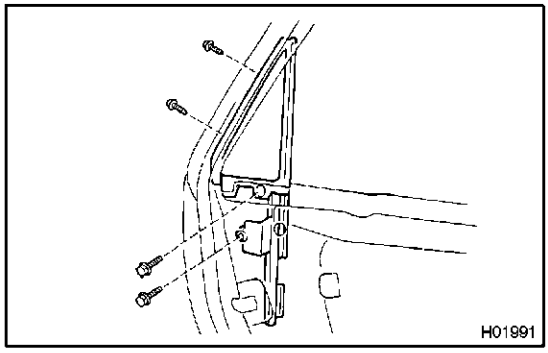


7. REMOVE DOOR BELT MOULDING

Using a screwdriver, remove the door belt moulding as shown in the illustration.

HINT:

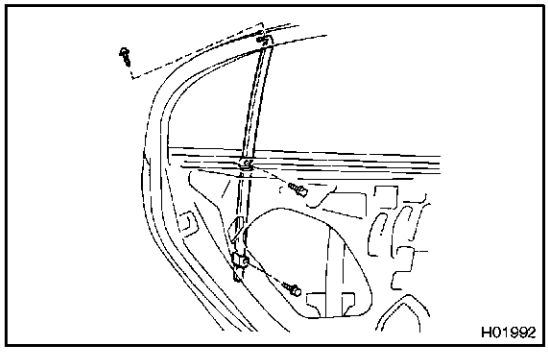
Tape the screwdriver tip before use.



8. Except sedan:
REMOVE REAR GUIDE SEAL

(a) Remove the 4 screws.

(b) Remove the rear guide seal.



9. Sedan:
REMOVE DIVISION BAR

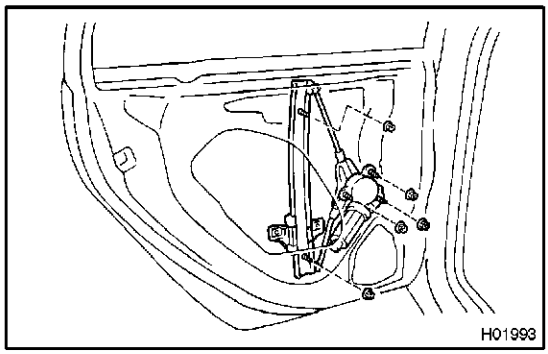
(a) Remove the screw and 2 bolts.

(b) Remove the division bar.

10. REMOVE THESE PARTS:

(a) Door glass

(b) Sedan:
Quarter window glass with weatherstrip



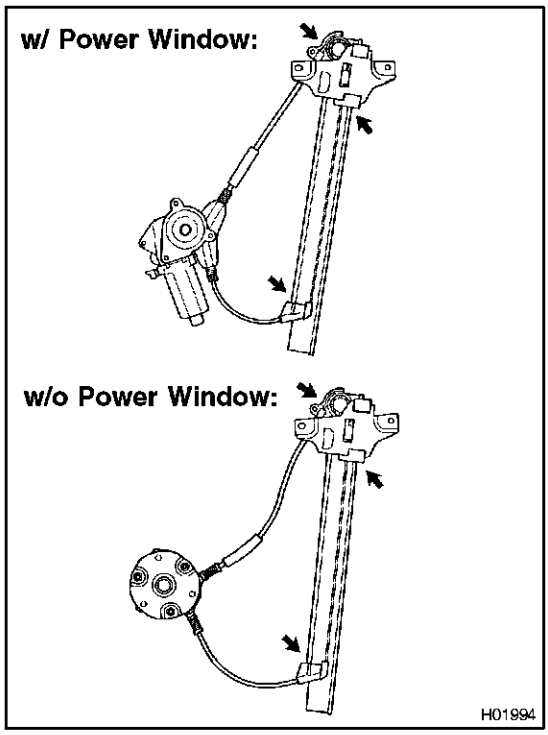
11. REMOVE WINDOW REGULATOR

(a) w/ Power Window:
Disconnect the connector, then remove the nuts and window regulator.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)

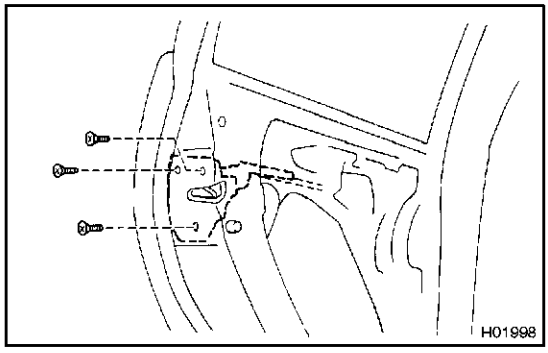
(b) w/o Power Window:
Remove the nuts and window regulator.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)

HINT:

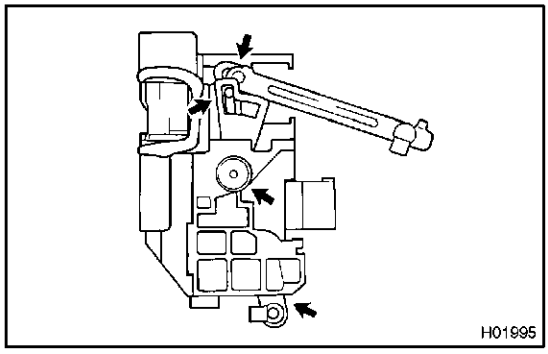
Remove the regulator through the service hole.



HINT:
At the time of reassembly, please refer to the following item.
Apply MP grease to the window regulator.
HINT:
After installing the window regulator, window regulator need to be re–initialized.
Refer to BE–81.



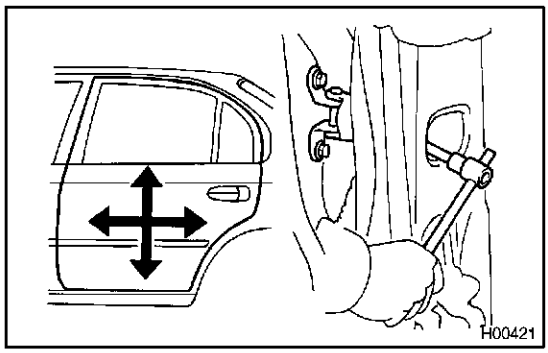
12. REMOVE DOOR LOCK
(a) Remove the 2 links.
(b) w/ Power Door Lock:
Disconnect the connector.
(c) Remove the 3 torx screws.
(d) Remove the door lock.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
HINT:
At the time of reassembly, please refer to the following item.
Apply adhesive to the 3 screws.
Part No. 08833–00070, THREE BOND 1324 or equivalent.



HINT:
At the time of reassembly, please refer to the following item.
Apply MP grease to the sliding and rotating parts of the door lock.
13. REMOVE OUTSIDE HANDLE
(a) Remove the 2 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(b) Remove the outside handle.

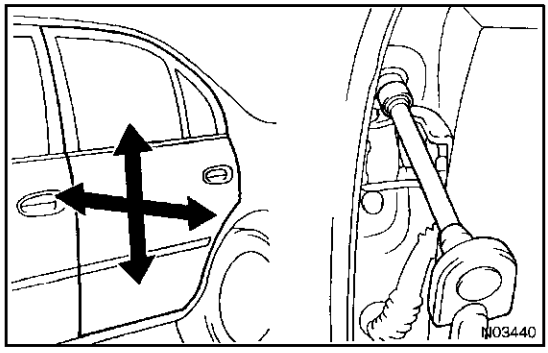
BO1B8–01

ADJUSTMENT



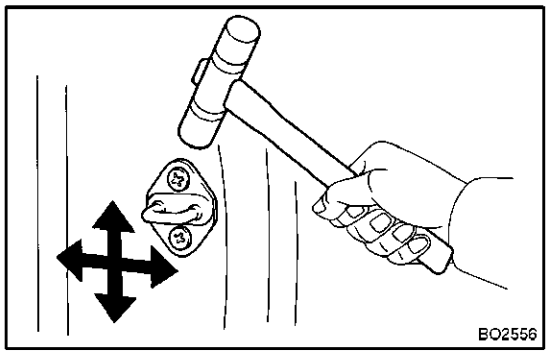
1. ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTIONS

(a) Remove the front door scuff plate.
(b) Remove the center pillar garnish.
(c) Remove the front seat belt.
(See page BO–145)
(d) Loosen the body side hinge nuts to adjust.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)
(e) Install the removed parts.



2. ADJUST DOOR IN RIGHT/LEFT AND VERTICAL DIRECTIONS

Loosen the door side hinge bolts to adjust.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)



3. ADJUST DOOR LOCK STRIKER

(a) Check that the door fit and door lock linkages are adjusted correctly.
(b) Loosen the striker mounting screws to adjust.
Torque: 23 N·m (230 kgf·cm, 17 ft·lbf)
(c) Using a plastic hammer, tap the striker to adjust it.

BO1E9–01

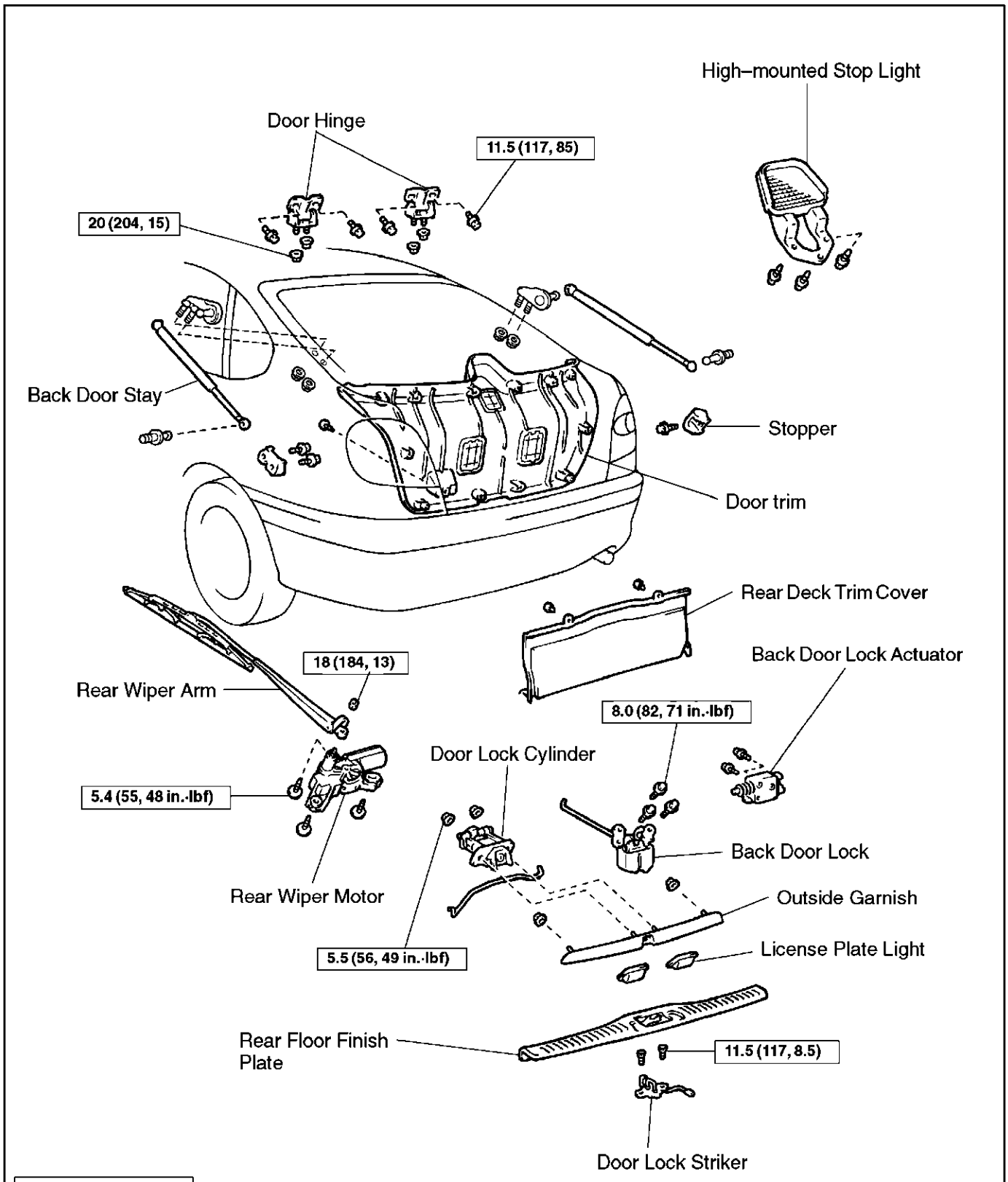
REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–19).

BACK DOOR (Liftback)

COMPONENTS

BO1BD–01



BO1BE–01

DISASSEMBLY

1. REMOVE DOOR TRIM

(a) Remove the screw.

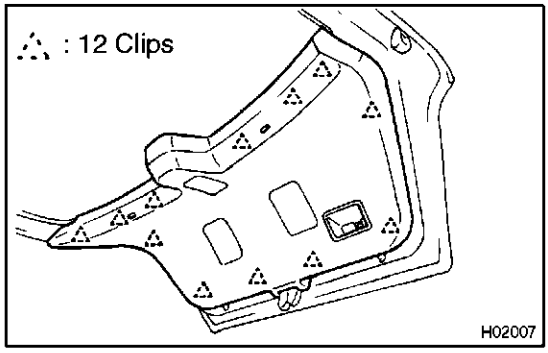
(b) Insert a screwdriver between the door and door trim to pry out.

NOTICE:

Be careful not to damage the door and door trim.

HINT:

Tape the screwdriver tip before use.



(c) Pull the trim to remove it.

2. REMOVE THESE PARTS:

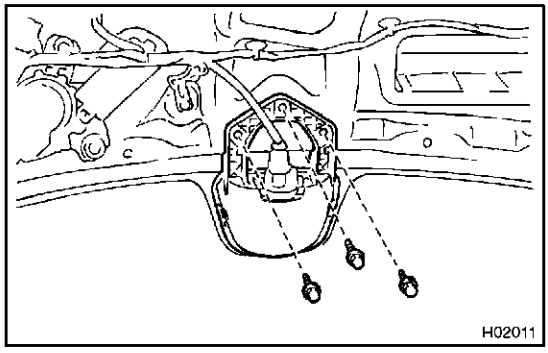
(See page BO–52)

(a) Rear wiper arm

Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(b) Rear wiper motor

Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)

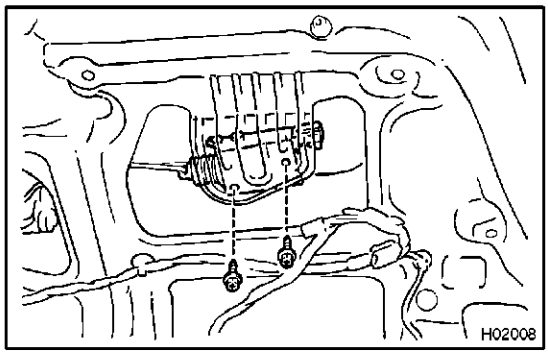


3. REMOVE HIGH–MOUNTED STOP LIGHT

(a) Disconnect the connector.

(b) Remove the 3 bolts.

(c) Remove the high–mounted stop light.

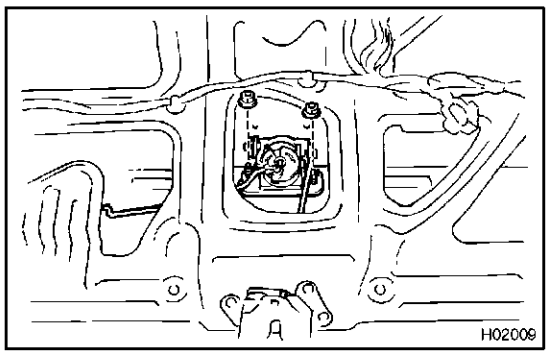


4. REMOVE BACK DOOR LOCK ACTUATOR

(a) Disconnect the control link from the back door lock actuator.

(b) Disconnect the connector.

(c) Remove the 2 screws.



5. REMOVE BACK DOOR LOCK CYLINDER

(a) Disconnect the 2 links.

(b) Remove the 2 nuts.

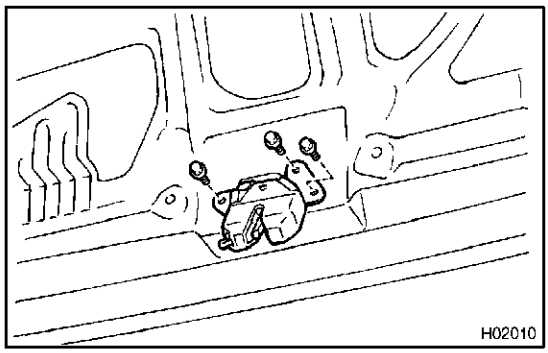
Torque: 5.5 N·m (56 kgf·cm, 49 in·lbf)

(c) Remove the door lock cylinder.

6. REMOVE THESE PARTS:

(a) Outside garnish

(b) License plate light



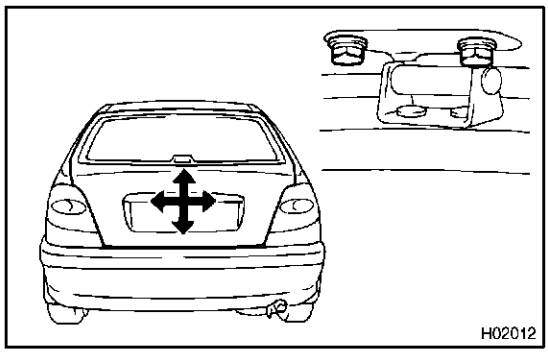
7. REMOVE BACK DOOR LOCK

(a) Remove the 3 bolts and back door lock.
Torque: 8.0 N·m (82 kgf·cm, 71 ft·lbf)

(b) Disconnect the control link from the back door lock.

BO1BF–01

ADJUSTMENT



1. ADJUST DOOR IN RIGHT/LEFT AND VERTICAL DIRECTIONS

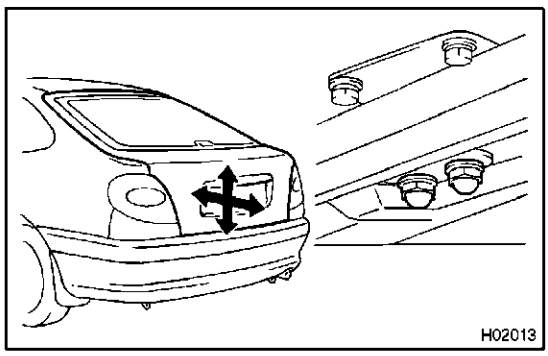
Loosen the door side hinge bolts to adjust.

Torque: 11.5 N·m (117 kgf·cm, 8.5 ft·lbf)

HINT:

Substitute the bolt with washer for the centering bolt.

(See page BO–10)



2. ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTION

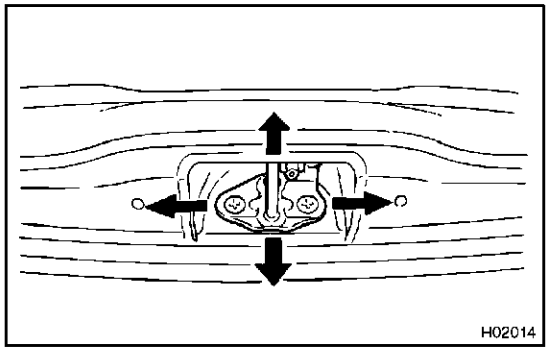
Loosen the body side hinge nuts to adjust.

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

HINT:

Substitute the bolt with washer for the centering bolt.

(See page BO–10)



3. ADJUST DOOR LOCK STRIKER

(a) Remove the rear deck trim cover.

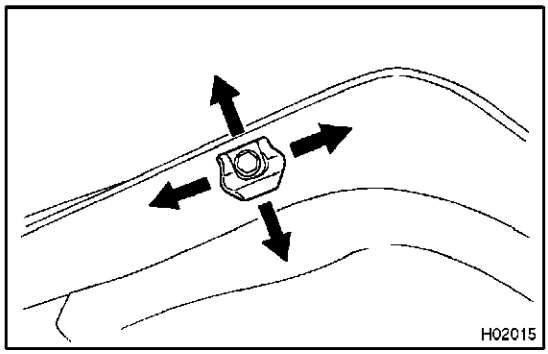
(b) Remove the rear floor finish plate.

(c) Check that the door fit and door linkages are adjusted correctly.

(d) Loosen the striker mounting screws to adjust.

Torque: 11.5 N·m (117 kgf·cm, 8.5 ft·lbf)

(e) Using a plastic hammer, tap the striker to adjust.



4. ADJUST DOOR MALE STOPPER

Loosen the stopper mounting bolts to adjust.

BO1BG–01

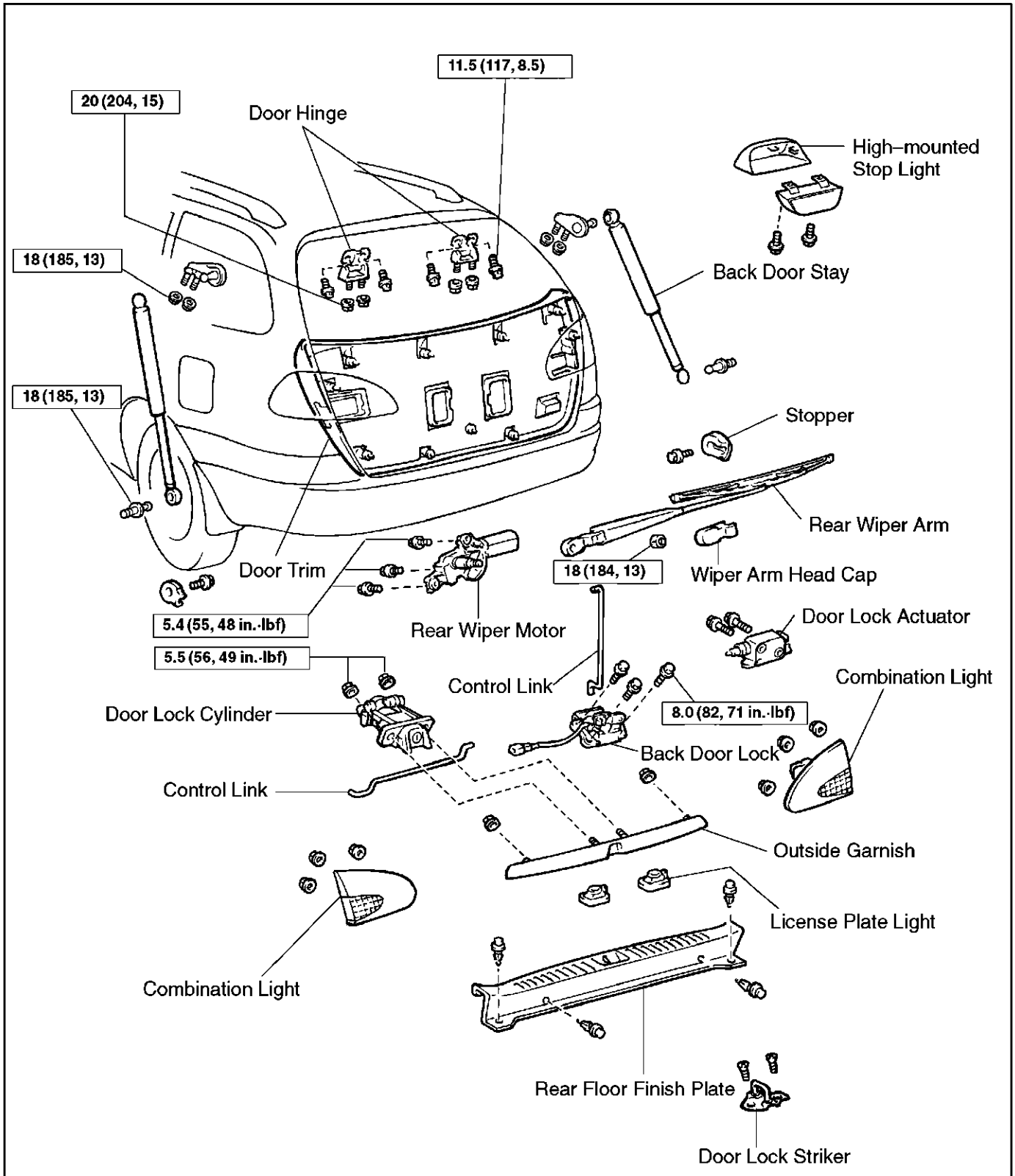
REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–25).

BACK DOOR (Wagon)

COMPONENTS

BO1AK–01



N·m (kgf·cm, ft·lbf) : Specified torque

H01996

BO1AL–01

DISASSEMBLY

1. REMOVE HIGH–MOUNTED STOP LIGHT

(a) Remove high–mounted stop light cover.

(b) Disconnect the connector.

(c) Remove the 2 bolts, then remove the light.

2. REMOVE DOOR TRIM

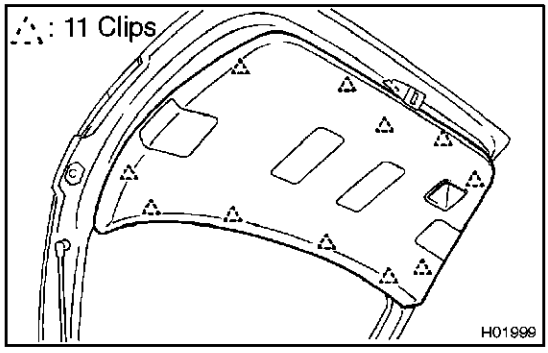
(a) Insert a screwdriver between the door and door trim to pry out.

NOTICE:

Be careful not to damage the door and door tirm.

HINT:

Tape the screwdriver tip before use.



(b) Pull off the trim to remove it.

3. REMOVE THESE PARTS:

(See page BO–57)

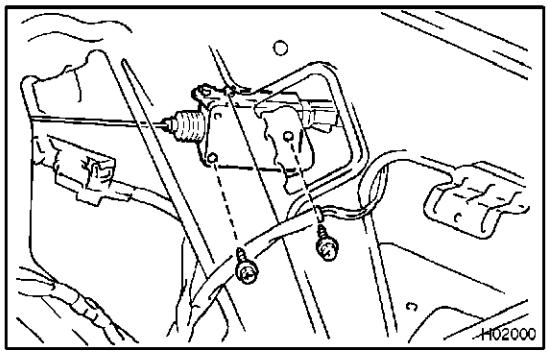
(a) Wiper arm head cap

(b) Rear wiper arm

Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(c) Rear wiper motor

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

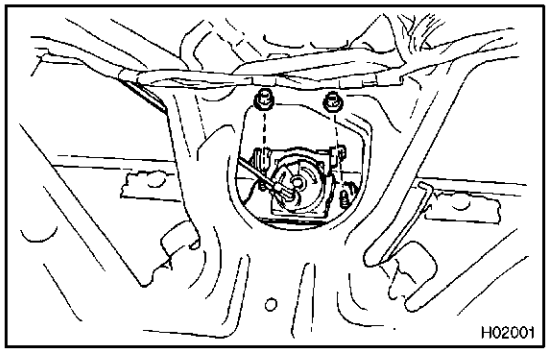


4. REMOVE BACK DOOR LOCK ACTUATOR

(a) Disconnect the control link from the back door lock actuator.

(b) Disconnect the connector.

(c) Remove the 2 screws.



5. REMOVE BACK DOOR LOCK CYLINDER

(a) Disconnect the 2 links.

(b) Remove the 2 nuts.

(c) Remove the door lock cylinder.

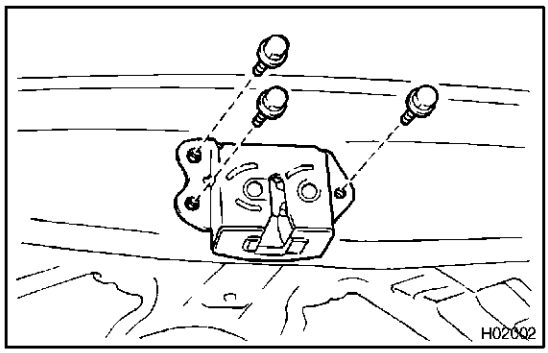
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

6. REMOVE THESE PARTS:

(a) Outside garnish

(b) License plate light

(c) Combination light



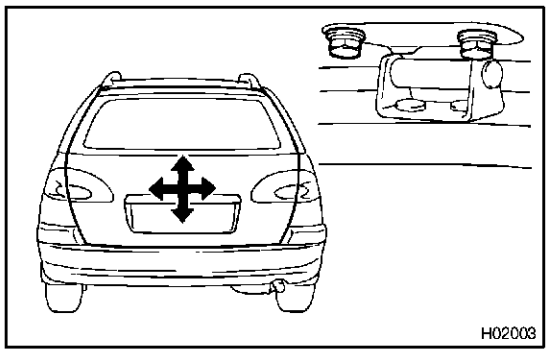
7. REMOVE BACK DOOR LOCK

(a) Remove the 3 bolts and back door lock.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Disconnect the control link from the back door lock.

BO1AM–01

ADJUSTMENT



1. ADJUST DOOR IN RIGHT/LEFT AND VERTICAL DIRECTIONS

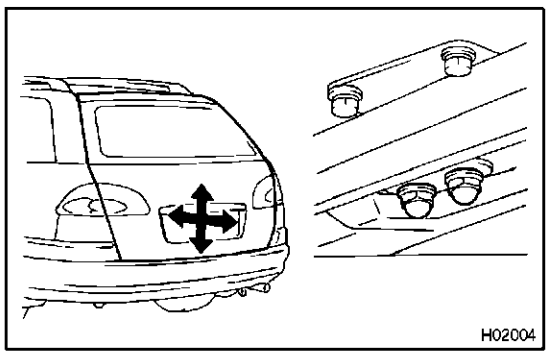
Loosen the door side hinge bolts to adjust.

Torque: 11.5 N·m (117 kgf·cm, 8.5 ft·lbf)

HINT:

Substitute the bolt with washer for the centering bolt.

(See page BO–10)



2. ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTION

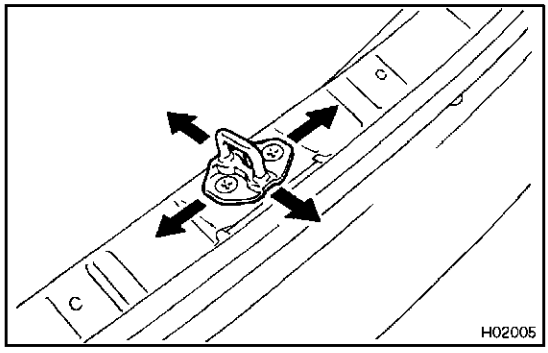
Loosen the body side hinge nuts to adjust.

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

HINT:

Substitute the bolt with washer for the centering bolt.

(See page BO–10)



3. ADJUST DOOR LOCK STRIKER

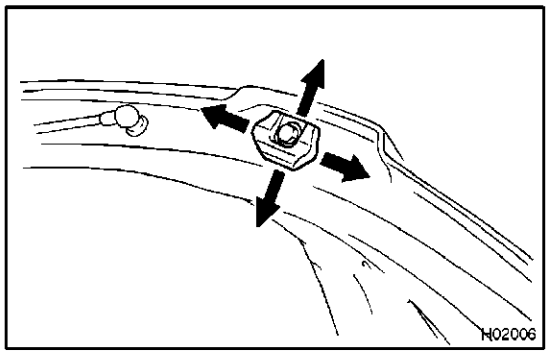
(a) Remove the rear floor finish plate.

(b) Check that the door fit and door linkages are adjusted correctly.

(c) Loosen the striker mounting screws to adjust.

Torque: 11.5 N·m (117 kgf·cm, 8.5 ft·lbf)

(d) Using a plastic hammer, tap the striker to adjust.



4. ADJUST DOOR MALE STOPPER

Loosen the stopper moulding bolts to adjust.

BO1AN–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–30).

BACK DOOR STAY

BO18V–01

REPLACEMENT

1. REMOVE BACK DOOR STAY

(a) Remove the bolts and back door stay from the back door.

HINT:

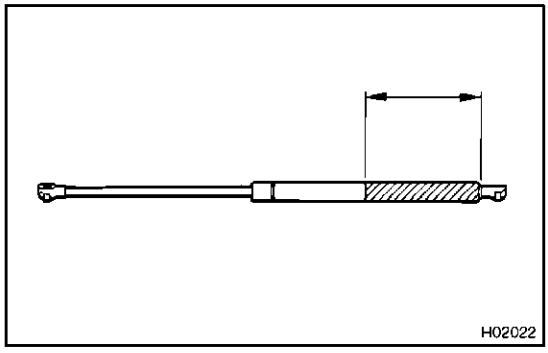
While supporting the back door with your hand, remove the back door stay.

(b) Remove the bolts and back door stay from the body.

2. IF NECESSARY, REPLACE BACK DOOR STAY

NOTICE:

- **Do not disassemble the back door stay because the cylinder is filled with pressurized gas.**



- **If the back door stay is to be replaced, drill a 2.0 – 3.0 mm (0.079 – 0.118 in.) hole in the bottom of the back door stay as shown in the illustration to completely release the high–pressure gas before disposing of it.**
- **When drilling, chips may fly out so work carefully.**
- **The gas is colorless, odorless and non–toxic.**
- **When working, handle the back door stay carefully. Never score or scratch the exposed part of the piston rod, and never allow paint or oil to get on it.**
- **Do not turn the piston rod and cylinder with the back door stay fully extended.**

3. INSTALL BACK DOOR STAY

(a) Install the bolts and back door stay to the body.
Torque:
Liftback: 18 N·m (184 kgf·cm, 13 ft·lbf)
Wagon: 18 N·m (184 kgf·cm, 13 ft·lbf)

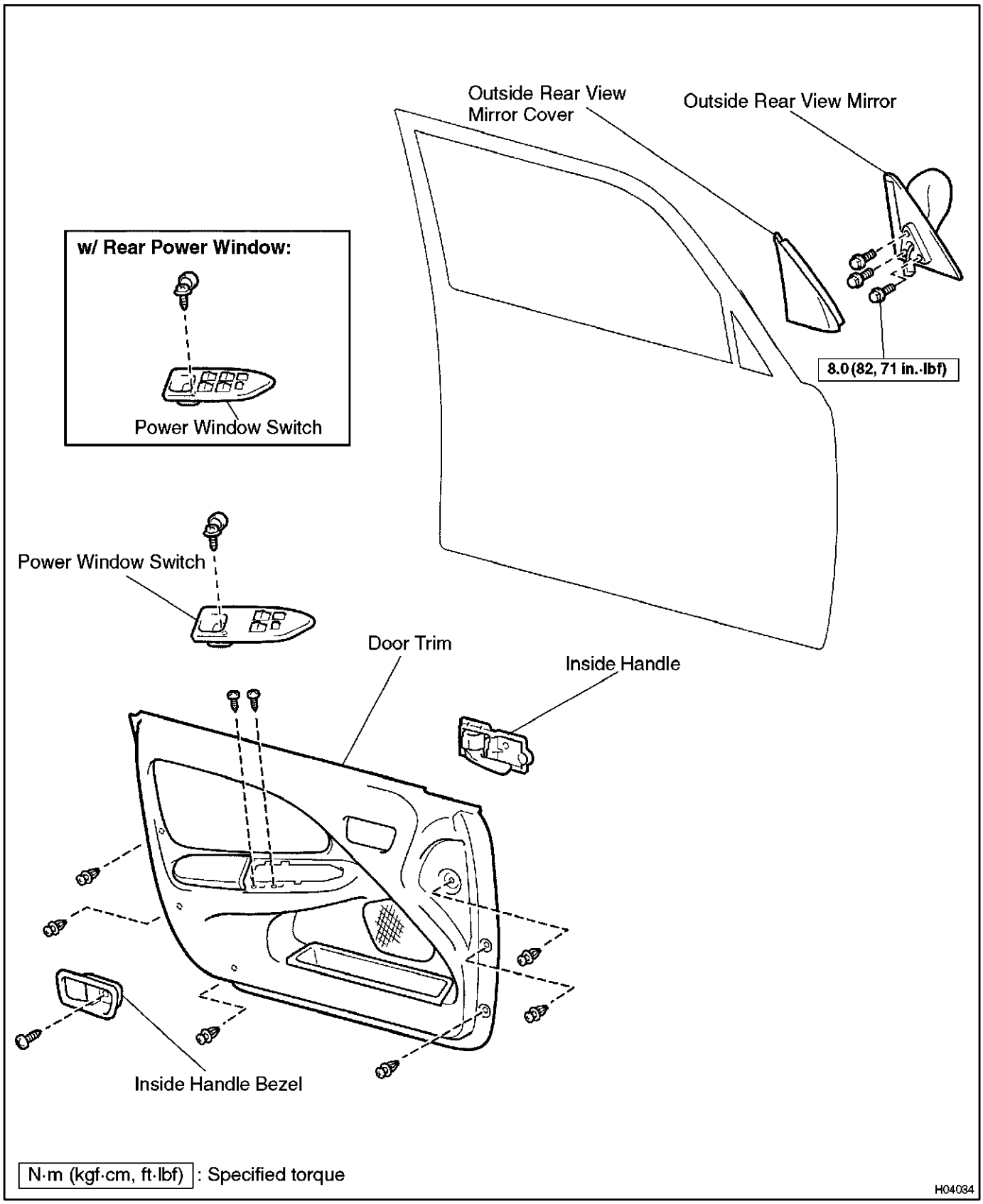
(b) Install the bolts and back door stay to the back door.
Torque:
Liftback: 18 N·m (184 kgf·cm, 13 ft·lbf)
Wagon: 18 N·m (184 kgf·cm, 13 ft·lbf)

(c) Install the brackets to the body.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

OUTSIDE REAR VIEW MIRROR

COMPONENTS

BO19Y–01

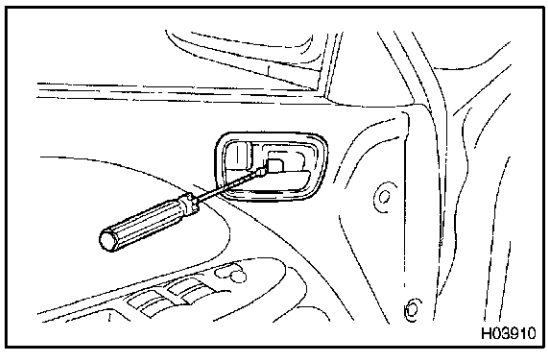


N·m (kgf·cm, ft·lbf) : Specified torque

H04084

BO19Z–01

REMOVAL



1. REMOVE INSIDE HANDLE BEZEL

(a) Using a screwdriver, raise up the plug.

HINT:

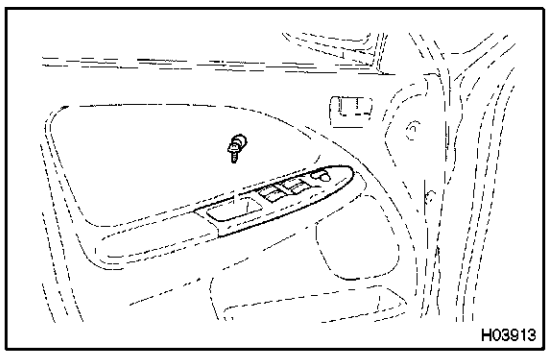
Tape the screwdriver tip before use.

(b) Remove the screw.

(c) Using a screwdriver, pry out the bezel.

HINT:

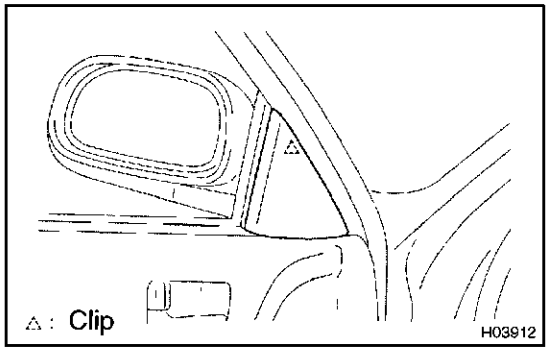
Tape the screwdriver tip before use.



2. REMOVE POWER WINDOW SWITCH

(a) Remove the screw.

(b) Pull the power window switch rearward to remove it, then disconnect the connector.

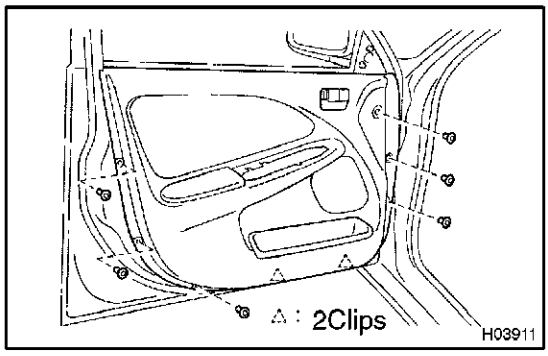


3. REMOVE MIRROR COVER

Using a screwdriver, remove the mirror cover.

HINT:

Tape the screwdriver tip before use.



4. REMOVE DOOR TRIM

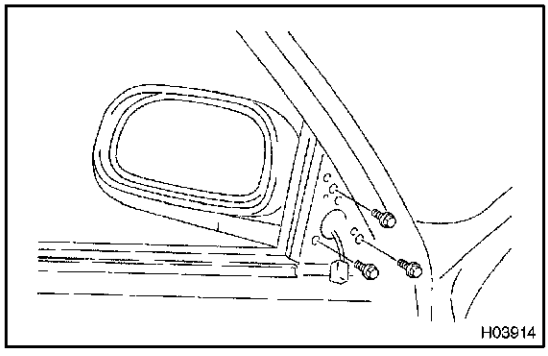
(a) Remove the 6 clips.

(b) Pull the door trim upward to remove it.

5. REMOVE INSIDE HANDLE

(a) Disconnect the locking link and inside handle open link from the inside handle.

(b) Remove the inside handle.



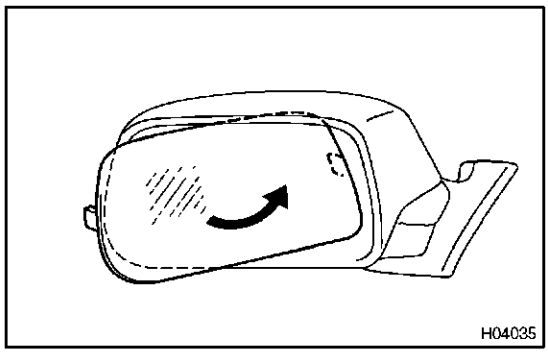
6. REMOVE OUTSIDE REAR VIEW MIRROR

(a) Remove the 3 bolts.

(b) Remove the outside rear view mirror, then disconnect the connector.

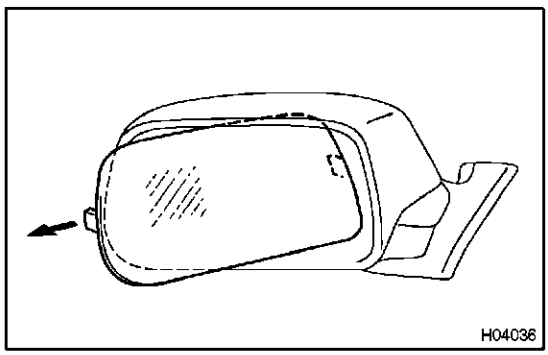
BO1A0–01

REPLACEMENT

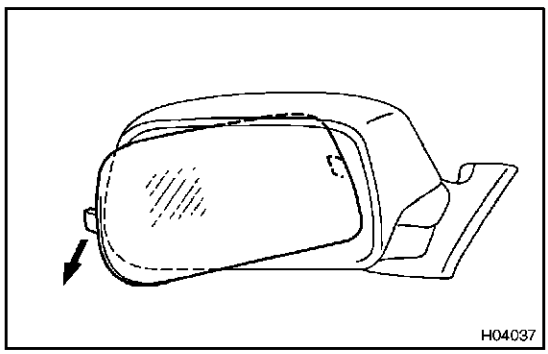


1. DISCONNECT MIRROR

(a) Adjust the mirror to the direction shown by an arrow.



(b) Push the mirror inward and move it outward to remove.



(c) Pull out the mirror.

2. CONNECT MIRROR

(a) Install the mirror to the holder.

(b) Adjust the mirror to the correct position.

BO1A1–01

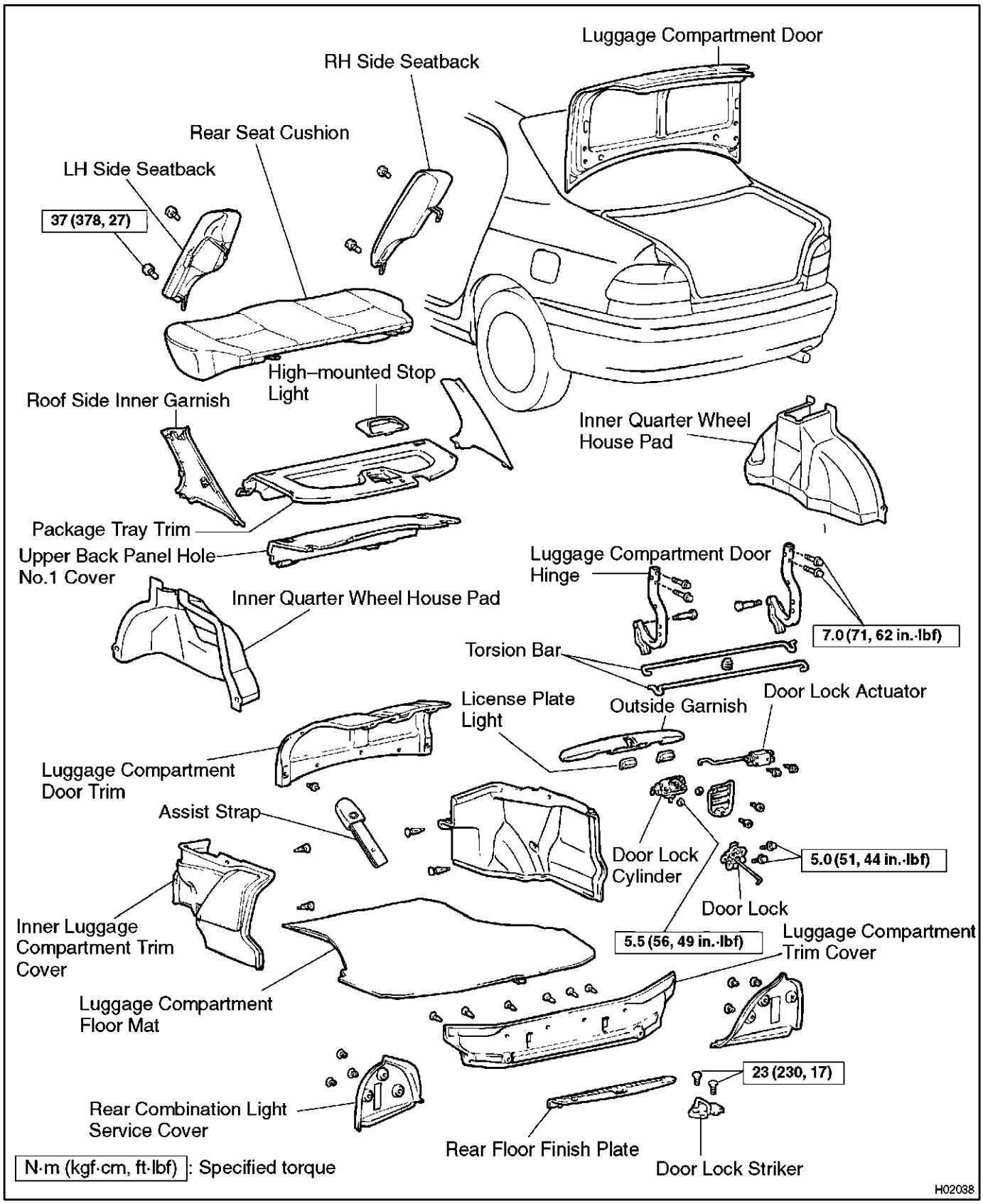
INSTALLATION

Installation is in the reverse order of removal (See page BO–36).

LUGGAGE COMPARTMENT DOOR AND HINGE

COMPONENTS

BO1A2–01



BO1A3–01

REMOVAL

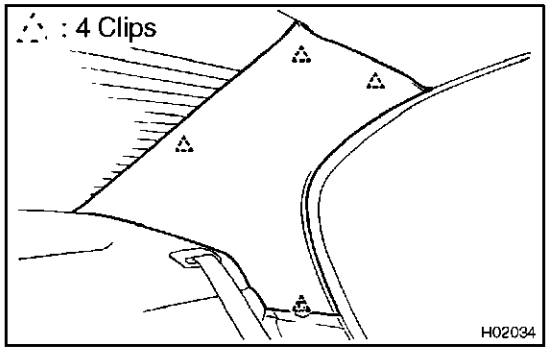
1. REMOVE LUGGAGE COMPARTMENT DOOR

Remove the 4 bolts and door.

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

2. REMOVE THESE PARTS:

(a) Luggage compartment floor mat
(b) Rear floor finish plate
(c) Luggage compartment trim cover
(d) Rear combination light service cover
(e) Inner luggage compartment trim cover
(f) Inner quarter wheel house pad
(g) Rear seat cushion and LH and RH side seatback (See page BO–136)
(h) High–mounted stop light
(i) LH Rear seat belt



3. REMOVE ROOF SIDE INNER GARNISH

Using a screwdriver, pry loose and remove the garnish.

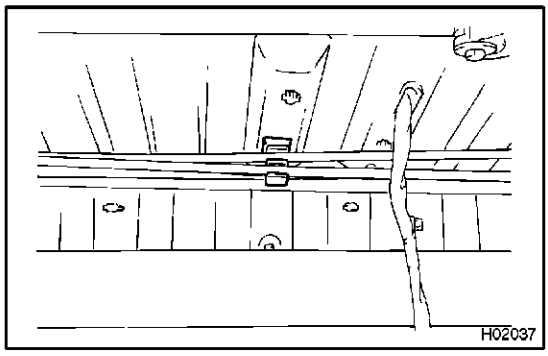
HINT:

Tape the screwdriver tip before use.

4. REMOVE PACKAGE TRAY TRIM

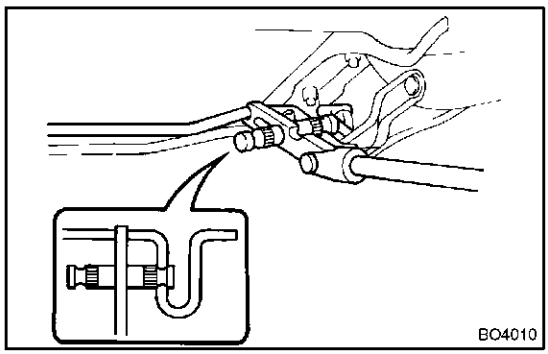
5. REMOVE UPPER BACK PANEL HOLE No.1 COVER

(a) Remove the 4 clips.
(b) Remove the upper back panel hole No.1 cover.

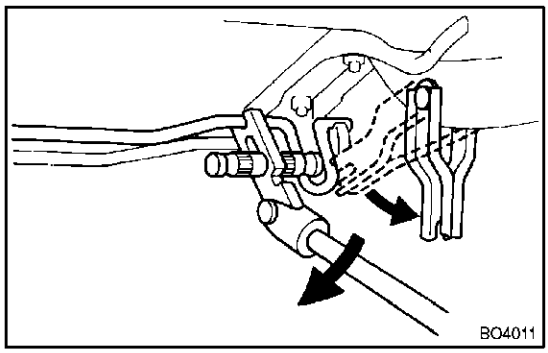


6. REMOVE TORSION BAR

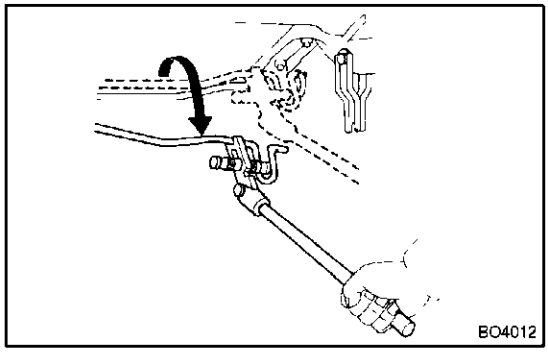
(a) Remove the torsion support from the torsion bar.



(b) Install SST to the torsion bar on the hinge side.
SST 09804–24010



(c) Push down on SST, and pull the luggage compartment door hinge from the torsion bar.



(d) Slowly lift SST, and remove the torsion bar from the torsion bar bracket with SST.
(e) Disconnect the torsion bar from the bracket.
(f) Do the same for the other side.

7. REMOVE LUGGAGE COMPARTMENT DOOR HINGE

Remove the pin and hinge.

BO1A4–01

DISASSEMBLY

1. REMOVE LUGGAGE COMPARTMENT DOOR TRIM

(a) Remove the 11 clips.

(b) Remove the trim.

2. REMOVE DOOR LOCK

(a) Remove the 2 bolts.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

(b) Disconnect the control link, then remove the door lock.

3. REMOVE DOOR LOCK CYLINDER

(a) Remove the 2 nuts.

(b) Remove the door lock cylinder.

4. REMOVE DOOR LOCK ACTUATOR

(a) Remove the 2 screws.

(b) Disconnect the control link.

(c) Disconnect the connector, then remove the door lock actuator.

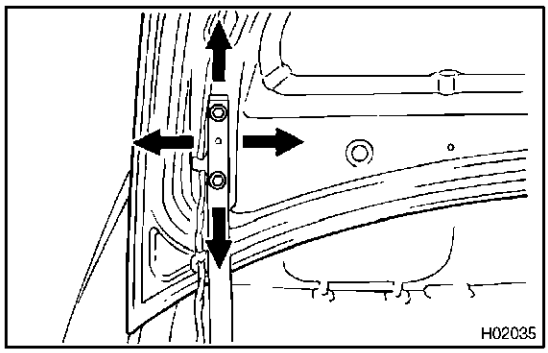
5. REMOVE THESE PARTS:

(a) License plate light

(b) Outside garnish

BO1A5–01

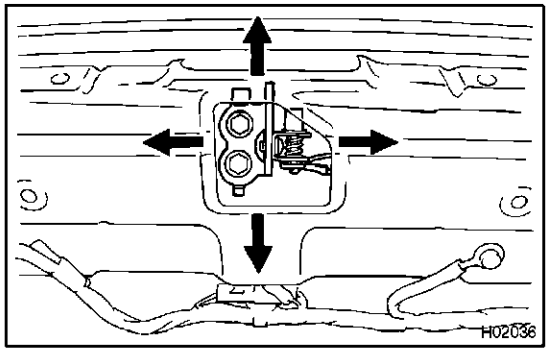
ADJUSTMENT



1. ADJUST LUGGAGE COMPARTMENT DOOR IN FORWARD/REARWARD AND LEFT/RIGHT DIRECTION

Loosen the hinge bolts to adjust.

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)



2. ADJUST DOOR LOCK STRIKER

(a) Remove the luggage compartment floor mat.
(b) Remove the rear floor finish plate.
(c) Remove the luggage compartment trim cover.
(d) Loosen the bolts to adjust.
(e) Install the removed parts.

Torque: 23 N·m (230 kgf·cm, 17 ft·lbf)

BO1A6–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–42).

BO1A7–01

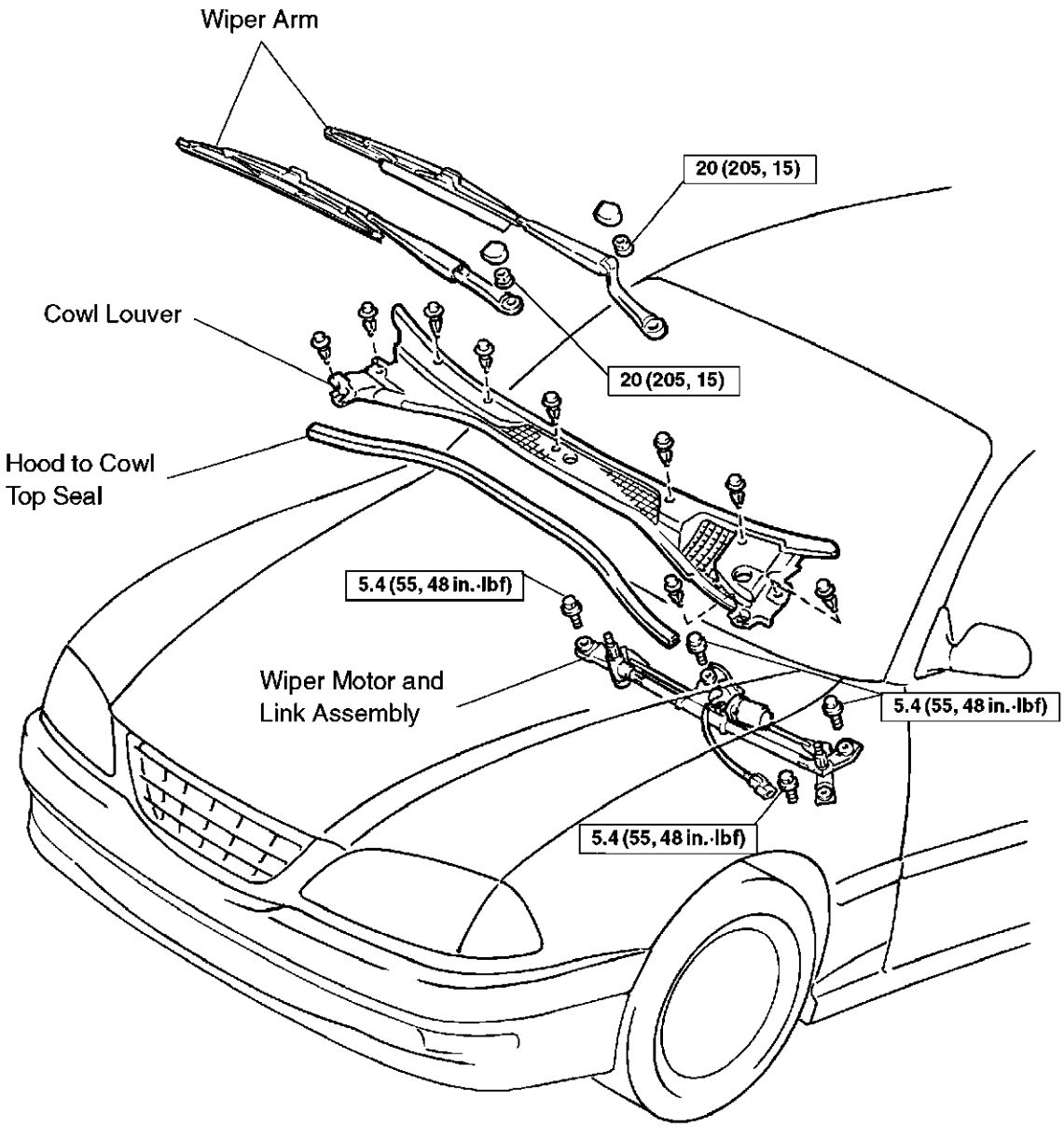
INSTALLATION

Installation is in the reverse order of removal (See page BO–40).

FRONT WIPER AND WASHER

COMPONENTS

BO18W–01



N·m (kgf·cm, ft·lbf) : Specified torque

H03646

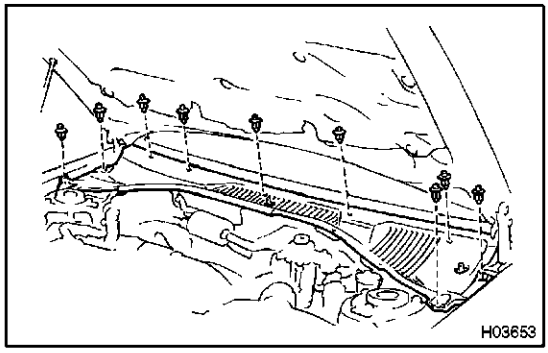
BO16X–01

REMOVAL

1. REMOVE THESE PARTS:

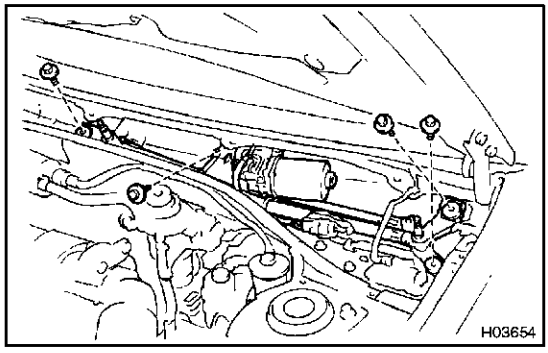
(a) Wiper arms

(b) Hood to cowl top seal



2. REMOVE COWL LOUVER

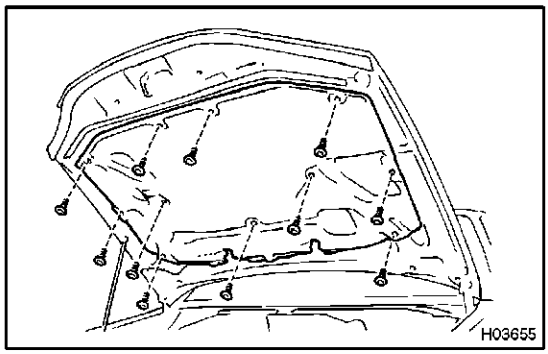
Remove the 9 clips and cowl louver.



3. REMOVE WIPER MOTOR AND LINK ASSEMBLY

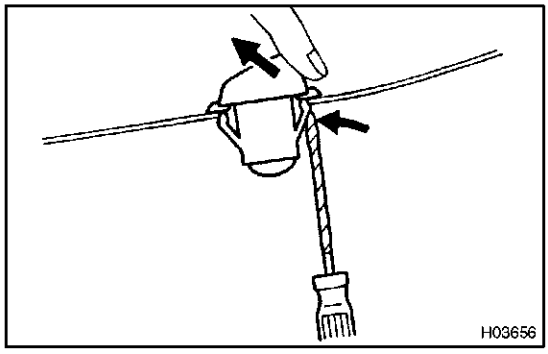
(a) Disconnect the connector.

(b) Remove the 4 bolts and wiper arm and link assembly.



4. REMOVE WINDOW WASHER NOZZLE

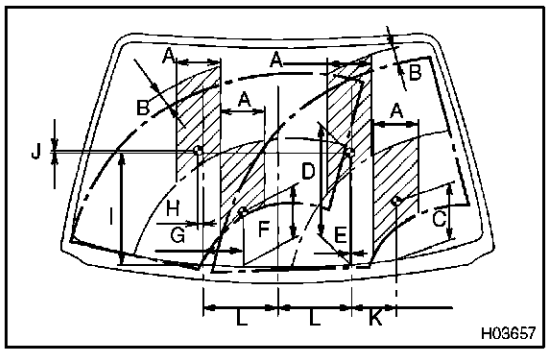
(a) Using a clip remover, remove the 11 clips and hood insulator.



(b) Disconnect the washer hose from the nozzle.

(c) Press on the claw on the underside of the nozzle and remove it from above.

BO18Y–01



INSPECTION

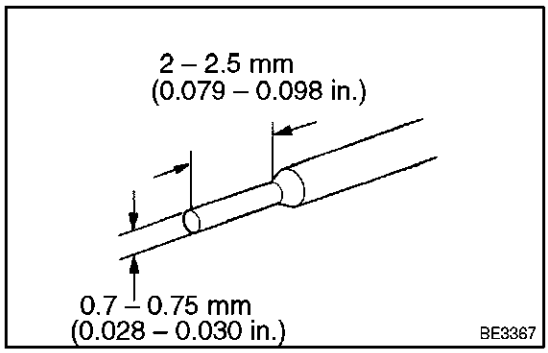
INSPECT WASHER NOZZLE

(a) While operating the washer, check that the points where the washer fluid hits the windshield and the upsurge area are within the range indicated by the hatched line.

A: Approx. 150 mm (5.91 in.)
B: Approx. 50 mm (1.99 in.)
C: Approx. 199 mm (7.83 in.)
D: Approx. 388 mm (15.28 in.)
E: Approx. 7.0 mm (0.28 in.)
F: Approx. 186 mm (7.32 in.)
G: Approx. 133 mm (5.24 in.)
H: Approx. 15 mm (0.59 in.)
I: Approx. 390 mm (15.35 in.)
J: Approx. 0 – 50 mm (0 – 1.97 in.)
K: Approx. 149 mm (5.87 in.)
L: Approx. 250 mm (9.84 in.)

(b) Check that the lower point where the washer fluid hits the windshield is within the range of the wiping pattern (the area of the glass which is wiped by the wiper blades).

BO18Z–01



ADJUSTMENT

ADJUST WASHER NOZZLE

Using a tool like the one shown in the illustration, change the direction of the nozzle hole to adjust the point where washer fluid strikes the windshield.

BO190-01

INSTALLATION

1. INSTALL THESE PARTS:

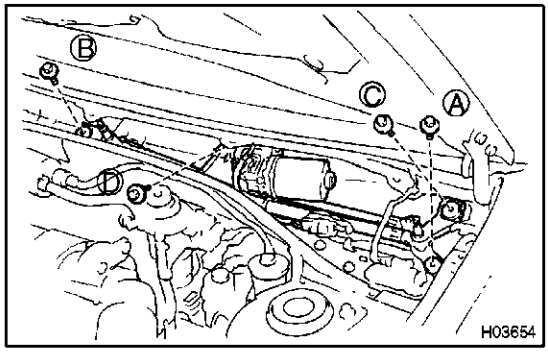
(a) Washer nozzle

(b) Hood insulator

2. INSTALL WIPER MOTOR AND LINK ASSEMBLY

(a) Put wiper motor and link assembly into cowl chamber from outside of vehicle.

(b) Adjust fixing points to cowl bracket.



(c) Tighten 4 bolts in order A, B, C and D, as shown in the illustration.

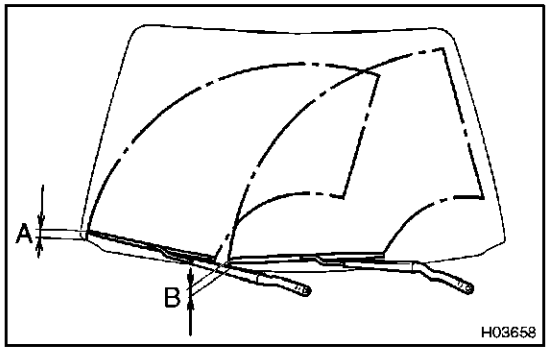
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(d) Connect the connector.

3. INSTALL THESE PARTS:

(a) Cowl louver

(b) Hood to cowl top seal



4. INSTALL WIPER ARM

(a) Install the wiper arms, operate the wipers once and turn the wiper switch OFF.

(b) Adjust the wiper arms to positions shown in the illustration.

A: 29.0 ± 10.0 mm (1.14 ± 0.39 in.)

B: 25.0 + 5.0 mm (0.98 + 0.20 in.)

25.0 – 10.0 mm (0.98 ± 0.39 in.)

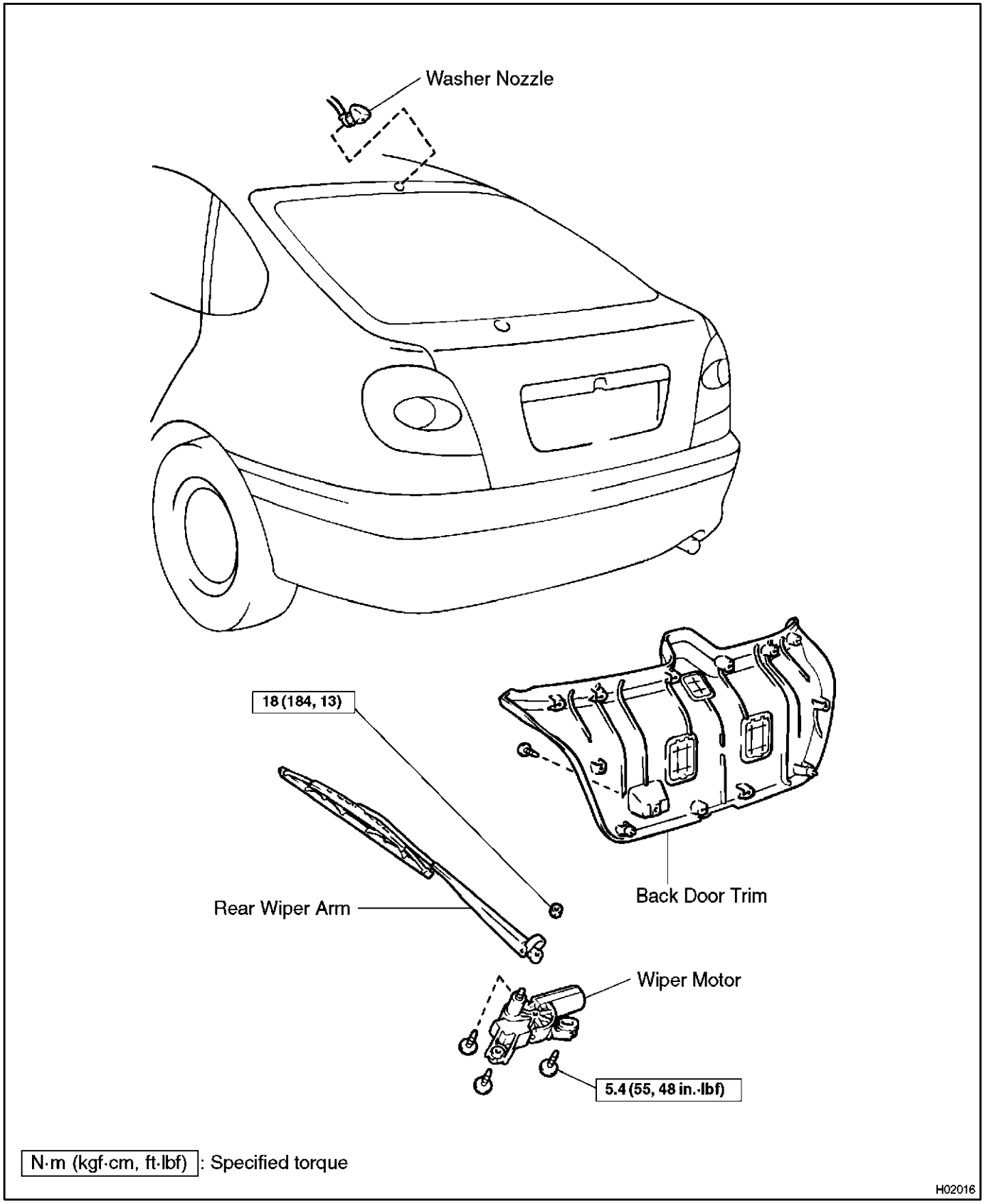
(c) Torque the nuts.

Torque: 20 N·m (205 kgf·cm, 15 kgf·cm)

REAR WIPER AND WASHER (Liftback)

COMPONENTS

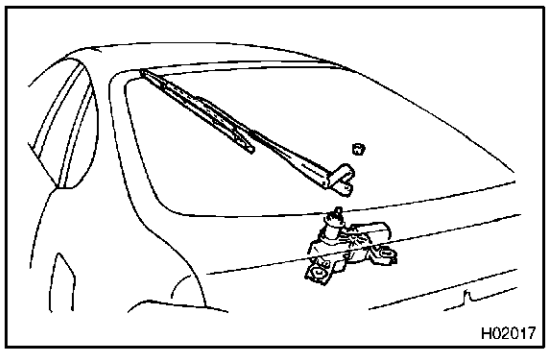
BO1AT–01



N·m (kgf·cm, ft·lbf) : Specified torque

H02016

BO1AU-01



REMOVAL

1. REMOVE REAR WIPER ARM

(a) Remove the nut.

(b) Remove the wiper arm.

2. REMOVE BACK DOOR TRIM

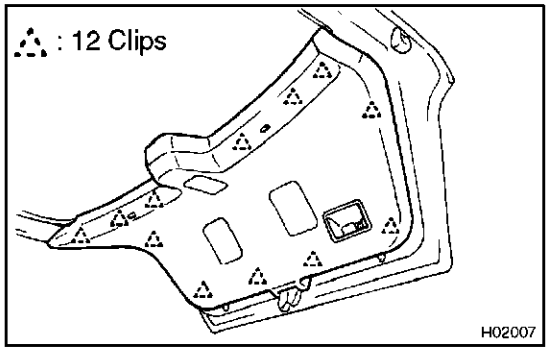
(a) Insert a screwdriver between the door and door trim to pry out.

NOTICE:

Be careful not to damage the door and door trim.

HINT:

Tape the screwdriver tip before use.

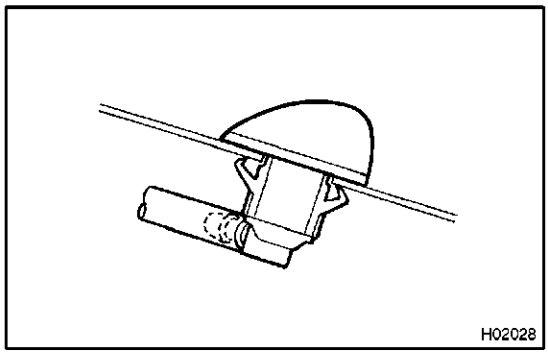


(b) Pull off the trim to remove it as shown in the illustration.

3. REMOVE WIPER MOTOR

(a) Disconnect the connector.

(b) Unfasten the 3 bolts and remove the wiper motor.



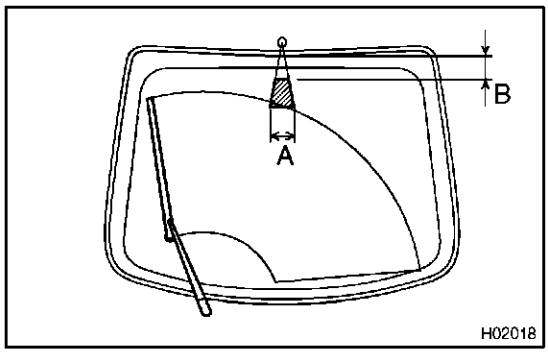
4. REMOVE WASHER NOZZLE

Using a screwdriver, remove the washer nozzle.

HINT:

Tape the screwdriver tip before use.

BO1AV–01



INSPECTION

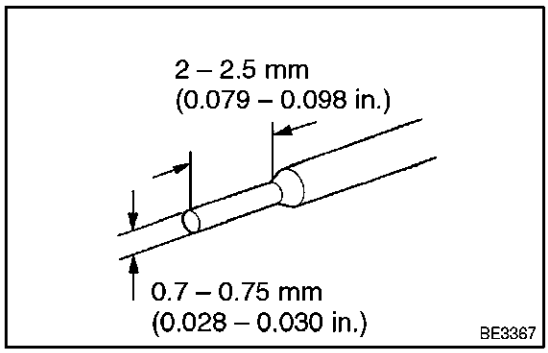
INSPECT REAR WASHER NOZZLE

While operating the washer, check if the point where the washer fluid hits the back door glass is within the range indicated by the hatched line.

A: Approx. 100 mm (3.91 in.)

B: Approx. 50 mm (1.97 in.)

BO1AW–01



ADJUSTMENT

ADJUST REAR WASHER NOZZLE

Using a tool like the one shown in the illustration, change the direction of the nozzle hole to adjust the point where washer fluid hits the back door glass.

BO1AX–01

INSTALLATION

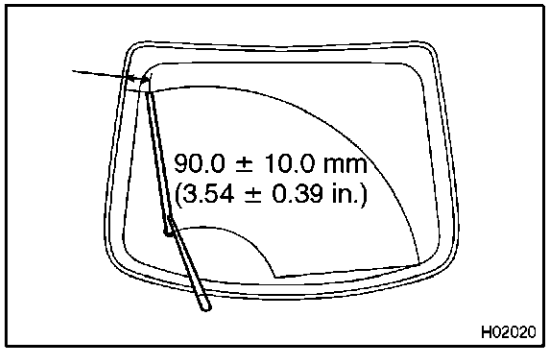
1. INSTALL THESE PARTS:

(a) Washer nozzle

(b) Wiper motor

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(c) Back door trim



2. INSTALL REAR WIPER ARM

(a) Install the wiper arm and tighten nut by hand. Operate the wiper once and turn the wiper switch OFF.

(b) Adjust the installation position of the wiper arm to the marked position shown in the illustration.

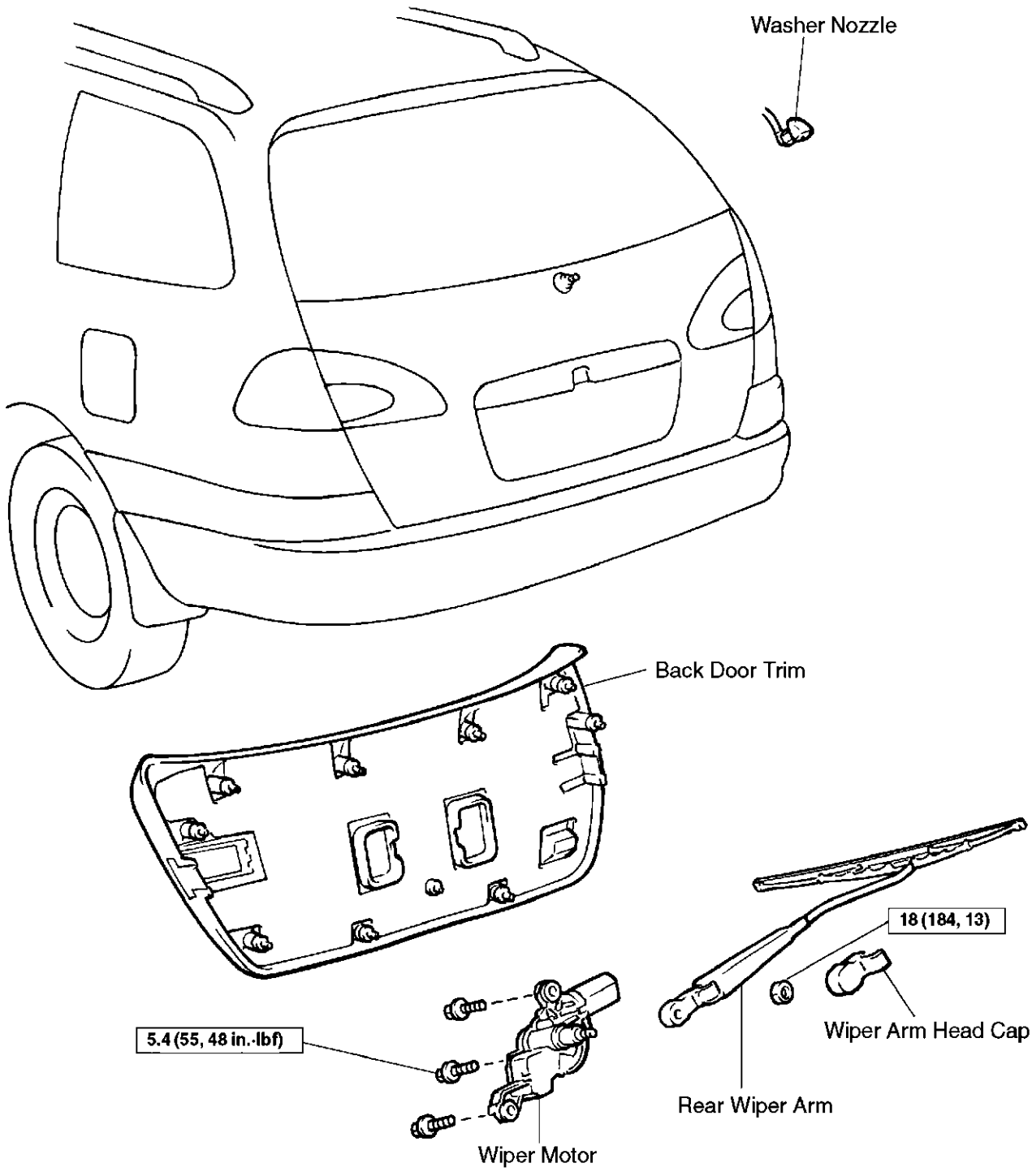
(c) Torque the nut.

Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

REAR WIPER AND WASHER (Wagon)

COMPONENTS

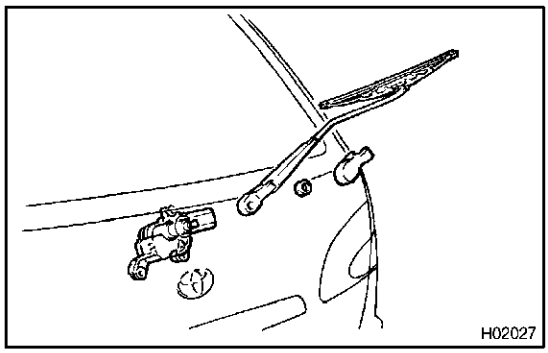
BO1AO–01



N·m (kgf·cm, ft·lbf) : Specified torque

H02026

BO1AP–01



REMOVAL

1. REMOVE REAR WIPER ARM

(a) Remove the nut.

(b) Remove the wiper arm.

2. REMOVE BACK DOOR TRIM

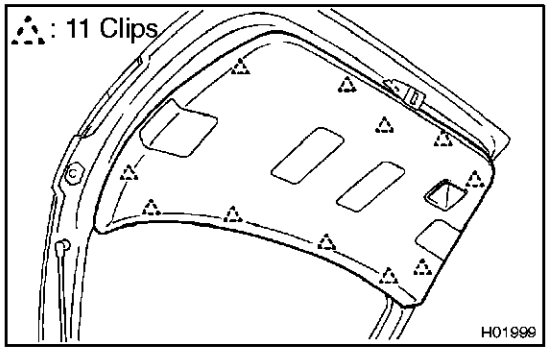
(a) Insert a screwdriver between the door and door trim to pry out.

NOTICE:

Be careful not to damage the door and door trim.

HINT:

Tape the screwdriver tip before use.

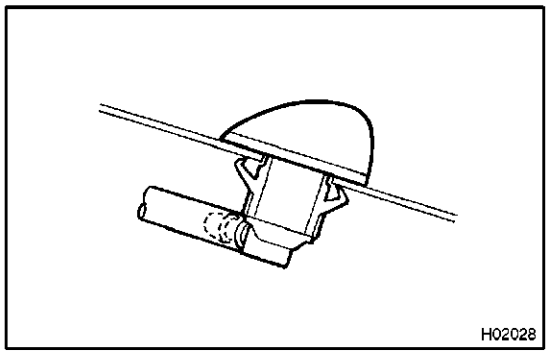


(b) Pull off the trim to remove it, as shown in the illustration.

3. REMOVE WIPER MOTOR

(a) Disconnect the connector.

(b) Unfasten the 3 bolts and remove the wiper motor.



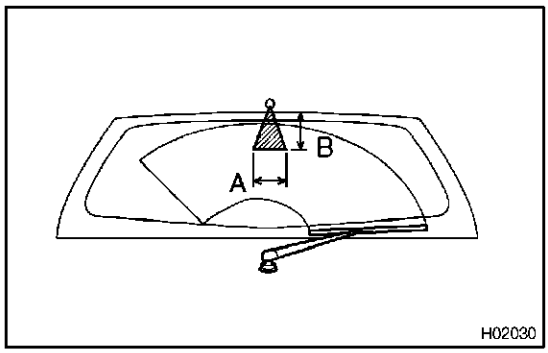
4. REMOVE WASHER NOZZLE

Using a screwdriver, remove the washer nozzle.

HINT:

Tape the screwdriver tip before use.

BO1AQ–01



INSPECTION

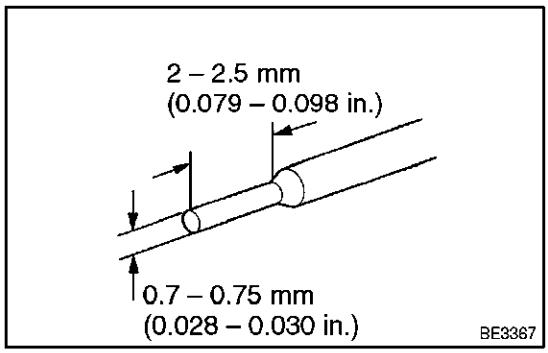
INSPECT REAR WASHER NOZZLE

While operating the washer, check if the point where the washer fluid hits the back door glass is within the range indicated by the hatched line.

A: Approx. 150 mm (5.91 in.)

B: Approx. 250 mm (9.84 in.)

BO1AR–01



ADJUSTMENT

ADJUST REAR WASHER NOZZLE

Using a tool like the one shown in the illustration, change the direction of the nozzle hole to adjust the point where washer fluid hits the back door glass.

BO1AS–01

INSTALLATION

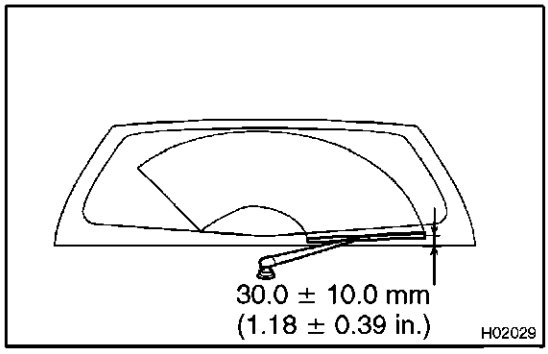
1. INSTALL THESE PARTS:

(a) Washer nozzle

(b) Wiper motor

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(c) Back door trim



2. INSTALL REAR WIPER ARM

(a) Install the wiper arm and tighten nut by hand. Operate the wiper once and turn the wiper switch OFF.

(b) Adjust the installation position of the wiper arm to the marked position shown in the illustration and confirm arm is set on the thermal line.

(c) Torque the nut.

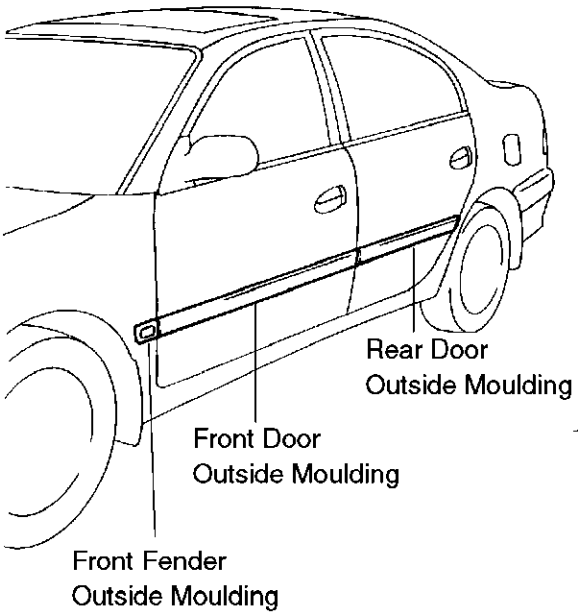
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

BODY OUTSIDE MOULDING

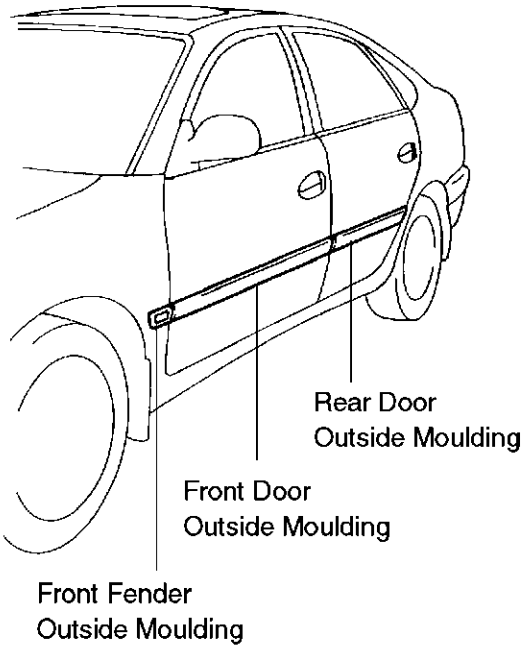
COMPONENTS

BO03R–02

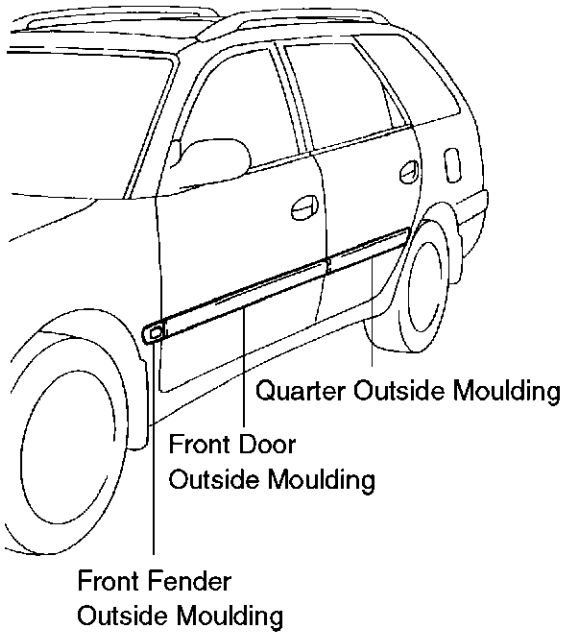
Sedan:



Liftback:



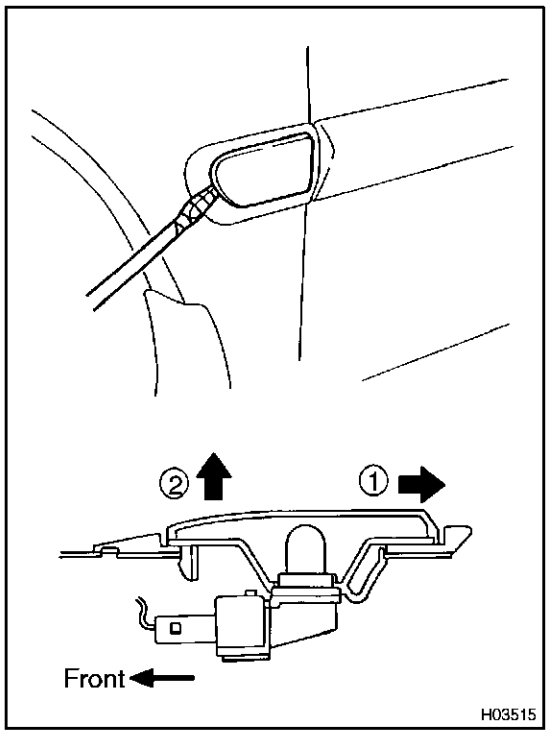
Hatchback:



H03540

BO1E0–01

REMOVAL



1. Front Fender Outside Moulding:
REMOVE SIDE TURN SIGNAL LIGHT

Using a screwdriver, push the side turn signal light rearward and lift up the front part of it to remove it from the body.

HINT:

Tape the screwdriver tip before use.

2. HEAT MOULDING

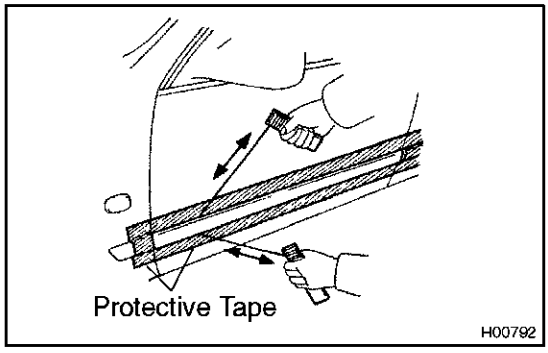
Using a heat light, heat the moulding to 40 – 60 °C (104 – 140 °F).

NOTICE:

Do not heat moulding excessively.

3. REMOVE OUTSIDE MOULDING

(a) Tie both piano wire ends to a wooden block or a similar object.



(b) Cut the adhesive tape by pulling the piano wire as shown.

NOTICE:

- **If reusing the moulding, take care not to damage the moulding.**
- **Do not damage the body.**

(c) Remove the moulding.

BO03T–02

INSTALLATION

1. CLEAN BODY MOUNTING SURFACE

(a) Using a heat light, heat the body mounting surface to 40 – 60 °C (104 – 140 °F).

NOTICE:

Do not heat body excessively.

(b) Remove the adhesive tape from the body.

(c) Wipe off stains with cleaner.

2. If reusing moulding:
CLEAN MOULDING

(a) Using a heat light, heat the moulding to 20 – 30 °C (68 – 86 °F).

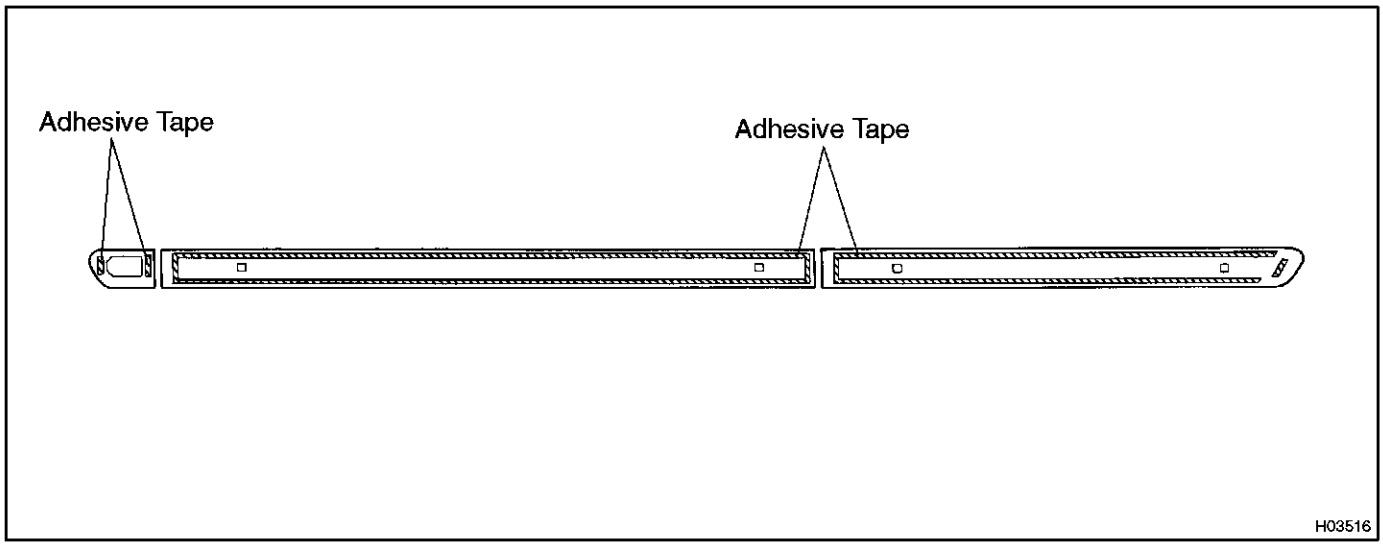
NOTICE:

Do not heat moulding excessively.

(b) Remove the adhesive tape from the moulding.

(c) Wipe off stains with cleaner.

(d) Apply a new adhesive tape to the moulding as shown in the illustration.



3. INSTALL MOULDING

(a) Using a heat light, heat the body and moulding.
Body: 40 – 60 °C (104 – 140 °F)
Moulding: 20 – 30 °C (68 – 86 °F)

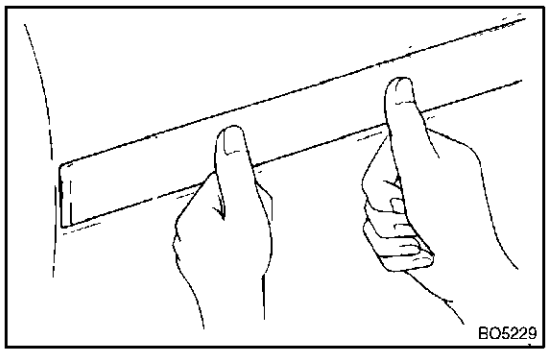
NOTICE:

Do not heat moulding excessively.

(b) Lift the moulding release sheet from the face of moulding.

NOTICE:

When the moulding release sheet is removed, make sure that no dirt or dust can get onto the uncoated area.



(c) Align the bosses with their corresponding holes in the body, and press firmly on the moulding. Refer to the illustration for the front fender moulding application procedures.

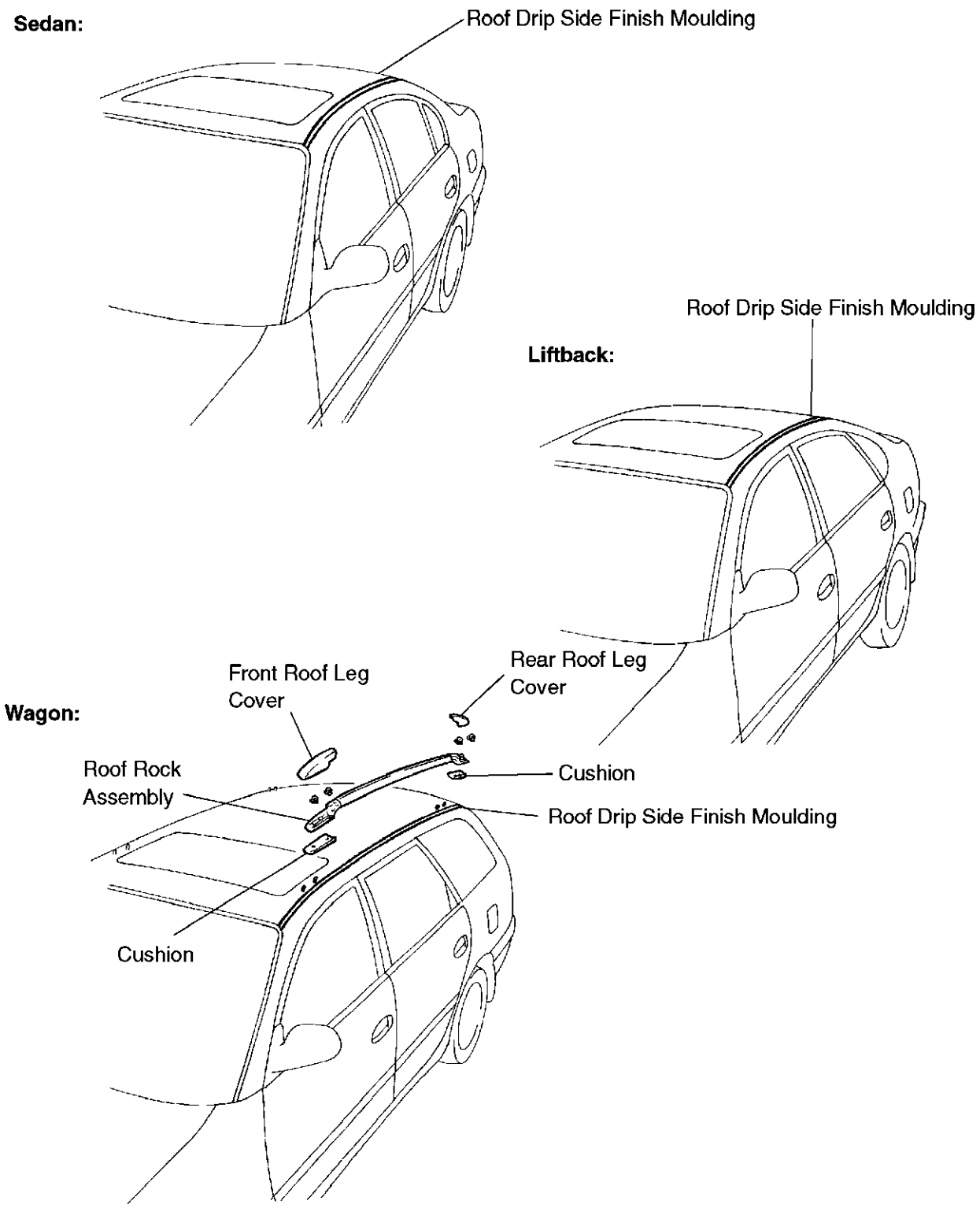
NOTICE:

Do not apply excessive force onto the moulding, but steady pressure with your thumbs.

ROOF DRIP SIDE FINISH MOULDING

COMPONENTS

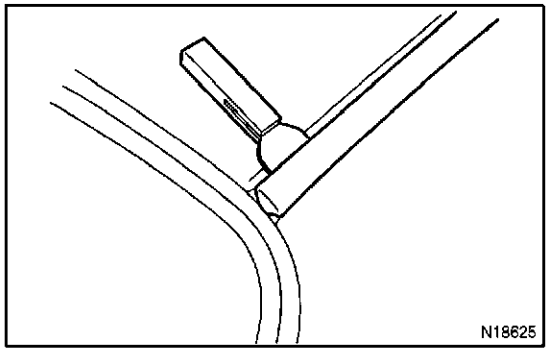
BO1BH–01



BO1B1–01

REMOVAL

1. **Wagon:**
   REMOVE ROOF RAIL
   (See page BO–161)

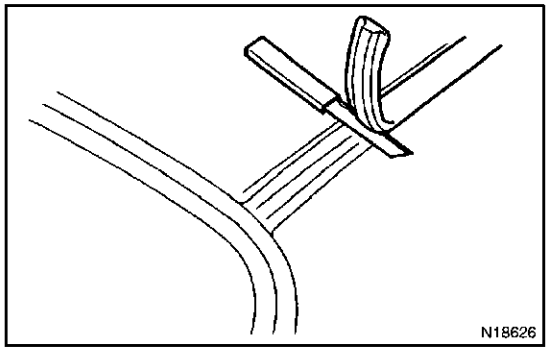


2. REMOVE ENDS OF MOULDING

Using a scraper, pull off the roof drip side finish center moulding from front end.

HINT:

Tape the scraper tip before use.



3. REMOVE MOULDING AND ADHESIVE

Pull off the moulding by cutting the adhesive with a knife.

NOTICE:

- **Do not reuse the moulding.**
- **Do not damage the body with the knife.**

BO1B2–01

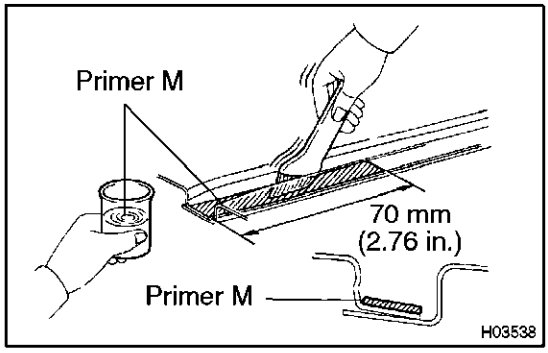
INSTALLATION

1. CLEAN CONTRACT SURFACE OF BODY

Using a knife, cut away any rough areas on the body.

NOTICE:

Do not damage the body with the knife.

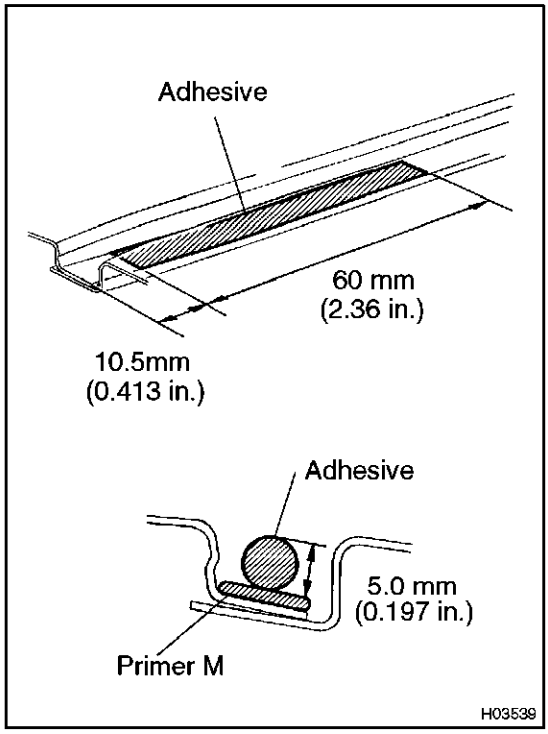


2. COAT CONTRACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat the contact surface on the body with Primer M as shown in the illustration.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**



3. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.
Part No. 08850–00801 or equivalent.

HINT:

After cutting off the rip, use all adhesive within the described in the chart below.

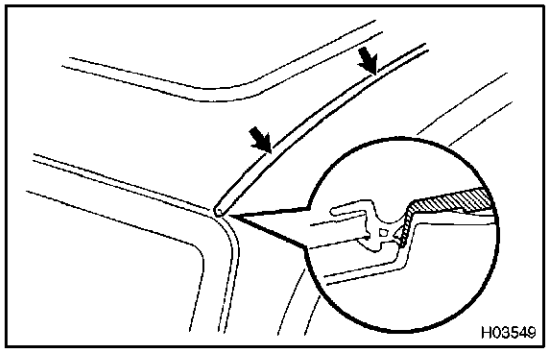
Temperature	Tackfree time
35 °C (95 °F)	15 minutes
20 °C (68 °F)	100 minutes
5 °C (41 °F)	8 hours

(b) Load the cartridge into the sealer gun.

(c) Apply adhesive to the hatched area in the illustration for both front and rear of the vehicle.

HINT:

When removing the moulding, apply adhesive well to the part where the body sealer is removed.



4. INSTALL MOULDING

Pull the moulding to the body, as shown in the illustration.

NOTICE:

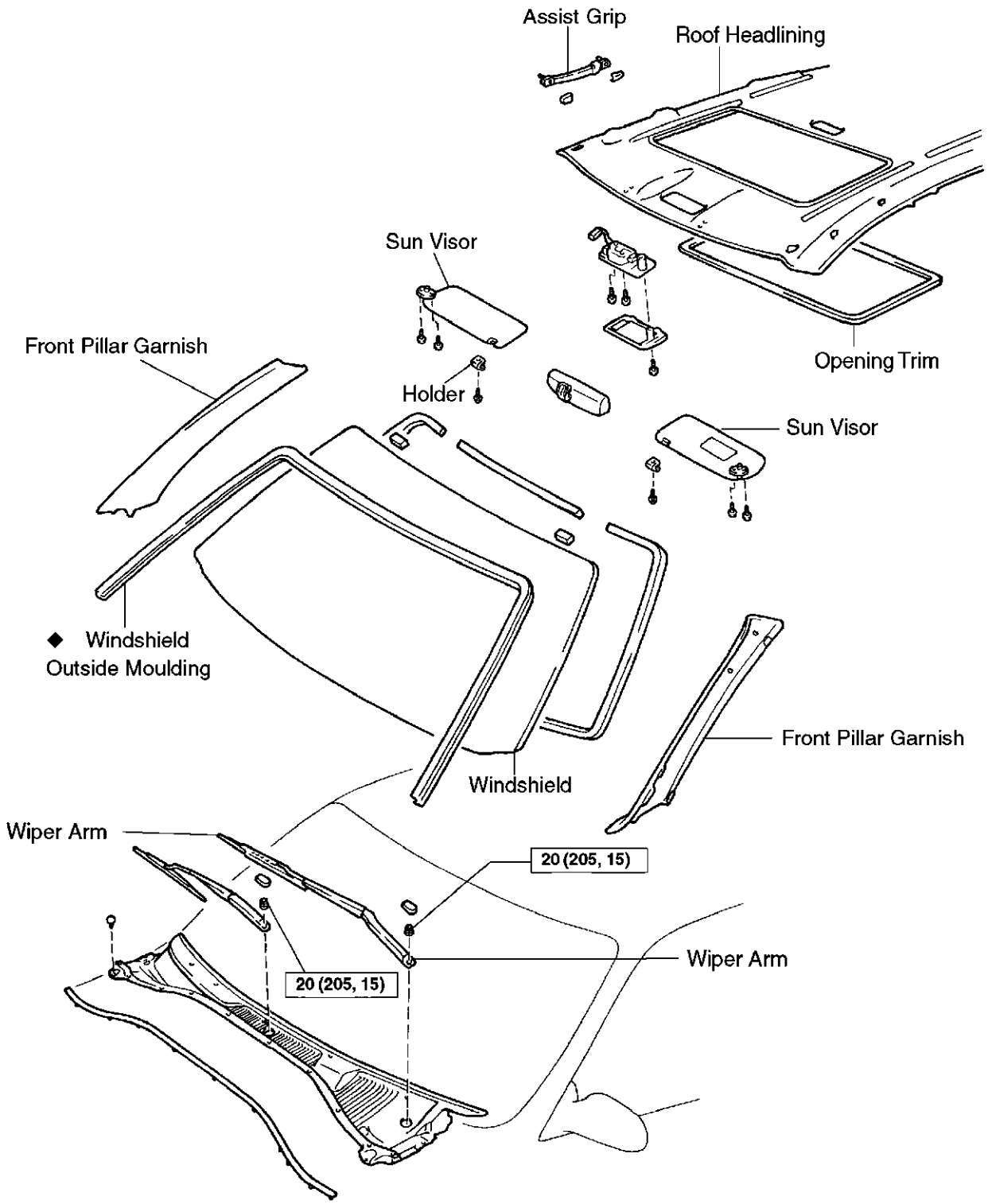
- **Make sure that the body and moulding are heated to the proper temperature.**
- **Do not depress the adhesive coated parrs excessively but just hold them down with your thumb.**
- **Scrape off any overflowing adhesive with a plastic spatula and clean the surface with a dry rag.**
- **Take care not to drive the vehicle during the time described in the chart below.**

Temperature	Minimum time prior to driving the vehicle
35 °C (95 °F)	1.5 hours
20 °C (68 °F)	5 hours
5 °C (41 °F)	24 hours

WINDSHIELD

COMPONENTS

BO0IO–02

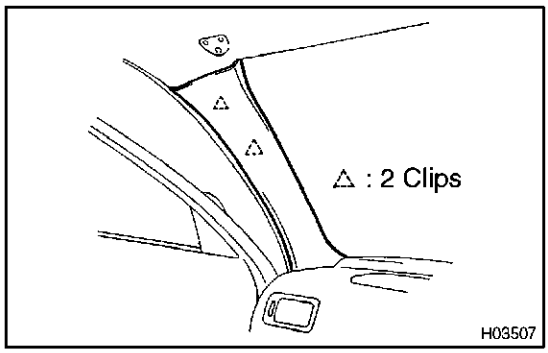


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

H03508

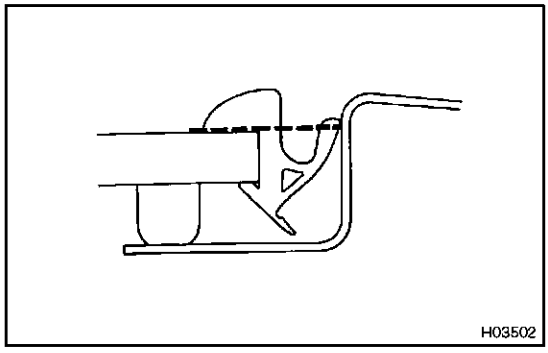
BO19X–01



REMOVAL

1. REMOVE THESE PARTS:

(a) Front wiper arms
(b) Weatherstrip
(c) Cowl louver
(d) Sun visors and holders
(e) Map light assembly
(f) Assist grip
(g) Upper part of front door opening trims
(h) Front pillar garnishes
(i) Inner rear view mirror
(j) Upper Back Panel Hole No.1 Cover

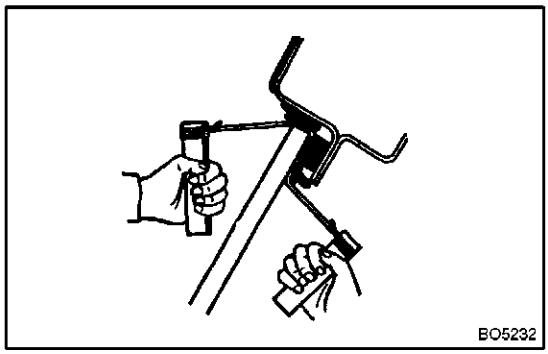


2. REMOVE WINDSHIELD OUTSIDE UPPER MOULDING

Using a knife, cut off the moulding, as shown.

NOTICE:

Do not damage the body with the knife.

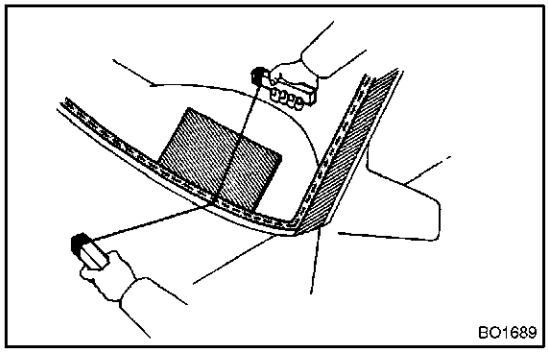


3. REMOVE WINDSHIELD GLASS

(a) Push piano wire through between the body and glass from the interior.
(b) Tie both wire ends to a wooden block or similar object.

HINT:

Apply adhesive tape to the outer surface to keep the surface from being scratched.



NOTICE:

When separating the glass, take care not to damage the paint and exterior ornaments. To prevent scratching the safety pad when removing the windshield, place a plastic sheet between the piano wire and safety pad.

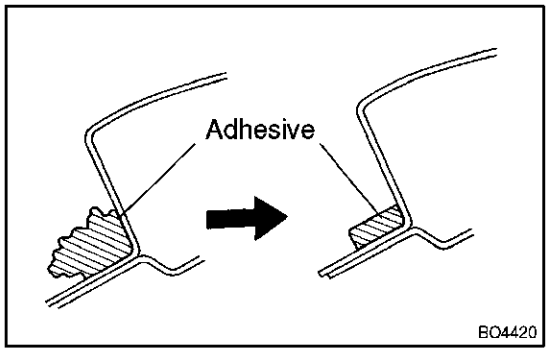
(c) Cut the adhesive by pulling the piano wire around it.
(d) Remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO0IQ–02

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

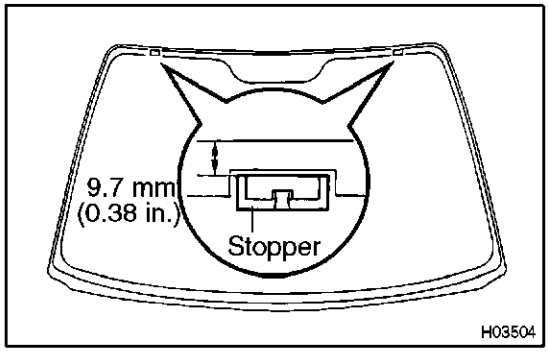
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed, clean the body.



2. REPLACE STOPPER

(a) Remove the damaged stopper.

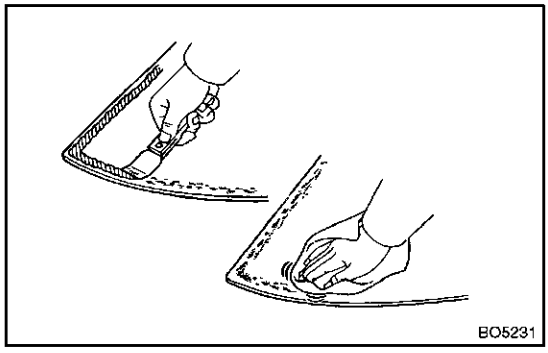
(b) Cut off the old adhesive around the stopper installation area.

NOTICE:

Be careful not to damage the body.

(c) Clean the installation area.

(d) Attach the stoppers to the glass with the ceramic notch on the glass aligned with the stoppers, as shown in the illustration.



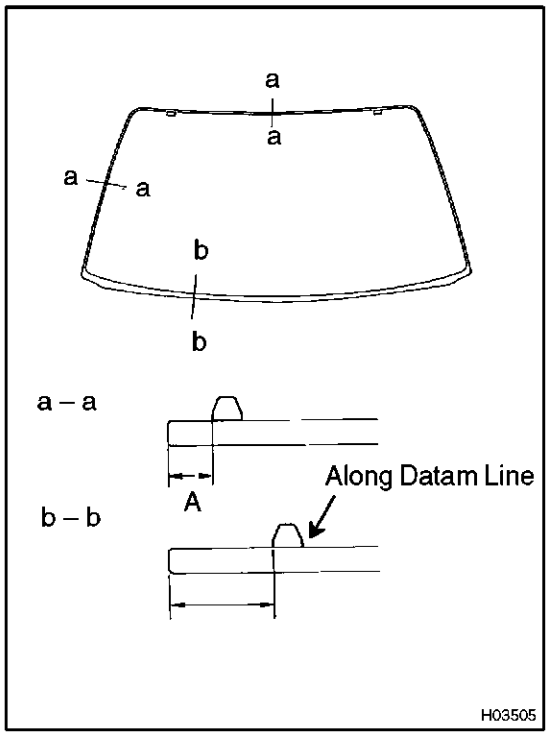
3. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

Do not touch the glass after cleaning it.



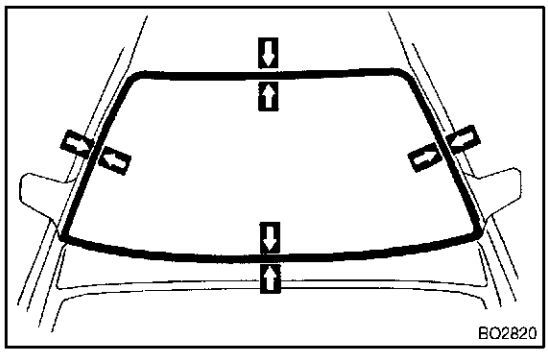
4. INSTALL DAMS

Install the dams with double – stick tape as shown in the illustration.

A: 7.0mm (0.28 in.)

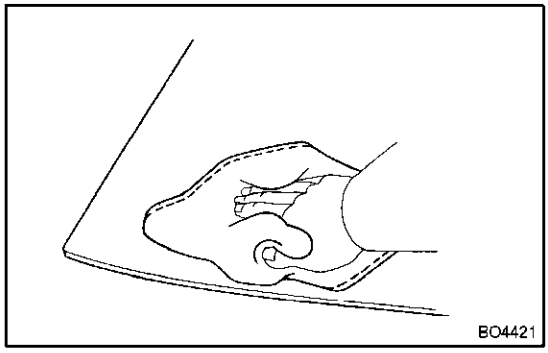
NOTICE:

Do not touch the glass surface after cleaning it.



5. POSITION GLASS

(a) Place the glass in the correct position.
(b) Check that all contacting parts of the glass rim are perfectly even.
(c) Place reference marks between the glass and body.
(d) Remove the glass.

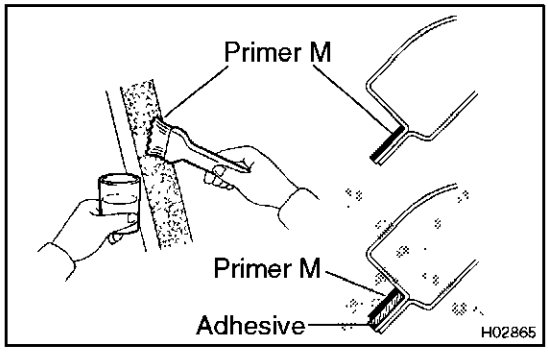


6. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black–colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.

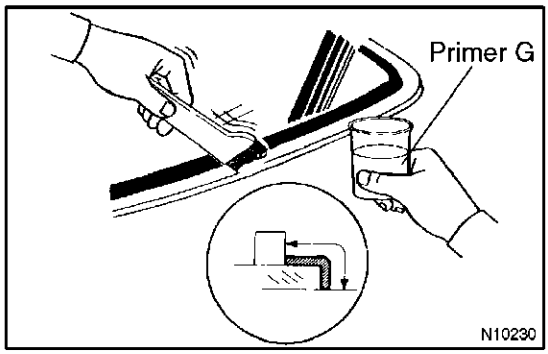


7. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**

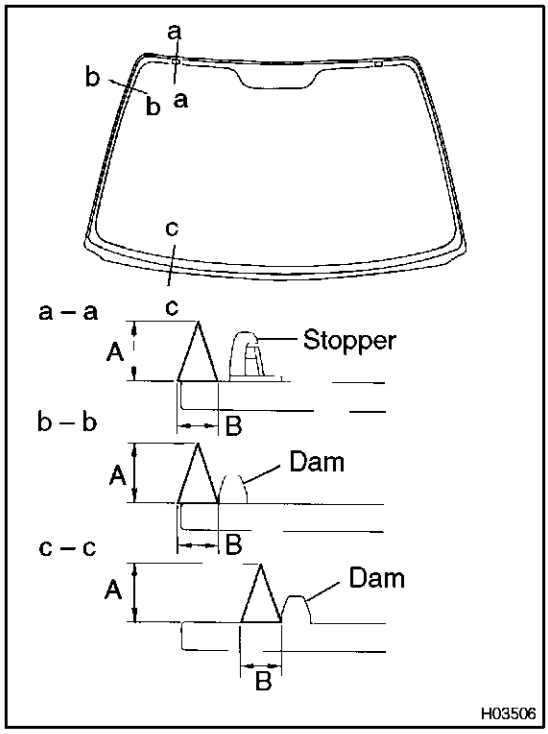


8. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.
(b) Before the primer dries, wipe it off with a clean shop rag.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**



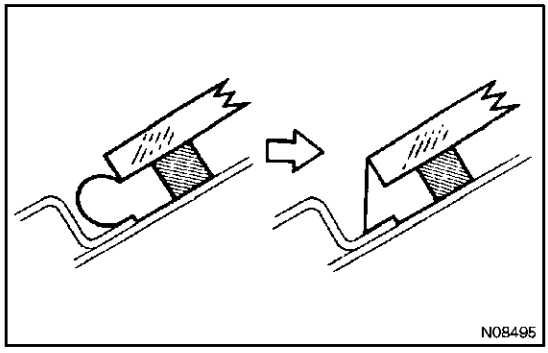
9. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.
Part No. 08850–00801 or equivalent.

HINT:
After cutting off the tip, use all adhesive within the time described in the table below.

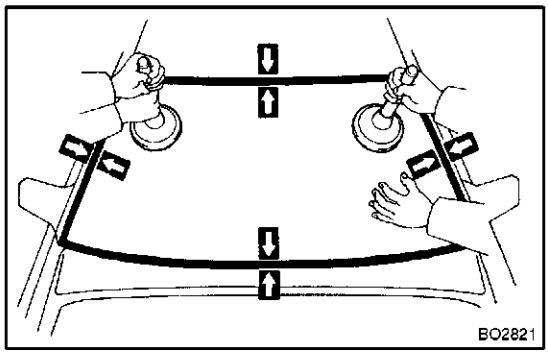
Temperature	Tackfree time
35 °C (95 °F)	15 minutes
20 °C (68 °F)	100 minutes
5 °C (41 °F)	8 hours

(b) Load the cartridge into the sealer gun.
(c) Coat the glass with adhesive as shown.
A: 12.5 mm (0.472 in.)
B: 8.0 mm (0.315 in.)

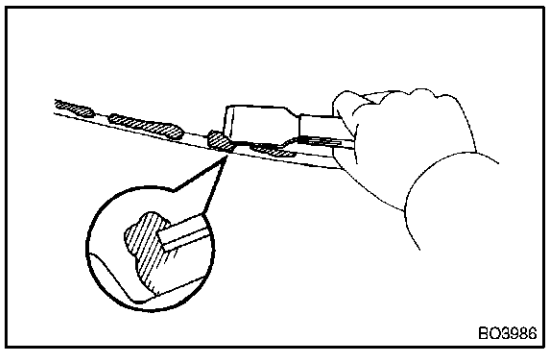


10. INSTALL GLASS

HINT:
Check that the dam is attached the body panel as shown in the illustration.



(a) Position the glass so that the reference marks are lined up, and press in gently along the rim.
(b) Using a spatula, apply adhesive on the glass rim.

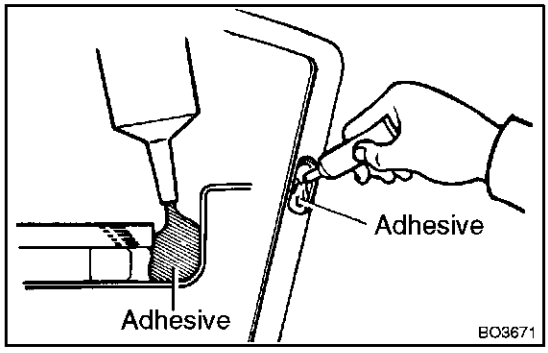

BO3986

(c) Use a scraper to remove any excessive or protruding adhesive.
(d) Hold the windshield glass in place securely with protective tape or equivalent until the adhesive hardenes.

NOTICE:
Take care not to drive the vehicle during the time described in the table below.

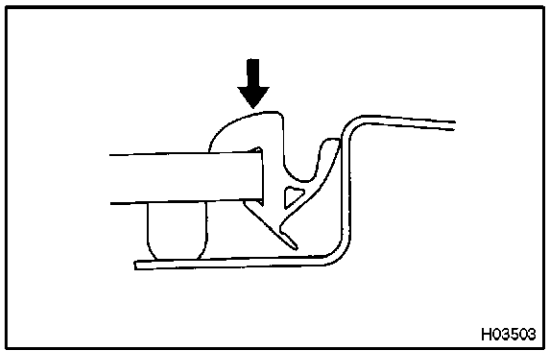
Temperature	Minimum time prior to driving the vehicle
35 °C (95 °F)	1.5 hours
20 °C (68 °F)	5 hours
5 °C (41 °F)	24 hours

11. INSPECT FOR LEAKAGE AND REPAIR
(a) Do a leak test after the hardening time has elapsed.
(b) Seal any leakage with sealant.
Part No. 08833–00030 or equivalent.



BO3671

12. APPLY ADHESIVE AT MOULDING INSTALLATION AREA
Coat the glass with adhesive at the moulding installation area.
Part No. 08833–00030 or equivalent.

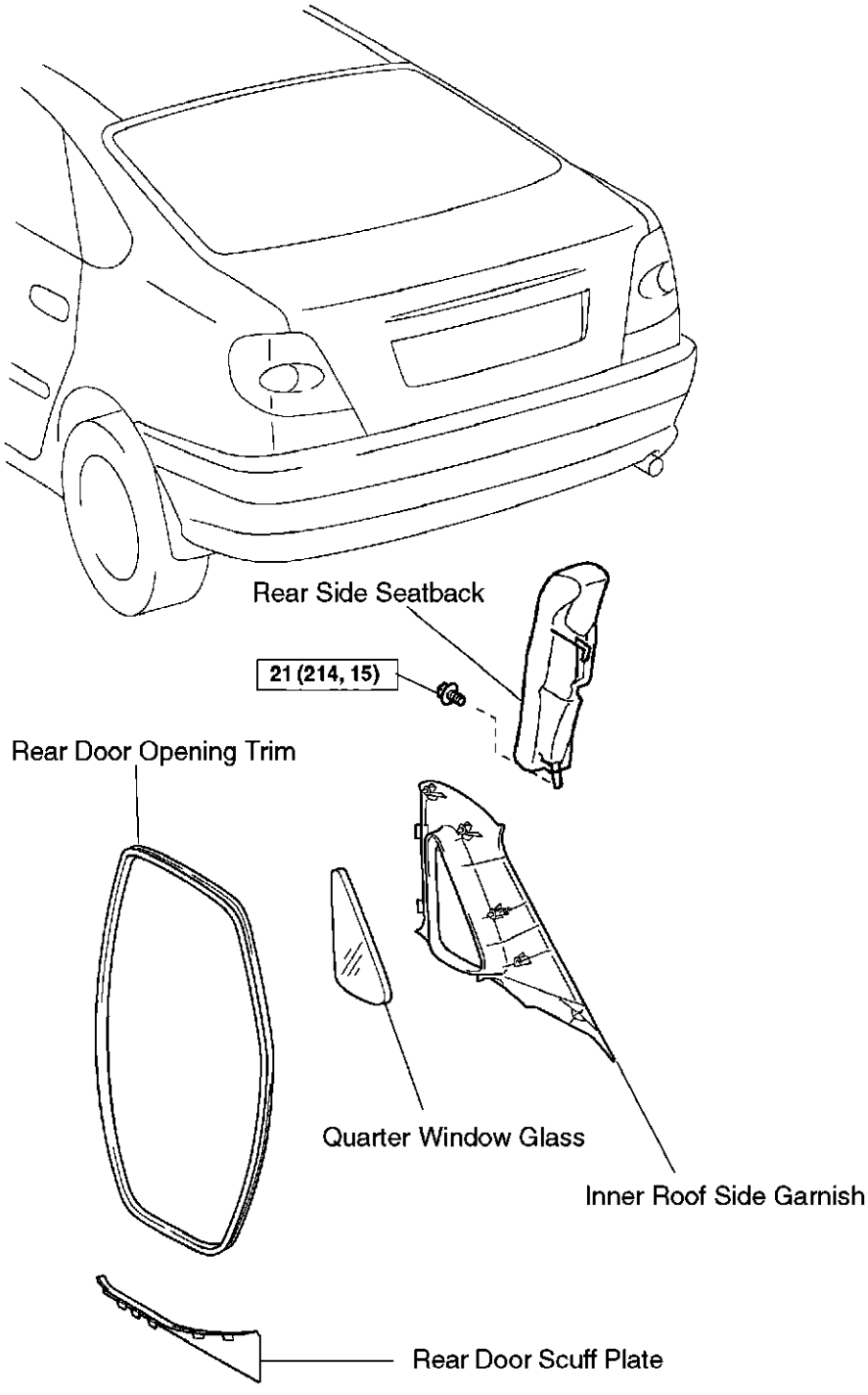

H03503

13. INSTALL WINDSHIELD MOULDING
Place the moulding onto the body and tap it by hand.
14. INSTALL THESE PARTS:
(a) Front part of roof headlining
(b) Inner rear view mirror
(c) Front pillar garnishes
(d) Upper part of roof headlining.
(e) Assist grip
(f) Map light assembly
(g) Sun visors and holders
(h) Cowl louver
(i) Weatherstrip
(j) Front wiper arms
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

QUARTER WINDOW GLASS (Liftback)

COMPONENTS

BO191-01



N·m (kgf·cm, ft·lbf) : Specified torque

H03699

BO192-01

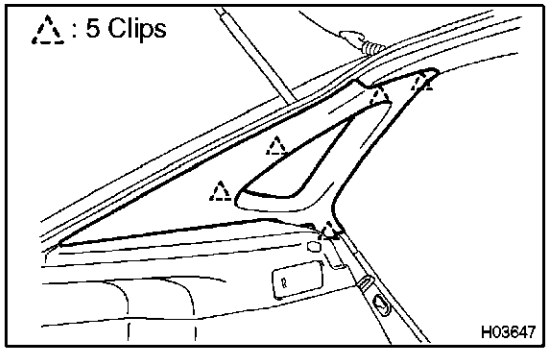
REMOVAL

1. REMOVE THESE PARTS:

(a) Rear door opening trim

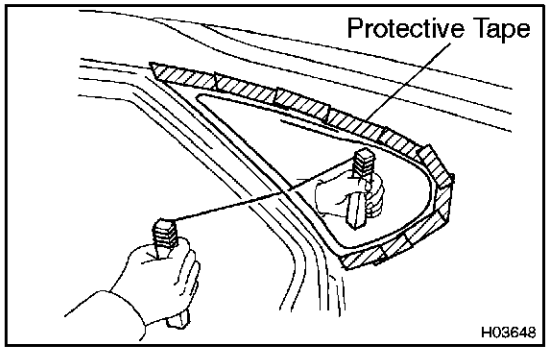
(b) Rear door scuff plate

(c) Rear side seatback



2. REMOVE INNER ROOF SIDE GARNISH

Remove the garnish.



3. REMOVE QUARTER WINDOW GLASS

(a) Push piano wire through from the interior.

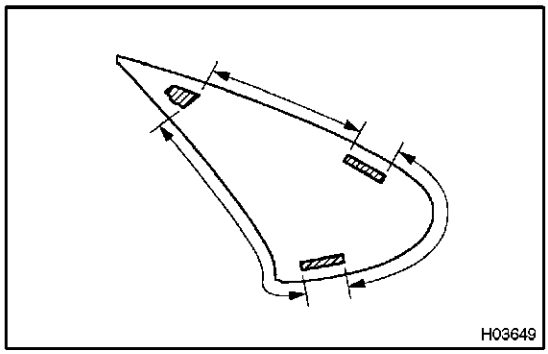
(b) Tie both wire ends to the wooden block or similar object.

HINT:

Apply adhesive tape to the outer surface to keep the surface from being scratched.

NOTICE:

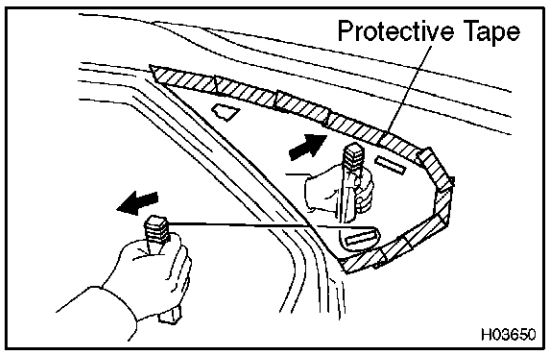
When separating the glass, take care not to damage the paint and exterior.



(c) Cut the adhesive by pulling the piano wire around it.

HINT:

Cut the adhesive areas as shown in the illustration, leaving the adhesive where the clip are.



(d) Let the piano wire pass as shown in the illustration, cut off the adhered part to the clips.

NOTICE:

Do not damage the glass retainers.

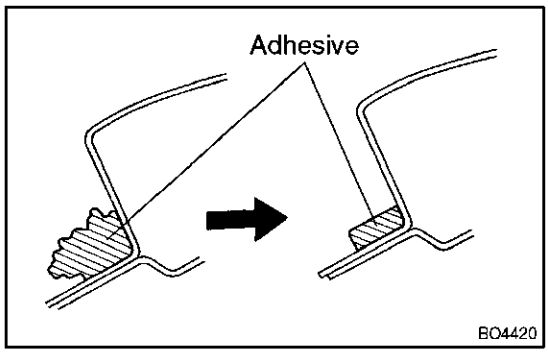
(e) Remove the 3 nuts and glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO193-01

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

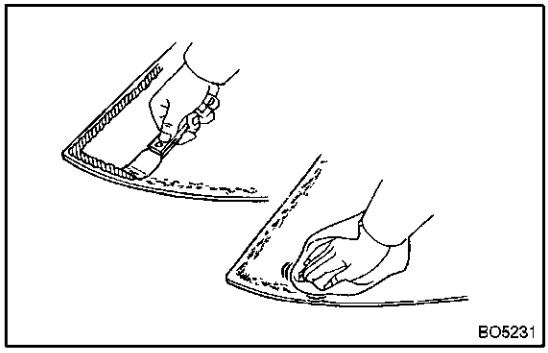
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a piece of shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed, clean the body.



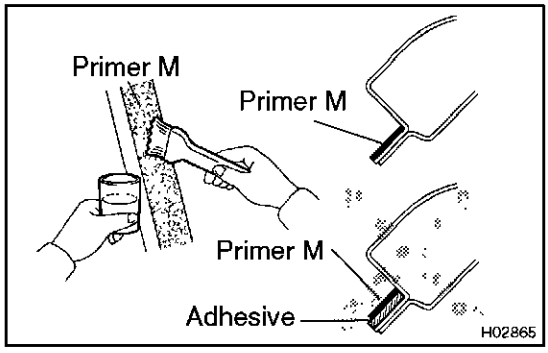
2. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

Do not touch the glass after cleaning it.

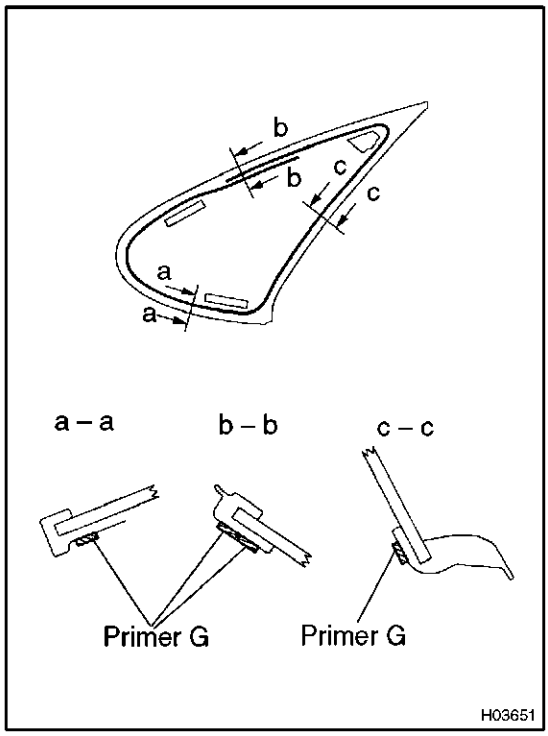


3. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat primer M to the adhesive.**
- **Do not keep any of the opened primer M for later use.**



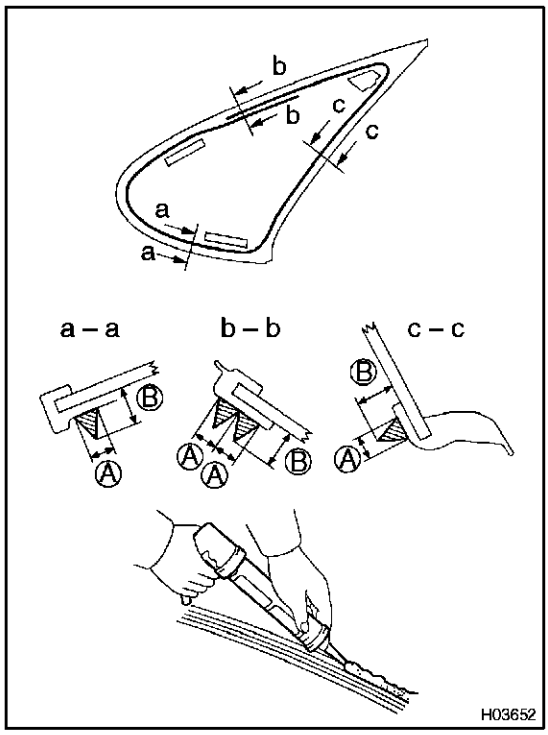
4. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and contact surface with primer G.

(b) Before the primer dries, wipe it off with a clean shop rag.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened primer G for later use.**



5. APPLY ADHESIVE

(a) 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)	15 minutes
20 °C (68 °F)	100 minutes
5 °C (41 °F)	8 hours

(b) Load the cartridge into the sealer gun.

(c) Coat the glass with adhesive, as shown in the illustration.

A: 6.0 mm (0.236 in.)

B: 8.0 mm (0.315 in.)

6. INSTALL QUARTER WINDOW GLASS

(a) Install the glass to the body.

(b) Use adhesive tape to keep the glass installed tightly against the body.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Minimum time prior to driving the car
35 °C (95 °F)	1.5 hours
20 °C (68 °F)	5 hours
5 °C (41 °F)	24 hours

7. INSPECT FOR LEAKS AND REPAIR

(a) Conduct a leak test after the hardening time has elapsed.

(b) Seal any leak with sealant.

Part No. 08833–00030 or equivalent

8. INSTALL THESE PARTS:

(a) Inner roof side garnish

(b) Rear side seatback

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

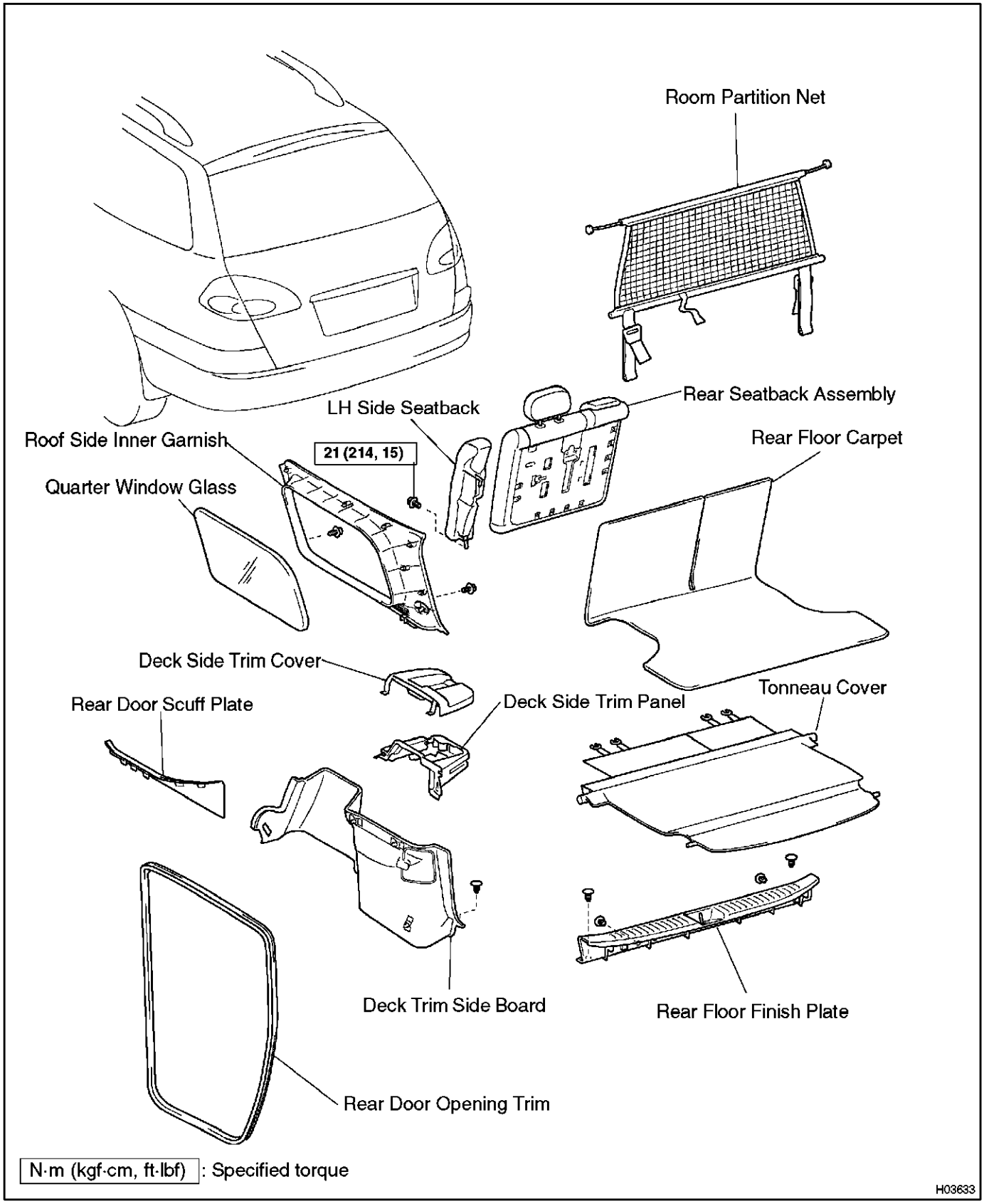
(c) Rear door scuff plate

(d) Rear door opening trim

QUARTER WINDOW GLASS (Wagon)

COMPONENTS

BO194–01



N·m (kgf·cm, ft·lbf) : Specified torque

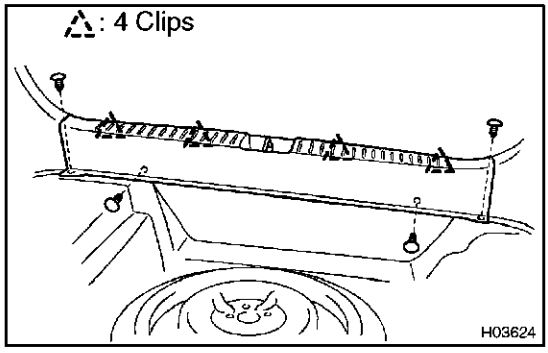
H03633

BO195–01

REMOVAL

1. REMOVE THESE PARTS:

(a) Rear floor carpet
(b) Rear seatback assembly
(c) Rear door opening trim
(d) Rear door scuff plate
(e) w/ Tonneau Cover:
Tonneau cover
(f) w/ Room Partition Net:
Room partition net



2. REMOVE REAR FLOOR FINISH PLATE

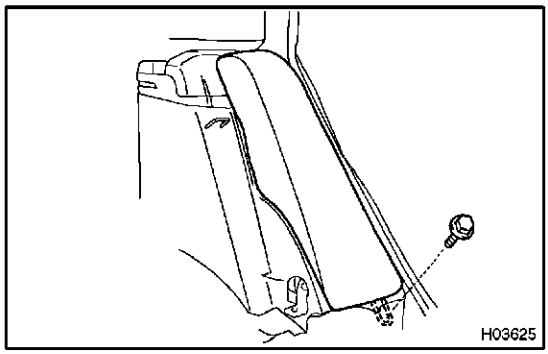
Using a screwdriver, remove the rear floor finish plate.

HINT:

Tape the screwdriver tip before use.

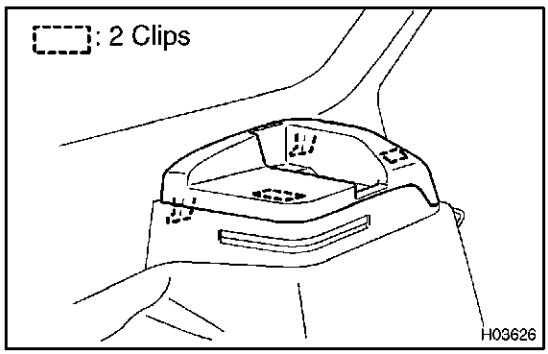
3. REMOVE REAR ROOM PARTITION NET HOOK

Remove the screw and hook.



4. REMOVE LH SIDE SEATBACK

Remove the bolts and LH side seatback, as shown in the illustration.

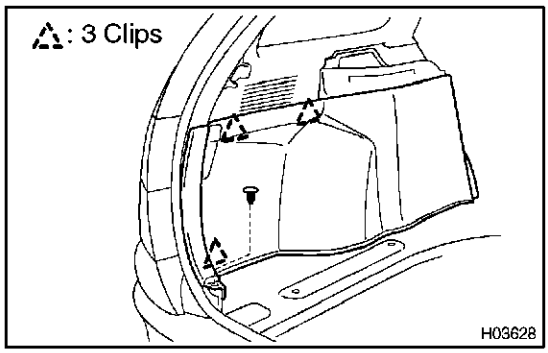


5. REMOVE DECK SIDE TRIM COVER

Using a screwdriver, remove the deck side trim cover, as shown in the illustration.

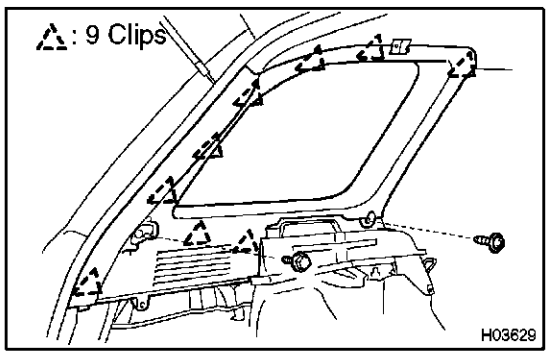
HINT:

Tape the screwdriver tip before use.



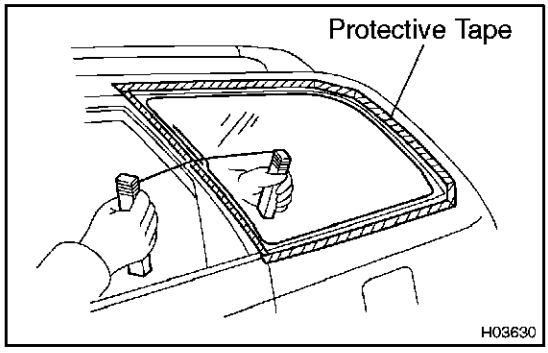
6. REMOVE DECK TRIM SIDE BOARD

Using a clip remover, remove the clip and deck trim side board.



7. REMOVE ROOF SIDE INNER GARNISH

Remove the bolt, screw and roof side inner garnish.



8. REMOVE QUARTER WINDOW GLASS

(a) Push piano wire through from the interior.

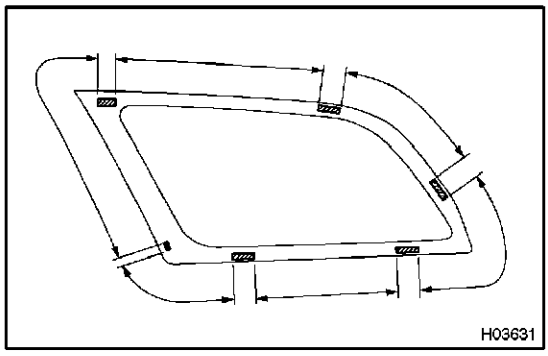
(b) Tie both wire ends to the wooden block or similar object.

HINT:

Apply adhesive tape to the outer surface to keep the surface from being scratched.

NOTICE:

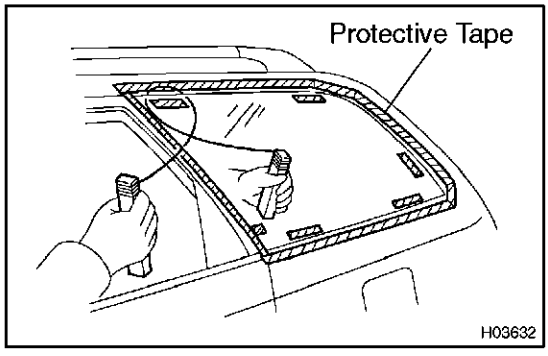
When separating the glass, take care not to damage the paint and exterior.



(c) Cut the adhesive by pulling the piano wire around it.

HINT:

Cut the adhesive areas as shown in the illustration, leaving the adhesive where the clip are.



(d) Let the piano wire pass as shown in the illustration, cut off the adhered part to the clips.

NOTICE:

Do not damage the glass retainers.

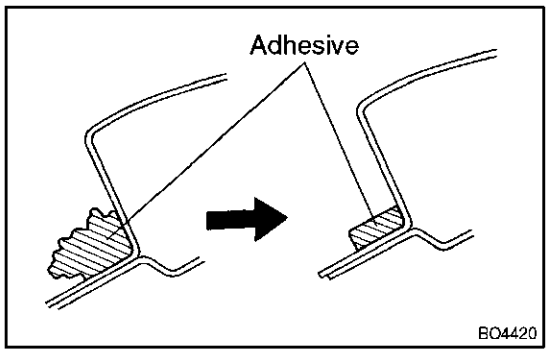
(e) Remove the 4 nuts and glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO196-01

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a piece of shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed, clean the body.

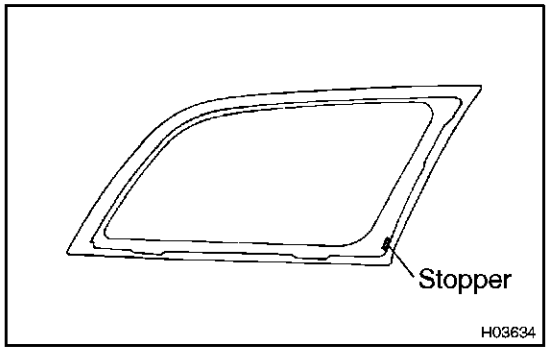
2. REPLACE STOPPER

(a) Remove the damaged stopper.

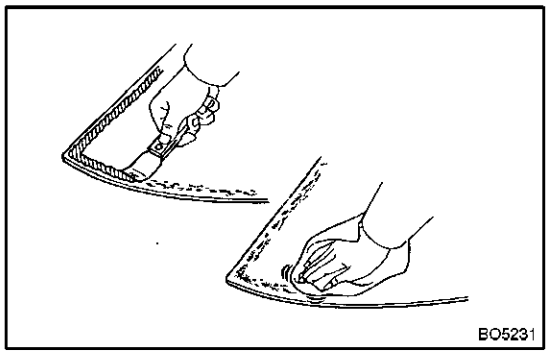
(b) Cut off the old adhesive around the stopper installation area.

NOTICE:

Be careful not to damage the glass.



(c) Install a new stopper onto the glass shown in the illustration.



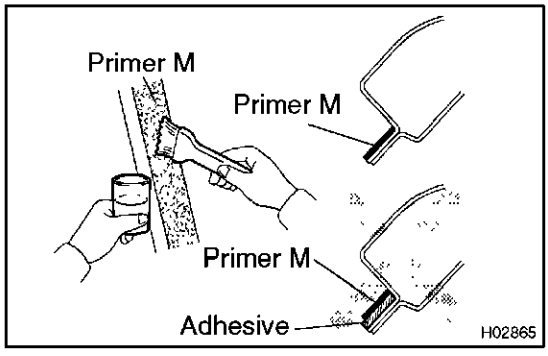
3. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

Do not touch the glass after cleaning it.

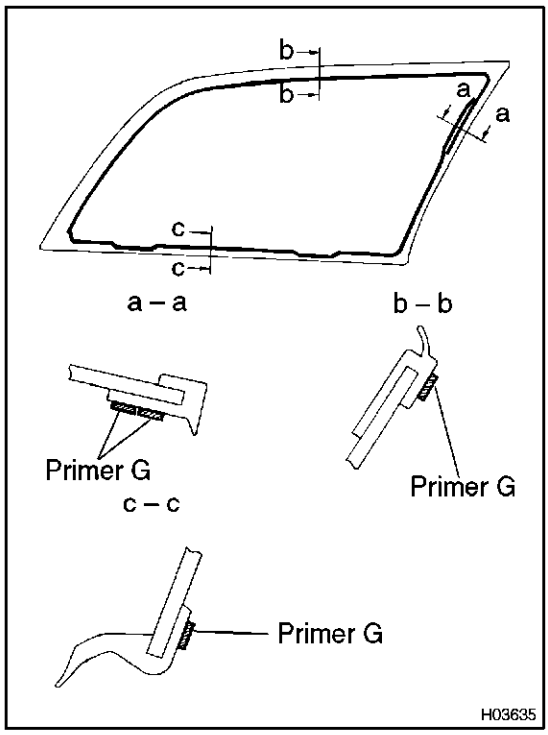


4. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat primer M to the adhesive.**
- **Do not keep any of the opened primer M for later use.**



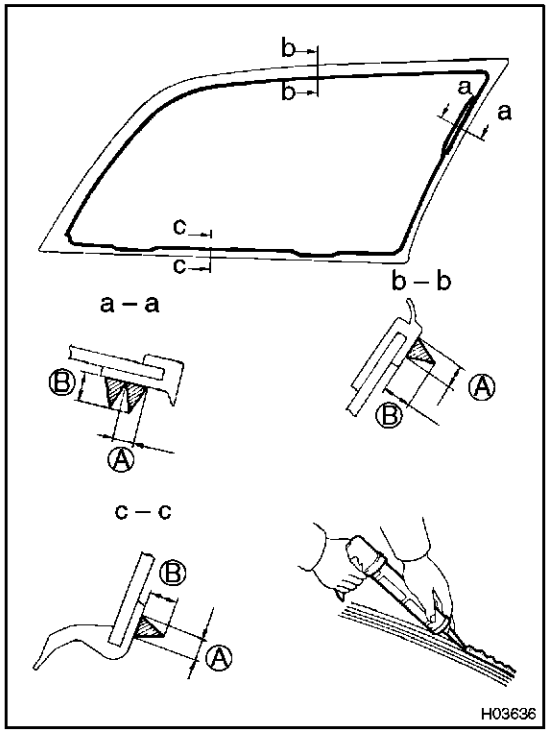
5. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and contact surface with Primer G.

(b) Before the primer dries, wipe it off with a clean shop rag.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened primer G for later use.**



6. APPLY ADHESIVE

(a) 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)	15 minutes
20 °C (68 °F)	100 minutes
5 °C (41 °F)	8 hours

(b) Load the cartridge into the sealer gun.

(c) Coat the glass with adhesive, as shown in the illustration.

A: 6.0 mm (0.236 in.)

B: 8.0 mm (0.315 in.)

7. INSTALL QUARTER WINDOW GLASS

(a) Install the glass to the body.

(b) Use adhesive tape to keep the glass installed tightly against the body.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Minimum time prior to driving the car
35 °C (95 °F)	1.5 hours
20 °C (68 °F)	5 hours
5 °C (41 °F)	24 hours

8. INSPECT FOR LEAKS AND REPAIR

(a) Conduct a leak test after the hardening time has elapsed.

(b) Seal any leak with sealant.

Part No. 08833–00030 or equivalent

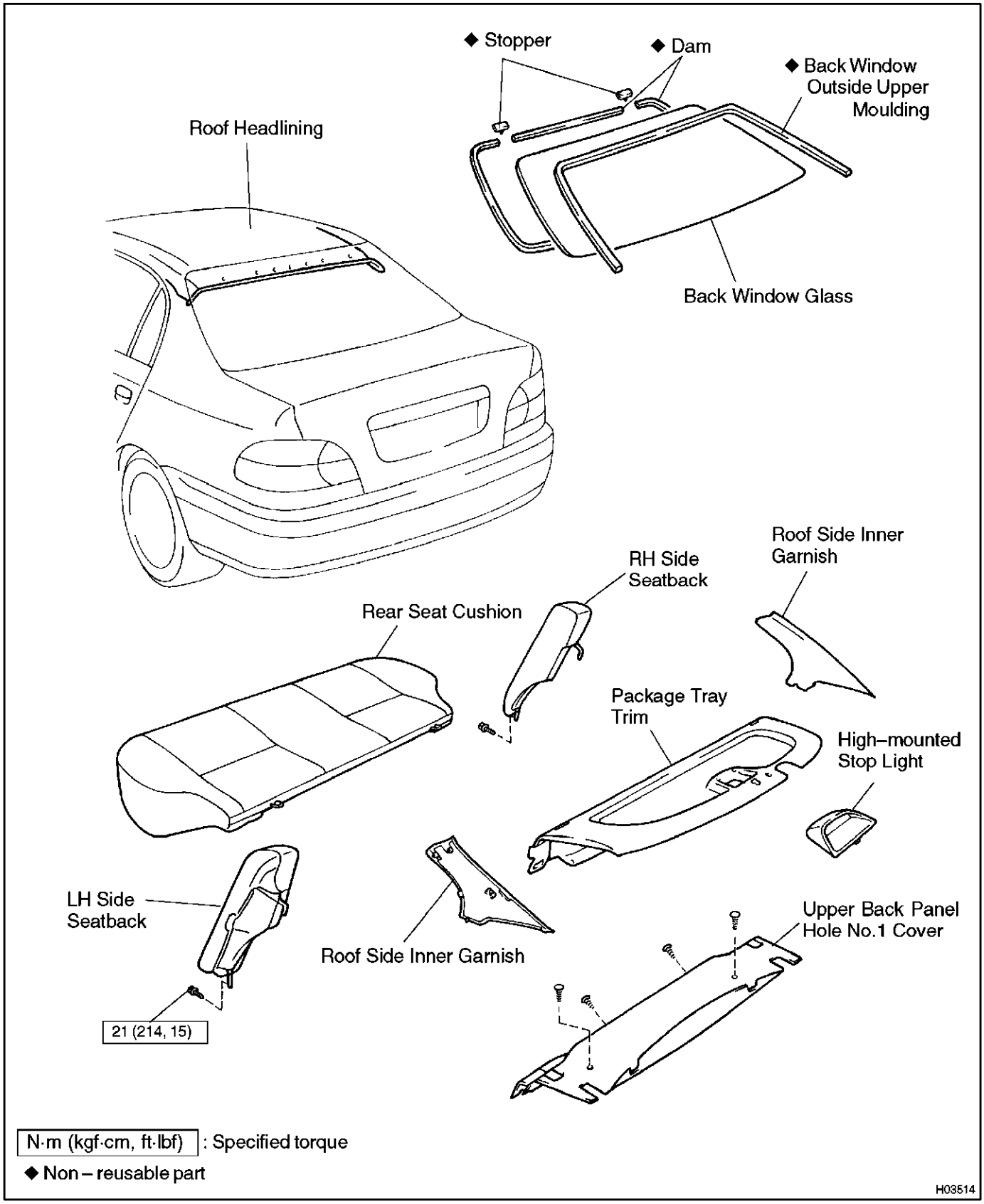
9. INSTALL THESE PARTS:

(a) Roof side inner garnish
(b) Deck trim side board
(c) Deck side trim cover
(d) Rear side seatback
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)
(e) Rear room partition net hook
(f) Rear floor finish plate
(g) w/ Room Partition Net:
Room partition net
(h) w/ Tonneau Cover:
Tonneau cover
(i) Rear door scuff plate
(j) Rear door opening trim
(k) Rear seatback assembly
(l) Rear floor carpet

BACK WINDOW GLASS (Sedan)

COMPONENTS

BO01U–02

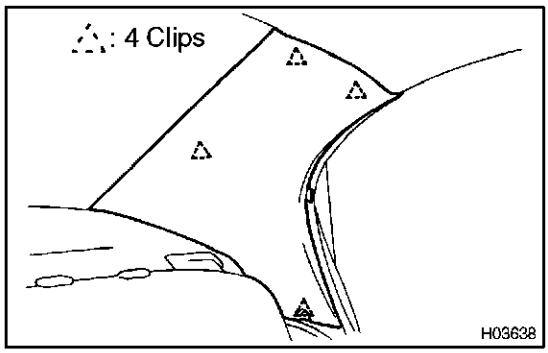


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non – reusable part

H03514

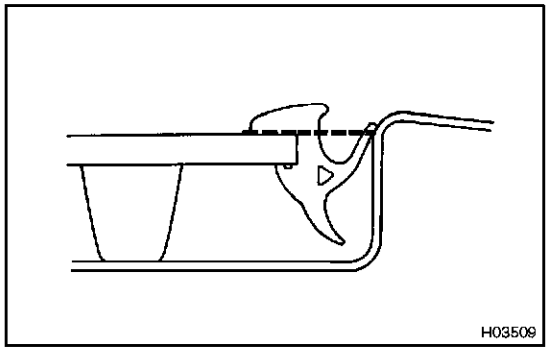
BO19H–01



REMOVAL

1. REMOVE THESE PARTS:

(a) Rear seat
(See page BO–136)
(b) Roof side inner garnishes
(c) Package tray trim
(d) w/ High–mounted Stop Light:
High–mounted stop light
(e) Rear part of roof headlining
(f) Room partition trim

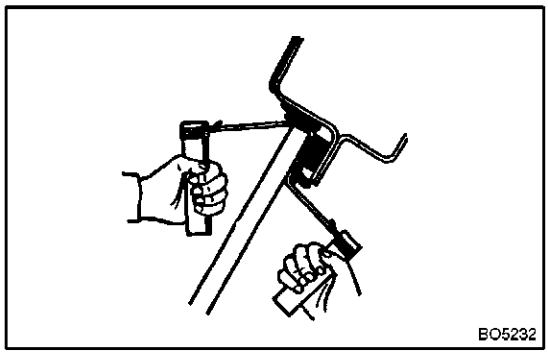


2. REMOVE BACK WINDOW OUTSIDE UPPER MOULDING

Using a knife, cut off the moulding, as shown.

NOTICE:

Do not damage the body with the knife.

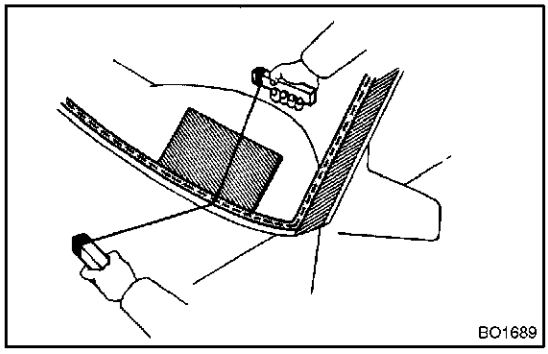


3. REMOVE BACK WINDOW GLASS

(a) Disconnect the connector.
(b) Push piano wire through between the body and glass from the interior.
(c) Tie both wire ends to a wooden block or similar object.

HINT:

Apply adhesive tape to the outer surface to keep the surface from being scratched.



NOTICE:

When separating the glass, take care not to damage the paint and exterior ornaments.

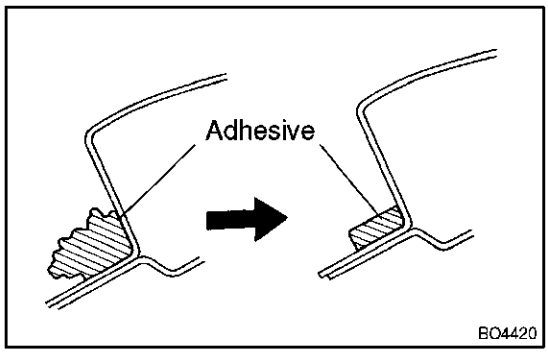
(d) Cut the adhesive by pulling the piano wire around it.
(e) Remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO19I-01

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

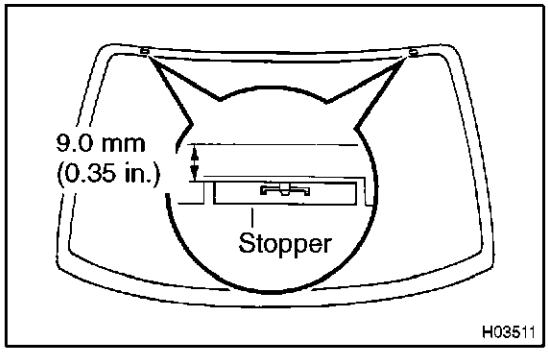
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed, clean the body.



2. REPLACE STOPPER

(a) Remove the damaged stopper.

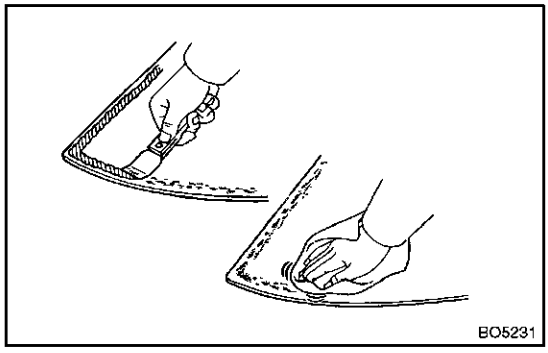
(b) Cut off the old adhesive around the stopper installation area.

NOTICE:

Be careful not to damage the body.

(c) Clean the installation area.

(d) Attach the stoppers to the glass with the ceramic notch on the glass aligned with the stoppers, as shown in the illustration.



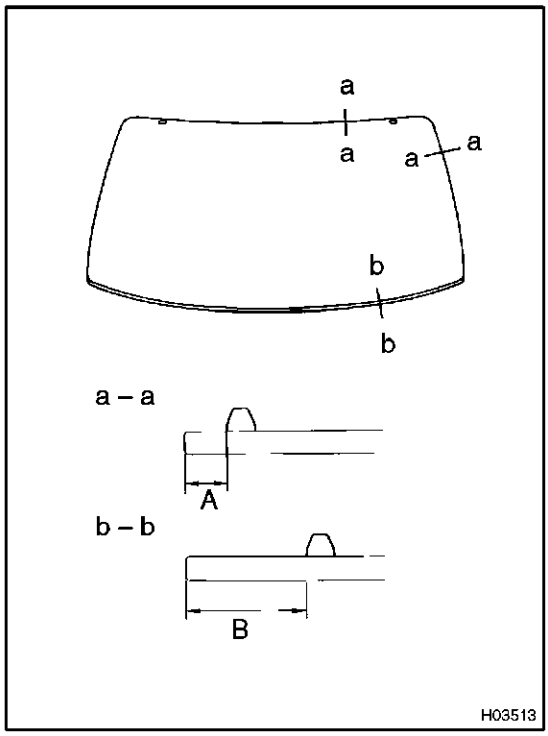
3. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

Do not touch the glass after cleaning it.



4. INSTALL DAMS

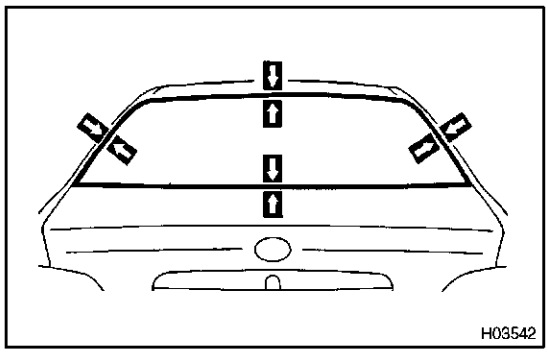
Install the dams with double – stick tape as shown in the illustration.

A: 7.0 mm (0.276 in.)

B: 20.0 mm (0.787 in.)

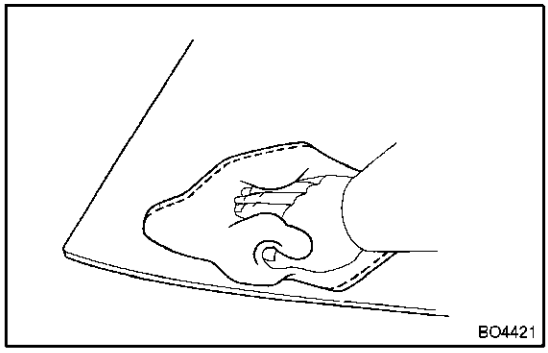
NOTICE:

Do not touch the glass surface after cleaning it.



5. POSITION GLASS

(a) Place the glass in the correct position.
(b) Check that all contacting parts of the glass rim are perfectly even.
(c) Place reference marks between the glass and body.
(d) Remove the glass.

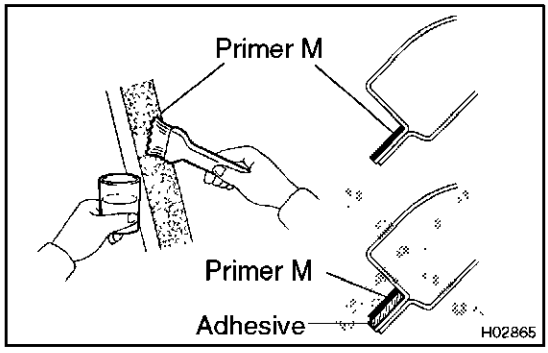


6. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black–colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.

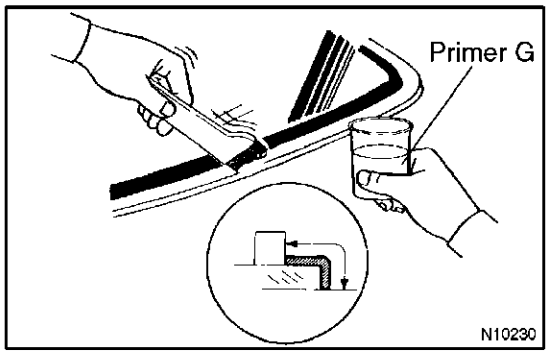


7. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**

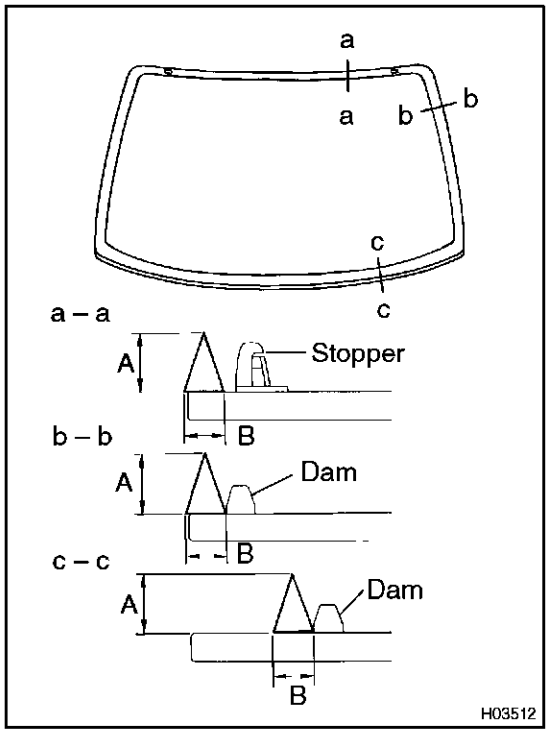


8. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.
(b) Before the primer dries, wipe it off with a clean shop rag.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**



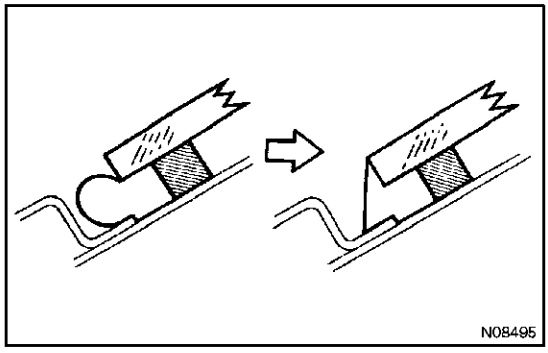
9. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.
Part No. 08850–00801 or equivalent.

HINT:
After cutting off the tip, use all adhesive within the time described in the table below.

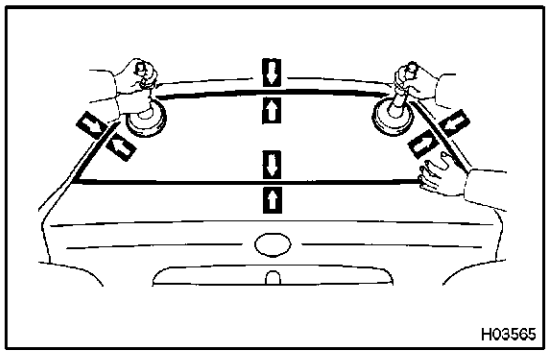
Temperature	Tackfree time
35 °C (95 °F)	15 minutes
20 °C (68 °F)	100 minutes
5 °C (41 °F)	8 hours

(b) Load the cartridge into the sealer gun.
(c) Coat the glass with adhesive as shown.
A: 12.5 mm (0.472 in.)
B: 8.0 mm (0.315 in.)

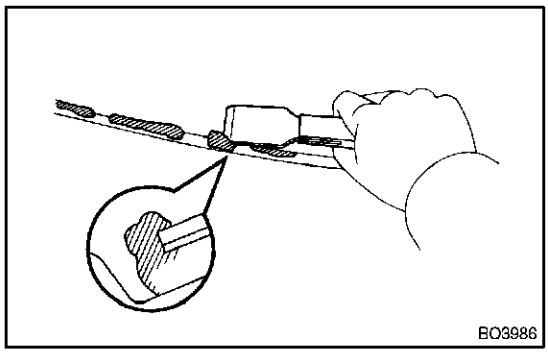


10. INSTALL GLASS

HINT:
Check that the dam is attached the body panel as shown in the illustration.



(a) Position the glass so that the reference marks are lined up, and press in gently along the rim.
(b) Using a spatula, apply adhesive on the glass rim.

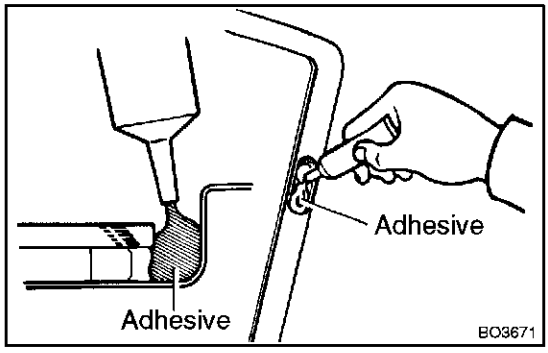

BO3986

(c) Use a scraper to remove any excessive or protruding adhesive.
(d) Hold the back window glass in place securely with protective tape or equivalent until the adhesive hardenes.

NOTICE:
Take care not to drive the vehicle during the time described in the table below.

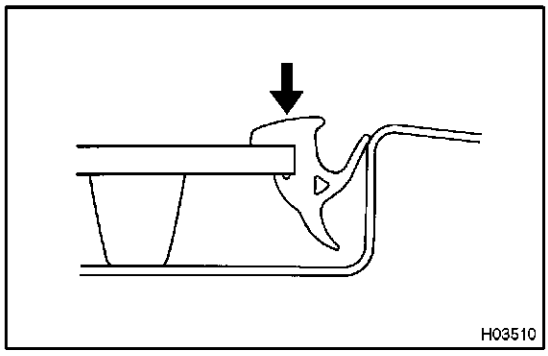
Temperature	Minimum time prior to driving the vehicle
35 °C (95 °F)	1.5 hours
20 °C (68 °F)	5 hours
5 °C (41 °F)	24 hours

11. INSPECT FOR LEAKAGE AND REPAIR
(a) Do a leak test after the hardening time has elapsed.
(b) Seal any leakage with sealant.
Part No. 08833–00030 or equivalent.



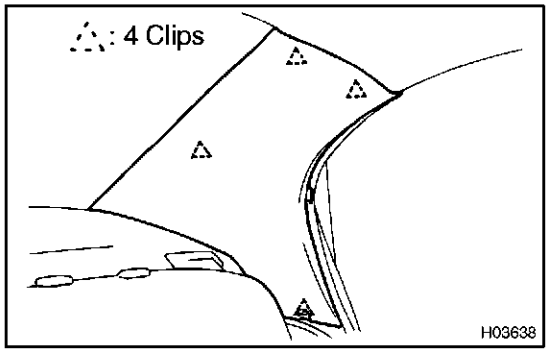
BO3671

12. APPLY ADHESIVE AT MOULDING INSTALLATION AREA
Coat the glass with adhesive at the moulding installation area.
Part No. 08833–00030 or equivalent.


H03510

13. INSTALL BACK WINDOW OUTSIDE UPPER MOULDING
Place the moulding onto the body and tap it by hand.

14. INSTALL THESE PARTS:
(a) Room partition Trim
(b) Rear part of roof headlining
(c) w/ High–mounted Stop Light
High–mounted stop light
(d) Package tray trim



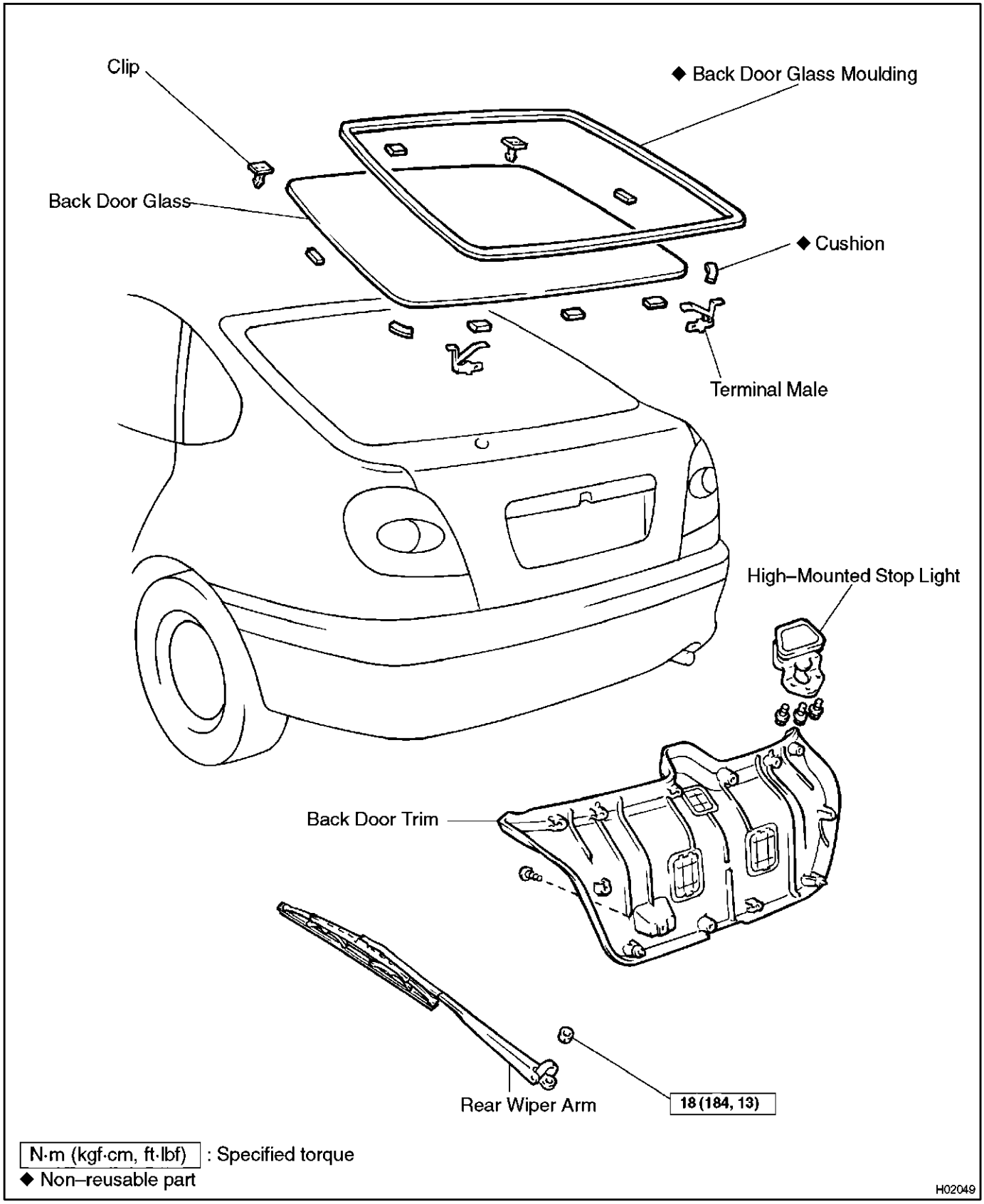
H03638

(e) Roof side inner garnishes
(f) Rear seat
(See page BO–139)

BACK DOOR GLASS (Liftback)

COMPONENTS

BO04C–02



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

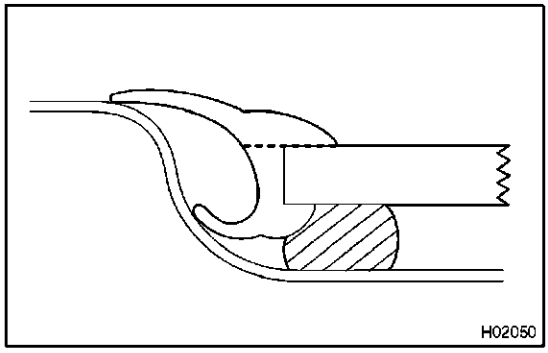
H02049

BO04D–02

REMOVAL

1. REMOVE THESE PARTS:

(a) Back door trim
(b) High–mounted stop light
(c) Rear wiper arm

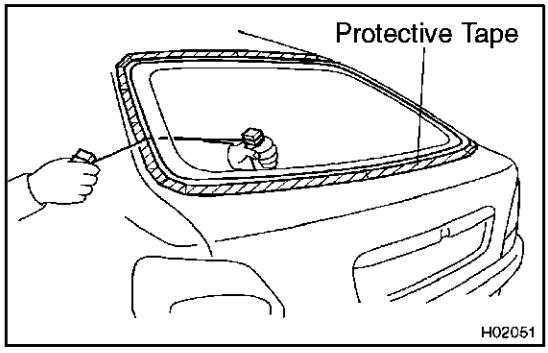


2. REMOVE BACK DOOR GLASS MOULDING

Using a knife, cut off the moulding, as shown in the illustration.

NOTICE:

Do not damage the body with the knife.



3. REMOVE BACK DOOR GLASS

(a) Push piano wire through from the interior.
(b) Tie both wire ends to wooden block or similar object.

HINT:

Apply adhesive tape to the outer surface to keep the surface from being scratched.

NOTICE:

When separating the glass, take care not to damage the paint and exterior.

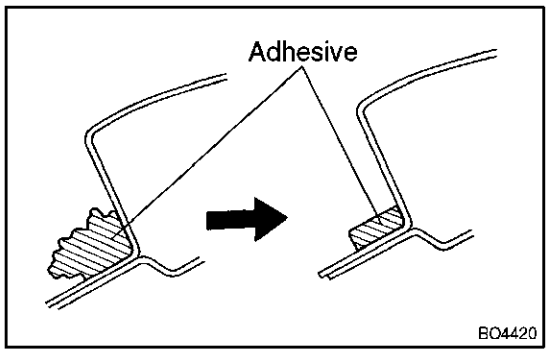
(c) Cut the adhesive by pulling the piano wire around it.
(d) Remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO04E–02

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a piece of shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed, clean the body.

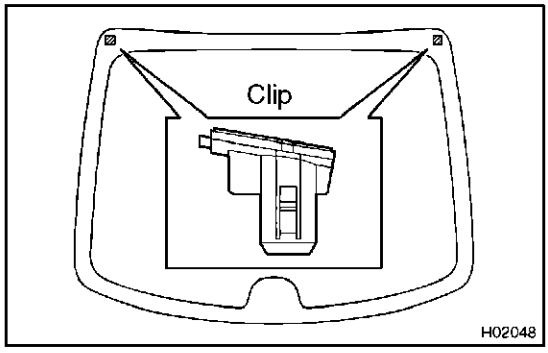
2. REPLACE SPACER

(a) Remove the damaged spacer.

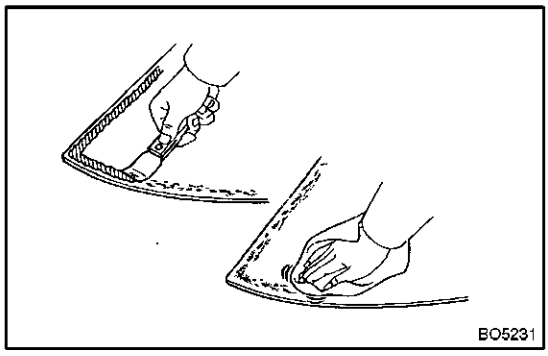
(b) Cut off the old adhesive around the spacer installation area.

NOTICE:

Be careful not to damage the back door glass.



(c) Install a new clip onto the back door, as shown in the illustration.



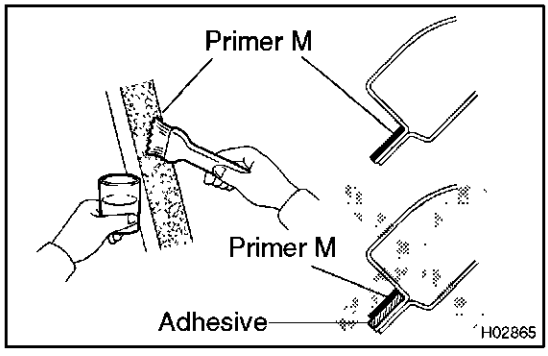
3. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

Do not touch the glass after cleaning it.

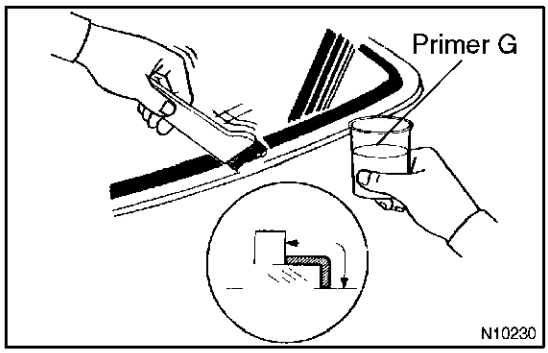


4. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat the contact surface on the body with Primer M.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat primer M to the adhesive.**
- **Do not keep any of the opened primer M for later use.**



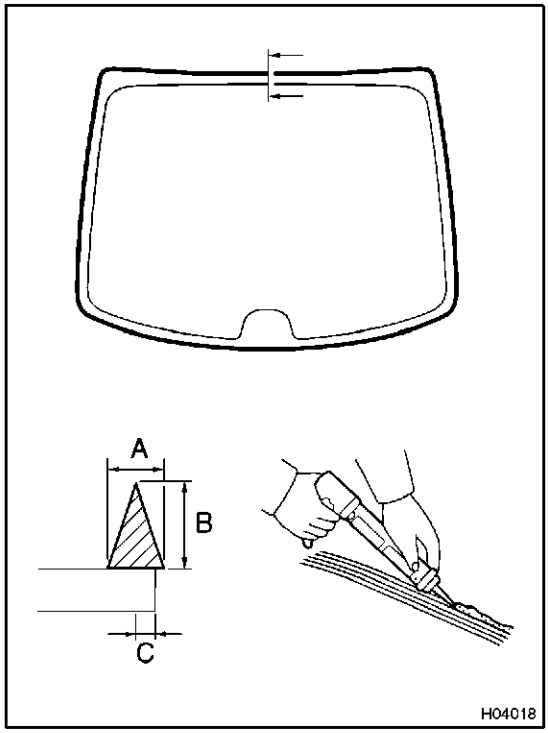
5. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and contact surface with Primer G.

(b) Before the primer dries, wipe it off with a clean shop rag.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened primer G for later use.**



6. APPLY ADHESIVE

(a) 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)	15 minute
20 °C (68 °F)	100 minute
5 °C (41 °F)	8 hour

(b) Load the cartridge into the sealer gun.

(c) Coat the glass with adhesive, as shown in the illustration.

A: 8.0 mm (0.315 in.)
B: 12.0 mm (0.472 in.)
C: 12.0 mm (0.472 in.)

7. INSTALL BACK DOOR GLASS

(a) Install the glass to the body.

(b) Use adhesive tape to keep the glass installed tightly against the body.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

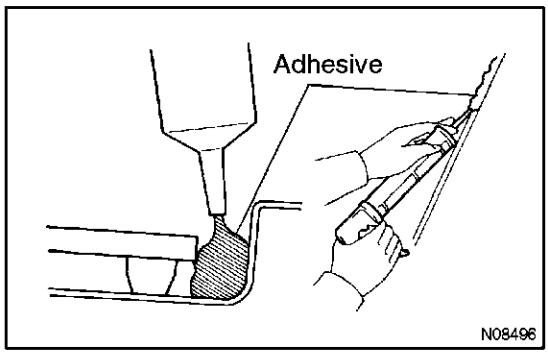
Temperature	Minimum time prior to moving a car
35 °C (95 °F)	1.5 hour
20 °C (68 °F)	5 hour
5 °C (41 °F)	24 hour

8. INSPECT FOR LEAKS AND REPAIR

(a) Conduct a leak test after the handling time has elapsed.

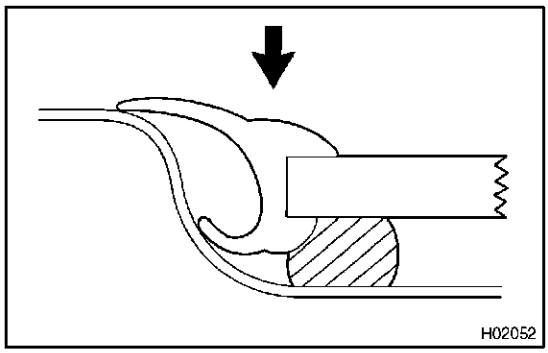
(b) Seal any leak with sealant.

Part No. 08833–00030 or equivalent



9. APPLY ADHESIVE MOULDING INSTALLATION AREA

Coat the glass with adhesive at the moulding installation area.



10. INSTALL BACK DOOR GLASS MOULDING

Place the moulding onto the body and tap it by hand.

11. INSTALL THESE PARTS:

(a) Rear wiper arm
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(b) Back door opening trim

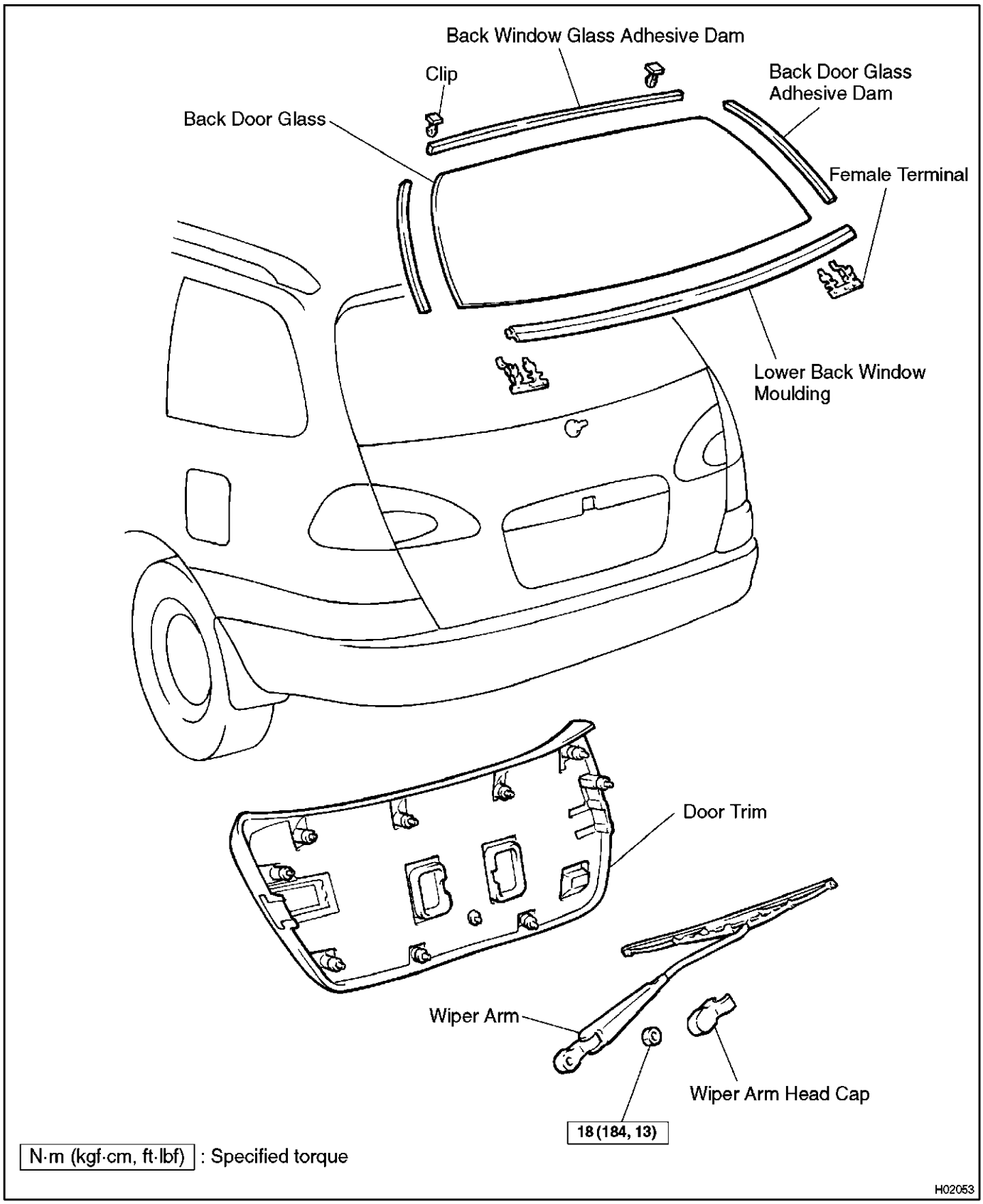
(c) High–mounted stop light

(d) Back door trim

BACK DOOR GLASS AND MOULDING (Wagon)

COMPONENTS

BO16A–01

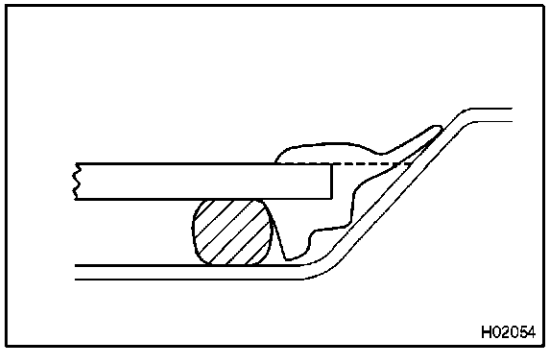


BO1BB–01

REMOVAL

1. REMOVE THESE PARTS:

(a) Back door trim
(b) Wiper arm head cap
(c) Rear wiper arm
(d) Rear wiper motor

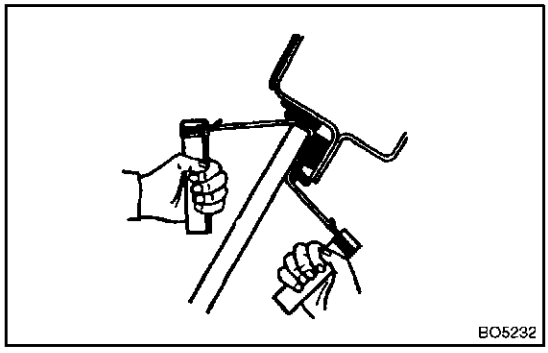


2. REMOVE LOWER BACK WINDOW MOULDING

Using a knife, cut off the moulding as shown.

NOTICE:

Do not damage the body with the knife.

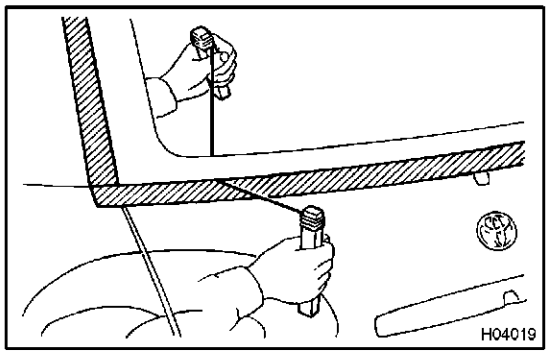


3. REMOVE BACK DOOR GLASS

(a) Disconnect the connector.
(b) Push piano wire through between the body and glass from the interior.
(c) Tie both wire ends to a wooden block of similar object.

HINT:

Apply adhesive tape to the outer surface to keep the surface from being scratched.



NOTICE:

When separating the glass, take care not to damage the paint and exterior ornaments.

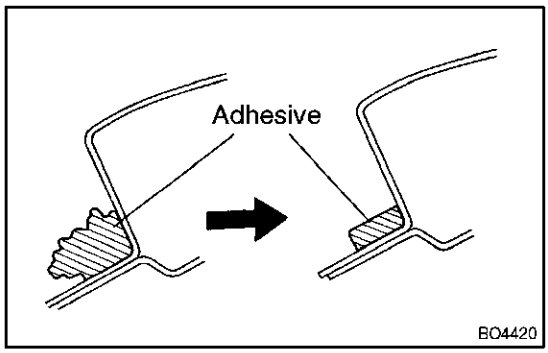
(d) Cut the adhesive by pulling the piano wire around it.
(e) Remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO1BO-01

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

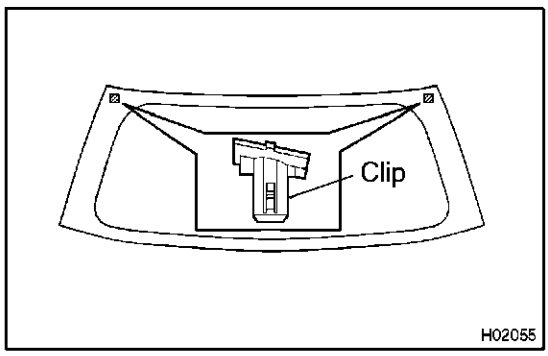
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed, clean the body.



2. REPLACE CLIP

(a) Remove the damaged clip.

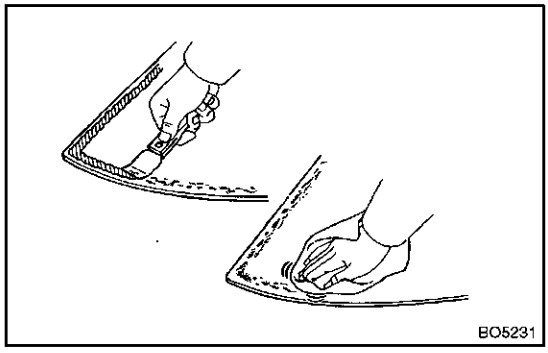
(b) Cut off the old adhesive around the clip installation area.

NOTICE:

Be careful not to damage the body.

(c) Clean the installation area.

(d) Attach the clips to the glass with the ceramic notch on the glass aligned with the clips, as shown in the illustration.



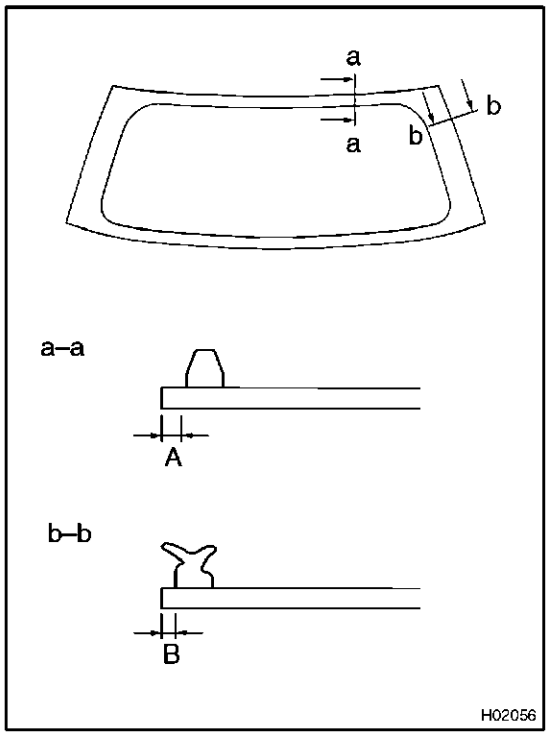
3. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

Do not touch the glass after cleaning it.



4. INSTALL DAMS

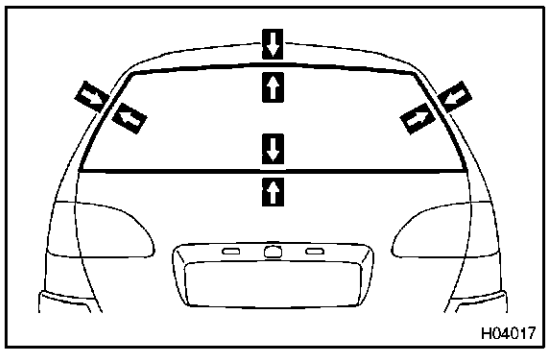
Install the dams with double–stick tape, as shown in the illustration.

A: 2.5 mm (0.098 in.)

B: 1.7 mm (0.067 in.)

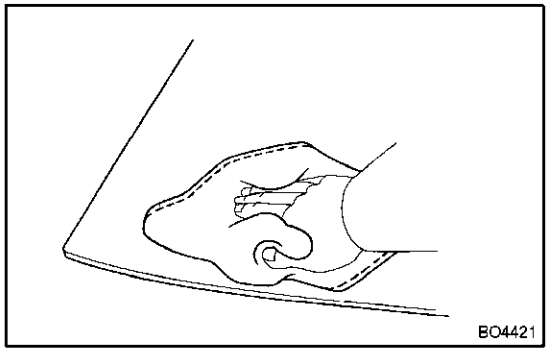
NOTICE:

Do not touch the glass surface after cleaning it.



5. POSITION GLASS

(a) Place the glass in the correct position.
(b) Check that all contacting parts of the glass rim are perfectly even.
(c) Place reference marks between the glass and body.
(d) Remove the glass.

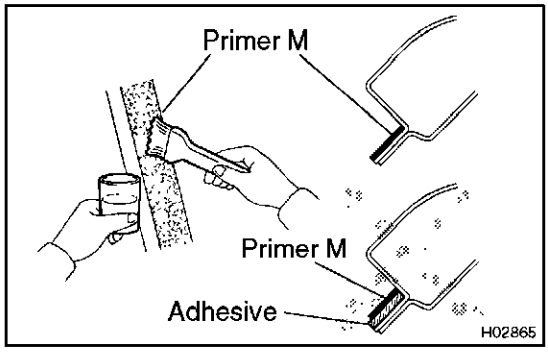


6. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black–colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.

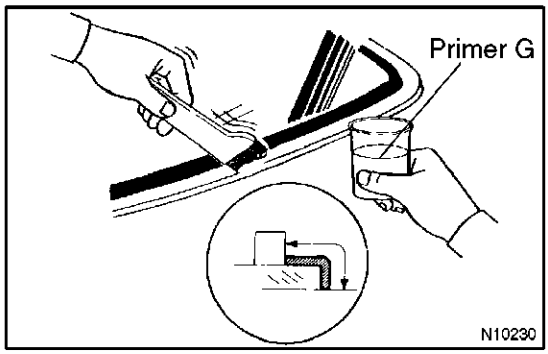


7. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**

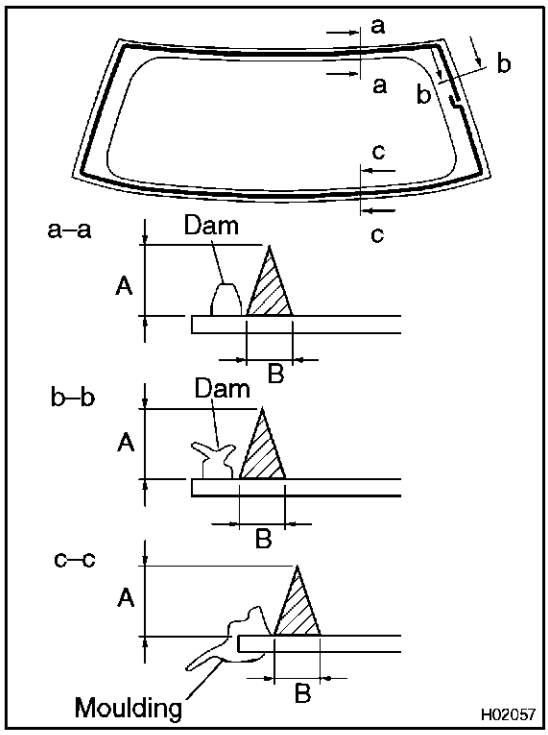


8. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.
(b) Before the primer dries, wipe it off with a clean shop rag.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep and of the opened Primer G for later use.**



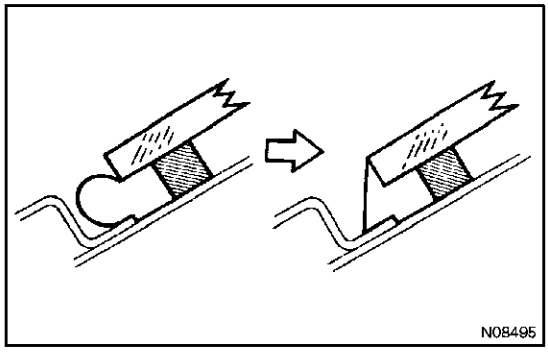
9. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.
PART No. 08850–00801 or equivalent.

HINT:
After cutting off the tip, use all adhesive within the time described in the table below.

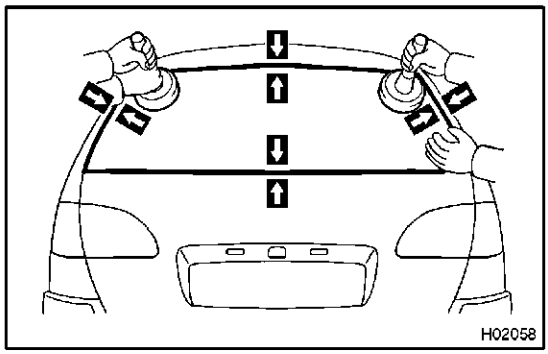
Temperature	Tackfree time
35 °C (95 °F)	15 minutes
20 °C (68 °F)	100 minutes
5 °C (41 °F)	8 hours

(b) Load the cartridge into the sealer gun.
(c) Coat the glass with adhesive as shown.
A: 12.5 mm (0.492 in.)
B: 8.0 mm (0.315 in.)

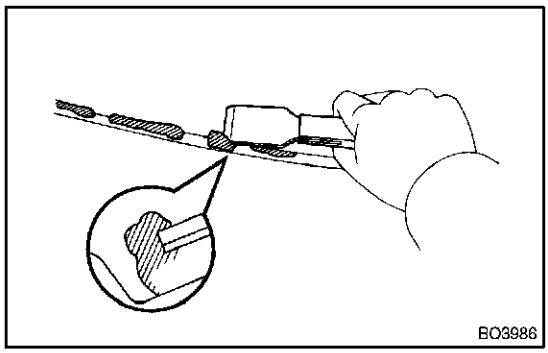


10. INSTALL GLASS

HINT:
Check that the dam is attached the body panel, as shown in the illustration.



(a) Position the glass so that the reference marks are lined up, and press in gently along the rim.
(b) Using a spatula, apply adhesive on the glass rim.

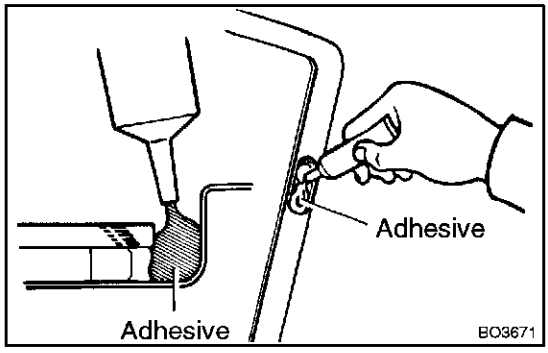

BO3986

(c) Use a scraper to remove any excessive or protruding adhesive.
(d) Hold back window glass in place securely with protective tape or equivalent until the adhesive hardens.

NOTICE:
Take care not to drive the vehicle during the time described in the table below.

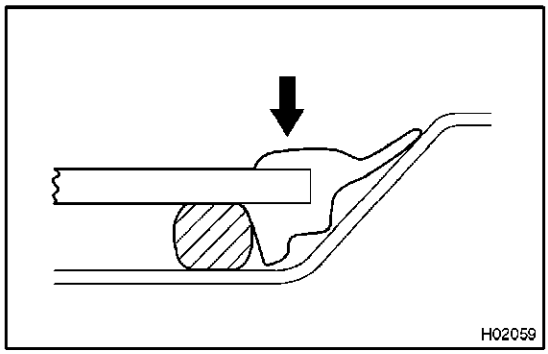
Temperature	Tackfree time
35 °C (95 °F)	1.5 hours
20 °C (68 °F)	5 hours
5 °C (41 °F)	24 hours

11. INSPECT FOR LEAKAGE AND REPAIR
(a) Do a leak test after the hardening time has elapsed.
(b) Seal any leakage with sealant.
Part No. 08833–00030 or equivalent.

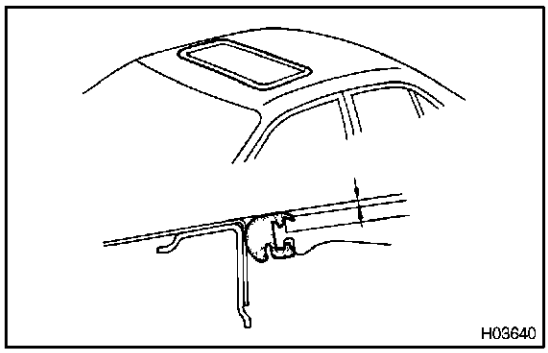


BO3671

12. APPLY ADHESIVE AT MOULDING INSTALLATION AREA
Coat the glass with adhesive at the moulding installation area.
Part No. 08833–00030 or equivalent.


H02059

13. INSTALL LOWER BACK WINDOW MOULDING
Place the moulding onto the body and tap it by hand.
14. INSTALL THESE PARTS:
(a) Rear wiper motor
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
(b) Rear wiper arm
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)
(c) Back door trim



SLIDING ROOF

BO197–01

ON–VEHICLE INSPECTION

INSPECT SLIDING ROOF GLASS ALIGNMENT

(a) Start the engine and check the operation time of the sliding roof.
Operation time:
Approx. 6 secs.

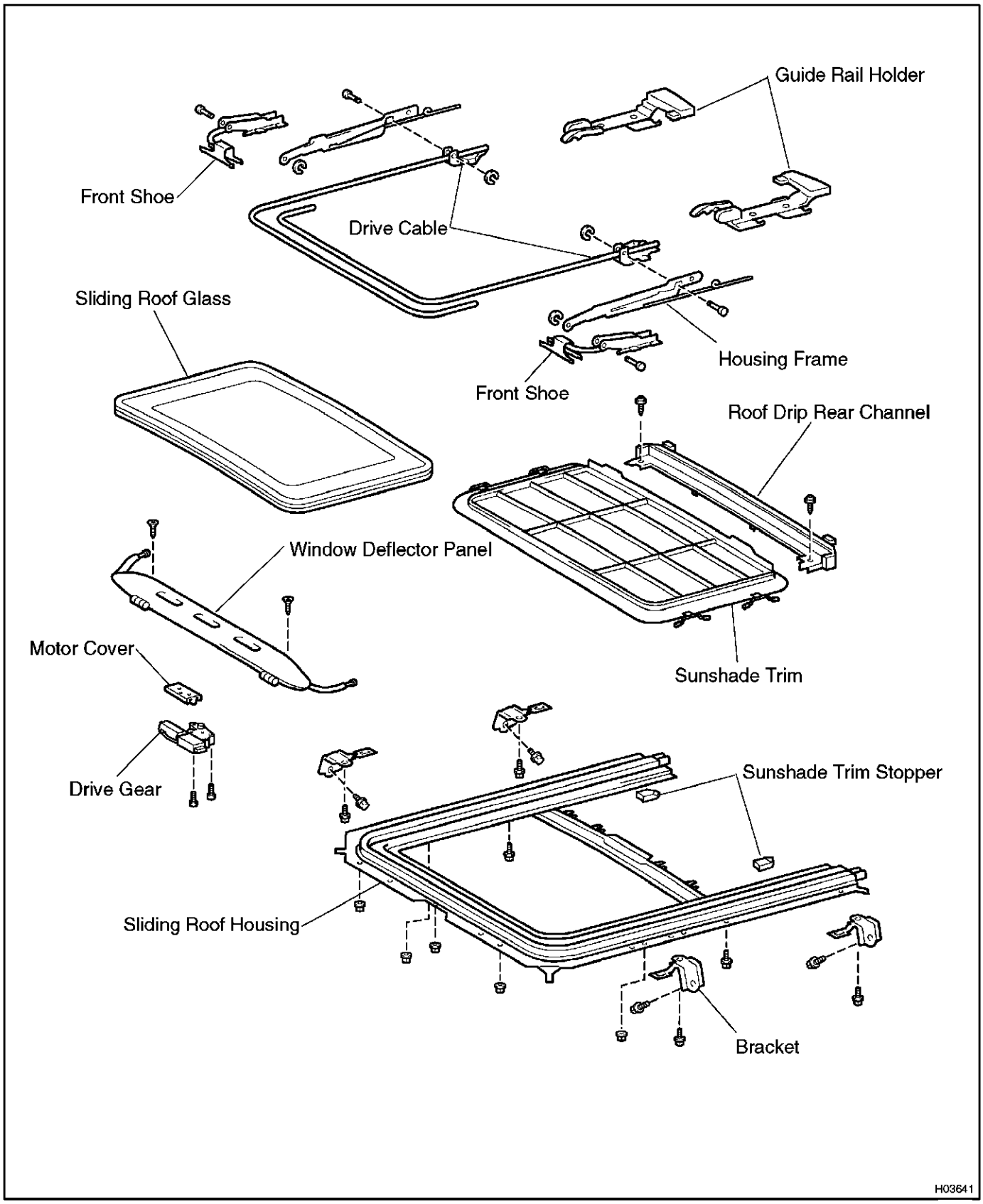
(b) Check for abnormal noise or bending during operation.

(c) With the sliding roof fully closed, check for water leakage.

(d) Check for a difference in level between the sliding roof weatherstrip and roof panel.
Except rear end:
0 ± 1.5 mm (0 ± 0.059 in.)
Rear end:
0 + 1.5 mm (0 + 0.059 in.)
0 – 1.0 mm (0 – 0.039 in.)

BO198-01

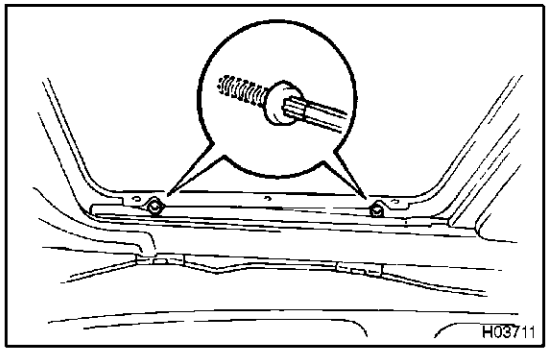
COMPONENTS



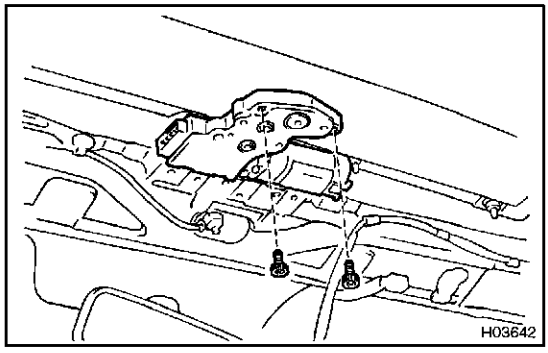
BO199–01

REMOVAL

1. REMOVE ROOF HEADLINING
(See page BO–119 or BO–122 or BO–125)

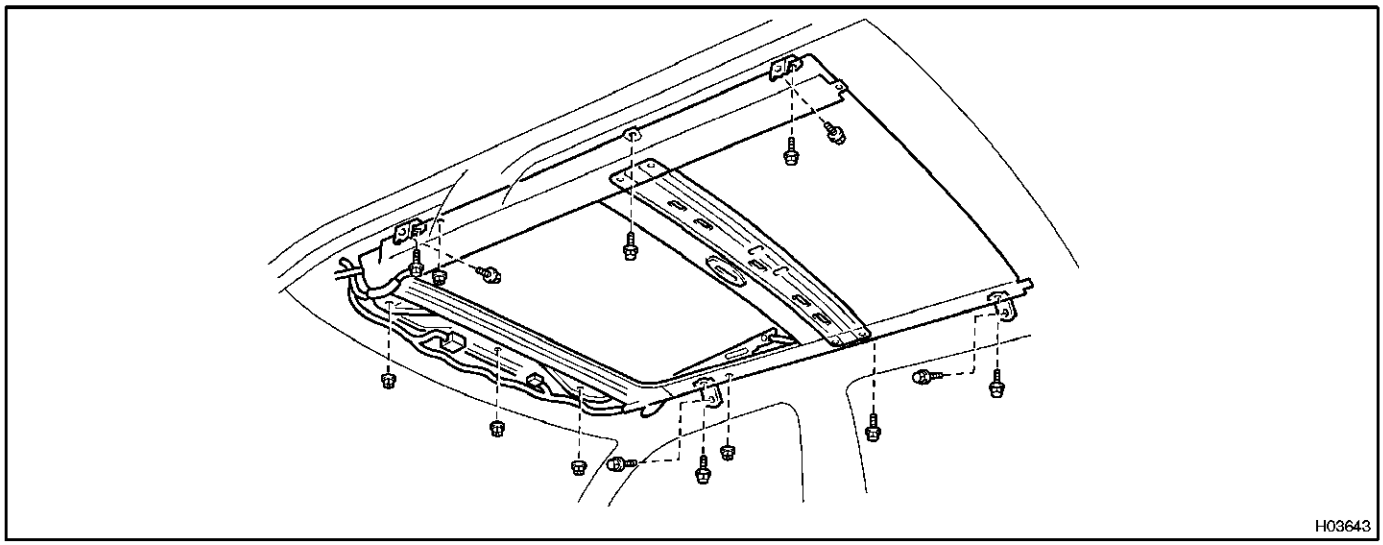


2. REMOVE SLIDING ROOF GLASS
(a) Using a torx wrench, remove the 4 screws.
(b) Pull the glass upward to remove it.



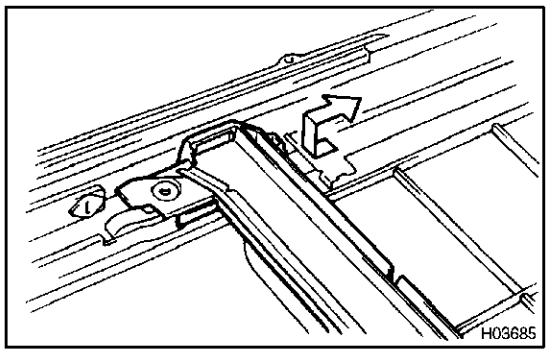
3. REMOVE DRIVE GEAR
(a) Disconnect the connector.
(b) Remove the 2 screws and drive motor.

4. REMOVE SLIDING ROOF HOUSING
(a) Disconnect the 4 drain hoses from the housing.
(b) Remove the 8 bolts and 4 brackets.
(c) Remove the 2 bolts, 5 nuts and housing.



BO19A–01

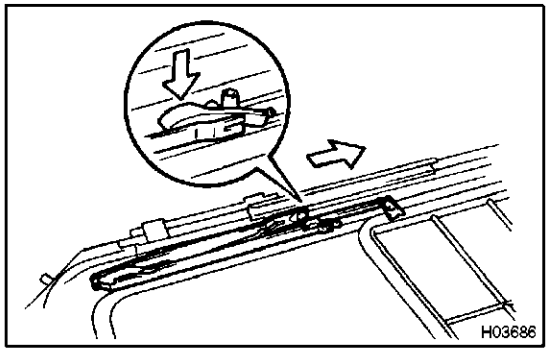
DISASSEMBLY



1. REMOVE ROOF DRIP REAR CHANNEL

(a) Remove the 2 screws.

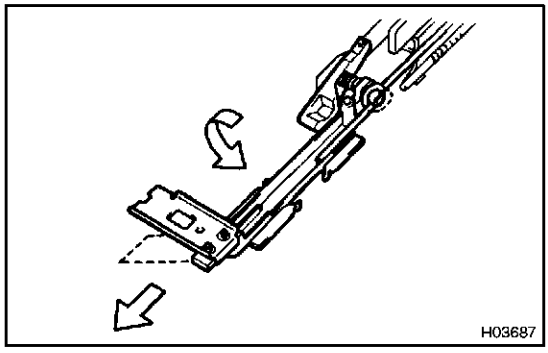
(b) Slide the rear channel forward and disengage the rear channel from the guide rail holder, then pull the channel backward and remove.



2. REMOVE SLIDING ROOF DRIVE CABLE ASSEMBLY

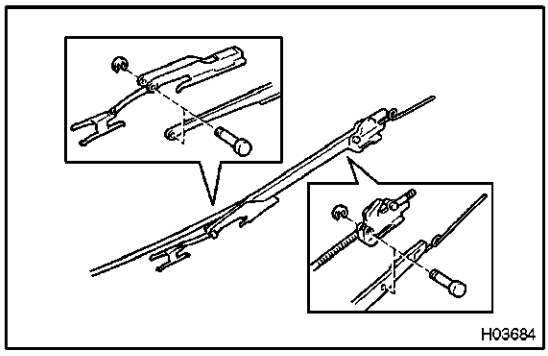
(a) Push the lever of the drive cable assembly (guide rail holder) and disengage it from the notch in the guide rail.

(b) Slide the drive cable assembly backward and pull it out of guide rail.



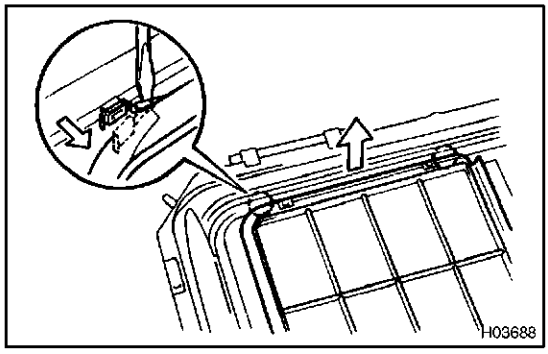
3. REMOVE GUIDE RAIL HOLDER

Turn the guide rail holder, as shown in the illustration and pull it off the housing frame.



4. REMOVE DRIVE CABLE AND FRONT SHOE

Remove the 2 E–rings to pull out 2 pins, and remove the front shoe, guide rail cover and drive cable from the housing frame.



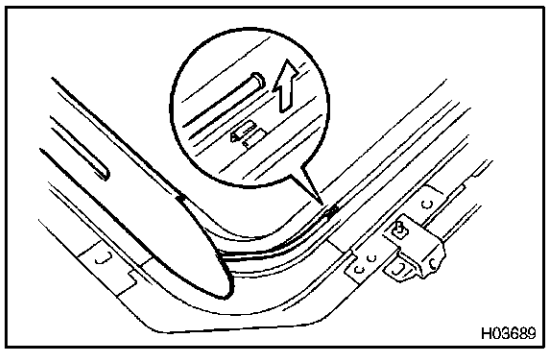
5. REMOVE SUNSHADE TRIM

(a) Remove the 2 sunshade trim stoppers.

(b) Using a screwdriver, pry up the spring to disengage the spring shoe from the guide rail and remove the sunshade trim.

HINT:

Tape the screwdriver tip before use.

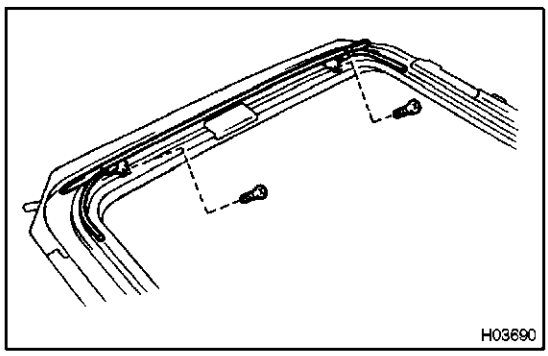


6. REMOVE WINDOW DEFLECTOR PANEL

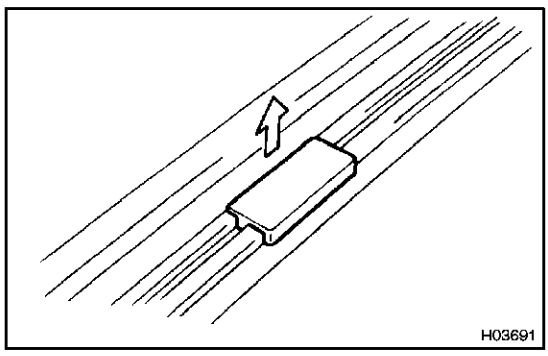
(a) Using a screwdriver, pry the arm of window deflector off the clip of guide rail.

HINT:

Tape the screwdriver tip before use.



(b) Remove the 2 screws and window deflector panel.



7. REMOVE MOTOR COVER

Pull the motor cover up and remove it.

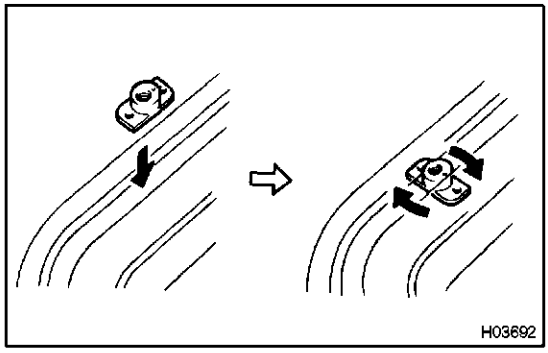
BO19B–01

REASSEMBLY

HINT:

Apply MP grease to the sliding part of the guide rail.

1. INSTALL MOTOR COVER

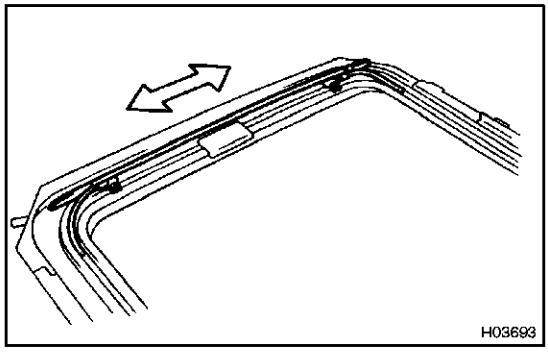


2. INSTALL WIND DEFLECTOR PANEL

(a) When T–nut is disengage from the guide rail, install the guide rail, as shown in the illustration.

HINT:

Do not mistake the T–nut installation direction.

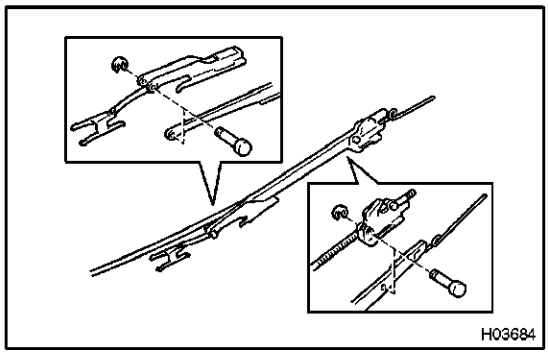


(b) Fit the arm of deflector panel into the clip.

3. INSTALL THESE PARTS:

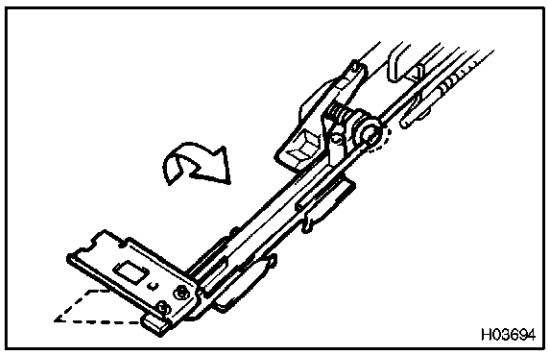
(a) Sunshade trim

(b) Sunshade trim stopper



4. INSTALL DRIVE CABLE AND FRONT SHOE

Install the front shoe, guide rail cover and drive cable with 2 pins and 2 E–rings to the housing frame.



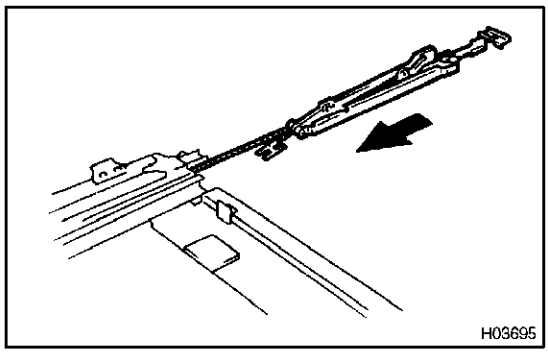
5. INSTALL GUIDE RAIL HOLDER

(a) Fit the guide rail holder into the housing frame.

(b) Turn the guide rail holder, as shown in the illustration and install it to the housing frame.

HINT:

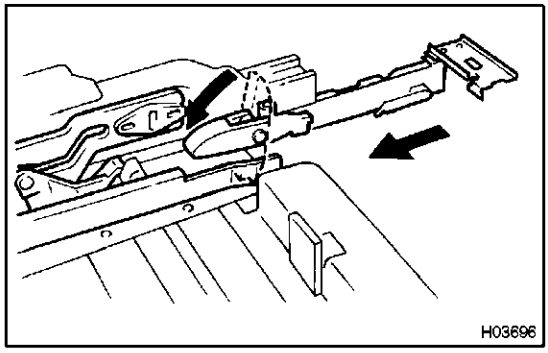
Check that the bushing fits into the housing frame securely.



6. INSTALL SLIDING ROOF DRIVE CABLE ASSEMBLY

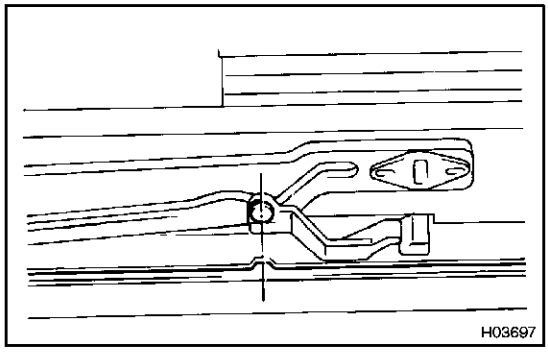
(a) Apply MP grease to the driver cable.

(b) Insert the drive cable into the guide rail from behind.

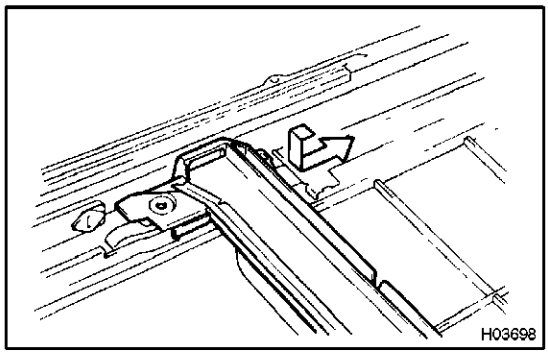


HINT:

- Turn the lever of the guide rail holder as shown in the illustration and insert it into the guide rail.
- Slide the guide rail holder forward until its lever fits in the notch in the guide rail.



(c) Slide the drive cable to align the pin of drive cable with the notch of the guide rail.



7. INSTALL ROOF DRIP REAR CHANNEL

(a) After fitting the front part of rear channel in the guide rail cover, fit the rear part in the guide rail holder.

(b) Install the 2 screws.

HINT:

Apply adhesive to 2 screws.

Part No. 08833–00070, THREE BOND 1324 or equivalent.

BO19C–01

INSTALLATION

Installation is in the reverse order of removal (See page BO–104).

HINT:

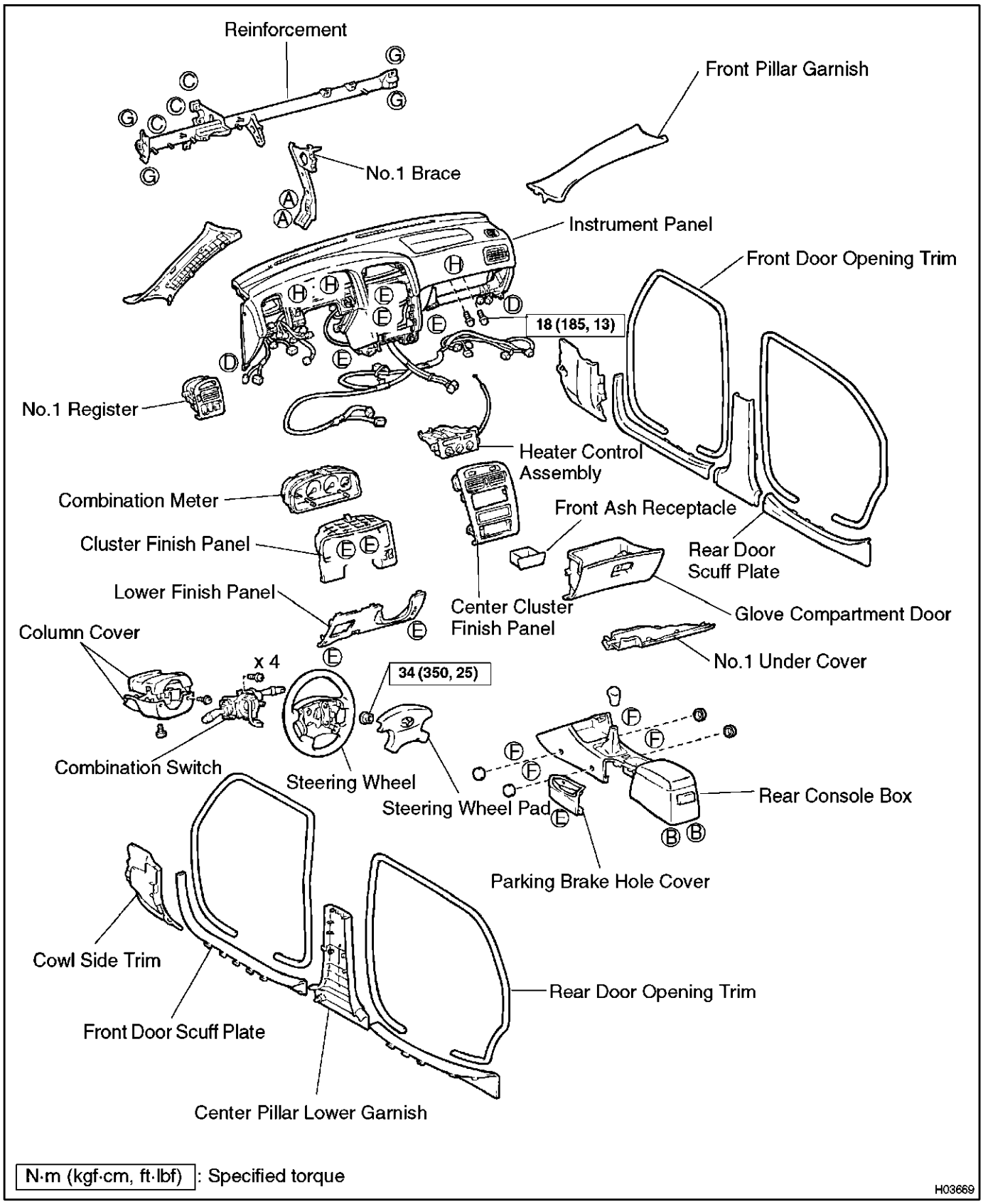
After installing the sliding roof, sliding roof need to be re–initialized.

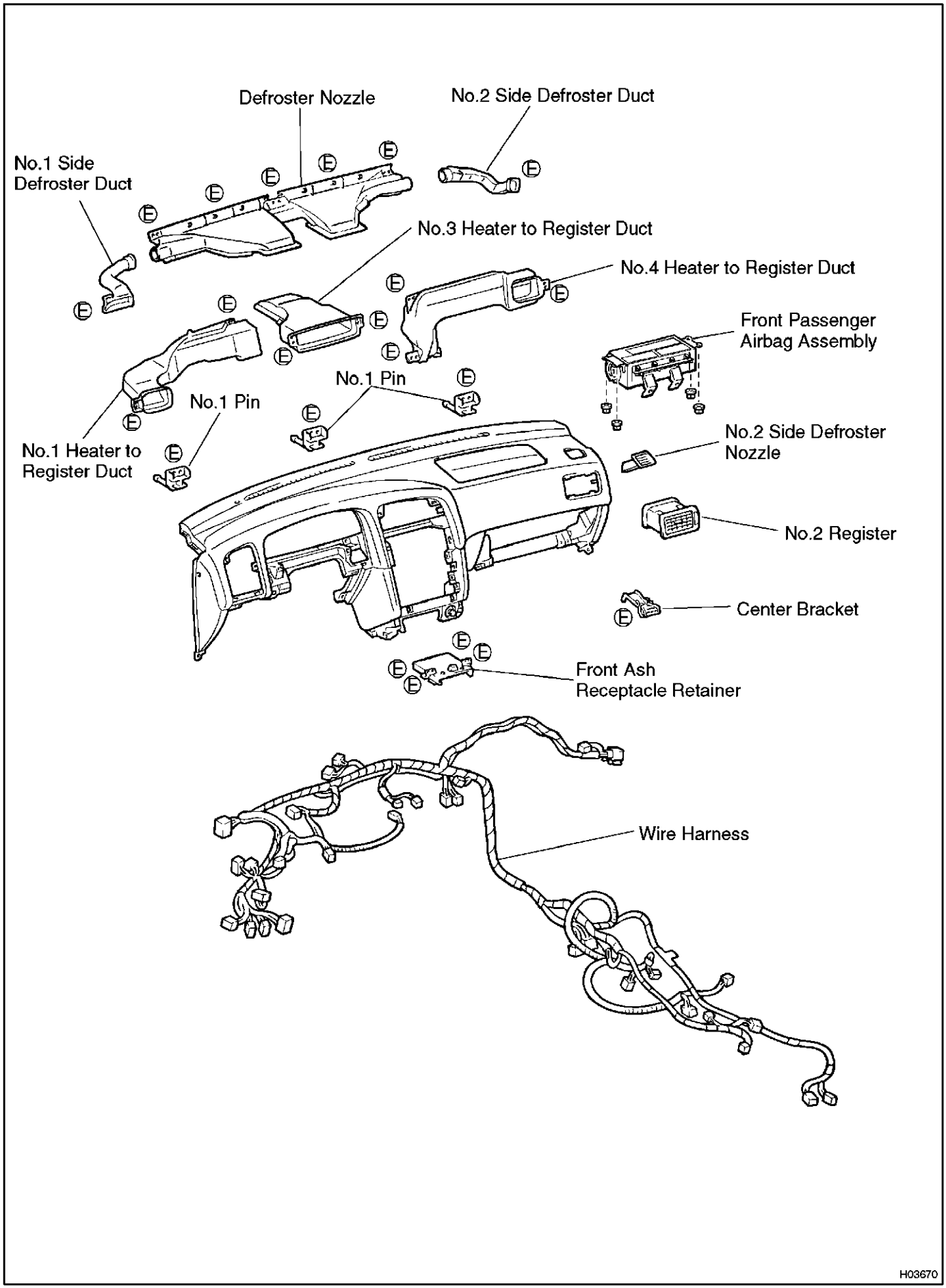
Refer to BE–104.

INSTRUMENT PANEL

COMPONENTS

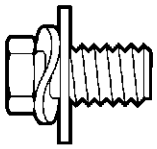
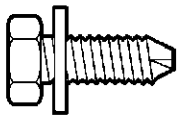
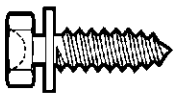
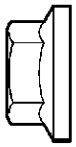
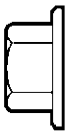
BO19J–01




Defroster Nozzle
No.2 Side Defroster Duct
No.1 Side Defroster Duct
No.3 Heater to Register Duct
No.4 Heater to Register Duct
Front Passenger Airbag Assembly
No.1 Pin
No.1 Pin
No.1 Heater to Register Duct
No.2 Side Defroster Nozzle
No.2 Register
Center Bracket
Front Ash Receptacle Retainer
Wire Harness
H03670

HINT:
Screw shapes and size are indicated in the table below. The codes (A – H) correspond to those indicated on the previous page.

mm (in.)

	Shape	Size		Shape	Size		Shape	Size
Ⓐ		ø = 8 (0.31) L = 16 (0.63)	Ⓑ		ø = 6 (0.24) L = 20 (0.79)	Ⓒ		ø = 6 (0.24) L = 18 (0.71)
Ⓓ		ø = 6 (0.24) L = 16 (0.63)	Ⓔ		ø = 5.22 (0.2055) L = 16 (0.63)	Ⓕ		ø = 5 (0.20) L = 18.5 (0.728)
Ⓖ		ø = 8 (0.31)	Ⓗ		ø = 6 (0.24)			

H03703

BO19K–01

REMOVAL

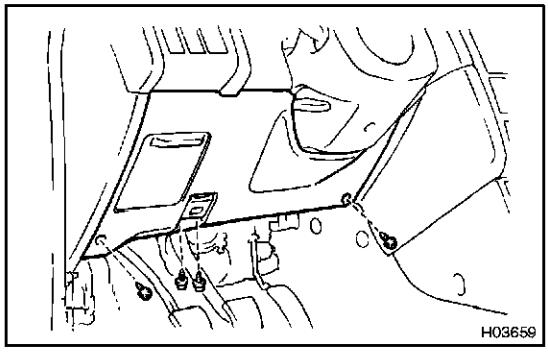
1. REMOVE THESE PARTS:

(a) Front door opening trims
(b) Front pillar garnishes
(c) Front door scuff plates
(d) Cowl side trims
(e) Rear door opening trims
(f) Rear door scuff plates
(g) Center pillar lower covers
(h) Front seats

Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

2. REMOVE STEERING WHEEL

(See page SR–13)



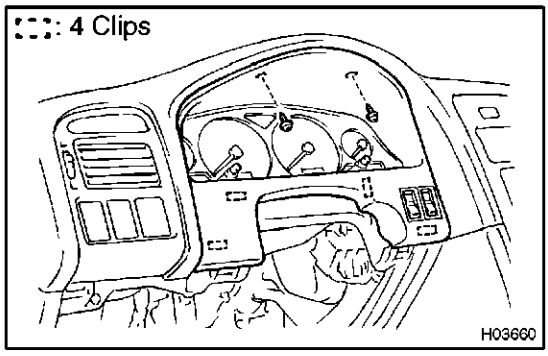
3. REMOVE LOWER FINISH PANEL

(a) Remove the 2 screws and hood lock control lever.
(b) Remove the 2 screws and lower finish panel.

4. REMOVE THESE PARTS:

(See page SR–13)

(a) Column cover
(b) Combination switch
(c) Steering column



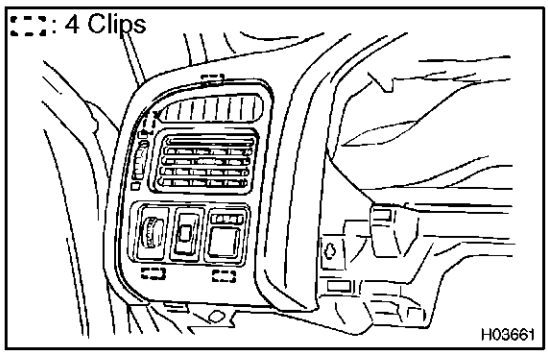
5. REMOVE CLUSTER FINISH PANEL

(a) Remove the 2 screws.
(b) Using a screwdriver, remove the cluster finish panel, then disconnect the connector.

HINT:

Tape the screwdriver tip before use.

6. REMOVE COMBINATION METER

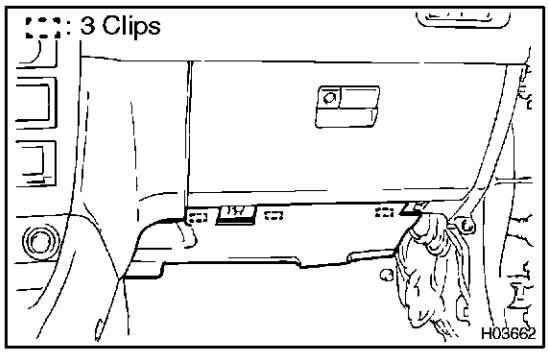


7. REMOVE NO.1 REGISTER

Using a screwdriver, remove the No.1 register.

HINT:

Tape the screwdriver tip before use.

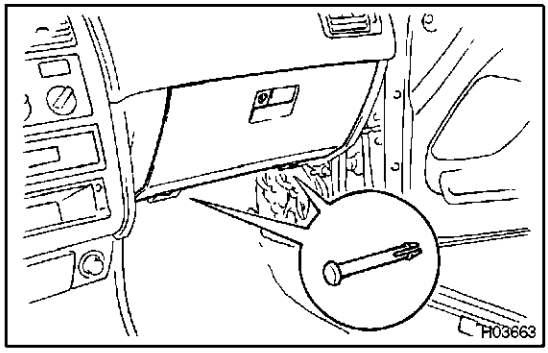


8. REMOVE NO.1 UNDER COVER

Using a screwdriver, remove the No.1 under cover.

HINT:

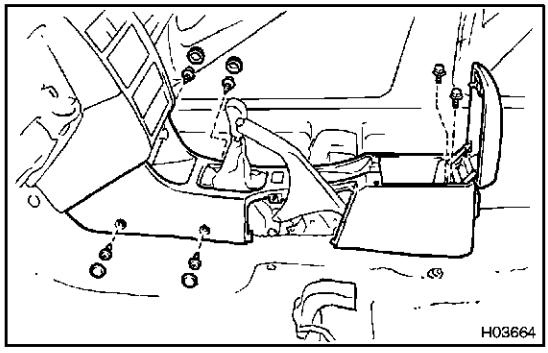
Tape the screwdriver tip before use.



9. REMOVE GLOVE COMPARTMENT DOOR

Remove the 2 glove shaft and glove compartment door.

10. REMOVE PARKING BRAKE HOLE COVER

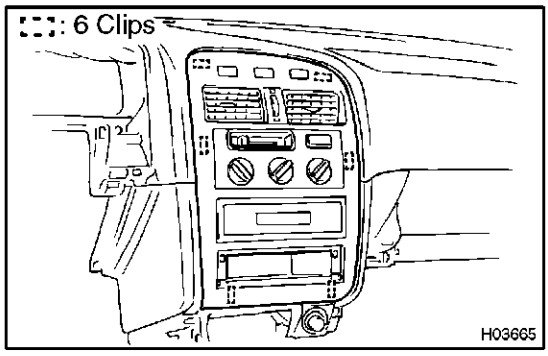


11. REMOVE REAR CONSOLE BOX

(a) M/T:

Remove the shift lever knob.

(b) Remove the 2 bolts, 4 caps, 4 screws and rear console box.

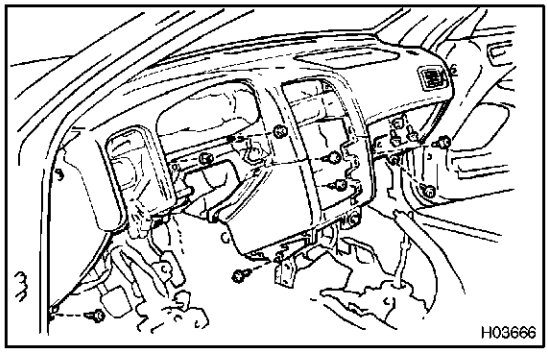


12. REMOVE CENTER CLUSTER FINISH PANEL

Using a screwdriver, remove the panel, then disconnect the connectors.

13. REMOVE HEATER CONTROL ASSEMBLY

(See page AC–106)



14. REMOVE INSTRUMENT PANEL

(a) Remove the 2 bolts from the front passenger airbag assembly.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(b) Remove the 6 screws and 3 nuts.

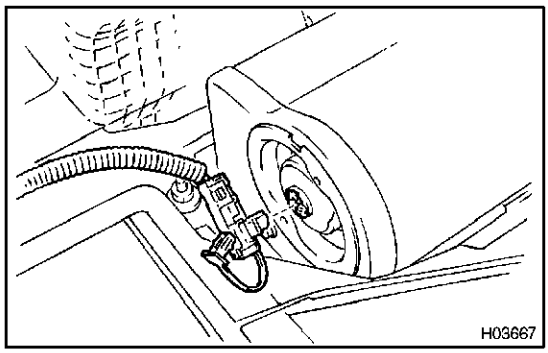
15. REMOVE THESE PARTS:

(a) No.1 brace

(b) Reinforcement

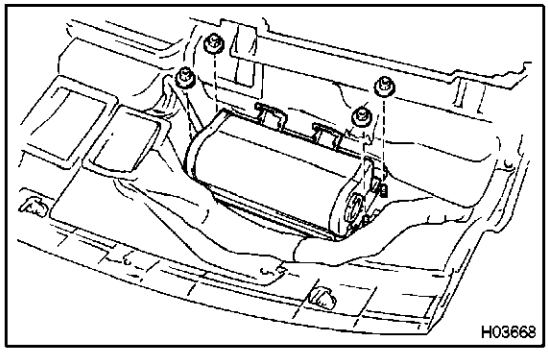
BO19L-01

DISASSEMBLY



1. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY

(a) Disconnect the connector, as shown in the illustration.



(b) Remove the 4 nuts and front passenger airbag assembly.

CAUTION:

- **Do not store the front passenger airbag assembly with the airbag deployment direction facing down.**
- **Never disassemble the front passenger airbag assembly.**

2. REMOVE THESE PARTS:

(a) No.1 pins
(b) Front ash receptacle retainer
(c) Defroster nozzle
(d) No.2 side defroster nozzle duct
(e) No.1 heater to register duct
(f) No.1 side defroster nozzle duct
(g) No.4 heater to register duct
(h) Center bracket
(i) No.2 side defroster nozzle
(j) No.2 register
(k) No.3 heater to register duct
(l) Wire harness

BO19M–01

REASSEMBLY

Reassembly is in the reverse order of disassmbly (See page BO–115).

BO19N–01

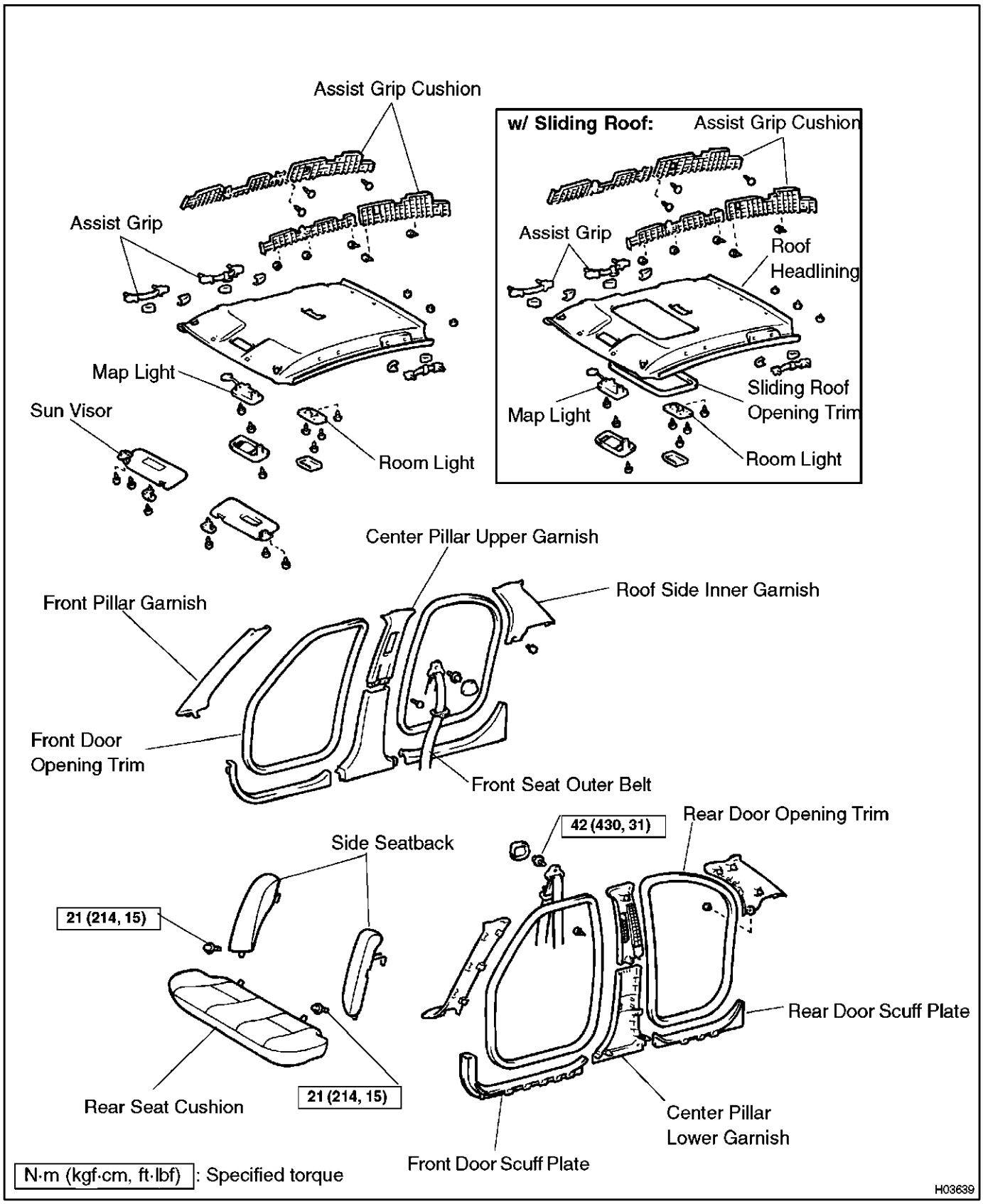
INSTALLATION

Installation is in the reverse order of removal (See page BO–113).

ROOF HEADLINING (Sedan)

COMPONENTS

BO190–01

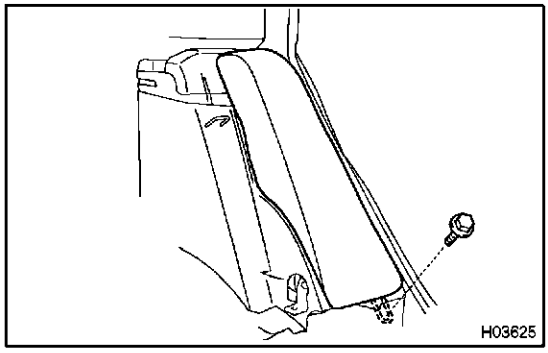


BO19P–01

REMOVAL

1. REMOVE THESE PARTS:

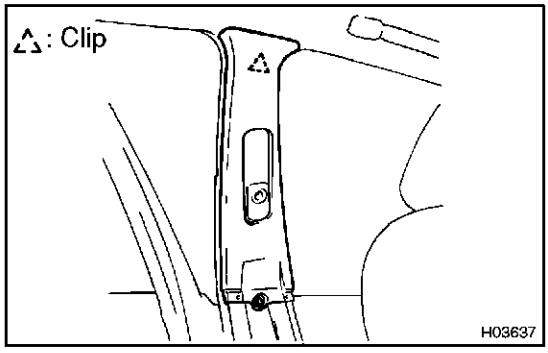
(a) Front door opening trims
(b) Front pillar garnishes
(c) Front door scuff plates
(d) Rear door opening trims
(e) Rear door scuff plates
(f) Center pillar lower garnishes
(g) Rear seat cushion



2. REMOVE REAR SIDE SEATBACK

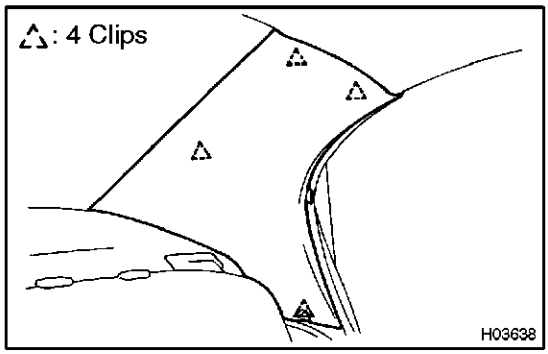
Remove the bolt and rear side seatback.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



3. REMOVE CENTER PILLAR UPPER GARNISH

(a) Remove the front seat outer belt shoulder anchor.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)
(b) Remove the screw and center pillar upper garnish.



4. REMOVE ROOF SIDE INNER GARNISH

Remove the roof side inner garnish.

5. REMOVE THESE PARTS:

(a) Assist grips
(b) Sun visors and holders
(c) Room light
(d) Map light
(e) w/ Sliding Roof:
Sliding roof opening trim

6. REMOVE ROOF HEADLINING

Using a clip remover, remove the 3 clips and roof headlining.

7. REMOVE ASSIST GRIP CUSHION

BO19Q–01

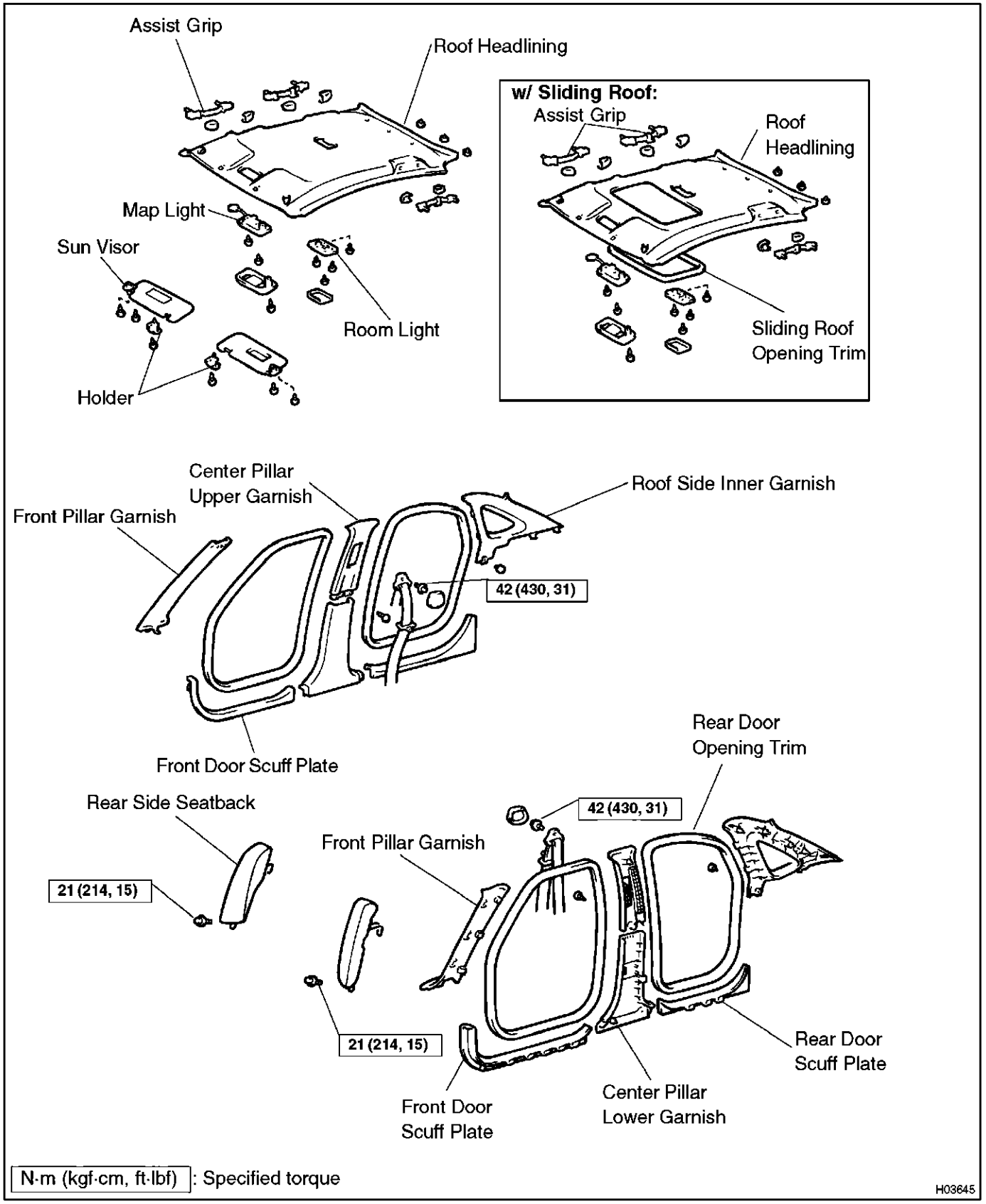
INSTALLATION

Installation is in the reverse order of removal (See page BO–119).

ROOF HEADLINING (Liftback)

COMPONENTS

BO19R–01



N·m (kgf·cm, ft·lbf) : Specified torque

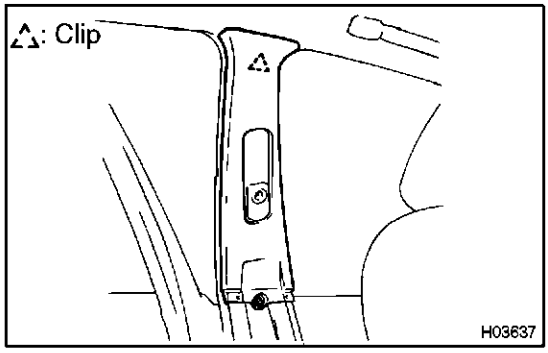
H03645

BO19S–01

REMOVAL

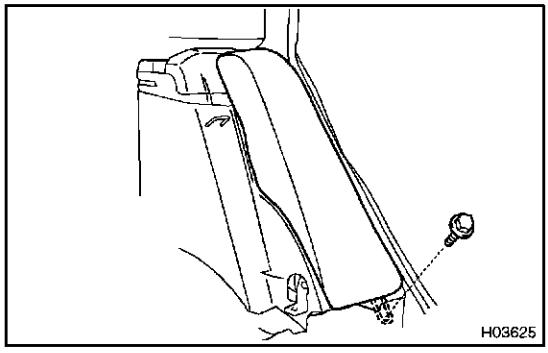
1. REMOVE THESE PARTS:

(a) Front door opening trims
(b) Front pillar garnishes
(c) Front door scuff plates
(d) Rear door opening trims
(e) Rear door scuff plates
(f) Center pillar lower garnishes



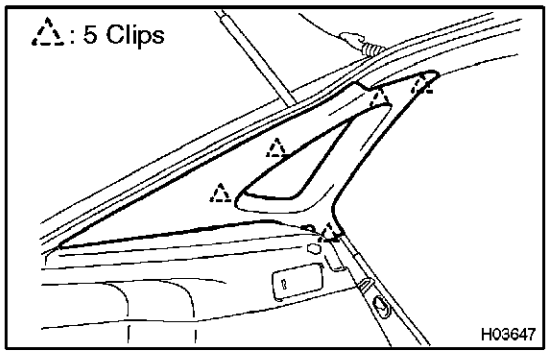
2. REMOVE CENTER PILLAR UPPER GARNISH

(a) Remove the front seat outer belt shoulder anchor.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)
(b) Remove the screw and center pillar upper garnish.



3. REMOVE REAR SIDE SEATBACK

Remove the bolt and rear side seatback.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



4. REMOVE ROOF SIDE INNER GARNISH

Remove the garnish.

5. REMOVE THESE PARTS:

(a) Assist grips
(b) Sun visors and holders.
(c) Room light
(d) Map light
(e) w/ Sliding Roof:
Sliding roof opening trim

6. REMOVE ROOF HEADLINING

Using a clip remover, remove the 3 clips and roof headlining.

BO19T–01

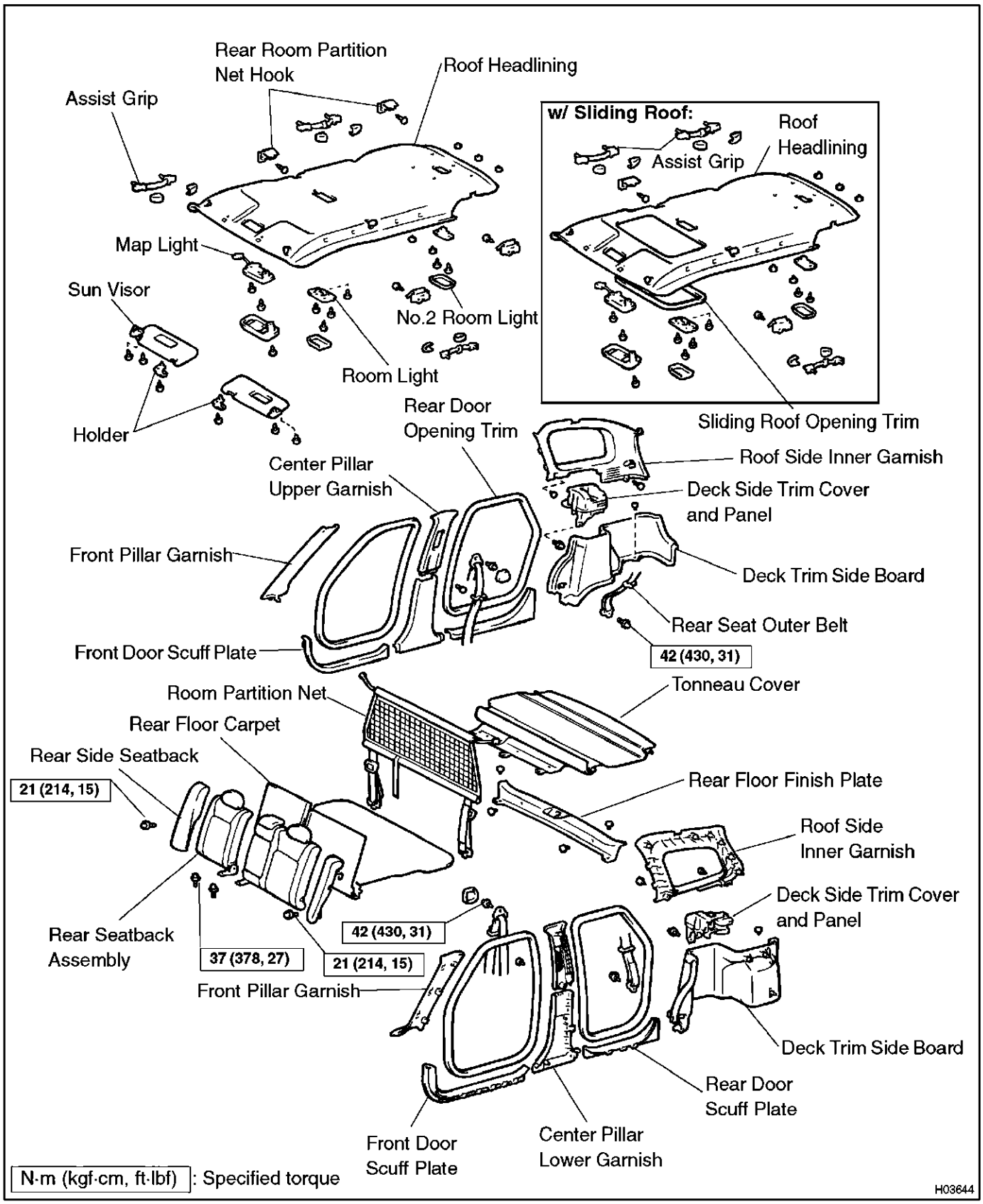
INSTALLATION

Installation is in the reverse order of removal (See page BO–122).

ROOF HEADLINING (Wagon)

COMPONENTS

BO19U–01

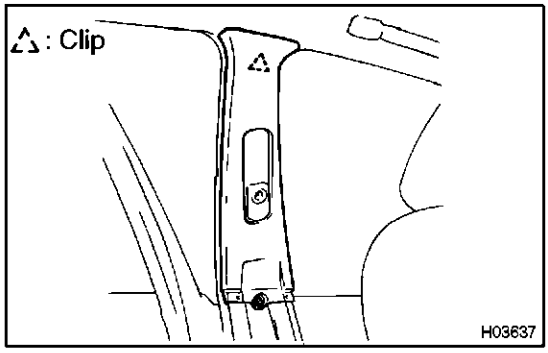


BO19V–01

REMOVAL

1. REMOVE THESE PARTS:

(a) Front door opening trims
(b) Front pillar garnishes
(c) Front door scuff plates
(d) Rear door opening trims
(e) Rear door scuff plates
(f) Center pillar lower garnishes

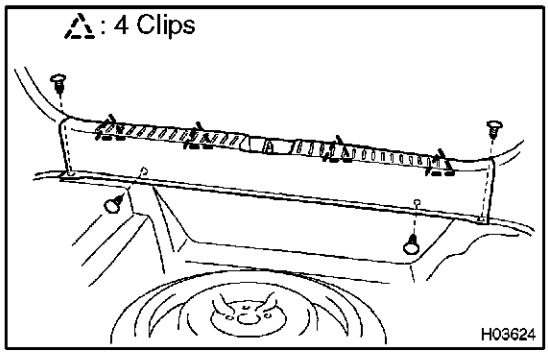


2. REMOVE CENTER PILLAR UPPER GARNISH

(a) Remove the front seat outer belt shoulder anchor.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)
(b) Remove the screw and center pillar upper garnish.

3. REMOVE THESE PARTS:

(a) Rear floor carpet
(b) Rear seatback assembly
Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)
(c) w/ Tonneau Cover:
Tonneau cover
(d) w/ Room Partition Net:
Room partition net

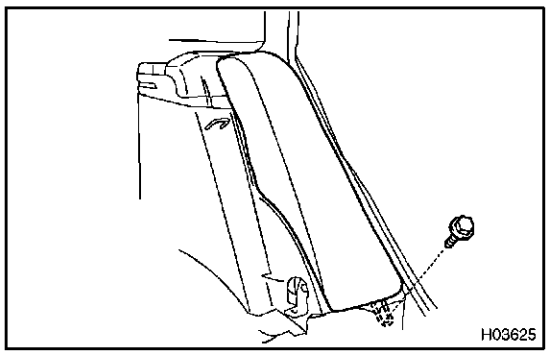


4. REMOVE REAR FLOOR FINISH PLATE

Using a screwdriver, remove the rear floor finish plate.
HINT:
Tape the screwdriver tip before use.

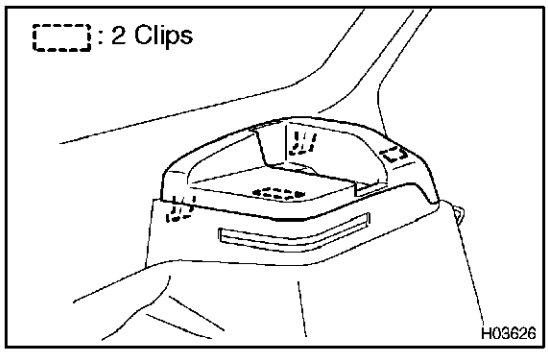
5. REMOVE REAR ROOM PARTITION NET HOOK

Remove the screw and hook.



6. REMOVE REAR SIDE SEATBACK

Remove the bolt and rear side seatback.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

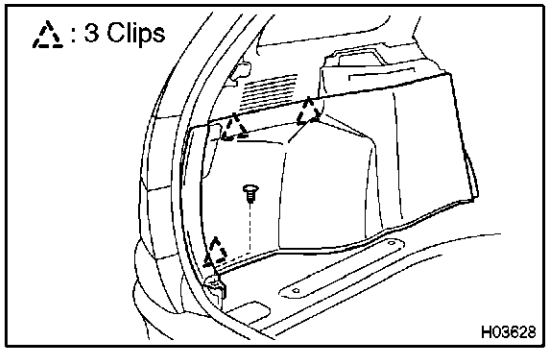


7. REMOVE DECK SIDE TRIM COVER

Using a screwdriver, remove the deck side trim cover.

HINT:

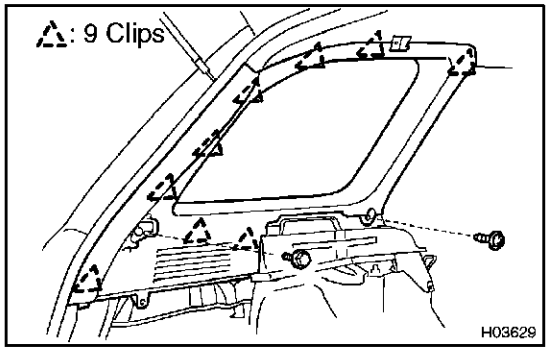
Tape the screwdriver tip before use.



8. REMOVE DECK TRIM SIDE BOARD

(a) Remove the rear seat outer belt floor anchor bolt.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(b) Using a clip remover, remove the clip and deck trim side board.



9. REMOVE ROOF SIDE INNER GARNISH

Remove the bolt, screw and roof side inner garnish.

10. REMOVE THESE PARTS:

(a) Assist grips
(b) Sun visors and holders
(c) Room light
(d) w/ Sliding Roof:
Sliding roof opening trim

11. REMOVE ROOF HEADLINING

Using a clip remover, remove the 5 clips and roof headlining.

BO19W–01

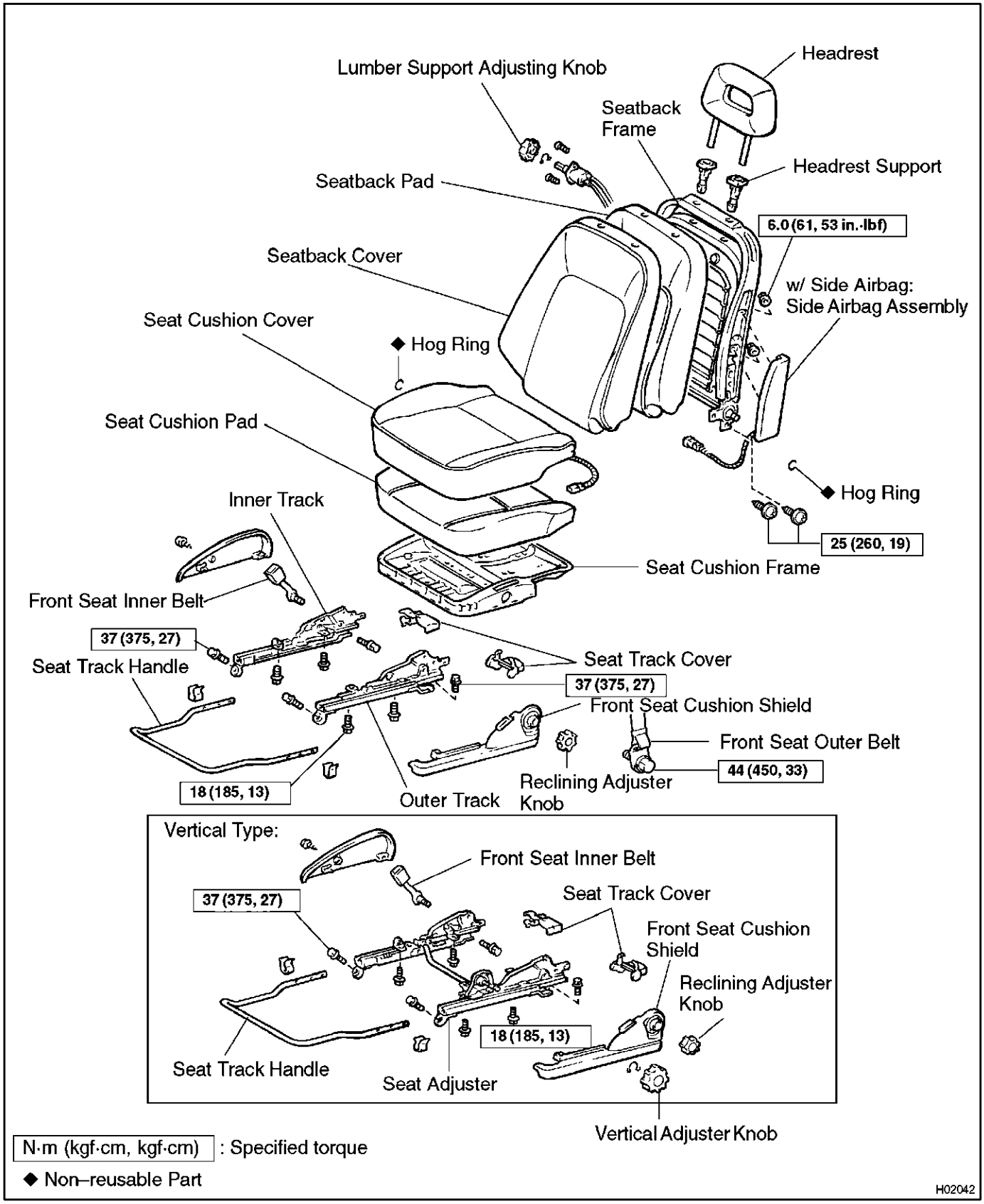
INSTALLATION

Installation is in the reverse order of removal (See page BO–125).

FRONT SEAT

COMPONENTS

BO1A8–01



BO1AS–01

REMOVAL

1. REMOVE THESE PARTS:

(a) Reclining adjuster knob
(b) Front seat cushion shield
(c) Front seat outer belt

2. REMOVE FRONT SEAT

(a) Using a screwdriver, remove the seat track covers.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 4 bolts.
(c) Disconnect the connectors.
(d) Remove the front seat.

BO1AA–01

DISASSEMBLY

1. REMOVE THESE PARTS:

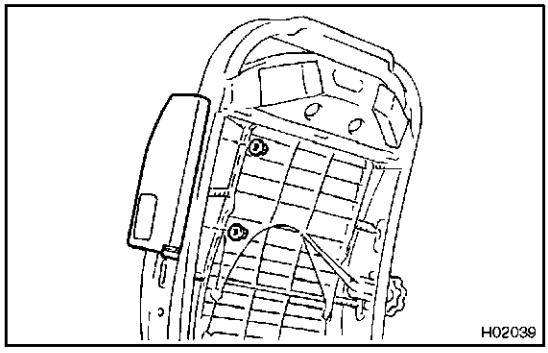
(a) Vertical Seat Adjuster:
Vertical adjuster knob
(b) Headrest
(c) Front seat inner belt
(d) Lumber support adjusting knob

2. REMOVE SEATBACK ASSEMBLY

(a) Remove the 4 screws.
(b) Remove the seatback assembly.

3. REMOVE SEATBACK COVER

(a) Remove the hog rings.
(b) Remove the headrest supports.
(c) Remove the hook.
(d) Remove the seatback cover from the seatback pad.
(e) Remove the seatback pad from the seatback frame.

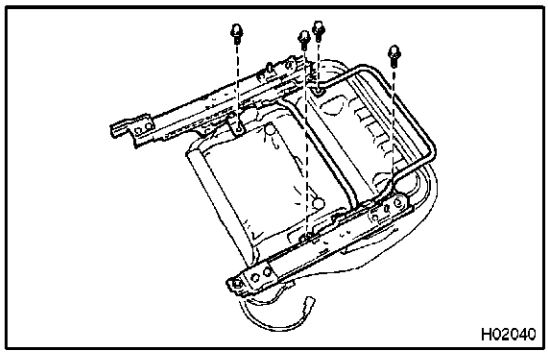

H02039

4. w/ Side Airbag Assembly:
REMOVE SIDE AIRBAG ASSEMBLY

Remove the 2 nuts and side airbag assembly from the seatback frame.

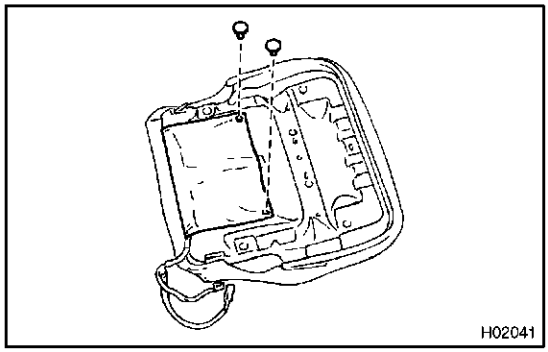
CAUTION:

- **Do not store the side airbag assembly with the airbag deployment side facing down.**
- **Never disassemble the side airbag assembly.**


H02040

5. REMOVE SEAT CUSHION ASSEMBLY

Remove the 4 bolts and seat cushion assembly from the seat adjuster.


H02041

6. REMOVE SEAT CUSHION COVER

(a) Remove the 2 clips.
(b) Remove the hog rings and seat cushion frame.
(c) Remove the hog rings and seat cushion cover from the seat cushion pad.

7. REMOVE SEAT TRACK HANDLE

BO1AB–01

INSPECTION

INSPECT RECLINING LOCK POSITION AND SLIDING LOCK POSITION SLIPPING OFF

(a) When reclining the seat, inspect that the outer and inner tracks are released at the same time.

HINT:

When the reclining lock positions slip off, disassemble the seat to adjust the positions.

(b) When sliding the seat, inspect that the outer and inner tracks are locked at the same time.

HINT:

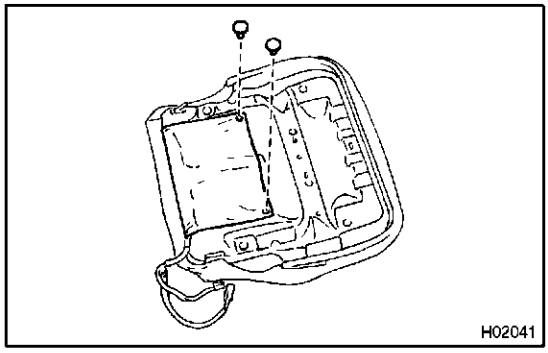
When sliding lock positions slip off, loosen the bolts to adjust the positions.

BO1AO-01

REASSEMBLY

1. INSTALL SEAT TRACK HANDLE

Install the seat track handle.



2. INSTALL SEAT CUSHION COVER

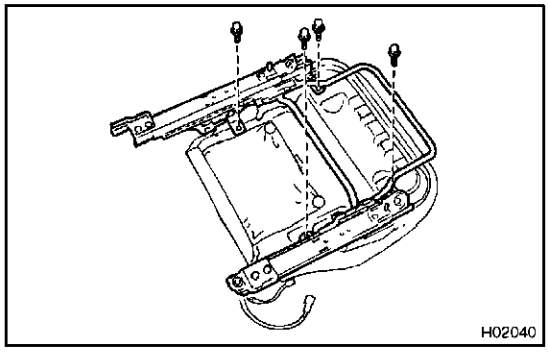
(a) Install the seat cushion cover with new hog rings to seat cushion pad.

(b) Install the seat cushion cover with pad to the seat cushion frame with new hog rings.

HINT:

Install the hog rings to prevent wrinkles as little as possible.

(c) Install the 2 clips.



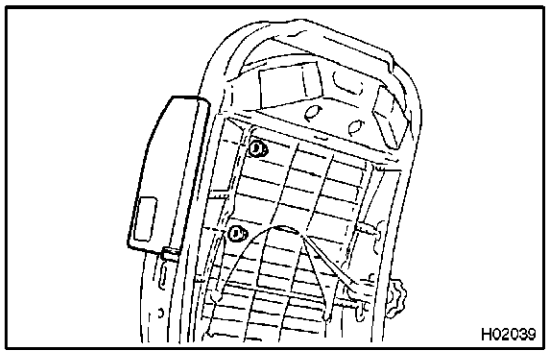
3. INSTALL SEAT CUSHION ASSEMBLY

Install the seat cushion assembly with 4 bolts to the seat adjuster.

HINT:

Tighten the 4 bolts temporarily, then tighten them completely starting from the bolts on the rear side.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



4. w/ Side Airbag Assembly: INSTALL SIDE AIRBAG ASSEMBLY

Install the side airbag assembly with 2 nuts to the seatback frame.

Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)

NOTICE:

- **Make sure that the side airbag assembly is installed to the specified torque.**
- **If the side airbag assembly has been dropped, or there are cracks, dents or other defects in the case or connector, replace the side airbag assembly with a new one.**
- **When installing the side airbag assembly, take care that it is not pinched between other parts.**

5. INSTALL SEATBACK COVER

(a) Install the seatback cover with pad to the seatback frame with new hog rings.

(b) Install the seatback cover with new hog rings to the seatback pad with seatback frame.

(c) Install the hook.

NOTICE:

- **Make sure that the hook is correct installed to the seatback frame.**
- **Reconfirm above item.**
- **Do not mistake the direction.**

6. INSTALL SEATBACK ASSEMBLY

(a) Install the seatback assembly with 4 bolts.

Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

HINT:

Tighten the 4 bolts temporarily, then tighten them completely starting from the bolt on the front right side.

(b) Install new hog rings.

HINT:

Install the hog rings to prevent wrinkles as little as possible.

7. INSTALL THESE PARTS:

(a) Lumber support adjusting knob

(b) Front seat inner belt

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(c) Inner shield

(d) Headrest

(e) Vertical Seat Adjuster:
Vertical adjuster knob

BO1AD-01

INSTALLATION

1. INSTALL FRONT SEAT

(a) Slide the front seat to the frontmost position.

NOTICE:

Make sure that seat adjuster locks.

(b) Without holding the seat track handle, mount the seat to the vehicle.

HINT:

If holding the seat track handle, the adjusted frontmost positions slip off.

(c) Tighten the bolts on the rear side temporarily, then tighten them completely starting from the bolt on the inner side.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

(d) Slide the seat to the rearmost position to install the bolts on the front side.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

(e) Connect the connectors.

2. INSTALL THESE PARTS:

(a) Front seat outer belt
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

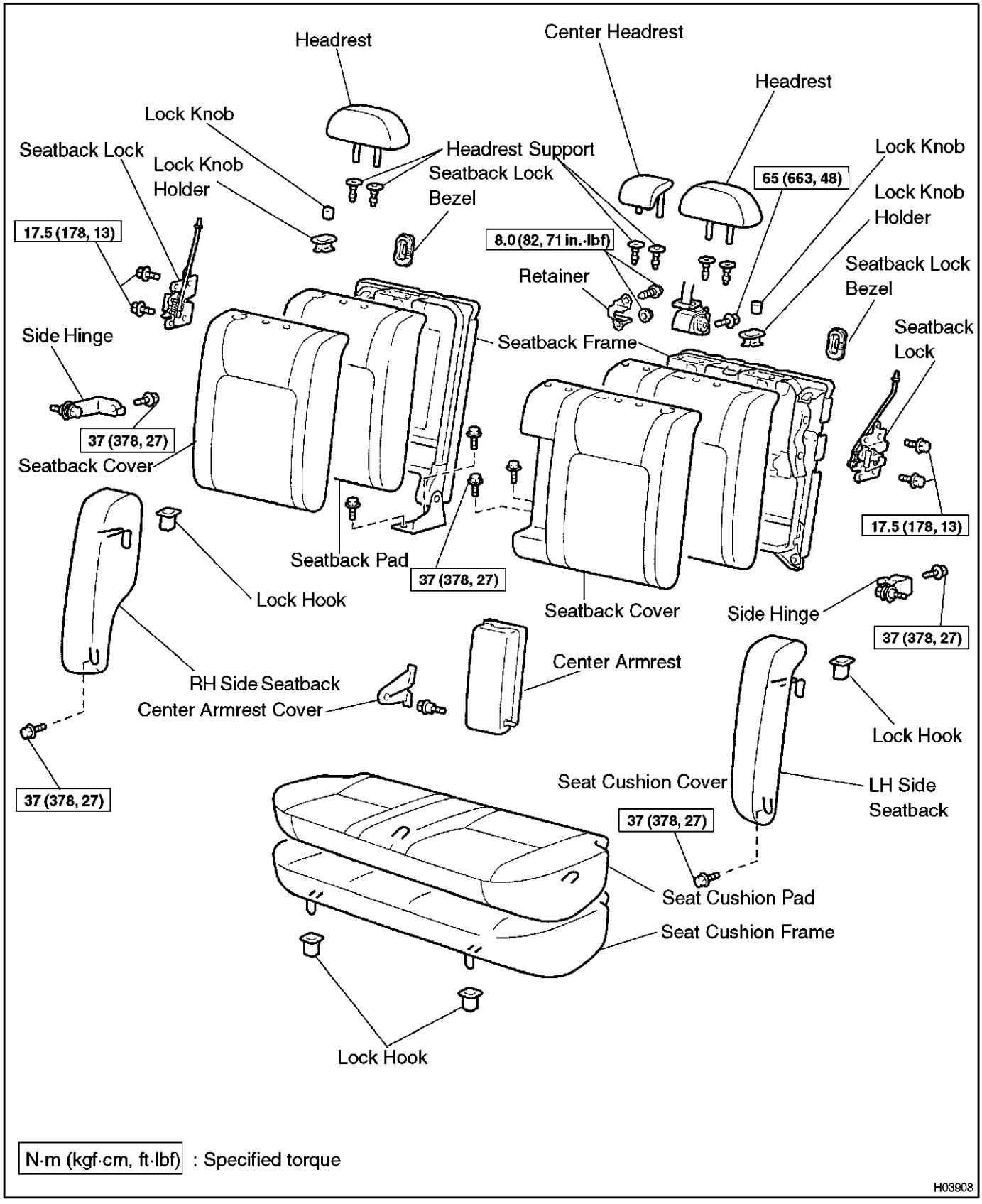
(b) Front seat cushion shield

(c) Reclining adjuster knob

REAR SEAT (Sedan)

COMPONENTS

BO18L-01



BO18M–01

REMOVAL

1. REMOVE SEAT CUSHION

Pull up the front portion of the seat cushion and remove it.

2. REMOVE SEAT CUSHION LOCK HOOK

Using a screwdriver, remove the 2 lock hooks.

HINT:

Tape the screwdriver tip before use.

NOTICE:

Be careful not to damage the body.

3. REMOVE SIDE SEATBACK

HINT:

Do the same for LH and RH.

(a) Remove the bolt.

(b) Pull up the side seatback to remove it.

4. REMOVE SIDE SEATBACK LOCK HOOK

Using a screwdriver, remove the 2 lock hooks.

HINT:

Tape the screwdriver tip before use.

NOTICE:

Be careful not to damage the body.

5. REMOVE SEATBACK ASSEMBLY

HINT:

Do the same for LH and RH.

(a) Remove the front side bolt.

(b) Release the seatback lock, then fold the seatback assembly.

(c) Remove the rear side bolt.

(d) Remove the bolt of side hinge.

(e) Remove the seatback assembly.

BO16N–01

DISASSEMBLY

1. REMOVE HEADRESTS

2. REMOVE CENTER ARMREST

(a) Remove the center armrest hinge cover and cap.

(b) Remove the bolt and center armrest.

3. REMOVE SEATBACK FRAME

HINT:

Do the same for LH and RH.

(a) Remove the hog rings.

(b) Remove the headrest supports.

(c) Remove the lock knob holder.

(d) Remove the lock knob from the seatback lock.

(e) Remove the seatback frame from the seatback cover with pad.

(f) Remove the 2 bolts and seatback lock from the seatback frame.

(g) LH side:
Remove the screw, nut and retainer for center seat belt.

(h) LH side:
Remove the bolt and center seat belt.

4. REMOVE SEATBACK COVER

Remove the hog rings and seatback cover from the seatback pad.

HINT:

Do the same for LH and RH.

5. REMOVE SEAT CUSHION COVER

Remove the hog rings and seat cushion cover from the seat cushion pad.

BO180–01

REASSEMBLY

1. INSTALL SEAT CUSHION COVER

Install the seat cushion cover with new hog rings to the seat cushion pad.

HINT:

When installing hog rings, take care to prevent wrinkles as little as possible.

2. INSTALL SEATBACK COVER

Install the seatback cover with new hog rings to the seatback pad.

HINT:

- When installing hog rings, take care to prevent wrinkles as little as possible.
- Do the same for LH and RH.

3. INSTALL SEATBACK FRAME

HINT:

Do the same for LH and RH.

(a) LH Side:
Install the seat belt with the bolt to the seatback frame.
Torque: 65 N·m (663 kgf·cm, 48 ft·lbf)

(b) Insall the retainer with the screw and nut.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(c) Install the seatback lock with the 2 bolts to the seatback frame.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(d) Install the lock knob to the seatback lock.

(e) Install the seatback frame from the seatback cover with pad.

(f) Install the lock knob holder.

(g) Install the headrest supports.

(h) Install the seatback cover with pad to the seatback frame with the new hog rings.

HINT:

When installing hog rings, take care to prevent wrinkles as little as possible.

4. INSTALL CENTER ARMREST

(a) Install the center armrest to the seatback assembly.

(b) Install the bolt and center armrest cover.

5. INSTALL HEADRESTS

BO18P–01

INSTALLATION

1. INSTALL SEATBACK ASSEMBLY

HINT:

Do the same for LH and RH.

(a) Install the seatback assembly, then tighten the bolt on the rear side temporarily.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(b) Install the side hinge with the bolt to the seatback assembly.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(c) Tighten the bolt on the front side temporarily.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

2. INSTALL SIDE SEATBACK LOCK HOOK

Install the 2 lock hooks to the body panel.

3. INSTALL SIDE SEATBACK

(a) Push down the side seatback wire to install the hook to the body panel.

HINT:

- Confirm that the side seatback is installed firmly.
- Do the same for LH and RH.

(b) Install the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

4. INSTALL SEAT CUSHION LOCK HOOK

Install the 2 lock hooks to the body panel.

5. INSTALL SEAT CUSHION

(a) Pass the seat cushion wire to the seatback.

(b) Push down the seat cushion to install the hook to the body panel.

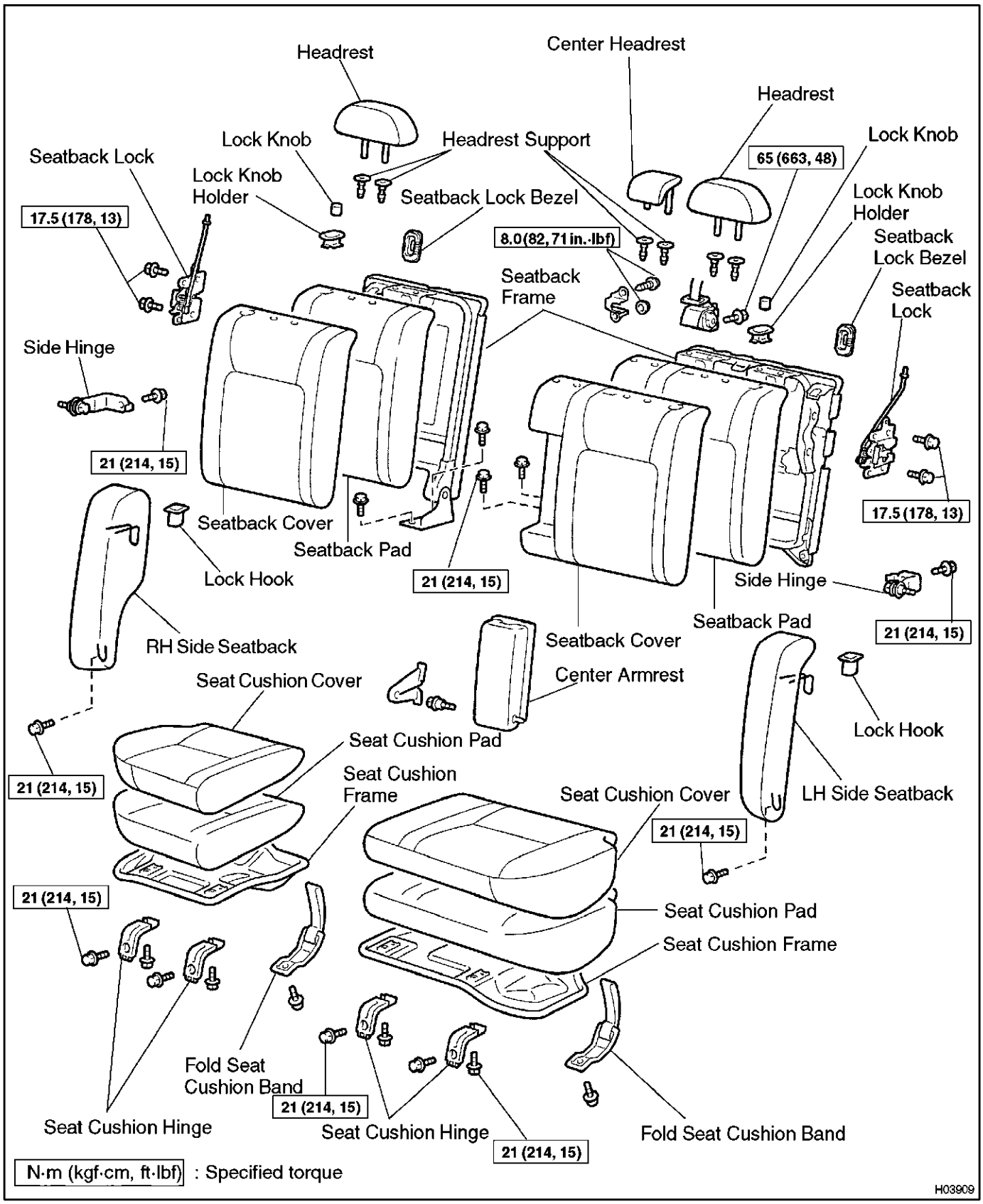
HINT:

Confirm that the seat side cushion is installed firmly.

REAR SEAT (Except Sedan)

COMPONENTS

BO18Q–01



BO18R–01

REMOVAL

1. REMOVE SEAT CUSHION ASSEMBLY

Remove the 2 bolts and seat cushion assemlby.

HINT:

Do the same for LH and RH.

NOTICE:

Be careful not to damage the body.

2. REMOVE SEAT SIDE CUSHION

HINT:

Do the same for LH and RH.

(a) Remove the bolt.

(b) Pull up the seat side cushion to remove it.

3. REMOVE SEAT SIDE CUSHION LOCK HOOK

Using a screwdriver, remove the 2 lock hooks.

HINT:

Tape the screwdriver tip before use.

NOTICE:

Be careful not to damage the body.

4. REMOVE SEATBACK ASSEMBLY

HINT:

Do the same for LH and RH.

(a) Remove the front side bolt.

(b) Release the seatback lock, then fold the seatback assembly.

(c) Remove the rear side bolt.

(d) Remove the bolt of side hinge.

(e) Remove the seatback assembly.

BO16S–01

DISASSEMBLY

1. REMOVE HEADRESTS

2. REMOVE CENTER ARMREST

(a) Remove the center armrest hinge cover.

(b) Remove the bolt and center armrest.

3. REMOVE SEATBACK FRAME

HINT:

Do the same for LH and RH.

(a) Remove the hog rings.

(b) Remove the headrest supports.

(c) Remove the lock knob holder.

(d) Remove the lock knob from the seatback lock.

(e) Remove the seatback frame from the seatback cover with pad.

(f) Remove the 2 bolts and seatback lock from the seatback frame.

(g) LH Side:
Remove the screw, nut and retainer for center seat belt.

(h) LH side:
Remove the bolt and center seat belt.

4. REMOVE SEATBACK COVER

Remove the hog rings and seatback cover from the seatback pad.

HINT:

Do the same for LH and RH.

5. REMOVE SEAT CUSHION FRAME

HINT:

Do the same for LH and RH.

(a) Remove the screw and fold seat cushion band.

(b) Remove the bolt and seat cushion hinge.

(c) Release the seat cover hook, then remove the seat cushion frame.

6. REMOVE SEAT CUSHION COVER

HINT:

Do the same for LH and RH.

Remove the hog rings and seat cushion cover from the seat cushion pad.

BO18T–01

REASSEMBLY

1. INSTALL SEAT CUSHION COVER

Install the seat cushion cover with new hog rings to the seat cushion pad.

HINT:

- When installing hog rings, take care to prevent wrinkles as little as possible.
- Do the same for LH and RH.

2. INSTALL SEAT CUSHION FRAME

HINT:

Do the same for LH and RH.

(a) Install the seat cushion cover hook to the seat cushion frame.

(b) Install the fold seat cushion band with the screw.

(c) Install the seat cushion hinge with the bolt.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

3. INSTALL SEATBACK COVER

Install the seatback cover with new hog rings to the seatback pad.

HINT:

- When installing hog rings, take care to prevent wrinkles as little as possible.
- Do the same for LH and RH.

4. INSTALL SEATBACK FRAME

HINT:

Do the same for LH and RH.

(a) LH Side:

Install the retainer with the screw and nut.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) LH Side:

Install the seat belt with the bolt to the seatback frame.

Torque: 65 N·m (663 kgf·cm, 48 ft·lbf)

(c) Install the seatback lock with the 2 bolts to the seatback frame.

Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

(d) Install the lock knob to the seatback lock.

(e) Install the seatback frame from the seatback cover with pad.

(f) Install the lock knob holder.

(g) Install the headrest supports.

(h) Install the seatback cover with pad to the seatback frame with the new hog rings.

HINT:

When installing hog rings, take care to prevent wrinkles as little as possible.

5. INSTALL CENTER ARMREST

(a) Install the center armrest to the seatback assembly.

(b) Install the bolt and center armrest cover.

6. INSTALL HEADRESTS

BO16U–01

INSTALLATION

1. INSTALL SEATBACK ASSEMBLY

HINT:

Do the same for LH and RH.

(a) Install the seatback assembly, then tighten the bolt on the rear side temporarily.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(b) Install the side hinge with the bolt to the seatback assembly.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(c) Tighten the bolt on the front side temporarily.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

2. INSTALL SEAT SIDE CUSHION LOCK HOOK

Install the 2 lock hooks to the body panel.

3. INSTALL SEAT SIDE CUSHION

(a) Push down the seat side cushion wire to install the hook to the body panel.

HINT:

- Confirm that the seat side cushion is installed firmly.
- Do the same for LH and RH.

(b) Install the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

4. INSTALL SEAT CUSHION ASSEMBLY

HINT:

Do the same for LH and RH.

(a) Mount the seat cushion assembly to the body.

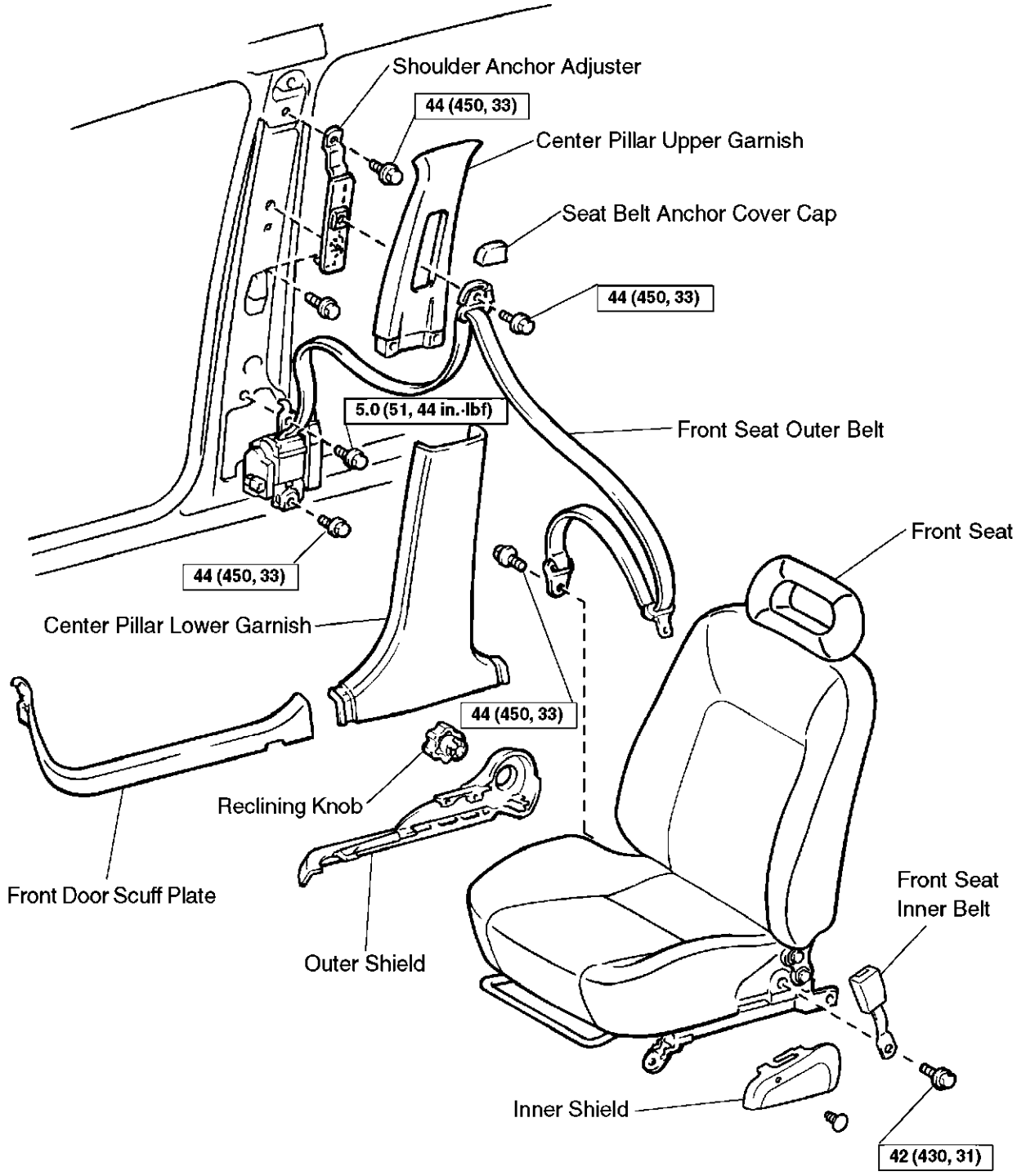
(b) Tighten the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

SEAT BELT

COMPONENTS

BO1AE–01

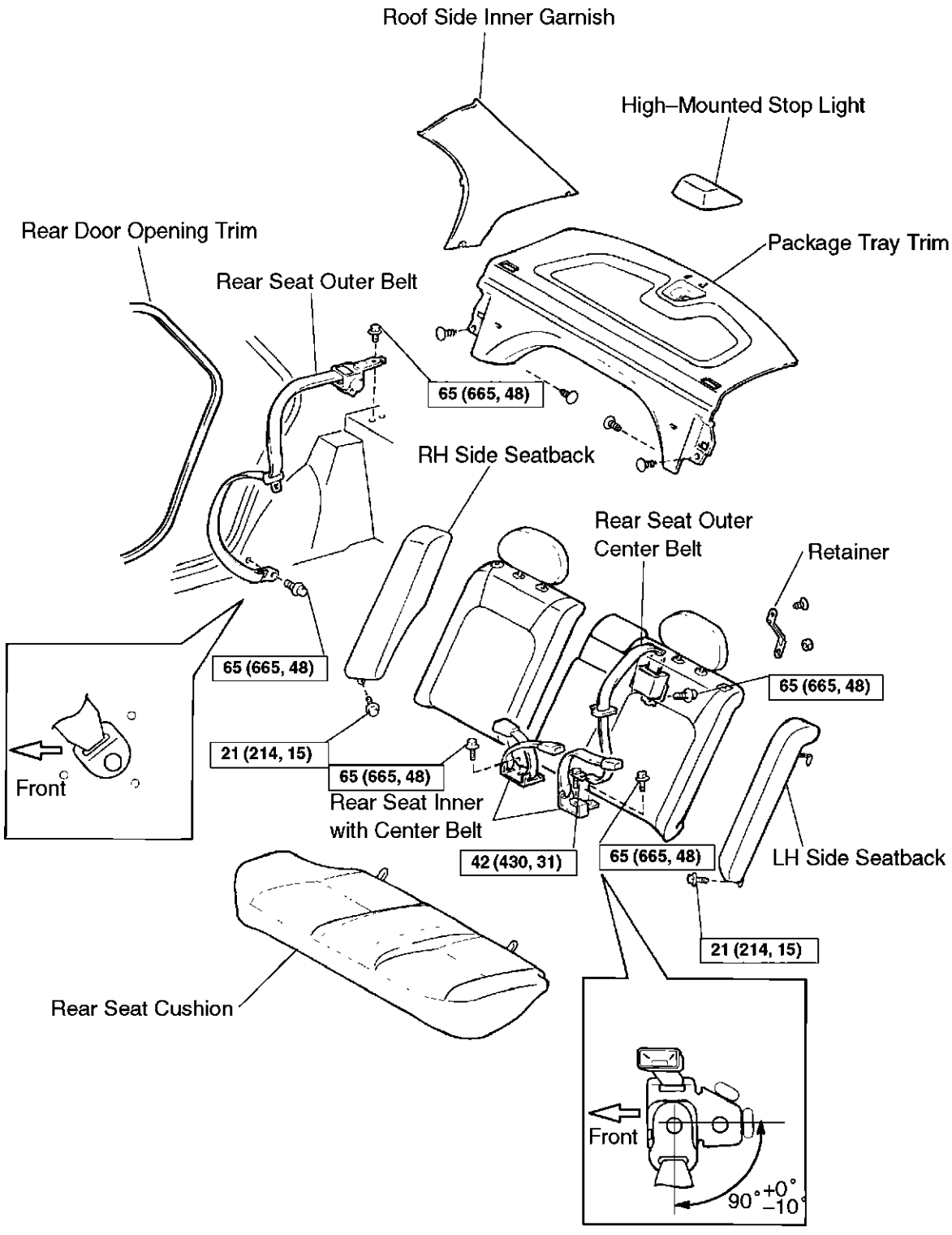
FRONT SEAT BELT



N·m (kgf·cm, ft·lbf) : Specified torque

H03683

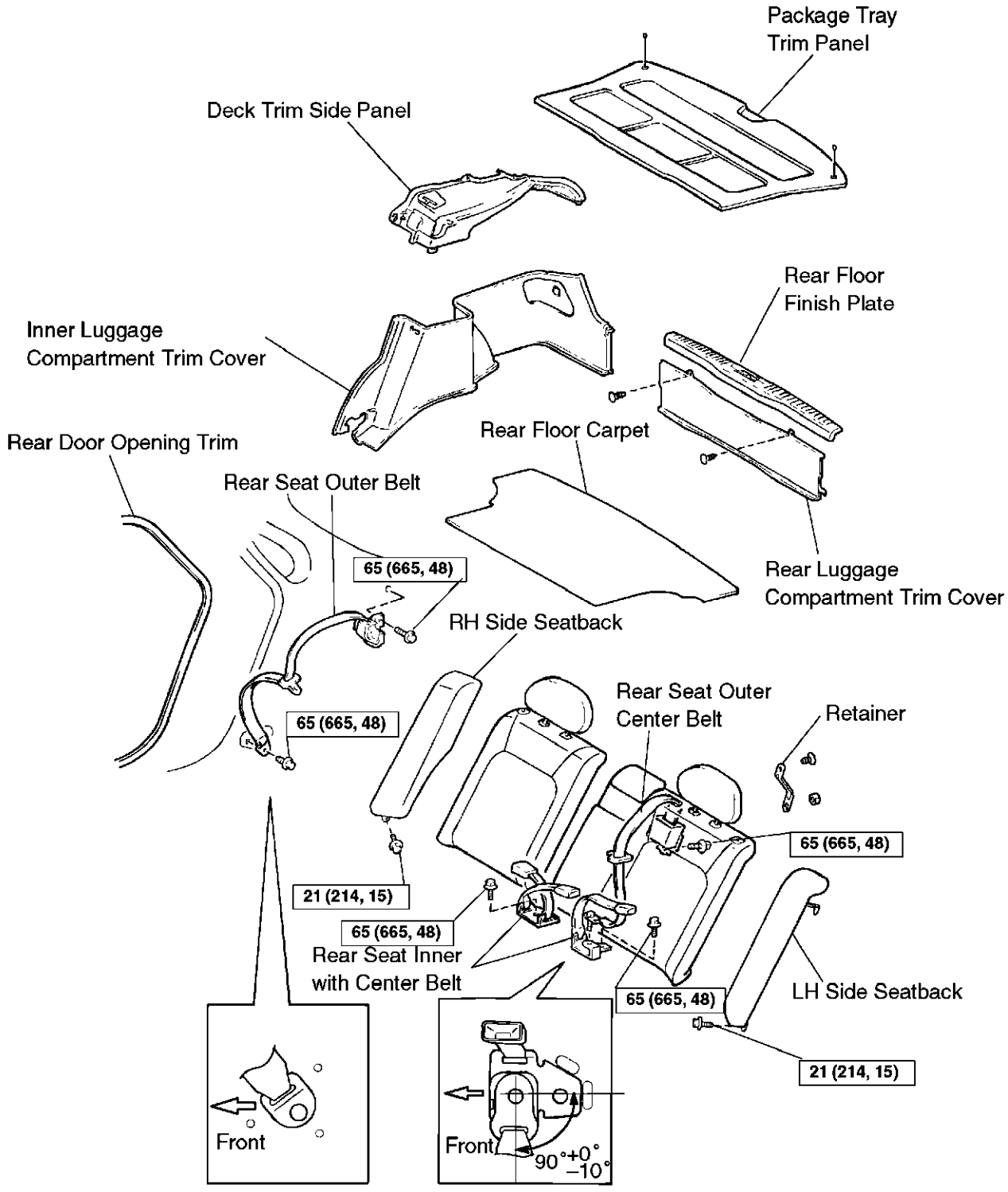
REAR SEAT BELT
(Sedan)



N·m (kgf·cm, ft·lbf) : Specified torque

H03673

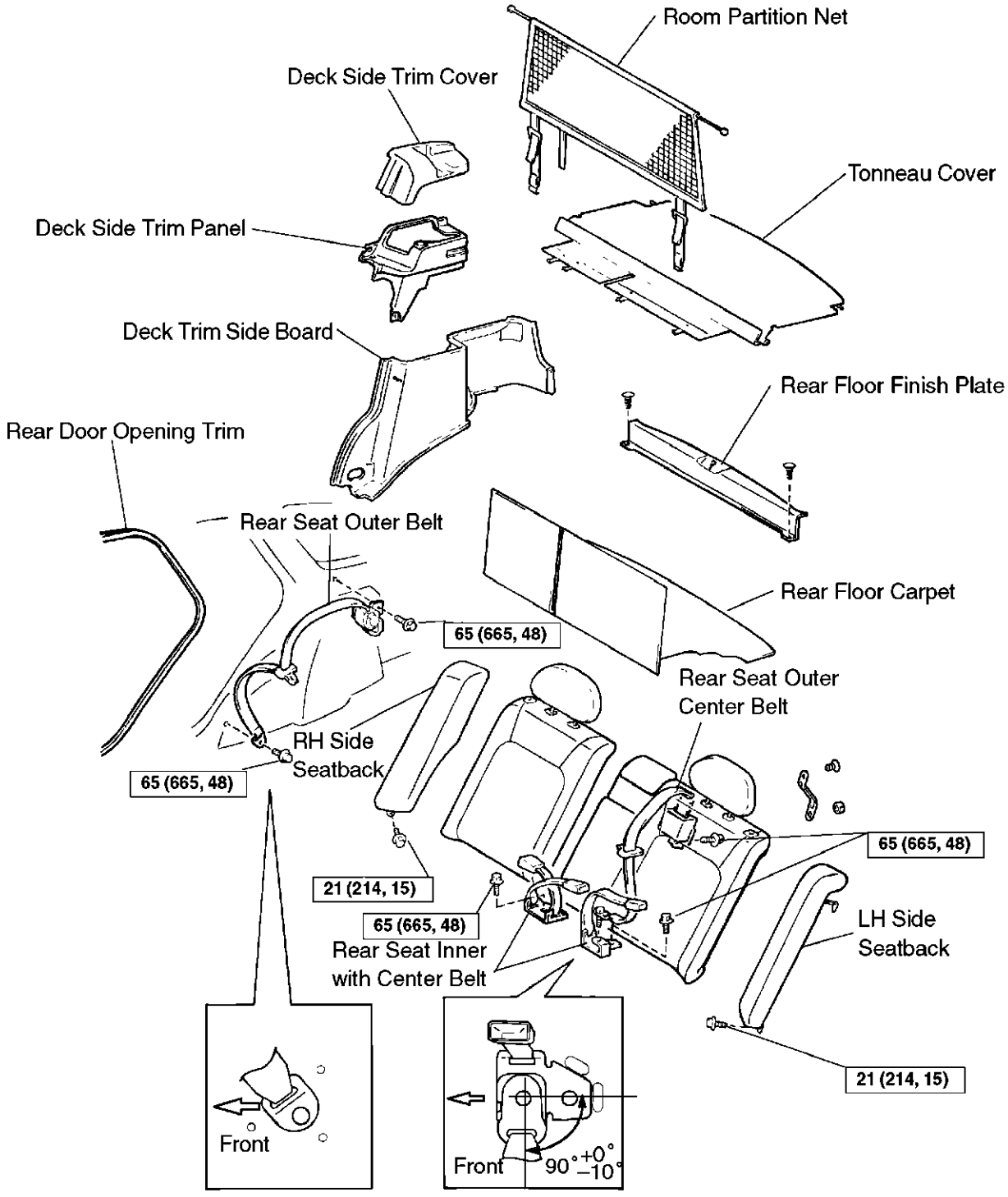
REAR SEAT BELT
(Liftback)



N·m (kgf·cm, ft·lbf) : Specified torque

H03671

REAR SEAT BELT
(Wagon)



N·m (kgf·cm, ft·lbf) : Specified torque

H03672

BO0BD-02

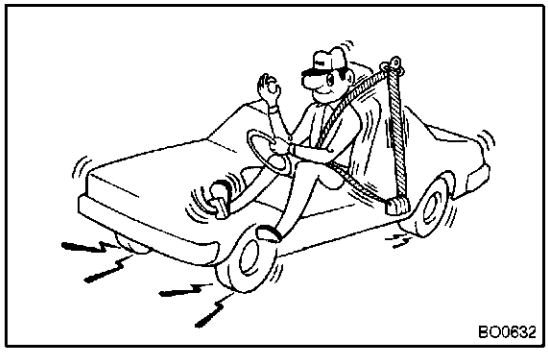
INSPECTION

CAUTION:

Replace the seat belt assembly (outer belt, inner belt, bolts, nuts or sill–bar) if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.

1. RUNNING TEST (IN SAFE AREA)

(a) Fasten the front seat belts.



(b) Drive the car at 10 mph (16 km/h) and slam on the brakes. Check that the belt locks and cannot be extended at this time.

HINT:

Conduct this test in a safe area. If the belt does not lock, remove the belt mechanism assembly and conduct the following static check. Also, whenever installing a new belt assembly, verify the proper operation before installation.

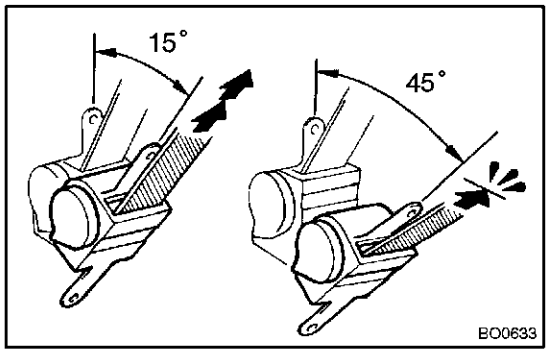
2. Driver's seat belt (ELR):

STATIC TEST

(a) Make sure that the belt locks when pulled out quickly.

(b) Remove the locking retractor assembly.

(c) Tilt the retractor slowly.



(d) Make sure that the belt can be pulled out at a tilt of 15 degrees or less, and cannot be pulled out over 45 degrees of tilt.

If a problem is found, replace the assembly.

3. Except driver's seat belt (ALR/ELR):

STATIC TEST

(a) Make sure that the belt locks when pulled out quickly.

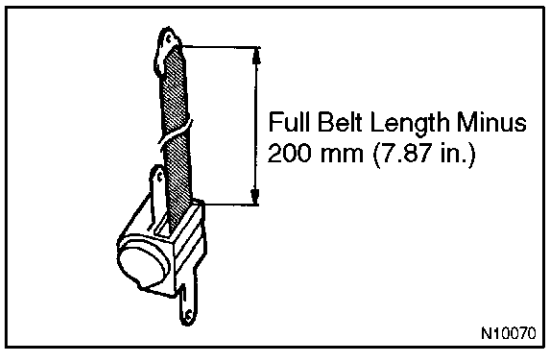
(b) Remove the locking retractor assembly.

(c) Pull out the whole belt and measure the length of the whole belt.

Then retract the belt slightly and pull it out again.

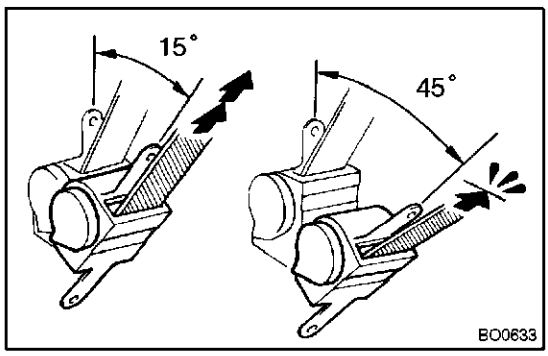
(d) Make sure that the belt cannot be extended further.

If a problem is found, replace the assembly.



(e) Retract the whole belt, then pull out the belt until 200 mm (7.87 in.) of belt remains retracted.

(f) Tilt the retractor slowly.



(g) Make sure that the belt can be pulled out at a tilt of 15 degrees or less, and cannot be pulled out at over 45 degrees of tilt.

If a problem is found, replace the assembly.

SEAT BELT PRETENSIONER

B01AF-01

REMOVAL

NOTICE:

- **If the wiring connector of the seat belt pretensioner is disconnected with the ignition switch at ON or ACC, diagnostic trouble codes will be recorded.**
- **Never use seat belt pretensioner from another vehicle. When replacing seat belt pretensioner, replace it with new.**

1. REMOVE THESE PARTS:

(a) Front door opening trim
(b) Front door scuff plate
(c) Rear door opening trim
(d) Rear door scuff plate
(e) Center pillar lower garnish

2. REMOVE FRONT SEAT OUTER BELT

CAUTION:

Never disassemble the front seat outer belt.

NOTICE:

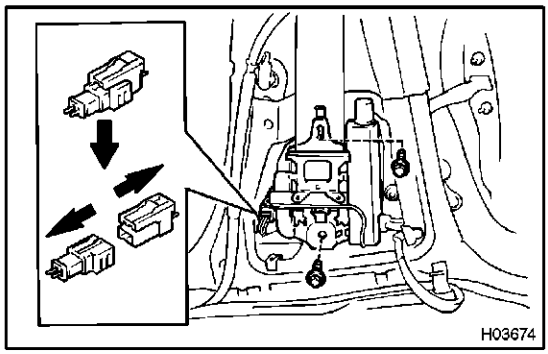
When removing the front outer seat belt, take care not to pull the seat belt pretensioner wire harness.

(a) Remove the front seat reclining knob.
(b) Remove the front seat outer shield.
(c) Remove the bolts and floor anchor.
(d) Using a screwdriver, remove the anchor cover caps.

HINT:

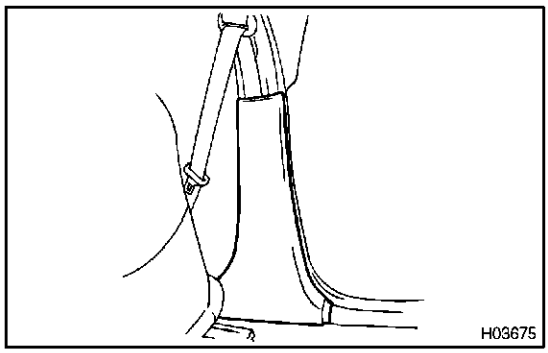
Tape the screwdriver tip before use.

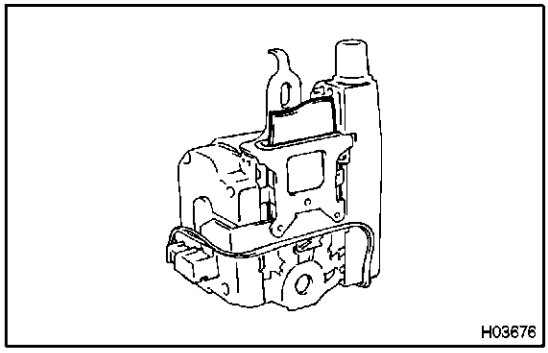
(e) Remove the bolt and shoulder anchor.

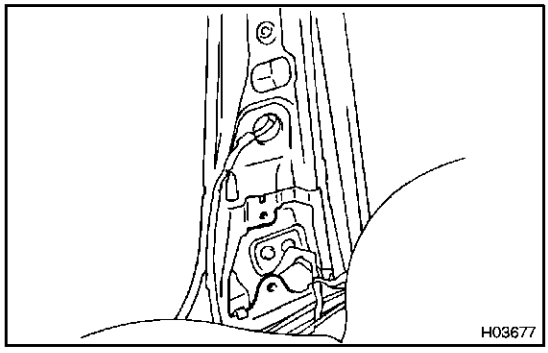


(f) Disconnect the pretensioner connector, then remove the 2 bolts and front seat outer belt as shown in the illustration.

BO1AG–01







INSPECTION

1. PRETENSIONER IS NOT ACTIVATED

(a) Perform a diagnostic system check.
(See page DI–152)

(b) Perform a visual check which includes the following items with the front seat outer belt removed from the vehicle.
- Check for cuts and cracks in, or marked discoloration of the center pillar lower garnish.
- Check for cuts and cracks in wire harness, and for chipping in connectors.
- Check for deformation of the center pillar.

CAUTION:
For removal and installation of the front seat outer belt, see page BO–151 and BO–159.
Be sure to follow the correct procedure.

2. PRETENSIONER IS ACTIVATED

(a) Perform a diagnostic system check.
(See page DI–152)

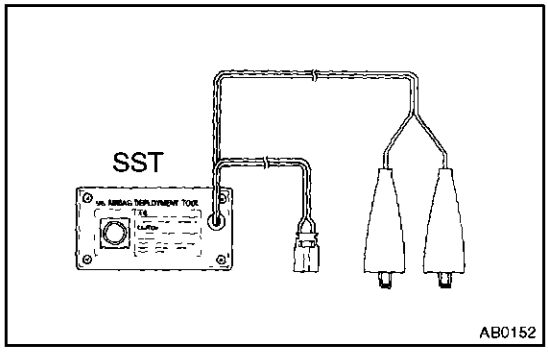
(b) Perform a visual check which includes the following items with the front seat outer belt removed from the vehicle.
- Check for deformation of the center pillar.
- Check for damage on the connector and wire harness.

BO1AH–01

DISPOSAL

HINT:

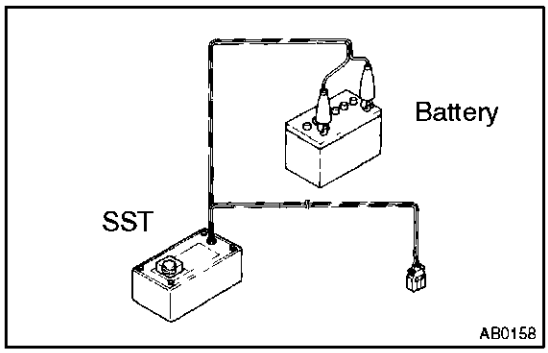
When scrapping vehicle equipped with a SRS or disposing of a front seat outer belt (with seat belt pretensioner), always first deploy the airbag in accordance with the procedure given in RS section or activate the seat belt pretensioner. If any abnormality occurs with the airbag deployment or seat belt pretensioner activation, contact the SERVICE DEP. of the DISTRIBUTOR. When disposing of a front seat outer belt (with seat belt pretensioner) activated in a collision, follow the same procedure given in step 1–(d) in "DISPOSAL".



CAUTION:

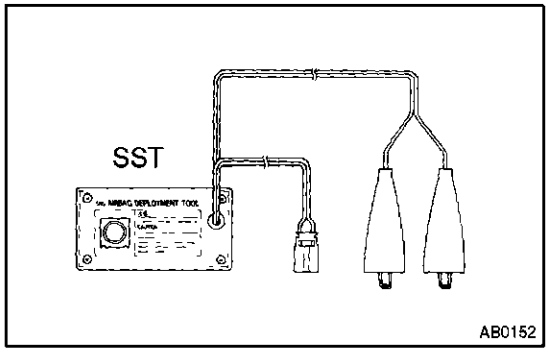
- **Never dispose of front seat outer belt which has inactivated pretensioner.**
- **The seat belt pretensioner produces a sizeable exploding sound when it activates, so perform the operation out–of–door and where it will not create a nuisance to nearby residents.**
- **When activating the seat belt pretensioner, always use the specified SST. (SRS Airbag Deployment Tool) Perform the operation in a place away from electrical noise.**

  SST 09082–00700, 09082–00760
- **When activating a front seat outer belt (with seat belt pretensioner), perform the operation at least 10 m (33 ft) away from the front seat outer belt.**
- **Use gloves and safety glasses when handling a front seat outer belt with activated pretensioner.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front seat outer belt with activated pretensioner.**



1. SEAT BELT PRETENSIONER ACTIVATION WHEN SCRAPPING VEHICLE

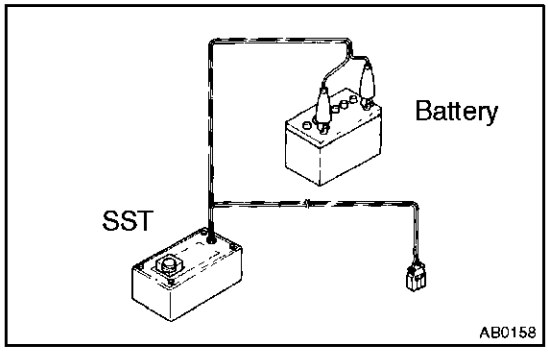
HINT:
Have a battery ready as the power source to activate the seat belt pretensioner.



(a) Check functioning of SST

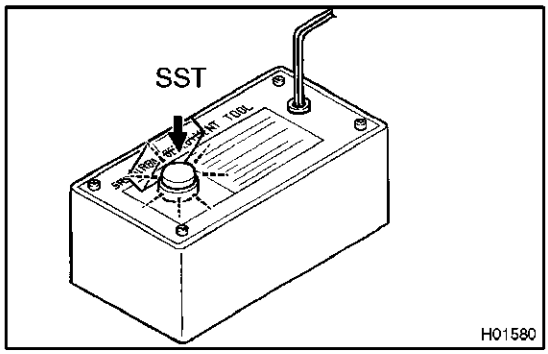
CAUTION:
When activating the seat belt pretensioner, always use the specified SST: SRS Airbag Deployment Tool.

SST 09082–00700, 09082–00760



(1) Connect the SST to battery.
Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the battery negative (–) terminal.

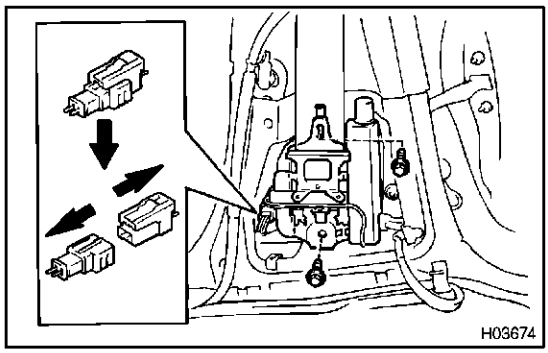
HINT:
Do not connect the yellow connector which will be connected with the seat belt pretensioner.



(2) Check functioning of SST
Press the SST activation switch, and check the LED of the SST activation switch lights up.

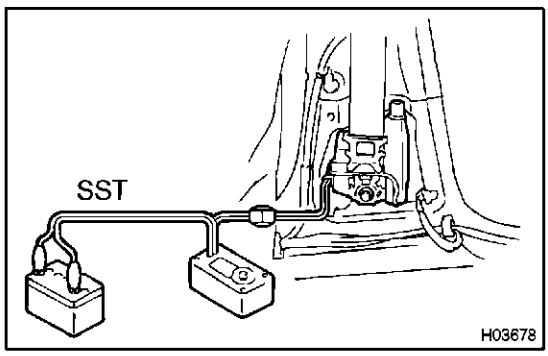
CAUTION:
If the LED lights up when the activation switch is not being pressed, SST malfunction is probable, so definitely do not use the SST.

(b) Install the SST.
(1) Remove the front door opening trim
(2) Remove the front door scuff plate
(3) Remove the rear door opening trim
(4) Remove the rear door scuff plate
(5) Remove the center pillar lower garnish



(6) Disconnect the pretensioner connector as shown in the illustration.

(7) Buckle the front seat belt and check that there is no looseness and slack in the front seat inner belt and front seat outer belt.

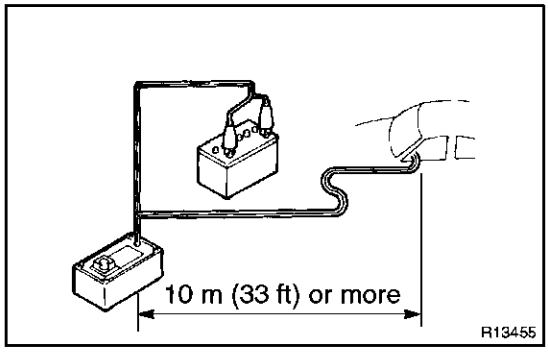


(8) Connect the 2 SST each other, then connect them to the seat belt pretensioner.

SST 09082–00700, 09082–00760

NOTICE:

To avoid damage the SST connector and wire harness, do not lock secondary lock of the twin lock.



(9) Move the SST to at least 10 m (33 ft) away from the front of the vehicle.

(10) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(11) Connect the SST red clip to the battery positive (–) terminal and the black clip to the negative (+) terminal.

(c) Activate seat belt pretensioner.

(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 activate the seat belt pretensioner.

HINT:

The seat belt pretensioner operates simultaneously as the LED of the SST activation switch lights up.

(d) Dispose of the front seat outer belt (with seat belt pretensioner).

CAUTION:

- **The front seat outer belt is very hot when the seat belt pretensioner is activated, so leave it alone for at least 30 minutes after activation.**
- **Use gloves and safety glasses when handling a front seat outer belt with activated seat belt pretensioner.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front seat outer belt with activated seat belt pretensioner.**

When scrapping a vehicle, activate the seat belt pretensioner and scrap the vehicle with activated front seat outer belt still installed.

2. ACTIVATION WHEN DISPOSING OF FRONT SEAT OUTER BELT ONLY

NOTICE:

- **When disposing of the front seat outer belt (with seat belt pretensioner) only, never use the customer's vehicle to activate the seat belt pretensioner.**
- **Be sure to follow the procedure given below when activating the seat belt pretensioner.**

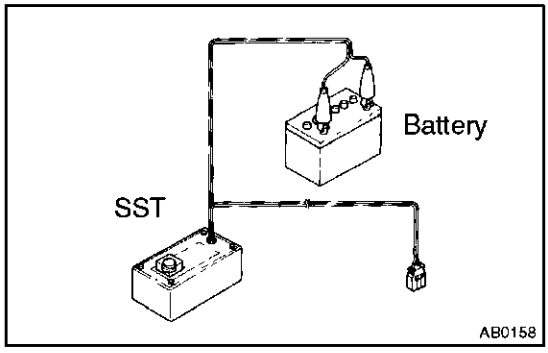
HINT:

Have a battery ready as the power source to activate the seat belt pretensioner.

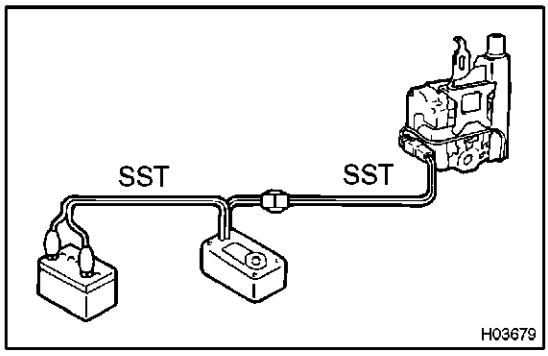
(a) Remove the front seat outer belt.
(See page BO–145)

HINT:

Cut the belt near the seat belt retractor.



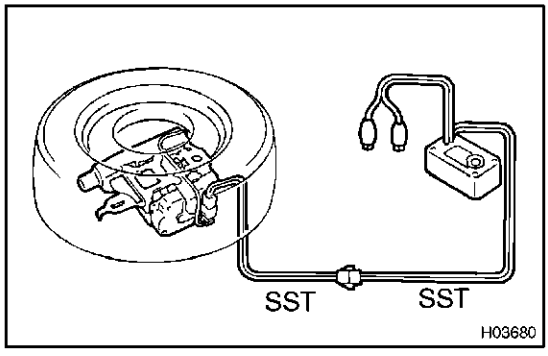
(b) Check functioning of SST.
(See step 1–(a))
SST 09082–00700, 09082–00760



(c) Install the SST.
(1) Connect the 2 SST each other, then connect them to the seat belt pretensioner.
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) Place the front seat outer belt on the ground and cover it with the disc wheel with tire.

NOTICE:

Place the front seat outer belt as shown in the illustration.

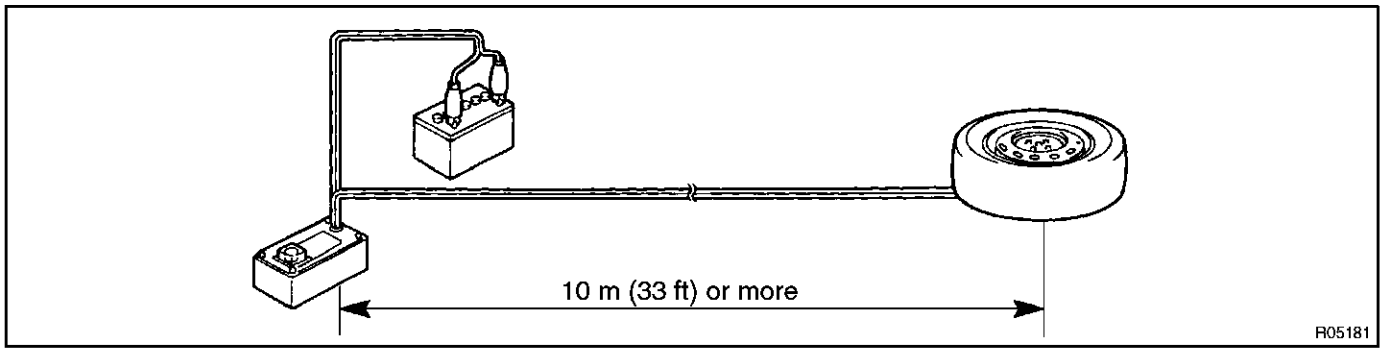
(3) Move the SST to at least 10 m (33 ft) away from the disc wheel.

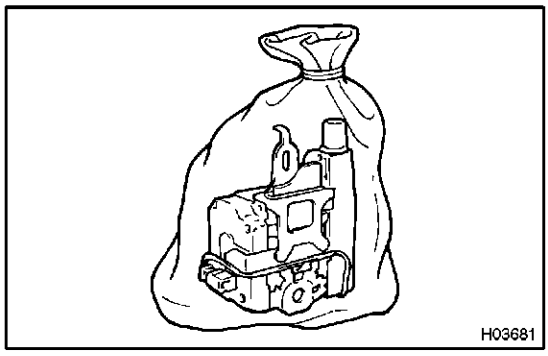
NOTICE:

Take care not to damage the SST wire harness.

(d) Activate the seat belt pretensioner.
(1) Connect the SST red clip to the battery positive (+) terminal and black clip to the battery negative (–) terminal.
(2) Check that no one is within 10 m (33 ft) area around the disc wheel.
(3) Press the SST activation switch and activate the seat belt pretensioner.

HINT:
The seat belt pretensioner operates simultaneously as the LED of the SST activation switch lights up.





(e) Dispose of the front seat outer belt (with seat belt pretensioner).

CAUTION:
- **The front seat outer belt is very hot when the seat belt pretensioner is activated, so leave it alone for at least 30 minutes after activation.**
- **Use gloves and safety glasses when handling a front seat outer belt with activated seat belt pretensioner.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front seat outer belt with activated seat belt pretensioner.**

(1) Remove the disc wheel and SST.
(2) Place the front seat outer belt in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts.

B01AI-01

REPLACEMENT

REPLACE REQUIREMENTS

In the following cases, replace the seat belt pretensioner.

- If the seat belt pretensioner has been activated.
- If the seat belt pretensioner has been found to be faulty in troubleshooting.
- If the front seat outer belt has been found to be faulty during the check in items 1–(b) or 2–(b).
- If the front seat outer belt has been dropped.

CAUTION:

For removal and installation of the seat belt pretensioner, see page BO–151 and BO–159.
Be sure to follow the correct procedure.

BO1AJ-01

INSTALLATION

NOTICE:

Never use seat belt pretensioner from another vehicle. When replacing parts, replace them with new parts.

1. INSTALL FRONT SEAT OUTER BELT

(a) Install the front seat belt parts by following the reverse order of removal and torque the following bolts.

(1) Front seat outer belt retractor

Torque:

Upper bolt: 5.0 N·m (51 kgf·cm, 66 in.·lbf)

Lower bolt: 42 N·m (430 kgf·cm, 31 ft·lbf)

(2) Seat belt shoulder anchor

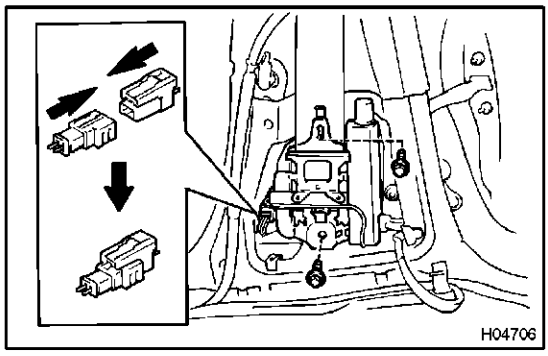
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(3) Seat belt floor anchor

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

NOTICE:

- **Make sure that the front seat outer belt is installed to the specified torque.**
- **If the front seat outer belt has been dropped, or there are cracks, dents or other defects in the case or connector, replace the front seat outer belt with a new one.**
- **When installing the front seat outer belt, take care that the wiring does not interfere with other parts and is not pinched between other parts.**



(b) Connect the pretensioner connector as shown in the illustration.

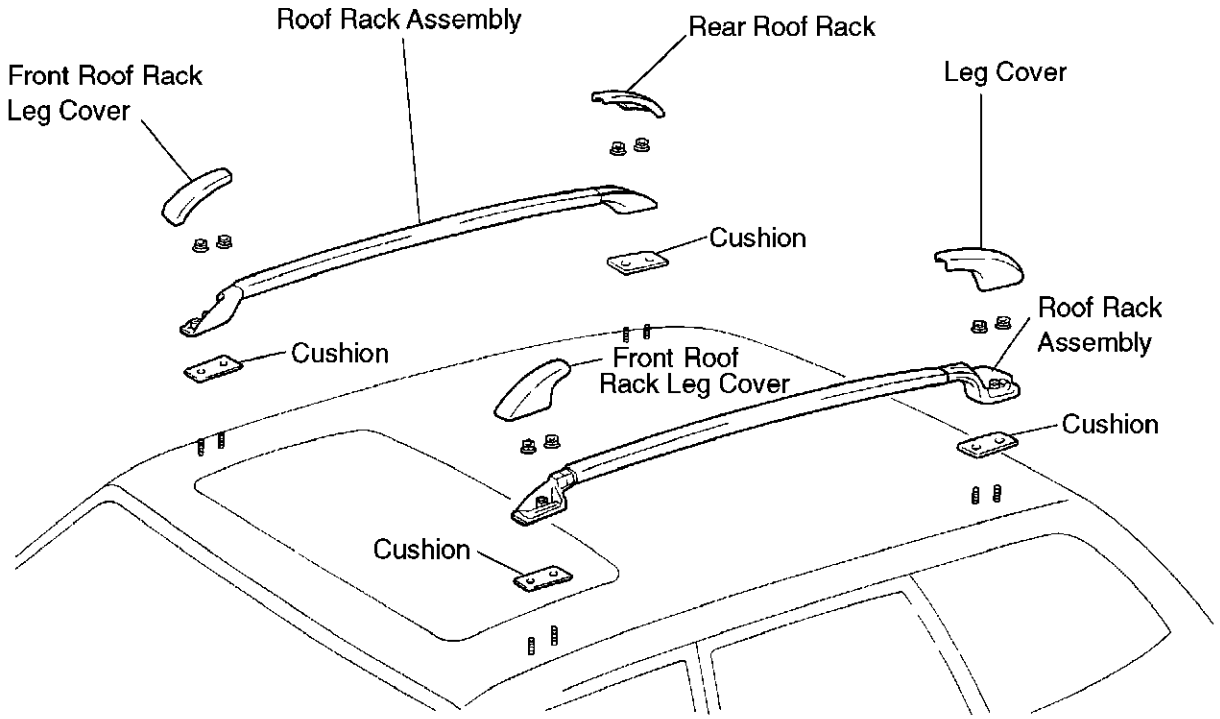
2. INSTALL THESE PARTS:

(a) Front seat outer shield
(b) Front seat reclining knob
(c) Anchor cover cap
(d) Center pillar lower garnish
(e) Rear door scuff plate
(f) Rear door opening trim
(g) Front door scuff plate
(h) Front door opening trim

ROOF RAIL

COMPONENTS

BO1B3–01

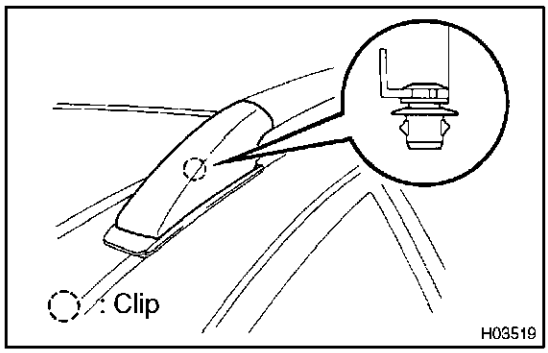


N·m (kgf·cm, ft·lbf) : Specified torque

H03517

BO1B4–01

REMOVAL

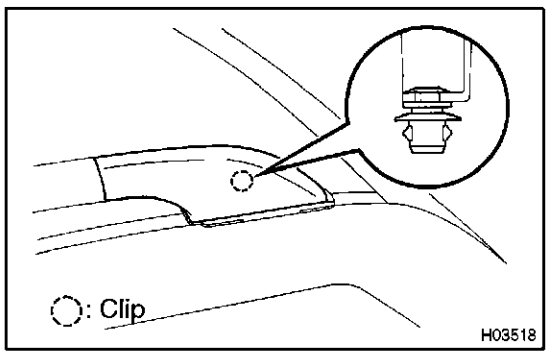


1. REMOVE FRONT ROOF RACK LEG COVER

Using a screwdriver, remove the front roof rack leg cover.

HINT:

Tape the screwdriver tip before use.



2. REMOVE REAR ROOF RACK LEG COVER

Using a screwdriver, remove the rear roof rack leg cover.

HINT:

Tape the screwdriver tip before use.

3. REMOVE ROOF RACK ASSEMBLY

Remove the 4 nuts and roof rack assembly roof the body.

4. REMOVE CUSHIONS

Remove the front and rear cushions from the roof rack assembly.

BO1B5–01

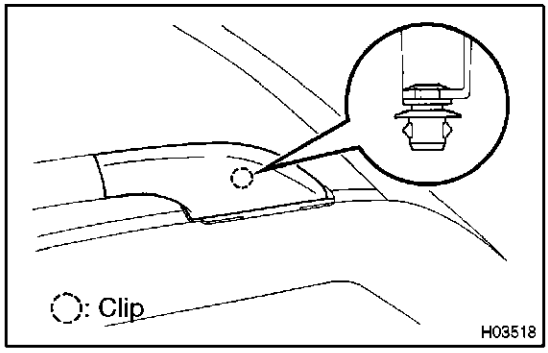
INSTALLATION

1. INSTALL CUSHIONS

Install the front and rear cushions to the roof rack assembly.

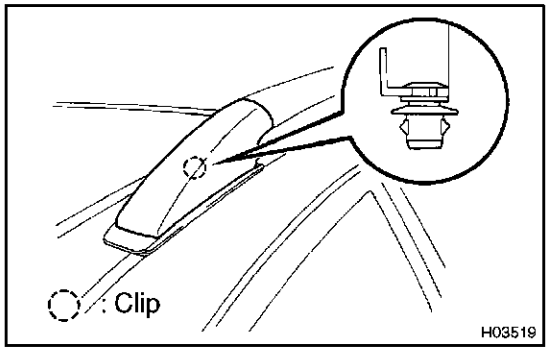
2. INSTALL ROOF RACK ASSEMBLY

Install the roof rack assembly with the 4 nuts to the body.



3. INSTALL REAR ROOF RACK LEG COVER

Tap the rear roof rack leg cover by your hand to install it.



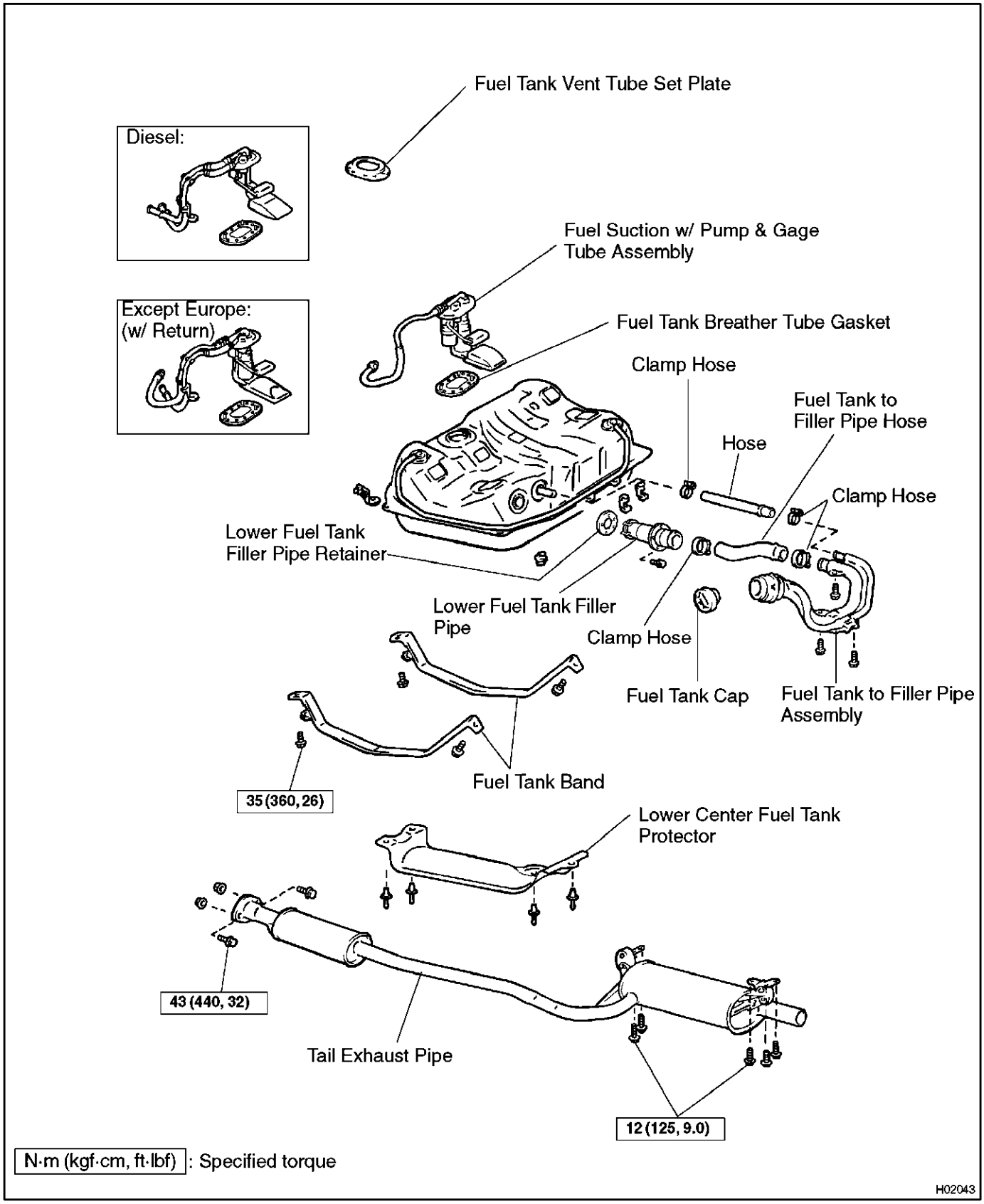
4. INSTALL FRONT ROOF RACK LEG COVER

Tap the front roof rack leg cover by your hand to install it.

FUEL TANK AND LINE

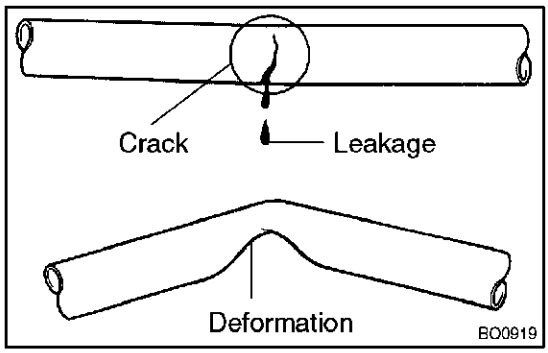
COMPONENTS

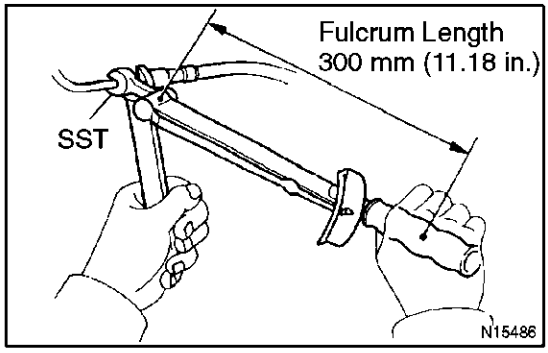
BO1AY–01

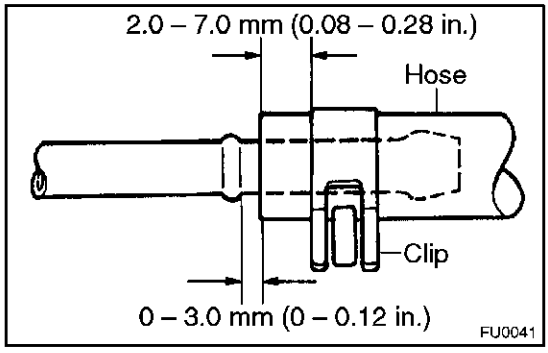


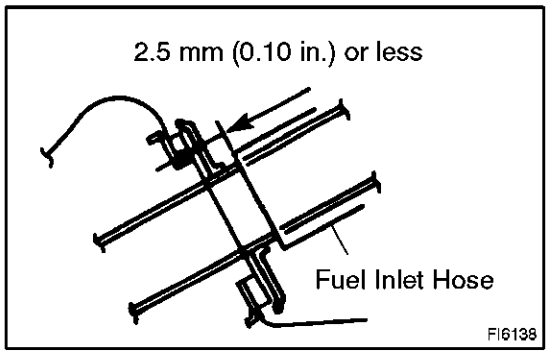
N·m (kgf·cm, ft·lbf) : Specified torque

H02043









BO1AZ–01

INSPECTION

NOTICE:

- **Always use new gaskets when replacing the fuel tank or components parts.**
- **Apply the proper torque to all parts to be tightened.**

INSPECT FUEL LINES AND CONNECTIONS

(a) Check the fuel lines for cracks or leakage, and all connections for deformation.

(b) Check the fuel tank vapor vent system hoses and connections for looseness, sharp bends or damage.

(c) Check the fuel tank for deformation, cracks, fuel leakage or tank band looseness.

(d) Check the inlet pipe for damage of fuel leakage.

(e) Hose and tube connections are shown in the illustration.

(f) Make sure that the hose clamps do not interfere with the tank, tubes, hoses and other parts.

If a problem is found, repair or replace the parts as necessary.

AIR CONDITIONING

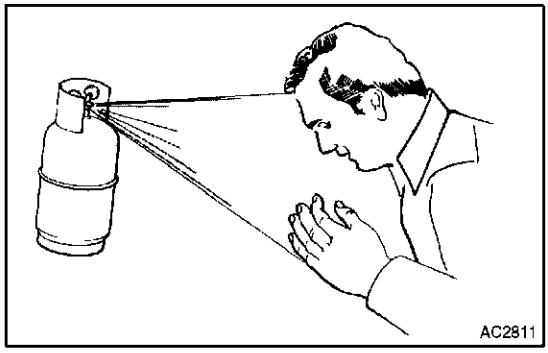
AIR CONDITIONING SYSTEM AC–1
TROUBLESHOOTING AC–15
DRIVE BELT AC–18
MANIFOLD GAUGE SET AC–22
REFRIGERANT LINE AC–25
AIR CONDITIONING UNIT AC–28
BLOWER UNIT AC–37
COMPRESSOR AND MAGNETIC CLUTCH AC–42
CONDENSER AC–58
EVAPORATOR AC–61
HEATER RADIATOR AC–64
EXPANSION VALVE AC–67
BLOWER MOTOR AC–70
BLOWER RESISTOR AC–73
BLOWER MOTOR LINEAR CONTROLLER AC–76
AIR MIX SERVOMOTOR AC–79
SENSOR AC–82
PRESSURE SWITCH AC–86
RELAY AC–89
CONDENSER FAN AC–90
AIR CONDITIONER AMPLIFIER AC–96
AIR CONDITIONER SWITCH AC–101
HEATER CONTROL ASSEMBLY AC–104
WATER TEMPERATURE SWITCH AC–113
AIR REFINER FILTER AC–114

AIR CONDITIONING SYSTEM

AC19U–01

PRECAUTION

1. **DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR WEAR EYE PROTECTION**
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.

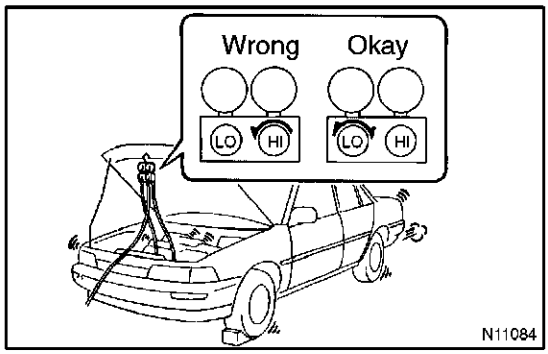
CAUTION:

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 REFRIGERATION SYSTEM**

If there is not enough refrigerant in the refrigerant system oil lubrication will be insufficient and compressor burnout may occur, so that care to avoid this, necessary care should be taken.

7. **DO NOT OPEN PRESSURE MANIFOLD VALVE WHILE COMPRESSOR IS OPERATE**

If the high pressure valve is 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**

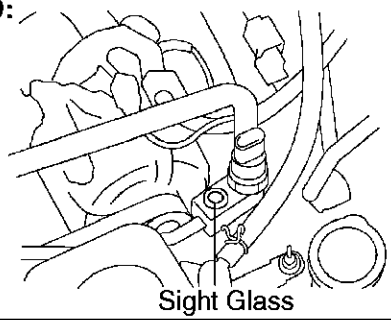
If refrigerant is overcharged, it causes problems such as insufficient cooling, poor fuel economy, engine overheating etc.

9. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

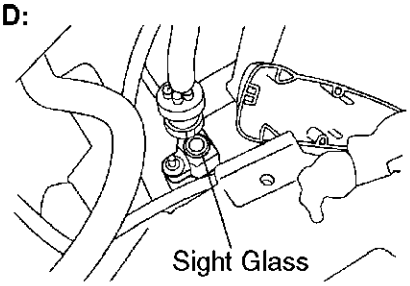
The AVENSIS/ CORONA are equipped with an SRS (Supplemental Restraint System) such as the driver and front passenger airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the RS section.

AC19V–01

LHD:



RHD:



ON–VEHICLE INSPECTION

1. INSPECT REFRIGERANT VOLUME

Observe the sight glass on the liquid tube.

Test conditions:

- Running engine at 1,500 rpm
- Blower speed control switch at "HI" position
- A/C switch ON
- Temperature control dial at "COOL" position
- Fully open the doors

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient*	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Add refrigerant until bubbles disappear
2	No bubbles present in sight glass	None, sufficient or too much	Refer item 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	Temperature between compressor inlet and outlet is noticeably different	Correct or too much	Refer to items 5 and 6
5	Immediately after air conditioner is turned off, refrigerant in sight glass stays clear	Too much	(1) Discharge refrigerant (2) Evacuate air and charge proper amount of purified refrigerant
6	When air conditioner is turned off, refrigerant foams and then stays 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

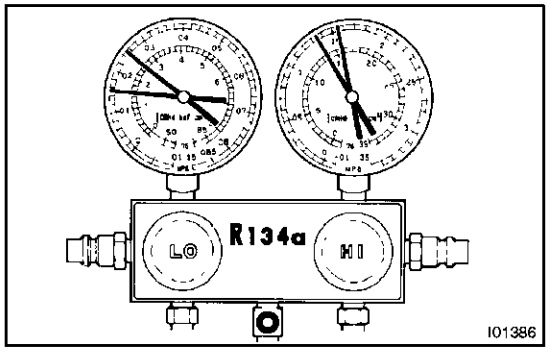
This is a method in which the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when these conditions are established.

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 on "COOL" position

HINT:

It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.



(1) Normally functioning refrigeration system.

Gauge reading:

Low pressure side:

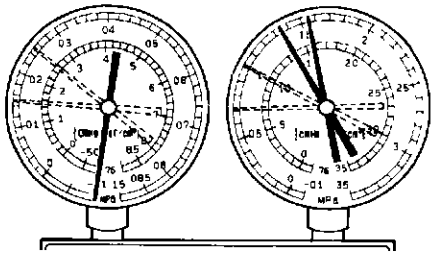
0.15 – 0.25 MPa (1.5 – 2.5 kgf/cm^2)

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

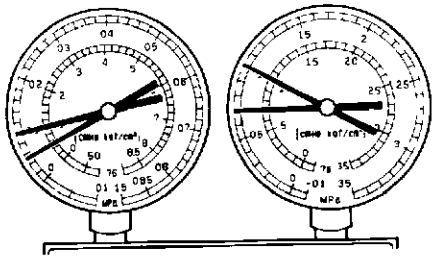


I01387

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time when the ice melts	• Drier in oversaturated state • Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	(1) Replace condenser (2) Remove moisture in cycle through repeatedly evacuating air (3) Charge proper amount of new refrigerant

(3) Insufficient cooling

Condition: Insufficient cooling

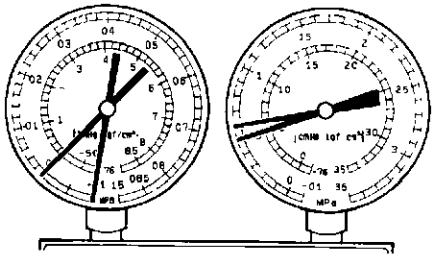


I01388

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low on both low and high pressure sides • Bubbles seen in sight glass continuously • Insufficient cooling performance	Gas leakage at some place in refrigeration system	• Insufficient refrigerant in system • Refrigerant leaking	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Charge proper amount of refrigerant (3) If indicated pressure value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak

(4) Poor circulation of refrigerant

Condition: Insufficient cooling

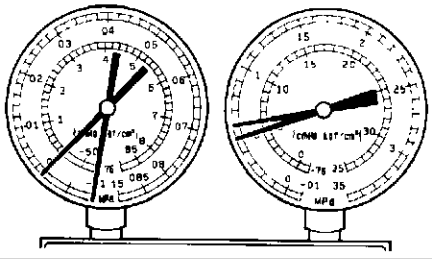


I01389

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low in both low and high pressure sides • Frost on tube from condenser to unit	Refrigerant flow obstructed by dirt in condenser	Condenser clogged	Replace condenser

(5) Refrigerant does not circulate

Condition: Does not cool (Cools from time to time in some cases)

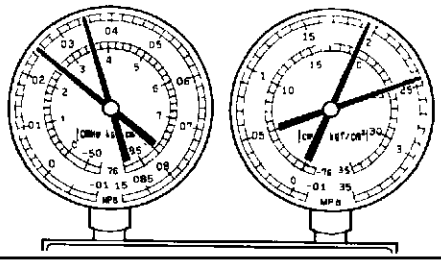


I01449

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Vacuum indicated on low pressure side, very low pressure indicated on high pressure side • Frost or dew seen on piping before and after receiver/ drier or expansion valve	• Refrigerant flow obstructed by moisture or dirt in refrigeration system • Refrigerant flow obstructed by gas leakage from expansion valve	Refrigerant does not circulate	(1) Check expansion valve (2) Clean out dirt in expansion valve by blowing with air (3) Replace condenser (4) Evacuate air and charge new refrigerant to proper amount (5) For gas leakage from expansion valve, replace expansion valve

(6) Refrigerant overcharged or insufficient cooling of condenser

Condition: Insufficient cooling

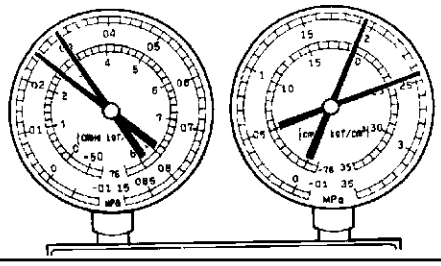


I01390

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • No air bubbles seen through the sight glass even when the engine rpm is lowered	• Unable to develop sufficient performance due to excessive refrigeration system • Insufficient cooling of condenser	• Excessive refrigerant in cycle → refrigerant over charged • Condenser cooling → condenser fins clogged of condenser fan faulty	(1) Clean condenser (2) Check condenser fan motor operation (3) If (1) and (2) are in normal state, check amount of refrigerant Charge proper amount of refrigerant

(7) Air present in refrigeration system

Condition: Insufficient cooling



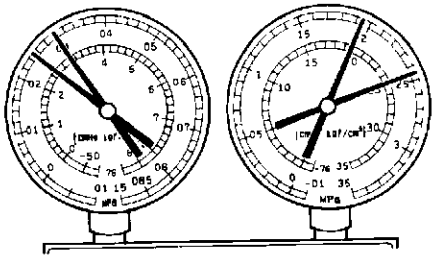
NOTE : These gauge indications are shown when the refrigeration system has been opened and the refrigerant charged without vacuum purging.

I01392

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • The low pressure piping hot to touch • Bubbles seen in sight glass	Air entered in refrigeration system	• Air present in refrigeration system • Insufficient vacuum purging	(1) Check compressor oil to see if it is dirty or insufficient (2) Evacuate air and charge new refrigerant

(8) Expansion valve improperly

Condition: Insufficient cooling

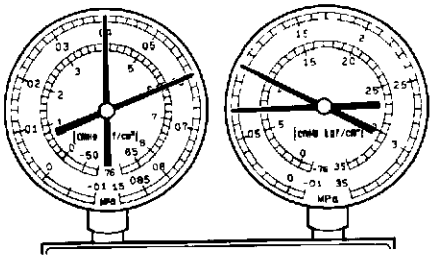


I01450

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • Frost or large amount of dew on piping on low pressure side	Trouble in expansion valve	• Excessive refrigerant in low pressure piping • Expansion valve opened too wide	Check expansion valve Replace if defective

(9) Defective compression compressor

Condition : Does not cool



I01393

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on low and high pressure sides • Pressure too low on high pressure side	Internal leak in compressor	• Compression defective • Valve leaking or broken sliding parts	Repair or replace compressor

3. 4A–FE, 7A–FE and 3S–FE Engine; INSPECT IDLE–UP SPEED

(a) Warm up engine

(b) Perform the these conditions:

- Idle speed set correctly
- Put gear shift in neutral
- Steering wheel at straight ahead
- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position
- A/C switch ON
- Put gear shift in neutral

(c) Check the engine rpm increase when magnetic clutch is engaged.

If idle speed is not as specified, check the idle speed control system.

4. INSPECT FOR LEAKAGE OF REFRIGERANT

(a) Perform in these conditions.

- Stop engine
- Secure good ventilation (If the gas leak detector may not react to volatile gases which are not refrigerant, such as evaporated gasoline and exhaust gas)
- Repeat the test 2 or 3 times
- Make sure that there is some refrigerant remaining in the refrigeration system.
  When compressor is OFF: approx. 392 – 588 kPa (4 – 6 kgf/cm^2, 57 –85 psi)

(b) Bring the gas leak detector close to the drain hose before performing the test.

HINT:

- After the blower motor has stopped, leave the cooling for more than 15 minutes.
- Expose the gas leak detector sensor under the drain hose.
- When bring the gas leak detector close to the drain hose, make sure that the gas leak detector does not react to the volatile gases.

If such reaction is unavoidable, the vehicle must be lifted up.

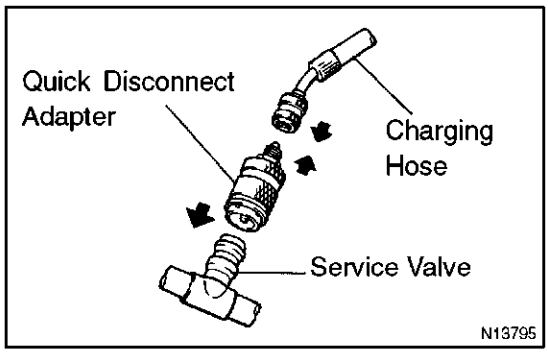
(c) If gas leak is not detected on the drain hose, remove the blower resistor from the cooling unit. Then insert the gas leak detector sensor into the unit and perform the test.

(d) Disconnect the connector and leave the pressure switch for approx. 20 minutes. Then bring the gas leak detector close to the pressure switch and perform the test.

(e) Bring the gas leak detector close to the refrigerant lines.

AC19W–01

EVACUATING



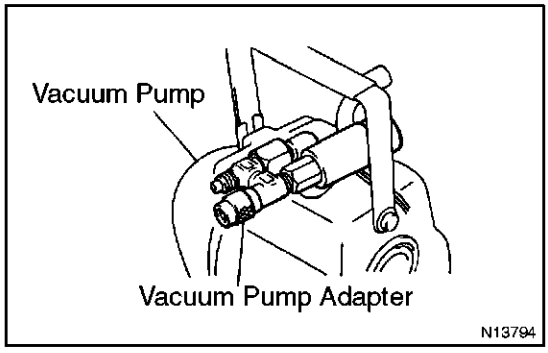
1. CONNECT QUICK DISCONNECT ADAPTER TO CHARGING HOSES

2. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINES

3. SET ON MANIFOLD GAUGE SET

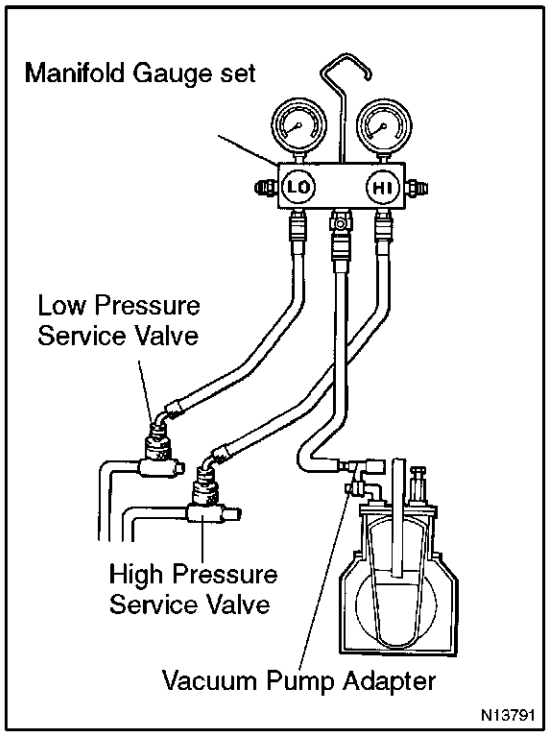
(a) Close both hand valves of manifold gauge set.

(b) Connect the quick disconnect adapters to the service valves.



4. EVACUATE AIR FROM REFRIGERATION SYSTEM

(a) Connect the vacuum pump adapter to the vacuum pump.



(b) Connect the center hose of the manifold gauge set to the vacuum pump adapter.

(c) Open both the high and low hand valves and run the vacuum pump.

(d) After 10 minutes or more, check that the low pressure gauge indicates 750 mmHg (30 in. Hg) or more.

HINT:

If the reading is 750 mmHg (30 in. Hg) or more, close both hand valves of manifold gauge set and stop the vacuum pump.

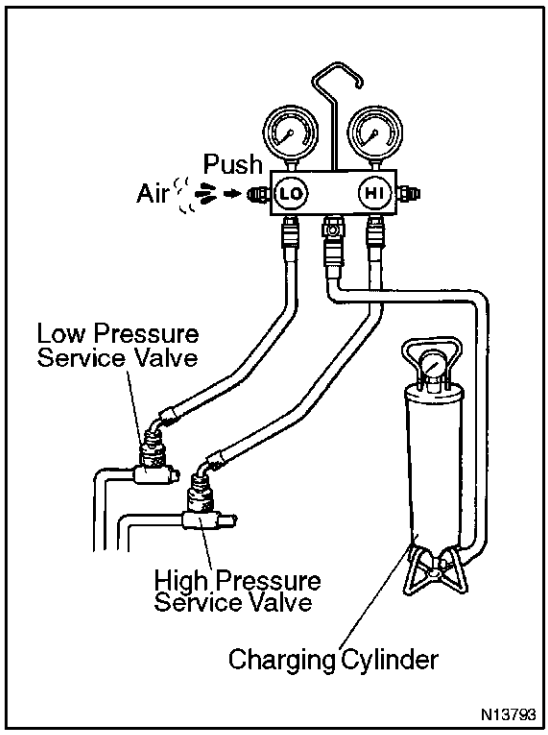
Check the system for leaks and repair if necessary.

