RM YARIS VERSO C&B

RM726- E

QTY

TOYOTA TOYOTA MOTOR

GENUINE PARTS MARKETING DIVISION

1

TOYOTA

REPAIR MANUAL FOR CHASSIS & BODY

YARIS / ECHO VERSO

NCP2_ series

Aug., 1999

Pub. No. RM726E

FOREWORD

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

Applicable models: NCP20, 22 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.
• 1NZ–FE, 2NZ–FE Engine Repair Manual	RM749E
• U440E, U441E Automatic Transaxle Repair Manual (Jan. 1999)	RM689E
• YARIS VERSO/ECHO VERSO Electrical Wiring Diagram	EWD398F
• YARIS/ECHO New Car Features	NCF165E
• YARIS/ECHO, YARIS VERSO/ECHO VERSO New Car Features Supplement	NCF176E

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

©2001 TOYOTA MOTOR CORPORATION
All rights reserved. This book may not be reproduced or copied, in whole or in part, without the written permission of Toyota Motor Corporation.
First Printing: Jul. 1, 1999 01-990701-00
Second Printing: Nov. 12, 2001 02-011112-01-2

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 IN
PREPARATION PP
SERVICE SPECIFICATIONS SS
DIAGNOSTICS DI
CLUTCH CL
MANUAL TRANSAXLE MX
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

INTRODUCTION

HOW TO USE THIS MANUAL IN–1
GENERAL INFORMATION IN–1
IDENTIFICATION INFORMATION IN–3
VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER IN–3
REPAIR INSTRUCTIONS IN–4
GENERAL INFORMATION IN–4
VEHICLE LIFT AND SUPPORT LOCATIONS .. IN–8
FOR ALL OF VEHICLES IN–10
PRECAUTION IN–10
HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS IN–18
GENERAL INFORMATION IN–18
HOW TO PROCEED WITH TROUBLESHOOTING IN–19
HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE IN–29
TERMS IN–34
ABBREVIATIONS USED IN THIS MANUAL IN–34

HOW TO USE THIS MANUAL

IN00U-31

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

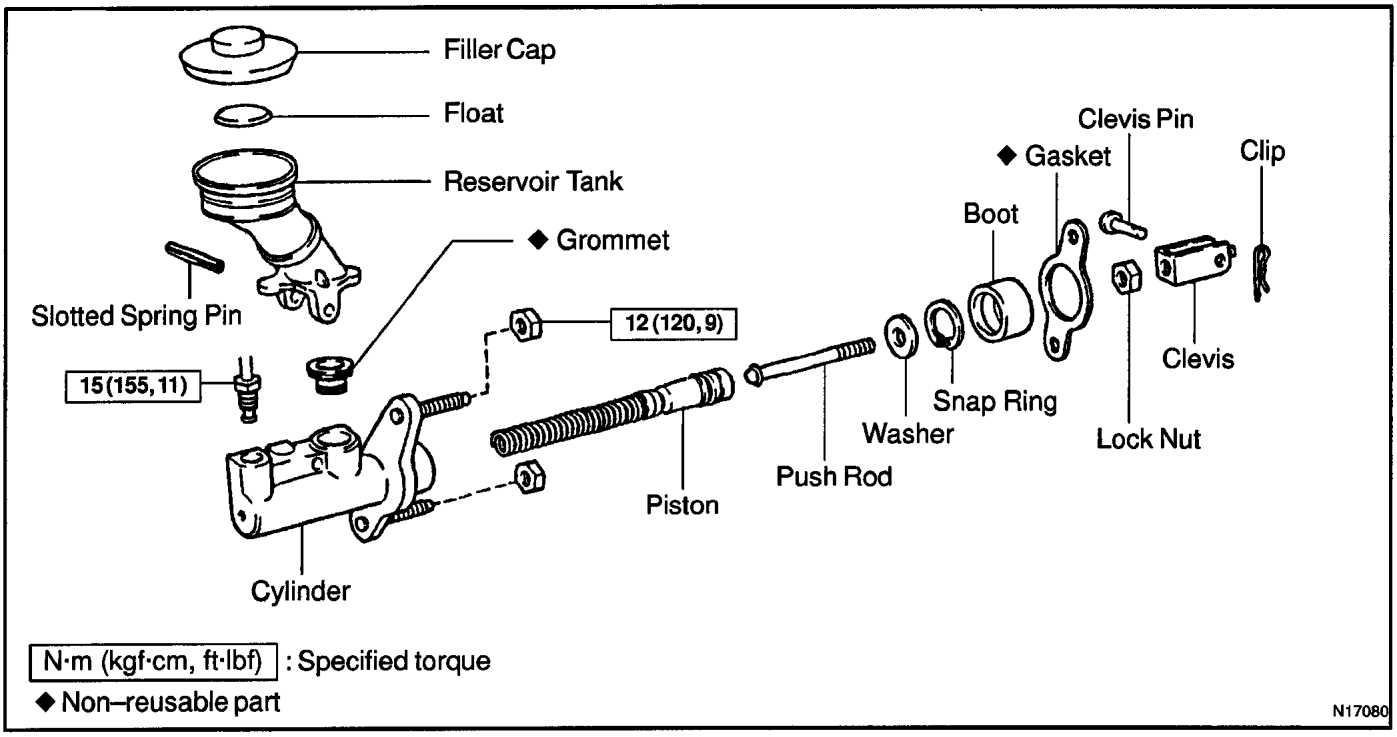
TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on page IN–19.
Be sure to read this before performing troubleshooting.

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

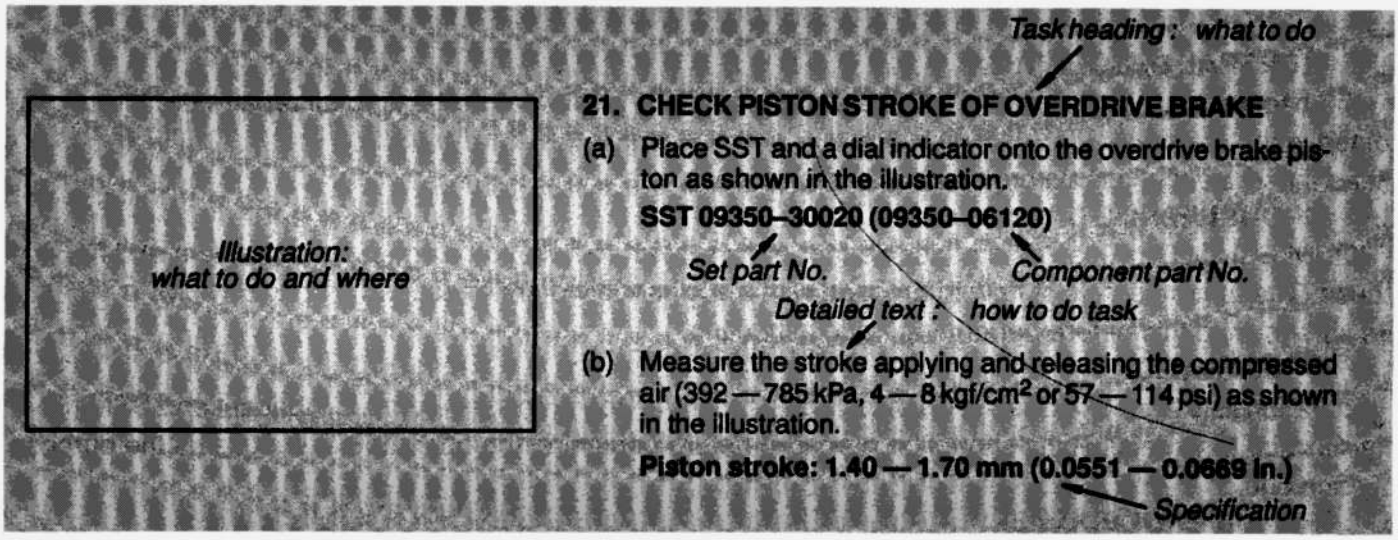
Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.
Example:



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:



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.

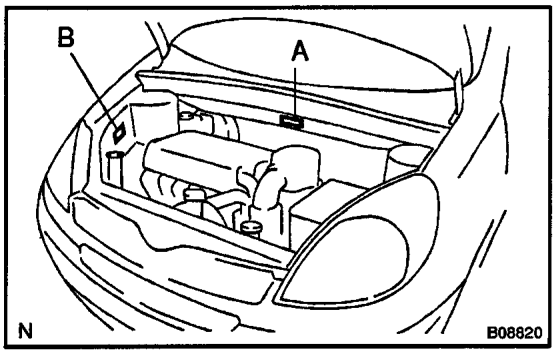
Example:

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

IDENTIFICATION INFORMATION

IN04P-07

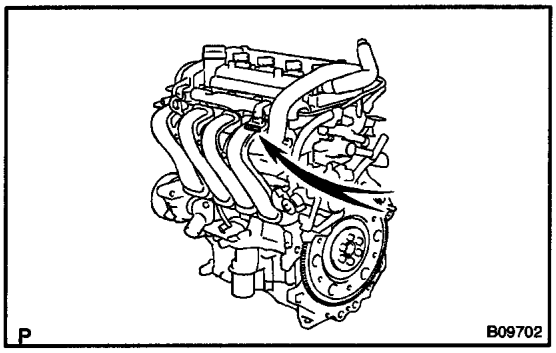
VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER



1. VEHICLE IDENTIFICATION NUMBER

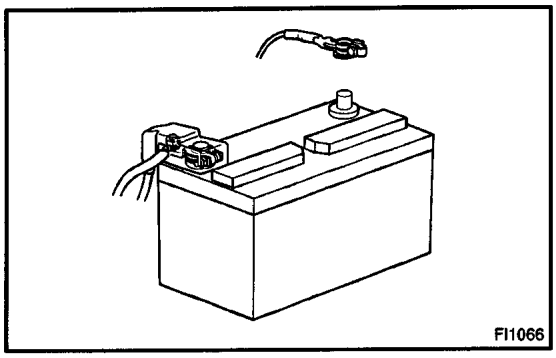
The vehicle identification number is stamped in the engine compartment, as shown in the illustration. This number has also been stamped on the manufacturer's plate.

A: Vehicle Identification Number
B: Manufacturer's Plate



2. ENGINE SERIAL NUMBER

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


FI1066

REPAIR INSTRUCTIONS

GENERAL INFORMATION

IN0DC–03

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 cable.

(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.

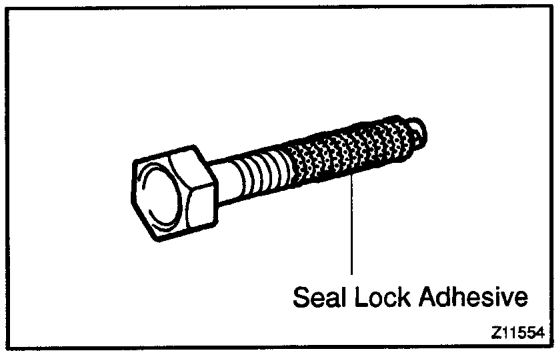
(6) Be sure the cover for the positive (+) terminal is properly in place.

(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, oil seals, etc. with new ones.

(2) Non–reusable parts are indicated in the component illustrations by the "◆" symbol.



Z11554

(f) Precoated parts

Precoated parts are bolts, 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.

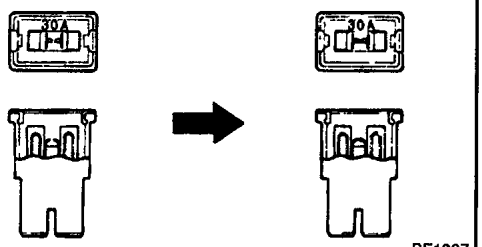
(3) Precoated parts are indicated in the component illustrations by the "★" symbol.

(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.

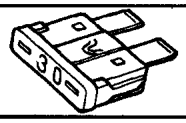
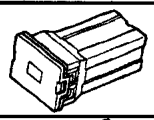
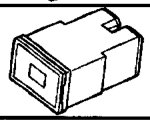
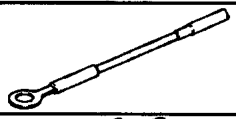
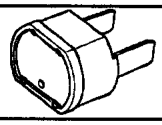
(i) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in Preparation section in this manual.

Medium Current Fuse and High Current Fuse Equal Amperage Rating



BE1367

(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.

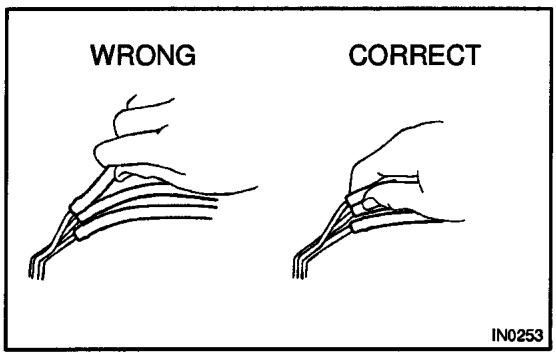
Illustration	Symbol	Part Name	Abbreviation
 BE5594	 IN0365	FUSE	FUSE
 BE5595	 IN0366	MEDIUM CURRENT FUSE	M–FUSE
 BE5596	 IN0367	HIGH CURRENT FUSE	H–FUSE
 BE5597	 IN0367	FUSIBLE LINK	FL
 BE5598	 IN0368	CIRCUIT BREAKER	CB

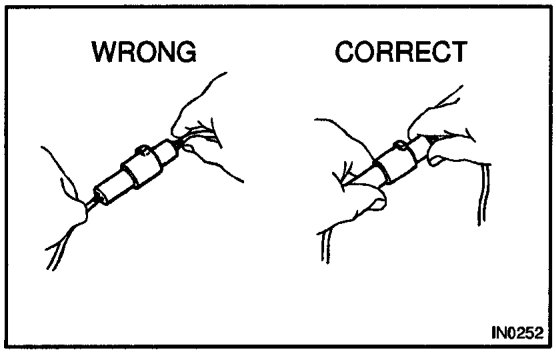
IN

(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–8).
- Cancel the parking brake on the level place and shift the transmission in Neutral (or N range).
- When jacking up the front wheels of the vehicle, at first place stoppers behind the rear wheels.
- When jacking up the rear wheels of the vehicle, at first place stoppers before the front wheels.
- When either the front or rear wheels only should be jacked up, set rigid racks and place stoppers in front and behind the other wheels on the ground.
- After the vehicle is jacked up, be sure to support it on rigid racks. 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.

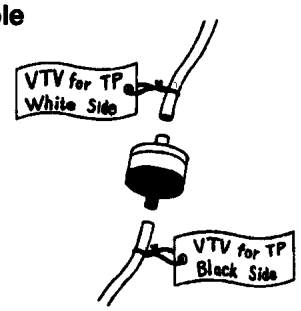
(5) When steam cleaning an engine, protect the electronic components, air filter and emission–related components from water.

(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.

Example



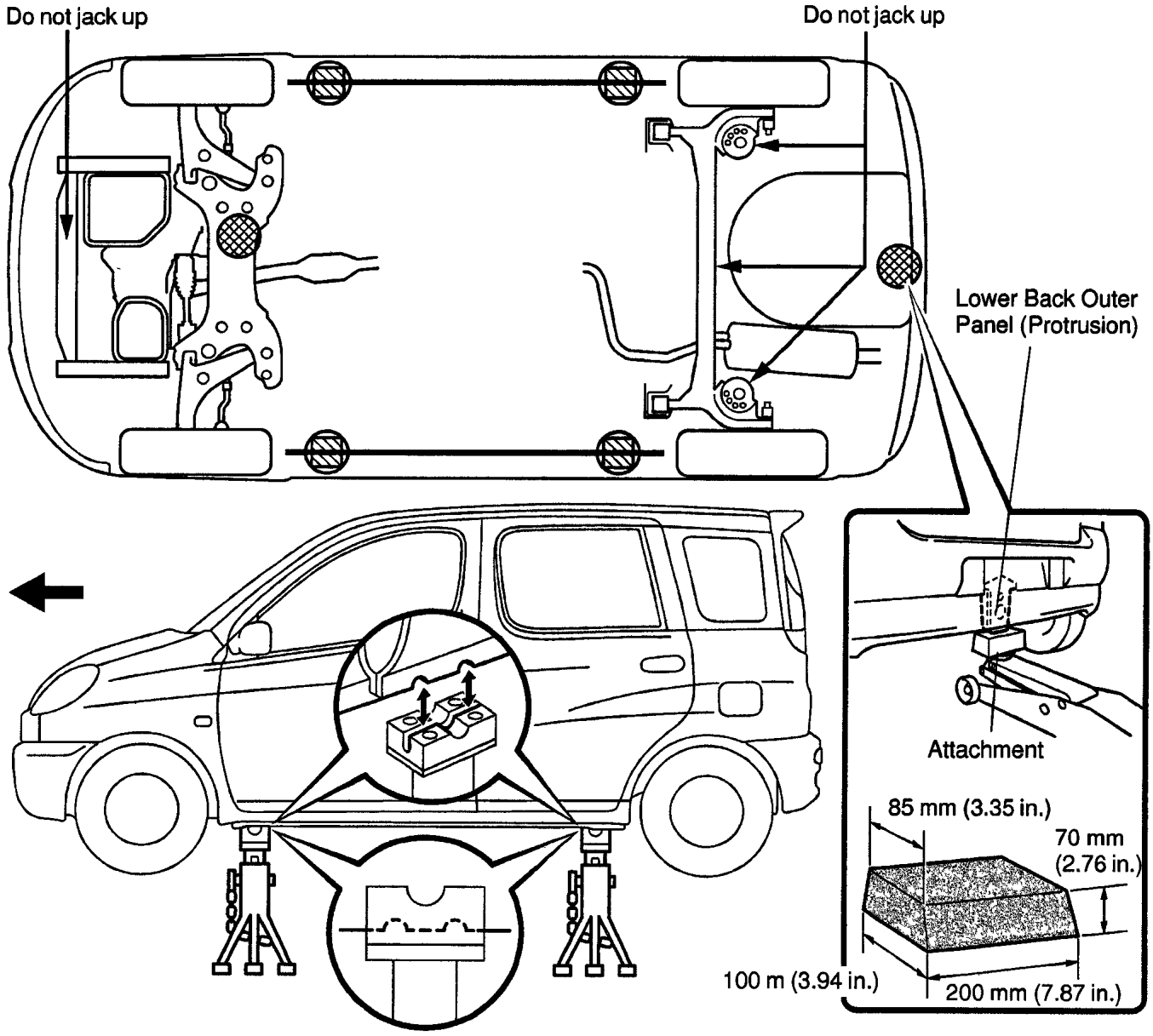
IN0002

(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.

IN04O–07

VEHICLE LIFT AND SUPPORT LOCATIONS



JACK POSITION

Front - - - - - - - - - Front suspension member
Rear - - - - - - - - - Lower Back Outer Panel (Protrusion)

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

PANTOGRAPH JACK POSITION

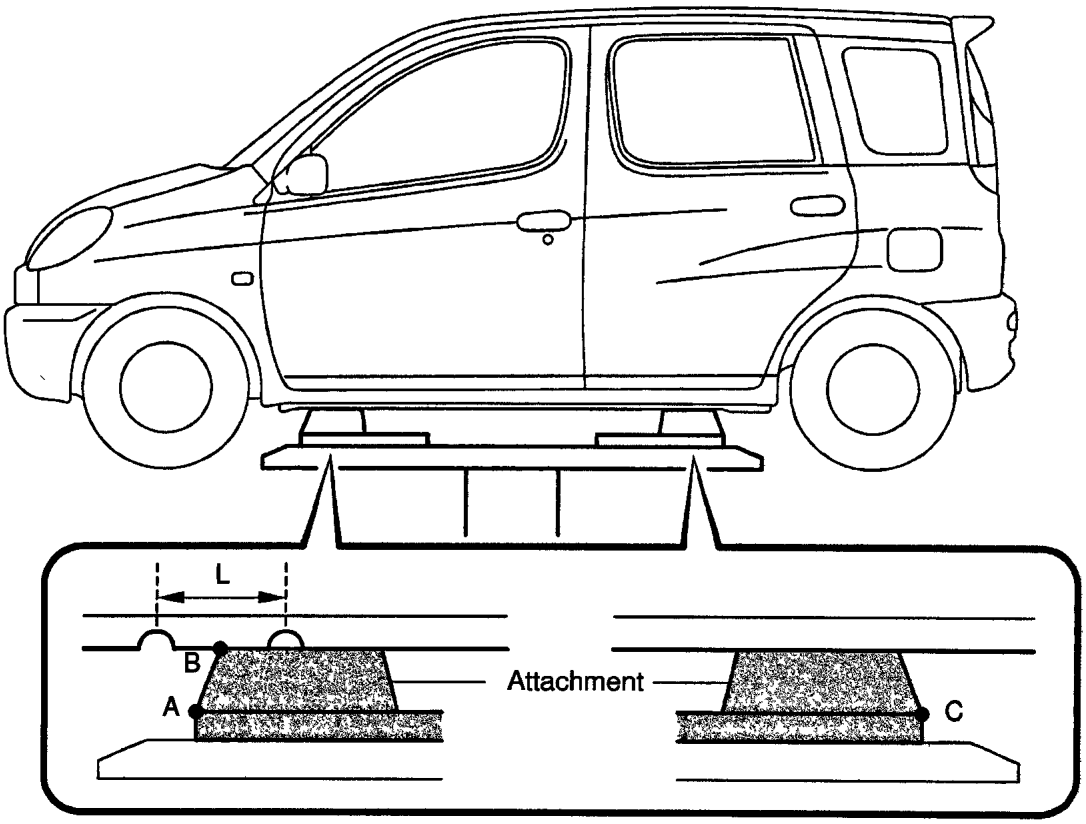
SUPPORT POSITION

Safety stand and swing arm type lift - - - - - - - - - - - - - - - - - - -

P

B09367

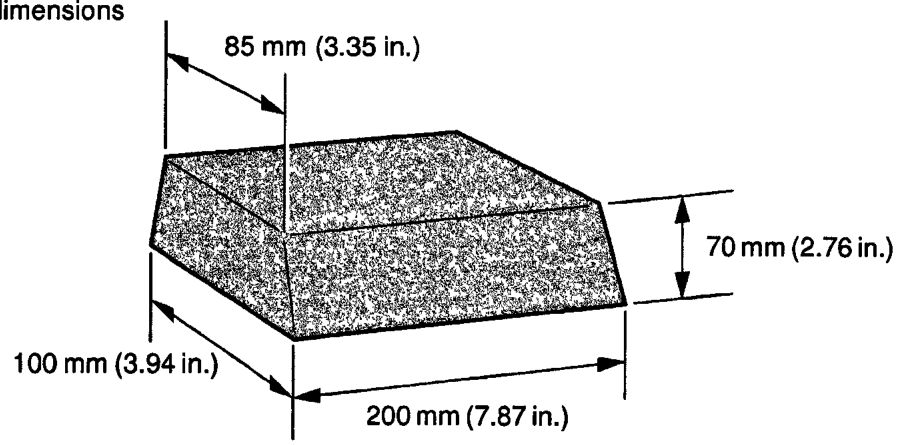
Plate type lift



HINT:

Right and left set position	Place the vehicle over the center of the lift.
Front and rear set position	● When using attachments, place the one for front side vertically and the one for rear side horizontally to the vehicle. ● Align the cushion gum ends of the plate with the attachment lower ends (A, C). ● Align the attachment upper end (B) with the rocker flange rear side notch.

Attachment dimensions



P

B09368

FOR ALL OF VEHICLES

IN0F9-01

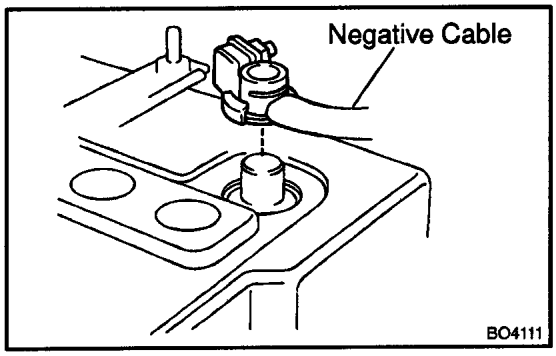
PRECAUTION

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

(a) The YARIS VERSO/ECHO VERSO is equipped with an SRS (Supplemental Restraint System), such as the driver airbag, front passenger airbag assembly 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

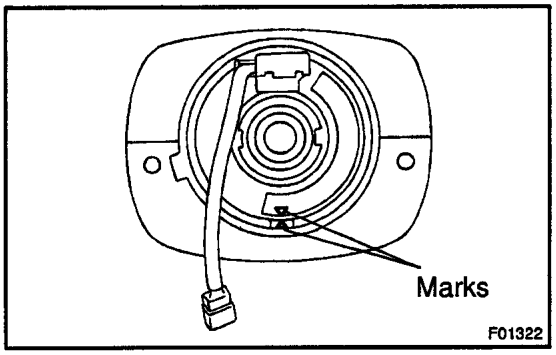
(1) Malfunction symptoms of the supplemental restraint system are difficult to confirm, so the diagnostic trouble codes become the most important source of information when troubleshooting. When troubleshooting the supplemental restraint system, always inspect the diagnostic trouble codes before disconnecting the battery (See page DI–102).

(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 another battery.

(3) Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad, front passenger airbag assembly, front airbag sensor and seat belt pretensioner should be inspected (See page RS–15, RS–30, RS–59 and BO–126).
(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, steering wheel pad, front passenger airbag assembly, front airbag sensor or seat belt pretensioner.
(7) If the airbag sensor assembly, steering wheel pad, front passenger airbag assembly, front airbag sensor or seat belt pretensioner has 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, steering wheel pad, front passenger airbag assembly, front airbag sensor 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–102).



(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–20 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 deploys for some reason. In addition do not store a steering wheel pad on top of another one.

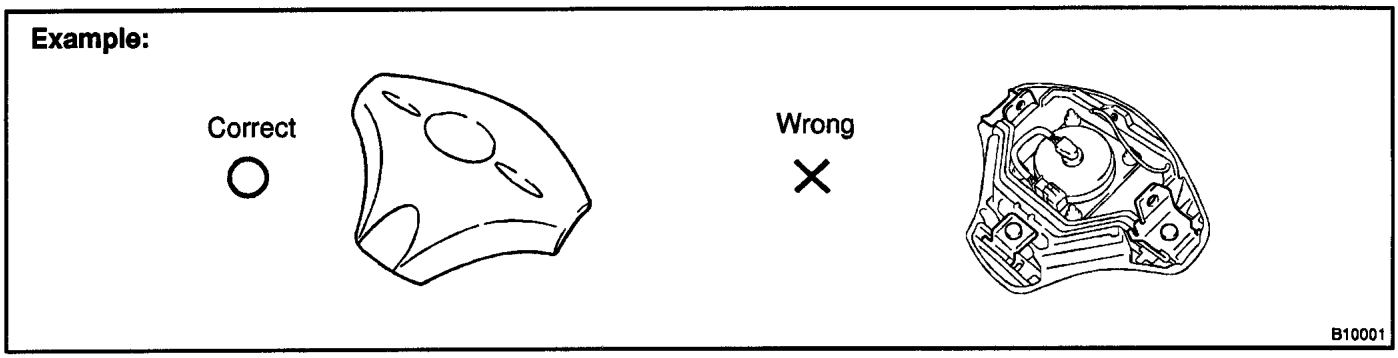
(2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)

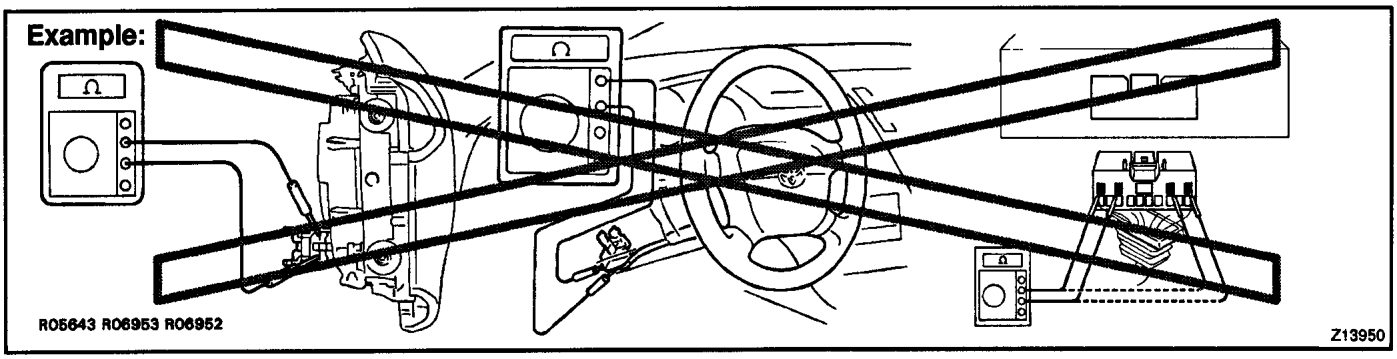
(3) Grease should not be applied to the steering wheel pad and the pad should not be cleaned with detergents of any kind.

(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 deploys.

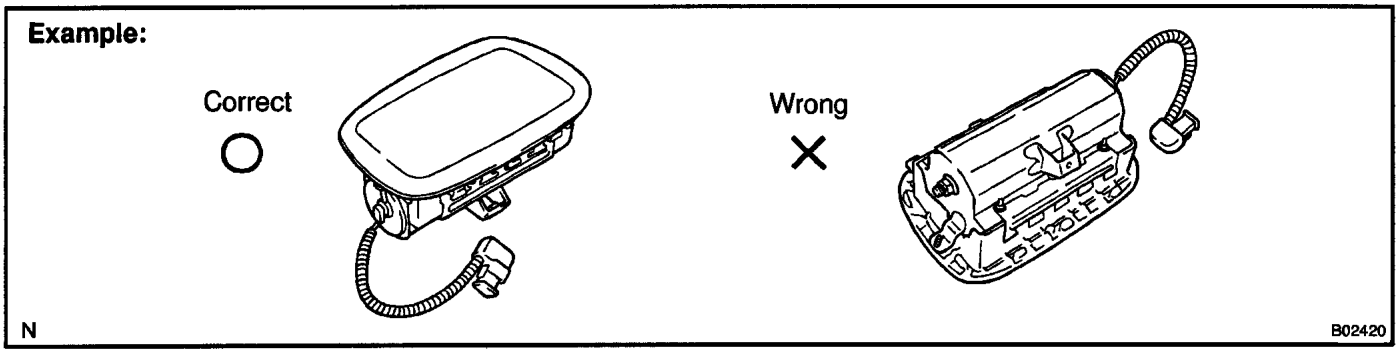
(2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)

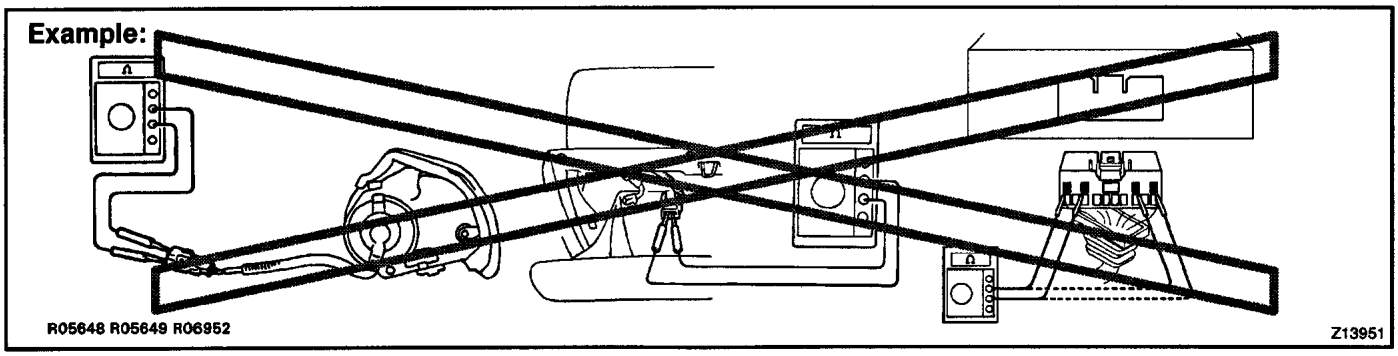
(3) Grease should not be applied to the front passenger airbag assembly and the airbag door should not be cleaned with detergents of any kind.

(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 front passenger airbag assembly alone, the airbag should be deployed using an SST before disposal (See page RS–31).
Perform the operation in a safe place away from electrical noise.





(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.

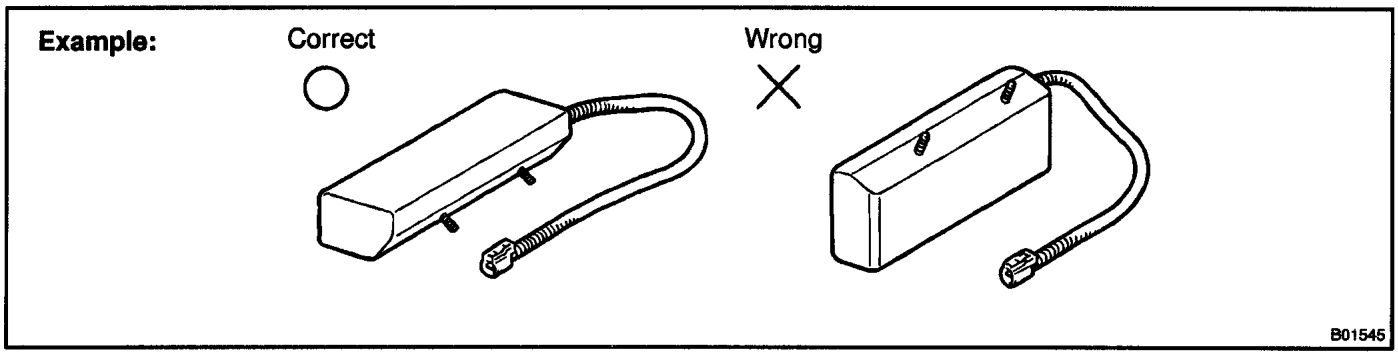
(2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)

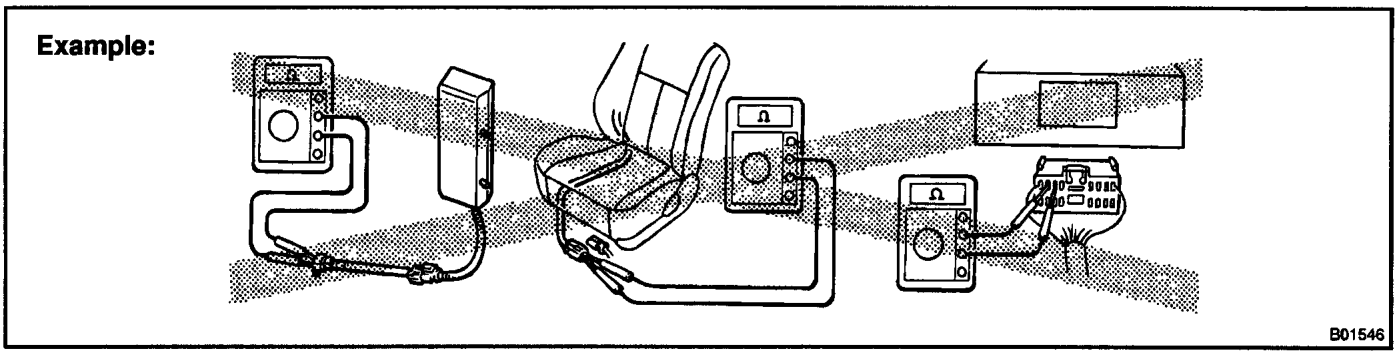
(3) Grease should not be applied to the side airbag assembly and the surface should not be cleaned with detergents of any kind.

(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–43). Perform the operation in a safe place away from electrical noise.





(g) SEAT BELT PRETENSIONER

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

(2) Never disassemble the seat belt pretensioner.

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

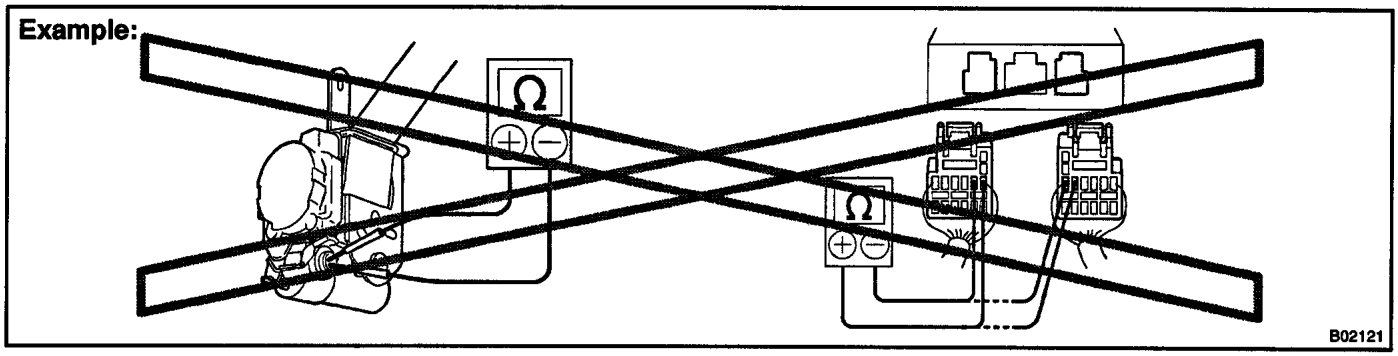
(4) Store the seat belt pretensioner where the ambient temperature remains below 80°C (176°F) and away from electrical noise without high humidity.

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

(6) When disposing of a vehicle or the seat belt pretensioner alone, the seat belt pretensioner should be activated before disposal (See page BO–127). Perform the operation in a safe place away from electrical noise.

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

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



(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 instrument panel wire harness assembly. All the connectors in the system are a standard yellow color. If the SRS wire harness becomes disconnected or the connector becomes broken due to an accident, etc., repair or replace it as shown on page RS–69.

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.
(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) Avoid winding the antenna feeder together with other wiring as much as possible, and 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.**

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

IN04S–14

GENERAL INFORMATION

A large number of ECU controlled systems are used in the YARIS VERSO/ECHO VERSO. 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	DI–1
2. Anti–Lock Brake System With Electronic Brake Force Distribution (EBD)	DI–58
3. Supplemental Restraint System	DI–100
4. Engine Immobiliser System	DI–241

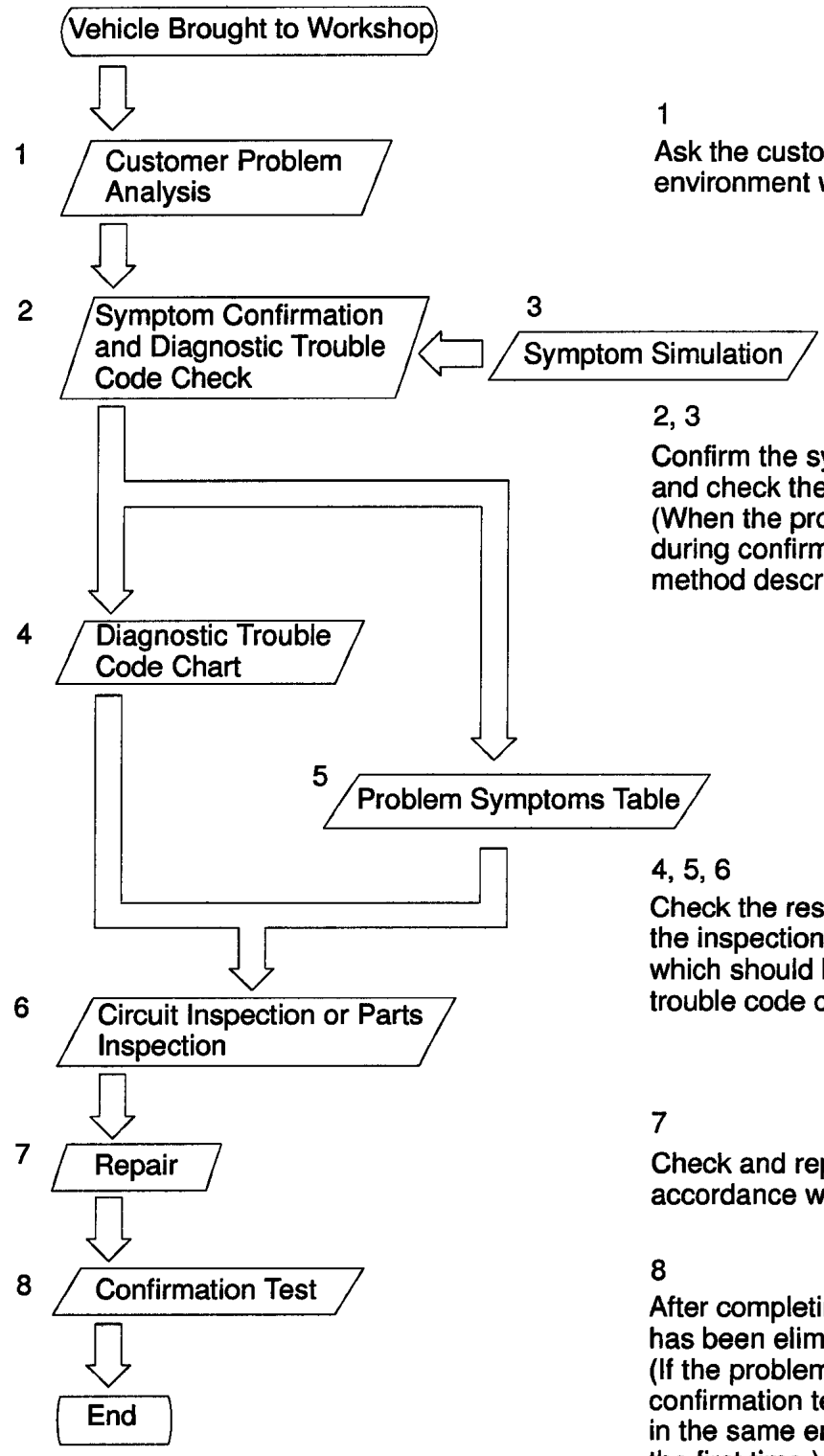
FOR USING HAND–HELD TESTER

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

IN0E0–04

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 Diagnostics 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 judgment. 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 Diagnostics section for each system for your use.

Important Points in the Customer Problem Analysis

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

(Sample) Supplemental restraint system check sheet.

CUSTOMER PROBLEM ANALYSIS CHECK

Supplemental Restraint System Check Sheet	Inspector's Name	

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

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

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

2. SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE CHECK

The diagnostic system in the YARIS VERSO/ECHO VERSO 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 YARIS VERSO/ECHO VERSO.

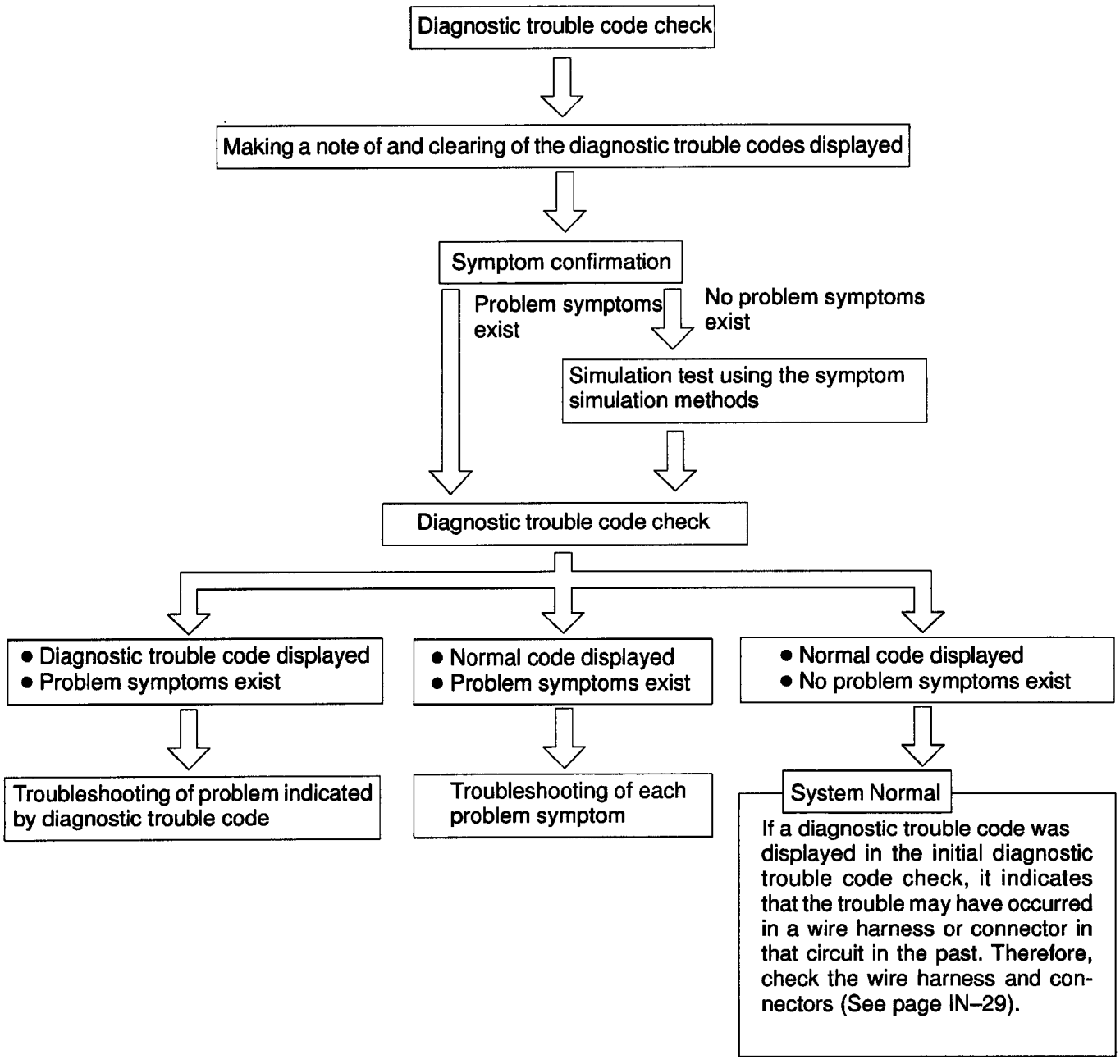
System	Diagnostic Trouble Code Check	Input Signal Check (Sensor Check)	Diagnostic Test Mode (Active Test)
Automatic Transaxle	○(with check Mode)		○
Anti–Lock Brake System With Electronic Brake Force Distribution (EBD)	○	○	○
Supplemental Restraint System	○	○	
Engine Immobiliser System	○		

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 points on the previous page, 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 table.

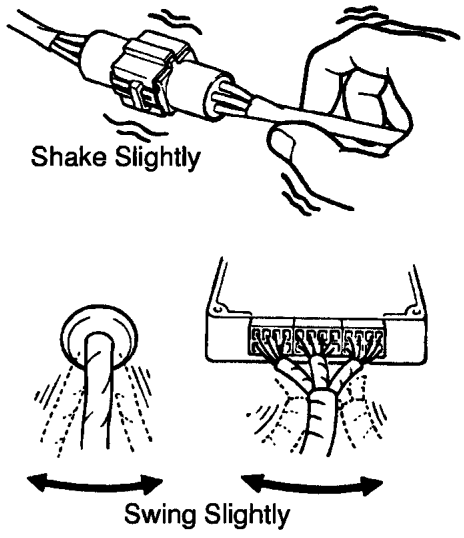
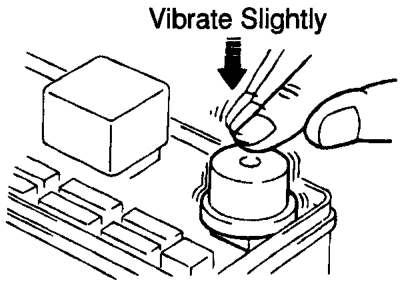


3. SYMPTOM SIMULATION

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 may be, if he proceeds to troubleshoot without confirming the problem symptoms he will tend to overlook something important in the repair operation and make a wrong guess somewhere, which will only lead to a standstill. For example, for a problem which only occurs when the engine is cold, or for a problem which occurs due to vibration caused by the road during driving, etc., the problem can never be determined 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

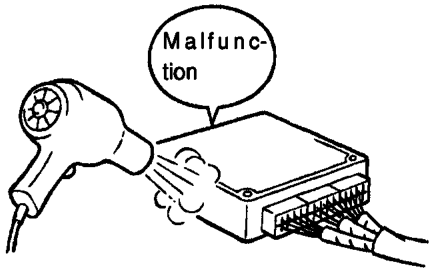
2	**HEAT METHOD: When the problem seems to occur when the suspect area is heated.**

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:

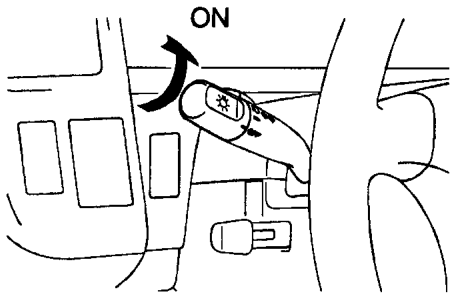
If a vehicle is subject to water leakage, the leaked water may contaminate the ECU. When testing a vehicle with a water leakage problem, special caution must be taken.



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.



B02389

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

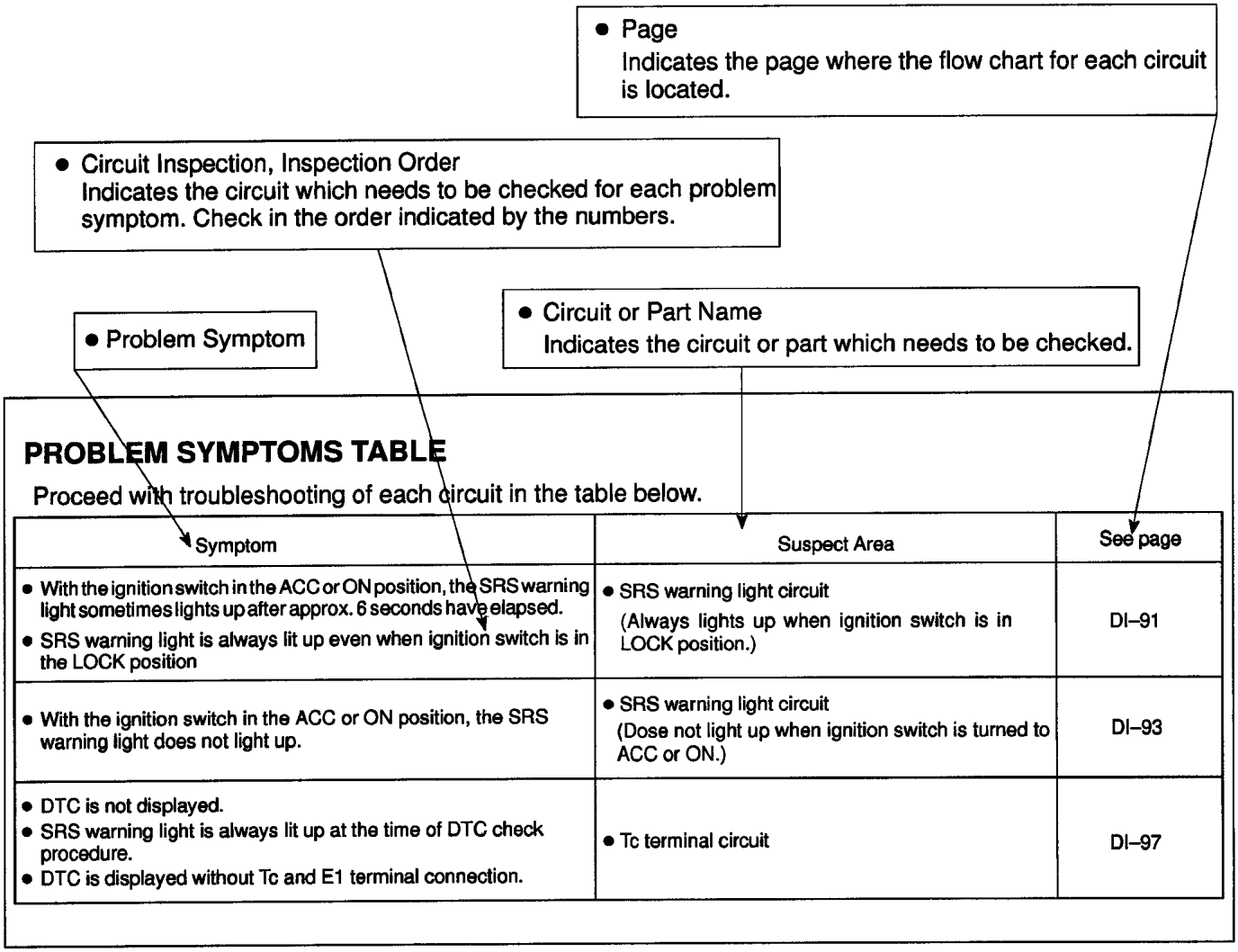
DTC No. (See page)	Detection Item	Trouble Area	SRS Warming Light
11 (DI–14)	• Short in D squib circuit (to ground)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
12 (DI–19)	• Short in D squib circuit (to B+)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
13 (DI–23)	• Short in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
14 (DI–27)	• Open in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
15 (DI–27)	• Front airbag sensor assembly (RH) malfunction	• Front airbag sensor assembly (RH) • Wire harness	ON
	• Front airbag sensor assembly malfunction	• Front airbag sensor assembly (LH) • Wire harness	
	ssembly malfunction	• 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.



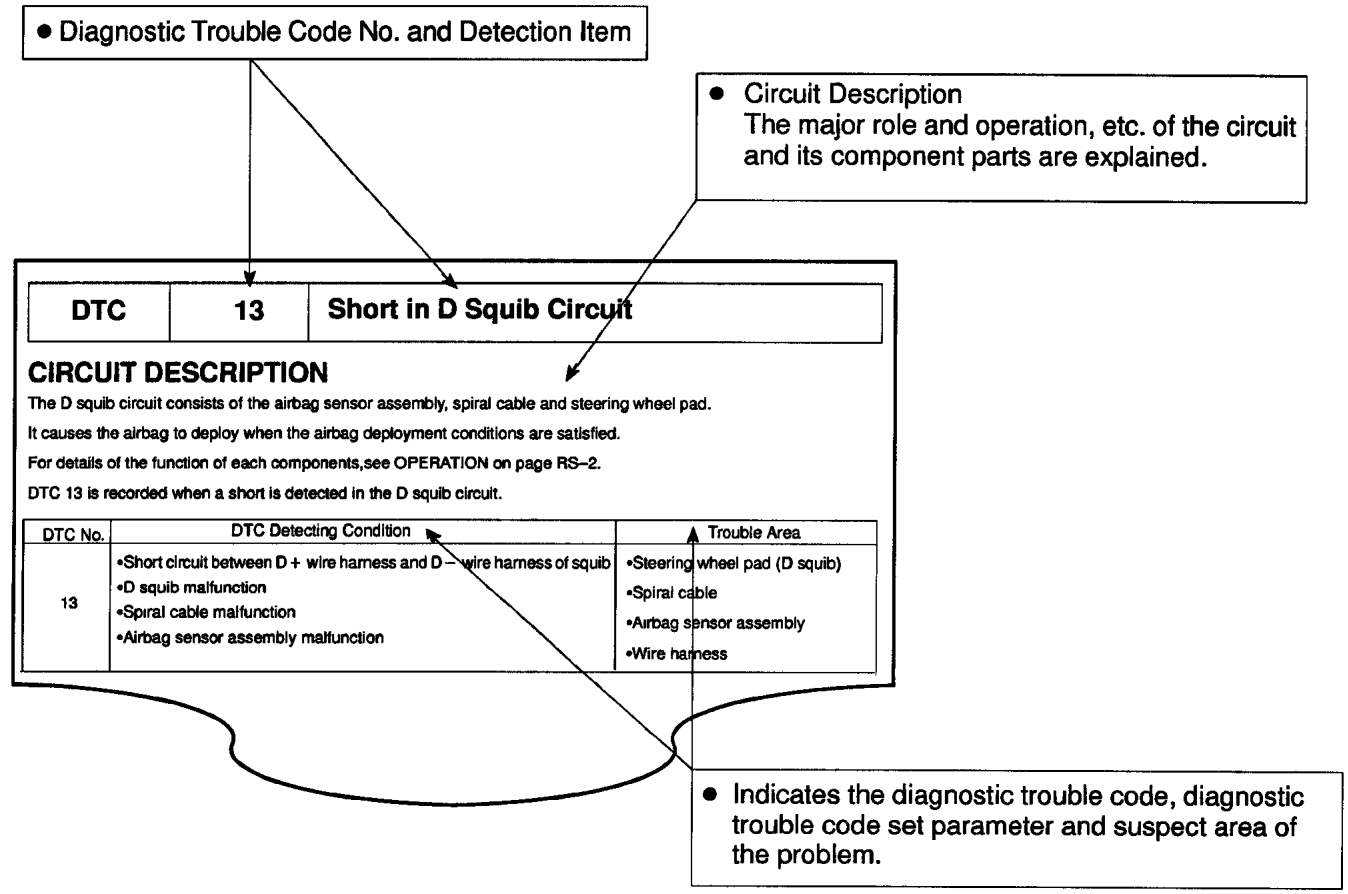
PROBLEM SYMPTOMS TABLE

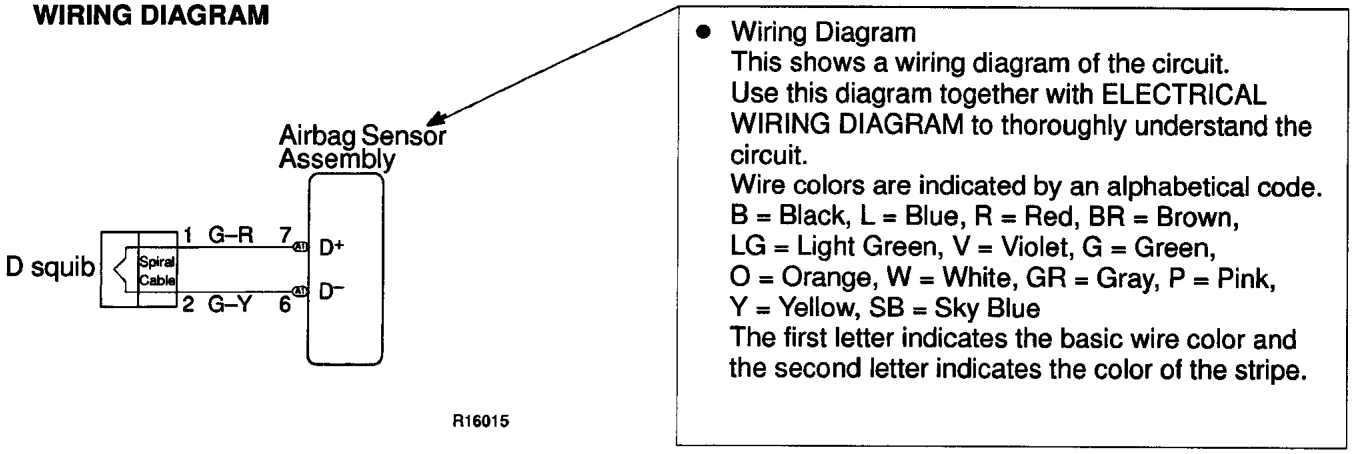
Proceed with troubleshooting of each circuit in the table below.

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–91
• 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–93
• 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–97

6. CIRCUIT INSPECTION

How to read and use each page is shown below.





B00803

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

LOCK
Ignition Switch LOCK (OFF)

ON
Ignition Switch ON

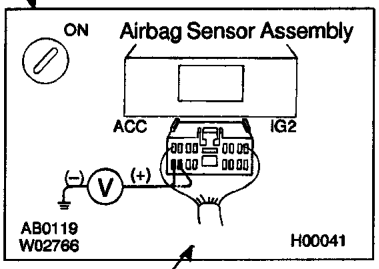
START
Ignition Switch START

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 16 V

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.

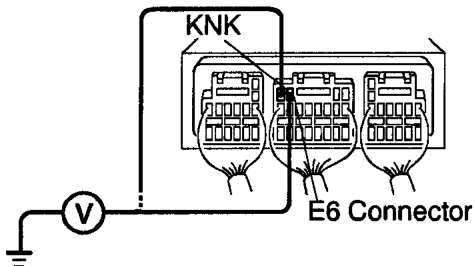


Check from the connector back side. (with harness)

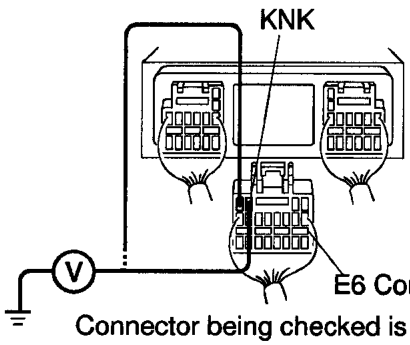


Check from the connector front side. (without harness)
In this case, care must be taken not to bend the terminals.

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



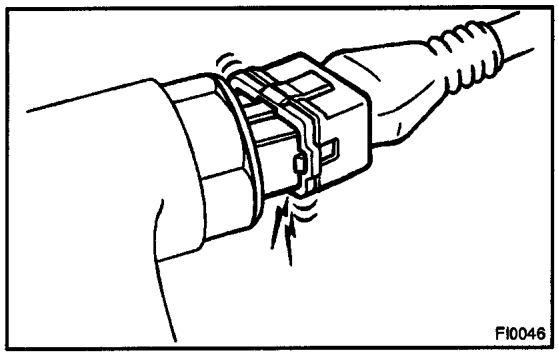
Connector being checked is connected.

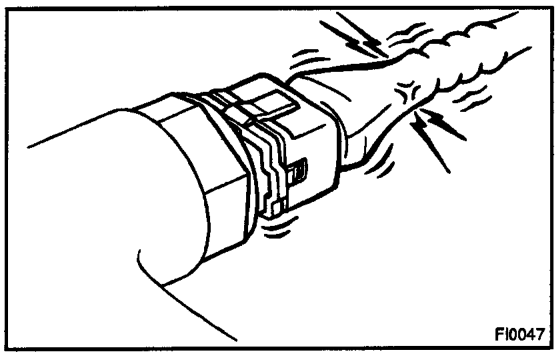


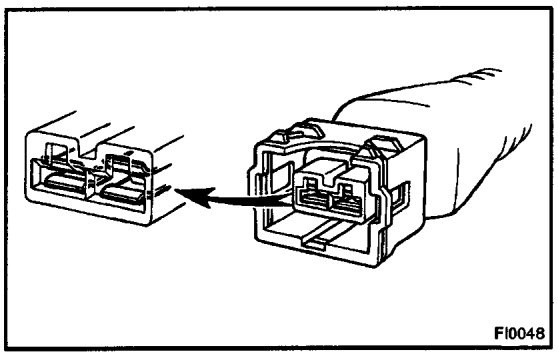
Connector being checked is disconnected.

B00691

B00972


FI0046


FI0047


FI0048

IN011-22

HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE

1. CONNECTOR CONNECTION AND TERMINAL INSPECTION

- For troubleshooting, diagnostic trouble code charts or problem symptom table 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:

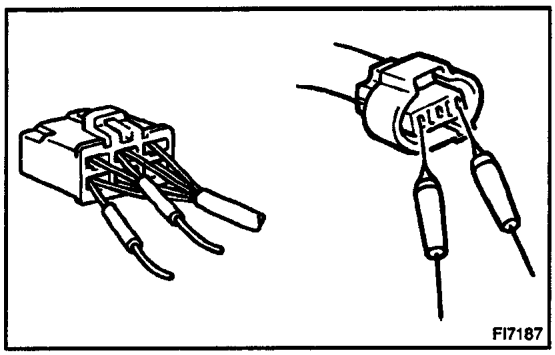
- It is rarely the case that a wire is broken in the middle of it. Most cases occur at the connector. In particular, carefully check the connectors of sensors and actuators
- Faulty contact could be due to rusting of the connector terminals, to foreign materials entering terminals or a deformation of 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.

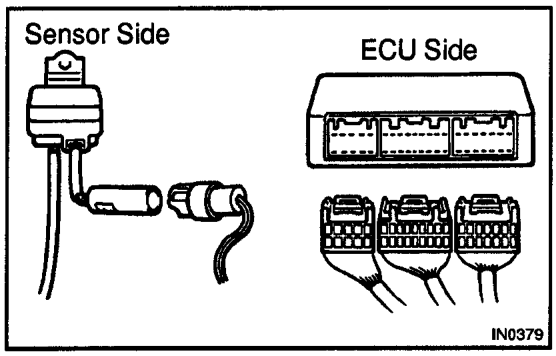
HINT:

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



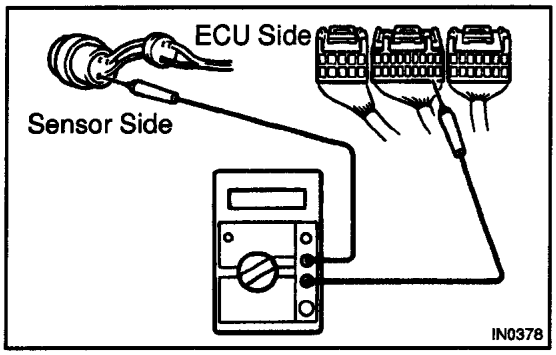
2. CONNECTOR HANDLING

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.

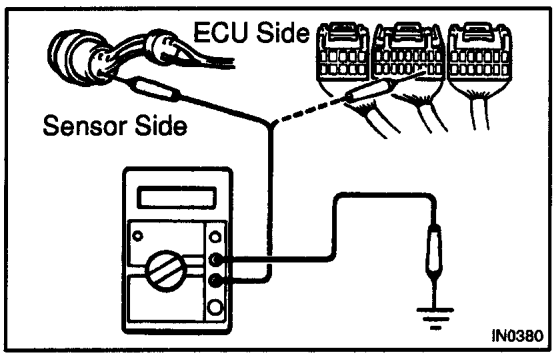


(b) Measure the resistance between the applicable terminals of the connectors.

Resistance: 1 Ω or less

HINT:

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



4. RESISTANCE CHECK (SHORT CIRCUIT CHECK)

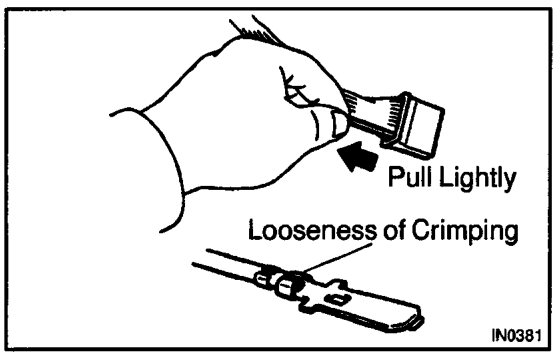
(a) Disconnect the connectors on both ends.

(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.

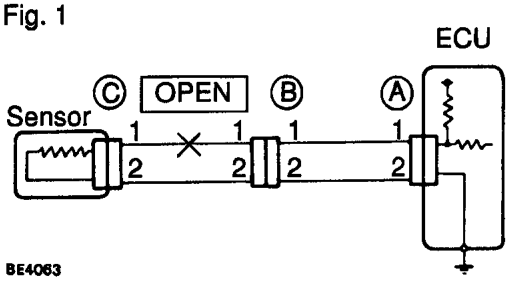
NOTICE:

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.

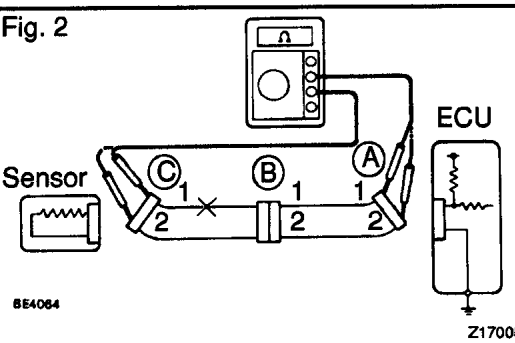
Fig. 1



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.

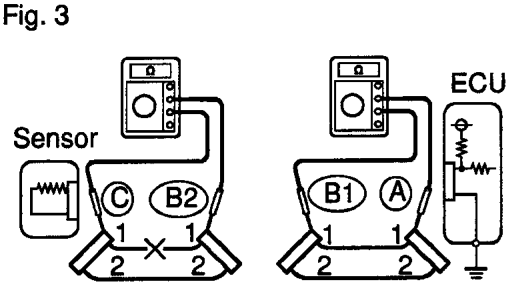
In the case of Fig. 2,

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 the connectors.

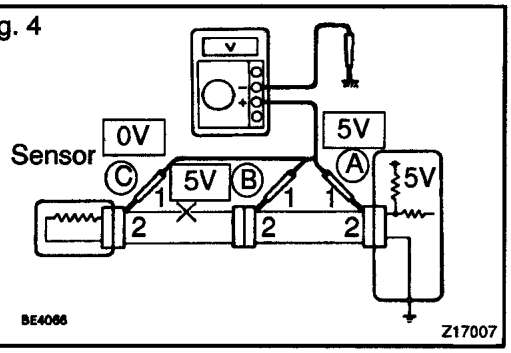
In the case of Fig. 3,

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".

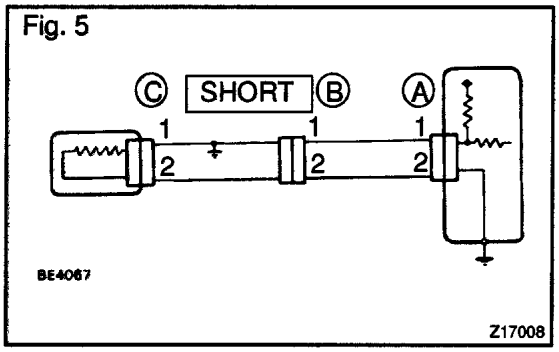
Fig. 4



(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".

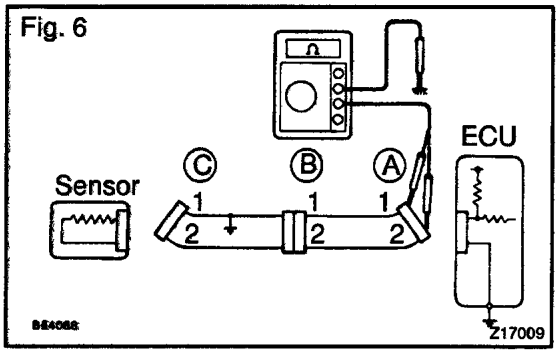
Fig. 5



7. CHECK SHORT CIRCUIT

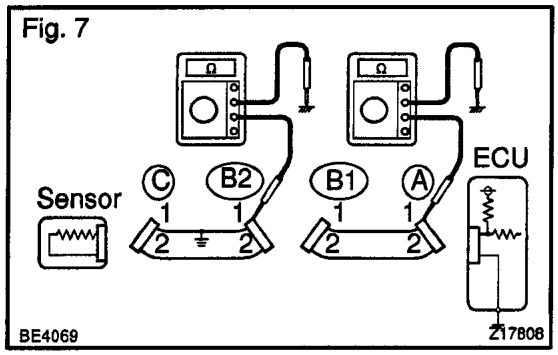
If the wire harness is ground shorted as in Fig. 5, locate the section by conducting a "continuity check with ground".

Fig. 6



Check the continuity with ground.

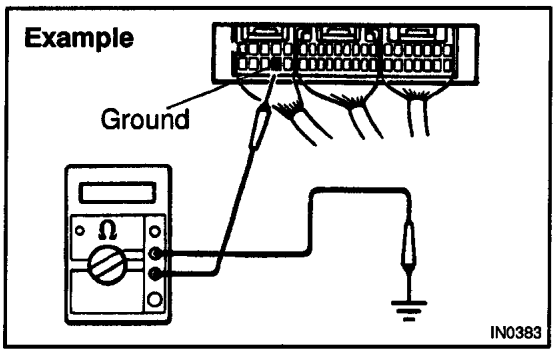
(1) Disconnect connectors "A" and "C" and measure the resistance between terminal 1 and 2 of connector "A" and body ground.
In the case of Fig. 6
Between terminal 1 of connector "A" and body ground → Continuity (short)
Between terminal 2 of connector "A" and body ground → No continuity
Therefore, it is found out that there is a short circuit between terminal 1 of connector "A" and terminal 1 of connector "C".



(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".

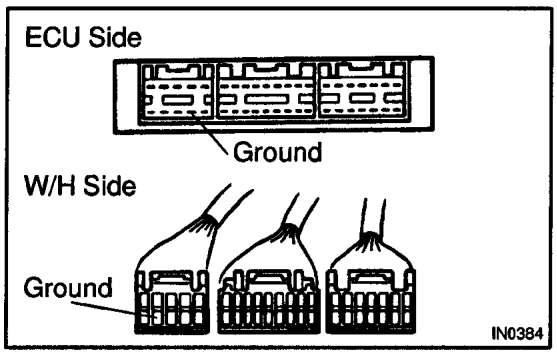
8. CHECK AND REPLACE ECU

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

IN012–16

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
BA	Brake Assist
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
EBD	Electronic Brake Force Distribution
ECT	Electronic Control Transmission
ECU	Electronic Control Unit
EDU	Electronic Driving Unit
EFI	Electronic Fuel Injection
E/G	Engine
ELR	Emergency Locking Retractor

FF	Front–Engine Front–Wheel–Drive
FIPG	Formed In Place Gasket
FL	Fusible Link
Fr	Front
FR	Front–Engine Rear–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
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)

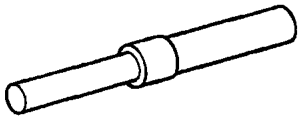
PREPARATION

CLUTCH PP–1
MANUAL TRANSAXLE PP–5
AUTOMATIC TRANSAXLE PP–11
SUSPENSION AND AXLE PP–16
BRAKE PP–23
STEERING PP–27
SUPPLEMENTAL RESTRAINT SYSTEM ... PP–35
BODY ELECTRICAL PP–38
BODY PP–42
AIR CONDITIONING PP–47

CLUTCH

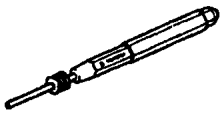
SST (Special Service Tools)

PP2EP-01

	09023–00100	Union Nut Wrench 10 mm	Clutch line
	09301–00210	Clutch Guide Tool	
	09333–00013	Clutch Diaphragm Spring Aligner	

PP0HD–04

RECOMMENDED TOOLS

	09031–00030	Pin Punch .	Inlet union
	09905–00013	Snap Ring Pliers .	

PP0HE-03

EQUIPMENT

Vernier calipers	
Dial indicator	
Torque wrench	

PPOCK-06

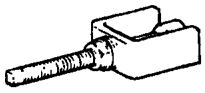
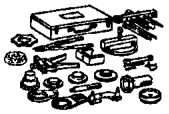
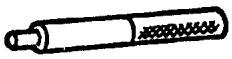
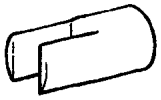
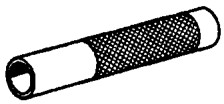
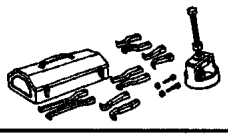
LUBRICANT

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

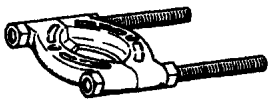
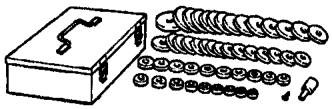
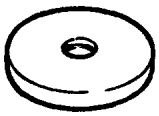
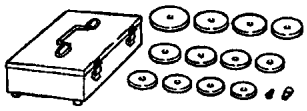
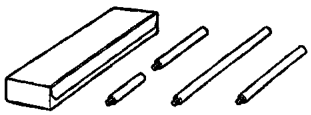
MANUAL TRANSAXLE

SST (Special Service Tools)

PP2EN–01

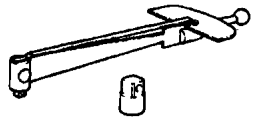
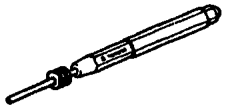
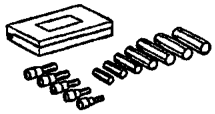
	09308–00010	Oil Seal Puller	Output shaft front bearing
	09309–12020	5th Driven Gear Replacer	
	09350–32014	TOYOTA Automatic Transmission Tool Set	
	(09351–32090)	Oil Seal Remover & Replacer	Differential side bearing
	(09351–32111)	Side Bearing Race Replacer	Differential side bearing oil seal (Transmission case side)
	(09351–32120)	Overdrive Bearing Replacer	Differential side bearing
	(09351–32130)	Handle	
	(09351–32150)	Oil Seal Replacer	Differential side bearing oil seal (Transaxle case side)
	09564–32011	Differential Preload Adaptor	
	09608–00071	Drive Pinion Rear Bearing Cone Replacer	Input shaft rear ball bearing 4th driven gear and rear ball bearing
	09612–22011	Tilt Handle Bearing Replacer	No. 3 hub sleeve assembly
	09612–65014	Steering Worm Bearing Puller	Input shaft front bearing Input shaft front oil seal Differential side bearing oute race

PP

	09950–00020 Bearing Remover	
	09950–00030 Bearing Remover Attachment	
	09950–40011 Puller B Set	
	09950–60010 Replacer Set	
	(09951–00360) Replacer 36	Input shaft front oil seal Differential side bearing
	(09951–00460) Replacer 46	Input shaft front 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	

PP2EO-01

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	Differential preload
	09031–00030	Pin Punch .	
	09040–00011	Hexagon Wrench Set .	
	09090–04020	Engine Sling Device	
	09905–00012	Snap Ring No.1 Expander .	

PP150-02

EQUIPMENT

Dial indicator with magnetic base	
Feeler gauge	
Micrometer	
Torque wrench	
Magnetic finger	
Wooden block or similar object	

PP151-01

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

PP152-02

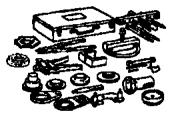
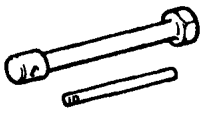
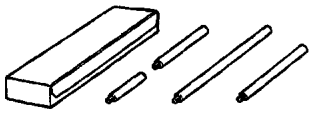
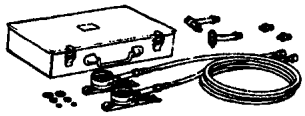
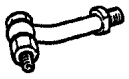
SSM (Special Service Materials)

08826–00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transmission case x Transaxle case Transmission case x Transmission case cover
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	

AUTOMATIC TRANSAXLE

SST (Special Service Tools)

PP26I–01

	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	
	09950–70010	Handle Set	
	(09951–07150)	Handle 150	
	(09351–32150)	Oil Seal Replacer	
	09992–00095	Automatic Transmission Oil Pressure Gauge Set	Line pressure
	(09992–00231)	Adaptor C	Line pressure
	(09992–00271)	Gauge Assy	Line pressure

PP26J-02

RECOMMENDED TOOLS

	09082–00040	TOYOTA Electrical Tester.	
	09090–04020	Engine Sling Device	

PP26K–01

EQUIPMENT

Straight edge	Torque converter clutch
Vernier calipers	Torque converter clutch
Dial indicator or dial indicator with magnetic base	Drive plate
Punch	
Torque wrench	

PP26L-02

LUBRICANT

Item	Capacity	Classification
Automatic transaxle fluid		
Drain and refill	5.6 liters (5.9 US qts, 4.9 Imp.qts) 2.0 liters (2.1 US qts, 1.8 Imp.qts)	ATF Type T–IV

PP28M–01

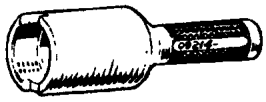
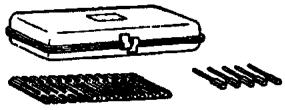
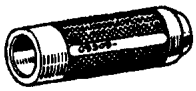
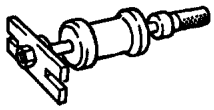
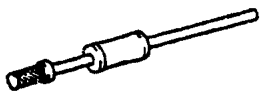
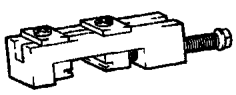
SSM (Special Service Materials)

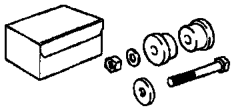
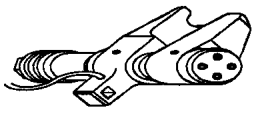
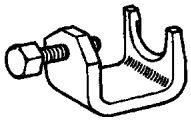
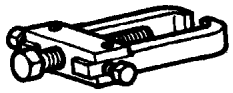
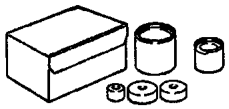
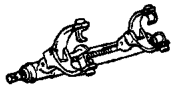
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	

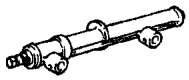
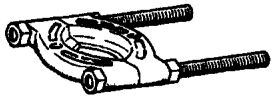
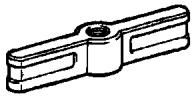
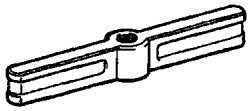
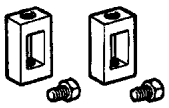
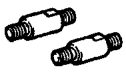
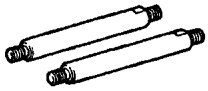
SUSPENSION AND AXLE

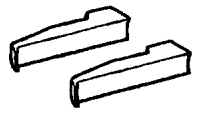
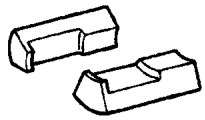
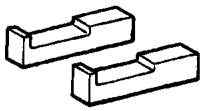
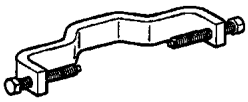
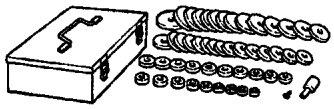
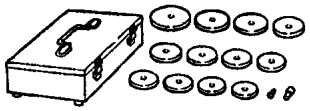
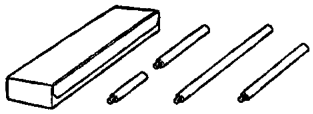
SST (Special Service Tools)

PP2F8-01

	09023–00100	Union Nut Wrench 10 mm	Rear suspension
	09214–76011	Crankshaft Pulley Replacer	Rear axle
	09240–00020	Wire Gauge Set	Front drive shaft
	09309–37010	Transmission Bearing Replacer	Rear suspension
	09520–00031	Rear Axle Shaft Puller	
	(09520–00040)	Shocker	Front axle Rear axle
	(09521–00010)	Attachment	Front axle
	(09521–00020)	Rod with Grip	Front axle Rear axle
	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

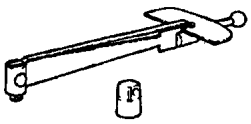
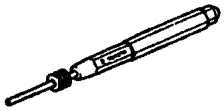
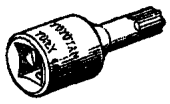
	09527–17011	Rear Axle Shaft Bearing Remover	Front axle
	09608–16042	Front Hub Bearing Adjusting Tool	Front drive shaft
	(09608–02021)	Bolt & Nut	
	(09608–02041)	Retainer	
	09608–32010	Steering Knuckle Oil Seal Replacer	Front axle
	09628–00011	Ball Joint Puller	Front axle Front drive shaft Front suspension
	09628–10011	Ball Joint Puller	Front axle Rear axle
	09628–62011	Ball Joint Puller	Front axle Front drive shaft Front suspension
	09670–00010	Front Crossmember Guide Tool	Front suspension
	09710–14013	Rear Suspension Bushing Tool Set	Rear suspension
	(09710–00021)	Pipe	
	09727–30021	Coil Spring Compressor	Front suspension
	(09727–00010)	Bolt Set	

	(09727–00021) Arm Set	
	(09727–00031) Compressor	
	09930–00010 Drive Shaft Nut Chisel	Front axle Front drive shaft
	09950–00020 Bearing Remover	Front drive shaft Rear axle
	09950–40011 Puller B Set	
	(09951–04010) Hanger 150	Rear suspension
	(09951–04020) Hanger 200	Front axle
	(09952–04010) Slide Arm	Front axle Rear suspension
	(09953–04010) Center Bolt 100	Rear suspension
	(09953–04020) Center Bolt 150	Front axle
	(09953–04030) Center Bolt 200	Rear suspension
	(09954–04010) Arm 25	Front axle
	(09954–04020) Arm 100	Rear suspension

	(09955–04011) Claw No.1	Front axle
	(09955–04031) Claw No.3	Rear suspension
	(09955–04051) Claw No.5	Rear suspension
	(09957–04010) Attachment	Front axle Rear suspension
	(09958–04011) Holder	Front axle Rear suspension
	09950–60010 Replacer Set	
	(09951–00370) Replacer 37	Front axle
	(09951–00560) Replacer 56	Rear suspension
	(09951–00600) Replacer 60	Front axle
	09950–60020 Replacer Set No.2	Front axle
	(09951–00680) Replacer 68	
	09950–70010 Handle Set	Front axle
	(09951–07150) Handle 150	

PP2DF–01

RECOMMENDED TOOLS

	09025–00010	Torque Wrench (30 kgf–cm)	
	09031–00030	Pin Punch .	
	09042–00010	Torx Socket T30 .	
	09090–04020	Engine Sling Device	
	09905–00012	Snap Ring No.1 Expander .	
	09905–00013	Snap Ring Pliers .	

PP0AM-01

EQUIPMENT

Dial indicator with magnetic base	
Drill	
Torque wrench	

PP26B-02

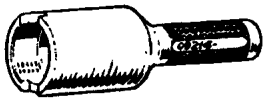
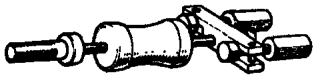
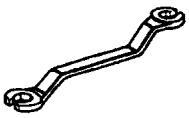
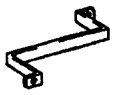
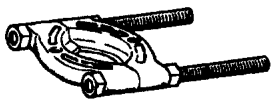
LUBRICANT

Item	Capacity	Application
Front drive shaft		
Inboard joint grease Color=Yellow ocher	125 – 135 g (4.4 – 4.8 oz.)	
Outboard joint grease Color=Black	155 – 170 g (5.5 – 6.0 oz.)	

BRAKE

SST (Special Service Tools)

PP2DP–01

	09023–00100	Union Nut Wrench 10 mm	
	09214–76011	Crankshaft Pulley Replacer	
	09520–00031	Rear Axle Shaft Puller	
	(09520–00040)	Shocker	
	(09521–00020)	Rod with Grip	
	09718–00010	Shoe Hold Down Spring Driver	
	09751–36011	Brake Line Union Nut 10 x 12 mm Wrench	
	09709–29018	LSPV Gauge Set	
	09737–00020	Brake Booster Push Rod Wrench	
	09843–18040	Diagnosis Check Wire No.2	
	09703–30010	Brake Shoe Return Spring Tool	
	09950–00020	Bearing Remover	

RECOMMENDED TOOLS

PP2EM-01

	09082–00040 TOYOTA Electrical Tester.	

EQUIPMENT

PP17U-06

Torque wrench	
Micrometer	Brake disc
Dial indicator	Brake disc
Vernier calipers	Brake drum
Brake drum gauge	Brake drum, brake disc

PP17V–01

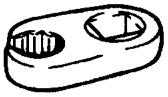
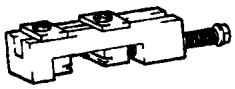
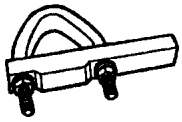
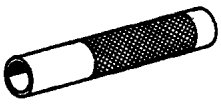
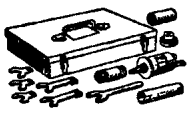
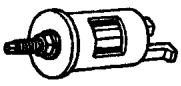
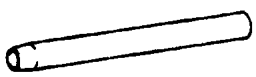
LUBRICANT

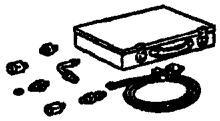
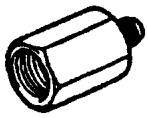
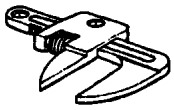
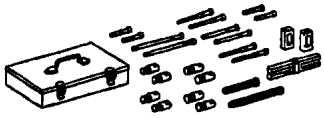
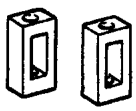
Item	Capacity	Classification
Brake fluid	–	SAEJ1703 or FMVSS No.116 DOT 3

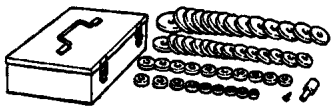
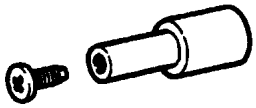
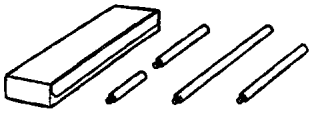
STEERING

SST (Special Service Tools)

PP26S-03

	09023–12700	Union Nut Wrench 17mm	PS vane pump PS gear
	09023–12900	Union Nut Wrench 19mm	PS gear
	09023–38200	Union Nut Wrench 12mm	PS gear
	09517–12010	Rear Axle Shaft Oil Seal Replacer	Manual steering gear
	09521–24010	Drive Shaft Boot Clamping Tool	PS gear
	09612–00012	Rack & Pinion Steering Rack Housing Stand	Manual steering gear PS gear
	09612–22011	Tilt Handle Bearing Replacer	Tilt steering column
	09612–24014	Steering Gear Housing Overhaul Tool Set	
	(09613–22011)	Steering Rack Shaft Bushing Puller	PS gear
	(09616–10010)	Steering Pinion Bearing Adjusting Socket	Manual steering gear
	09616–00010	Steering Worm Bearing Adjusting Socket	PS gear
	09631–10041	Steering Rack Cover "D"	PS gear

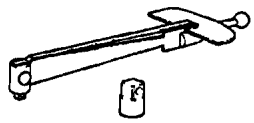
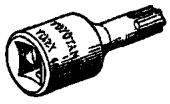
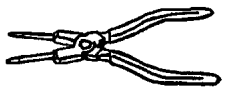
	09631–12071	Steering Rack Oil Seal Test Tool	PS gear
	(09633–00010)	Packing	
	09640–10010	Power Steering Pressure Gauge Set	Power steering fluid
	(09641–01010)	Gauge Assy	
	(09641–01030)	Attachment B	
	(09641–01060)	Attachment E	
	09670–00010	Front Crossmember Guide Tool	Manual steering gear PS gear
	09922–10010	Variable Open Wrench	Manual steering gear PS gear
	09950–50012	Puller C Set	Tilt steering column
	(09951–05010)	Hanger 150	
	(09952–05010)	Slide Arm	
	(09953–05020)	Center Bolt 150	
	(09954–05020)	Claw No.2	

 09950–60010 Replacer Set	
 (09951–00210) Replacer 21	PS gear
 (09951–00240) Replacer 24	PS gear
 (09951–00280) Replacer 28	PS vane pump
 (09951–00340) Replacer 34	PS gear
 (09951–00370) Replacer 37	PS gear
 (09952–06010) Adapter	PS gear
 09950–70010 Handle Set	
 (09951–07100) Handle 100	PS vane pump PS gear
 (09951–07200) Handle 200	PS gear
 (09951–07360) Handle 360	PS gear

MEMO

RECOMMENDED TOOLS

PP18K-04

	09025–00010	Torque Wrench (30 kgf–cm)	PS vane pump PS gear
	09042–00010	Torx Socket T30 .	Tilt steering column
	09904–00010	Expander Set .	
	(09904–00050)	No. 4 Claw	
	09905–00012	Snap Ring No.1 Expander .	
	09905–00013	Snap Ring Pliers .	

PP18L–06

EQUIPMENT

Caliper gauge	PS vane pump
Vernier calipers	PS vane pump
Dial indicator	Manual steering gear, PS gear
Feeler gauge	PS vane pump
Micrometer	PS vane pump
Torque wrench	

PP18M-05

LUBRICANT

Item	Capacity	Classification
Power steering fluid (Total)	0.7 liters (0.7 US qts, 0.6 Imp.qts)	ATF DEXRON® II or III

PP18N-05

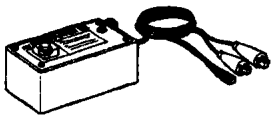
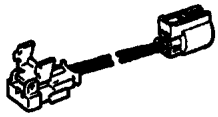
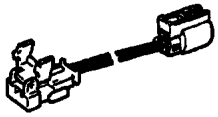
SSM (Special Service Materials)

08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	Manual steering gear PS gear

SUPPLEMENTAL RESTRAINT SYSTEM

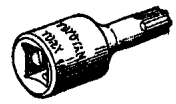
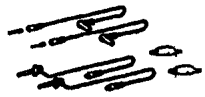
SST (Special Service Tools)

PP0MQ–01

	09082–00700	SRS Airbag Deployment Tool	
	09082–00750	Airbag Deployment Wire Sub–harness No.3	
	09082–00760	Airbag Deployment Wire Sub–harness No.4	
	09843–18020	Diagnosis Check Wire	

PP1XL-01

RECOMMENDED TOOLS

	09042–00020	Torx Socket T40 .	Airbag sensor assembly
	09082–00050	TOYOTA Electrical Tester Set.	
	09082–00040	TOYOTA Electrical Tester.	
	(09083–00150)	Test Lead Set	Seat belt pretensioner connector

PP0MS-01

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

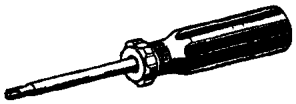
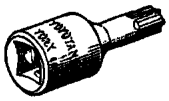
SST (Special Service Tools)

PP0BS-01

	09843–18020 Diagnosis Check Wire	

RECOMMENDED TOOLS

PP083-01

	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

PP0B4-01

EQUIPMENT

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	
Thermometer	Engine oil level warning switch, Seat heater
Syphon	Brake fluid level warning switch
Oil bath	Engine oil level warning switch
Bulb (3 W)	Fuel sender gauge
Bulb (3.4 W)	Seat belt warning relay
Bulb (21 W)	Turn signal flasher relay
Dry cell battery	Fuel sender gauge
Heat light	Seat heater
Torque wrench	
Masking tape	Rear window defogger wire
Tin foil	Rear window defogger wire

PP0VH-01

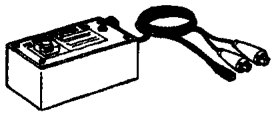
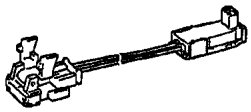
SSM (Special Service Materials)

	DuPont Paste No. 4817 or equivalent	Rear window defogger

BODY

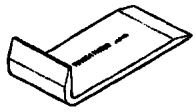
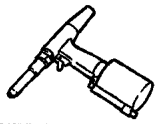
SST (Special Service Tools)

PP26N-01

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

RECOMMENDED TOOLS

PP280-01

	09070–20010 Moulding Remover .	
	09050–20010 Air Riveter.	

PP26P–02

EQUIPMENT

Clip remover	
Torque wrench	
Torx driver	
Hog ring pliers	
Hand riveter	
Tape	To avoid surface damage
Adhesive tape	To avoid surface damage
Adhesive	
Cleaner	
Shop rag	
Knife	
Piano wire	
Sealer gun	
Brush	
Putty spatula	
Wooden block or similar object	For tying both piano wire ends
Plastic sheet	To avoid surface damage
Rope (no projections, difficult to break)	Seat belt pretensioner disposal
Tire Width: 185 mm (7.28 in.) Inner diam: 360 mm (14.17 in.)	Seat belt pretensioner disposal
Tire with disc wheel Width: 185mm (7.28 in.) Inner diam: 360 mm (14.17 in.)	Seat belt pretensioner disposal
Vinyl bag	Seat belt pretensioner disposal

PP0S0-01

LUBRICANT

Item	Capacity	Classification
MP grease	–	–

PP26Q–02

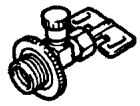
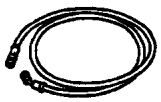
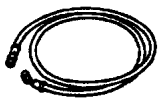
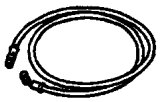
SSM (Special Service Materials)

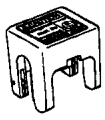
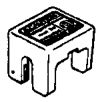
08833–00070	Adhesive 1324, THREE BOND 1324 or equivalent	Front Door Rear Door
08850–00801	Windshield Glass Adhesive Set or equivalent	

AIR CONDITIONING

SST (Special Service Tools)

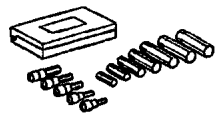
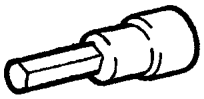
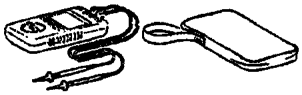
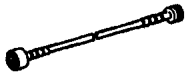
PP28G–01

	07110–58060	Air Conditioner Service Tool Set	
	(07117–58060)	Refrigerant Drain Service Valve	
	(07117–58070)	T–Joint	
	(07117–58080)	Quick Disconnect Adapter	
	(07117–58090)	Quick Disconnect Adapter	
	(07117–88060)	Refrigerant Charging Hose	
	(07117–88070)	Refrigerant Charging Hose	
	(07117–88080)	Refrigerant Charging Hose	
	07112–66040	Magnetic Clutch Remover	
	07112–76050	Magnetic Clutch Stopper	
	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 (LHD only)
	09870–00025	A/C Quick Joint Puller No.2	Liquid tube (LHD only)

RECOMMENDED TOOLS

PP28H-01

	09040–00011	Hexagon Wrench Set .	Expansion valve
	(09043–20050)	Socket Hexagon Wrench 5.	5.0 mm (0.20 in.)
	09082–00040	TOYOTA Electrical Tester.	
	09216–00021	Belt Tension Gauge .	
	09216–00030	Belt Tension Gauge Cable .	

PP0E4-04

EQUIPMENT

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	
Thermometer	Thermistor
Torque wrench	
Dial indicator	Magnetic clutch
Plastic hammer	Magnetic clutch

PP0ES-04

LUBRICANT

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

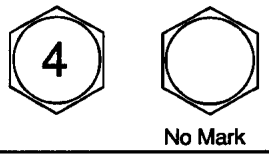
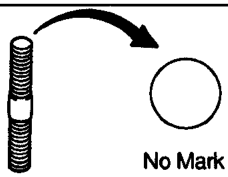
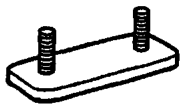
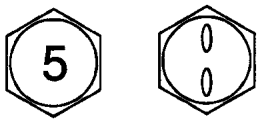
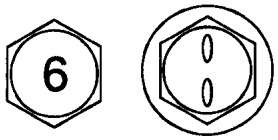
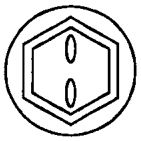
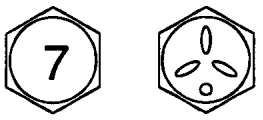
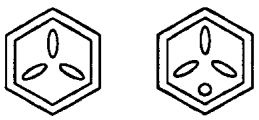
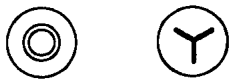
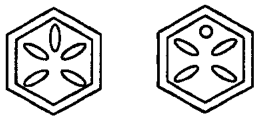
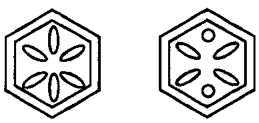
SERVICE SPECIFICATIONS

STANDARD BOLT SS–1
CLUTCH SS–4
MANUAL TRANSAXLE SS–6
AUTOMATIC TRANSAXLE SS–9
SUSPENSION AND AXLE SS–12
BRAKE SS–14
STEERING SS–16
SUPPLEMENTAL RESTRAINT SYSTEM ... SS–19
BODY ELECTRICAL SS–20
BODY SS–21
AIR CONDITIONING SS–23

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			
 No Mark	 No Mark	 No Mark		4T
				5T
 w/ Washer	 w/ Washer			6T
				7T
				8T
				9T
				10T
				11T

B06431

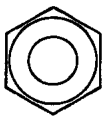
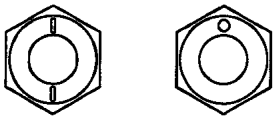
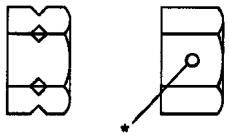
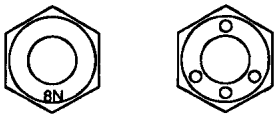
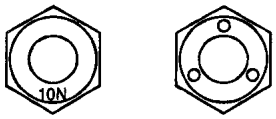
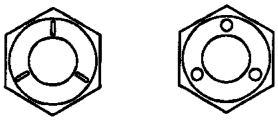
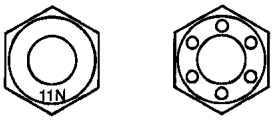
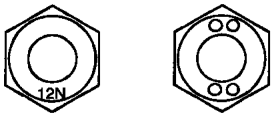
SS0ZT–01

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

SS

CLUTCH

SERVICE DATA

SS609Q-03

Pedal height from dash panel	RHD LHD	139.3 – 149.3 mm (5.484 – 5.878 in.) 134.3 – 144.3 mm (5.287 – 5.681 in.)
Pedal free play		5.0 – 15.0 mm (0.197 – 0.591 in.)
Push rod play at pedal top		1.0 – 5.0 mm (0.039 – 0.197 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Slotted spring pin protrusion		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.)

TORQUE SPECIFICATION

SS09R-03

Part tightened		N·m	kgf·cm	ft·lbf
Master cylinder installation nut		12	120	9
Clutch line		15	155	11
Release cylinder installation bolt		12	120	9
Union bolt		24.5	250	18
Bleeder plug		8.4	85	74 in.·lbf
Flywheel set bolt	1st	49	500	36
	2nd	Turn 90°		
Release fork support		37	375	27
Clutch cover x Flywheel		19	195	14

MANUAL TRANSAXLE

SERVICE DATA

SS0KT-03

Input shaft roller bearing journal diameter	Min.	24.967 mm (0.9830 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 – 0.55 mm (0.0039 – 0.0217 in.) 0.55 mm (0.0217 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 (0.0217 in.)
Gear thrust clearance 5th	STD Max.	0.10 – 0.57 mm (0.0039 – 0.0224 in.) 0.57 mm (0.0224 in.)
1st, 2nd, 3rd, 4th and 5th gear radial clearance (KOYO made)	STD Max.	0.015 – 0.058 mm (0.0006 – 0.0023 in.) 0.058 mm (0.0023 in.)
1st, 2nd, 3rd, 4th and 5th gear radial clearance (NSK made)	STD Max.	0.015 – 0.056 mm (0.0006 – 0.0022 in.) 0.056 mm (0.0022 in.)
No. 3 shift fork to No. 3 hub sleeve clearance	Max.	0.5 mm (0.020 in.)
No. 2 shift fork to No. 2 hub sleeve clearance	Max.	0.35 mm (0.014 in.)
No. 1 shift fork to reverse gear clearance	Max.	0.35 mm (0.014 in.)
Synchronizer ring to gear clearance	Min.	0.75 mm (0.0295 in.)
Drive in depth Input shaft front oil seal Control shaft cover oil seal Select inner lever slotted spring pin No. 1 shift inner lever slotted spring pin No. 2 shift inner lever slotted spring pin Transmission case oil seal Transaxle case oil seal		 15.8 ± 0.2 mm (0.622 ± 0.008 in.) 1.0 – 2.0 mm (0.039 – 0.079 in.) 0 ± 0.5 mm (0 ± 0.020 in.) 0 ± 0.5 mm (0 ± 0.020 in.) 0 ± 0.5 mm (0 ± 0.020 in.) 2.4 ± 0.3 mm (0.094 ± 0.012 in.) 1.9 ± 0.3 mm (0.075 ± 0.012 in.)
Differential side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Differential side gear thrust washer thickness		1.50 mm (0.0591 in.) 1.55 mm (0.0610 in.) 1.60 mm (0.0630 in.) 1.65 mm (0.0650 in.) 1.70 mm (0.0669 in.) 1.75 mm (0.0689 in.)
Differential side bearing preload (at starting) (For use with SST) New bearing Reused bearing		 0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf) 0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

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.)
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.)
Input shaft 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.)
Differential side bearing adjusting shim thickness		
	Mark AA	2.10 mm (0.0827 in.)
	Mark BB	2.15 mm (0.0846 in.)
	Mark CC	2.20 mm (0.0866 in.)
	Mark DD	2.25 mm (0.0886 in.)
	Mark EE	2.30 mm (0.0906 in.)
	Mark FF	2.35 mm (0.0925 in.)
	Mark GG	2.40 mm (0.0945 in.)
	Mark HH	2.45 mm (0.0965 in.)
	Mark JJ	2.50 mm (0.0984 in.)
	Mark KK	2.55 mm (0.1004 in.)
	Mark LL	2.60 mm (0.1024 in.)
	Mark MM	2.65 mm (0.1043 in.)
	Mark NN	2.70 mm (0.1063 in.)
	Mark PP	2.75 mm (0.1083 in.)
	Mark QQ	2.80 mm (0.1102 in.)
	Mark RR	2.85 mm (0.1122 in.)
	Mark SS	2.90 mm (0.1142 in.)
	Mark TT	2.95 mm (0.1161 in.)
	Mark UU	3.00 mm (0.1181 in.)