(e) Close both the high and low hand valves and stop the vacuum pump.

(f) Leave the system in this condition for 5 minutes or more and check that there is no gauge indicator.

AC19X–01

CHARGING



1. INSTALL CHARGING CYLINDER

HINT:

When handling the charging cylinder, always follow the directions given in the instruction manual.

(a) Charge the proper amount of refrigerant into the charging cylinder.

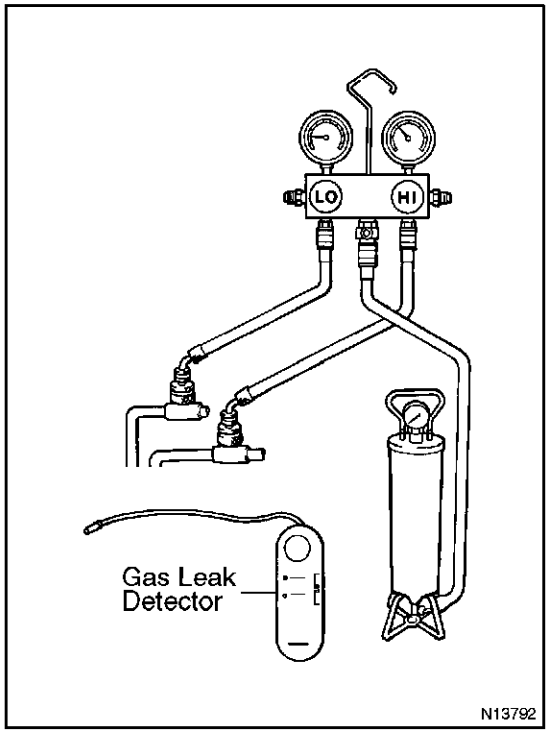
(b) Connect the center hose to the charging cylinder.

CAUTION:

Do not open both high and low hand valves of manifold gauge set.

(c) Open the valve of charging cylinder.

(d) Press the valve core on the side of manifold gauge and expel the air inside of the center hose.



2. INSPECT REFRIGERATION SYSTEM FOR LEAKS

(a) Open the high pressure hand valve and charge refrigerant.

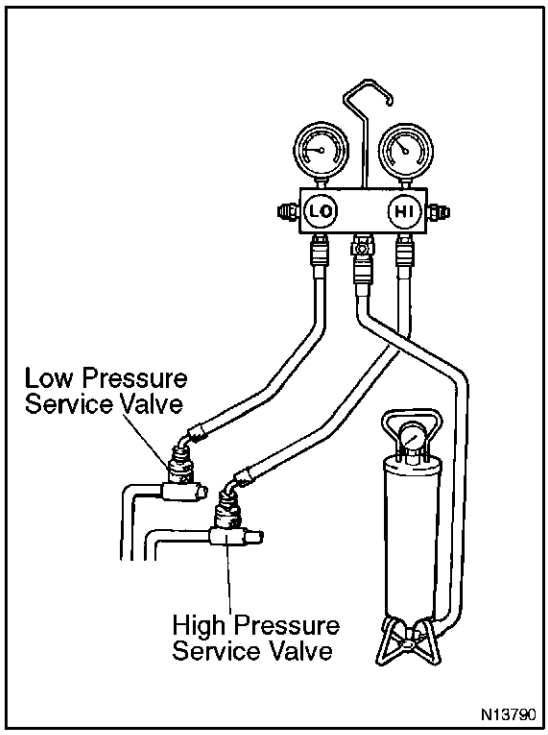
(b) When the low pressure gauge indicates 98 kPa (1 kgf/cm^2, 14 psi) close the high pressure hand valve.

(c) Using a gas leak detector, check the system for leakage.

If leak is found, repair the faulty component or connection.

CAUTION:

Use the refrigerant recovery/ recycling machine to recover the refrigerant whenever replacing parts.



3. CHARGE REFRIGERANT INTO REFRIGERATION SYSTEM

If there is no leak after refrigerant leak check charge, the proper amount of refrigerant in to refrigeration system.

CAUTION:

- **Never run the engine when charging the system through the high pressure side.**
- **Do not open the low pressure hand valve when the system is being charged with liquid refrigerant.**

(a) Open he high pressure hand valve fully.

(b) Charge specified amount of refrigerant, then close the high pressure hand valve.

HINT:

A fully charged system is indicated by the sight glass being free of any bubbles.

(c) Charge partially refrigeration system with refrigerant.

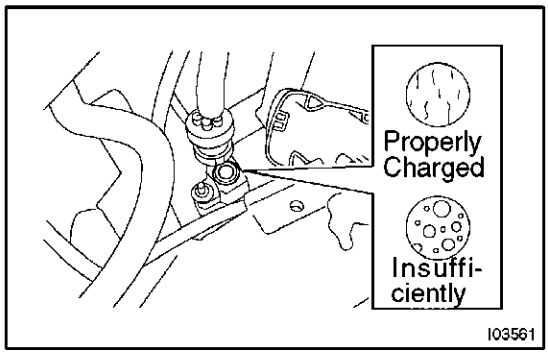
(1) Set vehicle in these conditions:

- Running engine at 1,500 rpm
- Blower speed control set at "HI"
- Temperature control set at "MAX. COOL"
- Air inlet control set at "RECIRC"
- Fully open doors (Sliding roof : closed)
- Operate electric cooling fans.
  (Short in pressure switch connector terminals 2 and 3)

(2) Open the low pressure hand valve.

CAUTION:

Do not open the high pressure hand valve.



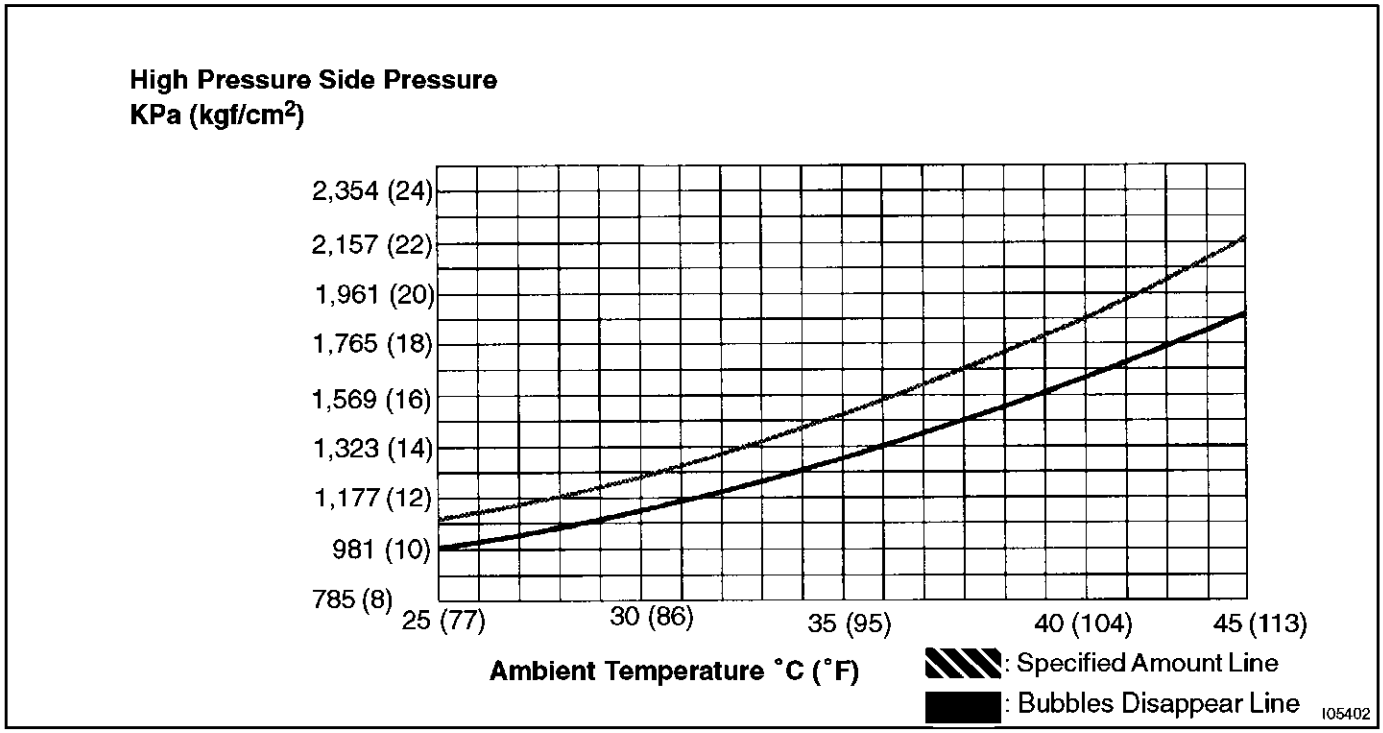
(3) Charge refrigerant until bubbles disappear and check the pressure on the gauge through the sight glass.

(4) Add the refrigerant gradually until the pressure reaches to of point of intersection with ambient temperature and the specified amount in the chart and check the pressure rise up.

(5) Stop adding the refrigerant when the pressure of the specified amount has been reached.

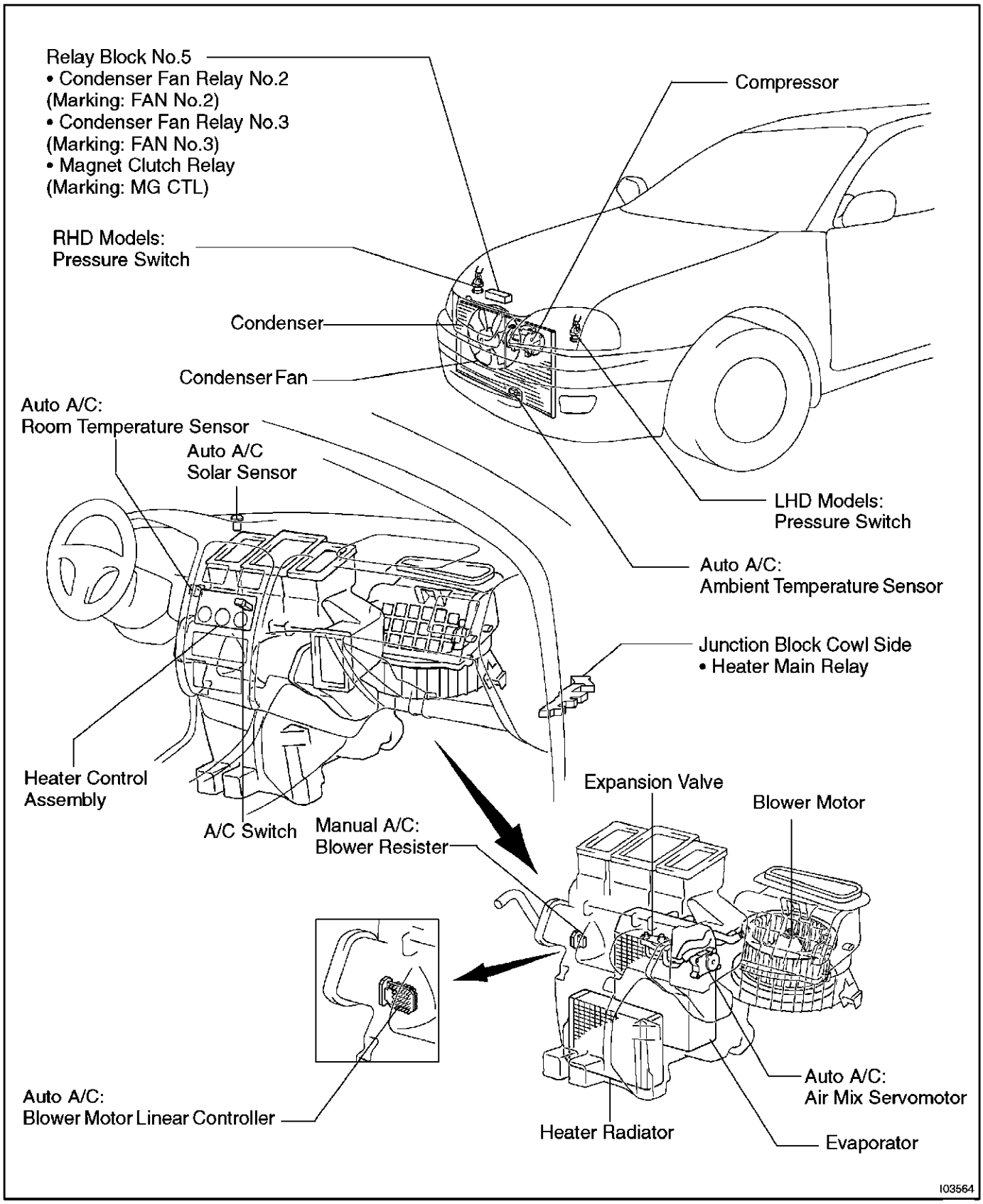
HINT:

- In the case that the refrigerant has been charged excessively, draw out the refrigerant until the pressure returns to the specified amount.
- When the ambient temperature is 25°C (77°F) below, a compressor might be OFF due the mechanism of the system. When checking the pressure based o this chart, check it at the ambient temperature of 25°C (77°F) above.



AC19Y–01

LOCATION



TROUBLESHOOTING

AC19Z–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.

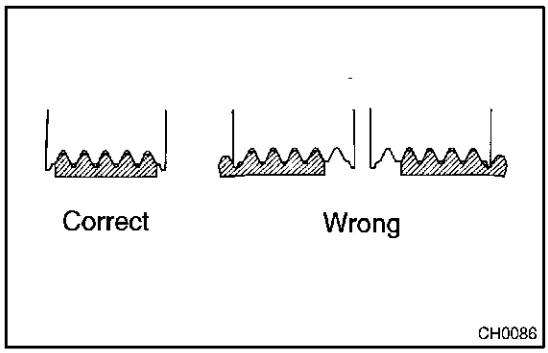
Manual A/C:

Symptom	Suspect Area	See page
No blower operation	1. HTR Fuse	–
	2. Heater main relay	AC–89
	3. Blower motor	AC–71
	4. Blower resistor	AC–74
	5. Blower speed control switch	AC–108
	6. Wire harness	–
No blower control	1. Blower motor	AC–71
	2. Blower resistor	AC–74
	3. Blower speed control switch	AC–108
	4. Wire harness	–
No air temperature control	1. Engine coolant volume	–
	2. Heater control assembly	AC–104
No compressor operation	1. Refrigerant volume	AC–3
	2. A.C Fuse	–
	3. Magnetic clutch	AC–42
	4. Except 4A and 7A–FE: Compressor lock sensor	AC–42
	5. Compressor	AC–42
	6. Pressure switch	AC–86
	7. Heater main relay	AC–89
	8. Blower speed control switch	AC–108
	9. A/C switch	AC–102
	10. A/C amplifier	AC–96
	11. Evaporator temp. sensor	AC–84
	12. Wire harness	–
No cool air comes out	1. Refrigerant volume	AC–3
	2. Refrigerant pressure	AC–3
	3. Drive belt	AC–18
	4. Magnetic clutch	AC–42
	5. Pressure switch	AC–86
	6. Evaporator temp. sensor	AC–84
	7. A/C switch	AC–102
	8. A/C amplifier	AC–96
	9. Heater control assembly	AC–104
	10. Wire harness	–
No engine idle–up when A/C switch ON	1. A/C amplifier	AC–96
	2. Idle control system	–
	3. Wire harness	–
No air inlet control	1. Heater control assembly	AC–104
No mode control	1. Heater control assembly	AC–104
Blinking of A/C indicator	1 Compressor	AC–42
	2. Drive belt	AC–18
	3. Compressor lock sensor	AC–42
	4. A/C amplifier	AC–96
Brightness does not change when light control switch is turned	1. Headlight and taillight system	BE–23
	2. A/C switch	AC–102

Auto A/C:

Symptom	Suspect Area	See page
Whole functions of A/C system do not operate	1. A.C Fuse 2. A/C amplifier	– AC–96
No blower operation	1. Heater main relay 2. Blower motor 3. Blower motor linear controller 4. A/C amplifier 5. Heater control assembly 6. Wire harness	AC–89 AC–71 AC–77 AC–96 AC–108 –
No blower control	1. Blower motor 2. Blower motor linear controller 3. A/C amplifier 4. Heater control assembly 5. Wire harness	AC–71 AC–77 AC–96 AC–108 –
Insufficient air out	1. Blower motor	AC–71
No cool air comes out	1. Refrigerant volume 2. Drive belt 3. Refrigerant pressure 4. Compressor lock sensor 5. Compressor 6. Pressure switch 7. Air mix servomotor 8. Room temp. sensor 9. Ambient temp. sensor 10. Heater control assembly 11. A/C amplifier 12. Wire harness	AC–3 AC–18 AC–3 AC–42 AC–42 AC–86 AC–80 AC–84 AC–84 AC–108 AC–96 –
No warm air comes out	1. Engine coolant volume 2. Air mix servomotor 3. Ambient temp. sensor 4. Room temp. sensor 5. A/C amplifier 6. Heater control assembly 7. Heater radiator	– AC–80 AC–84 AC–84 AC–96 AC–108 AC–65
Out put air is warmer or cooler than the set temperature or response is slow	1. Refrigerant volume 2. Engine coolant volume 3. Drive belt 4. Refrigerant pressure 5. Condenser fan 6. Ambient temp. sensor 7. Evaporator temp. sensor 8. Solar sensor 9. Air mix servomotor 10. Compressor 11. Condenser 12. Evaporator 13. Heater radiator 14. Expansion valve 15. A/C amplifier 16. Heater control assembly 17. Wire harness	AC–3 – AC–18 AC–3 AC–90 AC–84 AC–84 AC–84 AC–80 AC–42 AC–58 AC–62 AC–65 AC–67 AC–96 AC–108 –
No temperature control	1. Air mix servomotor 2. Heater control assembly 3. A/C amplifier	AC–80 AC–108 AC–96
No air inlet control	1. Heater control assembly	AC–104

No mode control	1. Heater control assembly	AC–104
No engine idle–up when A/C switch ON	1. A/C amplifier 2. Idle control system 3. Wire harness	AC–96 – –
Set temperature value does not match up with operation of temperature control switch	1. Heater control assembly 2. A/C amplifier	AC–108 AC–96
Blinking of A/C indicator	1 Compressor 2. Drive belt 3. Compressor lock sensor 4. A/C amplifier	AC–42 AC–18 AC–42 AC–96
Brightness does not change when light control switch is turned	1. Headlight and taillight system 2. A/C switch	BE–23 AC–102



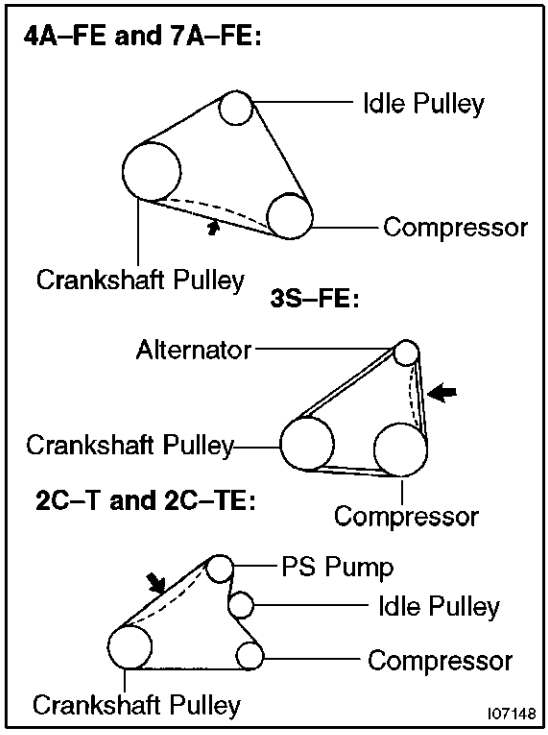
DRIVE BELT

AC1A0–01

ON–VEHICLE INSPECTION

1. INSPECT DRIVE BELT INSTALLATION CONDITION

Check that the drive belt fits properly in the ribbed grooves.



2. INSPECT DRIVE BELT DEFLECTION

Using a belt tension gauge, apply load of 98 N (10 kgf, 22 lbf) and measure drive belt deflection.

Drive belt deflection:
4A–FE and 7A–FE Engine Models:
New belt: 6.0 – 7.0 mm (0.24 – 0.28 in.)
Used belt: 8.5 – 9.5 mm (0.33 – 0.37 in.)
3S –FE Engine Models:
New belt: 6.0 – 9.0 mm (0.24 – 0.35 in.)
Used belt: 9.0 – 11.0 mm (0.35 – 0.43 in.)
2C–T and 2C–TE Engine Models:
New belt: 11.0 – 13.0 mm (0.43 – 0.51 in.)
Used belt: 15.0 – 18.0 mm (0.59 – 0.71 in.)

HINT:

- "New belt" refers to a belt which has been used less than 5 minutes on the running engine.
- "Used belt" refer 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.

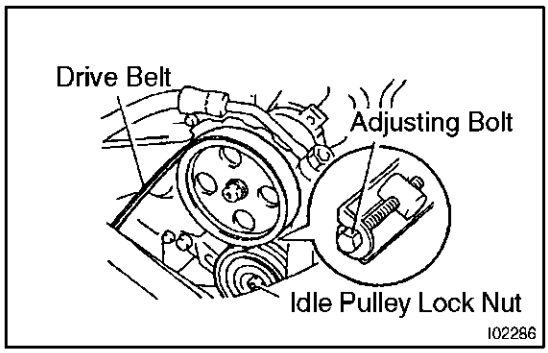
3. INSPECT DRIVE BELT TENSION

Using a belt tension gauge, check the drive belt tension.

Drive belt tension:
4A–FE and 7A–FE Engine Models:
New belt: 520 – 755 N (53 – 77 kgf)
Used belt: 196 – 392 N (20 – 40 kgf)
3S–FE Engine Models:
New belt: 618 – 853 N (63 – 87 kgf)
Used belt: 441 – 539 N (45 – 55 kgf)
2C–T and 2C–TE Engine Models:
New belt: 520 – 755 N (53 – 77 kgf)
Used belt: 196 – 392 N (20 – 40 kgf)

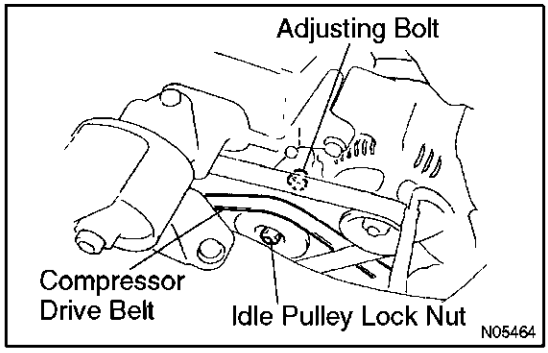
AC1A1–01

REMOVAL



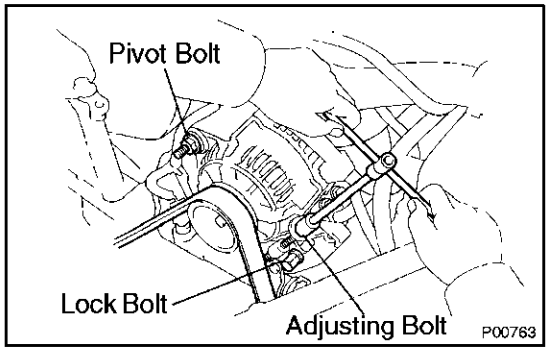
1. 2C–T and 2C–TE Engine Models:
REMOVE DRIVE BELT

(a) Loosen the idle pulley lock nut.
(b) Loosen the drive belt tension by adjusting bolt and remove the drive belt.



2. 4A–FE and 7A–FE Engine Models:
REMOVE DRIVE BELT

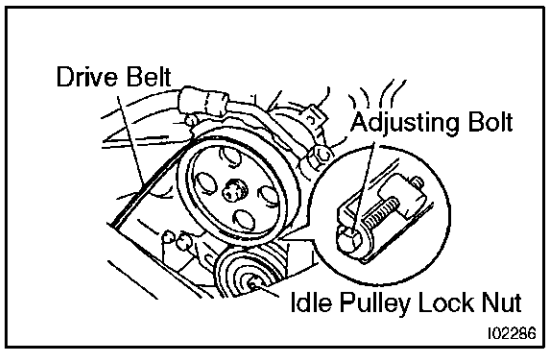
(a) Loosen the idle pulley lock nut.
(b) Remove the alternator drive belt.
(c) Loosen the drive belt tension by adjusting bolt and remove the drive belt.



3. 3S–FE Engine Models:
REMOVE DRIVE BELT

(a) Loosen the pivot bolt and lock bolt.
(b) Remove the drive belt.

AC1A2–01



INSTALLATION

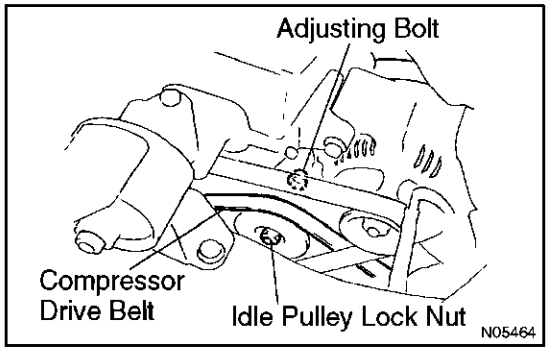
1. 2C–T and 2C–TE Engine Models:
INSTALL DRIVE BELT

(a) Tighten the idle pulley lock nut temporally.
Torque: 2.5 N·m (25 kgf·cm, 22 in.·lbf)

(b) Install the drive belt.

(c) Using a adjusting bolt, adjust drive belt tension.
Drive belt tension:
New belt: 520 – 755 N (53 – 77 kgf)
Used belt: 196 – 392 N (20 – 40 kgf)

(d) Tighten the idle pulley lock nut at regular torque.
Torque: 39 N·m (390 kgf·cm, 29 ft·lbf)



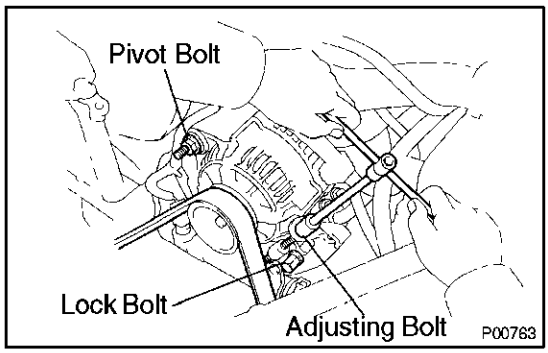
2. 4A–FE and 7A–FE Engine Models:
INSTALL DRIVE BELT

(a) Tighten the idle pulley lock nut temporally.
Torque: 2.5 N·m (25 kgf·cm, 22 in.·lbf)

(b) Install the drive belt.

(c) Using a adjusting bolt, adjust drive belt tension.
Drive belt tension:
New belt: 520 – 755 N (53 – 77 kgf)
Used belt: 196 – 392 N (20 – 40 kgf)

(d) Tighten the idle pulley lock nut at regular torque.
Torque: 39 N·m (390 kgf·cm, 29 ft·lbf)



3. 3S–FE Engine Models:
INSTALL DRIVE BELT

(a) Install the drive belt.

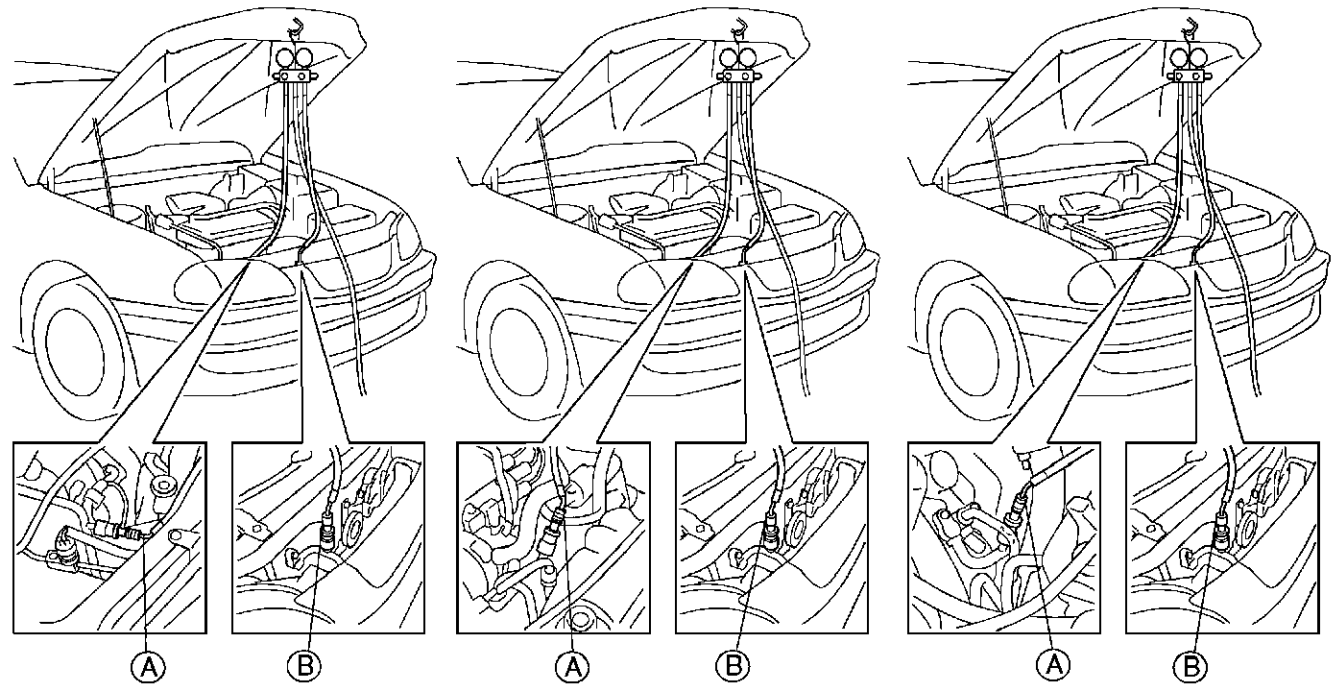
(b) Using a adjusting bolt, adjust drive belt tension.
Drive belt tension:
New belt: 618 – 853 N (63 – 87 kgf)
Used belt: 441 – 539 N (45 – 55 kgf)

(c) Tighten the lock bolt and pivot bolt.
Torque:
Lock bolt: 18 N·m (184 kgf·cm, 13 ft·lbf)
Pivot bolt: 52 N·m (530 kgf·cm, 38 ft·lbf)

MANIFOLD GAUGE SET

AC1A3–01

SET ON



1. **CONNECT CHARGE HOSE TO MANIFOLD GAUGE SET**

Tighten the nuts by hand.

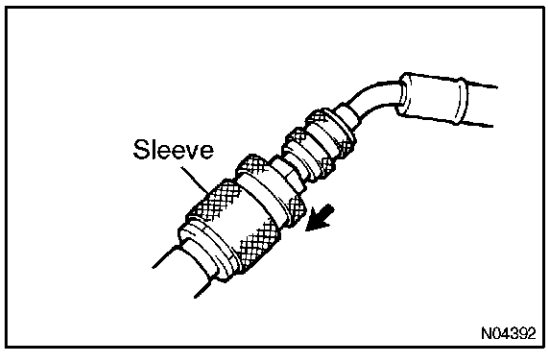
CAUTION:

Do not connect the wrong hoses.

2. **CONNECT QUICK DISCONNECT ADAPTERS TO CHARGING HOSES**

Tighten the nuts by hand.

3. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
4. **REMOVE CAPS FROM SERVICE VALVE ON REFRIGERANT LINE**

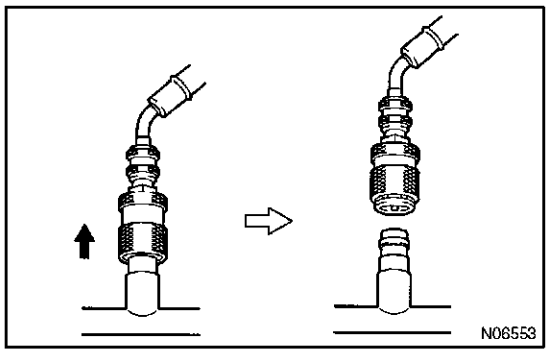


5. CONNECT QUICK DISCONNECT ADAPTER TO SERVICE VALVES

HINT:

Push the quick disconnect adapter onto the service valve, slide, then slide the sleeve of the quick disconnect adapter downward to lock it.

AC1A4–01



SET OFF

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
2. **DISCONNECT QUICK DISCONNECT ADAPTERS FROM SERVICE VALVES ON REFRIGERANT LINE**

HINT:

Slide the sleeve of the quick disconnect adapter upward to unlock the adapter and remove it from the service valve.

3. **INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINE**

REFRIGERANT LINE

AC1A5–01

ON–VEHICLE INSPECTION

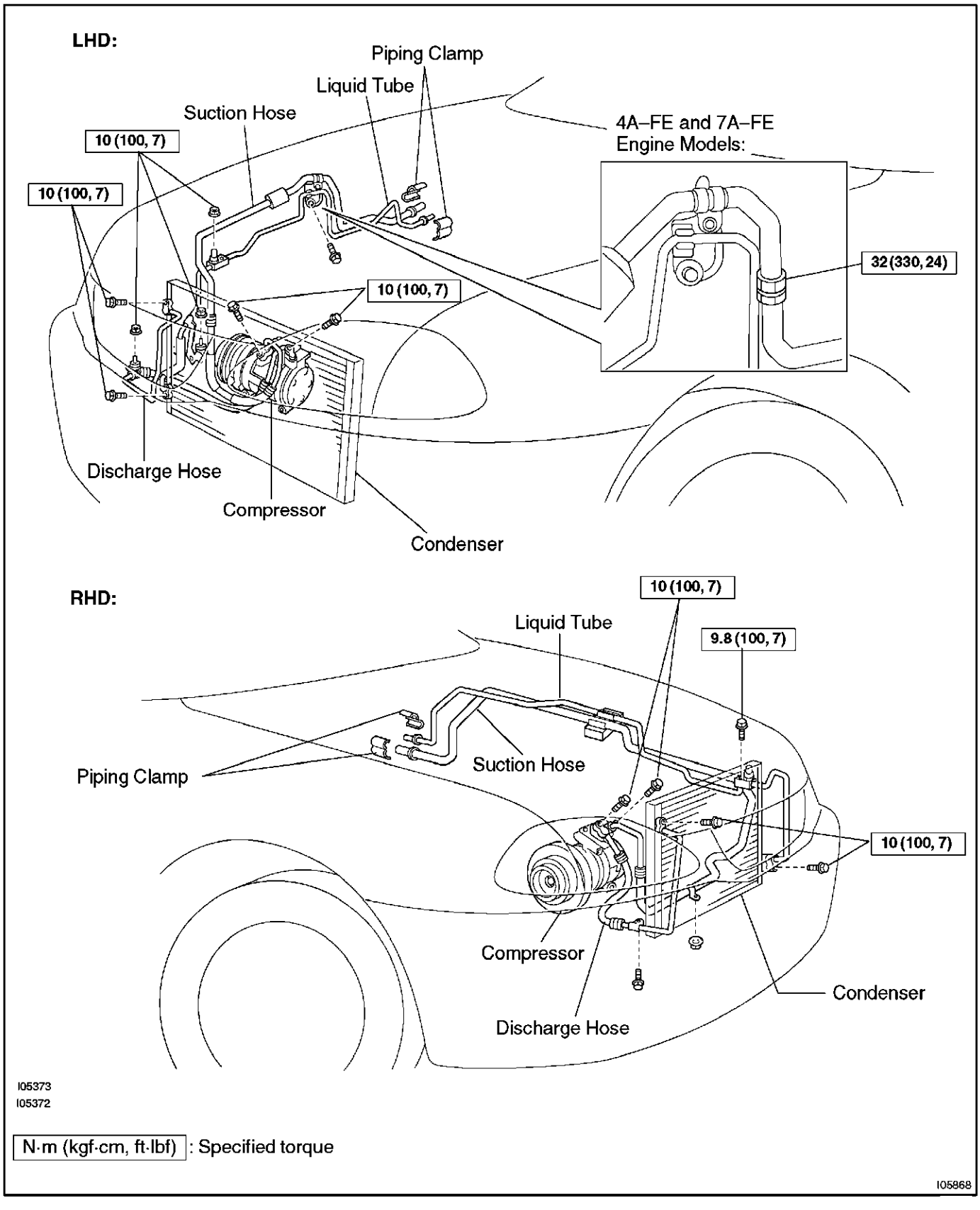
1. INSPECTION HOSE AND TUBE CONNECTIONS FOR LOOSENESS

2. INSPECT HOSES AND TUBES FOR LEAKAGE

Using a gas leak detector, check for leakage of refrigerant.

AC1A6–01

COMPONENTS



I05373
I05372

N·m (kgf·cm, ft·lbf) : Specified torque

I05868

AC1A7–01

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

2. REPLACE FAULTY TUBE OR HOSE

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

3. TIGHTEN JOINT OF BOLT OR NUT AT SPECIFIED TORQUE

NOTICE:

Connections should not be torqued tighter than the specified torque.

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Condenser x Discharge hose	10	100	7
Condenser x Liquid tube	10	100	7
Liquid line (Block joint)	10	100	7
Suction line (Piping joint)	32	330	24

4. EVACUATE AIR FROM REFRIGERATION SYSTEM AND CHARGE SYSTEM WITH REFRIGERANT

Specified amount: 450 ± 50 g (15.87 ± 1.76 oz.)

5. INSPECT FOR LEAKAGE OF REFRIGERANT

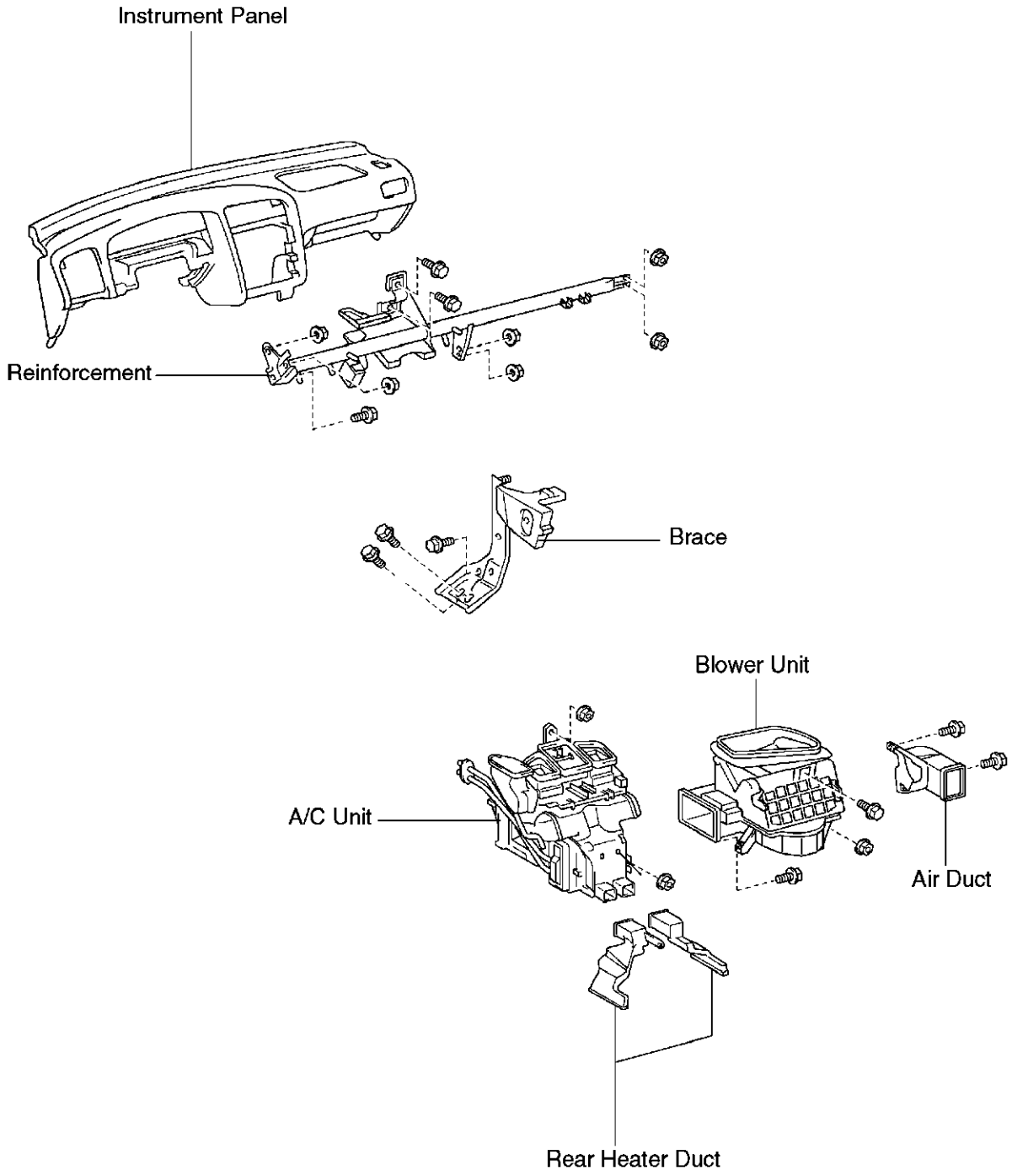
Using a gas leak detector, check for leakage of refrigerant.

6. INSPECT AIR CONDITIONING OPERATION

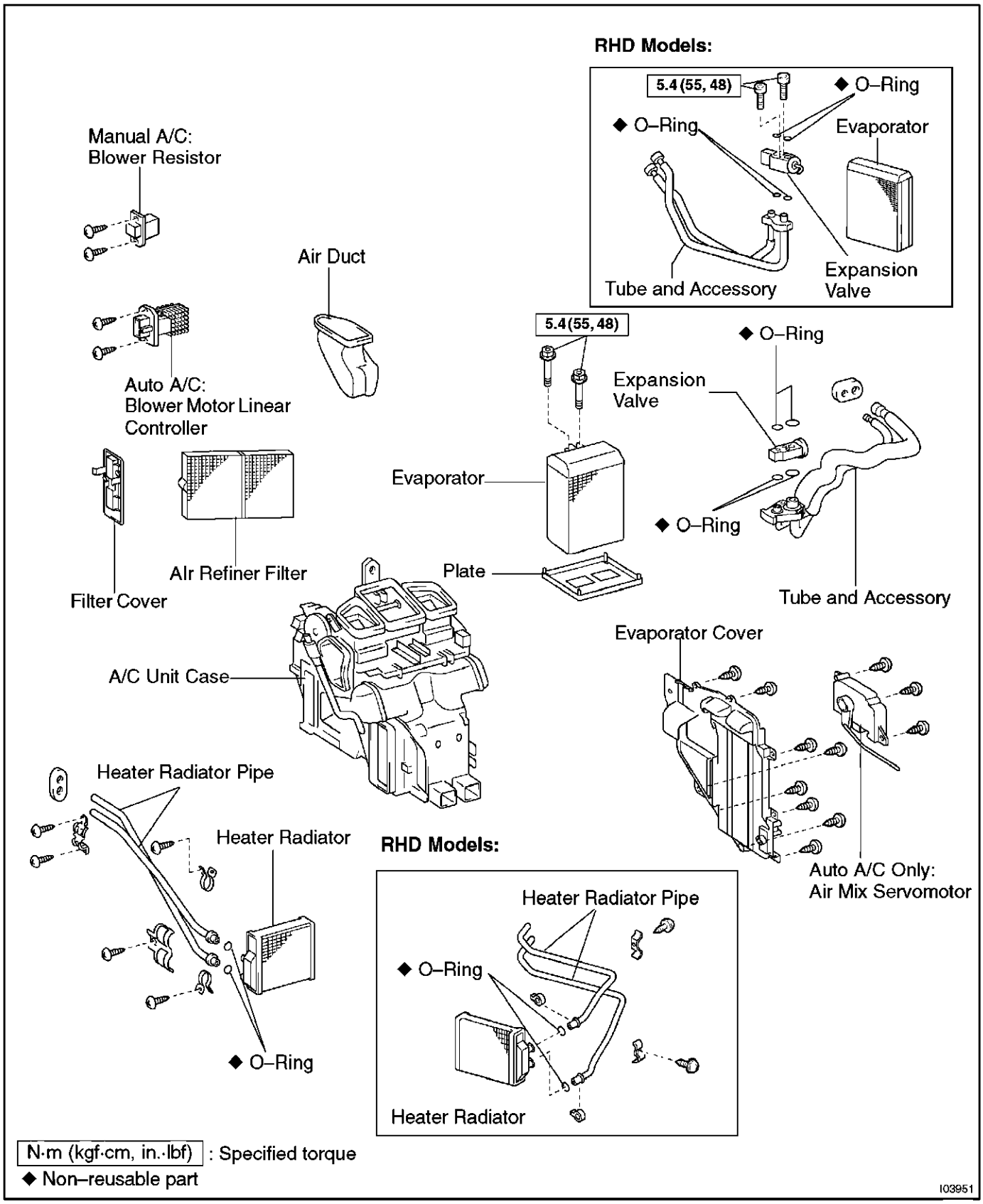
AIR CONDITIONING UNIT

COMPONENTS

AC1A8–01



I05336


RHD Models:
5.4 (55, 48)
◆ O–Ring
◆ O–Ring
Evaporator
Tube and Accessory
Expansion Valve
Manual A/C: Blower Resistor
Air Duct
Auto A/C: Blower Motor Linear Controller
5.4 (55, 48)
◆ O–Ring
Expansion Valve
Evaporator
◆ O–Ring
Air Refiner Filter
Plate
Filter Cover
Tube and Accessory
Evaporator Cover
A/C Unit Case
Heater Radiator Pipe
Heater Radiator
RHD Models:
Auto A/C Only: Air Mix Servomotor
Heater Radiator Pipe
◆ O–Ring
◆ O–Ring
Heater Radiator
N·m (kgf·cm, in.·lbf) : Specified torque
◆ Non–reusable part
I03951

AC1A9–01

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

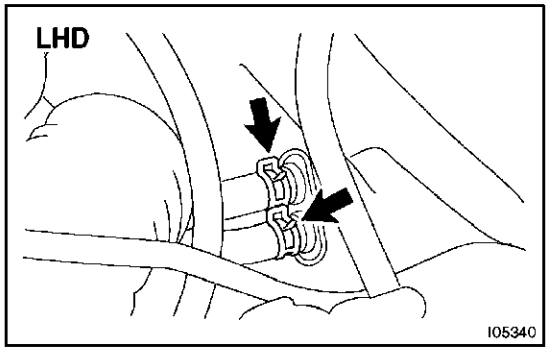
Charge system with refrigerant and inspect for leakage of refrigerant.

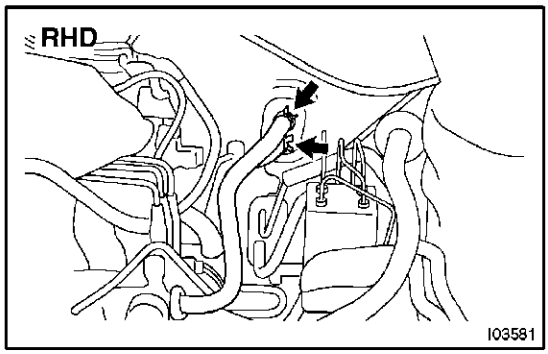
Specified amount: 450 ± 50 g (15.87 ± 1.76 oz.)

2. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

It is not necessary to drain out all the coolant.





3. DISCONNECT WATER HOSES FROM HEATER RADIATOR PIPES

(a) Using pliers, grip the claw of the hose clip and slide the hose clip along the hose.

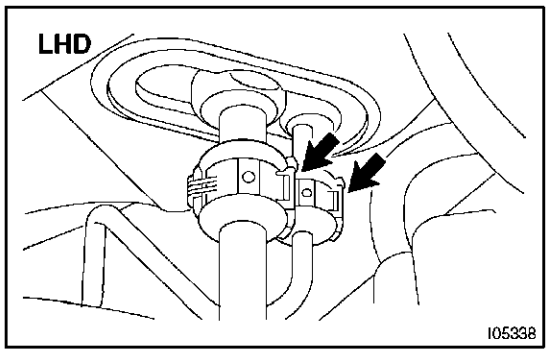
(b) Disconnect the water hoses.

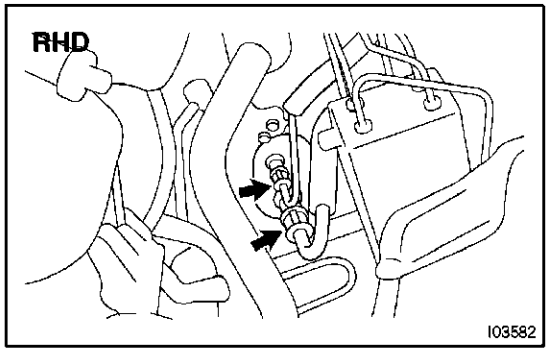
(c) Remove the pipe grommet.

HINT:

At the time of installation, please refer to the following item.

Push the water hose on to the heater radiator pipe as far as the pipe grommet and install the hose clip.

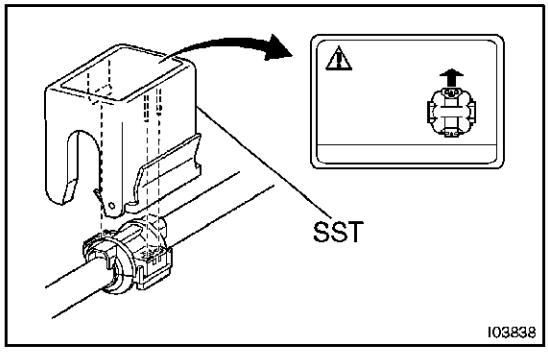




4. DISCONNECT LIQUID AND SUCTION TUBES

(a) Using SST, remove the piping clamps.

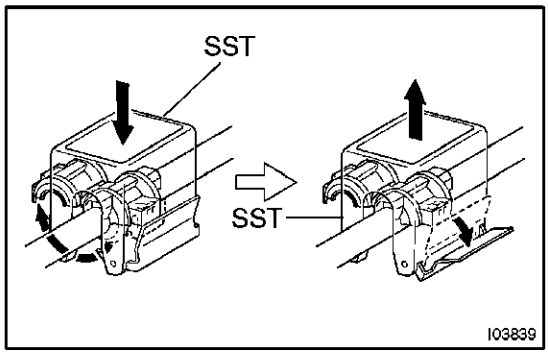
SST 09870–00025 (Liquid tube)
09870–00015 (Suction tube)



(1) Insert SST to piping clamps.

HINT:

Confirm the direction of the piping clamp claw and SST using the illustration showing on the caution label.



(2) Push down SST and release the clamp lock.

NOTICE:

Be careful not to deform the tubes, when pushing SST.

(3) Pull SST slightly and push the release lever, then remove piping clamp with SST.

(4) Remove the piping clamp from SST.

(b) Disconnect the both tubes.

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

HINT:

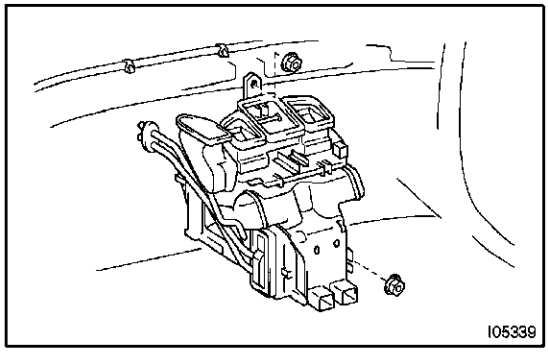
At the time of installation, please refer to the following item.

- Lubricate 4 new O–rings with compressor oil install them to the tubes.
- After connection, check the fitting for claw of the piping clamp.

5. REMOVE THESE PARTS:

(a) Blower unit
(See page AC–38)

(b) Instrument panel and reinforcement
(See page BO–113)



6. REMOVE A/C UNIT

(a) Slide the floor carpet backward.

(b) Remove the screw and 2 rear heater ducts.

(c) Remove the 2 nuts and A/C unit.

AC1AA–01

DISASSEMBLY

1. REMOVE HEATER RADIATOR

(a) Remove the heater core cover.

(b) LHD Models:
Remove the 3 screws and 2 clamps.

(c) RHD Models:
Remove the 2 screws and 2 clamps.

(d) Pullout the heater radiator with 2 heater radiator pipes.

2. REMOVE HEATER RADIATOR PIPES

(a) Remove the 2 screws, 2 clamps and 2 heater radiator pipes.

(b) Remove the 2 O–rings from heater radiator pipes.

HINT:

Do not reuse the 2 O–rings.

3. Manual A/C:
REMOVE BLOWER RESISTOR

Remove the 2 screws and blower resistor.

4. Auto A/C:
REMOVE BLOWER MOTOR LINEAR CONTROLLER

Remove the 2 screws and controller.

5. REMOVE AIR REFINER FILTER

(a) Remove the filter cover.

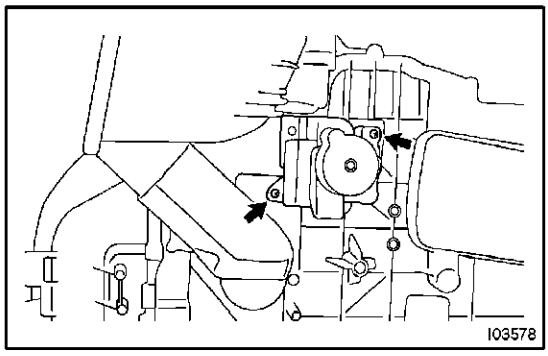
(b) Pull out the filter.

6. REMOVE THESE PARTS:

(a) 2 air ducts

(b) Drain hose

(c) Mode control cable



7. Auto A/C Only:
REMOVE AIR MIX SERVOMOTOR

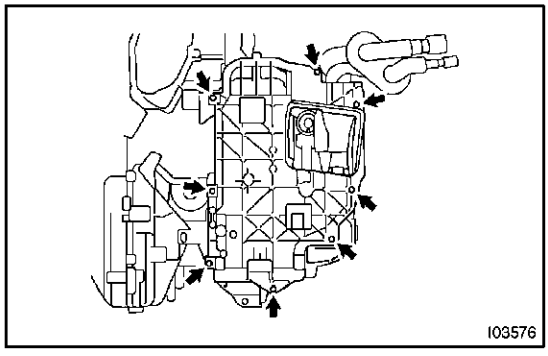
(a) Disconnect the control link.

(b) Remove the 2 screws and servomotor.

8. REMOVE EVAPORATOR TEMPERATURE SENSOR

(a) Disconnect the connector clamp.

(b) Using a screwdriver, pull out the sensor.



9. REMOVE EVAPORATOR

(a) Remove the 8 screws and evaporator cover.

(b) Pull out the evaporator.

(c) Release the 4 claws and remove the plate.

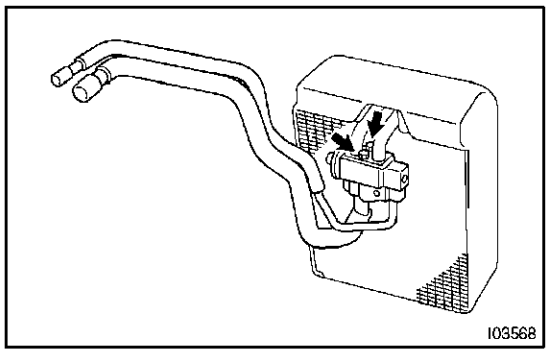
HINT:

At the time of reassembly, please refer to the following item.

If evaporator is replaced, add compressor oil to evaporator.

Add 40 cc (1.4 fl.oz.)

Compressor oil: ND–OIL 8 or equivalent



10. REMOVE EXPANSION VALVE

Using a hexagon wrench, remove the 2 bolts and separate the evaporator and expansion valve.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

HINT:

At the time of reassembly, please refer to the following item.

Lubricate 4 new O–rings with compressor oil and install the valve.

AC1AB–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–33).

AC1AC–01

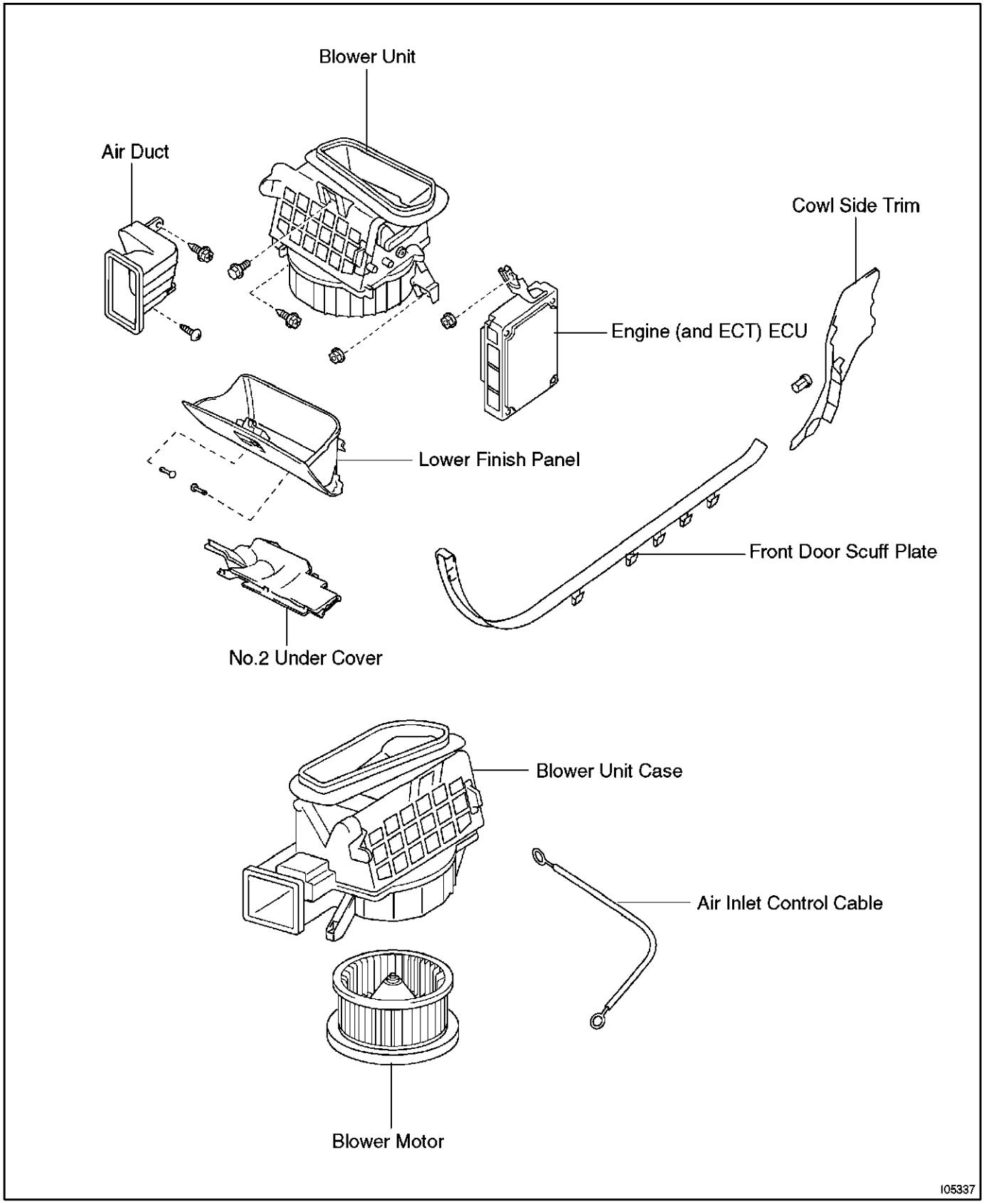
INSTALLATION

Installation is in the reverse order of removal (See page AC–30).

BLOWER UNIT

COMPONENTS

AC1AD–01

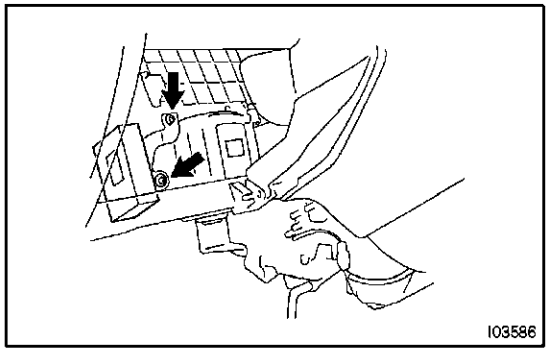


AC1AE–01

REMOVAL

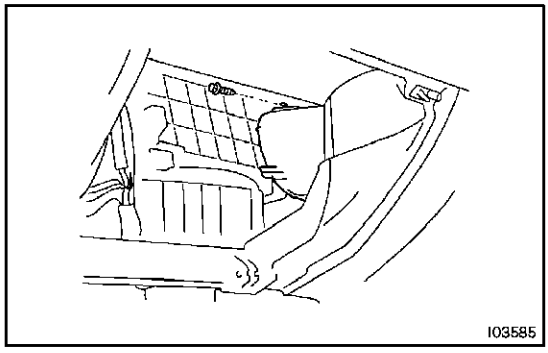
1. REMOVE THESE PARTS:

(a) Front door scuff plate on passenger side
(b) Cowl side trim on passenger side
(c) No.2 under cover
(d) Lower finish panel
(See page BO–113)
(e) Engine (and ECT) ECU



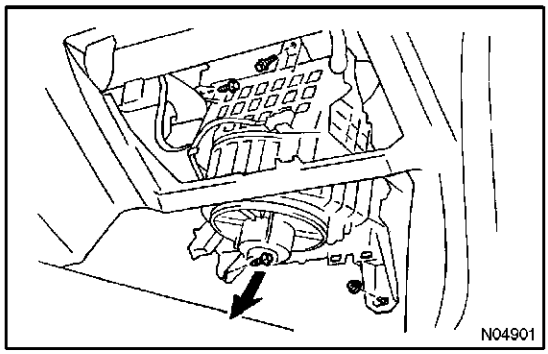
2. RHD Models Only:
REMOVE TVSS ECU

(a) Disconnect the connector.
(b) Remove the 2 screws and ECU.



3. REMOVE AIR DUCT

Remove the 2 screws and duct.



4. REMOVE BLOWER UNIT

(a) Disconnect the connectors.
(b) Remove the bolt, screw and nut.
(c) Disconnect the air inlet control cable.
(d) Remove the blower unit.

AC1AF–01

DISASSEMBLY

1. Manual A/C Models:
REMOVE A/C AMPLIFIER

Release the 2 claws and amplifier.

2. REMOVE BLOWER MOTOR

Remove the 3 screws and blower motor.

AC1AG–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–39).

AC1AH–01

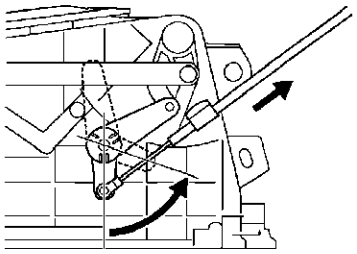
INSTALLATION

Installation is in the reverse order of removal (See page AC–38).

1. AFTER INSTALLATION, CHECK AIR INLET CONTROL LEVER OPERATION

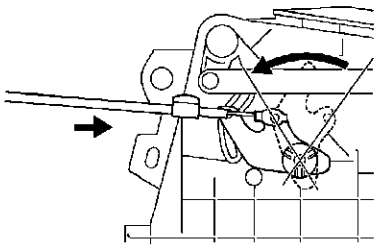
Move the lever left and then check that there the lever is click on operation, check there is not recoil of lever.
If operation is not as specified, proceed to next step.

LHD Models:



I03588

RHD Models:



I03587

2. ADJUST AIR INLET CONTROL CABLE

(a) Set air inlet control lever to "RECIRC" position.
(b) Set the air inlet link to "RECIRC" position and connect the cable and lock the clamp.

HINT:

- LHD Models:
  Lock the clamp during lightly pulling the outer cable in the direction, as shown in the illustration by an arrow.
- RHD Models:
  Lock the clamp during lightly pushing the outer cable in the direction, as shown in the illustration by an arrow.

COMPRESSOR AND MAGNETIC CLUTCH

AC1AI–01

ON–VEHICLE INSPECTION

1. MAKE THESE VISUAL CHECKS:

(a) Leakage of grease from the clutch bearing

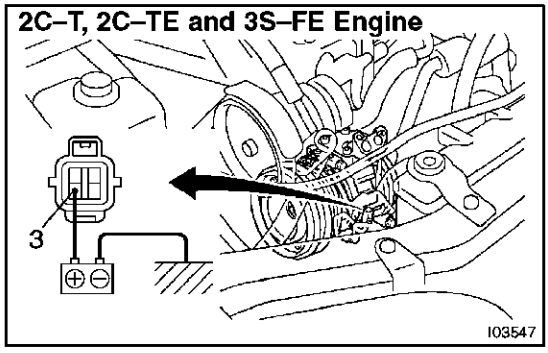
(b) Signs of oil on the pressure plate or rotor

2. INSPECT MAGNETIC CLUTCH BEARING FOR NOISE

(a) Start engine.

(b) Check for abnormal noise from the compressor when the A/C switch is OFF.

If abnormal noise is being emitted, replace the magnetic clutch.



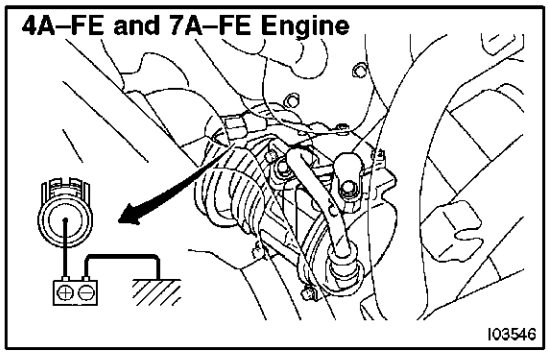
3. INSPECT MAGNETIC CLUTCH OPERATION

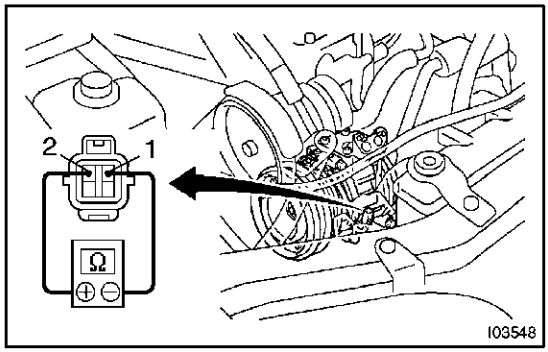
(a) Disconnect the connector.

(b) Connect the positive (+) lead from the battery to the terminal on the magnetic clutch connector and the negative (–) lead to the body ground.

(c) Check that the magnetic clutch is energized.

If operation is not as specified, replace the magnetic clutch.





4. 2C–T, 2C–TE and 3S–FE Engine Models: INSPECT COMPRESSOR LOCK SENSOR RESISTANCE

(a) Disconnect the connector.

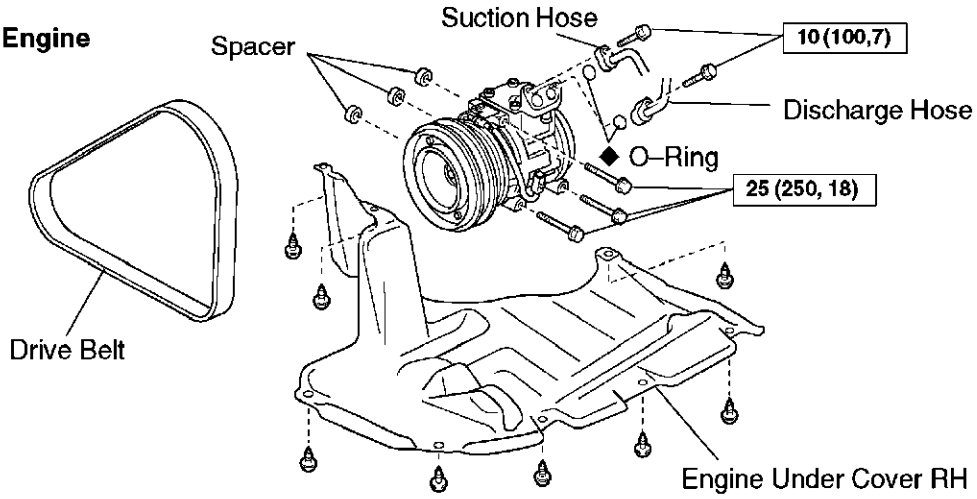
(b) Measure resistance between terminals 1 and 2.

Standard resistance: 65 – 125 Ω at 20 °C (68 °F)

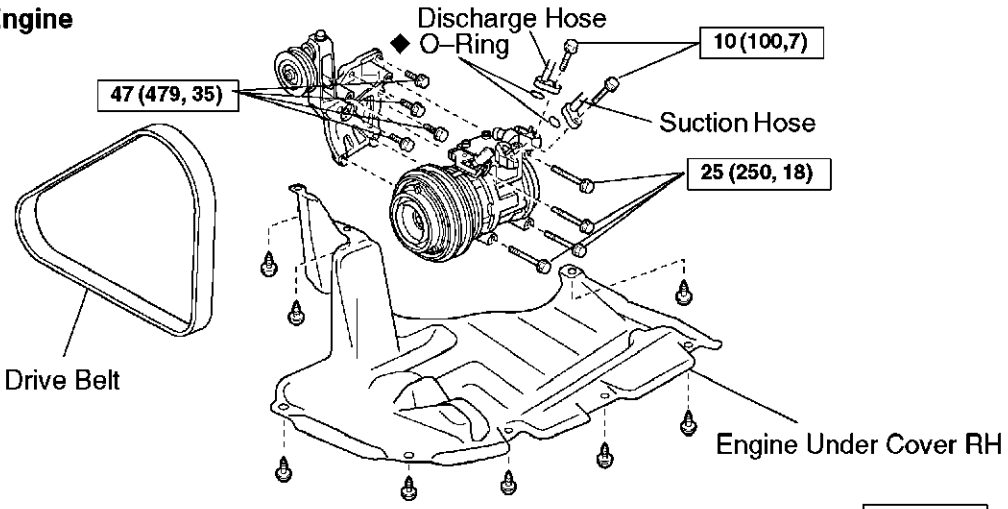
AC1AJ–01

COMPONENTS

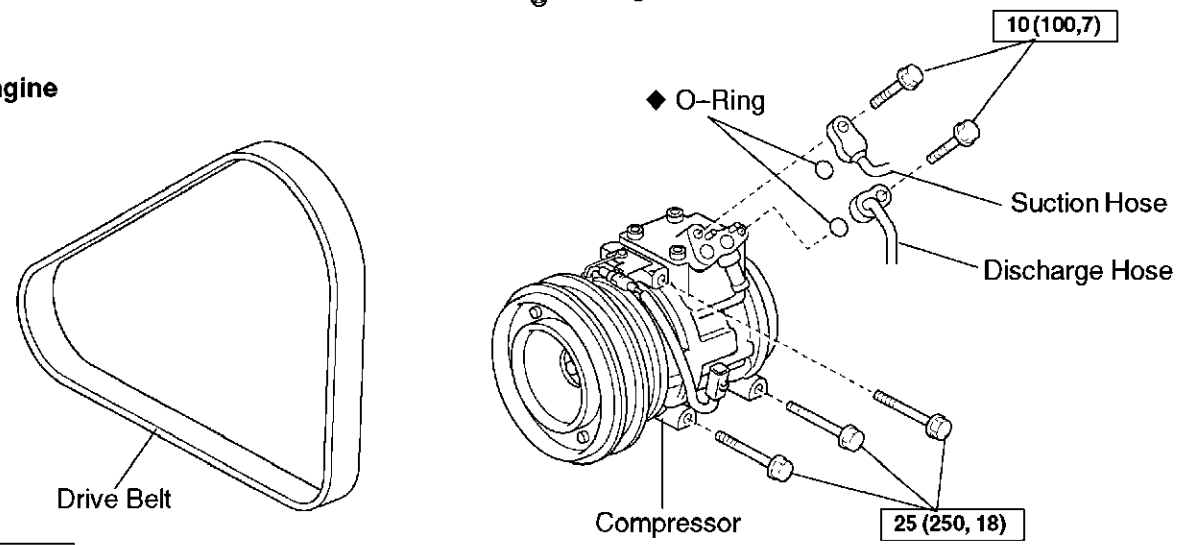
2C–TE and 2C–TE Engine



4A–FE and 7A–FE Engine



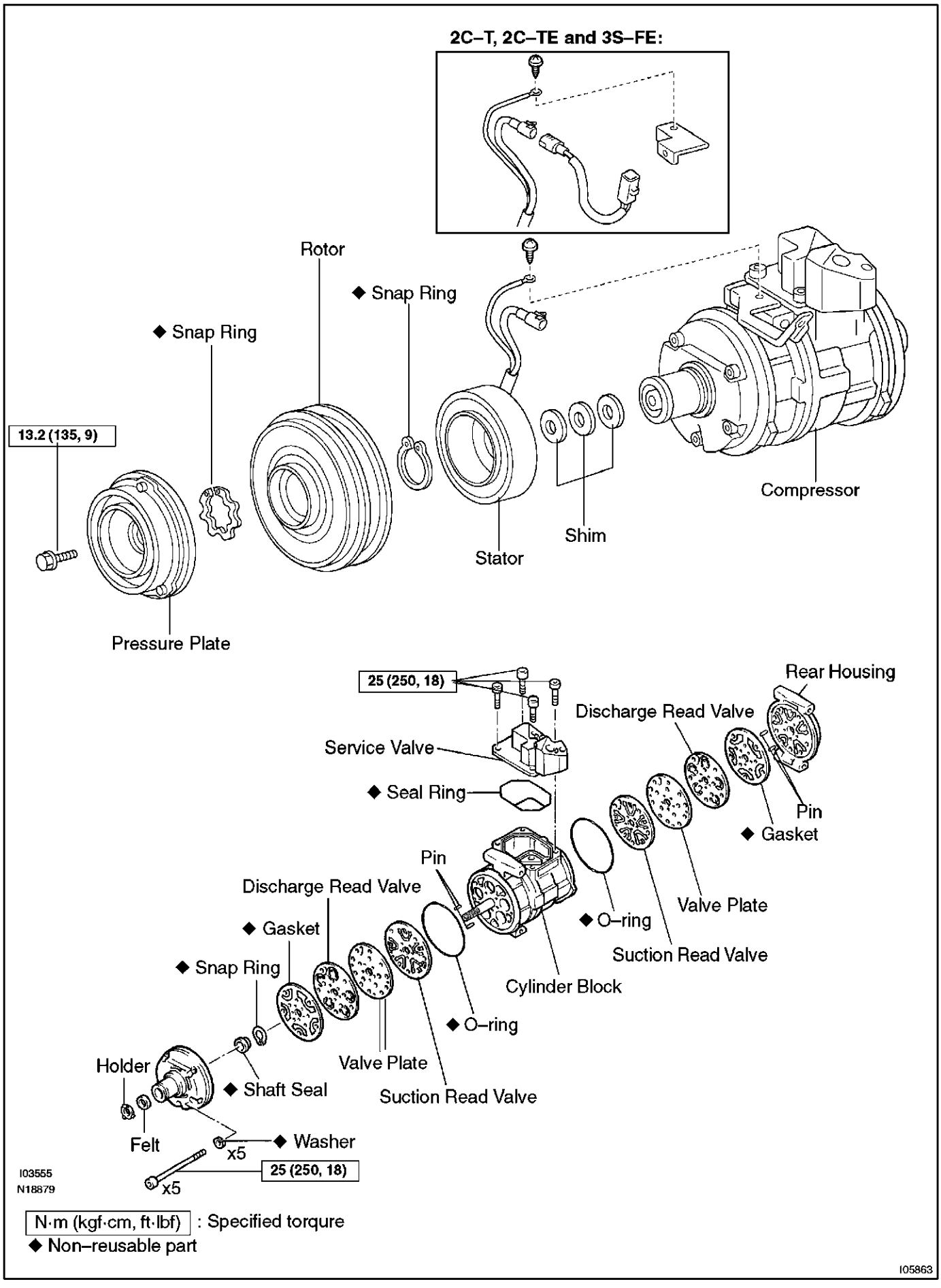
3S–FE Engine



I03559
I03558
I03560

N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

I05862

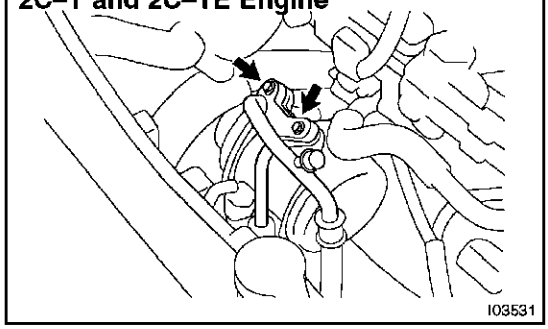

2C–T, 2C–TE and 3S–FE:
Rotor
◆ Snap Ring
◆ Snap Ring
13.2 (135, 9)
Compressor
Shim
Stator
Pressure Plate
25 (250, 18)
Rear Housing
Discharge Read Valve
Service Valve
◆ Seal Ring
Pin
◆ Gasket
Pin
Discharge Read Valve
◆ Gasket
◆ Snap Ring
◆ O–ring
Valve Plate
Suction Read Valve
Cylinder Block
◆ O–ring
Holder
Valve Plate
◆ Shaft Seal
Suction Read Valve
Felt
x5
◆ Washer
25 (250, 18)
x5
I03555
N18879
N·m (kgf·cm, ft·lbf) : Specified torqure
◆ Non–reusable part
I05863

AC1AK–01

REMOVAL

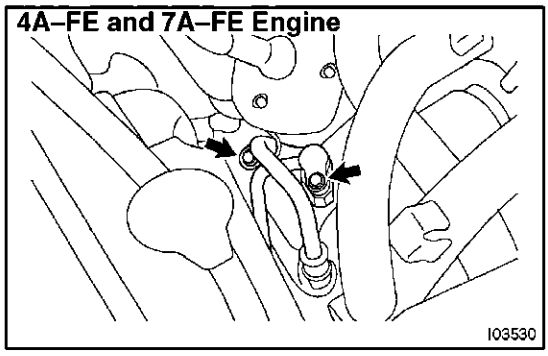
1. RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX. 10 MINUTES WITH A/C ON
2. STOP ENGINE
3. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY
4. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
5. 2C–T, 2C–TE, 4A–FE and 7A–FE Engine Models: REMOVE ENGINE UNDER COVER RH
6. REMOVE DRIVE BELT
(See page AC–19)

2C–T and 2C–TE Engine



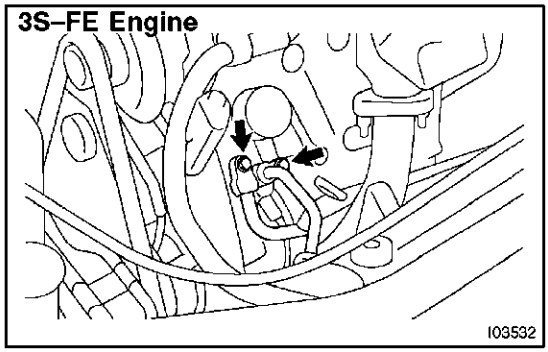
I03531

4A–FE and 7A–FE Engine



I03530

3S–FE Engine



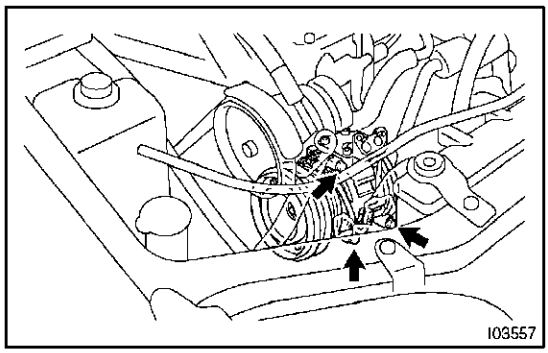
I03532

7. DISCONNECT DISCHARGE AND SUCTION HOSES

Remove the 2 bolts and disconnect the both hoses.

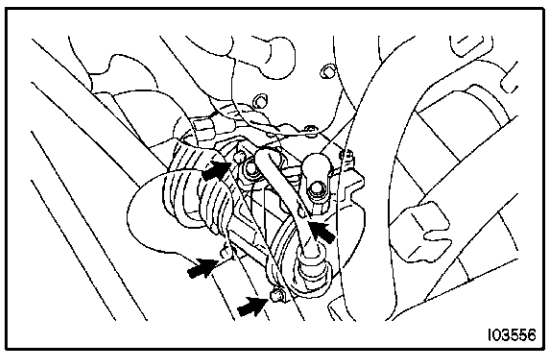
NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.



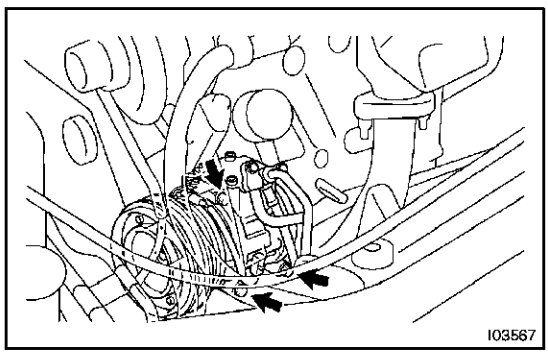
8. 2C–T and 2C–TE Engine Models:
REMOVE COMPRESSOR

(a) Disconnect the connector.
(b) Remove the 3 bolts and compressor.



9. 4A–FE and 7A–FE Engine Models:
REMOVE COMPRESSOR

(a) Disconnect the connector.
(b) Remove the 4 bolts and compressor.



10. 3S–FE Engine Models:
REMOVE COMPRESSOR

(a) Disconnect the connector.
(b) Remove the 3 bolts, compressor and spacer.

AC1AL–01

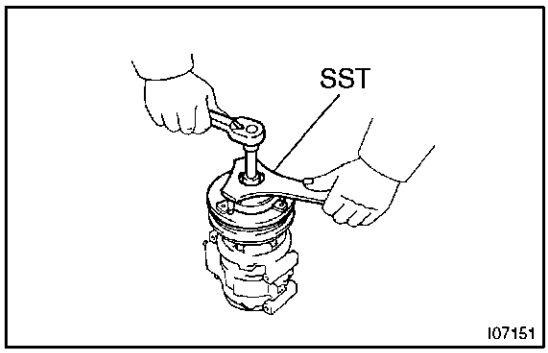
DISASSEMBLY

1. DISASSEMBLE MAGNETIC CLUTCH

(a) Remove the pressure plate.

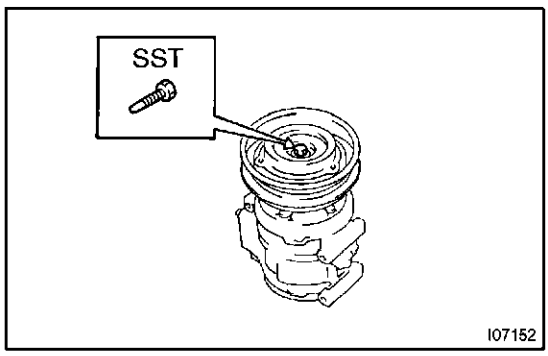
(1) Using a SST and socket wrench, remove the shaft bolt.

SST 07112–76060



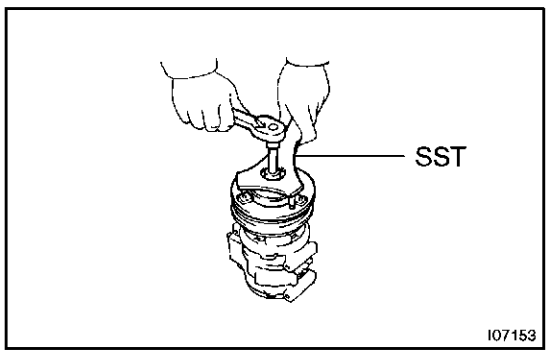
(2) Install a SST on the pressure plate.

SST 07112–66040

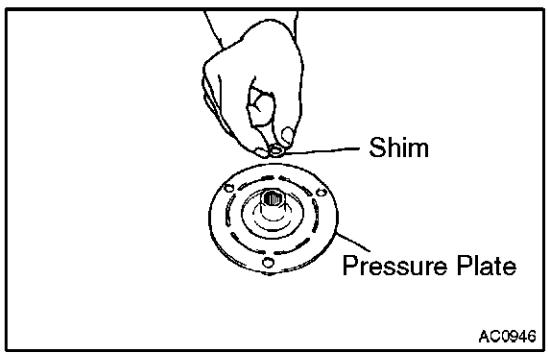


(3) Using a SST and socket wrench, remove the pressure plate.

SST 07112–66040, 07112–76060



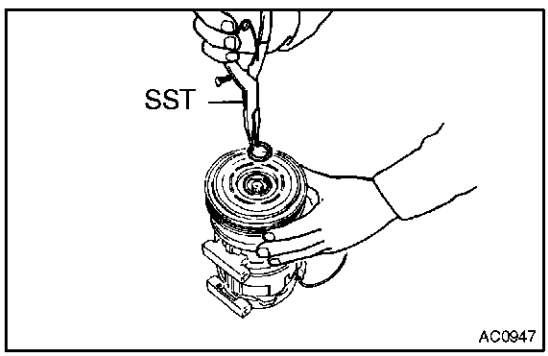
(4) Remove the shims from the pressure plate.

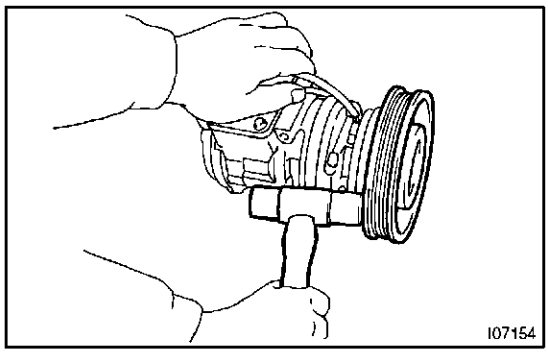


(b) Remove the rotor.

(1) Using a SST remove the snap ring.

SST 07114–08402

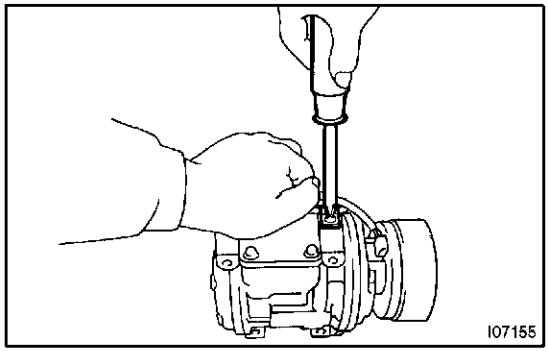




(2) Using a plastic hammer, tap the rotor off the shaft.

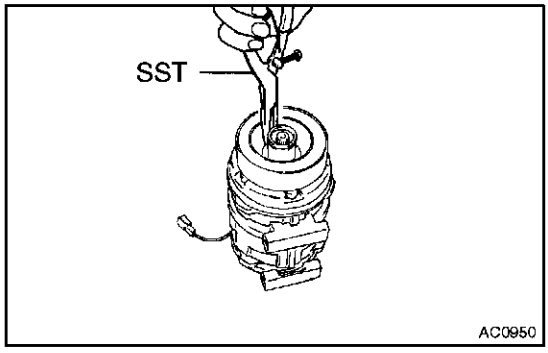
NOTICE:

Be careful not to damage the pulley when tapping on the rotor.



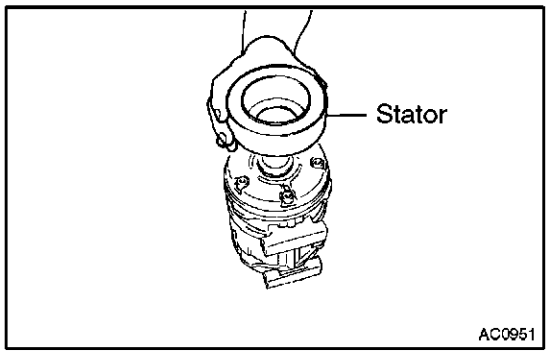
(c) Remove the stator.

(1) Disconnect the stator lead wire from the compressor housing.

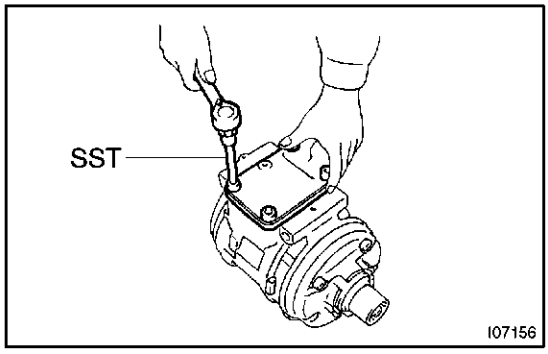


(2) Using a SST, remove the snap ring.

SST 07114–84020



(3) Remove the stator.



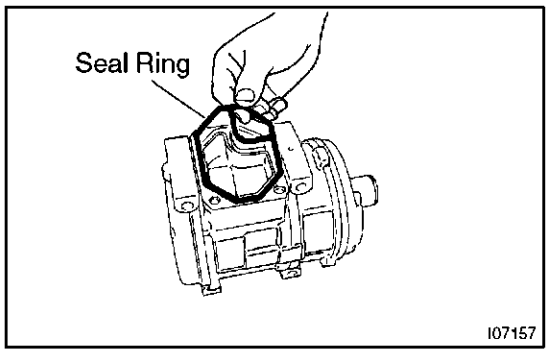
2. DISASSEMBLE COMPRESSOR

(a) Remove the service valve.

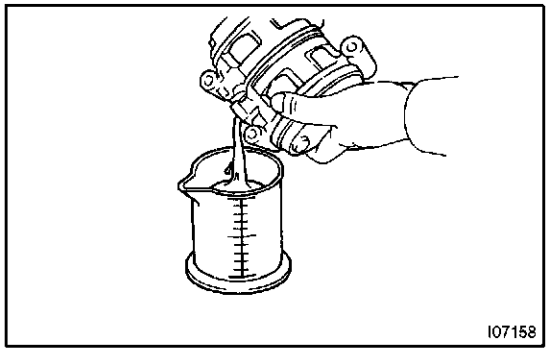
(1) Disconnect the connector.

(2) Using SST, remove the 4 bolts and service valve.

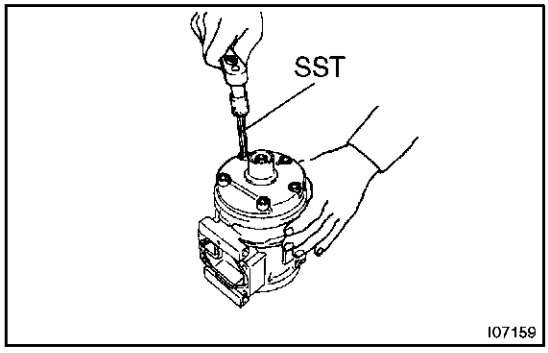
SST 07110–61050



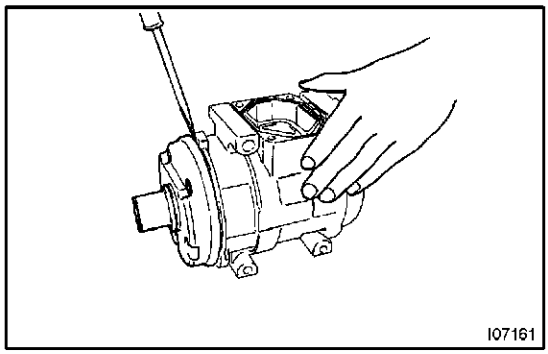
(3) Remove the seal ring from the cylinder block.
(4) Discard the seal ring.



(b) Drain compressor oil into measuring flask.
Measure the quantity of drained oil because the same amount should be replaced later.

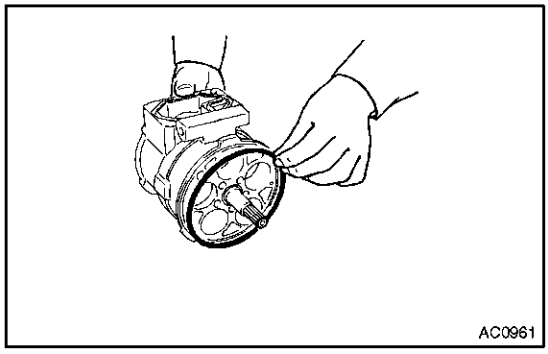


(c) Remove front housing.
(1) Using SST, remove the 5 through bolts and 5 washers.
SST 07110–61050

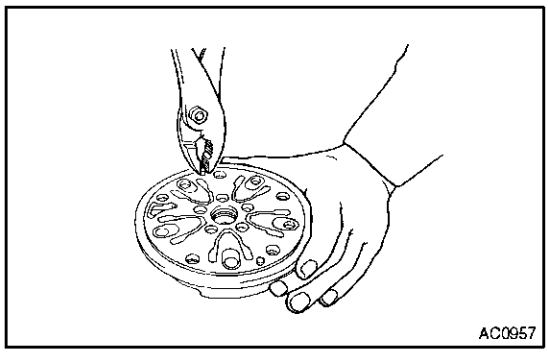


(2) Using a screwdriver, remove the front housing.

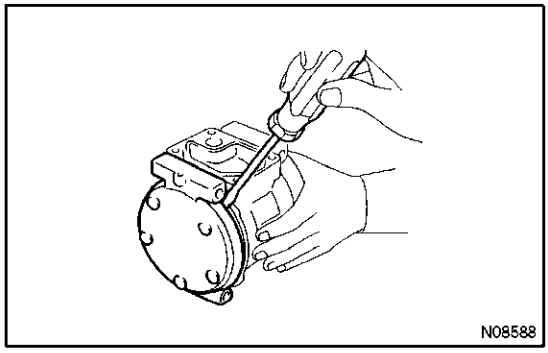
NOTICE:
Be careful not to scratch the sealing surface of the front housing.



(3) Remove a O–ring.
(4) Discard a O–ring.



(d) Remove the 2 pins.
Using pliers, pull out 2 pins from front housing.
(e) Remove these parts from front housing:
(1) Suction reed valve
(2) Front valve plate
(3) Discharge reed valve
(4) Gasket

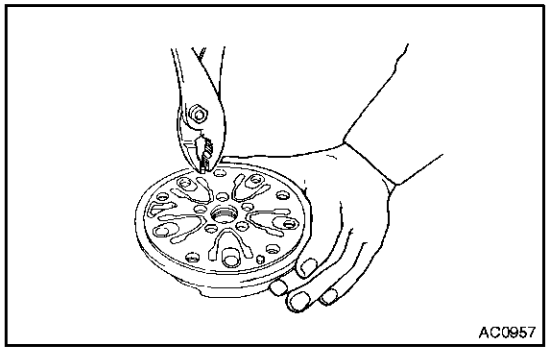


(f) Remove the rear housing.
(1) Using a screwdriver, remove the rear housing.

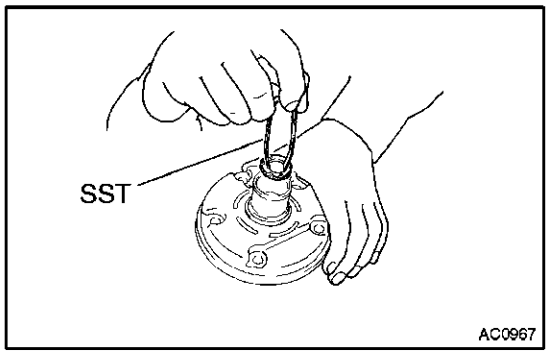
NOTICE:

Be careful not to scratch the sealing surface of the rear housing.

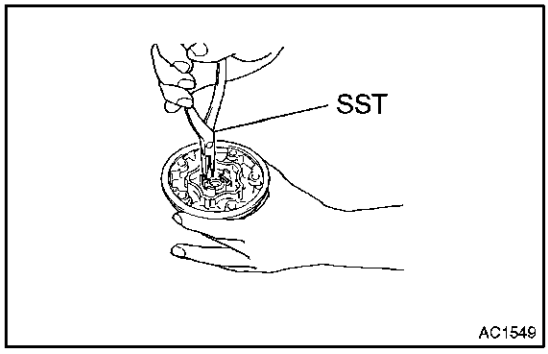
(2) Remove a O–ring.
(3) Discard a O–ring.



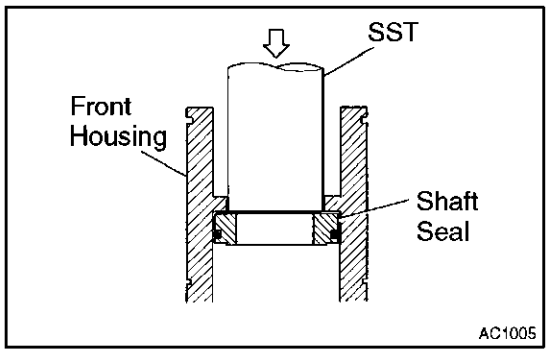
(g) Remove the 2 pins.
Using pliers, pull out 2 pins from rear housing.
(h) Remove these parts from rear housing:
(1) Suction reed valve
(2) Rear valve plate
(3) Discharge reed valve
(4) Gasket



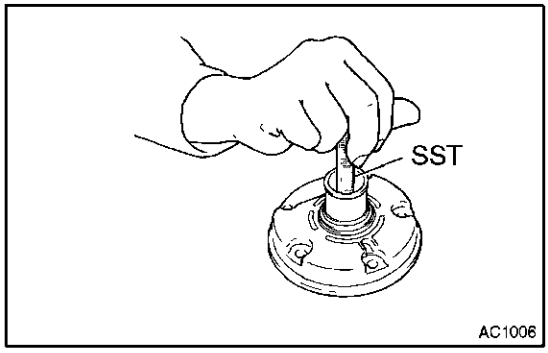
(i) Remove the felt.
(1) Set SST on the shaft.
SST 07112–15020
(2) Pull out the felt with felt holder of front housing.



(j) Remove the shaft seal.
(1) Using SST, remove the snap ring.
SST 07114–87010



(2) Set SST on the shaft seal.
SST 07112–87030



(3) Using SST, put the shaft seal out of the front housing.
SST 07112–85030
(4) Remove the O–ring from the shaft seal.
(5) Discard the O–ring.

AC1AM–01

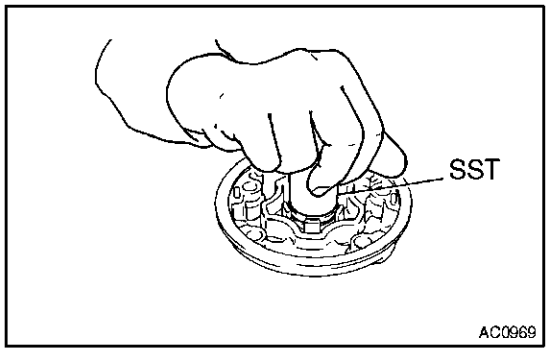
REASSEMBLY

1. ASSEMBLE COMPRESSOR

(a) Install new shaft seal.

(1) Fit the shaft seal onto SST, and install the shaft seal into the front housing.

SST 07112–85020

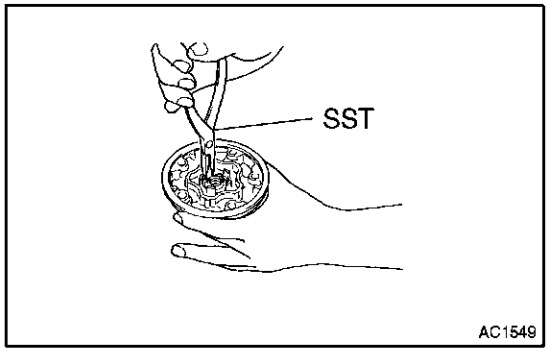


HINT:

Clean up the surface of the shaft seal with compressor oil.

(2) Using SST, install the snap ring.

SST 07114–84010

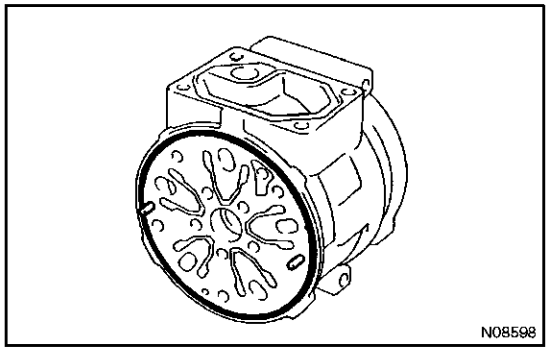


(b) Install rear housing on cylinder block.

(1) Install 2 pins on cylinder block.

(2) Lubricate a new O–ring with compressor oil and install the O–ring on cylinder block.

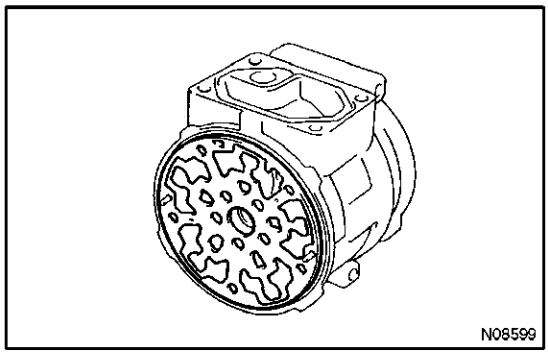
(3) Install the suction reed valve over the pins on the cylinder.



(4) Install the rear valve plate together with the discharge valve over the pins on the cylinder block.

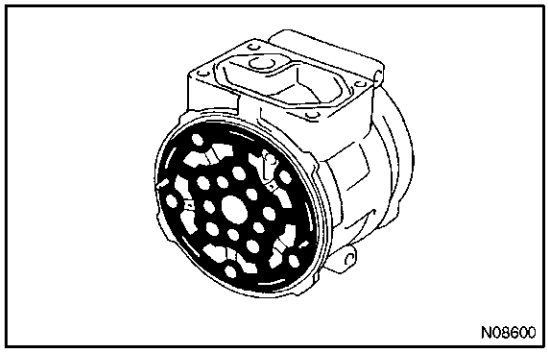
HINT:

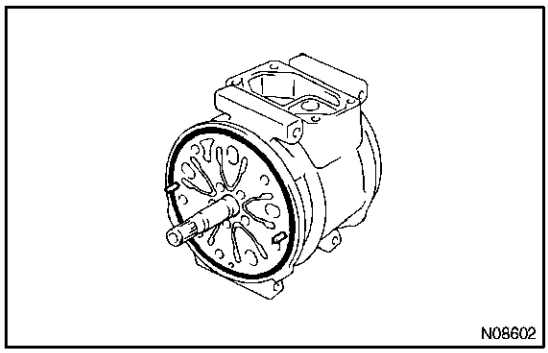
The rear valve plate is marked with an "R".



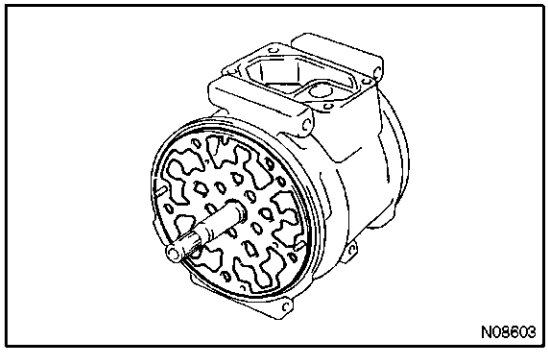
(5) Lubricate a new gasket with compressor oil and install the gasket on the valve plate.

(6) Install the rear housing on cylinder block.



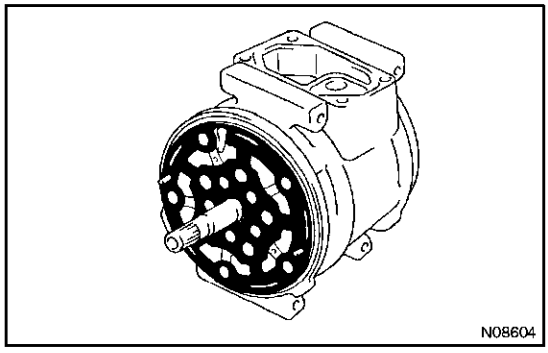


(c) Install the front housing on cylinder block.
(1) Install the 2 pins on cylinder block.
(2) Lubricate a new O–ring with compressor oil and install the O–ring on cylinder block.
(3) Install the front suction reed valve over the pins on the cylinder block.

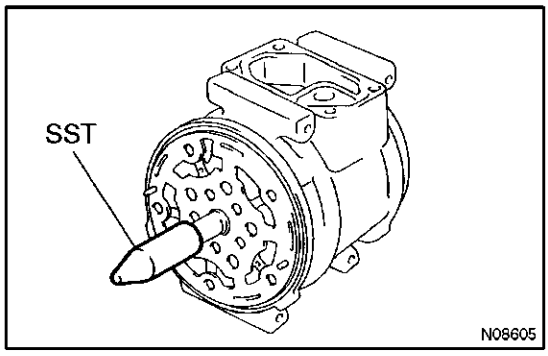


(4) Install the valve plate together with the discharge reed valve over the pins on the cylinder block.

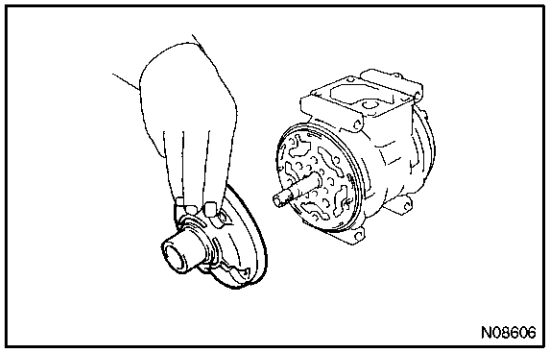
HINT:
The front valve plate is marked with an "F".



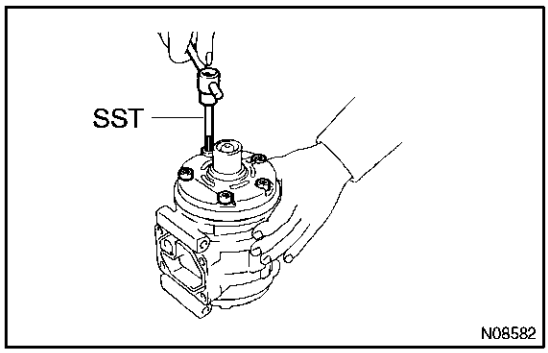
(5) Lubricate a new gasket with compressor oil and install the gasket on the valve plate.



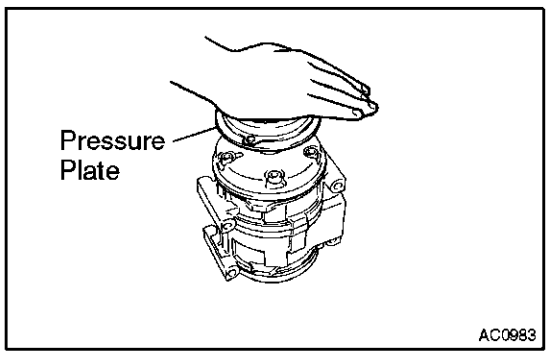
(6) Set SST on the shaft to protect the lip seal.



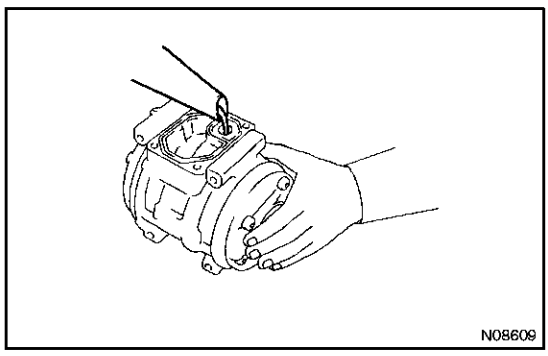
(7) Install the front housing on the cylinder block.
(8) Remove SST from the shaft.



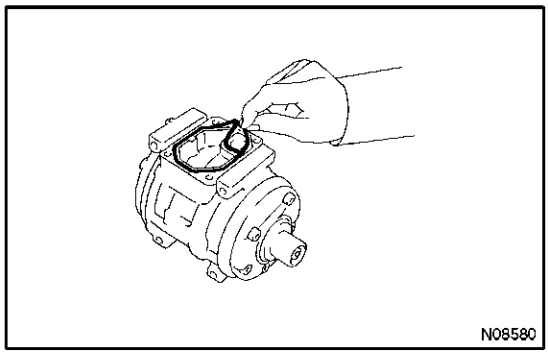
(9) Using SST and torque wrench, gradually tighten the 5 through bolts 2 or 3 times.
SST 07110–61050
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



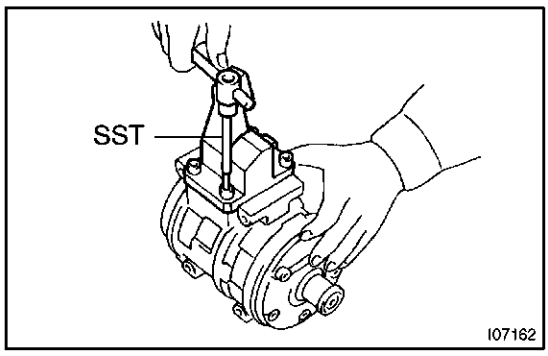
(d) Install the felt.
(1) Set the felt with felt holder to front housing.
(2) Using pressure plate of magnetic clutch, install the felt.



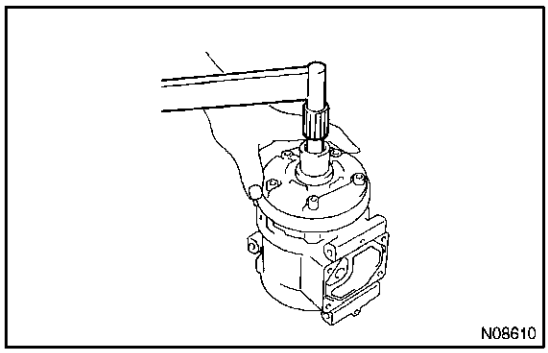
(e) Pour compressor oil into compressor.
Add the same quantity of oil as is removed, plus 20 cc (0.68 fl.oz.) into the compressor.
Compressor oil: ND–OIL 8 or equivalent.



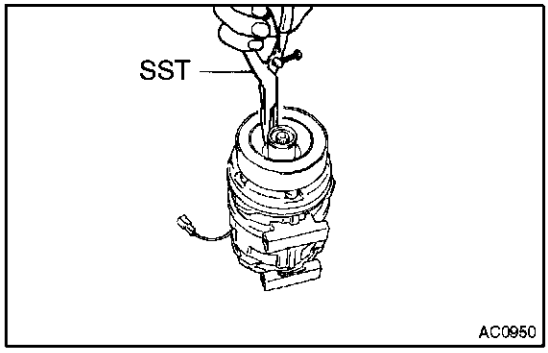
(f) Install the service valve.
(1) Lubricate a new seal ring with compressor oil and install the seal ring on cylinder block.



(2) Using SST and torque wrench, install the service valve with the 4 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)
(3) Connect the connector.

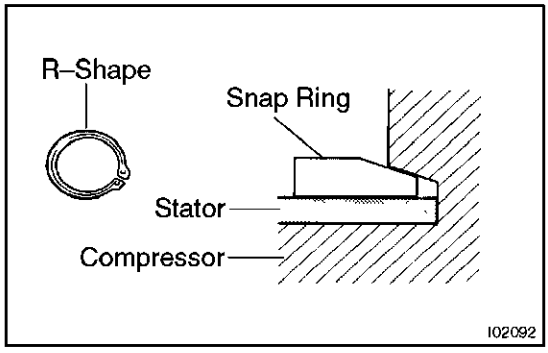


(g) Check shaft starting torque.
Torque: 2.9 N·m (30 kgf·cm, 26 in.·lbf)



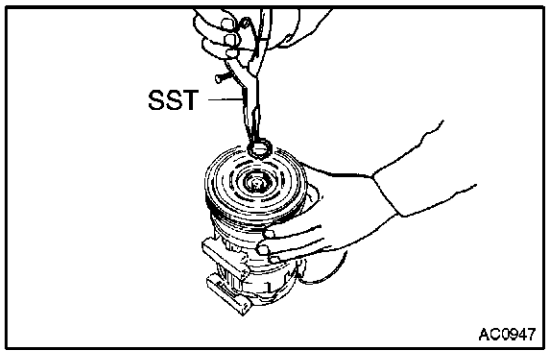
2. ASSEMBLE MAGNETIC CLUTCH

(a) Install the stator.
(1) Install the stator on compressor.
(2) Using SST, install the new snap ring.
SST 07114–84020

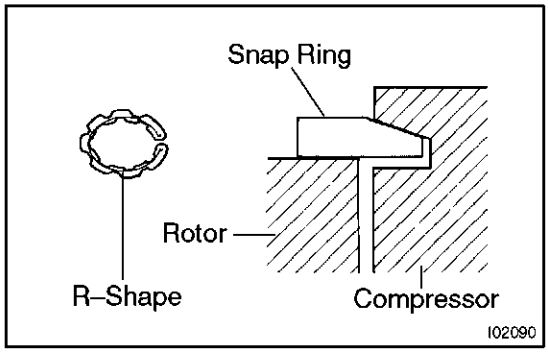


NOTICE:
The snap ring should be installed so that its beveled faces up.

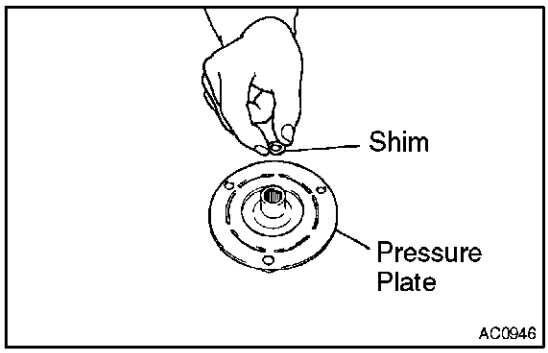
(3) Connect the stator lead wire to the compressor.



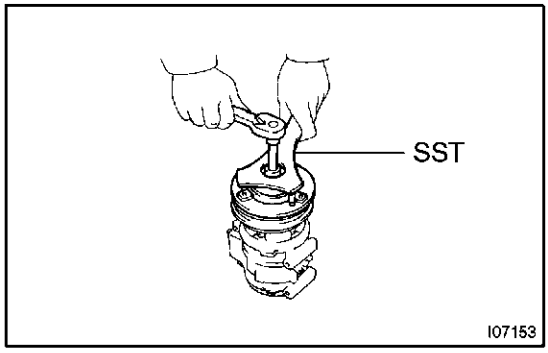
(b) Install the rotor.
(1) Install the rotor on compressor.
(2) Using SST, install the new snap ring.
SST 07114–84020



NOTICE:
The snap ring should be installed so that beveled side faces up.



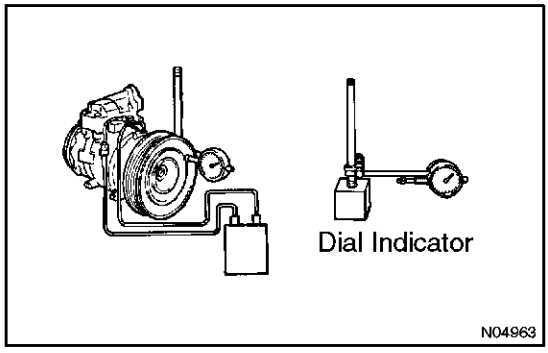
(c) Install the pressure plate.
(1) Install the shims to pressure plate.



(2) Install the pressure plate on the rotor.
(3) Using SST and a torque wrench, install the shaft bolt.

Torque: 13.2 N·m (135 kgf·cm, 9 ft·lbf)

SST 07112–76060



3. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the pressure plate of the magnetic clutch.
(b) Connect the magnetic clutch lead wire to the positive (+) terminal of the battery.
(c) Check the clearance between the pressure plate and rotor when connecting the negative (–) terminal to the battery.

Standard clearance:
0.5 ± 0.15 mm (0.020 ± 0.0059 in.)

If the clearance is not within the standard clearance, adjust the clearance using shims to obtain the standard clearance.

Shim thickness:
0.1 mm (0.004 in.)
0.3 mm (0.012 in.)
0.5 mm (0.020 in.)

AC1AN–01

INSTALLATION

1. 2C–T and 2C–TE Engine Models:
INSTALL COMPRESSOR

(a) Install the compressor with 3 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.

2. 4A–FE and 7A–FE Engine Models:
INSTALL COMPRESSOR

(a) Install the compressor with 4 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.

3. 3S–FE Engine Models:
INSTALL COMPRESSOR

(a) Install the compressor with 3 bolts and spacer.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.

4. CONNECT DISCHARGE AND SUCTION HOSES

Connect the both hoses with the 2 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

CAUTION:
Hoses should be connected immediately after the caps have removed.

HINT:
Lubricate 2 new O–rings with compressor oil and install the hoses.

5. INSTALL AND CHECK DRIVE BELT
(See page AC–20, AC–18)

6. 2C–T, 2C–TE, 4A–FE and 7A–FE Engine Models:
INSTALL ENGINE UNDER COVER RH

7. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

8. EVACUATE IR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT
Specified amount: 450 ± 50 g (15.87 ± 1.76 oz.)

9. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check the tightening torque at the joints.

10. INSPECT A/C OPERATION

CONDENSER

AC1AO–01

ON–VEHICLE INSPECTION

1. INSPECT CONDENSER FINS FOR BLOCKAGE OR DAMAGE

- If the fins are clogged, wash them with water and dry with compressed air.

NOTICE:

Be careful not to damage the fins.

- If the fins are bent, straighten them with a screwdriver or pliers.

2. INSPECT CONDENSER AND FITTING FOR LEAKAGE

Using a gas leak detector, check for leakage.

If there is leakage, check the tightening torque at the joints.

AC1AP–01

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

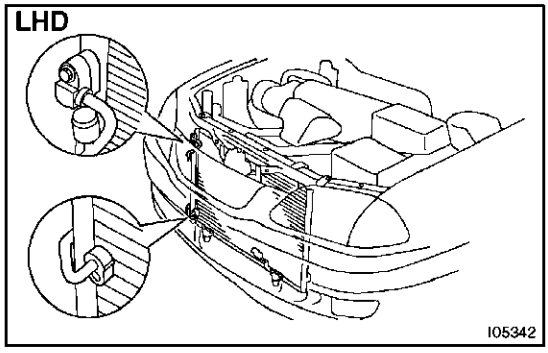
At the time of installation, please refer to the following item.

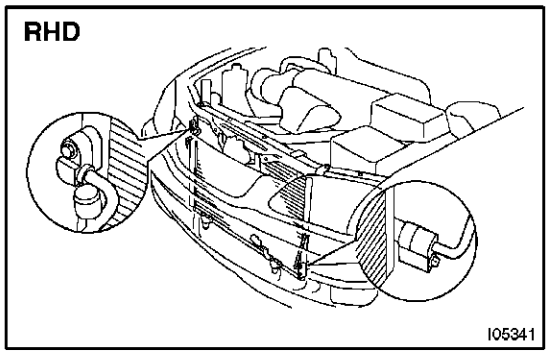
Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

Specified amount: 450 ± 50 g (15.87 ± 1.76 oz.)

2. REMOVE 2 RADIATOR UPPER SUPPORTS





3. DISCONNECT DISCHARGE HOSE AND LIQUID TUBE

Remove the 2 bolts and disconnect the hose and tube.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

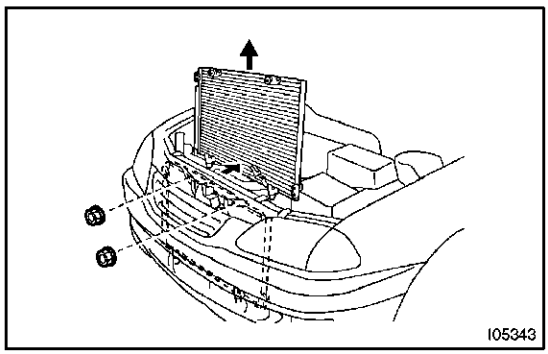
NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

HINT:

At the time of installation, please refer to the following item.

Lubricate a new O–ring with compressor oil and install them to the tube.



4. REMOVE CONDENSER

(a) Remove the 2 nuts from condenser upper mountings.

(b) Push the radiator toward the engine.

(c) Push the condenser toward the radiator and pull it upward.

HINT:

At the time of installation, please refer to the following item.

If condenser is replaced, add compressor oil to the compressor.

Add 40 – 50 cc (1.4 – 1.7 fl.oz.)

Compressor oil : ND–OIL 8 or equivalent

AC1AQ–01

INSTALLATION

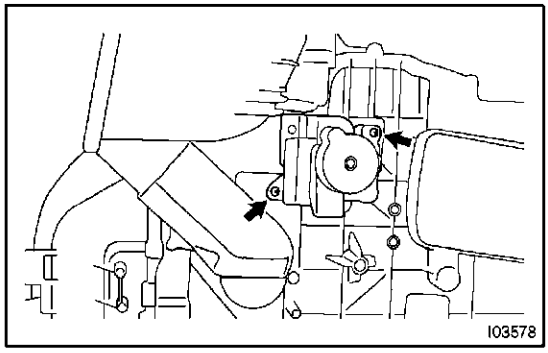
Installation is in the reverse order of removal (See page AC–59)

EVAPORATOR

AC1AR–01

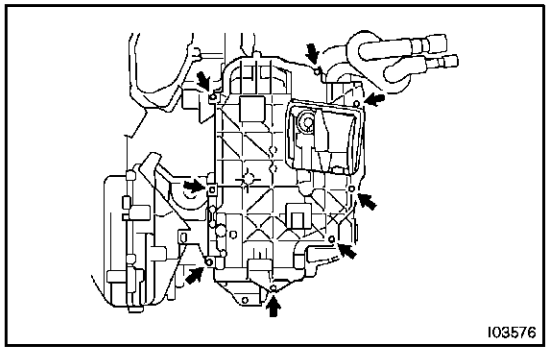
REMOVAL

1. REMOVE A/C UNIT
(See page AC–30)



2. REMOVE AIR MIX SERVOMOTOR

Remove the 2 screws and servomotor.



3. REMOVE EVAPORATOR

(a) Pull out the thermistor.
(b) Remove the 8 screws and evaporator cover.
(c) Pull out the evaporator.

HINT:

At the time of installation, please refer to the following item.
If evaporator is replaced add compressor oil to evaporator.

Add 40 cc (1.4 fl.oz.)
Compressor oil : ND–OIL 8 or equivalent

AC1AS–01

INSPECTION

1. CHECK EVAPORATOR FINS FOR BLOCKAGE

If the fins are clogged, clean them with compressor air.

NOTICE:

Never use water to clean the evaporator.

2. CHECK FITTINGS FOR CRACKS OR SCRATCHES

If necessary, repair or replace.

AC1AT–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–61).

HEATER RADIATOR

AC1AU–01

REMOVAL

1. DRAIN ENGINE COOLANT FROM RADIATOR

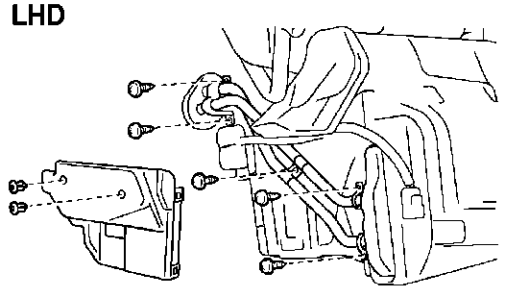
HINT:

It is not necessary to drain out all the coolant.

2. SLIDE FLOOR CARPET

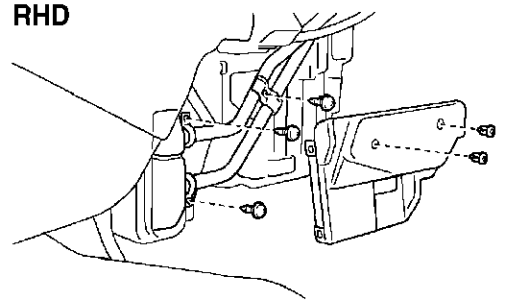
Remove the 2 screws and slide the floor carpet.

LHD



I03550

RHD



I03549

3. REMOVE HEATER RADIATOR

(a) Remove the 2 clips and plate.

(b) Remove the screw and piping clamp.

(c) Remove the 2 screws, 2 clamps and 2 heater radiator pipes from the heater radiator.

(d) Remove 2 O–rings from heater radiator pipes.

HINT:

At the time of installation, please refer to the following item.

Do not reuse 2 O–rings.

(e) Pull out the heater radiator.

AC1AV–01

INSPECTION

INSPECT FINS FOR BLOCKAGE

If the fins are clogged, clean them with compressor air.

AC1AW–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–64).

EXPANSION VALVE

AC1AX–01

ON–VEHICLE INSPECTION

1. CHECK QUANTITY OF GAS DURING REFRIGERANT CYCLE

2. SET ON MANIFOLD GAUGE SET

(See page AC–22)

3. RUN ENGINE

Run engine at 1,500 rpm for at least 5 minutes.

Then check that the high pressure reading is 1.37 – 1.57 MPa (14 – 16 kgf/cm^2, 199 – 228 psi).

4. CHECK EXPANSION VALVE

If the expansion valve is faulty , the low pressure reading will drop to 0 kPa (0 kgf/cm^2, 0 psi), otherwise it is OK.

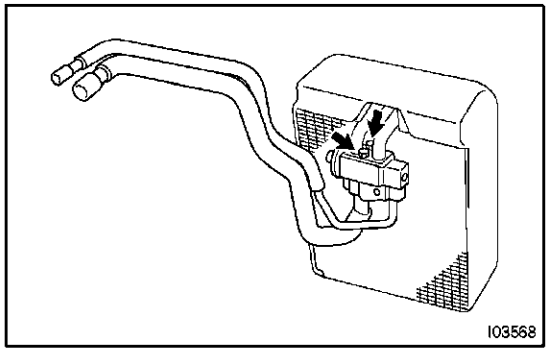
HINT:

When the low pressure drops to 0 kPa (0 kgf/cm^2, 0 psi), check the receiver's IN and OUT sides for no temperature difference.

AC1AY–01

REMOVAL

1. REMOVE EVAPORATOR
(See page AC–61)



2. REMOVE EXPANSION VALVE

Using a hexagon wrench, remove the 2 bolts and separate the expansion valve, evaporator, liquid and suction tubes.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

HINT:

At the time of installation, please refer to the following item.

Lubricate 4 new O–rings compressor oil and install the tubes and valve.

AC1AZ–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–68).

BLOWER MOTOR

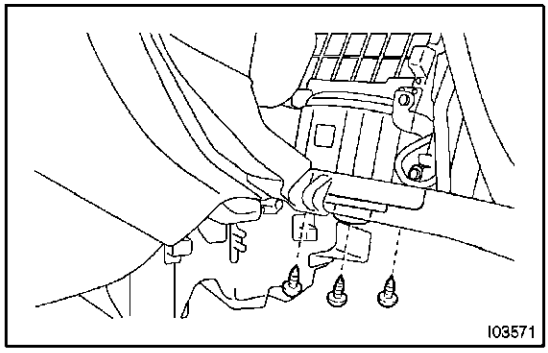
AC1B0–01

REMOVAL

1. REMOVE THESE PARTS:

(a) No.1 under cover
(See page BO–113)

(b) Lower finish panel
(See page BO–113)

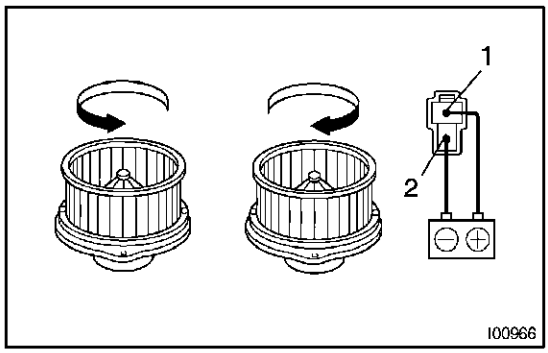


2. REMOVE MOTOR

(a) Disconnect the connector.

(b) Remove the 3 screws and the motor.

AC1B1–01



INSPECTION

INSPECT BLOWER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, then check that the motor operates smoothly.

If operation is not as specified, replace the blower motor.

AC1B2–01

INSTALLATION

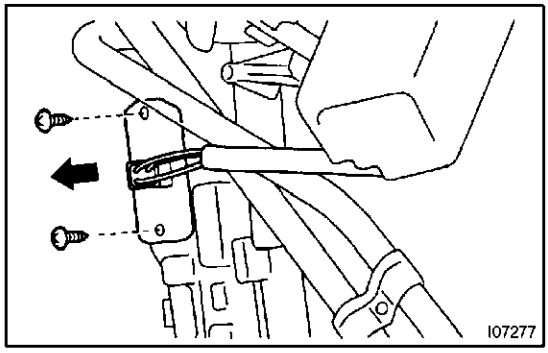
Installation is in the reverse order of removal (See page AC–70).

BLOWER RESISTOR

AC1B3–01

REMOVAL

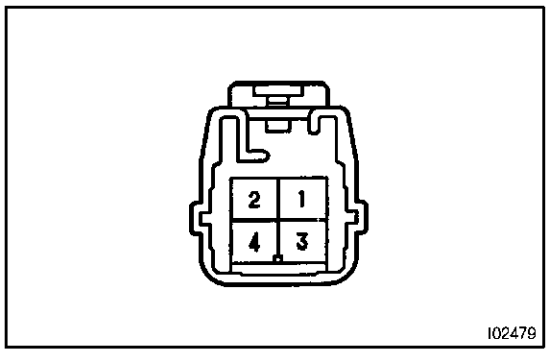
1. **REMOVE LOWER FINISH PANEL**
   (See page BO–113)



2. **REMOVE BLOWER RESISTOR**

(a) Disconnect the connector.

(b) Remove the 2 screws and blower resistor.



AC1B4–01

INSPECTION

INSPECT BLOWER RESISTOR RESISTANCE

Tester connection	Condition	Specified condition
1 – 3	Constant	Approx. 2.0 Ω
2 – 3	Constant	Approx. 0.8 Ω
2 – 4	Constant	Approx. 0.4 Ω

If resistance is not as specified, replace the blower resistor.

AC1B5–01

INSTALLATION

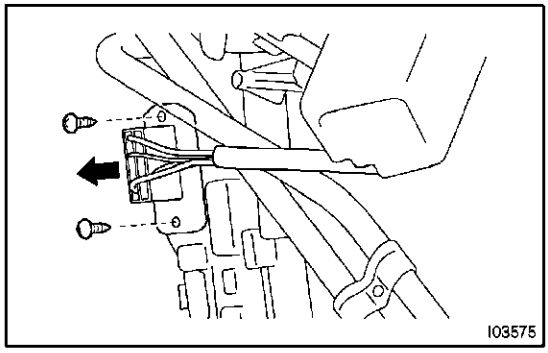
Installation is in the reverse order of removal (See page AC–73).

BLOWER MOTOR LINEAR CONTROLLER

AC1B6–01

REMOVAL

1. **REMOVE LOWER FINISH PANEL**
(See page BO–113)



2. **REMOVE CONTROLLER**

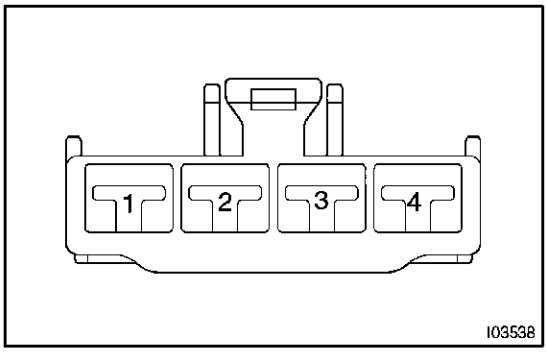
(a) Disconnect the connector.

(b) Remove the 2 screws and the controller.

AC1B7–01

INSPECTION

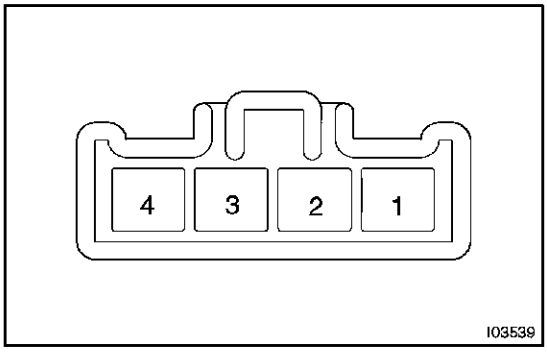
INSPECT BLOWER LINEAR CONTROLLER CIRCUIT



(a) Disconnect the connector from the relay and inspect the connector on wire harness side, as shown in the chart below.
Test condition:
- Ignition switch ON

Tester connection	Condition	Specified condition
1 – Ground	Constant	Continuity
3 – Ground	Constant	Battery voltage

If the circuit is as specified, try to replace the controller with a new one. If the circuit is not as specified, inspect the connected to other parts.



(b) Connect the connector to the relay and inspect the wire harness connector from the back side, as shown in the chart below.
Test condition:
- Ignition switch ON

Tester connection	Condition	Specified condition
4 – Ground	Constant	Battery voltage

If the circuit is as specified, try to replace the controller with a new one. If the circuit is not as specified, inspect the connected to other parts.

AC1BB–01

INSTALLATION

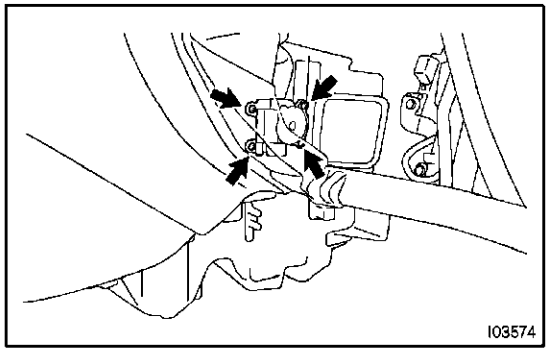
Installation is in the reverse order of removal (See page AC–76).

AIR MIX SERVOMOTOR

AC1B9–01

REMOVAL

1. **REMOVE BLOWER UNIT**
   (See page AC–38)



2. **REMOVE SERVOMOTOR**

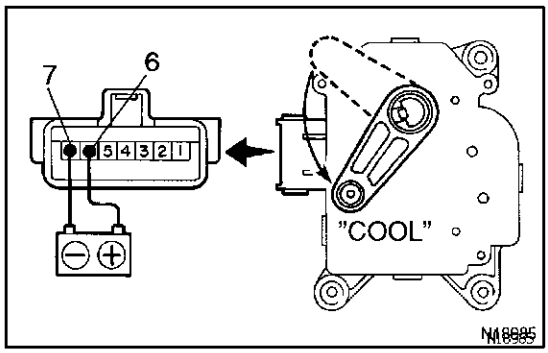
(a) Disconnect the connector.

(b) Remove the 4 screws and servomotor.

AC1BA–01

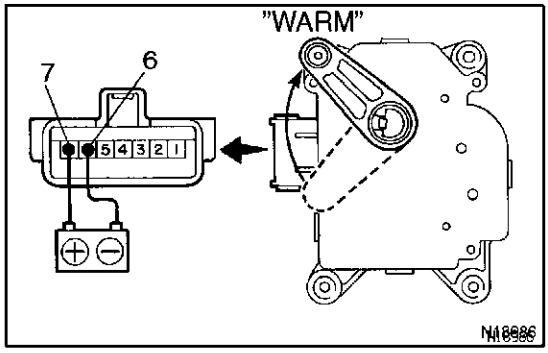
INSPECTION

1. INSPECT SERVOMOTOR OPERATION



(a) Connect the positive (+) lead from the battery to terminal 6 and negative (–) lead to terminal 7 and check that arm turns to "COOL" side smoothly.

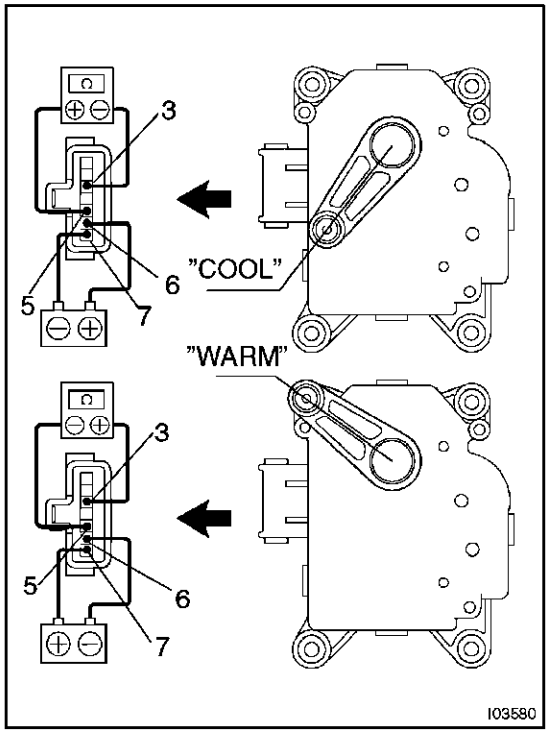
If operation is not as specified, replace the servomotor.



(b) Connect the positive (+) lead from the battery to terminal 7 and the negative (–) lead to terminal 6 and check that the arm turns to "WARM" side smoothly.

If operation is not as specified, replace the servomotor.

2. INSPECT POSITION SENSOR RESISTANCE



Measure resistance between terminals at servomotor arm each position as shown in the chart.

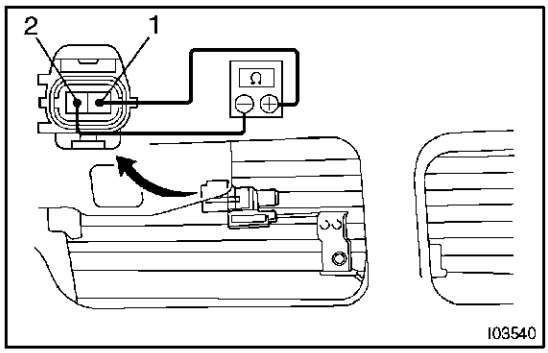
Tester connection	Condition	Specified condition
1 – 3	Constant	4.2 – 7.8 kΩ
3 – 5	Arm position at "COOL"	0.76 – 1.4 kΩ
3 – 5	Arm position at "WARM"	3.4 – 6.4 kΩ

If resistance is not as specified, replace the servomotor.

AC1BE–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–79).



SENSOR

ON–VEHICLE INSPECTION

AC1BC–01

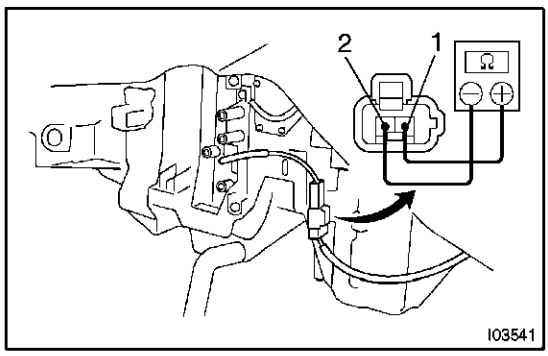
1. INSPECT AMBIENT TEMP. SENSOR RESISTANCE

(a) Disconnect the connector.

(b) Measure resistance between terminals.

Standard resistance: 1,700 ± 85 Ω at 25 °C (77 °F)

If resistance is not as specified, replace the relay.



2. INSPECT EVAPORATOR TEMP. SENSOR

(a) Disconnect the connector.

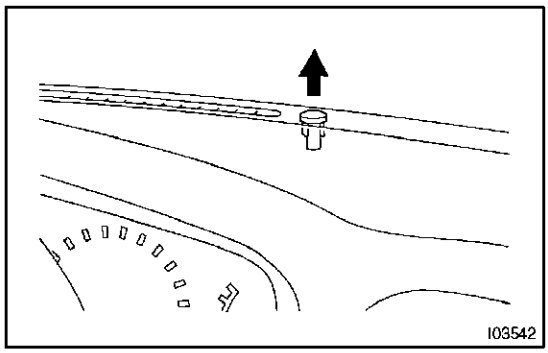
(b) Measure resistance between terminals.

Standard resistance: 1,500 Ω at 25 °C (77 °F)

If resistance is not as specified, replace the sensor.

AC1BD–01

REMOVAL

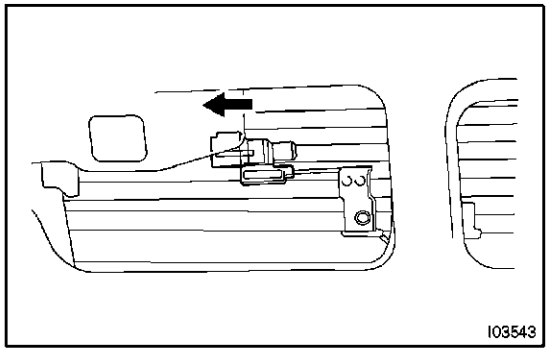


1. REMOVE SOLAR SENSOR

Using a screwdriver, pull out the sensor, then disconnect the connector.

HINT:

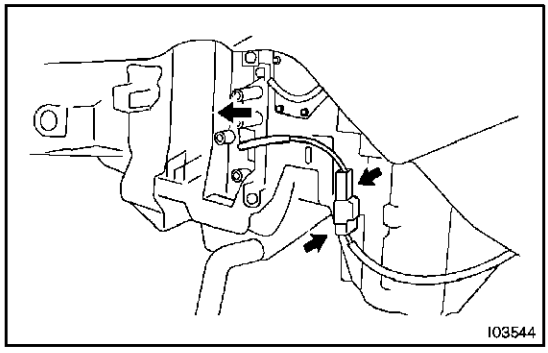
Tape the screwdriver tip before use.



2. REMOVE AMBIENT TEMPERATURE SENSOR

(a) Disconnect the connector.

(b) Release the claw and pull out the sensor from the condenser.

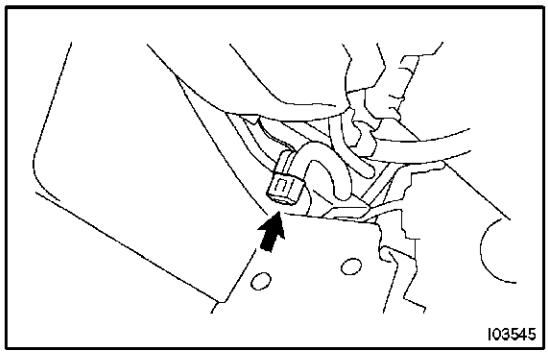


3. REMOVE EVAPORATOR TEMP. SENSOR

(a) Disconnect the connector.

(b) Disconnect the sensor connector.

(c) Pull out the sensor.



4. REMOVE ROOM TEMP. SENSOR

(a) Remove the instrument panel lower finish panel RH set screws.

(b) Disconnect the connector.

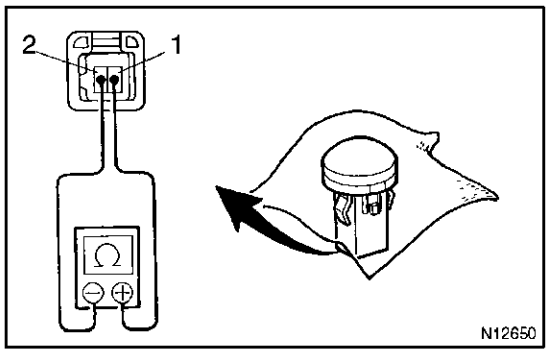
(c) Pry loose the sensor claw.

(d) Disconnect the aspirator hose.

AC1BE–01

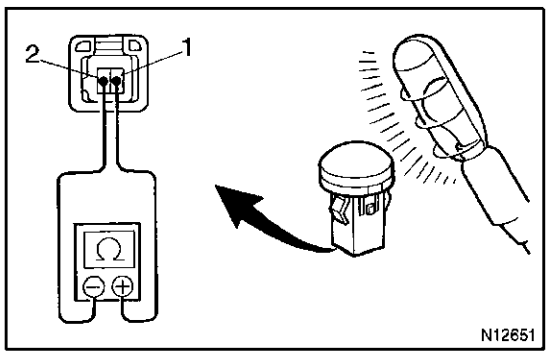
INSPECTION

1. INSPECT SOLAR SENSOR CONTINUITY



(a) Cover the sensor by a cloth, check that the no continuity exists between terminals.

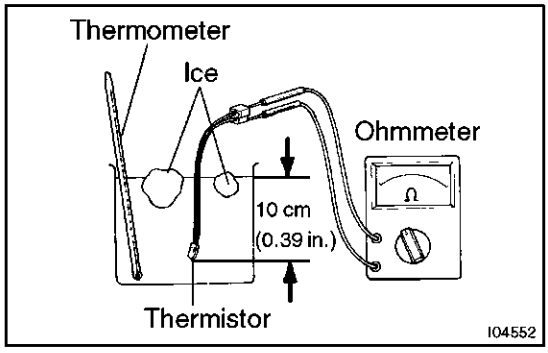
If continuity is not as specified, replace the sensor.



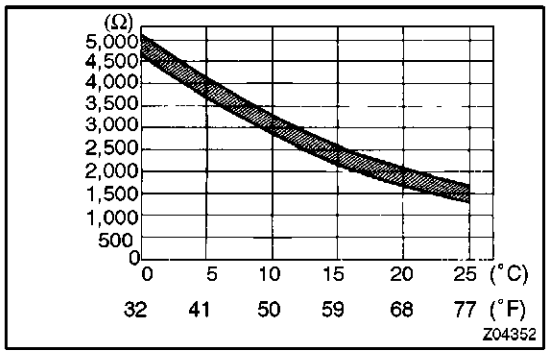
(b) Remove the cloth from the sensor and subject the sensor to electric light, check that continuity exists between terminals.

If continuity is not as specified, replace the sensor.

2. INSPECT EVAPORATOR TEMP. SENSOR RESISTANCE



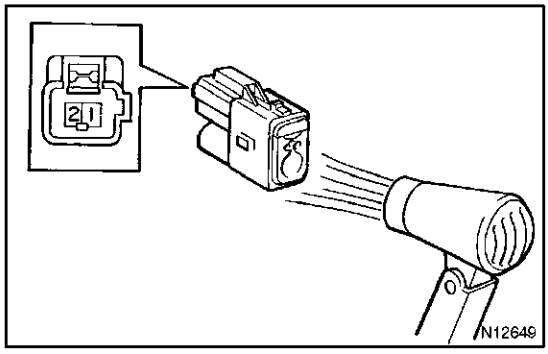
(a) Place the sensor in cold water. While changing the temperature of the water, measure resistance at the connector and at the same time, measure temperature of the water with a thermometer.



(b) Compare the 2 readings on the chart.

If resistance value is not as specified, replace the sensor.

3. INSPECT ROOM TEMP. SENSOR RESISTANCE



Measure resistance between terminals.

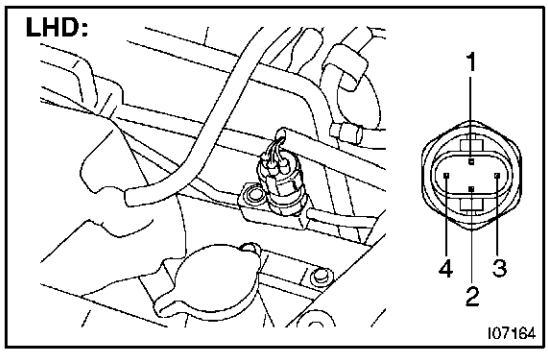
Standard resistance: 1,700 ± 85 Ω at 25 °C (77 °F)

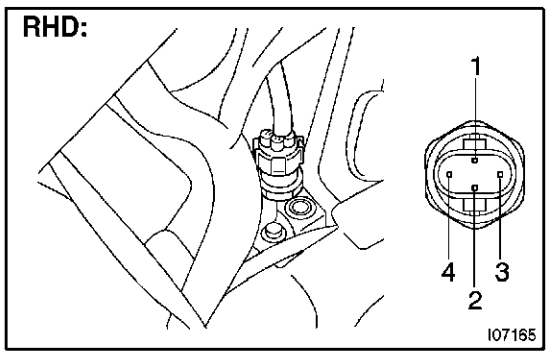
If resistance is not as specified, replace the sensor.

AC1BF–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–83).



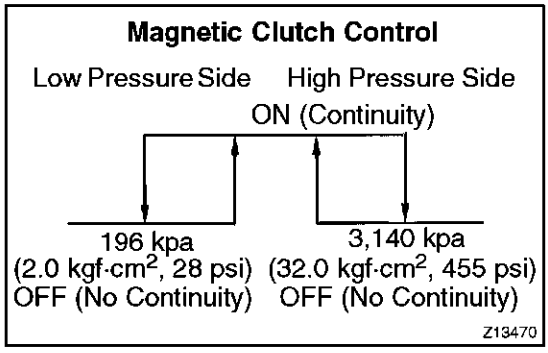


PRESSURE SWITCH

AC1BG-01

ON–VEHICLE INSPECTION

1. SET ON MANIFOLD GAUGE SET
(See page AC–22)
2. DISCONNECT CONNECTOR FROM PRESSURE SWITCH
3. RUN ENGINE AT APPROX. 1,500 RPM

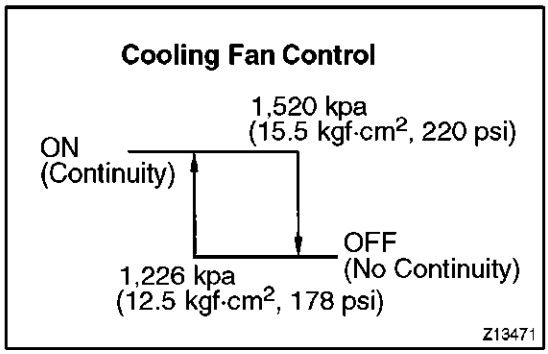


4. Magnetic Clutch Control:
INSPECT PRESSURE SWITCH OPERATION

(a) Connect the positive (+) lead from the ohmmeter to terminal 4 and the negative (–) lead to terminal 1.

(b) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.



5. Cooling Fan Control:
INSPECT PRESSURE SWITCH OPERATION

(a) Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (–) lead to terminal 3.

(b) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.

6. STOP ENGINE AND SET OFF MANIFOLD GAUGE SET
7. CONNECT CONNECTOR TO PRESSURE SWITCH

AC1BH–01

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERANT SYSTEM

HINT:

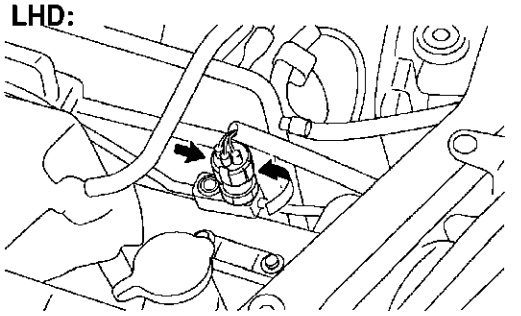
At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

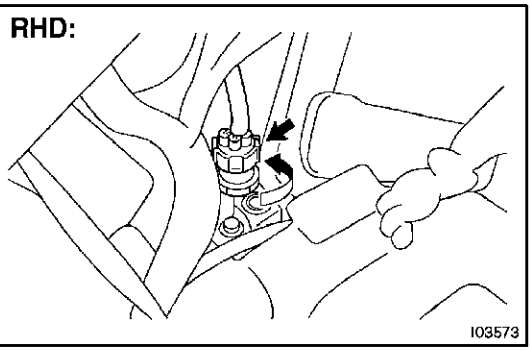
Specified amount: 450 ± 50 g (15.87 ± 1.76 oz.)

LHD:



I03572

RHD:



I03573

2. REMOVE PRESSURE SWITCH

(a) Disconnect the connector.

(b) Remove the pressure switch from the liquid tube.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

HINT:

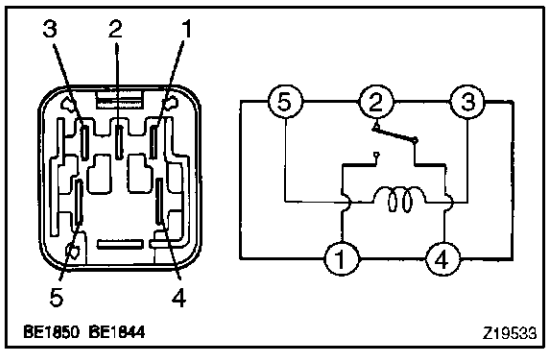
- Lock the switch mount on the tube with an open end wrench, being careful not deform the tube, and remove the switch.
- At the time of installation, please refer to the following item.

  Lubricate a new O–ring with the compressor oil and them to the switch.

AC1BI–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–87).



RELAY

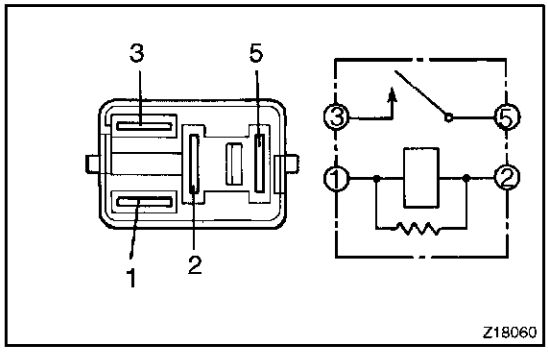
AC1C3–01

INSPECTION

1. INSPECT HEATER MAIN RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	2 – 4 3 – 5	Continuity
Apply B+ between terminals 3 and 5.	1 – 2	Continuity

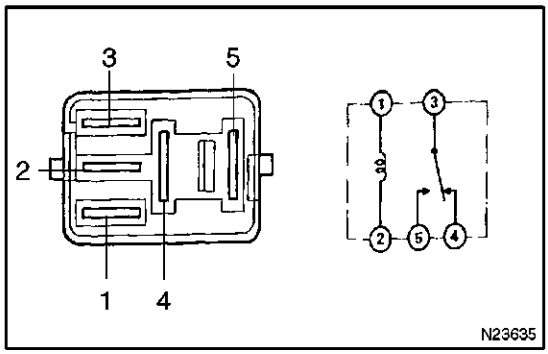
If continuity is not as specified, replace the relay.



2. INSPECT MAGNETIC CLUTCH RELAY (Marking: MG CLT) CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.



3. INSPECT No.2 COOLING FAN RELAY (Marking: FAN NO.2) CONTINUITY

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 relay.

4. INSPECT No.3 COOLING FAN RELAY (Marking: FAN NO.3) CONTINUITY

Check the relay in the same way as for "MAGNETIC CLUTCH RELAY".

CONDENSER FAN

AC1BJ–01

ON–VEHICLE INSPECTION

1. INSPECT CONDENSER FAN OPERATION

Inspect the fan operation, as shown in the chart below.

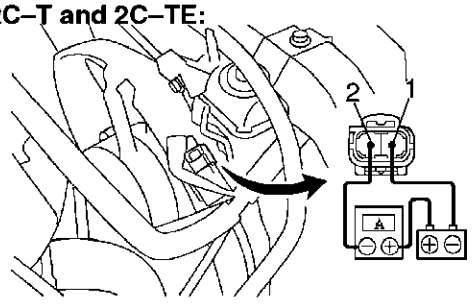
Test conditions:

- Ignition switch ON
- Blower speed control dial at "HI" position
- Temperature control dial at "COOL" position
- Set on manifold gauge set
- A/C switch ON

Condition	Fan operation (Fan speed)
Engine coolant temperature 91°C (196°F) or below	Not rotate
Engine coolant temperature 100°C (212°F) or above	Rotate
Refrigerant pressure is less than 1,520 kPa (15.5 kgf/cm^2, 220 psi)	Rotate (Low speed)
Refrigerant pressure is 1,520 kPa (15.5 kgf/cm^2, 220 psi) or above	Rotate (High speed)

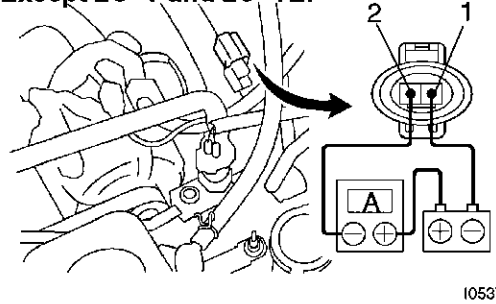
If operation is not as specified, proceed to the next inspection.

2C–T and 2C–TE:



I05375

Except 2C–T and 2C–TE:



I05374

2. INSPECT CONDENSER FAN MOTOR OPERATION

(a) Disconnect the connector.

(b) Connect battery and ammeter to fan connector, as shown in the illustration.

(c) Check that the fan rotates smoothly and then check that the reading on the ammeter.

Specified amperage:

2C–T and 2C–TE: 9.5 ± 1.5 A at 20 °C (68 °F)

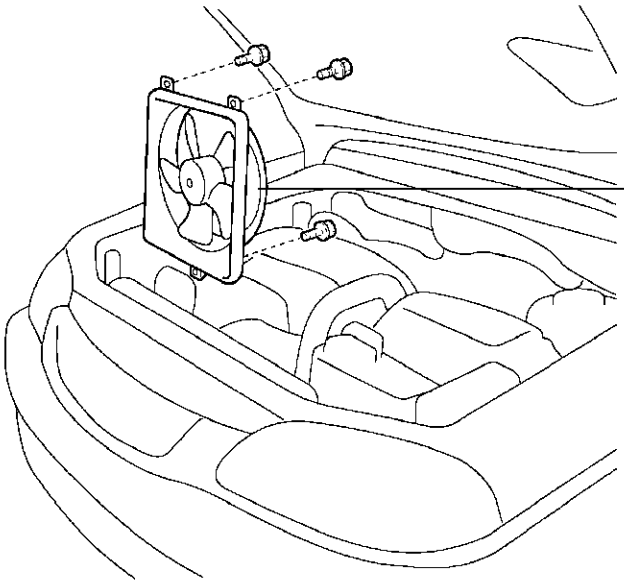
4A–FE and 7A–FE: 6.7 ± 1.5A at 20 °C (68 °F)

3S–FE: 6.0 ± 1.8 A at 20 °C (68 °F)

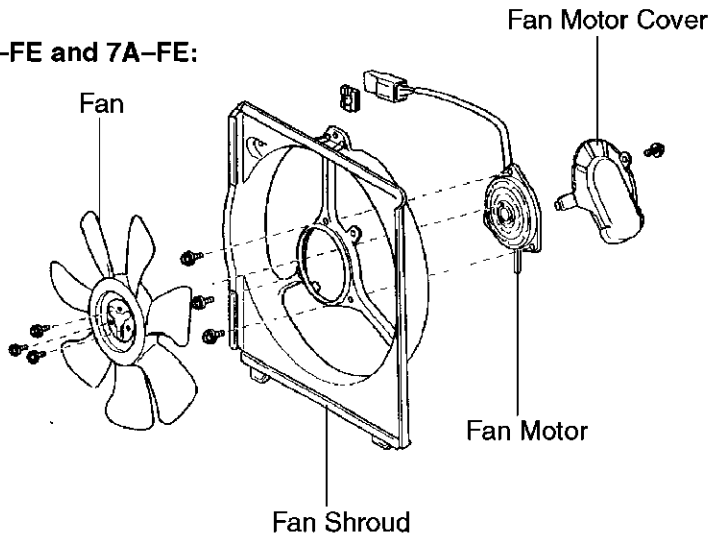
- If operation is not as specified, replace the fan motor.
- If operation is as specified, check the pressure switch, cooling fan relays and engine coolant temp. switch.

AC1BK–01

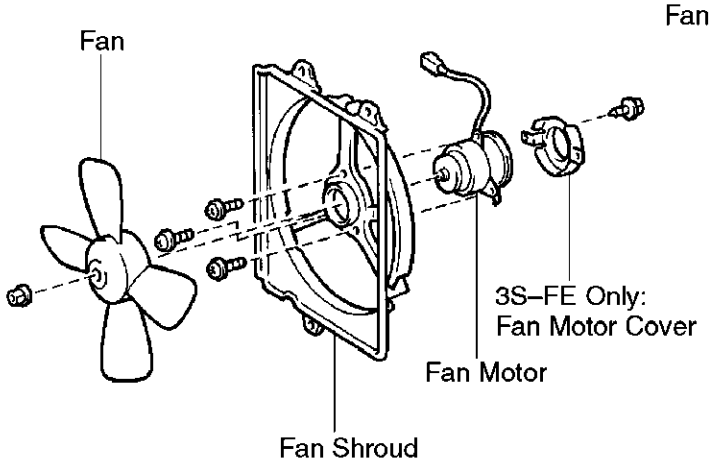
COMPONENTS



4A–FE and 7A–FE:



2C–T, 2C–TE and 3S–FE:



I06689

AC1BL–01

REMOVAL

1. DISCONNECT NO.5 RELAY BLOCK FROM RADIATOR

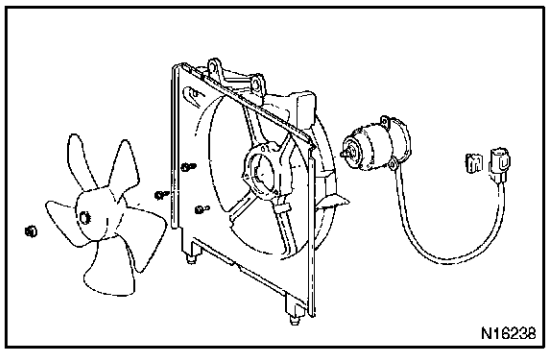
2. REMOVE CONDENSER FAN

(a) Disconnect the connector.

(b) Remove the 3 bolts and fan.

AC1BM–01

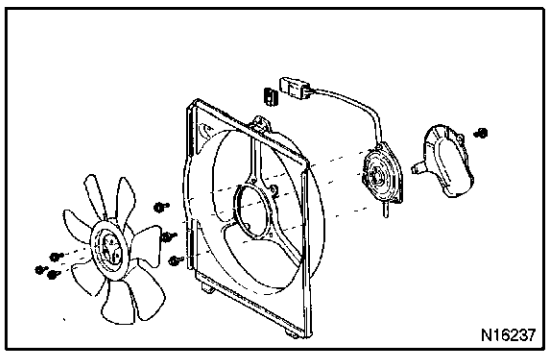
DISASSEMBLY



1. 2C–T and 2C–TE Engine:
DISASSEMBLE CONDENSER FAN

(a) Remove the fan.
Remove the nut and fan.

(b) Remove the fan motor.
(1) Disconnect the 3 wire harness clamps.
(2) Remove the 3 screws and fan motor.

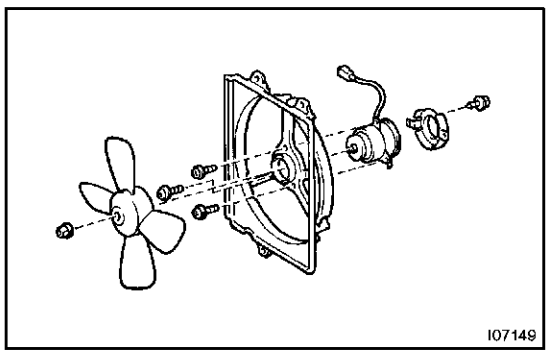


2. 4A–FE and 7A–FE Engine:
DISASSEMBLE CONDENSER FAN

(a) Remove the fan.
Remove the 3 screws and fan.

(b) Remove the fan motor cover.
Remove the 3 screws and cover.

(c) Remove the 3 screws and fan motor.



3. 3S–FE Engine:
DISASSEMBLE CONDENSER FAN

(a) Remove the fan.
Remove the nut and fan.

(b) Remove fan motor cover.
Remove the 2 bolts and cover.

(c) Remove the fan motor.
(1) Disconnect the 2 wire harness clamps.
(2) Remove the 3 screws and fan motor.

AC1BN–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–93).

AC1BO–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–92).

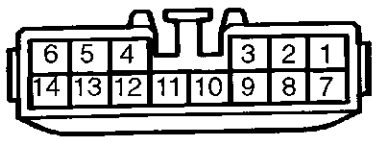
AIR CONDITIONER AMPLIFIER

AC1C2–01

ON–VEHICLE INSPECTION

1. **REMOVE LOWER FINISH PANEL**
   (See page BO–113)

Wire Harness Side



I00986

2. **Manual A/C:**
   INSPECT A/C AMPLIFIER CIRCUIT

(a) Disconnect the connector from amplifier and inspect the connector on wire harness side, as shown in the chart.
Test conditions:

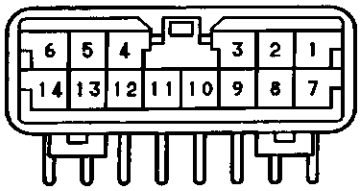
- Turn ignition switch to ON
- Blower speed control switch at "HI position

Tester connection	Condition	Specified condition
5 – Ground	Constant	Continuity
9 – 3	Constant	Continuity
3 – 13	Evaporator temperature at 25 °C (77 °F)	1.5 kΩ
*14 – 13	Constant	65 – 125 kΩ
8 – Ground	A/C switch ON	Battery voltage
	A/C switch OFF	No voltage
10 – Ground	A/C switch ON	Below 4.0 V
	A/C switch OFF	No voltage

*: 2C–T, 2C–TE and 3S–FE Engine Only

If the circuit is not as specified, inspect the circuit connected to other parts.

From Back Side



I00985

(b) Connect the connector to amplifier and inspect the wire harness side connector from the back side, as shown in the chart.
Test conditions:

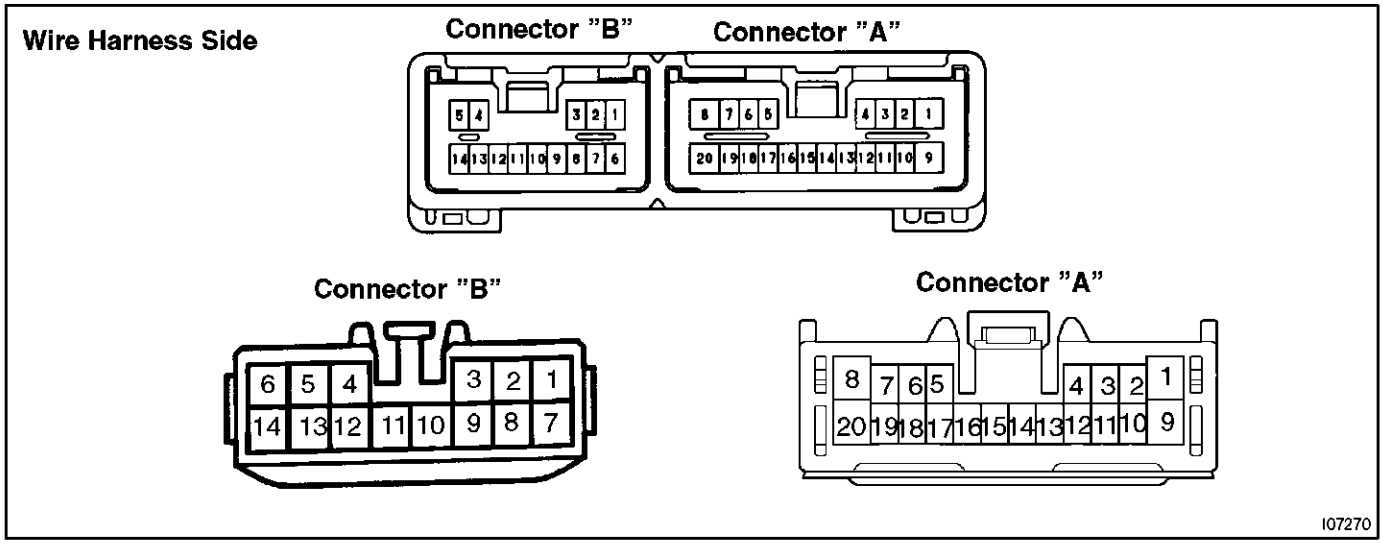
- Running engine at idle speed
- Blower speed control dial at "HI" position
- Temperature control dial at "MAX COOL" position
- A/C switch ON
- Set on manifold gauge set

Tester connection	Condition	Specified condition
2 – Ground	Refrigerant pressure 196 – 3,140 kPa	Battery voltage
	Refrigerant pressure less than 196 kPa or more than 3,140 kPa	No voltage
1 – Ground	Constant	No voltage
	Engine speed at idle–up speed	Below 1.0 V
6 – Ground	Magnetic clutch is engaged	Below 2.0 V
	Engine coolant temperature at above 83 °C (181 °F) or refrigerant pressure at 1,520 kPa or more	Below 1.0 V
7 – Ground	Magnetic clutch is not engaged	Below 1.0 V
	Magnetic clutch is engaged	No voltage
*4 – Ground	Constant	Pulse signal out put Below 2.0 V ↔ 8.0V
11 – Ground	Engine coolant temperature at above 83 °C (181 °F) or refrigerant pressure at 1,520 kPa or more	Below 1.0 V
	Engine coolant temperature at above 93 °C (199 °F) or refrigerant pressure at less than 1,520 kPa	Battery voltage
12 – Ground	Magnetic clutch is engaged	Below 2.0 V
	Magnetic clutch is not engaged	Battery voltage

*: 2C–T, 2C–TE and 3S–FE Engine Only

3. **Auto A/C:**
INSPECT A/C AMPLIFIER CIRCUIT

(a) Disconnect the connector from the amplifier and inspect the connector on wire harness side, as shown in the chart
Test conditions:
- Turn ignition switch to ON
- Blower speed control switch at "HI position

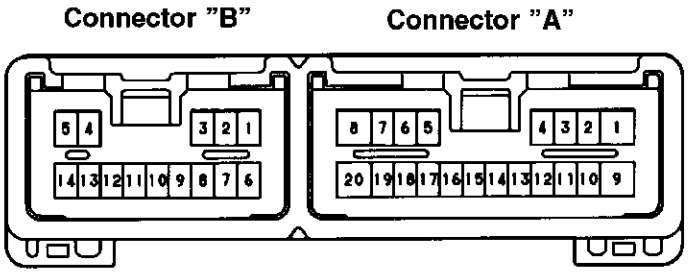


Tester connection	Condition	Specified condition
A13 – A8	Turn mode control dial to "FOOT" position	Continuity
A14 – A8	Turn mode control dial to "DEF" position	Continuity
A16 – A15	Cover solar sensor with a cloth	No continuity
	Subject to electric light	Continuity
A17 – A8	Room temperature at 25 °C (77 °F)	1.7 kΩ
A18 –A8	Ambient temperature at 25 °C (77 °F)	1.7 kΩ
A4 – A8	Constant	65 – 125 Ω at 25°C (77 °F)
A1 – Ground	Turn ignition switch to ON	Battery voltage
	Turn ignition switch to OFF	No voltage
B9 – Ground	A/C switch ON	Battery voltage
	A/C switch OFF	No voltage
B10 – Ground	A/C switch ON	Below 4.0 V
	A/C switch OFF	No voltage

If the circuit is not as specified, inspect the circuit connected to other parts.

(b) Connect the connector to amplifier and inspect the wire harness side connector from the back side, as shown in the chart.
Test conditions:
- Running engine at idle speed
- Blower speed control dial at "HI" position
- Temperature control dial at "MAX COOL" position
- A/C switch ON
- Set on manifold gauge set

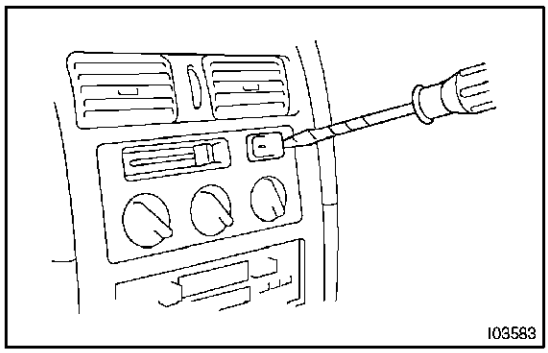
From Back Side



Tester connection	Condition	Specified condition
A2 – Ground	Constant	Pulse signal out put Below 1.0 V ↔ Battery voltage
A5 – Ground	Turn blower switch to "OFF" position	No voltage
	Turn blower switch to "AUTO" position	1.8 V
	Turn blower switch to "LO" position	2.6 V
	Turn blower switch to "M1" position	3.4 V
	Turn blower switch to "M2" position	4.2 V
	Turn blower switch to "HI" position	5.0 V
A6 – Ground	Turn temperature control dial to 32 °C (90 °F)	Below 0.3 V
	Turn temperature control dial to 25 °C (77 °F)	2.5 V
	Turn temperature control dial to 18 °C (64 °F)	Above 4.7 V
B4 – Ground	Turn temperature control dial to "MAX. COOL"	4.0 V
B5 – Ground	Turn temperature control dial to "MAX. WARM"	1.0 V
A15 – Ground	Constant	5.0 V
B2 – Ground	Blower motor operates	Below 1.0 V
	Blower motor does not operate	Battery voltage
B4 – Ground	Turn temperature control dial to "MAX COOL"	Battery voltage
	Turn temperature control dial to "MAX WARM"	Below 1.0 V
B5 – Ground	Turn temperature control dial to "MAX WARM"	Battery voltage
	Turn temperature control dial to "MAX COOL"	Below 1.0 V
B7 – Ground	Magnetic clutch is engaged	Battery voltage
	Magnetic clutch is not engaged	Battery voltage
B8 – Ground	Refrigerant pressure 196 – 3,140 kPa	Battery voltage
	Refrigerant pressure less than 196 kPa or more than 3,140 kPa	No voltage
B11 – Ground	Magnetic clutch is engaged	Below 1.0 V
	Magnetic clutch is not engaged	No voltage

B12 – Ground	Magnetic clutch is engaged	Below 1.0 V
	Magnetic clutch is not engaged	Battery voltage
B13 – Ground	Engine coolant temperature at above 83 °C (181 °F) or refrigerant pressure at 1,520 kPa or more	Below 1.0 V
	Engine coolant temperature at above 93 °C (199 °F) or refrigerant pressure at less than 1,520 kPa	Battery voltage
B14 – Ground	Magnetic clutch is engaged	Below 2.0 V
	Engine coolant temperature at above 83 °C (181 °F) or refrigerant pressure at 1,520 kPa or more	Battery voltage

If the circuit is not as specified, inspect the circuit connected to other parts. If the circuits is as specified, try to replace the amplifier with a new one.



AIR CONDITIONER SWITCH

AC1BP–01

REMOVAL

REMOVE A/C SWITCH

Using a screwdriver, pull out the switch.

HINT:

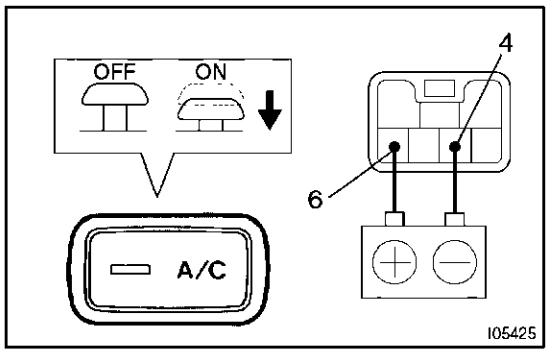
Tape the screwdriver tip before use.

AC1BQ–01

INSPECTION

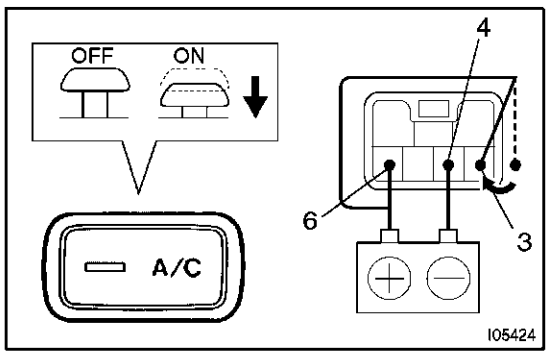
1. INSPECT A/C INDICATOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 6 and negative (–) lead to terminal 4 and check that the indicator lights up, when A/C switch ON.



(b) Connect the positive (+) lead from the battery to terminal 3 and check that the indicator dims.

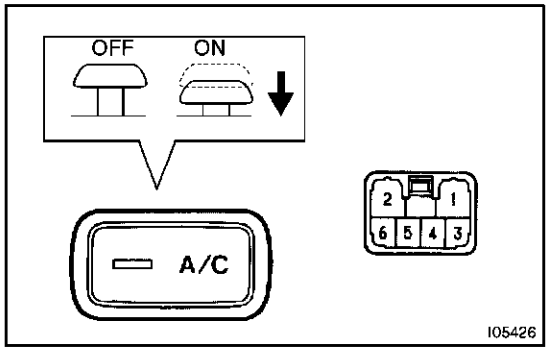
If operations are as specified, replace the A/C switch.



2. INSPECT A/C SWITCH CONTINUITY

Condition / Circuit	Tester connection	Specified condition
OFF	–	No continuity
ON	5 – 6	Continuity
Illumination circuit	3 – 1	Continuity

If continuity is not as specified, replace the A/C switch.

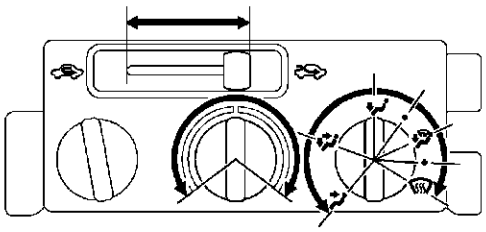


AC1BR–01

INSTALLATION

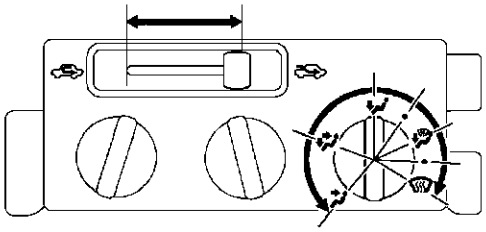
Installation is in the reverse order of removal (See page AC–101).

Manual A/C:



I03857

Auto A/C:



I03858

HEATER CONTROL ASSEMBLY

AC1BS–01

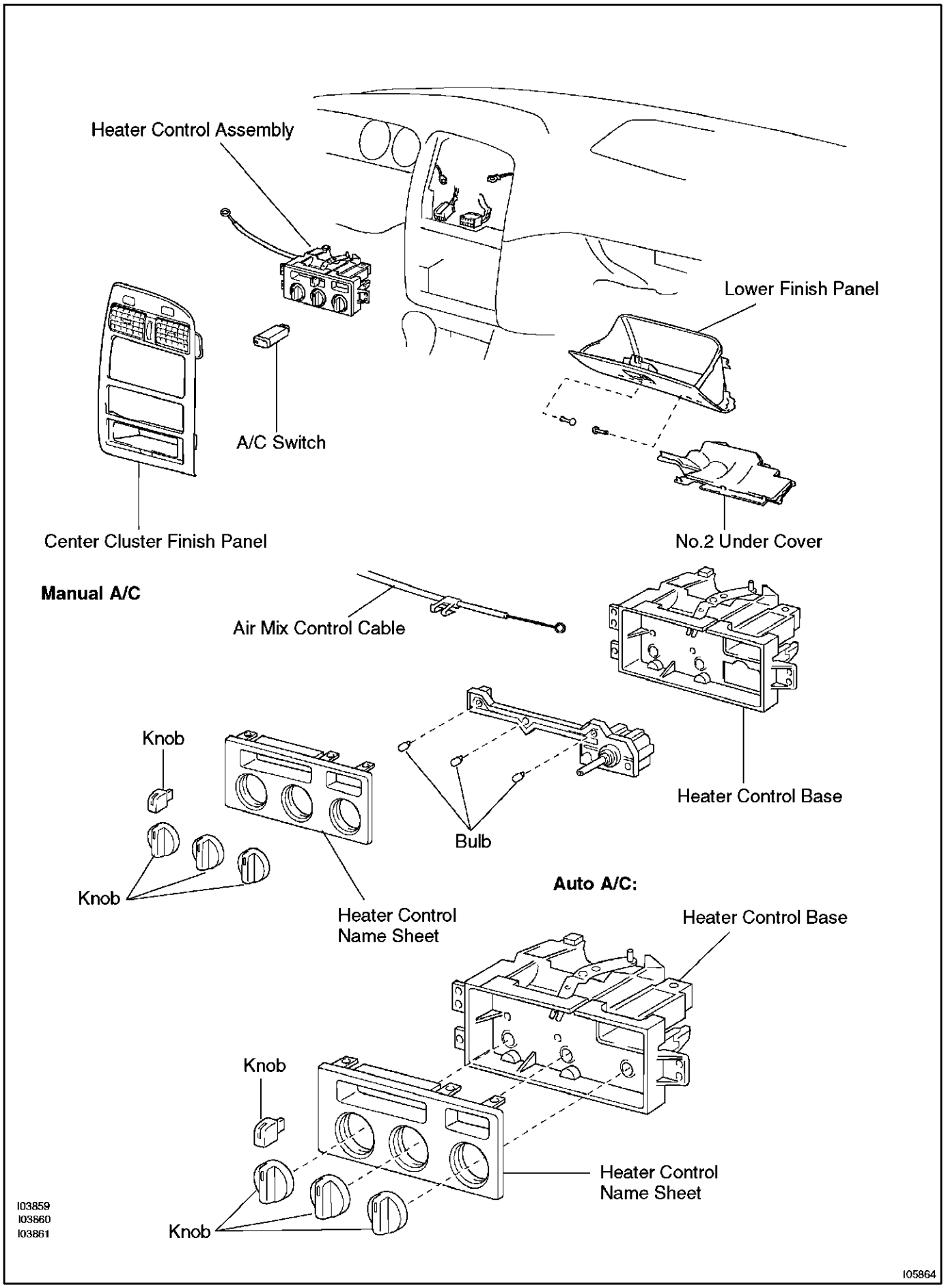
ON–VEHICLE INSPECTION

Turn the control lever and dials left and right then check that click sound can be heard and recoil is felt.

If click sound can be heard or recoil is felt, adjust the control cable or check control cable and heater control assembly.

AC1BT–01

COMPONENTS

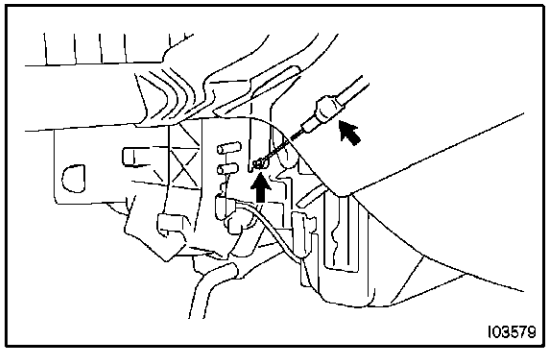


AC1BU–01

REMOVAL

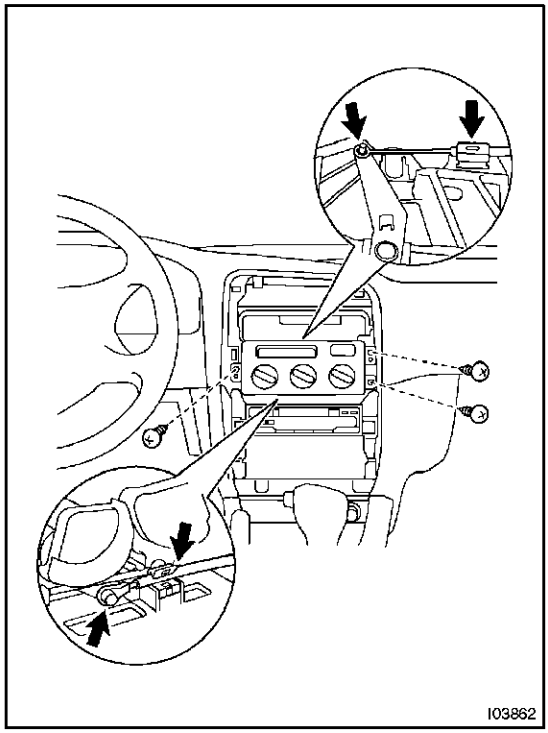
1. REMOVE THESE PARTS:

(a) A/C switch
(See page AC–101)
(b) Manual A/C Models Only:
Lower finish panel
(c) No.2 under cover
(d) Center cluster finish panel
(See page BO–113)



2. Manual A/C Models only:
DISCONNECT AIR MIX CONTROL CABLE

HINT:
At the time of installation, please refer to the following item.
After installation, check the heater control dial operation.



3. REMOVE HEATER CONTROL ASSEMBLY

Remove the 3 screws and pull out the heater control assembly, then disconnect the connector and heater control cables.

AC1BY–01

DISASSEMBLY

1. REMOVE HEATER CONTROL KNOBS

(a) Cover the control knob with cloth.

(b) Using pliers, pull out control knobs.

2. REMOVE HEATER CONTROL NAME SHEET

Using a screwdriver, release the 4 claws and remove the plate.

HINT:

Tape the screwdriver tip before use.

3. Manual A/C Only:
REMOVE HEATER BLOWER SWITCH

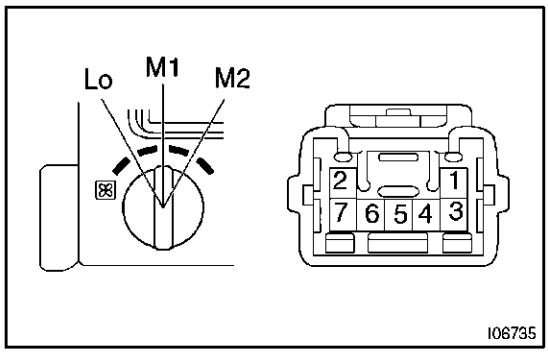
Using a screwdriver, release the 2 claws and remove the switch.

HINT:

Tape the screwdriver, tip before use.

AC1BV–01

INSPECTION



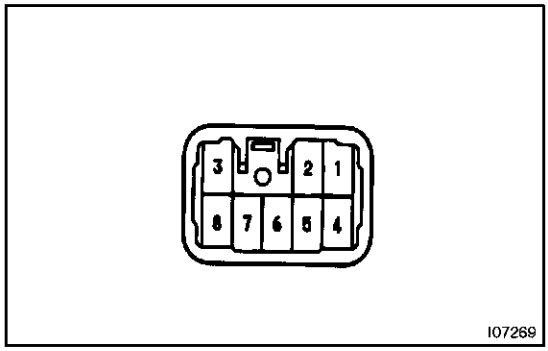
1. Manual A/C:

INSPECT HEATER BLOWER SWITCH OPERATION

Check the continuity between terminals at each position as shown in the chart.

Position / Circuit	Tester connection	Specified condition
OFF	–	No continuity
LO	3 – 6	Continuity
M1	3 – 6 – 7	Continuity
M2	3 – 5 – 6	Continuity
HI	3 – 4 – 6	Continuity
Illumination circuit	1 – 2	Continuity

If continuity is not as specified, replace the heater blower switch or bulb.



2. AUTO A/C:

INSPECT TEMPERATURE CONTROL SWITCH OPERATION

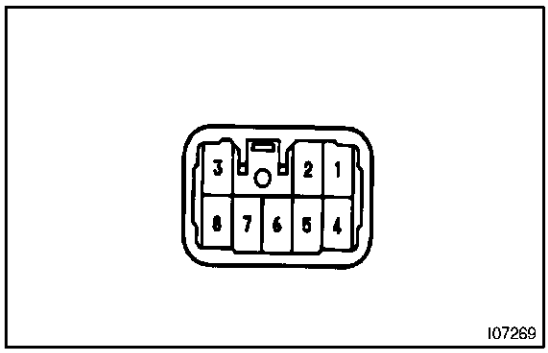
(a) Check that the resistance between terminals 8 and 3 is approx. 3.0 kΩ.

(b) Connect the positive (+) lead from the three 1.5 V dry cell batteries to terminal 8 and negative (–) lead to terminal 3.

(c) Connect the positive (+) lead from the tester to terminal 7 and negative (–) lead to terminal 3.

(d) Gradually turn the switch from "WARM" side to "COOL"side and check that the voltage increase from 0.3 – 4.5V.

If operation is not as specified, replace the heater control base.



3. **Auto A/C:**
INSPECT BLOWER SPEED CONTROL SWITCH OPERATION

(a) Check that the resistance between terminals 8 and 3 is approx. 3.0 kΩ.

(b) Connect the positive (+) lead from the three 1.5 V dry cell batteries to terminal 8 and negative (–) lead to terminal 3.

(c) Connect the positive (+) lead from the tester to terminal 4 and negative (–) lead to terminal 3, then check that the voltage at each switch position, as shown in the chart below.

Switch position	Specified condition
OFF	No voltage
AUTO	Approx. 1.3 V
LO	Approx. 2.1 V
M1	Approx. 2.9 V
M2	Approx. 3.7 V
HI	Approx. 4.5 V

If operation is not as specified, replace the heater control base.

4. **Auto A/C:**
INSPECT MODE CONTROL DIAL

Check the continuity exists between terminals while turn the mode control dial at each position, as shown in the chart.

Dial position	Tester connection
FOOT	5 – 3
DEF	6 – 3

If operation is not as specified, replace the heater control base.

AC1BW–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–107).

AC1BX–01

INSTALLATION

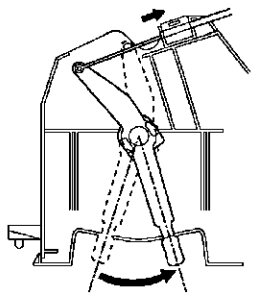
1. INSTALL HEATER CONTROL ASSEMBLY

(a) Connect the heater control cables.

(1) Set heater control lever and dials in these conditions:

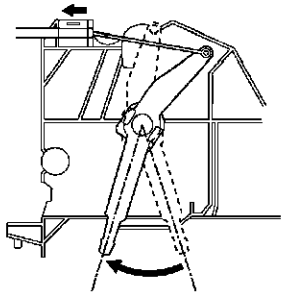
- LHD Models:
  Air inlet control lever in "RECIRC" position
- RHD Models:
  Air inlet control lever in "FRESH" position
- Manual A/C Only:
  Temperature control dial in "FACE" position

LHD:



I03864

RHD

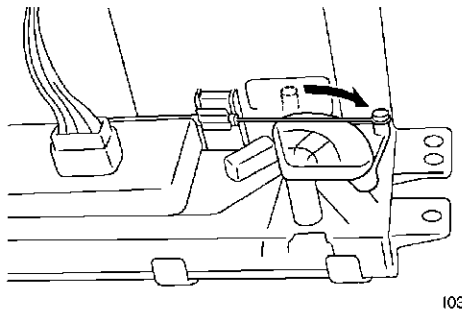


I03863

(2) Connect the air inlet control cable.

HINT:

- Lock the clamp during lightly pulling the outer cable in the direction, as shown in the illustration by an arrow.
- Align the marking on outer cable and lock clamp, when connecting outer cable.

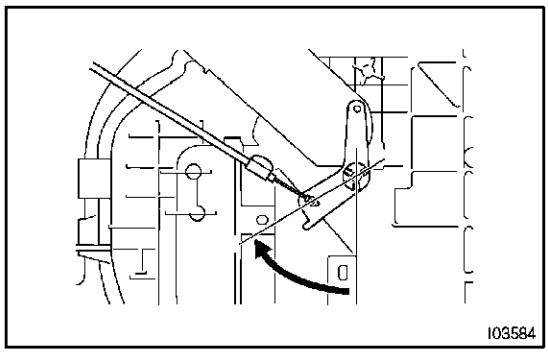


I03938

(3) Connect the mode control cable.

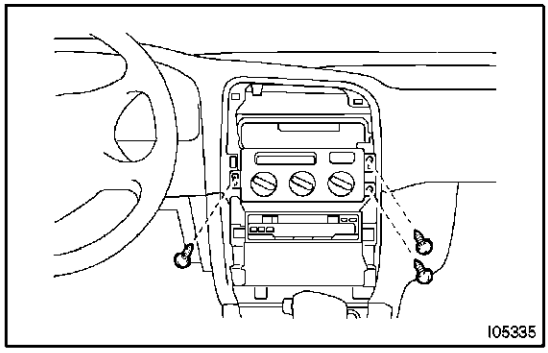
HINT:

- Lock the clamp during lightly pulling the outer cable in the direction, as shown in the illustration by an arrow.
- Align the marking on outer cable and lock clamp, when connecting outer cable.



(4) Manual A/C Only:
Connect the air mix control cable.
Turn the fully the air mix link hold up and connect the outer cable.

(5) After connection, check that there is click on operation and there is not recoil of heater control lever and dials.

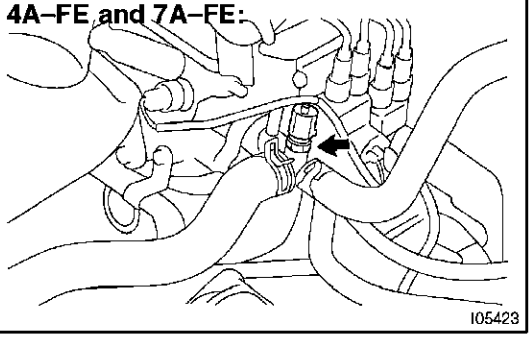


(b) Connect the connector and install the heater control assembly with 3 screws.

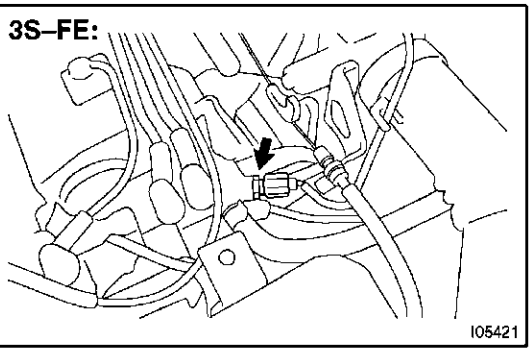
2. INSTALL THESE PARTS:

(a) Center cluster finish panel
(b) Lower finish panel
(c) No.2 under cover.
(See page BO–117)
(d) A/C Switch

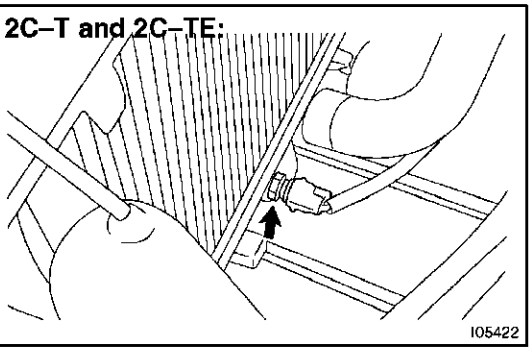
4A–FE and 7A–FE:

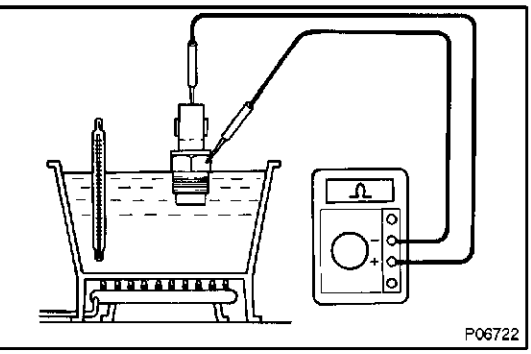


3S–FE:



2C–T and 2C–TE:





WATER TEMPERATURE SWITCH

AC1C1–01

INSPECTION

1. REMOVE WATER TEMPERATURE SWITCH

(a) Drain engine coolant.
(b) Disconnect the connector.
(c) Remove the water temperature switch.

2. INSPECT WATER TEMPERATURE SWITCH OPERATION

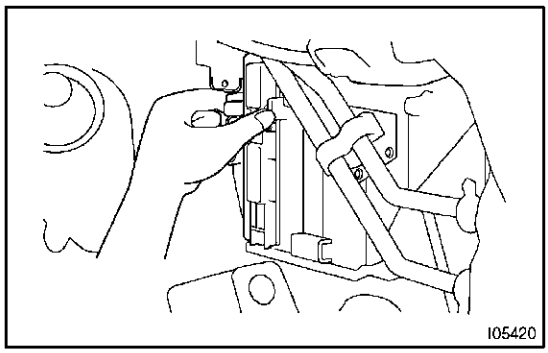
(a) Using an ohmmeter, check that the no continuity exists between terminal and body ground when the coolant temperature is above 93 °C (199 °F).

If continuity exists, replace the switch.

(b) Using an ohmmeter, check that the continuity exists between terminals when the coolant temperature is above 83 °C (181 °F).

If no continuity exists, replace the switch.

3. INSTALL WATER TEMPERATURE SWITCH



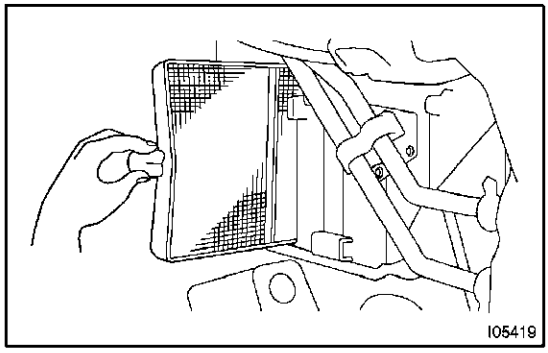
AIR REFINER FILTER

AC1BZ–01

REMOVAL

REMOVE AIR REFINER FILTER

(a) Remove the filter cover.



(b) Pull out the filter.

AC1C0–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–114).

ALPHABETICAL INDEX

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FOREWORD

This supplement has been prepared to provide information covering general service repairs for the chassis and body of the TOYOTA AVENSIS/CORONA which underwent changes in August, 1999.

Applicable models: AT220, 221 series
ST220 series
CT220 series
CDT220 series
AZT220 series
ZZT220, 221 series

For the service specifications and repair procedures of the above model other than those listed in this supplement, refer to the following manuals.

Manual Name	Pub. No.	Manual Name	Pub. No.
• AVENSIS/CORONA Chassis and Body Repair Manual	RM599E	• 2C Engine Repair Manual Supplement	RM297E
• 4A–FE Engine Repair Manual	RM296E	• 2C–T Engine Repair Manual Supplement	RM494E
• 7A–FE Engine Repair Manual	RM325E	• 2C–T, 2C–TE Engine Repair Manual Supplement	RM612E
• 4A–FE Engine Repair Manual Supplement	RM397E	• 1CD–FTV Engine Repair Manual	RM697E
• 7A–FE Engine Repair Manual Supplement	RM435E	• A241L, A241E Automatic Transaxle Repair Manual	RM177E
• 4A–FE, 7A–FE Engine Repair Manual Supplement	RM611E	• A245E Automatic Transaxle Repair Manual	RM350E
• 3S–FE Engine Repair Manual	RM395E	• AVENSIS/CORONA Electrical Wiring Diagram	EWD330Y
• 3S–FE Engine Repair Manual Supplement	RM495E	• AVENSIS/CORONA Electrical Wiring Diagram Supplement	EWD373F
• 3S–FE Engine Repair Manual Supplement	RM609E	• AVENSIS/CORONA New Car Features	NCF145E
• 1C, 2C, 2C–T Engine Repair Manual	RM025E	• AVENSIS/CORONA New Car Features Supplement	NCF168E

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.

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INTRODUCTION IN
PREPARATION PP
SERVICE SPECIFICATIONS SS
DIAGNOSTICS DI
E251 MANUAL TRANSAXLE MX
SUSPENSION AND AXLE SA
BRAKE BR
STEERING SR
SUPPLEMENTAL RESTRAINT SYSTEM RS
BODY ELECTRICAL BE
BODY BO
AIR CONDITIONING AC
ALPHABETICAL INDEX ID

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 good understanding 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.

INTRODUCTION

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IDENTIFICATION INFORMATION IN–3
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HOW TO USE THIS MANUAL

IN00U–34

GENERAL INFORMATION

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the section title and major heading are given at the top of every page.

2. PRECAUTION

At the beginning of each section, a PRECAUTION is given that pertains to all repair operations contained in that section.

Read these precautions before starting any repair task.

3. TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on page IN–19.

Be sure to read this before performing troubleshooting.

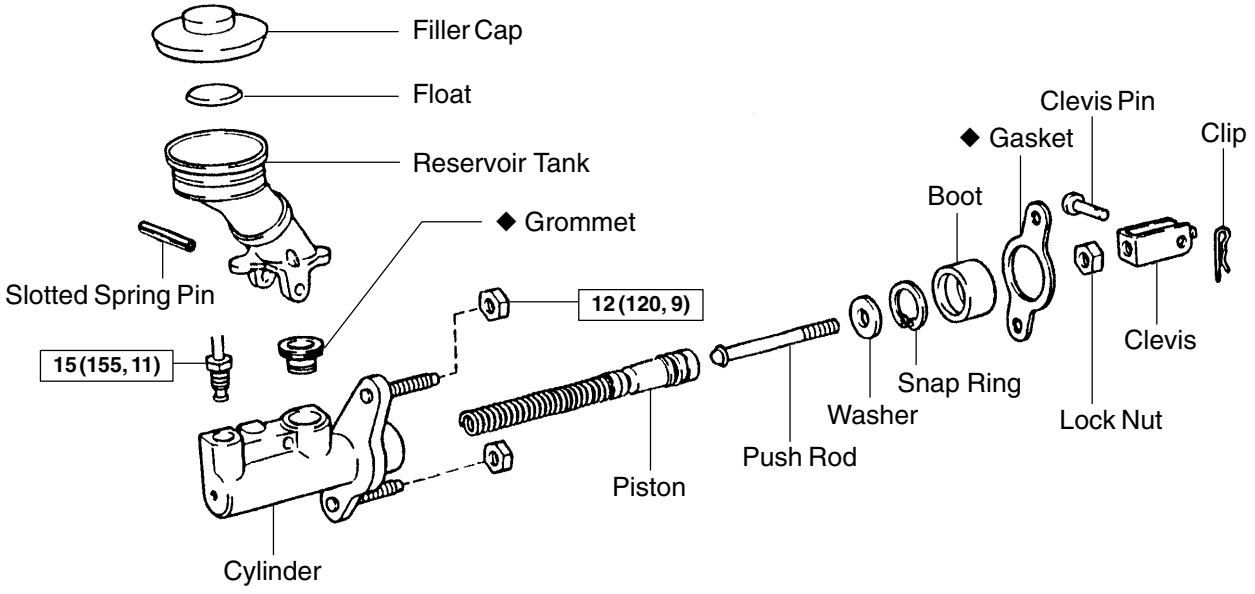
4. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

5. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

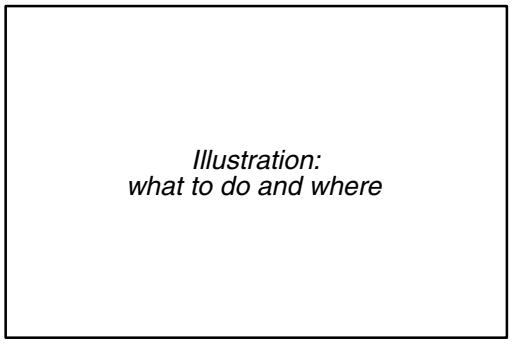
Example:



The procedures are presented in a step–by–step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example :



Task heading : what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the illustration.

SST 09350–30020 (09350–06120)

Set part No. *Component part No.*

Detailed text : how to do task

(b) Measure the stroke applying and releasing the compressed air (392 — 785 kPa, 4 — 8 kgf/cm^2 or 57 — 114 psi) as shown in the illustration.

Piston stroke: 1.40 — 1.70 mm (0.0551 — 0.0669 in.)

Specification

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

6. REFERENCES

References have been kept to a minimum. However, when they are required you are given the page to refer to.

7. SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in Service Specifications section for quick reference.

8. CAUTIONS, NOTICES, HINTS:

- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

9. SI UNIT

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.

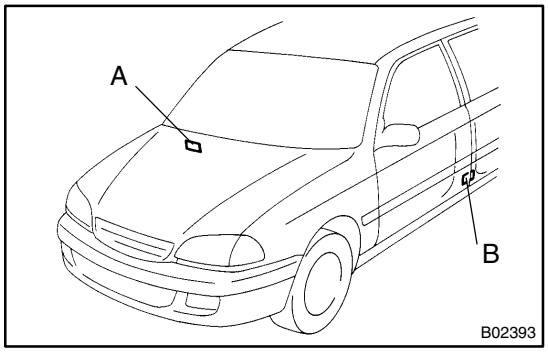
Example:

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

IDENTIFICATION INFORMATION

IN06B–05

VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER



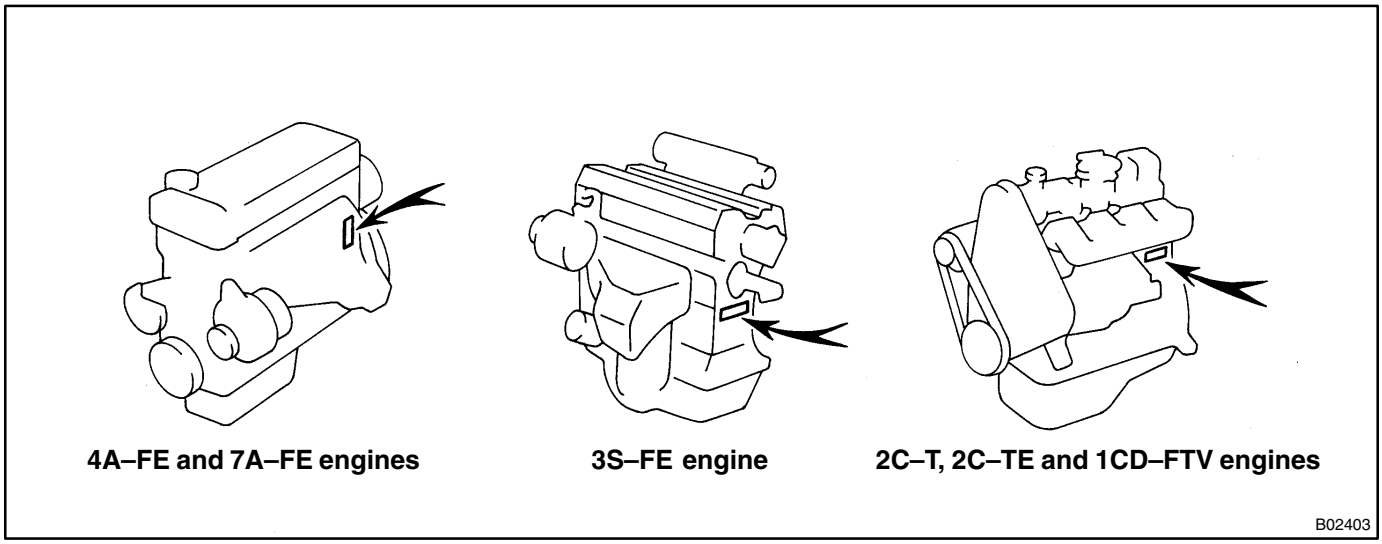
1. VEHICLE IDENTIFICATION NUMBER

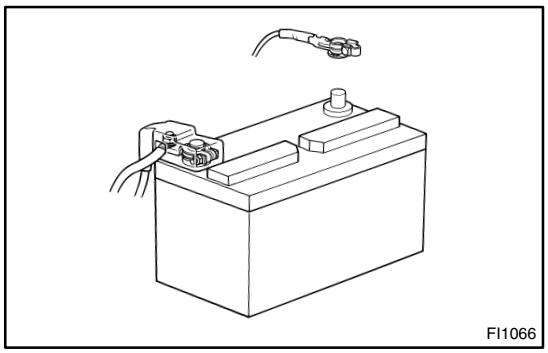
The vehicle identification number is stamped in the engine compartment. This number has also been stamped on the manufacturer's label.

A: Vehicle Identification Number
B: Manufacturer's Label

2. ENGINE SERIAL NUMBER

The engine serial number is stamped on the engine block, as shown in the illustration.




FI1066

REPAIR INSTRUCTIONS

GENERAL INFORMATION

IN03Z–01

BASIC REPAIR HINT

(a) Use fender, seat and floor covers to keep the vehicle clean and prevent damage.

(b) During disassembly, keep parts in the appropriate order to facilitate reassembly.

(c) Installation and removal of battery terminal:
  (1) Before performing electrical work, disconnect the negative (–) terminal cable from the battery.
  (2) If it is necessary to disconnect the battery for inspection or repair, first disconnect the negative (–) terminal.
  (3) When disconnecting the terminal cable, to prevent damage to the battery terminal, loosen the cable nut and raise the cable straight up without twisting or prying it.
  (4) Clean the battery terminals and cable ends with a clean shop rag. Do not scrape them with a file or other abrasive objects.
  (5) Install the cable ends to the battery terminals after loosening the nut and tighten the nut after installation. Do not use a hammer to tap the cable ends onto the terminals.
  (6) Be sure the cover for the positive (+) terminal is properly in place.

(d) Check hose and wiring connectors to make sure that they are connected securely and correctly.

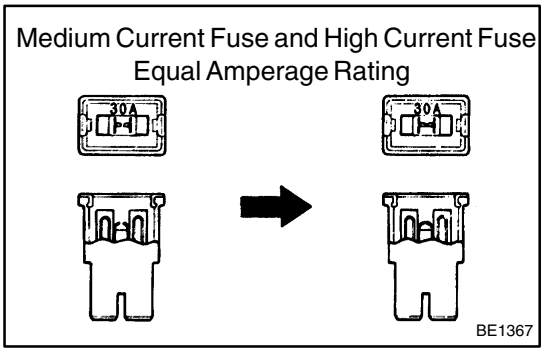
(e) Non–reusable parts
  (1) Always replace cotter pins, gaskets, O–rings and oil seals, etc. with new ones.
  (2) Non–reusable parts are indicated in the component illustrations by the "◆" symbol.

(f) Precoated parts
  Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.
  (1) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.
  (2) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.
  (3) Precoated parts are indicated in the component illustrations by the "★" symbol.

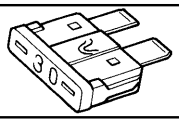
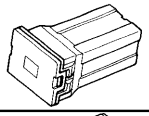
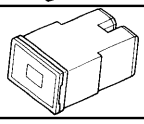
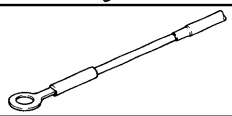
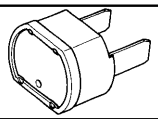
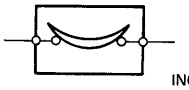
(g) When necessary, use a sealer on gaskets to prevent leaks.

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

(i) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in Preparation section in this manual.



(j) When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or 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
 BE5597	IN0367	FUSIBLE LINK	FL
 BE5598	 IN0368	CIRCUIT BREAKER	CB

V00076

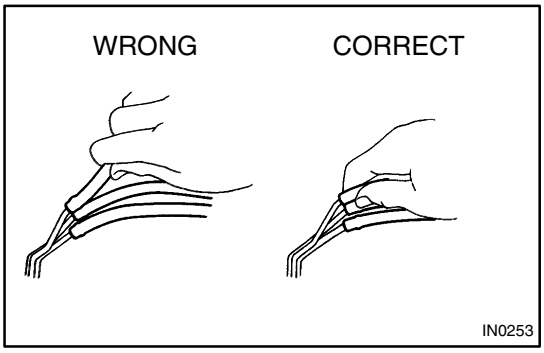
(k) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations (See page IN–7).

(1) If the vehicle is to be jacked up only at the front or rear end, make sure to place the stopper under the wheels at the opposite end to block them in order to ensure safety.

(2) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.

(l) Observe the following precautions to avoid damage to the following 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.)

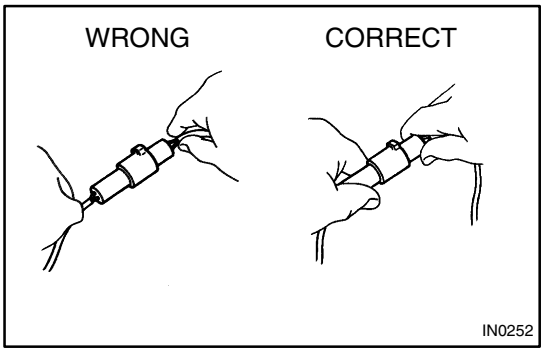


(2) To disconnect vacuum hoses, pull off the end, not the middle of the hose.

(3) To pull apart electrical connectors, pull on the connector itself, not the wires.

(4) 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.

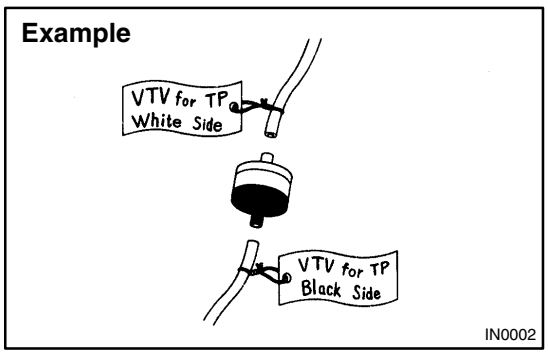
(5) When steam cleaning an engine, protect the electronic components, air filter and emission–related components from water.



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

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

(8) 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.



(m) Installation and removal of vacuum hose:

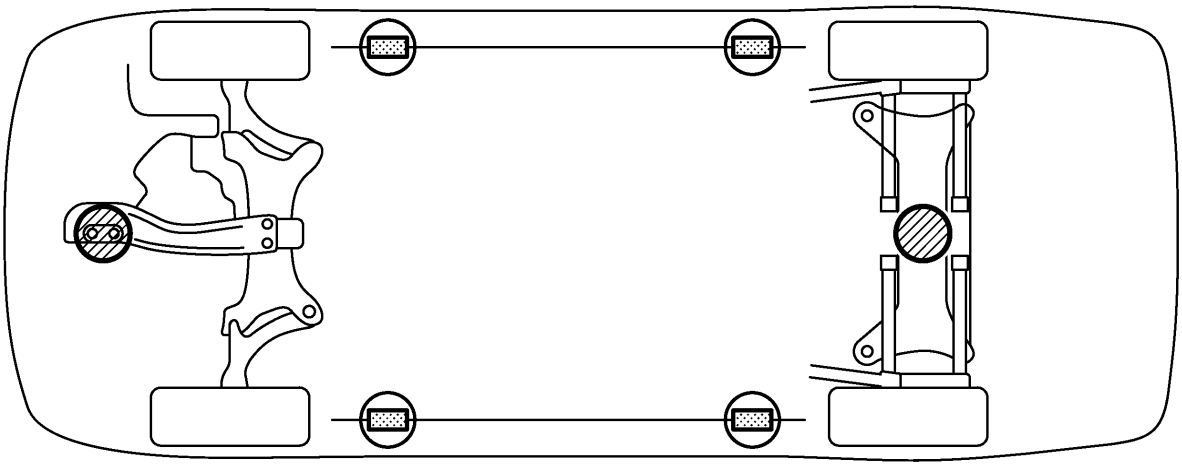
(1) When disconnecting vacuum hoses, use tags to identify where they should be reconnected to.

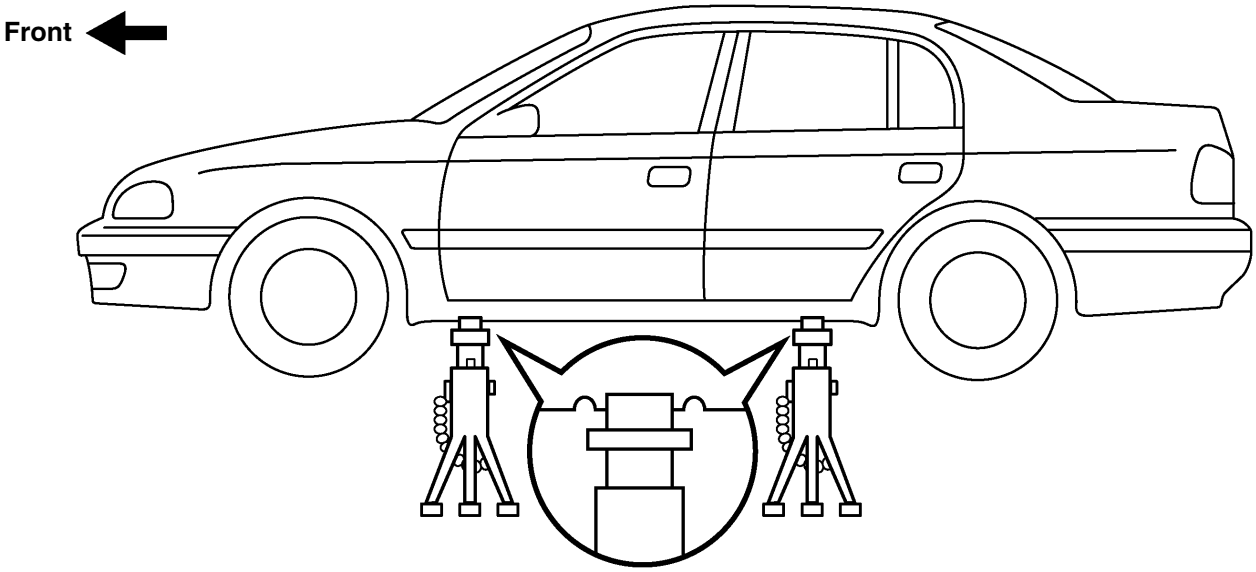
(2) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.

(n) Unless otherwise stated, all resistance is measured at an ambient temperature of 20°C (68°F). Because the resistance may be outside specifications if measured at high temperatures immediately after the vehicle has been running, measurement should be made when the engine has cooled down.

IN040–02

VEHICLE LIFT AND SUPPORT LOCATIONS





JACK POSITION

Front - - - - - - - - - - Front center member
Rear - - - - - - - - - - Rear suspension member

CAUTION : When jacking–up the rear and front, make sure the car is not carrying any extra weight.

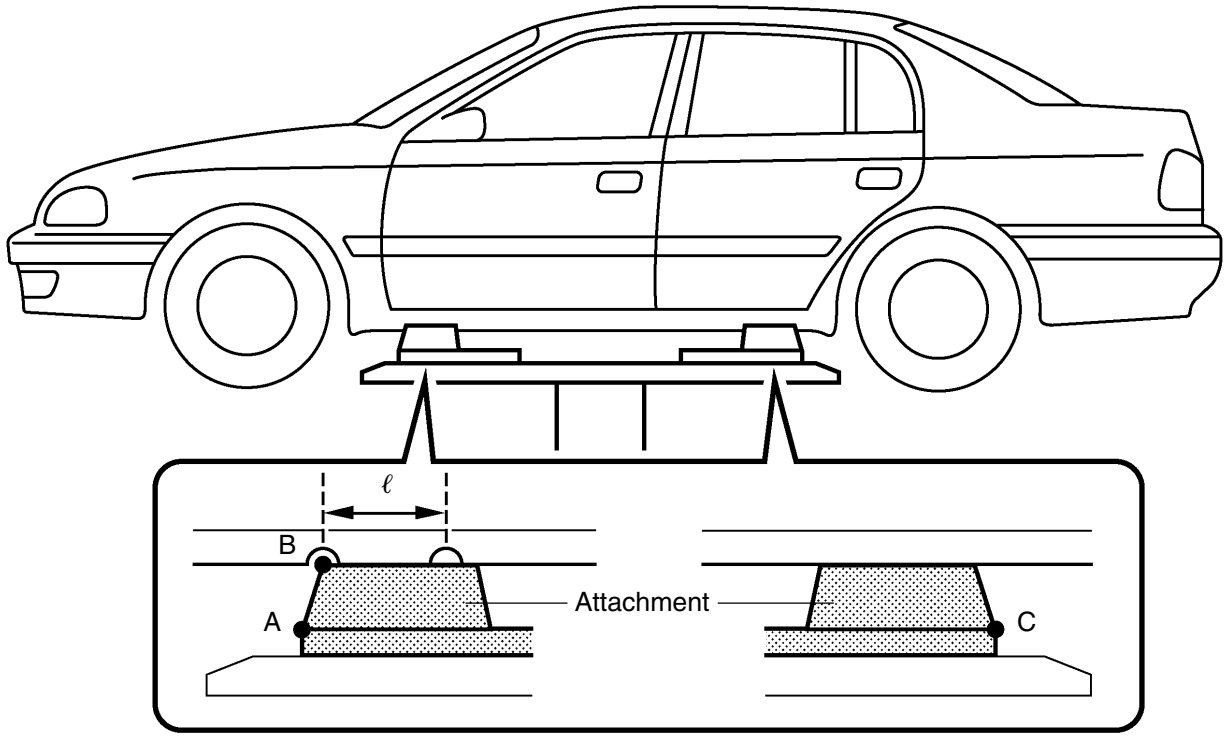
PANTOGRAPH JACK POSITION

SUPPORT POSITION

Safety stand and swing arm type lift -

B02394

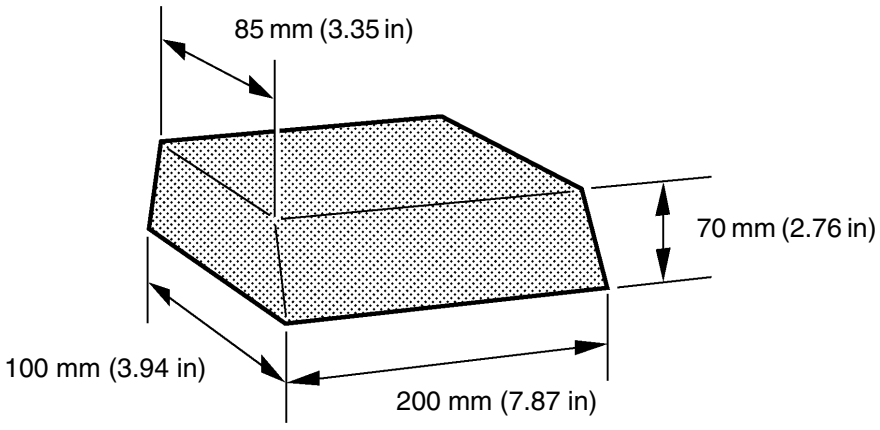
PLATE TYPE LIFT



HINT :

Left and right set position	Place the vehicle over the center of the lift.
Front and rear set position	● Align the cushion gum ends of the plate with the attachment lower ends (A, C). ● Align the attachment upper end (B) with the front jack supporting point (ℓ).

Attachment dimensions



B02395

FOR ALL OF VEHICLES

IN0EA–01

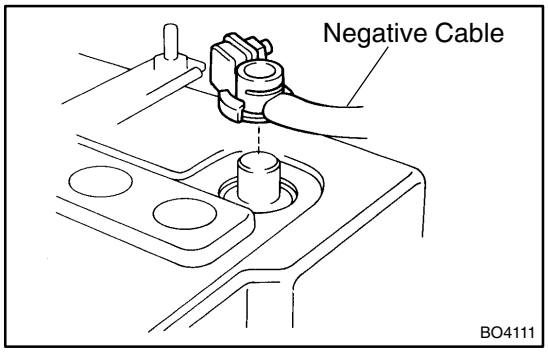
PRECAUTION

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

(a) The AVENSIS/ CORONA is equipped with an SRS (Supplemental Restraint System), such as the driver airbag, front passenger airbag, side airbags, curtain shield airbag and seat belt pretensioners.

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

Further, 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.



(b) 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 Pub. No. RM599E, page DI–152).

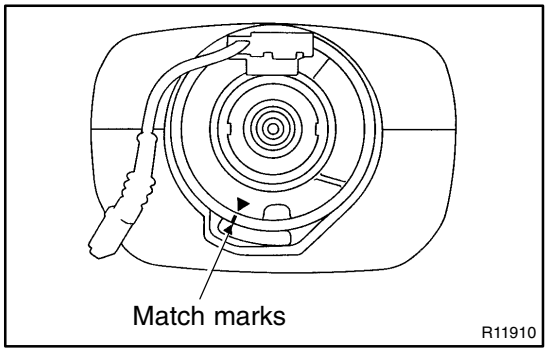
(2) Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (–) terminal cable is disconnected from the battery.

(The supplemental restraint system is equipped with a back–up power source so that if work is started within 90 seconds of 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 contents memorized by the each memory system. Then when work is finished, reset the clock and audio systems as before.

To avoid erasing the memory of each memory system, never use a back–up power supply from outside the vehicle.

(3) Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad (See Pub. No. RM599E, page RS–15), front passenger airbag assembly (See Pub. No. RM599E, page RS–28), side airbag assemblies (See page RS–11), curtain shield airbag assemblies (See page RS–25) and seat belt pretensioners (See Pub. No. RM599E, page BO–152) should be inspected.
(4) Never use SRS 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, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or seat belt pretensioner in order to reuse them.
(7) If the airbag sensor assembly, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or 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, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or seat belt pretensioner to hot air or flames.
(9) Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting of the electrical circuit.
(10) Information labels are attached to the periphery of 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 Pub. No. RM599E, page DI–152).



(c) SPIRAL CABLE (in Combination Switch)
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 result. Refer to Pub. No. RM599E, page SR–18 of this manual concerning correct steering wheel installation.

(d) STEERING WHEEL PAD (with Airbag)

(1) When removing the steering wheel pad or handling a new steering wheel pad, it should be placed with the pad top surface facing up.
Storing the pad with its metallic surface facing upward may lead to a serious accident if the airbag inflates for some reason. In addition do not store a steering wheel pad on top of another one.

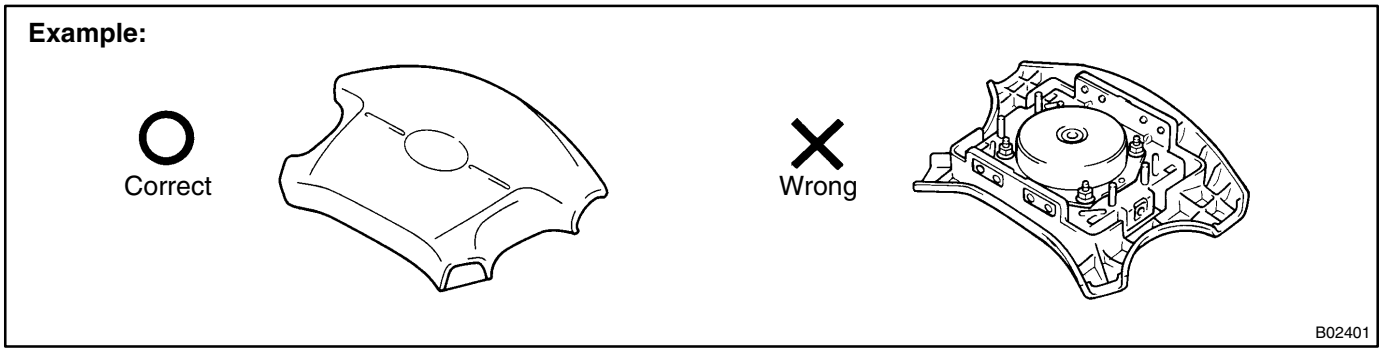
(2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)

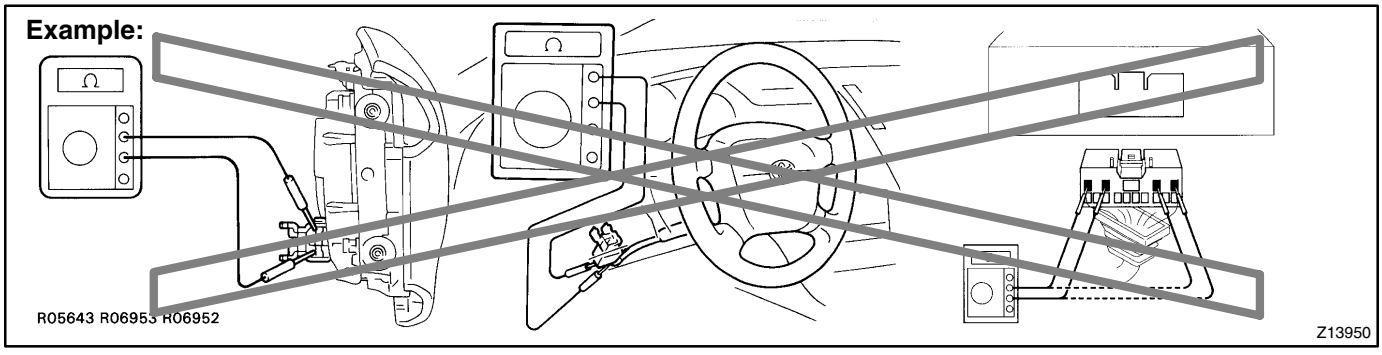
(3) Grease should not be applied to the steering wheel pad and the pad should not be cleaned with detergents of any kind.

(4) Store the steering wheel pad 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 (yellow color and 2 pins) under the steering column near the combination switch connector before starting work.

(6) When disposing of a vehicle or the steering wheel pad alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM599E, page RS–17).
Carry out the operation in a safe place away from electrical noise.





(e) FRONT PASSENGER AIRBAG ASSEMBLY

(1) Always store a removed or new front passenger airbag assembly with the airbag deployment direction facing up.
Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

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

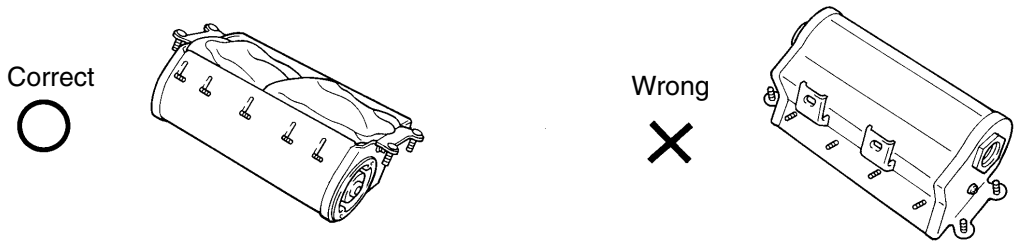
(3) Grease should not be applied to the front passenger airbag assembly and the airbag door should not be cleaned with detergents of any kind.

(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 (yellow color and 2 pins) installed on the assembly before starting work.

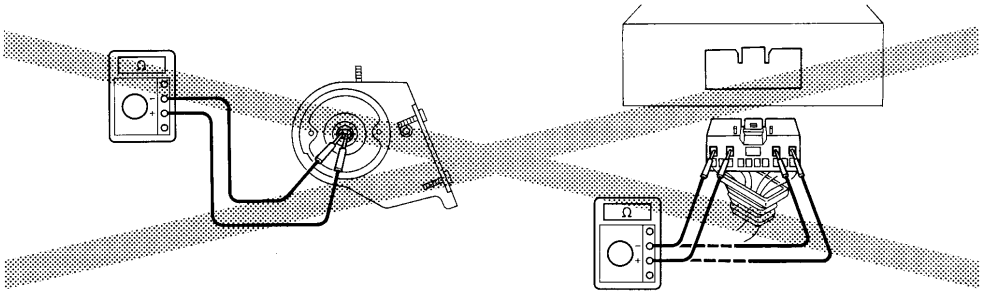
(6) When disposing of a vehicle or the airbag assembly alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM599E, page RS–30).
Perform the operation in a safe place away from electrical noise.

Example:



B02402

Example:



B02404

(f) SIDE AIRBAG ASSEMBLY

(1) Always store a removed or new side airbag assembly with the airbag deployment direction facing up. Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

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

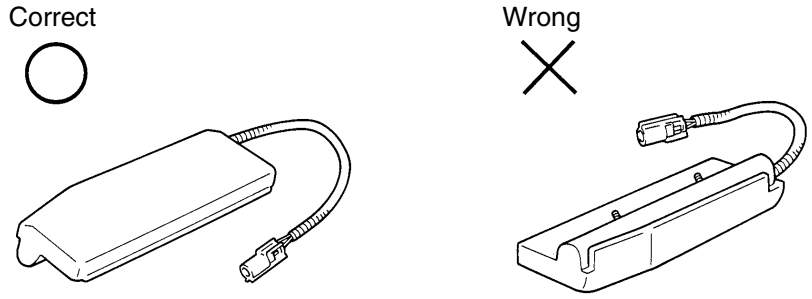
(3) Grease should not be applied to the side airbag assembly and the surface should not be cleaned with detergents of any kind.

(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 (yellow color and 2 pins) under the seat before starting work.

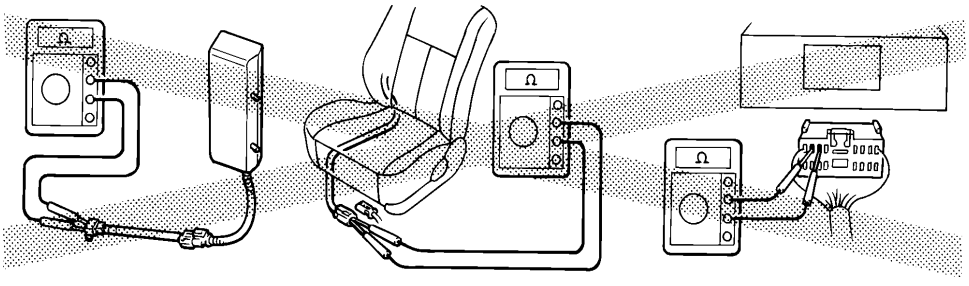
(6) When disposing of a vehicle or the side airbag assembly alone, the airbag should be deployed using an SST before disposal (See page RS–12).
Perform the operation in a safe place away from electrical noise.

Example:



B02129

Example:



B01546

(g) CURTAIN SHIELD AIRBAG ASSEMBLY

(1) Always store a removed or new curtain shield airbag assembly in a clear plastic bag, and keep it in a safe place.

NOTICE:

Protection bag is not reuse.

CAUTION:

Never disassemble the curtain shield airbag assembly

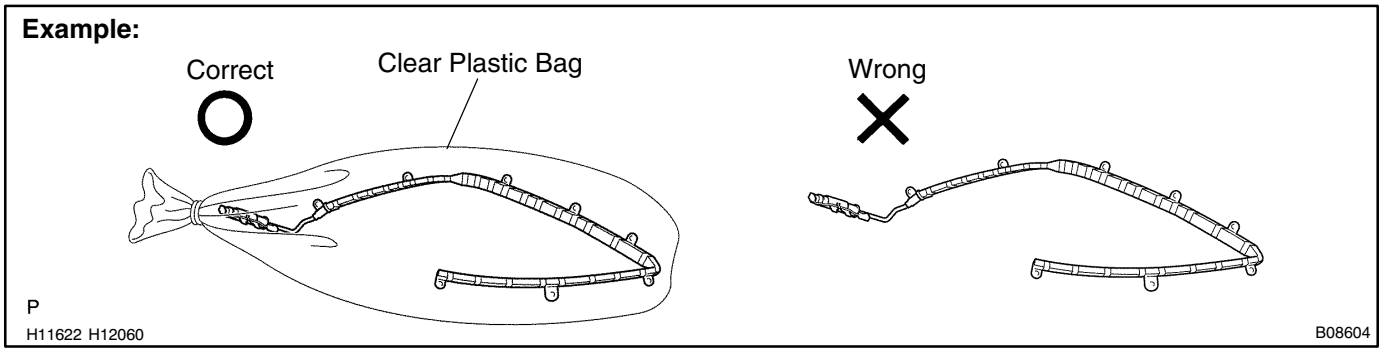
(2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)

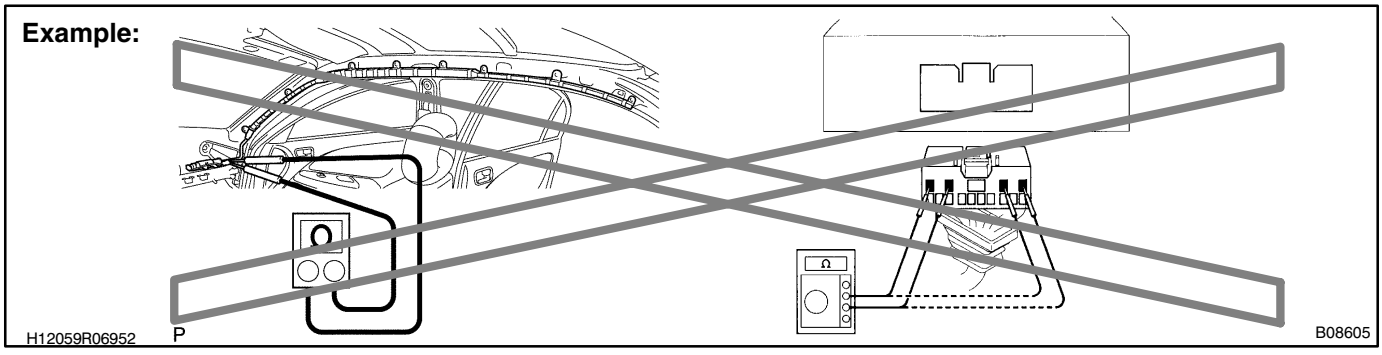
(3) Grease should not be applied to the curtain shield airbag assembly and the surface should not be cleaned with detergents of any kind.

(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 (yellow color and 2 pins) into the intrument panel before starting work.

(6) When disposing of a vehicle or the curtain shield airbag assembly alone, the airbag should be deployed using an SST before disposal (See page RS–26). Perform the operation in a safe place away from electrical noise.





(h) SEAT BELT PRETENSIONER

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

(2) Oil or water should not be put on the front seat outer belt and the front seat outer belt should not be cleaned with detergents of any kind.

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

(4) When using electric welding, first disconnect the connector (yellow color and 2 pins) installed at the center pillar lower garnish before starting work.

(5) When disposing of a vehicle or a front seat outer belt alone, the seat belt pretensioner should be activated before disposal (See Pub. No. RM599E, page BO–153). Perform the operation in a safe place away from electrical noise.

(i) AIRBAG SENSOR ASSEMBLY

(1) Never reuse the airbag sensor assembly involved in a collision when 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 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 loosing the set bolts of the airbag sensor assembly.

(j) WIRE HARNESS AND CONNECTOR

The SRS wire harness is integrated with the instrument panel wire harness and the cowl wire harness assembly and floor wire harness assembly. The wires for the SRS wire harness are encased in a yellow corrugated tube. All the connectors for the system are also 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 as shown on Pub. No. RM599E, page RS–65.

2. FOR VEHICLES EQUIPPED WITH A CATALYTIC CONVERTER

CAUTION:

If large amount of unburned gasoline flows into the converter, it may overheat and create a fire hazard. To prevent this, observe the following precautions and explain them to your customer.

(a) Use only unleaded gasoline.
(b) Avoid prolonged idling.
Avoid running the engine at idle speed for more than 20 minutes.
(c) Avoid spark jump test.
(1) Perform spark jump test only when absolutely necessary. Perform this test as rapidly as possible.
(2) While testing, never race the engine.
(d) Avoid prolonged engine compression measurement.
Engine compression tests must be done as rapidly as possible.
(e) Do not run engine when fuel tank is nearly empty.
This may cause the engine to misfire and create an extra load on the converter.
(f) Avoid coasting with ignition turned off and prolonged braking.
(g) Do not dispose of used catalyst along with parts contaminated with gasoline or oil.

3. IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM

For vehicles with mobile communication systems such as two–way radios and cellular telephones, observe the following precautions.

(a) Install the antenna as far as possible away from the ECU and sensors of the vehicle's electronic system.
(b) Install the antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle's electronic systems. For details about ECU and sensors locations, refer to the section on the applicable component.
(c) Do not wind the antenna feeder together with the other wiring as much as possible, also avoid running the antenna feeder parallel with other wire harnesses.
(d) Check that the antenna and feeder are correctly adjusted.
(e) Do not install powerful mobile communications system.

4. FOR USING HAND–HELD TESTER

CAUTION:

Observe the following items for safety reasons:

- **Before using the hand–held tester, the hand–held tester's operator manual should be read thoroughly.**
- **Be sure to route all cables securely when driving with the hand–held tester connected to the vehicle. (i.e. Keep cables away from feet, pedals, steering wheel and shift lever.)**
- **Two persons are required when test driving with the hand–held tester, one person to drive the vehicle and the other person to operate the hand–held tester.**

5. FOR VEHICLES EQUIPPED WITH POWER WINDOW CONTROL SYSTEM

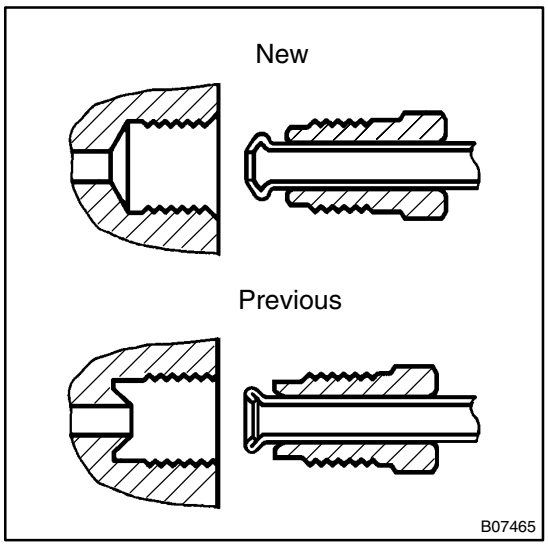
When the battery is disconnected or the power to the window regulator motor is cut, the power window control system does not operate. It is necessary to initialize the system in the following procedures. Otherwise window cannot be operated normally.

(1) Close window to the highest position.
(2) Keep holding the switch for 5 seconds.
(3) Check that automatic operation works. If not, repeat the above procedures.

6. FOR VEHICLES EQUIPPED WITH SLIDING ROOF SYSTEM

Sliding roof stop position might be required to be initialized when battery failures (such as battery disconnection, connector disconnection and the voltage drop) are detected while the system is in operation. This also occurs when rotating the motor with the battery disconnected. Sliding roof initialization can be done by the following procedures.

(1) Operate the roof up to the maximum tilt position.
(2) Release the switch, and push it again in the same direction. (After 10 seconds have elapsed, initialization begins.)
(3) The roof starts automatic operation if holding the switch, completes full one cycle (tilt down, slide open, slide close and tilt up) of travel. Do not release the switch until the roof stops.
(4) Check that the roof stops at the correct position.



7. FOR VEHICLES EQUIPPED WITH BRAKE PIPE FITTING OF NEW STANDARD

A flare shape of a new standard is used for the brake pipe fitting from this changed models.

NOTICE:

- **When ordering or replacing the parts, please be sure to check and use the fitting of the same flare type.**
- **Do not over–tighten them more than the standard torque.**
  Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

IN00Z–24

GENERAL INFORMATION

A large number of ECU controlled systems are used in the AVENSIS/CORONA. 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. However, the fact is 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 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
Supplemental Restraint System	DI–1

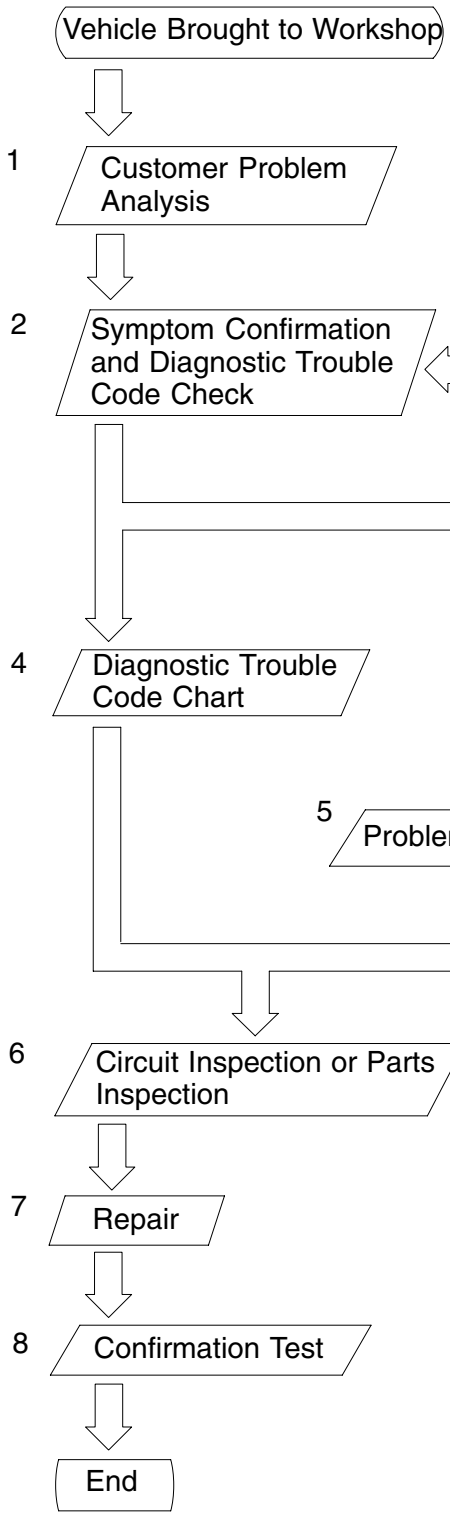
FOR USING HAND–HELD TESTER

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

IN06D–07

HOW TO PROCEED WITH TROUBLESHOOTING

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



1

Ask the customer about the conditions and the environment when the problem occurred.

2, 3

Confirm the symptoms and the problem conditions, and check the diagnostic trouble codes.
(When the problem symptoms do not appear during confirmation, use the symptom simulation method described later on.)

4, 5, 6

Check the results obtained in Step 2, then confirm the inspection procedure for the system or the part which should be checked using the diagnostic trouble code chart or the problem symptoms table.

7

Check and repair the affected system or part in accordance with the instructions in Step 6.

8

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

1. CUSTOMER PROBLEM ANALYSIS

In troubleshooting, the problem symptoms must be confirmed accurately and all preconceptions must be cleared away in order to give an accurate judgement. To ascertain just what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time it occurred.
Important Point in the Problem Analysis:
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 reference in troubleshooting. A customer problem analysis table is provided in DI 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]

2. SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE CHECK

The diagnostic system in the AVENSIS/ CORONA fulfills various functions. The first function is the Diagnostic Trouble Code Check in which a malfunction in the signal circuits to the ECU is stored in code in the ECU memory at the time of occurrence, to be output by the technician during troubleshooting. 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, the problem areas can be narrowed down quickly and troubleshooting can be performed effectively. Diagnostic functions are incorporated in the following systems in the AVENSIS/ CORONA.

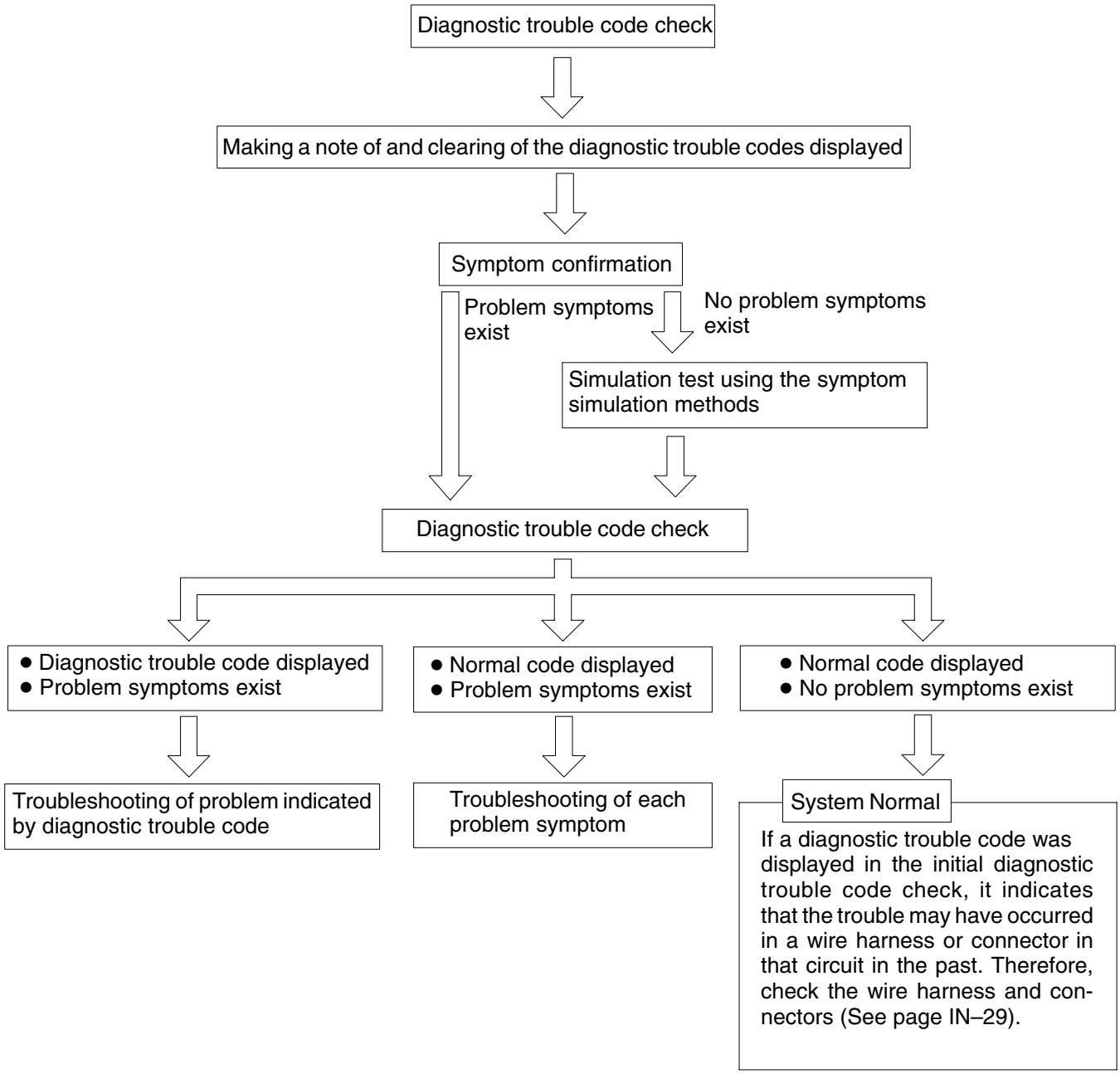
System	Diagnostic Trouble Code Check	Input Signal Check (Sensor Check)	Other Diagnosis Function
Supplemental Restraint System	○		

In diagnostic trouble code check, it is very important to determine whether the problem indicated by the diagnostic trouble code is still occurring or 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 diagnostic trouble code is directly related to the problem symptom or not. For this reason, the diagnostic trouble codes should be checked before and after the symptom confirmation to determine the current conditions, as shown in the table below. If this is not done, it may, depending on the case, result in unnecessary troubleshooting for normally operating systems, thus making it more difficult to locate the problem, or in repairs not pertinent to the problem. Therefore, always follow the procedure in correct order and perform the diagnostic trouble code check.

DIAGNOSTIC TROUBLE CODE CHECK PROCEDURE

Diagnostic Trouble Code Check (Make a note of and then clear)	**Confirmation of Symptoms**	**Diagnostic Trouble Code Check**	**Problem Condition**
Diagnostic Trouble Code Display	Problem symptoms exist	Same diagnostic trouble code is displayed	Problem is still occurring in the diagnostic circuit
⇨	⇨	Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit (The diagnostic trouble code displayed first is either for a past problem or it is a secondary problem)
⇨	No problem symptoms exist	⇨	The problem occurred in the diagnostic circuit in the past
Normal Code Display ⇨	Problem symptoms exist	Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit
⇨	No problem symptoms exist	Normal code is displayed	The problem occurred in a place other than in the diagnostic circuit in the past

Taking into account the above points, a flow chart showing how to proceed with troubleshooting using the diagnostic trouble code check is shown below. This flow chart shows how to utilize the diagnostic trouble code check effectively, then by carefully checking the results, indicates how to proceed either to diagnostic trouble code troubleshooting or to troubleshooting of problem symptoms.



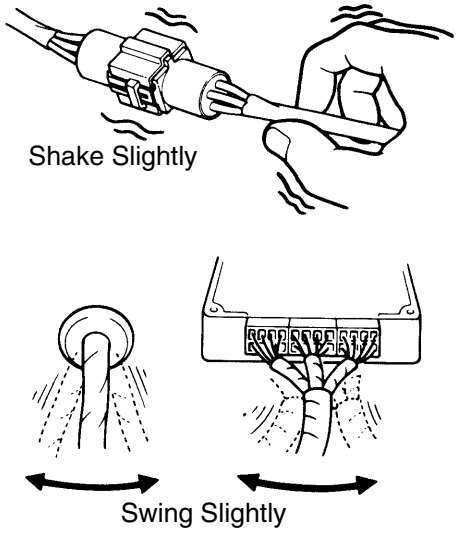
3. SYMPTOM SIMULATION

The most difficult case in troubleshooting is when there are no problem symptoms occurring. 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 or she may be, if he or she proceeds to troubleshoot without confirming the problem symptoms he or she 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 so long as the symptoms are confirmed with the engine hot condition or the vehicle at a standstill. Since vibration, heat or water penetration (moisture) is likely cause for problem which is difficult to reproduce, the symptom simulation tests introduced here are effective measures in that the external causes are applied to the vehicle in a stopped condition.

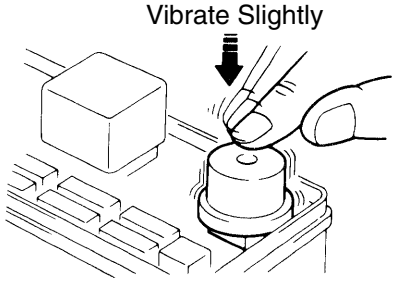
Important Points in the Symptom Simulation Test:

In the symptom simulation test, the problem symptoms should of course be confirmed, but the problem area or parts must also be found out. To do this, narrow down the possible problem circuits according to the symptoms before starting this test and connect a tester 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 for each system to narrow down the possible causes of the symptom.

<table>
<tr><td>1</td><td colspan="2">VIBRATION METHOD: When vibration seems to be the major cause.</td></tr>
<tr><td colspan="2">CONNECTORS
Slightly shake the connector vertically and horizontally.

WIRE HARNESS
Slightly shake the wire harness vertically and horizontally. The connector joint, fulcrum of the vibration, and body through portion are the major areas to be checked thoroughly.</td><td> 

FI2331
FI2332</td></tr>
<tr><td colspan="2">PARTS AND SENSOR
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.</td><td> 

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</table>

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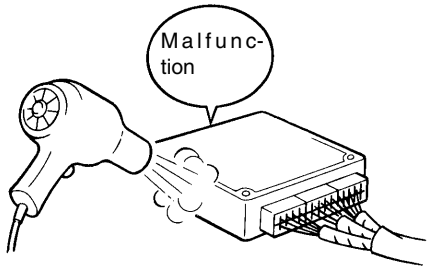
2	**HEAT METHOD: When the problem seems to occur when the suspect area is heated.**

Heat the component that is the likely cause of the malfunction with a hair dryer or similar object. Check to see if the malfunction occurs.

NOTICE:

(1) Do not heat to more than 60 ˚C (140 ˚F). (Temperature is limited not to damage the components.)

(2) Do not apply heat directly to parts in the ECU.



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

Sprinkle water onto the vehicle and check to see if the malfunction occurs.

NOTICE:

(1) Never sprinkle water directly into the engine compartment, but indirectly change the temperature and humidity by applying water spray onto the radiator front surface.

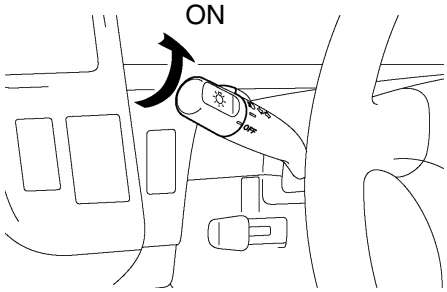
(2) Never apply water directly onto the electronic components.

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.

FI6649

4	**OTHER: When a malfunction seems to occur when electrical load is excessive.**

Turn on all electrical loads including the heater blower, head lights, rear window defogger, etc. and check to see if the malfunction occurs.



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4. DIAGNOSTIC TROUBLE CODE CHART

The inspection procedure is shown in the table below. This table permits efficient and accurate troubleshooting 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.

- DTC No.
  Indicates the diagnostic trouble code.
- Page or Instructions
  Indicates the page where the inspection procedure for each circuit is to be found, or gives instructions for checking and repairs.

- Trouble Area
  Indicates the suspect area of the problem.

- 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 listed for that code in the table below. (Proceed to the page given for that circuit).

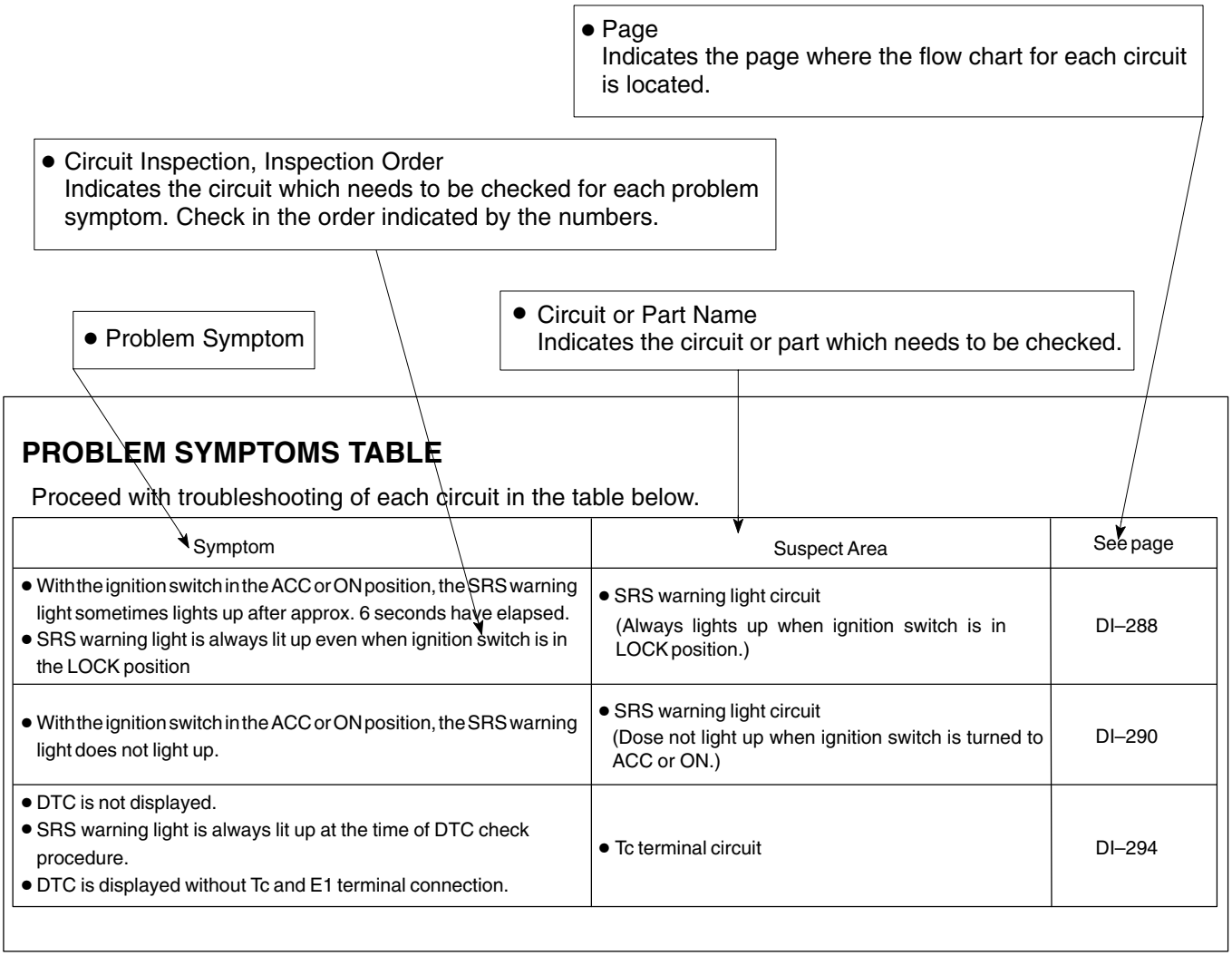
DTC No. (See page)	Detection Item	Trouble Area	SRS Warming Light
11 (DI–165)	Short in D squib circuit (to ground)	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
12 (DI–170)	Short in D squib circuit (to B+)	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
13 (DI–174)	Short in D squib circuit	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
14 (DI–178)	Open in D squib circuit	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
15 (DI–178)	Front airbag sensor assembly (RH) malfunction	● Front airbag sensor assembly (RH) ● Wire harness	ON
16	Front airbag sensor assembly (LH) malfunction	● Front airbag sensor assembly (LH) ● Wire harness	ON
	ssembly malfunction	Airbag sensor assembly	
	it (to ground)	● Front passenger airbag sensor assembly ● Airbag sensor assembly	

5. 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.



PROBLEM SYMPTOMS TABLE

Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
● With the ignition switch in the ACC or ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed. ● SRS warning light is always lit up even when ignition switch is in the LOCK position	● SRS warning light circuit (Always lights up when ignition switch is in LOCK position.)	DI–288
● With the ignition switch in the ACC or ON position, the SRS warning light does not light up.	● SRS warning light circuit (Dose not light up when ignition switch is turned to ACC or ON.)	DI–290
● DTC is not displayed. ● SRS warning light is always lit up at the time of DTC check procedure. ● DTC is displayed without Tc and E1 terminal connection.	● Tc terminal circuit	DI–294

6. CIRCUIT INSPECTION

How to read and use each page is shown below.

● Diagnostic Trouble Code No. and Detection Item

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

DTC	13	Short in D Squib Circuit

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.

It causes the airbag to deploy when the airbag deployment conditions are satisfied.

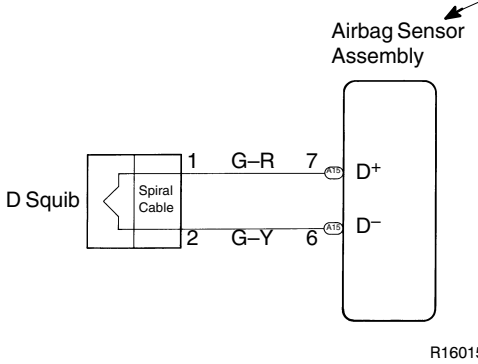
For details of the function of each components,see OPERATION on page RS–2.

DTC 13 is recorded when a short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
13	•Short circuit between D+ wire harness and D– wire harness of squib •D squib malfunction •Spiral cable malfunction •Airbag sensor assembly malfunction	•Steering wheel pad (D squib) •Spiral cable •Airbag sensor assembly •Wire harness

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

WIRING DIAGRAM



● 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
The first letter indicates the basic wire color and the second letter indicates the color of the stripe.

B02407

● Indicates the position of the ignition switch during the check.

LOCK
Ignition Switch LOCK (OFF)

ON
Ignition Switch ON

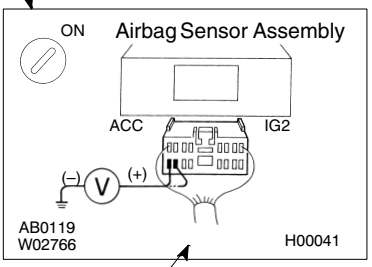
START
Ignition Switch START

ACC
Ignition Switch ACC

● 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.

INSPECTION PROCEDURE

2	**Check voltage at IG2 and ACC of airbag sensor assembly.**



PREPARATION:
Turn ignition switch ON.

CHECK:
Measure voltage between terminals IG2 and ACC of airbag sensor assembly and body ground.

OK:
Voltage: Below 16V

NG → **Check battery and charging system. (See charging system section)**

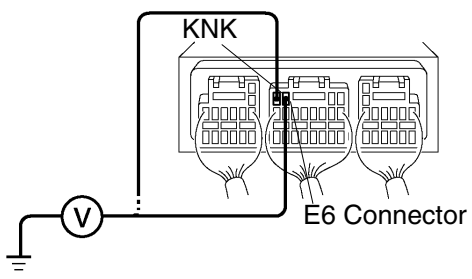
OK

● Indicates the place to check the voltage or resistance.
● Indicates the connector position to be checked, from the front or back side.

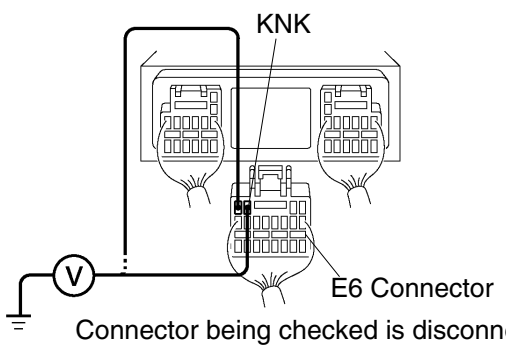
Check from the connector back side. (with harness)

Check from the connector front side. (without harness)
In this case, care must be taken not to bend the terminals.

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



Connector being checked is connected.



Connector being checked is disconnected.

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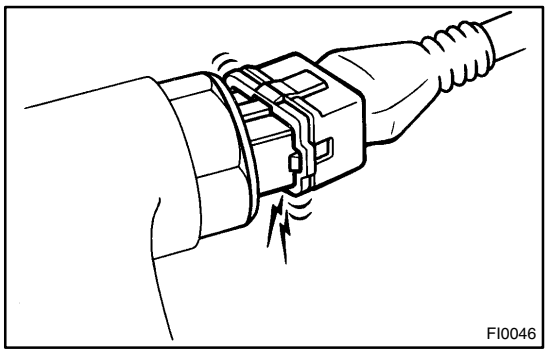
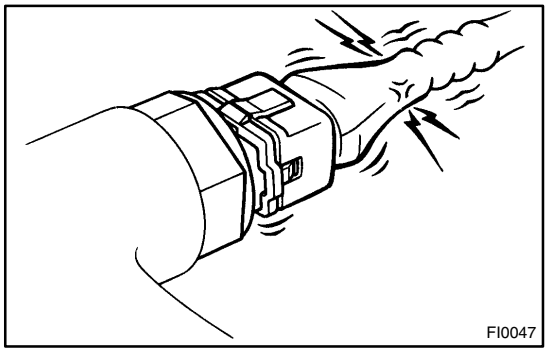
IN011–03


FI0046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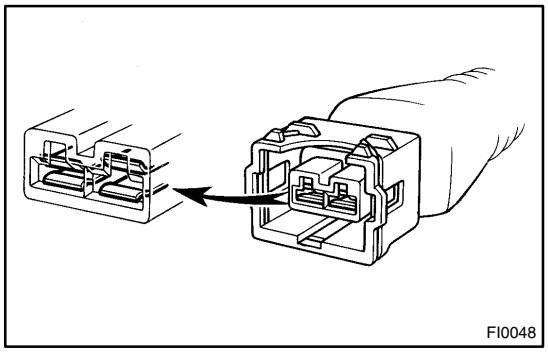

FI0048

HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE

1. CONNECTOR CONNECTION AND TERMINAL INSPECTION

- For troubleshooting, diagnostic trouble code charts or problem symptom charts are provided for each circuit with detailed inspection procedures on the following pages.
- When all the component parts, wire harnesses and connectors of each circuit except the ECU are found to be normal in troubleshooting, then it is determined that the problem is in the ECU. Accordingly, if diagnosis is performed without the problem symptoms occurring, refer to Step 8 to replace the ECU. So always confirm that the problem symptoms are occurring, or proceed with inspection while using the symptom simulation method.
- The instructions ”Check wire harness and connector” and ”Check and replace ECU” which appear in the inspection procedure, are common and applicable to all diagnostic trouble codes. Follow the procedure outlined below whenever these instructions appear.

OPEN CIRCUIT:

This could be due to a disconnected wire harness, faulty contact in the connector, and a connector terminal pulled out, etc.

HINT:

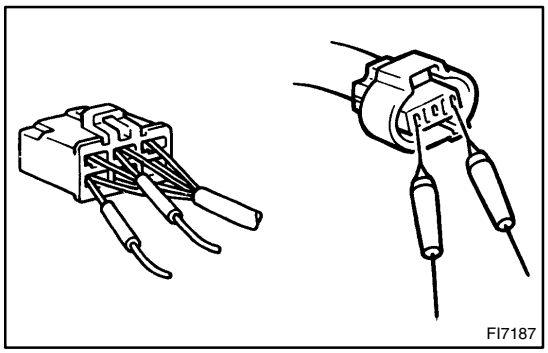
- It is rarely the case that a wire is broken in the middle of it. Most cases occur at the connector. In particular, carefully check the connectors of sensors and actuators
- Faulty contact could be due to rusting of the connector terminals, to foreign materials entering terminals or a deformation of connector terminals. Simply disconnecting and reconnecting the connectors once changes the condition of the connection and may result in a return to normal operation. Therefore, in troubleshooting, if no abnormality is found in the wire harness and connector check, but the problem disappears after the check, then the cause is considered to be in the wire harness or connectors.

SHORT CIRCUIT:

This could be due to a contact between wire harness and the body ground or to a short circuit occurred inside the switch, etc.

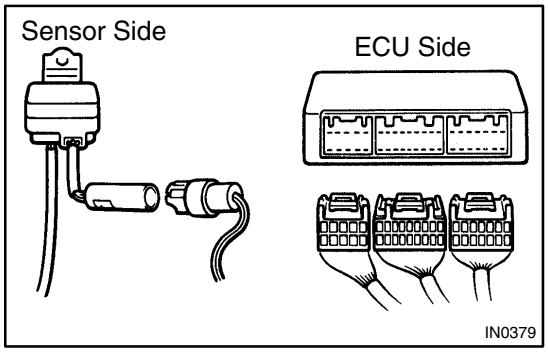
HINT:

When there is a short between the wire harness and body ground, check thoroughly whether the wire harness is caught in the body or is clamped properly.



2. CONNECTOR HANDLING

When inserting tester probes into a connector, insert them from the rear of the connector. When necessary, use mini test leads. For water resistant connectors which cannot be accessed from behind, take good care not to deform the connector terminals.



3. CONTINUITY CHECK (OPEN CIRCUIT CHECK)

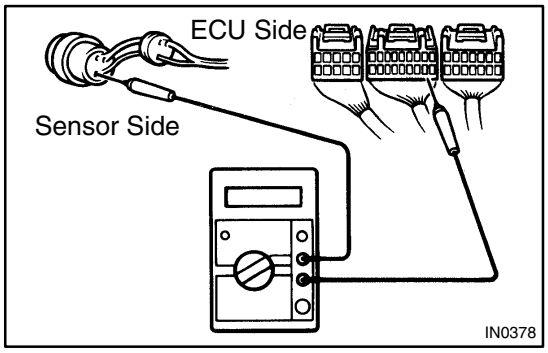
(a) Disconnect the connectors at both ECU and sensor sides.

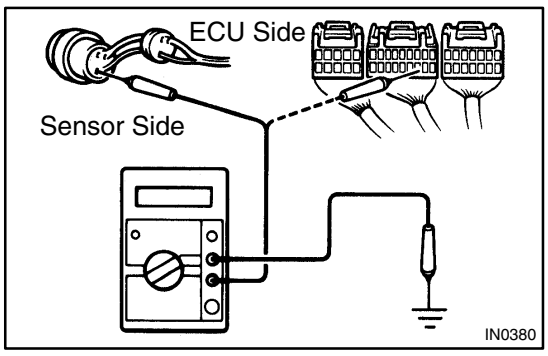
(b) Measure the resistance between the applicable terminals of the connectors.

Resistance: 1 Ω or less

HINT:

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





4. RESISTANCE CHECK (SHORT CIRCUIT CHECK)

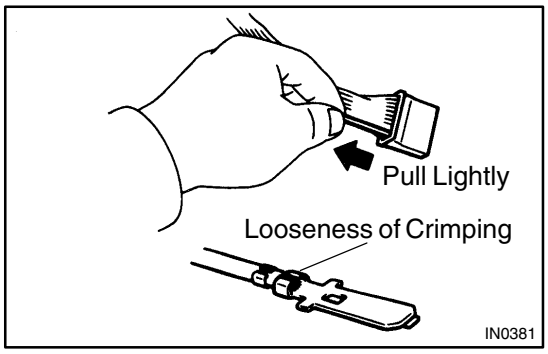
(a) Disconnect the connectors on both ends.

(b) Measure the resistance between the applicable terminals of the connectors and body ground. Be sure to carry out this check on the connectors on both ends.

Resistance: 1 MΩ or higher

HINT:

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



5. VISUAL CHECK AND CONTACT PRESSURE CHECK

(a) Disconnect the connectors at both ends.

(b) Check for rust or foreign material, etc. in the terminals of the connectors.

(c) Check crimped portions for looseness or damage and check that the terminals are secured in lock portion.

HINT:

The terminals should not come out when pulled lightly from the back.

(d) Prepare a test male terminal and insert it in the female terminal, then pull it out.

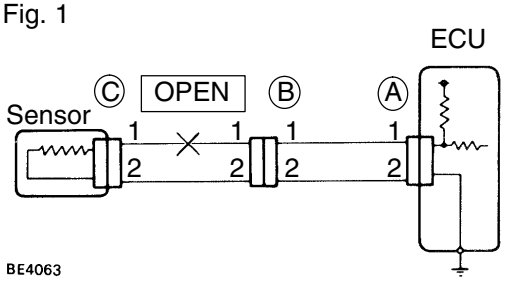
NOTICE:

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

HINT:

When the test terminal is pulled out more easily than others, there may be poor contact in that section.

Fig. 1



6. CHECK OPEN CIRCUIT

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

Fig. 2

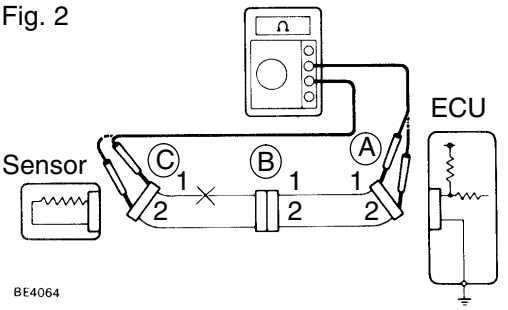
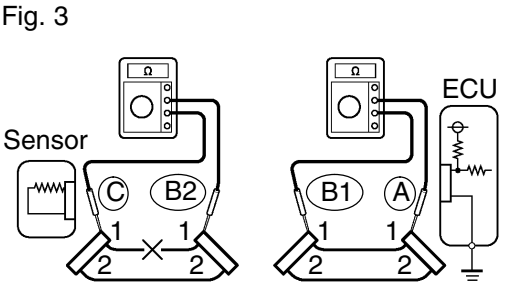


Fig. 3



(a) Check the continuity.

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

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".

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

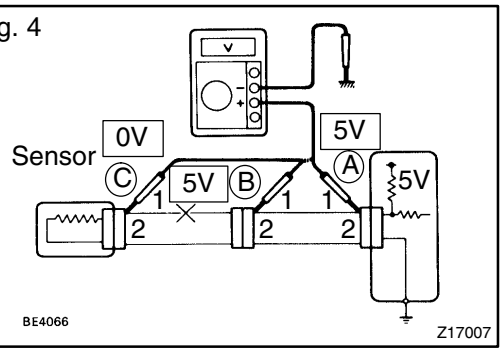
In the case of Fig. 3,

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



(b) Check the voltage.

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

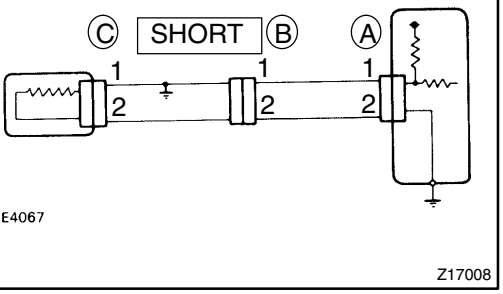
As shown in Fig. 4, with each connector still connected, measure the voltage between body ground and terminal 1 of connector "A" at the ECU 5V output terminal, terminal 1 of connector "B", and terminal 1 of connector "C", in that order.

If the results are:

5V: Between Terminal 1 of connector "A" and Body Ground
5V: Between Terminal 1 of connector "B" and Body Ground
0V: 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".

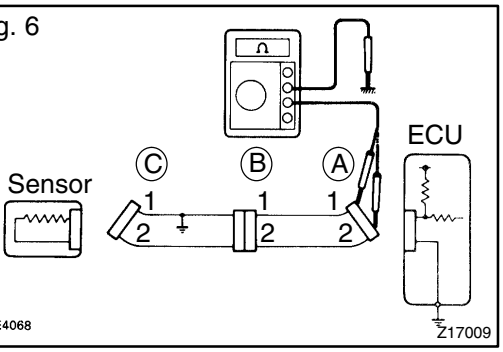
Fig. 5



7. CHECK SHORT CIRCUIT

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

Fig. 6



Check the continuity with ground.

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

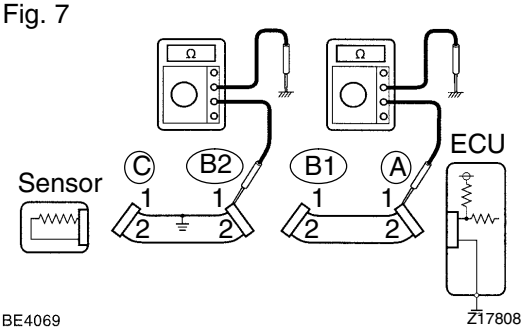
In the case of Fig. 6

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".

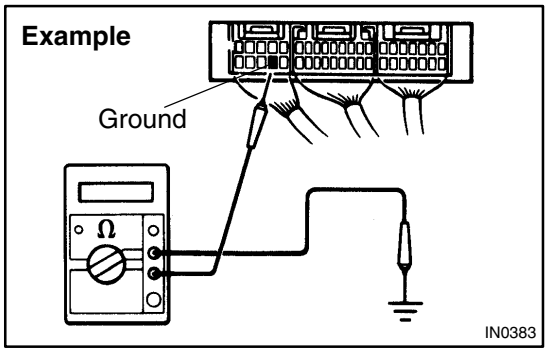
Fig. 7



(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.
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”.

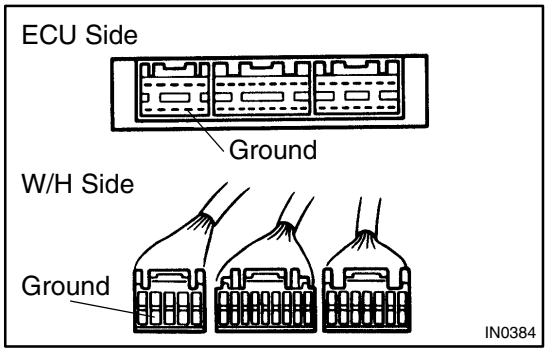
8. CHECK AND REPLACE ECU

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

IN044–07

Abbreviations	Meaning
ABS	Anti–Lock Brake System
A/C	Air Conditioner
AC	Alternating Current
ACC	Accessory
ACIS	Acoustic Control Induction System
ACSD	Automatic Cold Start Device
A.D.D.	Automatic Disconnecting Differential
AHC	Active Height Control Suspension
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Amplifier
ANT	Antenna
APPROX.	Approximately
A/T	Automatic Transmission (Transaxle)
ATF	Automatic Transmission Fluid
AUTO	Automatic
BACS	Boost Altitude Compensation System
BAT	Battery
B/L	Bi–Level
BVSV	Bimetallic Vacuum Switching Valve
CB	Circuit Breaker
CD	Compact Disc
CH	Channel
CKD	Complete Knock Down
COMB.	Combination
CPE	Coupe
CRS	Child Restraint System
CTR	Center
DC	Direct Current
DIFF.	Differential
DIFF. LOCK	Differential Lock
DLC	Data Link Connector
DSP	Digital Signal Processor
DTC	Diagnostic Trouble Code
ECT	Electronic Control Transmission
ECU	Electronic Control Unit
EDU	Electronic Driving Unit
EFI	Electronic Fuel Injection
E/G	Engine
EGR	Exhaust Gas Recirculation
ELR	Emergency Locking Retractor
E–VRV	Electronic Vacuum Regulating Valve

FF	Front–EngineFront–Wheel–Drive
FIPG	Formed In Place Gasket
FL	Fusible Link
Fr	Front
FR	Front–EngineRear–Wheel–Drive
FWD	Front–Wheel–Drive
GND	Ground
H/B	Hatchback
HI	High
HID	High Intensity Discharge (Head Lamp)
HT	Hard Top
HWS	Heated Windshield System
IAC	Idle Air Control
IFS	Independent Front Suspension
IG	Ignition
INT	Intermittent
I/P	Instrument Panel
IRS	Independent Rear Suspension
J/B	Junction Block
J/C	Junction Connector
LAN	Local Area Network
LB	Liftback
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	Left–Hand
LHD	Left–Hand Drive
LO	Low
LSD	Limited Slip Differential
LSP & PV	Load Sensing Proportioning And Bypass Valve
LSPV	Load Sensing Proportioning Valve
MAP	Manifold Absolute Pressure
MAX.	Maximum
MIC	Microphone
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MP	Multipurpose
MPI	Multipoint Electronic Fuel Injection
MPX	Multiplex Communication System
M/T	Manual Transmission
N	Neutral
No.	Number
O2S	Oxygen Sensor
O/D	Overdrive
OPT	Option
P & BV	Proportioning And Bypass Valve
PCS	Power Control System

PKB	Parking Brake
PPS	Progressive Power Steering
PS	Power Steering
PTO	Power Take–Off
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 Rear Suspension
RWD	Rear–Wheel Drive
SDN	Sedan
SEN	Sensor
SICS	Starting Injection Control System
SPEC	Specification
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
SW	Switch
SYS	System
T/A	Transaxle
TACH	Tachometer
TDC	Top Dead Center
TEMP.	Temperature
TEMS	TOYOTA Electronic Modulated Suspension
TFT	Toyota Free–Tronic
T/M	Transmission
TMC	TOYOTA Motor Corporation
TRC	Traction Control System
U/D	Underdrive
VENT	Ventilator
VIN	Vehicle Identification Number
VSC	Vehicle Skid Control Vehicle Stability Control
VSV	Vacuum Switching Valve
w/	With
WGN	Wagon
W/H	Wire Harness
w/o	Without
1st	First

2nd	Second
2WD	Two Wheel Drive Vehicle (4x2)
4WD	Four Wheel Drive Vehicle (4x4)

PREPARATION

MANUAL TRANSAXLE (E251) PP–1
SUSPENSION AND AXLE PP–6
BRAKE PP–11
STEERING PP–12
SUPPLEMENTAL RESTRAINT SYSTEM ... PP–16
BODY ELECTRICAL PP–19
BODY PP–20
AIR CONDITIONING PP–22

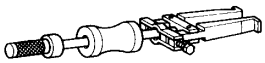
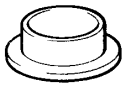
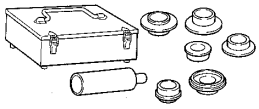
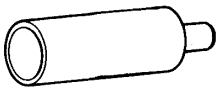
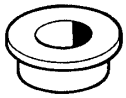
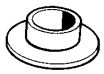
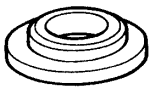
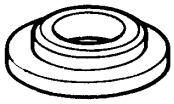
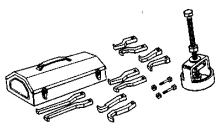
REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

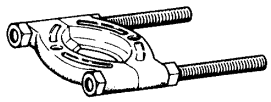
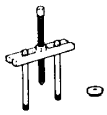
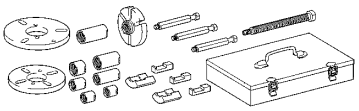
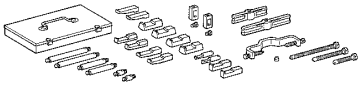
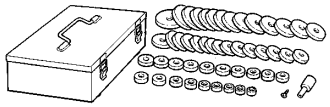
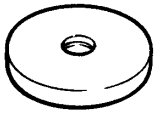
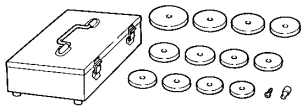
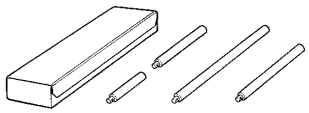
NOTE: The above pages contain only the points which differ from the above listed manual.

MANUAL TRANSAXLE (E251)

SST (Special Service Tools)

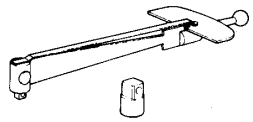
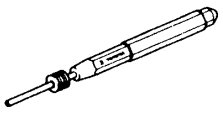
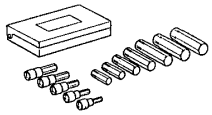
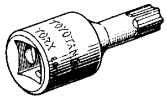
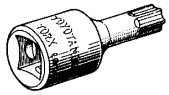
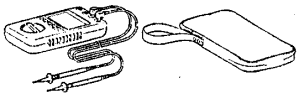
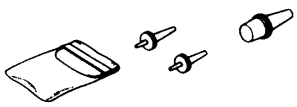
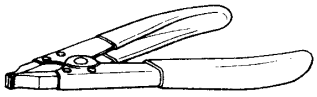
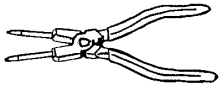
PP27T–01

	09223–15020	Oil Seal & Bearing Replacer	Differential case oil seal
	09308–00010	Oil Seal Puller	Output shaft front bearing outer race
	09316–20011	Transfer Bearing Replacer	Differential case tapered roller bearing
	09316–60011	Transmission & Transfer Bearing Replacer	
	(09316–00011)	Replacer Pipe	
	(09316–00021)	Replacer ”A”	
	(09316–00041)	Replacer ”C”	1st gear No.1 hub sleeve Differential case tapered roller bearing outer race
	(09316–00071)	Replacer ”F”	Output shaft front bearing
	09506–30012	Differential Drive Pinion Rear Bearing Cone Replacer	Output shaft rear bearing
	09506–35010	Differential Drive Pinion Rear Bearing Replacer	No.2 hub sleeve 3rd gear Input shaft rear bearing 1st gear bearing inner race
	09608–00081	Differential Side Bearing Cone Replacer	Input shaft oil seal
	09612–65014	Steering Worm Bearing Puller	Input shaft bearing Differential case tapered roller bearing outer race

	09950–00020	Bearing Remover	
	09950–00030	Bearing Remover Attachment	Output shaft front bearing
	09950–30011	Puller A Set	5th driven gear No.3 clutch hub
	09950–40011	Puller B Set	Differential case tapered roller bearing
	09950–60010	Replacer Set	
	(09951–00580)	Replacer 58	Input shaft bearing
	09950–60020	Replacer Set No.2	
	09950–70010	Handle Set	
	(09951–07150)	Handle 150	

PP0VD–02

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	Differential preload
	09031–00030	Pin Punch .	
	09040–00011	Hexagon Wrench Set .	
	09042–00040	Torx Socket T50 .	
	09042–00050	Torx Socket T45 .	
	09082–00040	TOYOTA Electrical Tester.	
	09258–00030	Hose Plug Set .	
	09905–00012	Snap Ring No.1 Expander .	
	09905–00013	Snap Ring Pliers .	

PP0VE–02

EQUIPMENT

Dial indicator with magnetic base	
Feeler gauge	
Magnetic finger	
Micrometer	
Plastigage	
Precision straight edge	
Torque wrench	
Vise	

PP0VF–02

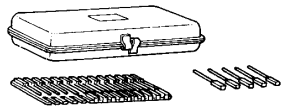
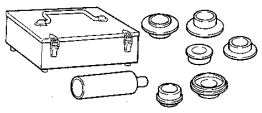
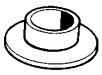
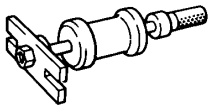
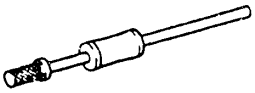
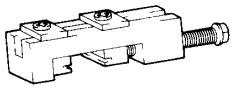
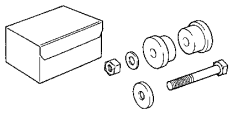
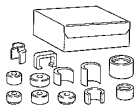
LUBRICANT

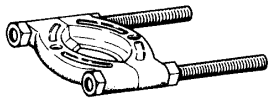
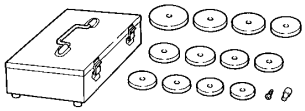
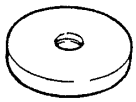
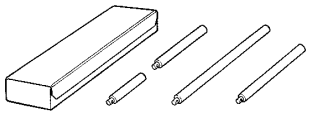
Item	Capacity	Classification
Manual transaxle oil (w/ Differential oil)	3.9 liters (4.1 US qts, 3.4 Imp. qts)	API GL–4 or GL–5 SAE 75W–90

SUSPENSION AND AXLE

PP27U–01

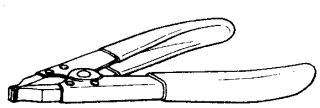
SST (Special Service Tools)

	09240–00020	Wire Gauge Set	
	09316–60011	Transmission & Transfer Bearing Replacer	
	(09316–00041)	Replacer ”C”	
	09520–01010	Drive Shaft Remover Attachment	
	09520–24010	Differential Side Gear Shaft Puller	
	(09520–32040)	Shocker Set	
	09521–24010	Drive Shaft Boot Clamping Tool	
	09608–16042	Front Hub Bearing Adjusting Tool	
	(09608–02021)	Bolt & Nut	
	(09608–02041)	Retainer	
	09710–30021	Suspension Bushing Tool Set	
	(09710–03121)	Bushing Remover Base	

	09950–00020	Bearing Remover	
	09950–60020	Replacer Set No.2	
	(09951–00720)	Replacer 72	
	09950–70010	Handle Set	
	(09951–07150)	Handle 150	

PP27V–01

RECOMMENDED TOOLS

	09905–00012	Snap Ring No.1 Expander .	Front drive shaft

PP11I–02

EQUIPMENT

Torque wrench	

PP11J–02

LUBRICANT

Item		Capacity	Application
1CD–FTV engine:			
Outboard joint grease	Color=Black	85 – 105 g (3.00 – 3.70 oz.)	
Inboard joint grease	Color=Yellow	120 – 130 g (4.23 – 4.59 oz.)	

BRAKE

EQUIPMENT

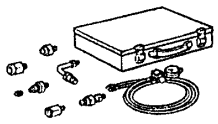
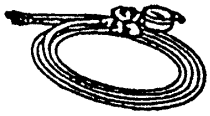
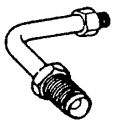
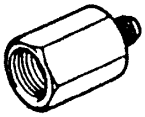
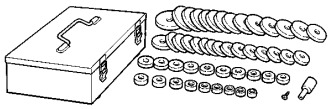
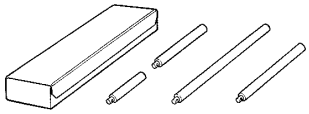
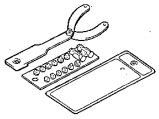
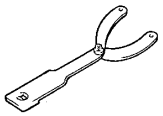
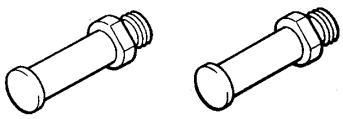
PP27W–01

Torque wrench	
Micrometer	Blade

STEERING

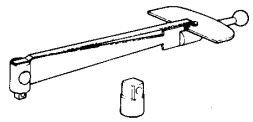
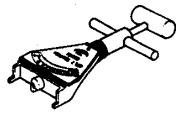
SST (Special Service Tools)

PP27X–01

	09640–10010	Power Steering Pressure Gauge Set	Power steering fluid
	(09641–01010)	Gauge Assy	
	(09641–01030)	Attachment B	
	(09641–01060)	Attachment E	
	09950–60010	Replacer Set	PS vane pump (2C–T, 2C–TE and 1CD–FTV engines)
	(09951–00310)	Replacer 31	
	09950–70010	Handle Set	PS vane pump (2C–T, 2C–TE and 1CD–FTV engines)
	(09951–07100)	Handle 100	
	09960–10010	Variable Pin Wrench Set	PS vane pump (2C–T, 2C–TE and 1CD–FTV engines)
	(09962–01000)	Variable Pin Wrench Arm Assy	
	(09963–01000)	Pin 10	

PP27Y–01

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	PS vane pump
	09216–00021	Belt Tension Gauge .	
	09216–00030	Belt Tension Gauge Cable .	

PP27Z–01

EQUIPMENT

Caliper gauge	PS vane pump (2C–T, 2C–TE and 1CD–FTV engines)
Vernier calipers	PS vane pump (2C–T, 2C–TE and 1CD–FTV engines)
Feeler gauge	PS vane pump (2C–T, 2C–TE and 1CD–FTV engines)
Micrometer	PS vane pump (2C–T, 2C–TE and 1CD–FTV engines)
Torque wrench	

PP280–01

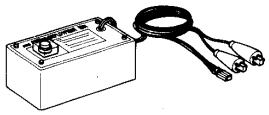
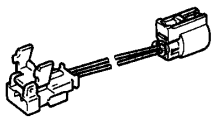
LUBRICANT

Item		Capacity	Classification
Power steering fluid	Total	0.8 liters (0.8 US qts, 0.7 Imp. qts)	ATF DEXRON® II or III

SUPPLEMENTAL RESTRAINT SYSTEM

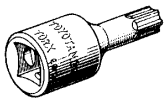
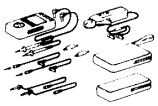
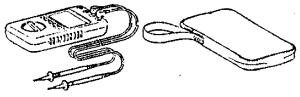
PP281–01

SST (Special Service Tools)

	09082–00700	SRS Airbag Deployment Tool	
	09082–00750	Airbag Deployment Wire Sub–harness No.3	Side airbag assembly Curtain shield airbag assembly
	09843–18020	Diagnosis Check Wire	

PP282–01

RECOMMENDED TOOLS

	09042–00020	Torx Socket T40 .	Airbag sensor assembly Seatback assembly
	09082–00050	TOYOTA Electrical Tester Set.	
	09082–00040	TOYOTA Electrical Tester.	

PP0MS–05

EQUIPMENT

Torque wrench	
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

BODY ELECTRICAL

EQUIPMENT

PP12J–02

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	
Syphon	Brake fluid level warning switch
Bulb (3.4 W)	Fuel sender gauge,
Dry cell battery	Fuel sender gauge

BODY

EQUIPMENT

PP060–04

Clip remover	
Torque wrench	
Tape	To avoid surface damage
Adhesive tape	To avoid surface damage
Adhesive	
Cleaner	
Shop rag	
Knife	
Heat light	
Piano wire	

PP284–01

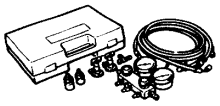
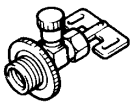
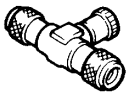
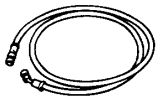
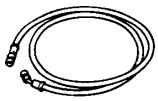
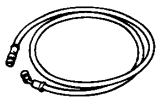
SSM (Special Service Materials)

08833–00030	Three cement black or equivalent	
08850–00801	Windshield Glass Adhesive Set or equivalent	

AIR CONDITIONING

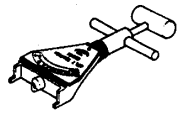
PP285–01

SST (Special Service Tools)

	07110–58060	Air Conditioner Service Tool Set	
	(07117–58060)	Refrigerant Drain Service Valve	
	(07117–58070)	T–Joint	
	(07117–58080)	Quick Disconnect Adapter	High pressure side
	(07117–58090)	Quick Disconnect Adapter	Low pressure side
	(07117–88060)	Refrigerant Charging Hose	High pressure side (Color: Red)
	(07117–88070)	Refrigerant Charging Hose	Low pressure side (Color: Blue)
	(07117–88080)	Refrigerant Charging Hose	Utility (Color: Green)

PP286–01

RECOMMENDED TOOLS

	09216–00021	Belt Tension Gauge .	
	09216–00030	Belt Tension Gauge Cable .	

PP095–04

EQUIPMENT

Ohmmeter	
Torque wrench	
Hexagon wrench	Expansion valve, Combustion type power heater

SERVICE SPECIFICATIONS

STANDARD BOLT SS–1
MANUAL TRANSAXLE (E251) SS–4
SUSPENSION AND AXLE SS–9
BRAKE SS–11
STEERING SS–13
SUPPLEMENTAL RESTRAINT SYSTEM ... SS–15
BODY ELECTRICAL SS–16
BODY SS–18
AIR CONDITIONING SS–19

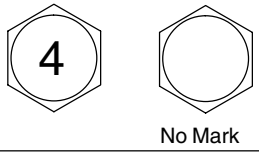
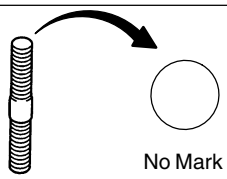
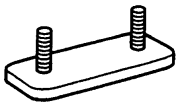
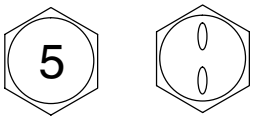
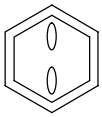
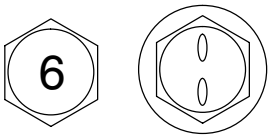
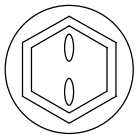
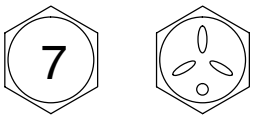
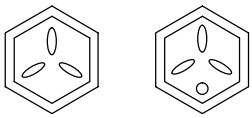
REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS0ZS–01

Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
				4T
				5T
				6T
				7T
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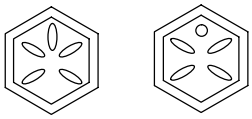
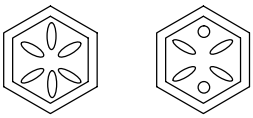
				9T
				10T
				11T

B06431

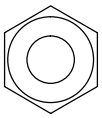
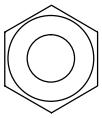
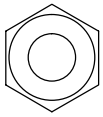
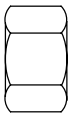
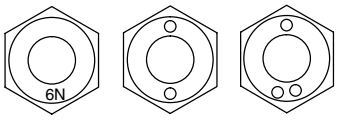
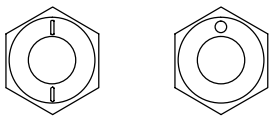
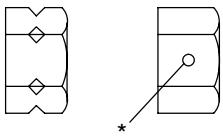
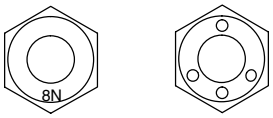
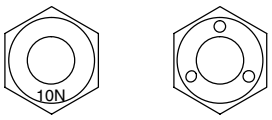
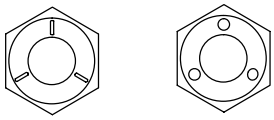
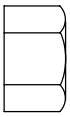
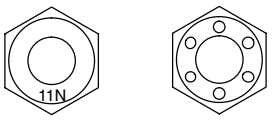
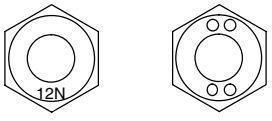
SS0ZT–01

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

SS0ZU–01

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

MANUAL TRANSAXLE (E251)

SERVICE DATA

SS0G6–02

Input shaft		
3rd & 4th gear journal diameter	Min.	35.950 mm (1.4154 in.)
5th gear journal diameter	Min.	27.950 mm (1.1004 in.)
Runout	Max.	0.05 mm (0.0020 in.)
Output shaft		
1st gear journal diameter	Min.	37.526 mm (1.4774 in.)
2nd gear journal diameter	Min.	34.512 mm (1.3588 in.)
Runout	Max.	0.06 mm (0.0024 in.)
Oil pump clearance		
Rotor body	STD	0.10 – 0.16 mm (0.0039 – 0.0063 in.)
	Max.	0.30 mm (0.0118 in.)
Rotor tip	STD	0.08 – 0.15 mm (0.0031 – 0.0059 in.)
	Max.	0.30 mm (0.0118 in.)
Rotor side	STD	0.03 – 0.08 mm (0.0012 – 0.0031 in.)
	Max.	0.15 mm (0.0059 in.)
Gear thrust clearance		
1st & 3rd	STD	0.10 – 0.35 mm (0.0039 – 0.0138 in.)
	Max.	0.40 mm (0.0157 in.)
2nd	STD	0.10 – 0.45 mm (0.0039 – 0.0177 in.)
	Max.	0.50 mm (0.0197 in.)
4th	STD	0.10 – 0.55 mm (0.0039 – 0.0217 in.)
	Max.	0.60 mm (0.0236 in.)
5th	STD	0.10 – 0.57 mm (0.0039 – 0.0224 in.)
	Max.	0.65 mm (0.0256 in.)
Gear radial clearance		
1st & 4th	STD	0.009 – 0.051 mm (0.0004 – 0.0020 in.)
2nd & 3rd	STD	0.009 – 0.053 mm (0.0004 – 0.0021 in.)
5th	STD	0.009 – 0.050 mm (0.0004 – 0.0020 in.)
1st, 2nd, 3rd, 4th & 5th	Max.	0.070 mm (0.0028 in.)
Shift fork to hub sleeve clearance	Max.	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance		
1st, 4th & 5th	Min.	0.8 mm (0.031 in.)
2nd & 3rd	Min.	0.7 mm (0.028 in.)
Drive in depth		
Control shaft cover oil seal		0 – 1.0 mm (0 – 0.039 in.)
Select inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.1 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.2 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
Input shaft snap ring thickness	Mark	
No.2 clutch hub	H	2.30 mm (0.0906 in.)
	J	2.35 mm (0.0925 in.)
	K	2.40 mm (0.0945 in.)
	L	2.45 mm (0.0965 in.)
	M	2.50 mm (0.0984 in.)
	N	2.55 mm (0.1004 in.)
	P	2.60 mm (0.1024 in.)

Input shaft snap ring thickness	Mark	
No.3 clutch hub	a	1.75 mm (0.0689 in.)
	b	1.80 mm (0.0709 in.)
	c	1.85 mm (0.0729 in.)
	d	1.90 mm (0.0748 in.)
	e	1.95 mm (0.0768 in.)
	f	2.00 mm (0.0787 in.)
	g	2.05 mm (0.0807 in.)
	h	2.10 mm (0.0827 in.)
	j	2.15 mm (0.0847 in.)
Ball bearing	1	2.35 mm (0.0925 in.)
	2	2.40 mm (0.0945 in.)
	3	2.45 mm (0.0965 in.)
	4	2.50 mm (0.0984 in.)
	5	2.55 mm (0.1004 in.)
	6	2.60 mm (0.1024 in.)
	7	2.65 mm (0.1043 in.)
	8	2.70 mm (0.1063 in.)
Differential pinion to side gear backlash	STD	0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Differential side gear thrust washer thickness		
		0.80 mm (0.0315 in.)
		0.90 mm (0.0354 in.)
		1.00 mm (0.0394 in.)
		1.10 mm (0.0433 in.)
		1.20 mm (0.0472 in.)
		1.30 mm (0.0512 in.)
		1.40 mm (0.0551 in.)
Differential case side bearing preload (at starting)		
New bearing (Output shaft preload plus)		0.2 – 0.3 N·m (1.8 – 3.5 kgf·cm, 1.6 – 3.0 in.·lbf)
Reused bearing (Output shaft preload plus)		0.1 – 0.2 N·m (1.1 – 2.2 kgf·cm, 1.0 – 1.9 in.·lbf)
Differential side bearing adjusting shim thickness	Mark	
	0	2.00 mm (0.0787 in.)
	1	2.05 mm (0.0807 in.)
	2	2.10 mm (0.0827 in.)
	3	2.15 mm (0.0846 in.)
	4	2.20 mm (0.0866 in.)
	5	2.25 mm (0.0886 in.)
	6	2.30 mm (0.0906 in.)
	7	2.35 mm (0.0925 in.)
	8	2.40 mm (0.0945 in.)
	9	2.45 mm (0.0965 in.)
	A	2.50 mm (0.0984 in.)
	B	2.55 mm (0.1004 in.)
	C	2.60 mm (0.1024 in.)
	D	2.65 mm (0.1043 in.)
	E	2.70 mm (0.1063 in.)
	F	2.75 mm (0.1083 in.)
	G	2.80 mm (0.1102 in.)
	H	2.85 mm (0.1122 in.)

Output shaft bearing preload (at starting)		
New bearing		0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Reused bearing		0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)
Output shaft rear bearing adjusting shim thickness	Mark	
	0	1.30 mm (0.0512 in.)
	1	1.35 mm (0.0531 in.)
	2	1.40 mm (0.0551 in.)
	3	1.45 mm (0.0571 in.)
	4	1.50 mm (0.0591 in.)
	5	1.55 mm (0.0610 in.)
	6	1.60 mm (0.0630 in.)
	7	1.65 mm (0.0650 in.)
	8	1.70 mm (0.0669 in.)
	9	1.75 mm (0.0689 in.)
	A	1.80 mm (0.0709 in.)
	B	1.85 mm (0.0728 in.)
	C	1.90 mm (0.0748 in.)
	D	1.95 mm (0.0768 in.)
	E	2.00 mm (0.0787 in.)
	F	2.05 mm (0.0807 in.)
	G	2.10 mm (0.0827 in.)
	H	2.15 mm (0.0846 in.)
	J	2.20 mm (0.0866 in.)
	K	2.25 mm (0.0886 in.)
	L	2.30 mm (0.0906 in.)
	M	2.35 mm (0.0925 in.)
	N	2.40 mm (0.0945 in.)
	P	2.45 mm (0.0965 in.)
	Q	2.50 mm (0.0984 in.)

SS0G7–04

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Transaxle upper side x Engine	Bolt A	64	650	47
	Bolt B	29	296	21
Transaxle lower side x Engine	Bolt A	40	408	30
	Bolt B	40	408	30
	Bolt C	8	82	71 in.·lbf
	Bolt D	20	204	15
	Bolt E	46	470	34
Diesel throttle body x Engine unit		21	214	15
No.1 air tube assembly x Engine unit		25	255	18
Diesel throttle body with No.2 air tube assembly x Engine unit		25	255	18
Engine front mounting x Engine front mounting bracket		87	890	64
Engine front mounting x Transaxle		64	650	47
Engine rear mounting x Engine rear mounting bracket		98	1,000	72
Engine rear mounting x Transaxle		64	650	47
Starter x Starter wire		15	153	11
Starter x Transaxle		39	400	29
Transaxle case protector x Transaxle		25	250	18
Clutch release cylinder x Clutch housing		12	120	9
Clutch line bracket x Transaxle	Bolt A	12	120	9
(See page MX–4)	Bolt B	4.9	50	43 in.·lbf
Engine left mounting x Bracket		87	890	64
Engine left mounting Bracket x Transaxle		52	530	38
Front wheel		103	1,050	76
Front exhaust pipe x Exhaust manifold		62	630	46
Front exhaust pipe x Center exhaust pipe		48	490	35
Engine rear mounting x Center member		73	740	54
Engine rear mounting bracket x Body		64	650	47
Engine rear mounting bracket x Engine rear mounting		87	890	64
Engine front mounting x Center member		52	540	38
Engine front mounting bracket x Transaxle		64	650	47
Engine front mounting bracket x Engine front mounting		87	890	64
Front transport hook x Center member		39	400	29
Engine mounting center member x Body		73	740	54
Transaxle case protector x Transaxle		25	250	18
No.2 selecting bellcrank with selecting bellcrank support		20	200	14
Shift and select lever shaft lock bolt		49	500	36
Shift and select lever shaft assembly x Transmission case		20	200	14
Transmission case cover x Transmission case		29	300	22
Breather plug		49	500	36
Output shaft lock nut		123	1,250	90
Shift fork and shift head set bolt		24	240	17
Rear bearing retainer x Transmission case		42	430	31
Straight screw plug		25	250	18
Straight screw plug (Reverse restrict pin)		13	130	9
Reverse idler gear shaft lock bolt		29	300	22

Transmission case x Transaxle case	29	300	22
Transmission oil pipe x Transaxle case	17	175	13
Reverse shift arm bracket assembly x Transaxle case	17	175	13
Transmission oil pump assembly x Transaxle case	17	175	13
Transaxle case receiver x Transaxle case	7.4	75	65 in.·lbf
Clutch release fork support	47	480	35
Control lever housing support bracket x Transaxle case	17	175	13
Vehicle speed sensor	17	175	13
Clutch release line bracket x Transaxle case	17	175	13
Back–up light switch	40	410	30
Filler and drain plugs	49	500	36
No.1 and No.2 oil receiver pipes x Transmission case	17	175	13
Transmission oil cooler sub–assembly x Elbow	34	350	25
Elbow x Transaxle case	27	275	20
Transmission oil pump case x Oil pump cover	10	105	8
Differential left case x Differential right case	63	640	46
Ring gear set bolt	124	1,260	91
Shift lever assembly x Body	12	120	9
Retainer x Body	4.9	50	43 in.·lbf
Grommet retainer x Body	4.9	50	43 in.·lbf

SUSPENSION AND AXLE

SS0IY–02

SERVICE DATA

Front drive shaft	Drive shaft standard length (1CD–FTV engine)	RH	852.15 ± 2.0 mm (33.55 ± 0.079 in.)
		LH	548.15 ± 2.0 mm (21.58 ± 0.079 in.)

SS0IZ–02

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Drive shaft center bearing bracket set bolt	64	650	47
Lower suspension arm x Lower ball joint	127	1,300	94
Tie rod and x steering knuckle	49	500	36
Axle hub x Drive shaft	216	2,200	159
ABS speed sensor set bolt	8.0	82	71 in.·lbf
Hub nut	103	1,050	76

BRAKE

SERVICE DATA

SS14B–01

Vacuum Pump (1CD–FTV)	Blade	Minimum height	16.20 mm (0.6378 in.)
		Minimum width	5.95 mm (0.2343 in.)
		Minimum length	44.96 mm (1.7701 in.)

SS0FT–04

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Brake pedal x Brake pedal bracket	36.8	375	27
End cover x Casing	7.8	80	68 in.·lbf
Check valve x End cover	74	750	54
Union x Check valve	14	140	10
Vacuum pump x Engine	21	214	15

STEERING

SERVICE DATA

SS0IF–02

DRIVE BELT		
4A–FE and 7A–FE engines:		
Drive belt deflection	New belt	5 – 6 mm (0.20 – 0.24 in.)
Drive belt deflection	Used belt	6 – 8 mm (0.24 – 0.31 in.)
*Drive belt tension	New belt	441 – 539 N (45 –55 kgf)
*Drive belt tension	Used belt	245 – 392 N (25 – 40 kgf)
3S–FE engine:		
Drive belt deflection	New belt	8 – 10 mm (0.31 – 0.39 in.)
Drive belt deflection	Used belt	10 – 13 mm (0.39 – 0.51 in.)
* Drive belt tension	New belt	441 – 539 N (45 – 55 kgf)
* Drive belt tension	Used belt	245 – 392 N (25 – 40 kgf)
2C–T, 2C–TE and 1CD–FTV engines:		
Drive belt deflection	New belt	11 – 14 mm (0.43 – 0.55 in.)
Drive belt deflection	Used belt	15 – 18 mm (0.59 – 0.71 in.)
* Drive belt tension	New belt	539 – 637 N (55 – 65 kgf)
* Drive belt tension	Used belt	245 – 392 N (25 – 40 kgf)
POWER STEERING FLUID		
Oil level rise	Maximum	5 mm (0.20 in.)
4A–FE and 7A–FE engines:		
Oil pressure at idle speed with valve closed	Minimum	8,238 kPa (84 kgf/cm^2, 1,195 psi)
3S–FE engine:		
Oil pressure at idle speed with valve closed	Minimum	9,022 kPa (92 kgf/cm^2, 1,309 psi)
2C–T, 2C–TE and 1CD–FTV engines:		
Oil pressure at idle speed with valve closed	Minimum	8,826 kPa (90 kgf/cm^2, 1,280 psi)
PS VANE PUMP (2C–T, 2C–TE and 1CD–FTV engines)		
Pump rotating torque	Maximum	0.3 N·m (2.8 kgf·cm, 2.4 in.·lbf)
Pump shaft and front housing bushing oil clearance	STD	0.01 – 0.03 mm (0.0004 – 0.0012 in.)
	Maximum	0.07 mm (0.0028 in.)
Vane plate height	Minimum	8.1 mm (0.319 in.)
Vane plate thickness	Minimum	1.797 mm (0.0708 in.)
Vane plate length	Minimum	14.988 mm (0.5901 in.)
Vane plate and pump rotor groove clearance	Maximum	0.03 mm (0.0012 in.)
Vane plate length	Pump rotor and cam ring mark	
	None	14.996 – 14.998 mm (0.59039 – 0.59047 in.)
	1	14.994 – 14.996 mm (0.59032 – 0.59039 in.)
	2	14.992 – 14.994 mm (0.59024 – 0.59032 in.)
	3	14.990 – 14.992 mm (0.59016 – 0.59024 in.)
	4	14.988 – 14.990 mm (0.59008 – 0.59016 in.)
Flow control valve spring length	Minimum	36.0 mm (1.417 in.)

*: For use with belt tension gauge

SS0IG–02

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
PS VANE PUMP (2C–T, 2C–TE and 1CD–FTV engines)			
Pressure port union x Front housing	69	700	51
Suction port union set bolt	13	130	9
Pulley cover x PS vane pump assembly	39	400	29
PS vane pump assembly set bolt	39	400	29
Union bolt x Pressure feed tube	52	525	38
PS vane pump pulley set nut	43	440	32
Idler pulley set nut	38	390	28

SUPPLEMENTAL RESTRAINT SYSTEM

SS061–28

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Steering wheel x Steering main shaft		78	790	58
Front passenger airbag assembly x Instrument panel reinforcement		21	210	15
Seatback frame set bolt		25	255	18
Front seat installation bolt		37	375	27
Front seat belt lap outer ancher set bolt		42	430	31
Curtain shield airbag (infrater) x Instrument panel reinforcement		9.8	100	87 in.·lbf
Curtain Shield Airbag (deployment section) x Body		5	51	44 in.·lbf
Side and curtain shield airbag sensor assembly x Body		21	210	15
Front seat outer belt retractor	Upper bolt	5.0	51	44 in.·lbf
	Lower bolt	42	430	31
Instrument panel x Reinfocement		18	184	13
Seatback x Body		21	214	15

BODY ELECTRICAL

SERVICE DATA

SS0JK–03

SPEEDOMETER (ON–VEHICLE)	
EUROPE MODELS :	
Standard indication (mph)	Allowable range (mph)
20	20 – 24.5
40	40 – 46.5
60	60 – 68.5
80	80 – 90.5
100	100 – 112.5
Standard indication (km/h)	Allowable range (km/h)
20	20 – 26
40	40 – 48
60	60 – 70
80	80 – 92
100	100 – 114
120	120 – 136
140	140 – 158
160	160 – 180
GENERAL COUNTRIES :	
Standard indication (mph)	Allowable range (mph)
20	21 – 23.5
40	41.5 – 44
60	625 – 66
80	83 – 87
100	104 – 108.5
Standard indication (km/h)	Allowable range (km/h)
20	21 – 25
40	41.5 – 46
60	62.5 – 67
80	83 – 88
100	104 – 109
120	125 – 130.5
140	145.5 – 151.5
160	166 – 173
TACHOMETER (ON–VEHICLE) / DC13.5V 25˚C at (77˚F)	
Standard indication	Allowable range
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

FUEL SENDER GAUGE	
Float position mm (in.)	Resistance (Ω)
F : Approx.19.76 (0.78) ±3 (0.12)	Approx.4.0 ±1.0
E : Approx. 92.7 (3.65) ±3 (0.12)	Approx.107.0 ±1.0

BODY

TORQUE SPECIFICATION

SS0K4–02

Part tightened	N·m	kgf·cm	ft·lbf
FRONT WIPER AND WASHER	–	–	–
Wiper arm x Wiper link	20	205	15
INSTRUMENT PANEL	–	–	–
Curtain shield air bag x Body	5	51	44
Steering wheel set nut	34	350	25
Passenger airbag assembly x Reinforcement	18	185	13
FRONT SEAT	–	–	–
Front seat assembly x Body	37	375	27
REAR SEAT (Sedan)	–	–	–
Seatback assembly x Body	21	214	15
Side seatback x Body	21	214	15
REAR SEAT (Except Sedan)	–	–	–
Side seatback x Body	21	214	15
Seat cushion assembly x Body	21	214	15
SEAT BELT	–	–	–
Front Seat Belt :			
Shoulder anchor adjuster x Body	42	430	31
Shoulder anchor x Body	42	430	31

AIR CONDITIONING

SS038–05

SERVICE DATA

Refrigerant volume		450 ± 50 g (15.87 ± 1.76 oz.)
Drive belt deflection (apply load of 9.8N)		–
1CD–FTV	New belt	11.0 – 13.0 mm (0.43 – 0.51 in.)
	Used belt	15.0 –18.0 mm (0.59 – 0.71 in.)
Drive belt tension		–
1CD–FTV	New belt	520 – 755 N (53 – 77 kgf)
	Used belt	196 – 392 N (20 – 40 kgf)

SS050–04

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Compressor bracket	25	250	18
Idle pulley lock nut	39	400	29
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Pressure plate x Compressor	13.2	135	9

DIAGNOSTICS

SUPPLEMENTAL RESTRAINT SYSTEM ... DI–1
- PRE–CHECK DI–1
- DIAGNOSTIC TROUBLE CODE CHART DI–4
- PARTS LOCATION DI–5
- TERMINALS OF ECU DI–6
- CIRCUIT INSPECTION DI–8

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.

SUPPLEMENTAL RESTRAINT SYSTEM

DI693–01

PRE–CHECK

RELEASE METHOD OF AIRBAG ACTIVATION PREVENTION MECHANISM

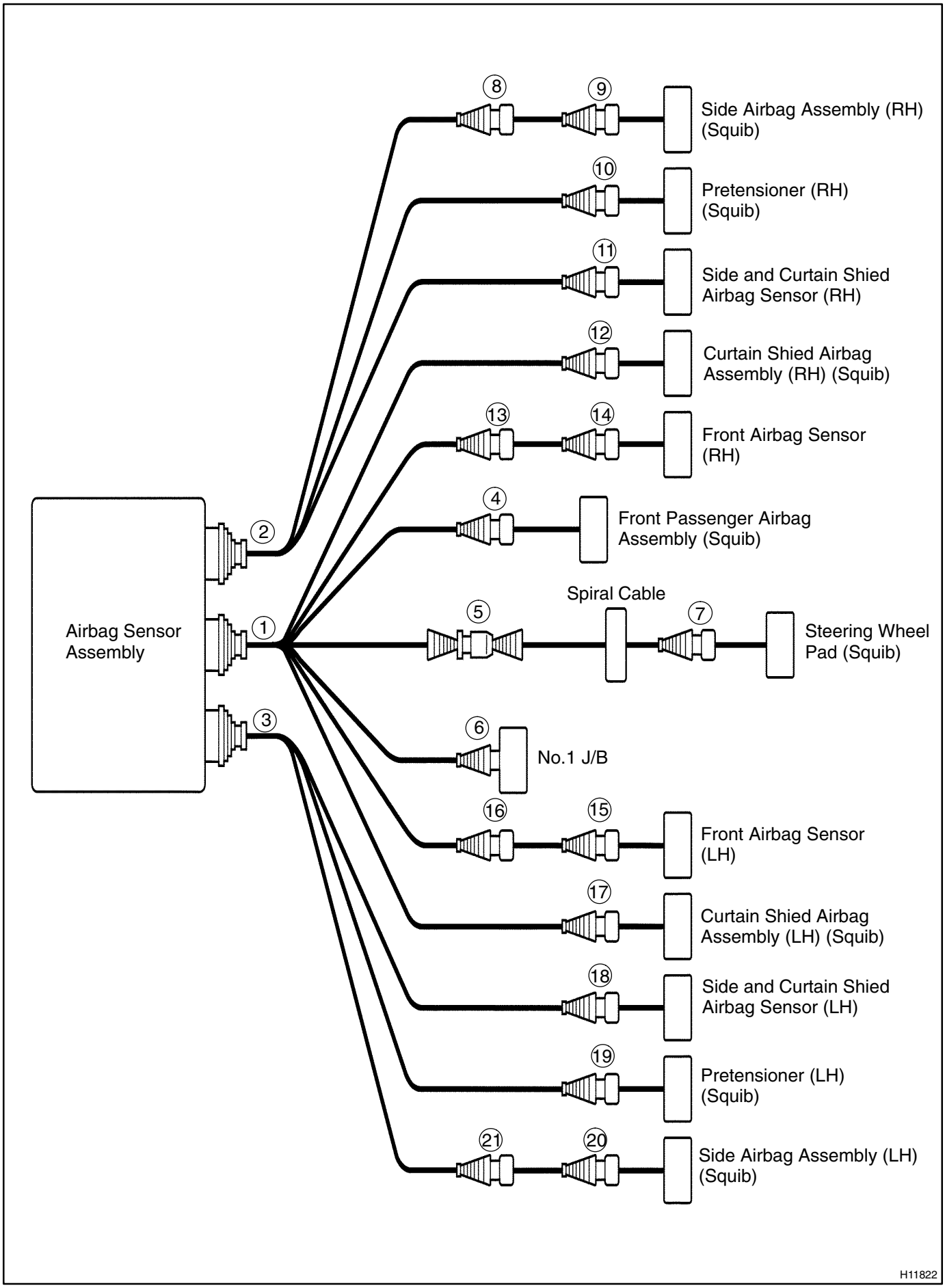
An airbag activation prevention mechanism is built into the connector for the squib circuit of the SRS. When release of the airbag activation prevention mechanism is directed in the troubleshooting procedure, as shown in the illustration on the following pages, insert paper which has the same thickness as the male terminal, between the terminal and short spring.

CAUTION:

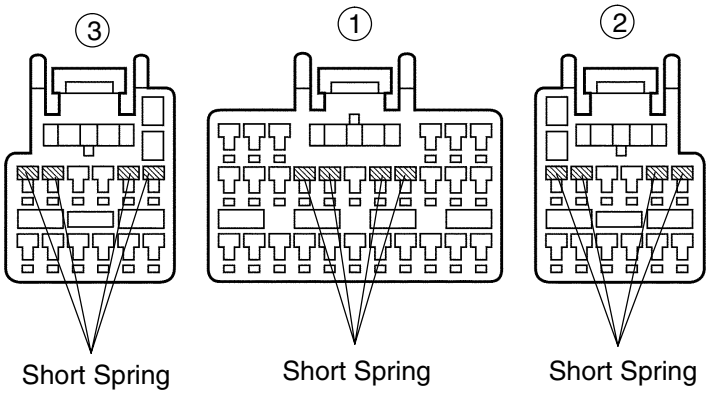
Never release the airbag activation prevention mechanism on the steering wheel pad connector.

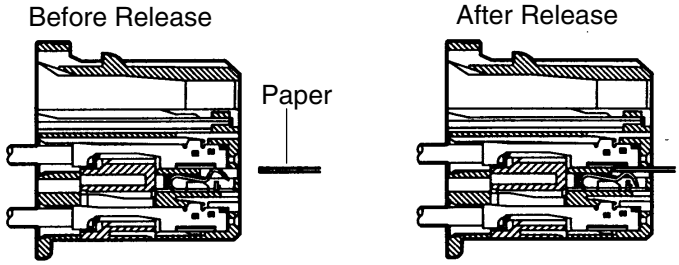
NOTICE:

- **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.**

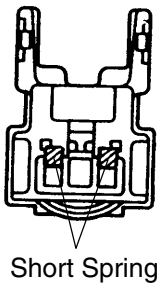

Airbag Sensor Assembly
1
2
3
8
9
Side Airbag Assembly (RH) (Squib)
10
Pretensioner (RH) (Squib)
11
Side and Curtain Shied Airbag Sensor (RH)
12
Curtain Shied Airbag Assembly (RH) (Squib)
13
14
Front Airbag Sensor (RH)
4
Front Passenger Airbag Assembly (Squib)
Spiral Cable
5
7
Steering Wheel Pad (Squib)
6
No.1 J/B
16
15
Front Airbag Sensor (LH)
17
Curtain Shied Airbag Assembly (LH) (Squib)
18
Side and Curtain Shied Airbag Sensor (LH)
19
Pretensioner (LH) (Squib)
21
20
Side Airbag Assembly (LH) (Squib)
H11822

Airbag Sensor Assembly Connector

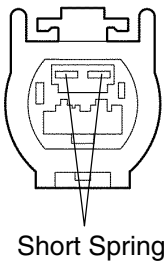




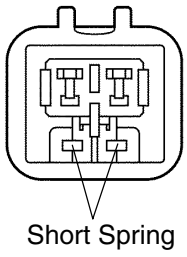
Connector ⑤

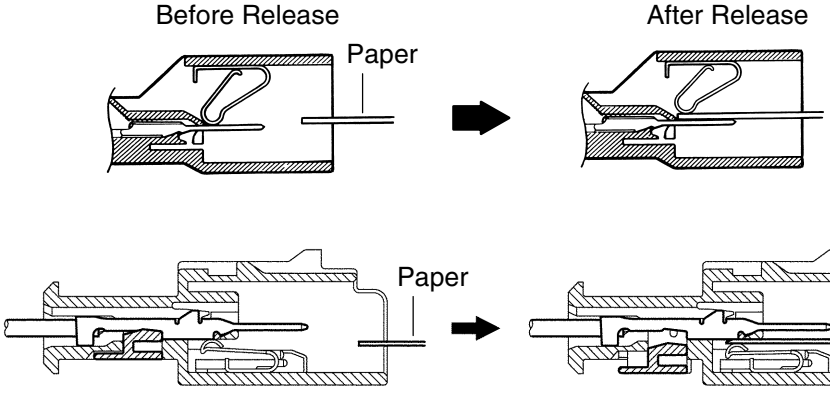


Connector ⑧ ㉑



Connector ⑩ ⑲





H01356
H01233
AB0130 H00992
AB0045 AB0046
H02249 H02248

H01358

DI694–01

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 (Proceed to the page given for that circuit.).

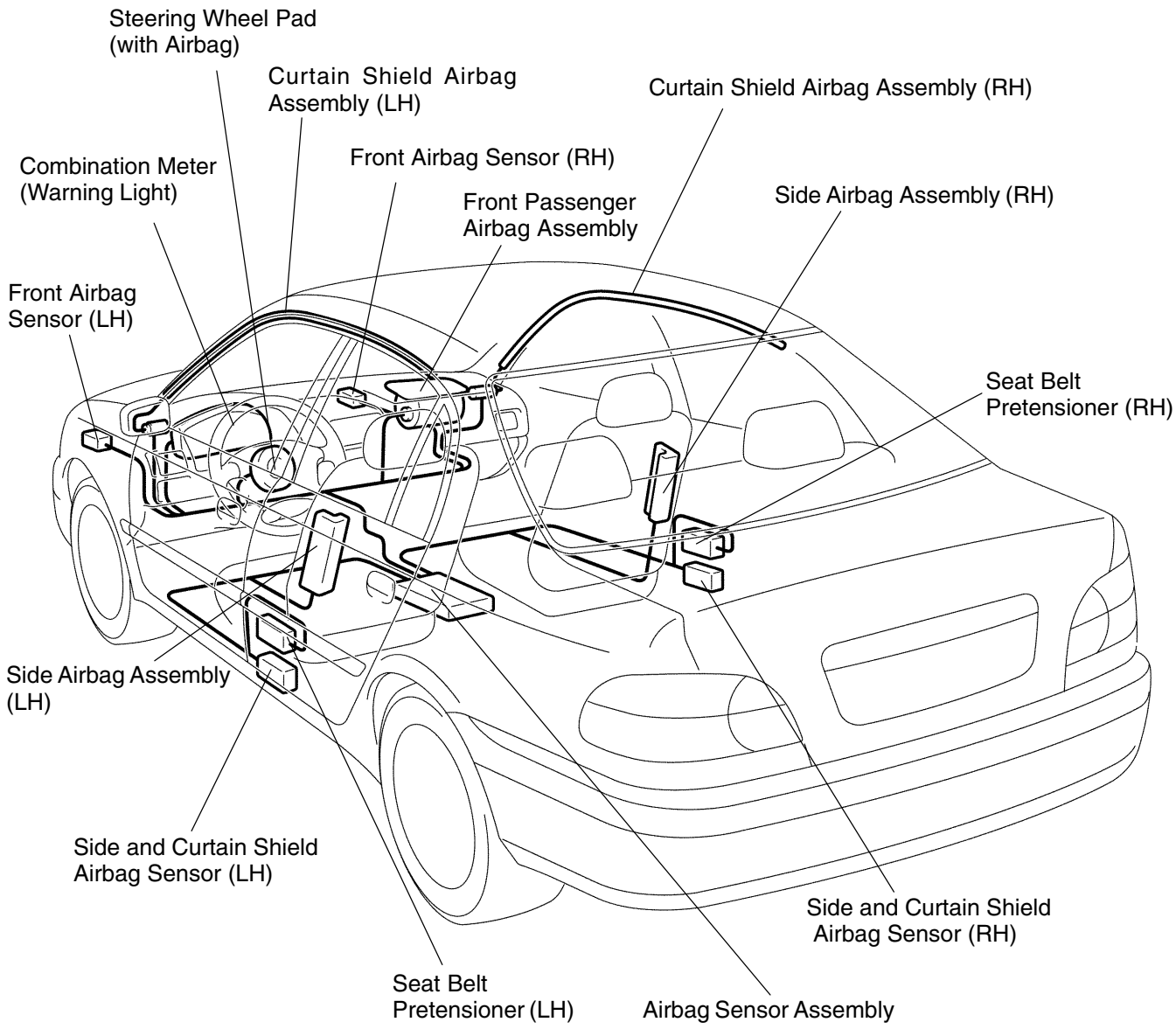
DTC No. (See Page)	Detection Item	Trouble Area	SRS Warning Light
81 (DI–8)	Short in curtain shield airbag (RH) circuit (to ground)	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
82 (DI–12)	Short in curtain shield airbag (RH) circuit circuit (to B+)	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
83 (DI–15)	Short in curtain shield airbag (RH) squib circuit	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
84 (DI–18)	Open in curtain shield airbag (RH) squib circuit	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
85 (DI–21)	Short in curtain shield airbag (LH) circuit (to ground)	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink
86 (DI–25)	Short in curtain shield airbag (LH) circuit circuit (to B+)	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink
87 (DI–28)	Short in curtain shield airbag (LH) squib circuit	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink
88 (DI–31)	Open in curtain shield airbag (LH) squib circuit	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink

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 assembly 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 assembly is faulty.

DI695–01

PARTS LOCATION

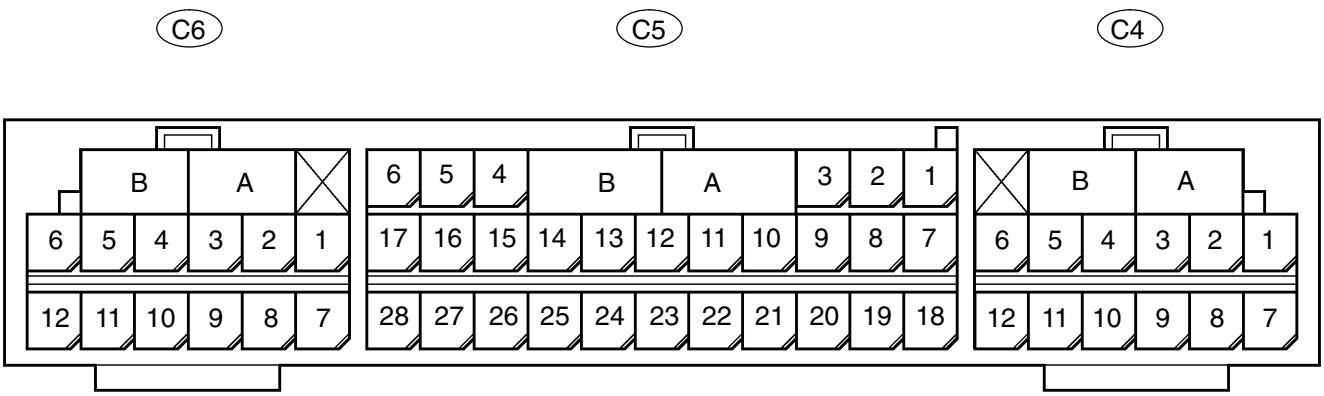


P

H11591

DI696–01

TERMINALS OF ECU



H01357

No.	Symbol	Terminal Name
A	–	Electrical Connector Check Mechanism
B	–	Electrical Connector Check Mechanism
C4 – 1	SFL–	Squib (Side, LH)
C4 – 2	SFL+	Squib (Side, LH)
C4 – 5	PL+	Squib (Seat Belt Pretensioner, LH)
C4 – 6	PL–	Squib (Seat Belt Pretensioner, LH)
C4 – 7	ESL	Side Airbag Sensor (LH)
C4 – 9	FSL	Side Airbag Sensor (LH)
C4 – 10	SSL+	Side Airbag Sensor (LH)
C4 – 12	VUPL	Side Airbag Sensor (LH)
C5 – 3	LA	SRS Warning Light
C5 – 5	IG2	Power Source (IGN Fuse)
C5 – 6	ACC	Power Source (CIG Fuse)
C5 – 7	ICL+	Squib (Curtain Shield Airbag, LH)
C5 – 8	ICL–	Squib (Curtain Shield Airbag, LH)
C5 – 9	SR+	Front Airbag Sensor (RH)
C5 – 10	P+	Squib (Passenger)
C5 – 11	P–	Squib (Passenger)
C5 – 12	SIL	Diagnosis
C5 – 13	D–	Squib (Driver)
C5 – 14	D+	Squib (Driver)
C5 – 15	SL+	Front Airbag Sensor (LH)
C5 – 16	ICR–	Squib (Curtain Shield Airbag, RH)
C5 – 17	ICR+	Squib (Curtain Shield Airbag, RH)
C5 – 19	Tc	Diagnosis

No.	Symbol	Terminal Name
C5 – 20	SR–	Front Airbag Sensor (RH)
C5 – 26	SL–	Front Airbag Sensor (LH)
C5 – 27	E1	Ground
C5 – 28	E2	Ground
C6 – 1	PR–	Squib (Seat Belt Pretensioner, RH)
C6 – 2	PR+	Squib (Seat Belt Pretensioner, RH)
C6 – 5	SFR+	Squib (Side, RH)
C6 – 6	SFR–	Squib (Side, RH)
C6 – 7	VUPR	Side Airbag Sensor (RH)
C6 – 9	SSR+	Side Airbag Sensor (RH)
C6 – 10	FSR	Side Airbag Sensor (RH)
C6 – 12	ESR	Side Airbag Sensor (RH)

DI697–01

CIRCUIT INSPECTION

DTC	81	Short in Curtain Shield Airbag Squib (RH) Circuit (to Ground)

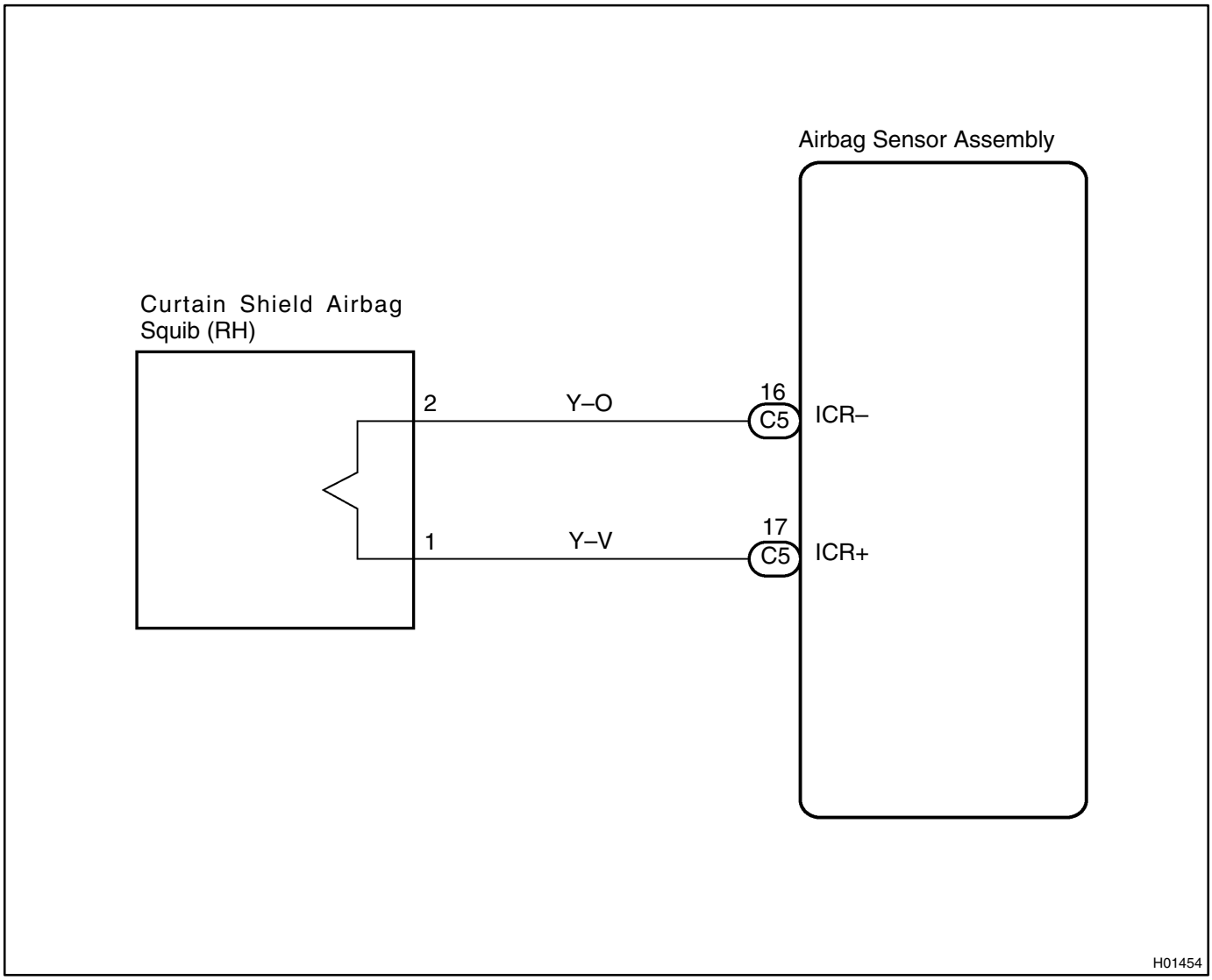
CIRCUIT DESCRIPTION

The curtain shield airbag squib (RH) circuit consists of the airbag sensor assembly and curtain shield airbag (RH).

It causes the curtain shield airbag (RH) to activate when the curtain shield airbag assembly (RH) activation conditions are satisfied.

DTC No.	DTC Detecting Condition	Trouble Area
81	• Short circuit in curtain shield airbag squib (RH) wire harness (to ground) • Curtain shield airbag squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag (RH) • Airbag sensor assembly • Wire harness

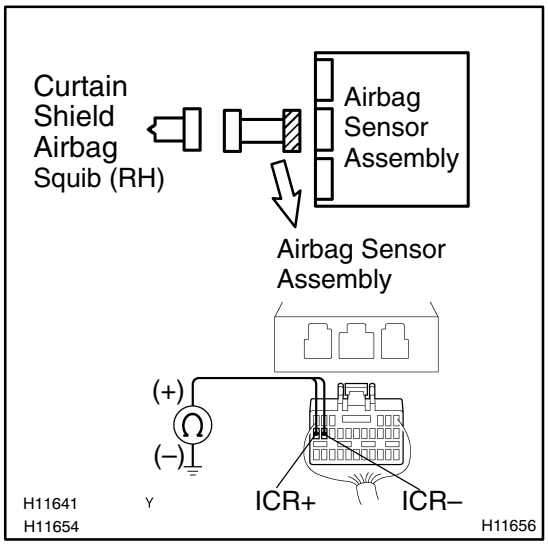
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (RH) circuit.**



CHECK:

For the connector (on the airbag sensor assembly side) between the curtain shield airbag assembly (RH) and airbag sensor assembly, measure the resistance between ICR+, ICR– and body ground.

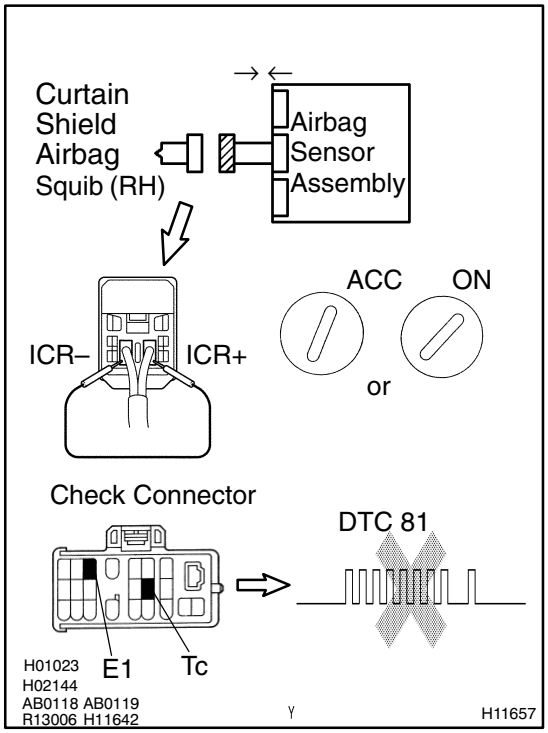
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect ICR+ and ICR– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

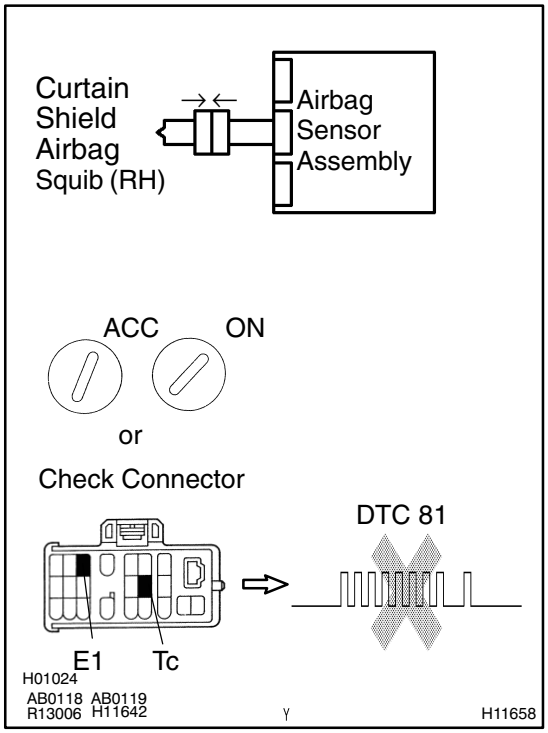
DTC 81 is not output.

HINT:
Codes other than code 81 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 81 is not output.

HINT:
Codes other than code 81 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI698-01

DTC	82	Short in Curtain Shield Airbag Squib (RH) Circuit (to B+)

CIRCUIT DESCRIPTION

The curtain shield airbag squib (RH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (RH).
It causes the curtain shield airbag assembly (RH) to activate when the curtain shield airbag assembly (RH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 82 is recorded when a B+ short is detected in the curtain shield airbag squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
82	• Short circuit in curtain shield airbag assembly (RH) wire harness (to B+) • Curtain shield airbag squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (RH) • Airbag sensor assembly • Wire harness

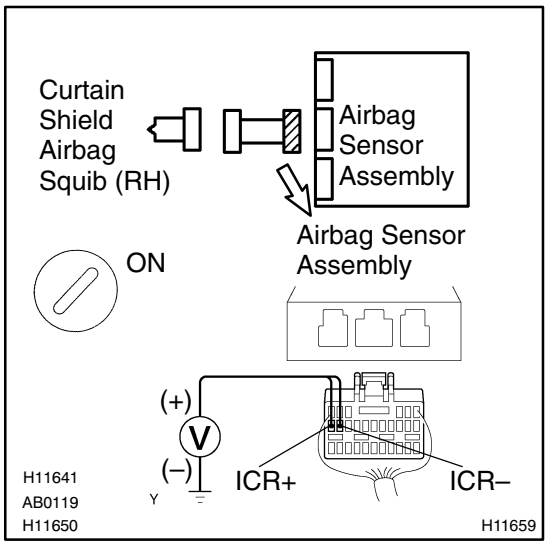
WIRING DIAGRAM

See page DI–8.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (RH) circuit.**



CHECK:

(a) Turn ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly, measure the voltage between ICR+, ICR– and body ground.

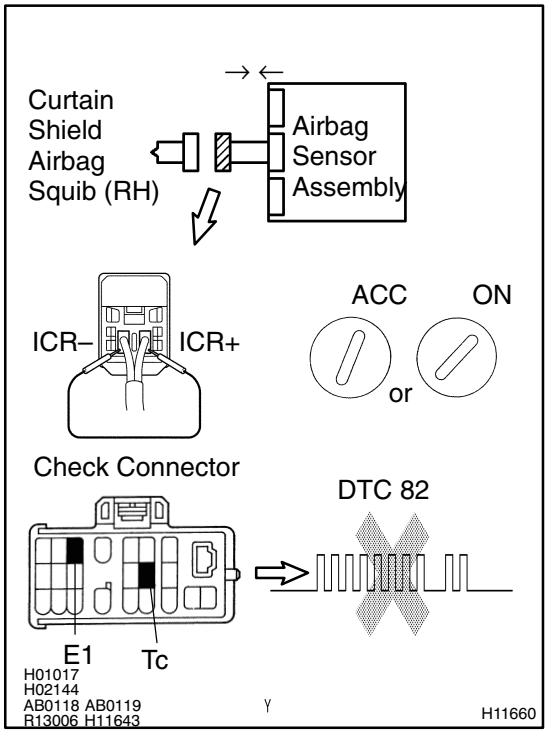
OK:

Voltage: 1 V or less

NG	**Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICR+ and ICR– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 82 is not output.

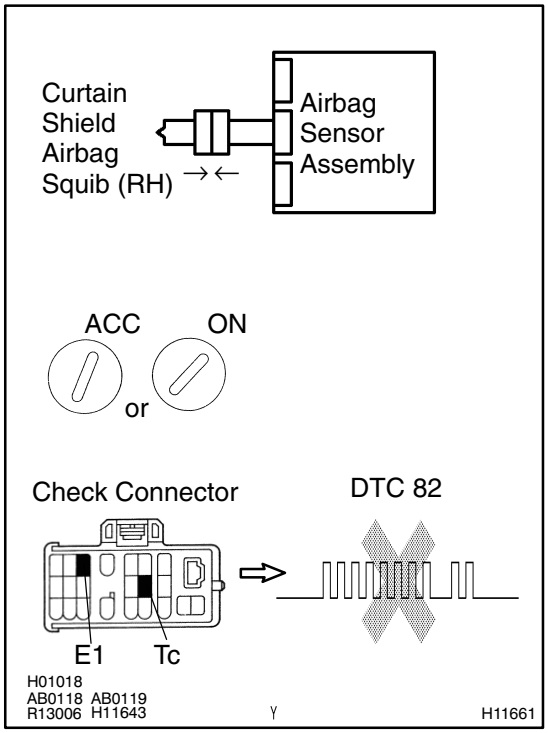
HINT:

Codes other than code 82 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 82 is not output.

HINT:
Codes other than code 82 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI699-01

DTC	83	Short in Curtain Shield Airbag Squib (RH) Circuit

CIRCUIT DESCRIPTION

The curtain shield airbag squib (RH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (RH).
It causes the curtain shield airbag assembly (RH) to activate when the curtain shield airbag assembly (RH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 83 is recorded when a short is detected in the curtain shield airbag squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
83	• Short circuit between ICR+ wire harness and ICR– wire harness of squib • Curtain shield airbag squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (RH) • Airbag sensor assembly • Wire harness

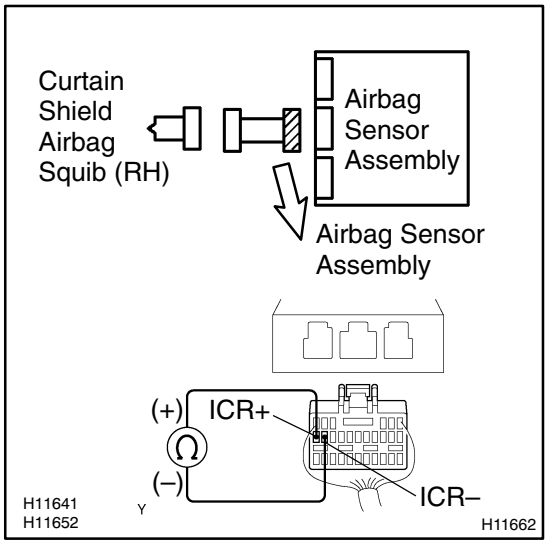
WIRING DIAGRAM

See page DI–8.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (RH) circuit.**



PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and curtain shield airbag assembly (RH). (See page DI–1)

CHECK:
For the connector (on the airbag sensor side) between the curtain shield airbag (RH) and airbag sensor assembly, measure the resistance between ICR+ and ICR–.

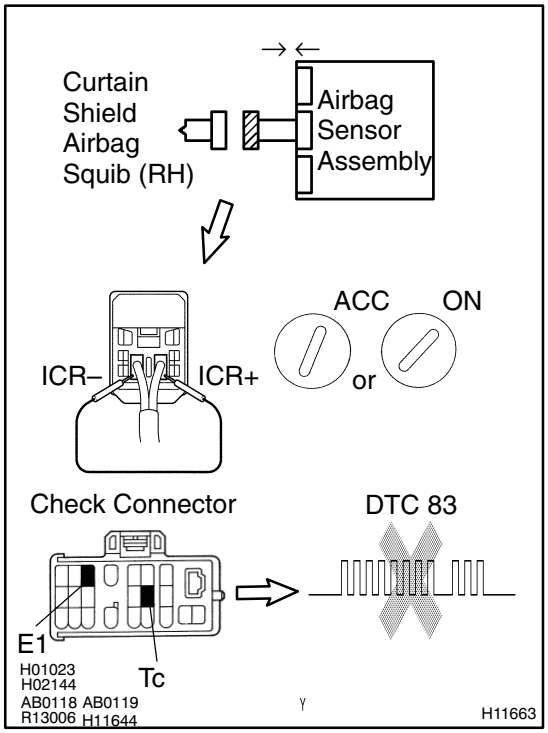
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect ICR+ and ICR– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

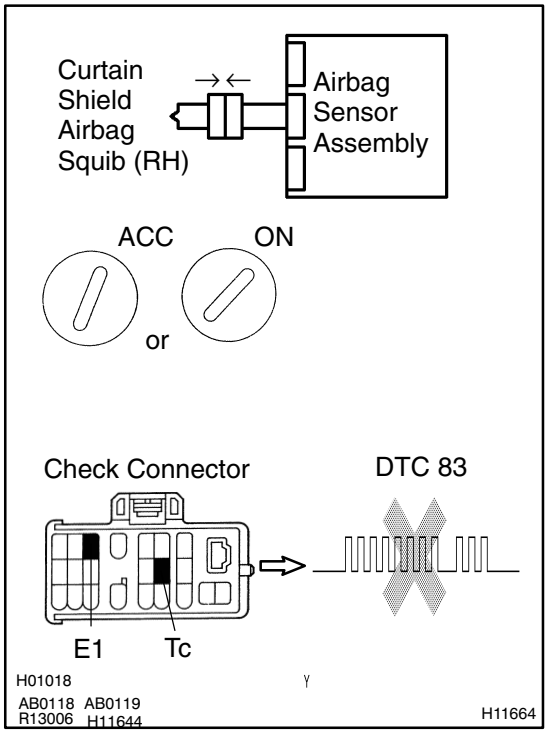
DTC 83 is not output.

HINT:
Codes other than code 83 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOCK, and wait at least for 20 second.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 83 is not output.

HINT:

Codes other than code 83 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DTC	84	Open in Curtain Shield Airbag Squib (RH) Circuit

CIRCUIT DESCRIPTION

The curtain shield airbag squib circuit (RH) consists of the airbag sensor assembly and curtain shield airbag assembly (RH).
It causes the curtain shield airbag assembly (RH) to activate when the curtain shield airbag assembly (RH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 84 is recorded when an open is detected in the curtain shield airbag squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
84	• Open circuit in ICR+ wire harness or ICR– wire harness of squib • Curtain shield airbag squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (RH) • Airbag sensor assembly • Wire harness

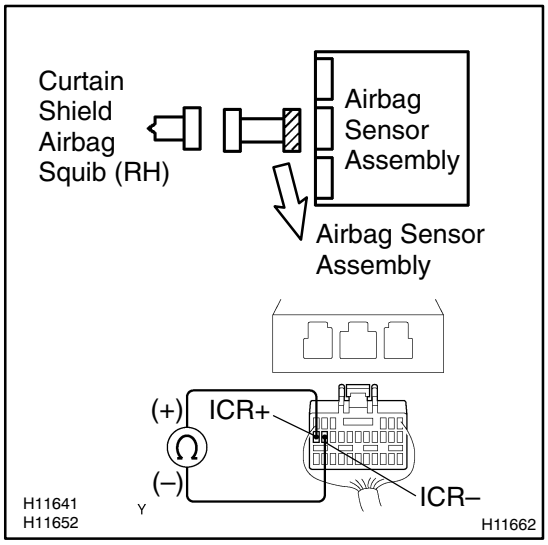
WIRING DIAGRAM

See page DI–8.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (RH) circuit.**

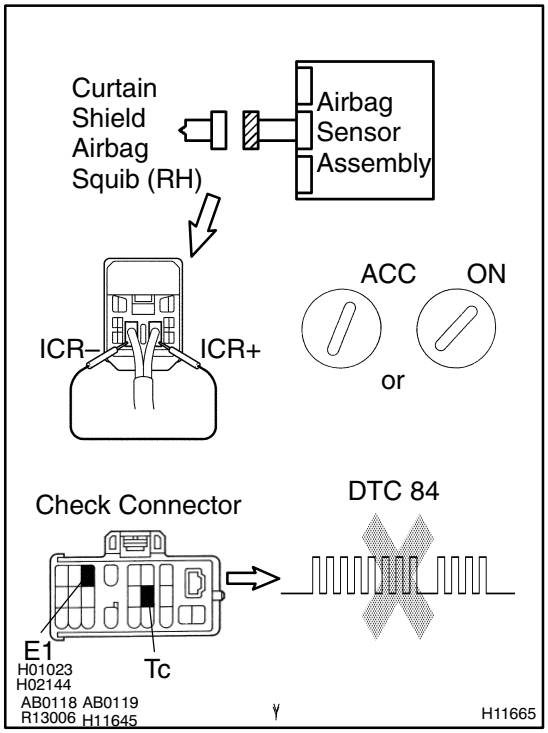


CHECK:
For the connector (on the airbag sensor assembly side) between the curtain shield airbag assembly (RH) and airbag sensor assembly, measure the resistance between ICR+ and ICR–.
OK:
Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICR+ and ICR– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 84 is not output.

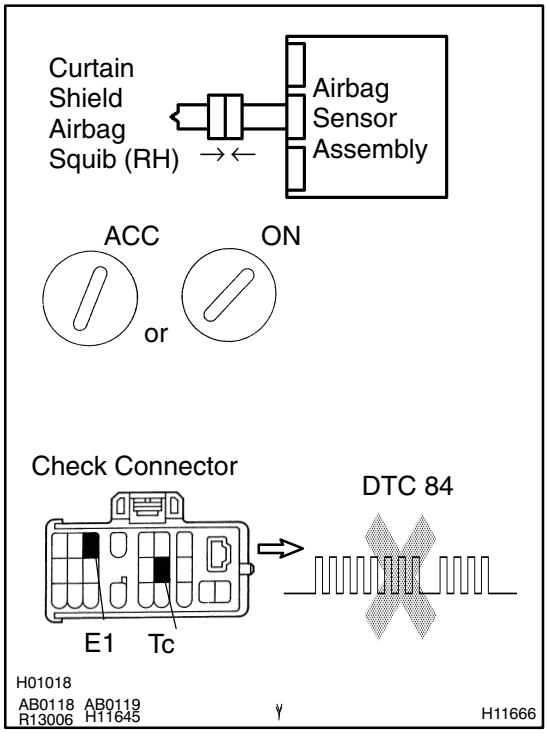
HINT:

Codes other than code 84 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 84 is not output.

HINT:
Codes other than code 84 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI69B–01

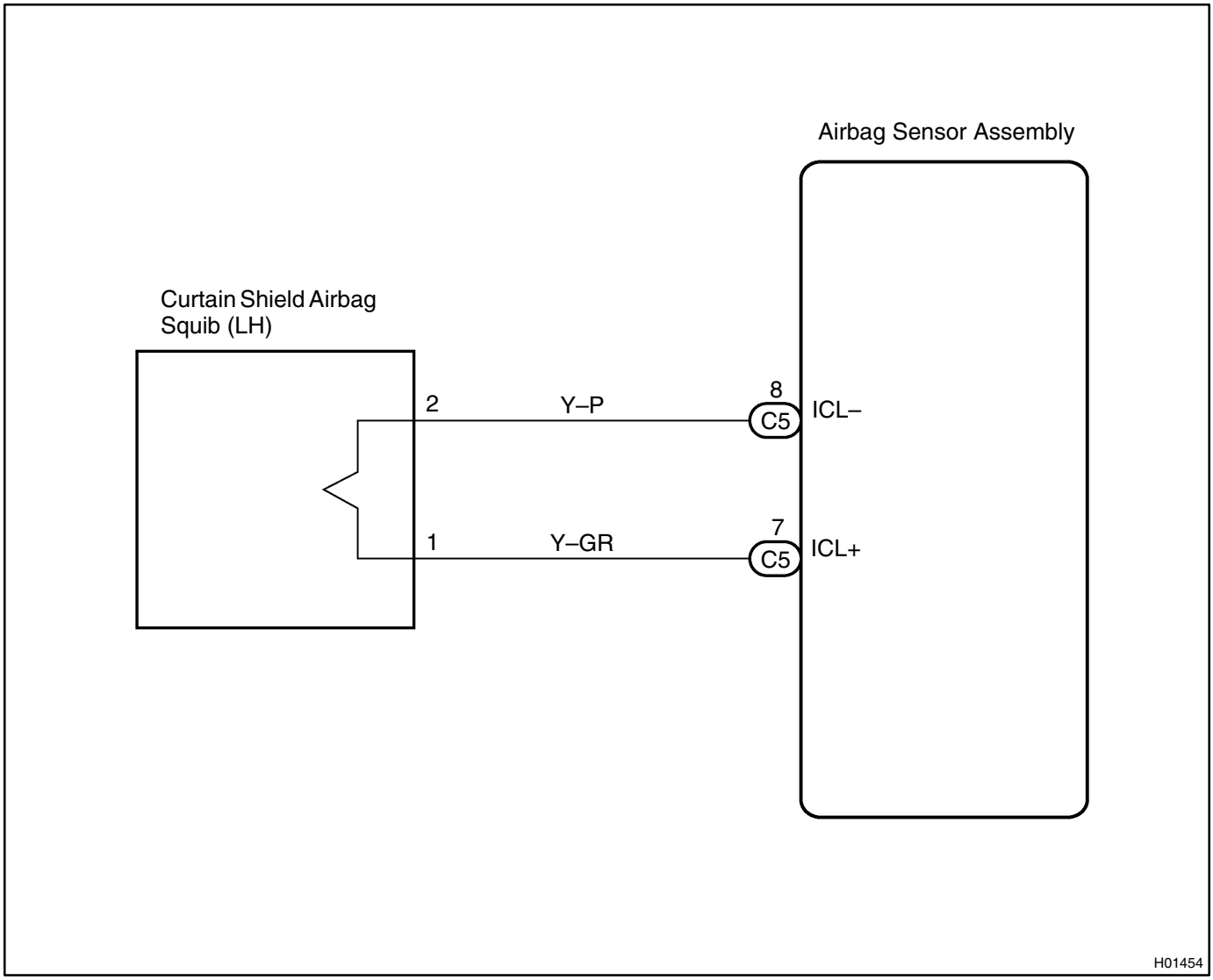
DTC	85	Short in Curtain Shield Airbag Squib (LH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The curtain shield airbag squib (LH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the curtain shield airbag assembly (LH) to activate when the curtain shield airbag assembly (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 85 is recorded when ground short is detected in the curtain shield airbag squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
85	• Short circuit in curtain shield airbag squib (LH) wire harness (to ground) • Curtain shield airbag squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

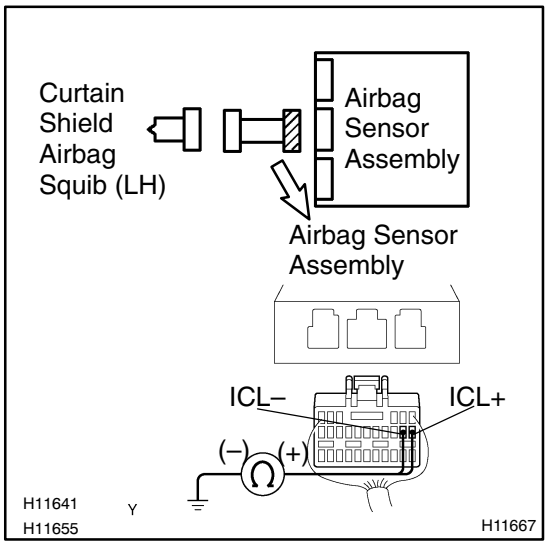
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (LH) circuit.**



CHECK:

For the connector (on the airbag sensor assembly side) between the curtain shield airbag assembly (LH) and airbag sensor assembly, measure the resistance between ICL+, ICL– and body ground.

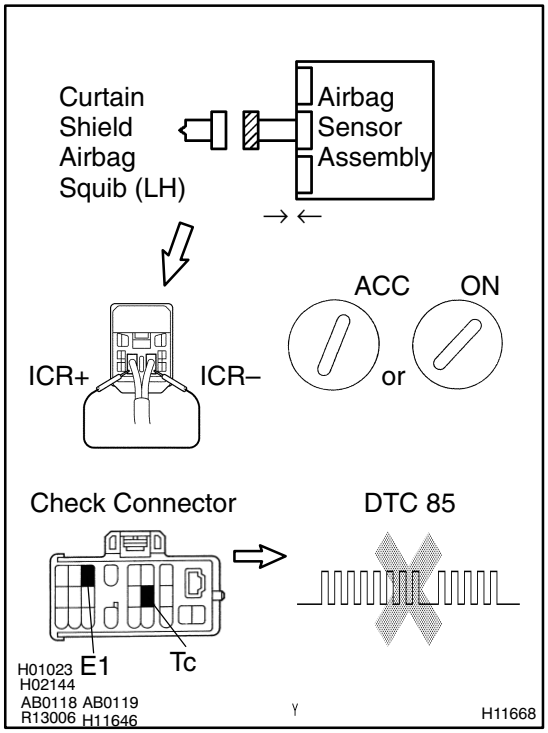
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICR– and ICR+ of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.

(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 85 is not output.

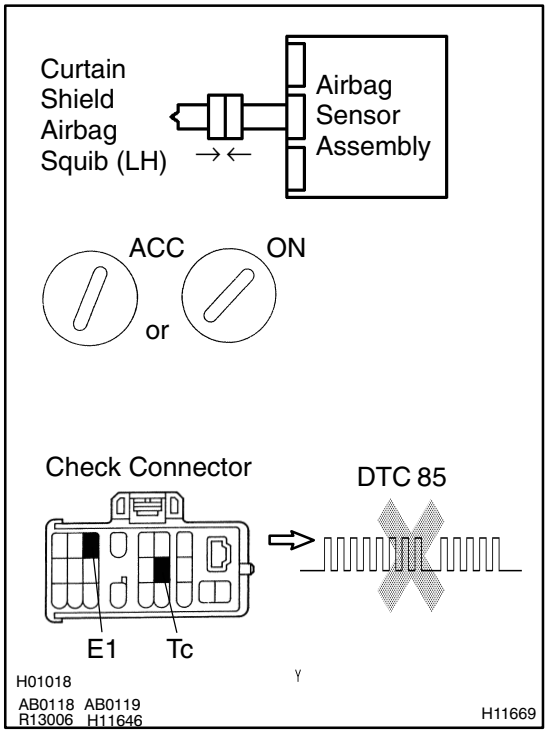
HINT:

Codes other than code 85 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 85 is not output.

HINT:
Codes other than code 85 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI69C–01

DTC	86	Short in Curtain Shield Airbag Squib (LH) Circuit (to B+)

CIRCUIT DESCRIPTION

The curtain shield airbag squib (LH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the curtain shield airbag assembly (LH) to activate when the curtain shield airbag assembly (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 86 is recorded when the B+ short is detected in the curtain shield airbag squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
86	• Short circuit in curtain shield airbag assembly (LH) wire harness (to B+) • Curtain shield airbag squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

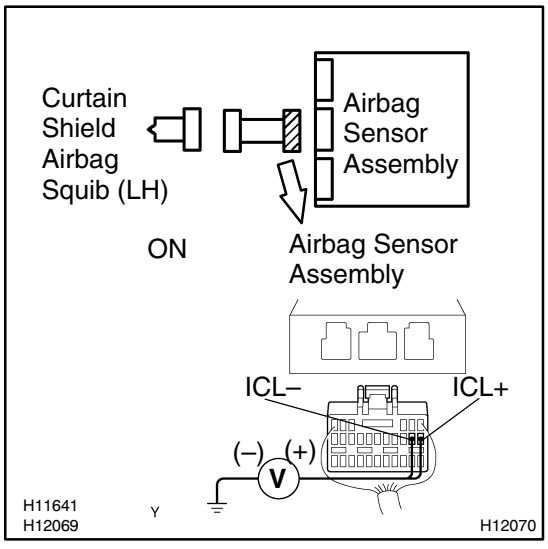
WIRING DIAGRAM

See page DI–21.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (LH) circuit.**



CHECK:

(a) Turn ignition switch to ON.
(b) For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and airbag sensor assembly, measure the voltage between ICL+, ICL– and body ground.

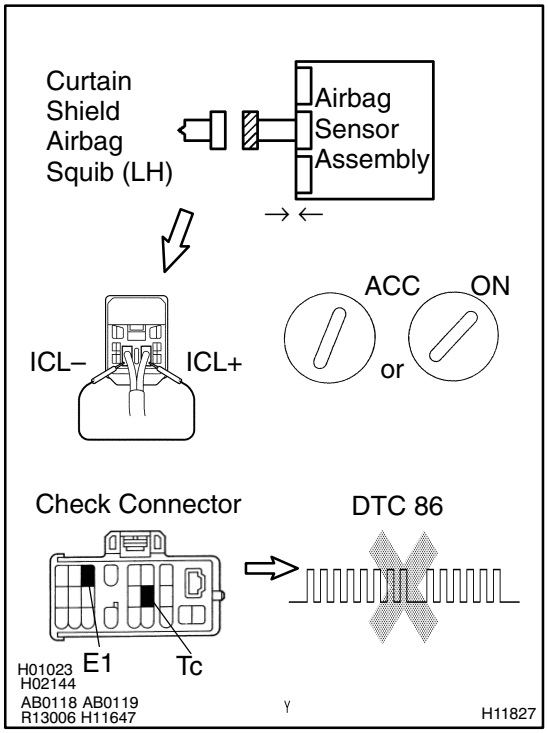
OK:

Voltage: 1 V or less

NG → **Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect ICL+ and ICL– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

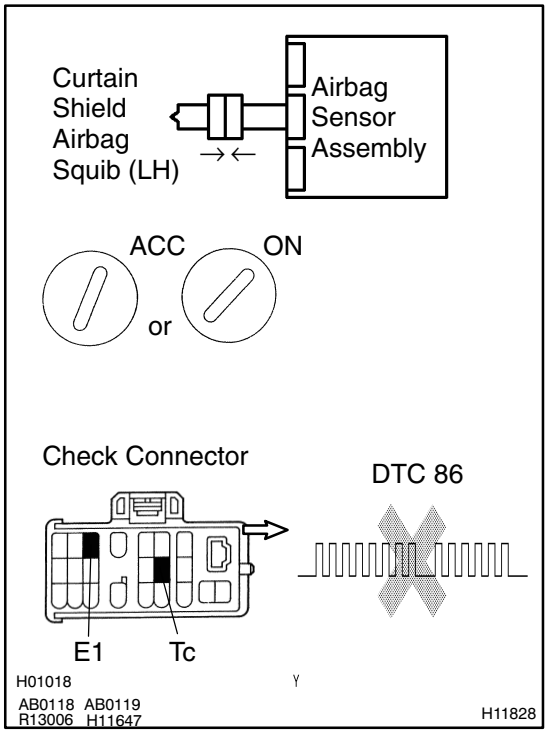
DTC 86 is not output.

HINT:
Codes other than code 86 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 86 is not output.

HINT:
Codes other than code 86 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DTC	87	Short in Curtain Shield Airbag Squib (LH) Circuit

CIRCUIT DESCRIPTION

The curtain shield airbag squib (LH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the curtain shield airbag assembly (LH) to activate when the curtain shield airbag assembly (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 87 is recorded when a short is detected in the curtain shield airbag squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
87	• Short circuit between ICL+ wire harness and ICL– wire harness of squib • Curtain shield airbag squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

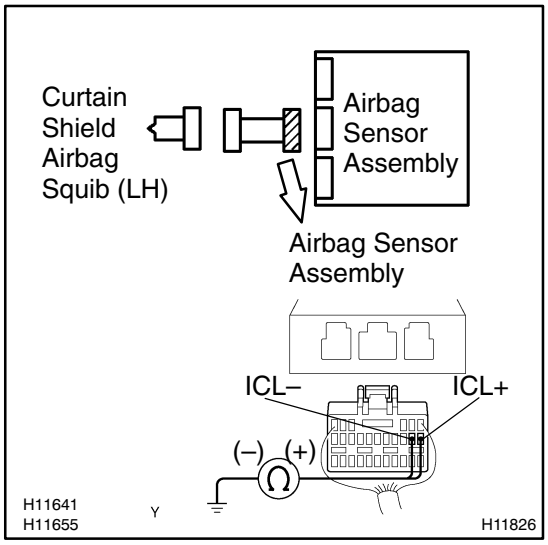
WIRING DIAGRAM

See page DI–21.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (LH) circuit.**

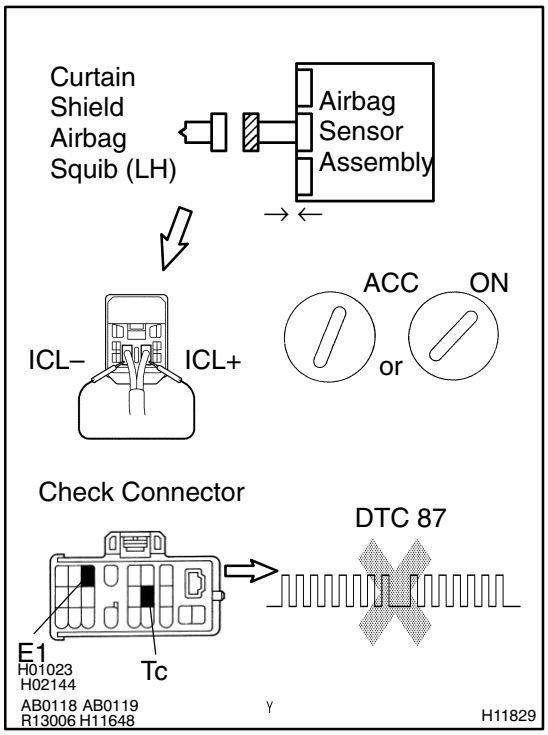


PREPARATION:
Release airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and curtain shield airbag assembly (LH).
(See page DI–1)
CHECK:
For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and airbag sensor assembly, measure the resistance between ICL+ and ICL–.
OK:
Resistance: 1 MΩ or Higher

NG	**Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect ICL+ and ICL– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

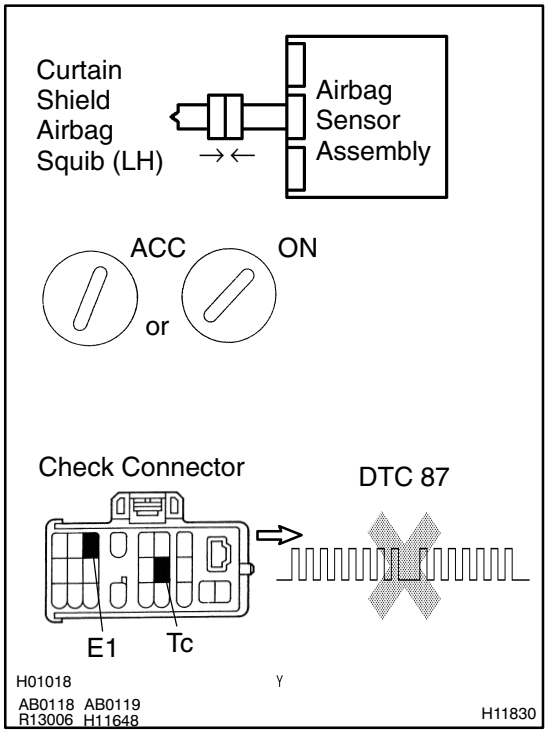
DTC 87 is not output.

HINT:
Codes other than code 87 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to LOCK, and wait at least for 20 second.
(b) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(f) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 87 is not output.

HINT:

Codes other than code 87 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DTC	88	Open in Curtain Shield Airbag Squib (LH) Circuit

CIRCUIT DESCRIPTION

The curtain shield airbag squib circuit (LH) consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the curtain shield airbag assembly (LH) to activate when the curtain shield airbag assembly (LH) activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC 88 is recorded when an open is detected in the curtain shield airbag squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
88	• Open circuit in ICL+ wire harness or ICL– wire harness of squib • Curtain shield airbag squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

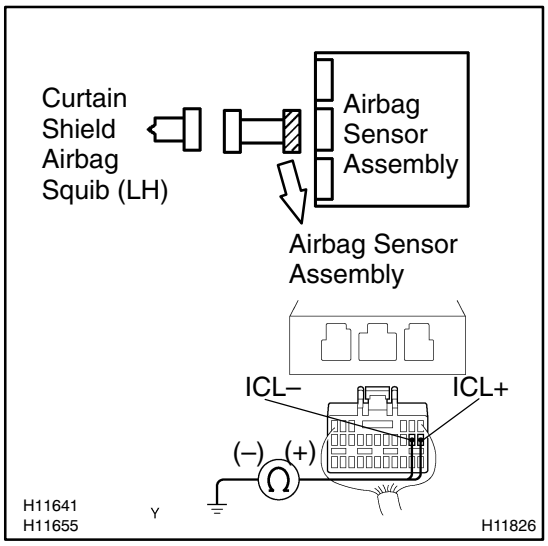
WIRING DIAGRAM

See page DI–21.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–285 of Pub. No. RM599E)**

2	**Check curtain shield airbag squib (LH) circuit.**

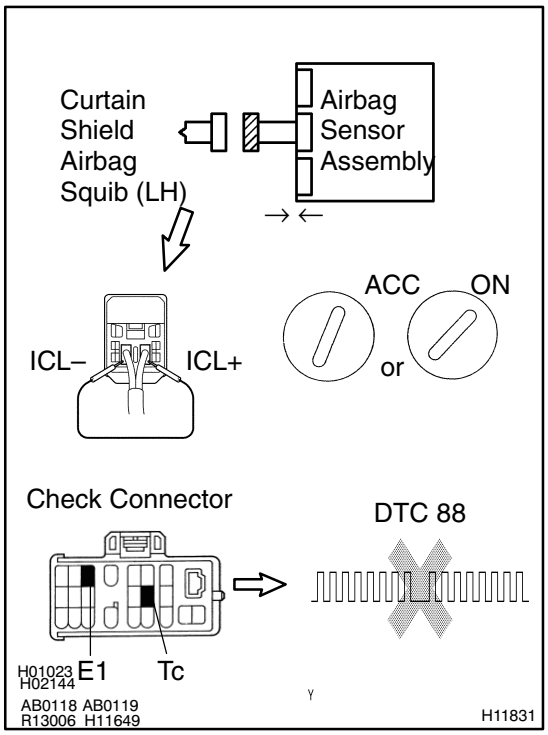


CHECK:
For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and the airbag sensor assembly, measure the resistance between ICL+ and ICL–.
OK:
Resistance: Below 1 Ω

NG	**Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect ICL+ and ICL– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

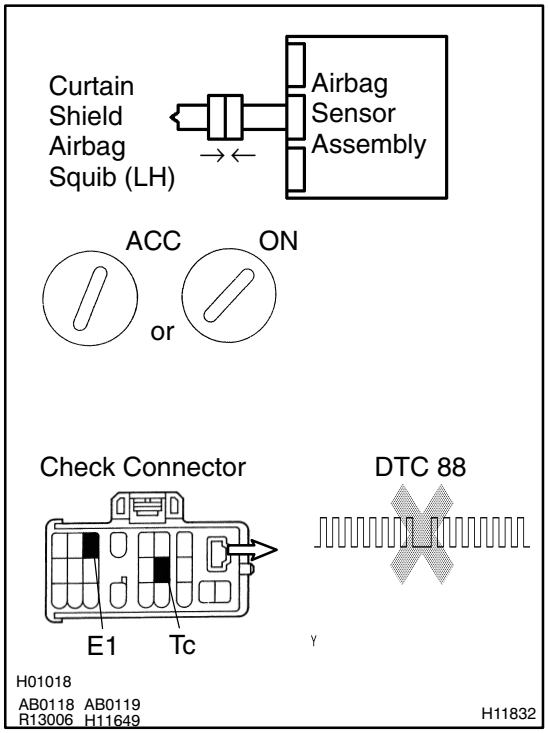
DTC 88 is not output.

HINT:
Codes other than code 88 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

4	Check curtain shield airbag squib (LH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–153 of Pub. No. RM599E)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ACC or ON, and wait at least for 20 seconds.
(e) Check DTC.
(See page DI–152 of Pub. No. RM599E)

OK:

DTC 88 is not output.

HINT:
Codes other than code 88 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

MANUAL TRANSAXLE (E251)

TROUBLESHOOTING MX–1
MANUAL TRANSAXLE UNIT MX–2
MANUAL TRANSAXLE ASSEMBLY MX–9
INPUT SHAFT MX–23
OUTPUT SHAFT MX–30
OIL PUMP MX–38
SHIFT AND SELECT LEVER SHAFT MX–40
DIFFERENTIAL CASE MX–41
SHIFT LEVER AND CONTROL CABLE MX–48

TROUBLESHOOTING

MX01Z–04

PROBLEM SYMPTOMS TABLE

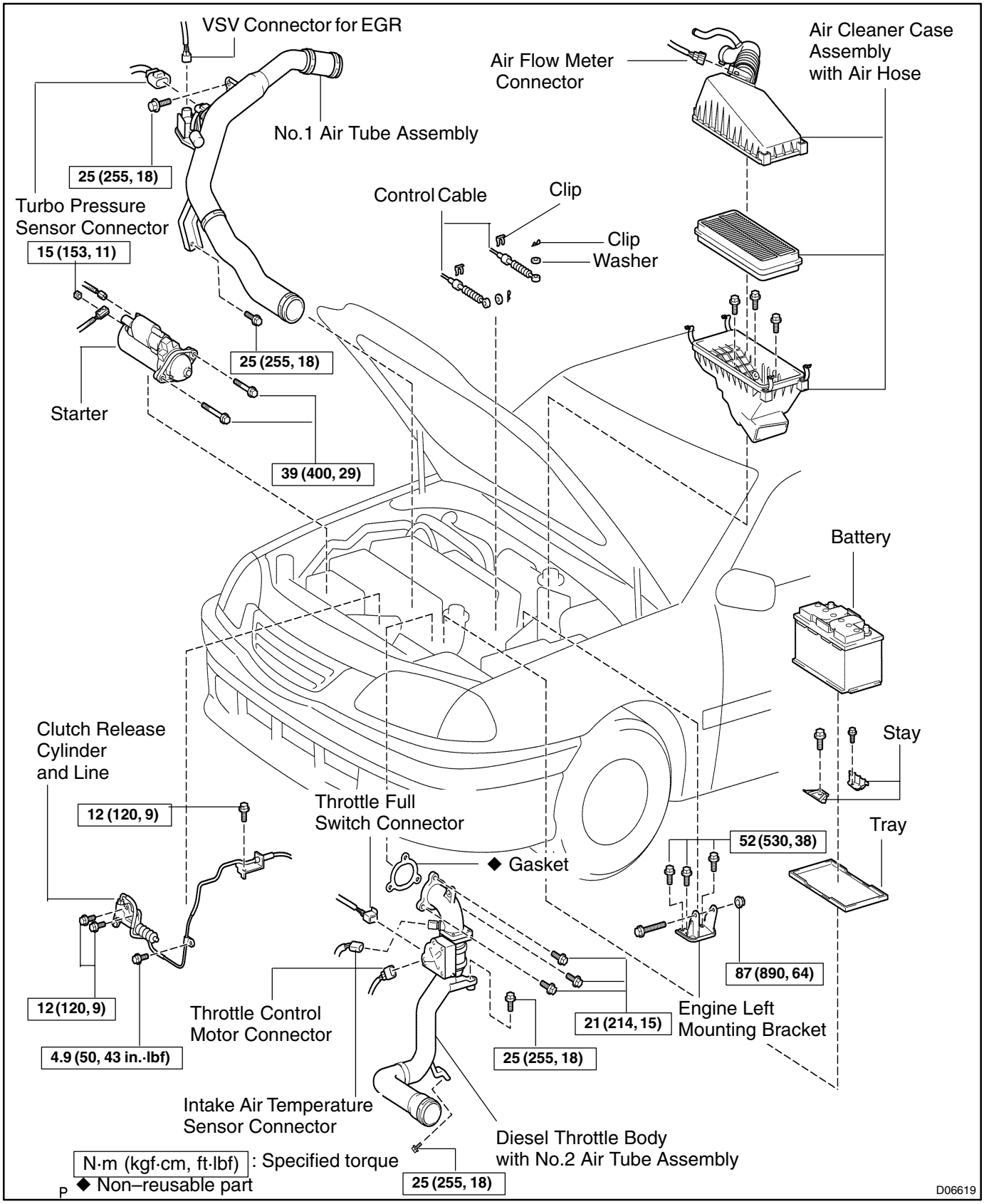
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

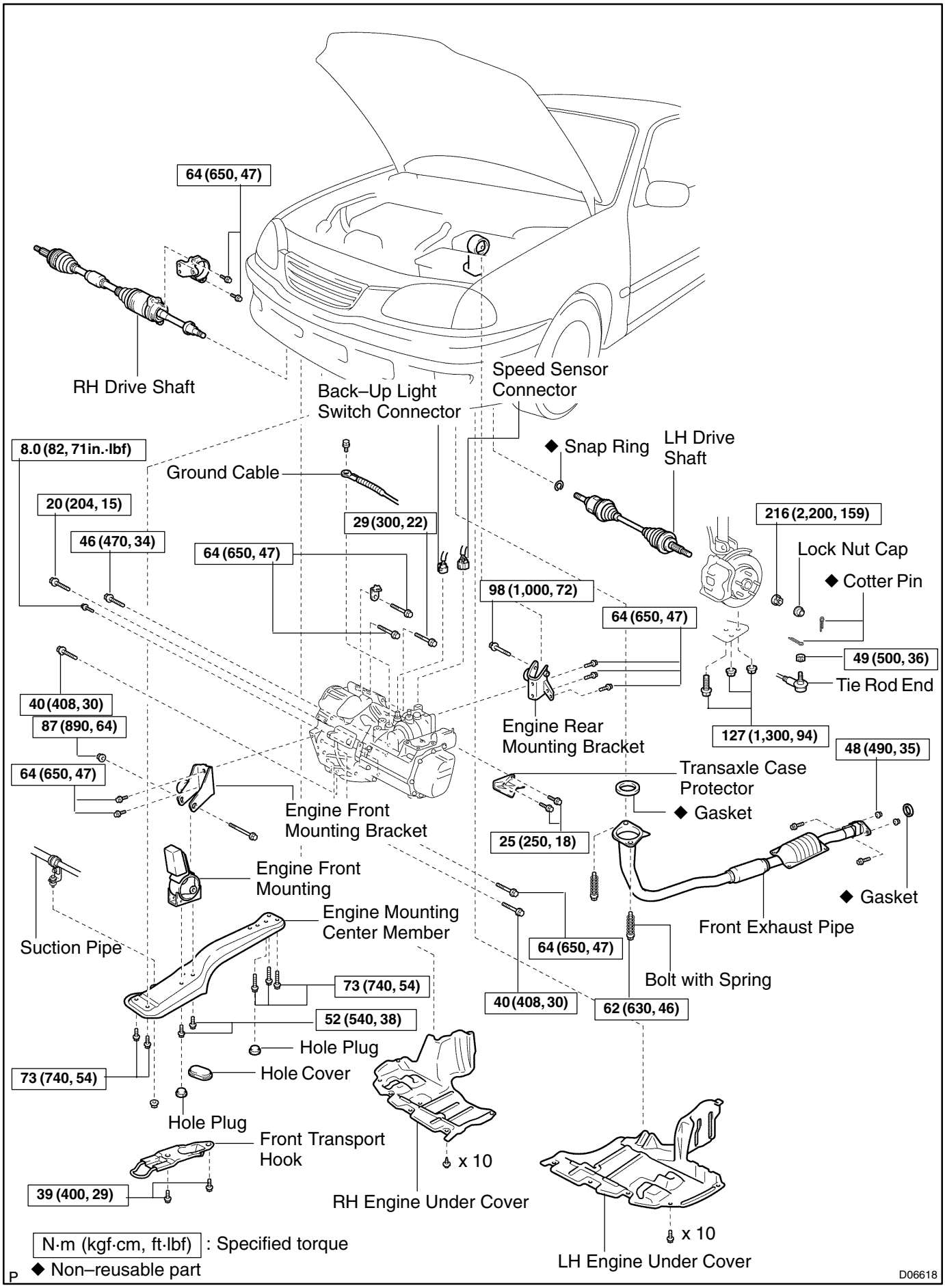
Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–4
	2. Oil (Wrong)	MX–4
	3. Gear (Worn or damaged)	MX–9
	4. Bearing (Worn or damaged)	MX–9
Oil leakage	1. Oil (Level too high)	MX–4
	2. Gasket (Damaged)	MX–9
	3. Oil seal (Worn or damaged)	MX–9
	4. O–Ring (Worn or damaged)	MX–9
Hard to shift or will not shift	1. Control cable (Faulty)	MX–48
	2. Synchronizer ring (Worn or damaged)	MX–9 MX–23 MX–30
	3. Shift key spring (Damaged)	MX–9 MX–23 MX–30
Jumps out of gear	1. Locking ball spring (Damaged)	MX–9
	2. Shift fork (Worn)	MX–9
	3. Gear (Worn or damaged)	MX–9
	4. Bearing (Worn or damaged)	MX–9

MANUAL TRANSAXLE UNIT

COMPONENTS

MX096–02





N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

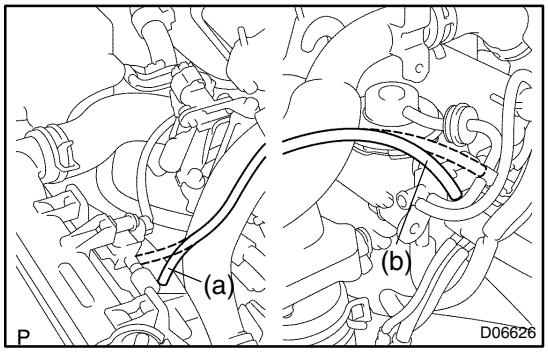
P

D06618

MX097–02

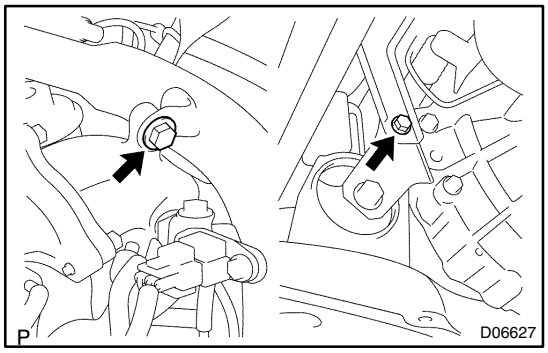
REMOVAL

1. **REMOVE BATTERY AND TRAY**
2. **REMOVE AIR CLEANER CASE ASSEMBLY WITH AIR HOSE**
3. **REMOVE LH AND RH ENGINE UNDER COVERS**



4. **REMOVE NO.1 AIR TUBE ASSEMBLY**

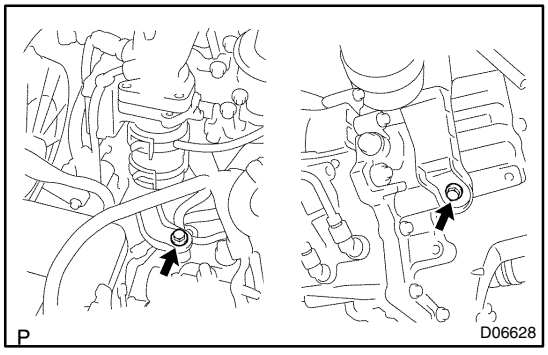
(a) Disconnect the No.2 vacuum hose from the E–VRV for EGR.
(b) Disconnect the No.2 vacuum hose from the VSV for EGR.
(c) Disconnect the VSV connector for EGR.
(d) Disconnect the turbo pressure sensor connector and vacuum hose.



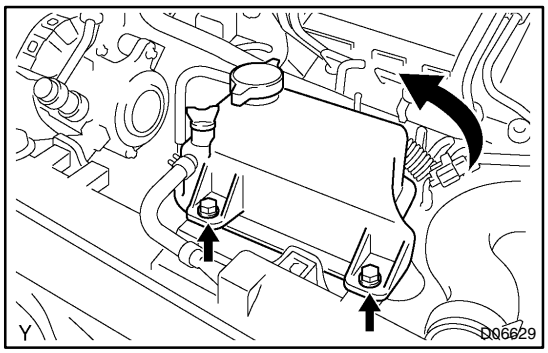
(e) Remove the 2 bolts as shown in the illustration.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)
(f) Disconnect the 2 hose clips, and remove the No.1 air tube assembly.

5. **REMOVE DIESEL THROTTLE BODY WITH NO.2 AIR TUBE ASSEMBLY**

(a) Disconnect the intake air temperature sensor connector.
(b) Disconnect the throttle control motor connector.
(c) Disconnect the full opener switch connector.
(d) Remove the 3 bolts from the diesel throttle body.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



(e) Remove the 2 bolts as shown in the illustration.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)
(f) Disconnect the 2 hose clips, and remove the diesel throttle body assembly with the No.2 air tube assembly.



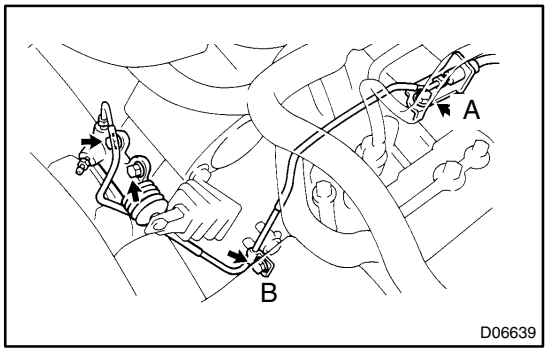
6. REMOVE STARTER

(a) Remove the 2 bolts and disconnect the radiator reservoir from the radiator.

(b) Disconnect the starter connector.

(c) Remove the nut, and disconnect the starter wire.
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

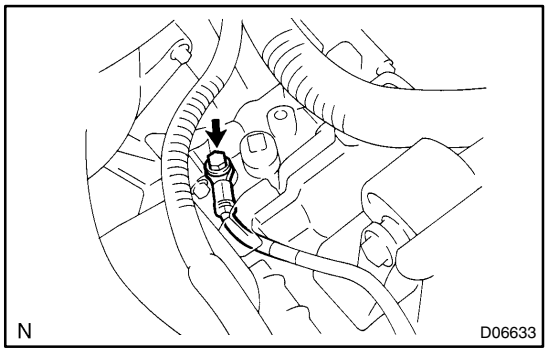
(d) Remove the 2 bolts and starter.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



7. DISCONNECT CLUTCH RELEASE CYLINDER AND LINE

(a) Remove the 2 set bolts of the clutch line bracket.
Torque:
Bolt A: 12 N·m (120 kgf·cm, 9 ft·lbf)
Bolt B: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

(b) Remove the 2 bolts and disconnect the release cylinder and line.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



8. DISCONNECT GROUND CABLE

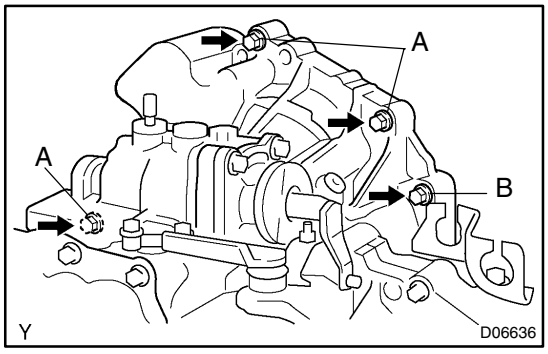
Remove the set bolt of the ground cable from the transaxle.

9. DISCONNECT VEHICLE SPEED SENSOR AND BACK–UP LIGHT SWITCH CONNECTORS

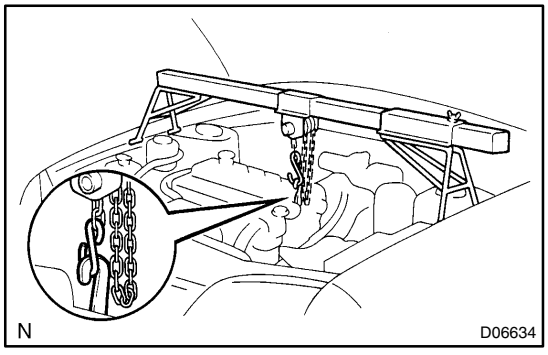
10. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips from the cables.

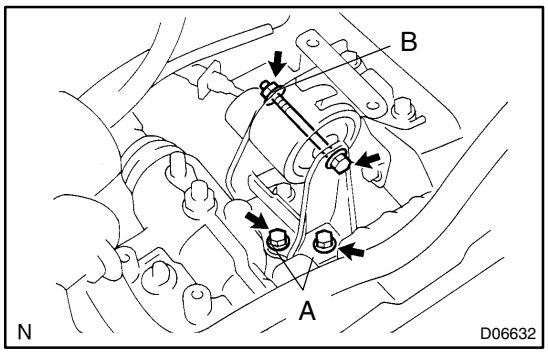


11. REMOVE 4 TRANSAXLE UPPER SIDE MOUNTING BOLTS
Torque:
Bolt A: 64 N·m (650 kgf·cm, 47 ft·lbf)
Bolt B: 29 N·m (296 kgf·cm, 21 ft·lbf)

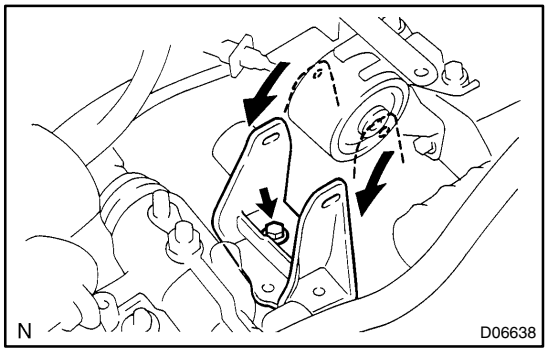


12. INSTALL ENGINE SUPPORT FIXTURE

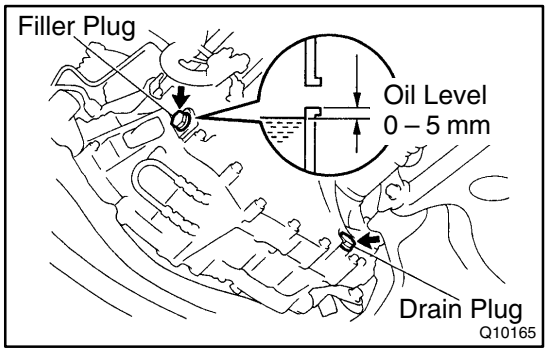
Install the engine hanger in the correct direction.
Parts No.:
Engine hanger: 12281–27010
Bolt: 96122–61020
Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)



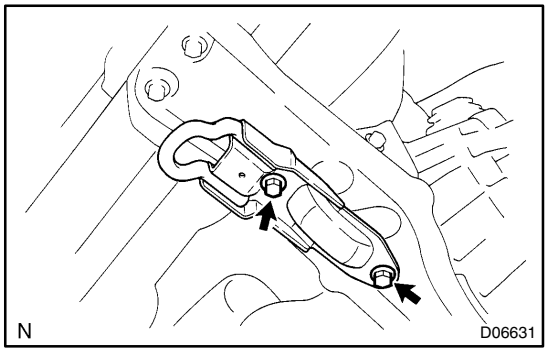
13. REMOVE ENGINE LEFT MOUNTING BRACKET 3 SET BOLTS AND NUT
Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B: 87 N·m (890 kgf·cm, 64 ft·lbf)



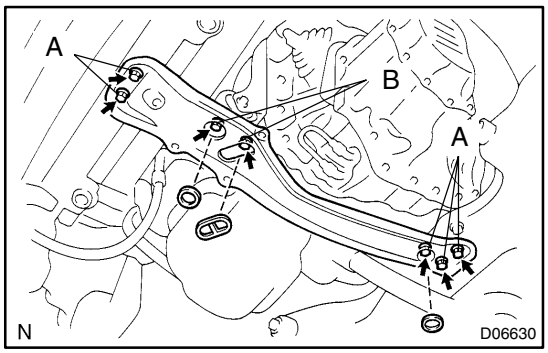
14. REMOVE ENGINE LEFT MOUNTING BRACKET
Lower the transaxle side and remove the bolt and bracket.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)
15. REMOVE FRONT WHEEL
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)
16. RAISE VEHICLE
NOTICE:
Make sure that the vehicle is securely supported.



17. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 3.9 liters (4.1 US qts, 3.4 Imp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
18. REMOVE FRONT EXHAUST PIPE
(a) Remove the 2 bolts, 2 nuts and gasket from the exhaust manifold.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)
(b) Remove the 2 bolts, 2 springs, gasket and pipe.
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)
19. REMOVE LH AND RH FRONT DRIVE SHAFTS
(See page SA–1)



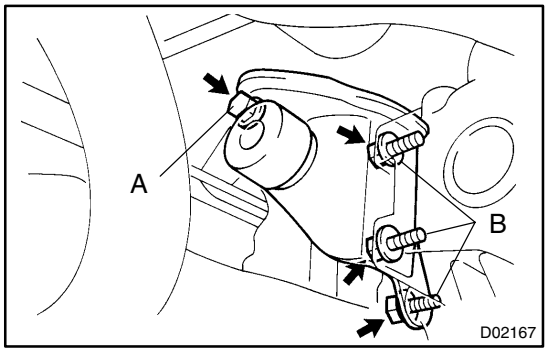
20. REMOVE ENGINE MOUNTING CENTER MEMBER
(a) Remove the 2 bolts and front transport hook.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
(b) Support the suspension crossmember with a jack.
(c) Remove the nuts, and disconnect the suction pipe.



(d) Remove the 2 hole plugs and hole cover.
(e) Remove the 7 bolts and center member.
Torque:
Bolt A: 73 N·m (740 kgf·cm, 54 ft·lbf)
Bolt B: 52 N·m (540 kgf·cm, 38 ft·lbf)

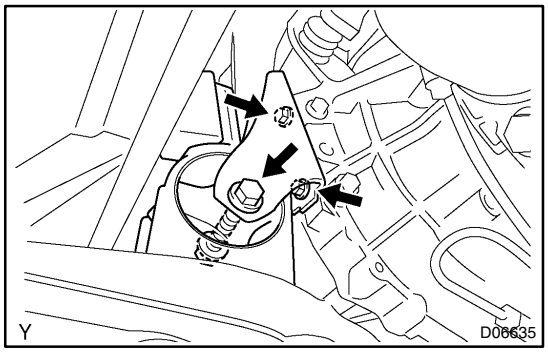
21. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



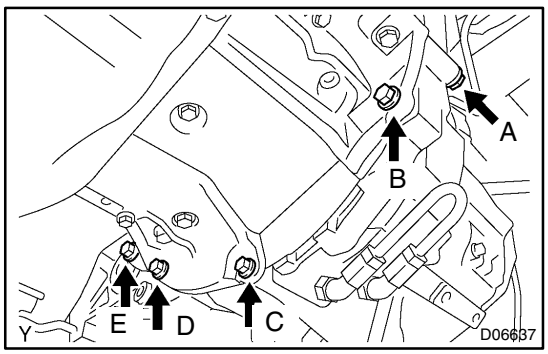
22. REMOVE ENGINE REAR MOUNTING BRACKET

Remove the 4 bolts and bracket.
Torque:
Bolt A: 98 N·m (1,000 kgf·cm, 72 ft·lbf)
Bolt B: 64 N·m (650 kgf·cm, 47 ft·lbf)



23. REMOVE ENGINE FRONT MOUNT AND MOUNTING BRACKET

(a) Remove the bolt and nut.
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)
(b) Remove the 2 bolts.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



24. REMOVE TRANSAXLE LOWER SIDE MOUNTING BOLT

Remove the 5 bolts.
Torque:
Bolt A: 40 N·m (408 kgf·cm, 30 ft·lbf)
Bolt B: 40 N·m (408 kgf·cm, 30 ft·lbf)
Bolt C: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
Bolt D: 20 N·m (204 kgf·cm, 15 ft·lbf)
Bolt E: 46 N·m (470 kgf·cm, 34 ft·lbf)

25. REMOVE TRANSAXLE

Lower engine left side and remove the transaxle from the engine.
HINT:
At the time of installation, please refer to the following items.
- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

26. REMOVE TRANSAXLE CASE PROTECTOR

Remove the 2 bolts and protector.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

MX05P–02

INSTALLATION

Installation is in the reverse order of removal.
(See page MX–4)

HINT:

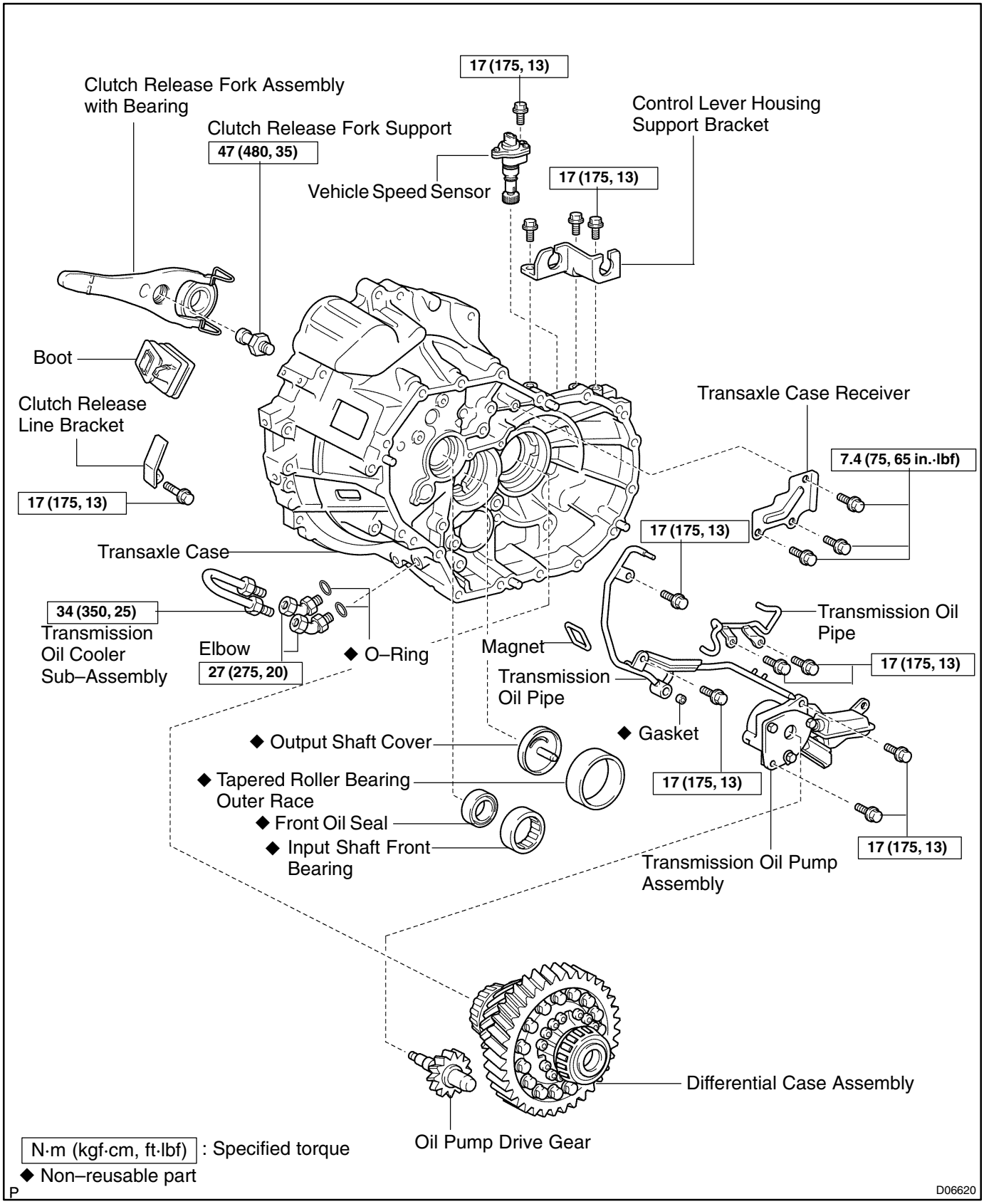
After installation, check and inspect items as follows.

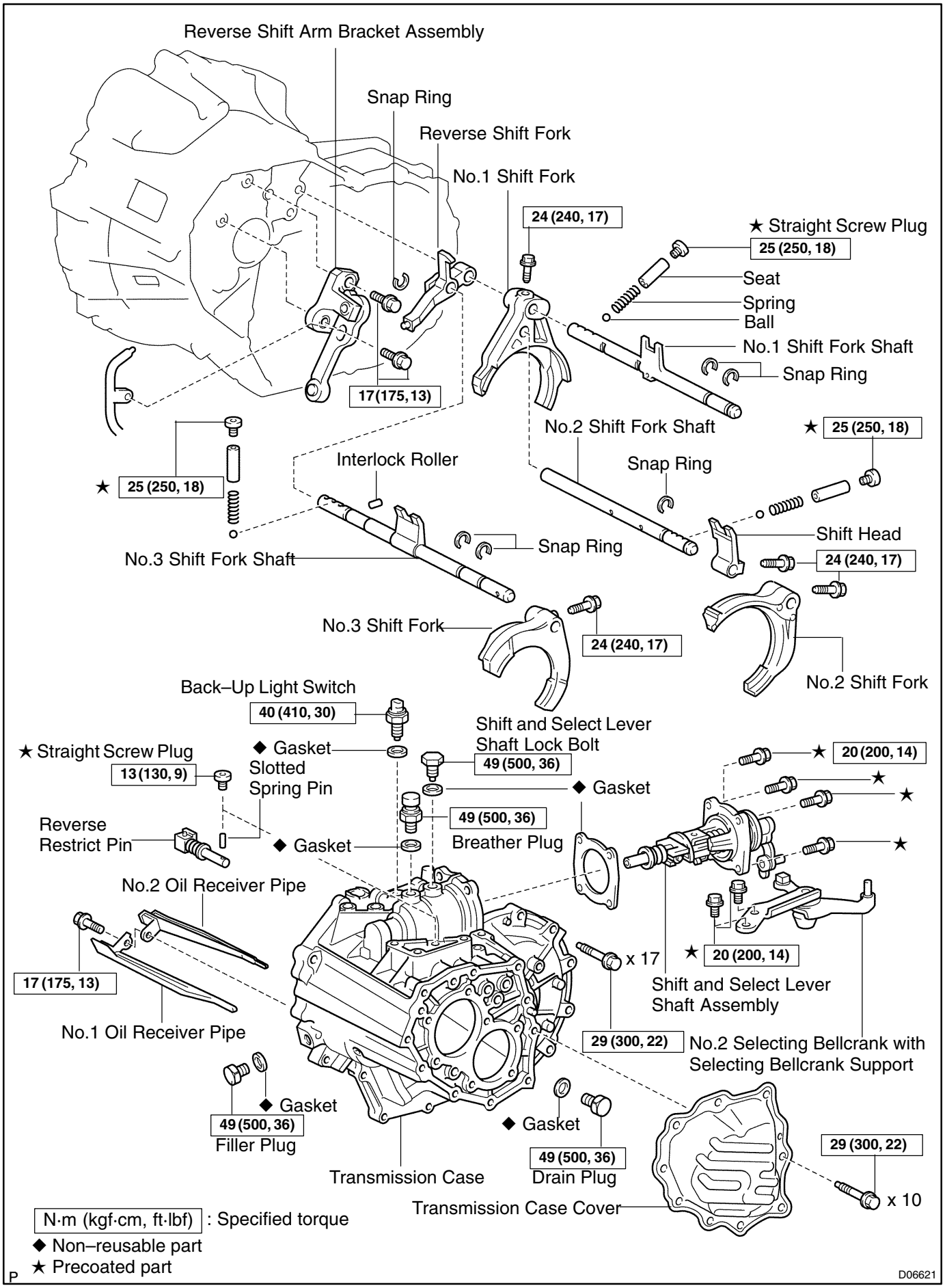
- Front wheel alignment (See Pub. No. RM599E, page SA–4).
- Do the road test.

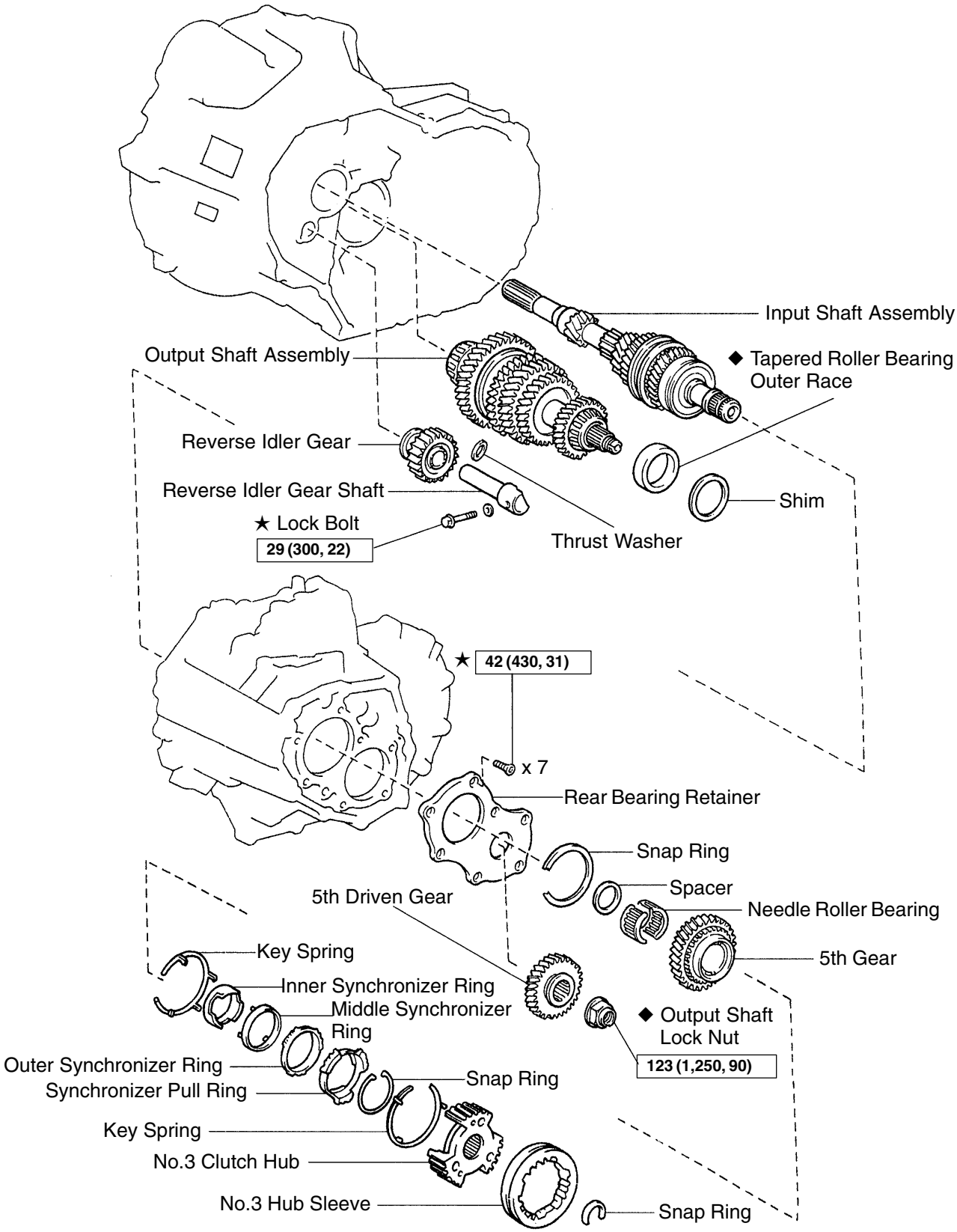
MANUAL TRANSAXLE ASSEMBLY

MX098–01

COMPONENTS




Reverse Shift Arm Bracket Assembly
Snap Ring
Reverse Shift Fork
No.1 Shift Fork
24 (240, 17)
★ Straight Screw Plug
25 (250, 18)
Seat
Spring
Ball
No.1 Shift Fork Shaft
Snap Ring
17 (175, 13)
No.2 Shift Fork Shaft
★ 25 (250, 18)
Interlock Roller
Snap Ring
★ 25 (250, 18)
Shift Head
Snap Ring
No.3 Shift Fork Shaft
24 (240, 17)
No.3 Shift Fork
24 (240, 17)
No.2 Shift Fork
Back–Up Light Switch
40 (410, 30)
Shift and Select Lever Shaft Lock Bolt
49 (500, 36)
◆ Gasket
★ Straight Screw Plug
13 (130, 9)
Slotted Spring Pin
◆ Gasket
★ 20 (200, 14)
★
★
★
Reverse Restrict Pin
◆ Gasket
49 (500, 36)
Breather Plug
No.2 Oil Receiver Pipe
17 (175, 13)
No.1 Oil Receiver Pipe
x 17
★ 20 (200, 14)
Shift and Select Lever Shaft Assembly
29 (300, 22)
No.2 Selecting Bellcrank with Selecting Bellcrank Support
◆ Gasket
49 (500, 36)
Filler Plug
Transmission Case
◆ Gasket
49 (500, 36)
Drain Plug
29 (300, 22)
x 10
Transmission Case Cover
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
P
D06621



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part

D06653

MX099–01

DISASSEMBLY

1. REMOVE RELEASE FORK AND BEARING

2. REMOVE BACK–UP LIGHT SWITCH WITH GASKET

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

3. REMOVE BOLT AND VEHICLE SPEED SENSOR

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

4. REMOVE NO.2 SELECTING BELLCRANK WITH SELECTING BELLCRANK SUPPORT

Remove the 2 bolts and No.2 selecting bellcrank with the selecting bellcrank support.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

5. REMOVE SHIFT AND SELECT LEVER SHAFT LOCK BOLT WITH GASKET

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

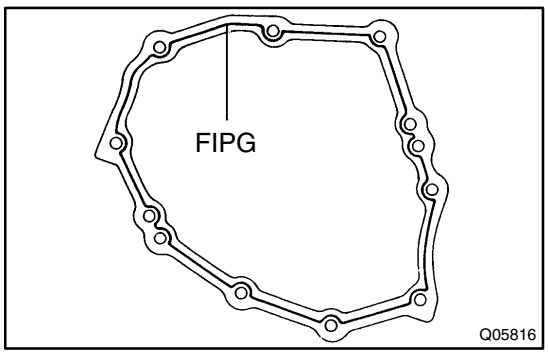
6. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY WITH GASKET

Remove the 4 bolts, the shift, select lever shaft assembly and gasket.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



7. REMOVE TRANSMISSION CASE COVER

Remove the 10 bolts and transmission case cover.

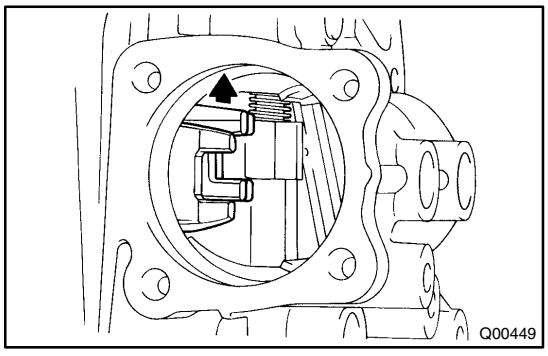
FIPG:

Part No. 08826–00090, THREE BOND 1281 or equivalent

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

8. REMOVE BREATHER PLUG WITH GASKET

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



9. REMOVE OUTPUT SHAFT LOCK NUT

(a) Remove the lock nut.

(b) Engage the gear double meshing.

(c) Remove the lock nut.

Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

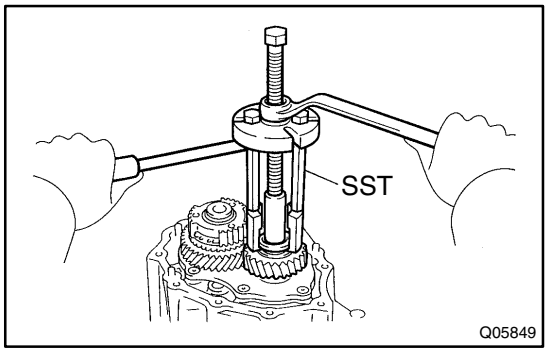
(d) Disengage the gear double meshing.

10. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

(a) Remove the No.3 shift fork set bolt.

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

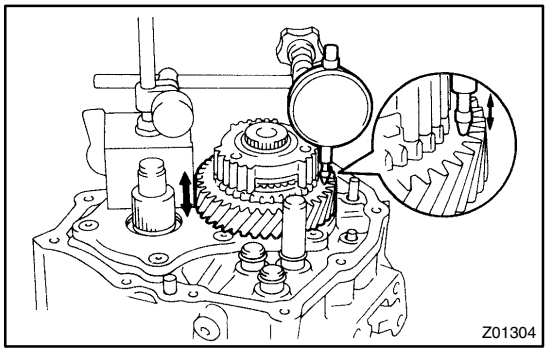
(b) Remove the No.3 hub sleeve and No.3 shift fork.



11. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.

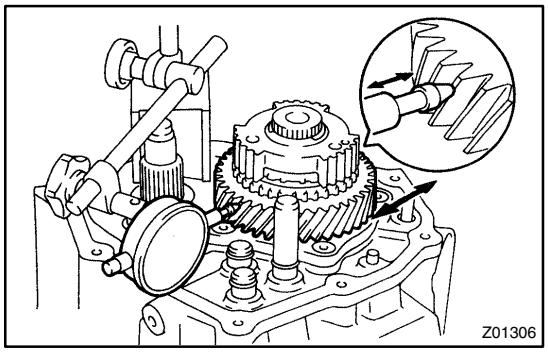
SST 09950–30011



12. MEASURE 5TH GEAR THRUST CLEARANCE AND RADIAL CLEARANCE

(a) Using a dial indicator, measure the thrust clearance.

Standard clearance:
0.10 – 0.57 mm (0.0039 – 0.0224 in.)
Maximum clearance:
0.65 mm (0.0256 in.)

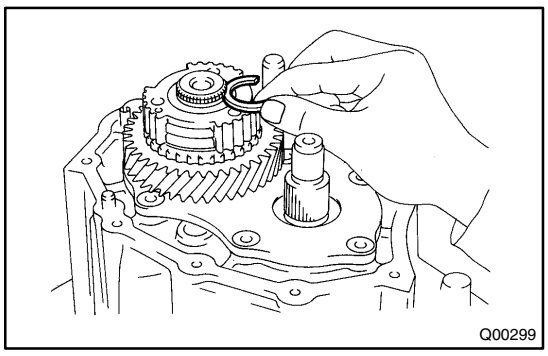


(b) Using a dial indicator, measure the radial clearance.

Standard clearance:
0.009 – 0.050 mm (0.0004 – 0.0020 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

13. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

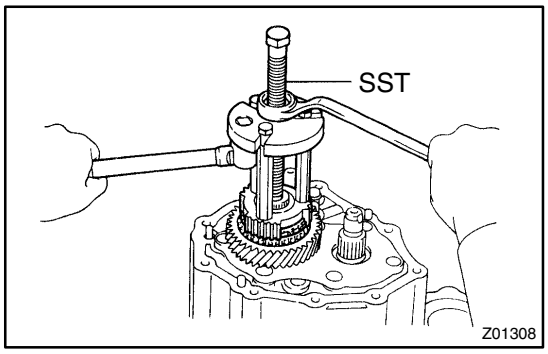
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.



HINT:

At the time of the reassembly, please refer to the following item.
Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
a	1.75 (0.0689)	f	2.00 (0.0787)
b	1.80 (0.0709)	g	2.05 (0.0807)
c	1.85 (0.0729)	h	2.10 (0.0827)
d	1.90 (0.0748)	j	2.15 (0.0847)
e	1.95 (0.0768)	–	–



(b) Using SST, remove the No.3 clutch hub with the synchronizer ring and 5th gear.

SST 09950–30011

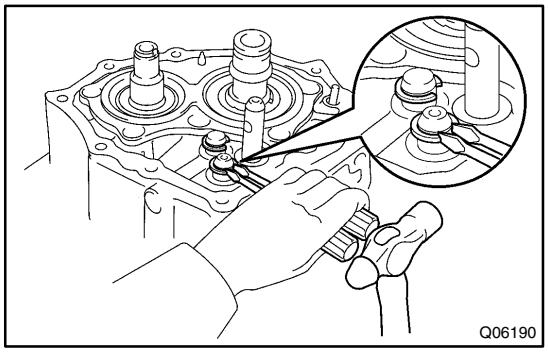
14. REMOVE NEEDLE ROLLER BEARING AND SPACER

15. REMOVE REAR BEARING RETAINER

Using a torx socket wrench (T45), remove the 7 torx screws and rear bearing retainer.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

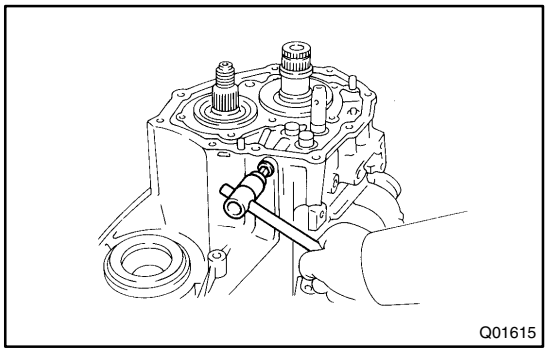
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



16. REMOVE SNAP RING

(a) Using a snap ring expander, remove the input shaft rear bearing snap ring.

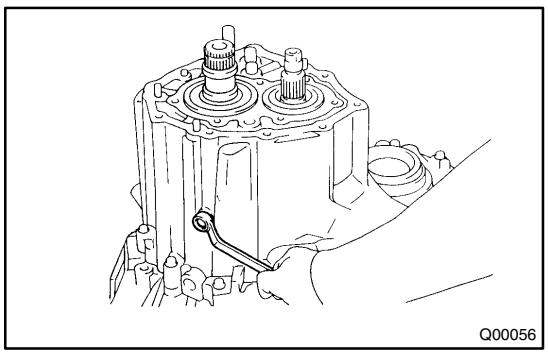
(b) Using 2 screwdrivers and a hammer, remove the 2 snap rings.



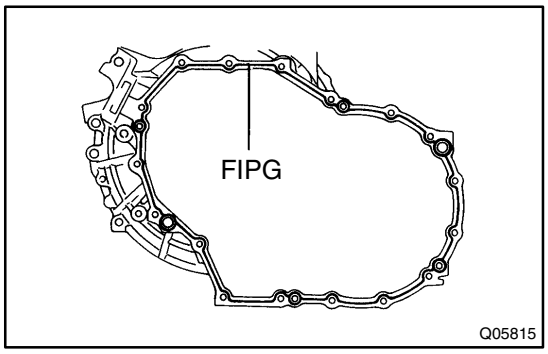
17. REMOVE STRAIGHT SCREW PLUG, SEAT, SPRING AND LOCKING BALL

(a) Using a hexagon wrench (6 mm), remove the plug.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Using a magnetic finger, remove the seat, spring and locking ball.

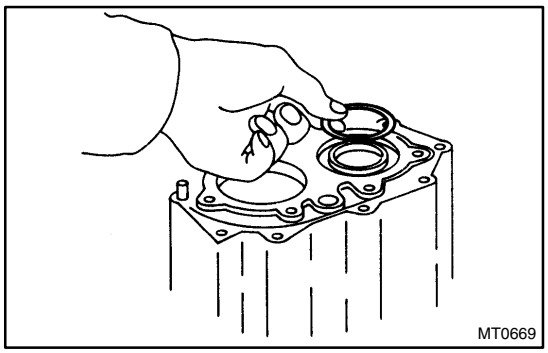


18. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



19. REMOVE TRANSMISSION CASE

Remove the 17 bolts and tap the case with a plastic hammer.
FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



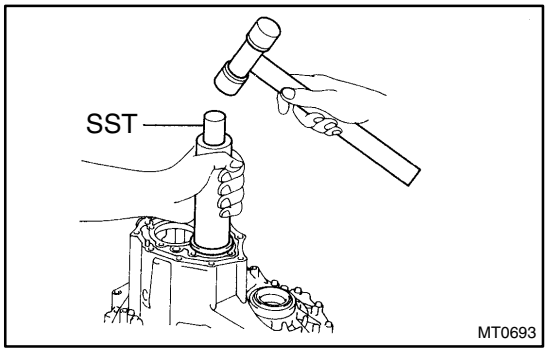
20. REMOVE SHIM

HINT:

At the time of reassembly, please refer to the following item.

Install the previously selected shim by adjusting output shaft preload.

(See page MX–21)



21. REMOVE OUTPUT SHAFT REAR TAPER ROLLER BEARING OUTER RACE

Using SST and a hammer, remove the output shaft rear taper roller bearing outer race.

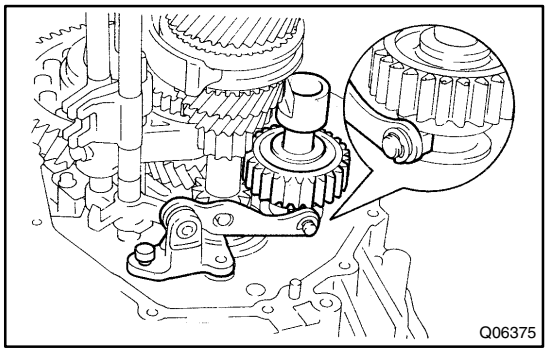
SST 09316–60011 (09316–00011)

22. REMOVE TRANSMISSION OIL PIPE

(a) Remove the gasket from the oil pipe.

(b) Remove the 2 bolts and oil pipe.

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)



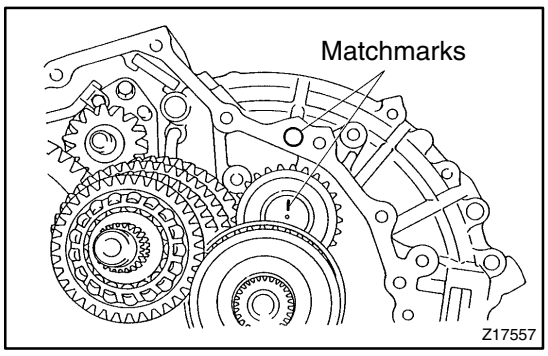
23. REMOVE REVERSE SHIFT ARM BRACKET ASSEMBLY

Remove the bolt and pull off the reverse shift arm and bracket.

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

24. REMOVE REVERSE IDLER GEAR AND SHAFT

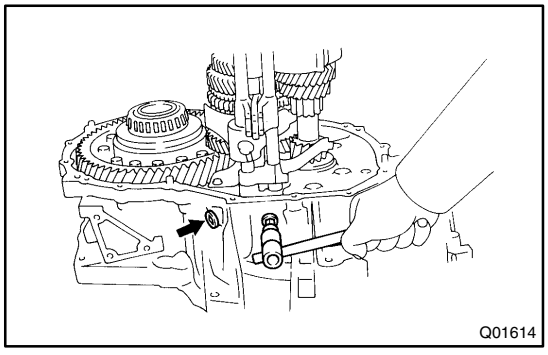
Pull out the shaft, remove the reverse idler gear and thrust washer.



HINT:

At the time of reassembly, please refer to the following item.

Align the matchmarks, as shown.



25. REMOVE STRAIGHT SCREW PLUG, LOCKING BALL AND SPRING

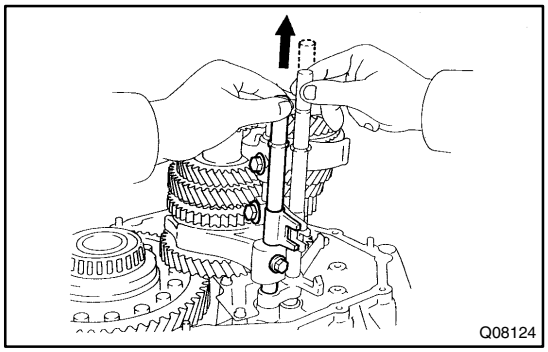
(a) Using a hexagon wrench (6 mm), remove the 2 plugs.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

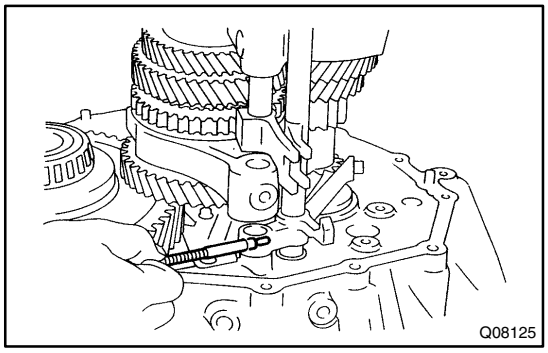
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Using a magnetic finger, remove the 2 seats, springs and balls.

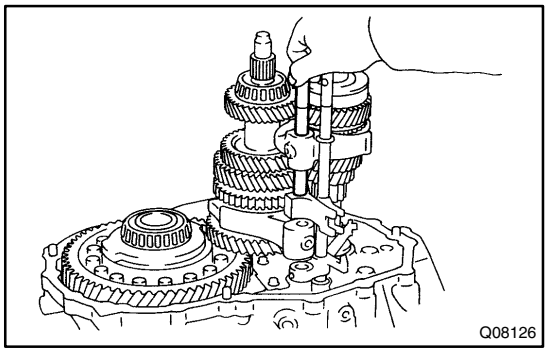


26. REMOVE NO.1, NO.2 SHIFT FORKS AND SHIFT HEAD SET BOLT
Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

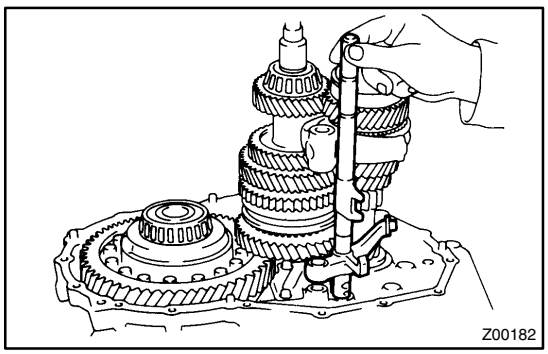
27. REMOVE NO.1 SHIFT FORK SHAFT
Pull up the No.3 shift fork shaft, remove the No.1 shift fork shaft.
HINT:
At the time of reassembly, please refer to the following item.
When it is difficult to push the fork shaft through the reverse shift fork, pull up the No.3 shift fork shaft.



28. REMOVE INTERLOCK ROLLER
Using a magnetic finger, remove the interlock roller from the reverse shift fork.



29. REMOVE NO.2 SHIFT FORK SHAFT, SHIFT HEAD AND NO.1 SHIFT FORK
(a) Pull out the No.2 shift fork shaft.
(b) Remove the shift head and No.1 shift fork.



30. REMOVE NO.3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK AND NO.2 SHIFT FORK
(a) Pull out the No.3 shift fork shaft with the reverse shift fork.
(b) Remove the No.2 shift fork.

31. REMOVE SNAP RING
(a) Using 2 screwdrivers and a hammer, remove the snap ring and reverse shift fork from the No.3 shift fork shaft.
(b) Using 2 screwdrivers and a hammer, remove the 3 snap rings from the No.1, No.2 and No.3 shift fork shafts.

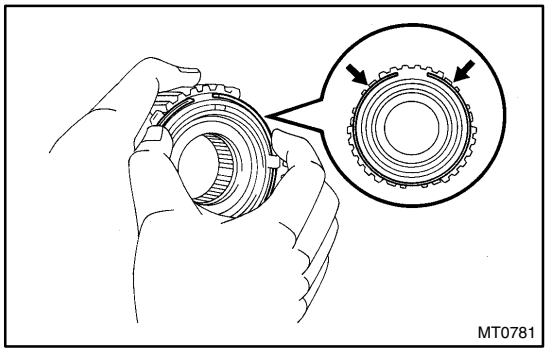
32. REMOVE INPUT AND OUTPUT SHAFTS ASSEMBLY
(a) Leaning the output shaft to the differential side, remove the input shaft assembly.
(b) Lift up the differential case assembly, remove the output shaft assembly.

33. REMOVE DIFFERENTIAL CASE ASSEMBLY
(a) Remove the oil pump drive gear.
(b) Remove the differential case assembly.

34. REMOVE MAGNET FROM TRANSAXLE CASE

35. REMOVE TRANSMISSION OIL PUMP ASSEMBLY AND OIL PIPE

(a) Remove the 2 bolts and oil pipe.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)
(b) Remove the 2 bolts and the oil pump assembly.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)



36. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

(a) Remove the No.5 synchronizer ring with the key spring from the No.3 clutch hub.
(b) Using a screwdriver, remove the snap ring.

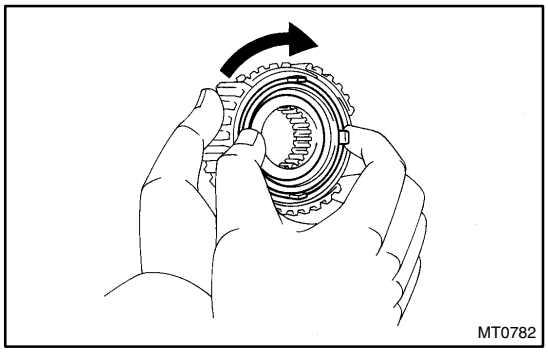
HINT:

Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

(c) Remove the synchronizer rings.

MX05W–02

INSPECTION

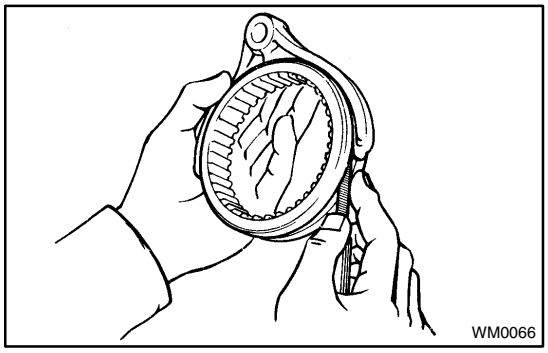


1. INSPECT NO.5 SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the middle No.5 synchronizer ring in one direction while pushing it to the outer No.5 synchronizer ring. Check that the ring locks.

If it does not lock, replace the synchronizer ring.

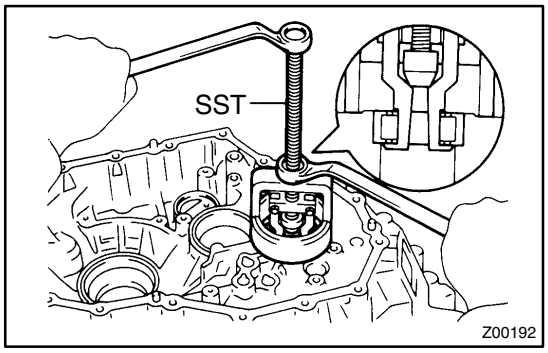


2. MEASURE SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

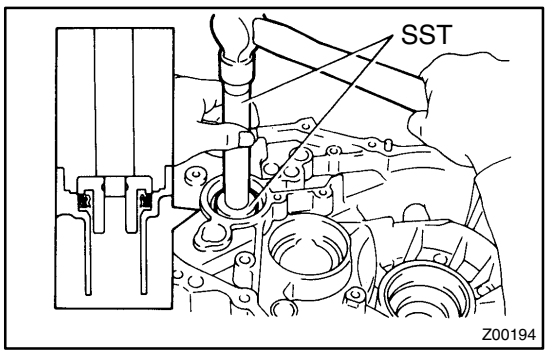


3. IF NECESSARY, REPLACE INPUT SHAFT BEARING AND OIL SEAL

(a) Remove the 3 bolts and transaxle case receiver.

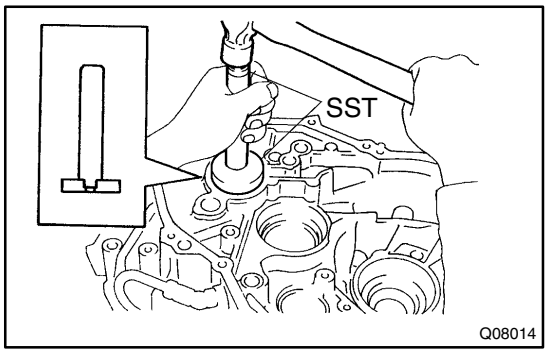
(b) Using SST, pull out the bearing.
SST 09612–65014

(c) Using a screwdriver, remove the oil seal.



(d) Using SST, drive in a new oil seal.
SST 09608–00081, 09950–70010 (09951–07150)

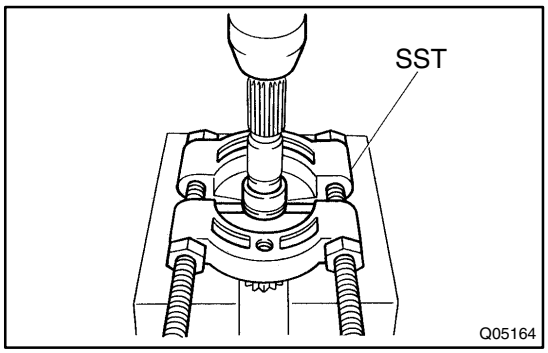
(e) Coat the lip of seal with MP grease.



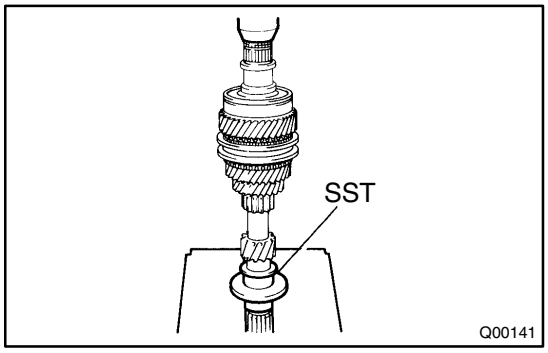
(f) Using SST, drive in a new bearing.
SST 09950–60010 (09951–00580), 09950–70010 (09951–07150)

(g) Install the transaxle case receiver.

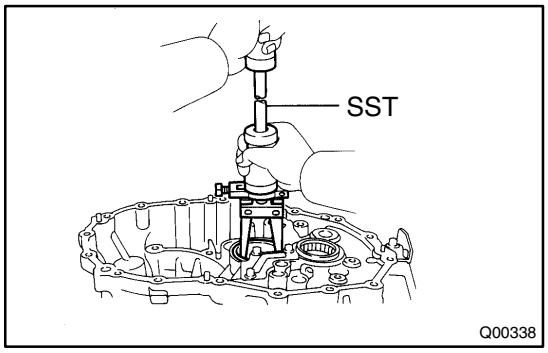
(h) Install and torque the 3 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



(i) Using SST and a press, remove the inner race.
SST 09950–00020



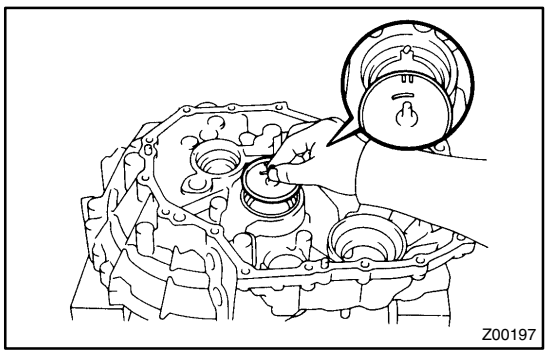
(j) Using SST and a press, install a new input shaft front bearing inner race.
SST 09316–60011 (09316–00021)



4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING OUTER RACE AND OUTPUT SHAFT FRONT COVER

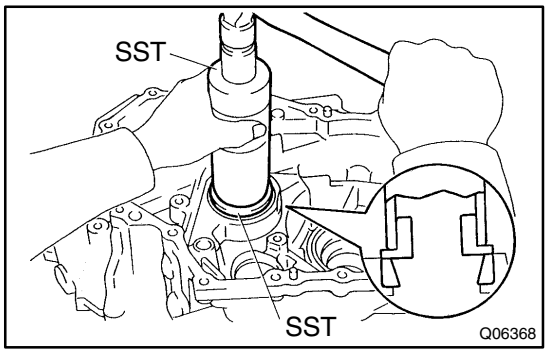
(a) Using SST, pull out the output shaft front bearing outer race.
SST 09308–00010

(b) Remove the output shaft cover.

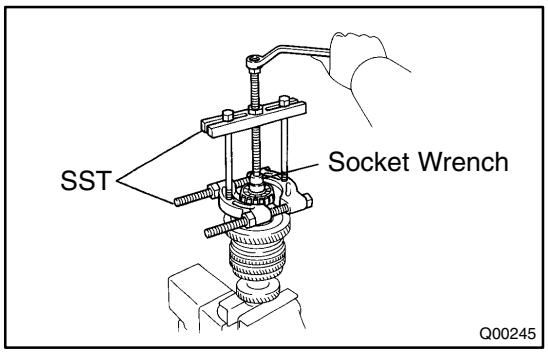


(c) Install a new output shaft cover.

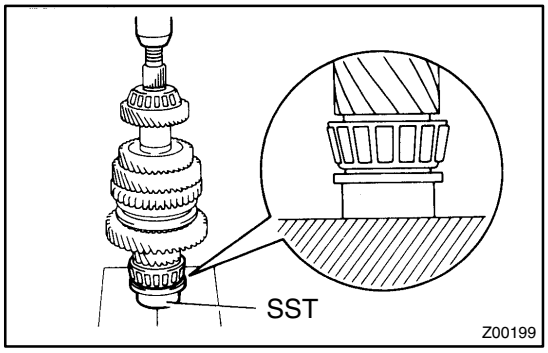
HINT:
Install the output shaft cover projection into the case side groove.



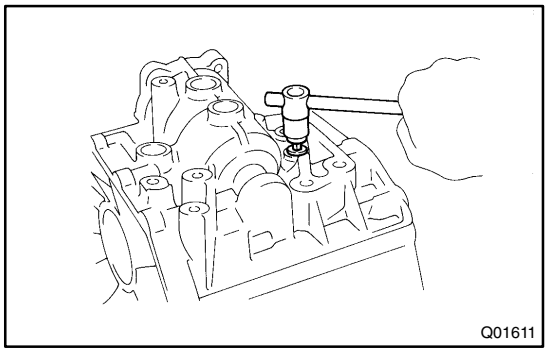
(d) Using SST and a hammer, drive in a new output shaft front bearing outer race.
SST 09316–60011 (09316–00011, 09316–00021)



(e) Using SST and a socket wrench, remove the output shaft front bearing.
SST 09950–00020, 09950–00030



(f) Using SST and a press, install a new output shaft front bearing.
SST 09316–60011 (09316–00071)

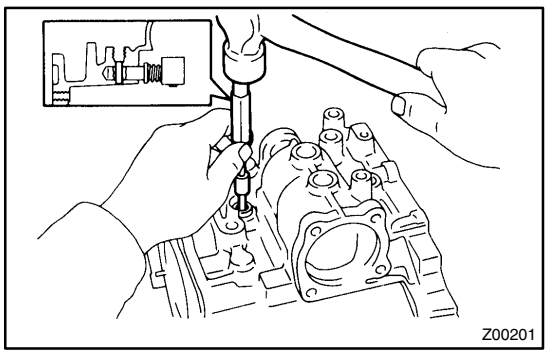


5. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench (6 mm), remove the screw plug.

(b) Using a pin punch and hammer, drive out the slotted spring pin.

(c) Replace the reverse restrict pin.



(d) Using a pin punch and hammer, drive in the slotted spring pin.

(e) Apply sealant to the screw plug threads.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(f) Using a hexagon wrench (6 mm), install and torque the screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX05X–02

REASSEMBLY

Reassembly is in the reverse order of disassembly.
(See page MX–12)

NOTICE:

When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non–residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

HINT:

- Before reassembly, select a shim by adjusting output shaft preload.
- Coat all of the sliding and rotating surfaces with gear oil before reassembly.

ADJUST OUTPUT SHAFT PRELOAD

(a) Install the output shaft assembly to the transaxle case.
(b) Install the transmission case to the transaxle case.

HINT:

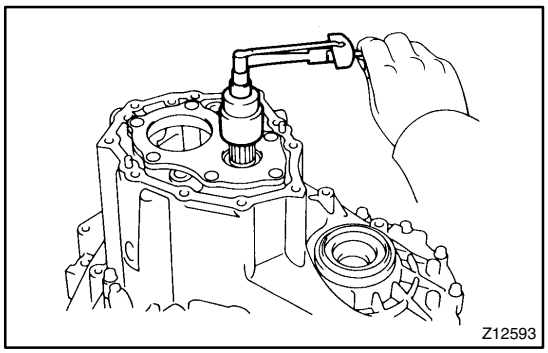
If necessary, tap on the case with a plastic hammer.

(c) Install and torque the 17 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
(d) Install the output shaft rear taper roller bearing outer race.
(e) Install the adjusting shim.

HINT:

When reusing the output shaft bearing, first install a shim of the same thickness as before. If installing a new taper roller bearing, first select and install a shim of lesser thickness than before.

(f) Install the rear bearing retainer.
(g) Using a torx wrench (T45), install and torque the 7 torx screws.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)
(h) Install a new lock nut to the output shaft.
(i) Turn the output shaft right and left 2 or 3 times to allow the bearing to settle.


Z12593

(j) Using a torque wrench, measure the preload.

Preload (at starting):
New bearing
0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Reused bearing
0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

If the preload is not within the specification, select an appropriate adjusting shim.

The preload will change about 0.4 – 0.5 N·m (4 – 5 kgf·cm, 3.5 – 4.3 in.·lbf) for every 0.05 mm change in adjusting shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	1.30 (0.0512)	D	1.95 (0.0768)
1	1.35 (0.0531)	E	2.00 (0.0787)
2	1.40 (0.0551)	F	2.05 (0.0807)
3	1.45 (0.0571)	G	2.10 (0.0827)
4	1.50 (0.0591)	H	2.15 (0.0846)
5	1.55 (0.0610)	J	2.20 (0.0866)
6	1.60 (0.0630)	K	2.25 (0.0886)
7	1.65 (0.0650)	L	2.30 (0.0906)
8	1.70 (0.0669)	M	2.35 (0.0925)
9	1.75 (0.0689)	N	2.40 (0.0945)
A	1.80 (0.0709)	P	2.45 (0.0965)
B	1.85 (0.0728)	Q	2.50 (0.0984)
C	1.90 (0.0748)	–	–

(k) Remove the lock nut.

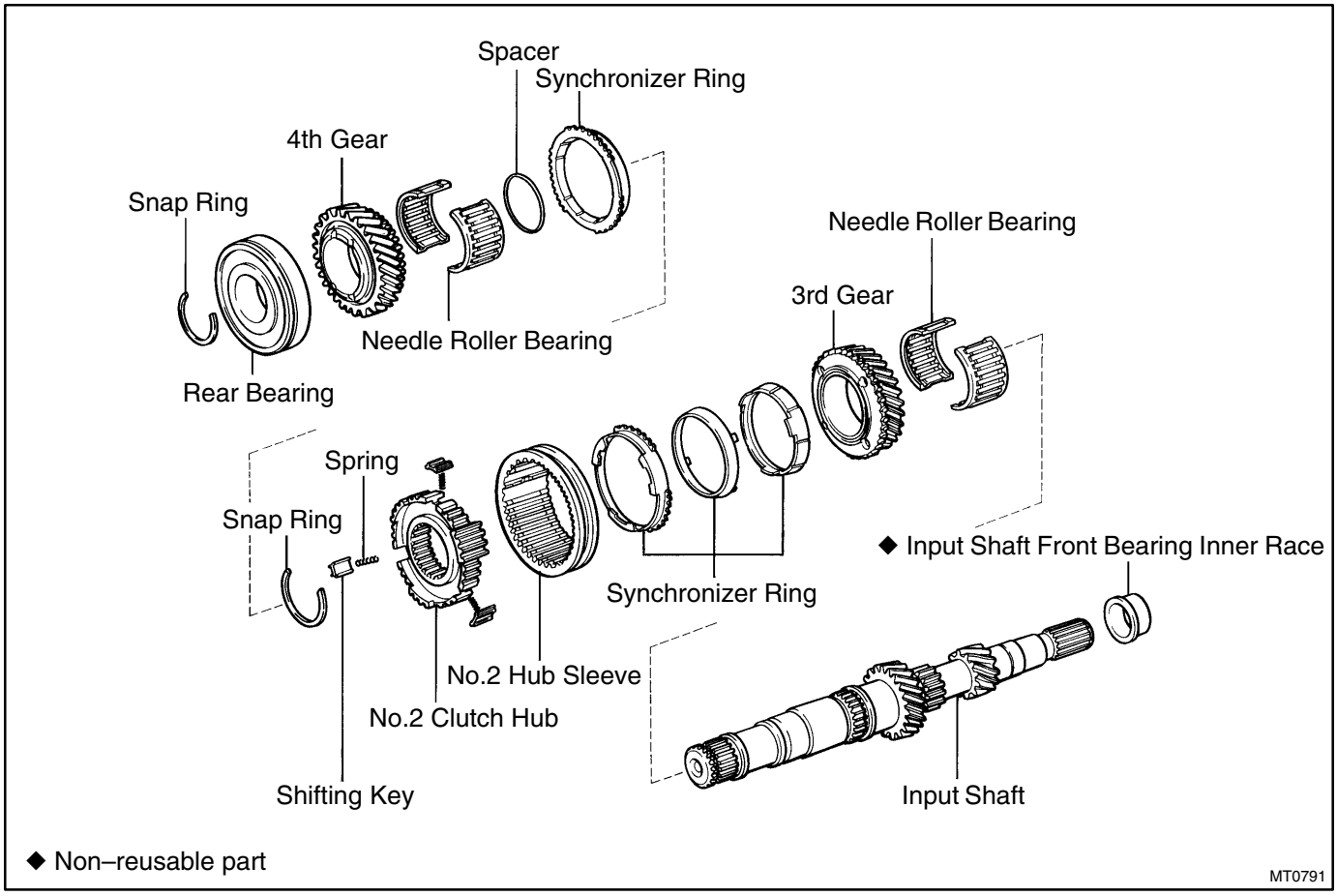
(l) Remove these parts. Removal is in the reverse order of installation.

- Rear bearing retainer
- Shim
- Transmission case
- Output shaft assembly
- Output shaft rear bearing outer race

INPUT SHAFT

COMPONENTS

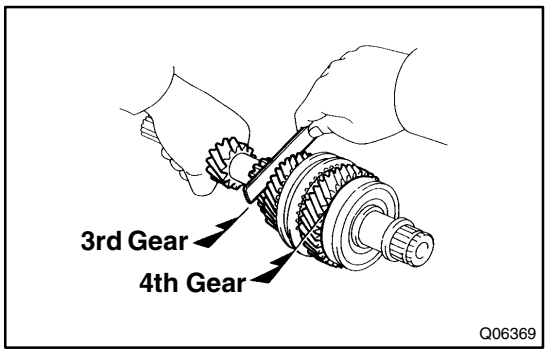
MX028–03



◆ Non–reusable part

MT0791

MX029–03

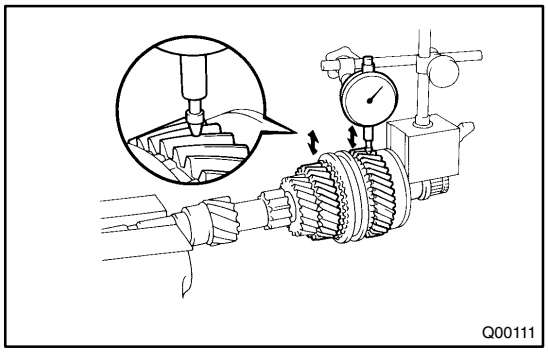


DISASSEMBLY

1. MEASURE 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:
3rd gear: 0.10 – 0.35 mm (0.0039 – 0.0138 in.)
4th gear: 0.10 – 0.55 mm (0.0039 – 0.0217 in.)
Maximum clearance:
3rd gear: 0.40 mm (0.0157 in.)
4th gear: 0.60 mm (0.0236 in.)



2. CHECK 3RD AND 4TH GEARS RADIAL CLEARANCE

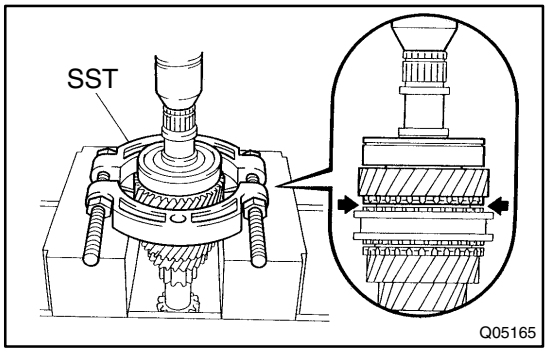
Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
3rd gear: 0.009 – 0.053 mm (0.0004 – 0.0021 in.)
4th gear: 0.009 – 0.051 mm (0.0004 – 0.0020 in.)
Maximum clearance:
3rd and 4th gears: 0.070 mm (0.0028 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.

3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.



4. REMOVE REAR BALL BEARING AND 4TH GEAR

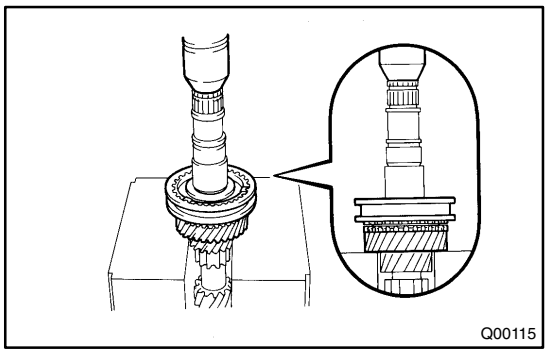
Using SST and a press, remove the rear bearing.

SST 09950–00020

5. REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING

6. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.



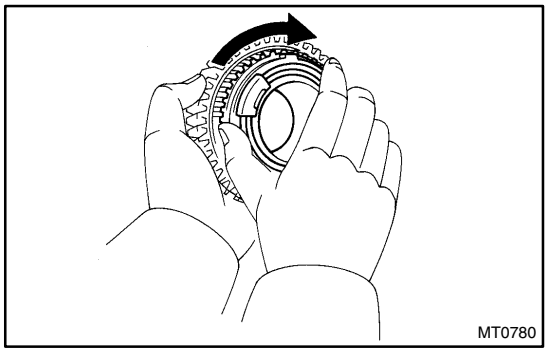
7. REMOVE NO.2 CLUTCH HUB ASSEMBLY, SYNCHRONIZER RING AND 3RD GEAR

Using a press, remove the No.2 hub sleeve, 3rd gear and synchronizer rings.

8. REMOVE NEEDLE ROLLER BEARING

MX02A–03

INSPECTION

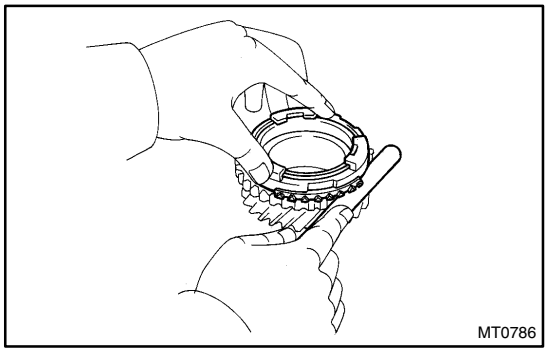


1. INSPECT 3RD GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

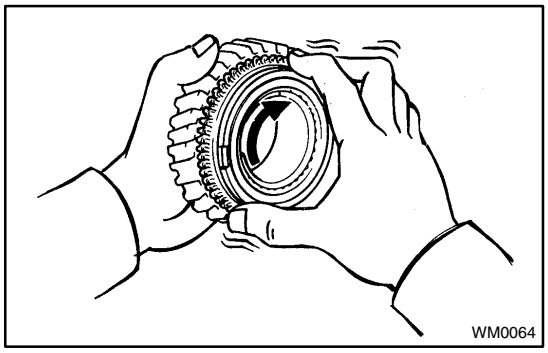
If it does not lock, replace the synchronizer ring.



(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring.



2. INSPECT 4TH GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

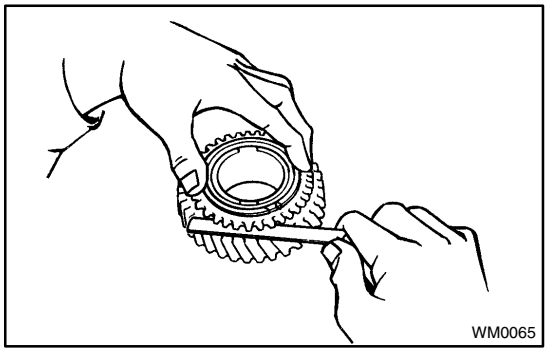
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



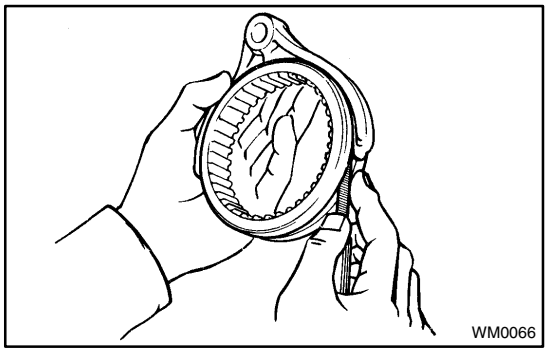
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and spline end.

Minimum clearance: 0.8 mm (0.031 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

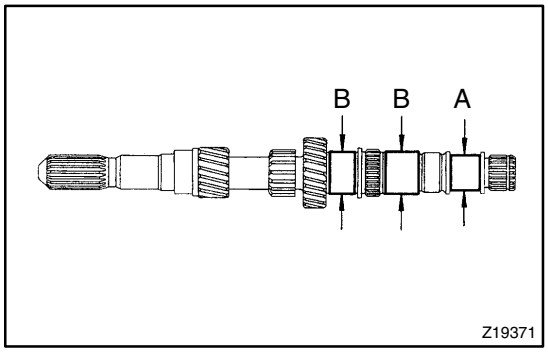


3. MEASURE NO.2 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

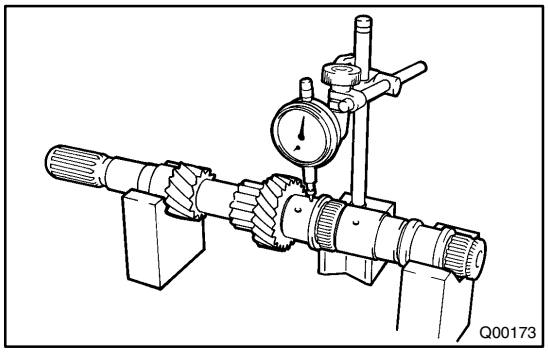


4. INSPECT INPUT SHAFT

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

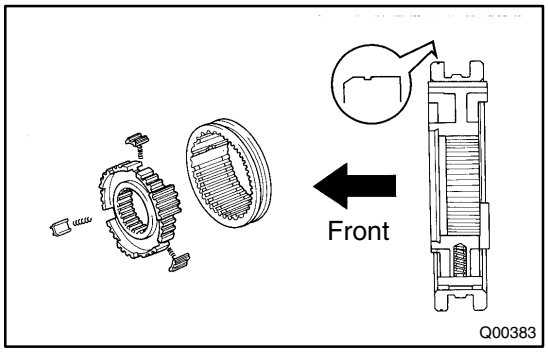
Minimum outer diameter:
Part A: 27.950 mm (1.1004 in.)
Part B: 35.950 mm (1.4154 in.)



(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.05 mm (0.0020 in.)

MX02B–03



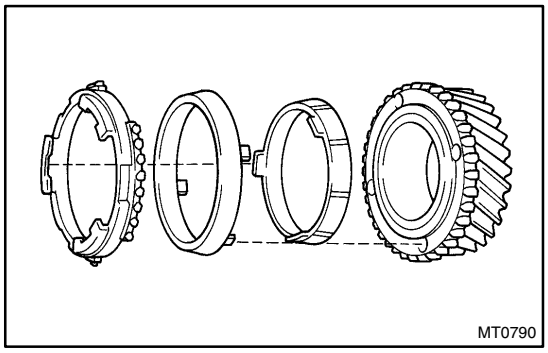
REASSEMBLY

HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.2 CLUTCH HUB INTO HUB SLEEVE

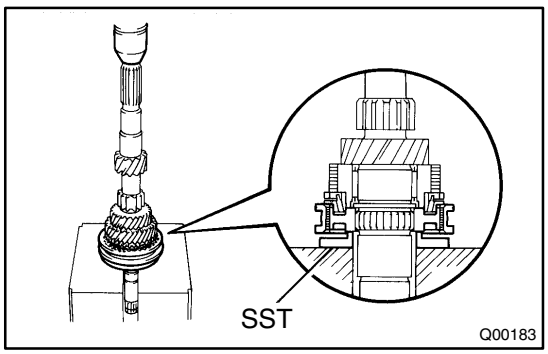
(a) Install the 3 springs and shifting keys to the clutch hub.
(b) Install the hub sleeve to the clutch hub.

HINT:
Direct identification groove of the hub sleeve to front of the transmission.

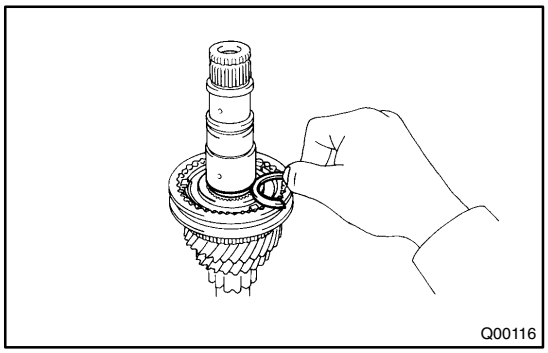


2. INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply MP grease to the needle roller bearing.
(b) Assemble the needle roller bearings into the 3rd gear.
(c) Place the synchronizer rings on the gear and align the ring slots with the shifting keys.



(d) Using SST and a press, install the 3rd gear and No.2 hub sleeve.
SST 09506–35010



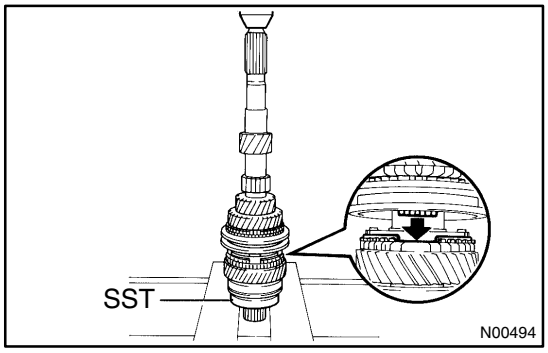
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
H	2.30 (0.0906)	M	2.50 (0.0984)
J	2.35 (0.0925)	N	2.55 (0.1004)
K	2.40 (0.0945)	P	2.60 (0.1024)
L	2.45 (0.0965)	–	–

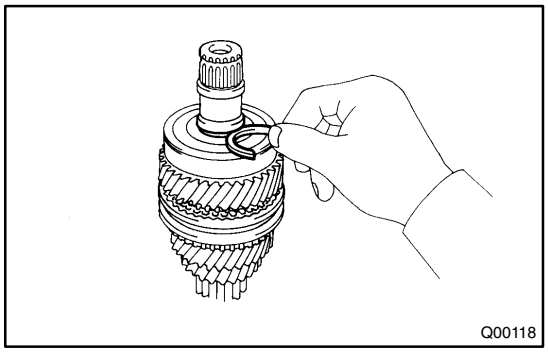
(b) Using a screwdriver and hammer, tap in the snap ring.

4. MEASURE 3RD GEAR THRUST CLEARANCE
(See page MX–24)



5. INSTALL SPACER, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, 4TH GEAR AND REAR BALL BEARING

(a) Install the spacer.
(b) Apply MP grease to the needle roller bearings.
(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.
(d) Install the 4th gear.
(e) Using SST and a press, install the rear ball bearing.
SST 09506–35010



6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	2.35 (0.0925)	5	2.55 (0.1004)
2	2.40 (0.0945)	6	2.60 (0.1024)
3	2.45 (0.0965)	7	2.65 (0.1043)
4	2.50 (0.0984)	8	2.70 (0.1063)

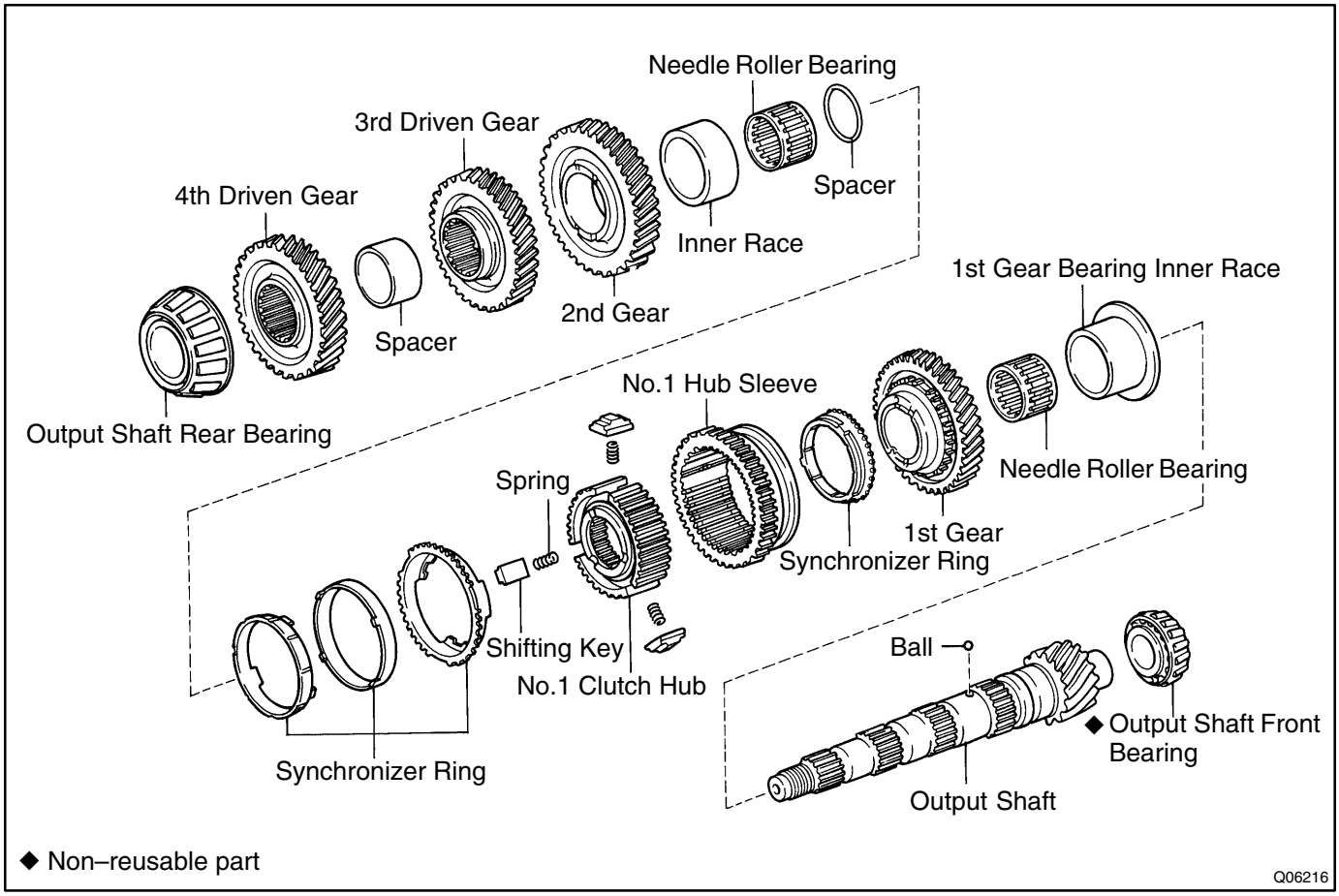
(b) Using a screwdriver and hammer, tap in the snap ring.

7. MEASURE 4TH GEAR THRUST CLEARANCE
(See page MX–24)

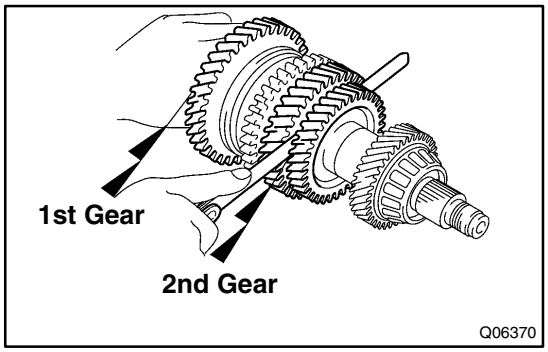
OUTPUT SHAFT

COMPONENTS

MX02C–03



MX02D–04

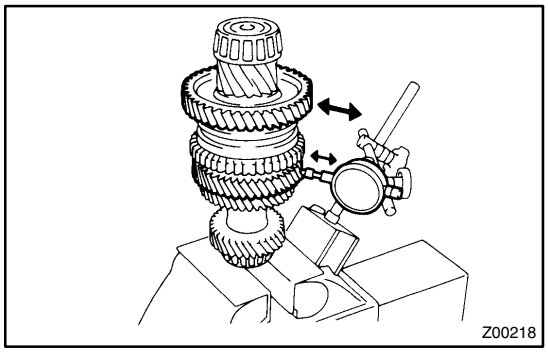


DISASSEMBLY

1. MEASURE 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:
1st gear: 0.10 – 0.35 mm (0.0039 – 0.0138 in.)
2nd gear: 0.10 – 0.45 mm (0.0039 – 0.0177 in.)
Maximum clearance:
1st gear: 0.40 mm (0.0157 in.)
2nd gear: 0.50 mm (0.0197 in.)

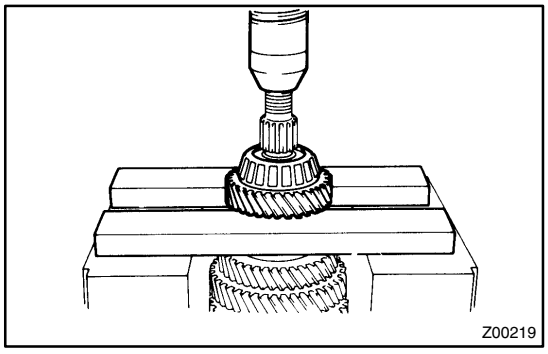


2. CHECK 1ST AND 2ND GEARS RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the gear and shaft.

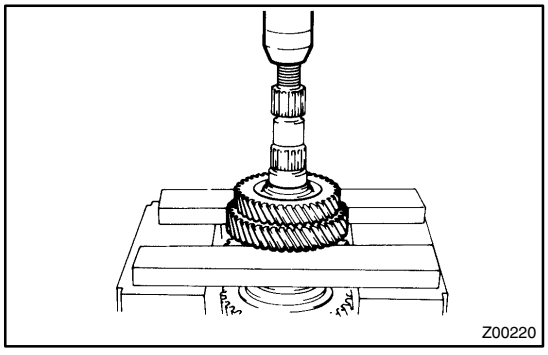
Standard clearance:
1st gear: 0.009 – 0.051 mm (0.0004 – 0.0020 in.)
2nd gear: 0.009 – 0.053 mm (0.0004 – 0.0021 in.)
Maximum clearance:
1st and 2nd gears: 0.070 mm (0.0028 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE OUTPUT SHAFT REAR BEARING, 4TH DRIVEN GEAR AND SPACER

(a) Using a press, remove the bearing and 4th driven gear.
(b) Remove the spacer.

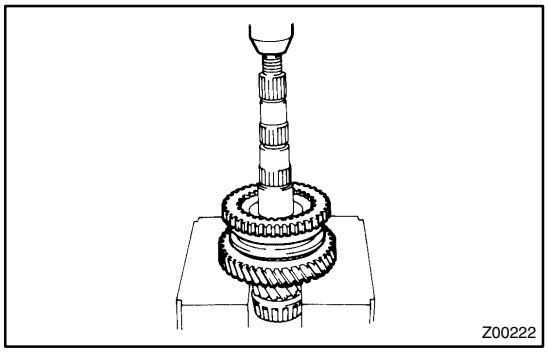


4. REMOVE 3RD DRIVEN GEAR AND 2ND GEAR

Using a press, remove the 3rd driven gear and 2nd gear.

5. REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING

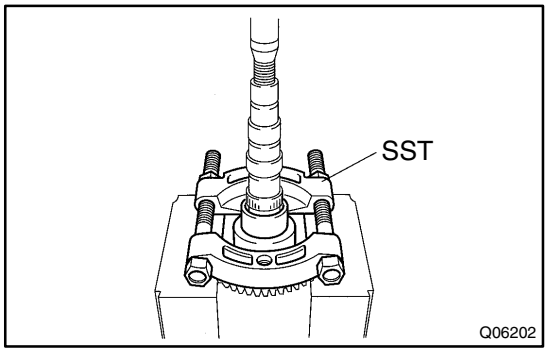
6. REMOVE INNER RACE AND BALL FROM OUTPUT SHAFT



7. REMOVE NO.1 HUB SLEEVE ASSEMBLY AND 1ST GEAR

Using a press, remove the No.1 hub sleeve and 1st gear.

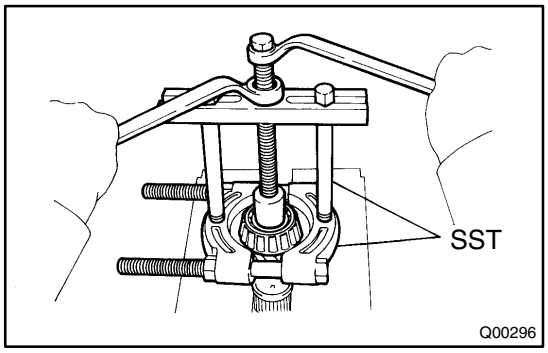
8. REMOVE SYNCHRONIZER RING AND NEEDLE ROLLER BEARING



9. REMOVE 1ST GEAR BEARING INNER RACE

Using SST and a press, remove the 1st gear bearing inner race.

SST 09950–00020

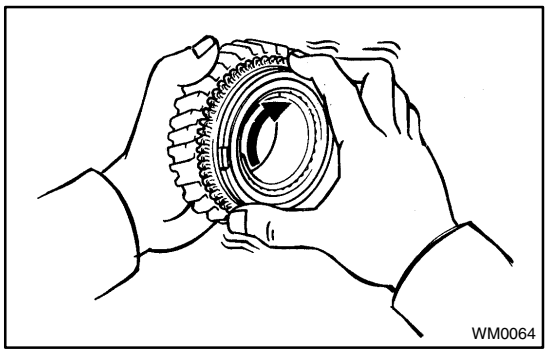


10. REMOVE OUTPUT SHAFT FRONT BEARING

Using SST, remove the output shaft front bearing.

SST 09950–00020, 09950–00030

MX02E–03



INSPECTION

1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

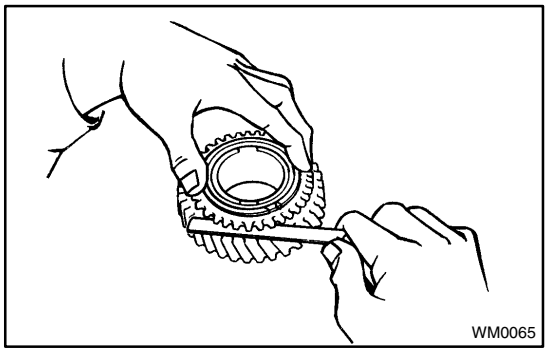
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



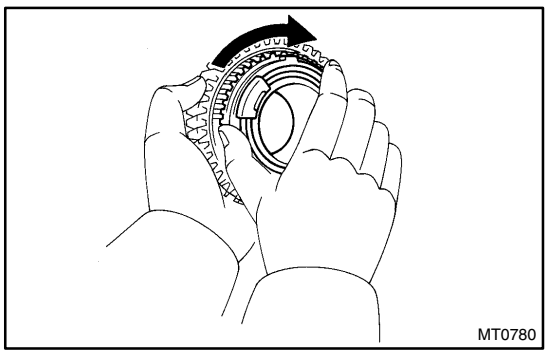
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.8 mm (0.031 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

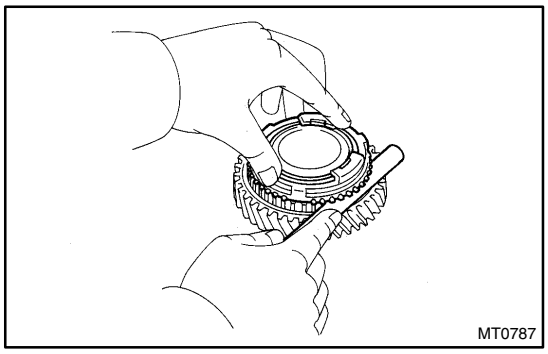


2. INSPECT 2ND GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

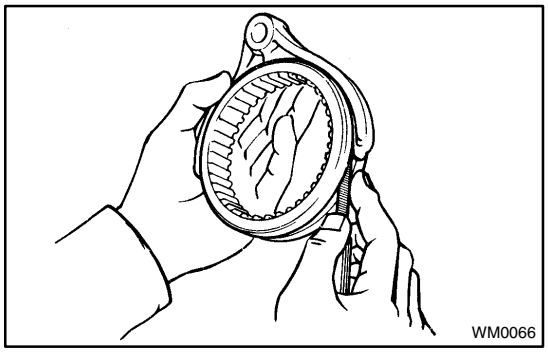
If it does not lock, replace the synchronizer ring.



(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring.

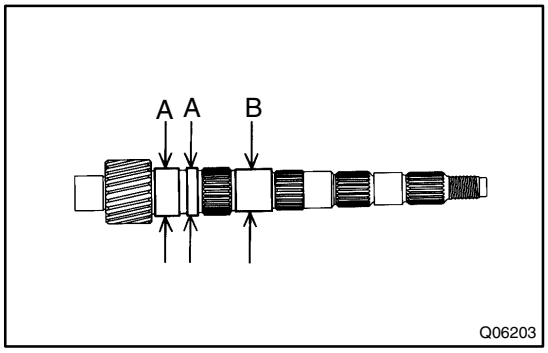


3. MEASURE NO.1 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

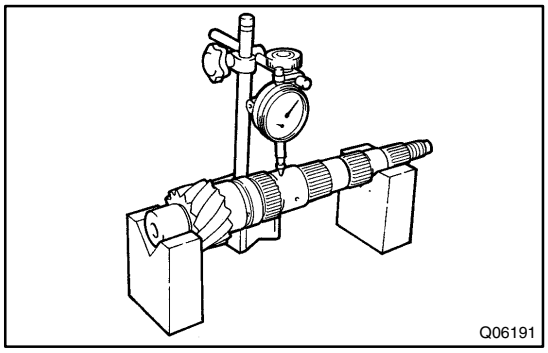


4. INSPECT OUTPUT SHAFT

(a) Check the output shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal surface.

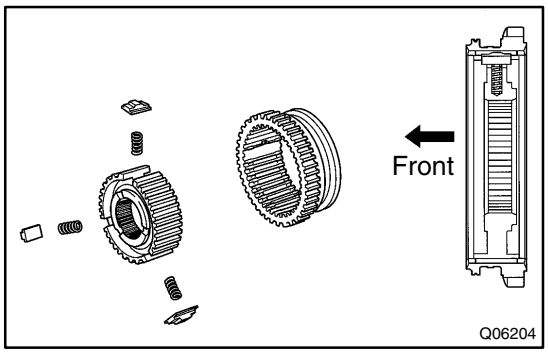
Minimum outer diameter:
Part A: 37.526 mm (1.4774 in.)
Part B: 34.512 mm (1.3588 in.)



(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.06 mm (0.0024 in.)

MX02F–03



REASSEMBLY

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

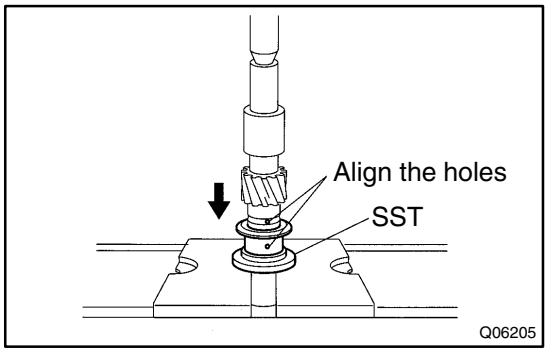
1. INSTALL NO.1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the 3 springs and shifting keys to the clutch hub.

(b) Install the hub sleeve to the clutch hub.

HINT:

Direct identification groove of the hub sleeve to the front of the transmission.



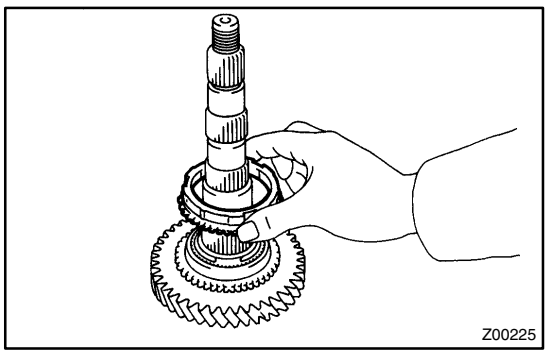
2. INSTALL 1ST GEAR BEARING INNER RACE

Using SST and a press, install the 1st gear bearing inner race.

SST 09506–35010

HINT:

Align the hole of the output shaft and inner race.

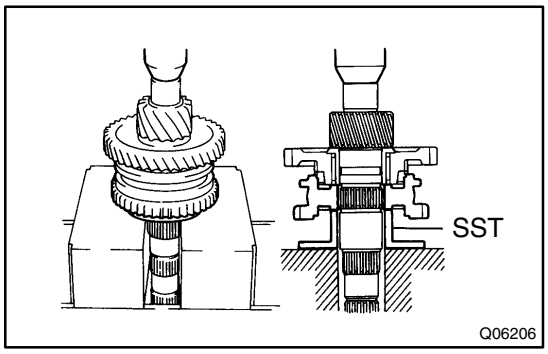


3. INSTALL NEEDLE ROLLER BEARING, 1ST GEAR, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

(a) Apply MP grease to the needle roller bearing.

(b) Install the 1st gear.

(c) Place the synchronizer ring (for the 1st gear) on the gear and align the ring slots with the shifting keys.

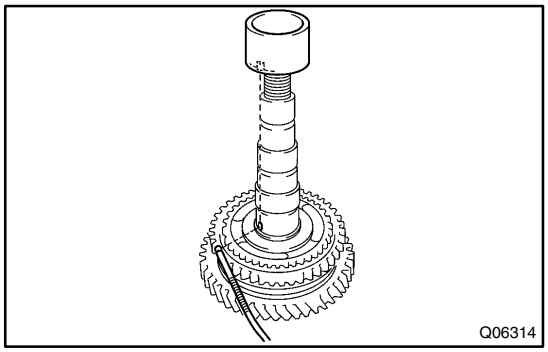


(d) Using SST and a press, install the 1st gear and No.1 hub sleeve.

SST 09316–60011 (09316–00041)

4. MEASURE 1ST GEAR THRUST CLEARANCE

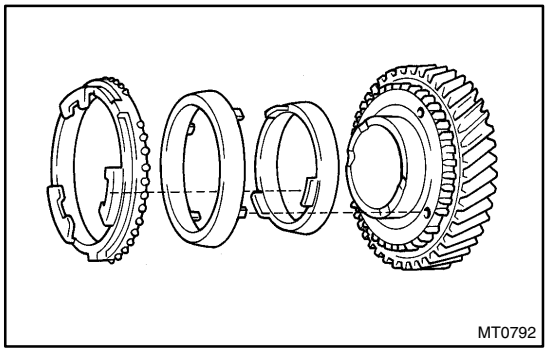
(See page MX–31)


Q06314

5. INSTALL BALL AND INNER RACE TO OUTPUT SHAFT

HINT:

Align the groove of the inner race and ball.


MT0792

6. INSTALL SPACER, NEEDLE ROLLER BEARING, SYNCHRONIZER RING, 2ND GEAR AND 3RD DRIVEN GEAR

(a) Install the spacer.

(b) Apply MP grease to the needle roller bearing.

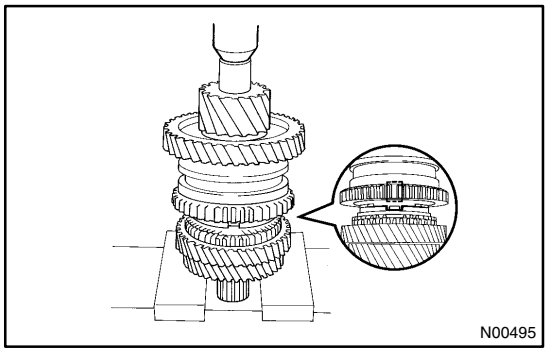
(c) Place the synchronizer rings (for the 2nd gear) on the gear.

NOTICE:

Do not install the synchronizer ring for the 1st gear.

(d) Install the 2nd gear.

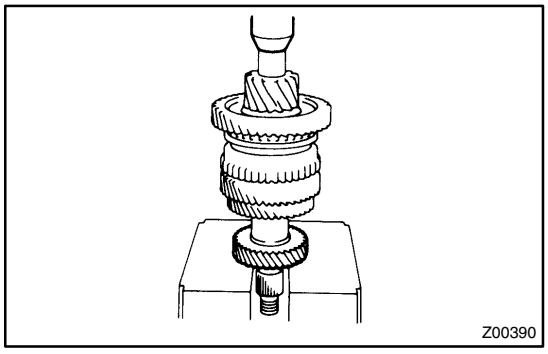
(e) Using a press, install the 3rd driven gear.


N00495

NOTICE:

Align the clutch hub grooves with the projections on the synchronizer ring.

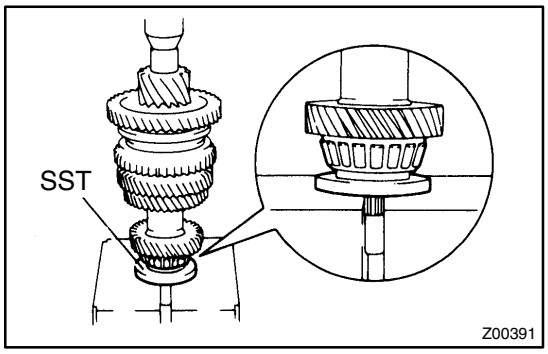
7. MEASURE 2ND GEAR THRUST CLEARANCE
(See page MX–31)


Z00390

8. INSTALL SPACER AND 4TH DRIVEN GEAR

(a) Install the spacer.

(b) Using a press, install the 4th driven gear.

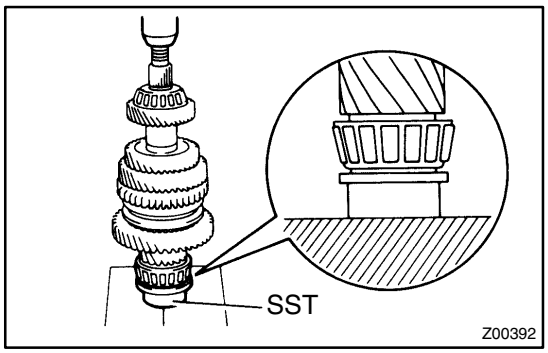


Z00391

9. INSTALL OUTPUT SHAFT REAR BEARING

Using SST and a press, install the bearing.

SST 09506–30012



10. INSTALL OUTPUT SHAFT FRONT BEARING

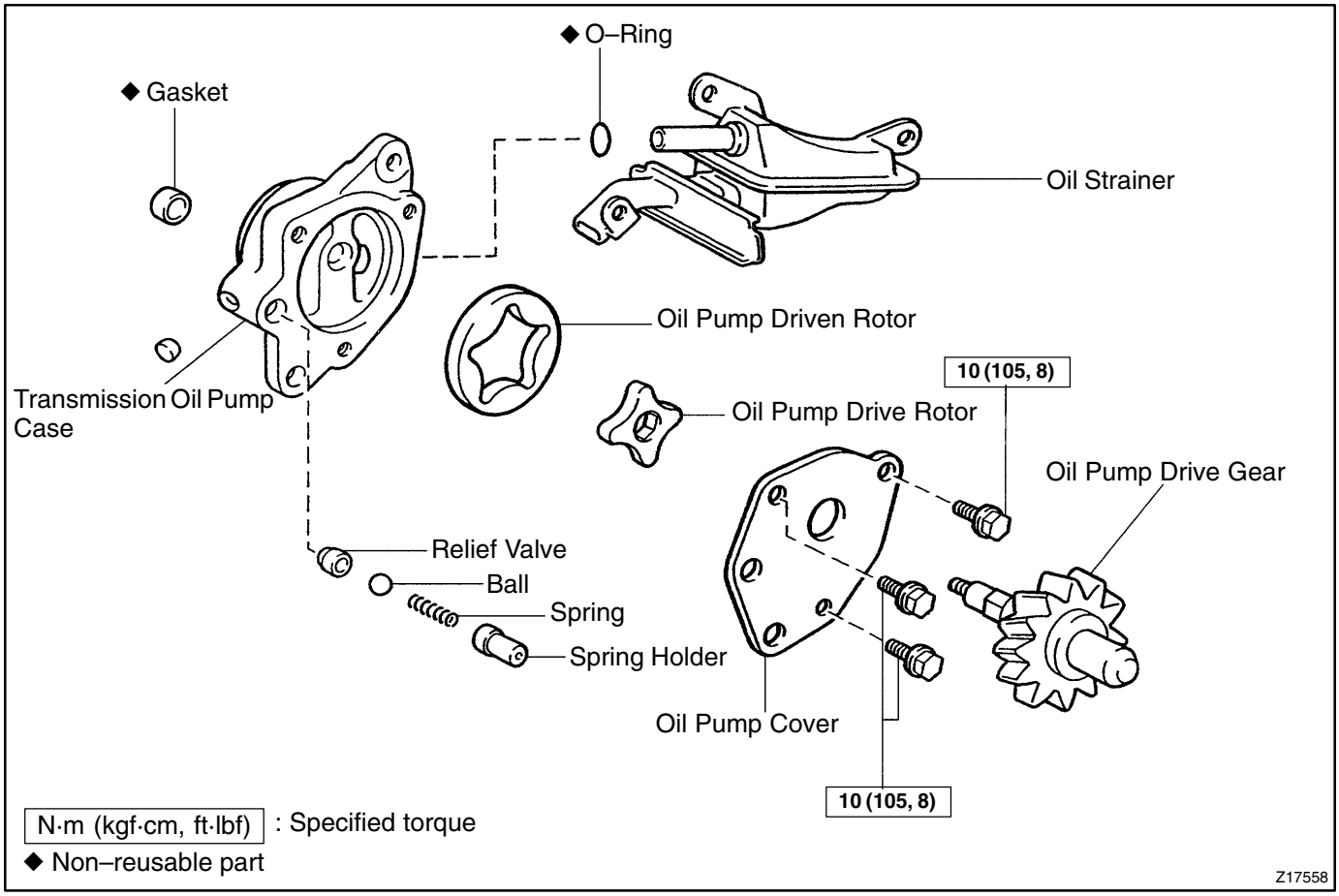
Using SST and a press, install a new output shaft front bearing.

SST 09316–60011 (09316–00071)

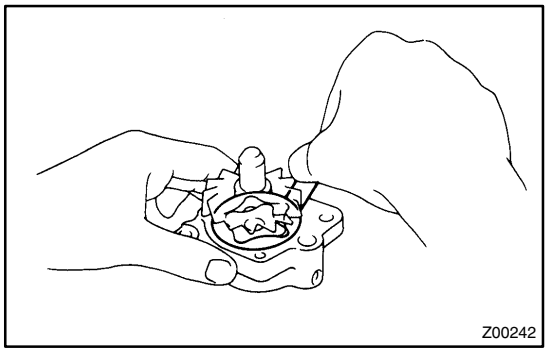
OIL PUMP

COMPONENTS

MX02G–03



MX02H–02



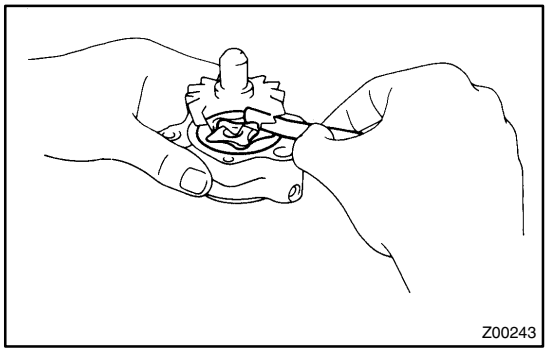
INSPECTION

1. CHECK ROTOR BODY CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

(b) Using a feeler gauge, measure the body clearance between the drive rotor and oil pump case.

Standard clearance:
0.10 – 0.16 mm (0.0039 – 0.0063 in.)
Maximum clearance:
0.30 mm (0.0118 in.)

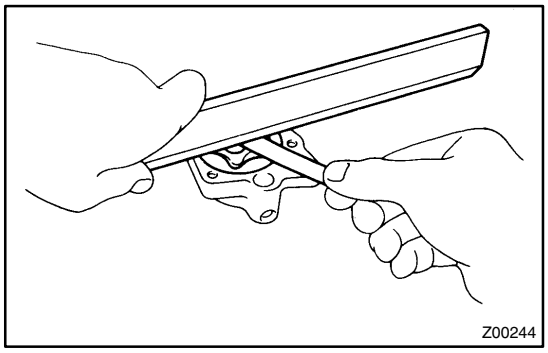


2. CHECK ROTOR TIP CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

(b) Using a feeler gauge, measure the tip clearance between the drive and driven rotors.

Standard clearance:
0.08 – 0.15 mm (0.0031 – 0.0059 in.)
Maximum clearance:
0.30 mm (0.0118 in.)



3. CHECK SIDE CLEARANCE

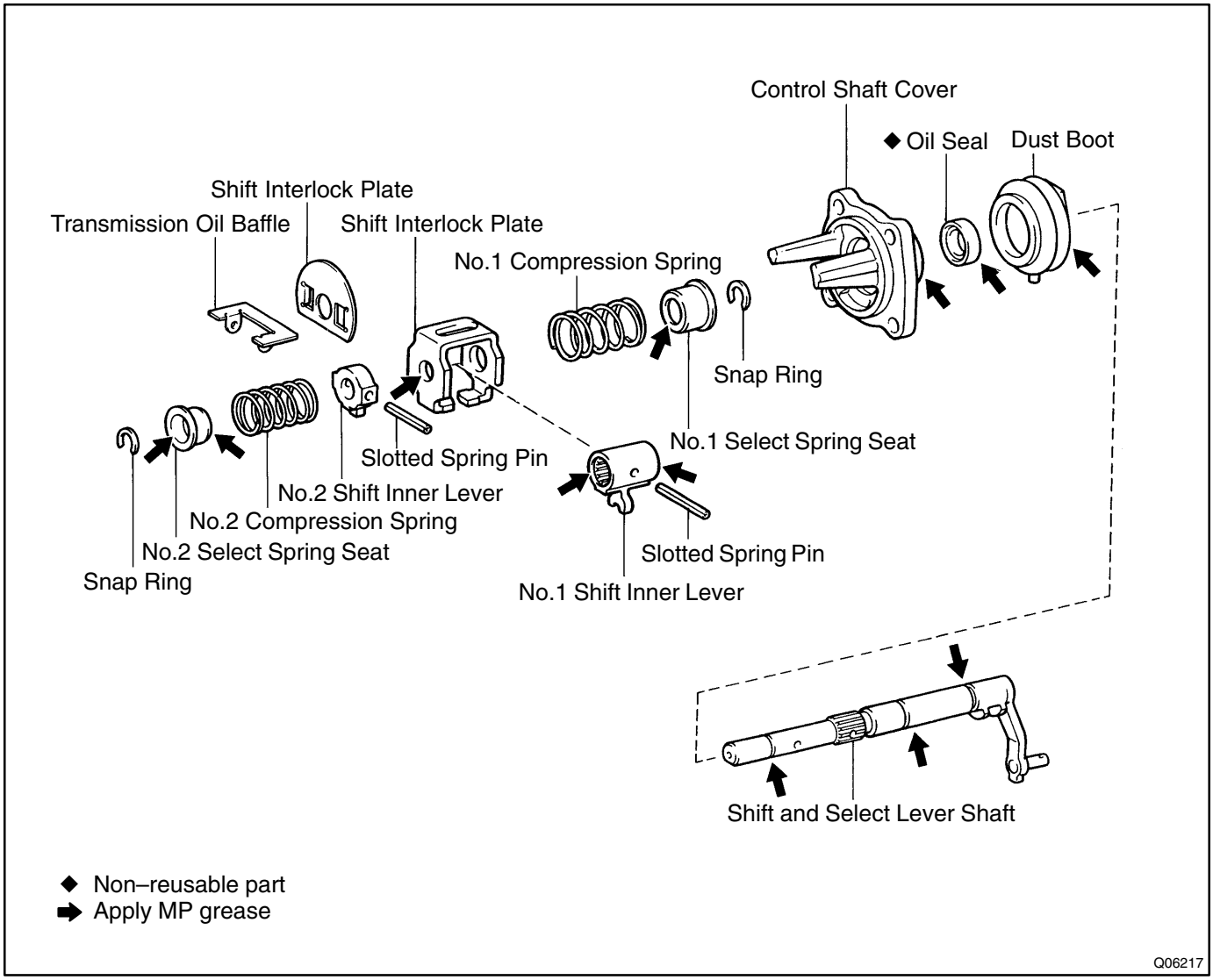
Using a precision straight edge and feeler gauge, measure the side clearance of both rotors.

Standard clearance:
0.03 – 0.08 mm (0.0012 – 0.0031 in.)
Maximum clearance:
0.15 mm (0.0059 in.)

SHIFT AND SELECT LEVER SHAFT

COMPONENTS

MX02I–03



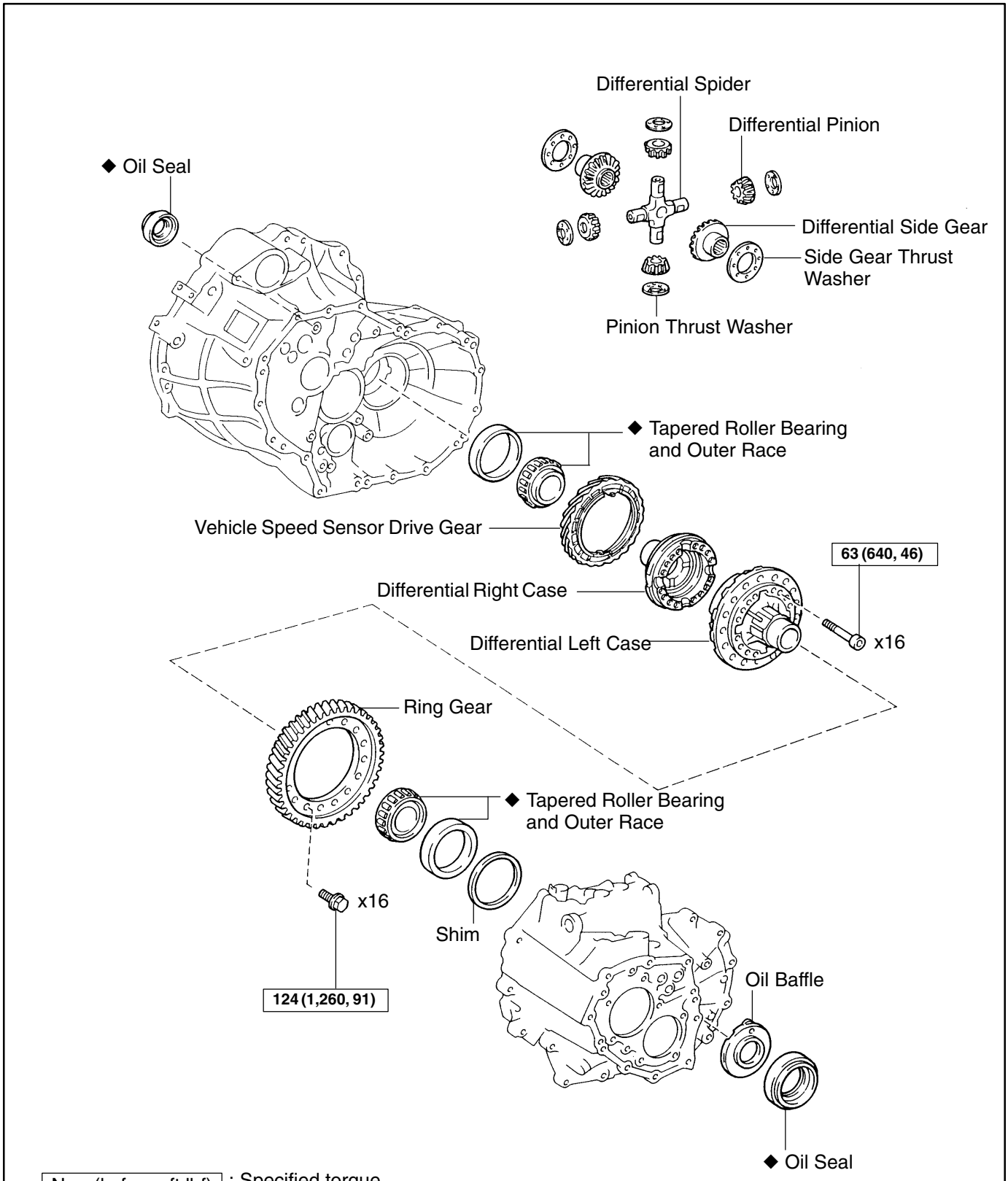
◆ Non–reusable part
➡ Apply MP grease

Q06217

DIFFERENTIAL CASE

COMPONENTS

MX060–02



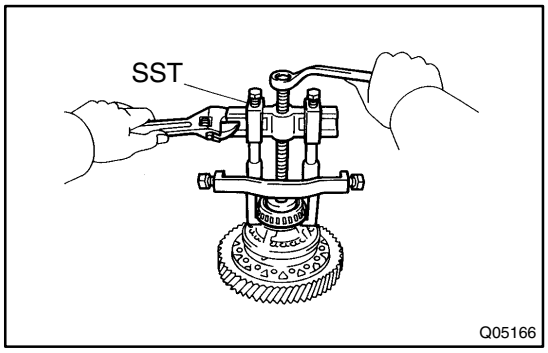
MX09A–01

DISASSEMBLY

NOTICE:

When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non–residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**



1. REMOVE TAPERED ROLLER BEARING

Using SST, remove the left and right bearings.

SST 09950–40011

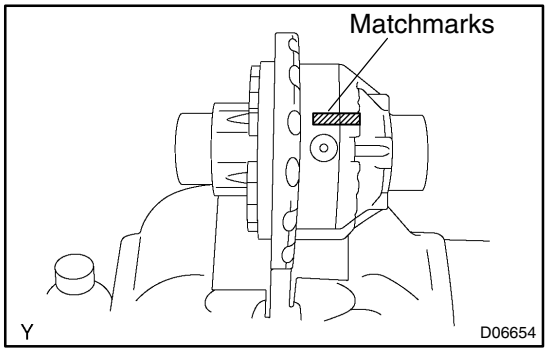
2. REMOVE VEHICLE SPEED SENSOR DRIVE GEAR FROM DIFFERENTIAL RIGHT CASE

3. REMOVE RING GEAR

(a) Place matchmarks on both the differential case and ring gear.

(b) Remove the 16 bolts.

(c) Using a plastic hammer, tap the ring gear and remove it.

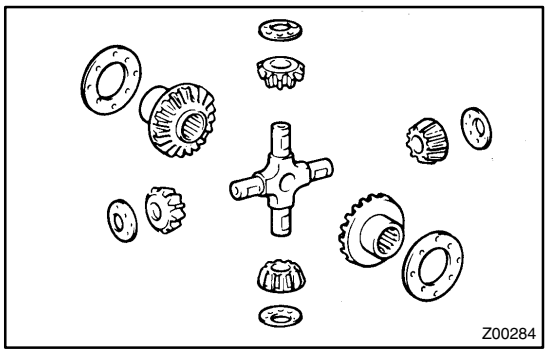


4. DISASSEMBLE DIFFERENTIAL CASE

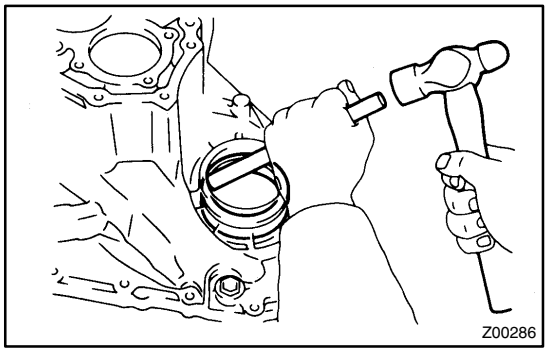
(a) Place matchmarks on the differential right and left cases.

(b) Using a torx wrench (T50), remove the 16 torx screws.

(c) Using a plastic hammer, tap the differential left case.



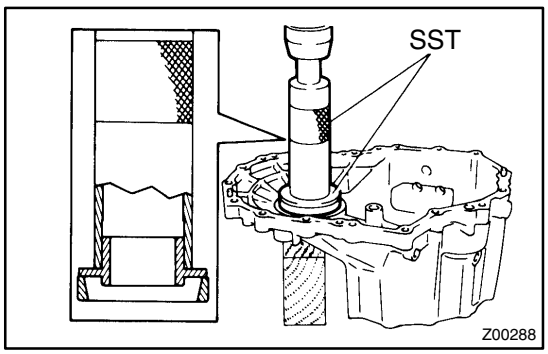
(d) Remove the 2 differential side gears, side gear thrust washers, 4 differential pinions and pinion thrust washers from the differential left case.



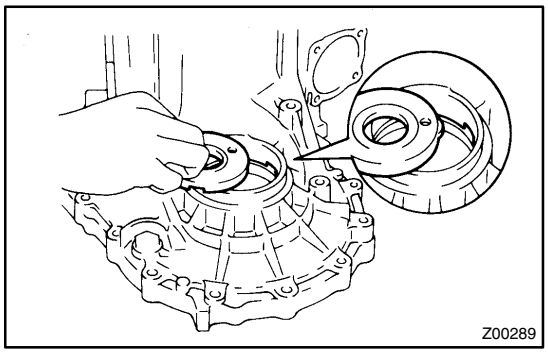
5. Transmission Case Side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

(a) Using a screwdriver, remove the oil seal.
(b) Remove the oil baffle.
(c) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly.
(d) Remove the shim.
(e) Install the shim.
(See page MX–41)

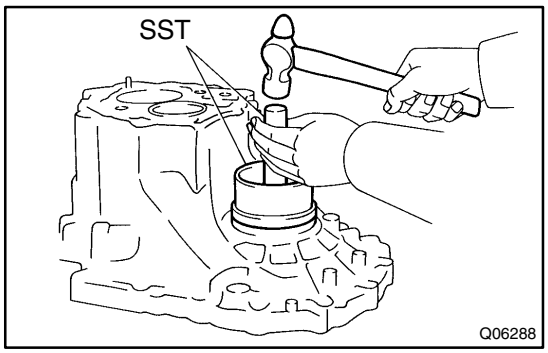
HINT:
First select and install a shim of lesser thickness than before.



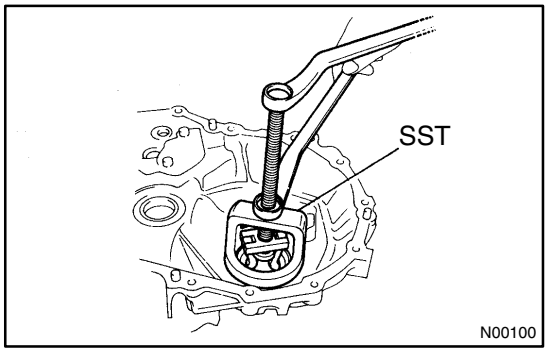
(f) Using SST and a press, install a new tapered roller bearing outer race.
SST 09316–60011 (09316–00011, 09316–00041)



(g) Install the oil baffle.
HINT:
Install the oil baffle projection into the case side cutout.

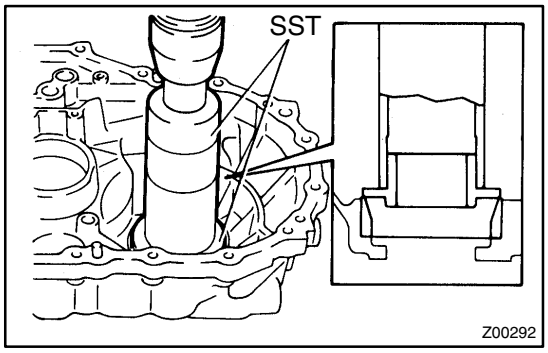


(h) Using SST and a hammer, drive in a new oil seal.
SST 09223–15020, 09950–70010 (09951–07150)
(i) Coat the lip of oil seal with MP grease.

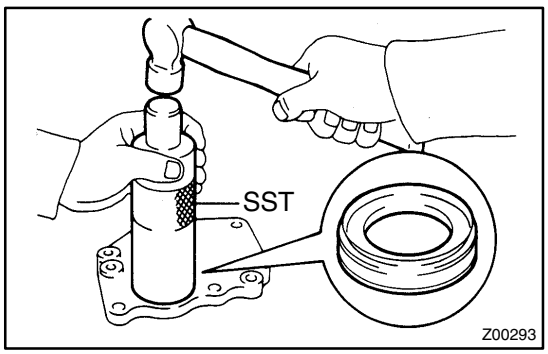


6. Transaxle Case Side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

(a) Using a screwdriver and hammer, drive out the oil seal from the transaxle case.
(b) Using SST, pull out the tapered roller bearing outer race.
SST 09612–65014

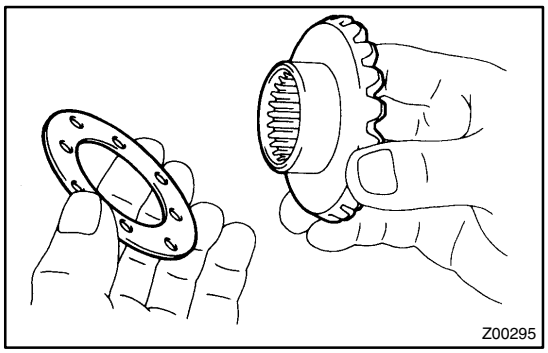


(c) Using SST and a press, install a new tapered roller bearing outer race.
SST 09316–60011 (09316–00011, 09316–00041)



(d) Using SST and a hammer, drive in a new oil seal.
SST 09316–60011 (09316–00011)
(e) Coat the oil seal lip with MP grease.

MX09B–01


Z00295

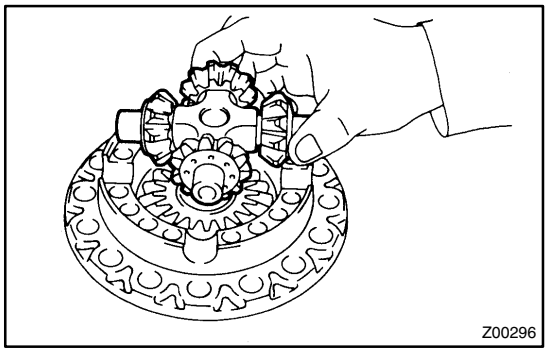
REASSEMBLY

HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

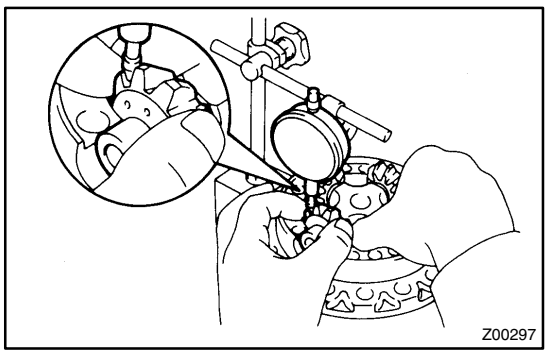
1. ASSEMBLE DIFFERENTIAL CASE

(a) Install the thrust washer to the side gear.
(b) Install the 4 pinions and thrust washers to the spider.
(c) Install the side gear and spider with the 4 pinions to the differential left case.
(d) Using a dial indicator, measure the backlash of the pinion gear while holding the differential left case.
Standard backlash: 0.05 – 0.20 mm (0.0020 – 0.0079 in.)

HINT:
Push the pinion gear and spider with the 4 pinions to the differential left case.

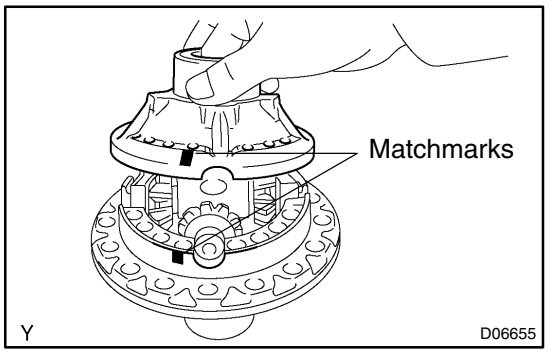

Z00296

(e) Install the side gear and spider with the 4 pinions to the right side of the differential case. Check the side gear backlash.


Z00297

(f) Refer to the table below, select the thrust washer which will ensure that the backlash is within the specification. Try to select a washer of the same size.

Thickness mm (in.)	Thickness mm (in.)
0.80 (0.0315)	1.20 (0.0472)
0.90 (0.0354)	1.30 (0.0512)
1.00 (0.0394)	1.40 (0.0551)
1.10 (0.0433)	–



D06655

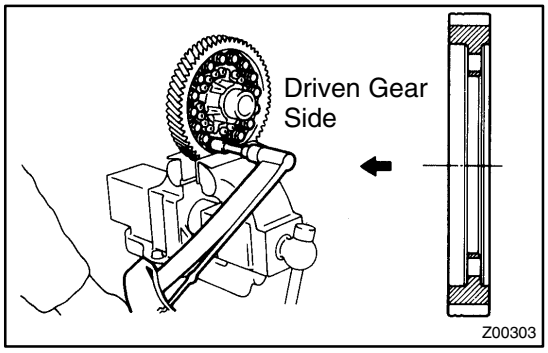
(g) Align the matchmarks on the differential cases.
(h) Using a plastic hammer, carefully tap the differential case to install it.
(i) Using a torx wrench (T50), install and torque the 16 torx screws.
Torque: 63 N·m (640 kgf·cm, 46 ft·lbf)

2. INSTALL RING GEAR

(a) Clean the contact surface of the differential case and the threads of the ring gear and differential case.

(b) Heat the ring gear to about 100°C (212°F) in boiling water.
(c) Carefully take the ring gear out of the water.
(d) Clean the contact surface of the ring gear with cleaning solvent.
(e) Quickly install the ring gear on the differential case.

HINT:
Align the matchmarks on the differential left case and contact the ring gear.

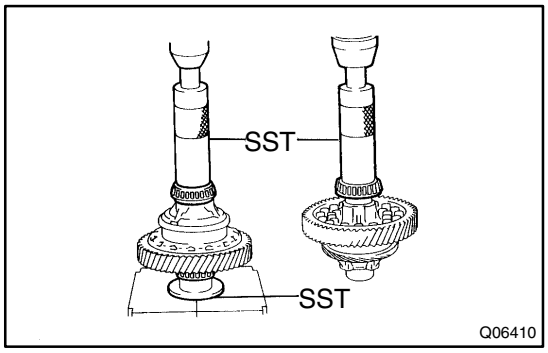


(f) Temporarily install the 16 bolts.

NOTICE:
The ring gear set bolts should not be tightened until the ring gear has cooled sufficiently.

(g) After the ring gear has cooled sufficiently, torque the ring gear set bolts.
Torque: 124 N·m (1,260 kgf·cm, 91 ft·lbf)

3. INSTALL VEHICLE SPEED SENSOR DRIVE GEAR



4. INSTALL TAPERED ROLLER BEARING

Using SST and a press, install new left and right bearings onto the differential case.
SST 09316–20011, 09316–60011 (09316–00011)

HINT:
Press the bearing on the ring side first.

5. ADJUST OUTPUT SHAFT ASSEMBLY PRELOAD (See page MX–21)

6. INSTALL DIFFERENTIAL CASE ASSEMBLY TO TRANSAXLE CASE

7. INSTALL OUTPUT SHAFT ASSEMBLY

Lift up the differential case and install the output shaft assembly.

8. INSTALL TRANSMISSION CASE

(a) Install the transmission case.

HINT:
If necessary, tap on the case with a plastic hammer.

(b) Install and torque the 17 bolts.
Torque: 29 N·m (300 kgf·cm 22 ft·lbf)

9. INSTALL OUTPUT SHAFT REAR TAPERED ROLLER BEARING OUTER RACE

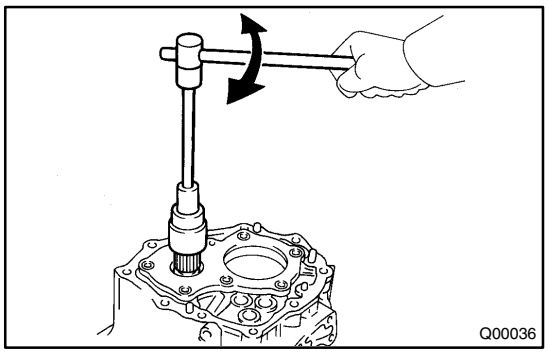
Using a plastic hammer, drive in the outer race.

10. INSTALL SHIM (See page MX–21)

HINT:
Install the previously selected shim.

11. INSTALL REAR BEARING RETAINER

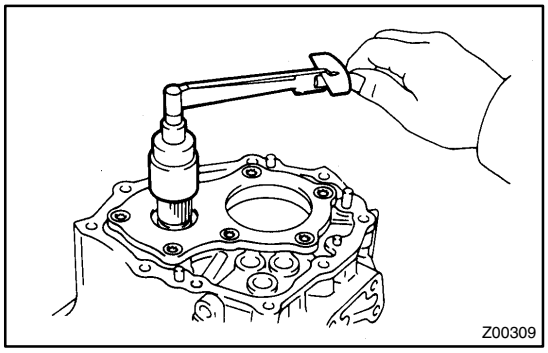
Using a torx wrench (T45), install and torque the 7 torx screws.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



12. ADJUST DIFFERENTIAL CASE SIDE BEARING PRELOAD

(a) Install a new lock nut to the output shaft.

(b) Turn the output shaft right and left 2 or 3 times to allow the bearings to settle.



(c) Using a torque wrench, measure the preload.

Preload (at starting):
New bearing (Output shaft preload plus)
0.2 – 0.3 N·m (1.8 – 3.5 kgf·cm, 1.6 – 3.0 in.·lbf)
Reused bearing (Output shaft preload plus)
0.1 – 0.2 N·m (1.1 – 2.2 kgf·cm, 1.0 – 1.9 in.·lbf)

If the preload is not within the specification, select an appropriate adjusting shim.

HINT:

The total preload will change by about 0.1 – 0.2 N·m (1 – 2 kgf·cm, 0.9 – 1.7 in.·lbf) with each 0.05 mm change in adjusting shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)

13. REMOVE REAR BEARING RETAINER

Using a torx wrench (T45), remove the 7 torx screws and rear bearing retainer.

14. REMOVE SHIM

15. REMOVE TRANSMISSION CASE

(a) Remove the 17 bolts.

(b) Using a plastic hammer, tap the transmission case.

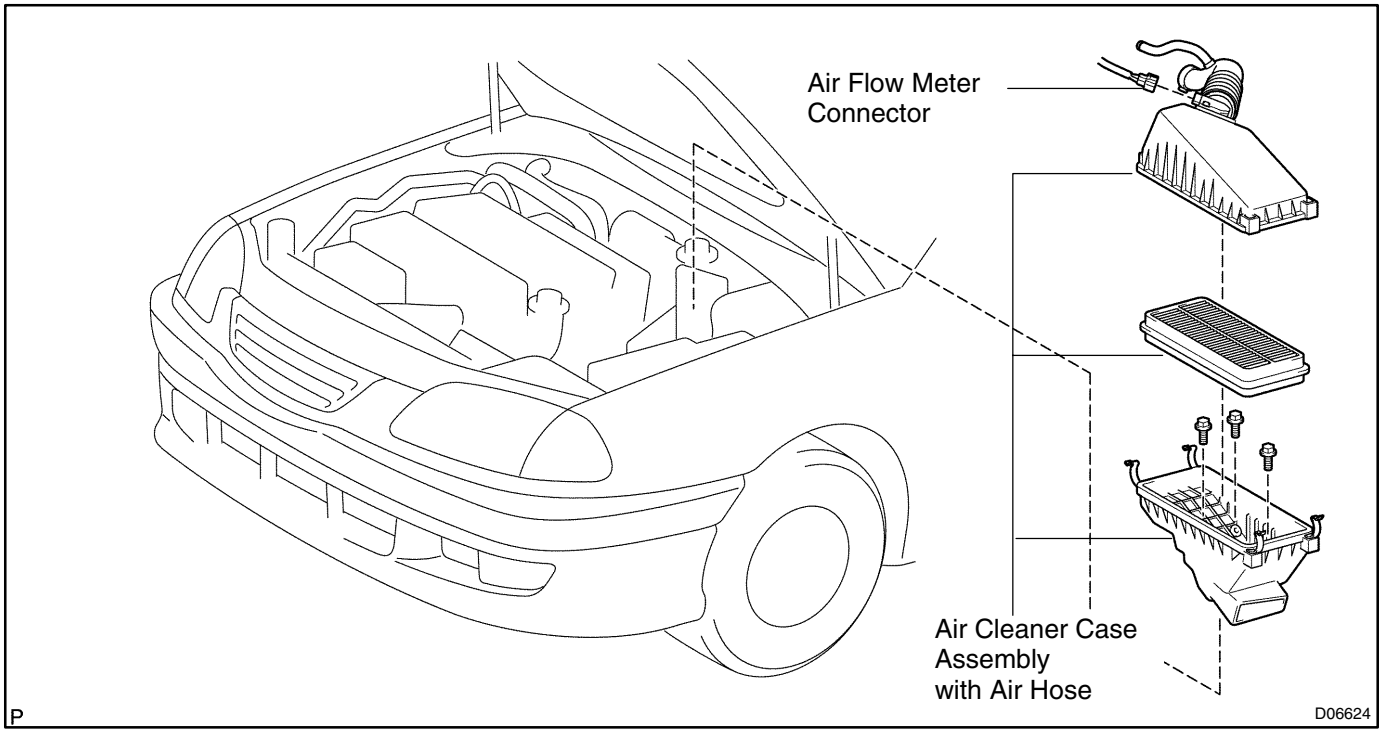
16. REMOVE OUTPUT SHAFT ASSEMBLY

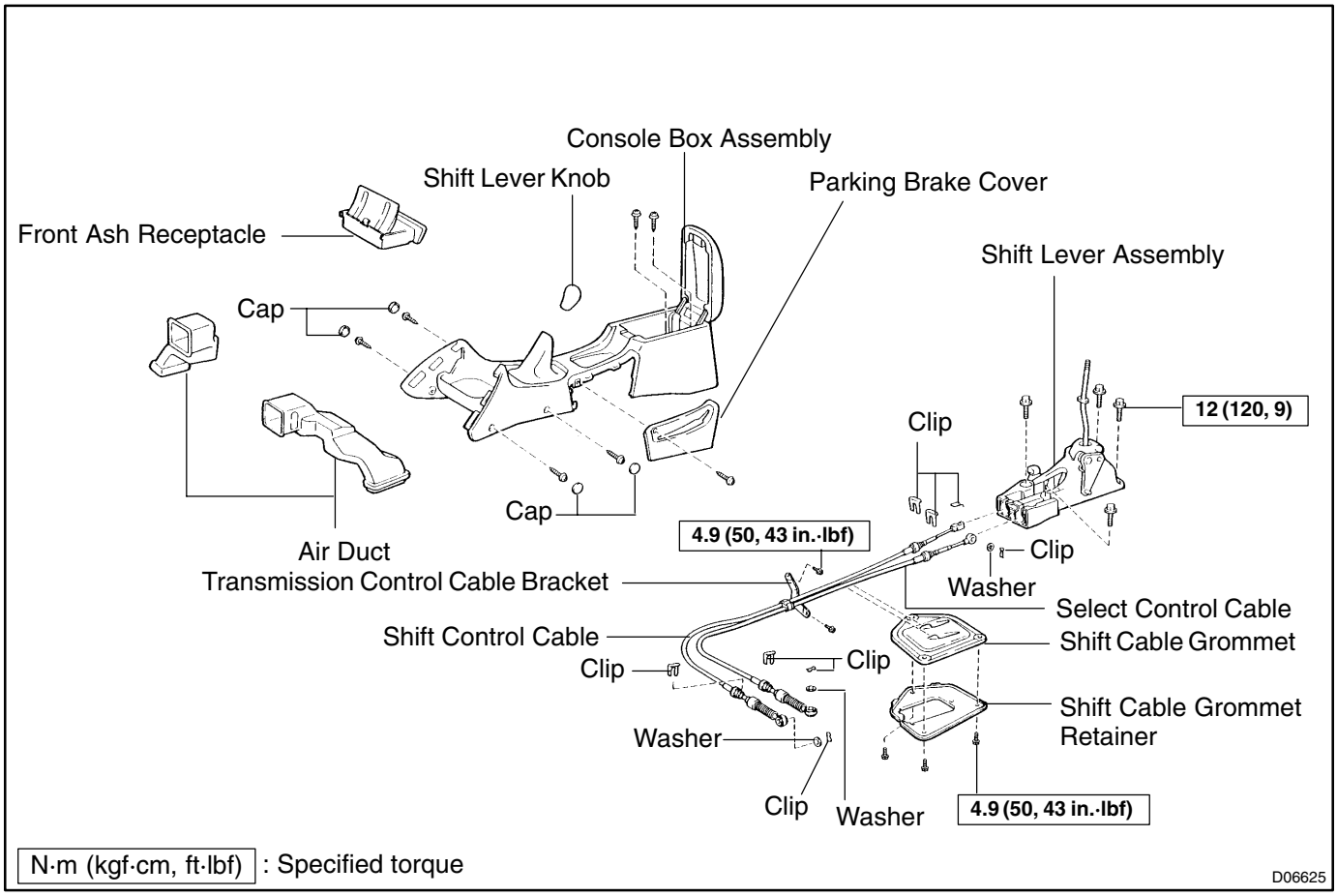
17. REMOVE DIFFERENTIAL CASE ASSEMBLY

SHIFT LEVER AND CONTROL CABLE

COMPONENTS

MX09C–01





SUSPENSION AND AXLE

FRONT DRIVE SHAFT SA–1

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

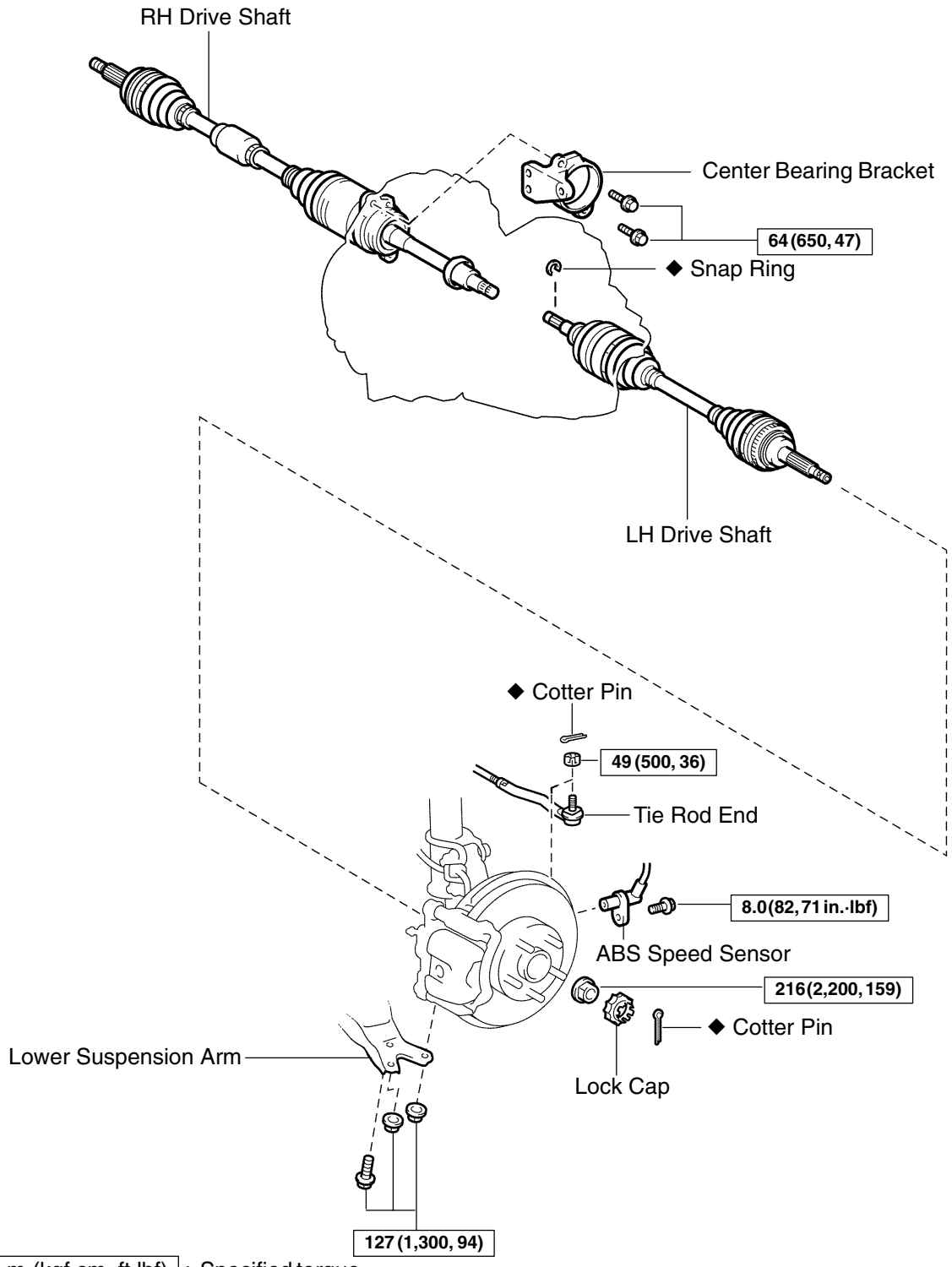
NOTE: The above pages contain only the points which differ from the above listed manual.

FRONT DRIVE SHAFT

COMPONENTS

SA109–02

1CD–FTV Engine



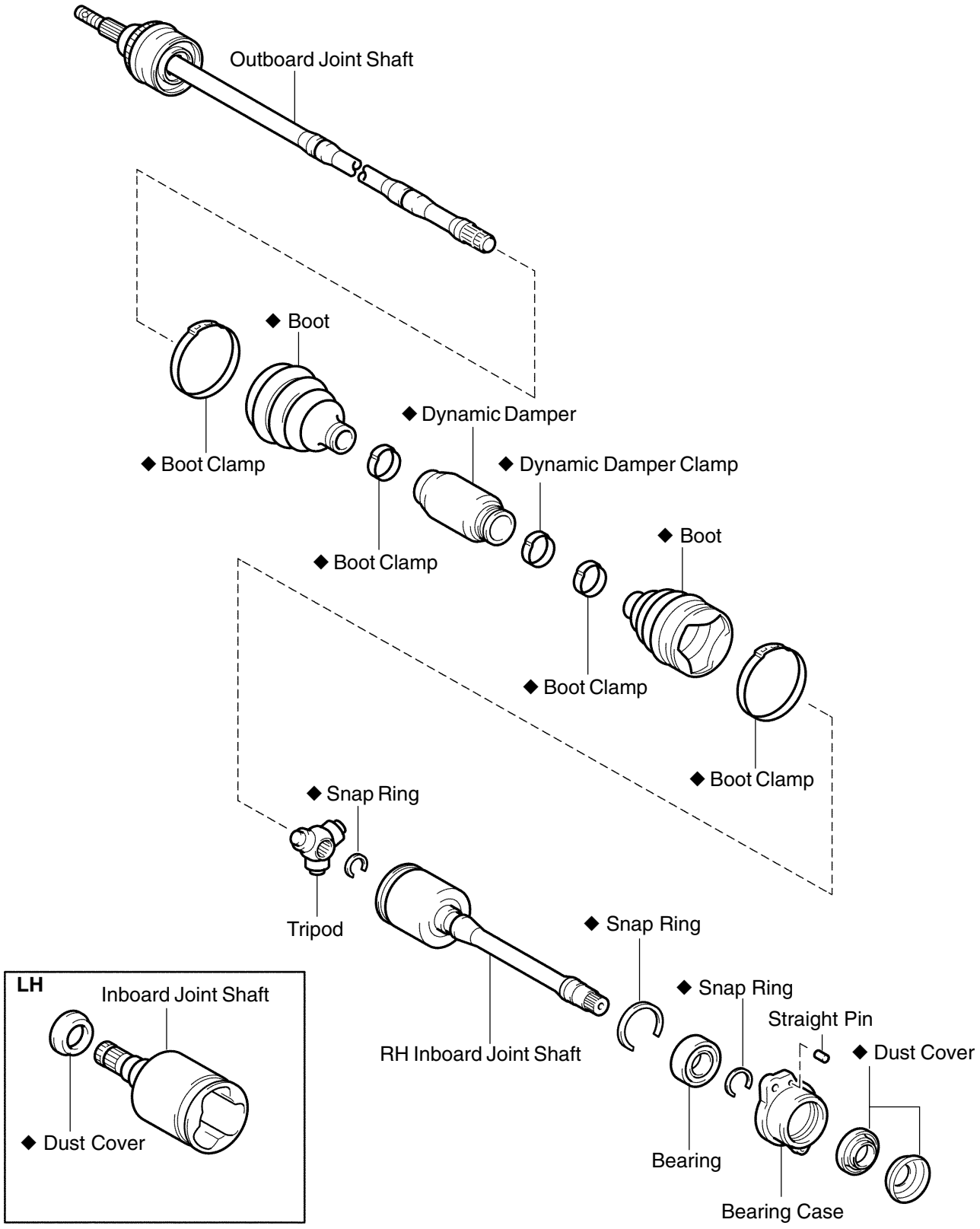
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

P

F08959

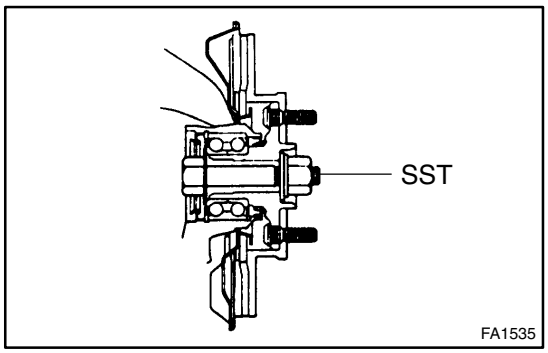
1CD–FTV Engine



◆ Non–reusable part

F08949

SA10A–02



REMOVAL

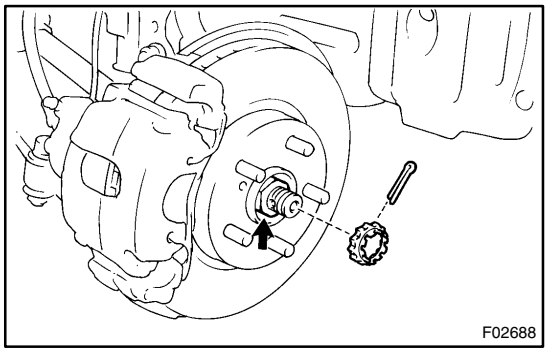
NOTICE:

- **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 the SST.
  SST 09608–16042 (09608–02021, 09608–02041)
- **w/ ABS:**
  After disconnecting the drive shaft from the axle hub, work carefully so as not to damage the ABS speed sensor rotor serration on the drive shaft.

1. REMOVE FRONT WHEEL

2. DRAIN OUT GEAR OIL

3. w/ ABS:
REMOVE BOLT AND ABS SPEED SENSOR



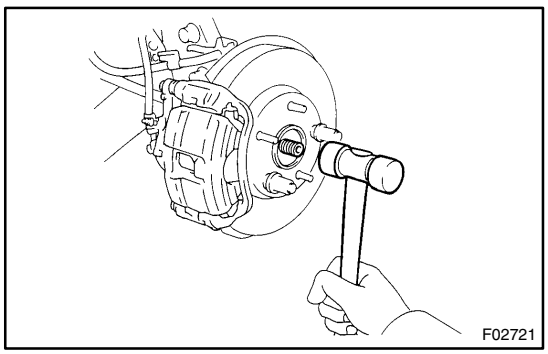
4. REMOVE DRIVE SHAFT LOCK NUT

(a) Remove the cotter pin and lock cap.

(b) While applying the brakes, remove the nut.

5. DISCONNECT TIE ROD END FROM STEERING KNUCKLE (See Pub. No. RM599E on page SA–11)

6. DISCONNECT LOWER BALL JOINT FROM LOWER SUSPENSION ARM (See Pub. No. RM599E on page SA–11)



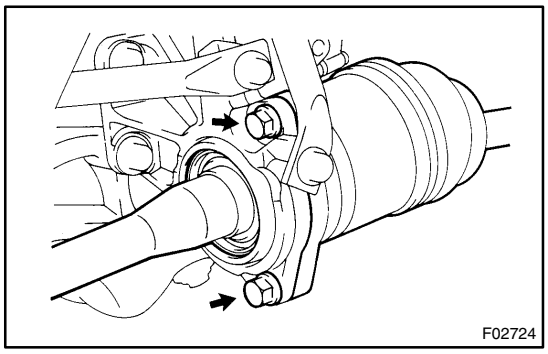
7. DISCONNECT DRIVE SHAFT FROM AXLE HUB

(a) Using a plastic hammer, disconnect the drive shaft from the axle hub.

NOTICE:

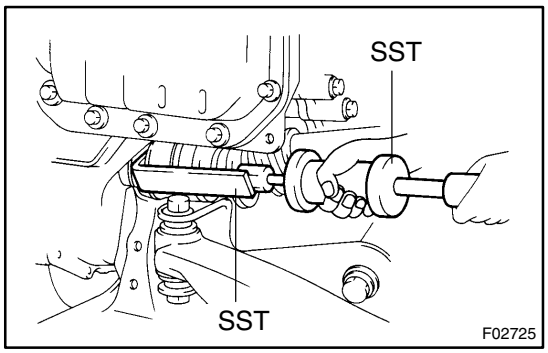
Cover the drive shaft boot and ABS speed sensor rotor with cloth to protect it from being damaged.

(b) Push the front axle hub toward the outside of the vehicle to separate the drive shaft from the axle hub.



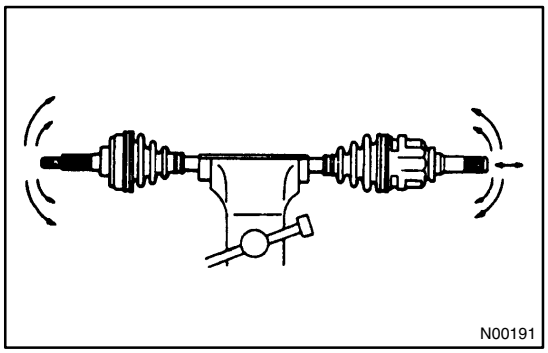
8. REMOVE DRIVE SHAFTS

(a) RH drive shaft:
Remove the 2 bolts and pull out the drive shaft together with the center bearing bracket.



(b) LH drive shaft:
(1) Using SST, remove the drive shaft.
SST 09520–01010, 09520–24010 (09520–32040)
(2) Using a screwdriver, remove the snap ring.

SA10B–02


N00191

DISASSEMBLY

1. CHECK DRIVE SHAFT

(a) Check to see that there is no obvious play in the outboard joint.

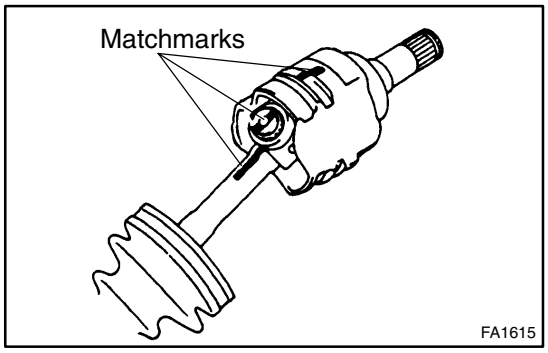
(b) Check to see that the inboard joint slides smoothly in the thrust direction.

(c) Check to see that there is no obvious play in the radial direction of the inboard joint.

(d) Check the boots for damage.

2. REMOVE INBOARD AND OUTBOARD JOINT BOOT CLAMPS

Using a side cutter, cut the 4 boots clamps and remove them.



FA1615

3. REMOVE INBOARD JOINT SHAFT

(a) Place matchmarks on the tripod, inboard and outboard joint shafts.

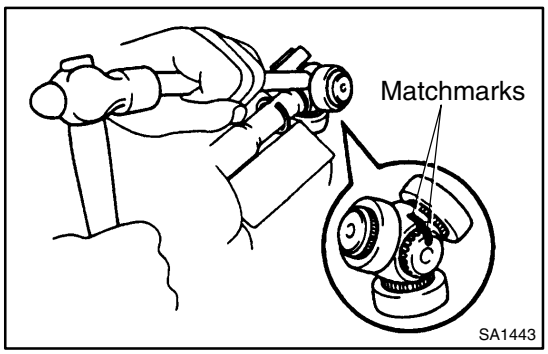
NOTICE:

Do not punch the marks.

(b) Remove the inboard joint shaft from the outboard joint shaft.

4. REMOVE TRIPOD

(a) Using a snap ring expander, remove the snap ring.



SA1443

(b) Place matchmarks on the outboard joint shaft and tripod.

NOTICE:

Do not punch the marks.

(c) Using a brass bar and hammer, remove the tripod from the drive shaft.

NOTICE:

Do not tap the roller.

5. REMOVE INBOARD JOINT BOOT

6. RH drive shaft:
REMOVE DYNAMIC DAMPER

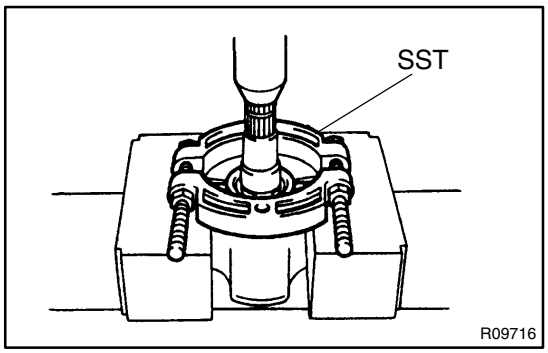
(a) Using a side cutter, cut the dynamic damper clamp and remove it.

(b) Remove the dynamic damper.

7. REMOVE OUTBOARD JOINT BOOT

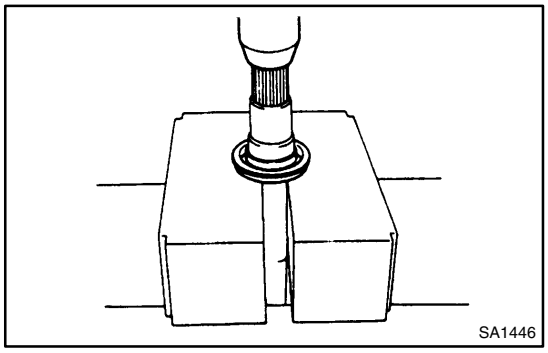
NOTICE:

Do not disassemble the outboard joint.

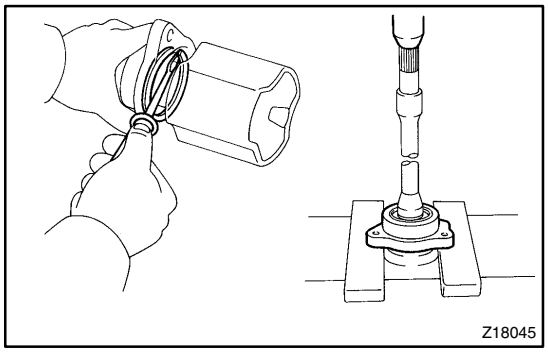


8. REMOVE DUST COVER

(a) LH drive shaft:
Using SST and a press, remove the dust cover from the inboard joint shaft.
SST 09950–00020

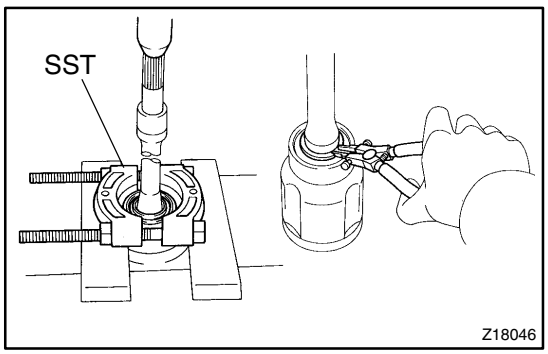


(b) RH drive shaft:
Using a press, remove the dust cover from the inboard joint shaft.

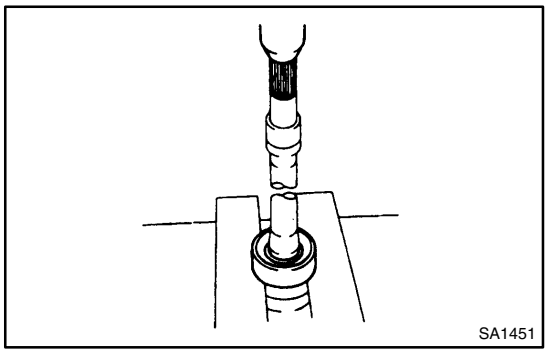


9. RH drive shaft:
DISASSEMBLE INBOARD JOINT SHAFT

(a) Using a screwdriver, remove the snap ring.
(b) Using a press, remove the bearing case.
(c) Using a pin punch and hammer, remove the straight pin from the bearing case.



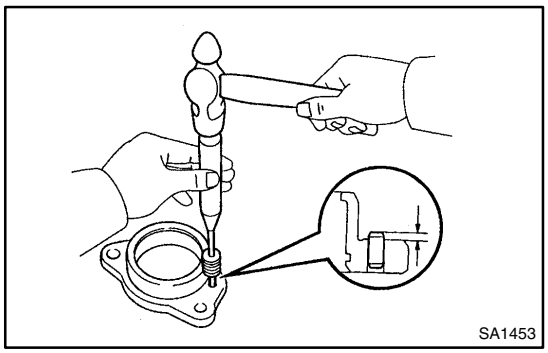
(d) Using SST and a press, remove the dust cover.
SST 09950–00020
(e) Using a snap ring expander, remove the snap ring.



(f) Using a press, remove the bearing.

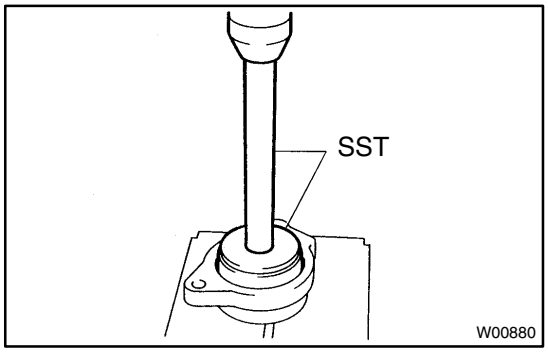
SA10C–02

REASSEMBLY



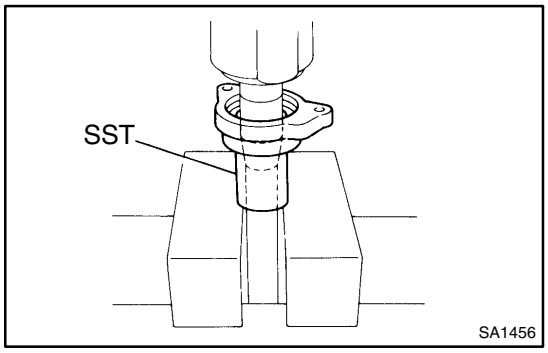
1. RH drive shaft:
ASSEMBLE INBOARD JOINT SHAFT

(a) Using a pin punch and hammer, install the straight pin into the bearing case.



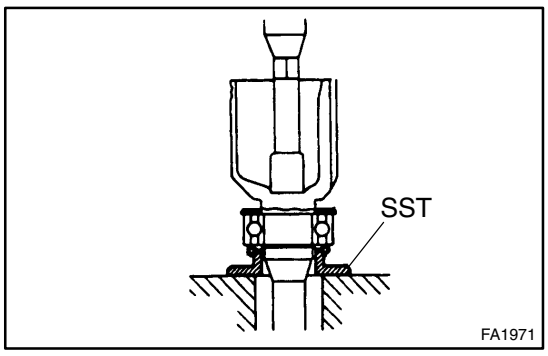
(b) Using SST and a press, install a new bearing into the bearing case.
SST 09950–60020 (09951–00720), 09950–70010 (09951–07150)

(c) Using a screwdriver, install a new snap ring.

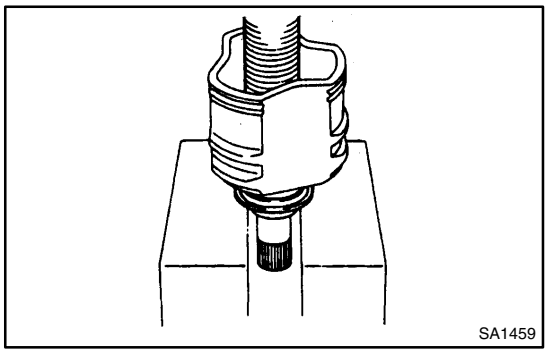


(d) Using SST and a press, install the bearing case assembly to the inboard joint shaft.
SST 09710–30021 (09710–03121)

(e) Using a snap ring expander, install a new snap ring.

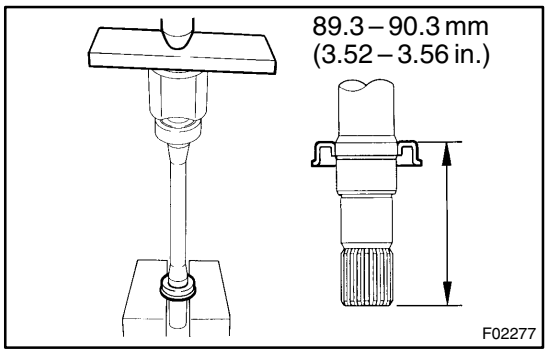


(f) Using SST, an extension bar and press, install a new dust cover.
SST 09316–60011 (09316–00041)

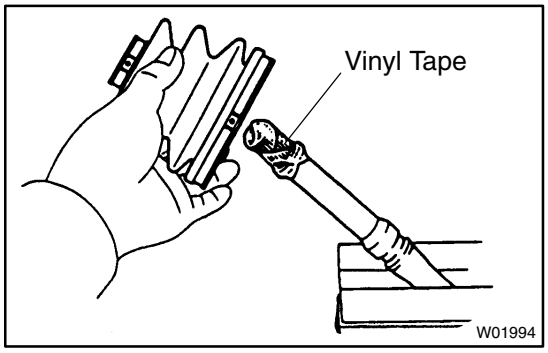


2. INSTALL NEW DUST COVER

(a) LH drive shaft:
Using a press, install a new dust cover.



(b) RH drive shaft:
Using a steel plate and 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.



3. TEMPORARILY INSTALL NEW OUTBOARD AND INBOARD JOINT BOOTS WITH NEW BOOT CLAMPS

HINT:

- Before installing the boots (and dynamic damper), wrap the spline of the outboard joint shaft with vinyl tape to prevent them from being damaged.
- Before installing the boots (and dynamic damper), place new clamps to each of them and then install boots to drive shaft.

(a) Temporarily install a new outboard joint boot with 2 clamps to the drive shaft.
(b) Temporarily install the dynamic damper with clamp to the drive shaft.
(c) Temporarily install a new inboard joint boot with 2 clamps to the drive shaft.

4. INSTALL TRIPOD

(a) Place the beveled side of the tripod axial spline toward the outboard joint.
(b) Align the matchmarks placed before removal.
(c) Using a brass bar and hammer, tap in the tripod to the drive shaft.

NOTICE:
Do not tap the roller.

(d) Using a snap ring expander, install a new snap ring.

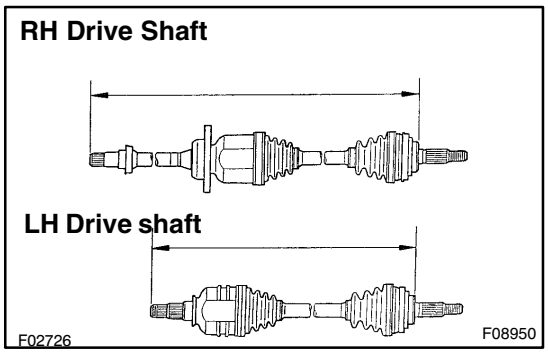
5. INSTALL BOOT TO OUTBOARD JOINT

Before assembling the boot, pack the outboard joint shaft and boot with grease in the boot kit.

Grease capacity: (Color = Black)
85 – 105 g (3.00 – 3.70 oz.)

6. INSTALL INBOARD JOINT SHAFT TO OUTBOARD JOINT SHAFT

(a) Pack the inboard joint shaft and boot with grease in the boot kit.
Grease capacity: (Color = Yellow)
120 – 130 g (4.23 – 4.59 oz.)
(b) Align the matchmarks placed before removal.
(c) Install the inboard joint shaft to the outboard joint shaft.
(d) Temporarily install the boot to the inboard joint shaft.



7. ASSEMBLE BOOT CLAMPS TO BOTH BOOTS

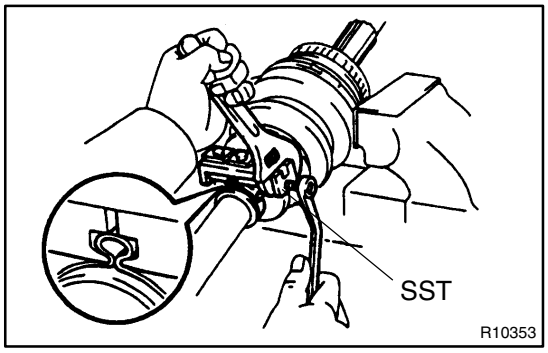
(a) Make sure that the 2 boots are on the shaft groove.

(b) Make sure that the 2 boots are not stretched or contracted when the drive shaft is at standard length.

Drive shaft standard length:

RH	852.15 ± 2.0 mm (33.55 ± 0.079 in.)
LH	548.15 ± 2.0 mm (21.58 ± 0.079 in.)

(c) Secure the clamps onto the boot.



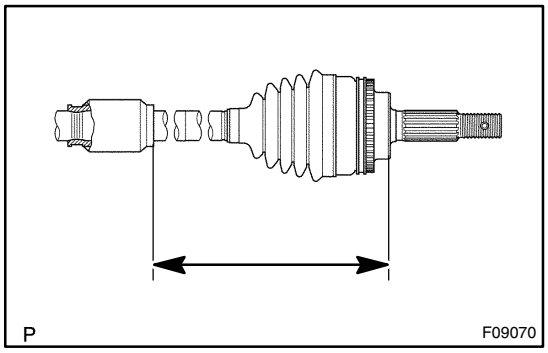
(d) Place SST onto the clamps.
SST 09521–24010

(e) Tighten the SST so that the clamps are pinched.

NOTICE:

Do not overtighten the SST.

(f) Using SST, adjust the clearance of the clamps.
SST 09240–00020
Clearance: 1.9 mm (0.075 in.) or less

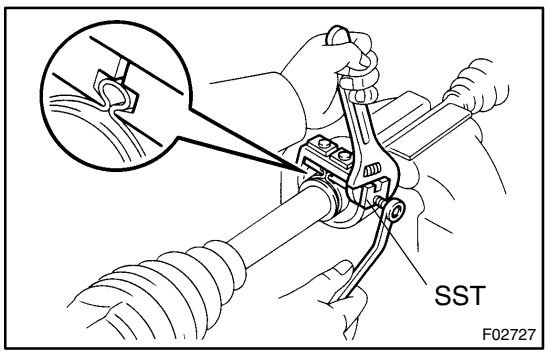


8. RH drive shaft:
ASSEMBLE DAMPER CLAMP

(a) Make sure that the dynamic damper is on the shaft groove.

(b) Set the distance, as described below.
Distance: 267 ± 2.0 mm (10.512 ± 0.079 in.)

(c) Secure the clamp onto the damper.



(d) Place SST onto the clamps.
SST 09521–24010

(e) Tighten the SST so that the clamps are pinched.

NOTICE:

Do not overtighten the SST.

(f) Using SST, adjust the clearance of the clamps.
SST 09240–00020
Clearance: 1.9 mm (0.075 in.) or less

9. CHECK DRIVE SHAFT (See page SA–5)

SA02Z–03

INSTALLATION

1. LH drive shaft:
INSTALL DRIVE SHAFT TO TRANSAXLE

(a) Install a new snap ring to the inboard joint shaft.
(b) Coat the gear oil to the inboard joint shaft and differential case sliding surface.
(c) Set the snap ring with opening side facing downward.
(d) Using a brass bar and hammer, install the drive shaft.

NOTICE:
Be careful not to damage the dust cover of the drive shaft and oil seal lip of the transaxle.

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.

(e) Check that there is 2 – 3 mm (0.08 – 0.12 in.) of play in the axial direction.
(f) Check that the drive shaft cannot be removed by hand.

2. RH drive shaft:
INSTALL DRIVE SHAFT TO TRANSAXLE

(a) Coat the gear oil to the inboard joint shaft and differential case sliding surface.
(b) Install the drive shaft with the center bearing bracket.

NOTICE:
Be careful not to damage the dust cover of the drive shaft and oil seal lip of the transaxle.

(c) Install the 2 bolts.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

3. CONNECT DRIVE SHAFT TO AXLE HUB

NOTICE:
Be careful not to damage the boot and ABS speed sensor rotor.

4. CONNECT LOWER SUSPENSION ARM TO LOWER BALL JOINT
Torque: 127 N·m (1,300 kgf·cm, 94 ft·lbf)

5. CONNECT TIE ROD END TO STEERING KNUCKLE

(a) Connect the tie rod end to the steering knuckle.
(b) Install the nut and a new cotter pin.

If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

6. INSTALL DRIVE SHAFT LOCK NUT

(a) While applying brakes, install the nut.
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)
(b) Install the lock cap and a new cotter pin.

If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.

7. w/ABS:
INSTALL ABS SPEED SENSOR AND BOLT
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

8. FILL AND CHECK GEAR OIL (See page MX–4)
9. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
10. CHECK FRONT WHEEL ALIGNMENT (See Pub. No. RM599E on page SA–4)
11. CHECK ABS SPEED SENSOR SIGNAL (See Pub. No. RM599E on page DI–115)

BRAKE

BRAKE PEDAL BR–1
VACUUM PUMP (1CD–FTV) BR–2

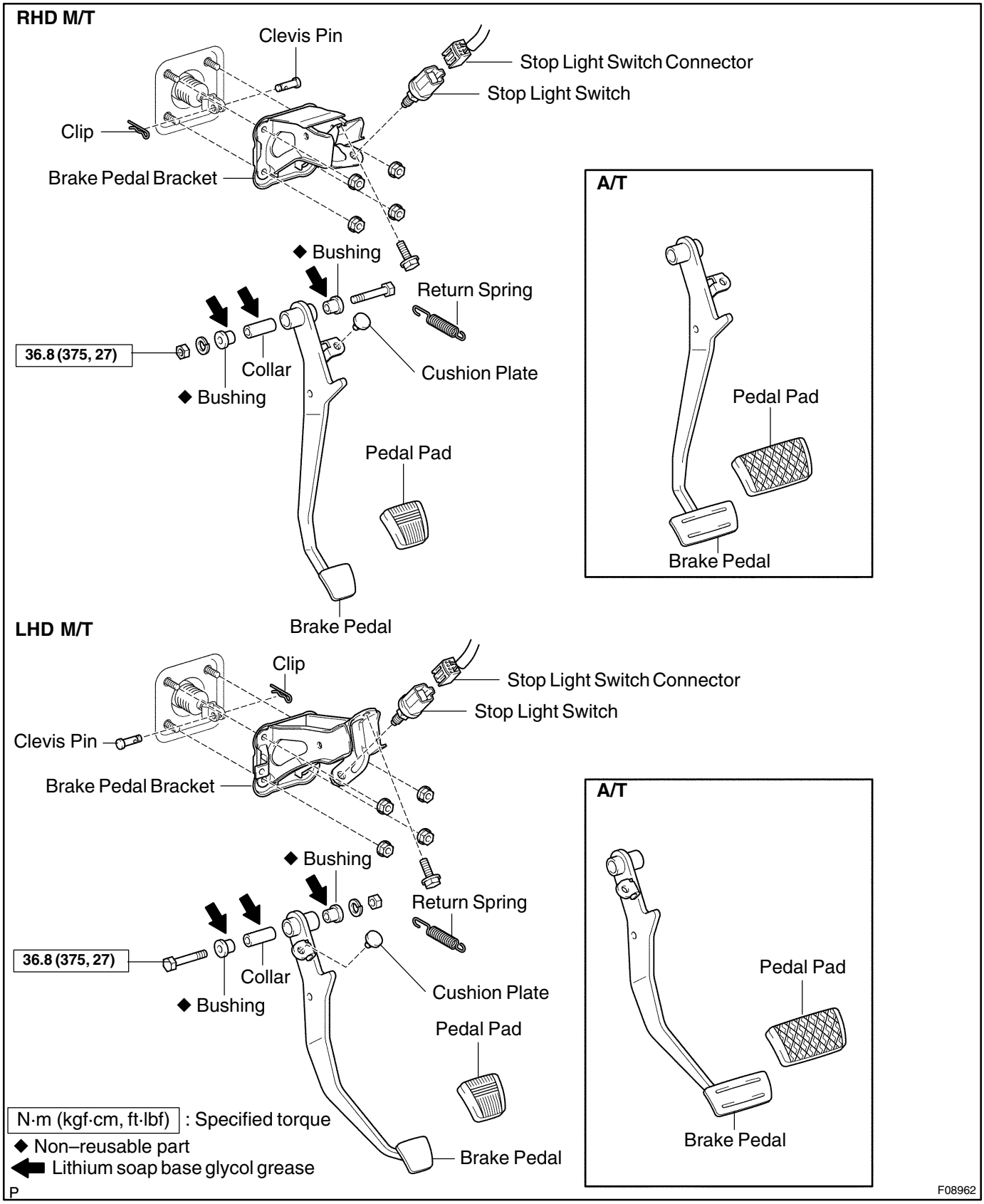
REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.

BRAKE PEDAL

COMPONENTS

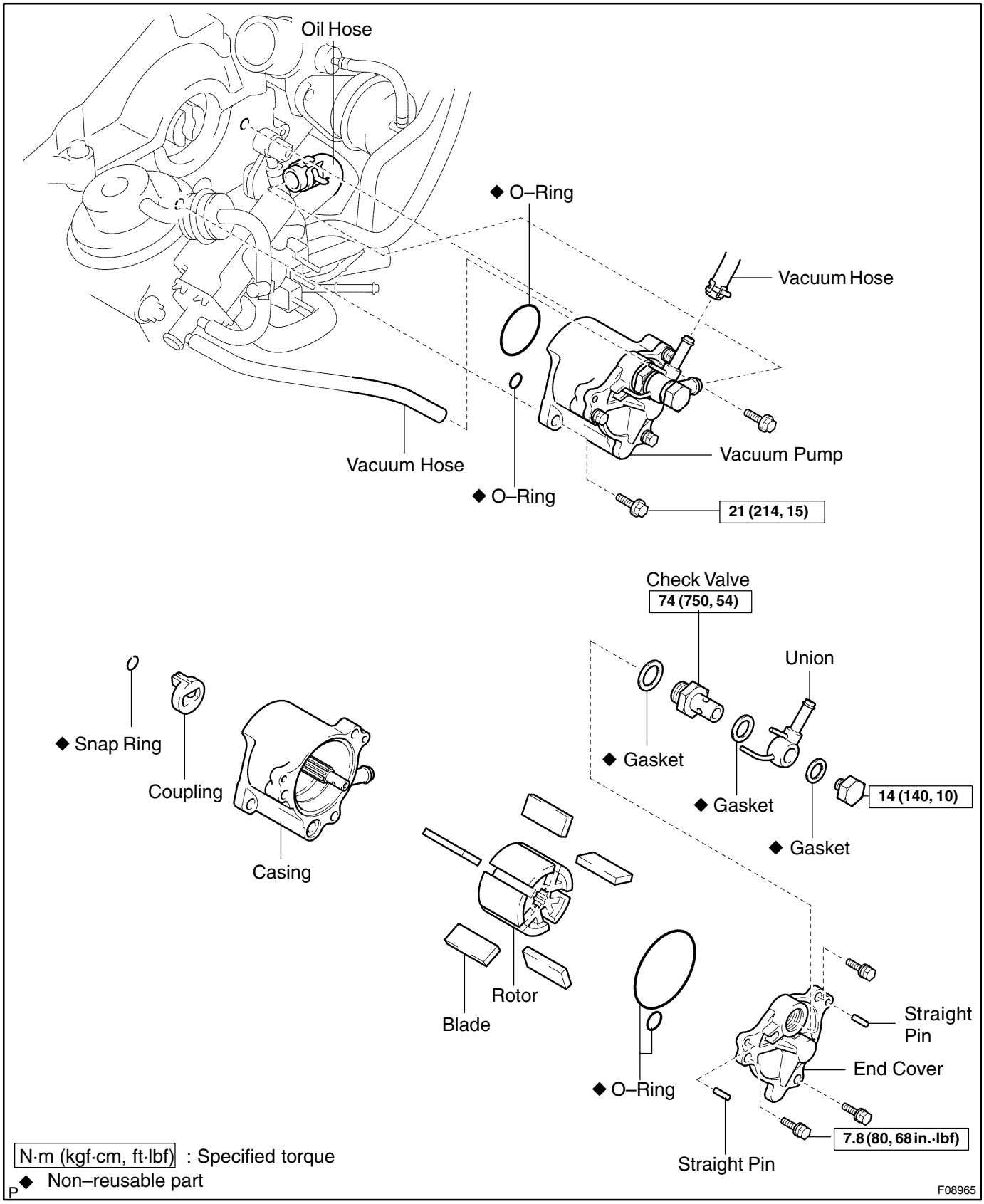
BR11N–01



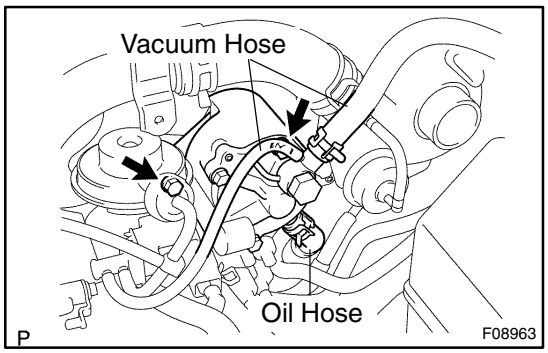
VACUUM PUMP (1CD–FTV)

COMPONENTS

BR11O–01



BR11P–01



REMOVAL

1. DISCONNECT 2 VACUUM HOSES AND OIL HOSE FROM VACUUM PUMP

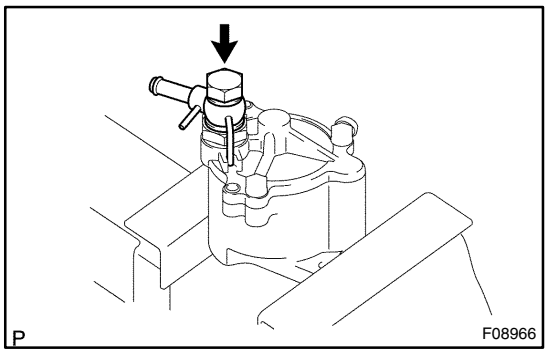
2. REMOVE VACUUM PUMP

(a) Remove the 2 bolts and vacuum pump.

(b) Remove the 2 O–rings from the vacuum pump.

BR11Q–01

DISASSEMBLY



1. PLACE VACUUM PUMP IN VISE

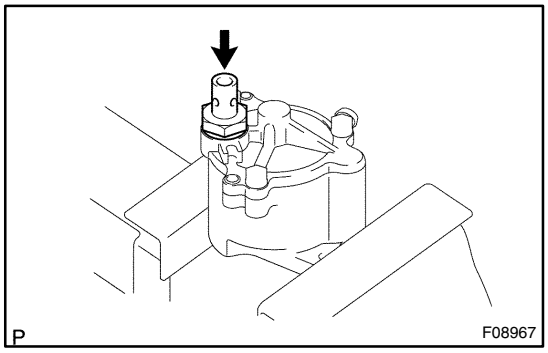
Using soft jaws on the vice, place the vacuum pump in the vice.

NOTICE:

Do not tighten the vise too tightly.

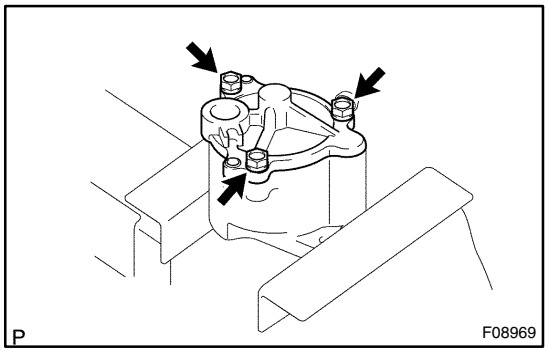
2. REMOVE VACUUM HOSE UNION

Remove the union bolt, union and 2 gaskets.



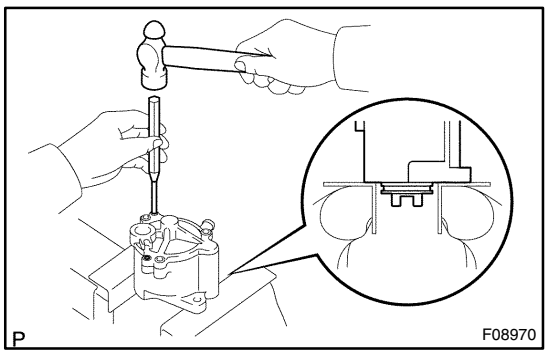
3. REMOVE CHECK VALVE

Remove the check valve and gasket.



4. REMOVE END COVER

(a) Remove the 3 bolts.



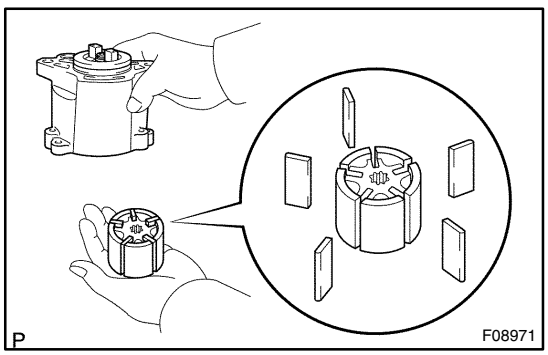
(b) Place the vacuum pump on vise, as shown in the illustration.

NOTICE:

Do not tighten the vise.

(c) Using a pin punch and hammer, drive out the 2 straight pins.

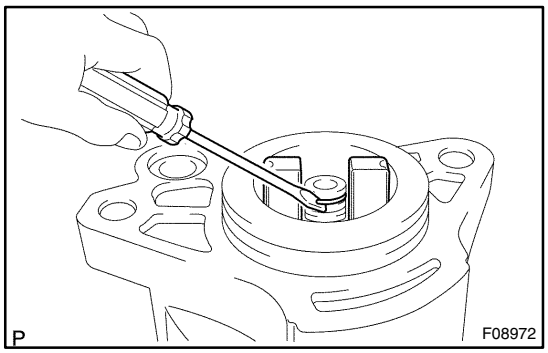
(d) Remove the end cover and 2 O–rings.



5. REMOVE ROTOR AND 5 BLADES

NOTICE:

Be careful not to drop the blades.



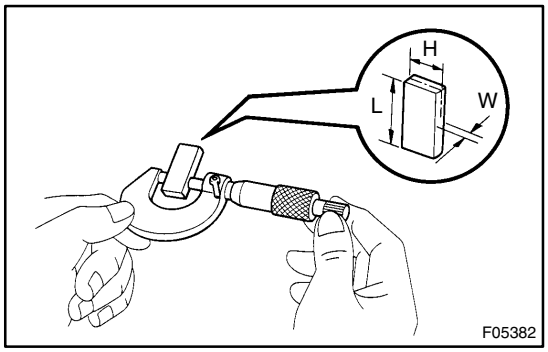
6. REMOVE COUPLING

(a) Using a screw driver, remove the snap ring.

(b) Remove the coupling.

BR11R–01

INSPECTION



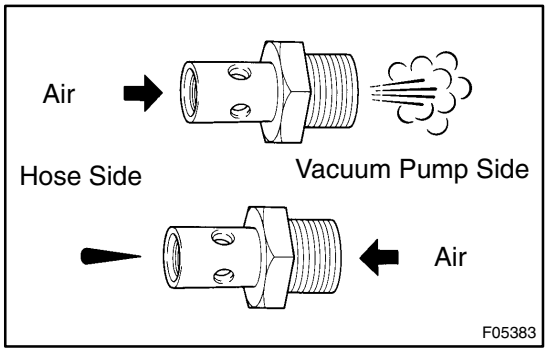
1. INSPECT BLADE

(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.

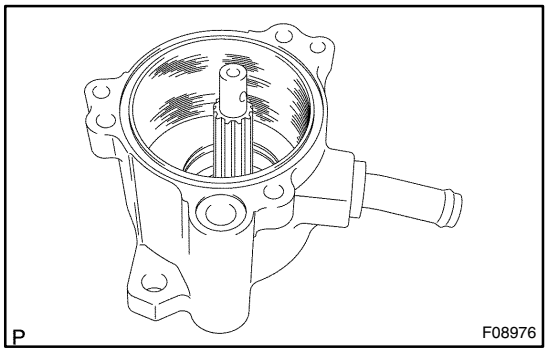


2. INSPECT CHECK VALVE OPERATION

(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.



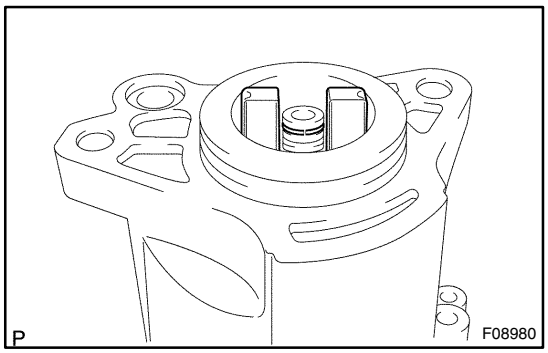
3. INSPECT INSIDE SURFACE OF CASING

Inspection the inside surface on the casing for scoring.

If necessary, replace the vacuum pump assembly.

BR11S–01

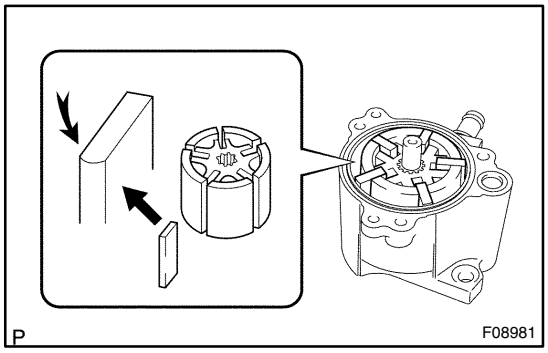
REASSEMBLY



1. INSTALL COUPLING

(a) Place the coupling to the rotor shaft.

(b) Install a new snap ring to the rotor shaft.



2. INSTALL ROTOR INTO CASING

Coat the rotor with engine oil, and install it to the rotor shaft.

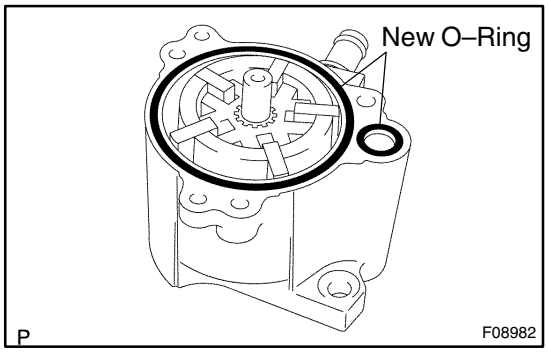
3. INSTALL 5 BLADES

(a) Coat the 5 blades with engine oil.

(b) Install the 5 blades with the round end facing outward.

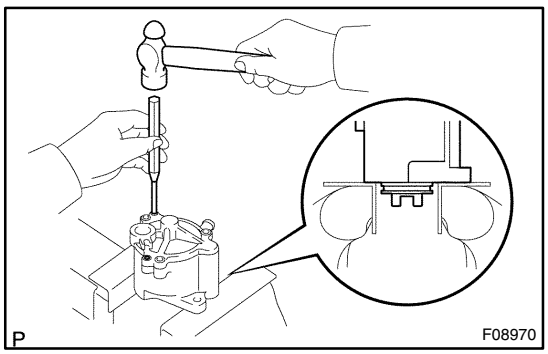
HINT:

Be sure that the blades and rotor surfaces are even.



4. INSTALL END COVER

(a) Coat 2 new O–rings with engine oil, and place them to the casing.



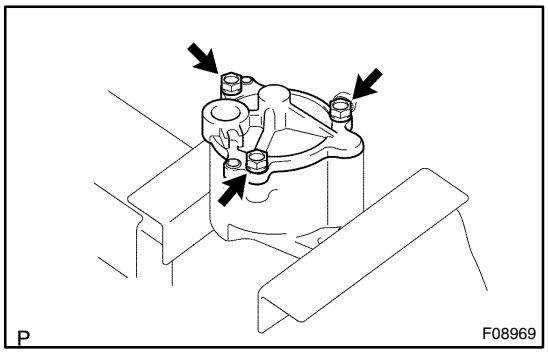
(b) Place the vacuum pump on the vise, as shown in the illustration.

NOTICE:

Do not tighten the vise.

(c) Place the end cover, and temporarily install the 3 bolts.

(d) Using a pin punch and hammer, drive in the 2 straight pins.



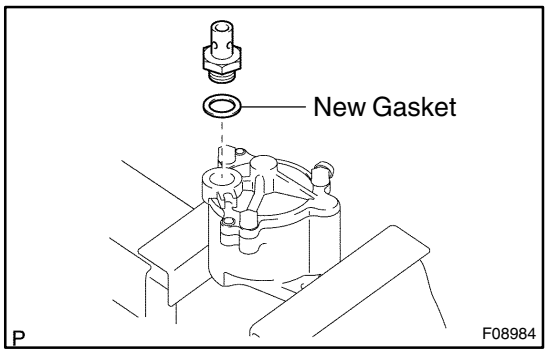
(e) Using soft jaws on the vise, place the vacuum pump in the vise.

NOTICE:

Do not tighten the vise too tightly.

(f) Tighten the 3 bolts.

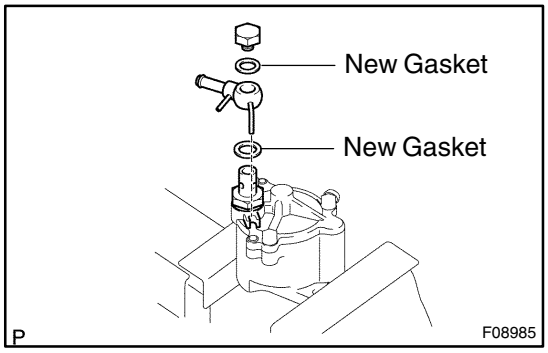
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)



5. INSTALL CHECK VALVE

Install the check valve with a new gasket.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



6. INSTALL VACUUM HOSE UNION

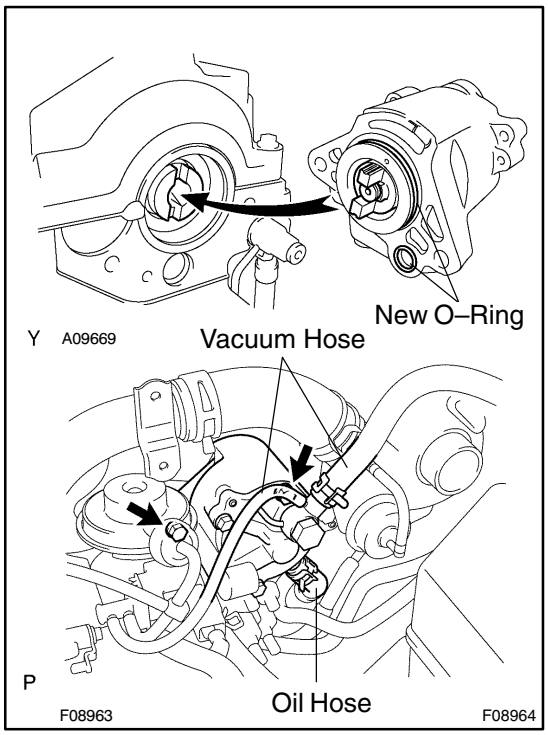
Install the vacuum hose union and 2 new gaskets with the union bolt.

Torque: 14 N·m (140 kgf·cm, 10 ft·lbf)

HINT:

Align and insert the union pin into the matching hole of the casing.

BR11T–01



INSTALLATION

1. INSTALL VACUUM PUMP

(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)

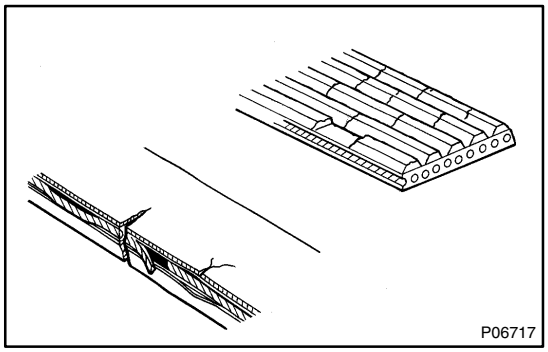
2. CONNECT 2 VACUUM HOSES AND OIL HOSE

STEERING

DRIVE BELT SR–1
POWER STEERING FLUID SR–3
POWER STEERING VANE PUMP
(2C–T, 2C–TE, 1CD–FTV) SR–6

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.



DRIVE BELT

SR0I6–02

INSPECTION

1. INSPECT DRIVE BELT

Visually check the belt for excessive wear, frayed cords, etc. If any defect has been found, replace the drive belt.

HINT:

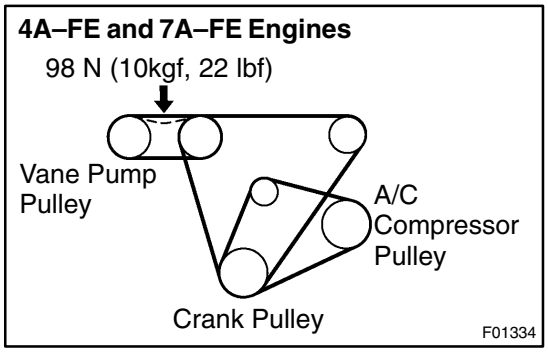
Cracks on the rib side of a belt are considered acceptable. If the missing chunks from the ribs are found on the belt, it should be replaced.

2. CHECK DRIVE BELT TENSION

Measure the drive belt deflection.

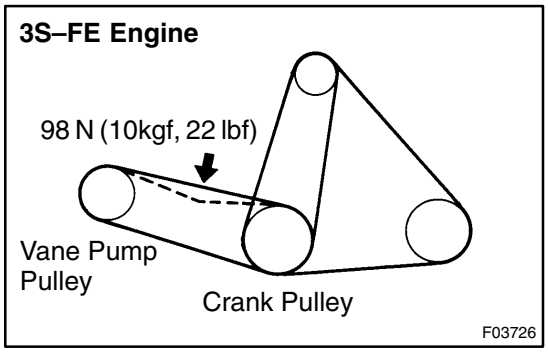
Drive belt tension: at 98 N (10 kgf, 22 lbf)

4A–FE and 7A–FE engines:



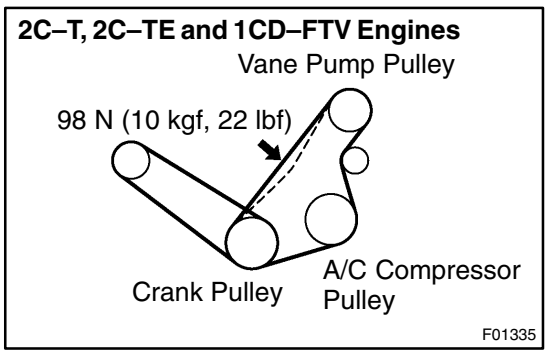
New belt	5 – 6 mm (0.20 – 0.24 in.)
Used belt	6 – 8 mm (0.24 – 0.31 in.)

3S–FE engine:

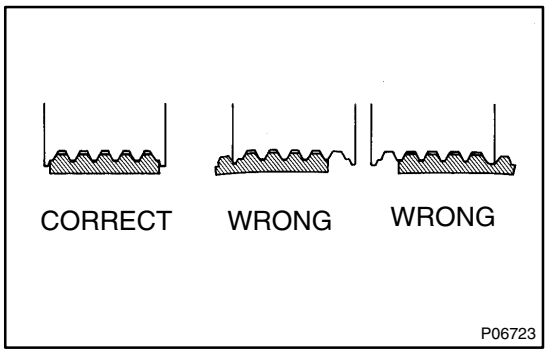


New belt	8 – 10 mm (0.31 – 0.39 in.)
Used belt	10 – 13 mm (0.39 – 0.51 in.)

2C–T, 2C–TE and 1CD–FTV engines:

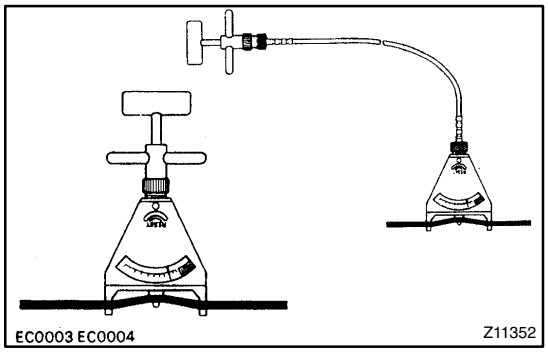


New belt	11 – 14 mm (0.43 – 0.55 in.)
Used belt	15 – 18 mm (0.59 – 0.71 in.)



HINT:

- ”New belt” refers to a belt which has been used less than 5 minutes on a running engine.
- ”Used belt” refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing a belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.



(Reference)

- Using a belt tension gauge, measure the drive belt tension.

Drive belt tension:

4A–FE, 7A–FE and 3S–FE engines:

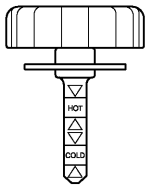
New belt	441 – 539 N (45 – 55 kgf)
Used belt	245 – 392 N (25 – 40 kgf)

2C–T, 2C–TE and 1CD–FTV engines:

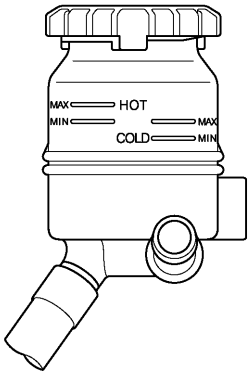
New belt	539 – 637 N (55 – 65 kgf)
Used belt	245 – 392 N (25 – 40 kgf)

If the belt tension is not as specified, adjust it.

4A–FE and 7A–FE Engines



2C–T, 2C–TE, 3S–FE and 1CD–FTV Engines



F03737

POWER STEERING FLUID

SR0I8–02

INSPECTION

1. CHECK FLUID LEVEL

(a) Keep the vehicle level.

(b) With the engine stopped, check the fluid level in the oil reservoir.

If necessary, add fluid.

Fluid: ATF DEXRON II or III

HINT:

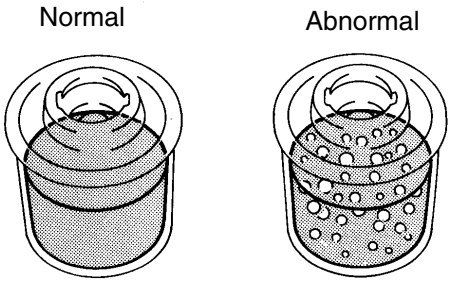
Check that the fluid level is within the HOT LEVEL range on the reservoir / reservoir cap dipstick.

If the fluid is cold, check that it is within the COLD LEVEL range.

(c) Start the engine and run it at idle.

(d) Turn the steering wheel from lock to lock several times to boost fluid temperature.

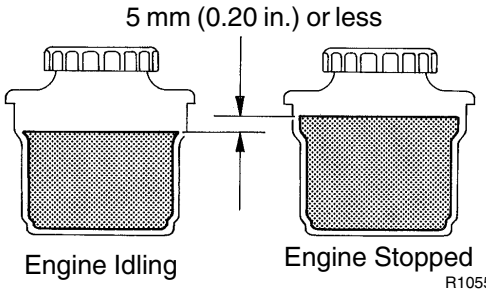
Fluid temperature: 80˚C (176˚F)



R07281

(e) Check for foaming or emulsification.

If there is foaming or emulsification, bleed power steering system (See Pub. No. RM599E on page SR–5).



R10552

(f) With the engine idling, measure the fluid level in the oil reservoir.

(g) Stop the engine.

(h) Wait a few minutes and remeasure the fluid level in the oil reservoir.

Maximum fluid level rise: 5 mm (0.20 in.)

If a problem is found, bleed power steering system (See Pub. No. RM599E on page SR–5).

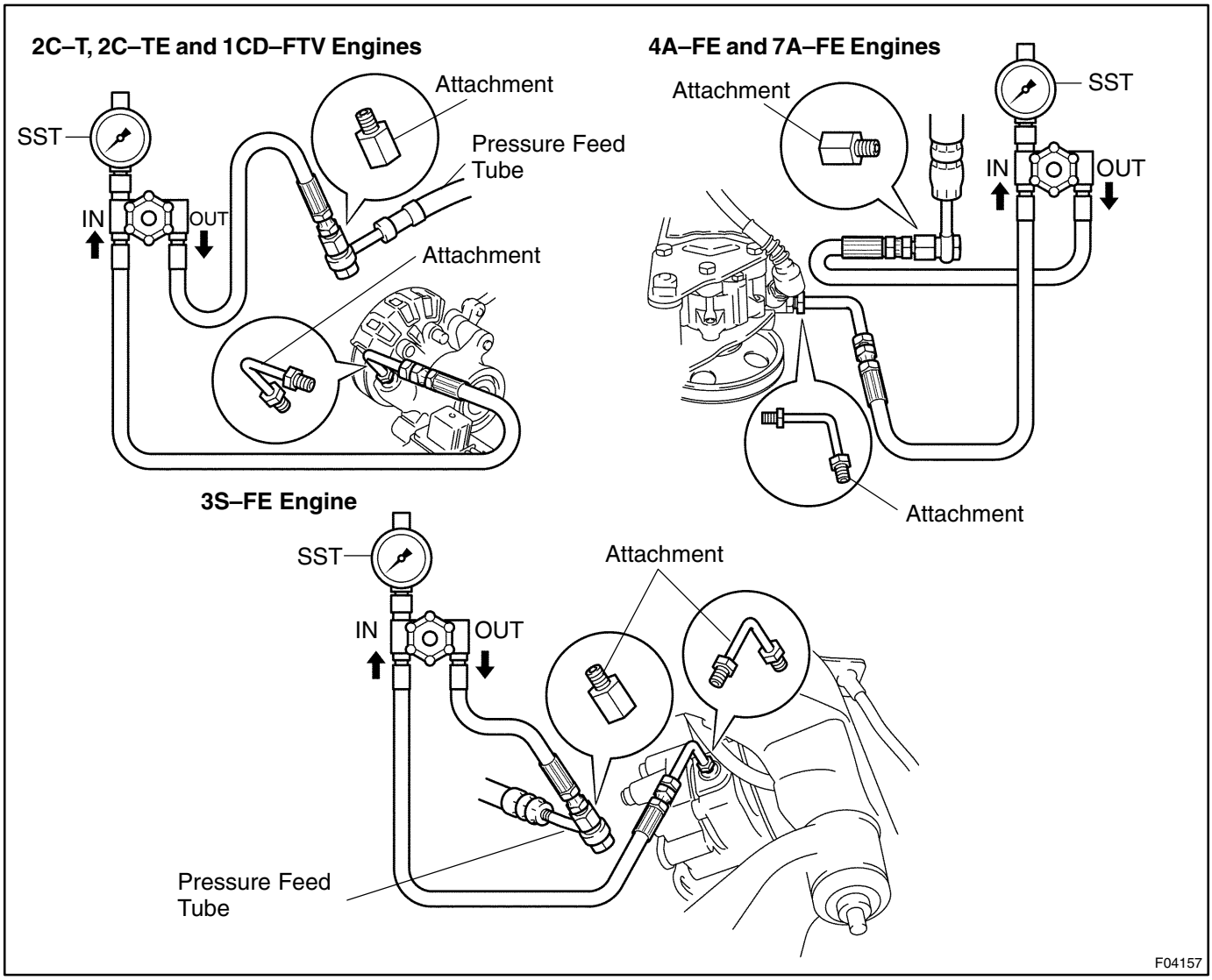
(i) Check the fluid level.

2. CHECK STEERING FLUID PRESSURE

(a) Disconnect the pressure feed tube from the PS vane pump [See Pub. No. RM599E on page SR–21 (4A–FE and 7A–FE engines), SR–24 (3S–FE engine) and see page SR–8 (2C–T, 2C–TE and 1CD–FTV engines)].

(b) Connect SST, as shown in the illustration below.
SST 09640–10010 (09641–01010, 09641–01030, 09641–01060)

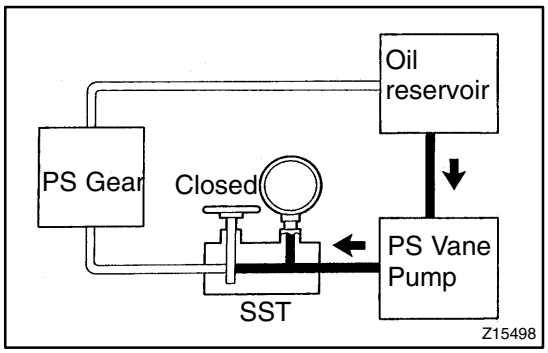
NOTICE:
Check that the valve of the SST is in the open position.



(c) Bleed the power steering system (See Pub. No. RM599E on page SR–5).

(d) Start the engine and run it at idle.

(e) Turn the steering wheel from lock to lock several times to boost fluid temperature.
Fluid temperature: 80˚C (176˚F)



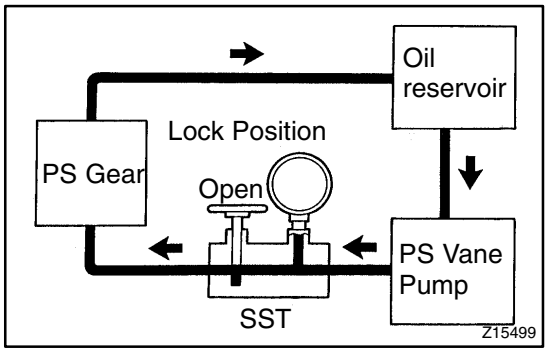
(f) With the engine idling, close the valve of the SST and observe the reading on the SST.

Minimum fluid pressure:

4A–FE and 7A–FE engines	8,238 kPa (84 kgf/cm^2, 1,195 psi)
3S–FE engine	9,022 kPa (92 kgf/cm^2, 1,309 psi)
2C–T, 2C–TE and 1CD–FTV engines	8,826 kPa (90 kgf/cm^2, 1,280 psi)

NOTICE:

- **Do not keep the valve closed for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**



(g) With the engine idling, open the valve fully.

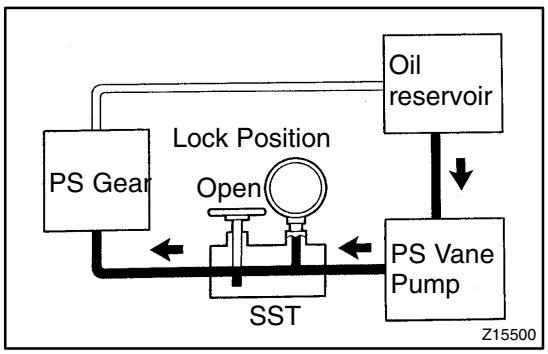
(h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

Difference fluid pressure:

490 kPa (5 kgf/cm^2, 71 psi) or less

NOTICE:

Do not turn the steering wheel.



(i) With the engine idling and valve fully opened, turn the steering wheel to full lock.

Minimum fluid pressure:

4A–FE and 7A–FE engines	8,238 kPa (84 kgf/cm^2, 1,195 psi)
3S–FE engine	9,022 kPa (92 kgf/cm^2, 1,309 psi)
2C–T, 2C–TE and 1CD–FTV engines	8,826 kPa (90 kgf/cm^2, 1,280 psi)

NOTICE:

- **Do not maintain lock position for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**

(j) Disconnect the SST.

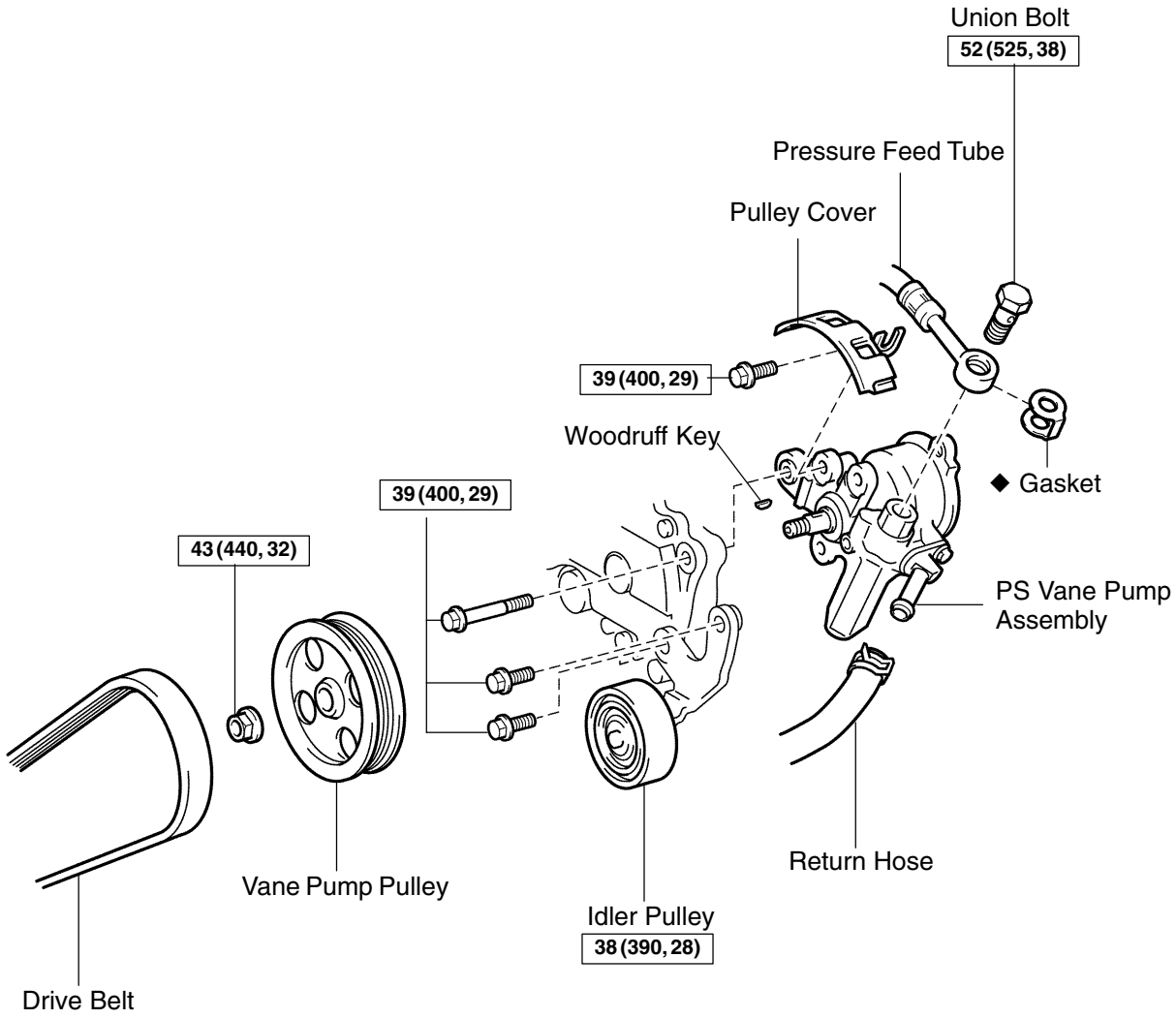
(k) Connect the pressure feed tube to PS vane pump [See Pub. No. RM599E on page SR–22 (4A–FE and 7A–FE engines), SR–25 (3S–FE engine), and see page SR–16 (2C–T, 2C–TE and 1CD–FTV engine)].

(l) Bleed the power steering system(See Pub. No. RM599E on page SR–5).

POWER STEERING VANE PUMP (2C–T, 2C–TE, 1CD–FTV)

SR0WB–01

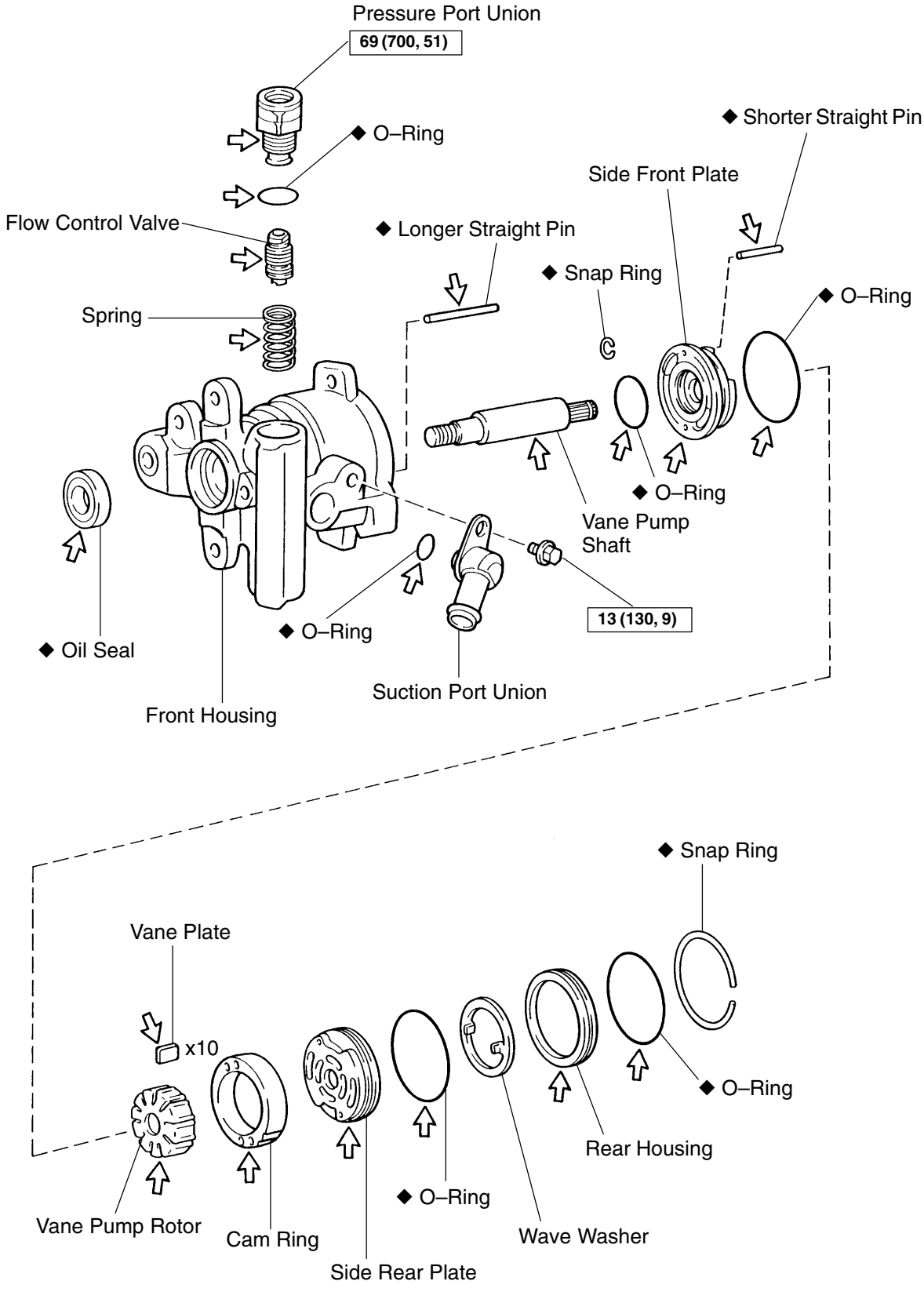
COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

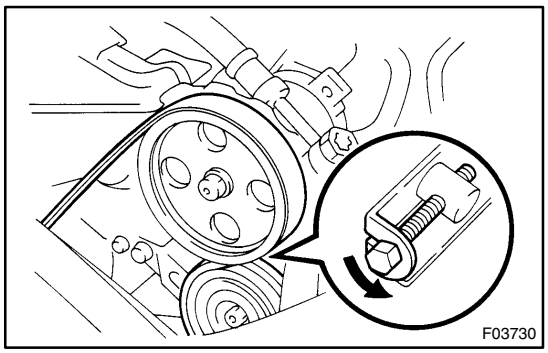
F08960



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
⇦ Power steering fluid

F03716

SR0WC–01

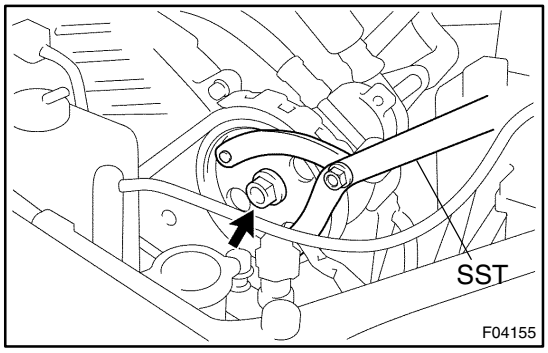


REMOVAL

1. REMOVE DRIVE BELT

(a) Loosen the idler pulley set nut.

(b) Loosen the belt tension adjusting bolt, and remove the drive belt.



2. REMOVE VANE PUMP PULLEY

(a) Using SST to stop the pulley rotating, remove the pulley set nut.

SST 09960–10010 (09962–01000, 09963–01000)

(b) Remove the pulley and woodruff key from the vane pump shaft.

3. DISCONNECT RETURN HOSE

Remove the clip and disconnect return the hose.

4. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket, and disconnect the pressure feed tube.

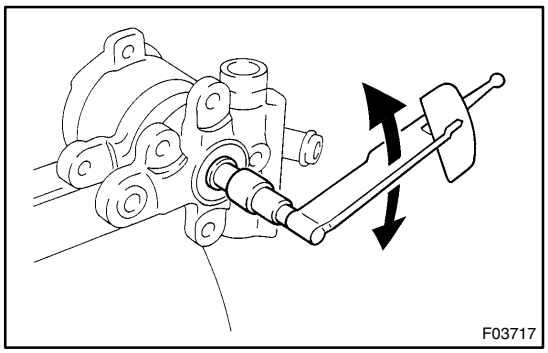
5. REMOVE PS VANE PUMP ASSEMBLY

Remove the 3 bolts and PS vane pump assembly.

6. REMOVE PULLEY COVER

Remove the bolt and pulley cover.

SR0WD–01



DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. MEASURE PS VANE PUMP ROTATING TORQUE

(a) Check that the pump rotates smoothly without abnormal noise.

(b) Temporarily install the vane pump pulley set nut.

(c) Using a torque wrench, check the pump rotating torque.

Rotating torque:

0.3 N·m (2.8 kgf·cm, 2.4 in.·lbf) or less

2. REMOVE SUCTION PORT UNION

(a) Remove the bolt and suction port union.

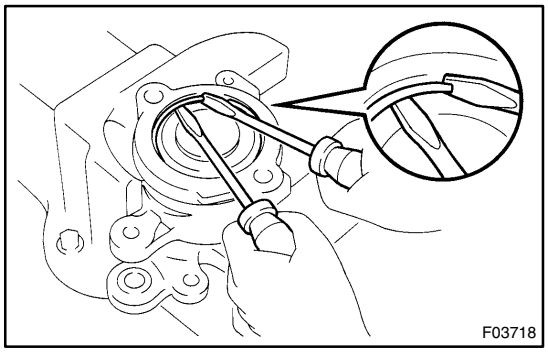
(b) Remove the O–ring from the union.

3. REMOVE PRESSURE PORT UNION

(a) Remove the pressure port union.

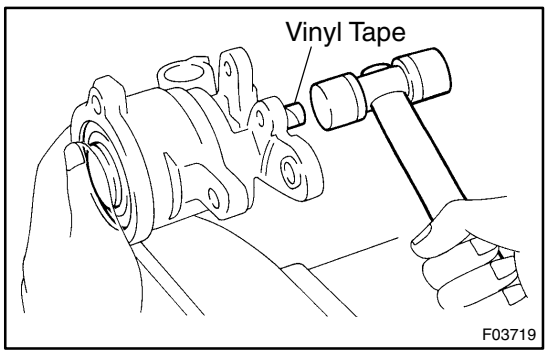
(b) Remove the O–ring from the union.

4. REMOVE FLOW CONTROL VALVE AND SPRING



5. REMOVE REAR HOUSING, WAVE WASHER AND SIDE REAR PLATE

(a) Using 2 screwdrivers, remove the snap ring.



(b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the vane pump shaft.

(c) Using a plastic hammer, tap out the rear housing, wave washer and side rear plate.

(d) Remove the O–ring from the rear housing.

(e) Remove the O–ring from the side rear plate.

6. REMOVE CAM RING AND 10 VANE PLATES

NOTICE:

Be careful not to drop the plate.

7. REMOVE VANE PUMP SHAFT WITH VANE PUMP ROTOR AND SIDE FRONT PLATE

8. REMOVE VANE PUMP ROTOR AND SIDE FRONT PLATE

(a) Using a screwdriver, remove the snap ring from the vane pump shaft.

(b) Remove the vane pump rotor and side front plate.

(c) Remove the 2 O–rings from the side front plate.

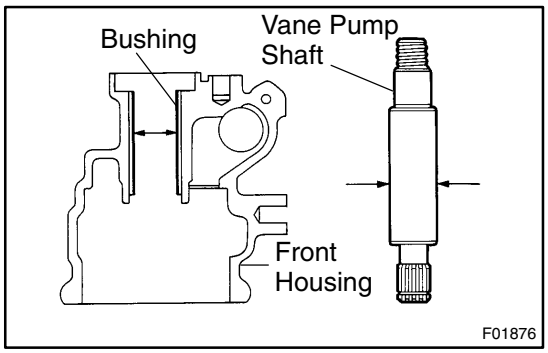
9. REMOVE SHORTER STRAIGHT PIN

Using pliers, remove the shorter straight pin from the side front plate.

10. REMOVE LONGER STRAIGHT PIN

Using pliers, remove the longer straight pin from the front housing.

SR0WE–01



INSPECTION

NOTICE:

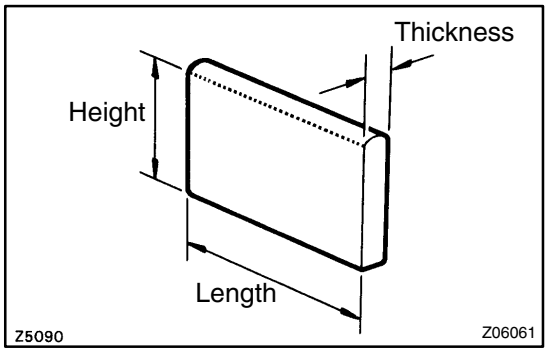
When using a vise, do not overtighten it.

1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

Using a micrometer and caliper gauge, measure the oil clearance.

Standard clearance:
0.01 – 0.03 mm (0.0004 – 0.0012 in.)
Maximum clearance: 0.07 mm (0.0028 in.)

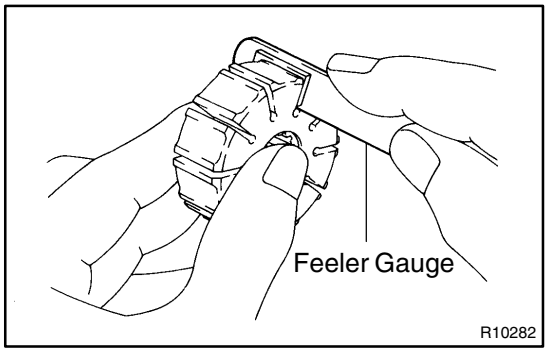
If it is more than the maximum, replace the front housing and vane pump shaft.



2. INSPECT VANE PUMP ROTOR AND VANE PLATES

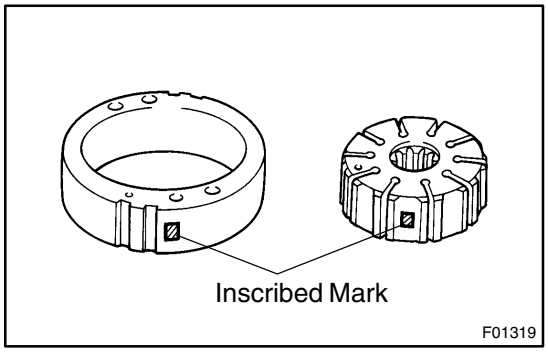
(a) Using a micrometer, measure the height, thickness and length of the 10 plates.

Minimum height: 8.1 mm (0.319 in.)
Minimum thickness: 1.797 mm (0.0708 in.)
Minimum length: 14.988 mm (0.5901 in.)



(b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

Maximum clearance: 0.03 mm (0.0012 in.)



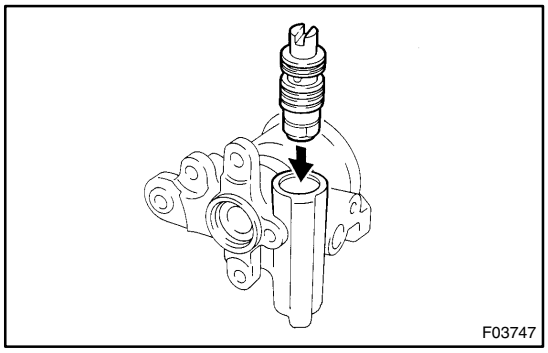
If it is more than the maximum, replace the plate and/or rotor with the one having the same mark stamped on the cam ring.

Inscribed mark: 1, 2, 3, 4 or None

HINT:

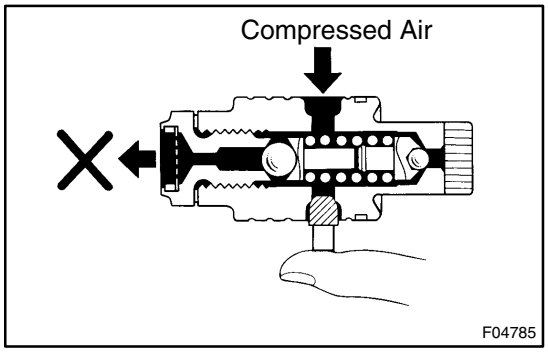
There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345–12010	14.996 – 14.998 (0.59039 – 0.59047)
1	44345–12020	14.994 – 14.996 (0.59032 – 0.59039)
2	44345–12030	14.992 – 14.994 (0.59024 – 0.59032)
3	44345–12040	14.990 – 14.992 (0.59016 – 0.59024)
4	44345–12050	14.988 – 14.990 (0.59008 – 0.59016)

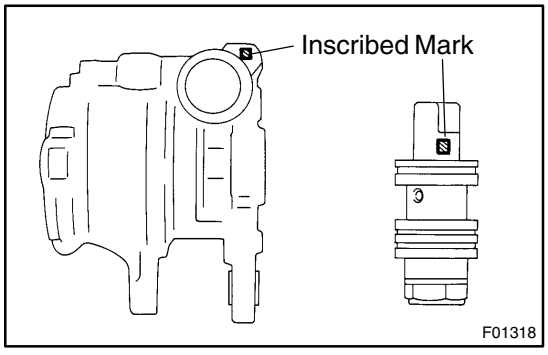


3. INSPECT FLOW CONTROL VALVE

(a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.

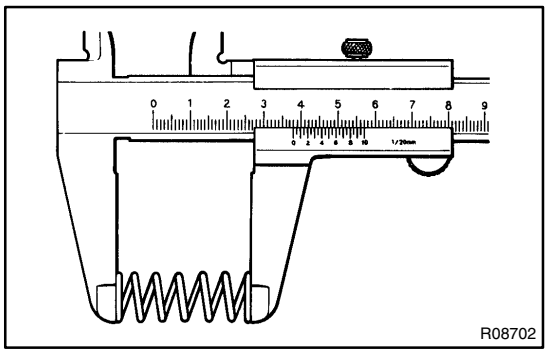


(b) Check the flow control valve for leakage. Close one of the holes and apply compressed air 392 – 490 kPa (4 – 5 kgf/cm^2, 57 – 71 psi) into the opposite side hole, and confirm that air does not come out from the end hole.



If necessary, replace the valve with the one having the same letter as inscribed on the front housing.

Inscribed mark: A, B, C, D, E or F

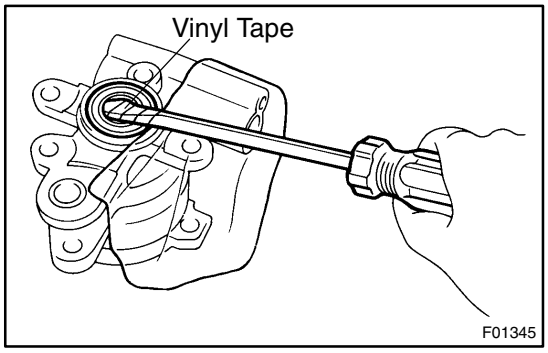


4. INSPECT SPRING

Using vernier calipers, measure the free length of the spring.

Minimum free length: 36.0 mm (1.417 in.)

If it is not within the specification, replace the spring.

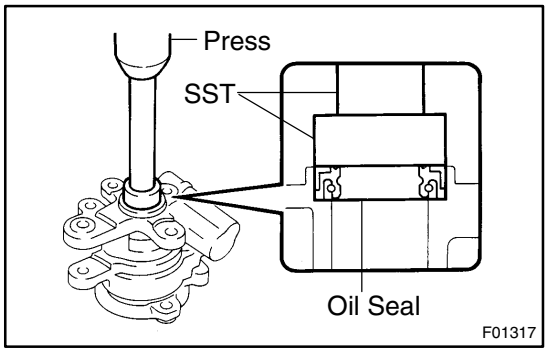


5. IF NECESSARY, REPLACE OIL SEAL

(a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal.

NOTICE:

Be careful not to damage the front housing.



(b) Coat a new oil seal lip with power steering fluid.

(c) Using SST and a press, press in the oil seal.

SST 09950–60010 (09951–00310),
09950–70010 (09951–07100)

NOTICE:

Make sure to install the oil seal facing the correct direction.

SR0WF–01

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page SR–6)

2. INSTALL LONGER STRAIGHT PIN

Using a plastic hammer, tap in a new longer straight pin to the front housing.

NOTICE:

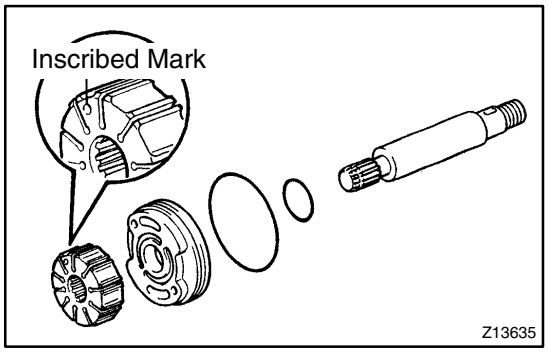
Be careful not to damage the pin.

3. INSTALL SHORTER STRAIGHT PIN

Install a new short straight pin to the side front plate.

NOTICE:

Be careful not to damage the pin.



4. INSTALL SIDE FRONT PLATE AND VANE PUMP ROTOR

(a) Coat 2 new O–rings with power steering fluid and install them to the side front plate.

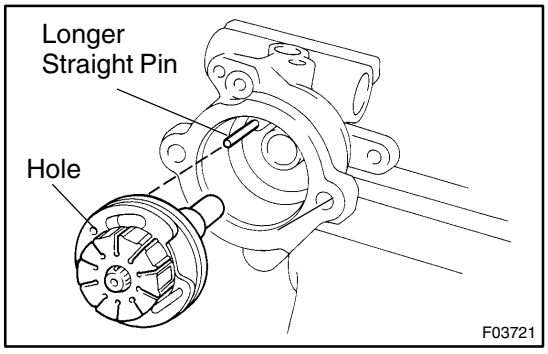
(b) Install the plate to the pump shaft.

NOTICE:

Make sure to install the plate facing the correct direction.

(c) Install the vane pump rotor to the pump shaft with the inscribed mark facing outward.

(d) Install a new snap ring to the vane pump shaft.

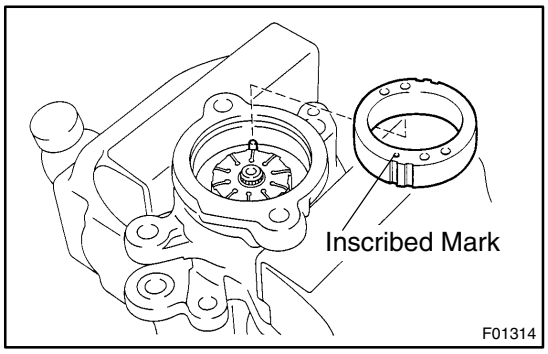


5. INSTALL VANE PUMP SHAFT WITH VANE PUMP ROTOR AND SIDE FRONT PLATE

Align the hole of the side front plate and longer straight pin, and tap in the shaft with a plastic hammer.

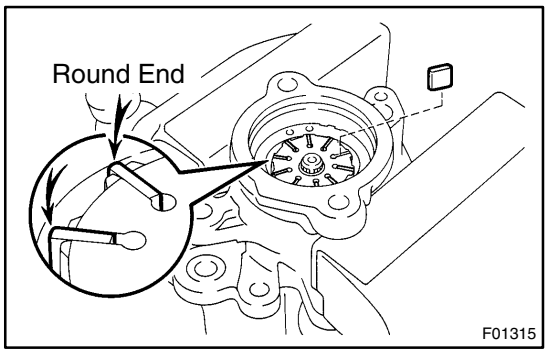
NOTICE:

Be careful not to damage the oil seal and O–rings.



6. INSTALL CAM RING

Align the holes of the cam ring and 2 straight pins and install the ring with the inscribed mark facing outward.



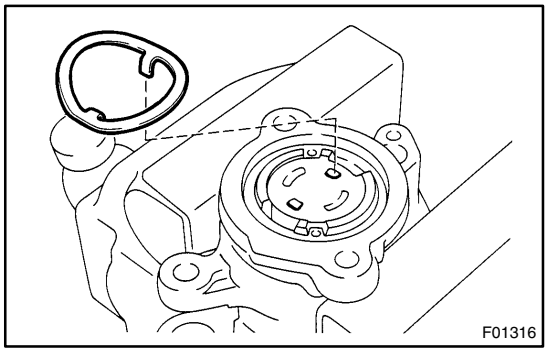
7. INSTALL VANE PLATES

Install the 10 plates with the round end facing outward.

8. INSTALL SIDE REAR PLATE

(a) Coat a new O–ring with power steering fluid and install it to the side rear plate.

(b) Align the holes of the plate and 2 straight pins, and install the plate.

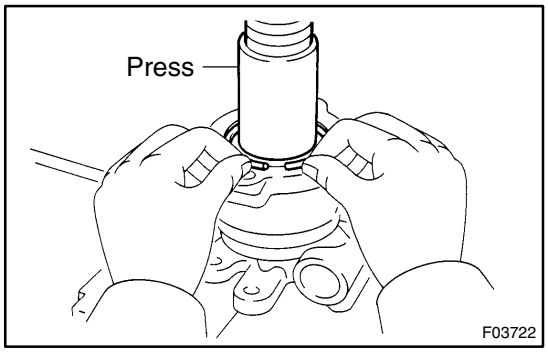


9. INSTALL WAVE WASHER

Install the washer so that its protrusions fit into the slots in the side rear plate.

10. INSTALL REAR HOUSING

(a) Coat a new O–ring with power steering fluid and install it to the rear housing.



(b) Install the housing and use a press to push down on the wave washer hard enough to compress it.

NOTICE:

- **Do not apply too much pressure.**
- **Be careful not to damage the O–ring.**

(c) Install a new snap ring.

11. INSTALL SPRING AND FLOW CONTROL VALVE

Install the valve facing the correct direction
(See page SR–6).

12. INSTALL PRESSURE PORT UNION

(a) Coat a new O–ring with power steering fluid and install it to the pressure pore union.

(b) Install the union.

Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

13. INSTALL SUCTION PORT UNION

(a) Coat a new O–ring with power steering fluid and install it to the suction port union.

(b) Install the bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

14. MEASURE PS VANE PUMP ROTATING TORQUE
(See page SR–9)

SR0WG–01

INSTALLATION

1. INSTALL PULLEY COVER

Install the pulley cover to the PS vane pump with the bolt.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

2. INSTALL PS VANE PUMP ASSEMBLY

Install the PS vane pump to the pulley bracket and engine with the 3 bolts.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

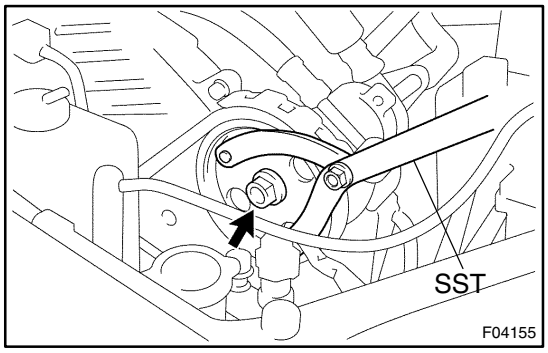
3. CONNECT PRESSURE FEED TUBE

Place a new gasket to the pressure feed tube and connect them with the union bolt.

Torque: 52 N·m (525 kgf·cm, 38 ft·lbf)

4. CONNECT RETURN HOSE

Connect the return hose with the clip.



5. INSTALL VANE PUMP PULLEY

(a) Install the woodruff key to the vane pump shaft.

(b) Install the vane pump pulley.

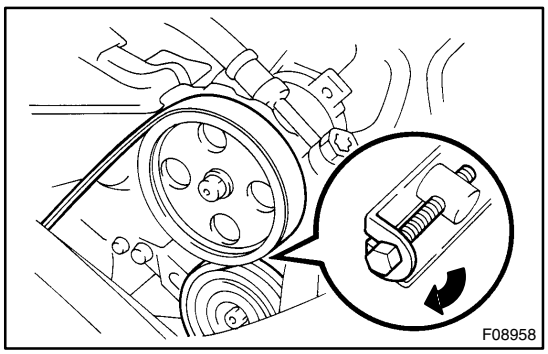
(c) Using SST to stop the pulley rotating, torque the nut.

SST 09960–10010 (09962–01000, 09963–01000)

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

6. INSTALL DRIVE BELT

(a) Install the drive belt to the pulley.



(b) Adjust drive belt tension with the belt tension adjusting bolt (See page SR–1).

(c) Torque the idler pulley set nut.

Torque: 38 N·m (390 kgf·cm, 28 ft·lbf)

7. BLEED POWER STEERING SYSTEM

(See Pub. No. RM599E on page SR–5)

SUPPLEMENTAL RESTRAINT SYSTEM

SRS AIRBAG RS–1
SIDE AIRBAG ASSEMBLY RS–9
CURTAIN SHIELD AIRBAG ASSEMBLY RS–20
SIDE AND CURTAIN SHIELD
AIRBAG SENSOR ASSEMBLY RS–34
WIRE HARNESS AND CONNECTOR RS–39

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.

SRS AIRBAG

PRECAUTION

RS0IJ–01

NOTICE:

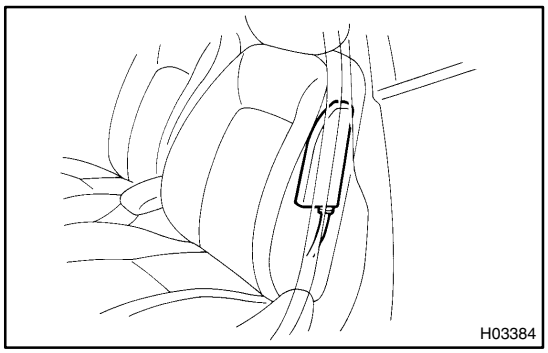
- **The AVENSIS / CORONA is equipped with SRS, which comprises a driver airbag, front passenger airbag, side airbag and curtain shield airbag. Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. 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.**
- **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 side airbag assembly, curtain shileld airbag assembly and side and curtain shield airbag sensor assembly should be inspected (See page RS–11, RS–25 and RS–36).**
- **Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.**
- **Never disassemble and repair the side airbag assembly, curtain shield airbag assembly or side and curtain shield airbag sensor assembly in order to reuse it.**
- **If the side airbag assembly, curtain shield airbag assembly or side and curtain shield airbag sensor assembly has been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace it with 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 working on the SRS is completed, perform the SRS warning light check (See Pub No. RM599E on page DI–152).**
- **If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.**

CAUTION:

- **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.)
- **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.**
- **Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.**
- **Do not expose the side airbag assembly, curtain shield airbag assembly or side and curtain shield airbag sensor assembly directly to hot air or flames.**

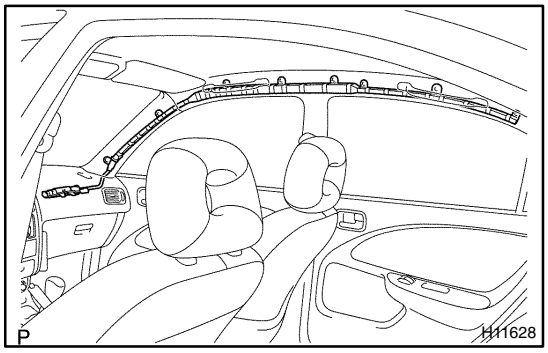
RS0IK–01

OPERATION



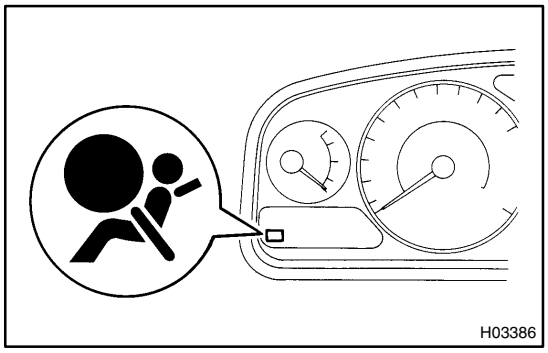
1. SIDE AIRBAG ASSEMBLY

The inflater and bag of the SRS side airbag are stored in the side airbag assembly and cannot be disassembled. The inflater contains a squib, igniter charge and gas generant, etc., and inflates the bag when instructed by the side airbag sensor assembly.



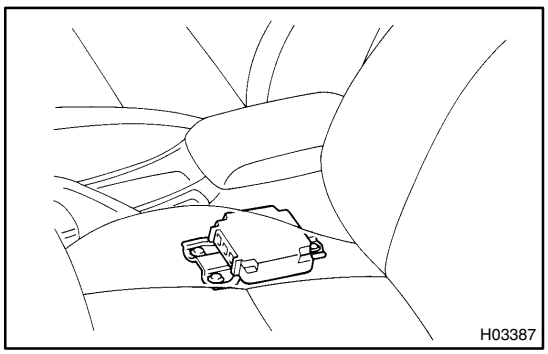
2. CURTAIN SHIELD AIRBAG ASSEMBLY

The inflater and bag of the SRS curtain shield airbag are stored in the curtain shield airbag assembly and cannot be disassembled. The inflater contains a squib, igniter charge and gas generant, etc., and inflates the bag when instructed by the side airbag sensor assembly.



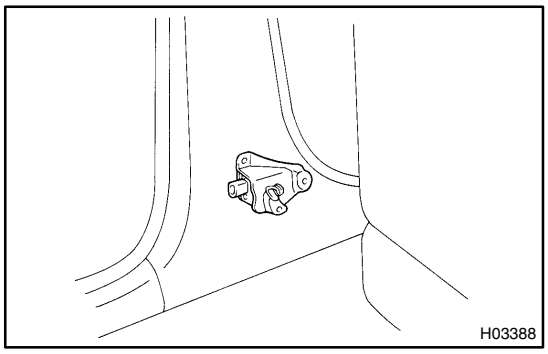
3. SRS WARNING LIGHT

The SRS warning light is located on the combination meter. It goes on to alert the driver of trouble in the system when a malfunction is detected in the airbag sensor assembly. In normal operation conditions when the ignition switch is turned to the ACC or ON position, the light goes on for about 6 seconds and then goes off.



4. AIRBAG SENSOR ASSEMBLY

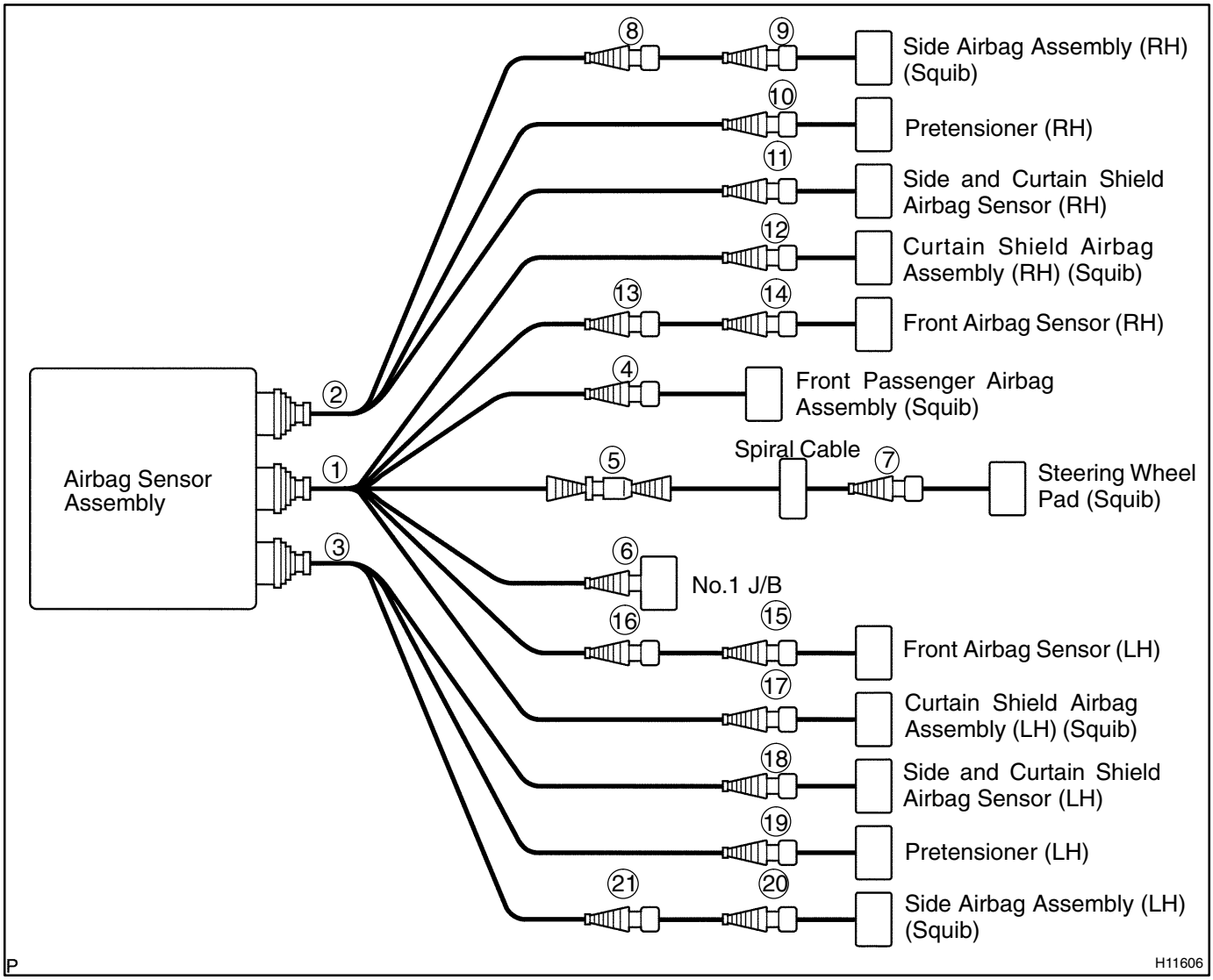
The airbag sensor assembly is mounted on the floor inside the lower center finish panel. The airbag sensor assembly consists of an airbag sensor, safing sensor, diagnosis circuit ignition control and drive circuit, etc. It receives signals from the airbag sensor, front airbag sensor, side airbag sensor and judges whether the SRS must be activated or not.



5. SIDE AND CURTAIN SHIELD AIRBAG SENSOR ASSEMBLY

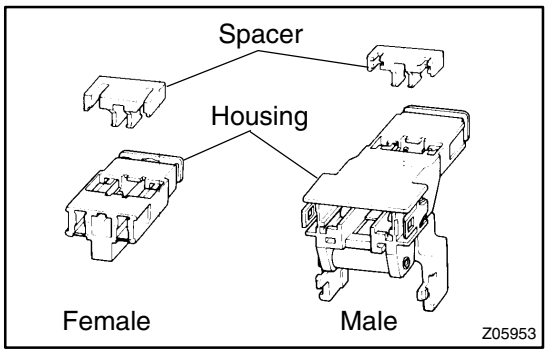
The side and curtain shield airbag sensor assembly is mounted in the LH and RH center pillars. The side airbag sensor assembly consists of a side airbag, sensor, safing sensor and diagnosis circuit, etc. It sends signals to the airbag sensor assembly to judges whether the SRS side airbag must be activated or not.

6. SRS CONNECTORS



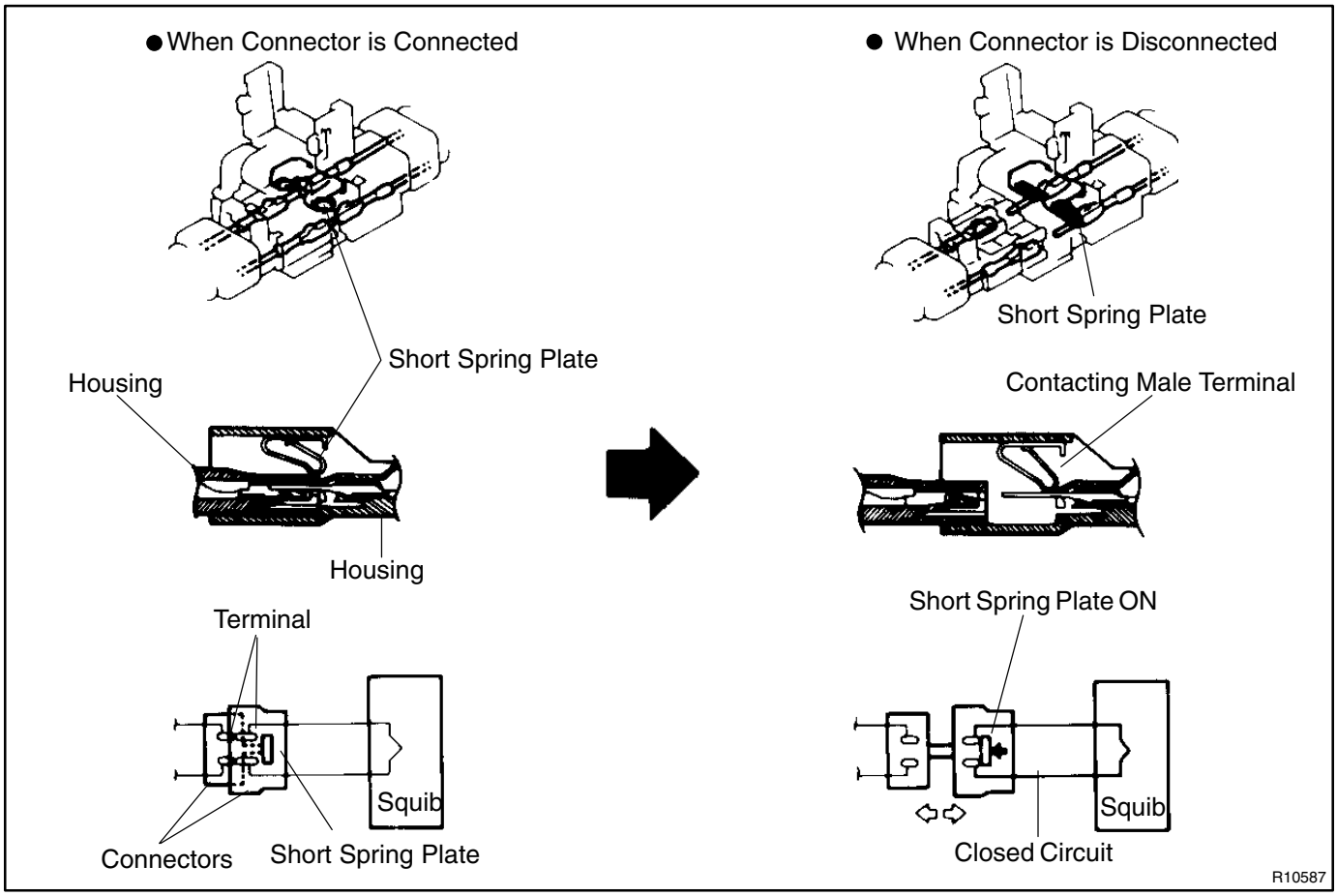
No.	Item	Application
(1)	Terminal Twin–Lock Mechanism	Connectors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
(2)	Airbag Activation Prevention Mechanism	Connectors 1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 17, 19, 20, 21
(3)	Electrical Connection Check Mechanism	Connectors 1, 2, 3
(4)	Connector Twin–Lock Mechanism	Connectors 5, 6

(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.

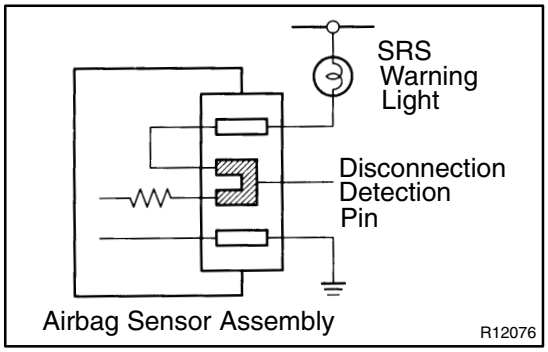


(1) Terminal Twin–Lock Mechanism
Each connector has a two–piece component consisting of a housing and a spacer. This design enables the terminal to be locked securely by two locking devices (the retainer and the lance) to prevent terminals from coming out.

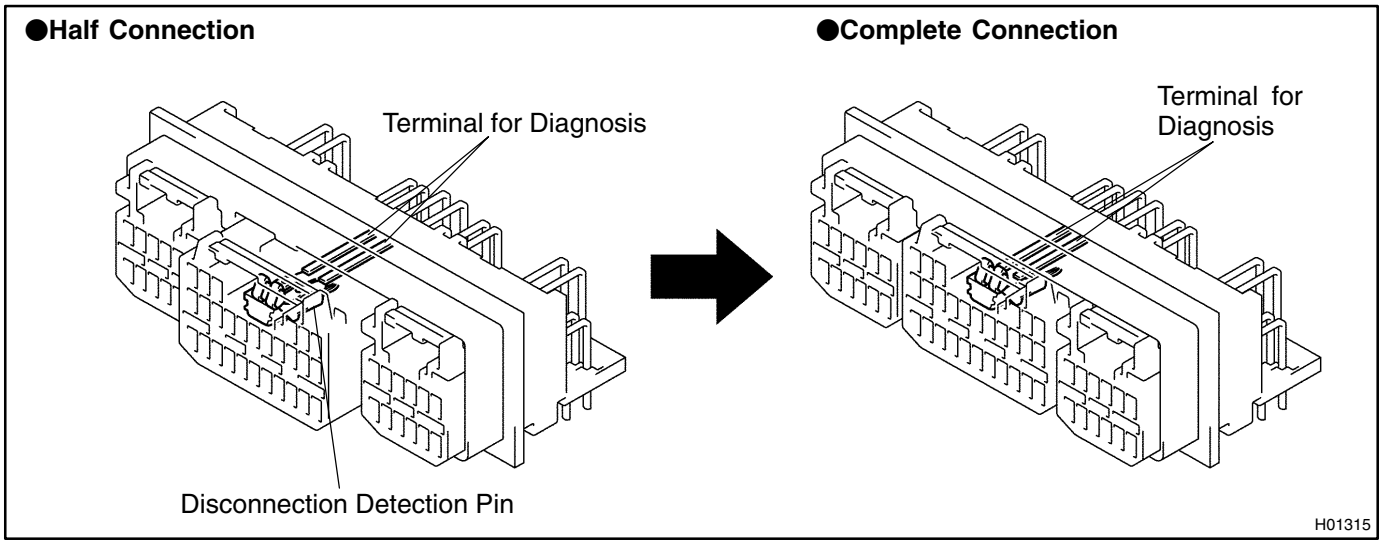
(2) Airbag Activation Prevention Mechanism
Each connector contains a short spring plate. When the connector is disconnected, the short spring plate automatically connects positive (+) terminal and negative (–) terminal of the squib.



HINT:
The type of connector is shown in the diagram on the previous page.

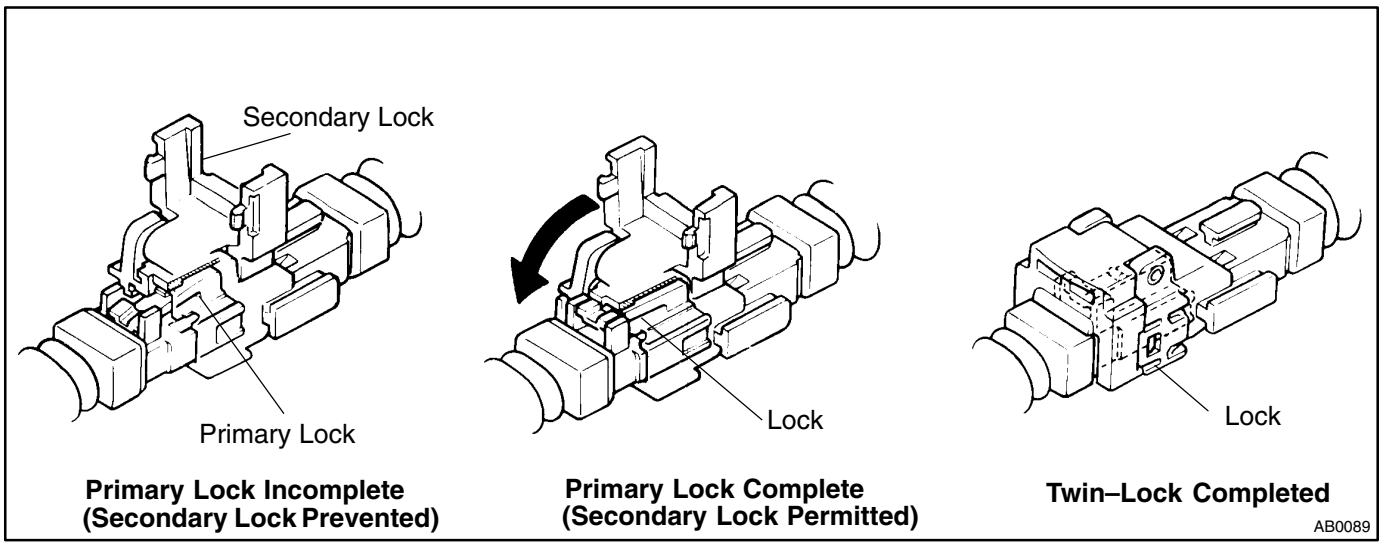


(3) Electrical Connection Check Mechanism
This mechanism electrically checks that connectors are connected correctly and completely. The electrical connection check mechanism is designed so that the disconnection detection pin connects with the diagnosis terminals when the connector housing lock is locked.



HINT:
The connectors shown in this illustration are connectors ”1”, ”2” and ”3” in step 10.

(4) Connector Twin–Lock Mechanism
With this mechanism connectors (male and female connectors) are locked by 2 locking devices to increase the connection reliability. If the primary lock is incomplete, ribs interfere and prevent the secondary lock.



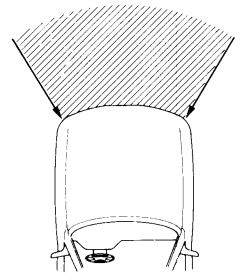


Fig.1

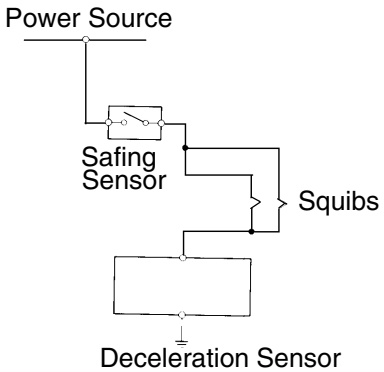
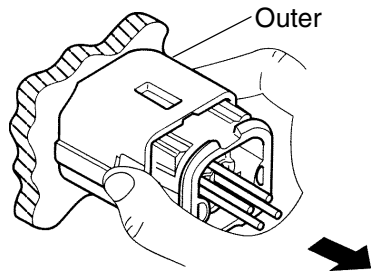


Fig.2

(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 steering wheel pad and instrument panel door. Bag inflation then ends, and the bags deflate as the gas is discharged through discharge holes at the bag's rear or side.



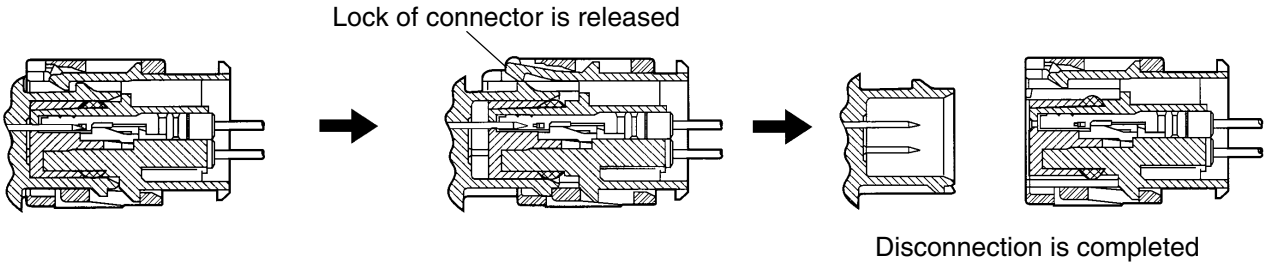
7. DISCONNECTION OF SIDE AND CURTAIN SHIELD AIRBAG SENSOR CONNECTOR

(a) With 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:

Make sure to hold both flank sides of the outer. If holding the top and bottom sides, it will obstruct disconnection.



8. CONNECTION OF SIDE AND CURTAIN SHIELD AIRBAG SENSOR CONNECTOR

(a) Align the male connector (of the side of sensor) and female connector in the same direction as shown in the illustration and fit in them without rubbing.

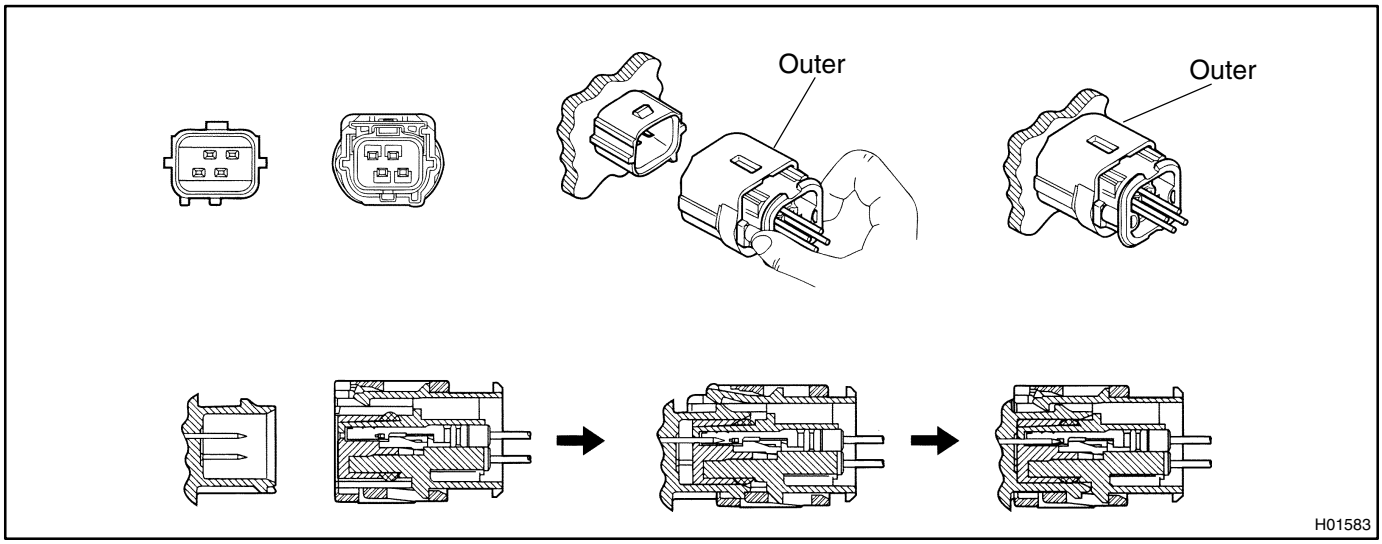
(b) As they are fitted in, the outer slides rearward. Press it until the outer returns to its original position again.

If fitting stops half way, connectors will separate.

(c) Make 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.)

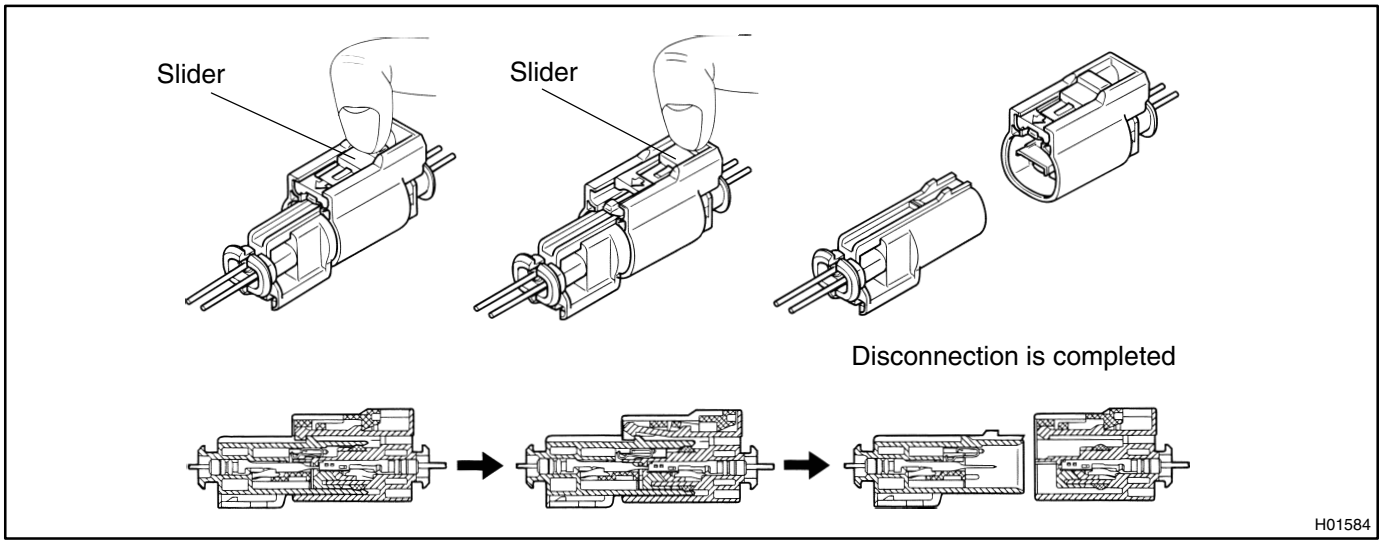
HINT:

- Do not fit in while holding the outer.
- When fitting in, the outer slides. Do not touch it.



9. DISCONNECTION OF SIDE AIRBAG AND CURTAIN SHIELD AIRBAG CONNECTOR

(a) Place a finger on the slider.
(b) Slide the slider to release lock.
(c) Disconnect the connector.

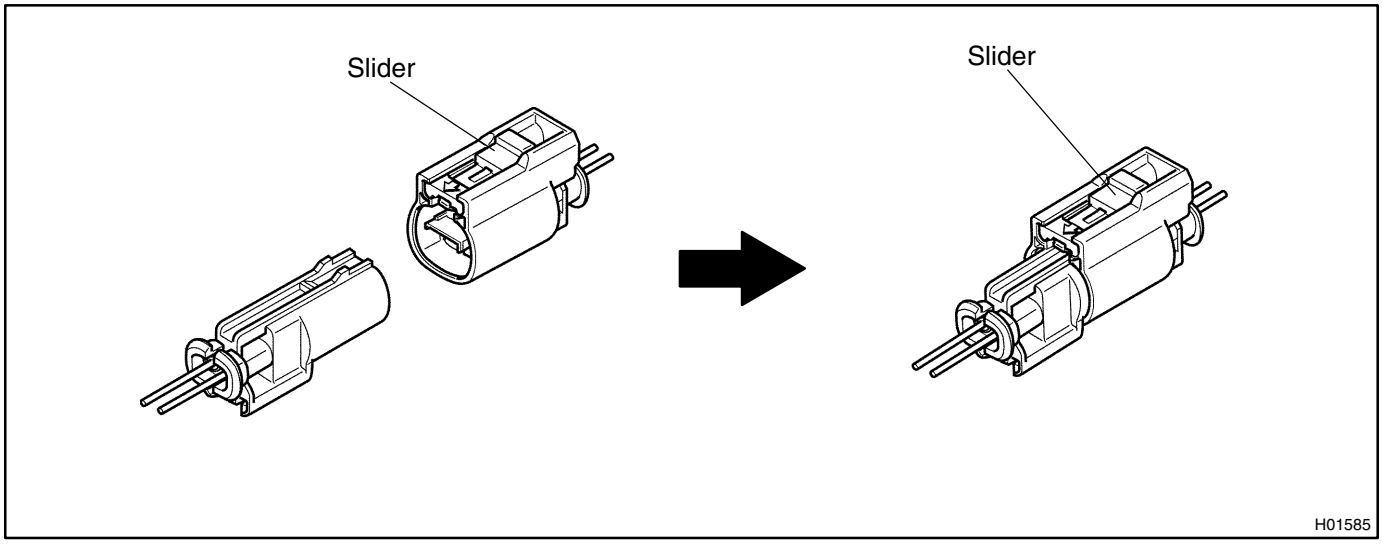


10. CONNECTION OF SIDE AIRBAG AND CURTAIN SHIELD AIRBAG CONNECTOR

(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) Make 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:

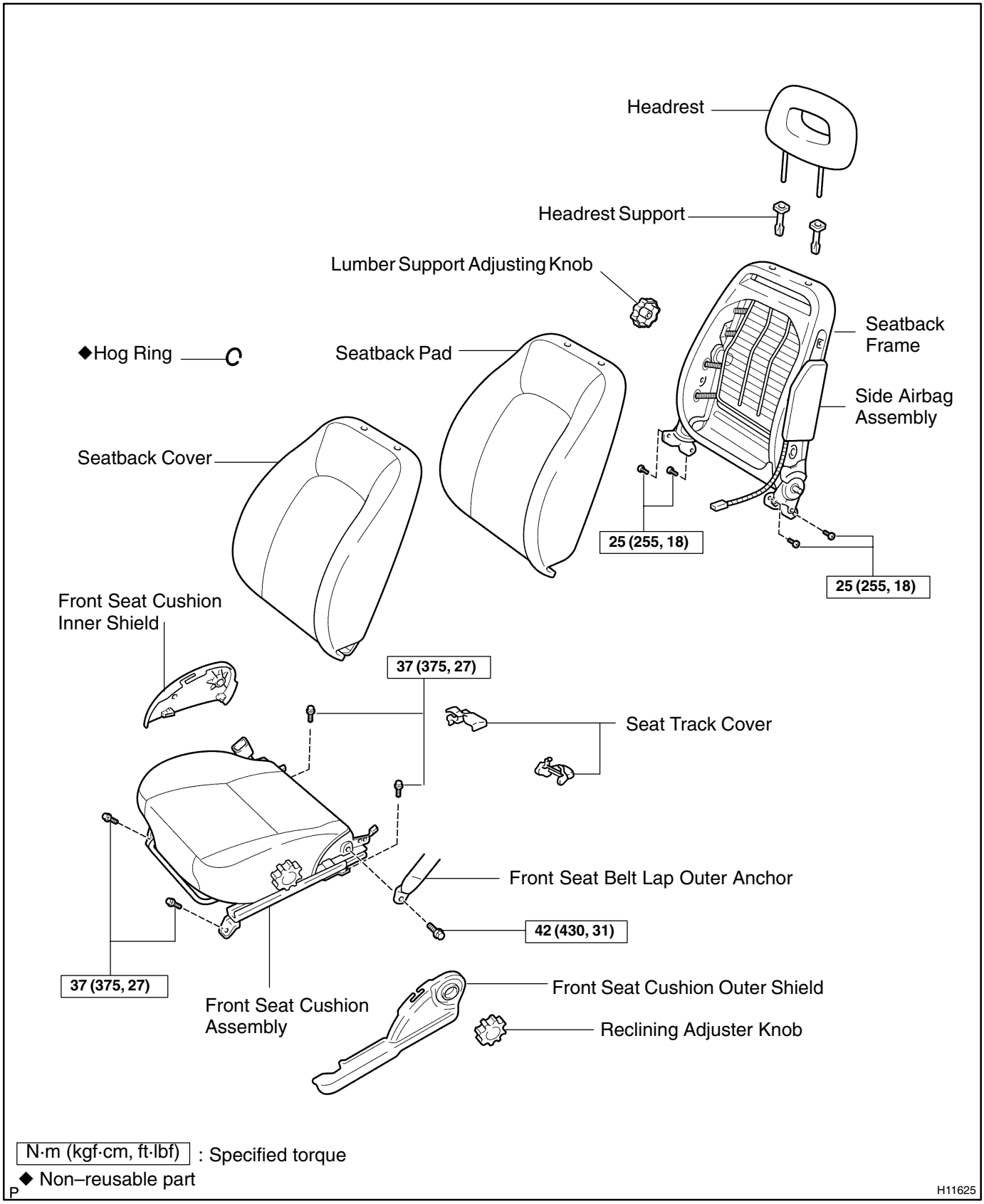
- As the slider slides, do not touch it.
- Be careful not to deform the release board. If the release board is deformed, replace it with a new one.



SIDE AIRBAG ASSEMBLY

COMPONENTS

RS0IL–01



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

P

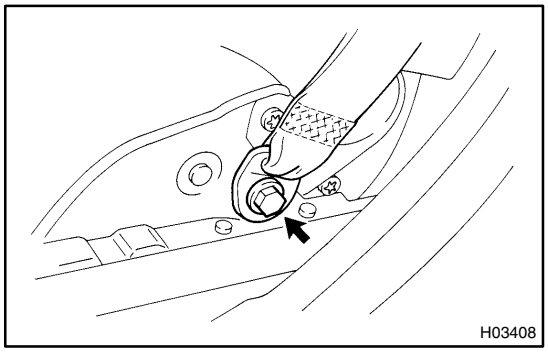
H11625

RS0IM–01

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is at ON or ACC position, DTCs will be recorded.**
- **Never use the airbag parts from another vehicle. When replacing parts, replace them with new parts.**



1. REMOVE FRONT SEAT

(a) Remove the reclining adjuster knob and front seat cushion outer shield.
(b) Remove the front seat belt lap outer anchor.
(c) Remove the 2 seat track covers and 4 bolts.
(d) Disconnect the side airbag connector.

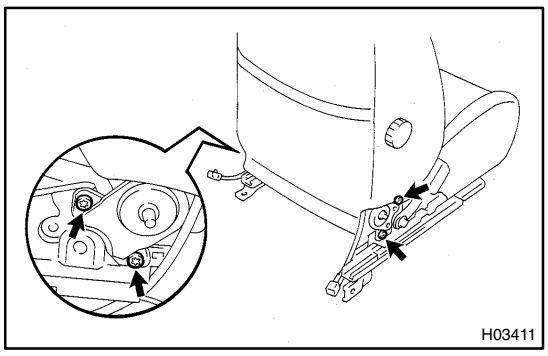
NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

(e) Remove the front seat.

2. REMOVE THESE PARTS FROM FRONT SEAT ASSEMBLY

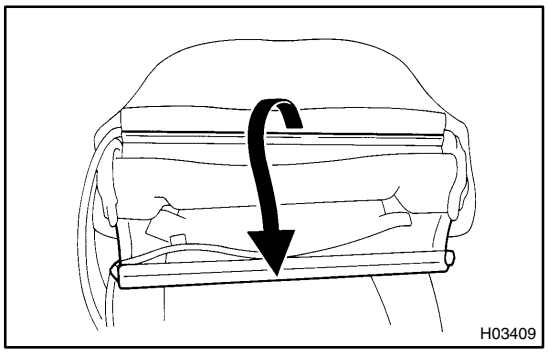
(a) Remove the headrest.
(b) Remove the 2 headrest supports.
(c) Remove the lumber support adjusting knob.
(d) Remove the front seat inner shield.



3. REMOVE SEATBACK FROM SEAT CUSHION ASSEMBLY

Using a torx wrench, remove the 4 screws and seatback assembly.

Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)



4. REMOVE THESE PARTS FROM SEATBACK FRAME

(a) Disengage the hook of the seatback cover.
(b) Remove the hog rings and seatback cover.
(c) Remove the seatback pad.

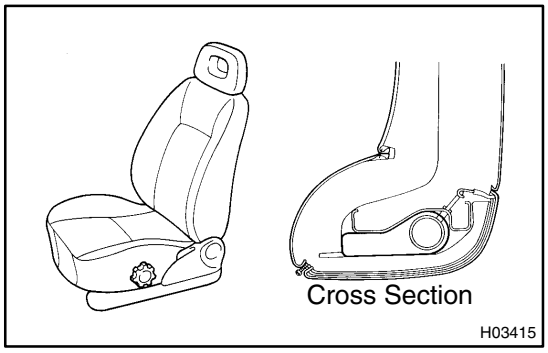
RS0IN–01

INSPECTION

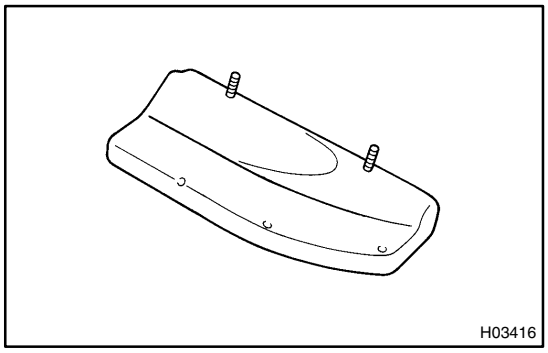
1. VEHICLES NOT INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

(b) Do a visual check which includes the following items with the side airbag assembly installed in the vehicle.



Check that there are no cuts or the frayed on seams and seatback cover.



2. VEHICLES INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

(a) Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

(b) Do a visual check which includes the following items with the side airbag assembly removed from the vehicle.

- Check cuts and cracks, or marked discoloration of the side airbag assembly.
- Check cuts and cracks in wire harnesses, and chipping in connectors.

CAUTION:

For removal and installation of the side airbag assembly, see page RS–10 and RS–19. Be sure to follow the correct procedure.

3. VEHICLES INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

(a) Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

(b) Do a visual check which includes the following items with the side airbag assembly removed from the vehicle.

- Check the side airbag installation part of the seat frame.
- Check the damage to the connector and wire harness.

HINT:

If the seat frame is deformed, never repair it. Always replace it with a new one.

RS0IO–01

DISPOSAL

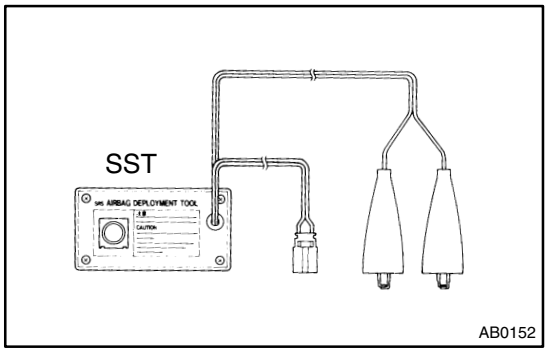
HINT:

When scrapping vehicles equipped with an SRS or disposing of the side airbag assembly 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.

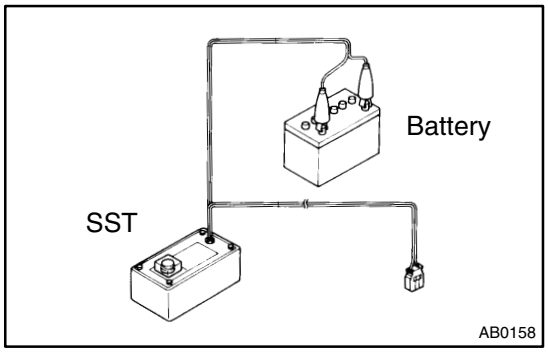
When disposing of a side airbag assembly with an airbag deployed in a collision, follow the same procedure given in step 1–(e) in ”DISPOSAL”.

CAUTION:

- **Never dispose of a side airbag assembly 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.**
  SST 09082–00700
- **When deploying the airbag, perform the operation at least 10 m (33 ft) away from the airbag assembly.**
- **The side airbag assembly 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 side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water etc. to a side airbag assembly with the deployed airbag.**



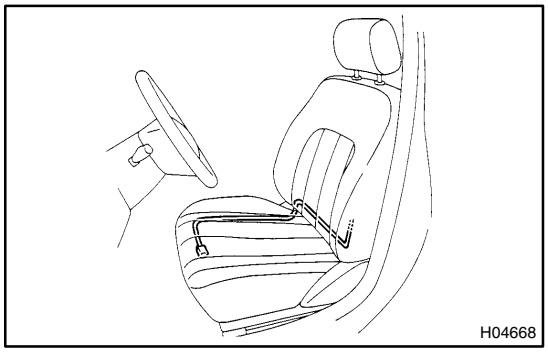
1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Check functioning of the SST. (See Pub. No. RM599E on page RS–17)

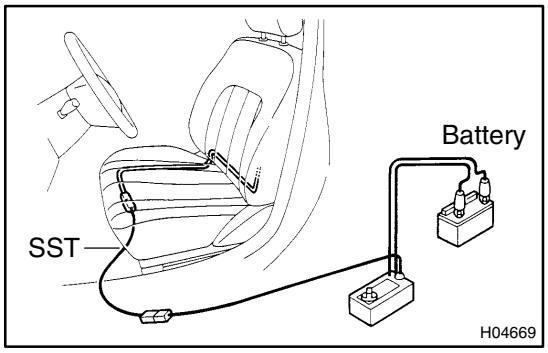
SST 09082–00700



(b) Disconnect the side airbag connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



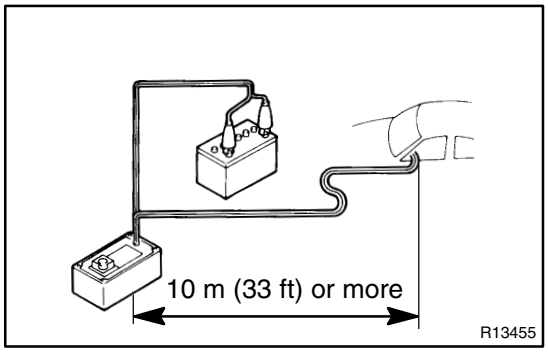
(c) Install the SST.

(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.



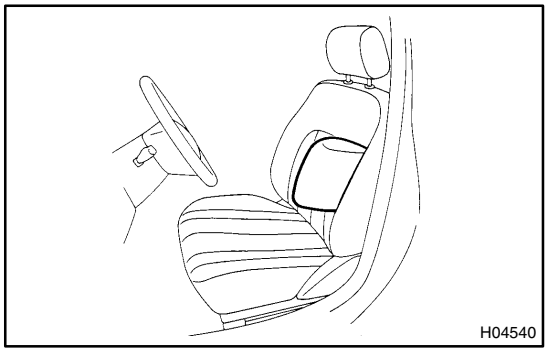
(2) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(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 side airbag assembly.

CAUTION:

- **The side airbag assembly 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 side airbag assembly with the deployed airbag.**
- **Do not apply water, etc. to a side airbag assembly 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 side airbag assembly still installed.

2. DEPLOYMENT WHEN DISPOSING OF SIDE AIRBAG ASSEMBLY

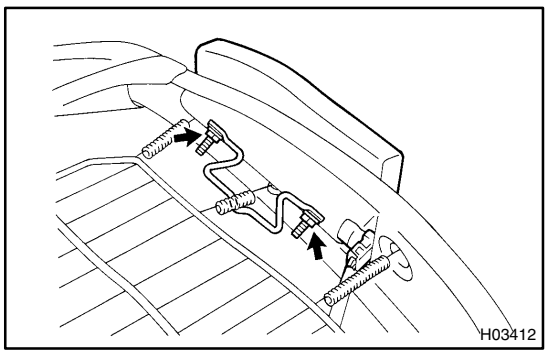
NOTICE:

- **When disposing of the side airbag assembly 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 seatback frame. (See page RS–10)

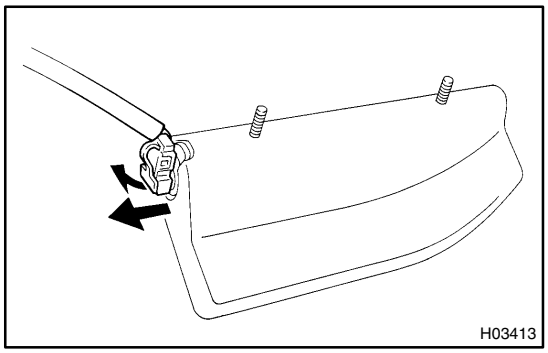


(b) Remove the side airbag assembly from the seatback frame.

(1) Remove the 2 nuts, wire and side airbag assembly.

CAUTION:

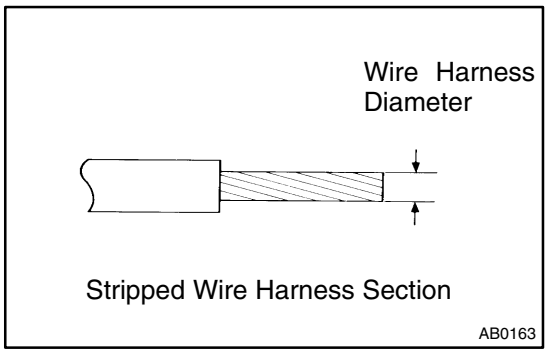
- **Never disassemble the side airbag assembly.**
- **Store the side airbag assembly with the airbag deployment side facing upward.**



(2) Release the lock of connector, then disconnect the connector of side airbag sub wire harness.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness



(c) Using a service–purpose wire harness, tie down the side airbag assembly.

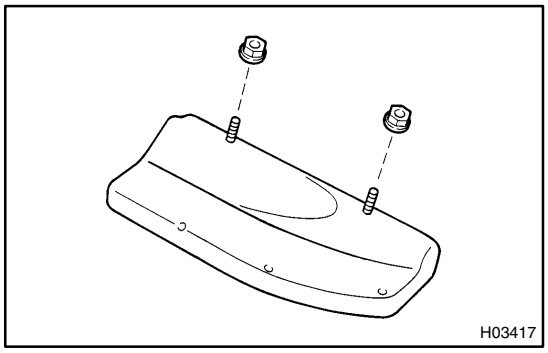
Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2 or more)

HINT:

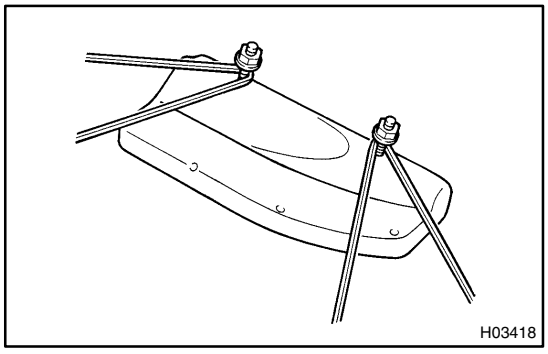
To calculate the square of the stripped wire harness section :
Square = 3.14 x (Diameter)^2 divided by 4

CAUTION:

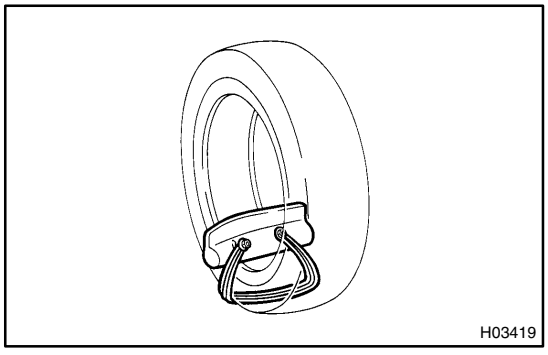
If a wire harness which is too thin or some other thing is used to tie down the side airbag assembly, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2).



(1) Install the 2 nuts in the side airbag assembly.



(2) Wind the wire harness around the stud bolts of the side airbag assembly as shown in the illustration.



(3) Position the side airbag assembly 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.)

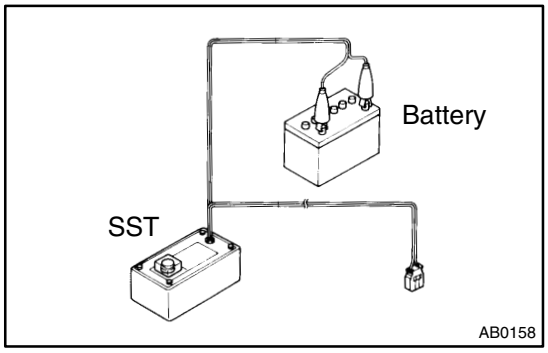
CAUTION:

- **Make sure the wire harness is tight. It is very dangerous when a loose wire harness results in the side airbag assembly coming free due to the shock from the airbag deploying.**

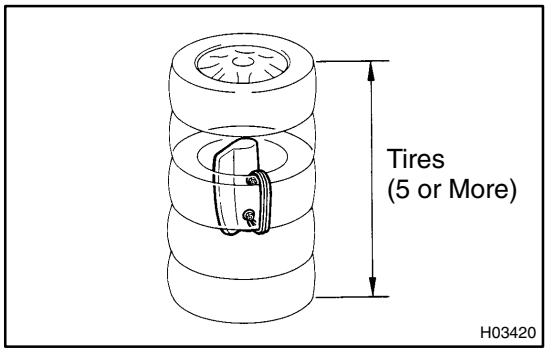
- **Always tie down the side airbag assembly with the airbag door facing inside.**

NOTICE:

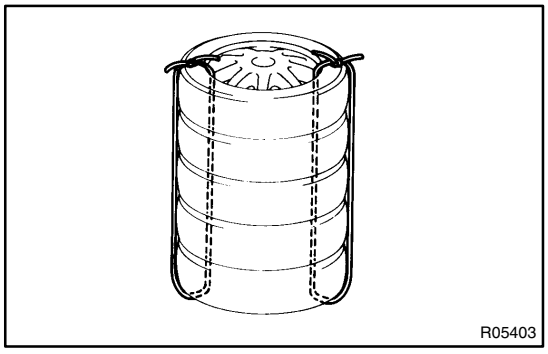
The tire will be marked by the airbag deployment, so use the redundant tire.



(d) Check functioning of the SST.
SST 09082–00700, 09082–00750



(e) Place the tires.
(1) Place at least 2 tires under the tire to which the side airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the side airbag assembly is tied. The top tire should have the wheel installed.



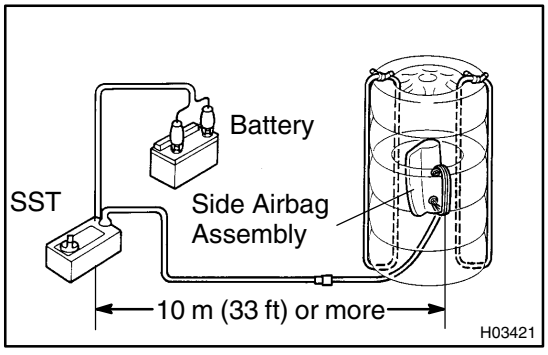
(3) Tie the tires together with 2 wire harnesses.

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.



(f) Install the SST.
Connect the connector of 2 SST to the side airbag assembly connector.
SST 09082–00700, 09082–00750

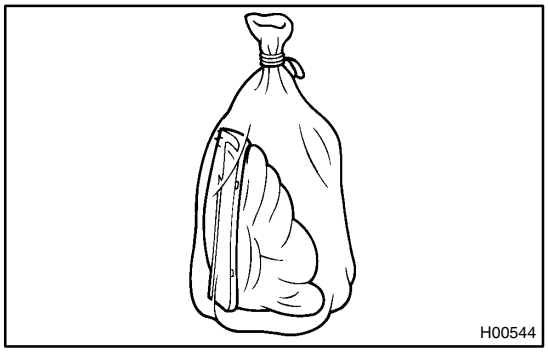
NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.

(g) 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 side airbag assembly 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.


H00544

(h) Dispose of the side airbag assembly.

CAUTION:

- **The side airbag assembly 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 side airbag assembly with the deployed airbag.**
- **Do not apply water etc. to a side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**

(1) Remove the side airbag assembly from the tire.
(2) Place the side airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS0IP–01

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the side airbag assembly or seatback cover.

Case	Replacing part
If the side airbag has been deployed.	Side airbag assembly
If the side airbag has been found to be faulty in troubleshooting.	Side airbag assembly
If the side airbag assembly has cut during checking items. (See page RS–11)	Side airbag assembly
If the seatback cover has cut and frayed seams during checking items. (See page RS–11)	Seatback cover
If the side airbag assembly has been found to be faulty during checking items. (See page RS–11)	Side airbag assembly
If the seatback cover has been found to be faulty during checking items. (See page RS–11)	Seatback cover
If the seatback frame assembly has been dropped.	Side airbag assembly

CAUTION:

For removal and installation of the side airbag assembly, see page RS–10 and RS–19. Be sure to follow the correct procedure.

RS0IQ–01

INSTALLATION

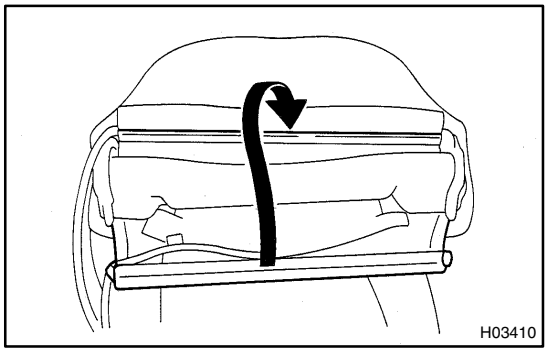
NOTICE:

Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.

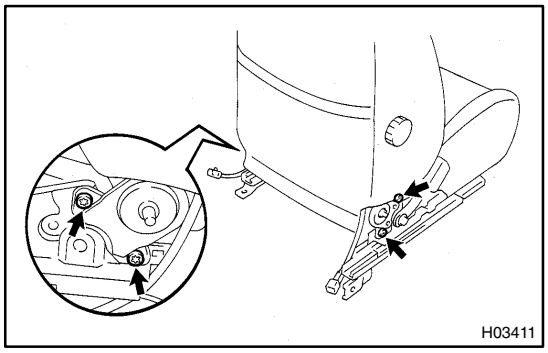
1. INSTALL THESE PARTS TO SEATBACK FRAME

(a) Install the seatback pad.

(b) Install the hog rings and seatback cover.



(c) Hang the hook of the seatback cover.



2. INSTALL SEATBACK TO SEAT CUSHION ASSEMBLY

Using a torx wrench, install the 4 screws and seatback assembly.

Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

3. INSTALL THESE PARTS TO FRONT SEAT ASSEMBLY

(a) Install the 2 headrest supports.

(b) Install the headrest.

(c) Install the lumber support adjusting knob.

(d) Install the front seat inner shield.

4. INSTALL FRONT SEAT

(a) Mount the seat to the vehicle.

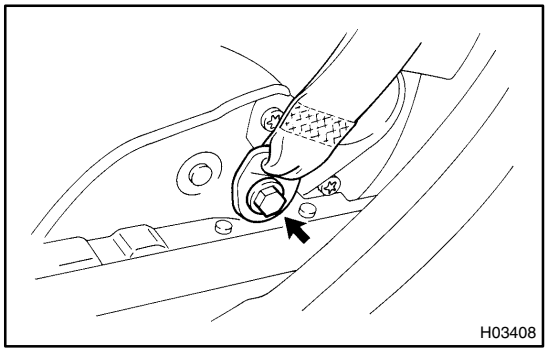
(b) Connect the side airbag connector.

(c) Install the outer bolt and inner bolt on the front side after sliding the seat to the rearmost position.

Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

(d) Tighten the bolts on the rear side temporarily, tighten them completely starting from the bolt on the inner side.

Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



(e) Install the front seat belt lap outer anchor.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

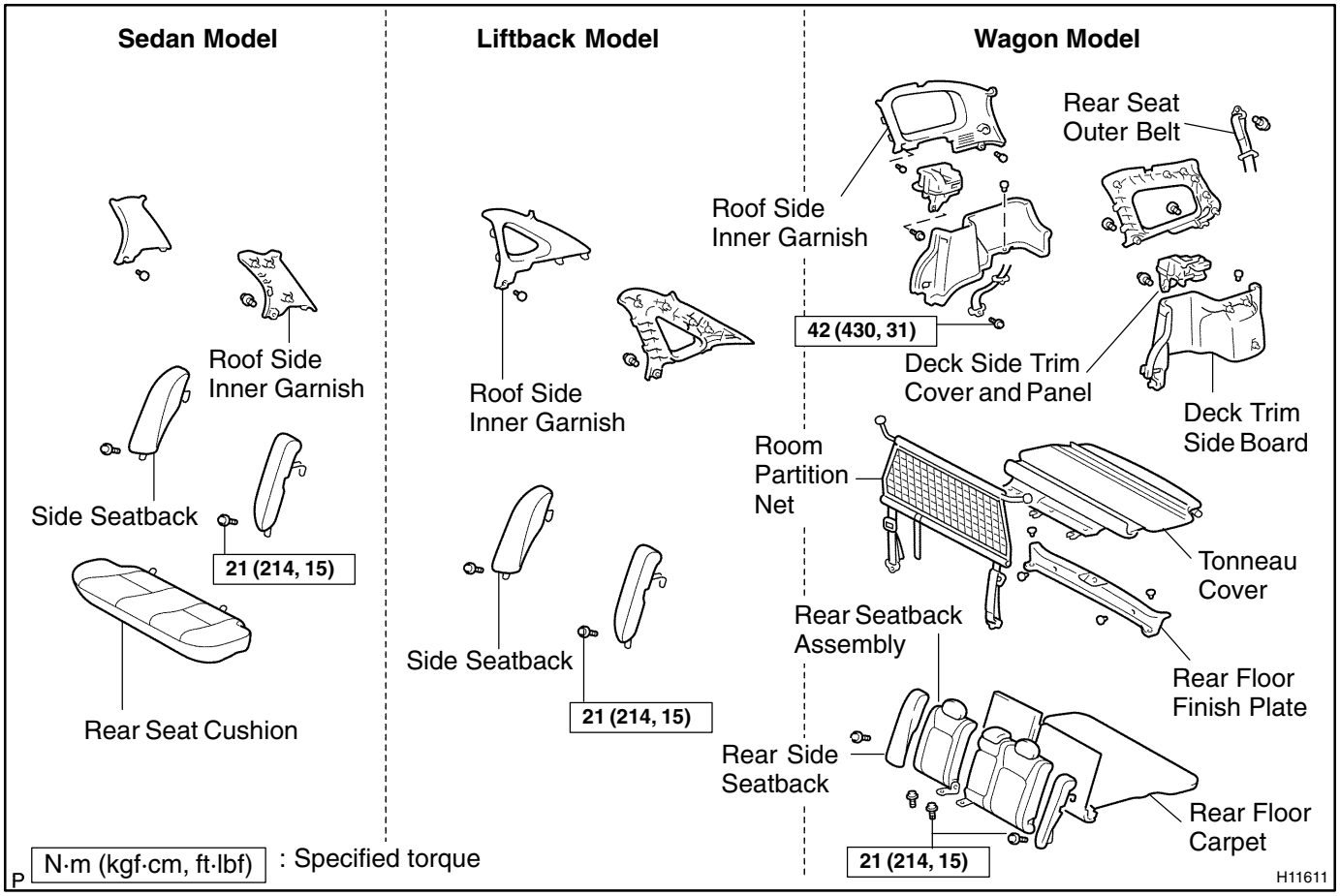
(f) Install the front seat cushion outer shield and reclining adjuster knob.

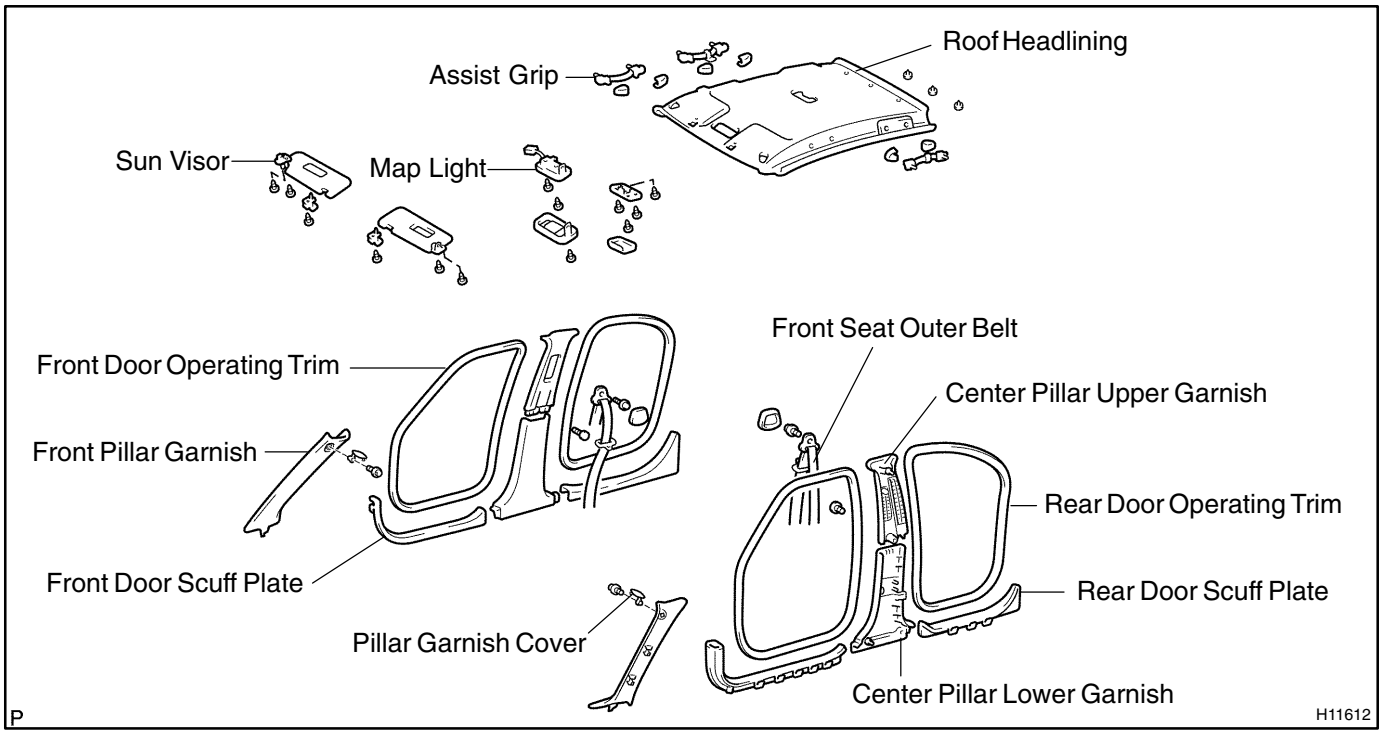
(g) Install the 2 seat track covers.

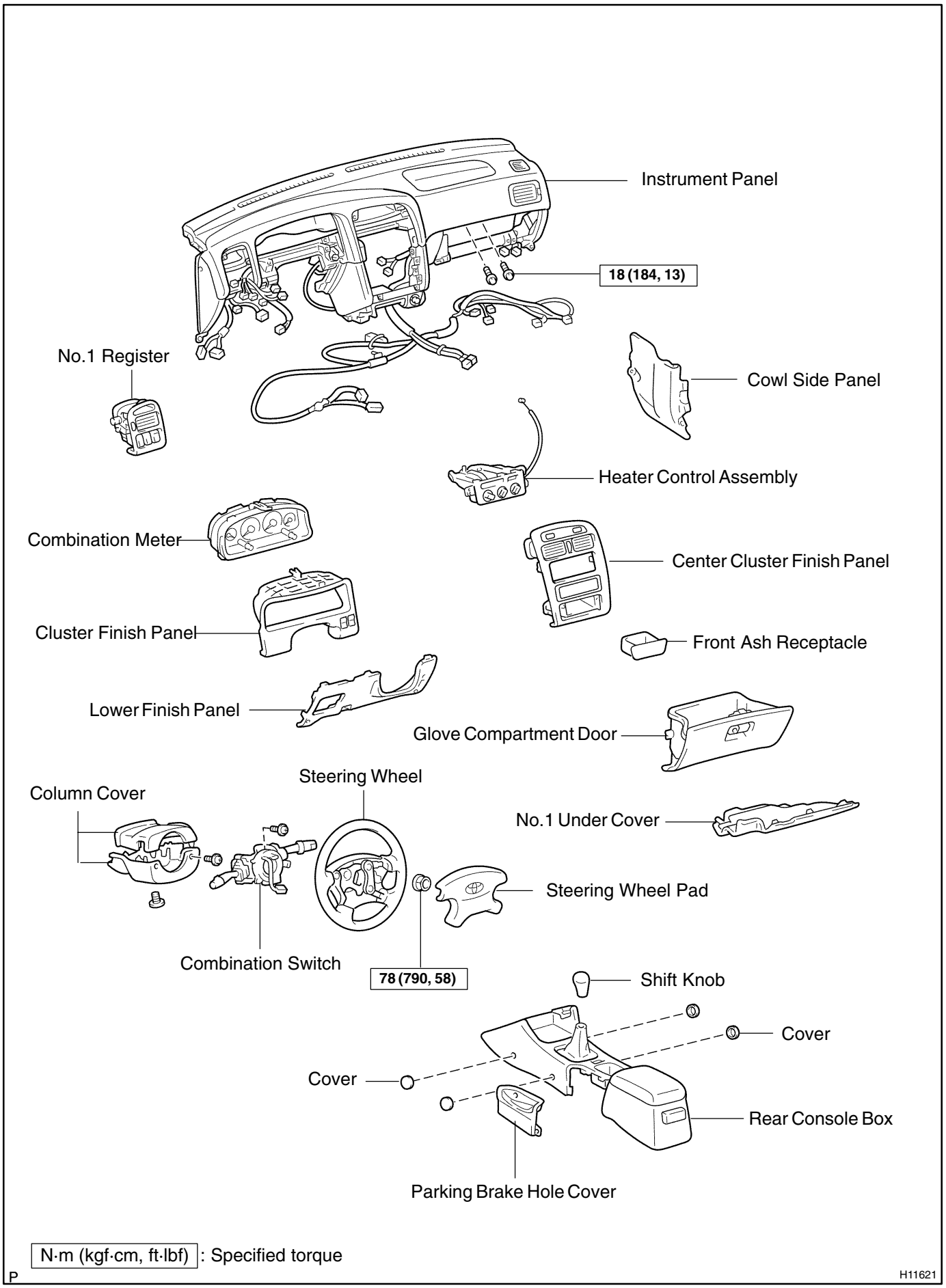
CURTAIN SHIELD AIRBAG ASSEMBLY

RS0IR–01

COMPONENTS



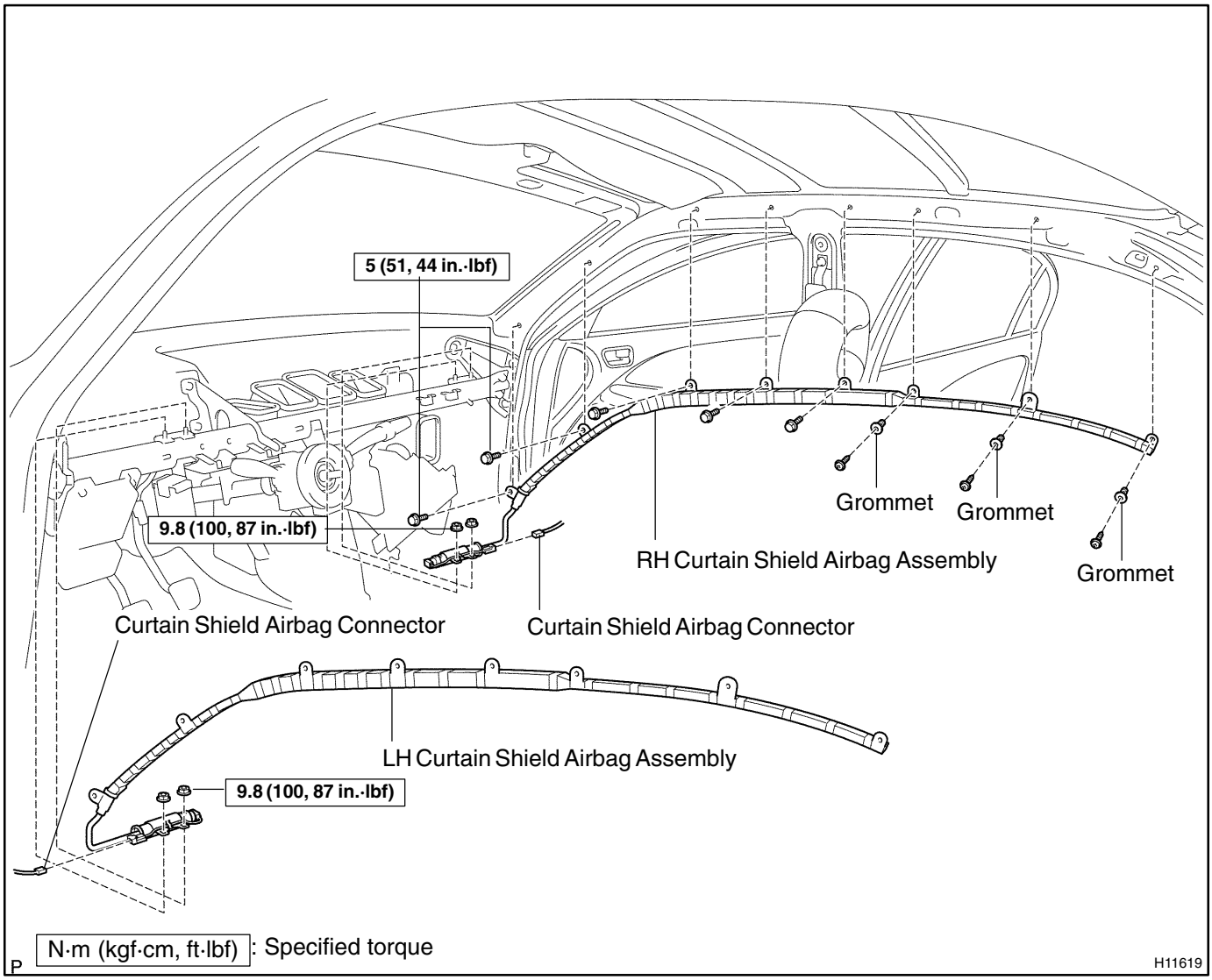


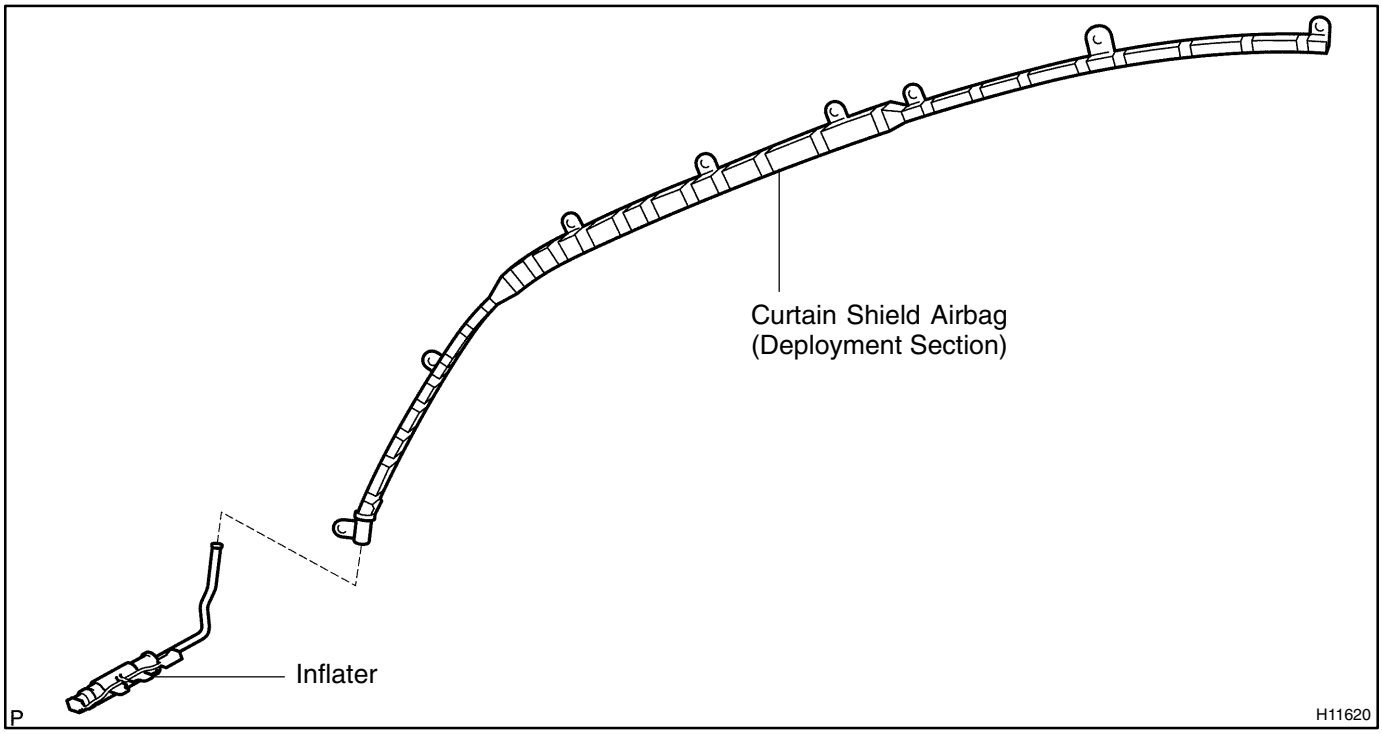


N·m (kgf·cm, ft·lbf) : Specified torque

P

H11621


5 (51, 44 in.·lbf)
9.8 (100, 87 in.·lbf)
Grommet
Grommet
Grommet
RH Curtain Shield Airbag Assembly
Curtain Shield Airbag Connector
Curtain Shield Airbag Connector
LH Curtain Shield Airbag Assembly
9.8 (100, 87 in.·lbf)
N·m (kgf·cm, ft·lbf): Specified torque
P
H11619

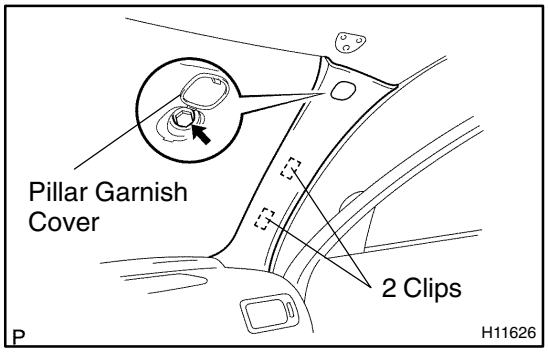

Curtain Shield Airbag
(Deployment Section)
Inflater
P
H11620

RS0IS–01

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is at ON or ACC position, DTCs will be recorded.**
- **Never use the airbag parts from another vehicle. When replacing parts, replace them with new parts.**



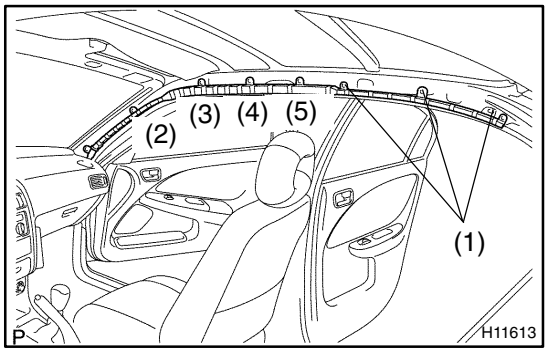
1. REMOVE FRONT PILLAR GARNISH

(a) Using a screw driver, raise the pillar garnish cover.

(b) Remove the bolt, pillar garnish cover, and front pillar garnish.

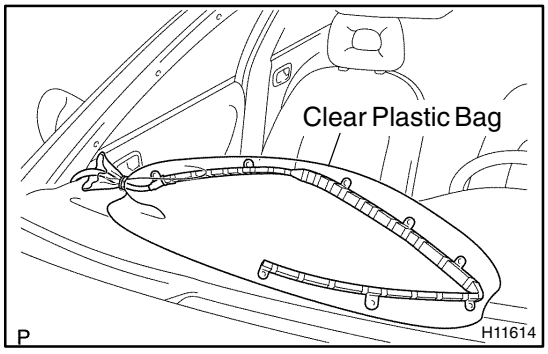
2. REMOVE ROOF HEADLINING

- Sedan model (See page BO–23)
- Liftback model (See page BO–28)
- Wagon model (See page BO–33)



3. REMOVE CURTAIN SHIELD AIRBAG (IN CASE WITHOUT REMOVING INFLATER)

(a) In the order shown in the illustration, remove the bolts and grommets, then remove the deployment section of the curtain shield airbag.



(b) Put the removed airbag in the clear plastic bag and put it on the instrument panel.

NOTICE:

Clear plastic bag is not reuse.

CAUTION:

Never diassemble the curtain shield airbag.

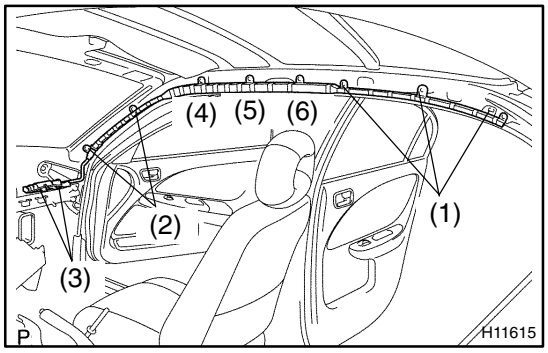
4. REMOVE CURTAIN SHIELD AIRBAG ASSEMBLY

(a) Remove the instrument panel assembly. (See page BO–16)

(b) Disconnect the curtain shield airbag connector.

NOTICE:

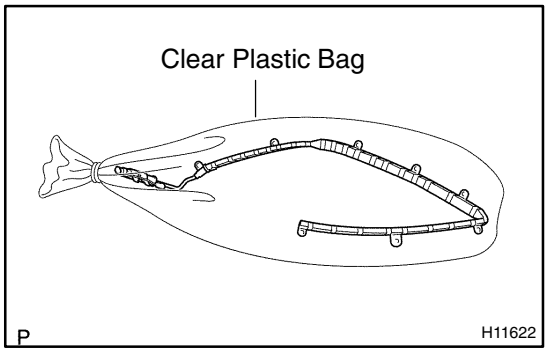
When handling the airbag connector, take care not to damage the airbag wire harness.



(c) In the order shown in the illustration, remove the bolts and grommets, then remove the curtain shield airbag assembly.

HINT:

In case of removing (5) and (6), bind the front and rear of the airbag, and remove.



(d) Put the removed curtain shield airbag in a clear plastic bag and keep it in a safe place.

NOTICE:

Protection bag is not reuse.

CAUTION:

Never disassemble the curtain shield airbag assembly.

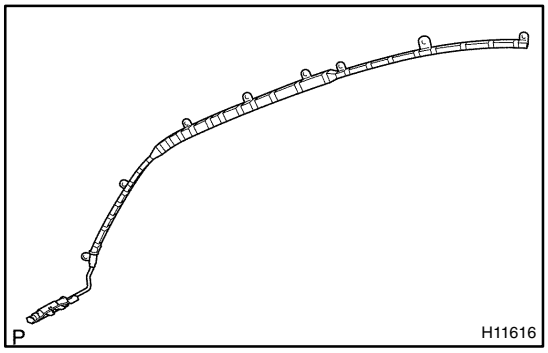
RS0IT–01

INSPECTION

1. VEHICLES NOT INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See Pub. No.RM599E on page DI–152)

(b) Do a visual check which includes the following items with the curtain shield airbag assembly installed in the vehicle. Check cuts, minute cracks or marked discoloration on the front pillar garnishes.



2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

(a) Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

(b) Do a visual check which includes the following items with the curtain shield airbag assembly removed from the vehicle.

- Check cuts and cracks, or marked discoloration of the curtain shield airbag assembly.
- Check cuts and cracks in wire harnesses, and chipping in connectors.

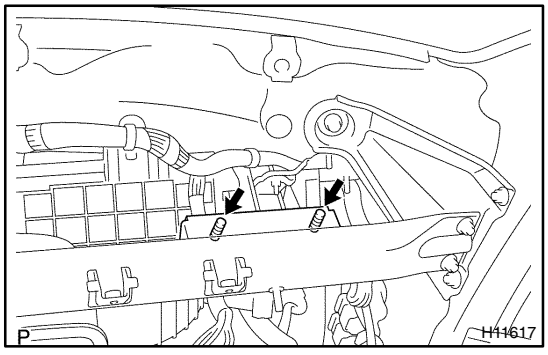
CAUTION:

For removal and installation of the curtain shield airbag assembly, see page RS–23 and RS–32. Be sure to follow the correct procedure.

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

(a) Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

(b) Do a visual check which includes the following items with the curtain shield airbag assembly removed from the vehicle.



- Check the curtain shield airbag installation part of the instrument panel reinforcement.
- Check the damage to the connector and wire harness.

HINT:

If the front pillar garnish or instrument panel reinforcement are deformed, never repair it. Always replace it with a new one.

RS0IU–01

DISPOSAL

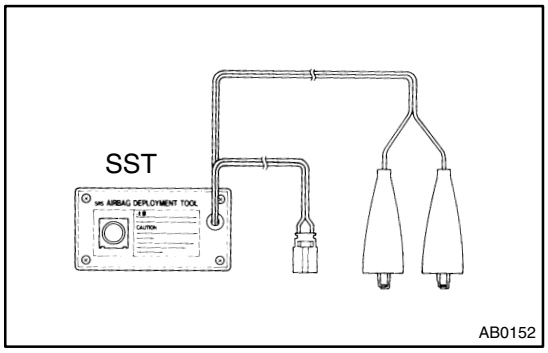
HINT:

When scrapping vehicles equipped with an SRS or disposing of the curtain shield airbag assembly, 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.

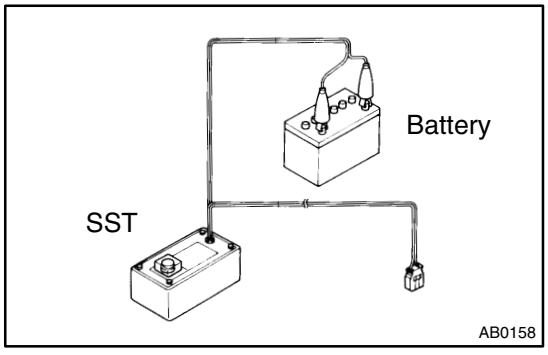
When disposing of a curtain shield airbag assembly with an airbag deployed in a collision, follow the same procedure given in step 1–(e) in "DISPOSAL".

CAUTION:

- **Never dispose of a curtain shield airbag assembly 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.**
  SST 09082–00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the airbag assembly.**
- **The curtain shield airbag assembly 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 curtain shield airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water etc. to a curtain shield airbag assembly with the deployed airbag.**



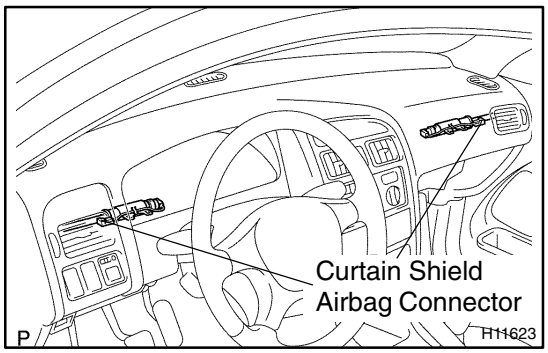
1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Check functioning of the SST. (See Pub. No. RM599E on page RS–17)
SST 09082–00700

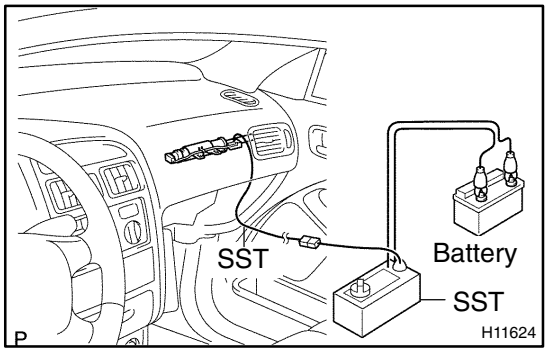
(b) Remove the lower finish panel and grove compartment door.



(c) Disconnect the curtain shield airbag connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



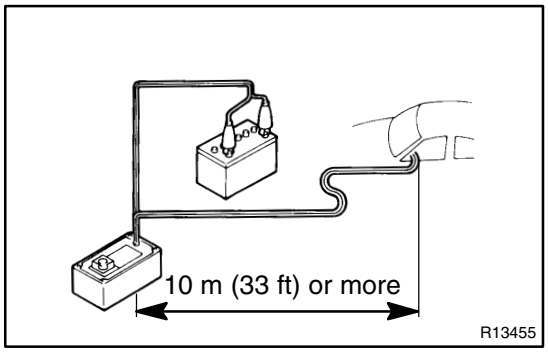
(d) Install the SST.

(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.



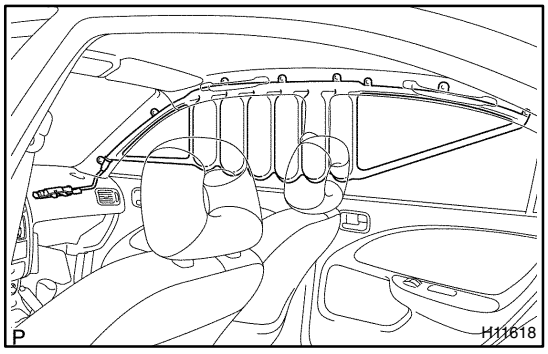
(2) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(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.



(e) 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.

(f) Dispose of the curtain shield airbag assembly.

CAUTION:

- **The curtain shield airbag assembly 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 curtain shield airbag assembly with the deployed airbag.**
- **Do not apply water etc. to a curtain shield airbag assembly 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 curtain shield airbag assembly still installed.

2. DEPLOYMENT WHEN DISPOSING OF CURTAIN SHIELD AIRBAG ASSEMBLY

NOTICE:

- **When disposing of the curtain shield airbag assembly only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

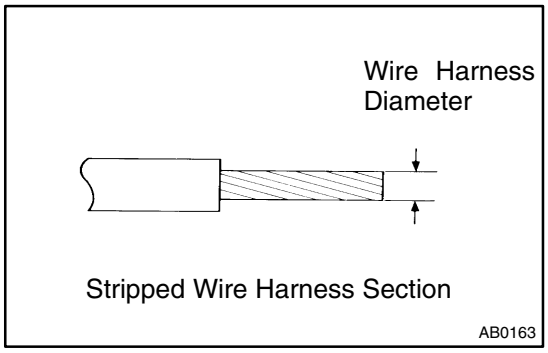
HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Remove the curtain shield airbag assembly.

CAUTION:

Store the curtain shield airbag assembly with the airbag deployment curtain shield facing upward.



(b) Using a service–purpose wire harness, tie down the curtain shield airbag assembly.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2 or more)

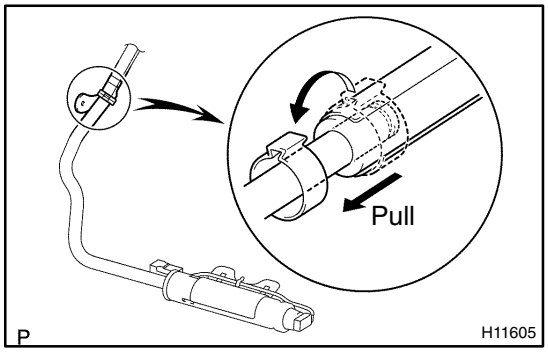
HINT:

To calculate the square of the stripped wire harness section :

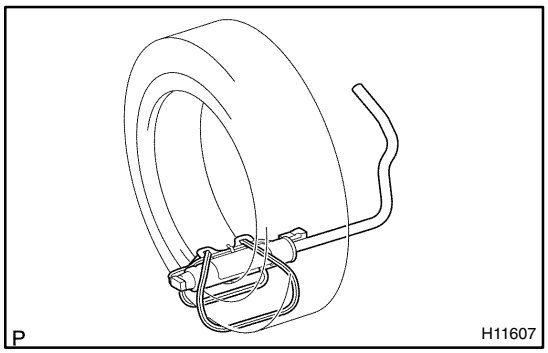
Square = 3.14 x $(Diameter)^2$ divided by 4

CAUTION:

If a wire harness which is too thin or some other thing is used to tie down the curtain shield airbag assembly, 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) Cut the deployment section of the curtain shield airbag assembly.



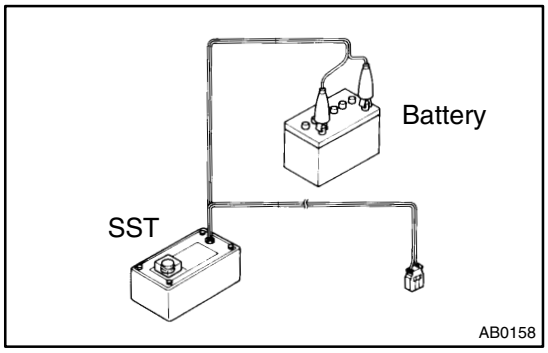
(2) Position the inflater of curtain shield airbag inside the tire with the airbag explosion direction facing inside.

Tire size : Must exceed the following dimensions:
Width 185 mm (7.28 in.)
Inner diameter 360 mm (14.17 in.)

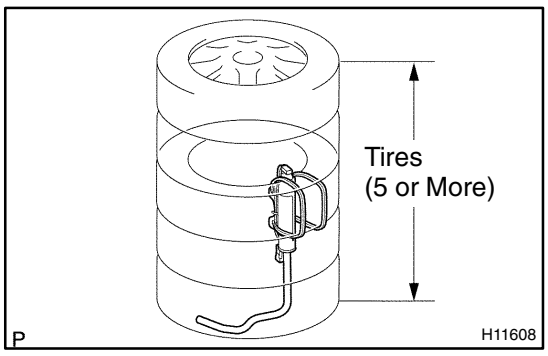
CAUTION:

- **Make sure the wire harness is tight. It is very dangerous when a loose wire harness results in the curtain shield airbag coming free due to the shock from the airbag exploding.**
- **Always tie down the curtain shield airbag with the explosion facing inside.**

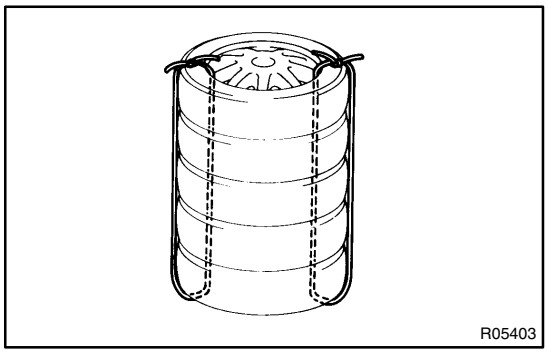
NOTICE:
The tire will be marked by the airbag explosion, so use the redundant tire.



(c) Check functioning of the SST.
SST 09082–00700, 09082–00750



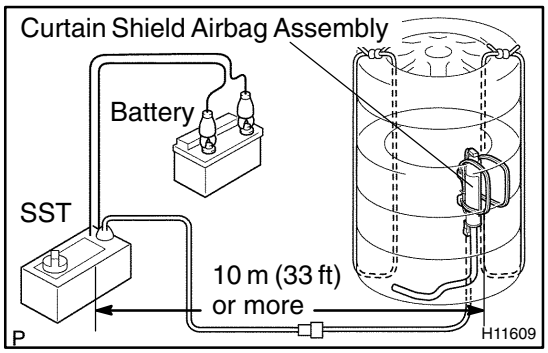
(d) Place the tires.
(1) Place at least 2 tires under the tire to which the curtain shield airbag is tied.
(2) Place at least 2 tires over the tire to which the curtain shield airbag is tied. The top tire should have the wheel installed.



(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 exploding.

HINT:
Place the SST connector and wire harness inside tires. Secure at least 1 m (3 ft) of slack for the wire harness.



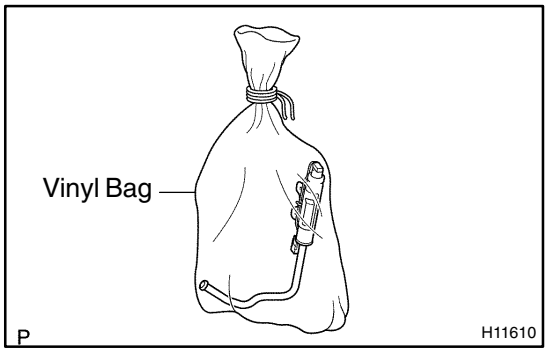
(e) Install the SST.
Connect the connector of 2 SST to the curtain shield airbag connector.
SST 09082–00700, 09082–00750

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.

(f) Explode 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 curtain shield airbag is tied to.
(3) Press the SST activation switch and explode the airbag.

HINT:
The airbag explodes simultaneously as the LED of the SST activation switch lights up.



(g) Dispose of the curtain shield airbag.

CAUTION:

- **The curtain shield airbag is very hot when the airbag is exploded, so leave it alone for at least 30 minutes after explosion.**
- **Use gloves and safety glasses when handling a curtain shield airbag with the exploded airbag.**
- **Do not apply water etc. to a curtain shield airbag with the exploded airbag.**
- **Always wash your hands with water after completing the operation.**

(1) Remove the curtain shield airbag from the tire.
(2) Place the curtain shield airbag in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS0IV–01

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the side airbag assembly.

Case	Replacing part
If the curtain shield airbag has been deployed.	Curtain shield airbag assembly
If the curtain shield airbag has been found to be faulty in troubleshooting.	Curtain shield airbag assembly
If the curtain shield airbag assembly has been found to be faulty during checking items. (See page RS–11)	Curtain shield airbag assembly
If the front pillar garnish and roof headlining has been found to be faulty during checking items. (See page RS–11)	Front pillar garnish Roof headlining
If the instrument panel reinforcement has been found to be faulty during checking items. (See page RS–11)	Instrument panel reinforcement
If the curtain shield airbag assembly has been dropped.	Curtain shield airbag assembly

CAUTION:

For removal and installation of the side airbag assembly, see page RS–23 and RS–32. Be sure to follow the correct procedure.

RS0IW–01

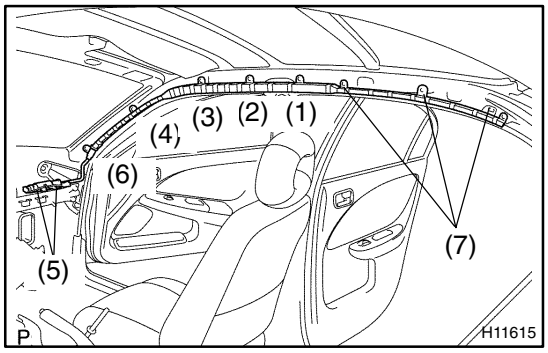
INSTALLATION

NOTICE:

- **Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.**
- **Make sure that the curtain shield airbag assembly is installed with the specified torque.**
- **If the curtain shield airbag assembly has been dropped, or there are cracks, dents or other defects in the case or connector, replace the curtain shield airbag assembly with a new one.**
- **When installing the curtain shield airbag assembly, take care it is not pinched between other parts.**

1. INSTALL CURTAIN SHIELD AIRBAG ASSEMBLY

(a) Connect the connector of the curtain shield airbag sub wire harness then lock it.

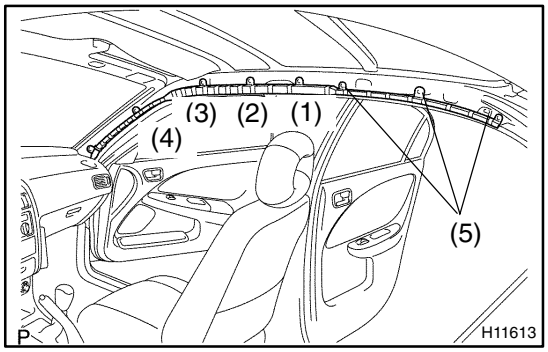


(b) In order shown in the illustration, install the curtain shield airbag with the bolts and grommets.

Torque:
Nuts: 9.8 N·m (100 kgf·cm, 87 in.·lbf)
Bolts: 5 N·m (51 kgf·cm, 44 in.·lbf)

CAUTION:
Pay attention for not causing twisting.

(c) Install the instrument panel assembly. (See page BO–19)



2. INSTALL CURTAIN SHIELD AIRBAG (IN CASE WITHOUT INSTALLING INFLATER)

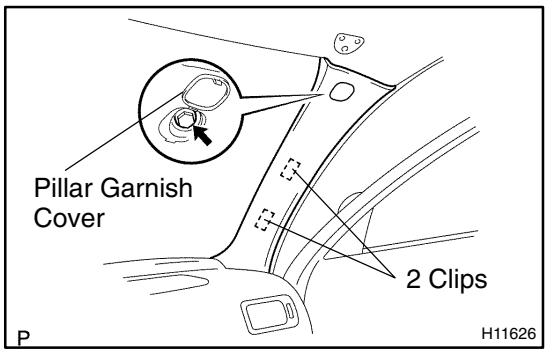
In order shown in the illustration, install the deployment section of the curtain shield airbag with the bolts and grommet.

Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

CAUTION:
Pay attention for not causing twisting.

3. INSTALL ROOF HEADLINING

- Sedan model (See page BO–25)
- Liftback model (See page BO–30)
- Wagon model (See page BO–36)



4. INSTALL FRONT PILLAR GARNISH

(a) Install the front pillar garnish.

(b) Install the pillar garnish cover with the bolt.

NOTICE:

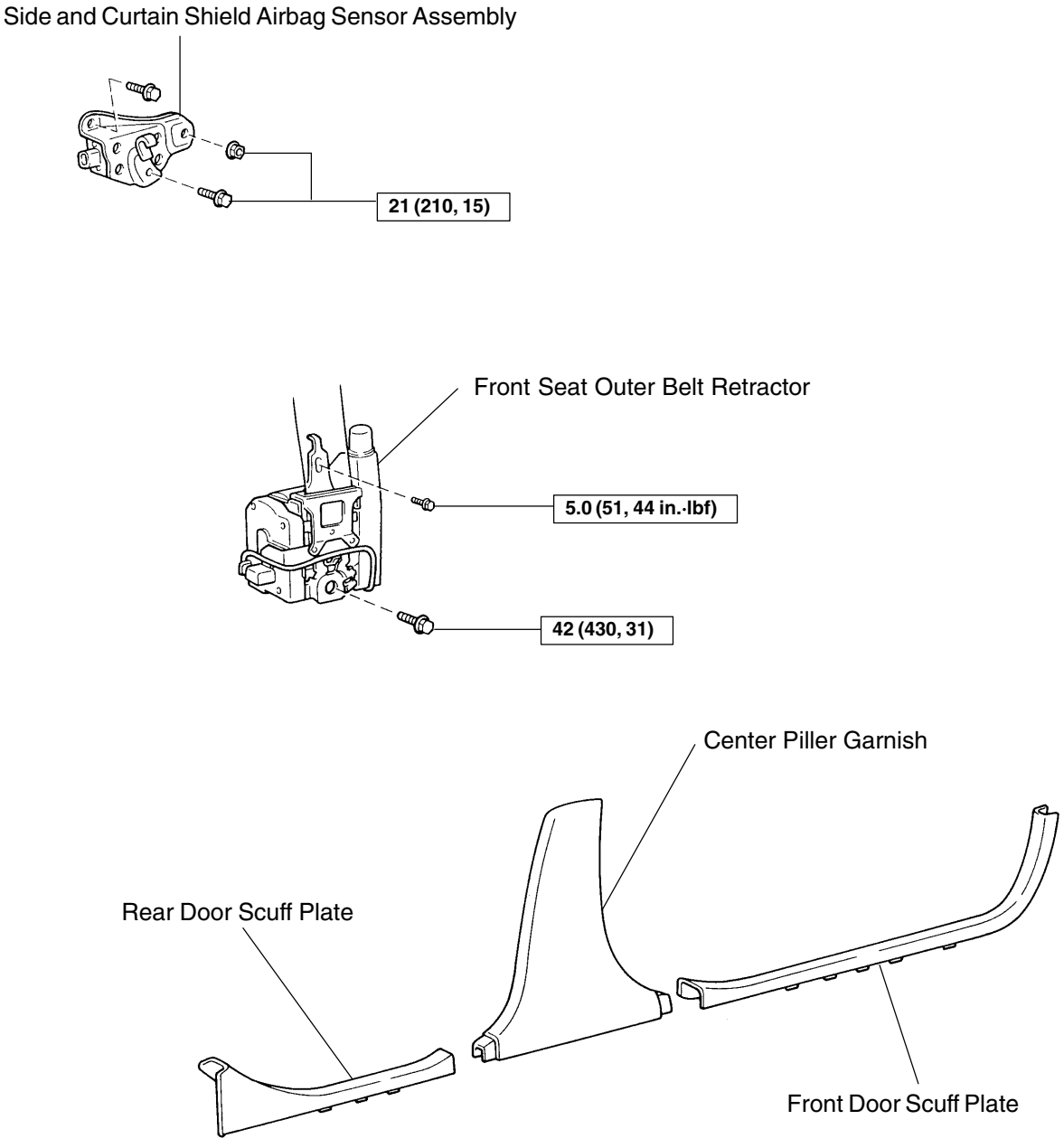
Be sure to tighten the bolt.

(c) Fell the pillar garnish cover.

SIDE AND CURTAIN SHIELD AIRBAG SENSOR ASSEMBLY

RS0IX–01

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

H03424

RS0IY–01

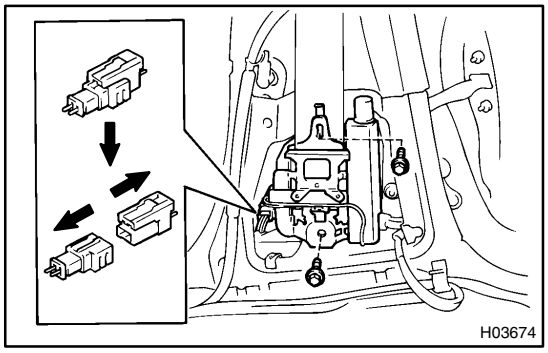
REMOVAL

NOTICE:

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

1. REMOVE FRONT AND REAR SCUFF PLATE

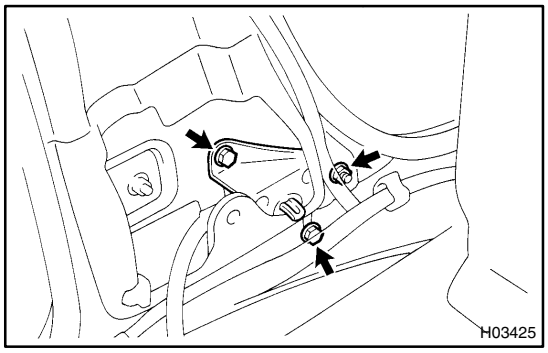
2. REMOVE CENTER PILLAR LOWER GARNISH



3. REMOVE FRONT SEAT OUTER BELT RETRACTOR (See Pub. No. RM599E on page BO–151)

(a) Disconnect the pretensioner connector.

(b) Remove the 2 bolts and retractor.



4. REMOVE SIDE AND CURTAIN SHIELD AIRBAG SENSOR ASSEMBLY

(a) Disconnect the connector.

NOTICE:

Remove the connector with the sensor assembly installed.

(b) Remove the 2 bolts, nut and side and curtain shield airbag sensor assembly.

RS0IZ–01

INSPECTION

1. VEHICLES NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

2. VEHICLES INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

3. VEHICLES INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

Replace the side and curtain shield airbag sensor assembly. (See page RS–34)

RSQJ0–01

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the side ans curtain shield airbag sensor assembly.

- If the side airbag assembly and curtain shield airbag assembly has been deployed in a collision.
- If the side and curtain shield airbag sensor assembly has been found to be faulty in troubleshooting.
- If the side and curtain shield airbag sensor assembly has been dropped.

CAUTION:

For removal and installation of the side and curtin shield airbag sensor assembly, see page RS–35 and RS–38.

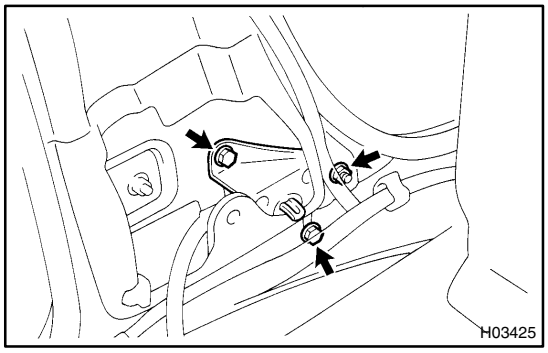
Be sure to follow the correct procedure.

RSQJ1–01

INSTALLATION

NOTICE:

- **Never use SRS parts from another vehicle. When replacing parts, replace them with new ones.**
- **Never reuse the side and curtain shield airbag sensor assembly involved in a collision when the airbag has deployed.**
- **Never repair a sensor in order to reuse it.**



1. INSTALL SIDE AND CURTAIN SHILD AIRBAG SENSOR

(a) Install the side and curtain shield airbag assembly with the 2 bolts and nut.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

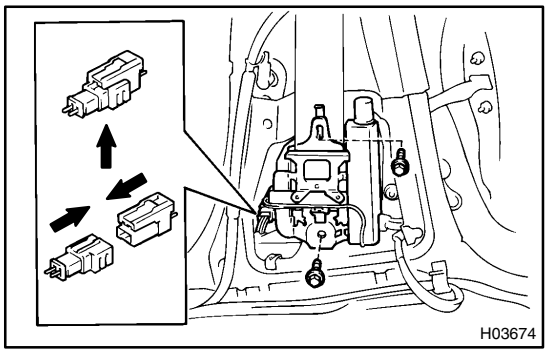
(b) Connect the side and curtain shild airbag sensor connector.

NOTICE:

- **Installation of the connector is done with the sensor assembly installed. Make sure the sensor assembly is installed with the specified torque.**
- **If the sensor assembly has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assembly with a new one.**
- **When installing the sensor assembly, take care that the SRS wiring does not interfere with other parts and is not pinched between other parts.**
- **After installation, shake the sensor assembly to check that there is no looseness.**

2. INSTALL FRONT SEAT OUTER BELT RETRACTOR (See pub. No. RM599E on page BO–159)

(a) Install the retractor with the 2 bolts.
Torque:
Upper bolt: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
Lower bolt: 42 N·m (430 kgf·cm, 31 ft·lbf)



(b) Connect the pretensioner connecter.

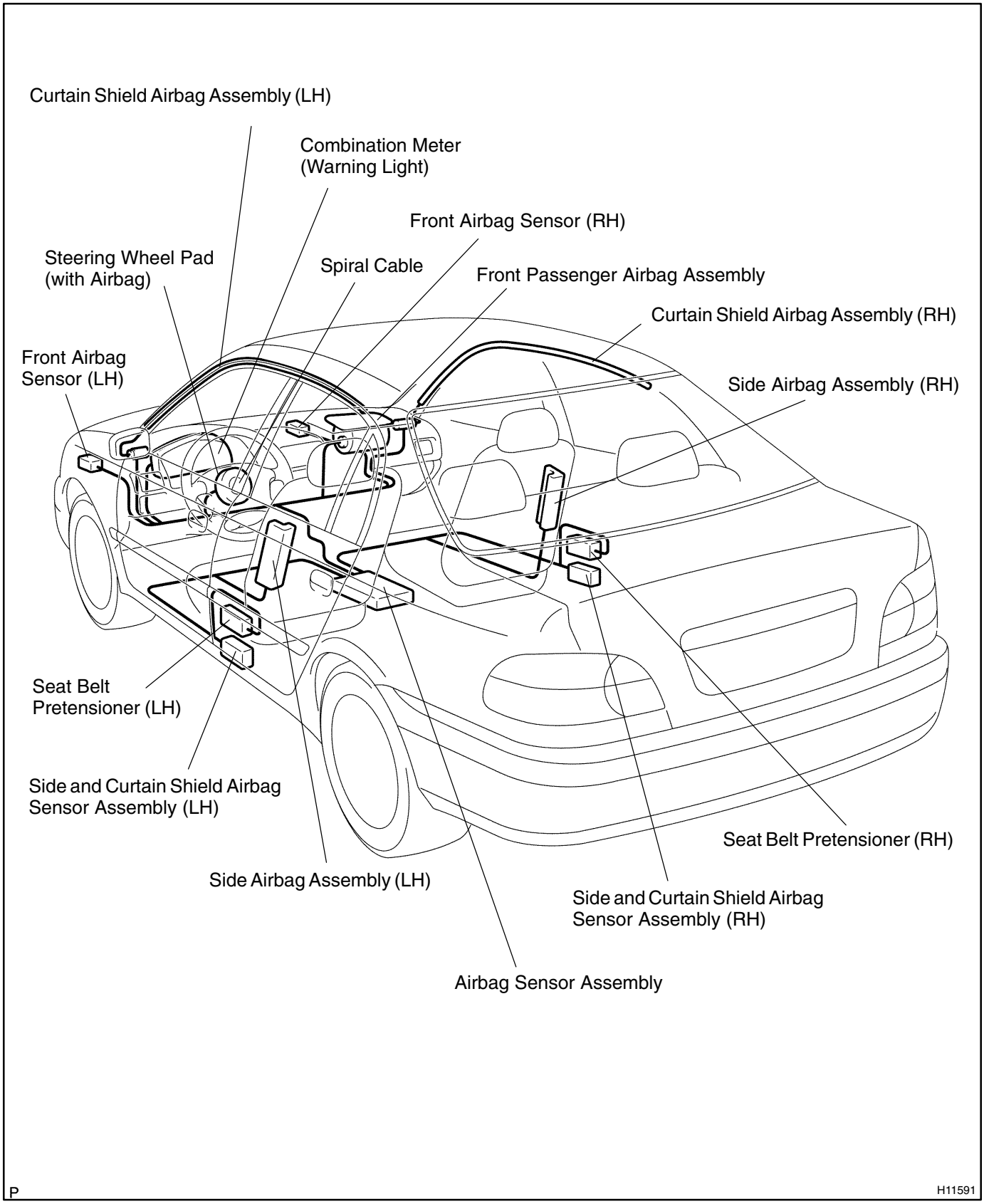
3. INSTALL CENTER PILLAR LOWER GARNISH

4. INSTALL FRONT AND REAR DOOR SCUFF PLATE

WIRE HARNESS AND CONNECTOR

LOCATION

RS0J2–01



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H11591

RSGJ3–01

INSPECTION

HINT:

The SRS wire harness is integrated with the instrument panel wire harness assembly. The wires for the SRS wire harness are encased in a yellow corrugated tube and all the connectors in the system are a standard yellow color.

1. VEHICLES NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

2. VEHICLES INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See Pub. No. RM599E on page DI–152)

(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.

RSQJ4–01

REPLACEMENT

In the following cases, replace the wire harness or connector.

- If any part of the SRS wire harness or any connector has been found to be faulty in troubleshooting.
- If any part of the SRS wire harness or any connector has been found to be faulty during checking items. (See page RS–40)

CAUTION:

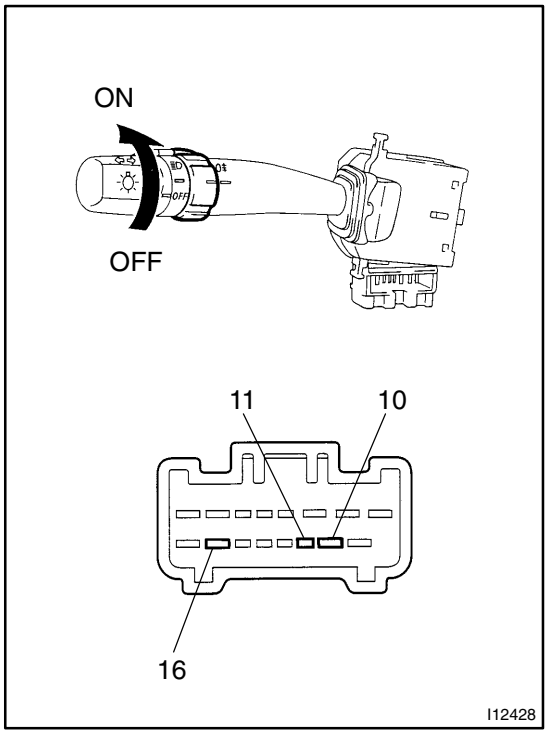
If the wire harness used in the SRS is damaged, replace the whole wire harness assembly.

BODY ELECTRICAL

FOG LIGHT SYSTEM BE–1
COMBINATION METER BE–2

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.



FOG LIGHT SYSTEM

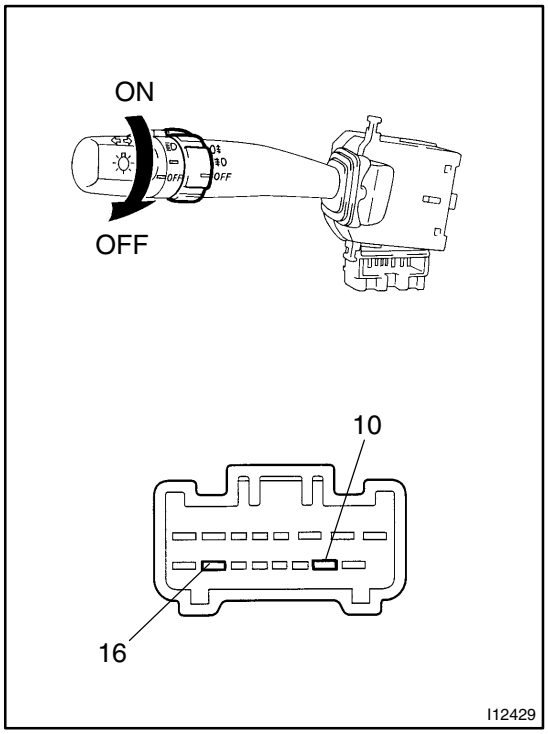
BE196–02

INSPECTION

1. INSPECT FRONT/REAR FOG LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
ON (FRONT)	11 – 16	Continuity
ON (FRONT/REAR)	10 – 11 – 16	Continuity

If continuity is not as specified, replace the switch.



2. INSPECT REAR FOG LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
ON	10 – 16	Continuity

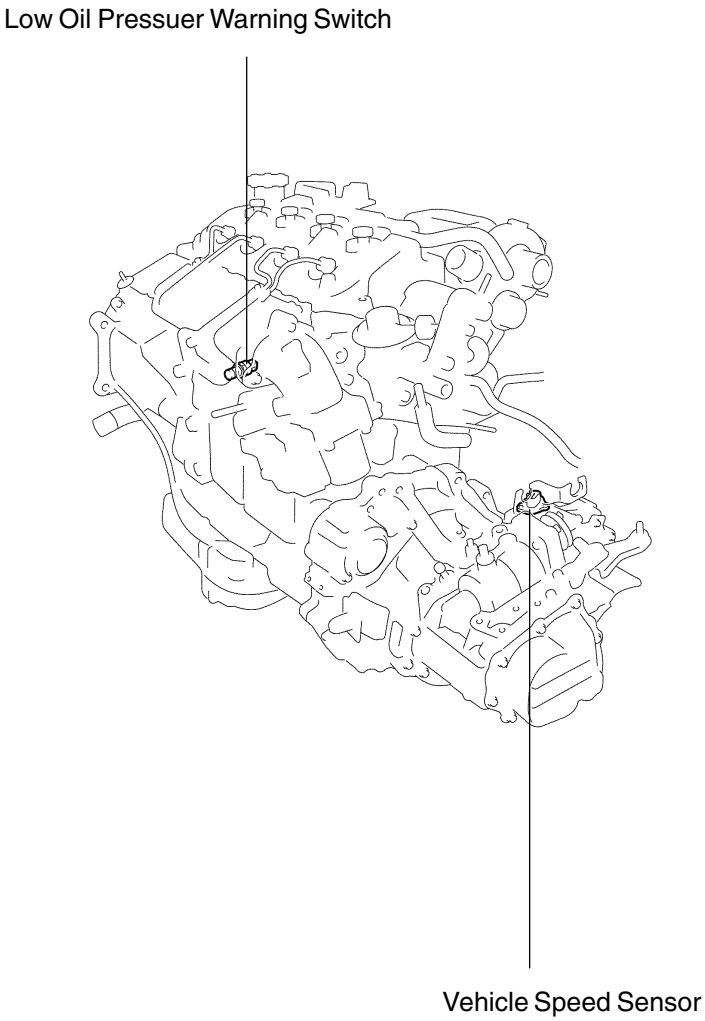
If continuity is not as specified, replace the switch.