SS0KU-03

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
No. 2 cylinder head cover	7.0	71	62 in.·lbf
Clutch line bracket set bolt	4.9	50	43 in.·lbf
Clutch release cylinder x Transaxle	12	120	9
Transaxle x Engine	33	340	25
Starter x Transaxle	39	400	29
No. 1 engine hanger	40	400	29
RH and LH front suspension member reinforcement	47	480	35
Engine left mounting bracket x Engine left mounting insulator	49	490	35
Engine rear mounting insulator x Engine rear mounting bracket	64	650	47
Engine rear mounting bracket x Transaxle	49	500	36
Shift lever assembly x Body	12	120	9
Shift and select control cable x Body	4.9	50	43 in.·lbf
Clutch release fork support	37	375	27
Filler and drain plugs	39	400	29
Speed sensor	11	115	8
Back–up light switch	40	410	30
Control lever housing support bracket x Transaxle case	11	115	8
Selecting bellcrank assembly x Transmission case	25	250	18
Transmission case x Transmission case cover	18	185	13
Shift and select lever shaft assembly lock bolt	29	300	22
Shift and select lever assembly	20	200	14
Output shaft lock nut	118	1,200	87
Shift fork and shift head x Shift fork shaft	16	160	12
Rear bearing retainer	27	280	20
Reverse idler gear shaft lock bolt	29	300	22
Straight screw plug (Shift fork shaft)	25	250	18
Lock ball assembly	39	400	29
Transmission case x Transaxle case	29	300	22
Oil receiver pipe x Transmission case	17	175	13
Reverse shift arm bracket	17	175	13
Output shaft front bearing lock plate set bolt	11	115	8
Transaxle case receiver x Transaxle case	11	115	8
Straight screw plug (Reverse restrict pin)	13	130	9
Ring gear x Differential case	124	1,260	91

AUTOMATIC TRANSAXLE

SERVICE DATA

SS13Y-03

Line pressure (Wheel locked)		
	Engine idling	
	D range	372 – 407 kPa (3.8 – 4.2 kgf/cm^2, 54 – 60 psi)
	R range	588 – 683 kPa (6.0 – 7.0 kgf/cm^2, 85 – 100 psi)
	at stall (Throttle valve fully opened)	
	D range	1,067 – 1,187 kPa (10.9 – 12.1 kgf/cm^2, 155 – 172 psi)
	R range	1,420 – 1,675 kPa (14.5 – 17.1 kgf/cm^2, 206 – 243 psi)
Engine stall revolution	D and R ranges	2,280 ± 200 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 9.3 mm (0.366 in.)
Differential oil seal drive in depth	RH	3.1 ± 0.5 mm (0.122 ± 0.020 in.)
	LH	4.3 ± 0.5 mm (0.169 ± 0.020 in.)
Shift schedule (w/ Kick down switch)		
D range		
(Throttle valve fully opened)	1 → 2	46 – 51 km/h (29 – 32 mph)
	2 → 3	88 – 96 km/h (55 – 60 mph)
	3 → O/D	142 – 151 km/h (88 – 94 mph)
	O/D → 3 (Kick down switch OFF)	117 – 125 km/h (73 – 78 mph)
	O/D → 3 (Kick down switch ON)	137 – 146 km/h (85 – 91 mph)
	3 → 2 (Kick down switch OFF)	66 – 71 km/h (41 – 44 mph)
	3 → 2 (Kick down switch ON)	82 – 90 km/h (51 – 56 mph)
	2 → 1 (Kick down switch OFF)	10 – 14 km/h (6 – 9 mph)
	2 → 1 (Kick down switch ON)	40 – 44 km/h (25 – 27mph)
(Throttle valve fully closed)	3 → O/D	32 – 36 km/h (20 – 22 mph)
	O/D → 3	27 – 31 km/h (17 – 19 mph)
2 range		
(Throttle valve fully opened)	1 → 2	46 – 51 km/h (29 – 32 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1 (Kick down switch OFF)	10 – 14 km/h (6 – 9 mph)
	2 → 1 (Kick down switch ON)	40 – 44 km/h (25 – 27mph)
L range		
(Throttle valve fully opened)	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	44 – 48 km/h (25 – 30 mph)

SS

Shift schedule (w/o Kick down switch)		
D range		
(Throttle valve fully opened)	1 → 2	46 – 51 km/h (29 – 32 mph)
	2 → 3	88 – 96 km/h (55 – 60 mph)
	3 → O/D	142 – 151 km/h (88 – 94 mph)
	O/D → 3	137 – 146 km/h (85 – 91 mph)
	3 → 2	82 – 90 km/h (51 – 56 mph)
	2 → 1	40 – 44 km/h (25 – 27mph)
(Throttle valve fully closed)	3 → O/D	32 – 36 km/h (20 – 22 mph)
	O/D → 3	27 – 31 km/h (17 – 19 mph)
2 range		
(Throttle valve fully opened)	1 → 2	46 – 51 km/h (29 – 32 mph)
	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	40 – 44 km/h (25 – 27mph)
L range		
(Throttle valve fully opened)	3 → 2	85 – 93 km/h (53 – 58 mph)
	2 → 1	44 – 48 km/h (25 – 30 mph)
Lock–up point	Throttle valve opening 5 %	
3rd gear (O/D main switch OFF)	Lock–up ON	65 – 70 km/h (40 – 43 mph)
	Lock–up OFF	60 – 65 km/h (37 – 40 mph)
O/D gear	Lock–up ON	62 – 67 km/h (39 – 42 mph)
	Lock–up OFF	58 – 63 km/h (36 – 39 mph)

SS132-02

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Vehicle speed sensor x Transaxle		11.3	115	8
Direct clutch speed sensor x Transaxle		5.4	55	48 in.·lbf
Transaxle control cable x Control shaft		12	120	9
Control shaft x Neutral start switch		12	120	9
Neutral start switch x Transaxle	Bolt	5.4	55	48 in.·lbf
	Nut	6.9	70	61 n.·lbf
Solenoid valve x Valve body		11	110	8
Valve body x Transaxle		11	110	8
ATF temperature sensor x Transaxle		11	110	8
Solenoid wire clamp x Transaxle		11	110	8
Oil strainer x Valve body		10	100	7
Oil pan x Transaxle		9.0	91	80 in.·lbf
Drain plug x Oil pan		17	175	13
Floor shift assembly x Body		12	120	9
Floor shift assembly x Transaxle control cable		12	120	9
Air cleaner bracket x Transaxle		19	195	14
Starter x Transaxle		39	400	29
Transaxle x Engine		29.5	300	22
Engine hanger x Engine		40	400	29
Steering wheel x column shaft		34	350	25
Tie rod end x Axle carrier		49	500	36
Torque converter x Drive plate		27	275	20
Lower suspension arm x Axle carrier		98	1,000	72
Drive shaft lock nut		216	2,200	159
LH engine mounting x Transaxle		49	500	36
Drive plate x Crank shaft		88	900	65
PS pipe clamp x front suspension member		7.8	80	69 in.·lbf
Front suspension member reinforcement x Front suspension member		47	480	35
Front suspension member reinforcement x Body		47	480	35
Rear engine mounting bracket x Front suspension member		80	810	59
Front suspension member x Body	Bolt A:	116	1,185	86
(MS: See page SR–36)	Bolt B:	70	715	52
(PS: See page SR–52)				
Wiper arm x Wiper link assembly		21	214	15
Wiper arm assembly x Body		5.5	55	49 in.·lbf
Outer front cowl top panel x Body		5.0	50	43 in.·lbf
No.3 instermediate shaft assembly x Steering gear assembly		47	480	35
PS only:				
Pressure feed and return tubes x Steering gear assembly	LHD:	37 (44)	375 (450)	27 (33)
	RHD:	32 (250)	325 (250)	24 (18)

( ): For use without SST

SUSPENSION AND AXLE

SS13W-03

SERVICE DATA

Cold tire inflation pressure Tire size: 175/65R14 82T	Vehicle load up to 4 passengers	Front, rear	220 kPa (2.2 kgf/cm^2, 32 psi)
	Vehicle load up to 5 passengers and full rated loads	Front, rear*1 Front, rear*2	220 kPa (2.2 kgf/cm^2, 32 psi) 240 kPa (2.4 kgf/cm^2, 35 psi)
Front wheel alignment	Vehicle height Rear drum brake	Front*3 Rear*4	187 mm (7.36 in.) 257 mm (10.12 in.)
	Rear disc brake	Front*3 Rear*4	187 mm (7.36 in.) 256 mm (10.08 in.)
	Camber	Right–left error	–0°35' ± 45' (–0.58° ± 0.75°) 45' (0.75°) or less
	Caster (Rear drum brake)	Manual steering Power steering Right–left error	0°55' ± 45' (0.92° ± 0.75°) 1°54' ± 45' (1.90° ± 0.75°) 45' (0.75°) or less
	Caster (Rear disc brake)	Manual steering Power steering Right–left error	0°57' ± 45' (0.95° ± 0.75°) 1°56' ± 45' (1.93° ± 0.75°) 45' (0.75°) or less
	Steering axis inclination	Right–left error	10°05' ± 45' (10.08° ± 0.75°) 45' (0.75°) or less
	Toe–in (total)	Rack end length difference	0° ± 12' (0° ± 0.2°, 0 ± 2 mm, 0 ± 0.08 in.) 1.5 mm (0.059 in.) or less
	Wheel angle Manual steering	Inside wheel Outside wheel: Reference	36°59' ± 2° (36.98° ± 2°) 32°09' (32.15°)
	Power steering	Inside wheel Outside wheel: Reference	36°58' ± 2° (36.97° ± 2°) 32°19' (32.32°)
Rear wheel alignment	Camber	Right–left error	–0°57' ± 45' (–0.95° ± 0.75°) 45' (0.75°) or less
	Toe–in (total)		0°21' ± 15' (0.35° ± 0.25°) 3.3 ± 2.3 mm (0.13 ± 0.09 in.)
Front axle	Axle bearing backlash	Maximum	0.05 mm (0.0020 in.)
	Axle hub deviation	Maximum	0.05 mm (0.0020 in.)
Front drive shaft	Drive shaft standard length	LH RH	574.3 ± 5.0 mm (22.610 ± 0.197 in.) 813.3 ± 5.0 mm (32.020 ± 0.197 in.)
Front suspension	Lower suspension arm ball joint turning torque		0.59 – 3.43 N·m (6 – 35 kgf·cm, 5.2 – 30 in.·lbf)
Rear axle	Axle bearing backlash	Maximum	0.05 mm (0.0020 in.)
	Axle hub deviation	Maximum	0.07 mm (0.0028 in.)

*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 head 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 rear axle beam mounting bolt.

SS13X-03

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
FRONT AXLE				
Hub nut		103	1,050	76
Tie rod end lock nut		47	480	35
Steering knuckle x Shock absorber		132	1,350	97
Steering knuckle x Brake caliper		88	900	65
Steering knuckle x Tie rod end		49	500	36
Axle hub x Drive shaft		216	2,200	159
Lower suspension arm x Steering knuckle		98	1,000	72
Steering knuckle x Dust cover		8.3	85	74 in.·lbf
ABS speed sensor set bolt		8.0	82	71 in.·lbf
FRONT SUSPENSION				
Suspension support x Body		39	400	29
Suspension support x Piston rod		33	340	24
Flexible hose and ABS speed sensor wire harness clamp x Shock absorber		29	300	22
Lower suspension arm front side set bolt		88	900	65
Lower suspension arm rear side set bolt		132	1,350	97
Engine rear mount x Suspension member		80	810	59
Suspension member set bolt	Front side	70	715	52
	Rear side	116	1,185	86
Stabilizer bar bracket set bolt		19	190	14
Stabilizer bar link set nut		18	180	13
REAR AXLE				
Hub nut		103	1,050	76
Brake caliper set bolt		47	475	34
Axle hub set bolt		52	526	38
REAR SUSPENSION				
Shock absorber x Body		25	250	18
Shock absorber x Rear axle beam		49	500	36
Brake line x Flexible hose		15	155	11
Flexible hose bracket set bolt		29	300	22
LSPV bracket x Axle beam		9.0	92	80 in.·lbf
ABS speed sensor wire harness clamp set bolt		5.4	55	48 in.·lbf
Parking brake cable clamp set nut		5.4	55	48 in.·lbf
Axle beam x Body		82	837	60

BRAKE

SERVICE DATA

SS0M2-06

Brake pedal height (from dash panel)	LHD	124.3 – 134.3 mm (4.89 – 5.287 in.)
Brake pedal height (from dash panel)	RHD	129.3 – 139.3 mm (5.091 – 5.482 in.)
Brake pedal free play		1 – 3 mm (0.04 – 0.12 in.)
Brake pedal reserve distance at 490 N (50 kgf, 110.2 lbf)		More than 48 mm (1.89 in.)
Parking brake lever travel at 196 N (20 kgf, 44.1 lbf)		6 – 9 clicks
Front brake pad thickness	STD	11.0 mm (0.433 in.)
Front brake pad thickness	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness	STD	20.0 mm (0.787 in.)
Front brake disc thickness	Minimum	18.0 mm (0.709 in.)
Front brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake drum inside diameter	STD	200.0 mm (7.874 in.)
Rear brake drum inside diameter	Maximum	201.0 mm (7.913 in.)
Rear brake shoe lining thickness	STD	4.0 mm (0.157 in.)
Rear brake shoe lining thickness	Minimum	1.0 mm (0.039 in.)
Rear brake drum to shoe clearance		0.6 mm (0.024 in.)
Rear brake pad thickness	STD	10.0 mm (0.394 in.)
Rear brake pad thickness	Minimum	1.0 mm (0.039 in.)
Rear brake disc thickness	STD	9.0 mm (0.354 in.)
Rear brake disc thickness	Minimum	8.0 mm (0.315 in.)
Rear brake disc runout	Maximum	0.15 mm (0.0059 in.)
Rear brake disc inside diameter	STD	173.0 mm (6.811 in.)
Rear brake disc inside diameter	Maximum	174.0 mm (6.850 in.)

SS0M3-07

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Bleeder plug (Front brake caliper, rear brake wheel cylinder)	8.3	85	73 in.·lbf
Bleeder plug (Rear brkae caliper)	11	110	8
Parking brake equalizer lock nut	5.4	55	48 in.·lbf
Master cylinder x Brake booster	13	130	9
Brake line union nut	15	155	11
Brake booster clevis lock nut	26	260	19
Brake booster installation nut	13	130	9
Brake pedal assembly x Reinforcement	19.5	200	14
Brake pedal x Pedal Bracket	37	375	27
Front brake caliper installation bolt	34	350	25
Front brake torque plate x Steering knuckle	88	900	65
Front brake caliper x Flexible hose	30	310	22
Rear drum brake wheel cylinder x Backing plate	10	100	7
Flexible hose x Rear axle beam	30	310	22
Rear brake caliper x Flexible hose	30	310	22
Rear brake caliper installation bolt	47	475	34
Load sensing proportioning valve assembly x Body	19	195	14
Load sensing proportioning valve assembly x Rear axle beam	13	130	9
ABS actuator assembly x Body	19	195	14
ABS actuator assembly x Clamp	19	195	14
ABS actuator x Actuator No. 1 bracket	4.7	48	42 in.·lbf
Front speed sensor x Steering knuckle	8.0	82	71 in.·lbf
Front speed sensor wire harness clamp x Shock absorber	29	300	22
Front speed sensor wire harness clamp x Body	8.0	82	71 in.·lbf
Rear axle hub installation bolt	52	526	38

STEERING

SERVICE DATA

SS0MY–09

DRIVE BELT		
Drive belt deflection	New belt	8 – 10 mm (0.315 – 0.394 in.)
	Used belt	11 – 13 mm (0.433 – 0.512 in.)
*Drive belt tension	New belt	440 – 540 N (45 – 55 kgf)
	Used belt	240 – 340 N (25 – 35 kgf)
POWER STEERING FLUID		
Fluid level rise	Maximum	5 mm (0.20 in.)
Fluid pressure at idle speed with valve closed	Minimum	5,900 kPa (60 kgf/cm^2, 852 psi)
STEERING WHEEL		
Steering wheel freeplay	Maximum	30 mm (1.18 in.)
Steering effort at idle speed	Reference	
	Manual steering	28 N·m (285 kgf·cm, 21 ft·lbf)
	Power steering	6.5 N·m (65 kgf·cm, 58 in.·lbf)
POWER STEERING VANE PUMP		
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	0.021 – 0.043 mm (0.0008 – 0.0017 in.)
	Maximum	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.)
MANUAL STEERING GEAR		
Steering rack runout	Maximum	0.15 mm (0.0059 in.)
Total preload	Turning	0.6 – 1.5 N·m (6 – 15 kgf·cm, 5.2 – 13.0 in.·lbf)
POWER STEERING GEAR		
Steering rack runout	Maximum	0.1 mm (0.004 in.)
Total preload	Turning	
	LHD	1.2 – 1.4 N·m (12 – 14 kgf·cm, 10.4 – 12.2 in.·lbf)
	RHD	0.8 – 1.5 N·m (8 – 15 kgf·cm, 6.9 – 13.0 in.·lbf)

* For use with belt tension gauge

SS141-03

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
TILT STEERING COLUMN				
Adjusting nut		See page SR–18		
No. 2 tilt lever lock bolt		5.4	55	48 in.·lbf
No. 2 intermediate shaft assembly x Main shaft assembly		28	290	21
Column assembly set bolt		21	210	15
Sliding yoke x No. 3 intermediate shaft assembly		28	290	21
No. 2 intermediate shaft assembly x Sliding yoke		28	290	21
Steering wheel set nut		34	350	25
Steering wheel pad set screw (Torx screw)		8.8	90	78 in.·lbf
POWER STEERING VANE PUMP				
Rear housing x Front housing		22	220	16
Oil pressure sensor		21	210	15
Pressure port union		69	700	51
Front and rear bracket x Pump housing		44	440	32
Heat insulator and rear stay x Rear housing		44	440	32
Oil reservoir x Pump housing		9.0	90	78 in.·lbf
Pump assembly set bolt	Bolt A	44	440	32
	Bolt B	44	440	32
	Bolt C	44	440	32
Pressure feed tube x Pump assembly		41 (44)	415 (450)	30 (33)
MANUAL STEERING GEAR				
Engine hanger set bolt		20	204	15
Rack guide spring cap lock nut		36 (49)	365 (500)	26 (36)
Rack end x Rack		62 (83)	630 (850)	46 (61)
Tie rod end lock nut		47	480	35
Engine rear mount bracket set bolt		49	500	36
Engine rear mount bracket x Engine rear mount insulator		64	650	47
No. 3 intermediate shaft assembly x Steering pinion		28	290	21
Manual steering gear assembly set bolt		74	750	54
Steering gear heat insulator set bolt		7.4	75	65 in.·lbf
Front suspension member x Frame	Bolt A	116	1,185	86
	Bolt B	70	715	52
Engine rear mount insulator x Front suspension member		80	810	59
Front suspension member reinforcement set bolt		47	480	35
Lower suspension arm x Steering knuckle		98	1,000	72
Engine hood x Hinge		13	130	9
Tie rod end x Steering knuckle		49	500	36
POWER STEERING GEAR				
Engine hanger set bolt		20	204	15
Control valve housing x Rack housing	LHD	21	220	15
	RHD	18	185	13
Rack guide spring cap lock nut (LHD)		28 (39)	290 (400)	21 (29)
Rack end x Rack (LHD)		62 (83)	630 (850)	46 (61)
Rack end x Rack (RHD)		57 (76)	580 (780)	42 (56)

Part tightened		N·m	kgf·cm	ft·lbf
Tie rod end lock nut		47	480	35
Turn pressure tube x Rack housing	LHD	11 (13)	115 (130)	8 (9)
	RHD	22 (25)	225 (250)	16 (18)
Engine rear mount bracket set bolt		49	500	36
Engine rear mount bracket x Engine rear mount insulator		64	650	47
No. 3 intermediate shaft assembly x Control valve shaft		28	290	21
PS gear assembly set bolt		74	750	54
Rack housing heat insulator set bolt (RHD)		7.4	75	65 in.·lbf
Dynamic damper (with rack housing heat insulator) set bolt (LHD)		18	180	13
Rack housing heat insulator set bolt		35	360	26
Front suspension member x Frame	Bolt A	116	1,185	86
	Bolt B	70	715	52
Engine rear mount insulator x Front suspension member		80	810	59
Front suspension member reinforcement set bolt		47	480	35
Lower suspension arm x Steering knuckle		98	1,000	72
Engine hood x Hinge		13	130	9
Tube clamp		7.8	80	69 in.·lbf
Pressure feed and return tube	LHD	27 (25)	280 (250)	20 (18)
	RHD	41 (44)	415 (450)	30 (33)

( ): For use without SST

SUPPLEMENTAL RESTRAINT SYSTEM

TORQUE SPECIFICATION

SS16X-01

Part tightened		N·m	kgf·cm	ft·lbf
Steering wheel		34	350	25
Steering wheel pad		8.8	90	78 in.·lbf
Front passenger airbag assembly x Instrument panel		5.0	51	44 in.·lbf
Front passenger airbag assembly x Instrument panel reinforcement		20	205	15
Front seat installation bolt		37	375	27
Seatback assembly x Seat cushion assembly		43	440	32
Airbag sensor assembly		20	205	15
Side airbag sensor assembly		20	205	15
Front seat outer belt retractor	Upper bolt	4.7	48	42 in.·lbf
	Lower bolt	42	430	31
Front airbag sensor		20	205	15

BODY ELECTRICAL

SERVICE DATA

SS05U–05

DAYTIME RUNNING LIGHT RELAY (MAIN) (Wire Harness Side)	
1 – Ground (Ignition switch position LOCK or ACC)	No voltage
1 – Ground (Ignition switch position ON or START)	Battery positive voltage
8 – Ground (Engine Stop)	No voltage
8 – Ground (Engine Running)	Battery positive voltage
3 – Ground (Constant)	Battery positive voltage
5 – Ground (Constant)	Battery positive voltage
HEADLIGHT BEAM LEVEL CONTROL ECU (Wire Harness Side)	
2 – Ground (Light control switch TAIL OR HEAD)	Battery positive voltage
SPEEDOMETER (ON–VEHICLE)	
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
TACHOMETER (ON–VEHICLE)/ DC 13.5 V 25 °C at (77 °F)	
Standard indication	Allowable range
1,000	970 – 1,030
2,000	1,940 – 2,060
3,000	2,910 – 3,090
4,000	3,880 – 4,120
5,000	4,850 – 5,150
6,000	5,820 – 6,180
7,000	6,790 – 7,210
FUEL SENDER GAUGE	
Float position mm (in.)	Resistance (Ω)
F: Approx. 92.0 (3.62) ± 3.0 (0.12)	Approx. 4.0±0.5
1/2: Approx. 35.4 (1.00) ± 3.0 (0.12)	Approx. 55.0±1.5
E: Approx. 46.6 (1.84) ± 3.0 (0.12)	Approx. 107.0±2.5
ENGINE COOLANT TEMPERATURE SENDER GAUGE (Resistance)	
Temperature °C (°F)	Resistance (Ω)
50 (122.0)	160 – 240
120 (248.0)	17.1 ± 21.2

BODY

TORQUE SPECIFICATION

SS140-02

Part tightened	N·m	kgf·cm	ft·lbf
FRONT BUMPER	–	–	–
Reinforcement x Body	20	204	15
HOOD	–	–	–
Hood x Hood hinge	13	130	9
Hood lock x Body	8.0	82	71 in.·lbf
FRONT DOOR	–	–	–
Window regulator x Door panel	5.5	56	49 in.·lbf
Door lock x Door panel	5.5	56	49 in.·lbf
Outside handle x Door panel	5.5	56	49 in.·lbf
Door hinge x Door panel	43	440	32
Door hinge x Body	43	440	32
Door lock striker x Body	23	230	17
Door check x Door panel	5.5	56	49 in.·lbf
Door check x Body	30	310	22
Outer rear view mirror x Door panel	5.5	56	49 in.·lbf
REAR DOOR	–	–	–
Window regulator x Door panel	5.5	56	49 in.·lbf
Door lock x Door panel	5.5	56	49 in.·lbf
Outside handle x Door panel	5.5	56	49 in.·lbf
Door hinge x Door panel	26	265	19
Door hinge x Body	43	440	32
Door lock striker x Body	23	230	17
Door check x Door panel	5.5	56	49 in.·lbf
Rear door check x Body	30	310	22
BACK DOOR	–	–	–
Door hinge x Body	43	438	32
Door hinge x Door panel	26	265	19
Door check x Body	30	306	22
Door check x Door panel	5.5	56	49 in.·lbf
Back door lock x Door panel	5.5	56	49 in.·lbf
Door lock striker x Body	23	230	17
FRONT WIPER AND WASHER	–	–	–
Wiper motor x Wiper link	5.5	56	49 in.·lbf
Wiper link x Body	5.5	56	49 in.·lbf
Wiper arm x Wiper link	21	214	15
Outer front cowl top panel x Body	7.8	80	69 in.·lbf
REAR WIPER AND WASHER	–	–	–
Rear wiper arm x Door panel	5.5	56	49 in.·lbf
Rear wiper motor x Door panel	5.5	56	49 in.·lbf
TILT MOON ROOF	–	–	–
Tilt roof glass x Body	7.4	75	48 in.·lbf
Housing x Body	5.5	56	49 in.·lbf

SLIDING ROOF	–	–	–
Housing x Body	5.5	56	49 in.·lbf
INSTRUMENT PANEL	–	–	–
Steering wheel set nut	34	350	25
Front passenger airbag assembly x Reinforcement	20	205	15
Front passenger airbag assembly x Instrument panel upper	5.0	51	44 in.·lbf
ROOF HEADLINING	–	–	–
Center floor board x Body	8.0	82	71 in.·lbf
FRONT SEAT	–	–	–
Seat adjuster x Body	42	430	31
Seat adjuster x Seatback frame	42	430	31
Seat adjuster x Seat inner belt	42	430	31
REAR SEAT (Outer Side)	–	–	–
Seatback frame x Seat cushion frame	20	204	15
Seat cushion frame x Body	21	215	16
Seat cushion frame x Rear seat inner belt	42	430	31
Seat cushion frame x Support	37	375	27
REAR SEAT (Center)	–	–	–
Seat cushion frame x Seatback frame	20	204	15
SEAT BELT	–	–	–
Front seat outer belt shoulder Anchor x Body	42	430	31
Front seat outer belt floor anchor x Body	42	430	31
Front seat outer belt retractor x Body Upper:	8.0	82	71 in.·lbf
Front seat outer belt retractor x Body Lower:	42	430	31
Rear seat outer belt shoulder anchor x Body	42	430	31
Rear seat outer belt floor anchor x Body	42	430	31
Rear seat outer belt retractor x Body	42	430	31
Rear seat inner belt RH x Center seat	42	430	31
Rear seat inner belt LH x Center seat	42	430	31
Front seat inner belt x Front seat	42	430	31
FUEL TANK AND LINE	–	–	–
Fuel tank filler pipe support x Body	31	318	23
Fuel tank x Body	20	199	14
Fuel tank vent tube set plate x Fuel tank	3.5	36	30 in.·lbf

AIR CONDITIONING

SERVICE DATA

SS072-04

Refrigerant charge volume	430 ± 30 g (15.17 ± 1.06 oz.)
Drive belt tension	–
New belt	490 – 690 N (50 – 70 kgf)
Used belt	340 – 440 N (35 – 45 kgf)
Idle–up speed (M/T)	–
Magnetic clutch not engaged	600 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at low)	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at high)	875 ± 50 rpm
Idle–up speed (A/T)	–
Magnetic clutch not engaged	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at low)	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at high)	875 ± 50 rpm
Magnetic clutch clearance	0.5 ± 0.15 mm (0.020 ± 0.0059 in.)

SS073-03

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Engine	25	250	18
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
A/C unit x Liquid and Suction hose (RHD only)	5.4	55	48 in.·lbf
Expansion valve x Evaporator	3.4	35	30 in.·lbf
Condenser x Liquid tube	5.4	55	48 in.·lbf
Condenser x Discharge hose	5.4	55	48 in.·lbf
Pressure switch x Liquied tube	10	100	7
Pressure plate x Compressor	13.2	135	9
Water temperature switch x Engine	34	350	25
Front passenger airbag x Reinforcement	20	205	15

DIAGNOSTICS

AUTOMATIC TRANSAXLE DI–1
HOW TO PROCEED WITH TROUBLESHOOTING DI–1
CUSTOMER PROBLEM ANALYSIS CHECK ... DI–3
PRE–CHECK DI–4
DIAGNOSTIC TROUBLE CODE CHART DI–16
PARTS LOCATION DI–17
TERMINALS OF ECU DI–18
PROBLEM SYMPTOMS TABLE DI–19
CIRCUIT INSPECTION DI–22
ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD) DI–58
HOW TO PROCEED WITH TROUBLESHOOTING DI–58
CUSTOMER PROBLEM ANALYSIS CHECK ... DI–59
PRE–CHECK DI–60
DIAGNOSTIC TROUBLE CODE CHART DI–63
PARTS LOCATION DI–65
TERMINALS OF ECU DI–67
PROBLEM SYMPTOMS TABLE DI–68
CIRCUIT INSPECTION DI–69
SUPPLEMENTAL RESTRAINT SYSTEM ... DI–100
HOW TO PROCEED WITH TROUBLESHOOTING DI–100
CUSTOMER PROBLEM ANALYSIS CHECK ... DI–101
PRE–CHECK DI–102
DIAGNOSTIC TROUBLE CODE CHART DI–108
PARTS LOCATION DI–110
TERMINALS OF ECU DI–111
PROBLEM SYMPTOMS TABLE DI–113
CIRCUIT INSPECTION DI–114
ENGINE IMMOBILISER SYSTEM DI–241
HOW TO PROCEED WITH TROUBLESHOOTING DI–241
CUSTOMER PROBLEM ANALYSIS CHECK ... DI–242
PRE–CHECK DI–243
DIAGNOSTIC TROUBLE CODE CHART DI–246
PARTS LOCATION DI–247
TERMINALS OF ECU DI–248
PROBLEM SYMPTOMS TABLE DI–249
CIRCUIT INSPECTION DI–250

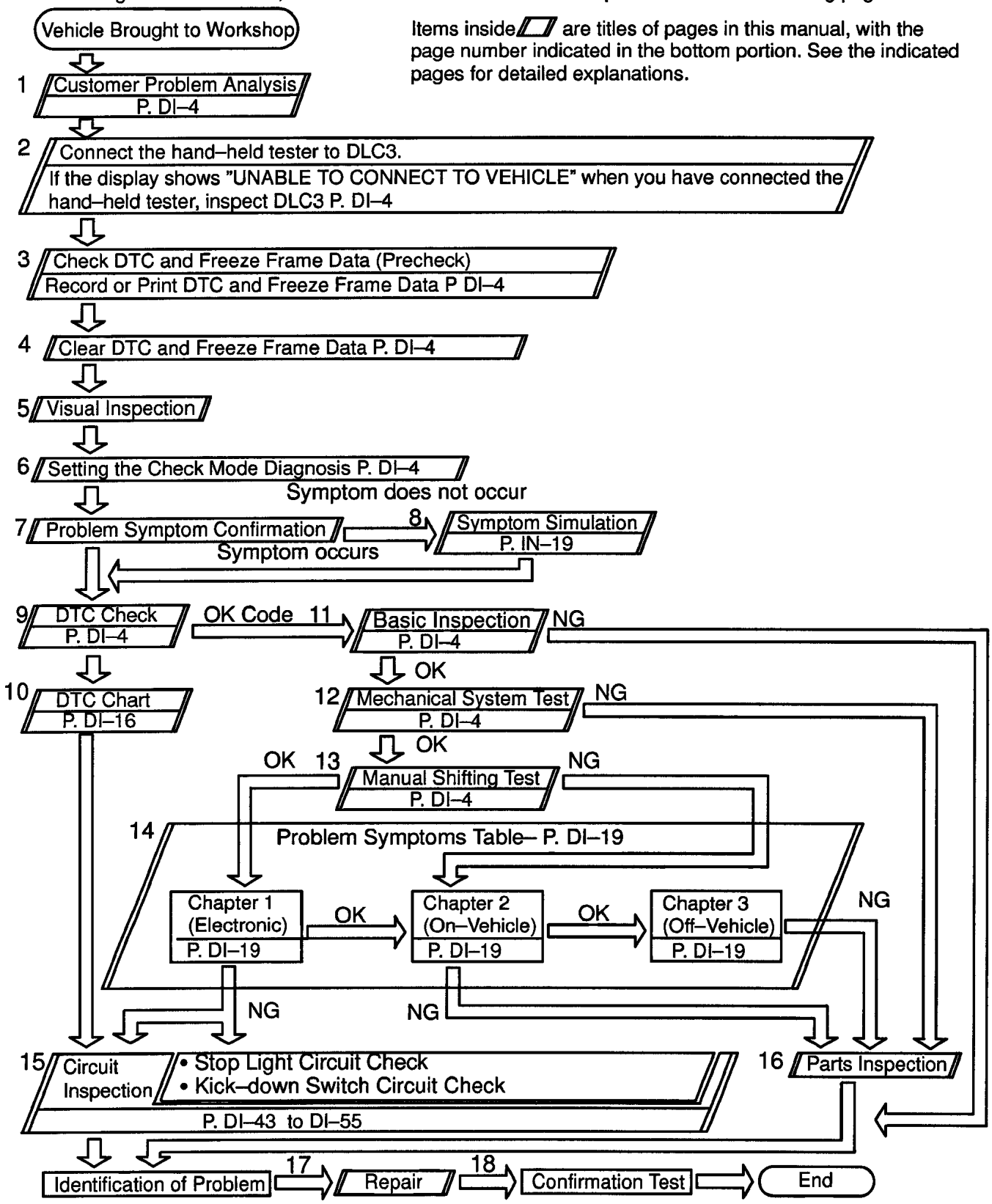
AUTOMATIC TRANSAXLE

HOW TO PROCEED WITH TROUBLESHOOTING

DI2L4-05

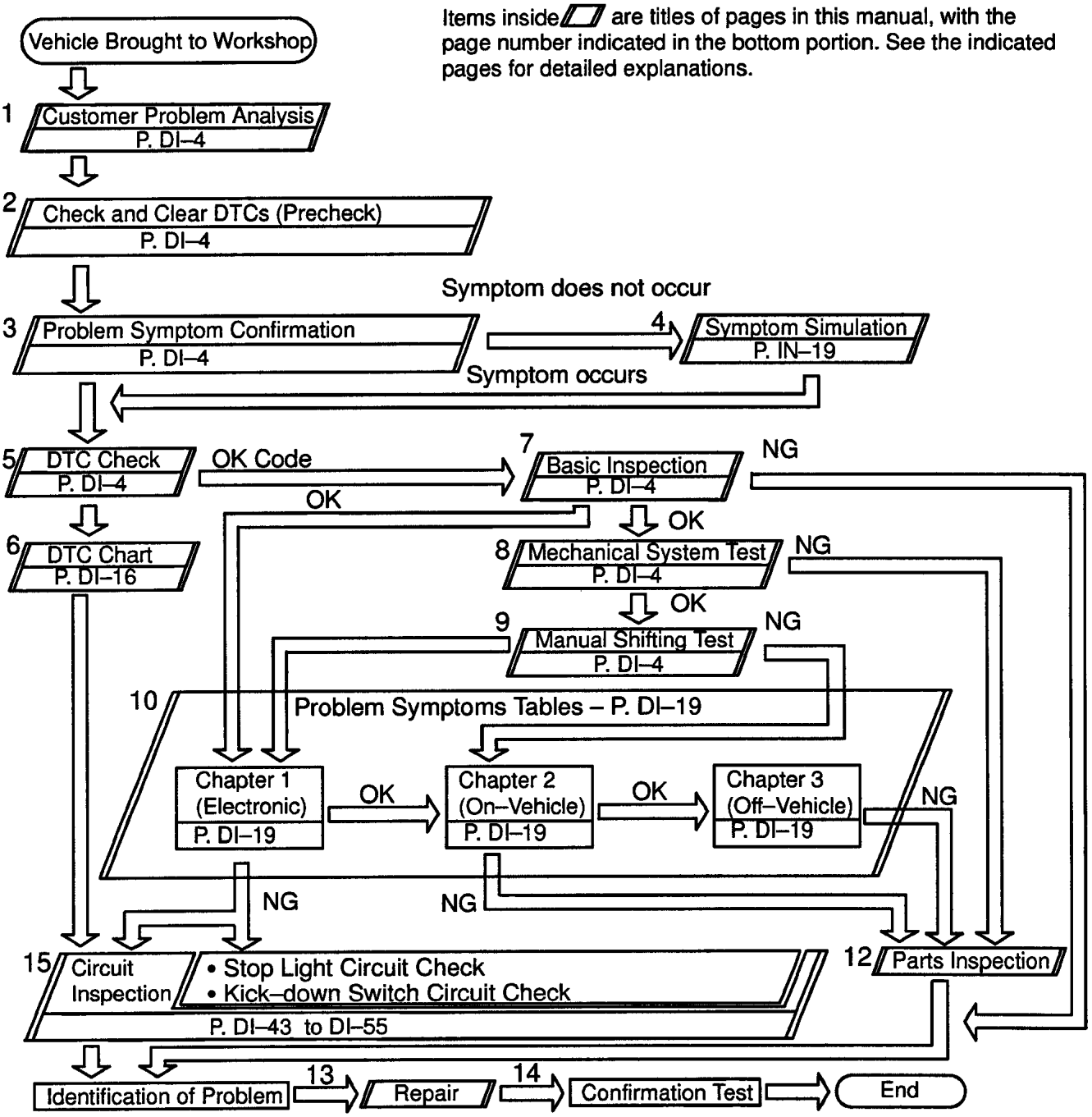
When using hand–held tester, troubleshoot in accordance with the procedure on the following pages.

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.



DI2LS-05

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)

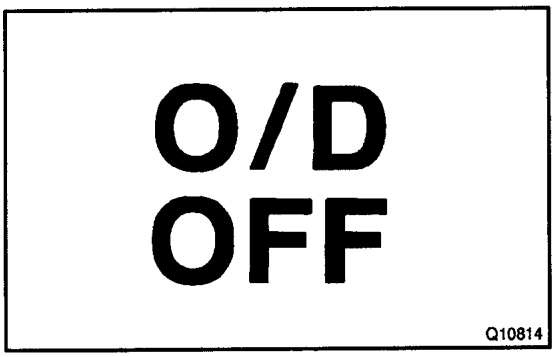
Symptoms	☐ Vehicle does not move (☐ Any rangen ☐ Particular range)
	☐ No up–shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → O/D)
	☐ No down–shift (☐ O/D → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)
	☐ Lock–up malfunction
	☐ Shift point too high or too low
	☐ Harsh engagement (☐ N → D ☐ Lock–up ☐ Any drive range)
	☐ Slip or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

DI

DI67P-02

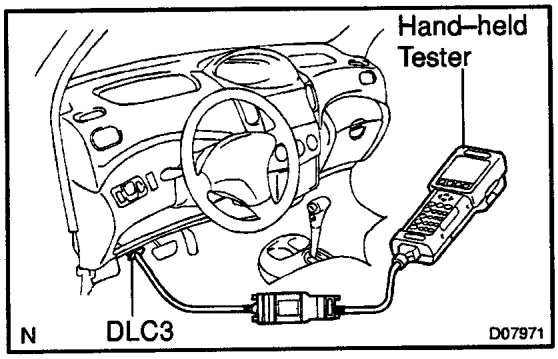


PRE–CHECK

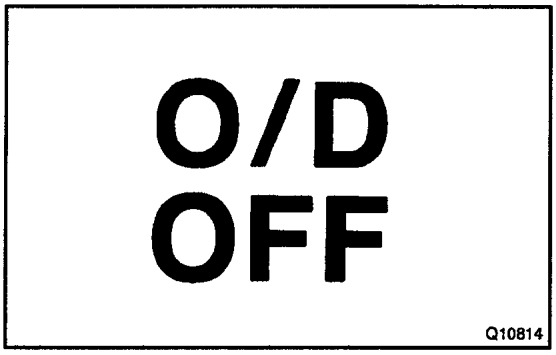
1. DIAGNOSIS SYSTEM

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.
  If the malfunction only occurs in 3–trip, 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 light 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:

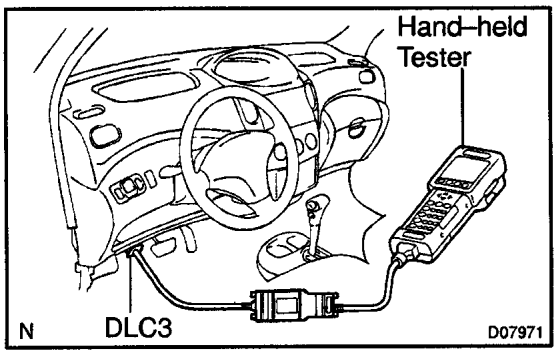
- If the O/D OFF indicator light does not light up or stays on all the time, carry out the check for "O/D OFF Indicator Light Circuit" on page DI–51.
- If the O/D OFF indicator light blinks, a malfunction code is stored in the ECU memory.

DI

(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.



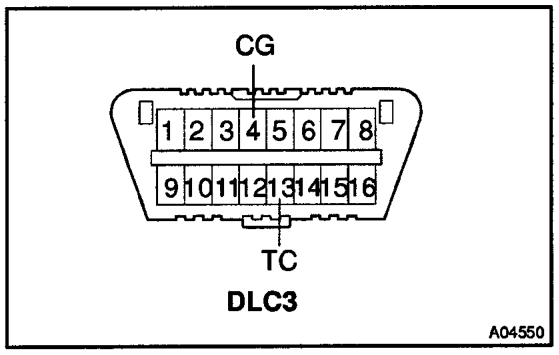
(1) Prepare the hand–held tester.

(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–16 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.

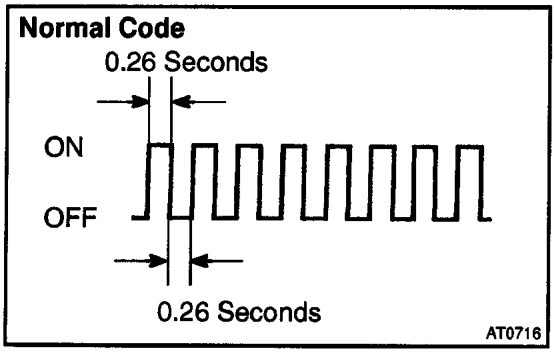
(2) Push in the O/D main switch to ON.

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.

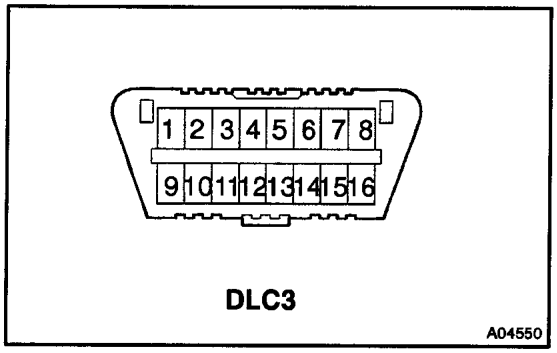
SST 09843–18040



(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.

DI

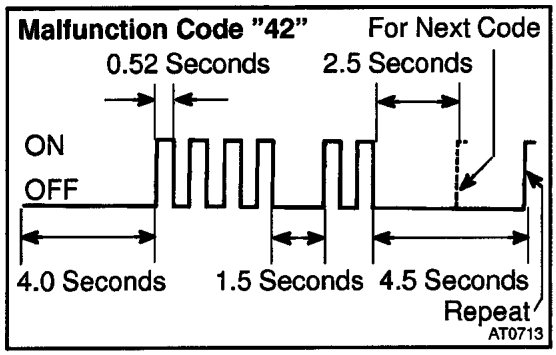


(d) Inspect the DLC3.
(1) The vehicle's Engine and ECT ECU uses ISO 14230 for communication. The terminal arrangement of DLC3 complies with SAE J1962 and matches the ISO 14230 format.

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

DI

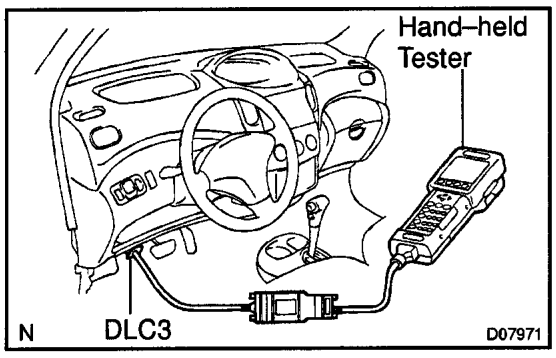
HINT:
Hand–held tester only: Compared to the normal mode, the check mode has high sensing ability to detect malfunctions. Furthermore, the same diagnostic items which are detected in Normal mode can also be detected in Check mode.

(a) Check the DTC.

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

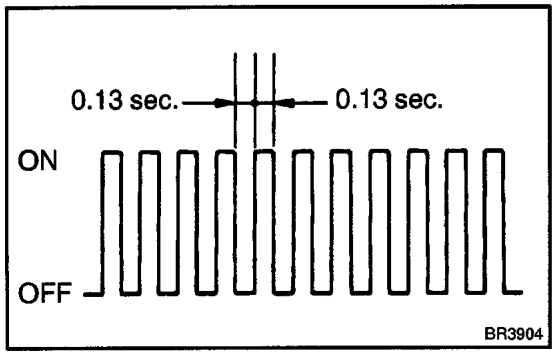
(2) Turn the ignition switch OFF.

(3) Prepare a hand–held tester.



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

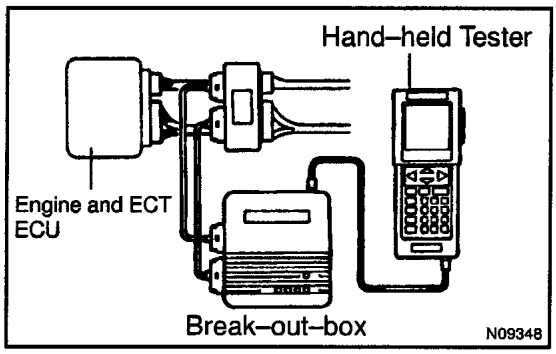
(9) After simulating the malfunction conditions, use the hand–held tester diagnosis selector to check the DTCs and freeze frame data, etc.

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 R/B No. 1 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–9).

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–9).

(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–9).

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.

DI

(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.

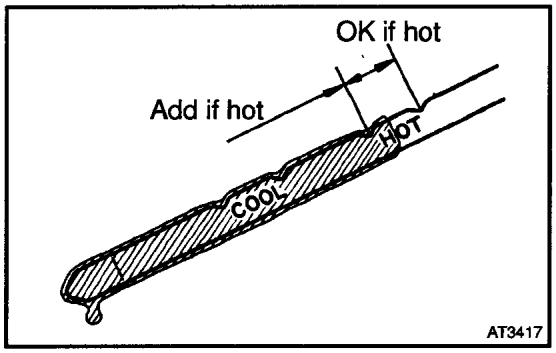
7. BASIC INSPECTION

(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)

(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.

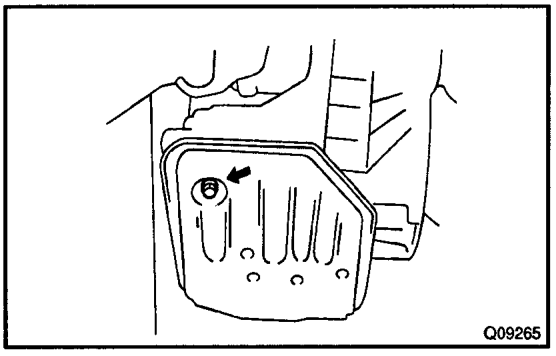


If the level is not within the range, add new fluid.

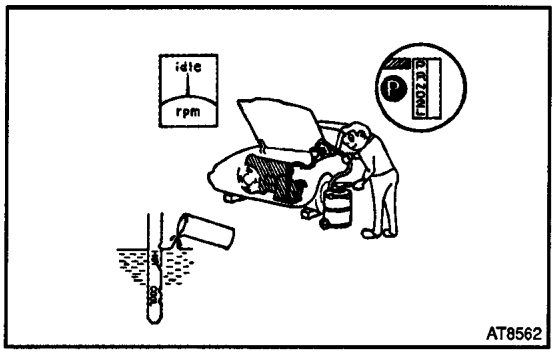
Fluid type: ATF Type T–IV

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.

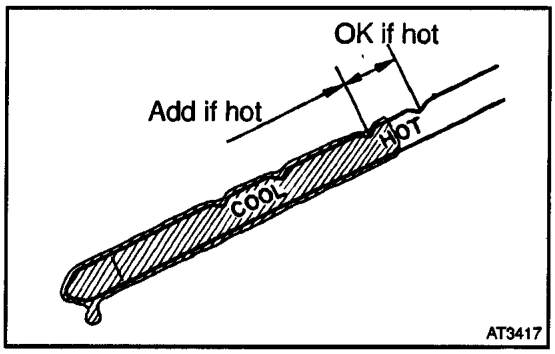


(3) With the engine OFF add new fluid through the oil filler pipe.

Fluid type: ATF Type T–IV

Capacity: 2.0 liters (2.1 US qts, 1.8 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.

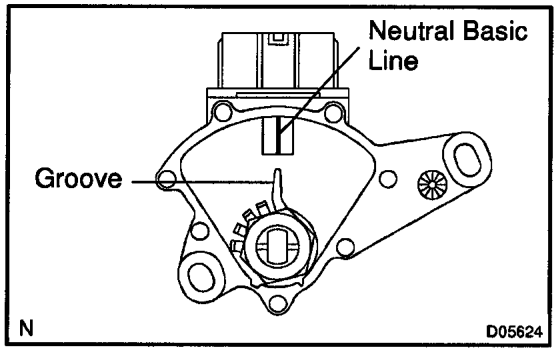
NOTICE:

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 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.
- For continuity inspection of the neutral start switch, see page DI–47.

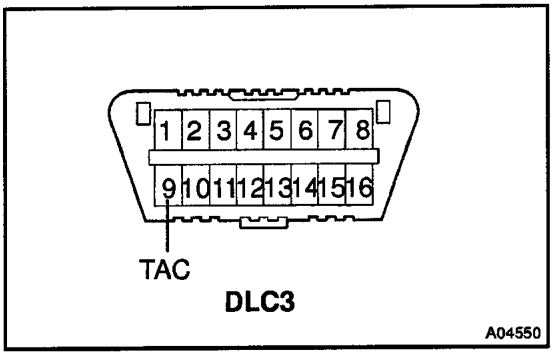
8. MECHANICAL SYSTEM TESTS

(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: 2,280 ± 200 rpm

- Do the same test in the R range.

Stall speed: 2,280 ± 200 rpm

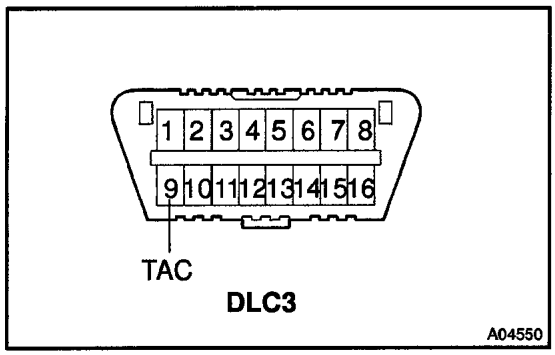
Evaluation:

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
(c) Stall speed high in R range	• Line pressure too low • Reverse clutch slipping • 1st & reverse brake slipping
(d) Stall speed high in D and R ranges	• Line pressure too low • Improper fluid level

(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.**



- 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: 700 ± 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 • One–way clutch No. 2 not operating properly
N → R time lag is longer	• Line pressure too low • Reverse clutch worn • 1st & reverse brake worn

9. 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.**

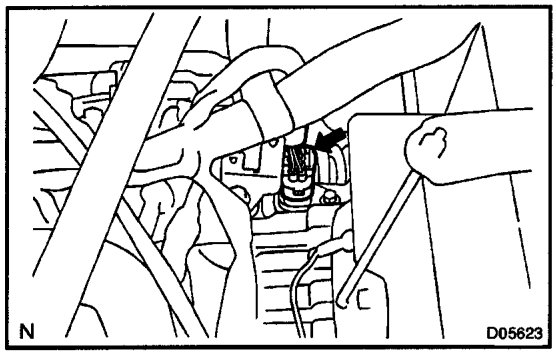
(1) Warm up the ATF.
(2) Remove the test plug on the rear side of the transaxle case and connect SST.
(See page AX–23 for the location to connect SST)
SST 09992–00095 (09992– 00231, 09992–00271)
(3) Fully apply the parking brake and chock the 4 wheels.
(4) Connect a hand–held tester to DLC3.
(5) Start 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 – 407 (3.8 – 4.2, 54 – 60)	588 – 683 (6.0 – 7.0, 85 – 100)
Stall	1,,067 – 1,187 (10.9 – 12.1, 155 – 172)	1,420 – 1,675 (14.5 – 17.1, 206 – 243)

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
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 • Reverse 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	3rd
2	3rd
L	3rd
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.

D167G-02

DIAGNOSTIC TROUBLE CODE CHART

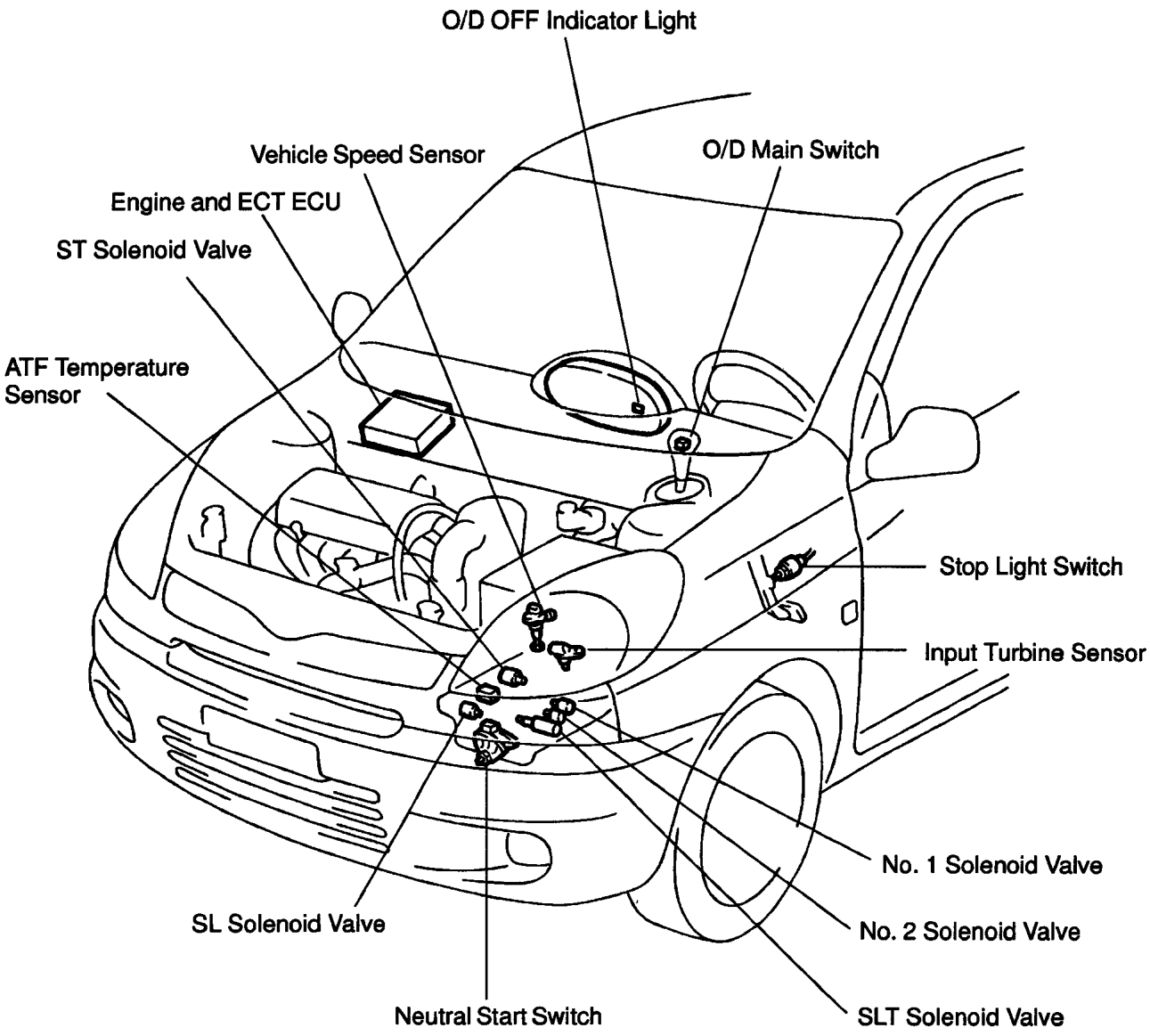
If a DTC is displayed during the DTC check, check the circuit listed in the table below and proceed to the page given.