COMBINATION METER

LOCATION

BE197–02

1CD–FTV Engine



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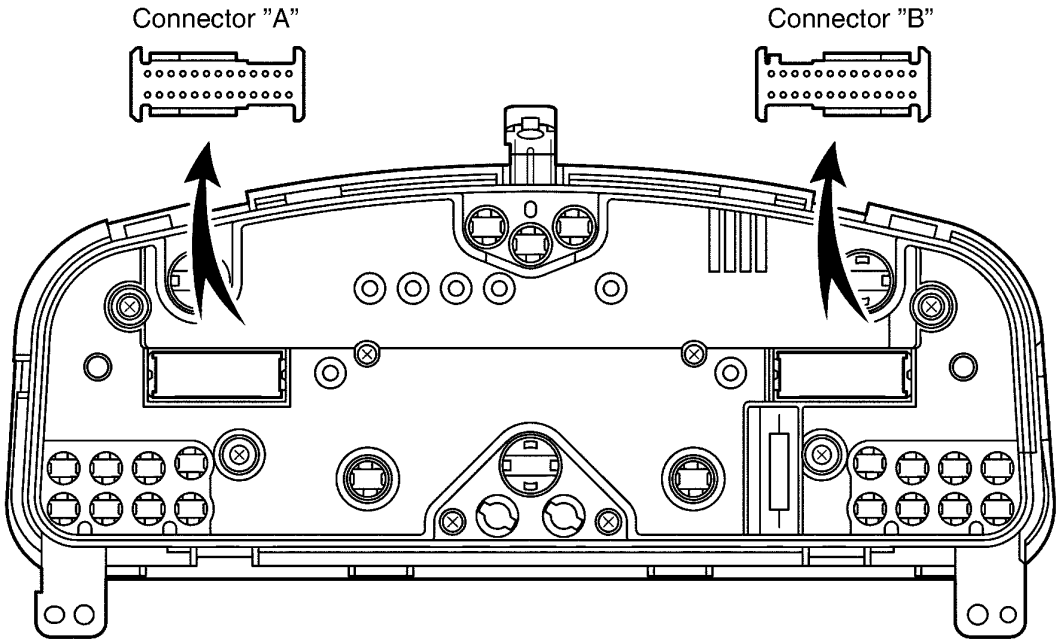
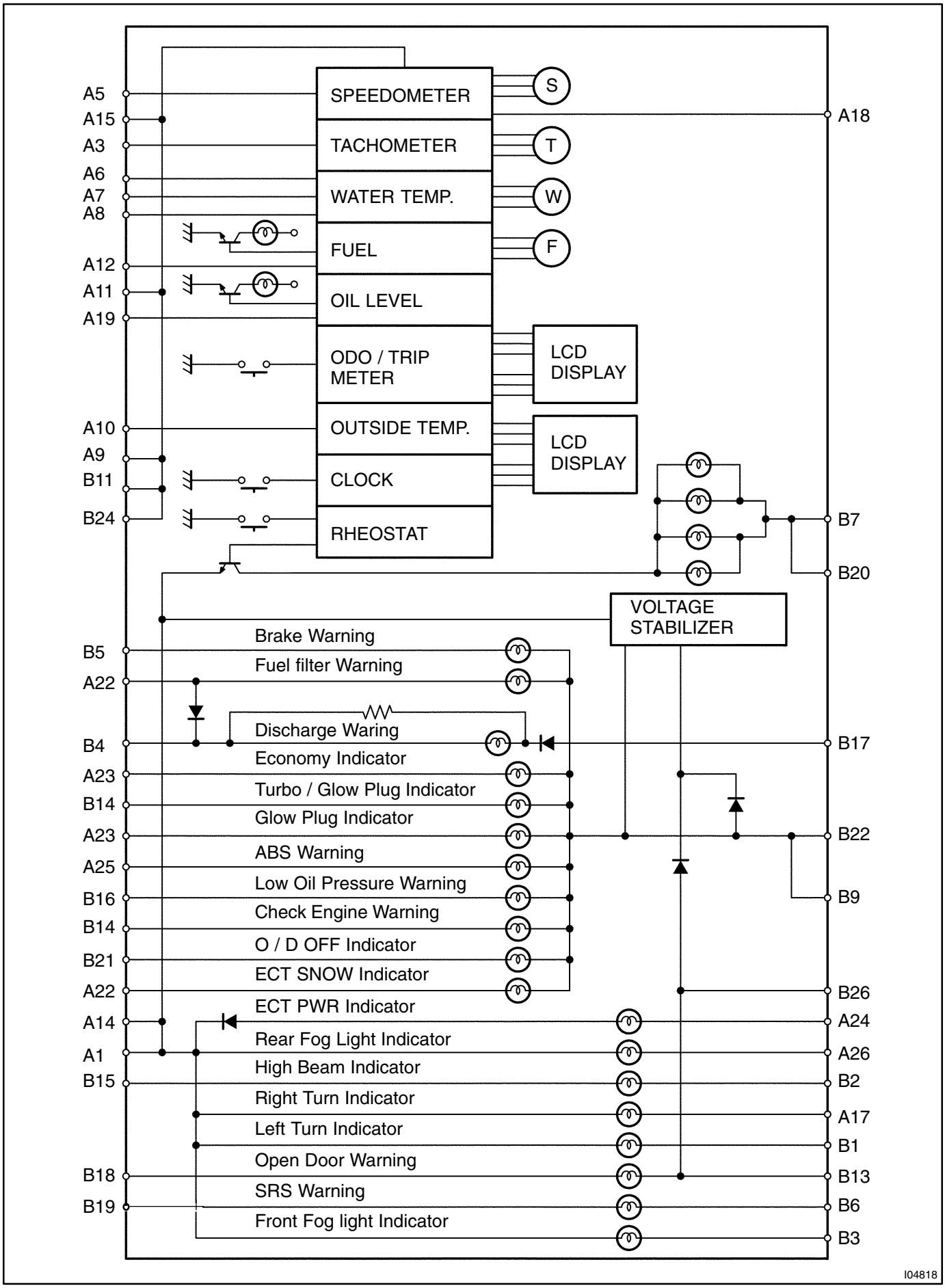
BE198–02

CIRCUIT



I04817


A5
A15
A3
A6
A7
A8
A12
A11
A19
A10
A9
B11
B24
B5
A22
B4
A23
B14
A23
A25
B16
B14
B21
A22
A14
A1
B15
B18
B19
SPEEDOMETER
TACHOMETER
WATER TEMP.
FUEL
OIL LEVEL
ODO / TRIP METER
OUTSIDE TEMP.
CLOCK
RHEOSTAT
S
T
W
F
LCD DISPLAY
LCD DISPLAY
A18
B7
B20
VOLTAGE STABILIZER
Brake Warning
Fuel filter Warning
Discharge Waring
Economy Indicator
Turbo / Glow Plug Indicator
Glow Plug Indicator
ABS Warning
Low Oil Pressure Warning
Check Engine Warning
O / D OFF Indicator
ECT SNOW Indicator
ECT PWR Indicator
Rear Fog Light Indicator
High Beam Indicator
Right Turn Indicator
Left Turn Indicator
Open Door Warning
SRS Warning
Front Fog light Indicator
B17
B22
B9
B26
A24
A26
B2
A17
B1
B13
B6
B3
I04818

No.		Wire Harness Side
A	1	Ground (Power)
	3	Tacho Pick–UP Sensor EFI ECU (3S–FE, 2C–TE Engine) EGR (2C–T Engine)
	5	Vehicle Speed Sensor
	6	EFI ECU
	7	Water Temperature Sender Gauge (2C–T Engine)
	8	Ground (Engine)
	9	Ground
	10	Outside Temperature Sender Gauge
	11	Ground (Fuel)
	12	Fuel Sender Gauge
	14	Ground (Power)
	15	Ground (Speed)
	17	Turn Signal Switch (Right)
	18	Other Parts
	19	Oil Level Warning Switch
	21	O/D OFF Switch
	22	ECT ECU (Gasoline Engine) Fuel Filter Warning Switch (Diesel Engine)
	23	Glow Plug Timer (Diesel Engine) EFI ECU (Gasoline Engine)
	24	ECT Pattern Select Switch
	25	ABS ECU
	26	Rear Fog Light Switch
B	1	Turn Signal Switch (Left)
	2	H–LP Fuse
	3	Front Fog Light Switch
	4	Alternator L Terminal
	5	Brake Fluid Level Warning Switch Parking Brake Switch
	6	ECU+B Fuse
	7	Taillight Relay
	9	GAUGE Fuse
	11	Ground (Signal)
	13	DOOR Fuse
	14	EFI ECU (Gasoline Engine) EGR ECU (Diesel Engine)
	15	Headlight Dimmer Switch
	16	Low Oil Pressure Warning Switch
	17	IGN Fuse
	18	Door Courtesy Switch
	19	Airbag ECU
	20	Taillight Relay
	22	GAUGE Fuse
	24	Ground (Signal)
	26	DOOR Fuse

BE199–02

INSPECTION

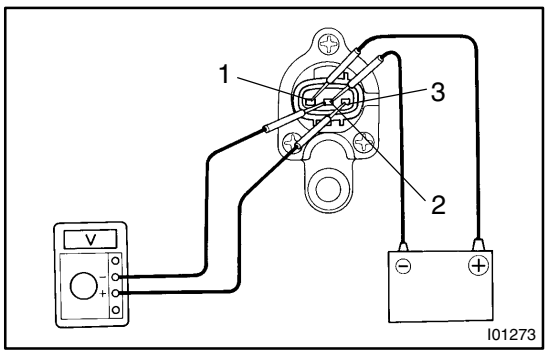
1. INSPECT SPEEDOMETER ON–VEHICLE

Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.
HINT:
Tire wear and tire over or under inflation will increase the indication error.

Europe Models

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	20 – 24.5	20	20 – 26
40	40 – 46.5	40	40 – 48
60	60 – 68.5	60	60 – 70
80	80 – 90.5	80	80 – 92
100	100 – 112.5	100	100 – 114
		120	120 – 136
		140	140 – 158
		160	160 – 180

If error is excessive, replace the speedometer.



2. INSPECT VEHICLE SPEED SENSOR OPERATION

(a) Connect the positive (+) lead from battery to terminal 1 and negative (–) lead to terminal 2.
(b) Connect the positive (+) lead from tester to terminal 3 and the negative (–) lead to terminal 2.
(c) Rotate the shaft.
(d) Check that the voltage changes from approx. 0 V to 11 V or more between terminals 2 and 3.

HINT:
The voltage changes be 4 times every revolution of the speed sensor shaft.
If operation is not as specified, replace the sensor.

3. INSPECT TACHOMETER/ ON–VEHICLE

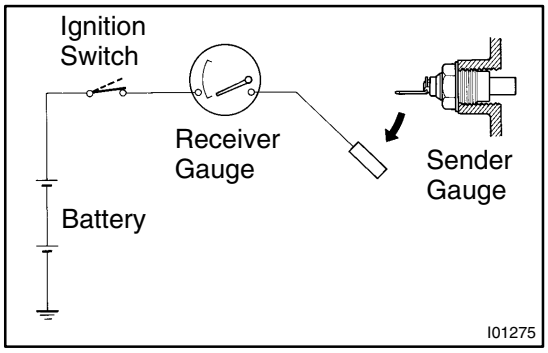
(a) Connect a tune–up test tachometer, and start the engine.

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.**

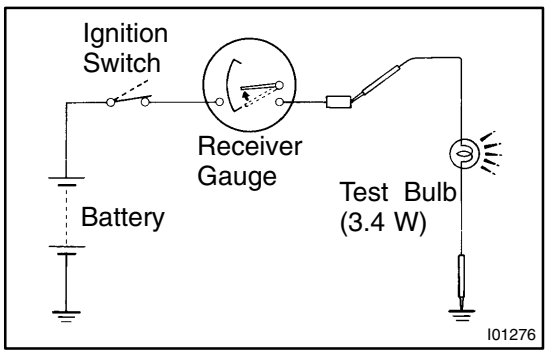
(b) Compare the tester and tachometer indications.
DC 13.5 V 25 ˚C at (77˚F)

Standard indication	Allowable range
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



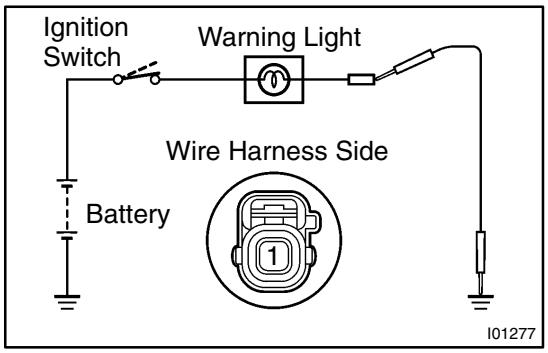
4. INSPECT ENGINE COOLANT TEMPERATURE RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge.
(b) Turn the ignition switch ON and check that the receiver gauge needle indicates COOL.



(c) Ground terminal on the wire harness side connector through a 3.4 W test bulb.
(d) Turn the ignition switch ON, and check that the bulb lights up and the receiver gauge needle moves to the hot side.

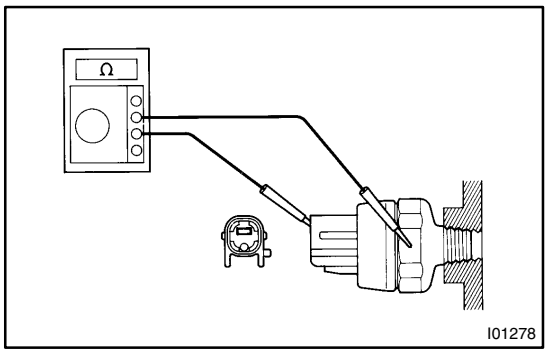
If operation is as specified, replace the sender gauge.
Then recheck the system.
If operation is not as specified, measure the receiver gauge resistance.



5. INSPECT LOW OIL PRESSURE WARNING LIGHT

(a) Disconnect the connector from the warning switch and ground terminal on the wire harness side connector.
(b) Turn the ignition switch ON and check that the warning light lights up.

If the warning light does not light up, test the bulb.



6. INSPECT LOW OIL PRESSURE SWITCH CONTINUITY

(a) Disconnect the connector from the switch.

(b) Check that continuity exists between terminal and ground with the engine stopped.

(c) Check that no continuity exists between terminal and ground with the engine running.

HINT:

Oil pressure should be over 24.5 kPa (0.25 kgf/cm^2, 3.55 psi).

If operation is not as specified, replace the switch.

BODY

CLIP BO–1
WINDSHIELD BO–3
SLIDING ROOF BO–11
INSTRUMENT PANEL BO–13
ROOF HEADLINING (Sedan) BO–22
ROOF HEADLINING (Liftback) BO–27
ROOF HEADLINING (Wagon) BO–32

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

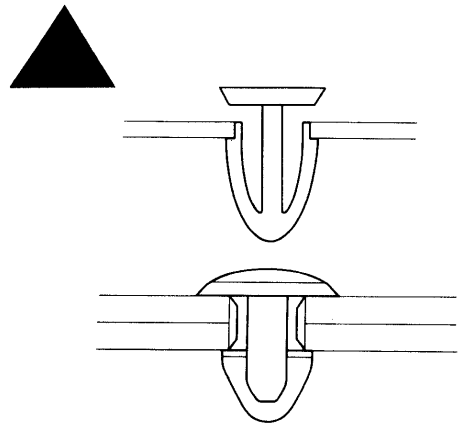
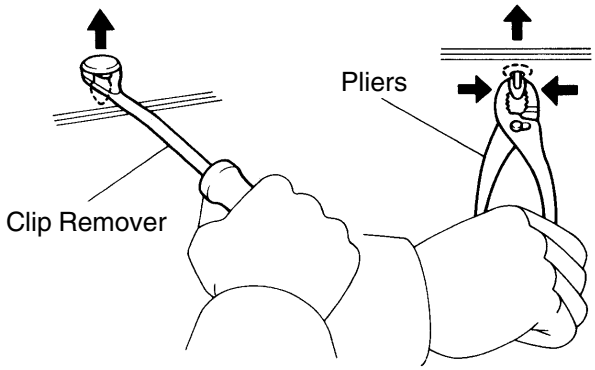
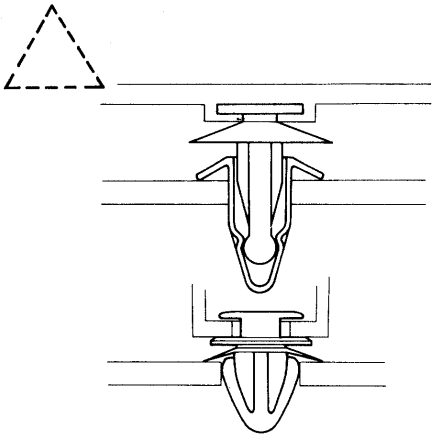
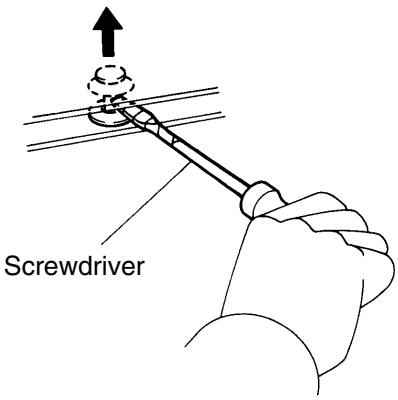
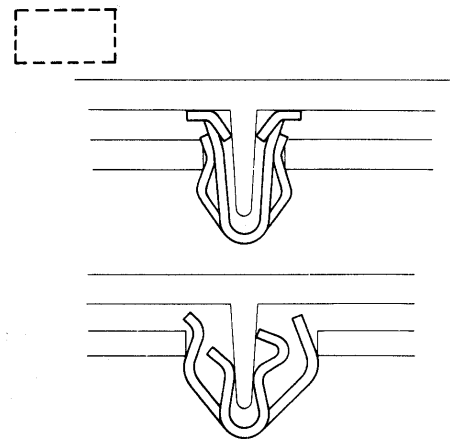
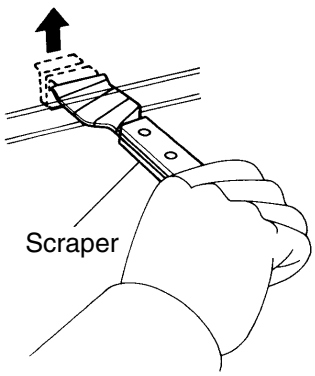
NOTE: The above pages contain only the points which differ from the above listed manual.

CLIP

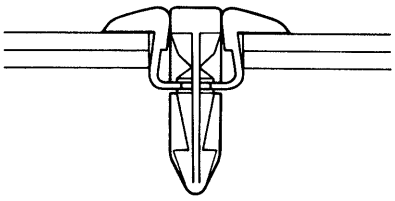
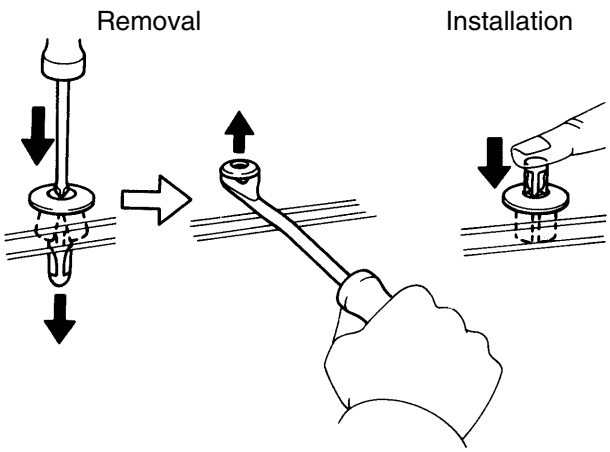
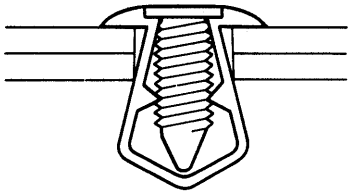
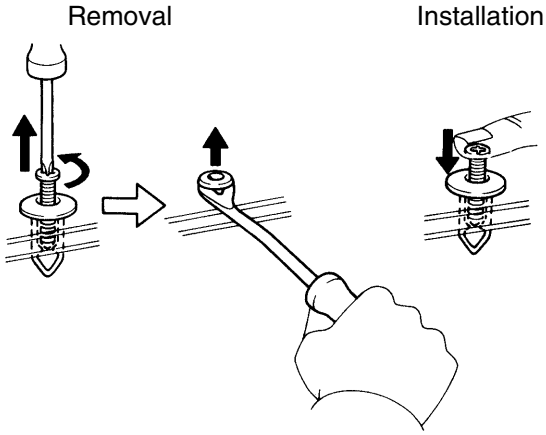
BO19D–01

REPLACEMENT

The removal and installation 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
	
	
	

V00005

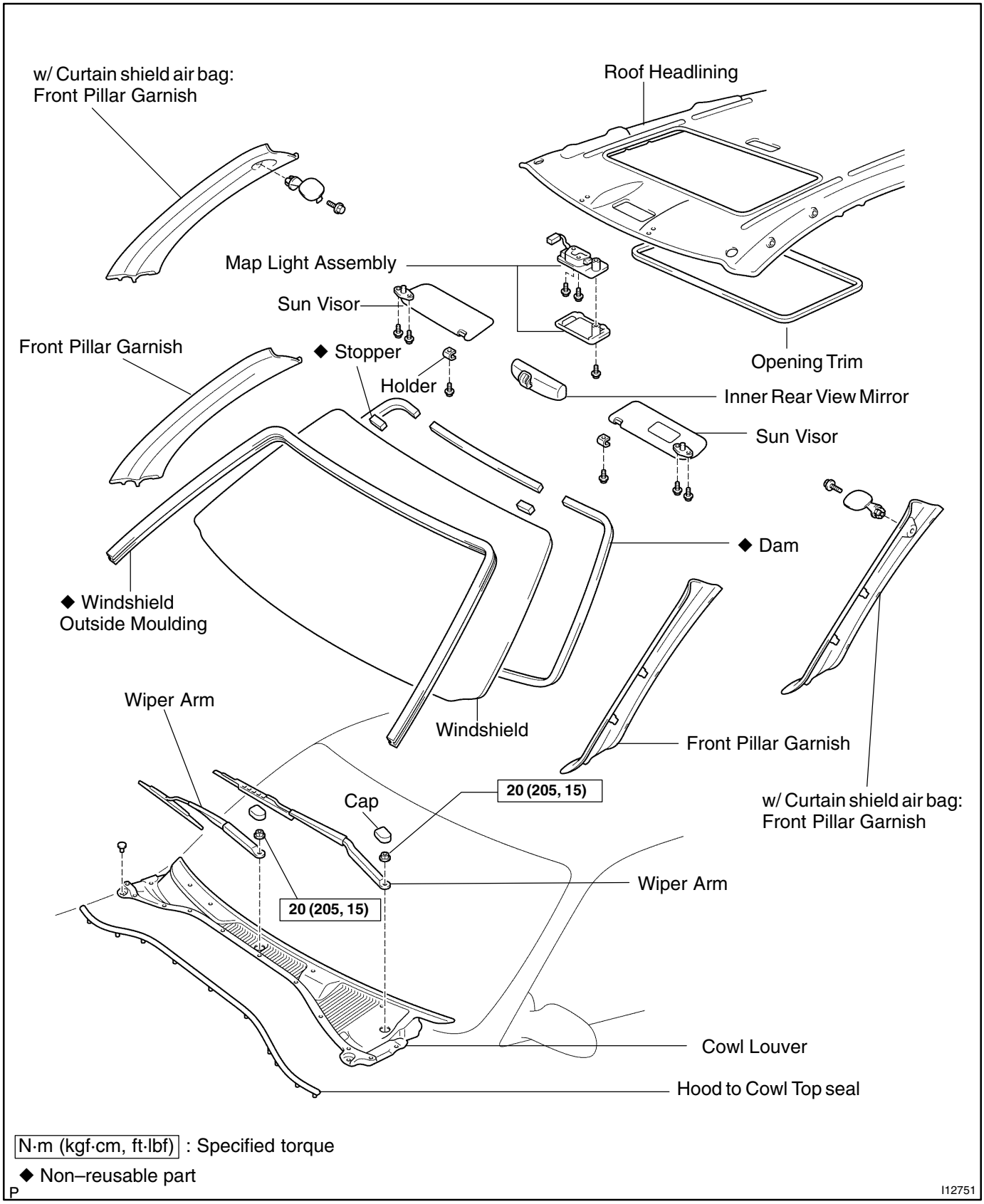
Shape (Example)	Removal/Installation
	
	

V00012

WINDSHIELD

COMPONENTS

BO0IO–04



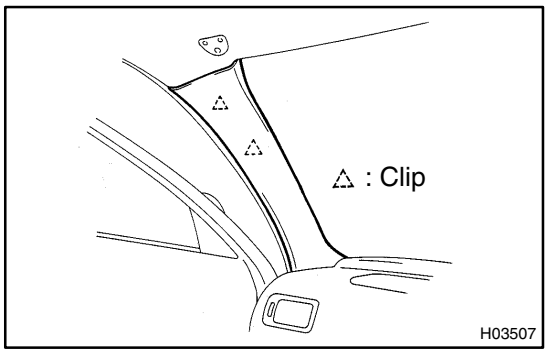
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

P

I12751

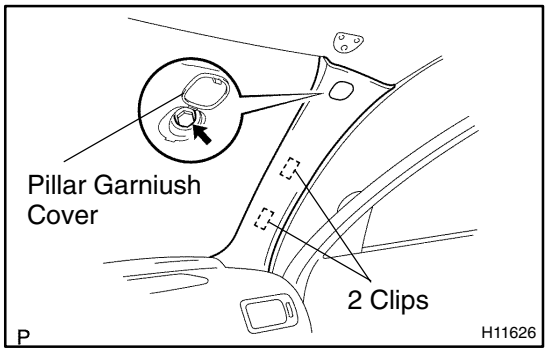
BO2J0–01



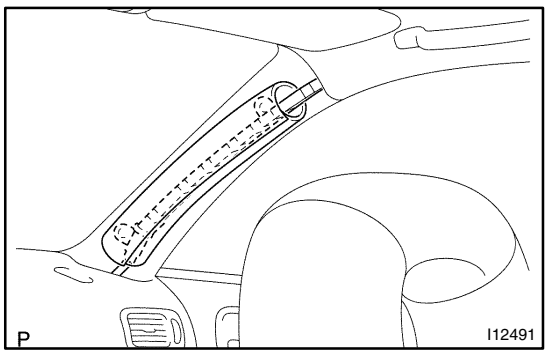
REMOVAL

1. REMOVE THESE PARS

(a) Remove the front wiper arms.
(b) Remove the weatherstrip.
(c) Remove the cowl louver.
(d) Remove the sun visors and holders.
(e) Remove the map light assembly.
(f) Remove the assist grip.
(g) Remove the upper part of front door opening trims.



(h) w/ Curtain Shield Airbag:
  (1) Using a screwdriver, raise the pillar garnish cover.
  (2) Remove the bolt, pillar garnish cover and front pillar garnish.

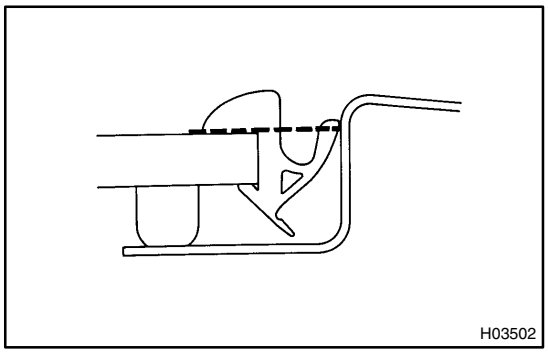


  (3) Remove the 2 bolts.
  (4) Pack the airbag with protection cover.

NOTICE:

Protection range is from instrument panel to ceiling.

(i) Remove the front pillar garnishes.
(j) Remove the inner rear view mirror.
(k) Remove the upper back panel hole No.1 cover.

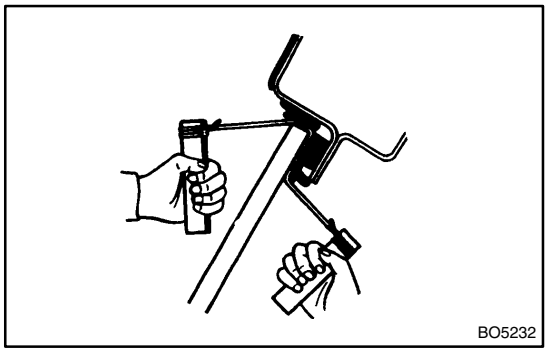


2. REMOVE WINDSHIELD OUTSIDE UPPER MOULDING

Using a knife, cut off the moulding, as shown.

NOTICE:

Do not damage the body with the knife.


BO5232

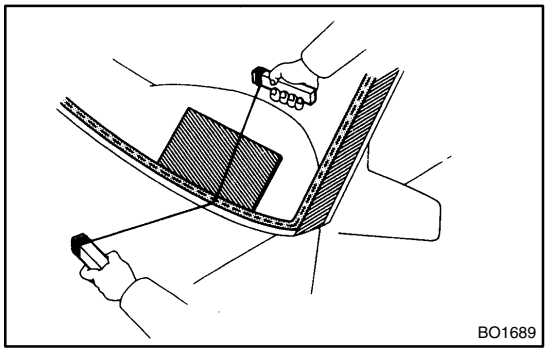
3. REMOVE WINDSHIELD GLASS

(a) Push piano wire through between the body and glass from the interior.

(b) Tie both wire ends to a wooden block or similar object.

HINT:

Apply adhesive tape to the outer surface to keep the surface from being scratched.


BO1689

NOTICE:

When separating the glass, take care not to damage the paint and exterior ornaments. To prevent scratching the safety pad when removing the windshield, place a plastic sheet between the piano wire and safety pad.

(c) Cut the adhesive by pulling the piano wire around it.

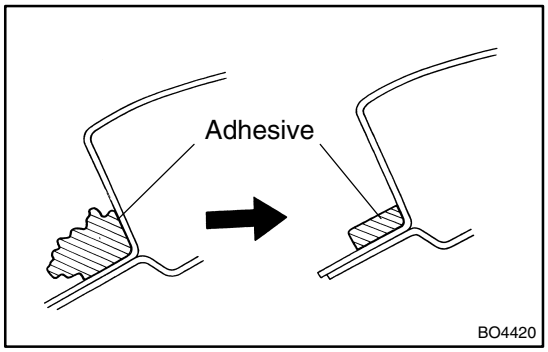
(d) Remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO2J1–01

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

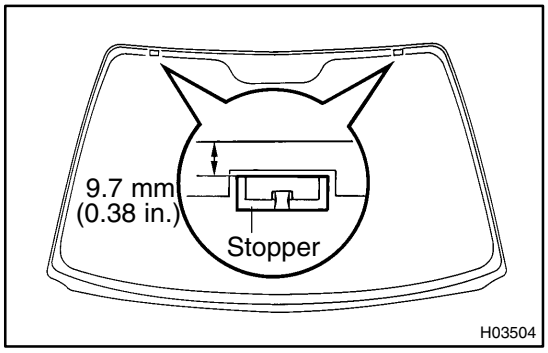
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed, clean the body.



2. REPLACE STOPPER

(a) Remove the damaged stopper.

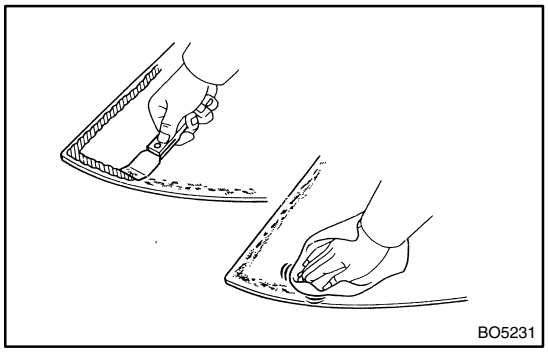
(b) Cut off the old adhesive around the stopper installation area.

NOTICE:

Be careful not to damage the body.

(c) Clean the installation area.

(d) Attach the stoppers to the glass with the ceramic notch on the glass aligned with the stoppers, as shown in the illustration.



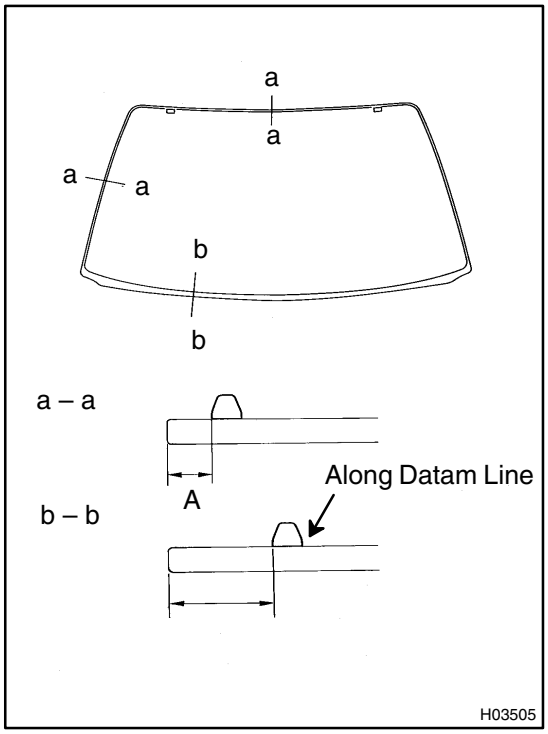
3. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

Do not touch the glass after cleaning it.



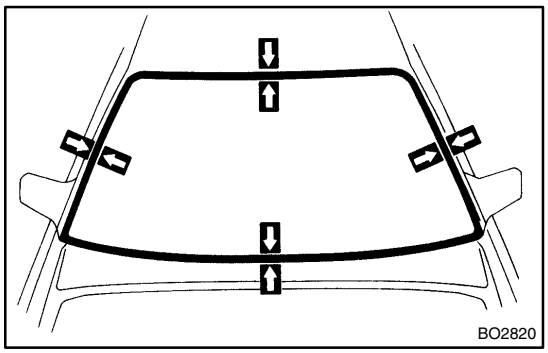
4. INSTALL DAMS

Install the dams with double – stick tape as shown in the illustration.

A: 7.0 mm (0.28 in.)

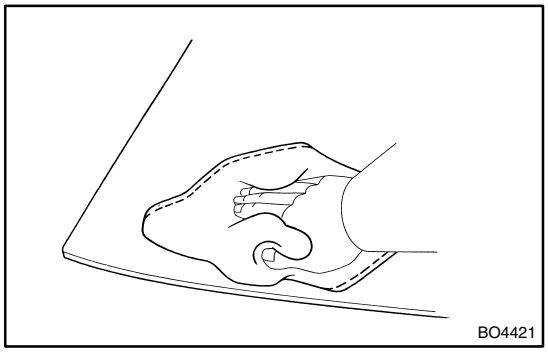
NOTICE:

Do not touch the glass surface after cleaning it.



5. POSITION GLASS

(a) Place the glass in the correct position.
(b) Check that all contacting parts of the glass rim are perfectly even.
(c) Place reference marks between the glass and body.
(d) Remove the glass.

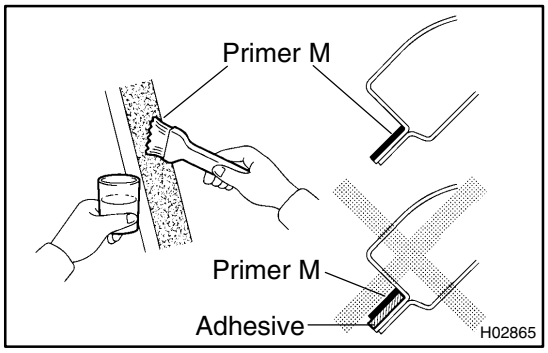


6. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black–colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.

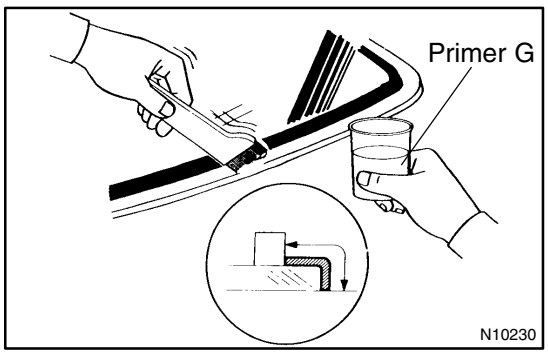


7. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**

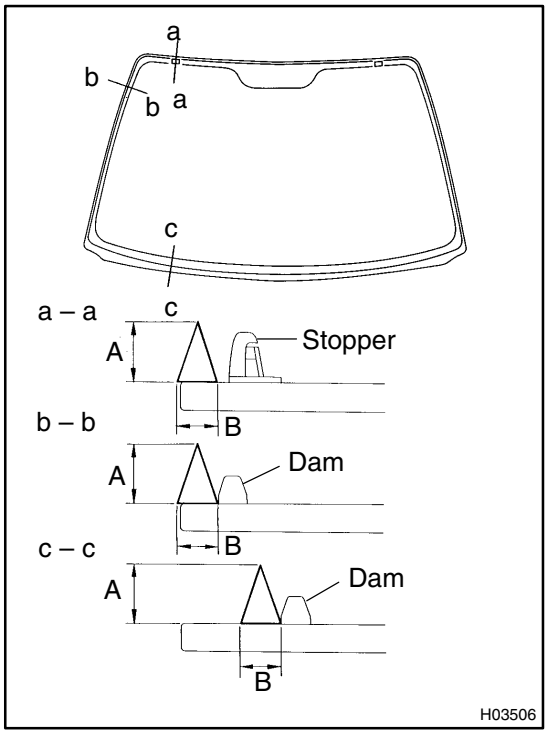


8. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.
(b) Before the primer dries, wipe it off with a clean shop rag.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**



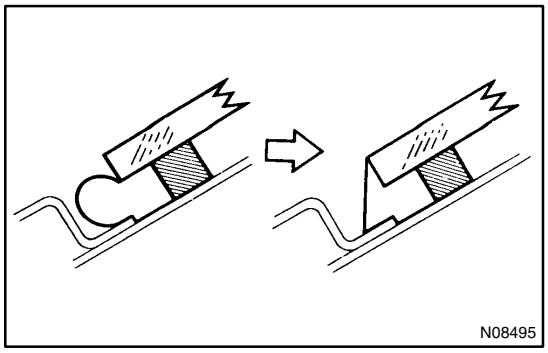
9. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.
Part No. 08850–00801 or equivalent

HINT:
After cutting off the tip, use all adhesive within the time described in the table below.

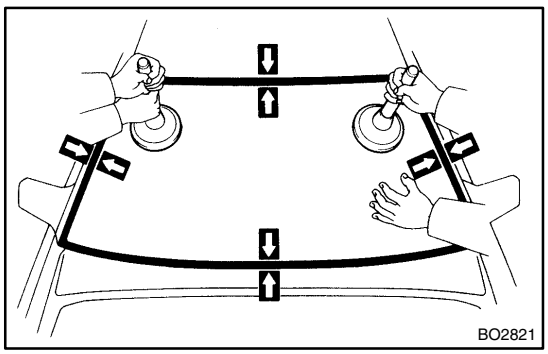
Temperature	Tackfree time
35˚C (95˚F)	15 minutes
20˚C (68˚F)	100 minutes
5˚C (41˚F)	8 hours

(b) Load the cartridge into the sealer gun.
(c) Coat the glass with adhesive as shown.
A: 12.5 mm (0.472 in.)
B: 8.0 mm (0.315 in.)

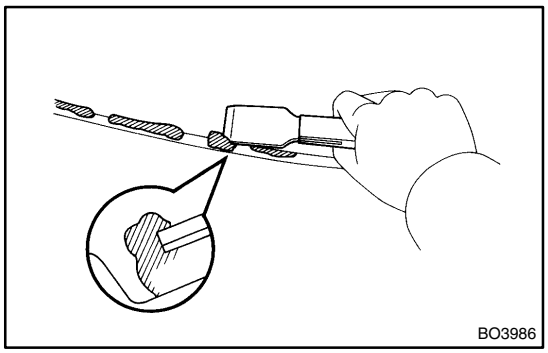


10. INSTALL GLASS

HINT:
Check that the dam is attached the body panel as shown in the illustration.



(a) Position the glass so that the reference marks are lined up, and press in gently along the rim.
(b) Using a spatula, apply adhesive on the glass rim.


BO3986

(c) Use a scraper to remove any excessive or protruding adhesive.
(d) Hold the windshield glass in place securely with protective tape or equivalent until the adhesive hardenes.

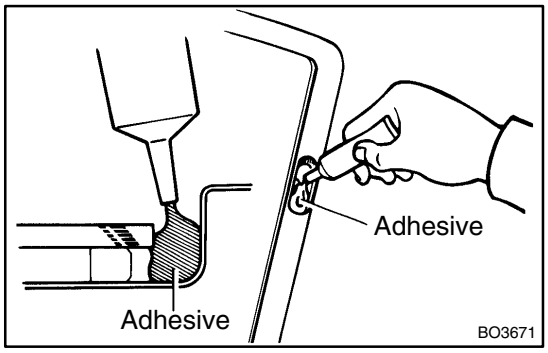
NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Minimum time prior to driving the vehicle
35˚C (95˚F)	1.5 hours
20˚C (68˚F)	5 hours
5˚C (41˚F)	24 hours

11. INSPECT FOR LEAKAGE AND REPAIR

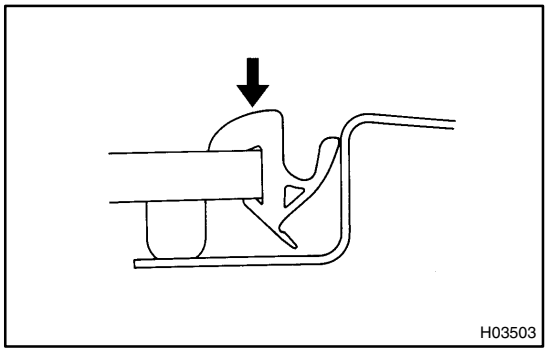
(a) Do a leak test after the hardening time has elapsed.
(b) Seal any leakage with sealant.
Part No. 08833–00030 or equivalent



BO3671

12. APPLY ADHESIVE AT MOULDING INSTALLATION AREA

Coat the glass with adhesive at the moulding installation area.
Part No. 08833–00030 or equivalent

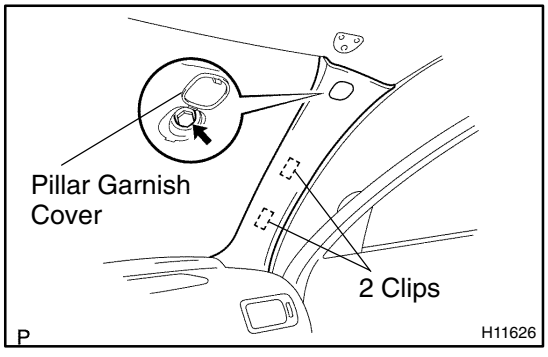

H03503

13. INSTALL WINDSHIELD MOULDING

Place the moulding onto the body and tap it by hand.

14. INSTALL THESE PARTS:

(a) Install the front part of roof headlining.
(b) Install the inner rear view mirror



H11626

(c) w/ Curtain Shield Air Bag:
(1) Remove the protection cover.
(2) Install the 2 bolts.
Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)
(3) Install the front pillar garnish.
(4) Install the pillar garnish cover and bolt.

NOTICE:

Be sure to tighten the bolt.

(5) Fell the pillar garnish cover.
(d) Install the front pillar garnishes.

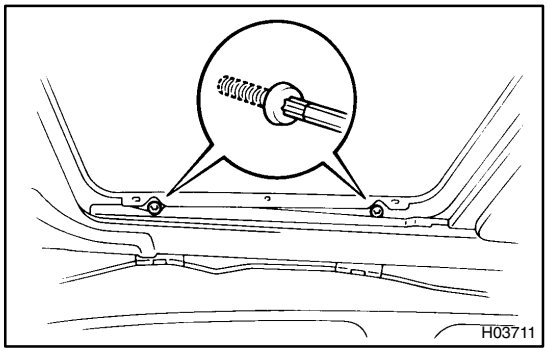
(e) Install the upper part of roof headlining.
(f) Install the assist grip.
(g) Install the map light assembly.
(h) Install the sun visors and holders.
(i) Install the cowl louver.
(j) Install the weatherstrip.
(k) Install the front wiper arms.
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

SLIDING ROOF

BO199–02

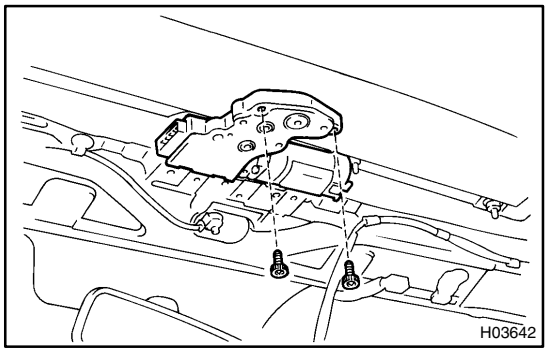
REMOVAL

1. REMOVE ROOF HEADLINING
(See page BO–23 , BO–28 or BO–33)



2. REMOVE SLIDING ROOF GLASS

(a) Using a torx wrench, remove the 4 screws.
(b) Pull the glass upward to remove it.

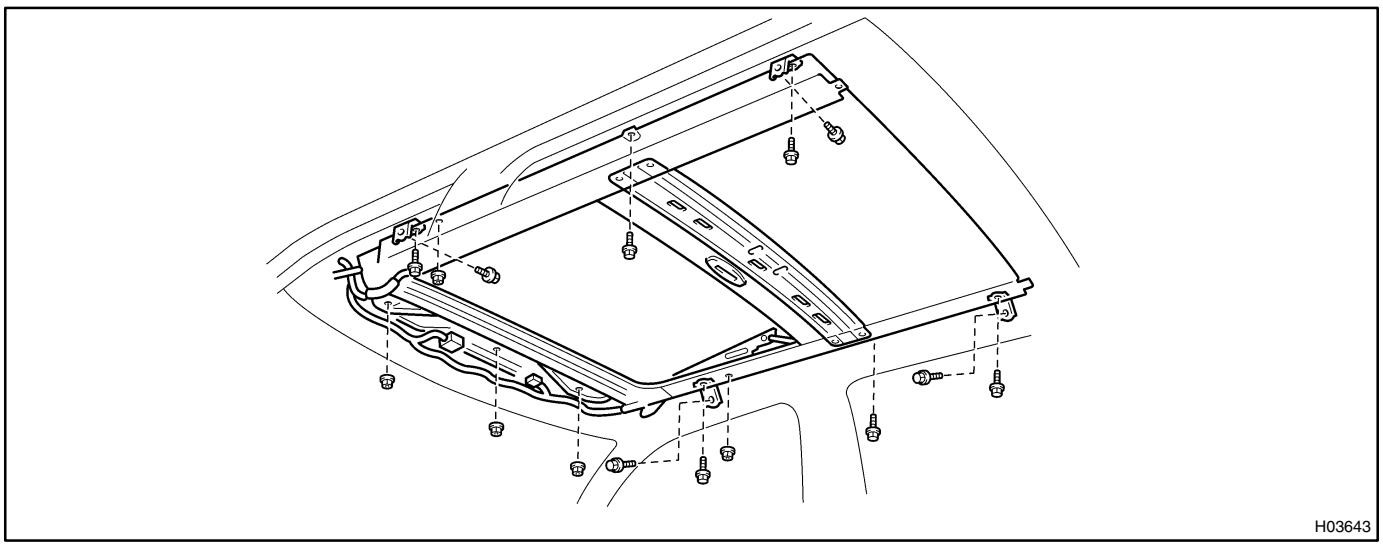


3. REMOVE DRIVE GEAR

(a) Disconnect the connector.
(b) Remove the 2 screws and drive motor.

4. REMOVE SLIDING ROOF HOUSING

(a) Disconnect the 4 drain hoses from the housing.
(b) Remove the 8 bolts and 4 brackets.
(c) Remove the 2 bolts, 5 nuts and housing.



BO2J2–01

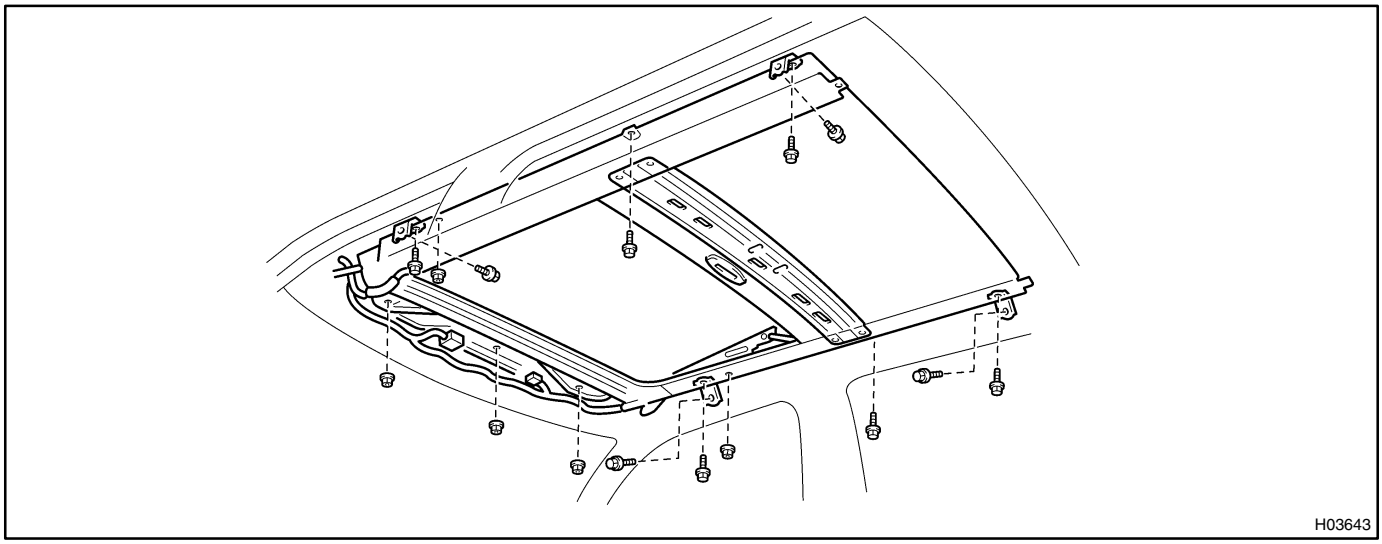
INSTALLATION

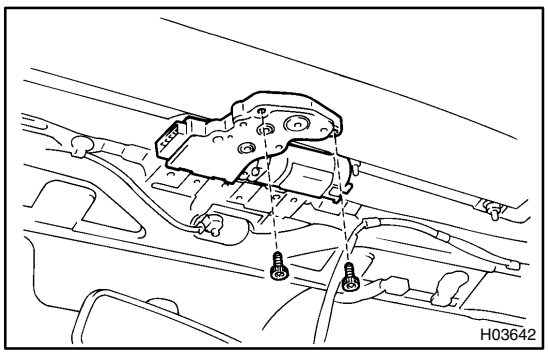
1. INSTALL SLIDING ROOF HOUSING

(a) Install the housing with the 2bolts and 5nuts.

(b) Install the 4 brackets with the 8 bolts.

(c) Connect the 4 drain hoses to the housing.

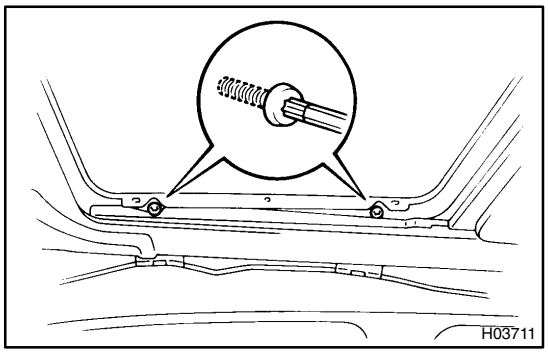




2. INSTALL DRIVE GEAR

(a) Install the drive motor with 2 screws.

(b) Connect the connector.



3. INSTALL SLIDING ROOF GLASS

(a) Push the glass upward to remove it.

(b) Install the 4 screws.

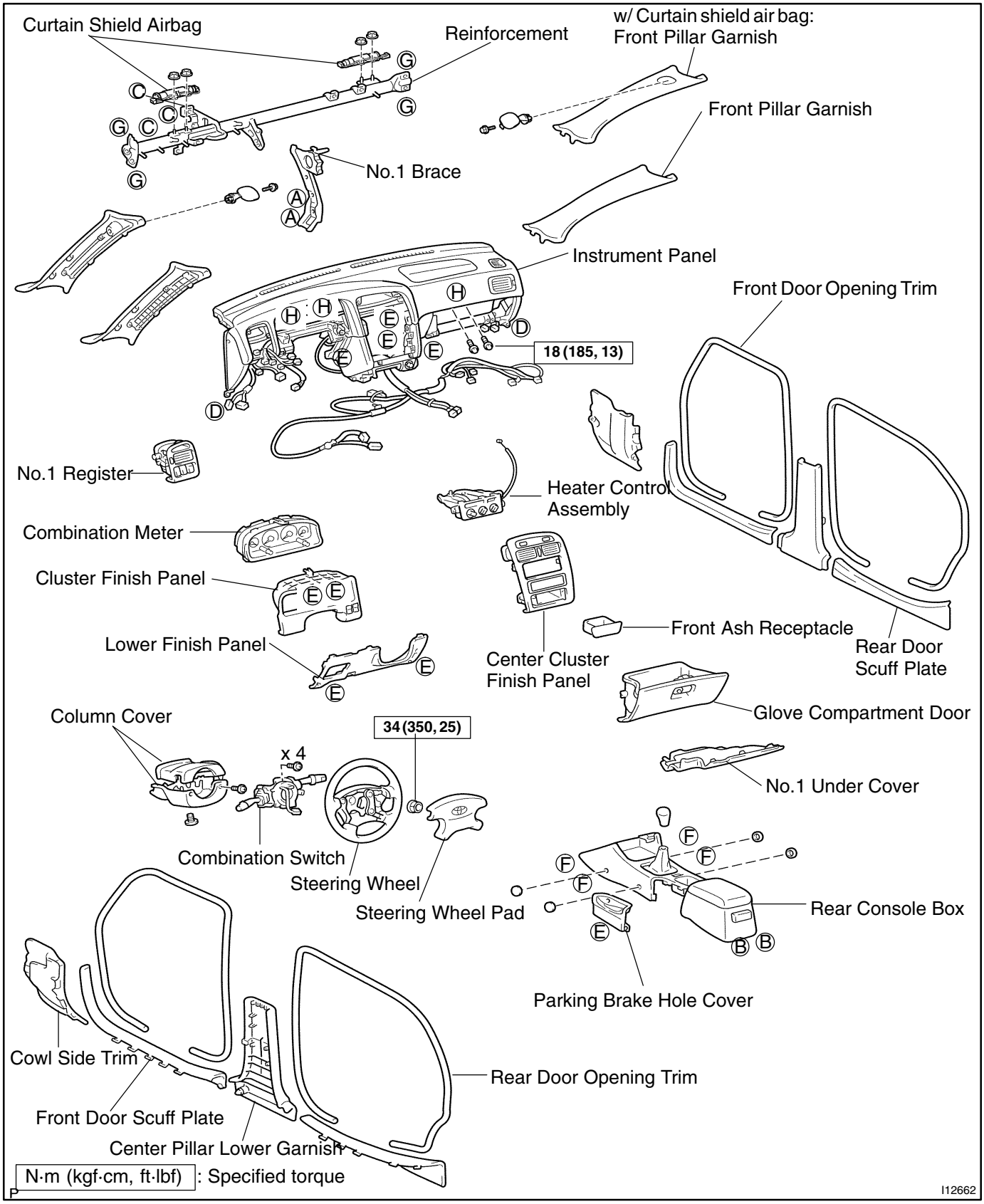
4. INSTALL ROOF HEADLINING

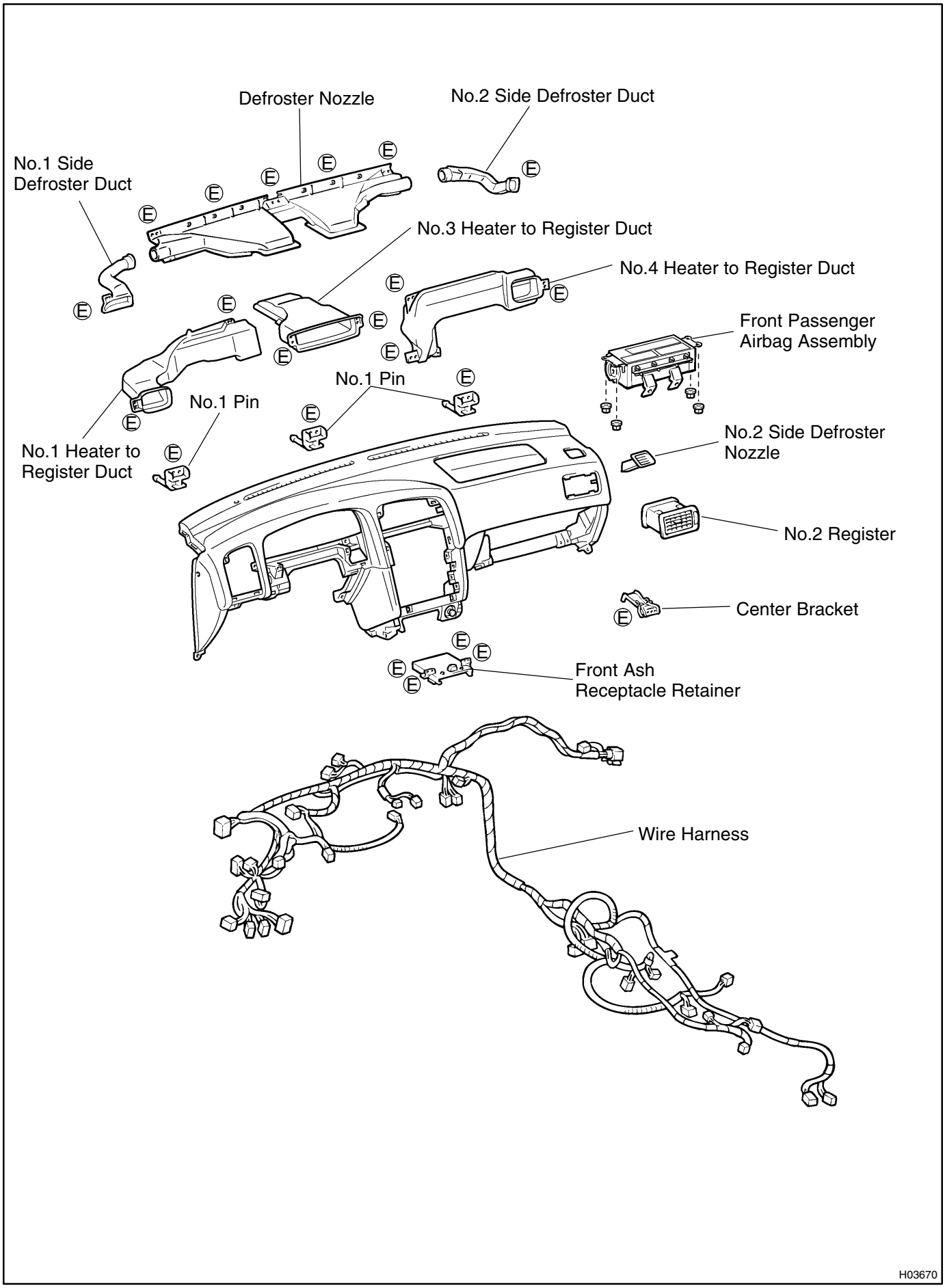
(See page BO–23, BO–28 or BO–33)

INSTRUMENT PANEL

COMPONENTS

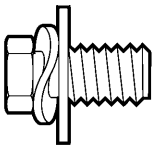
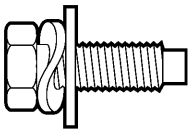
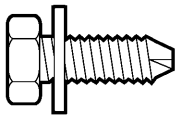
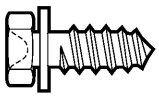
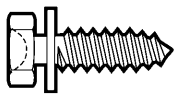
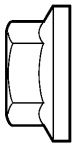
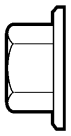
BO19J–02




Defroster Nozzle
No.2 Side Defroster Duct
No.1 Side Defroster Duct
No.3 Heater to Register Duct
No.4 Heater to Register Duct
Front Passenger Airbag Assembly
No.1 Pin
No.1 Pin
No.1 Heater to Register Duct
No.2 Side Defroster Nozzle
No.2 Register
Center Bracket
Front Ash Receptacle Retainer
Wire Harness
H03670

HINT:
Screw shapes and size are indicated in the table below. The codes (A – H) correspond to those indicated on the previous page.

mm (in.)

	Shape	Size		Shape	Size		Shape	Size
Ⓐ		ø = 8 (0.31) L = 16 (0.63)	Ⓑ		ø = 6 (0.24) L = 20 (0.79)	Ⓒ		ø = 6 (0.24) L = 18 (0.71)
Ⓓ		ø = 6 (0.24) L = 16 (0.63)	Ⓔ		ø = 5.22 (0.2055) L = 16 (0.63)	Ⓕ		ø = 5 (0.20) L = 18.5 (0.728)
Ⓖ		ø = 8 (0.31)	Ⓗ		ø = 6 (0.24)			

H03703

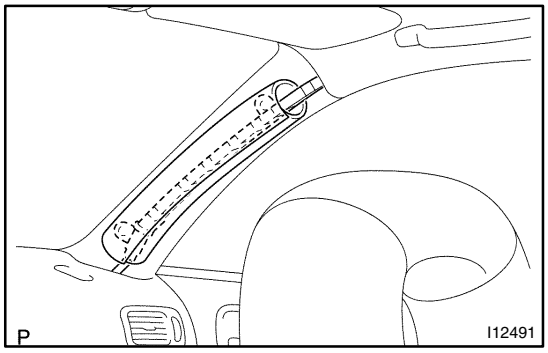
BO2J3–01

REMOVAL

1. REMOVE THESE PARTS:

(a) Remove the front door opening trims.

(b) Remove the front pillar garnishes.



(c) w/ Curtain Shield Airbag:

(1) Remove the 2 bolts.

(2) Pack the airbag with protection cover.

(3) Using a screwdriver, raise the pillar garnish cover.

(4) Remove the bolt, pillar garnish cover and front pillar garnish.

NOTICE:

Protection rang is from instrument panel to ceiling.

(d) Remove the front door scuff plates.

(e) Remove the cowl side trims.

(f) Remove the rear door opening trims.

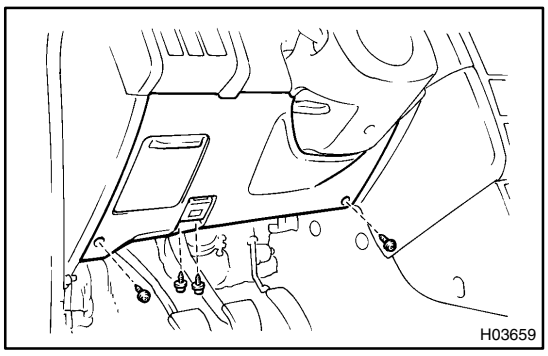
(g) Remove the rear door scuff plates.

(h) Remove the center pillar lower covers.

(i) Remove the front seats.

2. REMOVE STEERING WHEEL

(See Pub. No.RM599E on page SR–13)



3. REMOVE LOWER FINISH PANEL

(a) Remove the 2 screws and hood lock control lever.

(b) Remove the 2 screws and lower finish panel.

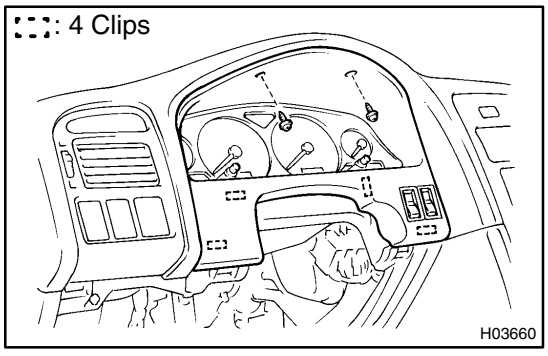
4. REMOVE THESE PARTS:

(See Pub. No.RM599E on page SR–13)

(a) Remove the column cover.

(b) Remove the combination switch.

(c) Remove the steering column.



5. REMOVE CLUSTER FINISH PANEL

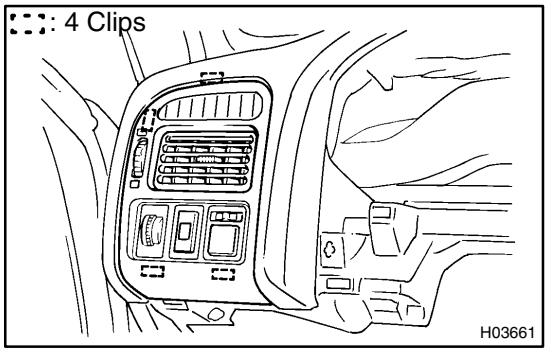
(a) Remove the 2 screws.

(b) Using a screwdriver, remove the cluster finish panel, then disconnect the connector.

HINT:

Tape the screwdriver tip before use.

6. REMOVE COMBINATION METER

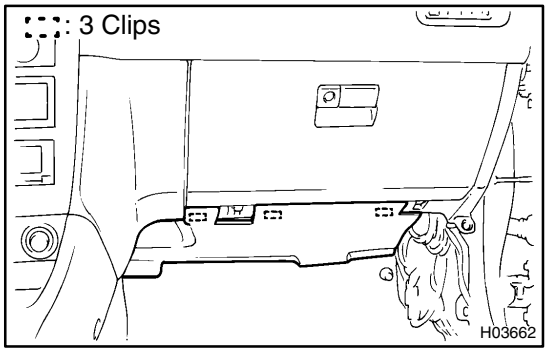


7. REMOVE NO.1 REGISTER

Using a screwdriver, remove the No.1 register.

HINT:

Tape the screwdriver tip before use.

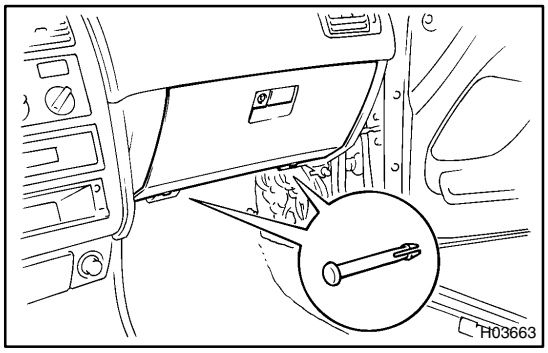


8. REMOVE NO.1 UNDER COVER

Using a screwdriver, remove the No.1 under cover.

HINT:

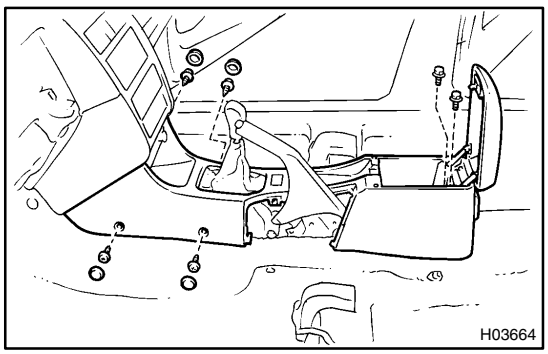
Tape the screwdriver tip before use.



9. REMOVE GLOVE COMPARTMENT DOOR

Remove the 2 glove shaft and glove compartment door.

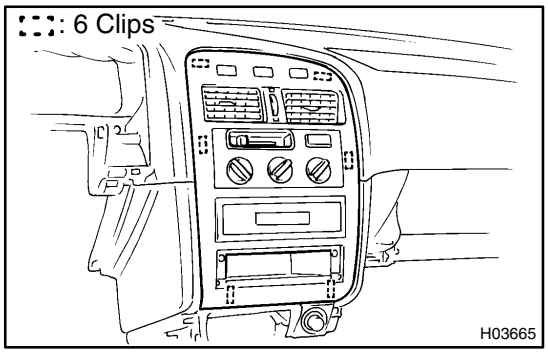
10. REMOVE PARKING BRAKE HOLE COVER



11. REMOVE REAR CONSOLE BOX

(a) M/T:
Remove the shift lever knob.

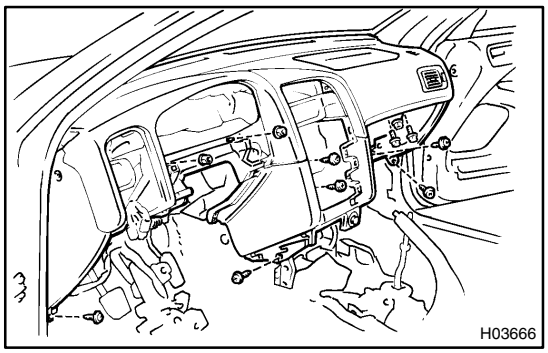
(b) Remove the 2 bolts, 4 caps, 4 screws and rear console box.



12. REMOVE CENTER CLUSTER FINISH PANEL

Using a screwdriver, remove the panel, then disconnect the connectors.

13. REMOVE HEATER CONTROL ASSEMBLY
(See Pub. No.RM599E on page AC–106)



14. REMOVE INSTRUMENT PANEL

(a) Remove the 2 bolts and front passenger airbag assembly.

(b) Remove the 6 screws and 3 nuts.

15. REMOVE THESE PARTS:

(a) Remove the No.1 brace.

(b) Remove the reinforcement.

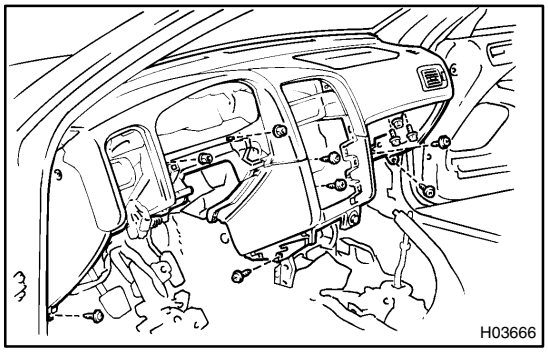
BO2J4–01

INSTALLATION

1. INSTALL THESE PARTS:

(a) Install the reinforcement.

(b) Install the No.1 brace.

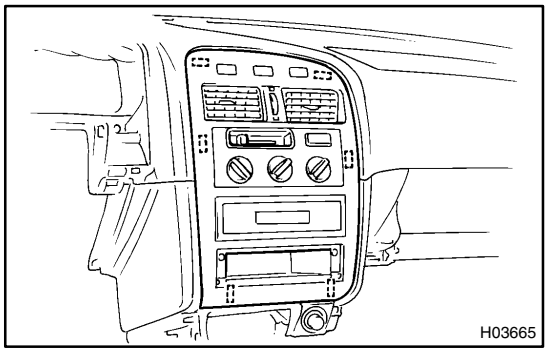


2. INSTALL INSTRUMENT PANEL

(a) Install the 6 screws and 3 nuts.

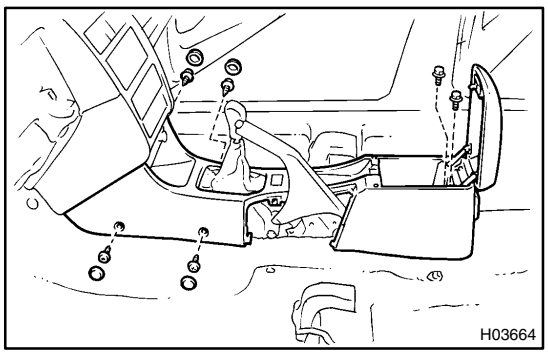
(b) Install the passenger airbag assembly with the 2 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

3. INSTALL HEATER CONTROL ASSEMBLY
(See Pub. No.RM599E on page AC–111)



4. INSTALL CENTER CLUSTER FINISH PANEL

Install the panel, then connect the connectors.

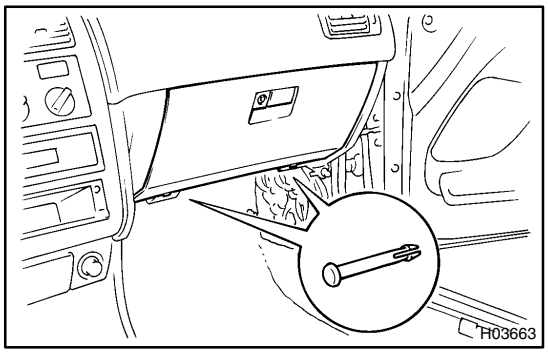


5. INSTALL REAR CONSOLE BOX

(a) Install the console box with the 2 bolts and 4 caps, 4 screws.

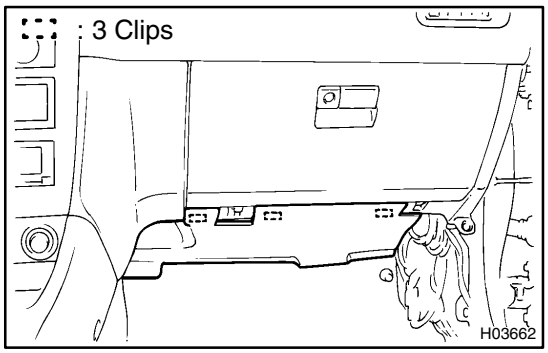
(b) M/T:
Install the shift lever knob.

6. INSTALL PARKING BRAKE HOLE COVER



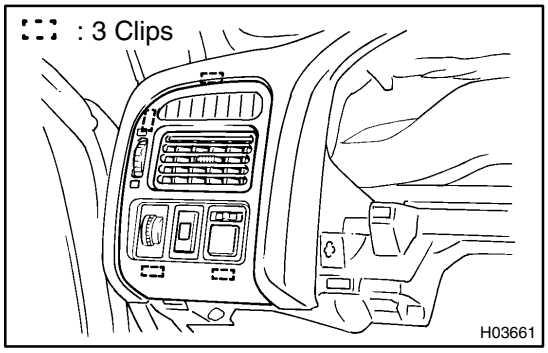
7. INSTALL GLOVE COMPARTMENT DOOR

Install the glove compartment door with the 2 glove shaft.



8. INSTALL NO.1 UNDER COVER

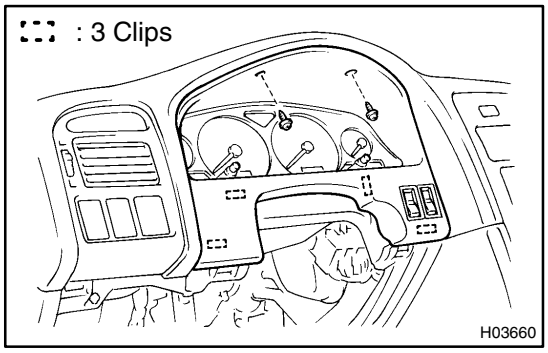
Install the No.1 under cover.



9. INSTALL NO.1 REGISTER

Install the No.1 register.

10. INSTALL COMBINATION METER



11. INSTALL CLUSTER FINISH PANEL

(a) Install the cluster finish panel, then connect the connector.

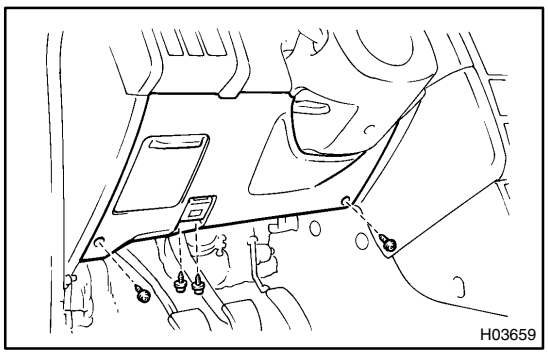
(b) Install the 2 screws.

12. INSTALL THESE PARTS:
(See Pub. No. RM 599E, page SR–13)

(a) Install the steering column.

(b) Install the combination switch.

(c) Install the column cover.



13. INSTALL LOWER FINISH PANEL

(a) Install the lower finish panel with the 2 screws.

(b) Install the hood lock control lever.

14. INSTALL STEERING WHEEL
(See Pub. No. RM 599E, page SR–13)

15. INSTALL THESE PARTS:

(a) Install the front seats.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

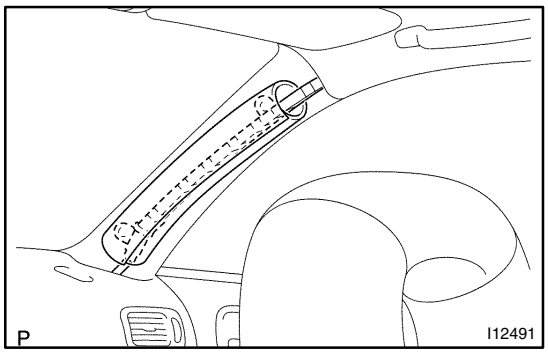
(b) Install the center pillar lower covers.

(c) Install the rear door scuff plates.

(d) Install the rear door opening trims.

(e) Install the cowl side trims.

(f) Install the front door scuff plates.



(g) w/ Curtain Shield Airbag:
  (1) Remove the protection cover.
  (2) Install the 2 bolts.
  Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
  (3) Install the pillar garnish cover with the bolt.

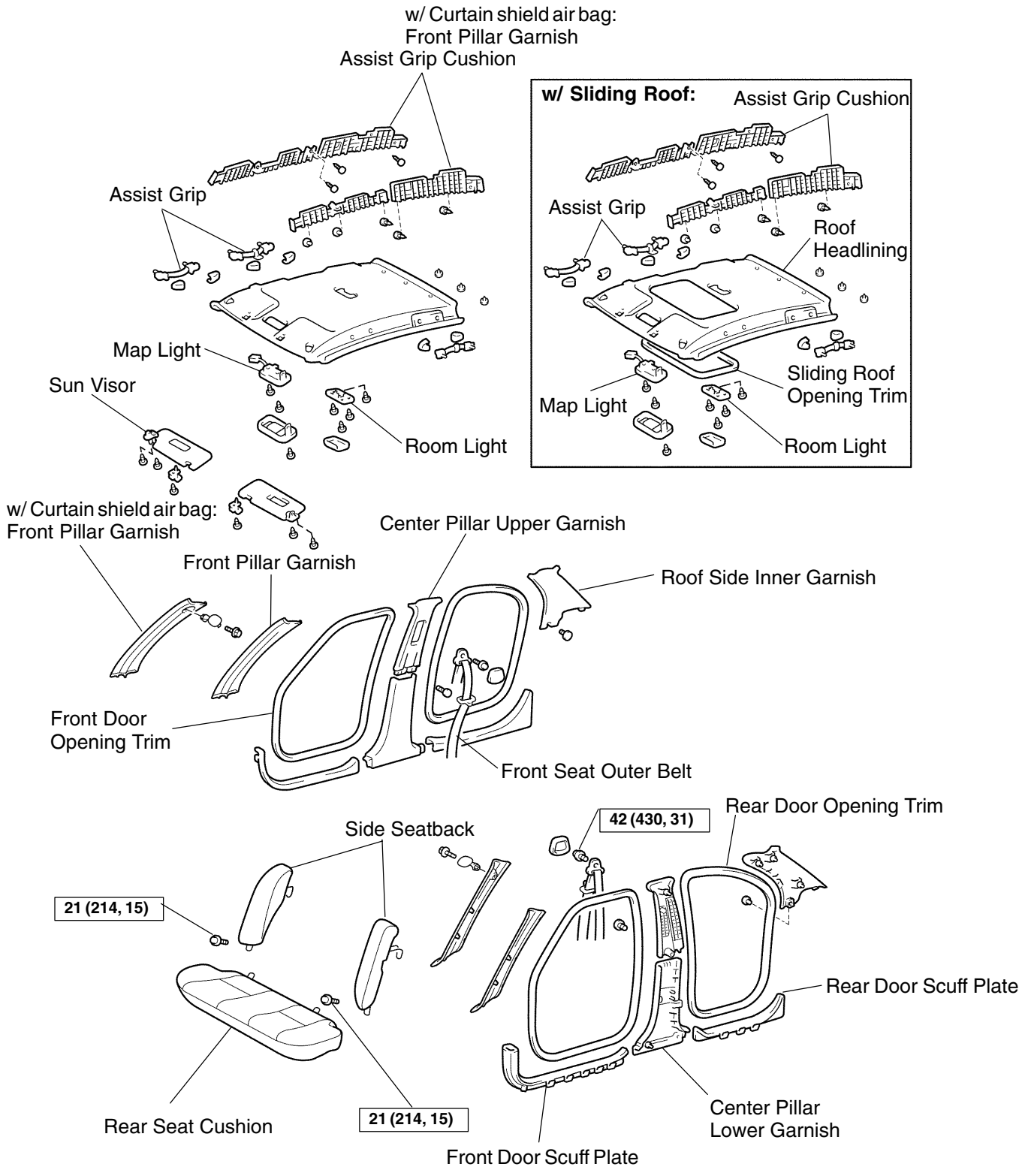
NOTICE:
Be sure to tighten the bolt.

  (4) Fell the pillar garnish cover.
(h) Install the front pillar garnishes.
(i) Install the front door opening trims.

ROOF HEADLINING (Sedan)

COMPONENTS

BO19O–02



N·m (kgf·cm, ft·lbf) : Specified torque

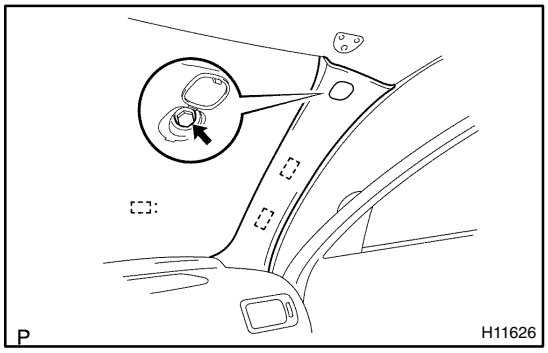
I12752

BO2J5–01

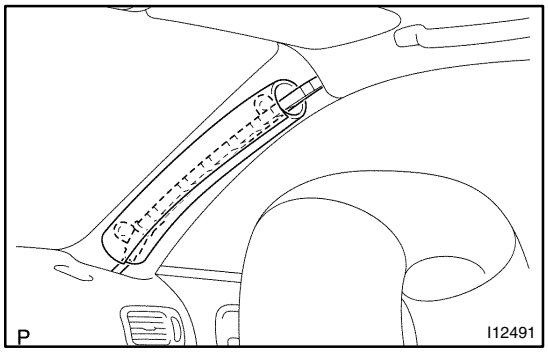
REMOVAL

1. REMOVE THESE PARTS:

(a) Remove the front door opening trims.



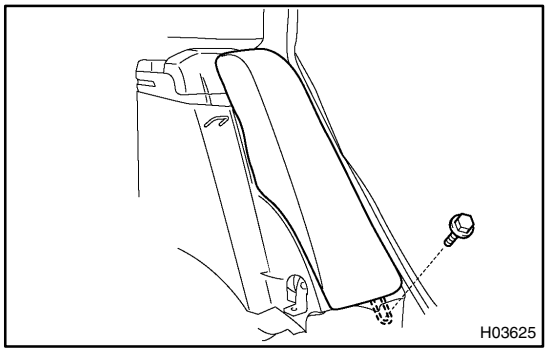
(b) w/ Curtain Shield Airbag:
  (1) Using a screwdriver,raise the pillar garnish cover.
  (2) Remove the bolt, pillar garnish cover and front pillar garnish.



  (3) Remove the 2 bolts.
  (4) Pack the air bag with protection cover.
(c) Remove the front pillar garnishes.
(d) Remove the front door scuff plates.
(e) Remove the rear door opening trims.
(f) Remove the rear door scuff plates.
(g) Remove the center pillar lower garnishes.
(h) Remove the rear seat cushion.

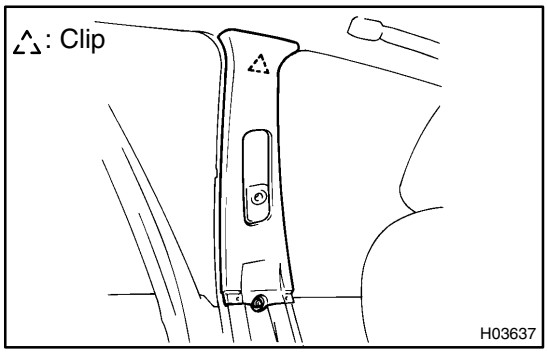
2. REMOVE REAR SIDE SEATBACK

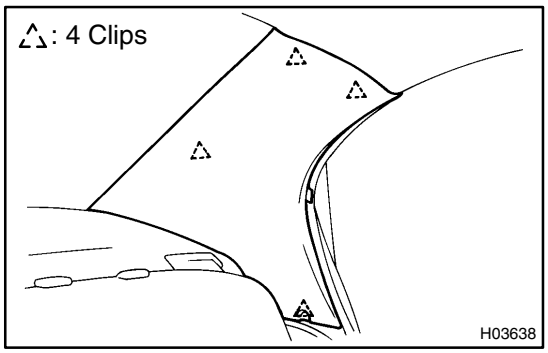
Remove the bolt and rear side seatback.



3. REMOVE CENTER PILLAR UPPER GARNISH

(a) Remove the front seat outer belt shoulder anchor.
(b) Remove the screw and center pillar upper garnish.





4. REMOVE ROOF SIDE INNER GARNISH

Remove the roof side inner garnish.

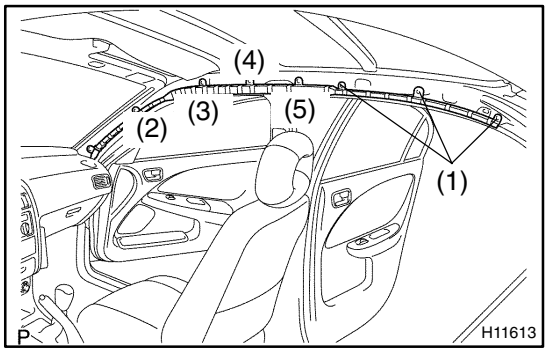
5. REMOVE THESE PARTS:

(a) Remove the assist grips.
(b) Remove the sun visors and holders.
(c) Remove the room light.
(d) Remove the map light.
(e) w/ Sliding Roof:
Remove the sliding roof opening trim.

6. REMOVE ROOF HEADLINING

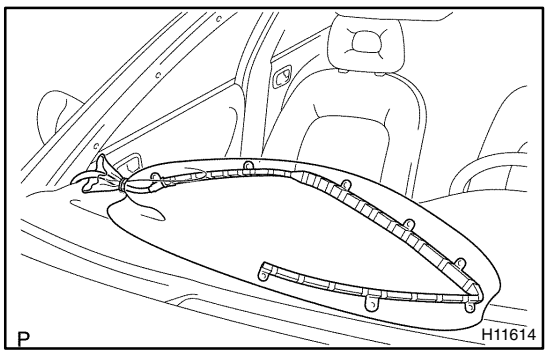
Using a clip remover, remove the 3 clips and roof headlining.

7. REMOVE ASSIST GRIP CUSHION



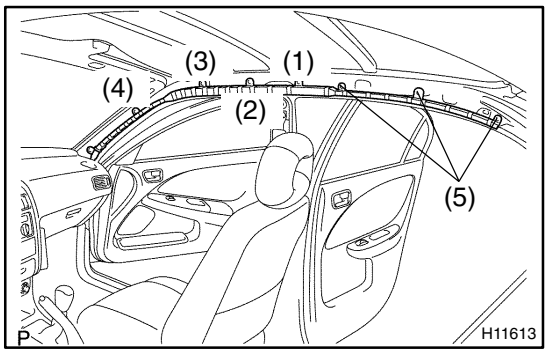
8. w/ Curtain Shield Airbag:
REMOVE CURTAIN SHIELD AIRBAG

(a) In the oder shown in the illustration, remove the bolts and grommets, then, remove the deployment section of the curtain shield airbag.



(b) Put the removed air bag in the clear plastic bag and put it on the instrument panel.

BO2J6–01



INSTALLATION

1. w/ curtain shield airbag:
INSINSTALL CURTAIN SHIELD AIRBAG

In order shown in the illustration, install the deployment section of the curtain shield airbag with the bolts and grommet.

Torque: 9.8 N·m (100 kgf·cm, 7 ft·lbf)

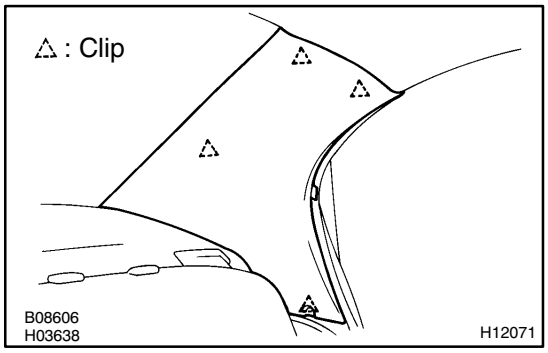
2. INSTALL ASSIST GRIP CUSHION

3. INSTALL ROOF HEAD LINING

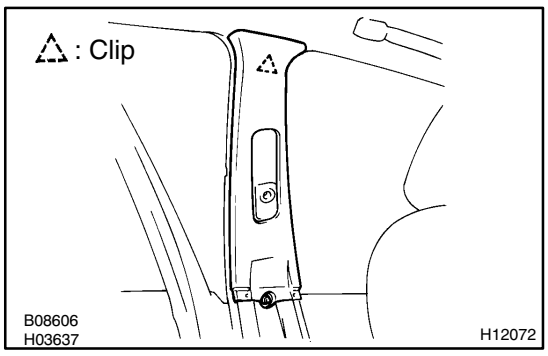
Install the roof headlining with the 3 clips.

4. INSTALL THESE PARTS:

(a) w/ Sliding Roof:
Install the sliding roof opening trim.
(b) Install the map light.
(c) Install the room light.
(d) Install the sun visors and holders.
(e) Install the assist grips.



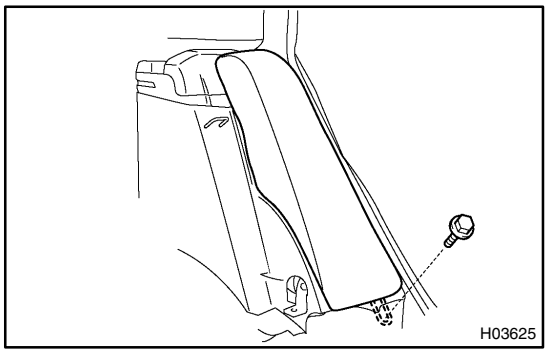
5. INSTALL ROOF SIDE INNER GARNISH



6. INSTALL CENTER PILLAR UPPER GARNISH

(a) Install the and center pillar upper garnish with the screw.
(b) Install the front seat outer belt shoulder anchor with the bolt.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



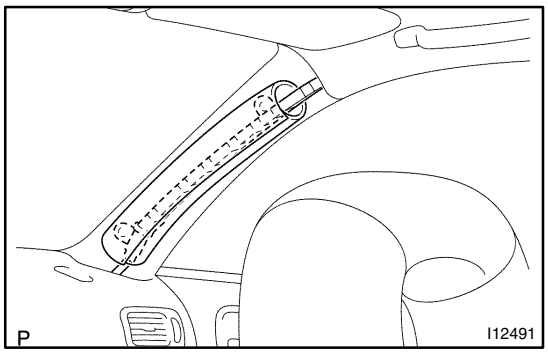
7. INSTALL REAR SIDE SEATBACK

Install the rear side seatback with the bolt.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

8. INSTALL THESE PARTS:

(a) Install the rear seat cushion.
(b) Install the center pillar lower garnishes.
(c) Install the rear door scuff plates.
(d) Install the rear door opening trims.
(e) Install the front door scuff plates.



(f) w/ Curtain Shield Airbag:
  (1) Remove the protection cover.
  (2) Install the 2 bolts.
  Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)
  (3) Install the front pillar garnish.
  (4) Install the pillar garnish cover and bolt.

NOTICE:

Be sure to tighten the bolt.

  (5) Fell the pillar garnish cover.

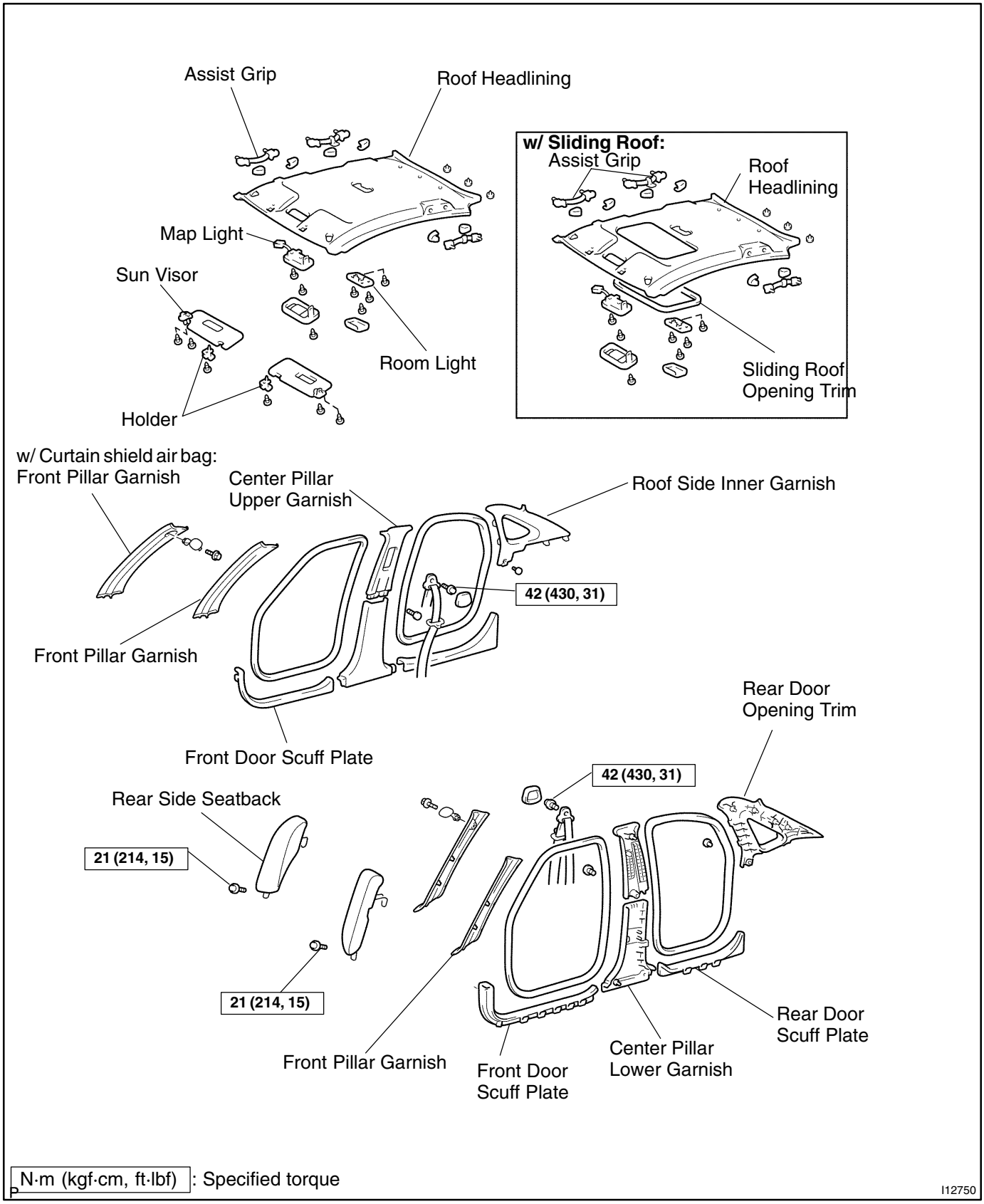
(g) Install the front pillar garnishes.

(h) Install the front door opening trims.

ROOF HEADLINING (Liftback)

COMPONENTS

BO19R–02



N·m (kgf·cm, ft·lbf) : Specified torque

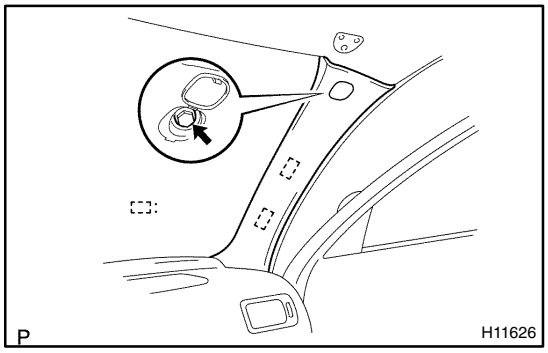
I12750

BO2J7–01

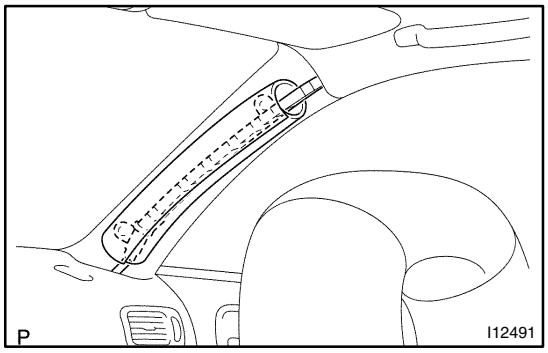
REMOVAL

1. REMOVE THESE PARTS:

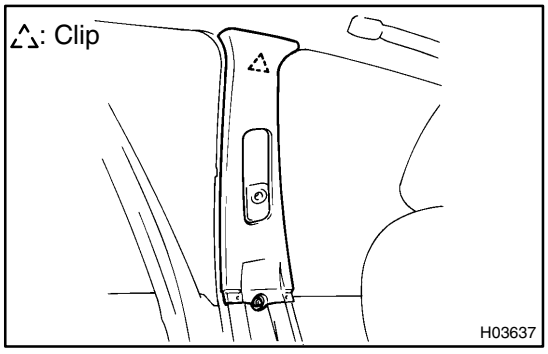
(a) Remove the front door opening trims.



(b) w/ Curtain Shield Airbag:
  (1) Using a screwdriver,raise the pillar garnish cover.
  (2) Remove the bolt, pillar garnish cover and front pillar garnish.

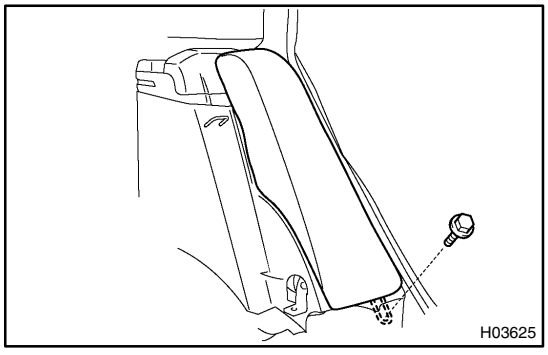


  (3) Remove the 2 bolts.
  (4) Pack the air bag with protection cover.
(c) Remove the front pillar garnishes.
(d) Remove the front door scuff plates.
(e) Remove the rear door opening trims.
(f) Remove the rear door scuff plates.
(g) Remove the center pillar lower garnishes.



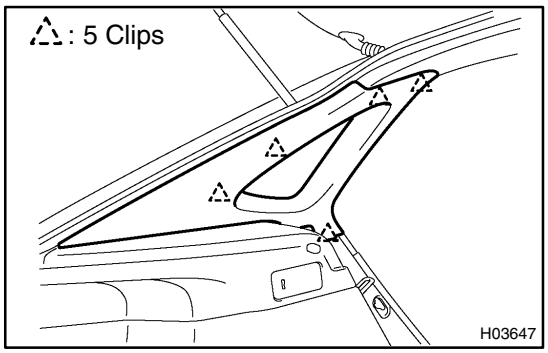
2. REMOVE CENTER PILLAR UPPER GARNISH

(a) Remove the front seat outer belt shoulder anchor.
(b) Remove the screw and center pillar upper garnish.



3. REMOVE REAR SIDE SEATBACK

Remove the bolt and rear side seatback.



4. REMOVE ROOF SIDE INNER GARNISH

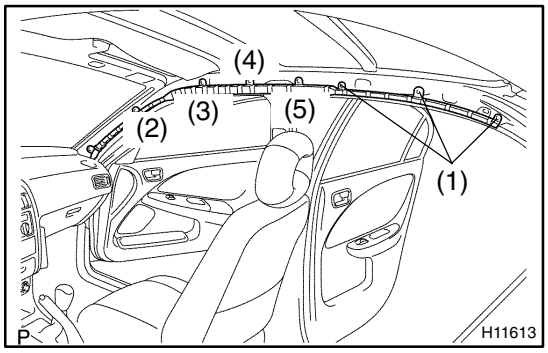
Remove the garnish.

5. REMOVE THESE PARTS:

(a) Remove the assist grips.
(b) Remove the sun visors and holders.
(c) Remove the room light.
(d) Remove the map light.
(e) w/ Sliding Roof:
Remove the sliding roof opening trim.

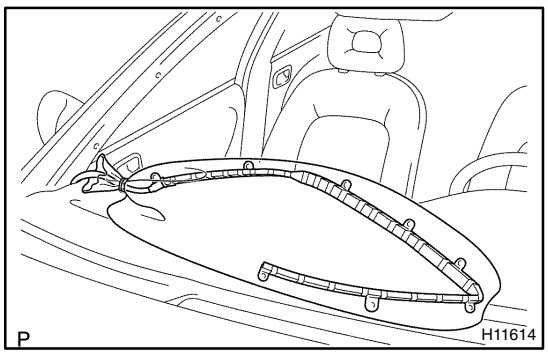
6. REMOVE ROOF HEADLINING

Using a clip remover, remove the 3 clips and roof headlining.



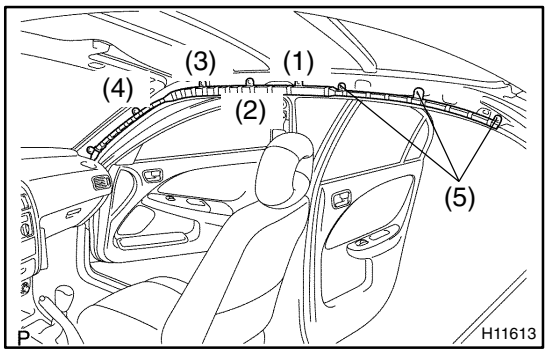
7. w/ Curtain Shield Airbag:
REMOVE CURTAIN SHIELD AIRBAG

(a) In the oder shown in the illustration, remove the bolts and grommets, then, remove the deployment section of the curtain shield airbag.



(b) Put the removed airbag in the clear plastic bag and put it on the instrument panel.

BO2J8–01



INSTALLATION

1. w/ Curtain Shield Airbag:
INSTALL CURTAIN SHIELD AIRBAG

In order shown in the illustration, install the deployment section of the curtain shield airbag with the bolts and grommet.

Torque: 9.8 N·m (100 kgf·cm, 7 ft·lbf)

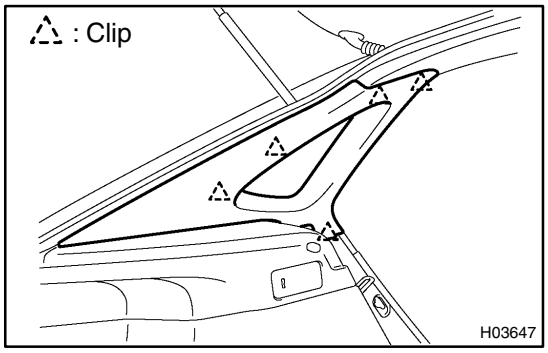
2. INSTALL ASSIST GRIP CUSHION

3. INSTALL ROOF HEAD LINING

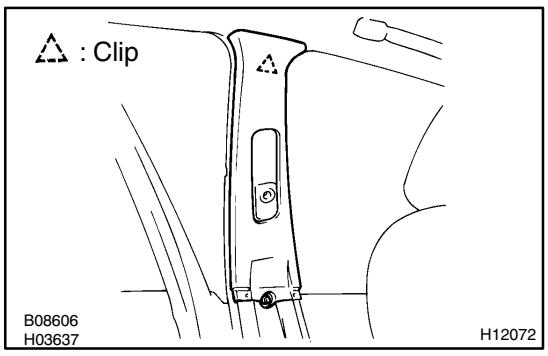
Install the 3 clips and roof headlining.

4. INSTALL THESE PARTS:

(a) w/ Sliding Roof:
Install the sliding roof opening trim.
(b) Install the map light.
(c) Install the room light.
(d) Install the sun visors and holders.
(e) Install the assist grips.

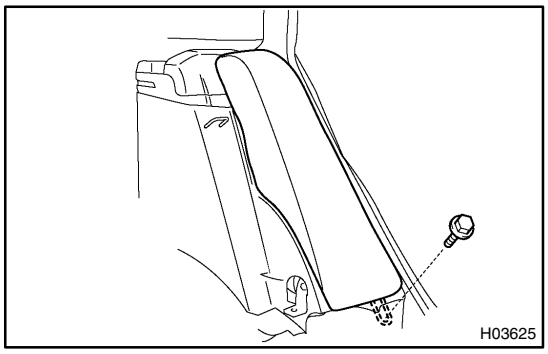


5. INSTALL ROOF SIDE INNER GARNISH



6. INSTALL CENTER PILLAR UPPER GARNISH

(a) Install the center pillar upper garnish with the screw.
(b) Install the front seat outer belt shoulder anchor with the bolts.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

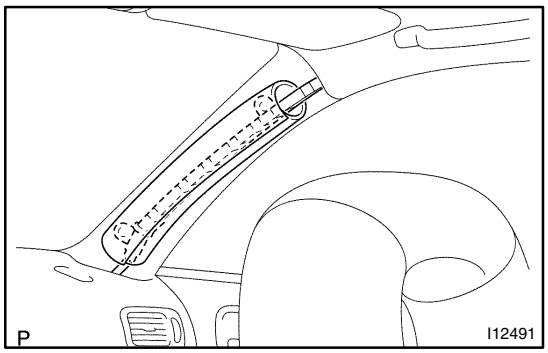


7. INSTALL REAR SIDE SEATBACK

Install the rear side seatback with the bolt.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

8. INSTALL THESE PARTS:

(a) Install the center pillar lower garnishes.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)
(b) Install the rear door scuff plates.
(c) Install the rear door opening trims.
(d) Install the front door scuff plates.



(e) w/ Curtain Shield Airbag:
  (1) Remove the protection cover.
  (2) Install the 2 bolts.
  Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)
  (3) Install the front pillar garnish.
  (4) Install the pillar garnish cover and bolt.

NOTICE:

Be sure to tighten the bolt.

  (5) Fell the pillar garnish cover.

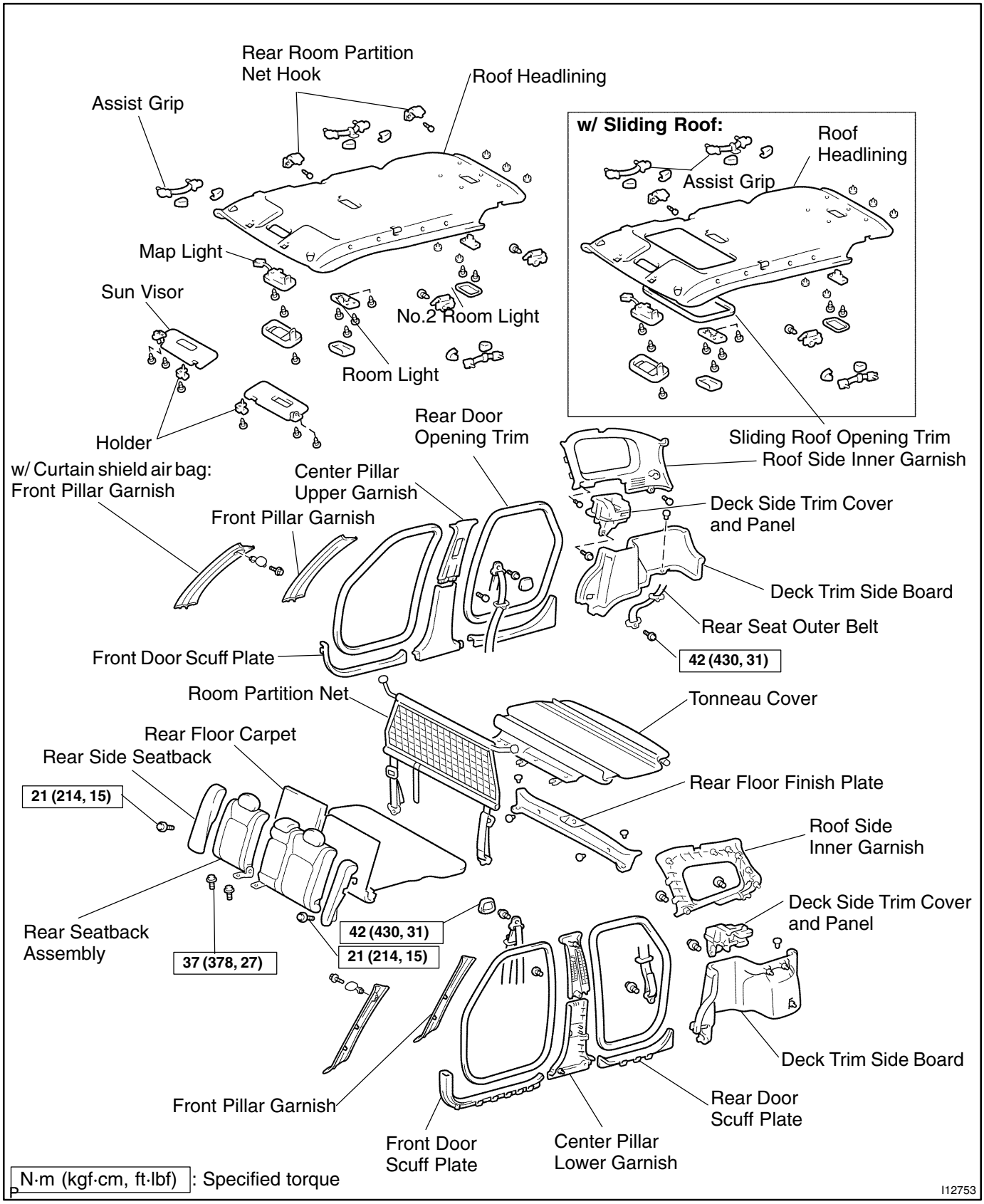
(f) Install the front pillar garnishes.

(g) Install the front door opening trims.

ROOF HEADLINING (Wagon)

COMPONENTS

BO19U–02

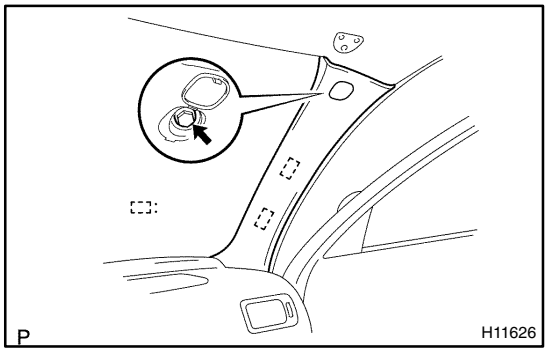


BO2J9–01

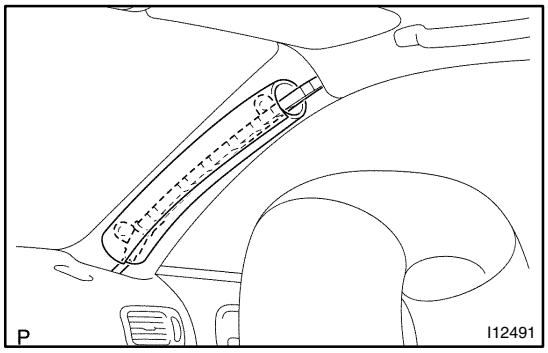
REMOVAL

1. REMOVE THESE PARTS:

(a) Remove the front door opening trims.

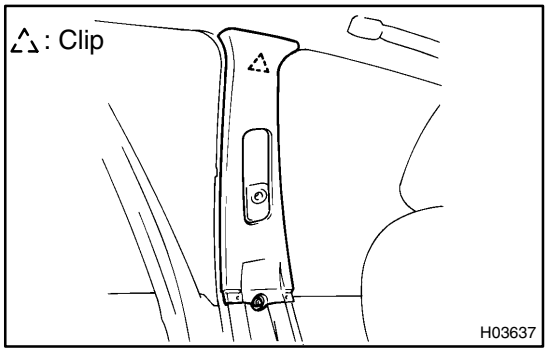


(b) w/ Curtain Shield Airbag:
  (1) Using a screwdriver,raise the pillar garnish cover.
  (2) Remove the bolt, pillar garnish cover and front pillar garnish.



  (3) Remove the 2 bolts.
  (4) Pack the air bag with protection cover.

(c) Remove the front pillar garnishes.
(d) Remove the front door scuff plates.
(e) Remove the rear door opening trims.
(f) Remove the rear door scuff plates.
(g) Remove the center pillar lower garnishes.

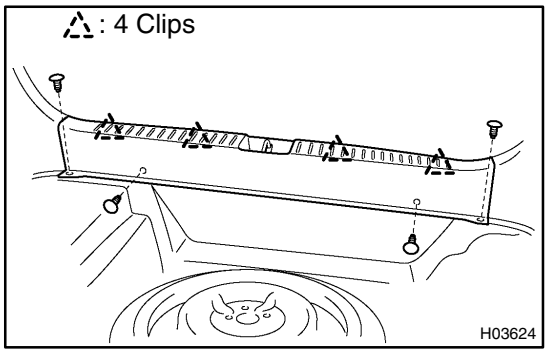


2. REMOVE CENTER PILLAR UPPER GARNISH

(a) Remove the front seat outer belt shoulder anchor.
(b) Remove the screw and center pillar upper garnish.

3. REMOVE THESE PARTS:

(a) Remove the rear floor carpet.
(b) Remove the rear seatback assembly.
(c) w/ Tonneau Cover:
  Remove the tonneau cover.
(d) w/ Room Partition Net:
  Remove the room partition net.

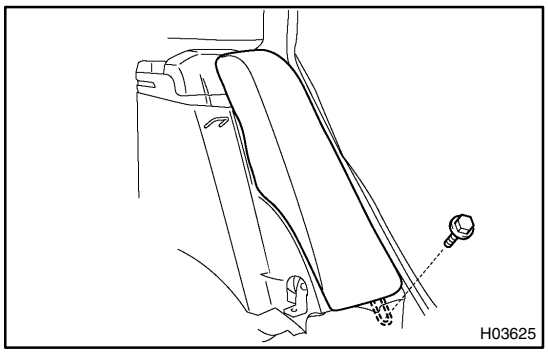


4. REMOVE REAR FLOOR FINISH PLATE

Using a screwdriver, remove the rear floor finish plate.
HINT:
Tape the screwdriver tip before use.

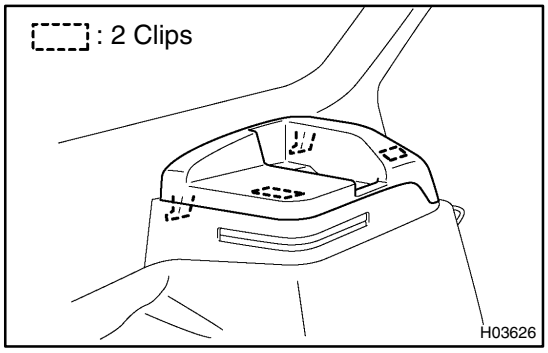
5. REMOVE REAR ROOM PARTITION NET HOOK

Remove the screw and hook.



6. REMOVE REAR SIDE SEATBACK

Remove the bolt and rear side seatback.

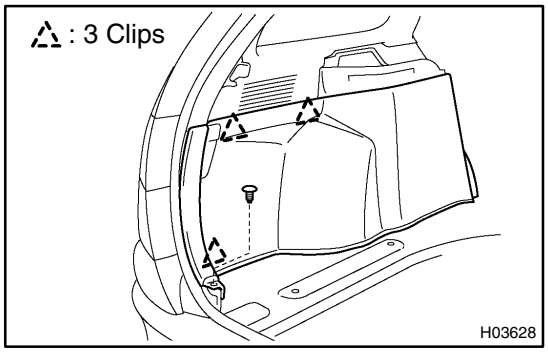


7. REMOVE DECK SIDE TRIM COVER

Using a screwdriver, remove the deck side trim cover.

HINT:

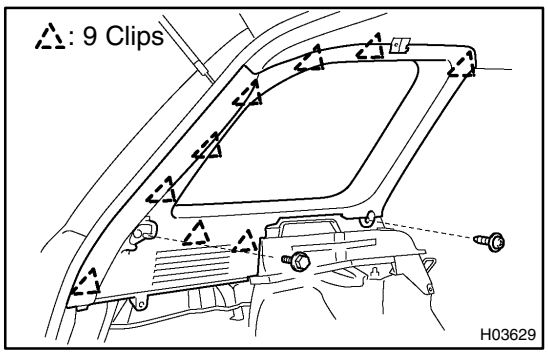
Tape the screwdriver tip before use.



8. REMOVE DECK TRIM SIDE BOARD

(a) Remove the rear seat outer belt floor anchor bolt.

(b) Using a clip remover, remove the clip and deck trim side board.



9. REMOVE ROOF SIDE INNER GARNISH

Remove the bolt, screw and roof side inner garnish.

10. REMOVE THESE PARTS:

(a) Remove the assist grips.

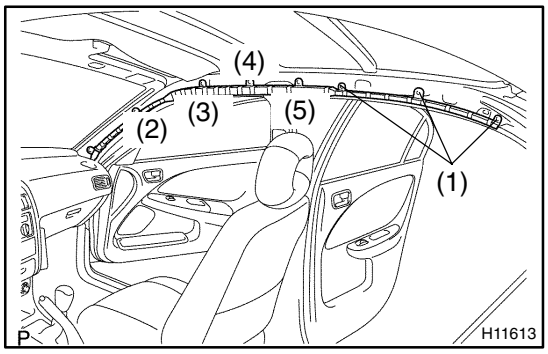
(b) Remove the sun visors and holders.

(c) Remove the room light.

(d) w/ Sliding Roof:
Remove the sliding roof opening trim.

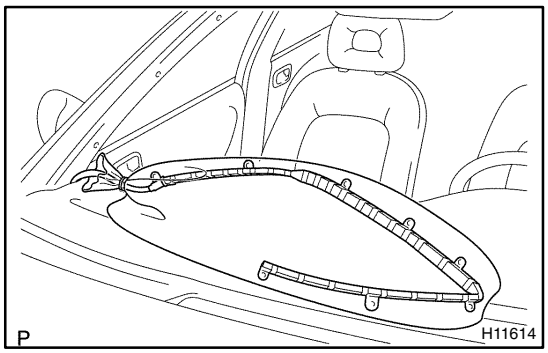
11. REMOVE ROOF HEADLINING

Using a clip remover, remove the 5 clips and roof headlining.



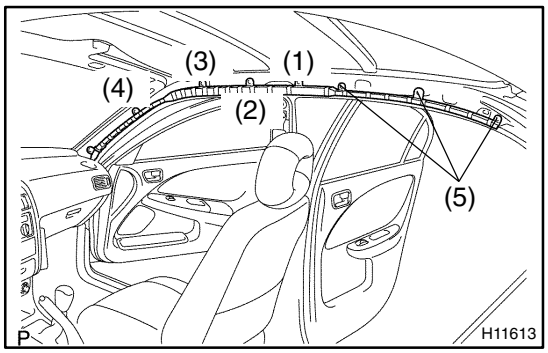
12. w/ Curtain Shield Airbag:
REMOVE CURTAIN SHIELD AIRBAG

(a) In the oder shown in the illustration , remove the bolts and grommets , theN, remove the deployment section of the curtain shield air bag.



(b) Put the removed air bag in the clear plastic bag and put it on the instrument panel.

BO2JA–01



INSTALLATION

1. w/ Curtain Shield Airbag:
INSTALL CURTAIN SHIELD AIRBAG

In order shown in the illustration, install the deployment section of the curtain shield airbag with the bolts and grommet.

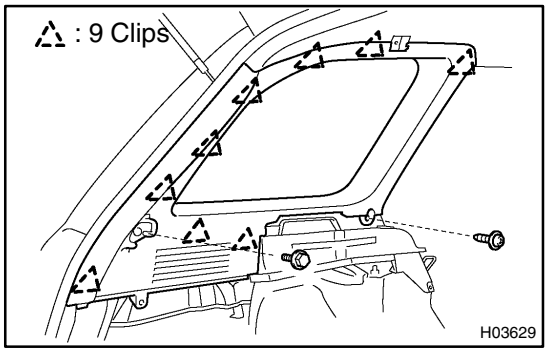
Torque: 9.8 N·m (100 kgf·cm, 7 ift·lbf)

2. INSTALL ROOF HEAD LINING

Install the 5 clips and roof headlining.

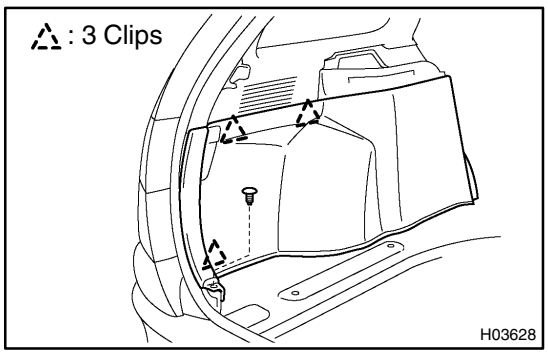
3. INSTALL THESE PARTS:

(a) w/ Sliding Roof:
Install the sliding roof opening trim.
(b) Install the room light.
(c) Install the sun visors and holders.
(d) Install the assist grips.



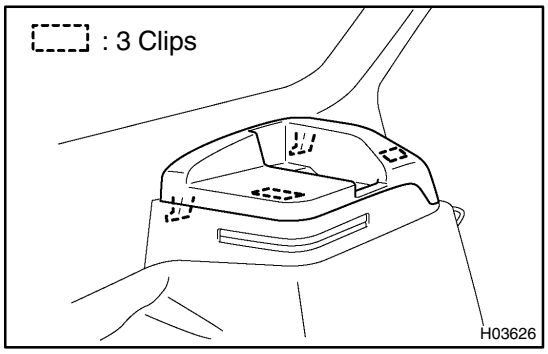
4. INSTALL ROOF SIDE INNER GARNISH

Install the roof side inner garnish with the bolt and screw.



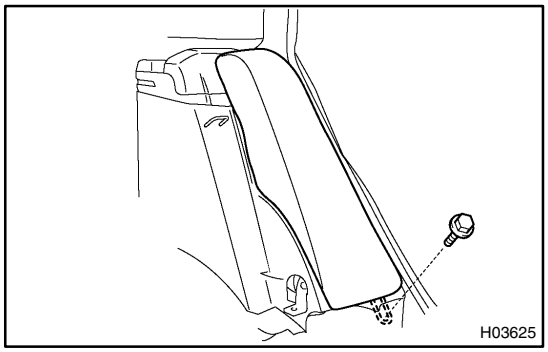
5. INSTALL DECK TRIM SIDE BOARD

(a) Install the deck trim side board with the clip.
(b) Install the rear seat outer belt floor anchor bolt.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



6. INSTALL DECK SIDE TRIM COVER

Install the deck side trim cover.



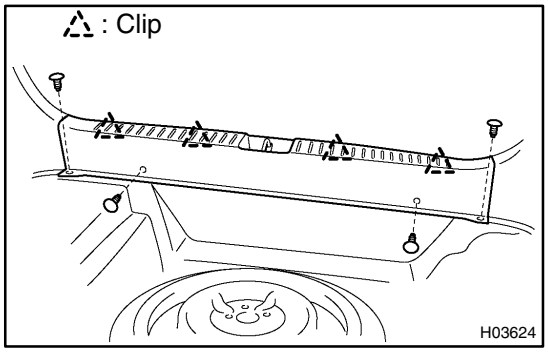
7. INSTALL REAR SIDE SEATBACK

Install rear side seatback with the bolt.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

8. INSTALL REAR ROOM PARTITION NET HOOK

Install the hook with the screw.



9. INSTALL REAR FLOOR FINISH PLATE

Install the rear floor finish plate.

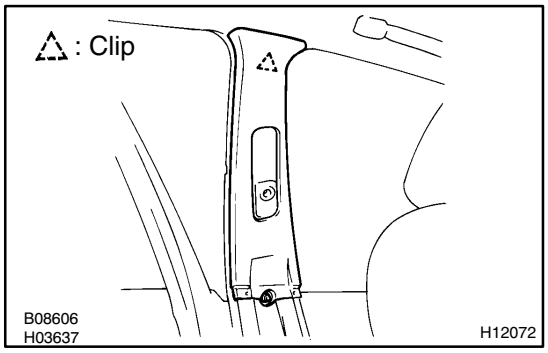
10. INSTALL THESE PARTS:

(a) w/ Room Partition Net:
Install the room partition net.

(b) w/ Tonneau Cover:
Install the tonneau cover.

(c) Install the rear seatback assembly.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(d) Install the rear floor carpet.



11. INSTALL CENTER PILLAR UPPER GARNISH

(a) Install the center pillar upper garnish with the screw.

(b) Install the front seat outer belt shoulder anchor.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

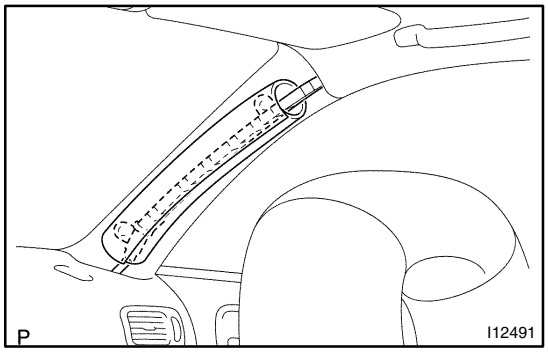
12. INSTALL THESE PARTS:

(a) Install the center pillar lower garnishes.

(b) Install the rear door scuff plates.

(c) Install the rear door opening trims.

(d) Install the front door scuff plates.



(e) w/ Curtain Shield Airbag:

(1) Remove the protection cover.

(2) Install the 2 bolts.
Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

(3) Install the front pillar garnish.

(4) Install the pillar garnish cover and bolt.

NOTICE:

Be sure to tighten the bolt.

(5) Fell the pillar garnish cover.

(f) Install the front pillar garnishes.

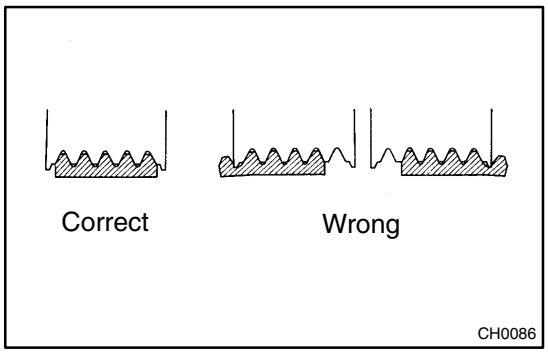
(g) Install the front door opening trims.

AIR CONDITIONING

DRIVE BELT (1CD–FTV) AC–1
MANIFOLD GAUGE SET (1CD–FTV) AC–4
REFRIGERANT LINE AC–6
COMBUSTION TYPE POWER HEATER AC–9
ELECTRICAL TYPE POWER HEATER AC–23
COMPRESSOR AND MAGNETIC CLUTCH (1CD–FTV) AC–25
RELAY (1CD–FTV) AC–29
CONDENSER FAN (1CD–FTV) AC–30
WATER TEMPERATURE SWITCH (1CD–FTV) AC–36

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.



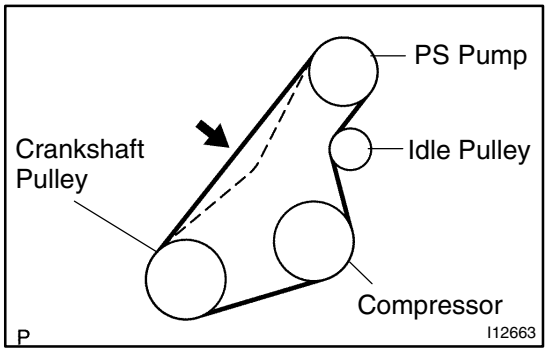
DRIVE BELT (1CD–FTV)

AC2A4–01

ON–VEHICLE INSPECTION

1. INSPECT DRIVE BELT INSTALLATION CONDITION

Check that the drive belt fits properly in the ribbed grooves.



2. INSPECT DRIVE BELT DEFLECTION

Using a belt tension gauge, apply load of 98 N (10 kgf, 22 lbf) and measure drive belt deflection.

Drive belt deflection:
New belt: 11 – 13 mm (0.47 – 0.51 in.)
Used belt: 15 – 18 mm (0.59 – 0.71 in.)

HINT:

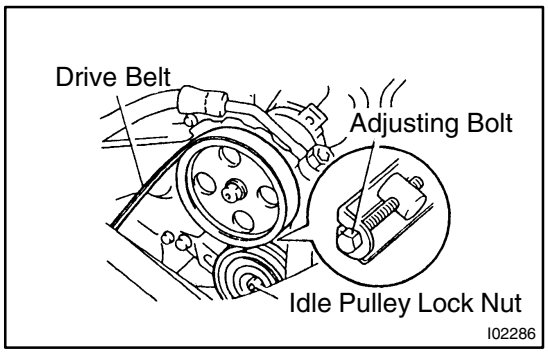
- ”New belt” refers to a belt which has been used less than 5 minutes on the running engine.
- ”Used belt” refer to a belt which has been on a running engine for 5 minutes or more.
- After installing the drive belt, check that it fits properly in the ribbed grooves.

3. INSPECT DRIVE BELT TENSION

Using a belt tension gauge, check the drive belt tension.

Drive belt tension:
New belt: 520 – 755 N (53 – 77 kgf)
Used belt: 196 – 392 N (20 – 40 kgf)

AC2A5–01



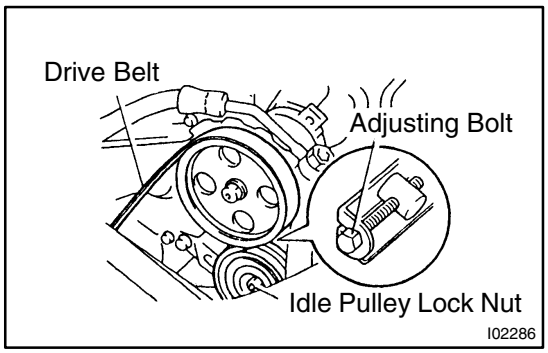
REMOVAL

REMOVE DRIVE BELT

(a) Loosen the idle pulley lock nut.

(b) Loosen the drive belt tension by adjusting bolt and remove the drive belt.

AC2A6–01



INSTALLATION

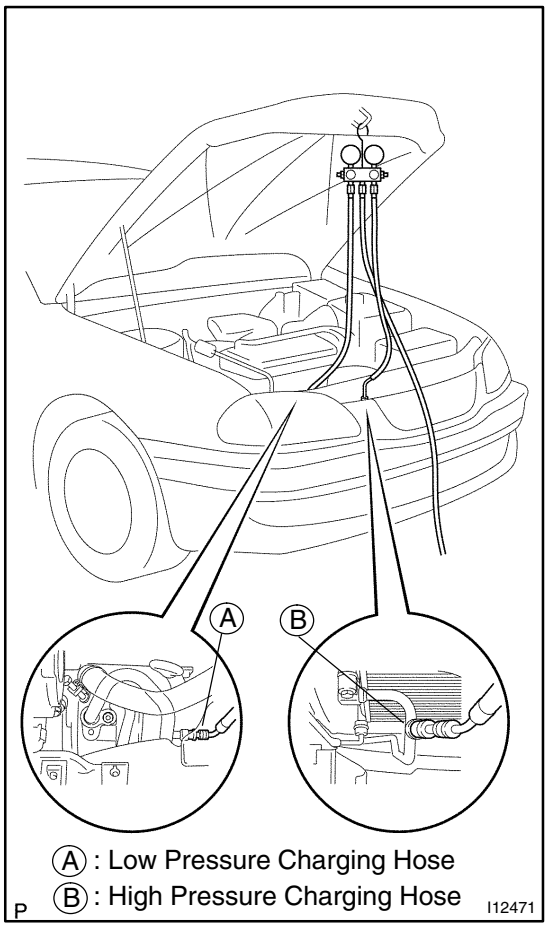
INSTALL DRIVE BELT

(a) Tighten the idle pulley lock nut temporarily.
Torque: 2.5 N·m (25 kgf·cm, 22 in.·lbf)

(b) Install the drive belt.

(c) Using a adjusting bolt, adjust drive belt tension.
Drive belt tension:
New belt: 520 – 755 N (53 – 77 kgf)
Used belt: 196 – 392 N (20 – 40 kgf)

(d) Tighten the idle pulley lock nut at regular torque.
Torque: 39 N·m (390 kgf·cm, 29 ft·lbf)



MANIFOLD GAUGE SET (1CD–FTV)

AC2A7–02

SET ON

1. CONNECT CHARGE HOSE TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

CAUTION:

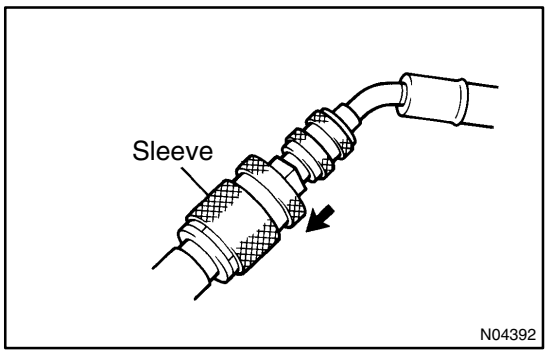
Do not connect the wrong hoses.

2. CONNECT QUICK DISCONNECT ADAPTERS TO CHARGING HOSES

Tighten the nuts by hand.

3. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

4. REMOVE CAPS FROM SERVICE VALVE ON REFRIGERANT LINE

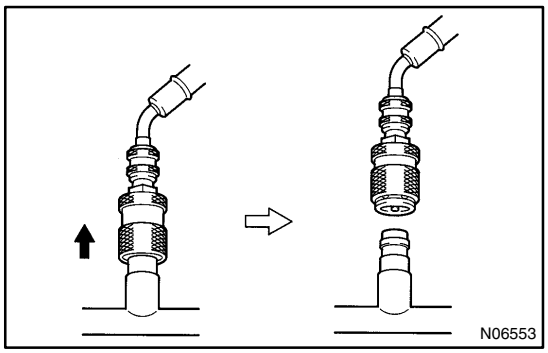


5. CONNECT QUICK DISCONNECT ADAPTER TO SERVICE VALVES

HINT:

Push the quick disconnect adapter onto the service valve, slide, then slide the sleeve of the quick disconnect adapter downward to lock it.

AC2A8–01



SET OFF

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
2. **DISCONNECT QUICK DISCONNECT ADAPTERS FROM SERVICE VALVES ON REFRIGERANT LINE**

HINT:

Slide the sleeve of the quick disconnect adapter upward to unlock the adapter and remove it from the service valve.

3. **INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINE**

REFRIGERANT LINE

AC1A5–02

ON–VEHICLE INSPECTION (1CD–FTV Engine Models)

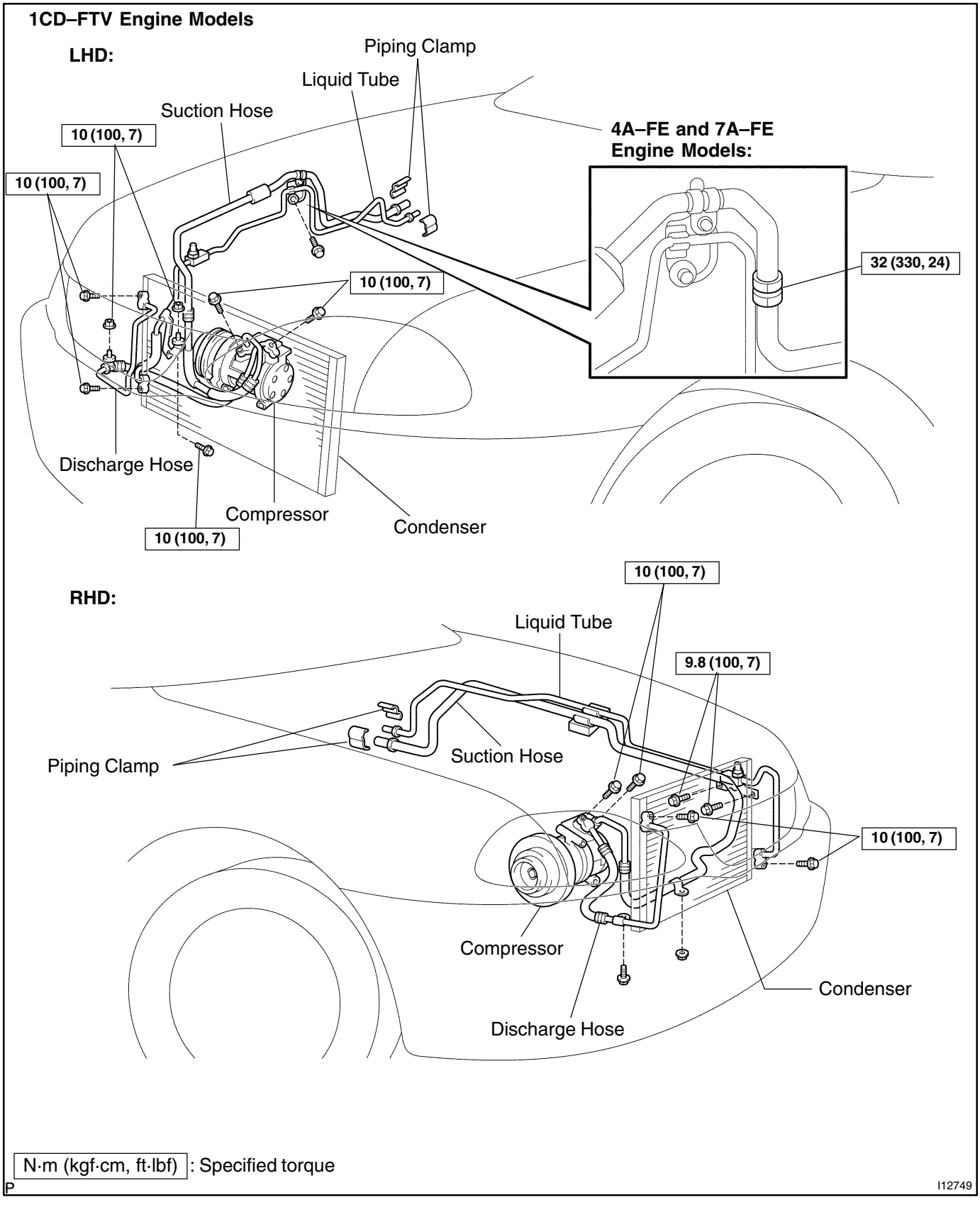
1. INSPECTION HOSE AND TUBE CONNECTIONS FOR LOOSENESS

2. INSPECT HOSES AND TUBES FOR LEAKAGE

Using a gas leak detector, check for leakage of refrigerant.

AC1A6–03

COMPONENTS



AC1A7–01

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

2. REPLACE FAULTY TUBE OR HOSE

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

3. TIGHTEN JOINT OF BOLT OR NUT AT SPECIFIED TORQUE

NOTICE:

Connections should not be torqued tighter than the specified torque.

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Condenser x Discharge hose	10	100	7
Condenser x Liquid tube	10	100	7
Liquid line (Block joint)	10	100	7
Suction line (Piping joint)	32	330	24

4. EVACUATE AIR FROM REFRIGERATION SYSTEM AND CHARGE SYSTEM WITH REFRIGERANT

Specified amount: 450 ± 50 g (15.87 ± 1.76 oz.)

5. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

6. INSPECT AIR CONDITIONING OPERATION

COMBUSTION TYPE POWER HEATER

AC29V–02

ON–VEHICLE INSPECTION

NOTICE:

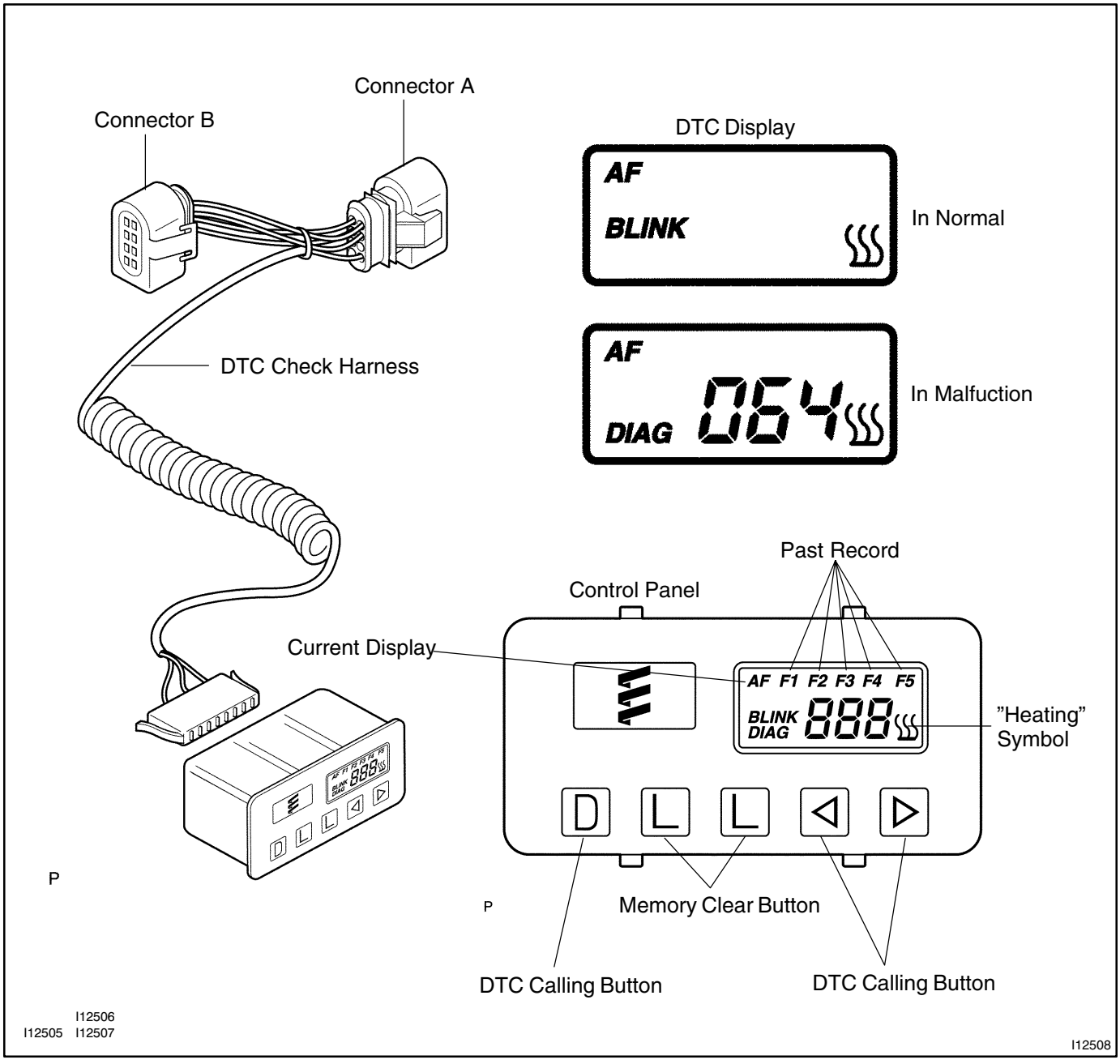
- **If the glow plug breaks, the ECU detects the breakage and stops the automatic operation, so the burner heater does not activate. (For other failures, similarly activated.)**
- **The cause of failures (such as voltage malfunction, overheating malfunction, short–circuit or breakage of functional componects, etc.) and how to remedy are shown by connecting the DTC tester and reading the DTC.**

1. OPERATION

(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

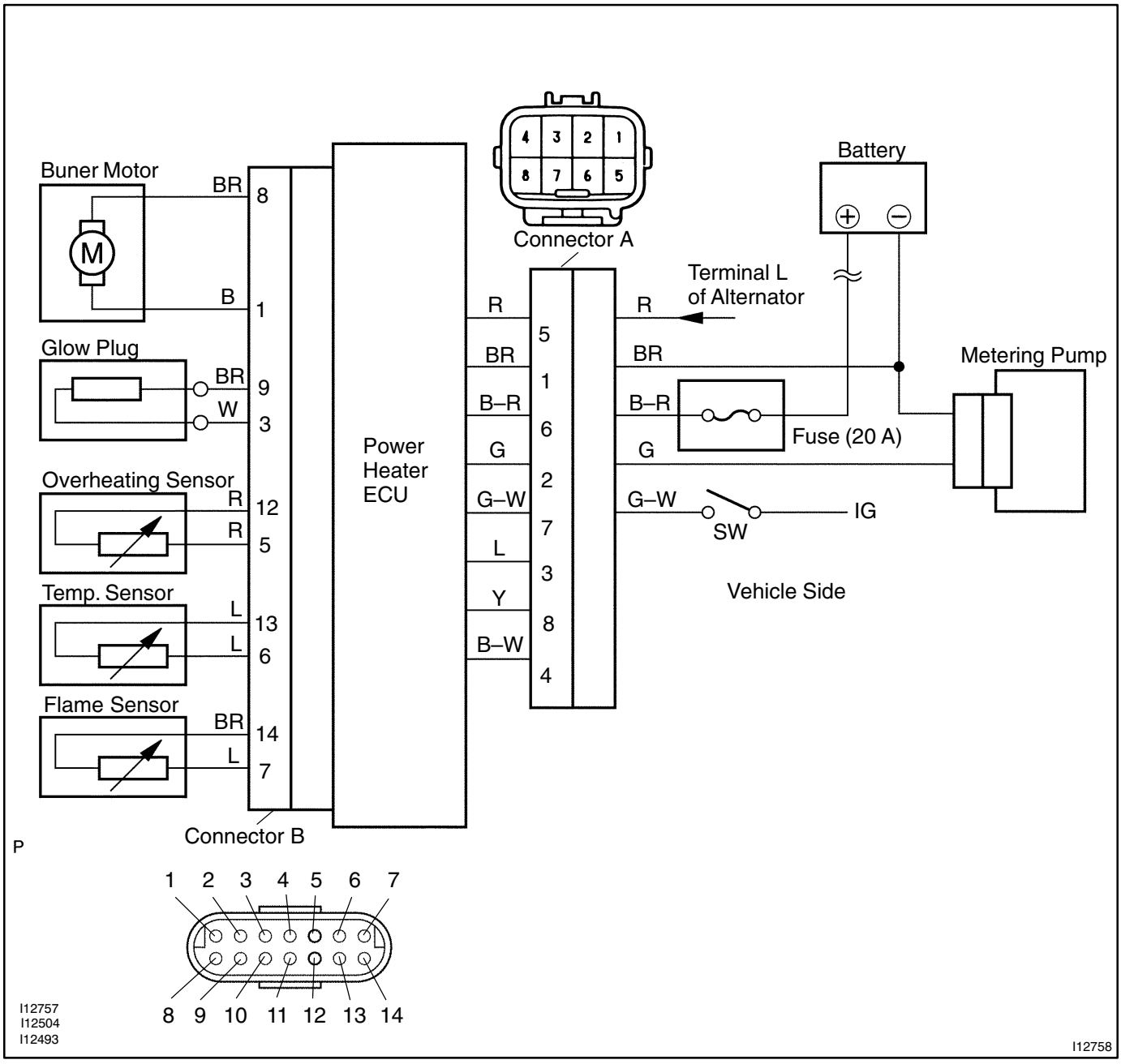
AF: Current Value Malfunction (Blinking at current failure)
Diag: DTC (Example: 064 Flame sensor break)
Mamory Clear button: Deletion of faulty memory (Press both buttons together for longer than 2 sec.)
> Button: Scroll up of faulty memory (The past 5 codes can be stored.)
< Button: Scroll down of faulty memory (The past 5 codes can be stored.)

3. FAULTY MEMORY

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

Wire colors are indicated by an alphabetical code.
B=Black W=White BR=Brown L=Blue R=Red G=Green Y=Yellow
The first letter insicates the basic wire color and the seconk letter indicates the color of the stripe.



5. ON–VEHICLE INSPECTION

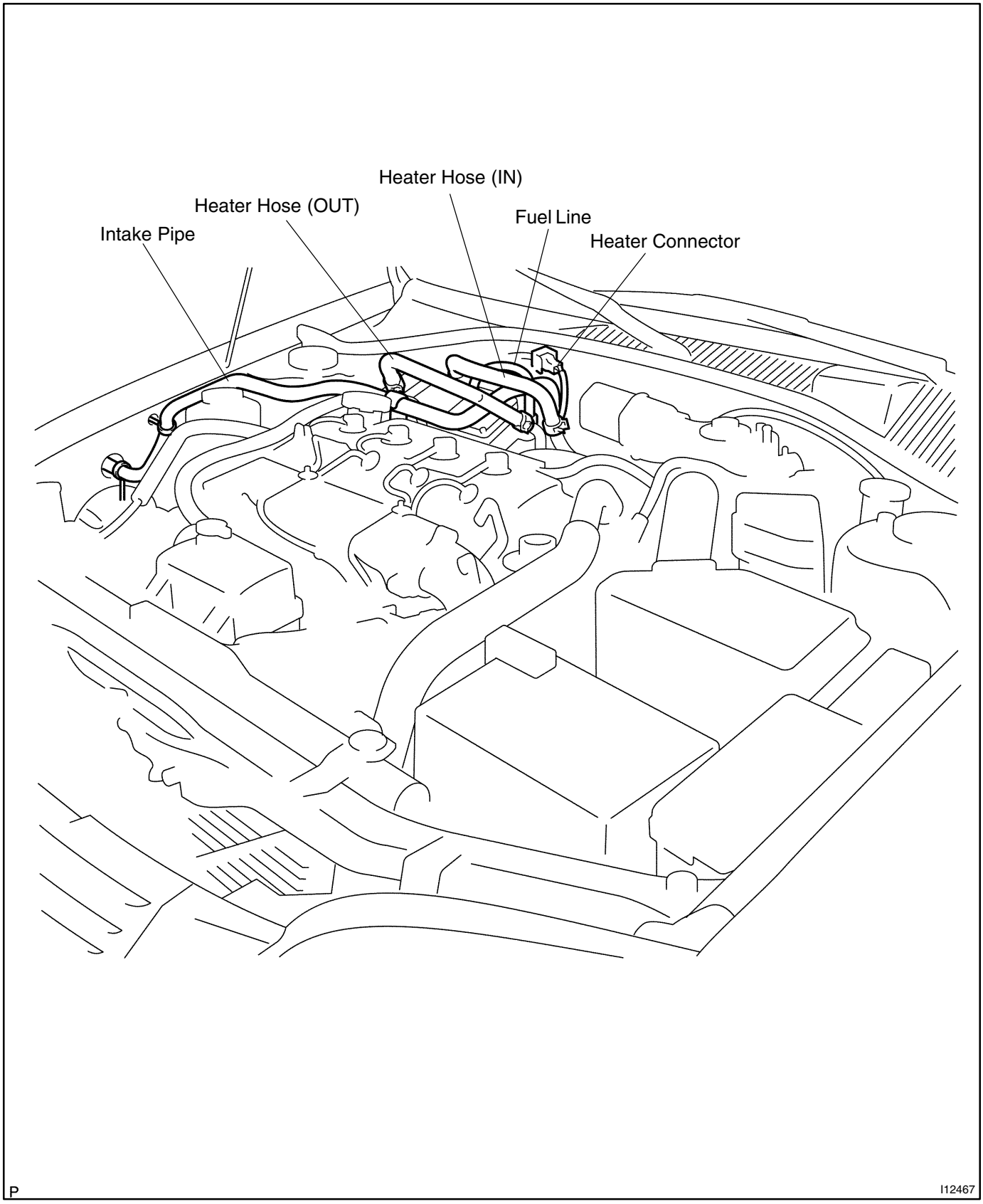
If a malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the appropriate page.

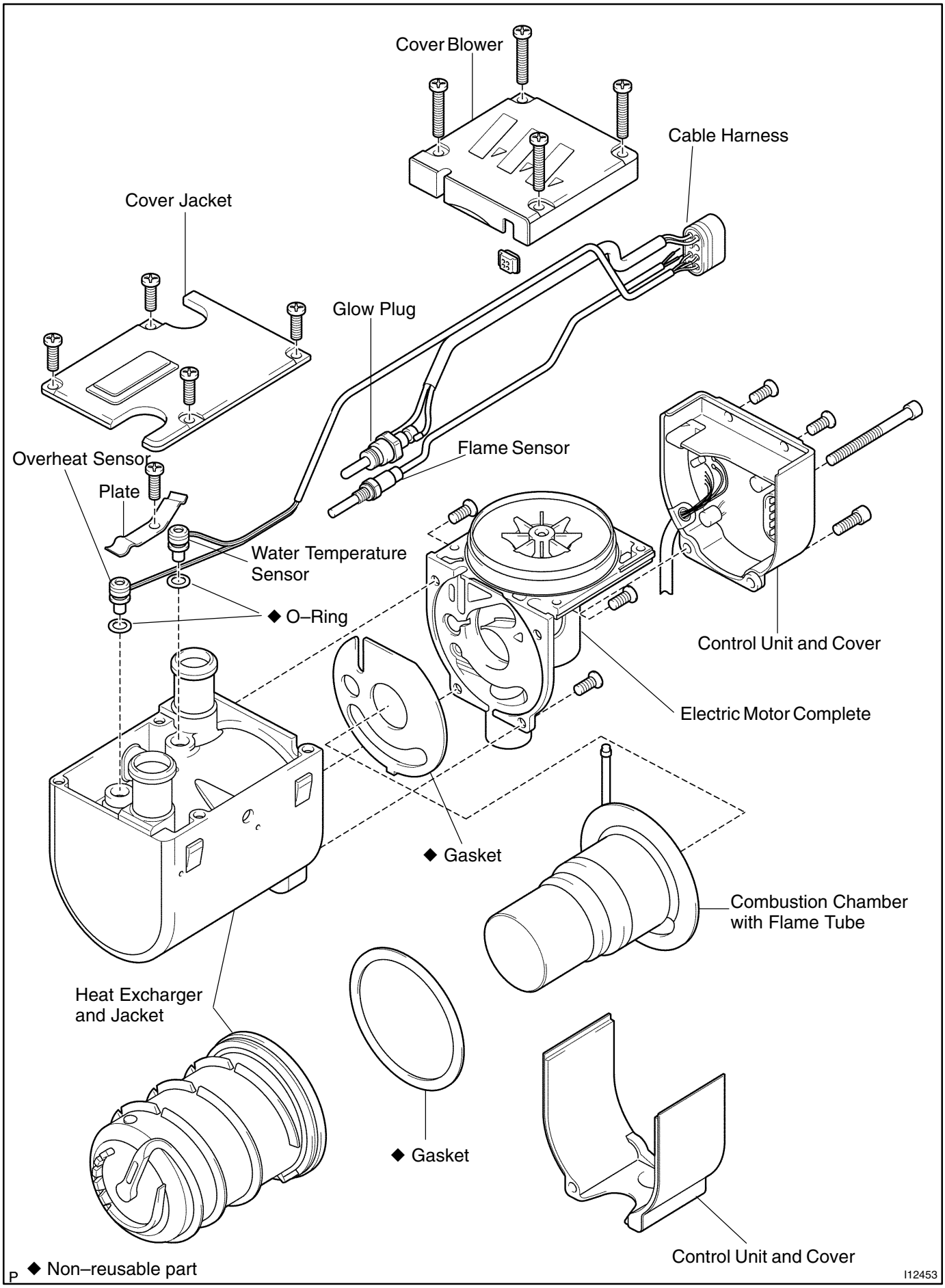
DTC No.	Description of fault	Comment / Remedy
000	No malfunction	–
010 011	Overvoltage shutoff Undervoltage shutoff	Voltage between 1 and 5 at connector A > 16 V Voltage between 1 and 5 at connector A < 10.2 V (Voltage values must be present > 20 seconds) Check battery, regulator and electrical leads.
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	Flame cutout, HIGH setting	Check fuel delivery and fuel supply. Check exhaust gas and combustion air ducts. If combustion OK → Check flame sensor, replace if necessary.
056	Flame cutout, LOW setting	
060	Temperature sensor break	Check connecting leads. Resistance value between 6 and 13 at 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)

DTC No.	Description of fault	Comment / Remedy
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)
071	Overheating sensor break	Check connecting leads. Resistance value between 5 and 12 at connector B > 2MΩ (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 detectice (Intermal 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 interlerence; eliminale 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.

AC29W–02

COMPONENTS



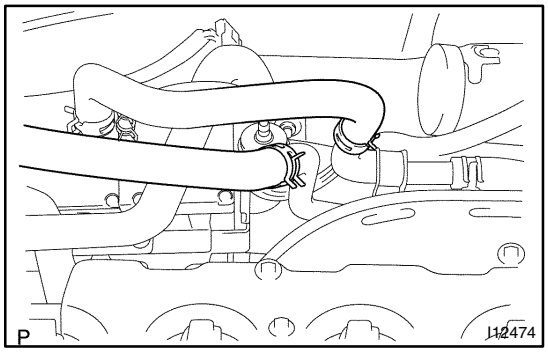

Cover Blower
Cable Harness
Cover Jacket
Glow Plug
Flame Sensor
Overheat Sensor
Plate
Water Temperature Sensor
◆ O–Ring
Control Unit and Cover
Electric Motor Complete
◆ Gasket
Combustion Chamber with Flame Tube
Heat Excharger and Jacket
◆ Gasket
Control Unit and Cover
P ◆ Non–reusable part
I12453

AC29X–01

REMOVAL

1. REMOVE RH UNDER COVER

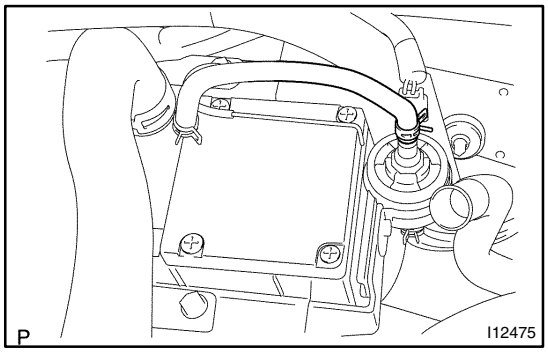
2. DRAIN ENGINE COOLANT



3. DISCONNECT HEATER HOSES

(a) Disconnect the inlet heater hose.

(b) Disconnect the outlet heater hose.

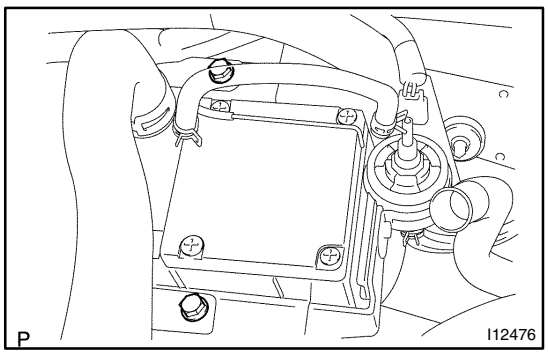


4. DISCONNECT FUEL LINE

Disconnect the fuel line from the fuel pump.

5. DISCONNECT FUEL PUMP CONNECTOR

6. DISCONNECT COMBUSTION TYPE POWER HEATER CONNECTOR

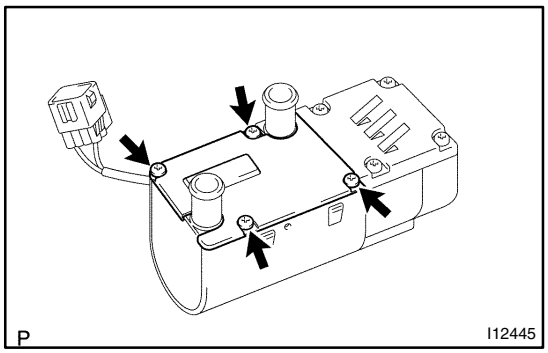


7. REMOVE COMBUSTION TYPE POWER HEATER

Remove the 2 bolts holding the combustion type power heater to the 2 brackets.

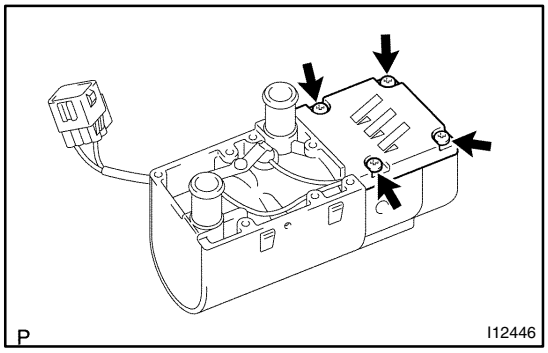
AC29Y–01

DISASSEMBLY



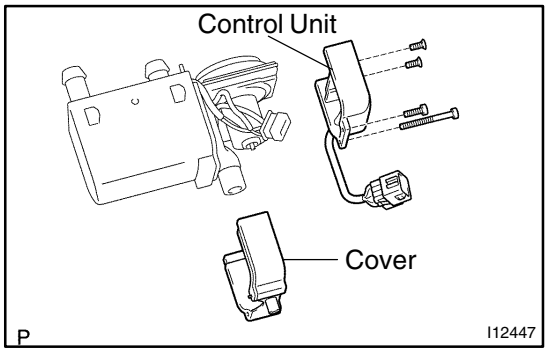
1. REMOVE JACKET COVER

Remove the 4 screws and jacket cover.



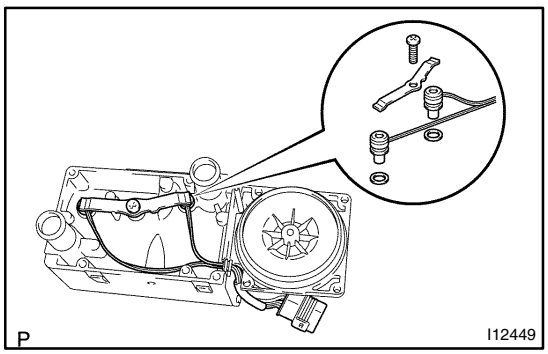
2. REMOVE BLOWER COVER

Remove the 4 screws and blower cover.



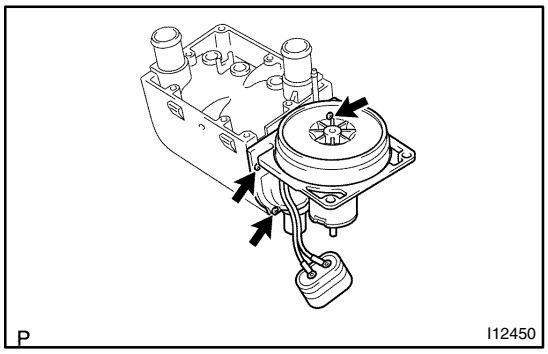
3. REMOVE CONTROL UNIT AND COVER

(a) Remove the 2 screws.
(b) Remove the 2 hexagon screws.
(c) Remove the control unit and cover.



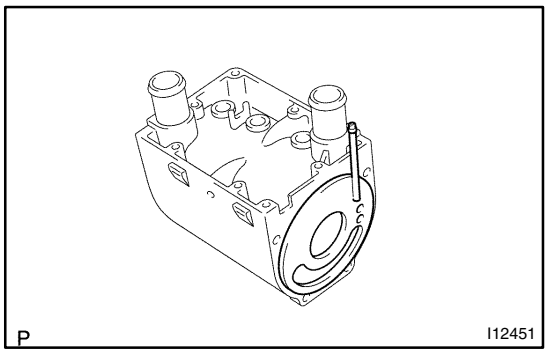
4. REMOVE CABLE HARNESS

(a) Remove the screw and plate.
(b) Remove the water temperature sensor and overheat sensor.



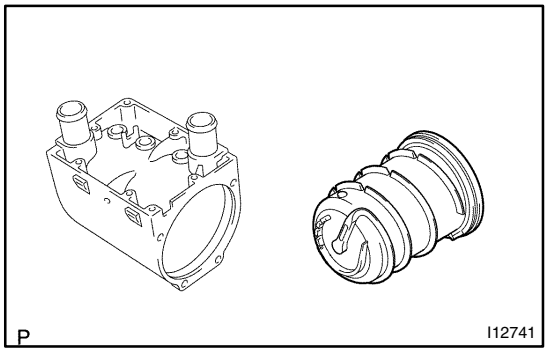
5. REMOVE ELECTRIC MOTER

(a) Remove the 3 screws and the electric moter.
(b) Remove the gasket.



6. REMOVE COMBUSTION CHAMBER WITH FLAME TUBE

Remove the combustion chamber and gasket.



7. REMOVE HEAT EXCHAMBER

AC29Z–01

INSPECTION

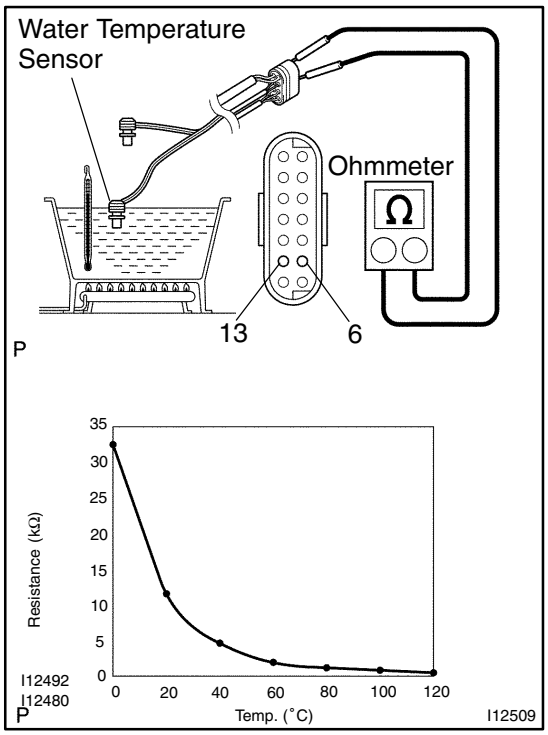
1. INSPECT WATER TEMPERATURE SENSOR

Measure the resistance between the terminals 6, 13.

Using an ohmmeter, measure the resistance between the terminals.

Resistance: Refer to the graph

If the resistance is not as speaified, replace the water temperature sensor.



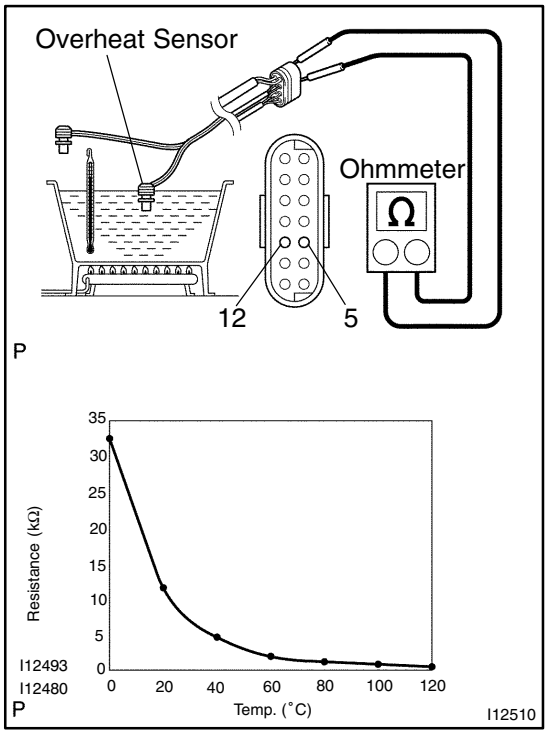
2. INSPECT OVERHEAT SENSOR

Measur the resistance between the terminal 5, 12.

Using an ohmmeter, measure the resistance between the terminals.

Resistance: Refer to the graph

If the resistance is not as speaified, replace the over heat sensor.

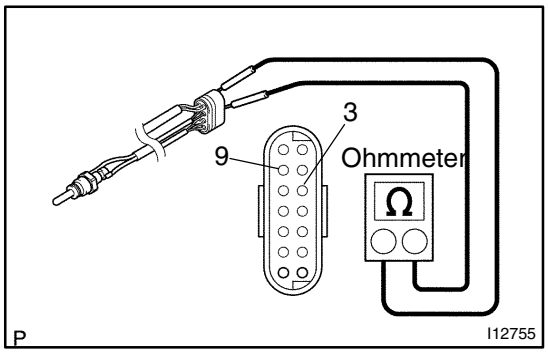


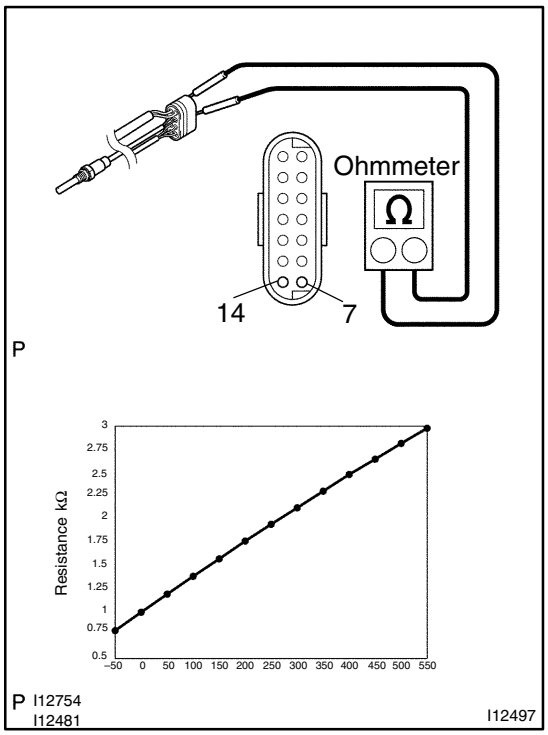
3. INSPECT GLOW PLUG

Using an ohmmeter, check that there is continuity, between the glow plug terminal 3, 9.

Standard resistance: about 0.5 Ω (20°C, reference valve)

If resistance is over 1Ω, replace the glow plug.



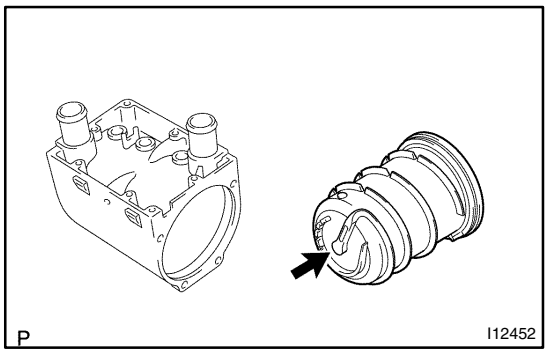


4. INSPECT FLAME SENSOR

Measur the resistance between the terminal 7, 14.

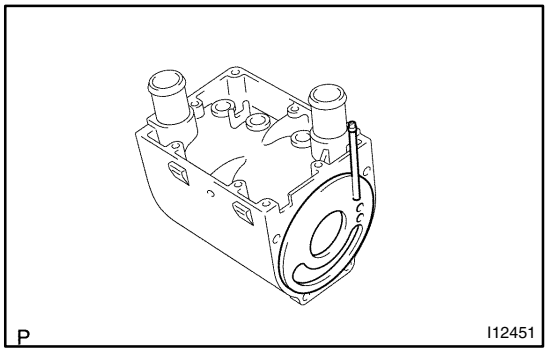
AC2A0–01

REASSEMBLY



1. INSTALL HEAT EXCHAMBER

Align slot on heat exchanger (arrow) with lug in jacket.

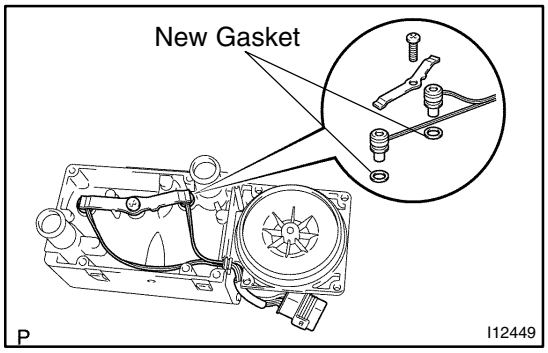


2. INSTALL COMBUSTION CHAMBER WITH FLAME TUBE

Install a new gasket and the combustion chamber.

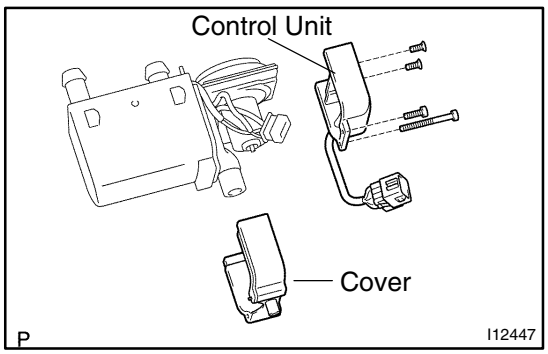
3. INSTALL ELECTRIC MOTOR

(a) Install a new gasket.
(b) Install the electric motor with the 3 screws.



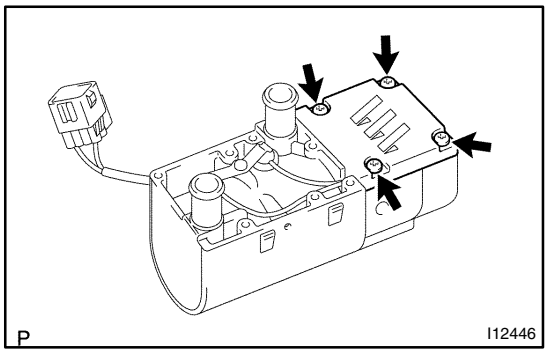
4. INSTALL CABLE HARNESS

(a) Install the water temperature sensor and over heat sensor.
(b) Install the plate with the screw.



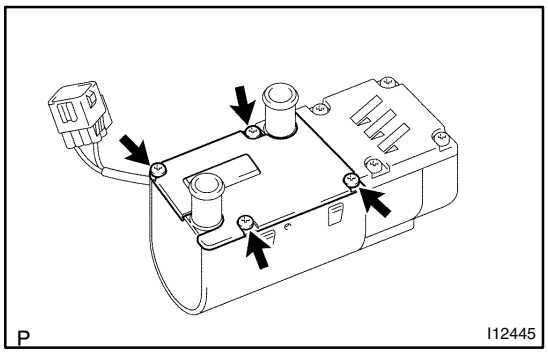
5. INSTALL COVER AND CONTROL UNIT

(a) Install the cover and control unit.
(b) Install the 2 hexagon screws.
(c) Install the 2 screws.



6. INSTALL BLOWER COVER

Install the blower cover with the 4 screws.

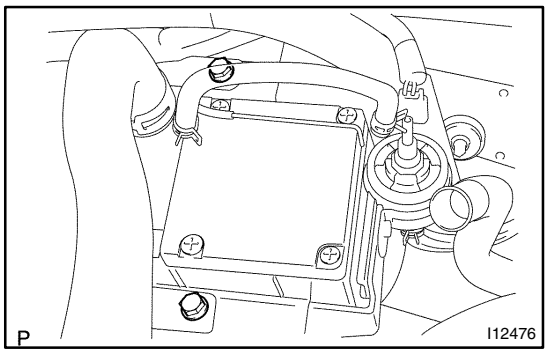


7. INSTALL JACKET COVER

Install the jacket cover with the 4 screws.

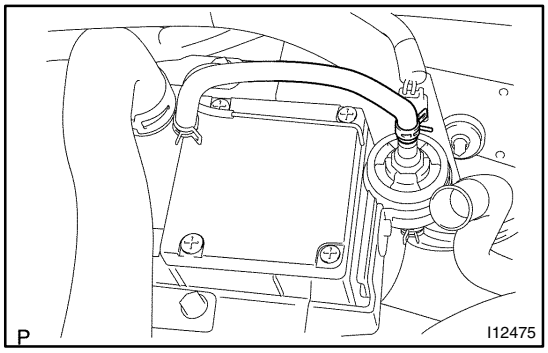
AC2A1–01

INSTALLATION



1. INSTALL COMBUSTION TYPE POWER HEATER

Install the combustion type power heater with the 2 bolts.

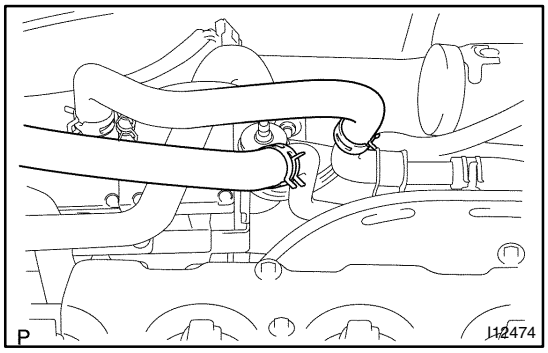


2. CONNECT COMBUSTION TYPE POWER HEATER CONNECTOR

3. CONNECT FUEL PUMP CONNECTOR

4. CONNECT FUEL LINE

Connect the fuel line to the fuel pump.



5. CONNECT HEATER HOSES

(a) Connect the inlet heater hose.

(b) Connect the outlet heater hose.

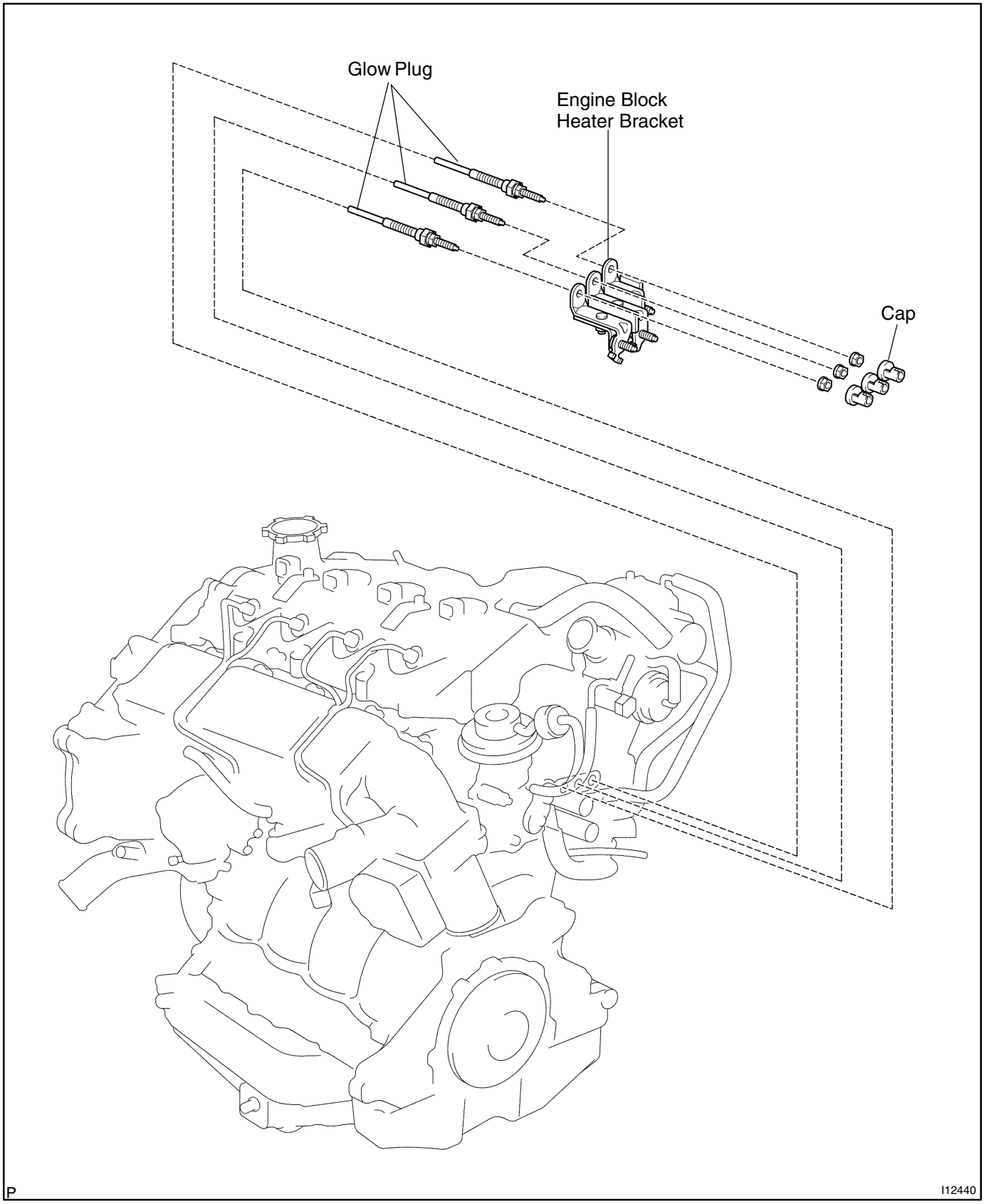
6. FILL ENGINE COOLANT

7. INSTALL RH UNDER COVER

ELECTRICAL TYPE POWER HEATER

AC29T–01

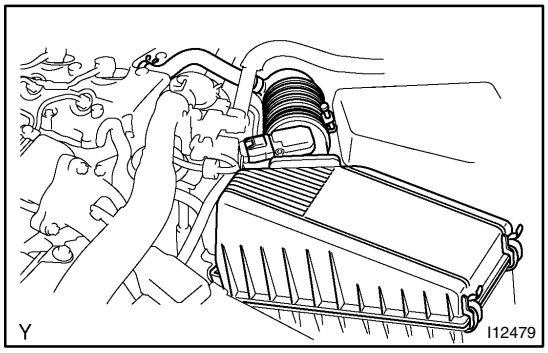
COMPONENTS



AC29U–01

INSPECTION

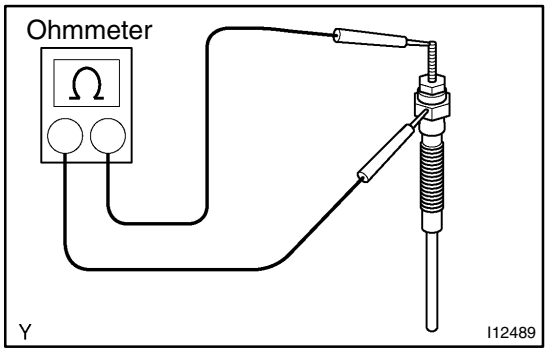
1. DRAIN ENGINE COOLANT



2. REMOVE AIR CLEANER ASSEMBLY

3. REMOVE GLOW PLUGS

(a) Remove the glow plug cap.
(b) Remove the 3 bolts.
(c) Remove the glow plug plate.
(d) Remove the glow plug stay.
(e) Remove the 3 glow plugs.



4. INSPECT GLOW PLUGS

Using an ohmmeter, check that there is continuity between the glow plug terminal and ground.

Standard resistance at 20˚C (68˚F):
Approx. 0.22 Ω

If there is continuity, replace the glow plug.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

5. REINSTALL GLOW PLUGS

(a) Install the 3 glow plugs.
(b) Install the glow plug stay.
(c) Install the glow plug plate.
(d) Install the 3 bolts.
(e) Install the glow plug cap.

6. REINSTALL AIR CLEANER ASSEMBLY

7. FILL ENGINE COOLANT

COMPRESSOR AND MAGNETIC CLUTCH (1CD–FTV)

AC2A9–01

ON–VEHICLE INSPECTION

1. MAKE THESE VISUAL CHECKS:

(a) Leakage of grease from the clutch bearing

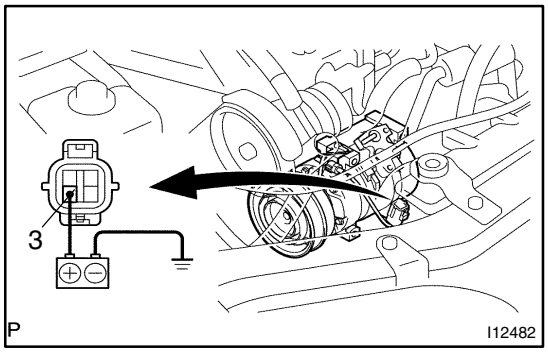
(b) Signs of oil on the pressure plate or rotor

2. INSPECT MAGNETIC CLUTCH BEARING FOR NOISE

(a) Start the engine.

(b) Check for abnormal noise from the compressor when the A/C switch is OFF.

If abnormal noise is being emitted, replace the magnetic clutch.



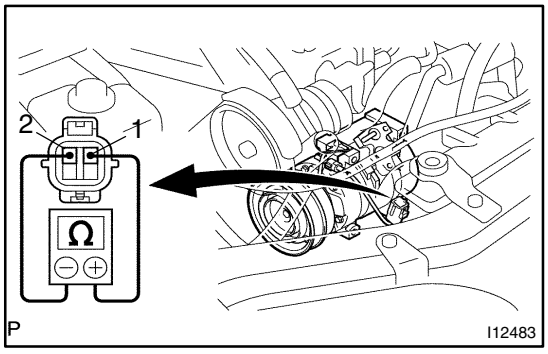
3. INSPECT MAGNETIC CLUTCH OPERATION

(a) Disconnect the connector.

(b) Connect the positive (+) lead from the battery to the terminal 3 on the magnetic clutch connector and the negative (–) lead to the body ground.

(c) Check that the magnetic clutch is energized.

If operation is not as specified, replace the magnetic clutch.



4. INSPECT COMPRESSOR LOCK SENSOR RESISTANCE

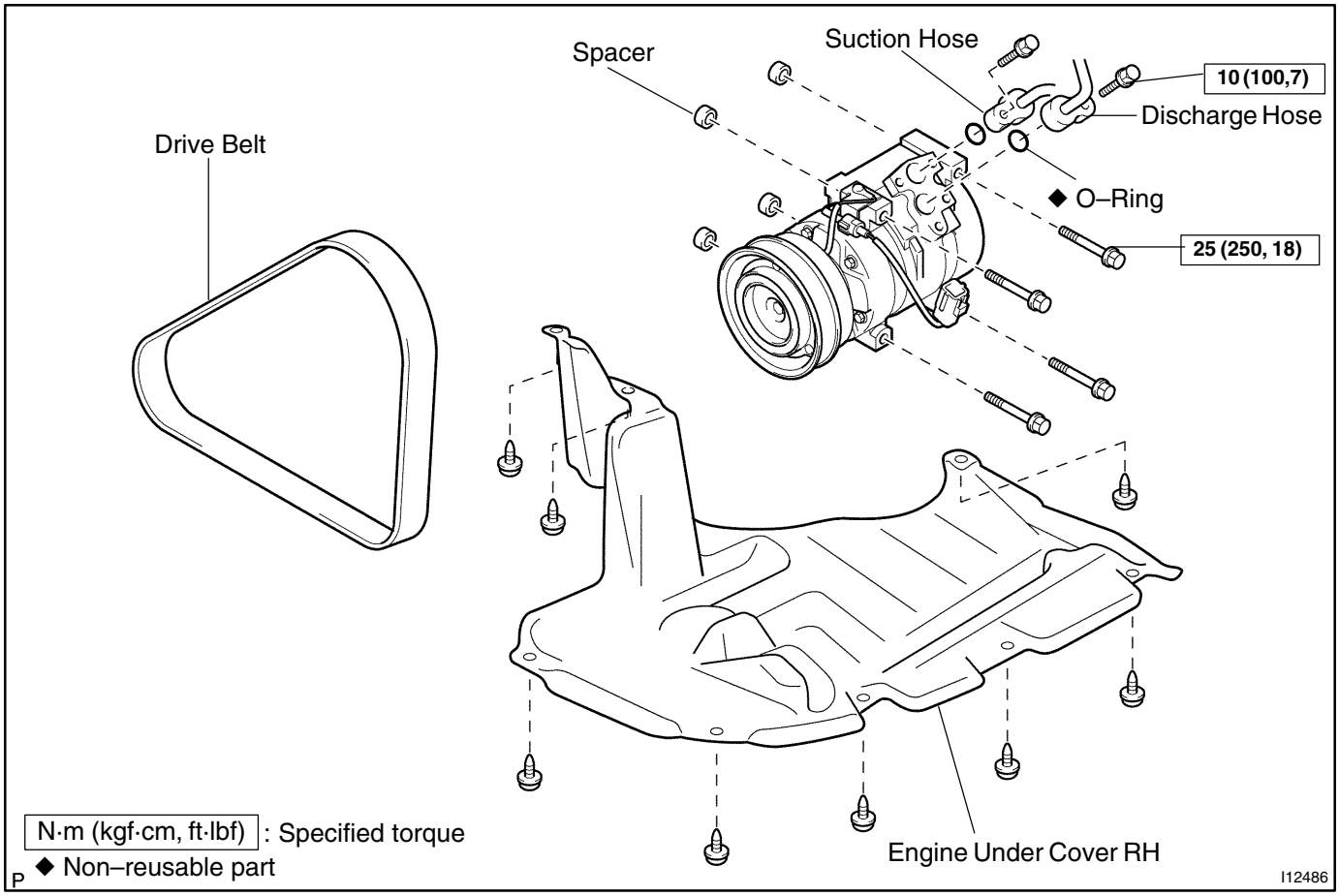
(a) Disconnect the connector.

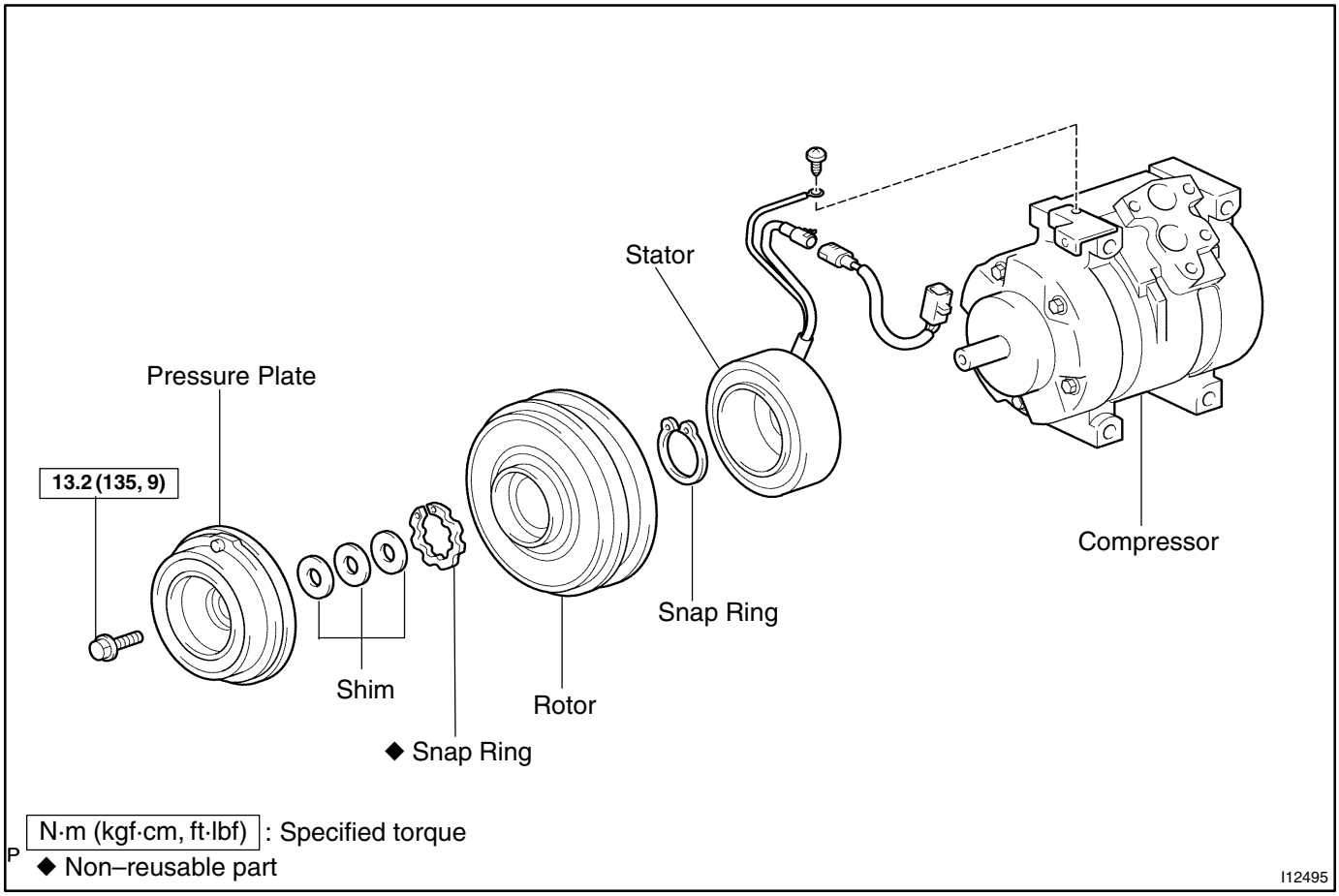
(b) Measure resistance between terminals 1 and 2.

Standard resistance: 65 – 125 Ω at 20˚C (68˚F)

AC2AA–01

COMPONENTS

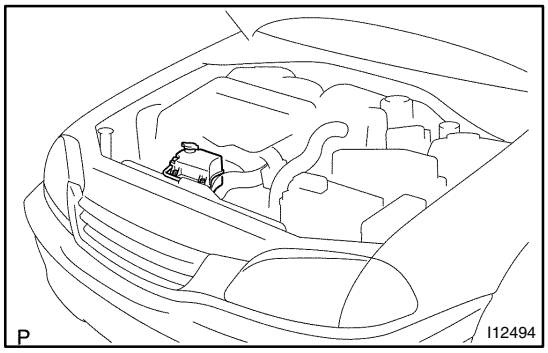




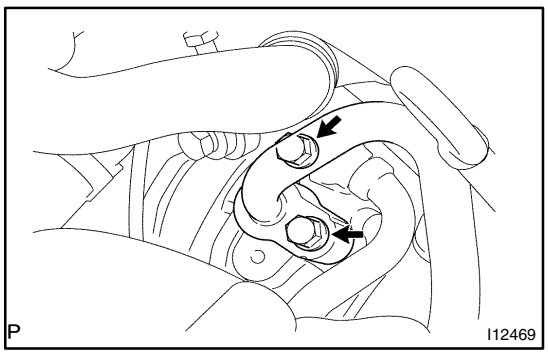
AC2AB–01

REMOVAL

1. RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX. 10 MINUTES WITH A/C ON
2. STOP ENGINE
3. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY
4. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
5. REMOVE ENGINE UNDER COVER RH
6. REMOVE DRIVE BELT
(See page AC–2)
7. DRAIN ENGINE COOLANT



8. REMOVE RESERVOIR TANK
(a) Remove the upper hose.
(b) Disconnect the lower hose.
(c) Disconnect the 2 bolts and reservoir tank.



9. DISCONNECT DISCHARGE AND SUCTION HOSES
Remove the 2 bolts and disconnect the both hoses.
NOTICE:
Cap the open fittings immediately to keep moisture or dirt out of the system.
10. REMOVE COMPRESSOR
(a) Disconnect the connector.
(b) Remove the 3 bolts and compressor.

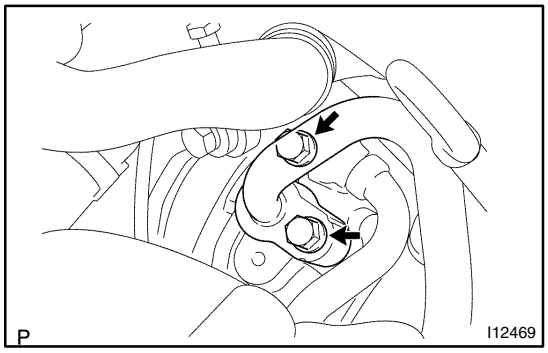
AC2AC–01

INSTALLATION

1. INSTALL COMPRESSOR

(a) Install the compressor with the 3 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.

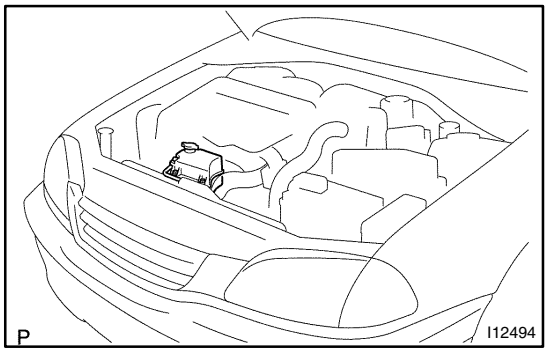


2. CONNECT DISCHARGE AND SUCTION HOSES

Connect the both hoses with the 2 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

CAUTION:
Hoses should be connected immediately after the caps have removed.

HINT:
Lubricate 2 new O–rings with compressor oil and install the hoses.



3. INSTALL RESERVOIR TANK

(a) Connect the reservoir tank with the 2 bolts.
(b) Connect the lower hose.
(c) Install the upper hose.

4. REFILL ENGINE COOLANT

5. INSTALL AND CHECK DRIVE BELT
(See page AC–3)

6. INSTALL ENGINE UNDER COVER RH

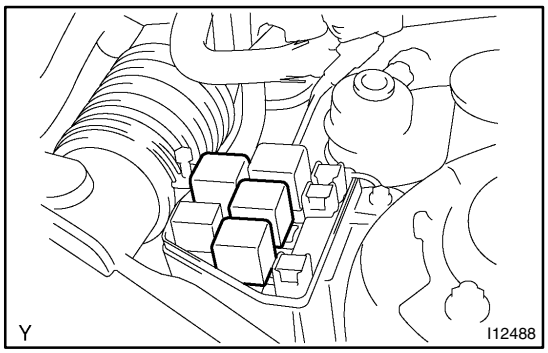
7. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

8. EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT
Specified amount: 450 ± 50 g (15.87 ± 1.76 oz.)

9. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check the tightening torque at the joints.

10. INSPECT A/C OPERATION



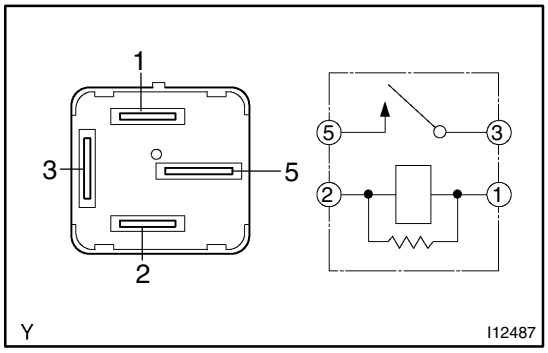
RELAY (1CD–FTV)

AC2AD–01

INSPECTION

ELECTRICAL TYPE POWER HEATER

(a) Remove magnetic clutch relay (marking: HTR sub1, sub2, sub3) from engine room relay block.



(b) Inspect magnetic clutch relay (marking: HTR sub1, sub2, sub3) continuity.

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.

(c) Reinstall relay to engine room relay block.

CONDENSER FAN (1CD–FTV)

AC2AE–01

ON–VEHICLE INSPECTION

1. INSPECT CONDENSER FAN OPERATION

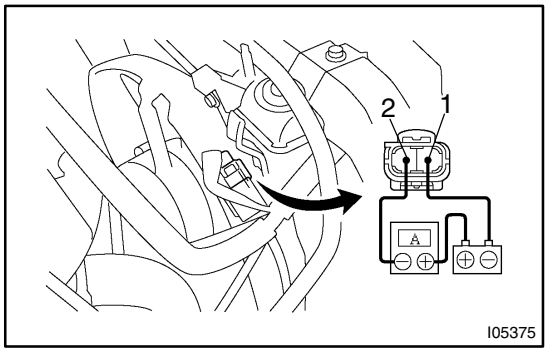
Inspect the fan operation, as shown in the chart below.

Test conditions:

- Ignition switch ON
- Blower speed control dial at ”HI” position
- Temperature control dial at ”COOL” position
- Set on manifold gauge set
- A/C switch ON

Condition	Fan operation (Fan speed)
Engine coolant temperature 91˚C (196˚F) or below	Not rotate
Engine coolant temperature 100˚C (212˚F) or above	Rotate
Refrigerant pressure is less than 1,520 kPa (15.5 kgf/cm^2, 220 psi)	Rotate (Low speed)
Refrigerant pressure is 1,520 kPa (15.5 kgf/cm^2, 220 psi) or above	Rotate (High speed)

If operation is not as specified, proceed to the next inspection.



2. INSPECT CONDENSER FAN MOTOR OPERATION

(a) Disconnect the connector.

(b) Connect the battery and ammeter to fan connector, as shown in the illustration.

(c) Check that the fan rotates smoothly and then check that the reading on the ammeter.

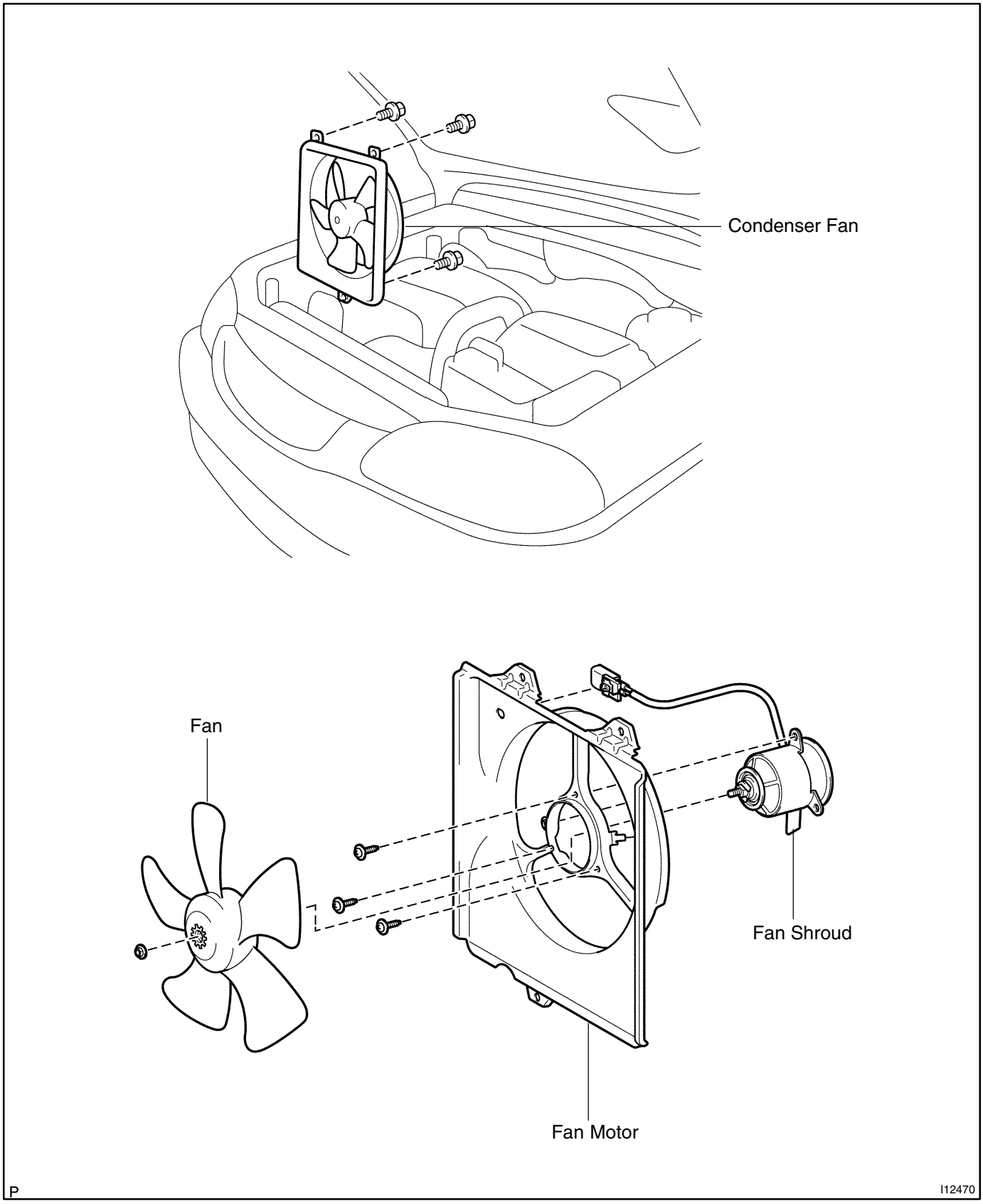
Specified amperage:

9.5 ± 1.5 A at 20˚C (68˚F)

- If operation is not as specified, replace the fan motor.
- If operation is as specified, check the pressure switch, cooling fan relays and water temp. switch.

AC2AF–01

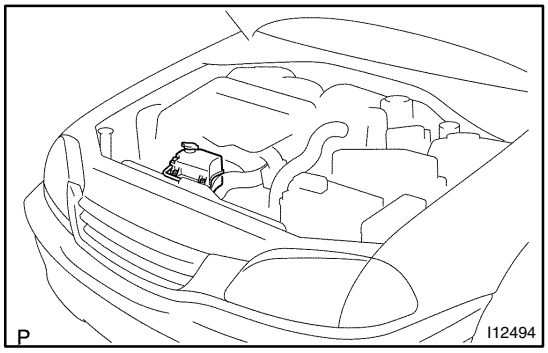
COMPONENTS



AC2AG–01

REMOVAL

1. DRAIN ENGINE COOLANT



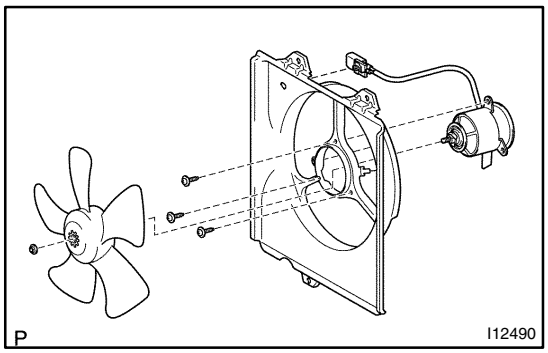
2. REMOVE RESERVOIR TANK

(a) Disconnect the upper hose.
(b) Disconnect the lower hose.
(c) Remove the 2 bolts and reservoir tank.

3. REMOVE CONDENSER FAN

(a) Disconnect the connector.
(b) Remove the 3 bolts and condenser fan.

AC2AH–01

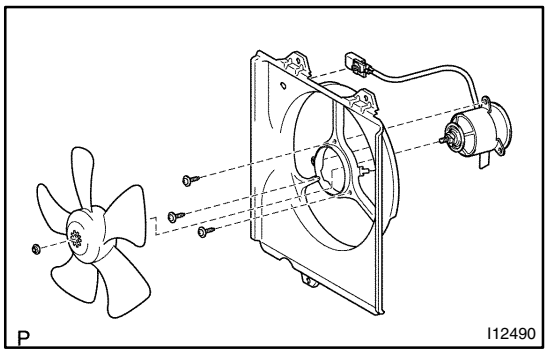


DISASSEMBLY

REMOVE FAN

(a) Remove the nut and fan.
(b) Remove the fan motor.
    (1) Disconnect the 3 wire harness clamps.
    (2) Remove the 3 screws and fan motor.

AC2AI–01



REASSEMBLY

INSTALL FAN

(a) Install the fan motor.
  (1) Install the fan with the 3 screws.
  (2) Connect the wire harness clamps.
(b) Install the fan with the nut.

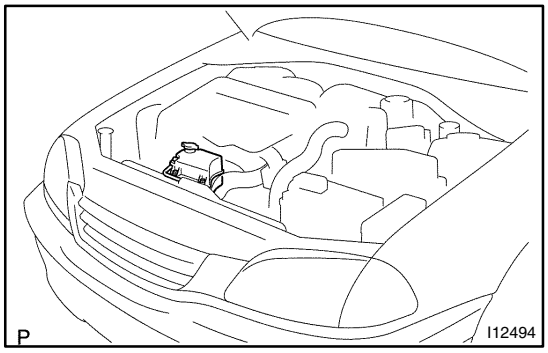
AC2AJ–01

INSTALLATION

1. INSTALL CONDENSER FAN

(a) Install the fan with the 3 bolts.

(b) Connect the fan connector.



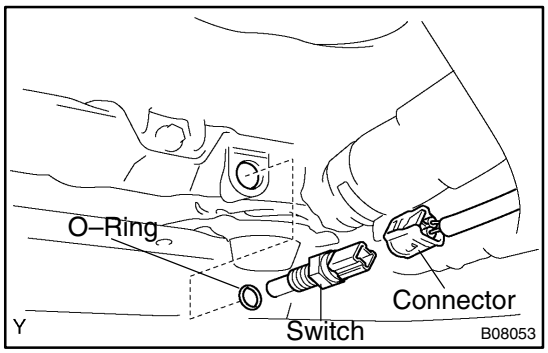
2. INSTALL RESERVOIR TANK

(a) Install the reservoir tank with the 2 bolts.

(b) Install the lower hose.

(c) Install the upper hose.

3. FILL ENGINE COOLANT



WATER TEMPERATURE SWITCH (1CD–FTV)

AC2AK–01

INSPECTION

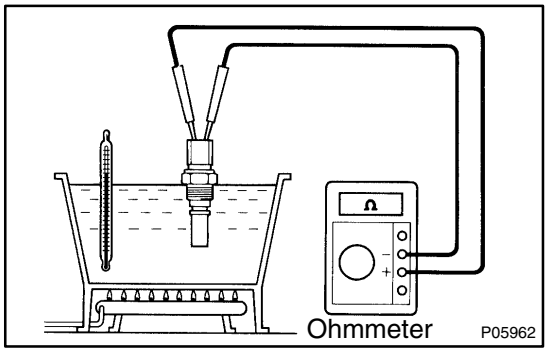
1. REMOVE ENGINE UNDER COVER

2. DRAIN ENGINE COOLANT

3. REMOVE WATER TEMPERATURE SWITCH

(a) Disconnect the connector.

(b) Remove the water temperature switch and O–ring.



4. INSPECT WATER TEMPERATURE SWITCH OPERATION

(a) Using an ohmmeter, check that the no continuity exists between terminals when the coolant temperature is above 93°C (199°F).

If continuity exists, replace the switch.

(b) Using an ohmmeter, check that there is no continuity exists between the terminals when the coolant temperature is below 83°C (181°F).

If no continuity exists, replace the switch.

5. REINSTALL WATER TEMPERATURE SWITCH

(a) Install a new O–ring to the water temperature switch.

(b) Install the water temperature switch.

(c) Connect the connector.

6. REINSTALL ENGINE UNDER COVER

7. FILL WITH ENGINE COOLANT

8. START ENGINE AND CHECK FOR COOLANT LEAK

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FOREWORD

This supplement has been prepared to provide information covering general service repairs for the chassis and body of the TOYOTA AVENSIS/CORONA which underwent changes in July, 2000.

Applicable models: ZZT220, 221 series
AZT220 series
ST220 series
CDT220 series

For the service specifications and repair procedures of the above model other than those listed in this supplement, refer to the following manuals.

Manual Name	Pub. No.
• AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
• AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E
• 1ZZ–FE, 3ZZ–FE Engine Repair Manual	RM782E
• 1AZ–FSE Engine Repair Manual	RM783E
• 3S–FE Engine Repair Manual	RM395E
• 3S–FE Engine Repair Manual Supplement (Jan., 1996)	RM495E
• 3S–FE Engine Repair Manual Supplement (Oct., 1997)	RM609E
• 1CD–FTV Engine Repair Manual	RM697E
• A245E Automatic Transaxle Repair Manual	RM757E
• U240E Automatic Transaxle Repair Manual	RM740U
• AVENSIS/CORONA Electrical Wiring Diagram	EWD330Y
• AVENSIS/CORONA Electrical Wiring Diagram Supplement (May, 1999)	EWD373F
• AVENSIS/CORONA Electrical Wiring Diagram Supplement (Jul., 2000)	EWD418F
• AVENSIS/CORONA New Car Features	NCF145E
• AVENSIS/CORONA New Car Features Supplement	NCF168E
• TOYOTA Model New Car Features Supplement	NCF195E

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.

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INTRODUCTION IN
PREPARATION PP
SERVICE SPECIFICATIONS SS
DIAGNOSTICS DI
CLUTCH CL
C50, C250 MANUAL TRANSAXLE MX
E351 MANUAL TRANSAXLE MX
S54, S55 MANUAL TRANSAXLE MX
A246E AUTOMATIC TRANSAXLE AX
U240E AUTOMATIC TRANSAXLE AX
SUSPENSION AND AXLE SA
BRAKE BR
STEERING SR
BODY ELECTRICAL BE
BODY BO
AIR CONDITIONING AC
ALPHABETICAL INDEX ID

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 good understanding 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.

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HOW TO USE THIS MANUAL

IN00U–65

GENERAL INFORMATION

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the section title and major heading are given at the top of every page.

2. PRECAUTION

At the beginning of each section, a PRECAUTION is given that pertains to all repair operations contained in that section.

Read these precautions before starting any repair task.

3. TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on page IN–20.

Be sure to read this before performing troubleshooting.

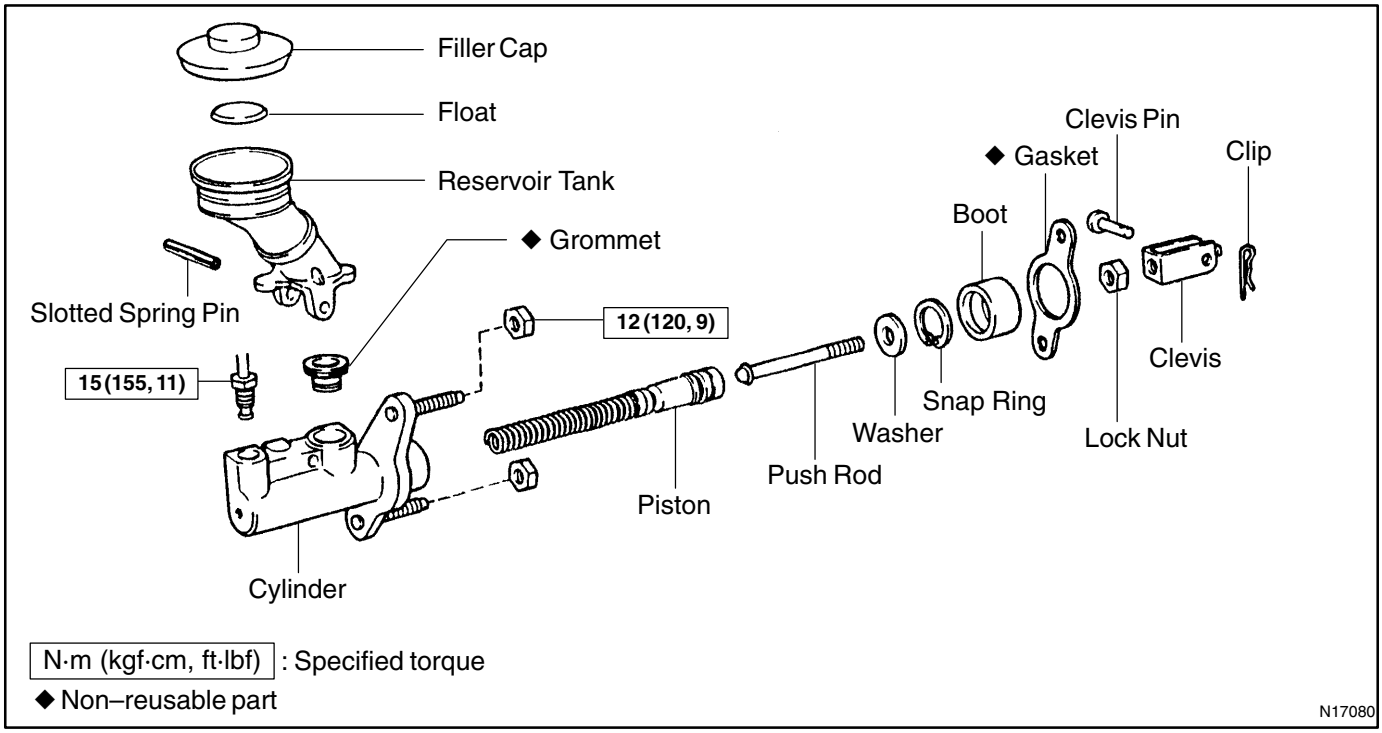
4. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

5. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

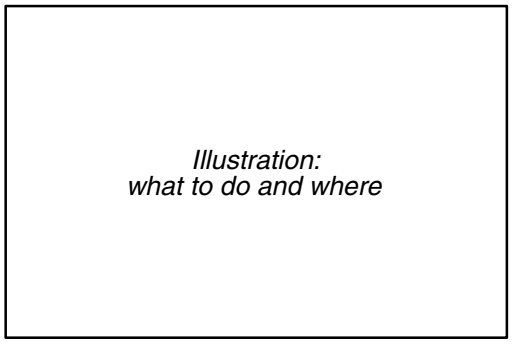
Example:



The procedures are presented in a step–by–step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example :



Task heading : what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the illustration.

SST 09350–30020 (09350–06120)

Set part No. *Component part No.*

Detailed text : how to do task

(b) Measure the stroke applying and releasing the compressed air (392 — 785 kPa, 4 — 8 kgf/cm^2 or 57 — 114 psi) as shown in the illustration.

Piston stroke: 1.40 — 1.70 mm (0.0551 — 0.0669 in.)

Specification

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

6. REFERENCES

References have been kept to a minimum. However, when they are required you are given the page to refer to.

7. SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in Service Specifications section for quick reference.

8. CAUTIONS, NOTICES, HINTS:

- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

9. SI UNIT

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.

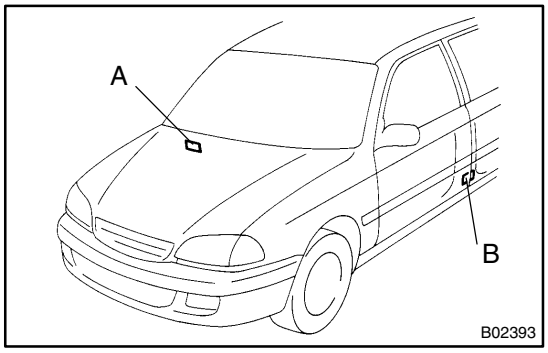
Example:

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

IDENTIFICATION INFORMATION

IN06B–11

VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER



1. VEHICLE IDENTIFICATION NUMBER

The vehicle identification number is stamped in the engine compartment. This number has also been stamped on the manufacturer's label.

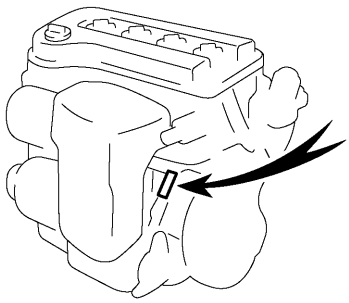
A: Vehicle Identification Number

B: Manufacturer's Label

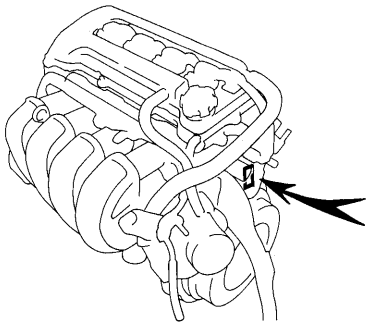
2. ENGINE SERIAL NUMBER

The engine serial number is stamped on the engine block, as shown in the illustration.

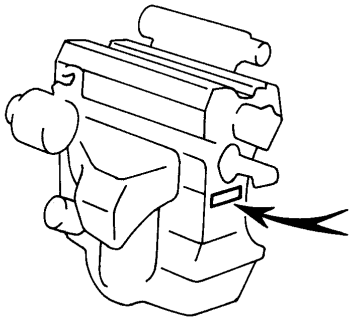
1AZ–FSE engine:



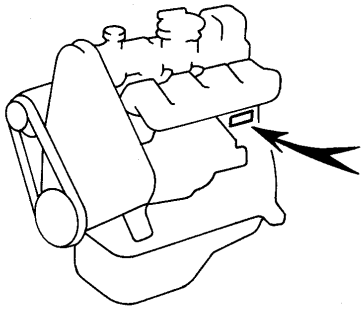
1ZZ–FE, 3ZZ–FE engines:



3S–FE engine:



1CD–FTV engine:



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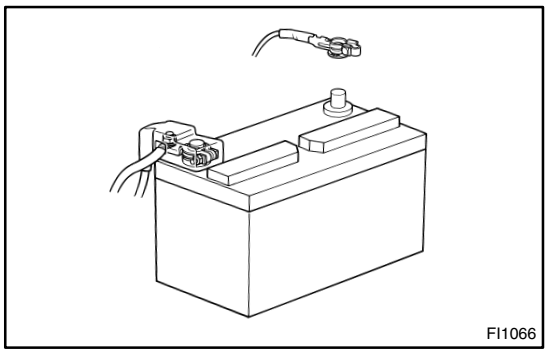

FI1066

REPAIR INSTRUCTIONS

IN03Z–03

GENERAL INFORMATION

BASIC REPAIR HINT

(a) Use fender, seat and floor covers to keep the vehicle clean and prevent damage.

(b) During disassembly, keep parts in the appropriate order to facilitate reassembly.

(c) Installation and removal of battery terminal:
  (1) Before performing electrical work, disconnect the negative (–) terminal cable from the battery.
  (2) If it is necessary to disconnect the battery for inspection or repair, first disconnect the negative (–) terminal.
  (3) When disconnecting the terminal cable, to prevent damage to the battery terminal, loosen the cable nut and raise the cable straight up without twisting or prying it.
  (4) Clean the battery terminals and cable ends with a clean shop rag. Do not scrape them with a file or other abrasive objects.
  (5) Install the cable ends to the battery terminals after loosening the nut and tighten the nut after installation. Do not use a hammer to tap the cable ends onto the terminals.
  (6) Be sure the cover for the positive (+) terminal is properly in place.

(d) Check hose and wiring connectors to make sure that they are connected securely and correctly.

(e) Non–reusable parts
  (1) Always replace cotter pins, gaskets, O–rings and oil seals, etc. with new ones.
  (2) Non–reusable parts are indicated in the component illustrations by the "◆" symbol.

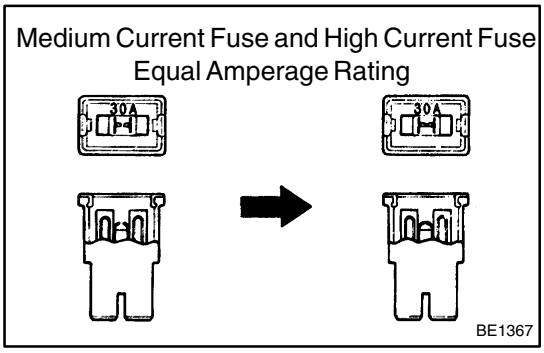
(f) Precoated parts

Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.
  (1) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.
  (2) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.
  (3) Precoated parts are indicated in the component illustrations by the "★" symbol.

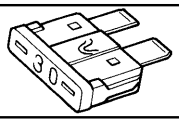
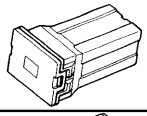
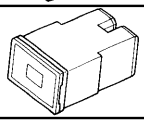
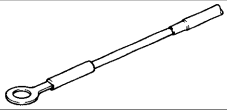
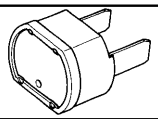
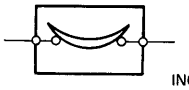
(g) When necessary, use a sealer on gaskets to prevent leaks.

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

(i) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in Preparation section in this manual.



(j) When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or 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
 BE5597	IN0367	FUSIBLE LINK	FL
 BE5598	 IN0368	CIRCUIT BREAKER	CB

V00076

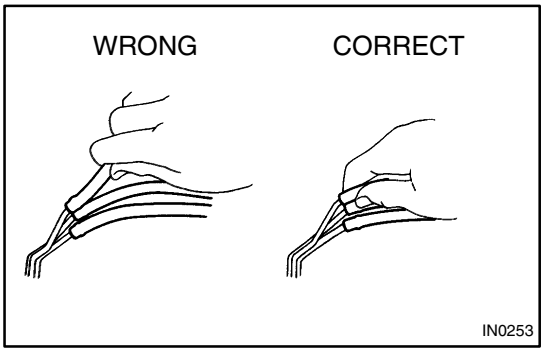
(k) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations (See page IN–7).

(1) If the vehicle is to be jacked up only at the front or rear end, make sure to place the stopper under the wheels at the opposite end to block them in order to ensure safety.

(2) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.

(l) Observe the following precautions to avoid damage to the following 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.)

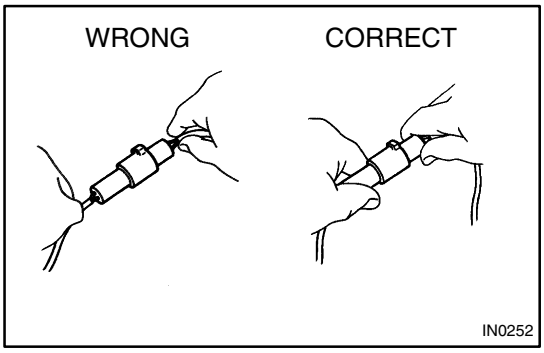


(2) To disconnect vacuum hoses, pull off the end, not the middle of the hose.

(3) To pull apart electrical connectors, pull on the connector itself, not the wires.

(4) 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.

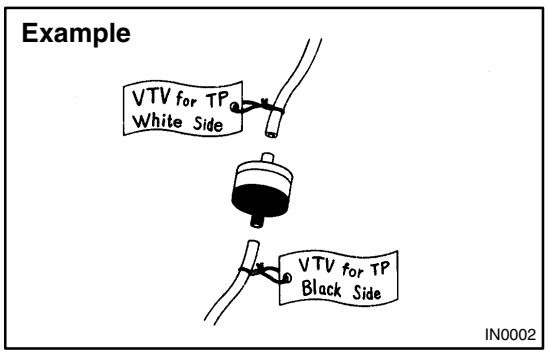
(5) When steam cleaning an engine, protect the electronic components, air filter and emission–related components from water.



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

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

(8) 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.



(m) Installation and removal of vacuum hose:

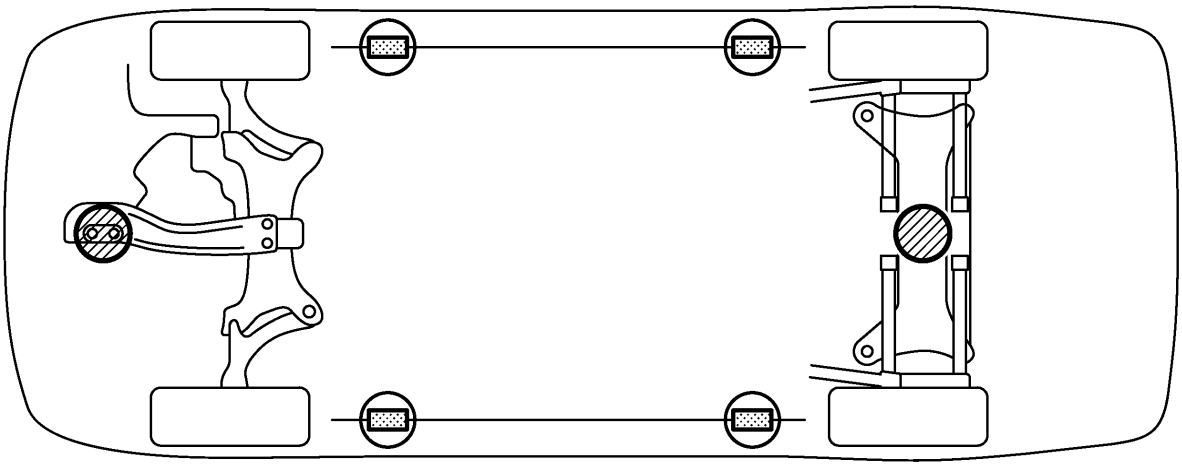
(1) When disconnecting vacuum hoses, use tags to identify where they should be reconnected to.

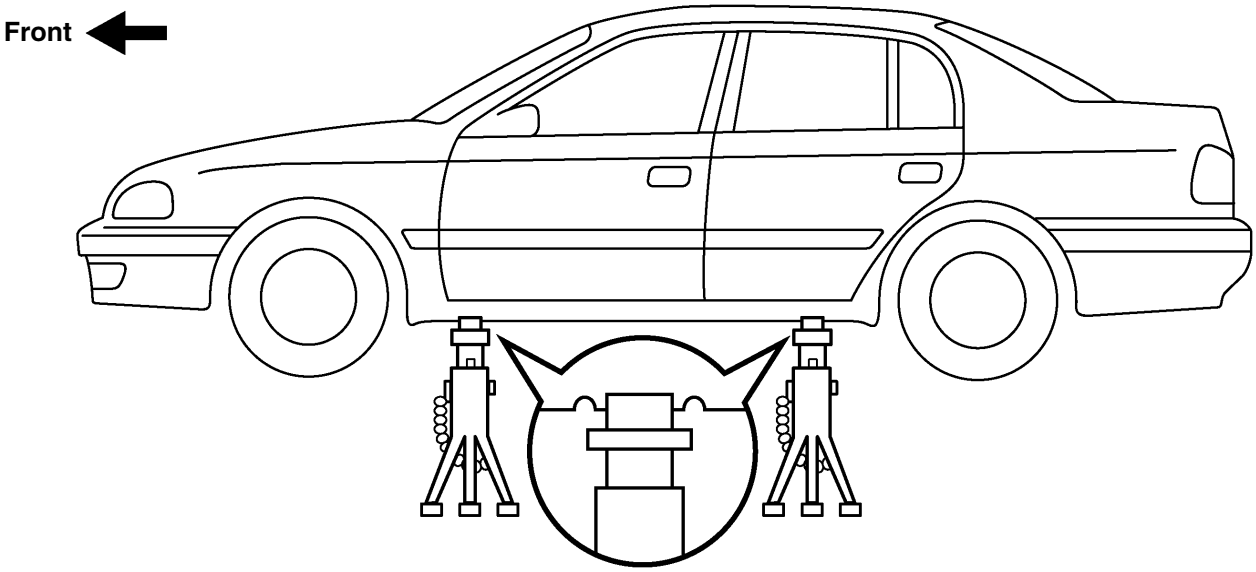
(2) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.

(n) Unless otherwise stated, all resistance is measured at an ambient temperature of 20°C (68°F). Because the resistance may be outside specifications if measured at high temperatures immediately after the vehicle has been running, measurement should be made when the engine has cooled down.

IN040–06

VEHICLE LIFT AND SUPPORT LOCATIONS





JACK POSITION

Front - - - - - - - - - - Front center member
Rear - - - - - - - - - - Rear suspension member

CAUTION : When jacking–up the rear and front, make sure the car is not carrying any extra weight.

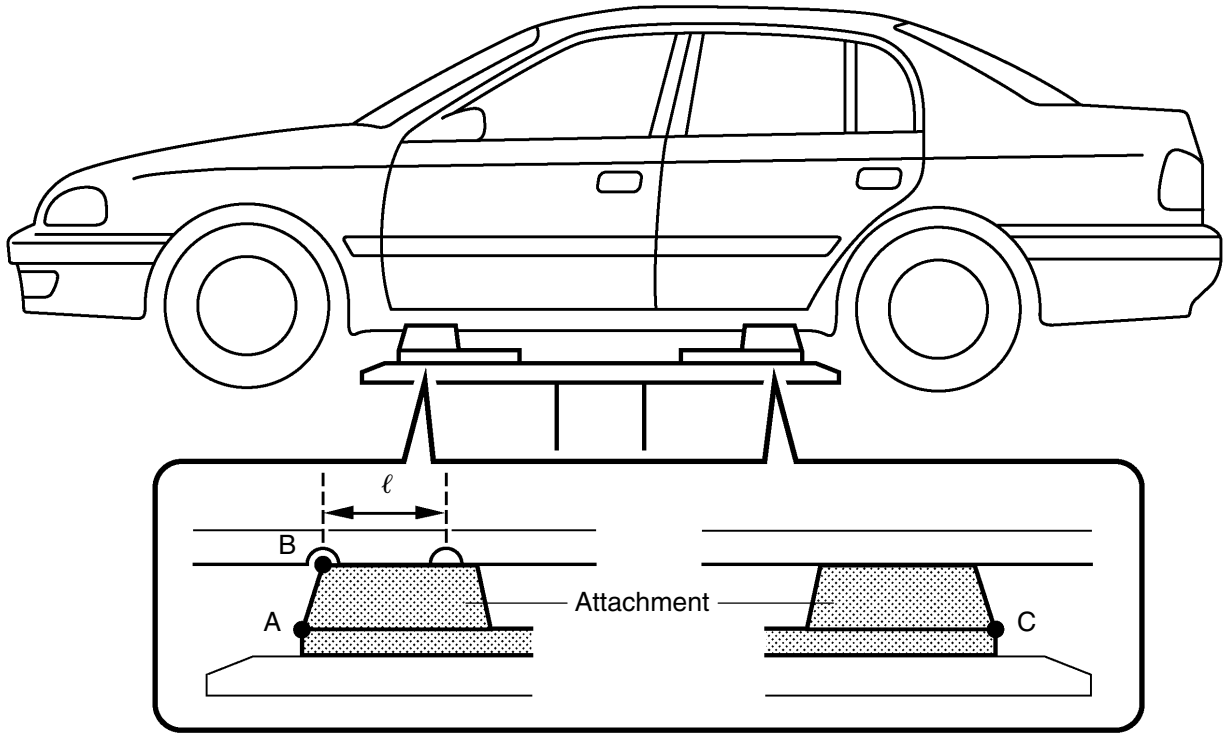
PANTOGRAPH JACK POSITION

SUPPORT POSITION

Safety stand and swing arm type lift -

B02394

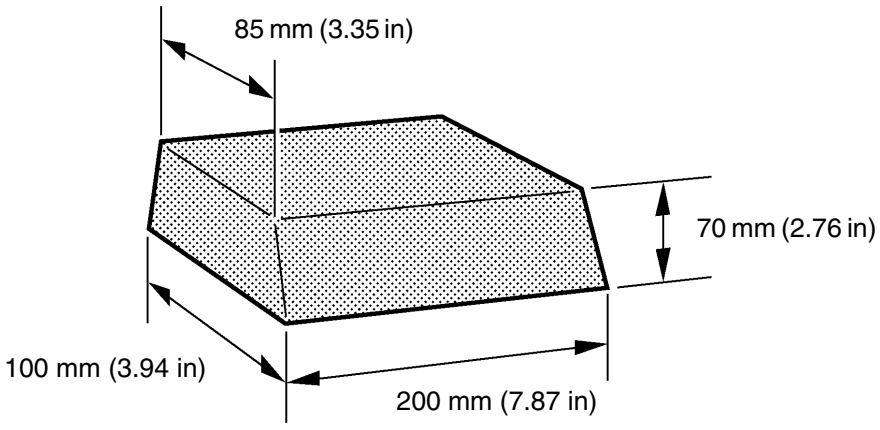
PLATE TYPE LIFT



HINT :

Left and right set position	Place the vehicle over the center of the lift.
Front and rear set position	● Align the cushion gum ends of the plate with the attachment lower ends (A, C). ● Align the attachment upper end (B) with the front jack supporting point (ℓ).

Attachment dimensions



B02395

FOR ALL OF VEHICLES

IN0HV–01

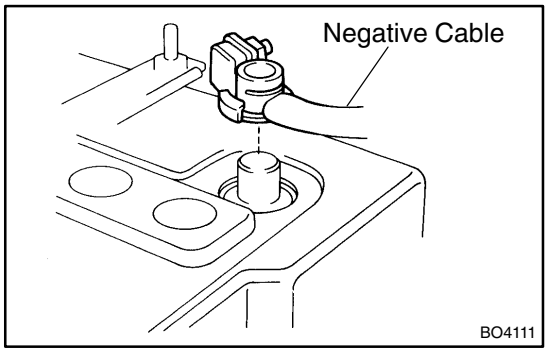
PRECAUTION

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

(a) The AVENSIS/CORONA is equipped with an SRS (Supplemental Restraint System), such as the driver airbag, front passenger airbag, side airbags, curtain shield airbag and seat belt pretensioners.

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

Further, 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.



(b) 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 Pub. No. RM599E, page DI–152).

(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 that if work is started within 90 seconds of 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 contents memorized by the each memory system. Then when work is finished, reset the clock and audio systems as before.

To avoid erasing the memory of each memory system, never use a back–up power supply from outside the vehicle.

(3) Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad (See Pub. No. RM599E, page RS–15), front passenger airbag assembly (See Pub. No. RM599E, page RS–28), side airbag assemblies (See Pub. No. RM698E, page RS–11), curtain shield airbag assemblies (See Pub. No. RM698E, page RS–25) and seat belt pretensioners (See Pub. No. RM599E, page BO–152) should be inspected.

(4) Never use SRS 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, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or seat belt pretensioner in order to reuse them.

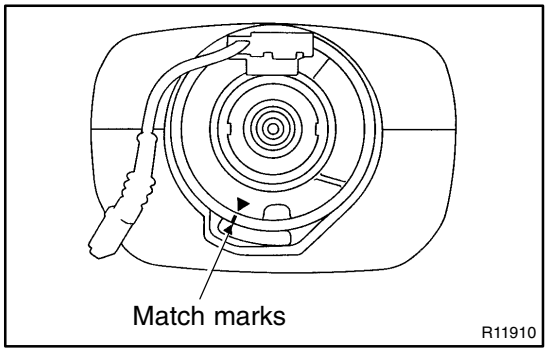
(7) If the airbag sensor assembly, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or seat belt pretensioner have been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace them with new ones.

(8) Do not directly expose the airbag sensor assembly, side airbag sensor assembly, steering wheel pad, front passenger airbag, side airbag or seat belt pretensioner to hot air or flames.

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

(10) Information labels are attached to the periphery of 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 Pub. No. RM599E, page DI–152).



(c) SPIRAL CABLE (in Combination Switch)

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 result. Refer to Pub. No. RM599E, page SR–18 of this manual concerning correct steering wheel installation.

(d) STEERING WHEEL PAD (with Airbag)

(1) When removing the steering wheel pad or handling a new steering wheel pad, it should be placed with the pad top surface facing up.
Storing the pad with its metallic surface facing upward may lead to a serious accident if the airbag inflates for some reason. In addition do not store a steering wheel pad on top of another one.

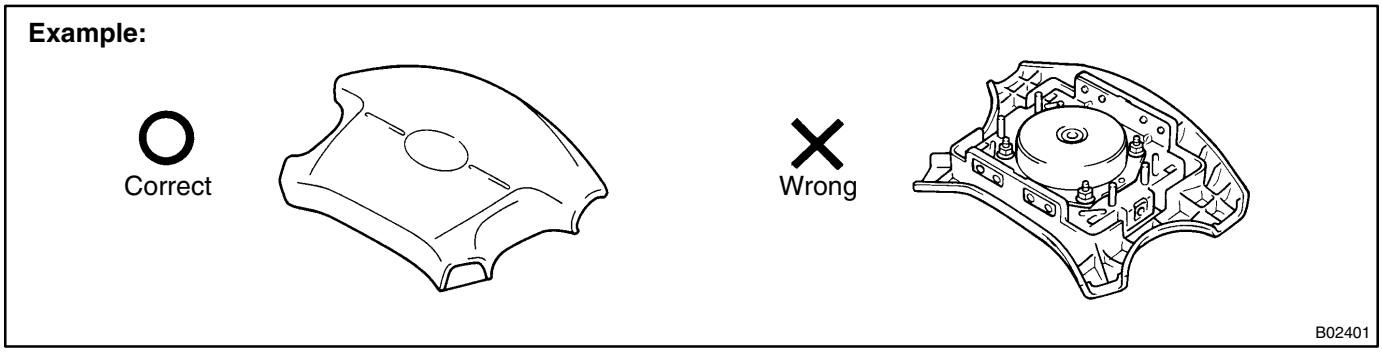
(2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)

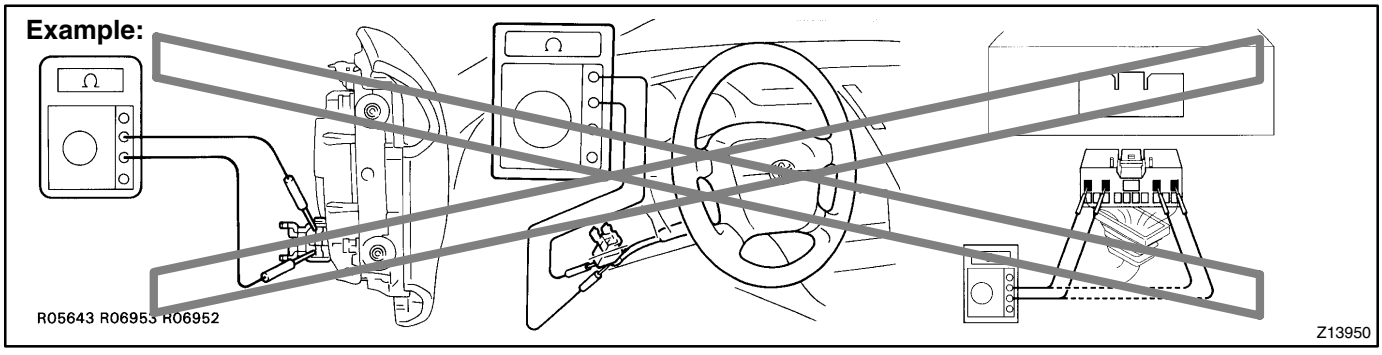
(3) Grease should not be applied to the steering wheel pad and the pad should not be cleaned with detergents of any kind.

(4) Store the steering wheel pad 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 (yellow color and 2 pins) under the steering column near the combination switch connector before starting work.

(6) When disposing of a vehicle or the steering wheel pad alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM599E, page RS–17).
Carry out the operation in a safe place away from electrical noise.





(e) FRONT PASSENGER AIRBAG ASSEMBLY

(1) Always store a removed or new front passenger airbag assembly with the airbag deployment direction facing up.
Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

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

(3) Grease should not be applied to the front 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.

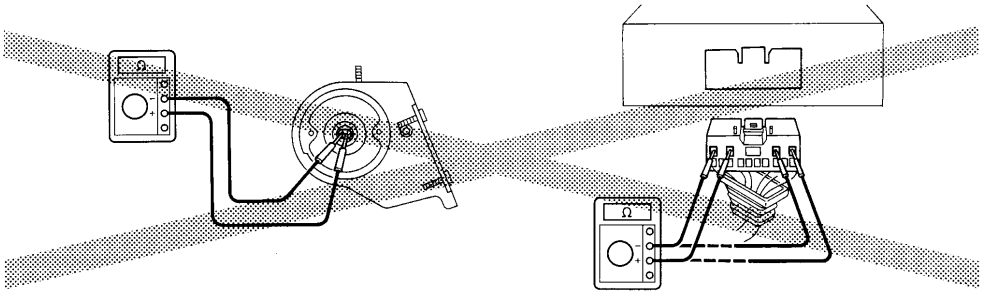
(5) When using electric welding, first disconnect the airbag connector (yellow color and 2 pins) installed on the assembly before starting work.

(6) When disposing of a vehicle or the airbag assembly alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM599E, page RS–30).
Perform the operation in a safe place away from electrical noise.

Example:

B02402

Example:



B02404

(f) SIDE AIRBAG ASSEMBLY

(1) Always store a removed or new side airbag assembly with the airbag deployment direction facing up. Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

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

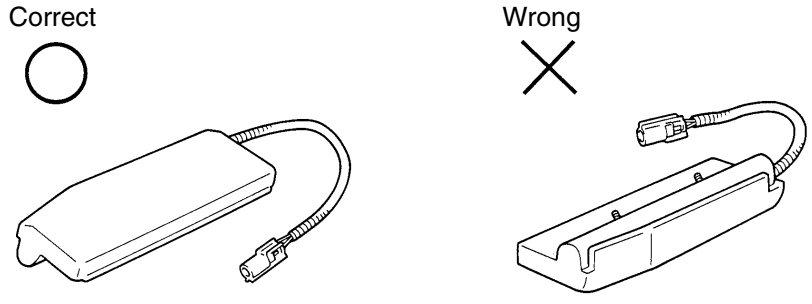
(3) Grease should not be applied to the side airbag assembly and the surface should not be cleaned with detergents of any kind.

(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 (yellow color and 2 pins) under the seat before starting work.

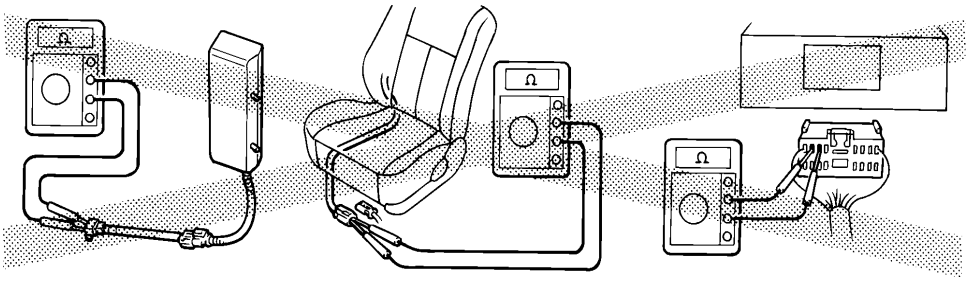
(6) When disposing of a vehicle or the side airbag assembly alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM698E, page RS–12).
Perform the operation in a safe place away from electrical noise.

Example:



B02129

Example:



B01546

(g) CURTAIN SHIELD AIRBAG ASSEMBLY

(1) Always store a removed or new curtain shield airbag assembly in a clear plastic bag, and keep it in a safe place.

NOTICE:

Protection bag is not reuse.

CAUTION:

Never disassemble the curtain shield airbag assembly.

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

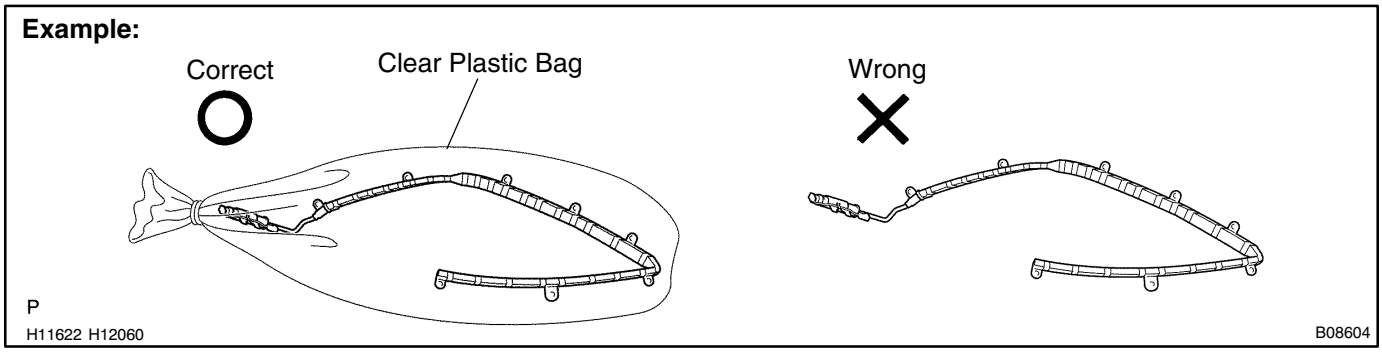
(3) Grease should not be applied to the curtain shield airbag assembly and the surface should not be cleaned with detergents of any kind.

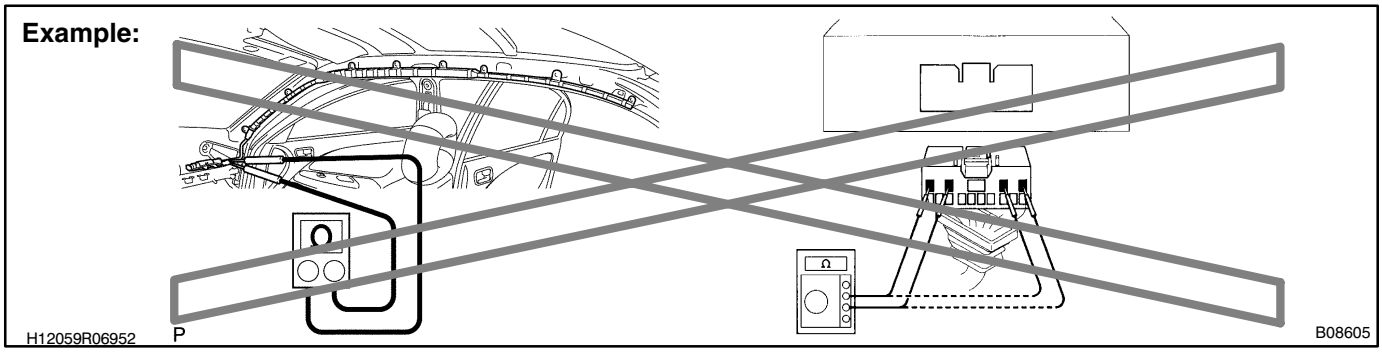
(4) Store the airbag assembly where the ambient temperature remains below 93˚C (200˚F), without high humidity and away from electrical noise.

(5) When using electric welding, first disconnect the airbag connector (yellow color and 2 pins) into the instrument panel before starting work.

(6) When disposing of a vehicle or the curtain shield airbag assembly alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM698E, page RS–26).

Perform the operation in a safe place away from electrical noise.





(h) SEAT BELT PRETENSIONER

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

(2) Oil or water should not be put on the front seat outer belt and the front seat outer belt should not be cleaned with detergents of any kind.

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

(4) When using electric welding, first disconnect the connector (yellow color and 2 pins) installed at the center pillar lower garnish before starting work.

(5) When disposing of a vehicle or a front seat outer belt alone, the seat belt pretensioner should be activated before disposal (See Pub. No. RM599E, page BO–153). Perform the operation in a safe place away from electrical noise.

(i) AIRBAG SENSOR ASSEMBLY

(1) Never reuse the airbag sensor assembly involved in a collision when 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 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 loosing the set bolts of the airbag sensor assembly.

(j) WIRE HARNESS AND CONNECTOR

The SRS wire harness is integrated with the instrument panel wire harness and the cowl wire harness assembly and floor wire harness assembly. The wires for the SRS wire harness are encased in a yellow corrugated tube. All the connectors for the system are also 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 as shown on Pub. No. RM599E, page RS–65.

2. FOR VEHICLES EQUIPPED WITH A CATALYTIC CONVERTER

CAUTION:

If large amount of unburned gasoline flows into the converter, it may overheat and create a fire hazard. To prevent this, observe the following precautions and explain them to your customer.

(a) Use only unleaded gasoline.
(b) Avoid prolonged idling.
Avoid running the engine at idle speed for more than 20 minutes.
(c) Avoid spark jump test.
(1) Perform spark jump test only when absolutely necessary. Perform this test as rapidly as possible.
(2) While testing, never race the engine.
(d) Avoid prolonged engine compression measurement.
Engine compression tests must be done as rapidly as possible.
(e) Do not run engine when fuel tank is nearly empty.
This may cause the engine to misfire and create an extra load on the converter.
(f) Avoid coasting with ignition turned off and prolonged braking.
(g) Do not dispose of used catalyst along with parts contaminated with gasoline or oil.

3. IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM

For vehicles with mobile communication systems such as two–way radios and cellular telephones, observe the following precautions.

(1) Install the antenna as far as possible away from the ECU and sensors of the vehicle's electronic system.
(2) Install the antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle's electronic systems. For details about ECU and sensors locations, refer to the section on the applicable component.
(3) Do not wind the antenna feeder together with the other wiring as much as possible, also avoid running the antenna feeder parallel with other wire harnesses.
(4) Check that the antenna and feeder are correctly adjusted.
(5) Do not install powerful mobile communications system.

4. FOR USING HAND–HELD TESTER

CAUTION:

Observe the following items for safety reasons:

- **Before using the hand–held tester, the hand–held tester's operator manual should be read thoroughly.**
- **Be sure to route all cables securely when driving with the hand–held tester connected to the vehicle. (i.e. Keep cables away from feet, pedals, steering wheel and shift lever.)**
- **Two persons are required when test driving with the hand–held tester, one person to drive the vehicle and the other person to operate the hand–held tester.**

5. FOR VEHICLES EQUIPPED WITH POWER WINDOW CONTROL SYSTEM

When the battery is disconnected or the power to the window regulator motor is cut, the power window control system does not operate. It is necessary to initialize the system in the following procedures. Otherwise window cannot be operated normally.

(1) Close window to the highest position.
(2) Keep holding the switch for 5 seconds.
(3) Check that automatic operation works. If not, repeat the above procedures.

6. FOR VEHICLES EQUIPPED WITH SLIDING ROOF SYSTEM

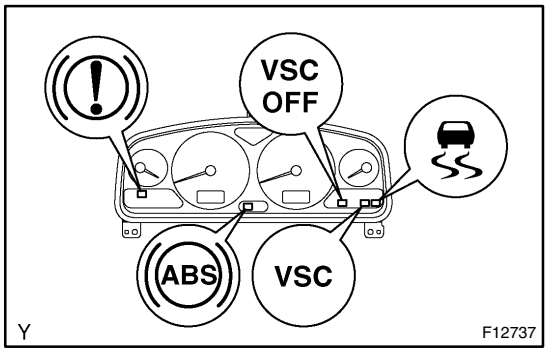
Sliding roof stop position might be required to be initialized when battery failures (such as battery disconnection, connector disconnection and the voltage drop) are detected while the system is in operation. This also occurs when rotating the motor with the battery disconnected. Sliding roof initialization can be done by the following procedures.

(1) Operate the roof up to the maximum tilt position.
(2) Release the switch, and push it again in the same direction. (After 10 seconds have elapsed, initialization begins.)
(3) The roof starts automatic operation if holding the switch, completes full one cycle (tilt down, slide open, slide close and tilt up) of travel. Do not release the switch until the roof stops.
(4) Check that the roof stops at the correct position.

7. FOR VEHICLES EQUIPPED WITH TRACTION CONTROL (TRC) & VEHICLE STABILITY CONTROL (VSC) SYSTEM

NOTICE:

- **When replacing the steering angle sensor or ECU, 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 the steering angle sensor zero point calibration (See page DI–171).**
- **Do not remove or install the VSC related parts unless necessary. Otherwise, there is a possibility that the setting of the VSC to be affected.**
- **When working on the VSC related operation, make sure to check that the preparations before and after work are completed according to the following instruction.**
- **When using a drum tester such as a speedometer tester or chassis dynamometer, etc., or jacking up the front wheels and driving the wheels, always push in the TRC & VSC cut (”VSC OFF”) switch and turn the TRC & VSC system OFF.**

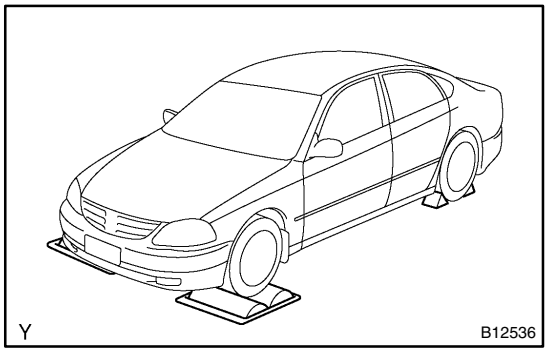


(a) Press the VSC OFF switch.

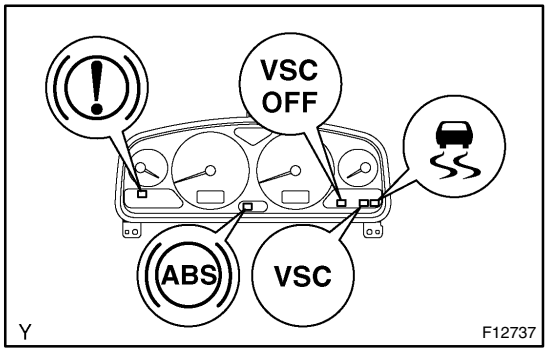
(b) Check that the VSC OFF indicator light comes ON.

HINT:

The VSC OFF indicator light should be always OFF when the engine is restarted.



(c) Begin measurements.



(d) Press the VSC OFF switch again to change the TRC & VSC system to operational condition and check that the VSC OFF indicator light goes off.

HINT:

- The SLIP indicator light blinks when the TRC system is operational.
- The SLIP indicator light blinks and the VSC buzzer sounds when the VSC system is operational.

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

IN00Z–45

GENERAL INFORMATION

A large number of ECU controlled systems are used in the AVENSIS/CORONA. 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. However, the fact is 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 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. Automatic Transaxle (A246E)	DI–1
2. Automatic Transaxle (U240E)	DI–60
3. Anti–Lock Brake System with Electronic Brake Force Distribution (EBD)	DI–127
4. ABS with EBD & BA & TRC & VSC System	DI–169
5. Engine Immobiliser System	DI–255

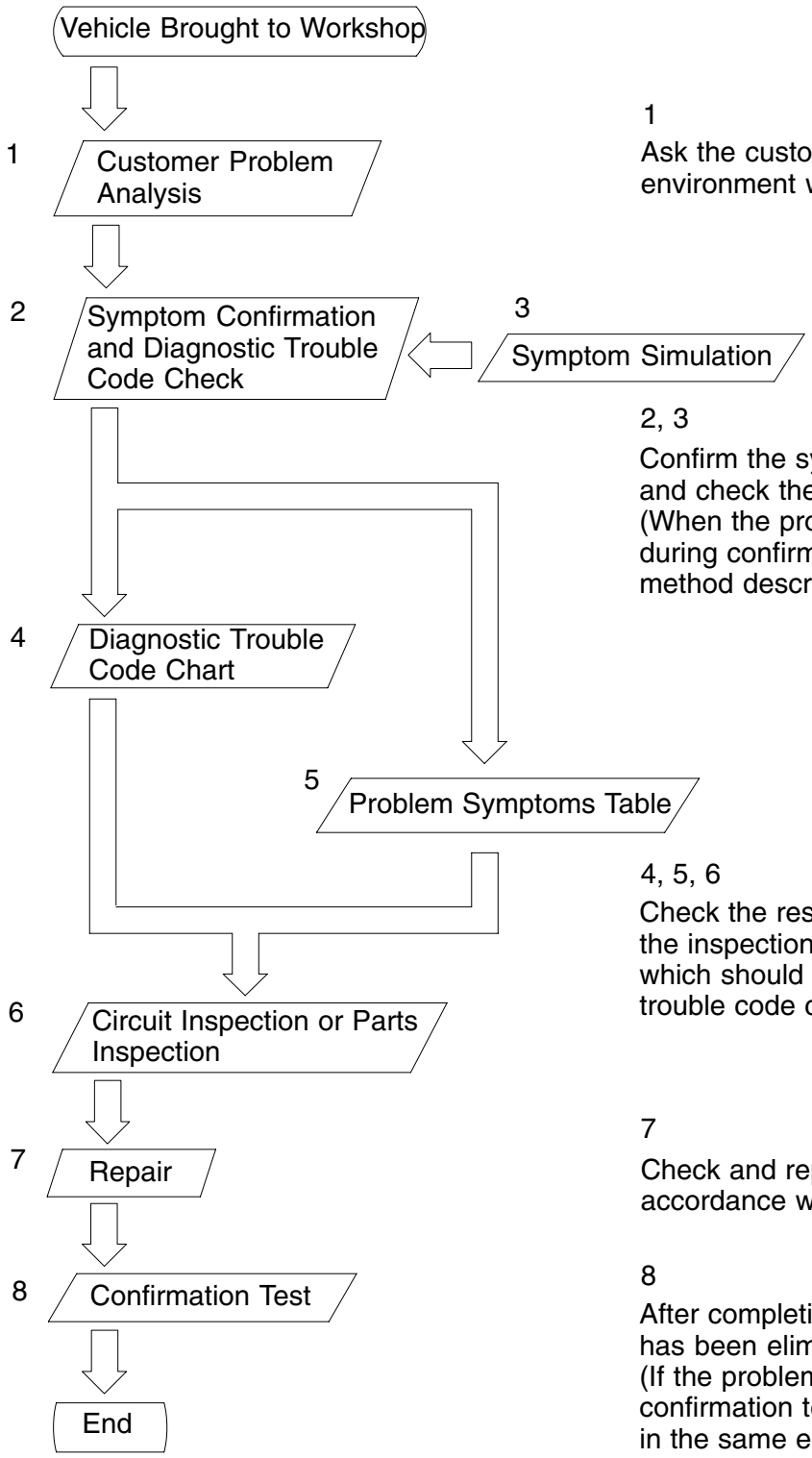
FOR USING HAND–HELD TESTER

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

IN06D–10

HOW TO PROCEED WITH TROUBLESHOOTING

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



1

Ask the customer about the conditions and the environment when the problem occurred.

2, 3

Confirm the symptoms and the problem conditions, and check the diagnostic trouble codes.
(When the problem symptoms do not appear during confirmation, use the symptom simulation method described later on.)

4, 5, 6

Check the results obtained in Step 2, then confirm the inspection procedure for the system or the part which should be checked using the diagnostic trouble code chart or the problem symptoms table.

7

Check and repair the affected system or part in accordance with the instructions in Step 6.

8

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

1. CUSTOMER PROBLEM ANALYSIS

In troubleshooting, the problem symptoms must be confirmed accurately and all preconceptions must be cleared away in order to give an accurate judgement. To ascertain just what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time it occurred.
Important Point in the Problem Analysis:
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 reference in troubleshooting. A customer problem analysis table is provided in DI 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]

2. SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE CHECK

The diagnostic system in the AVENSIS/CORONA fulfills various functions. The first function is the Diagnostic Trouble Code Check in which a malfunction in the signal circuits to the ECU is stored in code in the ECU memory at the time of occurrence, to be output by the technician during troubleshooting. 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, the problem areas can be narrowed down quickly and troubleshooting can be performed effectively. Diagnostic functions are incorporated in the following systems in the AVENSIS/CORONA.

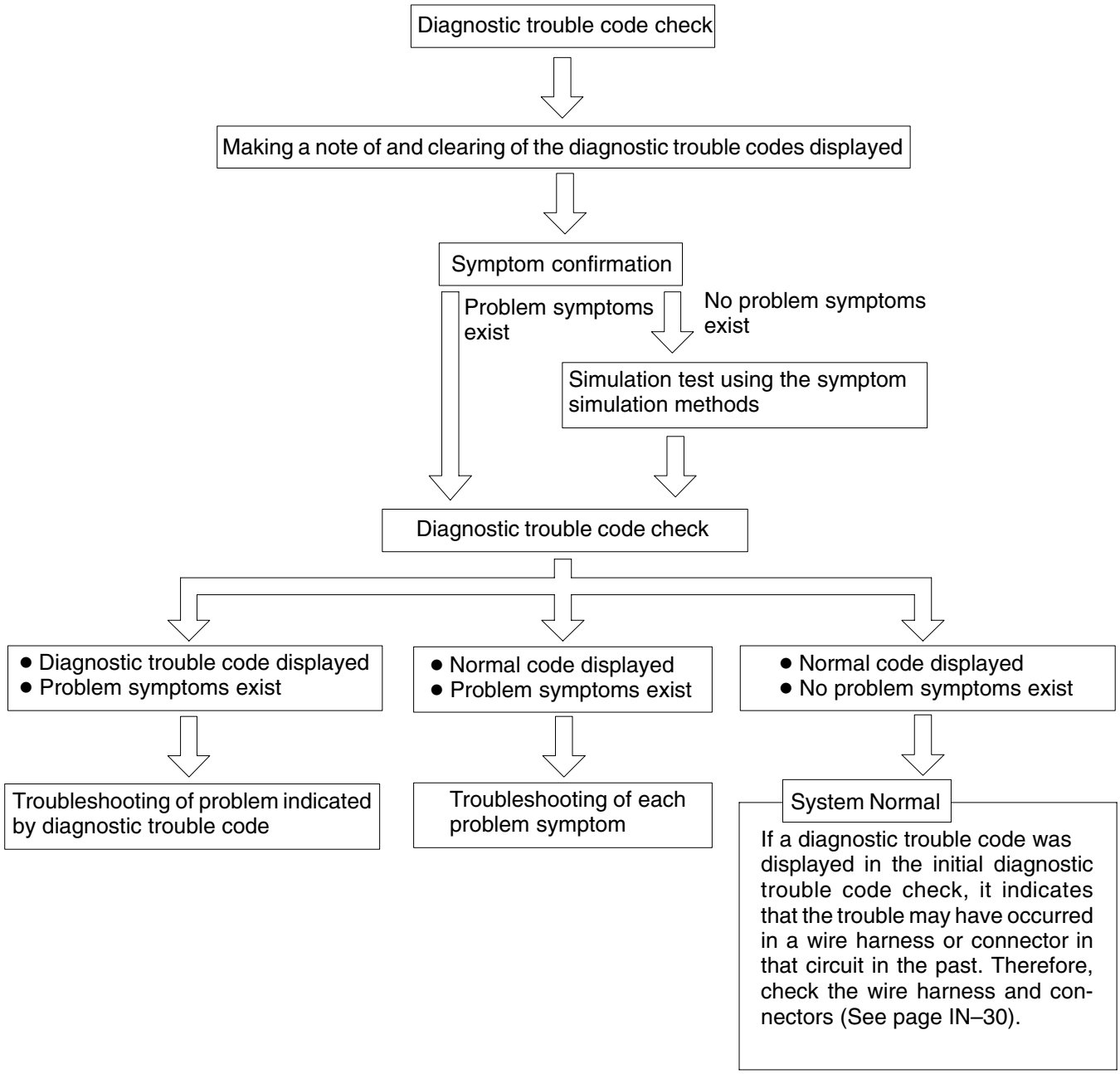
System	Diagnostic Trouble Code Check	Input Signal Check (Sensor Check)	Diagnostic Test Mode (Active Test)
1. Automatic Transaxle (A246E)	○ (with check mode)	○	
2. Automatic Transaxle (U240E)	○ (with check mode)	○	
3. Anti–Lock Brake System with Electronic Brake Force Distribution (EBD)	○	○	○
4. ABS with EBD & BA & TRC & VSC System	○	○	○
5. Engine Immobiliser System	○		

In diagnostic trouble code check, it is very important to determine whether the problem indicated by the diagnostic trouble code is still occurring or 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 diagnostic trouble code is directly related to the problem symptom or not. For this reason, the diagnostic trouble codes should be checked before and after the symptom confirmation to determine the current conditions, as shown in the table below. If this is not done, it may, depending on the case, result in unnecessary troubleshooting for normally operating systems, thus making it more difficult to locate the problem, or in repairs not pertinent to the problem. Therefore, always follow the procedure in correct order and perform the diagnostic trouble code check.

DIAGNOSTIC TROUBLE CODE CHECK PROCEDURE

Diagnostic Trouble Code Check (Make a note of and then clear)	**Confirmation of Symptoms**	**Diagnostic Trouble Code Check**	**Problem Condition**
Diagnostic Trouble Code Display	Problem symptoms exist	Same diagnostic trouble code is displayed	Problem is still occurring in the diagnostic circuit
⇨		Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit (The diagnostic trouble code displayed first is either for a past problem or it is a secondary problem)
⇨	No problem symptoms exist		The problem occurred in the diagnostic circuit in the past
Normal Code Display ⇨	Problem symptoms exist	Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit
⇨	No problem symptoms exist	Normal code is displayed	The problem occurred in a place other than in the diagnostic circuit in the past

Taking into account the above points, a flow chart showing how to proceed with troubleshooting using the diagnostic trouble code check is shown below. This flow chart shows how to utilize the diagnostic trouble code check effectively, then by carefully checking the results, indicates how to proceed either to diagnostic trouble code troubleshooting or to troubleshooting of problem symptoms.

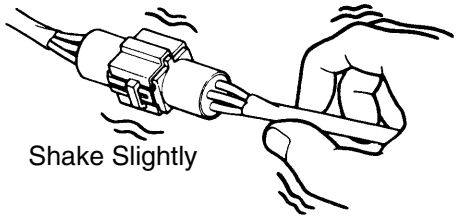
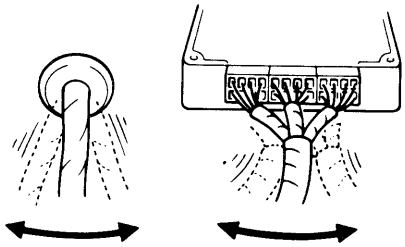
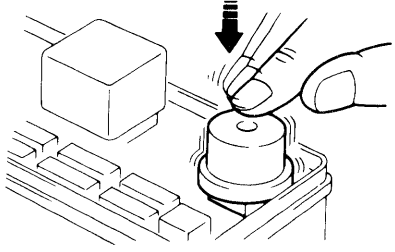


3. SYMPTOM SIMULATION

The most difficult case in troubleshooting is when there are no problem symptoms occurring. 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 or she may be, if he or she proceeds to troubleshoot without confirming the problem symptoms he or she 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 so long as the symptoms are confirmed with the engine hot condition or the vehicle at a standstill. Since vibration, heat or water penetration (moisture) is likely cause for problem which is difficult to reproduce, the symptom simulation tests introduced here are effective measures in that the external causes are applied to the vehicle in a stopped condition.

Important Points in the Symptom Simulation Test:

In the symptom simulation test, the problem symptoms should of course be confirmed, but the problem area or parts must also be found out. To do this, narrow down the possible problem circuits according to the symptoms before starting this test and connect a tester 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 for each system to narrow down the possible causes of the symptom.

1	**VIBRATION METHOD: When vibration seems to be the major cause.**
CONNECTORS Slightly shake the connector vertically and horizontally. **WIRE HARNESS** Slightly shake the wire harness vertically and horizontally. The connector joint, fulcrum of the vibration, and body through portion are the major areas to be checked thoroughly.	  FI2331 FI2332
PARTS AND SENSOR 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.	 FI2330

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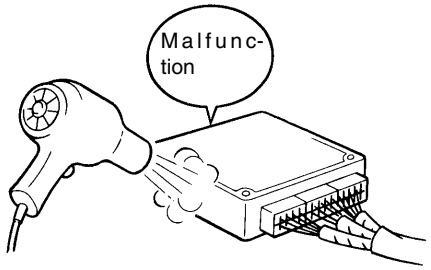
2	**HEAT METHOD: When the problem seems to occur when the suspect area is heated.**

Heat the component that is the likely cause of the malfunction with a hair dryer or similar object. Check to see if the malfunction occurs.

NOTICE:

(1) Do not heat to more than 60 ˚C (140 ˚F). (Temperature is limited not to damage the components.)

(2) Do not apply heat directly to parts in the ECU.



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

Sprinkle water onto the vehicle and check to see if the malfunction occurs.

NOTICE:

(1) Never sprinkle water directly into the engine compartment, but indirectly change the temperature and humidity by applying water spray onto the radiator front surface.

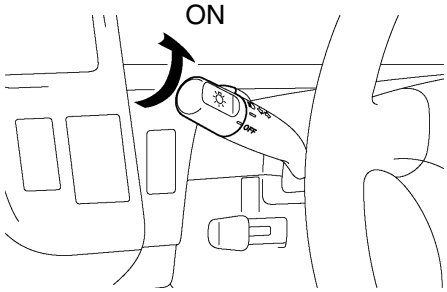
(2) Never apply water directly onto the electronic components.

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.

FI6649

4	**OTHER: When a malfunction seems to occur when electrical load is excessive.**

Turn on all electrical loads including the heater blower, head lights, rear window defogger, etc. and check to see if the malfunction occurs.



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4. DIAGNOSTIC TROUBLE CODE CHART

The inspection procedure is shown in the table below. This table permits efficient and accurate troubleshooting 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.

- DTC No.
  Indicates the diagnostic trouble code.
- Page or Instructions
  Indicates the page where the inspection procedure for each circuit is to be found, or gives instructions for checking and repairs.

- Trouble Area
  Indicates the suspect area of the problem.

- 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 listed for that code in the table below. (Proceed to the page given for that circuit).

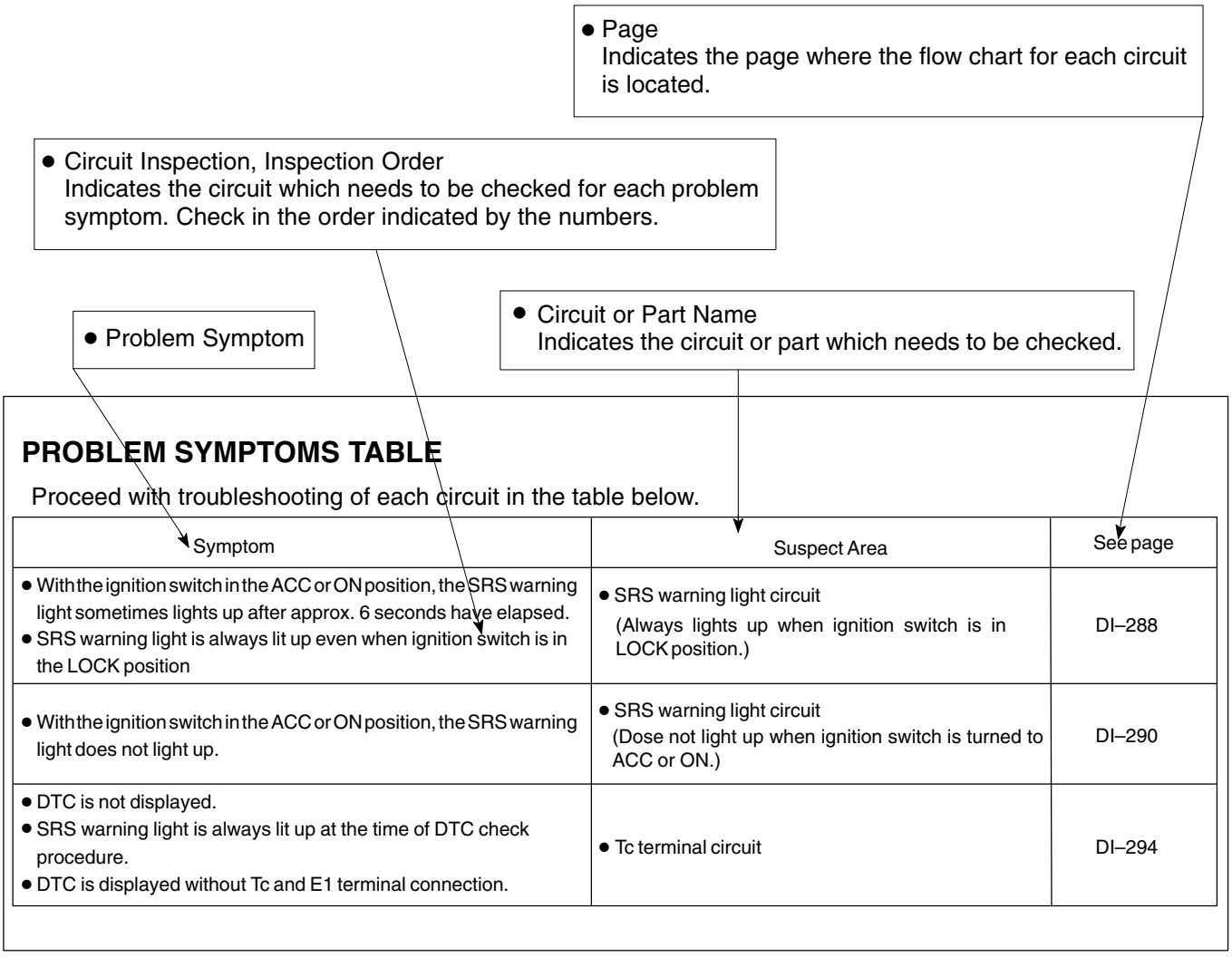
DTC No. (See page)	Detection Item	Trouble Area	SRS Warming Light
11 (DI–165)	Short in D squib circuit (to ground)	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
12 (DI–170)	Short in D squib circuit (to B+)	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
13 (DI–174)	Short in D squib circuit	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
14 (DI–178)	Open in D squib circuit	● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness	ON
15 (DI–178)	Front airbag sensor assembly (RH) malfunction	● Front airbag sensor assembly (RH) ● Wire harness	ON
16	Front airbag sensor assembly (LH) malfunction	● Front airbag sensor assembly (LH) ● Wire harness	ON
	ssembly malfunction	Airbag sensor assembly	
	it (to ground)	● Front passenger airbag sensor assembly ● Airbag sensor assembly	

5. 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.



PROBLEM SYMPTOMS TABLE

Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
● With the ignition switch in the ACC or ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed. ● SRS warning light is always lit up even when ignition switch is in the LOCK position	● SRS warning light circuit (Always lights up when ignition switch is in LOCK position.)	DI–288
● With the ignition switch in the ACC or ON position, the SRS warning light does not light up.	● SRS warning light circuit (Dose not light up when ignition switch is turned to ACC or ON.)	DI–290
● DTC is not displayed. ● SRS warning light is always lit up at the time of DTC check procedure. ● DTC is displayed without Tc and E1 terminal connection.	● Tc terminal circuit	DI–294

6. CIRCUIT INSPECTION

How to read and use each page is shown below.

● Diagnostic Trouble Code No. and Detection Item

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

DTC	13	Short in D Squib Circuit

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.

It causes the airbag to deploy when the airbag deployment conditions are satisfied.

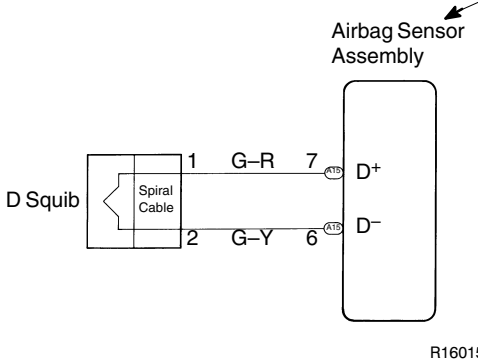
For details of the function of each components,see OPERATION on page RS–2.

DTC 13 is recorded when a short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
13	•Short circuit between D+ wire harness and D– wire harness of squib •D squib malfunction •Spiral cable malfunction •Airbag sensor assembly malfunction	•Steering wheel pad (D squib) •Spiral cable •Airbag sensor assembly •Wire harness

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

WIRING DIAGRAM



● 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
The first letter indicates the basic wire color and the second letter indicates the color of the stripe.

B02407

● Indicates the position of the ignition switch during the check.

LOCK
Ignition Switch LOCK (OFF)

ON
Ignition Switch ON

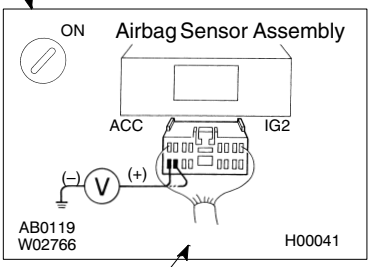
START
Ignition Switch START

ACC
Ignition Switch ACC

● 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.

INSPECTION PROCEDURE

2	**Check voltage at IG2 and ACC of airbag sensor assembly.**



PREPARATION:
Turn ignition switch ON.

CHECK:
Measure voltage between terminals IG2 and ACC of airbag sensor assembly and body ground.

OK:
Voltage: Below 16V

NG → **Check battery and charging system. (See charging system section)**

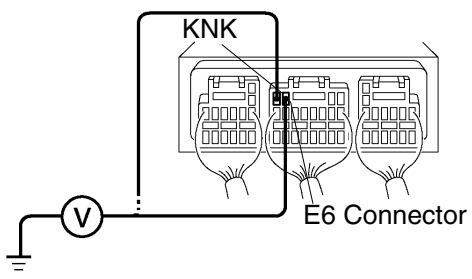
OK

● Indicates the place to check the voltage or resistance.
● Indicates the connector position to be checked, from the front or back side.

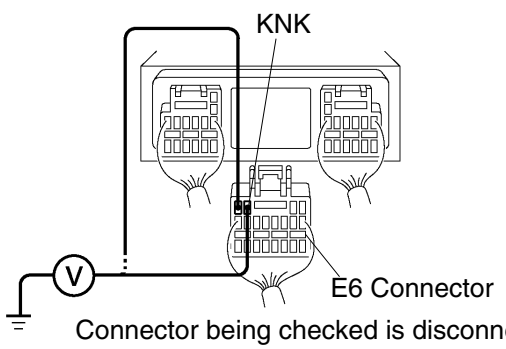
Check from the connector back side. (with harness)

Check from the connector front side. (without harness)
In this case, care must be taken not to bend the terminals.

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



Connector being checked is connected.

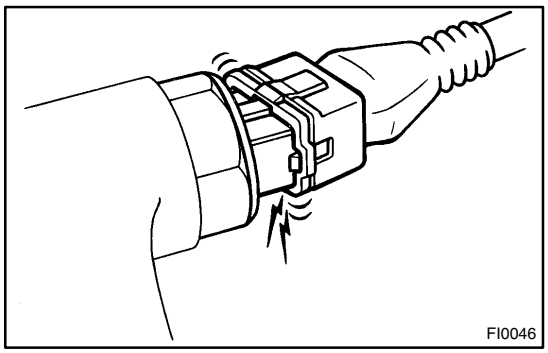


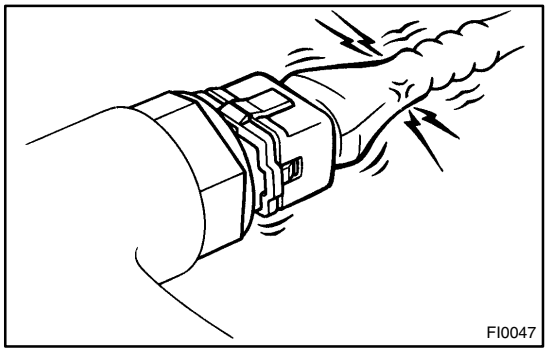
Connector being checked is disconnected.

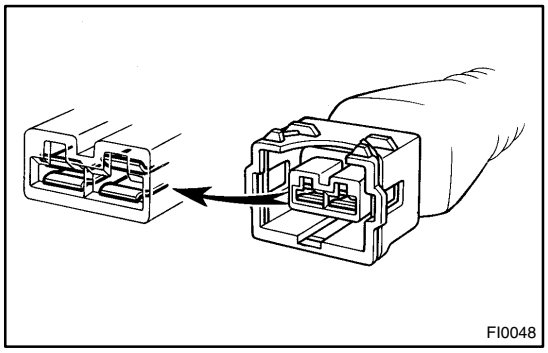
B00691

B00972

IN011–38


FI0046


FI0047


FI0048

HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE

1. CONNECTOR CONNECTION AND TERMINAL INSPECTION

- For troubleshooting, diagnostic trouble code charts or problem symptom charts are provided for each circuit with detailed inspection procedures on the following pages.
- When all the component parts, wire harnesses and connectors of each circuit except the ECU are found to be normal in troubleshooting, then it is determined that the problem is in the ECU. Accordingly, if diagnosis is performed without the problem symptoms occurring, refer to Step 8 to replace the ECU. So always confirm that the problem symptoms are occurring, or proceed with inspection while using the symptom simulation method.
- The instructions ”Check wire harness and connector” and ”Check and replace ECU” which appear in the inspection procedure, are common and applicable to all diagnostic trouble codes. Follow the procedure outlined below whenever these instructions appear.

OPEN CIRCUIT:

This could be due to a disconnected wire harness, faulty contact in the connector, and a connector terminal pulled out, etc.

HINT:

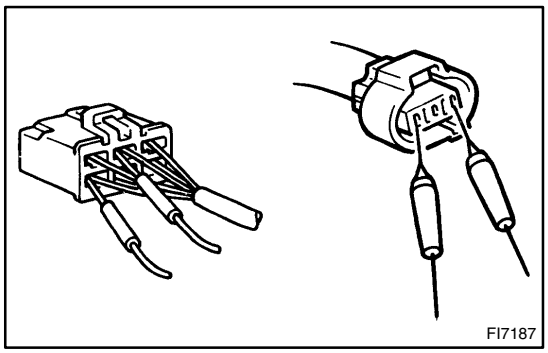
- It is rarely the case that a wire is broken in the middle of it. Most cases occur at the connector. In particular, carefully check the connectors of sensors and actuators
- Faulty contact could be due to rusting of the connector terminals, to foreign materials entering terminals or a deformation of connector terminals. Simply disconnecting and reconnecting the connectors once changes the condition of the connection and may result in a return to normal operation. Therefore, in troubleshooting, if no abnormality is found in the wire harness and connector check, but the problem disappears after the check, then the cause is considered to be in the wire harness or connectors.

SHORT CIRCUIT:

This could be due to a contact between wire harness and the body ground or to a short circuit occurred inside the switch, etc.

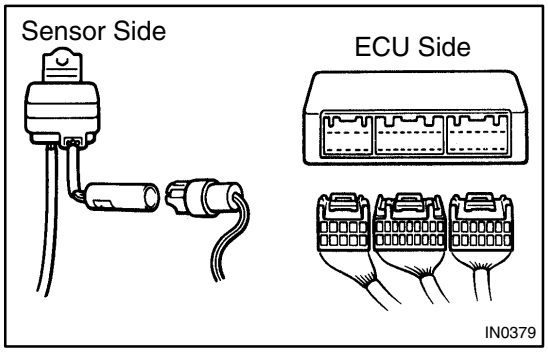
HINT:

When there is a short between the wire harness and body ground, check thoroughly whether the wire harness is caught in the body or is clamped properly.



2. CONNECTOR HANDLING

When inserting tester probes into a connector, insert them from the rear of the connector. When necessary, use mini test leads. For water resistant connectors which cannot be accessed from behind, take good care not to deform the connector terminals.



3. CONTINUITY CHECK (OPEN CIRCUIT CHECK)

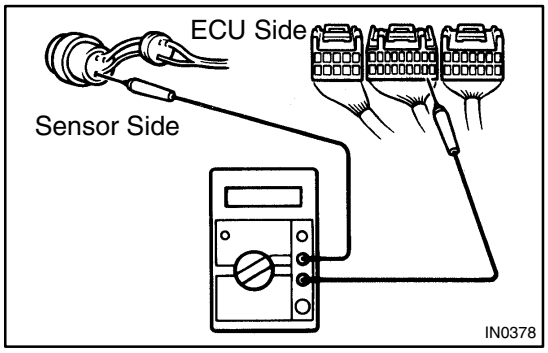
(a) Disconnect the connectors at both ECU and sensor sides.

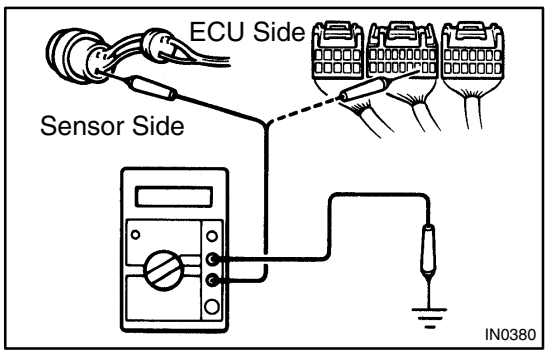
(b) Measure the resistance between the applicable terminals of the connectors.

Resistance: 1 Ω or less

HINT:

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





4. RESISTANCE CHECK (SHORT CIRCUIT CHECK)

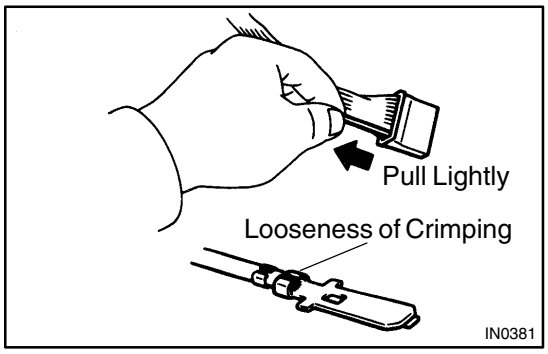
(a) Disconnect the connectors on both ends.

(b) Measure the resistance between the applicable terminals of the connectors and body ground. Be sure to carry out this check on the connectors on both ends.

Resistance: 1 MΩ or higher

HINT:

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



5. VISUAL CHECK AND CONTACT PRESSURE CHECK

(a) Disconnect the connectors at both ends.

(b) Check for rust or foreign material, etc. in the terminals of the connectors.

(c) Check crimped portions for looseness or damage and check that the terminals are secured in lock portion.

HINT:

The terminals should not come out when pulled lightly from the back.

(d) Prepare a test male terminal and insert it in the female terminal, then pull it out.

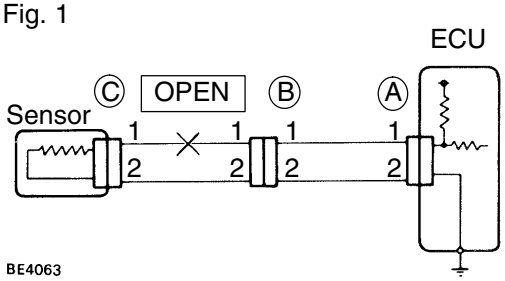
NOTICE:

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

HINT:

When the test terminal is pulled out more easily than others, there may be poor contact in that section.

Fig. 1



6. CHECK OPEN CIRCUIT

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

Fig. 2

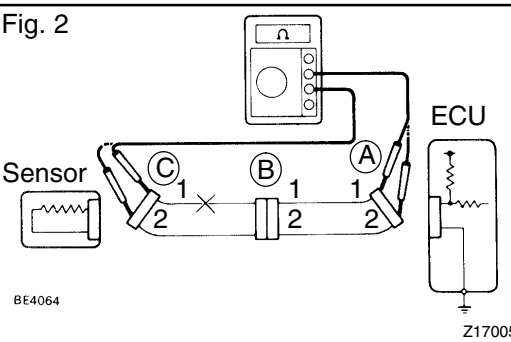
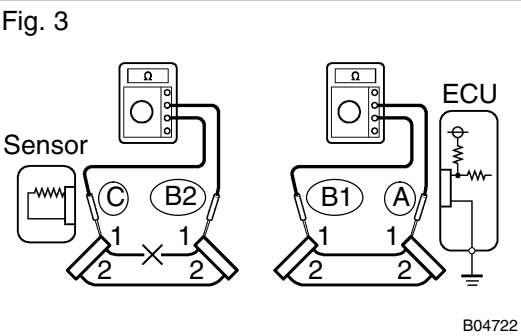


Fig. 3



(a) Check the continuity.

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

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".

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

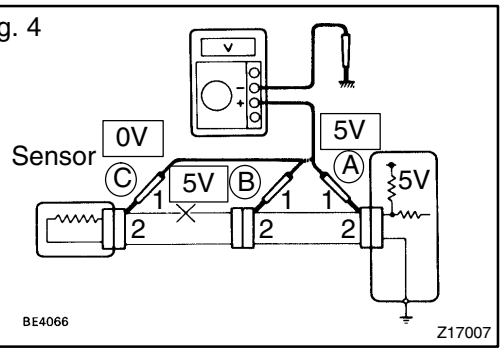
In the case of Fig. 3:

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



(b) Check the voltage.

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

As shown in Fig. 4, with each connector still connected, measure the voltage between 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.

If the results are:

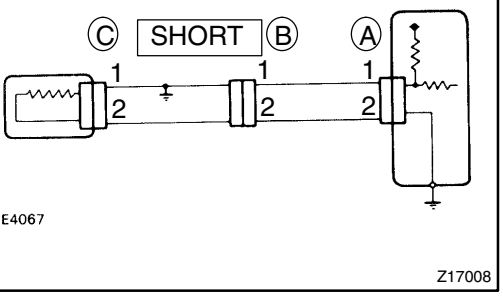
5V: Between Terminal 1 of connector "A" and Body Ground

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

0V: 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".

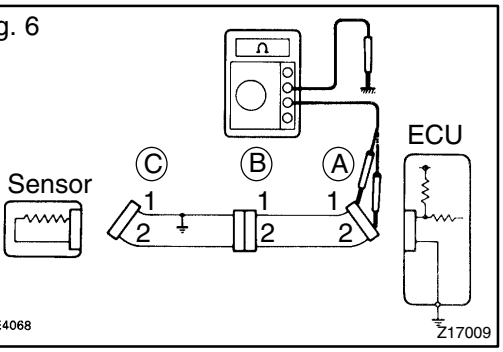
Fig. 5



7. CHECK SHORT CIRCUIT

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

Fig. 6



Check the continuity with ground.

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

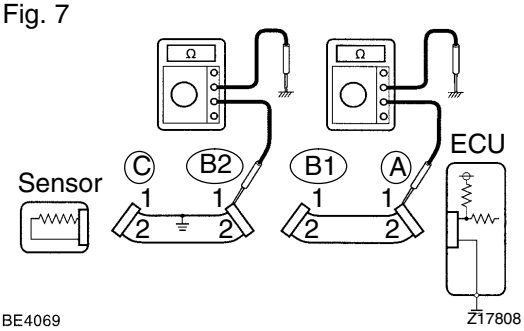
In the case of Fig. 6:

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".

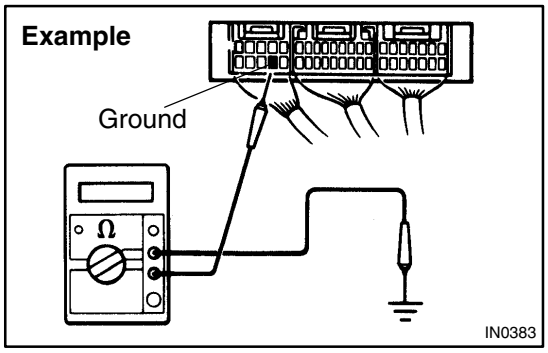
Fig. 7



(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”.

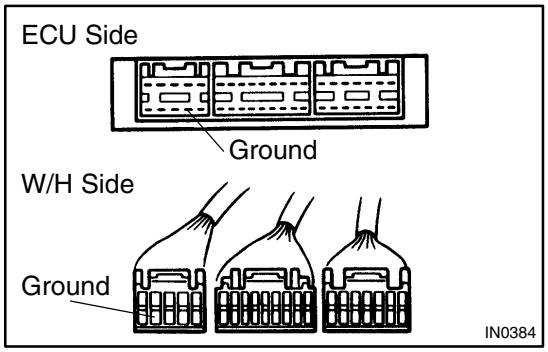
8. CHECK AND REPLACE ECU

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

IN044–12

ABBREVIATIONS USED IN THIS MANUAL

Abbreviations	Meaning
ABS	Anti–Lock Brake System
A/C	Air Conditioner
AC	Alternating Current
ACC	Accessory
ACIS	Acoustic Control Induction System
ACSD	Automatic Cold Start Device
A.D.D.	Automatic Disconnecting Differential
AHC	Active Height Control Suspension
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Amplifier
ANT	Antenna
APPROX.	Approximately
A/T	Automatic Transmission (Transaxle)
ATF	Automatic Transmission Fluid
AUTO	Automatic
BACS	Boost Altitude Compensation System
BAT	Battery
B/L	Bi–Level
BVSV	Bimetallic Vacuum Switching Valve
CB	Circuit Breaker
CD	Compact Disc
CH	Channel
CKD	Complete Knock Down
COMB.	Combination
CPE	Coupe
CRS	Child Restraint System
CTR	Center
DC	Direct Current
DIFF.	Differential
DIFF. LOCK	Differential Lock
DLC	Data Link Connector
DSP	Digital Signal Processor
DTC	Diagnostic Trouble Code
ECT	Electronic Control Transmission
ECU	Electronic Control Unit
EDU	Electronic Driving Unit
EFI	Electronic Fuel Injection
E/G	Engine
EGR	Exhaust Gas Recirculation
ELR	Emergency Locking Retractor
E–VRV	Electronic Vacuum Regulating Valve

FF	Front–EngineFront–Wheel–Drive
FIPG	Formed In Place Gasket
FL	Fusible Link
Fr	Front
FR	Front–EngineRear–Wheel–Drive
FWD	Front–Wheel–Drive
GND	Ground
H/B	Hatchback
HI	High
HID	High Intensity Discharge (Head Lamp)
HT	Hard Top
HWS	Heated Windshield System
IAC	Idle Air Control
IFS	Independent Front Suspension
IG	Ignition
INT	Intermittent
I/P	Instrument Panel
IRS	Independent Rear Suspension
J/B	Junction Block
J/C	Junction Connector
LAN	Local Area Network
LB	Liftback
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	Left–Hand
LHD	Left–Hand Drive
LO	Low
LSD	Limited Slip Differential
LSP & PV	Load Sensing Proportioning And Bypass Valve
LSPV	Load Sensing Proportioning Valve
MAP	Manifold Absolute Pressure
MAX.	Maximum
MIC	Microphone
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MP	Multipurpose
MPI	Multipoint Electronic Fuel Injection
MPX	Multiplex Communication System
M/T	Manual Transmission
N	Neutral
No.	Number
O2S	Oxygen Sensor
O/D	Overdrive
OPT	Option
P & BV	Proportioning And Bypass Valve
PCS	Power Control System

PKB	Parking Brake
PPS	Progressive Power Steering
PS	Power Steering
PTO	Power Take–Off
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 Rear Suspension
RWD	Rear–Wheel Drive
SDN	Sedan
SEN	Sensor
SICS	Starting Injection Control System
SPEC	Specification
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
SW	Switch
SYS	System
T/A	Transaxle
TACH	Tachometer
TDC	Top Dead Center
TEMP.	Temperature
TEMS	TOYOTA Electronic Modulated Suspension
TFT	Toyota Free–Tronic
T/M	Transmission
TMC	TOYOTA Motor Corporation
TRC	Traction Control System
U/D	Underdrive
VENT	Ventilator
VIN	Vehicle Identification Number
VSC	Vehicle Stability Control
VSV	Vacuum Switching Valve
w/	With
WGN	Wagon
W/H	Wire Harness
w/o	Without
1st	First

2nd	Second
2WD	Two Wheel Drive Vehicle (4x2)
4WD	Four Wheel Drive Vehicle (4x4)

PREPARATION

CLUTCH PP–1
MANUAL TRANSAXLE (C50, C250) PP–3
MANUAL TRANSAXLE (E351) PP–10
MANUAL TRANSAXLE (S54, S55) PP–16
AUTOMATIC TRANSAXLE (A246E) PP–22
AUTOMATIC TRANSAXLE (U240E) PP–27
SUSPENSION AND AXLE PP–32
STEERING PP–37
BODY ELECTRICAL PP–41
BODY PP–43
AIR CONDITIONING PP–44

REFER TO FOLLOWING REPAIR MANUALS:

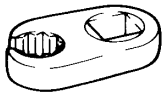
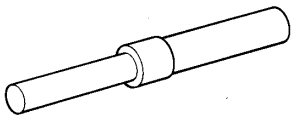
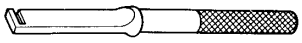
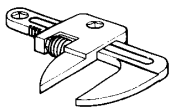
Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

NOTE: The above pages contain only the points which differ from the above listed manuals.

CLUTCH

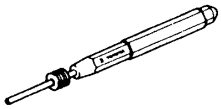
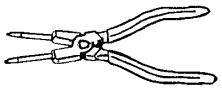
PP119–02

SST (Special Service Tools)

	09023–00100	Union Nut Wrench 10 mm	Clutch line
	09249–63010	Torque Wrench Adaptor	LHD Clutch line
	09301–00120	Clutch Guide Tool	
	09301–00210	Clutch Guide Tool	
	09333–00013	Clutch Diaphragm Spring Aligner	
	09922–10010	Variable Open Wrench	Clutch accumulator

PP11A–02

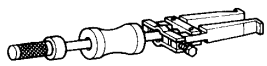
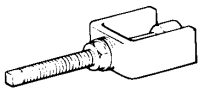
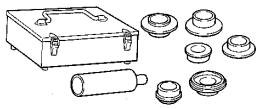
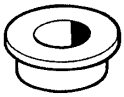
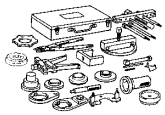
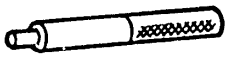
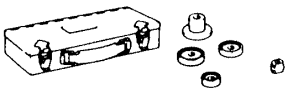
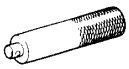
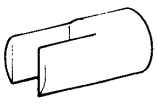
RECOMMENDED TOOLS

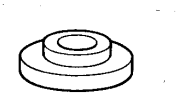
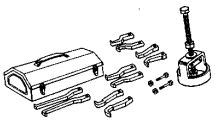
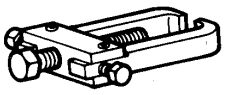
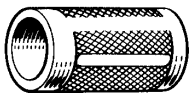
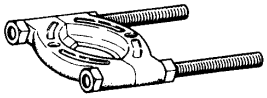
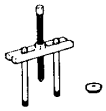
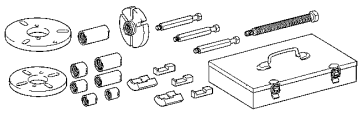
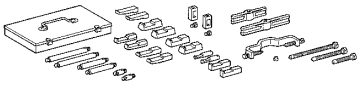
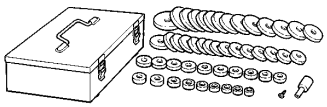
	09031–00030	Pin Punch .	Reservoir tank
	09905–00013	Snap Ring Pliers .	

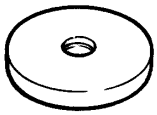
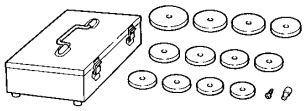
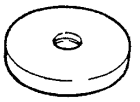
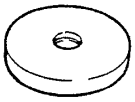
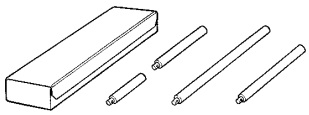
MANUAL TRANSAXLE (C50, C250)

PP11B–02

SST (Special Service Tools)

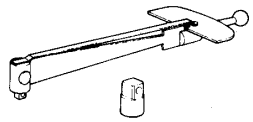
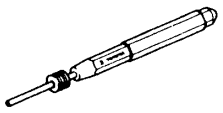
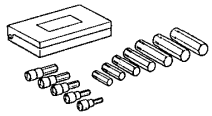
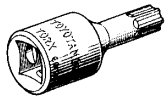
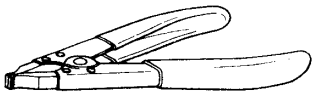
	09308–00010	Oil Seal Puller	Output shaft front bearing
	09309–12020	5th Driven Gear Replacer	
	09316–60011	Transmission & Transfer Bearing Replacer	Output shaft rear ball bearing
	(09316–00021)	Replacer "A"	
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32111)	Side Bearing Race Replacer	Differential case oil seal
	(09351–32130)	Handle	
	(09351–32150)	Oil Seal Replacer	Differential case oil seal
	09550–10013	Replacer Set "B"	Differential side bearing
	(09252–10010)	No. 1 Replacer Handle	
	(09556–10011)	Differential Drive Pinion Front Bearing Remover	
	09564–32011	Differential Preload Adaptor	

	09608–03071	Replacer	Input shaft rear ball bearing
	09612–65014	Steering Worm Bearing Puller	Input shaft front bearing Differential side bearing outer race
	09628–62011	Ball Joint Puller	5th driven gear
	09636–20010	Upper Ball Joint Dust Cover Replacer	No.3 hub sleeve assembly
	09950–00020	Bearing Remover	
	09950–00030	Bearing Remover Attachment	Differential side bearing
	09950–30011	Puller A Set	No. 3 clutch hub
	09950–40011	Puller B Set	5th driven gear
	(09957–04010)	Attachment	
	09950–60010	Replacer Set	
	(09951–00230)	Replacer 23	5th driven gear
	(09951–00360)	Replacer 36	Differential side bearing
	(09951–00400)	Replacer 40	Input shaft front oil seal

	(09951–00460)	Replacer 46	Input shaft front bearing Differential side bearing
	(09951–00620)	Replacer 62	Output shaft front bearing
	09950–60020	Replacer Set No.2	
	(09951–00680)	Replacer 68	Differential side bearing outer race (Transaxle case side)
	(09951–00710)	Replacer 71	Differential side bearing outer race (Transmission case side)
	09950–70010	Handle Set	
	(09951–07150)	Handle 150	

PP04O–03

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	Differential preload
	09031–00030	Pin Punch .	
	09040–00011	Hexagon Wrench Set .	
	09042–00010	Torx Socket T30 .	
	09905–00012	Snap Ring No.1 Expander .	

PP04Q–01

EQUIPMENT

Dial indicator with magnetic base	
Feeler gauge	
Micrometer	
Torque wrench	
Magnetic finger	

PP04S–01

LUBRICANT

Item	Capacity	Classification
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

PP11C–02

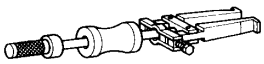
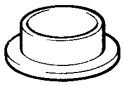
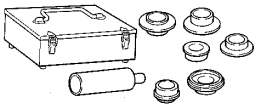
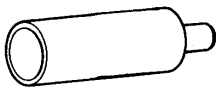
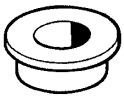
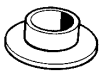
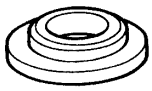
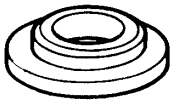
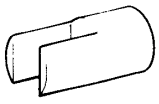
SSM (Special Service Materials)

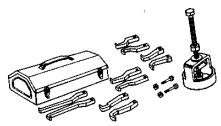
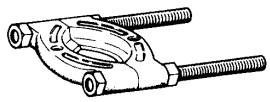
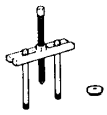
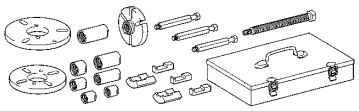
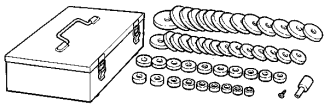
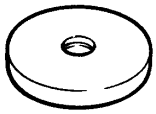
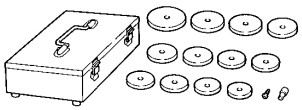
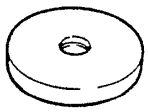
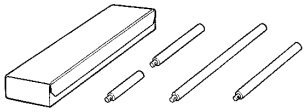
08826–00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transmission case x Transaxle case Transmission case x Case cover
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	Transmission case cover bolt Straight screw plug Control shaft cover bolt

MANUAL TRANSAXLE (E351)

PP3D3–01

SST (Special Service Tools)

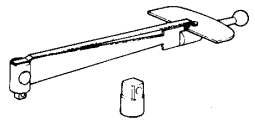
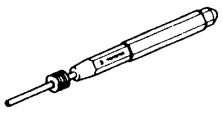
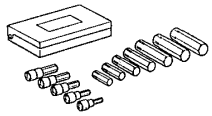
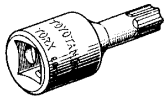
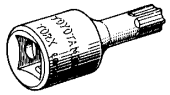
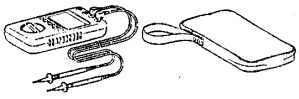
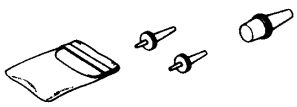
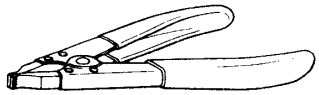
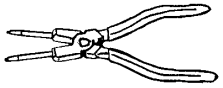
	09223–15020	Oil Seal & Bearing Replacer	Differential case oil seal
	09308–00010	Oil Seal Puller	Output shaft front bearing outer race
	09316–20011	Transfer Bearing Replacer	Differential case tapered roller bearing
	09316–60011	Transmission & Transfer Bearing Replacer	
	(09316–00011)	Replacer Pipe	
	(09316–00021)	Replacer ”A”	
	(09316–00041)	Replacer ”C”	1st gear No.1 hub sleeve Differential case tapered roller bearing outer race
	(09316–00071)	Replacer ”F”	Output shaft front bearing
	09506–30012	Differential Drive Pinion Rear Bearing Cone Replacer	Output shaft rear bearing
	09506–35010	Differential Drive Pinion Rear Bearing Replacer	No.2 hub sleeve 3rd gear Input shaft rear bearing 1st gear bearing inner race
	09564–32011	Differential Preload Adaptor	Differential case taperd roller bearing preload
	09608–00081	Differential Side Bearing Cone Replacer	Input shaft oil seal

	09612–65014	Steering Worm Bearing Puller	Input shaft bearing Differential case tapered roller bearing outer race
	09950–00020	Bearing Remover	
	09950–00030	Bearing Remover Attachment	Output shaft front bearing
	09950–30011	Puller A Set	5th driven gear No.3 clutch hub
	09950–40011	Puller B Set	Differential case tapered roller bearing
	(09957–04010)	Attachment	Differential case taperd roller bearing inner race
	09950–60010	Replacer Set	
	(09951–00530)	Replacer 53	Differential case taperd roller bearing inner race
	(09951–00580)	Replacer 58	Input shaft bearing
	(09951–00450)	Replacer 45	Differential case taperd roller bearing inner race
	09950–60020	Replacer Set No.2	
	(09951–00890)	Replacer 89	Differential case taperd roller bearing outer race
	09950–70010	Handle Set	

	(09951–07150) Handle 150	

PP0VD–04

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	Differential preload
	09031–00030	Pin Punch .	
	09040–00011	Hexagon Wrench Set .	
	09042–00040	Torx Socket T50 .	
	09042–00050	Torx Socket T45 .	
	09082–00040	TOYOTA Electrical Tester.	
	09258–00030	Hose Plug Set .	
	09905–00012	Snap Ring No.1 Expander .	
	09905–00013	Snap Ring Pliers .	

PP0VE–02

EQUIPMENT

Dial indicator with magnetic base	
Feeler gauge	
Magnetic finger	
Micrometer	
Plastigage	
Precision straight edge	
Torque wrench	
Vise	

PP0VF–05

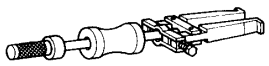
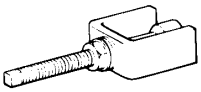
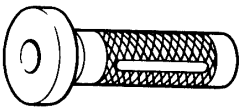
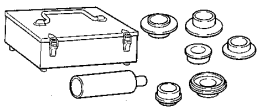
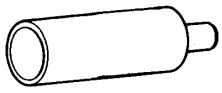
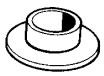
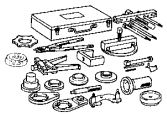
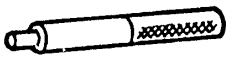
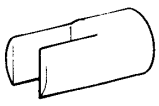
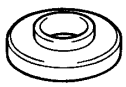
LUBRICANT

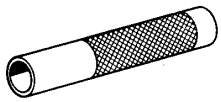
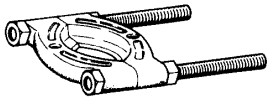
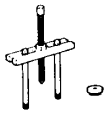
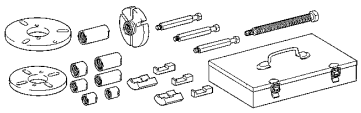
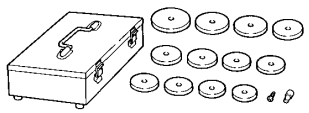
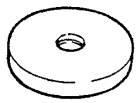
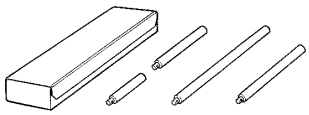
Item	Capacity	Classification
Manual transaxle oil (w/ Differential oil)	2.5 liters (2.6 US qts, 2.2 Imp. qts)	API GL–4 or GL–5 SAE 75W–90

MANUAL TRANSAXLE (S54, S55)

PP0H2–07

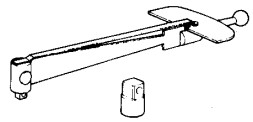
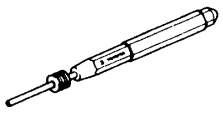
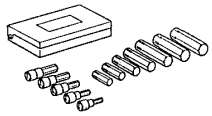
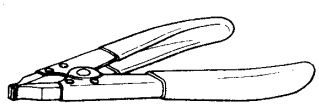
SST (Special Service Tools)

	09308–00010	Oil Seal Puller	Input shaft front bearing Output shaft front bearing
	09309–12020	5th Driven Gear Replacer	5th driven gear
	09310–35010	Countershaft Bearing Replacer	Input shaft front bearing Output shaft front bearing
	09316–60011	Transmission & Transfer Bearing Replacer	
	(09316–00011)	Replacer Pipe	3rd driven gear Differential side bearing
	(09316–00041)	Replacer ”C”	Output shaft thrust washer
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32120)	Overdrive Bearing Replacer	Differential side bearing
	(09351–32130)	Handle	Differential side bearing retainer oil seal Differential case oil seal (Transaxle case side)
	(09351–32150)	Oil Seal Replacer	Differential side bearing retainer oil seal Differential case oil seal (Transaxle case side)
	09564–32011	Differential Preload Adaptor	
	09608–00071	Drive Pinion Rear Bearing Cone Replacer	Input shaft rear bearing

	09608–00081	Differential Side Bearing Cone Replacer	Input shaft front oil seal
	09612–22011	Tilt Handle Bearing Replacer	Output shaft rear bearing No.3 clutch hub
	09950–00020	Bearing Remover	
	09950–00030	Bearing Remover Attachment	
	09950–30011	Puller A Set	No. 3 clutch hub
	09950–40011	Puller B Set	5th driven gear
	09950–60020	Replacer Set No.2	Differential side bearing retainer oil seal Differential side bearing outer race
	(09951–00680)	Replacer 68	
	09950–70010	Handle Set	
	(09951–07150)	Handle 150	

PP11D–02

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	Differential preload
	09031–00030	Pin Punch .	
	09040–00011	Hexagon Wrench Set .	
	09905–00012	Snap Ring No.1 Expander .	

PP0H4–01

EQUIPMENT

Dial indicator	
Torque wrench	
Feeler gauge	
Magnetic finger	
Micrometer	

PP0H5–02

LUBRICANT

Item	Capacity	Classification
Manual transaxle oil (w/ Differential oil)	2.2 liters (2.3 US qts, 1.9 Imp. qts)	API GL–4 or GL–5 SAE 75W–90

PP11E–02

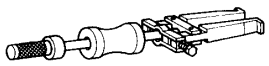
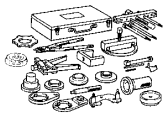
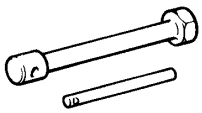
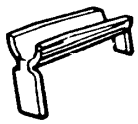
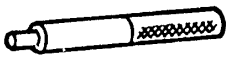
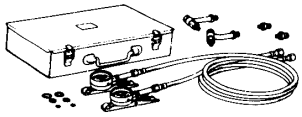
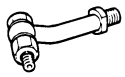
SSM (Special Service Materials)

08826–00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transmission case x Transaxle case Transmission case x Case cover
08833–00070	Adhesive 1324, THREE BOND 1324 or equivalent	Rear bearing retainer set bolt
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	Straight screw plug Control shaft cover bolt Lock ball assembly

AUTOMATIC TRANSAXLE (A246E)

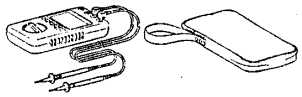
PP2J6–02

SST (Special Service Tools)

	09308–00010	Oil Seal Puller	
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32010)	One–way Clutch Test Tool	
	(09351–32020)	Stator Stopper	
	(09351–32111)	Side Bearing Race Replacer	
	(09351–32130)	Handle	
	(09351–32150)	Oil Seal Replacer	
	09992–00095	Automatic Transmission Oil Pressure Gauge Set	
	(09992–00231)	Adaptor C	
	(09992–00271)	Gauge Assy	

PP2J7–02

RECOMMENDED TOOLS

	09082–00040 TOYOTA Electrical Tester.	

PP2J8–01

EQUIPMENT

Vernier calipers	Torque converter
Dial indicator or dial indicator with magnetic base	Drive plate
Straight edge	Torque converter
Torque wrench	

PP0IP–02

LUBRICANT

Item	Capacity	Classification
Automatic transmission fluid		
Dry fill	7.6 liters (8.0 US qts, 6.7 Imp. qts)	ATF D–II or DEXRON® III (DEXRON® II)
Drain and refill	3.1 liters (3.3 US qts, 2.7 Imp. qts)	

PP2J9–01

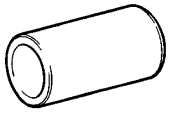
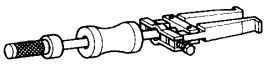
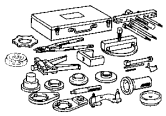
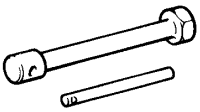
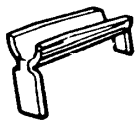
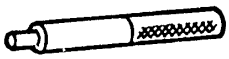
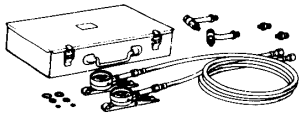
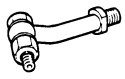
SSM (Special Service Materials)

08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	

AUTOMATIC TRANSAXLE (U240E)

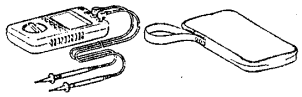
PP2J6–03

SST (Special Service Tools)

	09223–00010	Cover & Seal Replacer	
	09308–00010	Oil Seal Puller	
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32010)	One–way Clutch Test Tool	
	(09351–32020)	Stator Stopper	
	(09351–32130)	Handle	
	(09351–32150)	Oil Seal Replacer	
	09992–00095	Automatic Transmission Oil Pressure Gauge Set	
	(09992–00231)	Adaptor C	
	(09992–00271)	Gauge Assy	

PP2J7–03

RECOMMENDED TOOLS

	09082–00040 TOYOTA Electrical Tester.	

PP2J8–01

EQUIPMENT

Vernier calipers	Torque converter
Dial indicator or dial indicator with magnetic base	Drive plate
Straight edge	Torque converter
Torque wrench	

PP0IP–03

LUBRICANT

Item	Capacity	Classification
Automatic transmission fluid		
Dry fill	7.4 liters (7.8 US qts, 6.5 Imp. qts)	ATF Type T–IV
Drain and refill	4.1 liters (4.3 US qts, 3.6 Imp. qts)	

PP2J9–01

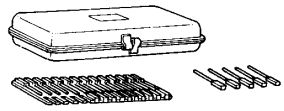
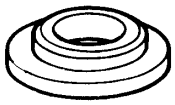
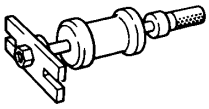
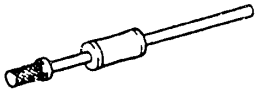
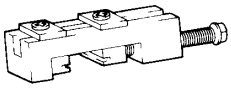
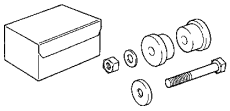
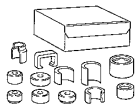
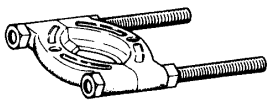
SSM (Special Service Materials)

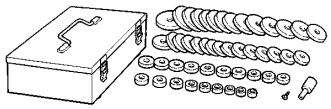
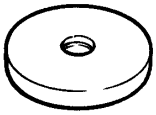
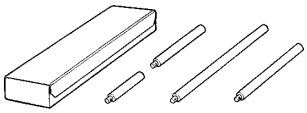
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	

SUSPENSION AND AXLE

PP3CN–01

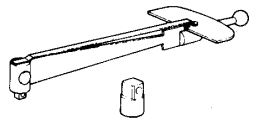
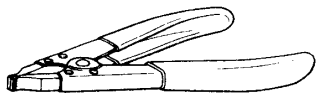
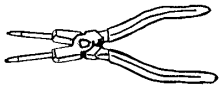
SST (Special Service Tools)

	09240–00020	Wire Gauge Set	Front drive shaft
	09506–35010	Differential Drive Pinion Rear Bearing Replacer	Front drive shaft
	09520–01010	Drive Shaft Remover Attachment	Front drive shaft
	09520–24010	Differential Side Gear Shaft Puller	Front drive shaft
	(09520–32040)	Shocker Set	
	09521–24010	Drive Shaft Boot Clamping Tool	Front drive shaft
	09608–16042	Front Hub Bearing Adjusting Tool	Front drive shaft
	(09608–02021)	Bolt & Nut	
	(09608–02041)	Retainer	
	09710–30021	Suspension Bushing Tool Set	Front drive shaft
	(09710–03141)	Bushing Remover Base	
	09950–00020	Bearing Remover	Front axle Front drive shaft

	09950–60010	Replacer Set	
	(09951–00640)	Replacer 64	Front axle Front drive shaft
	09950–70010	Handle Set	
	(09951–07150)	Handle 150	Front axle Front drive shaft

PP3CO–01

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	
	09905–00012	Snap Ring No.1 Expander .	
	09905–00013	Snap Ring Pliers .	

PP11I–03

EQUIPMENT

Dial indicator	
Torque wrench	

PP11J–03

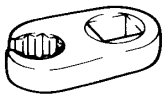
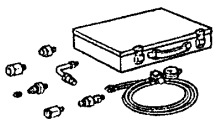
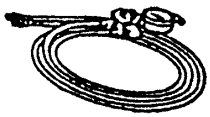
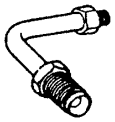
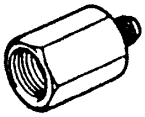
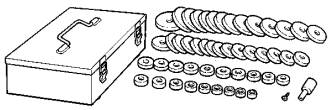
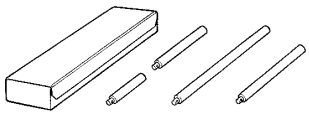
LUBRICANT

Item		Capacity	Application
Outboard joint grease	Color=Black	85 – 105 g (3.00 – 3.70 oz.)	
Inboard joint grease	Color=Yellow	125.5 – 135.5 g (4.43 – 4.78 oz.)	

STEERING

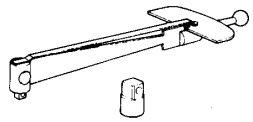
SST (Special Service Tools)

PP2JE–03

	09023–12700	Union Nut Wrench 17mm	PS vane pump (1ZZ–FE, 3ZZ–FE)
	09249–63010	Torque Wrench Adaptor	PS vane pump (1AZ–FSE)
	09640–10010	Power Steering Pressure Gauge Set	Power steering fluid
	(09641–01010)	Gauge Assy	
	(09641–01030)	Attachment B	
	(09641–01060)	Attachment E	
	09950–60010	Replacer Set	
	(09951–00280)	Replacer 28	PS vane pump (1ZZ–FE, 3ZZ–FE) PS vane pump (1AZ–FSE)
	09950–70010	Handle Set	
	(09951–07100)	Handle 100	PS vane pump (1ZZ–FE, 3ZZ–FE) PS vane pump (1AZ–FSE)

PP2JF–03

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	PS vane pump

PP0J9–11

EQUIPMENT

Caliper gauge	PS vane pump
Vernier Calipers	PS vane pump
Feeler gauge	PS vane pump
Micrometer	PS vane pump
Torque wrench	

PP18M–03

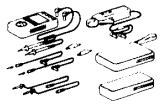
LUBRICANT

Item	Capacity	Classification
Power steering fluid (Total)	0.8 liters (0.9 US qts, 0.7 Imp.qts)	ATF DEXRON® II or III

BODY ELECTRICAL

RECOMMENDED TOOLS

PP090–04

	09082–00050 TOYOTA Electrical Tester Set.	

PP091–04

EQUIPMENT

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	

BODY

EQUIPMENT

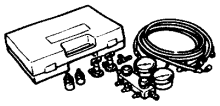
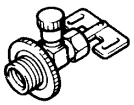
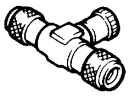
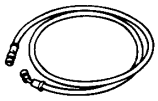
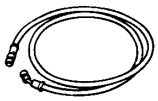
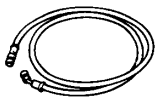
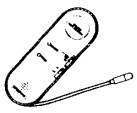
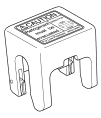
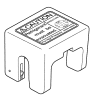
PP0M7–02

Clip remover	
Torque wrench	

AIR CONDITIONING

PP3D0–01

SST (Special Service Tools)

	07110–58060	Air Conditioner Service Tool Set	
	(07117–58060)	Refrigerant Drain Service Valve	
	(07117–58070)	T–Joint	
	(07117–58080)	Quick Disconnect Adapter	High pressure side
	(07117–58090)	Quick Disconnect Adapter	Low pressure side
	(07117–88060)	Refrigerant Charging Hose	High pressure side (Color: Red)
	(07117–88070)	Refrigerant Charging Hose	Low pressure side (Color: Blue)
	(07117–88080)	Refrigerant Charging Hose	Utility (Color: Green)
	07116–38360	Gas Leak Detector Assembly	
	09249–63010	Torque Wrench Adaptor	Drive belt (1AZ–FSE)
	09870–00015	A/C Quick Joint Puller No.1	Suction Tube
	09870–00025	A/C Quick Joint Puller No.2	Liquid Tube

PP3D1–01

RECOMMENDED TOOLS

	09082–00040 TOYOTA Electrical Tester.	

PP095–05

EQUIPMENT

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	
Torque wrench	

PP096–02

LUBRICANT

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

SERVICE SPECIFICATIONS

STANDARD BOLT SS–1
CLUTCH SS–4
MANUAL TRANSAXLE (C50, C250) SS–6
MANUAL TRANSAXLE (E351) SS–10
MANUAL TRANSAXLE (S54, S55) SS–15
AUTOMATIC TRANSAXLE (A246E) SS–19
AUTOMATIC TRANSAXLE (U240E) SS–23
SUSPENSION AND AXLE SS–27
BRAKE SS–29
STEERING SS–30
BODY SS–32
AIR CONDITIONING SS–33

REFER TO FOLLOWING REPAIR MANUALS:

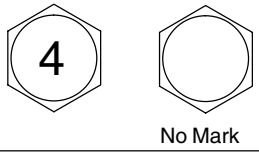
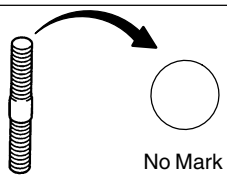
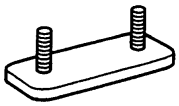
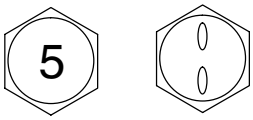
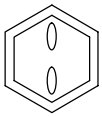
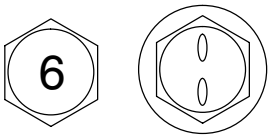
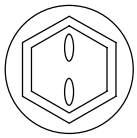
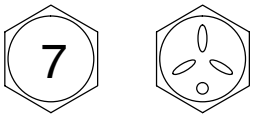
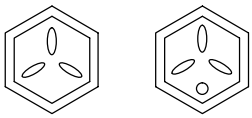
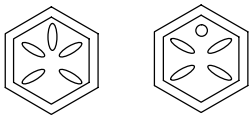
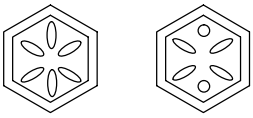
Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

NOTE: The above pages contain only the points which differ from the above listed manuals.

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS0ZS–01

Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
				4T
				5T
				6T
				7T
				8T
				9T
				10T
				11T

B06431

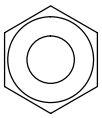
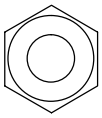
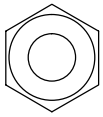
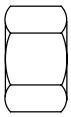
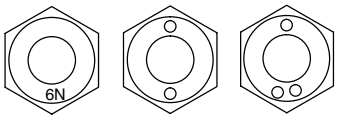
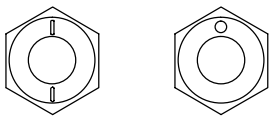
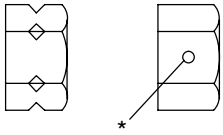
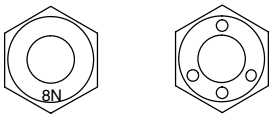
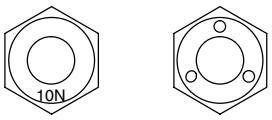
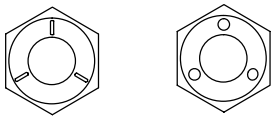
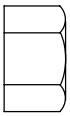
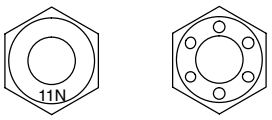
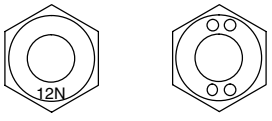
SS0ZT–01

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

SS0ZU–01

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

CLUTCH

SS02L–03

SERVICE DATA

Pedal height from asphalt sheet	3ZZ–FE LHD	139.7 – 149.7 mm (5.500 – 5.894 in.)
	RHD	144.3 – 154.3 mm (5.681 – 6.075 in.)
	1ZZ–FE Engine LHD	139.7 – 149.7 mm (5.500 – 5.894 in.)
	RHD	144.3 – 154.3 mm (5.681 – 6.075 in.)
	1AZ–FSE Engine LHD	148.3 – 158.3 mm (5.893 – 6.232 in.)
	RHD	152.9 – 162.9 mm (6.020 – 6.413 in.)
Pedal freeplay		1.0 – 5.0 mm (0.039 – 0.197 in.)
Push rod play at pedal top		5.0 – 15.0 mm (0.197 – 0.591 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Disc rivet head depth	Min.	0.3 mm (0.012 in.)
Disc runout	Max.	0.8 mm (0.031 in.)
Flywheel runout	Max	0.1 mm (0.004 in.)
Diaphragm spring finger wear	Max. depth	0.5 mm (0.020 in.)
Diaphragm spring finger wear	Max. width	6.0 mm (0.236 in.)
Diaphragm spring tip non–alignment	Max.	0.5 mm (0.020 in.)

SS02M–03

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Clutch line union		15	155	11
Master cylinder installation nut		12	120	9
Master cylinder x Clutch accumulator	1CD–FTV Engine RHD	32 (44)	330 (450)	24 (33)
Clutch cover x Flywheel		19	195	14
Release fork support	1ZZ–FE, 3ZZ–FE Engine	37	375	27
	Others Engine	39	400	29

( ): For use without SST

MANUAL TRANSAXLE (C50, C250)

SS02P–06

SERVICE DATA

Input shaft roller bearing journal diameter	Min.	24.985 mm (0.9834 in.)
Input shaft 3rd gear journal diameter	Min.	30.985 mm (1.2199 in.)
Input shaft 4th gear journal diameter	Min.	28.985 mm (1.1411 in.)
Input shaft 5th gear journal diameter	Min.	24.885 mm (0.9797 in.)
Input shaft runout	Max.	0.03 mm (0.0012 in.)
Output shaft roller bearing journal diameter	Min.	32.985 mm (1.2986 in.)
Output shaft 1st gear journal diameter	Min.	37.985 mm (1.4955 in.)
Output shaft 2nd gear journal diameter	Min.	31.985 mm (1.2592 in.)
Output shaft runout	Max.	0.03 mm (0.0012 in.)
Gear thrust clearance 1st	STD Max.	0.10 – 0.40 mm (0.0039 – 0.0157 in.) 0.40 mm (0.0157 in.)
Gear thrust clearance 2nd	STD Max.	0.10 – 0.45 mm (0.0039 – 0.0177 in.) 0.45 mm (0.0177 in.)
Gear thrust clearance 3rd	STD Max.	0.10 – 0.35 mm (0.0039 – 0.0138 in.) 0.35 mm (0.0138 in.)
Gear thrust clearance 4th	STD Max.	0.10 – 0.55 mm (0.0039 – 0.0217 in.) 0.55 mm (0.0022 in.)
Gear thrust clearance 5th	STD Max.	0.10 – 0.57 mm (0.0039 – 0.0244 in.) 0.57 mm (0.0224 in.)
Gear radial clearance 1st, 2nd, 3rd, 4th, and 5th (KOYO made)	STD Max.	0.015 – 0.058 mm (0.0006 – 0.0023 in.) 0.058 mm (0.0023 in.)
Gear radial clearance 1st, 2nd, 3rd, 4th, and 5th (NSK made)	STD Max.	0.015 – 0.056 mm (0.0006 – 0.0022 in.) 0.056 mm (0.0022 in.)
No. 3 gear shift fork to No. 3 hub sleeve clearance	Max.	0.5 mm (0.020 in.)
No. 2 gear shift fork to No. 2 hub sleeve clearance	Max.	0.35 mm (0.014 in.)
No. 1 gear shift fork to reverse gear clearance	Max.	0.35 mm (0.014 in.)
Synchronizer ring to gear clearance 1st, 4th and 5th	Min.	0.75 mm (0.0295 in.)
Synchronizer ring to gear clearance 3rd	Min.	0.65 mm (0.0256 in.)
Synchronizer ring to gear clearance 2nd	Min.	0.70 mm (0.0276 in.)
Drive in depth		
Control shaft cover oil seal		1.0 – 2.0 mm (0.039 – 0.079 in.)
Transmission case oil seal		9.9 ± 0.3 mm (0.390 ± 0.012 in.)
Transaxle case oil seal		1.9 ± 0.3 mm (0.075 ± 0.012 in.)
Select inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.1 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.2 shift inner lever slotted spring pin		3.5 ± 0.5 mm (0.138 ± 0.020 in.)

Input shaft snap ring thickness		
No.2 clutch hub	Mark 0	2.30 mm (0.0906 in.)
	Mark 1	2.36 mm (0.0929 in.)
	Mark 2	2.42 mm (0.0953 in.)
	Mark 3	2.48 mm (0.0976 in.)
	Mark 4	2.54 mm (0.1000 in.)
	Mark 5	2.60 mm (0.1024 in.)
Rear bearing	Mark A	2.29 mm (0.0902 in.)
	Mark B	2.35 mm (0.0925 in.)
	Mark C	2.41 mm (0.0949 in.)
	Mark D	2.47 mm (0.0972 in.)
	Mark E	2.53 mm (0.0996 in.)
	Mark F	2.59 mm (0.1020 in.)
Output shaft snap ring thickness		
No.1 clutch hub	Mark A	2.50 mm (0.0984 in.)
	Mark B	2.56 mm (0.1008 in.)
	Mark C	2.62 mm (0.1031 in.)
	Mark D	2.68 mm (0.1055 in.)
	Mark E	2.74 mm (0.1079 in.)
	Mark F	2.80 mm (0.1102 in.)
No.3 clutch hub	Mark A	2.25 mm (0.0886 in.)
	Mark B	2.31 mm (0.0909 in.)
	Mark C	2.37 mm (0.0933 in.)
	Mark D	2.43 mm (0.0957 in.)
	Mark E	2.49 mm (0.0980 in.)
	Mark F	2.55 mm (0.1004 in.)
	Mark G	2.61 mm (0.1028 in.)
Differential side bearing preload (at starting)(For use with SST)		
	New bearing	0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
	Reused bearing	0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)
Differential pinion to side gear backlash		0.05 mm – 0.20 mm (0.0020 – 0.0079 in.)
Differential side gear thrust washer thickness		0.95 mm (0.0374 in.)
		1.00 mm (0.0394 in.)
		1.05 mm (0.0413 in.)
		1.10 mm (0.0433 in.)
		1.15 mm (0.0453 in.)
		1.20 mm (0.0472 in.)

Differential side bearing adjusting shim thickness	
Mark A	2.10 mm (0.0827 in.)
Mark B	2.15 mm (0.0846 in.)
Mark C	2.20 mm (0.0866 in.)
Mark D	2.25 mm (0.0886 in.)
Mark E	2.30 mm (0.0906 in.)
Mark F	2.35 mm (0.0925 in.)
Mark G	2.40 mm (0.0945 in.)
Mark H	2.45 mm (0.0965 in.)
Mark J	2.50 mm (0.0984 in.)
Mark K	2.55 mm (0.1004 in.)
Mark L	2.60 mm (0.1024 in.)
Mark M	2.65 mm (0.1043 in.)
Mark N	2.70 mm (0.1063 in.)
Mark P	2.75 mm (0.1083 in.)
Mark Q	2.80 mm (0.1102 in.)
Mark R	2.85 mm (0.1122 in.)
Mark S	2.90 mm (0.1142 in.)
Mark T	2.95 mm (0.1161 in.)
Mark U	3.00 mm (0.1181 in.)

SS02Q–07

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Clutch release cylinder x Transaxle		12	120	9
Starter x Transaxle		39	400	29
Transaxle x Engine		64	650	47
Stiffener plate set bolt (See page MX–3)	Bolt B	47	480	35
	Bolt A	23	230	17
Engine left mounting bracket x Transaxle	Bolt A	52	530	38
	Nut B	87	890	64
Front wheel		216	2,200	159
Filler and Drain plugs		39	400	29
Front exhaust pipe x Exhaust manifold		62	630	46
Center exhaust pipe x Tail exhaust pipe		43	440	32
Front transport hook x Engine mounting center member		39	400	29
Engine mounting center member (See page MX–3)	Bolt A	73	740	54
	Bolt B	72	730	53
Engine rear mounting bracket x Insulator		87	890	64
Transmission case x Transaxle case		29	300	22
Transmission case x Transmission case cover		18	185	13
Straight screw plug (Reverse restrict pin)		13	130	9
Straight screw plug		25	250	18
Transaxle case receiver x Transaxle case		11	115	8
Differential case x Ring gear		77	790	57
Transaxle case x Differential case		29	300	22
Reverse shift arm bracket set bolt		17	175	13
No.1, No.2, No.3 shift forks and shift head set bolt		16	160	12
Lock ball assembly (Reverse shift fork side)		39	400	29
Lock ball assembly (Shift and select lever shaft side)		29	300	22
Reverse idler gear shaft lock bolt		29	300	22
Rear bearing retainer x Transmission case		27	280	20
5th driven gear lock nut		118	1,200	87
Control shaft cover x Transmission case		20	200	14
Control shift lever x Dust boot		12	120	9
Selecting bellcrank assembly x Transaxle case		25	250	18
Control shaft assembly x Transaxle case		12	120	9
Oil receiver pipe set bolt		17	175	13
Control cable bracket x Transmission case		25	250	18
Back–up light switch		40	410	30
Speed sensor lock plate set bolt		11	115	8
Clutch release fork support		37	375	27

MANUAL TRANSAXLE (E351)

SERVICE DATA

SS0G6–06

Input shaft		
3rd & 4th gear journal diameter	Min.	35.984 mm (1.4167 in.)
5th gear journal diameter	Min.	27.957 mm (1.1007 in.)
Runout	Max.	0.03 mm (0.0012 in.)
Output shaft		
1st gear journal diameter	Min.	37.610 mm (1.4807 in.)
2nd gear journal diameter	Min.	34.502 mm (1.3583 in.)
Runout	Max.	0.03 mm (0.0012 in.)
Gear thrust clearance		
1st	Max.	0.40 mm (0.0157 in.)
	Min.	0.25 mm (0.0098 in.)
2nd & 3rd	Max.	0.35 mm (0.0138 in.)
	Min.	0.10 mm (0.0039 in.)
4th	Max.	0.57 mm (0.0224 in.)
	Min.	0.10 mm (0.0039 in.)
5th	Max.	0.65 mm (0.0256 in.)
	Min.	0.10 mm (0.0039 in.)
Gear radial clearance		
1st, 2nd & 3rd	MAX.	0.053 mm (0.0021 in.)
4th	MAX.	0.051 mm (0.0020 in.)
5th	MAX.	0.050 mm (0.0020 in.)
No.3 shift fork to hub sleeve clearance	Max.	0.35 mm (0.014 in.)
No.2 shift fork to hub sleeve clearance	Max.	0.69 mm (0.027 in.)
No.1 shift fork to hub sleeve clearance	Max.	0.35 mm (0.014 in.)
Synchronizer ring to gear clearance		
1st & 2nd	Min.	0.70 mm (0.028 in.)
3rd	Min.	0.65 mm (0.026 in.)
4th	Min.	0.75 mm (0.030 in.)
5th	Min.	1.25 mm (0.049 in.)
Drive in depth		
Control shaft cover oil seal		0 – 1.0 mm (0 – 0.039 in.)
Transmission case oil seal		3.5 ± 0.5 mm (0.138 ± 0.020 in.)
Transaxle case oil seal		0± 0.5 mm (0 ± 0.020 in.)
Select inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.1 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.2 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
Input shaft snap ring thickness	Mark	
No.2 clutch hub	H	2.30 mm (0.0906 in.)
	J	2.35 mm (0.0925 in.)
	K	2.40 mm (0.0945 in.)
	L	2.45 mm (0.0965 in.)
	M	2.50 mm (0.0984 in.)
	N	2.55 mm (0.1004 in.)
	P	2.60 mm (0.1024 in.)

Input shaft snap ring thickness	Mark	
No.3 clutch hub	a	1.75 mm (0.0689 in.)
	b	1.80 mm (0.0709 in.)
	c	1.85 mm (0.0729 in.)
	d	1.90 mm (0.0748 in.)
	e	1.95 mm (0.0768 in.)
	f	2.00 mm (0.0787 in.)
	g	2.05 mm (0.0807 in.)
	h	2.10 mm (0.0827 in.)
	j	2.15 mm (0.0847 in.)
Ball bearing	1	2.35 mm (0.0925 in.)
	2	2.40 mm (0.0945 in.)
	3	2.45 mm (0.0965 in.)
	4	2.50 mm (0.0984 in.)
	5	2.55 mm (0.1004 in.)
	6	2.60 mm (0.1024 in.)
	7	2.65 mm (0.1043 in.)
	8	2.70 mm (0.1063 in.)
Differential pinion to side gear backlash	STD	0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Differential side gear thrust washer thickness		
		1.00 mm (0.0394 in.)
		1.10 mm (0.0433 in.)
		1.20 mm (0.0472 in.)
		1.30 mm (0.0512 in.)
Differential case side bearing preload (at starting)		
New bearing (Output shaft preload plus)		0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Reused bearing (Output shaft preload plus)		0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)
Differential side bearing adjusting shim thickness	Mark	
	0	2.00 mm (0.0787 in.)
	1	2.05 mm (0.0807 in.)
	2	2.10 mm (0.0827 in.)
	3	2.15 mm (0.0846 in.)
	4	2.20 mm (0.0866 in.)
	5	2.25 mm (0.0886 in.)
	6	2.30 mm (0.0906 in.)
	7	2.35 mm (0.0925 in.)
	8	2.40 mm (0.0945 in.)
	9	2.45 mm (0.0965 in.)
	A	2.50 mm (0.0984 in.)
	B	2.55 mm (0.1004 in.)
	C	2.60 mm (0.1024 in.)
	D	2.65 mm (0.1043 in.)
	E	2.70 mm (0.1063 in.)
	F	2.75 mm (0.1083 in.)
	G	2.80 mm (0.1102 in.)
	H	2.85 mm (0.1122 in.)

Output shaft bearing preload (at starting)		
New bearing		0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Reused bearing		0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)
Output shaft rear bearing adjusting shim thickness	Mark	
	0	1.30 mm (0.0512 in.)
	1	1.35 mm (0.0531 in.)
	2	1.40 mm (0.0551 in.)
	3	1.45 mm (0.0571 in.)
	4	1.50 mm (0.0591 in.)
	5	1.55 mm (0.0610 in.)
	6	1.60 mm (0.0630 in.)
	7	1.65 mm (0.0650 in.)
	8	1.70 mm (0.0669 in.)
	9	1.75 mm (0.0689 in.)
	A	1.80 mm (0.0709 in.)
	B	1.85 mm (0.0728 in.)
	C	1.90 mm (0.0748 in.)
	D	1.95 mm (0.0768 in.)
	E	2.00 mm (0.0787 in.)
	F	2.05 mm (0.0807 in.)
	G	2.10 mm (0.0827 in.)
	H	2.15 mm (0.0846 in.)
	J	2.20 mm (0.0866 in.)
	K	2.25 mm (0.0886 in.)
	L	2.30 mm (0.0906 in.)
	M	2.35 mm (0.0925 in.)
	N	2.40 mm (0.0945 in.)
	P	2.45 mm (0.0965 in.)
	Q	2.50 mm (0.0984 in.)

SS0G7–08

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Transaxle upper side x Engine	Bolt A	64	650	47
	Bolt B	25	296	21
Transaxle lower side x Engine	Bolt A	40	408	30
	Bolt B	40	408	30
	Bolt C	8	82	71 in.·lbf
	Bolt D	20	204	15
	Bolt E	46	470	34
Diesel throttle body x Engine unit		21	214	15
No.1 air tube assembly x Engine unit		25	255	18
Diesel throttle body with No.2 air tube assembly x Engine unit		25	255	18
Engine front mounting x Engine front mounting bracket		87	890	64
Engine front mounting x Transaxle		64	650	47
Engine rear mounting x Engine rear mounting bracket		98	1,000	72
Engine rear mounting x Transaxle		64	650	47
Starter x Starter wire		15	153	11
Starter x Transaxle		39	400	29
Transmission case protector x Transmission		18	185	13
Clutch release cylinder x Clutch housing		12	120	9
Clutch line bracket x Transaxle	Bolt A	12	120	9
(See page MX–4)	Bolt B	4.9	50	43 in.·lbf
Engine left mounting x Bracket		87	890	64
Engine left mounting Bracket x Transaxle		52	530	38
Front wheel		103	1,050	76
Front exhaust pipe x Exhaust manifold		62	630	46
Front exhaust pipe x Center exhaust pipe		43	440	32
Engine rear mounting x Center member		73	740	54
Engine rear mounting bracket x Body		64	650	47
Engine rear mounting bracket x Engine rear mounting		87	890	64
Engine front mounting x Center member		52	540	38
Engine front mounting bracket x Transaxle		64	650	47
Engine front mounting bracket x Engine front mounting		87	890	64
Front transport hook x Center member		39	400	29
Engine mounting center member x Body		73	740	54
No.2 selecting bellcrank with selecting bellcrank support		20	200	14
Lock ball assembly		29	300	22
Shift and select lever shaft assembly x Transmission case		20	200	14
Transmission case cover x Transmission case		29	300	22
Breather plug		49	500	36
Output shaft lock nut		123	1,250	90
Shift fork and shift head set bolt		24	240	17
Rear bearing retainer x Transmission case		42	430	31
Straight screw plug		25	250	18
Straight screw plug (Reverse restrict pin)		13	130	9
Reverse idler gear shaft lock bolt		29	300	22
Transmission case x Transaxle case		29	300	22

Reverse shift arm bracket assembly x Transaxle case	17	175	13
Transaxle case receiver x Transaxle case	7.4	75	65 in.·lbf
Clutch release fork support	39	400	29
Control cable bracket x Transaxle case	17	175	13
Vehicle speed sensor	17	175	13
Clutch release line bracket x Transaxle case	17	175	13
Back–up light switch	40	410	30
Filler and drain plugs	49	500	36
No.1 and No.2 oil receiver pipes x Transmission case	17	175	13
Ring gear set bolt	106	1,080	78
Shift lever assembly x Body	12	120	9
Retainer x Body	4.9	50	43 in.·lbf
Grommet retainer x Body	4.9	50	43 in.·lbf

MANUAL TRANSAXLE (S54, S55)

SS09M–04

SERVICE DATA

Input shaft roller bearing journal diameter	Min.	29.987 mm (1.181 in.)
Input shaft 3rd gear journal diameter	Min.	33.100 mm (1.3031 in.)
Input shaft 4th gear journal diameter	Min.	32.484 mm (1.2789 in.)
Input shaft 5th gear journal diameter	Min.	26.987 mm (1.0625 in.)
Input shaft runout	Max.	0.03 mm (0.0012 in.)
Output shaft roller bearing journal diameter	Min.	31.984 mm (1.2592 in.)
Output shaft 1st gear journal diameter	Min.	37.987 mm (1.4956 in.)
Output shaft 2nd gear journal diameter	Min.	32.002 mm (1.2599 in.)
Output shaft runout	Max.	0.05 mm (0.0020 in.)
Gear thrust clearance 1st	Max. Min.	0.29 mm (0.0114 in.) 0.10 mm (0.0039 in.)
Gear thrust clearance 2nd	Max. Min.	0.34 mm (0.0134 in.) 0.10 mm (0.0039 in.)
Gear thrust clearance 3rd	Max. Min.	0.35 mm (0.0138 in.) 0.10 mm (0.0039 in.)
Gear thrust clearance 4th	Max. Min.	0.45 mm (0.0177 in.) 0.10 mm (0.0039 in.)
Gear thrust clearance 5th	Max. Min.	0.57 mm (0.0224 in.) 0.10 mm (0.0039 in.)
Gear radial clearance 1st, 2nd, 3rd and 4th	Max. Min.	0.051 mm (0.0020 in.) 0.009 mm (0.0004 in.)
Gear radial clearance 5th	Max. Min.	0.048 mm (0.0019 in.) 0.009 mm (0.0004 in.)
Shift fork to hub sleeve clearance	Max.	0.4 mm (0.016 in.)
Synchronizer ring to gear clearance 1st and 4th	Min.	0.75 mm (0.030 in.)
Synchronizer ring to gear clearance 2nd	Min.	0.7 mm (0.028 in.)
Synchronizer ring to gear clearance 3rd	Min.	0.65 mm (0.026 in.)
Differential case side bearing preload (at starting)(For use with SST)		1.0 – 1.6 N·m (10 – 16 kgf·cm, 8.7 – 13.9 in.·lbf)
Differential pinion to side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Drive in depth Input shaft front oil seal Slotted spring pin for reverse restrict pin Shift and select lever shaft slotted spring pin		 0 – 0.5 mm (0 – 0.020 in.) 13.5 ± 0.5 mm (0.531 ± 0.020 in.) 23.5 ± 1.0 mm (0.925 ± 0.039 in.)
Differential side gear thrust washer thickness		0.95 mm (0.0374 in.) 1.00 mm (0.0394 in.) 1.05 mm (0.0413 in.) 1.10 mm (0.0433 in.) 1.15 mm (0.0453 in.) 1.20 mm (0.0472 in.)

Input shaft snap ring thickness		
No.2 clutch hub	Mark 1	1.95 – 2.00 mm (0.0768 – 0.0787 in.)
	Mark 2	2.00 – 2.05 mm (0.0787 – 0.0807 in.)
	Mark 3	2.05 – 2.10 mm (0.0807 – 0.0827 in.)
	Mark 4	2.10 – 2.15 mm (0.0827 – 0.0846 in.)
	Mark 5	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
	Mark 6	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
No.3 clutch hub	Mark 13	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
	Mark 14	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
	Mark 15	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
	Mark 16	2.35 – 2.40 mm (0.0925 – 0.0945 in.)
	Mark 17	2.40 – 2.45 mm (0.0945 – 0.0965 in.)
	Mark 18	2.45 – 2.50 mm (0.0965 – 0.0984 in.)
	Mark 19	2.50 – 2.55 mm (0.0984 – 0.01004 in.)
	Mark 20	2.55 – 2.60 mm (0.1004 – 0.01024 in.)
	Mark 21	2.60 – 2.65 mm (0.1024 – 0.01043 in.)
	Mark 22	2.65 – 2.70 mm (0.1043 – 0.01063 in.)
	Mark 23	2.70 – 2.75 mm (0.1063 – 0.01083 in.)
	Mark 24	2.75 – 2.80 mm (0.1083 – 0.01102 in.)
	Mark 25	2.80 – 2.85 mm (0.1102 – 0.01122 in.)
	Mark 26	2.85 – 2.90 mm (0.1122 – 0.01142 in.)
	Mark 27	2.90 – 2.95 mm (0.1142 – 0.01161 in.)
Rear bearing	Mark A	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
	Mark B	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
	Mark C	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
	Mark D	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
	Mark E	2.35 – 2.40 mm (0.0925 – 0.0945 in.)
Differential side bearing adjusting shim thickness		
	Mark 1	1.90 mm (0.0748 in.)
	Mark 2	1.95 mm (0.0768 in.)
	Mark 3	2.00 mm (0.0787 in.)
	Mark 4	2.05 mm (0.0807 in.)
	Mark 5	2.10 mm (0.0827 in.)
	Mark 6	2.15 mm (0.0846 in.)
	Mark 7	2.20 mm (0.0866 in.)
	Mark 8	2.25 mm (0.0886 in.)
	Mark 9	2.30 mm (0.0906 in.)
	Mark 10	2.35 mm (0.0925 in.)
	Mark 11	2.40 mm (0.0945 in.)
	Mark 12	2.45 mm (0.0965 in.)
	Mark 13	2.50 mm (0.0984 in.)
	Mark 14	2.55 mm (0.1004 in.)
	Mark 15	2.60 mm (0.1024 in.)
	Mark 16	2.65 mm (0.1043 in.)
	Mark 17	2.70 mm (0.1063 in.)
	Mark 18	2.75 mm (0.1083 in.)
	Mark 19	2.80 mm (0.1102 in.)

SS09N–05

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Starter x Transaxle		39	400	29
Clutch release cylinder x Transaxle		12	120	9
Clutch line bracket x Transaxle (See page MX–3)	Bolt A	12	120	9
	Bolt B	4.9	50	43 in.·lbf
Engine left mounting bracket x Transaxle		52	530	38
Engine left mounting bracket x Insulator		87	890	64
Transaxle x Engine (See page MX–3)	Upper bolt	64	650	47
		25	250	18
Stiffener plate x Transaxle (See page MX–3)	Bolt A	43	440	32
	Bolt B	21	210	15
Front wheel		216	2,200	159
Filler and Drain plugs		49	500	36
Front exhaust pipe x Exhaust manifold		62	630	46
Front exhaust pipe x Center exhaust pipe		43	440	32
Front transport hook x Engine Mounting Center Member		39	400	29
Engine Mounting Center Member (See page MX–3)	Bolt A	73	740	54
	Bolt B	72	730	53
Engine rear mounting bracket x Insulator		87	890	64
Engine rear mounting bracket x Transaxle		64	650	47
Intake manifold stay		44	450	33
Shift lever assembly x Body		12	120	9
Shift cable grommet retainer x Body		4.9	50	43 in.·lbf
Transmission control cable bracket x Body		4.9	50	43 in.·lbf
Transmission case x Transaxle case		29	300	22
Transmission case x Case cover		29	300	22
Transmission case protector		18	185	13
Rear bearing retainer		42	430	31
Output shaft front bearing lock plate		18	185	13
Transaxle case receiver set bolt		7.4	75	65 in.·lbf
5th driven gear lock nut		123	1,250	90
No.3 shift fork x No.1 shift fork shaft		18	185	13
Reverse idler shaft lock bolt		29	300	22
Shift and select lever aseembly		37	375	27
Control shift lever x Lever shaft		6.4	65	56 in.·lbf
Ring gear x Differential case		83	850	61
Selecting bellcrank x Transmission case		37	380	27
Reverse shift arm bracket		18	185	13
No.3 shift fork x Shift fork shaft		18	185	13
Lock ball assembly		29	300	22
Back–up light switch		44	450	33
Differential side bearing retainer		18	185	13
Release bearing retainer		7.4	75	65 in.·lbf
Straight screw plug		13	130	9

Speed sensor lock plate set bolt	5.4	55	48 in.·lbf
Clutch release fork support	47	480	35

AUTOMATIC TRANSAXLE (A246E)

SS0YH–02

SERVICE DATA

Line pressure (Wheel locked)		
	Engine idling	
	D range	372 – 441 kPa (3.8 – 4.5 kgf/cm^2, 54 – 64 psi)
	R range	598 – 716 kPa (6.1 – 7.3 kgf/cm^2, 87 – 104 psi)
	at stall (Throttle valve fully opened)	
	D range	981 – 1,138 kPa (10.0 – 11.6 kgf/cm^2, 142 – 165 psi)
	R range	1,392 – 1,726 kPa (14.2 – 17.6 kgf/cm^2, 202 – 250 psi)
Engine stall revolution		
	D and R range	2,500 ± 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	700 ± 50 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter runout	Max.	0.30 mm (0.0118 in.)
Torque converter correct distance		More than 15.5 mm (0.610 in.)
Differential oil seal drive in depth		
	LH side	5.3 ± 0.5 mm (0.209 ± 0.020 in.)
	RH side	3.1 ± 0.5 mm (0.122 ± 0.020 in.)
LHD		
Shift schedule (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	120 – 132 km/h (75 – 82 mph)
	3 → 2	64 – 71 km/h (40 – 44 mph)
	2 → 1	20 – 25 km/h (12 – 16 mph)
(Kick–down Switch ON)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	146 –159 km/h (91 – 99 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
(Throttle valve fully closed)	3 → 4	32 – 38 km/h (20 – 24 mph)
	4 → 3	14 – 20 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 1	38 – 44 km/h (24 – 27 mph)
(Kick–down Switch ON)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	45 – 51 km/h (28 – 32 mph)

Shift schedule (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	142 – 155 km/h (88 – 96 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	38 – 44 km/h (24 – 27 mph)
(Kick–down Switch ON)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
(Throttle valve fully closed)	3 → 4	32 – 38 km/h (20 – 24 mph)
	4 → 3	14 – 20 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 1	38 – 44 km/h (24 – 27 mph)
(Kick–down Switch ON)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	45 – 51 km/h (28 – 32 mph)
Shift schedule (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	120 – 132 km/h (75 – 82 mph)
	3 → 2	64 – 71 km/h (40 – 44 mph)
(Kick–down Switch ON)	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
(Throttle valve fully closed)	3 → 4	32 – 38 km/h (20 – 24 mph)
	4 → 3	14 – 20 km/h (9 – 12 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5%)	
3rd Gear (O/D main switch OFF)	Lock–up ON	52 – 59 km/h (32 – 37 mph)
	Lock–up OFF	49 – 56 km/h (30 – 35 mph)
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 68 km/h (38 – 42 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5%)	
3rd Gear (O/D main switch OFF)	Lock–up ON	55 – 62 km/h (34 – 39 mph)
	Lock–up OFF	52 – 59 km/h (32 – 37 mph)
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 68 km/h (38 – 42 mph)
Lock–up point (SNOW mode)	(Throttle valve opening 5%)	
3rd Gear (O/D main switch OFF)	Lock–up ON	52 – 59 km/h (32 – 37 mph)
	Lock–up OFF	49 – 56 km/h (30 – 35 mph)
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 68 km/h (38 – 42 mph)

RHD		
Shift schedule (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
(Throttle valve fully closed)	3 → 4	32 – 38 km/h (20 – 24 mph)
	4 → 3	14 – 20 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	45 – 51 km/h (28 – 32 mph)
Shift schedule (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
(Throttle valve fully closed)	3 → 4	32 – 38 km/h (20 – 24 mph)
	4 → 3	14 – 20 km/h (9 – 12 mph)
2 range		
(Throttle valve fully opened)	1 → 2	50 – 58 km/h (31 – 36 mph)
	2 → 1	42 – 48 km/h (26 – 30 mph)
L range		
(Throttle valve fully opened)	2 → 1	45 – 51 km/h (28 – 32 mph)
Shift schedule (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	95 – 103 km/h (59 – 64 mph)
	3 → 4	151 – 164 km/h (94 – 102 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
(Throttle valve fully closed)	3 → 4	32 – 38 km/h (20 – 24 mph)
	4 → 3	14 – 20 km/h (9 – 12 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5%)	
3rd Gear (O/D main switch OFF)	Lock–up ON	52 – 59 km/h (32 – 37 mph)
	Lock–up OFF	49 – 56 km/h (30 – 35 mph)
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 68 km/h (38 – 42 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5%)	
3rd Gear (O/D main switch OFF)	Lock–up ON	55 – 62 km/h (34 – 39 mph)
	Lock–up OFF	52 – 59 km/h (32 – 37 mph)
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 68 km/h (38 – 42 mph)
Lock–up point (SNOW mode)	(Throttle valve opening 5%)	
3rd Gear (O/D main switch OFF)	Lock–up ON	52 – 59 km/h (32 – 37 mph)
	Lock–up OFF	49 – 56 km/h (30 – 35 mph)
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 68 km/h (38 – 42 mph)

SS0YI–02

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Drain plug x Transaxle case		17	175	13
Oil pan set bolt		5.3	55	48 in.·lbf
Oil strainer set bolt		10	100	7
Valve body set bolt		10	100	7
Detent spring		10	100	7
Neutral start switch x Transaxle case		5.4	55	48 in.·lbf
Neutral start switch lock nut		6.9	70	61 in.·lbf
Control cable x Control shift lever		12	120	9
Air cleaner assembly set bolt		5.0	50	43 in.·lbf
Engine mounting bracket LH	Through bolt : Set bolt :	87 52	890 530	64 38
Starter		39	400	29
Transaxle x Engine		64	650	47
Exhaust front pipe x Exhaust manihold		43	440	32
Center member protector set bolt		39	400	29
Center member set bolt	A bolt : B bolt :	73 35	740 360	54 26
Starter connector set bolt		10	100	7
Control cable bracket x Transaxle		12	120	9
Engine rear mounting bracket	Through bolt : Set bolt :	87 64	890 650	64 48
Torque converter x Drive plate		28	290	21
Engine x Transaxle	Lower side : A bolt : B bolt :	 46 23	 470 230	 34 17
Ground cable x Transaxle		18	185	13
Suction hose (RHD) x Center member		35	360	26

AUTOMATIC TRANSAXLE (U240E)

SS18S–02

SERVICE DATA

Line pressure (Wheel locked)		
	Engine idling	
	D range	372 – 412 kPa (3.8 – 4.2 kgf/cm^2, 54 – 59 psi)
	R range	640 – 742 kPa (6.5 – 7.6 kgf/cm^2, 93 – 107 psi)
	at stall (Throttle valve fully opened)	
	D range	931 – 1,031 kPa (9.5 – 10.5 kgf/cm^2, 134 – 149 psi)
	R range	1,768 – 1,968 kPa (18.0 – 20.1 kgf/cm^2, 255 – 286 psi)
Engine stall revolution	D and R range	2,550 ± 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	700 ± 50 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter runout	Max.	0.30 mm (0.0118 in.)
Torque converter installation distance		More than 13.4 mm (0.528 in.)
Differential oil seal drive in depth	LH side	2.7 ± 0.5 mm (0.106 ± 0.020 in.)
	RH side	0 ± 0.5 mm (0 ± 0.020 in.)
LHD		
Shift schedule (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	116 – 128 km/h (72 – 80 mph)
	3 → 2	67 – 74 km/h (42 – 46 mph)
(Kick–down Switch ON)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	146 –159 km/h (91 – 99 mph)
	3 → 2	92 – 99 km/h (57 – 62 mph)
	2 → 1	46 – 52 km/h (29 – 32 mph)
(Throttle valve fully closed)	3 → 4	35 – 41 km/h (22 – 25 mph)
	4 → 3	16 – 21 km/h (10 – 13 mph)
2 range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	3 → 2	99 – 106 km/h (62 – 66 mph)
(Kick–down Switch ON)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 1	46 – 52 km/h (29 – 32 mph)
L range		
(Throttle valve fully opened)	3 → 2	99 – 106 km/h (62 – 66 mph)
	2 → 1	48 – 54 km/h (30 – 34 mph)

Shift schedule (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	81 – 88 km/h (50 – 55 mph)
	2 – 1	46 – 52 km/h (29 – 32 mph)
(Kick–down Switch ON)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	146 –159 km/h (91 – 99 mph)
	3 → 2	92 – 99 km/h (57 – 62 mph)
	2 → 1	46 – 52 km/h (29 – 32 mph)
(Throttle valve fully closed)	3 → 4	35 – 41 km/h (22 – 25 mph)
	4 → 3	17 – 23 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	3 → 2	99 – 106 km/h (62 – 66 mph)
	2 → 1	46 – 52 km/h (29 – 32 mph)
(Kick–down Switch ON)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 1	46 – 52 km/h (29 – 32 mph)
L range		
(Throttle valve fully opened)	3 → 2	99 – 106 km/h (62 – 66 mph)
	2 → 1	48 – 54 km/h (30 – 34 mph)
Shift schedule (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	116 – 128 km/h (72 – 80 mph)
	3 → 2	67 – 74 km/h (42 – 46 mph)
(Kick–down Switch ON)	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	146 –159 km/h (91 – 99 mph)
	3 → 2	92 – 99 km/h (57 – 62 mph)
(Throttle valve fully closed)	3 → 4	35 – 41 km/h (22 – 25 mph)
	4 → 3	16 – 21 km/h (10 – 13 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5%)	
O/D gear	Lock–up ON	58 – 64 km/h (36 – 40 mph)
	Lock–up OFF	54 – 60 km/h (34 – 37 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5%)	
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 67 km/h (38 – 42 mph)

RHD		
Shift schedule (NORM mode)		
D range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	92 – 99 km/h (57 – 62 mph)
	2 → 1	46 – 52 km/h (29 – 32 mph)
(Throttle valve fully closed)	3 → 4	35 – 41 km/h (22 – 25 mph)
	4 → 3	16 – 21 km/h (10 – 13 mph)
2 range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	3 → 2	99 – 10 km/h (62 – 66 mph)
L range		
(Throttle valve fully opened)	3 → 2	99 – 107 km/h (62 – 66 mph)
	2 → 1	48 – 54 km/h (30 – 34 mph)
Shift schedule (PWR mode)		
D range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	92 – 99 km/h (57 – 62 mph)
	2 → 1	46 – 52 km/h (29 – 32 mph)
(Throttle valve fully closed)	3 → 4	35 – 41 km/h (22 – 25 mph)
	4 → 3	17 – 23 km/h (11 – 14 mph)
2 range		
(Throttle valve fully opened)	1 → 2	53 – 60 km/h (33 – 37 mph)
	3 → 2	99 – 107 km/h (62 – 66 mph)
L range		
(Throttle valve fully opened)	3 → 2	99 – 107 km/h (62 – 66 mph)
	2 → 1	48 – 54 km/h (30 – 34 mph)
Shift schedule (SNOW mode)		
D range		
(Throttle valve fully opened)	2 → 3	99 – 107 km/h (62 – 66 mph)
	3 → 4	154 – 166 km/h (96 – 103 mph)
	4 → 3	146 – 159 km/h (91 – 99 mph)
	3 → 2	92 – 99 km/h (57 – 62 mph)
(Throttle valve fully closed)	3 → 4	35 – 41 km/h (22 – 25 mph)
	4 → 3	16 – 21 km/h (10 – 13 mph)
Lock–up point (NORM mode)	(Throttle valve opening 5%)	
O/D gear	Lock–up ON	58 – 64 km/h (36 – 40 mph)
	Lock–up OFF	54 – 60 km/h (34 – 37 mph)
Lock–up point (PWR mode)	(Throttle valve opening 5%)	
O/D gear	Lock–up ON	64 – 71 km/h (40 – 44 mph)
	Lock–up OFF	61 – 67 km/h (38 – 42 mph)

SS0YI–03

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Input turbine speed sensor x Transaxle case		11.3	115	8
Counter gear speed sensor x Transaxle case		11.3	115	8
ATF Temperature sensor x Valve body		6.6	67	58 in.·lbf
Oil strainer x Valve body		10.8	110	8
Oil pan x Transaxle case		7.8	80	69 in.·lbf
Drain plug		49	500	36
Neutral start switch x Transaxle	Bolt: Nut:	5.4 6.9	55 70	48 in.·lbf 61 in.·lbf
Shaft lever x Body		12	120	9
Shift control cable x Control shaft lever		13	130	9
Solenoid valve x Valve body (See page AX–8)	Bolt A: Bolt B:	6.6 10.8	67 110	58 in.·lbf 8
Valve body x Transaxle case		10.8	110	8
Air cleaner assembly set bolt		5.0	50	43 in.·lbf
Engine mounting bracket LH	Through bolt : Set bolt :	87 52	890 530	64 38
Starter		39	400	29
Transaxle x Engine	Upper side :	64	650	47
Exhaust front pipe x Exhaust manihold		62	630	46
Center member protector set bolt		39	400	29
Center member set bolt	A bolt : B bolt :	73 35	740 360	54 26
Starter connector set bolt		10	100	7
Control cable bracket x Transaxle		12	120	9
Engine rear mounting bracket	Through bolt : Set bolt :	87 64	890 650	64 48
Torque converter x Drive plate		41	420	30
Engine x Transaxle	Lower side :	46	470	34
Solenoid valve x Valve body	A bolt : B bolt :	6.6 11	67 110	58 in.·lbf 8
Ground cable x Transaxle		18	185	13
Suction hose (RHD) x Center member		35	360	26

SUSPENSION AND AXLE

SERVICE DATA

SS0IY–03

Front drive shaft	Drive shaft standard length		
	1ZZ–FE engine (M/T)	RH	943.60 ± 1.0 mm (37.15 ± 0.039 in.)
		LH	657.90 ± 0.8 mm (25.90 ± 0.032 in.)
	1ZZ–FE engine (A/T)	RH	943.60 ± 1.0 mm (37.15 ± 0.039 in.)
		LH	653.20 ± 0.8 mm (25.72 ± 0..032 in.)
	3ZZ–FE engine	RH	944.70 ± 0.8 mm (37.19 ± 0.032 in.)
		LH	655.70 ± 0.8 mm (25.82 ± 0.032 in.)
	1AZ–FSE engine	RH	922.65 ± 1.0 mm (36.32 ± 0.039 in.)
		LH	650.85 ± 0.7 mm (25.62 ± 0.028 in.)

SS0IZ–03

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
FRONT:			
Steering knuckle x Shock absorber	255	2,600	188
Suspension support x Body	80	820	59
Suspension support x Piston rod	47	475	34
ABS speed sensor set bolt	8.0	82	71 in.·lbf
ABS speed sensor wire harness clamp x Shock absorber	5.5	55	48 in.·lbf
Flexible hose x Shock absorber bracket	29	300	22

BRAKE

SS0FS–06

SERVICE DATA

Brake pedal height (from asphalt sheet)	LHD	147.0 – 157.0 mm (5.787 – 6.181 in.)
	RHD	149.5 – 159.5 mm (5.886 – 6.280 in.)
Brake pedal freeplay		1 – 6 mm (0.04 – 0.24 in.)
Brake pedal reserve distance at 490 N (50 kgf, 110.2 lbf)		
	LHD Gasoline engine (w/o ABS)	More than 70 mm (2.76 in.)
	LHD Others	More than 55 mm (2.17 in.)
	RHD Gasoline engine (w/o ABS)	More than 90 mm (3.54 in.)
	RHD Others	More than 75 mm (2.95 in.)

STEERING

SERVICE DATA

SS0IF–03

POWER STEERING FLUID		
Oil level rise	Maximum	5 mm (0.20 in.)
1ZZ–FE, 3ZZ–FE Engines:		
Oil pressure at idle speed with valve closed	Minimum	8,300 kPa (85 kgf/cm^2, 1,209 psi)
1AZ–FSE Engine:		
Oil pressure at idle speed with valve closed	Minimum	8,800 kPa (90 kgf/cm^2, 1,280 psi)
POWER STEERING VANE PUMP (1ZZ–FE, 3ZZ–FE)		
Vane pump rotating torque		0.27 N·m (2.8 kgf·cm, 2.4 in.·lbf) or less
Vane pump shaft and front housing bushing oil clearance	STD Maximum	0.021 – 0.043 mm (0.0008 – 0.0017 in.) 0.07 mm (0.0028 in.)
Vane plate height	Minimum	7.6 mm (0.299 in.)
Vane plate thickness	Minimum	1.405 mm (0.0553 in.)
Vane plate length	Minimum	11.993 mm (0.4722 in.)
Vane plate and vane pump rotor groove clearance	Maximum	0.03 mm (0.0012 in.)
Vane plate length	pump rotor and cam ring mark	
	0	12.001 – 12.003 mm (0.47248 – 0.47256 in.)
	1	11.999 – 12.001 mm (0.47240 – 0.47248 in.)
	2	11.997 – 11.999 mm (0.47232 – 0.47240 in.)
	3	11.995 – 11.997 mm (0.47224 – 0.47232 in.)
	4	11.993 – 11.995 mm (0.47216 – 0.47224 in.)
Spring free length	Minimum	35.8 mm (1.409 in.)
POWER STEERING VANE PUMP (1AZ–FSE)		
Vane pump rotating torque		0.27 N·m (2.8 kgf·cm, 2.4 in.·lbf) or less
Vane pump shaft and front housing bushing oil clearance	STD Maximum	0.021 – 0.043 mm (0.0008 – 0.0017 in.) 0.07 mm (0.0028 in.)
Vane plate height	Minimum	7.6 mm (0.299 in.)
Vane plate thickness	Minimum	1.405 mm (0.0553 in.)
Vane plate length	Minimum	11.993 mm (0.4722 in.)
Vane plate and vane pump rotor groove clearance	Maximum	0.03 mm (0.0012 in.)
Vane plate length	pump rotor and cam ring mark	
	0	12.001 – 12.003 mm (0.47248 – 0.47256 in.)
	1	11.999 – 12.001 mm (0.47240 – 0.47248 in.)
	2	11.997 – 11.999 mm (0.47232 – 0.47240 in.)
	3	11.995 – 11.997 mm (0.47224 – 0.47232 in.)
	4	11.993 – 11.995 mm (0.47216 – 0.47224 in.)
Spring free length	Minimum	35.8 mm (1.409 in.)

*: For use with belt tension gauge

SS0IG–03

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
TILT STEERING COLUMN			
Steering column assembly set bolt and nut	25.5	260	19
Control valve shaft x Yoke	35	360	26
Steering wheel set nut	50	510	37
Steering wheel pad set screw (Torx screw)	8.8	90	78 in.·lbf
POWER STEERING VANE PUMP (1ZZ–FE, 3ZZ–FE)			
Rear housing set bolt	22	220	16
Pressure port union x Front housing	69	700	51
Suction port union set bolt	12	120	9
Oil pressure switch	21	210	15
PS vane pump assembly set nut	37	370	27
Pressure feed tube x PS vane pump assembly	37(44)	375(450)	27(33)
Pressure feed tube x Rear bracket	7.8	80	69 in.·lbf
POWER STEERING VANE PUMP (1AZ–FSE)			
Rear housing set bolt	22	220	16
Pressure port union x Front housing	69	700	51
Suction port union set bolt	12	120	9
Oil pressure switch	21	210	15
PS vane pump assembly set bolt	50	510	37
Pressure feed tube x PS vane pump assembly	52	530	38

( ): For use without SST

BODY

TORQUE SPECIFICATION

SS0BN–02

Part tightened	N·m	kgf·cm	ft·lbf
FRONT BUMPER			
Bumper reinforcement x Body	20	205	15

AIR CONDITIONING

SS038–06

SERVICE DATA

Refrigerant volume	460 ± 20 g (16.23 ±0.71 oz.)

SS050–07

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Compressor bracket	25	250	18
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Condenser x Liquid tube	5.5	55	48 in.·lbf
Condenser x Discharge hose	5.5	55	48 in.·lbf

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REFER TO FOLLOWING REPAIR MANUALS:

Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

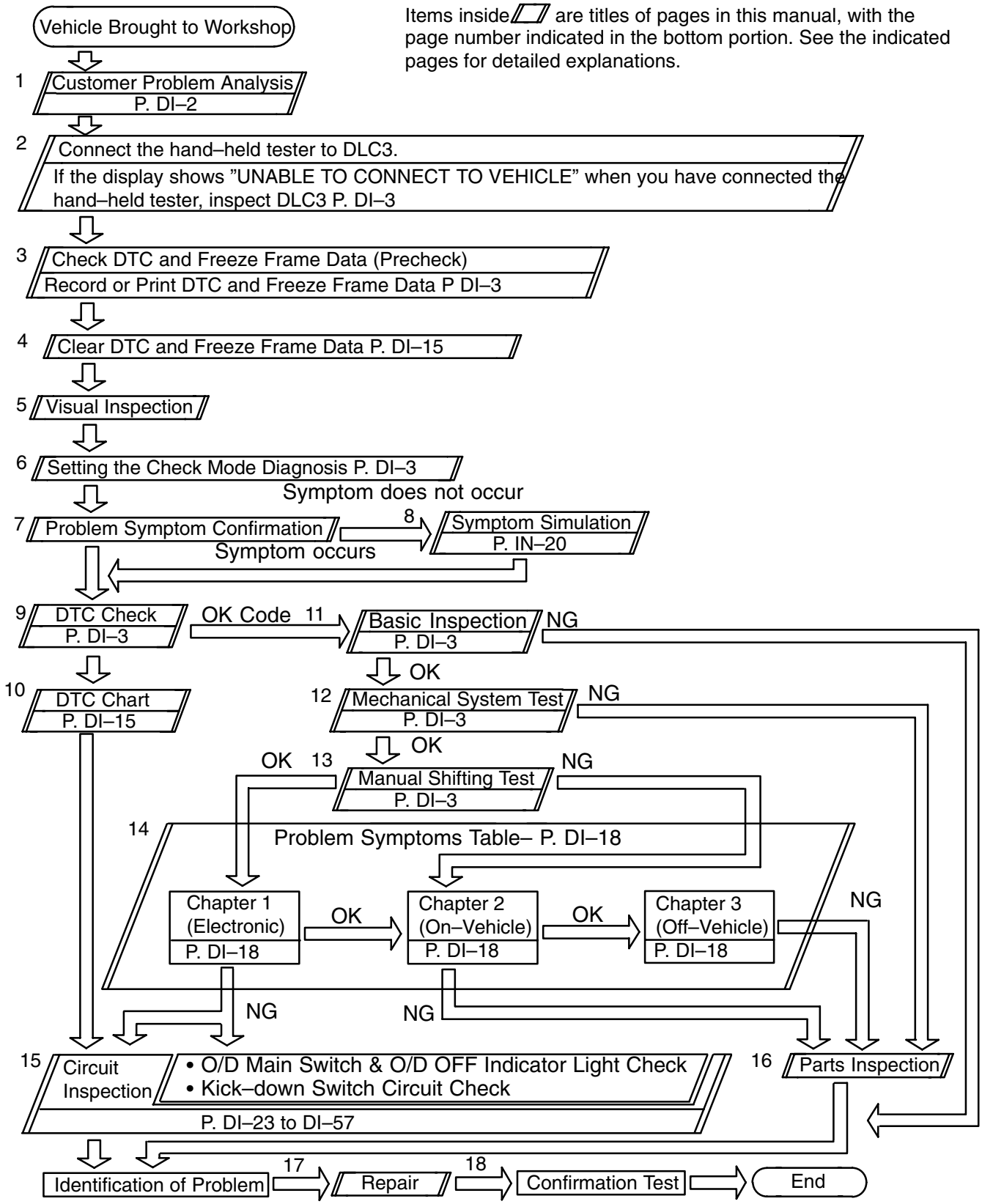
NOTE: The above pages contain only the points which differ from the above listed manuals.

AUTOMATIC TRANSAXLE (A246E)

HOW TO PROCEED WITH TROUBLESHOOTING

DI2L4–10

Items inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



DI2L5–04

CUSTOMER PROBLEM ANALYSIS CHECK

Transaxle 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?	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Vehicle does not move (☐ Any range ☐ Particular range)
	☐ No up–shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → O/D)
	☐ No down–shift (☐ O/D → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)
	☐ Lock–up malfunction
	☐ Shift point too high or too low
	☐ Harsh engagement (☐ N → D ☐ Lock–up ☐ Any drive range)
	☐ Slip or shudder
	☐ No kick–down
	☐ Others ( )

Check Item	Malfunction Indicator Light	☐ Normal ☐ Remains ON

DTC Check	1st Time	☐ Normal code	☐ Malfunction code (Code)
	2nd Time	☐ Normal code	☐ Malfunction code (Code)

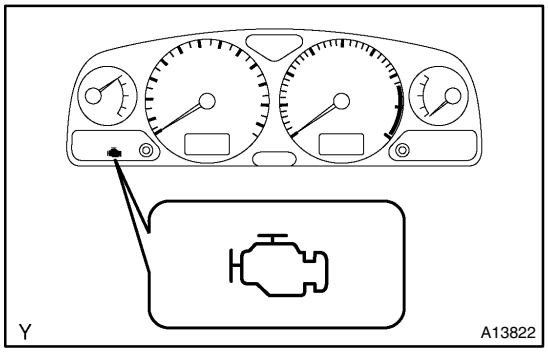
DI80A–01

PRE–CHECK

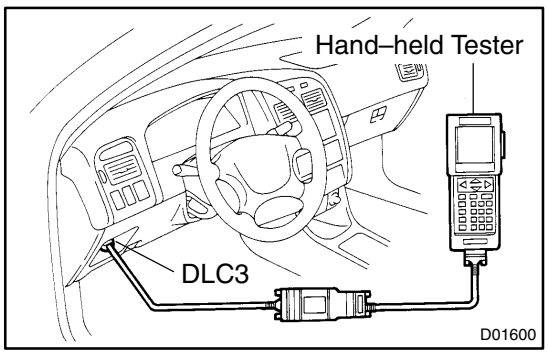
1. DIAGNOSIS SYSTEM

(a) Description

- When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect an OBD scan tool complying with ISO15031–4 or hand–held tester to the vehicle, and read off various data output from the vehicle's engine and ECT ECU.

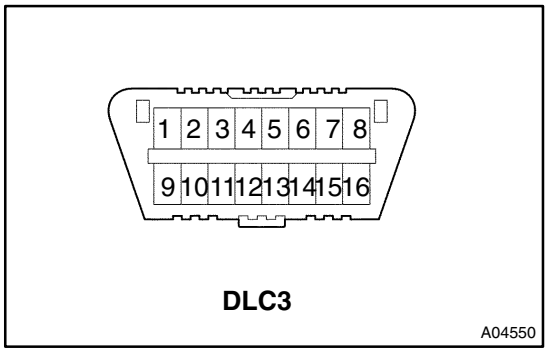


- Euro–OBD regulations require that the vehicle's on–board computer lights up the check engine warning light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components which affect vehicle emissions. In addition to the CHK ENG lighting up when a malfunction is detected, the applicable DTCs prescribed by ISO15031–6 are recorded in the engine and ECT ECU memory (See page DI–15).
  If the malfunction only occurs in 3 trips, the CHK ENG goes off but the DTCs remain recorded in the engine and ECT ECU memory.



- To check the DTCs, connect an OBD scan tool or hand–held tester to the Data Link Connector (DLC3) on the vehicle. The OBD scan tool or hand–held tester also enables you to erase the DTCs and check freeze frame data and various forms of engine data (For 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 DI–15).

- The diagnosis system operates in normal mode during normal vehicle use, and also has a check mode for technicians to simulate malfunction symptoms and perform troubleshooting. Most DTCs use 2 trip detection logic(*) to prevent erroneous detection. By switching the engine and ECT ECU to check mode when troubleshooting, the technician can cause the CHK ENG to light up and for a malfunction that is only detected once or momentarily. (hand–held tester) (See page DI–3)
- *2 trip detection logic:
  When a logic malfunction is first detected, the malfunction is temporarily stored in the engine and ECT ECU memory. If the same malfunction is detected again during the 2nd test drive, this 2nd detection causes the CHK ENG to light up .



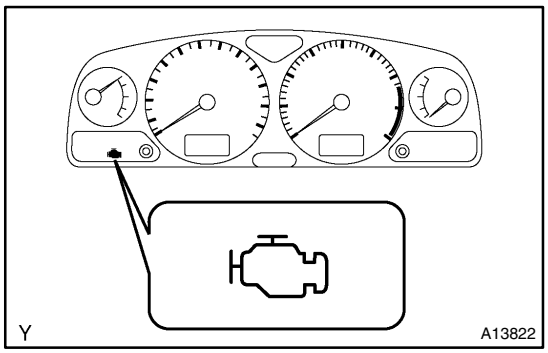
DLC3

(b) Inspect the DLC3.
The vehicle's engine and ECT ECU uses ISO 9141–2 for communication. The terminal arrangement of DLC3 complies with ISO15031–3 and matches the ISO 9141–2 format.

Tester connection	Condition	Specified condition
7 (Bus ⊕ Line) – 5 (Signal ground)	During communication	Pulse generation
4 (Chassis Ground) – Body	Always	1 Ω or less
16 (B+) – Body	Always	9 – 14 V

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

- If communication is normal when the tool is connected to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when the tool is connected 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. INSPECT DIAGNOSIS (Normal Mode)

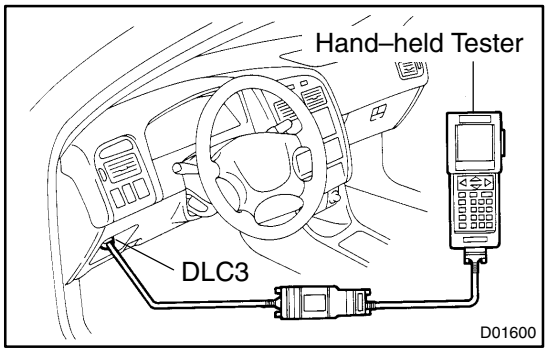
(a) Check the CHK ENG.

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

HINT:

If the CHK ENG does not light up, troubleshoot the combination meter (See page BE–1).

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



(b) Check the DTC.

NOTICE:

Hand–held tester only: When the diagnostic system is switched from the normal mode to the check 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) Prepare an OBD scan tool or hand–held tester.

(2) Connect the OBD scan tool or hand–held tester to the DLC3 at the lower of the instrument panel.

(3) Turn the ignition switch ON and push the OBD scan tool or hand–held tester switch ON.

(4) Use the OBD scan tool or hand–held tester to check the DTCs and freeze frame data and note them down (For operating instructions, see the OBD scan tool's instruction book).

(5) See page DI–15 to confirm the details of the DTCs.

NOTICE:

When simulating symptoms with an OBD scan tool (excluding 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 1st time. Then repeat the simulation process again. When the problem has been simulated twice, the CHK ENG is indicated on the instrument panel and DTCs are recorded in the engine and ECT ECU.

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 the check mode.

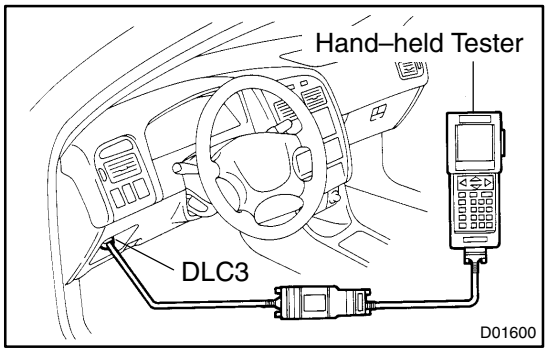
(a) Check the DTC.

(1) Check the initial conditions.

- Battery positive voltage 11 V or more.
- Throttle valve fully closed.
- Transaxle in P position.
- A/C switched off.

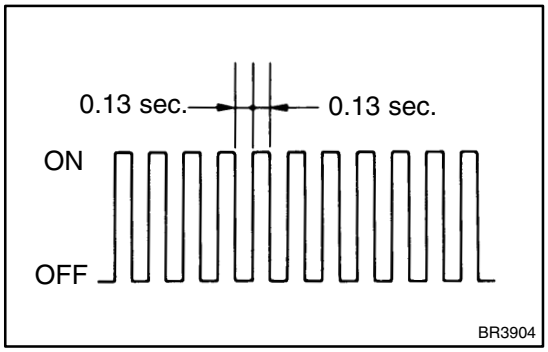
(2) Turn the ignition switch OFF.

(3) Prepare the hand–held tester.



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

(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 CHK ENG flashes).

(7) Start the engine (CHK ENG 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, so all DTCs, etc. are erased.

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

(b) Clear the DTC.
The following actions will erase the DTC and freezed frame data. Operating an OBD scan tool or hand–held tester to erase the codes (See the OBD scan tool's instruction book for operating instructions.).

4. PROBLEM SYMPTOM CONFIRMATION

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 SS–19).

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 SS–19).
(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 SS–19).

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.

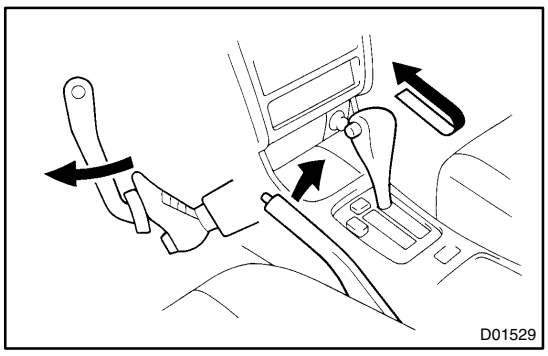
(d) R range test
Shift into the R range and fully depress the accelerator pedal and check for slipping.

CAUTION:
Before conducting this test ensure that the test area is free from people and obstruction.

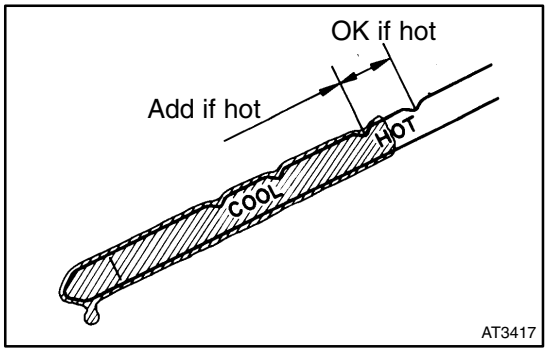
(e) P range test
Stop the vehicle on a grade (more than 5°) and after shifting into the P range, release the parking brake. Then, check to see that the parking lock pawl holds the vehicle in place.

6. BASIC INSPECTION

(a) 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.

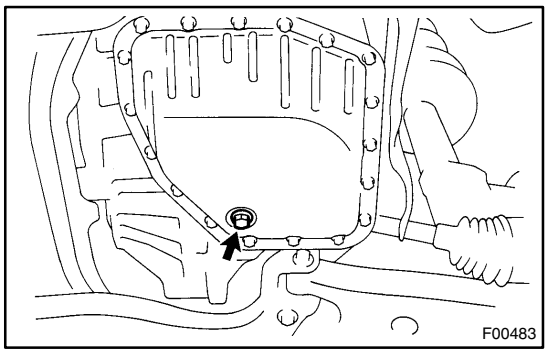


(5) Pull it out and check that the fluid level is in the HOT range.

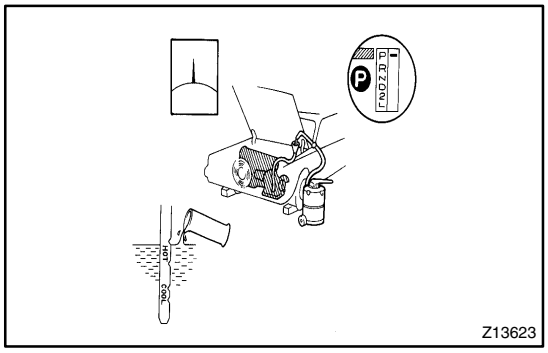
If the level is not within the range, add new fluid.
Fluid type: ATF Type D–II or DEXRON®III (DEXRON®II)

NOTICE:
Do not overfill.

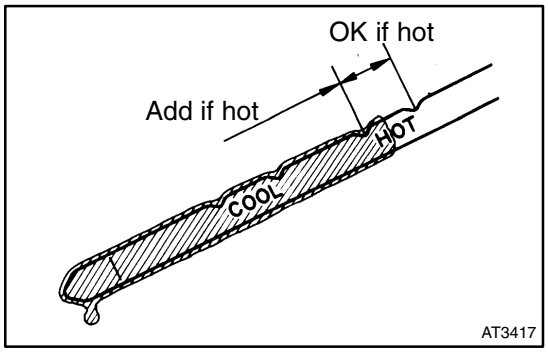
(b) Check the fluid condition.
If the fluid smells burnt or is black, replace it.



(c) Replace the ATF.
(1) Remove the drain plug and drain the fluid.
(2) Reinstall the drain plug securely.



(3) With the engine OFF add new fluid through the oil filler pipe.
Fluid type: ATF Type D–II or DEXRON®III (DEXRON®II)
Capacity: 3.1 liters (3.3 US qts, 2.7 Imp.qts)
(4) Start the engine and shift the shift lever into all ranges from P to L range and then shift into P range.

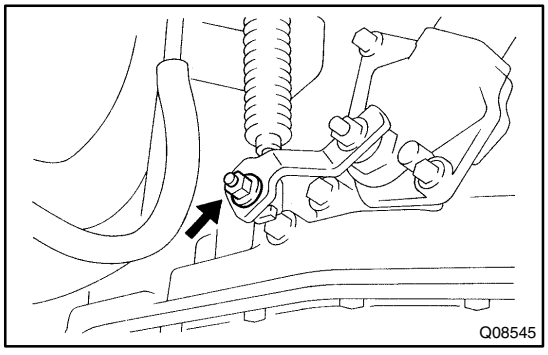


(5) With the engine idling, check the fluid level. Add fluid up to the COOL level on the dipstick.
(6) Check the fluid level at the normal operating temperature, 70 – 80 °C (158 – 176 °F), and add as necessary.

NOTICE:
Do not overfill.

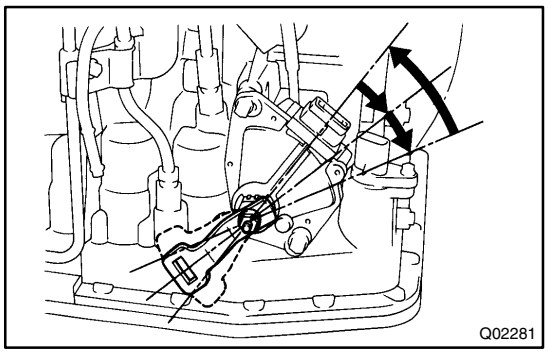
(d) Check the fluid leaks.
Check for leaks in the transaxle.

If there are leaks, it is necessary to repair or replace O–rings, FIPGs, oil seals, plugs or other parts.



(e) Inspect and adjust the shift lever range.
When shifting the shift lever from the N range to the other range, check that the lever can be shifted smoothly and accurately to each range and that the range indicator correctly indicates the range.

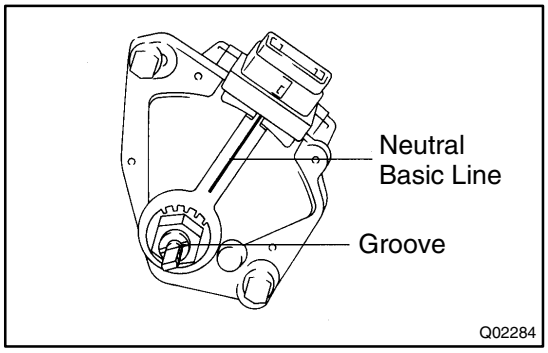
If the indicator is not aligned with the correct range, carry out the following adjustment procedures:
(1) Loosen the nut the control shaft lever.
(2) Push the control shaft lever fully downward.



(3) Return the control shaft lever 2 notches to the N range.
(4) Set the shift lever to N range.
(5) While holding the shift lever lightly toward the R range side, tighten the shift lever nut.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

(6) Start the engine and make sure that the vehicle moves forward when shifting the lever from the N to D range and reveres when shifting it to the R range.



(f) Inspect and adjustment the neutral start switch.
Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If not as started above, carry out the following adjustment procedures:

(1) Loosen the neutral start switch bolt and set the shift lever to the N range.
(2) Align the groove and the neutral basic line.
(3) Holding the shift selector, and tighten the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

HINT:
For continuity inspection of the neutral start switch, see page DI–45.

7. 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.
(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: 2,500 ± 150 rpm

(8) Do the same test in the R range.

Stall speed: 2,500 ± 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.
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.**

(1) Chock the 4 wheels.
(2) Connect a hand–held tester to DLC3.
(3) Start engine and check idle speed.
Idle speed: 700 ± 50 rpm (In N range and A/C OFF)
(4) 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
(5) 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

8. HYDRAULIC TEST

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 (See page AX–28 for the location to 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.

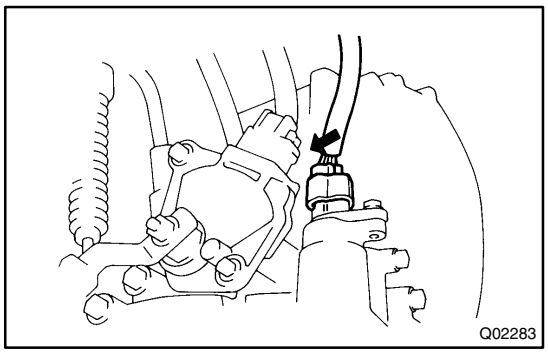
(9) In the same way, do the test in R range.

Specified line pressure:

Condition	D range kPa (kgf / cm^2, psi)	R range kPa (kgf / cm^2, psi)
Idling	372 – 441 (3.8 – 4.5, 54 – 64)	598 – 716 (6.1 – 7.3, 87 – 104)
Stall	981 – 1,138 (10.0 – 11.6, 142 – 165)	1,392 – 1,726 (14.2 – 17.6, 202 – 250)

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



9. 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 solenoid wire.

(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 solenoid wire.

(d) Cancel out the DTC.

DI1FQ-05

DIAGNOSTIC TROUBLE CODE CHART

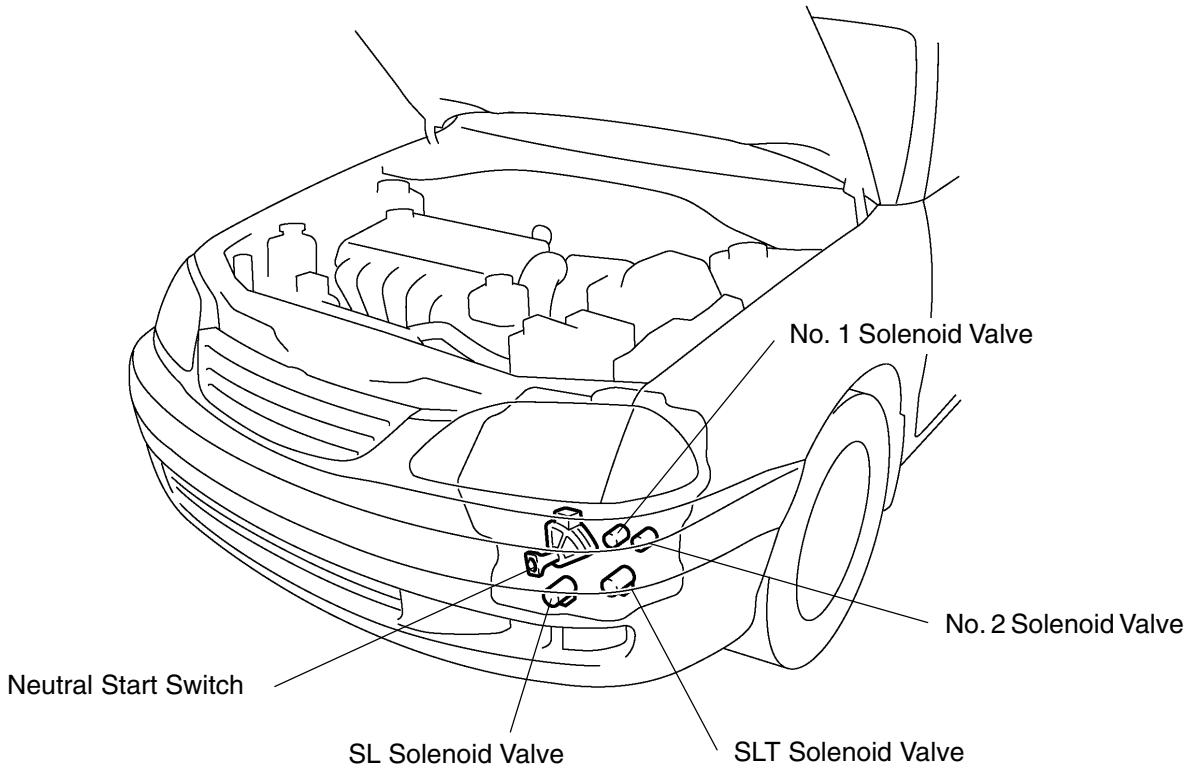
If a DTC is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the page given.

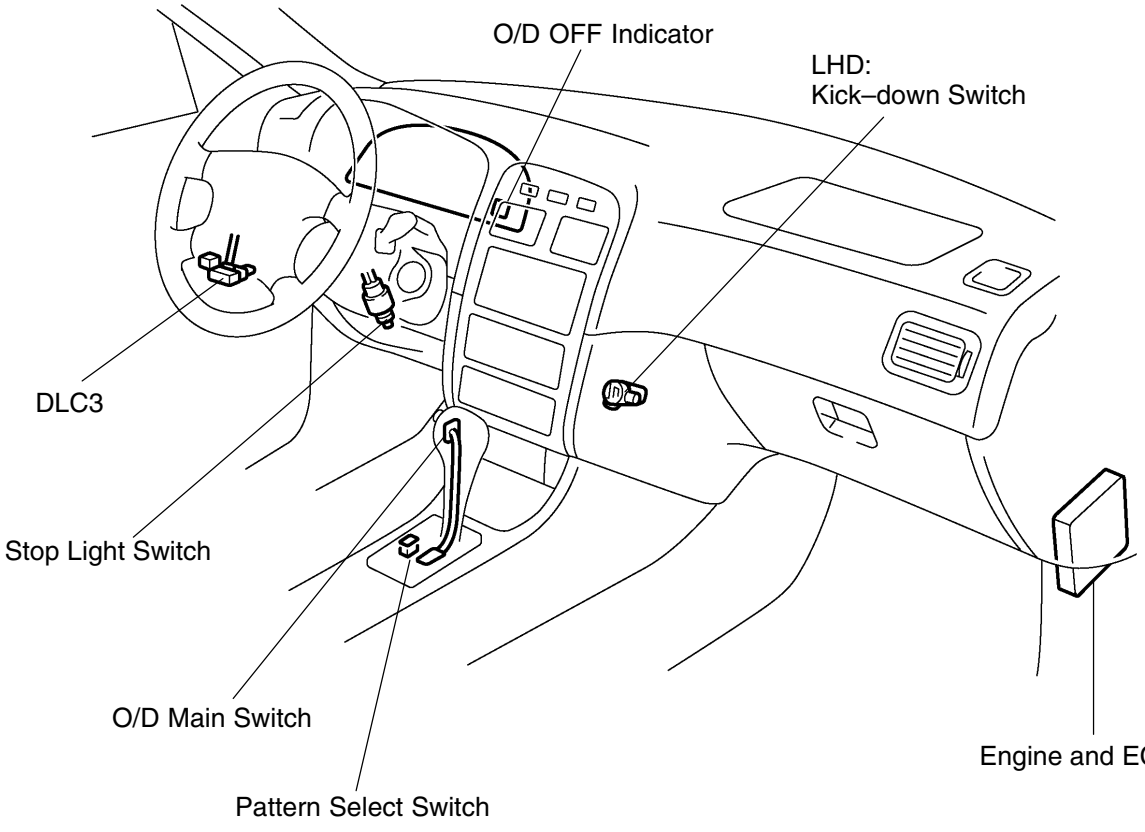
DTC No. (See Page)	Detection Item	Trouble Area	Check engine warning light *1	Memory *2
P0500 (DI–23)	Vehicle speed sensor malfunction	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combinationmeter • Engine and ECT ECU • Automatic transaxle (clutch, brake or gear etc.)	○	○
P0750 *3 (DI–26)	Shift solenoid "A" malfunction (No. 1 solenoid valve)	• No. 1 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transaxle (clutch, brake or gear etc.)	○	○
P0753 (DI–28)	Shift solenoid "A" electrical malfunction (No. 1 solenoid valve)	• Open or short in No. 1 solenoid valve circuit • No. 1 solenoid valve • Engine and ECT ECU	○	○
P0755 *3 (DI–26)	Shift solenoid "B" malfunction (No. 2 solenoid valve)	• No.2 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transaxle (clutch, brake or gear etc.)	○	○
P0758 (DI–28)	Shift solenoid "B" electrical malfunction (No. 2 solenoid valve)	• Open or short in No.2 solenoid valve circuit • No.2 solenoid valve • Engine and ECT ECU	○	○
P0770 *3 (DI–32)	Shift solenoid "E" malfunction (SL solenoid valve)	• SL solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Lock–up clutch • Automatic transaxle (clutch, brake or gear etc.)	○	○
P0773 (DI–34)	Shift solenoid "E" electrical malfunction (SL solenoid valve)	• Open or short in SL solenoid valve circuit • SL solenoid valve • Engine and ECT ECU	○	○
P1520 (DI–37)	Stop light switch signalmalfunction	• Open or short in stop light switch signal circuit • Stop light switch • Engine and ECT ECU	○	○
P1760 (DI–42)	Linear solenoid line pressure control circuit malfunction (SLT solenoid valve)	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine and ECU ECU	○	○
P1780 (DI–45)	Neutral start switch malfunction	• Short in neutral start switch circuit • Neutral start switch • Engine and ECT ECU	○	○

*1: "○" mark means Check engine warning light blinks once every 2 seconds.
"X" mark means Check engine warning light never blinks.
*2: "○" mark means Engine and ECT ECU memorizes the malfunction code if the Engine and ECT ECU detects the DTC detection condition.
*3: European spec. only

PARTS LOCATION

DI1FR–05





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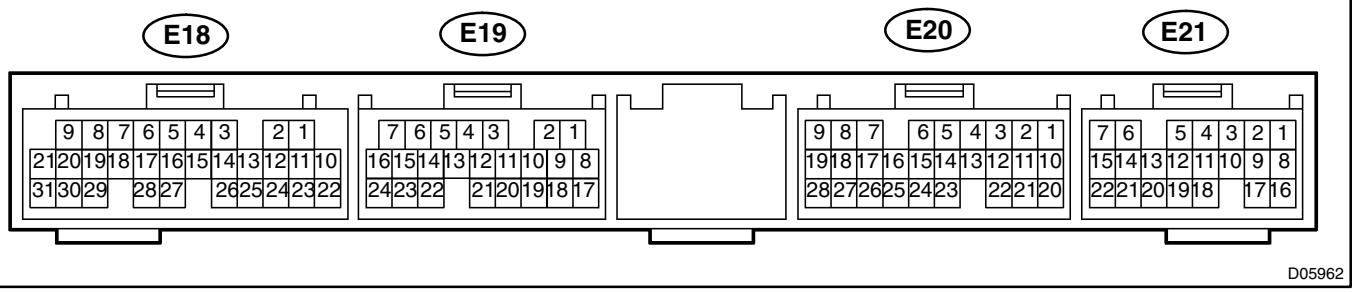
DI77O–02

TERMINALS OF ECU

Engine and ECT ECU Terminals



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
S1 (E18–8) – E1 (E19–17)	LG ↔ BR	IG ON	9 – 14
		1st or 2nd gear	9 – 4
		3rd or O/D gear	Below 1.5
S2 (E18–20) – E1 (E19–17)	V–W ↔ BR	IG ON	Below 1.5
		2nd or 3rd gear	9 – 4
		1st or O/D gear	Below 1.5
SL (E18–19) – E1 (E19–17)	P ↔ BR	IG ON	Below 1.5
		Vehicle driving under lock–up position	9 – 14
OD2 (E20–19) – E1 (E19–17)	L ↔ BR	O/D main switch ON (O/D OFF)	Below 3
		O/D main switch OFF (O/D ON)	9 – 14
L (E20–12) – E1 (E19–17)	Y–G ↔ BR	IG ON and Shift lever L range	7.5 – 14
		IG ON and Shift lever other than L range	Below 1.5
2 (E20–3) – E1 (E19–17)	O ↔ BR	IG ON and Shift lever 2 range	7.5 – 14
		IG ON and Shift lever other than 2 range	Below 1.5
R (E20–2) – E1 (E19–17)	R–B ↔ BR	IG ON and Shift lever R range	7.5 – 14
		IG ON and Shift lever other than R range	Below 1.5
NSW (E20–13) – E1 (E19–17)	B–W ↔ BR	IG ON and Shift lever P or N range	Below 3
		IG ON and Shift lever other than P or N range	9 –14
SLT^+ (E18–6) – SLT^- (E18–5)	LG–B ↔ P–B	IG ON	9 – 14
SPD (E20–22) – E1 (E19–17)	G ↔ BR	IG ON and rotate driving wheel slowly	Pulse generation
KD (E20–4) – E1 (E19–17)	Y ↔ BR	IG ON and accelerator pedal fully depressed	Below 1.5
		IG ON and accelerator pedal released	9 – 14
STP (E20–6) – E1 (E19–17)	G–W ↔ BR	IG ON and brake pedal depressed	9 – 14
		IG ON and brake pedal released	Below 1.5
PWR (E20–28) – E1 (E19–17)	P ↔ BR	IG ON and pattern select switch: PWR	9 – 14
		IG ON and pattern select switch: NORM	Below 1.5
SNWI (E20–16) – E1 (E19–17)	P–B ↔ BR	IG ON and SNOW mode switch: ON	9 – 14
		IG ON and SNOW mode switch: OFF	Below 1.5

DI1FT–06

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 tnto 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 eaxh 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 Engine and ECT ECU.

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)	Engine and ECT ECU	IN–30
No up–shift (3rd → O/D)	1. O/D main switch & O/D OFF indicator light circuit 2. Engine and ECT ECU	DI–49 IN–30
No down–shift (O/D → 3rd)	1. O/D main switch & O/D OFF indicator light circuit 2. Engine and ECT ECU	DI–49 IN–30
No down–shift (A particular gear, from 1st to 3rd gear, is not down–shifted)	Engine and ECT ECU	IN–30
No lock–up	Engine and ECT ECU	IN–30
No lock–up OFF	Engine and ECT ECU	IN–30
Shift point too high or too low	Engine and ECT ECU	IN–30
Up–shift to O/D from 3rd while O/D main switch is OFF	1. O/D main switch & O/D OFF indicator light circuit 2. Engine and ECT ECU	DI–49 IN–30
Up–shift to O/D from 3rd while engine is cold	Engine and ECT ECU	IN–30
No kick–down	1. Kick–down switch circuit 2. Engine and ECT ECU	DI–57 IN–30
Engine stalls when starting off or stopping	Engine and ECT ECU	IN–30

Chapter 2: On–vehicle repair
(★ : A245E automatic transaxle repair manual Pub. No. RM757E)

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. Primary regulator valve 2. Manual valve 3. Off–vehicle matrix chart	★ ★ –
No–up shift (1st → 2nd)	1. 1 – 2 shift valve 2. Off–vehicle matrix chart	★ –
No–up shift (2nd → 3rd)	1. 2 – 3 shift valve 2. Off–vehicle matrix chart	★ –
No–up shift (3rd → O/D)	1. 3 – 4 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (O/D → 3rd)	1. 3 – 4 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (3rd → 2nd)	1. 2 – 3 shift valve 2. Off–vehicle matrix chart	★ –
No–down shift (2nd → 1st)	1. 1 – 2 shift valve 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → R)	1. C_2 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → D)	1. C_1 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (N → L)	1. C_1 accumulator 2. Low coast modulator valve 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (1st → 2nd ”D” range)	1. Accumulator control valve 2. B_2 accumulator 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (1st → 2nd ”2” range)	1. B_2 accumulator 2. Accumulator control valve 3. 2nd coast modulator control 4. Off–vehicle matrix chart	★ ★ ★ –
Harsh engagement (1st → 2nd → 3rd → O/D)	Primary regulator valve	★
Harsh engagement (2nd → 3rd)	1. C_2 accumulator 2. Accumulator control valve 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (3rd → O/D)	1. B_2 accumulator 2. C_3 accumulator 3. Off–vehicle matrix chart	★ ★ –
Harsh engagement (O/D → 3rd)	1. B_4 accumulator 2. Off–vehicle matrix chart	★ –
Harsh engagement (3rd → 2nd)	1. C_2 accumulator 2. Off–vehicle matrix chart	★ –
Slip (Forward & Reverse)	1. Primary regulator valve 2. Oil strainer 3. Off–vehicle matrix chart	★ AX–4 –
Slip (”R” range, 1st, 2nd, 3rd, O/D)	Off–vehicle matrix chart	–

Symptom	Suspect Area	See page
No engine braking (1st "L" range)	1. Low coast modulator valve 2. Off–vehicle matrix chart	★ –
No engine braking (2nd "2" range)	1. 2nd coast modulator valve 2. Off–vehicle matrix chart	★ –
No kick down	1. 1 – 2 shift valve 2. 2 – 3 shift valve 3. 3 – 4 shift valve	★ ★ ★
Poor acceleration	1. Primary regulator valve 2. Off–vehicle matrix chart	★ –
No lock–up	1. Lock–up relay valve 2. Off–vehicle matrix chart	★ –

Chapter 3: Off–vehicle repair
(★ : A245E automatic transaxle repair manual Pub. No. RM757E)

Symptom	Suspect Area	See page
Does not move in any forward ranges	Forward clutch (C_1)	★
Does not move in reverse range	1. Direct clutch (C_2) 2. 1st and reverse brake (B_3) 3. U/D brake (B_4)	★ ★ ★
Does not move in any ranges	1. Torque converter 2. Oil pump 3. U/D one–way clutch (F_3) 4. Front planetary gear 5. Rear planetary gear	AX–33 ★ ★ ★ ★
No–up shift (1st → 2nd)	1. 2nd brake (B_2) 2. No.1 one–way clutch (F_1)	★ ★
No–up shift (2nd → 3rd)	Direct clutch (C_2)	★
No–up shift (3rd → O/D)	U/D clutch (C_3)	★
No–down shift (O/D → 3rd)	1. U/D brake (B_4) 2. U/D one–way clutch (F_3)	★ ★
No–down shift (3rd → 2nd)	No.1 one–way clutch (F_1)	★
No–down shift (2nd → 1st)	No.2 one–way clutch (F_2)	★
Harsh engagement (N → R)	1. Direct clutch (C_2) 2. 1st and reverse brake (B_3)	★ ★
Harsh engagement (N → D)	1. Forward clutch (C_1) 2. On–vehicle matrix chart	★ –
Harsh engagement (N → L)	Forward clutch (C_1)	★
Harsh engagement (1st → 2nd ”D” range)	1. 2nd brake (B_2) 2. No.1 one–way clutch (F_1)	★ ★
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)	★ ★ ★
Harsh engagement (2nd → 3rd)	Direct clutch (C_2)	★
Harsh engagement (3rd → O/D)	U/D clutch (C_3)	★
Harsh engagement (O/D → 3rd)	U/D brake (B_4)	★
Harsh engagement (3rd → 2nd)	Direct clutch (C_2)	★
Slip (Forward & Reverse)	1. Torque converter 2. Oil pump	AX–33 ★
Slip (”R” range)	1. Direct clutch (C_2) 2. 1st and reverse brake (B_3)	★ ★
Slip (1st)	1. Forward clutch (C_1) 2. No.2 one–way clutch (F_2) 3. U/D one–way clutch (F_3)	★ ★ ★

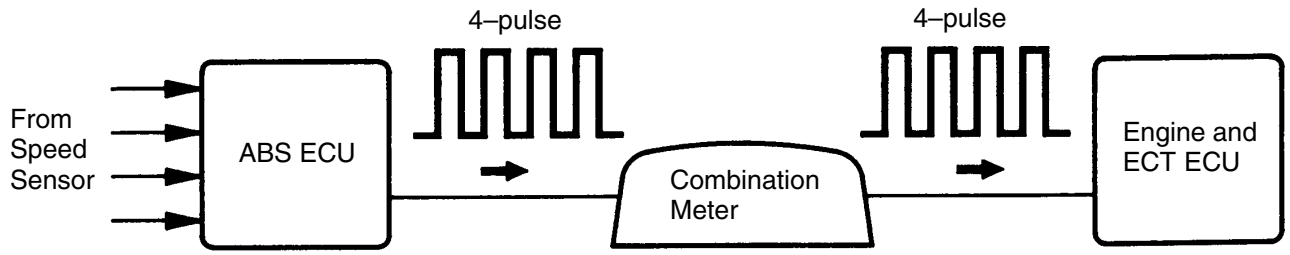
Symptom	Suspect Area	See page
Slip (2nd)	1. Forward clutch (C_1) 2. 2nd brake (B_2) 3. No.1 one–way clutch (F_1) 4. U/D one–way clutch (F_3)	★ ★ ★ ★
Slip (3rd)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D one–way clutch (F_3)	★ ★ ★
Slip (O/D)	1. Forward clutch (C_1) 2. Direct clutch (C_2) 3. U/D clutch (C_3)	★ ★ ★
No engine braking (1st ”L” range)	1st and reverse brake (B_3)	★
No engine braking (2nd ”2” range)	2nd coast brake (B_1)	★
Poor acceleration	1. Torque converter 2. Forward clutch (C_1)	AX–33 ★
No lock–up	Torque converter	AX–33
Engine stalls when starting off or stopping	Torque converter	AX–33

DI3VC–05

CIRCUIT INSPECTION

DTC	P0500	Speed Sensor Malfunction

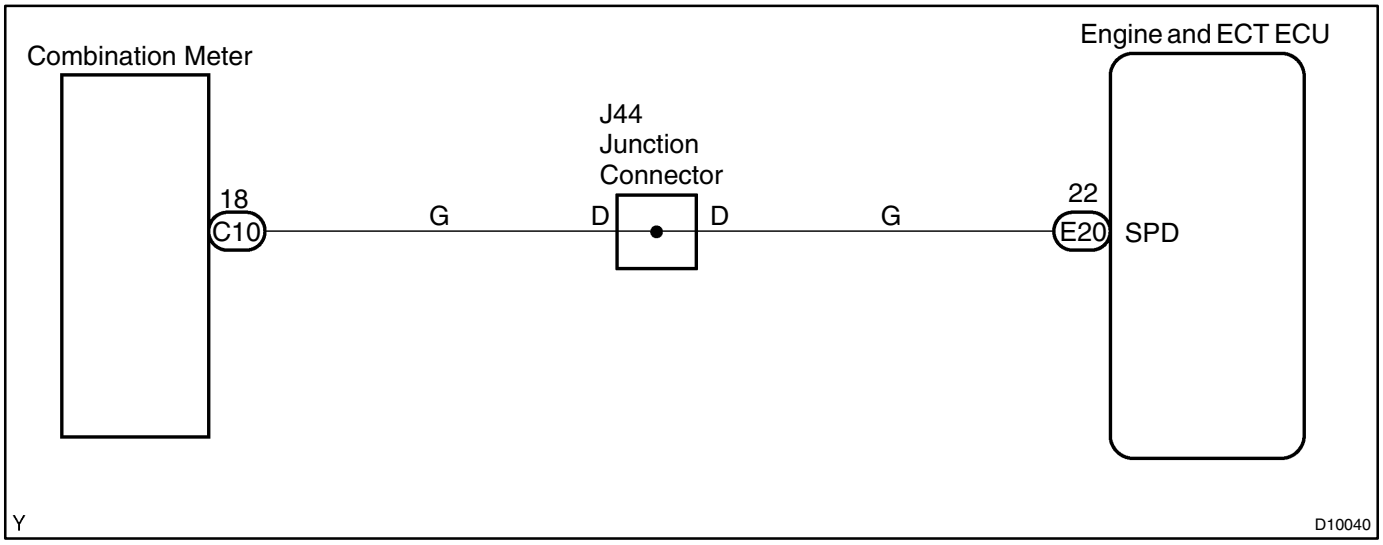
The No.1 speed sensor outputs a 4–pulse signal for every revolution of the transaxle output shaft. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the Engine and ECT ECU.



A00022

DTC No.	DTC Detecting Condition	Trouble Area
P0500	No vehicle speed sensor signal to Engine and ECT ECU during vehicle driving (2 trip detection logic)	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Engine and ECT ECU • Combination meter

WIRING DIAGRAM



INSPECTION PROCEDURE

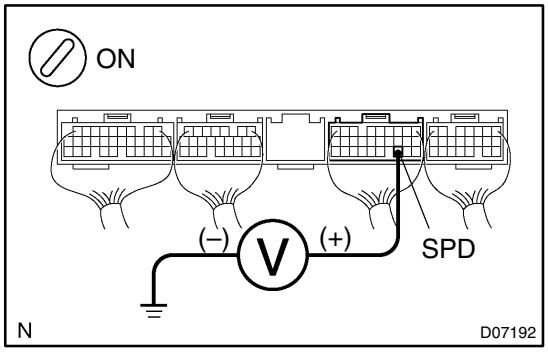
1	**Check operation of speedometer.**

CHECK:
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. See combination meter troubleshooting.**

OK

2	**Check voltage between terminal SPD of Engine and ECT ECU connector and body ground.**

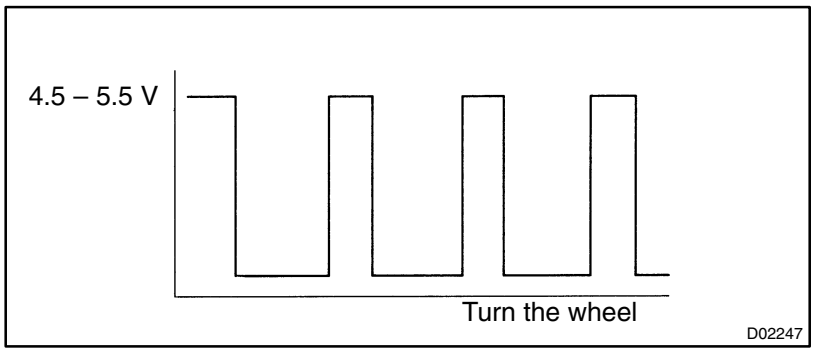


PREPARATION:
(a) Turn up the floor mat on the passenger side.
(b) Remove the 2 bolts for Engine and ECT ECU.
(c) Shift the shift lever to N range.
(d) Jack up one of the front wheels.
(e) Turn ignition switch ON.

CHECK:
Measure voltage between terminal SPD of Engine and ECT ECU connector and body ground when the wheel is turned slowly.

OK:

Voltage is generated intermittently.



NG → **Check and repair harness and connector between combination meter and Engine and ECT ECU.**

OK

3	**Check Engine and ECT ECU (See page IN–30).**

NG → **Replace Engine and ECT ECU.**

OK

Check and repair ABS system.

DTC	P0750, P0755	Shift Solenoid A/B Malfunction (No. 1/No. 2 Solenoid Valve)

SYSTEM DESCRIPTION

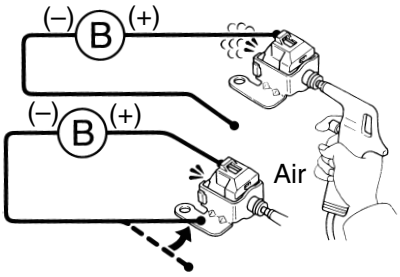
The Engine and ECT ECU uses signals from the vehicle speed sensor and crankshaft position sensor to detect the actual gear position (1st, 2nd, 3rd or O/D gear).
Then the Engine and ECT ECU compares the actual gear with the shift schedule in the Engine and ECT ECU memory to detect the mechanical trouble of the shift solenoid valves, the valve body or automatic transaxle (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0750 P0755	During normal driving, the gear required by the Engine and ECT ECU does not match the actual gear (2–trip detection logic)	• No. 1/No. 2 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transaxle (clutch, brake or gear etc.)

HINT:
Check the No. 1 solenoid valve when DTC P0750/62 is output and check the No. 2 solenoid valve when DTC P0755/63 is output.

INSPECTION PROCEDURE

1	Check No. 1 or No. 2 solenoid valve operation.



PREPARATION:
(a) Remove the oil pan.
(b) Remove the No. 1 or No. 2 solenoid valve .

CHECK:
(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak the air.
(b) When battery voltage is supplied to the shift solenoid valve, check that the valve opens.

OK:
(a) Solenoid valve does not leak air.
(b) Solenoid valve opens.

NG → **Replace the No. 1 or No. 2 solenoid valve.**

OK

2	**Check the valve body (See chapter 2 in the problem symptoms table).**

NG → **Repair or replace the valve body.**

OK

Repair the transaxle (See page AX–28).

DTC	P0753,P0758	Shift Solenoid A/B Electrical Malfunction (No. 1/No. 2 Solenoid Valve)

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 Engine and ECT ECU. If an open or short circuit occurs in either of the solenoid valves, the Engine and ECT ECU controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

Position	NORMAL			SHIFT SOLENOID NO.1 MALFUNCTIONING			SHIFT SOLENOID NO.2 MALFUNCTIONING			BOTH SOLENOID MALFUNCTIONING
	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear	Gear when shift selector is manually operated
	No.1	No.2		No.1	No.2		No.1	No.2		
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	O/D	3rd
	OFF	ON	3rd	X	ON	3rd	OFF	X	O/D	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 No. 1 solenoid valve when DTC P0753/62 is output and check the No. 2 solenoid valve when DTC P0758/63 is output.

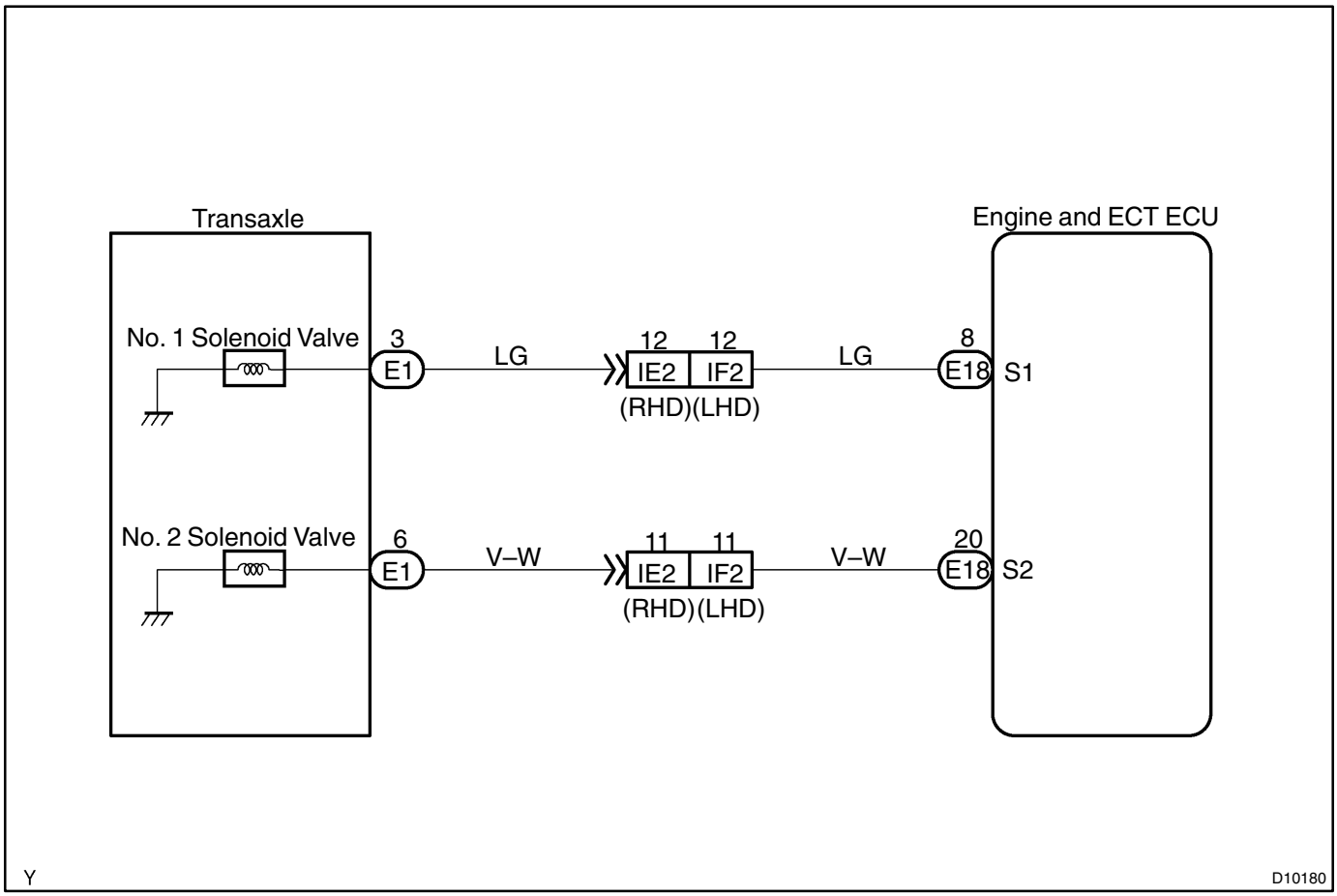
DTC No.	DTC Detecting Condition	Trouble Area
P0753 P0758	The Engine and ECT ECU checks for an open or short circuit in the No. 1 or No. 2 solenoid valve circuit when it changes. The Engine and ECT ECU records DTC P0753/62 or P0758/63 if condition (a) or (b) is detected once, but it does not blink the O/D OFF indicator light. After Engine and ECT ECU detects condition (a) or (b) continuously 8 times or more in one–trip, it causes the O/D OFF indicator light to light up until condition (a) or (b) disappears. After that, if the Engine and ECT ECU detects condition (a) or (b) once, it starts lighting up O/D OFF indicator light again. (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.	• Open or short in No. 1/No. 2 solenoid valve circuit • No. 1/No. 2 solenoid valve • Engine and ECT ECU

Fail safe function:

If either of the solenoid valve circuits develops an open or short, the Engine and ECT ECU turns the other solenoid valve ON and OFF to shift to the gear positions shown in the table above. The Engine and ECT ECU 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.

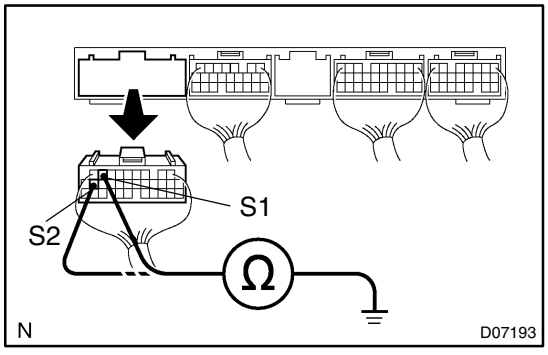
Manual shifting as shown in the above table must be done (In the case of a short circuit, the Engine and ECT ECU stops sending current to the short circuited solenoid).

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal S1 or S2 of Engine and ECT ECU connector and body ground.**



PREPARATION:
Disconnect the connector from Engine and ECT ECU.

CHECK:
Measure resistance between the terminal S1 or S2 of Engine and ECT ECU connector and the body ground.

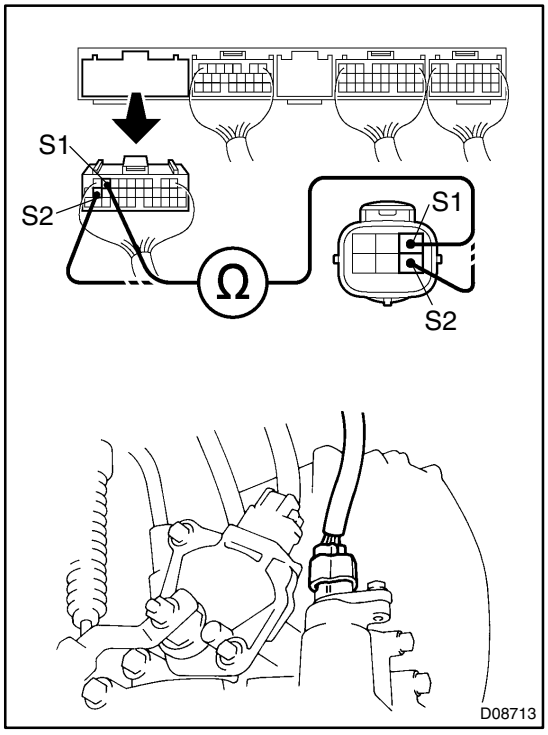
OK:

Resistance: 11 – 15 Ω at 20˚C (68˚F)

OK → **Check and replace Engine and ECT ECU (See page IN–30).**

NG

2	**Check harness and connector between Engine and ECT ECU and automatic transaxle solenoid connector.**



PREPARATION:

Disconnect the solenoid connector from the automatic transaxle.

CHECK:

Check harness and connector between the terminal S1 or S2 of Engine and ECT ECU and the terminal S1 or S2 of solenoid connector.

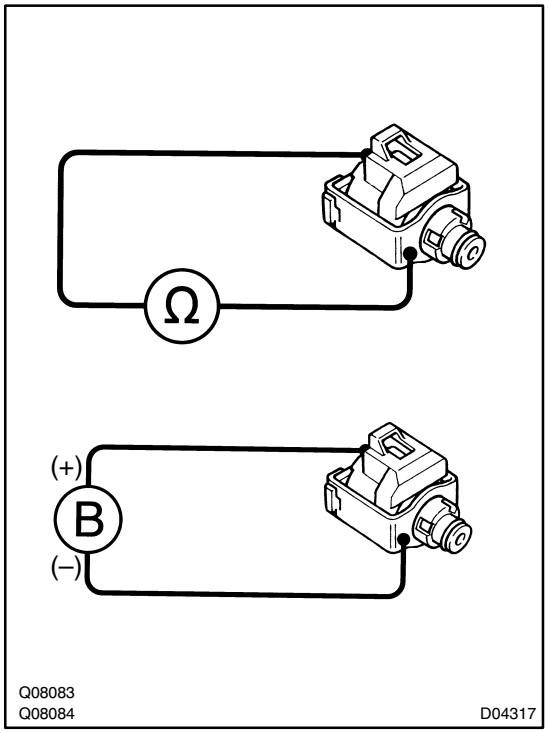
OK:

There is no open and short circuit.

NG → **Repair or replace harness or connector.**

OK

3	Check No. 1 or No. 2 solenoid valve.



PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the No. 1 or No. 2 solenoid valve .

CHECK:

(a) Measure resistance between the solenoid connector and the solenoid body.
(b) Connector positive ⊕ lead to the terminal of solenoid connector, negative ⊖ lead to the solenoid body.

OK:

(a) Resistance: 11 – 15 Ω at 20˚C (68˚F)
(b) The solenoid makes an operating noise.

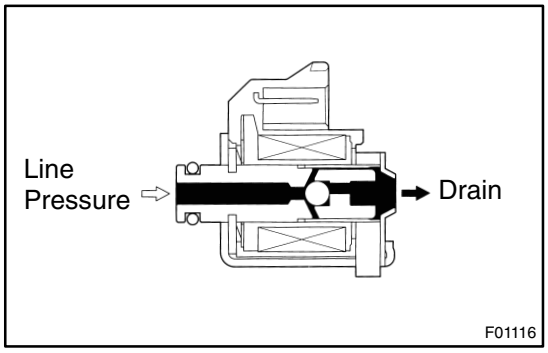
NG → **Replace shift solenoid valve.**

OK

Repair or replace solenoid wire.

DTC	P0770	Shift Solenoid E Malfunction (SL Solenoid Valve)

SYSTEM DESCRIPTION

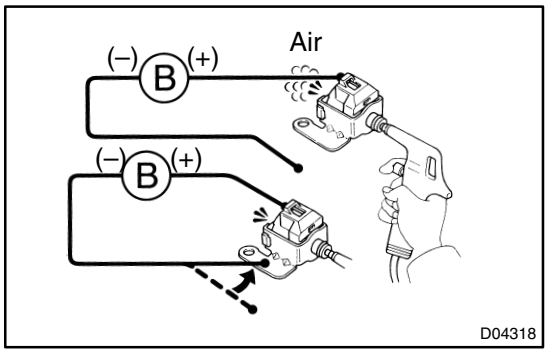


The Engine and ECT ECU uses the signals from the throttle position sensor, air–flow meter and crankshaft position sensor to monitor the engagement condition of the lock–up clutch. Then the Engine and ECT ECU compares the engagement condition of the lock–up clutch with the lock–up schedule in the Engine and ECT ECU memory to detect the mechanical trouble of the shift solenoid valve SL, the valve body and the torque converter or automatic transaxle (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0770	• Lock–up does not occur when driving in the lock–up range (normal driving at 80 km/h (50 mph)), or lock–up remains ON in the lock–up OFF range. (2–trip detection logic) • When lock–up is ON, clutch or brake slips or gear is broken.	• SL solenoid valve is stuck open or closed • Valve body blocked up or stuck • Lock–up clutch • Automatic transaxle (clutch, brake or gear etc.)

INSPECTION PROCEDURE

1	Check SL solenoid valve operation.



PREPARATION:

(a) Remove the oil pan.

(b) Remove the SL solenoid valve from the valve body.

CHECK:

(a) Applying 490 kPa (5 km/cm^2, 71 psi) of compressed air, check that the solenoid valve opens.

(b) When battery positive voltage is supplied to the shift solenoid valve, check that it does no leak air.

OK:

(a) Solenoid valve opens.

(b) Solenoid valve does not leak air.

NG → **Replace the SL solenoid valve.**

OK

2	**Check valve body (See chapter 2 in the problem symptoms table).**

NG → **Repair or replace the valve body.**

OK

3	**Check torque converter (See page AX–33).**

NG → **Replace the torque converter.**

OK

Repair the transaxle.

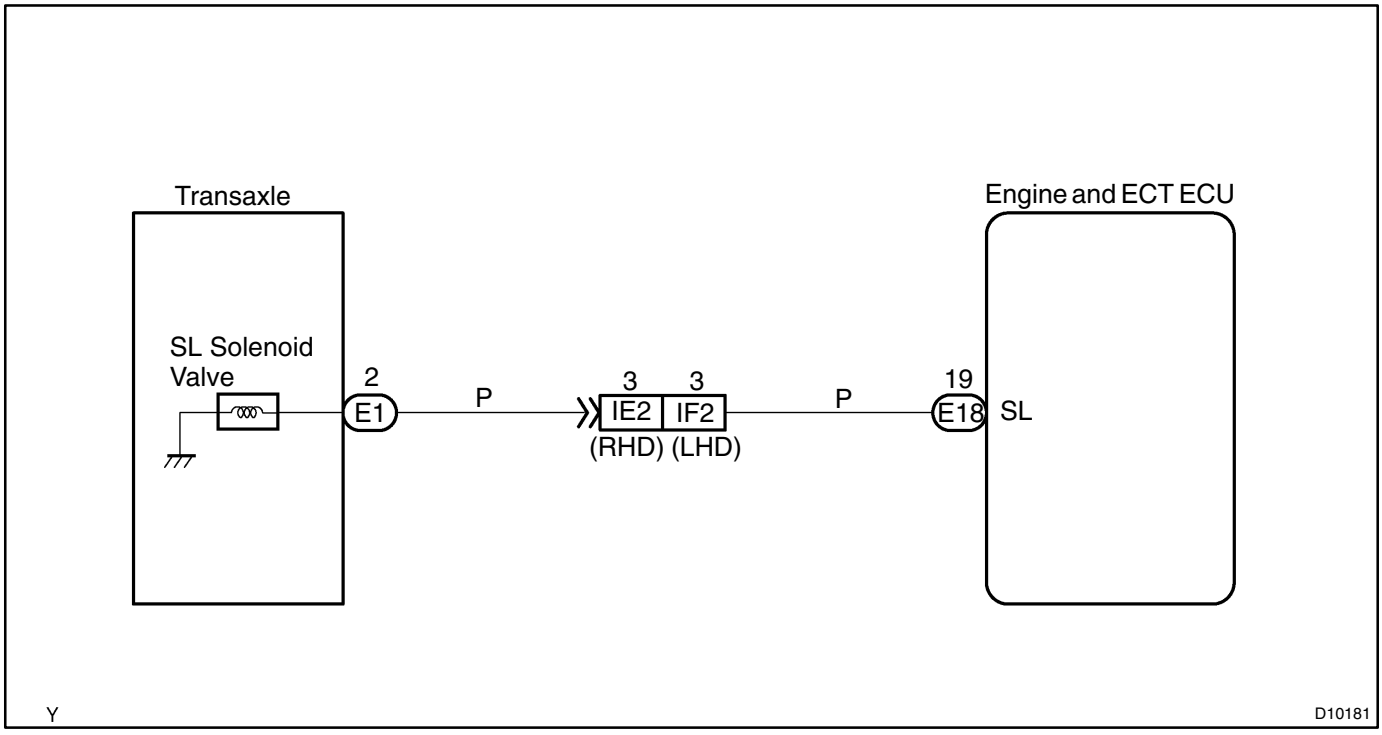
DTC	P0773	Shift Solenoid E Electrical Malfunction (SL Solenoid Valve)

CIRCUIT DESCRIPTION

The SL solenoid valve is turned ON and OFF by signals from the Engine and ECT ECU to control the hydraulic pressure acting on the lock–up relay valve, then the signals control operation of the lock–up clutch.
Fail safe function
If the Engine and ECT ECU detects a malfunction, it turns the SL solenoid valve OFF.

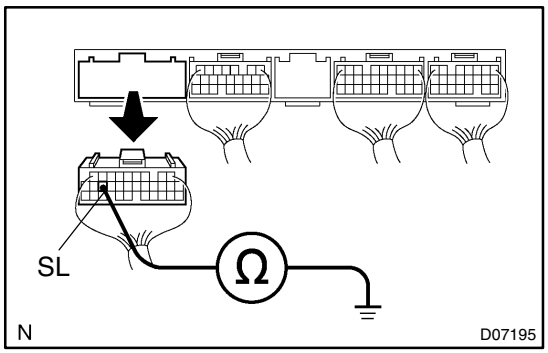
DTC No.	DTC Detecting Condition	Trouble Area
P0773	Either (a) or (b) is detected for 1 time. (2–trip detection logic) (a) Solenoid resistance is 8 Ω or less for short circuit when solenoid is energized. (b) Solenoid resistance is 100 kΩ or more for open circuit when solenoid is not energized.	• Open or short on SL solenoid valve circuit • SL solenoid valve • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal SL of Engine and ECT ECU and body ground.**



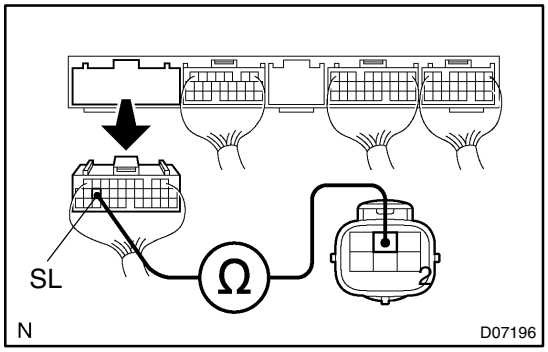
PREPARATION:
Disconnect the connector from Engine and ECT ECU.
CHECK:
Measure resistance between the terminal SL of Engine and ECT ECU and the body ground.
OK:

Resistance: 11 – 15 Ω

OK → **Check and replace the Engine and ECT ECU (See page IN–30).**

NG

2	**Check harness and connector between Engine and ECT ECU and automatic transaxle solenoid connector.**



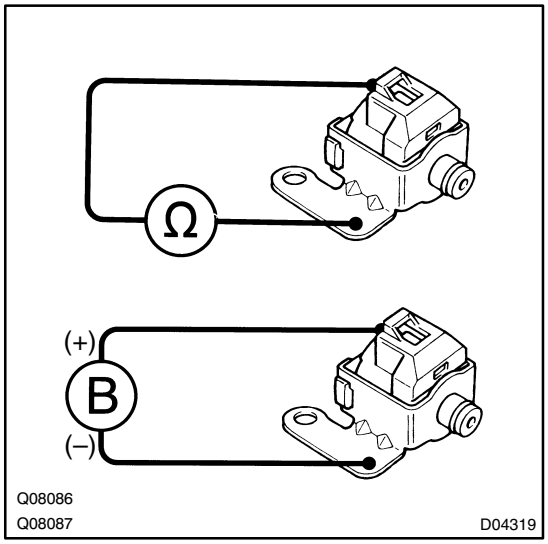
PREPARATION:
Disconnect the solenoid connector from the transaxle.
CHECK:
Check the harness and connector between the terminal SL of Engine and ECT ECU and the terminal 2 of solenoid connector.
OK:

There is no open or short circuit.

NG → **Repair or replace the harness or connector.**

OK

3	Check SL solenoid valve.



PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the SL solenoid valve connector.
(d) Remove the SL solenoid valve.

CHECK:

(a) Measure resistance between the terminal SL of shift solenoid valve and the solenoid body.
(b) Connect positive (+) lead to the terminal of solenoid connector, negative (–) lead to the solenoid body.

OK:

(a) Resistance: 11 – 15 Ω
(b) The SL solenoid valve makes operation noise.

NG → **Replace the SL solenoid valve.**

OK

Check and replace or repair the solenoid wire.

DI80B–01

DTC	P1520	Stop Light Switch Signal Malfunction

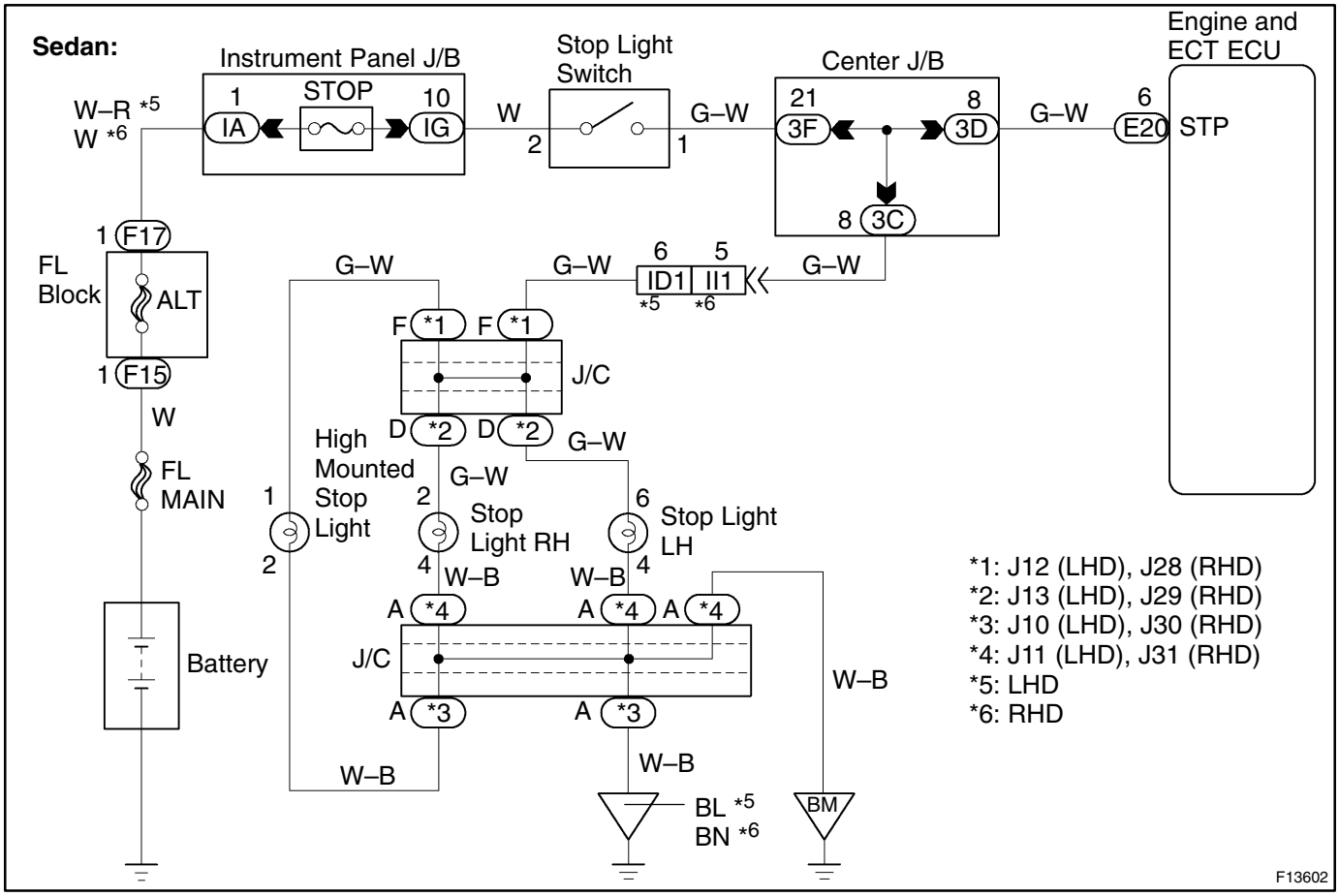
CIRCUIT DESCRIPTION

The purpose of this circuit is to prevent the engine from stalling, while driving in lock–up condition, when brakes are suddenly applied.

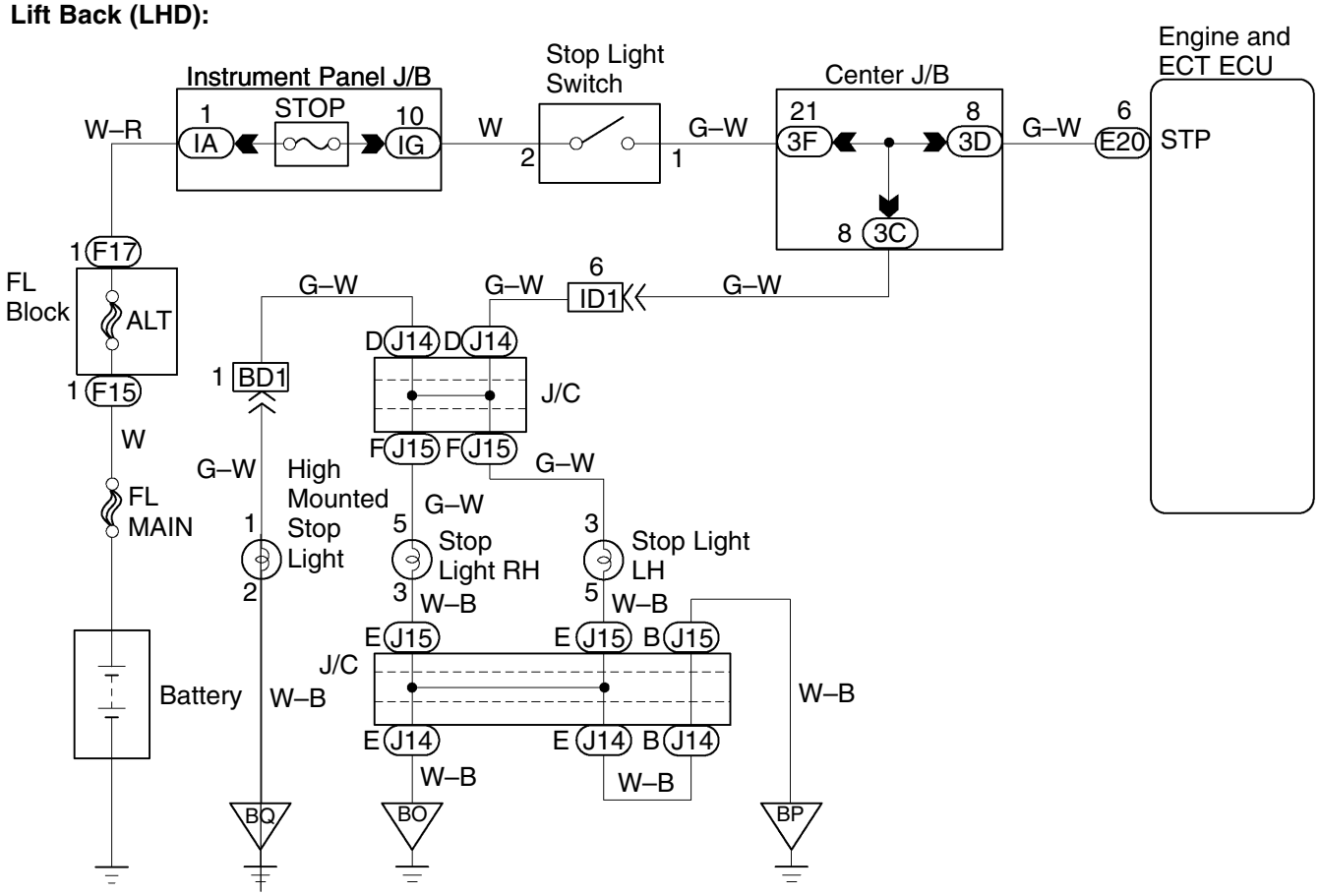
When the brake pedal is operated, this switch sends a signals to Engine and ECT ECU. Then the Engine and ECT ECU cancels operation of the lock–up clutch while braking is in progress.

DTC No.	DTC Detecting Condition	Trouble Area
P1520	No stop light switch signal to Engine and ECT ECU during driving. (2–trip detection logic)	• Open or short in stop light switch circuit • Stop light switch • Engine and ECT ECU

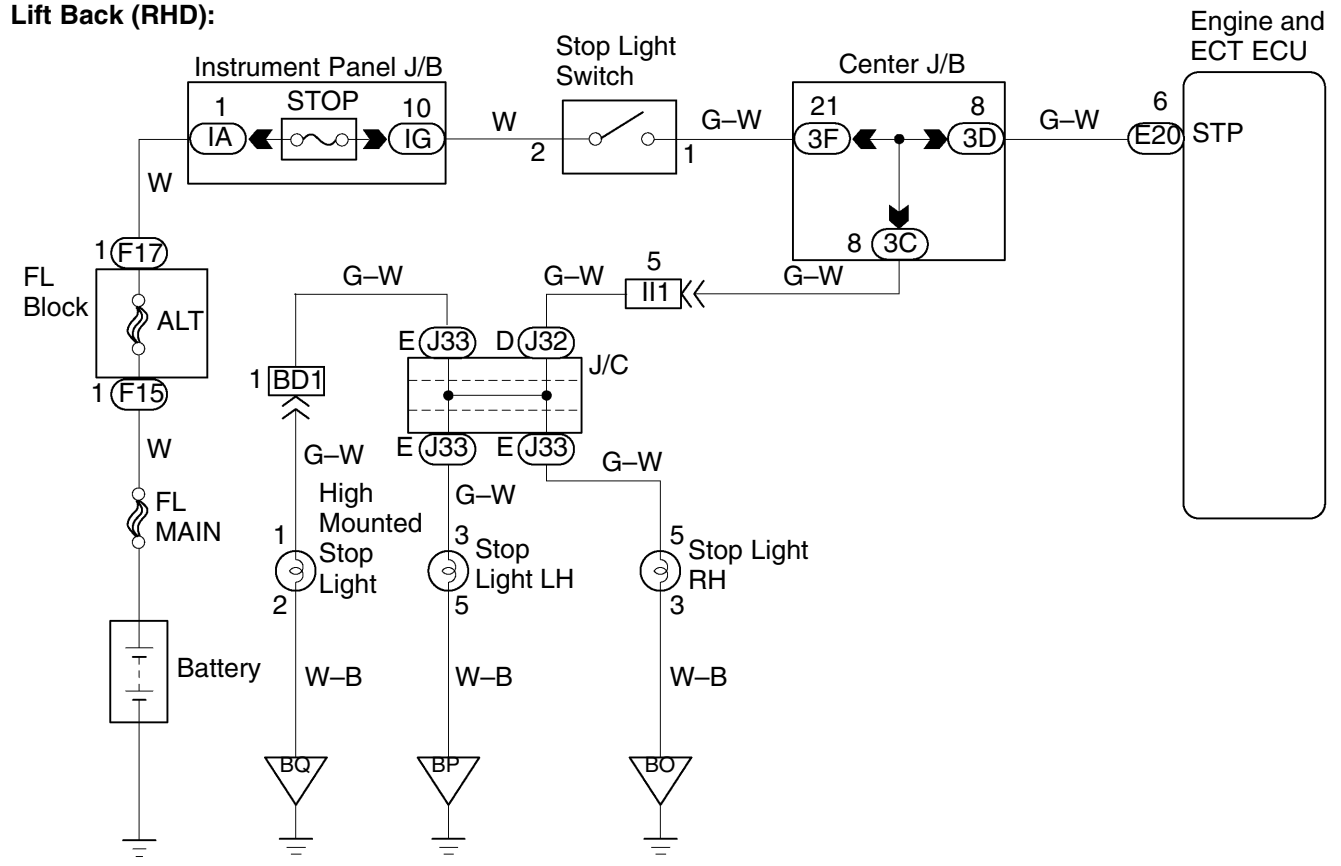
WIRING DIAGRAM



Lift Back (LHD):

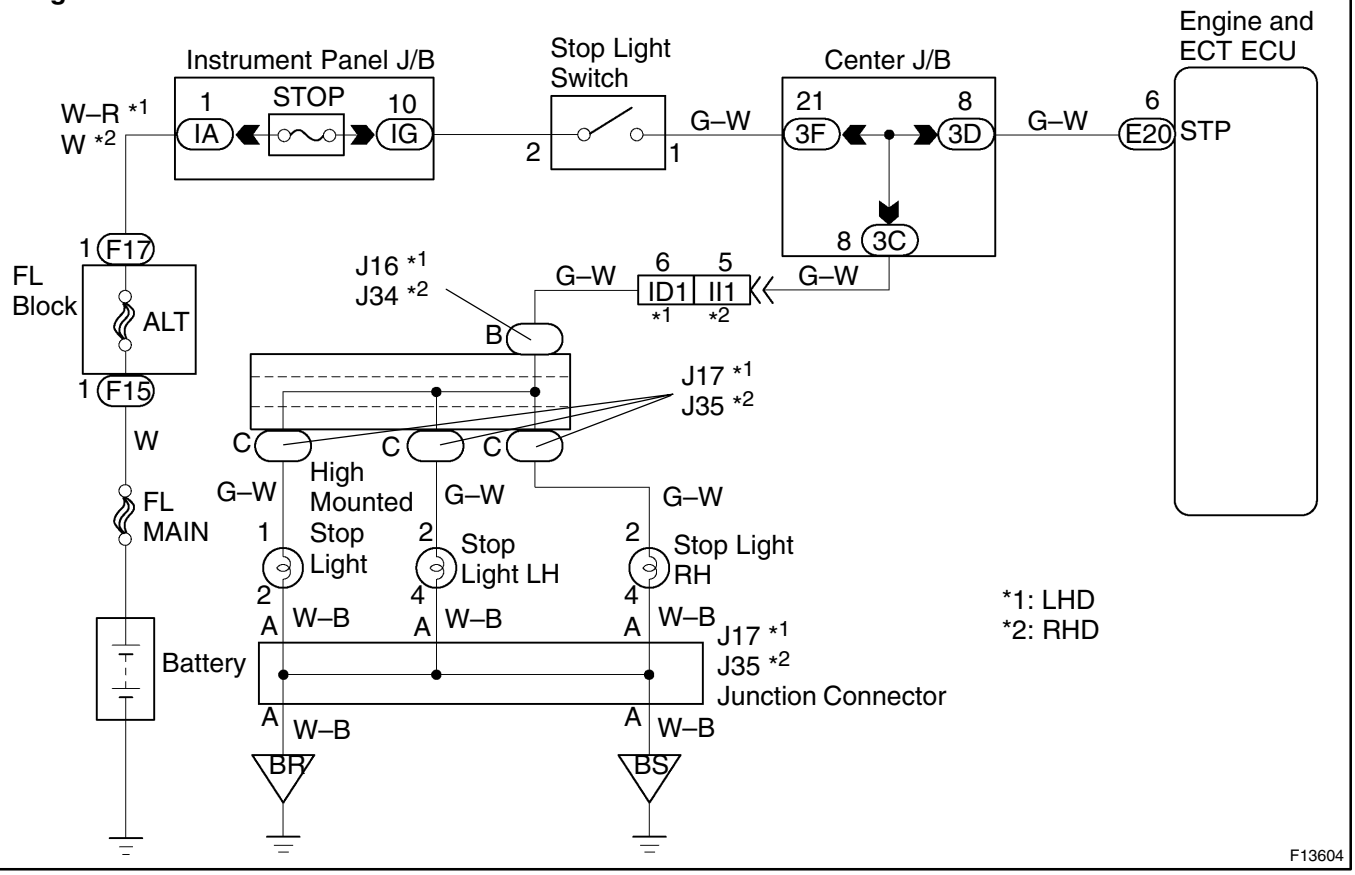


Lift Back (RHD):



F13603

Wagon:


Instrument Panel J/B
Stop Light Switch
Center J/B
Engine and ECT ECU
W–R *1
W *2
1
STOP
10
IA
IG
2
1
G–W
21
8
3F
3D
G–W
6
E20
STP
8
3C
1
F17
FL Block
ALT
1
F15
W
FL MAIN
J16 *1
J34 *2
G–W
6
5
ID1
II1
*1
*2
G–W
B
J17 *1
J35 *2
C
C
C
High Mounted Stop Light
Stop Light LH
Stop Light RH
G–W
G–W
G–W
1
2
2
4
4
A
A
A
W–B
W–B
W–B
Battery
J17 *1
J35 *2
Junction Connector
A
A
W–B
W–B
BR
BS
*1: LHD
*2: RHD
F13604

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	**Check operation of stop light.**

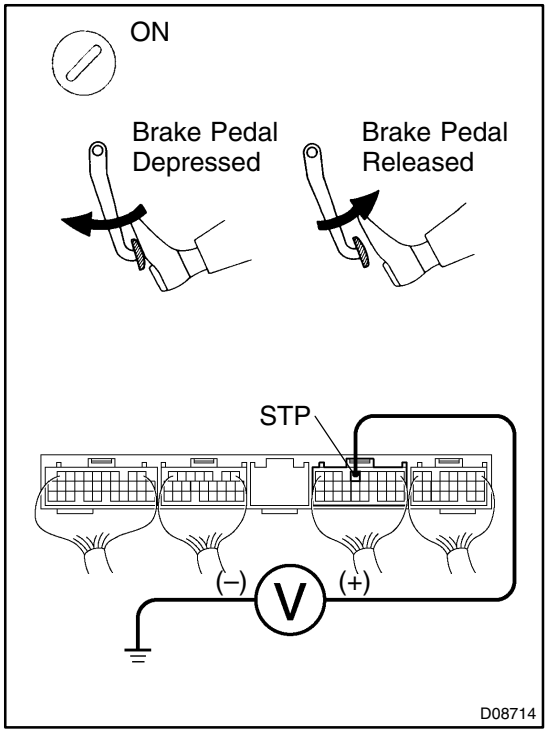
PREPARATION:

Check if the stop lights go on and off normally when the brake pedal is operated and released.

NG → **Check and repair stop light circuit (See Pub. No. RM599E BE section).**

OK

2	**Check STP signal.**



When using hand–held tester:

PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the STP signal on the hand–held tester.

OK:

Brake pedal is depressed: STP ... ON
Brake pedal is released: STP ... OFF

When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal STP of Engine and ECT ECU and body ground.

OK:

Brake pedal	Voltage
Depressed	7.5 – 14 V
Released	Below 1.5 V

OK → **Check for intermittent problems (See page DI–18).**

NG

3	**Check harness and connector between Engine and ECT ECU and stop light switch (See page IN–30).**

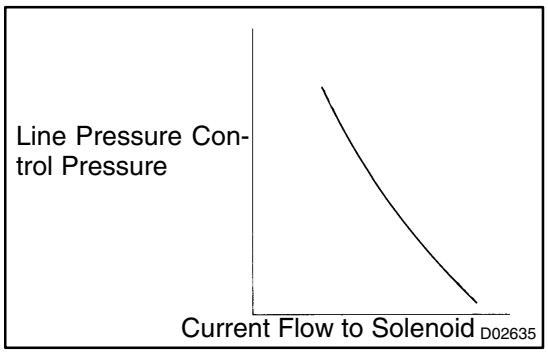
NG → **Repair or replace harness or connector.**

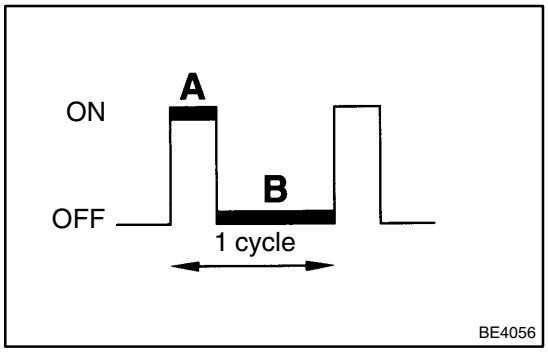
OK

Check and replace Engine and ECT ECU (See page IN–30).

DI61W–05

DTC	P1760	Linear Solenoid for Line Pressure Control Circuit malfunction (SLT Solenoid Valve)



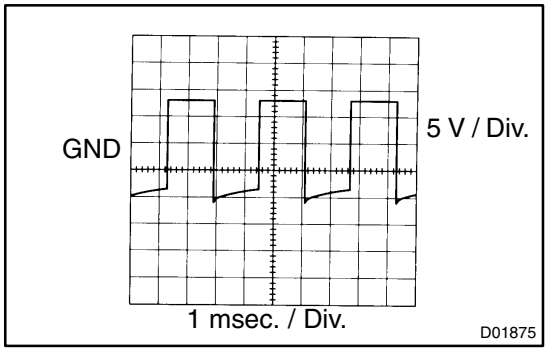


CIRCUIT DESCRIPTION

The throttle pressure that is applied to the primary regulator valve (which modulates line pressure) causes the SLT solenoid valve, under electronic control, to precisely and minutely modulates and generates line pressure according to the accelerator pedal effort, or engine power output detected.
This reduces the function of line pressure and provides smooth shifting characteristics.
Upon receiving the throttle valve opening angle signal, Engine and ECT ECU controls the line pressure by sending a predetermined (*) duty ratio to the solenoid valve, modulating the line pressure, 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

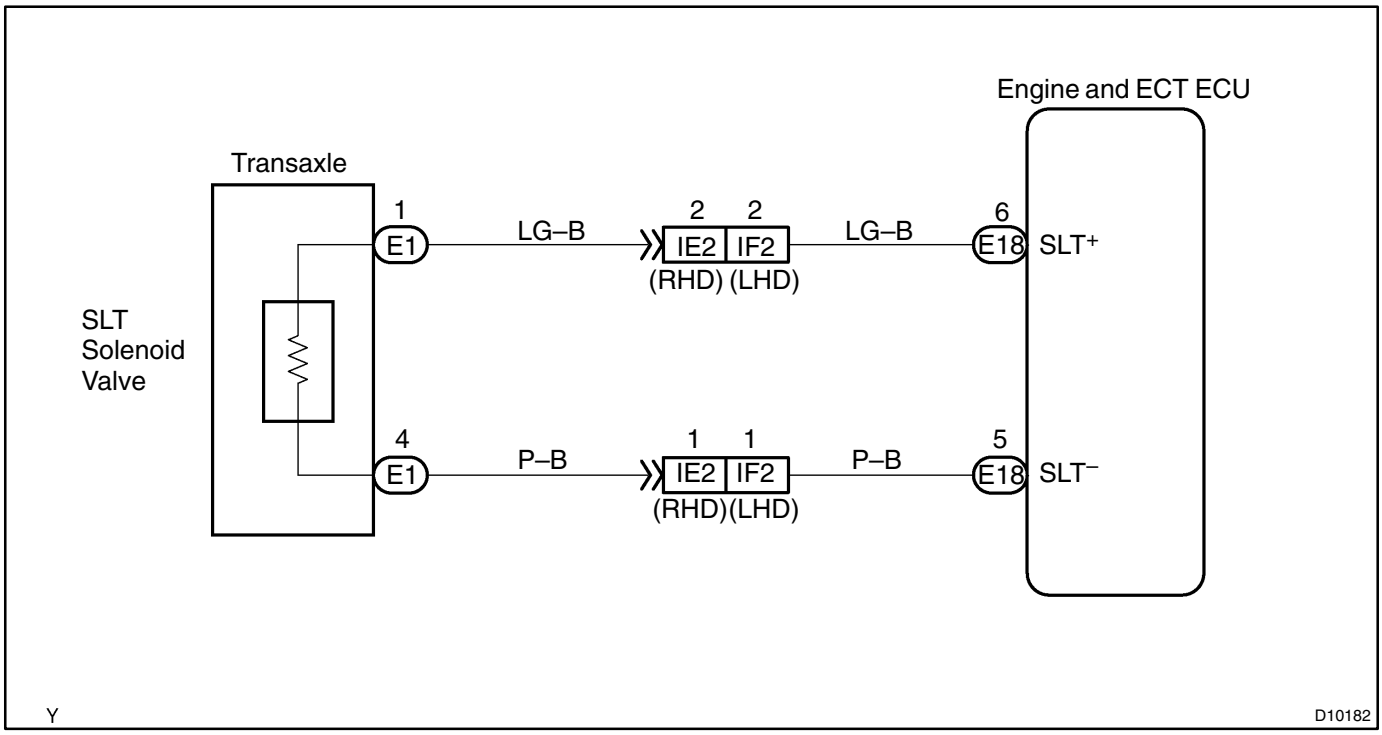
$$\text{Duty Ratio} = \frac{A}{A + B} \times 100\ (\%)$$

DTC No.	DTC Detecting Condition	Trouble Area
P1760	(a) or (b) condition below is detected for 1 second or more. (a) SLT^- terminal: 0V (b) SLT^- terminal: 12V	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine and ECT ECU



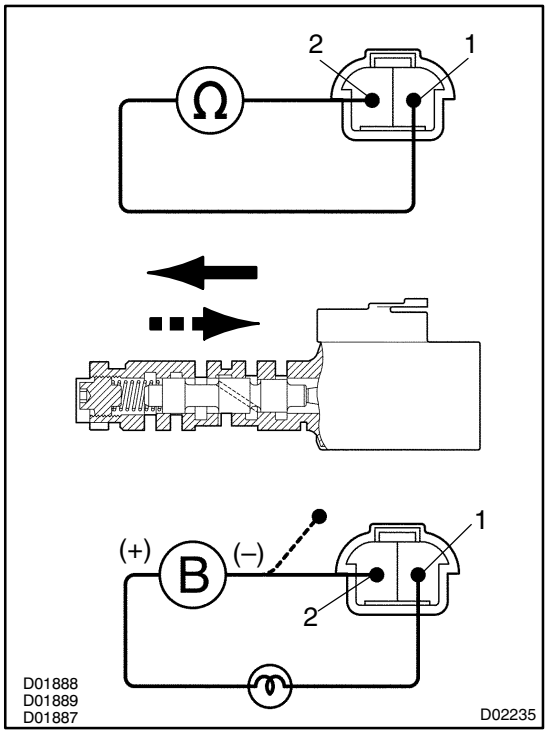
HINT:
Refer to the chart for the wave form between terminals SLT^+ and SLT^- during engine idling.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check SLT solenoid valve.**



PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.

Check solenoid resistance:

CHECK:

Measure resistance between terminals 1 and 2 of solenoid connector.

OK:

Resistance: 5.0 – 5.6 Ω at 20 °C (68°F)

Check solenoid operation:

CHECK:

Connect positive (+) lead with an 8 ~ 10 W bulb to terminal 1 of solenoid connector and negative (–) lead to terminal 2, then check the movement of the valve.

OK:

When battery voltage is applied.	Valve moves in ◄ direction in the illustration.
When battery voltage is cut off.	Valve moves in ■■► direction in the illustration.

NG → **Replace SLT solenoid valve.**

OK

2	**Check harness and connector between SLT solenoid valve and Engine and ECT ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace Engine and ECT ECU (See page IN–30).

DI80C–01

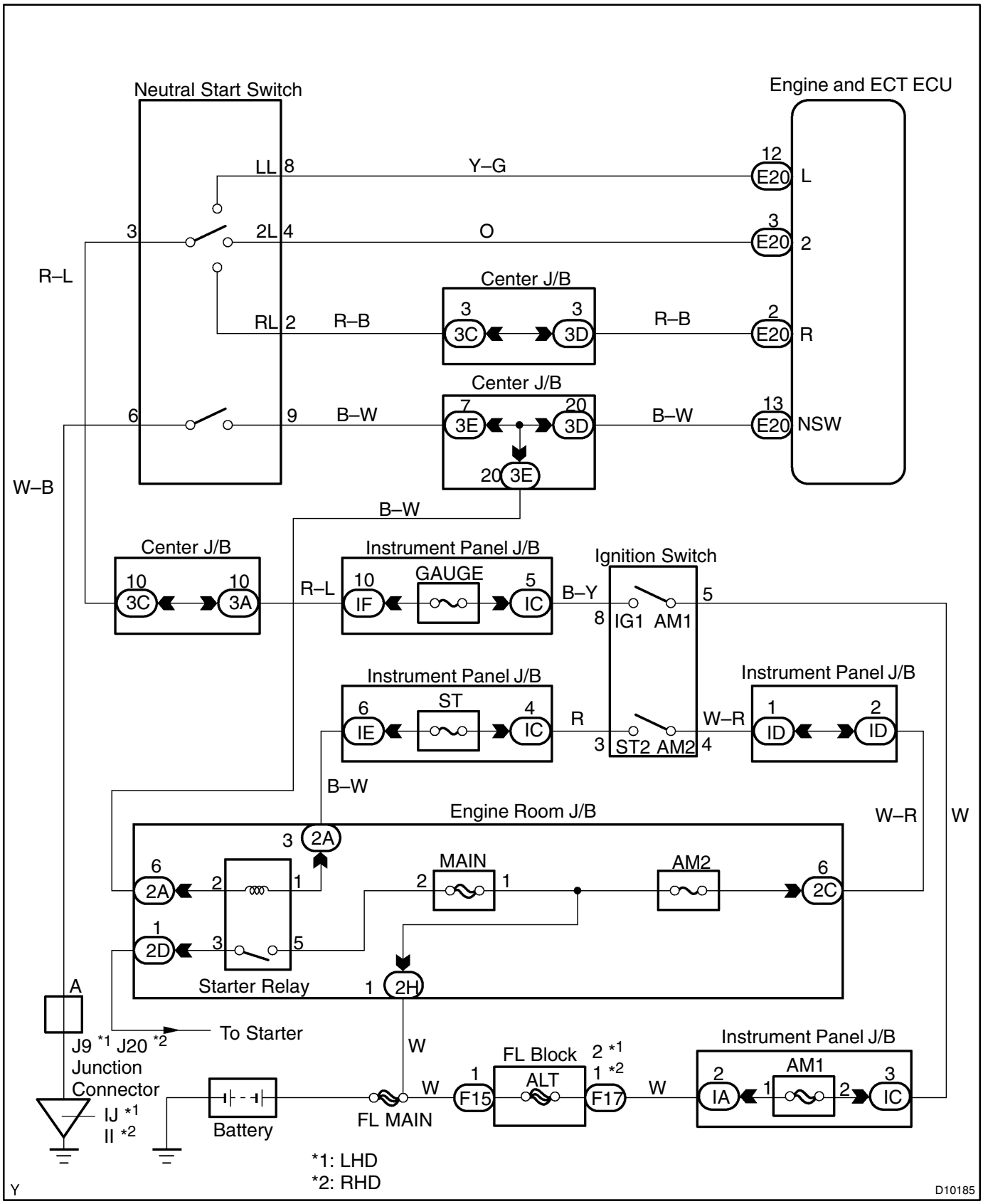
DTC	P1780	Neutral Start Switch Malfunction

CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever range and sends the signals to the Engine and ECT ECU. The Engine and ECT ECU receives the signals (NSW, R, 2 and L) from the neutral start switch, when the signal is not sent to the Engine and ECT ECU from the neutral start switch, the Engine and ECT ECU judges that the shift lever is in the D range.

DTC No.	DTC Detecting Condition	Trouble Area
P1780	2 or more switches are ON simultaneously for ”N”, ”R”, ”2” or ”L” range. (2–trip detection logic)	• Short in neutral start switch circuit • Neutral start switch • Engine and ECT ECU
	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



INSPECTION PROCEDURE

1	**Read NSW, REVERSE, 2ND and LOW signals.**

When using hand–held tester:

PREPARATION:

(a) Connect the hand–held tester to the DLC3.

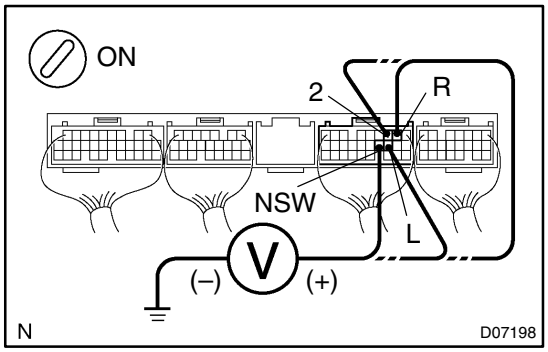
(b) Turn the ignition switch ON.

CHECK:

Shift the shift lever to the P, R, N, 2 and L ranges, and read the NSW, REVERSE, 2ND and LOW signals on the hand–held tester.

OK:

Shift range	Signal
P, N	NSW OFF → ON
R	REVERSE OFF → ON
2	2ND OFF → ON
L	LOW OFF → ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between the terminals NSW, R, 2 and L of Engine and ECT ECU and the body ground when the shift lever is shifted to the following ranges.

OK:

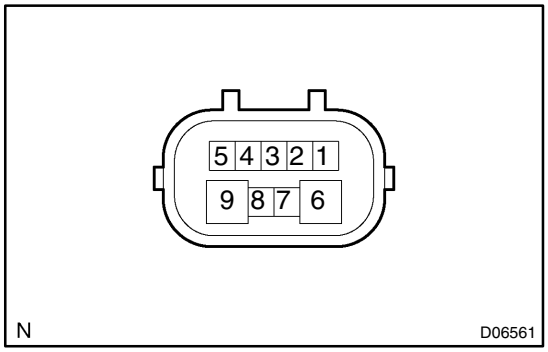
Range	NSW–Body ground	R–Body ground	2–Body ground	L–Body ground
P, N	0 V	0 V	0 V	0 V
R	7.5 – 14 V*	7.5 – 14 V*	0 V	0 V
D	7.5 – 14 V	0 V	0 V	0 V
2	7.5 – 14 V	0 V	7.5 – 14 V	0 V
L	7.5 – 14 V	0 V	0 V	7.5 – 14 V

*: The voltage will drop slightly due to lighting up of the back up light.

OK → **Check and replace Engine and ECT ECU (See page IN–30).**

NG

2	Check neutral start switch.



PREPARATION:

(a) Jack up the vehicle.

(b) Remove the neutral start switch.

CHECK:

Check continuity between each terminal shown below when the shift lever is moved to each range.

Shift Range	Terminal No. to continuity	
P	–	6 – 9
R	2 – 3	–
N	–	6 – 9
2	3 – 4	–
L	3 – 8	–

OK:

There is continuity.

NG	Replace the neutral start switch.

OK

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine and ECT ECU (See page IN–30).

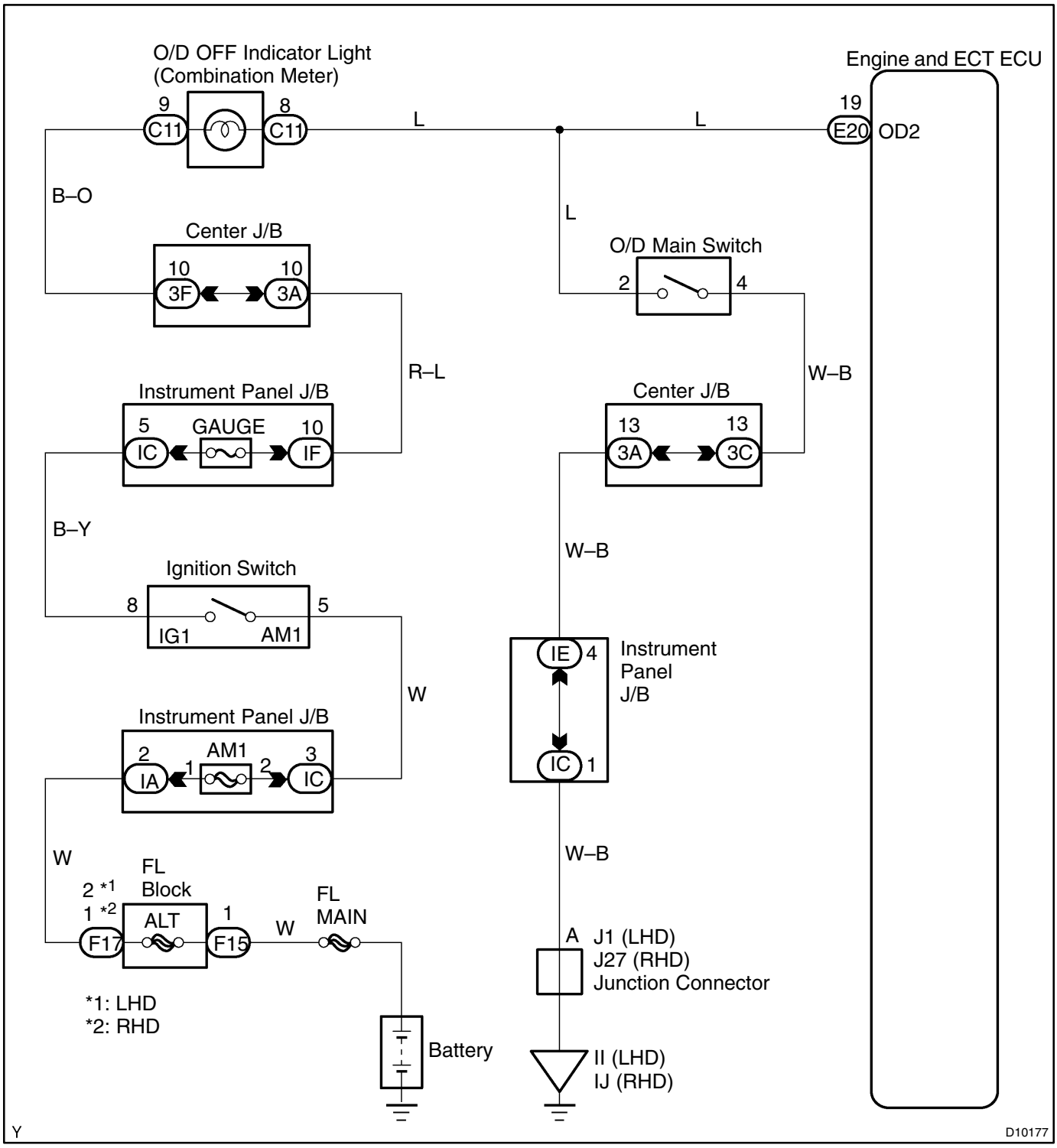
DI80D–01

O/D Main Switch & O/D OFF Indicator Light Circuit

CIRCUIT INSPECTION

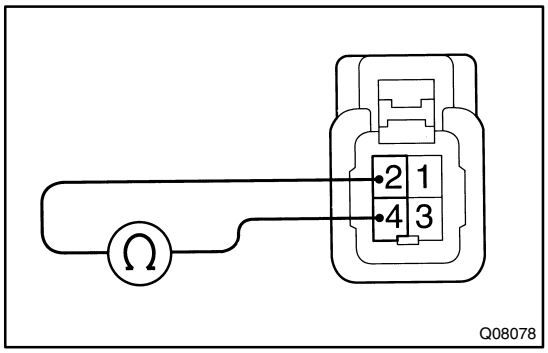
The O/D main switch contacts go open when the switch is pushed in and go closed when it is pushed once again. In O/D main switch OFF position, the O/D OFF indicator light lights up, and the Engine and ECT ECU prohibits shifting to O/D.

WIRING DIAGRAM



INSPECTION PROCEDURE
O/D OFF indicator light does not light up

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity between the terminals 2 and 4 of the O/D main switch connector.
OK:

O/D main switch	Specified condition
ON	No continuity
OFF	Continuity

NG → **Replace the O/D main switch.**

OK

2	**Check and replace the combination meter (See page BE–1).**

NG → **Replace the combination meter.**

OK

3	Check OVERDRIVE CUT SW2 signal.

When using hand–held tester:

PREPARATION:

(a) Connect a hand–held tester to the DLC3.

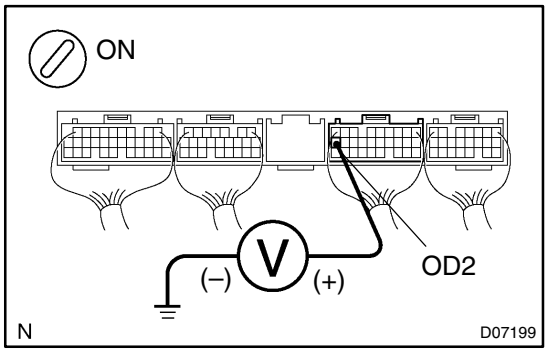
(b) Turn the ignition switch ON and the hand–held tester main switch ON.

CHECK:

Read the OVERDRIVE CUT SW2 signal on the hand–held tester.

OK:

O/D main switch condition	OVERDRIVE CUT SW2 signal
O/D ON (Pushed in)	OFF
O/D OFF (Pushed once again)	ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between the terminal OD2 of Engine and ECT ECU and the body ground.

OK:

O/D main switch	Voltage
ON	Below 3 V
OFF	9 – 14

OK → **Check and replace the Engine and ECT ECU (See page IN–30).**

NG

4	**Check harness and connector between O/D OFF indicator light and Engine and ECT ECU (See page IN–30).**

PREPARATION:
Disconnect the connector (E6) of Engine and ECT ECU and the connector (C14) of the combination meter.

CHECK:
Measure the continuity between the connector (E6) of Engine and ECT ECU and the connector (C14) of the combination meter.

OK:

Continuity

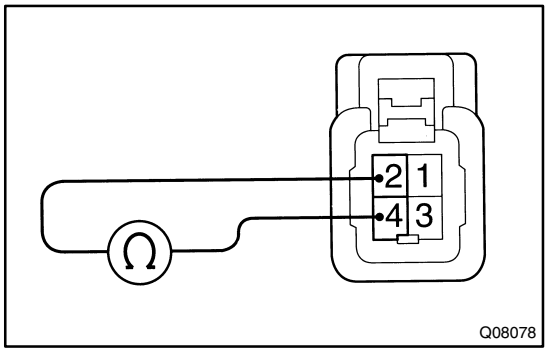
NG → **Repair or replace the harness or connector.**

OK

Repair or replace the wire harness or connectors between the connector of Engine and ECT ECU and the body ground.

O/D OFF indicator light remains ON

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.

CHECK:
Check continuity between the terminals 2 and 4 of O/D main switch connector.

OK:

O/D main switch	Resistance
ON	No continuity
OFF	Continuity

NG → **Repair the O/D main switch.**

OK

2	**Check harness and connector between O/D OFF indicator light and O/D main switch, O/D OFF indicator light and Engine and ECT ECU (See page IN–30).**

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine and ECT ECU (See page IN–30).

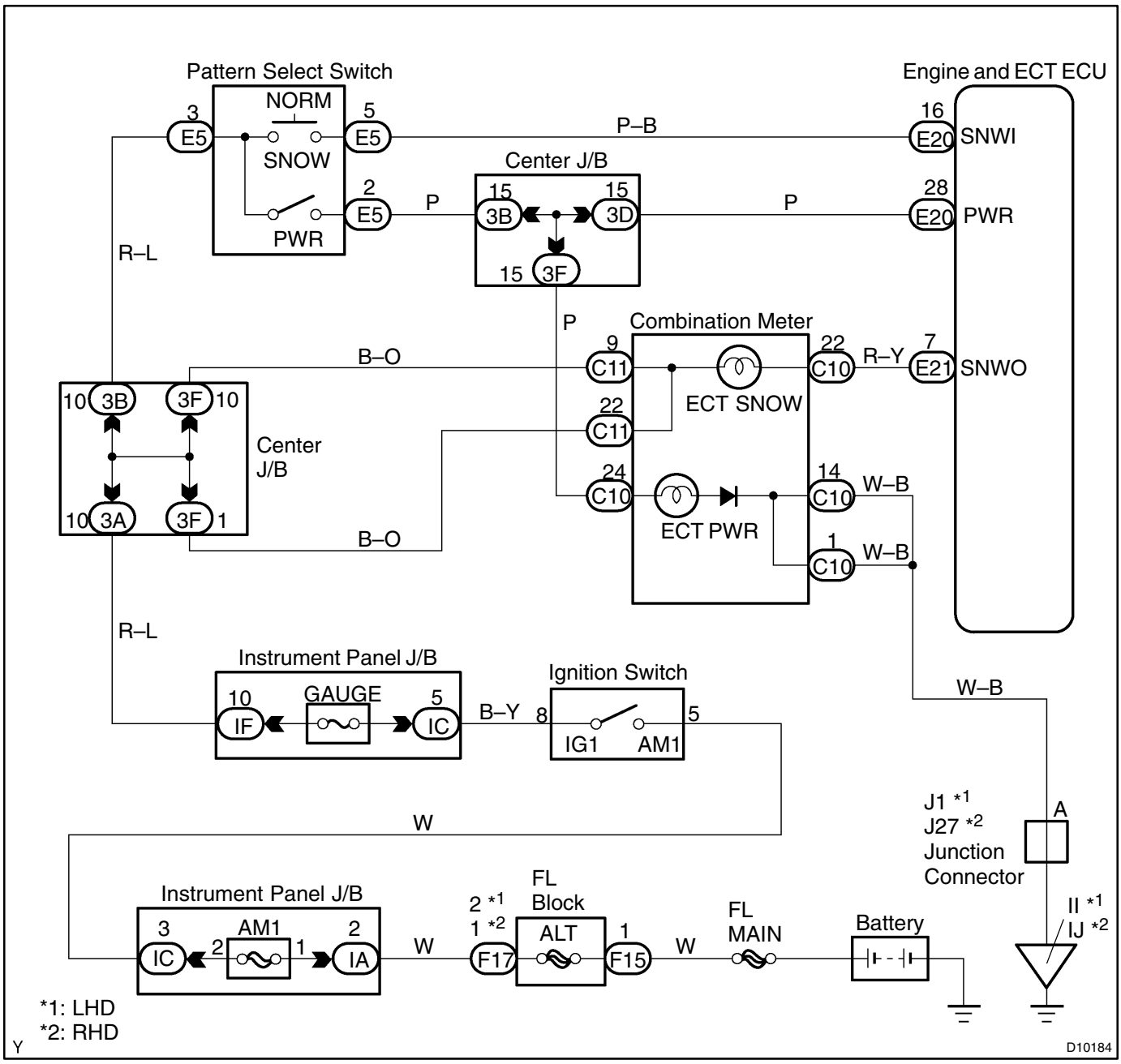
DI336-03

Pattern Select Switch Circuit

CIRCUIT DESCRIPTION

The Engine & ECT ECU memory contains the shift programs for the NORMAL, POWER and SNOW (w/ SNOW mode) patterns, 2 range, L range and the lock–up patterns. By following the programs corresponding to the signals from the pattern select switch, the neutral start switch and other various sensors, the Engine & ECT ECT switches the solenoid valves ON and OFF, and controls the transaxle gear change and the lock–up clutch operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check PATTERN SEL SW signal.**

When using hand–held tester:

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the PATTERN SEL SW signal on the hand–held tester.

OK:

Pattern select switch	PATTERN SEL SW signal
POWER	ON
NORM	OFF
SNOW	OFF

When not using hand–held tester:

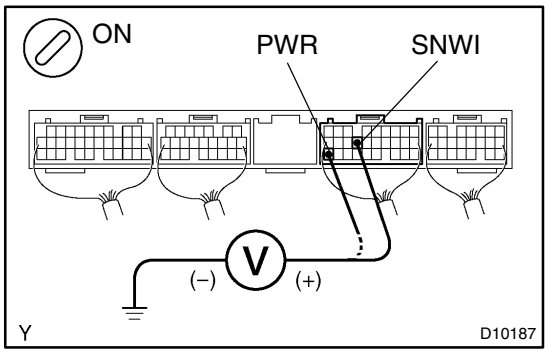
PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal each of PWR, SNWI of Engine & ECT ECU and body ground when the pattern select switch is set to the PWR (POWER), NORM (NORMAL) or SNOW (SNOW) position.

OK:



Switch position	Tester connection	Specified condition
PWR	PWR – Body ground	9 – 14 V
	SNWI – Body ground	Below 1.5 V
NORM	PWR – Body ground	Below 1.5 V
	SNWI – Body ground	Below 1.5 V
SNOW	PWR – Body ground	Below 1.5 V
	SNWI – Body ground	9 – 14 V

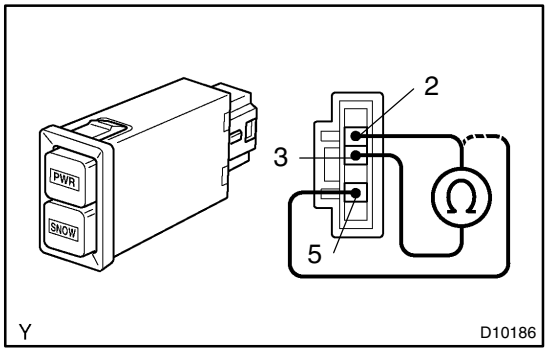
HINT:

The Engine & ECT ECU uses the normal pattern signal if the PWR and SNWI signals are not input.

OK → **Proceed to next circuit inspection shown in symptom problems table (See page DI–18).**

NG

2	Check pattern select switch



PREPARATION:
Disconnect the pattern select switch connector.
CHECK:
Check continuity between terminals 2 and 3 (PWR, NORM), 3 and 5 (SNOW) of pattern select switch connector when the select switch is set to PWR, NORM or SNOW position.
OK:

Switch position	Tester connection	Specified condition
PWR	2 – 3	Continuity
NORM	2 – 3, 3 – 5	No continuity
SNOW	3 – 5	Continuity

NG → **Replace the pattern select switch.**

OK

3	Check harness and connector between battery and pattern select switch, pattern select switch and Engine & ECT ECU (See page IN–30).

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–30).

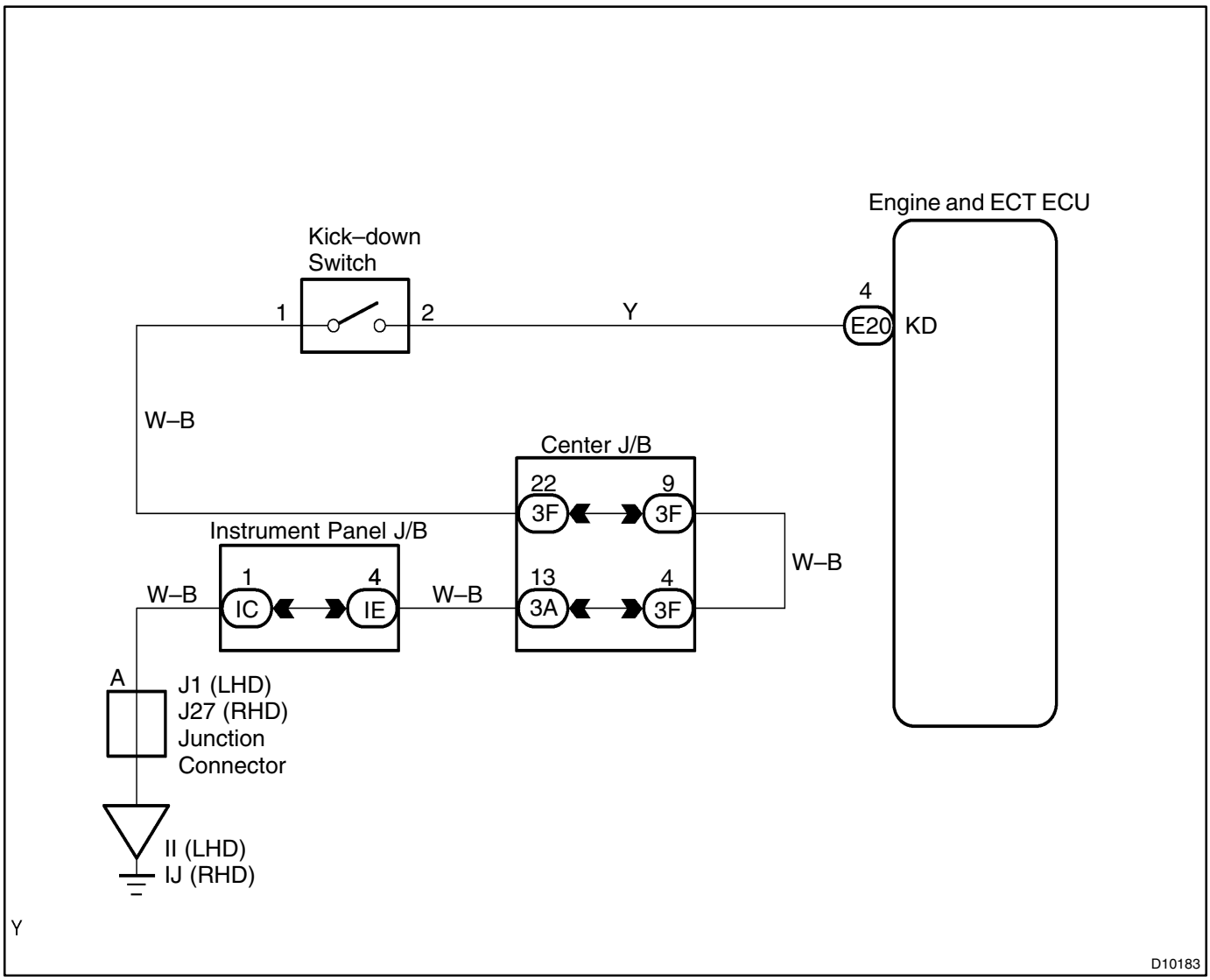
DI80E–01

Kick–down Switch Circuit (LHD)

CIRCUIT DESCRIPTION

The kick–down switch is turned ON when the accelerator pedal is depressed beyond the full throttle opening and sends signals to Engine and ECT ECU.
When the kick–down switch is turned ON, the Engine and ECT ECU controls gear shifting according to the programmed shift diagrams.
If a short circuit develops in the kick–down switch, the Engine and ECT ECU disregards the kick–down signals and controls shifting at the normal shift points.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check KICK DOWN SW signal.**

When using hand–held tester:

PREPARATION:

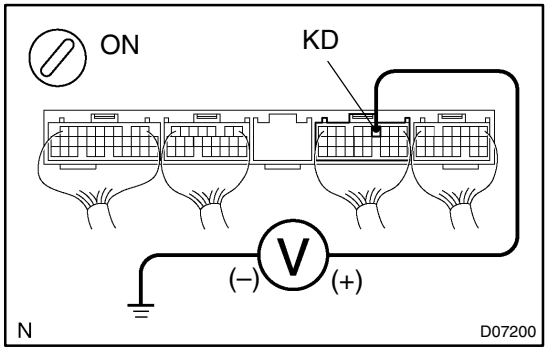
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the KICK DOWN SW signal on the hand–held tester.

OK:

Accelerator Pedal	KICK DOWN SW signal
Fully depressed (kick–down SW is ON)	ON
Released (kick–down SW is OFF)	OFF



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal KD of Engine and ECT ECU connector and body ground when accelerator pedal is fully depressed or not.

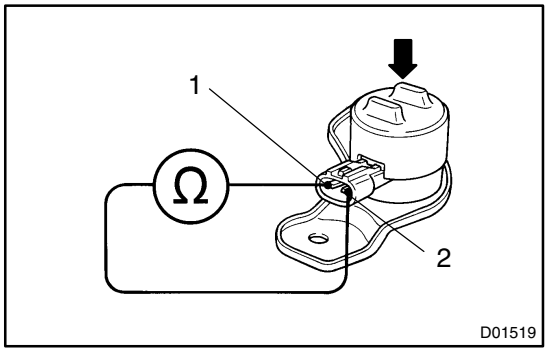
OK:

Accelerator Pedal	Voltage
Fully depressed (kick–down SW is on)	Below 1 V
Released (kick–down SW is OFF)	10 – 14 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–18).**

NG

2	Check kick–down switch.



PREPARATION:
Disconnect the kick–down switch connector.
CHECK:
Check continuity at each terminal of kick–down switch connector.
OK:

Kick–down Switch	Specified continuity
ON	Continuity
OFF	No continuity

NG → **Replace kick–down switch**

OK →

3	Check harness and connector between Engine & ECT ECU and kick–down switch, kick–down switch and body ground (See page IN–30).

NG → **Repair or replace the harness or connector.**

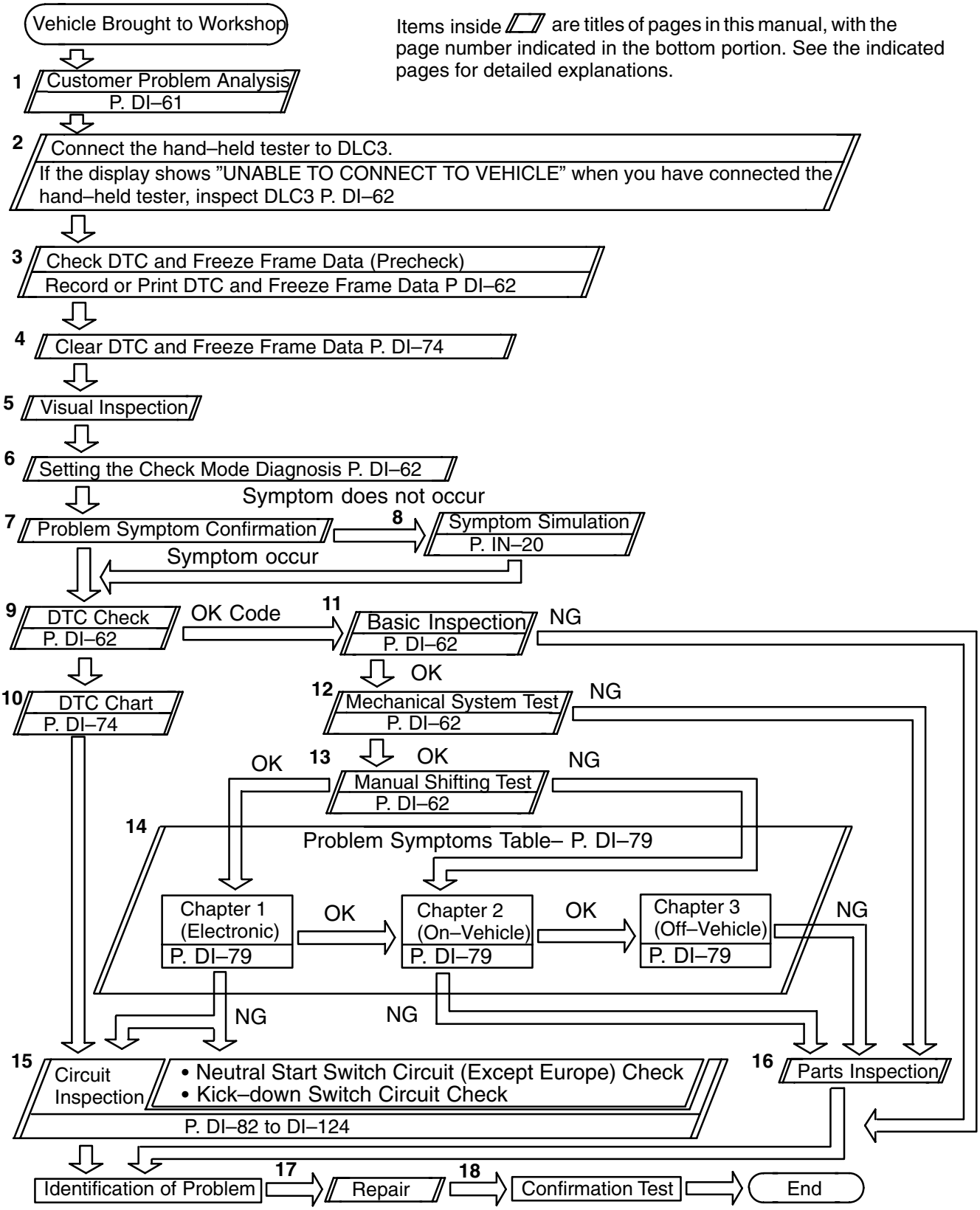
OK →

Check and replace Engine & ECT ECU (See page IN–30).

AUTOMATIC TRANSAXLE (U240E)

HOW TO PROCEED WITH TROUBLESHOOTING

DI2L4–11



DI2L5–06

CUSTOMER PROBLEM ANALYSIS CHECK

Automatic Transaxle 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?	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Vehicle does not move (☐ Any range ☐ Particular range)
	☐ No up–shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → O/D)
	☐ No down–shift (☐ O/D → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)
	☐ Lock–up malfunction
	☐ Shift point too high or too low
	☐ Harsh engagement (☐ N → D ☐ Lock–up ☐ Any drive range)
	☐ Slip or shudder
	☐ No kick–down
	☐ Others ( )

Check Item	Malfunction Indicator Lamp	☐ Normal ☐ Remains ON

DTC Check	1st Time	☐ Normal code ☐ Malfunction code (DTC)
	2nd Time	☐ Normal code ☐ Malfunction code (DTC)

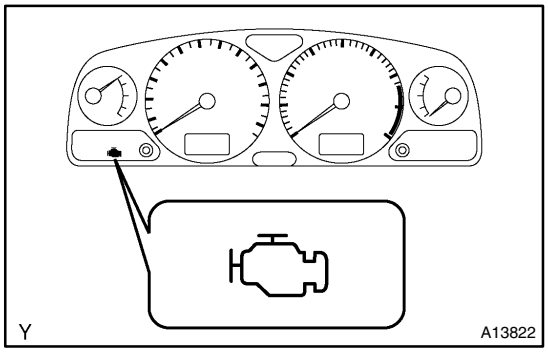
DI80F–01

PRE–CHECK

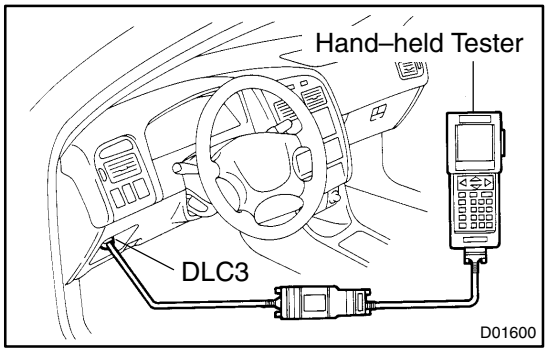
1. DIAGNOSIS SYSTEM

(a) Description

- When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect an OBD scan tool complying with ISO15031–4 or hand–held tester to the vehicle, and read off various data output from the vehicle's engine and ECT ECU.

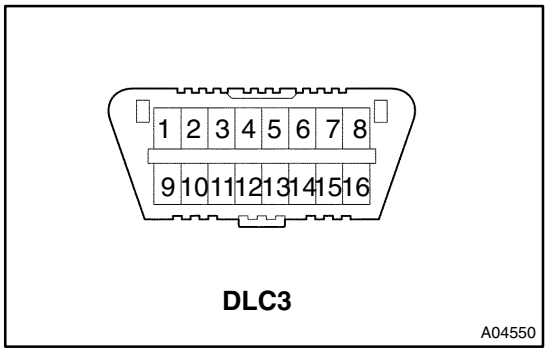


- Euro–OBD regulations require that the vehicle's on–board computer lights up the check engine warning light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components which affect vehicle emissions. In addition to the CHK ENG lighting up when a malfunction is detected, the applicable DTCs prescribed by ISO15031–6 are recorded in the engine and ECT ECU memory (See page DI–74).
  If the malfunction only occurs in 3 trips, the CHK ENG goes off but the DTCs remain recorded in the engine and ECT ECU memory.



- To check the DTCs, connect an OBD scan tool or hand–held tester to the Data Link Connector (DLC3) on the vehicle. The OBD scan tool or hand–held tester also enables you to erase the DTCs and check freeze frame data and various forms of engine data (For 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 DI–74).

- The diagnosis system operates in normal mode during normal vehicle use, and also has a check mode for technicians to simulate malfunction symptoms and perform troubleshooting. Most DTCs use 2 trip detection logic(*) to prevent erroneous detection. By switching the engine and ECT ECU to check mode when troubleshooting, the technician can cause the CHK ENG to light up and for a malfunction that is only detected once or momentarily (hand–held tester) (See page DI–62).
- *2 trip detection logic:
  When a logic malfunction is first detected, the malfunction is temporarily stored in the engine and ECT ECU memory. If the same malfunction is detected again during the 2nd test drive, this 2nd detection causes the CHK ENG to light up .



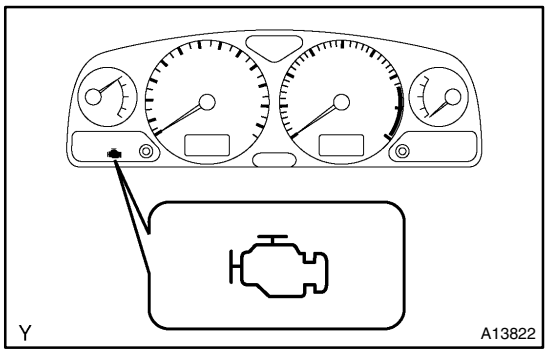
DLC3

(b) Inspect the DLC3.
The vehicle's engine and ECT ECU uses ISO 9141–2 for communication. The terminal arrangement of DLC3 complies with ISO15031–3 and matches the ISO 9141–2 format.

Tester connection	Condition	Specified condition
7 (Bus ⊕ Line) – 5 (Signal ground)	During communication	Pulse generation
4 (Chassis Ground) – Body	Always	1 Ω or less
16 (B+) – Body	Always	9 – 14 V

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

- If communication is normal when the tool is connected to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when the tool is connected 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. INSPECT DIAGNOSIS (Normal Mode)

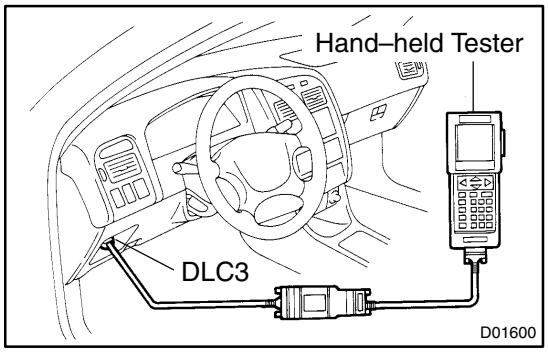
(a) Check the CHK ENG.

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

HINT:

If the CHK ENG does not light up, troubleshoot the combination meter (See page BE–1).

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



(b) Check the DTC.

NOTICE:

Hand–held tester only: When the diagnostic system is switched from the normal mode to the check 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) Prepare an OBD scan tool or hand–held tester.

(2) Connect the OBD scan tool or hand–held tester to the DLC3 at the lower of the instrument panel.

(3) Turn the ignition switch ON and push the OBD scan tool or hand–held tester switch ON.

(4) Use the OBD scan tool or hand–held tester to check the DTCs and freeze frame data and note them down (For operating instructions, see the OBD scan tool's instruction book).

(5) See page DI–74 to confirm the details of the DTCs.

NOTICE:

When simulating symptoms with an OBD scan tool (excluding 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 1st time. Then repeat the simulation process again. When the problem has been simulated twice, the CHK ENG is indicated on the instrument panel and DTCs are recorded in the engine and ECT ECU.

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 the check mode.

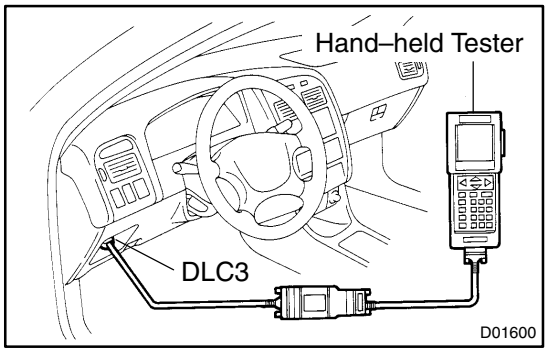
(a) Check the DTC.

(1) Check the initial conditions.

- Battery positive voltage 11 V or more.
- Throttle valve fully closed.
- Transaxle in P position.
- A/C switched off.

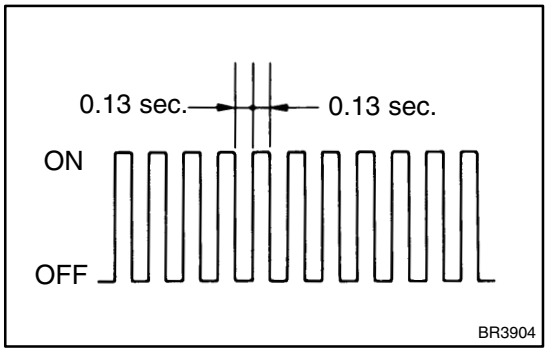
(2) Turn the ignition switch OFF.

(3) Prepare the hand–held tester.



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

(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 CHK ENG flashes).

(7) Start the engine (CHK ENG 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, so all DTCs, etc. are erased.

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

(b) Clear the DTC.
The following actions will erase the DTC and freezed frame data. Operating an OBD scan tool or hand–held tester to erase the codes (See the OBD scan tool's instruction book for operating instructions.).

4. PROBLEM SYMPTOM CONFIRMATION

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 SS–23).

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 SS–23).
(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 SS–23).

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.

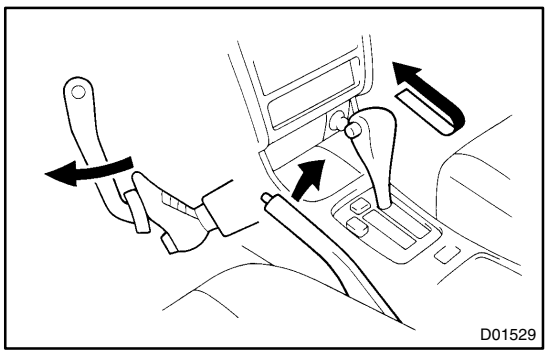
6. BASIC INSPECTION

(a) 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)

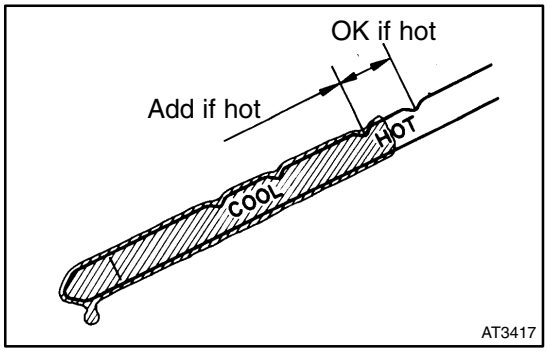


(1) Park the vehicle on a level surface and set the parking brake.

(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 the level is not within the range, add new fluid.

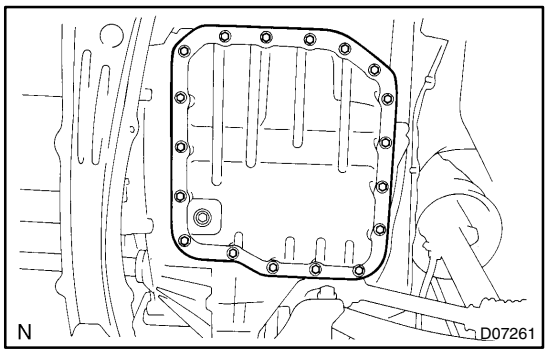
Fluid type: ATF Type T–IV

NOTICE:

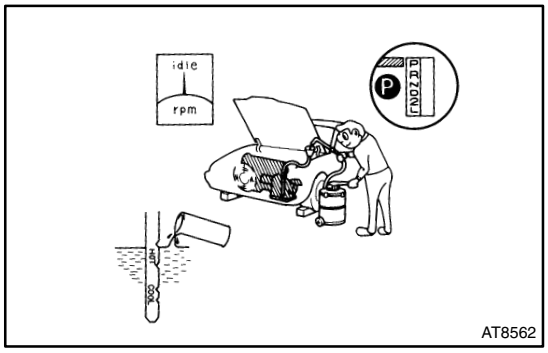
Do not overfill.

(b) Check the fluid condition.

If the fluid smells burnt or is black, replace it.



(c) Replace the ATF.
(1) Remove the drain plug and drain the fluid.
(2) Reinstall the drain plug securely.

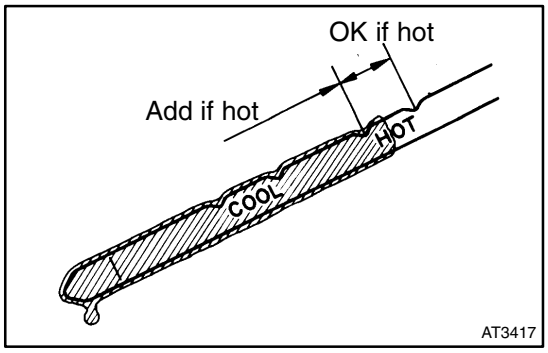


(3) With the engine OFF add new fluid through the oil filler pipe.

Fluid type: ATF Type T–IV

Capacity: 4.1 liters (4.3 US qts, 3.6 Imp.qts)

(4) Start the engine and shift the shift lever into all ranges from P to L range and then shift into P range.



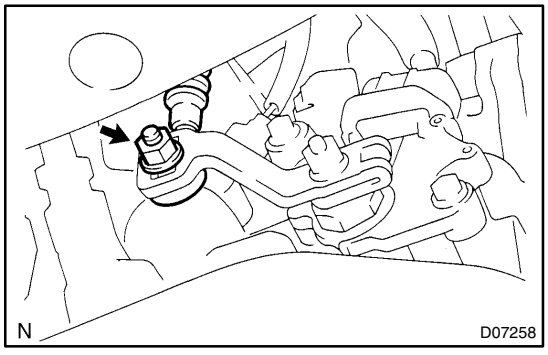
(5) With the engine idling, check the fluid level. Add fluid up to the COOL level on the dipstick.
(6) Check the fluid level at the normal operating temperature, 70 – 80 °C (158 – 176 °F), and add as necessary.

NOTICE:

Do not overfill.

(d) Check the fluid leaks.
Check for leaks in the transaxle.

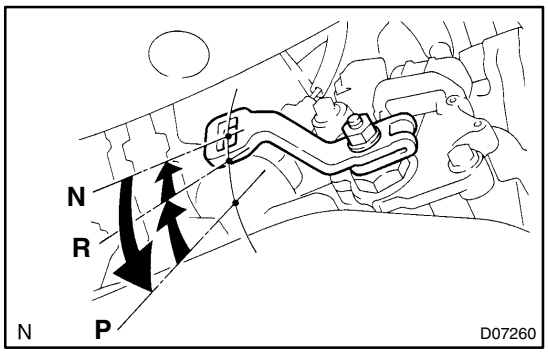
If there are leaks, it is necessary to repair or replace O–rings, FIPGs, oil seals, plugs or other parts.



(e) Inspect and adjust the shift lever position.
When shifting the shift lever from the N range to other positions, check that the lever can be shifted smoothly and accurately to each range and that the position indicator is not aligned with the correct position.

If the indicator is not aligned with the correct position, carry out the following adjustment procedures.

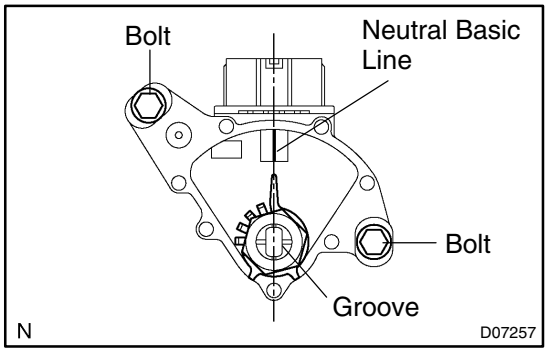
(1) Loosen the nut on the shift lever.
(2) Push the control shaft fully downward.



(3) Return the control shaft lever 2 notches to N range.
(4) Set the shift lever to N range.
(5) While holding the shift lever lightly toward the R range side, tighten the shift lever nut.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(6) 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.



(f) Inspect and adjust the neutral start switch.
Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If it is not as stated above, carry out the following adjustment procedures.

(1) Loosen the neutral start switch bolt and set the shift lever to the N range.
(2) Align the groove and the neutral basic line.
(3) Holding the shift selector, and tighten the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

HINT:

For continuity inspection of the neutral start switch, see page DI–112.

7. 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.
(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: 2,550 ± 150 rpm

(8) Do the same test in the R range.

Stall speed: 2,550 ± 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 • No.2 one–way clutch not operating properly • O/D clutch slipping
(c) Stall speed high in R range	• Line pressure too low • Direct clutch slipping • 1st & reverse brake slipping • O/D clutch slipping
(d) Stall speed high in D and R ranges	• Line pressure too low • Improper fluid level • O/D one–way clutch not operating properly

(b) Measure the time lag.

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 & 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.**

(1) Chock the 4 wheels.

(2) Connect a hand–held tester to DLC3.

(3) Start engine and check idle speed.

Idle speed: 675 ± 50 rpm (In N range and A/C OFF)

(4) 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

(5) 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 • O/D No. 2 one–way clutch not operating properly
N → R time lag is longer	• Line pressure too low • Direct clutch worn • 1st & reverse brake worn • O/D one–way clutch not operating properly

8. HYDRAULIC TEST

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.**

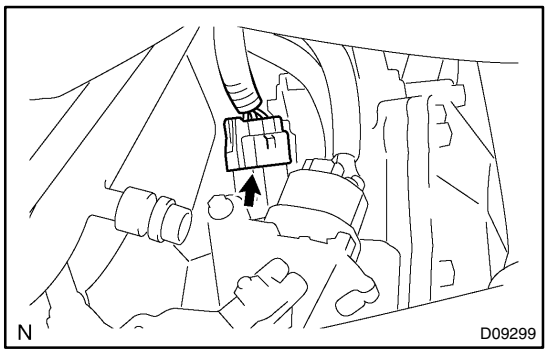
(1) Warm up the ATF.
(2) Remove the test plug on the rear side of the transaxle case and connect SST (See page AX–33 for the location to connect SST).
SST 09992–00095 (09992– 00231, 09992–00271)
(3) Fully apply the parking brake and chock the 4 wheels.
(4) Connect a hand–held tester to DLC3.
(5) Start 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	372 – 412 (3.8 – 4.2, 54 – 59)	640 – 742 (6.5 – 7.6, 93 – 107)
Stall	931 – 1,031 (9.5 – 10.5, 134 – 149)	1,768 – 1,968 (18.0 – 20.1, 255 – 286)

Evaluation:

Problem	Possible cause
If the measured values at all ranges are higher	• Throttle valve defective • Regulator valve detective
If the measured values at all ranges are lower	• Throttle 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 & reverse brake defective



9. 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 solenoid wire.

(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	O/D
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 solenoid wire.

(d) Cancel out the DTC.

DI6RF–03

DIAGNOSTIC TROUBLE CODE CHART

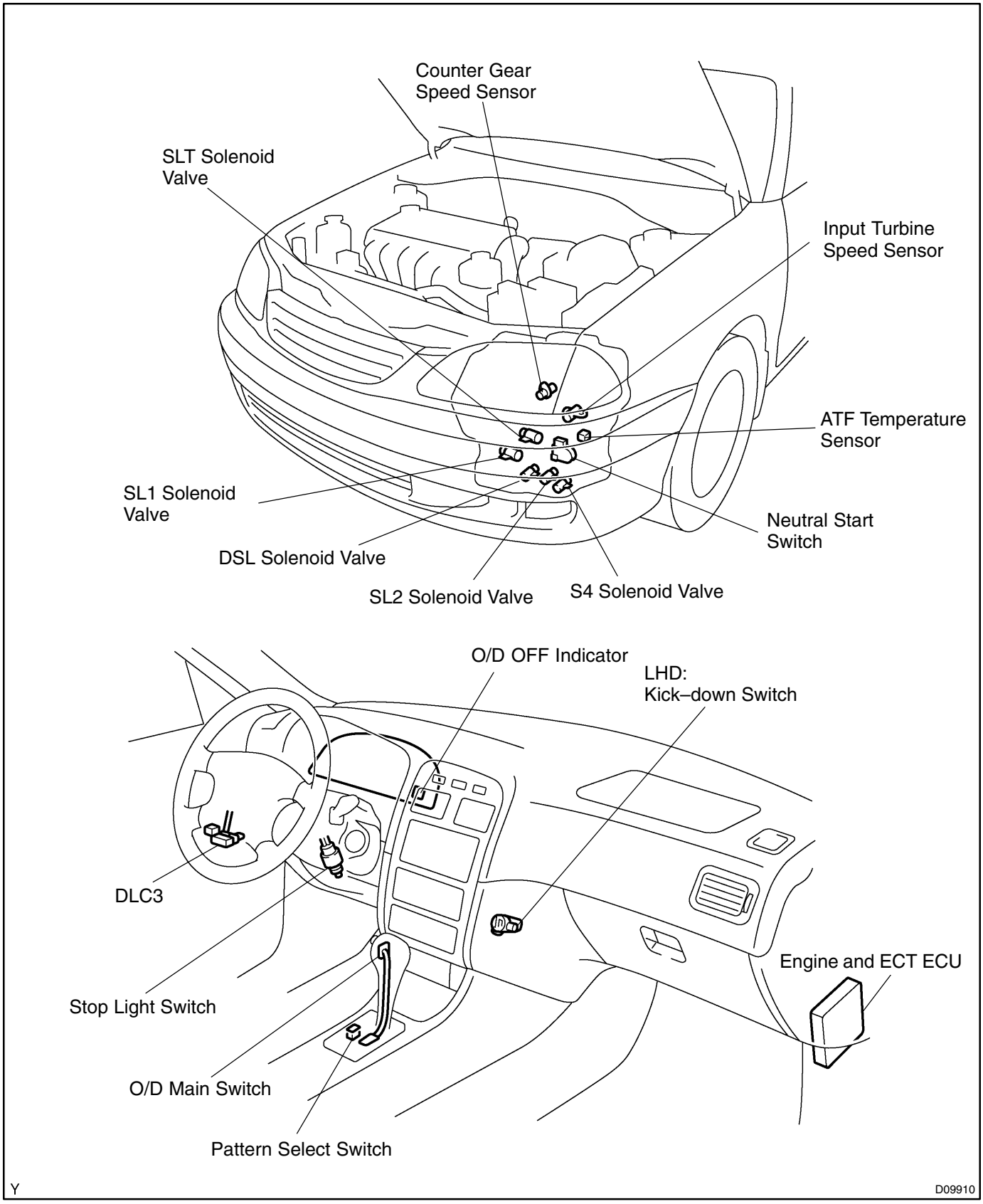
If a DTC is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the page given.

DTC No. (See Page)	Detection Item	Trouble Area	Check engine warning light *1	Memory*2
P0500 (DI–82)	Vehicle Speed Sensor Malfunction	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combinationmeter • Engine and ECT ECU • Automatic transaxle assembly	○	○
P0710 (DI–85)	Transmission Fluid Temperature Sensor Malfunction	• Open or short in ATF temperature sensor circuit • ATF temperature sensor • Engine and ECT ECU	○	○
P0711 *3 (DI–85)	Transmission Fluid Temperature Sensor Rnge/Performance problem	• Open or short in ATF temperature sensor circuit • ATF temperature sensor • Engine and ECT ECU	○	○
P0750 *3 (DI–87)	Shift Solenoid A Malfunction (SL1 Solenoid Valve)	• SL1 solenoid valve is stuck open or closed • Valve body is blocked up or stuck	○	○
P0753 (DI–89)	Shift Solenoid A Electrical Malfunction (SL1 Solenoid Valve)	• Open or short in SL1 solenoid valve circuit • SL1 solenoid valve • Engine and ECT ECU	○	○
P0755 *3 (DI–87)	Shift Solenoid B Malfunction (SL2 Solenoid Valve)	• SL2 solenoid valve is stuck open or closed • Valve body is blocked up or stuck	○	○
P0758 (DI–89)	Shift Solenoid B Electrical Malfunction (SL2 Solenoid Valve)	• Open or short in SL2 solenoid valve circuit • SL2 solenoid valve • Engine and ECT ECU	○	○
P0765 *3 (DI–87)	Shift Solenoid D Malfunction (S4 Solenoid Valve)	• S4 solenoid valve is stuck open or closed • Valve body is blocked up or stuck	○	○
P0768 (DI–89)	Shift Solenoid D Electrical Malfunction (S4 Solenoid Valve)	• Open or short in S4 solenoid valve circuit • S4 solenoid valve • Engine and ECT ECU	○	○
P0770 *3 (DI–95)	Shift Solenoid E Malfunction (DSL Solenoid Valve)	• DSL solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Lock–up clutch	○	○
P0773 (DI–97)	Shift Solenoid E Electrical Malfunction (DSL Solenoid Valve)	• Open or short in shift solenoid valve DSL circuit • DSL solenoid valve • Engine and ECT ECU	○	○
P1520 (DI–100)	Stop Light Switch Circuit	• Open or short in stop light switch circuit • Stop light switch • Engine and ECT ECU	○	○
P1725 (DI–105)	NT Revolution Sensor Circuit Malfunction (Input Turbine Speed Sensor)	• Open or short in input turbine speed sensor circuit • Input turbine speed sensor • Engine and ECT ECU	○	○
P1730 (DI–107)	NC Revolution Sensor Circuit Malfunction (Counter Gear Speed Sensor)	• Open or short in counter gear speed sensor circuit • Counter gear speed sensor • Engine and ECT ECU	○	○
P1760 (DI–109)	Linear Solenoid for Accumulator Pressure Control Circuit Malfunction (SLT Solenoid Valve)	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine and ECT ECU	○	○
P1780 (DI–112)	Neutral Start Switch Malfunction	• Short in neutral start switch circuit • Neutral start switch • Engine and ECT ECU	○	○

*1: "○" mark means Check engine warning light blinks once every 2 seconds.
"X" mark means Check engine warning light never blinks.
*2: "○" mark means Engine and ECT ECU memorizes the malfunction code if the Engine and ECT ECU detects the DTC detection condition.
*3: European spec. only
HINT:
This DTC may be output when the clutch, brake and gear components etc. inside the automatic transaxle are damaged.

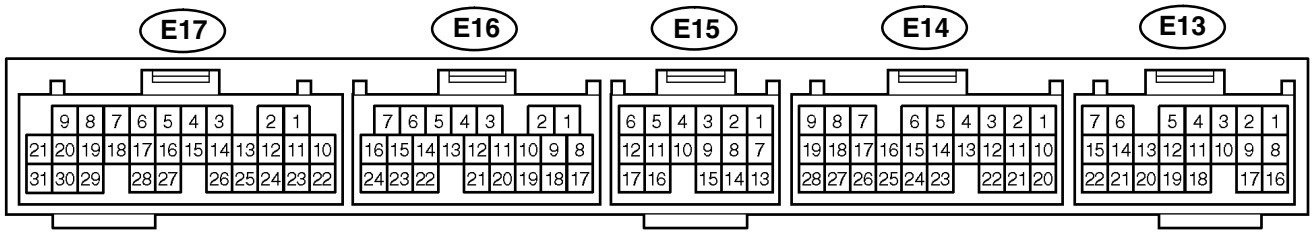
DI6TF–03

PARTS LOCATION



DI6RG–03

TERMINALS OF ECU



D01054 D03442

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
STP (E13–22) ↔ E1 (E16–3)	G–W ↔ BR	IG ON and brake pedal depressed	10 – 14
		IG ON and brake pedal released	Below 1
$SL1^+$ (E14–7) ↔ $SL1^-$ (E14–6)	B ↔ W	IG ON	10 – 14
		1st or 2nd gear	10 – 14
		3rd or O/D gear	Below 1
$SL2^+$ (E14–7) ↔ $SL2^-$ (E14–16)	G ↔ L	IG ON	Below 1
		1st or 2nd gear	10 – 14
		3rd or O/D gear	Below 1
DSL (E14–25) ↔ Body ground	P ↔ Body ground	IG ON	Below 1
		Vehicle driving under lock–up position	10 – 14
NC^+ (E15–4) ↔ NC^- (E15–10)	W ↔ B	Engine is running	Pulse signal is output Below 1 ↔ 4 – 5
NT^+ (E15–5) ↔ NT^- (E15–11)	G ↔ R	Engine is running	Pulse signal is output Below 1 ↔ 4 – 5
SLT^+ (E14–15) ↔ SLT^- (E14–24)	R ↔ L–W	IG ON	10 – 14
OD2 (E13–11) ↔ E1 (E16–3)	L ↔ BR	O/D main switch ON	10 – 14
		O/D main switch OFF	Below 1
L (E14–4) ↔ E1 (E16–3)	Y–G ↔ BR	IG ON and Shift lever L range	10 – 14
		IG ON and Shift lever other than L range	Below 1
2 (E14–11) ↔ E1 (E16–3)	O ↔ BR	IG ON and Shift lever 2 range	10 – 14
		IG ON and Shift lever other than 2 range	Below 1
R (E14–1) ↔ E1 (E16–3)	R–B ↔ BR	IG ON and Shift lever R range	10 – 14
		IG ON and Shift lever other than R range	Below 1
D (E14–10) ↔ E1 (E16–3)	B–Y ↔ BR	IG ON and Shift lever D range	10 – 14
		IG ON and Shift lever other than D range	Below 1
NSW (E15–23) ↔ E1 (E16–3)	B–W ↔ BR	IG ON and Shift lever P or N range	10 – 14
		IG ON and Shift lever other than P or N range	Below 1
THO (E14–8) ↔ E2 (E16–19)	O ↔ BR	IG ON and ATF temperature 110 °C (230 °F)	Below 1
S4 (E14–26) ↔ E1 (E16–3)	Y ↔ BR	IG ON	Below 1
		IG ON and O/D gear	10 – 14
KD (E13–17) ↔ E1 (E16–3)	Y ↔ BR	IG ON and accelerator pedal is fully depressed	Below 1.5
		IG ON and accelerator is released	10 – 14

SPD (E13–6) ↔ E1 (E16–3)	G ↔ BR	IG ON and vehicle stationary	Below 1
		IG ON and turn one front wheel slowly	Pulse signal is output Below 1 ↔ 4 –6
PWR (E14–9) – E1 (E16–3)	P ↔ BR	IG ON and pattern select switch: PWR	9 – 14
		IG ON and pattern select switch: NORM	Below 1
SNWI (E14–19) – E1 (E16–3)	P–B ↔ BR	IG ON and SNOW mode switch: ON	9 – 14
		IG ON and SNOW mode switch: OFF	Below 1.5

DI6RH–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.

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 Engine and ECT ECU.

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)	1. Neutral start switch circuit 2. Engine and ECT ECU	DI–112 IN–30
No up–shift (3rd → O/D)	1. O/D main switch circuit 2. Engine and ECT ECU	DI–116 IN–30
No down–shift (O/D → 3rd)	Engine and ECT ECU	IN–30
No down–shift (A particular gear, from 3rd to 1st gear, is not down–shifted)	1. Neutral start switch circuit 2. Engine and ECT ECU	DI–112 IN–30
No lock–up or No lock–up off	1. Stop light switch circuit 2. Engine and ECT ECU	DI–100 IN–30
Shift point too high or too low	Engine and ECT ECU	IN–30
Up–shift to 2nd while in L range	Engine and ECT ECU	IN–30
Up–shift to 3rd while in 2 range	Engine and ECT ECU	IN–30
Up–shift to O/D from 3rd while O/D main switch is OFF	1. O/D main switch circuit 2. Engine and ECT ECU	DI–116 IN–30
Up–shift to O/D from 3rd while engine is cold	Engine and ECT ECU	IN–30
Harsh engagement (N → D)	Engine and ECT ECU	IN–30
Harsh engagement (Lock–up)	Engine and ECT ECU	IN–30
Harsh engagement (Any driving range)	Engine and ECT ECU	IN–30
Poor acceleration	Engine and ECT ECU	IN–30
No kick–down	1. Kick–down switch circuit 2. Engine and ECT ECU	DI–124 IN–30
Engine stalls when starting off or stopping	Engine and ECT ECU	IN–30

Chapter 2: On–vehicle repair
(★: U240E automatic transaxle repair manual Pub. No. RM740U)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. Manual valve 2. Primary regulator valve 3. Off–vehicle repair matrix chart	★ ★ –
Vehicle does not move in R range	Off–vehicle repair matrix chart	–
No up–shift (1st → 2nd)	1. 1–2 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (2nd → 3rd)	1. 2–3 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (3rd → O/D)	1. 3–4 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (O/D → 3rd)	3–4 shift valve	★
No down–shift (3rd → 2nd)	2–3 shift valve	★
No down–shift (2nd → 1st)	1–2 shift valve	★
No lock–up or No lock–up off	1. Lock–up relay valve 2. Off–vehicle repair matrix chart	★ –
Harsh engagement (N → D)	1. C_1 accumulator 2. Off–vehicle repair matrix chart	★ –
Harsh engagement (N → R)	1. C_2 accumulator 2. Off–vehicle repair matrix chart	★
Harsh engagement (Lock–up)	1. Lock–up relay valve 2. Off–vehicle repair matrix chart	★ –
Harsh engagement (2nd → 3rd)	C_2 accumulator	★
Harsh engagement (3rd → O/D)	B_0 accumulator	★
Harsh engagement (O/D → 3rd)	1. C_0 accumulator 2. B_0 accumulator	★ ★
Slip or shudder (Forward and reverse)	1. Oil strainer 2. Off–vehicle repair matrix chart	★ –
No engine braking (1st: L range)	Off–vehicle repair matrix chart	–
No engine braking (2nd: 2 range)	Off–vehicle repair matrix chart	–
No kick–down	1. 1–2 shift valve 2. 2–3 shift valve 3. 3–4 shift valve	★ ★ ★

Chapter 3: Off–vehicle repair
(★: U240E automatic transaxle repair manual Pub. No. RM740U)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. Front and rear planetary gear 2. U/D planetary gear 3. U/D one–way clutch (F_2) 4. Forward clutch (C_1) 5. U/D brake (B_3)	★ ★ ★ ★ ★
Vehicle does not move in R range	1. Front and rear planetary gear unit 2. U/D planetary gear unit 3. Direct clutch (C_2) 4. U/D brake (C_3) 5. 1st & reverse brake (B_2)	★ ★ ★ ★ ★
No up–shift (1st → 2nd)	1. No. 1 one–way clutch (F_1) 2. 2nd brake (B_1)	★ ★
No up–shift (2nd → 3rd)	Direct clutch (C_2)	★
No up–shift (3rd → O/D)	U/D clutch (C_3)	★
No lock–up or No lock–up off	Torque converter	AX–38
Harsh engagement (N → D)	1. Forward clutch (C_1) 2. U/D one–way clutch (F_2) 3. No. 1 one–way clutch (F_1)	★ ★ ★
Harsh engagement (N → R)	1. Direct clutch (C_2) 2. 1st & reverse brake (B_2)	★ ★
Harsh engagement (Lock–up)	Torque converter	AX–38
Slip or shudder (Forward position: After warm–up)	1. Torque converter 2. Forward clutch (C_1) 3. Direct clutch (C_2) 4. U/D brake (C_3) 5. No. 1 one–way clutch (F_1) 6. U/D one–way clutch (F_2)	AX–38 ★ ★ ★ ★ ★
Slip or shudder (R range)	1. Direct clutch (C_2) 2. 1st & reverse brake (B_2)	★ ★
Slip or shudder (1st)	No. 1 one–way clutch (F_1)	★
Slip or shudder (2nd)	1. U/D one–way clutch (F_2) 2. 2nd brake (B_1)	★ ★
Slip or shudder (3rd)	Direct clutch (C_2)	★
Slip or shudder (O/D)	U/D clutch (C_3)	★
No engine braking (1st – 3rd: D range)	U/D brake (B_3)	★
No engine braking (1st: L range)	1st & reverse brake (B_2)	★
No engine braking (2nd: 2 range)	2nd brake (B_1)	★
Poor acceleration (All range)	1. Torque converter 2. U/D planetary gear	AX–38 ★
Poor acceleration (O/D)	1. U/D clutch (C_3) 2. U/D planetary gear	★ ★
Large shift shock or engine stalls when starting off or stopping	Torque converter	AX–38

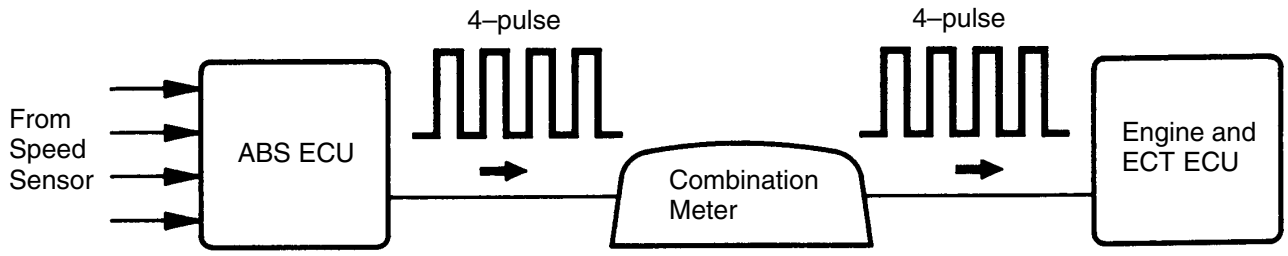
DI6RI–03

CIRCUIT INSPECTION

DTC	P0500	Vehicle Speed Sensor Malfunction

CIRCUIT DESCRIPTION

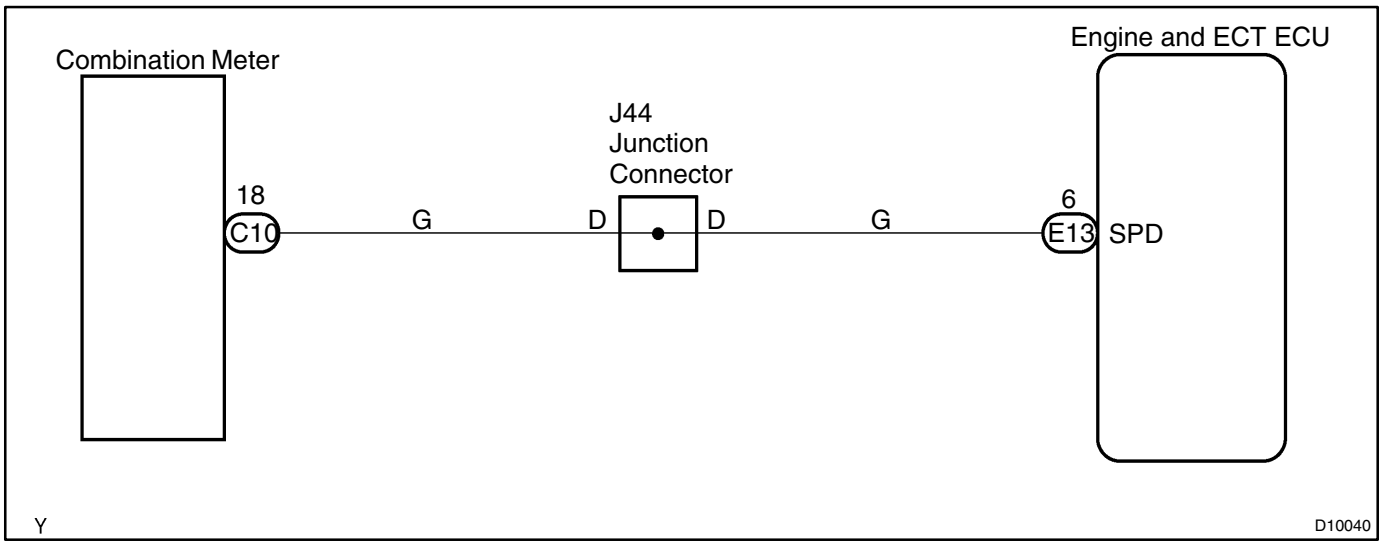
The ABS ECU output the vehicle speed signals to a speedometer in the combination meter, and the signals it is then transmitted to the Engine and ECT ECU. The Engine and ECT ECU determines the vehicle speed based on the frequency of these pulse signals.



A00022

DTC No.	DTC Detecting Condition	Trouble Area
P0500	No vehicle speed sensor signal to Engine and ECT ECU during vehicle driving (2 trip detection logic)	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Engine and ECT ECU • Combination meter

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check operation of speedometer.**

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.

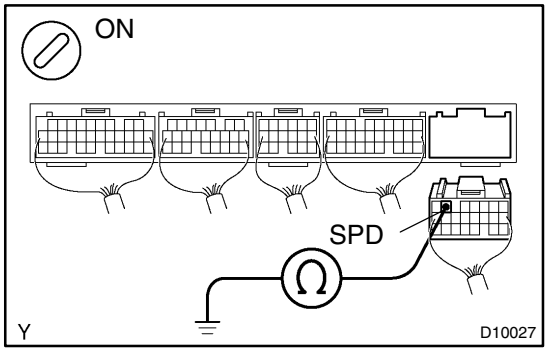
CHECK:

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 (See page BE–1).**

OK

2	**Check for short in harness and connector between terminal SPD of Engine and ECT ECU connector and body ground.**



PREPARATION:

Disconnect the connector of the Engine and ECT ECU.

CHECK:

Check continuity between terminal SPD of the Engine and ECT ECU connector and body ground.

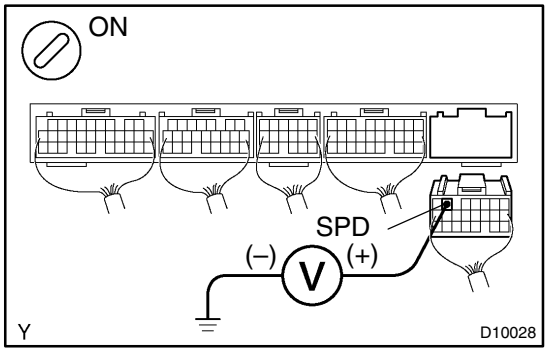
OK:

No continuity (1M Ω or higher)

NG → **Repair or replace harness or connector.**

OK

3	Check voltage between terminal SPD of Engine and ECT ECU connector and body ground.



PREPARATION:
Turn ignition switch ON.
CHECK:
Measure voltage between terminal SPD of Engine and ECT ECU connector and body ground.
OK:
Voltage: 9 – 14 V

NG → **Check for open in harness and connector between J44 junction connector and Engine and ECT ECU (See page IN–30).**

OK

4	Check for open in harness and connector between J44 junction connector and combination meter (See page IN–30).

NG → **Repair or replace harness or connector.**

OK

5	Check Engine and ECT ECU (See page IN–20).

NG → **Replace Engine and ECT ECU.**

OK

Check and repair ABS system.

DI80G–01

DTC	P0710	Transmission Fluid Temperature Sensor Malfunction (ATF Temperature Sensor)

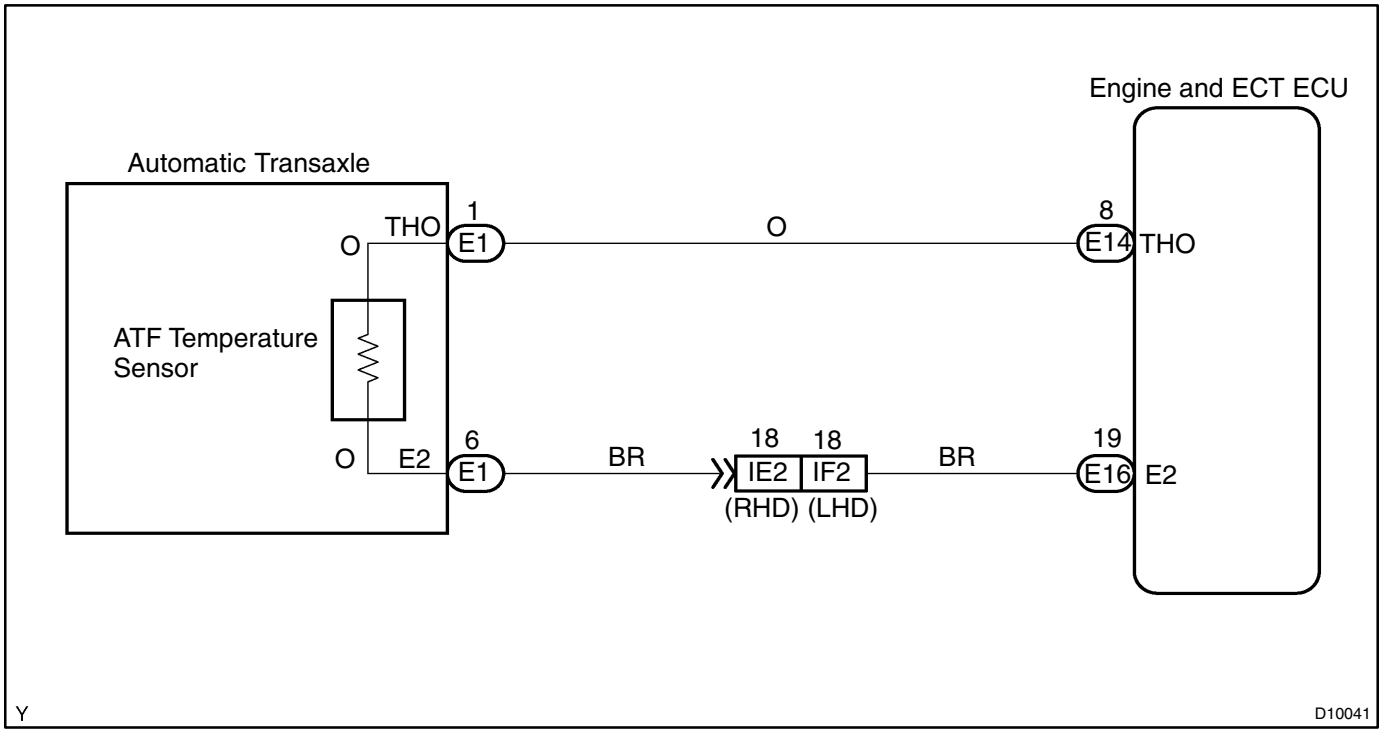
DTC	P0711	Transmission Fluid Temperature Circuit Range/Performance problem (Europe only)

CIRCUIT DESCRIPTION

The ATF temperature sensor converts fluid temperature into a resistance value which is input into the Engine and ECT ECU.

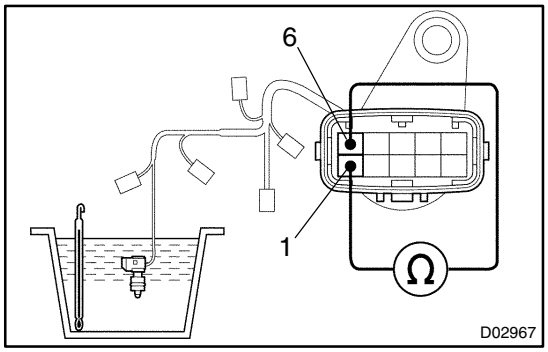
DTC No.	DTC Detecting Condition	Trouble Area
P0710	Either (a) or (b) is detected for 0.5 sec. or more. (1–trip detection logic) (a) Temp. sensor resistance is less than 79 Ω. (b) After the engine has been operating for 15 minutes or more, the resistance at the temp. sensor is more than 156 kΩ.	• Open or short in ATF temp. sensor • ATF temp. sensor • Engine and ECT ECU
P0711	Both (a) and (b) are detected. (2–trip detection logic) (a) After 12 seconds of the engine start, the temp. of the atmosphere and that of the engine coolant is more than –10°C. (b) After a normal driving for over 20 minutes and 10km, the ATF temp. is less than 10°C.	• Open in ATF temp. sensor • ATF temp. sensor • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check ATF temperature sensor.**



PREPARATION:

(a) Disconnect the solenoid wire connector.
(b) Remove the oil pan.
(c) Disconnect all solenoid valve connectors.
(d) Remove the transmission wire harness.

CHECK:

Measure resistance between terminals 1 and 6 of solenoid connector at 25 °C (77 °F) and 110 °C (230 °F).

OK:

Resistance (Approx.):
25 °C (77 °F): 3.5 kΩ
110 °C (230 °F): 231 – 263 Ω

NG → **Replace the ATF temperature sensor (transaxle wire).**

OK

2	**Check harness and connector between ATF temperature sensor and Engine and ECT ECU (See page IN–30).**

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine and ECT ECU (See page IN–30).

DI4ZZ–05

DTC	P0750	Shift Solenoid A Malfunction (SL1 Solenoid Valve) (Europe only)

DTC	P0755	Shift Solenoid B Malfunction (SL2 Solenoid Valve) (Europe only)

DTC	P0765	Shift Solenoid D Malfunction (S4 Solenoid Valve) (Europe only)

SYSTEM DESCRIPTION

The Engine and ECT ECU uses signals from the vehicle speed sensor to detect the actual gear position (1st, 2nd, 3rd or O/D gear).

Then the Engine and ECT ECU compares the actual gear with the shift schedule in the Engine and ECT ECU memory to detect mechanical trouble of the shift solenoid valves and valve body.

DTC No.	DTC Detecting Condition	Trouble Area
P0750 P0755 P0765	During normal driving, the gear required by the ECM does not match the actual gear (2–trip detection logic)	• SL1/SL2/S4 solenoid valve is stuck open or closed • Valve body is blocked up or stuck

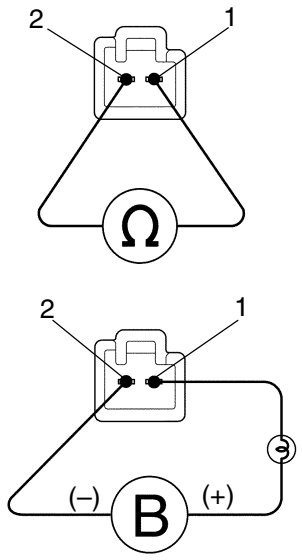
HINT:

Check the SL1 solenoid valve when DTC P0750/62 is output, check the SL2 solenoid valve when DTC P0755/63 is output and check S4 solenoid valve when DTC P0765/65 is output.

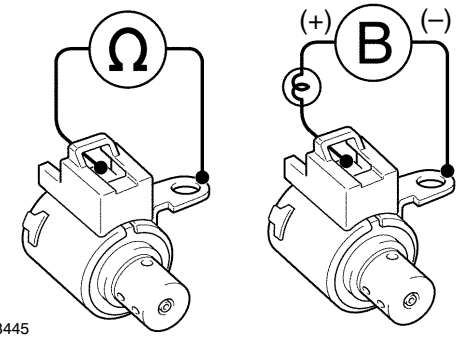
INSPECTION PROCEDURE

1	Check SL1, SL2 or S4 solenoid valve operation.

SL1 and SL2 solenoid valve



S4 solenoid valve



D03445
D03446
D03424 D03423
D03724

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Remove the SL1, SL2 or S4 solenoid valve.

Check Solenoid Resistance:

CHECK:

(a) SL1 or SL2 solenoid valve:
Measure resistance between terminals 1 and 2 of solenoid connector.
(b) S4 solenoid valve:
Measure resistance between terminal 1 of solenoid connector and solenoid body.

OK:

(a) Resistance: 5.1 – 5.5 Ω
(b) The shift solenoid valve makes operation noise.

Check Solenoid Operation:

CHECK:

(a) SL1 or SL2 solenoid valve:
Connect the positive (+) lead with an 23–W bulb to terminal 1 and the negative (–) lead to terminal 2 of solenoid connector, then check the movement of the valve.
(b) S4 solenoid valve:
Connect the positive (+) lead with an 23–W bulb to terminal 1 of solenoid connector and the negative (–) lead to the solenoid valve body, then check the movement of the valve.

OK:

(a) Resistance: 5.1 – 5.5 Ω
(b) The shift solenoid valve makes operation noise.

NG → **Replace the SL1, SL2 or S4 solenoid valve.**

OK

Check the valve body (See page AX–8).

DI6RY–03

DTC	P0753	Shift Solenoid A Electrical Malfunction (SL1 Solenoid Valve)

DTC	P0758	Shift Solenoid B Electrical Malfunction (SL2 Solenoid Valve)

DTC	P0768	Shift Solenoid D Electrical Malfunction (S4 Solenoid Valve)

CIRCUIT DESCRIPTION

Shifting from 1st to O/D is performed in combination with ON and OFF of the SL1 and SL2 solenoid valves controlled by Engine and ECT ECU. If an open or short circuit occurs in either of the solenoid valves, the Engine and ECT ECU controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

DTC No.	DTC Detecting Condition	Trouble Area
P0753 P0758	The Engine and ECT ECU checks for an open or short circuit in the SL1 and SL2 solenoid valves. (a) When the solenoid is energized, the duty ratio exceed 75 %. (b) When the solenoid is not energized, the duty ratio is less than 3 %.	• Open or short in SL1/SL2/S4 solenoid valve circuit • SL1/SL2/S4 solenoid valve • Engine and ECT ECU
P0768	The Engine and ECT ECU checks for an open or short circuit in the S4 solenoid valve circuit when it changes. The Engine and ECT ECU records DTC P0768/65 if condition (a) or (b) is detected. (a) When the solenoid is energized, the solenoid resistance is 8 Ω or less and is counted. (b) When the solenoid is not energized, the solenoid resistance is 100 kΩ or more and is counted.	

HINT:

Check the SL1 solenoid valve when DTC P0753/62 is output, check the SL2 solenoid valve when DTC P0758/63 is output and check the S4 solenoid valve when DTC P0768/65 is output.

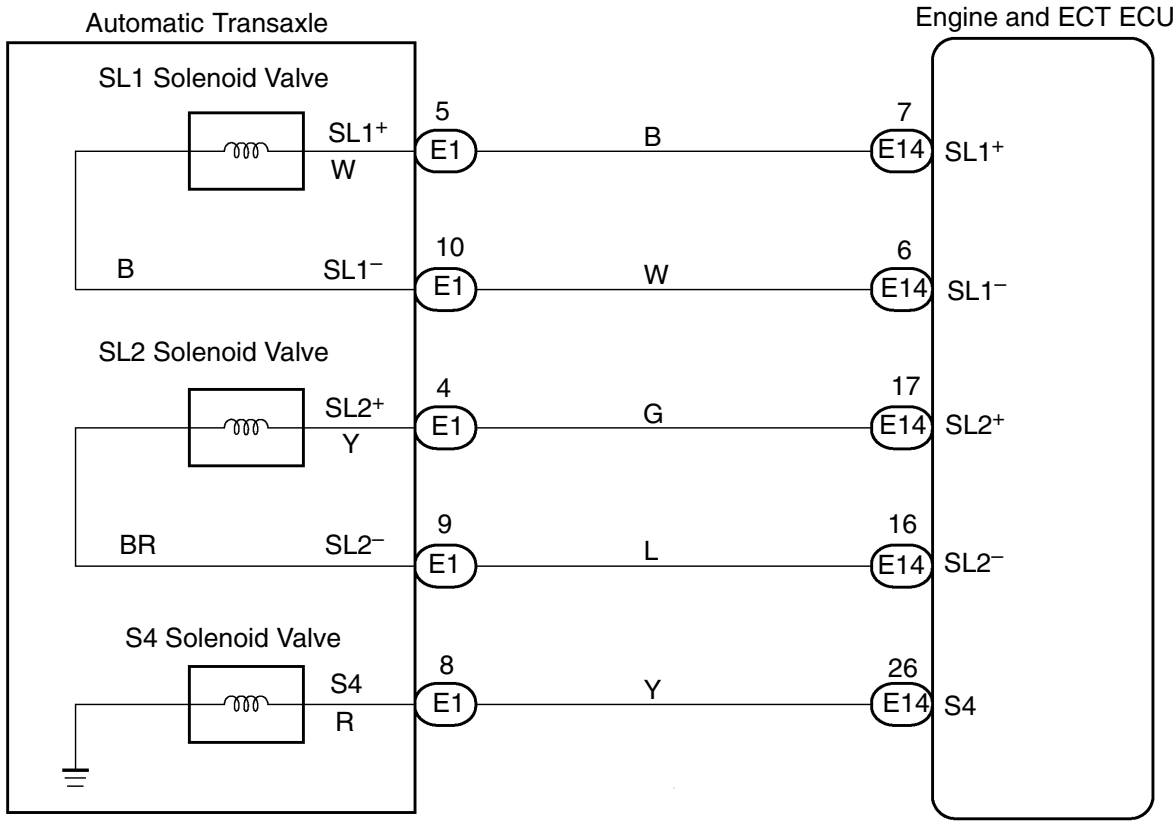
Fail safe function:
If either of the shift solenoid valve circuits develops an open or short, the Engine and ECT ECU turns the other solenoid ON and OFF to shift to the gear positions shown in the table below. The Engine and ECT ECU also turns the DSL solenoid valve OFF at the same time. If both solenoids are malfunction, hydraulic control cannot be performed electronically and must be done manually.
Manual shifting as shown in the following table must be done (In the case of a short circuit, the Engine and ECT ECU stops sending current to the short circuited solenoid).

NORMAL				SL1 SOLENOID MALFUNCTIONING								SL2 SOLENOID MALFUNCTIONING			
				Driving at 3rd or O/D				Driving at 1st or 2nd							
Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4	
ON	ON	OFF	1st	X	ON ↓ OFF	OFF	3rd	X	ON	OFF	2nd	ON ↓ OFF	X	OFF	3rd
OFF	ON	OFF	2nd	X	ON ↓ OFF	OFF	3rd	X	ON	OFF	2nd	OFF	X	OFF	3rd
OFF	OFF	OFF	3rd	X	OFF	OFF	3rd	X	OFF ↓ ON	OFF ↓ ON	3rd	OFF	X	OFF	3rd
OFF	OFF	ON	O/D	X	OFF	ON	O/D	X	OFF ↓ ON	ON	3rd	OFF	X	ON	O/D

S4 SOLENOID MALFUNCTIONING				SL1 AND SL2 SOLENOID MALFUNCTIONING				SL1 AND S4 SOLENOID MALFUNCTIONING							
								Driving at 3rd or O/D				Driving at 1st or 2nd			
Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4	
ON	ON	X	1st	X	X	OFF	3rd	X	ON ↓ OFF	X	3rd	X	ON	X	2nd
OFF	ON	X	2nd	X	X	OFF	3rd	X	ON ↓ OFF	X	3rd	X	ON	X	2nd
OFF	OFF	X	3rd	X	X	OFF	3rd	X	OFF	X	3rd	X	OFF ↓ ON	X	2nd
OFF	OFF	X	3rd	X	X	ON	O/D	X	OFF	X	3rd	X	OFF ↓ ON	X	2nd

SL2 AND S4 SOLENOID MALFUNCTIONING				SL1, SL2 AND S4 SOLENOID MALFUNCTIONING			
Solenoid Valve			Gear	Solenoid Valve			Gear
SL1	SL2	S4		SL1	SL2	S4	
ON ↓ OFF	X	X	3rd	X	X	X	3rd
OFF	X	X	3rd	X	X	X	3rd
OFF	X	X	3rd	X	X	X	3rd
OFF	X	X	3rd	X	X	X	3rd

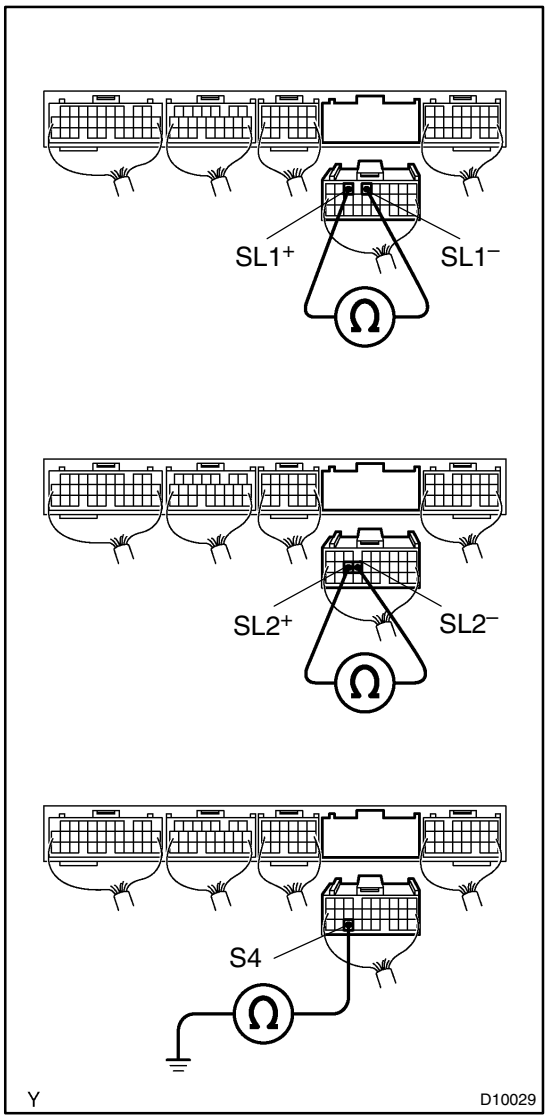
WIRING DIAGRAM



D10189

INSPECTION PROCEDURE

1	**Measure resistance between terminals of Engine and ECT ECU.**



PREPARATION:

Disconnect the connector from Engine and ECT ECU.

CHECK:

(a) Measure resistance between terminals SL1+ and SL1– of Engine and ECT ECU connector.

(b) Measure resistance between terminals SL2+ and SL2– of Engine and ECT ECU connector.

(c) Measure resistance between terminal S4 of Engine and ECT ECU connector and body ground.

OK:

Resistance:

(a) SL1+ – SL1–: 5.3 ± 0.2 Ω

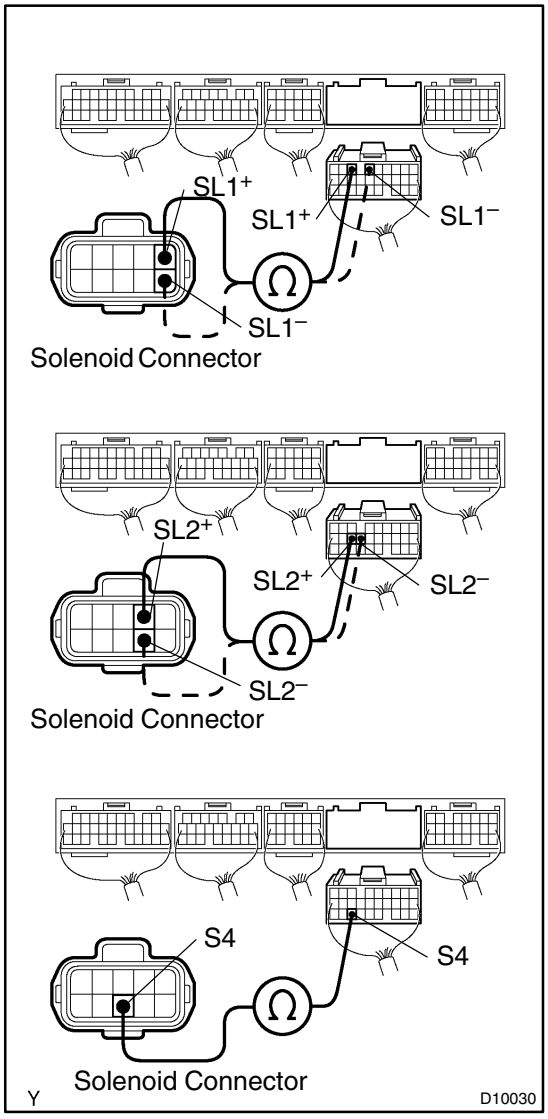
(b) SL2+ – SL2–: 5.3 ± 0.2 Ω

(c) S4 – Body ground: 13 ± 2 Ω

OK	**Check and replace the Engine and ECT ECU.**

NG

2	**Measure harness and connector between Engine and ECT ECU and automatic transaxle solenoid connector.**



PREPARATION:

(a) Disconnect the solenoid connector from the automatic transaxle.

(b) Disconnect the connector from the Engine and ECT ECU.

CHECK:

(a) Measure the harness and connector between terminal $SL1^+$ or $SL1^-$ of Engine and ECT ECU and terminal $SL1^+$ or $SL1^-$ of solenoid connector.

(b) Measure the harness and connector between terminal $SL2^+$ or $SL2^-$ of Engine and ECT ECU and terminal $SL2^+$ or $SL2^-$ of solenoid connector.

(c) Measure the harness and connector between terminal S4 of Engine and ECT ECU and terminal S4 of solenoid connector.

OK:

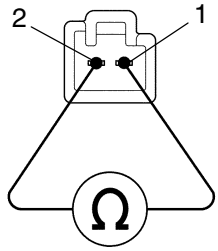
Resistance: 0 Ω

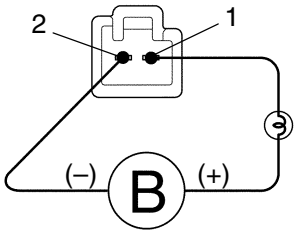
NG → **Repair or replace the harness or connector.**

OK

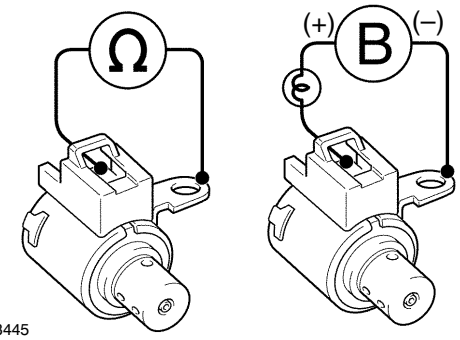
3	Check SL1, SL2 or S4 solenoid valve.

SL1 and SL2 solenoid valve





S4 solenoid valve



D03445
D03446
D03424 D03423
D03724

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Remove the SL1, SL2, or S4 solenoid valve.

Check Solenoid Resistance:

CHECK:

(a) SL1 or SL2 solenoid valve:
Measure resistance between terminals 1 and 2 of solenoid connector.
(b) S4 solenoid valve:
Measure resistance between terminal 1 of solenoid connector and solenoid body.

OK:

Resistance: 5.1 – 5.5 Ω

Check Solenoid Operation:

CHECK:

(a) SL1 or SL2 solenoid valve:
Connect the positive (+) lead with an 23–W bulb to terminal 1 and the negative (–) lead to terminal 2 of solenoid connector, then check the movement of the valve.
(b) S4 solenoid valve:
Connect the positive (+) lead with an 23–W bulb to terminal 1 of solenoid connector and the negative (–) lead to the solenoid valve body, then check the movement of the valve.

OK:

The shift solenoid valve makes operation noise.

NG → **Replace the solenoid valve.**

OK

Repair or replace the solenoid wire, harness and connector between Engine and ECT ECU and automatic transaxle solenoid connector.

DI4ZX–05

DTC	P0770	Shift Solenoid E Malfunction (DSL Solenoid Valve) (Europe only)

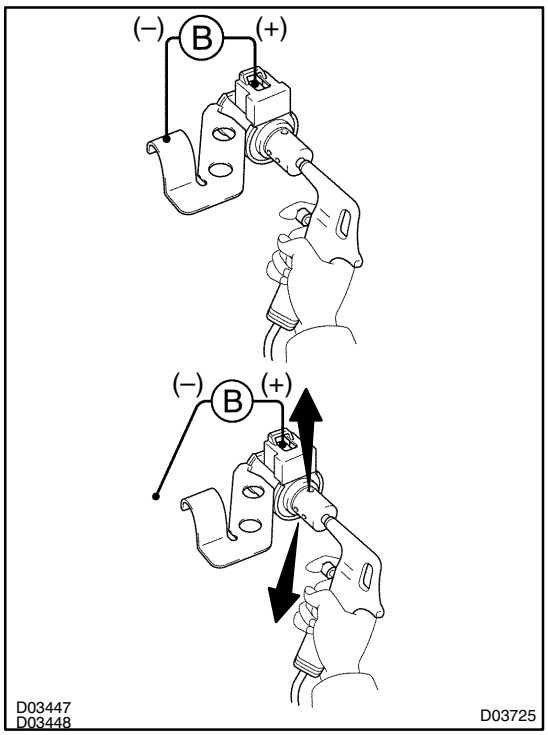
SYSTEM DESCRIPTION

The Engine and ECT ECU uses the signals from the throttle position sensor, air–flow meter and crankshaft position sensor to monitor the engagement condition of the lock–up clutch.
Then the Engine and ECT ECU compares the engagement condition of the lock–up clutch with the lock–up schedule in the Engine and ECT ECU memory to detect mechanical trouble of the DSL solenoid valve, valve body and torque converter.

DTC No.	DTC Detecting Condition	Trouble Area
P0770	Lock–up does not occur when driving in the lock–up range (normal driving at 80 km/h [50 mph]), or lock–up remains ON in the lock–up OFF range. (2–trip detection logic)	• DSL solenoid valve is stuck open or closed • Valve body blocked up or stuck • Lock–up clutch

INSPECTION PROCEDURE

1	**Check DSL solenoid valve operation.**



PREPARATION:
(a) Remove the oil pan.
(b) Remove the DSL solenoid valve.

CHECK:
(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(b) When battery positive voltage is supplied to the shift solenoid valve, check that the solenoid valve opens.

OK:

(a) Solenoid valve does not leak air.
(b) Solenoid valve opens.

NG → **Replace the DSL solenoid valve.**

OK

2	**Check valve body (See page AX–8).**

NG → **Repair or replace the valve body.**

OK

Replace the torque converter (See page AX–38).

DTC	P0773	Shift Solenoid E Electrical Malfunction (DSL Solenoid Valve)

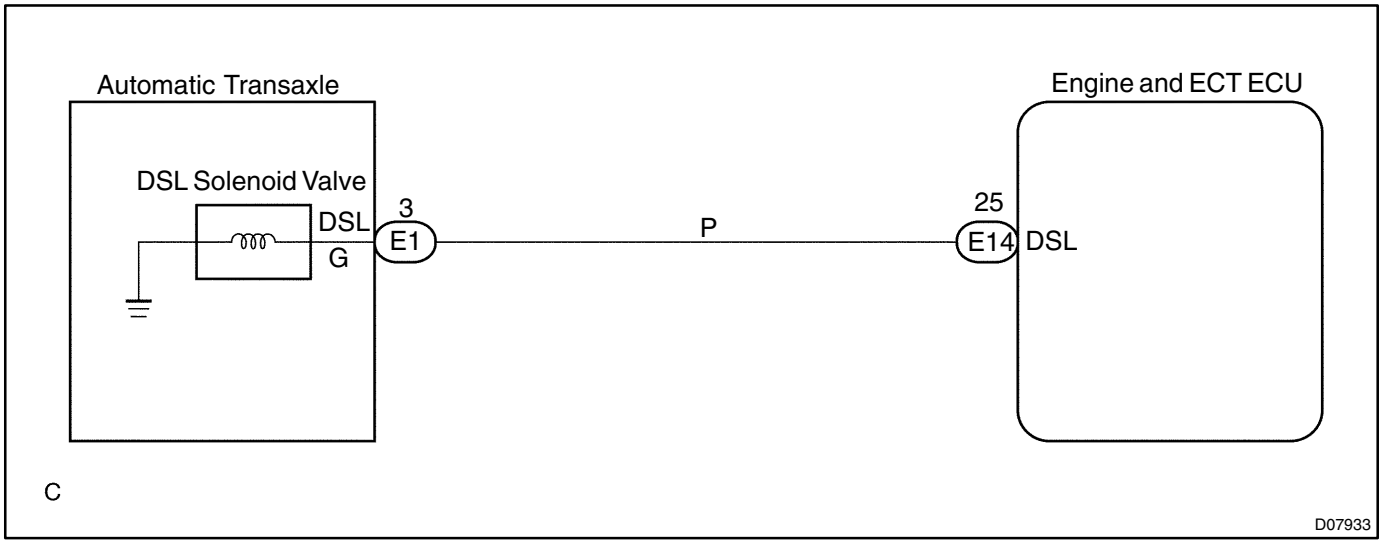
CIRCUIT DESCRIPTION

The DSL solenoid valve is turned ON and OFF by signals from the Engine and ECT ECU to control the hydraulic pressure acting on the lock–up relay valve, which then controls operation of the lock–up clutch.

DTC No.	DTC Detecting Condition	Trouble Area
P0773	Either (a) or (b) are detected for 1 time. (2–trip detection logic) (a) Solenoid resistance is 8 Ω or less short circuit when solenoid is energized. (b) Solenoid resistance is 100 kΩ or more open circuit when solenoid is not energized.	• Open or short in DSL solenoid valve circuit • DSL solenoid valve • Engine and ECT ECU

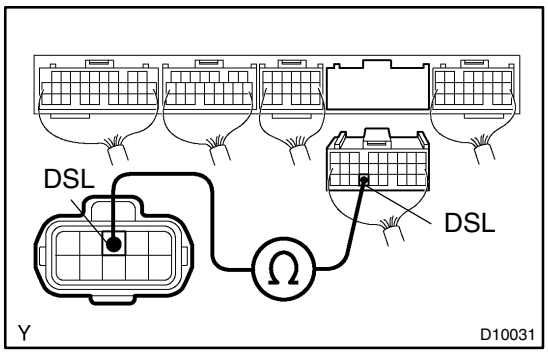
Fail safe function:
If the Engine and ECT ECU detects a malfunction, it turns the DSL solenoid valve OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check harness and connector between Engine and ECT ECU and automatic transaxle solenoid connector.**



PREPARATION:

(a) Disconnect the solenoid connector from the transaxle.

(b) Disconnect the connector from the Engine and ECT ECU.

CHECK:

Measure the harness and connector between terminal DSL of Engine and ECT ECU and terminal DSL of solenoid connector.

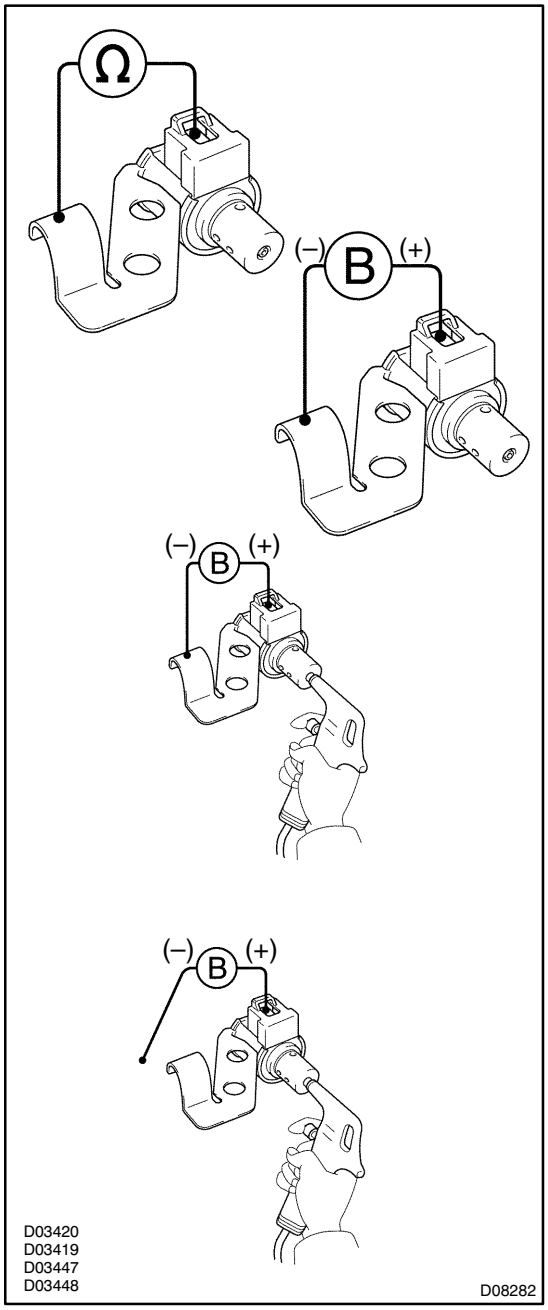
OK:

There is continuity.

NG → **Repair or replace the harness or connector.**

OK

2	Check shift solenoid valve DSL.



Electrical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the DSL solenoid valve connector.
(d) Remove the DSL solenoid valve.

CHECK:

(a) Measure resistance between terminal DSL of shift solenoid valve and solenoid body.
(b) Connect positive (+) lead to terminal of solenoid connector, negative (–) lead to solenoid body.

OK:

(a) Resistance: 11 – 15 Ω
(b) The DSL solenoid valve makes operation noise.

Mechanical Check (Except Europe Only):

PREPARATION:

(a) Remove the oil pan.
(b) Remove the DSL solenoid valve.

CHECK:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(b) When battery positive voltage is supplied to the shift solenoid valve, check that the solenoid valve opens.

OK:

(a) Solenoid valve does not leak air.
(b) Solenoid valve opens.

NG → **Replace the DSL solenoid valve.**

OK

Check and replace or repair the solenoid wire.

DI80H–01

DTC	P1520	Stop Light Switch Signal Malfunction

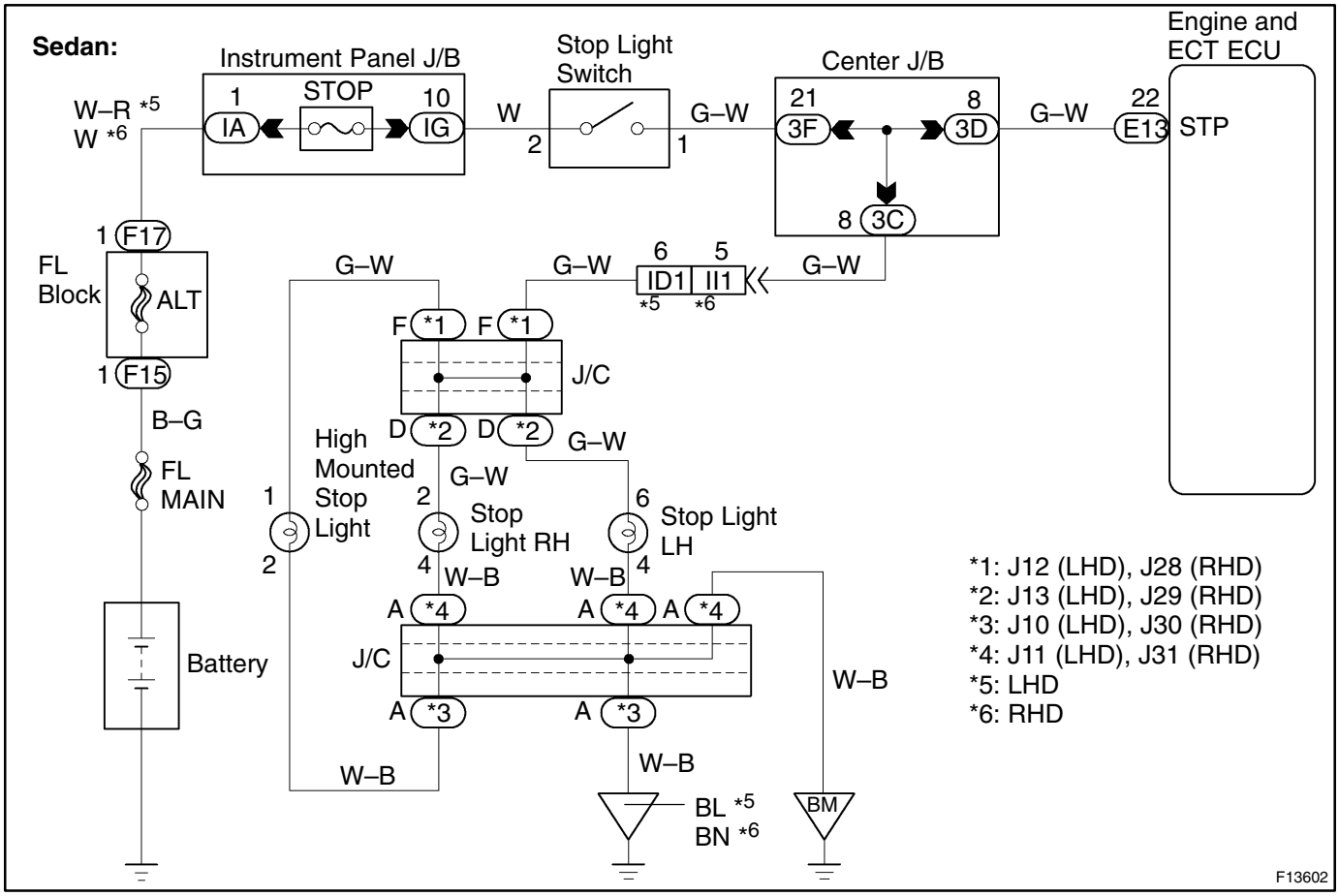
CIRCUIT DESCRIPTION

The purpose of this circuit is to prevent the engine from stalling, while driving in lock–up condition, when brakes are suddenly applied.

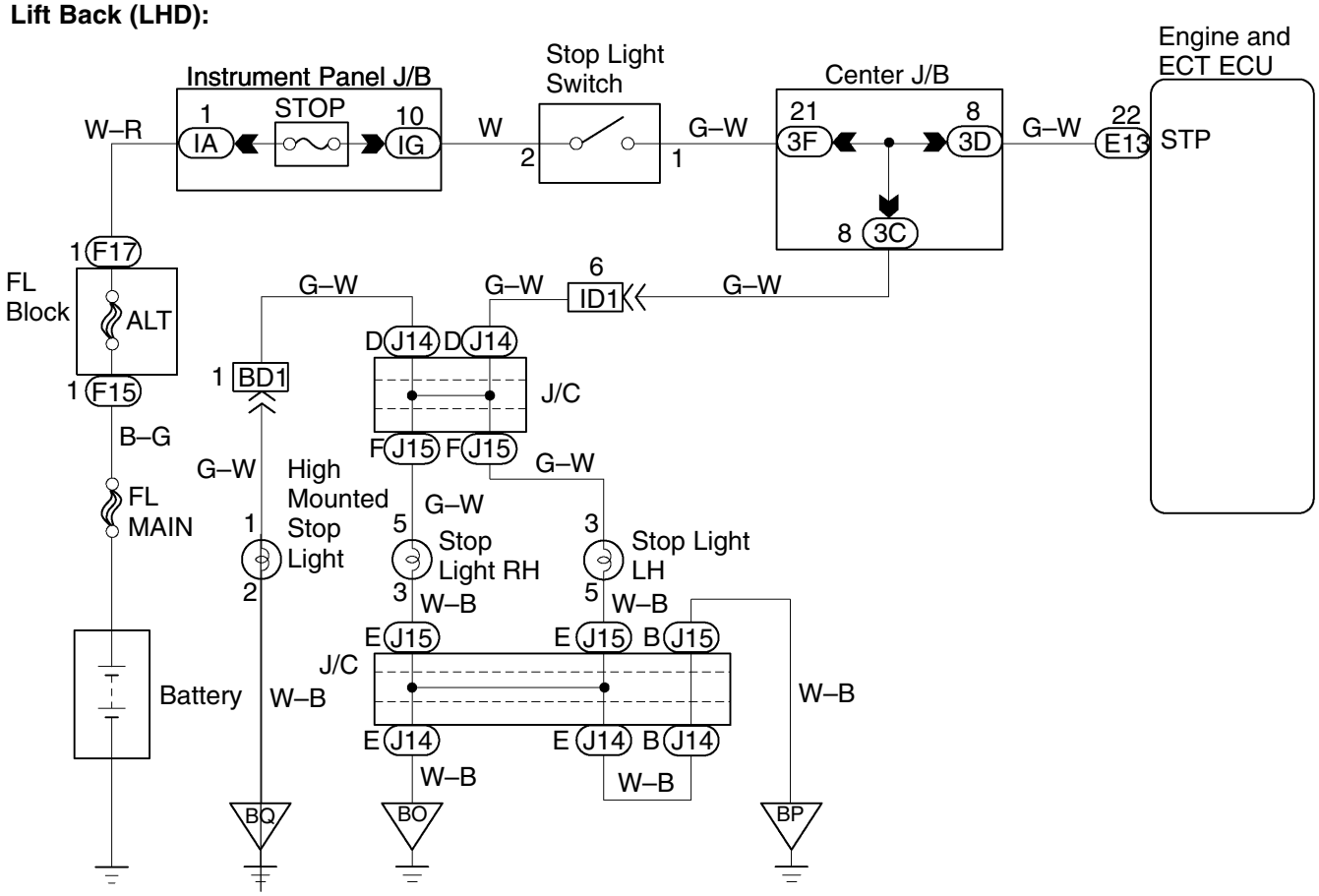
When the brake pedal is operated, this switch sends a signals to Engine and ECT ECU. Then the Engine and ECT ECU cancels operation of the lock–up clutch while braking is in progress.

DTC No.	DTC Detecting Condition	Trouble Area
P1520	No stop light switch signal to Engine and ECT ECU during driving. (2–trip detection logic)	• Open or short in stop light switch circuit • Stop light switch • Engine and ECT ECU

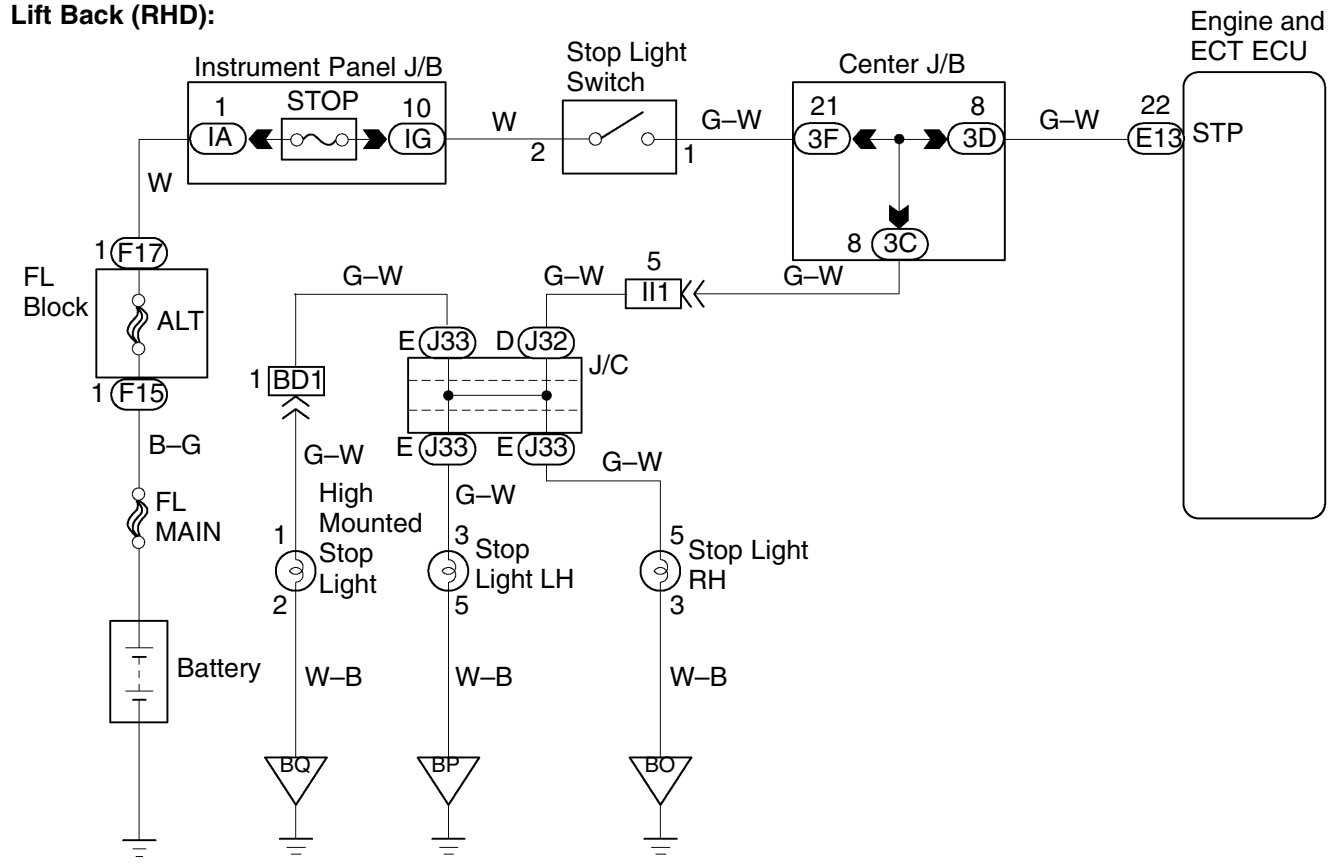
WIRING DIAGRAM



Lift Back (LHD):

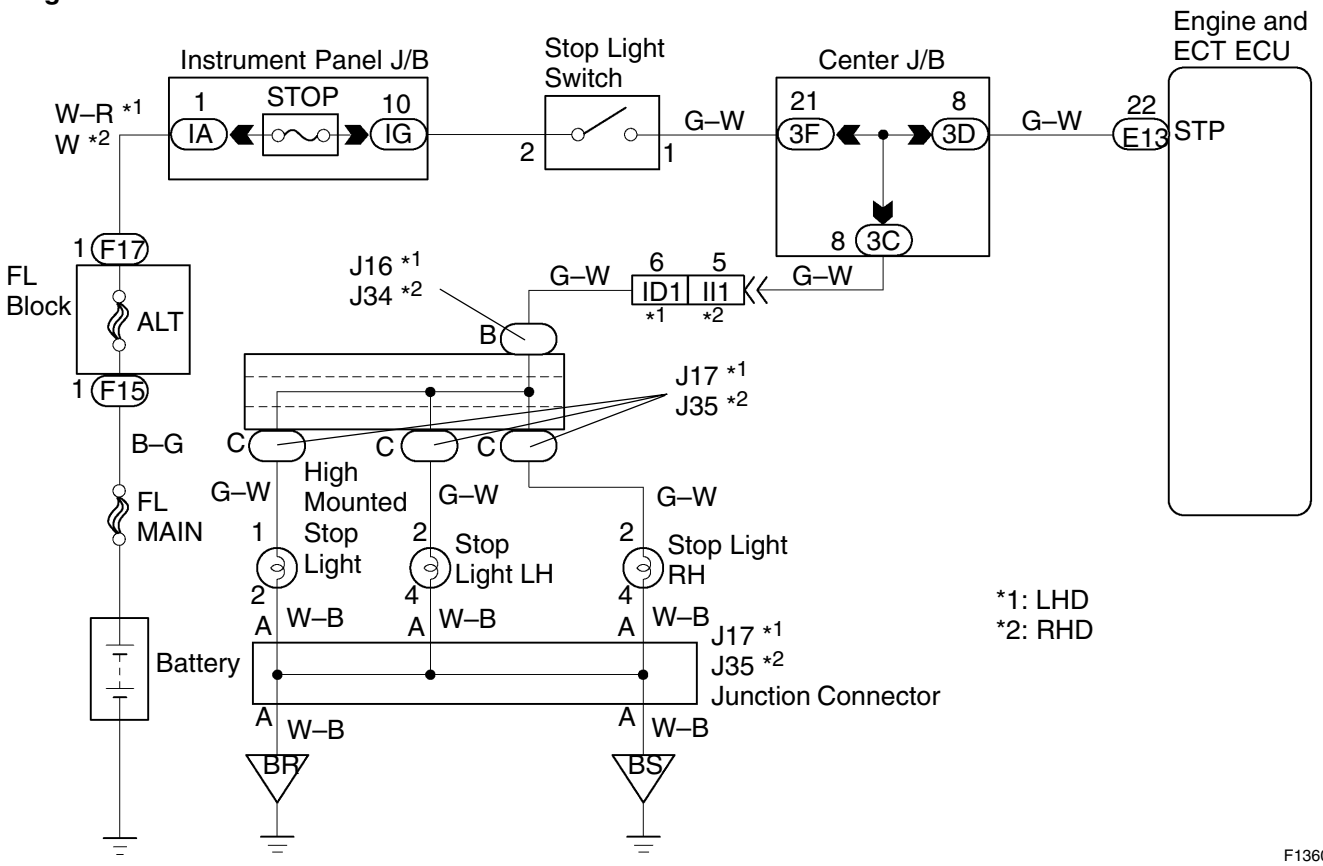


Lift Back (RHD):



F13603

Wagon:


Instrument Panel J/B
Stop Light Switch
Center J/B
Engine and ECT ECU
W–R *1
W *2
1
STOP
10
IA
IG
2
1
G–W
21
8
3F
3D
G–W
22
E13
STP
8
3C
1
F17
FL Block
ALT
1
F15
J16 *1
J34 *2
G–W
6
5
ID1
II1
*1
*2
G–W
B
J17 *1
J35 *2
B–G
C
C
C
High Mounted Stop Light
Stop Light LH
Stop Light RH
G–W
G–W
G–W
1
2
2
FL MAIN
2
4
4
A
A
A
W–B
W–B
W–B
Battery
J17 *1
J35 *2
Junction Connector
A
A
W–B
W–B
BR
BS
*1: LHD
*2: RHD
F13604

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	**Check operation of stop light.**

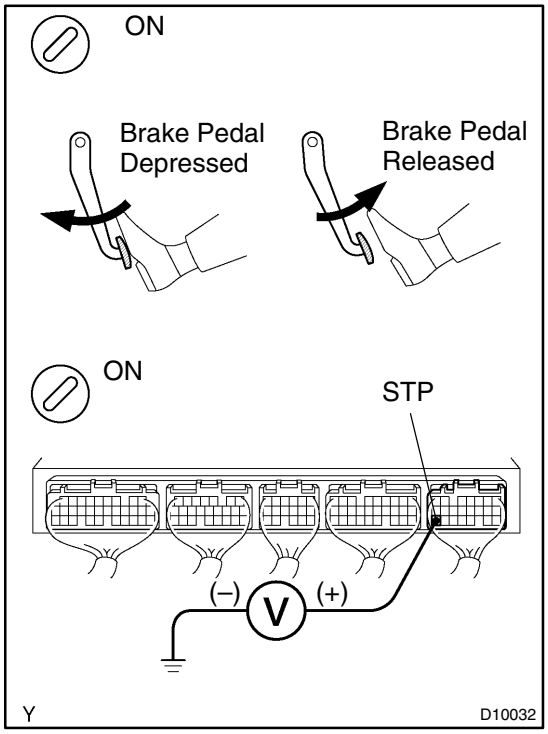
CHECK:

Check if the stop lights go on and off normally when the brake pedal is depressed and released.

NG → **Check and repair stop light circuit.**

OK

2	**Check STP signal.**



When using hand–held tester:

PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the STP signal on the hand–held tester.

OK:

Brake pedal is depressed: STP...ON

Brake pedal is released: STP...OFF

When not using hand–held tester:

PREPARATION:

(a) Remove the glove compartment door.

(b) Turn the ignition switch ON.

CHECK:

Check voltage between terminal STP of the Engine and ECT ECU and body ground.

OK:

Brake pedal	Voltage
Depressed	9.0 – 14 V
Released	Below 1.5 V

OK → **Check for intermittent problems.**

NG

3	**Check harness and connector between Engine and ECT ECU and stop light switch (See page IN–20).**

NG → **Repair or replace harness or connector.**

OK

Check and replace Engine and ECT ECU (See page IN–20).

DI6RW–03

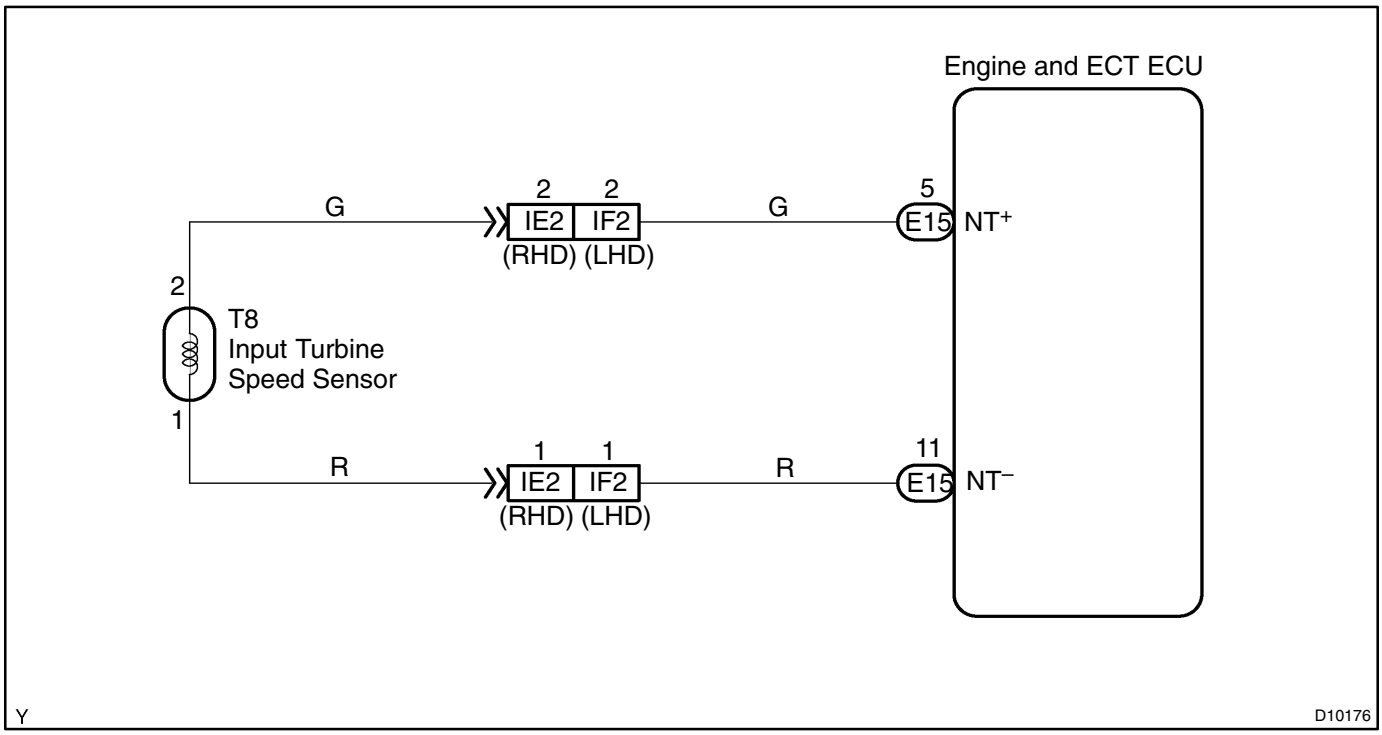
DTC	P1725	NT Revolution Sensor Circuit Malfunction (Input Turbine Speed Sensor)

CIRCUIT DESCRIPTION

This sensor detects the rotation speed of the input turbine. By comparing the input turbine speed signal (NT) and the counter gear speed sensor signal (NC), the Engine and ECT ECU detects the shift timing of the gears and appropriately controls the engine torque and hydraulic pressure in response to various conditions, thus performing smooth gear shifting.

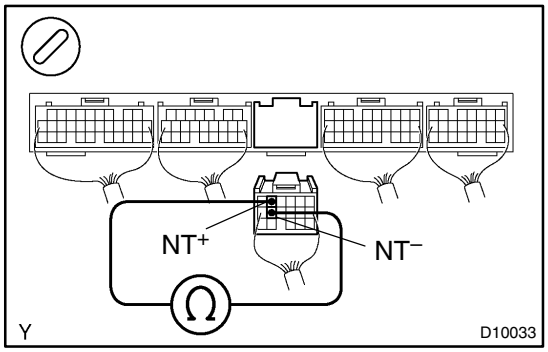
DTC No.	DTC Detecting Condition	Trouble Area
P1725	The Engine and ECT ECU detects conditions (a), (b), (c), (d) and (e) continuity for 5 seconds or more. (1–trip detection logic) (a) Gear change not being performed (b) Gear position: 2nd, 3rd or O/D gear (c) Solenoid valves and neutral start switch are normal (d) T/M input shaft rpm: 300 rpm or less (e) T/M output shaft rpm: 1,000 rpm or less	• Open or short in input turbine (NT) speed sensor circuit • Input turbine (NT) speed sensor • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check resistance between terminals NT+ and NT– of Engine and ECT ECU.

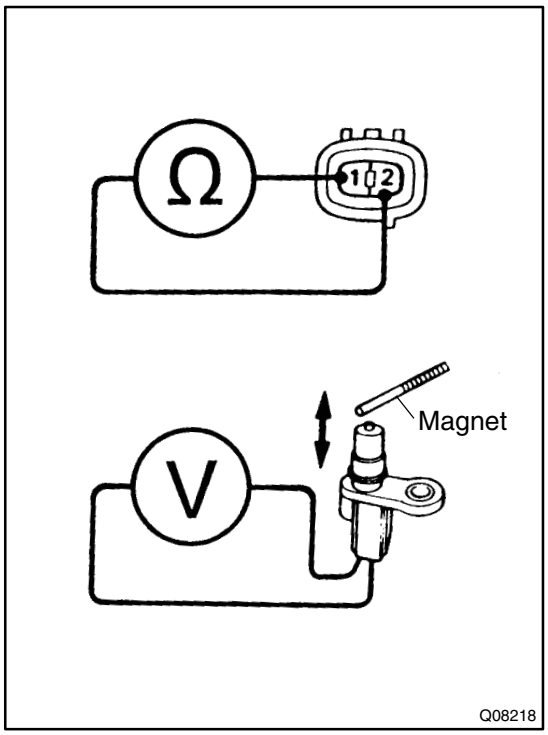


PREPARATION:
Disconnect the connector from Engine and ECT ECU.
CHECK:
Check resistance between terminals NT+ and NT– of Engine and ECT ECU.
OK:
Resistance: 620 ± 60 Ω

OK	Check and replace the Engine and ECT ECU (See page IN–30).

NG

2	Check input turbine speed sensor.



PREPARATION:
Remove the input turbine speed sensor from transaxle.
CHECK:
(a) Measure resistance between terminals 1 and 2 of speed sensor.
(b) Check voltage between terminals 1 and 2 of the speed sensor when a magnet is put close to the front end of the speed sensor then taken away quickly.
OK:
(a) Resistance: 620 ± 60 Ω at 20 °C (68 °F)
(b) Voltage is generated intermittently.
HINT:
The voltage generated is extremely low.

NG	Replace the input turbine speed sensor.

OK

Check and repair the harness and connector between Engine and ECT ECU and input turbine speed sensor (See page IN–30).

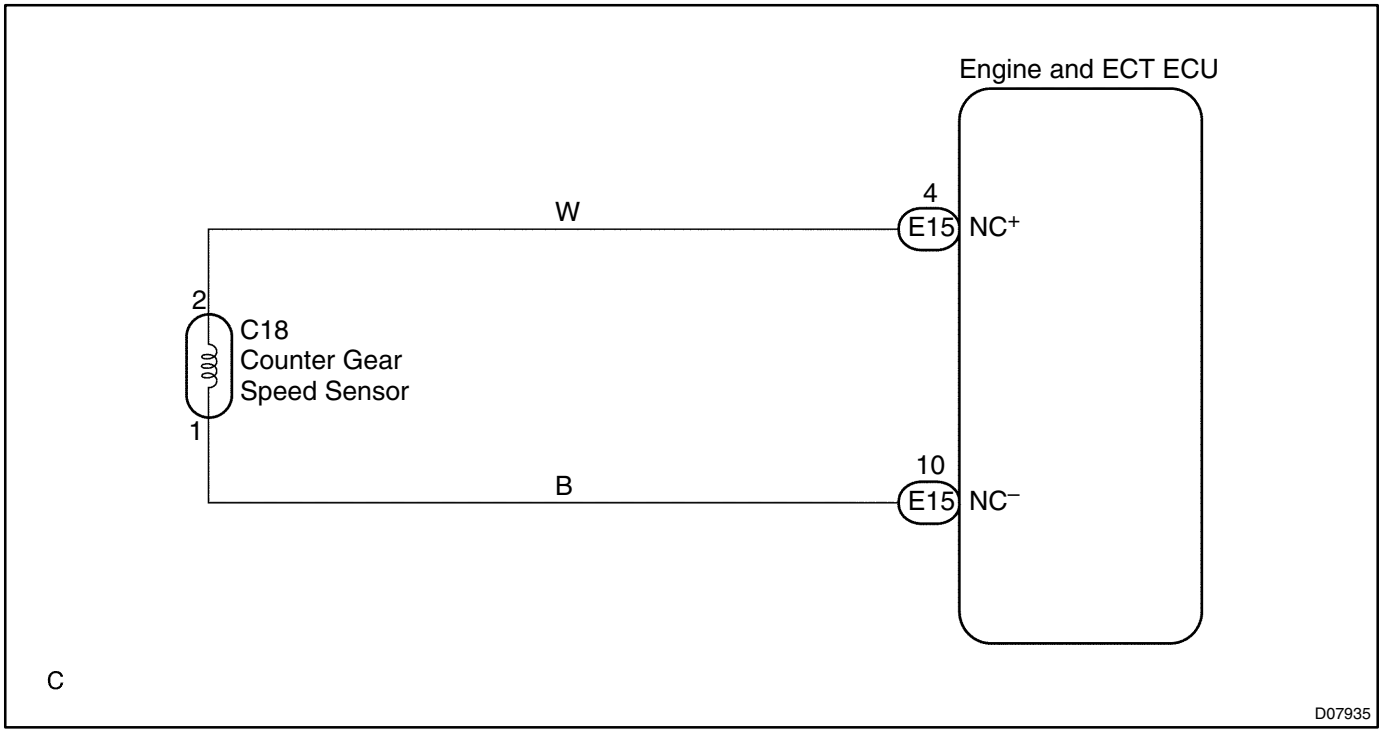
DTC	P1730	NC Revolution Sensor Circuit Malfunction (Counter Gear Speed Sensor)

CIRCUIT DESCRIPTION

This sensor detects the rotation speed of the counter gear. By comparing the counter gear speed signal (NC) and the input turbine speed sensor signal (NT), the Engine and ECT ECU detects the shift timing of the gears and appropriately controls the engine torque and hydraulic pressure in response to various conditions, thus performing smooth gear shifting.

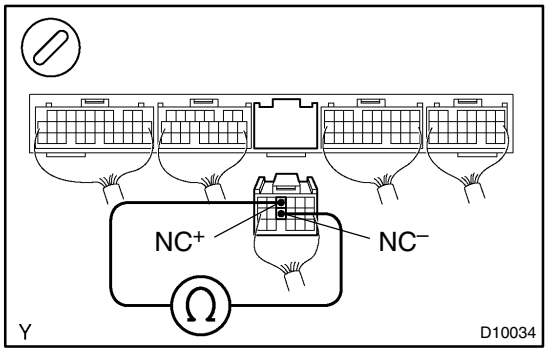
DTC No.	DTC Detecting Condition	Trouble Area
P1730	The Engine and ECT ECU detects conditions (a), (b), (c) and (d) continuity for 5 secs or more. (1–trip detection logic) (a) IG SW: ON (b) Neutral start switch: Except P, N range (c) T/M input shaft rpm: 300 rpm or less (d) T/M output shaft rpm: 1,000 rpm or more	• Open or short in counter gear (NC) speed sensor circuit • Counter gear (NC) speed sensor • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check resistance between terminals NC+ and NC– of Engine and ECT ECU.

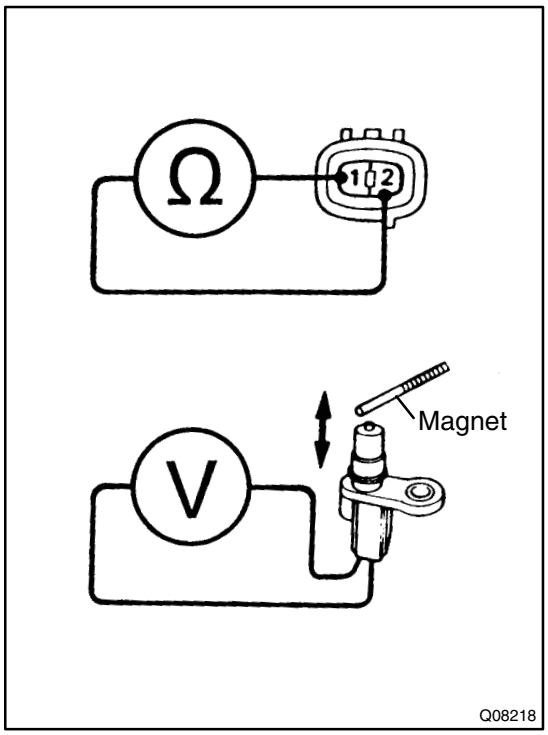


PREPARATION:
Disconnect the connector from Engine and ECT ECU.
CHECK:
Check resistance between terminals NC+ and NC– of Engine and ECT ECU.
OK:
Resistance: 620 ± 60 Ω

OK	Check and replace the Engine and ECT ECU (See page IN–30).

NG

2	Check counter gear speed sensor.



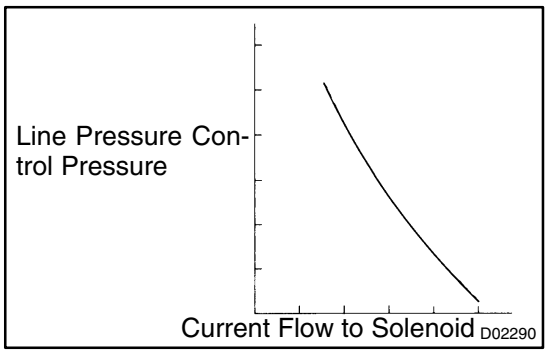
PREPARATION:
Remove the counter gear speed sensor from transaxle.
CHECK:
(a) Measure resistance between terminals 1 and 2 of speed sensor.
(b) Check voltage between terminals 1 and 2 of the speed sensor when a magnet is put close to the front end of the speed sensor then taken away quickly.
OK:
(a) Resistance: 620 ± 60 Ω at 20 °C (68 °F)
(b) Voltage is generated intermittently.
HINT:
The voltage generated is extremely low.

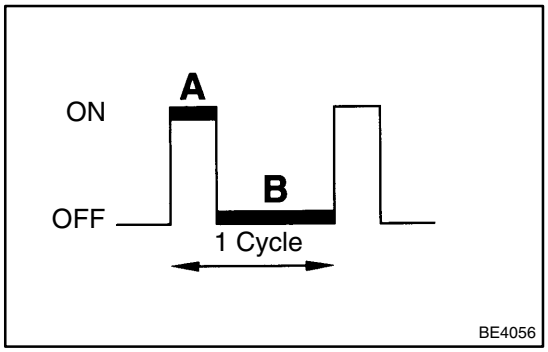
NG	Replace the counter gear speed sensor.

OK

Check and repair the harness and connector between Engine and ECT ECU and counter gear speed sensor (See page IN–30).

DTC	P1760	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLT Solenoid Valve)



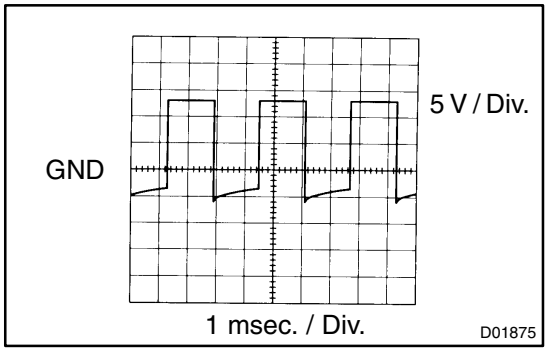


CIRCUIT DESCRIPTION

The throttle pressure that is applied to the primary regulator valve (which modulates line pressure) causes the solenoid valve SLT, under electronic control, to precisely and minutely modulate and generate line pressure according to the accelerator pedal effort, or engine power output detected.
This reduces the function of line pressure and provides smooth shifting characteristics.
Upon receiving the throttle valve opening angle signal, Engine and ECT ECU controls the line pressure by sending a predetermined (*) duty ratio to the solenoid valve, modulating the line pressure, 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

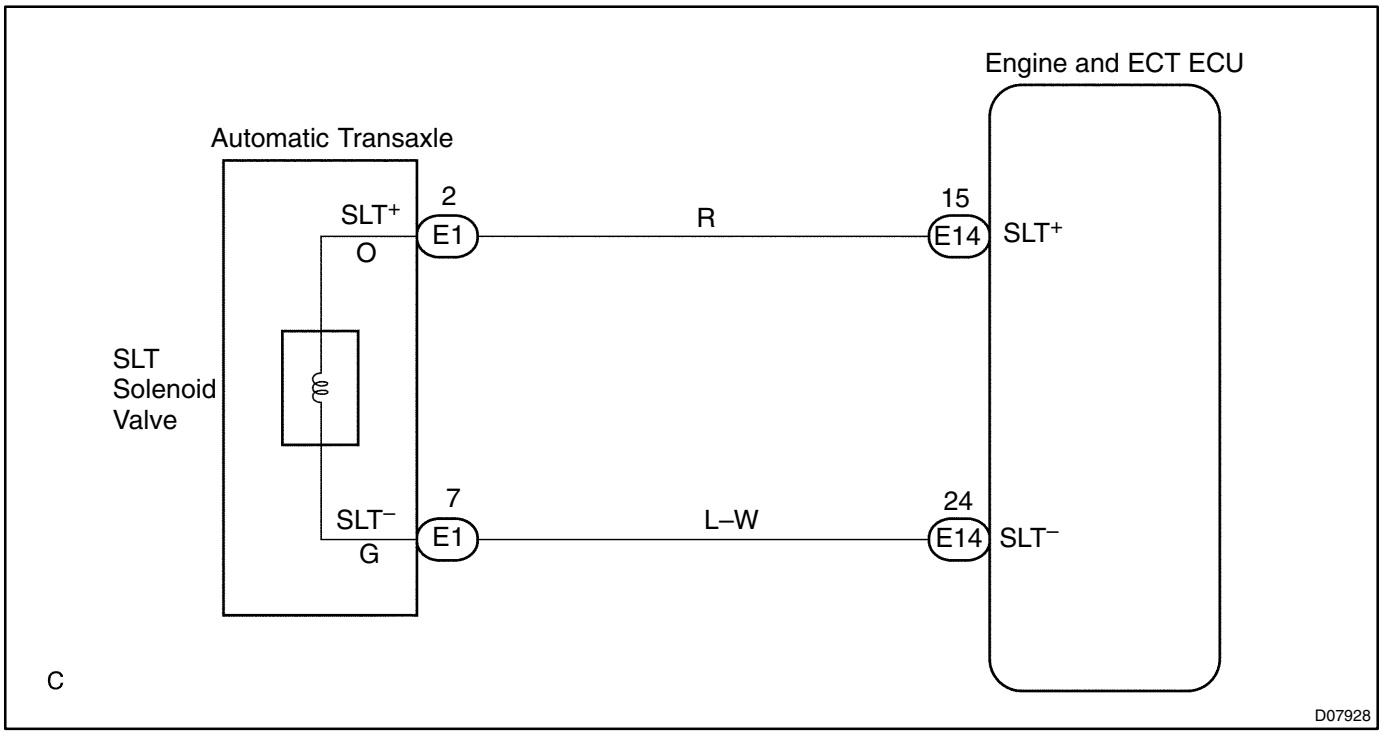
$$\text{Duty Ratio} = \frac{A}{A + B} \times 100\ (\%)$$

DTC No.	DTC Detecting Condition	Trouble Area
P1760	(a) or (b) condition below is detected 1 second or more. (a) SLT^- terminal: 0V (b) SLT^- terminal: 12V	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine and ECT ECU



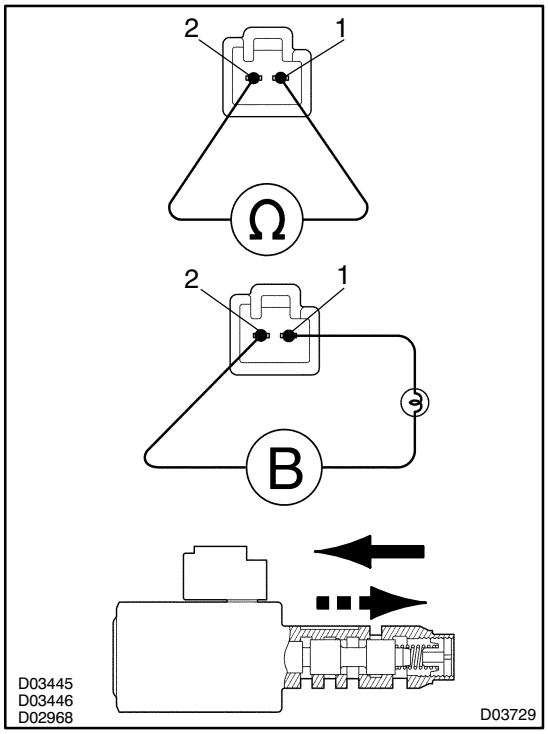
Reference:
Wave form between terminals SLT^+ and SLT^- during engine idling.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check SLT solenoid valve.**



PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.

Check Solenoid Resistance:

CHECK:

Measure resistance between terminals 1 and 2 of solenoid connector.

OK:

Resistance: 5.0 – 5.6 Ω at 20 °C (68 °F)

Check Solenoid Operation:

CHECK:

Connect positive (+) lead with an 8 – 10W bulb to terminal 1 of solenoid connector and negative (–) lead to terminal 2, then check the movement of the valve.

OK:

When battery positive voltage is applied.	Valve moves in ■■➡ direction in illustration at right.
When battery positive voltage is cut off.	Valve moves in ⬅ direction in illustration at left.

NG → **Replace SLT solenoid valve.**

OK

2	**Check harness and connector between SLT solenoid valve and Engine and ECT ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Replace Engine and ECT ECU.

DI4ZS–05

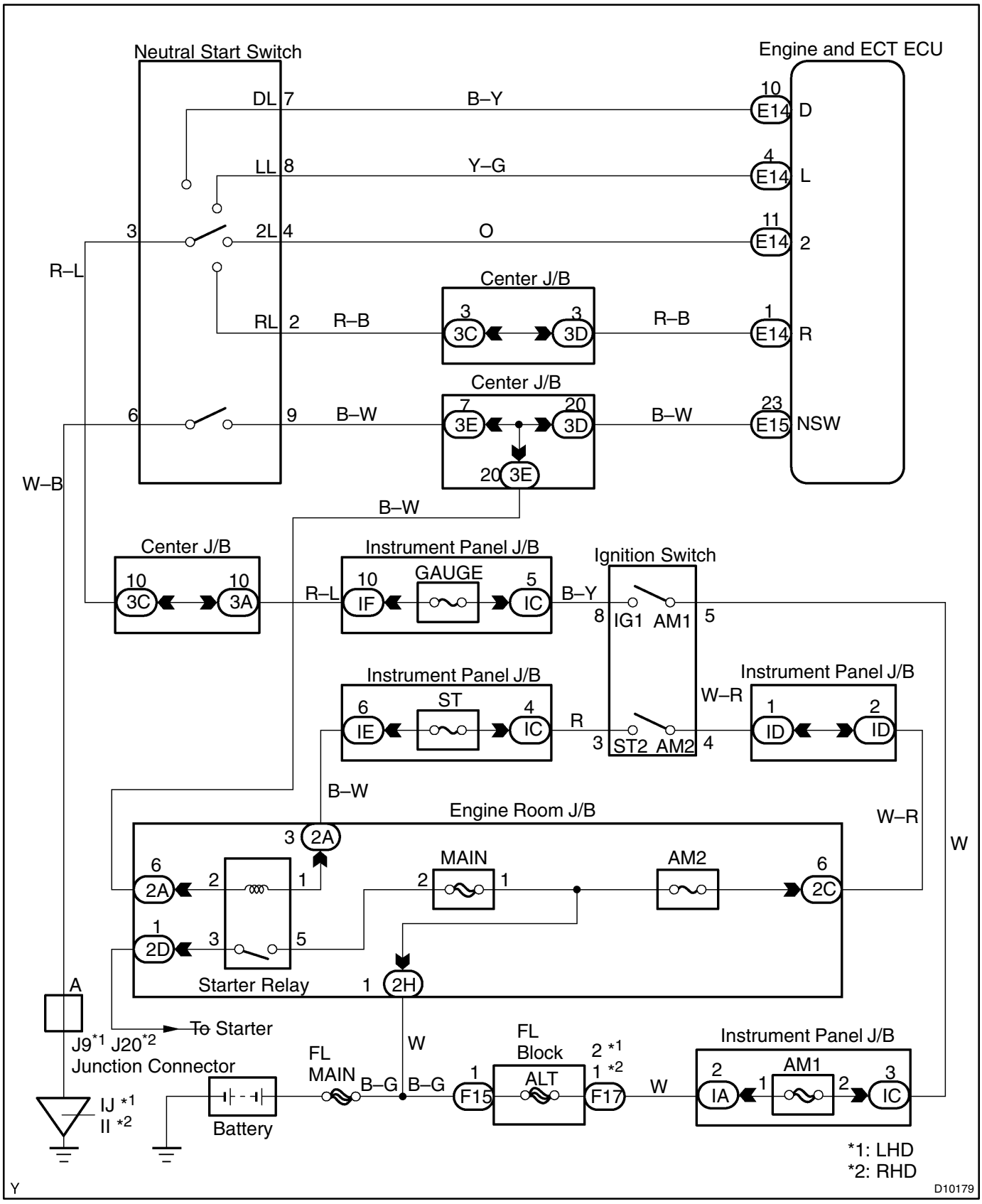
DTC	P1780	Neutral Start Switch Malfunction

CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever position and sends signals to the Engine and ECT ECU. The Engine and ECT ECU receives signals (NSW, R, D 2 and L) from the neutral start switch.

DTC No.	DTC Detection Condition	Trouble Area
P1780	When more than one of the following conditions continue for 500 sec. or more. (a) P, N range input signal is ON. (b) R range input signal is ON. (c) N range input signal is ON. (d) L range input signal is ON. (e) 2 range input signal is ON. (h) D range input signal is ON.	• Short in neutral start switch circuit • Neutral start switch • Engine and ECT ECU
	When any of following conditions for 500 msec. or more in the M position. (a) P, N range input signal is ON. (b) P range input signal is ON. (c) N range input signal is ON. (d) L range input signal is ON.	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Read PNP, REVERSE, 2ND DRIVE and LOW signals.**

When using hand–held tester:

PREPARATION:

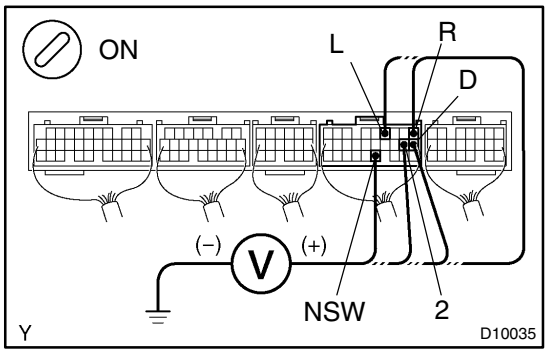
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Shift lever into the P, R, N, D, 2 and L positions, and read the PNP, REVERSE, 2ND DRIVE and LOW signals on the hand–held tester.

OK:

Shift range	Signal
2	2ND OFF → ON
L	LOW OFF → ON
D	DRIVE OFF → ON
R	REVERSE OFF → ON
P, N	PNP OFF → ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminals P. R. N. D. 2 and L of Engine and ECT ECU and body ground when the shift lever is shifted to the following positions.

OK:

Shift range	Tester connection	Specified value
P, R	NSW – Body ground	Battery positive voltage
R	R – Body ground	*Battery positive voltage
D	D – Body ground	Battery positive voltage
2	2 – Body ground	Battery positive voltage
L	L– Body ground	Battery positive voltage

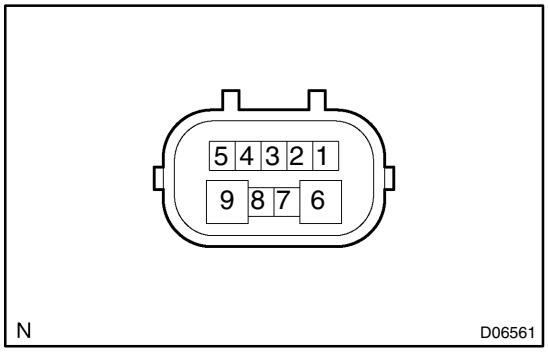
HINT:

*: The voltage will drop slightly due to lighting up of the back up light.

OK → **Check and replace the Engine and ECT ECU (See page IN–30).**

NG

2	Check neutral start switch.



PREPARATION:

(a) Jack up the vehicle.

(b) Remove the neutral start switch.

CHECK:

Check continuity between each terminal shown below when the shift lever is moved to each position.

Shift range	Terminal No. to continuity	
P	–	6 – 9
R	2 – 3	–
N	–	6 – 9
D	3 – 7	–
2	3 – 4	–
L	3 – 8	–

OK:

There is continuity.

NG → **Replace the neutral start switch.**

OK

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine and ECT ECU (See page IN–30).

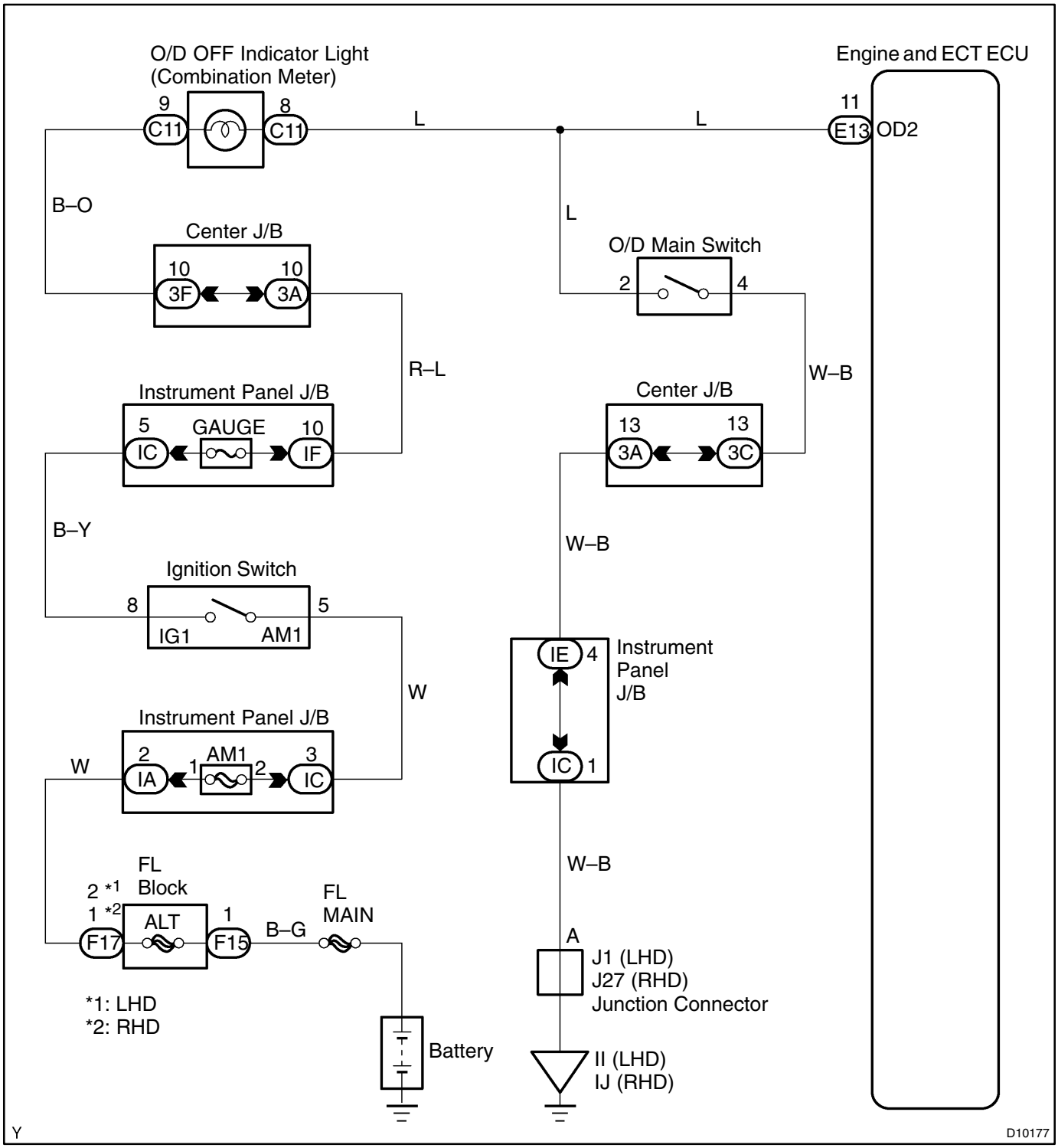
DI6SY–03

O/D Main Switch & O/D OFF Indicator Light Circuit

CIRCUIT DESCRIPTION

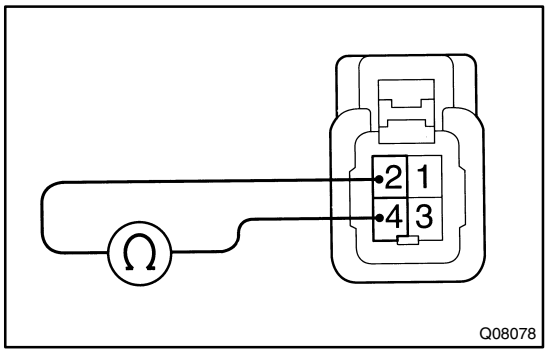
The O/D main switch contacts go open when the switch is pushed in and go closed when it is pushed out. If O/D main switch is at OFF position, the O/D OFF indicator light lights up, and the Engine and ECT ECU prohibits shifting overdrive.

WIRING DIAGRAM



INSPECTION PROCEDURE
O/D OFF indicator light does not light up

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity between terminals 5 and 6 of O/D main switch connector.
OK:

O/D main switch	Resistance
ON	∞ Ω (open)
OFF	0 Ω (continuity)

NG → **Replace the O/D main switch.**

OK

2	**Check and replace combination meter (See page BE–1).**

NG → **Replace the combination meter.**

OK

3	Check OVERDRIVE CUT SW2 signal.

When using hand–held tester:

PREPARATION:

(a) Connect a hand–held tester to the DLC3.

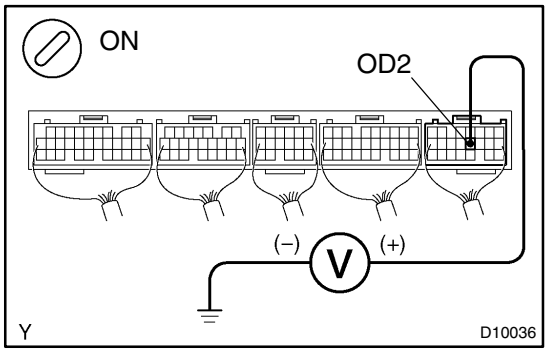
(b) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the OVERDRIVE CUT SW2 signal on the hand–held tester.

OK:

O/D main switch condition	OVERDRIVE CUT SW2 signal
Pushed in	OFF
Pushed out	ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal OD2 of Engine and ECT ECU and body ground.

OK:

O/D main switch	Voltage
OFF	Below 1.0 V
ON	10 – 14 V

OK → **Check and replace the Engine and ECT ECU (See page IN–30).**

NG

4	**Check harness and connector between O/D OFF indicator light and Engine and ECT ECU (See page IN–20).**

PREPARATION:

Disconnect the connector of Engine and ECT ECU and the connector of the combination meter.

CHECK:

Measure the continuity between the connector of Engine and ECT ECU and the connector of the combination meter.

OK:

Continuity

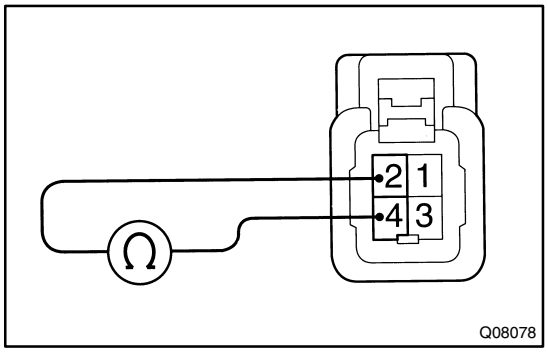
NG → **Repair or replace the harness or connector.**

OK

Repair or replace the wire harness or connectors between the connector of Engine and ECT ECU and body Ground.

O/D OFF indicator light remains ON

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.

CHECK:
Check continuity between terminals 1 and 2 of O/D main switch connector.

OK:

O/D main switch	Resistance
ON	∞ Ω (open)
OFF	0 Ω (continuity)

NG → **Replace the O/D main switch.**

OK

2	**Check harness and connector between O/D OFF indicator light and O/D main switch, O/D OFF indicator light and Engine and ECT ECU (See page IN–30).**

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine and ECT ECU (See page IN–20).

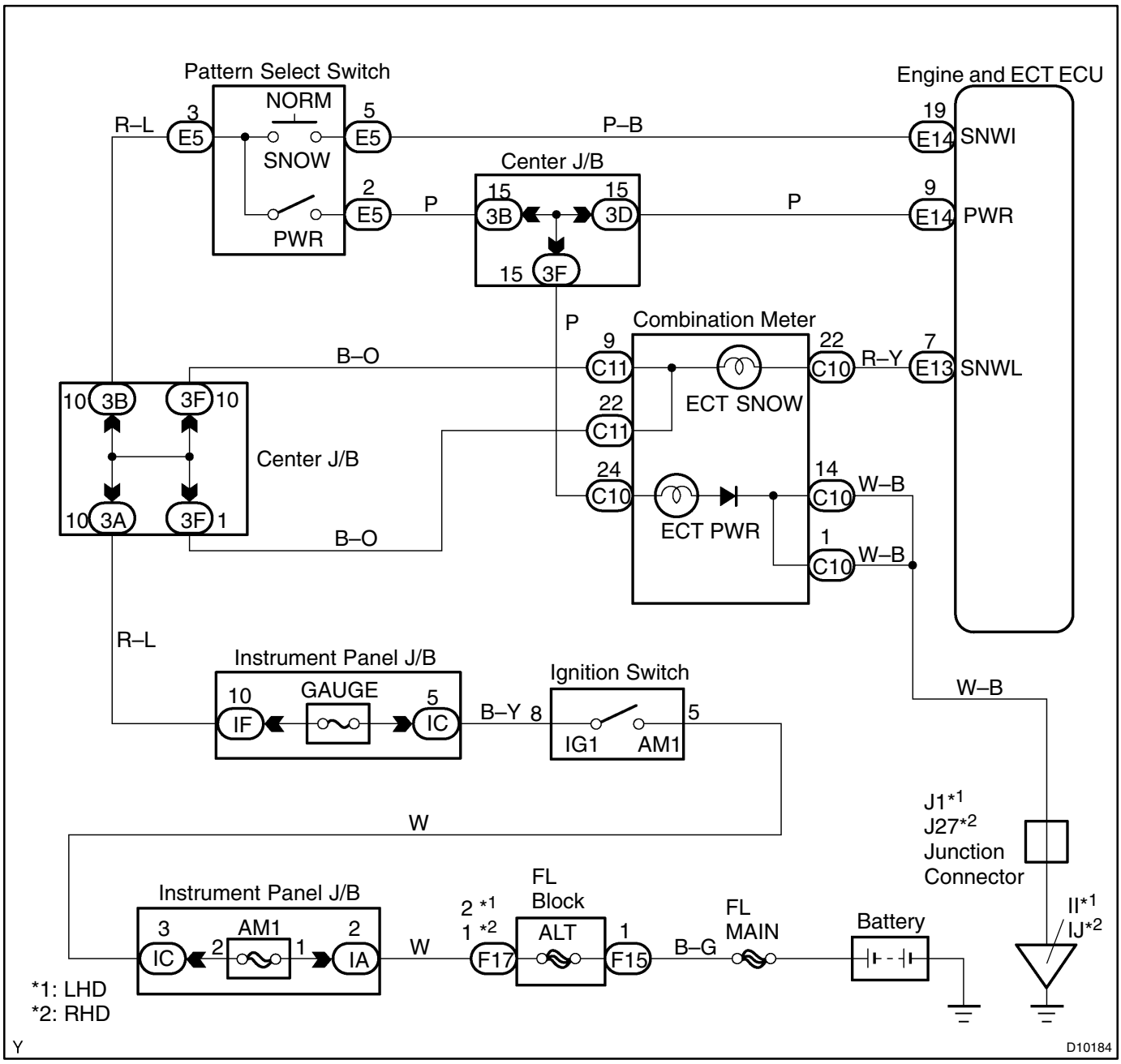
DI336-04

Pattern Select Switch Circuit

CIRCUIT DESCRIPTION

The Engine & ECT ECU memory contains the shift programs for the NORMAL, POWER and SNOW (w/ SNOW mode) patterns, 2 range, L range and the lock–up patterns. By following the programs corresponding to the signals from the pattern select switch, the neutral start switch and other various sensors, the Engine & ECT ECT switches the solenoid valves ON and OFF, and controls the transaxle gear change and the lock–up clutch operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check PATTERN SEL SW signal.**

When using hand–held tester:

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the PATTERN SEL SW signal on the hand–held tester.

OK:

Pattern select switch	PATTERN SEL SW signal
POWER	ON
NORM	OFF
SNOW	OFF

When not using hand–held tester:

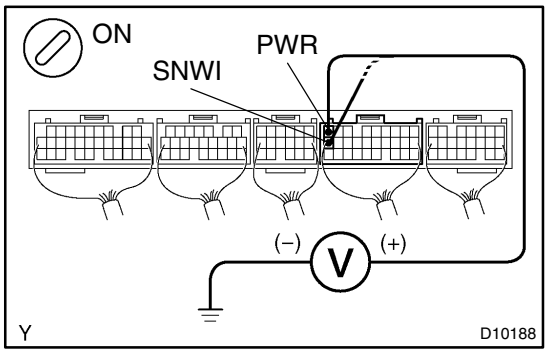
PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal each of PWR, SNWI of Engine & ECT ECU and body ground when the pattern select switch is set to the PWR (POWER), NORM (NORMAL) or SNOW (SNOW) position.

OK:



Switch position	Tester connection	Specified condition
PWR	PWR – Body ground	9 – 14 V
	SNWI – Body ground	Below 1.5 V
NORM	PWR – Body ground	Below 1.5 V
	SNWI – Body ground	Below 1.5 V
SNOW	PWR – Body ground	Below 1.5 V
	SNWI – Body ground	9 – 14 V

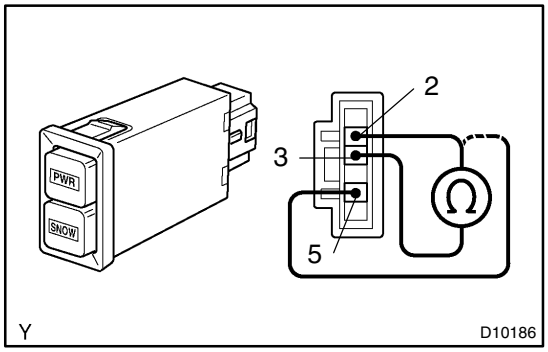
HINT:

The Engine & ECT ECU uses the normal pattern signal if the PWR and SNWI signals are not input.

OK → **Proceed to next circuit inspection shown in symptom problems table (See page DI–79).**

NG

2	Check pattern select switch



PREPARATION:

Disconnect the pattern select switch connector.

CHECK:

Check continuity between terminals 2 and 3 (PWR, NORM), 3 and 5 (SNOW) of pattern select switch connector when the select switch is set to PWR, NORM or SNOW position.

OK:

Switch position	Tester connection	Specified condition
PWR	2 – 3	Continuity
NORM	2 – 3, 3 – 5	No continuity
SNOW	3 – 5	Continuity

NG → **Replace the pattern select switch.**

OK

3	Check harness and connector between battery and pattern select switch, pattern select switch and Engine & ECT ECU (See page IN–30).

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–30).

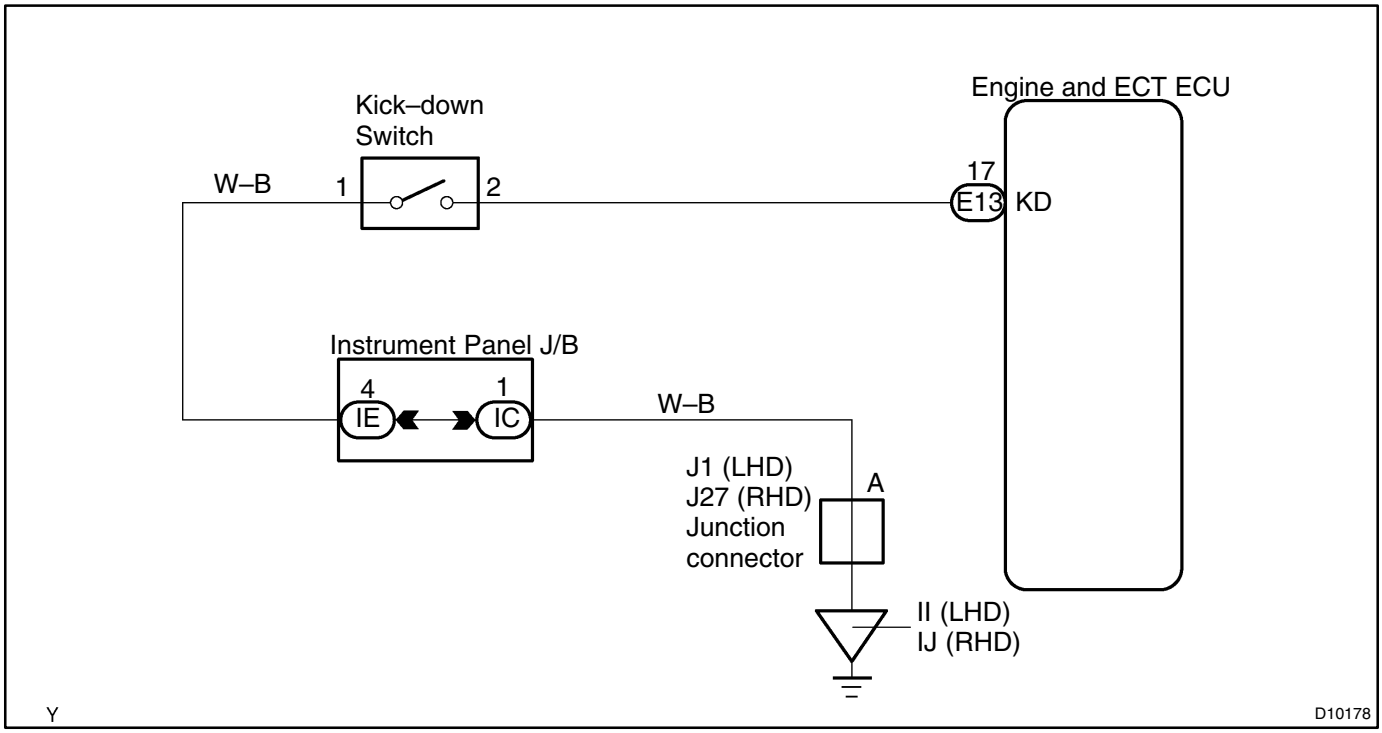
DI703–03

Kick–down Switch Circuit (LHD)

CIRCUIT DESCRIPTION

The kick–down switch is turned ON when the accelerator pedal is depressed beyond the full throttle opening and sends signals to Engine and ECT ECU.
When the kick–down switch is turned ON, the Engine and ECT ECU controls gear shifting according to the programmed shift diagrams.
If a short circuit develops in the kick–down switch, the Engine and ECT ECU disregards the kick–down signals and controls shifting at the normal shift points.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check KICK DOWN SW signal.**

When using hand–held tester:

PREPARATION:

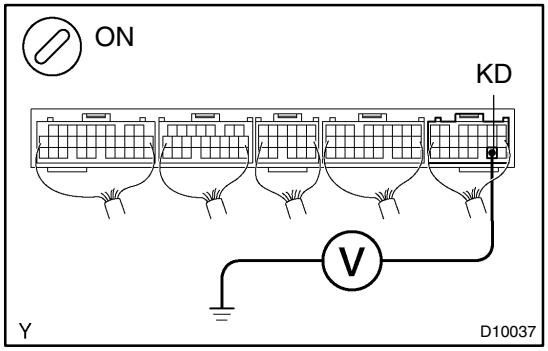
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the KICK DOWN SW signal on the hand–held tester.

OK:

Accelerator Pedal	KICK DOWN SW signal
Fully depressed (kick–down SW is ON)	ON
Released (kick–down SW is OFF)	OFF



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal KD of Engine and ECT ECU connector and body ground when accelerator pedal is fully depressed or not.

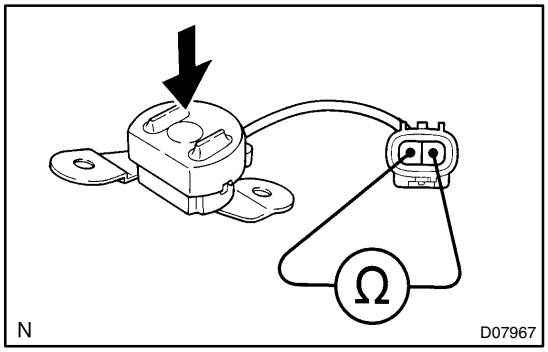
OK:

Accelerator Pedal	Voltage
Fully depressed (kick–down SW is ON)	Below 1 V
Released (kick–down SW is OFF)	10 – 14 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–79).**

NG

2	Check kick–down switch.



PREPARATION:
Disconnect the kick–down switch connector.
CHECK:
Check continuity at each terminal of kick–down switch connector.
OK:

Kick–down Switch	Specified continuity
ON	Continuity
OFF	No continuity

NG → **Replace kick–down switch.**

OK

3	Check harness and connector between Engine and ECT ECU and kick–down switch, kick–down switch and body ground (See page IN–30).

NG → **Repair or replace the harness or connector.**

OK

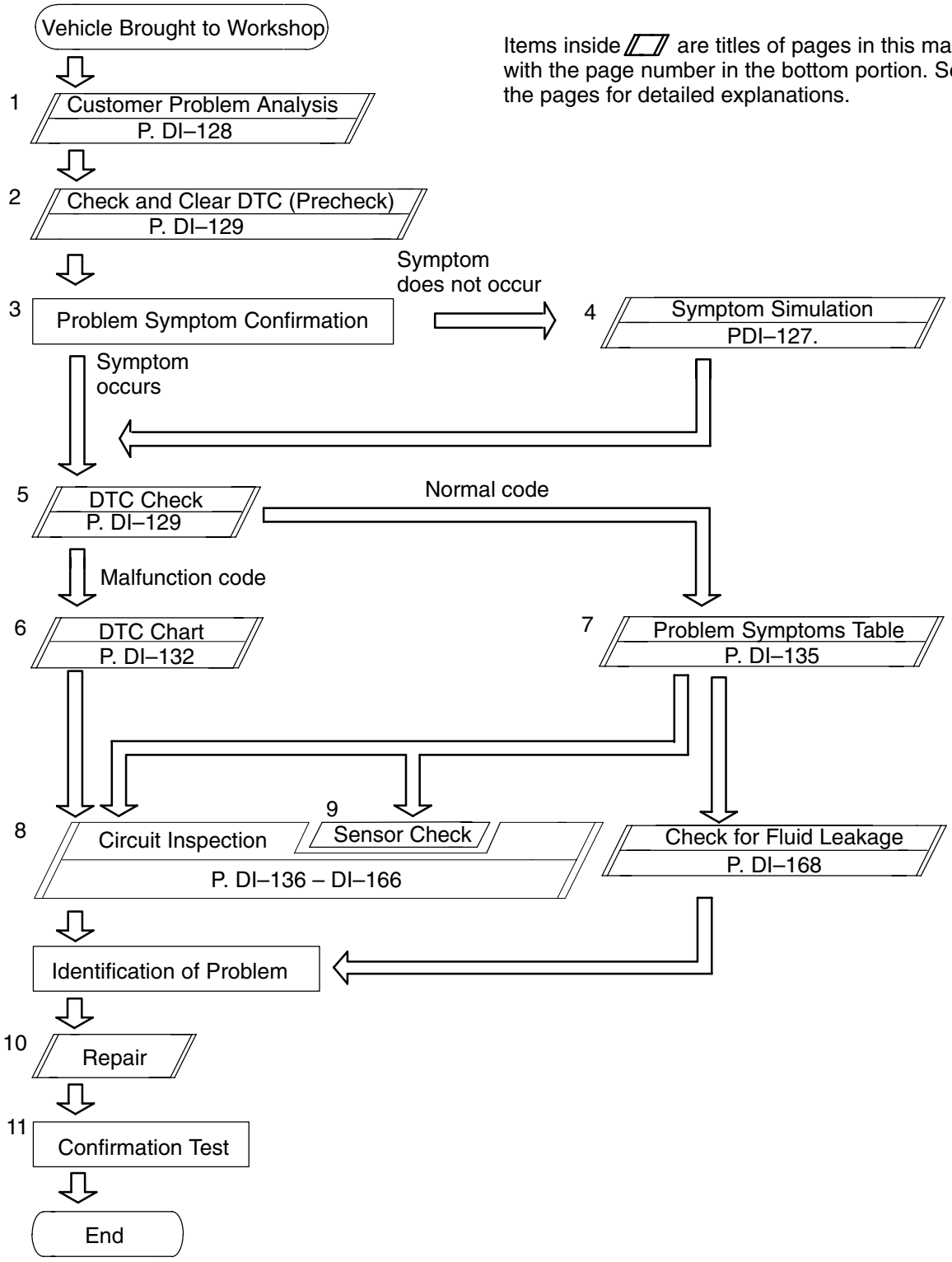
Check and replace Engine and ECT ECU (See page IN–30).

ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)

DI7YR–01

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshoot in accordance with the procedure on the following pages.



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 EBD operation is prohibited.

DI7YS–01

CUSTOMER PROBLEM ANALYSIS CHECK

ABS Check Sheet

Inspector's Name :

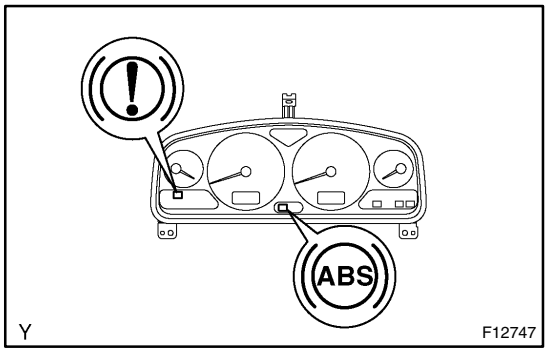
Customer's Name		**Registration No.**	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuously ☐ Intermittently (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate intermittently.	
	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)

DI7YT–01



PRE–CHECK

1. DIAGNOSIS SYSTEM

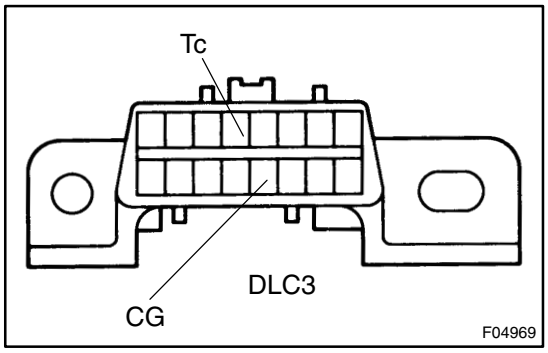
(a) Release the parking brake lever.

(b) Check the indicator.

When the ignition switch is turned ON, check that the ABS warning light and brake warning light goes on for 3 seconds.

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 or brake warning light circuit (See page DI–159, DI–161).



(c) Check the DTC

(1) Using SST, connect terminals Tc and CG of DLC3.

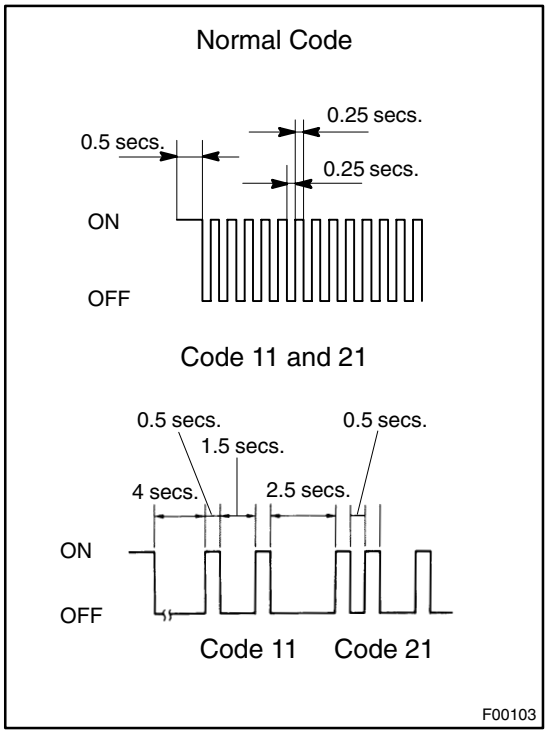
SST 09843 –18040

(2) Turn the ignition switch ON.

(3) Read the DTC from the ABS warning light on the combination meter.

HINT:

- If no code appears, inspect the diagnostic circuit or ABS warning light circuit (See page DI–164 or DI–159).

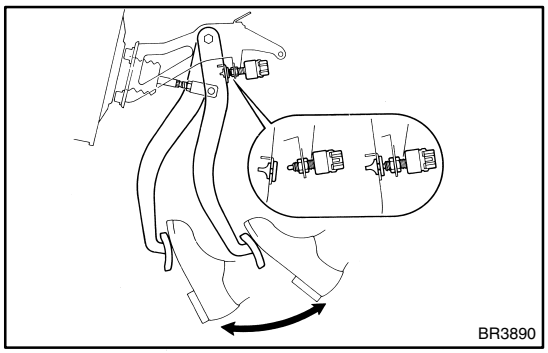


- As an example, the blinking patterns for normal code and codes 11 and 21 are shown on the left.

(4) Codes are explained in the code table on page DI–132.

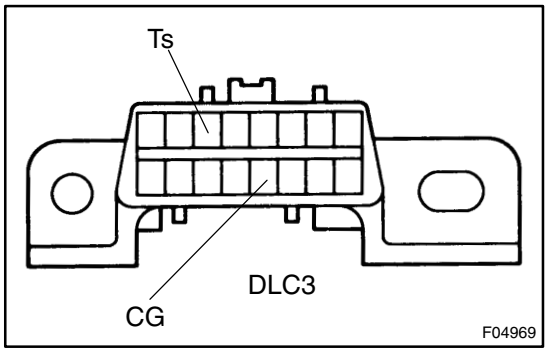
(5) After completing the check, disconnect terminals Tc and CG, and turn off the display.

If 2 or more malfunctions are indicated at the same time the lowest numbered DTC will be displayed 1st.



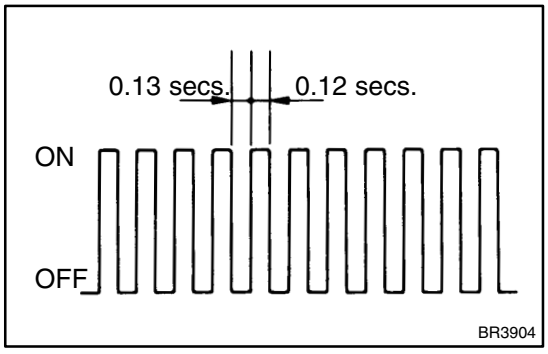
(d) Clear the DTC.
(1) Using SST, connect terminals Tc and CG of DLC3.
SST 09843 – 18040
(2) Turn the ignition switch ON.
(3) Clear the DTC stored in ECU by depressing the brake pedal 8 or more times within 3 seconds.
(4) Check that the warning light shows the normal code.
(5) Remove the SST from the terminals of DLC3.
SST 09843 – 18040

HINT:
Cancellation cannot be done by removing the battery cable or ECU–IG fuse.



2. SPEED SENSOR SIGNAL

(a) Check the speed sensor signal.
(1) When the ignition switch is turned ON, check that the ABS warning light goes on for 3 seconds.
(2) Turn the ignition switch OFF.
(3) Using SST, connect terminals Ts and CG of DLC3.
SST 09843 – 18040
(4) Start the engine.



(5) Check that the ABS warning light blinks.

HINT:
If the ABS warning light does not blink, inspect the ABS warning light circuit (See page DI–159).

(6) Drive vehicle straight forward.
Drive vehicle at 45 – 55 km/h (28 – 34 mph) for several seconds.

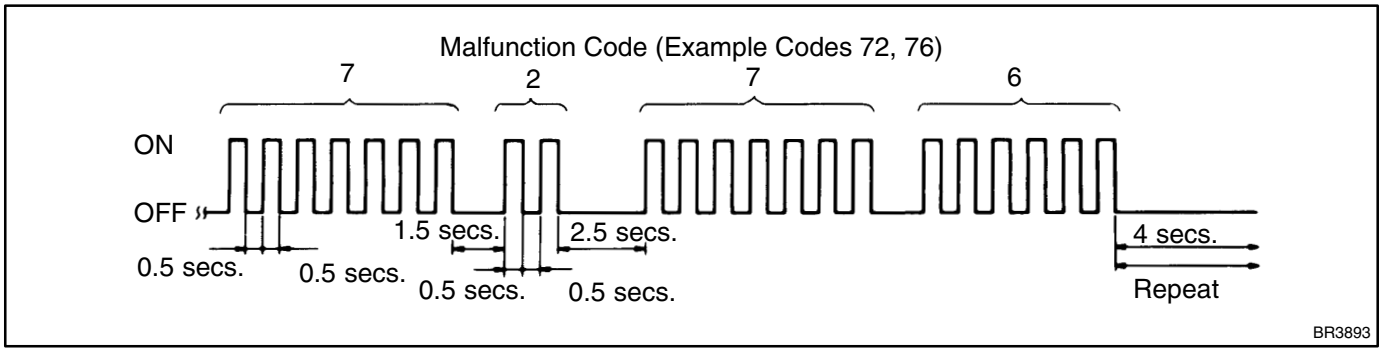
HINT:
If the brake is applied during the check, the check routine must be started again.

(7) Stop the vehicle.
(8) Turn the ignition switch OFF.
(9) Disconnect the SST from terminals Ts and CG, and connect the SST to terminals Tc and CG of DLC3.
SST 09843 – 18040
(10) Turn the ignition switch ON.

(11) Read the number of blinks of the ABS warning light.

HINT:

- See the list of DTC shown below.
- If every sensor is normal, a normal code is output (A cycle of 0.25 secs. ON and 0.25 secs. OFF is repeated).
- If 2 or more malfunctions are indicated at the same time, the lowest numbered code will be displayed 1st.



(12) After doing the check, disconnect the SST from terminals Tc and CG of DLC3 and turn ignition switch OFF.

SST 09843 –18040

DTC of the speed sensor check function:

Code No.	Diagnosis	Trouble Area
71	Low output voltage of right front speed sensor	• Right front speed sensor • Sensor installation • Right front speed sensor rotor
72	Low output voltage of left front speed sensor	• Left front speed sensor • Sensor installation • Left front speed sensor rotor
73	Low output voltage of right rear speed sensor	• Right rear speed sensor • Sensor installation • Right rear speed sensor rotor
74	Low output voltage of left rear speed sensor	• Left rear speed sensor • Sensor installation • Left rear speed sensor rotor
75	Abnormal change in output voltage of right front speed sensor	Right front speed sensor rotor
76	Abnormal change in output voltage of left front speed sensor	Left front speed sensor rotor
77	Abnormal change in output voltage of right rear speed sensor	Right rear speed sensor rotor
78	Abnormal change in output voltage of left rear speed sensor	Left rear speed sensor rotor

DI7YU–01

DIAGNOSTIC TROUBLE CODE CHART

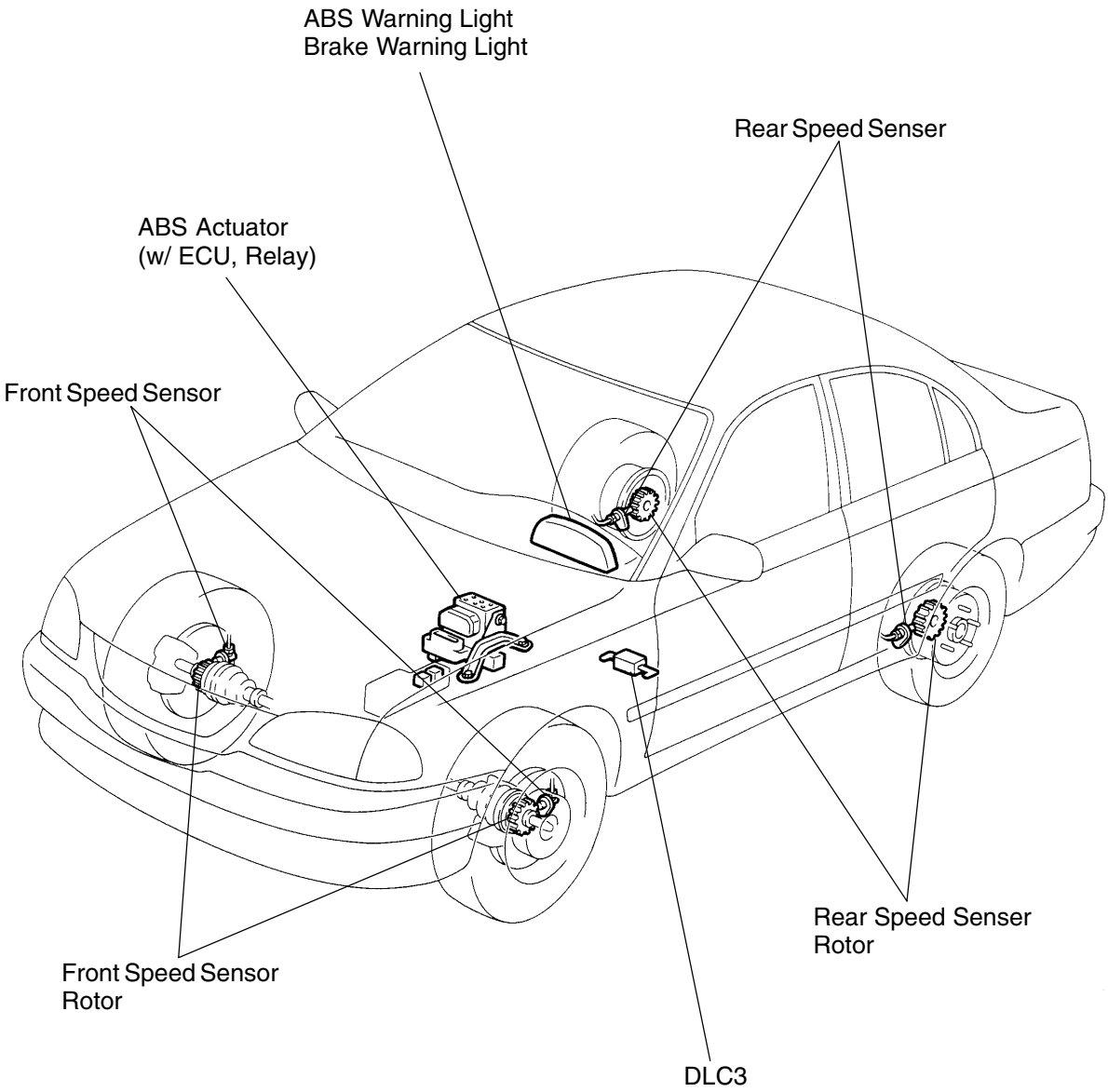
HINT:

- Using SST 09843 –18040, connect the terminals Tc and CG.
- If a malfunction code is displayed during the DTC check, check the circuit listed for 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.

DTC No. (See Page)	Detection Item	Trouble Area
11 (DI–136)	ABS solenoid valve relay faulty	• ABS solenoid valve relay • Valve supply voltage • ECU
13 (DI–138)	ABS pump motor faulty	• ABS motor relay • Pump motor voltage • Pump motor lead disconnected • ECU
21 (DI–140)	Right front solenoid valves faulty	ABS actuator (right front inlet or outlet solenoid valve)
22 (DI–140)	Left front solenoid valves faulty	ABS actuator (left front inlet or outlet solenoid valve)
23 (DI–140)	Right rear solenoid valves faulty	ABS actuator (right rear inlet or outlet solenoid valve)
24 (DI–140)	Left rear solenoid valves faulty	ABS actuator (left rear inlet or outlet solenoid valve)
31 (DI–142)	Right front wheel speed sensor signal malfunction	• Right front, left front, right rear and left rear speed sensor • Each speed sensor circuit • Sensor installation • ECU
32 (DI–142)	Left front wheel speed sensor signal malfunction	
33 (DI–142)	Right rear wheel speed sensor signal malfunction	
34 (DI–142)	Left rear wheel speed sensor signal malfunction	
35 (DI–142)	Open circuit in right front wheel speed sensor circuit	• Right front, left front speed sensor • Each speed sensor circuit • ECU
36 (DI–142)	Open circuit in left front wheel speed sensor circuit	
37 (DI–147)	Speed sensor rotor is wrong number of teeth on one of the 4 wheels	• Speed sensor • Sensor rotor • ECU
38 (DI–142)	Open circuit in right rear wheel speed sensor circuit	• Right rear, left rear speed sensor • Each speed sensor circuit • ECU
39 (DI–142)	Open circuit in left rear wheel speed sensor circuit	
41 (DI–149)	Low battery voltage	• Battery • IC regulator • Power source circuit • ECU
58 (DI–153)	Open circuit in stop light switch circuit	• Stop light switch • Stop light switch circuit • ECU
62 (DI–157)	Malfunction in ECU	ECU

DI7YV–01

PARTS LOCATION



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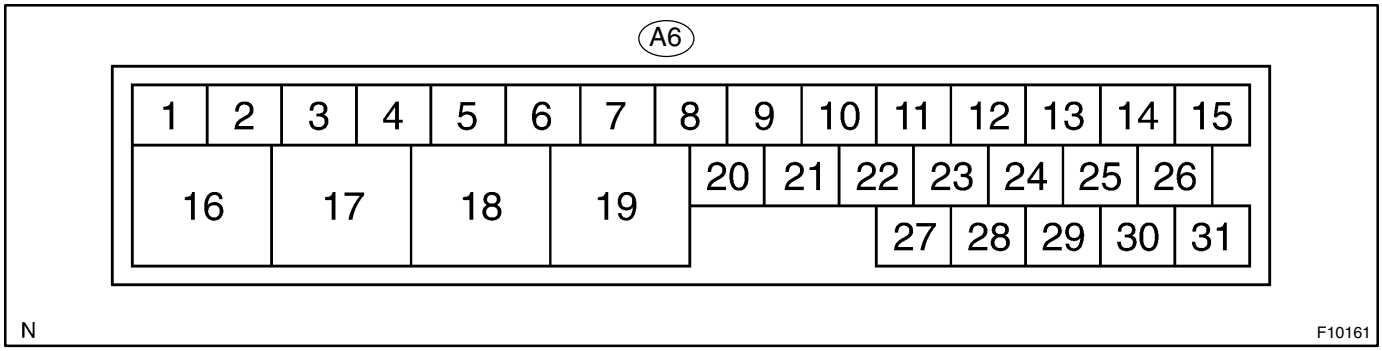
DI7YW–01

TERMINALS OF ECU



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
+B (A6 – 17, 18) – GND (A6 – 16, 19)	B ↔ W–B	Constant	10 – 14
IG1(A6 – 15) – GND (A6 – 16, 19)	B–R ↔ W–B	IG switch ON	10 – 14
WA (A6 – 20) – GND (A6 – 16, 19)	P–L ↔ W–B	IG switch ON, ABS warning light ON	10 – 14
		IG switch ON, ABS warning light OFF	Below 2.6
STP (A6 – 14) – GND (A6 – 16, 19)	G–W ↔ W–B	Stop light switch OFF	Below 1.5
		Stop light switch ON	5 – 14
Tc (A6 – 12) – GND (A6 – 16, 19)	LG–R ↔ W–B	IG switch ON	5.7 – 8.1
Ts (A6 – 11) – GND (A6 – 16, 19)	R–B ↔ W–B	IG switch ON	5.7 – 8.1
FR+ (A6 – 5) – FR– (A6 – 4)	W–R*1 ↔ B	IG switch ON, slowly turn right front wheel	AC generation
	W*2 ↔ B		
FL+ (A6 – 7) – FL– (A6 – 6)	R ↔ L–W	IG switch ON, slowly turn left front wheel	AC generation
RR+ (A6 – 2) – RR– (A6 – 1)	P ↔ L–R*1	IG switch ON, slowly turn right rear wheel	AC generation
	P ↔ L*2		
RL+ (A6 – 9) – RL– (A6 – 8)	Y ↔ BR	IG switch ON, slowly turn left rear wheel	AC generation
SP1 (A6 – 10) – GND (A6 – 16, 19)	L ↔ W–B	Vehicle driveing at about 20 km/h (12 mph)	Pulse generation
PKB (A6 – 13) – GND (A6 – 16, 19)	R–W ↔ W–B	IG switch ON, parking brake switch ON	Below 2.6
		IG switch ON, parking brake switch OFF	10 – 14
PN (A6 – 23) – GND (A6 – 16, 19)	B–W ↔ W–B	IG switch ON, shift lever P or N range	10 – 14
		IG switch ON, except shift lever P or N range	Below 1.6
EBDW (A6 – 21) – GND (A6 – 16, 19)	R–W ↔ W–B	IG switch ON, brake warning light OFF	Below 2.6
		IG switch ON, brake warning light ON	10 – 14

*1: LHD

*2: RHD

DI7YX–01

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.

Symptoms	Inspection Circuit	See page
ABS does not operate.	Only when 1.to 4. are all normal and the problem is still occurring, replace the ABS ECU. 1. Check the DTC reconfirming that the normal code is output. 2. Power source circuit 3. Speed sensor circuit 4. Check the hydraulic circuit for leakage.	 DI–129 DI–149 DI–142 DI–168
ABS does not operate intermittently.	Only when 1. τo 4. are all normal and the problem is still occurring, replace the ABS ECU. 1. Check the DTC reconfirming that the normal code is output. 2. Speed sensor circuit 3. Stop light switch circuit 4. Check the hydraulic circuit for leakage.	 DI–129 DI–142 DI–153 DI–168
ABS warning light abnormal.	1. ABS warning light circuit 2. ABS ECU	DI–159
Brake warning light abnormal.	1. Brake warning light circuit 2. ABS ECU	DI–161
DTC check cannot be done.	Only when 1. and 2. are all normal and the problem is still occurring, replace the ABS ECU. 1. ABS warning light circuit 2. Tc terminal circuit	 DI–159 DI–164
Speed sensor signal check cannot be done.	1. Ts terminal circuit 2. ABS ECU	DI–166

DI7YY–01

CIRCUIT INSPECTION

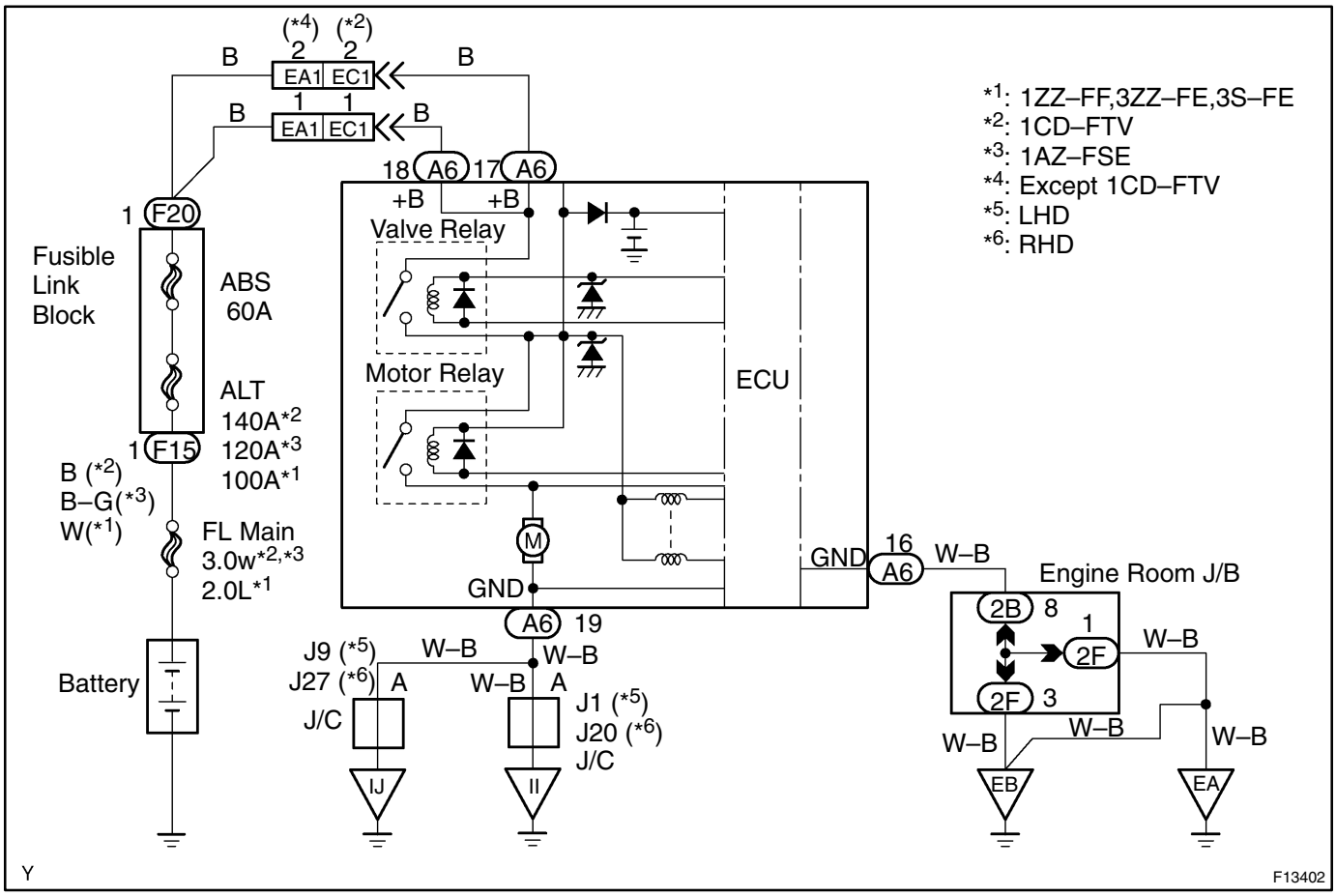
DTC	11	ABS Solenoid Valve Relay Circuit

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.

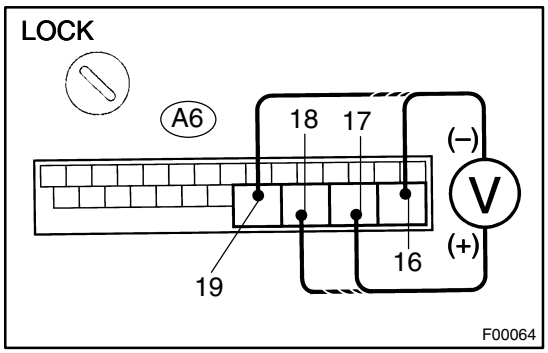
DTC No.	DTC Detecting Condition	Trouble Area
11	Detection of any conditions from 1. through 3.: 3. 3 or more solenoid valves are detected faulty in response and at the same time valve supply voltage is detected faulty. 4. Solenoid valve relay will not be switched OFF. 5. Valve relay is stuck in spite of its high valve relay supply voltage.	• ABS solenoid valve relay • Valve supply voltage • ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals A6 – 17, 18 and A6 – 16, 19 of ABS actuator connector.**



PREPARATION:
Disconnect the ABS actuator connector.

CHECK:
Measure the voltage between terminals A6 – 17, 18 and A6 – 16, 19 of ABS actuator harness side connector.

OK:

Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Check and repair harness or connector.

OK

If the same code is still output after the DTC is deleted, check the contact condition of each connection. If the connections are normal, the ECU may be defective.

DI7YZ–01

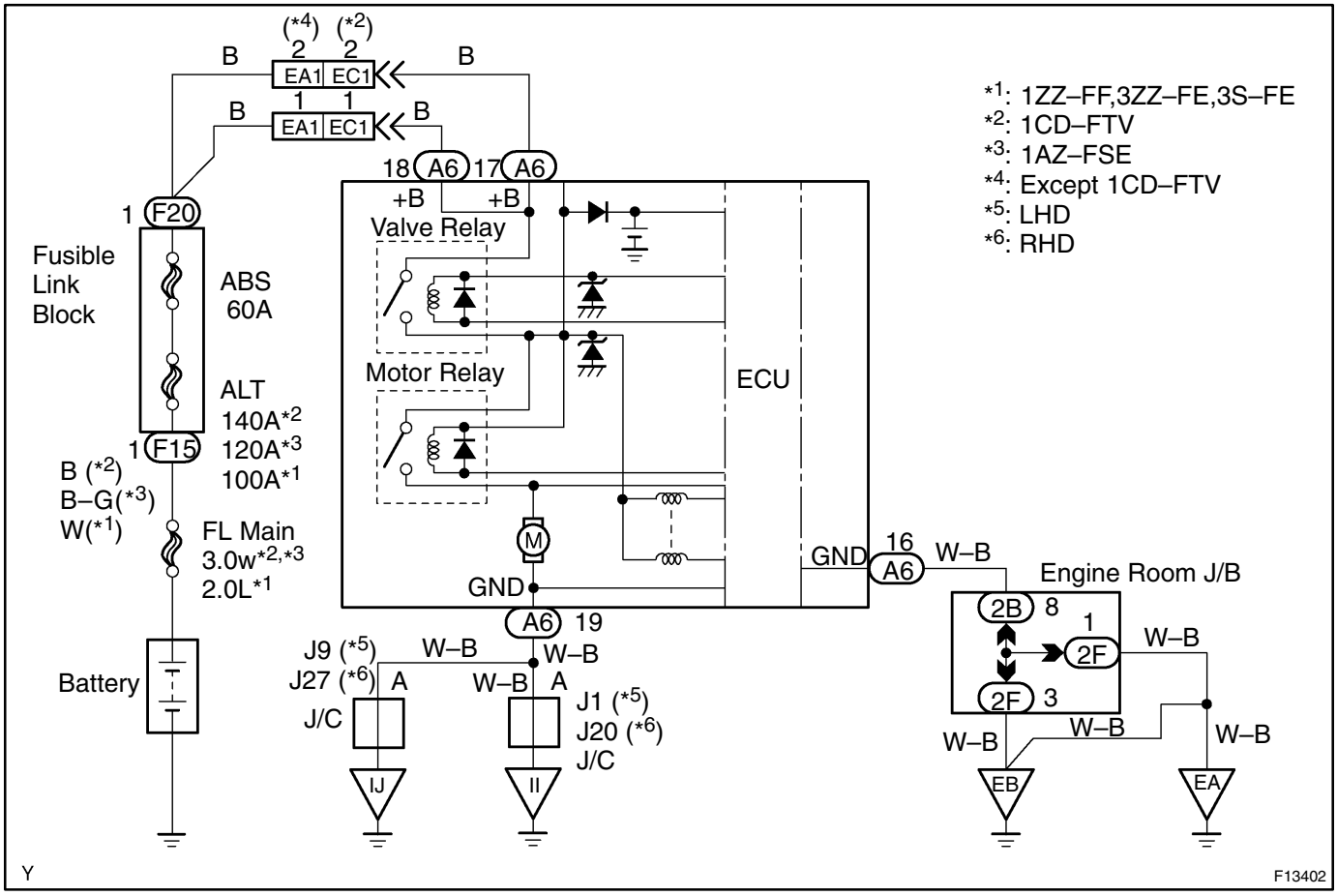
DTC	13	Pump Motor Circuit

CIRCUIT DESCRIPTION

The ABS motor relay supplies power to the ABS pump motor. While the ABS is activated, the ECU switches the ABS motor relay ON and operates the ABS pump motor.

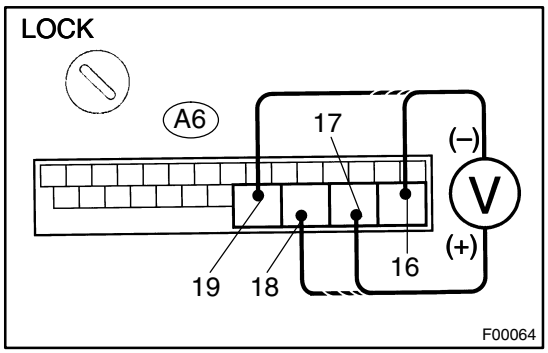
DTC No.	DTC Detecting Condition	Trouble Area
13	Detection of any conditions from 1. through 3.: 1. After actuating the motor relay, voltage will not be supplied to the pump motor within 0.4 secs. 2. Although the voltage supplied to the pump motor is in a high level, motor relay will not actuate for 2.5 secs, or more. 3. The voltage supplied to the pump motor keeps low level for louger than 0.4 secs. and the pump repeats activating for 7 secs. 3times maximally. After the last activation, the pump motor has been gone dead because of short circuit.	• ABS motor relay • Pump motor voltage • Pump motor lead disconnected • ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals A6 – 17, 18 and A6 – 16, 19 of ABS actuator connector.**



PREPARATION:
Disconnect the ABS actuator connector.

CHECK:
Measure the voltage between terminals A6 – 17, 18 and A6 – 16, 19 of ABS actuator harness side connector.

OK:

Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Check and repair harness or connector.

OK

If the same code is still output after the DTC is deleted, check the contact condition of each connection. If the connections are normal, the ECU may be defective.

DI7Z0–01

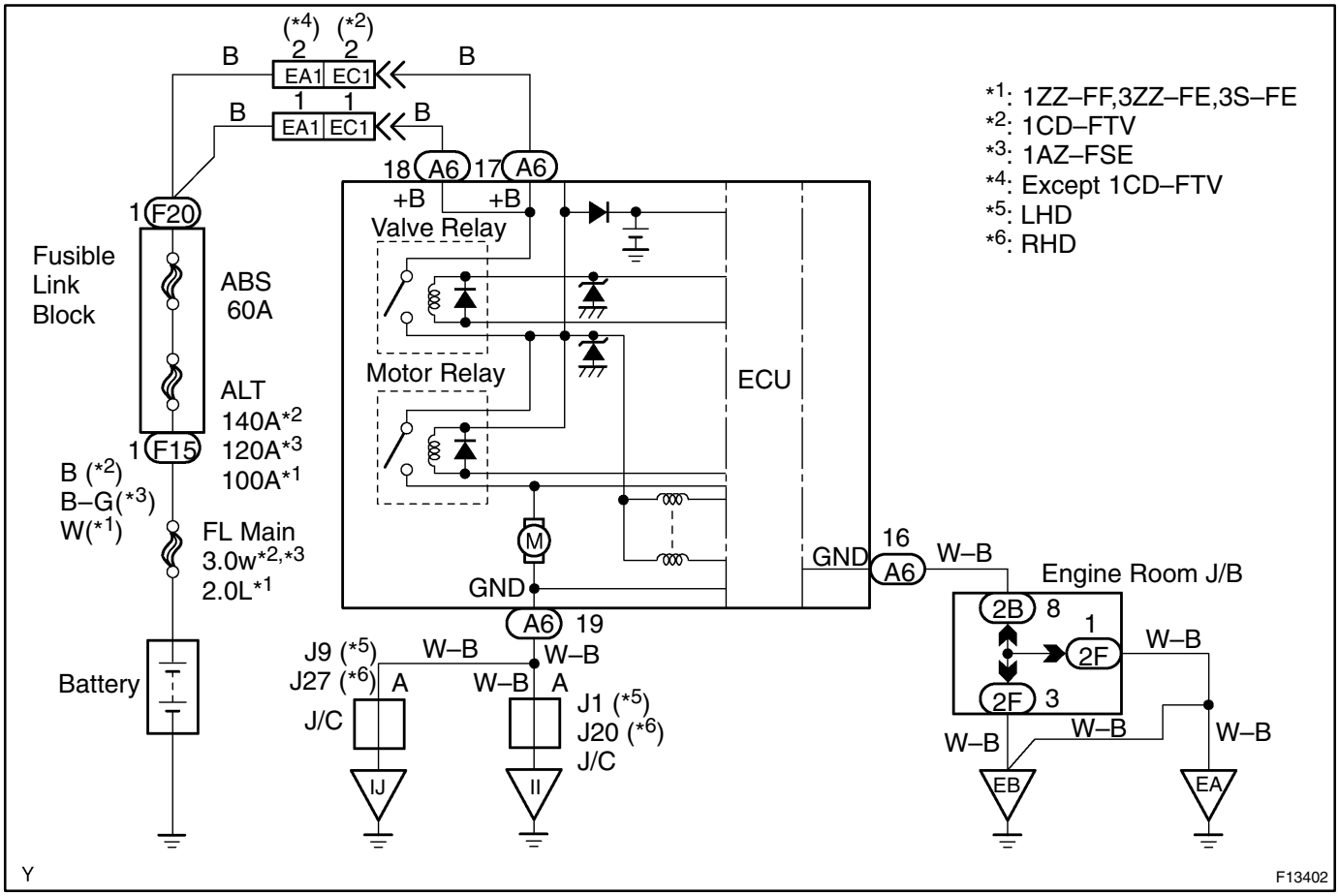
DTC	21, 22, 23, 24	ABS Solenoid Valve Circuit

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
21, 22, 23, 24	Solenoid valve signal does not match for the check result.	Each solenoid valve

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check the DTC once more.**

PREPARATION:

(a) Clear the DTC (See page DI–129).

(b) Turn the ignition switch OFF.

CHECK:

Turn the ignition switch ON, and check if the same DTC is stored in the memory.

NO → **No problem.**

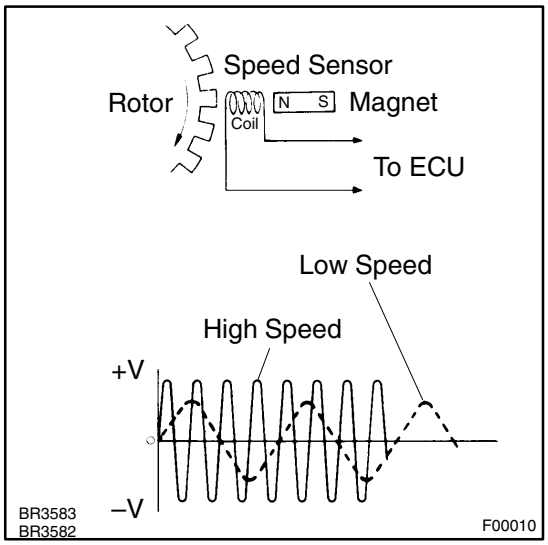
YES

Replace ABS ECU.

DI7Z1–01

DTC	31, 32, 33, 34, 35, 36, 38, 39	Speed Sensor Circuit

CIRCUIT DESCRIPTION



The speed sensor detects wheel speed and sends the appropriate signals to the ECU. These signals are used to control the ABS system. The front and rear rotors each have 48 serrations.

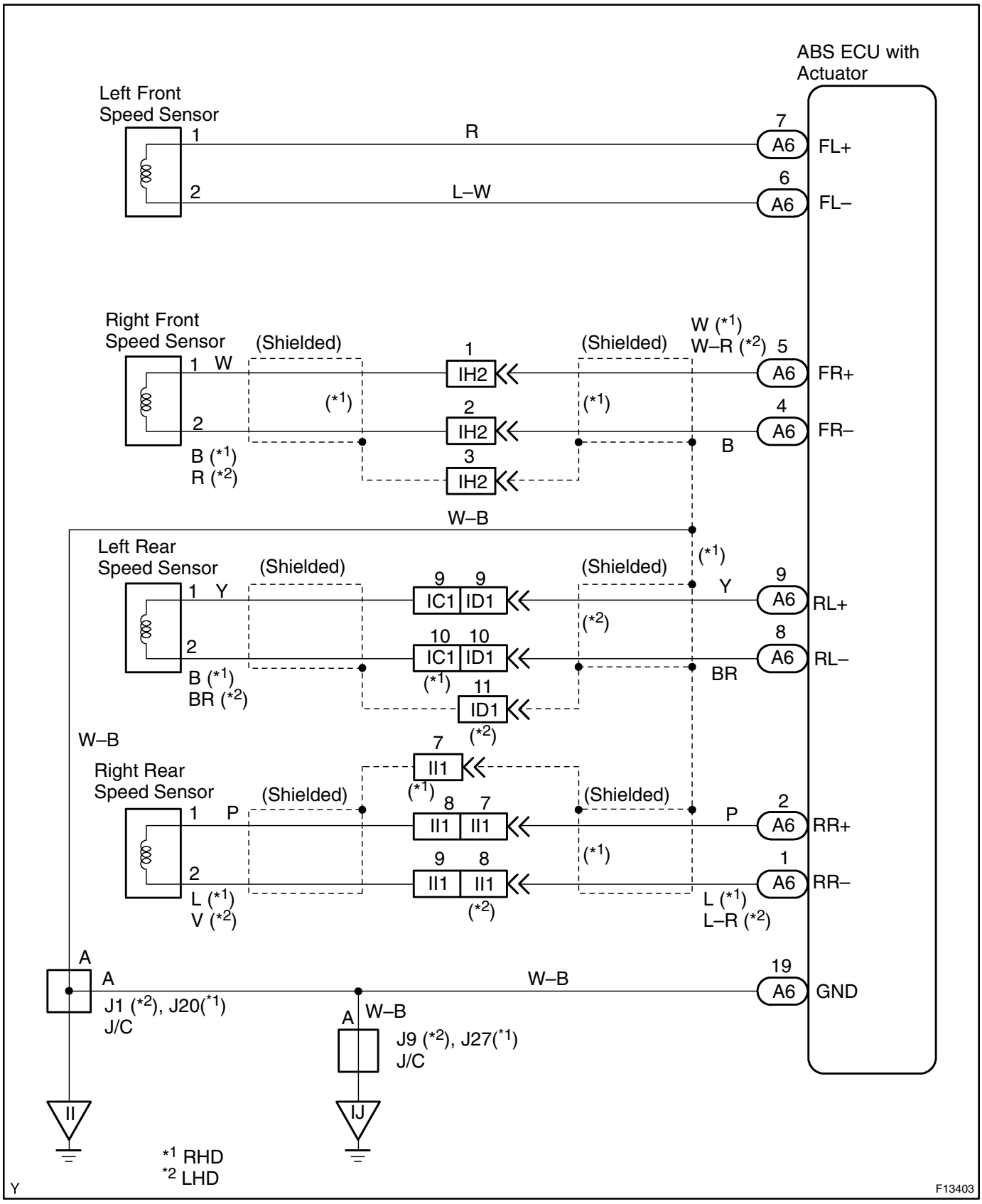
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
31, 32, 33, 34	Detection of any of conditions from 1. through 3.: 1. Vehicle speed is more than 40 km/h (25 mph), pulses are not input for 0.01 secs. 2. After the initial start or restart and when the vehicle speed has reached 12 km/h (7 mph), the wheel with 0 km/h (0 mph) of wheel speed was detected. 3. After the initial start or restart and when the vehicle speed has reached 70 km/h (44 mph), front wheel with 0 km/h (0 mph) of wheel speed was detected. 4. In case that the vehicle equipped with the temporaly tire is driven with high speed but without low pressure in that temporaly tire.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • Sensor installation • ECU • Tire pressure
35, 36, 38, 39	Detecting abnormality in the resistance value of each speed sensor.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • ECU

HINT:

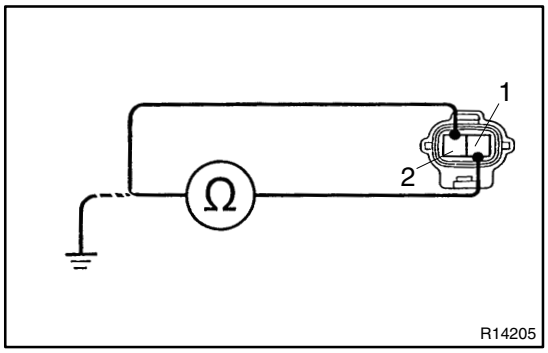
- DTC Nos. 31 and 35 are for the right front speed sensor.
- DTC Nos. 32 and 36 are for the left front speed sensor.
- DTC Nos. 33 and 38 are for the right rear speed sensor.
- DTC Nos. 34 and 39 are for the left rear speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check speed sensor.**



Front

PREPARATION:

(a) Remove the front fender liner.

(b) Disconnect the speed sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector.

OK:

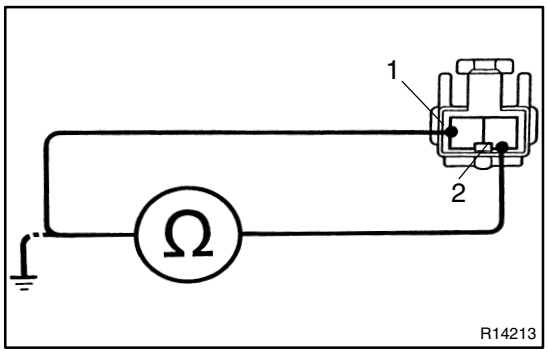
Resistance: 0.6 – 2.5 kΩ (1.6 ± 0.2 kΩ at 20 °C)

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector and body ground.

OK:

Resistance: 1 MΩ or higher



Rear

PREPARATION:

(a) Remove the seat cushion and side seatback.

(b) Disconnect the speed sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector.

OK:

Resistance: 1.2 – 2.3 kΩ (1.6 ± 0.1 kΩ at 20 °C)

CHECK:

Measure resistance between terminals 1 and 2 of speed sensor connector and body ground.

OK:

Resistance: 1 MΩ or higher

NG → **Replace speed sensor.**

NOTICE:

Check the speed sensor signal last (See page DI–129).

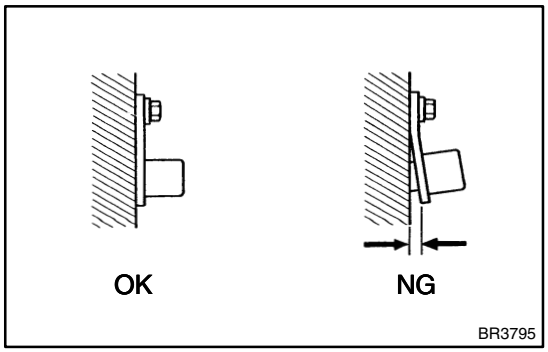
OK

2	Check for open and short circuit in harness and connector between each speed sensor and ECU (See page IN–30).

NG → **Repair or replace harness or connector.**

OK

3	Check speed sensor installation.



CHECK:
Check the speed sensor installation.
OK:

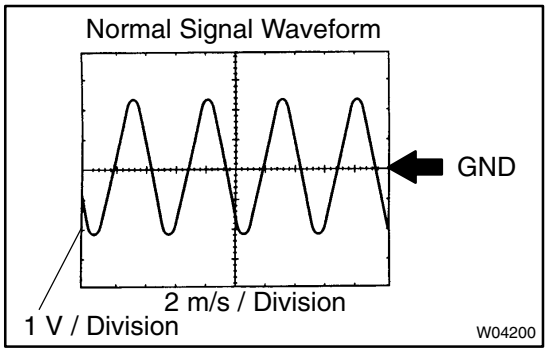
The installation bolt is tightened properly and there is no clearance between the sensor and front steering knuckle or rear axle carrier.

NG → **Replace speed sensor.**

NOTICE:
Check the speed sensor signal last (See page DI–129).

OK

4	Check speed sensor and sensor rotor serrations.



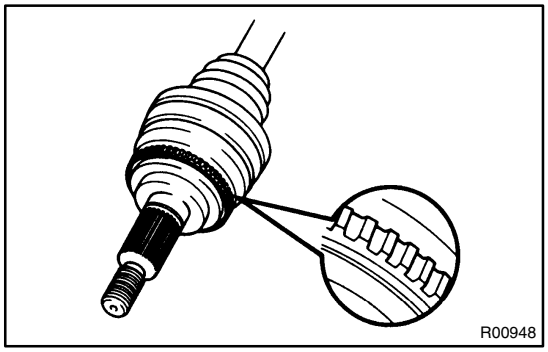
REFERENCE: INSPECTION USING OSCILLOSCOPE
PREPARATION:
(a) Remove the ABS ECU.
(b) Connect the oscilloscope to the terminals FR+, FL+, RR+ or RL+ and GND of the ABS ECU.

CHECK:
Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

OK → **Check and replace ABS ECU.**

NG

5	Check sensor rotor and sensor tip.



Front

PREPARATION:

Remove the front drive shaft (See page SA–3).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches or missing teeth or foreign objects.

PREPARATION:

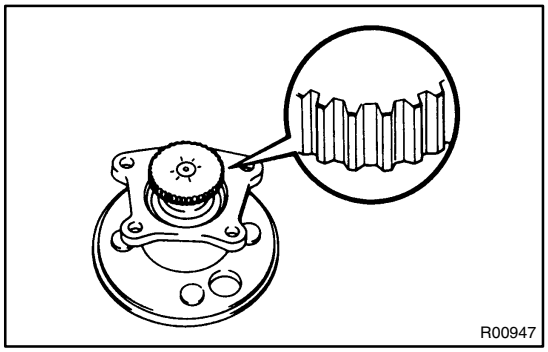
Remove the front speed sensor (See Pub. No. RM599E on page BR–41).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.



Rear

PREPARATION:

Remove the axle hub (See Pub. No. RM599E on page SA–10).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches or missing teeth or foreign objects.

PREPARATION:

Remove the rear speed sensor (See Pub. No. RM599E on page BR–44).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.

NG → **Replace sensor rotor or speed sensor.**

NOTICE:

Check the speed sensor signal last (See page DI–129).

OK

Check and replace ABS ECU.

DI7Z2–01

DTC	37	Speed Sensor Rotor Faulty

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
37	Detection of any of conditions from 1. through 3.: 1. Occurrence of differential to some degree in the wheel speed between the front and rear wheels of either left or right side of the vehicle and the front left and right wheels. (Detection of differential in mini tire size, spinning wheel and decelerating wheel.) 2. Continuous ABS control for 60 secs. or more. 3. Interference on 1 or more wheels for 20 secs. with the brake pedal depressed, or for 5 secs. when the brake pedal is not depressed. 4. In case that the vehicle equipped with the temporaly tire is driven with high speed but without low pressure in that temporaly tire.	• Speed sensor • Sensor rotor • ECU • Tire pressure

INSPECTION PROCEDURE

1	**Check sensor rotor (See page DI–142).**

NG → **Replace sensor rotor.**

OK

2	**Check speed sensor (See page DI–142).**

NG → **Replace speed sensor.**

OK

3	**Check for open or short circuit in harness and connector between speed sensor and ECU (See page IN–30).**

NG → **Repair or replace harness and connector.**

OK

Check and replace ABS ECU.

DI7Z3–01

DTC	41	Power Source Circuit

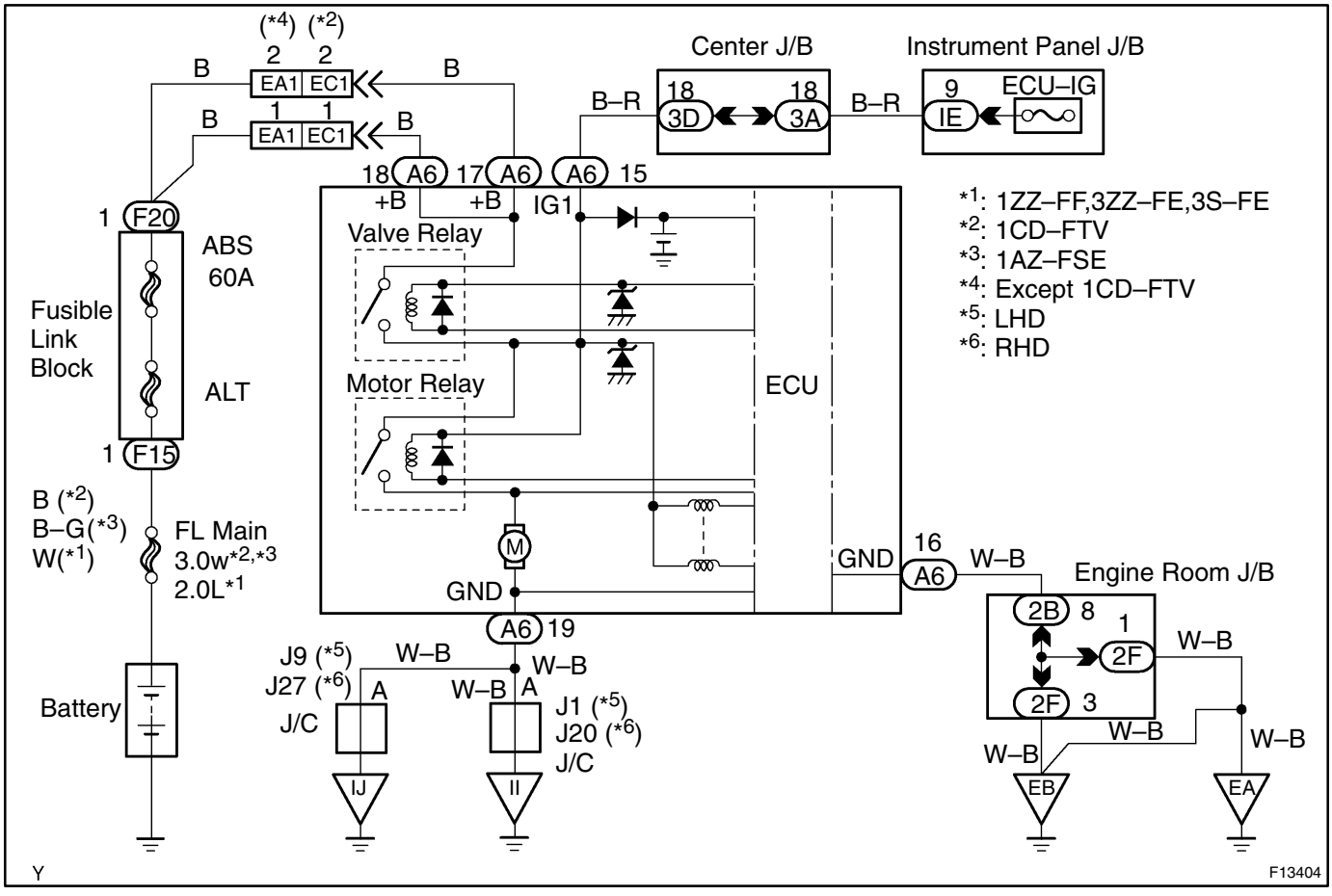
CIRCUIT DESCRIPTION

This circuit is the power source for the ECU, hence the actuators.

DTC No.	DTC Detecting Condition	Trouble Area
41	When the vehicle speed is at aprox. 6 km/h (4 mph), low battery voltage is 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 is more than 17.4 V.	• Battery • IC regulator • Power source circuit • ECU

Fail safe function:
If trouble occurs in the power source circuit, the ECU cuts off current to the ABS solenoid valve relay and prohibits ABS control.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check battery voltage.**

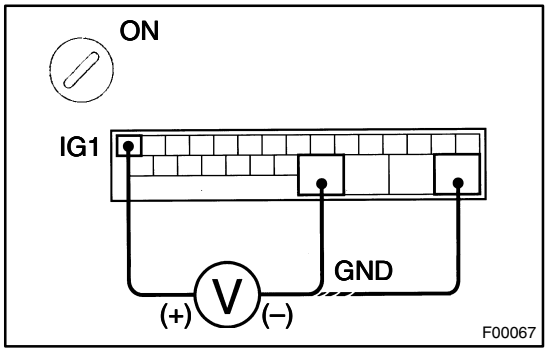
OK:

Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Check and repair the charging system.

OK

2	**Check voltage between terminals IG1 and GND of ABS actuator connector.**



PREPARATION:

Disconnect ABS actuator connector.

CHECK:

(a) Turn the ignition switch ON.

(b) Measure voltage between terminals IG1 and GND of ABS actuator harness side connector.

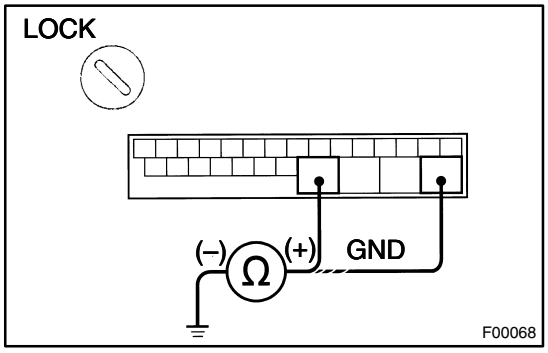
OK:

Voltage: 10 – 14 V

NG → **Check and replace fuses.**
Repair or replace harness or connector.

OK

3	**Check continuity between terminals GND of ABS actuator connector and body ground.**



CHECK:

Measure resistance between terminals GND of ABS actuator harness side connector and body ground.

OK:

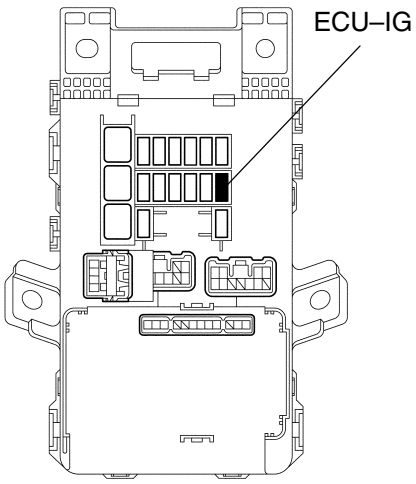
Resistance: 1 Ω or less

NG → **Repair or replace harness or connector.**

OK

4	**Check ECU–IG fuse.**

Instrument Panel J/B



PREPARATION:

Remove ECU–IG fuse from instrument panel J/B.

CHECK:

Check continuity of ECU–IG fuse.

OK:

Continuity

NG → **Check for short circuit in all the harness and components connected to ECU–IG fuse (See attached wiring diagram.**

OK

Check and replace ABS ECU.

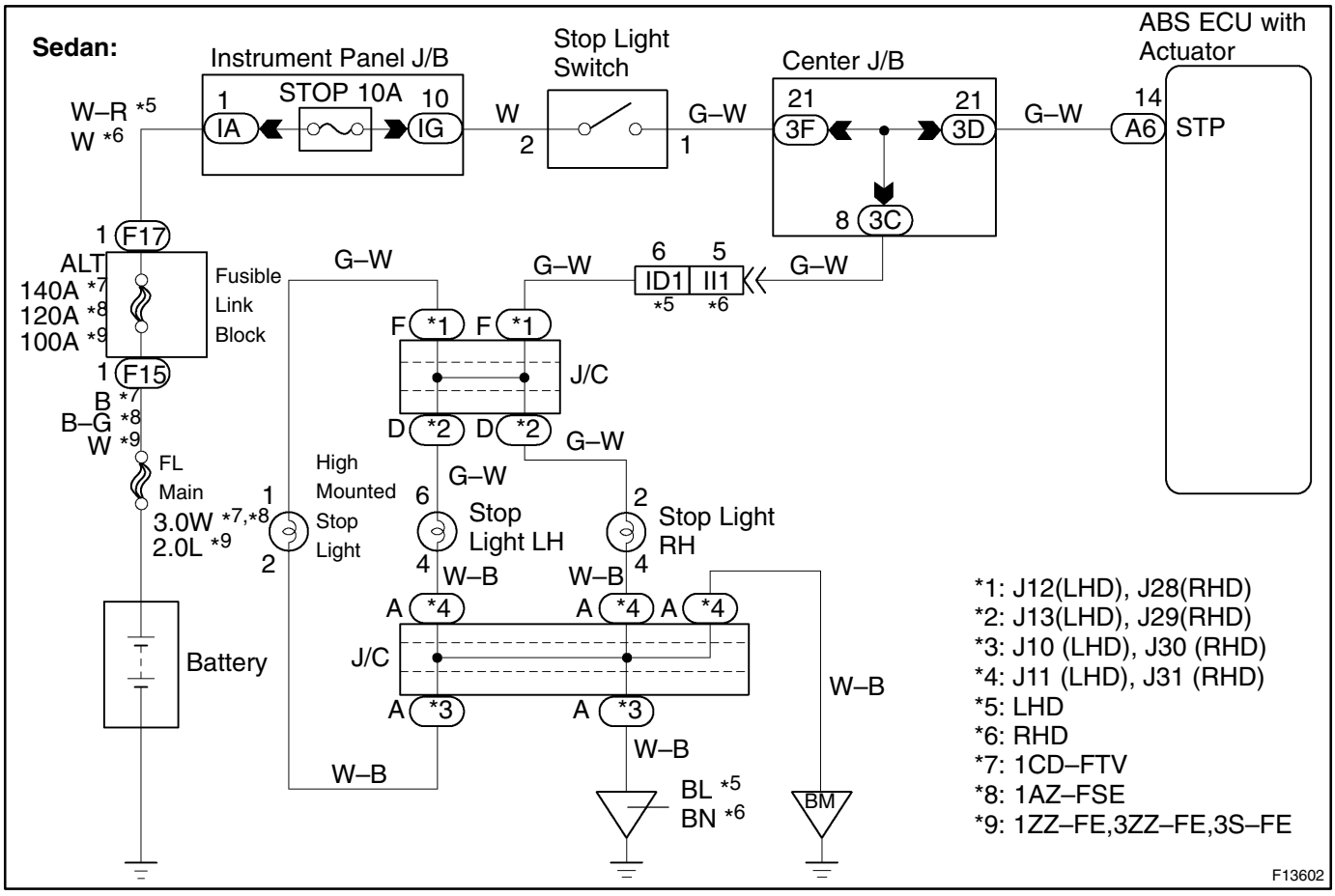
DI7Z4–01

DTC	58	Stop Light Switch Circuit

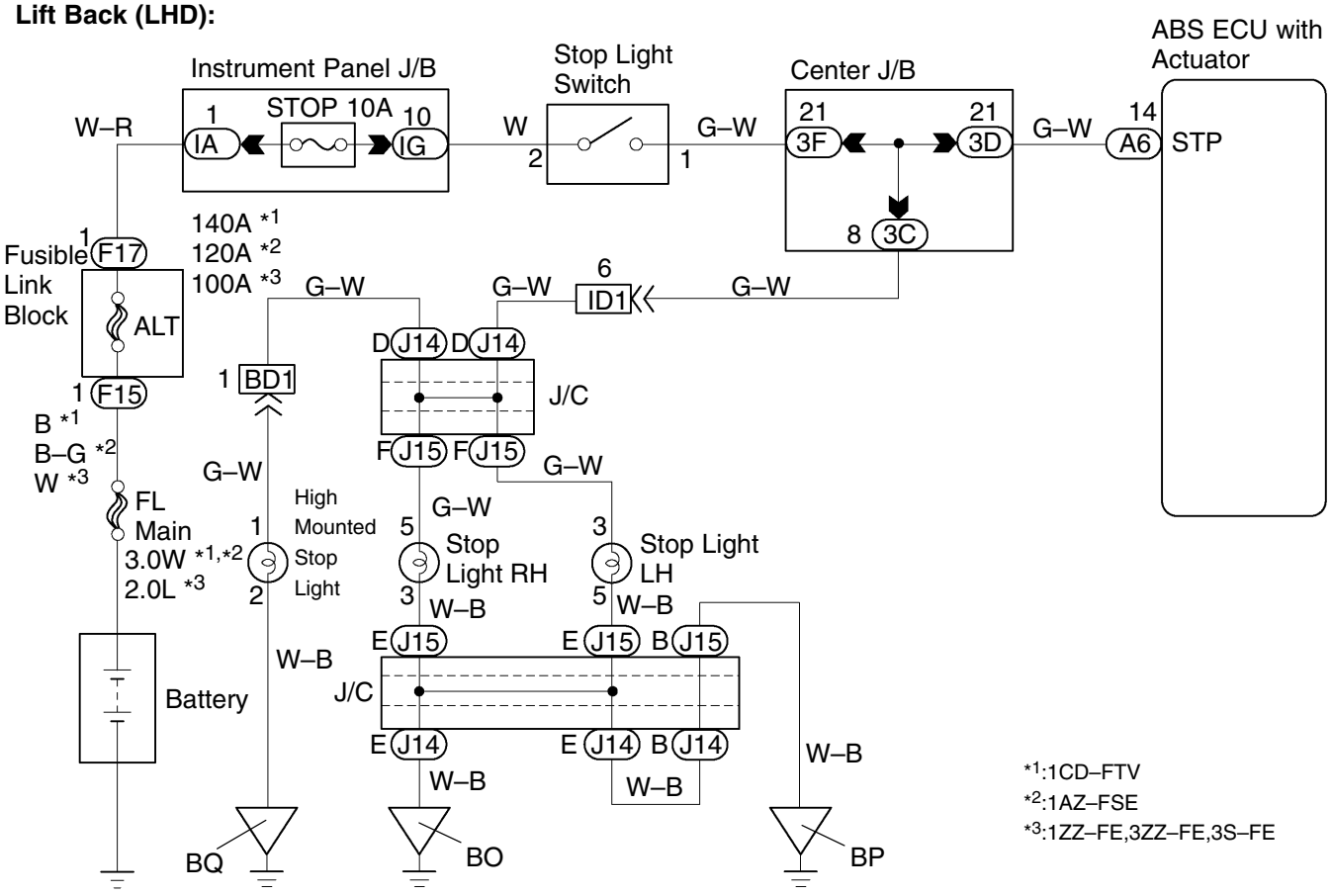
CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
58	Stop light switch circuit is open circuit, and stop light switch voltage is in the level between 65 % or more and less than 93 % of the battery voltage.	• Stop light switch • Stop light switch circuit • ECU

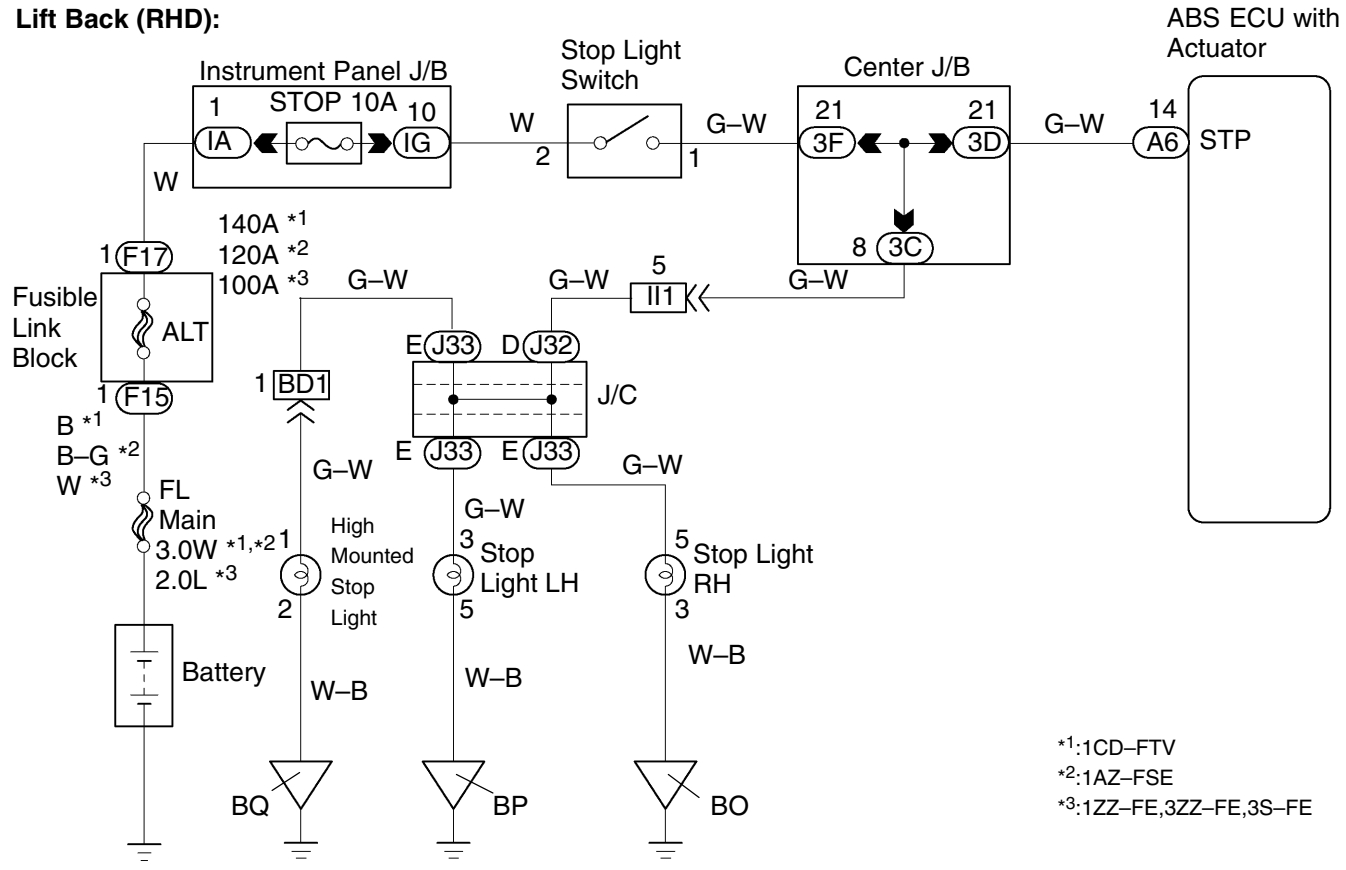
WIRING DIAGRAM



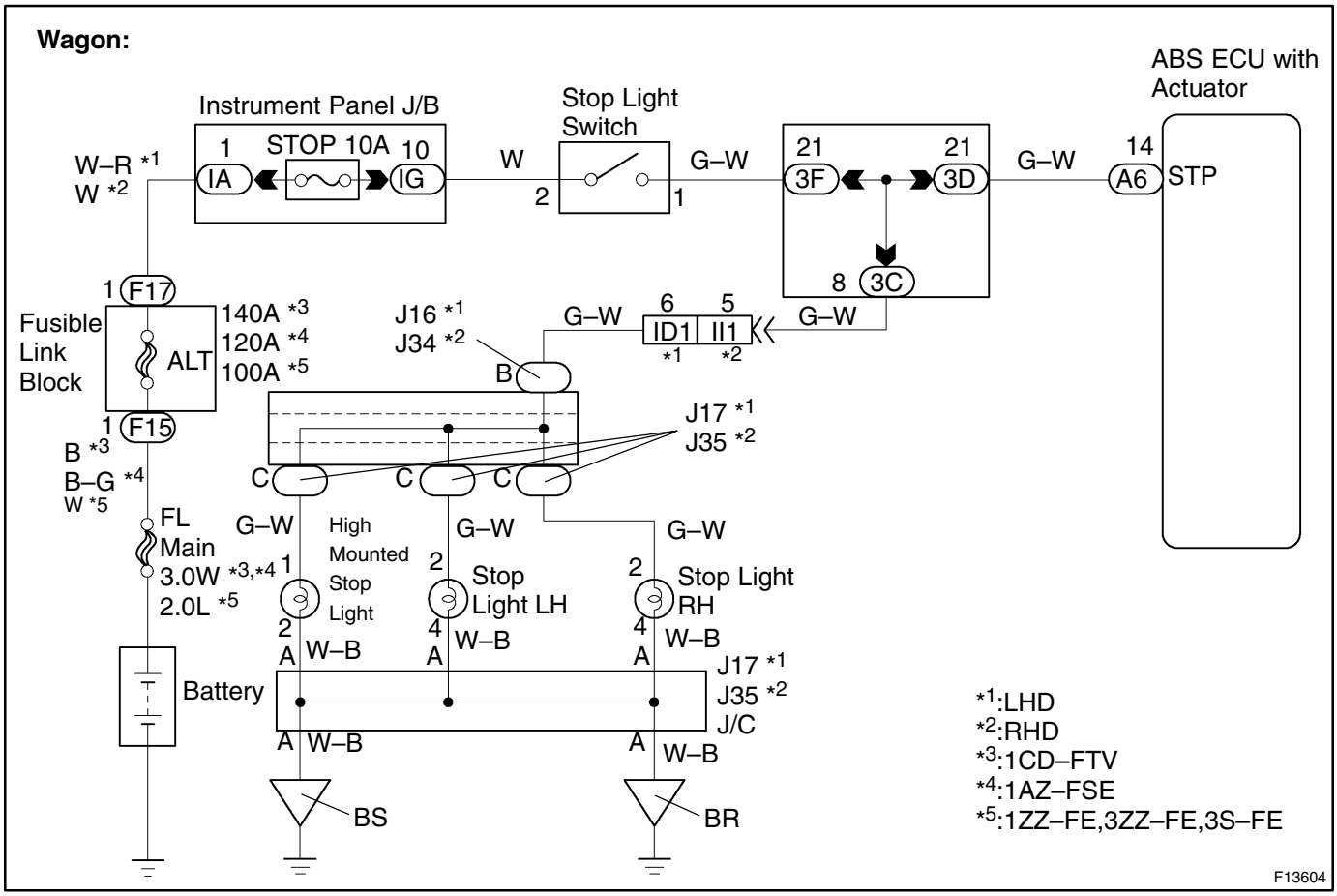
Lift Back (LHD):



Lift Back (RHD):



F13603



INSPECTION PROCEDURE

1	**Check operation of stop light.**

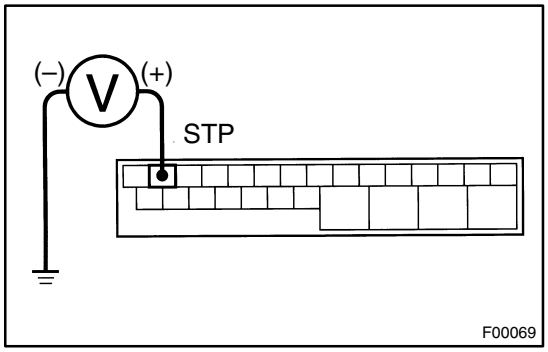
CHECK:

Check that stop light lights up when brake pedal is depressed and turns off when brake pedal is released.

NG → **Repair stop light circuit (See Pub. No. RM599E on BE–57).**

OK

2	**Check voltage between terminal STP of ABS actuator and body ground.**



PREPARATION:

Disconnect ABS actuator connector.

CHECK:

Measure voltage between terminal STP of ABS actuator harness side connector and body ground when brake pedal is depressed.

OK:

Voltage: 8 – 14 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–135).**

NG

3	**Check for open circuit in harness and connector between ABS ECU and stop light switch (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS ECU.

DI7Z5–01

DTC	62	ABS ECU Malfunction

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
62	ABS ECU continuously detected the inproper operation of ABS.	• Battery • ECU

INSPECTION PROCEDURE

1	Is DTC output?

Check DTC on page DI–129.

YES → **Repair circuit indicated by the output code.**

NO

2	Is normal code displayed?

YES → **Check for short circuit in harness and connector between DLC3 and ABS ECU (See page IN–30).**

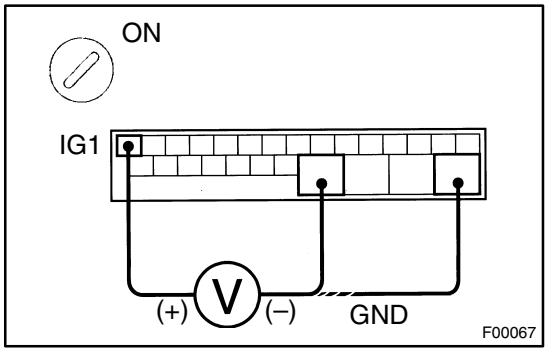
NO

3	Does ABS warning light go off?

YES → **Check open and short circuit of the harness and connector in the Tc circuit between ECU and DLC3.**

NO

4	Check voltage between terminals IG1 and GND of ABS actuator connector.



PREPARATION:
Disconnect ABS actuator connector.
CHECK:
(a) Turn the ignition switch ON.
(b) Measure voltage between terminals IG1 and GND of ABS actuator harness side connector.
OK:
Voltage: 10 – 14 V

YES → **Check for open or short circuit in harness and connector between ECU–IG fuse and ABS actuator (See page IN–30).**

OK

5	Check connection of ABS actuator connector.

CHECK:
(a) Check the connection of the ABS actuator connector.
(b) Check the ABS warning light goes off.

OK → **Check and replace ABS ECU.**

NG

Repair or replace harness or connector.

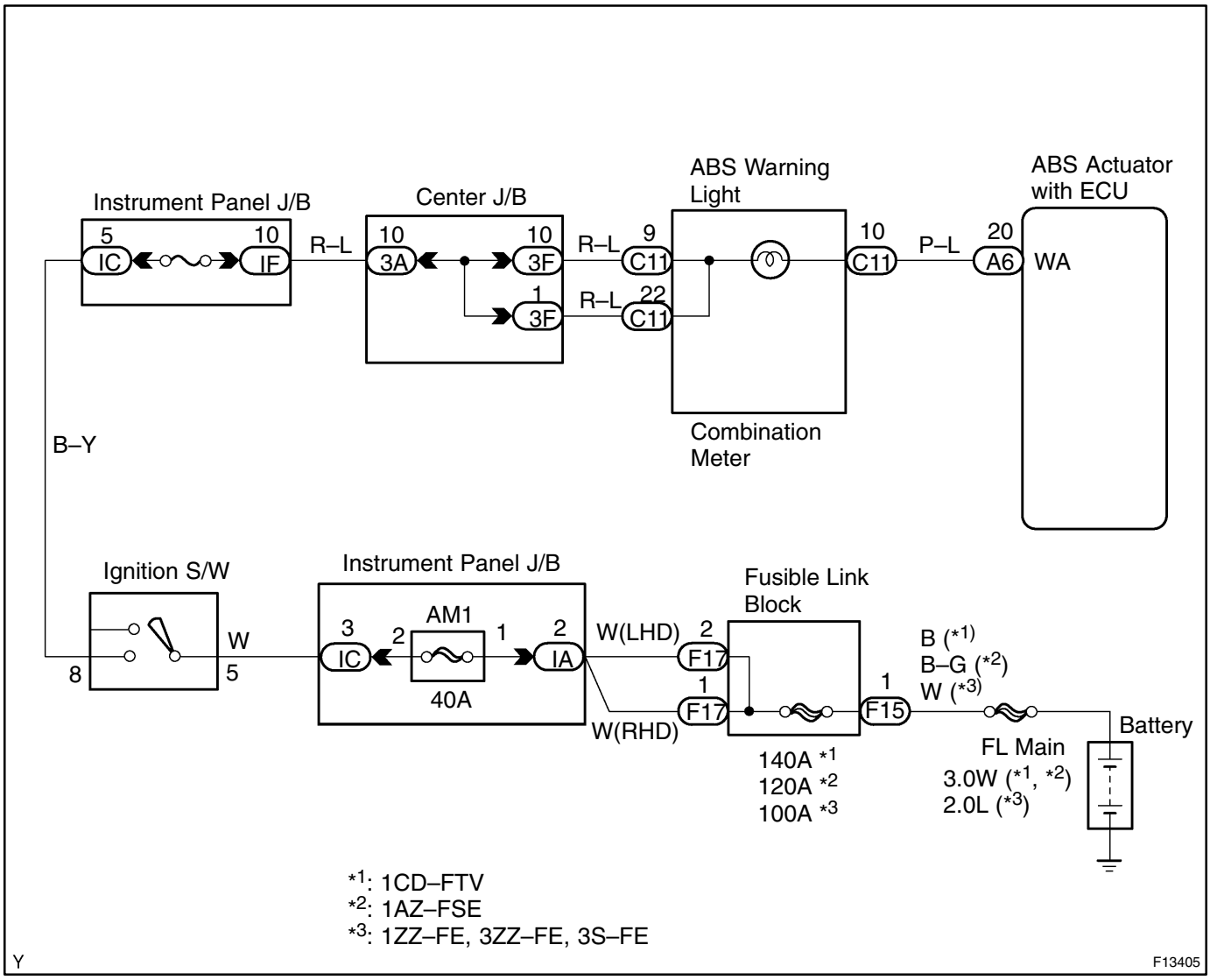
DI7Z6–01

ABS Warning Light Circuit

CIRCUIT DESCRIPTION

If the ECU detects trouble, it lights the ABS warning light while at the same time prohibiting ABS control. At this time, the ECU records a DTC in memory.
Connecting terminals Tc and CG of the DLC3 makes the ABS warning light blink and output the DTC.

WIRING DIAGRAM



INSPECTION PROCEDURE

Troubleshoot in accordance with the chart below for each trouble symptom.

ABS warning light does not light up	Go to step 1
ABS warning light remains ON	Go to step 2

1	**Check ABS warning light.**

See combination meter troubleshooting (See Pub. No. RM599E on page BE–57).

NG → **Repair bulb or combination meter assembly.**

OK

Check for open circuit in harness and connector between GAUGE fuse and ABS ECU (See page IN–30).

2	**Is DTC output?**

Check DTC on page DI–129.

YES → **Repair circuit indicated by the output code.**

NO

Check for short circuit in harness and connector between ABS warning light, DLC3 and ECU (See page IN–30).

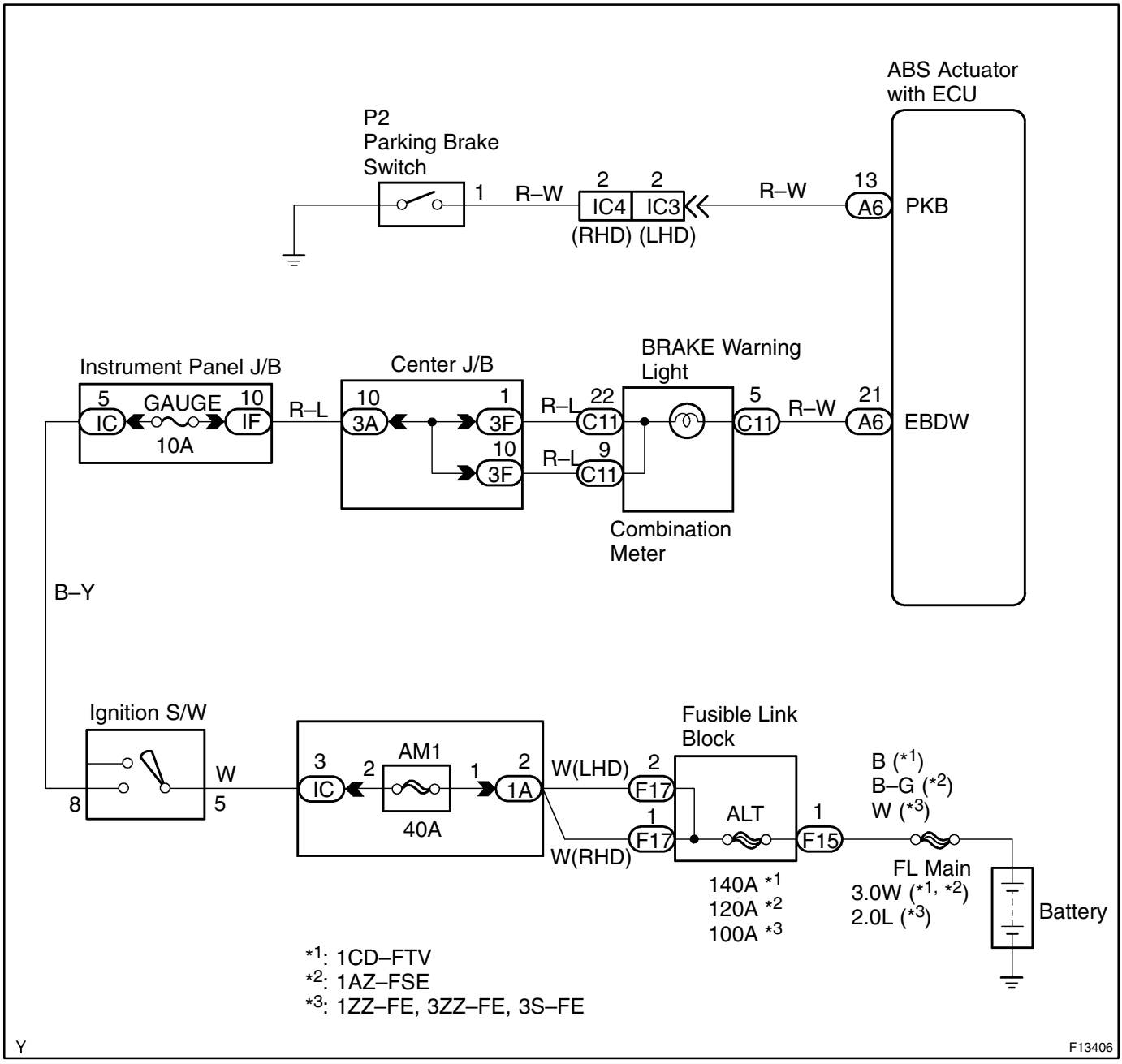
DI7Z7–01

BRAKE Warning Light Circuit

CIRCUIT DESCRIPTION

The BRAKE warning light lights up when the brake fluid is insufficient, parking brake is applied or the EBD is defective.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check parking brake switch circuit (See Pub. No. RM599E on page BE–45).**

NG → **Repair or replace parking brake switch circuit.**

OK

2	**Check brake fluid level warning switch circuit (See Pub. No. RM599E on page BE–45).**

NG → **Repair or replace brake fluid level warning switch circuit.**

OK

3	**Is DTC output for ABS ?**

Yes → **Repair circuit indicated by the output code.**

No

4	**Check brake warning light.**

See combination meter troubleshooting (See Pub. No. RM599E on page BE–57).

NG → **Repair or replace combination meter.**

OK

5	**Check for open or short circuit in harness and connector (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS ECU.

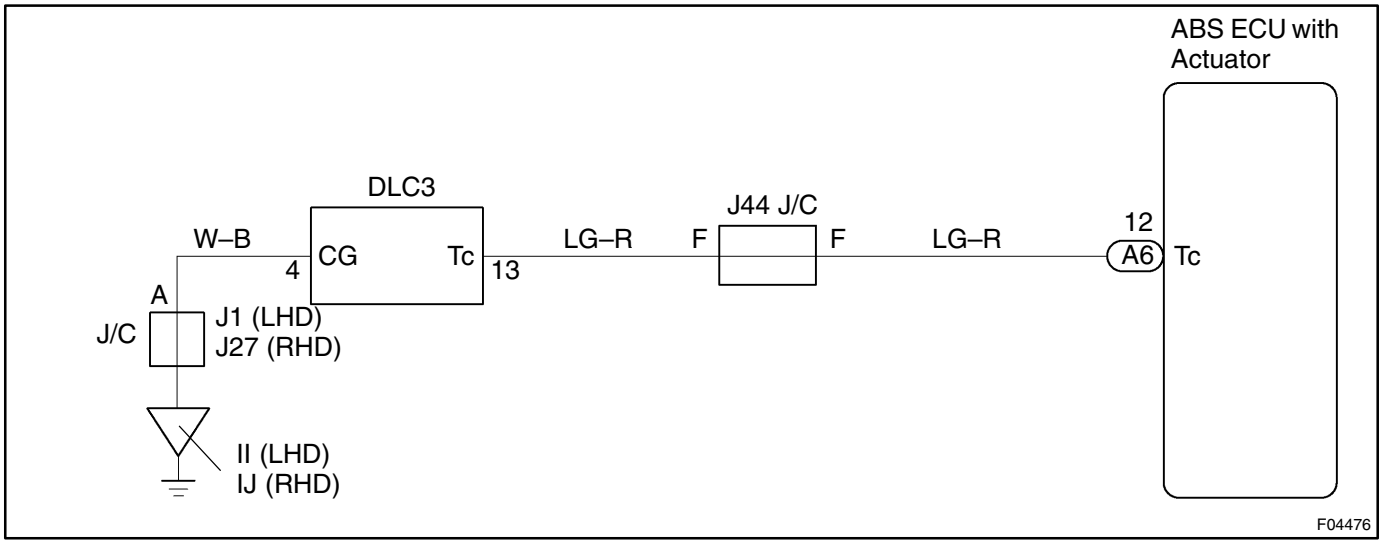
DI7Z8–01

Tc Terminal Circuit

CIRCUIT DESCRIPTION

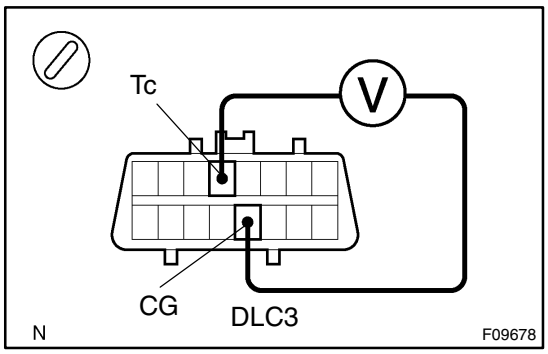
Connecting between terminals Tc and CG of the DLC3 causes the ECU to display the DTC by flashing the ABS warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Tc and CG of DLC3.**



CHECK:

(a) Turn the ignition switch ON.

(b) Measure voltage between terminals Tc and CG of DLC3.

OK:

Voltage: 5.7 – 8.1 V

OK	**If ABS warning light does not blink even after Tc and CG are connected, the ECU may be defective.**

NG

2	**Check for open and short circuit in harness and connector between ABS ECU and DLC3, DLC3 and body ground (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS ECU.

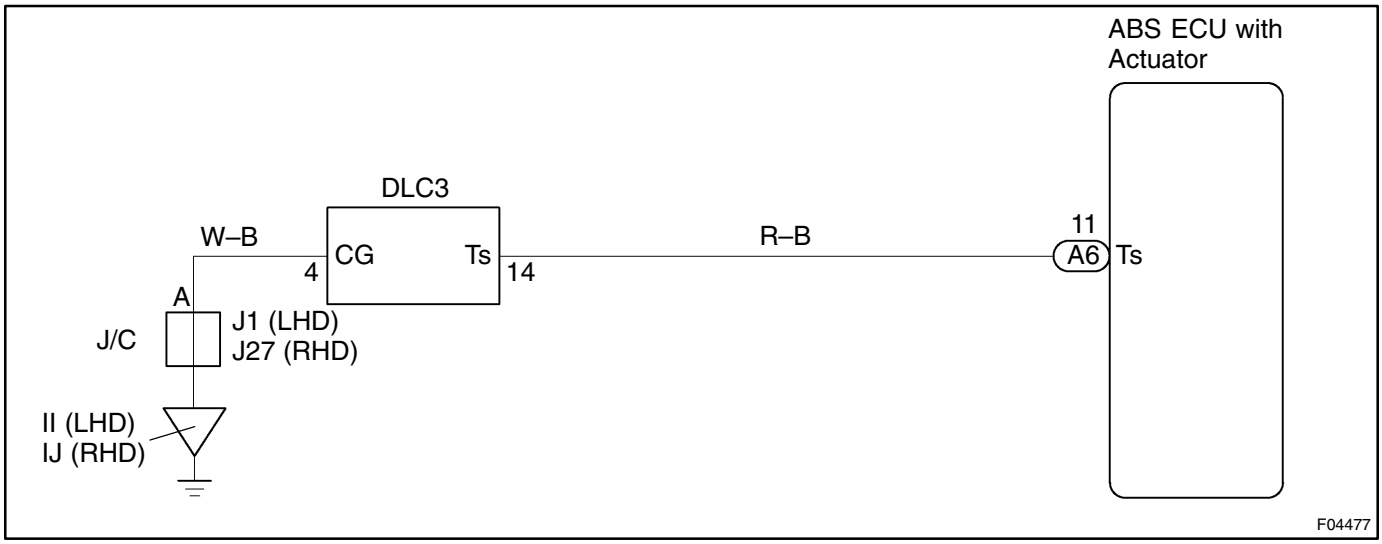
DI7Z9–01

Ts Terminal Circuit

CIRCUIT DESCRIPTION

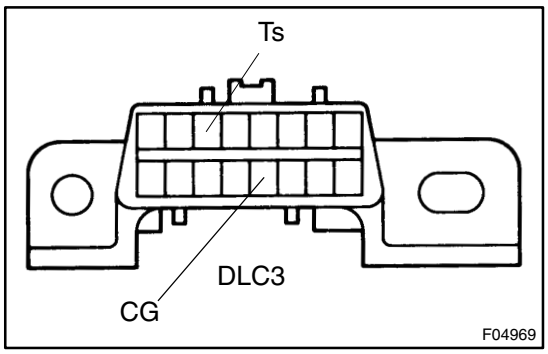
The sensor check circuit detects abnormalities in the speed sensor signal which cannot be detected with the DTC check.
Connecting terminals Ts and CG of the DLC3 on the lower finish panel starts the check.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Ts and CG of DLC3.**



CHECK:

(a) Turn the ignition switch ON.
(b) Measure voltage between terminals Ts and CG of DLC3.

OK:

Voltage: 5.7 – 8.1 V

OK

If ABS warning light does not blink even after Ts and CG are connected, the ECU may be defective.

NG

2	**Check for open and short circuit in harness and connector between ABS ECU and DLC3 and body ground (See page IN–30).**

NG → **Repair or replace harness or connector.**

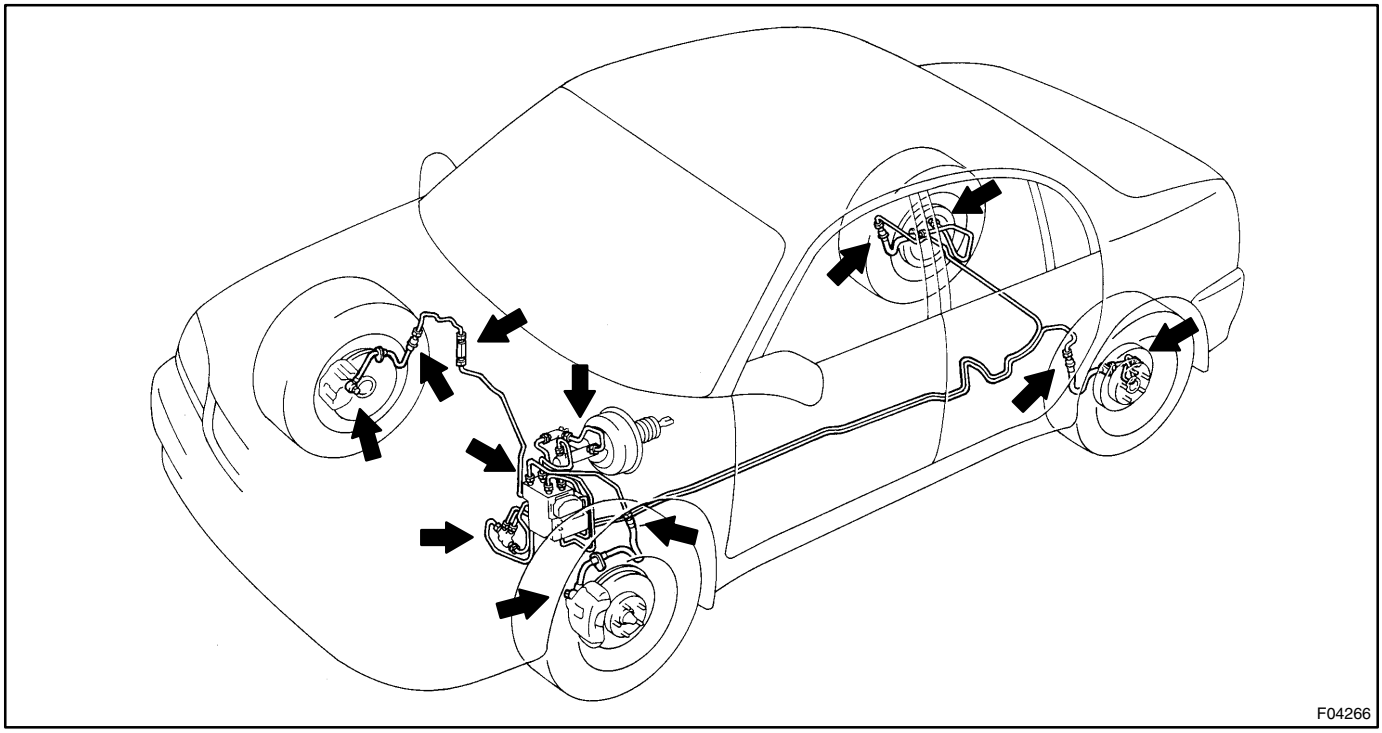
OK

Check and replace ABS ECU.

DI7ZA–01

Check for Fluid Leakage

Check for fluid leakage from actuator or hydraulic lines.