DTC No. (See Page)	Detection Item	Trouble Area	*1O/D OFF Indicator Light Blink	*2Memory
P0500/42 (DI-22)	Vehicle Speed Sensor Malfunction	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine and ECT ECU • Automatic Transaxle Assembly	X	O
P0710/38 (DI-25)	Transmission Fluid Temperature Sensor Circuit Malfunction (ATF Temperature Sensor)	• Open or short in ATF temperature sensor circuit • ATF temperature sensor • Engine and ECT ECU	X	O
P0753/62 (DI-27)	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	X	O
P0758/63 (DI-27)	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	X	O
P0773/64 (DI-31)	Shift Solenoid E Electrical Malfunction (SL Solenoid Valve)	• Open or short in SL solenoid valve circuit • SL solenoid valve • Engine and ECT ECU	X	O
P1725/37 (DI-34)	Input / Turbine Speed Sensor Circuit Malfunction (Direct Clutch Speed Sensor)	• Open or short in direct clutch speed sensor circuit • Direct clutch speed sensor • Engine and ECT ECU • Automatic Transaxle Assembly	X	O
P1760/77 (DI-36)	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLT Solenoid Valve)	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine and ECT ECU	X	O
P1790/65 (DI-39)	ST Solenoid Valve Circuit Malfunction	• Open or short in ST solenoid valve circuit • ST solenoid valve • Engine and ECT ECU	X	O

*1: "O" mark means O/D OFF indicator light blinks once every 2 seconds.
· "X" mark means O/D OFF indicator light never blinks.
*2: "O" mark means Engine and ECT ECU memorizes the malfunction code if the Engine and ECT ECU detects the DTC detection condition.
HINT:
This DTC may be output when the clutch, brake and gear components etc. inside the automatic transmission are damaged.

D67R-02

PARTS LOCATION



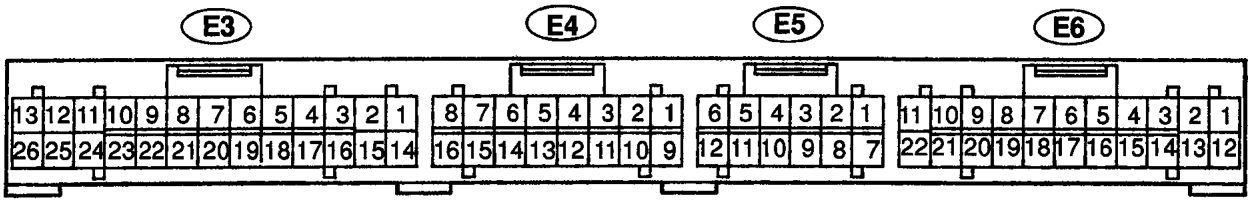
N

D07969

DI67S-02

TERMINALS OF ECU

Engine and ECT ECU



FI6526

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
S1 (E5,3) ↔ E1 (E3,14)	W – G ↔ BR	IG ON	9 – 14
		IG ON and 1st or 2nd gear	9 – 14
		IG ON and 3rd or O/D gear	Below 1.5
S2 (E5,9) ↔ E1 (E3,14)	W – R ↔ BR	IG ON	9 – 14
		IG ON and 1st or O/D gear	9 – 14
		IG ON and 2nd or 3rd gear	Below 1.5
ST (E5,2) ↔ E1 (E3,14)	B – W ↔ BR	IG ON	Below 1.5
		IG ON and R gear	9 – 14
SL (E5,6) ↔E1 (E3,14)	G ↔ W	IG ON	9 – 14
SLT^+ (E5,1) ↔ SLT^- (E5,7)	W – L ↔ W	IG ON	9 – 14
OIL (E5,10) ↔ E2 (E4,9)	Y ↔ BR	IG ON	9 – 14
OD2 (E5,4) ↔ E1 (E3,14)	G – O ↔ BR	IG ON and O/D main switch ON	9 – 14
		IG ON and O/D main switch OFF	Below 1.5
STP (E3,6) ↔ E1 (E3,14)	G – W ↔ BR	IG ON and brake pedal depressed	9 – 14
		IG ON and brake pedal released	Below 1.5
NT^+ (E5,5) ↔ NT^- (E5,11)	R ↔ B	IG ON	Pulse generation
D (E3,5) ↔ E1 (E3,14)	R – Y ↔ BR	IG ON and shift lever D range	9 – 14
		IG ON and shift lever other than D range	Below 1.5
L (E6,19) ↔ E1 (E3,14)	G – B ↔ 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 (E3,14)	Y – G ↔ BR	IG ON and shift lever 2 range	9 – 14
		IG ON and shift lever other than 2 range	Below 1.5
R (E6,17) ↔ E1 (E3,14)	R – W ↔ BR	IG ON and shift lever R range	9 – 14
		IG ON and shift lever other than R range	Below 1.5
SPD (E6,9) ↔ E1 (E3,14)	LG – R ↔ BR	IG ON and rotate driving wheel slowly	Pulse generation
KD (E5,12) ↔ E1 (E3,14)	G – W ↔ BR	IG ON and accelerator pedal is fully depressed	Below 1.5
		IG ON and accelerator pedal is released	9 – 14
NSW (E6, 22) ↔ E1 (E3, 14)	B ↔ BR	IG ON and shift lever P, N range	9 – 14
		IG ON and shift lever other than P, N range	Below 1.5

DI67T-02

PROBLEM SYMPTOMS TABLE

HINT:

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.

The Matrix Chart is divided into 3 chapters.

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)	Engine and ECT ECU	–
No up–shift (3rd → O/D)	1. O/D main switch and O/D OFF indicator light circuit 2. Engine and ECT ECU	DI–51 –
No down–shift (A particular gear, from 1st to 3rd gear, is not down–shifted)	Engine and ECT ECU	–
No down–shift (O/D → 3rd)	1. O/D main switch and O/D OFF indicator light circuit 2. Engine and ECT ECU	DI–51 –
No lock–up	1. Stop light switch circuit 2. Engine and ECT ECU	DI–43 –
No lock–up OFF	Engine and ECT ECU	–
Shift point too high or too low	Engine and ECT ECU	–
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–51 –
Up–shift to O/D from 3rd while engine is cold	Engine and ECT ECU	–
No kick–down	1. Kick–down switch circuit 2. Engine and ECT ECU	DI–55 –
Engine stalls when starting off or stopping	Engine and ECT ECU	–

CHAPTER 2: ON–VEHICLE REPAIR
(★: U440E, U441E AUTOMATIC TRANSAXLE Repair Manual Pub. No. RM689E)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. Manual valve 2. Primary regulator valve 3. Secondary regulator valve 4. Off–vehicle repair matrix chart	★ ★ ★ –
Vehicle does not move in R range	1. Manual valve 2. 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. Lock–up control valve 3. Off–vehicle repair matrix chart	★ ★ –
Harsh engagement (N → D)	1. C_1 accumulator 2. C–1 orifice control valve 3. Clutch apply control valve 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (N → R)	1. C_3 accumulator 2. Reverse control valve 3. Off–vehicle repair matrix chart	★ ★ –
Harsh engagement (Lock–up)	1. Lock–up relay valve 2. Lock–up control valve 3. Off–vehicle repair matrix chart	★ ★ –
Harsh engagement (1st → 2nd)	B_2 accumulator	★
Harsh engagement (2nd → 3rd)	C_2 accumulator	★
Harsh engagement (3rd → O/D)	B_1 accumulator	★
Slip or shudder (Forward and reverse)	1. Oil strainer 2. Off–vehicle repair matrix chart	AX–6 –
No engine braking (1st: L range)	1. Reverse control valve 2. Off–vehicle repair matrix chart	★ –
No engine braking (2nd: 2 range)	3–4 shift valve	★
No kick–down	1. 1–2 shift valve 2. 2–3 shift valve 3. 3–4 shift valve	★ ★ ★

CHAPTER 3: OFF–VEHICLE REPAIR
(★: U440E, U441E AUTOMATIC TRANSAXLE Repair Manual Pub. No. RM689E)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. Planetary gear unit 2. Forward clutch 3. One–way clutch No. 2 4. Reverse Clutch 5. 1st and reverse brake	★ ★ ★ ★ ★
Vehicle does not move in R range	1. Planetary gear unit 2. Reverse Clutch 3. 1st and reverse brake	★ ★ ★
No up–shift (1st → 2nd)	1. 2nd brake 2. One–way clutch No. 1	★ ★
No up–shift (2nd → 3rd)	Direct clutch	★
No up–shift (3rd → O/D)	O/D and 2nd brake	★
No lock–up or No lock–up off	Torque converter	AX–31
Harsh engagement (N → D)	1. Forward clutch 2. One–way clutch No. 2	★ ★
Harsh engagement (N → R)	1. Reverse clutch 2. 1st and reverse brake	★ ★
Harsh engagement (Lock–up)	Torque converter	AX–31
Harsh engagement (1st → 2nd)	1. 2nd brake 2. One–way clutch No. 1	★ ★
Harsh engagement (2nd → 3rd)	Direct clutch	★
Harsh engagement (3rd → O/D)	O/D and 2nd brake	★
Slip or shudder (Forward range)	1. Torque converter 2. Forward clutch 3. Direct clutch 4. O/D and 2nd brake 5. 2nd brake 6. One–way clutch No. 1 7. One–way clutch No. 2	AX–31 ★ ★ ★ ★ ★ ★
Slip or shudder (Reverse range)	1. Reverse clutch 2. 1st and reverse brake	★ ★
Slip or shudder (1st)	One–way clutch No. 2	★
Slip or shudder (2nd)	1. 2nd brake 2. One–way clutch No. 1	★ ★
Slip or shudder (3rd)	Direct clutch	★
Slip or shudder (O/D)	O/D and 2nd brake	★
No engine braking (1st: L range)	1st and reverse brake	★
No engine braking (2nd: 2 range)	O/D and 2nd brake	★
Poor acceleration (All range)	Torque converter	AX–31
Large shift shock or engine stalls when starting off or stopping	Torque converter	AX–31

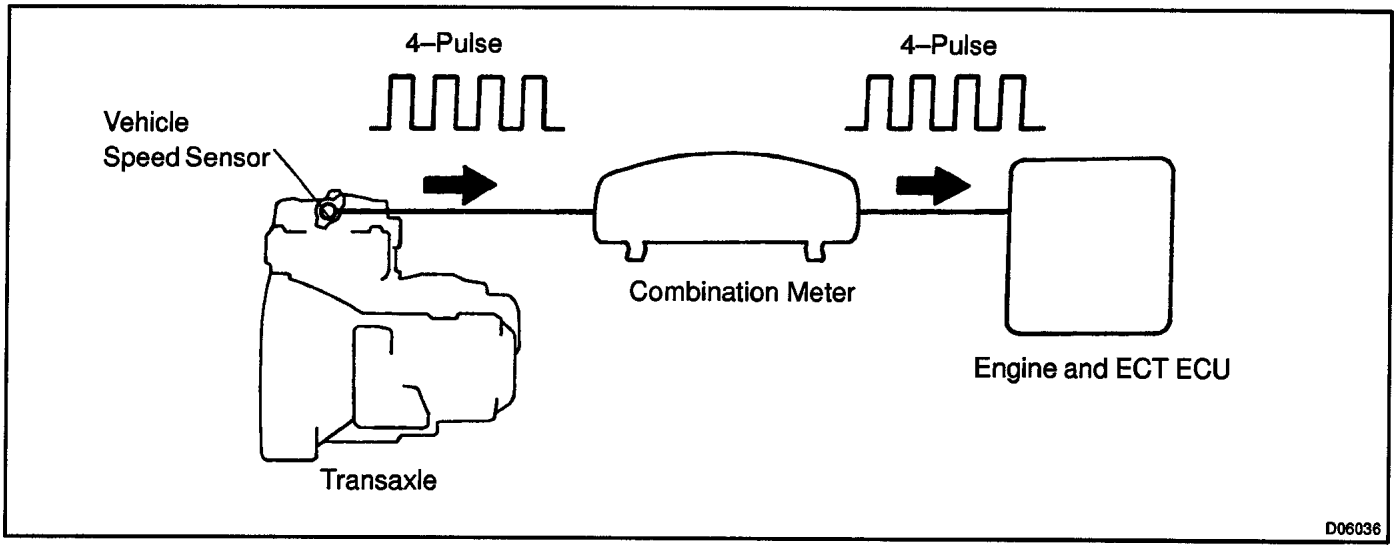
CIRCUIT INSPECTION

DI67U-02

DTC	P0500/42	Speed Sensor Malfunction

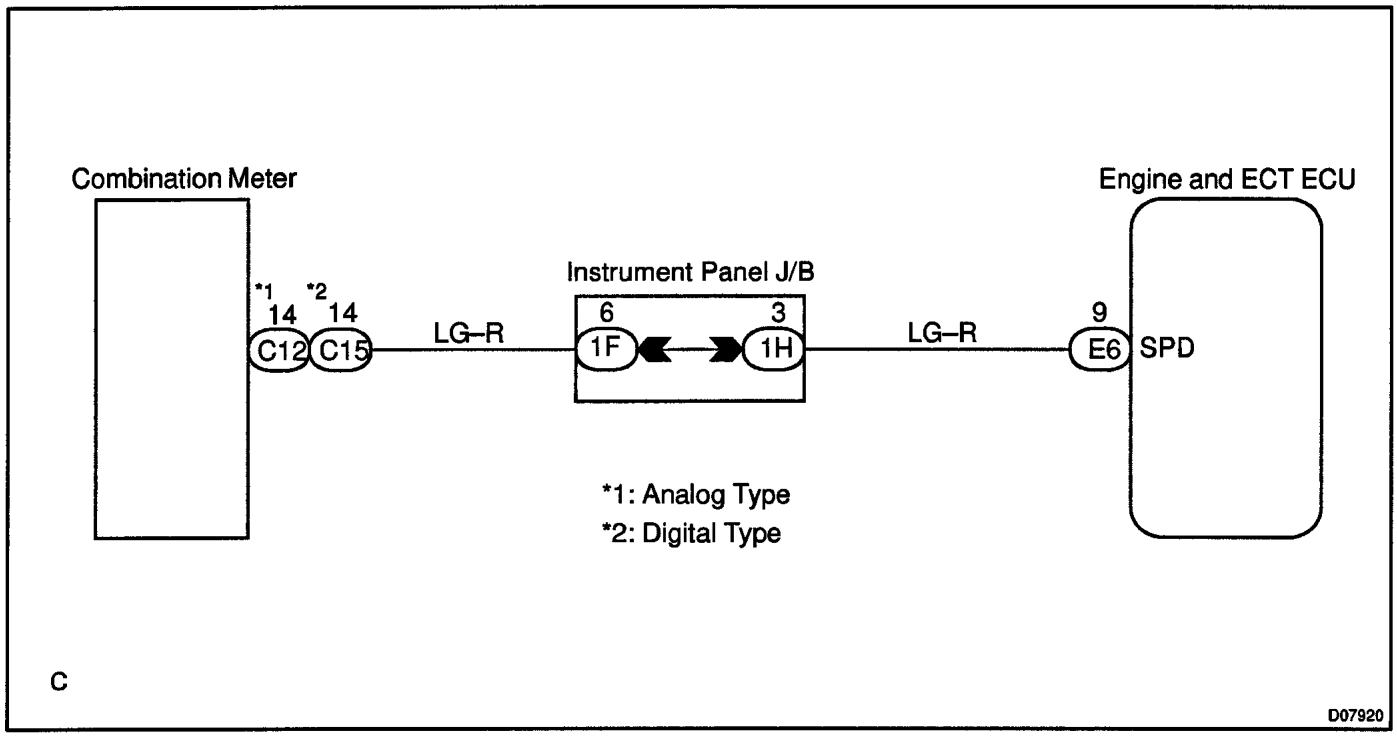
CIRCUIT DESCRIPTION

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 wave form by the wave form shaping circuit inside the combination meter, it is then transmitted to the Engine and ECT ECU.



DTC No.	DTC Detecting Condition	Trouble Area
P0500/42	No vehicle speed sensor signal to Engine and ECT ECU under conditions (1) and (2); (2–trip detection logic) 1. Neutral start switch is OFF 2. Vehicle is being driven	• Combination meter • Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Engine and ECT ECU • Automatic transaxle (clutch, brake or gear etc,)
	Clutch or brake slips or gear is broken	

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.

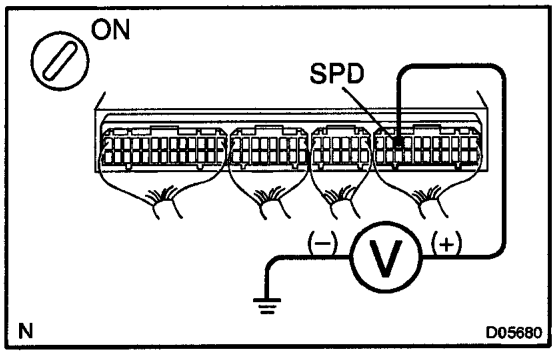
HINT:

The vehicle speed sensor is operating normally if the speedometer display is normal.

NG → **Check speedometer (See page BE–2).**

OK

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



PREPARATION:

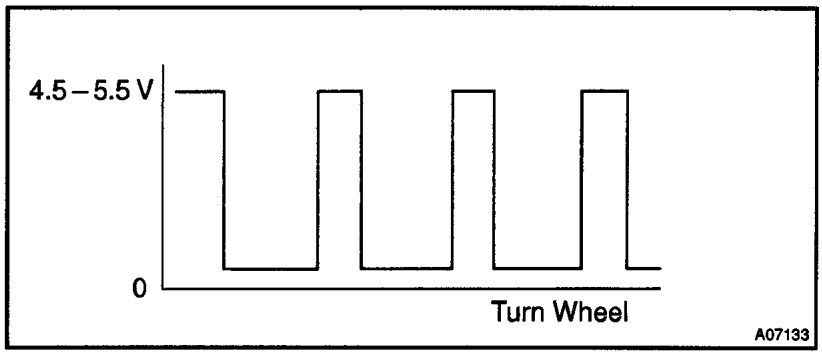
(a) Shift the shift lever to neutral.
(b) Lift up the vehicle.
(c) Turn the ignition switch ON.

CHECK:

Measure voltage between terminal SPD of the 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–19).

NG → **Replace Engine and ECT ECU.**

OK →

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

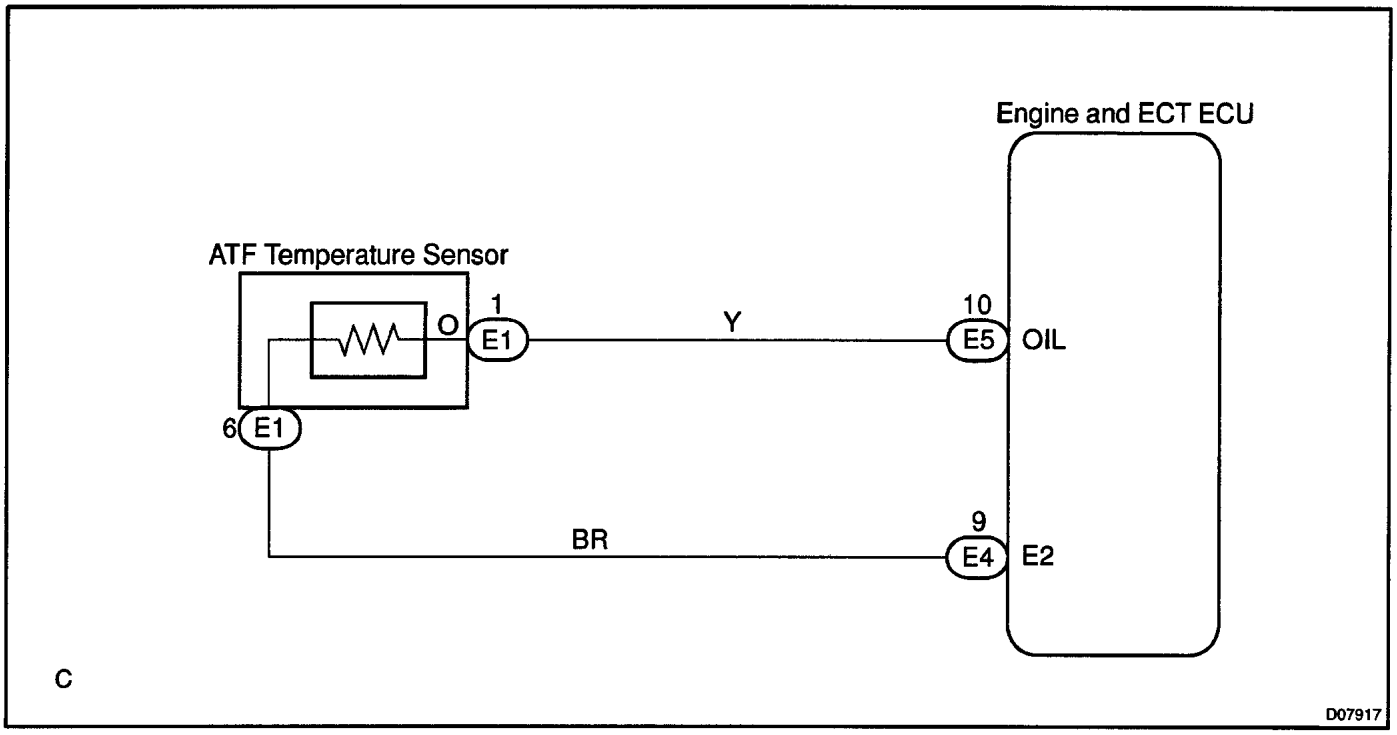
DTC	P0710/38	Transmission Fluid Temperature Sensor Malfunction (ATF Temperature Sensor)

CIRCUIT DESCRIPTION

The ATF temperature sensor converts fluid temperature into a resistance value which is input into the Engine and ECT ECU.

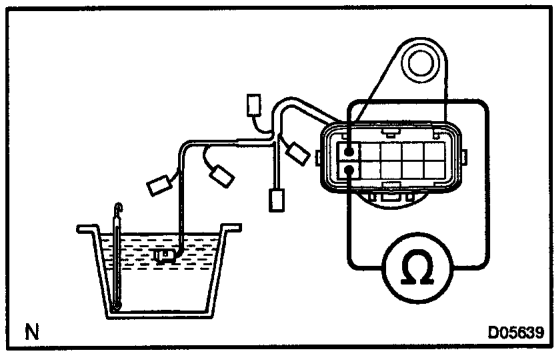
DTC No.	DTC Detecting Condition	Trouble Area
P0710/38	Either (a) or (b) is detected for 0.5 sec. or more. (2–trip detection logic) (a) Temperature sensor resistance is less than 79 Ω (b) After the engine has been operating for 15 minutes or more, the resistance at the temp. sensor is more than 156 kΩ	• Open or short in ATF temperature sensor • ATF temperature sensor • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check ATF temperature sensor.



PREPARATION:
Remove the solenoid wiring (See page AX–6).
CHECK:
Measure resistance between terminals of ATF temperature sensor at 25 °C (77 °F) and 110 °C (230 °F).
OK:
Resistance (Approx.):
25 °C (77 °F): 3.5 kΩ
110 °C (230 °F): 247 Ω

NG → **Replace the solenoid wiring.**

OK

2	Check harness and connector between solenoid wiring and Engine and ECT ECU (See page IN–19).

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

OK

Check and replace the Engine and ECT ECU (See page IN–29).

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 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).

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	ON	1st	X	ON	3rd	ON	X	1st	O/D
	ON	OFF	2nd	X	OFF	3rd	OFF	X	O/D	O/D
	OFF	OFF	3rd	X	OFF	3rd	OFF	X	O/D	O/D
	OFF	ON	O/D	X	ON	O/D	OFF	X	O/D	O/D
2	ON	ON	1st	X	ON	3rd	ON	X	1st	3rd
	ON	OFF	2nd	X	OFF	3rd	OFF	X	3rd	3rd
	OFF	OFF	3rd	X	OFF	3rd	OFF	X	3rd	3rd
L	ON	ON	1st	X	ON	1st	ON	X	1st	1st
	ON	OFF	2nd	X	OFF	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.

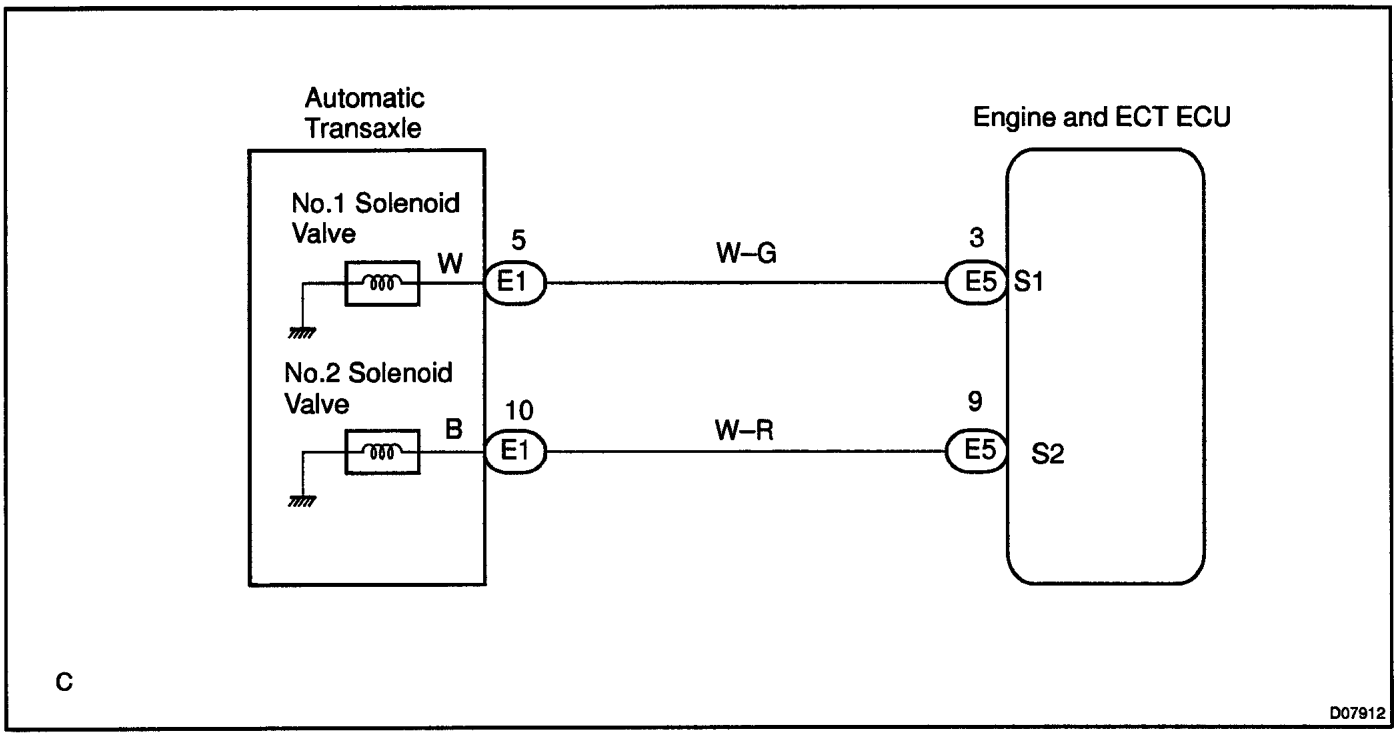
DTC No.	DTC Detecting Condition	Trouble Area
P0753/62 P0758/63	The Engine and ECT ECU checks for an open or short circuit in the No. 1 or No. 2 solenoid valve circuit when it changes. The Engine and ECT ECU records DTC P0753/62 or P0758/63 if condition (a) or (b) is detected once, but it does not blink 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.

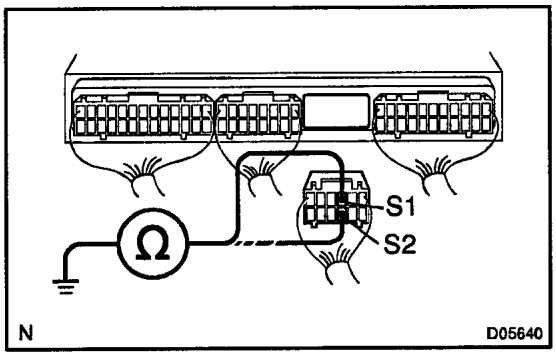
Manual shifting as shown in the above table must be done (In the case of a short circuit, the Engine and ECT ECU stops sending current to the short circuited solenoid).

WIRING DIAGRAM



INSPECTION PROCEDURE

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

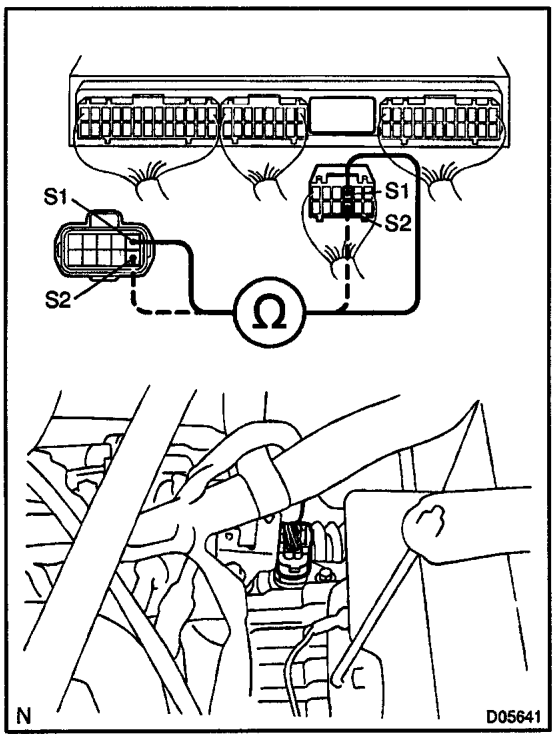


PREPARATION:
Disconnect the connector from Engine and ECT ECU.
CHECK:
Measure resistance between terminal S1 or S2 of Engine and ECT ECU and body ground.
OK:
Resistance: 11 – 15 Ω at 20 °C (68 °F)

OK → **Check and replace the Engine and ECT ECU (See page IN–29).**

NG

2	Measure harness and connector between Engine and ECT ECU and automatic transmission solenoid connector.



PREPARATION:

Disconnect the solenoid connector from the automatic transaxle.

CHECK:

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

OK:

Resistance: 0 Ω

NG → **Repair or replace the harness or connector (See page IN–29).**

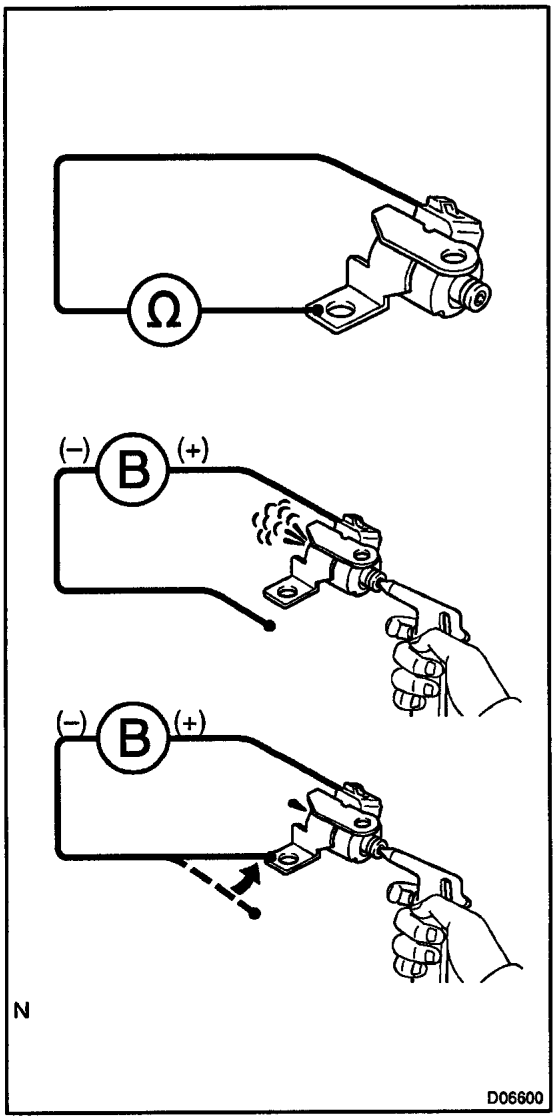
OK

3	Check connection of the connectors.

NG → **Connect the connectors correctly.**

OK

4	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:

Measure resistance between solenoid connector and body ground.

OK:

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

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

OK:

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

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

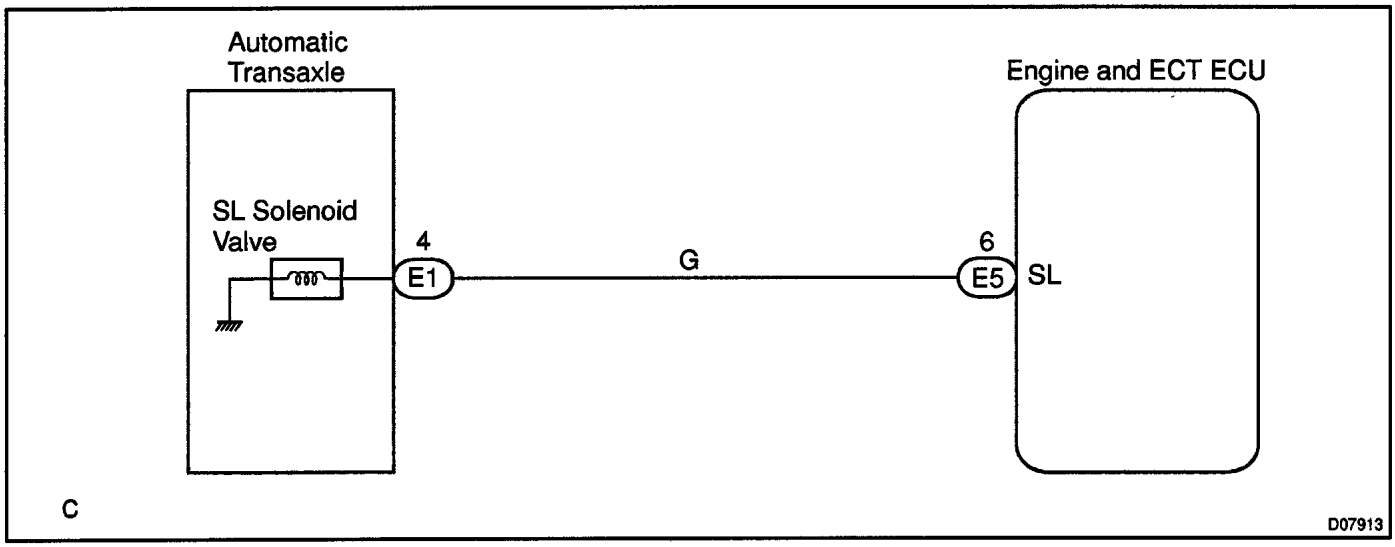
The SL solenoid valve is turned ON and OFF by signals from the Engine and ECT ECU to control the hydraulic pressure acting on the lock–up relay valve, which then controls operation of the lock–up clutch.

DTC No.	DTC Detecting Condition	Trouble Area
P0773/64	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 and ECT ECU

Fail safe function

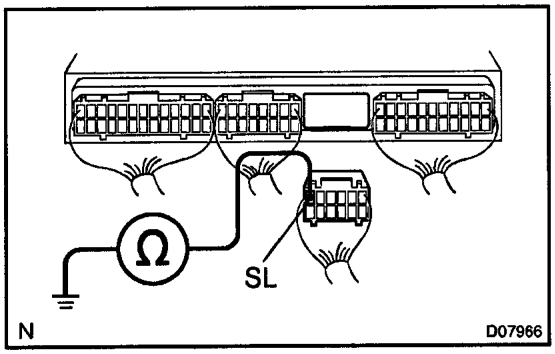
If the Engine and ECT ECU detects a malfunction, it turns the SL solenoid valve OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

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

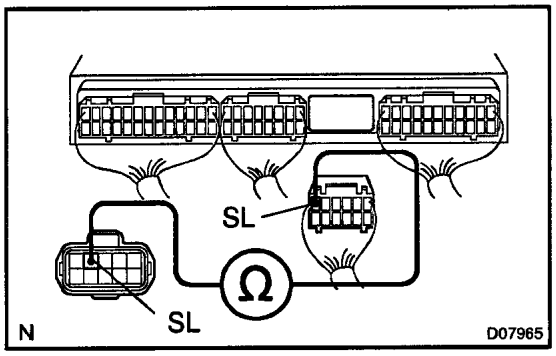


PREPARATION:
Disconnect the connector from Engine and ECT ECU.
CHECK:
Measure resistance between terminal SL of Engine and ECT ECU and body ground.
OK:
Resistance: 11 – 15 Ω at 20 °C (68 °F)

OK	**Check and replace the Engine and ECT ECU (See page IN–29).**

NG

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

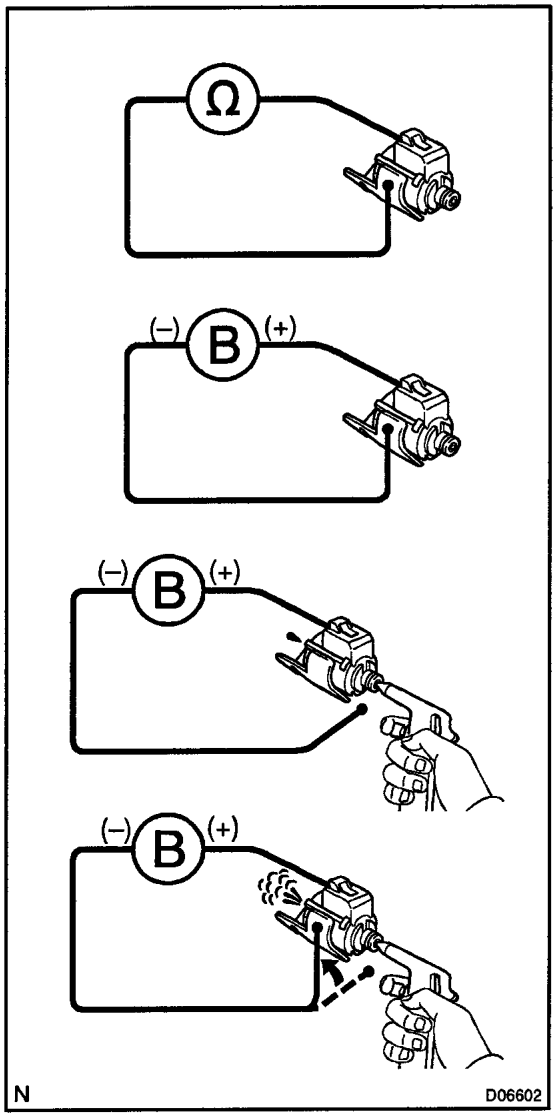


PREPARATION:
Disconnect the solenoid connector from the transmission.
CHECK:
Check the harness between terminal SL of Engine and ECT ECU and terminal SL of transmission solenoid connector.
OK:
There is no open or short circuit.

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.

D67V–02

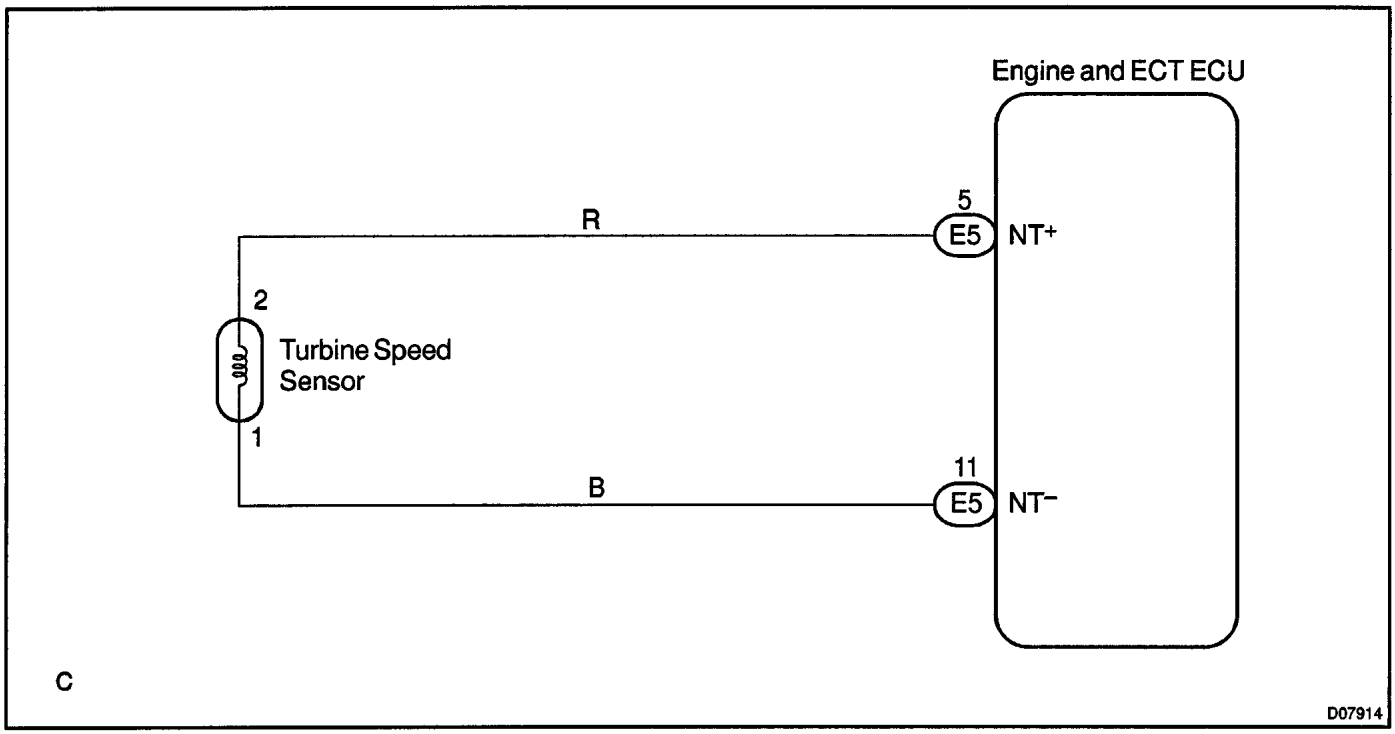
DTC	P1725/37	NT Revolution Sensor Circuit Malfunction (Input Turbine Speed Sensor)

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.

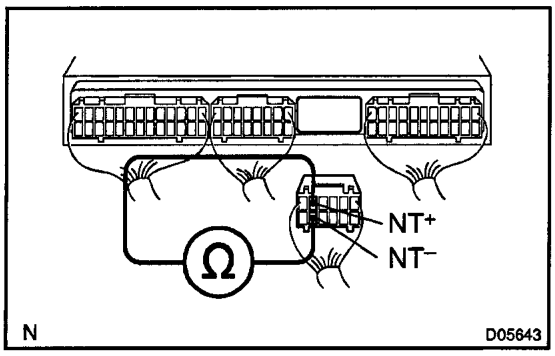
DTC No.	DTC Detecting Condition	Trouble Area
P1725/37	The Engine and ECT ECU detects conditions (a), (b), (c) and (d) continuity for 5 secs or more. (1–trip detection logic) (a) Vehicle speed : 50 km/h (20 mph) or more (b) 2nd, 3rd or O/D gear (c) Solenoid valves and neutral start switch are normal (d) NT < 300 rpm	• 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.

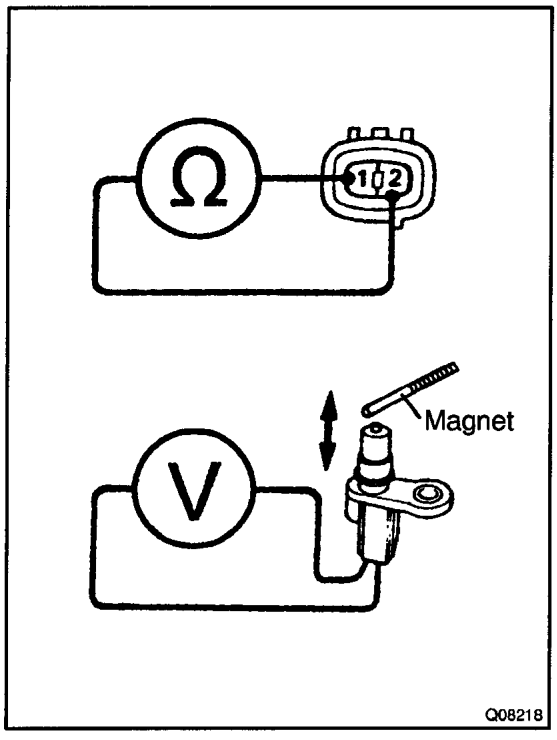


PREPARATION:
Disconnect the connector from Engine and ECT ECU.
CHECK:
Check resistance between terminals NT^+ and NT^- of Engine and ECT ECU.
OK:
Resistance: 620 ± 60 Ω

OK	Check and replace the Engine and ECT ECU.

NG

2	Check NT revolution sensor.



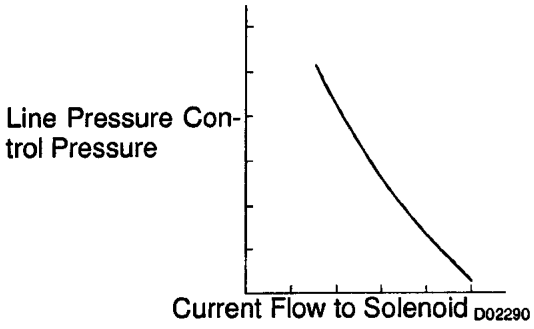
PREPARATION:
Remove the NT revolution speed sensor from transaxle.
CHECK:
(a) Measure resistance between terminals 1 and 2 of speed sensor.
(b) Check voltage between terminals 1 and 2 of the speed sensor when a magnet is put close to the front end of the speed sensor then taken away quickly.
OK:
(a) Resistance: 620 ± 60 Ω at 20 °C (68 °F)
(b) Voltage is generated intermittently.
HINT:
The generated voltage is extremely low.

NG	Replace the NT input shaft speed sensor.

OK

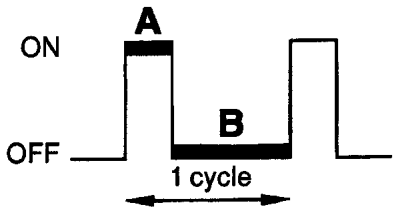
Check and repair the harness and connector between Engine and ECT ECU and Turbine speed sensor (See page IN–29).

DTC	P1760/77	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLT solenoid valve)



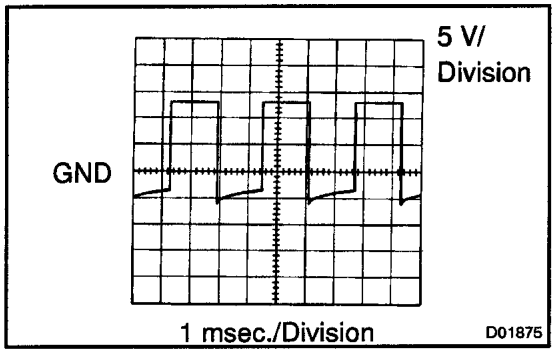
CIRCUIT DESCRIPTION

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 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



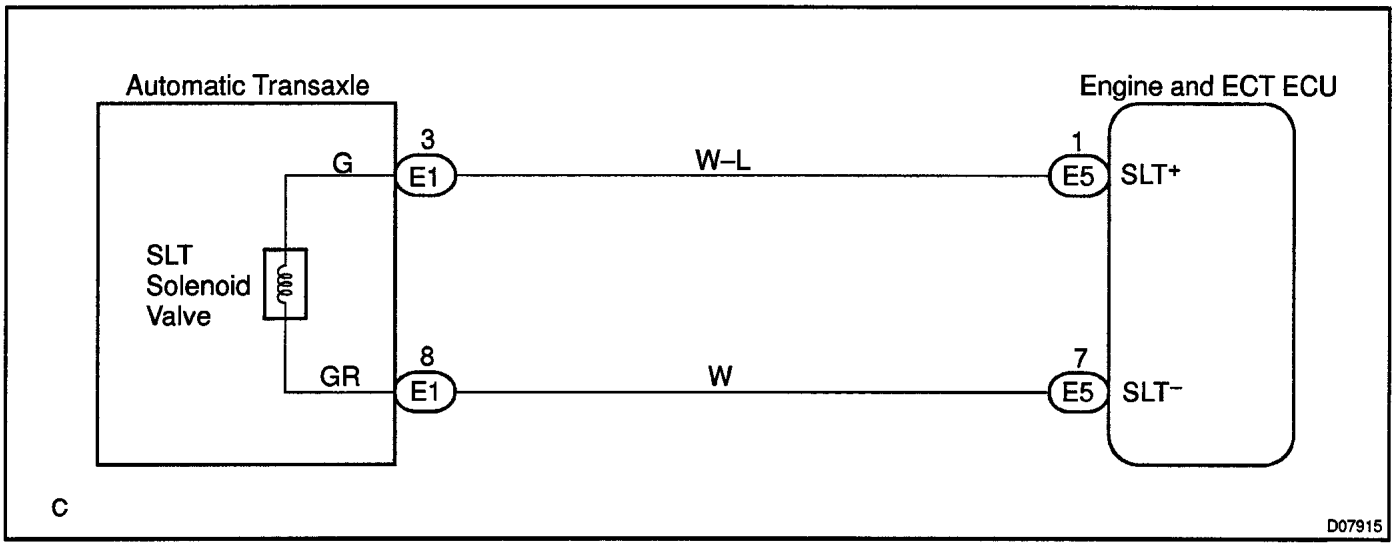
$$\text{Duty Ratio} = \frac{A}{A+B} \times 100\ (\%)$$

DTC No.	DTC Detecting Condition	Trouble Area
P1760/77	(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



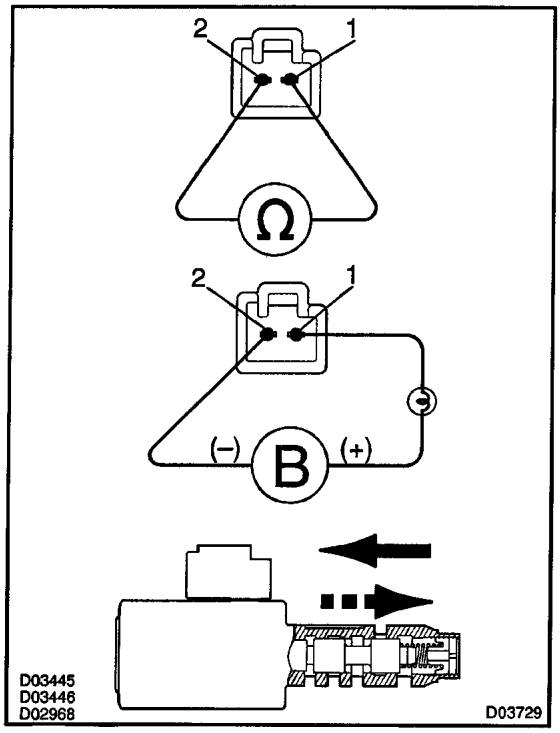
HINT:
Refer to the chart for the wave form between terminals SLT+ and SLT⁻ during engine idling.

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 5 – 6W bulb to terminal 1 of solenoid connector and negative (–) lead to terminal 2, then check the movement of the valve.

HINT:

The solenoid valve operates with the current of 0.9 – 1.0 A.

OK:

When battery positive voltage is applied.	Valve moves in ■■► direction in illustration.
When battery positive voltage is cut off.	Valve moves in ◄■■ direction in illustration.

NG → **Replace SLT solenoid valve.**

OK ↓

2	Check harness and connector between SLT solenoid valve and Engine and ECT ECU (See page IN–29).

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

OK ↓

Replace Engine and ECT ECU (See page IN–29).