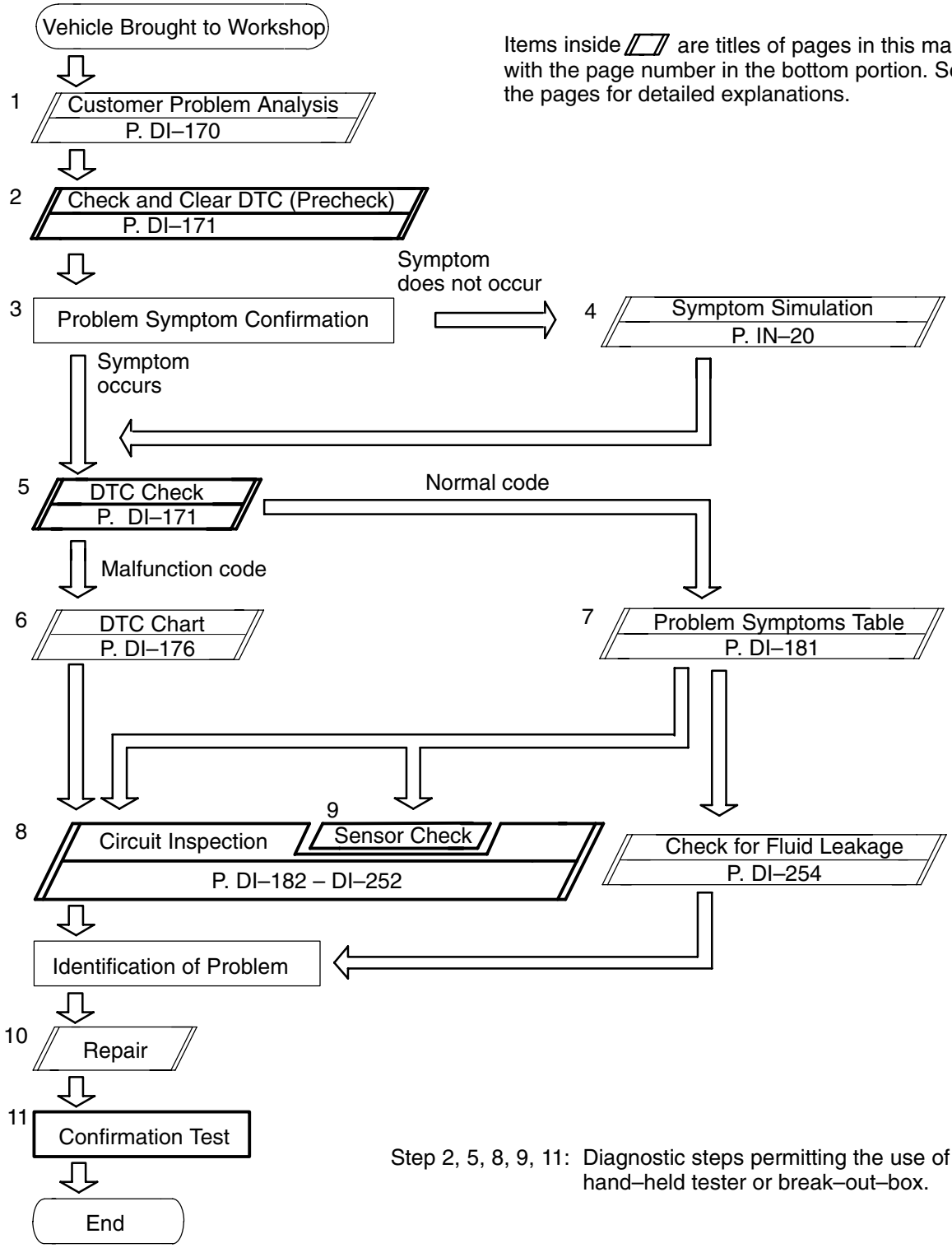
F04266

ABS WITH EBD & BA & TRC & VSC SYSTEM

DI7ZB–01

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshoot in accordance with the procedure on the following pages.



Items inside ▱ are titles of pages in this manual, with the page number in the bottom portion. See the pages for detailed explanations.

Step 2, 5, 8, 9, 11: Diagnostic steps permitting the use of the hand–held tester or break–out–box.

Fail safe function:
When a failure occurs in the ABS & BA & TRC & VSC system, the respective warning light (ABS, VSC) is lit and the operation of ABS & BA & TRC & VSC 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.

DI7ZC–01

CUSTOMER PROBLEM ANALYSIS CHECK

ABS & BA & TRC & VSC Check Sheet

Inspector's Name :

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

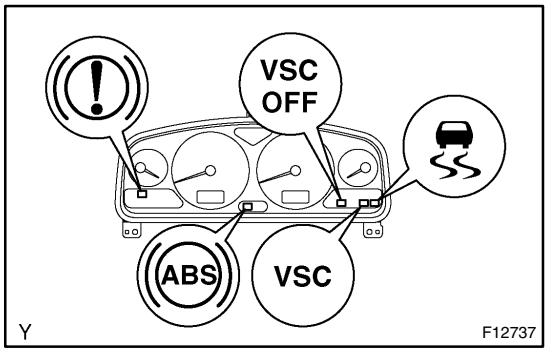
Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate efficiently.	
	☐ TRC does not operate.	
	☐ VSC does not operate. (Wheels spin when starting rapidly.)	
	☐ BA does not operate.	
	ABS Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up
	VSC OFF Indicator Light Abnormal	☐ Remains ON ☐ Does not Light Up
	VSC Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up
	SLIP Indicator Light Abnormal	☐ Remains ON ☐ Does not Light Up
	BRAKE Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up

Check Item	**Malfunction Indicator Light**	☐ Normal ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

DI7ZD–01



PRE–CHECK

1. DIAGNOSIS SYSTEM

(a) Check the warning lights.

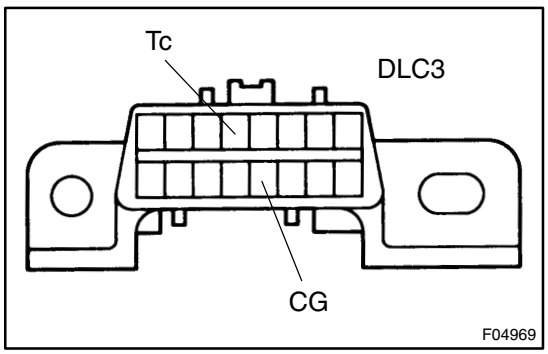
(1) Release the parking brake lever.

(2) When the ignition switch is turned ON, check that the ABS warning light, VSC warning light, VSC OFF indicator light, BRAKE warning light and SLIP indicator light goes on for approx. 2 seconds.

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, VSC warning light circuit, VSC OFF indicator light circuit, BRAKE warning light circuit or SLIP indicator light circuit.

Trouble Area	See page
ABS warning light circuit	DI–231, DI–225
VSC warning light circuit	DI–233, DI–228
VSC OFF indicator light circuit	DI–243
BRAKE warning light circuit	DI–236
SLIP indicator light circuit	DI–240



(b) In case of not using hand–held tester:
Check the DTC of ABS & BA & TRC & VSC ECU.

(1) Using SST, connect terminals Tc and CG of DLC3.
SST 09843–18040

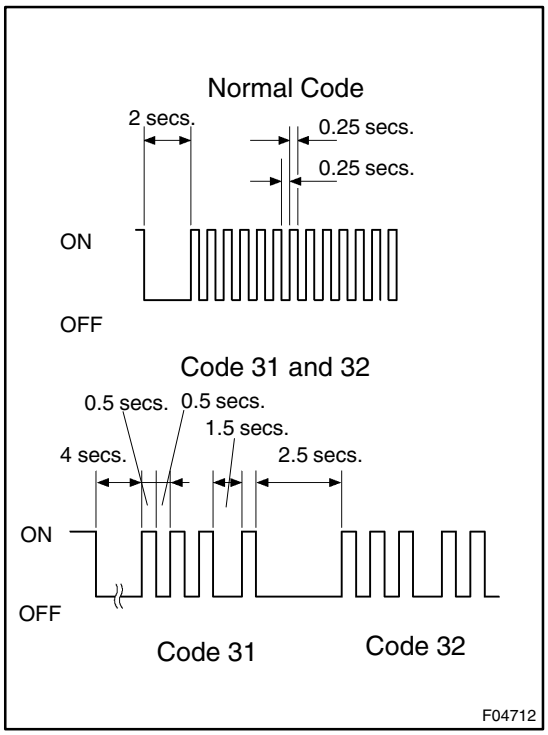
(2) Turn the ignition switch ON.

(3) Read the DTC from the ABS warning light and VSC warning light on the combination meter.

HINT:

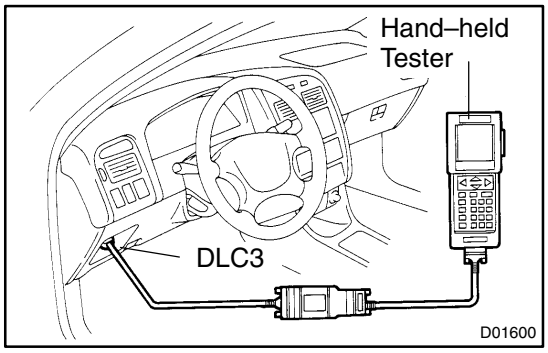
- If no code appears, inspect the diagnostic circuit, ABS warning light circuit or VSC waning light circuit.

Trouble Area	See page
Tc terminal circuit	DI–250
ABS warning light circuit	DI–231
VSC warning light circuit	DI–233



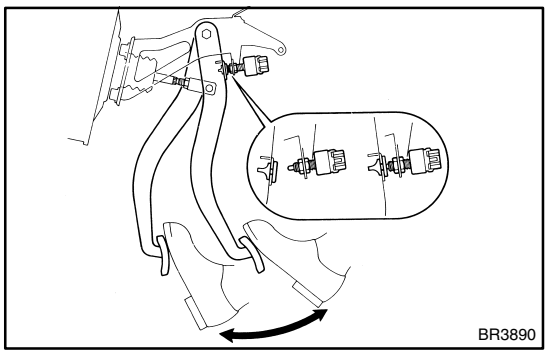
- As an example, the blinking patterns for normal code and code 31 and 32 are shown on the left.
  (4) Codes are explained in the code table on page DI–176.
  (5) After completing the check, disconnect terminals Tc and E_1, and turn OFF the display.

If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC will be displayed 1st.

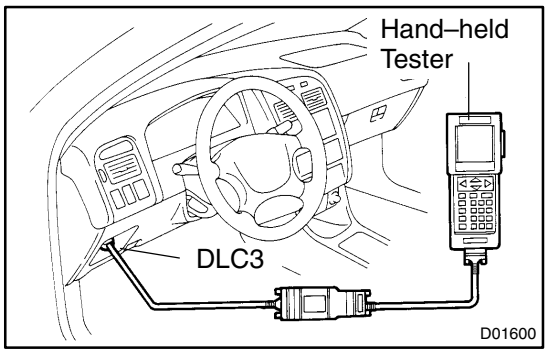


(c) In case of using hand–held tester :
Check the DTC.
(1) Hook up the hand–held tester to the DLC3.
(2) Turn the ignition switch ON.
(3) Read the DTC by following the prompts on the tester screen.

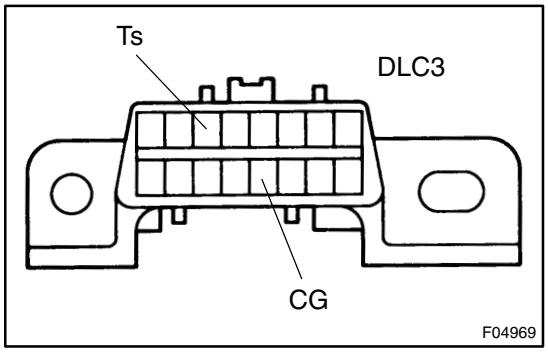
HINT:
Please refer to the hand–held tester operator's manual for further details.



(d) In case of not using hand–held tester:
Clear the DTC.
(1) Using SST, connect terminals Tc and E_1 of check connector.
SST 09843 – 18040
(2) Turn the ignition switch ON.
(3) Clear the DTC stored in ECU by depressing the brake pedal 8 or more times within 5 seconds.
(4) Check that the warning light shows the normal code.
(5) Remove the SST from the terminals of DLC 3.
SST 09843 – 18040

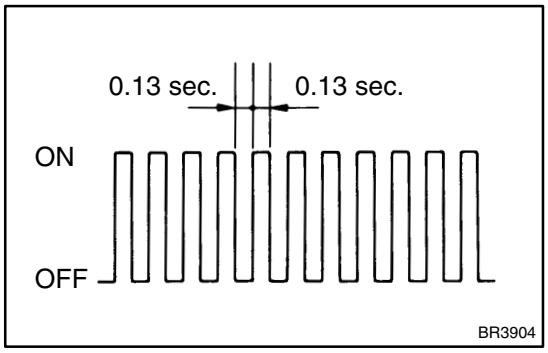


(e) In case of using hand–held tester:
Clear the DTC.
(1) Hook up the hand–held tester to the DLC3.
(2) Turn the ignition switch ON.
(3) Operate the hand–held tester to erase the codes. (See hand–held tester operator's manual.)



2. SPEED SENSOR SIGNAL CHECK (TEST MODE)

(a) In case of not using hand–held tester:
Check the sensor signal.
(1) Turn the ignition switch OFF.
(2) Using SST, connect terminals Ts and CG of DLC3.
SST 09843–18040
(3) Start the engine.



(4) Check that the ABS warning light blinks.

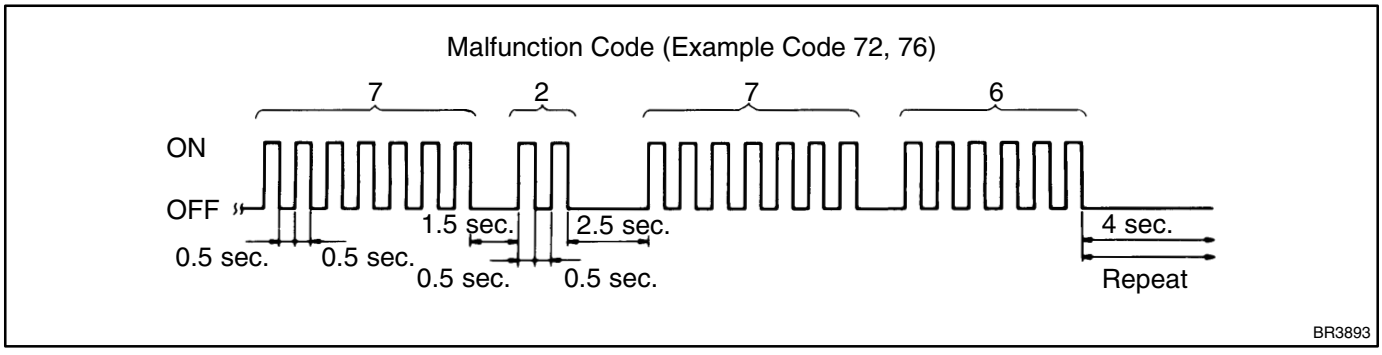
HINT:
If the ABS warning light does not blink, inspect the ABS warning light circuit (See page DI–231).

(5) Drive vehicle straight forward.
Drive vehicle at a speed faster than 45 km/h (28 mph) for several seconds.

HINT:
The sensor check may not be completed if the front wheels are spun or the steering wheel is steered during this check.

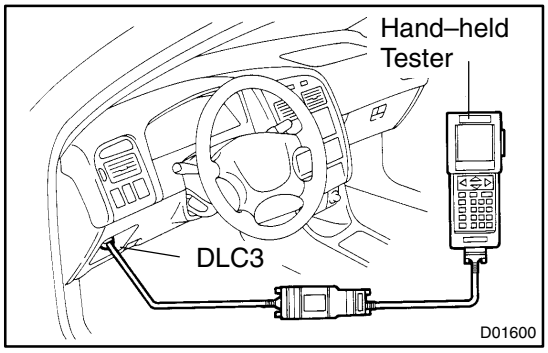
(6) Stop the vehicle.
(7) Using SST, connect terminals Tc and CG of DLC3.
SST 09843–18040
(8) Read the number of blinks of the ABS warning light.

HINT:
- See the list of DTC shown on the next page.
- 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 malfunction codes are identified at the same time, the lowest numbered code will be displayed 1st.



(9) After doing the check, disconnect the SST from terminals Ts and CG, Tc and CG of DLC3, and turn the ignition switch OFF.

SST 09843–18040



(b) In case of using hand–held tester:
Check the sensor signal.
(1) Hook up the hand–held tester to the DLC3.
(2) Do step (3) – (6) on the previous page and this page.
(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.

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 • Right front speed sensor rotor
C1272 / 72	Low output voltage of left front speed sensor	• Left front speed sensor • Sensor installation • Left front speed sensor rotor
C1273 / 73	Low output voltage of right rear speed sensor	• Right rear speed sensor • Sensor installation • Right rear speed sensor rotor
C1274 / 74	Low output voltage of left rear speed sensor	• Left rear speed sensor • Sensor installation • Left rear speed sensor rotor
C1275 / 75	Abnormal change in output signal of right front speed sensor	Right front speed sensor rotor
C1276 / 76	Abnormal change in output signal of left front speed sensor	Left front speed sensor rotor
C1277 / 77	Abnormal change in output signal of right rear speed sensor	Right rear speed sensor rotor
C1278 / 78	Abnormal change in output signal of left rear speed sensor	Left rear speed sensor rotor

3. STEERING ANGLE SENSOR ZERO POINT CALIBRATION

NOTICE:

When replacing the steering angle sensor with column assembly or ABS & BA & TRC & VSC 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 VSC OFF switch and hold it.

HINT:

(e) Depress the brake pedal 3 times or more within 2 seconds.

(f) Check that the VSC buzzer sounds for 3 seconds.

HINT:

- Press and hold the VSC OFF switch until VSC buzzer sounds.
  When it starts sounding, turn off the switch.
- When the VSC buzzer starts sounding, turn off the VSC OFF switch.
- If the VSC buzzer sounds, the sensor calibration is in normal completion.
- If the VSC buzzer does not sound, do the sensor calibration again.
- If the VSC buzzer still will not sound, there is malfunction in the steering angle sensor, so check the DTC.

DI7ZE–01

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, connect the terminals Tc and CG of the DLC 3.
- If any abnormality is not found when inspecting parts, inspect the ECU.
- If a malfunction code is displayed during the DTC check, check the circuit listed for the code. For details of each code, refer to the page under the ”See page” for respective ”DTC No.” in the DTC chart.

DTC chart of ABS system:

DTC No. (See Page)	Detection Item	Trouble Area
C0278 / 11 (DI–190)	Open or short circuit in ABS solenoid relay circuit	• ABS solenoid relay • ABS solenoid relay circuit
C0273 / 13 (DI–189)	Open or short circuit in ABS motor relay circuit	• ABS motor relay • ABS motor relay circuit
C0226 / 21 (DI–188)	Open or short circuit in brake actuator	• Brake actuator • SFRR or SFRH circuit
C0236 / 22 (DI–188)	Open or short circuit in brake actuator	• Brake actuator • SFLR or SFLH circuit
C0246 / 23 (DI–188)	Open or short circuit in brake actuator	• Brake actuator • SRRR or SRRH circuit
C0256 / 24 (DI–188)	Open or short circuit in brake actuator	• Brake actuator • SRLR or SRLH circuit
C0200 / 31 (DI–182)	Right front wheel speed sensor signal malfunction	• Right front, left front, right rear and left rear speed sensor • Each speed sensor circuit • Speed sensor rotor
C0205 / 32 (DI–182)	Left front wheel speed sensor signal malfunction	
C0210 / 33 (DI–182)	Right rear wheel speed sensor signal malfunction	
C0215 / 34 (DI–182)	Left rear wheel speed sensor signal malfunction	
C1330 / 35 (DI–182)	Open circuit in right front speed sensor circuit	• Right front speed sensor • Right front speed sensor circuit
C1331 / 36 (DI–182)	Open circuit in left front speed sensor circuit	• Left front speed sensor • Left front speed sensor circuit
C1237 / 37 (DI–206)	Front tires are different from rear in size.	• Tire size • Speed sensor rotor
C1332 / 38 (DI–182)	Open circuit in right rear speed sensor circuit	• Right rear speed sensor • Right rear speed sensor circuit
C1333 / 39 (DI–182)	Open circuit in left rear speed sensor circuit	• Left rear speed sensor • Left rear speed sensor circuit
C1241 / 41 (DI–208)	Low battery positive voltage or abnormally high battery positive voltage	• Battery • Charging system • Power source circuit
C1249 / 58 (DI–215)	Open circuit in stop light switch circuit	• Stop light switch • Stop light switch circuit

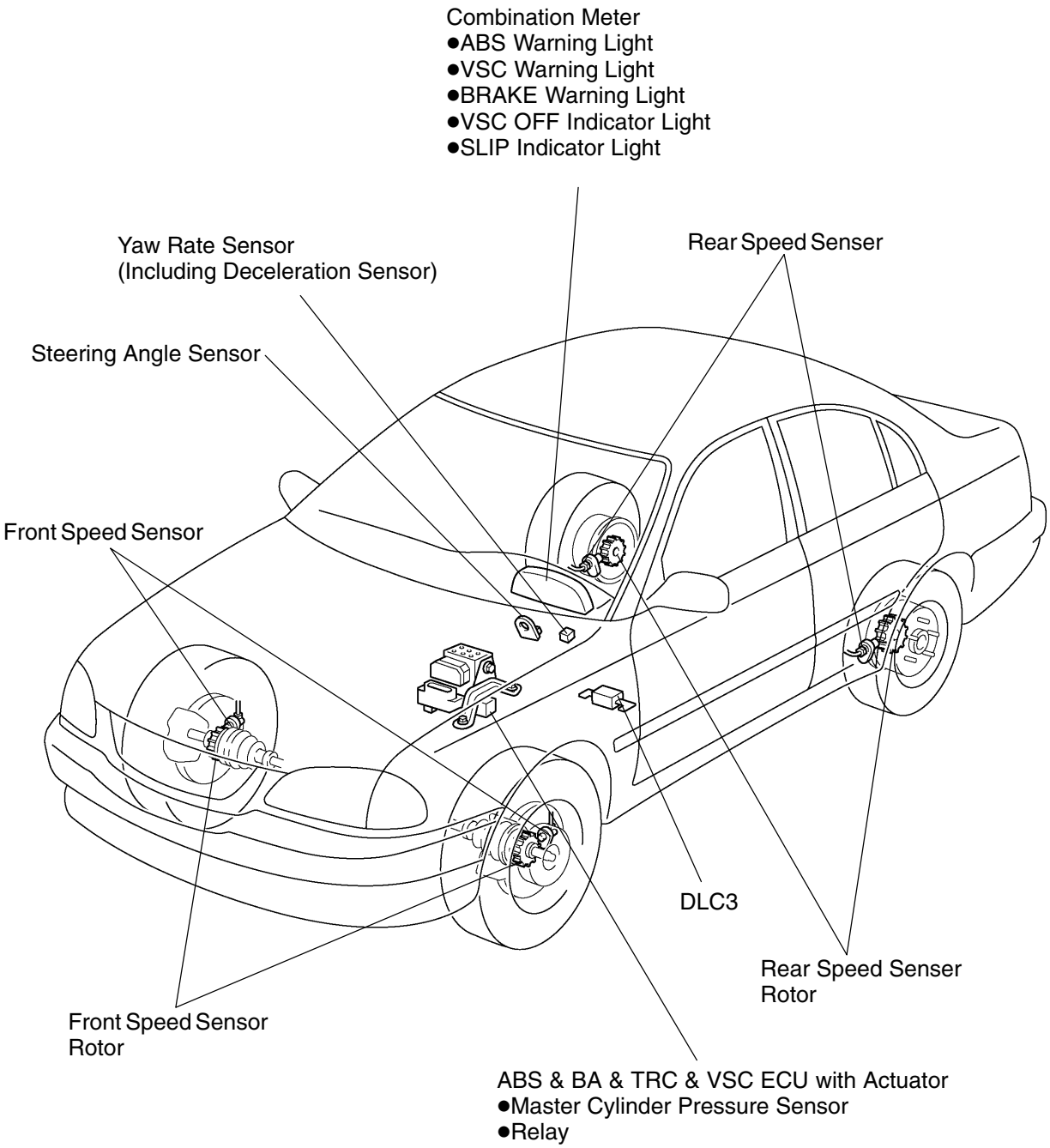
C1300 / 62 (DI–220)	Malfunction in ABS & BA & TRC & VSC ECU	ABS & BA & TRC & VSC ECU
Always ON (DI–225)	Malfunction in ABS & BA & TRC & VSC ECU Open circuit in ABS warning light circuit	• Charging system • ABS warning light circuit

DTC chart of VSC system:

DTC No. (See Page)	Detection Item	Trouble Area
C1225 / 25 (DI–188)	Open or short circuit in brake actuator solenoid circuit (SMC1 circuit)	• Brake actuator • SMC1 circuit
C1226 / 26 (DI–188)	Open or short circuit in brake actuator solenoid circuit (SMC2 circuit)	• Brake actuator • SMC2 circuit
C1227 / 27 (DI–188)	Open or short circuit in brake actuator solenoid circuit (SRC1 circuit)	• Brake actuator • SRC1 circuit
C1228 / 28 (DI–188)	Open or short circuit in brake actuator solenoid circuit (SRC2 circuit)	• Brake actuator • SRC2 circuit
C1301 / 42 (DI–222)	Malfunction in CAN communication (steering angle circuit, yaw rate sensor circuit)	• Steering angle sensor circuit • Yaw rate sensor circuit • ABS & BA & TRC & VSC ECU
C0365 / 43 (DI–191)	Malfunction in deceleration sensor (combined in yaw rate sensor)	• Deceleration sensor • Deceleration sensor circuit
C1202 / 44 (DI–197)	Open or short circuit in NE signal circuit	• NEO circuit • Engine and ECT ECU (A/T) or Engine ECU (M/T) • ABS & BA & TRC & VSC ECU
C1350 / 51 (DI–221)	Pump motor is locked Open circuit in pump motor ground	• Brake actuator pump motor • Brake actuator pump motor circuit
C1246 / 53 (DI–212)	Malfunction in master cylinder pressure sensor	• Master cylinder pressure sensor • Master cylinder pressure sensor circuit
C1208 / 54 (DI–202)	Malfunction in steering angle sensor	• Steering angle sensor • Steering angle sensor circuit
C0371 / 55 (DI–194)	Malfunction in yaw rate sensor circuit	• Yaw rate sensor • Yaw rate sensor circuit
Always ON (DI–228)	Malfunction in ABS & BA & TRC & VSC ECU Open circuit in VSC warning light circuit	• Charging system • VSC warning light circuit
C1203 / 59 (DI–200)	Malfunction in ENGINE and ECT ECU (A/T) or ENGINE ECU (M/T) and ABS & BA & TRC & VSC ECU circuit	• ENGINE and ECT ECU (A/T) or ENGINE ECU (M/T) • ABS & BA & TRC & VSC ECU • Serial communication circuit
C1288 / 88 (DI–219)	Malfunction in ENGINE and ECT ECU (A/T) or ENGINE ECU (M/T) version	• ABS & BA & TRC & VSC ECU • Steering angle sensor zero point calibration

DI7ZF–01

PARTS LOCATION



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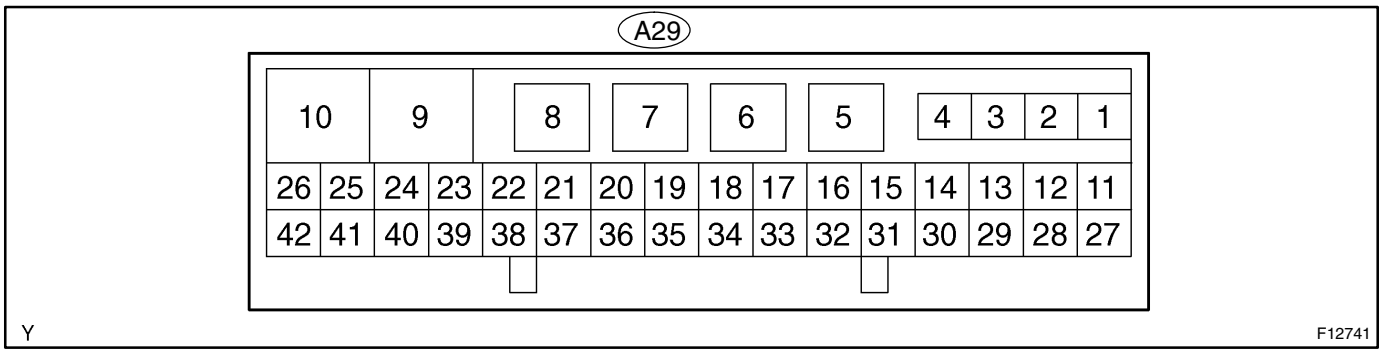
DI7ZG–01

TERMINALS OF ECU

ABS & BA & TRC & VSC ECU:



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
WT (A29 – 2) – GND (A29 – 6, 10)	O ↔ W–B	IG switch ON, VSC OFF indicator light ON	Below 2.0
		IG switch ON, VSC OFF indicator light OFF	10 – 14
IND (A29 – 4) – GND (A29 – 6, 10)	L ↔ W–B	IG switch ON, SLIP indicator light ON	Below 2.0
		IG switch ON, SLIP indicator light OFF	10 – 14
+BS (A29 – 5) – GND (A29 – 6, 10)	B ↔ W–B		10 – 14
ENG+ (A29 – 8) – ENG– (A29 – 7)	R ↔ L	Engine idling	Pulse generation
+BM (A29 – 9) – GND (A29 – 6, 10)	B ↔ W–B		10 – 14
PMC (A29 – 11) – GND (A29 – 6, 10)	LG ↔ W–B	IG switch ON, brake pedal released	0.3 – 0.8
E2 (A29 – 12) – GND (A29 – 6, 10)	BR ↔ W–B	IG switch OFF	continuity
SS1 (A29 – 13) – GND (A29 – 6, 10)	W ↔ W–B	IG switch ON	Pulse generation
IG1 (A29 – 14) – GND (A29 – 6, 10)	B–R ↔ W–B	IG switch ON	10–14
BZ (A29 – 15) – GND (A29 – 6, 10)	G ↔ W–B	IG switch ON, VSC buzzer sounds	Below1.0 ↔ 10–14
		IG switch ON, VSC buzzer does not sound	10–14
YGND (A29 – 16) – YIGA (A29 – 30)	BR–W ↔ LG–R	Engine idling, slowly turn steering wheel	Pulse generation
TC (A29 – 17) – GND (A29 – 6, 10)	LG–R ↔ W–B	IG switch ON	10 – 14
TRC+ (A29 – 18) – TRC– (A29 – 19)	Y ↔ B	Engine idling	Pulse generation
EBDW (A29 – 20) – GND (A29 – 6, 10)	R–W ↔ W–B	IG switch ON, BRAKE warning light ON	Below 1.5
		IG switch ON, BRAKE warning light OFF	10 – 14
FR+ (A29 – 21) – FR– (A29 – 22)	W–R *1 ↔ B	IG switch ON, slowly turn right front wheel	AC generation
	W *2 ↔ B		
RL+ (A29 – 23) – RL– (A29 – 40)	Y ↔ BR	IG switch ON, slowly turn left rear wheel	AC generation
D/G (A29 – 26) – GND (A29 – 6, 10)	LG–R ↔ W–B	IG switch ON	10 – 14
VCM (A29 – 27) – GND (A29 – 6, 10)	L–Y ↔ W–B	IG switch ON	4.5 – 5.5
TS (A29 – 28) – GND (A29 – 6, 10)	R–B ↔ W–B	IG switch ON	10 – 14
SS2 (A29 – 29) – GND (A29 – 6, 10)	B ↔ W–B	IG switch ON	Pulse generation
PKB (A29 – 31) – GND (A29 – 6, 10)	R–W ↔ W–B	IG switch ON, parking brake switch ON	Below 2.0
		IG switch ON, parking brake switch OFF	10 – 14
NEO (A29 – 32) – GND (A29 – 6, 10)	P ↔ W–B	Engine idling	Pulse generation
VSCW (A29 – 34) – GND (A29 – 6, 10)	R ↔ W–B	IG switch ON, VSC warning light ON	Below 2.0
		IG switch ON, VSC warning light OFF	10 – 14

*1: LHD
*2: RHD

WA (A29 – 35) – GND (A29 – 6, 10)	P–L ↔ W–B	IG switch ON, ABS warning light ON	10 – 14
		IG switch ON, ABS warning light OFF	Below 2.0
SP1 (A29 – 36)*3 – GND (A29 – 6, 10)	L ↔ W–B	Vehicle driving at about 20 km/h (12 mph)	Pulse generation
STP (A29 – 37) – GND (A29 – 6, 10)	G–W ↔ W–B	Stop light switch ON (Brake pedal pushed)	8 – 14
		Stop light switch OFF (Brake pedal released)	Below 1.5
RR+ (A29 – 38) – RR– (A29 – 39)	P ↔ L–R*1	IG switch ON, slowly turn right rear wheel	AC generation
	P ↔ L*2		
FL+ (A29 – 41) – FL– (A29 – 24)	R ↔ L–W	IG switch ON, slowly turn left front wheel	AC generation
CSW (A29 – 42) – GND (A29 – 6, 10)	G–W*1 ↔ W–B	IG switch ON, VSC OFF switch pushed in	Below 1.5
	G–R*2 ↔ W–B	IG switch ON, VSC OFF switch released	8–14

*1: LHD
*2: RHD
*3: A/T vehicle only

DI7ZH–01

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 ABS & BA & TRC & VSC ECU, sensor, etc., turn the IG switch OFF.

Symptom	Suspect Area	See page
ABS does not operate	Only when 1. – 4. are all normal and the problem is still occurring, replace the ABS & BA & TRC & VSC 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.	 DI–171 DI–208 DI–182 DI–182
ABS does not operate efficiently	Only when 1. – 4. are all normal and the problem is still occurring, replace the ABS & BA & TRC & VSC 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.	 DI–171 DI–182 DI–215 DI–215
ABS warning light abnormal	1. ABS warning light circuit 2. ABS & BA & TRC & VSC ECU	DI–231
DTC check cannot be done	Only when 1. – 3. are all normal and the problem is still occurring, replace the ABS & BA & TRC & VSC ECU. 1. ABS warning light circuit 2. VSC warning light circuit 3. Tc terminal circuit	 DI–231 DI–233 DI–250
Speed sensor signal check cannot be done	1. Ts terminal circuit 2. ABS & BA & TRC & VSC ECU	DI–252
VSC does not operate	Only when circuits inspected for each problem symptom are all normal and the problem is still occurring, replace the ABS & BA & TRC & VSC ECU. 1. Check the DTC, reconfirming that the normal code is output. 2. IG power source circuit 3. Hydraulic circuit for leakage 4. Speed sensor circuit	 DI–171 DI–208 DI–254 DI–182
BA does not operate	Stop light switch circuit	DI–215
SLIP indicator light abnormal	SLIP indicator light circuit	DI–240
BRAKE warning light abnormal	1. BRAKE warning light circuit 2. ABS & BA & TRC & VSC ECU	DI–236
VSC OFF indicator light abnormal	Only when circuits inspected for each problem symptom are all normal and the problem is still occurring, replace the ABS & BA & TRC & VSC ECU. 1. VSC OFF indicator light circuit 2. VSC OFF switch circuit	 DI–243 DI–243

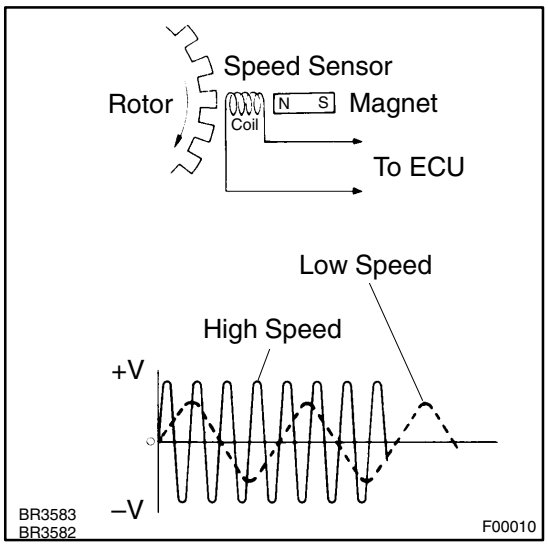
DI7ZI–01

CIRCUIT INSPECTION

DTC	C0200 / 31 – C1331 / 36	Speed Sensor Circuit

DTC	C1332 / 38, C1333 / 39	Speed Sensor Circuit

CIRCUIT DESCRIPTION



The speed sensor detects a wheel speed and sends the appropriate signals to the ECU. These signals are used to control of the ABS and VSC system. Each of the front and rear rotors has 48 serrations.

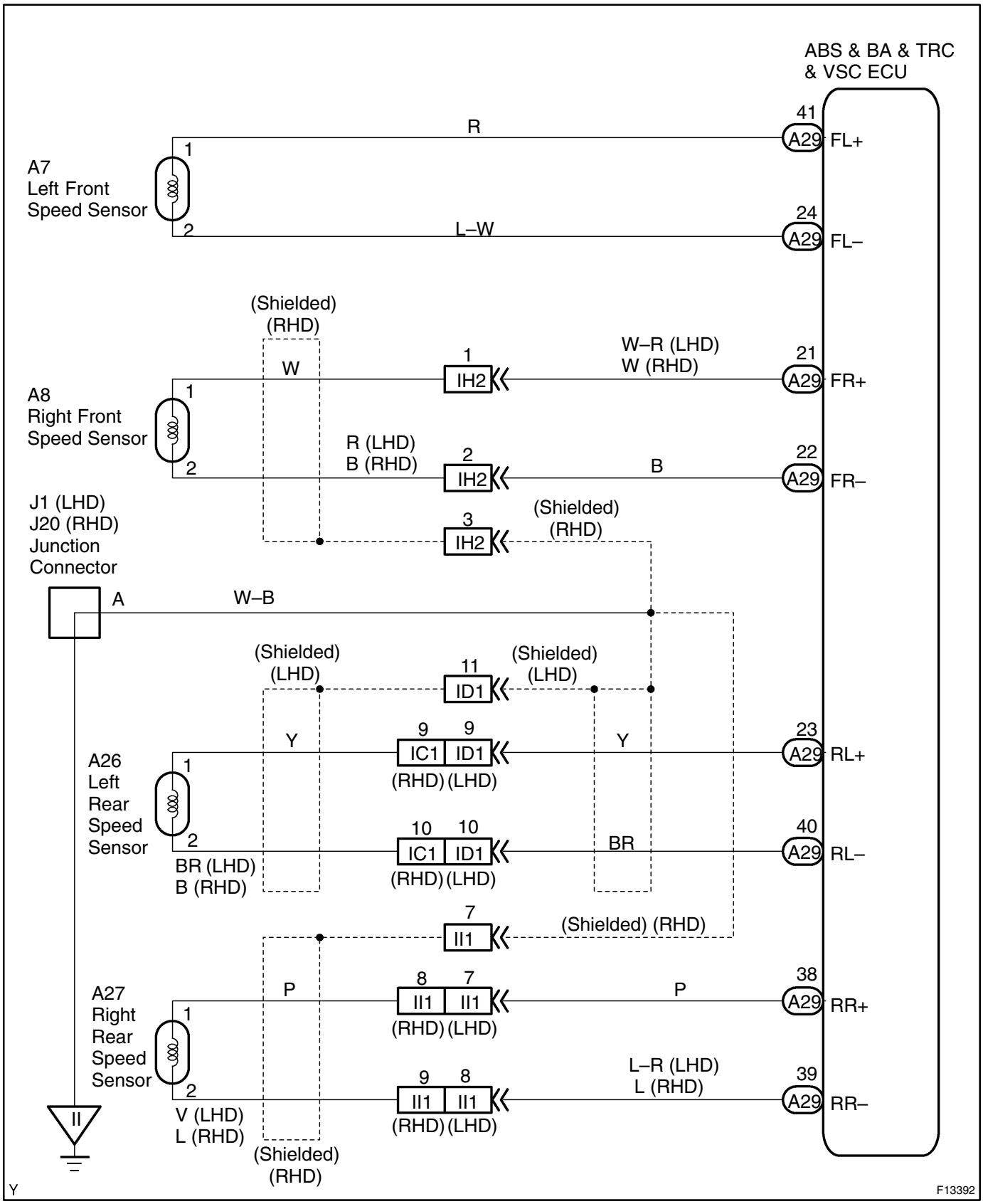
When the rotors rotate, a magnetic field emitted by a permanent magnet in the speed sensor generates an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200 / 31 C0205 / 32 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.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • Sensor installation • Tire size
C1330 / 35 C1331 / 36 C1332 / 38 C1333 / 39	Detecting abnormality in the resistance value of each speed sensor.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit

HINT:

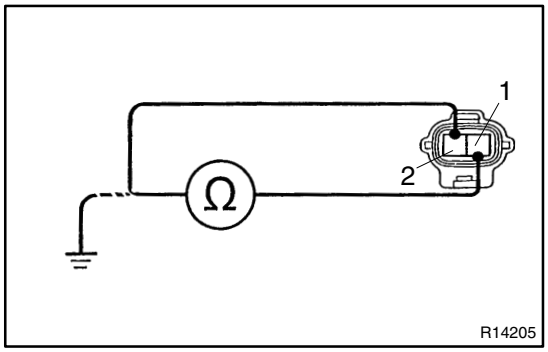
- DTC No. C0200 / 31 and C1330 / 35 are for the right front speed sensor.
- DTC No. C0205 / 32 and C1331 / 36 are for the left front speed sensor.
- DTC No. C0210 / 33 and C1332 / 38 are for the right rear speed sensor.
- DTC No. C0215 / 34 and C1333 / 39 are for the left rear speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check speed sensor.**



Front:

PREPARATION:

(a) Remove the front fender liner.

(b) Disconnect the speed sensor connector.

CHECK:

Measure the resistance between terminals 1 and 2 of speed sensor connector.

OK:

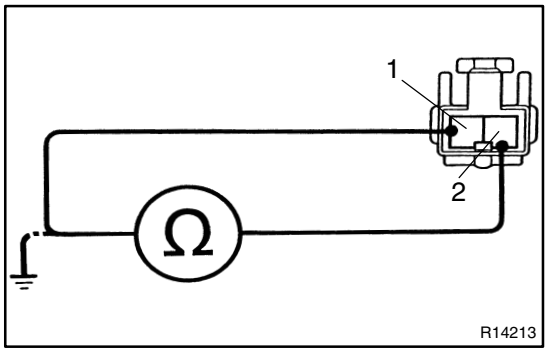
Resistance: 0.6 – 2.5 kΩ (1.6 ± 0.2 kΩ at 20 °C)

CHECK:

Measure the resistance between terminals 1 and 2 of speed sensor connector and body ground.

OK:

Resistance: 1 MΩ or higher



Rear:

PREPARATION:

(a) Remove the seat cushion and seatback.

(b) Disconnect the speed sensor connector.

CHECK:

Measure the resistance between terminals 1 and 2 of speed sensor connector.

OK:

Resistance: 1.2 – 2.3 kΩ (1.6 ± 0.1 kΩ at 20 °C)

CHECK:

Measure the resistance between terminals 1 and 2 of speed sensor connector and body ground.

OK:

Resistance: 1 MΩ or higher

NG	**Replace speed sensor.**

NOTICE:

Check the speed sensor signal last (See page DI–171).

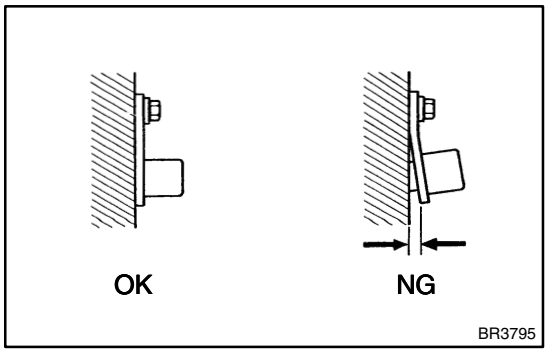
OK

2	**Check for open and short circuit in harness and connector between each speed sensor and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

3	**Check speed sensor installation.**



CHECK:
Check the speed sensor installation.
OK:

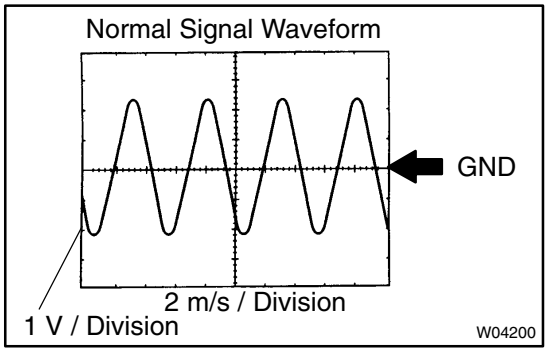
The installation bolt shall be tightened properly and no clearance is allowed between the sensor and front steering knuckle or rear axle carrier.

NG → **Replace speed sensor.**

NOTICE:
Check the speed sensor signal last (See page DI–171).

OK

4	Check speed sensor and sensor rotor serrations.



REFERENCE: INSPECTION USING OSCILLOSCOPE

PREPARATION:

(a) Disconnect the connector from the ABS & BA & TRC & VSC ECU.

(b) Connect the oscilloscope to the terminals FR+, FL+, RR+ or RL+ and GND of the ECU harness side connector.

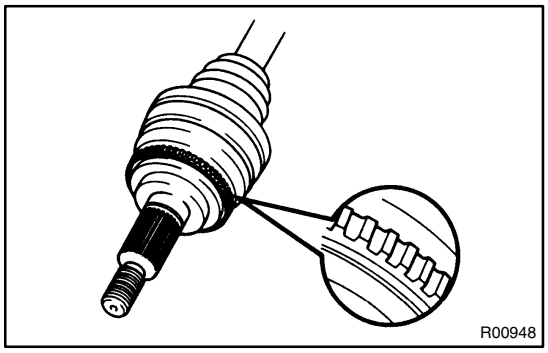
CHECK:

Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

OK	Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

NG

5	Check sensor rotor and sensor tip.



Front:

PREPARATION:

Remove the front drive shaft (See page SA–3).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches, missing teeth or foreign objects.

PREPARATION:

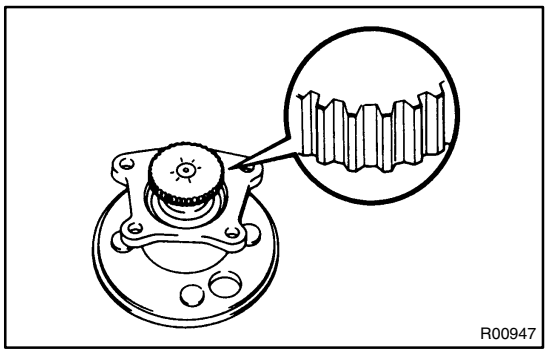
Remove the front speed sensor (See Pub. No. RM599E on page BR–41).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.



Rear:

PREPARATION:

Remove the axle hub (See Pub. No. RM599E on page SA–10).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches, missing teeth or foreign objects.

PREPARATION:

Remove the rear speed sensor (See Pub. No. RM599E on page BR–44).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.

NG → **Replace sensor rotor or speed sensor.**

NOTICE:

Check the speed sensor signal last (See page DI–171).

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZJ–01

DTC	C0226 / 21 – C1228 / 28	Brake Actuator 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	1. Solenoid signal does not match the check result. 2. Solenoid open & short.	• Brake actuator • SFRR or SFRH circuit
C0236 / 22	Solenoid signal does not match the check result.	• Brake actuator • SFLR or SFLH circuit
C0246 / 23		• Brake actuator • SRRR or SRRH circuit
C0256 / 24		• Brake actuator • SRLR or SRLH circuit
C1225 / 25		• Brake actuator • SMC 1 circuit
C1226 / 26		• Brake actuator • SMC 2 circuit
C1227 / 27		• Brake actuator • SRC 1 circuit
C1228 / 28		• Brake actuator • SRC 2 circuit

INSPECTION PROCEDURE

1	Check the DTC once more.

PREPARATION:

(a) Clear the DTC (See page DI–171).

(b) Turn the ignition switch OFF.

CHECK:

Turn the ignition switch ON, and check if the same DTC is stored in the memory.

NO → **No problem.**

YES

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZK–01

DTC	C0273 / 13	ABS Motor Relay Circuit

CIRCUIT DESCRIPTION

The ABS motor relay supplies power to the ABS pump motor. When the ABS is activated, the ECU switches the ABS motor relay ON and operates the ABS pump motor.

DTC No.	DTC Detecting Condition	Trouble Area
C0273/13	When any of the following 1. through 2. is detected: 1. Pump motor voltage is high, and the motor relay will not actuate . 2. Pump motor voltage remains low for longer 0.4 sec. or more and the pump repeats activating for 0.7 sec. 3 times maximally. After the last activation, the pump motor is deactivated gone dead because of short circuit.	• ABS motor relay • ABS motor relay circuit

INSPECTION PROCEDURE

1	**Check the DTC once more.**

PREPARATION:

(a) Clear the DTC (See page DI–171).
(b) Turn the ignition switch OFF.
(c) Turn the ignition switch ON.

CHECK:

Vehicle speed is more than 6 km/h (4 mph), and check if the same DTC is stored in the memory.

NO → **No problem.**

YES

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZL–01

DTC	C0278 / 11	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	Detection of any conditions from 1. through 2.: 1. 3 or more solenoids are show faulty in response and simultaneously solenoid supply voltage is detected faulty. 2. Solenoid relay will not be switched OFF.	• ABS solenoid relay • ABS solenoid relay circuit

INSPECTION PROCEDURE

1	**Check the DTC once more.**

PREPARATION:

(a) Clear the DTC (See page DI–171).

(b) Turn the ignition switch OFF.

CHECK:

Turn the ignition switch ON, and check if the same DTC is stored in the memory.

NO → **No problem.**

YES

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZM–01

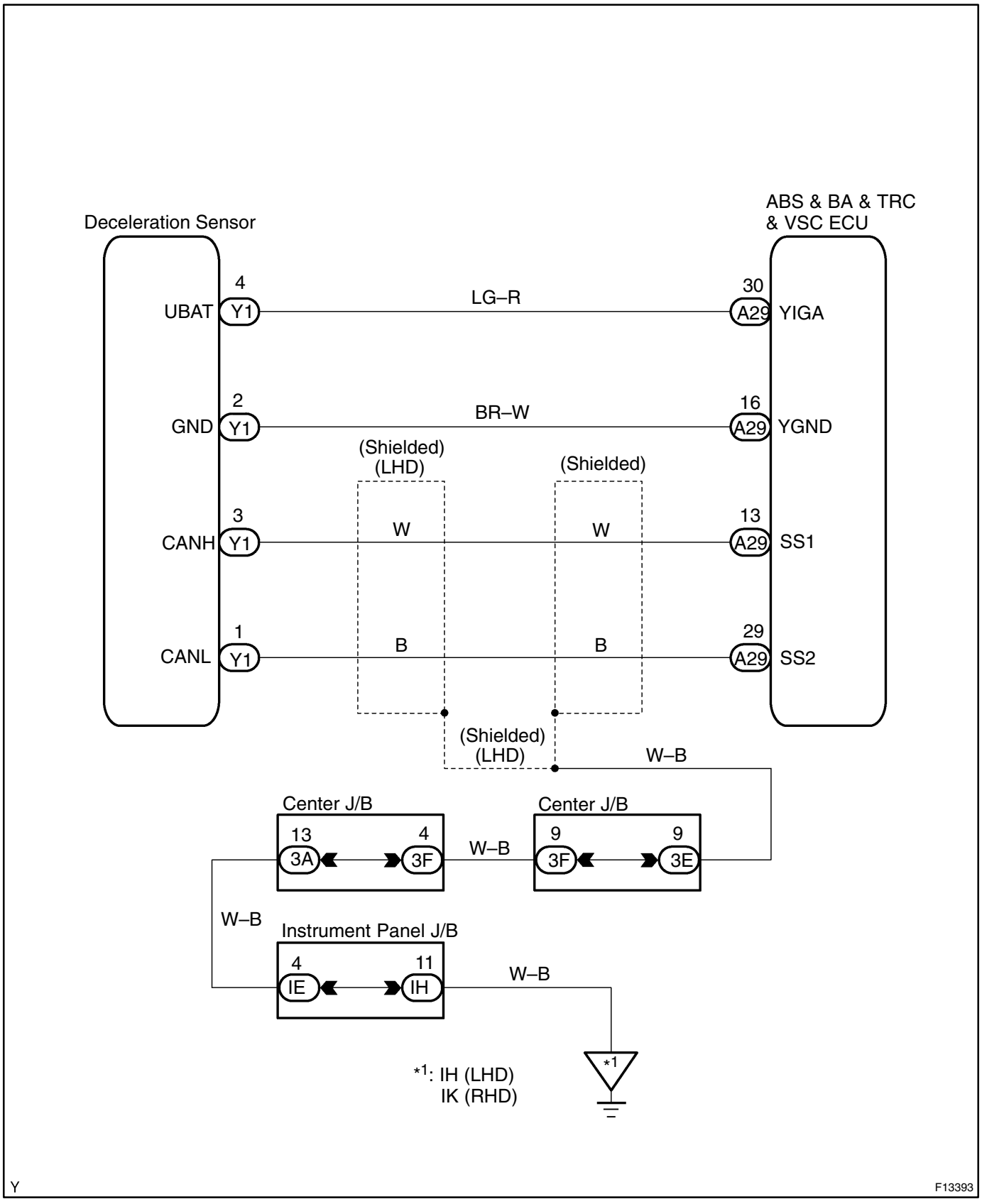
DTC	C0365 / 43	Deceleration Sensor Circuit

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.	• Deceleration sensor • Deceleration sensor circuit • ABS & BA & TRC & VSC ECU

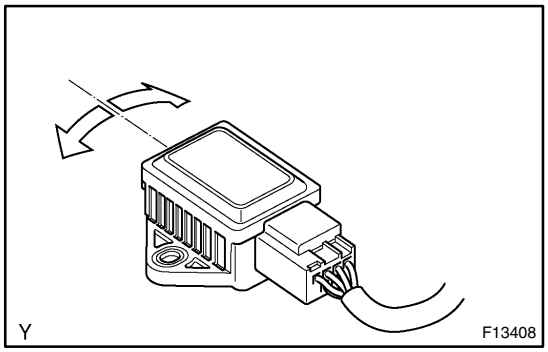
WIRING DIAGRAM



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	**Check output value of the deceleration sensor.**



PREPARATION:

(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.

CHECK:

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 ABS & BA & TRC & VSC ECU with actuator assembly.**

2	**Check for open and short circuit in harness and connector between deceleration sensor and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG	**Repair or replace harness and connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

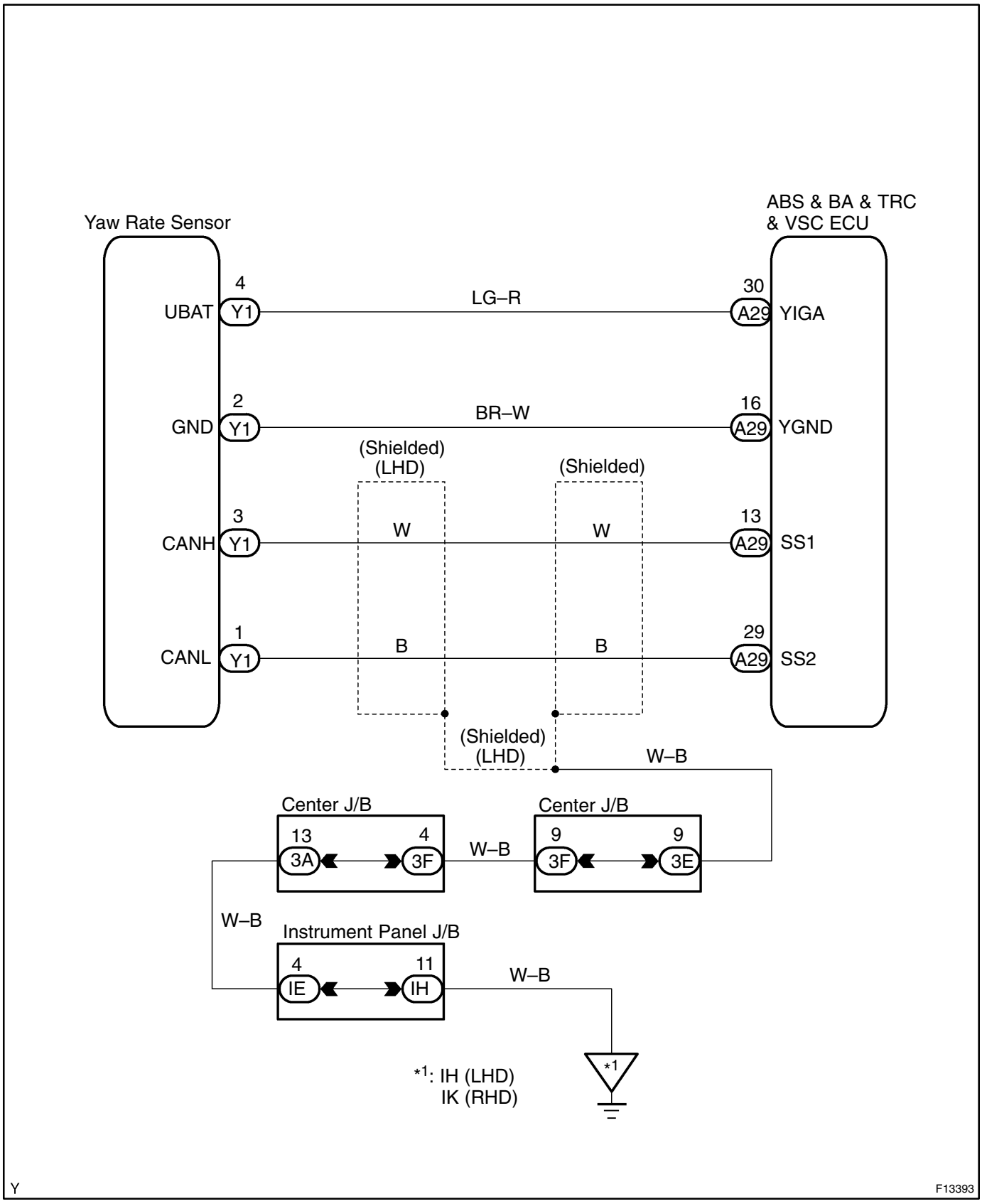
DI7ZN–01

DTC	C0371 / 55	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.	• Yaw rate sensor • Yaw rate sensor circuit • ABS & BA & TRC & VSC ECU

WIRING DIAGRAM

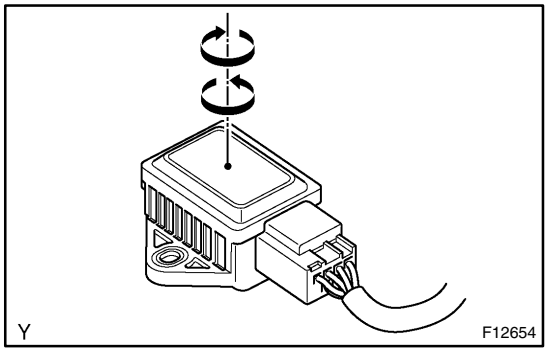


INSPECTION PROCEDURE

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	**Check output value of the yaw rate sensor.**



PREPARATION:

(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.

CHECK:

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 ABS & BA & TRC & VSC ECU with actuator assembly.**

2	**Check for open and short circuit in harness and connector between yaw rate sensor and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG	**Repair or replace harness or connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZO–01

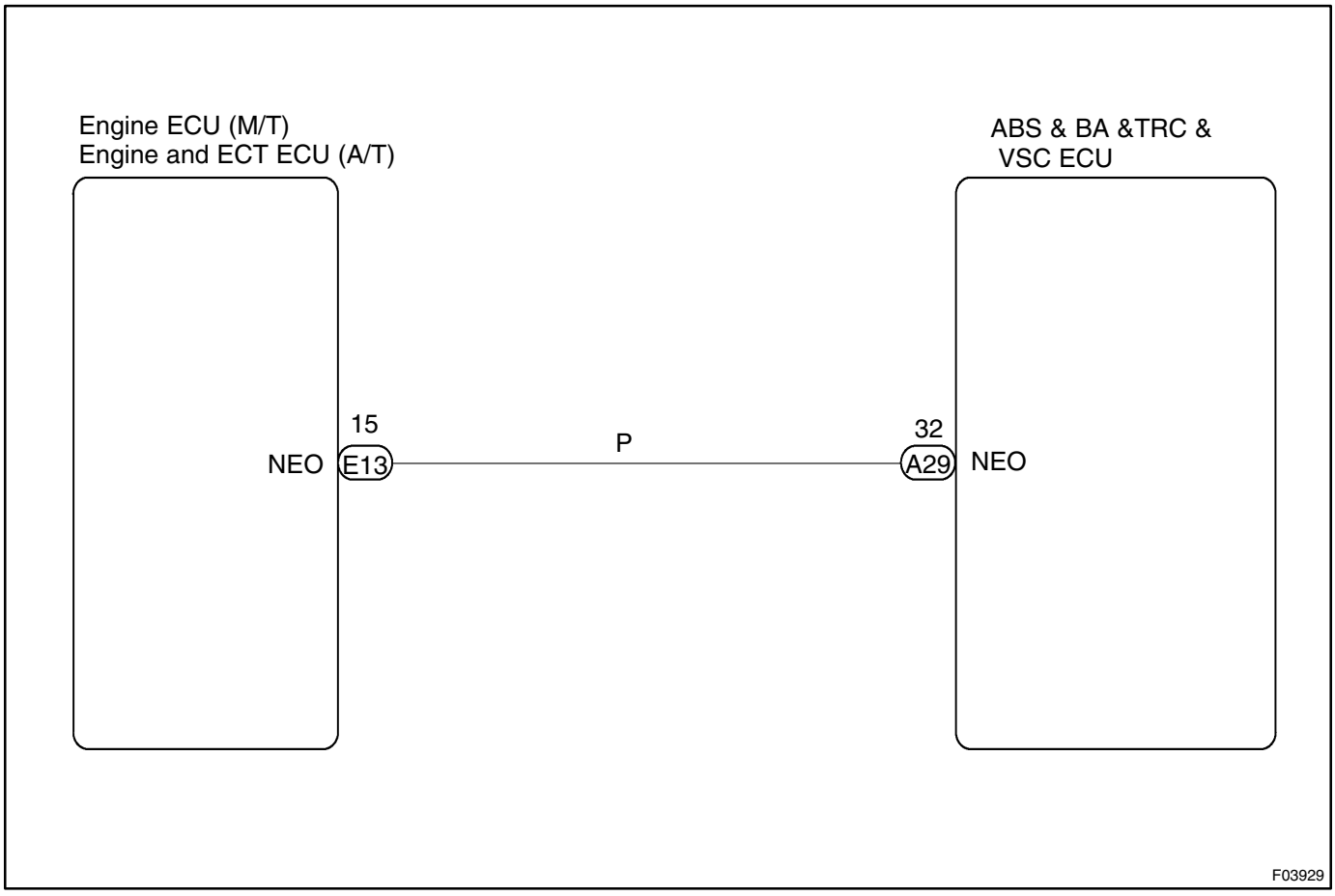
DTC	C1202 / 44	NE Signal Circuit

CIRCUIT DESCRIPTION

The ABS & BA & TRC & VSC ECU receives engine revolution speed signals (NE signals) from the Engine and ECT ECU (A/T) or Engine ECU (M/T).

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 Engine and ECT ECU (A/T) or Engine ECU (M/T) is in normal condition, and open or short circuit for engine revolution signal circuit continues for 5 secs. or more.	• NEO circuit • Engine and ECT ECU (A/T) or Engine ECU (M/T) • ABS & TRC & VSC ECU

WIRING DIAGRAM



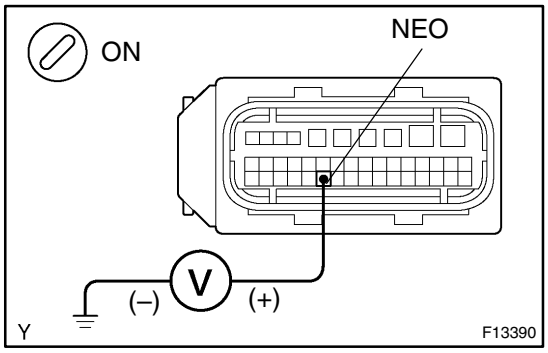
INSPECTION PROCEDURE

1	**Check for open and short circuit in harness and connector between terminal NEO of ABS & BA & TRC & VSC ECU and terminal NEO of Engine and ECT ECU (A/T) or Engine ECU (M/T) (See page IN–30).**

NG → **Repair or replace harness and connector.**

OK

2	**Check voltage between terminal NEO of ABS & BA & TRC & VSC ECU and body ground.**



PREPARATION:

(a) Remove ABS & BA & TRC & VSC ECU with connectors still connected.

(b) Turn ignition switch ON.

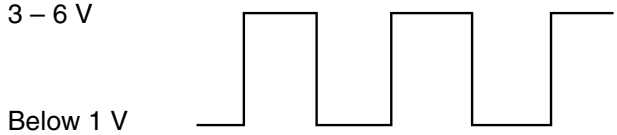
CHECK:

Measure voltage between terminal NEO of ABS & BA & TRC & VSC ECU 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 ABS & BA & TRC & VSC ECU with actuator assembly or Engine and ECT ECU (A/T) or Engine ECU (M/T).**

OK

If the same codes is still output after the DTC is deleted, check the contact condition of each connection.

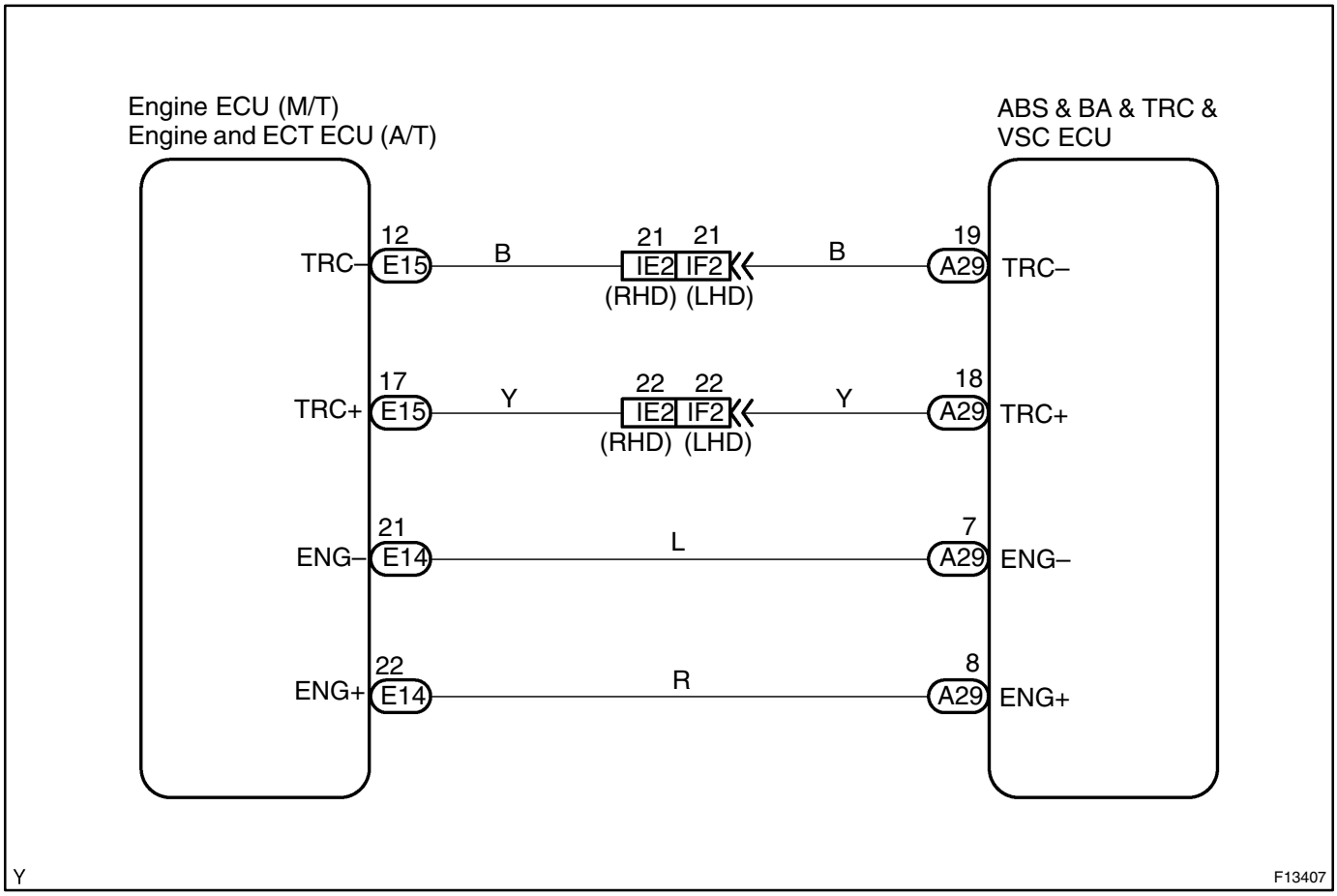
DTC	C1203 / 59	EFI Communication Circuit Malfunction

CIRCUIT DESCRIPTION

The circuit is used to send TRAC & VSC control information from the ABS & BA & TRC & VSC ECU to the Engine and ECT ECU (A/T) or Engine ECU (M/T) (TRC+, TRC–), and engine control information from the Engine and ECT ECU (A/T) or Engine ECU (M/T) to the ABS & BA & TRC & VSC ECU (ENG+, ENG–).

DTC No.	DTC Detecting Condition	Trouble Area
53	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 Engine ECU (M/T) or Engine and ECT ECU (A/T) 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 Engine ECU (M/T) or Engine and ECT ECU (A/T) continues for 5 sec. or more. 3. The condition that data can not be transmitted between the ABS & BA & TRC & VSC ECU and Engine ECU (M/T) or Engine and ECT ECU (A/T) occurs at least once within 5 sec. continues 10 consecutive times.	• TRC+ or TRC– circuit • ENG+ or ENG– circuit • Engine ECU (M/T) or Engine and ECT ECU (A/T) • ABS & BA & TRC & VSC ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check for open and short circuit in harness and connector between each of terminals ENG+, ENG–, TRC+ and TRC– of ABS & BA & TRC & VSC ECU and Engine ECU (M/T) or Engine and ECT ECU (A/T) (See page IN–30).

NG → Repair or replace harness or connector.

OK ↓

2	Check operation of the malfunction indicator.

NG → Check and replace Engine and ECT ECU (A/T) or Engine ECU (M/T).

OK ↓

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

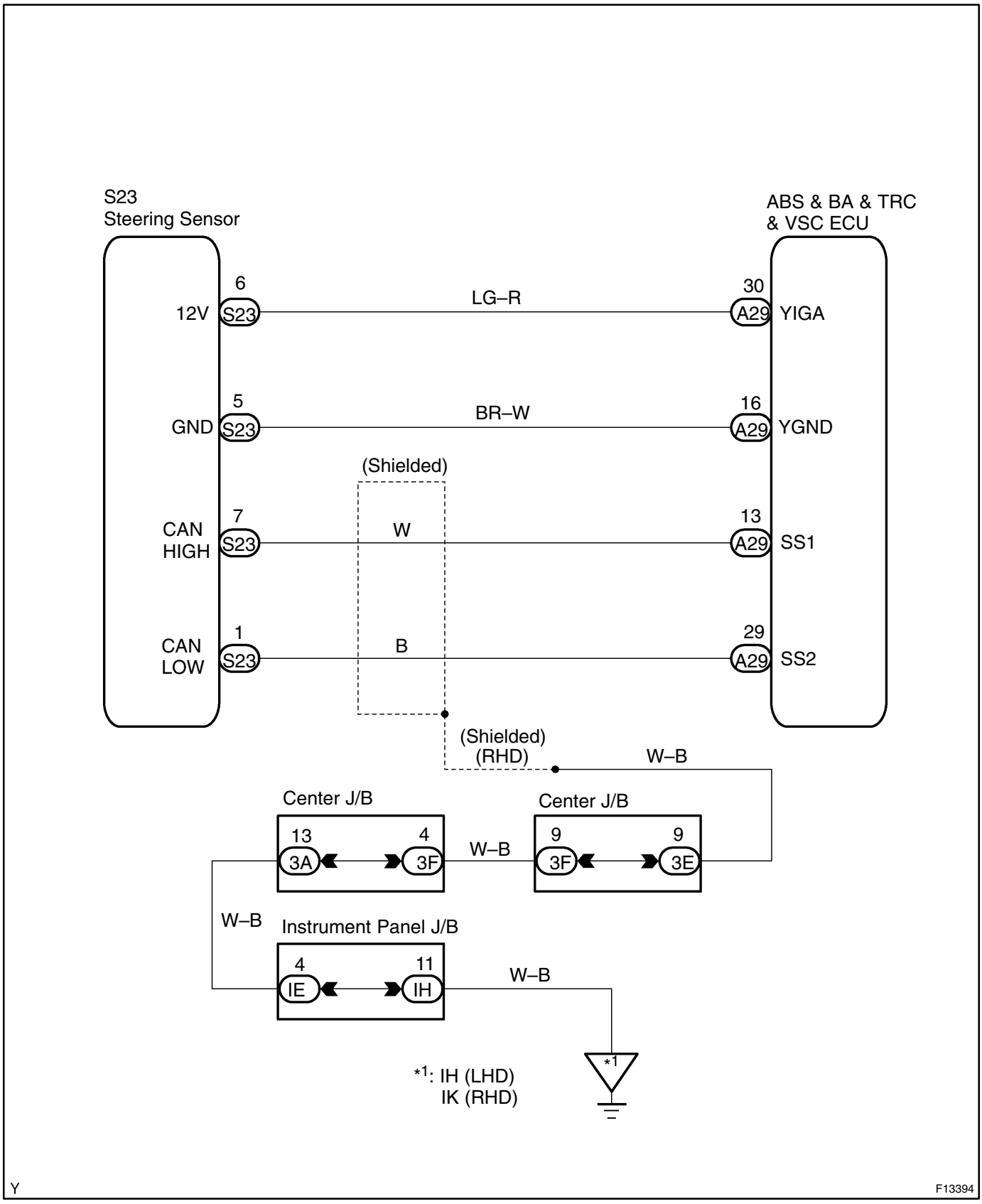
DI7ZQ–01

DTC	C1208 / 54	Steering Angle Sensor Circuit

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1208 / 54	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.	• Steering angle sensor • 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	**Check output value of the steering angle sensor.**

PREPARATION:

(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) Select the DATALIST mode on the hand–held tester.

CHECK:

Check that the steering wheel turning angle value of the steering angle sensor displayed on the hand–held tester is appropriate when turning the steering wheel.

OK:

Steering wheel turning angle value must be appropriate.

OK → **Go to step 4.**

NG

2	**Check the installation condition of steering angle sensor.**

NG → **Repair or replace steering angle sensor with column Assembly (See page SR–6).**

OK

3	**Check for open and short circuit in harness and connector between steering angle sensor and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

4	Calibrate the steering angle sensor (See page DI–171).

NG → Replace steering angle sensor with colum Assembly (See page SR–6).

OK

5	Replace the ECU and check whether or not the trouble occurs again.

YES → Replace steering angle sensor with colum Assembly (See page SR–6).

NO

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DTC	C1237 / 37	Wrong Number of Teeth at 1 of 4 Wheels

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.	• Tire size • Speed sensor rotor

INSPECTION PROCEDURE

1	**Check tire size.**

NG → **Replace tires so that all 4 tires are the same in size.**

OK

2	**Check sensor rotor (See page DI–182).**

NG → **Replace speed sensor rotor.**

OK

3	**Check speed sensor (See page DI–182).**

NG → **Replace speed sensor.**

OK

4	**Check for open and short circuit in harness and connector between front speed sensor, rear speed sensor and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG → **Repair or replace harness and connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator.

DI7ZS–01

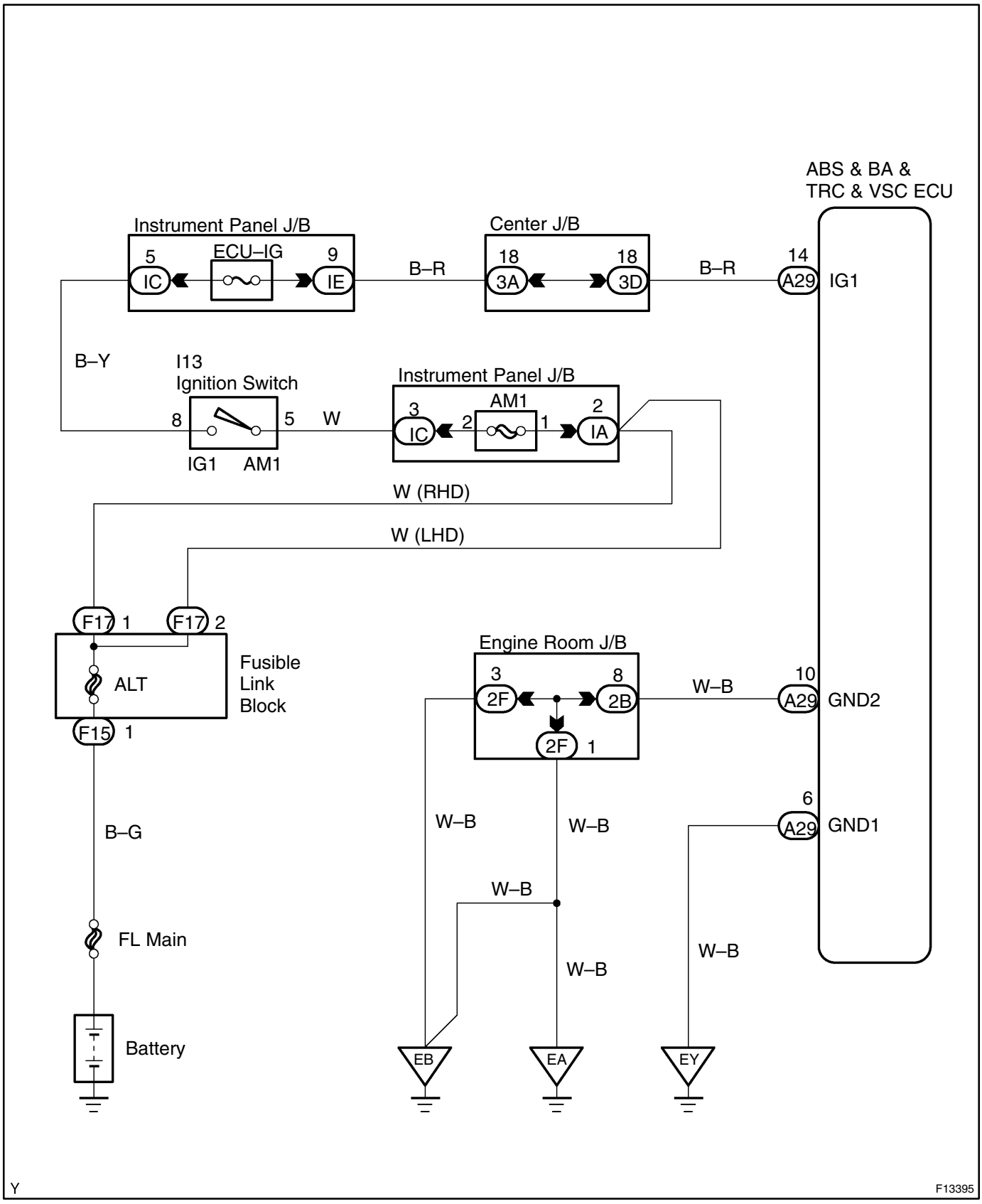
DTC	C1241 / 41	IG Power Source Circuit

CIRCUIT DESCRIPTION

This is the power source for the ECU, hence the brake actuators.

DTC No.	DTC Detecting Condition	Trouble Area
C1241 / 41	At a vehicle speed of 6 km/h (4 mph) or more, the condition that low battery voltage is 10 V or less and high battery voltage is more than 17.4 V.	• Battery • Charging system • Power source circuit

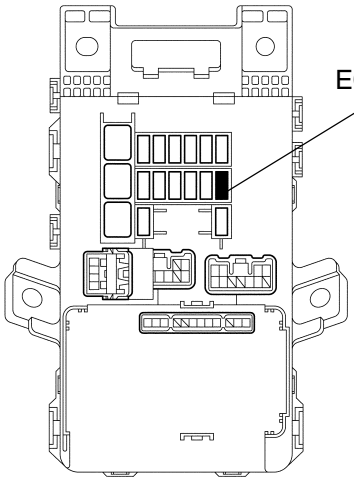
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check ECU–IG fuse.**

Instrument Panel J/B



PREPARATION:
Remove the ECU–IG fuse from the instrument panel J/B.
CHECK:
Check continuity of the ECU–IG fuse.
OK:
Continuity

NG → **Check for short circuit in all the harness and components connected to ECU–IG fuse (See attached wiring diagram).**

OK

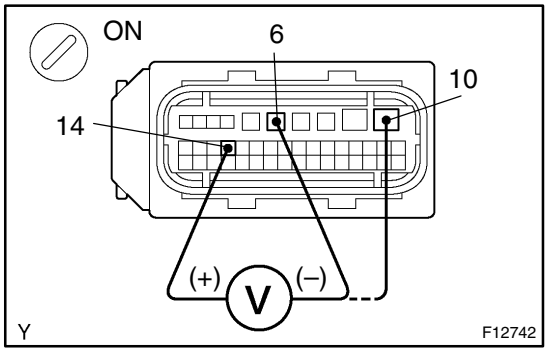
2	**Check battery voltage.**

OK:
Voltage: 10 – 14 V

NG → **Check and repair the charging system.**

OK

3	Check voltage between terminals IG1 (14) and GND (6, 10) of ABS & BA & TRC & VSC ECU.



PREPARATION:
Disconnect the connector from the ABS & BA & TRC & VSC ECU.

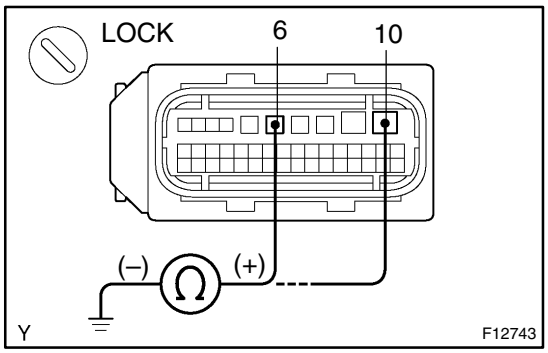
CHECK:
(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals 14 and 6, 10 of ABS & BA & TRC & VSC ECU harness side connector.

OK:
Voltage: 10 – 14 V

OK	Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

NG

4	Check continuity between terminals GND (6, 10) of ABS & BA & TRC & VSC ECU and body ground.



CHECK:
Measure the resistance between terminal 6, 10 of ABS & BA & TRC & VSC ECU harness side connector and body ground.

OK:
Resistance: 1 Ω or less

NG	Repair or replace harness or connector.

OK

Check for open circuit in harness and connector between ABS & BA & TRC & VSC ECU and ECU–IG fuse (See page IN–30).

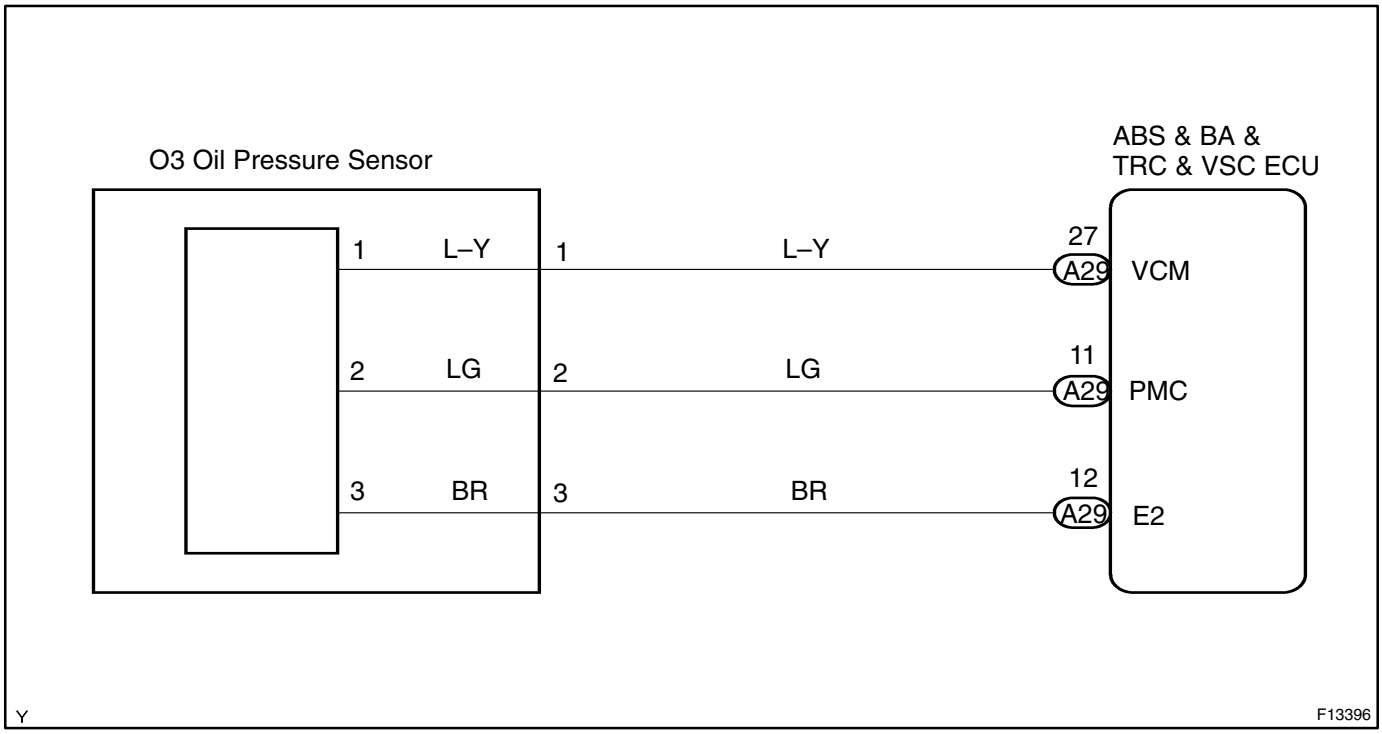
DI7ZT–01

DTC	C1246 / 53	Master Cylinder Pressure Sensor Circuit

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.	• Master cylinder pressure sensor • Master cylinder pressure sensor circuit • Stop light FUSE

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	**Check the stop light FUSE and stop light bulb.**

NG → **Check the stop light switch circuit (See Pub. No. RM599E on page BE–45)**

OK

2	**Check output value of the master cylinder pressure sensor.**

PREPARATION:

(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) Select the DATALIST mode on the hand–held tester.

CHECK:

Check that the brake fluid pressure value of the master cylinder pressure sensor displayed on the hand–held tester is changing when depressing the brake pedal.

OK:

Brake fluid pressure value must be changing.

OK → **Go to step 4.**

NG

3	**Check for open and short circuit in harness and connector between master cylinder pressure sensor and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

4	**Check whether or not the ECU terminal STP input voltage is changed when the stop light switch is turned on and off.**

NO → **Check the stop light switch circuit (See Pub. No. RM599E on page BE–45).**

YES

Check and replace ABS & BA & TRC & VSC ECU with actuator.

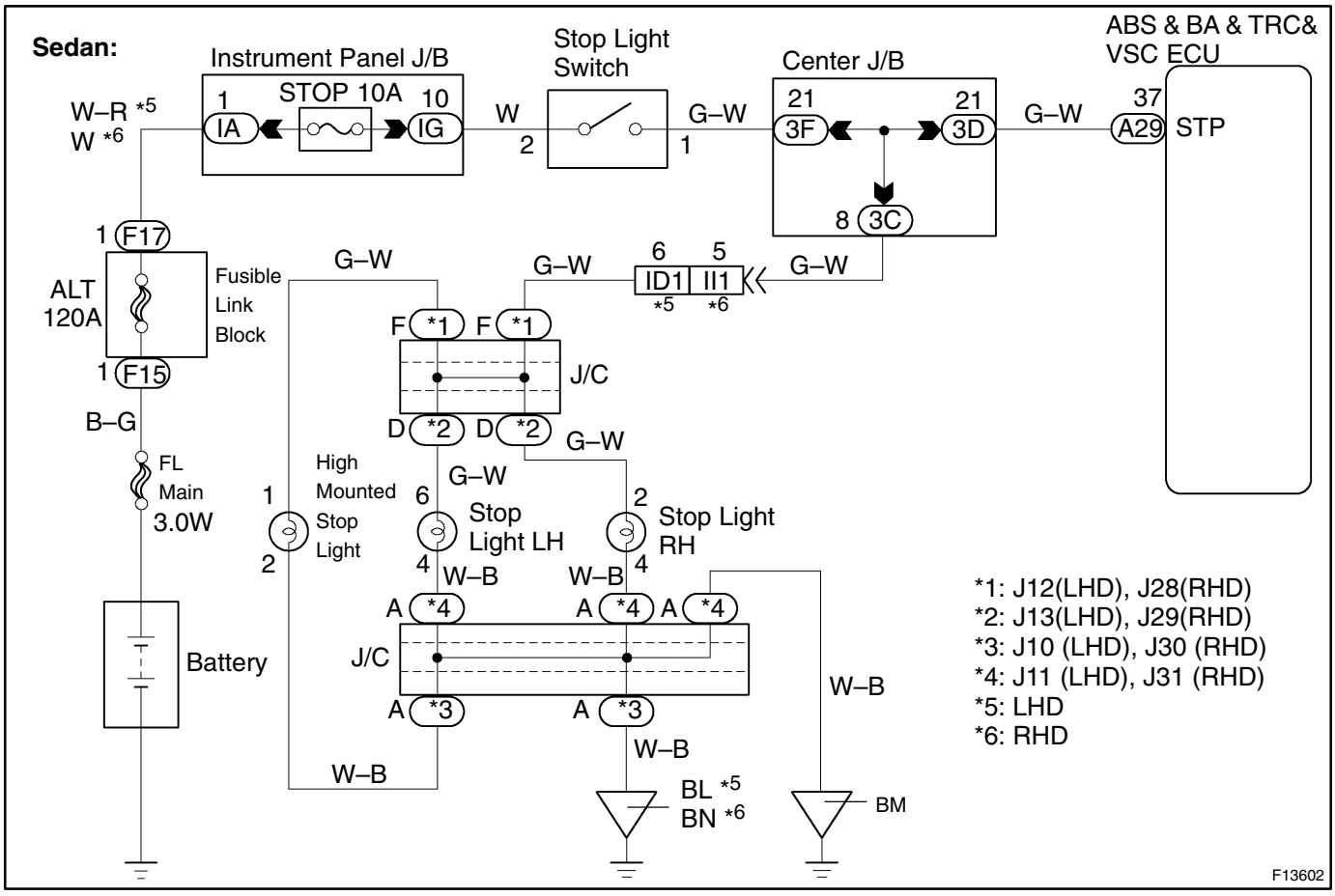
DI7ZU–01

DTC	C1249 / 58	Stop Light Switch Circuit

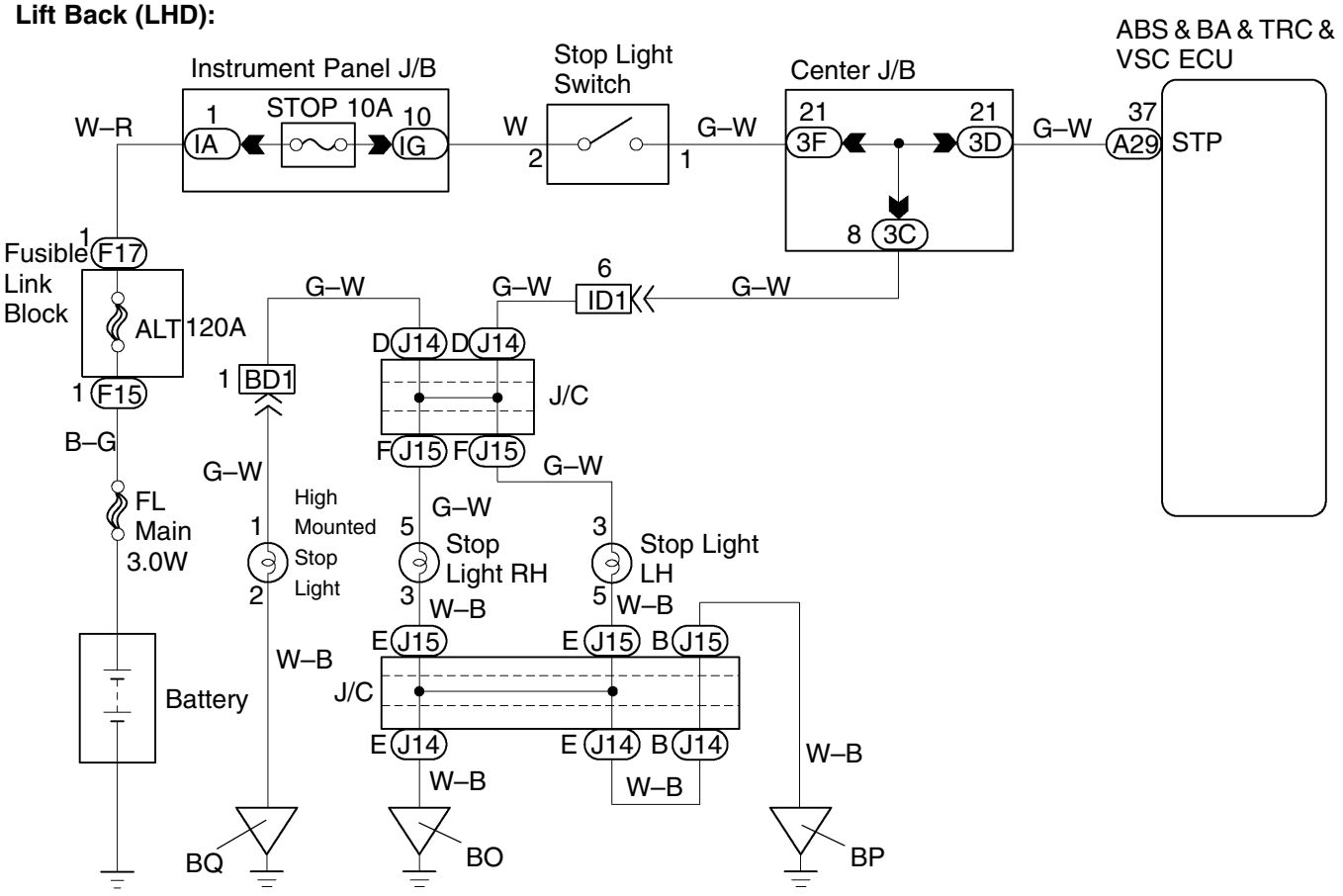
CIRCUIT DESCRIPTION

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 • Stop light switch circuit • Stop light blub

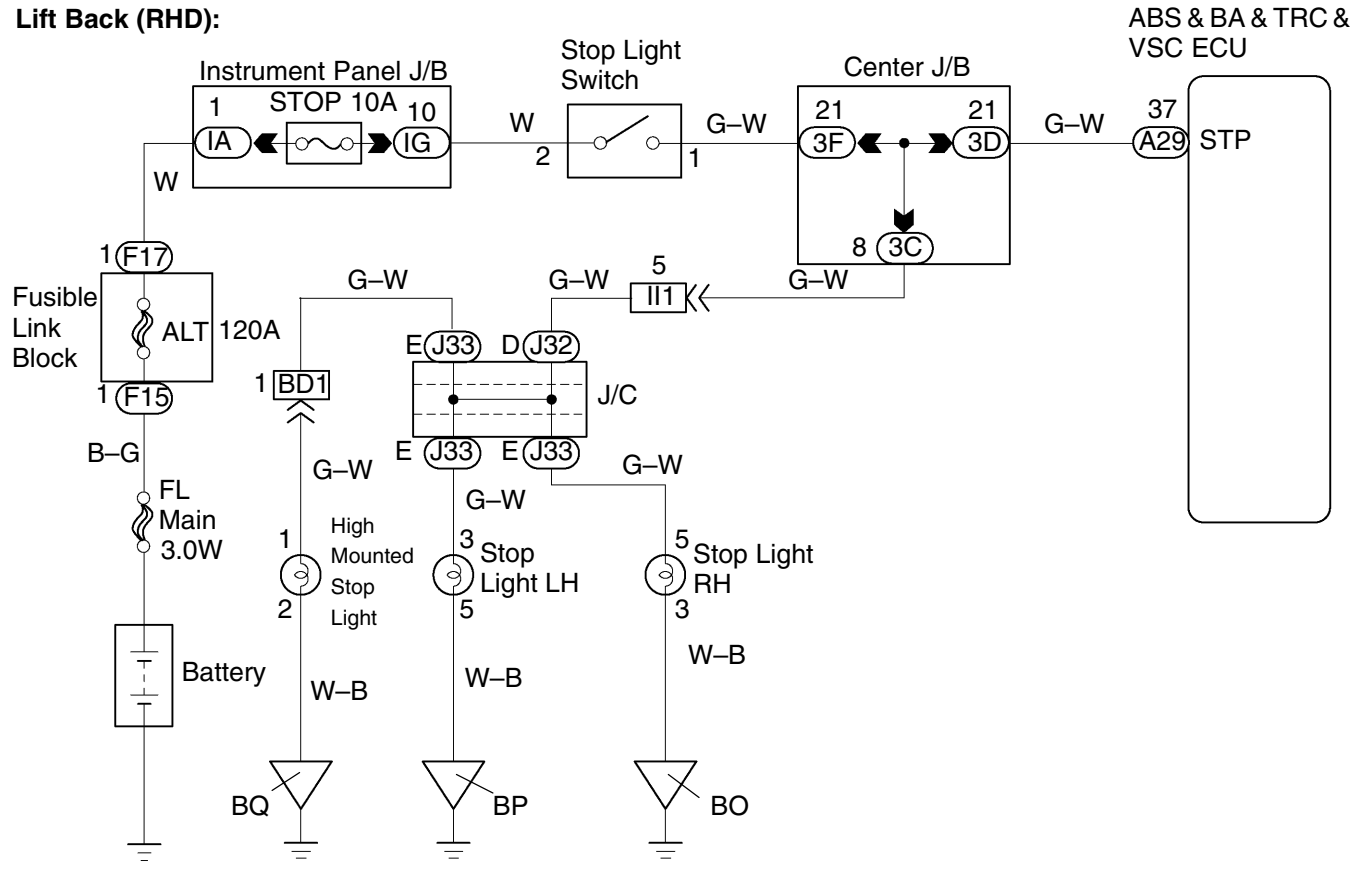
WIRING DIAGRAM

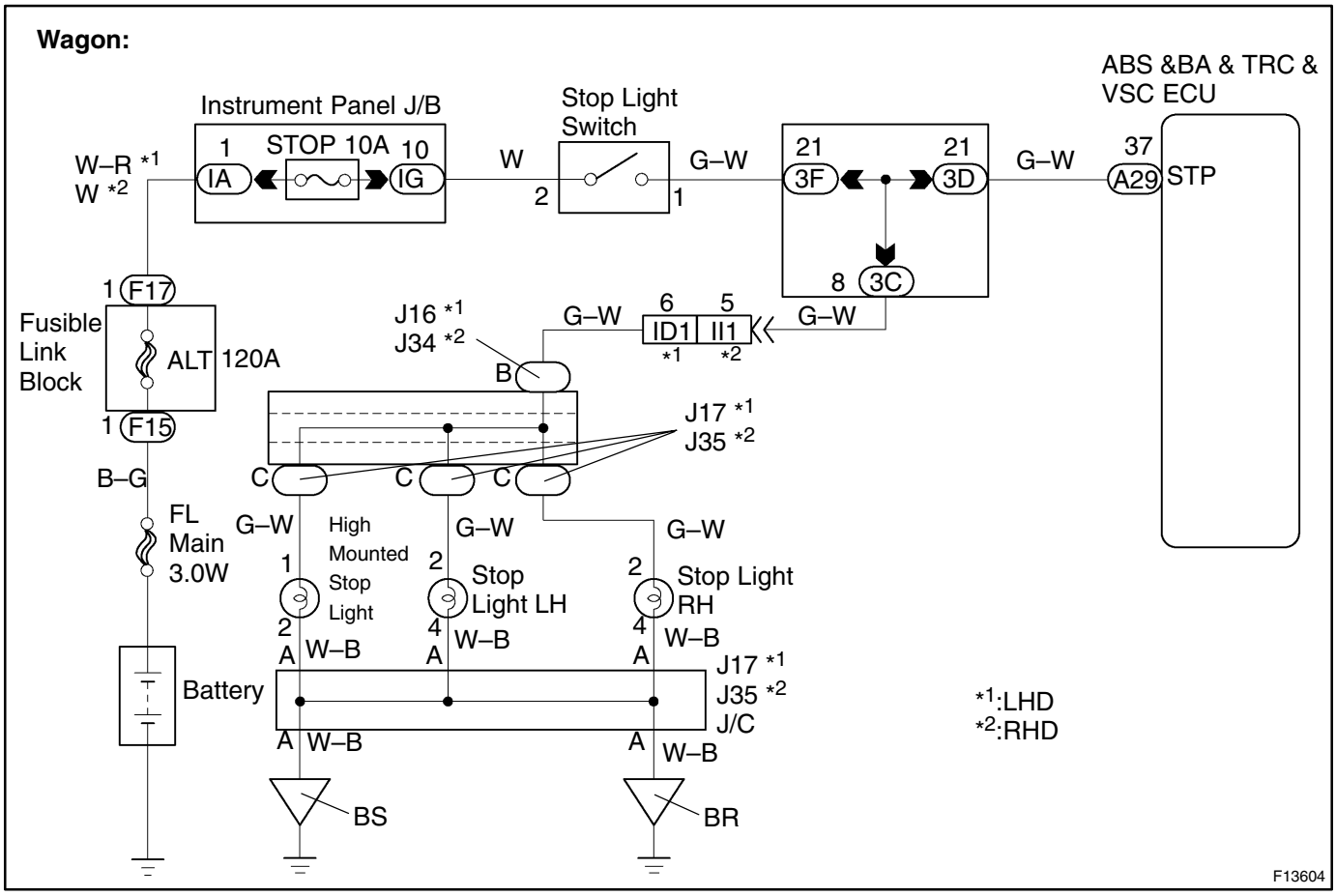


Lift Back (LHD):



Lift Back (RHD):





INSPECTION PROCEDURE

1	**Check operation of stop light.**

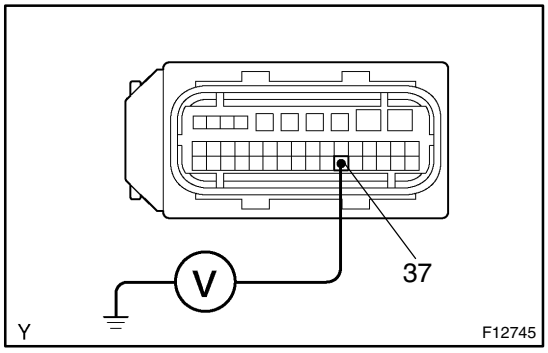
CHECK:

Check that the stop light lights up when the brake pedal is depressed and turns off when the brake pedal is released.

NG → **Repair stop light circuit (See Pub. No. RM599E on page BE–45).**

OK

2	Check voltage between terminal STP (37) of ABS & BA & TRC & VSC ECU and body ground.



PREPARATION:
Disconnect the connector from the ABS & BA & TRC & VSC ECU.

CHECK:
Measure the voltage between terminal 37 of ABS & BA & TRC & VSC ECU harness side connector and body ground when the brake pedal is depressed.

OK:

Voltage: 7.5 – 14 V

OK	Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

NG

3	Check for open circuit in harness and connector between terminal STP of ABS & BA & TRC & VSC ECU and stop light switch (See page IN–30).

NG	Repair or replace harness or connector.

OK

Proceed to next circuit inspection shown in problem symptoms table (See page DI–181).

DI7ZV–01

DTC	C1288 / 88	ECU Version Miss Match

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1288 / 88	When any of the following 1, through 2, is detecte: 1, Engine ECU (M/T) or Engine and ECT ECU (A/T) does not match. 2, Steering angle sensor is not calibration.	• ABS & BA & TRC & VSC ECU • Engine ECU (M/T) or Engine and ECT ECU (A/T) • Steering angle sensor calibration.

INSPECTION PROCEDURE

1	**Check the steering angle sensor calibration.**

NG → **Steering angle sensor calibration (See page DI–171).**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZW–02

DTC	C1300 / 62	ABS & BA & TRC & VSC ECU Malfunction

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1300 / 62	ABS & BA & TRC & VSC ECU internal malfunction is detected.	ABS & BA & TRC & VSC ECU

INSPECTION PROCEDURE

1	**Check the DTC for the ABS and VSC (See page DI–171).**

***1** → **Repair ABS and VSC control system according to the code output.**

***2**

Check for ECU is connected to malfunction indicator light.

*1: Output NG code
*2: Malfunction indicator light remains ON

DI7ZX–01

DTC	C1350 / 51	Brake Actuator Pump Motor Failure

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 ABS & BA & TRC & VSC ECU of the motor relay. 2. A high level of motor voltage with no ABS & BA & TRC & VSC 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 • Brake actuator pump motor circuit

INSPECTION PROCEDURE

1	Check the DTC once more.

PREPARATION:

(a) Clear the DTC (See page DI–171).
(b) Turn the ignition switch OFF.
(c) Turn the ignition switch ON.

CHECK:

Vehicle speed is more than 6 km/h (4 mph), and check if the same DTC is stored in the memory.

NO → **No problem.**

YES

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZY–01

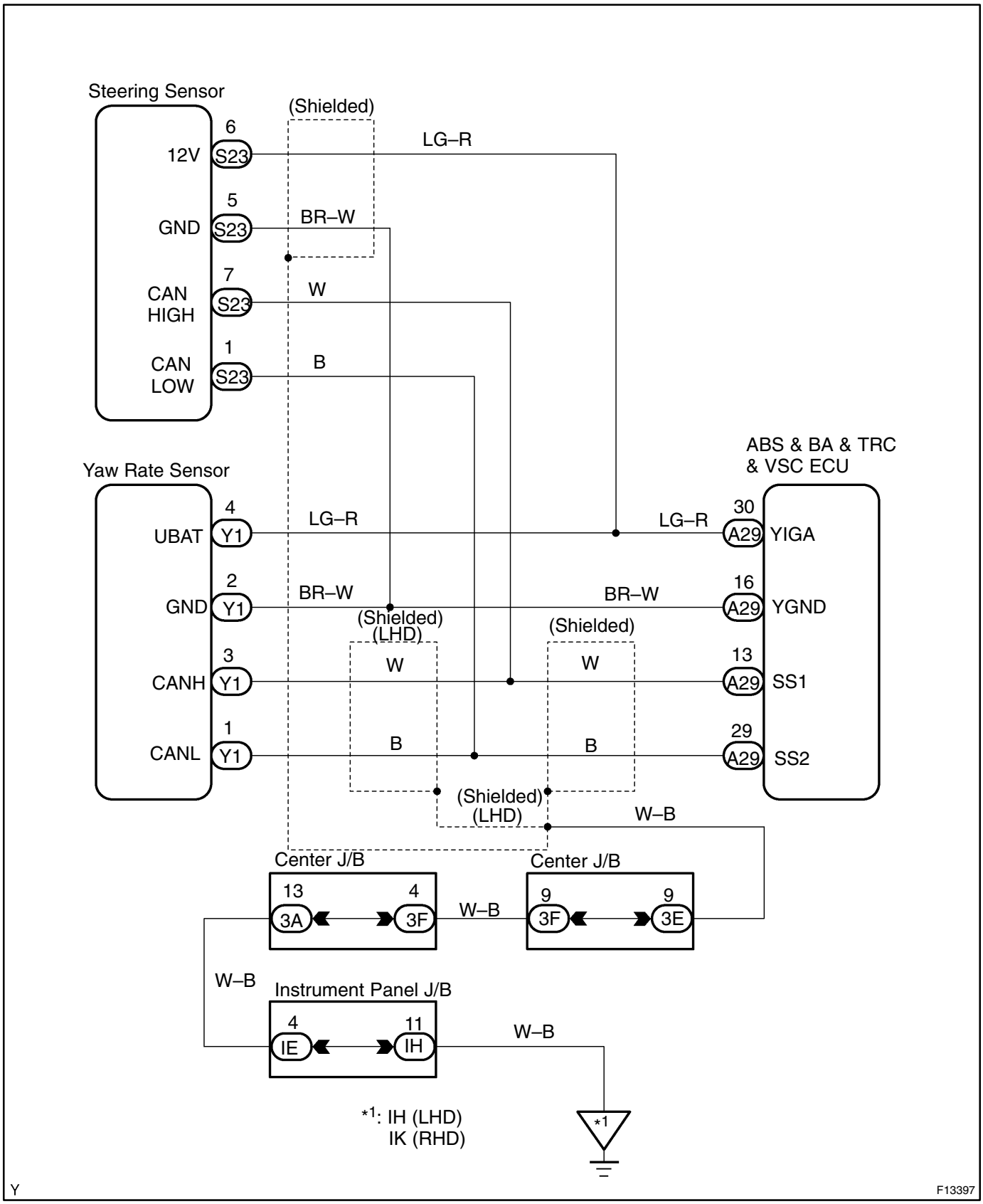
DTC	C1352 / 42	CAN Communication System Malfunction

CIRCUIT DESCRIPTION

The circuit is used to send TRC & VSC control information from yaw rate sensor and steering angle sensor information to ABS & BA & TRC & VSC ECU

DTC No.	DTC Detecting Condition	Trouble Area
C1352 / 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.	• Yaw rate sensor circuit • Steering angle sensor circuit • ABS & BA & TRC & VSC ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open and short circuit in harness and connector between each of terminals CANLOW and CANHIGH of steering angle sensor, CANL and CANH of yaw rate sensor and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI7ZZ–01

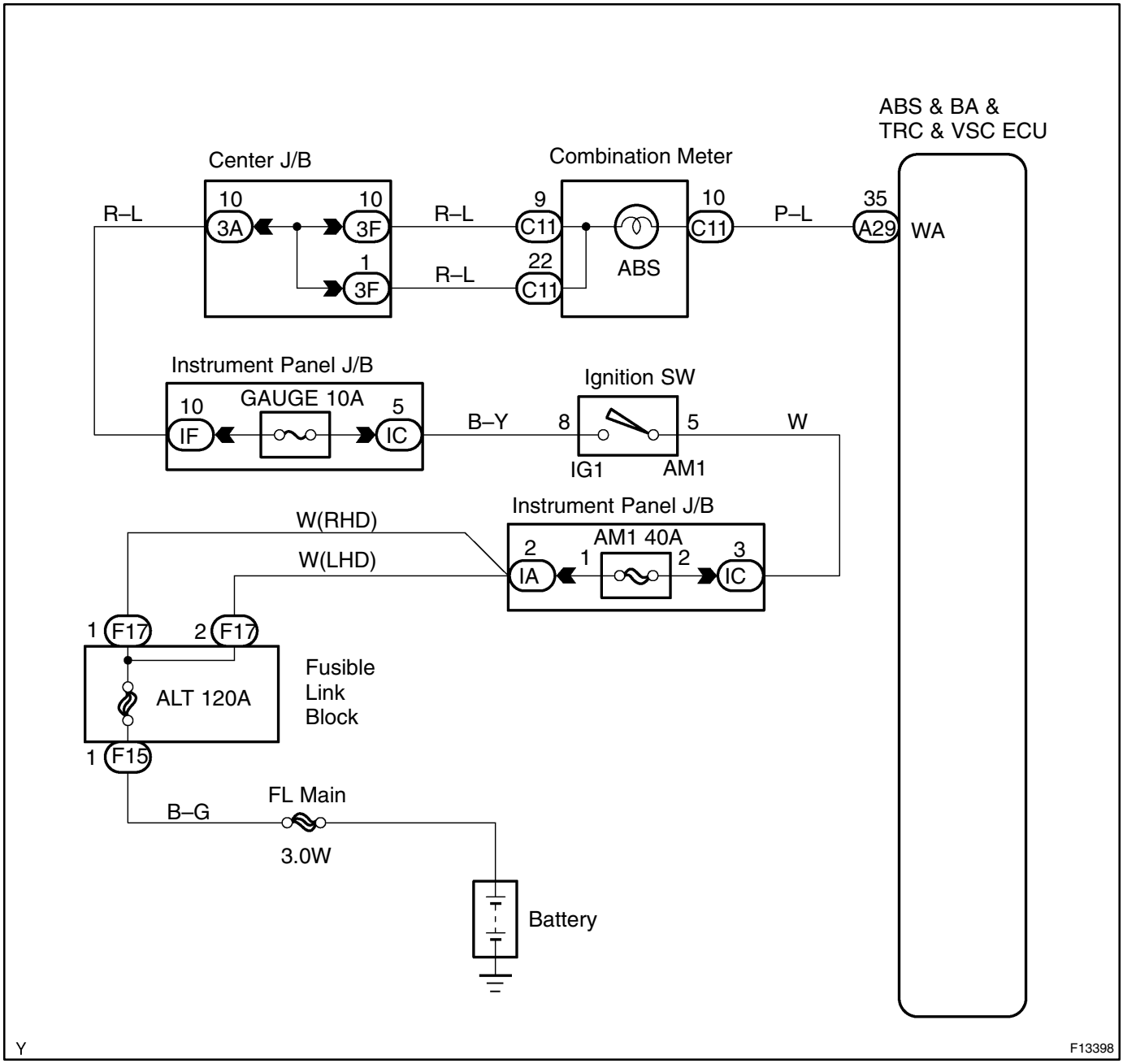
DTC	Always ON	Malfunction in ECU ABS Warning Light Circuit

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
Always ON	Either of the following 1., 2. or 3. is detected: 1. The ECU connectors are OFF the ECU. 2. There is a malfunction in the ECU internal circuit. 3. There is a malfunction in ABS warning light circuit.	• Charging system • ABS warning light circuit

HINT:
Hand–held tester may not be able to be used when the ECU is defective.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check that the ECU connectors are securely connected to the ECU.**

NO → **Connect the connector to the ECU.**

YES

2	**Is DTC output?**

Check DTC on page DI–171.

YES → **Repair circuit indicated by the output code .**

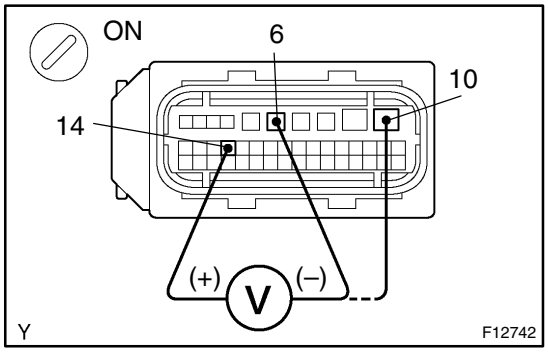
NO

3	**Check for open or short circuit in harness and connector between combination meter and ABS & BA & TRC & VSC ECU (WA).**

NG → **Repair or replace harness or connector.**

OK

4	**Check voltage between terminals IG1 (14) and GND (6,10)or ABS & BA & TRC & VSC ECU.**



PREPARATION:

Disconnect the connector from the ABS & BA & TRC & VSC ECU.

CHECK:

(a) Turn the ignition switch ON.

(b) Measure the voltage between terminals 14 and 6, 10 of ABS & BA & TRC & VSC ECU harness side connector.

OK:

Voltage: 10 – 14 V

OK → **Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.**

NG

Repair or replace harness or connector.

DI800-01

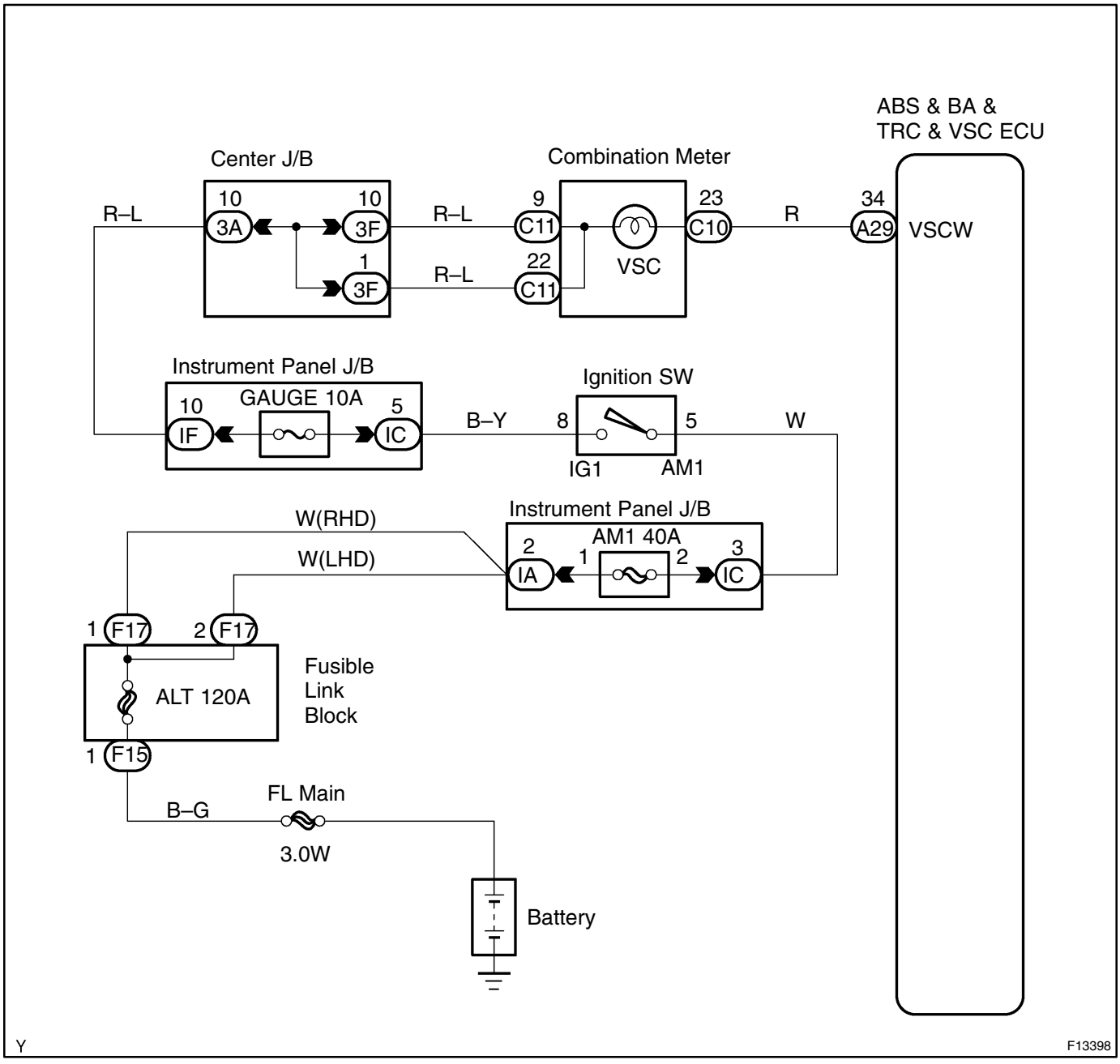
DTC	Always ON	Malfunction in ECU VSC Warning Light Circuit

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
Always ON	Either of the following 1. or 2. is detected: 1. There is a malfunction in the ECU internal circuit. 2. There is a malfunction in VSC warning light circuit.	• Charging system • VSC warning light circuit

HINT:
Hand–held tester may not be able to be used when ECU is defective.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Does both VSC warning light and VSC OFF indicator light go on?**

YES → **Go to step 4.**

NO

2	**Is DTC output?**

Check DTC on page DI–171.

YES → **Repair circuit indicated by the output code .**

NO

3	**Check for open or short circuit in harness and connector between combination mater and ABS & BA & TRC & VSC ECU (WT).**

OK → **Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.**

NG

Repair or replace harness or connector.

4	**Is DTC output?**

Check DTC on page DI–171.

YES → **Repair circuit indicated by the output code .**

NO

5	**Check the steering angle sensor calibration.**

NO → **Calibrate the steering angle sensor (See page DI–171).**

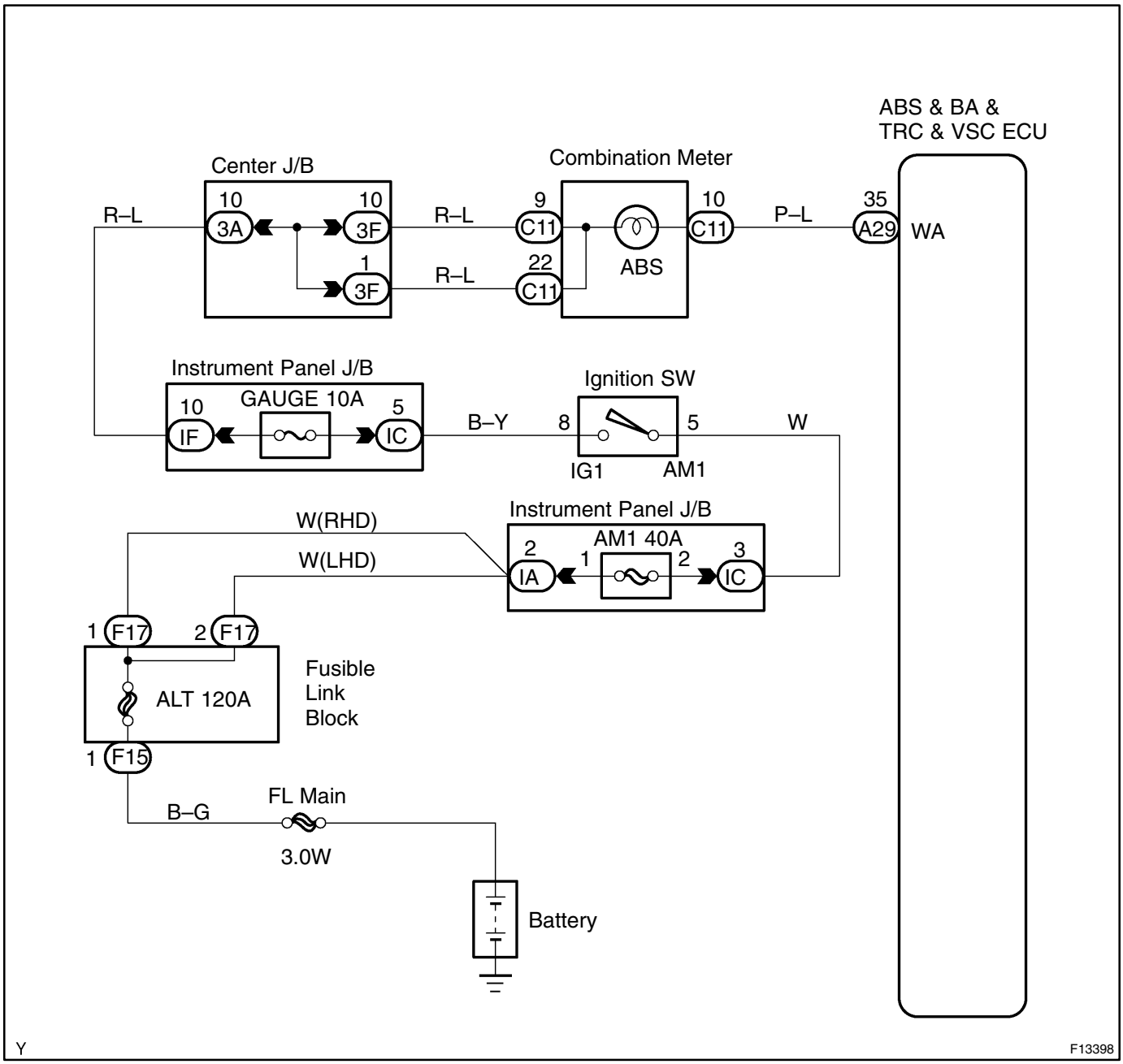
OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI801–01

ABS Warning Light Circuit (Does Not Light Up)

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using a hand–held tester and start from step 2 in case of not using the hand–held tester.

1	**Check operation of the ABS warning light.**

PREPARATION:
(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) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:
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 ABS & BA & TRC & VSC ECU with actuator assembly.**

NG

2	**Check ABS warning light.**

See combination meter troubleshooting (See Pub. No. RM599E on page BE–57).

NG → **Replace or repair bulb or combination meter.**

OK

Repair or replace and check for open or short circuit in harness and connector.

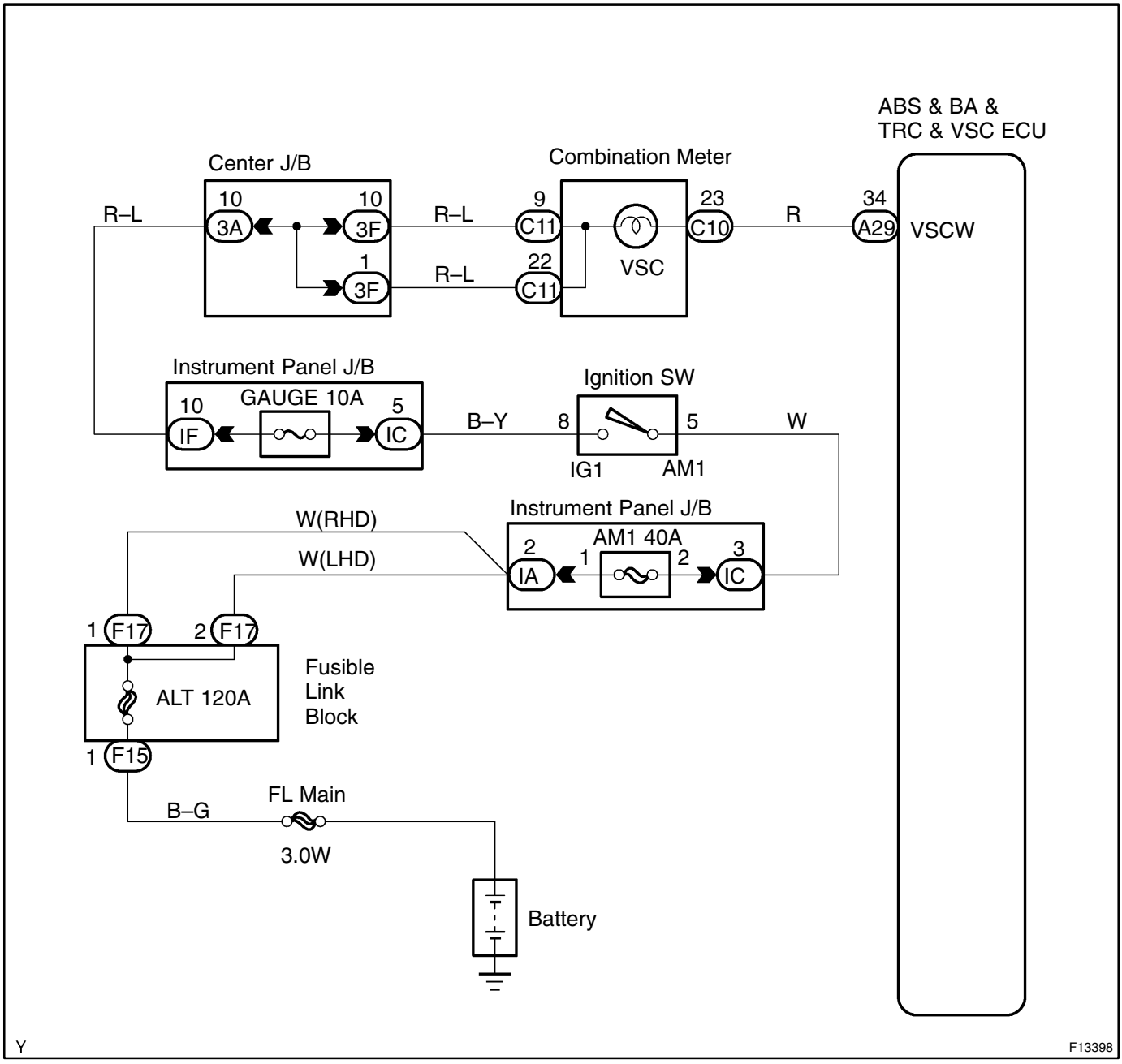
DI802-01

VSC Warning Light Circuit (Does Not Light Up)

CIRCUIT DESCRIPTION

If the ECU stores DTC to be necessary to shut down VSC operation, 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	**Check operation of the VSC warning light.**

PREPARATION:

(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) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

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 ABS & BA & TRC & VSC ECU with astuator assembly.**

NG

2	**Is DTC output?**

YES → **Repair circuit indicated by the output code.**

NO

3	**Check for open and short circuit in harness and connector between ABS & BA & TRC & VSC ECU and VSC warning light (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

4	**Check VSC warning light.**

See the combination meter troubleshooting (See Pub. No. RM599E on page BE–57).

NG → **Repair or replace bulb or combination meter.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator aseembly.

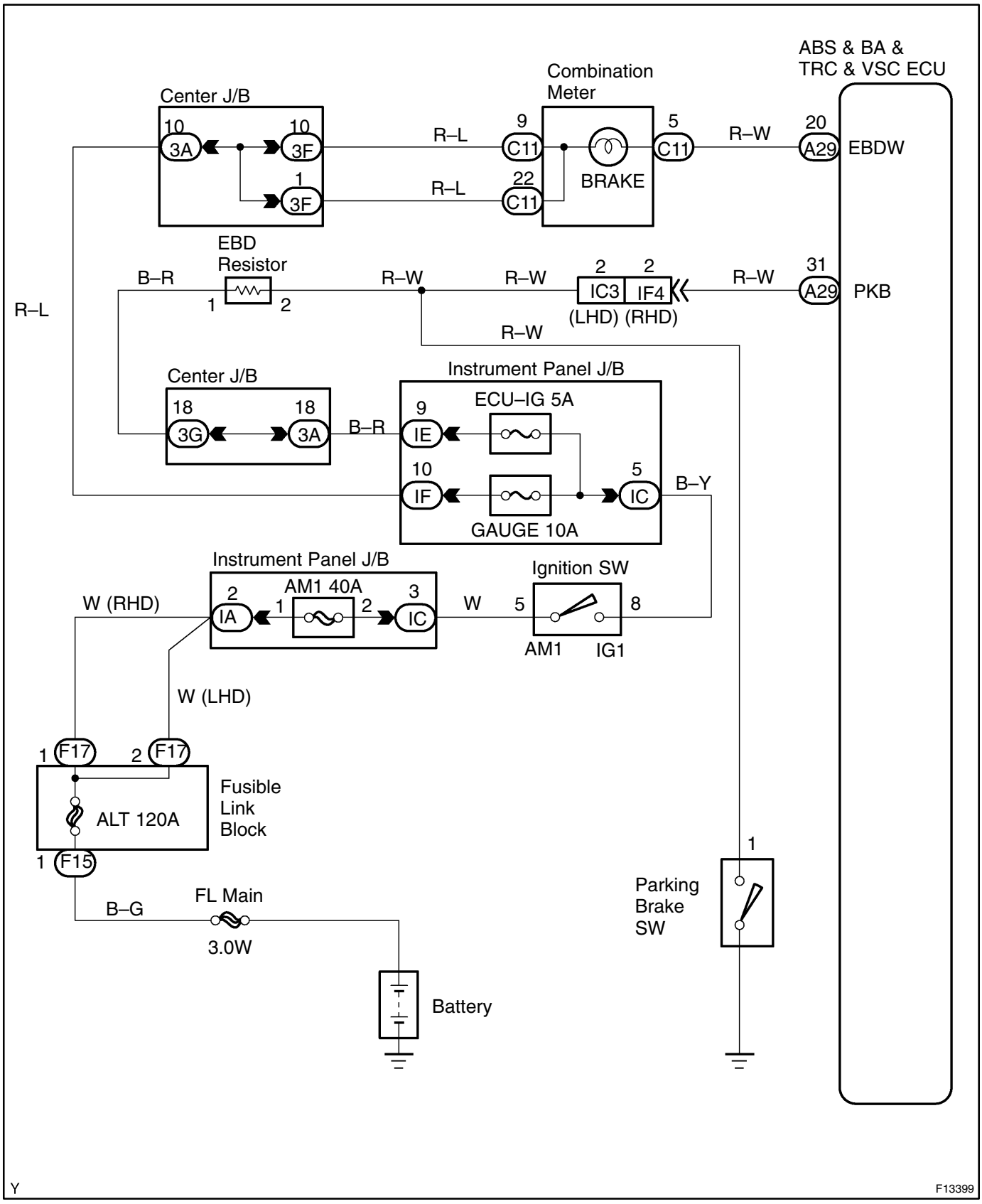
DI803-01

BRAKE Warning Light Circuit

CIRCUIT DESCRIPTION

The BRAKE warning light lights up when the brake fluid is insufficient, when the parking brake is applied or when the EBD is defective.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check parking brake switch circuit (See Pub. No. RM599E on page BE–57).**

NG → **Repair or replace parking brake switch circuit.**

OK

2	**Check brake fluid level warning switch circuit (See Pub. No. RM599E on page BE–57).**

NG → **Repair or replace brake fluid level warning switch circuit.**

OK

3	**Is DTC output for ABS ?**

YES → **Repair circuit indicated by the output code.**

No

4	**Check BRAKE warning light.**

See combination meter troubleshooting (See Pub. No. RM599E on page BE–57).

NG → **Repair or replace bulb or combination meter.**

OK

5	**Check for open or short circuit in harness and connector between combination meter and ABS & BA & TRC & VSC ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

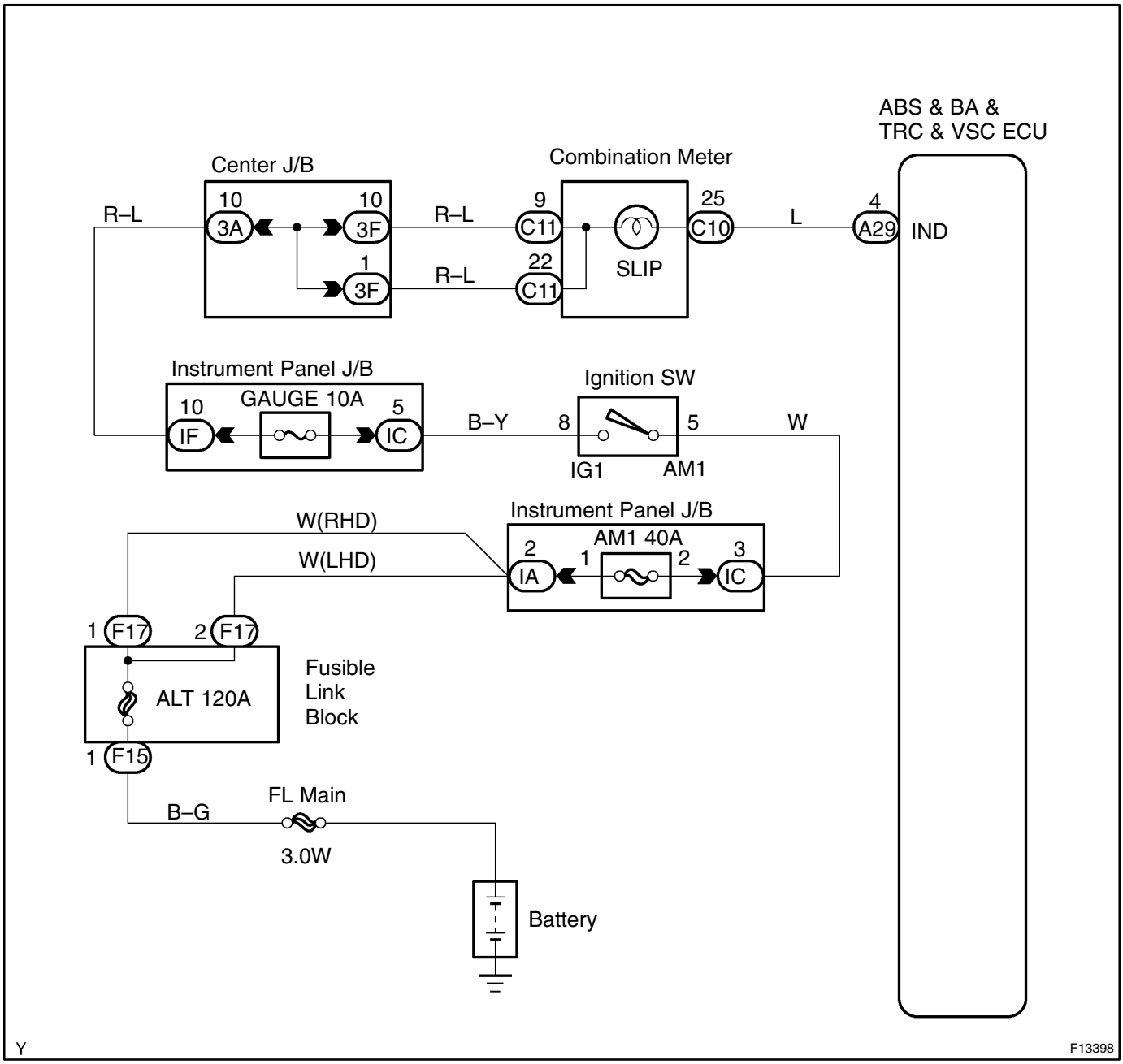
DI804–01

SLIP Indicator Light Circuit

CIRCUIT DESCRIPTION

The SLIP indicator light 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	**Check operation of the SLIP indicator light.**

PREPARATION:

(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) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

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 4.**

NG

2	**Check that the SLIP indicator light is ON for 3 seconds immediately after ignition switch is turned ON.**

OK → **Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.**

NG

3	**Check SLIP indicator light.**

See combination meter troubleshooting (See Pub. No. RM599E on page BE–57).

NG → **Repair or replace bulb or combination meter. Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.**

OK

4	**Check for open and short circuit in harness and connector between ABS & BA TRC & VSC ECU and SLIP indicator light (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

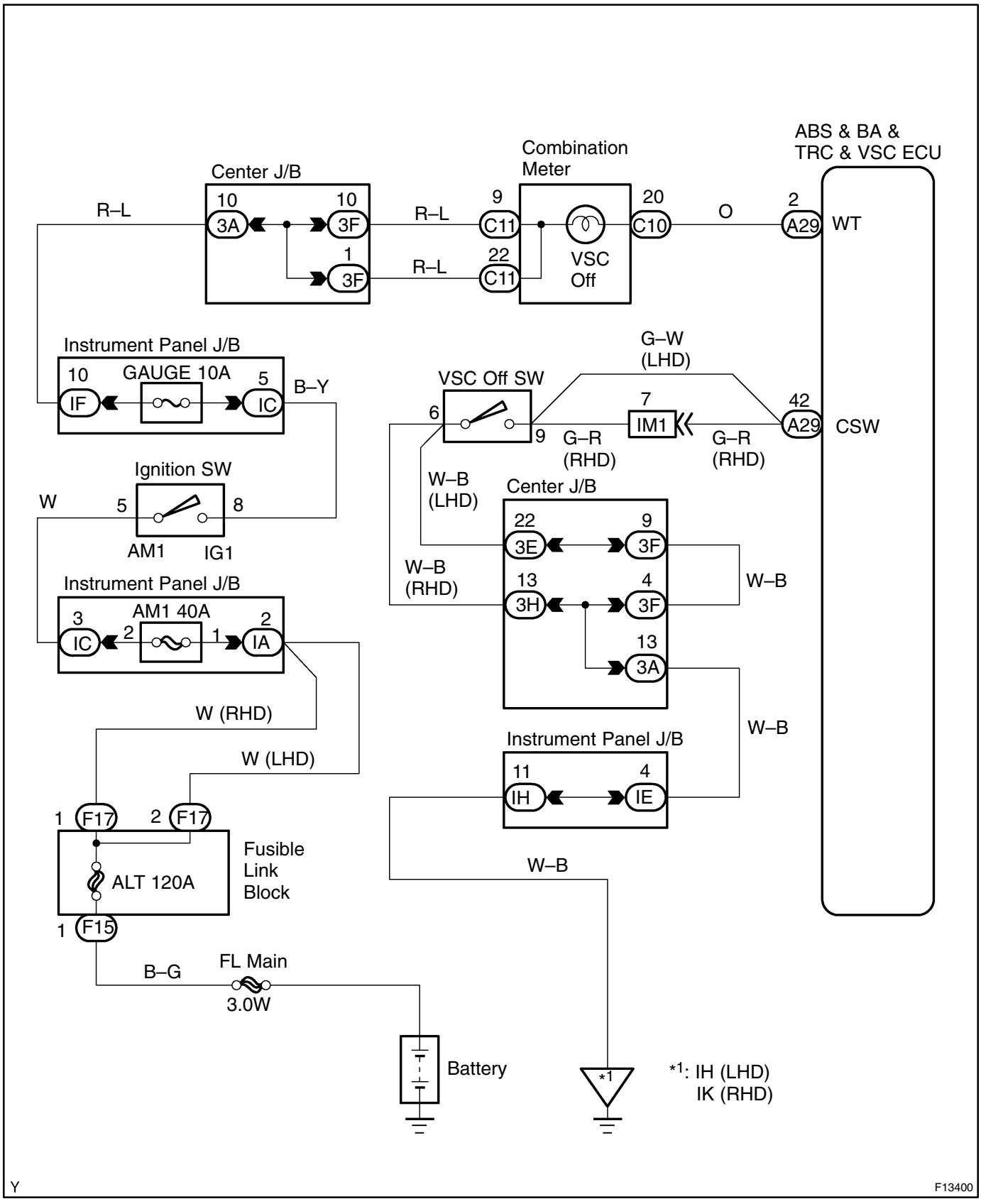
DI805-01

VSC OFF Indicator Light, VSC OFF Switch Circuit

CIRCUIT DESCRIPTION

This is the TRC & VSC control main switch. When the VSC OFF switch is pressed, TRC & VSC control is deactivated and the VSC OFF indicator light lights up. By turning off the ignition switch, TRC & VSC control is surely activated when the ignition switch turns ON next time. Also, the VSC OFF indicator light truns ”ON” when the ECU prohibit TRC & VSC controls.

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	**Check operation of the VSC OFF indicator light.**

PREPARATION:

(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) Select the ACTIVE TEST mode on the hand–held tester.

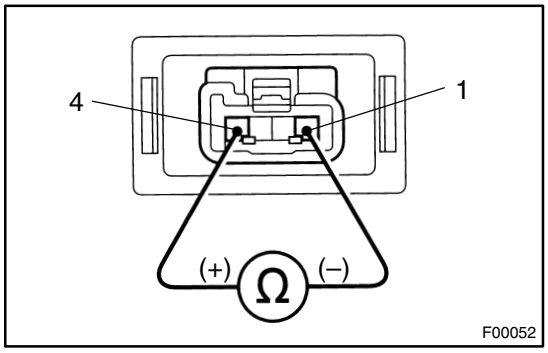
CHECK:

Check that ”ON” and ”OFF” of the VSC OFF indicator light can be shown on the combination meter with the hand–held tester.

NG → **Go to step 4.**

OK

2	**Check VSC OFF switch.**



PREPARATION:

(a) Remove the VSC OFF switch.
(b) Disconnect the VSC OFF switch connector.

CHECK:

Measure the resistance between terminals 1 and 4 of the VSC OFF switch when the VSC OFF switch is ON and OFF.

OK:

VSC OFF switch	Resistance
Pressed	Continuity
Released	1MΩ or higher

NG → **Replace VSC OFF switch.**

OK

3	**Check for open and short circuit in harness and connector between terminal CSW of ABS & BA & TRC & VSC ECU and VSC OFF switch and body ground (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

4	**Check VSC OFF indicator light.**

See combination meter troubleshooting (See Pub. No. RM599E on page BE–57).

NG → **Repair or replace bulb or combination meter.**

OK

5	**Check for open and short circuit in harness and connector between terminal WT of ABS & BA & TRC & VSC ECU and VSC OFF indicator light (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

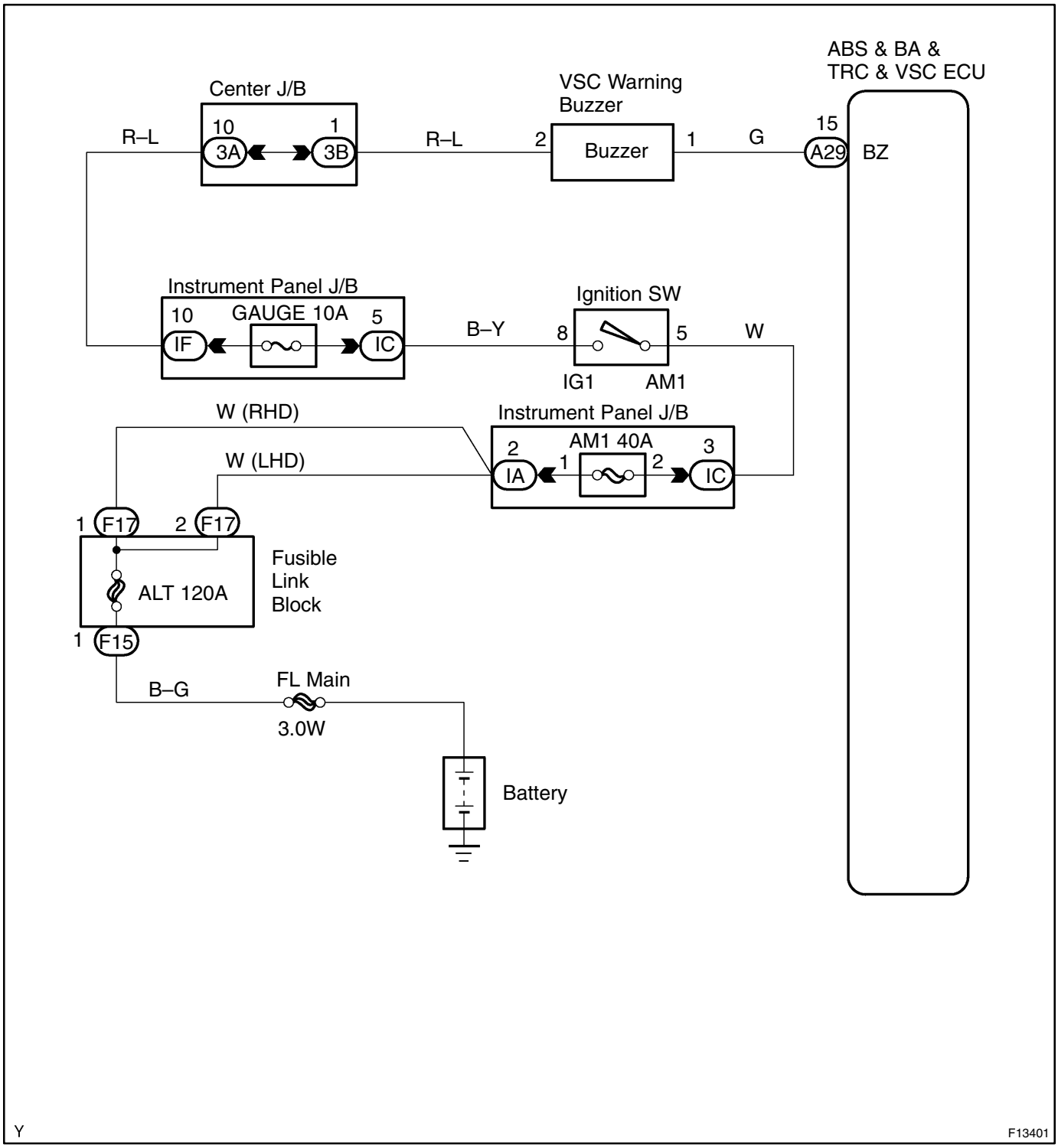
DI806-01

VSC Buzzer Circuit

CIRCUIT DESCRIPTION

The VSC 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 3 in case of not using the hand–held tester.

1	**Check operation of the VSC buzzer.**

PREPARATION:

(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) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check ”ON–OFF” function of the VSC buzzer with the hand–held tester.

OK → **Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.**

NG

2	**Check voltage between terminal 1 of VSC buzzer and body ground.**

PREPARATION:

Disconnect the connector from VSC buzzer.

CHECK:

(a) Turn the ignition switch ON.
(b) Measure voltage between terminal (1) of VSC buzzer and body ground.

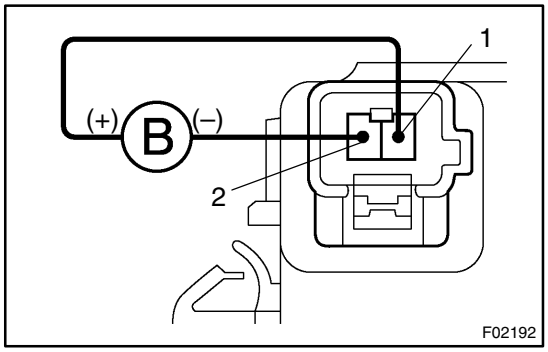
OK:

Voltage: 10 – 14 V

NG → **Repair or replace harness or connector from battery to VSC buzzer.**

OK

3	Check VSC buzzer.



PREPARATION:
Disconnect the VSC buzzer connector.
CHECK:
Apply battery voltage to the terminals 1 and 2 of VSC buzzer connector, and check that the VSC buzzer sounds.

NG → **Replace VSC buzzer.**

OK ↓

4	Check for open and short circuit in harness and connector between ABS & BA & TRC & VSC ECU and VSC buzzer (See page IN–30).

NG → **Repair or replace harness or connector.**

OK ↓

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

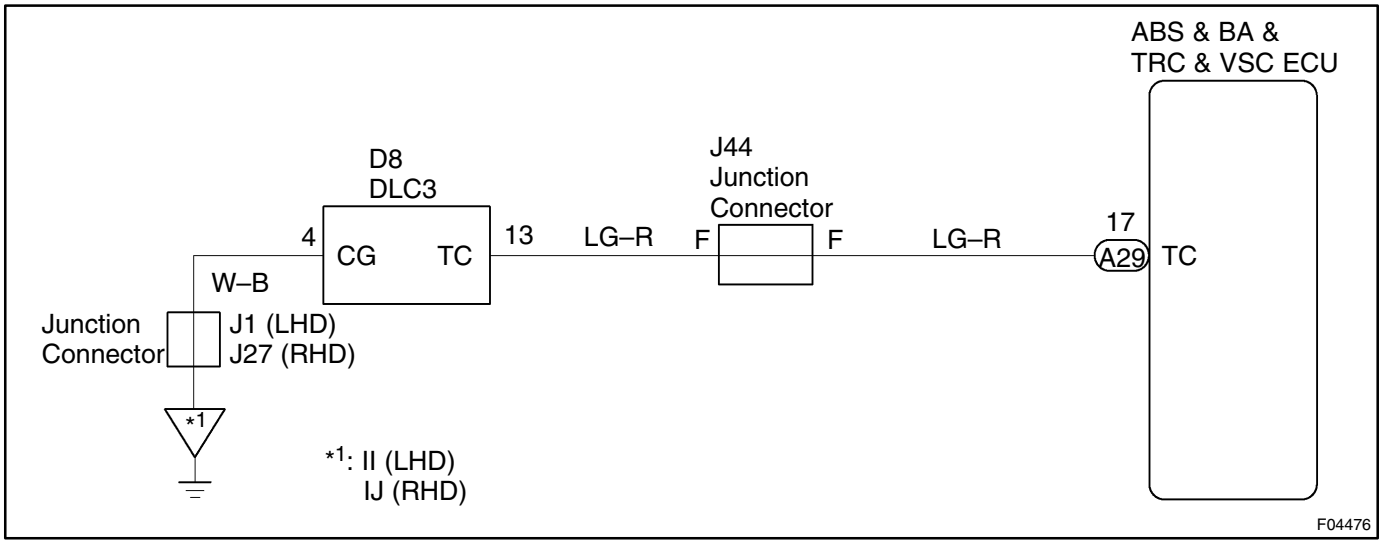
DI807–01

Tc Terminal Circuit

CIRCUIT DESCRIPTION

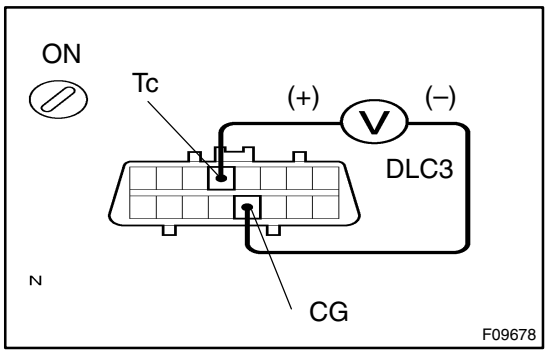
Connecting between terminals Tc and CG of the DLC3 causes the ECU to display DTC by blinking the ABS warning light, VSC warning light and BRAKE warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Tc and CG of DLC3.**



CHECK:

(a) Turn the ignition switch ON.

(b) Measure voltage between terminals Tc and CG of DLC3.

OK:

Voltage: 10 – 14 V

OK	**If each warning light does not blink even after Tc and CG are connected, the ECU may be defective.**

NG

2	**Check for open and short circuit in harness and connector between ABS & BA & TRC & VSC ECU and DLC3, DLC3 and body ground (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

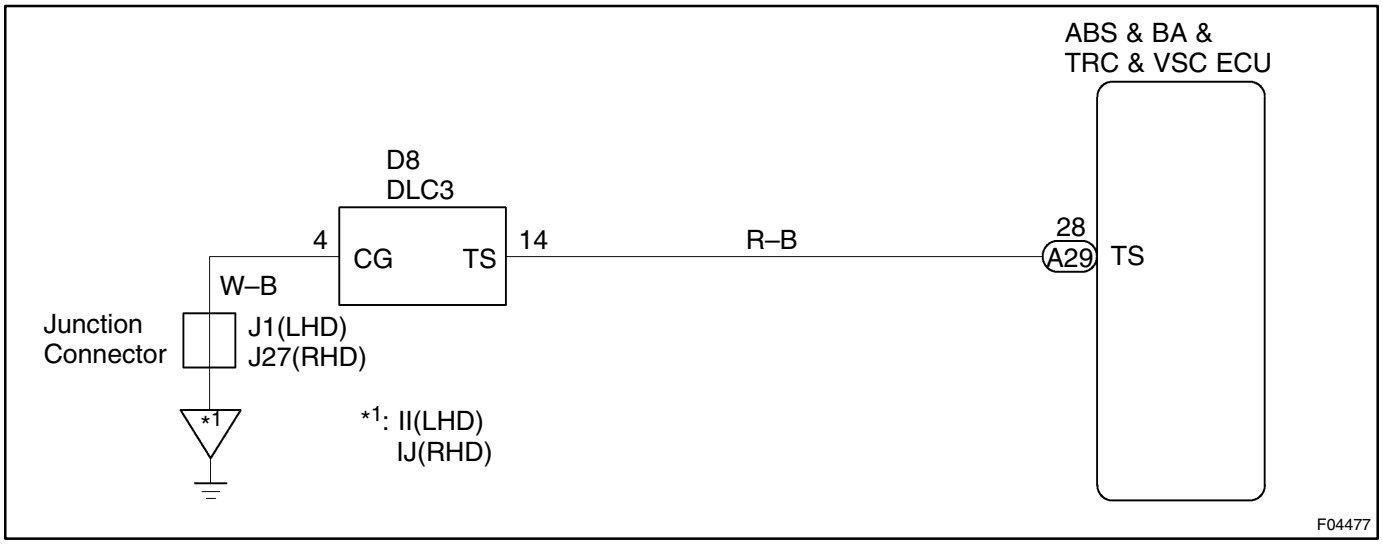
DI808-01

Ts Terminal Circuit

CIRCUIT DESCRIPTION

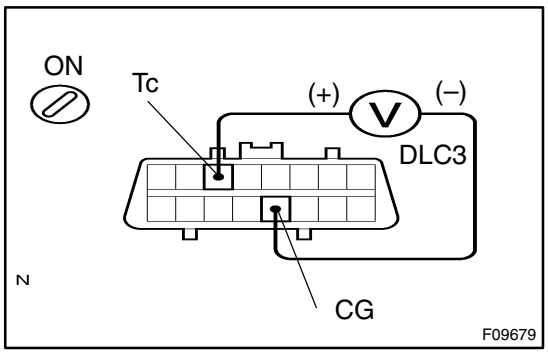
The sensor check circuit detects abnormality in the speed sensor signal which cannot be detected with the DTC check.
Connecting terminals Ts and CG of the DLC3 starts the check.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Ts and CG of DLC3.**



CHECK:

(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals Ts and CG of DLC3.

OK:

Voltage: 10 – 14 V

OK	**If ABS warning light does not blink even after Ts and CG are connected, the ECU may be defective.**

NG

2	**Check for open and short circuit in harness and connector between ABS & BA & TRC & VSC ECU and DLC3, DLC3 and body ground (See page IN–30).**

NG → **Repair or replace harness or connector.**

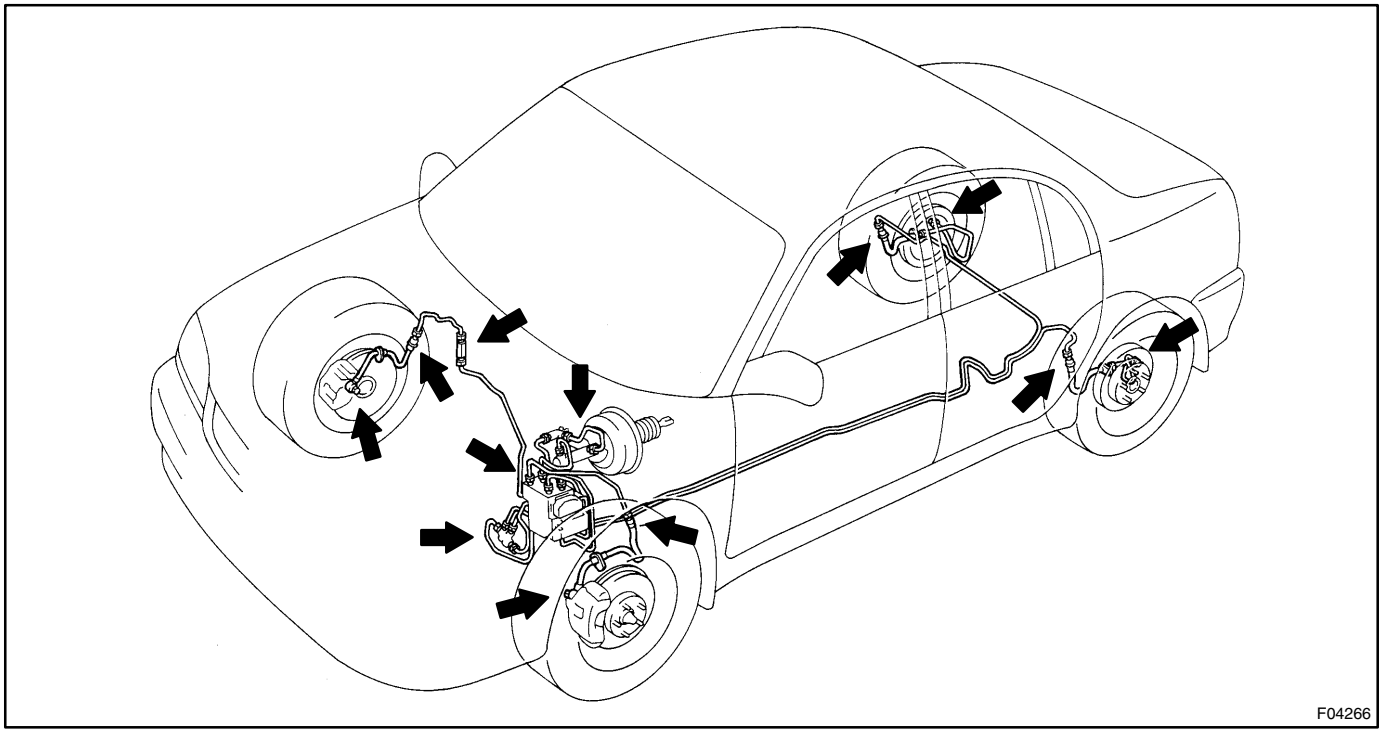
OK

Check and replace ABS & BA & TRC & VSC ECU with actuator assembly.

DI809-01

Check for Fluid Leakage

Check for fluid leakage from actuator or hydraulic lines.



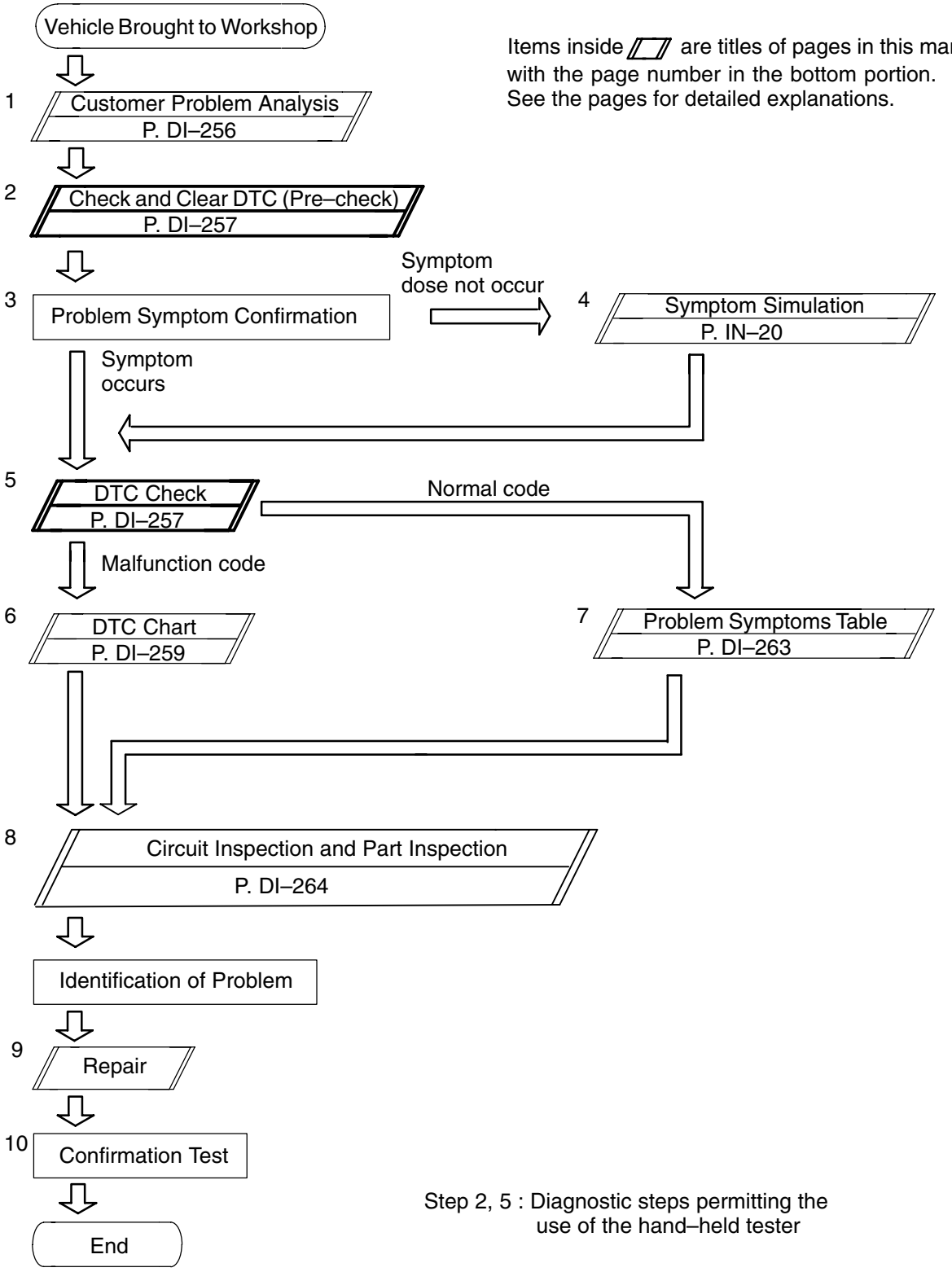
F04266

ENGINE IMMOBILISER SYSTEM

DI7FG–03

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshooting in accordance with the procedure on the following pages.



Items inside ▱ are titles of pages in this manual, with the page number in the bottom portion. See the pages for detailed explanations.

Step 2, 5 : Diagnostic steps permitting the use of the hand–held tester

DI7FH–01

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE IMMOBLISER Check Sheet

Inspector's Name :

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

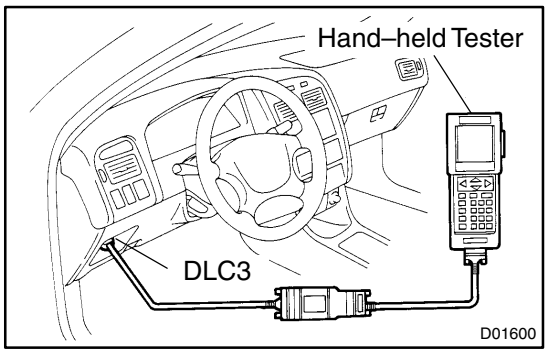
Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Immobiliser is not set. (Engine starts with key codes other than the registered key code.)
	☐ Engine does not start.

Check Item	**Malfunction Indicator Light**	☐ Normal ☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

DI7W6–02



PRE–CHECK

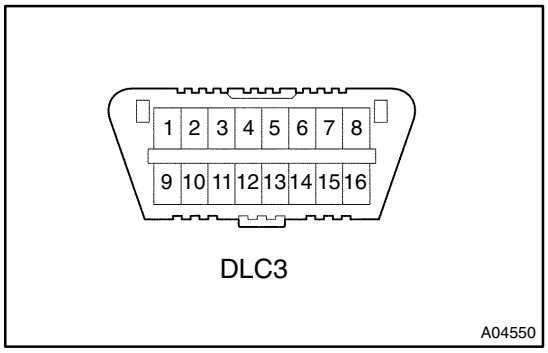
1. DIAGNOSIS SYSTEM

(a) Description

Engine ECU controls the function of immobiliser on this vehicle.

Data of the immobiliser or Diagnostic Trouble Code (DTC) can be read from the Data Link Connector 3 (DLC3) of the vehicle. When a trouble occurs in immobiliser, Malfunction Indicator Lamp (MIL) does not light ON but DTC inspection is performed.

Therefore when there seems to be a trouble with immobiliser, use hand–held tester or SST (diagnosis check wire No. 2) to check and troubleshoot it.



(b) Inspect the DLC3.

The vehicle's engine ECU uses ISO 14230 for communication.

The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 14230 format.

Tester connection	Condition	Specified condition
7 (Bus + Line) – 5 (Signal Ground)	During communication	Pulse generation
4 (Chassis Ground) – Body Ground	Always	1 Ω or less
5 (Signal Ground) – Body Ground	Always	1 Ω or less
16 (B+) – Body Ground	Always	9 – 14 V

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 another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still impossible 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. INSPECT DIAGNOSIS

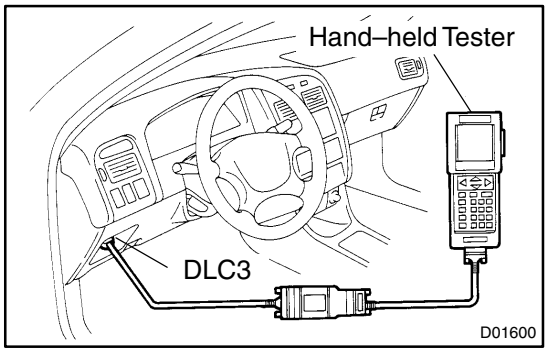
(a) Using hand–held tester:
Check the DTC.

NOTICE:

Hand–held tester only:

When the diagnosis system is switched from the normal mode to the check mode, it erases all DTCs and freezed frame data recorded in the normal mode. So before switching the 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 under the instrument panel lower pad.
(3) Turn the ignition switch ON and push the hand–held tester switch ON.
(4) Use the hand–held tester to check the DTCs and freeze frame data; note them down. (For operating instructions, see the hand–held tester instruction book.)
(5) See page DI–259 to confirm the details of the DTCs.

(b) Clear the DTC.
The following procedures will erase the DTCs and freeze frame data.
(1) Operating the hand–held tester to erase the codes. (See the hand–held tester instruction book for operating instructions.)
(2) Disconnecting the battery terminals or EFI fuse.

DI7FJ–02

DIAGNOSTIC TROUBLE CODE CHART

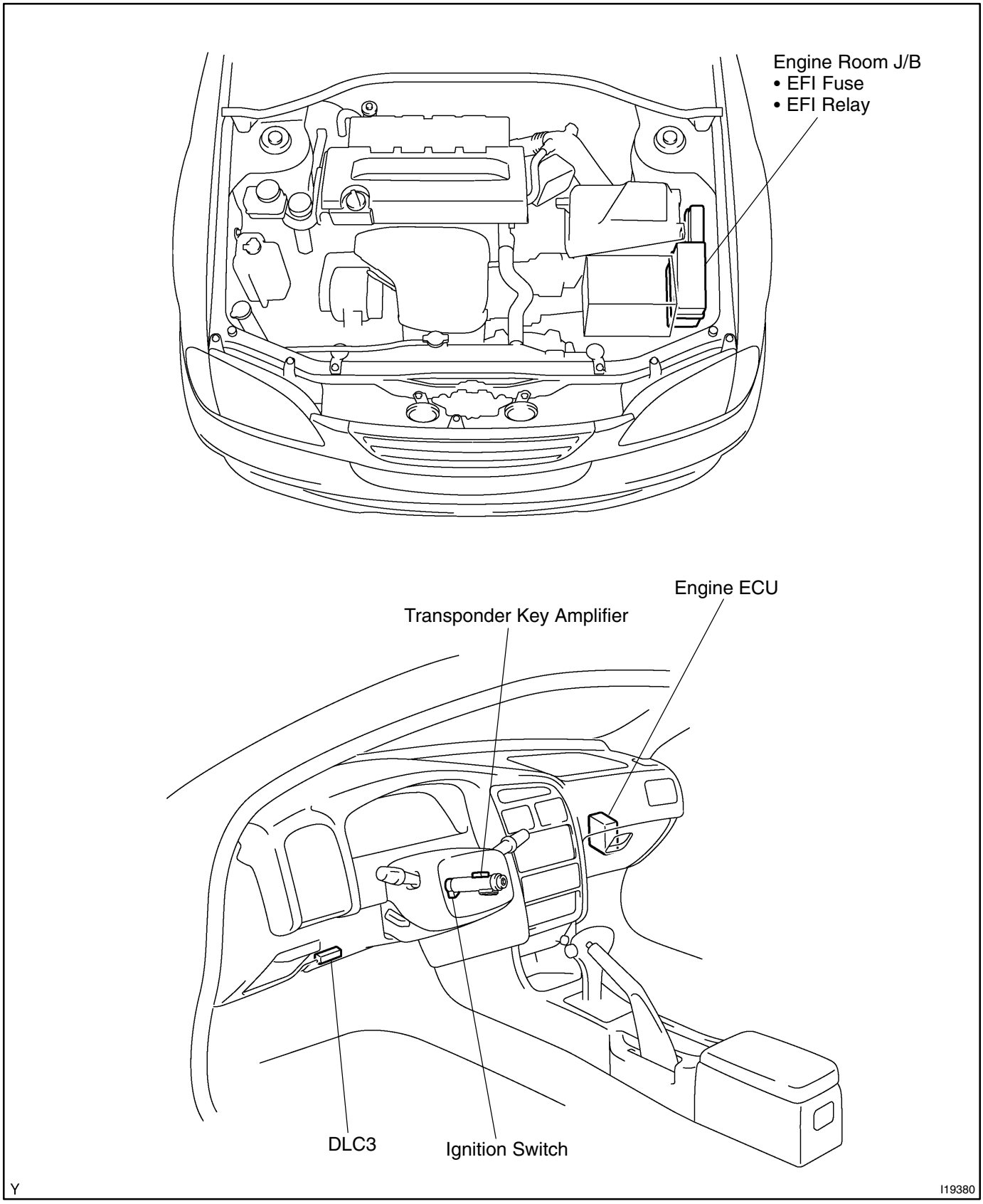
DTC No. (See page)	Detection Item	Trouble Area
B2795 (DI–264)	Unmatched Key Code	• Key • Unregistered key inserted before
B2796 (DI–265)	No Communication in Immobiliser System	• Key • Transponder key amplifier • Wire harness • Engine ECU
B2797 (DI–267)	Communication Malfunction No. 1	• Wire harness • Transponder key amplifier • Unregistered key inserted before • Engine ECU
B2798 (DI–268)	Communication Malfunction No. 2	• Key • Transponder key amplifier • Wire harness • Engine ECU

HINT:

To reduce the unnecessary exchange of engine ECU, check that a trouble occurs with the original engine ECU at the time of exchanging engine ECU and the problem will be solved with a new engine ECU.

DI7FK–03

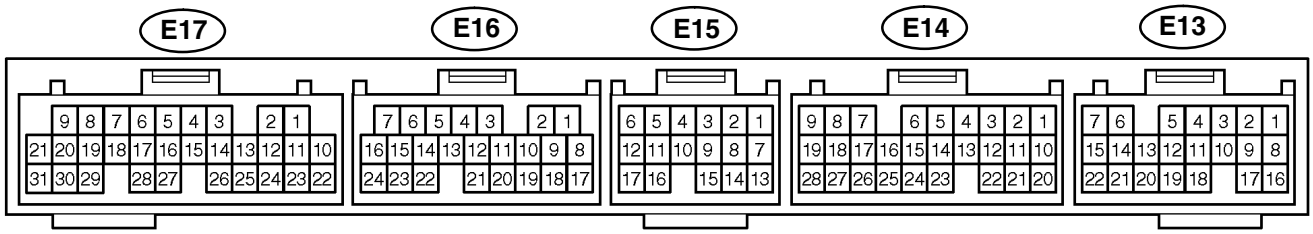
PARTS LOCATION



DI80I–01

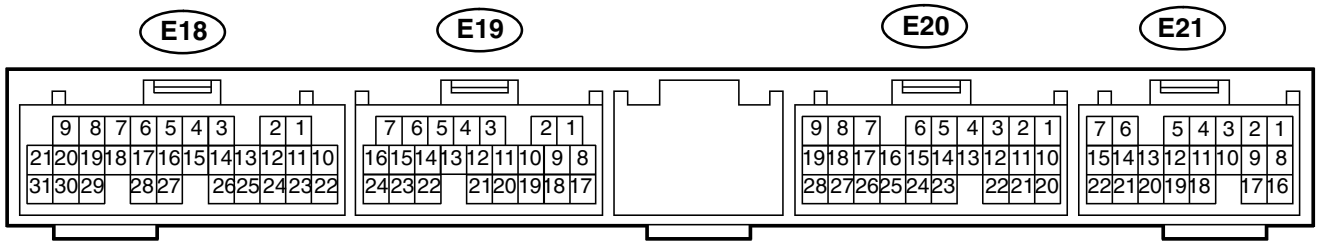
TERMINALS OF ECU

1AZ–FSE Engine ECU Terminals



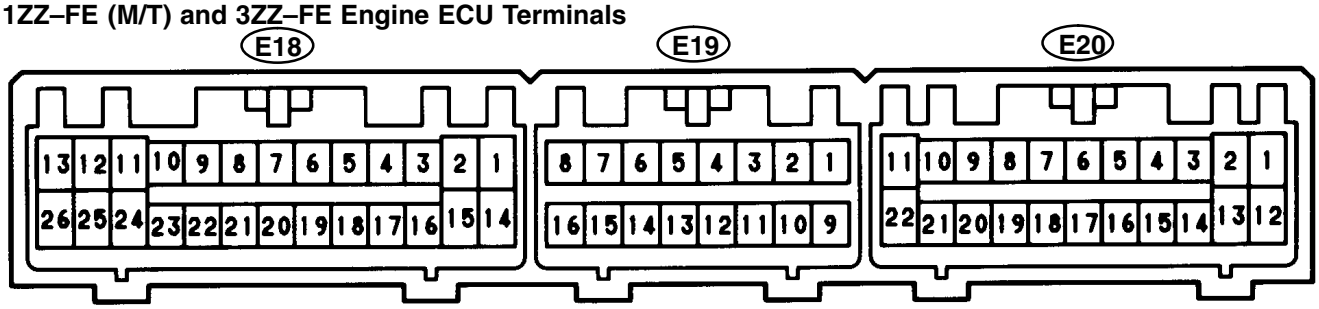
Symbols (Terminal No.)	Wiring Color	Condition	STD Voltage (V)
CODE (E13–14) – E1 (E16–3)	B – BR	Ignition switch ON	9 – 14
RXCK ⟨E13–13) – E1 (E16–3)	B–O – BR	Ignition switch ON	9 – 14
TXCT ⟨E13–21) – E1 (E16–3)	B–W – BR	Ignition switch ON	9 – 14

1ZZ–FE (A/T) Engine and ECT ECU Terminals



Symbols (Terminal No.)	Wiring Color	Condition	STD Voltage (V)
CODE (E20–7) – E1 (E19–17)	B – BR	Ignition switch ON	9 – 14
RXCK (E20–26) – E1 (E19–17)	B–O – BR	Ignition switch ON	9 – 14
TXCT(E20–15) – E1 (E19–17)	B–W – BR	Ignition switch ON	9 – 14

1ZZ–FE (M/T) and 3ZZ–FE Engine ECU Terminals



Symbols (Terminal No.)	Wiring Color	Condition	STD Voltage (V)
CODE (E20–19) – E1 (E18–14)	B – BR	Ignition switch ON	9 – 14
RXCK (E20–20) – E1 (E18–14)	B–O – BR	Ignition switch ON	9 – 14
TXCT(E20–18) – E1 (E18–14)	B–W – BR	Ignition switch ON	9 – 14

DI7FM–02

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Immobiliser is not set (Engine starts with key codes other than the registered key code)	1. Engine ECU	IN–30
Engine does not start	1. Key 2. Wire harness 3. Transponder key amplifier 4. Engine ECU	★ IN–30 – IN–30

★: Check that the key which did not start the engine has been registered and that it is possible to start with other already registered key codes.

DI7FN–01

CIRCUIT INSPECTION

DTC	B2795	Unmatched Key Code

CIRCUIT DESCRIPTION

This DTC is output when an unregistered key is inserted. When this DTC is output, delete DTC and insert the key of the customer to check that DTC B2795 is output.
When the key that outputs DTC B2795, register this key. When DTC B2795 is not output, there is a possibility that the unregistered key has been inserted before. (Engine ECU is normal.)
Inquire of a customer the condition of using the system to find the cause of the trouble.
(Example: Another key has been inserted, etc.)

DTC No.	DTC Detection Condition	Trouble Area
B2795	Unmatched key code	• Key • Unregistered key inserted before

INSPECTION PROCEDURE

1	**Delete DTC and insert all presently available keys to check whether engine starts or not.**

HINT:
When inserting the key that does not start the engine, DTC B2795 is stored in memory.

RESULT:

OK	All keys starts engine.
NG	A specific key does not start engine.

OK → **No problem.**

HINT:
If the result is ”OK”, please confirm whether or not customers have ever inserted the unregistered key or the immobiliser key (with transponder chip) of other vehicle in the ignition key cylinder, and find out the cause of detecting DTC.

NG

Register key that does not start engine.

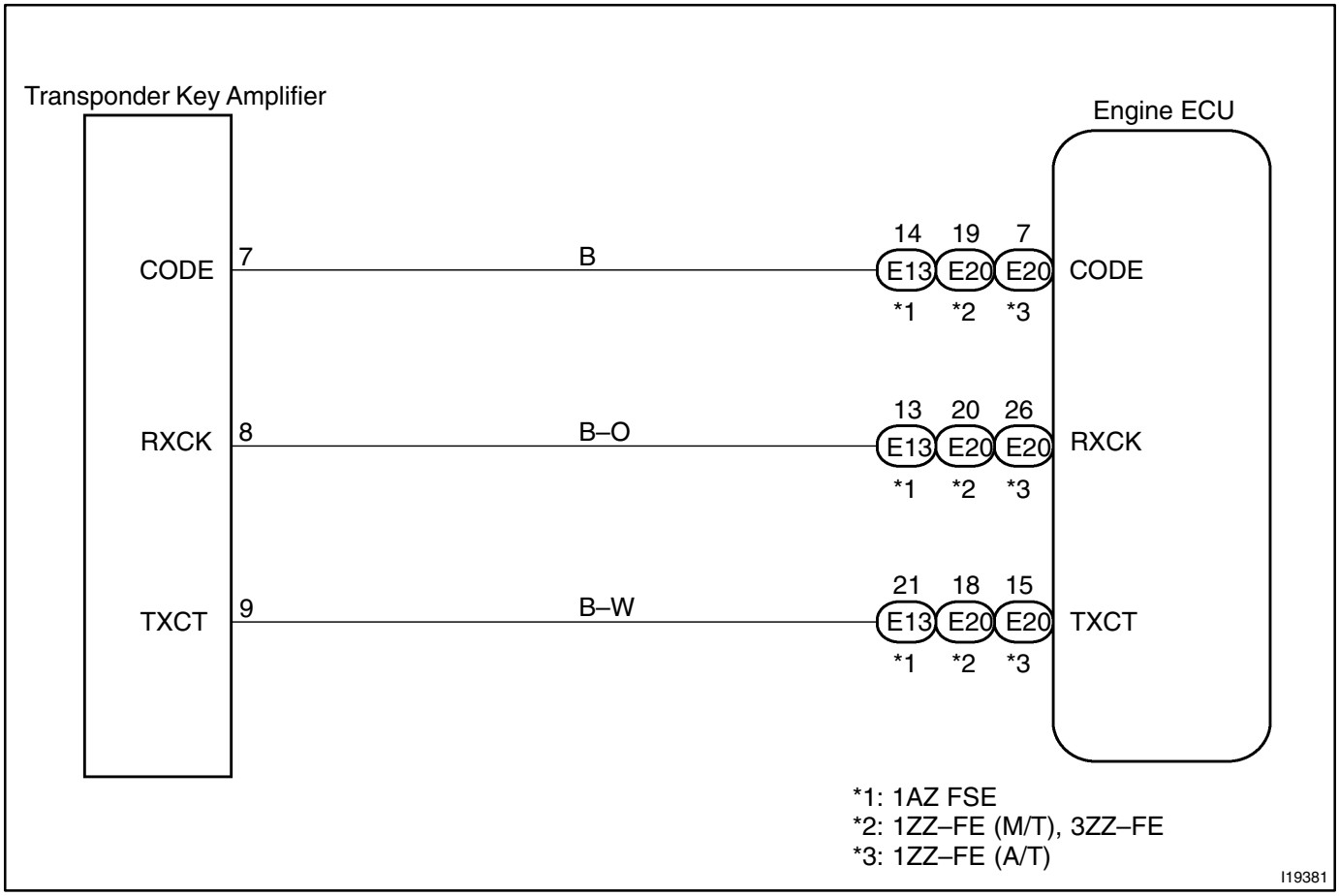
DI7FO–03

DTC	B2796	No Communication in Immobiliser system

CIRCUIT DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
B2796	No communication	• Key • Transponder key amplifier • Wire harness • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Delete DTC and insert all presently available keys to check whether engine starts or not**

RESULT:

A	All keys start engine.
B	A specific key does not start engine. In this case, DTC B2796 is stored in memory.
C	All keys do not start engine. In this case, DTC B2796 is stored in memory.

A → **No problem at this time.**

HINT:
If the result is ”A”, please confirm whether or not customers have ever inserted the key (without transponder chip) of other vehicle in the ignition key cylinder, and find out the cause of detecting DTC.

B → **Transponder chip of a specific key is defective. Replace key.**

C

2	**Check harness and connector between transponder key amplifier and engine ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

3	**Does it operate normally after replacement of transponder key amplifier ?**

Yes → **Replace transponder key amplifier.**

No

Check and replace engine ECU (See page IN–30).

DI7FP–03

DTC	B2797	Communication Malfunction No. 1

CIRCUIT DESCRIPTION

This code is detected when an error occurs despite of normal communication.
(Example: Some noise is included in communication line.)

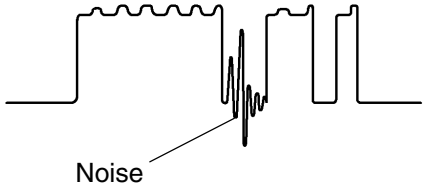
DTC No.	DTC Detection Condition	Trouble Area
B2797	Communication error	• Wire harness • Transponder key amplifier • Unregistered key inserted before • Engine ECU

WIRING DIAGRAM

Refer to DTC B2796 on page DI–265.

INSPECTION PROCEDURE

1	Check noise.



I02681

PREPARATION:
Insert already registered master key in the key cylinder.
CHECK:
Using an oscilloscope or hand–held tester, check that noise is included in the CODE terminal of the engine ECU.
OK:
No noise is detected.

NG → **Try to find cause of noise and remove it.**

OK

2	Does it operate normally after replacement of transponder key amplifier?

Yes → **Replace transponder key amplifier.**

No

Check and replace engine ECU (See page IN–30).

DI7FQ–02

DTC	B2798	Communication Malfunction No. 2

CIRCUIT DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
B2798	Communication error	• Key • Transponder key amplifier • Wire harness • Engine ECU

WIRING DIAGRAM

Refer to DTC B2796 on page DI–265.

INSPECTION PROCEDURE

1	**Check harness and connector between transponder key amplifier and engine ECU (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

2	**Does it operate normally after replacement of transponder key amplifier?**

Yes → **Replace transponder key amplifier.**

No

Check and replace engine ECU (See page IN–30).

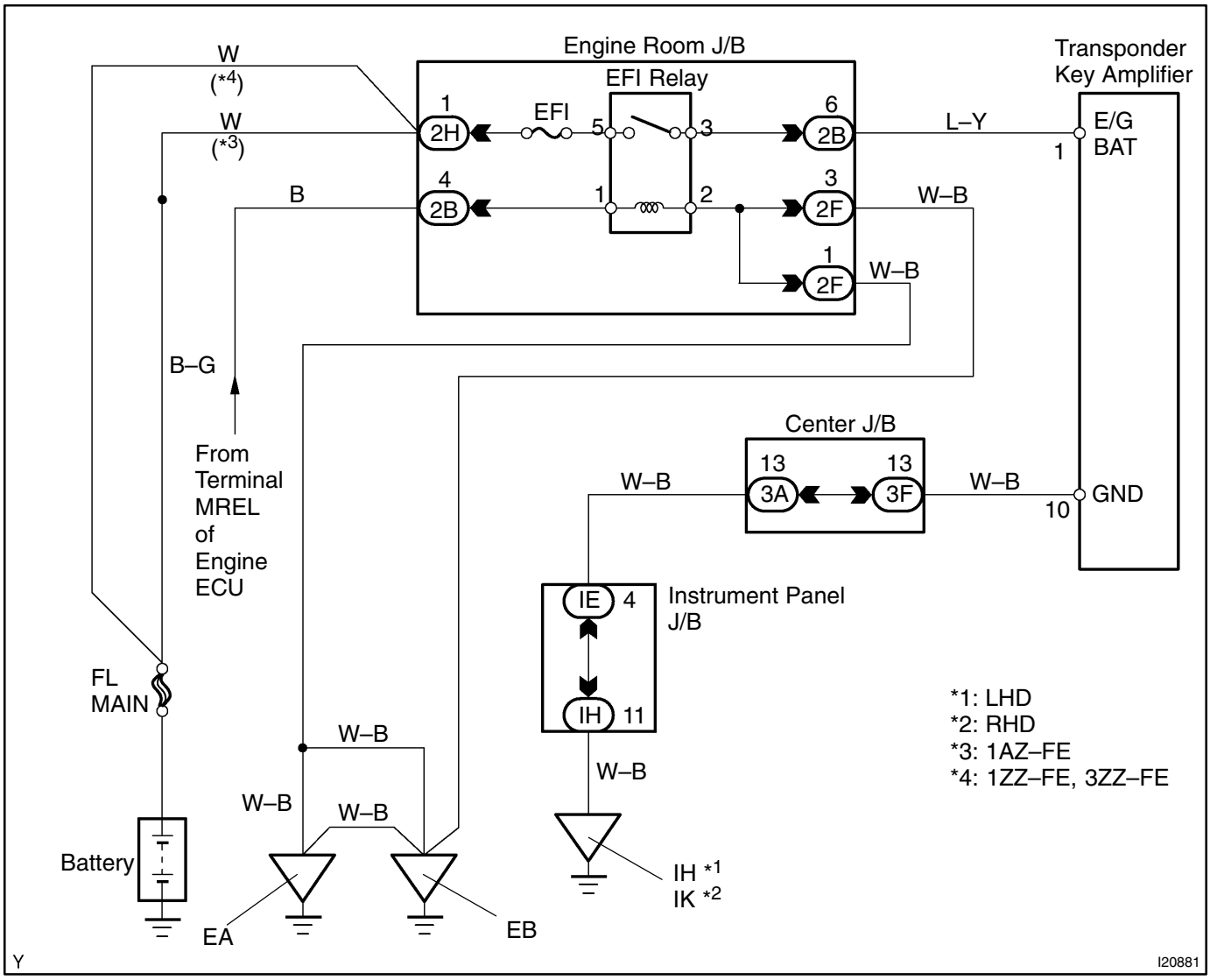
DI7FR–03

Power Source Circuit

CIRCUIT DESCRIPTION

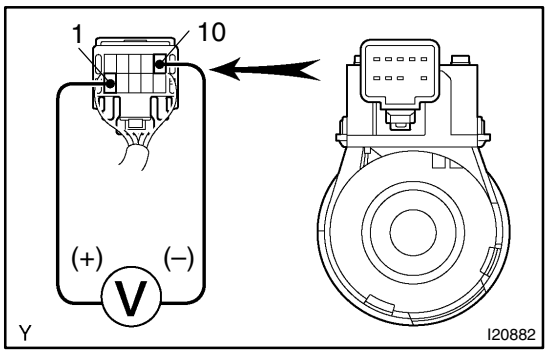
This circuit provides power to operate the transponder key amplifier.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals +B and GND of transponder key amplifier connector.**



PREPARATION:

(a) Turn the ignition switch OFF.

(b) Disconnect the transponder key amplifier connector.

CHECK:

Measure the voltage between terminals +B and GND of the transponder key amplifier connector.

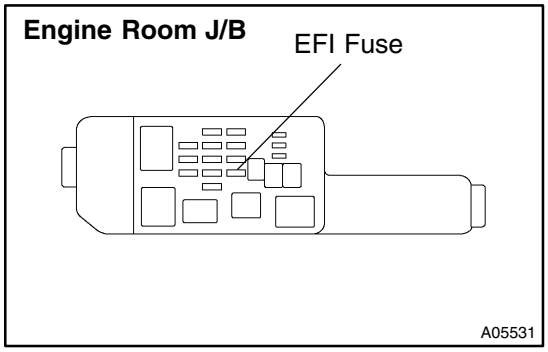
OK:

Voltage: 9 – 14 V

OK	**Proceed to next circuit inspection shown in problem symptoms table (See page DI–263).**

NG

2	**Check EFI fuse.**



PREPARATION:

Remove the EFI fuse from the engine room J/B.

CHECK:

Check the continuity of the EFI fuse.

OK:

Continuity

NG	**Check for short in all harness and components connected to EFI fuse.**

OK

3	**Check harness and connector between transponder key amplifier and body ground (See page IN–30).**

NG → **Repair or replace harness or connector.**

OK

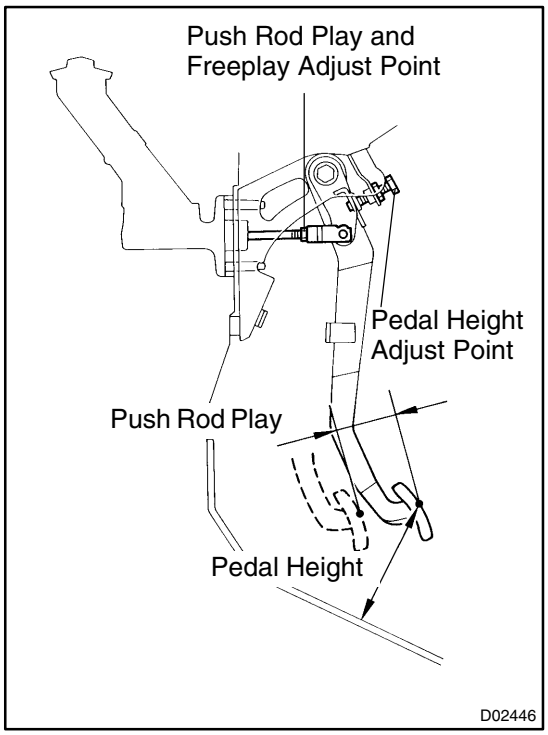
Check and repair harness and connector between transponder key amplifier and battery (See page IN–30).

CLUTCH

CLUTCH PEDAL CL–1
CLUTCH MASTER CYLINDER CL–3
CLUTCH UNIT CL–9

REFER TO AVENSIS/CORONA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM599E)

NOTE: The above pages contain only the points which differ from the above listed manual.



CLUTCH PEDAL

INSPECTION

CL015-05

1. CHECK PEDAL HEIGHT

Pedal height from asphalt sheet:
LHD:
1ZZ–FE Engine:
139.7 – 149.7 mm (5.500 – 5.894 in.)
3ZZ–FE Engine:
139.7 – 149.7 mm (5.500 – 5.894 in.)
1AZ–FSE Engine:
148.3 – 158.3 mm (5.839 – 6.232 in.)
RHD:
1ZZ–FE Engine:
144.3 – 154.3 mm (5.681 – 6.075 in.)
3ZZ–FE Engine:
144.3 – 154.3 mm (5.681 – 6.075 in.)
1AZ–FSE Engine:
152.9 – 162.9 mm (6.010 – 6.413 in.)

2. IF NECESSARY, ADJUST PEDAL HEIGHT

Loosen the lock nut and turn the stopper bolt until the height is correct. Tighten the lock nut.

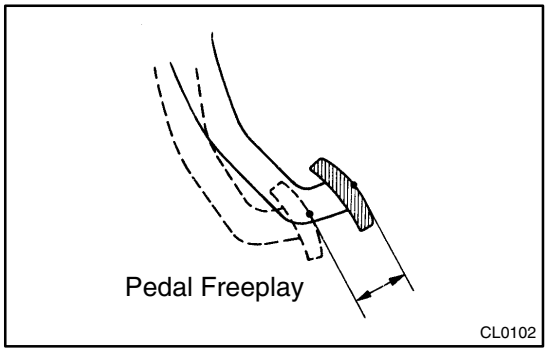
3. CHECK PEDAL FREEPLAY AND PUSH ROD PLAY

Depress pedal until clutch resistance begins to be felt.

Pedal freeplay:
1.0 – 5.0 mm (0.039 – 0.197 in.)

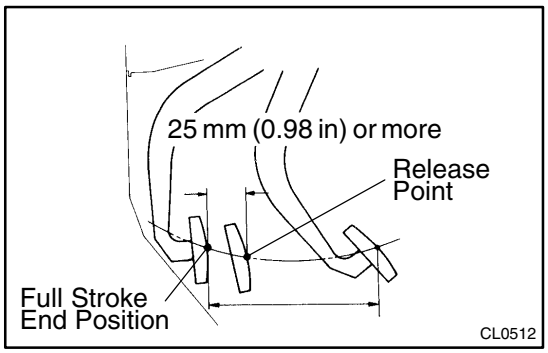
Gently push on the pedal until the resistance begins to increase a little.

Push rod play at pedal top:
5.0 – 15.0 mm (0.197 – 0.591 in.)



4. IF NECESSARY, ADJUST PEDAL FREEPLAY AND PUSH ROD PLAY

(a) Remove the air duct and the lower finish panel (See page BO–8).
(b) Loosen the lock nut and turn the push rod until the free-play and push rod play are correct.
(c) Tighten the lock nut.
(d) After adjusting the pedal freeplay, check the pedal height.
(e) Connect the air duct and install the lower finish panel.



5. CHECK CLUTCH RELEASE POINT

(a) Pull the parking brake lever and install wheel stopper.

(b) Start the engine and idle the engine.

(c) Without depressing the clutch pedal, slowly shift the shift lever into reverse position until the gears make contact.

(d) Gradually depress the clutch pedal and measure the stroke distance from the point the gear noise stops (release point) 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.

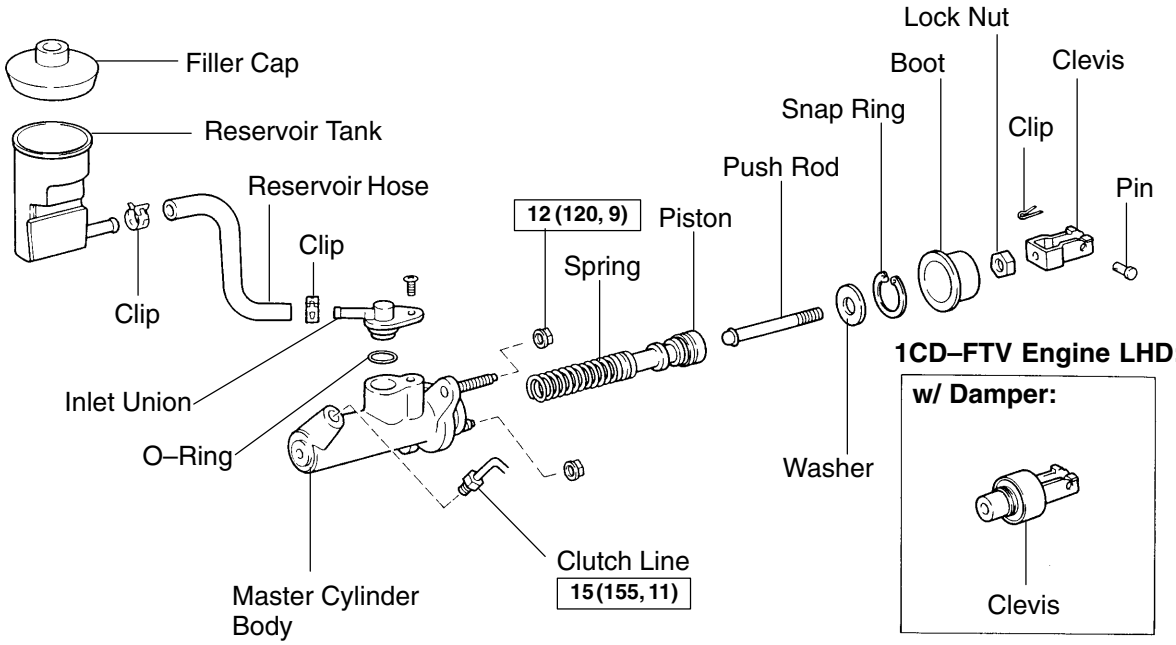
- Inspect pedal height.
- Inspect push rod play and pedal freeplay.
- Bleed the clutch line.
- Inspect the clutch cover and disc.

CLUTCH MASTER CYLINDER

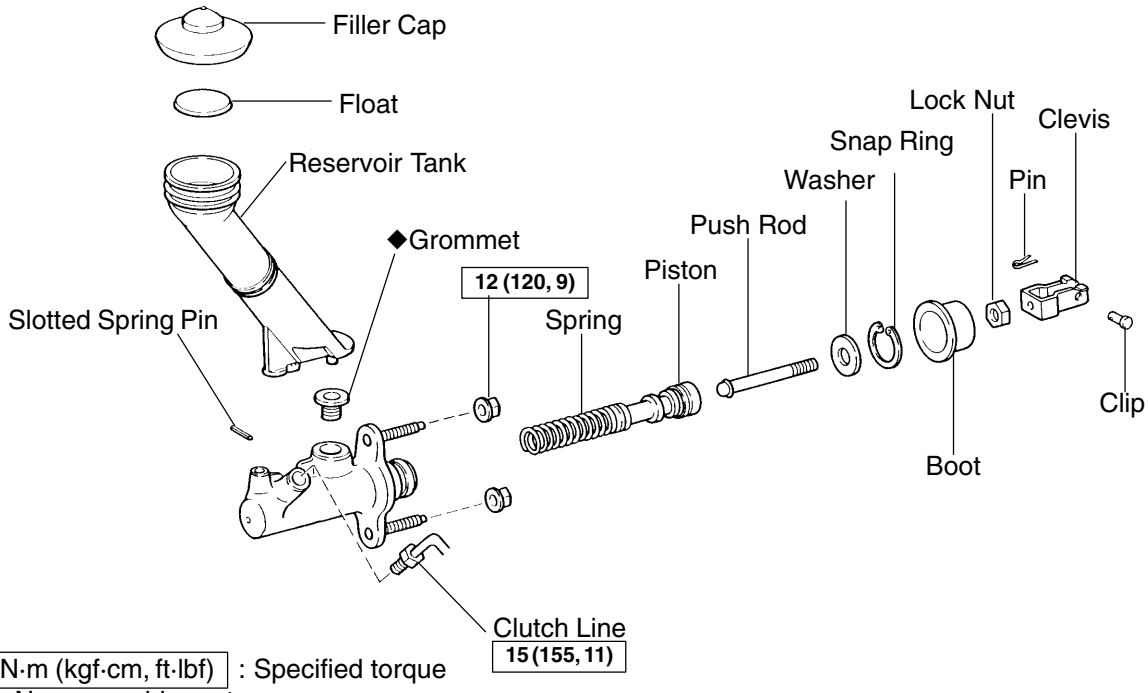
COMPONENTS

CL016–03

LHD:



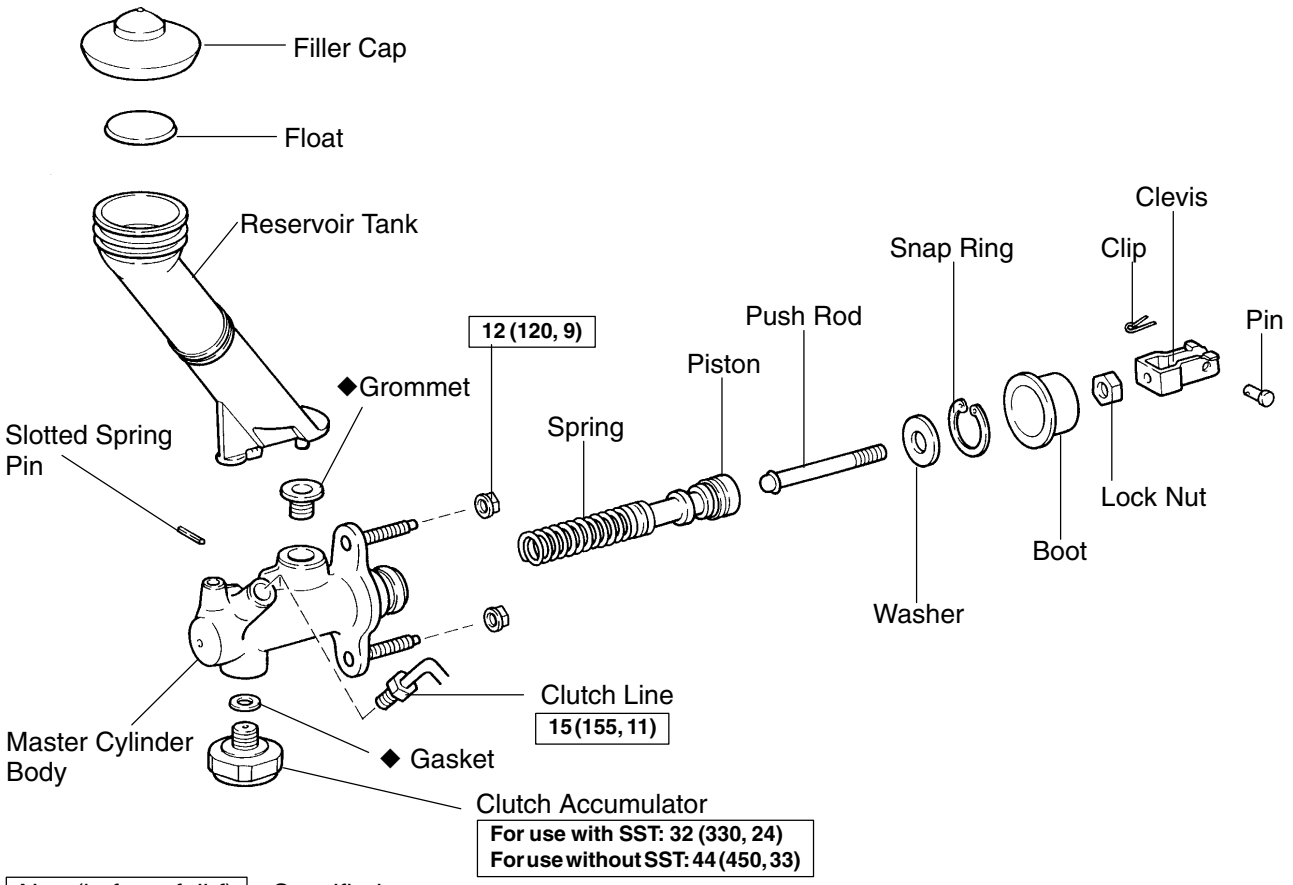
1ZZ–FE, 3ZZ–FE, 1AZ–FSE Engine RHD:



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

D02178

1CD–FTV Engine RHD:



N·m (kgf·cm, ft·lbf) : Specified torque

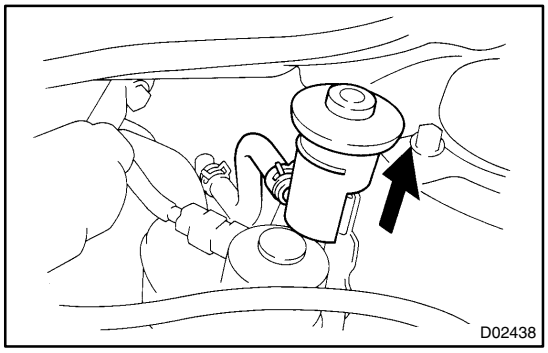
◆ Non–reusable part

D02437

CL017–07

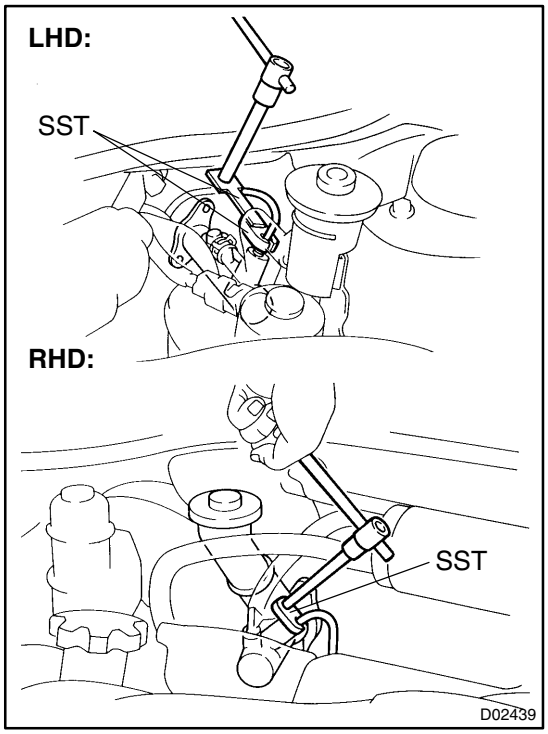
REMOVAL

1. DRAW OUT FLUID WITH SYRINGE



2. LHD:
DISCONNECT RESERVOIR TANK

Disconnect reservoir tank from reservoir tank bracket.



3. LHD:
DISCONNECT CLUTCH LINE

Using SST, disconnect the clutch line. Use a container to catch the fluid.

SST 09023–00100, 09249–63010

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

4. RHD:
DISCONNECT CLUTCH LINE

Using SST, disconnect the clutch line. Use a container to catch the fluid.

SST 09023–00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

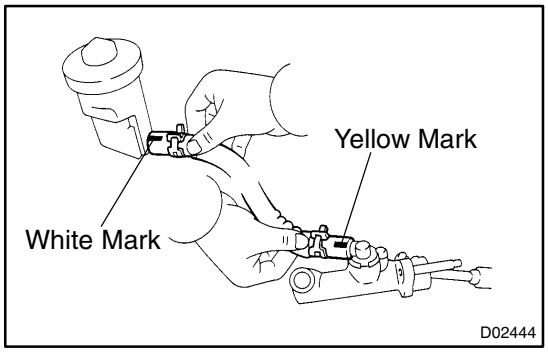
5. REMOVE CLIP AND PIN

6. REMOVE 2 MOUNTING NUTS AND PULL OUT MASTER CYLINDER AND GASKET

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

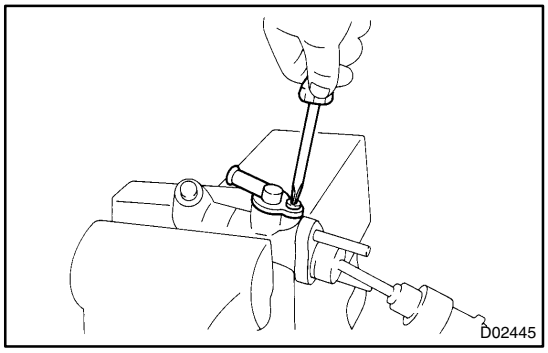
CL051–02

DISASSEMBLY

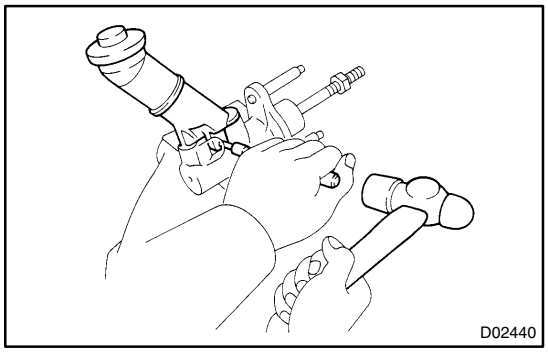


1. LHD:
REMOVE RESERVOIR TANK

(a) Using a pliers, disconnect the 2 clips.
(b) Remove the reservoir tank from reservoir hose.
(c) Remove the reservoir hose from inlet union.

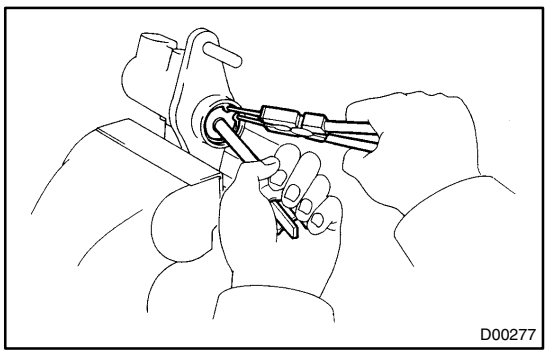


(d) Remove the inlet union.



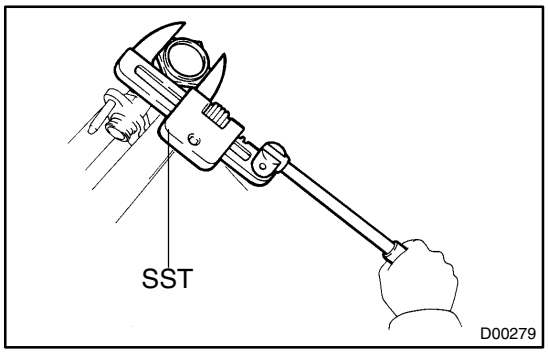
2. RHD:
REMOVE RESERVOIR TANK

(a) Using a pin punch and hammer, drive out the slotted spring pin.
(b) Remove the reservoir tank and grommet.



3. REMOVE PUSH ROD

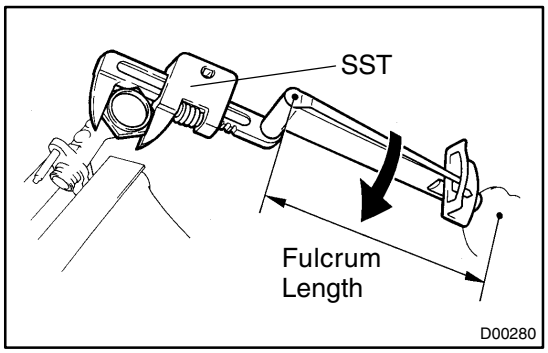
(a) Pull back the boot and remove the snap ring with snap ring pliers.
(b) Pull out the push rod and washer.
(c) Remove the piston from the cylinder.



4. 1CD–FTV ENGINE RHD:
REMOVE CLUTCH ACCUMULATOR

Using SST, remove the accumulator and gasket.
SST 09922–10010

CL052–03



REASSEMBLY

1. 1CD–FTV ENGINE RHD:
INSTALL CLUTCH ACCUMULATOR

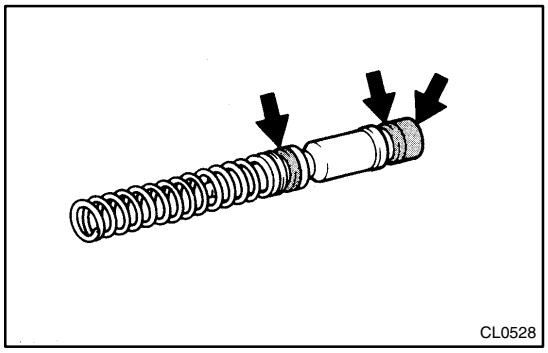
Using SST, install the accumulator with a new gasket.

SST 09922–10010

Torque:
For use with SST:
32 N·m (330 kgf·cm, 24 ft·lbf)
For use without SST
44 N·m (450 kgf·cm, 33 ft·lbf)

HINT:

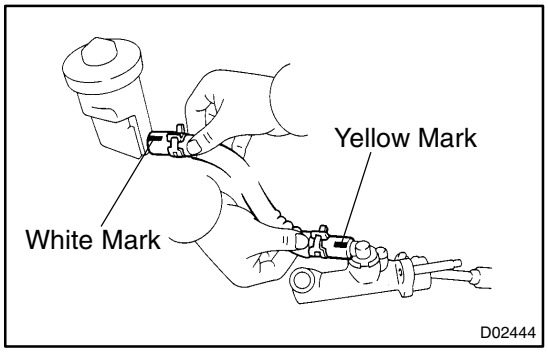
Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).



2. COAT PARTS WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN IN ILLUSTRATION

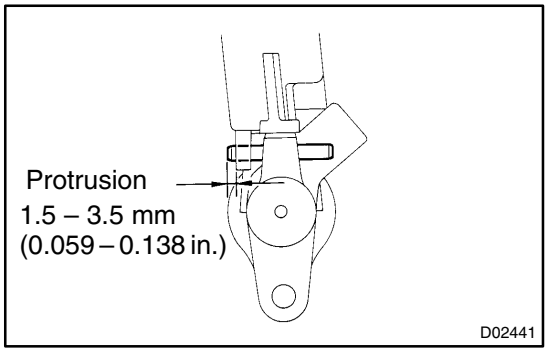
3. INSERT PISTON INTO CYLINDER

4. INSTALL PUSH ROD ASSEMBLY WITH NEW GASKET AND NEW PISTON STOP PLATE



5. LHD:
INSTALL RESERVOIR TANK

(a) Install the O–ring and inlet union.
(b) Facing the white mark upwards, install the reservoir hose to the reservoir tank.
(c) Facing the yellow mark upwards, install the reservoir hose to the cylinder.
(d) Using a pliers, connect the 2 clips.



6. RHD:
INSTALL RESERVOIR TANK

(a) Install the reservoir tank and a new grommet.
(b) Using a pin punch and hammer, drive in the slotted spring pin.

CL01A–02

INSTALLATION

Installation is in the reverse order of removal (See page CL–5).

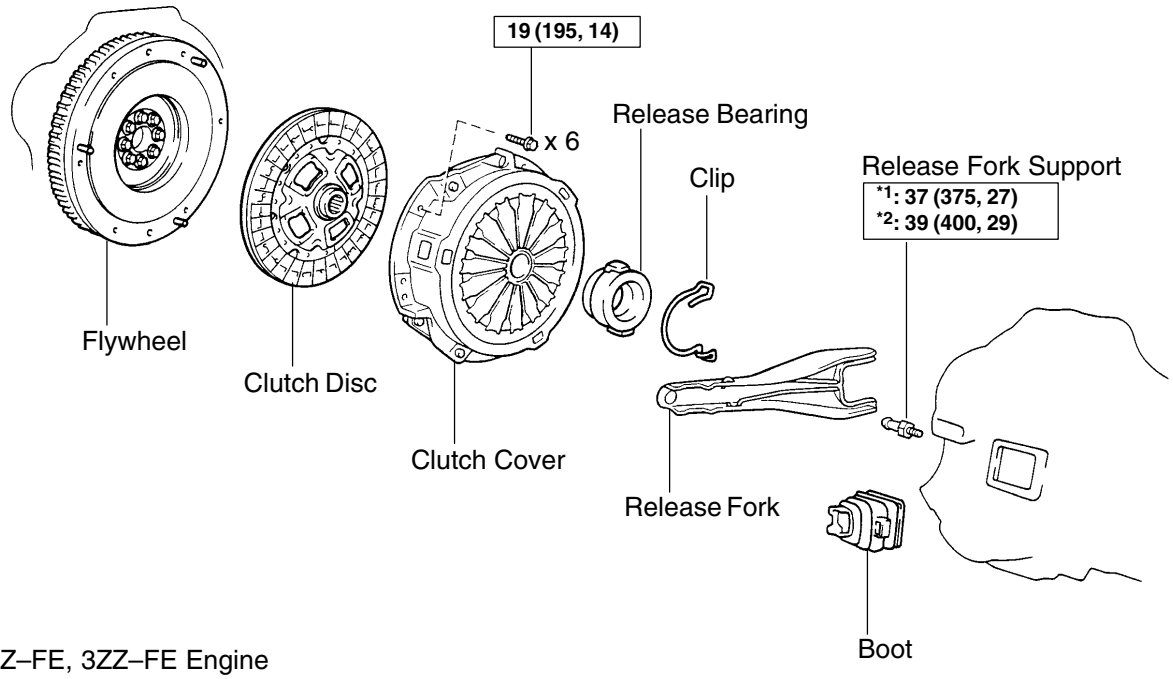
HINT:

After installation, bleed the clutch system and adjust the clutch pedal.

CLUTCH UNIT

COMPONENTS

CL01J–04



*1: 1ZZ–FE, 3ZZ–FE Engine
*2: 1CD–FTV Engine

N·m (kgf·cm, ft·lbf) : Specified torque

D00201

CL01K–04

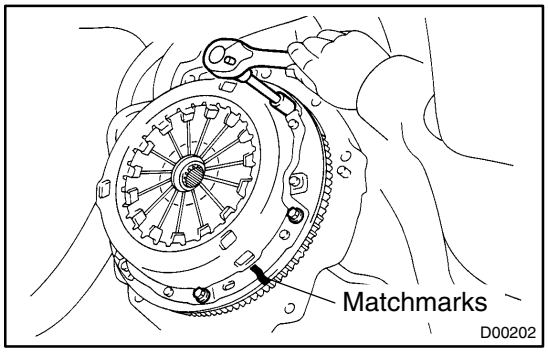
REMOVAL

1. REMOVE TRANSAXLE FROM ENGINE

C50, C250 M/T: See page MX–2

S54, S55 M/T: See page MX–2

E351 M/T: See page MX–2



2. REMOVE CLUTCH COVER AND DISC

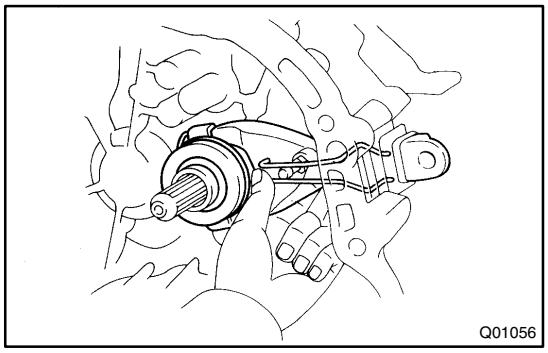
(a) Place matchmarks on the flywheel and clutch cover.

(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 with the clutch disc.

NOTICE:

Do not drop the clutch disc.

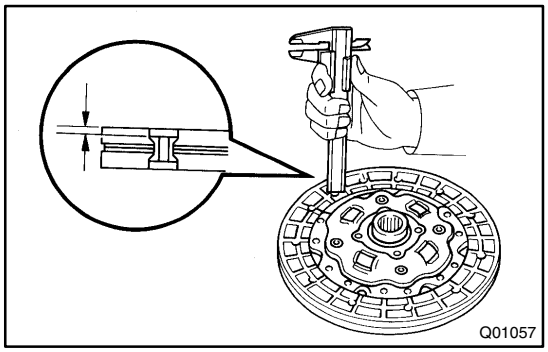


3. REMOVE RELEASE BEARING AND FORK FROM TRANSAXLE

Remove the release bearing with the fork together and then separate them.

CL01L–04

INSPECTION

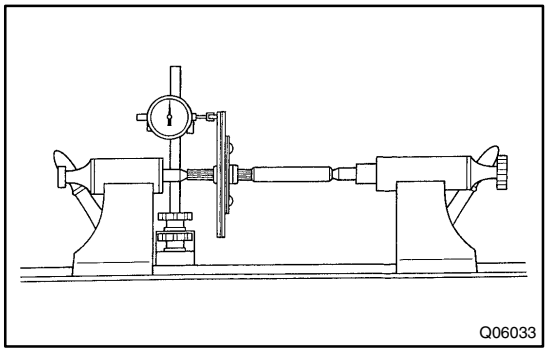


1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using calipers, measure the rivet head depth.

Minimum rivet depth:
0.3 mm (0.012in.)

If necessary, replace the clutch disc.

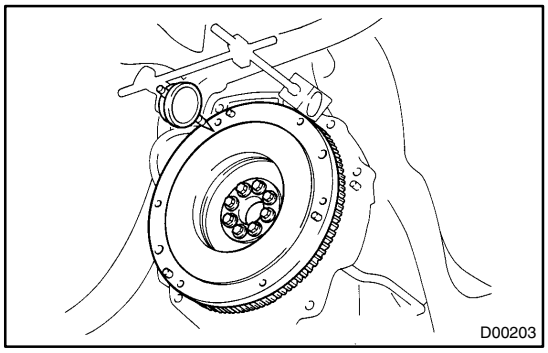


2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator, check the disc.

Maximum runout:
0.8 mm (0.031 in.)

If necessary, replace the clutch disc runout.

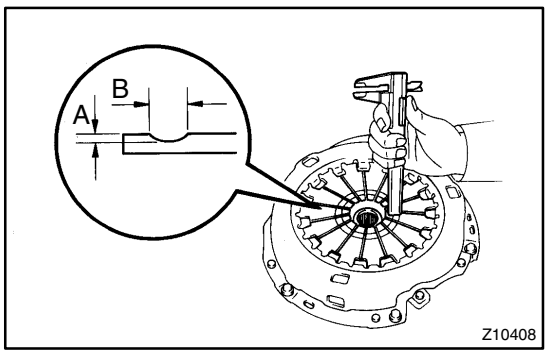


3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator, check the flywheel runout.

Maximum runout:
0.1 mm (0.004 in.)

If necessary, replace the flywheel.

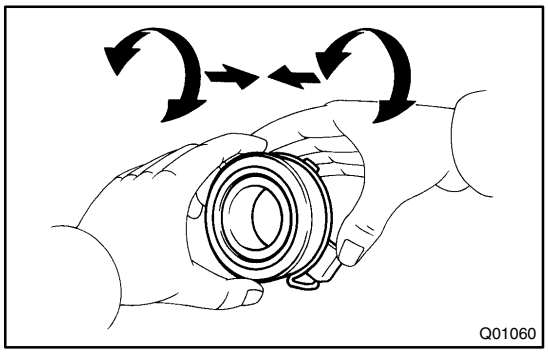


4. INSPECT DIAPHRAGM SPRING FOR WEAR

Using calipers, measure the diaphragm spring for depth and width of wear.

Maximum runout:
A (Depth): 0.5 mm (0.020 in.)
B (Width): 6.0 mm (0.236 in.)

If necessary, replace the clutch cover.



5. INSPECT RELEASE BEARING

Turn the bearing by hand while applying force in the axial direction.

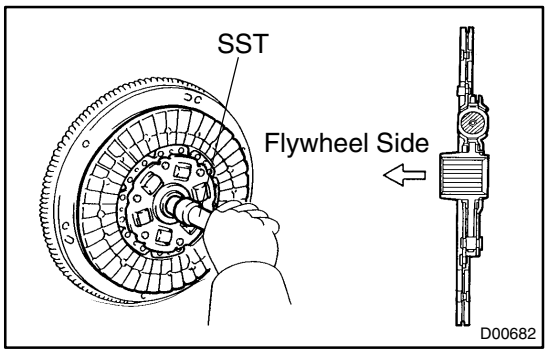
HINT:

The bearing is permanently lubricated and requires no cleaning or lubrication.

If necessary, replace the release bearing.

CL01M–04

INSTALLATION



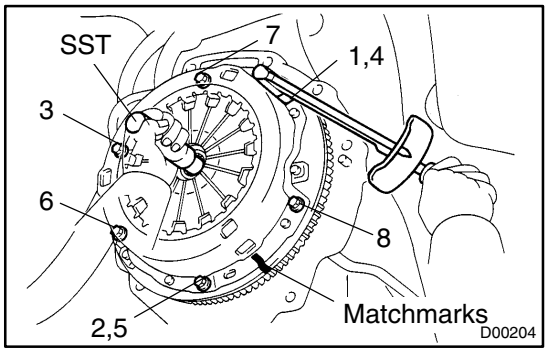
1. INSTALL CLUTCH DISC AND CLUTCH COVER ON FLYWHEEL

(a) 1CD–FTV Engine:
Insert SST in the clutch disc, and then insert them in the flywheel.
SST 09301–00210

HINT:
Take care not to insert clutch disc in the wrong direction.

(b) Others:
Insert SST in the clutch disc, and then insert them in the flywheel.
SST 09301–00120

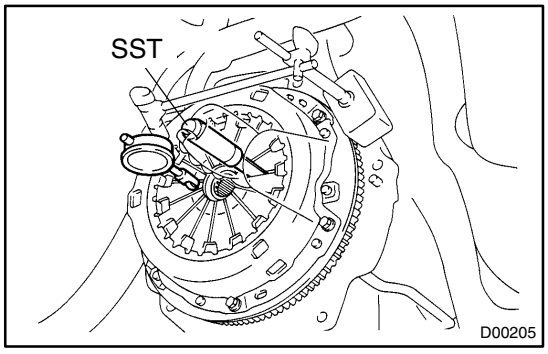
HINT:
Take care not to insert clutch disc in the wrong direction.



(c) Align the matchmark on the clutch cover with the one on the flywheel.

(d) Torque the bolts on the clutch cover in the order shown in the illustration.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

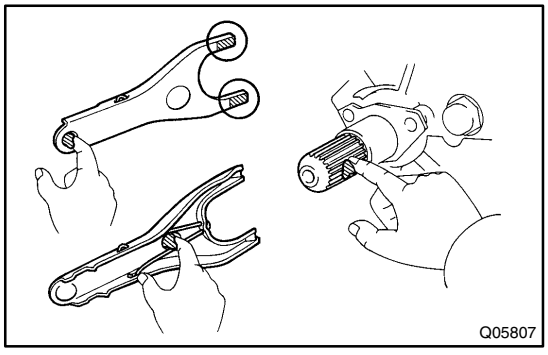
HINT:
Temporarily tighten the No.1 and No.2 bolts.



2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT

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



3. APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO.2)

(a) Apply release hub grease to the following parts.
- Release fork and hub contact point
- Release fork and push rod contact point
- Release fork pivot point

(b) Apply clutch spline grease.
- Clutch disc spline

HINT:
Recommended grease part number 08887–01706 (100g).

4. INSTALL RELEASE BEARING AND FORK TO TRANSAXLE

Install the bearing to the release fork, and then install them to the transaxle.

5. INSTALL TRANSAXLE TO ENGINE

C50, C250 M/T: See page MX–2
S54, S55 M/T: See page MX–2
E351 M/T: See page MX–2

MANUAL TRANSAXLE (C50, C250)

TROUBLESHOOTING MX–1
MANUAL TRANSAXLE UNIT MX–2
MANUAL TRANSAXLE ASSEMBLY MX–8
INPUT SHAFT MX–23
OUTPUT SHAFT MX–30
SHIFT AND SELECT LEVER SHAFT MX–37
DIFFERENTIAL CASE MX–38
SHIFT LEVER AND CONTROL CABLE MX–45

TROUBLESHOOTING

MX002–02

PROBLEM SYMPTOMS TABLE

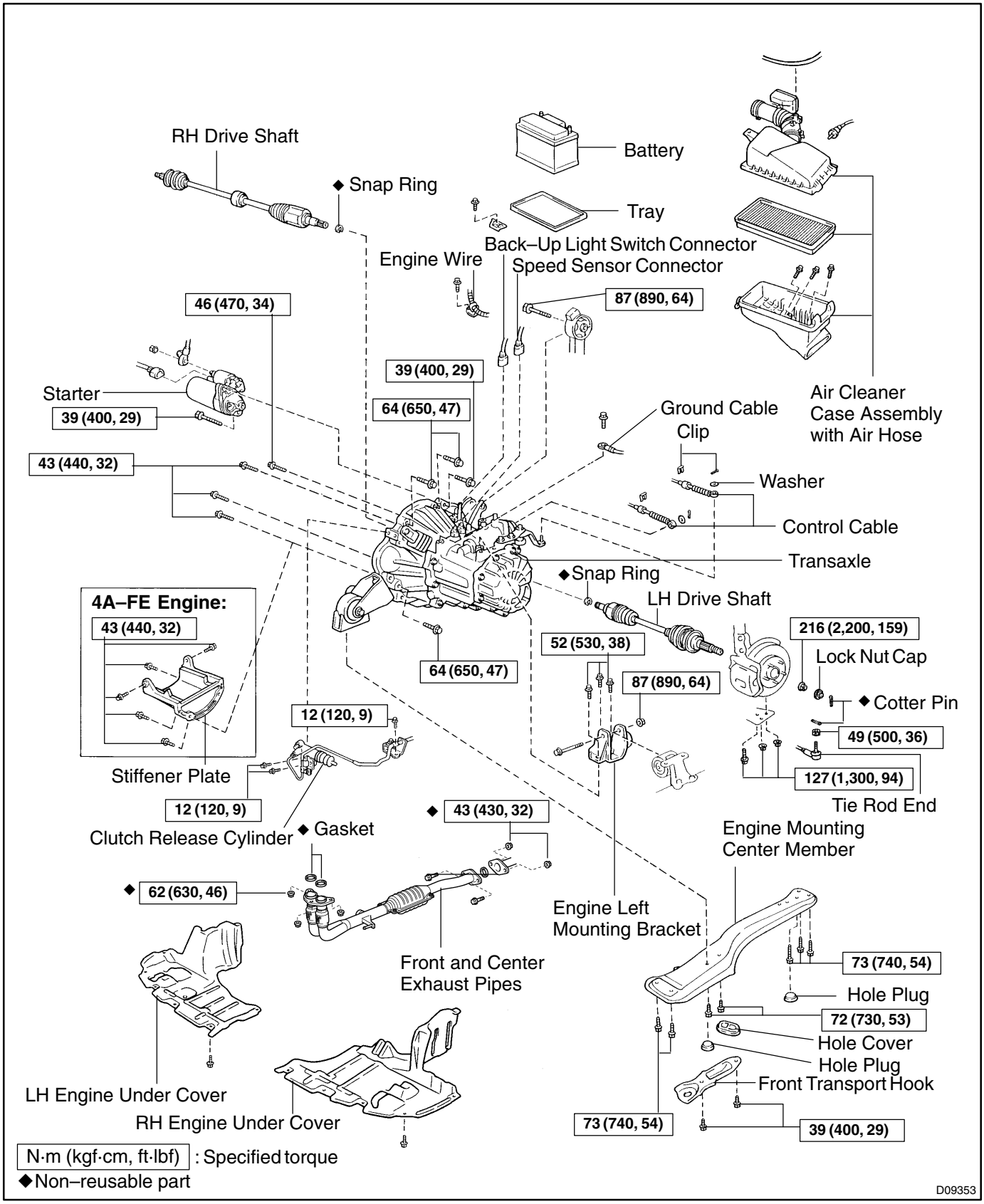
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace parts.

Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–3
	2. Oil (Wrong)	MX–3
	3. Gear (Worn or damaged)	MX–8
	4. Bearing (Worn or damaged)	MX–8
Oil leakage	1. Oil (Level too high)	MX–3
	2. Gasket (Damaged)	MX–8
	3. Oil seal (Worn or damaged)	MX–8
	4. O–Ring (Worn or damaged)	MX–8
Hard to shift or will not shift	1. Control cable (Faulty)	MX–45
	2. Synchronizer ring (Worn or damaged)	MX–8 MX–23 MX–30
	3. Shift key spring (Damaged)	MX–8 MX–23 MX–30
Jumps out of gear	1. Locking ball spring (Damaged)	MX–8
	2. Shift fork (Worn)	MX–8
	3. Gear (Worn or damaged)	MX–8
	4. Bearing (Worn or damaged)	MX–8

MANUAL TRANSAXLE UNIT

COMPONENTS

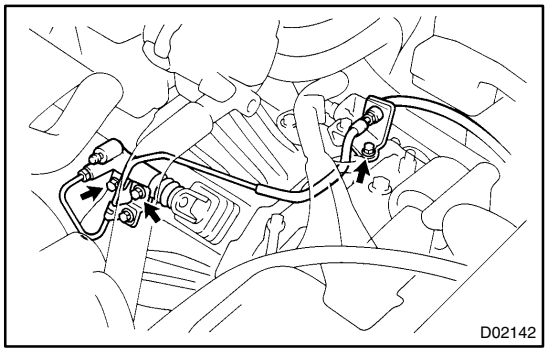
MX06E–02



MX0CZ–01

REMOVAL

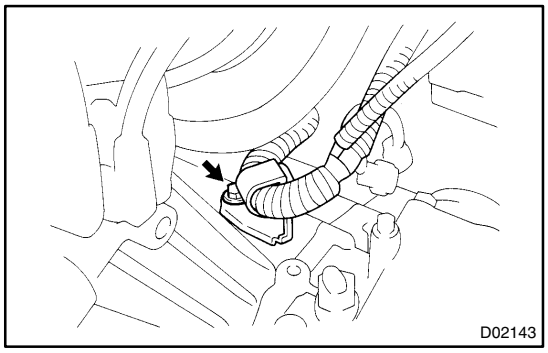
1. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE



2. DISCONNECT CLUTCH RELEASE CYLINDER AND LINE

(a) Remove the set bolt of the clutch line bracket.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

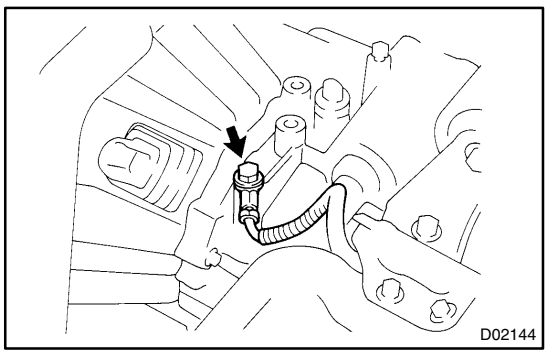
(b) Remove the 2 bolts and disconnect the clutch release cylinder and line.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



3. DISCONNECT ENGINE WIRE FROM CLAMP

Remove the bolt and engine wire clamp from the transaxle.

4. DISCONNECT BACK–UP LIGHT SWITCH AND SPEED SENSOR CONNECTORS



5. DISCONNECT GROUND CABLE

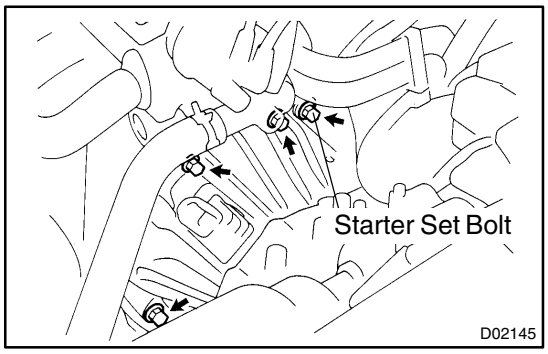
Remove the set bolt and disconnect the ground cable from the transaxle.

6. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips from the cables.

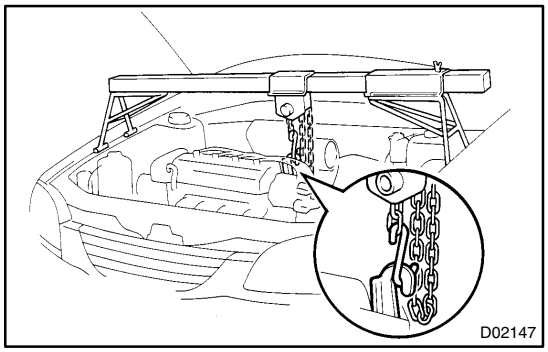
(c) Disconnect the 2 control cables from the transaxle.



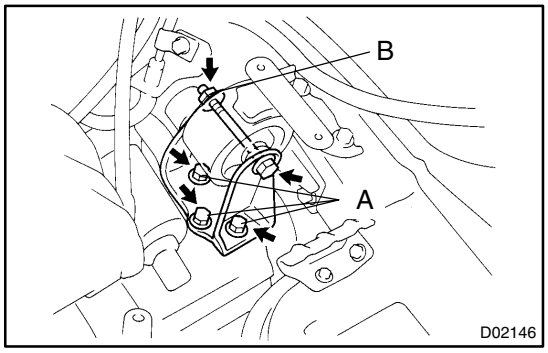
7. REMOVE STARTER SET BOLT

Remove the set bolt of the starter from the transaxle upper side.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

8. REMOVE 3 TRANSAXLE UPPER SIDE MOUNTING BOLTS
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



9. INSTALL ENGINE SUPPORT FIXTURE



10. REMOVE ENGINE LEFT MOUNTING BRACKET

Remove the 4 bolts, nut and bracket.

Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B : 87 N·m (890 kgf·cm, 64 ft·lbf)

11. REMOVE FRONT WHEEL

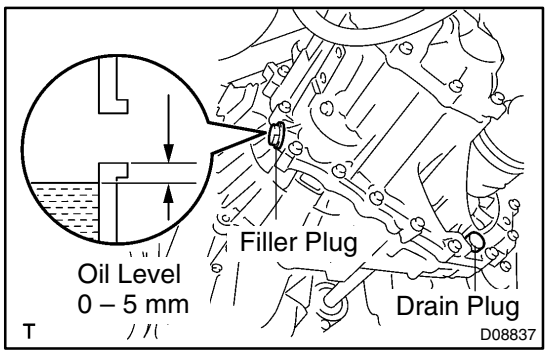
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)

12. RAISE VEHICLE

NOTICE:

Make sure that the vehicle is securely supported.

13. REMOVE LH AND RH ENGINE UNDER COVERS

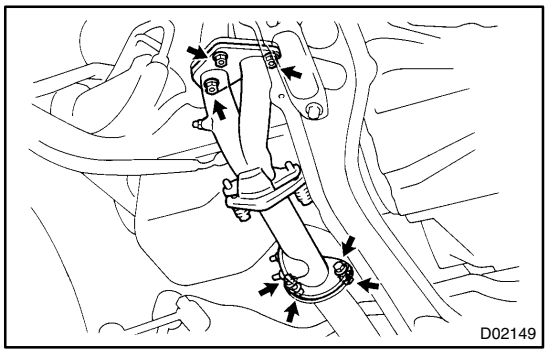


14. DRAIN TRANSAXLE OIL

Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 1.9 liters (2.0 US qts, 1.7 Imp. qts)
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

15. REMOVE LH AND RH DRIVE SHAFTS

(See page SA–1)



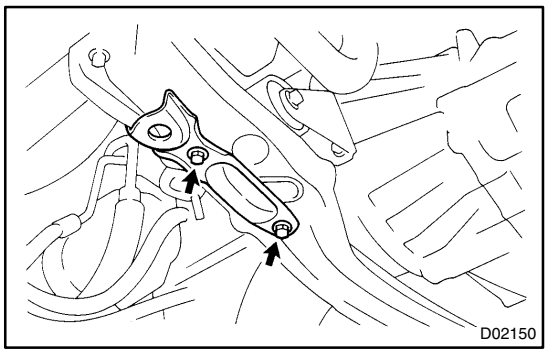
16. REMOVE FRONT AND CENTER EXHAUST PIPES

(a) Remove the 3 nuts and 2 gaskets from the exhaust manifold.

Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

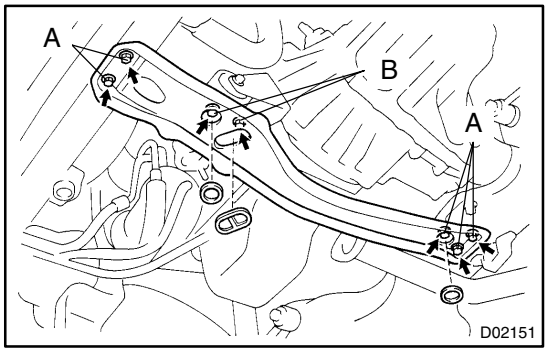
(b) Remove the 2 bolts, nuts, gasket and front and center exhaust pipes.

Torque: 43 N·m (430 kgf·cm, 32 ft·lbf)

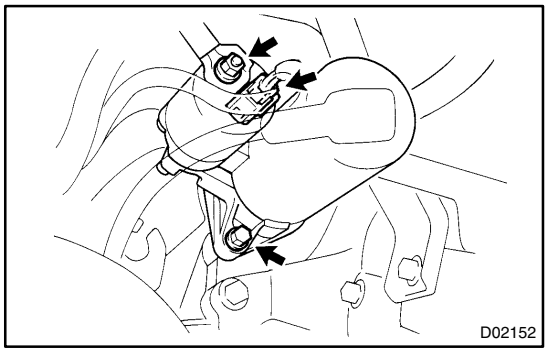


17. REMOVE ENGINE MOUNTING CENTER MEMBER

(a) Remove the 2 bolts and front transport hook.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



(b) Remove the 2 hole plugs and hole cover.
(c) Remove the 7 bolts and center member.
Torque:
Bolt A: 73 N·m (740 kgf·cm, 54 ft·lbf)
Bolt B: 72 N·m (730 kgf·cm, 53 ft·lbf)

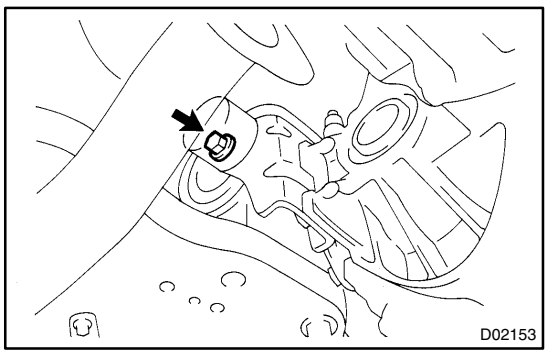


18. REMOVE STARTER

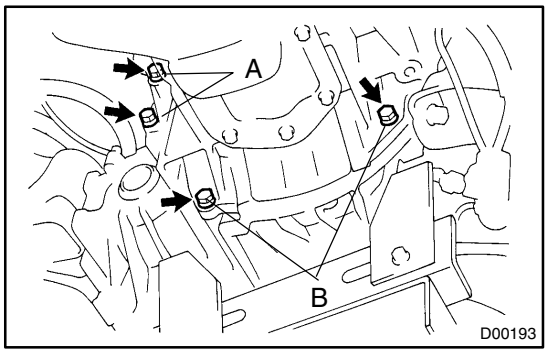
(a) Disconnect the connector and wire from the starter.
(b) Remove the set bolt of the starter from the lower side.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
(c) Remove the starter.

19. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



20. REMOVE ENGINE REAR MOUNTING BOLT
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)



21. REMOVE 4 TRANSAXLE LOWER SIDE MOUNTING BOLT

Remove the 4 bolts.
Torque:
Bolt A: 47 N·m (480 kgf·cm, 35 ft·lbf)
Bolt B: 23 N·m (230 kgf·cm, 17 ft·lbf)

22. REMOVE TRANSAXLE

Lower the engine left side and remove the transaxle from the engine.

HINT:

At the time of installation, please refer to the following items.

- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

MX005–04

INSTALLATION

Installation is in the reverse order of removal (See page MX–3).

HINT:

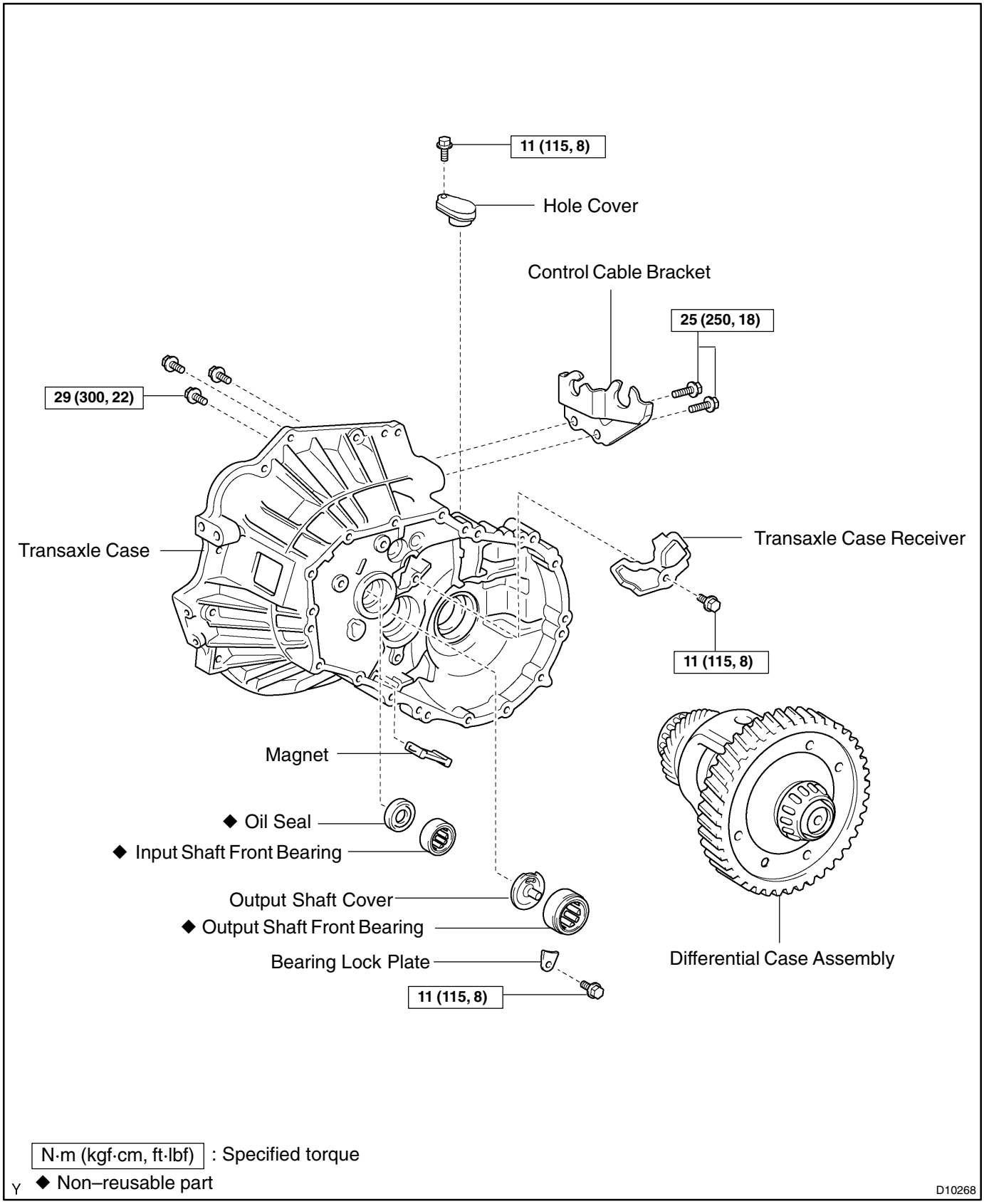
After installation, check and inspect items as follows.

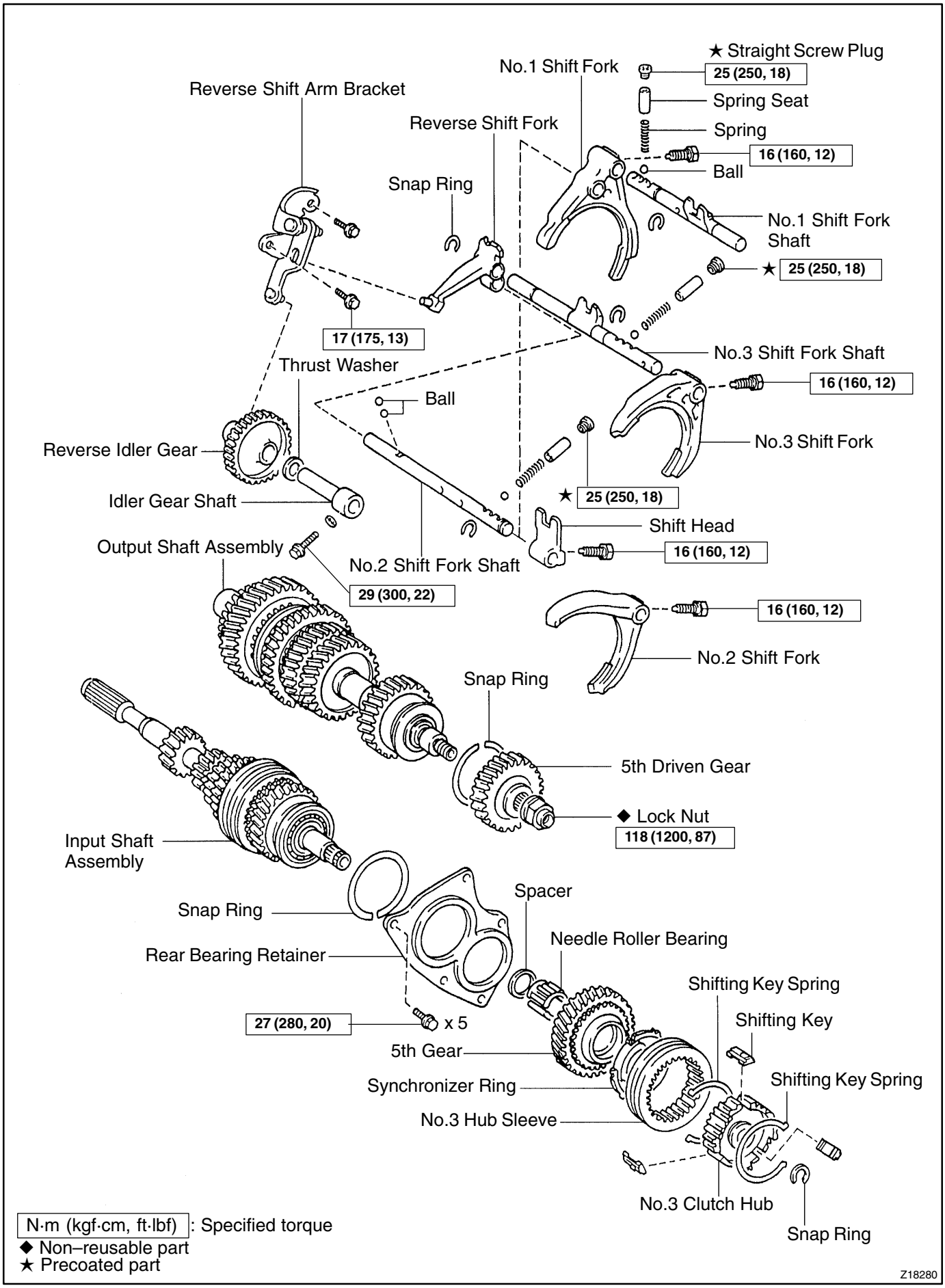
- Front wheel alignment (See Pub. No. RM599E on page SA–4).
- Do the road test.

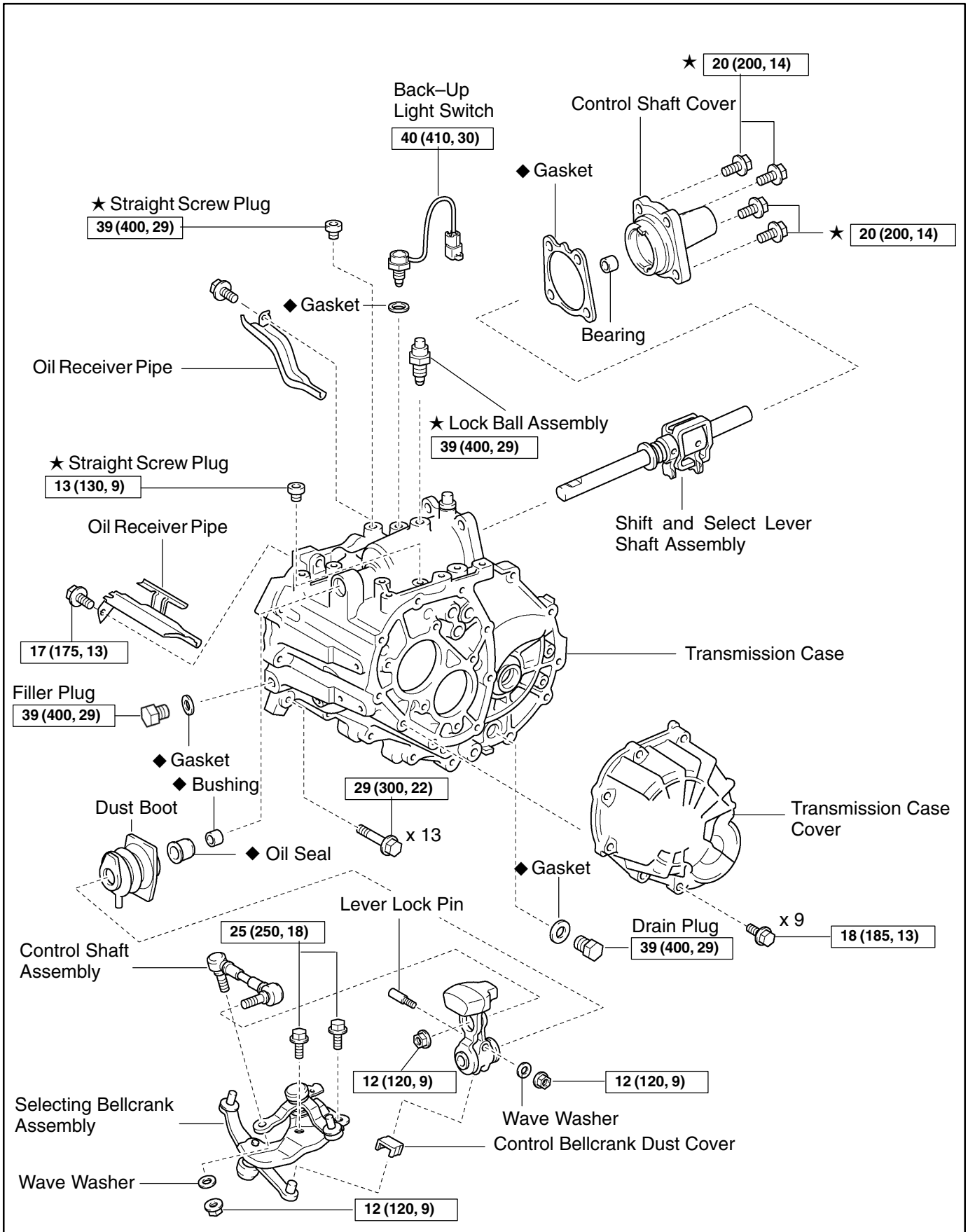
MANUAL TRANSAXLE ASSEMBLY

COMPONENTS

MX006–06




★ Straight Screw Plug
25 (250, 18)
No.1 Shift Fork
Spring Seat
Spring
16 (160, 12)
Ball
Reverse Shift Arm Bracket
Reverse Shift Fork
Snap Ring
No.1 Shift Fork Shaft
★ 25 (250, 18)
17 (175, 13)
No.3 Shift Fork Shaft
16 (160, 12)
Thrust Washer
Ball
Reverse Idler Gear
No.3 Shift Fork
★ 25 (250, 18)
Idler Gear Shaft
Shift Head
16 (160, 12)
Output Shaft Assembly
No.2 Shift Fork Shaft
29 (300, 22)
16 (160, 12)
No.2 Shift Fork
Snap Ring
5th Driven Gear
◆ Lock Nut
118 (1200, 87)
Input Shaft Assembly
Spacer
Snap Ring
Needle Roller Bearing
Rear Bearing Retainer
Shifting Key Spring
Shifting Key
27 (280, 20)
x 5
5th Gear
Synchronizer Ring
Shifting Key Spring
No.3 Hub Sleeve
No.3 Clutch Hub
Snap Ring
N·m (kgf·cm, ft·lbf): Specified torque
◆ Non–reusable part
★ Precoated part
Z18280



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part

D10269

MX0D0–01

DISASSEMBLY

1. REMOVE RELEASE FORK AND BEARING

HINT:

At the time of reassembly, please refer to the following item.

Apply molybdenum disulphide lithium base grease.

(See page CL–12)

2. REMOVE BOLT AND SPEED SENSOR

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

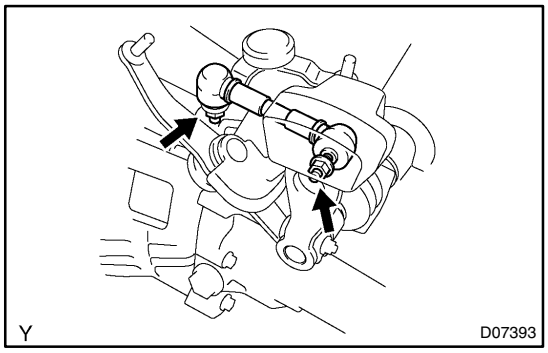
3. REMOVE BACK–UP LIGHT SWITCH

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

4. REMOVE CONTROL CABLE BRACKET

Remove the 2 bolts and control cable bracket.

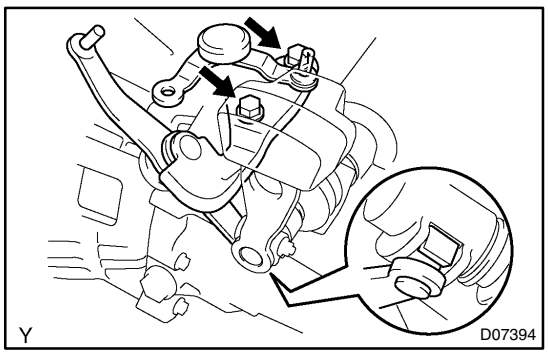
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



5. REMOVE CONTROL SHAFT ASSEMBLY

Remove the 2 nuts, wave washer and control shaft assembly.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



6. REMOVE SELECTING BELLCRANK ASSEMBLY

(a) Remove the 2 bolts and selecting bellcrank assembly.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

NOTICE:

At the time of reassembly, please refer to the following item.

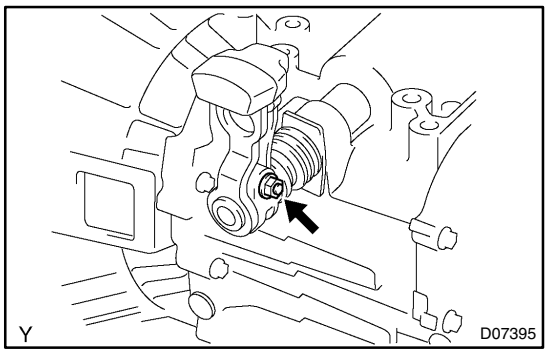
Fit the selecting bellcrank assembly pin part with the dust cover into a groove in the control shift lever.

(b) Remove the control bellcrank dust cover from the selecting bellcrank assembly.

NOTICE:

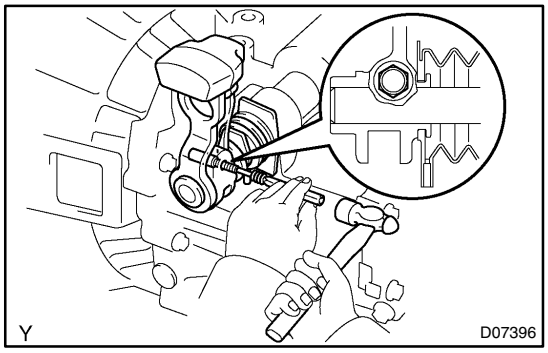
At the time of reassembly, please refer to the following item.

Apply MP grease to the inside circumferential surface of the control bellcrank dust cover.



7. REMOVE CONTROL SHIFT LEVER AND DUST BOOT

(a) Remove the nut and wave washer.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



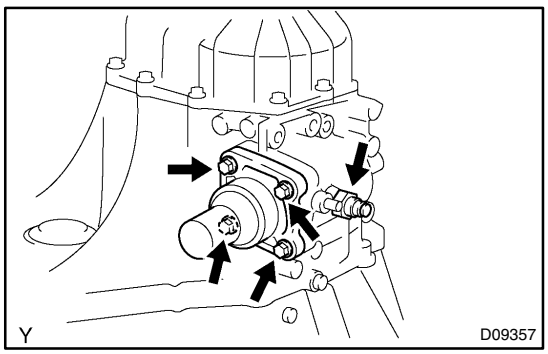
(b) Using a pin punch and hammer, drive out the lever lock pin.

NOTICE:
At the time of reassembly, please refer to the following item.
When fixing the lever lock pin, properly position the shaft groove.

(c) Remove the control shift lever and dust boot.

NOTICE:
At the time of reassembly, please refer to the following items.

- **Install the dust boot into a groove in the control shift lever.**
- **Be sure to install the dust boot in the correct direction, as shown in the illustration.**

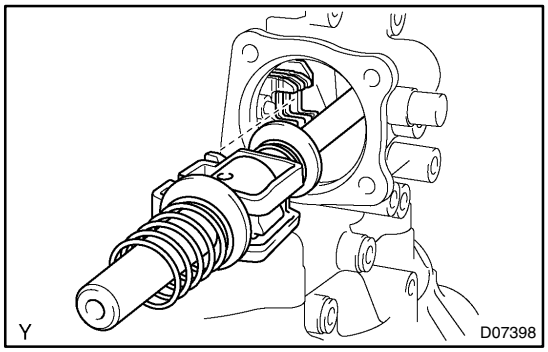


8. REMOVE PLUG, LOCK BALL ASSEMBLY AND CONTROL SHAFT COVER ASSEMBLY

(a) Using a hexagon wrench, remove the plug and gasket.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(b) Remove the lock ball assembly.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(c) Remove the 4 bolts and control shaft cover assembly with the gasket.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



9. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY

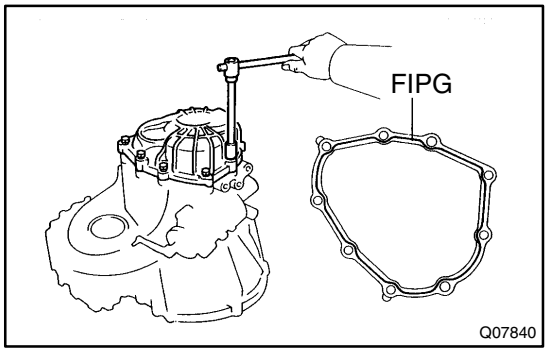
(a) Remove the shift and select lever shaft assembly.

NOTICE:

At the time of reassembly, please refer to the following item.

Set the claws of the shift interlock plate into the shift head part of the gear shift fork shaft securely.

(b) Remove the select spring seat and compression spring from the shift and select lever shaft assembly.



10. REMOVE TRANSMISSION CASE COVER

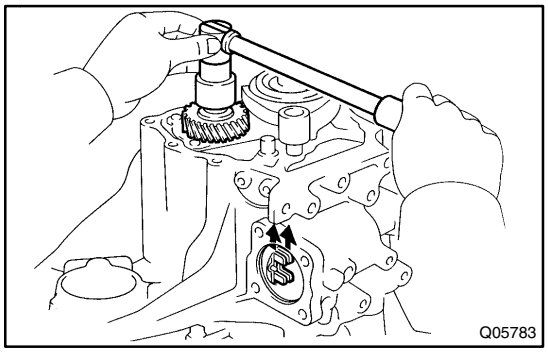
(a) Remove the 9 bolts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(b) Using a brass bar and hammer, carefully tap the projection of the transmission case cover to remove the transmission case cover from the transmission case.

FIPG:

Part No. 08826–00090, THREE BOND 1281 or equivalent



11. REMOVE LOCK NUT

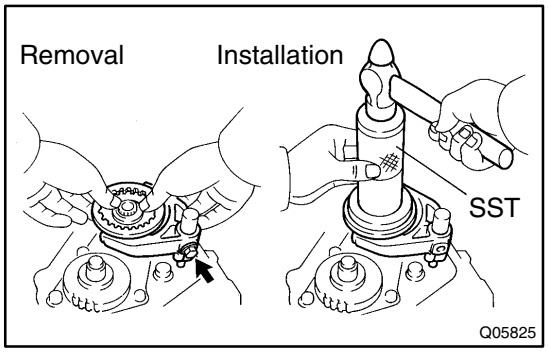
(a) Engage the gear to the double meshing.

(b) Using a chisel and hammer, loosen the staked part of the nut.

(c) Remove the lock nut.

Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

(d) Disengage the gear double meshing.



12. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

(a) Remove the bolt from the No.3 shift fork.

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

(b) Remove the No.3 hub sleeve with the shift fork.

HINT:

At the time of reassembly, please refer to the following item.

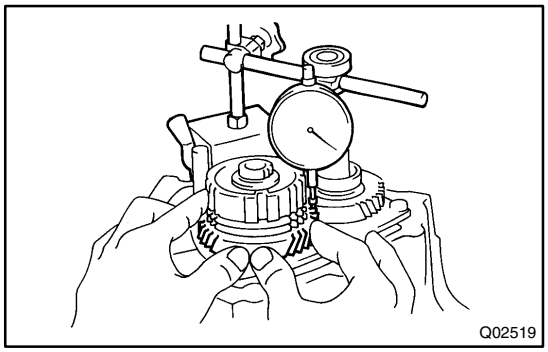
Using SST and a hammer, drive in the No.3 hub sleeve with the shift fork.

SST 09636–20010

NOTICE:

At the time of installation, please refer to the following item.

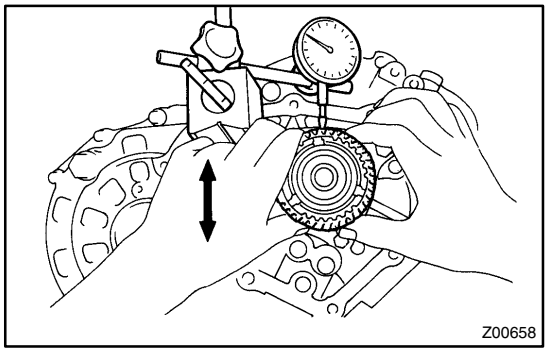
Align the synchronizer ring slots with the shifting keys.



13. INSPECT 5TH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.

Standard clearance:
0.10–0.57 mm (0.0039–0.0024 in.)
Maximum clearance:
0.57 mm (0.0224 in.)

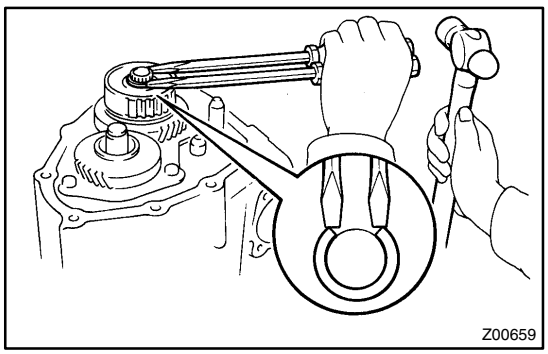


14. INSPECT 5TH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance.

Standard clearance:
KOYO made:
0.015–0.058 mm (0.0006–0.0023 in.)
NSK made:
0.015–0.056 mm (0.0006–0.0022 in.)
Maximum clearance:
KOYO made:0.058 mm (0.0023 in.)
NSK made:0.056 mm (0.0022 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



15. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

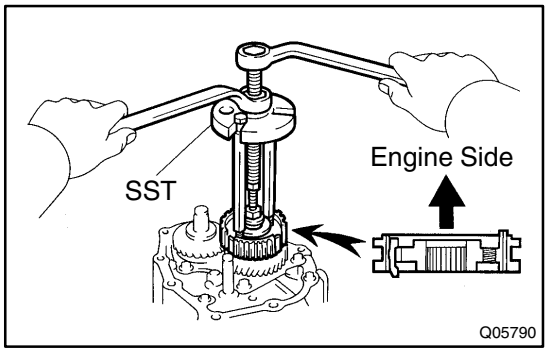
HINT:

At the time of reassembly, please refer to the following item.

Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.25 (0.0886)	E	2.49 (0.0980)
B	2.31 (0.0909)	F	2.55 (0.1004)
C	2.37 (0.0933)	G	2.61 (0.1028)
D	2.43 (0.0957)	–	–

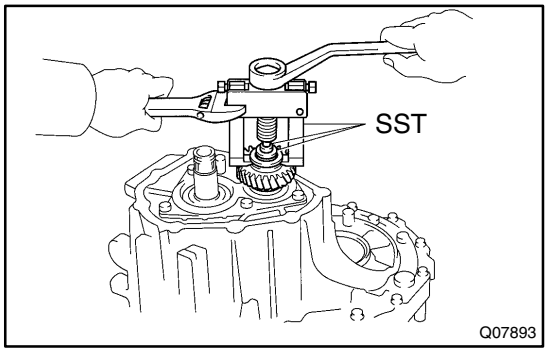
(b) Using a screwdriver, remove the key spring.



(c) Install a bolt and washer to the tip of the input shaft and using SST, remove the No.3 clutch hub.
SST 09950–30011

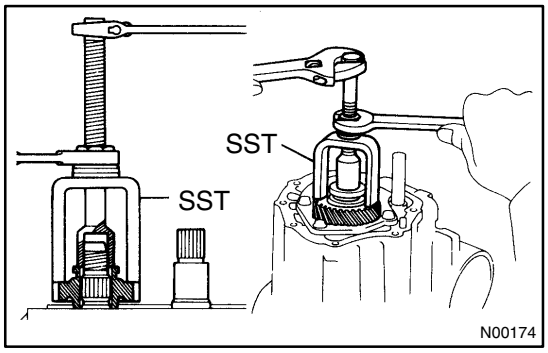
NOTICE:
Select a bolt whose outer diameter is smaller than the screw hole of the input shaft so that it can be turned easily.

(d) Remove the synchronizer ring, 5th gear and needle roller bearing.

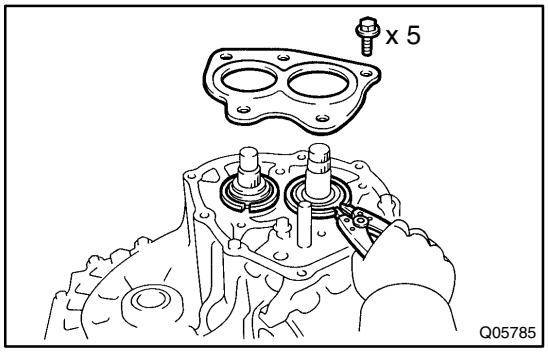


16. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.
SST 09628–62011, 09950–40011 (09957–04010), 09950–60010 (09951–00230)



HINT:
At the time of reassembly, please refer to the following item.
Using SST, install the 5th driven gear.
SST 09309–12020

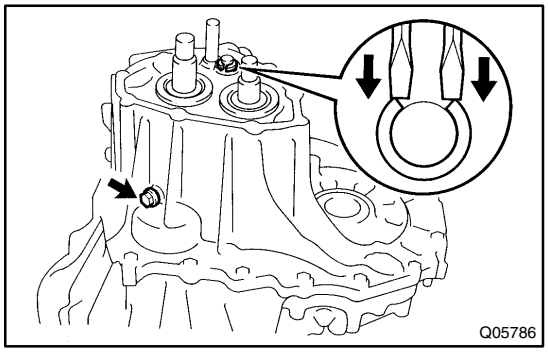


17. REMOVE REAR BEARING RETAINER

Remove the 5 bolts and retainer.
Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)

18. REMOVE BEARING SNAP RING

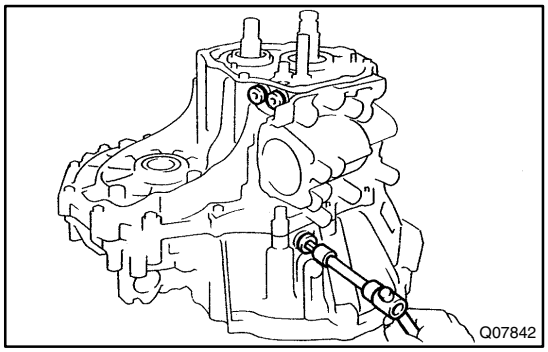
Using a snap ring expander, remove the 2 snap rings.
HINT:
If it is difficult to remove and install the snap rings, pull up the shafts.



19. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

20. REMOVE SNAP RING FROM NO.2 SHIFT FORK SHAFT

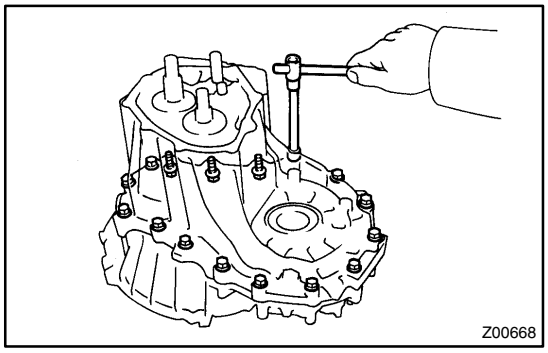
Using 2 screwdrivers and a hammer, tap out the snap ring.



21. REMOVE PLUG, SEAT, SPRING AND BALL

(a) Using a hexagon wrench, remove the 3 plugs.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

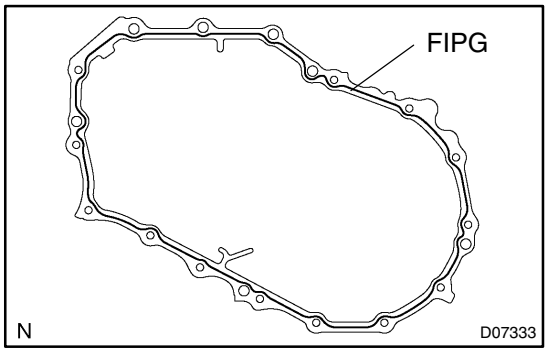
(b) Using a magnetic finger, remove the 3 seats, springs and balls.



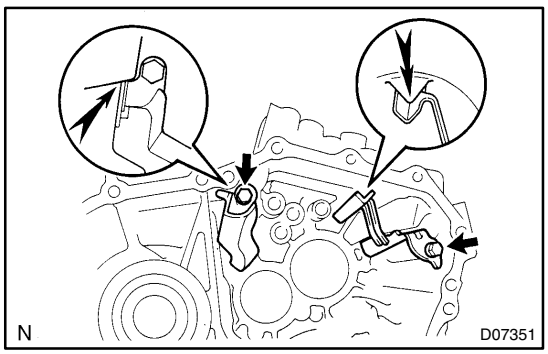
22. REMOVE TRANSMISSION CASE

(a) Remove the 16 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Using a plastic hammer, carefully tap the projection of the transmission case to remove the transmission case from the transaxle case.



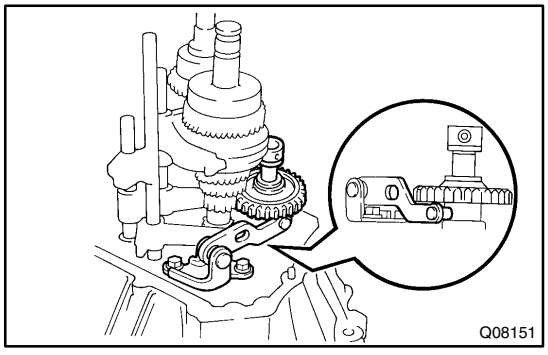
HINT:
At the time of reassembly, please refer to the following item.
Apply FIPG to the transaxle case, as shown in the illustration.
FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent



23. REMOVE OIL RECEIVER PIPE

Remove the 2 bolts and oil receiver pipes from the transmission case.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

NOTICE:
At the time of reassembly, please refer to the following items.
- **Prevent the oil receiver pipes from being deformed.**
- **Install the oil receiver pipes while placing it against the transmission case, as shown in the illustration.**



24. REMOVE REVERSE IDLER GEAR, THRUST WASHER AND SHAFT

25. REMOVE REVERSE SHIFT ARM BRACKET

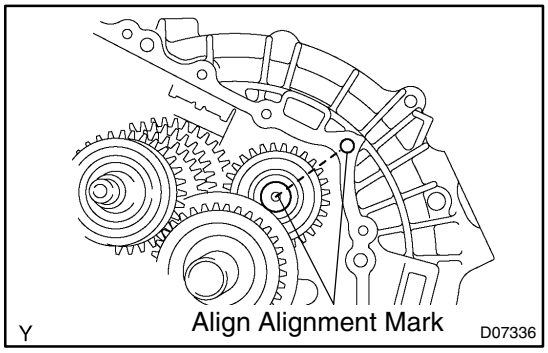
Remove the 2 bolts and reverse shift arm bracket.

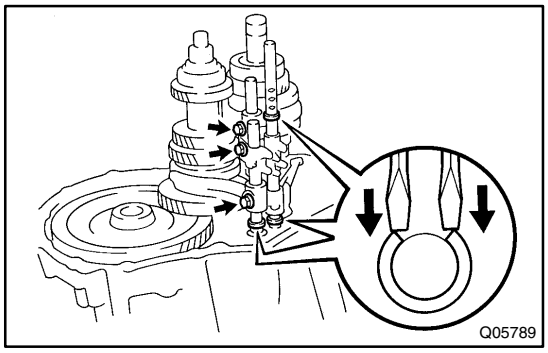
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

NOTICE:

At the time of reassembly, please refer to the following items.

- **Set the pin on the top of the reverse shift arm into a groove on the reverse idler gear.**
- **Fit the claw of the reverse shift arm bracket with the notch of the input shaft front bearing.**
- **Install the reverse idler gear, thrust washer and shaft, as shown in the illustration.**





26. REMOVE GEAR SHIFT FORK AND GEAR SHIFT FORK SHAFT

(a) Using 2 screwdrivers and a hammer, tap out the 3 snap rings from each gear shift fork shaft.

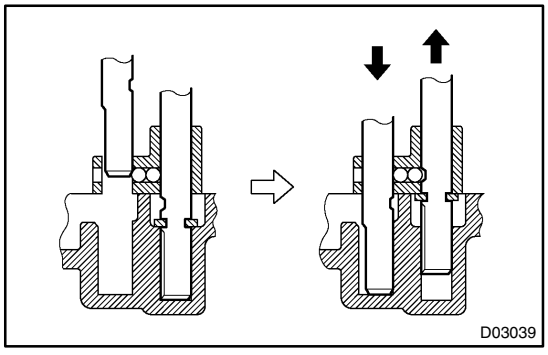
(b) Remove the 3 bolts from the No. 1 gear shift head, No. 1 and No. 2 gear shift forks.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

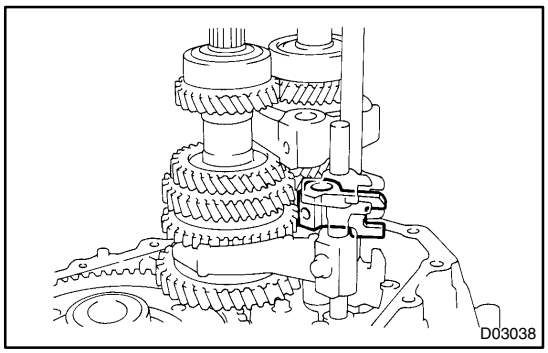
(c) Pull up the No. 3 gear shift fork shaft, remove the No. 2 gear shift fork shaft.



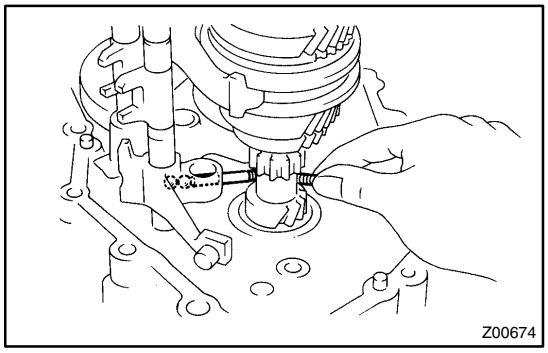
NOTICE:

At the time of reassembly, please refer to the following item.

To avoid the interference of the 2 balls, lift up the No. 3 gear shift fork shaft at the position shown in the illustration.



(d) Remove the No. 1 gear shift head.



(e) Using a magnetic finger, remove the 2 balls from the reverse shift fork.
(f) Remove the No. 3 gear shift fork shaft and reverse shift fork.
(g) Pull out the No. 1 gear shift fork shaft.
(h) Remove the No. 1 and No. 2 gear shift forks.

27. REMOVE INPUT AND OUTPUT SHAFTS TOGETHER FROM TRANSAXLE CASE

28. REMOVE DIFFERENTIAL CASE ASSEMBLY

NOTICE:

At the time of reassembly, please refer to the following item.

Before reassembly, inspect the differential tapered roller bearing preload. (See page MX–42)

29. REMOVE MAGNET FROM TRANSAXLE CASE

30. DISASSEMBLE NO. 3 CLUTCH HUB ASSEMBLY

(a) Using a screwdriver, remove the shifting key spring.

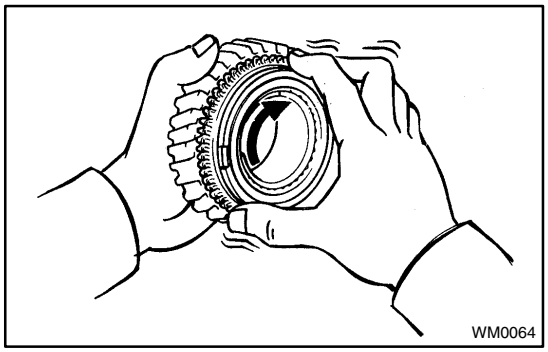
NOTICE:

At the time of reassembly, please refer to the following item.

Position the shifting key springs so that their end gaps are not aligned.

(b) Remove the 3 No. 3 shifting keys from the No. 3 clutch hub.

MX06G–02



INSPECTION

1. INSPECT 5TH GEAR SYNCHRONIZER RING

(a) Check wear or damage.

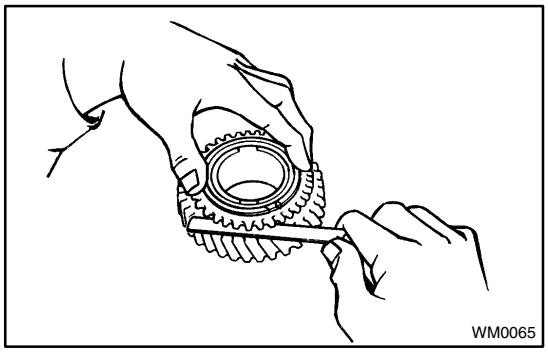
(b) Check the braking effect of the synchronizer ring.
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

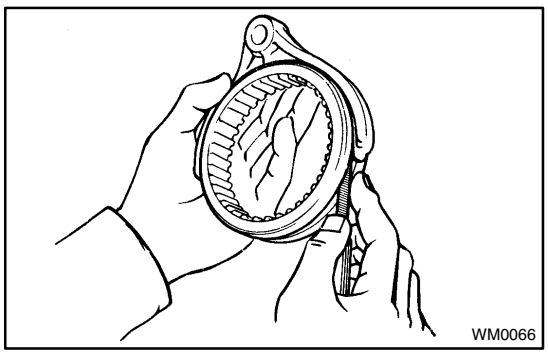


(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance: 0.75 mm (0.030 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.



2. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

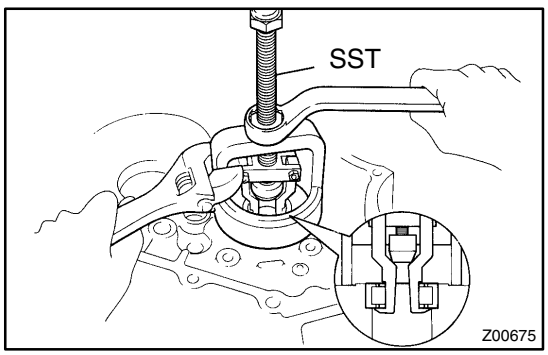
Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.5 mm (0.020 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

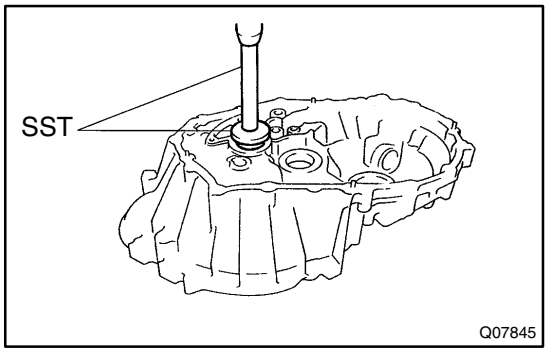
3. REMOVE TRANSAXLE CASE RECEIVER

Remove the bolt and transaxle case receiver.

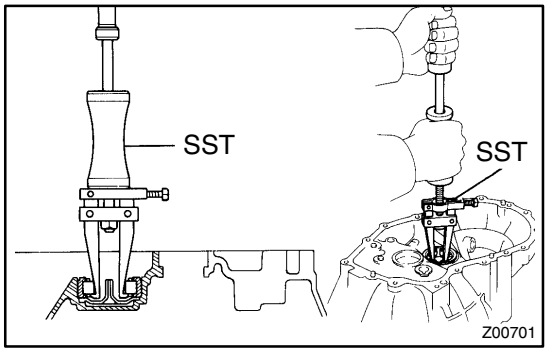


4. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING

(a) Using SST, pull out the bearing.
SST 09612–65014

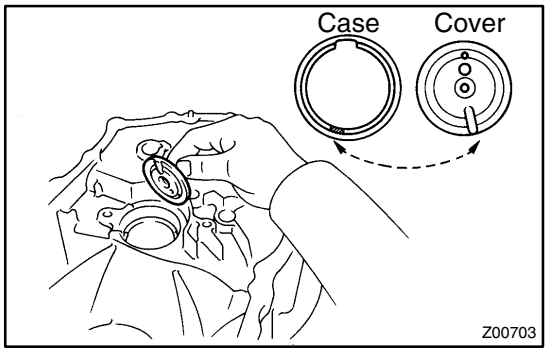


(b) Using SST and a press, install a new bearing.
SST 09950–60010 (09951–00460), 09950–70010 (09951–07150)



5. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING

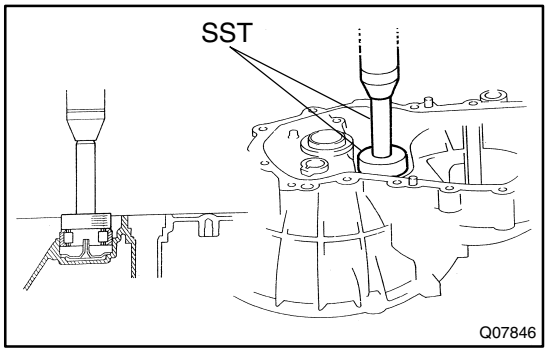
(a) Remove the bolt and bearing lock plate.
(b) Using SST, pull out the bearing.
SST 09308–00010
(c) Remove the output shaft front cover.



(d) Install the output shaft front cover.

HINT:

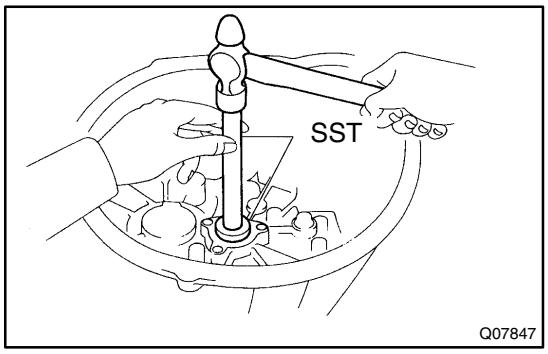
Set the projection of the cover into the hollow in the case.



(e) Using SST and a press, install a new bearing.
SST 09950–60010 (09951–00620), 09950–70010 (09951–07150)
(f) Install the bearing lock plate and torque the bolt.
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

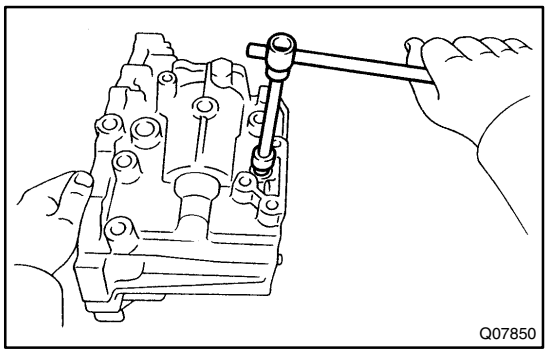
6. INSTALL TRANSAXLE CASE RECEIVER

Install the transaxle case receiver and torque the bolt.
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)



7. IF NECESSARY, REPLACE INPUT SHAFT FRONT OIL SEAL

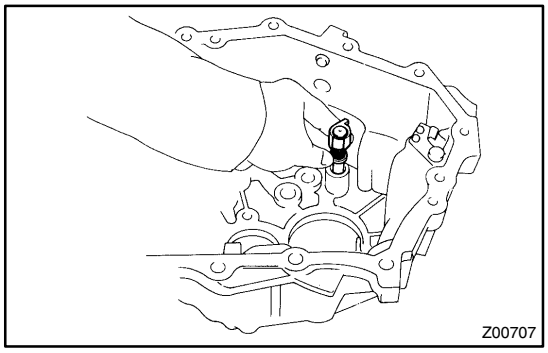
(a) Using a screwdriver, pry out the oil seal.
(b) Using SST, drive in a new oil seal until its surface is flush with the transaxle case.
SST 09950–60010 (09951–00400), 09950–70010 (09951–07150)
(c) Coat the lip of the oil seal with MP grease.



8. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench, remove the straight screw plug.

(b) Using a pin punch and hammer, drive out the slotted spring pin.



(c) Replace the reverse restrict pin.

(d) Using a pin punch and hammer, drive in the slotted spring pin.

(e) Apply sealant to the screw plug threads.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(f) Using a hexagon wrench, install the straight screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX009–02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page MX–11).

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

NOTICE:

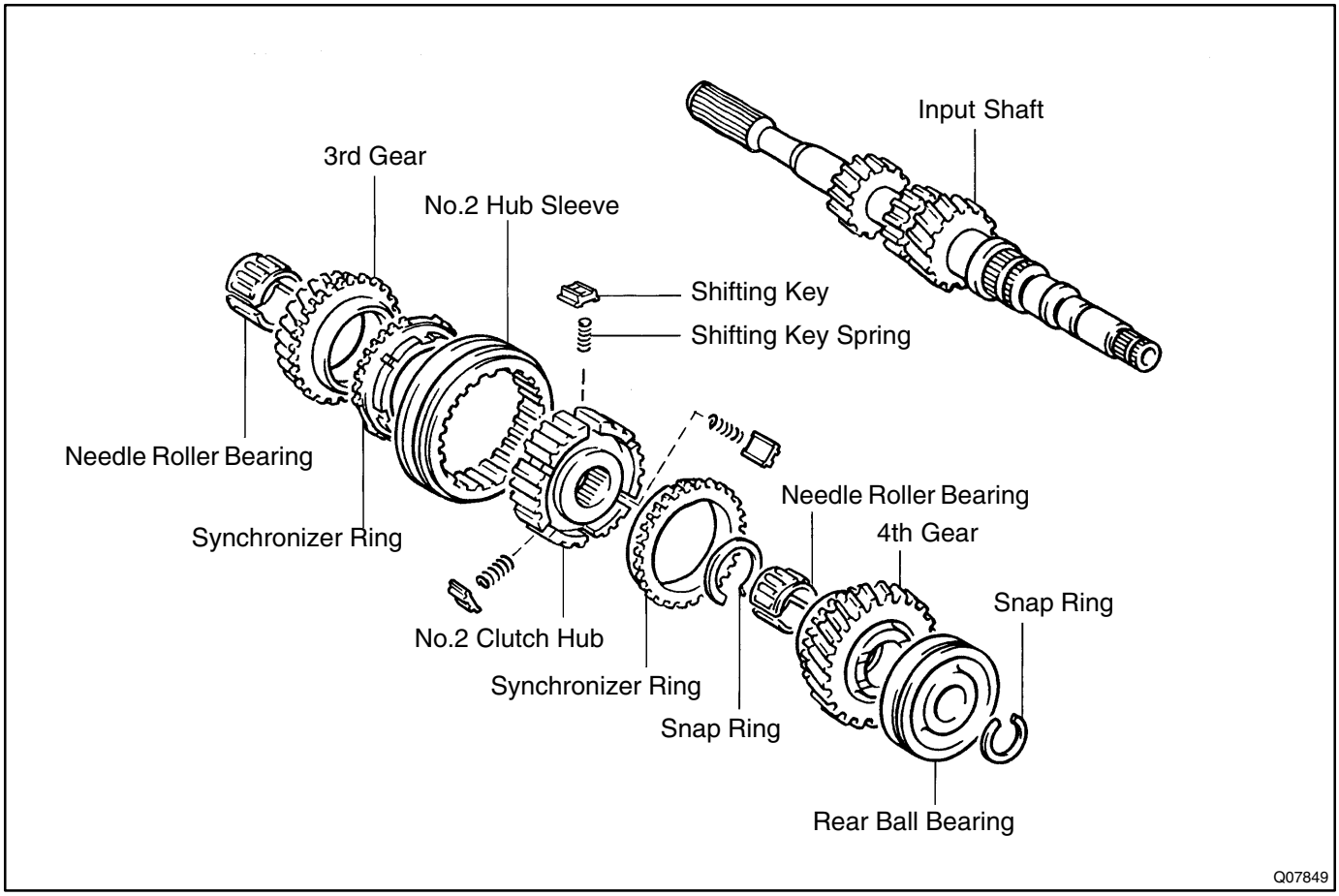
When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non–residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

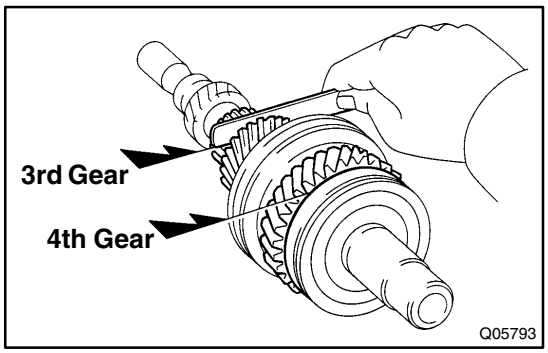
INPUT SHAFT

COMPONENTS

MX00A–03



MX00B–03

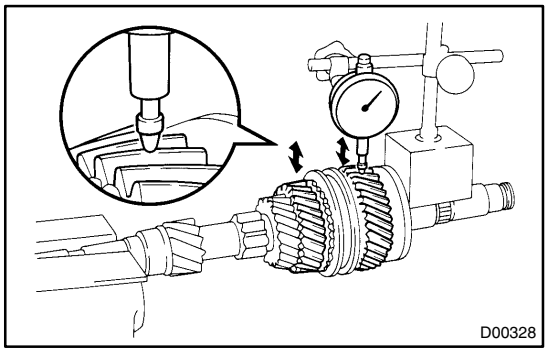


DISASSEMBLY

1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:
3rd gear: 0.10–0.35 mm (0.0039–0.0138 in.)
4th gear: 0.10–0.55 mm (0.0039–0.0217 in.)
Maximum clearance:
3rd gear: 0.35 mm (0.0138 in.)
4th gear: 0.55 mm (0.0022 in.)



2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCE

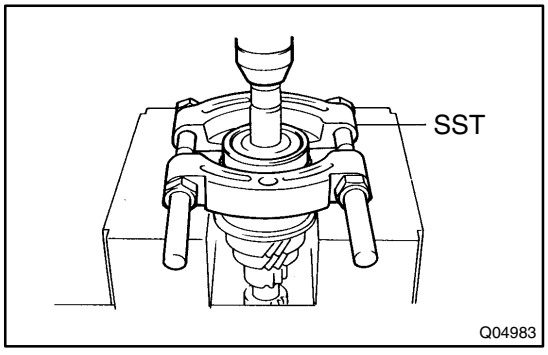
Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
KOYO made:
0.015 – 0.058 mm (0.0006 – 0.0023 in.)
NSK made:
0.015 – 0.056 mm (0.0006 – 0.0022 in.)
Maximum clearance:
KOYO made: 0.058 mm (0.0023 in.)
NSK made: 0.056 mm (0.0022 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.

3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.



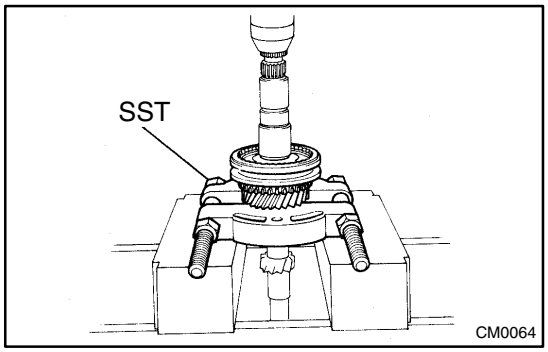
4. REMOVE REAR BALL BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING FROM INPUT SHAFT

(a) Using SST and a press, remove the rear ball bearing.
SST 09950–00020

(b) Remove the 4th gear, needle roller bearings, spacer and synchronizer ring.

5. REMOVE SNAP RING

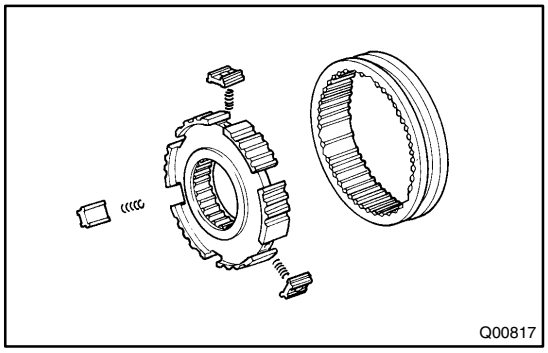
Using 2 screwdrivers and a hammer, tap out the snap ring.



6. REMOVE NO.2 HUB SLEEVE ASSEMBLY, 3RD GEAR, SYNCHRONIZER RING AND NEEDLE ROLLER BEARING

Using SST and a press, remove the No.2 hub sleeve assembly, 3rd gear, synchronizer ring and needle roller bearings.

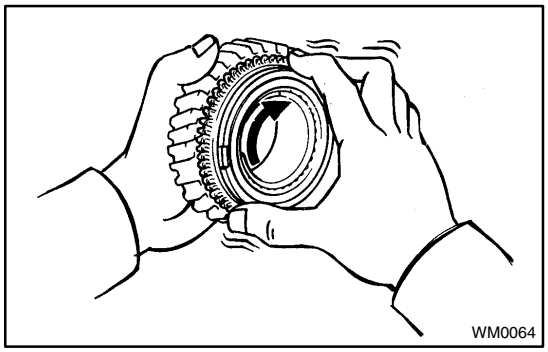
SST 09950–00020



7. REMOVE NO.2 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.2 CLUTCH HUB

Remove the 3 shifting keys, springs and No.2 hub sleeve from the No.2 clutch hub.

MX00C–03



INSPECTION

1. INSPECT SYNCHRONIZER RING

(a) Check wear or damage.

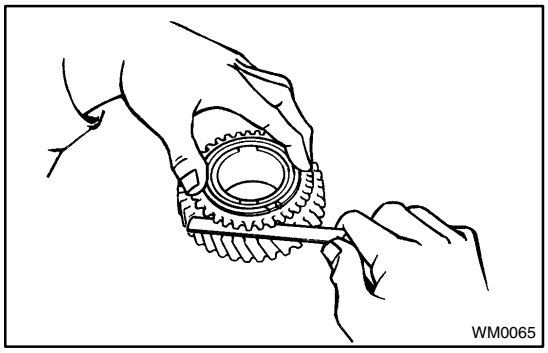
(b) Check the braking effect of the synchronizer ring.
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

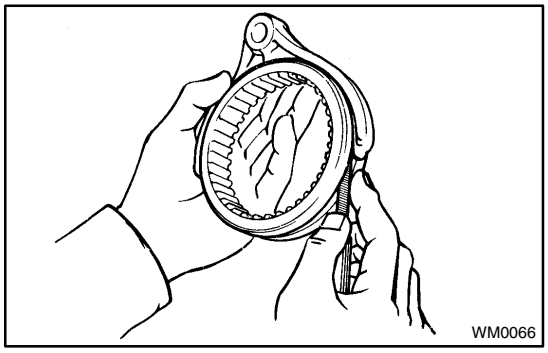


(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance:
3rd gear: 0.65 mm (0.0256 in.)
4th gear: 0.75 mm (0.0295 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

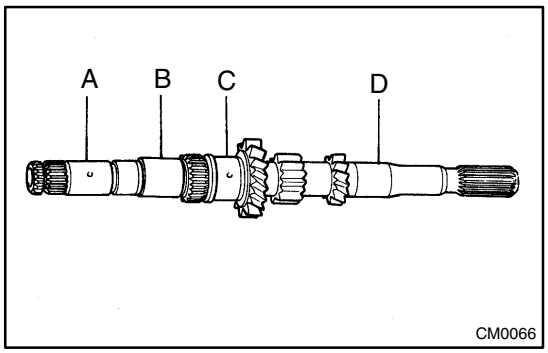


2. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.35 mm (0.014 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



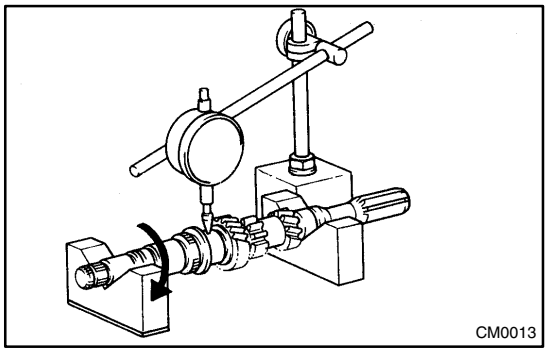
3. INSPECT INPUT SHAFT

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

Minimum outer diameter:
Part A: 24.885 mm (0.9797 in.)
Part B: 28.985 mm (1.1411 in.)
Part C: 30.985 mm (1.2199 in.)
Part D: 24.985 mm (0.9834 in.)

If the outer diameter is less than the minimum, replace the input shaft.

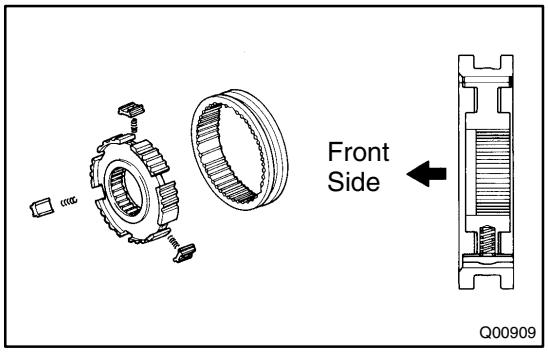


(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

If the runout exceeds the maximum, replace the input shaft.

MX00D–03



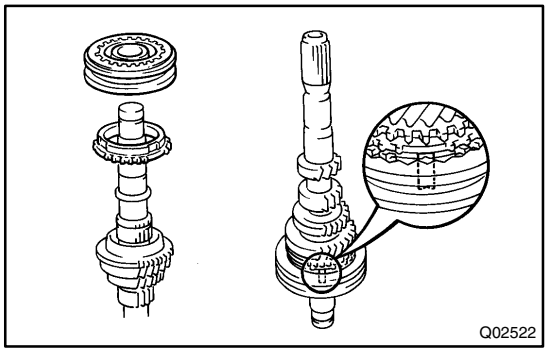
REASSEMBLY

HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.2 CLUTCH HUB INTO NO.2 HUB SLEEVE

(a) Install the 3 springs and shifting keys to the No.2 clutch hub.

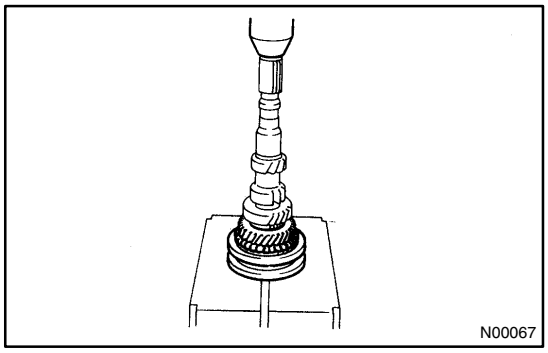
(b) Install the No.2 hub sleeve to the No. 2 clutch hub.



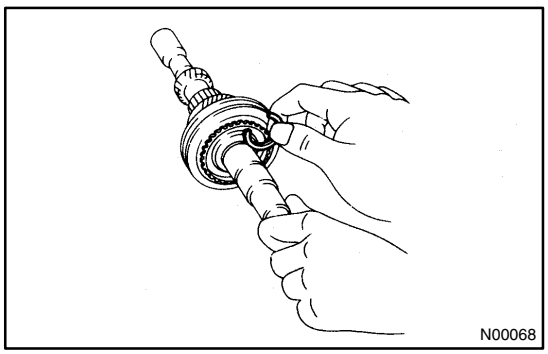
2. INSTALL 3RD GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO. 2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply gear oil to the needle roller bearings.

(b) Place the synchronizer ring on the gear and align the ring slots with shifting keys.



(c) Using a press, install the 3rd gear and No.2 hub sleeve assembly.



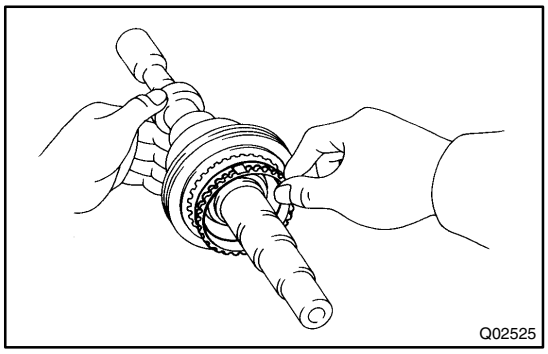
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.30 (0.0906)	3	2.48 (0.0976)
1	2.36 (0.0929)	4	2.54 (0.1000)
2	2.42 (0.0953)	5	2.60 (0.1024)

(b) Using a screwdriver and hammer, tap in the snap ring.

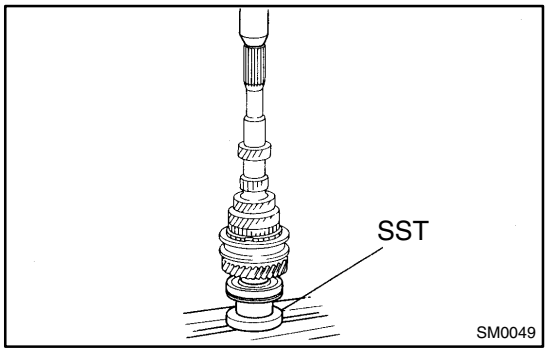
4. INSPECT 3RD GEAR THRUST CLEARANCE
(See page MX–24)



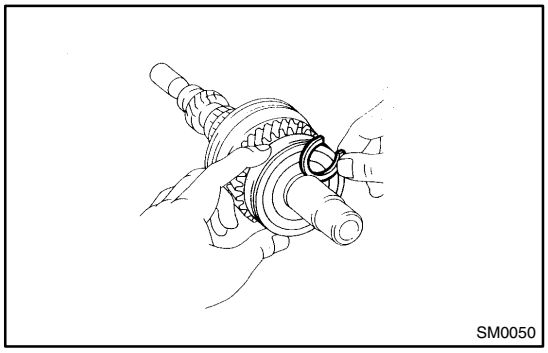
5. INSPECT SYNCHRONIZER RING, NEEDLE ROLLER BEARING, SPACER, 4TH GEAR AND REAR BALL BEARING

(a) Apply gear oil to the needle roller bearings.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



(c) Using SST and a press, install the rear ball bearing.
SST 09608–03071



6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.29 (0.0902)	D	2.47 (0.0972)
B	2.35 (0.0925)	E	2.53 (0.0996)
C	2.41 (0.0949)	F	2.59 (0.1020)

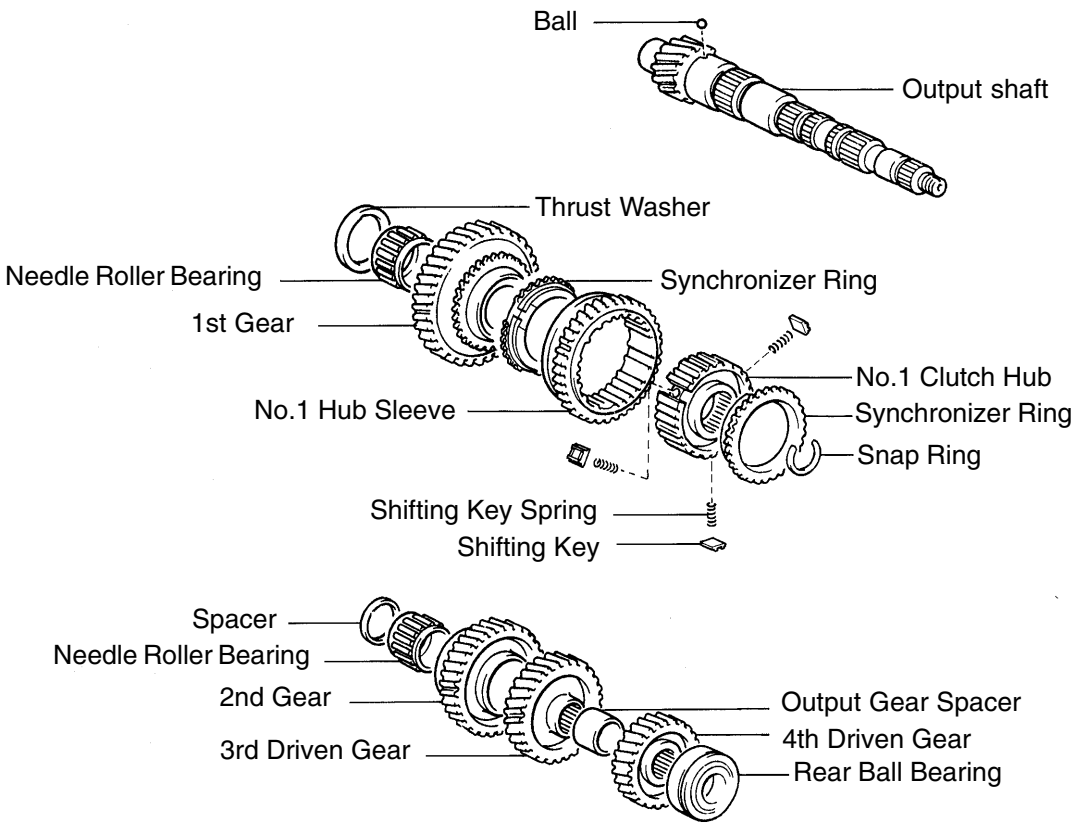
(b) Using a screwdriver and hammer, tap in the snap ring.

7. INSPECT 4TH GEAR THRUST CLEARANCE
(See page MX–24)

OUTPUT SHAFT

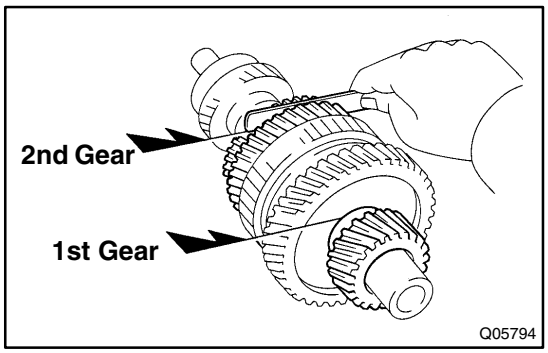
COMPONENTS

MX00E–03



Q07853

MX00F–03

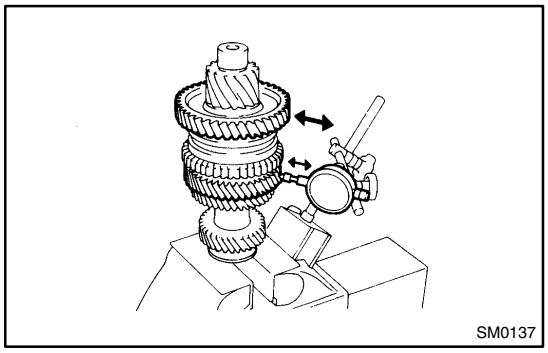


DISASSEMBLY

1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCES

Using a feeler gauge, measure each thrust clearance.

Standard clearance:
1st gear: 0.10–0.40 mm (0.0039–0.0157 in.)
2nd gear: 0.10–0.45 mm (0.0039–0.0177 in.)
Maximum clearance:
1st gear: 0.40 mm (0.0157 in.)
2nd gear: 0.45 mm (0.0177 in.)

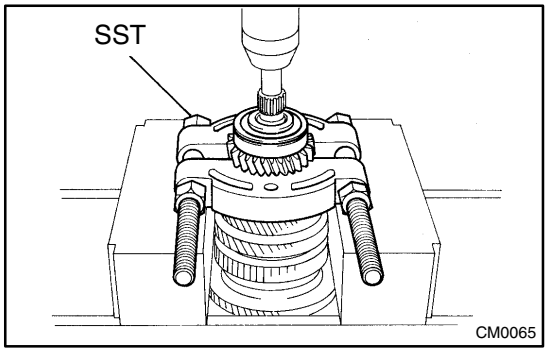


2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
KOYO made:
0.015 – 0.058 mm (0.0006 – 0.0023 in.)
NSK made:
0.015 – 0.056 mm (0.0006 – 0.0022 in.)
Maximum clearance:
KOYO made: 0.058 mm (0.0023 in.)
NSK made: 0.056 mm (0.0022 in.)

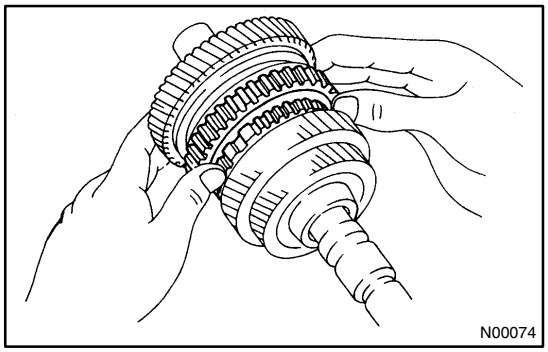
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE REAR BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER FROM OUTPUT SHAFT

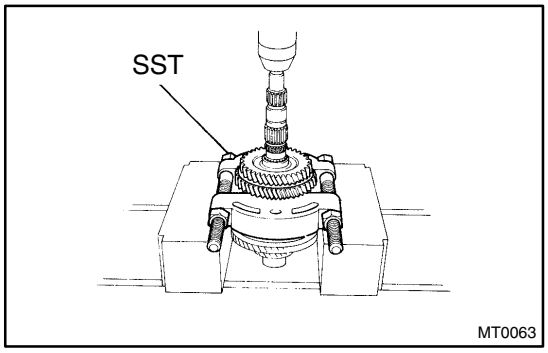
(a) Using SST and a press, remove the ball bearing and 4th driven gear.
SST 09950–00020

(b) Remove the output spacer.



4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND SPACER

(a) Shift the No.1 hub sleeve into the 1st gear.

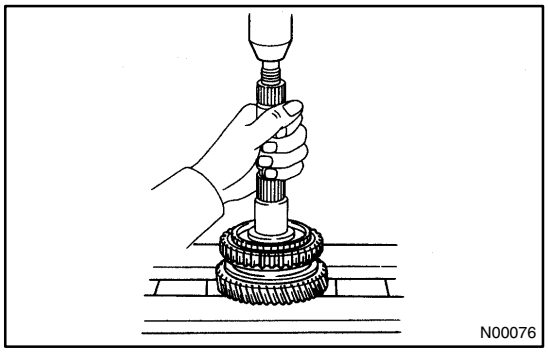


(b) Using SST and a press, remove the 3rd driven gear.
SST 09950–00020

(c) Remove the 2nd gear, needle roller bearing, synchronizer ring and spacer.

5. REMOVE SNAP RING

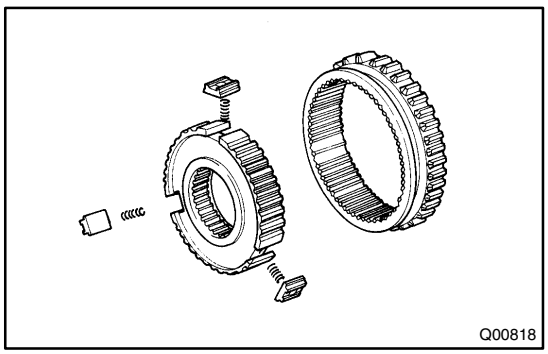
Using 2 screwdrivers and a hammer, tap out the snap ring.



6. REMOVE NO.1 HUB SLEEVE ASSEMBLY 1ST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, THRUST WASHER AND BALL

(a) Using a press, remove the No.1 hub sleeve assembly, 1st gear and synchronizer ring.

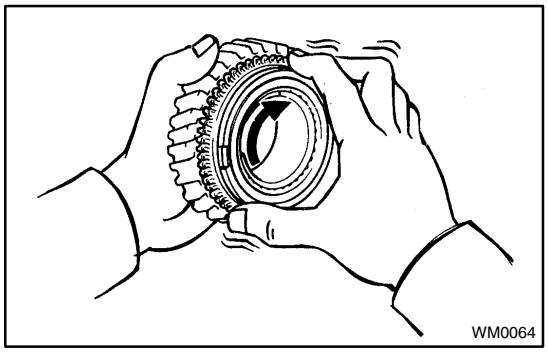
(b) Remove the needle roller bearing, thrust washer and ball.



7. REMOVE NO.1 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.1 CLUTCH HUB

Remove the 3 shifting keys, springs and No.1 hub sleeve from the No.1 clutch hub.

MX0D1–01



INSPECTION

1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

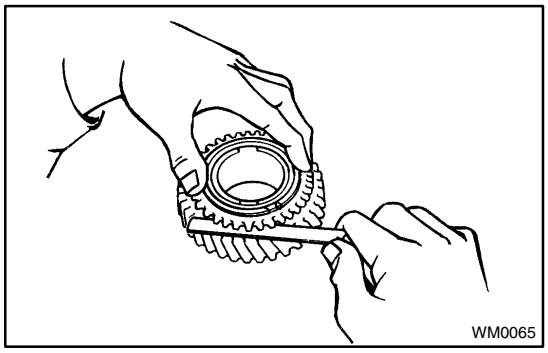
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



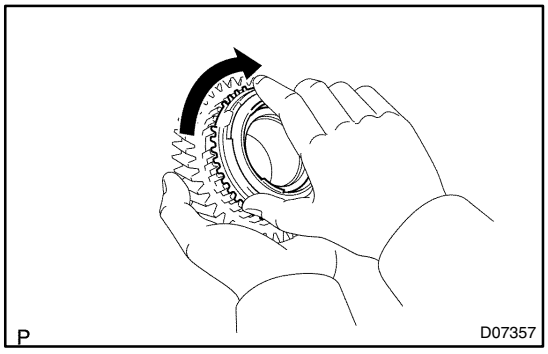
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.75 mm (0.0295 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

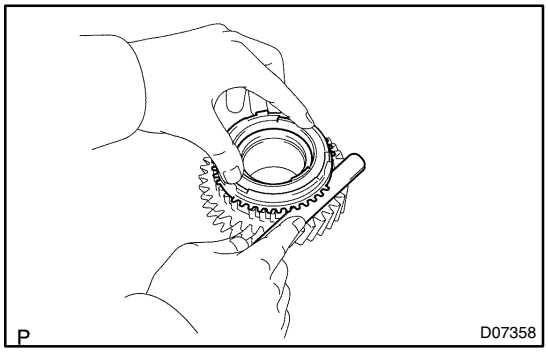


2. INSPECT 2ND GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

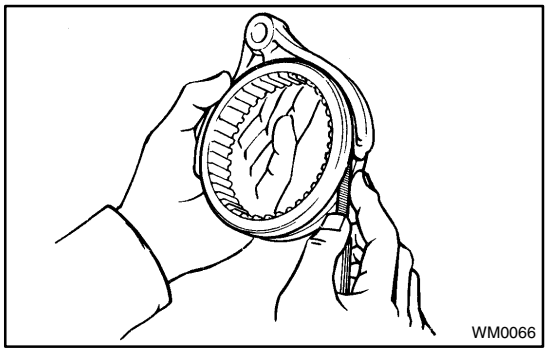
If the braking effect is insufficient, replace the synchronizer ring.



(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.70 mm (0.0276 in.)

If the clearance is less than the minimum, replace the synchronizer ring.

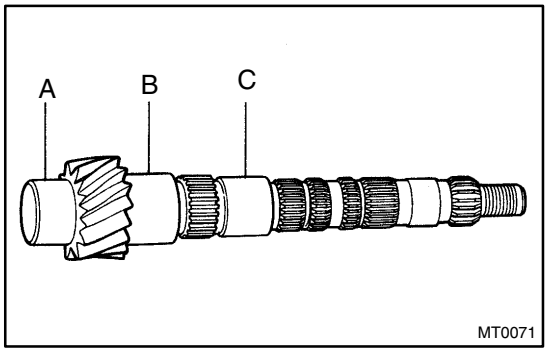


3. INSPECT GEAR SHIFT FORK AND REVERSE GEAR CLEARANCE

Using a feeler gauge, measure the clearance between the reverse gear and gear shift fork.

Maximum clearance: 0.35 mm (0.014 in.)

If the clearance exceeds the maximum, replace the gear shift fork or hub sleeve.



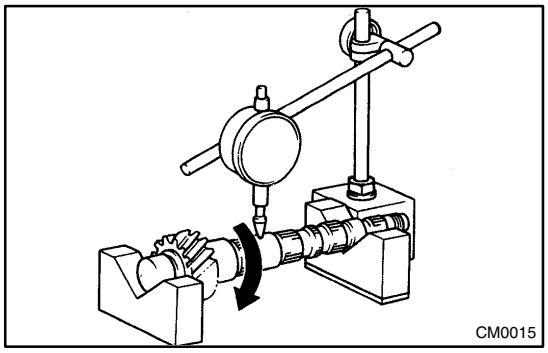
4. INSPECT OUTPUT SHAFT

(a) Check the output shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:
Part A: 32.985 mm (1.2986 in.)
Part B: 37.985 mm (1.4955 in.)
Part C: 31.985 mm (1.2592 in.)

If the outer diameter is less than the minimum, replace the output shaft.

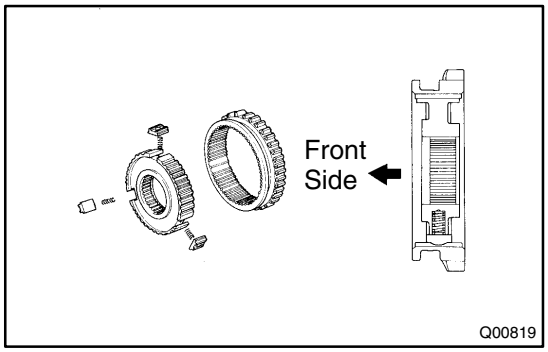


(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

If the runout exceeds the maximum, replace the output shaft.

MX00H–03



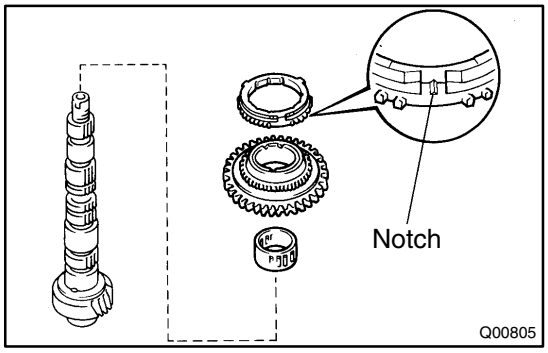
REASSEMBLY

HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.1 CLUTCH HUB INTO NO.1 HUB SLEEVE

(a) Install the 3 springs and shifting keys to the No.1 clutch hub.

(b) Install the No.1 clutch hub to the No.1 hub sleeve.



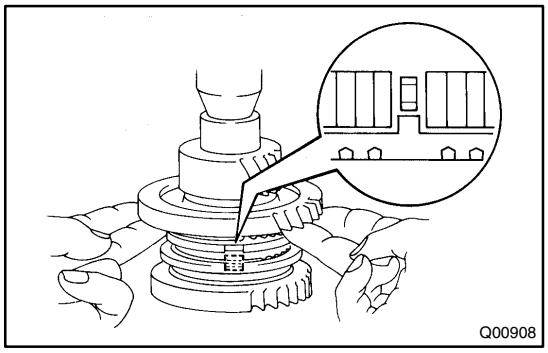
2. INSTALL BALL, THRUST WASHER, 1ST GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.1 HUB SLEEVE ASSEMBLY TO OUTPUT SHAFT

(a) Install the ball to the shaft.

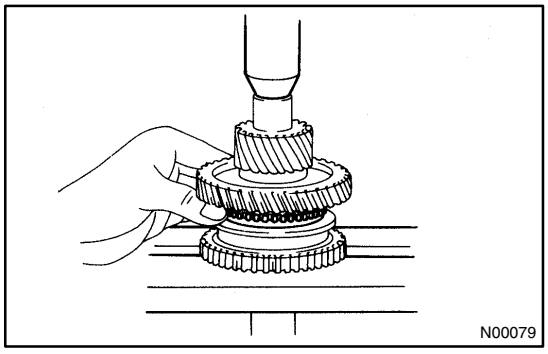
(b) Fit the thrust washer groove securely over the locking ball when installing the thrust on the shaft.

(c) Apply gear oil to the needle roller bearing.

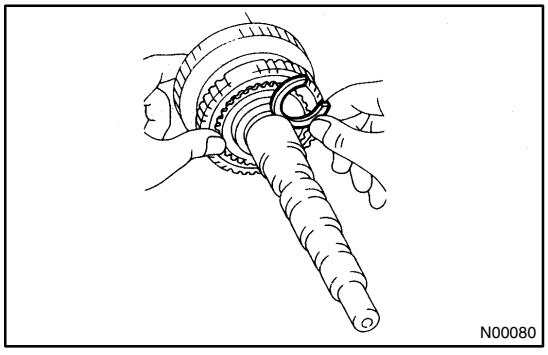
(d) Install the needle roller bearing, 1st gear and synchronizer ring.



(e) Place the synchronizer ring on the gear and align the clutch hub grooves with the projections on the synchronizer ring.



(f) Using a press, install the 1st gear and No.1 hub sleeve.



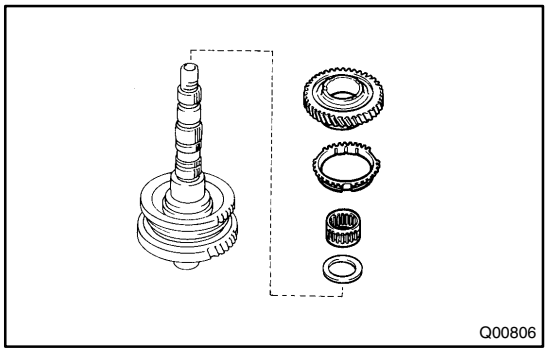
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.50 (0.0984)	D	2.68 (0.1055)
B	2.56 (0.1008)	E	2.74 (0.1079)
C	2.62 (0.1031)	F	2.80 (0.1102)

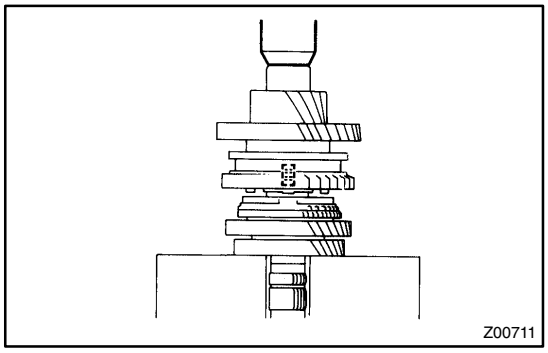
(b) Using a screwdriver and hammer, tap in the snap ring.

4. INSPECT 1ST GEAR THRUST CLEARANCE
(See page MX–31)


Q00806

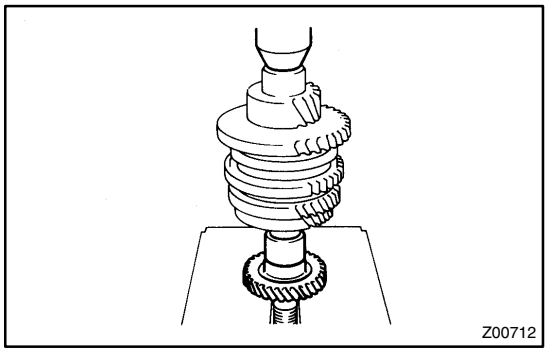
5. INSTALL SYNCHRONIZER RING, SPACER, NEEDLE ROLLER BEARING, 2ND GEAR AND 3RD DRIVEN GEAR

(a) Place the synchronizer ring on the gear and align the clutch hub grooves with the projections on the synchronizer ring.
(b) Install the spacer.
(c) Apply gear oil to the needle roller bearing.
(d) Install the 2nd gear.


Z00711

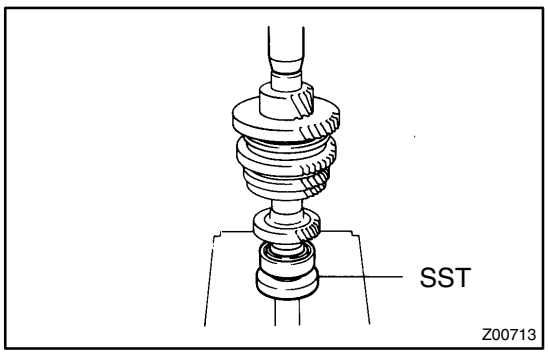
(e) Using a press, install the 3rd driven gear.

6. INSPECT 2ND GEAR THRUST CLEARANCE
(See page MX–31)


Z00712

7. INSTALL OUTPUT GEAR SPACER AND 4TH DRIVEN GEAR

(a) Install the output gear spacer.
(b) Using a press, install the 4th driven gear.



Z00713

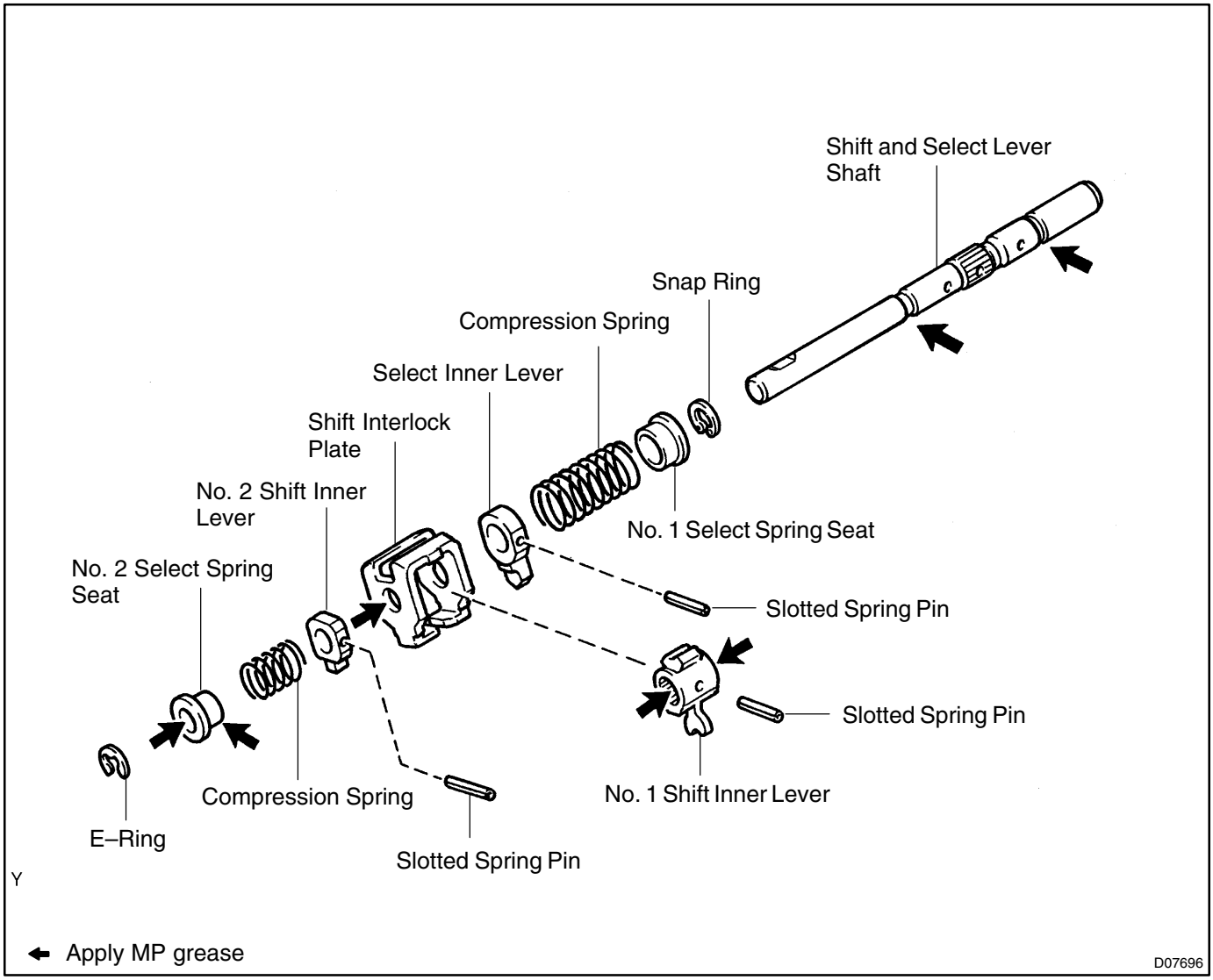
8. INSTALL REAR BALL BEARING

Using SST and a press, install the rear ball bearing.
SST 09316–60011 (09316–00021)

SHIFT AND SELECT LEVER SHAFT

COMPONENTS

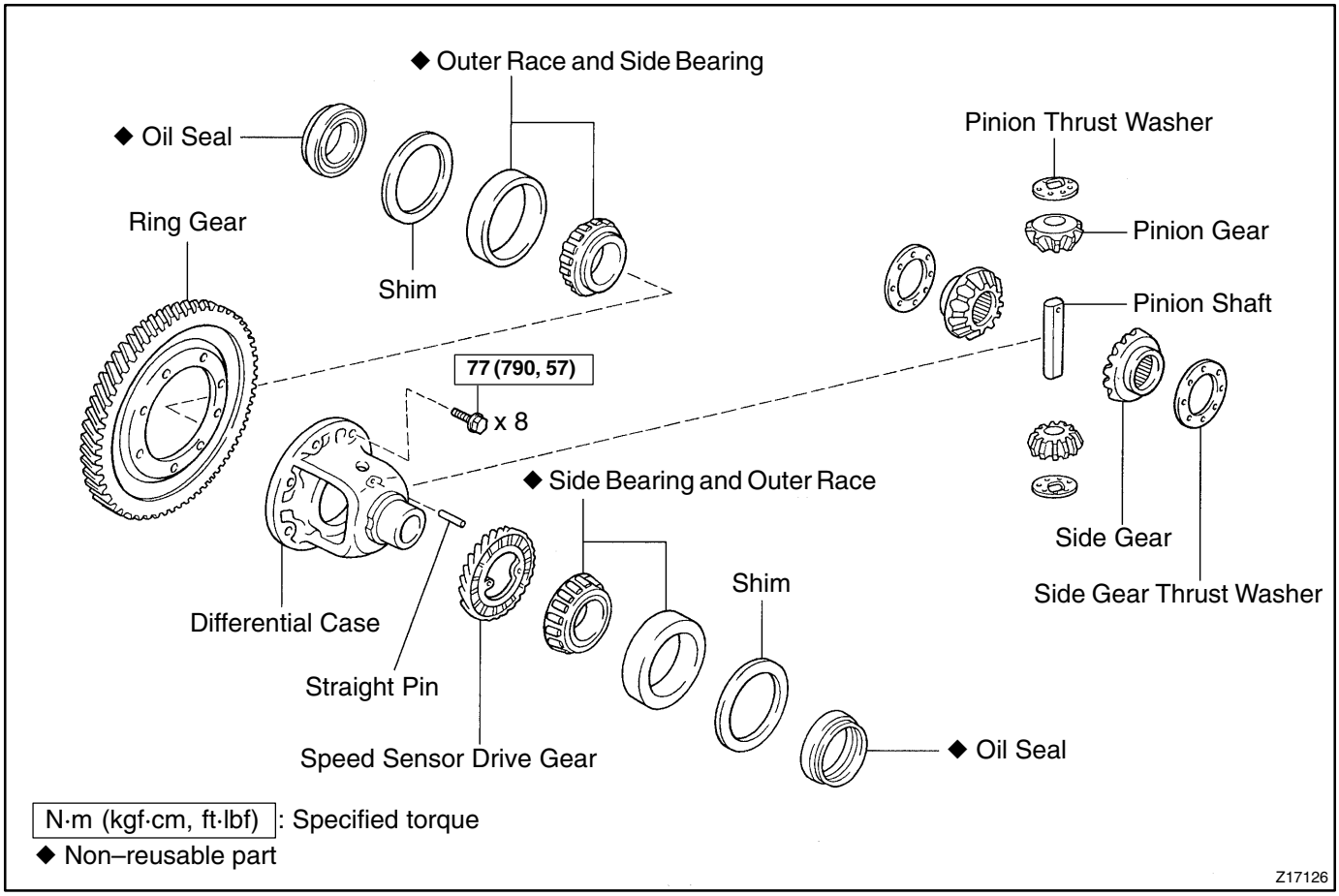
MX00I–06



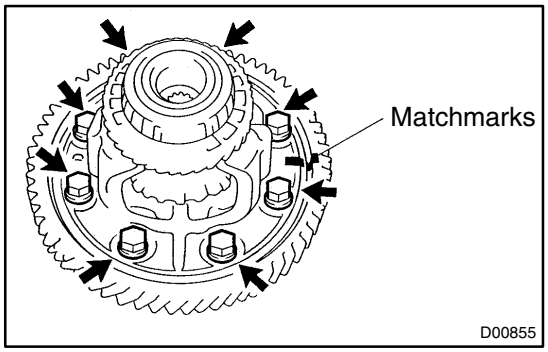
DIFFERENTIAL CASE

COMPONENTS

MX00J–03



MX00K–03



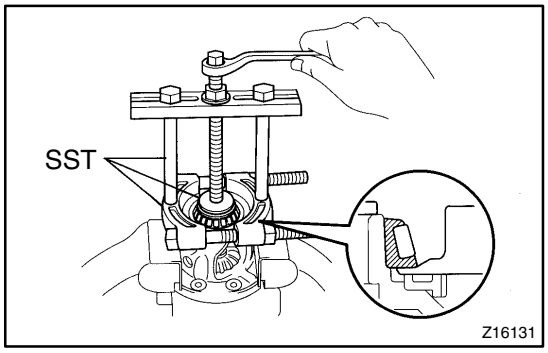
DISASSEMBLY

1. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and case.

(b) Remove the 8 bolts.

(c) Using a copper hammer, tap on the ring gear to remove it from the case.

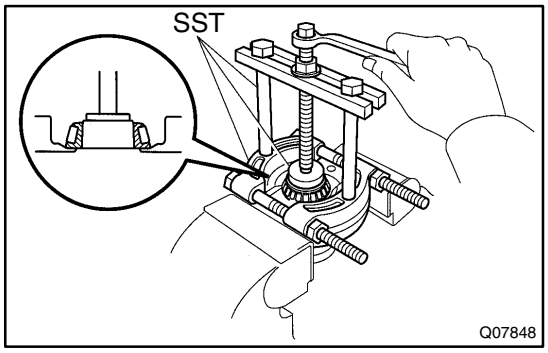


2. Speed Sensor Drive Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

(a) Using SST, remove the side bearing.
SST 09950–00020, 09950–00030, 09950–60010 (09951–00360)

HINT:
Set the claw of SST to the bearing inner race at the position where the speed sensor drive gear is indented.

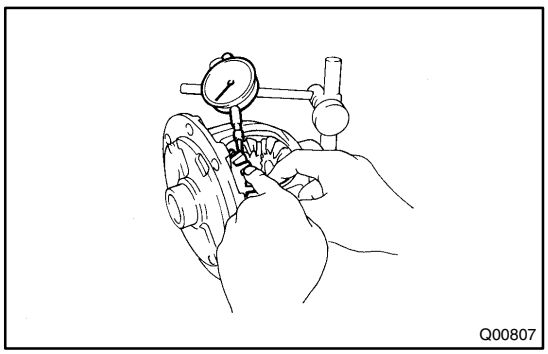
(b) Remove the speed sensor drive gear.



3. Ring Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

Using SST, remove the side bearing.
SST 09950–00020, 09950–00030, 09950–60010 (09951–00360)

HINT:
Set the claw of SST to the bearing inner race at the position where the differential case is indented.



4. INSPECT SIDE GEAR BACKLASH

Using a dial indicator, measure the backlash of one side gear while holding one pinion toward the case.

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

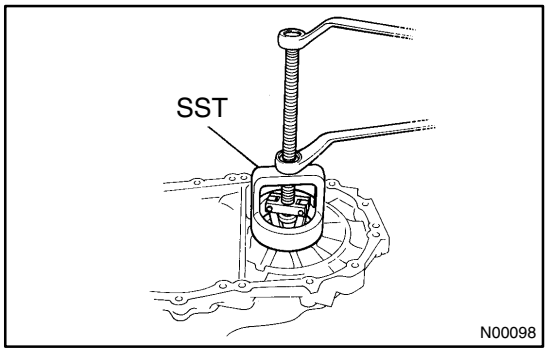
If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

(a) Using a pin punch and hammer, drive out the straight pin.

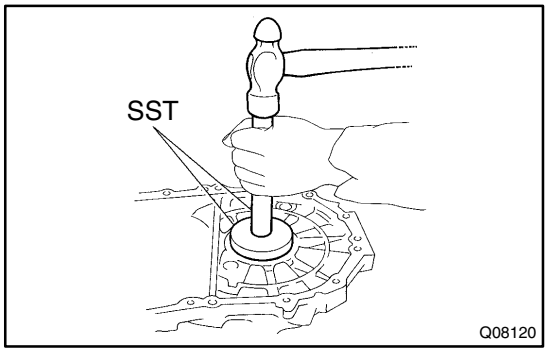
(b) Remove the pinion shaft from the case.

(c) Remove the 2 pinions and side gears with the 4 thrust washers from each gear.

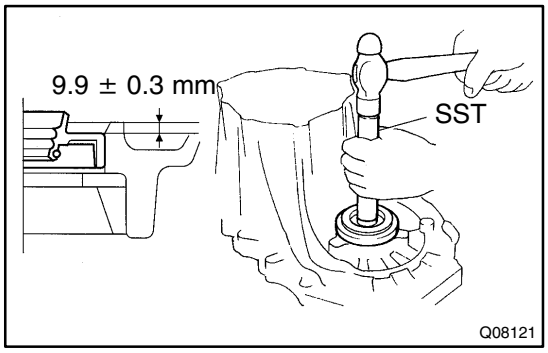


6. Transmission Case Side:
IF NECESSARY, REPLACE OIL SEAL AND SIDE BEARING OUTER RACE

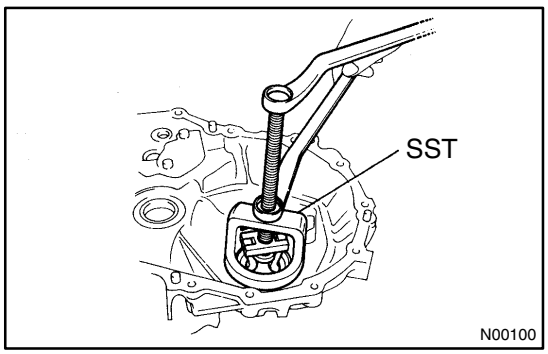
(a) Using a screwdriver and hammer, drive out the oil seal.
(b) Using SST, pull out the outer race and shim.
SST 09612–65014
(c) Place the shim into the case.



(d) Using SST and a hammer, drive in a new outer race.
SST 09950–60020 (09951–00710), 09950–70010 (09951–07150)

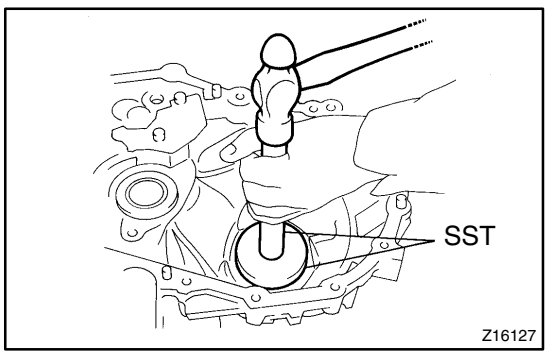


(e) Using SST and a hammer, drive in a new oil seal.
SST 09350–32014 (09351–32111, 09351–32130)
Drive in depth: 9.9 ± 0.3 mm (0.390 ± 0.012 in.)
(f) Coat the lip of the oil seal with MP grease.

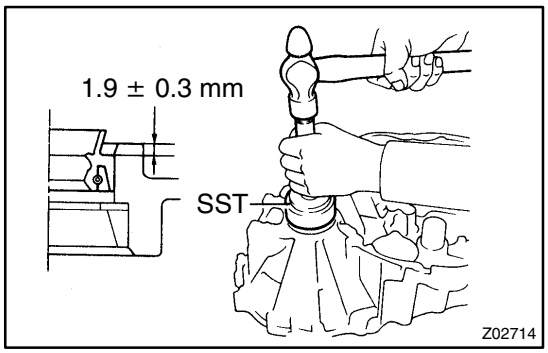


7. Transaxle Case Side:
IF NECESSARY, REPLACE OIL SEAL AND SIDE BEARING OUTER RACE

(a) Using a screwdriver and hammer, drive out the oil seal.
(b) Using SST, pull out the outer race and shim.
SST 09612–65014
(c) Place the shim into the case.



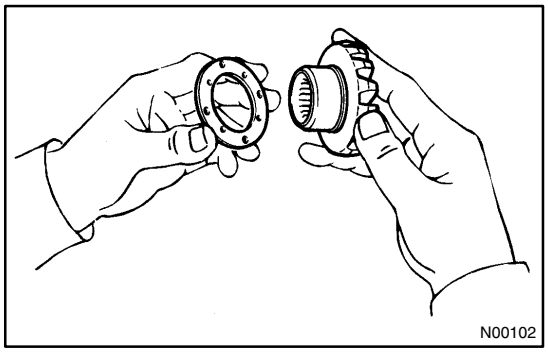
(d) Using SST and a hammer, drive in a new outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)



(e) Using SST and a hammer, drive in a new oil seal.
SST 09350–32014 (09351–32130, 09351–32150)
Drive in depth: 1.9 ± 0.3 mm (0.075 ± 0.012 in.)

(f) Coat the lip of the oil seal with MP grease.

MX00L–03


N00102

REASSEMBLY

1. ASSEMBLE DIFFERENTIAL CASE

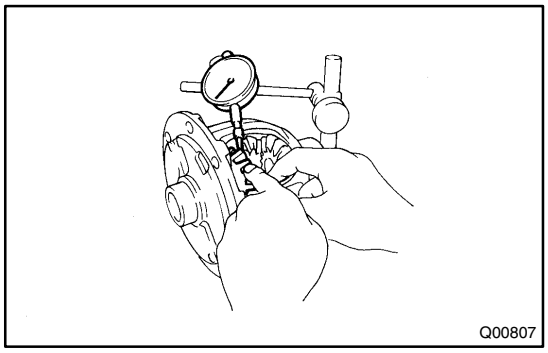
(a) Install the correct thrust washers and side gears. Refer to the table below, select thrust washers which will allow that the backlash is within the specification.

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

Thickness mm (in.)	Thickness mm (in.)
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

(b) Install the thrust washers and side gears in the differential case.

(c) Install the pinion shaft.


Q00807

(d) Using a dial indicator, check the side gear backlash. Measure the side gear backlash while holding one pinion gear toward the case.

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

If the backlash is not within the specification, install a thrust washer of different thickness.

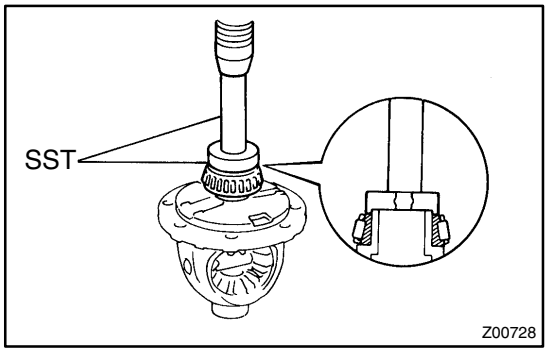
(e) Using a pin punch and hammer, drive in the straight pin through the case and hole in the pinion shaft.

(f) Stake the differential case.

2. Ring Gear Side: INSTALL SIDE BEARING

Using SST and a press, install a new side bearing.

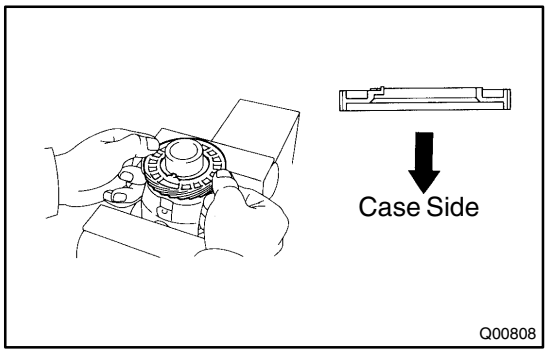
SST 09550–10013 (09252–10010, 09556–10011)



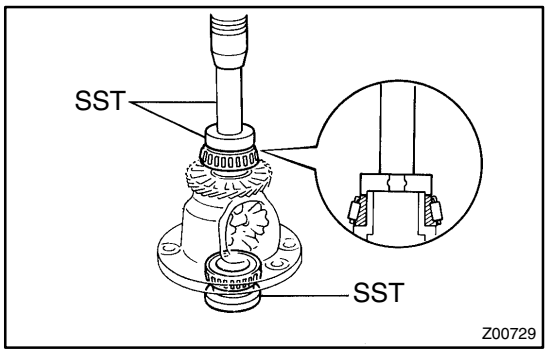
Z00728

3. Speed Sensor Drive Side: INSTALL SIDE BEARING

(a) Install the speed sensor drive gear.



Q00808

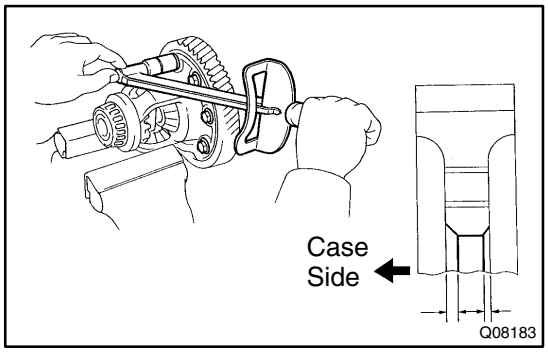


(b) Using SST and a press, install a new side bearing.
SST 09550–10013 (09556–10011), 09950–60010 (09951–00460), 09950–70010 (09951–07150)

4. INSTALL RING GEAR ON DIFFERENTIAL CASE

(a) Clean the contact surface of the differential case.
(b) Heat the ring gear in boiling water.
(c) Carefully take the ring gear out of the water.
(d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

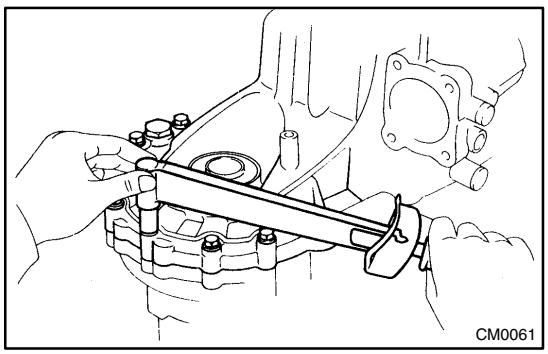
HINT:
Align the matchmarks on the differential case and contact the ring gear.



(e) Temporarily install the 8 set bolts.

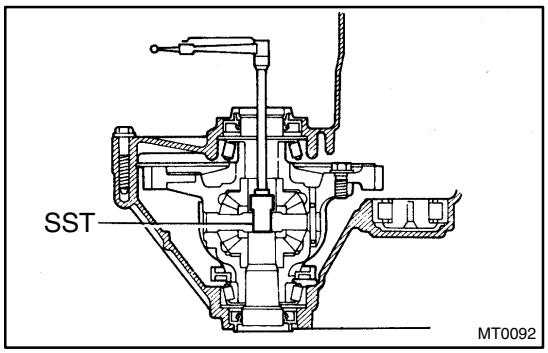
NOTICE:
The ring gear set bolts should not be tightened until the ring gear has cooled sufficiently.

(f) After the ring gear has cooled sufficiently, torque the ring gear set bolts uniformly at a time.
Torque: 77 N·m (790 kgf·cm, 57 ft·lbf)



5. INSPECT DIFFERENTIAL SIDE BEARING PRELOAD

(a) Install the differential case assembly to the transaxle case.
(b) Install the transmission case.
(c) Install and torque the case bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



(d) Using SST and a torque wrench, measure the preload.
SST 09564–32011
Preload (at starting):
New bearing
0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Reused bearing
0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

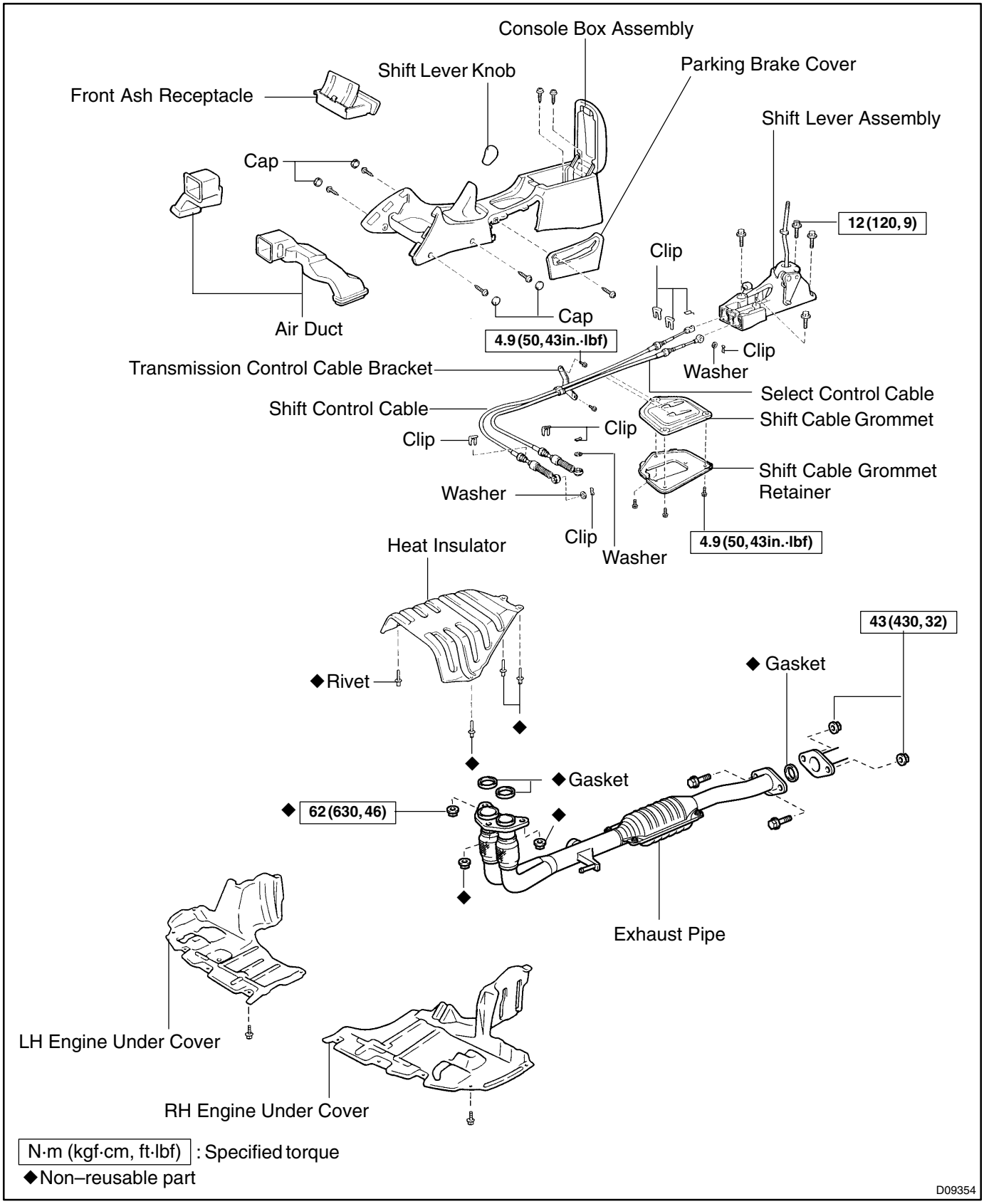
If the preload is not within the specification, remove the transmission case side outer race of the side bearing with SST.
(See page MX–39)
Select another shim.
HINT:
The preload will change by about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 in.·lbf) with each 0.05 mm change in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.10 (0.0827)	L	2.60 (0.1024)
B	2.15 (0.0846)	M	2.65 (0.1043)
C	2.20 (0.0866)	N	2.70 (0.1063)
D	2.25 (0.0886)	P	2.75 (0.1083)
E	2.30 (0.0906)	Q	2.80 (0.1102)
F	2.35 (0.0925)	R	2.85 (0.1122)
G	2.40 (0.0945)	S	2.90 (0.1142)
H	2.45 (0.0965)	T	2.95 (0.1161)
J	2.50 (0.0984)	U	3.00 (0.1181)
K	2.55 (0.1004)	–	–

SHIFT LEVER AND CONTROL CABLE

COMPONENTS

MX06H–02



MANUAL TRANSAXLE (E351)

TROUBLESHOOTING MX–1
MANUAL TRANSAXLE UNIT MX–2
MANUAL TRANSAXLE ASSEMBLY MX–9
INPUT SHAFT MX–23
OUTPUT SHAFT MX–29
SHIFT AND SELECT LEVER SHAFT MX–37
DIFFERENTIAL CASE MX–38
SHIFT LEVER AND CONTROL CABLE MX–45

TROUBLESHOOTING

MX01Z–07

PROBLEM SYMPTOMS TABLE

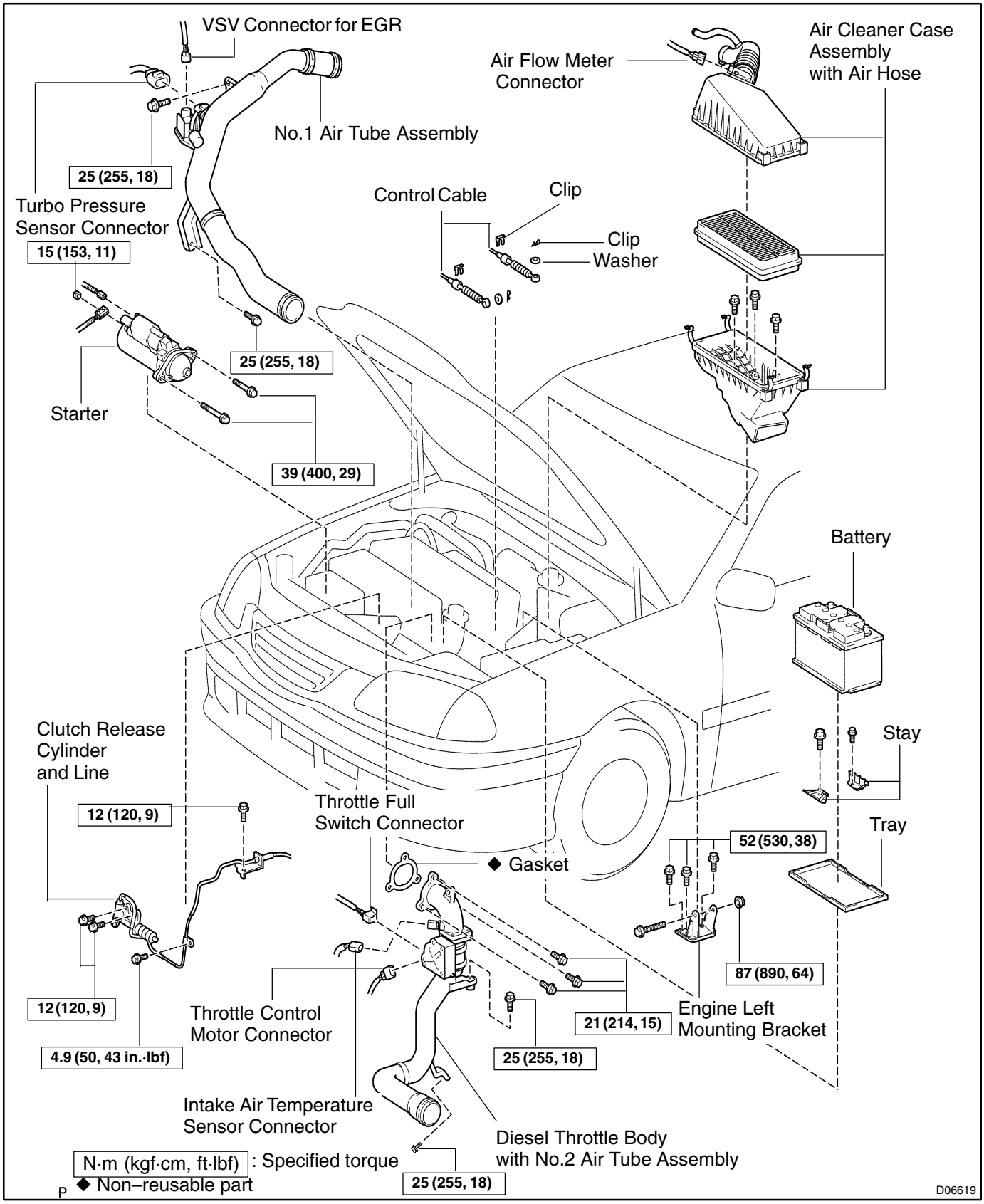
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

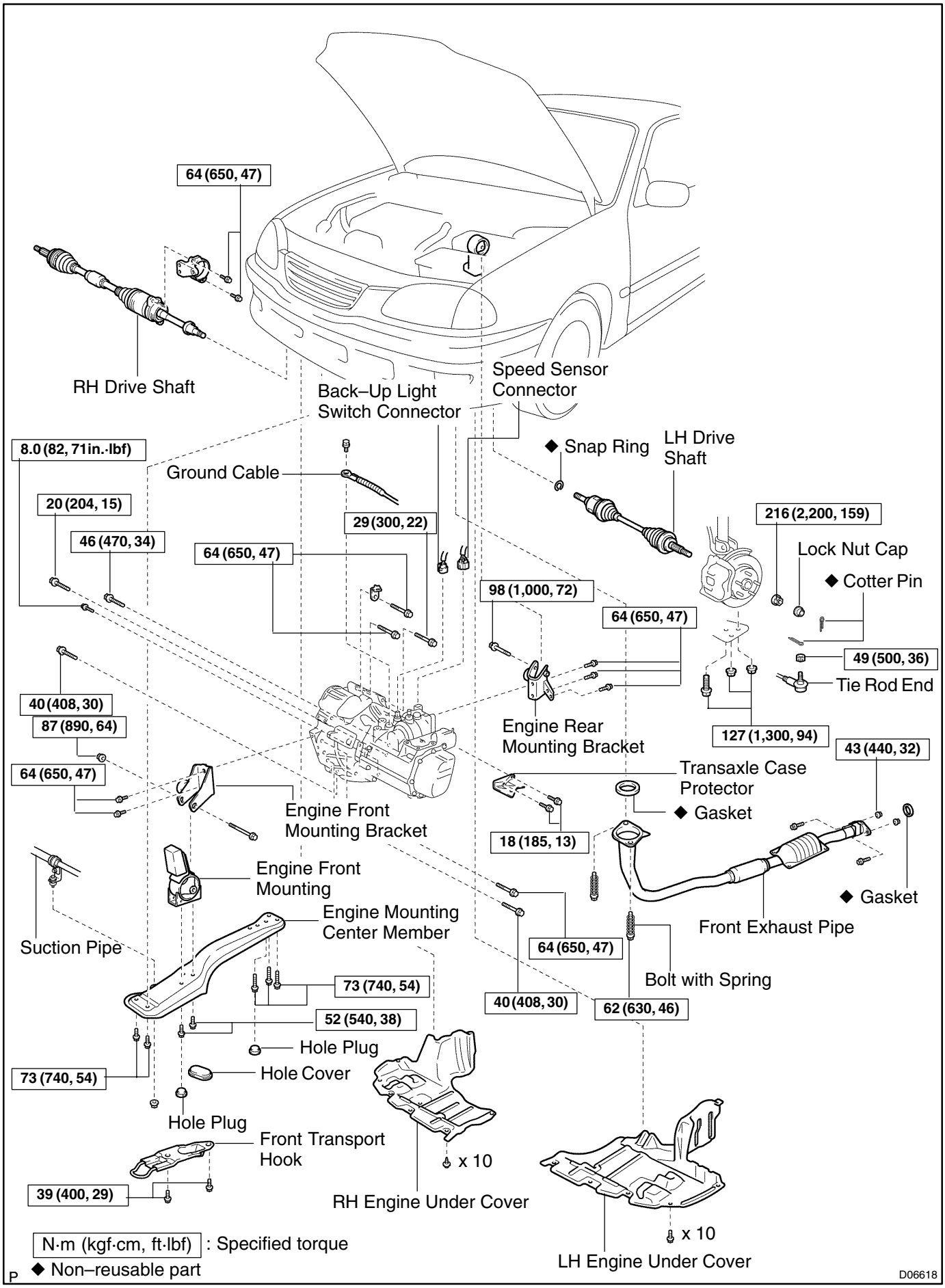
Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–4
	2. Oil (Wrong)	MX–4
	3. Gear (Worn or damaged)	MX–9
	4. Bearing (Worn or damaged)	MX–9
Oil leakage	1. Oil (Level too high)	MX–4
	2. Gasket (Damaged)	MX–9
	3. Oil seal (Worn or damaged)	MX–9
	4. O–Ring (Worn or damaged)	MX–9
Hard to shift or will not shift	1. Control cable (Faulty)	MX–45
	2. Synchronizer ring (Worn or damaged)	MX–9 MX–23 MX–29
	3. Shift key spring (Damaged)	MX–9 MX–23 MX–29
Jumps out of gear	1. Locking ball spring (Damaged)	MX–9
	2. Shift fork (Worn)	MX–9
	3. Gear (Worn or damaged)	MX–9
	4. Bearing (Worn or damaged)	MX–9

MANUAL TRANSAXLE UNIT

MX096–03

COMPONENTS

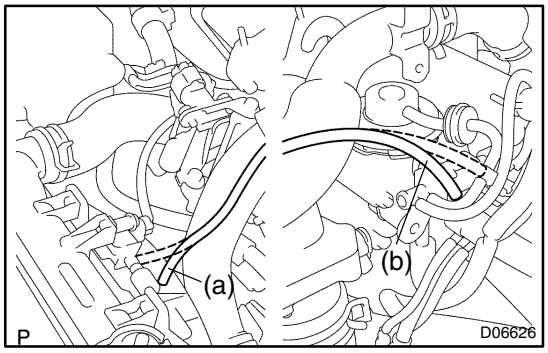



64 (650, 47)
RH Drive Shaft
Back–Up Light Switch Connector
Speed Sensor Connector
8.0 (82, 71in.·lbf)
Ground Cable
◆ Snap Ring
LH Drive Shaft
20 (204, 15)
46 (470, 34)
29 (300, 22)
64 (650, 47)
216 (2,200, 159)
Lock Nut Cap
◆ Cotter Pin
98 (1,000, 72)
64 (650, 47)
49 (500, 36)
Tie Rod End
40 (408, 30)
87 (890, 64)
Engine Rear Mounting Bracket
127 (1,300, 94)
43 (440, 32)
64 (650, 47)
Transaxle Case Protector
◆ Gasket
Engine Front Mounting Bracket
18 (185, 13)
Engine Front Mounting
◆ Gasket
Engine Mounting Center Member
Front Exhaust Pipe
Suction Pipe
64 (650, 47)
Bolt with Spring
73 (740, 54)
40 (408, 30)
62 (630, 46)
52 (540, 38)
Hole Plug
Hole Cover
73 (740, 54)
Hole Plug
Front Transport Hook
x 10
39 (400, 29)
RH Engine Under Cover
x 10
LH Engine Under Cover
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
P
D06618

MX097–03

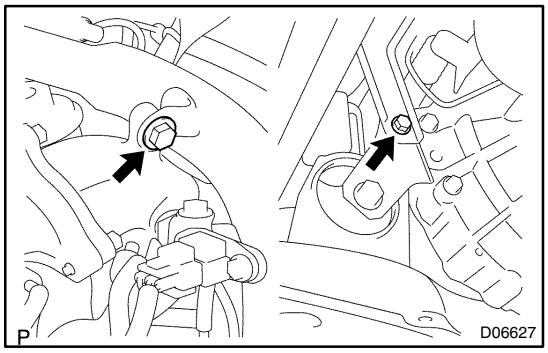
REMOVAL

1. **REMOVE BATTERY AND TRAY**
2. **REMOVE AIR CLEANER CASE ASSEMBLY WITH AIR HOSE**
3. **REMOVE LH AND RH ENGINE UNDER COVERS**



4. **REMOVE NO.1 AIR TUBE ASSEMBLY**

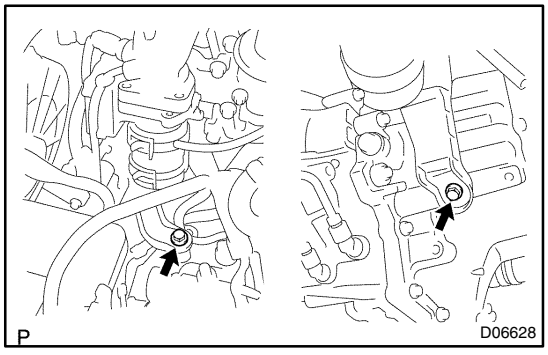
(a) Disconnect the No.2 vacuum hose from the E–VRV for EGR.
(b) Disconnect the No.2 vacuum hose from the VSV for EGR.
(c) Disconnect the VSV connector for EGR.
(d) Disconnect the turbo pressure sensor connector and vacuum hose.



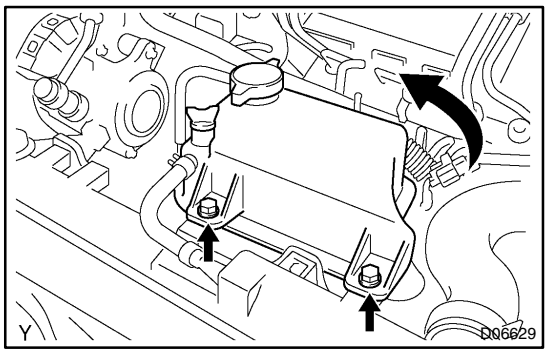
(e) Remove the 2 bolts as shown in the illustration.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)
(f) Disconnect the 2 hose clips, and remove the No.1 air tube assembly.

5. **REMOVE DIESEL THROTTLE BODY WITH NO.2 AIR TUBE ASSEMBLY**

(a) Disconnect the intake air temperature sensor connector.
(b) Disconnect the throttle control motor connector.
(c) Disconnect the full opener switch connector.
(d) Remove the 3 bolts from the diesel throttle body.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



(e) Remove the 2 bolts as shown in the illustration.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)
(f) Disconnect the 2 hose clips, and remove the diesel throttle body assembly with the No.2 air tube assembly.



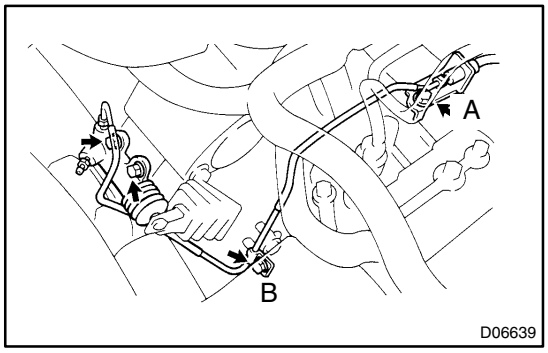
6. REMOVE STARTER

(a) Remove the 2 bolts and disconnect the radiator reservoir from the radiator.

(b) Disconnect the starter connector.

(c) Remove the nut, and disconnect the starter wire.
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

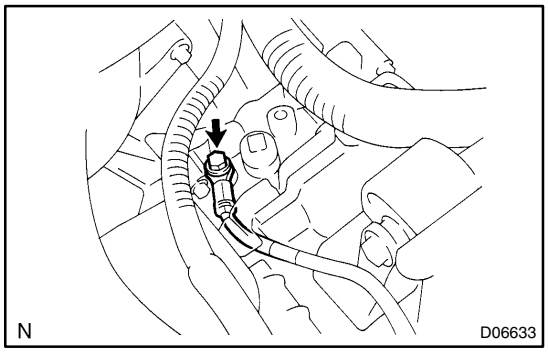
(d) Remove the 2 bolts and starter.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



7. DISCONNECT CLUTCH RELEASE CYLINDER AND LINE

(a) Remove the 2 set bolts of the clutch line bracket.
Torque:
Bolt A: 12 N·m (120 kgf·cm, 9 ft·lbf)
Bolt B: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

(b) Remove the 2 bolts and disconnect the release cylinder and line.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



8. DISCONNECT GROUND CABLE

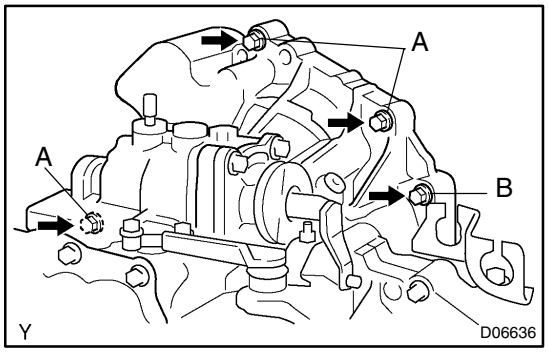
Remove the set bolt of the ground cable from the transaxle.

9. DISCONNECT VEHICLE SPEED SENSOR AND BACK–UP LIGHT SWITCH CONNECTORS

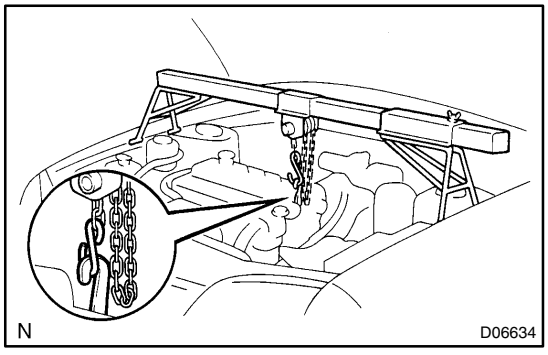
10. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips from the cables.

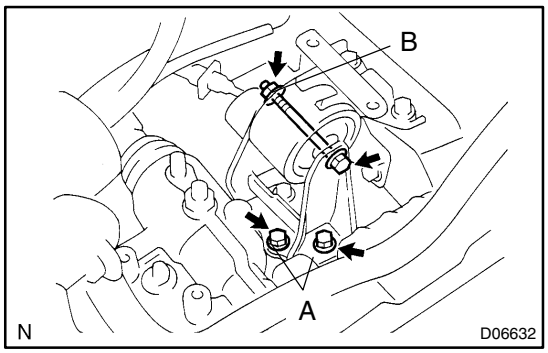


11. REMOVE 4 TRANSAXLE UPPER SIDE MOUNTING BOLTS
Torque:
Bolt A: 64 N·m (650 kgf·cm, 47 ft·lbf)
Bolt B: 29 N·m (296 kgf·cm, 21 ft·lbf)

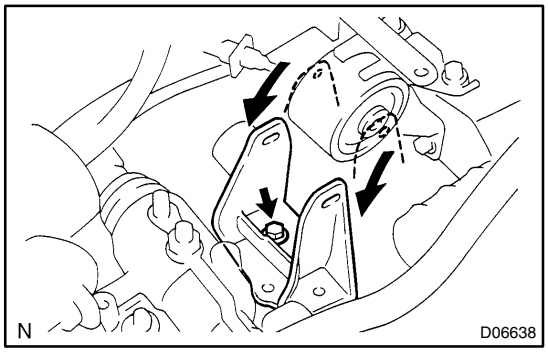


12. INSTALL ENGINE SUPPORT FIXTURE

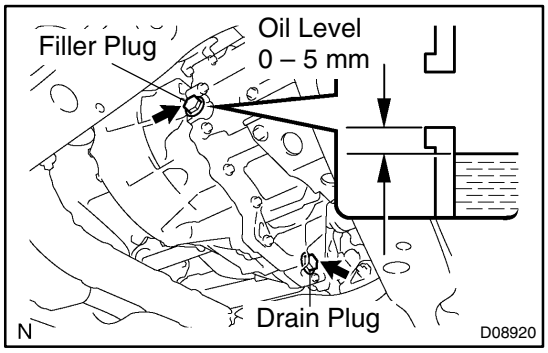
Install the engine hanger in the correct direction.
Parts No.:
Engine hanger: 12281–27010
Bolt: 96122–61020
Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)



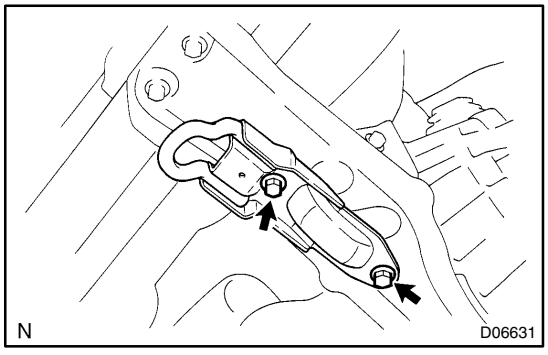
13. REMOVE ENGINE LEFT MOUNTING BRACKET 3 SET BOLTS AND NUT
Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B: 87 N·m (890 kgf·cm, 64 ft·lbf)



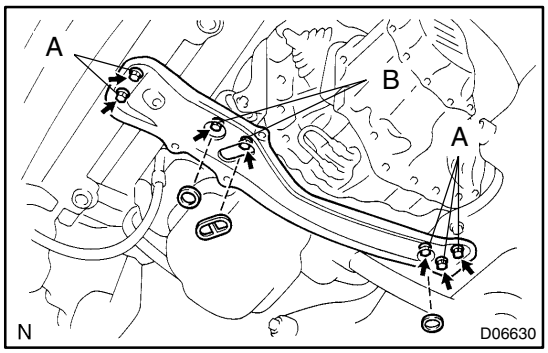
14. REMOVE ENGINE LEFT MOUNTING BRACKET
Lower the transaxle side and remove the bolt and bracket.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)
15. REMOVE FRONT WHEEL
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)
16. RAISE VEHICLE
NOTICE:
Make sure that the vehicle is securely supported.



17. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 2.5 liters (2.6 US qts, 2.2 Imp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
18. REMOVE FRONT EXHAUST PIPE
(a) Remove the 2 bolts, 2 nuts and gasket from the exhaust manifold.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)
(b) Remove the 2 bolts, 2 springs, gasket and pipe.
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)
19. REMOVE LH AND RH FRONT DRIVE SHAFTS
(See page SA–1)



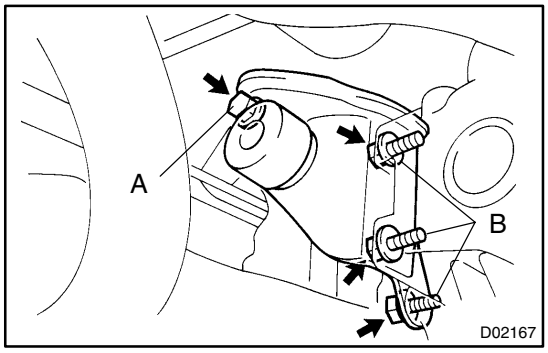
20. REMOVE ENGINE MOUNTING CENTER MEMBER
(a) Remove the 2 bolts and front transport hook.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
(b) Support the suspension crossmember with a jack.
(c) Remove the nuts, and disconnect the suction pipe.



(d) Remove the 2 hole plugs and hole cover.
(e) Remove the 7 bolts and center member.
Torque:
Bolt A: 73 N·m (740 kgf·cm, 54 ft·lbf)
Bolt B: 52 N·m (540 kgf·cm, 38 ft·lbf)

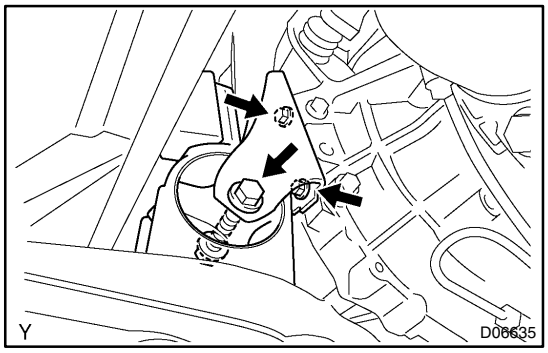
21. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



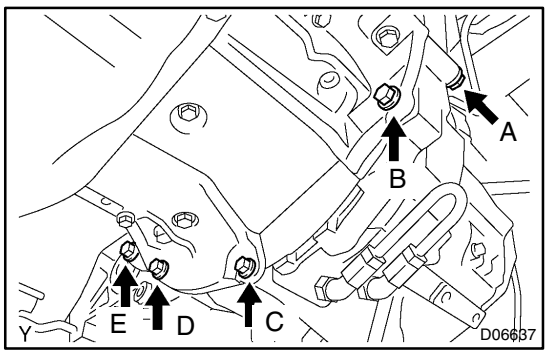
22. REMOVE ENGINE REAR MOUNTING BRACKET

Remove the 4 bolts and bracket.
Torque:
Bolt A: 98 N·m (1,000 kgf·cm, 72 ft·lbf)
Bolt B: 64 N·m (650 kgf·cm, 47 ft·lbf)



23. REMOVE ENGINE FRONT MOUNT AND MOUNTING BRACKET

(a) Remove the bolt and nut.
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)
(b) Remove the 2 bolts.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



24. REMOVE TRANSAXLE LOWER SIDE MOUNTING BOLT

Remove the 5 bolts.
Torque:
Bolt A: 40 N·m (408 kgf·cm, 30 ft·lbf)
Bolt B: 40 N·m (408 kgf·cm, 30 ft·lbf)
Bolt C: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
Bolt D: 20 N·m (204 kgf·cm, 15 ft·lbf)
Bolt E: 46 N·m (470 kgf·cm, 34 ft·lbf)

25. REMOVE TRANSAXLE

Lower engine left side and remove the transaxle from the engine.
HINT:
At the time of installation, please refer to the following items.
- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

26. REMOVE TRANSAXLE CASE PROTECTOR

Remove the 2 bolts and protector.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

MX05P–03

INSTALLATION

Installation is in the reverse order of removal (See page MX–4).

HINT:

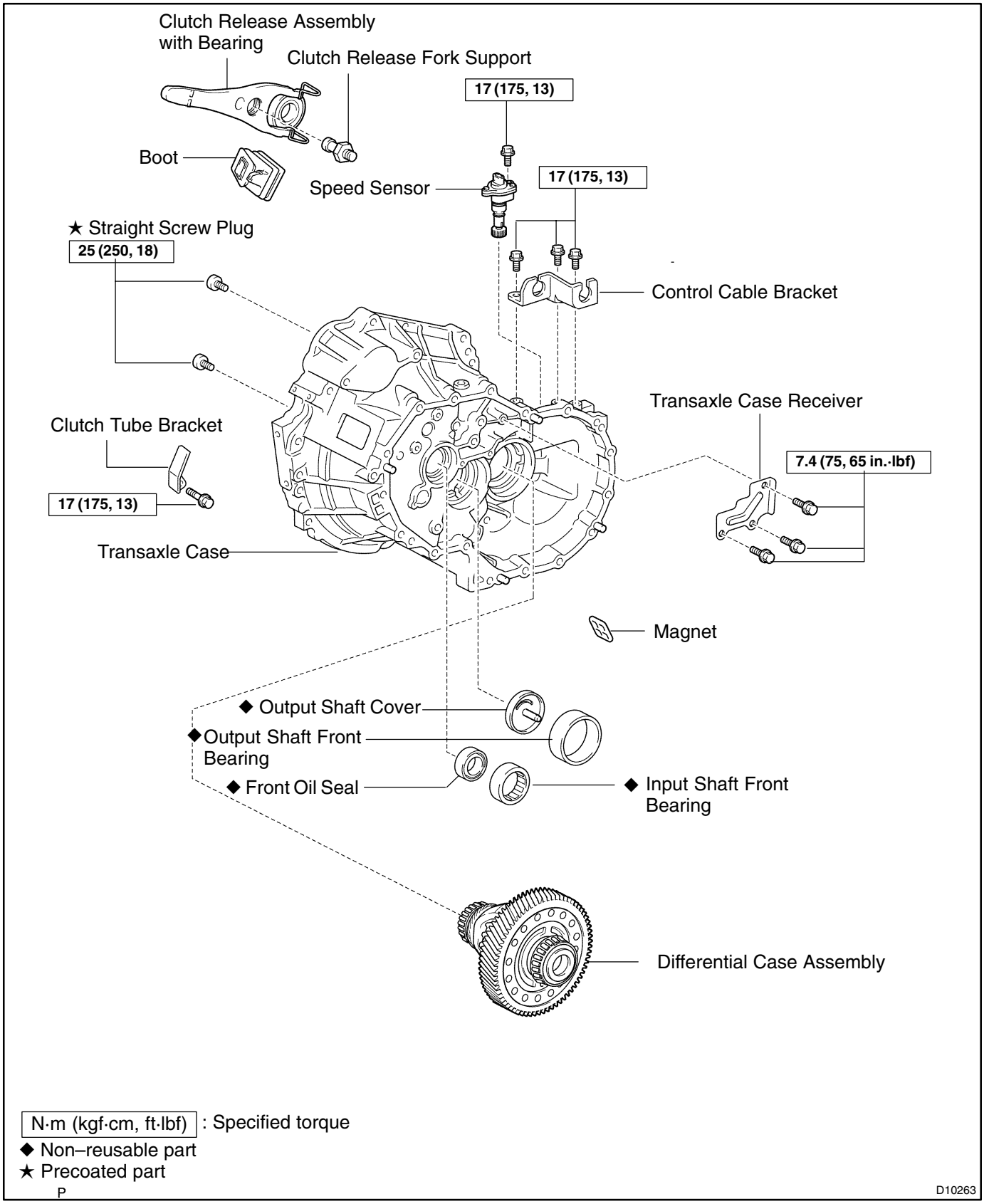
After installation, check and inspect items as follows.

- Front wheel alignment (See Pub. No. RM599E on page SA–4).
- Do the road test.

MANUAL TRANSAXLE ASSEMBLY

MX098–03

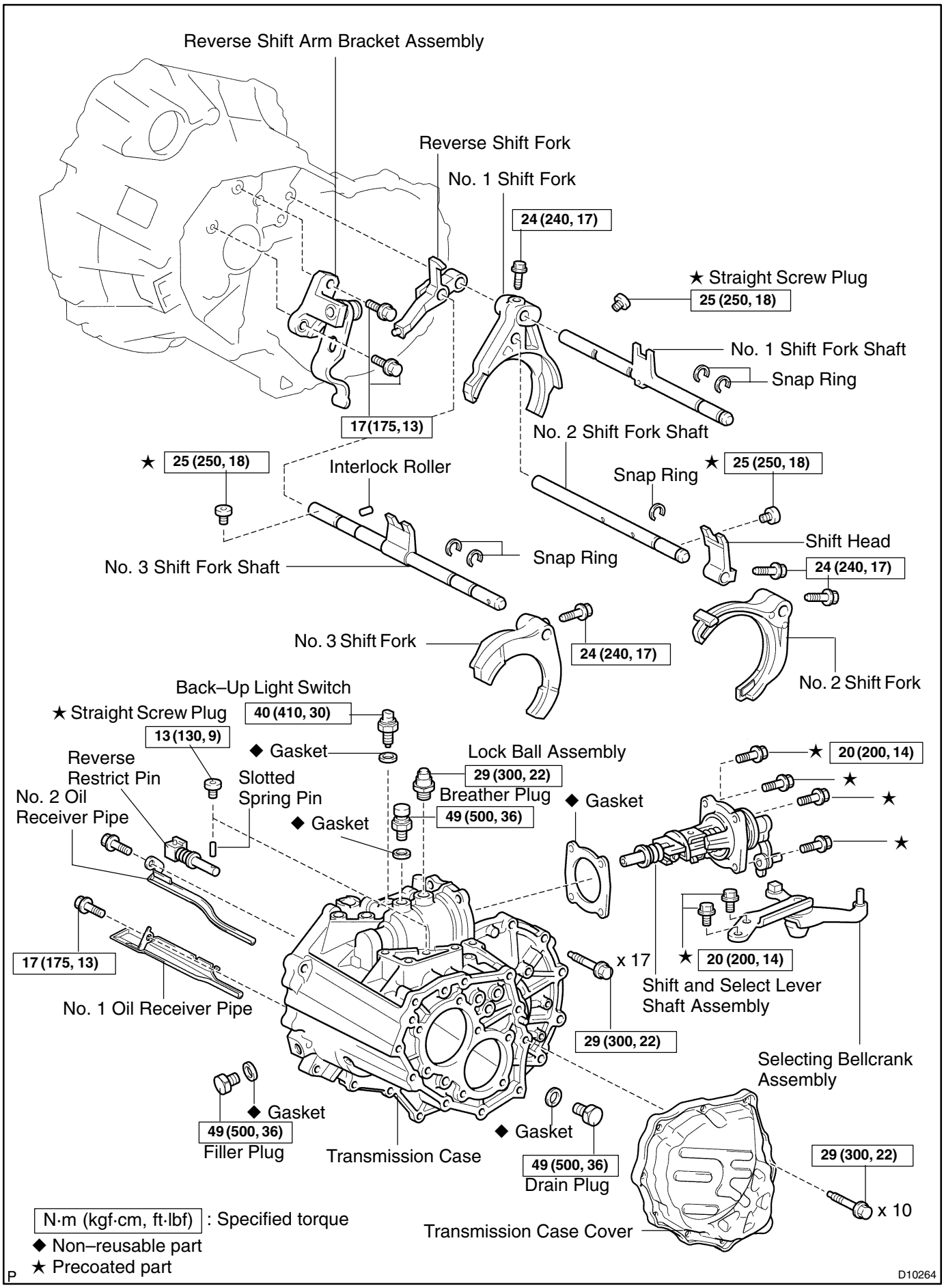
COMPONENTS

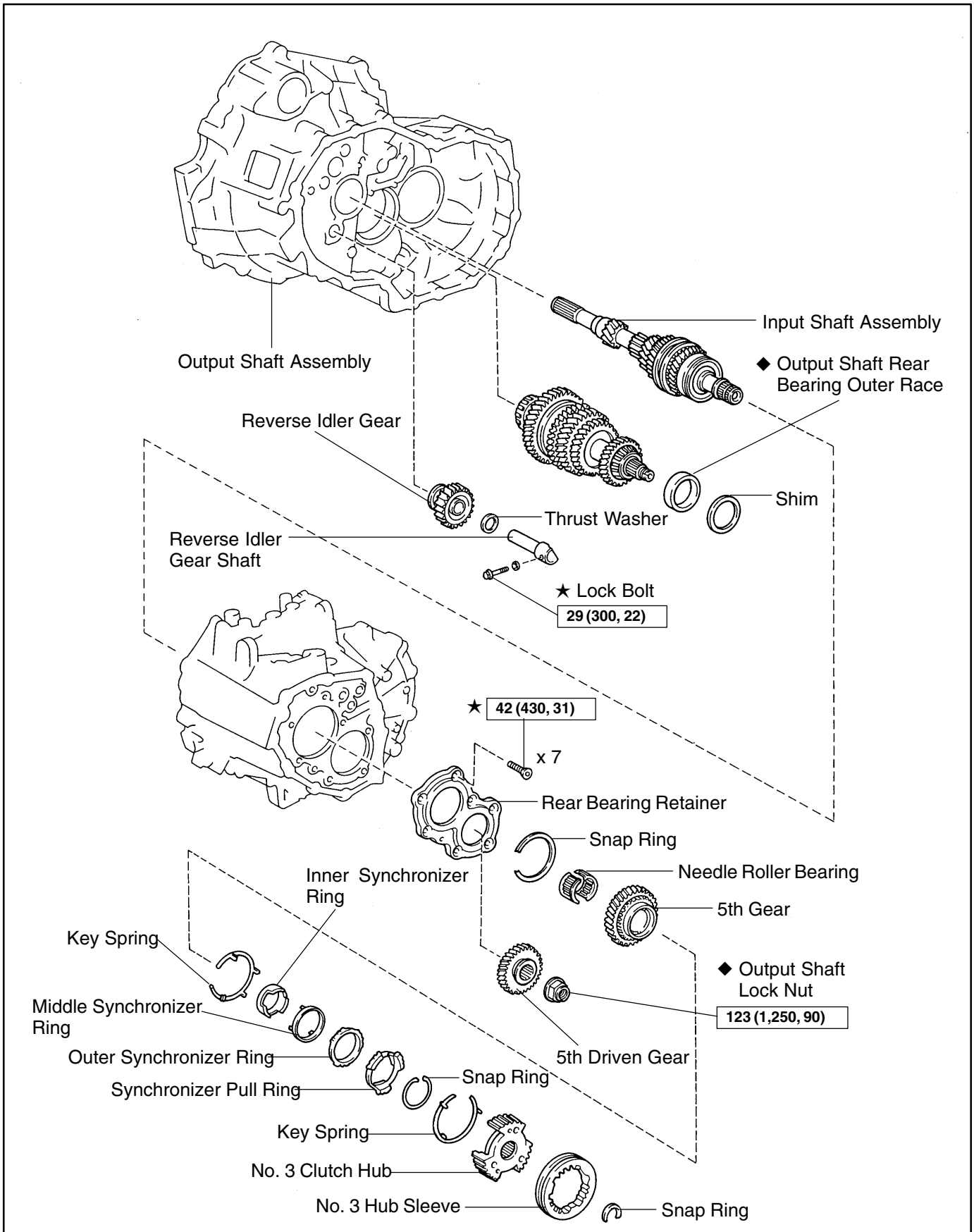


N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part

P

D10263


Reverse Shift Arm Bracket Assembly
Reverse Shift Fork
No. 1 Shift Fork
24 (240, 17)
★ Straight Screw Plug
25 (250, 18)
No. 1 Shift Fork Shaft
Snap Ring
17 (175, 13)
No. 2 Shift Fork Shaft
★ 25 (250, 18)
Interlock Roller
Snap Ring
★ 25 (250, 18)
Shift Head
No. 3 Shift Fork Shaft
Snap Ring
24 (240, 17)
No. 3 Shift Fork
24 (240, 17)
No. 2 Shift Fork
Back–Up Light Switch
★ Straight Screw Plug
40 (410, 30)
13 (130, 9)
◆ Gasket
Lock Ball Assembly
29 (300, 22)
Reverse Restrict Pin
Slotted Spring Pin
Breather Plug
49 (500, 36)
◆ Gasket
◆ Gasket
No. 2 Oil Receiver Pipe
★ 20 (200, 14)
★
★
★
17 (175, 13)
No. 1 Oil Receiver Pipe
x 17
★ 20 (200, 14)
Shift and Select Lever Shaft Assembly
29 (300, 22)
Selecting Bellcrank Assembly
◆ Gasket
49 (500, 36)
Filler Plug
Transmission Case
◆ Gasket
49 (500, 36)
Drain Plug
29 (300, 22)
x 10
Transmission Case Cover
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
P
D10264


Output Shaft Assembly
Input Shaft Assembly
◆ Output Shaft Rear Bearing Outer Race
Reverse Idler Gear
Shim
Thrust Washer
Reverse Idler Gear Shaft
★ Lock Bolt
29 (300, 22)
★ 42 (430, 31)
x 7
Rear Bearing Retainer
Snap Ring
Needle Roller Bearing
Inner Synchronizer Ring
5th Gear
Key Spring
◆ Output Shaft Lock Nut
123 (1,250, 90)
Middle Synchronizer Ring
5th Driven Gear
Outer Synchronizer Ring
Snap Ring
Synchronizer Pull Ring
Key Spring
No. 3 Clutch Hub
No. 3 Hub Sleeve
Snap Ring
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
N
D09632

MX099–03

DISASSEMBLY

1. REMOVE RELEASE FORK AND BEARING

2. REMOVE BACK–UP LIGHT SWITCH WITH GASKET

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

3. REMOVE BOLT AND VEHICLE SPEED SENSOR

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

4. REMOVE SELECTING BELLCRANK ASSEMBLY

Remove the 2 bolts and No.2 selecting bellcrank with the selecting bellcrank support.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

5. REMOVE LOCK BALL ASSEMBLY WITH GASKET

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

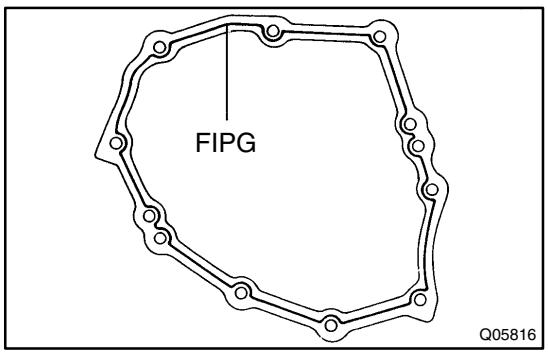
6. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY WITH GASKET

Remove the 4 bolts, the shift, select lever shaft assembly and gasket.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



7. REMOVE TRANSMISSION CASE COVER

Remove the 10 bolts and transmission case cover.

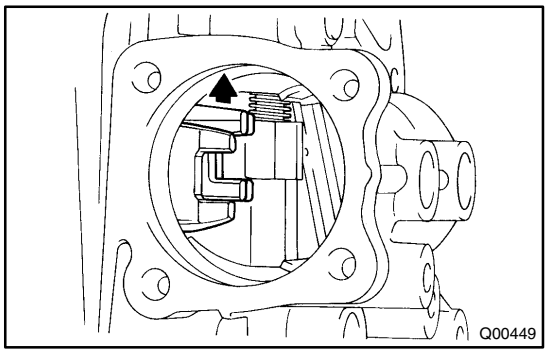
FIPG:

Part No. 08826–00090, THREE BOND 1281 or equivalent

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

8. REMOVE BREATHER PLUG WITH GASKET

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



9. REMOVE OUTPUT SHAFT LOCK NUT

(a) Remove the lock nut.

(b) Engage the gear double meshing.

(c) Remove the lock nut.

Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

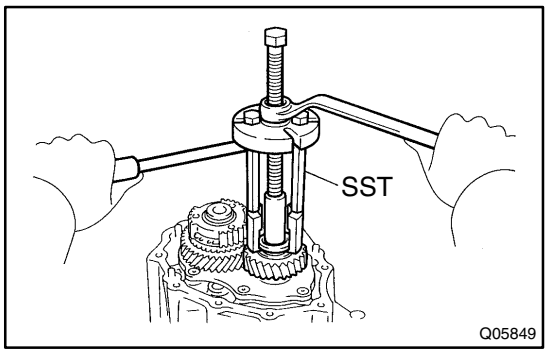
(d) Disengage the gear double meshing.

10. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

(a) Remove the No.3 shift fork set bolt.

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

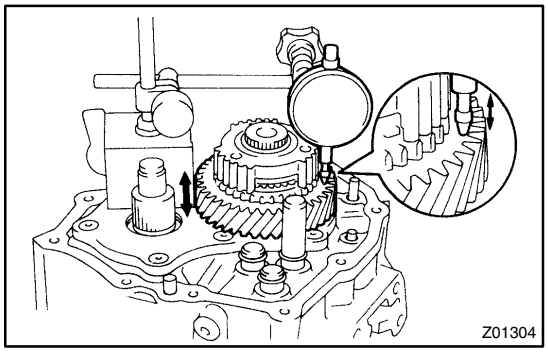
(b) Remove the No.3 hub sleeve and No.3 shift fork.



11. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.

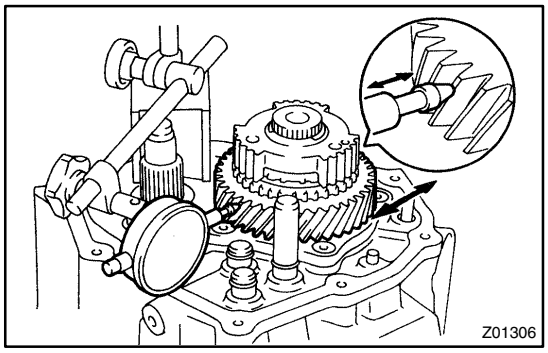
SST 09950–30011



12. MEASURE 5TH GEAR THRUST CLEARANCE AND RADIAL CLEARANCE

(a) Using a dial indicator, measure the thrust clearance.

Minimum clearance:
0.10 mm (0.0039 in.)
Maximum clearance:
0.65 mm (0.0256 in.)

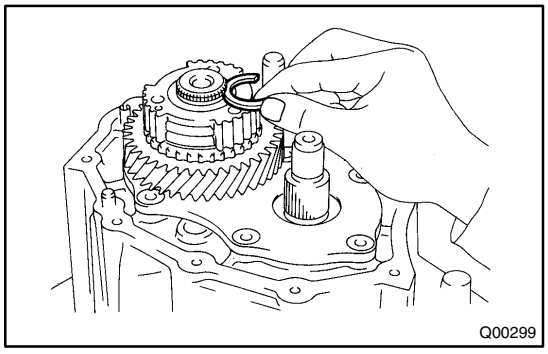


(b) Using a dial indicator, measure the radial clearance.

Maximum clearance:
0.050 mm (0.0020 in.)

13. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

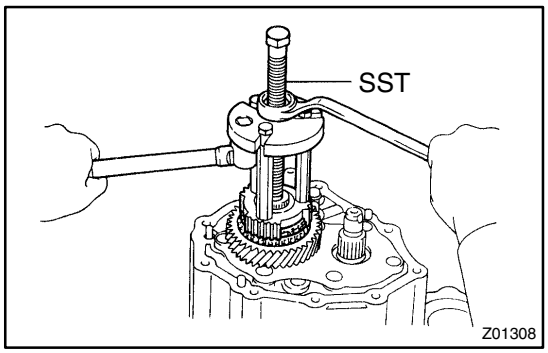


HINT:

At the time of the reassembly, please refer to the following item.

Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
a	1.75 (0.0689)	f	2.00 (0.0787)
b	1.80 (0.0709)	g	2.05 (0.0807)
c	1.85 (0.0729)	h	2.10 (0.0827)
d	1.90 (0.0748)	j	2.15 (0.0847)
e	1.95 (0.0768)	–	–



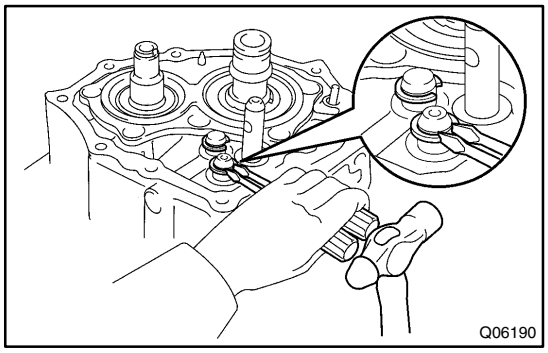
(b) Using SST, remove the No.3 clutch hub with the synchronizer ring and 5th gear.
SST 09950–30011

14. REMOVE NEEDLE ROLLER BEARING AND SPACER

15. REMOVE REAR BEARING RETAINER

Using a torx socket wrench (T45), remove the 7 torx screws and rear bearing retainer.

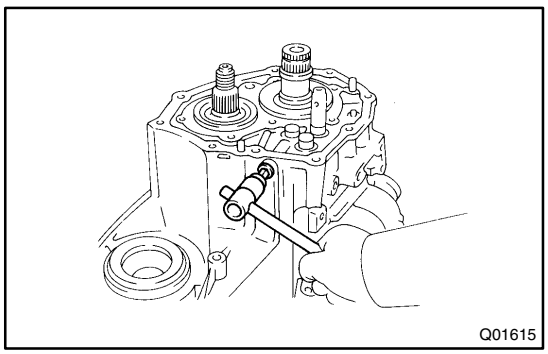
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



16. REMOVE SNAP RING

(a) Using a snap ring expander, remove the input shaft rear bearing snap ring.

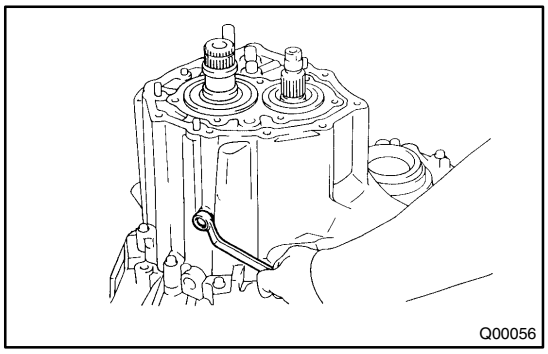
(b) Using 2 screwdrivers and a hammer, remove the 2 snap rings.



17. REMOVE STRAIGHT SCREW PLUG

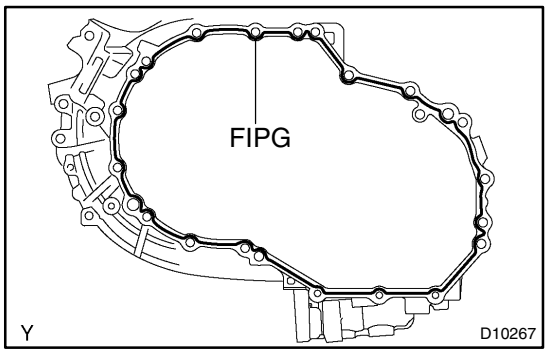
Using a hexagon wrench (6 mm), remove the plug.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



18. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



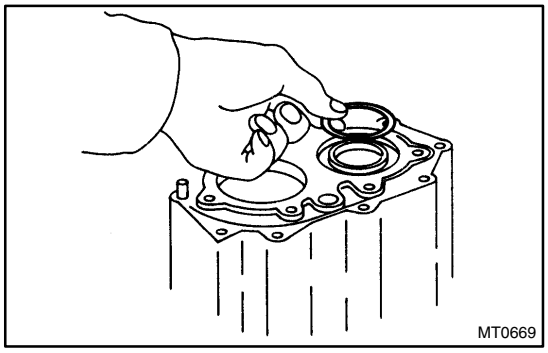
19. REMOVE TRANSMISSION CASE

Remove the 17 bolts and tap the case with a plastic hammer.

FIPG:

Part No. 08826–00090, THREE BOND 1281 or equivalent

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

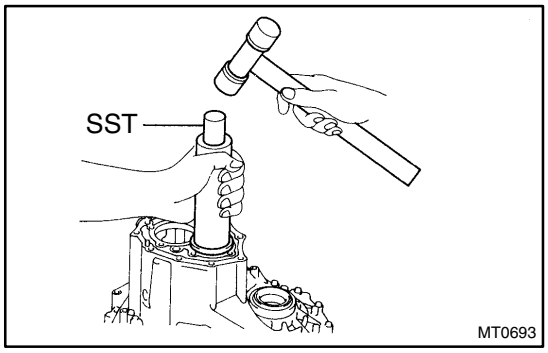


20. REMOVE SHIM

HINT:

At the time of reassembly, please refer to the following item.

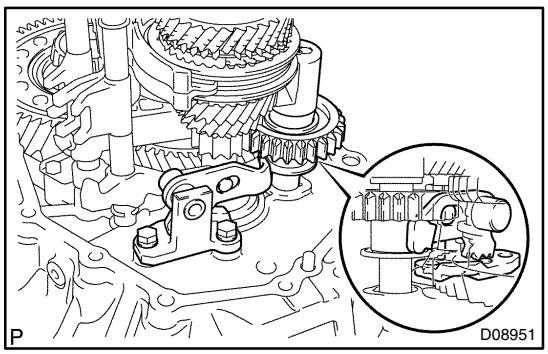
Install the previously selected shim by adjusting output shaft preload.(See page MX–21)



21. REMOVE OUTPUT SHAFT REAR TAPER ROLLER BEARING OUTER RACE

Using SST and a hammer, remove the output shaft rear taper roller bearing outer race.

SST 09316–60011 (09316–00011)



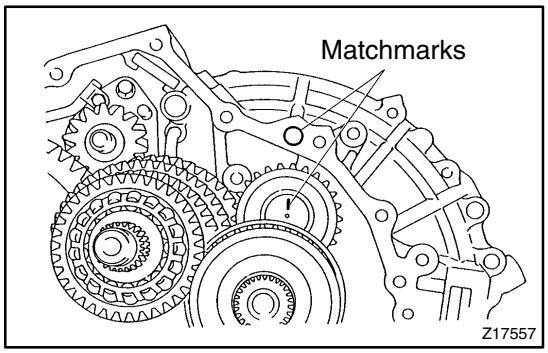
22. REMOVE REVERSE SHIFT ARM BRACKET ASSEMBLY

Remove the bolt and pull off the reverse shift arm and bracket.

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

23. REMOVE REVERSE IDLER GEAR AND SHAFT

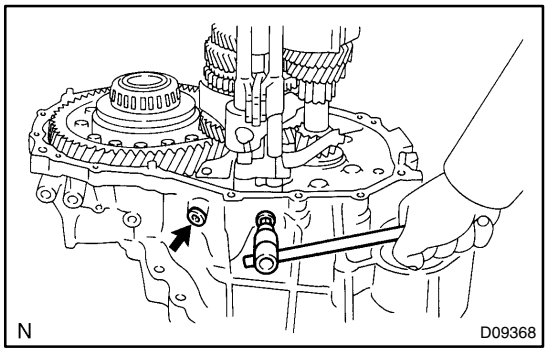
Pull out the shaft, remove the reverse idler gear and thrust washer.



HINT:

At the time of reassembly, please refer to the following item.

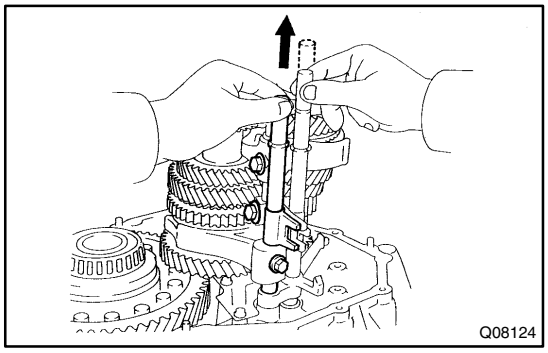
Align the matchmarks, as shown.



24. REMOVE STRAIGHT SCREW PLUG

Using a hexagon wrench (6 mm), remove the 2 plugs.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



25. REMOVE NO.1, NO.2 SHIFT FORKS AND SHIFT HEAD SET BOLT

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

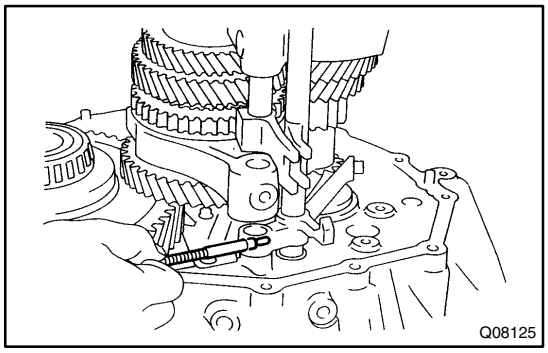
26. REMOVE NO.1 SHIFT FORK SHAFT

Pull up the No.3 shift fork shaft, remove the No.1 shift fork shaft.

HINT:

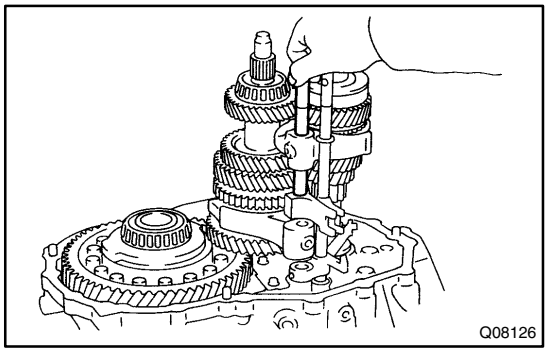
At the time of reassembly, please refer to the following item.

When it is difficult to push the fork shaft through the reverse shift fork, pull up the No.3 shift fork shaft.



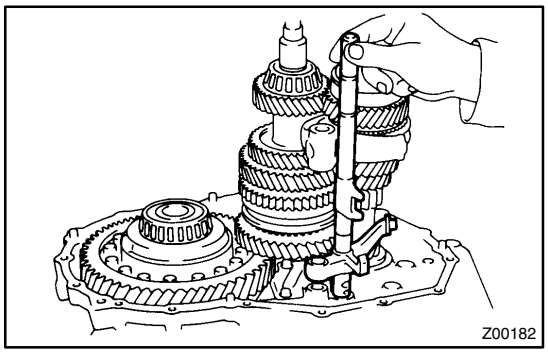
27. REMOVE INTERLOCK ROLLER

Using a magnetic finger, remove the interlock roller from the reverse shift fork.



28. REMOVE NO.2 SHIFT FORK SHAFT, SHIFT HEAD AND NO.1 SHIFT FORK

(a) Pull out the No.2 shift fork shaft.
(b) Remove the shift head and No.1 shift fork.



29. REMOVE NO.3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK AND NO.2 SHIFT FORK

(a) Pull out the No.3 shift fork shaft with the reverse shift fork.
(b) Remove the No.2 shift fork.

30. REMOVE SNAP RING

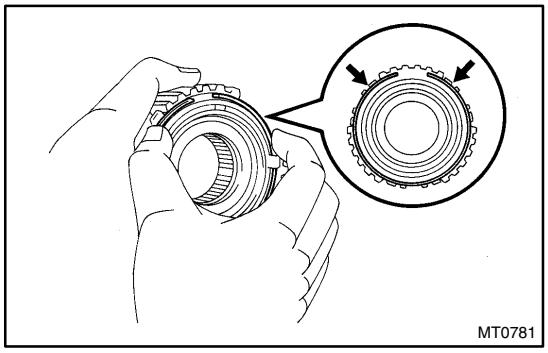
(a) Using 2 screwdrivers and a hammer, remove the snap ring and reverse shift fork from the No.3 shift fork shaft.
(b) Using 2 screwdrivers and a hammer, remove the 3 snap rings from the No.1, No.2 and No.3 shift fork shafts.

31. REMOVE INPUT AND OUTPUT SHAFTS ASSEMBLY

(a) Leaning the output shaft to the differential side, remove the input shaft assembly.

(b) Lift up the differential case assembly, remove the output shaft assembly.

32. REMOVE MAGNET FROM TRANSAXLE CASE



33. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

(a) Remove the No.5 synchronizer ring with the key spring from the No.3 clutch hub.

(b) Using a screwdriver, remove the snap ring.

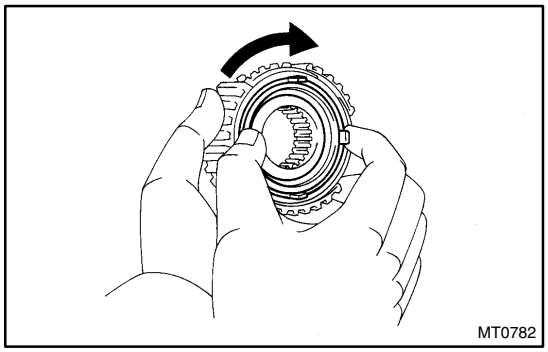
HINT:

Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

(c) Remove the synchronizer rings.

MX05W–03

INSPECTION

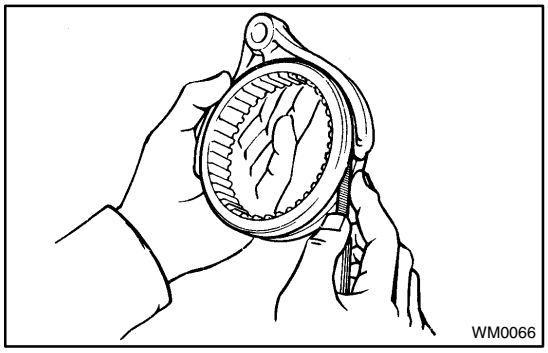


1. INSPECT NO.5 SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the middle No.5 synchronizer ring in one direction while pushing it to the outer No.5 synchronizer ring. Check that the ring locks.

If it does not lock, replace the synchronizer ring.

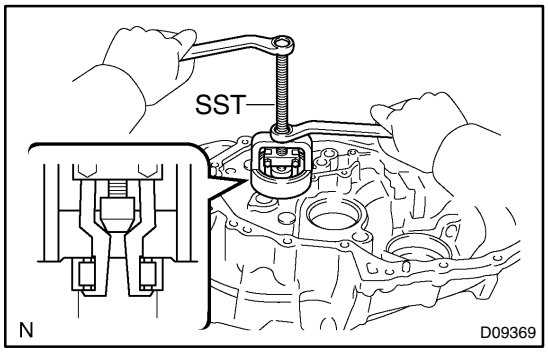


2. MEASURE No.3 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.35 mm (0.014 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

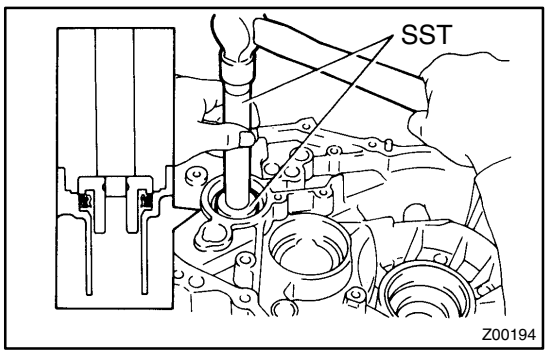


3. IF NECESSARY, REPLACE INPUT SHAFT BEARING AND OIL SEAL

(a) Remove the 3 bolts and transaxle case receiver.

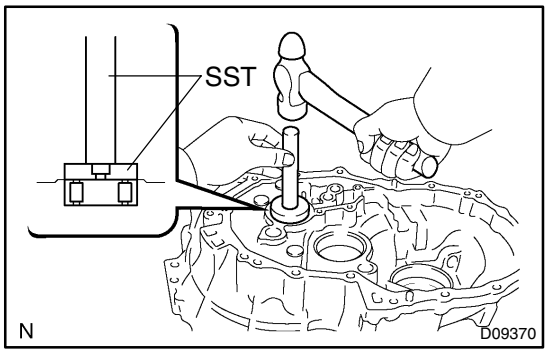
(b) Using SST, pull out the bearing.
SST 09612–65014

(c) Using a screwdriver, remove the oil seal.



(d) Using SST, drive in a new oil seal.
SST 09608–00081, 09950–70010 (09951–07150)

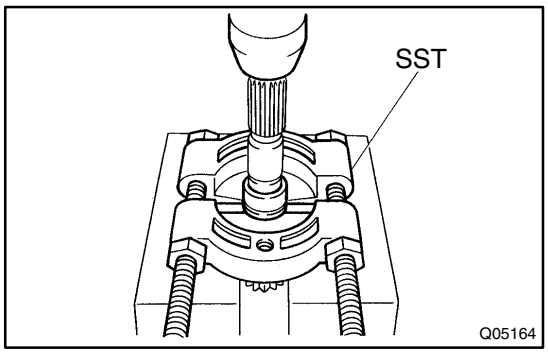
(e) Coat the lip of seal with MP grease.



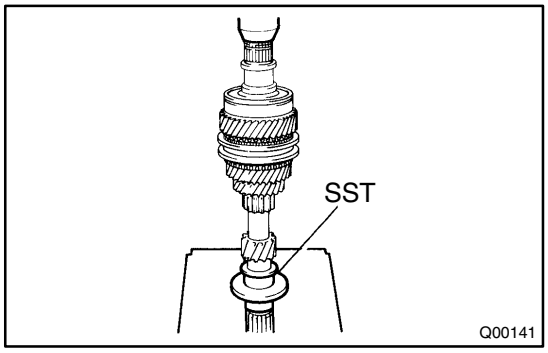
(f) Using SST, drive in a new bearing.
SST 09950–60010 (09951–00580), 09950–70010 (09951–07150)

(g) Install the transaxle case receiver.

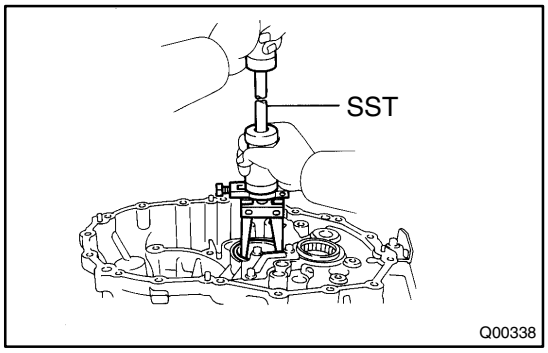
(h) Install and torque the 3 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



(i) Using SST and a press, remove the inner race.
SST 09950–00020



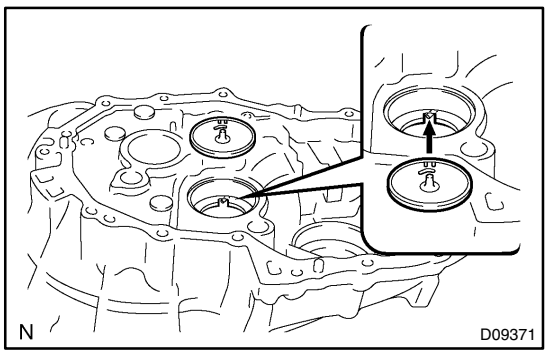
(j) Using SST and a press, install a new input shaft front bearing inner race.
SST 09316–60011 (09316–00021)



4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING OUTER RACE AND OUTPUT SHAFT FRONT COVER

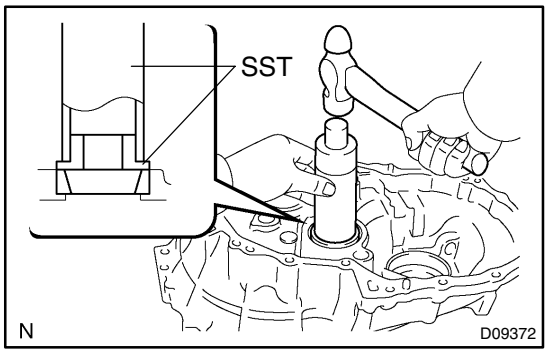
(a) Using SST, pull out the output shaft front bearing outer race.
SST 09308–00010

(b) Remove the output shaft cover.

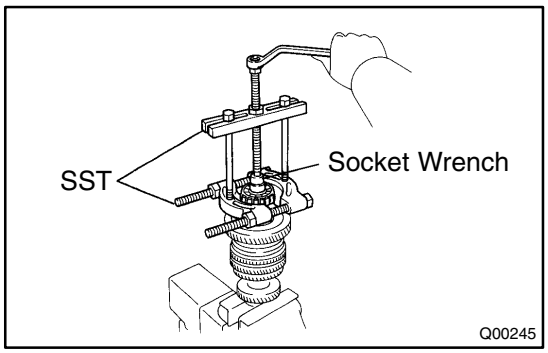


(c) Install a new output shaft cover.

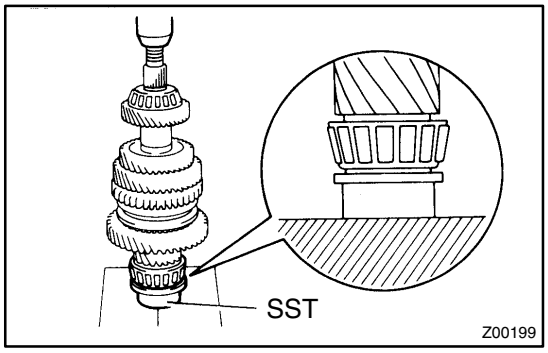
HINT:
Install the output shaft cover projection into the case side groove.



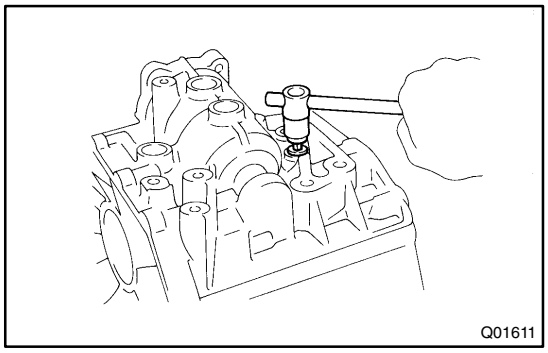
(d) Using SST and a hammer, drive in a new output shaft front bearing outer race.
SST 09316–60011 (09316–00011, 09316–00021)



(e) Using SST and a socket wrench, remove the output shaft front bearing.
SST 09950–00020, 09950–00030



(f) Using SST and a press, install a new output shaft front bearing.
SST 09316–60011 (09316–00071)

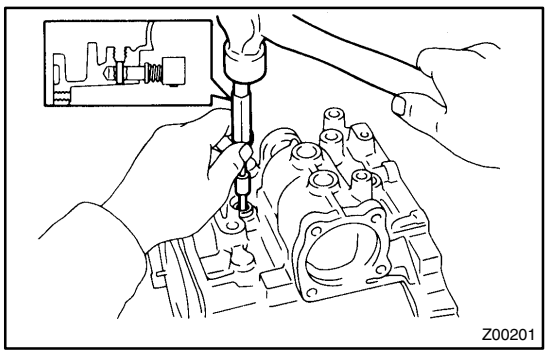


5. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench (6 mm), remove the screw plug.

(b) Using a pin punch and hammer, drive out the slotted spring pin.

(c) Replace the reverse restrict pin.



(d) Using a pin punch and hammer, drive in the slotted spring pin.

(e) Apply sealant to the screw plug threads.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(f) Using a hexagon wrench (6 mm), install and torque the screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX05X–04

REASSEMBLY

Reassembly is in the reverse order of disassembly.
(See page MX–12)

NOTICE:

When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non–residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

HINT:

- Before reassembly, select a shim by adjusting output shaft preload.
- Coat all of the sliding and rotating surfaces with gear oil before reassembly.

ADJUST OUTPUT SHAFT PRELOAD

(a) Install the output shaft assembly to the transaxle case.
(b) Install the transmission case to the transaxle case.

HINT:

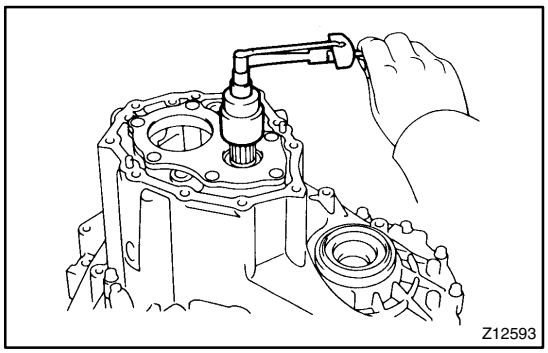
If necessary, tap on the case with a plastic hammer.

(c) Install and torque the 17 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
(d) Install the output shaft rear taper roller bearing outer race.
(e) Install the adjusting shim.

HINT:

When reusing the output shaft bearing, first install a shim of the same thickness as before. If installing a new taper roller bearing, first select and install a shim of lesser thickness than before.

(f) Install the rear bearing retainer.
(g) Using a torx wrench (T45), install and torque the 7 torx screws.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)
(h) Install a new lock nut to the output shaft.
(i) Turn the output shaft right and left 2 or 3 times to allow the bearing to settle.


Z12593

(j) Using a torque wrench, measure the preload.

Preload (at starting):

New bearing

0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)

Reused bearing

0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

If the preload is not within the specification, select an appropriate adjusting shim.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	1.30 (0.0512)	D	1.95 (0.0768)
1	1.35 (0.0531)	E	2.00 (0.0787)
2	1.40 (0.0551)	F	2.05 (0.0807)
3	1.45 (0.0571)	G	2.10 (0.0827)
4	1.50 (0.0591)	H	2.15 (0.0846)
5	1.55 (0.0610)	J	2.20 (0.0866)
6	1.60 (0.0630)	K	2.25 (0.0886)
7	1.65 (0.0650)	L	2.30 (0.0906)
8	1.70 (0.0669)	M	2.35 (0.0925)
9	1.75 (0.0689)	N	2.40 (0.0945)
A	1.80 (0.0709)	P	2.45 (0.0965)
B	1.85 (0.0728)	Q	2.50 (0.0984)
C	1.90 (0.0748)	–	–

(k) Remove the lock nut.

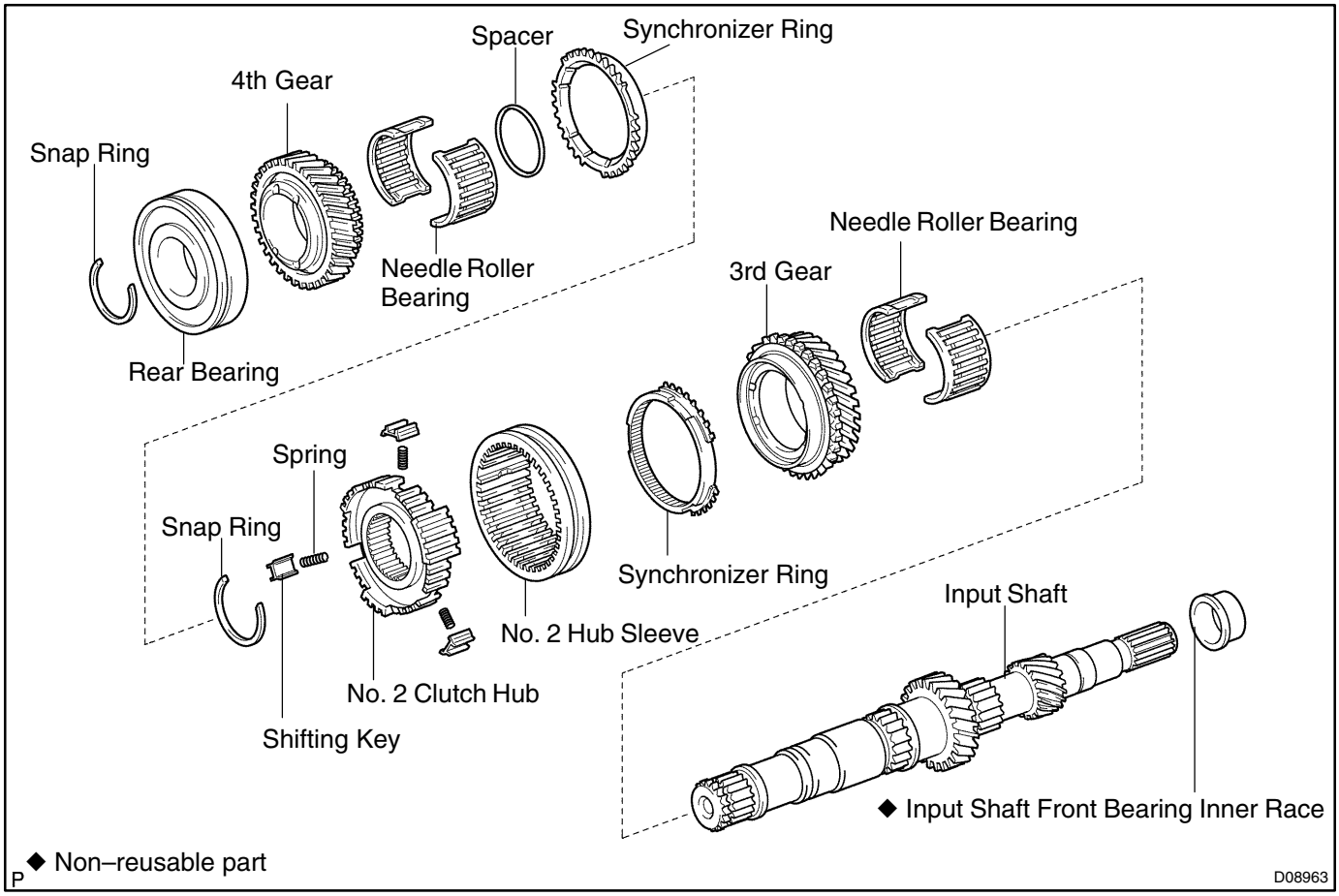
(l) Remove these parts. Removal is in the reverse order of installation.

- Rear bearing retainer
- Shim
- Transmission case
- Output shaft assembly
- Output shaft rear bearing outer race

INPUT SHAFT

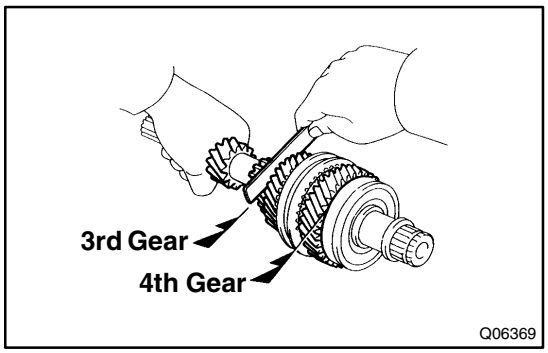
COMPONENTS

MX028–06



MX029–04

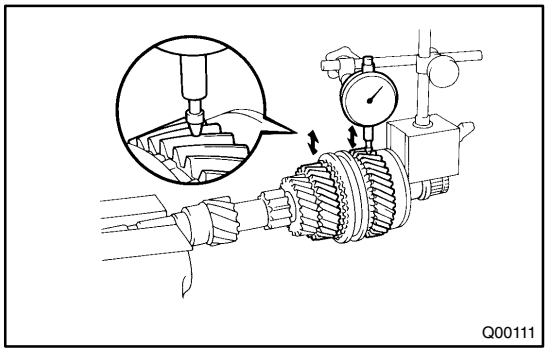
DISASSEMBLY



1. MEASURE 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Minimum clearance:
3rd gear and 4th gear: 0.10 mm (0.0039 in.)
Maximum clearance:
3rd gear: 0.40 mm (0.0157 in.)
4th gear: 0.60 mm (0.0236 in.)



2. CHECK 3RD AND 4TH GEARS RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the gear and shaft.

Maximum clearance:
3rd gear: 0.053 mm (0.0021 in.)
4th gear: 0.051 mm (0.0020 in)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.

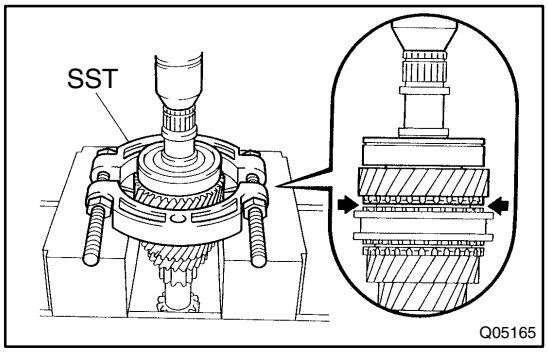
3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.

4. REMOVE REAR BALL BEARING AND 4TH GEAR

Using SST and a press, remove the rear bearing.

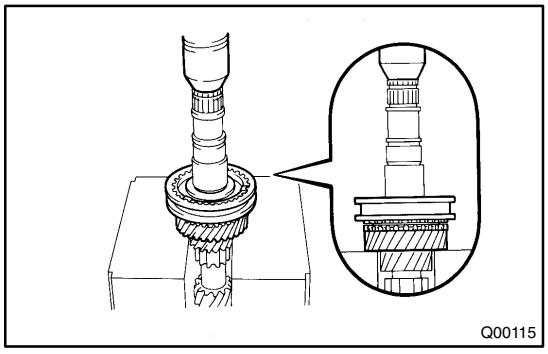
SST 09950–00020



5. REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING

6. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.



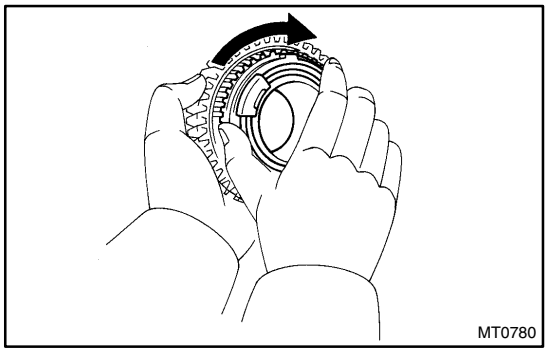
7. REMOVE NO.2 CLUTCH HUB ASSEMBLY, SYNCHRONIZER RING AND 3RD GEAR

Using a press, remove the No.2 hub sleeve, 3rd gear and synchronizer rings.

8. REMOVE NEEDLE ROLLER BEARING

MX02A–04

INSPECTION

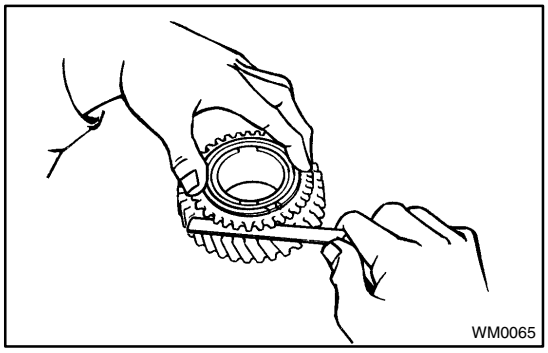


1. INSPECT 3RD GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

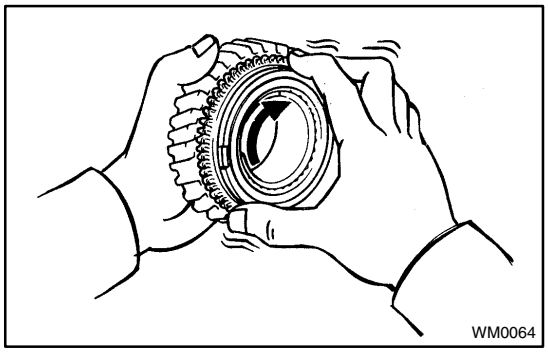
If it does not lock, replace the synchronizer ring.



(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.65 mm (0.026 in.)

If the clearance is less than the minimum, replace the synchronizer ring.



2. INSPECT 4TH GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

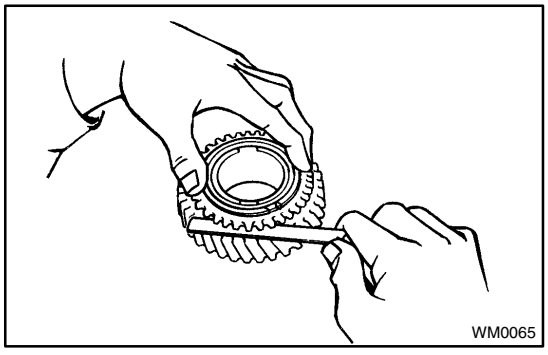
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



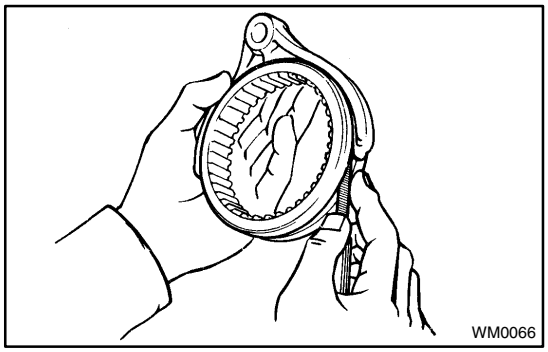
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and spline end.

Minimum clearance: 0.75 mm (0.030 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

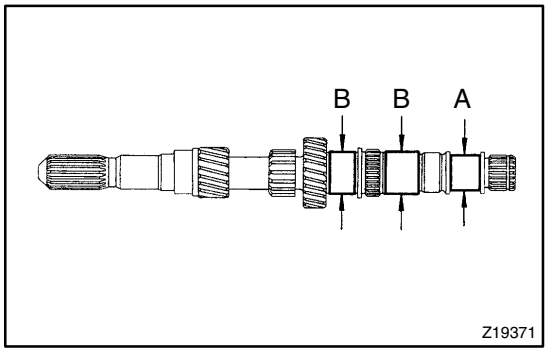


3. MEASURE NO.2 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.69 mm (0.027 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

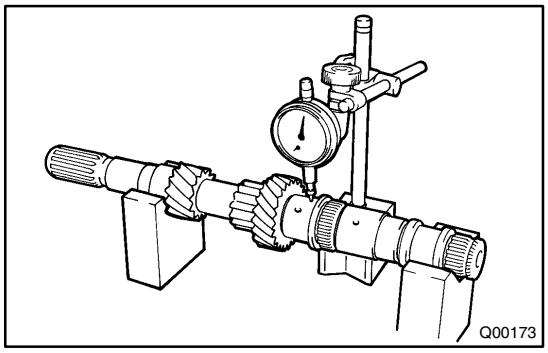


4. INSPECT INPUT SHAFT

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

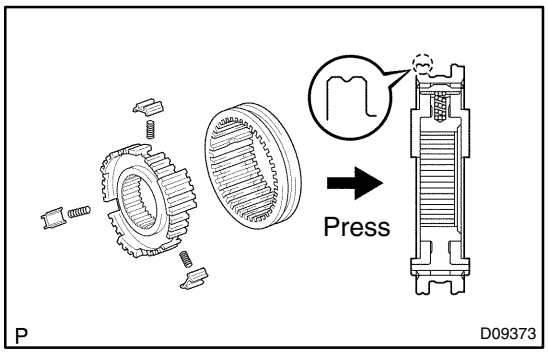
Minimum outer diameter:
Part A: 27.957 mm (1.1007 in.)
Part B: 35.984 mm (1.4167 in.)



(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

MX0D2–01



REASSEMBLY

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the 3 springs and shifting keys to the clutch hub.

(b) Install the hub sleeve to the clutch hub.

HINT:

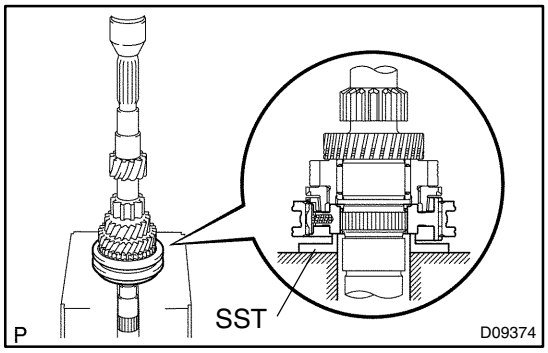
Direct identification groove of the hub sleeve to front of the transmission.

2. INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply MP grease to the needle roller bearing.

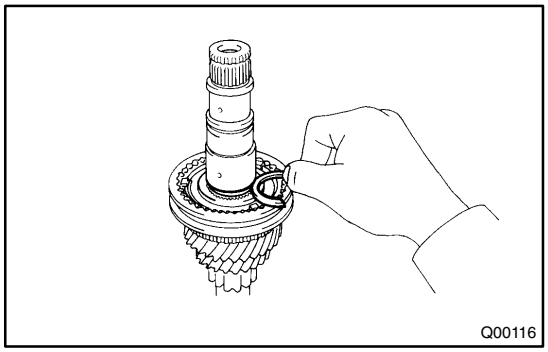
(b) Assemble the needle roller bearings into the 3rd gear.

(c) Place the synchronizer rings on the gear and align the ring slots with the shifting keys.



(d) Using SST and a press, install the 3rd gear and No.2 hub sleeve.

SST 09506–35010



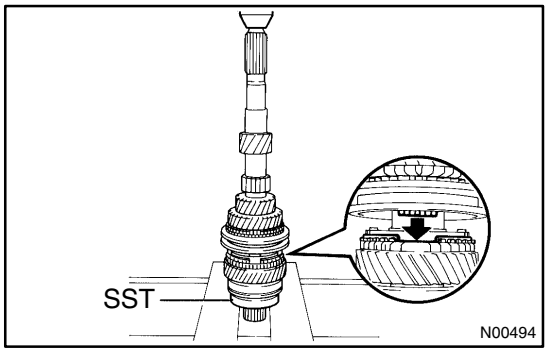
3. INSTALL SNAP RING

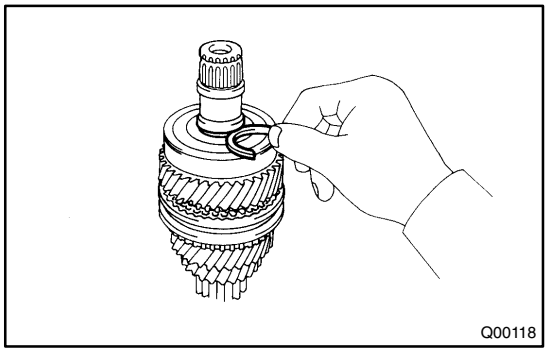
(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
H	2.30 (0.0906)	M	2.50 (0.0984)
J	2.35 (0.0925)	N	2.55 (0.1004)
K	2.40 (0.0945)	P	2.60 (0.1024)
L	2.45 (0.0965)	–	–

(b) Using a screwdriver and hammer, tap in the snap ring.

4. MEASURE 3RD GEAR THRUST CLEARANCE
(See page MX–24)





5. INSTALL SPACER, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, 4TH GEAR AND REAR BALL BEARING

(a) Install the spacer.
(b) Apply MP grease to the needle roller bearings.
(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.
(d) Install the 4th gear.
(e) Using SST and a press, install the rear ball bearing.
SST 09506–35010

6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	2.35 (0.0925)	5	2.55 (0.1004)
2	2.40 (0.0945)	6	2.60 (0.1024)
3	2.45 (0.0965)	7	2.65 (0.1043)
4	2.50 (0.0984)	8	2.70 (0.1063)

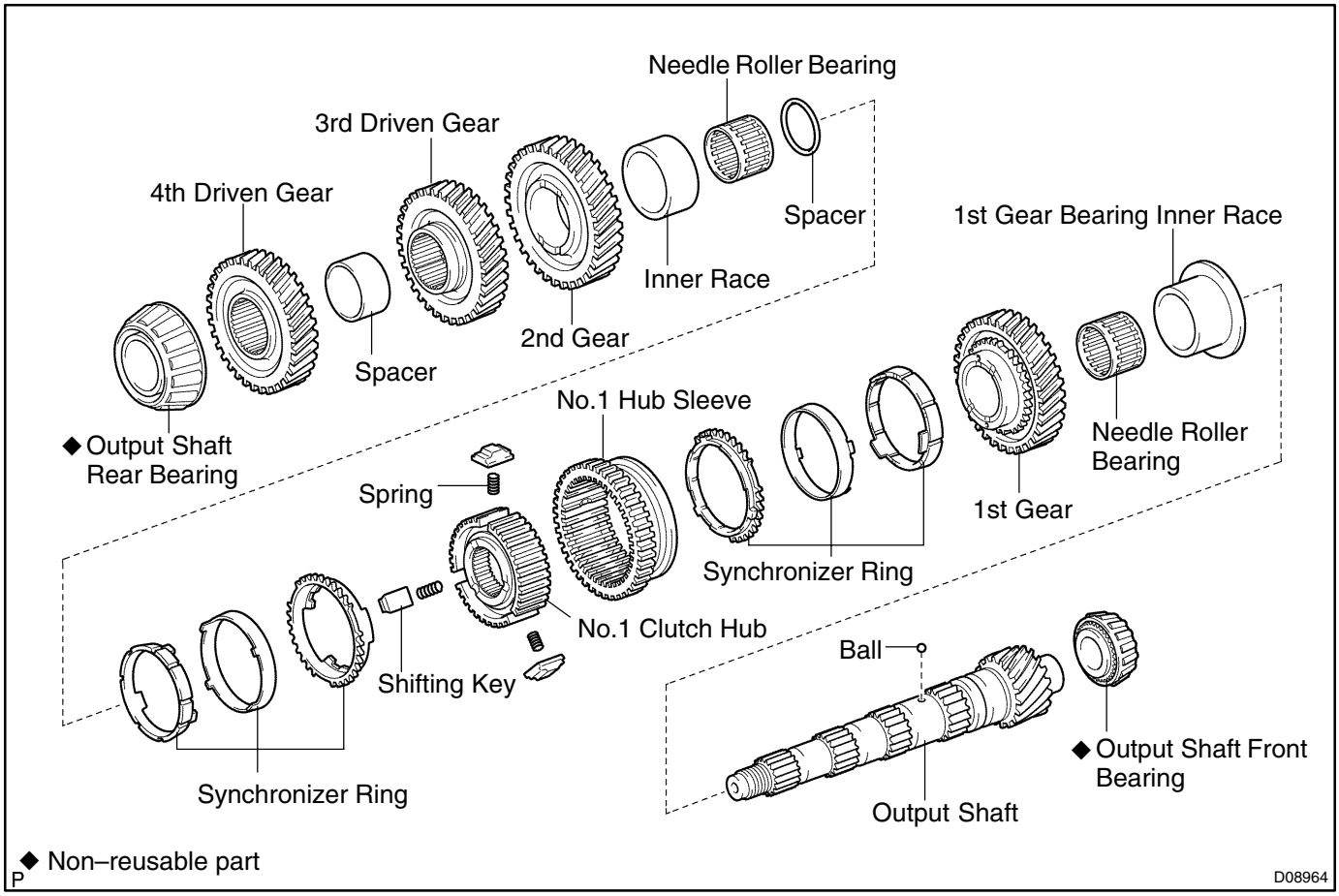
(b) Using a screwdriver and hammer, tap in the snap ring.

7. MEASURE 4TH GEAR THRUST CLEARANCE
(See page MX–24)

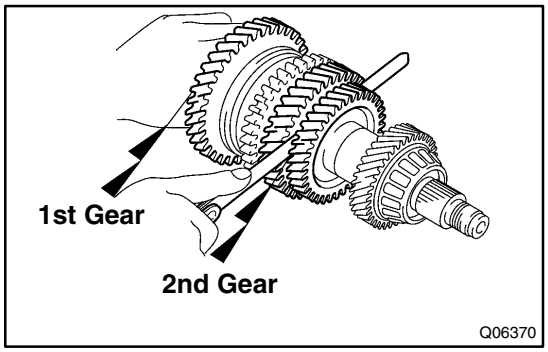
OUTPUT SHAFT

COMPONENTS

MX02C–06



MX02D–05

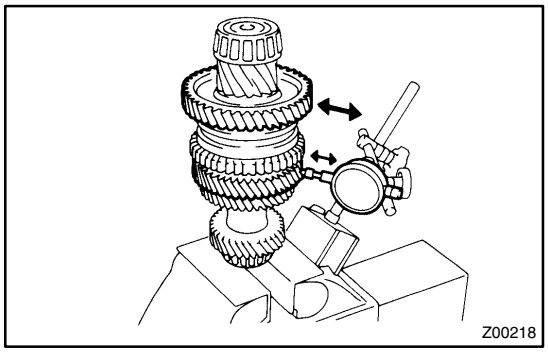


DISASSEMBLY

1. MEASURE 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Minimum clearance:
1st gear: 0.25 mm (0.0098 – 0.0138 in.)
2nd gear: 0.10 – 0.45 mm (0.0039 – 0.0177 in.)
Maximum clearance:
1st gear: 0.40 mm (0.0157 in.)
2nd gear: 0.35 mm (0.0137 in.)

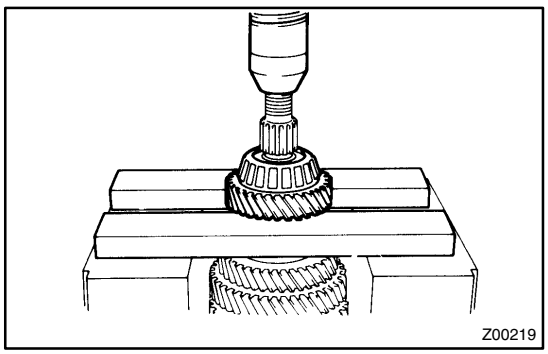


2. CHECK 1ST AND 2ND GEARS RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the gear and shaft.

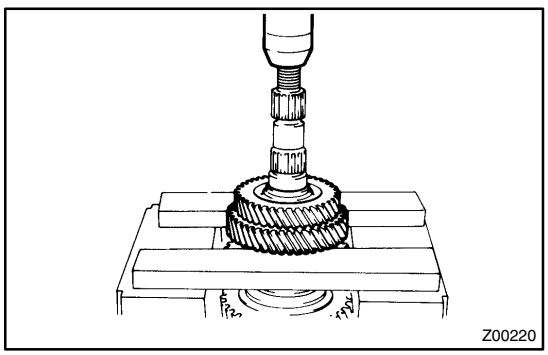
Maximum clearance:
1st and 2nd gears: 0.053 mm (0.0020 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE OUTPUT SHAFT REAR BEARING, 4TH DRIVEN GEAR AND SPACER

(a) Using a press, remove the bearing and 4th driven gear.
(b) Remove the spacer.

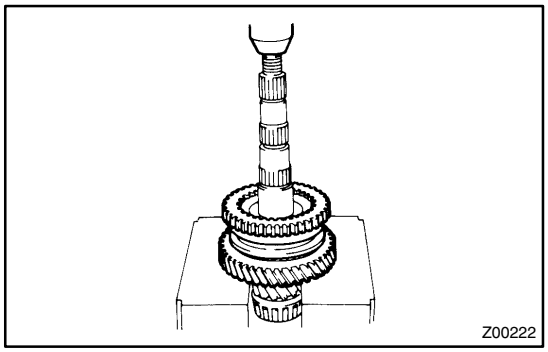


4. REMOVE 3RD DRIVEN GEAR AND 2ND GEAR

Using a press, remove the 3rd driven gear and 2nd gear.

5. REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING

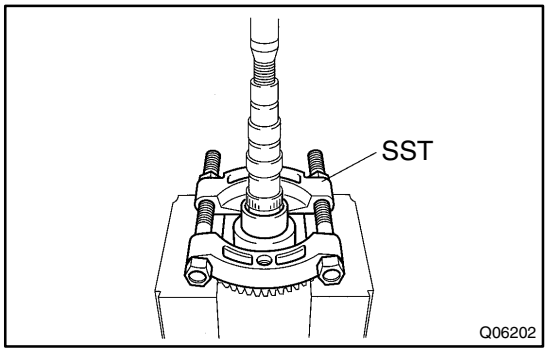
6. REMOVE INNER RACE AND BALL FROM OUTPUT SHAFT



7. REMOVE NO.1 HUB SLEEVE ASSEMBLY AND 1ST GEAR

Using a press, remove the No.1 hub sleeve and 1st gear.

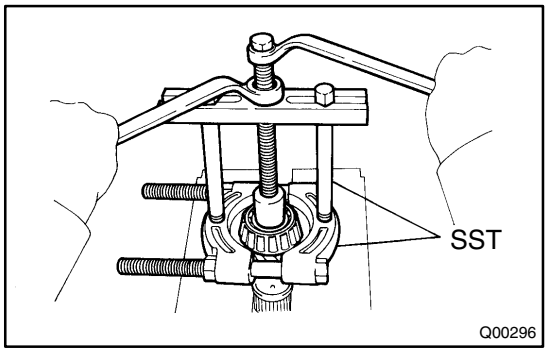
8. REMOVE SYNCHRONIZER RING AND NEEDLE ROLLER BEARING



9. REMOVE 1ST GEAR BEARING INNER RACE

Using SST and a press, remove the 1st gear bearing inner race.

SST 09950–00020

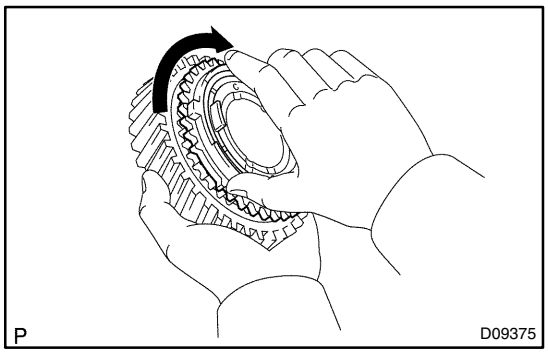


10. REMOVE OUTPUT SHAFT FRONT BEARING

Using SST, remove the output shaft front bearing.

SST 09950–00020, 09950–00030

MX02E–04



INSPECTION

1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

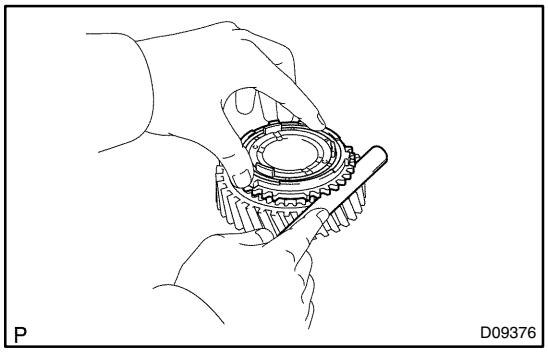
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



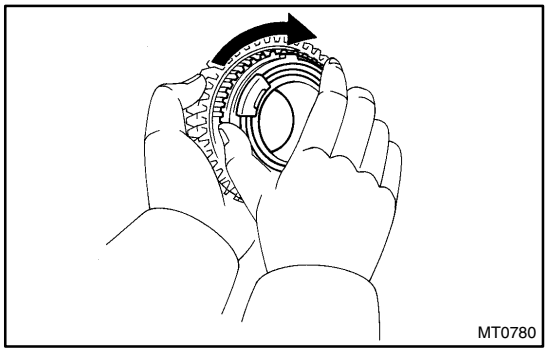
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

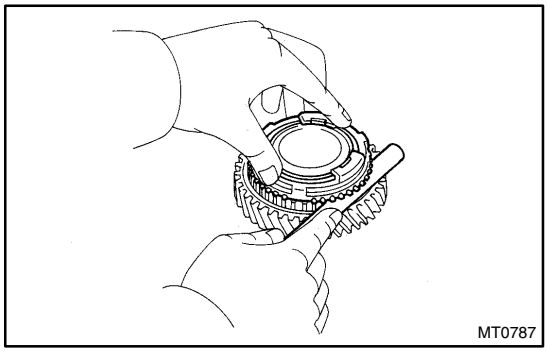


2. INSPECT 2ND GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

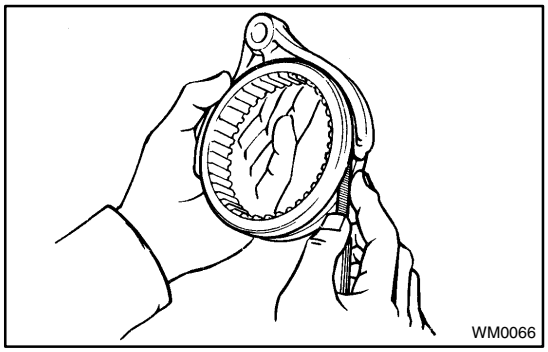
If it does not lock, replace the synchronizer ring.



(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring.

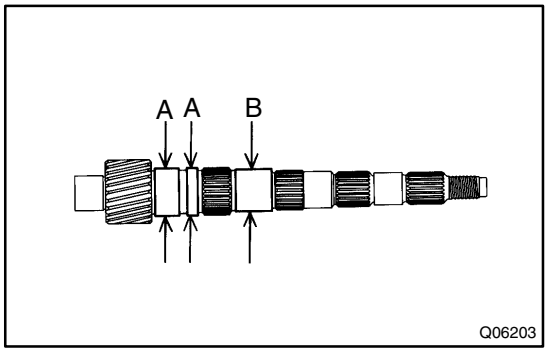


3. MEASURE NO.1 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.35 mm (0.014 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

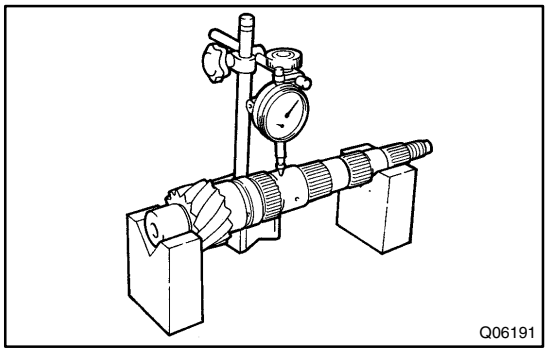


4. INSPECT OUTPUT SHAFT

(a) Check the output shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:
Part A: 37.610 mm (1.4807 in.)
Part B: 34.502 mm (1.3584 in.)



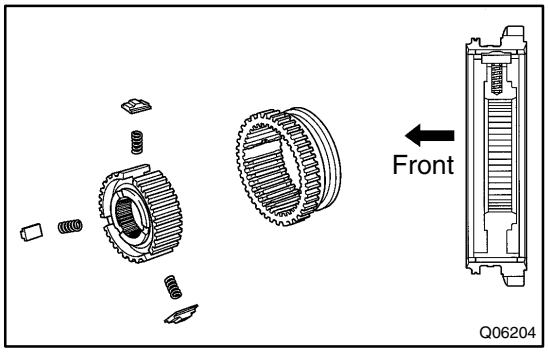
(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

MX02F–07

REASSEMBLY

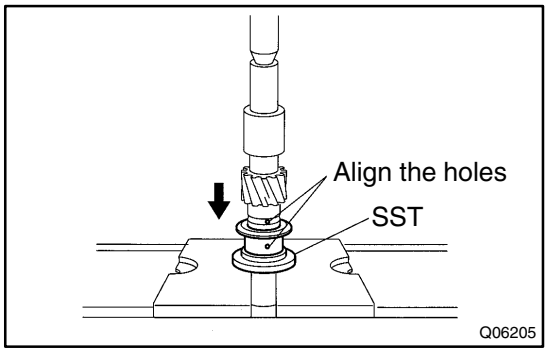
HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.



1. INSTALL NO.1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the 3 springs and shifting keys to the clutch hub.
(b) Install the hub sleeve to the clutch hub.

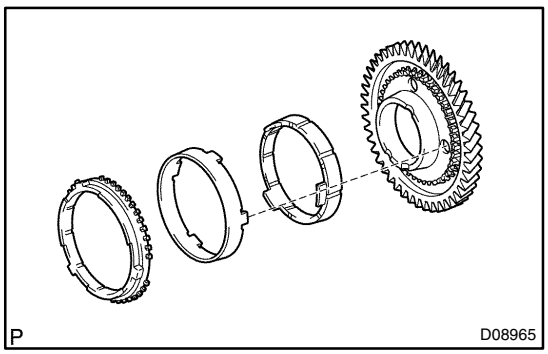
HINT:
Direct identification groove of the hub sleeve to the front of the transmission.



2. INSTALL 1ST GEAR BEARING INNER RACE

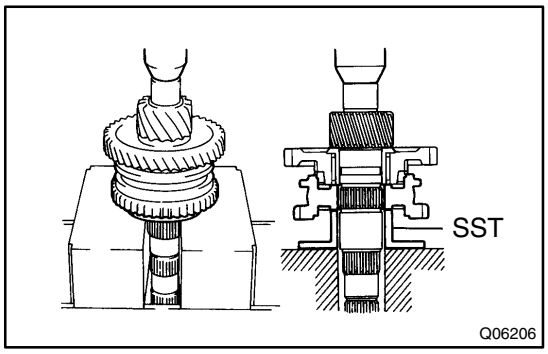
Using SST and a press, install the 1st gear bearing inner race.
SST 09506–35010

HINT:
Align the hole of the output shaft and inner race.



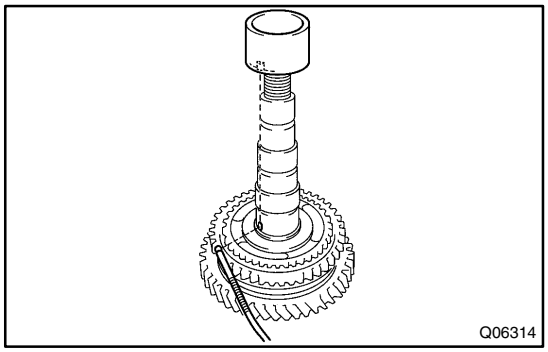
3. INSTALL NEEDLE ROLLER BEARING, 1ST GEAR, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

(a) Apply MP grease to the needle roller bearing.
(b) Install the 1st gear.
(c) Place the synchronizer ring (for the 1st gear) on the gear and align the ring slots with the shifting keys.



(d) Using SST and a press, install the 1st gear and No.1 hub sleeve.
SST 09316–60011 (09316–00041)

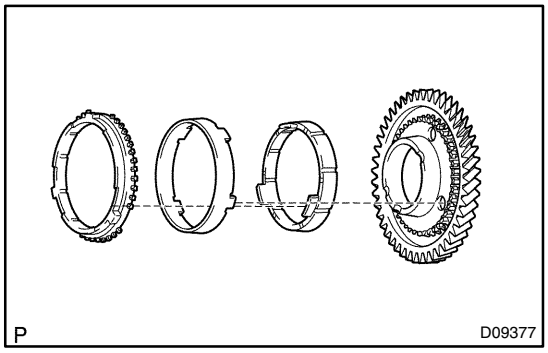
4. MEASURE 1ST GEAR THRUST CLEARANCE
(See page MX–30)



5. INSTALL BALL AND INNER RACE TO OUTPUT SHAFT

HINT:

Align the groove of the inner race and ball.



6. INSTALL SPACER, NEEDLE ROLLER BEARING, SYNCHRONIZER RING, 2ND GEAR AND 3RD DRIVEN GEAR

(a) Install the spacer.

(b) Apply MP grease to the needle roller bearing.

(c) Place the synchronizer rings (for the 2nd gear) on the gear.

NOTICE:

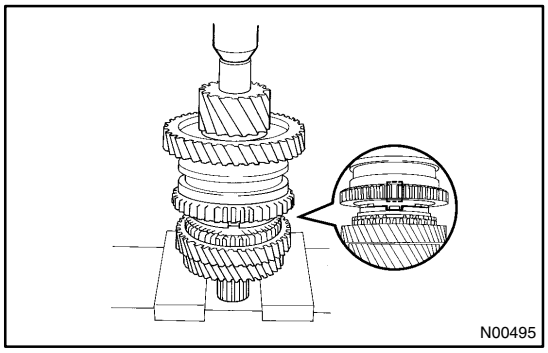
Do not install the synchronizer ring for the 1st gear.

(d) Install the 2nd gear.

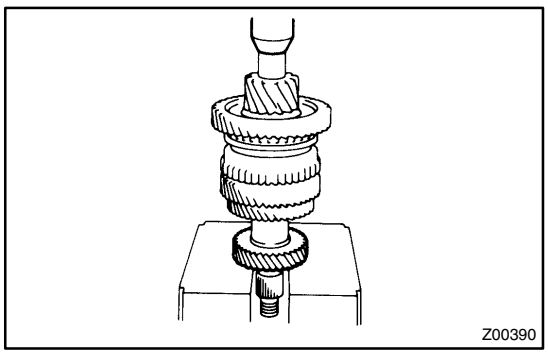
(e) Using a press, install the 3rd driven gear.

NOTICE:

Align the clutch hub grooves with the projections on the synchronizer ring.



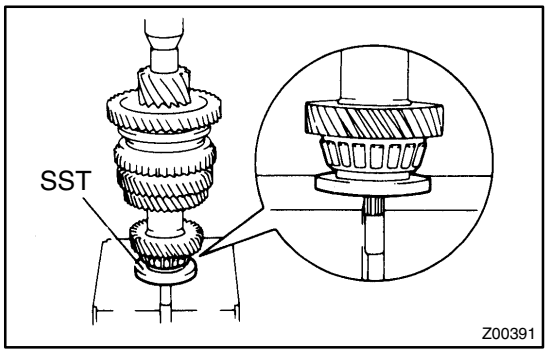
7. MEASURE 2ND GEAR THRUST CLEARANCE
(See page MX–30)



8. INSTALL SPACER AND 4TH DRIVEN GEAR

(a) Install the spacer.

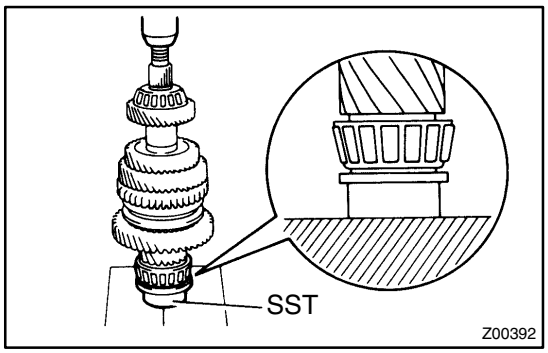
(b) Using a press, install the 4th driven gear.



9. INSTALL OUTPUT SHAFT REAR BEARING

Using SST and a press, install the bearing.

SST 09506–30012



10. INSTALL OUTPUT SHAFT FRONT BEARING

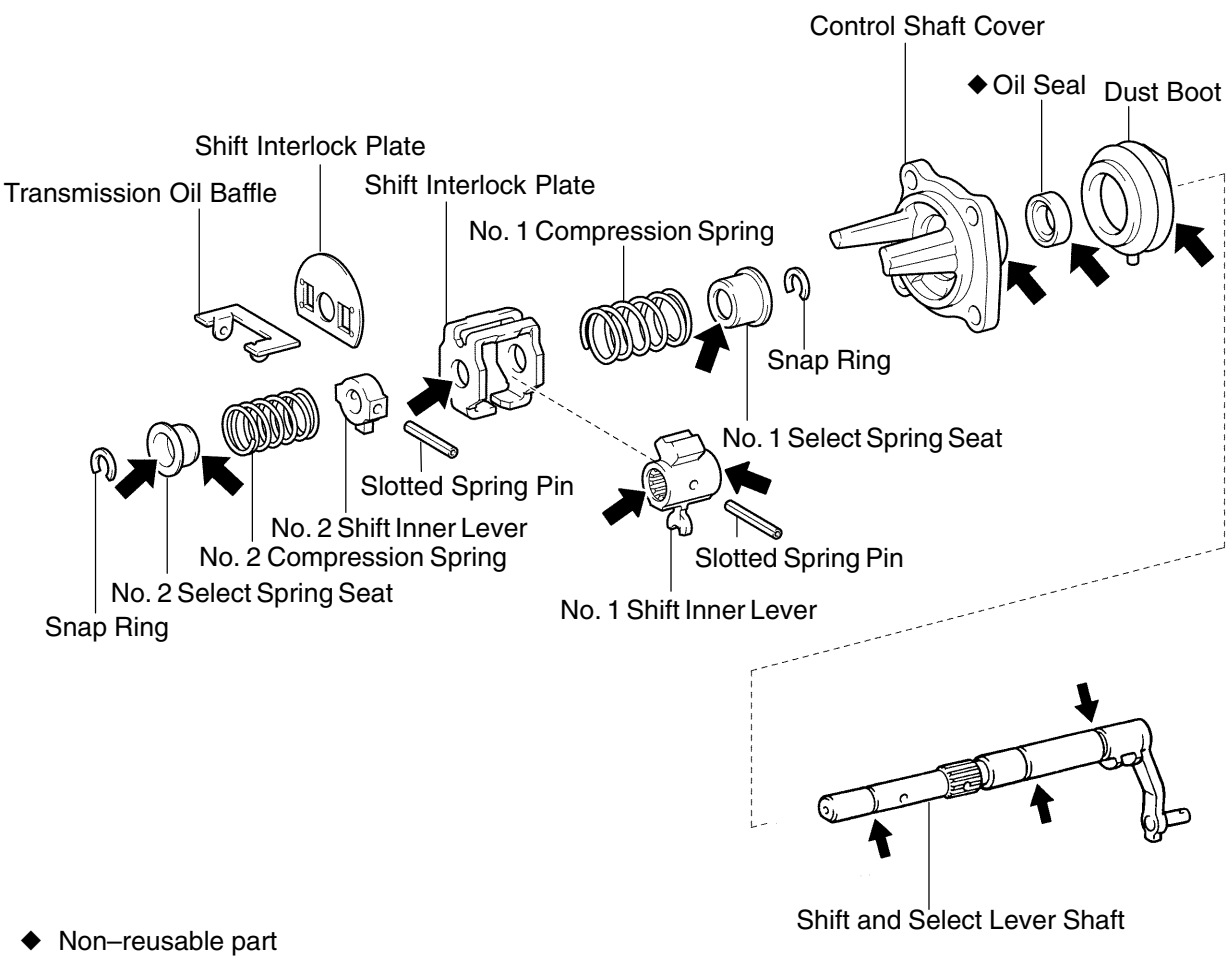
Using SST and a press, install a new output shaft front bearing.

SST 09316–60011 (09316–00071)

SHIFT AND SELECT LEVER SHAFT

COMPONENTS

MX02I–06



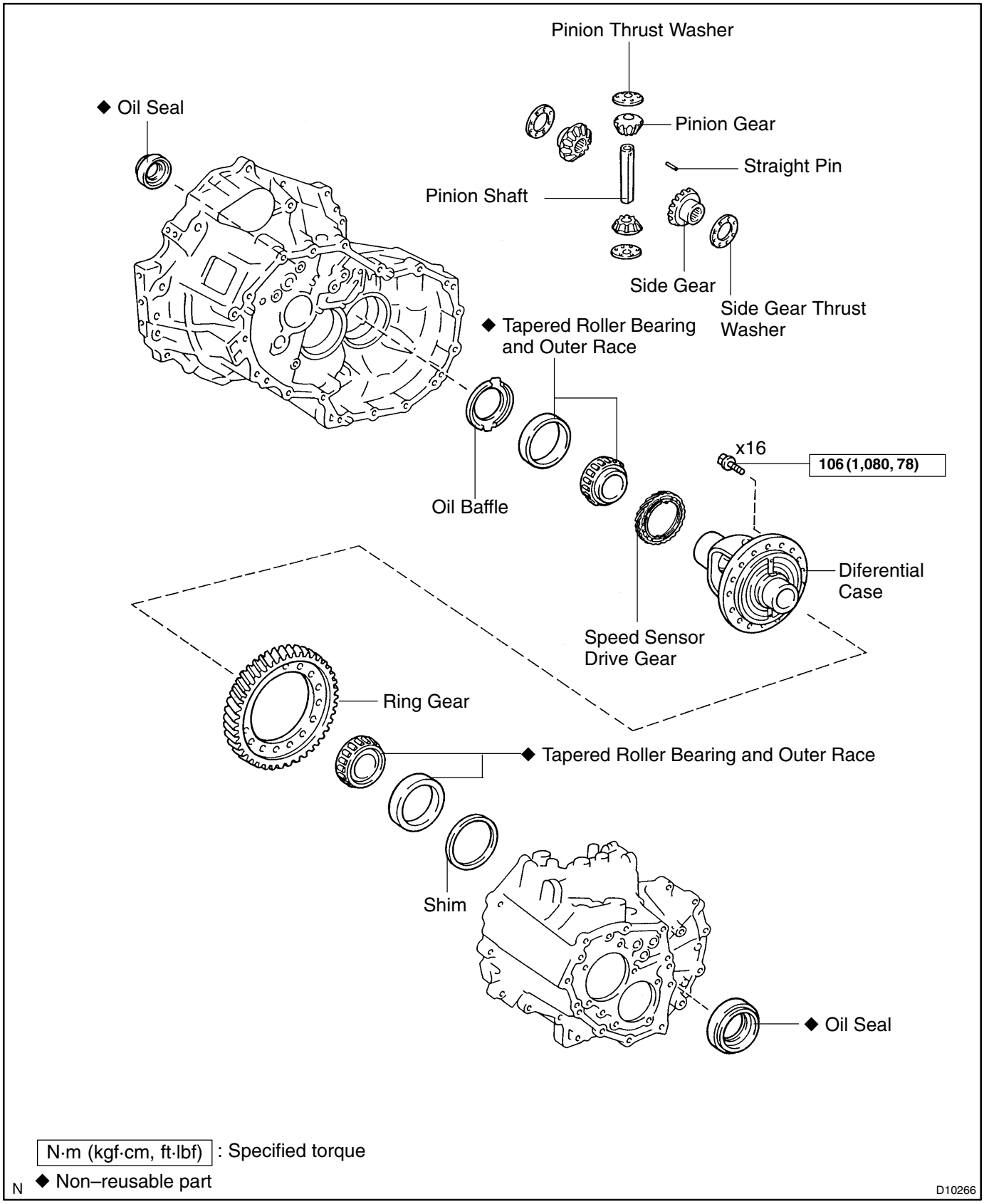
P

D10265

DIFFERENTIAL CASE

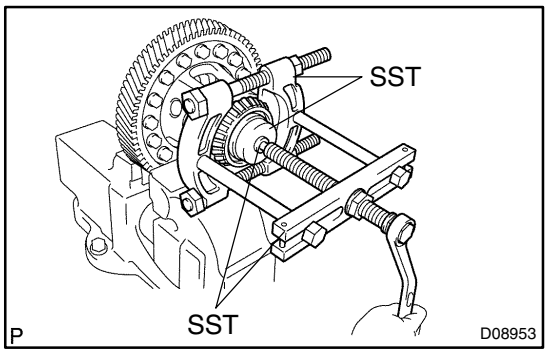
COMPONENTS

MX060–04



MX09A–03

DISASSEMBLY

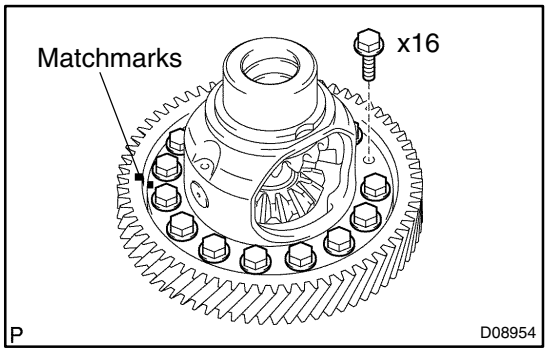


1. Speed sensor drive gear side:
REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

(a) Using SST, remove the tapered roller bearing.
SST 09950–00020, 09950–00030, 09950–40011 (09957–04010), 09950–60010 (09951–00530)

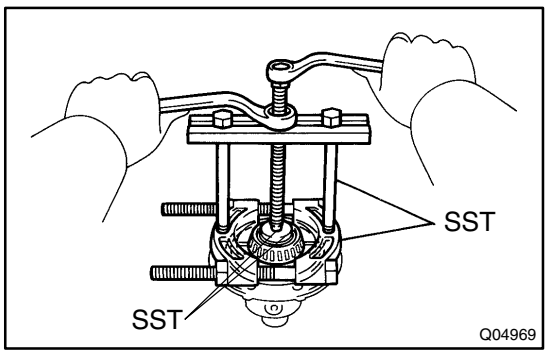
HINT:
Set the claw of SST to the bearing inner race securely.

(b) Remove the speed sensor drive gear.



2. REMOVE RING GEAR

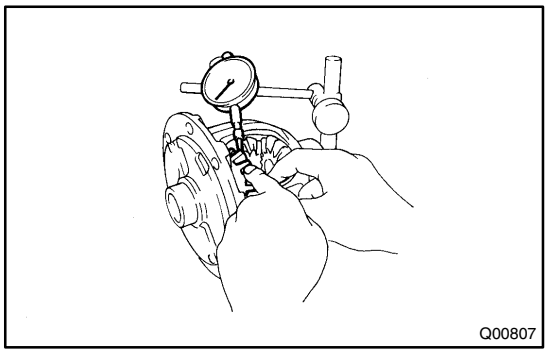
(a) Place matchmarks on the ring gear and differential case.
(b) Remove the 16 bolts.
(c) Using a copper hammer, tap on the ring gear to remove it from the differential case.



3. Ring gear side:
REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

Using SST, remove the tapered roller bearing.
SST 09950–00020, 09950–00030, 09950–40011 (09957–04010), 09950–60010 (09951–00450)

HINT:
Set the claw of SST to the bearing inner race at the position where the differential case is indented.



4. INSPECT SIDE GEAR BACKLASH

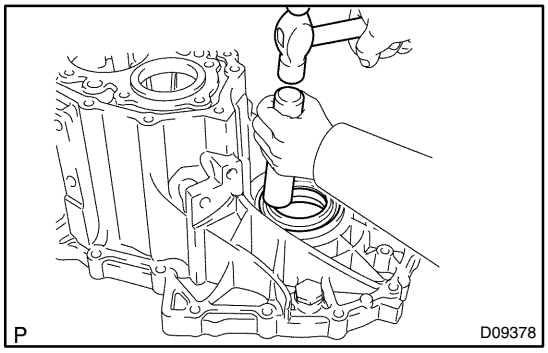
Using a dial indicator, measure the backlash of one side gear while holding one pinion toward the differential case.

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

(a) Using a pin punch and hammer, drive out the straight pin.
(b) Remove the pinion shaft from the differential case.
(c) Remove the 2 pinions and side gears with the 4 thrust washers from each gear.



6. Transmission Case Side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

(a) Using a screwdriver and a hammer, remove the oil seal.
(b) Using a brass bar and hammer, drive out the tapered roller bearing outer race lightly and evenly.
(c) Remove the shim.
(d) Install the shim.

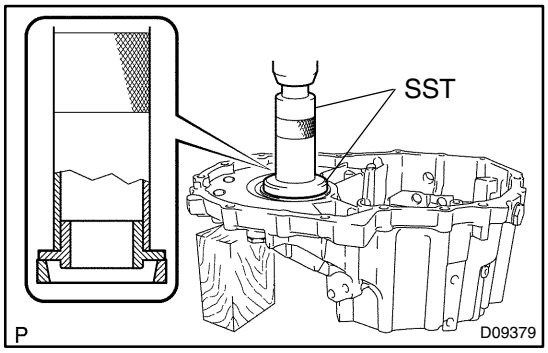
HINT:

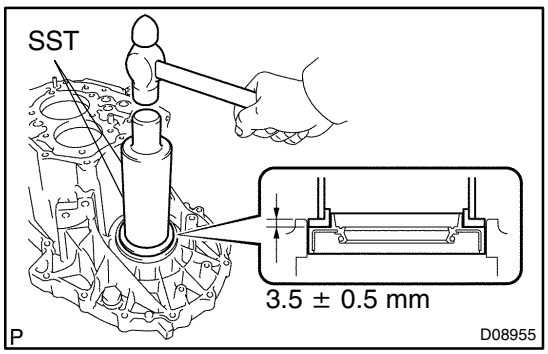
First select and install a shim of lesser thickness than before.

(e) Using SST and a press, install a new tapered roller bearing outer race.
SST 09316–60011 (09316–00011, 09316–00041)

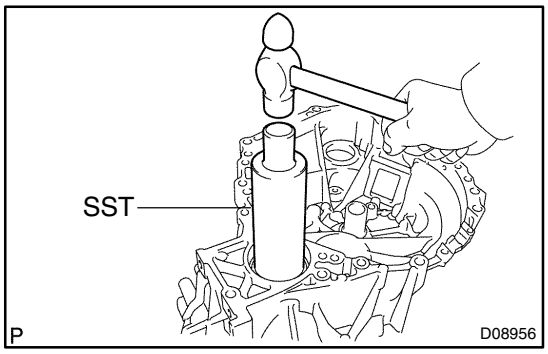
NOTICE:

When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.





(f) Using SST and a hammer, drive in a new oil seal.
SST 09316–60010 (09316–00011, 09316–00031)
Drive in depth: 3.5 ± 0.5 mm (0.138 ± 0.020 in.)
(g) Coat the lip of oil seal with MP grease.



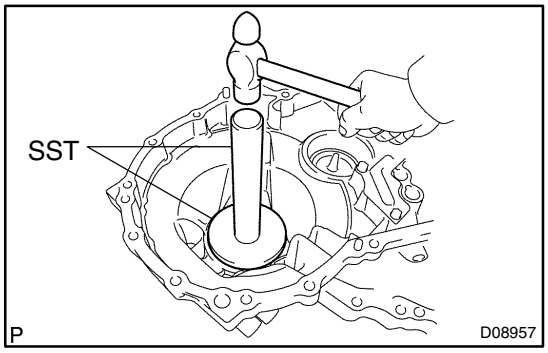
7. Transaxle Case Side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

(a) Using a screwdriver and hammer, drive out the oil seal from the transaxle case.
(b) Using SST, remove the tapered roller bearing outer race.
SST 09316–60011 (09316–00011, 09316–00021)
(c) Remove the oil baffle.

(d) Install the oil baffle.

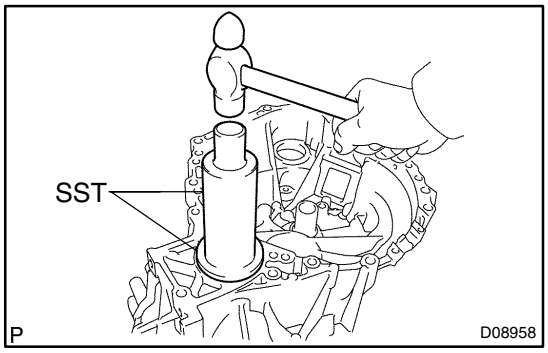
HINT:

Install the oil baffle projection into the case side cutout.



(e) Using SST and a press, install a new tapered roller bearing outer race.

SST 09950–60020 (09951–00890), 09950–70010 (09951–00150)



(f) Using SST and a hammer, drive in a new oil seal.

SST 09316–60011 (09316–00011, 09316–00041)

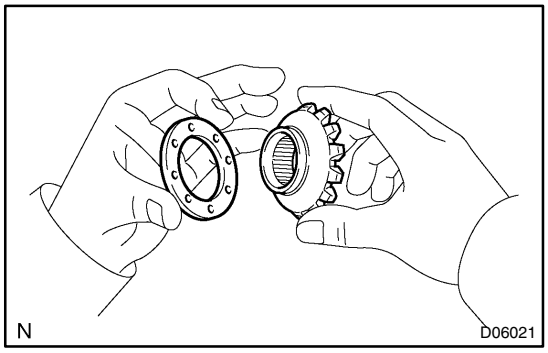
Drive in depth: 0 ± 0.5 mm (0 ± 0.020 in.)

(g) Coat the oil seal lip with MP grease.

MX09B–03

REASSEMBLY

HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.



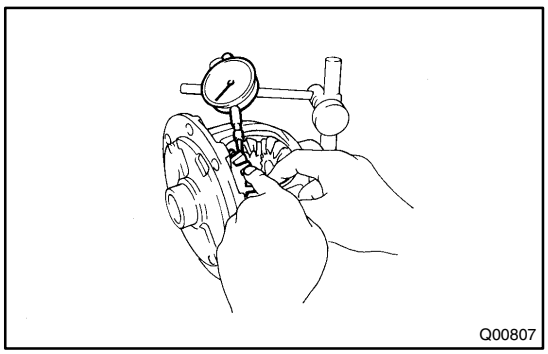
1. ASSEMBLE DIFFERENTIAL CASE

(a) Install the correct thrust washers and side gears.
Refer to the table below, select thrust washers which will ensure that the backlash is within the specification. Try to select washers of the same size for both sides.
Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

Thickness mm (in.)	Thickness mm (in.)
1.00 (0.0394)	1.20 (0.0472)
1.10 (0.0433)	1.30 (0.0512)

(b) Install the thrust washers and side gears in the differential case.

(c) Install the pinion shaft.

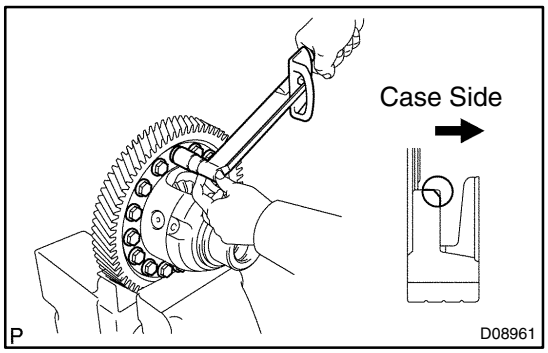


(d) Using a dial indicator, check the side gear backlash.
Measure the side gear backlash while holding one pinion toward the differential case.
Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

If the backlash is not within the specification, install a thrust washer of different thickness.

(e) Using a pin punch and hammer, drive in the straight pin through the differential case and hole in the pinion shaft.

(f) Using a chisel and hammer, caulk the pin holes around the circumference of the differential case.



2. INSTALL RING GEAR ON DIFFERENTIAL CASE

(a) Clean the contact surface of the differential case.

(b) Heat the ring gear in boiling water.

(c) Carefully take the ring gear out of the water.

(d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

HINT:

Align the matchmarks on the differential case and contact the ring gear.

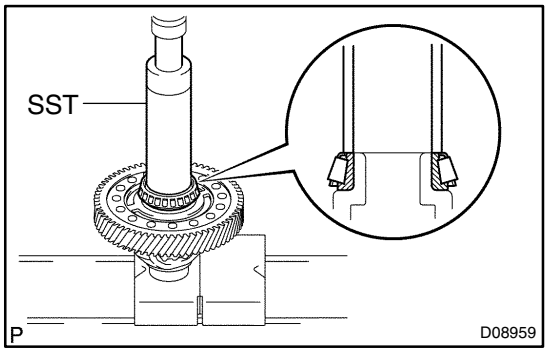
(e) Temporarily install the 16 set bolts.

CAUTION:

The ring gear set bolts should not be tightened until the ring gear has cooled sufficiently.

(f) After the ring gear has cooled sufficiently, torque the ring gear set bolts uniformly at a time.

Torque: 106 N·m (1,080 kgf·cm, 78 ft·lbf)



3. Ring gear side:
INSTALL TAPERED ROLLER BEARING

Using SST and a press, install a new tapered roller bearing.

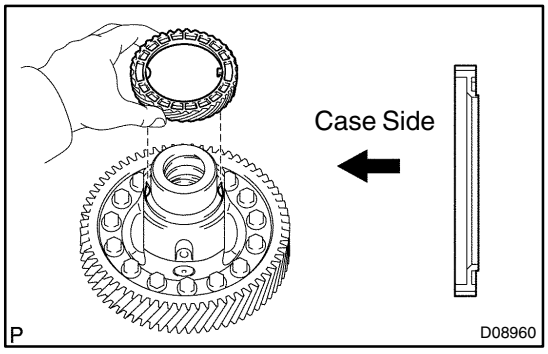
SST 09316–60011 (09316–00011)

NOTICE:

When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.

HINT:

Set SST to the bearing inner race securely.

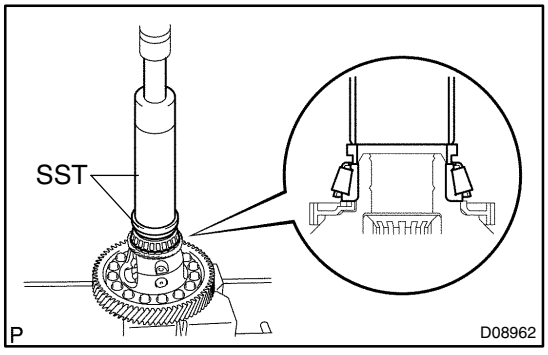


4. Speed sensor drive gear side:
INSTALL TAPERED ROLLER BEARING

(a) Place the speed sensor drive gear in position to stop it turning, and install the speed sensor drive gear.

NOTICE:

Be sure to install the speed sensor drive gear in the correct direction, as shown in the illustration.



(b) Using SST, a steel plate and press, install a new tapered roller bearing.

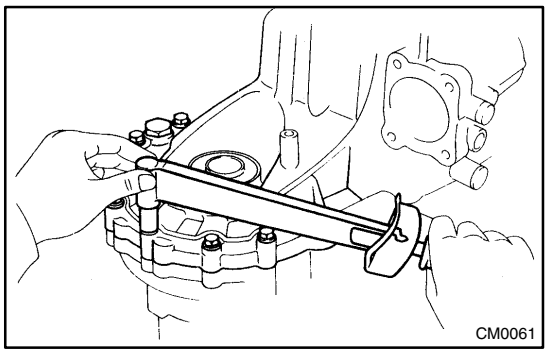
SST 09316–20011, 09316–60011 (09316–00011)

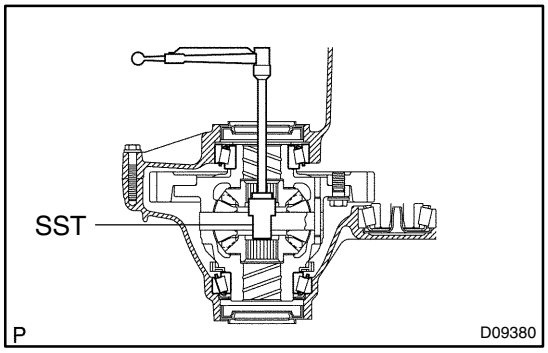
NOTICE:

When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.

HINT:

Set SST to the bearing inner race securely.





5. INSPECT DIFFERENTIAL TAPERED ROLLER BEARING PRELOAD

NOTICE:

Perform this only when replacing the tapered roller bearing and outer race of the differential case.

(a) Install the differential case assembly to the transaxle case.

(b) Install the transmission case to the transaxle case with the 17 bolts.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(c) Using SST and a torque wrench, turn the differential case assembly right and left 2 or 3 times to allow the bearings to settle.

SST 09564–32011

(d) Using SST and a torque wrench, measure the preload.

SST 09564–32011

Preload (at starting):

New bearing

0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)

Reused bearing

0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

If the preload is not within the specification, remove the transmission case side outer race of the tapered roller bearing with SST (See page MX–39). Select an appropriate shim.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)

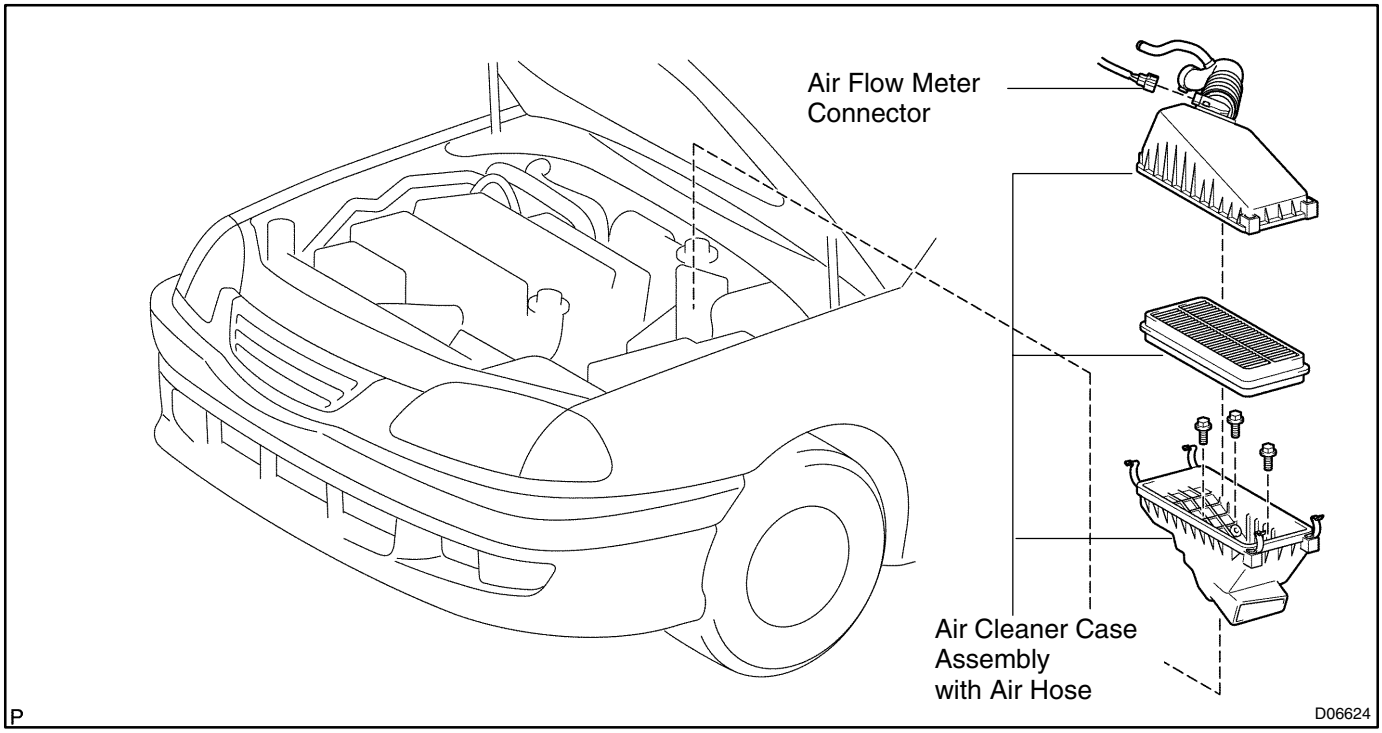
(e) Remove the 17 bolts and transmission case.

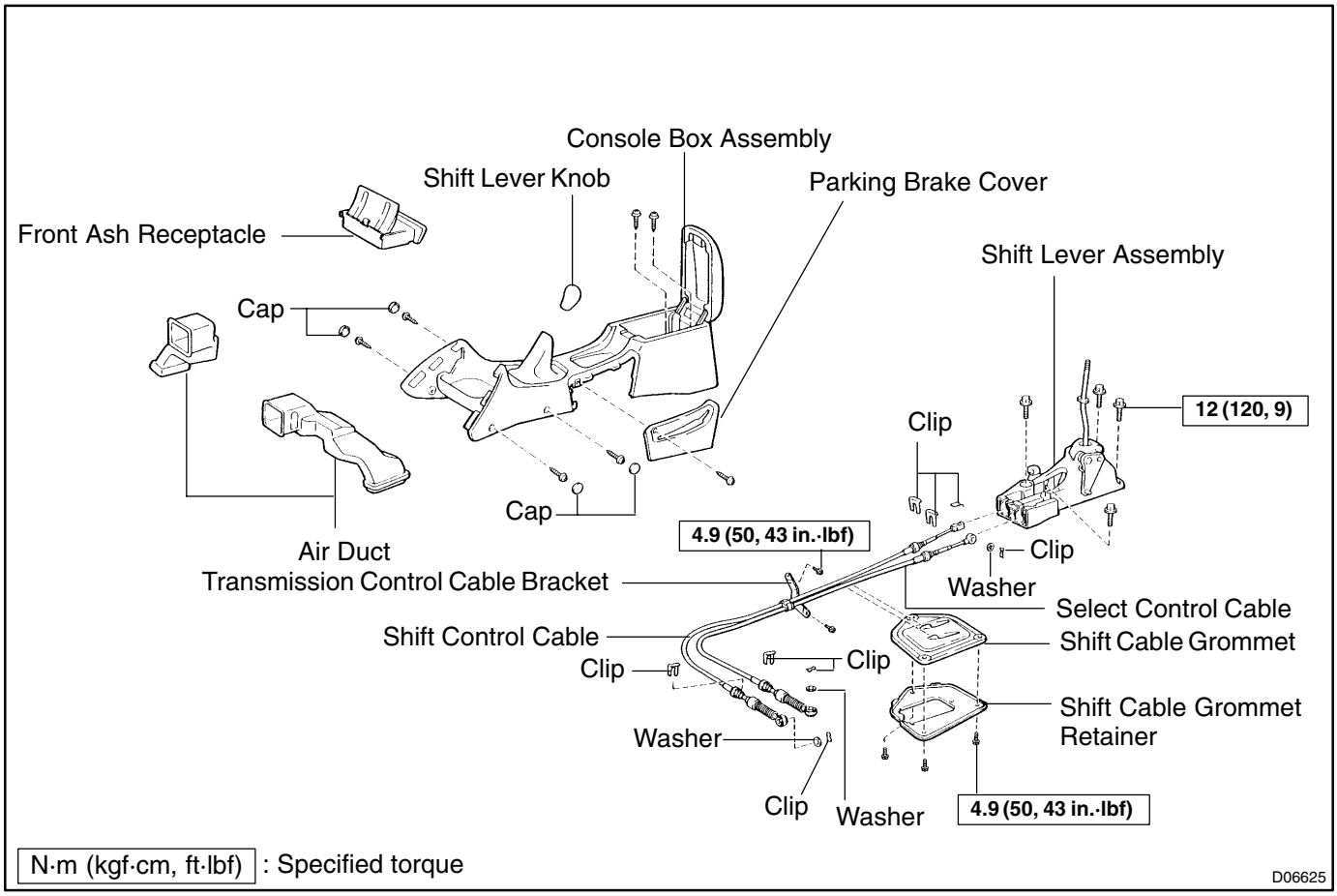
(f) Remove the differential case assembly.

SHIFT LEVER AND CONTROL CABLE

MX09C–02

COMPONENTS





MANUAL TRANSAXLE (S54, S55)

TROUBLESHOOTING MX–1
MANUAL TRANSAXLE UNIT MX–2
MANUAL TRANSAXLE ASSEMBLY MX–8
INPUT SHAFT MX–19
OUTPUT SHAFT MX–27
SHIFT AND SELECT LEVER SHAFT MX–34
DIFFERENTIAL CASE MX–35
SHIFT LEVER AND CONTROL CABLE MX–42

TROUBLESHOOTING

MX030–04

PROBLEM SYMPTOMS TABLE

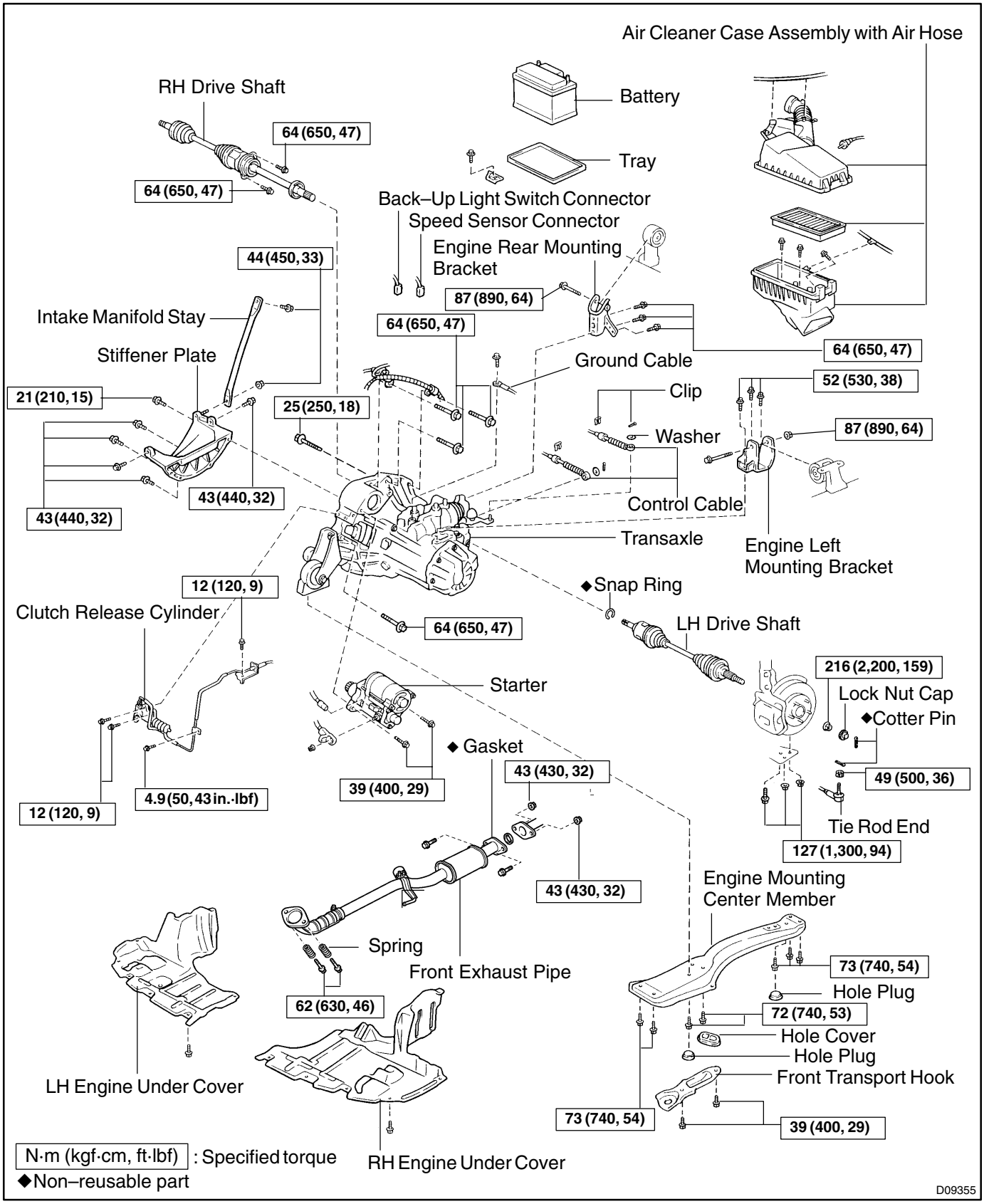
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace parts.

Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–3
	2. Oil (Wrong)	MX–3
	3. Gear (Worn or damaged)	MX–8
	4. Bearing (Worn or damaged)	MX–8
Oil leakage	1. Oil (Level too high)	MX–3
	2. Gasket (Damaged)	MX–8
	3. Oil seal (Worn or damaged)	MX–8
	4. O–ring (Worn or damaged)	MX–8
Hard to shift or will not shift	1. Control cable (Faulty)	MX–42
	2. Synchronizer ring (Worn or damaged)	MX–8 MX–19
	3. Shift key spring (Damaged)	MX–27 MX–8 MX–19 MX–27
Jumps out of gear	1. Locking ball spring (Damaged)	MX–8
	2. Shift fork (Worn)	MX–8
	3. Gear (Worn or damaged)	MX–8
	4. Bearing (Worn or damaged)	MX–8

MANUAL TRANSAXLE UNIT

COMPONENTS

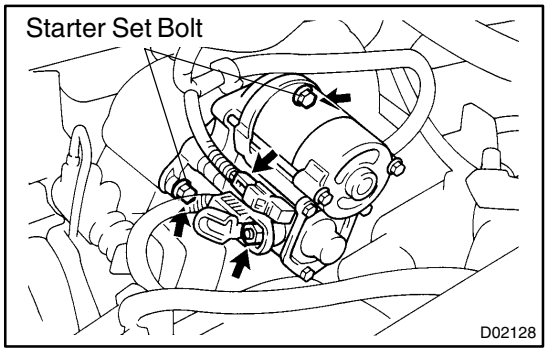
MX06M–02



MX06N–02

REMOVAL

1. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE

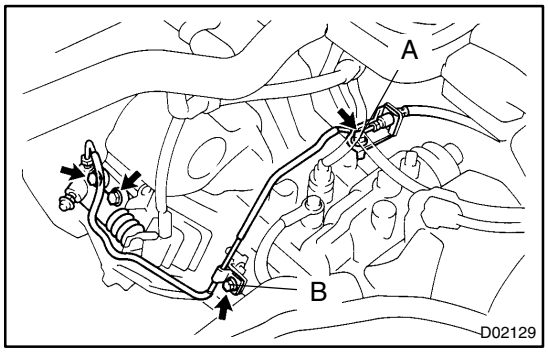


2. REMOVE STARTER

(a) Disconnect the connector and wire from the starter.

(b) Remove the 2 bolts and starter.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



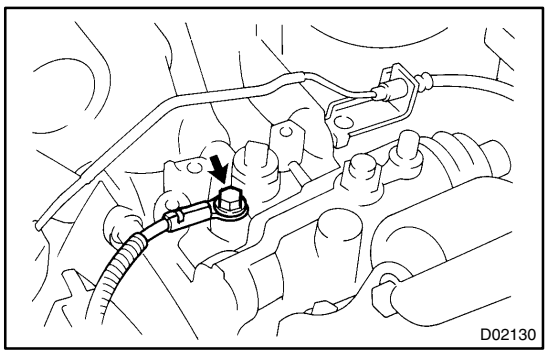
3. DISCONNECT CLUTCH RELEASE CYLINDER AND LINE

(a) Remove the 2 set bolts of the clutch line bracket.

Torque:
Bolt A: 12 N·m (120 kgf·cm, 9 ft·lbf)
Bolt B: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

(b) Remove the 2 bolts and disconnect the clutch release cylinder and line.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



4. DISCONNECT GROUND CABLE

Remove the set bolt of the ground cable from the transaxle.

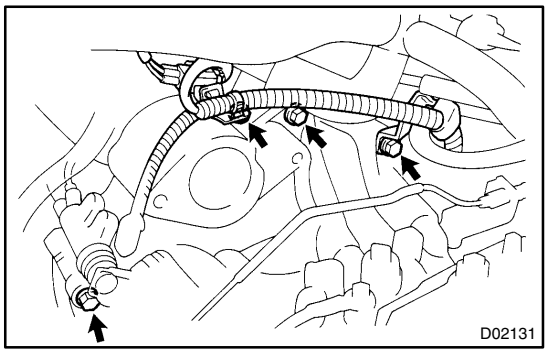
5. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips from the cables.

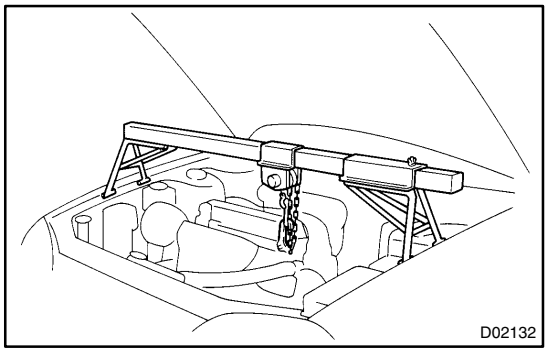
(c) Disconnect the 2 control cables from the transaxle.

6. DISCONNECT BACK–UP LIGHT SWITCH AND SPEED SENSOR CONNECTORS

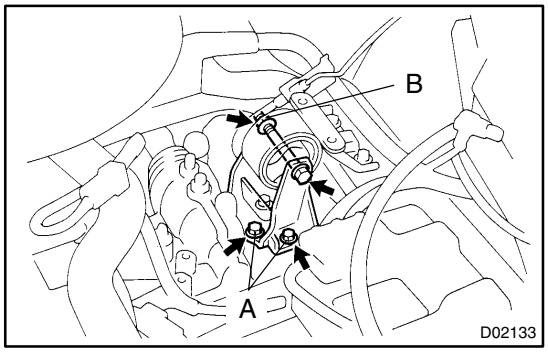


7. REMOVE 4 TRANSAXLE UPPER SIDE MOUNTING BOLTS

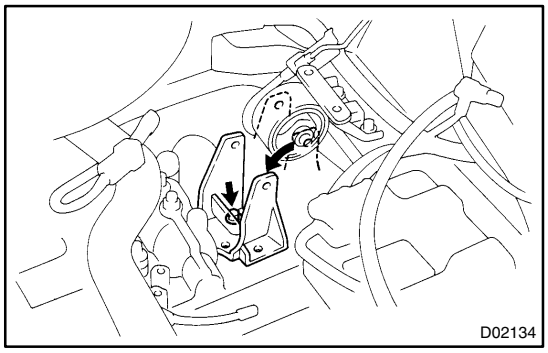
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



8. INSTALL ENGINE SUPPORT FIXTURE



9. REMOVE ENGINE LEFT MOUNTING BRACKET 3 SET BOLTS AND NUT
Torque:
Bolt A: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut B: 87 N·m (890 kgf·cm, 64 ft·lbf)



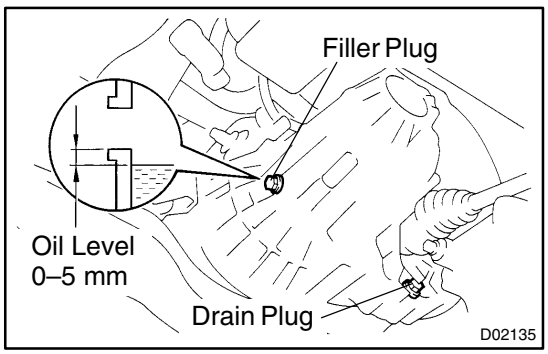
10. REMOVE ENGINE LEFT MOUNTING BRACKET
Lower the transaxle side and remove the bolt and bracket.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

11. REMOVE FRONT WHEEL
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)

12. RAISE VEHICLE

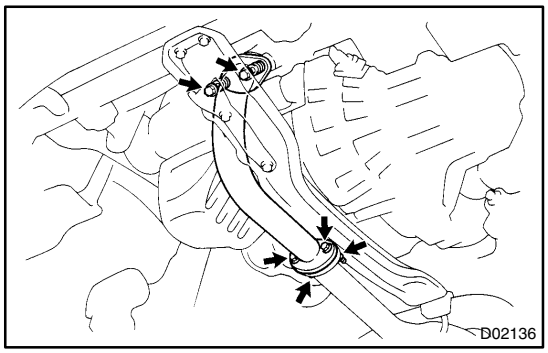
NOTICE:
Make sure that the vehicle is securely supported.

13. REMOVE LH AND RH ENGINE UNDER COVERS



14. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 2.2 liters (2.3 US qts, 1.9 Imp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

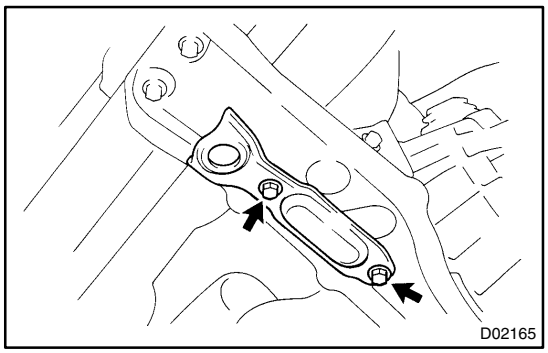
15. REMOVE LH AND RH DRIVE SHAFTS
(See page SA–3)



16. REMOVE FRONT EXHAUST PIPE

(a) Remove the 2 bolts, springs and gasket from the exhaust manifold.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

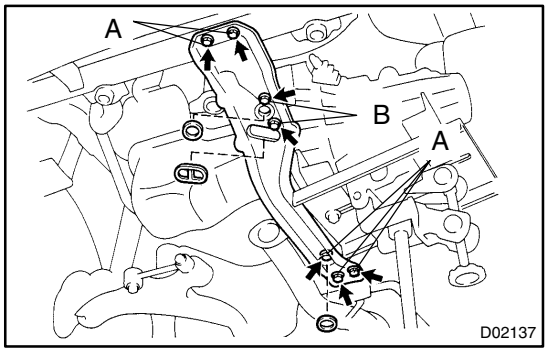
(b) Remove the 2 bolts, nuts, gasket and front exhaust pipe.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



17. REMOVE ENGINE MOUNTING CENTER MEMBER

(a) Remove the 2 bolts and front transport hook.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(b) Support the suspension crossmember with a jack.

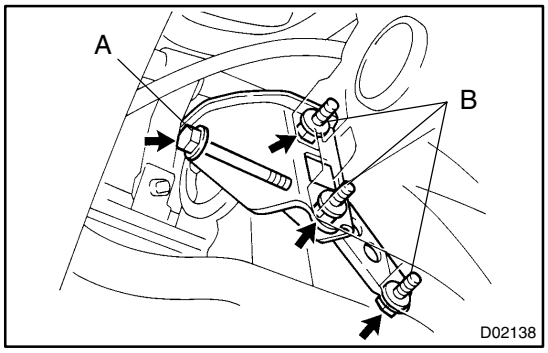


(c) Remove the 2 hole plugs and hole cover.

(d) Remove the 7 bolts and center member.
Torque:
Bolt A: 73 N·m (740 kgf·cm, 54 ft·lbf)
Bolt B: 72 N·m (730 kgf·cm, 53 ft·lbf)

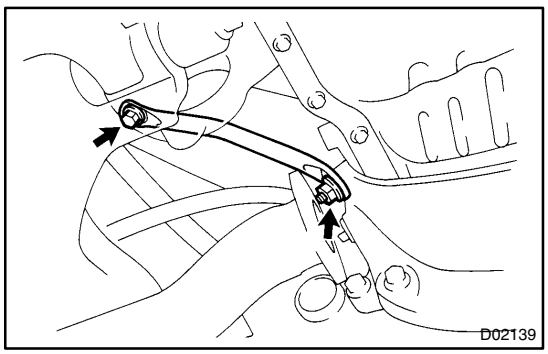
18. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



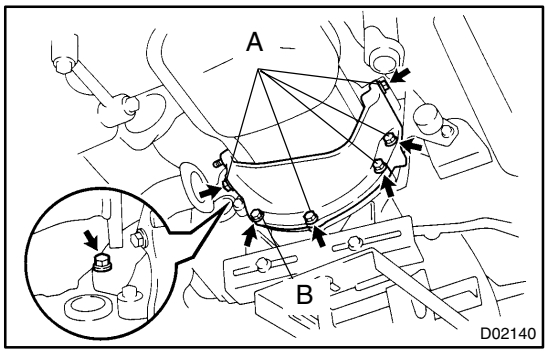
19. REMOVE ENGINE REAR MOUNTING BRACKET

Remove the 4 bolts and bracket.
Torque:
Bolt A: 87 N·m (890 kgf·cm, 64 ft·lbf)
Bolt B: 64 N·m (650 kgf·cm, 47 ft·lbf)



20. REMOVE INTAKE MANIFOLD STAY

Remove the bolt, nut and intake manifold stay.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)



21. REMOVE STIFFENER PLATE AND TRANSAXLE LOWER SIDE MOUNTING BOLT

(a) Remove the 6 bolts and stiffener plate.
Torque:
Bolt A: 43 N·m (440 kgf·cm, 32 ft·lbf)
Bolt B: 21 N·m (210 kgf·cm, 15 ft·lbf)

(b) Remove the bolt of transaxle lower side.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

22. REMOVE TRANSAXLE

Lower engine left side and remove the transaxle from the engine.

HINT:

At the time of installation, please refer to the following items.

- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

MX06O–02

INSTALLATION

Installation is in the reverse order of removal (See page MX–3).

HINT:

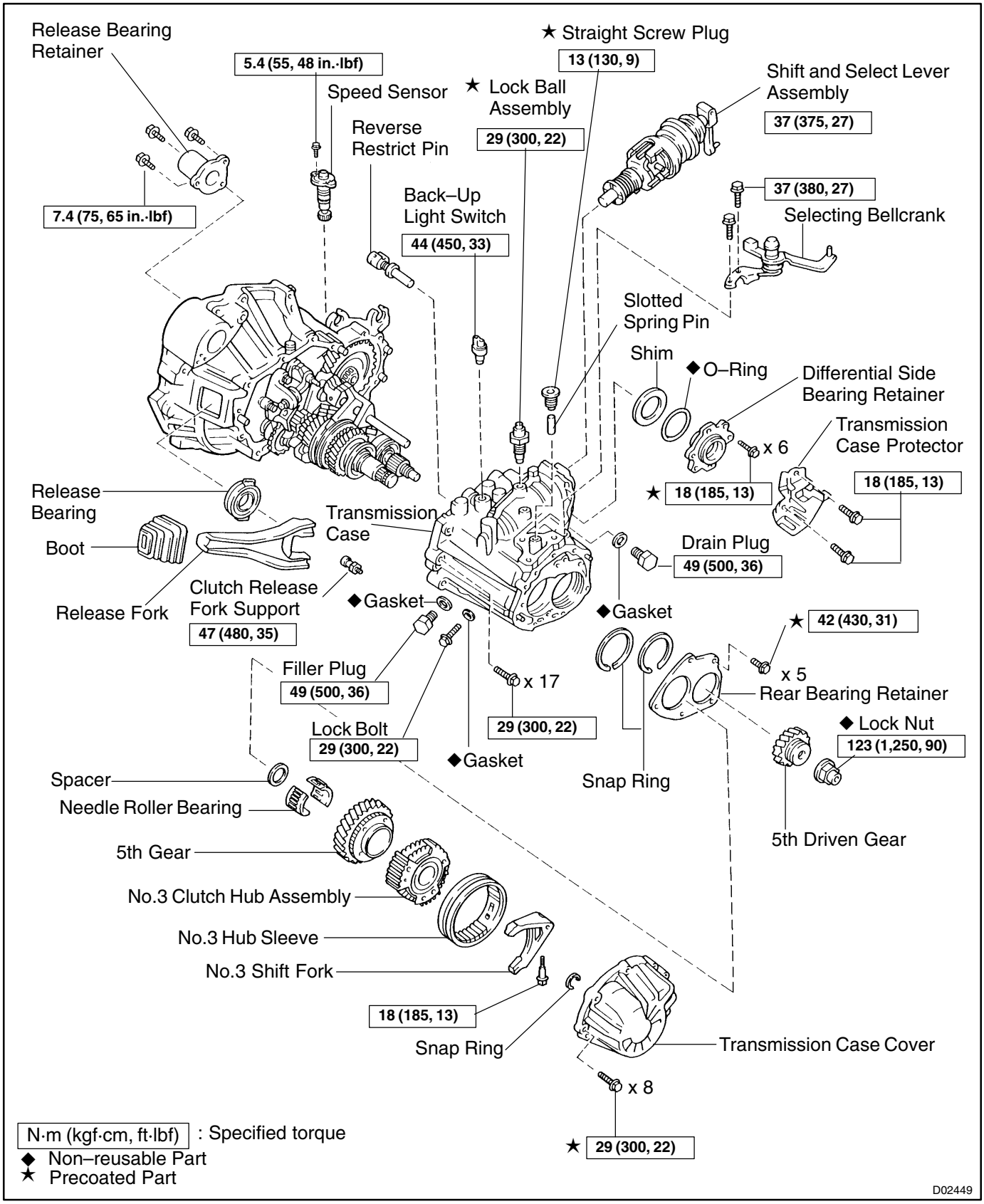
After installation, check and inspect items as follows.

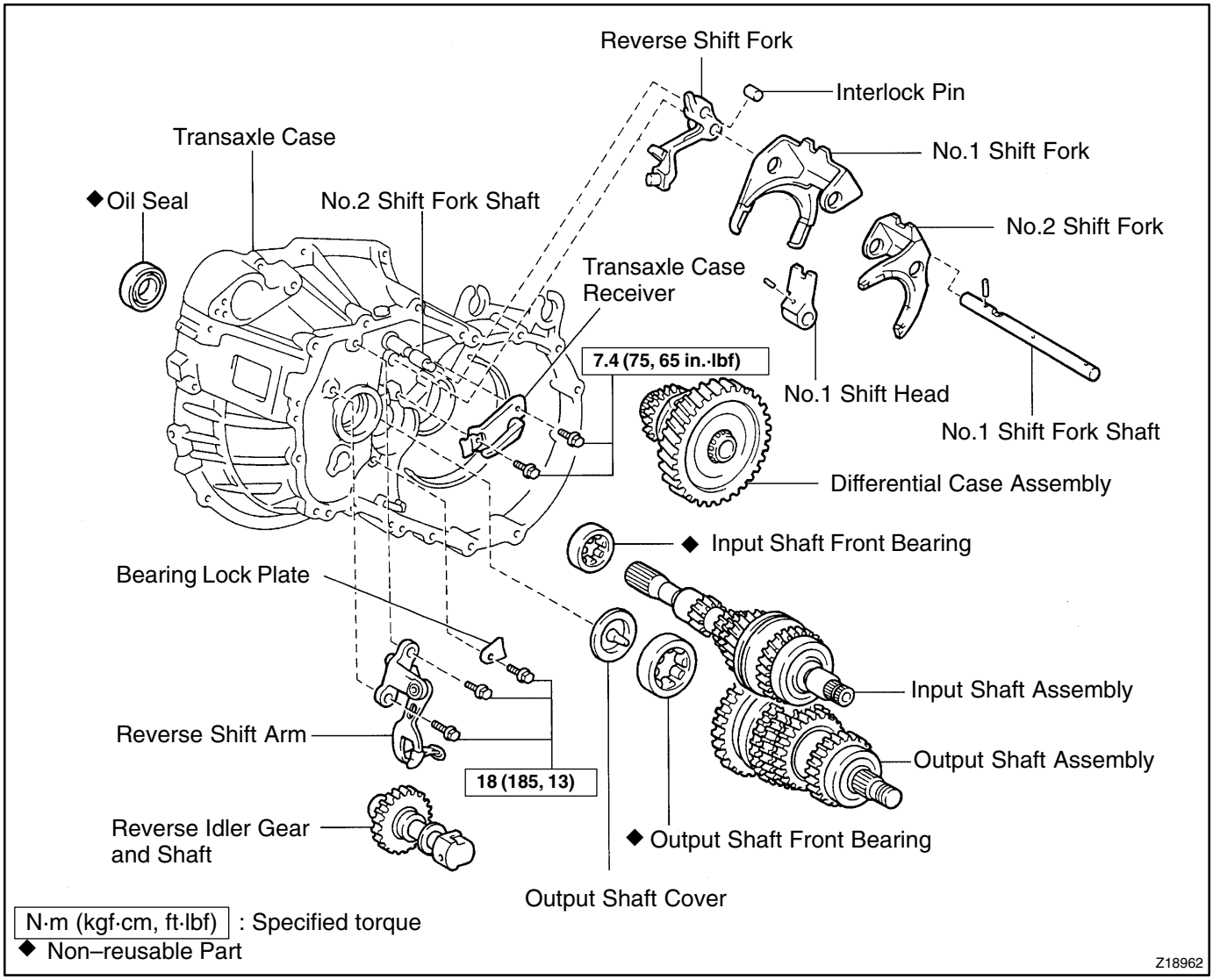
- Front wheel alignment (See Pub. No. RM599E on page SA–4).
- Do the road test.

MANUAL TRANSAXLE ASSEMBLY

MX034–04

COMPONENTS




Reverse Shift Fork
Interlock Pin
Transaxle Case
No.1 Shift Fork
◆Oil Seal
No.2 Shift Fork Shaft
No.2 Shift Fork
Transaxle Case Receiver
7.4 (75, 65 in.·lbf)
No.1 Shift Head
No.1 Shift Fork Shaft
Differential Case Assembly
◆ Input Shaft Front Bearing
Bearing Lock Plate
Input Shaft Assembly
Output Shaft Assembly
Reverse Shift Arm
18 (185, 13)
Reverse Idler Gear and Shaft
◆ Output Shaft Front Bearing
Output Shaft Cover
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable Part
Z18962

MX035–04

DISASSEMBLY

1. REMOVE RELEASE FORK AND BEARING

2. REMOVE BACK–UP LIGHT SWITCH

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

3. REMOVE BOLT AND SPEED SENSOR

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

4. REMOVE RELEASE BEARING RETAINER

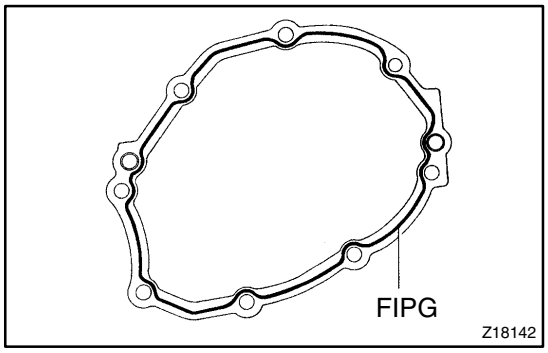
Remove the 3 bolts and retainer.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

5. REMOVE SELECTING BELLCRANK

Remove the 2 bolts and selecting bellcrank.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)



6. REMOVE TRANSMISSION CASE COVER

(a) Remove the 8 bolts.

Sealant:

Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Using a plastic hammer, tap the transmission case cover and remove it.

FIPG:

Part No. 08826–00090, THREE BOND 1281 or equivalent

7. REMOVE LOCK BALL ASSEMBLY

Sealant:

Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

8. REMOVE SHIFT AND SELECT LEVER ASSEMBLY

HINT:

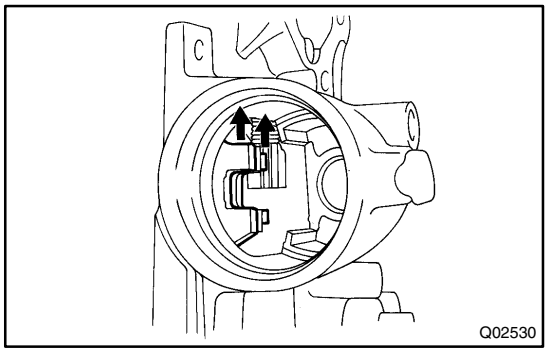
At the time of reassembly, please refer to the following item.

Apply FIPG to the underside of the flanged portion of the control shaft cover.

FIPG:

Part No. 08826–00090, THREE BOND 1281 or equivalent

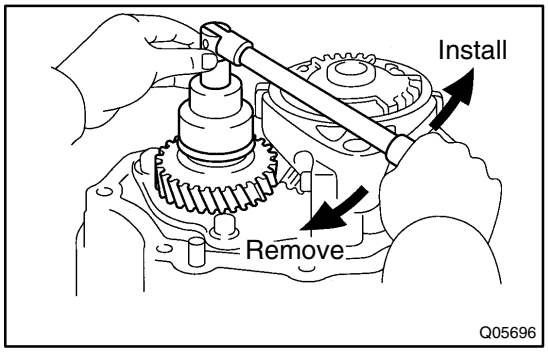
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



9. REMOVE OUTPUT SHAFT LOCK NUT

(a) Unstake the nut.

(b) Engage the gear to the double meshing, with the gear into 1st and 3rd or 2nd and 4th.



(c) Remove the lock nut clockwise and remove it.

Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

HINT:

The lock nut has LH threads.

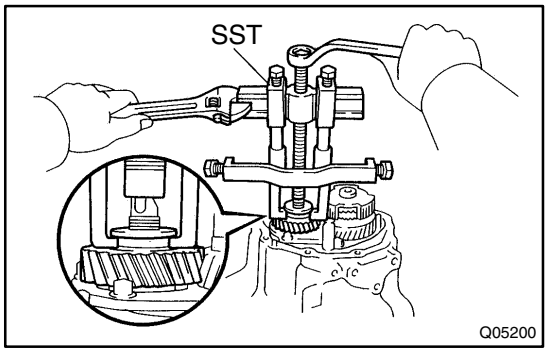
(d) Disengage the double meshing of the gear.

10. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

(a) Remove the No.3 shift fork set bolt.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

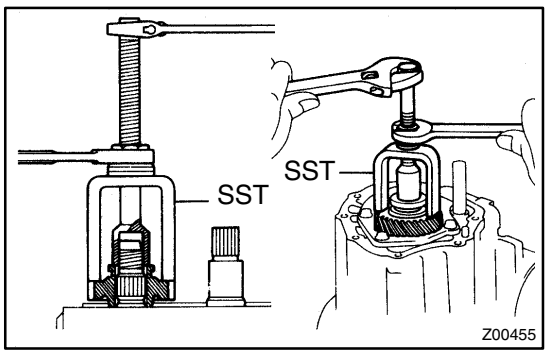
(b) Remove the No.3 hub sleeve and No.3 shift fork.



11. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.

SST 09950–40011

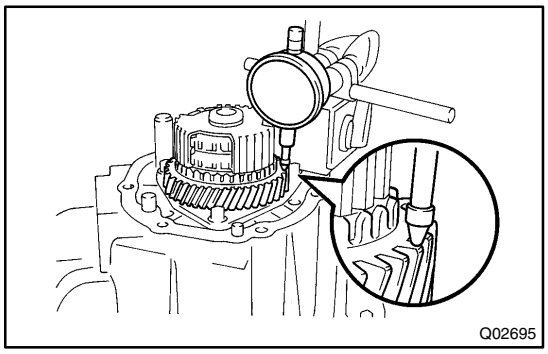


HINT:

At the time of installation, please refer to the following item.

Using SST, install the 5th driven gear.

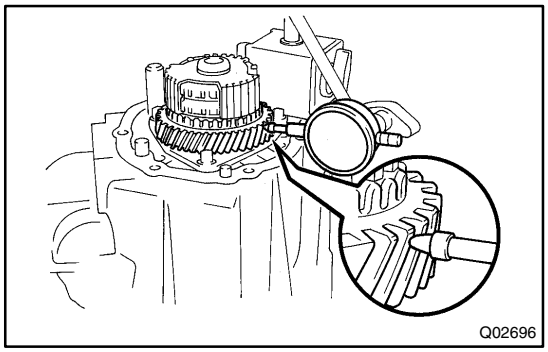
SST 09309–12020



12. MEASURE 5TH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.

Maximum clearance:
0.57 mm (0.0224 in.)
Minimum clearance:
0.10 mm (0.0039 in.)


Q02696

13. MEASURE 5TH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance.

Maximum clearance:
0.048 mm (0.0019 in.)
Minimum clearance:
0.009 mm (0.0004 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or input shaft.

14. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

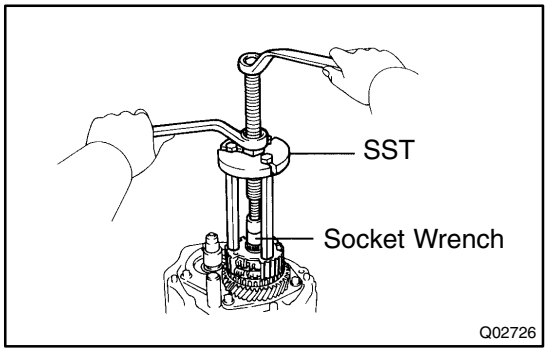
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

At the time of reassembly, please refer to the following item.

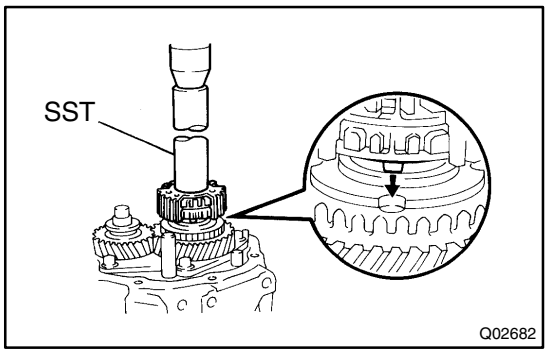
Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
13	2.20–2.25 (0.0866–0.0886)	21	2.60–2.65 (0.1024–0.1043)
14	2.25–2.30 (0.0886–0.0906)	22	2.65–2.70 (0.1043–0.1063)
15	2.30–2.35 (0.0906–0.0925)	23	2.70–2.75 (0.1063–0.1083)
16	2.35–2.40 (0.0925–0.0945)	24	2.75–2.80 (0.1083–0.1102)
17	2.40–2.45 (0.0945–0.0965)	25	2.80–2.85 (0.1102–0.1122)
18	2.45–2.50 (0.0965–0.0984)	26	2.85–2.90 (0.1122–0.1142)
19	2.50–2.55 (0.0984–0.1004)	27	2.90–2.95 (0.1142–0.1161)
20	2.55–2.60 (0.1004–0.1024)	–	–



Q02726

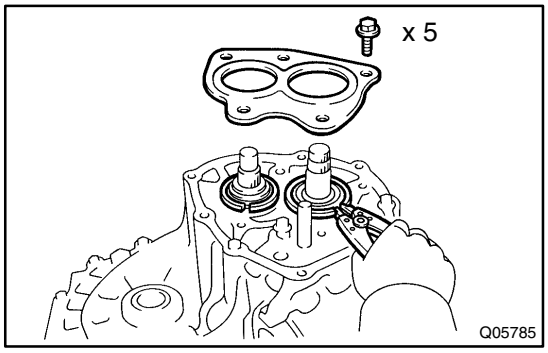
(b) Using SST and a socket wrench, remove the No.3 clutch hub with the synchronizer ring.
SST 09950–30011



HINT:
At the time of reassembly, please refer to the following item.
Using SST and a press, install the No.3 clutch hub assembly.
SST 09612–22011

(c) Remove the 5th gear.

15. REMOVE NEEDLE ROLLER BEARING



16. REMOVE REAR BEARING RETAINER

Remove the 5 bolts and retainer.

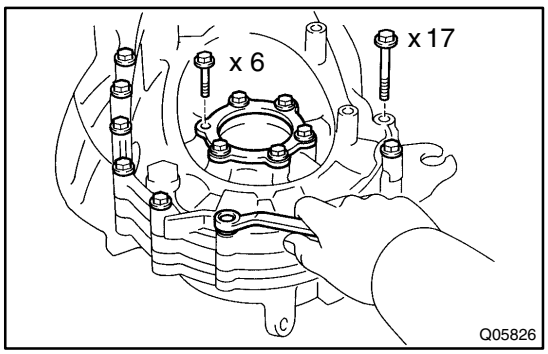
Sealant:
Part No.08833–00070, THREE BOND 1324 or equivalent
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

17. REMOVE SNAP RING

Using a snap ring expander, remove the 2 snap rings.

HINT:
If it is difficult to remove and install the snap rings, pull up the shafts.

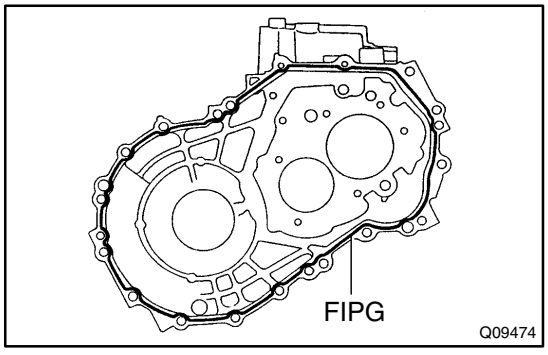
18. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND GASKET
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



19. REMOVE DIFFERENTIAL SIDE BEARING RETAINER AND SHIM

Remove the 6 bolts, retainer and shim.

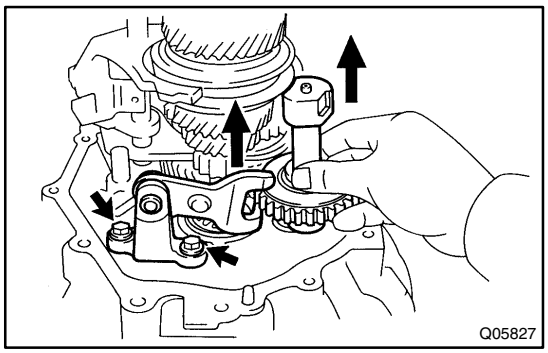
Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



20. REMOVE TRANSMISSION CASE

(a) Remove the 17 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Using a plastic hammer, tap the transmission case and remove it.
FIPG:
Part No. 08833–00090, THREE BOND 1281 or equivalent



21. REMOVE REVERSE IDLER GEAR AND SHAFT

(a) Pull out the shaft.

(b) Remove the idler gear and thrust washer.

22. REMOVE REVERSE SHIFT ARM

(a) Shift the fork shaft into reverse.

(b) Remove the 2 bolts and pull off the reverse shift arm.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

23. REMOVE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1 AND NO.2 SHIFT FORKS, REVERSE SHIFT FORK WITH INTERLOCK PIN, INPUT AND OUTPUT SHAFTS ASSEMBLY

24. REMOVE DIFFERENTIAL CASE ASSEMBLY

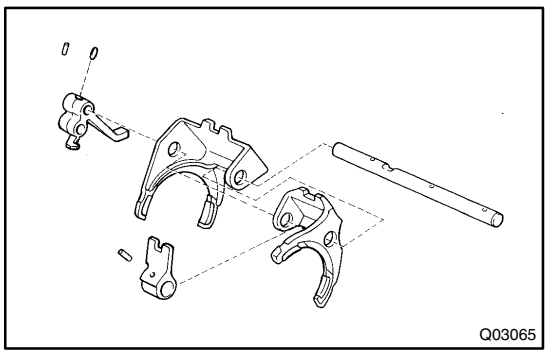
25. REMOVE MAGNET FROM TRANSAXLE CASE

26. REMOVE NO.2 FORK SHAFT

(a) Using a hexagon wrench, remove the straight screw plug.
Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(b) Using a pin punch and hammer, drive out the slotted spring pin.

(c) Pull out the shaft.



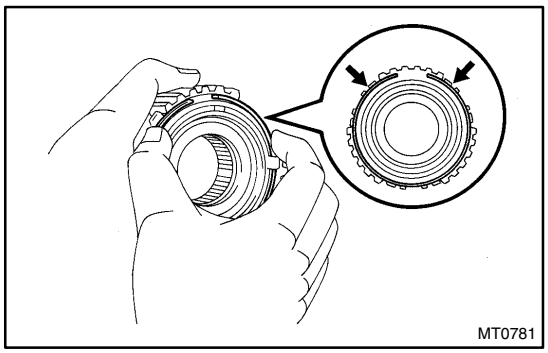
27. SEPARATE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1, NO.2 SHIFT FORKS AND REVERSE SHIFT FORK

(a) Mount the shift forks to the vise.

(b) Using a pin punch and hammer, drive out the slotted spring pin from the No.1 fork shaft.

(c) Using a pin punch and hammer, drive out the slotted spring pin from the No.1 fork shaft, as shown in the illustration.

(d) Separate the No.1 shift fork shaft, No.1 shift head, No.1 and No.2 shift forks and reverse shift fork.



28. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

(a) Remove the No.5 synchronizer ring with the key spring from the No.3 clutch hub.

(b) Using a screwdriver, remove the snap ring.

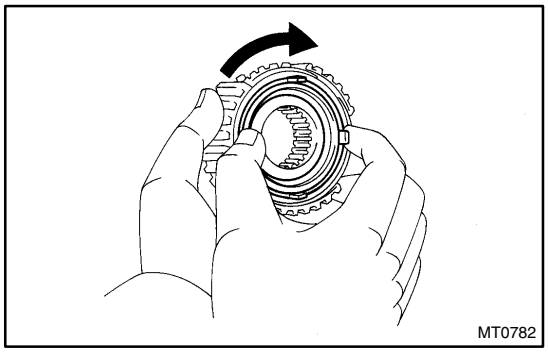
HINT:

Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

(c) Remove the synchronizer rings.

MX06P–02

INSPECTION

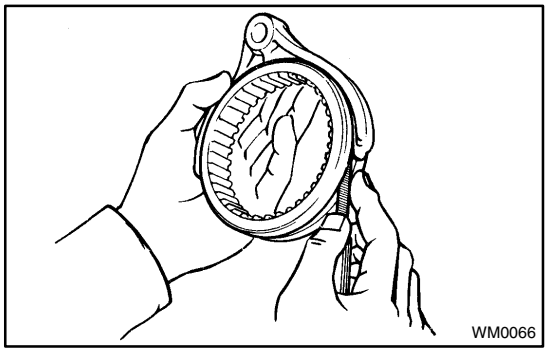


1. INSPECT NO.5 SYNCHRONIZER RING

(a) Check wear or damage.

(b) Check the braking effect of the synchronizer ring turn the middle No.5 synchronizer ring in one direction while pushing it to the outer No.5 synchronizer ring. Check that the ring locks.

If the braking effect is insufficient, replace the synchronizer ring.

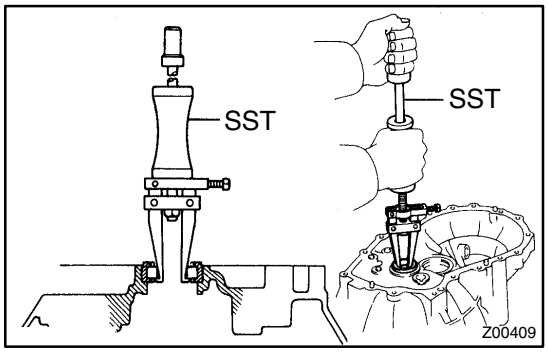


2. INSPECT NO.3 SHIFT FORK AND NO.3 HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.4 mm (0.0157 in.)

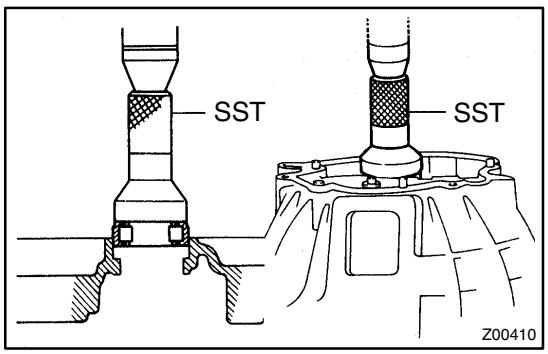
If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



3. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING

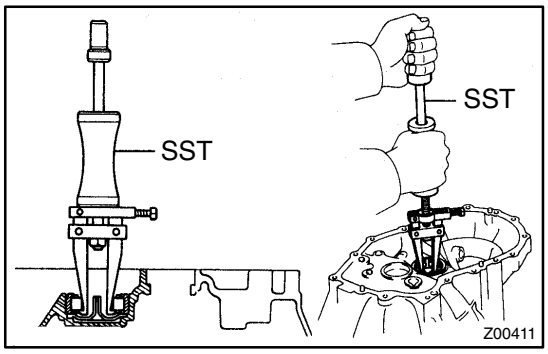
(a) Remove the 2 bolts and transaxle case receiver.

(b) Using SST, pull out the bearing.
SST 09308–00010



(c) Using SST and a press in a new bearing.
SST 09310–35010

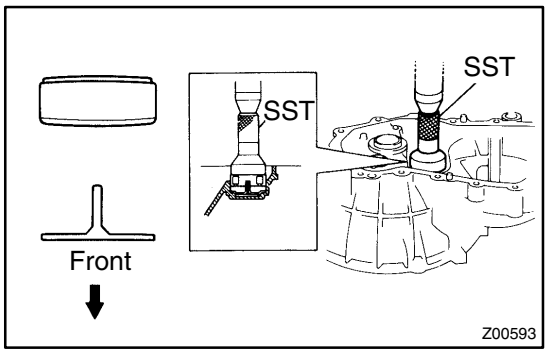
(d) Install the transaxle case receiver and torque the 2 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



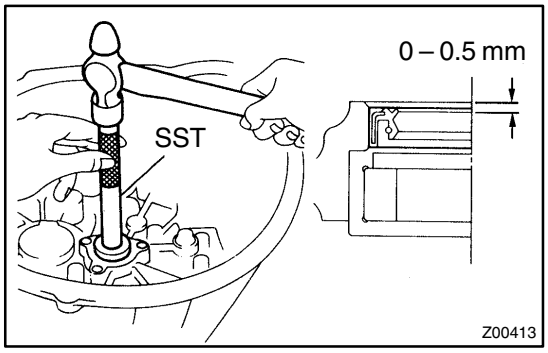
4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING

(a) Remove the bolt and bearing lock plate.

(b) Using SST, pull out the bearing.
SST 09308–00010

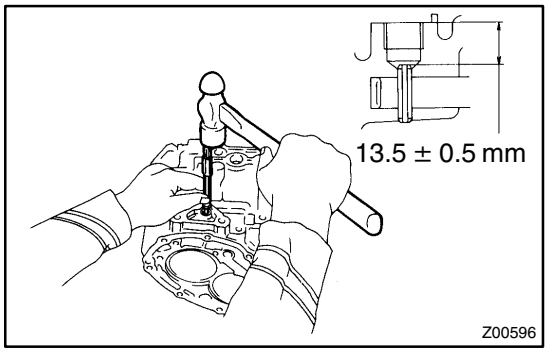


(c) Using SST and a press in a new bearing.
SST 09310–35010
(d) Install the bearing lock plate and torque the bolt.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



5. IF NECESSARY, REPLACE INPUT SHAFT FRONT OIL SEAL

(a) Using a screwdriver, pry out the oil seal.
(b) Using SST and a hammer, drive in a new oil seal.
SST 09608–00081, 09950–70010 (09951–07150)
Drive in depth: 0–0.5 mm (0–0.020 in.)
(c) Coat the lip of the oil seal with MP grease.



6. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench, remove the straight screw plug.
(b) Using a pin punch and hammer, drive out the slotted spring pin.
(c) Replace the reverse restrict pin.
(d) Using a pin punch and hammer, drive in the slotted spring pin.
Drive in depth: 13.5±0.5 mm (0.531±0.020 in.)
(e) Apply sealant to the plug threads.
Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
(f) Using a hexagon wrench, install and torque the straight screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX037–04

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page MX–10).

HINT:

Coat all of the sliding and rotating surfaces with gear oil before assembly.

NOTICE:

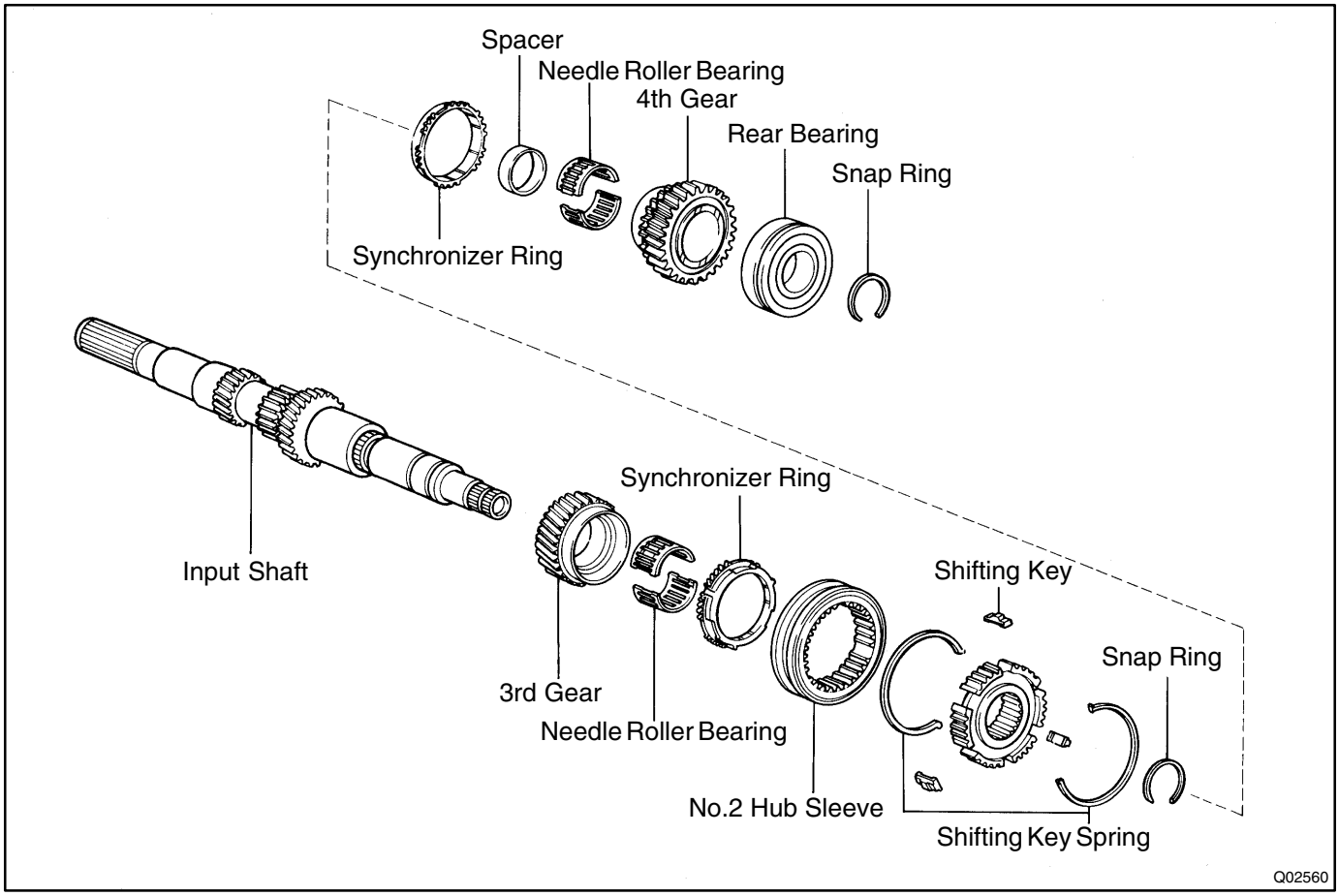
When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non–residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

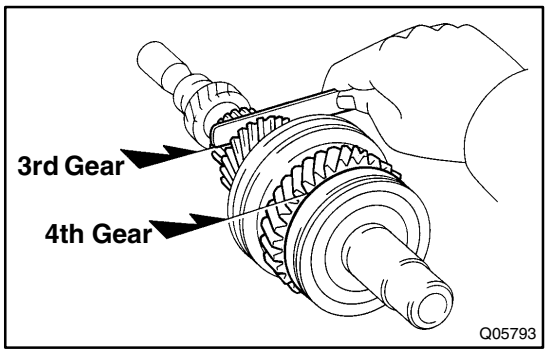
INPUT SHAFT

COMPONENTS

MX038–04



MX039–04

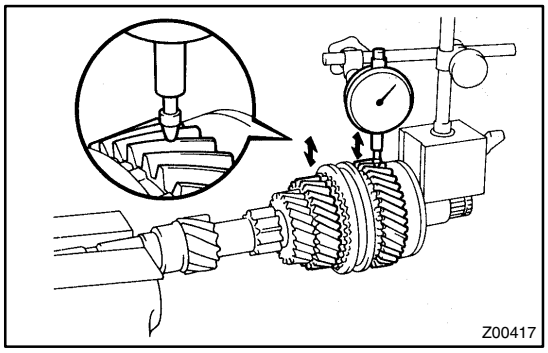


DISASSEMBLY

1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCES

Using a feeler gauge, measure each thrust clearance.

Maximum clearance:
3rd gear: 0.35 mm (0.0138 in.)
4th gear: 0.45 mm (0.0177 in.)
Minimum clearance:
3rd gear: 0.10 mm (0.0039 in.)
4th gear: 0.10 mm (0.0039 in.)



2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCES

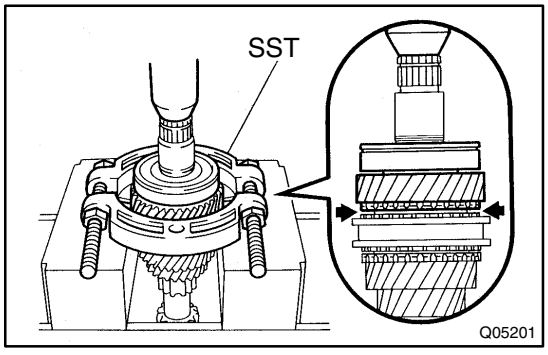
Using a dial indicator, measure the radial clearance between the gear and shaft.

Maximum clearance:
0.051 mm (0.0020 in.)
Minimum clearance:
0.009 mm (0.0004 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.

3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.



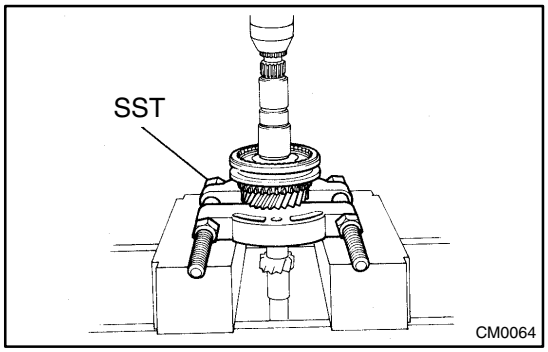
4. REMOVE REAR BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING FROM INPUT SHAFT

(a) Using SST and a press, remove the 4th gear and rear bearing.
SST 09950–00020

(b) Remove the needle roller bearings, spacer and synchronizer ring.

5. REMOVE SNAP RING

Using a snap ring expander, remove the snap ring.



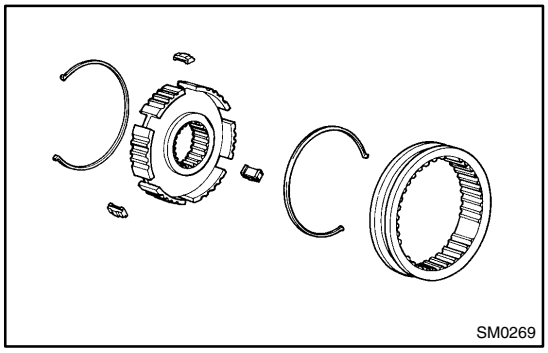
6. REMOVE NO.2 HUB SLEEVE ASSEMBLY, 3RD GEAR SYNCHRONIZER RING AND NEEDLE ROLLER BEARING

Using SST and a press, remove the No.2 hub sleeve, 3rd gear, synchronizer ring and needle roller bearings.

SST 09950–00020

NOTICE:

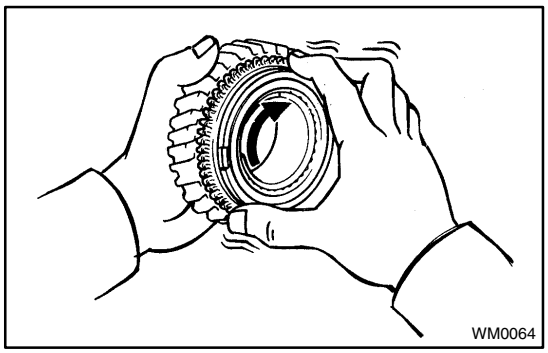
Be careful not to mistake the 3rd gear synchronizer ring for the 4th gear synchronizer ring.



7. REMOVE NO.2 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.2 CLUTCH HUB

Using a screwdriver, remove the 3 shifting keys and 2 springs from the No.2 clutch hub.

MX03A–04



INSPECTION

1. INSPECT SYNCHRONIZER RING

(a) Check wear or damage.

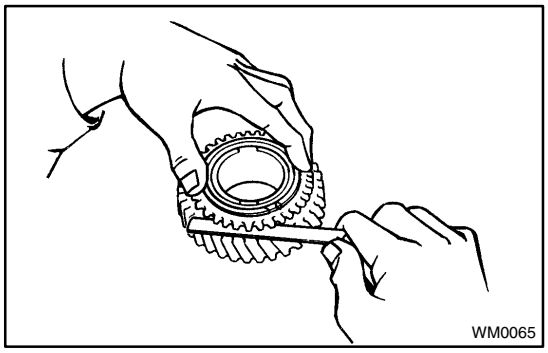
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance:

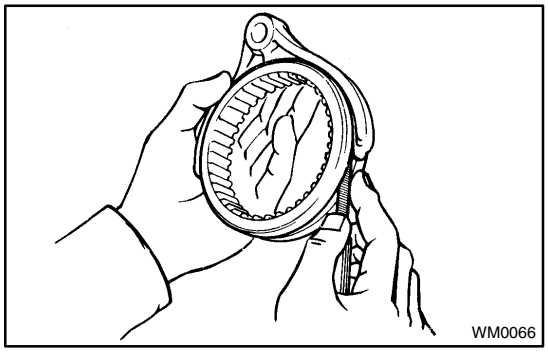
3rd gear: 0.65 mm (0.0256 in.)

4th gear: 0.75 mm (0.0295 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

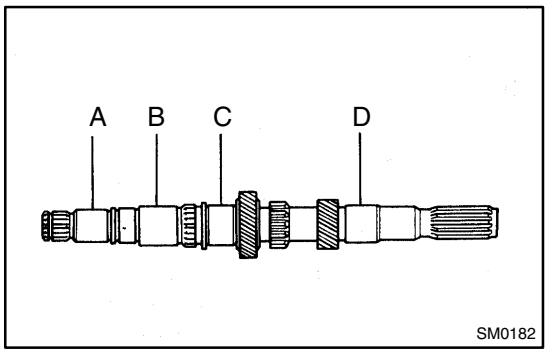


2. INSPECT NO.2 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.4 mm (0.0157 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



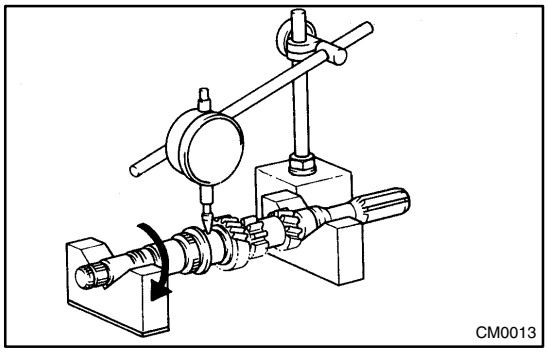
3. INSPECT INPUT SHAFT

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

Minimum outer diameter:
Part A: 26.987 mm (1.0625 in.)
Part B: 32.484 mm (1.2789 in.)
Part C: 33.100 mm (1.3031 in.)
Part D: 29.987 mm (1.1806 in.)

If the outer diameter is less than the minimum, replace the input shaft.

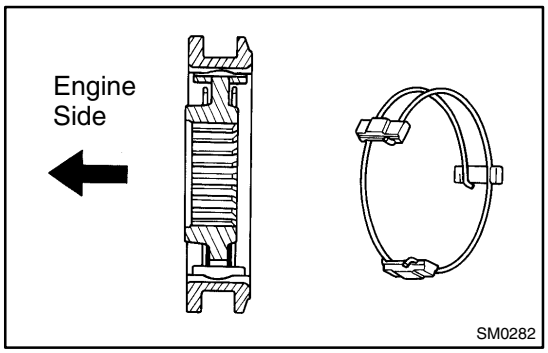


(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

If the runout exceeds the maximum, replace the input shaft.

MX03B–04



REASSEMBLY

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

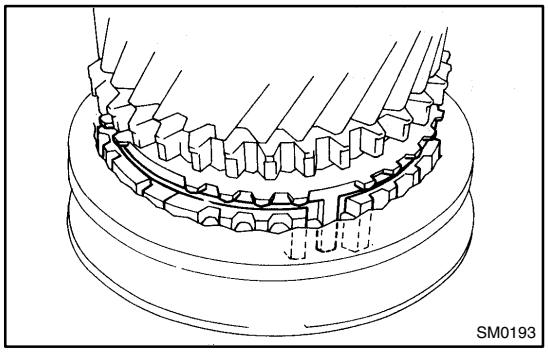
1. INSTALL NO.2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.

NOTICE:

Install the key springs positioned so that their end gaps are not in line.



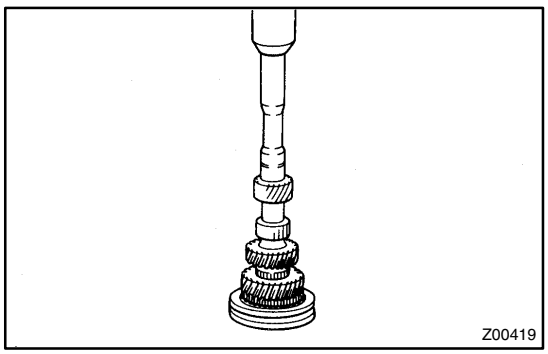
2. INSTALL 3RD GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply gear oil to the needle roller bearings.

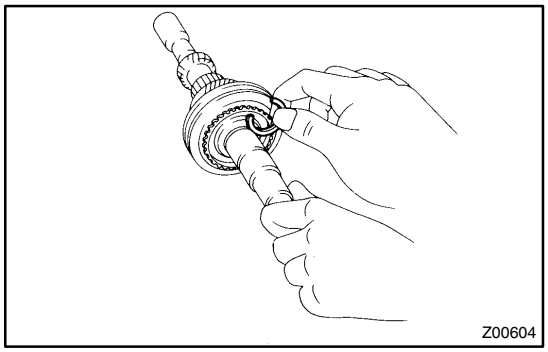
(b) Place the synchronizer ring (for the 3rd gear) on the gear and align the ring slots with the shifting keys.

NOTICE:

Do not install the synchronizer ring for 4th gear.



(c) Using a press, install the 3rd gear and No.2 hub sleeve.


Z00604

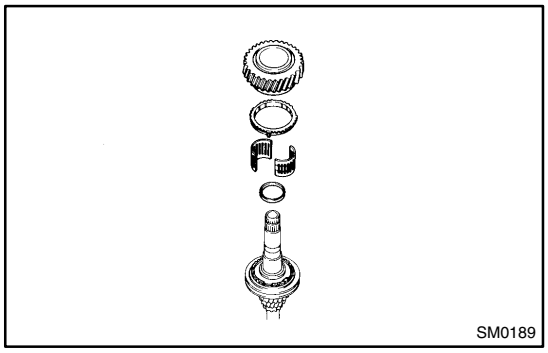
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
1	1.95–2.00 (0.0768–0.0787)
2	2.00–2.05 (0.0787–0.0807)
3	2.05–2.10 (0.0807–0.0827)
4	2.10–2.15 (0.0827–0.0846)
5	2.15–2.20 (0.0846–0.0866)
6	2.20–2.25 (0.0866–0.0886)

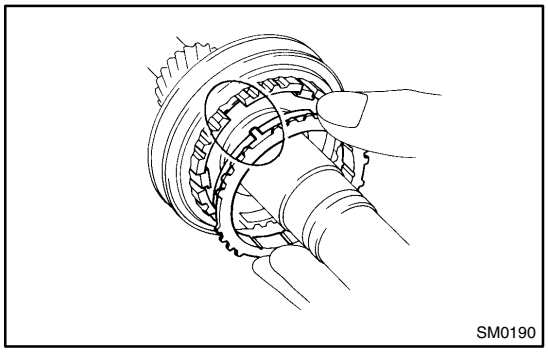
(b) Using a snap ring expander, install the snap ring.

4. INSPECT 3RD GEAR THRUST CLEARANCE
(See page MX–20)

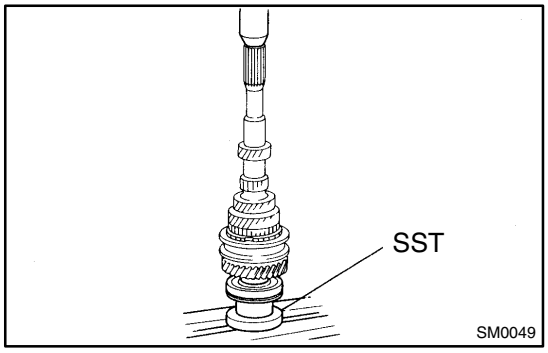

SM0189

5. INSTALL SYNCHRONIZER RING, NEEDLE ROLLER BEARING, SPACER, 4TH GEAR AND REAR BALL BEARING

(a) Apply gear oil to the needle roller bearings.
(b) Install the spacer and needle roller bearings.
(c) Place the synchronizer ring on the gear.

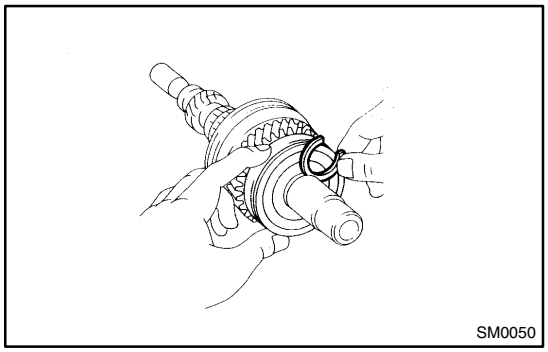

SM0190

HINT:
Align the ring slots with the shifting keys and the ring projections with the hub slots.



SM0049

(d) Using SST and a press, install the rear ball bearing.
SST 09608–00071


SM0050

6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
A	2.15–2.20(0.0846–0.0866)
B	2.20–2.25(0.0866–0.0886)
C	2.25–2.30(0.0886–0.0906)
D	2.30–2.35(0.0906–0.0925)
E	2.35–2.40(0.0925–0.0945)

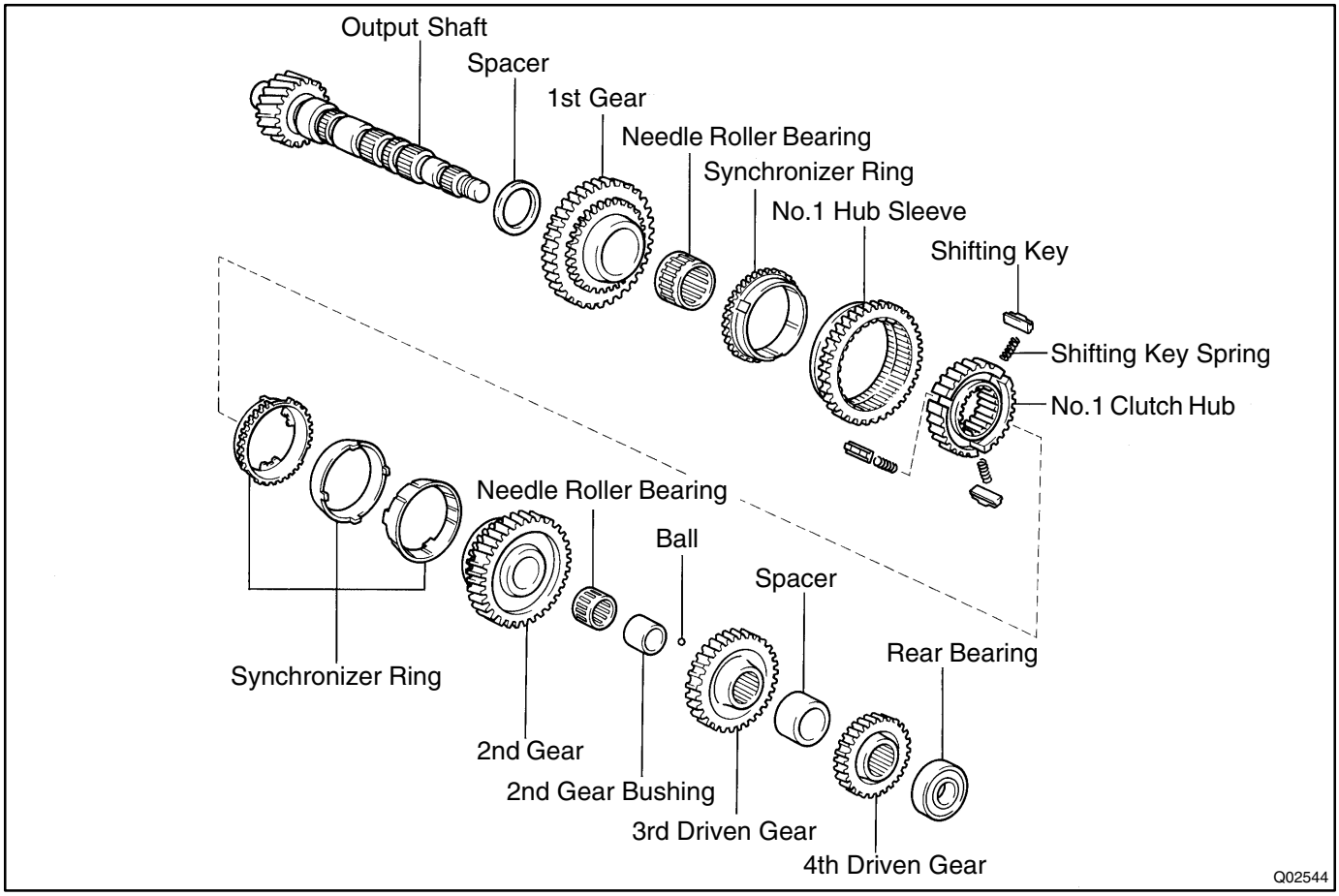
(b) Using a screwdriver and hammer, tap in the snap ring.

7. INSPECT 4TH GEAR THRUST CLEARANCE
(See page MX–20)

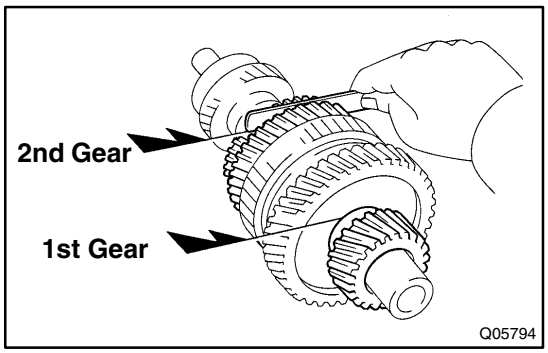
OUTPUT SHAFT

COMPONENTS

MX03C–04



MX03D–03

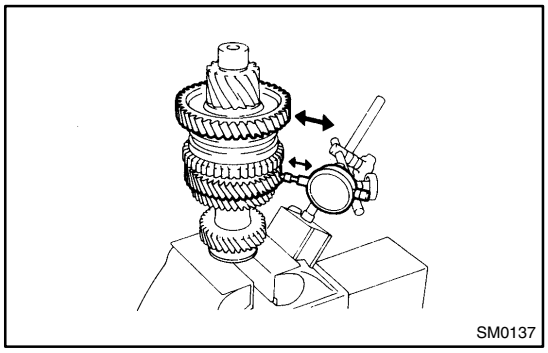


DISASSEMBLY

1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCES

Using a feeler gauge, measure each thrust clearance.

Maximum clearance:
1st gear: 0.29 mm (0.0114 in.)
2nd gear: 0.34 mm (0.0134 in.)
Minimum clearance:
1st gear: 0.10 mm (0.0039 in.)
2nd gear: 0.10 mm (0.0039 in.)

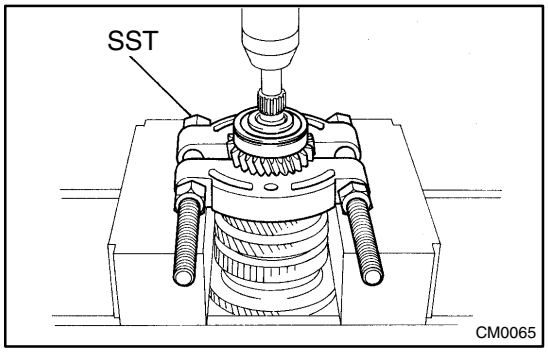


2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCES

Using a dial indicator, measure the radial clearance between the gear and shaft.

Maximum clearance:
0.051 mm (0.0020 in.)
Minimum clearance:
0.009 mm (0.0004 in.)

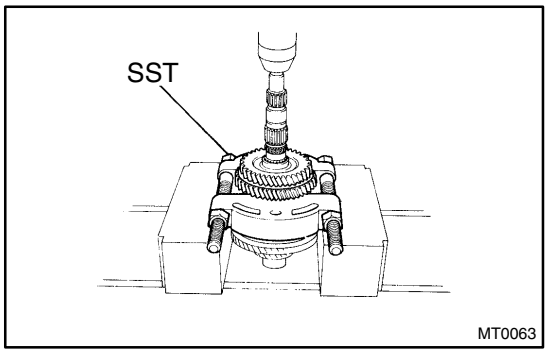
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE REAR BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER

(a) Using SST and a press, remove the rear ball bearing and 4th driven gear.
SST 09950–00020

(b) Remove the output gear spacer and ball.

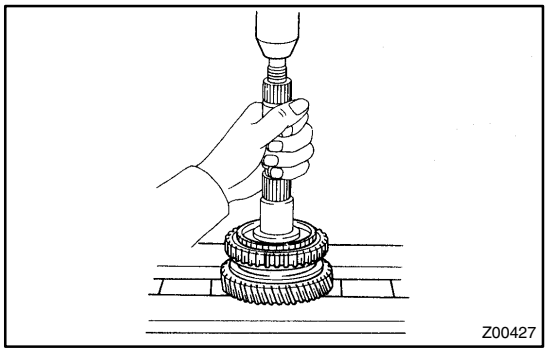


4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING AND SYNCHRONIZER RING

(a) Shift the No.1 hub sleeve into the 1st gear.

(b) Using SST and a press, remove the 3rd driven gear and 2nd gear.
SST 09950–00020

(c) Remove the needle roller bearing and synchronizer rings.

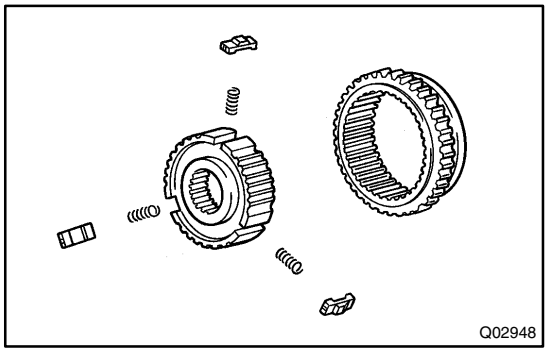


5. REMOVE NO.1 HUB SLEEVE ASSEMBLY, 1ST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, THRUST WASHER AND LOCKING BALL

(a) Using a press, remove the No.1 hub sleeve, 1st gear and synchronizer ring.

(b) Remove the needle roller bearing and locking ball.

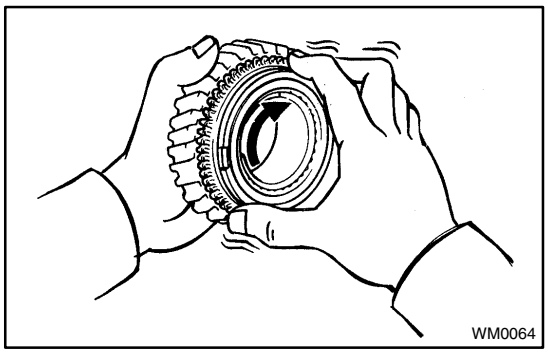
(c) Using a screwdriver and hammer, drive out the thrust washer.



6. REMOVE NO.1 HUB SLEEVE, 3 SHIFTING KEYS AND SPRINGS FROM NO.1 CLUTCH HUB

MX03E–04

INSPECTION



1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check wear or damage.

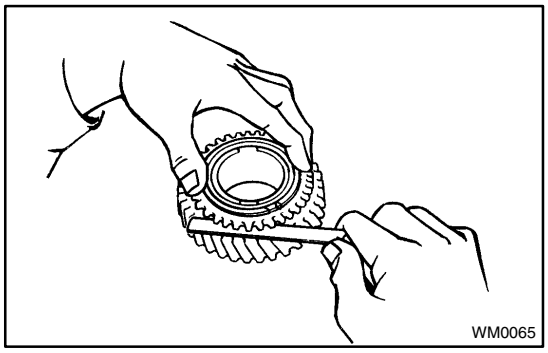
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



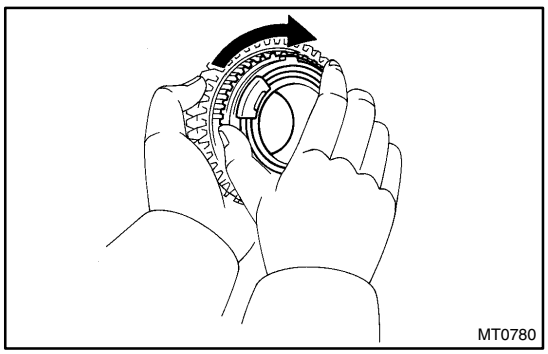
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and the gear spline end.

Minimum clearance: 0.75 mm (0.030 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

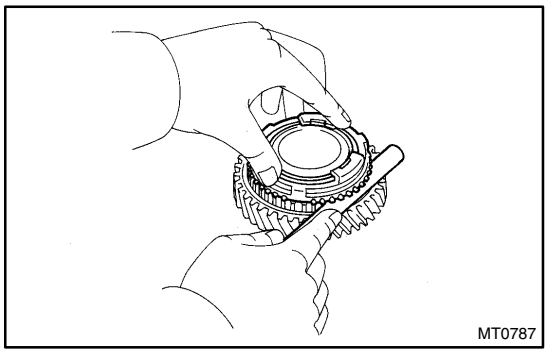


2. INSPECT 2ND GEAR SYNCHRONIZER RING

(a) Check wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

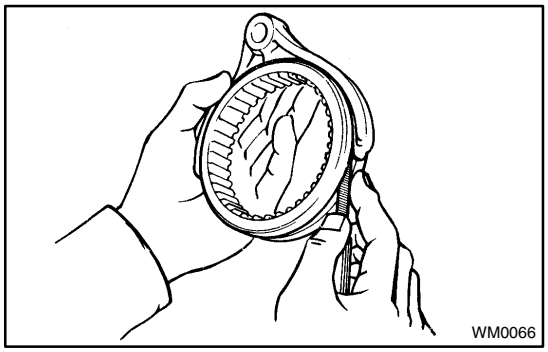
If the braking effect is insufficient, replace the synchronizer ring.



(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring.

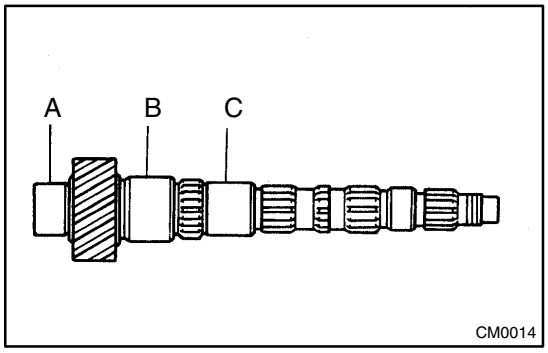


3. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.4 mm (0.016 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

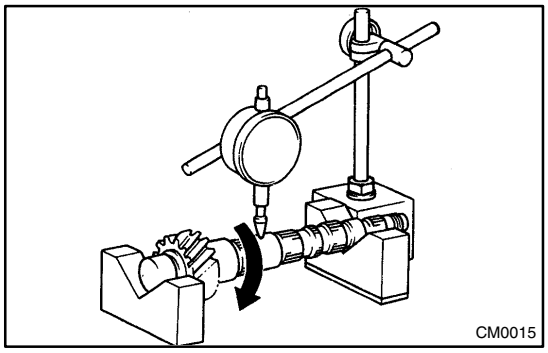


4. INSPECT OUTPUT SHAFT

(a) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:
Part A: 31.984 mm (1.2592 in.)
Part B: 37.984 mm (1.4954 in.)
Part C: 32.002 mm (1.2599 in.)

If the outer diameter is less than the minimum, replace the output shaft.



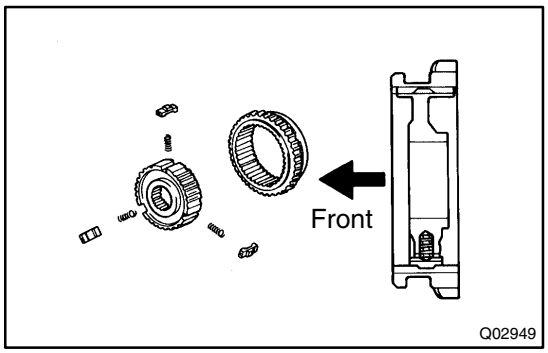
(b) Using a dial indicator, check the shaft runout.

Maximum runout: 0.05 mm (0.0020 in.)

If the runout exceeds the maximum, replace the output shaft.

MX03F–04

REASSEMBLY

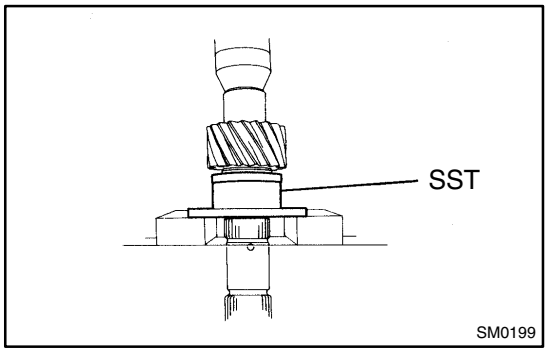


HINT:
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO.1 CLUTCH HUB INTO HUB SLEEVE

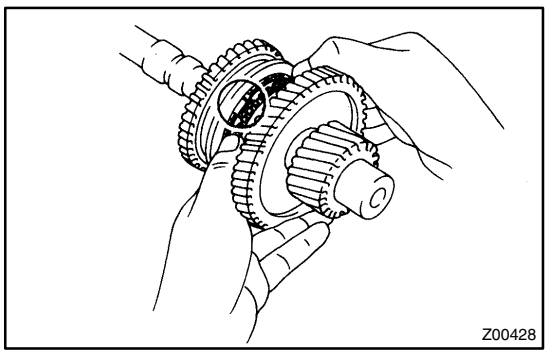
(a) Install the 3 springs and shifting keys to the clutch hub.
(b) Install the hub sleeve to the clutch hub.

HINT:
Position the identification groove of the hub sleeve to the front of the transmission.

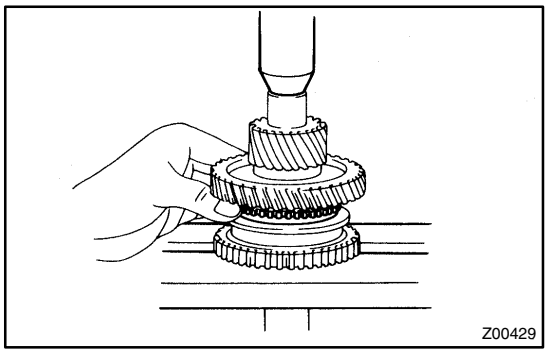


2. INSTALL THRUST WASHER, 1ST GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

(a) Using SST and a press, install the thrust washer.
SST 09316–60011 (09316–00041)
(b) Apply gear oil to the needle roller bearing.

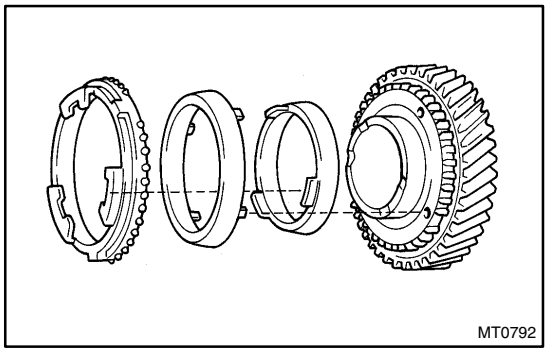


(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



(d) Using a press, install the 1st gear and No.1 hub sleeve.

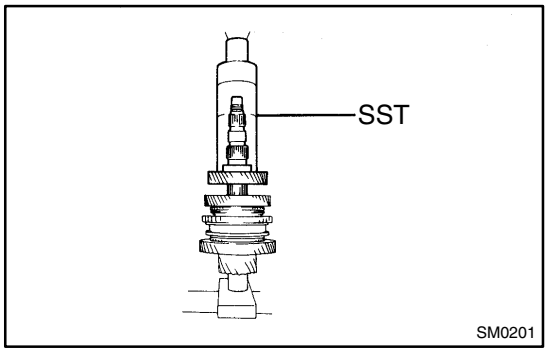
3. INSPECT 1ST GEAR THRUST CLEARANCE
(See page MX–28)



4. INSTALL SYNCHRONIZER RING, 2ND GEAR, NEEDLE ROLLER BEARING AND 3RD DRIVEN GEAR

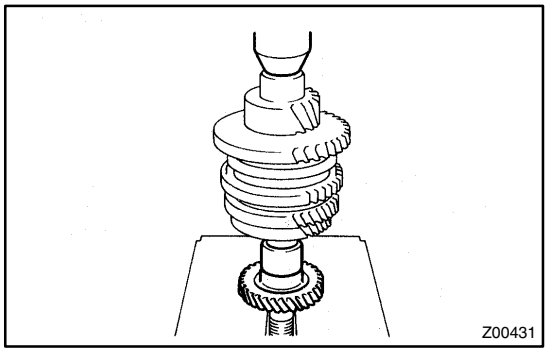
(a) Install the ball.
(b) Fit the 2nd gear bushing groove securely over the ball when installing the 2nd gear bushing on the shaft.
(c) Place the synchronizer rings on the 2nd gear.
(d) Apply gear oil to the needle roller bearing and install it.
(e) Install the 2nd gear.

NOTICE:
Align the clutch hub grooves with the projections on the synchronizer ring.



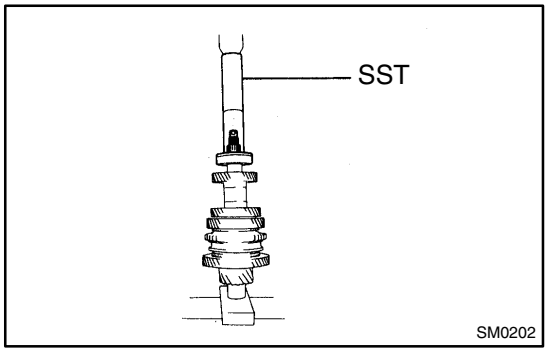
(f) Using SST and a press, install the 3rd driven gear.
SST 09316–60011 (09316–00011)

5. INSPECT 2ND GEAR THRUST CLEARANCE
(See page MX–28)



6. INSTALL OUTPUT GEAR SPACER, 4TH DRIVEN GEAR AND RADIAL BALL BEARING

(a) Install the outer gear spacer.
(b) Using a press, install the 4th driven gear and bearing.



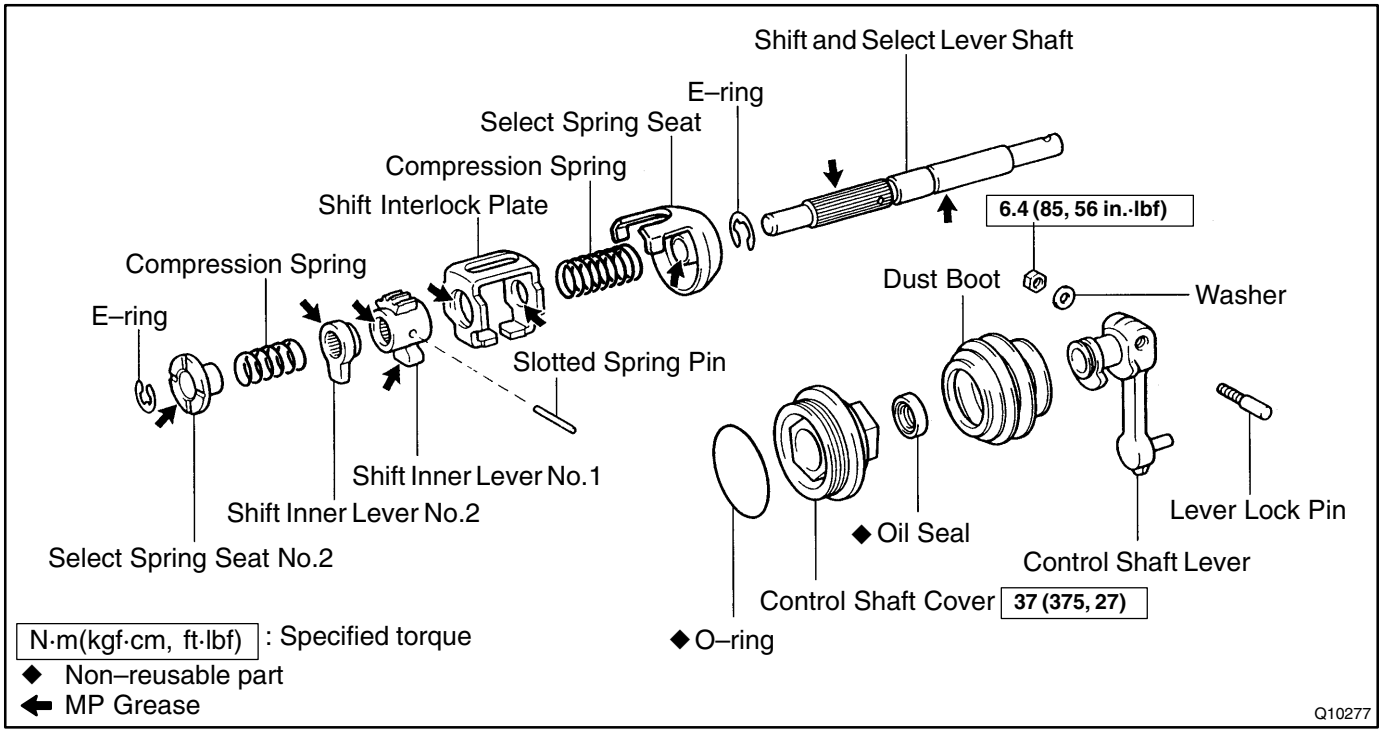
7. INSTALL REAR BEARING

Using SST and a press, install the rear bearing.
SST 09612–22011

SHIFT AND SELECT LEVER SHAFT

MX03G–04

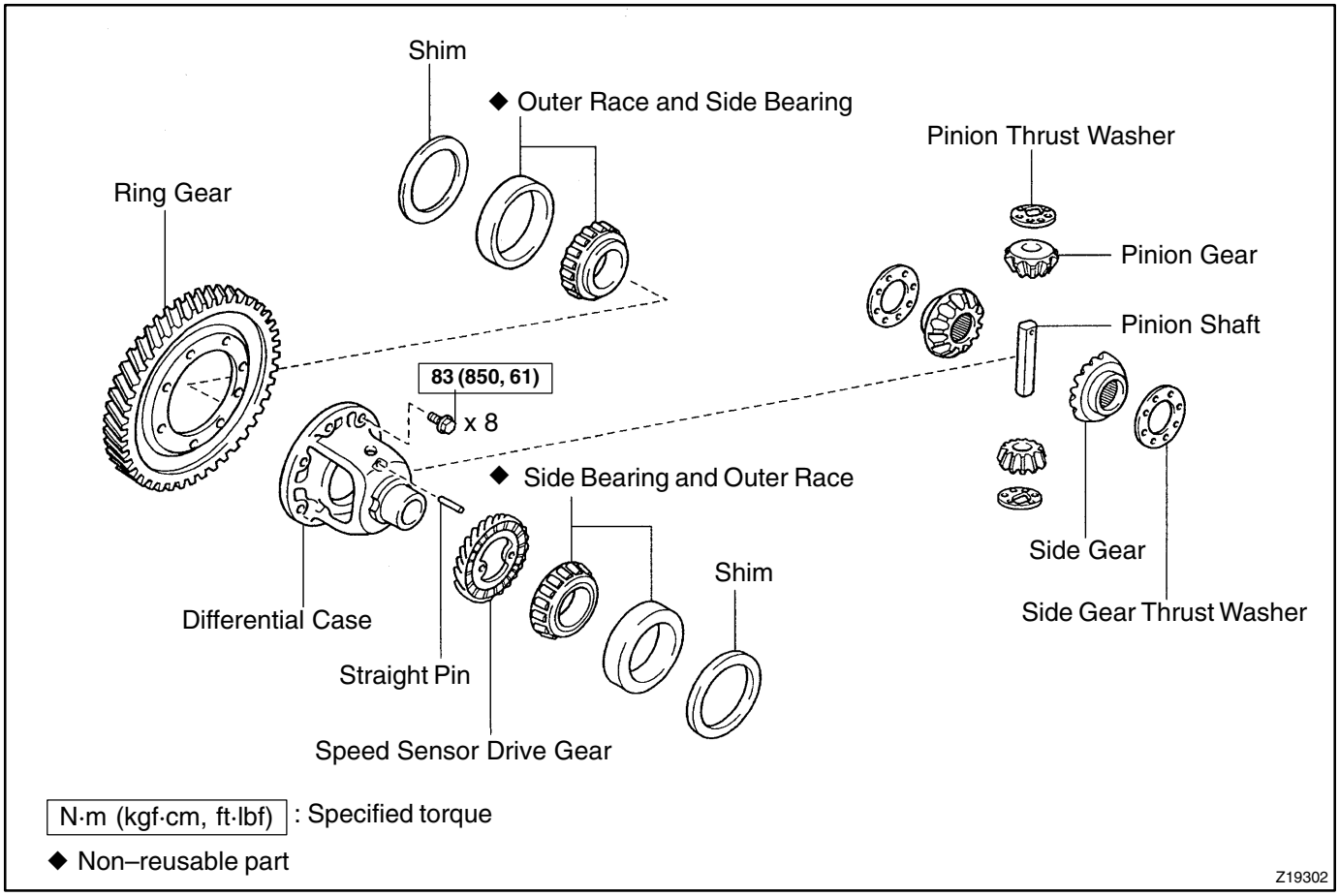
COMPONENTS



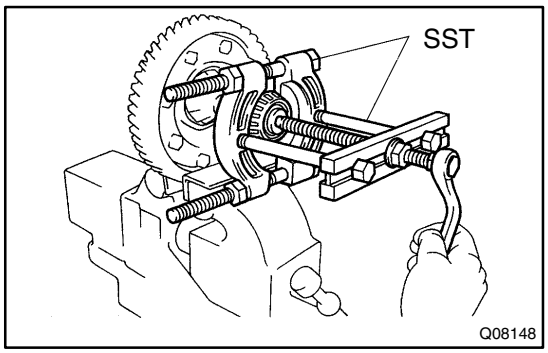
DIFFERENTIAL CASE

COMPONENTS

MX03H–04



MX03I–04



DISASSEMBLY

1. Speed Sensor Drive Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

(a) Using SST, remove the bearing from the drive gear side of the case.
SST 09950–00020, 09950–00030

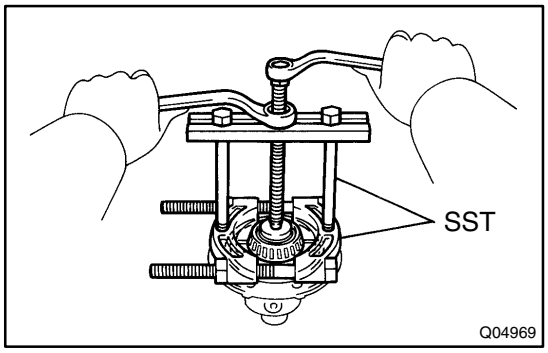
(b) Remove the speed sensor drive gear.

2. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and case.

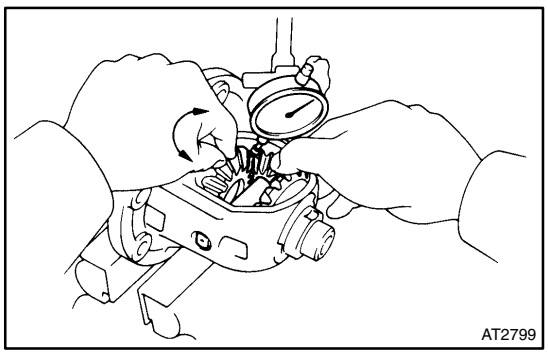
(b) Remove the 8 bolts.

(c) Using a copper hammer, tap on the ring gear to remove it from the case.



3. Ring Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

Using SST, remove the bearing from the ring gear side of the case.
SST 09950–00020, 09950–00030



4. INSPECT SIDE GEAR BACKLASH

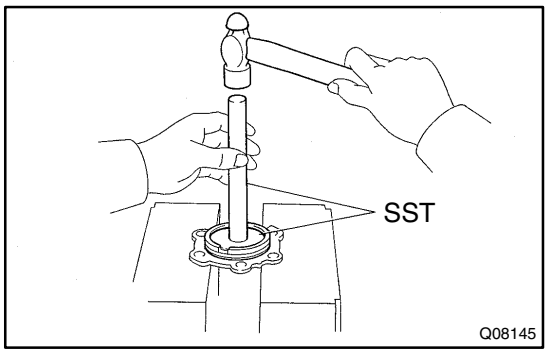
Using a dial indicator, measure the backlash of one side gear while holding one pinion toward the case.
Standard backlash: 0.05–0.20 mm (0.0020–0.0079 in.)
If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

(a) Using a pin punch and hammer, drive out the straight pin.

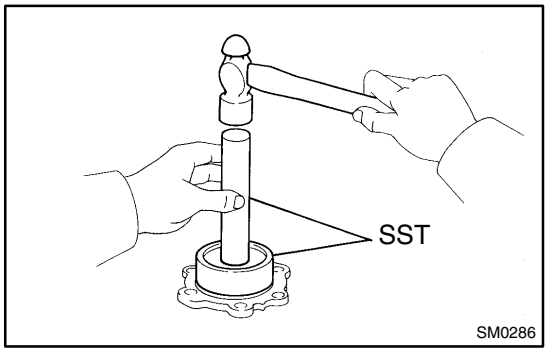
(b) Remove the pinion shaft from the case.

(c) Remove the 2 pinions and side gears with the 4 thrust washers from each gear.



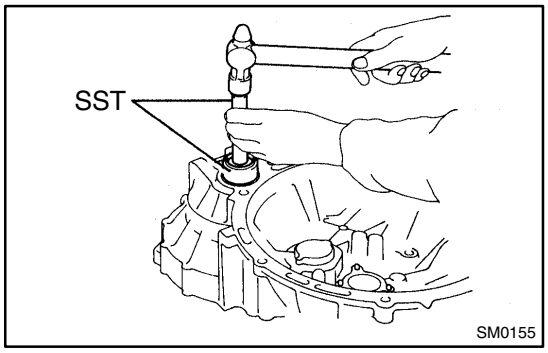
6. Transmission Case Side:
IF NECESSARY, REPLACE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL

(a) Using SST and a hammer, drive out the oil seal from the retainer.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)



(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)

(c) Coat the lip of oil seal with MP grease.

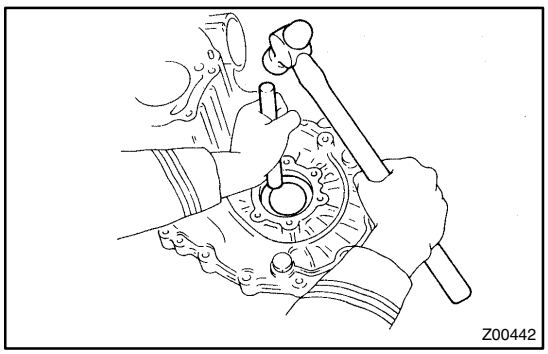


7. Transaxle Case Side:
IF NECESSARY, REPLACE SIDE OIL SEAL

(a) Using a screwdriver and hammer, drive out the oil seal.

(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)

(c) Coat the lip of oil seal with MP grease.



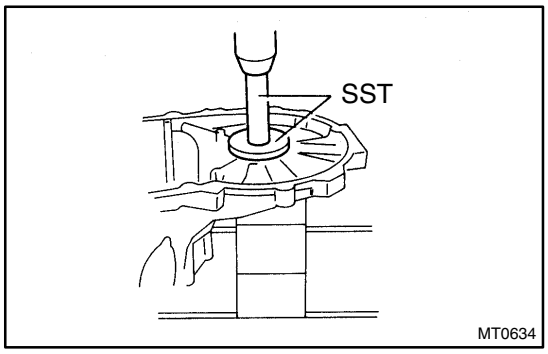
8. Transmission Case Side:
IF NECESSARY, REPLACE SIDE BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race.

(b) Install the bearing retainer without an O–ring.

(c) Install and torque the 6 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

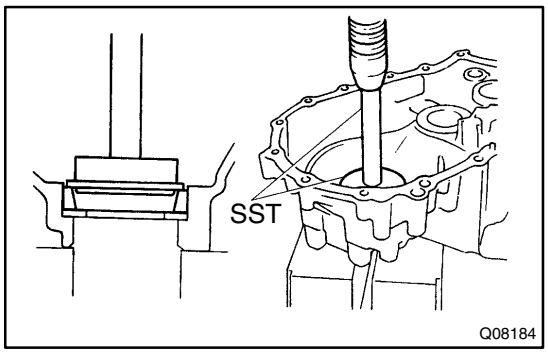
(d) Place the thinnest shim into the case.



(e) Using SST and a press, install a new bearing outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

(f) Remove the 6 bolts.

(g) Remove the bearing retainer and shim.



9. Transaxle Case Side:
IF NECESSARY, REPLACE SIDE BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race and shim.

(b) Place the shim into the case.

(c) Using SST and a press, install a new bearing outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

MX03J–04

REASSEMBLY

1. ASSEMBLE DIFFERENTIAL CASE

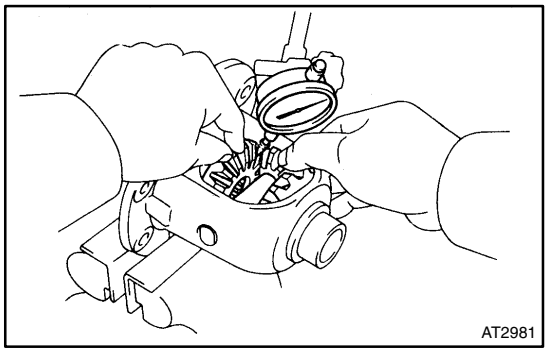
(a) Install the correct thrust washers and side gears. Refer to the table below, select thrust washers which will allow that the backlash is within the specification. Try to select washers of the same size for both sides.

Standard backlash: 0.05–0.20 mm (0.0020–0.0079 in.)

Thickness mm (in.)	Thickness mm (in.)
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

Install the thrust washers and side gears in the differential case.

(b) Install the pinion shaft.


AT2981

(c) Inspect the side gear backlash.

Using a dial indicator, measure the side gear backlash while holding one pinion gear toward the case.

Standard backlash: 0.05–0.20 mm (0.0020–0.0079 in.)

If the backlash is not within the specification, install a thrust washer of different thickness.

(d) Using a pin punch and hammer, drive in the straight pin through the case and hole in the pinion shaft.

(e) Stake the differential case.

2. INSTALL RING GEAR ON DIFFERENTIAL CASE

(a) Clean the contact surface of the differential case and the threads of the ring gear and differential case.

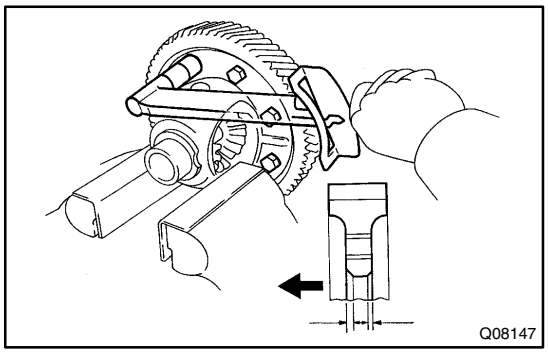
(b) Heat the ring gear in boiling water.

(c) Carefully remove the ring gear from the water.

(d) After moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

HINT:

Align the matchmark on the differential case with the one on the ring gear.


Q08147

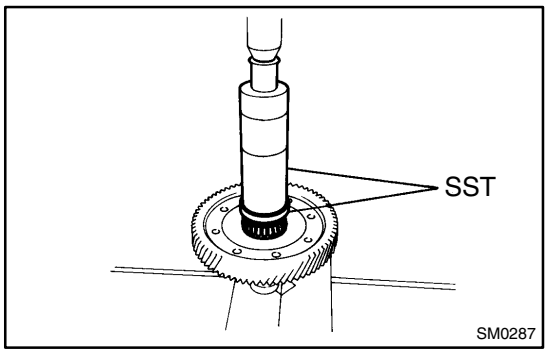
(e) Temporarily install the 8 bolts.

NOTICE:

The ring gear set bolts should not be torqued until the ring gear has cooled sufficiently.

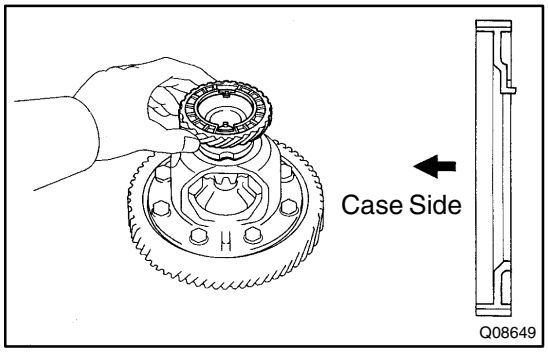
(f) After the ring gear has cooled sufficiently, torque the ring gear set bolts.

Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)

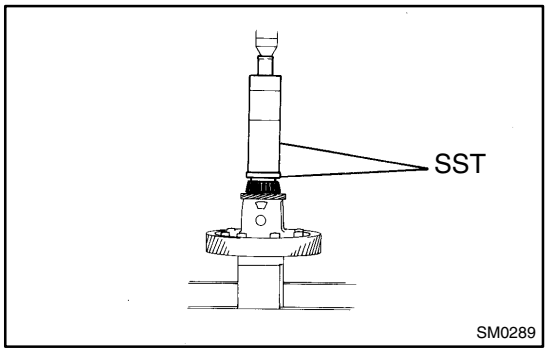


3. INSTALL SIDE BEARING TO DIFFERENTIAL CASE

(a) Using SST and a press, install a new side bearing to the transmission case side.
SST 09316–60011 (09316–00011), 09350–32014 (09351–32120)



(b) Install the speed sensor drive gear to the transaxle case side.

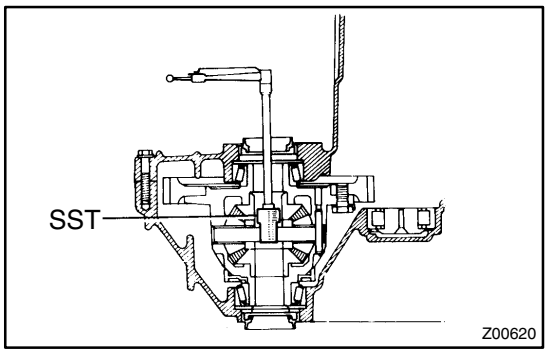


(c) Using SST and a press, install a new side bearing to the transaxle case side.
SST 09316–60011 (09316–00011), 09350–32014 (09351–32120)

NOTICE:
Install the black cage bearing on the speed sensor drive gear side.

4. ADJUST DIFFERENTIAL CASE SIDE BEARING PRELOAD

(a) Install the differential to the transaxle case.
(b) Install the transmission case.
(c) Install and torque the case bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
(d) Install the shim into the transmission case.
(e) Install the bearing retainer without an O–ring.
(f) Install and torque the 6 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



(g) Using SST and a torque wrench, measure the preload.
SST 09564–32011
Preload (at starting):
1.0–1.6 N·m (10–16 kgf·cm, 8.7–13.9 in.·lbf)

If the preload is not within the specification, remove the transmission case side bearing retainer. Select another shim.

HINT:

The preload will change by approx. 0.3–0.4 N·m (3–4 kgf·cm, 2.6–3.5 in.·lbf) corresponding to a change of 0.05 mm in shim thickness.

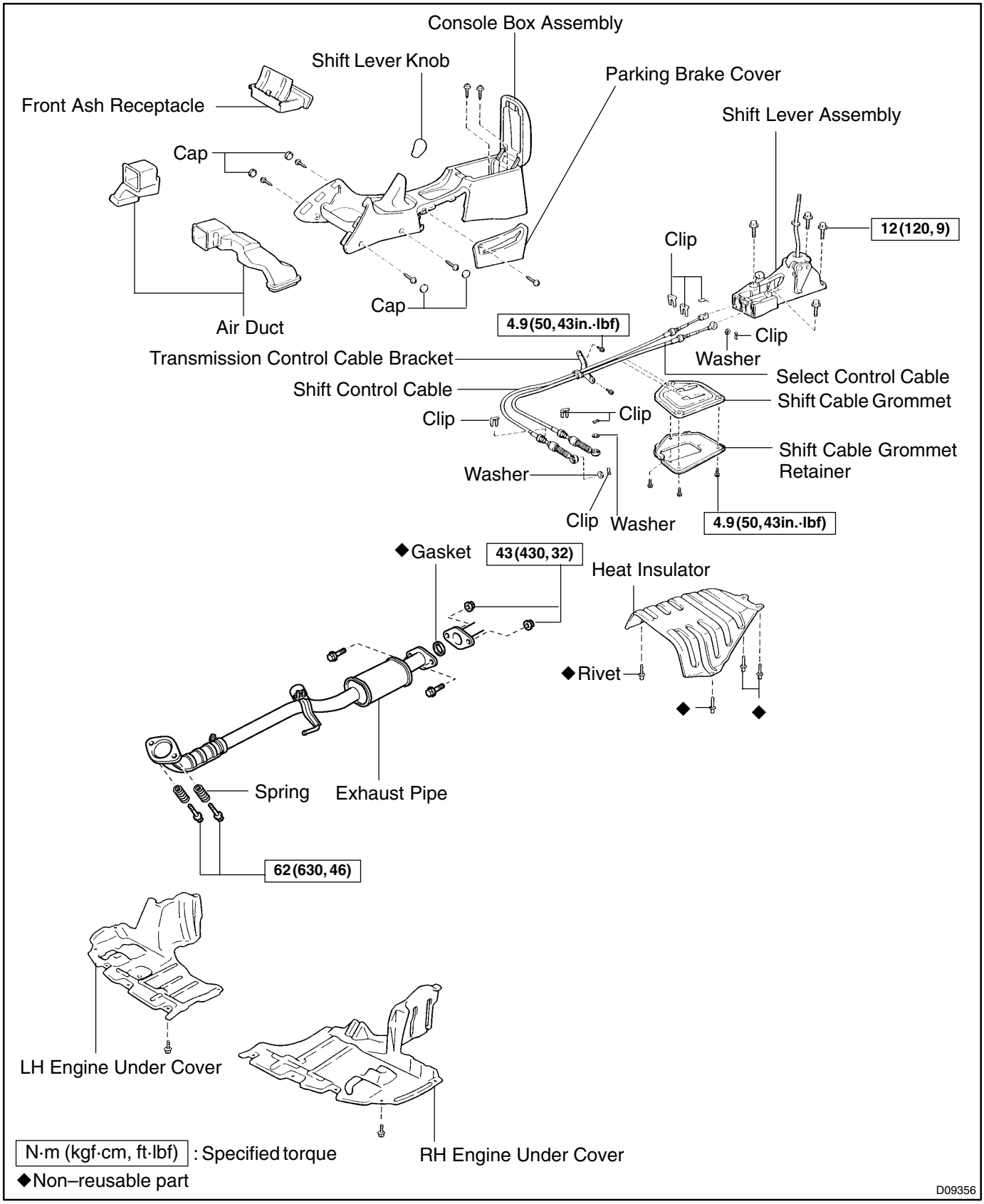
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	1.90 (0.0748)	11	2.40 (0.0945)
2	1.95 (0.0768)	12	2.45 (0.0965)
3	2.00 (0.0787)	13	2.50 (0.0984)
4	2.05 (0.0807)	14	2.55 (0.1004)
5	2.10 (0.0827)	15	2.60 (0.1024)
6	2.15 (0.0846)	16	2.65 (0.1043)
7	2.20 (0.0866)	17	2.70 (0.1063)
8	2.25 (0.0886)	18	2.75 (0.1083)
9	2.30 (0.0906)	19	2.80 (0.1102)
10	2.35 (0.0925)	–	–

(h) Remove the 6 bolts.
(i) Remove the bearing retainer and shim.
(j) Remove the 17 bolts.
(k) Remove the transmission case.

SHIFT LEVER AND CONTROL CABLE

MX03K–03

COMPONENTS



AUTOMATIC TRANSAXLE (A246E)

AUTOMATIC TRANSAXLE SYSTEM AX–1
NEUTRAL START SWITCH AX–3
VALVE BODY ASSEMBLY AX–4
DIFFERENTIAL OIL SEAL AX–7
SHIFT LOCK SYSTEM AX–8
FLOOR SHIFT ASSEMBLY (LHD) AX–11
FLOOR SHIFT ASSEMBLY (RHD) AX–20
AUTOMATIC TRANSAXLE UNIT AX–28
TORQUE CONVERTER AND
DRIVE PLATE AX–33

AUTOMATIC TRANSAXLE SYSTEM

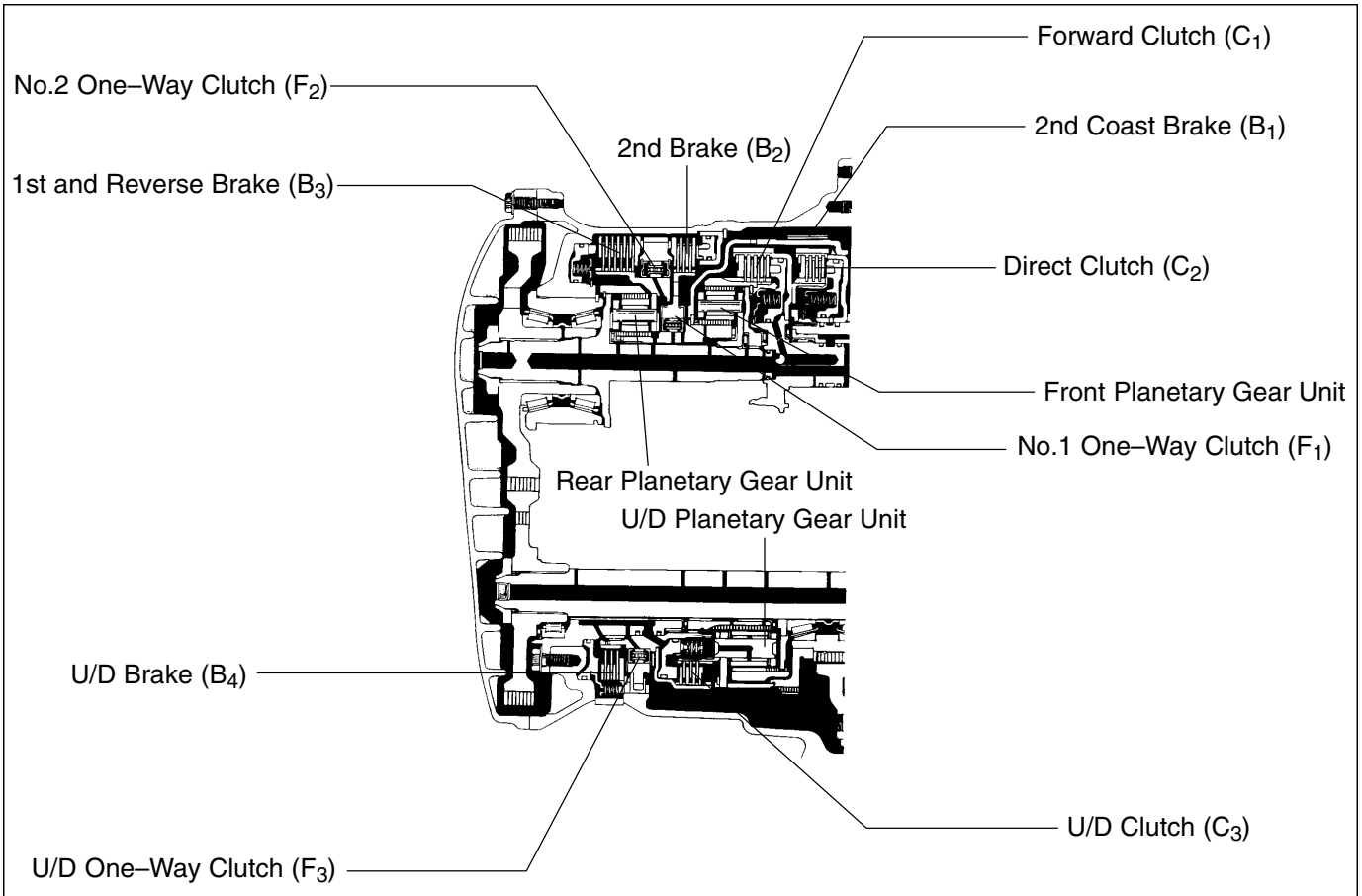
AX02L–04

PRECAUTION

If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

AX02M–06

OPERATION



Shift Lever Range	Gear	No. 1 Solenoid Valve	No. 2 Solenoid Valve	C_1	C_2	C_3	B_1	B_2	B_3	B_4	F_1	F_2	F_3
P	Park	ON	OFF							●			
R	Reverse	ON	OFF		●				●	●			
N	Neutral	ON	OFF							●			
D	1st	ON	OFF	●						●		●	●
	2nd	ON	ON	●				●		●	●		●
	3rd	OFF	ON	●	●			●		●			●
	O/D	OFF	OFF	●	●	●		●					
2	1st	ON	OFF	●						●		●	●
	2nd	ON	ON	●			●	●		●	●		●
	3rd*	OFF	ON	●	●			●		●			●
L	1st	ON	OFF	●					●	●		●	●
	2nd*	ON	ON	●			●	●		●	●		●

● : Operating
*: Down–shift only in the 3rd gear for the 2 range and 2nd gear for the L range – no up–shift

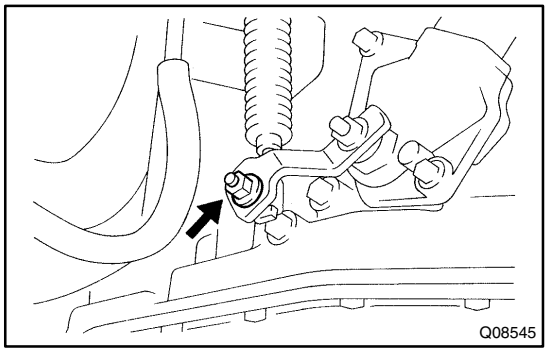
F00484

NEUTRAL START SWITCH

AX0PK–02

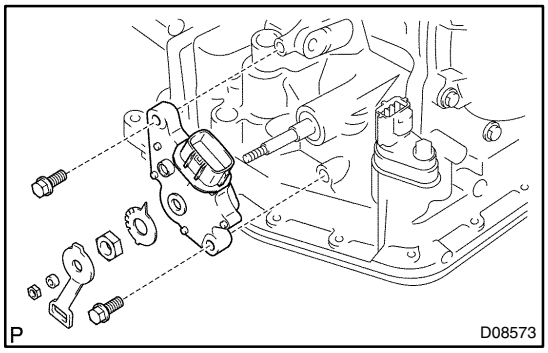
ON–VEHICLE REPAIR

1. REMOVE LH ENGINE UNDER COVER



2. DISCONNECT SHIFT CABLE FROM CONTROL SHIFT LEVER

3. DISCONNECT NEUTRAL START SWITCH CONNECTOR



4. REMOVE NEUTRAL START SWITCH

(a) Remove the nut, washer and control shaft lever.

(b) Pry out the lock washer and remove the manual valve shaft nut.

(c) Remove the 2 bolts and pull out the neutral start switch.

5. INSTALL AND ADJUST NEUTRAL START SWITCH

(a) Install the neutral start switch with 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Install a new lock plate and tighten the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

(c) Stake the nut with lock plate.

(d) Install the control shift lever, washer and nut.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

6. CONNECT NEUTRAL START SWITCH CONNECTOR

7. CONNECT SHIFT CABLE TO CONTROL SHIFT LEVER
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

8. CHECK NEUTRAL START SWITCH OPERATION

Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If not as started above, carry out the adjustment procedure (See page DI–3).

9. INSTALL LH ENGINE UNDER COVER

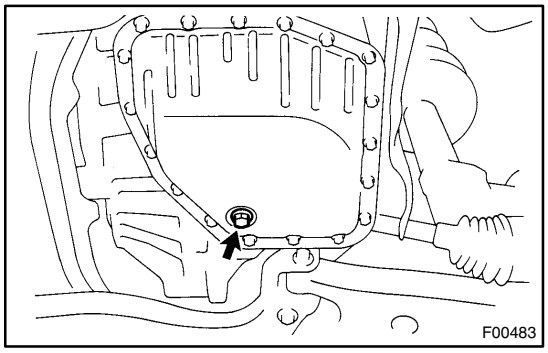
10. TEST DRIVE VEHICLE

VALVE BODY ASSEMBLY

AX0PL–02

ON–VEHICLE REPAIR

1. REMOVE LH ENGINE UNDER COVER



2. REMOVE DRAIN PLUG AND DRAIN ATF

3. REMOVE OIL PAN AND GASKET

Remove the 18 bolts.

NOTICE:

- **Some fluid will remain in the oil pan.**
- **Remove all pan bolts, and carefully remove the oil pan assembly.**
- **Discard the gasket.**

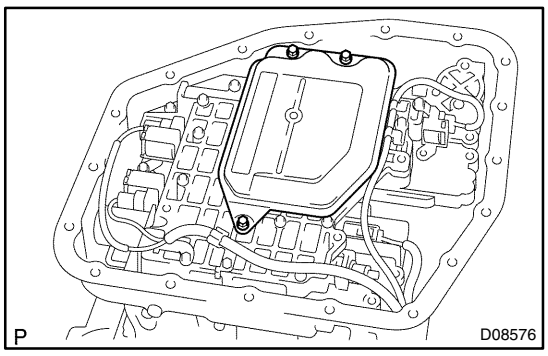
4. REMOVE 2 MAGNETS FROM OIL PAN

5. EXAMINE PARTICLES IN PAN

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): bushing wear

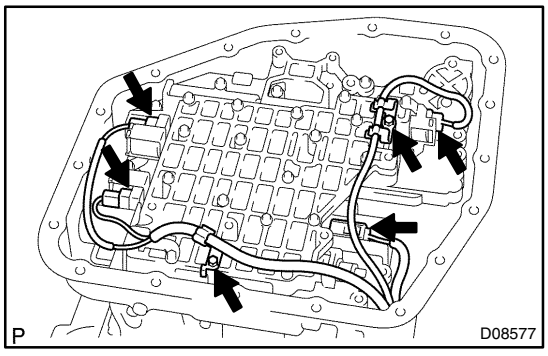


6. REMOVE OIL STRAINER

Remove the 3 bolts and oil strainer.

NOTICE:

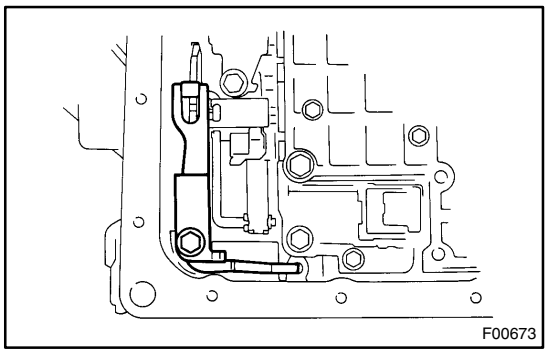
Be careful as some fluid will come out with the oil strainer.



7. DISCONNECT SOLENOID CONNECTOR

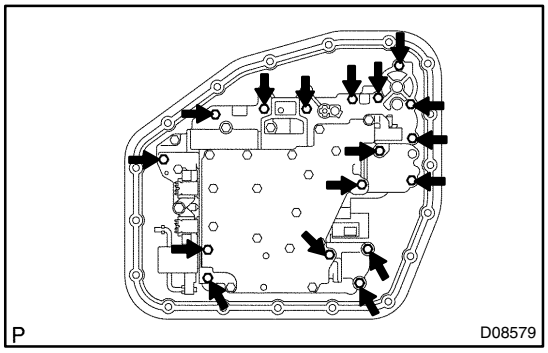
(a) Remove the 2 bolts and wire retainers.

(b) Disconnect the 4 solenoid connecters.



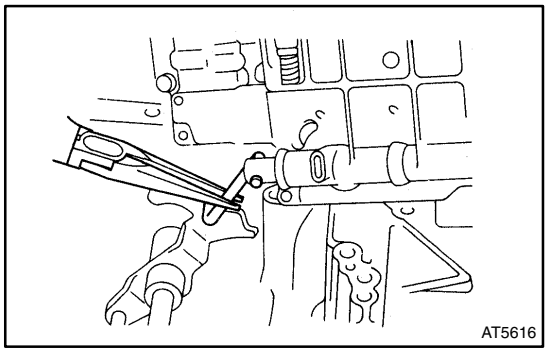
8. REMOVE MANUAL DETENT SPRING

Remove the bolt and manual detent spring.



9. REMOVE VALVE BODY

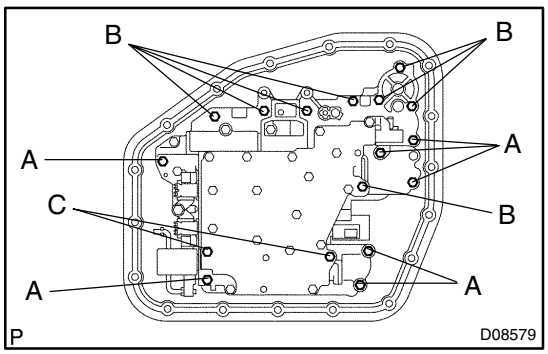
(a) Remove the 17 bolts.



(b) While disconnecting the manual valve connecting rod from the manual valve lever, remove the valve body with the manual valve together.

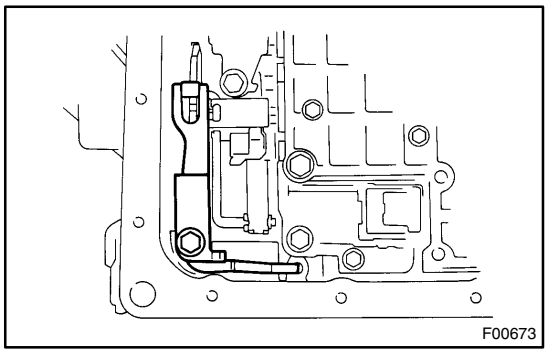
10. INSTALL VALVE BODY

(a) While connecting the manual valve connecting rod to the manual valve lever, install the valve body with the manual valve together.



(b) Install the 17 bolts.

Bolt length:
A: 20 mm (0.79 in.)
B: 28 mm (1.10 in.)
C: 50 mm (1.97 in.)
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



11. INSTALL MANUAL DETENT SPRING

Install the manual detent spring and bolt.

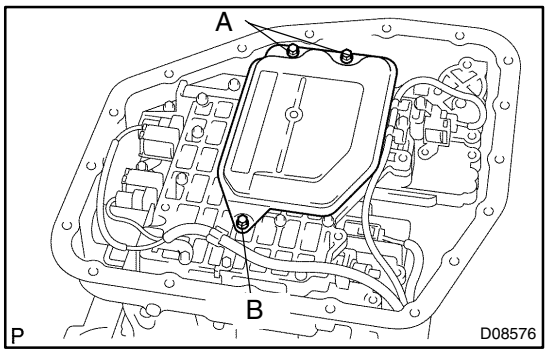
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

12. CONNECT 4 SOLENOID CONNECTORS

(a) Connect the 4 solenoid connectors.

(b) Install the wire retainer and bolt.

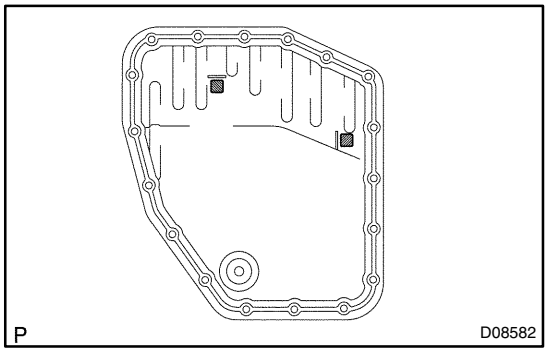
Torque: 6.4 N·m (65 kgf·cm, 56 in.·lbf)



13. INSTALL OIL STRAINER

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)



14. INSTALL MAGNETS IN OIL PAN

15. INSTALL OIL PAN AND GASKET

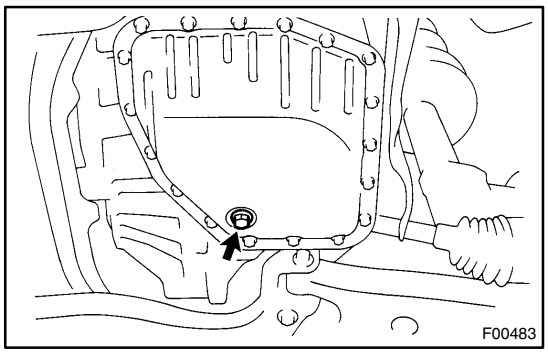
(a) Install a new gasket to the oil pan and install them to the transaxle.

(b) Install the 18 bolts.
Torque: 5.3 N·m (55 kgf·cm, 48 in.·lbf)

16. INSTALL DRAIN PLUG
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

17. INSTALL LH ENGINE UNDER COVER

18. FILL ATF AND CHECK FLUID LEVEL (See page DI–3)

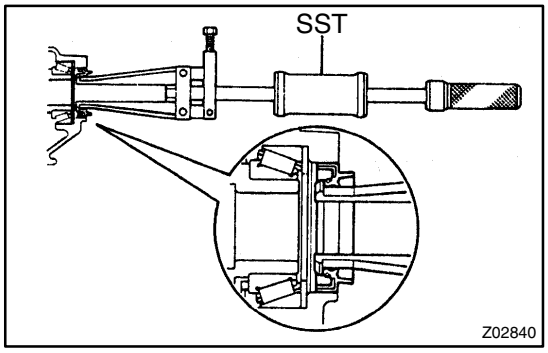


DIFFERENTIAL OIL SEAL

AX02R–06

ON–VEHICLE REPAIR

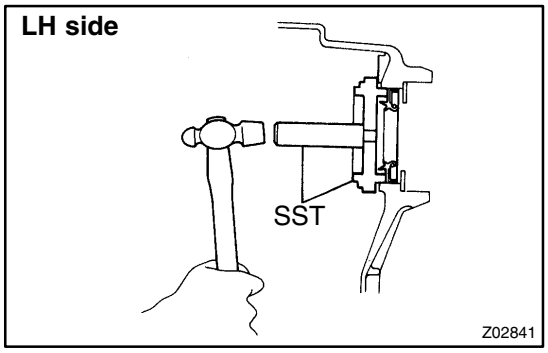
1. **DRAIN ATF**
2. **REMOVE LH AND RH ENGINE UNDER COVERS**
3. **REMOVE LH AND RH DRIVE SHAFTS (See page SA–3)**



4. **REMOVE LH AND RH OIL SEAL**

Using SST, drive out the oil seal.

SST 09308–00010



5. **INSTALL LH SIDE OIL SEAL**

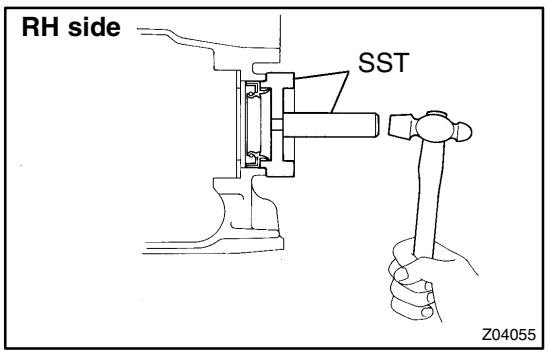
(a) Using SST, drive in a new oil seal.

SST 09350–32014 (09351–32111, 09351–32130)

Oil seal drive in depth:

5.3 ± 0.5 mm (0.209 ± 0.020 in.)

(b) Coat the lip of oil seal with MP grease.



6. **INSTALL RH SIDE OIL SEAL**

(a) Using SST, drive in a new oil seal until SST makes contact with the case surface.

SST 09350–32014 (09351–32130, 09351–32150)

Oil seal drive in depth:

3.1 ± 0.5 mm (0.122 ± 0.020 in.)

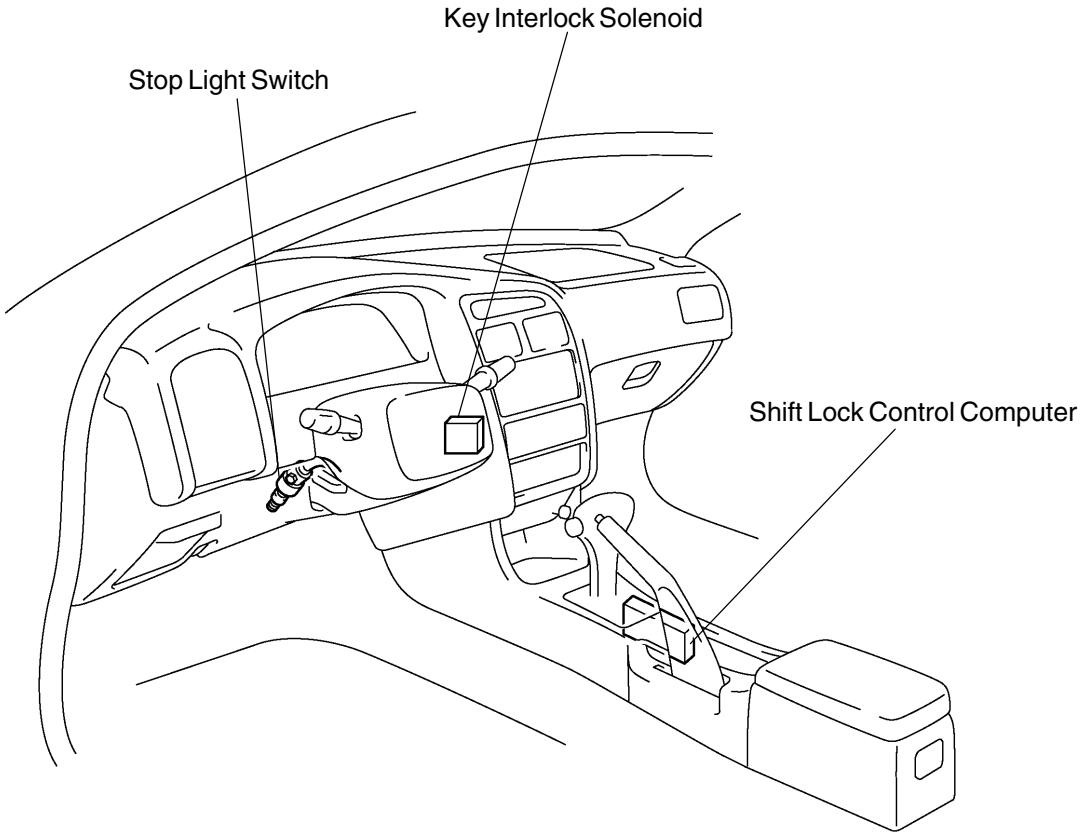
(b) Coat the lip of the oil seal with MP grease.

7. **INSTALL LH AND RH DRIVE SHAFTS (See page SA–12)**
8. **FILL AND CHECK FLUID LEVEL (See page DI–3)**
9. **INSTALL LH AND RH ENGINE UNDER COVERS**

SHIFT LOCK SYSTEM

AX10R–01

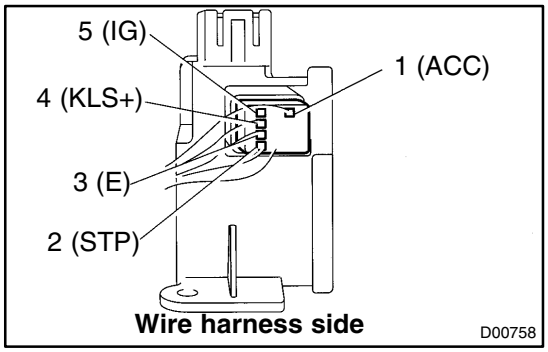
LOCATION



Y

D10026

AX10S–01



INSPECTION

1. LHD:

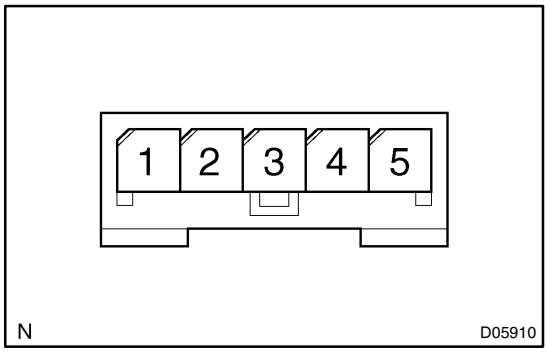
INSPECT SHIFT LOCK CONTROL COMPUTER

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift lock control computer connector.

Terminal	Measuring Condition	Voltage (V)
1 – 3 (ACC – E)	Ignition switch ACC	10 – 14
5 – 3 (IG – E)	Ignition switch ON	10 – 14
2 – 3 (STP – E)	Depressing brake pedal	10 – 14
4 – 3 (KLS^+ – E)	(1) Ignition switch ACC and P range (2) Ignition switch ACC and except P range (3) Ignition switch ACC and except P range (After approx. 1 second)	0 7.5 – 11 6 – 9.5



2. RHD:

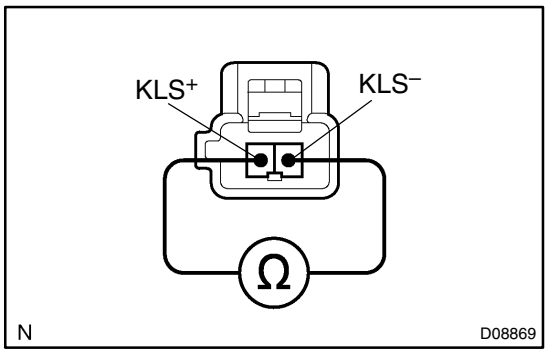
INSPECT SHIFT LOCK CONTROL COMPUTER

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift control computer connector.

Terminal	Measuring Condition	Voltage (V)
2 – 3 (ACC – E)	Ignition switch ACC	10 – 14
4 – 3 (IG – E)	Ignition switch ON	10 – 14
5 – 3 (STP – E)	Depressing brake pedal	10 – 14
1 – 3 (KLS^+ – E)	(1) Ignition switch ACC and P range (2) Ignition switch ACC and except P range (3) Ignition switch ACC and except P range (After approx. 1 second)	0 7.5 – 11 6 – 9.5



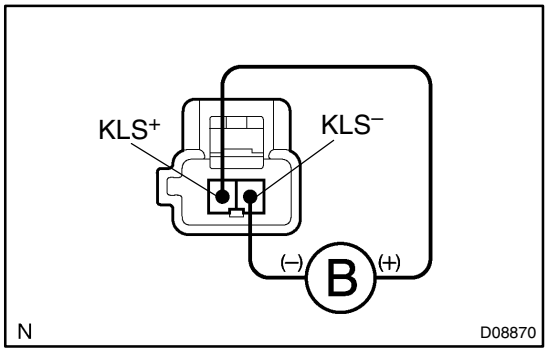
3. INSPECT KEY INTERLOCK SOLENOID

(a) Disconnect the solenoid connector.

(b) Using an ohmmeter, measure the resistance between the terminals.

Standard resistance: 12.5 – 16.5 Ω

If the resistance value is not as specified, replace the solenoid.



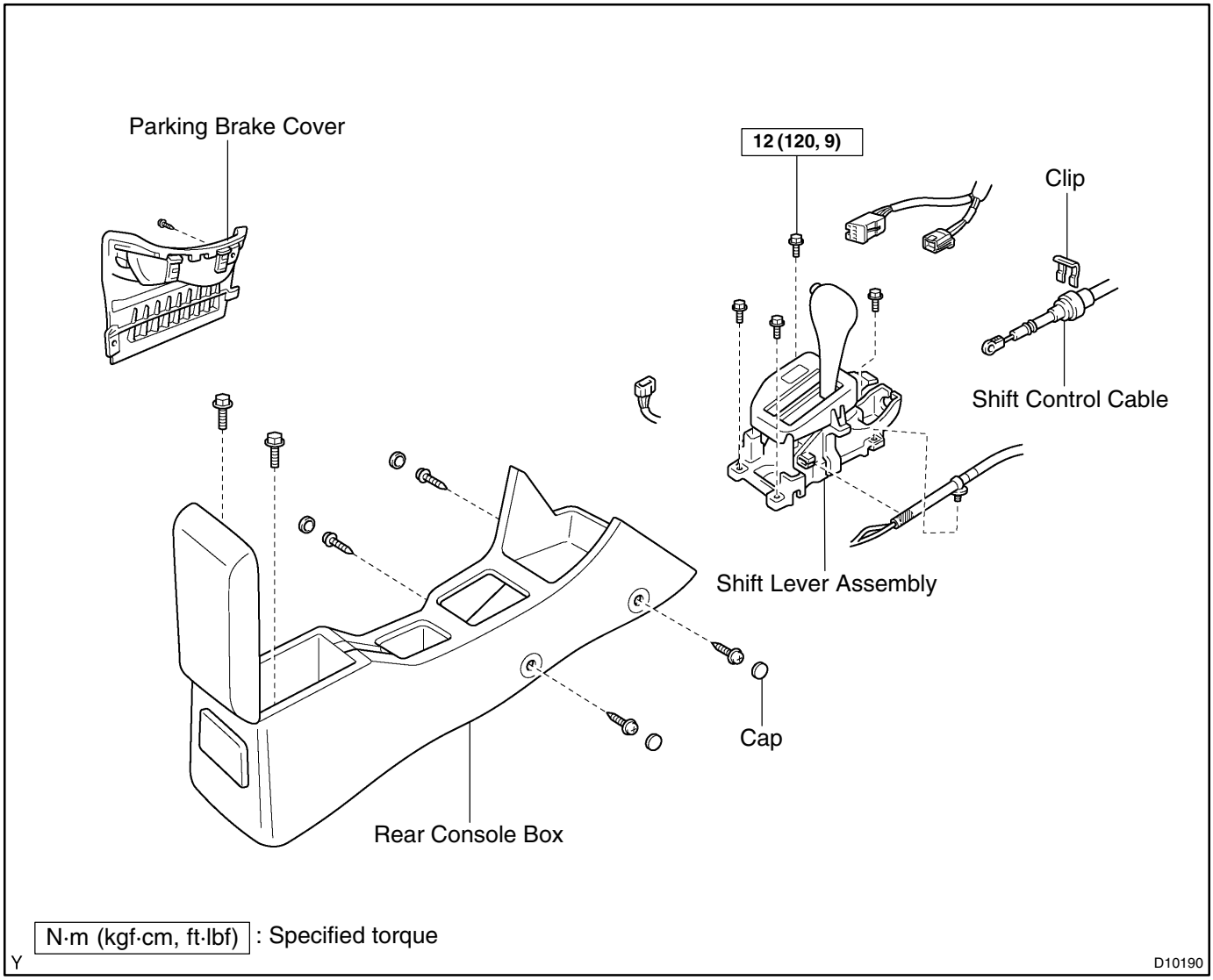
(c) Provide the battery voltage between the terminals. Check that the solenoid can be heard its operating.

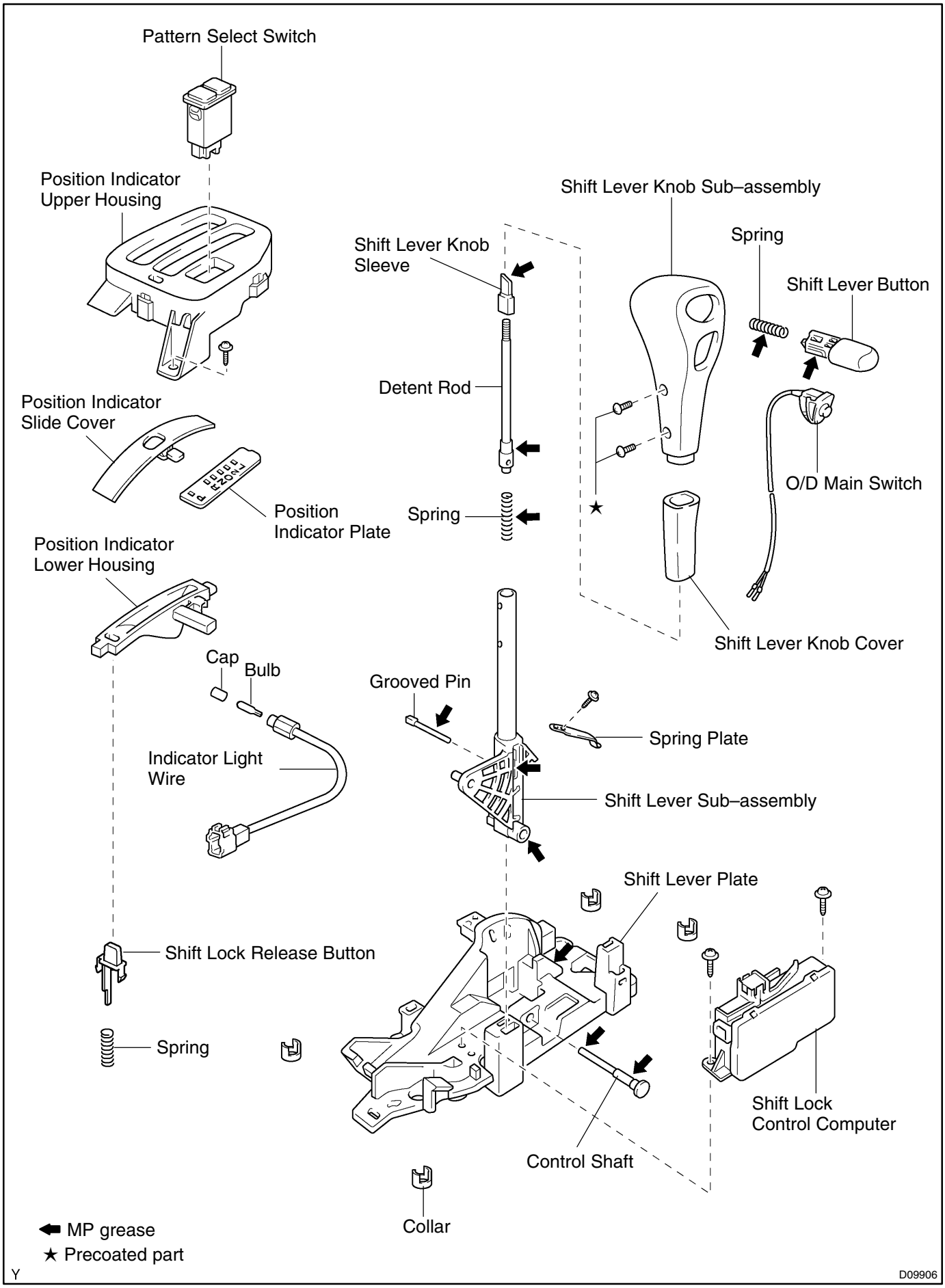
If the operation is not as specified, replace the solenoid.

FLOOR SHIFT ASSEMBLY (LHD)

COMPONENTS

AX02U–07




Pattern Select Switch
Position Indicator Upper Housing
Position Indicator Slide Cover
Position Indicator Plate
Position Indicator Lower Housing
Cap
Bulb
Indicator Light Wire
Shift Lever Knob Sub–assembly
Shift Lever Knob Sleeve
Spring
Shift Lever Button
Detent Rod
O/D Main Switch
Spring
Shift Lever Knob Cover
Grooved Pin
Spring Plate
Shift Lever Sub–assembly
Shift Lever Plate
Shift Lock Release Button
Spring
Shift Lock Control Computer
Control Shaft
Collar
MP grease
★ Precoated part
Y
D09906

AX10T–01

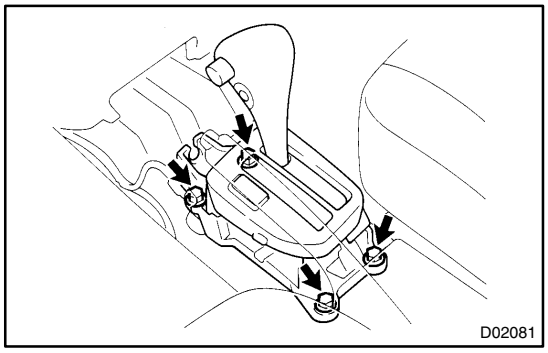
REMOVAL

1. REMOVE REAR CONSOLE (See page BO–8)

2. REMOVE SHIFT LEVER ASSEMBLY

(a) Disconnect the 3 connectors and wire harness.

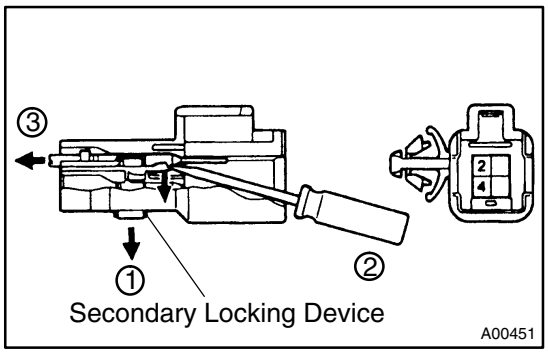
(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and floor shift assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX0C5–03

DISASSEMBLY



1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove the O/D main switch connector from the shift lever plate.
(b) Disengage the secondary locking device.
(c) Release the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to put unnatural load onto O/D main switch wire harness.

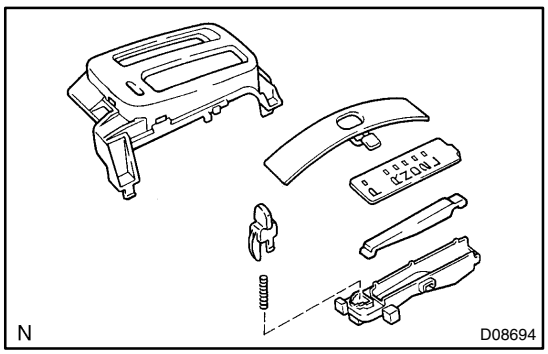
(b) Remove the shift lever knob cover.
(c) Remove the shift lever button and spring.
(d) Remove the O/D main switch.

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE CAP AND BULB FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING

Remove the screws and an indicator housing.



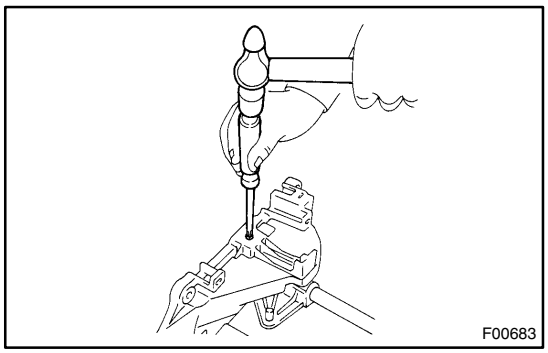
6. DISASSEMBLE INDICATOR HOUSING

(a) Remove the pattern select switch.
(b) Remove the position indicator lower housing.
(c) Remove the shift lock release button and spring.
(d) Remove the position indicator slide cover.
(e) Remove the position indicator plate.

7. REMOVE SHIFT LOCK CONTROL COMPUTER

Remove the 2 screws and shift lock control computer.

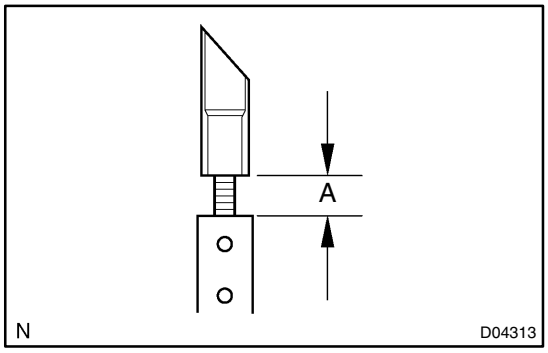
8. REMOVE SPRING PLATE



9. REMOVE SHIFT LEVER SUB–ASSEMBLY

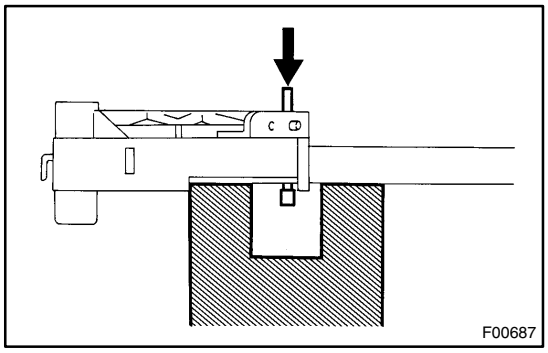
(a) Using a screwdriver and a hammer, remove the control shaft.

(b) Remove the shift lever sub–assembly.



10. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Measure the distance ”A” between the lower edge of the shift lever knob sleeve and the upper edge of the shift lever sub–assembly.



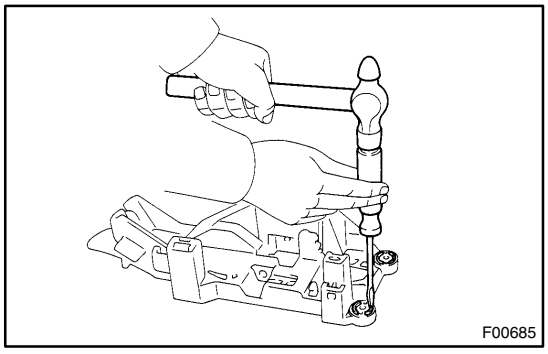
(b) Using a hammer, remove the grooved pin.

NOTICE:

When pressing down the grooved pin, if doing it at the place other than the notch, there may be fear of damaging the shift lever sub–assembly.

(c) Remove the detent rod and spring.

(d) Remove the shift lever knob sleeve from the detent rod.



11. REMOVE COLLARS

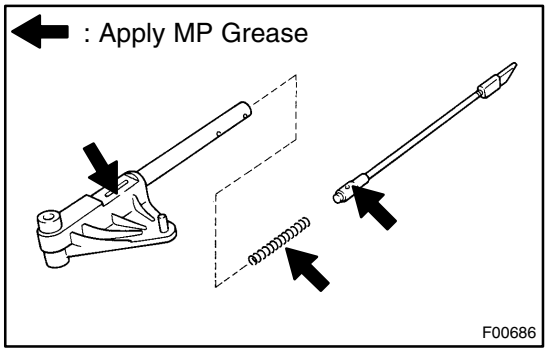
Using a screwdriver and a hammer, remove the 4 collars.

AX0C6–03

REASSEMBLY

1. INSTALL COLLARS

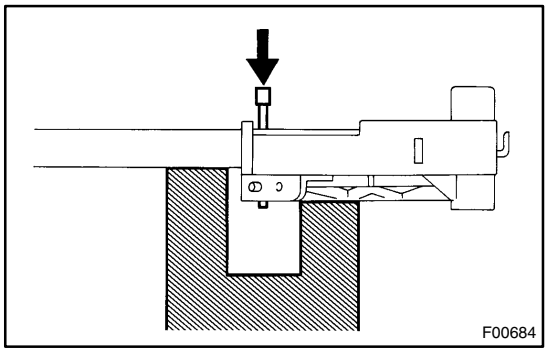
2. INSTALL SHIFT LEVER KNOB SLEEVE TO DETENT ROD



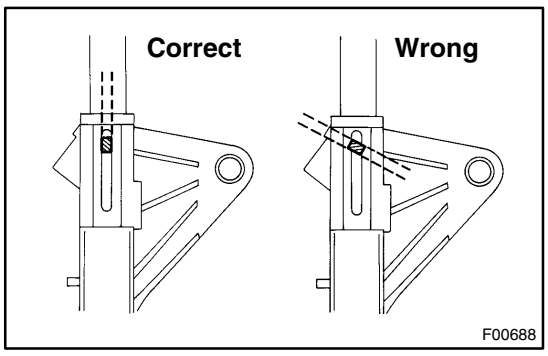
3. ASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Apply MP grease on the compression spring, the detent rod and the shift lever sub–assembly.

(b) Install the spring and the detent rod to shift lever sub–assembly.



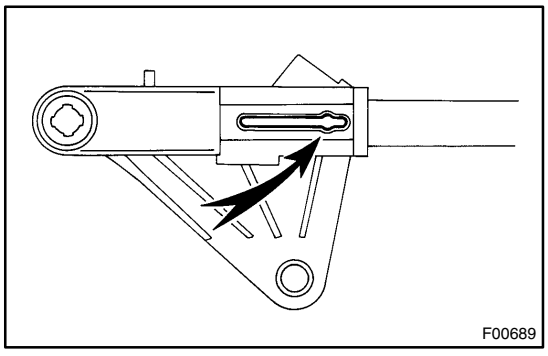
(c) Place the shift lever sub–assembly as shown in the illustration.



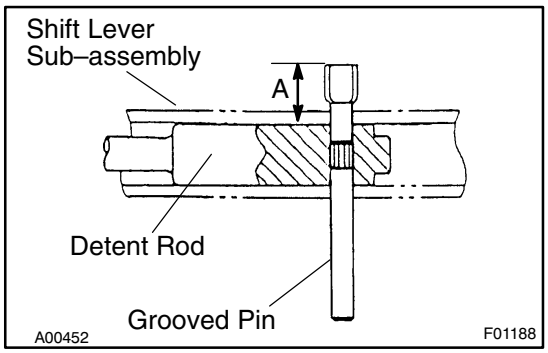
(d) Insert the grooved pin in the detent rod pin hole.

NOTICE:

- **Assemble the grooved pin to ensure that it fits into the guide hole of the shift lever sub–assembly in parallel.**
- **Take care not to insert the pin in the wrong direction of the detent rod.**



(e) Meet the grooved pin with the notch of the guide hole.



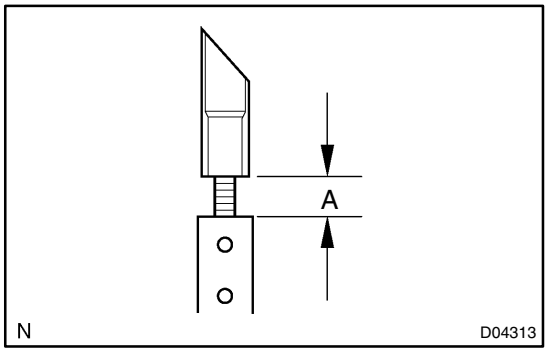
(f) Press the pin with a hammer.

A: 10.0 – 10.4 mm (0.39 – 0.41 in.)

NOTICE:

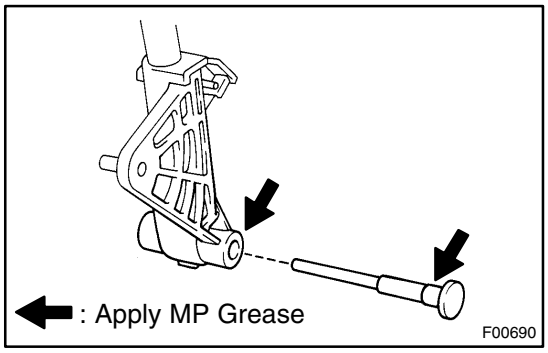
When pressing in the grooved pin, if doing it at the place other than the notch, the shift lever sub–assembly might be damaged.

4. CHECK DETENT ROD OPERATION



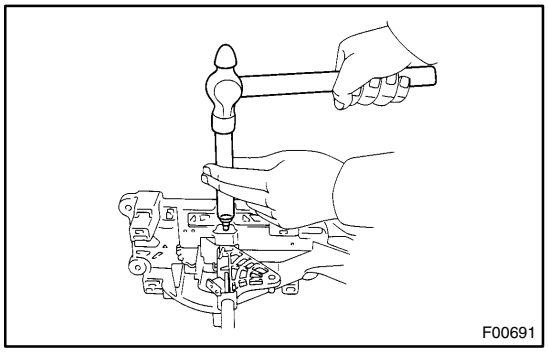
5. INSTALL SHIFT LEVER KNOB SLEEVE DETENT ROD

Drive the shift lever knob sleeve to the distance A measured before removal.



6. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply MP grease.

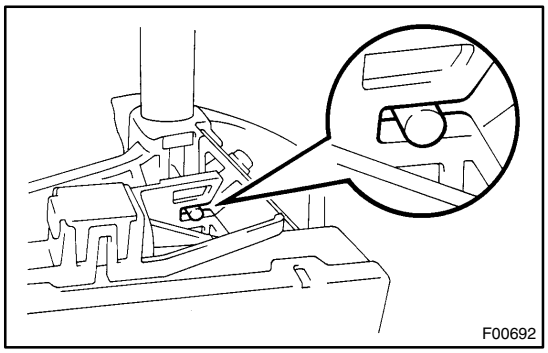


(b) Using a brass bar and a hammer, install the control shaft and the shift lever sub–assembly to the shift lever plate.

NOTICE:

Take care not to install them in the wrong direction of the shift lever sub–assembly.

7. INSTALL SPRING PLATE



8. INSTALL SHIFT LOCK CONTROL COMPUTER

Install the shift control control computer and 2 screws.

NOTICE:

Install the grooved pin into the groove of the shift lock unit as shown in the illustration.

9. ASSEMBLE INDICATOR HOUSING

(a) Install the position indicator plate.
(b) Install the position indicator slide cover.
(c) Install the spring and shift lock release button.
(d) Install the position indicator lower housing.
(e) Install the pattern select switch.

NOTICE:

Do not make indicator housing dirty with MP grease.

10. INSTALL INDICATOR HOUSING

Install the screws and an indicator housing.

11. INSTALL CAP AND BULB TO INDICATOR LIGHT WIRE

12. INSTALL INDICATOR LIGHT WIRE

13. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Install the O/D main switch.
(b) Install the spring and shift lever button.
(c) Install the shift lever knob cover.

HINT:

Apply MP grease to shift lever knob button.

(d) Install the shift lever sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

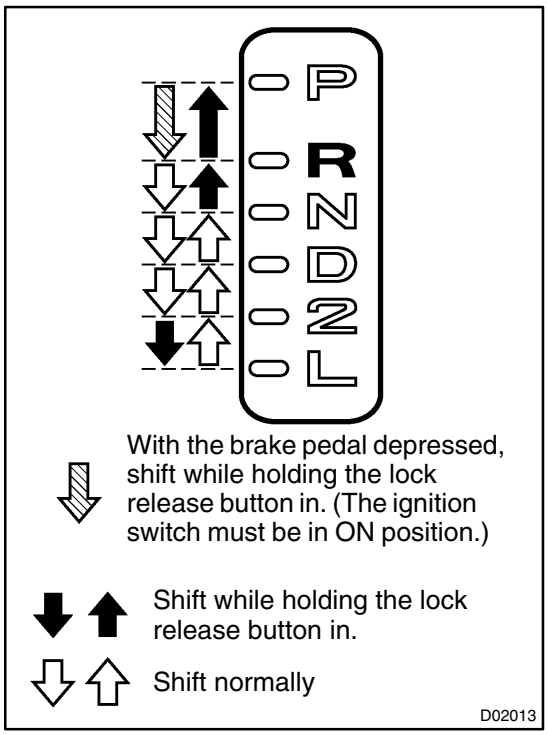
NOTICE:

Make sure not to catch O/D main switch wire harness.

(e) Install the O/D main switch wire harness securely to hung on the hook of the shift lever sub–assembly.

14. INSTALL O/D MAIN SWITCH TERMINAL

AX02Y–07



INSTALLATION

INSTALL FLOOR SHIFT ASSEMBLY

Installation is in the reverse order of removal (See page AX–13).

HINT:

After installation, adjust shift lever ranges (See page DI–3) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

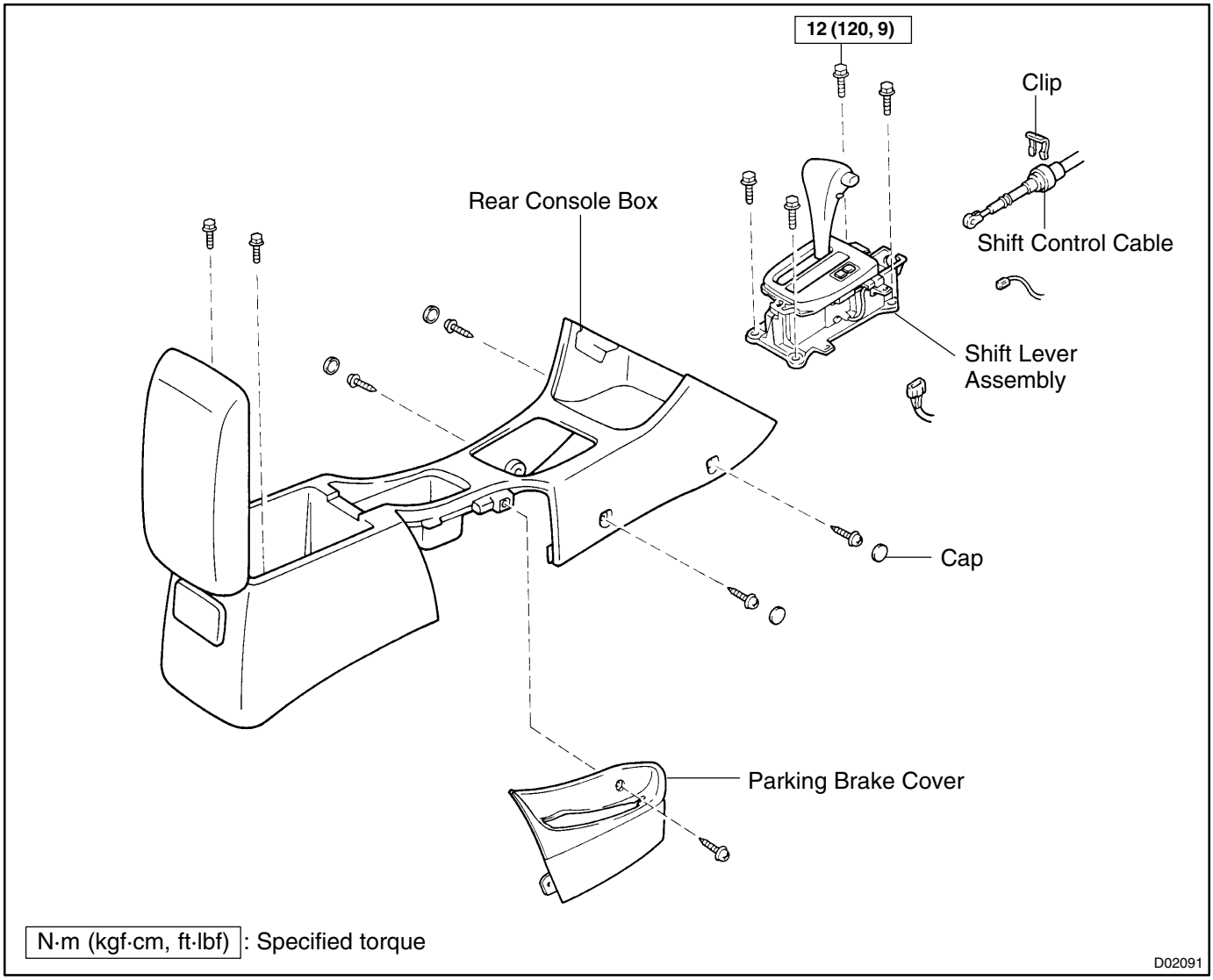
  Ranges which can be operated only with pressing the shift lever nob button

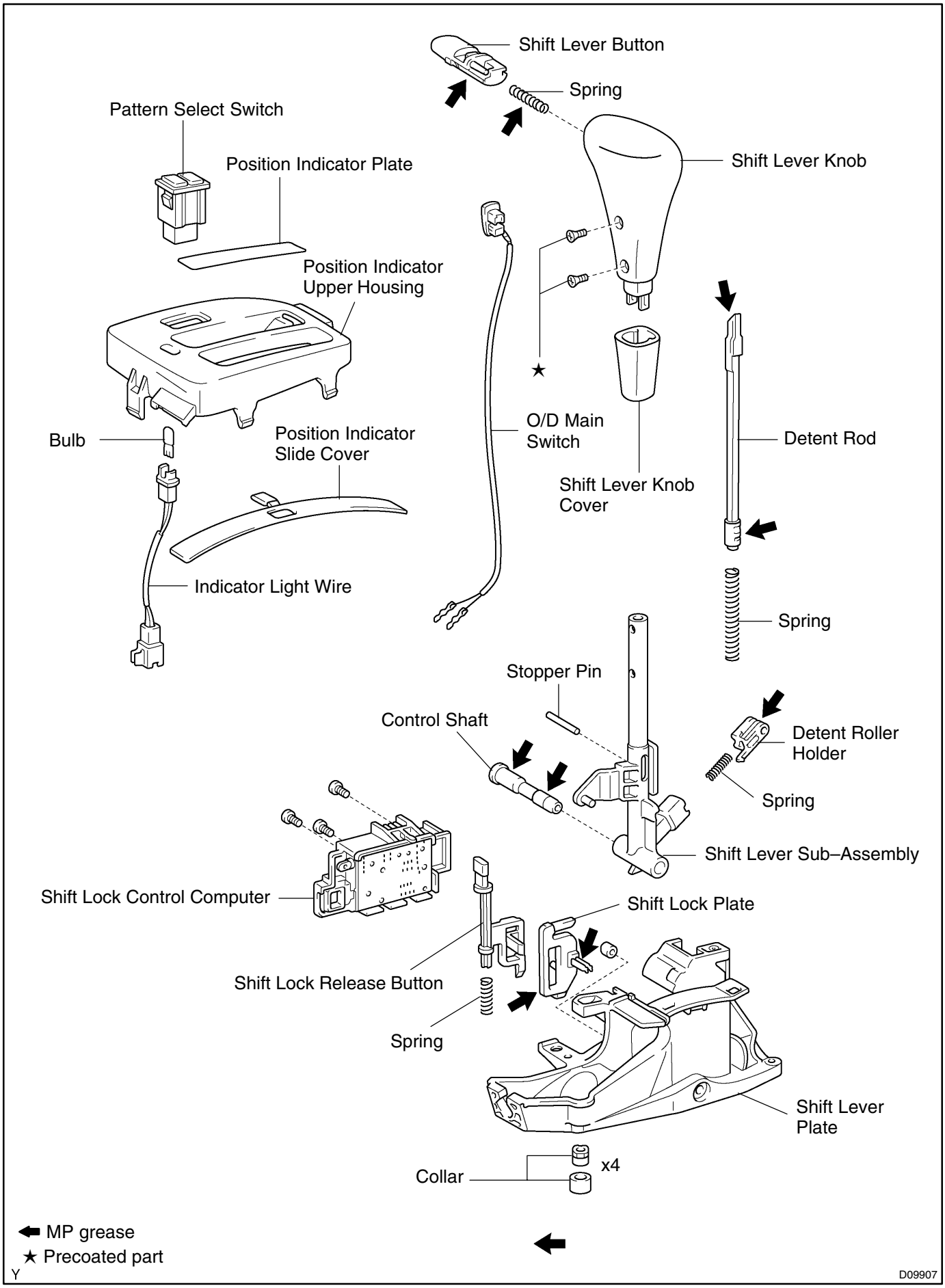
  P → R, 2 → L, N → R → P
- When starting the engine, make sure that the vehicle moves forward when shifting from N to D range, and moves rearward when shifting to R range.

FLOOR SHIFT ASSEMBLY (RHD)

COMPONENTS

AX01B–03




Shift Lever Button
Spring
Pattern Select Switch
Position Indicator Plate
Shift Lever Knob
Position Indicator Upper Housing
★
O/D Main Switch
Detent Rod
Bulb
Position Indicator Slide Cover
Shift Lever Knob Cover
Indicator Light Wire
Spring
Stopper Pin
Control Shaft
Detent Roller Holder
Spring
Shift Lever Sub–Assembly
Shift Lock Control Computer
Shift Lock Plate
Shift Lock Release Button
Spring
Shift Lever Plate
Collar
x4
MP grease
★ Precoated part
Y
D09907

AX10U–01

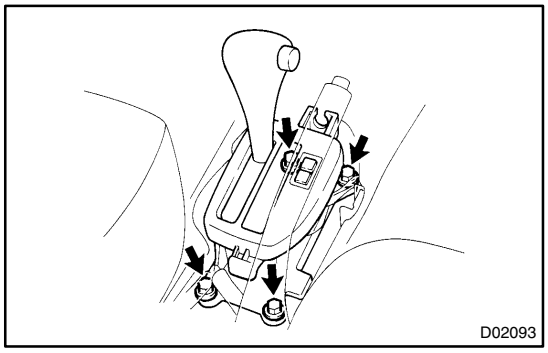
REMOVAL

1. REMOVE REAR CONSOLE (See page BO–8)

2. REMOVE FLOOR SHIFT ASSEMBLY

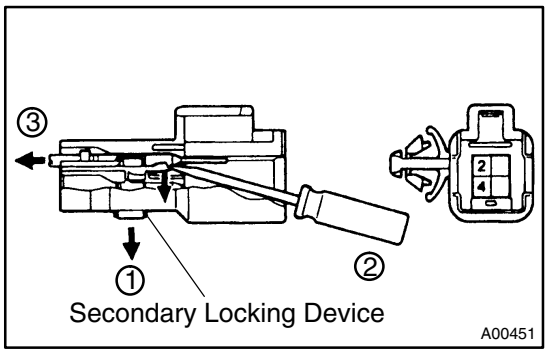
(a) Disconnect the connectors.

(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and shift lever assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX10V–01



DISASSEMBLY

1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove O/D main switch connector from the shift lever plate.

(b) Disengage the secondary locking device.

(c) Disengage the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to apply unnatural load onto O/D main switch wire harness.

(b) Remove the Shift lever knob cover.

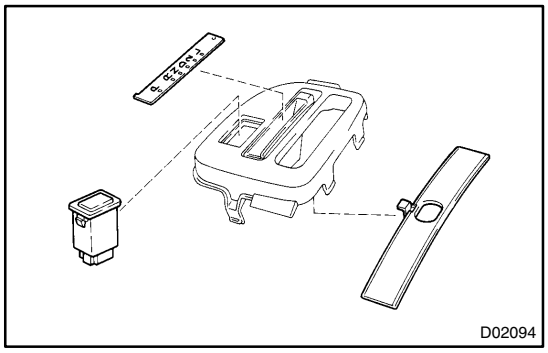
(c) Remove the Shift lever button and spring.

(d) Remove the O/D main switch.

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE BULB FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING SUB–ASSEMBLY

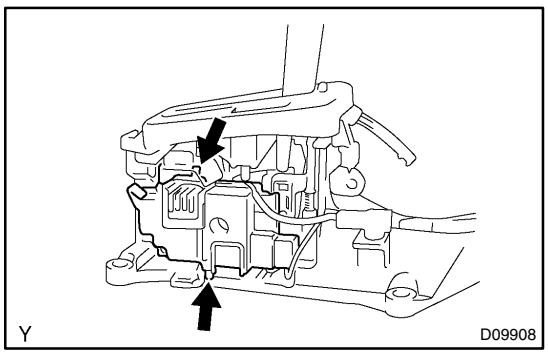


6. DISASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

(a) Remove the position indicator side cover.

(b) Remove the position indicator plate.

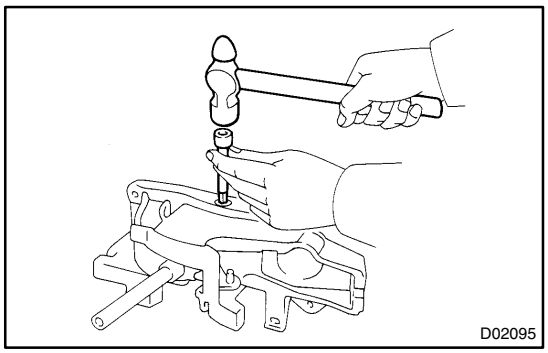
(c) Remove the pattern select switch.



7. REMOVE SHIFT LOCK CONTROL COMPUTER

Remove the 3 screws and shift lock control computer.

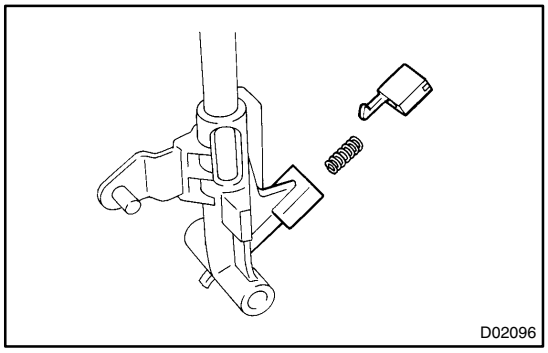
8. REMOVE STOPPER PIN, DETENT ROD AND SPRING



9. REMOVE SHIFT LEVER SUB–ASSEMBLY

(a) Using an extension bar and hammer, remove the control shaft.

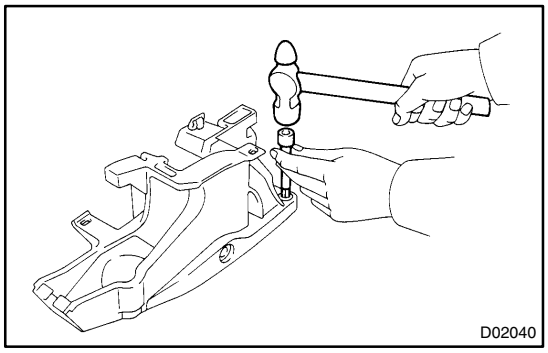
(b) Remove the shift lever sub–assembly.



10. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Remove the Detent roller holder.

(b) Remove the Compression spring.



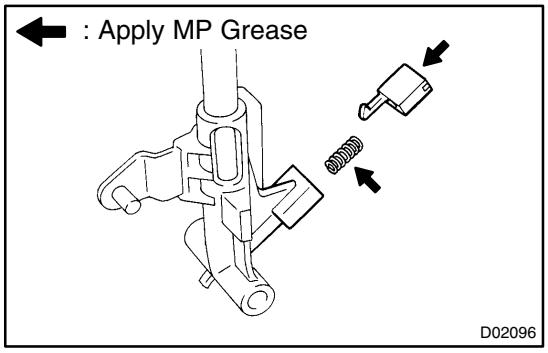
11. REMOVE COLLARS

Using an extension bar and hammer, remove the 4 collars.

AX10W–01

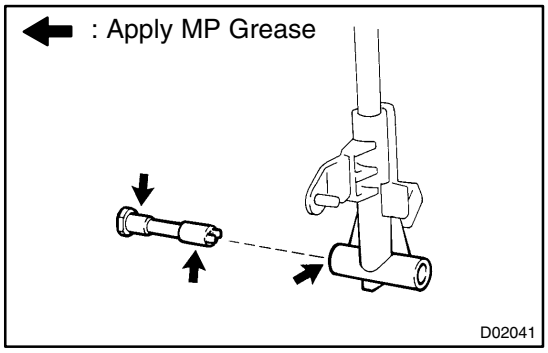
REASSEMBLY

1. INSTALL COLLARS



2. ASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the detent roller holder, compression spring and shift lever sub–assembly.
(b) Install the compression spring to the detent roller holder.
(c) Install the detent roller holder with the compression spring to the shift lever sub–assembly.



3. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the control shaft and shift lever sub–assembly.
(b) Using an extension bar and hammer, install the control shaft and shift lever sub–assembly to the shift lever plate.

4. INSTALL SPRING, DETENT ROD AND STOPPER PIN

(a) Apply the MP grease to the detent rod and stopper pin.
(b) Install the compression spring and detent rod to the shift lever sub–assembly.
(c) Insert the stopper pin in the stopper pin hole.

NOTICE:

Take care not to insert the pin in the wrong direction against the detent rod.

5. INSTALL SHIFT LOCK CONTROL COMPUTER

Install the shift lock control computer with 3 screws.

6. CHECK SHIFT LEVER OPERATION

7. ASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

(a) Install the pattern select switch.
(b) Install the position indicator plate.
(c) Install the position indicator slide plate.

8. INSTALL INDICATOR HOUSING SUB–ASSEMBLY

9. INSTALL BULB TO INDICATOR LIGHT WIRE

10. INSTALL INDICATOR LIGHT WIRE

11. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

HINT:

Apply MP grease to the shift lever knob button.

(a) Install the O/D main switch.

(b) Install the shift lever button and spring.

(c) Install the shift lever knob cover.

(d) Install the shift lever knob sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

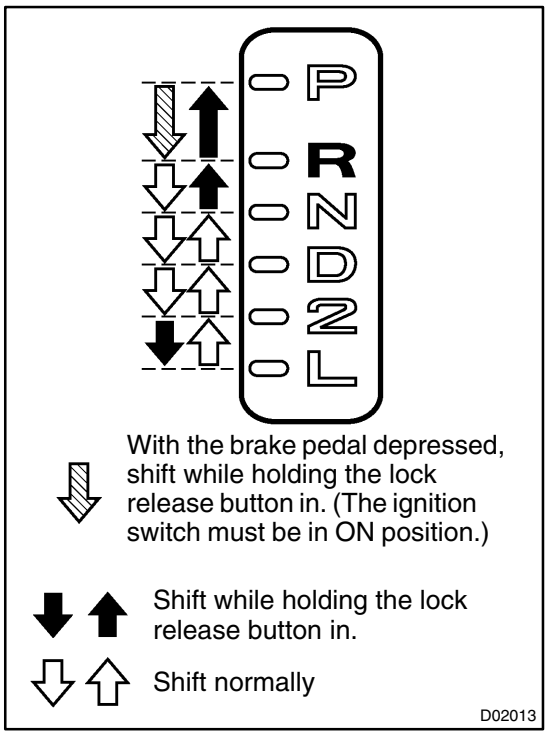
NOTICE:

Make sure not to catch O/D main switch wire harness.

(e) Install the O/D main switch wire harness securely and hang it on the hook of the shift lever sub–assembly.

12. INSTALL O/D MAIN SWITCH TERMINAL

AX01F–03



INSTALLATION

INSTALL FLOOR SHIFT ASSEMBLY

Installation is in the reverse order of removal (See page AX–22).

HINT:

After installation, adjust shift lever ranges (See page DI–3) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

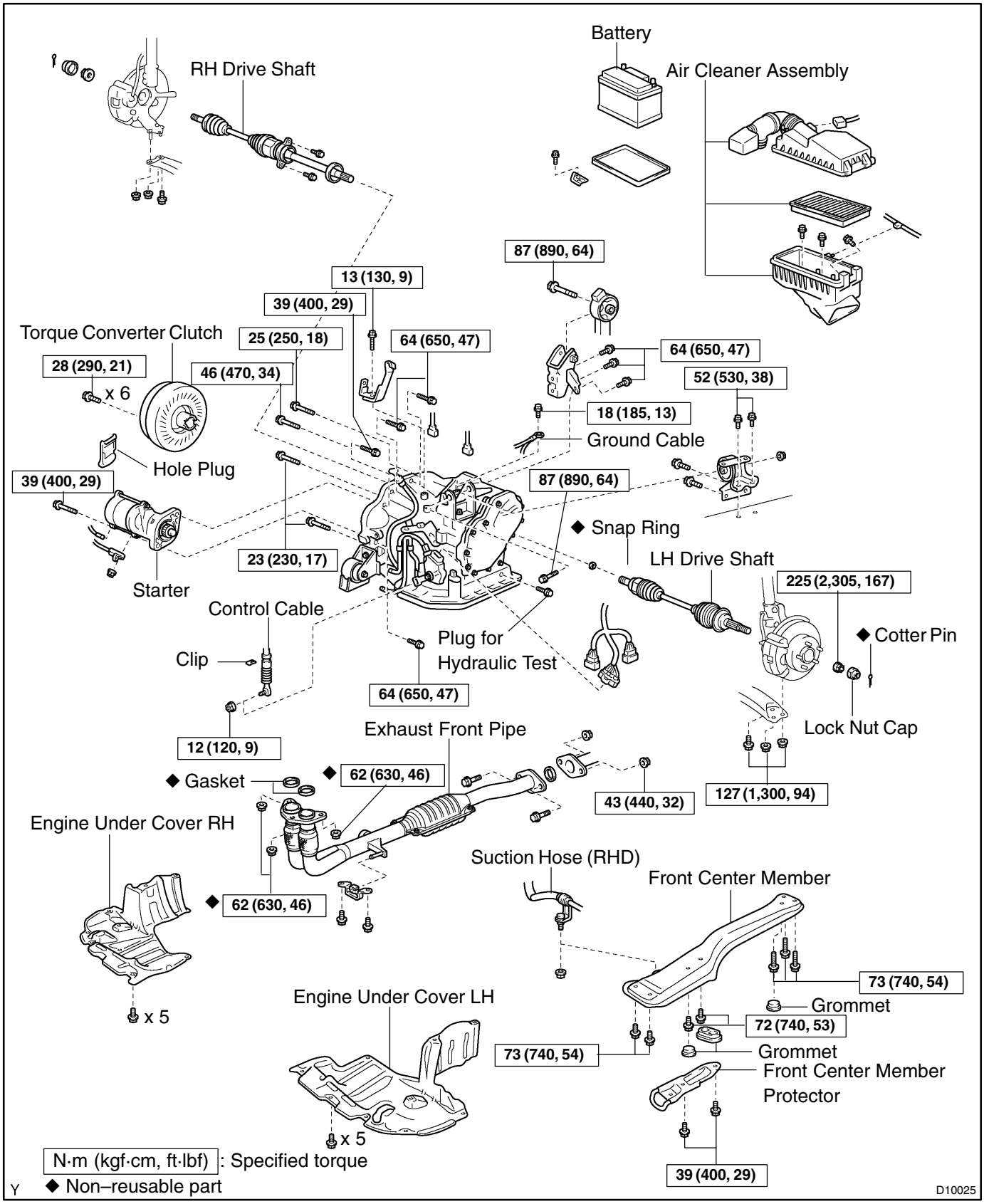
  Ranges which can be operated only with pressing the shift lever nob button

  P → R, 2 → L, N → R → P
- 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.

AUTOMATIC TRANSAXLE UNIT

AX02Z–04

COMPONENTS



AX10X–01

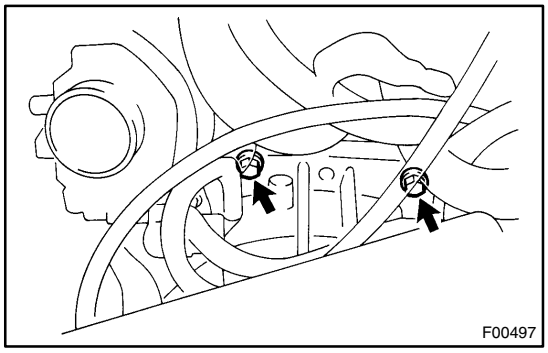
REMOVAL

1. REMOVE BATTERY

2. REMOVE AIR CLEANER

3. REMOVE GROUND CABLE

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



4. REMOVE 2 UPPER SIDE TRANSAXLE MOUNTING BOLTS FROM TRANSAXLE SIDE

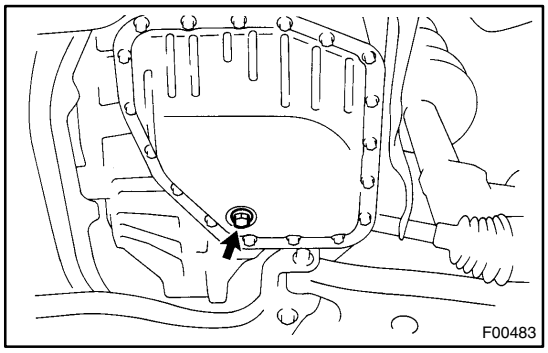
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

5. REMOVE UPPER SIDE STARTER MOUNTING BOLT

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

6. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR

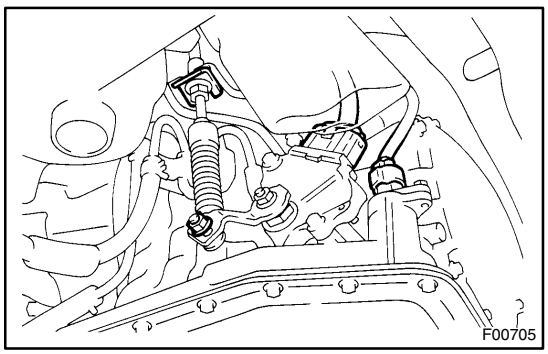
7. REMOVE LH AND RH ENGINE UNDER COVERS



8. REMOVE DRAIN PLUG AND DRAIN ATF

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

9. REMOVE LH AND RH DRIVE SHAFTS (See page SA–3)



10. DISCONNECT SOLENOID CONNECTOR AND NEUTRAL START SWITCH CONNECTOR

(a) Disconnect the solenoid connector and the neutral start switch connector.

(b) Remove the wire harness clamps.

11. REMOVE SHIFT CONTROL CABLE

(a) Remove the nut from the control shift lever.

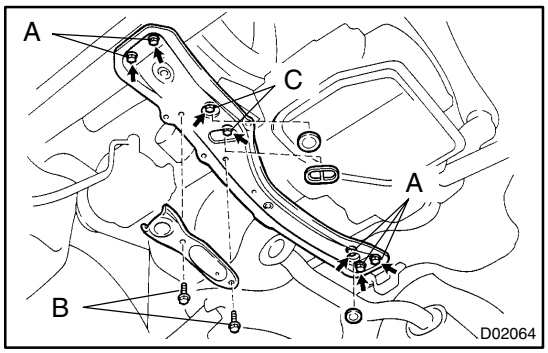
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

(b) Remove the clip and disconnect the control cable.

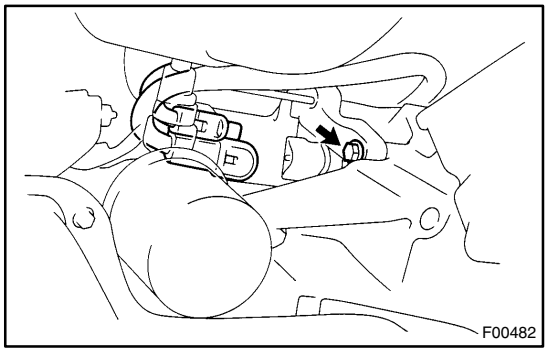
12. REMOVE FRONT CENTER MEMBER

(a) RHD:

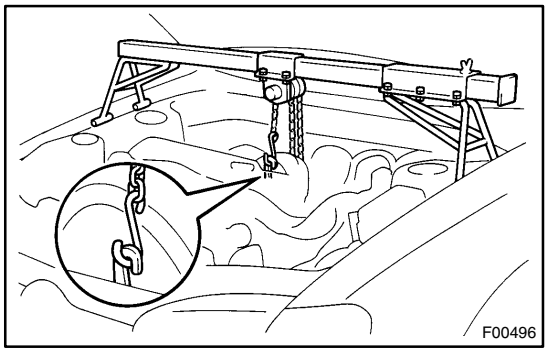
Remove the nut and disconnect the suction hose from the front center member.



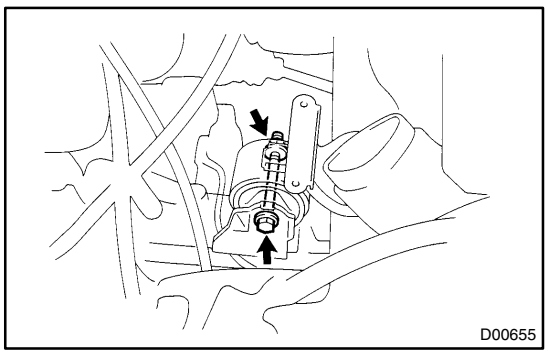
(b) Remove the 9 bolts, 3 grommets, front center member protector and front center member.
Torque:
A: 73 N·m (740 kgf·cm, 54 ft·lbf)
B: 39 N·m (400 kgf·cm, 29 ft·lbf)
C: 72 N·m (740 kgf·cm, 53 ft·lbf)



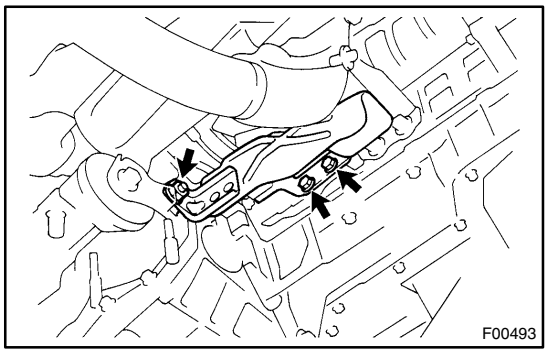
13. REMOVE STARTER
(a) Remove the nut and cable, and disconnect the connector.
(b) Remove the bolt and the starter.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



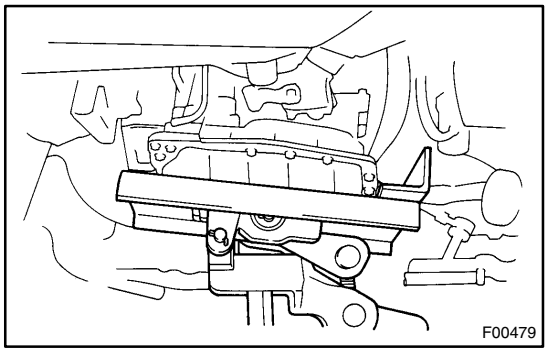
14. INSTALL ENGINE SUPPORT FIXTURE



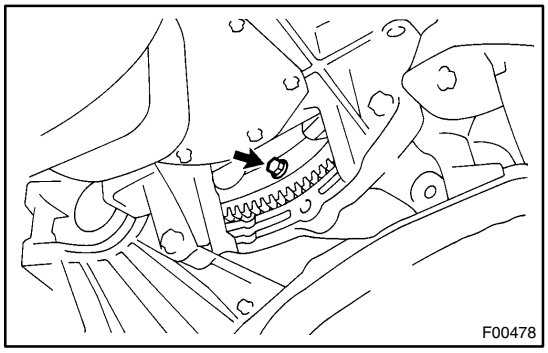
15. REMOVE UPPER SIDE ENGINE LEFT MOUNTING BOLT
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)
16. REMOVE OIL COOLER HOSE
Loosen the 2 clips and disconnect the 2 oil cooler hoses.



17. REMOVE HEAT INSULATOR
Remove the 2 bolts and a nut.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)



18. JACK UP TRANSAXLE

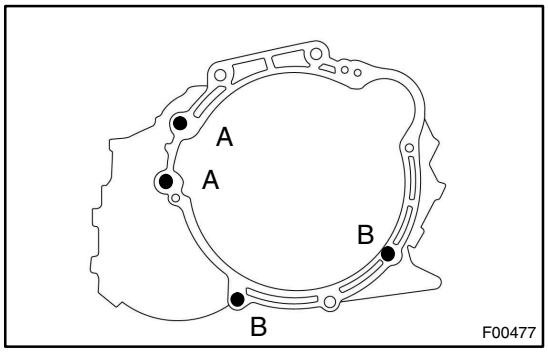


19. REMOVE TRANSAXLE

(a) Remove the hole plug.

(b) Turn the crankshaft to gain access and remove the 6 bolts holding the crankshaft pulley set bolt with a wrench.
Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)

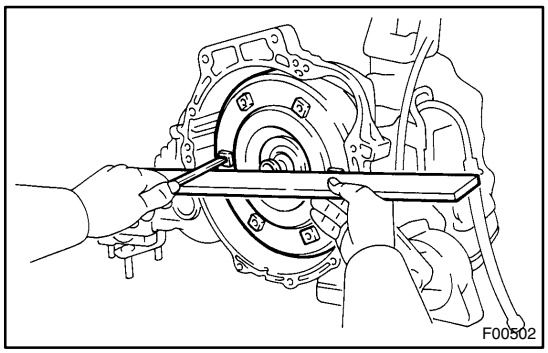
HINT:
At the time of installation, please refer to the following item.
First install green colored bolt and then 5 other bolts.



(c) Remove the 4 bolts.
Torque:
Bolt A: 46 N·m (470 kgf·cm, 34 ft·lbf)
Bolt B: 23 N·m (230 kgf·cm, 17 ft·lbf)

(d) Lower the engine to move it to the left side and remove the transaxle from the engine.

AX031–05



INSTALLATION

1. CHECK TORQUE CONVERTER INSTALLATION

Using calipers and a straight edge, measure the distance between the installed surface and the front surface of the transaxle housing.

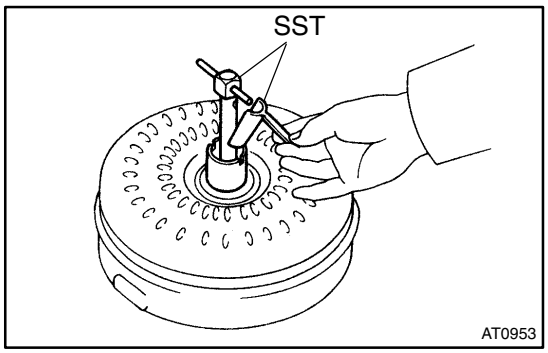
Correct distance: More than 15.5 mm (0.610 in.)

2. TRANSAXLE INSTALLATION

Installation is in the reverse order of removal (See page AX–29).

HINT:

- After installation, adjust the shift control cable and neutral start switch (See page DI–3).
- Fill ATF and check fluid level (See page DI–3).
- Perform the test drive of the vehicle (See page DI–3).



TORQUE CONVERTER AND DRIVE PLATE

AX032–04

INSPECTION

1. INSPECT ONE–WAY CLUTCH

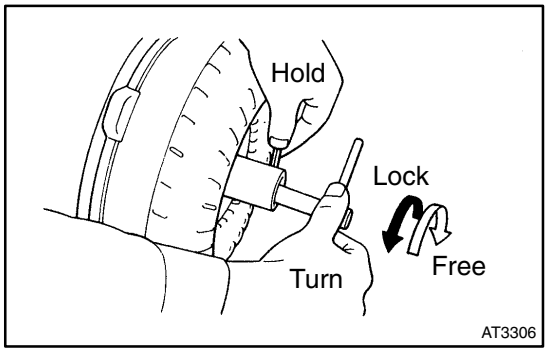
(a) Install SST into the inner race of the one–way clutch.
SST 09350–32014 (09351–32010)

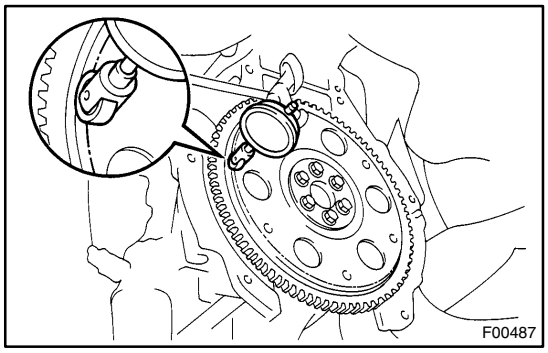
(b) Install SST so that it fits in the notch of the converter hub and outer race of the one–way clutch.
SST 09350–32014 (09351–32020)

(c) With the torque converter 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 converter and retest the one–way clutch.

Replace the converter if the one–way clutch still fails the test.





2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

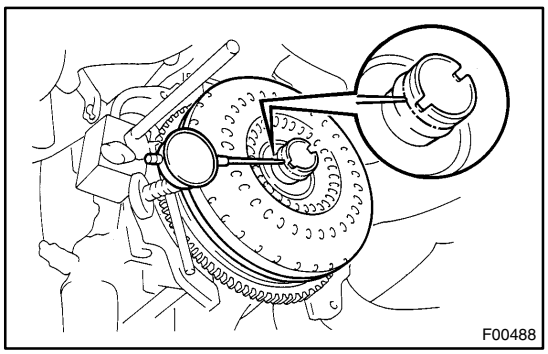
(a) Set up a dial indicator and measure the drive plate runout.

(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.

Torque: 64 N·m (650 kgf·cm 47 ft·lbf)



3. MEASURE TORQUE CONVERTER SLEEVE RUNOUT

Temporarily mount the torque converter to the drive plate. Set up a dial indicator and measure the torque converter sleeve runout.

Maximum runout: 0.30 mm (0.0118 in.)

If the runout is not within the specification, try to correct by reorienting the installation of the converter.

HINT:

Mark the position of the converter to ensure the correct installation.

AUTOMATIC TRANSAXLE (U240E)

AUTOMATIC TRANSAXLE SYSTEM AX–1
SPEED SENSOR AX–3
ATF TEMPERATURE SENSOR AX–4
NEUTRAL START SWITCH AX–6
VALVE BODY ASSEMBLY AX–8
DIFFERENTIAL OIL SEAL AX–12
SHIFT LOCK SYSTEM AX–13
FLOOR SHIFT ASSEMBLY (LHD) AX–16
FLOOR SHIFT ASSEMBLY (RHD) AX–25
AUTOMATIC TRANSAXLE UNIT AX–33
TORQUE CONVERTER AND
DRIVE PLATE AX–38

AUTOMATIC TRANSAXLE SYSTEM

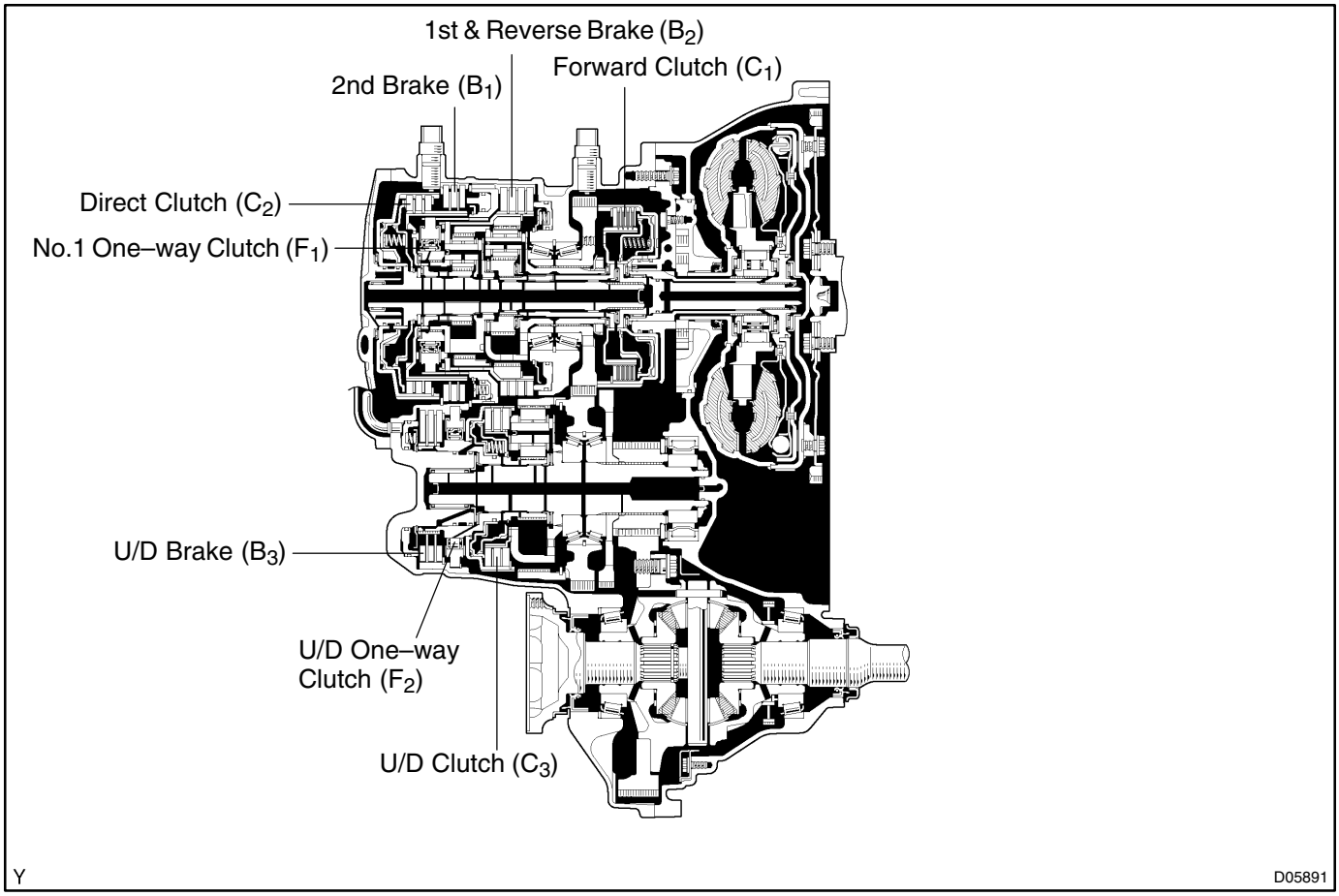
AX0LF–01

PRECAUTION

If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

AX0LG–03

OPERATION



○ ... Operating

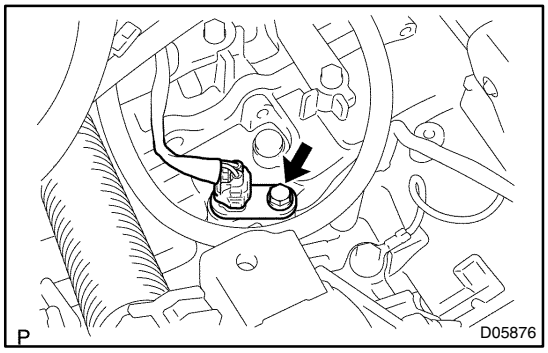
Shift lever range	Gear range	C_1	C_2	C_3	B_1	B_2	B_3	F_1	F_2
P	Parking						○		
R	Reverse		○			○	○		
N	Neutral						○		
D	1st	○					○	○	○
	2nd	○			○		○		○
	3rd	○	○				○		○
	O/D	○	○	○					
2	1st	○					○	○	○
	2nd	○			○		○		○
L	1st	○				○	○	○	○

SPEED SENSOR

AX0LI–03

ON–VEHICLE REPAIR

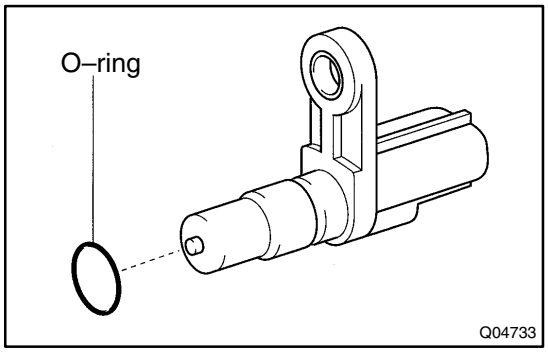
1. REMOVE AIR CLEANER ASSEMBLY



2. DISCONNECT COUNTER GEAR SPEED SENSOR CONNECTOR

3. REMOVE COUNTER GEAR SENSOR

(a) Remove the bolt and counter gear speed sensor.



(b) Remove the O–ring from the counter gear speed sensor.

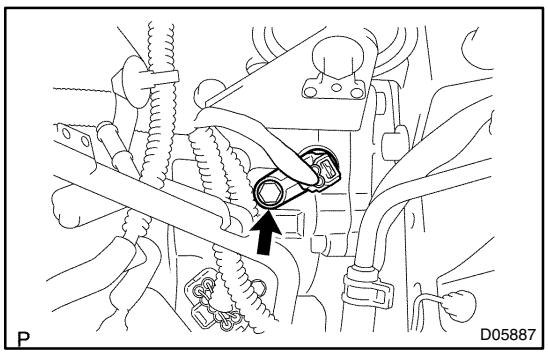
4. INSTALL COUNTER GEAR SPEED SENSOR

(a) Coat a new O–ring with ATF and install it to the counter gear speed sensor.

(b) Install the counter gear speed sensor with the bolt.

Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)

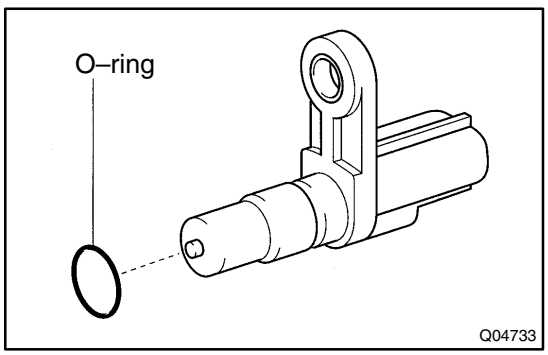
5. CONNECT COUNTER GEAR SPEED SENSOR CONNECTOR



6. DISCONNECT INPUT TURBINE SPEED SENSOR CONNECTOR

7. REMOVE INPUT TURBINE SPEED SPEED SENSOR

(a) Remove the bolt and input turbine speed sensor.



(b) Remove the O–ring from the input turbine speed sensor.

8. INSTALL INPUT TURBINE SPEED SENSOR

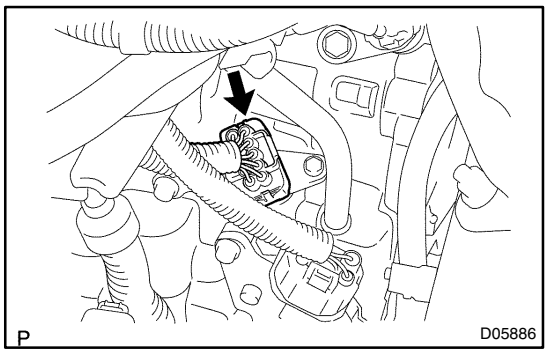
(a) Coat a new O–ring with ATF and install it to the input turbine speed sensor.

(b) Install the input turbine speed sensor with the bolt.

Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)

9. CONNECT INPUT TURBINE SPEED SENSOR CONNECTOR

10. INSTALL AIR CLEANER ASSEMBLY



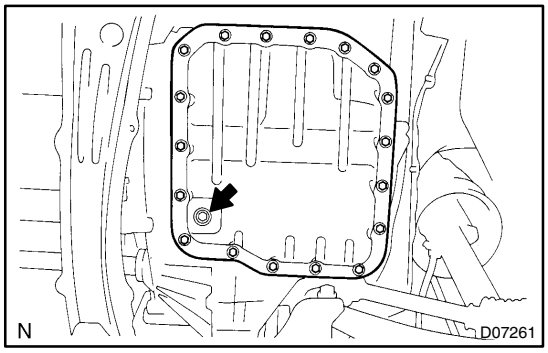
ATF TEMPERATURE SENSOR

AX0LJ–03

ON–VEHICLE REPAIR

1. DISCONNECT SOLENOID CONNECTOR

2. REMOVE LH ENGINE UNDER COVER



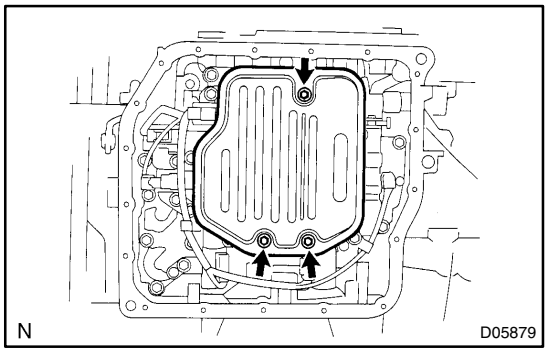
3. REMOVE DRAIN PLUG AND DRAIN ATF

4. REMOVE OIL PAN AND GASKET

NOTICE:

Some fluid will remain in the oil pan.

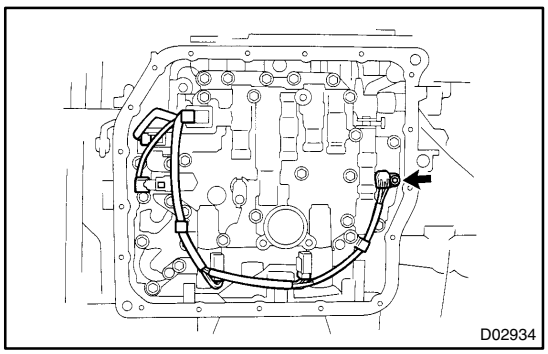
Remove the 18 bolts, and carefully remove the oil pan assembly. Discard the gasket.



5. REMOVE OIL STRAINER

(a) Remove the 3 bolts and oil strainer.

(b) Remove the O–ring.



6. DISCONNECT 5 SHIFT SOLENOID VALVE CONNECTORS

7. REMOVE ATF TEMPERATURE SENSOR

Remove the bolt and lock plate, and remove the ATF temperature sensor.

8. SEPARATE WIRE HARNESS FROM 2 CLAMPS

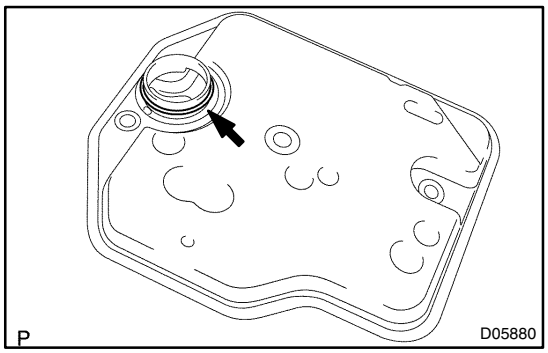
9. CLAMP WIRE HARNESS TO 2 CLAMPS

10. INSTALL ATF TEMPERATURE SENSOR

Install the ATF temperature sensor with the lock plate and bolt.

Torque: 6.6 N·m (67 kgf·cm, 58 in.·lbf)

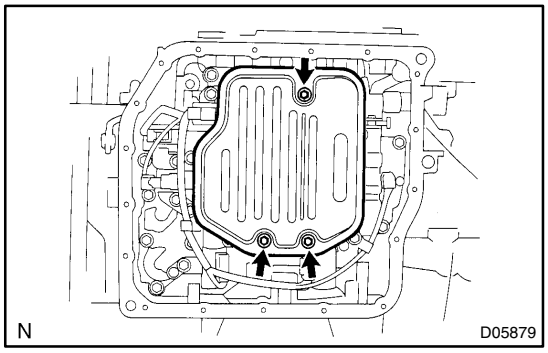
11. CONNECT 5 SHIFT SOLENOID VALVE CONNECTORS



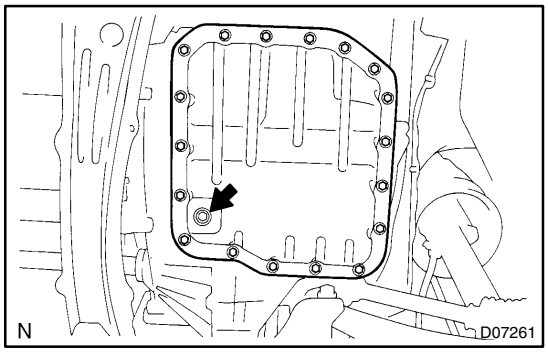
12. INSTALL OIL STRAINER

(a) Coat a new O–ring with ATF.

(b) Install the O–ring to the oil strainer.



(c) Install the oil strainer with the 3 bolts.
Torque: 10.8 N·m (110 kgf·cm, 8 ft·lbf)

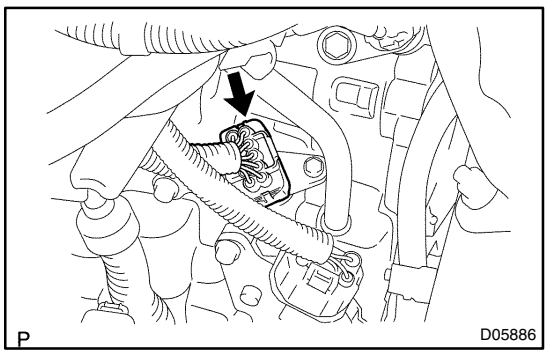


13. INSTALL OIL PAN

Install the oil pan and a new gasket with the 18 bolts.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

14. INSTALL DRAIN PLUG

Install a new gasket and drain plug.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



15. CONNECT SOLENOID CONNECTOR

16. FILL ATF AND CHECK ATF LEVEL (See page DI–62)

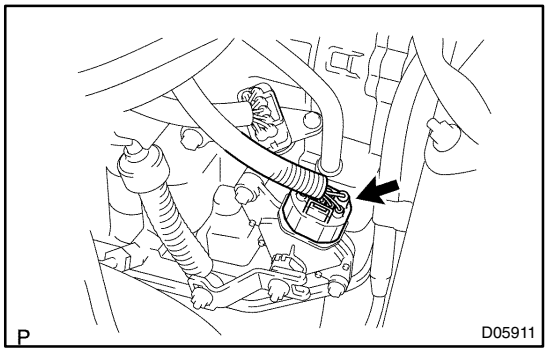
17. INSTALL LH ENGINE UNDER COVER

NEUTRAL START SWITCH

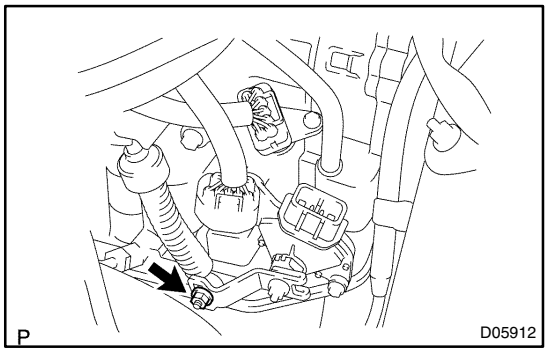
AX0LK–03

ON–VEHICLE REPAIR

1. REMOVE AIR CLEANER ASSEMBLY

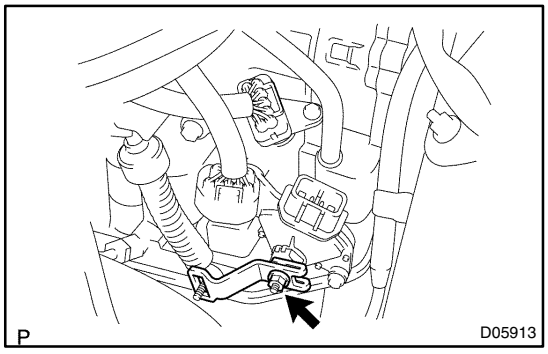


2. DISCONNECT NEUTRAL START SWITCH CONNECTOR

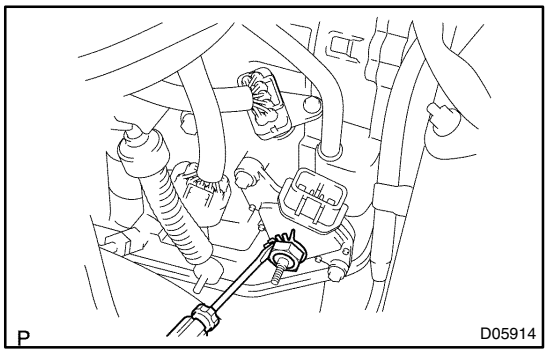


3. REMOVE NEUTRAL START SWITCH

(a) Remove the nut.

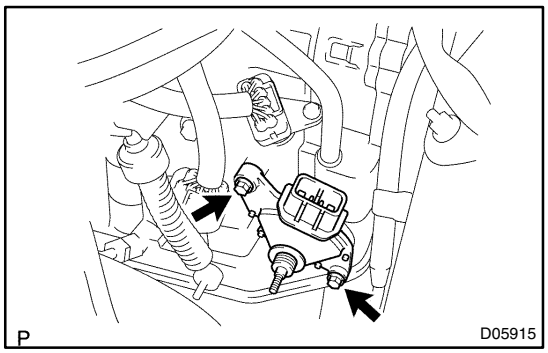


(b) Remove the nut, washer and control shift lever.



(c) Using a screwdriver, pry off the lock plate.

(d) Remove the nut and lock plate.



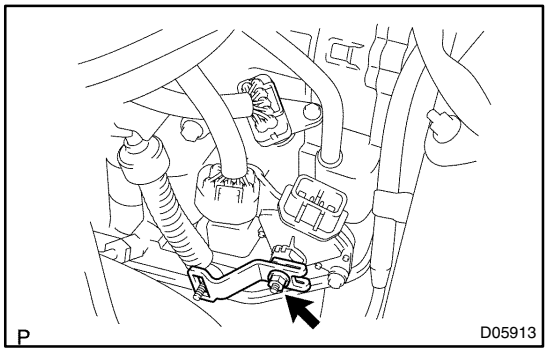
(e) Remove the 2 bolts and pull out the neutral start switch.

4. INSTALL AND ADJUST NEUTRAL START SWITCH

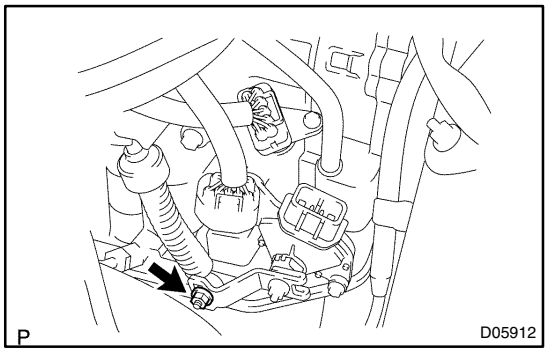
(a) Install the neutral start switch with the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Install a new lock plate and nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

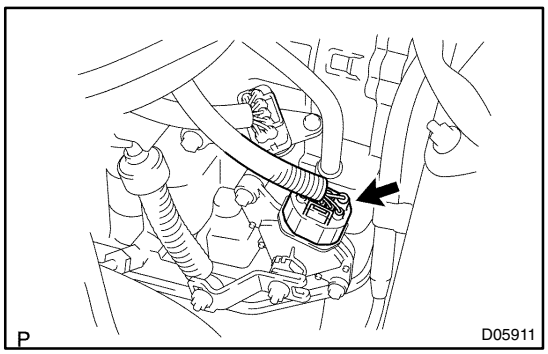
(c) Bend the claws on the lock plate to fix the nut.



(d) Install the control shift lever with the nut.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



(e) Connect the control cable to the control shaft.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



5. CONNECT NEUTRAL START SWITCH CONNECTOR

6. CHECK NEUTRAL START OPERATION

Check that the engine can be started with the shift lever only in the N or P range, but not in other position.

If the engine can not be stated not as started above, carry out the adjustment procedure (See page DI–62).

7. INSTALL AIR CLEANER ASSEMBLY

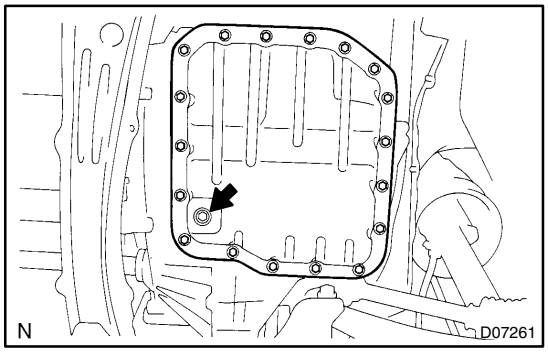
8. TEST DRIVE VEHICLE

VALVE BODY ASSEMBLY

AX0LM–03

ON–VEHICLE REPAIR

1. REMOVE LH ENGINE UNDER COVER



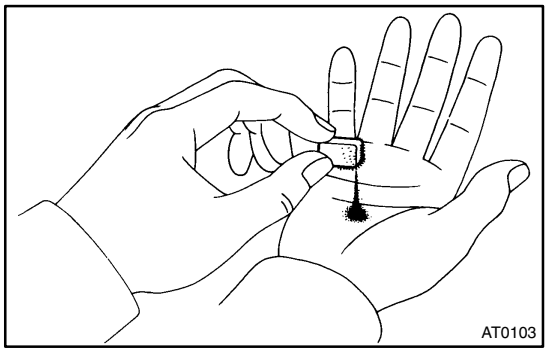
2. REMOVE DRAIN PLUG AND DRAIN ATF

3. REMOVE OIL PAN AND GASKET

NOTICE:

Some fluid will remain in the oil pan.

Remove the 18 bolts, and carefully remove the oil pan assembly. Discard the gasket.

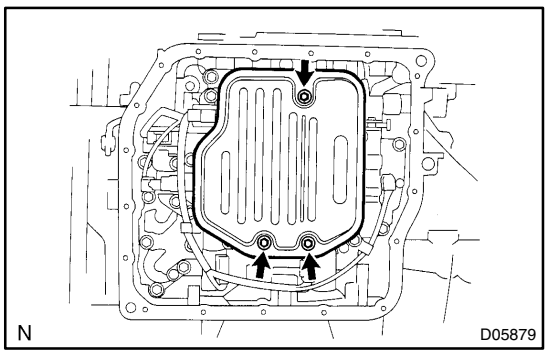


4. EXAMINE PARTICLES IN OIL PAN

Remove the magnets and use them to collect any steel chips. Look carefully at the chips and particles in the pan and on the magnet to anticipate what type of wear you will find in the transaxle.

Steel (magnetic)...bearing, gear and plate wear

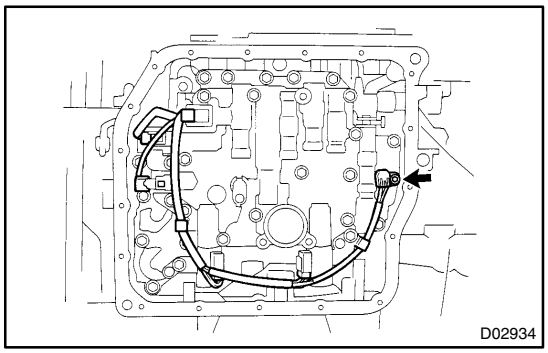
Brass (non–magnetic)... bushing wear



5. REMOVE OIL STRAINER

(a) Remove the 3 bolts and oil strainer.

(b) Remove the O–ring.

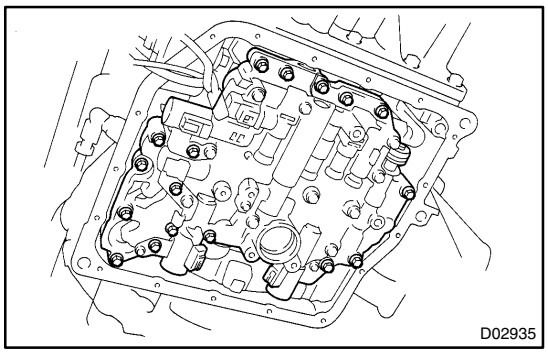


6. DISCONNECT 5 SHIFT SOLENOID VALVE CONNECTORS

7. REMOVE ATF TEMPERATURE SENSOR

Remove the bolt and lock plate, and remove the ATF temperature sensor.

8. SEPARATE WIRE HARNESS FROM 2 CLAMPS

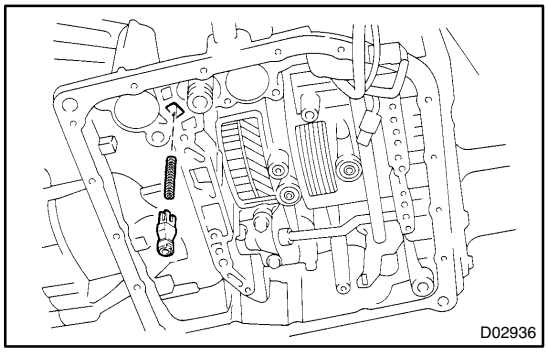


9. REMOVE VALVE BODY

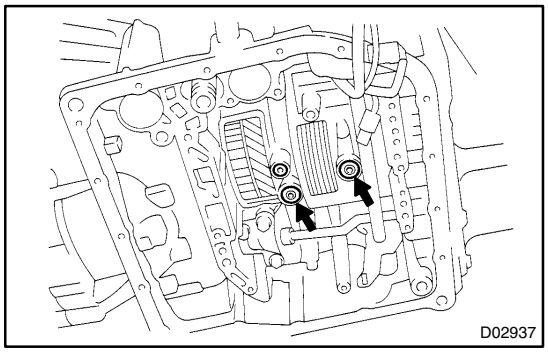
Remove the 17 bolts and valve body.

NOTICE:

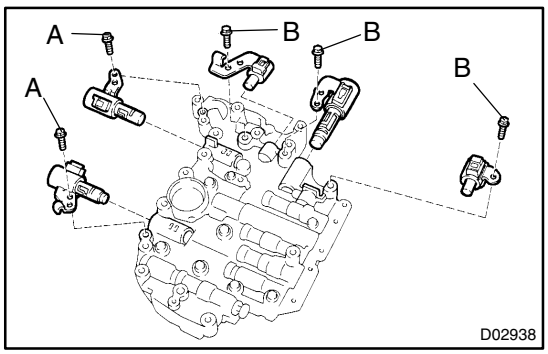
Be careful not to drop the check valve body, spring and accumulator piston.



10. REMOVE CHECK BALL BODY AND SPRING



11. REMOVE 2 APPLY GASKETS



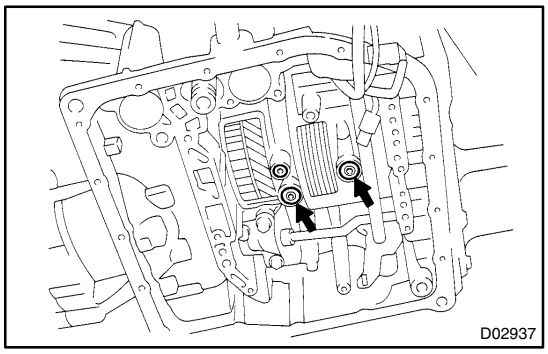
12. REMOVE SHIFT SOLENOID VALVE

Remove the 5 bolts and 5 shift solenoid valves.

13. INSTALL SHIFT SOLENOID VALVE

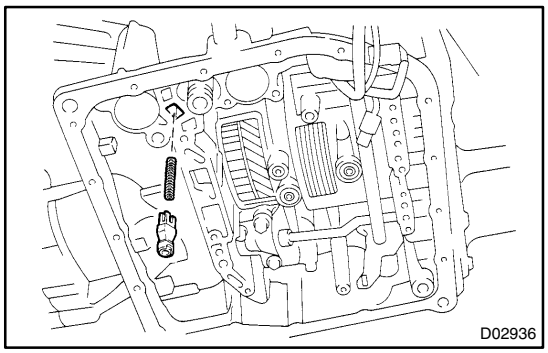
Install the 5 shift solenoid valves with the 5 bolts.

Torque:
Bolt A: 6.6 N·m (67 kgf·cm, 58 in.·lbf)
Bolt B: 10.8 N·m (110 kgf·cm, 8 ft·lbf)
Bolt length:
Bolt A: 12 mm (0.47 in.)
Bolt B: 45 mm (1.77 in.)

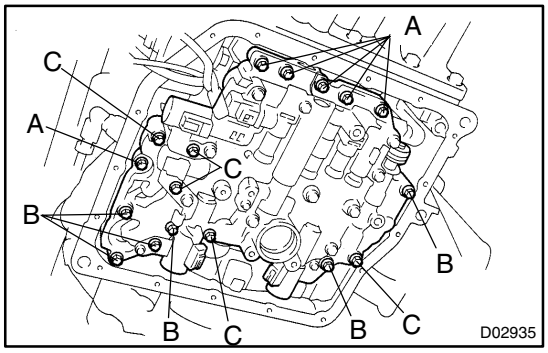


14. INSTALL 2 APPLY GASKETS

(a) Coat 2 new apply gaskets with ATF.
(b) Install the 2 gaskets to the transaxle case.



15. INSTALL CHECK VALVE AND SPRING



16. INSTALL VALVE BODY

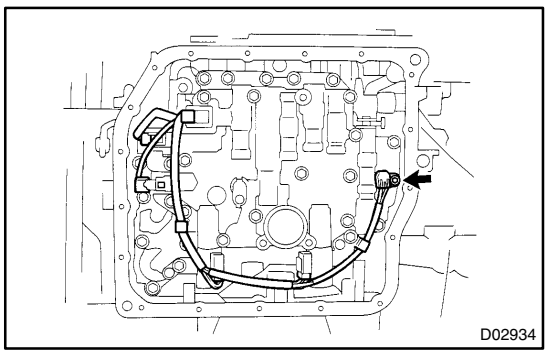
(a) Align the groove of the manual valve with the pin of the manual valve lever.

(b) Temporarily install the valve body with the 17 bolts.
Bolt length:
Bolt A: 25 mm (0.98 in.)
Bolt B: 41 mm (1.61 in.)
Bolt C: 45 mm (1.77 in.)

(c) Check that the manual valve lever contacts the center of the roller at the tip of the detent spring.

(d) Tighten the 17 bolts.
Torque: 10.8 N·m (110 kgf·cm, 8 ft·lbf)

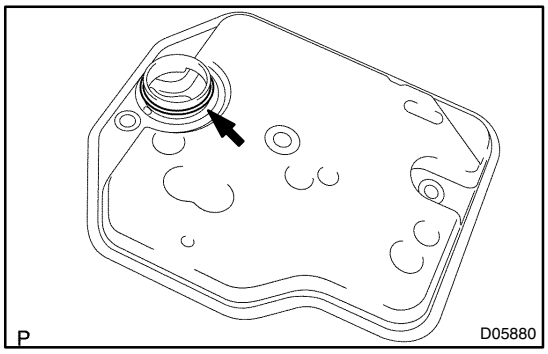
17. CLAMP WIRE HARNESS TO 2 CLAMPS



18. INSTALL ATF TEMPERATURE SENSOR

Install the ATF temperature sensor with the lock plate and bolt.
Torque: 6.6 N·m (67 kgf·cm, 58 in.·lbf)

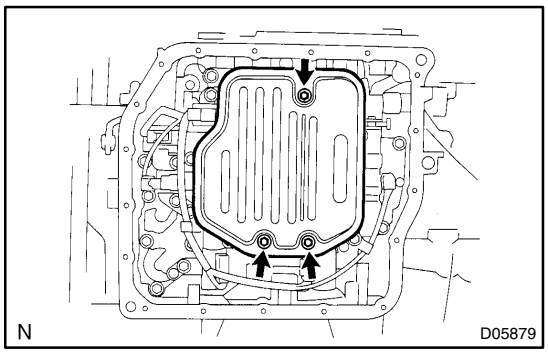
19. CONNECT 5 SHIFT SOLENOID VALVE CONNECTORS



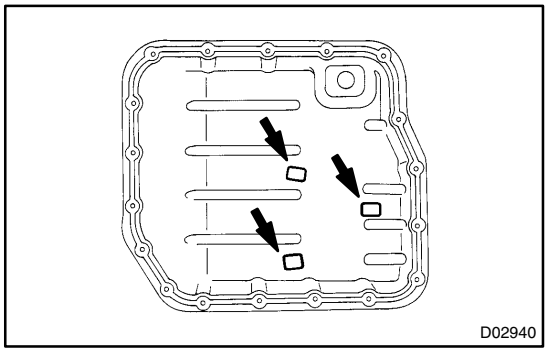
20. INSTALL OIL STRAINER

(a) Coat a new O–ring with ATF.

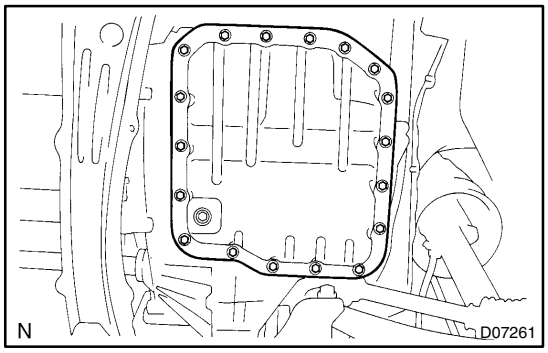
(b) Install the O–ring to the oil strainer.



(c) Install the oil strainer with the 3 bolts.
Torque: 10.8 N·m (110 kgf·cm, 8 ft·lbf)



21. INSTALL MAGNET IN OIL PAN
Install the 3 magnets in the oil pan, as shown in the illustration.

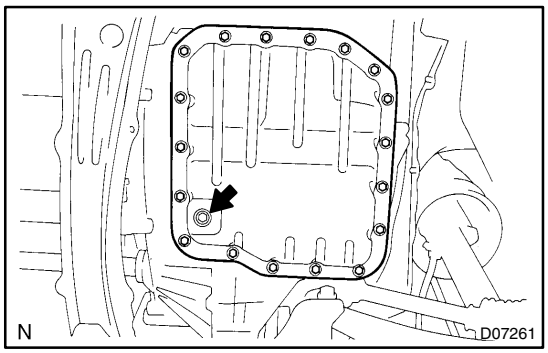


22. INSTALL OIL PAN
Install the oil pan and a new gasket with the 18 bolts.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

23. INSTALL DRAIN PLUG
Install a new gasket and drain plug.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

24. FILL ATF AND CHECK ATF LEVEL (See page DI–62)

25. INSTALL LH ENGINE UNDER COVER



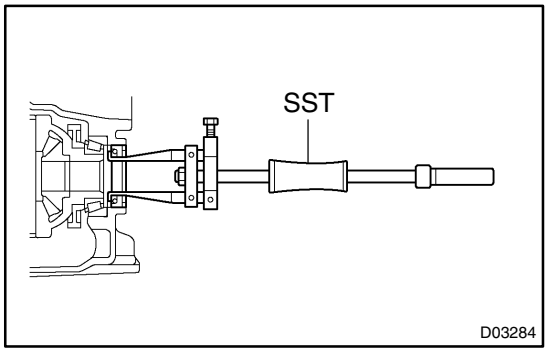
DIFFERENTIAL OIL SEAL

AX0LN–02

ON–VEHICLE REPAIR

1. DRAIN ATF

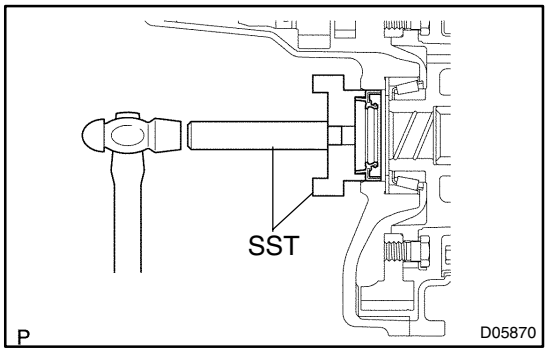
2. REMOVE LH AND RH DRIVE SHAFTS (See page SA–3)



3. REMOVE LH AND RH SIDE OIL SEAL

Using SST, drive out both the side oil seals.

SST 09308–10010



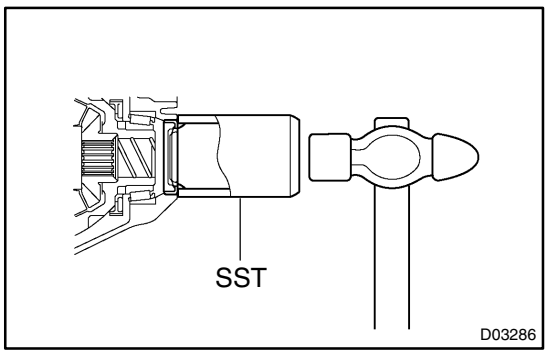
4. INSTALL LH SIDE OIL SEAL

(a) Using SST and a hammer, drive in a new oil seal.

SST 09350–32014 (09351–32130, 09351–32150)

Oil seal drive in depth: 2.7 ± 0.5 mm (0.106 ± 0.020 in.)

(b) Coat the oil seal lip with MP grease.



5. INSTALL RH SIDE OIL SEAL

(a) Using SST and a hammer, drive in a new oil seal.

SST 09223–00010

Oil seal drive in depth: 0 ± 0.5 mm (0 ± 0.020 in.)

(b) Coat the oil seal lip with MP grease.

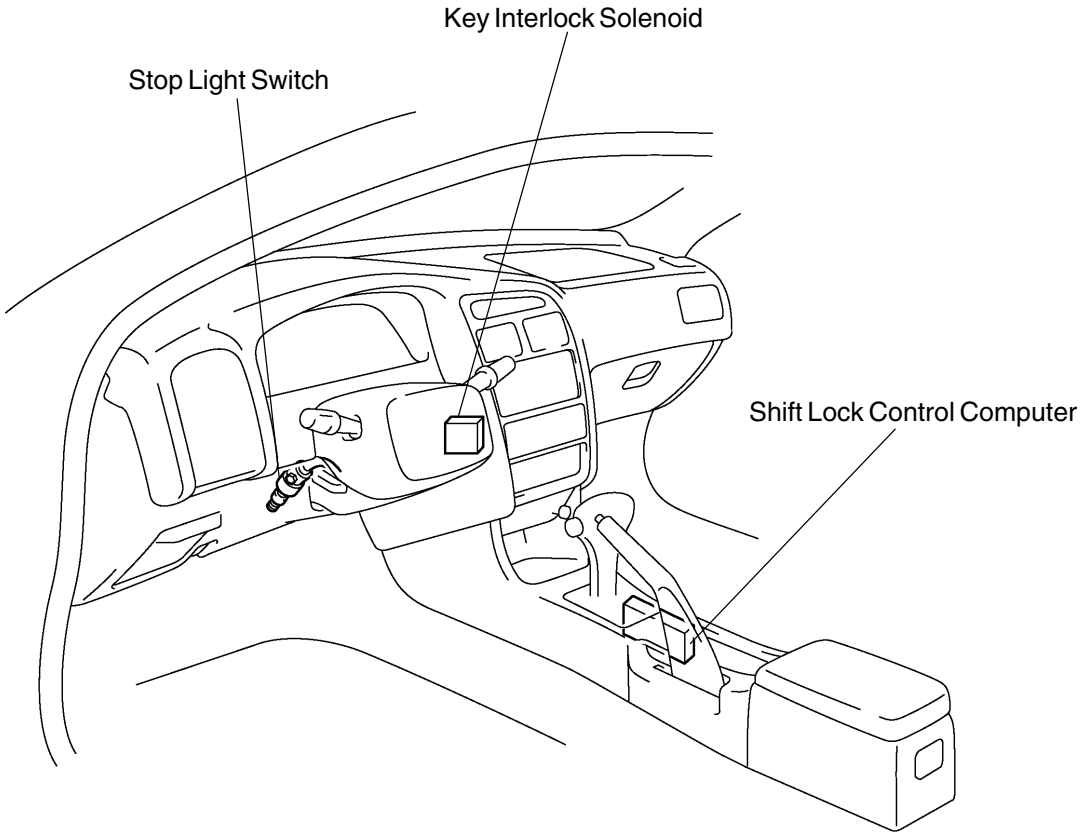
6. INSTALL LH AND RH DRIVE SHAFTS (See page SA–12)

7. FILL ATF AND CHECK ATF LEVEL (See page DI–62)

SHIFT LOCK SYSTEM

AX10Y–01

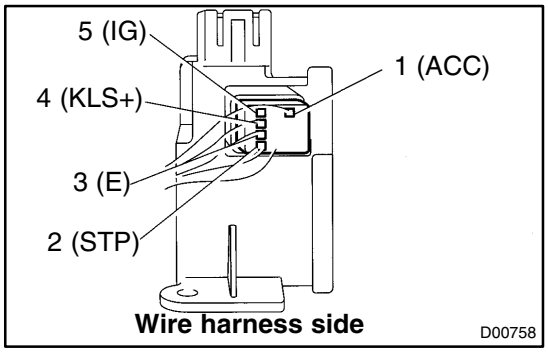
LOCATION



Y

D10026

AX10Z–01



INSPECTION

1. LHD:

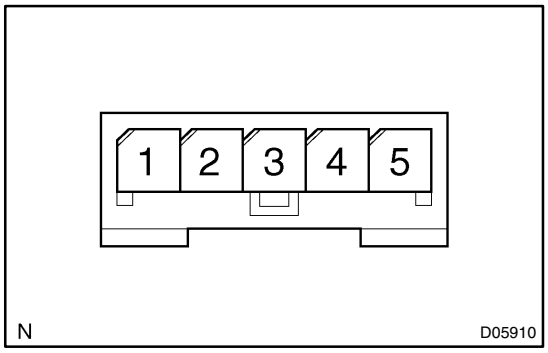
INSPECT SHIFT LOCK CONTROL COMPUTER

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift lock control computer connector.

Terminal	Measuring Condition	Voltage (V)
1 – 3 (ACC – E)	Ignition switch ACC	10 – 14
5 – 3 (IG – E)	Ignition switch ON	10 – 14
2 – 3 (STP – E)	Depressing brake pedal	10 – 14
4 – 3 (KLS^+ – E)	(1) Ignition switch ACC and P range (2) Ignition switch ACC and except P range (3) Ignition switch ACC and except P range (After approx. 1 second)	0 7.5 – 11 6 – 9.5



2. RHD:

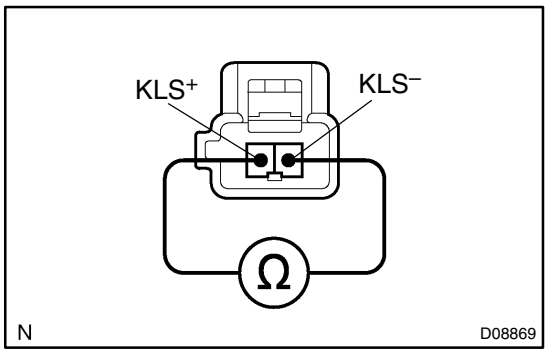
INSPECT SHIFT LOCK CONTROL COMPUTER

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift control computer connector.

Terminal	Measuring Condition	Voltage (V)
2 – 3 (ACC – E)	Ignition switch ACC	10 – 14
4 – 3 (IG – E)	Ignition switch ON	10 – 14
5 – 3 (STP – E)	Depressing brake pedal	10 – 14
1 – 3 (KLS^+ – E)	(1) Ignition switch ACC and P range (2) Ignition switch ACC and except P range (3) Ignition switch ACC and except P range (After approx. 1 second)	0 7.5 – 11 6 – 9.5



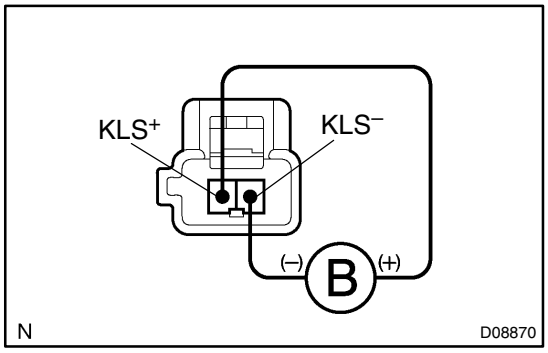
3. INSPECT KEY INTERLOCK SOLENOID

(a) Disconnect the solenoid connector.