D687X-02

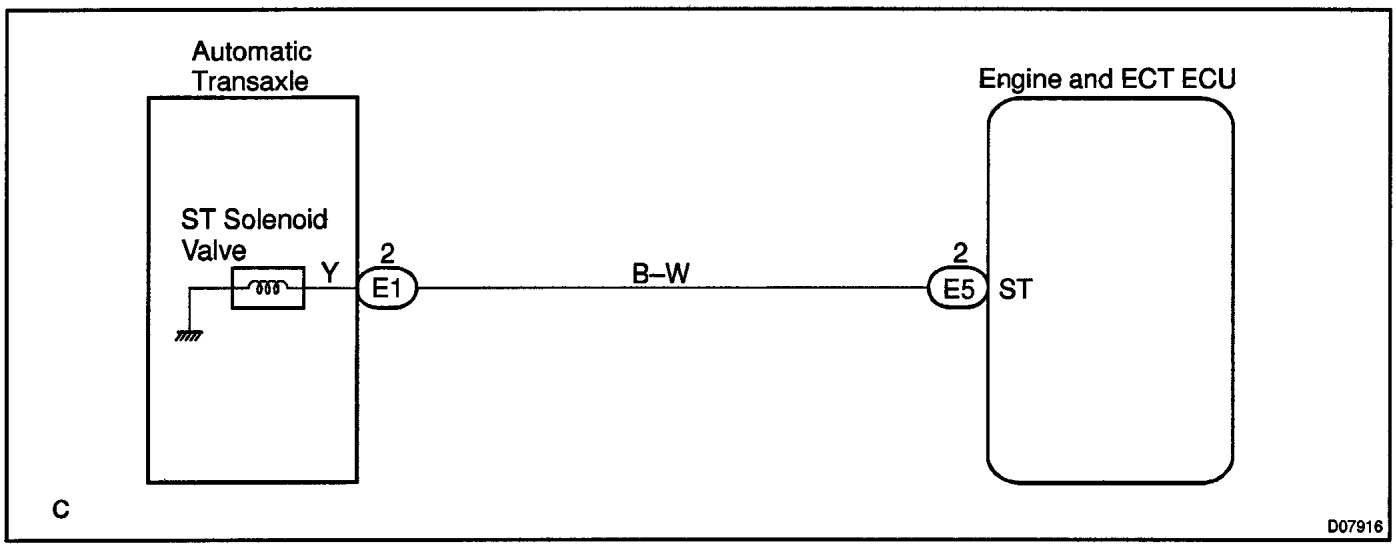
DTC	P1790/65	ST Solenoid Valve Circuit Malfunction

CIRCUIT DESCRIPTION

ST solenoid valve is switched ON–OFF by a signal from Engine and ECT ECU so that let in or out timing of 2nd brake is adjusted by operating orifice control valve. Therefore, ST solenoid operates when letting in or out 2nd brake.
If it is broken, the shift shock becomes big.

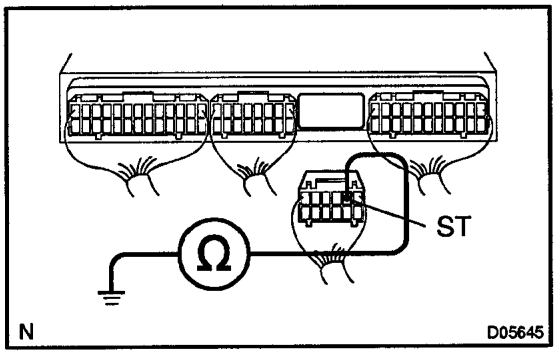
DTC No.	DTC Detecting Condition	Trouble Area
P1790/65	ECU memorizes DTC P1790/65 if (a) or (b) condition below is detected once or more, but ECU does not start O/D OFF indicator light blinking. (a) Solenoid resistance is 30 Ω or lower (short circuit) when solenoid energized. (b) Solenoid resistance is 100 kΩ or higher (open circuit) when solenoid is not energized.	• Open or short in ST solenoid valve circuit • ST solenoid valve • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

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

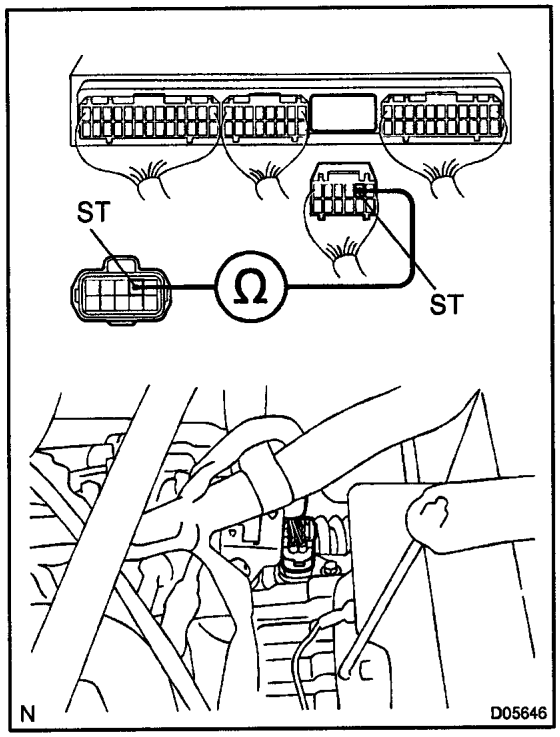


PREPARATION:
Disconnect the connector from Engine and ECT ECU.
CHECK:
Measure resistance between terminal ST of Engine and ECT ECU and body ground.
OK:
Resistance: 11 – 15 Ω at 20 °C (68 °F)

OK	**Check and replace the Engine and ECT ECU (See page IN–29).**

NG

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



PREPARATION:
Disconnect the solenoid connector from the automatic transaxle.
CHECK:
Measure the harness and connector between terminal ST of Engine and ECT ECU and terminal ST of solenoid connector.
OK:
Resistance: 0 Ω

NG → Repair or replace the harness or connector.

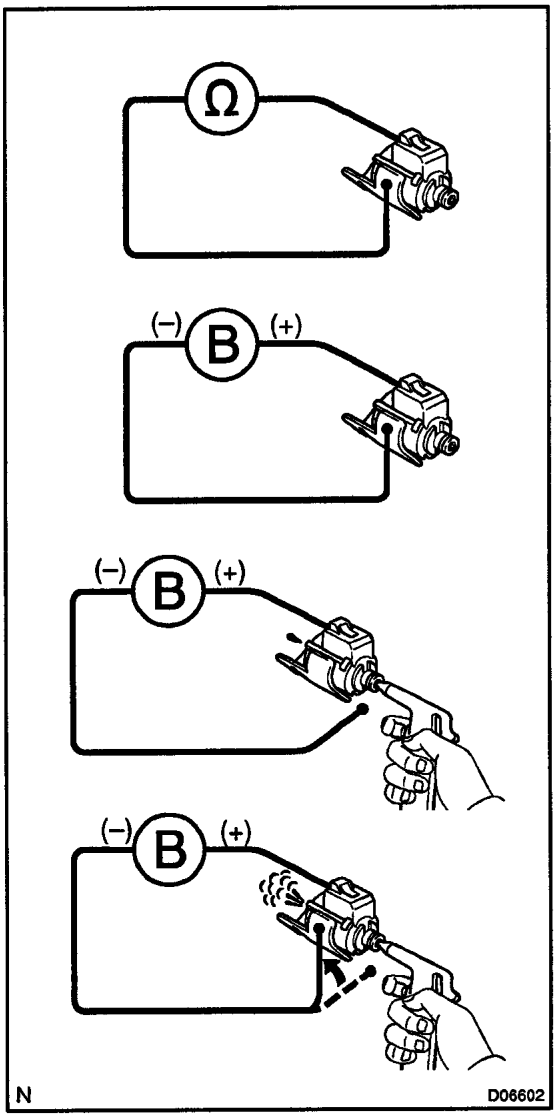
OK

3	Check connection of the connectors.

NG → Connect the connectors correctly.

OK

4	Check ST solenoid valve.



Electrical check:

PREPARATION:

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

CHECK:

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

CHECK:

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

OK:

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

NG → **Replace the solenoid valve.**

OK

Repair or replace the solenoid wire.

DI2LN-04

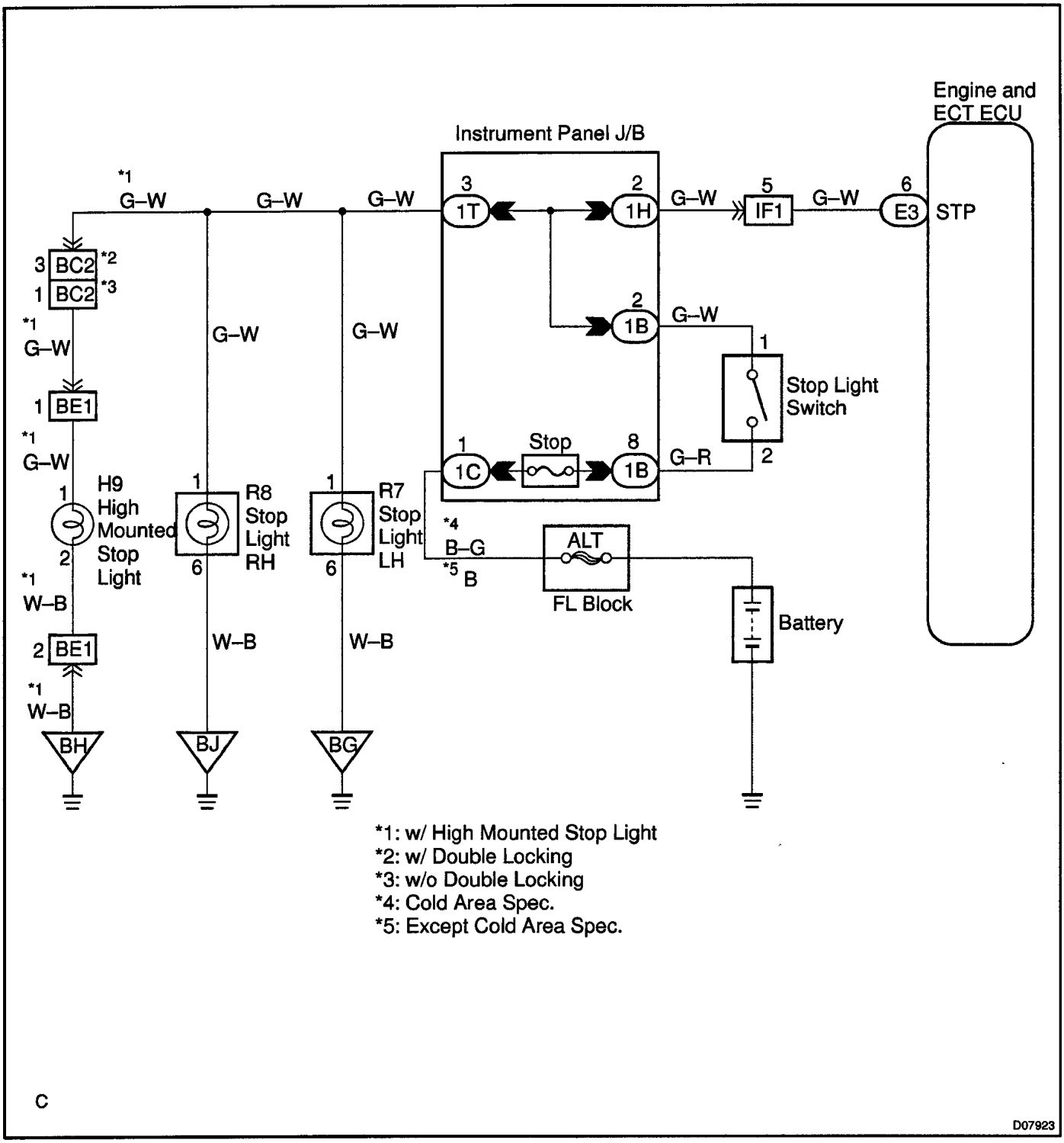
Stop Light Switch Signal Circuit

CIRCUIT DESCRIPTION

The purpose of this circuit is to prevent the engine from stalling, while driving in lock–up condition, when brakes are suddenly applied.

When the brake pedal is depressed, this switch sends a signal to Engine and ECT ECU. Then the Engine and ECT ECU cancels operation of the lock–up clutch while braking is in progress.

WIRING DIAGRAM



*1: w/ High Mounted Stop Light
*2: w/ Double Locking
*3: w/o Double Locking
*4: Cold Area Spec.
*5: Except Cold Area Spec.

INSPECTION PROCEDURE

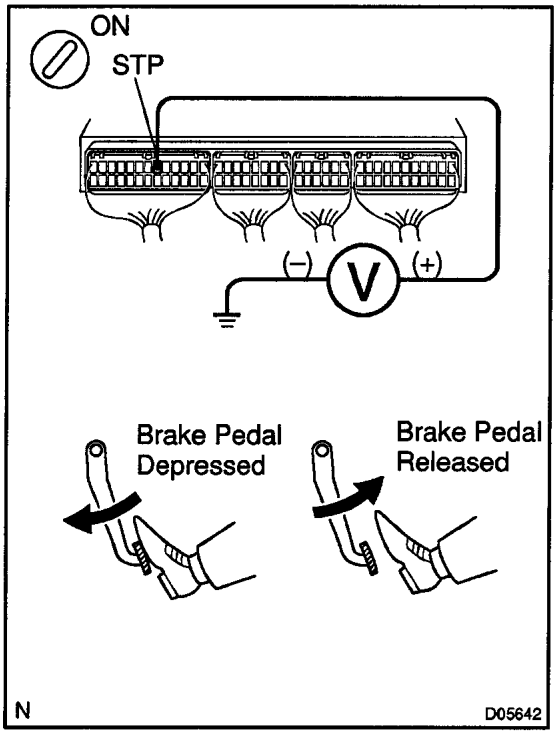
1	Check operation of stop light.

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 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–29).

NG → Repair or replace harness or connector.

OK →

Check and replace Engine and ECT ECU (See page IN–29).

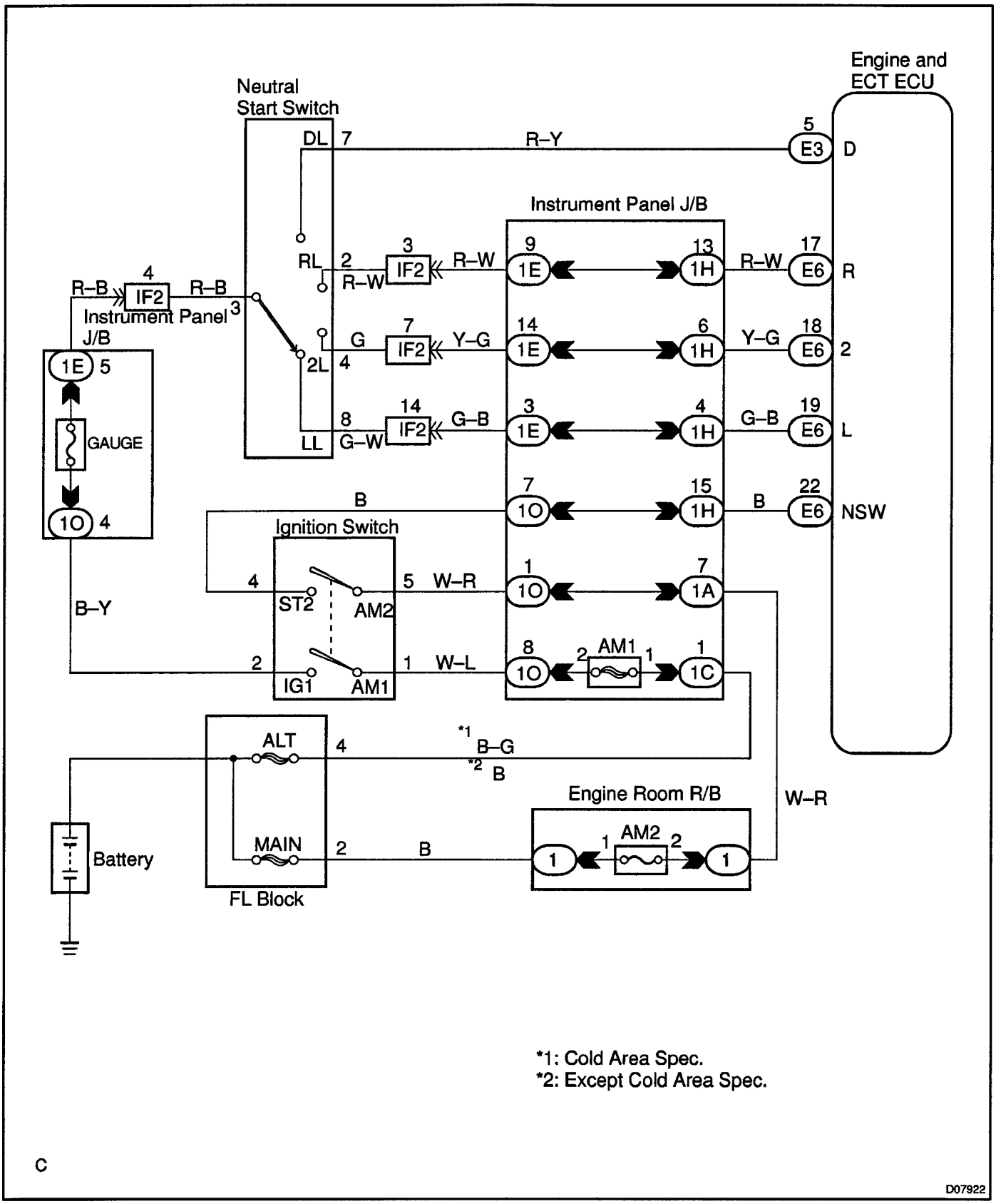
DI0CZ-06

Neutral Start Switch Malfunction

CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever range 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.

WIRING DIAGRAM



INSPECTION PROCEDURE

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

When using hand–held tester:

PREPARATION:

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

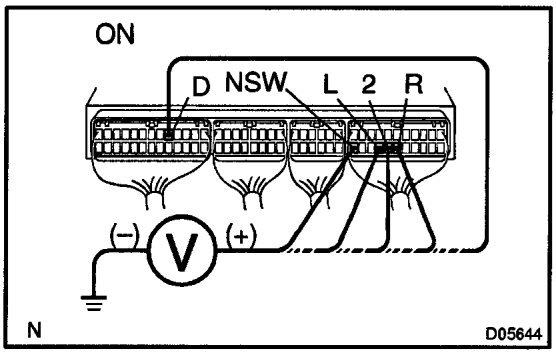
(b) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Shift lever into 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
2	2ND OFF → ON
L	LOW OFF → ON
R	REVERSE OFF → ON
P, N	NSW 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 and ECT ECU and body ground when the shift lever is shifted to the following ranges.

OK:

Range	Tester connection	Specified value
P, N	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

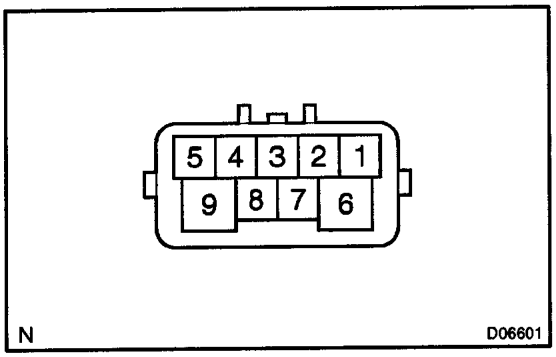
HINT:

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

OK → **Proceed to next circuit inspection shown on problem symptoms table (See page DI–19).**

NG

2	Check neutral start switch.



PREPARATION:
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	1 – 3	6 – 9
R	2 – 3	–
N	3 – 5	6 – 9
D	3 – 7	–
2	3 – 4	–
L	3 – 8	–

OK:
There is continuity.

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

OK

3	Check harness and connector between battery and neutral start switch, neutral start switch and Engine and ECT ECU (See page IN-29).

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

OK

Check and replace the Engine and ECT ECU (See page IN-29).

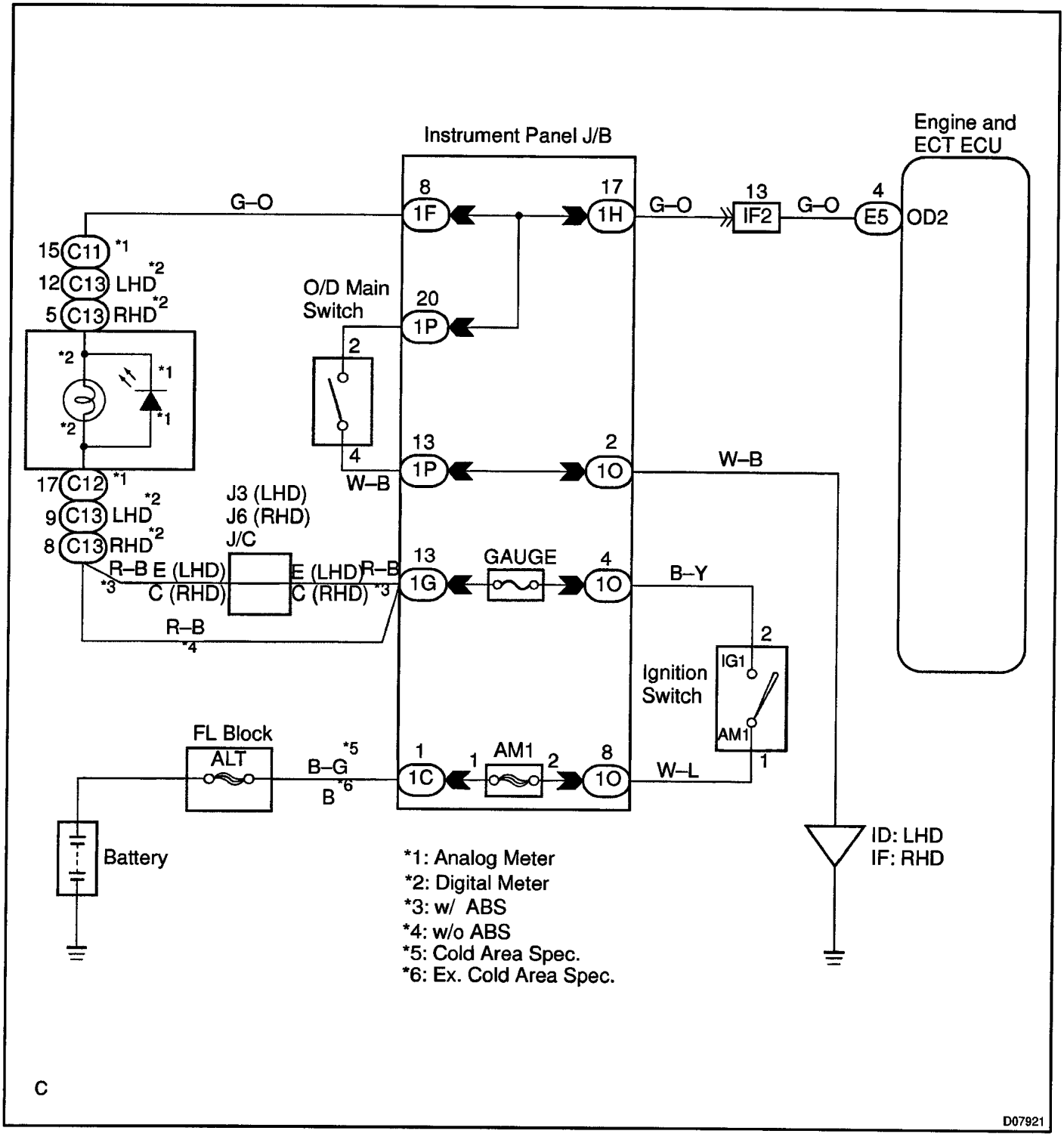
DI67Y-02

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 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



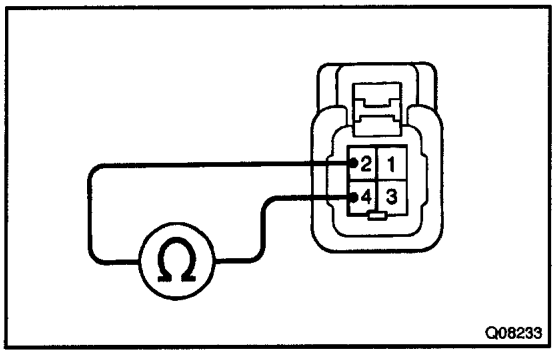
C

D07921

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–2).**

NG → **Replace the combination meter.**

OK

3	Check OVRDRIVE CUT SW2 signal.

When using hand–held tester:

PREPARATION:

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

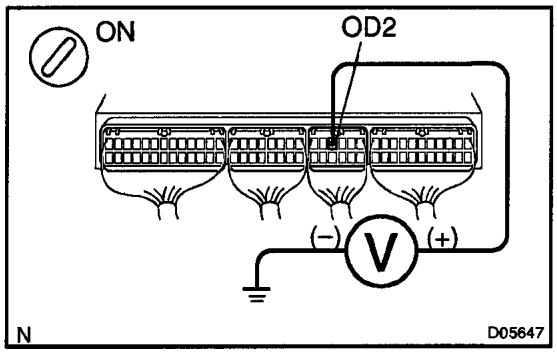
(b) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the 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 and ECT ECU and body ground.

OK:

O/D main switch condition	Voltage
O/D ON (Pushed in)	9.0 – 14 V
O/D (Pushed once again)	Below 1.5 V

OK → **Proceed to next circuit inspection shown in symptom problems table (See page DI–19).**

NG

4	Check harness and connector between O/D OFF indicator light and Engine and ECT ECU (See page IN–29).

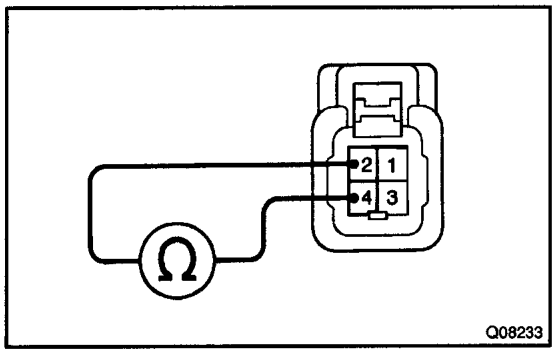
NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine and ECT ECU (See page IN–29).

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 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 and ECT ECU (See page IN–29).**

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

OK

Check and replace the Engine and ECT ECU (See page IN–29).

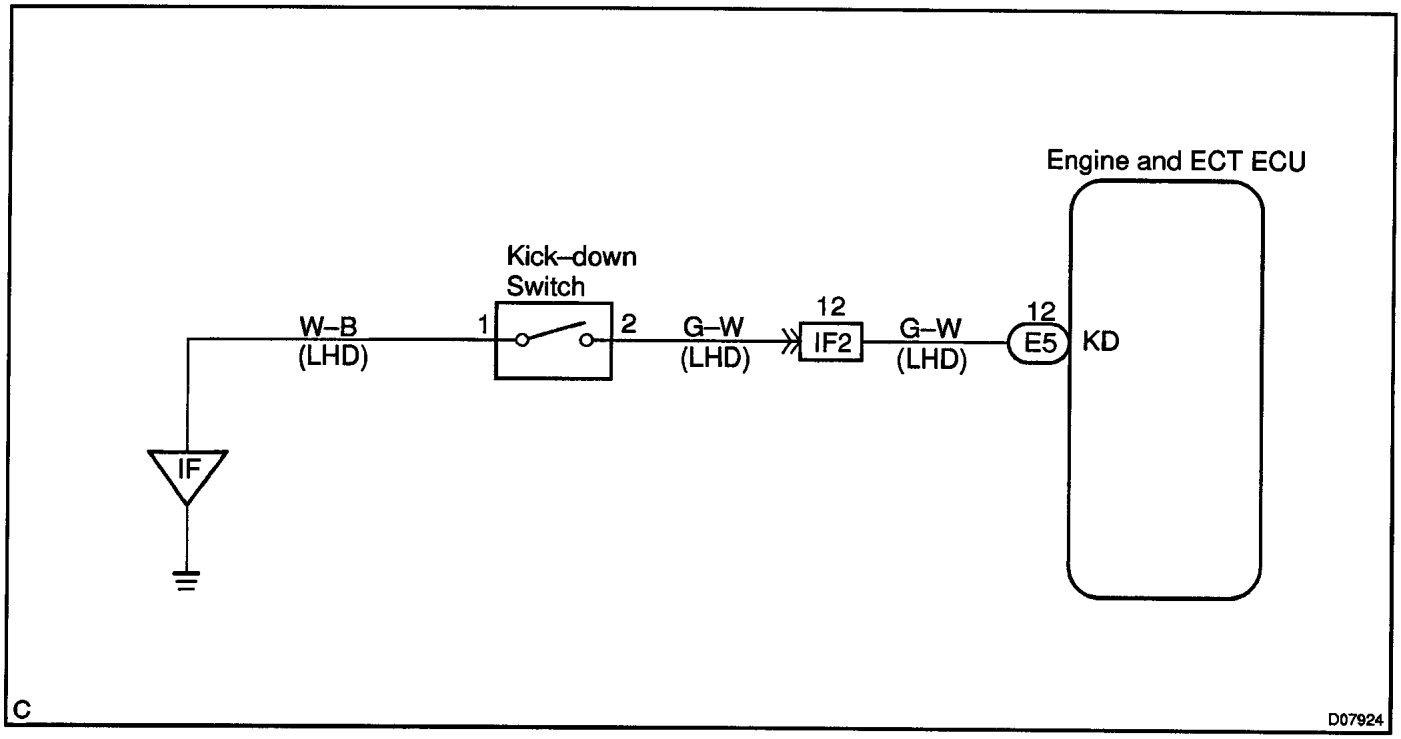
DI333-02

Kick–down Switch Circuit

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:

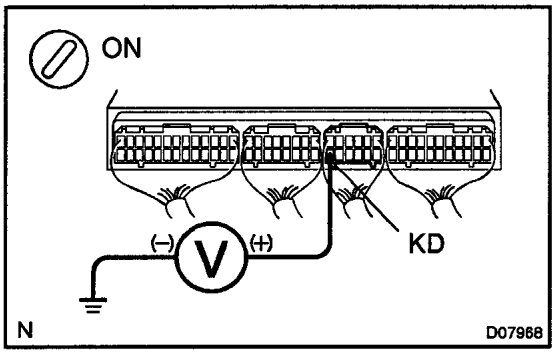
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

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.

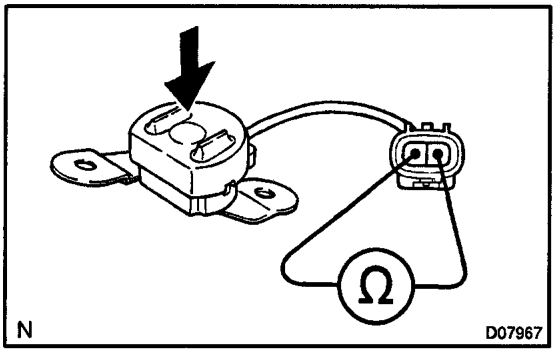
OK:

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–19).**

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–29).

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

OK

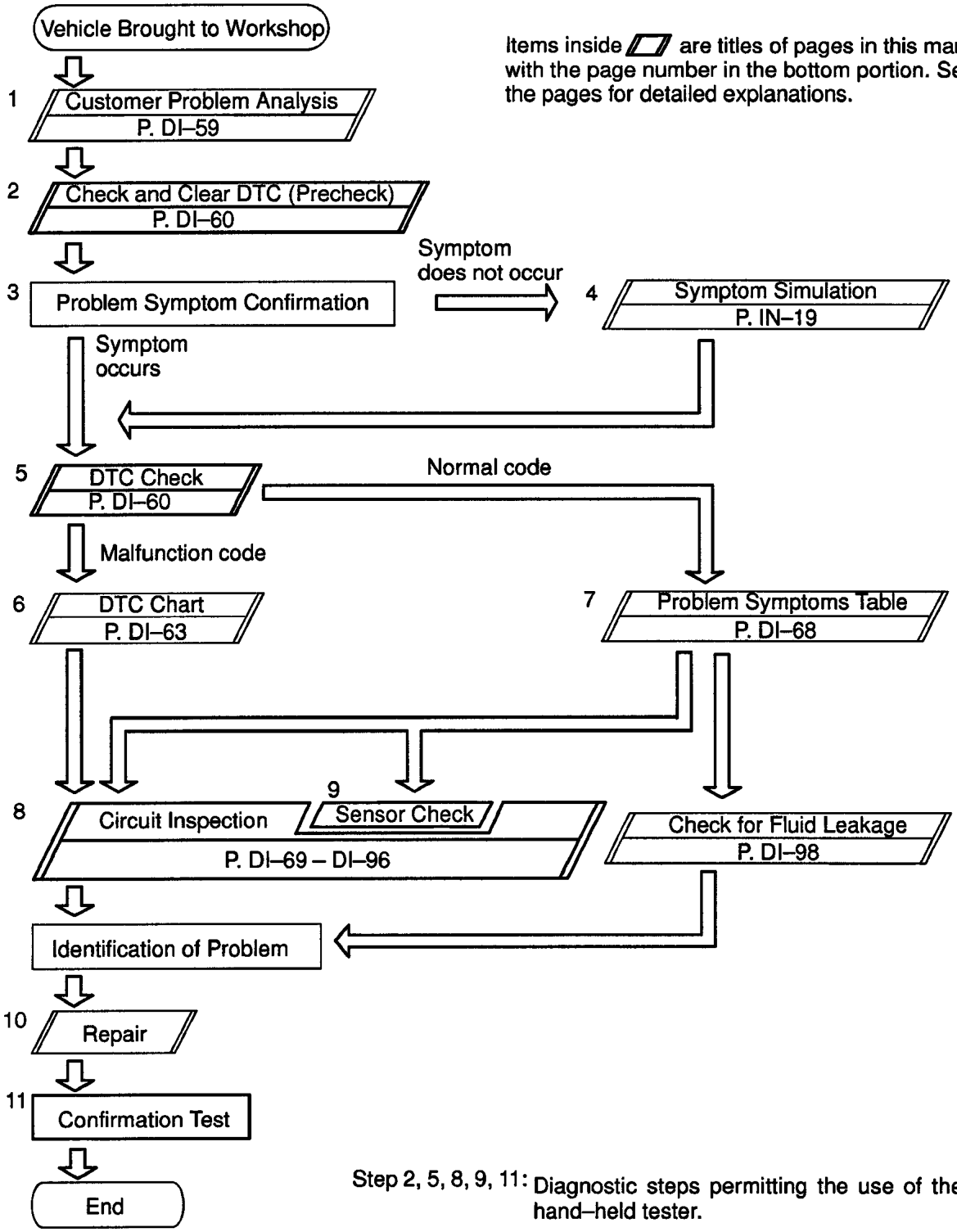
Check and replace Engine and ECT ECU (See page IN–29).

ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)

HOW TO PROCEED WITH TROUBLESHOOTING

DI6SE–01

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.

Fail safe function:
In the event of a malfunction in the ABS system, the ABS ECU turns on the ABS warning light and prohibits the ABS control. In the case of the malfunction that the EBD control can not be carried out, the ECU also turns on the brake warning light and prohibits the EBD control.

DI6SF-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	☐ Continuous ☐ Intermittent (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)

DI6SG–01

PRE–CHECK

1. DIAGNOSIS SYSTEM

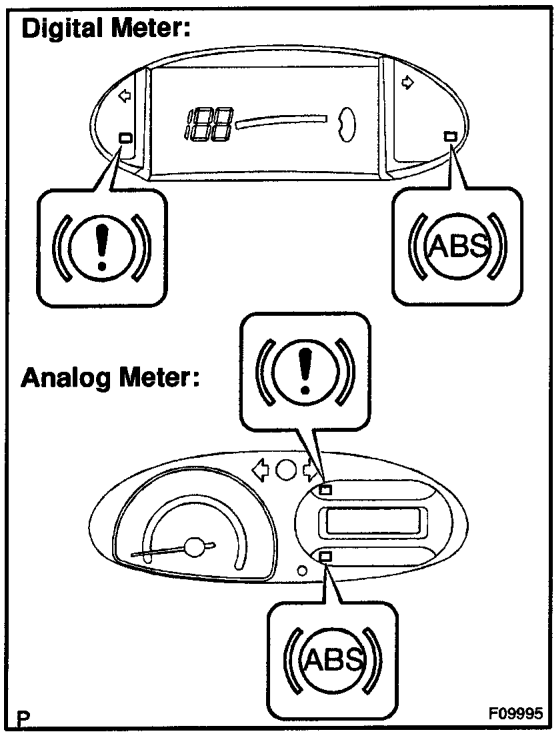
(a) Release parking brake lever.

(b) Check the indicator.

When the ignition switch is turned ON, check that the ABS warning light and brake warning light goes on for approx. 3 seconds.

HINT:

- When the parking brake is applied or the level of the brake fluid is low, 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–91 or DI–94).



(c) In case of not using hand–held tester:

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.

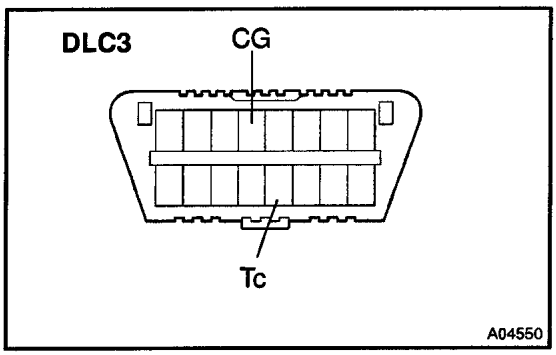
HINT:

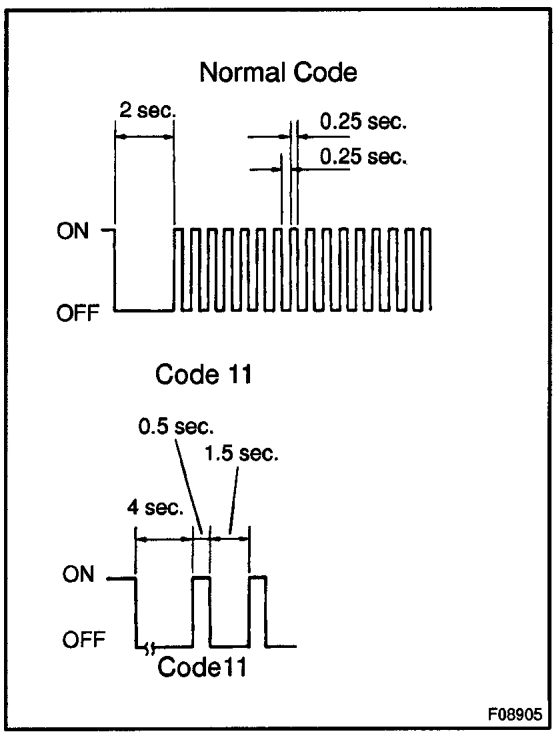
- If no code appears, inspect the diagnostic circuit or ABS warning light circuit (See page DI–96 or DI–91).
- As an example, the blinking patterns for normal code and codes 11 are shown on the left.

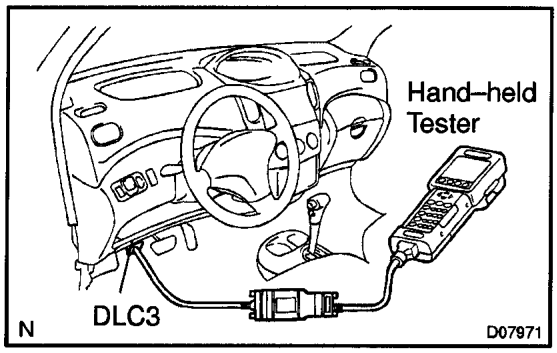
(4) Codes are explained in the code table on page DI–63.

(5) After completing the check, disconnect terminals Tc and CG, and turn off the ignition switch.

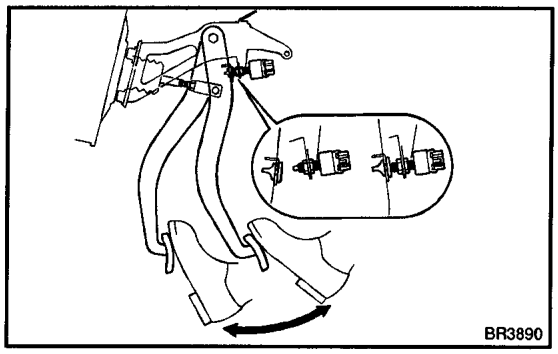
Even if 2 or more malfunctions are detected, the lowest numbered DTC will be displayed.



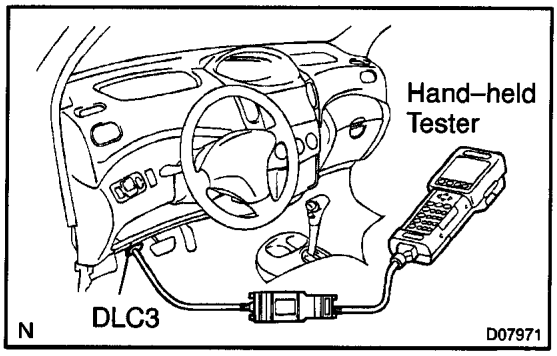




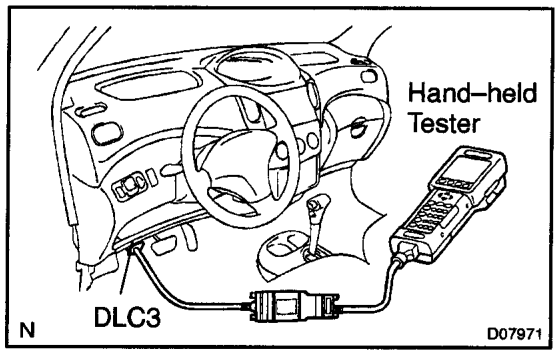
(d) In case of using hand–held tester:
Check the DTC.
(1) Hook up the hand–held tester to the DLC3.
(2) Turn the ignition switch ON.
(3) Read the DTC by following the prompts on the tester screen.
Please refer to the hand–held tester operator's manual for further details.



(e) In case of not using hand–held tester:
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 5 seconds.
(4) Check that the warning light shows the normal code.
(5) Remove the SST from the terminals of DLC3.
SST 09843–18040



(f) 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 code.
(See hand–held tester operator's manual.)



2. SPEED SENSOR SIGNAL CHECK (TEST MODE)

(a) Hook up the hand–held tester to the DLC3.
(b) Start the engine.
(c) Drive vehicle faster than 45 km/h (28 mph) for several seconds.

HINT:
There is a case that the sensor check is not completed if the vehicle has its wheels spined or its steering wheel steered during this check.

(d) Read the DTC, from hand–held tester screen.

HINT:

See the list of DTC the bottom in this page.

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 • Right front speed sensor rotor • Sensor installation
C1272 / 72	Low output voltage of left front speed sensor	• Left front speed sensor • Left front speed sensor rotor • Sensor installation
C1273 / 73	Low output voltage of right rear speed sensor	• Right rear speed sensor • Right rear speed sensor rotor • Sensor installation
C1274 / 74	Low output voltage of left rear speed sensor	• Left rear speed sensor • Left rear speed sensor rotor • Sensor installation
C1275 / 75	Abnormal change in output voltage of right front speed sensor	Right front speed sensor rotor
C1276 / 76	Abnormal change in output voltage of left front speed sensor	Left front speed sensor rotor
C1277 / 77	Abnormal change in output voltage of right rear speed sensor	Right rear speed sensor rotor
C1278 / 78	Abnormal change in output voltage of left rear speed sensor	Left rear speed sensor rotor

DI6SH–01

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

When removing the part, turn the ignition switch OFF.

HINT:

- Using SST 09843–18040, connect the terminals Tc and CG of DLC3.
- If any abnormality is not found when inspecting each inspection part, inspect ECU.
- 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.
- EBD shall be checked according to the ABS trouble code chart.

DTC No. (See Page)	Detection Item	Trouble Area
C0278 / 11 (DI–80)	Open circuit in ABS solenoid valve relay circuit	• ABS solenoid valve relay (Included ABS ECU) • ABS solenoid valve relay circuit • Valve supply voltage
C0279 / 12 (DI–80)	Short circuit in ABS solenoid valve relay circuit	
C0273 / 13 (DI–78)	Open circuit in ABS motor relay circuit	• ABS motor relay (Included ABS ECU) • ABS motor relay circuit • ABS motor voltage
C0274 / 14 (DI–78)	Short circuit in ABS motor relay circuit	
C0226 / 21 (DI–76)	Right front solenoid valve faulty	• Right front solenoid valve circuit • ABS actuator
C0236 / 22 (DI–76)	Left front solenoid valve faulty	• Left front solenoid valve circuit • ABS actuator
C0246 / 23 (DI–76)	Right rear solenoid valve faulty	• Right rear solenoid valve circuit • ABS actuator
C0256 / 24 (DI–76)	Left rear solenoid valve faulty	• Left rear solenoid valve circuit • ABS actuator
C0200 / 31* (DI–69)	Right front wheel speed sensor signal malfunction	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • Sensor installation • Sensor rotor
C0205 / 32* (DI–69)	Left front wheel speed sensor signal malfunction	
C0210 / 33* (DI–69)	Right rear wheel speed sensor signal malfunction	
C0215 / 34* (DI–69)	Left rear wheel speed sensor signal malfunction	
C1241 / 41 (DI–82)	Low battery voltage or abnormally high battery voltage	• Battery • Charging system • Power source circuit
C1249 / 49 (DI–85)	Open circuit in stop light switch circuit	• Stop light bulb • Stop light switch • Stop light switch circuit
C1251 / 51* (DI–87)	Pump motor is locked	ABS pump motor
Always ON (DI–89)	Malfunction in ECU IG power source circuit	• Battery • Charging system • Power source circuit • ABS ECU • ABS waring light circuit

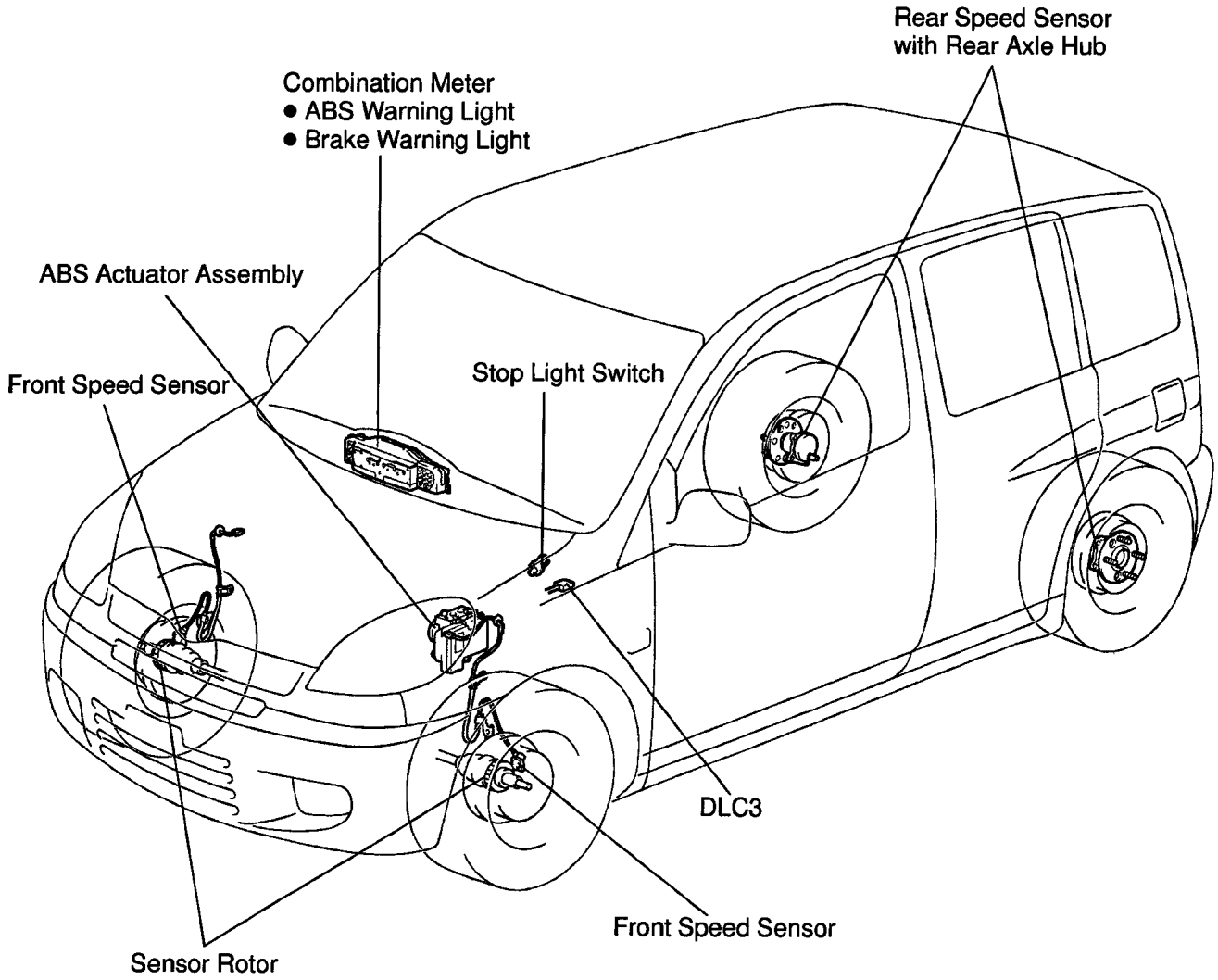
* : As the DTC cannot be erased by replacing parts alone, do either of the following operations.

- Clear the DTC (See page DI–60).
- At the vehicle speed of 20 km/h (12 mph), drive the vehicle for 30 sec. or more.

PARTS LOCATION

DI6SI-01

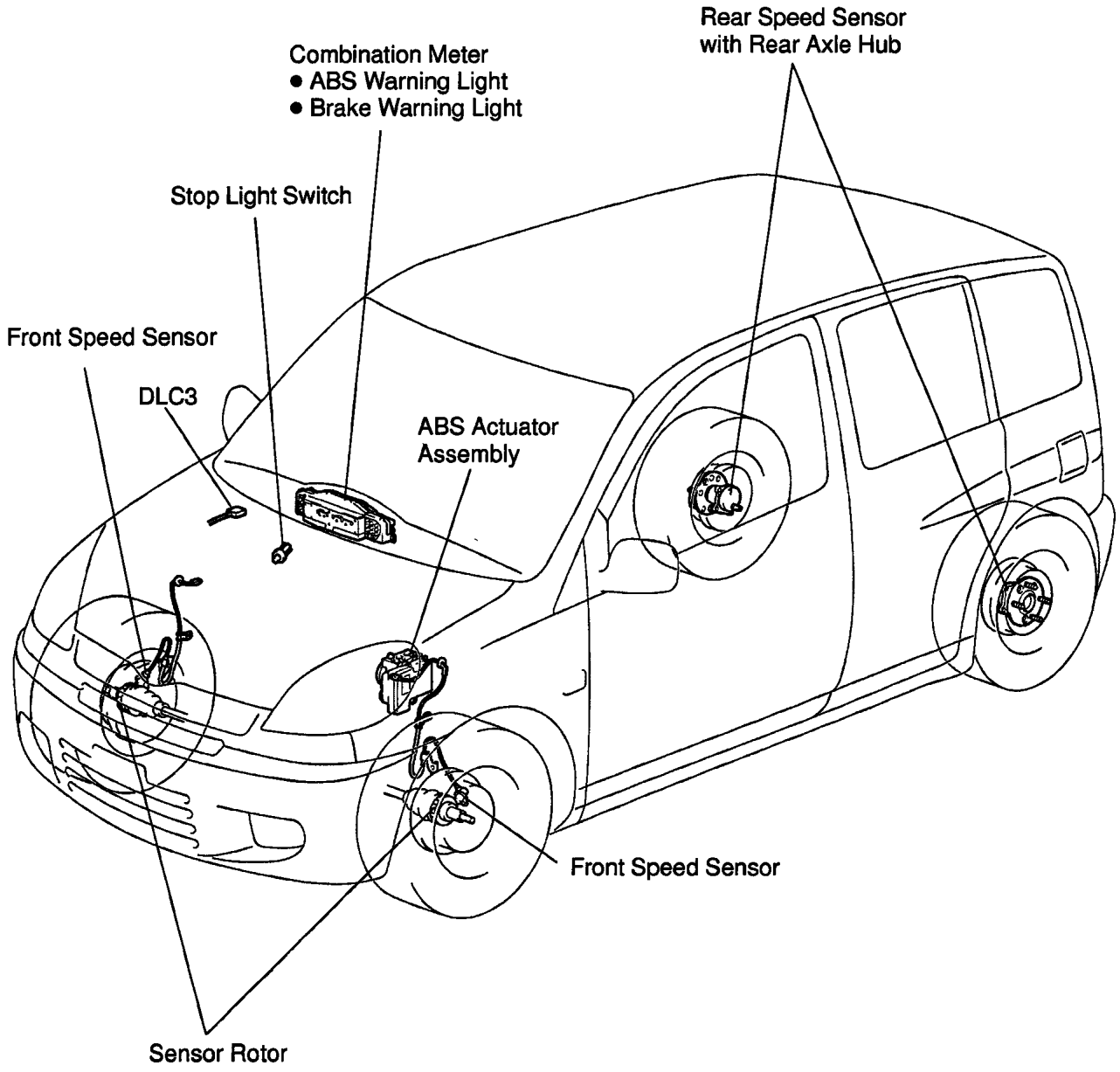
LHD models:



P

F09980

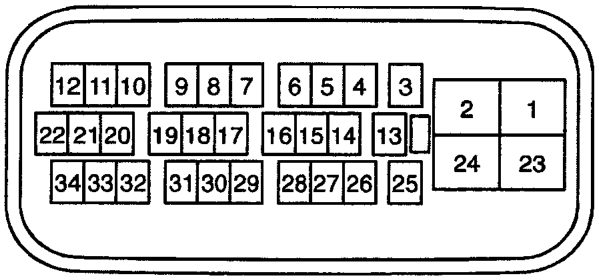
RHD models:



P F09970

DI6SJ-01

TERMINALS OF ECU



F07812

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
IG (3) – GND (1, 23)	P–L ↔ W–B	IG switch ON	10 – 14
+BS (2) – GND (1, 23)	B ↔ W–B	Always	10 – 14
RR+ (5) – RR– (4)	L–R ↔ R	IG switch ON Slowly turn right rear wheel	AC generation
RL+ (7) – RL– (6)	Y–B ↔ L–W	IG switch ON Slowly turn left rear wheel	AC generation
Tc (8) – GND (1, 23)	P–B ↔ W–B	IG switch ON	10 – 14
FL+ (13) – FL– (26)	Y ↔ G	IG switch ON Slowly turn left front wheel	AC generation
STP (16) – GND (1, 23)	G–W ↔ W–B	Stop light switch ON	10 – 14
	G–W ↔ W–B	Stop light switch OFF	Below 1.0
EBD (19) – GND (1, 23)	B–W ↔ W–B	Release parking brake lever, IG switch ON, brake warning light ON	7 – 10
		Release parking brake lever, IG switch ON, brake warning light OFF	Below 2.0
+BM (24) – GND (1, 23)	B ↔ W–B	Always	10 – 14
FR+ (27) – FR– (28)	B–R ↔ W	IG switch ON Slowly turn right front wheel	Below 1.0
WA (30) – GND (1, 23)	P ↔ W–B	IG switch ON, ABS warning light ON	7 – 10
		IG switch ON, ABS warning light OFF	Below 2.0

DI6SK–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.

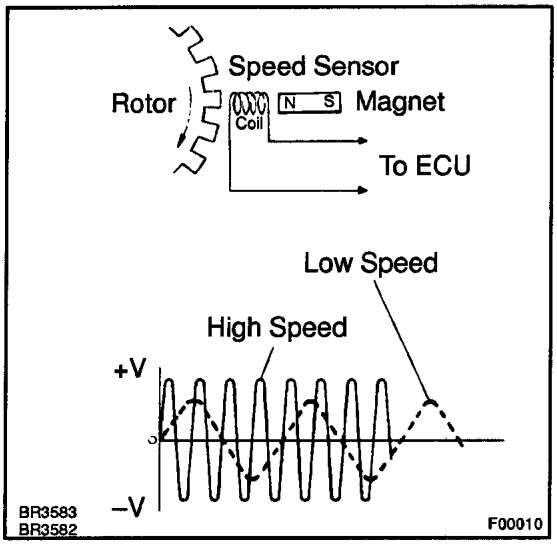
Symptom	Suspect Area	See page
ABS does not operate.	Only when 1. – 4. are all normal and the problem is still occurring, replace the ABS actuator assembly. 1. Check the DTC reconfirming that the normal code is output. 2. Power source circuit 3. Speed sensor circuit 4. Check the ABS actuator with a hand–held tester. If abnormal, check the hydraulic circuit for leakage (See page DI–98).	 DI–60 DI–82 DI–69 BR–53
ABS does not operate efficiently.	Only when 1. – 5. are all normal and the problem is still occurring, replace the ABS actuator assembly. 1. Check the DTC reconfirming that the normal code is output. 2. Speed sensor circuit 3. Stop light switch circuit 4. Power source circuit 5. Check the ABS actuator with a hand–held tester. If abnormal, check the hydraulic circuit for leakage (See page DI–98).	 DI–60 DI–69 DI–85 DI–82 BR–53
ABS warning light abnormal.	1. ABS warning light circuit 2. ABS ECU	DI–91 IN–29
Brake warning light abnormal.	1. Brake warning light circuit 2. ABS ECU	DI–94 IN–29
DTC check cannot be done.	Only when 1. and 2. are all normal and the problem is still occurring, replace the ABS actuator assembly. 1. ABS warning light circuit 2. Tc terminal circuit	 DI–91 DI–96
Speed sensor signal check cannot be done.	ABS ECU	IN–29

DI6SL-01

CIRCUIT INSPECTION

DTC	C0200 / 31 to C0215 / 34	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 of the ABS system. The front and rear rotors each have 48 serrations.

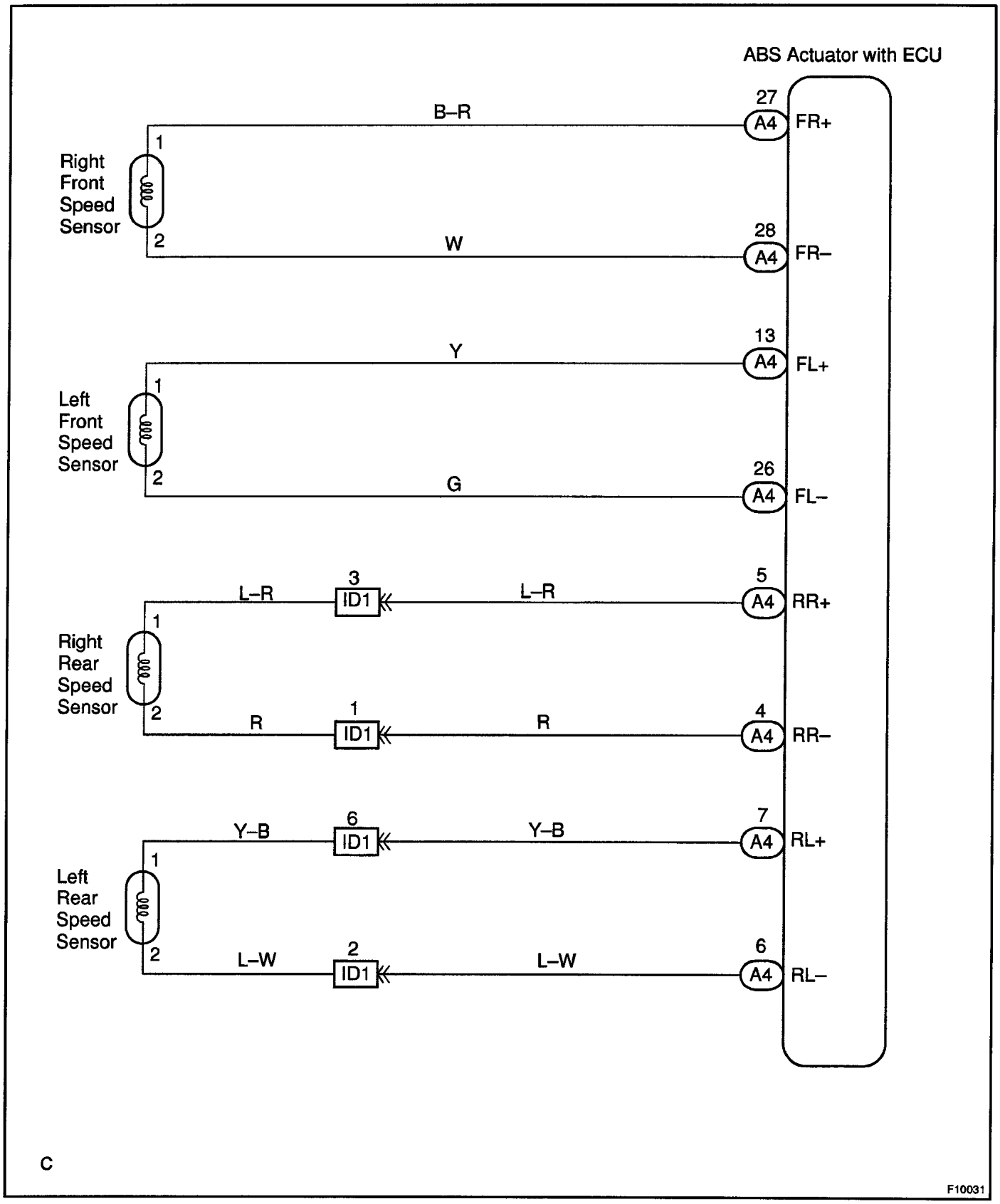
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200 / 31 C0205 / 32 C0210 / 33 C0215 / 34	Detection of any of conditions from 1. through 4.: 1. With vehicle speed at 10 km/h or more, sensor signal circuit of faulty wheel is open or short for 30 sec. or longer. 2. Momentary interruption of sensor signal of faulty wheel has occurred 7 times or more. 3. Sensor signal circuit is open for 0.2 sec. or longer.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • Sensor installation • Sensor rotor

HINT:

- DTC No. C0200 / 31 is for the right front speed sensor.
- DTC No. C0205 / 32 is for the left front speed sensor.
- DTC No. C0210 / 33 is for the right rear speed sensor.
- DTC No. C0215 / 34 is for the left rear speed sensor.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand–held tester and start from step 2 in case of not using the hand–held tester.

1	**Check output value of speed 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 there is no difference between the speed value output from the speed sensor displayed on the hand–held tester and the speed value displayed on the speedometer when driving the vehicle.

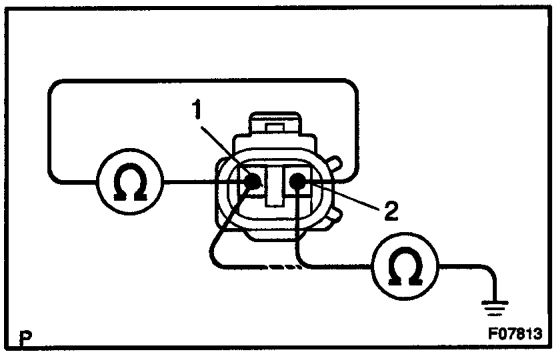
OK:
There is almost no difference from the displayed speed value.

HINT:
There is tolerance of ± 10 % in the speedometer indication.

OK	**Check and replace ABS actuator assembly.**

NG

2	**Check speed sensor.**



Front:

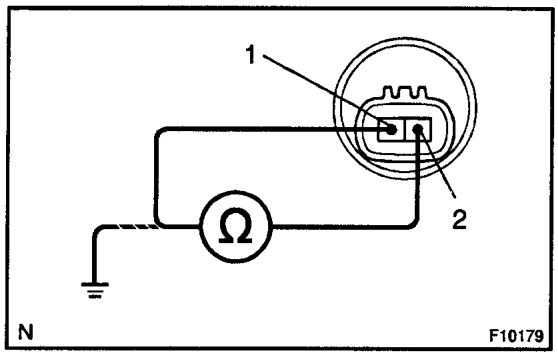
PREPARATION:
Disconnect the speed sensor connector.

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

OK:
Resistance: 1.4 – 1.8 kΩ

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

OK:
Resistance: 1 MΩ or higher



Rear speed sensor:

PREPARATION:

(a) Make sure that there is no looseness at the connector lock part and connecting part of the connector.

(b) Disconnect the speed sensor connector at hub bearing .

CHECK:

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

OK:

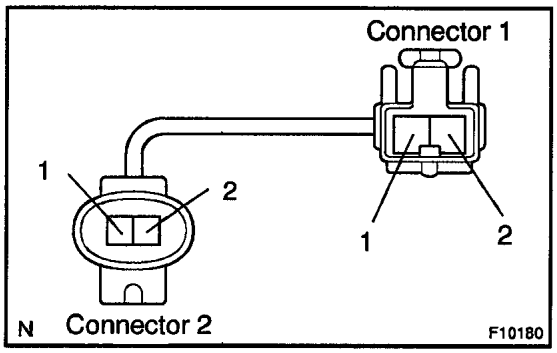
Resistance: 0.9 – 1.3 kΩ at 25 ± 5 °C

CHECK:

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

OK:

Resistance: 1 MΩ or higher



Rear speed sensor sub–wire harness:

PREPARATION:

(a) Remove the seat cushion and seatback.

(b) Make sure that there is no looseness at the connector lock part and connecting part of the connector.

(c) Disconnect the speed sensor connector inside vehicle.

CHECK:

(a) Measure resistance between terminal 1 of connector 1 and terninal 2 of connector 2.

(b) Measure resistance between terminal 2 of connector 1 and terninal 1 of connector 2.

OK:

Resistance: below 1 Ω

CHECK:

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

OK:

Resistance: 1 MΩ or higher

NG → **Replace speed sensor or sub–wire harness.**

NOTICE:

Check the speed sensor signal last (See page DI–60).

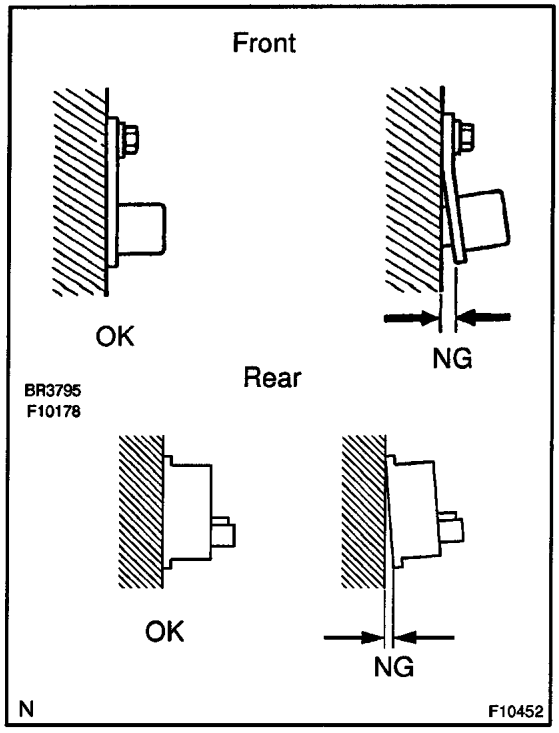
OK

3	**Check for open and short circuit in harness and connector between each speed sensor and ABS ECU (See page IN–29).**

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

OK

4	**Check speed sensor installation.**



CHECK:
Check the speed sensor installation.
OK:

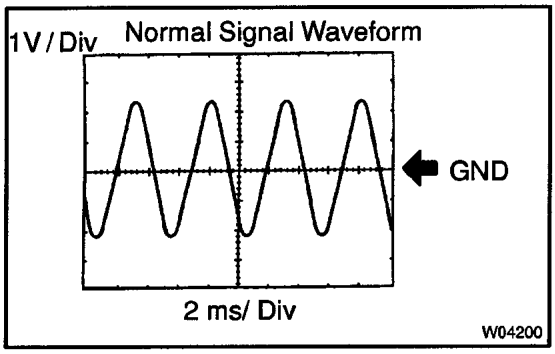
The installation bolt is tightened properly and there is no clearance between the sensor and steering knuckle or rear axle hub.

NG → **Replace speed sensor.**

NOTICE:
Check the speed sensor signal last (See page DI–60).

OK

5	Check speed sensor and sensor rotor serrations.



(REFERENCE) INSPECTION USING OSCILLOSCOPE

PREPARATION:

Connect the oscilloscope to the terminals FR+, FL+, RR+, or RL+ and GND of the ABS actuator assembly.

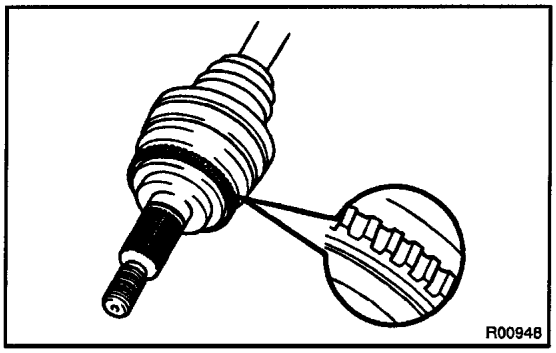
CHECK:

Drive the vehicle at 20 km/h (12 mph), and check the signal waveform.

OK	Check and replace ABS actuator.

NG

6	Check sensor rotor and sensor tip.



Front:

PREPARATION:

Remove the front drive shaft (See page SA–17).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches, missing teeth or foreign objects.

PREPARATION:

Remove the front speed sensor (See page BR–59).

CHECK:

Check the sensor tip.

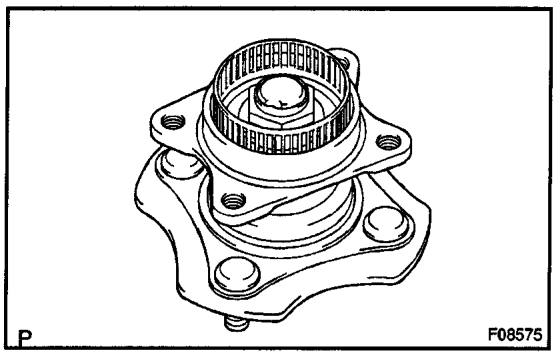
OK:

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–60).



Rear:

PREPARATION:

Remove the axle hub and disconnect the rear speed sensor (See page BR–62).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches or missing teeth or foreign objects.

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–60).

OK

Check and replace ABS actuator assembly.

DI6SM–01

DTC	C0226 / 21 to C0256 / 24	ABS Solenoid Valve Circuit

CIRCUIT DESCRIPTION

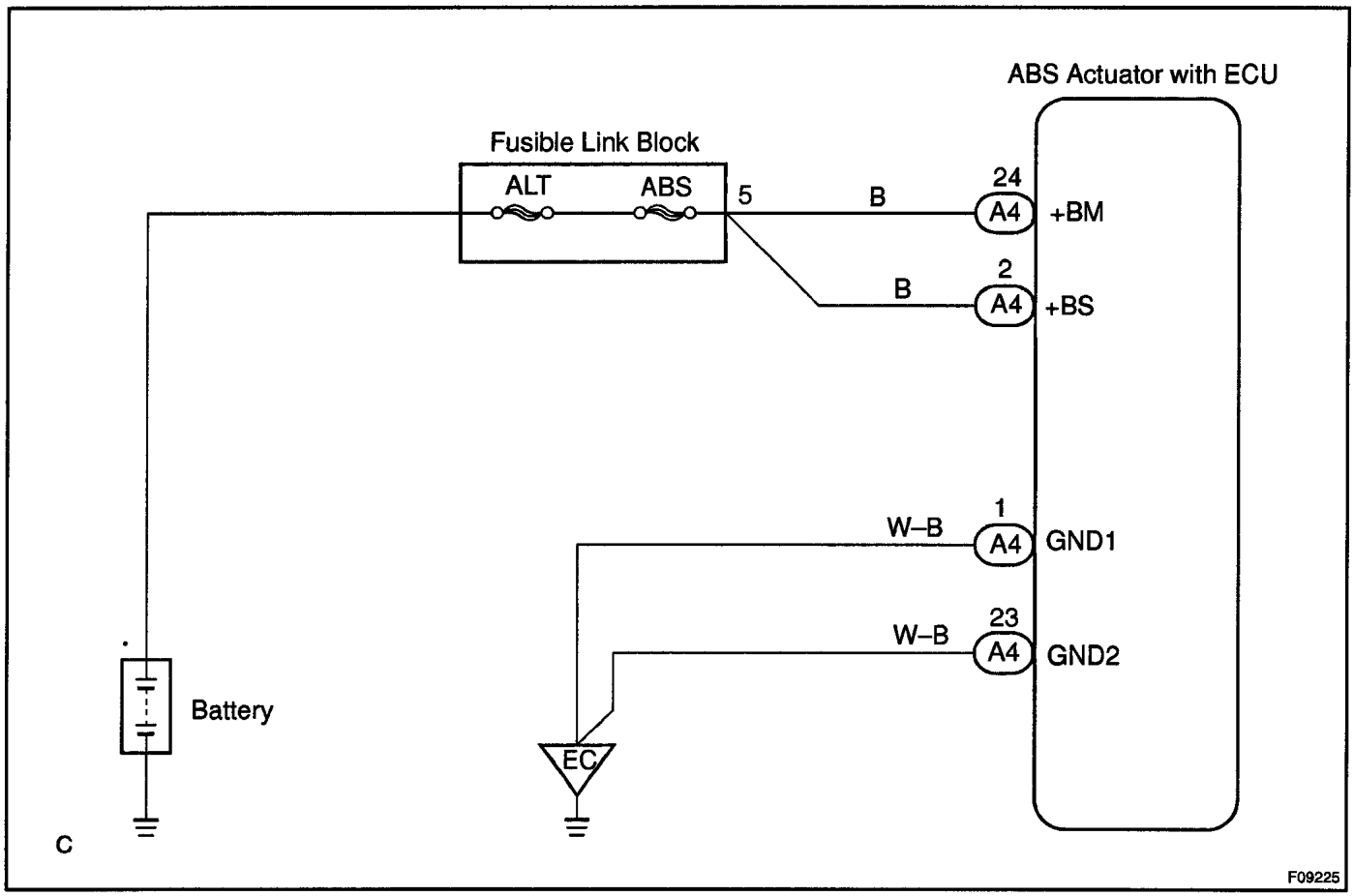
This solenoid goes on when signals are received from the ECU and controls the pressure acting on the wheel cylinders thus controlling the braking force.

DTC No.	DTC Detecting Condition	Trouble Area
C0226 / 21 C0236 / 22 C0246 / 23 C0256 / 24	With IG1 terminal voltage at 8.5 V – 19 V, solenoid circuit is open or short for 0.05 sec. or longer.	• Each solenoid valves circuit • ABS actuator

HINT:

- DTC No. C0226 / 21 is for right front solenoid valve.
- DTC No. C0236 / 22 is for left front solenoid valve.
- DTC No. C0246 / 23 is for right rear solenoid valve.
- DTC No. C0256 / 24 is for left rear solenoid valve.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check the DTC once more.**

PREPARATION:

(a) Clear the DTC (See page DI–60).

(b) Turn the ignition switch OFF.

CHECK:

Turn the ignition switch ON, and check that the same DTC is stored in the memory.

NO → **No problem.**

YES

Replace ABS actuator assembly.

DI6SN-01

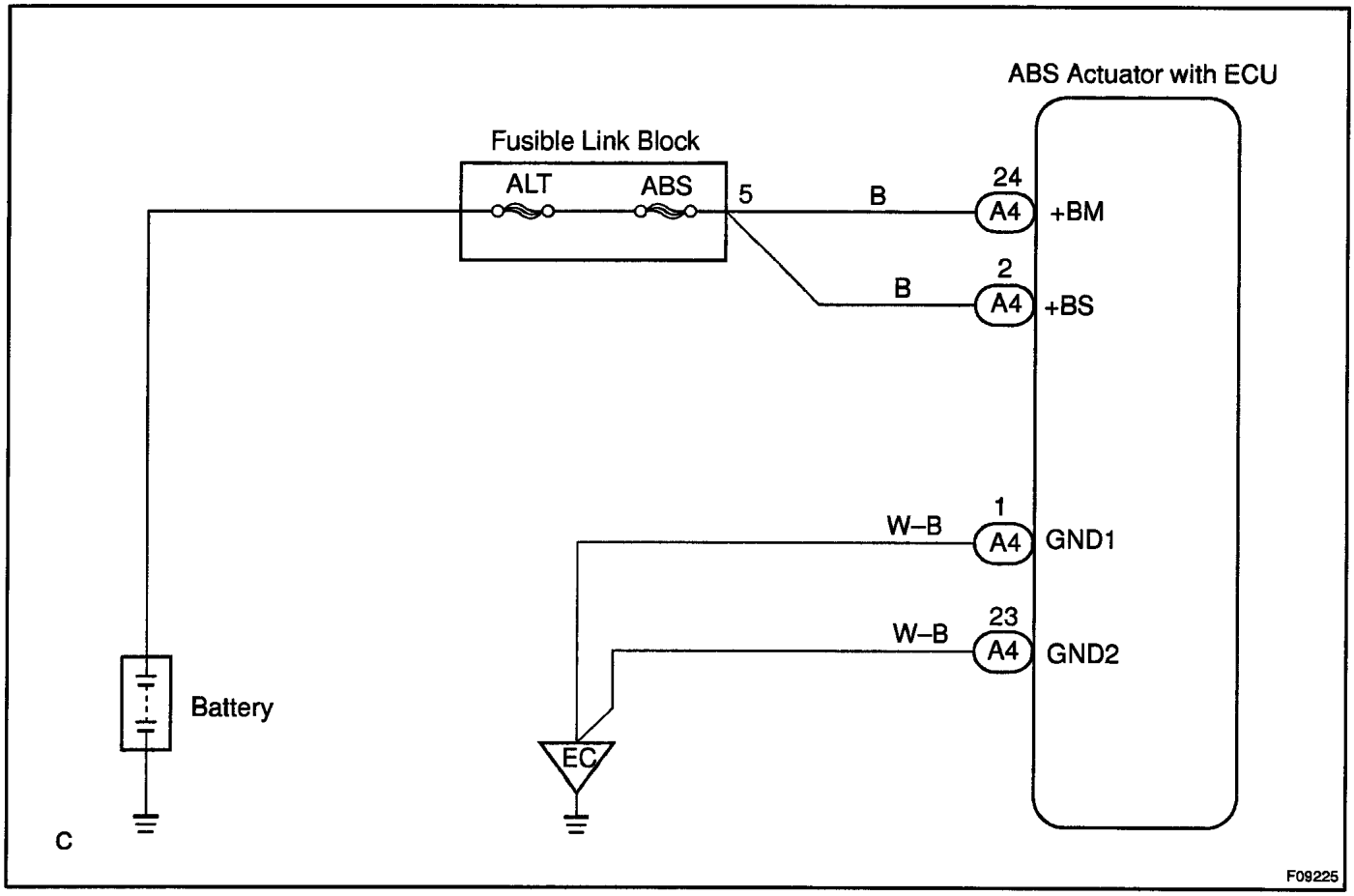
DTC	C0273 / 13, C0274 / 14	ABS Motor Relay Circuit

CIRCUIT DESCRIPTION

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

DTC No.	DTC Detecting Condition	Trouble Area
C0273 / 13	Detection of any conditions in 1. and 2.: 1. When ABS motor relay is ON, relay contact is OFF for 0.2 sec. or longer. 2. When ABS motor relay is turned ON, relay contact is OFF for 0.5 sec. or longer.	• ABS motor relay • ABS motor relay circuit • ABS motor voltage
C0274 / 14	Detection of any conditions in 1. and 2.: 1. When ABS motor relay is OFF, relay contact is ON for 0.2 sec. or longer. 2. When ABS motor relay is turned OFF, relay contact is ON for 2 sec. or longer.	

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 in case of using the hand–held tester and start from step 2 in case of not using hand–held tester.

1	**Check ABS motor relay operation.**

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 the operation sound of the ABS motor individually when operating it with the hand–held tester.

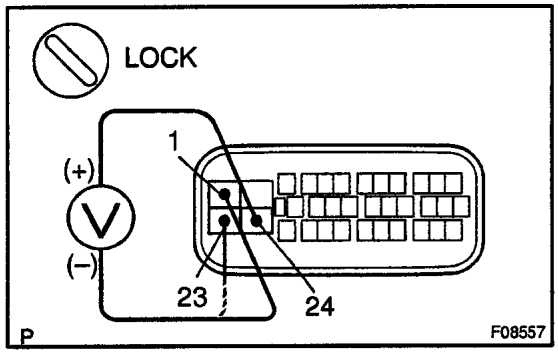
OK:

The operation sound of the ABS motor should be heard.

NG → **Check and replace ABS actuator assembly.**

OK

2	**Check voltage between terminals +BM (24) and GND (1, 23) of ABS ECU connector.**



PREPARATION:

Disconnect the ABS ECU connector.

CHECK:

Measure the voltage between terminals 24 and 1, 23 of ABS ECU harness side connector.

OK:

Voltage: 10 – 14 V

NG → **Check and replace ABS fuse.**
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 connection is normal, the ECU may be defective.

D6SO–01

DTC	C0278 / 11, C0279 / 12	ABS Solenoid Relay Circuit

CIRCUIT DESCRIPTION

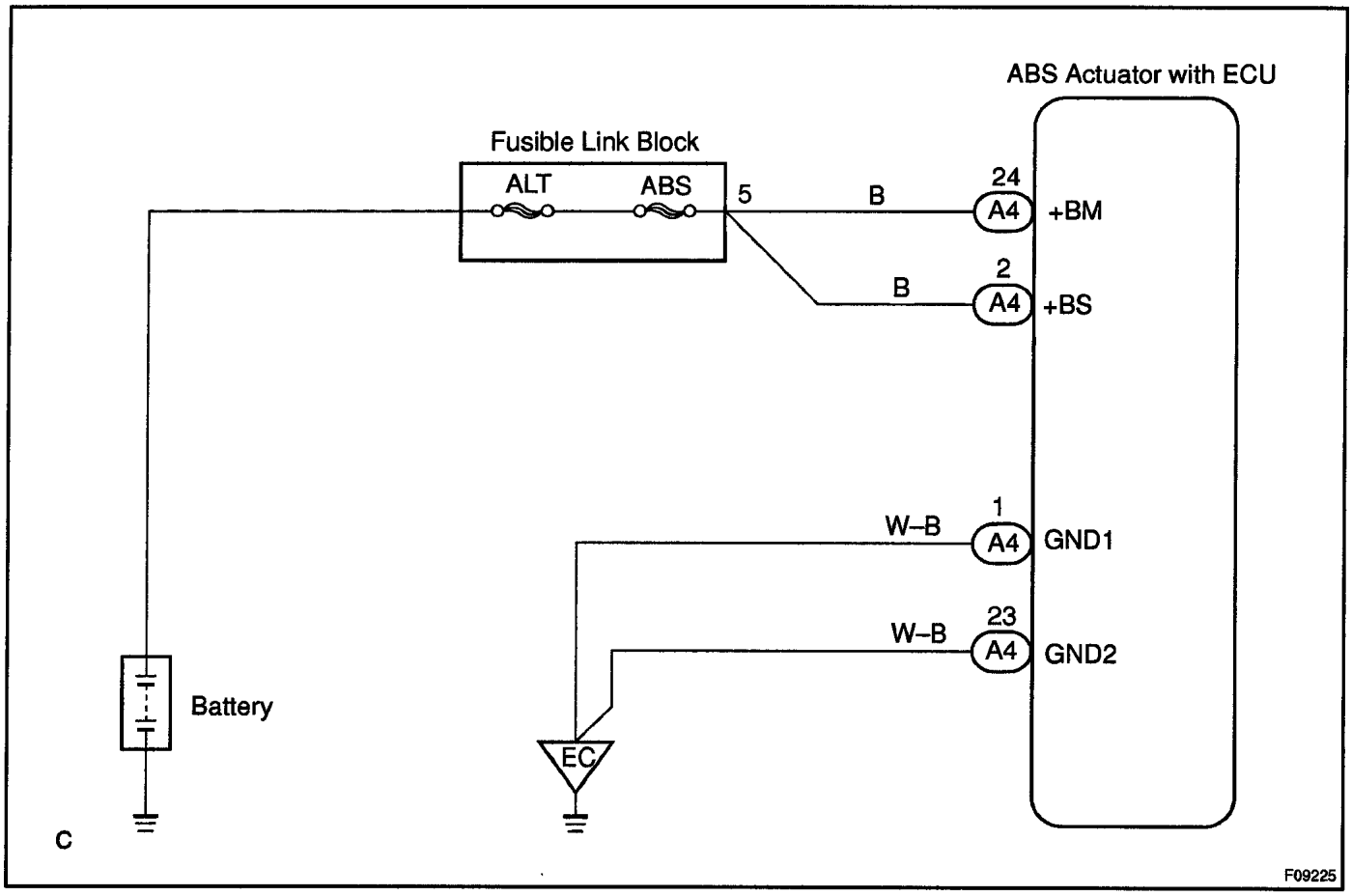
This relay supplies power to each ABS solenoid. After the ignition switch is turned ON, if the initial check is OK, the relay goes on.

DTC No.	DTC Detecting Condition	Trouble Area
C0278 / 11	With IG1 terminal voltage at 8.5 V –19 V, when solenoid relay is turned ON, relay contact is OFF*1 for 0.2 sec. or longer.	• ABS solenoid valve relay • ABS solenoid valve relay circuit • Valve supply voltage
C0279 / 12	Immediately after IG1 is turned ON, when solenoid relay is turned OFF, relay contact is ON*2 for 0.2 sec. or longer.	

*1 Relay contact OFF condition: When all solenoid supplied voltage are below 2.5 V.

*2 Relay contact ON condition: Any of voltage supplied by solenoid is 6 V or more.

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 ABS solenoid relay operation.**

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 the operation sound of the ABS solenoid relay when operating it with the hand–held tester.

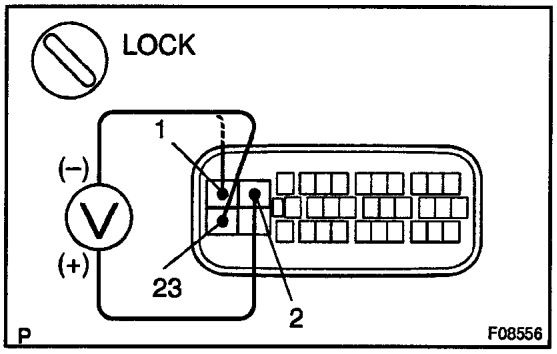
OK:

The operation sound of the ABS solenoid relay should be heard.

NG → **Check and replace ABS actuator assembly.**

OK

2	**Check voltage between terminals +BS (2) and GND (1, 23) of ABS ECU.**



PREPARATION:

Disconnect the ABS ECU connector.

CHECK:

Measure the voltage between terminals 2 and 1, 23 of ABS ECU harness side connector.

OK:

Voltage: 10 – 14 V

NG → **Check and replace ECU–IG fuse.**
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 connection is normal, the ECU may be defective.

DI6SP–01

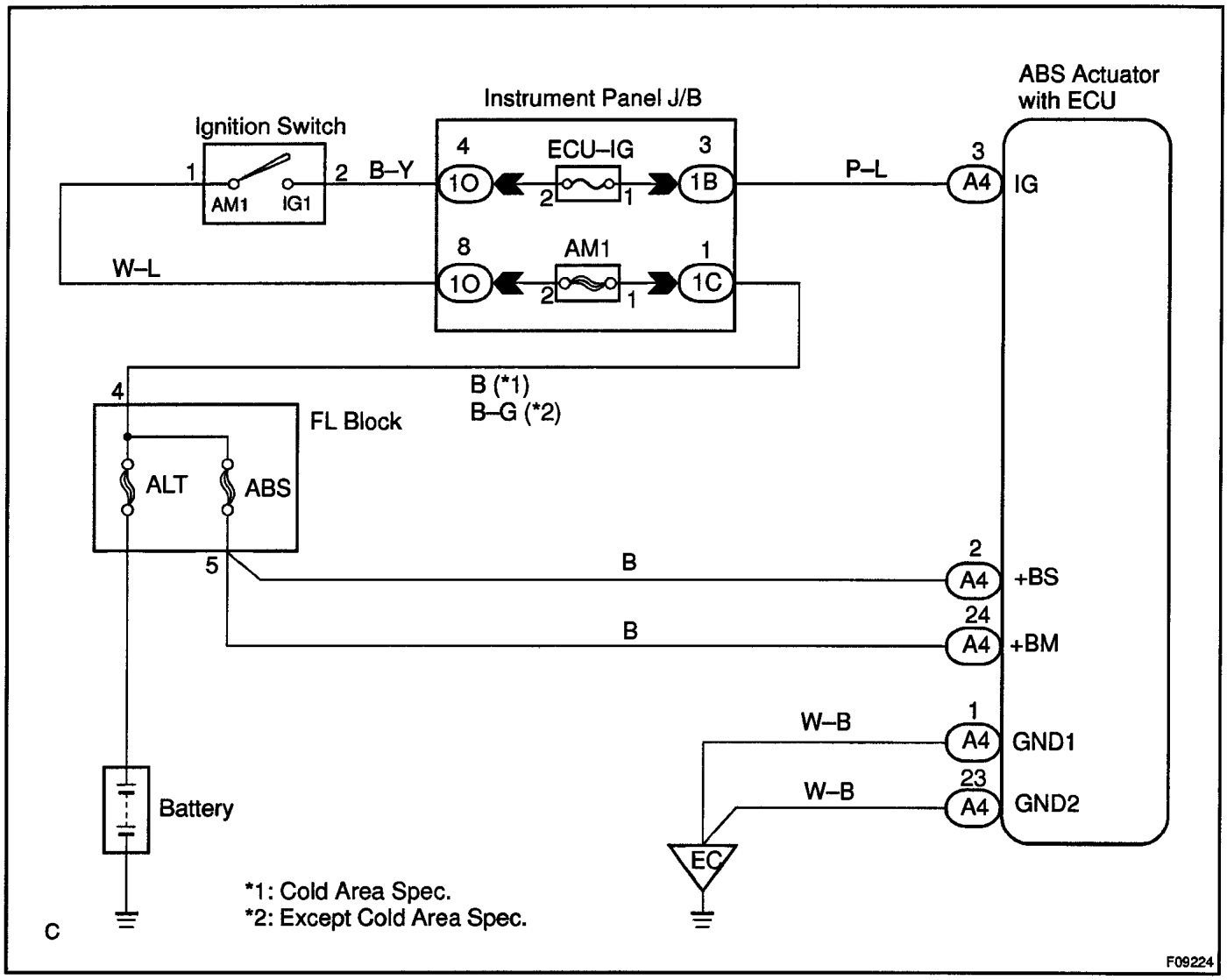
DTC	C1241 / 41	IG Power Source Circuit

CIRCUIT DESCRIPTION

This is the power source for the ECU, hence for the CPU, and ABS actuator.

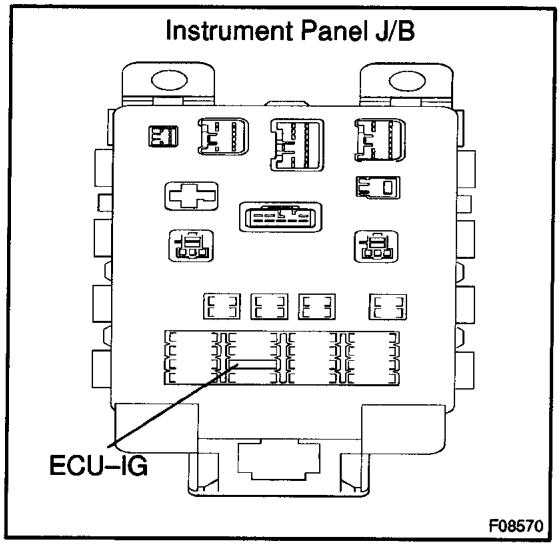
DTC No.	DTC Detecting Condition	Trouble Area
C1241 / 41	Detection of any of conditions from 1. through 3. 1. With vehicle speed at 3 km/h or more, IG1 or +BS terminal voltage is 8.5 V or below for 10 sec. or longer. 2. With IG1 terminal voltage at 8.5 V or below, ABS solenoid relay open, ABS motor relay open, solenoid fault detecting condition are established. 3. +BS terminal voltage is 19 V or above for 1 sec. or longer	• Battery • Charging system • Power source circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	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 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

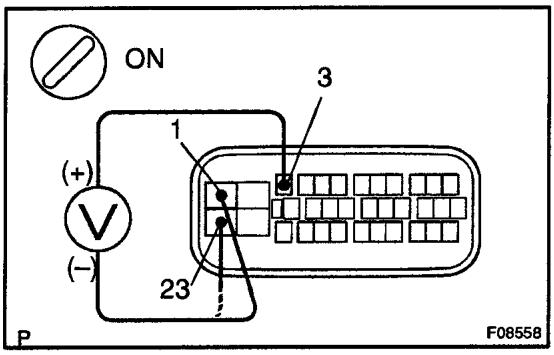
NG → **Check and repair the charging system (See page IN–29).**

OK ↓

3	Check voltage of the ECU IG power source.

In case of using the hand–held tester:
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 the voltage condition output from the ECU displayed on the hand–held tester.
OK:
"Normal" is displayed.

In case of not using the hand–held tester:



PREPARATION:

Disconnect ABS ECU connector.

CHECK:

(a) Turn the ignition switch ON.

(b) Measure voltage between terminals 3 and 1, 23 of ABS ECU harness side connector.

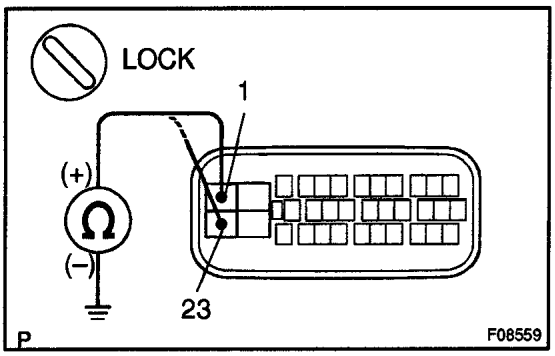
OK:

Voltage: 10 – 14 V

OK	**Check or replace ABS actuator assembly.**

NG

4	**Check continuity between terminals GND (1, 23) of ABS ECU connector and body ground.**



CHECK:

Measure resistance between terminals 1 and 23 of ABS 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 ECU and ECU–IG fuse (See page IN–29).

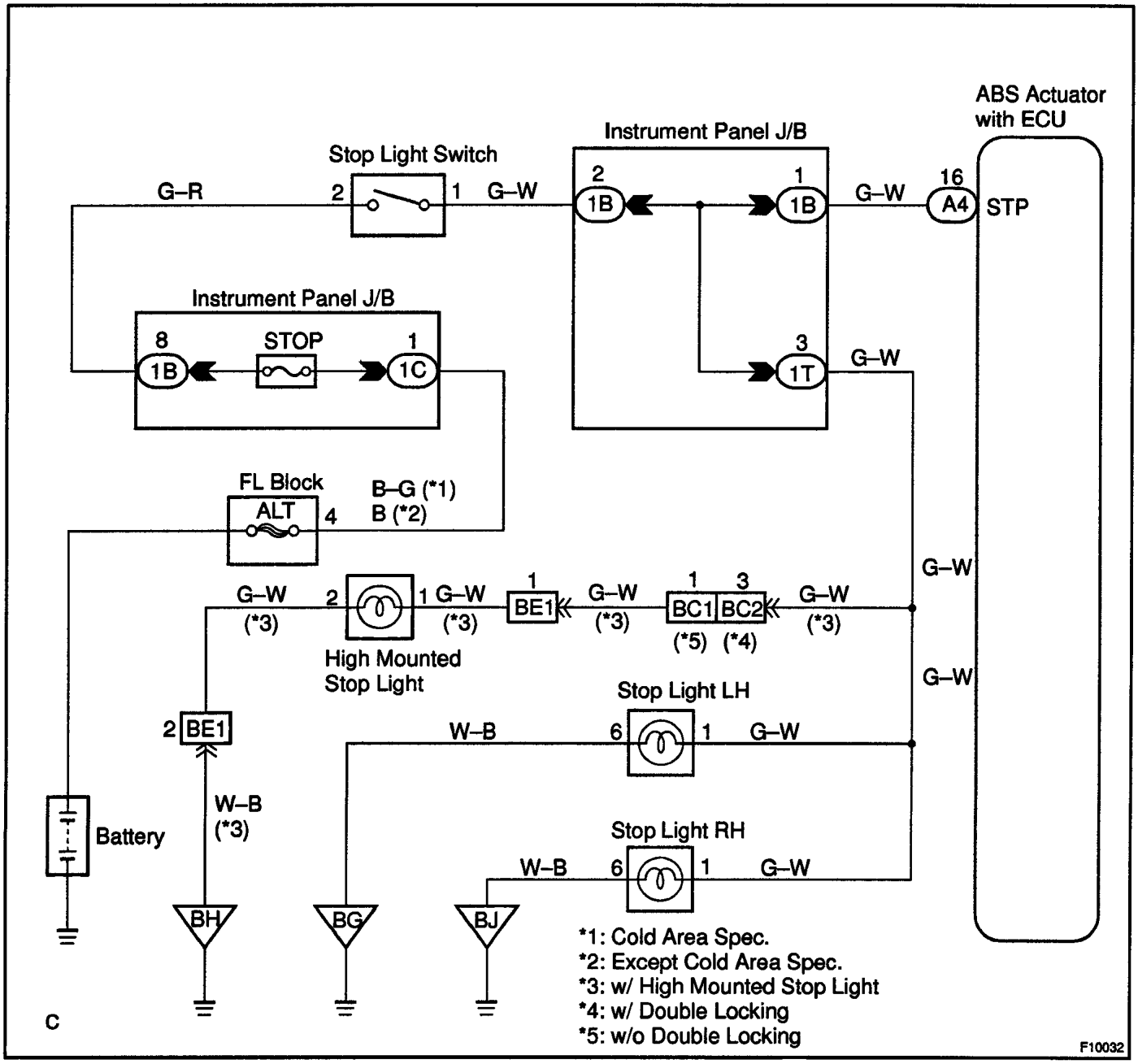
D6SQ–01

DTC	C1249 / 49	Stop Light Switch Circuit

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1249 / 49	With IG1 terminal voltage at 8.5 V – 19 V, and when ABS is in non–operation stop light switch circuit is open for 0.3 sec. or longer.	• Stop light bulb • Stop light switch • Stop light switch circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

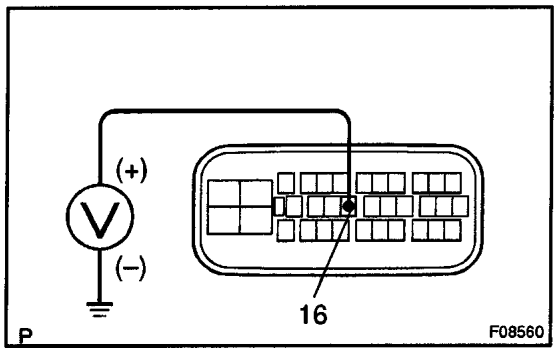
1	**Check operation of stop light.**

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–42).**

OK

2	**Check voltage between terminal STP (16) of ABS ECU and body ground.**



PREPARATION:
Disconnect ABS ECU connector.
CHECK:
Measure the voltage between terminal 16 of ABS ECU harness side connector and body ground when brake pedal is depressed.
OK:
Voltage: 10 – 14 V

OK → **Check and replace ABS actuator assembly.**

NG

3	**Check for open circuit in harness and connector between ABS ECU and stop light switch (See page IN–29).**

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

OK

Check and replace ABS ECU.

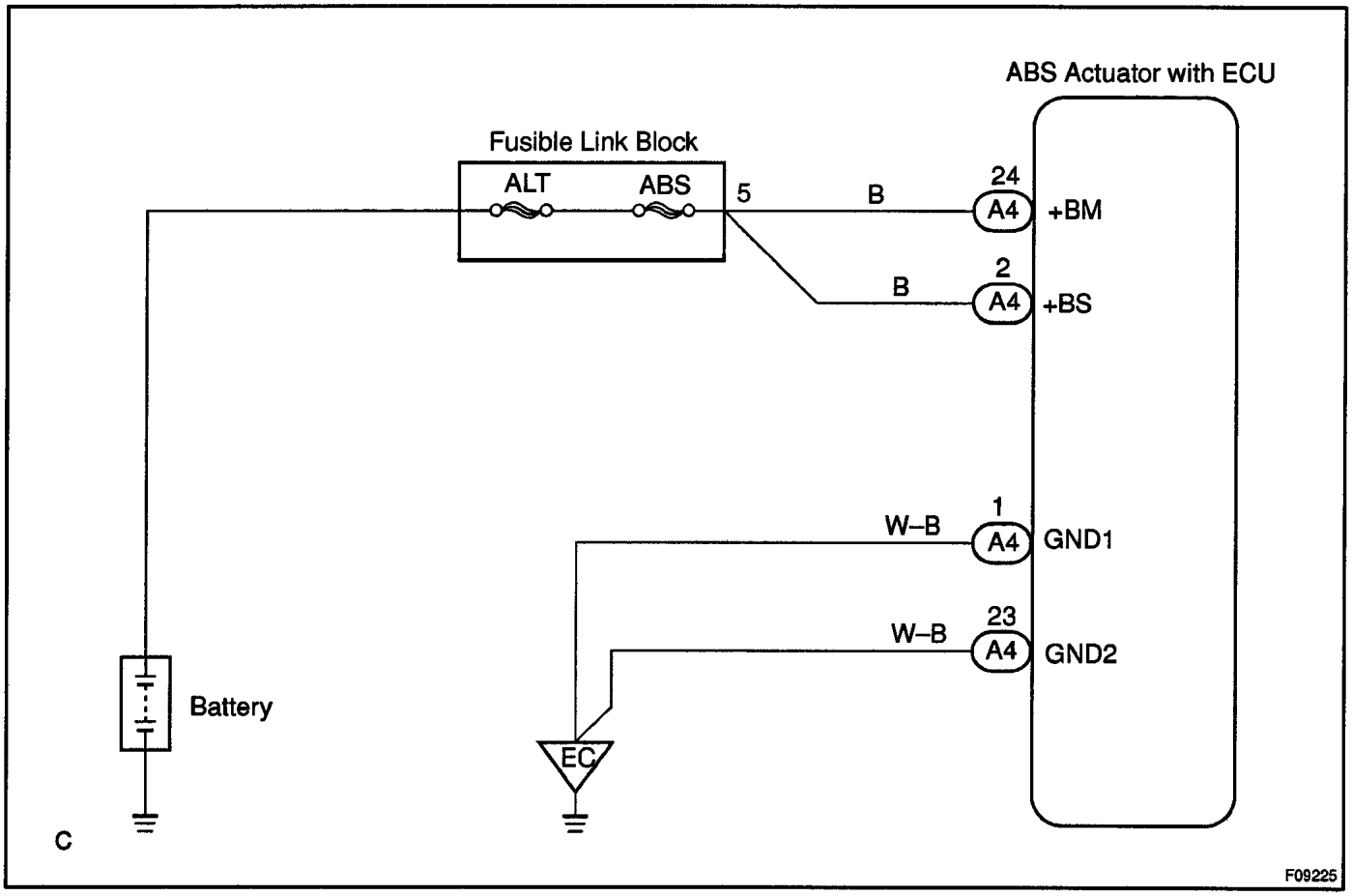
DI6SR–01

DTC	C1251 / 51	ABS Pump Motor Lock

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1251 / 51	ABS actuator pump motor is not operating normally during initial check.	ABS pump motor

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check ABS pump motor operation.**

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 the operation sound of the ABS pump motor when operating it with the hand–held tester.

OK:

The operation sound of the ABS pump motor should be heard.

NG → **Check and replace ABS actuator assembly.**

OK

Proceed to next circuit inspection shown in problem symptoms chart (See page DI–68).

DI6S9-01

DTC	Always ON	ABS ECU Malfunction

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
Always ON	There is a malfunction in the ECU internal circuit	• Battery • Charging system • Power source circuit • ABS ECU • ABS warning light circuit

INSPECTION PROCEDURE

1	Check that the ABS ECU connectors are securely connected to the ABS ECU.

NO → Connect the connector to the ABS ECU.

YES

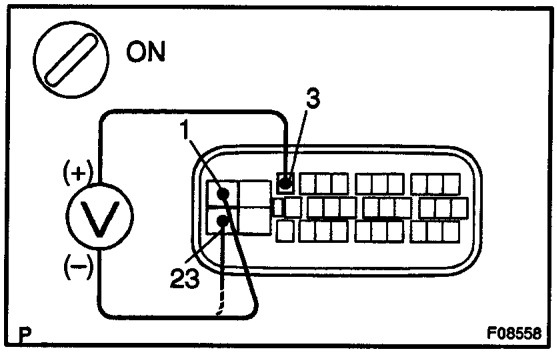
2	Is DTC output?

Check DTC on page DI–60.

YES → Repair circuit indicated by the code output.

NO

3	Check voltage between terminals IG1 (3) and GND (1, 23) of ABS ECU connector.



PREPARATION:
Disconnect ABS ECU connector.

CHECK:
(a) Turn the ignition switch ON.
(b) Measure voltage between terminals 3 and 1, 23 of ABS ECU harness side connector.

OK:
Voltage: 10 – 14 V

NG → Check for open and short circuit in harness and connector between ECU-IG fuse and ABS ECU (See page IN–29).

OK

4	Check ABS warning light.

In case of using the hand–held tester:

PREPARATION:

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

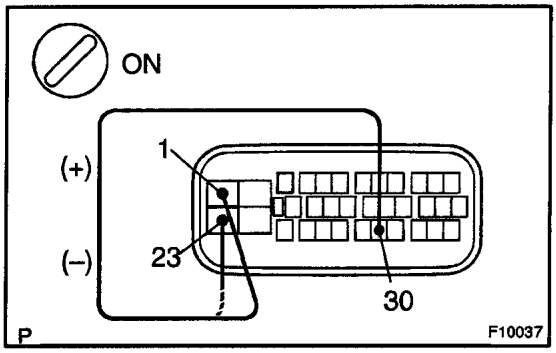
(b) Turn the ignition switch ON and push the hand–held tester main switch ON.

(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 by the hand–held tester.

In case of not using the hand–held tester:



PREPARATION:

Disconnect ABS ECU connector.

CHECK:

(a) Using service wire, connect terminal WA (30) and GND (1, 23) of ABS ECU harness side connector.

(b) Turn the ignition switch ON.

OK:

ABS warning light go off

OK	Check and replace ABS actuator assembly.

NG

Check for open or short circuit in harness and connector between ABS warning light, DLC3 and ABS ECU (See page IN–29).