(b) Using an ohmmeter, measure the resistance between the terminals.

Standard resistance: 12.5 – 16.5 Ω

If the resistance value is not as specified, replace the solenoid.



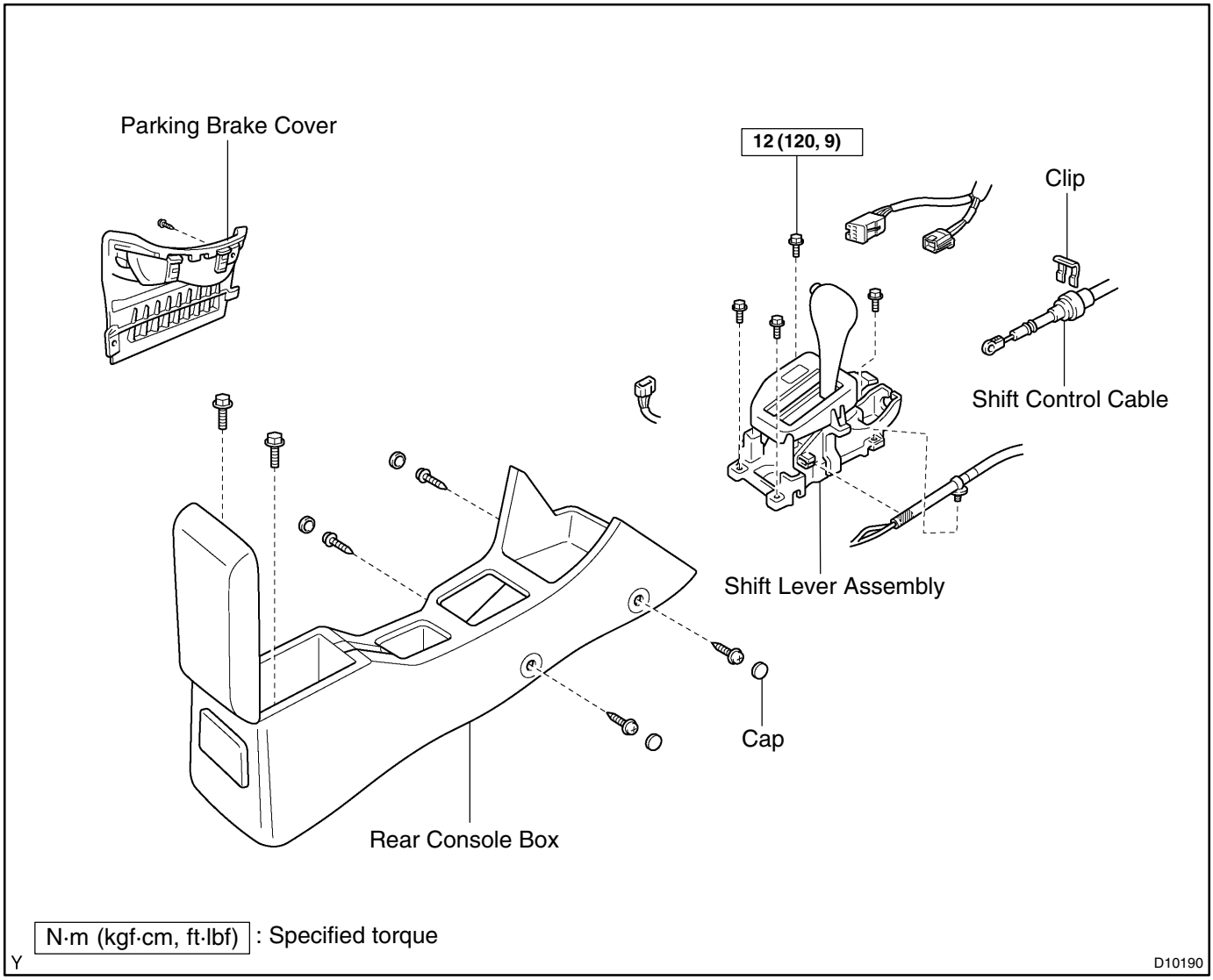
(c) Provide the battery voltage between the terminals. Check that the solenoid can be heard its operating.

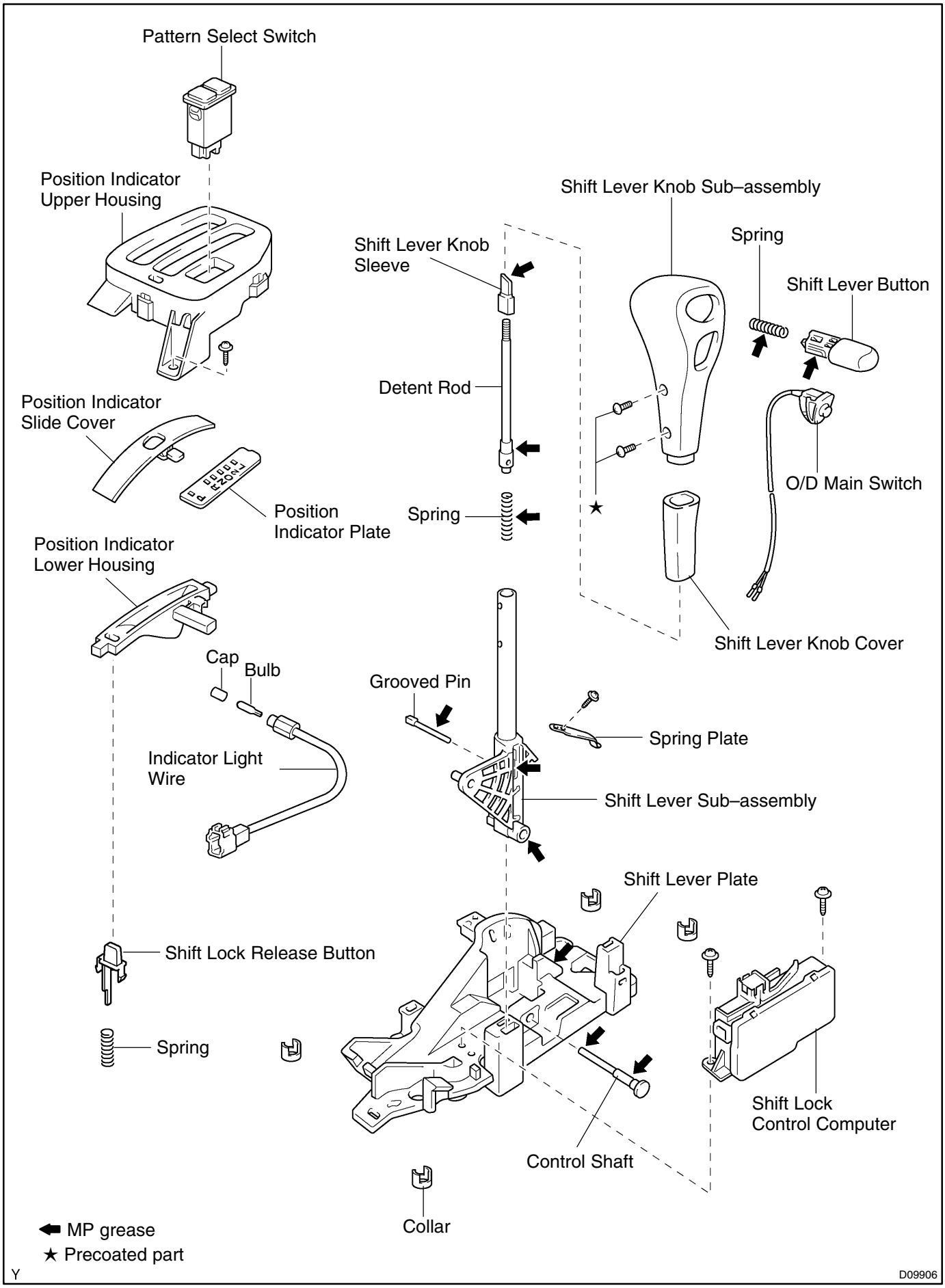
If the operation is not as specified, replace the solenoid.

FLOOR SHIFT ASSEMBLY (LHD)

AX02U–08

COMPONENTS




Pattern Select Switch
Position Indicator Upper Housing
Position Indicator Slide Cover
Position Indicator Plate
Position Indicator Lower Housing
Cap
Bulb
Indicator Light Wire
Shift Lever Knob Sub–assembly
Shift Lever Knob Sleeve
Spring
Shift Lever Button
Detent Rod
O/D Main Switch
Spring
Shift Lever Knob Cover
Grooved Pin
Spring Plate
Shift Lever Sub–assembly
Shift Lever Plate
Shift Lock Release Button
Spring
Shift Lock Control Computer
Control Shaft
Collar
MP grease
★ Precoated part
Y
D09906

AX05L–03

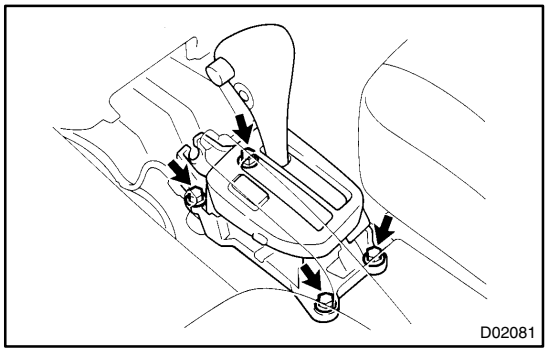
REMOVAL

1. REMOVE REAR CONSOLE (See page BO–8)

2. REMOVE SHIFT LEVER ASSEMBLY

(a) Disconnect the 3 connectors and wire harness.

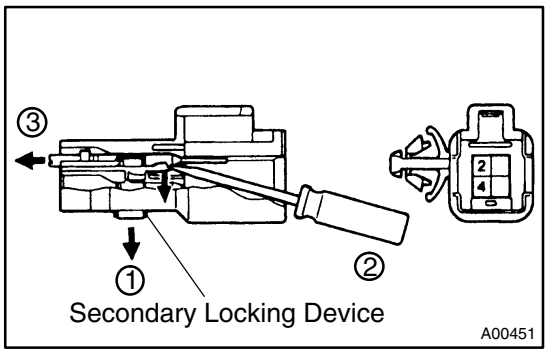
(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and floor shift assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX0C5–04

DISASSEMBLY



1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove the O/D main switch connector from the shift lever plate.
(b) Disengage the secondary locking device.
(c) Release the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to put unnatural load onto O/D main switch wire harness.

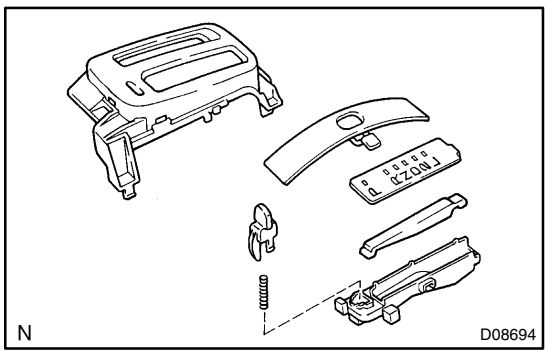
(b) Remove the shift lever knob cover.
(c) Remove the shift lever button and spring.
(d) Remove the O/D main switch.

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE CAP AND BULB FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING

Remove the screws and an indicator housing.



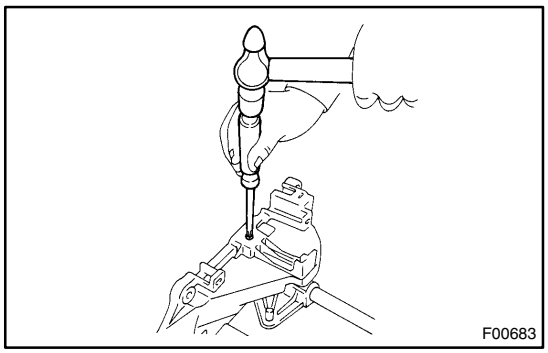
6. DISASSEMBLE INDICATOR HOUSING

(a) Remove the pattern select switch.
(b) Remove the position indicator lower housing.
(c) Remove the shift lock release button and spring.
(d) Remove the position indicator slide cover.
(e) Remove the position indicator plate.

7. REMOVE SHIFT LOCK CONTROL COMPUTER

Remove the 2 screws and shift lock control computer.

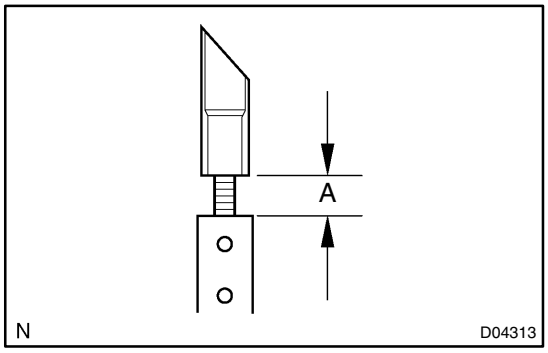
8. REMOVE SPRING PLATE



9. REMOVE SHIFT LEVER SUB–ASSEMBLY

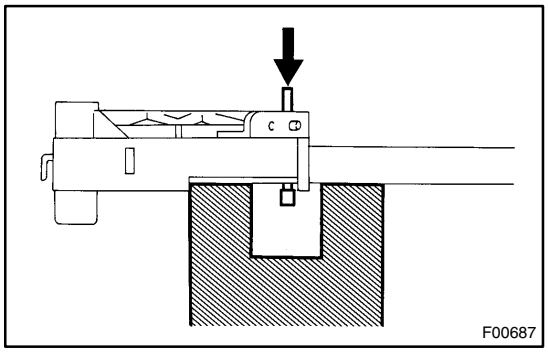
(a) Using a screwdriver and a hammer, remove the control shaft.

(b) Remove the shift lever sub–assembly.



10. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Measure the distance ”A” between the lower edge of the shift lever knob sleeve and the upper edge of the shift lever sub–assembly.



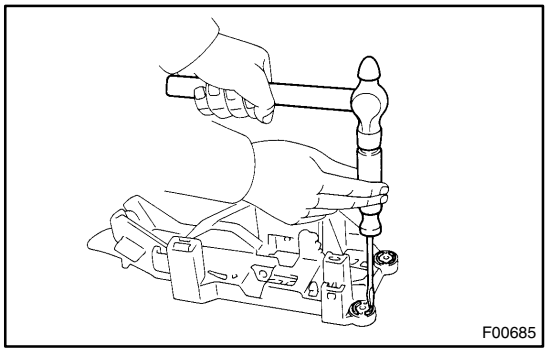
(b) Using a hammer, remove the grooved pin.

NOTICE:

When pressing down the grooved pin, if doing it at the place other than the notch, there may be fear of damaging the shift lever sub–assembly.

(c) Remove the detent rod and spring.

(d) Remove the shift lever knob sleeve from the detent rod.



11. REMOVE COLLARS

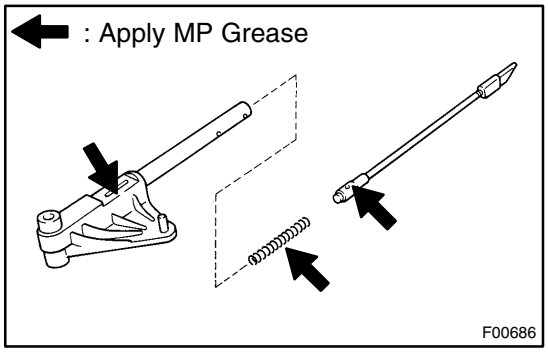
Using a screwdriver and a hammer, remove the 4 collars.

AX0C6–04

REASSEMBLY

1. INSTALL COLLARS

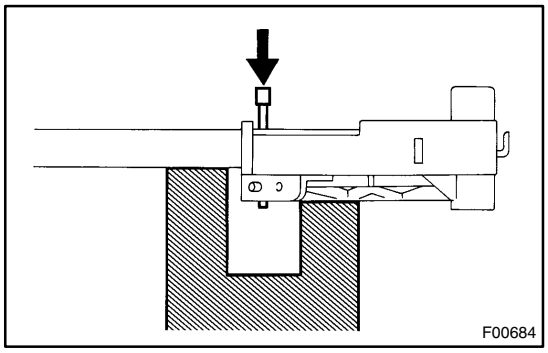
2. INSTALL SHIFT LEVER KNOB SLEEVE TO DETENT ROD



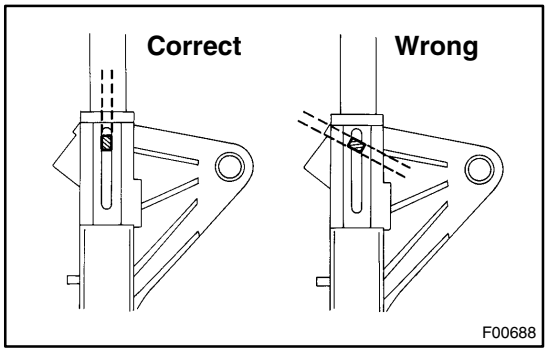
3. ASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Apply MP grease on the compression spring, the detent rod and the shift lever sub–assembly.

(b) Install the spring and the detent rod to shift lever sub–assembly.



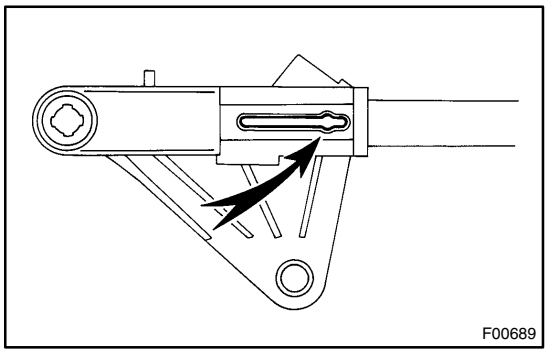
(c) Place the shift lever sub–assembly as shown in the illustration.



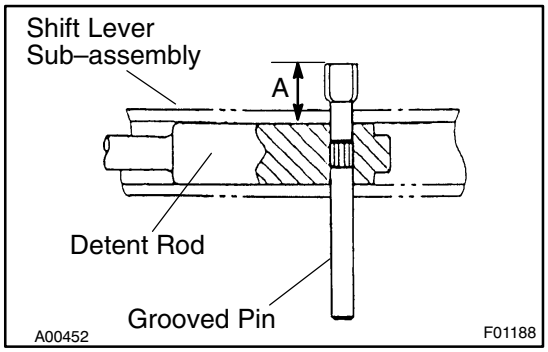
(d) Insert the grooved pin in the detent rod pin hole.

NOTICE:

- **Assemble the grooved pin to ensure that it fits into the guide hole of the shift lever sub–assembly in parallel.**
- **Take care not to insert the pin in the wrong direction of the detent rod.**



(e) Meet the grooved pin with the notch of the guide hole.



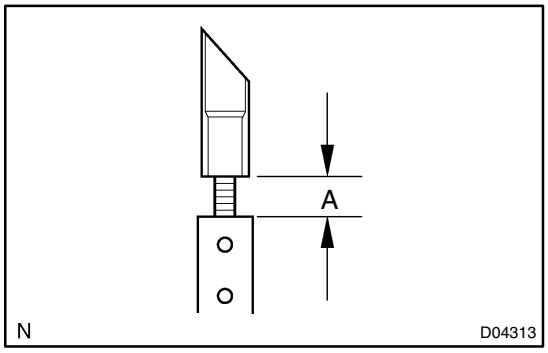
(f) Press the pin with a hammer.

A: 10.0 – 10.4 mm (0.39 – 0.41 in.)

NOTICE:

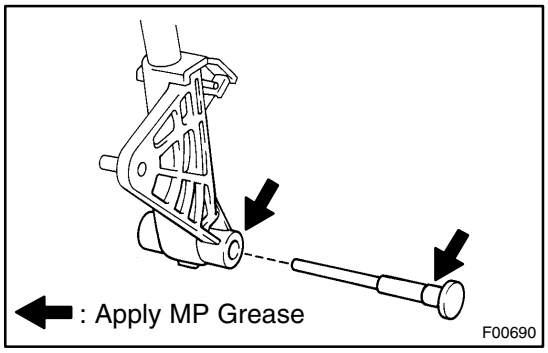
When pressing in the grooved pin, if doing it at the place other than the notch, the shift lever sub–assembly might be damaged.

4. CHECK DETENT ROD OPERATION



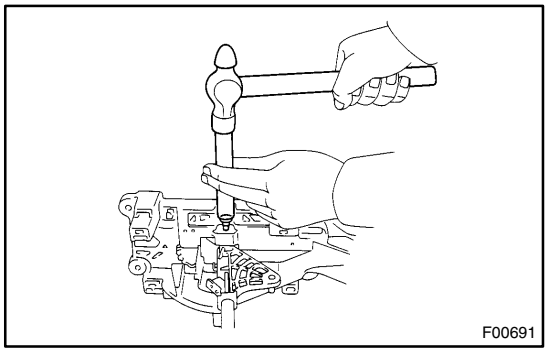
5. INSTALL SHIFT LEVER KNOB SLEEVE DETENT ROD

Drive the shift lever knob sleeve to the distance A measured before removal.



6. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply MP grease.

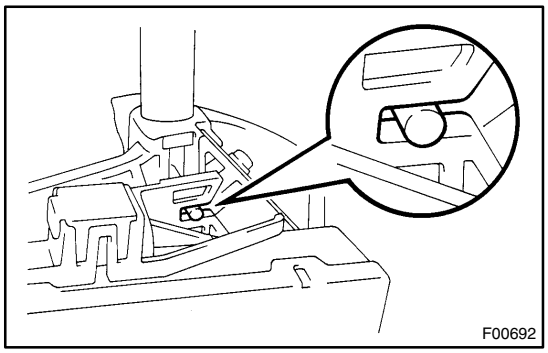


(b) Using a brass bar and a hammer, install the control shaft and the shift lever sub–assembly to the shift lever plate.

NOTICE:

Take care not to install them in the wrong direction of the shift lever sub–assembly.

7. INSTALL SPRING PLATE



8. INSTALL SHIFT LOCK CONTROL COMPUTER

Install the shift control control computer and 2 screws.

NOTICE:

Install the grooved pin into the groove of the shift lock unit as shown in the illustration.

9. ASSEMBLE INDICATOR HOUSING

(a) Install the position indicator plate.
(b) Install the position indicator slide cover.
(c) Install the spring and shift lock release button.
(d) Install the position indicator lower housing.
(e) Install the pattern select switch.

NOTICE:

Do not make indicator housing dirty with MP grease.

10. INSTALL INDICATOR HOUSING

Install the screws and an indicator housing.

11. INSTALL CAP AND BULB TO INDICATOR LIGHT WIRE

12. INSTALL INDICATOR LIGHT WIRE

13. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Install the O/D main switch.
(b) Install the spring and shift lever button.
(c) Install the shift lever knob cover.

HINT:

Apply MP grease to shift lever knob button.

(d) Install the shift lever sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

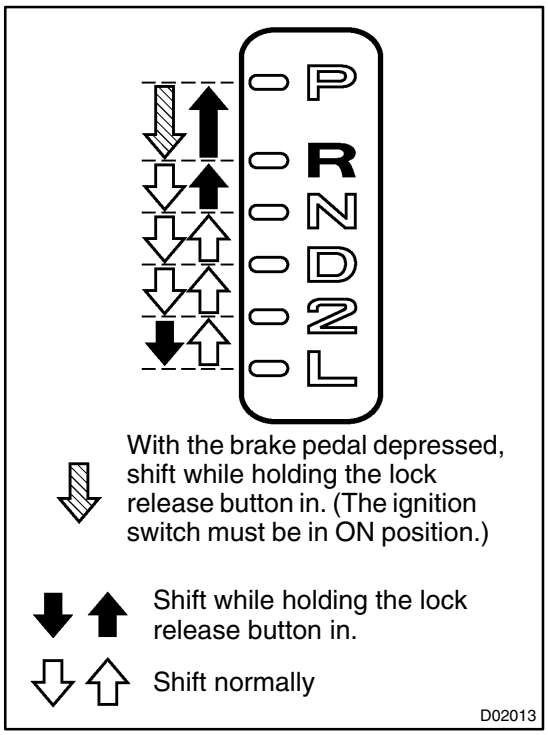
NOTICE:

Make sure not to catch O/D main switch wire harness.

(e) Install the O/D main switch wire harness securely to hung on the hook of the shift lever sub–assembly.

14. INSTALL O/D MAIN SWITCH TERMINAL

AX02Y–08



INSTALLATION

INSTALL FLOOR SHIFT ASSEMBLY

Installation is in the reverse order of removal (See page AX–18).

HINT:

After installation, adjust shift lever ranges (See page DI–62) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

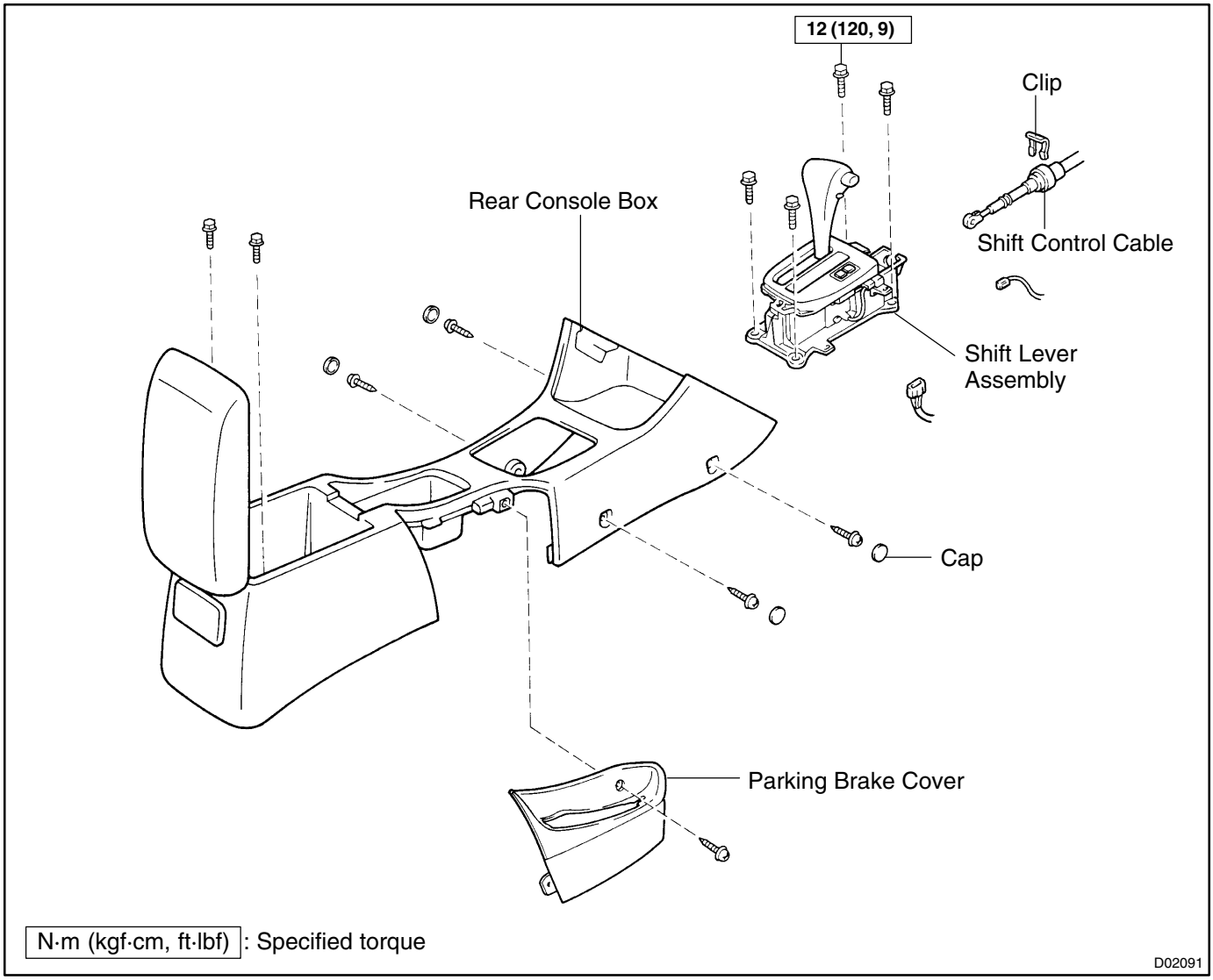
  Ranges which can be operated only with pressing the shift lever nob button

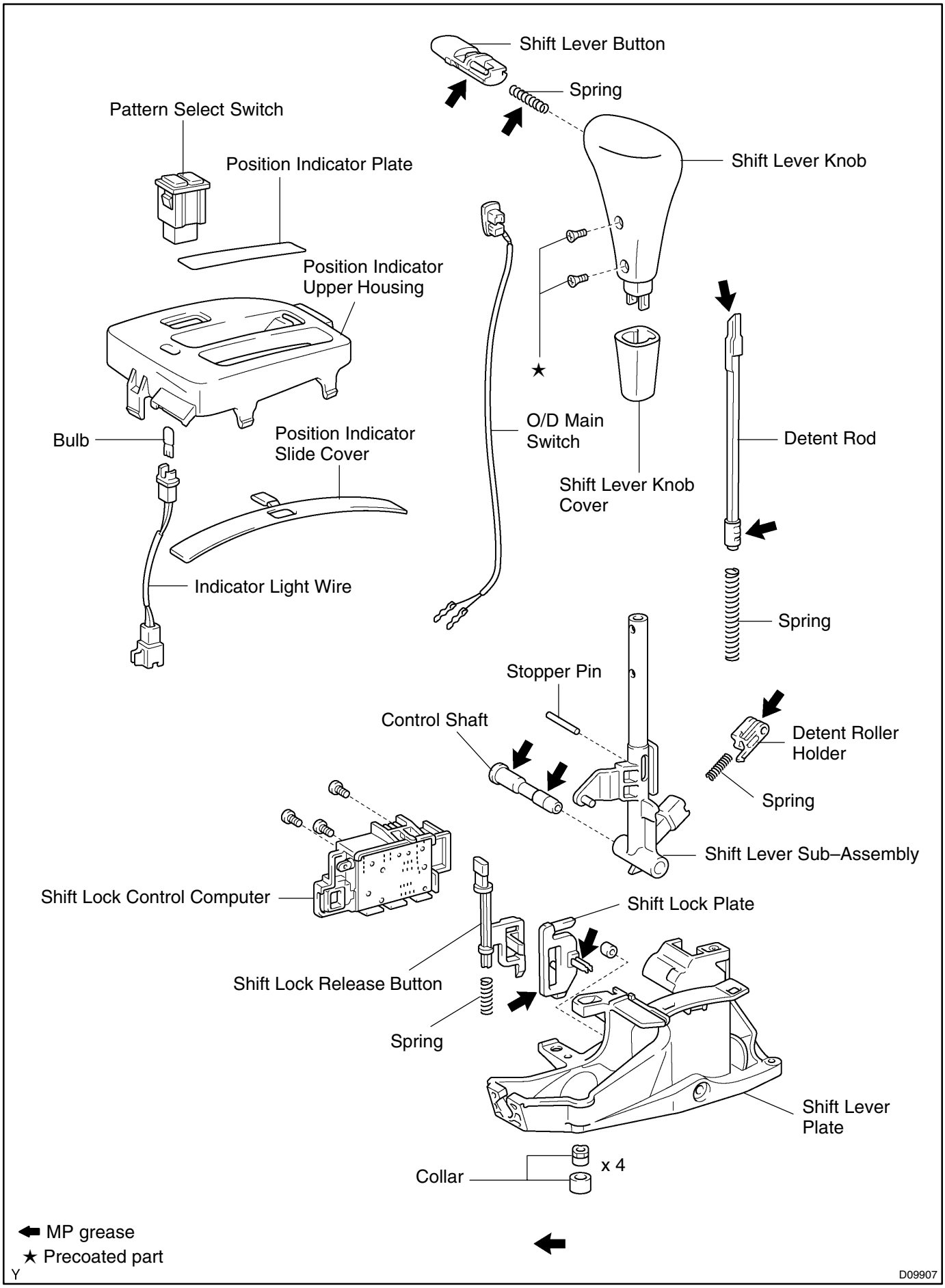
  P → R, 2 → L, N → R → P
- When starting the engine, make sure that the vehicle moves forward when shifting from N to D range, and moves rearward when shifting to R range.

FLOOR SHIFT ASSEMBLY (RHD)

COMPONENTS

AX05N–02




Shift Lever Button
Spring
Pattern Select Switch
Position Indicator Plate
Shift Lever Knob
Position Indicator Upper Housing
★
O/D Main Switch
Detent Rod
Bulb
Position Indicator Slide Cover
Shift Lever Knob Cover
Indicator Light Wire
Spring
Stopper Pin
Control Shaft
Detent Roller Holder
Spring
Shift Lever Sub–Assembly
Shift Lock Control Computer
Shift Lock Plate
Shift Lock Release Button
Spring
Shift Lever Plate
Collar
x 4
MP grease
★ Precoated part
Y
D09907

AX05O–02

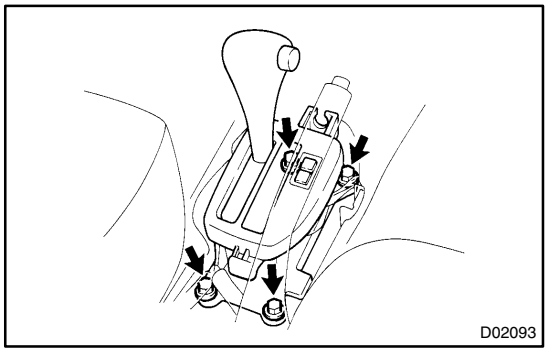
REMOVAL

1. REMOVE REAR CONSOLE (See page BO–8)

2. REMOVE FLOOR SHIFT ASSEMBLY

(a) Disconnect the connectors.

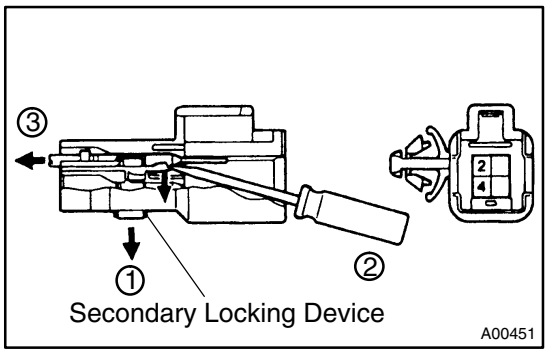
(b) Remove the clip and disconnect the shift control cable.



(c) Remove the 4 bolts and shift lever assembly.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

AX110–01

DISASSEMBLY



1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove O/D main switch connector from the shift lever plate.

(b) Disengage the secondary locking device.

(c) Disengage the locking lug of the terminals 2 and 4, and pull the terminals out from the rear.

2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

Pay attention not to apply unnatural load onto O/D main switch wire harness.

(b) Remove the Shift lever knob cover.

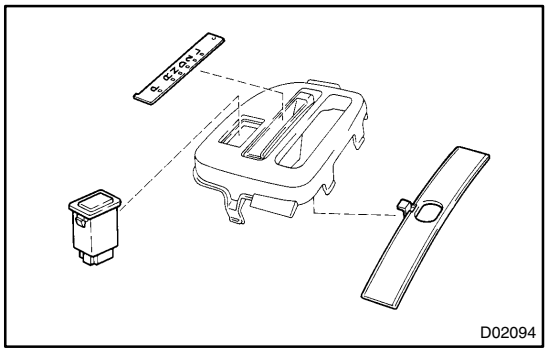
(c) Remove the Shift lever button and spring.

(d) Remove the O/D main switch.

3. REMOVE INDICATOR LIGHT WIRE

4. REMOVE BULB FROM INDICATOR LIGHT WIRE

5. REMOVE INDICATOR HOUSING SUB–ASSEMBLY

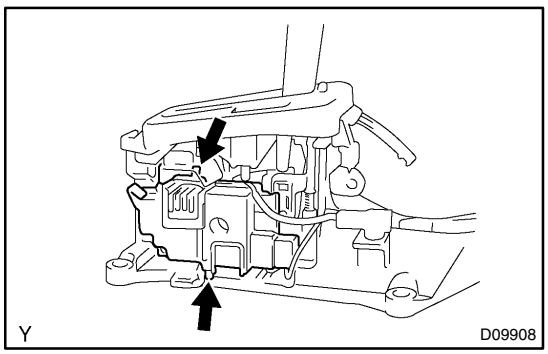


6. DISASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

(a) Remove the position indicator side cover.

(b) Remove the position indicator plate.

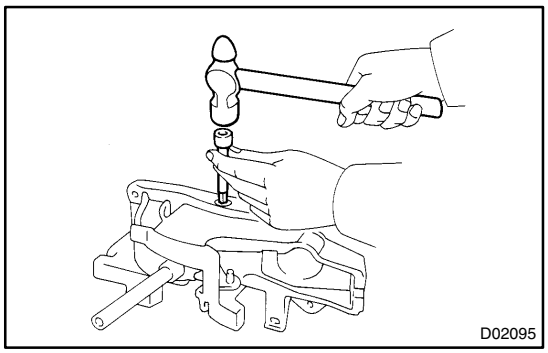
(c) Remove the pattern select switch.



7. REMOVE SHIFT LOCK CONTROL COMPUTER

Remove the 3 screws and shift lock control computer.

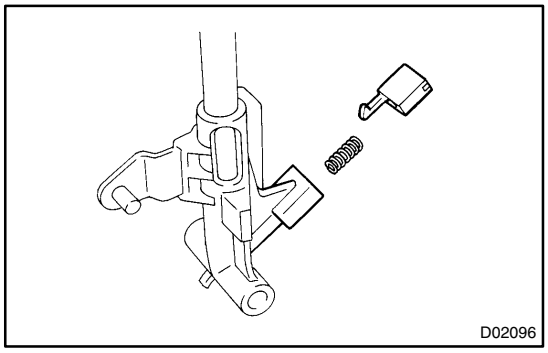
8. REMOVE STOPPER PIN, DETENT ROD AND SPRING



9. REMOVE SHIFT LEVER SUB–ASSEMBLY

(a) Using an extension bar and hammer, remove the control shaft.

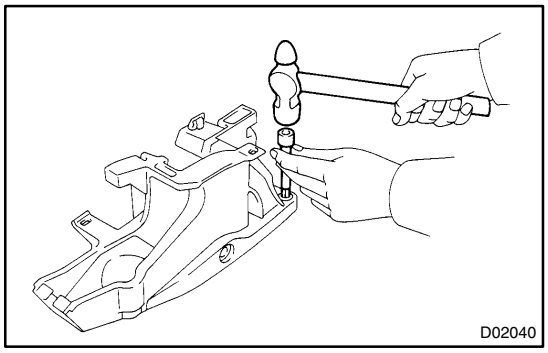
(b) Remove the shift lever sub–assembly.



10. DISASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Remove the Detent roller holder.

(b) Remove the Compression spring.



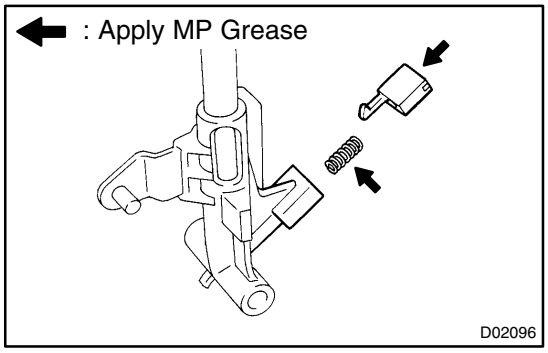
11. REMOVE COLLARS

Using an extension bar and hammer, remove the 4 collars.

AX05Q–02

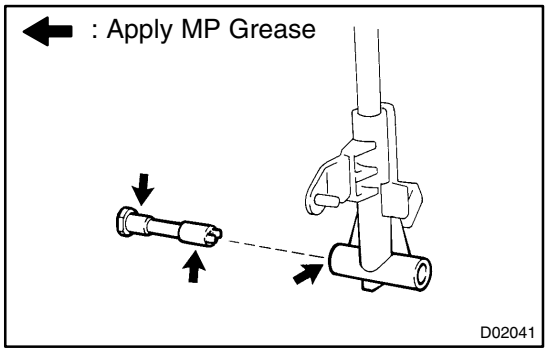
REASSEMBLY

1. INSTALL COLLARS



2. ASSEMBLE SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the detent roller holder, compression spring and shift lever sub–assembly.
(b) Install the compression spring to the detent roller holder.
(c) Install the detent roller holder with the compression spring to the shift lever sub–assembly.



3. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply the MP grease to the control shaft and shift lever sub–assembly.
(b) Using an extension bar and hammer, install the control shaft and shift lever sub–assembly to the shift lever plate.

4. INSTALL SPRING, DETENT ROD AND STOPPER PIN

(a) Apply the MP grease to the detent rod and stopper pin.
(b) Install the compression spring and detent rod to the shift lever sub–assembly.
(c) Insert the stopper pin in the stopper pin hole.

NOTICE:

Take care not to insert the pin in the wrong direction against the detent rod.

5. INSTALL SHIFT LOCK CONTROL COMPUTER

Install the shift lock control computer with 3 screws.

6. CHECK SHIFT LEVER OPERATION

7. ASSEMBLE INDICATOR HOUSING SUB–ASSEMBLY

(a) Install the pattern select switch.
(b) Install the position indicator plate.
(c) Install the position indicator slide plate.

8. INSTALL INDICATOR HOUSING SUB–ASSEMBLY

9. INSTALL BULB TO INDICATOR LIGHT WIRE

10. INSTALL INDICATOR LIGHT WIRE

11. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

HINT:

Apply MP grease to the shift lever knob button.

(a) Install the O/D main switch.

(b) Install the shift lever button and spring.

(c) Install the shift lever knob cover.

(d) Install the shift lever knob sub–assembly and 2 screws.

HINT:

Coat the threads of the screws with sealant.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

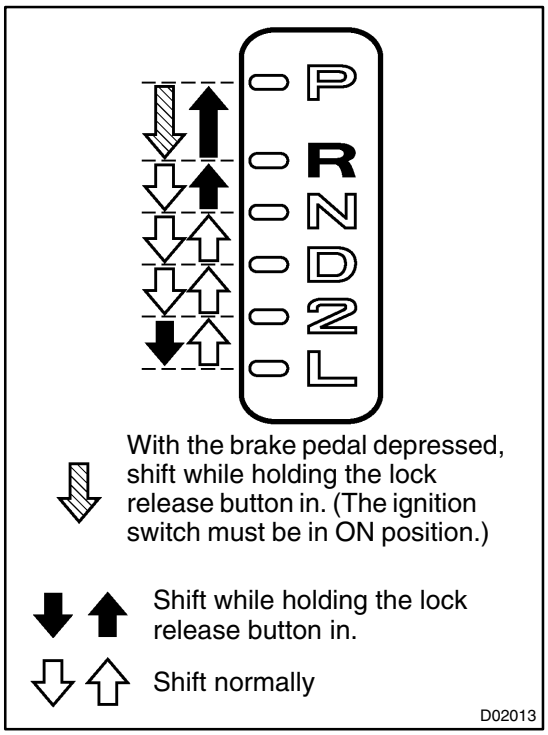
NOTICE:

Make sure not to catch O/D main switch wire harness.

(e) Install the O/D main switch wire harness securely and hang it on the hook of the shift lever sub–assembly.

12. INSTALL O/D MAIN SWITCH TERMINAL

AX05R–03



INSTALLATION

INSTALL FLOOR SHIFT ASSEMBLY

Installation is in the reverse order of removal (See page AX–27).

HINT:

After installation, adjust shift lever ranges (See page DI–62) and inspect shift lever operation.

- When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the range indicator displays correctly.

  Ranges which can be operated without pressing the shift lever nob button

  R → N → D→ 2

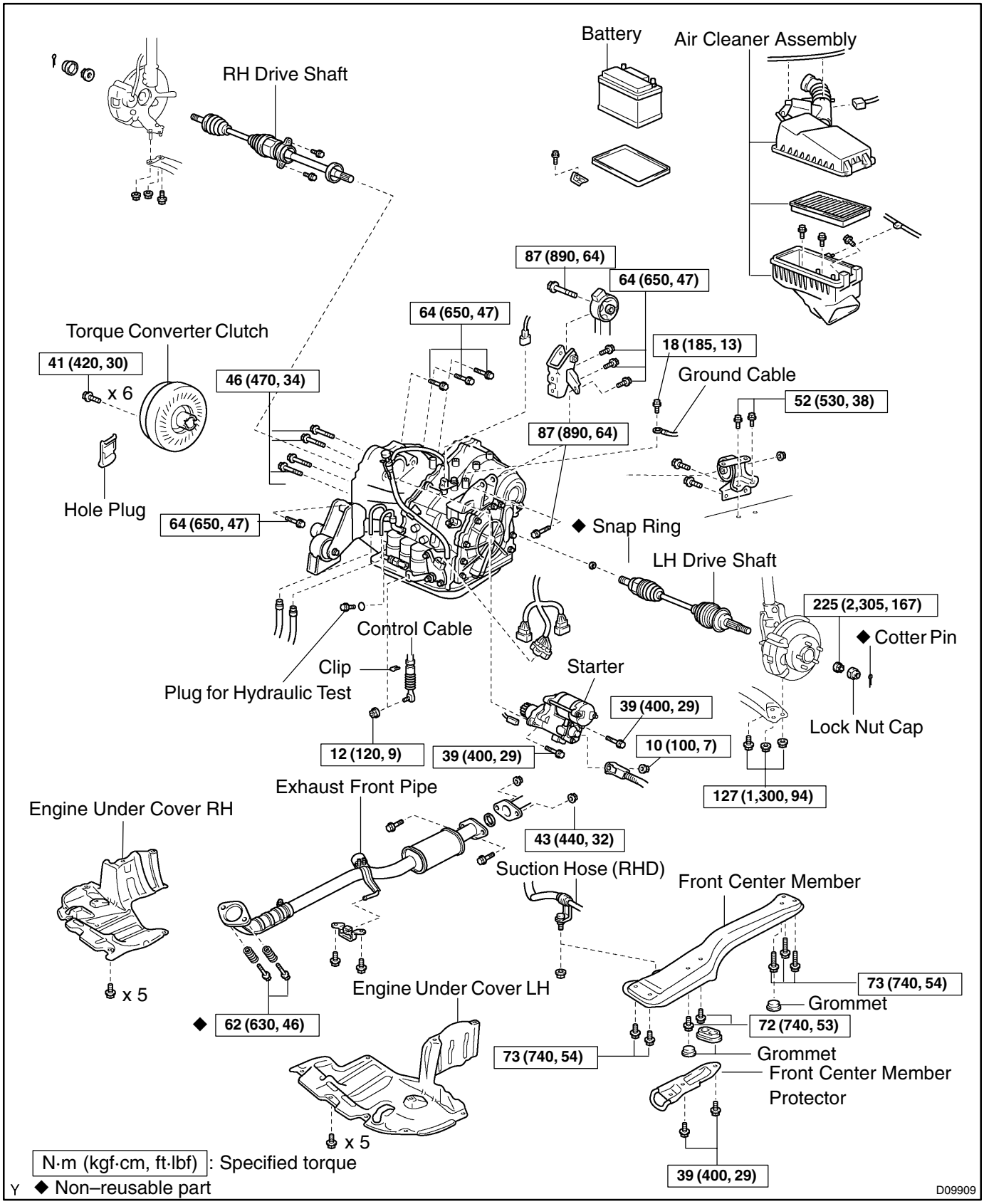
  Ranges which can be operated only with pressing the shift lever nob button

  P → R, 2 → L, N → R → P
- 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.

AUTOMATIC TRANSAXLE UNIT

COMPONENTS

AX064–02

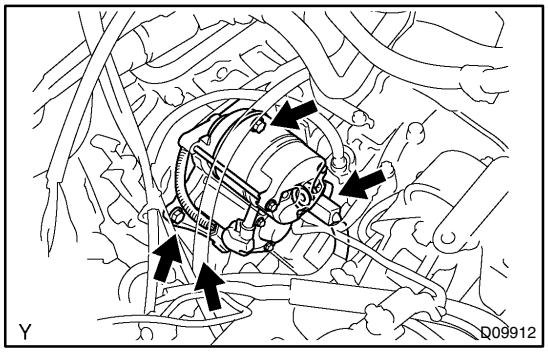


AX111–01

REMOVAL

1. REMOVE BATTERY

2. REMOVE AIR CLEANER ASSEMBLY



3. REMOVE STARTER

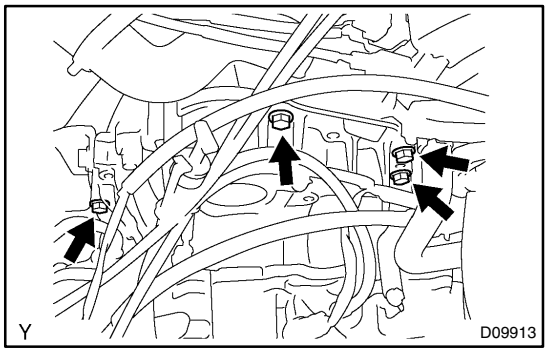
(a) Remove the nut and disconnect the connector.

(b) Remove the 2 bolts, bracket and starter.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

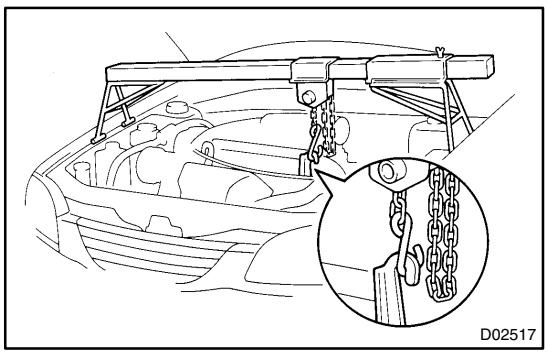
4. DISCONNECT GROUND CABLE

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



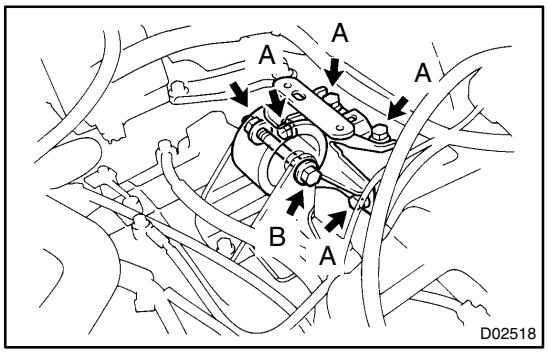
5. REMOVE 4 UPPER SIDE TRANSAXLE MOUNTING BOLTS

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



6. INSTALL ENGINE SUPPORT FIXTURE

7. REMOVE ENGINE UNDER COVERS



8. REMOVE LH SIDE ENGINE MOUNTING

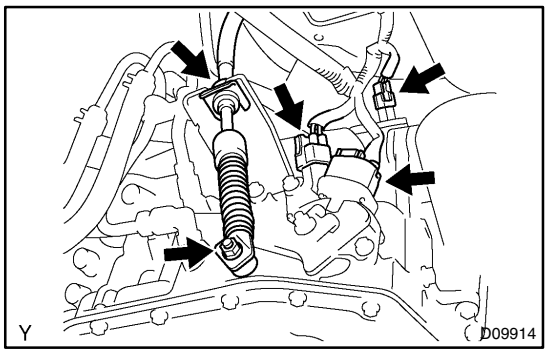
Remove the 5 bolts, nut and LH engine mounting.

Torque:

A: 52 N·m (530 kgf·cm, 38 ft·lbf)

B: 87 N·m (890 kgf·cm, 64 ft·lbf)

9. REMOVE LH AND RH DRIVE SHAFTS (See page SA–3)



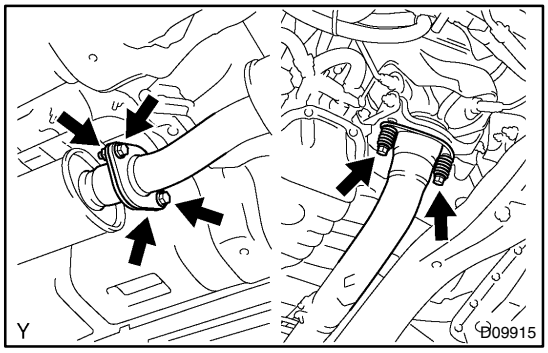
10. DISCONNECT SHIFT CONTROL CABLE

Remove the nut, clip and disconnect the shift control cable.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

11. DISCONNECT NEUTRAL START SWITCH CONNECTOR AND SOLENOID CONNECTOR

12. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR



13. REMOVE EXHAUST FRONT PIPE

(a) Disconnect the oxygen sensor connector.

(b) Remove the 2 nuts from the exhaust manifold.

Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

HINT:

At the time of installation, please refer to the following item.

Replace the used nuts with new ones.

(c) Remove the 2 bolts, nuts and exhaust front pipe with 2 gaskets.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

HINT:

At the time of installation, please refer to the following item.

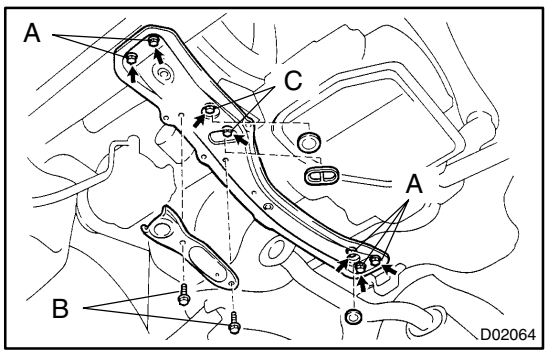
Replace the used nuts with new ones.

(d) Remove the 2 gaskets from the exhaust front pipe.

HINT:

At the time of installation, please refer to the following item.

Replace the used gaskets with new ones.



14. REMOVE FRONT CENTER MEMBER

(a) RHD:

Remove the nut and disconnect the suction hose from the front center member.

(b) Remove the 9 bolts, 3 grommets, front center member protector and front center member.

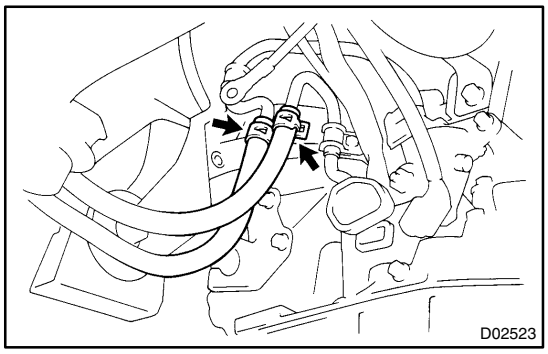
Torque:

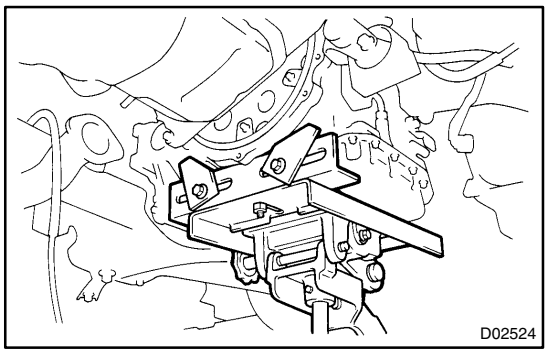
A: 73 N·m (740 kgf·cm, 54 ft·lbf)

B: 39 N·m (400 kgf·cm, 29 ft·lbf)

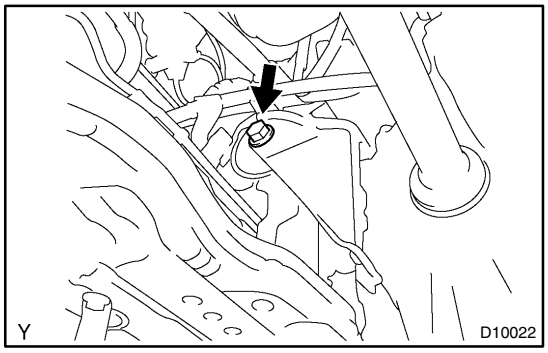
C: 72 N·m (740 kgf·cm, 53 ft·lbf)

15. DISCONNECT OIL COOLER HOSES

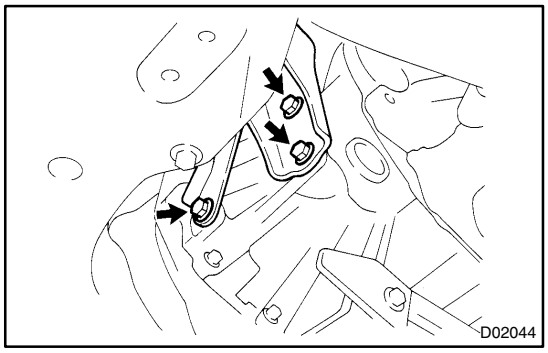




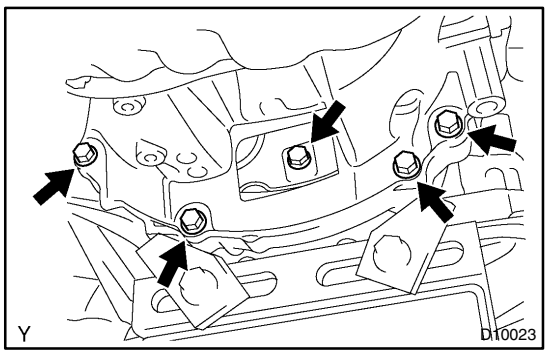
16. SUPPORT TRANSAXLE



17. REMOVE ENGINE REAR MOUNTING BOLT
Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)



18. REMOVE ENGINE REAR MOUNTING BRACKET
Remove the 3 bolts and engine rear mounting bracket.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



19. REMOVE TRANSAXLE
(a) Turn the crankshaft to gain access and remove the 6 bolts with holding the crankshaft pulley bolt by a wrench.
Torque: 41 N·m (420 kgf·cm, 30 ft·lbf)

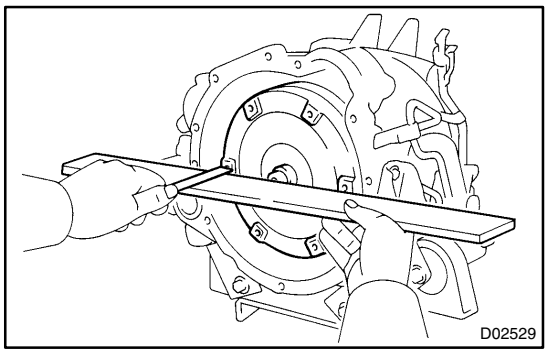
HINT:
At the time of installation, please refer to the following item.
First, install the gray bolt. Then install 5 black bolts.

(b) Remove the 4 bolts.
Torque: 46 N·m (470 kgf·cm, 34 ft·lbf)

(c) Lower the left side of the engine and remove the transaxle from the engine.

HINT:
At the time of installation, please refer to the following item.
Temporarily tighten the transaxle mounting bolts.

AX066–02



INSTALLATION

1. CHECK TORQUE CONVERTER INSTALLATION

Using a scale and a straight edge, measure the distance from the installation surface to the front surface of the transaxle housing.

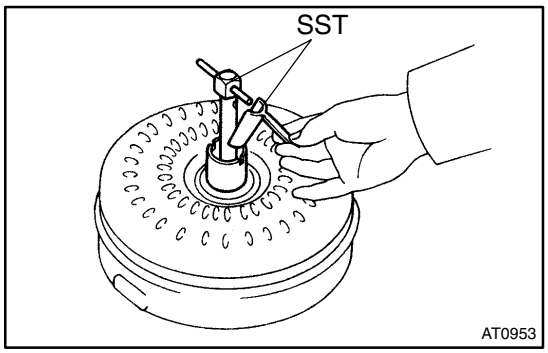
Correct distance: More than 12.75 mm (0.502 in.)

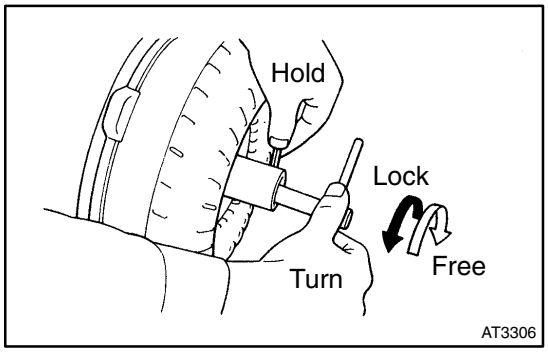
2. TRANSAXLE INSTALLATION

Installation is in the reverse order of removal (See page AX–34).

HINT:

- After installation, adjust the shift control cable and neutral start switch (See page DI–62).
- Fill ATF and check fluid level (See page DI–62).
- Perform the test drive of the vehicle (See page DI–62).





TORQUE CONVERTER AND DRIVE PLATE

INSPECTION

AX067–02

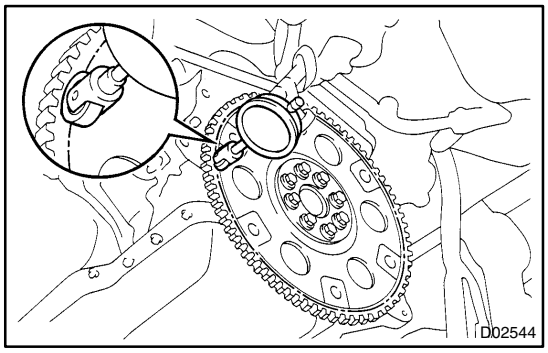
1. INSPECT ONE–WAY CLUTCH

(a) Install SST into the inner race of the one–way clutch.
SST 09350–32014 (09351–32010)

(b) 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)

(c) With the torque converter set up on its side, check that the clutch locks when it is turned counterclockwise, and rotates smoothly clockwise.

If necessary, clean the converter and retest the clutch.
Replace the converter if the clutch still fails the test.



2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

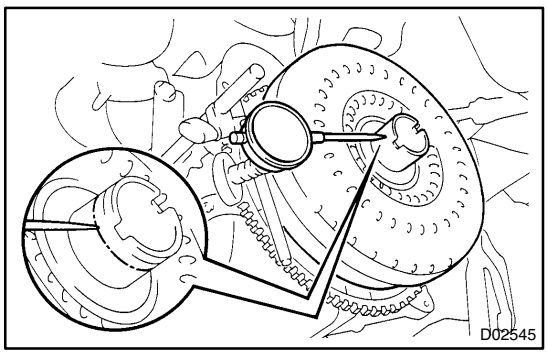
(a) Set up a dial indicator and measure the drive plate runout.

(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.

Torque: 98 N·m (1,000 kgf·cm 72 ft·lbf)



3. MEASURE TORQUE CONVERTER SLEEVE RUNOUT

Temporarily mount the torque converter to the drive plate. Set up a dial indicator and measure the torque converter sleeve runout.

Maximum runout: 0.30 mm (0.0118 in.)

If the runout is not within the specification, try to correct by reorienting the installation of the converter.

HINT:

Mark the position of the converter to ensure the correct installation.

SUSPENSION AND AXLE

FRONT DRIVE SHAFT SA–1
FRONT SHOCK ABSORBER SA–13

REFER TO FOLLOWING REPAIR MANUALS:

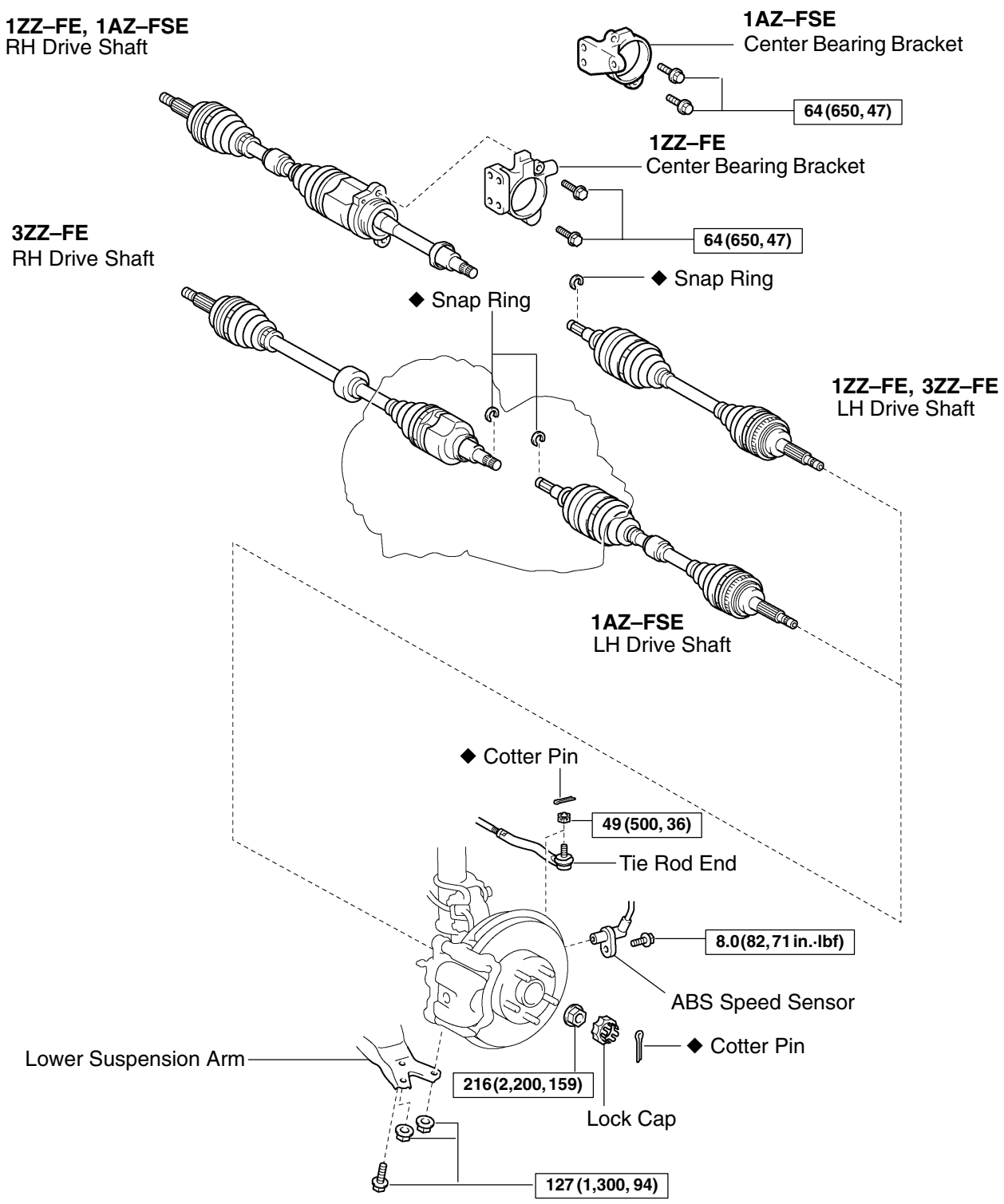
Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

NOTE: The above pages contain only the points which differ from the above listed manuals.

FRONT DRIVE SHAFT

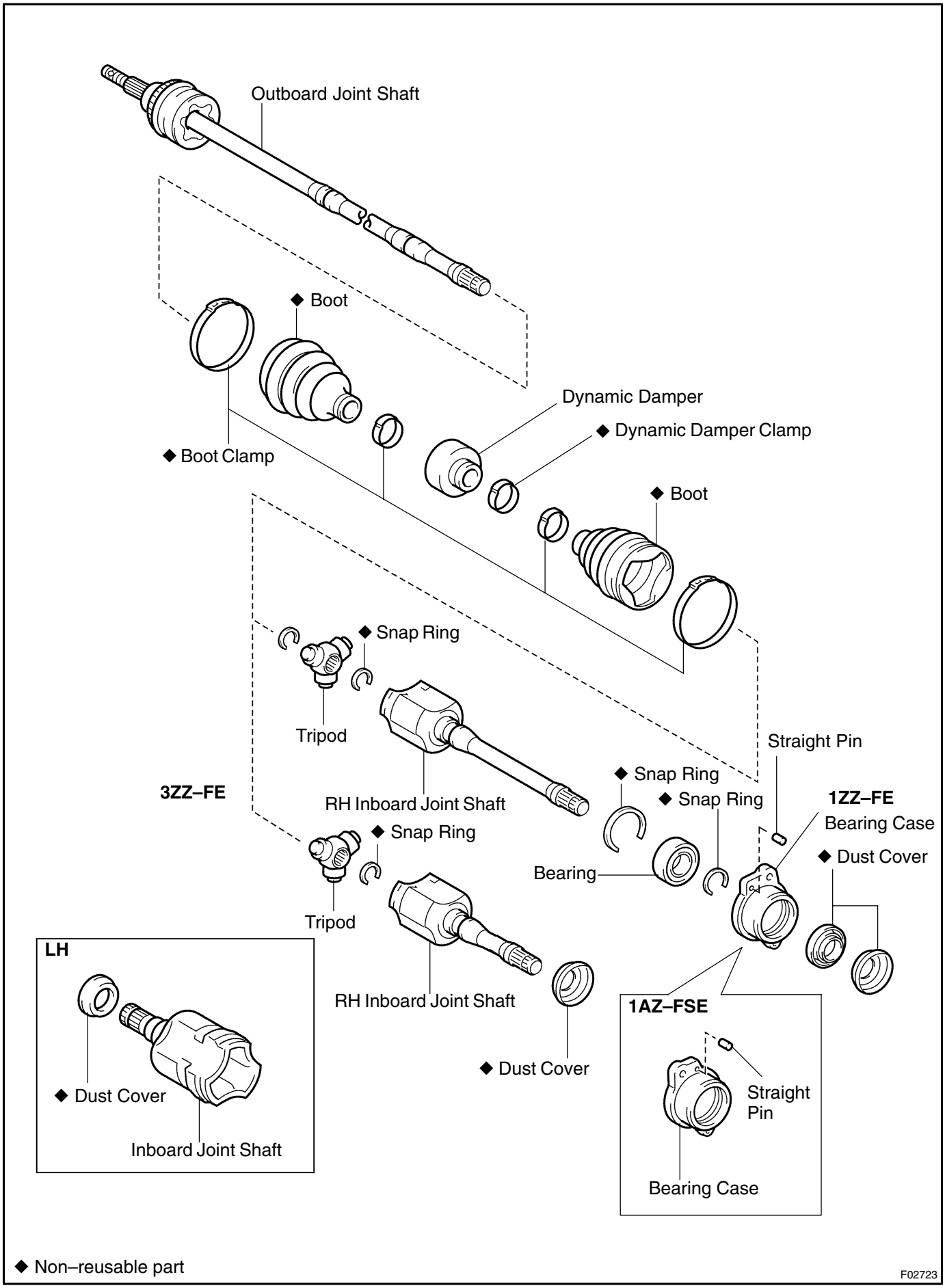
COMPONENTS

SA109–03



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

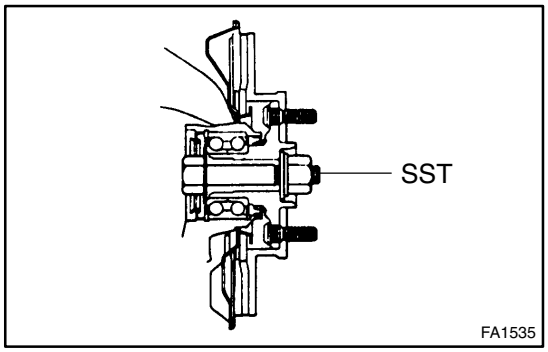
F12734



◆ Non–reusable part

F02723

SA10A–03



REMOVAL

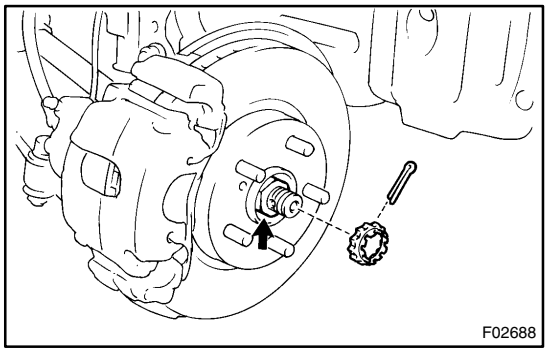
NOTICE:

- **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 the SST.
  SST 09608–16042 (09608–02021, 09608–02041)
- **w/ ABS:**
  After disconnecting the drive shaft from the axle hub, work carefully so as not to damage the ABS speed sensor rotor serration on the drive shaft.

1. REMOVE FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. DRAIN OUT GEAR OIL (M/T) OR ATF (A/T)

3. w/ ABS:
REMOVE BOLT AND ABS SPEED SENSOR
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)



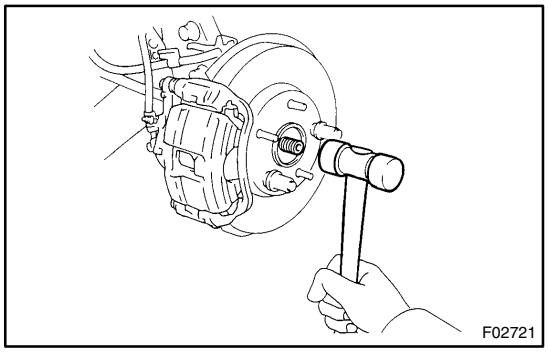
4. REMOVE DRIVE SHAFT LOCK NUT

(a) Remove the cotter pin and lock cap.

(b) While applying the brakes, remove the nut.
Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)

5. DISCONNECT TIE ROD END FROM STEERING KNUCKLE (See Pub. No. RM599E on page SA 36)

6. DISCONNECT LOWER BALL JOINT FROM LOWER SUSPENSION ARM (See Pub. No. RM599E on page SA–36)



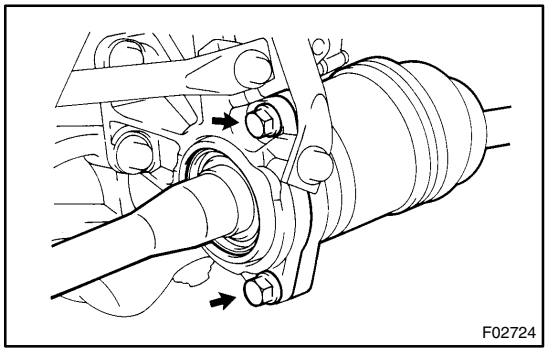
7. DISCONNECT DRIVE SHAFT FROM AXLE HUB

(a) Using a plastic hammer, disconnect the drive shaft from the axle hub.

NOTICE:

Cover the drive shaft boot and ABS speed sensor rotor with cloth to protect it from being damaged.

(b) Push the front axle hub toward the outside of the vehicle to separate the drive shaft from the axle hub.



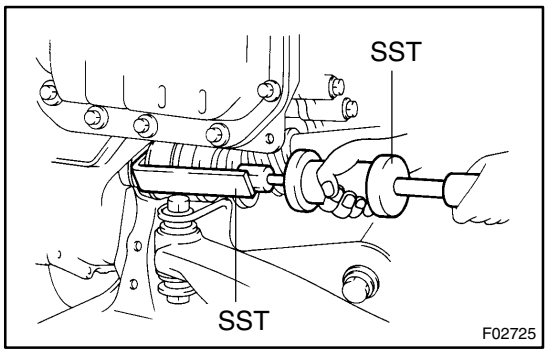
8. RH drive shaft of 1ZZ–FE and 1AZ–FSE engine: REMOVE DRIVE SHAFT

Remove the 2 bolts and pull out the drive shaft together with the center bearing bracket.

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

HINT:

At the time of installation, coat gear oil to the inboard joint shaft and differential case sliding surface.



9. 3ZZ–FE engine:
REMOVE DRIVE SHAFT

(a) Using SST, remove the drive shaft.
SST 09520–01010, 09520–24010 (09520–32040)

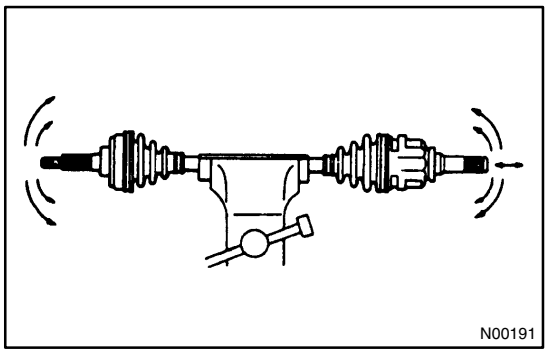
(b) Using a screwdriver, remove the snap ring.

HINT:

At the time of installation, please refer to the following items.

- Apply gear oil to the inboard joint shaft and differential case sliding surface.
- Before installing the drive shaft, set the snap ring with its opening side facing downward.
- Whether inboard joint shaft is in contact with pinion shaft or not can be known from the sound or feeling.
- After installation, check that there is 2 – 3 mm (0.08 – 0.12 in.) of play in the axial direction.
- After installation, check that the drive shaft cannot be removed by hand.

SA10B–03


N00191

DISASSEMBLY

1. CHECK DRIVE SHAFT

(a) Check to see that there is no obvious play in the outboard joint.

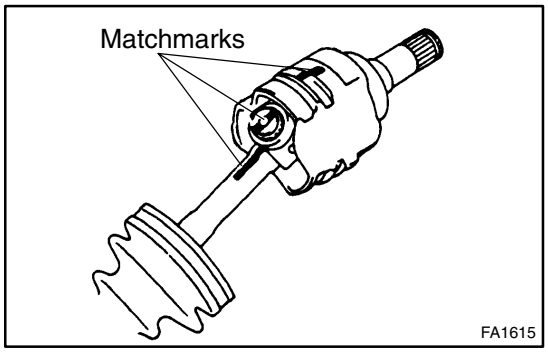
(b) Check to see that the inboard joint slides smoothly in the thrust direction.

(c) Check to see that there is no obvious play in the radial direction of the inboard joint.

(d) Check the boots for damage.

2. REMOVE INBOARD AND OUTBOARD JOINT BOOT CLAMPS

Using a side cutter, cut the 4 boots clamps and remove them.



FA1615

3. REMOVE INBOARD JOINT SHAFT

(a) Place matchmarks on the tripod, inboard and outboard joint shafts.

NOTICE:

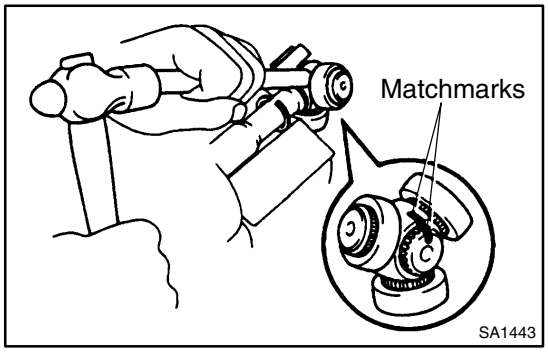
Do not punch the marks.

(b) Remove the inboard joint shaft from the outboard joint shaft.

4. REMOVE TRIPOD

(a) Using a snap ring expander, remove the snap ring.

(b) Using a snap ring expander, temporarily slide the snap ring toward the outboard joint shaft side.



SA1443

(c) Place matchmarks on the outboard joint shaft and tripod.

NOTICE:

Do not punch the marks.

(d) Using a brass bar and hammer, remove the tripod from the drive shaft.

NOTICE:

Do not tap the roller.

(e) Using a snap ring expander, remove the snap ring.

5. REMOVE INBOARD JOINT BOOT

6. REMOVE DYNAMIC DAMPER

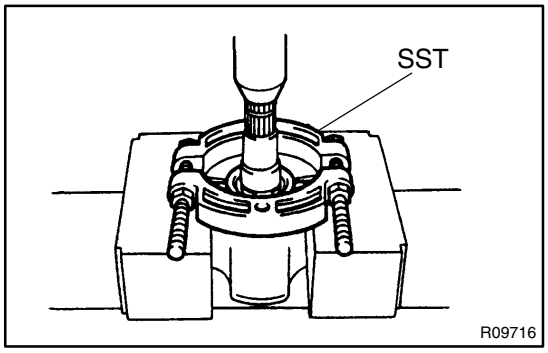
(a) Using a side cutter, cut the dynamic damper clamp and remove it.

(b) Remove the dynamic damper.

7. REMOVE OUTBOARD JOINT BOOT

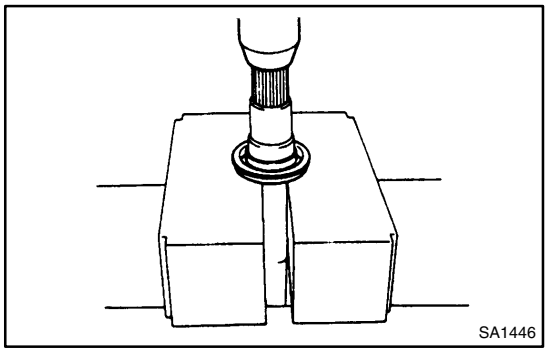
NOTICE:

Do not disassemble the outboard joint.

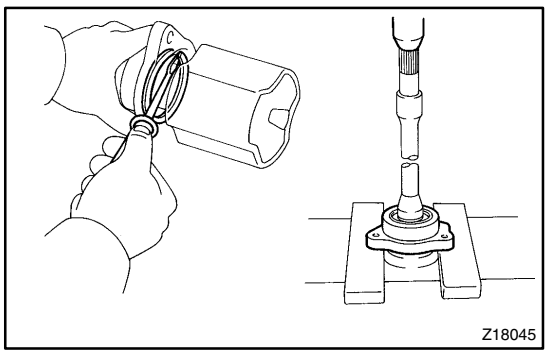


8. REMOVE DUST COVER

(a) RH drive shaft of 3ZZ–FE engine and LH drive shaft:
Using SST and a press, remove the dust cover from the inboard joint shaft.
SST 09950–00020



(b) RH drive shaft of 1ZZ–FE and 1AZ–FSE engine:
Using a press, remove the dust cover from the inboard joint shaft.

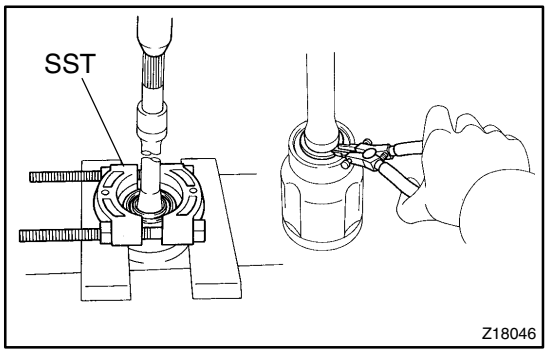


9. RH drive shaft of 1ZZ–FE and 1AZ–FSE engine: DISASSEMBLE INBOARD JOINT SHAFT

(a) Using a screwdriver, remove the snap ring.

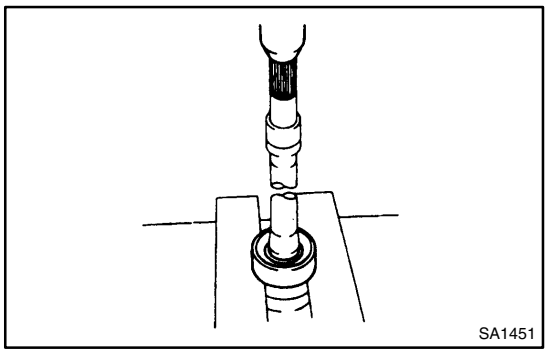
(b) Using a press, remove the bearing case.

(c) Using a pin punch and hammer, remove the straight pin from the bearing case.



(d) Using SST and a press, remove the dust cover.
SST 09950–00020

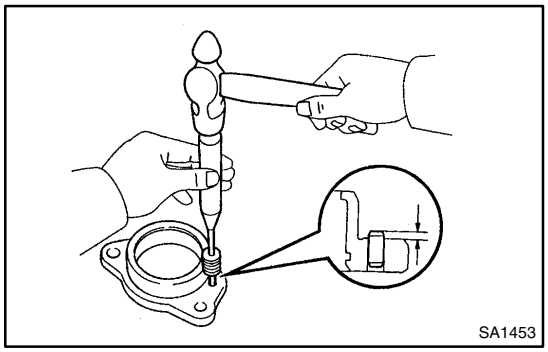
(e) Using a snap ring expander, remove the snap ring.



(f) Using a press, remove the bearing.

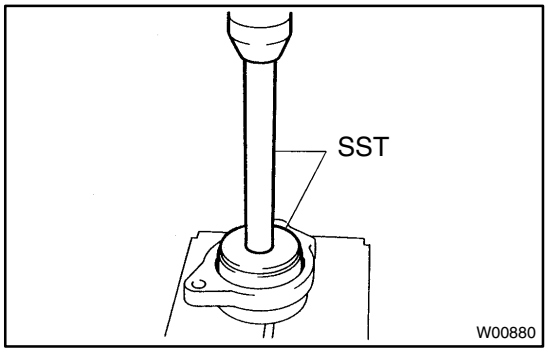
SA10C–03

REASSEMBLY



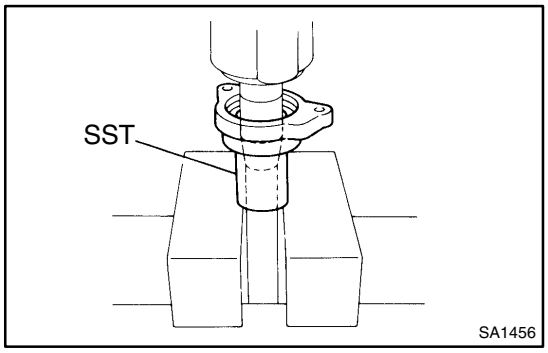
1. RH drive shaft of 1ZZ–FE and 1AZ–FSE engine: ASSEMBLE INBOARD JOINT SHAFT

(a) Using a pin punch and hammer, install the straight pin into the bearing case.



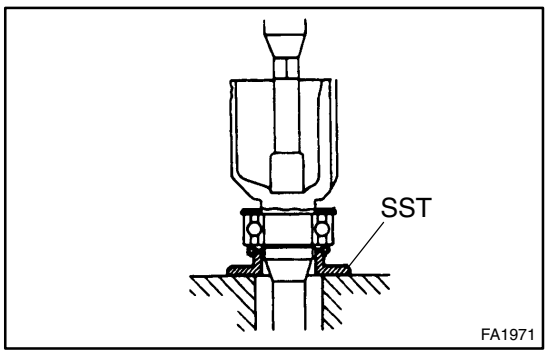
(b) Using SST and a press, install a new bearing into the bearing case.
SST 09950–60010 (09951–00640), 09950–70010 (09951–07150)

(c) Using a screwdriver, install a new snap ring.

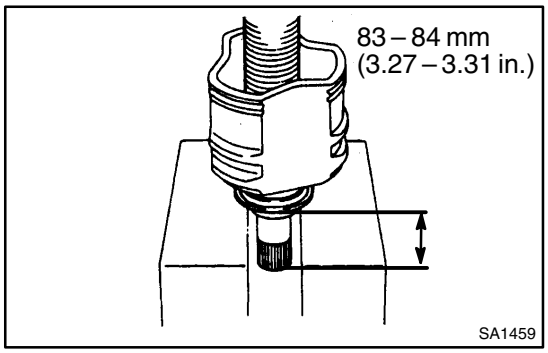


(d) Using SST and a press, install the bearing case assembly to the inboard joint shaft.
SST 09710–30021 (09710–03141)

(e) Using a snap ring expander, install a new snap ring.

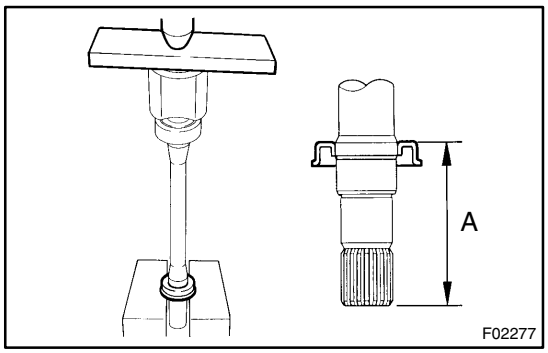


(f) Using SST, an extension bar and press, install a new dust cover.
SST 09506–35010



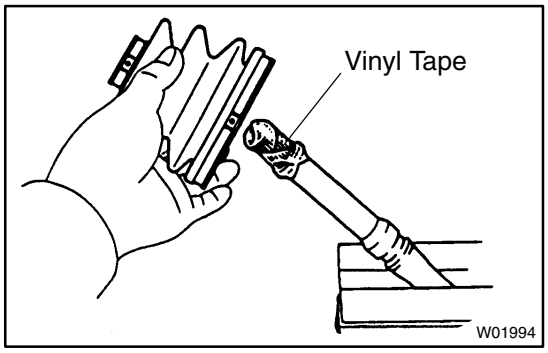
2. INSTALL NEW DUST COVER

(a) RH drive shaft of 3ZZ–FE engine:
Using a steel plate and 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.



(b) RH drive shaft of 1ZZ–FE and 1AZ–FSE engine:
Using a steel plate and 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.

A:
1ZZ–FE Engine M/T:
86 – 87 mm (3.39 – 3.43 in.)
1ZZ–FE Engine A/T:
83 – 84 mm (3.27 – 3.31 in.)
1AZ–FSE Engine:
87 – 88 mm (3.43 – 3.46 in.)



3. TEMPORARILY INSTALL NEW OUTBOARD AND INBOARD JOINT BOOTS WITH NEW BOOT CLAMPS

HINT:

- Before installing the boots (and dynamic damper), wrap the spline of the outboard joint shaft with vinyl tape to prevent them from being damaged.
- Before installing the boots (and dynamic damper), place new clamps to each of them and then install boots to drive shaft.

(a) Temporarily install a new outboard joint boot with 2 clamps to the drive shaft.

(b) w/ Dynamic damper:
Temporarily install the dynamic damper with clamp to the drive shaft.

(c) Temporarily install a new inboard joint boot with 2 clamps to the drive shaft.

4. INSTALL TRIPOD

(a) Using a snap ring expander, install a new snap ring.

(b) Place the beveled side of the tripod axial spline toward the outboard joint.

(c) Align the matchmarks placed before removal.

(d) Using a brass bar and hammer, tap in the tripod to the drive shaft.

NOTICE:
Do not tap the roller.

(e) Using a snap ring expander, install a new snap ring.

5. INSTALL BOOT TO OUTBOARD JOINT

Before assembling the boot, pack the outboard joint shaft and boot with grease in the boot kit.

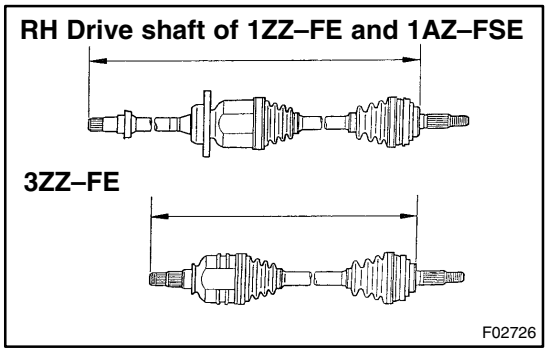
Grease capacity: (Color = Black)
85 – 105 g (3.00 – 3.70 oz.)

6. INSTALL INBOARD JOINT SHAFT TO OUTBOARD JOINT SHAFT

(a) Pack the inboard joint shaft and boot with grease in the boot kit.

Grease capacity: (Color = Yellow)
1ZZ–FE engine:
140 – 150 g (4.94 – 5.29 oz.)
3ZZ–FE engine:
125.5 – 135.5 g (4.43 – 4.78 oz.)
1AZ–FSE engine:
120 – 130 g (4.23 – 4.59 oz.)

(b) Align the matchmarks placed before removal.
(c) Install the inboard joint shaft to the outboard joint shaft.
(d) Temporarily install the boot to the inboard joint shaft.



7. ASSEMBLE BOOT CLAMPS TO BOTH BOOTS

(a) Make sure that the 2 boots are on the shaft groove.
(b) Make sure that the 2 boots are not stretched or contracted when the drive shaft is at standard length.

Drive shaft standard length:
1ZZ–FE engine M/T:

RH	943.60 ± 1.0 mm (37.15 ± 0.039 in.)
LH	657.90 ± 0.8 mm (25.90 ± 0.032 in.)

1ZZ–FE engine A/T:

RH	943.60 ± 1.0 mm (37.15 ± 0.039 in.)
LH	653.20 ± 0.8 mm (25.72 ± 0.032 in.)

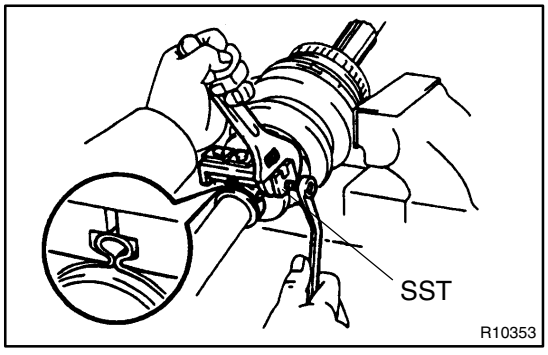
3ZZ–FE engine:

RH	944.70 ± 0.8 mm (37.19 ± 0.032 in.)
LH	655.70 ± 0.8 mm (25.82 ± 0.032 in.)

1AZ–FSE engine:

RH	922.65 ± 1.0 mm (36.32 ± 0.039 in.)
LH	650.85 ± 0.7 mm (25.62 ± 0.028 in.)

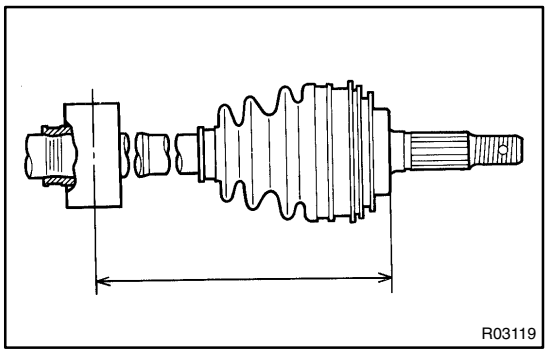
(c) Secure the clamps onto the boot.



(d) Place SST onto the clamps.
SST 09521–24010
(e) Tighten the SST so that the clamps are pinched.

NOTICE:
Do not overtighten the SST.

(f) Using SST, adjust the clearance of the clamps.
SST 09240–00020
Clearance: 1.9 mm (0.075 in.) or less

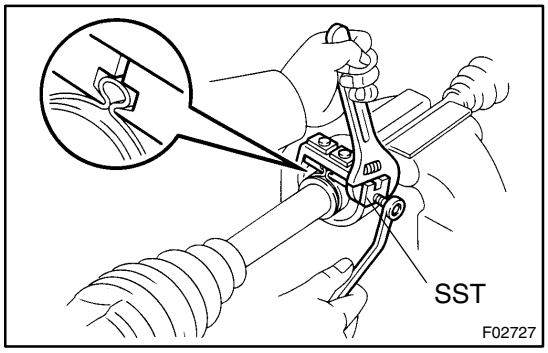


8. RH drive shaft of 3ZZ–FE engine:
ASSEMBLE DAMPER CLAMP

(a) Make sure that the dynamic damper is on the shaft groove.

(b) Set the distance, as described below.
Distance: 432.1 ± 2.0 mm (17.012 ± 0.079 in.)

(c) Secure the clamp onto the damper.



(d) Place SST onto the clamps.
SST 09521–24010

(e) Tighten the SST so that the clamps are pinched.

NOTICE:
Do not overtighten the SST.

(f) Using SST, adjust the clearance of the clamps.
SST 09240–00020
Clearance: 1.9 mm (0.075 in.) or less

9. CHECK DRIVE SHAFT (See page SA–5)

SA02Z–04

INSTALLATION

Installation is in the reverse order of removal (See page SA–3).

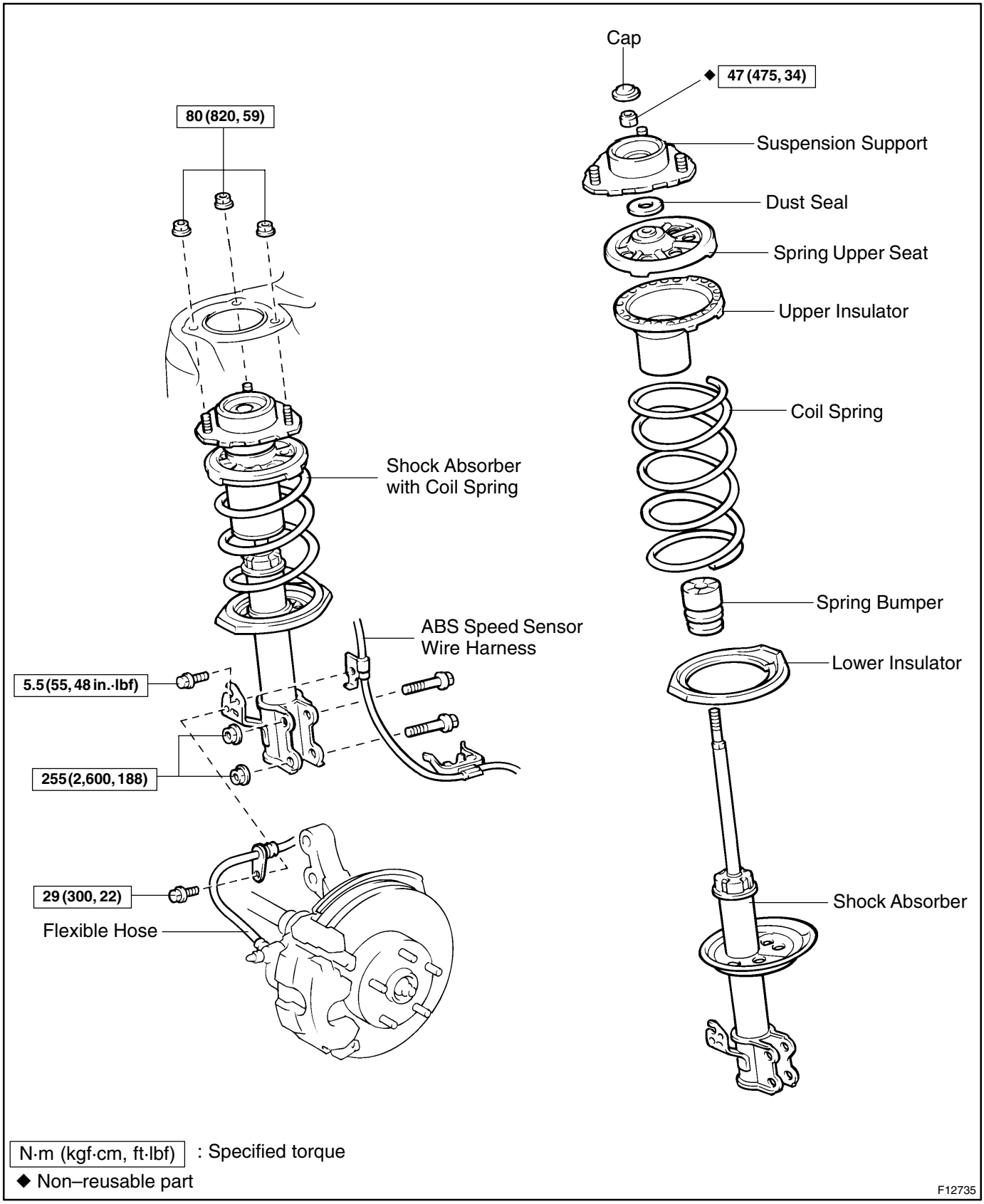
HINT:

After installation, check the ABS speed sensor signal and front wheel alignment (See Pub. No. RM599E on page SA–4).

FRONT SHOCK ABSORBER

SA10J–06

COMPONENTS



SA10K–03

REMOVAL

1. REMOVE FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. DISCONNECT ABS SPEED SENSOR WIRE HARNESS CLAMPS FROM SHOCK ABSORBER

Remove the bolt and disconnect the ABS speed sensor wire harness clamps.

Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

3. DISCONNECT FLEXIBLE HOSE

Remove the bolt and disconnect the flexible hose from the shock absorber bracket.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

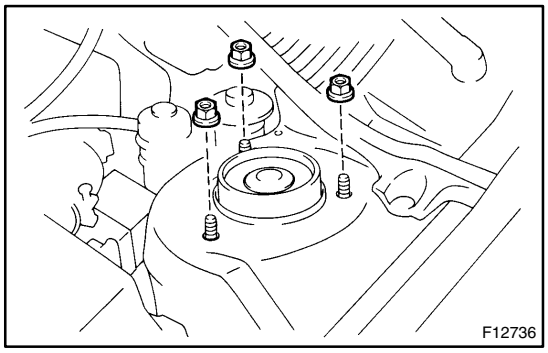
4. REMOVE SHOCK ABSORBER WITH COIL SPRING

(a) Loosen the 2 nuts on the lower side of shock absorber.

Torque: 255 N·m (2,600 kgf·cm, 188 ft·lbf)

HINT:

Do not remove the 2 bolts.



(b) Remove the 3 nuts.

Torque: 80 N·m (820 kgf·cm, 59 ft·lbf)

(c) Remove the 2 nuts and bolts on the lower side of shock absorber.

HINT:

At the time of installation, coat the nut's thread with engine oil.

(d) Remove the shock absorber with coil spring.

SA10P–05

INSTALLATION

Installation is in the reverse order of removal (See page SA–14).

HINT:

After installation, check the front wheel alignment (See Pub. No. RM599E on page SA–4).

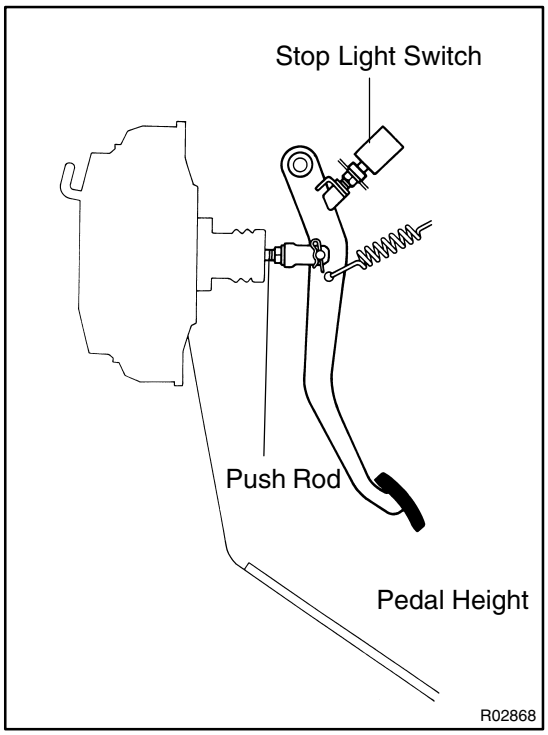
BRAKE

BRAKE PEDAL BR–1

REFER TO FOLLOWING REPAIR MANUALS:

Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

NOTE: The above pages contain only the points which differ from the above listed manuals.



BRAKE PEDAL

BR0KI–06

ON–VEHICLE INSPECTION

1. CHECK PEDAL HEIGHT

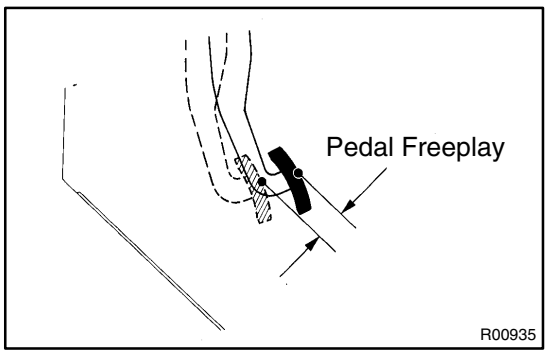
Pedal height from asphalt sheet:
(LHD)
147.0 – 157.0 mm (5.787 – 6.181 in.)
(RHD)
149.5 – 159.5 mm (5.886 – 6.280 in.)

If the pedal height is incorrect, adjust it.

2. RHD:

IF NECESSARY, ADJUST PEDAL HEIGHT

(a) Disconnect the connector from the stop light switch.
(b) Loosen the stop light switch lock nut and remove the stop light switch.
(c) Loosen the push rod lock nut.
(d) Adjust the pedal height by turning the pedal push rod.
(e) Tighten the push rod lock nut.
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)
(f) Install the stop light switch.
(g) Push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), turn the stop light switch and lock the nut in the position where the stop light goes off.
(h) Connect the connector to the stop light switch.
(i) After installation, push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), check that stop light lights up.
(j) After adjusting the pedal height, check the pedal freeplay.

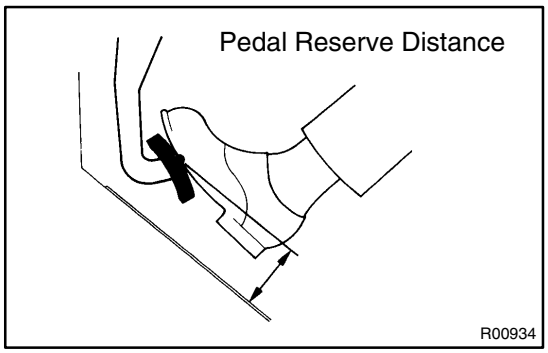


3. CHECK PEDAL FREEPLAY

(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 by hand until the resistance begins to be felt, then measure the distance.
Pedal freeplay: 1 – 6 mm (0.04 – 0.24 in.)

HINT:
The freeplay to the 1st resistance is due to the play between the clevis and pin. This is magnified up to 1 – 3 mm (0.04 – 0.12 in.) at the pedal.

- If incorrect, check the stop light switch clearance.
- If the clearance is OK, then troubleshoot the brake system.



4. CHECK PEDAL RESERVE DISTANCE

Release the parking brake. With the 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):
LHD Gasoline engine (w/o ABS)
More than 70 mm (2.76 in.)
LHD others
More than 55 mm (2.17 in.)
RHD Gasoline engine (w/o ABS)
More than 90 mm (3.54 in.)
RHD others
More than 75 mm (2.95 in.)

If the reserve distance is incorrect, troubleshoot the brake system.

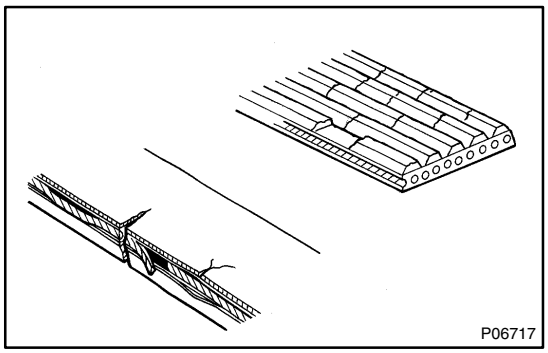
STEERING

DRIVE BELT SR–1
POWER STEERING FLUID SR–2
TILT STEERING COLUMN SR–6
POWER STEERING VANE PUMP
(1ZZ–FE, 3ZZ–FE) SR–8
POWER STEERING VANE PUMP
(1AZ–FSE) SR–19

REFER TO FOLLOWING REPAIR MANUALS:

Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

NOTE: The above pages contain only the points which differ from the above listed manuals.



DRIVE BELT

SR08H–06

INSPECTION

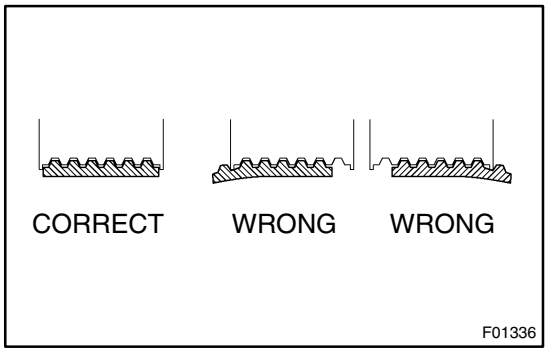
INSPECT DRIVE BELT

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 belt are considered acceptable. If the missing chunks from the ribs are found on the drive belt, it should be replaced.



- After installing a drive belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the drive belt has not slipped out of the groove on the bottom of the pulley.

POWER STEERING FLUID BLEEDING

SR08I–07

1. CHECK FLUID LEVEL (See page SR–3)

2. JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS

3. TURN STEERING WHEEL

With the engine stopped, turn the steering wheel slowly from lock to lock several times.

4. LOWER VEHICLE

5. START ENGINE

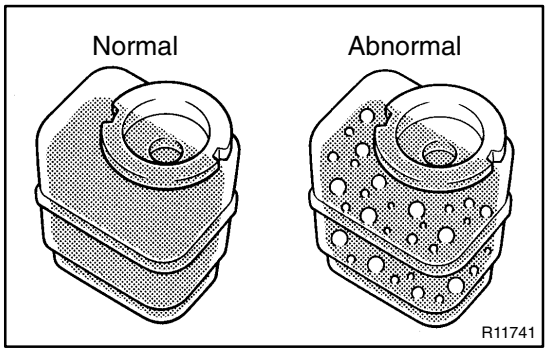
Run the engine at idle for a few minutes.

6. TURN STEERING WHEEL

(a) With the engine idling, turn the steering wheel to left or right full lock position and keep it there for 2–3 seconds, then turn the steering wheel to the opposite full lock position and keep it there for 2–3 seconds.

(b) Repeat (a) several times.

7. STOP ENGINE

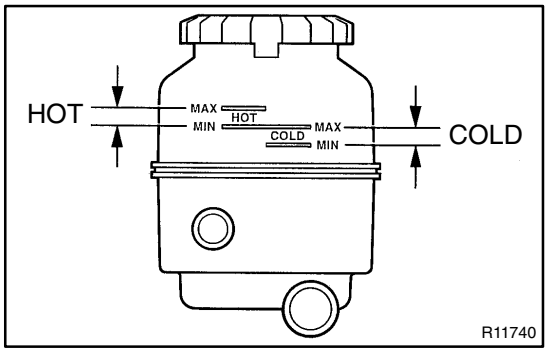


8. CHECK FOAMING OR EMULSIFICATION

If the system has to be bled twice specifically because of foaming or emulsification, check for fluid leaks in the system.

9. CHECK FLUID LEVEL (See page SR–3)

SR08J–05



INSPECTION

1. CHECK FLUID LEVEL

(a) Keep the vehicle level.

(b) With the engine stopped, check the fluid level in the oil reservoir.

If necessary, add fluid.

Fluid: ATF DEXRON® II or III

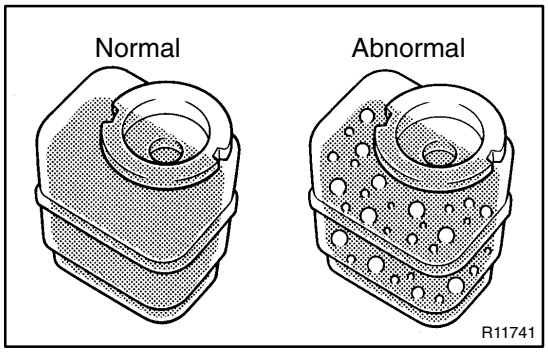
HINT:

Check that the fluid level is within the HOT LEVEL range on the reservoir. If the fluid is cold, check that it is within the COLD LEVEL range.

(c) Start the engine and run it at idle.

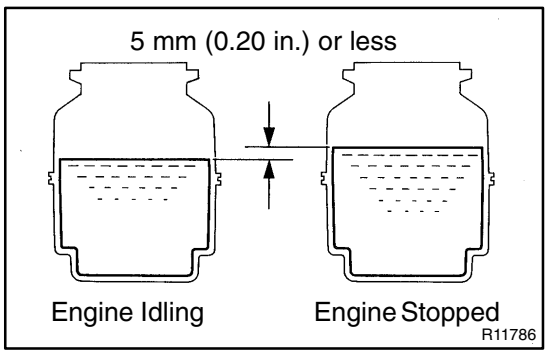
(d) Turn the steering wheel from lock to lock several times to boost fluid temperature.

Fluid temperature: 80˚C (176˚F)



(e) Check for foaming or emulsification.

If there is foaming or emulsification, bleed power steering system (See page SR–2).



(f) With the engine idling, measure the fluid level in the oil reservoir.

(g) Stop the engine.

(h) Wait a few minutes and remeasure the fluid level in the oil reservoir.

Maximum fluid level rise: 5 mm (0.20 in.)

If a problem is found, bleed power steering system (See page SR–2).

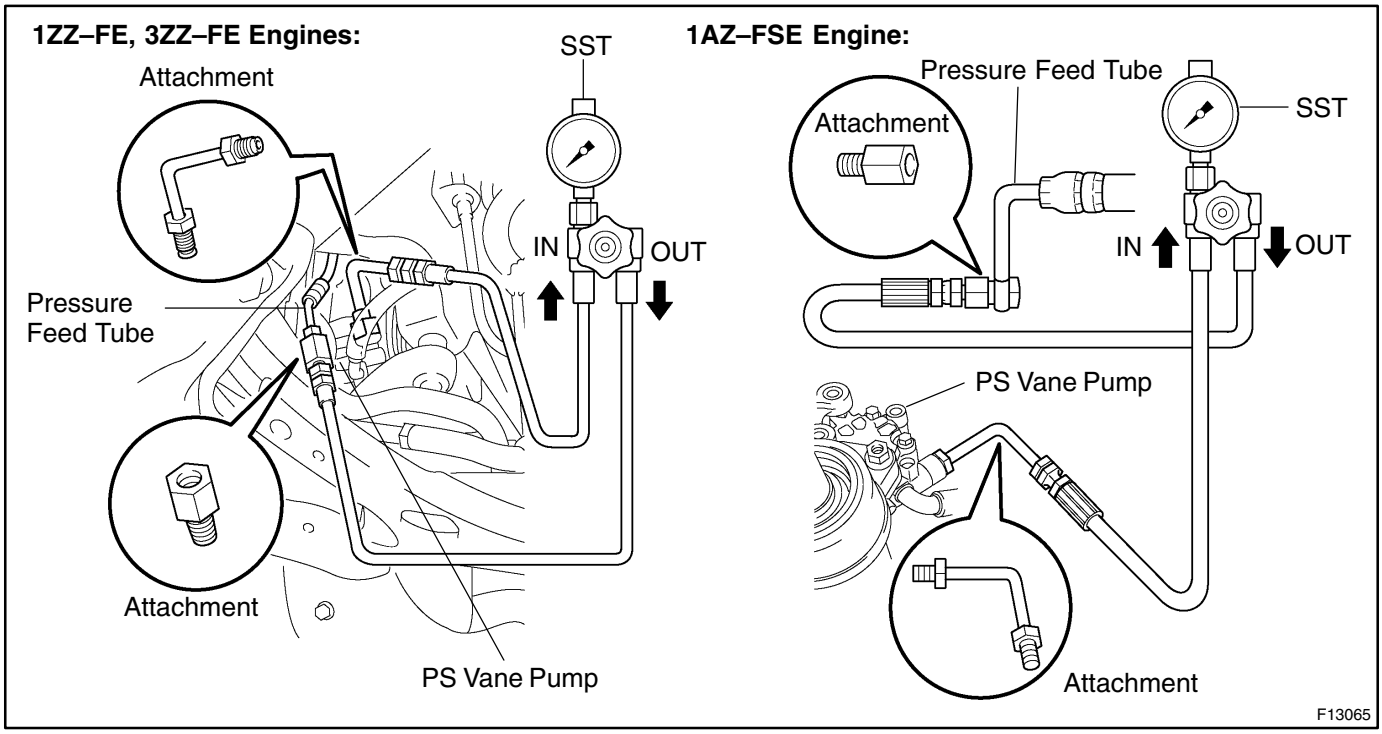
(i) Check the fluid level.

2. CHECK STEERING FLUID PRESSURE

(a) Disconnect the pressure feed tube from the PS vane pump.
(1ZZ–FE, 3ZZ–FE Engines: See page SR–10)
(1AZ–FSE Engine: See page SR–21)

(b) Connect SST, as shown in the illustration below.
SST 09640–10010 (09641–01010, 09641–01030, 09641–01060)

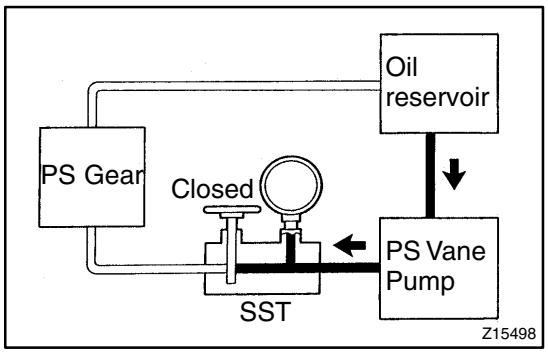
NOTICE:
Check that the valve of the SST is in the open position.



(c) Bleed the power steering system (See page SR–2).

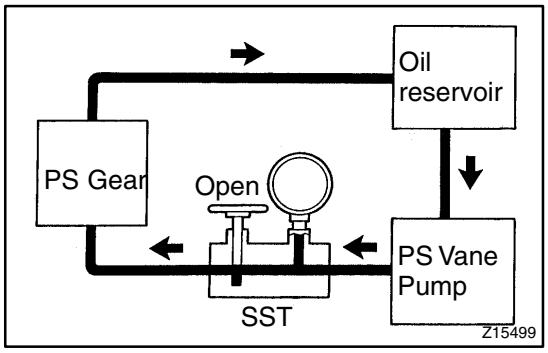
(d) Start the engine and run it at idle.

(e) Turn the steering wheel from lock to lock several times to boost fluid temperature.
Fluid temperature: 80 °C (176 °F)



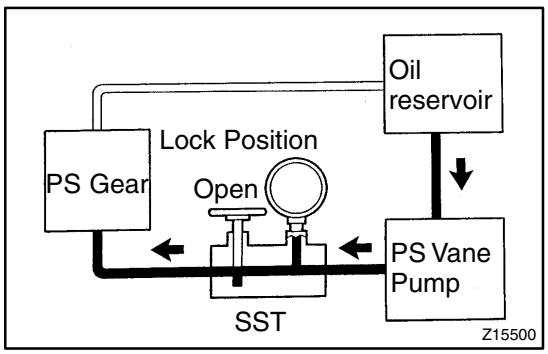
(f) With the engine idling, close the valve of the SST and observe the reading on the SST.
Minimum fluid pressure:
1ZZ–FE, 3ZZ–FE Engines:
8,300 kPa (85 kgf/cm^2, 1209 psi)
1AZ–FSE Engine:
8,800 kPa (90 kgf/cm^2, 1280 psi)

NOTICE:
- **Do not keep the valve closed for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**



(g) With the engine idling, open the valve fully.
(h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.
Difference fluid pressure:
490 kPa (5 kgf/cm^2, 71 psi) or less

NOTICE:
Do not turn the steering wheel.



(i) With the engine idling and valve fully opened, turn the steering wheel to full lock.
Minimum fluid pressure:
1ZZ–FE, 3ZZ–FE Engines:
8,300 kPa (85 kgf/cm^2, 1209 psi)
1AZ–FSE Engine:
8,800 kPa (90 kgf/cm^2, 1280 psi)

NOTICE:
- **Do not maintain lock position for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**

(j) Disconnect the SST.
SST 09640–10010 (09641–01010, 09641–01030, 09641–01060)
(k) Connect the pressure feed tube to the PS vane pump.
(1ZZ–FE, 3ZZ–FE Engines: See page SR–18)
(1AZ–FSE Engine: See page SR–29)
(l) Bleed the power steering system (See page SR–2).

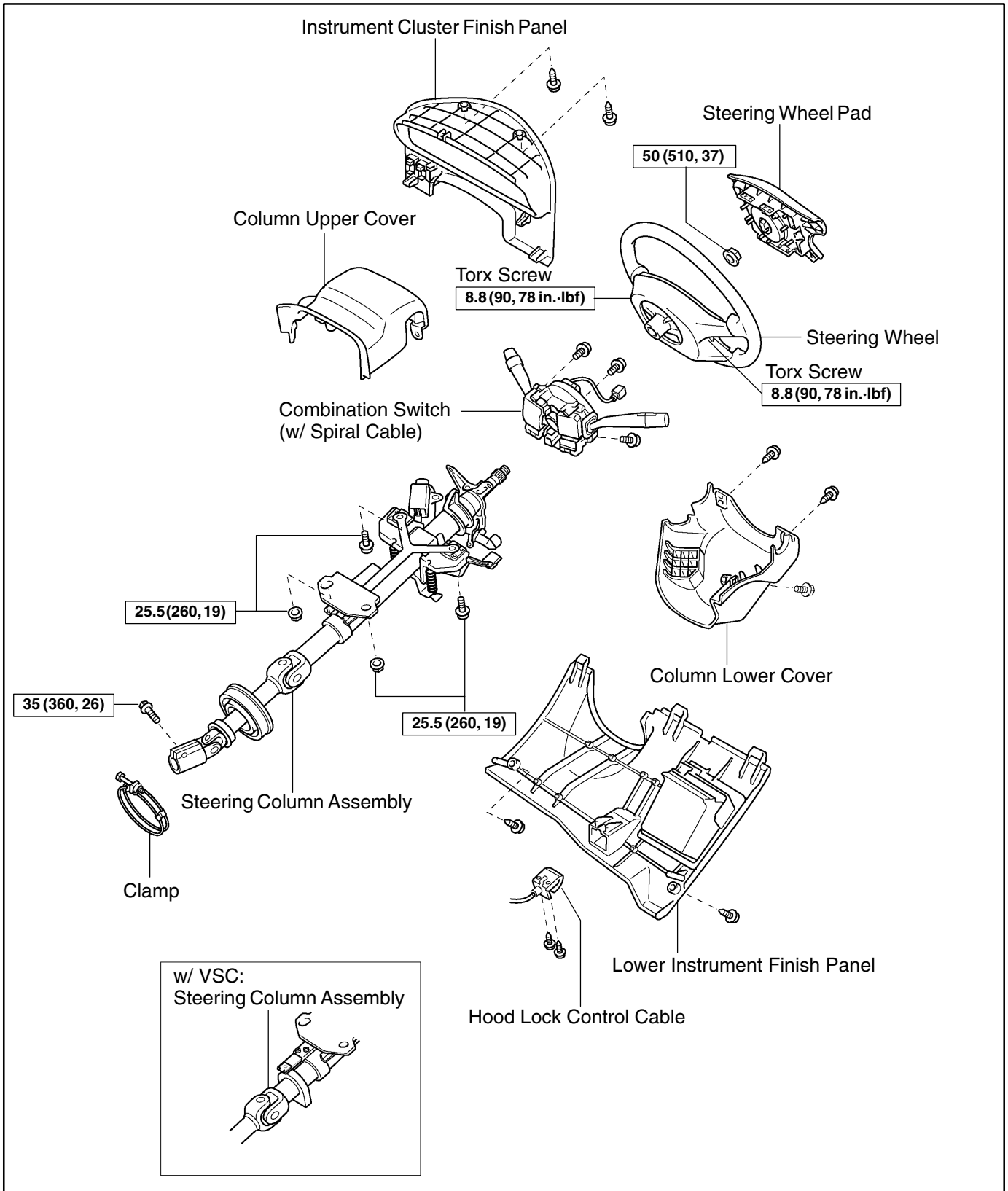
TILT STEERING COLUMN

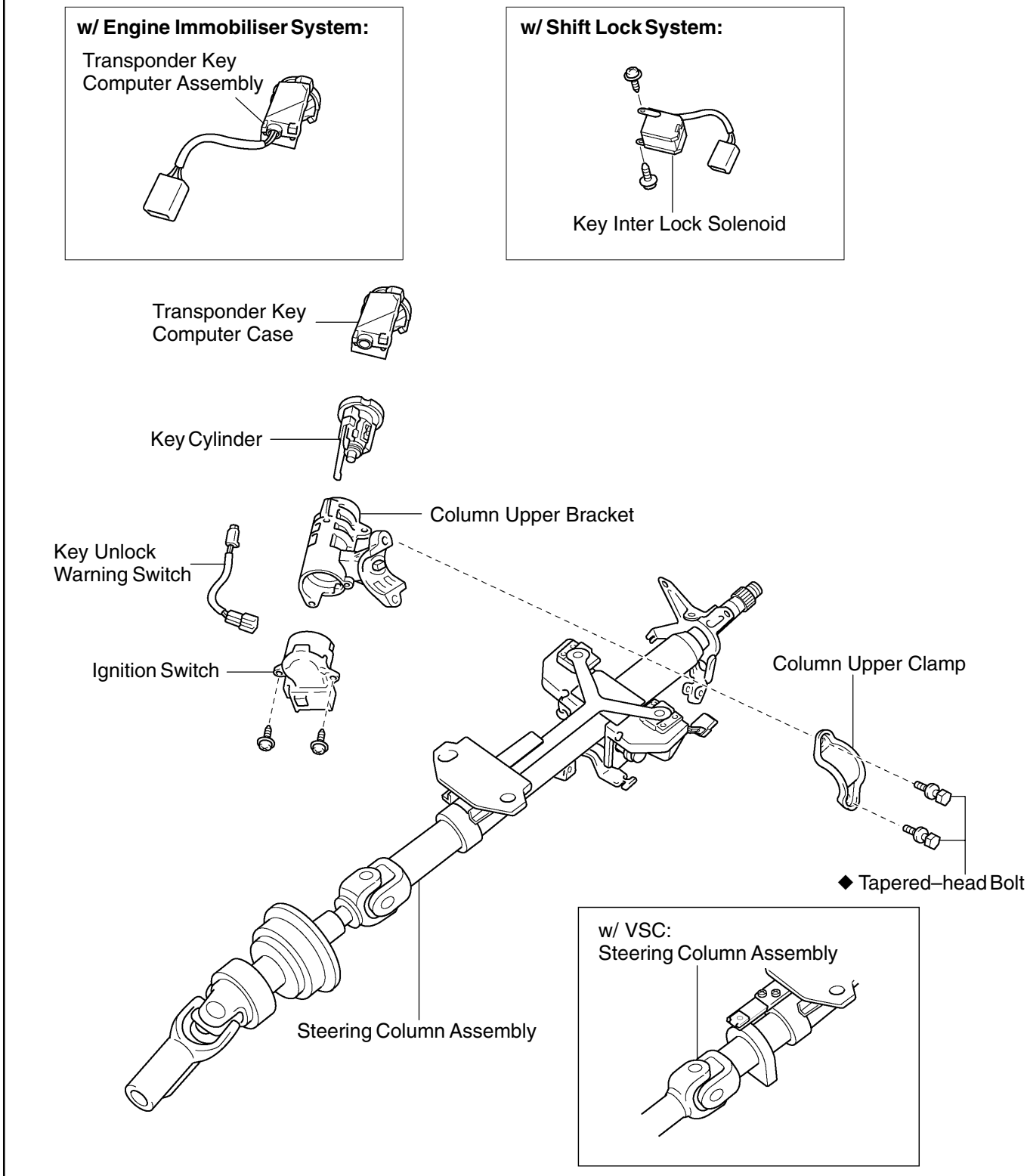
COMPONENTS

SR0IB–02

HINT:

If the steering column assembly (w/ VSC) is removed or replaced, calibrate the steering angle sensor zero point (See page DI–171).

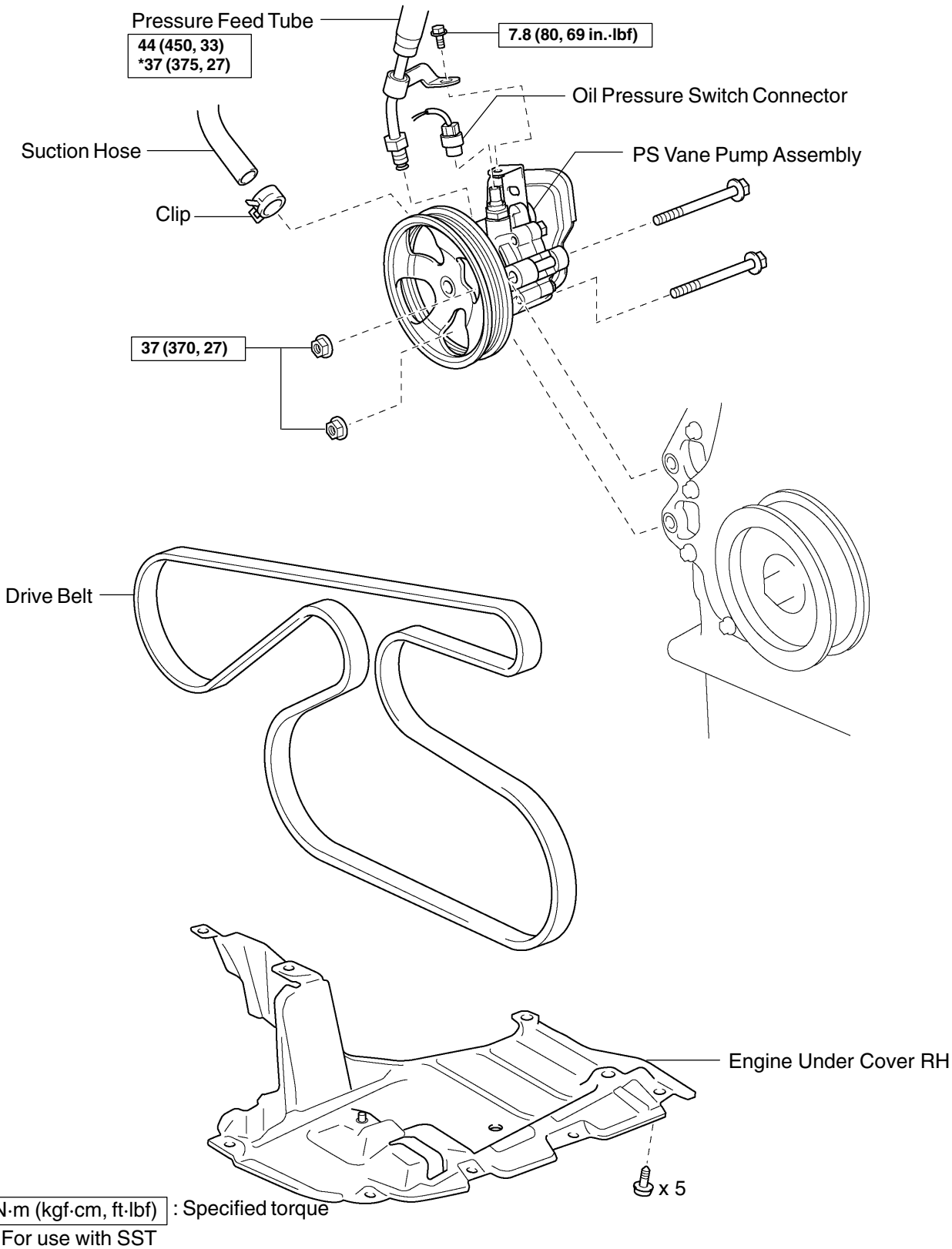


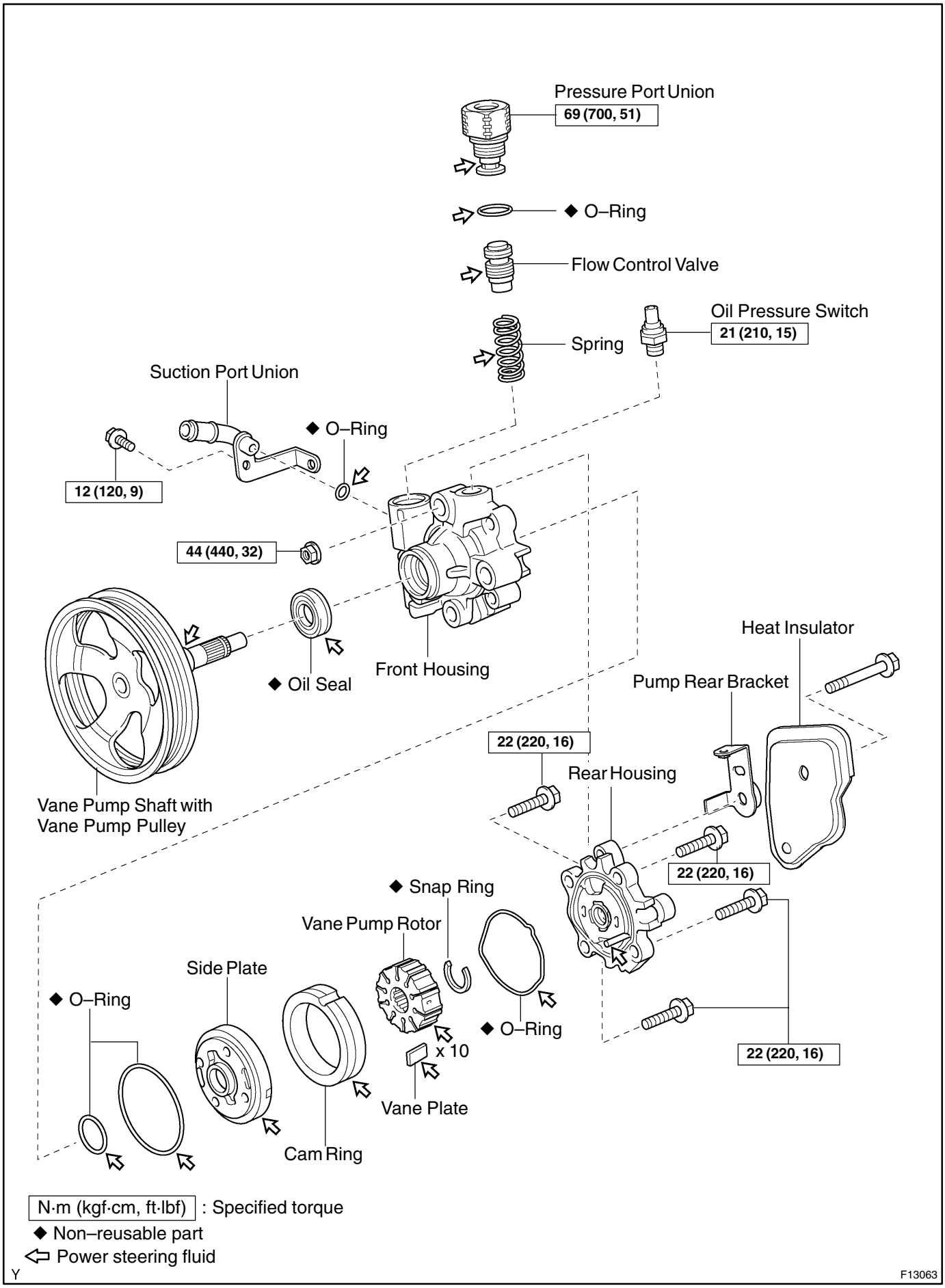

w/ Engine Immobiliser System:
Transponder Key Computer Assembly
w/ Shift Lock System:
Key Inter Lock Solenoid
Transponder Key Computer Case
Key Cylinder
Column Upper Bracket
Key Unlock Warning Switch
Ignition Switch
Column Upper Clamp
◆ Tapered–head Bolt
w/ VSC:
Steering Column Assembly
Steering Column Assembly
Y
◆ Non–reusable part
F13067

POWER STEERING VANE PUMP (1ZZ–FE, 3ZZ–FE)

SR0YO–05

COMPONENTS



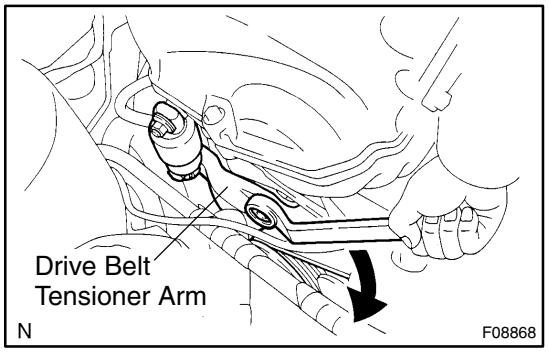

Pressure Port Union
69 (700, 51)
◆ O–Ring
Flow Control Valve
Oil Pressure Switch
21 (210, 15)
Spring
Suction Port Union
◆ O–Ring
12 (120, 9)
44 (440, 32)
◆ Oil Seal
Front Housing
Heat Insulator
Pump Rear Bracket
22 (220, 16)
Rear Housing
Vane Pump Shaft with
Vane Pump Pulley
◆ Snap Ring
Vane Pump Rotor
22 (220, 16)
Side Plate
◆ O–Ring
◆ O–Ring
x 10
Vane Plate
22 (220, 16)
Cam Ring
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
Power steering fluid
Y
F13063

SR0YP–02

REMOVAL

1. REMOVE ENGINE UNDER COVER RH

Remove the 5 bolts and engine under cover RH.



2. REMOVE DRIVE BELT

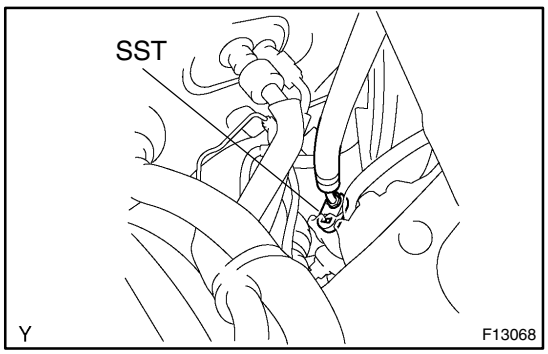
Loosen the drive belt tension by turning the drive belt tensioner arm clockwise, and remove the drive belt.

3. DISCONNECT SUCTION HOSE

Remove the clip and disconnect the suction hose.

NOTICE:

Take care not to spill fluid on the drive belt.



4. DISCONNECT PRESSURE FEED TUBE

(a) Using SST, disconnect the pressure feed tube.
SST 09023–12700

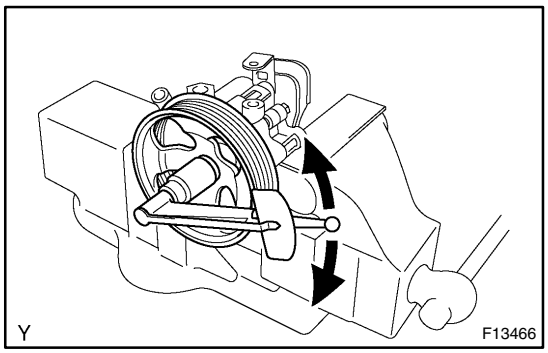
(b) Remove the bolt and disconnect the pressure feed tube clamp.

5. DISCONNECT OIL PRESSURE SWITCH CONNECTOR

6. REMOVE PS VANE PUMP ASSEMBLY

Remove the 2 pump assembly set bolts, nuts and PS vane pump assembly.

SR0VS–07



DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. MEASURE PS VANE PUMP ROTATING TORQUE

(a) Check that the pump rotates smoothly without abnormal noise.

(b) Using a torque wrench, check the pump rotating torque.

Rotating torque:

0.27 N·m (2.8 kgf·cm, 2.4 in.·lbf) or less

2. REMOVE SUCTION PORT UNION

(a) Remove the bolt and suction port union.

(b) Remove the O–ring from the suction port union.

3. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

(a) Remove the pressure port union, flow control valve and spring.

(b) Remove the O–ring from the pressure port union.

4. REMOVE OIL PRESSURE SWITCH

NOTICE:

Be careful not to drop the oil pressure switch.

If the oil pressure switch is dropped or strongly damaged, replace it with a new one.

5. REMOVE REAR HOUSING

(a) Remove the bolt, nut, heat insulator and pump rear bracket.

(b) Remove the 4 bolts and rear housing.

(c) Remove the O–ring from the rear housing.

6. REMOVE CAM RING, 10 VANE PLATES, VANE PUMP ROTOR AND SIDE PLATE

(a) Remove the cam ring and 10 vane plates.

NOTICE:

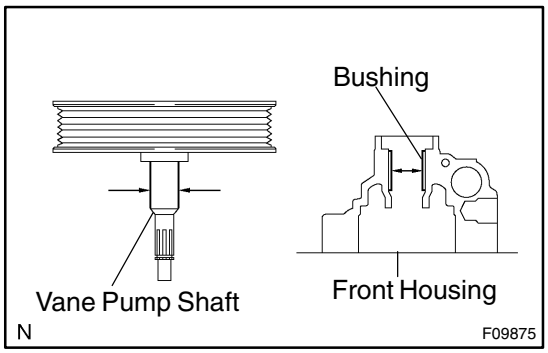
Take care not to drop the vane plate.

(b) Using a screwdriver, remove the snap ring, vane pump rotor and side plate.

(c) Remove the 2 O–rings from the side plate.

7. REMOVE VANE PUMP SHAFT WITH VANE PUMP PULLEY

SR0VT–07



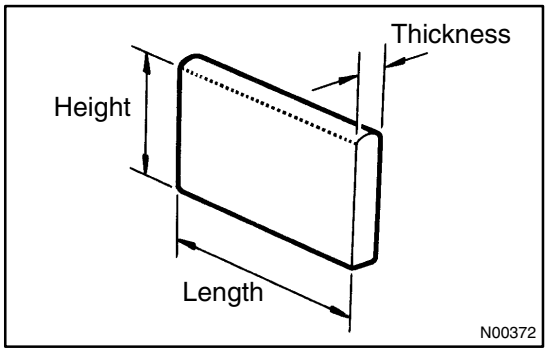
INSPECTION

1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

Using a micrometer and a caliper gauge, measure the oil clearance.

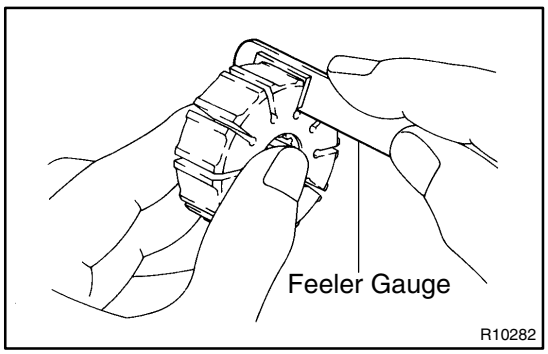
Standard clearance:
0.021 – 0.043 mm (0.0008 – 0.0017 in.)
Maximum clearance: 0.07 mm (0.0028 in.)

If it is more than the maximum, replace the front housing and vane pump shaft.

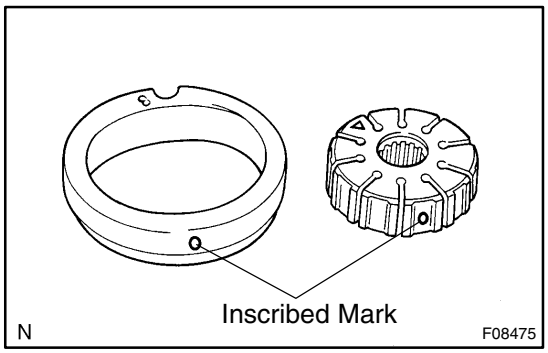


2. INSPECT VANE PUMP ROTOR AND VANE PLATES

(a) Using a micrometer, measure the height, thickness and length of the 10 vane plates.
Minimum height: 7.6 mm (0.299 in.)
Minimum thickness: 1.405 mm (0.0553 in.)
Minimum length: 11.993 mm (0.4722 in.)



(b) Using a feeler gauge, measure the clearance between the vane pump rotor groove and vane plate.
Maximum clearance: 0.03 mm (0.0012 in.)



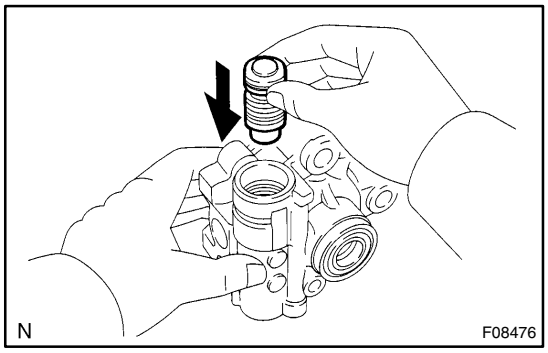
If it is more than the maximum, replace the vane plate and/or vane pump rotor with the one having the same mark stamped on the cam ring.

Inscribed mark: 0, 1, 2, 3, or 4

HINT:

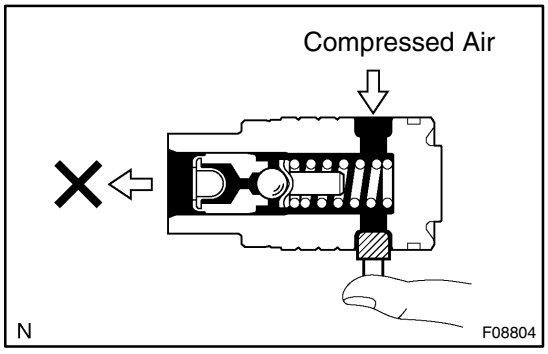
There are 5 vane plate lengths corresponding to the following vane pump rotor and cam ring marks:

Vane pump rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
0	44345 – 02110	12.001 – 12.003 (0.47248 – 0.47256)
1	44345 – 02120	11.999 – 12.001 (0.47240 – 0.47248)
2	44345 – 02130	11.997 – 11.999 (0.47232 – 0.47240)
3	44345 – 02140	11.995 – 11.997 (0.47224 – 0.47232)
4	44345 – 02150	11.993 – 11.995 (0.47216 – 0.47224)

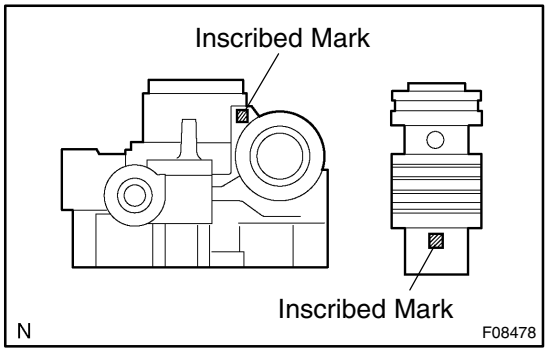


3. INSPECT FLOW CONTROL VALVE

(a) Coat the flow control valve with power steering fluid and check that it falls smoothly into the valve hole of the front housing by its own weight.

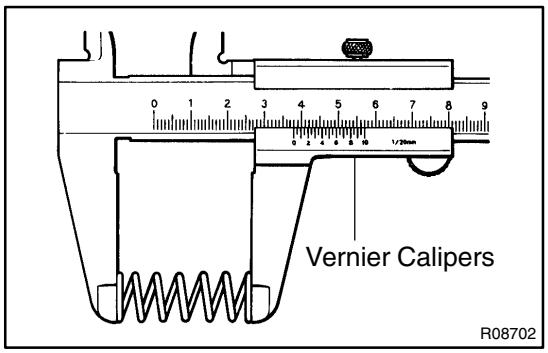


(b) Check the flow control valve for leakage. Close one of the holes and apply compressed air of 392 – 490 kPa (4 – 5 kgf/cm^2, 57 – 71 psi) into the opposite side hole, and confirm that air does not come out from the end hole.



If necessary, replace the flow control valve with the one having the same letter as inscribed on the front housing.

Inscribed mark: A, B, C, D, E or F



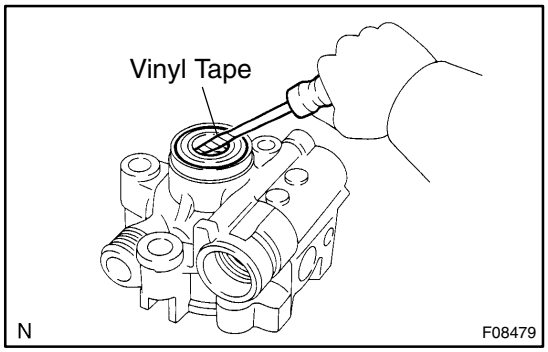
4. INSPECT SPRING

Using vernier calipers, measure the free length of the spring.

Minimum free length: 35.8 mm (1.409 in.)

If it is not within the specification, replace the spring.

SR0VU–07



REPLACEMENT

NOTICE:

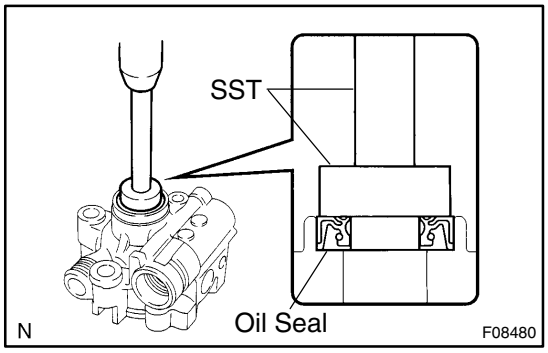
When using a vise, do not overtighten it.

IF NECESSARY, REPLACE OIL SEAL

(a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal.

NOTICE:

Be careful not to damage the bushing of the front housing.



(b) Coat a new oil seal lip with power steering fluid.

(c) Using SST, press in the oil seal.

SST 09950–60010 (09951–00280),
09950–70010 (09951–07100)

NOTICE:

Make sure that the oil seal is installed facing in the correct direction.

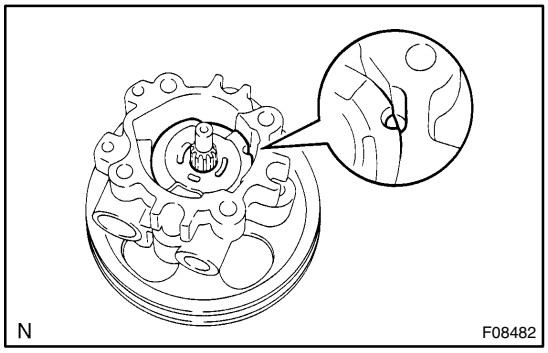
SR0VV–07

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page SR–8)**
2. **INSTALL VANE PUMP SHAFT WITH VANE PUMP PULLEY**



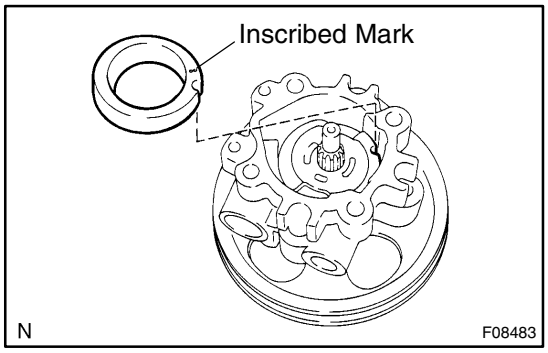
3. INSTALL SIDE PLATE

(a) Coat 2 new O–rings with power steering fluid, and install them to the side plate.

(b) Align the dent of the side plate with the dent of the front housing, and install the side plate.

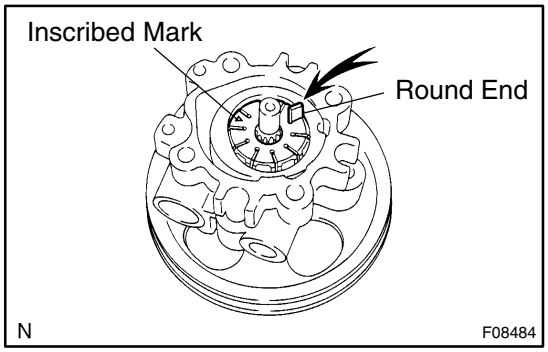
NOTICE:

Make sure that the side plate is installed facing in the correct direction.



4. INSTALL CAM RING

Align the dent of the cam ring with the dent of the side plate, and install the cam ring with the inscribed mark facing outward.



5. INSTALL VANE PUMP ROTOR

(a) Install the vane pump rotor with the inscribed mark facing outward.

(b) Install a new snap ring to the vane pump shaft.

6. INSTALL 10 VANE PLATES

Install the 10 vane plates with the round end facing outward.

7. INSTALL REAR HOUSING

(a) Coat a new O–ring with power steering fluid, and install it to the rear housing.

(b) Align the straight pin of the rear housing with the dents of the cam ring, side plate and front housing, and install the rear housing with the 4 bolts.

Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)

(c) Install the rear bracket and heat insulator with the bolt and nut.

Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

8. INSTALL OIL PRESSURE SWITCH
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

9. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

(a) Install the spring.

(b) Install the flow control valve facing in the correct direction (See page SR–8).

(c) Coat a new O–ring with power steering fluid, and install it to the pressure port union.

(d) Install the pressure port union.
Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

10. INSTALL SUCTION PORT UNION

(a) Coat a new O–ring with power steering fluid, and install it to the suction port union.

(b) Install the suction port union with the bolt.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

11. MEASURE PS VANE PUMP ROTATING TORQUE (See page SR–11)

SR0YQ–02

INSTALLATION

1. INSTALL PS VANE PUMP ASSEMBLY

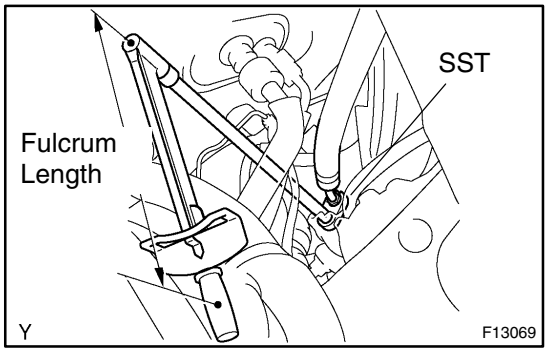
Install the PS vane pump assembly with the 2 pump assembly set bolts and nuts.

Torque: 37 N·m (370 kgf·cm, 27 ft·lbf)

2. CONNECT OIL PRESSURE SWITCH CONNECTOR

NOTICE:

Be careful to prevent oil from being attached to the connector.



3. CONNECT PRESSURE FEED TUBE

(a) Connect the pressure feed tube clamp with the bolt.

Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

(b) Using SST, connect the pressure feed tube.

SST 09023–12700

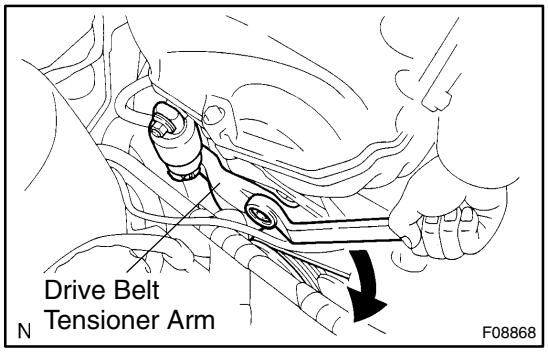
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 345 mm (11.81 in).
- This torque value is effective in case that SST is parallel to a torque wrench.

4. CONNECT SUCTION HOSE

Connect the suction hose with the clip.



5. INSTALL DRIVE BELT

Loosen the drive belt tension by turning the drive belt tensioner arm clockwise, and install the drive belt.

6. INSTALL ENGINE UNDER COVER RH

Install the engine under cover RH with 5 bolts.

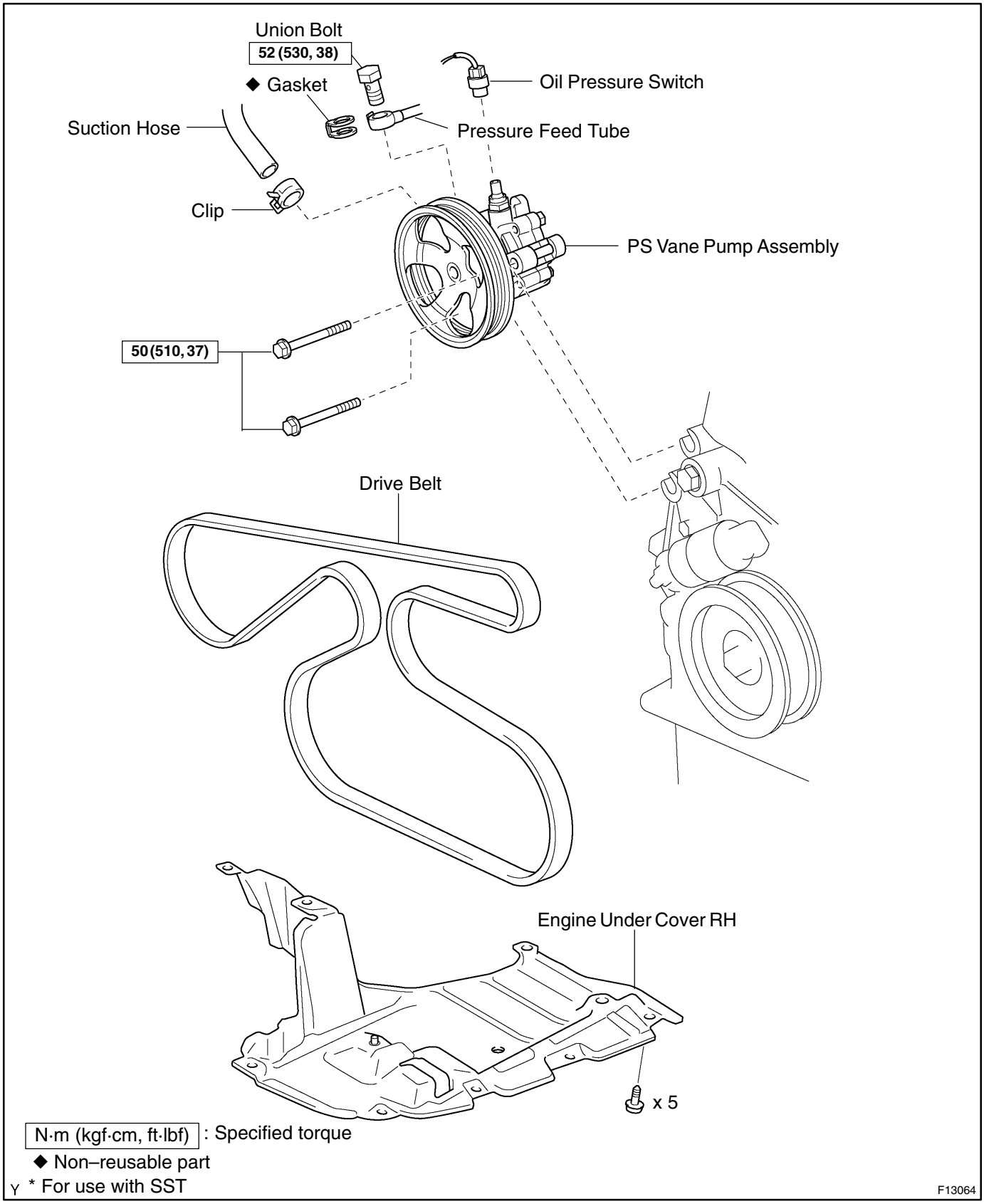
7. BLEED POWER STEERING SYSTEM

(See page SR–2)

POWER STEERING VANE PUMP (1AZ–FSE)

SR19E–02

COMPONENTS

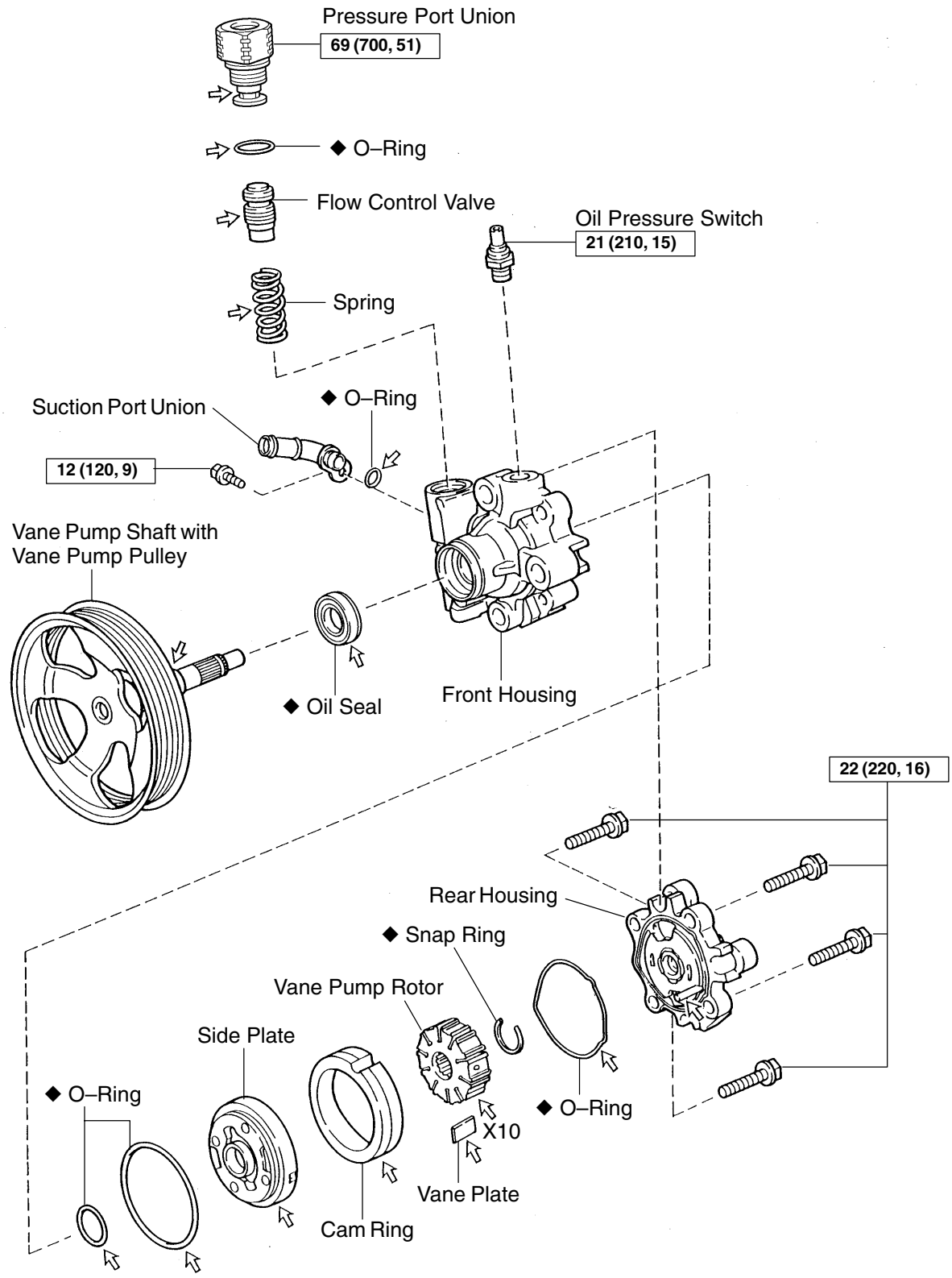


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

Y * For use with SST

F13064



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

⇦ Power steering fluid

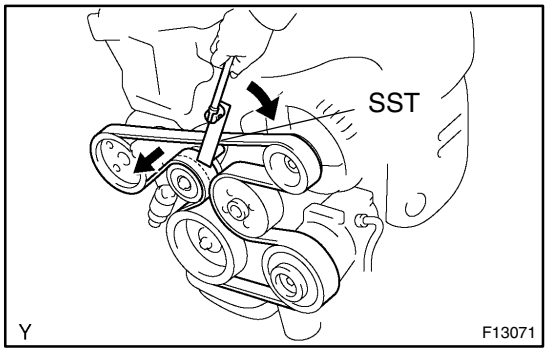
F13606

SR1C8–01

REMOVAL

1. REMOVE ENGINE UNDER COVER RH

Remove the 5 bolts and engine under cover RH.



2. REMOVE DRIVE BELT

Using SST, loosen the drive belt tension by turning the drive belt tensioner arm clockwise, and remove the drive belt.

SST 09249–63010

3. DISCONNECT SUCTION HOSE

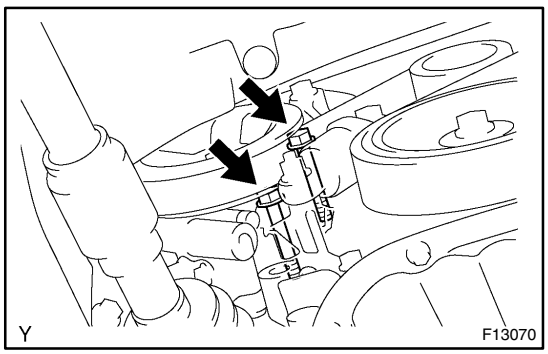
Remove the clip and disconnect the suction hose.

NOTICE:

Take care not to spill fluid on the drive belt.

4. REMOVE PRESSURE FEED TUBE

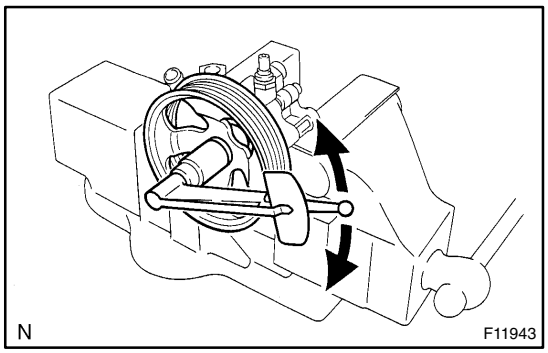
Remove the union bolt, gasket and pressure feed tube.



5. REMOVE PS VANE PUMP ASSEMBLY

Loosen the 2 bolts and PS vane pump assembly.

SR0VS–08



DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. MEASURE PS VANE PUMP ROTATING TORQUE

(a) Check that the pump rotates smoothly without abnormal noise.

(b) Using a torque wrench, check the pump rotating torque.

Rotating torque:

0.27 N·m (2.8 kgf·cm, 2.4 in.·lbf) or less

2. REMOVE SUCTION PORT UNION

(a) Remove the bolt and suction port union.

(b) Remove the O–ring from the suction port union.

3. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

(a) Remove the pressure port union, flow control valve and spring.

(b) Remove the O–ring from the pressure port union.

4. REMOVE OIL PRESSURE SWITCH

NOTICE:

Be careful not to drop the oil pressure switch.

If the oil pressure switch is dropped or strongly damaged, replace it with a new one.

5. REMOVE REAR HOUSING

(a) Remove the 4 bolts and rear housing.

(b) Remove the O–ring from the rear housing.

6. REMOVE CAM RING, 10 VANE PLATES, VANE PUMP ROTOR AND SIDE PLATE

(a) Remove the cam ring and 10 vane plates.

NOTICE:

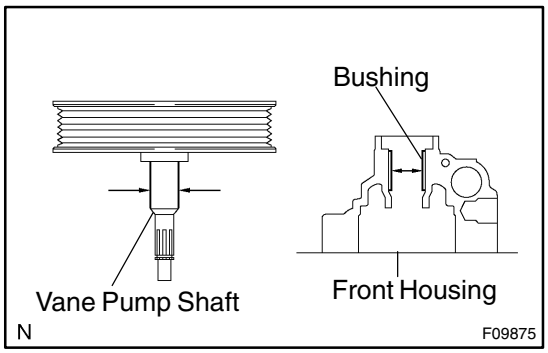
Take care not to drop the vane plate.

(b) Using a screwdriver, remove the snap ring, vane pump rotor and side plate.

(c) Remove the 2 O–rings from the side plate.

7. REMOVE VANE PUMP SHAFT WITH VANE PUMP PULLEY

SR0VT–08



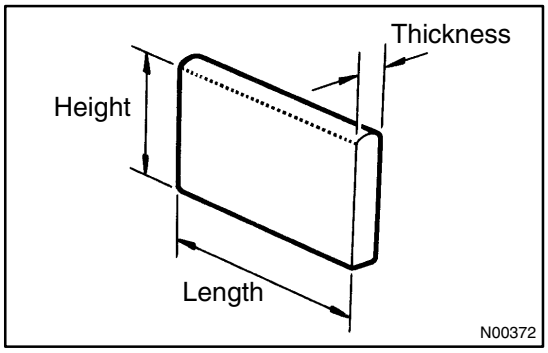
INSPECTION

1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

Using a micrometer and a caliper gauge, measure the oil clearance.

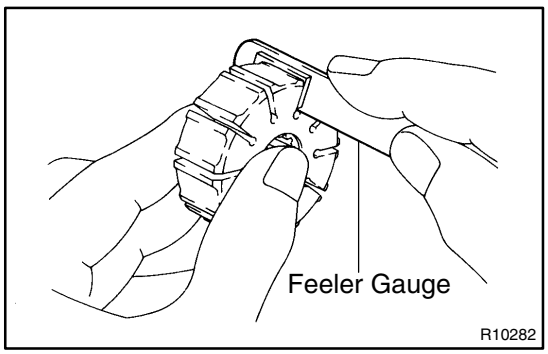
Standard clearance:
0.021 – 0.043 mm (0.0008 – 0.0017 in.)
Maximum clearance: 0.07 mm (0.0028 in.)

If it is more than the maximum, replace the front housing and vane pump shaft.

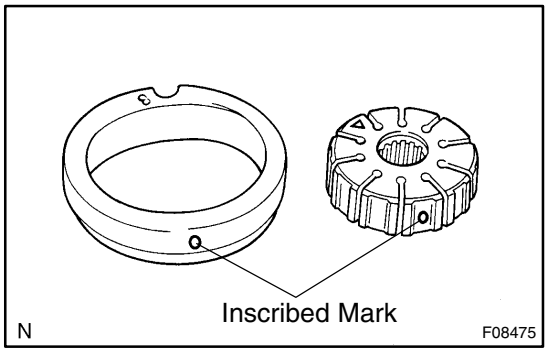


2. INSPECT VANE PUMP ROTOR AND VANE PLATES

(a) Using a micrometer, measure the height, thickness and length of the 10 vane plates.
Minimum height: 7.6 mm (0.299 in.)
Minimum thickness: 1.405 mm (0.0553 in.)
Minimum length: 11.993 mm (0.4722 in.)



(b) Using a feeler gauge, measure the clearance between the vane pump rotor groove and vane plate.
Maximum clearance: 0.03 mm (0.0012 in.)



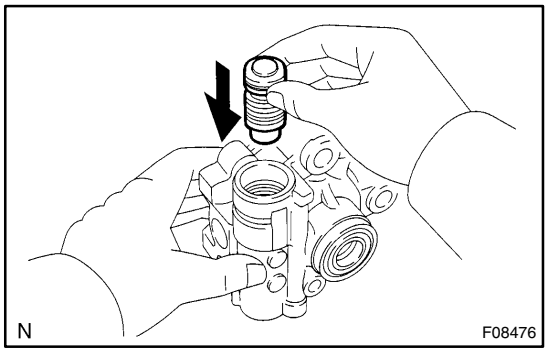
If it is more than the maximum, replace the vane plate and/or vane pump rotor with the one having the same mark stamped on the cam ring.

Inscribed mark: 0, 1, 2, 3, or 4

HINT:

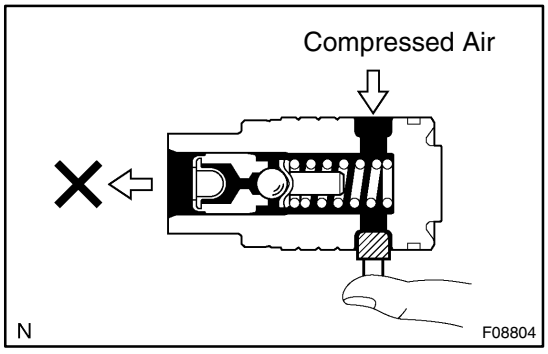
There are 5 vane plate lengths corresponding to the following vane pump rotor and cam ring marks:

Vane pump rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
0	44345 – 02110	12.001 – 12.003 (0.47248 – 0.47256)
1	44345 – 02120	11.999 – 12.001 (0.47240 – 0.47248)
2	44345 – 02130	11.997 – 11.999 (0.47232 – 0.47240)
3	44345 – 02140	11.995 – 11.997 (0.47224 – 0.47232)
4	44345 – 02150	11.993 – 11.995 (0.47216 – 0.47224)

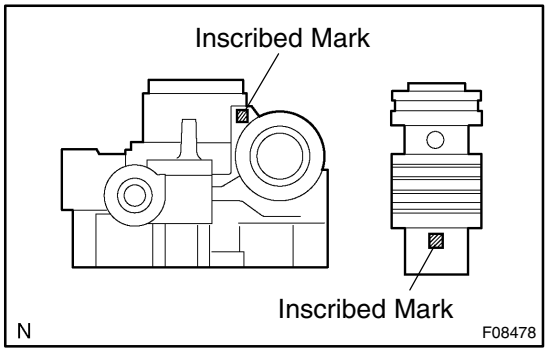


3. INSPECT FLOW CONTROL VALVE

(a) Coat the flow control valve with power steering fluid and check that it falls smoothly into the valve hole of the front housing by its own weight.

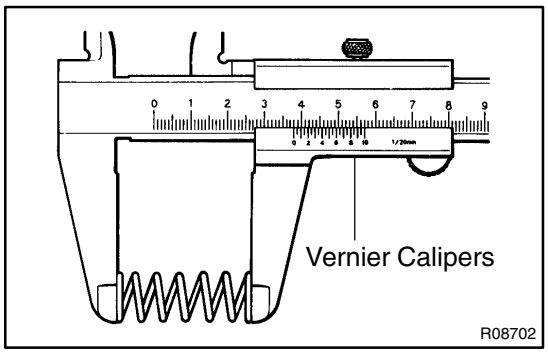


(b) Check the flow control valve for leakage. Close one of the holes and apply compressed air of 392 – 490 kPa (4 – 5 kgf/cm^2, 57 – 71 psi) into the opposite side hole, and confirm that air does not come out from the end hole.



If necessary, replace the flow control valve with the one having the same letter as inscribed on the front housing.

Inscribed mark: A, B, C, D, E or F



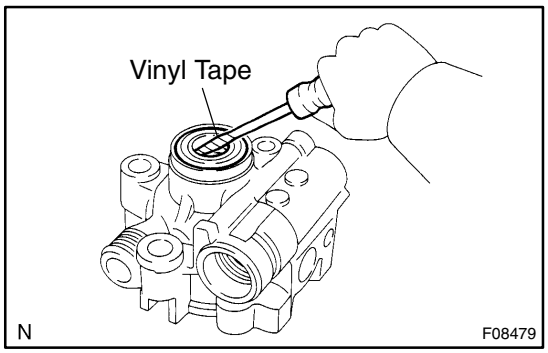
4. INSPECT SPRING

Using vernier calipers, measure the free length of the spring.

Minimum free length: 35.8 mm (1.409 in.)

If it is not within the specification, replace the spring.

SR0VU–08



REPLACEMENT

NOTICE:

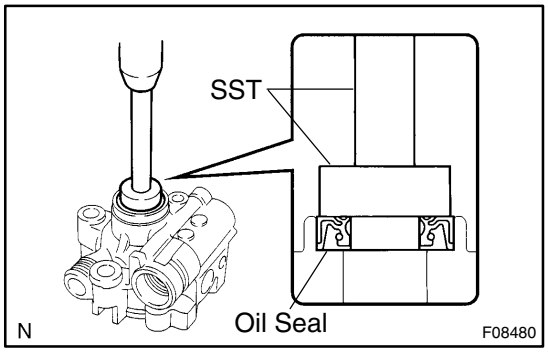
When using a vise, do not overtighten it.

IF NECESSARY, REPLACE OIL SEAL

(a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal.

NOTICE:

Be careful not to damage the bushing of the front housing.



(b) Coat a new oil seal lip with power steering fluid.

(c) Using SST, press in the oil seal.

SST 09950–60010 (09951–00280),
09950–70010 (09951–07100)

NOTICE:

Make sure that the oil seal is installed facing in the correct direction.

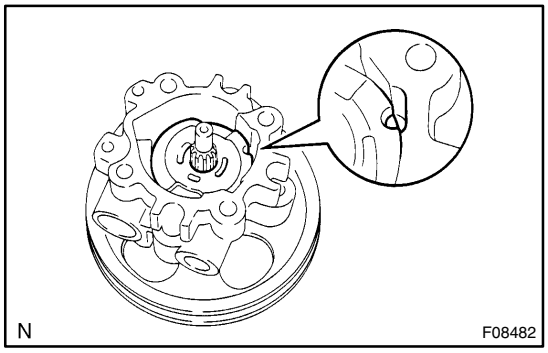
SR0VV–08

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page SR–19)**
2. **INSTALL VANE PUMP SHAFT WITH VANE PUMP PULLEY**



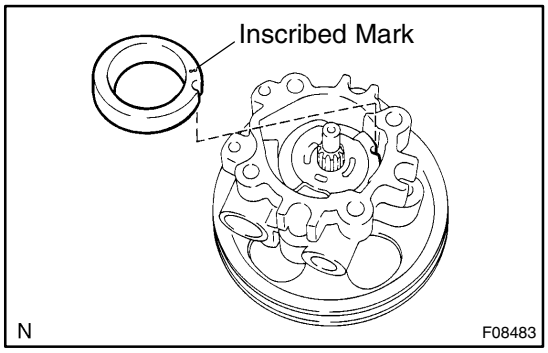
3. **INSTALL SIDE PLATE**

(a) Coat 2 new O–rings with power steering fluid, and install them to the side plate.

(b) Align the dent of the side plate with the dent of the front housing, and install the side plate.

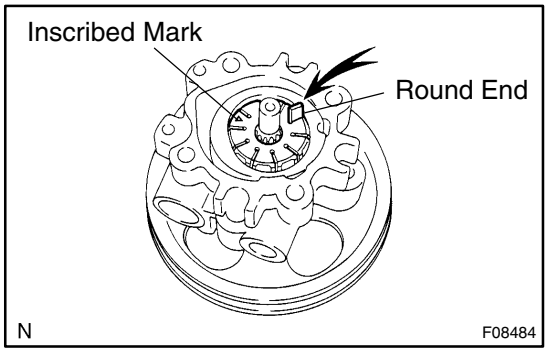
NOTICE:

Make sure that the side plate is installed facing in the correct direction.



4. **INSTALL CAM RING**

Align the dent of the cam ring with the dent of the side plate, and install the cam ring with the inscribed mark facing outward.



5. **INSTALL VANE PUMP ROTOR**

(a) Install the vane pump rotor with the inscribed mark facing outward.

(b) Install a new snap ring to the vane pump shaft.

6. **INSTALL 10 VANE PLATES**

Install the 10 vane plates with the round end facing outward.

7. **INSTALL REAR HOUSING**

(a) Coat a new O–ring with power steering fluid, and install it to the rear housing.

(b) Align the straight pin of the rear housing with the dents of the cam ring, side plate and front housing, and install the rear housing with the 4 bolts.

Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)

8. **INSTALL OIL PRESSURE SWITCH**

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

9. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

(a) Install the spring.

(b) Install the flow control valve facing in the correct direction (See page SR–19).

(c) Coat a new O–ring with power steering fluid, and install it to the pressure port union.

(d) Install the pressure port union.

Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

10. INSTALL SUCTION PORT UNION

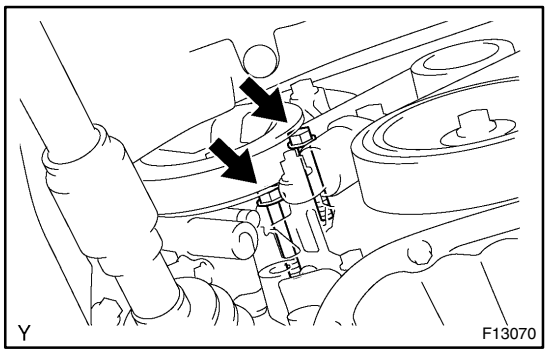
(a) Coat a new O–ring with power steering fluid, and install it to the suction port union.

(b) Install the suction port union with the bolt.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

11. MEASURE PS VANE PUMP ROTATING TORQUE (See page SR–22)

SR1C9–01



INSTALLATION

1. INSTALL PS VANE PUMP ASSEMBLY

(a) Insert the 2 bolts to the PS vane pump assembly.

(b) Install the PS vane pump assembly.

(c) Tighten the 2 bolts.

Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

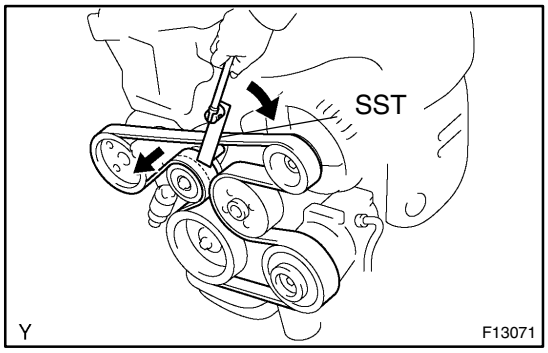
2. INSTALL PRESSURE FEED TUBE

Install the pressure feed tube and gasket to the PS vane pump assembly with union bolt.

Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

3. CONNECT SUCTION HOSE

Connect the suction hose with the clip.



4. INSTALL DRIVE BELT

Using SST, loosen the drive belt tension by turning the drive belt tensioner arm clockwise, and install the drive belt.

SST 09249–63010

5. INSTALL ENGINE UNDER COVER RH

Install the engine under cover RH with 5 bolts.

6. BLEED POWER STEERING SYSTEM

(See page SR–2)

BODY ELECTRICAL

COMBINATION METER BE–1
POWER DOOR LOCK
CONTROL SYSTEM BE–4
DOUBLE LOCKING SYSTEM BE–11
AUDIO SYSTEM BE–16

REFER TO FOLLOWING REPAIR MANUALS:

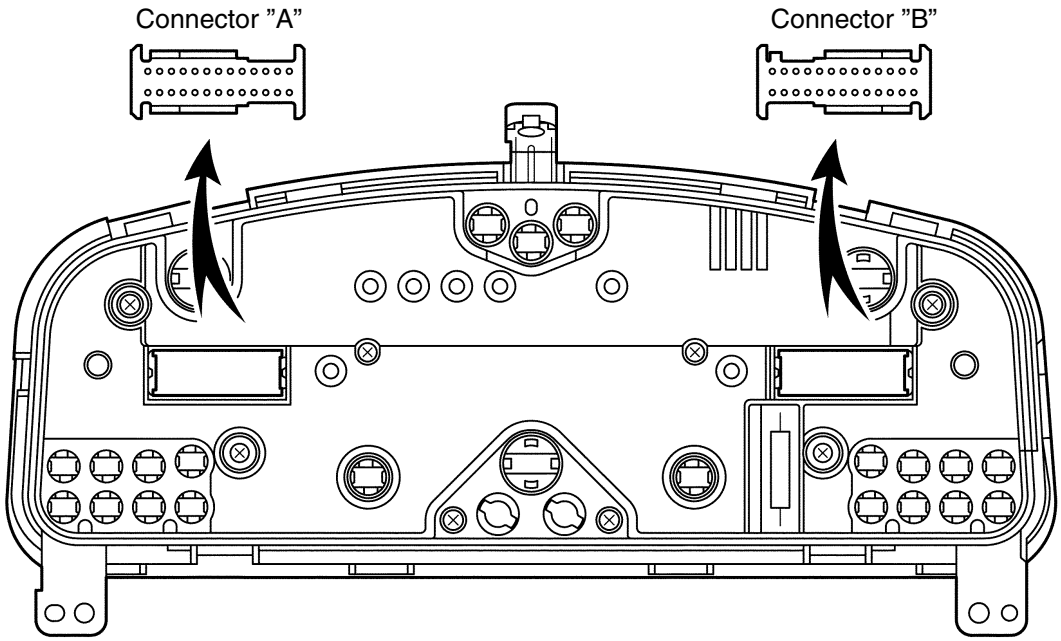
Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

NOTE: The above pages contain only the points which differ from the above listed manuals.

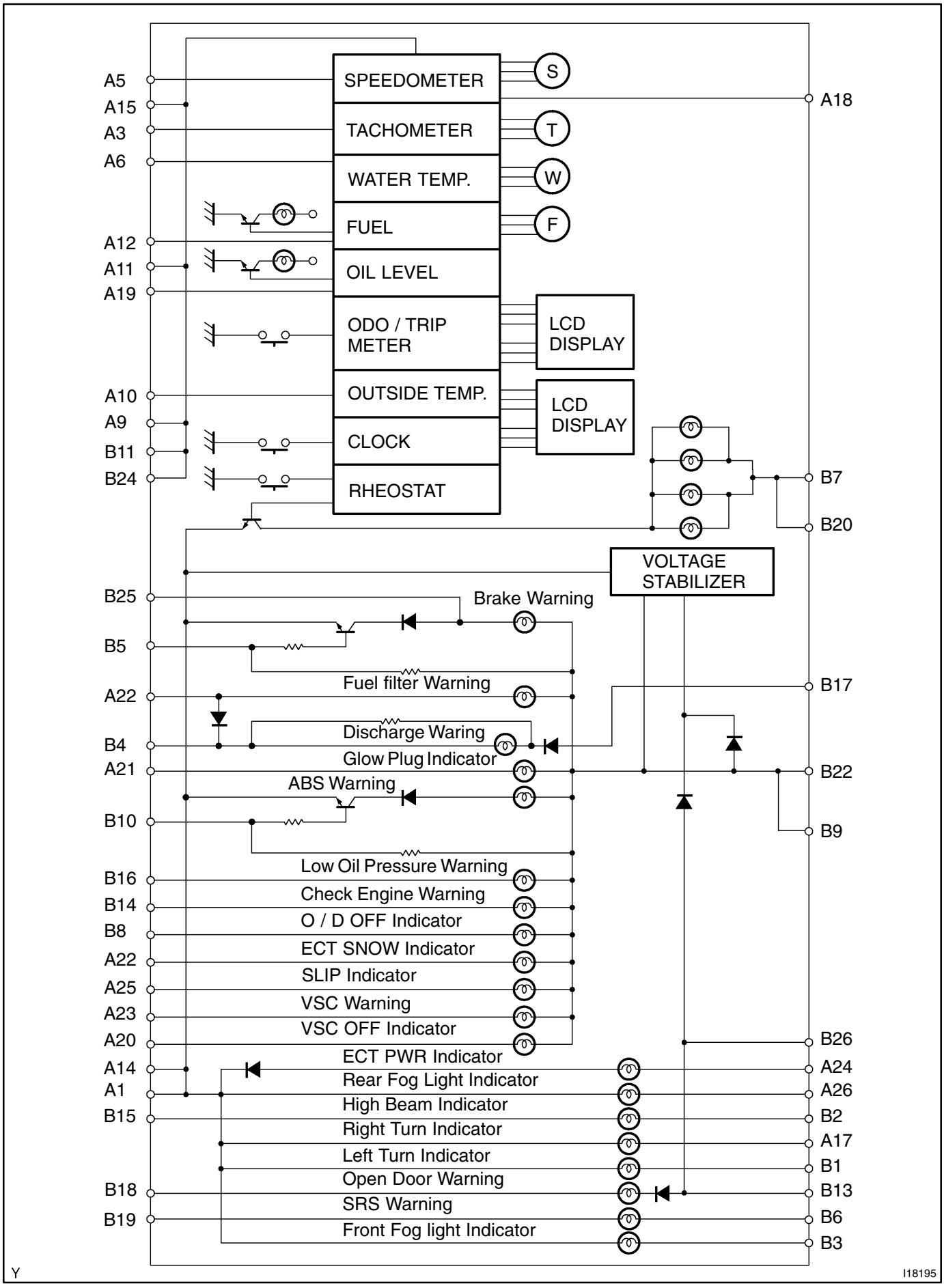
COMBINATION METER

BE028–03

CIRCUIT



I04817


A5
A15
A3
A6
A12
A11
A19
A10
A9
B11
B24
B25
B5
A22
B4
A21
B10
B16
B14
B8
A22
A25
A23
A20
A14
A1
B15
B18
B19
SPEEDOMETER
TACHOMETER
WATER TEMP.
FUEL
OIL LEVEL
ODO / TRIP METER
OUTSIDE TEMP.
CLOCK
RHEOSTAT
S
T
W
F
LCD DISPLAY
LCD DISPLAY
VOLTAGE STABILIZER
Brake Warning
Fuel filter Warning
Discharge Waring
Glow Plug Indicator
ABS Warning
Low Oil Pressure Warning
Check Engine Warning
O / D OFF Indicator
ECT SNOW Indicator
SLIP Indicator
VSC Warning
VSC OFF Indicator
ECT PWR Indicator
Rear Fog Light Indicator
High Beam Indicator
Right Turn Indicator
Left Turn Indicator
Open Door Warning
SRS Warning
Front Fog light Indicator
A18
B7
B20
B17
B22
B9
B26
A24
A26
B2
A17
B1
B13
B6
B3
Y
I18195

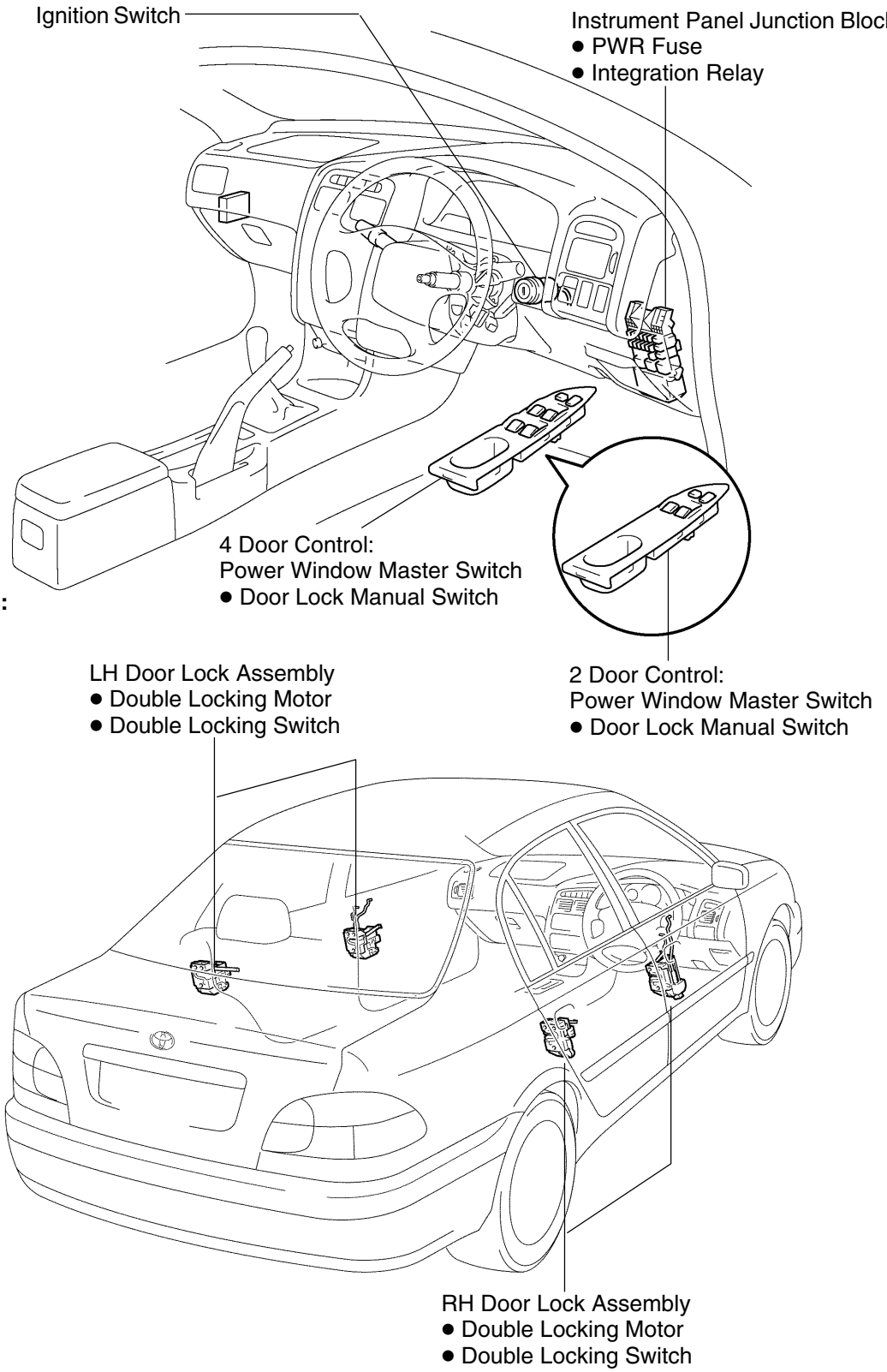
No.		Wire Harness Side
A	1	Ground (Power)
	3	Engine ECU (M/T) or Engine and ECT ECU (A/T)
	5	Vehicle Speed Sensor
	6	Engine ECU (M/T) Engine and ECT ECU (A/T)
	9	Ground
	10	Outside Temperature Sender Gauge
	11	Ground (Fuel)
	12	Fuel Sender Gauge
	14	Ground (Power)
	15	Ground (Speed)
	17	Turn Signal Switch (Right)
	18	Other Parts
	19	Oil Level Warning Switch
	20	ABS & BA & TRC & VSC ECU (w/ ABS & BA & TRC & VSC)
	21	Engine ECU (1CD–FTV Glow)
	22	Engine and ECT ECU (Gasoline Engine) or Fuel Filter Warning Switch (Diesel Engine)
	23	ABS & BA & TRC & VSC ECU (w/ ABS & BA & TRC & VSC)
	24	ECT Pattern Select Switch
	25	ABS & BA & TRC & VSC ECU (w/ ABS & BA & TRC & VSC)
	26	Rear Fog Light Switch
B	1	Turn Signal Switch (Left)
	2	H–LP Fuse
	3	Front Fog Light Switch
	4	Alternator L Terminal
	5	ABS, VSC System (w/ ABS) or Ground (w/o ABS)
	6	ECU+B Fuse
	7	Taillight Relay
	.8	O/D Main Switch (A/T)
	9	GAUGE Fuse
	10	ABS ECU
	11	Ground (Signal)
	13	DOOR Fuse
	14	EFI ECU (Gasoline Engine) EGR ECU (Diesel Engine)
	15	Headlight Dimmer Switch
	16	Low Oil Pressure Warning Switch
	17	IGN Fuse
	18	Door Courtesy Switch
	19	Airbag ECU
	20	Taillight Relay
	22	GAUGE Fuse
	24	Ground (Signal)
	25	Brake Fluid Level Warning Switch, Brake Vacuum Warning Switch (1CD–FTV) or Parking Brake Switch (w/o ABS)
	26	DOOR Fuse

POWER DOOR LOCK CONTROL SYSTEM

BE1XO–01

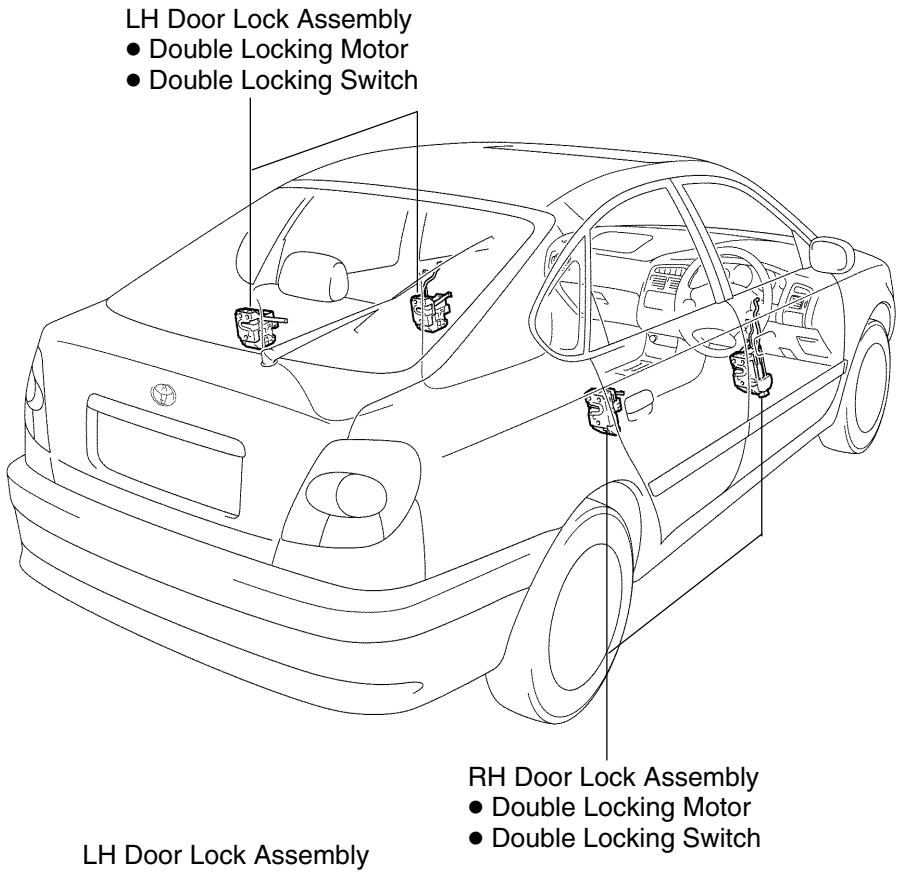
LOCATION

Sedan models:

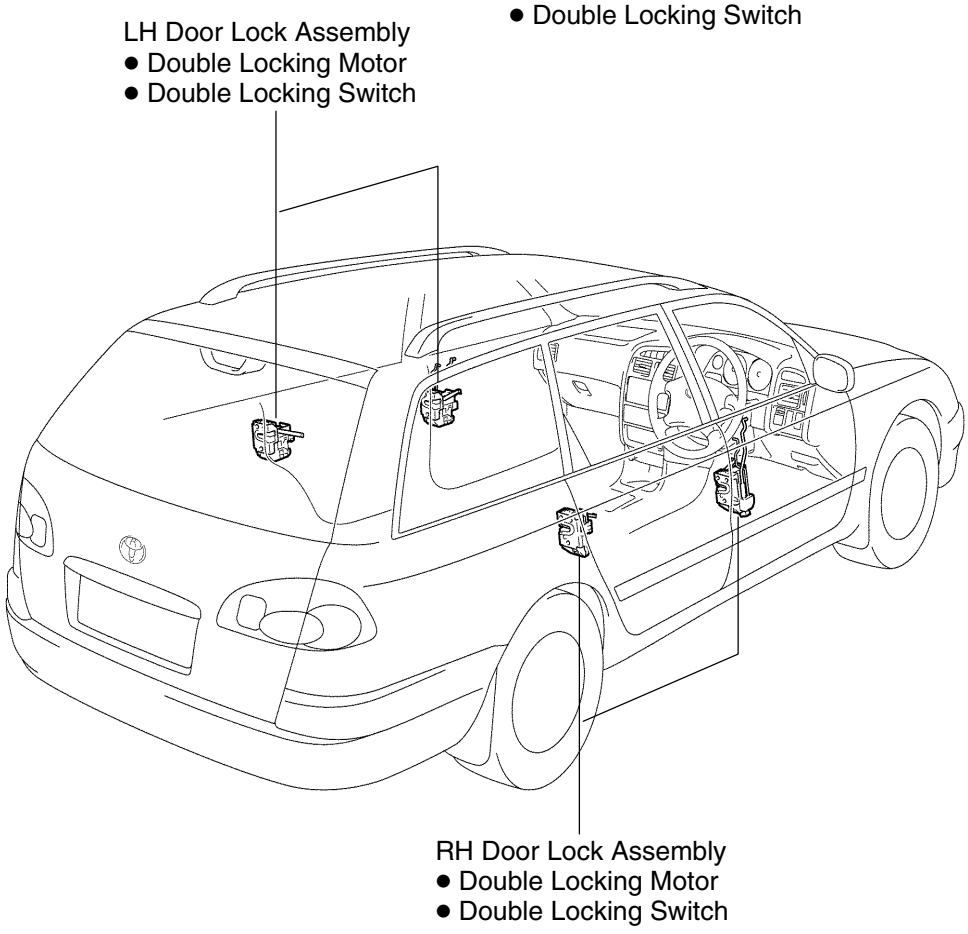


I19378

Hatchback models:



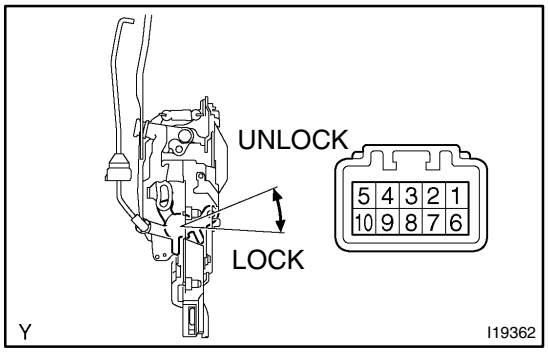
Wagon models:



I18194

BE1XP–01

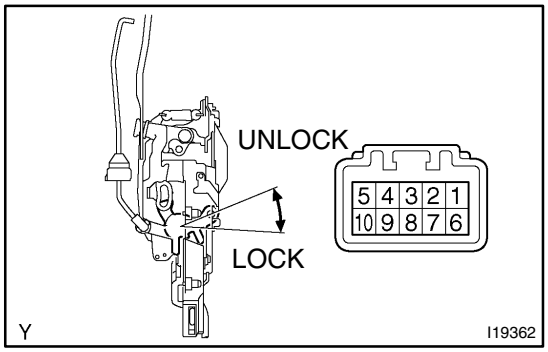
INSPECTION



1. w/ Double locking system:
INSPECT DOOR KEY LOCK SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	5 – 10	Continuity
OFF	–	No continuity

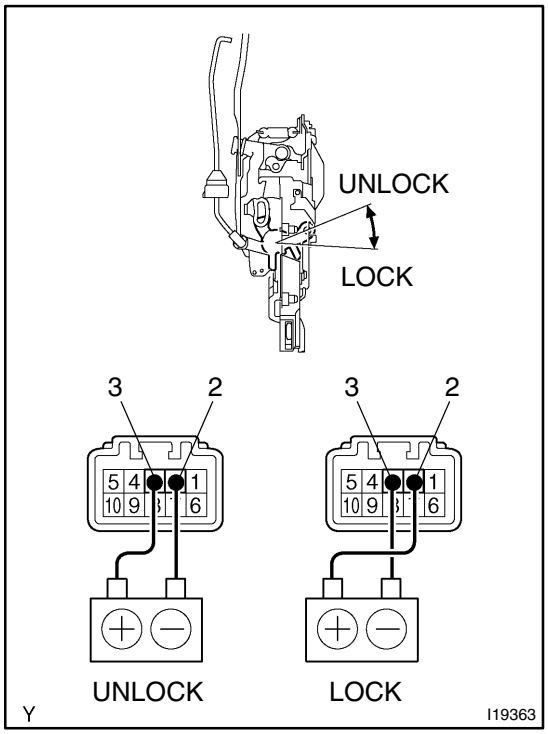
If continuity is not as specified, replace the switch.



2. w/ Double locking system:
INSPECT DOOR UNLOCK DETECTION SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Door Lock set to LOCK)	–	No continuity
ON (Door Lock set to UNLOCK)	6 – 1	Continuity

If continuity is not as specified, replace the switch.

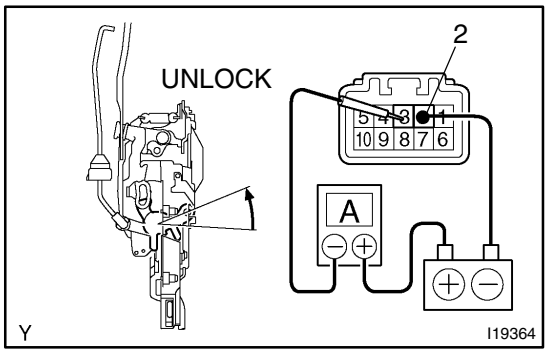


3. w/ Double locking system:
INSPECT DRIVER'S DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 2, and check that the door lock link moves to UNLOCK position.

(b) Reverse the polarity and check that the door lock link moves to LOCK position.

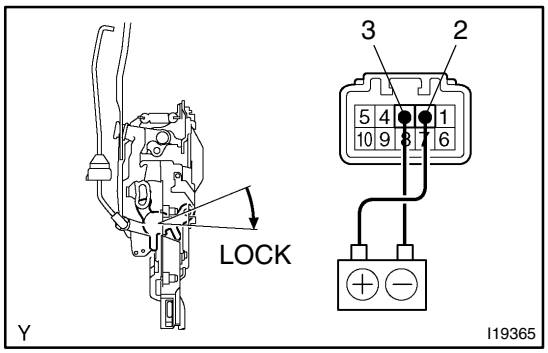
If operation is not as specified, replace the door lock assembly.



4. w/ Double locking system:
INSPECT DRIVER'S DOOR PTC THERMISTOR OPERATION

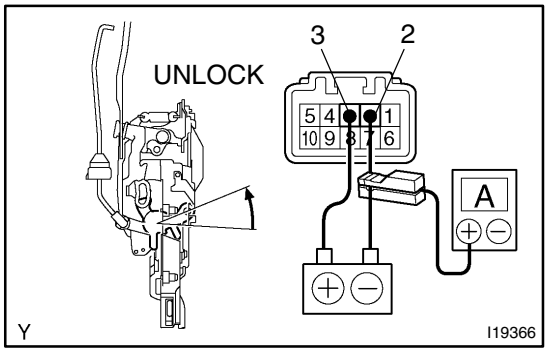
(a) Connect the negative (–) lead from the battery to terminal 2.

(b) Connect the negative (–) lead from the ammeter to terminal 3 and the positive (+) lead to battery positive (+) terminal, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.



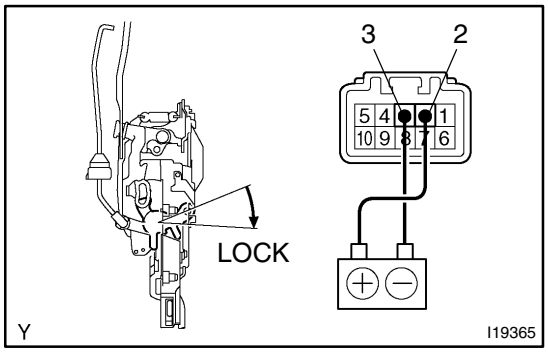
(c) Disconnect the leads from terminals.
(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 3, and check that the door lock moves to the LOCK position.

If operation is not as specified, replace the door lock assembly.



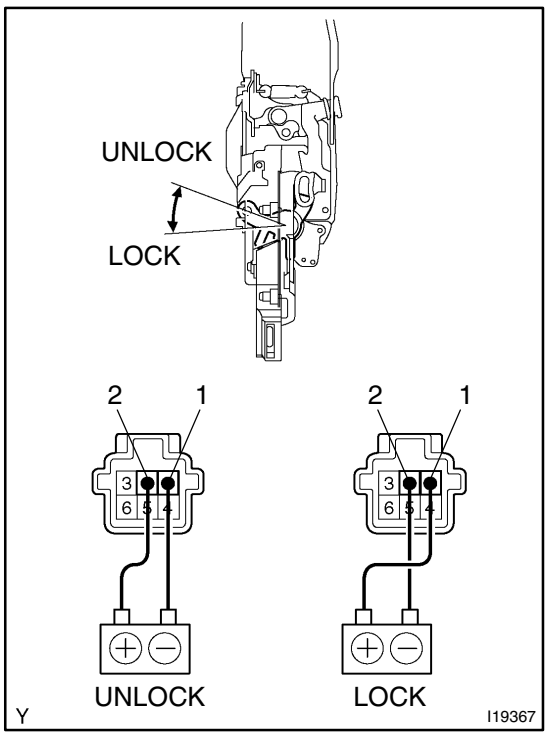
5. w/ Double locking system:
INSPECT DRIVER'S DOOR PTC THERMISTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 2.
(b) Attach a current–measuring probe to either the positive (+) lead or the negative (–) lead, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.



(c) Disconnect the leads from terminals.
(d) Approximately 60 seconds later, reverse the polarity, and check that the door lock moves to the LOCK position.

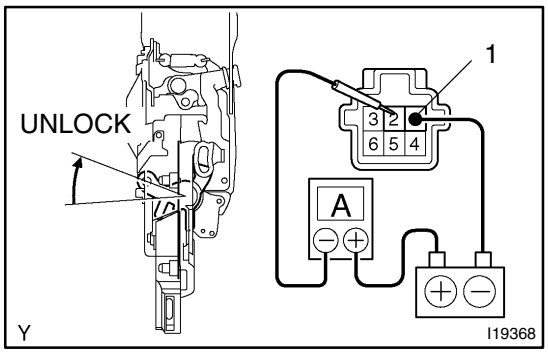
If operation is not as specified, replace the door lock assembly.



6. w/ Double locking system:
INSPECT PASSENGER'S DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, and check that the door lock link moves to UNLOCK position.
(b) Reverse the polarity and check that the door lock link moves to LOCK position.

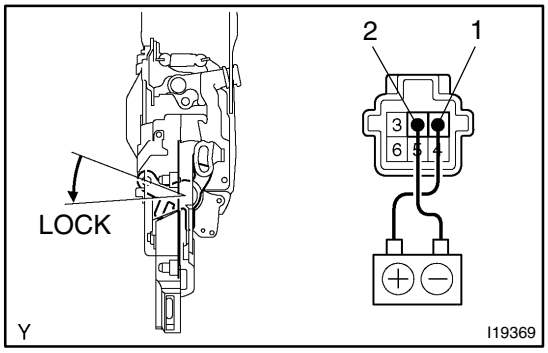
If operation is not as specified, replace the door lock assembly.



7. w/ Double locking system:
INSPECT PASSENGER'S DOOR PTC THERMISTOR OPERATION

(a) Connect the negative (–) lead from the battery to terminal 1.

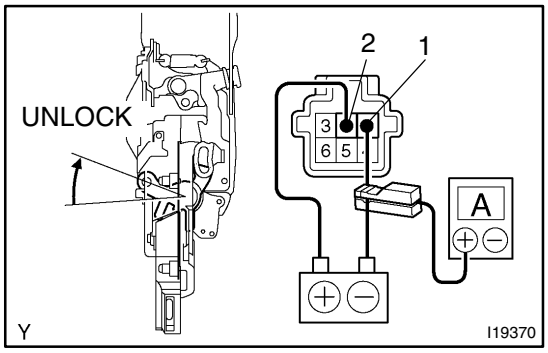
(b) Connect the negative (–) lead from the ammeter to terminal 2 and the positive (+) lead to battery positive (+) terminal, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.



(c) Disconnect the leads from terminals.

(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the door lock moves to the LOCK position.

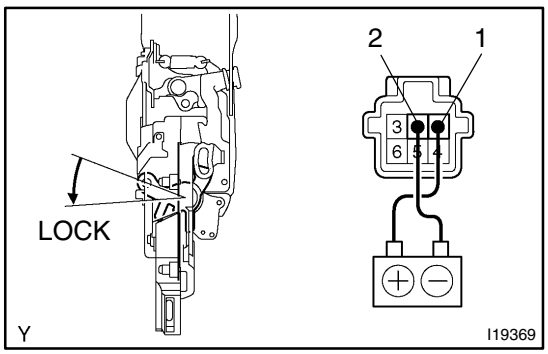
If operation is not as specified, replace the door lock assembly.



8. w/ Double locking system:
INSPECT PASSENGER'S DOOR PTC THERMISTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1.

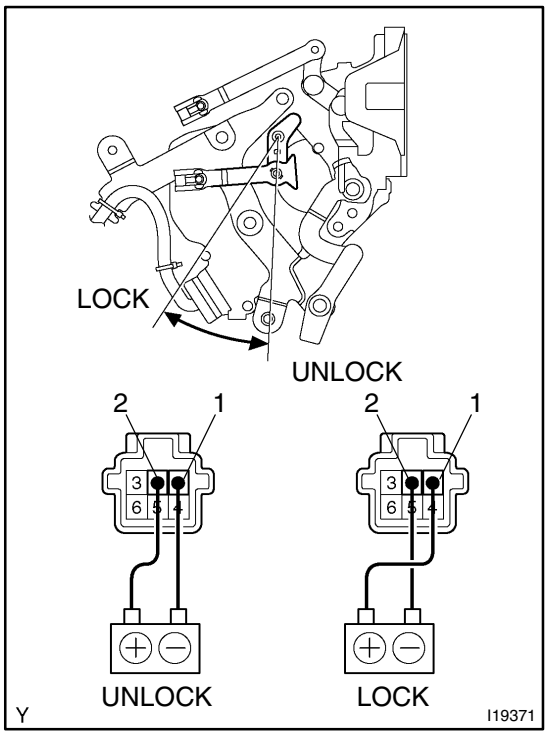
(b) Attach a current–measuring probe to either the positive (+) lead or the negative (–) lead, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.



(c) Disconnect the leads from terminals.

(d) Approximately 60 seconds later, reverse the polarity, and check that the door lock moves to the LOCK position.

If operation is not as specified, replace the door lock assembly.

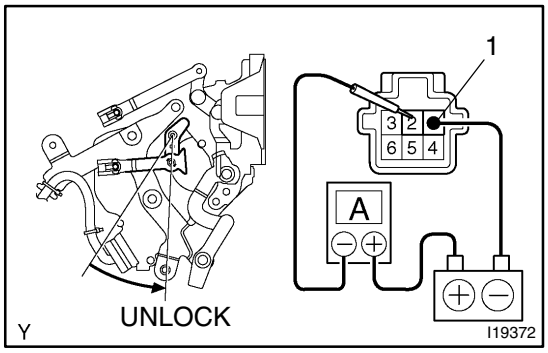


9. w/ Double locking system:
INSPECT REAR DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, and check that the door lock link moves to UNLOCK position.

(b) Reverse the polarity and check that the door lock link moves to LOCK position.

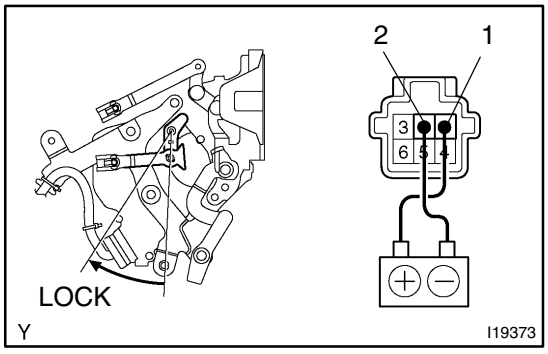
If operation is not as specified, replace the door lock assembly.



10. w/ Double locking system:
INSPECT REAR DOOR PTC THERMISTOR OPERATION

(a) Connect the negative (–) lead from the battery to terminal 1.

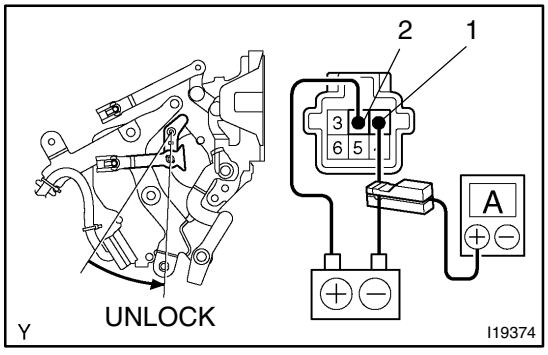
(b) Connect the negative (–) lead from the ammeter to terminal 2 and the positive (+) lead to battery positive (+) terminal, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.



(c) Disconnect the leads from terminals.

(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the door lock moves to the LOCK position.

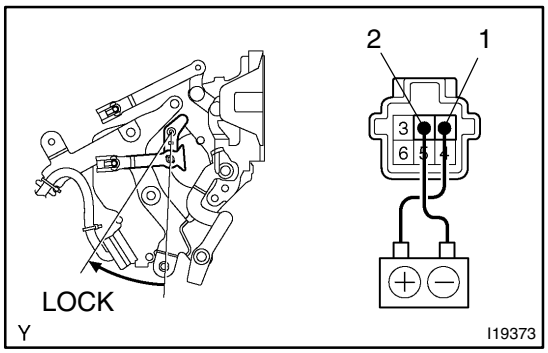
If operation is not as specified, replace the door lock assembly.



11. w/ Double locking system:
INSPECT REAR DOOR PTC THERMISTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1.

(b) Attach a current–measuring probe to either the positive (+) lead or the negative (–) lead, and check that the current changes from approximately 3.2 A to less than 0.5 A within 20 to 70 seconds.



(c) Disconnect the leads from terminals.

(d) Approximately 60 seconds later, reverse the polarity, and check that the door lock moves to the LOCK position.

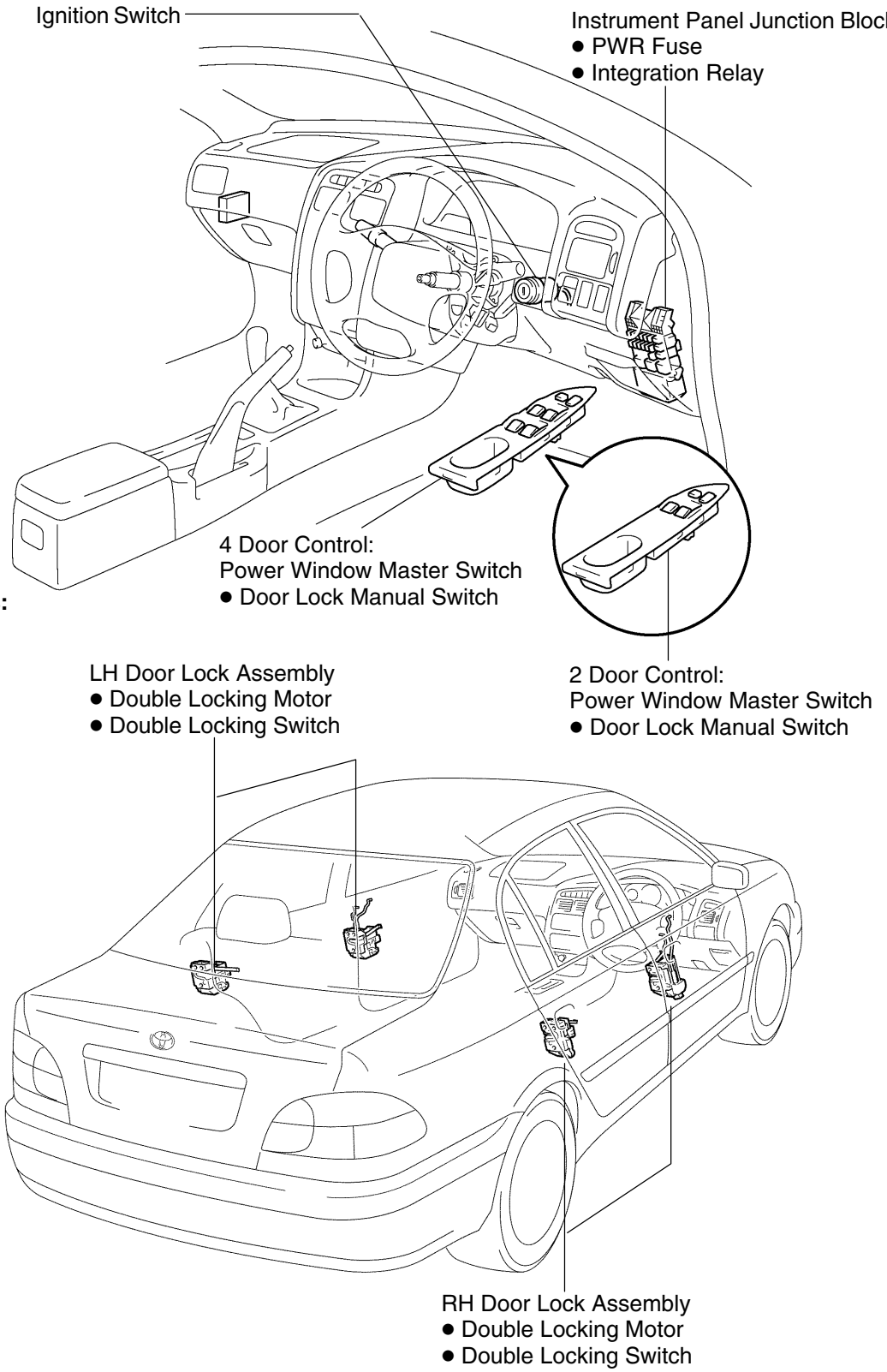
If operation is not as specified, replace the door lock assembly.

DOUBLE LOCKING SYSTEM

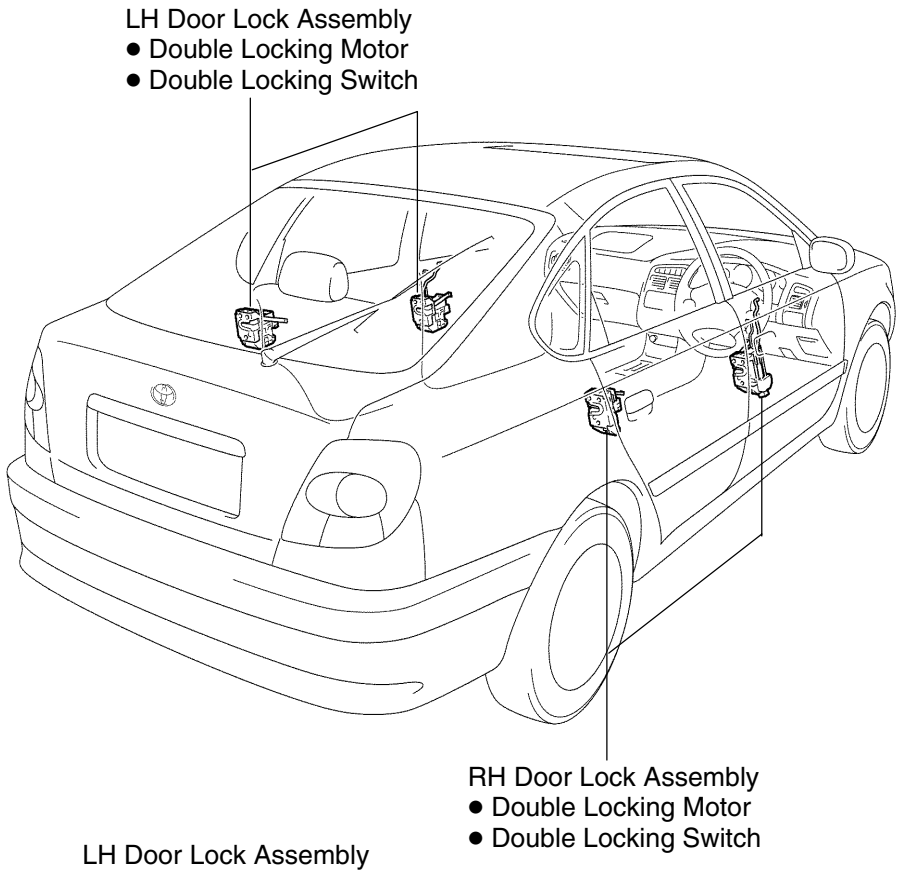
LOCATION

BE1XQ–01

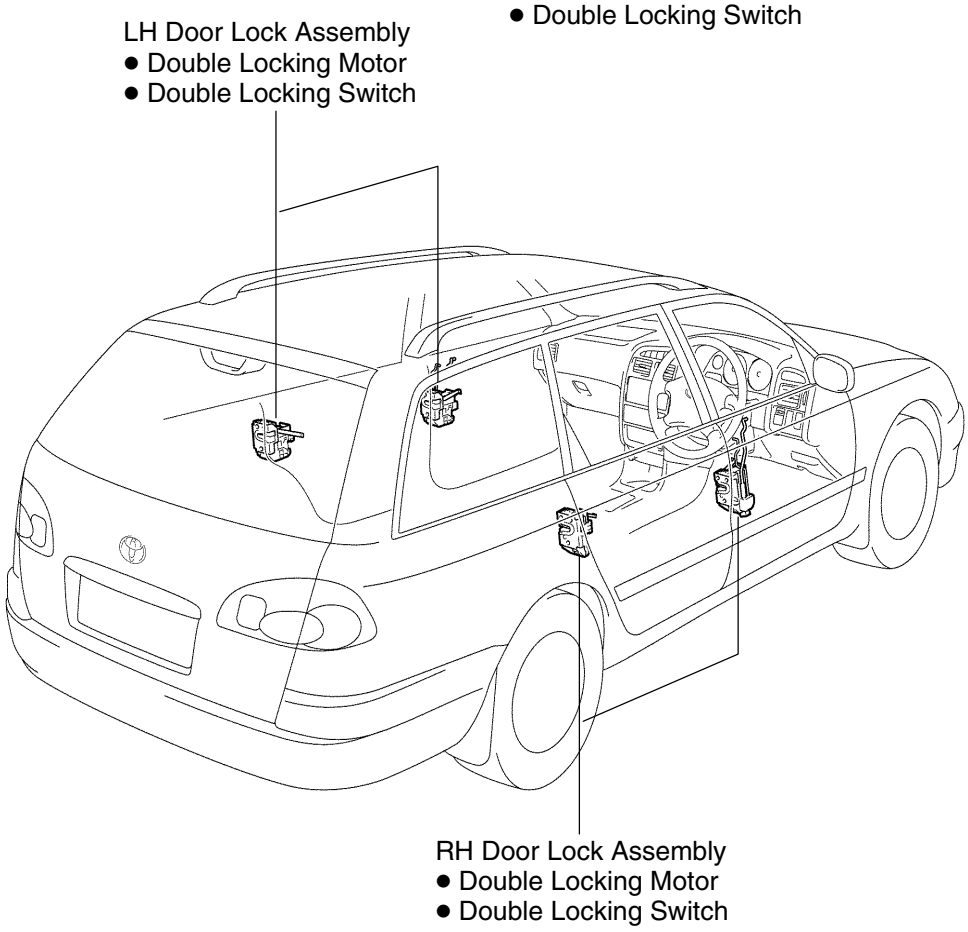
Sedan models:



Hatchback models:



Wagon models:



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BE1XR–01

INSPECTION

1. INSPECT DOUBLE LOCKING SYSTEM FUNCTION

HINT:

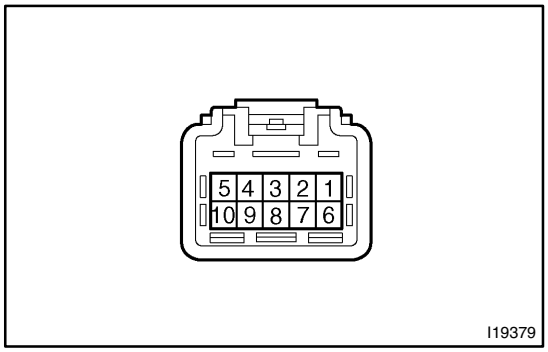
- In case of doing the following inspection, must open one of the windows of the doors.
- To set the double lock, turn the ignition switch OFF, pull out the key, open the driver's door and then perform the lock operation on the wireless transmitter. Locking again within 5 sec, after the first locking sets the double lock.

(a) Check that the double lock is set.
  (1) With the glass window opened, set the double lock from the outside of a vehicle using a wireless transmitter.
  (2) Check that the doors won't open from the inside of the vehicle even operating the door lock knob and inside door handle

(b) Check that the double lock is released (Case 1).
  (1) Press the UNLOCK button on the wireless transmitter.
  (2) Check that the doors will open from the inside of the vehicle by operating the door knob and inside door handle.

(c) Check that the double lock is released (Case 2).
  (1) With the glass window opened, set the double lock from the outside of a vehicle using a wireless transmitter.
  (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), troubleshoot according to the Problem Symptom Table.



2. INSPECT DRIVER'S DOUBLE LOCKING SWITCH CONTINUITY

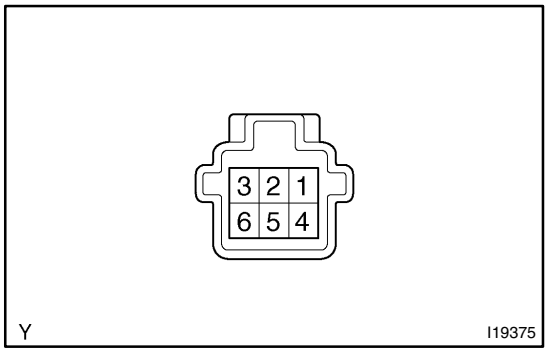
Switch position	Tester connection	Specified condition
OFF (Double Locking is released)	–	No continuity
ON (Double Locking is set)	9 – 1	Continuity

If continuity is not as specified, replace the door lock assembly.

3. INSPECT DRIVER'S DOUBLE LOCKING MOTOR OPERATION

(a) Set the Door Lock to LOCK position by the locking cable.
(b) Connect the positive (+) lead from the battery to terminal 7 and negative (–) lead to terminal 8, and check that the Door Lock will not unlock by pulling the locking cable.
(c) Reverse the polarity and check that the Door Lock will unlock by pulling the locking cable.

If operation is not as specified, replace the door lock assembly.



4. INSPECT PASSENGER'S AND REAR DOUBLE LOCKING SWITCH CONTINUITY

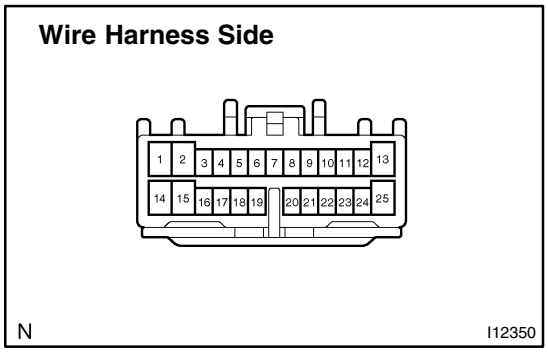
Switch position	Tester connection	Specified condition
OFF (Double Locking is released)	–	No continuity
ON (Double Locking is set)	3 – 6	Continuity

If continuity is not as specified, replace the door lock assembly.

5. INSPECT PASSENGER'S AND REAR DOUBLE LOCKING MOTOR OPERATION

(a) Set the Door Lock to LOCK position by the locking cable.
(b) Connect the positive (+) lead from the battery to terminal 4 and negative (–) lead to terminal 5, and check that the Door Lock will not unlock by pulling the locking cable.
(c) Reverse the polarity and check that the Door Lock will unlock by pulling the locking cable.

If operation is not as specified, replace the door lock assembly.

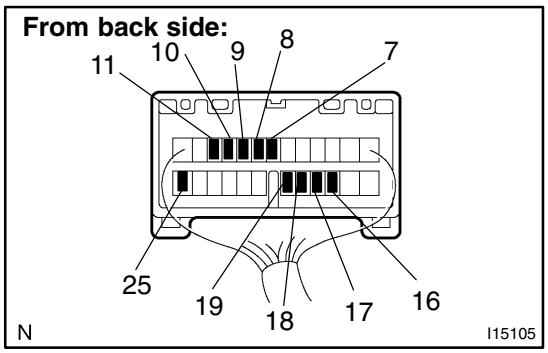


6. INSPECT DOUBLE LOCKING DOOR CONTROL RELAY CIRCUIT

(a) Disconnect connector from the double locking door control relay and inspect the connectors on the wire harness side as follows.

Tester connection	Condition	Specified condition
14 – Ground	Constant	Battery voltage
15 – Ground	Turn ignition switch ON	Battery voltage
	Turn ignition switch OFF	No voltage
25 – Ground	Constant	Continuity

If circuit is as specified, replace the double locking door control relay.



(b) Connect the wire harness side connector to the double locking door control relay and inspect the connector from the back side as shown in the chart.

Tester connection	Condition	Specified condition
7 – 25	Driver's door lock control switch LOCK	Below 2.0 V
	Driver's door lock control switch UNLOCK	More than 5.7 V
8 – 25	Driver's door lock switch LOCK	More than 5.7 V
	Driver's door lock control switch UNLOCK	Below 2.0 V
9 – 25	Driver door key lock and unlock switch LOCK	Below 2.0 V
11 – 25	Driver's door is unlocked	Below 1.0 V
	Driver's door is locked	More than 5.0 V
18 – 25	Driver door is opened	Below 1.0 V
	Driver door is closed	More than 5.0 V
19 – 25	Passenger door is opened	Below 1.0 V
	Passenger door is closed	More than 5.0 V

If circuit is not as specified, wiring diagram and inspect the circuits connected to other parts.

AUDIO SYSTEM

BE1XS–01

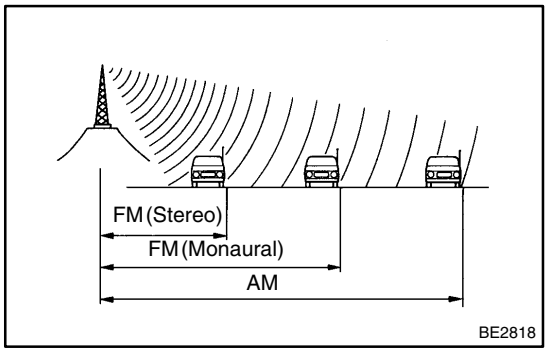
DESCRIPTION

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	LW ⟷	AM (MW) ⟷	SW ⟷	FM (UKW) ⟷	
Modulation	Amplitube modulation			Frequency modulation	

LF: Low Frequency
MF: Medium Frequency
HF: High Frequency
VHF: Very High Frequency

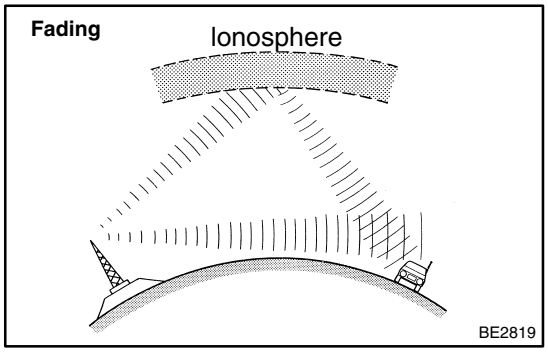


2. SERVICE AREA

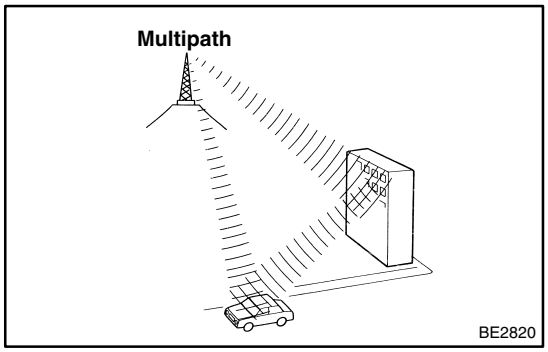
There are great differences in the size of the service area for AM and FM monaural. Sometimes FM stereo broadcasts cannot be received even through AM can be received in very clearly.
Not only does FM stereo have the smallest service area, but it also picks up static and other types of interference (”noise”) easily.

3. RECEPTION PROBLEMS

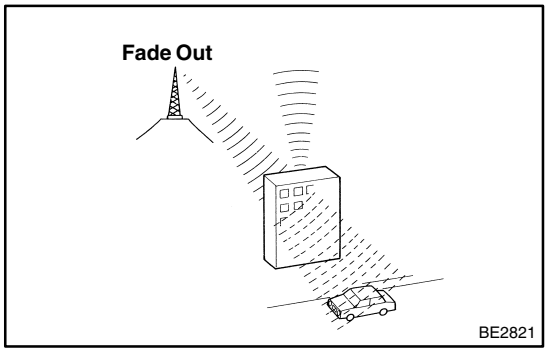
Besides the problem of static, there are also the problems called ”fading”, ”multipath” and ”fade out”. These problems are caused not by electrical noise but by the nature of the radio waves themselves.



(1) 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”.



(2) Multipath
One type of interference caused by the bounce of radio waves off of obstructions is called ”multipath”. Multipath occurs when a signal from the broadcast transmitter antenna bounces off buildings and mountains and interferes with the signal that is received directly.



(3) Fade Out
Because FM radio waves are of higher frequencies than AM radio waves, they bounce off buildings, mountains, and other obstructions. For this reason, FM signals often seem to gradually disappear or fade away as the vehicle goes behind a building or other obstruction. This is called ”fade out”.

4. COMPACT DISC PLAYER

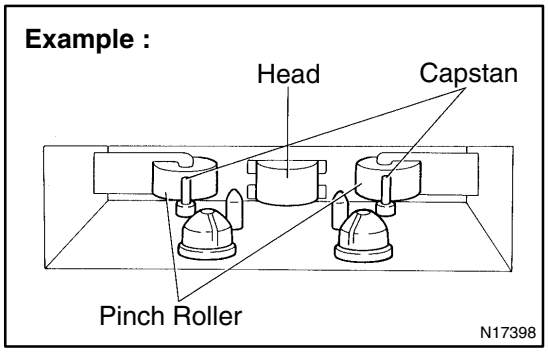
Compact Disc (hereafter called ”CD”) Players use a laser beam pick–up to read the digital signals recorded on the CD and reproduce analog signals of the music, etc. There are 4.7 in. (12 cm) and 3.2 in. (8 cm) discs in the CD player.

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:

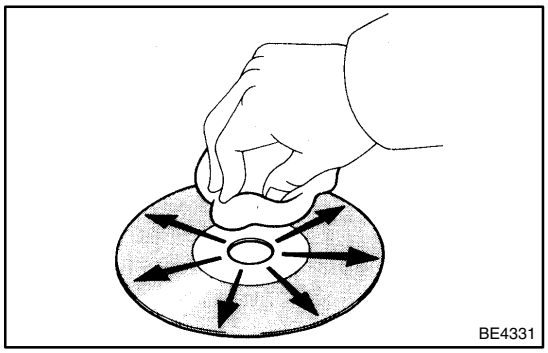
CD players use an invisible laser beam which could cause hazardous radiation exposure. Be sure to operate the player correctly as instructed.



5. Tape Player/Head Cleaning:
MAINTENANCE

(a) Raise the cassette door with your finger.
Next, 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.



6. CD Player/Disc Cleaning:
MAINTENANCE

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:

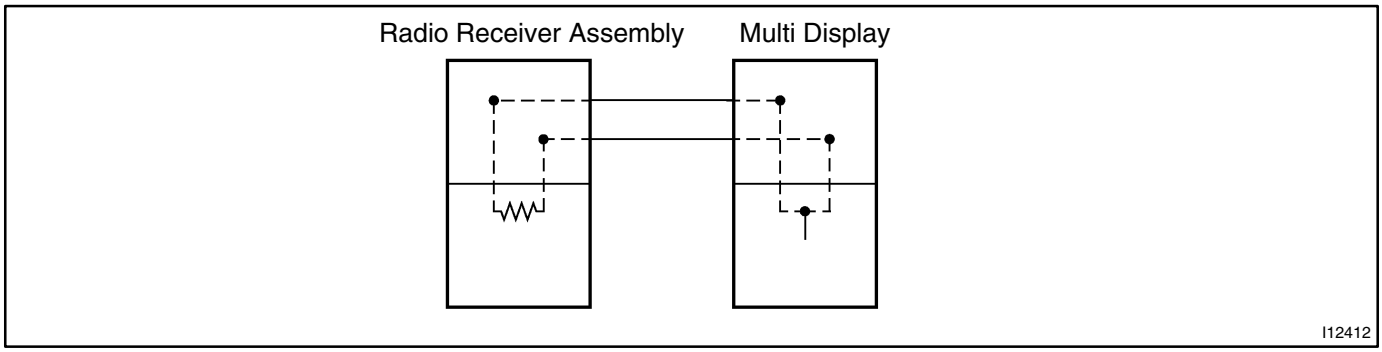
Do not use a conventional record cleaner or anti–static preservative.

7. OUTLINE OF AVC–LAN

(a) What is AVC–LAN?

AVC–LAN is the abbreviation, which stands for Audio Visual Communication–Local Area Network. This is a unified standard co–developed by 6 audio manufactures associated with Toyota Motor Corporation.

The Unified standard covers signals, such as audio signal, visual signal, signal for switch indication and communication signal.



(b) Objectives

Recently the car audio system has been rapidly developed and functions have been changed drastically. The conventional system has been switched to the multi–media type such as a navigation system. At the same time the level of customers needs to audio system has been upgraded. This lies behind this standardization.

The concrete objectives are explained below.

(1) When products by different manufactures were combined together, there used to be a case that malfunction occurred such as sound did not come out. This problem has been resolved by standardization of signals.

(2) Various types of after market products have been able to add or replace freely.

(3) Because of the above (2), each manufacture has become able to concentrate on developing products in their strongest field. This has enabled many types of products provided inexpensively.

(4) Conventionally, a new product developed by a manufacture could not be used due to a lack of compatibility with other manufactures products. Because of this new standard, users can enjoy compatible products provided for them timely.

The above descriptions are the objectives to introduce AVC–LAN. By this standardization, development of new products will no longer cause systematic errors. Thus, this is very effective standard for a product in the future.

HINT:

- When +B short or GND short is detected in AVC–LAN circuit, communication stops. Accordingly the audio system does not function normally.
- When audio system is not equipped with a navigation system, audio head unit is the master unit. (When audio system is equipped with a navigation system, navigation ECU is the master unit.)
- The car audio system using AVC–LAN circuit has a diagnosis function.
- Each product has its own specified numbers called physical address. Numbers are also allotted to each function in one product, which are called logical address.

BE1XT–01

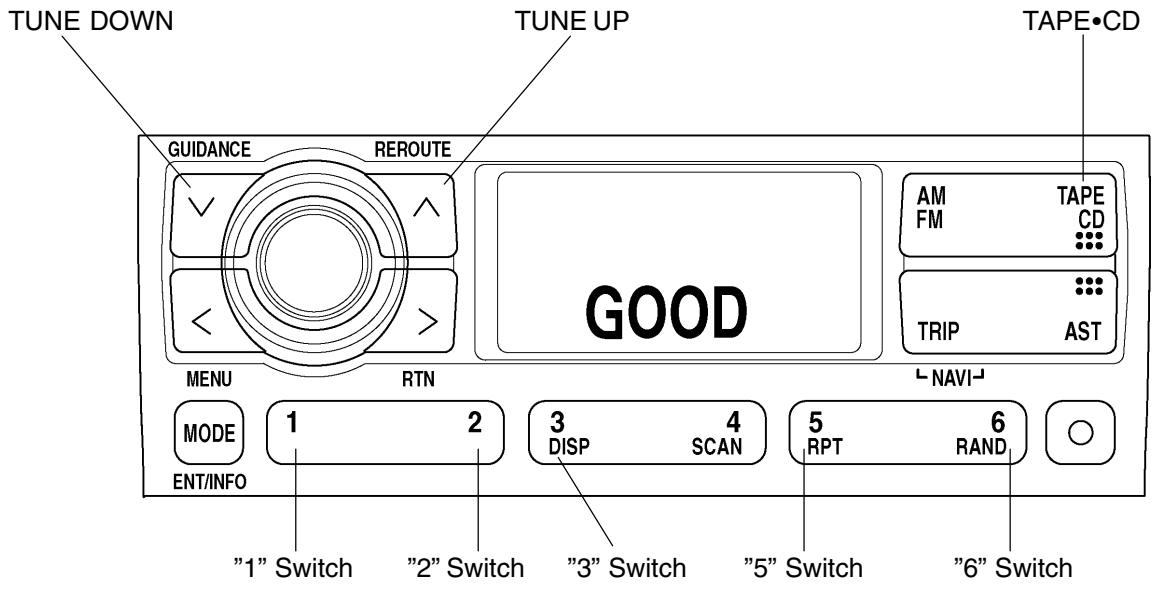
TROUBLESHOOTING

1. DISPLAYING RESULTS

Results for each check are displayed as follows:

- GOOD:
  No DTC is detected for both ”System Check Confirmation” and ”Diagnosis Memory Response”.
- NCON:
  The Component does not respond to the ”Diagnosis On Instruction” command.
  Applicable to only the system where connected components are limited to be used.
- ECHN:
  Application of new version has been confirmed by the ”Diagnosis On Check”, and there is one or more DTC which indicates ”Replacement” in the ”System Check Result Response” or ”Diagnosis Memory Response”.
- CHEC:
  Application of new version has been confirmed by the ”Diagnosis On Check”, and there is no DTC which indicates ”Replacement” in the ”System Check Result Response” or ”Diagnosis Memory Response”, but one or more DTC which indicated ”Check” is identified.
- OLD:
  Application of old version is confirmed by the ”Diagnosis On Check”, and DTC is identified in the ”System Check Result Response” or ”Diagnosis Memory Response”.
- NRES:
  No response is identified to the ”System Check Start Instruction” and ”Request for System Check Result” commands.

Example:



Y I18196

2. FUNCTION

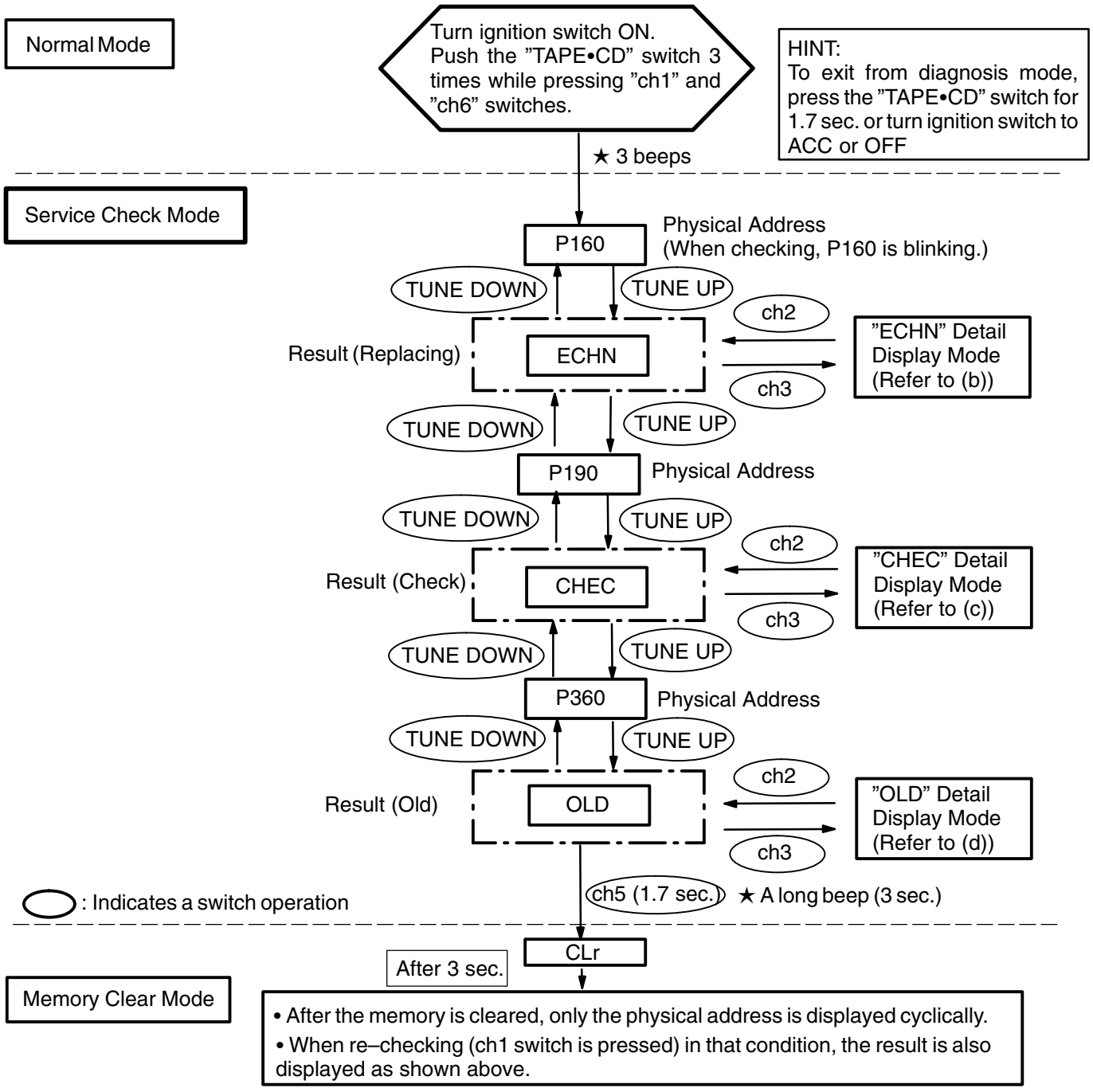
HINT:

- Check the present and past condition of components by performing the System Check and collecting stored DTC memories.
- Check results shall be displayed as one of six following indications: ”GOOD”, ”ECHN”, ”CHEC” ,”NCON”, ”OLD” or ”NRES”.

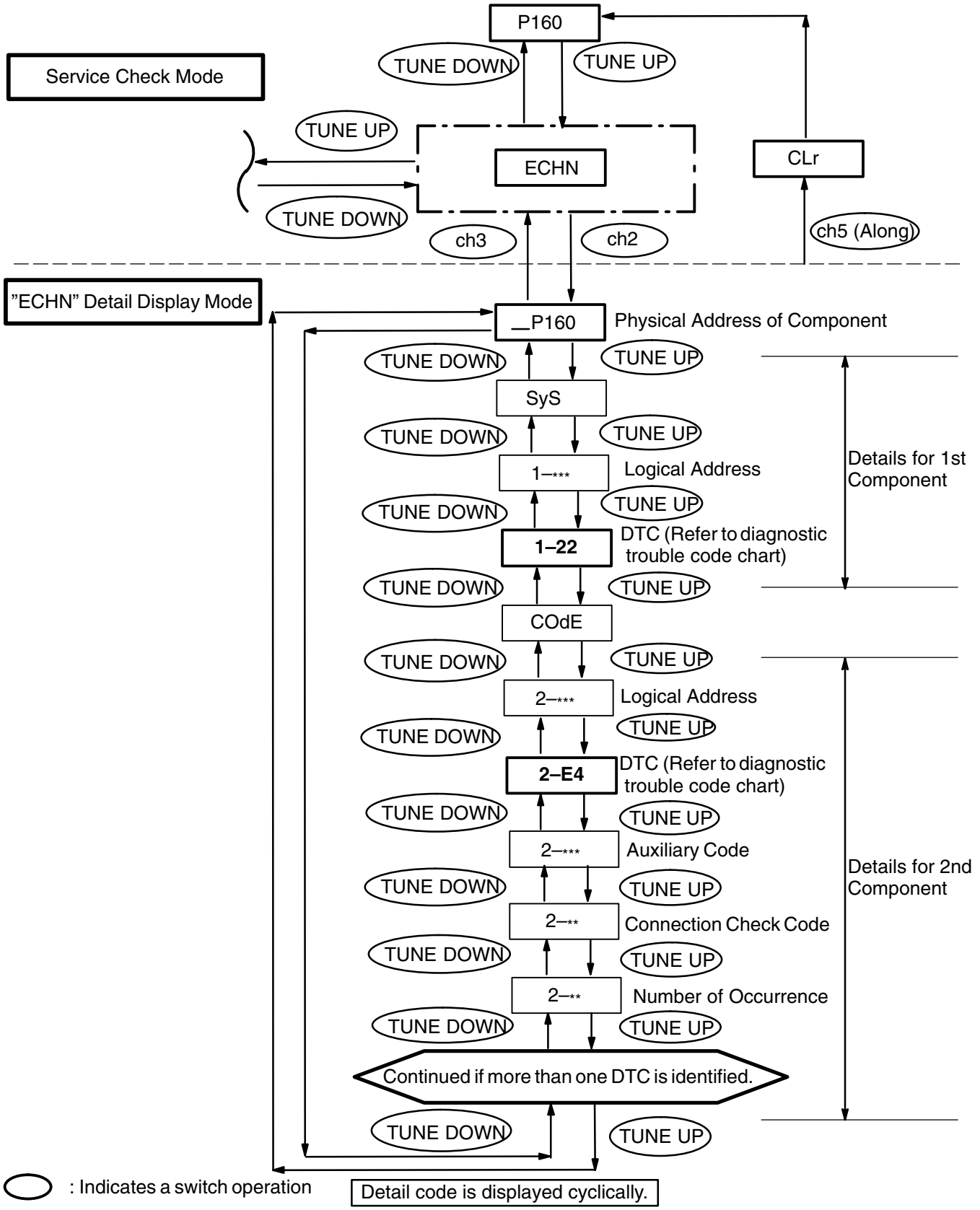
(a) Display Screen for Service Check.

Example:

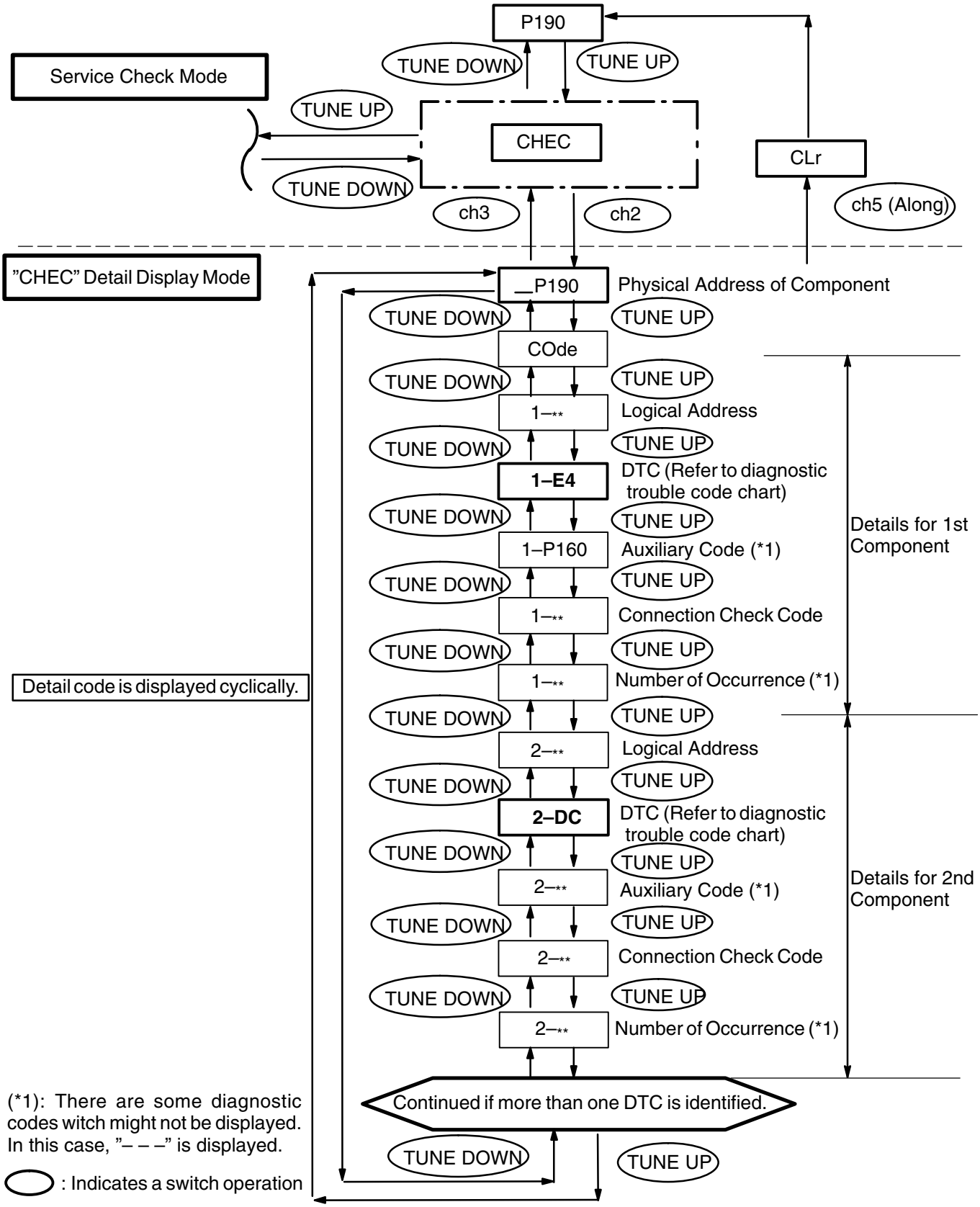
Connection parts (physical address): Multi Display (P160), Radio Receiver (P190), CD changer (P360)



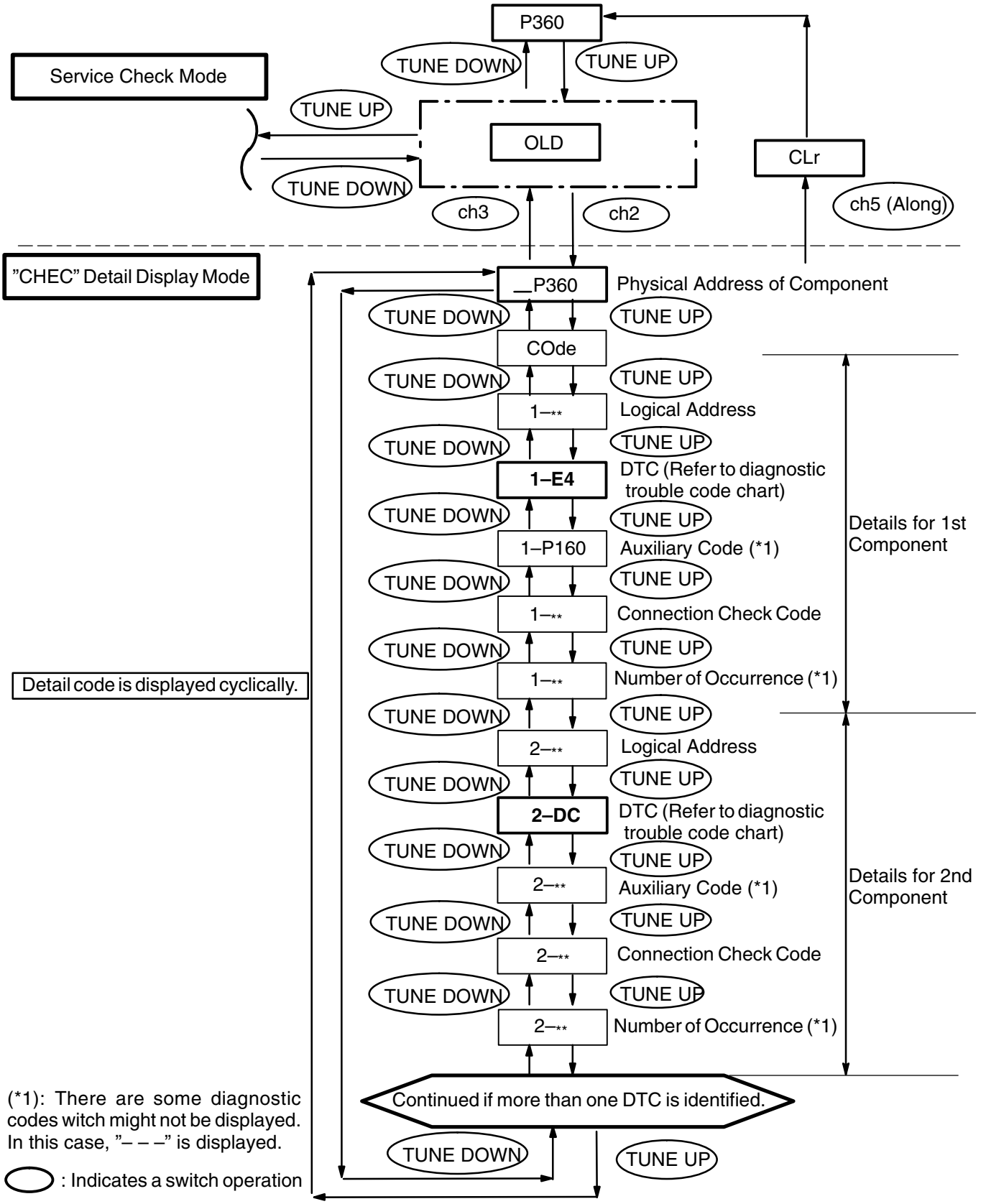
(b) ”ECHN” Detail Display Mode Screen



(c) ”CHEC” Detail Display Mode Screen



(d) ”OLD” Detail Display Mode Screen



(e) Recheck

(1) Pressing the [ch1] key in Service Check Mode executes recheck.

(2) To display the recheck process, follow the sequence indicated Display Screen for Service Check.

3. DIAGNOSIS 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.

Physical address: 160 Multi display

Logical address	DTC	Diagnosis item	Diagnosis content	Countermeasure and inspected parts
01 (Communication control)	21	ROM Error	Abnormal condition of ROM is detected.	Replace multi–display assembly.
01 (Communication control)	22	RAM Error	Abnormal condition of RAM is detected.	Replace multi–display assembly.
01 *2 (Communication Control)	D8	No response to connection check	Component shown by auxiliary code is or was disconnected from system after engine is started.	● Check harness for power supply of component shown by auxiliary code ● Check harness for communication system of component shown by auxiliary code
01 *1 (Communication Control)	D9	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 auxiliary code ● Check harness for communication system of component shown by auxiliary code
01 (Communication Control)	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 of component shown by auxiliary code. ● Check harness for communication system of component shown by auxiliary code. ● If error occurs again, replace component shown by auxiliary code.
01 *1 (Communication Control)	DB	Mode Status Error	Dual sound is detected.	● Check harness for power supply system of component shown by auxiliary code. ● Check harness for communication system of component shown by auxiliary code.
01 *3 (Communication Control)	DC	Transmission Error	Transmission to component shown by auxiliary code has been failed. (This code does not necessarily mean actual failure.)	If same component shown by auxiliary code is recorded in other component(s), check harness for power supply and communication system of components shown sub code.

01 *4 (Communication Control)	DE	Slave Reset (Momentary Interruption)	After engine start, slave component has been disconnected and connected again.	● Check harness for power supply system of component shown by auxiliary code. ● Check harness for communication system of component shown by auxiliary code.
01 (Communication Control)	E4	Multiple Frame Abort	Multiple frame transmission is aborted.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.

*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 240 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 again 1 min. after engine start.

*4: It may be stored when the engine key is turned again after engine start.

Physical address: 190 Radio receiver assembly

Logical address	DTC	Diagnosis item	Diagnosis content	Countermeasure and inspected parts
01 (Communication Control)	21	ROM Error	Error is detected in internal ROM.	Replace radio receiver assembly.
01 (Communication Control)	22	RAM Error	Error is detected in internal RAM.	Replace radio receiver assembly.
01 *1 (Communication Control)	D6	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 assembly was disconnected.	● Check harness for power supply system of multi display. ● Check harness for communication system of multi display. ● Check harness for power supply system of radio receiver assembly. ● Check harness for communication system of radio receiver assembly.
01 *4 (Communication Control)	D7	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 assembly was disconnected.	● Check harness for power supply system of multi display. ● Check harness for communication system of multi display.
01 *2 (Communication Control)	DC	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessary mean actual failure.)	● If same auxiliary code is recorded in other component, check harness for power supply and communication system of components shown sub code.
01 *3 (Communication Control)	DD	Master Reset (Momentary Interruption)	After engine is started, multi–display assembly was disconnected and connected again from system.	● If this error occurs frequently, replace multi–display assembly.
01 (Communication Control)	E0	Registration Completion Instruction Error	”Registration Completion Instruction” command from multi display cannot be received.	● Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
01 *1 (Communication Control)	E1	Audio processor ON error	While source equipment is operating, AMP output is stopped.	● Check harness for power supply of multi–display assembly. ● Check harness for communication system of multi–display assembly.
01 (Communication Control)	E2	ON/OFF Instruction Parameter Error	Error occurs in ON/OFF controlling command from multi–display assembly.	● Replace multi–display assembly.
01 (Communication Control)	E3	Registration Request Transmission	Registration Request command is output from slave component.	● Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

01 (Communication Control)	E4	Plural Frame Abort	Plural frame transmission is aborted.	● Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
62 (CD player)	42	No Disc Readout	Disc cannot be read.	Inspect CD.
62 (CD player)	44	CD Error	Error is detected in CD player.	Replace radio receiver assembly.
62 (CD player)	51	EJECT Error	CD cannot be ejected.	Replace radio receiver assembly.
62 (CD player)	46	Scratched/ Reversed Disc	Scratches or dirt is found on CD surface or CD is set upside down.	Inspect CD.

*1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.

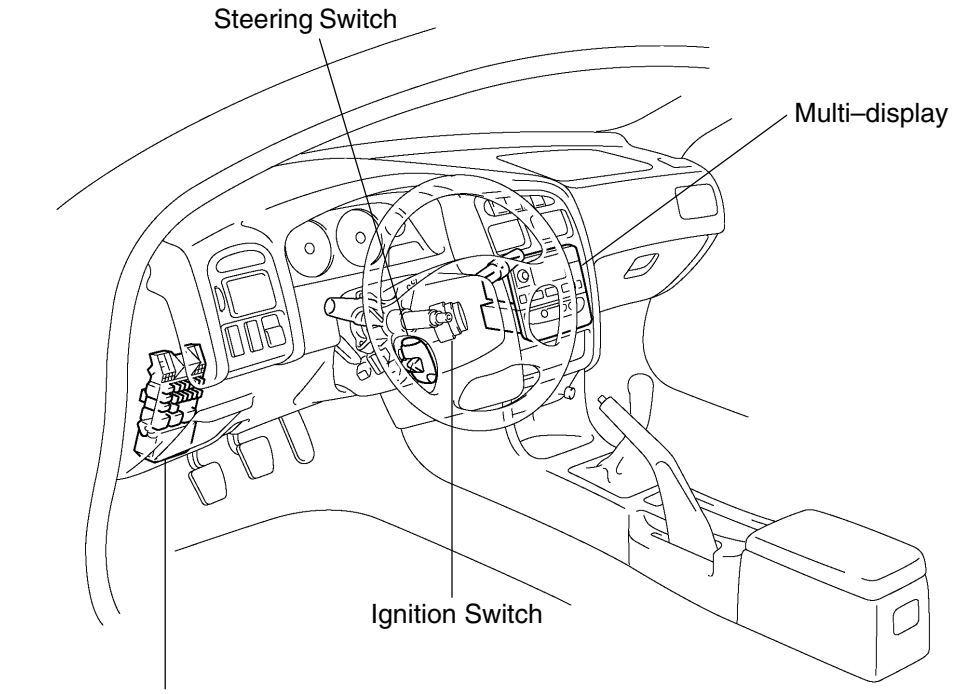
*2: It may be stored when the engine key is turned again 1 min. after engine start.

*3: It may be stored when the engine key is turned again after engine start.

*4: 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.

BE1XU–01

LOCATION



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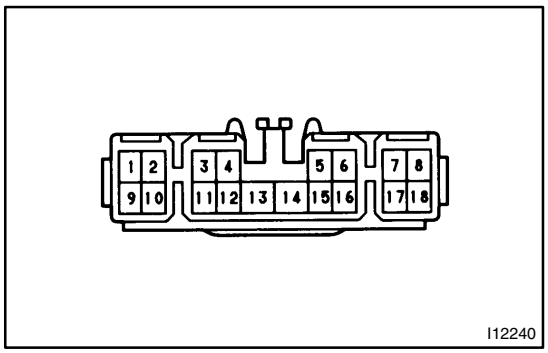
BE1XV–01



INSPECTION

INSPECT MULTI–DISPLAY CIRCUIT

Disconnect the connectors from the multi–display, and inspect the connector on the wire harness side.

Tester connection	Condition	Specified condition
4 – Ground	Constant	Continuity
7 – Ground	Ignition switch ON	Battery voltage
	Ignition switch LOCK	No voltage
8 – Ground	Constant	Battery voltage
18 – Ground	Ignition switch ACC or ON	No voltage
	Ignition switch LOCK	Battery voltage

If the circuit is not as specified, inspect the circuits connected to other parts.

BODY

CLIP BO–1
SRS AIRBAG BO–3
FRONT BUMPER BO–4
INSTRUMENT PANEL BO–5

REFER TO FOLLOWING REPAIR MANUALS:

Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

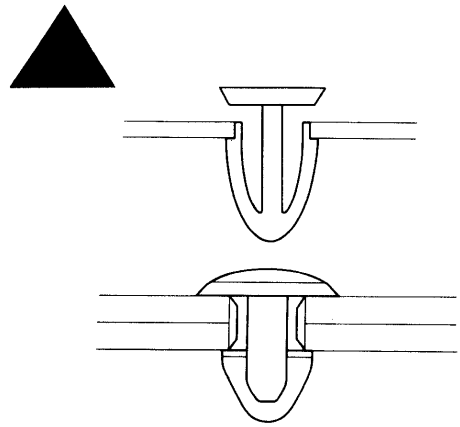
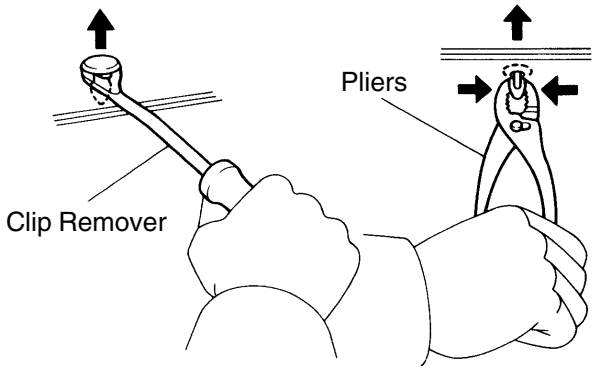
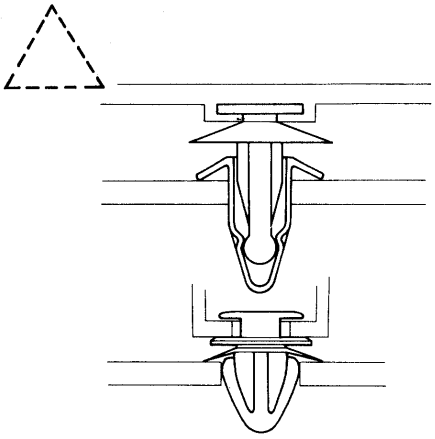
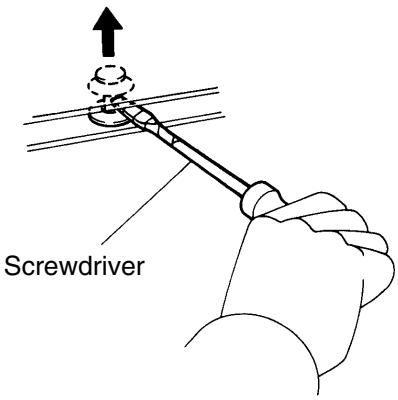
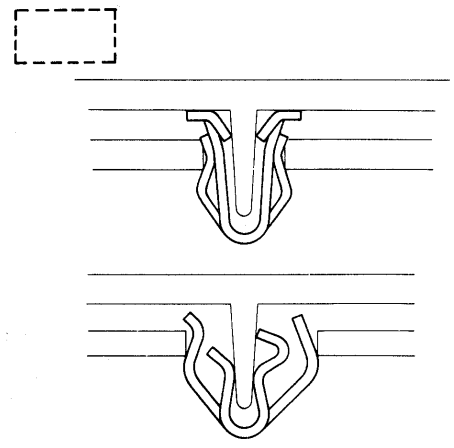
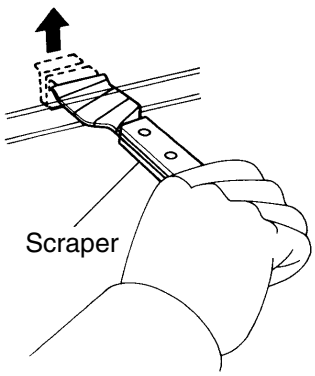
NOTE: The above pages contain only the points which differ from the above listed manuals.

CLIP

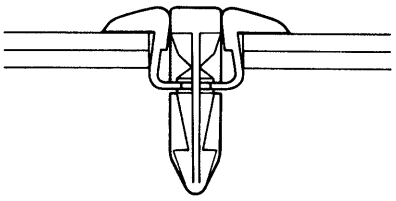
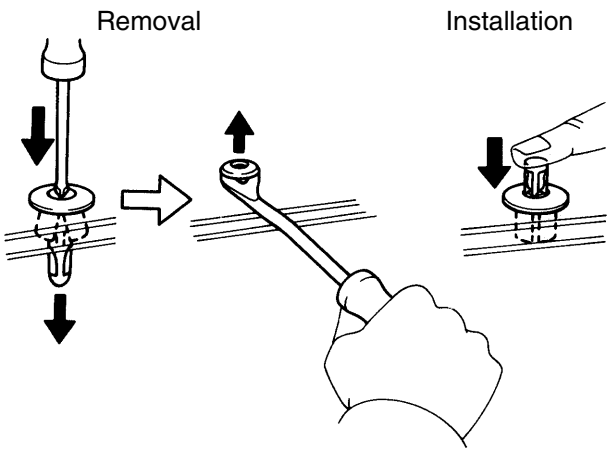
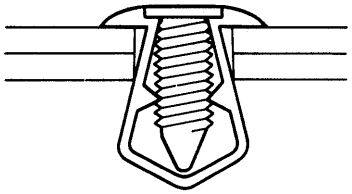
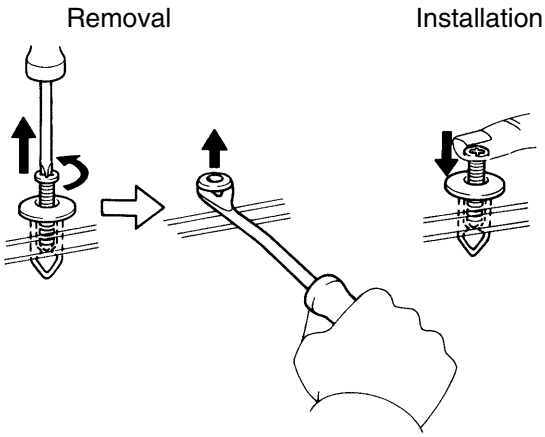
BO19D–01

REPLACEMENT

The removal and installation 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
	
	
	

V00005

Shape (Example)	Removal/Installation
	
	

V00012

SRS AIRBAG

BO19E–01

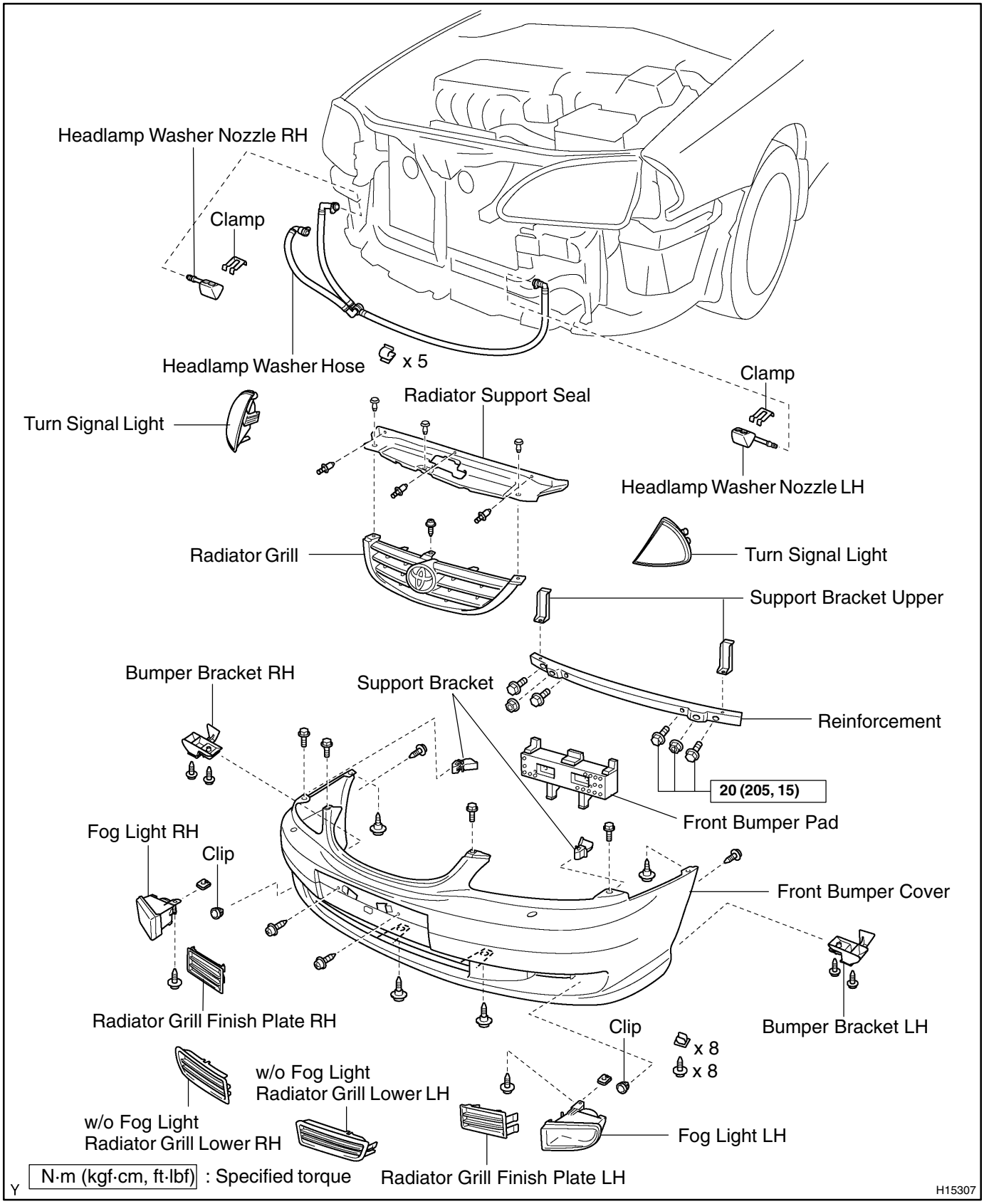
PRECAUTION

The TOYOTA AVENSIS/CORONA is equipped with an SRS (Supplemental Restraint System) such as the driver airbag, front passenger airbag and side 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 RS section.

FRONT BUMPER

COMPONENTS

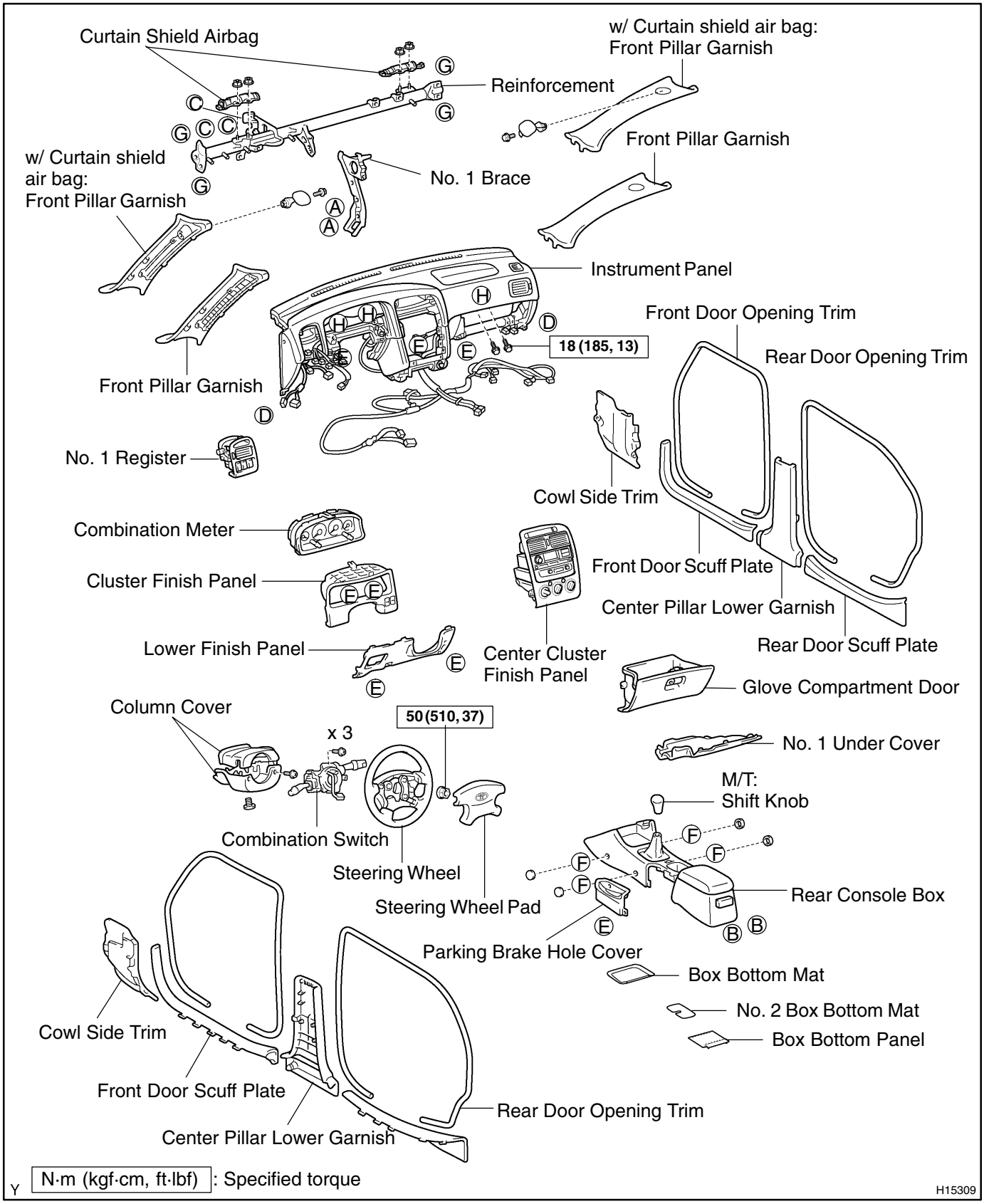
BO18F–02

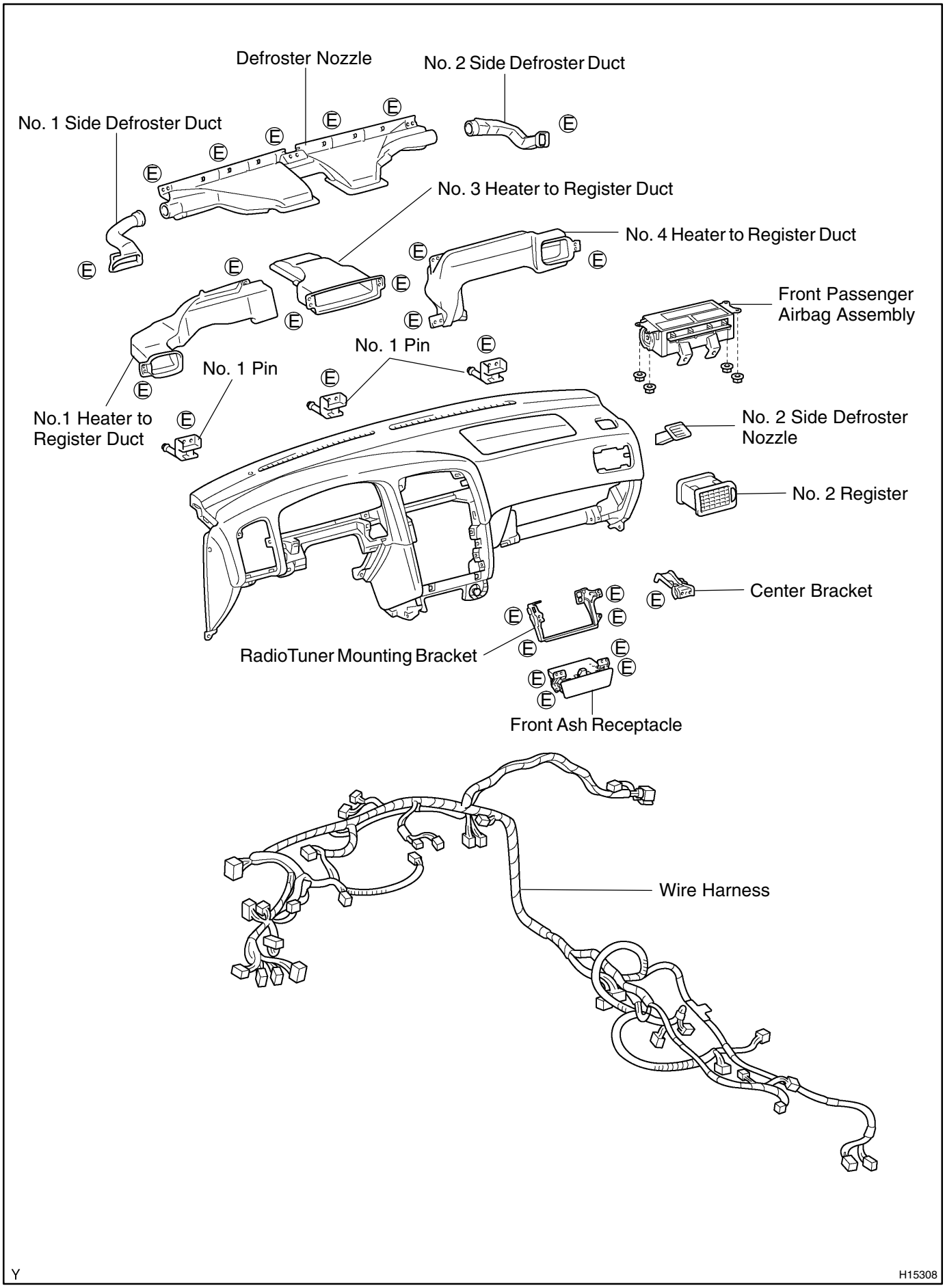


INSTRUMENT PANEL

COMPONENTS

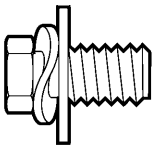
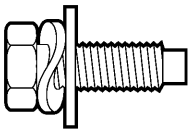
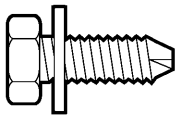
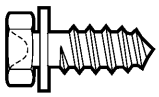
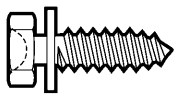
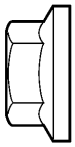
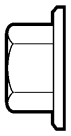
BO19J–03




Defroster Nozzle
No. 2 Side Defroster Duct
No. 1 Side Defroster Duct
No. 3 Heater to Register Duct
No. 4 Heater to Register Duct
Front Passenger Airbag Assembly
No. 1 Pin
No. 1 Pin
No.1 Heater to Register Duct
No. 2 Side Defroster Nozzle
No. 2 Register
Center Bracket
RadioTuner Mounting Bracket
Front Ash Receptacle
Wire Harness
Y
H15308

HINT:
Screw shapes and size are indicated in the table below. The codes (A – H) correspond to those indicated on the previous page.

mm (in.)

	Shape	Size		Shape	Size		Shape	Size
Ⓐ		ø = 8 (0.31) L = 16 (0.63)	Ⓑ		ø = 6 (0.24) L = 20 (0.79)	Ⓒ		ø = 6 (0.24) L = 18 (0.71)
Ⓓ		ø = 6 (0.24) L = 16 (0.63)	Ⓔ		ø = 5.22 (0.2055) L = 16 (0.63)	Ⓕ		ø = 5 (0.20) L = 18.5 (0.728)
Ⓖ		ø = 8 (0.31)	Ⓗ		ø = 6 (0.24)			

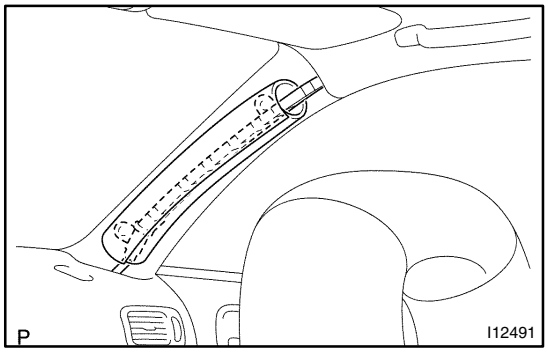
H03703

BO3VQ–01

REMOVAL

1. REMOVE FRONT DOOR OPENING TRIMS

2. REMOVE FRONT PILLAR GARNISHES



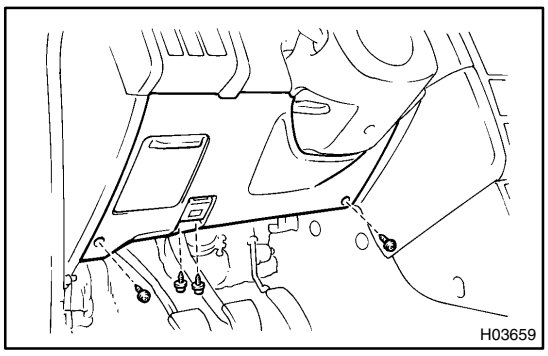
(a) w/ Curtain Shield Airbag:
  (1) Remove the 2 bolts.
  (2) Pack the airbag with protection cover.
  (3) Using a screwdriver, raise the pillar garnish cover.
  (4) Remove the bolt, pillar garnish cover and front pillar garnish.

NOTICE:

Protection rang is from instrument panel to ceiling.

(b) Remove the front door scuff plates.
(c) Remove the cowl side trims.
(d) Remove the rear door opening trims.
(e) Remove the rear door scuff plates.
(f) Remove the center pillar lower covers.
(g) Remove the front seats.

3. REMOVE STEERING WHEEL (See page SR–6)



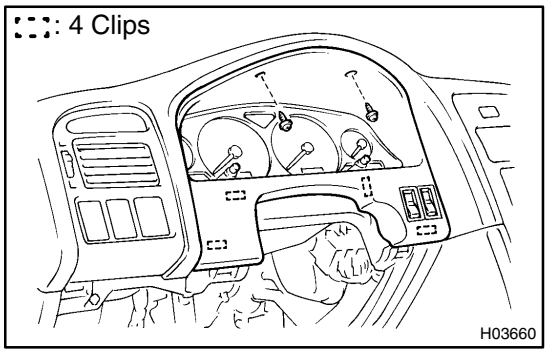
4. REMOVE LOWER FINISH PANEL

(a) Remove the 2 screws and hood lock control lever.
(b) Remove the 2 screws and lower finish panel.

5. REMOVE COLUMN COVER (See page SR–6)

6. REMOVE COMBINATION SWITCH (See page SR–6)

7. REMOVE STEERING COLUMN (See page SR–6)



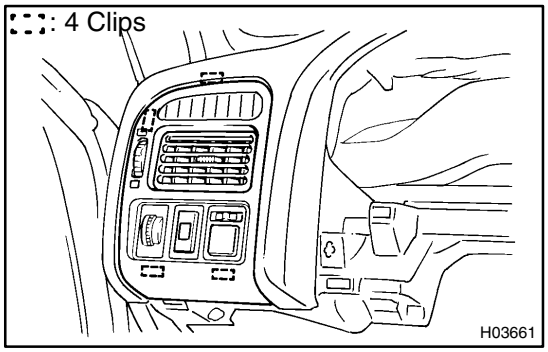
8. REMOVE CLUSTER FINISH PANEL

(a) Remove the 2 screws.
(b) Using a screwdriver, remove the cluster finish panel, then disconnect the connector.

HINT:

Tape the screwdriver tip before use.

9. REMOVE COMBINATION METER

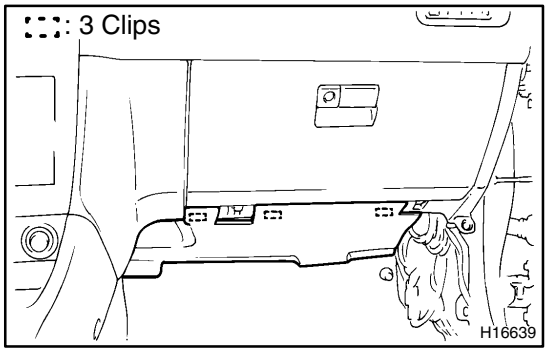


10. REMOVE NO. 1 REGISTER

Using a screwdriver, remove the No. 1 register.

HINT:

Tape the screwdriver tip before use.

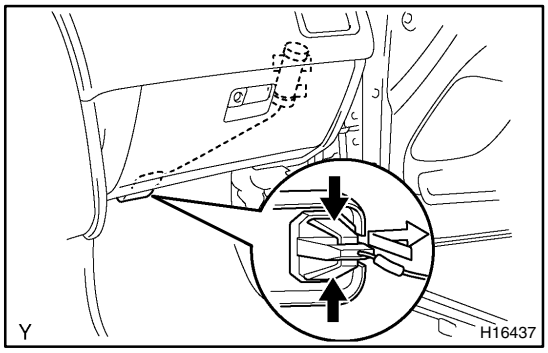


11. REMOVE NO. 1 UNDER COVER

Using a screwdriver, remove the No. 1 under cover.

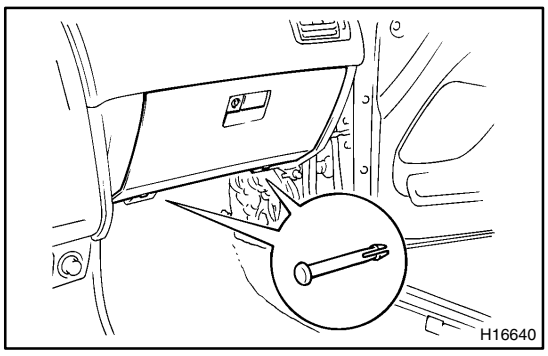
HINT:

Tape the screwdriver tip before use.



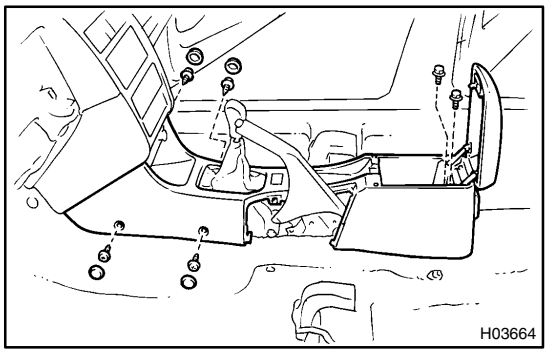
12. REMOVE GLOVE COMPARTMENT DOOR

(a) Remove the damper clip from the bracket as shown in the illustration.



(b) Remove the 2 glove shaft and glove compartment door.

13. REMOVE PARKING BRAKE HOLE COVER

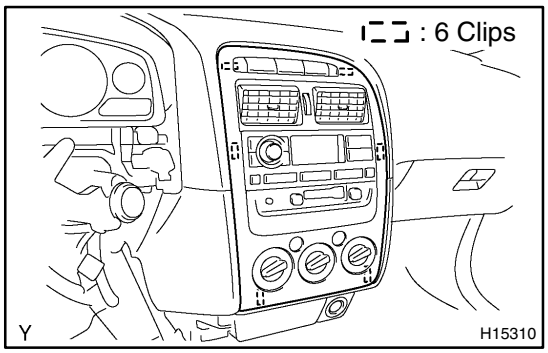


14. REMOVE REAR CONSOLE BOX

(a) M/T:
Remove the shift lever knob.

(b) Remove the box bottom mat, No. 2 box bottom mat and box bottom panel.

(c) Remove the 2 bolts, 4 caps, 4 screws and rear console box.

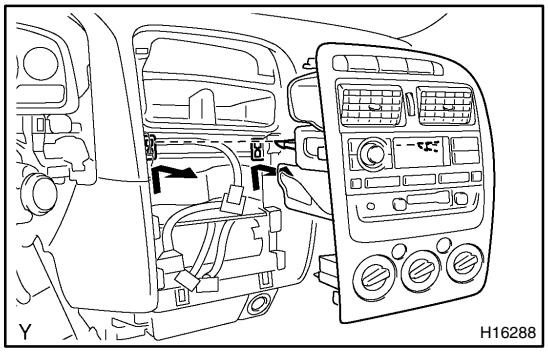


15. REMOVE CENTER CLUSTER FINISH PANEL

(a) Using a screwdriver, remove the 6 clips of the center cluster finish panel.

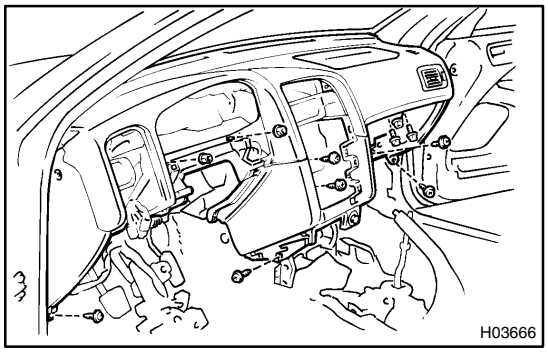
HINT:

Tape the screwdriver tip before use.



(b) Remove the center cluster finish panel with holding up as shown in the illustration.

(c) Disconnect the connectors.



16. REMOVE INSTRUMENT PANEL

(a) Remove the 2 bolts and front passenger airbag assembly.

(b) Remove the 6 screws and 3 nuts.

17. REMOVE NO. 1 BRACE

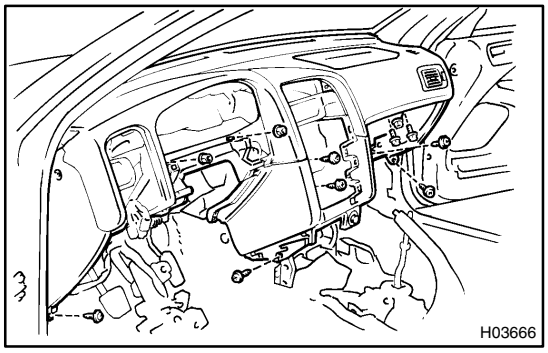
18. REMOVE REINFORCEMENT

BO2J4–02

INSTALLATION

1. INSTALL REINFORCEMENT

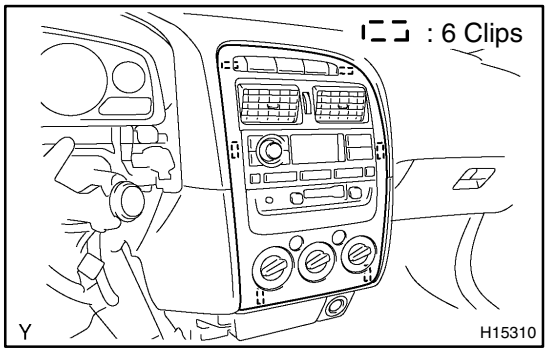
2. INSTALL NO. 1 BRACE



3. INSTALL INSTRUMENT PANEL

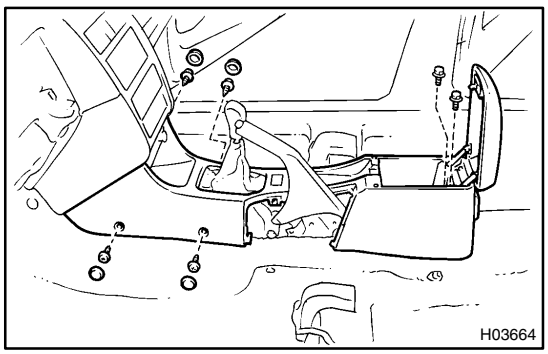
(a) Install the 6 screws and 3 nuts.

(b) Install the passenger airbag assembly with the 2 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



4. INSTALL CENTER CLUSTER FINISH PANEL

Install the panel, then connect the connectors.



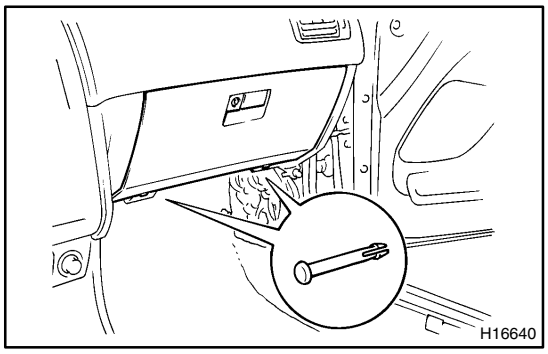
5. INSTALL REAR CONSOLE BOX

(a) Install the console box with the 2 bolts and 4 caps, 4 screws.

(b) Install the box bottom panel, No. 2 box bottom mat and box bottom mat.

(c) M/T:
Install the shift lever knob.

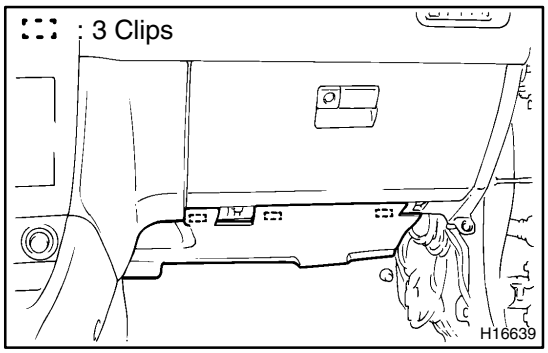
6. INSTALL PARKING BRAKE HOLE COVER



7. INSTALL GLOVE COMPARTMENT DOOR

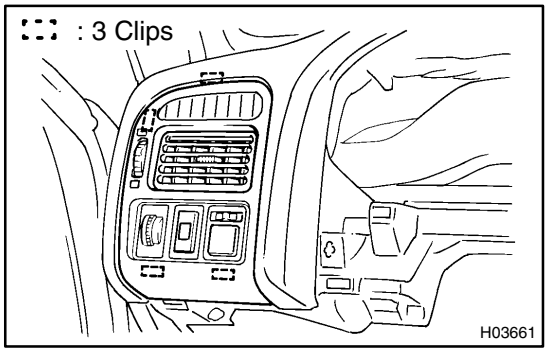
(a) Install the glove compartment door with the 2 glove shaft.

(b) Install the damper clip.



8. INSTALL NO. 1 UNDER COVER

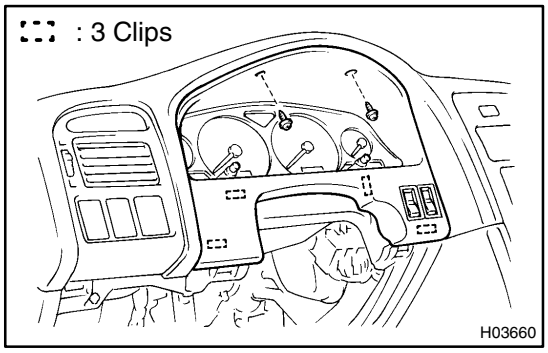
Install the No. 1 under cover.



9. INSTALL NO. 1 REGISTER

Install the No. 1 register.

10. INSTALL COMBINATION METER



11. INSTALL CLUSTER FINISH PANEL

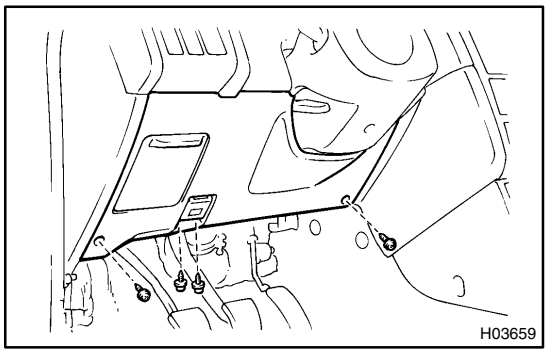
(a) Install the cluster finish panel, then connect the connector.

(b) Install the 2 screws.

12. INSTALL STEERING COLUMN (See page SR–6)

13. INSTALL COMBINATION SWITCH (See page SR–6)

14. INSTALL COLUMN COVER (See page SR–6)

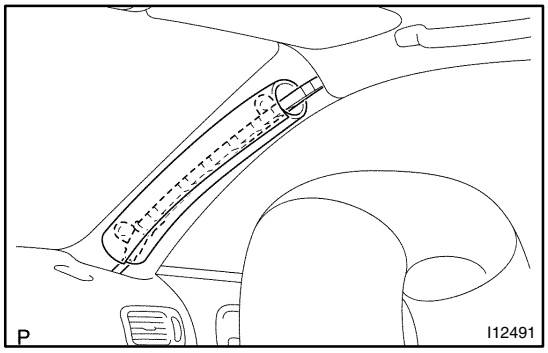


15. INSTALL LOWER FINISH PANEL

(a) Install the lower finish panel with the 2 screws.

(b) Install the hood lock control lever.

16. INSTALL STEERING WHEEL (See page SR–6)
17. INSTALL FRONT SEATS
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)
18. INSTALL CENTER PILLAR LOWER COVERS
19. INSTALL REAR DOOR SCUFF PLATES
20. INSTALL REAR DOOR OPENING TRIMS
21. INSTALL COWL SIDE TRIMS
22. INSTALL FRONT DOOR SCUFF PLATES



(a) w/ Curtain Shield Airbag:
(1) Remove the protection cover.
(2) Install the 2 bolts.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
(3) Install the pillar garnish cover with the bolt.

NOTICE:
Be sure to tighten the bolt.

(4) Fell the pillar garnish cover.
(b) Install the front pillar garnishes.
(c) Install the front door opening trims.

AIR CONDITIONING

AIR CONDITIONING SYSTEM AC–1
DRIVE BELT AC–2
MANIFOLD GAUGE SET AC–5
REFRIGERANT LINE AC–8
COMPRESSOR AND
MAGNETIC CLUTCH AC–11
AIR INLET SERVOMOTOR AC–15
AIR MIX SERVOMOTOR AC–19
AIR OUTLET SERVOMOTOR AC–23
AIR CONDITIONER
CONTROL ASSEMBLY AC–27
AIR CONDITIONER AMPLIFIER AC–30

REFER TO FOLLOWING REPAIR MANUALS:

Manual Name	Pub. No.
AVENSIS/CORONA Chassis and Body Repair Manual	RM599E
AVENSIS/CORONA Chassis and Body Repair Manual Supplement (Aug., 1999)	RM698E

NOTE: The above pages contain only the points which differ from the above listed manuals.

AIR CONDITIONING SYSTEM

AC39E–01

ON–VEHICLE INSPECTION

INSPECT IDLE–UP SPEED

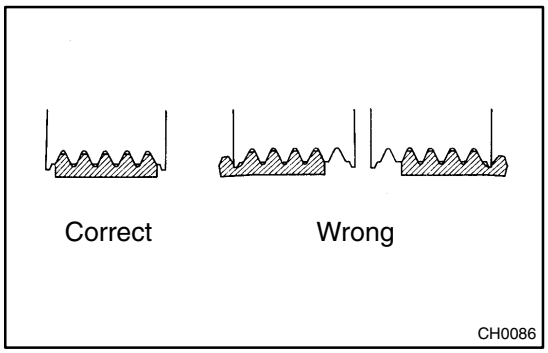
(a) Warm up engine.

(b) Inspect idle–up speed when the these conditions are established.

- Warm up engine
- Blower speed control switch at ”HI” position
- A/C switch ON
- Temperature control dial at ”COOL” position

1ZZ–FE, 3ZZ–FE engine models (M/T):
Magnetic clutch not engaged: 650 ± 50 rpm
Magnetic clutch engaged: 800 ± 50 rpm
1ZZ–FE, 3ZZ–FE engine models (A/T):
Magnetic clutch not engaged: 700 ± 50 rpm
Magnetic clutch engaged: 800 ± 50 rpm
1AZ–FSE engine models (M/T):
Magnetic clutch not engaged: 675 ± 50 rpm
Magnetic clutch engaged: 800 ± 50 rpm
1AZ–FSE engine models (A/T):
Magnetic clutch not engaged: 675 ± 50 rpm
Magnetic clutch engaged: 750 ± 50 rpm

If idle speed is not as specified, check Idle control system.



DRIVE BELT

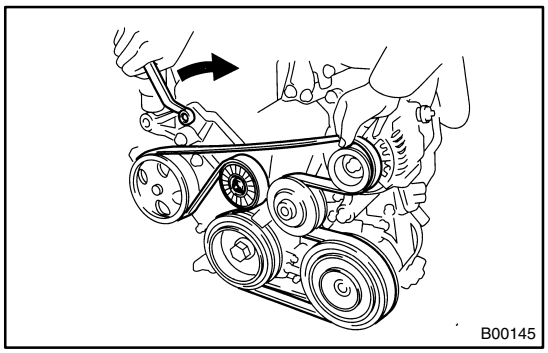
ON–VEHICLE INSPECTION

AC2I6–02

INSPECT DRIVE BELT'S INSTALLATION CONDITION

Check that the drive belt fits properly in the ribbed grooves.

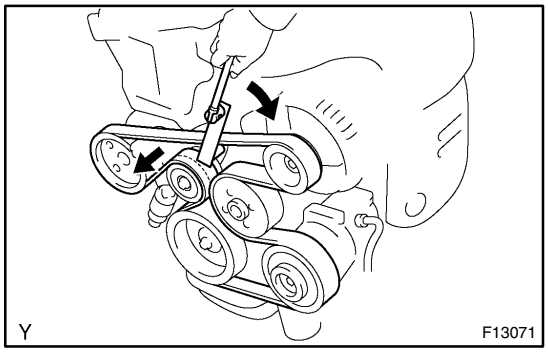
AC39F–01



REMOVAL

1. 1ZZ–FE, 3ZZ–FE Engines:
REMOVE DRIVE BELT

Loosen the drive belt tension by turning the drive belt tensioner arm clockwise, and remove the drive belt.

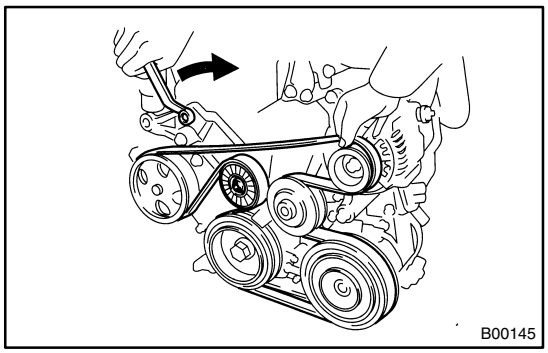


2. 1AZ–FSE Engine:
REMOVE DRIVE BELT

Using the SST, loosen the drive belt tension by turning the drive belt tensioner arm clockwise, and remove the drive belt.

SST 09249–63010

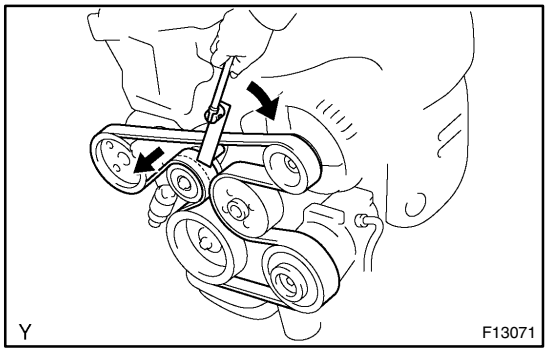
AC39G–01



INSTALLATION

1. 1ZZ–FE, 3ZZ–FE Engines:
INSTALL DRIVE BELT

Turning the drive belt tensioner arm clockwise, and install the drive belt.



2. 1AZ–FSE Engine:
REMOVE DRIVE BELT

Using the SST, turning the drive belt tensioner arm clockwise, and install the drive belt.

SST 09249–63010

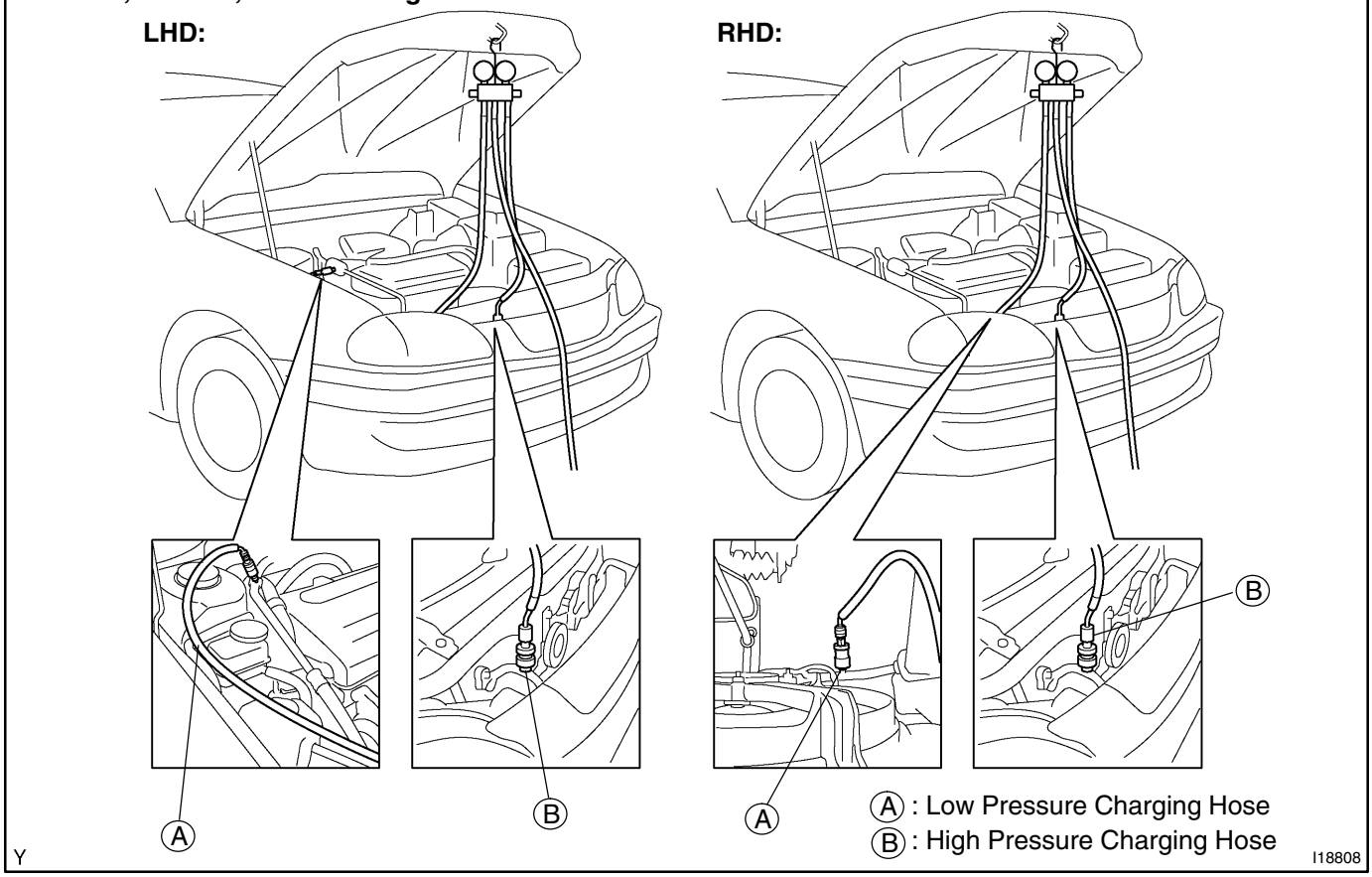
3. CHECK DRIVE BELT INSTALLING CONDITION

MANIFOLD GAUGE SET

AC2A7–03

SET ON

1ZZ–FE, 3ZZ–FE, 1AZ–FSE Engines



1. CONNECT CHARGE HOSE TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

CAUTION:

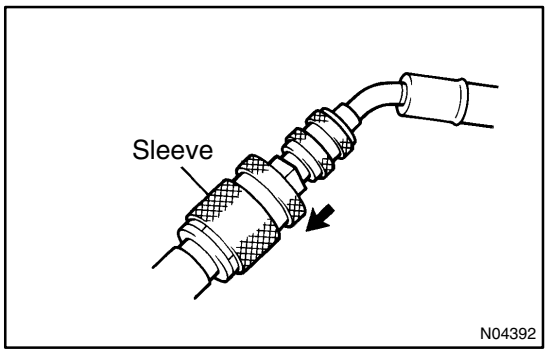
Do not connect the wrong hoses.

2. CONNECT QUICK DISCONNECT ADAPTERS TO CHARGING HOSES

Tighten the nuts by hand.

3. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

4. REMOVE CAPS FROM SERVICE VALVE ON REFRIGERANT LINE

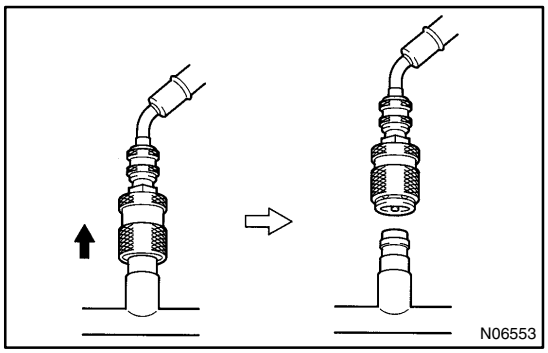


5. CONNECT QUICK DISCONNECT ADAPTER TO SERVICE VALVES

HINT:

Push the quick disconnect adapter onto the service valve, slide, then slide the sleeve of the quick disconnect adapter downward to lock it.

AC2A8–02



SET OFF

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
2. **DISCONNECT QUICK DISCONNECT ADAPTERS FROM SERVICE VALVES ON REFRIGERANT LINE**

HINT:

Slide the sleeve of the quick disconnect adapter upward to unlock the adapter and remove it from the service valve.

3. **INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINE**

REFRIGERANT LINE

AC2IB–01

ON–VEHICLE INSPECTION

1. INSPECTION HOSE AND TUBE CONNECTIONS FOR LOOSENESS

2. INSPECT HOSES AND TUBES FOR LEAKAGE

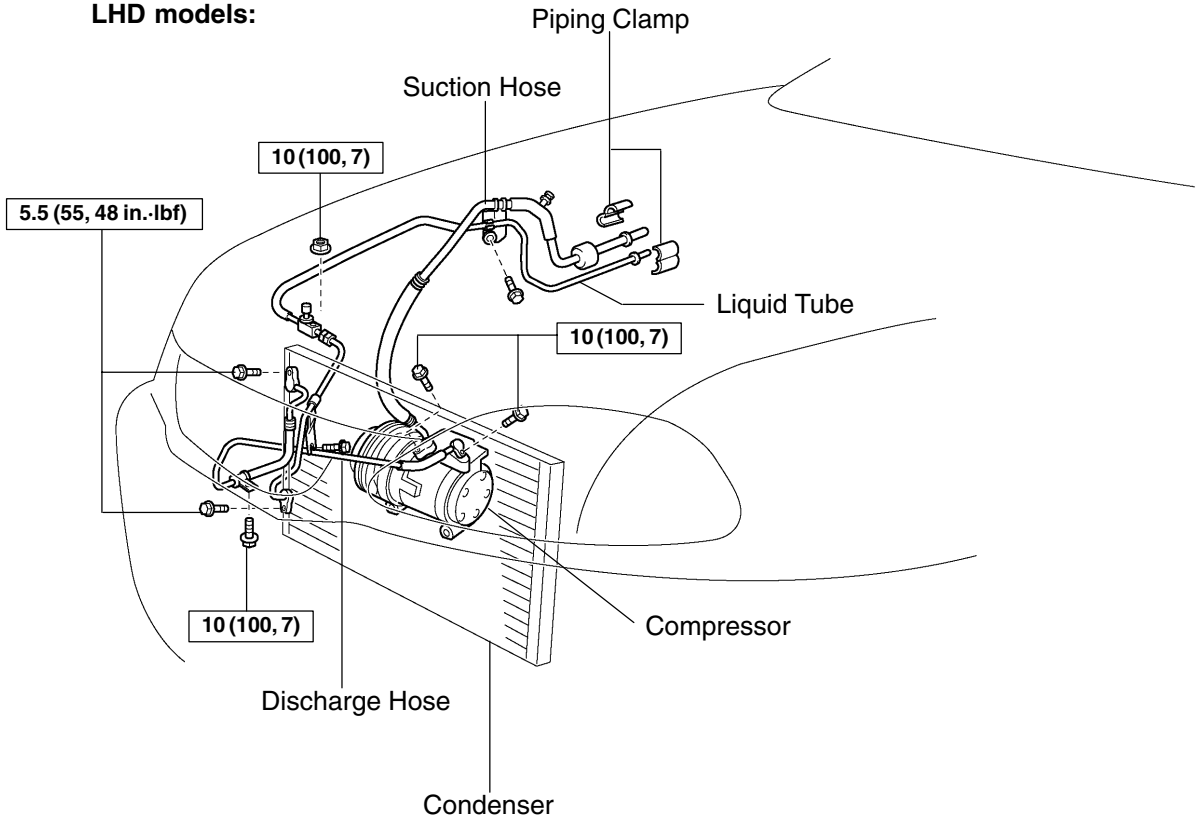
Using a gas leak detector, check for leakage of refrigerant.

AC2IC–02

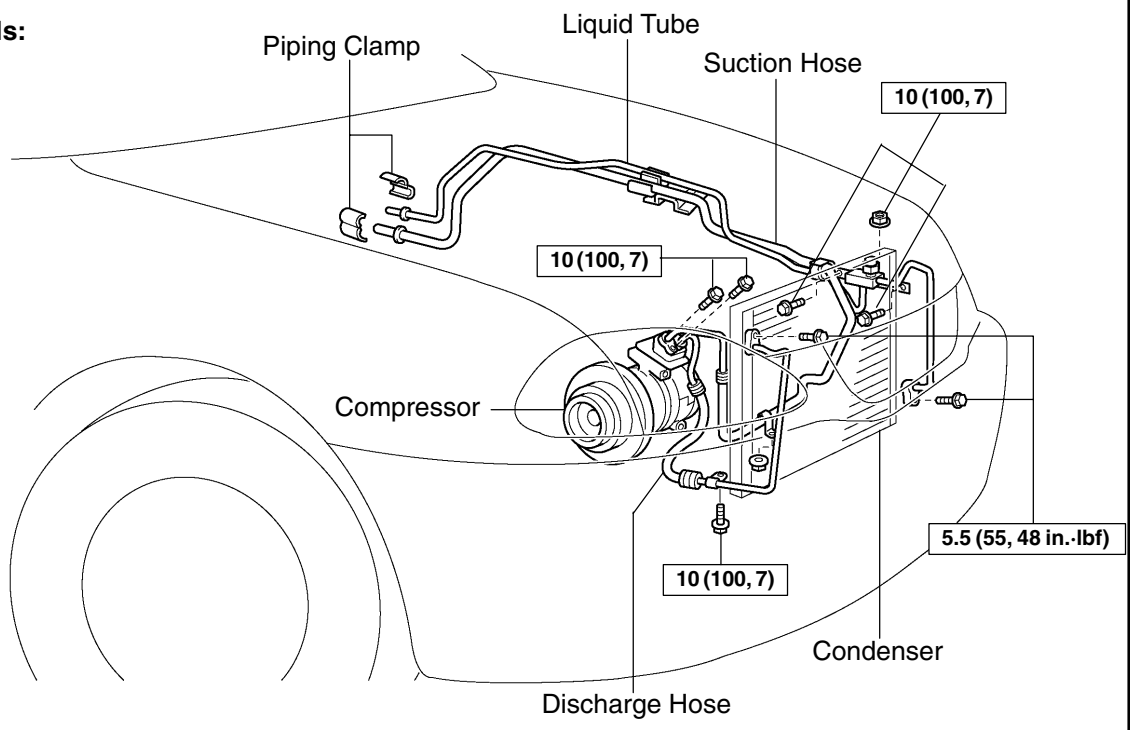
LOCATION

1ZZ–FE, 3ZZ–FE, 1AZ–FSE Engines

LHD models:



RHD models:



N·m (kgf·cm, ft·lbf) : Specified torque

Y

I18809

AC2ID–02

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

2. REPLACE FAULTY TUBE OR HOSE

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

3. TORQUE CONNECTIONS TO SPECIFIED TORQUE

NOTICE:

Connections should not be torqued tighter than the specified torqued.

Part tightened	N·m	kgf·cm	ft·lbf
Condenser x Discharge tube	5.5	55	48 in.·lbf
Condenser x Liquid tube	5.5	55	48 in.·lbf
Compressor x Discharge tube	10	100	7
Compressor x Suction tube	10	100	7

4. EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT

Specified amount: 460 ± 20 g (16.23 ± 0.71 oz.)

5. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

6. INSPECT AIR CONDITIONING OPERATION

COMPRESSOR AND MAGNETIC CLUTCH

AC1GA–05

ON–VEHICLE INSPECTION

1. INSPECT COMPRESSOR FOR METALLIC SOUND

Check there is abnormal metallic sound from the compressor when the A/C switch is ON.

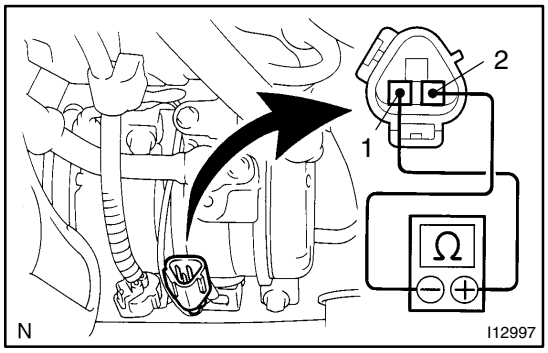
If abnormal metallic sound is heard, replace the compressor assembly.

2. INSPECT REFRIGERANT PRESSURE (See page AC–1)

3. INSPECT VISUALLY FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

If there is any leakage, replace the compressor assembly.



4. INSPECT COMPRESSOR LOCK SENSOR RESISTANCE

(a) Disconnect the connector.

(b) Measure resistance between terminals 1 and 2 .

Standard resistance:

165 – 205 Ω at 20 °C (68 °F)

If resistance is not as specified, replace the sensor.

5. CHECK FOR LEAKAGE OF GREASE FROM CLUTCH BEARING

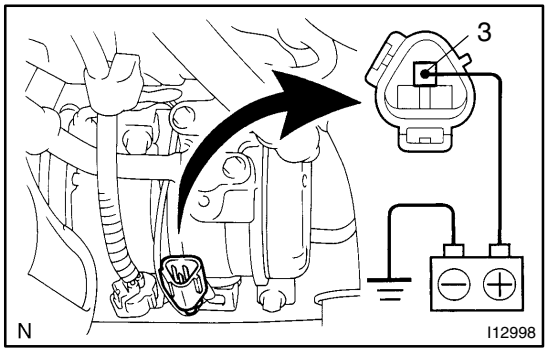
6. CHECK FOR SIGNS OF OIL ON PRESSURE PLATE OR ROTOR

7. INSPECT MAGNETIC CLUTCH BEARING FOR NOISE

(a) Start engine.

(b) Check for abnormal noise from the compressor when the A/C switch is OFF.

If abnormal noise is being emitted, replace the magnetic clutch.



8. INSPECT MAGNETIC CLUTCH OPERATION

(a) Disconnect the connector.

(b) Connect the positive (+) lead form the battery to terminal 3 and the negative (–) lead to the body ground.

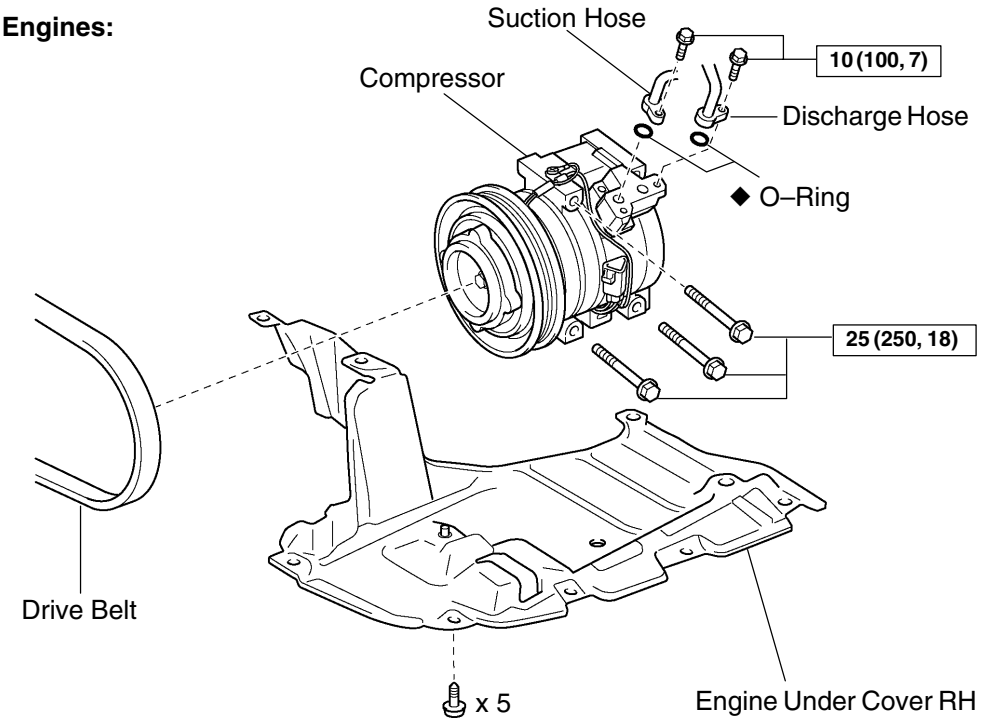
(c) Check that the magnetic clutch energized.

If operation is not as specified, replace the magnetic clutch.

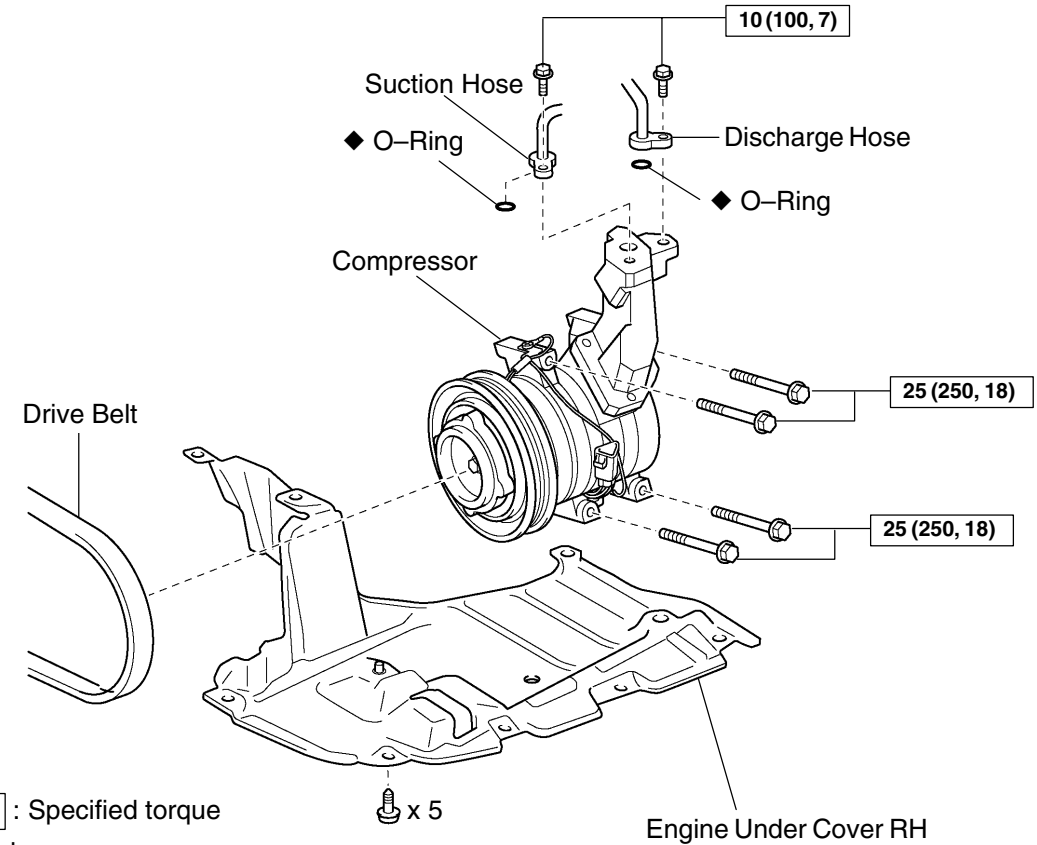
AC1GB–03

COMPONENTS

1ZZ–FE, 3ZZ–FE Engines:



1AZ–FSE Engine:



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

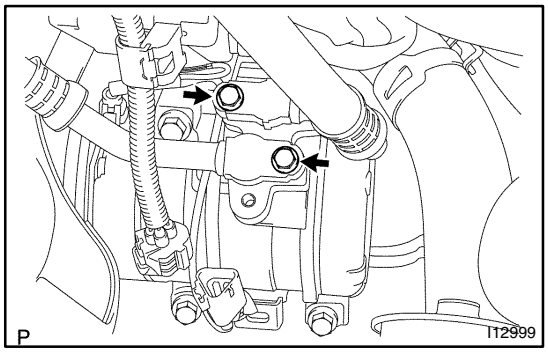
Y

I18811

AC2IP–02

REMOVAL

1. **RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX. 10 MINUTES**
2. **STOP ENGINE**
3. **DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY**
4. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM**
5. **REMOVE ENGINE UNDER COVER RH**
6. **REMOVE DRIVE BELT (See page AC–3)**

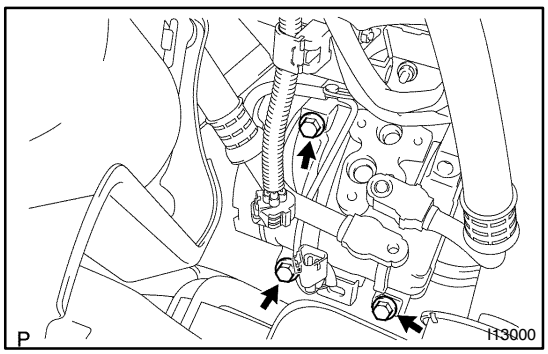


7. DISCONNECT DISCHARGE AND SUCTION HOSES

Remove the 2 bolts and disconnect the both hoses.

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.



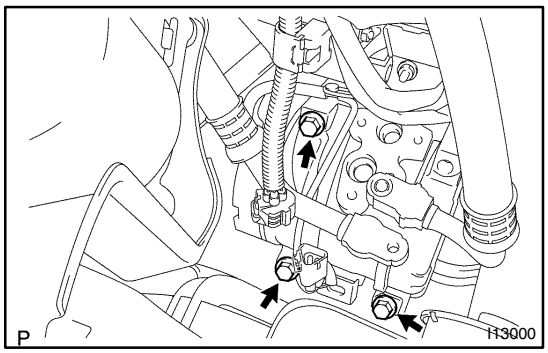
8. 1ZZ–FE, 3ZZ–FE Engines: REMOVE COMPRESSOR

(a) Disconnect the connector.
(b) Disconnect the wire harness clamp.
(c) Remove the 3 bolts and compressor.

9. 1AZ–FSE Engine: REMOVE COMPRESSOR

(a) Disconnect the connector.
(b) Disconnect the wire harness clamp.
(c) Remove the 4 bolts and compressor.

AC39H–01



INSTALLATION

1. 1ZZ–FE, 3ZZ–FE Engines:
INSTALL COMPRESSOR

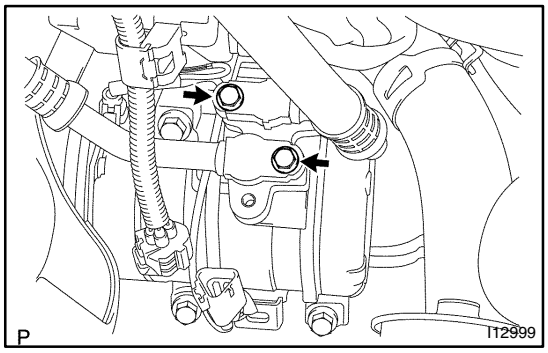
(a) Install the compressor with 3 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.

2. 1AZ–FSE Engine:
INSTALL COMPRESSOR

(a) Install the compressor with 4 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.



3. CONNECT DISCHARGE AND SUCTION HOSES

(a) Lubricate 2 new O–rings with compressor oil and install them to the hoses.

(b) Connect the both hoses with 2 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

NOTICE:
Hose should be connected immediately after the caps have been removed.

4. INSTALL AND CHECK DRIVE BELT (See page AC–2, AC–4)

5. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

6. EVACUATE AIR FROM REFRIGERATION SYSTEM CHARGE SYSTEM WITH REFRIGERANT
Specified amount: 460 ± 20 g (16.23 ± 0.71 oz.)

7. INSPECT FOR LEAKAGE OF REFRIGERANT

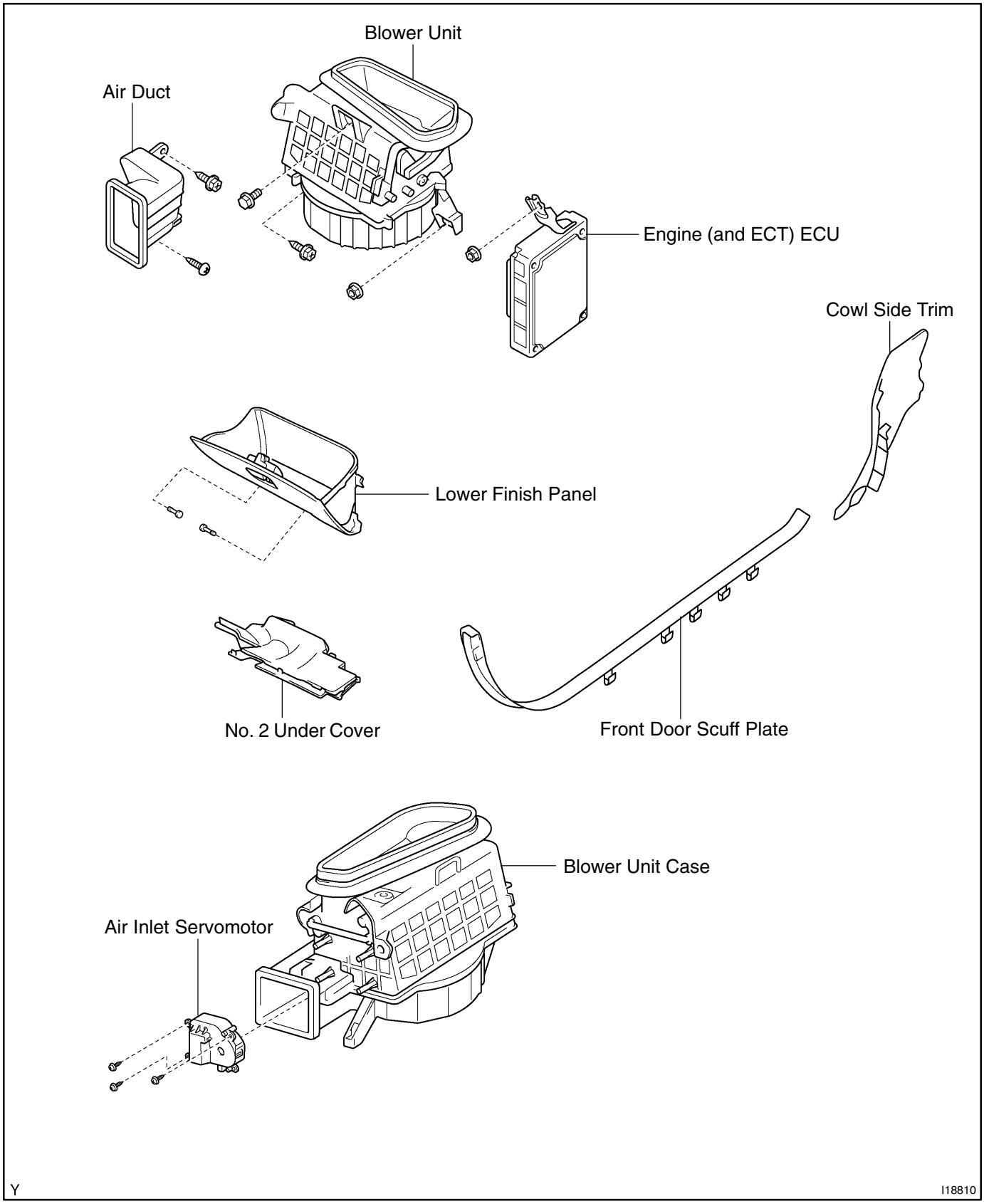
Using a gas leak detector, check for leakage of refrigerant.
If there is leakage, check the tightening torque at the joints.

8. INSPECT A/C OPERATION

AIR INLET SERVOMOTOR

COMPONENTS

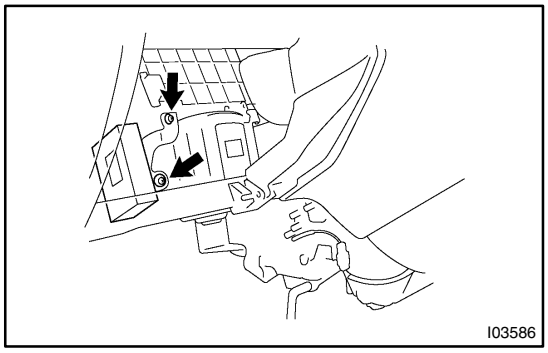
AC39I–01



AC39J–01

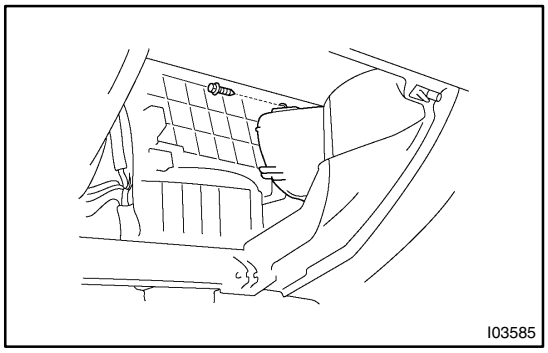
REMOVAL

1. **REMOVE FRONT DOOR SCUFF PLATE ON PASSENGER SIDE**
2. **REMOVE COWL SIDE TRIM ON PASSENGER SIDE**
3. **REMOVE NO. 2 UNDER COVER**
4. **REMOVE LOWER FINISH PANEL (See page BO–8)**
5. **REMOVE ENGINE (and ECT) ECU**



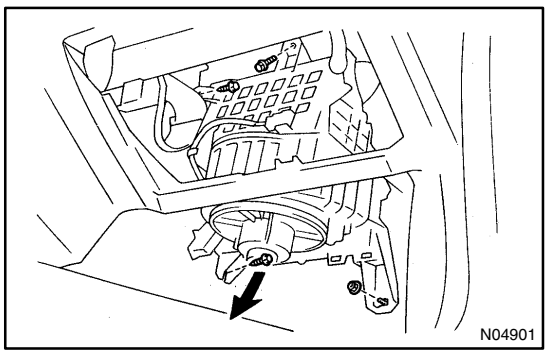
6. **RHD Models Only:**
   REMOVE THEFT DETERRENT ECU

(a) Disconnect the connector.
(b) Remove the 2 screws and ECU.



7. **REMOVE AIR DUCT**

Remove the 2 screws and duct.



8. **REMOVE BLOWER UNIT**

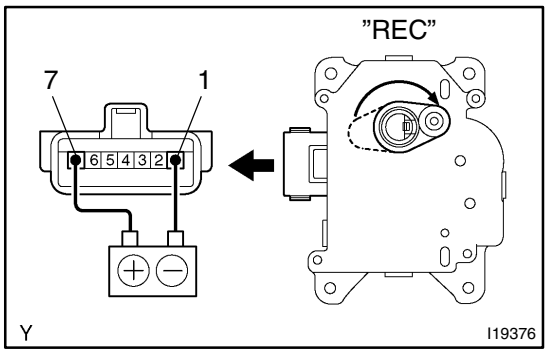
(a) Disconnect the connectors.
(b) Remove the bolt, screw and nut.
(c) Remove the blower unit.

9. **REMOVE AIR INLET SERVOMOTOR**

Remove the 3 screws and air inlet servomotor.

AC39K–01

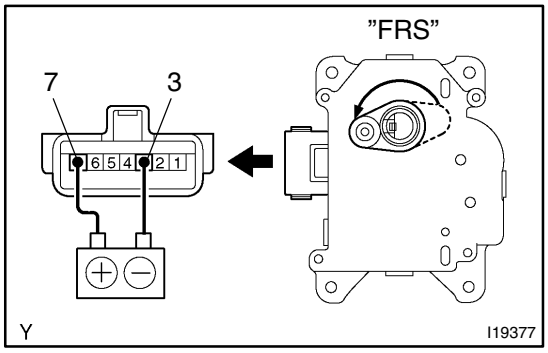
INSPECTION



1. LHD:
INSPECT AIR INLET SERVOMOTOR OPERATION

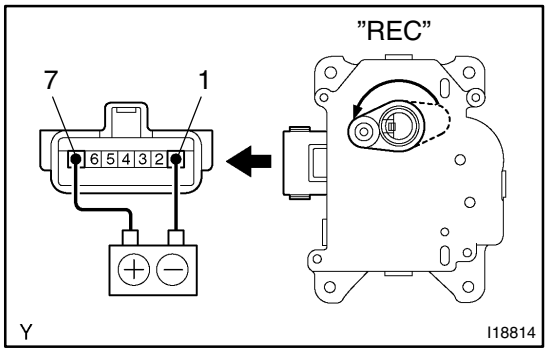
(a) Connect the positive (+) lead from the battery to terminal 7 and negative (–) lead to terminal 1 and check that arm turns to "REC" side smoothly.

If operation is not as specified, replace the servomotor.



(b) Connect the positive (+) lead from the battery to terminal 7 and the negative (–) lead to terminal 3 and check that the arm turns to "FRS" side smoothly.

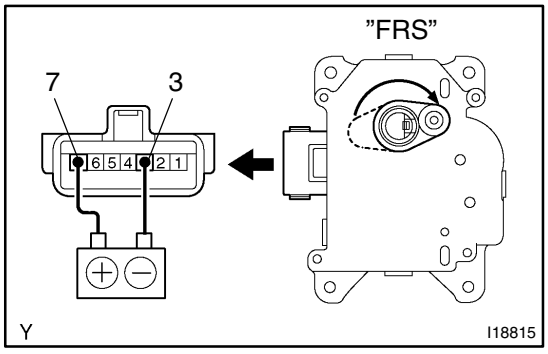
If operation is not as specified, replace the servomotor.



2. RHD:
INSPECT AIR INLET SERVOMOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 7 and negative (–) lead to terminal 1 and check that arm turns to "REC" side smoothly.

If operation is not as specified, replace the servomotor.



(b) Connect the positive (+) lead from the battery to terminal 7 and the negative (–) lead to terminal 3 and check that the arm turns to "FRS" side smoothly.

If operation is not as specified, replace the servomotor.

AC39L–01

INSTALLATION

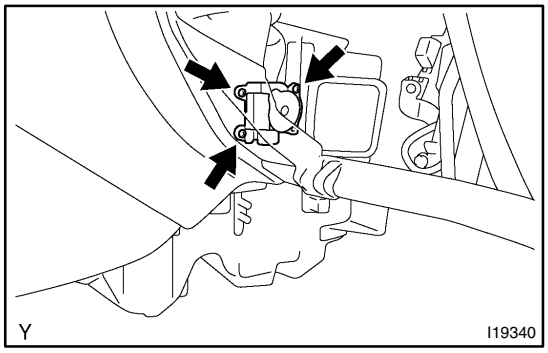
Installation is in the reverse order of removal (See page AC–16).

AIR MIX SERVOMOTOR

AC39M–01

REMOVAL

1. REMOVE BLOWER UNIT (See page AC–16)



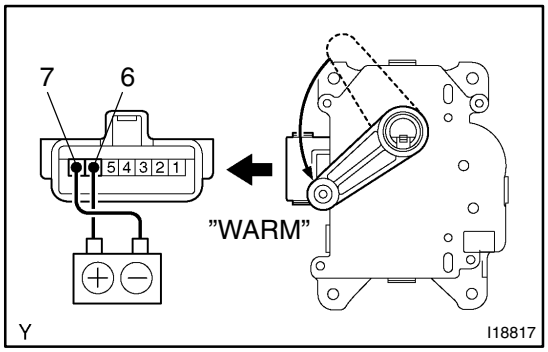
2. REMOVE AIR MIX SERVOMOTOR

(a) Disconnect the connector.

(b) Remove the 3 screws and air mix servomotor.

AC39N–01

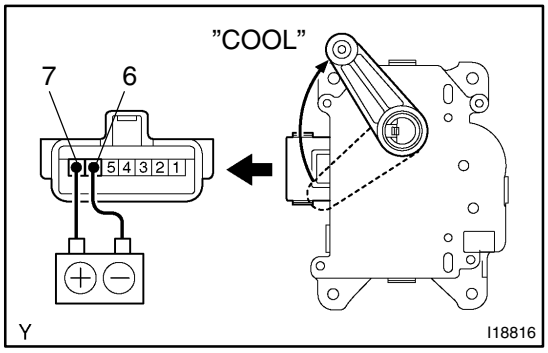
INSPECTION



1. LHD:
INSPECT AIR MIX SERVOMOTOR OPERATION

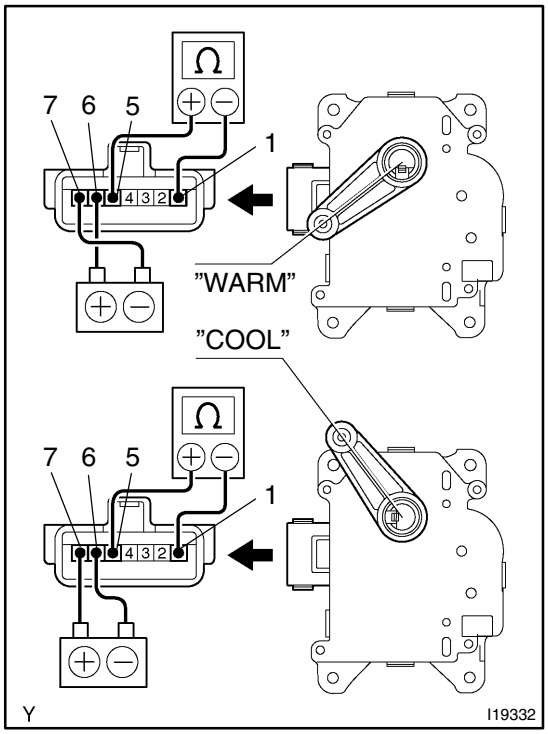
(a) Connect the positive (+) lead from the battery to terminal 6 and the negative (–) lead to terminal 7 and check that the arm turns to ”WARM” side smoothly.

If operation is not as specified, replace the servomotor.



(b) Connect the positive (+) lead from the battery to terminal 7 and negative (–) lead to terminal 6 and check that arm turns to ”COOL” side smoothly.

If operation is not as specified, replace the servomotor.

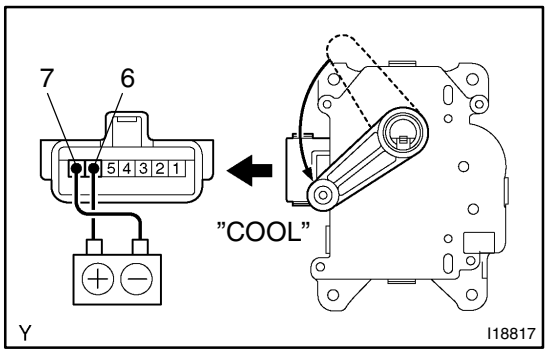


2. LHD:
INSPECT AIR MIX POSITION SENSOR RESISTANCE

Measure resistance between terminals at servomotor arm each position as shown in the chart.

Tester connection	Condition	Specified condition
3 – 1	Constant	4.2 – 7.8 kΩ
5 – 1	Arm position at ”WARM”	0.84 – 1.56 kΩ
5 – 1	Arm position at ”COOL”	3.36 – 6.24 kΩ

If resistance is not as specified, replace the servomotor.

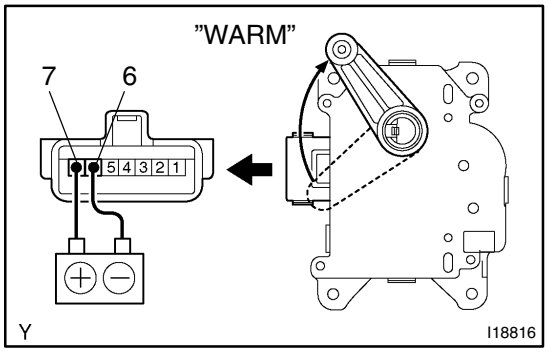


3. RHD:

INSPECT AIR MIX SERVOMOTOR OPERATION

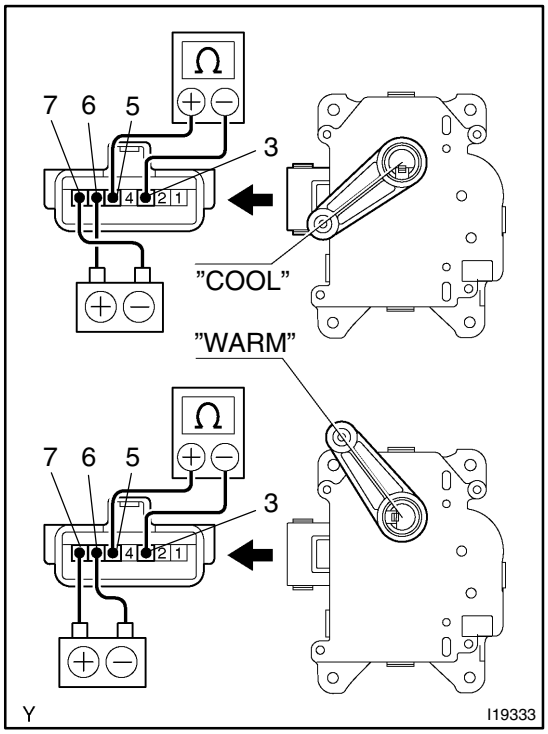
(a) Connect the positive (+) lead from the battery to terminal 6 and the negative (–) lead to terminal 7 and check that the arm turns to "COOL" side smoothly.

If operation is not as specified, replace the servomotor.



(b) Connect the positive (+) lead from the battery to terminal 7 and negative (–) lead to terminal 6 and check that arm turns to "WARM" side smoothly.

If operation is not as specified, replace the servomotor.



4. RHD:

INSPECT AIR MIX POSITION SENSOR RESISTANCE

Measure resistance between terminals at servomotor arm each position as shown in the chart.

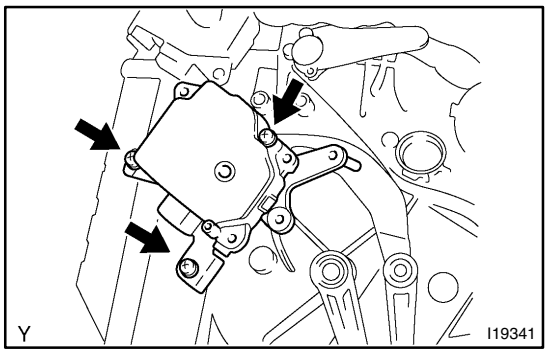
Tester connection	Condition	Specified condition
3 – 1	Constant	4.2 – 7.8 kΩ
5 – 3	Arm position at "COOL"	3.36 – 6.24 kΩ
5 – 3	Arm position at "WARM"	0.84 – 1.56 kΩ

If resistance is not as specified, replace the servomotor.

AC39O–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–19).



AIR OUTLET SERVOMOTOR

AC39P–01

REMOVAL

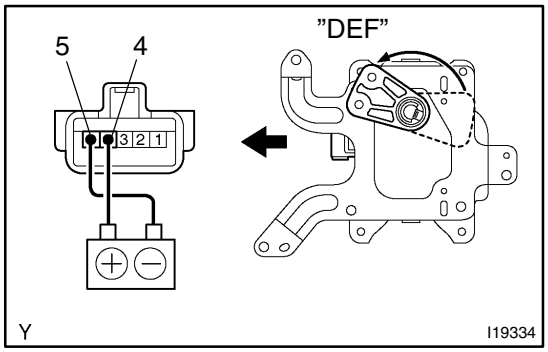
REMOVE AIR OUTLET SERVOMOTOR

(a) Disconnect the connector.

(b) Remove the 3 screws and air outlet servomotor.

AC39Q–01

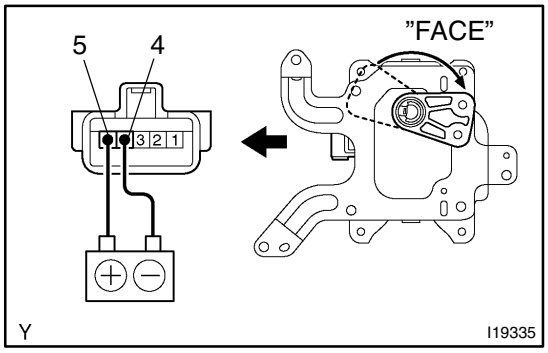
INSPECTION



1. LHD:
INSPECT AIR OUTLET SERVOMOTOR OPERATION

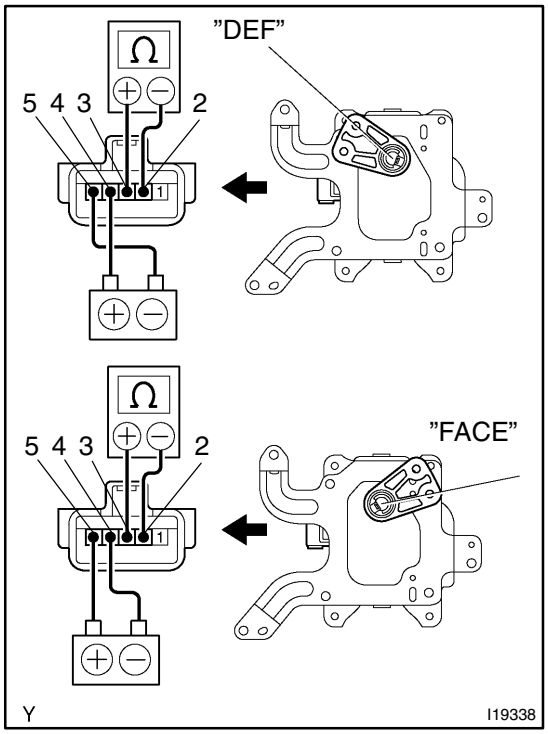
(a) Connect the positive (+) lead from the battery to terminal 4 and negative (–) lead to terminal 5 and check that arm turns to "DEF" side smoothly.

If operation is not as specified, replace the servomotor.



(b) Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 4 and check that the arm turns to "FACE" side smoothly.

If operation is not as specified, replace the servomotor.

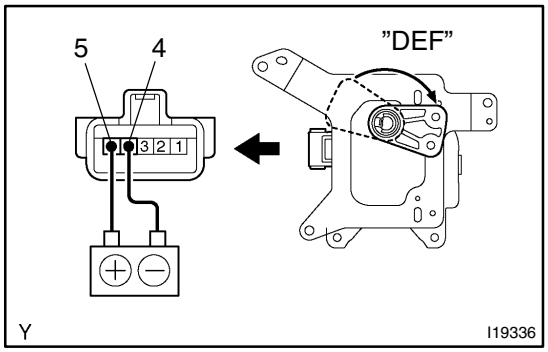


2. LHD:
INSPECT AIR OUTLET POSITION SENSOR RESISTANCE

Measure resistance between terminals at servomotor arm each position as shown in the chart.

Tester connection	Condition	Specified condition
2 – 1	Constant	4.2 – 7.8 kΩ
3 – 2	Arm position at "DEF"	3.49 – 6.47 kΩ
3 – 2	Arm position at "FACE"	0.71 – 1.33 kΩ

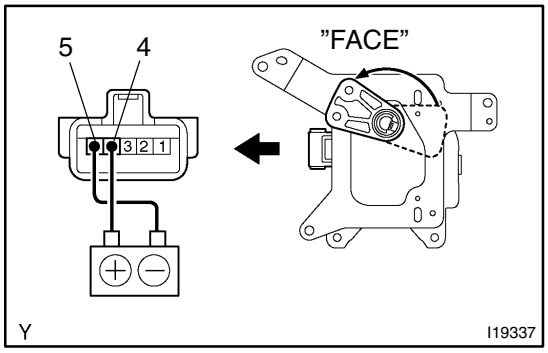
If resistance is not as specified, replace the servomotor.



3. RHD:
INSPECT AIR OUTLET SERVOMOTOR OPERATION

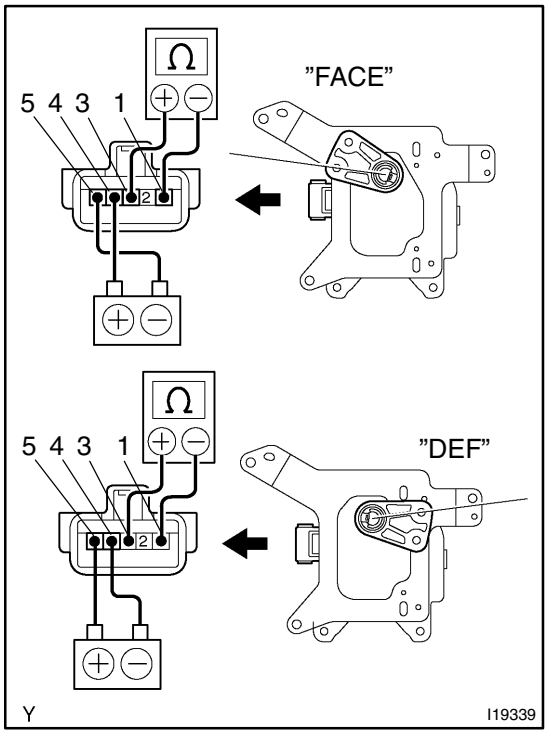
(a) Connect the positive (+) lead from the battery to terminal 5 and negative (–) lead to terminal 4 and check that arm turns to "DEF" side smoothly.

If operation is not as specified, replace the servomotor.



(b) Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5 and check that the arm turns to "FACE" side smoothly.

If operation is not as specified, replace the servomotor.



4. RHD:
INSPECT AIR OUTLET POSITION SENSOR RESISTANCE

Measure resistance between terminals at servomotor arm each position as shown in the chart.

Tester connection	Condition	Specified condition
2 – 1	Constant	4.2 – 7.8 kΩ
3 – 1	Arm position at "DEF"	3.49 – 6.47 kΩ
3 – 1	Arm position at "FACE"	0.71 – 1.33 kΩ

If resistance is not as specified, replace the servomotor.

AC39R–01

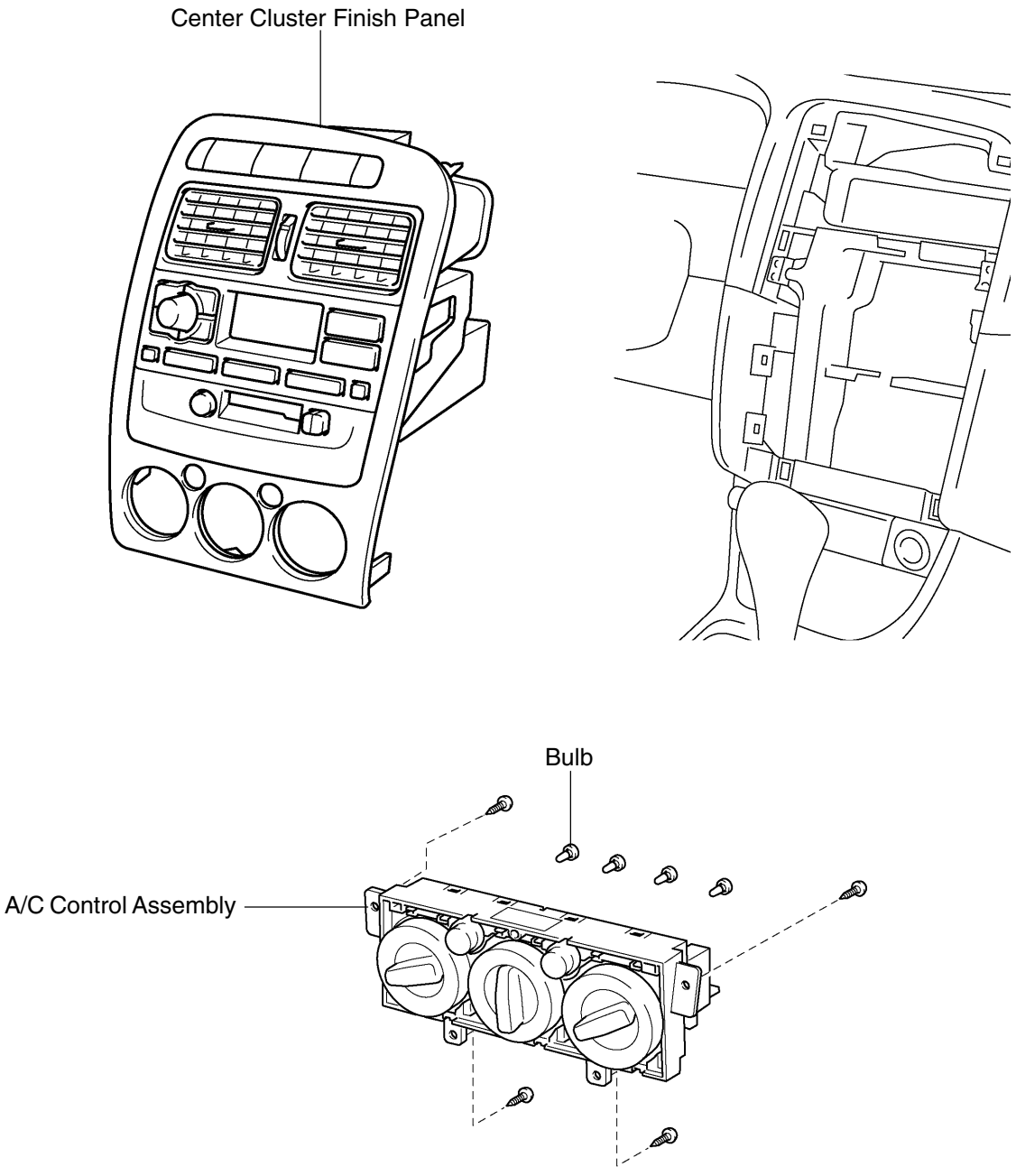
INSTALLATION

Installation is in the reverse order of removal (See page AC–23).

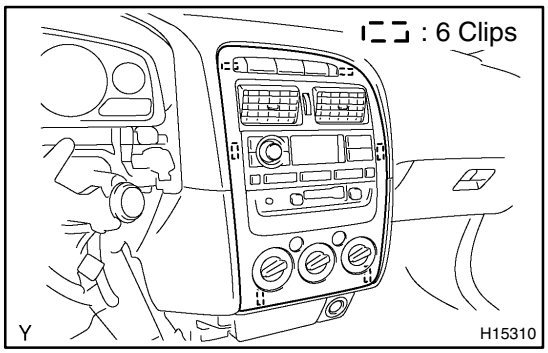
AIR CONDITIONER CONTROL ASSEMBLY

AC39S–01

COMPONENTS



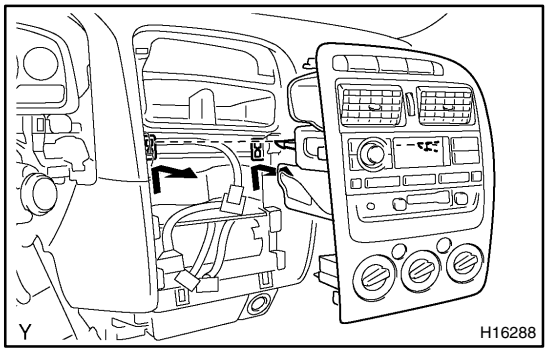
AC39T–01



REMOVAL

1. REMOVE CENTER CLUSTER FINISH PANEL

(a) Using a screwdriver, remove the cluster finish panel.



(b) Remove the cluster finish panel shown in the illustration.
(c) Disconnect the connecters.

2. REMOVE A/C CONTROL ASSEMBLY

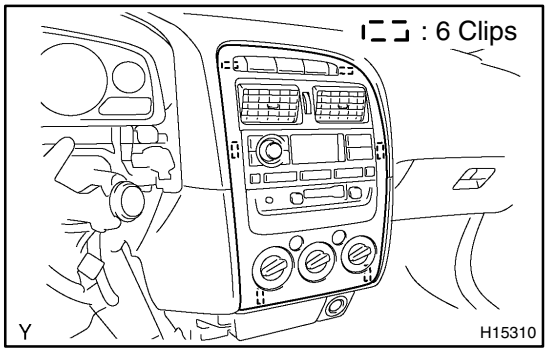
Remove the 4 screws and A/C control panel assembly.

AC39U–01

INSTALLATION

1. INSTALL A/C CONTROL ASSEMBLY

Install the A/C control panel assembly to the cluster finish panel with the 4 screws.



2. INSTALL CENTER CLUSTER FINISH PANEL

(a) Connect the connectors.

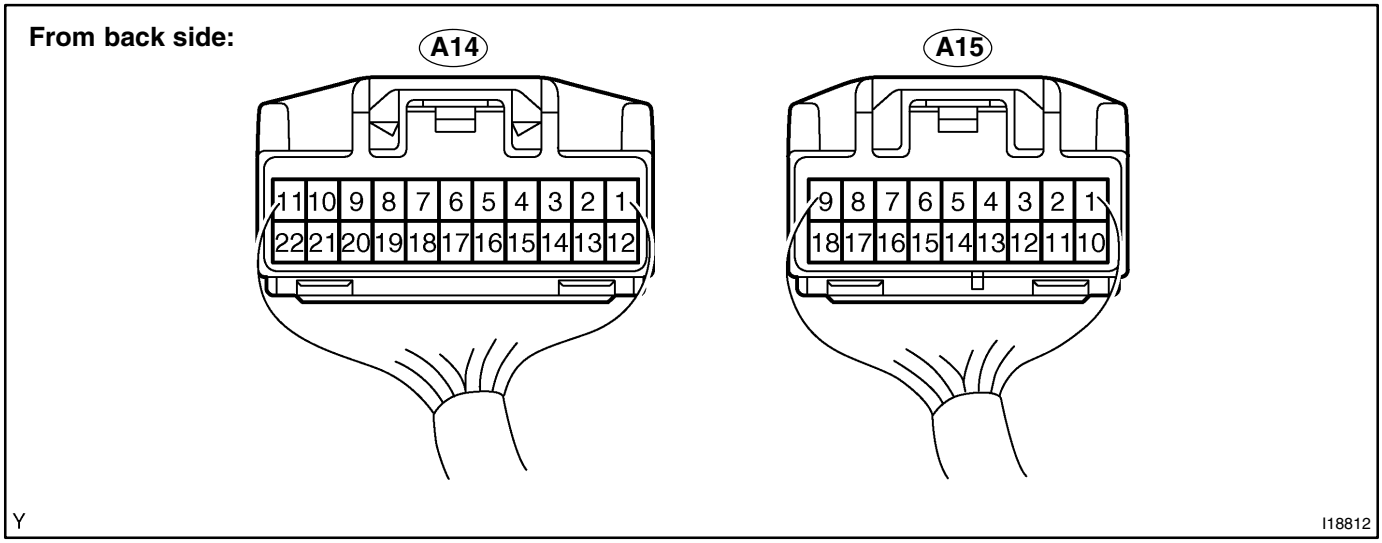
(b) Install the cluster finish panel.

AIR CONDITIONER AMPLIFIER

AC39V–01

ON–VEHICLE INSPECTION

1. **REMOVE A/C CONTROL ASSEMBRY (See page AC–28)**
2. **INSPECT A/C AMPLIFIER CIRCUIT**



Tester connection	Condition	Specified condition
TAM ↔ TAM–SG (A14–18 ↔ A14–14)	IG ON. Ambient temp.: 25 °C (77 °F)	1.35 – 1.75 V
	IG ON. Ambient temp.: 40 °C (104 °F)	0.85 – 1.25 V
TR ↔ TR–SG (A14–7 ↔ A14–3)	IG ON. Room temp.: 25 °C (77 °F)	1.8 – 2.2 V
	IG ON. Room temp.: 40 °C (104 °F)	0.85 – 1.25 V
TS ↔ TS–S5 (A14–19 ↔ A14–3)	IG ON. Solar sensor subject to electric light	1.0 V or more
	IG ON. Solar sensor covered by cloth	Below 1.0 V
TE ↔ TE–SG (A14–8 ↔ A14–15)	IG ON. Evaporator temp.: 0 °C (32 °F)	2.0 – 2.4 V
	IG ON. Evaporator temp.: 15 °C (59 °F)	1.4 – 1.8 V
LOCK ↔ LOCK–SG (A15–9 ↔ A15–18)	Start engine. Compressor: Operate	4.5 – 5.5 V
TW ↔ GND (A15–7 ↔ A14–12)	IG ON	Pulse generation
MGC ↔ GND (A15–4 ↔ A14–12)	Start engine (idling). Magnetic clutch: ON	10 – 14 V
	Start engine (idling). Magnetic clutch: OFF	Below 1.5 V
TPM ↔ TPM–SG (A14–20 ↔ A14–17)	IG ON. Mode selector: FACE	3.5 – 4.5 V
	IG ON. Mode selector: DEF	0.5 – 1.5 V
TPM–S5 ↔ TPM–SG (A14–1 ↔ A14–17)	IG ON. Set temp.: MAX. COOL	3.5 – 4.5 V
	IG ON. Set temp.: MAX. HOT	0.5 – 1.5 V
TPM–SG ↔ Body ground (A14–17 ↔ Body ground)	Always	1 Ω or less
AOF ↔ GND (A15–1 ↔ A14–12)	IG ON. Mode selector: Except FACE	Below 1.0 V
	IG ON. Mode selector: FACE	10 – 14 V
AOD ↔ GND (15–2 ↔ A14–12)	IG ON. Mode selector: Except DEF	Below 1.0 V
	IG ON. Mode selector: DEF	10 – 14 V

AMC ↔ GND (A15–10 ↔ A14–12)	IG ON. Set temp.: Except MAX. COOL	Below 1.0 V
	IG ON. Set temp.: COOL	10 – 14 V
AMH ↔ GND (A15–11 ↔ A14–12)	IG ON. set temp.: Except MAX. HOT	Below 1.0 V
	IG ON. Set temp.: HOT	10 – 14 V
HR ↔ GND (A14–4 ↔ A14–12)	IG ON. Blower motor: Operate	Below 1.0 V
	IG ON. Blower motor: Not operate	10 – 14 V
ILL+ ↔ GND (A14–22 ↔ A14–12)	Light control switch: TAIL	10 – 14 V
	Light control switch: OFF	0 V
BLW ↔ GND (A14–5 ↔ A14–12)	IG ON. Blower motor: Operate	Pulse generation
	IG ON. Blower motor: Not operate	10 – 14 V
GND ↔ Body ground (A14–12 ↔ Body ground)	Always	1 Ω or less
REC ↔ GND (A15–17 ↔ A14–12)	IG ON. Air inlet selector: RECIRCULATE	Below 0.7 V
	IG ON. Air inlet selector: FRESH	10 – 14 V
FRS ↔ GND (A15–16 ↔ A14–12)	IG ON. Air inlet selector: FRESH	Below 0.7 V
	IG ON. Air inlet selector: RECIRCULATE	10 – 14 V
IG ↔ GND (A14–11 ↔ A14–12)	IG ON.	10 – 14 V
	IG OFF.	0 V

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