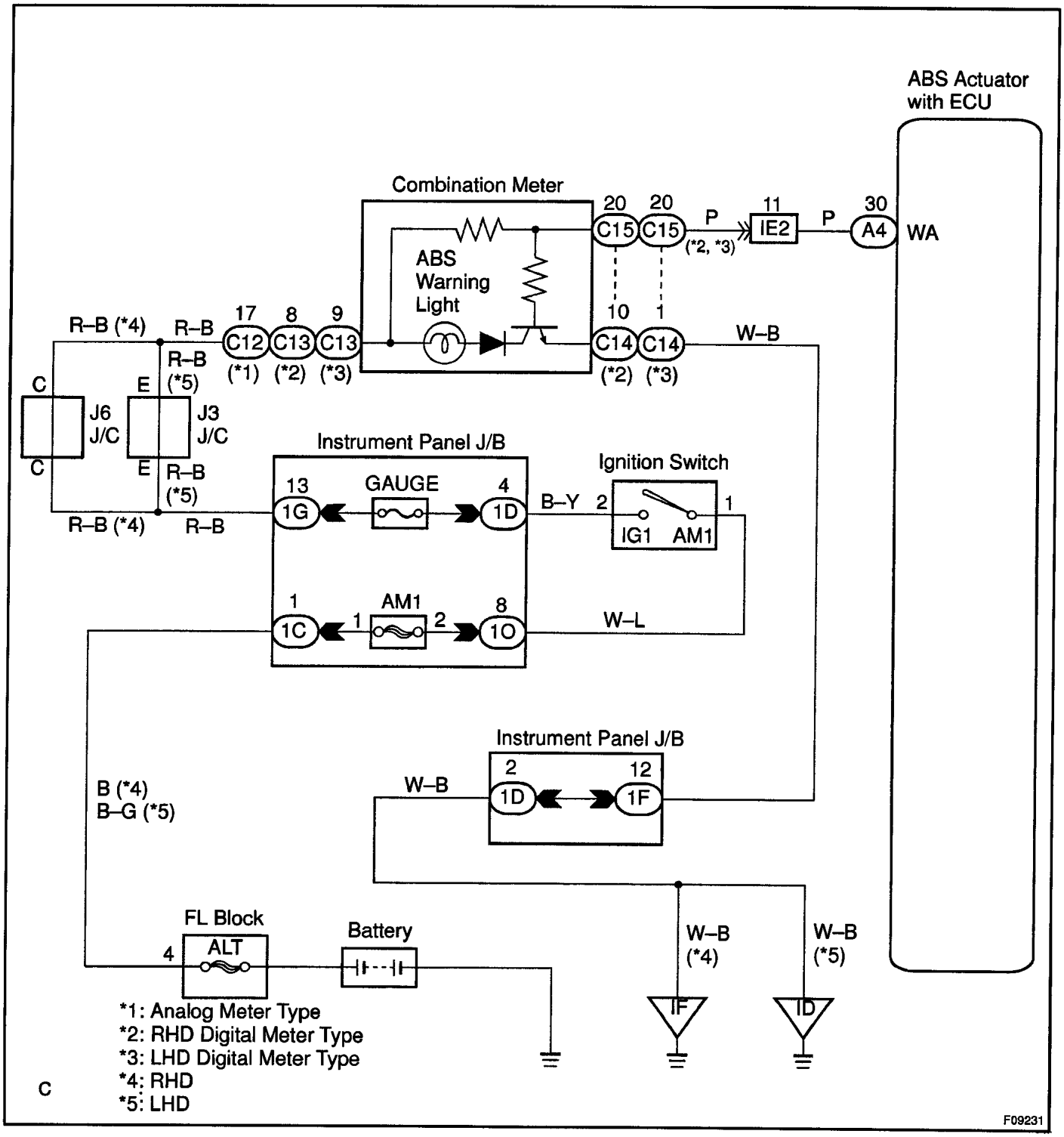
DI6ST-01

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.
Connect terminals Tc and CG of the DLC3 make the ABS warning light blink and output the DTC.

WIRING DIAGRAM



INSPECTION PROCEDURE

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

ABS warning light does not light up	*1
ABS warning light remains on	*2

*1: Start the inspection from step 1 in case of using the hand–held tester and start from step 2 in case of not using hand–held tester.

*2: After inspection with step 3, start the inspection from step 4 in case of using the hand–held tester and start from step 5 in case of not using 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 by the hand–held tester.

OK → **Check and replace ABS actuator assembly.**

NG

2	**Check ABS warning light.**

See combination meter troubleshooting on page BE–2.

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

OK

Check for open circuit in harness and connector between GAUGE fuse and ABS warning light. (See page IN–29).

3	**Check that the ECU connectors are securely connected to the ECU.**

NO → **Connect the connector to the ECU.**

YES

4	**Check operation of the ABS warning light (See step 1).**

OK → **Check and replace ABS actuator assembly.**

NG

5	**Is DTC output?**

Check DTC on page DI–60.

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

NO

Check for short circuit in harness and connector between ABS warning light, DLC3 and ABS ECU (See page IN–29).

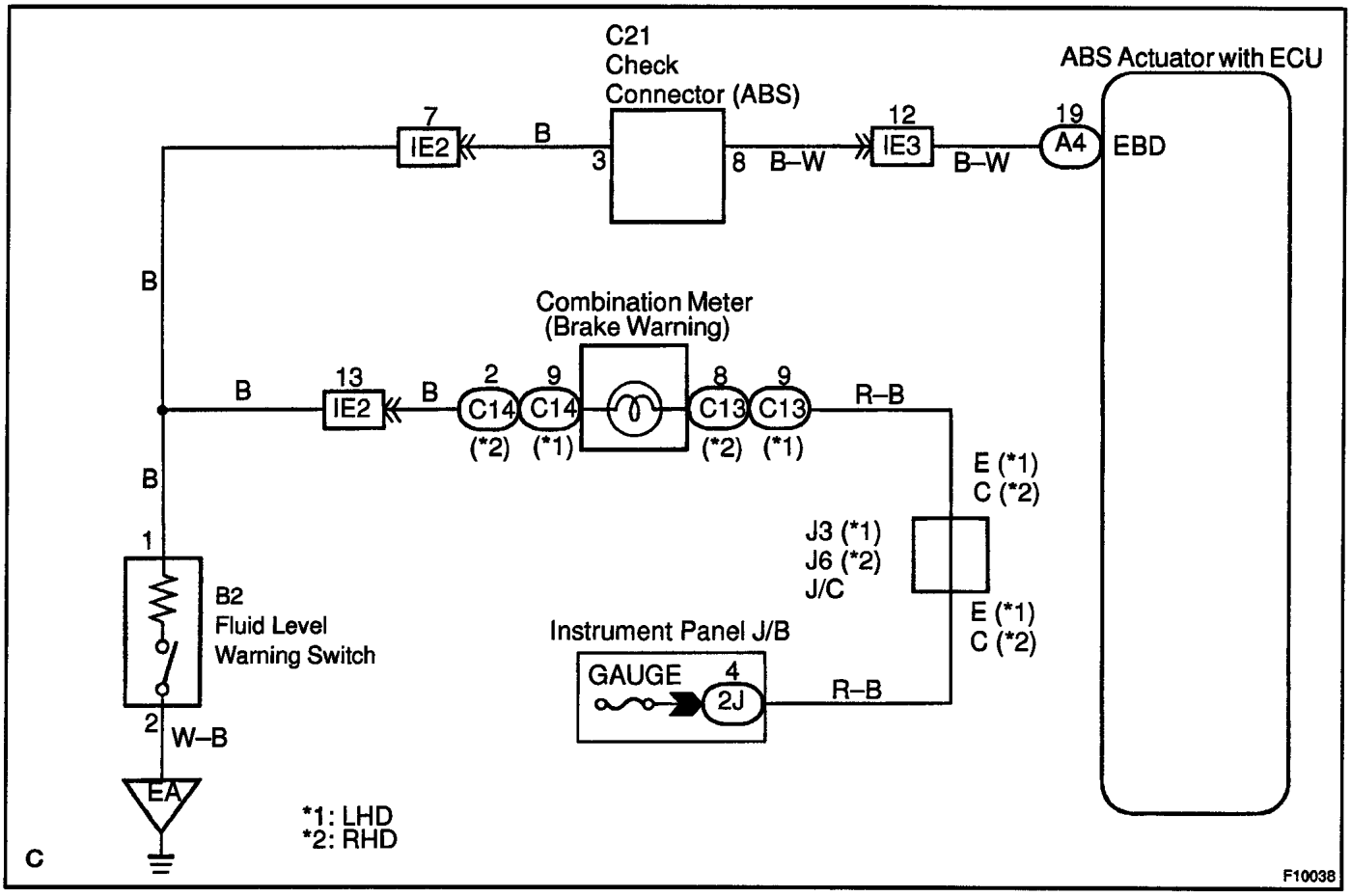
DI6SU–01

Brake Warning Light Circuit

CIRCUIT DESCRIPTION

The brake warning light lights up when the brake fluid is insufficient, the EBD is abnormally, or the parking brake is applied.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check parking brake switch circuit (See page BE–2).**

NG → **Repair or replace parking brake switch circuit.**

OK

2	**Check brake fluid level warning switch circuit (See page BE–2).**

NG → **Repair or replace brake fluid level warning switch circuit.**

OK

3	**Is DTC output for ABS?**

Check DTC on page DI–60.

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

NO

4	**Check brake warning light.**

See combination meter troubleshooting on page BE–2.

NG → **Repair or replace combination meter.**

OK

Check and replace ABS actuator assembly.

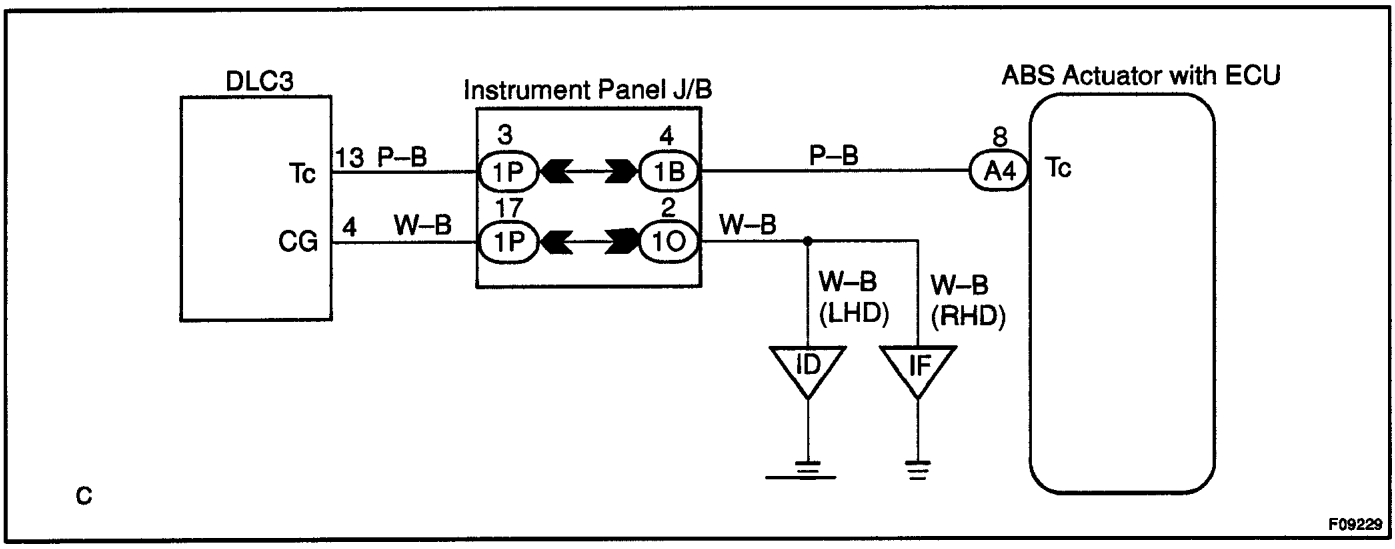
DI6SV–01

Tc Terminal Circuit

CIRCUIT DESCRIPTION

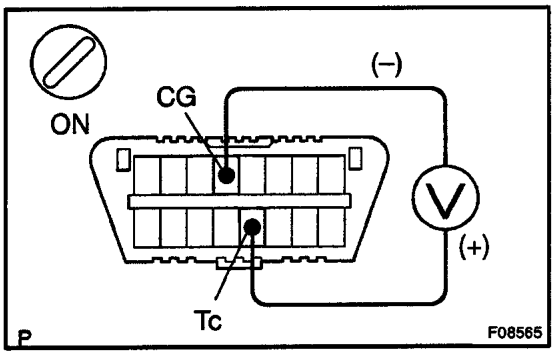
Connecting between terminals Tc and CG of the DLC3 causes the ECU to display the DTC by flashing the ABS warning light.

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: 10 – 14 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–29).**

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

OK

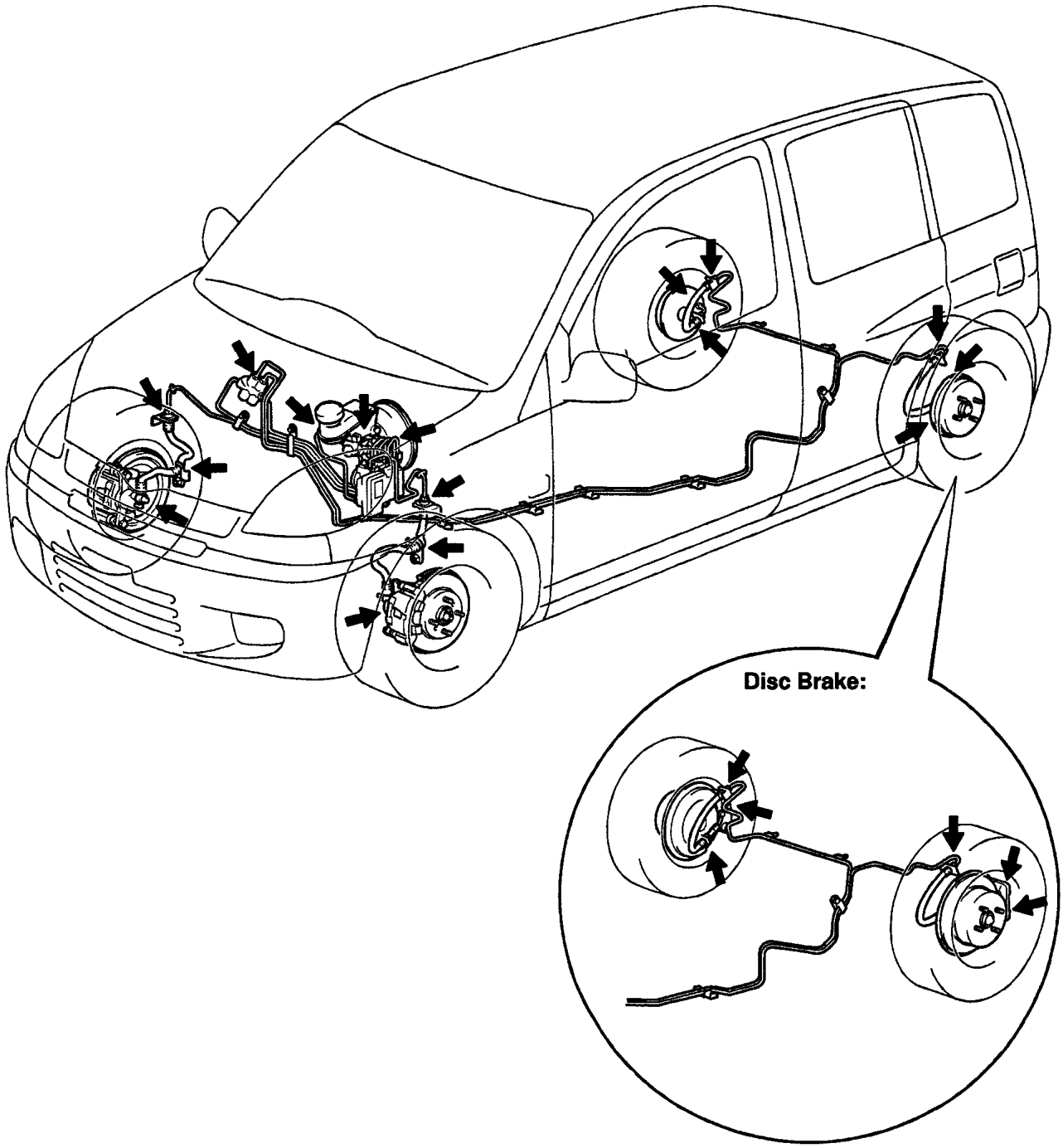
Check and replace ABS actuator assembly.

DISSW–01

Check for Fluid Leakage

Check for fluid leakage from actuator or hydraulic lines.

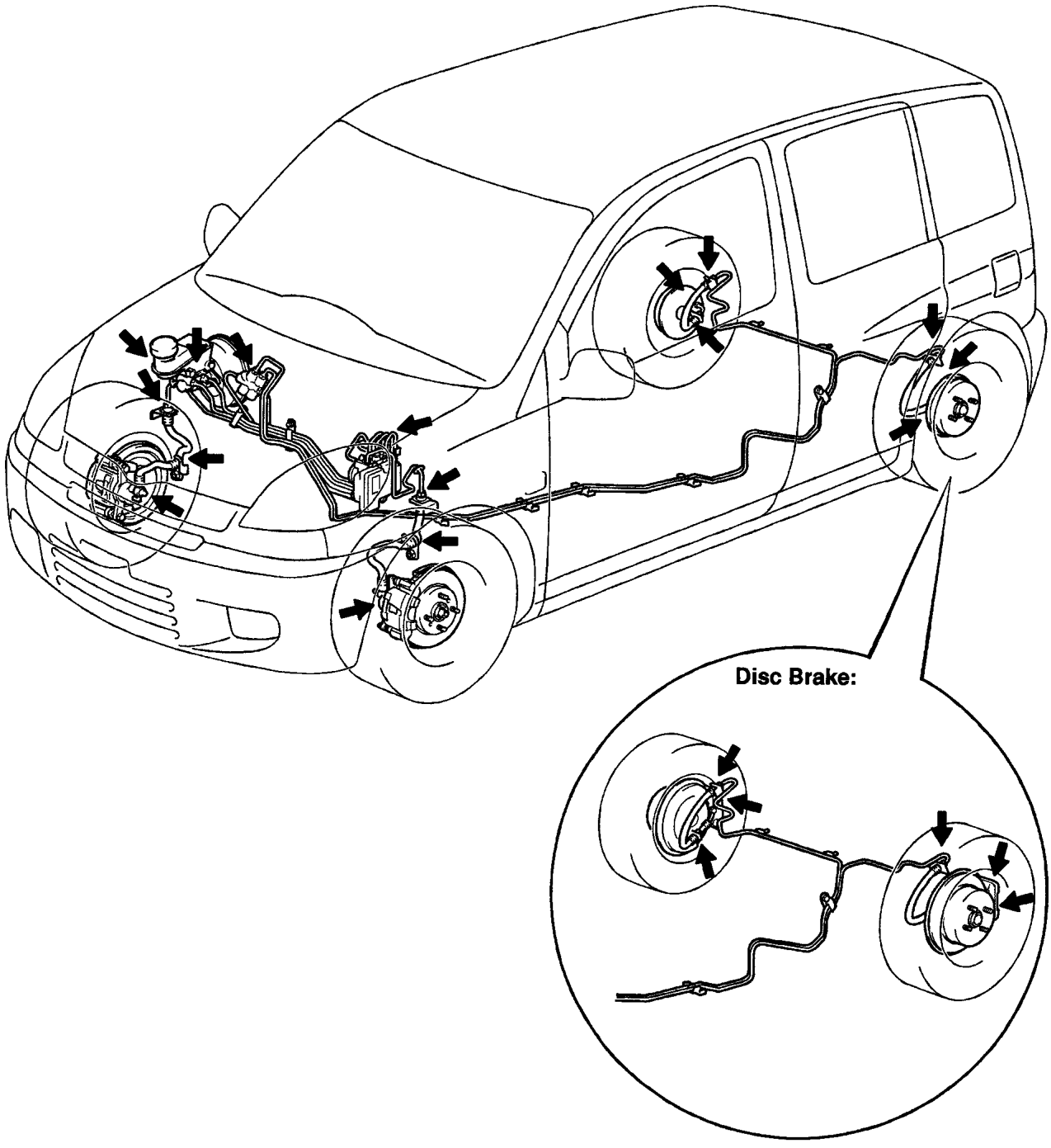
LHD models:



P

F09978

RHD models:



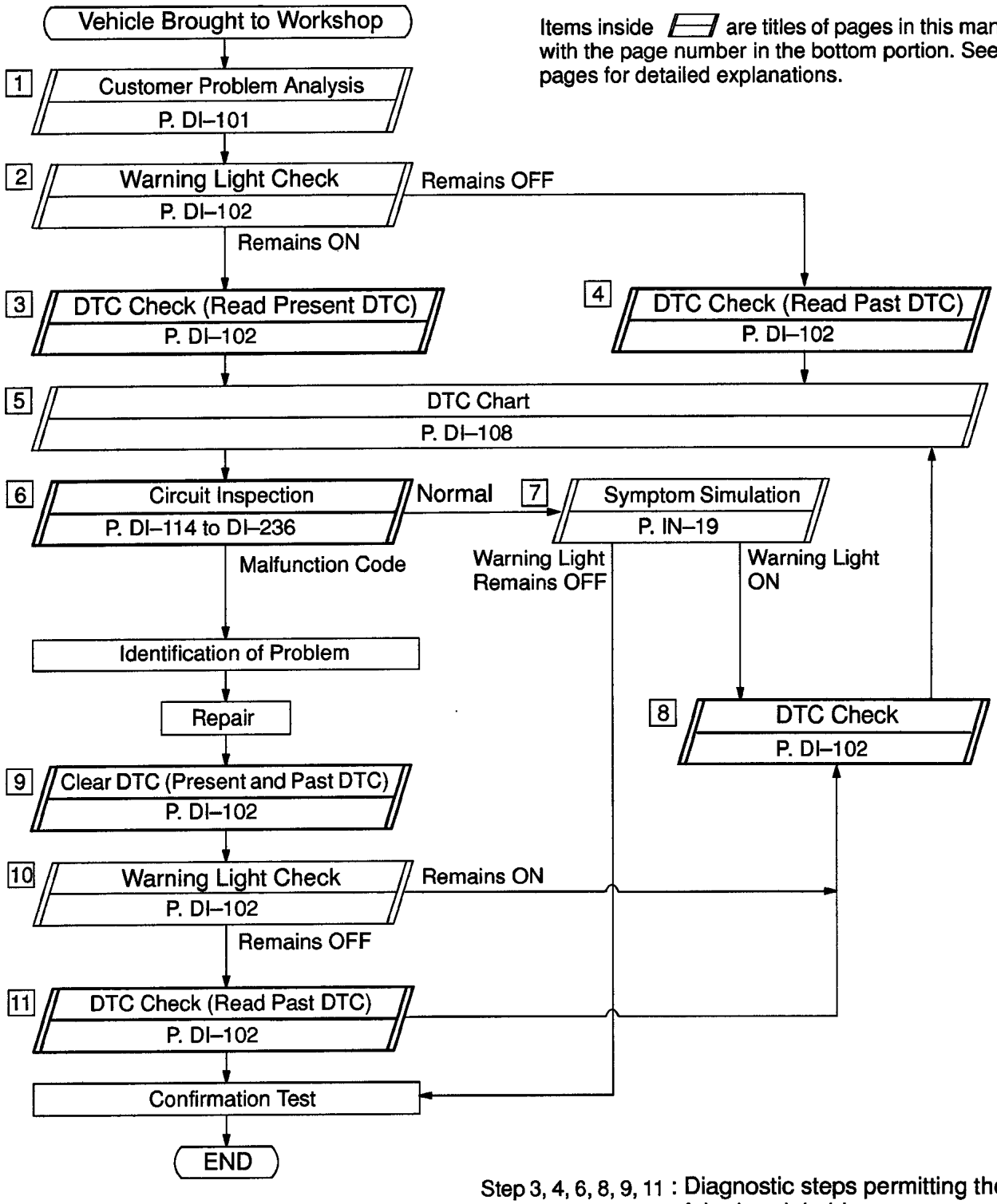
P

F09979

SUPPLEMENTAL RESTRAINT SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI1AX–11



Step 3, 4, 6, 8, 9, 11 : Diagnostic steps permitting the use of the hand–held tester.

DI15Z-07

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, Repair History Prior to Occurrence of Malfunction (Including Supplemental Restraint System)	

Diagnosis System Inspection

SRS Warning Light Inspection	1st Time	☐ Remains ON ☐ Sometimes Light Up ☐ Does Not Light Up
	2nd Time	☐ Remains ON ☐ Sometimes Light Up ☐ Does Not Light Up
DTC Inspection	1st Time	☐ Normal Code ☐ Malfunction Code [Code.]
	2nd Time	☐ Normal Code ☐ Malfunction Code [Code.]

DI4L1-09

PRE–CHECK

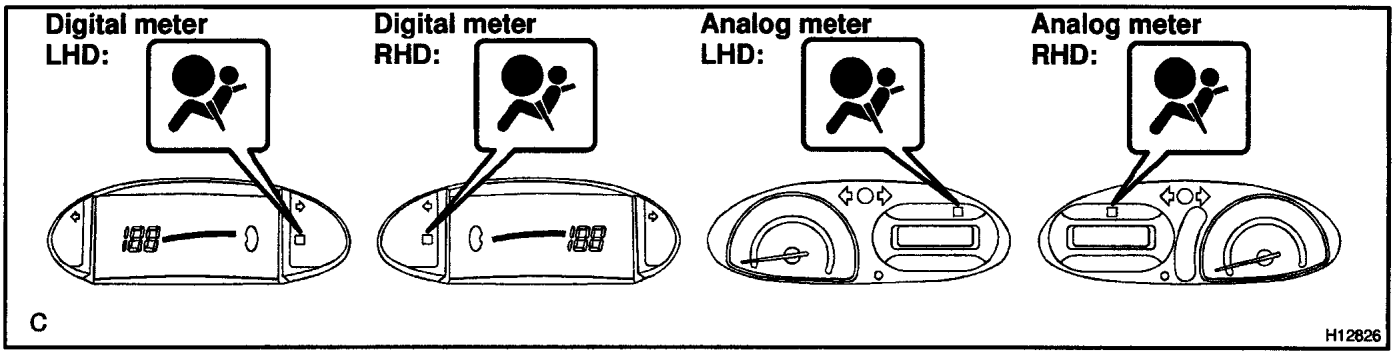
1. SRS WARNING LIGHT CHECK

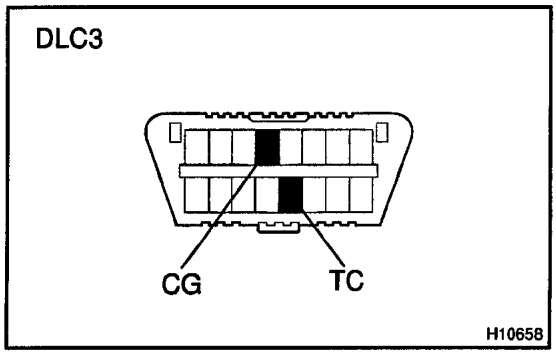
(a) Turn the ignition switch to the ON position and check that the SRS warning light lights up.

(b) Check that the SRS warning light goes out after approx. 6 seconds.

HINT:

- When the ignition switch is at ON and the SRS warning light remains on or flashes, the airbag sensor 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–231.





2. DTC CHECK (Using diagnosis check wire)

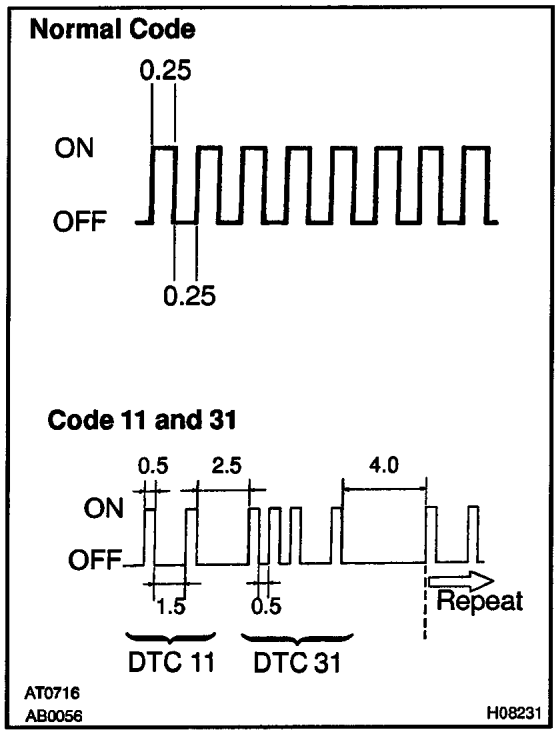
(a) Present troubles codes:
Output the DTC.
(1) Turn the ignition switch to the ON position and wait for approx. 20 seconds.
(2) Using SST, connect terminals Tc and CG of the DLC3.
SST 09843–18040

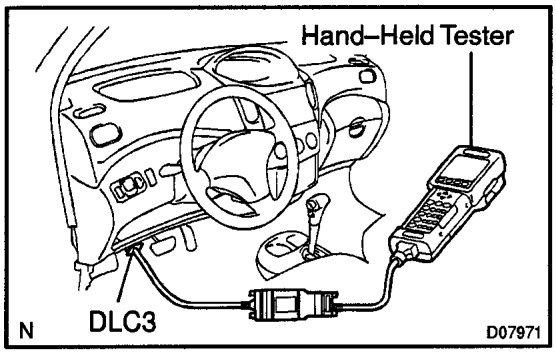
NOTICE:

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

(b) Past troubles codes:
Output the DTC.
(1) Using service wire, connect terminals Tc and CG of the DLC3.
SST 09843–18040
(2) Turn the ignition switch to the ON position and wait for approx. 20 seconds.

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





(c) Read the DTC.
Read the 2–digit DTC as indicated by the number of times the SRS warning light blinks. As an example, the blinking patterns, normal, 11 and 31 are shown in the illustration.

- Normal code indication
  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–236.

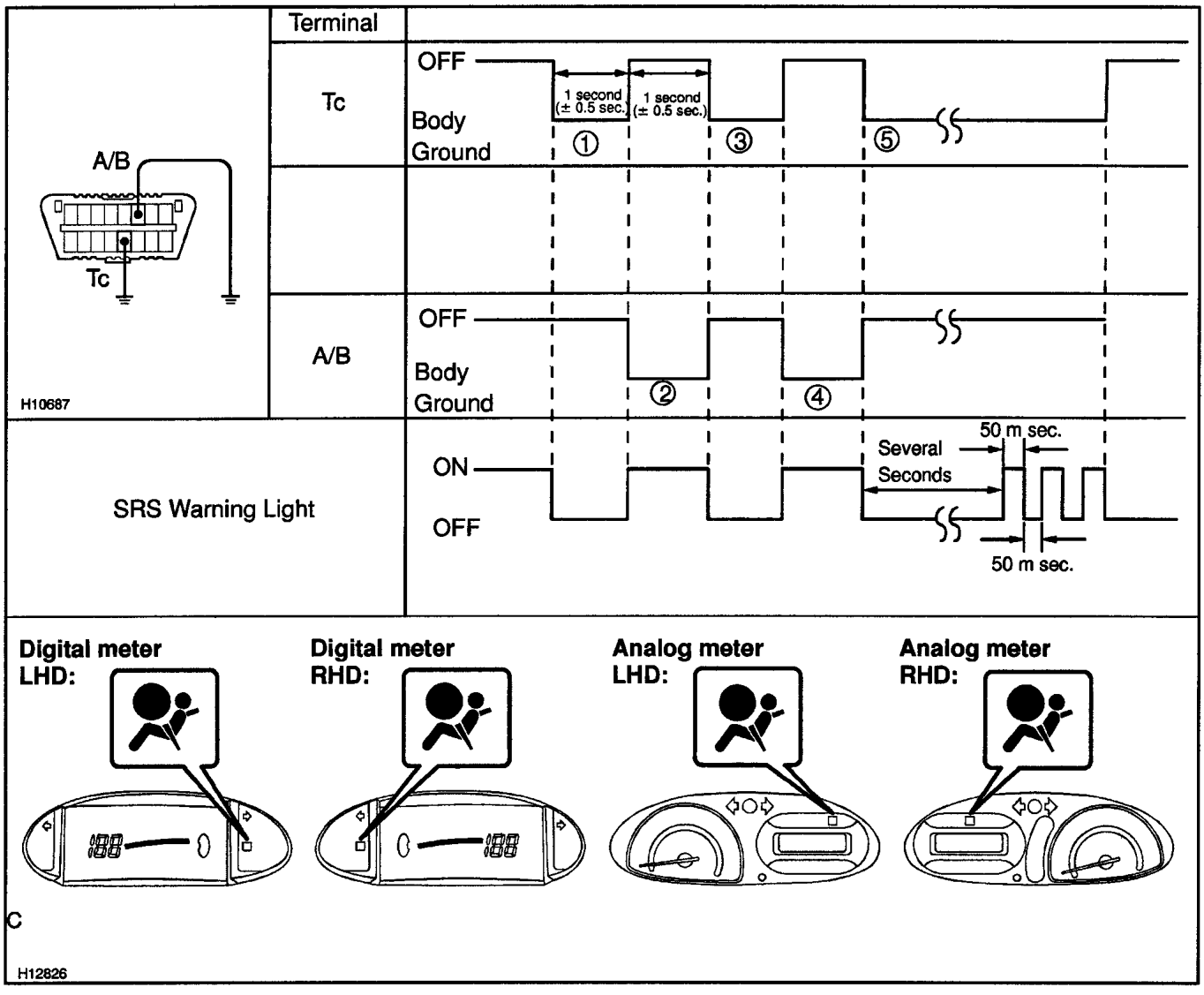
3. DTC CHECK (Using hand–held tester)
(a) Hook up the hand–held tester to the DLC3.
(b) Read the DTCs by following the prompts on the tester screen.
HINT:
Please refer to the hand–held tester operator's manual for further details.
4. DTC CLEARANCE (Not using service wire)
When the ignition switch is 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 terminals Tc and A/B of DLC3.
(b) Turn the ignition switch to ON and wait for approx. 6 seconds.

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

HINT:

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

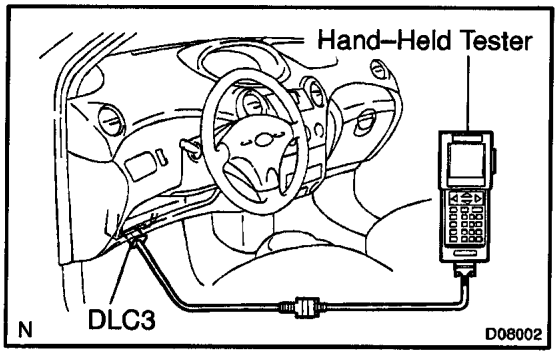
If DTCs are not cleared, repeat the above procedure until the codes are cleared.



H00934

H12905

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



6. DTC CLEARANCE (Using hand–held tester)

(a) Hook up the hand–held tester to the DLC3.

(b) Clear the DTCs by following the prompts on the tester screen.

HINT:

Please refer to the hand–held tester operation's manual for further details.

7. RELEASE METHOD OF AIRBAG ACTIVATION PREVENTION MECHANISM

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

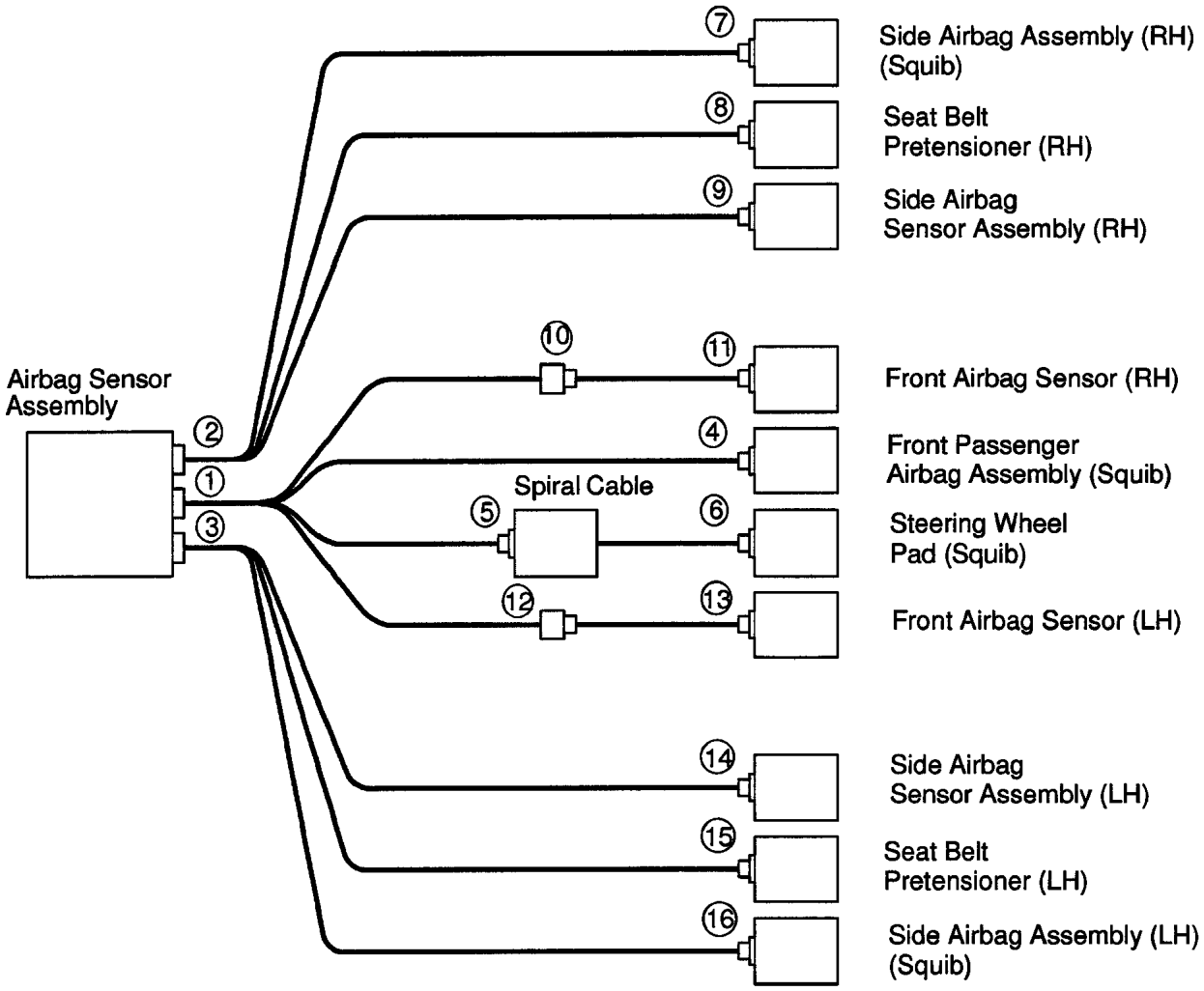
When release of the airbag activation prevention mechanism is directed in the troubleshooting procedure, as shown in the illustration of the connectors on the next pages, insert paper which has the same thickness as the male terminal between the terminal and the short spring.

CAUTION:

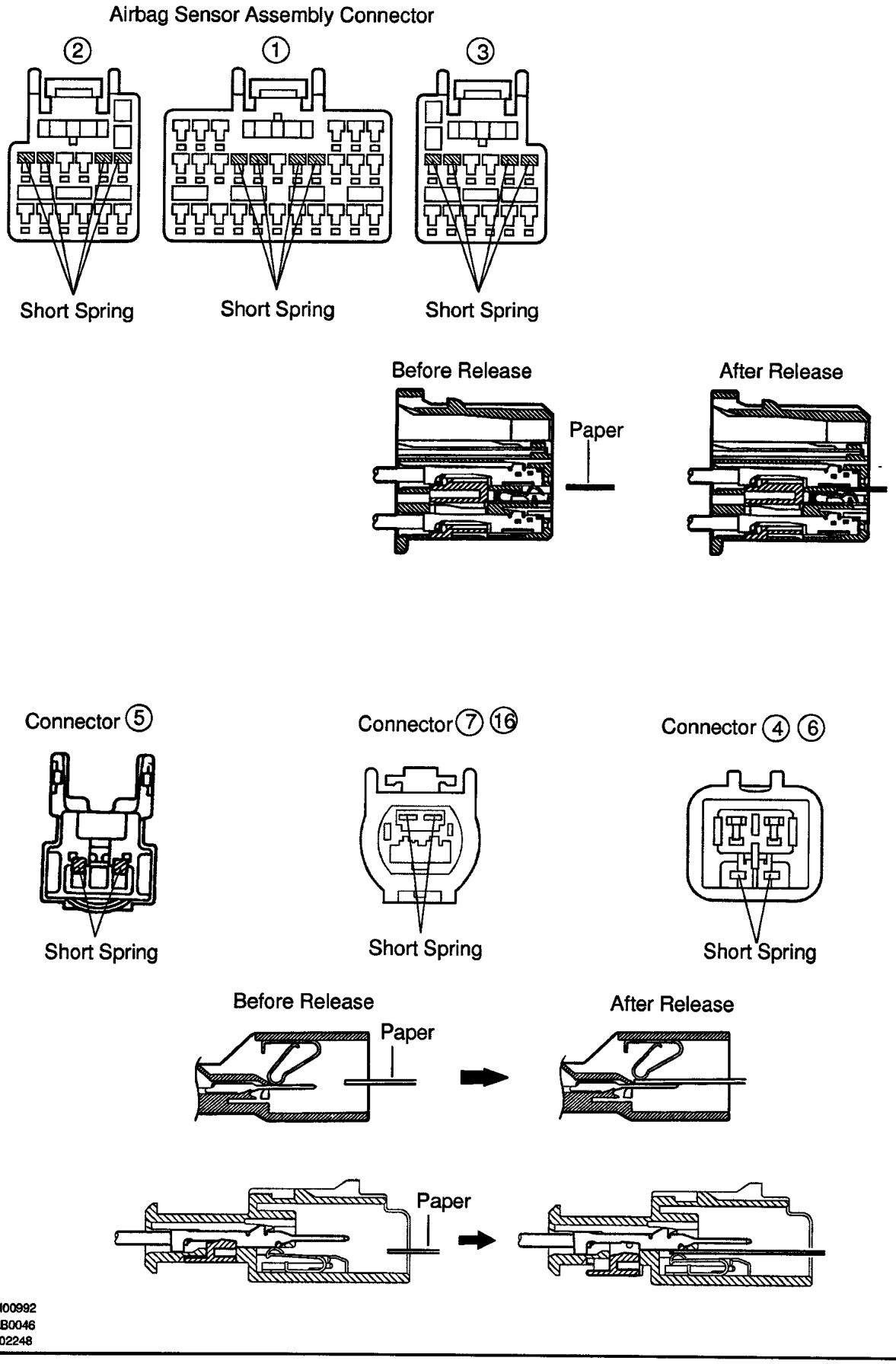
Never release the airbag activation prevention mechanism on the steering wheel pad connector.

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
2
1
3
Spiral Cable
5
10
12
7
8
9
11
4
6
13
14
15
16
Side Airbag Assembly (RH) (Squib)
Seat Belt Pretensioner (RH)
Side Airbag Sensor Assembly (RH)
Front Airbag Sensor (RH)
Front Passenger Airbag Assembly (Squib)
Steering Wheel Pad (Squib)
Front Airbag Sensor (LH)
Side Airbag Sensor Assembly (LH)
Seat Belt Pretensioner (LH)
Side Airbag Assembly (LH) (Squib)

H13449



H01356
H01233
AB0130 H00992
AB0045 AB0046
H02249 H02248

H01358

DI1AZ-13

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
B0100/13 (DI–114)	• Short in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0101/14 (DI–119)	• Open in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0102/11 (DI–123)	• Short in D and P squib circuits (to Ground)	• Steering wheel pad (squib) • Front passenger airbag assembly (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0103/12 (DI–130)	• Short in D and P squib circuits (to B+)	• Steering wheel pad (squib) • Front passenger airbag assembly (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0105/53 (DI–136)	• Short in P squib circuit	• Front passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
B0106/54 (DI–140)	• Open in P squib circuit	• Front passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
B0110/43 (DI–143)	• Short in side squib (RH) circuit	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0111/44 (DI–147)	• Open in side squib (RH) circuit	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0112/41 (DI–150)	• Short in side squib (RH) circuit (to Ground)	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0113/42 (DI–153)	• Short in side squib (RH) circuit (to B+)	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0115/47 (DI–156)	• Short in side squib (LH) circuit	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0116/48 (DI–160)	• Open in side squib (LH) circuit	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0117/45 (DI–163)	• Short in side squib (LH) circuit (to Ground)	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink

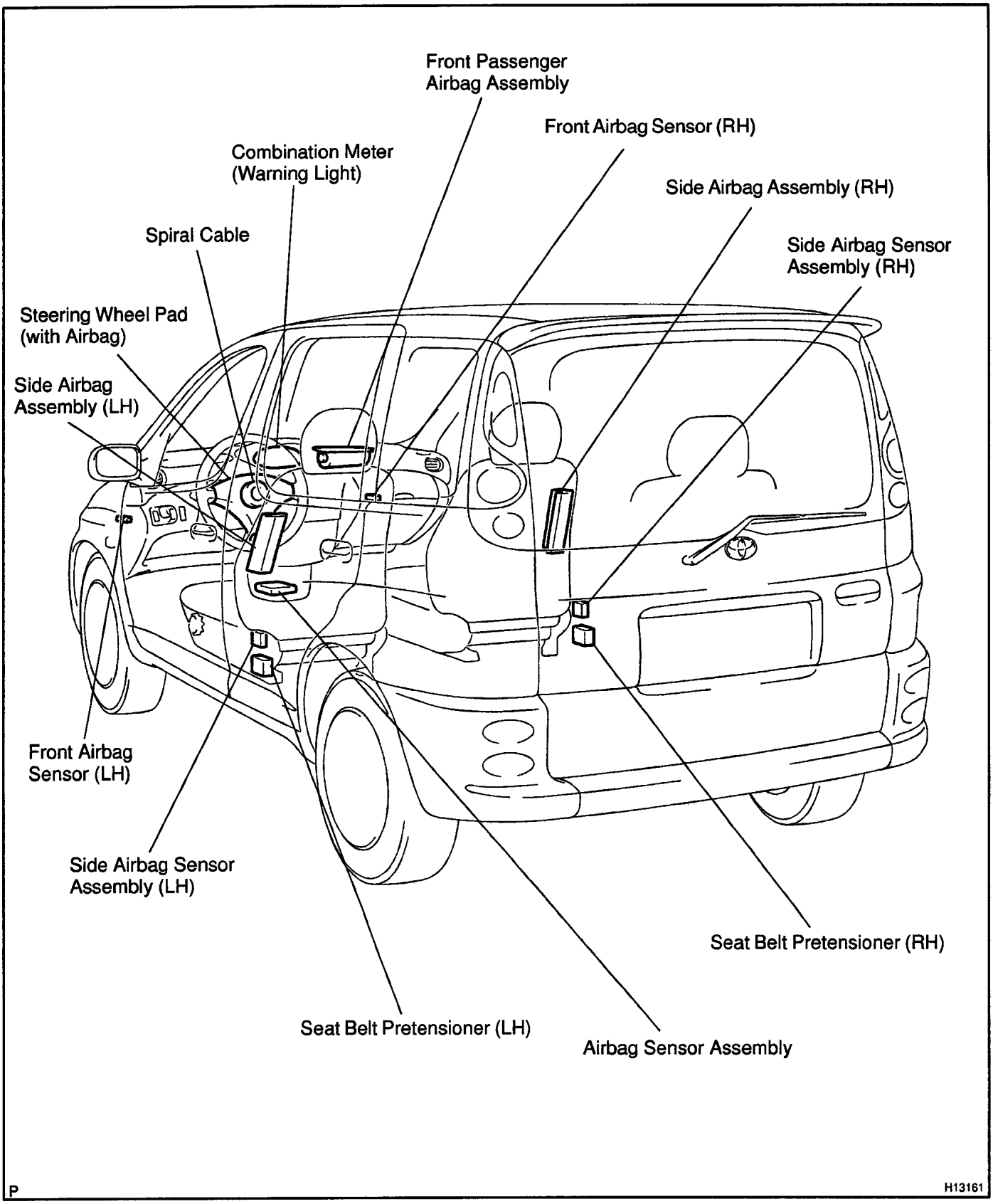
DTC No. (See Page)	Detection Item	Trouble Area	SRS Warning Light
B0118/46 (DI-166)	• Short in side squib (LH) circuit (to B+)	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0130/63 (DI-169)	• Short in P/T squib (RH) circuit	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0131/64 (DI-173)	• Open in P/T squib (RH) circuit	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0132/61 (DI-176)	• Short in P/T squib circuits (to Ground)	• Seat belt pretensioner (squib) • Airbag sensor assembly • Wire harness	Blink
B0133/62 (DI-182)	• Short in D, P, side and P/T squib (RH) circuits (to B+)	• Steering wheel pad (squib) • Front passenger airbag assembly (squib) • Side airbag assembly (squib) • Seat belt pretensioner (squib) • Airbag sensor assembly • Wire harness	Blink
B0135/73 (DI-187)	• Short in P/T squib (LH) circuit	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0136/74 (DI-191)	• Open in P/T squib (LH) circuit	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
B1100/31 (DI-194)	• Airbag sensor assembly malfunction	• Airbag sensor assembly	ON
B1140/32 (DI-196)	• Side airbag sensor assembly (RH) malfunction	• Side airbag sensor assembly (RH) • Airbag sensor assembly • Wire harness	Blink
B1141/33 (DI-204)	• Side airbag sensor assembly (LH) malfunction	• Side airbag sensor assembly (LH) • Airbag sensor assembly • Wire harness	Blink
B1156/B1157/15 (DI-212)	• Front airbag sensor (RH) malfunction	• Front airbag sensor (RH) • Airbag sensor assembly • Wire harness • Engine room main wire haness	ON
B1158/B1159/16 (DI-220)	• Front airbag sensor (LH) malfunction	• Front airbag sensor (LH) • Airbag sensor assembly • Wire harness • Engine room main wire harness	ON
Normal (DI-228)	• 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.

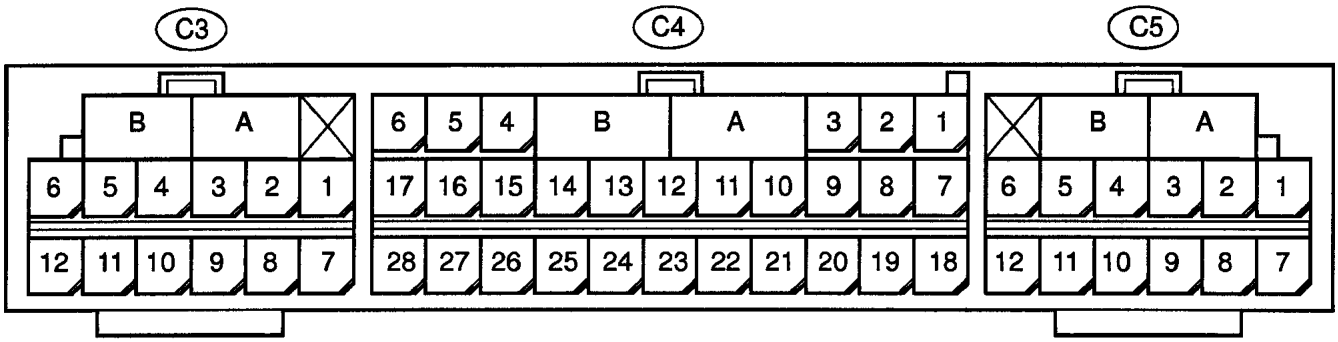
DI1B0-14

PARTS LOCATION



DI1HE-21

TERMINALS OF ECU



H01357

No.	Symbol	Terminal Name
A	–	Electrical Connector Check Mechanism
B	–	Electrical Connector Check Mechanism
C4 – 3	LA	SRS Warning Light
C4 – 5	IG2	Power Source (IGN Fuse)
C4 – 6	IG1	Power Source (CIG Fuse)
C4 – 9	+SR	Front Airbag Sensor (RH)
C4 – 10	P+	Squib (Passenger)
C4 – 11	P–	Squib (Passenger)
C4 – 12	SIL	Diagnosis
C4 – 13	D–	Squib (Driver)
C4 – 14	D+	Squib (Driver)
C4 – 15	+SL	Front Airbag Sensor (LH)
C4 – 19	Tc	Diagnosis
C4 – 20	–SR	Front Airbag Sensor (RH)
C4 – 26	–SL	Front Airbag Sensor (LH)
C4 – 27	E1	Ground
C4 – 28	E2	Ground
C3 – 1	PL–	Squib (Seat Belt Pretensioner, LH)
C3 – 2	PL+	Squib (Seat Belt Pretensioner, LH)
C3 – 5	SFL+	Squib (Side, LH)
C3 – 6	SFL–	Squib (Side, LH)
C3 – 7	VUPL	Side Airbag Sensor Assembly (LH)
C3 – 9	SSL	Side Airbag Sensor Assembly (LH)
C3 – 10	FSL	Side Airbag Sensor Assembly (LH)
C3 – 12	ESL	Side Airbag Sensor Assembly (LH)

No.	Symbol	Terminal Name
C5 – 1	SFR–	Squib (Side, RH)
C5 – 2	SFR+	Squib (Side, RH)
C5 – 5	PR+	Squib (Pretensioner, RH)
C5 – 6	PR–	Squib (Pretensioner, RH)
C5 – 7	ESR	Side Airbag Sensor Assembly (RH)
C5 – 9	FSR	Side Airbag Sensor Assembly (RH)
C5 – 10	SSR	Side Airbag Sensor Assembly (RH)
C5 – 12	VUPR	Side Airbag Sensor Assembly (RH)

DI164-26

PROBLEM SYMPTOMS TABLE

Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
• With the ignition switch in ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed.	• SRS warning light circuit	DI–231
• SRS warning light is always lit up even when ignition switch is in the LOCK position.		
• With the ignition switch in ON position, the SRS warning light does not light up.		
• DTC is not displayed.	• Tc terminal circuit	DI–236
• SRS warning light is always lit up at the time of DTC check procedure.		
• DTC is displayed without Tc and CG terminal connection.		

DI18Q-21

CIRCUIT INSPECTION

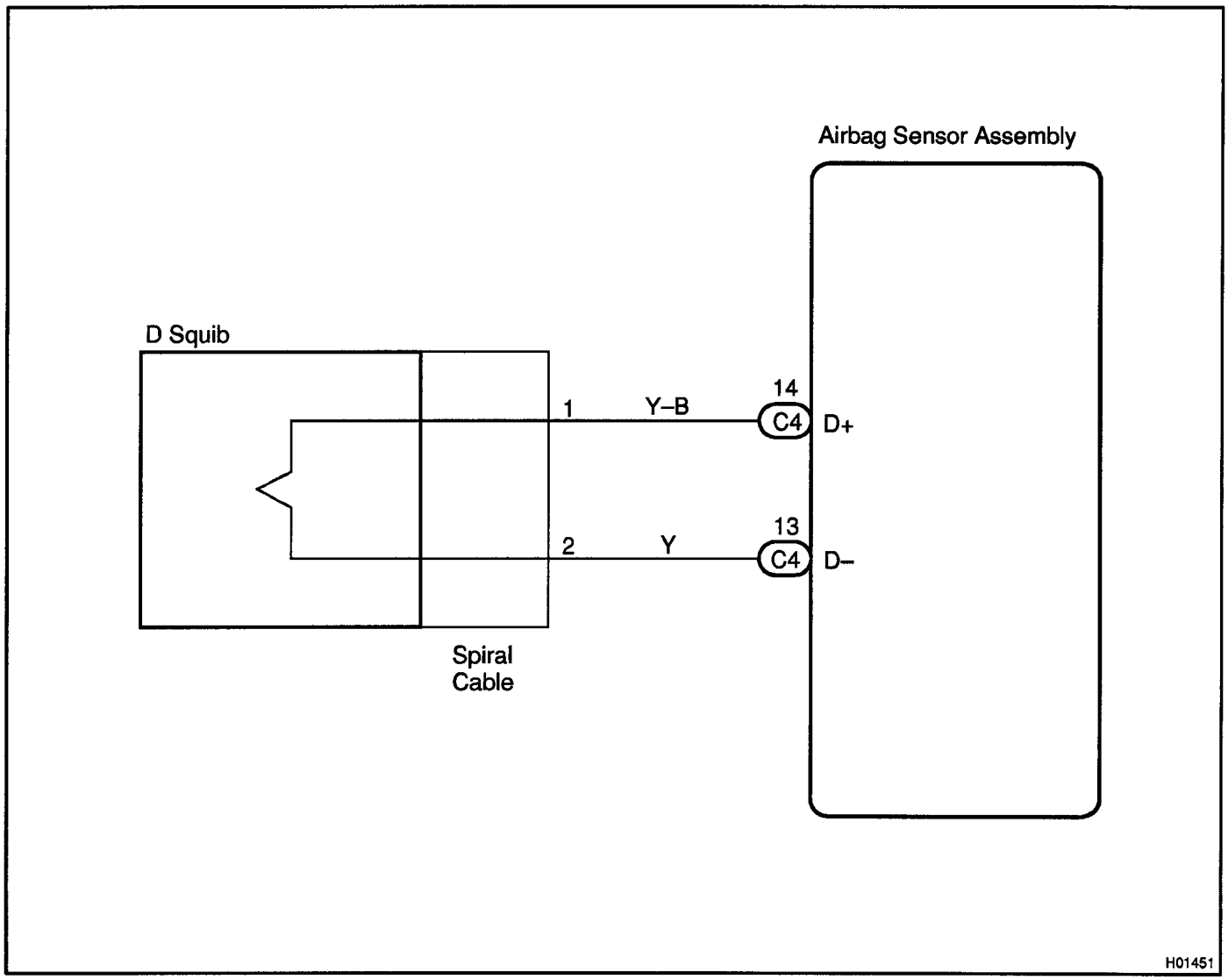
DTC	B0100/13	Short in D Squib Circuit

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 B0100/13 is recorded when a short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0100/13	• 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

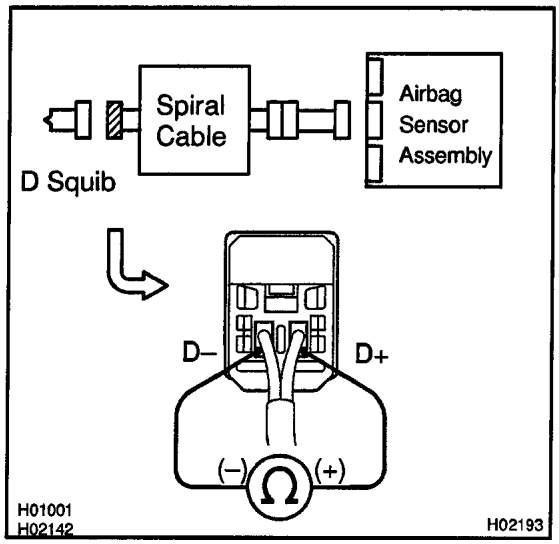
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check D squib circuit.**



PREPARATION:
Release the 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–102)

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–.

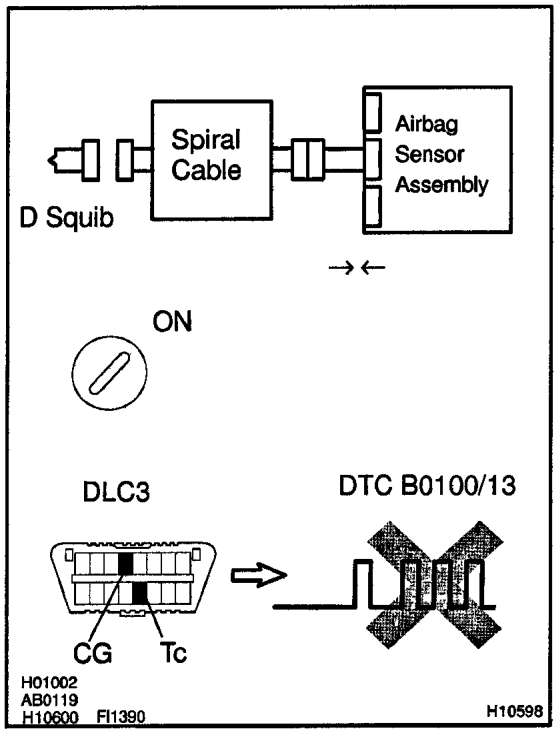
OK:

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 the ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0100/13 is not output.

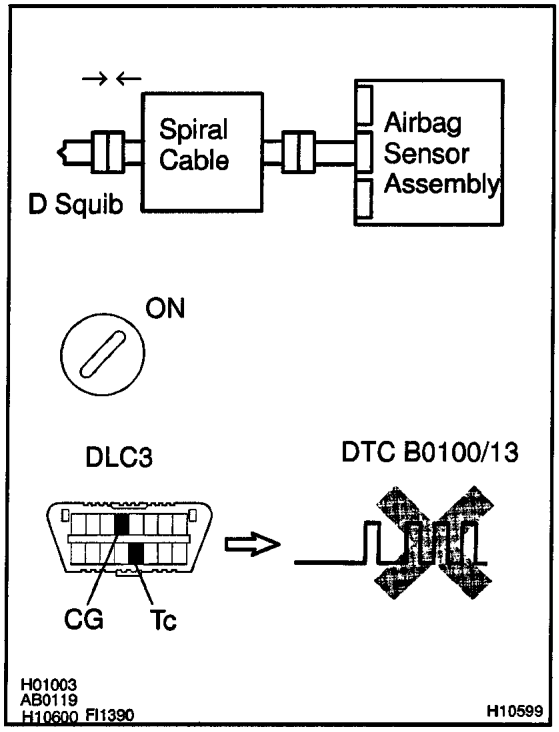
HINT:

Codes other than code B0100/13 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check D squib.



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory. (See page DI–102)
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check DTC. (See page DI–102)

OK:

DTC B0100/13 is not output.

HINT:

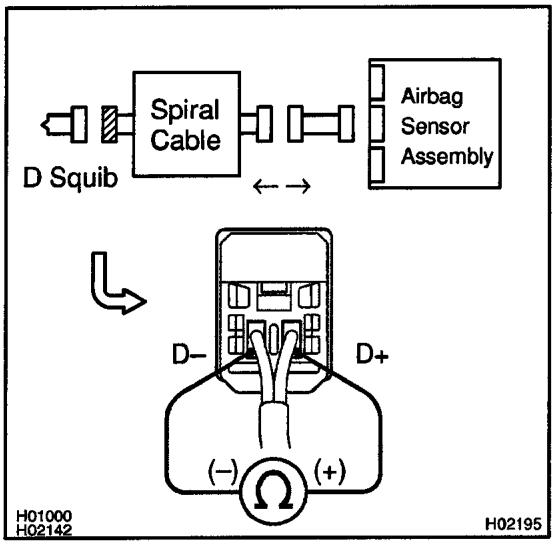
Codes other than code B0100/13 may be output at this time, but they are not relevant to this check.

NG → **Replace 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 the airbag activation prevention mechanism of the spiral cable connector on the airbag sensor assembly side. (See page DI–102)

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–.

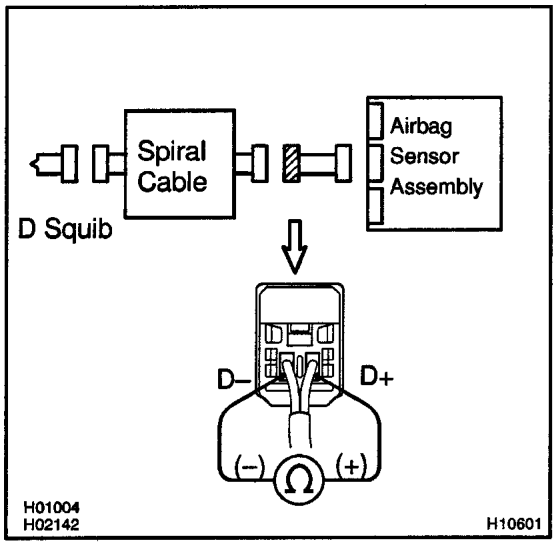
OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace spiral cable.

OK

6	Check harness between airbag sensor assembly and spiral cable.



PREPARATION:

Release the 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–102)

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.

DI16R-30

DTC	B0101/14	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 B0101/14 is recorded when an open is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0101/14	• 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

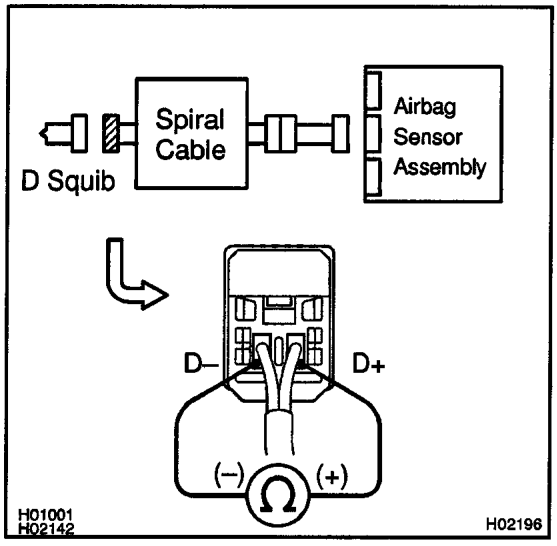
WIRING DIAGRAM

See page DI–114.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–228)

2	Check D squib circuit.

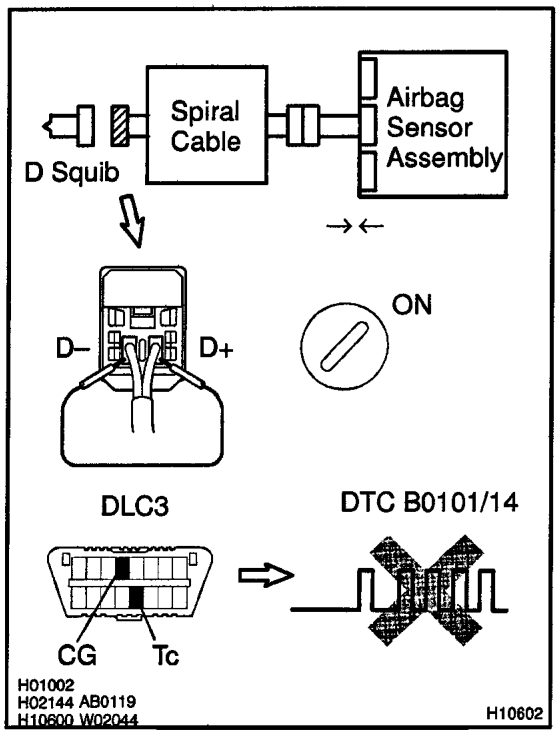


CHECK:
For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.
OK:
Resistance: Below 1 Ω

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 the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0101/14 is not output.

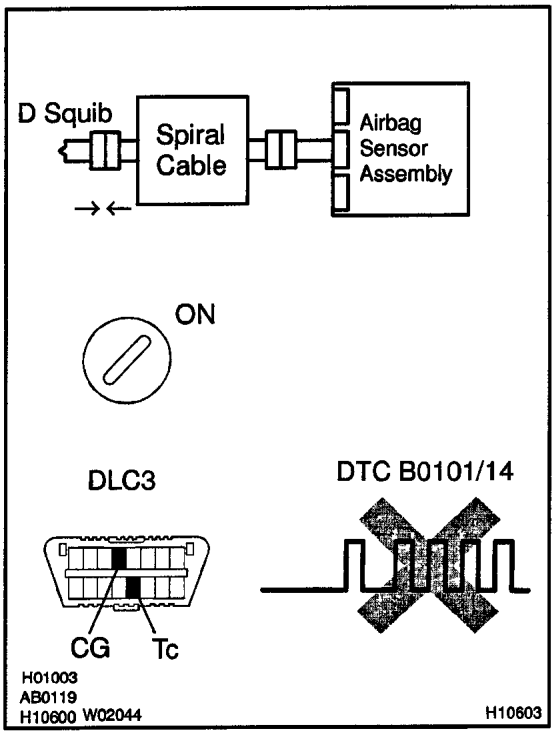
HINT:

Codes other than code B0101/14 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check D squib.



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0101/14 is not output.

HINT:

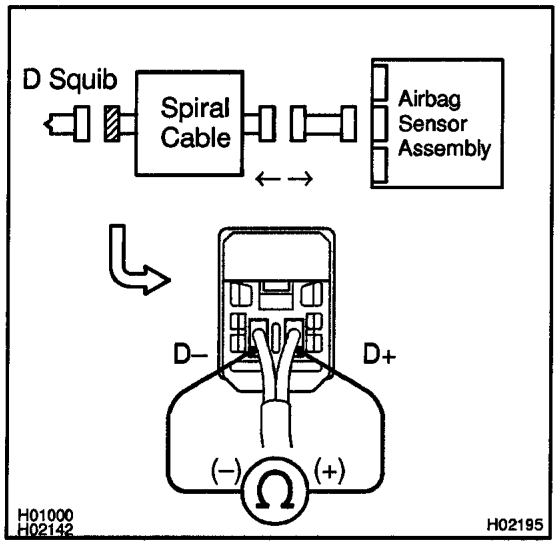
Codes other than code B0101/14 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

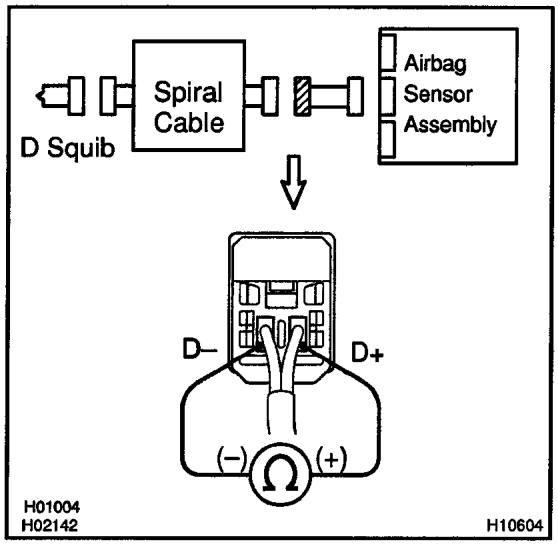


PREPARATION:
Disconnect the connector between the airbag sensor assembly and the spiral cable.
CHECK:
For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.
OK:
Resistance: Below 1 Ω

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.

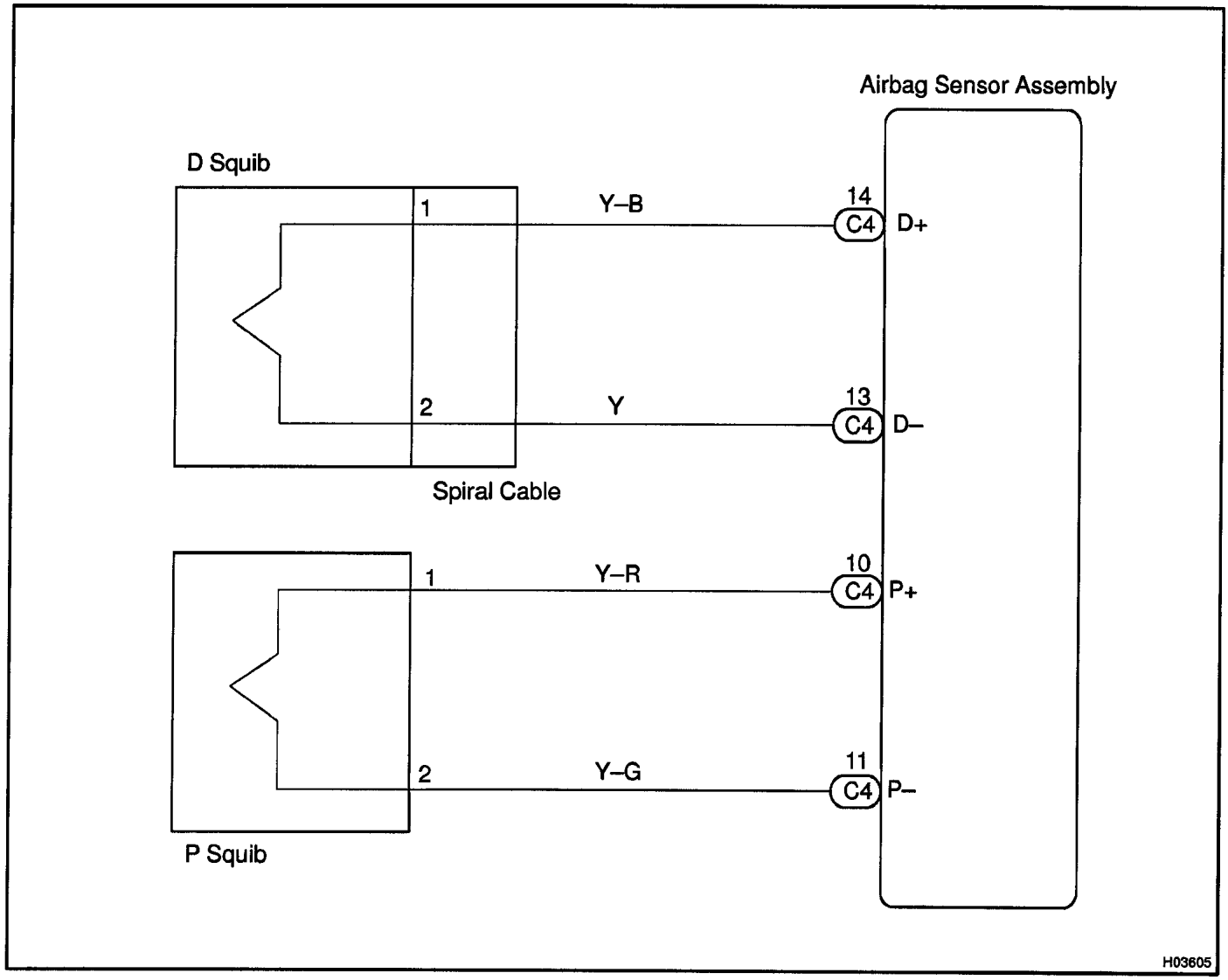
DTC	B0102/11	Short in D Squib Circuit (to Ground) (possible for P squib)

CIRCUIT DESCRIPTION

The D and P squib circuits consist of the airbag sensor assembly, spiral cable, steering wheel pad 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 B0102/11 is recorded when ground short is detected in the D and P squib circuits.

DTC No.	DTC Detecting Condition	Trouble Area
B0102/11	• Short circuit in D squib wire harness (to ground) • Short circuit in P squib wire harness (to ground) • D squib malfunction • P squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Front passenger airbag assembly (P squib) • Spiral cable • Airbag sensor assembly • Wire harness

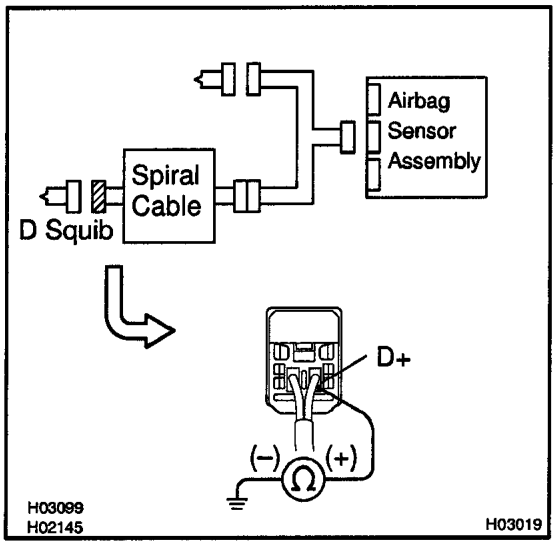
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	Check D squib circuit.



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

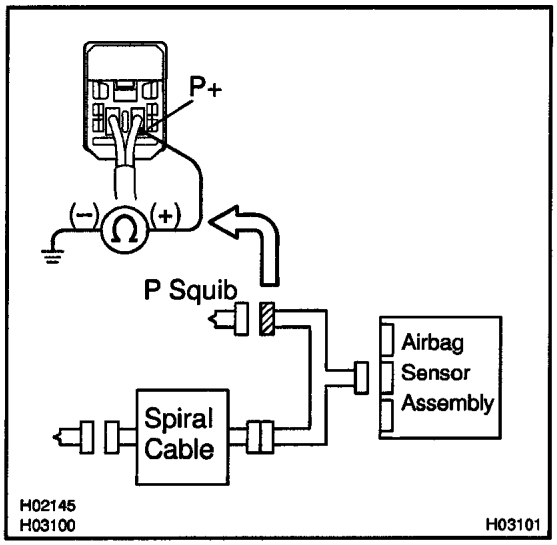
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 7.**

OK

3	Check P squib circuit.



CHECK:
For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and airbag sensor assembly, measure the resistance between P+ and body ground.

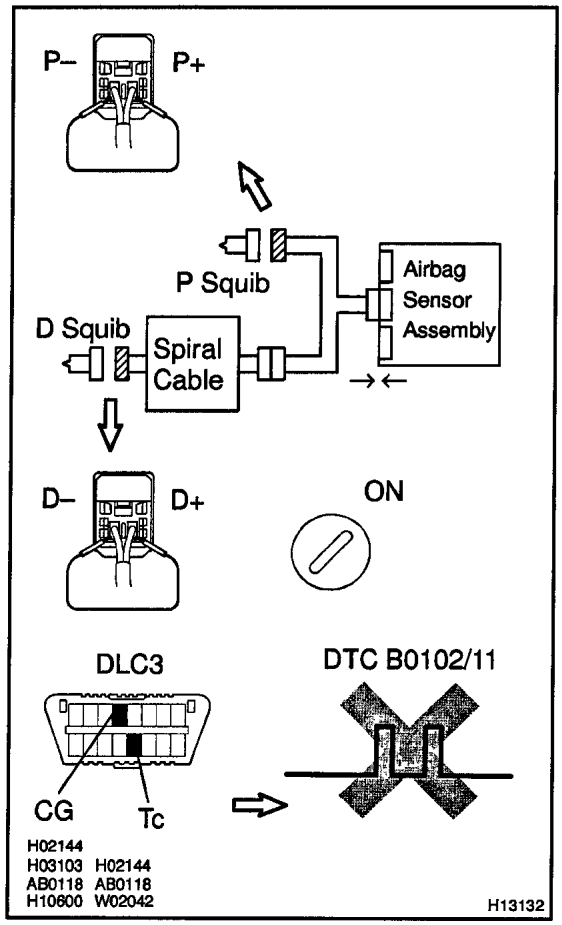
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

4	**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 steering wheel pad.
(c) 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 airbag sensor assembly.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least 20 seconds.
(d) Turn ignition switch to ON, and wait at least 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0102/11 is not output.

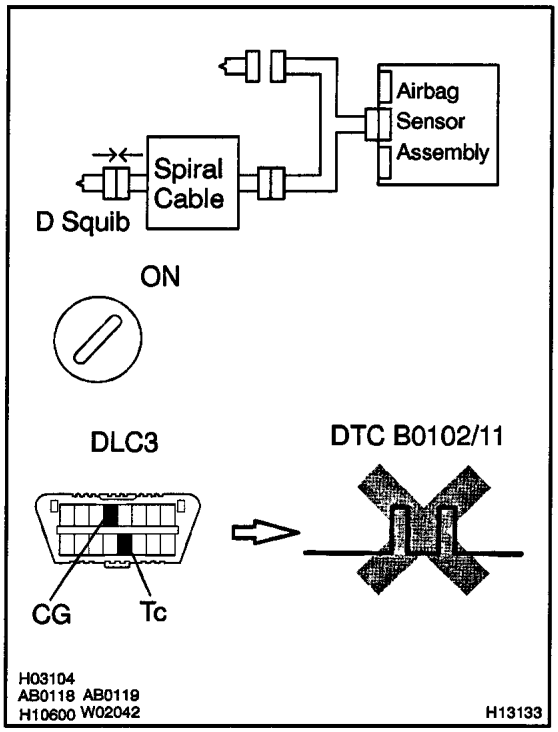
HINT:

Codes other than DTC B0102/11 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

5	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 ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

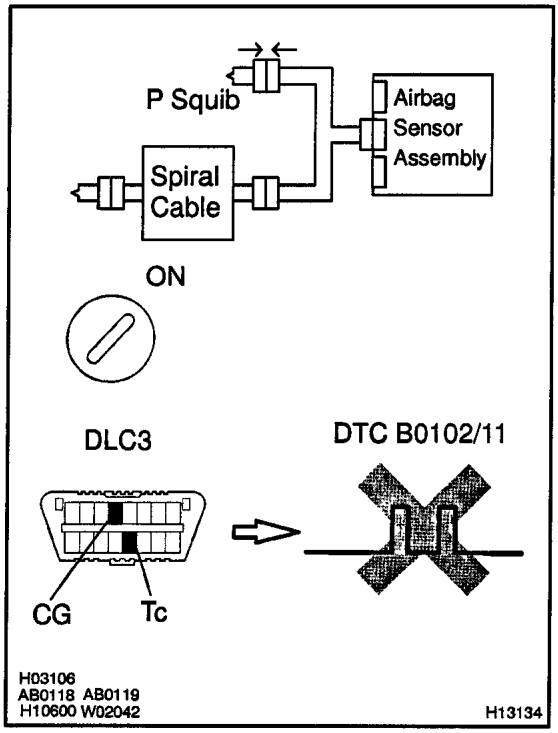
DTC B0102/11 is not output.

HINT:
Codes other than DTC B0102/11 may be output at this time, but they are not relevant to this check.

NG → **Replace steering wheel pad.**

OK

6	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 ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0102/11 is not output.

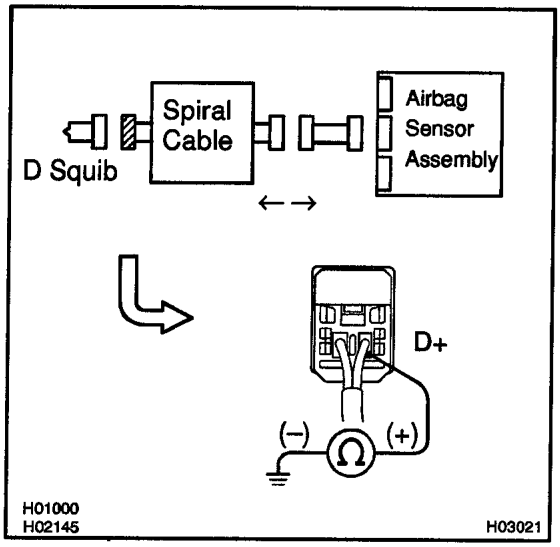
HINT:
Codes other than DTC B0102/11 may be output at this time, but they are not relevant to this check.

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.

7	Check spiral cable.



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

CHECK:
For the connector (on the spiral cable side) between the steering wheel pad and 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 the airbag sensor assembly and spiral cable.

DTC	B0103/12	Short in D Squib Circuit (to B+) (possible for P squib)

CIRCUIT DESCRIPTION

The D and P squib circuits consist of the airbag sensor assembly, spiral cable, steering wheel pad 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 page OPERATION on page RS–2.
DTC B0103/12 is recorded when B+ short is detected in the D and P squib circuits.

DTC No.	DTC Detecting Condition	Trouble Area
B0103/12	• Short circuit in D squib wire harness (to B+) • Short circuit in P squib wire harness (to B+) • D squib malfunction • P squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Front passenger airbag assembly (P squib) • Spiral cable • Airbag sensor assembly • Wire harness

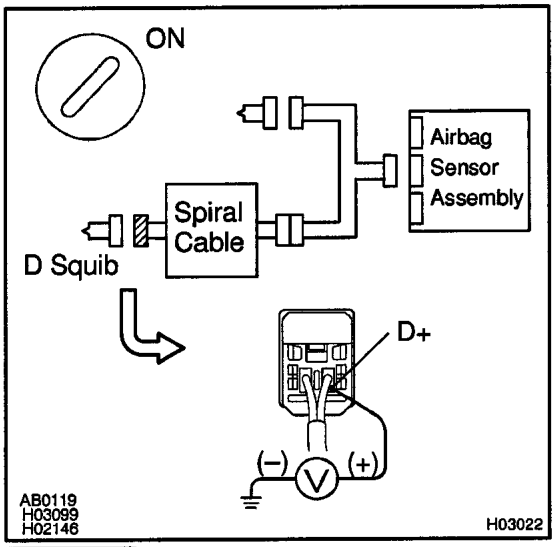
WIRING DIAGRAM

See page DI–123.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–228)

2	Check D squib circuit.

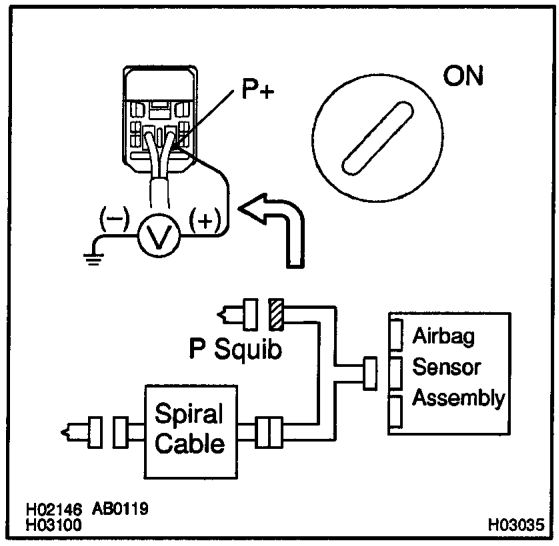


PREPARATION:
Turn ignition switch ON
CHECK:
For the connector (on the spiral cable side) between the spiral cable and steering wheel pad, measure the voltage between D+ and body ground.
OK:
Voltage: Below 1 V

NG → **Go to step 7.**

OK

3	Check P squib circuit.



CHECK:

For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and airbag sensor assembly, measure the voltage between P+ and body ground.

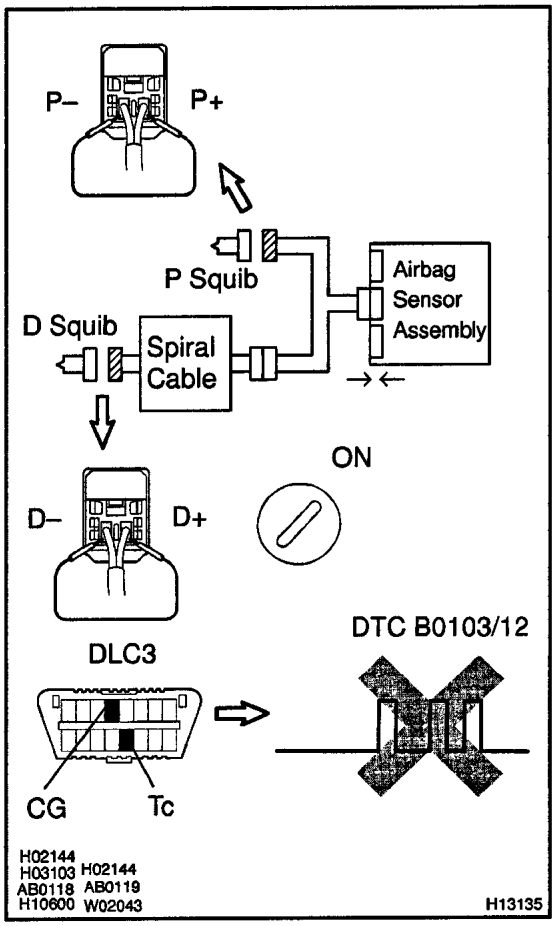
OK:

Voltage: Below 1 V

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK →

4	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 steering wheel pad.
(c) 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 airbag sensor.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

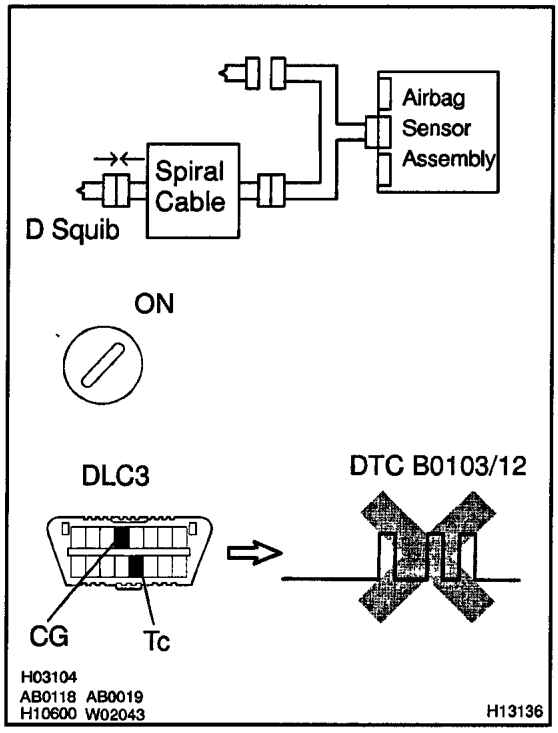
DTC B0103/12 is not output.

HINT:
Codes other than DTC B0103/12 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

5	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 ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0103/12 is not output.

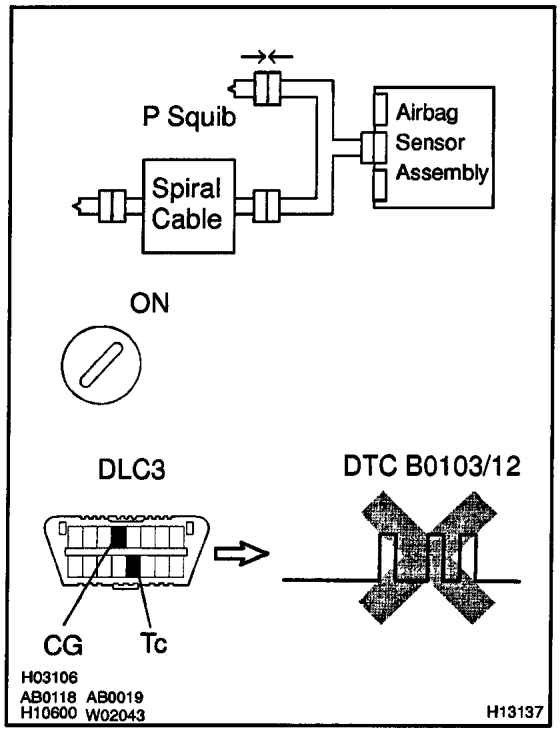
HINT:

Codes other than DTC B0103/12 may be output at this time, but they are not relevant to this check.

NG → **Replace steering wheel pad.**

OK

6	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 connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0103/12 is not output.

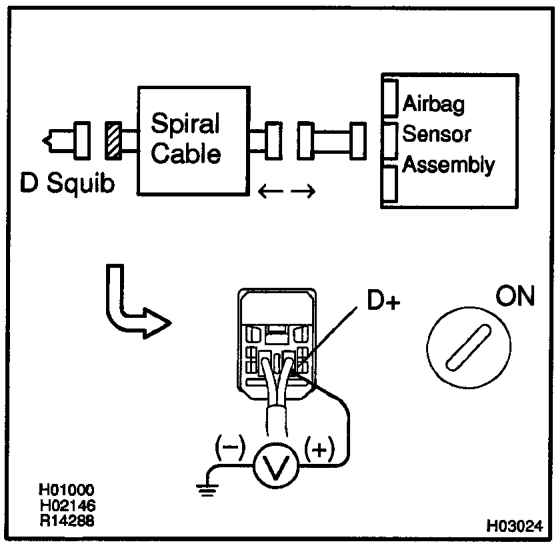
HINT:
Codes other than DTC B0103/12 may be output at this time, but they are not relevant to this check.

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.

7	Check spiral cable.



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect the connector between the airbag sensor assembly and spiral cable.
(c) Turn ignition switch ON.

CHECK:

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

OK:

Voltage: Below 1 V

NG → **Repair or replace spiral cable.**

OK →

Repair or replace harness or connector between the airbag sensor assembly and spiral cable.

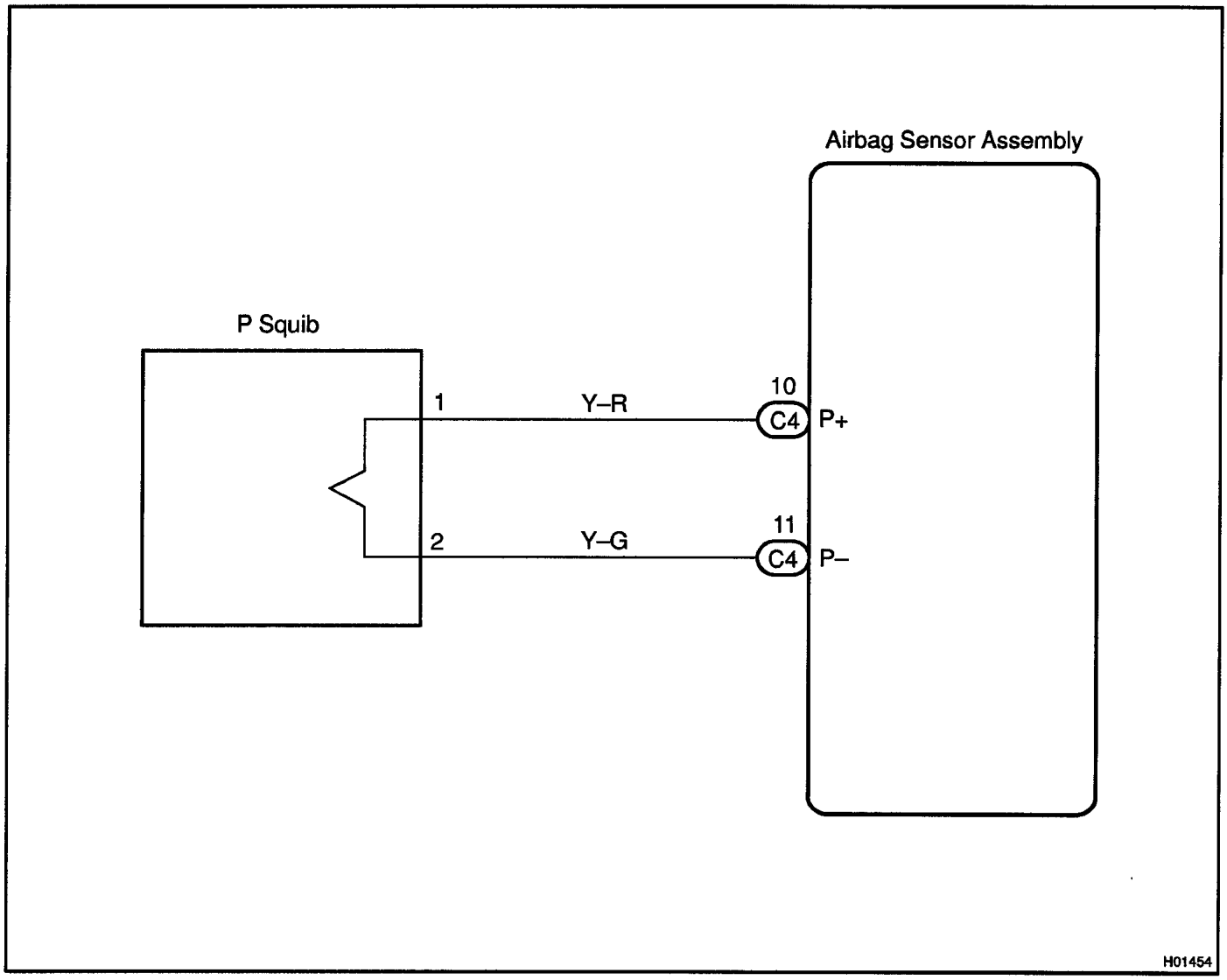
DTC	B0105/53	Short in P Squib Circuit

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 B0105/53 is recorded when a short is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0105/53	• 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

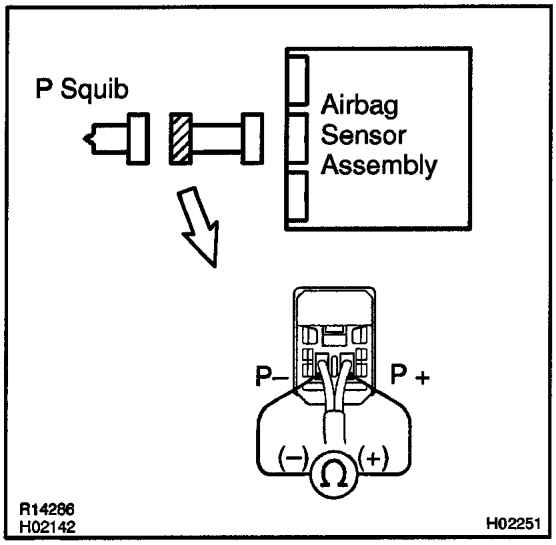
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check P squib circuit.**



PREPARATION:
Release the 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–102)

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–.

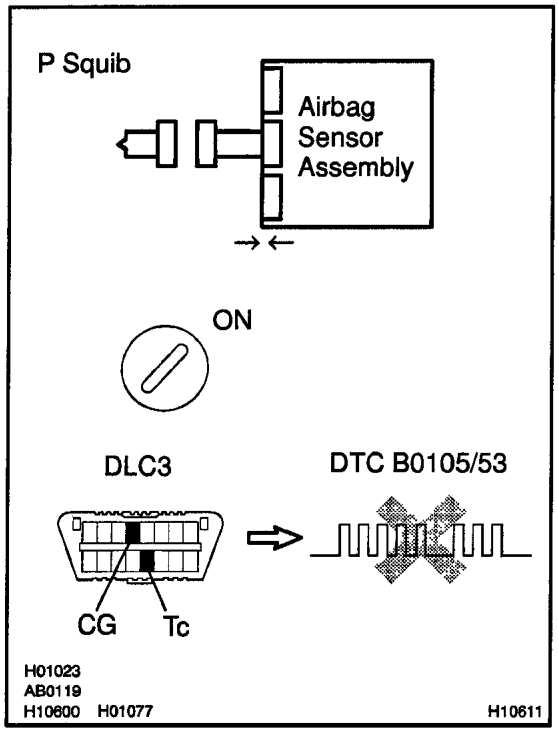
OK:

Resistance: 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) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0105/53 Is not output.

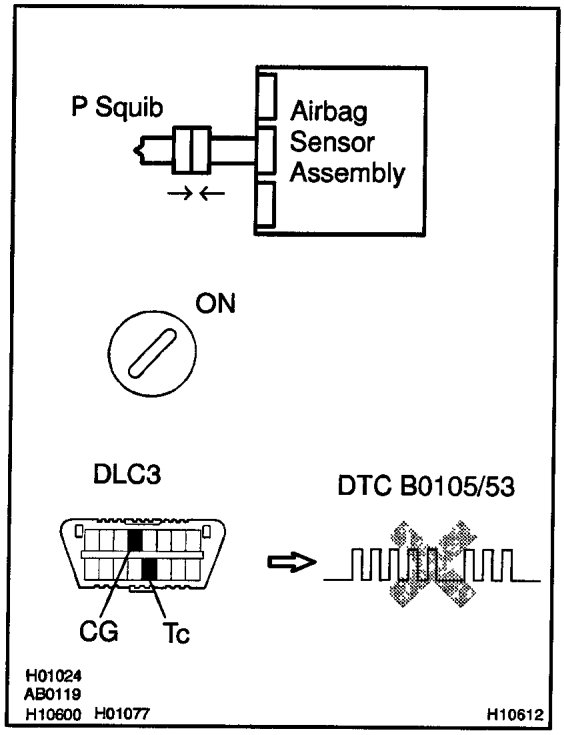
HINT:

Codes other than code B0105/53 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	**Check P squib.**



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory. (See page DI–102)
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check DTC. (See page DI–102)

OK:

DTC B0105/53 is not output.

HINT:

Codes other than code B0105/53 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DI1B7-28

DTC	B0106/54	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 B0106/54 is recorded when an open is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0106/54	• Open circuit in P+ 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

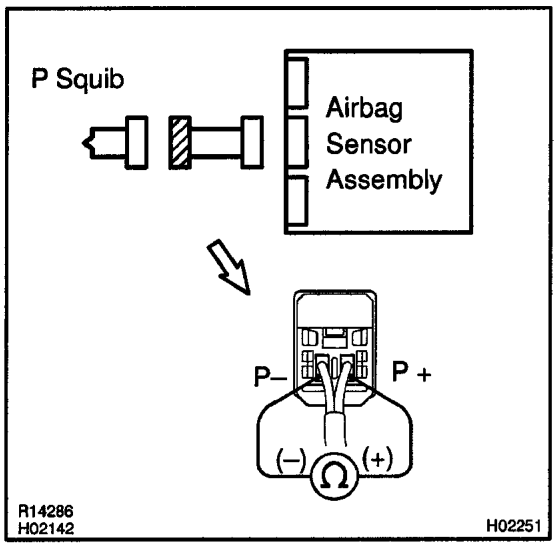
WIRING DIAGRAM

See page DI–136.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

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–.

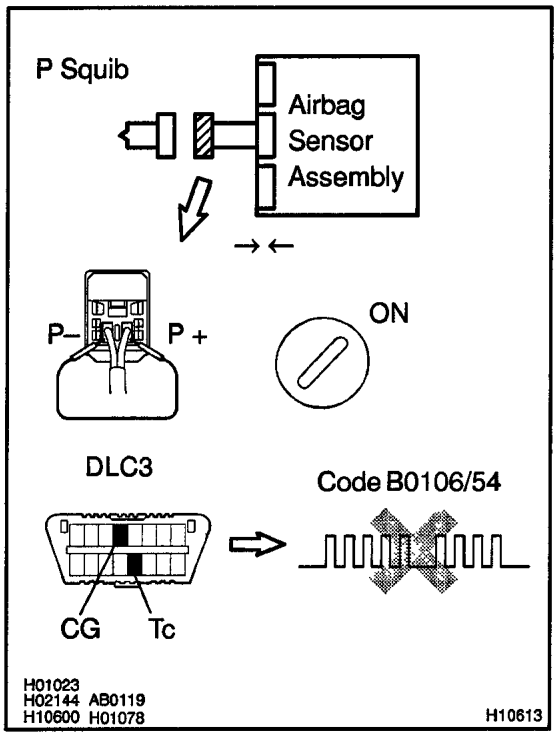
OK:

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 the ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0106/54 is not output.

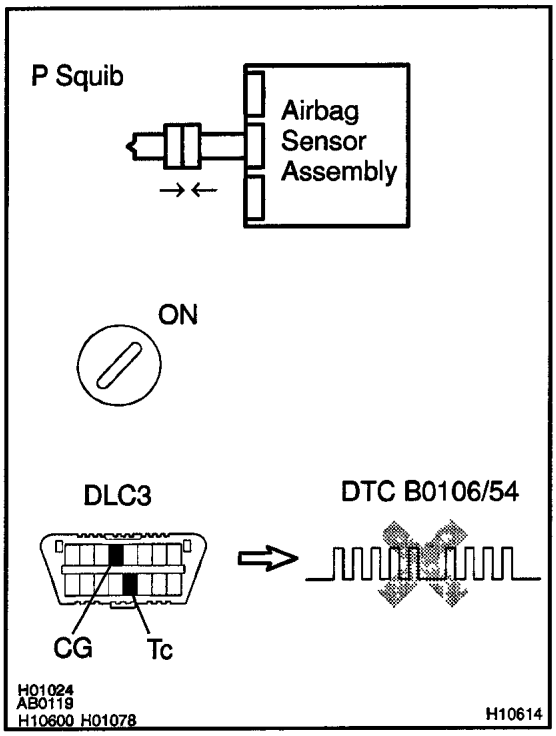
HINT:

Codes other than code B0106/54 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P squib.



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0106/54 is not output.

HINT:

Codes other than code B0106/54 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DI1NC–11

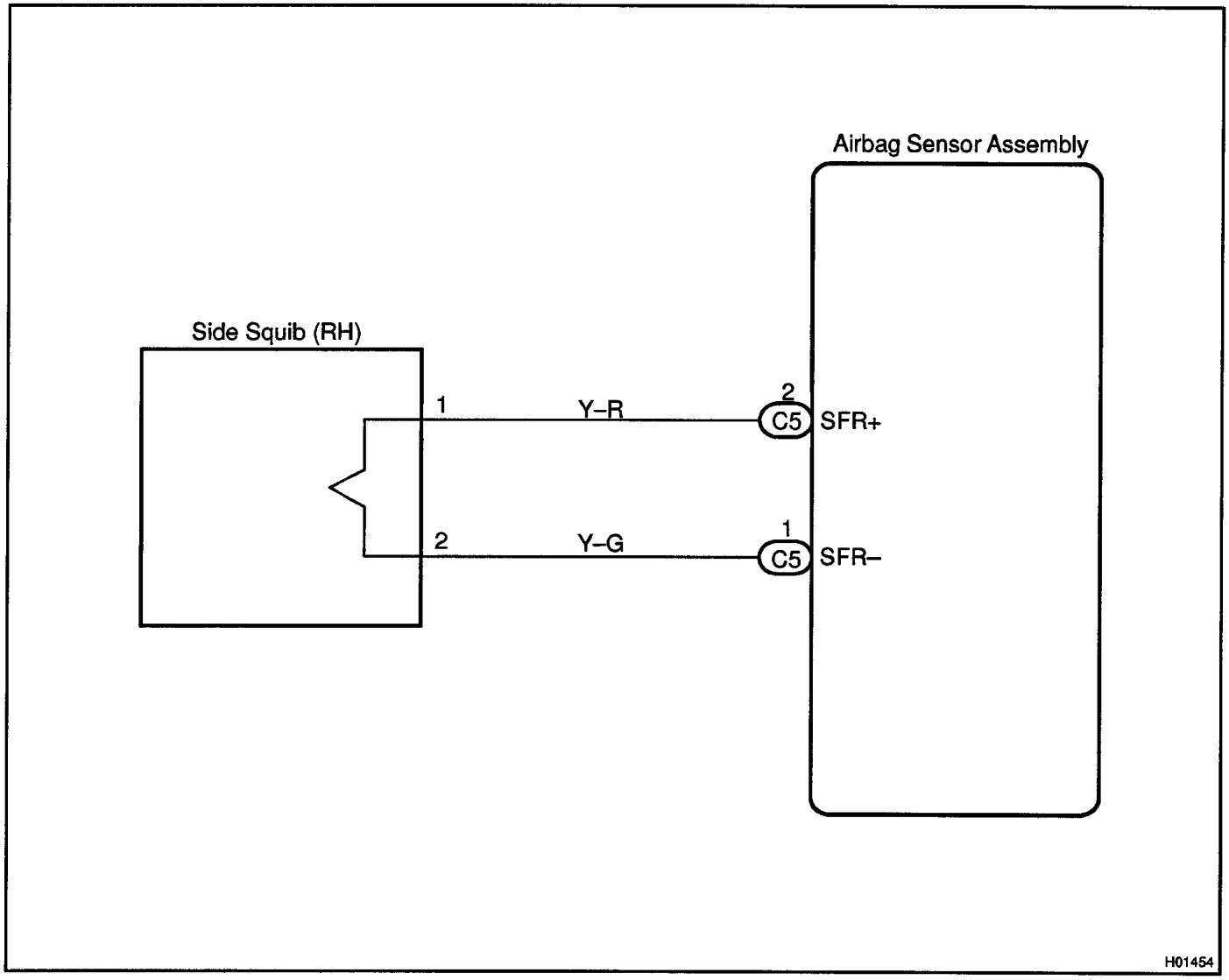
DTC	B0110/43	Short in Side Squib (RH) Circuit

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 B0110/43 is recorded when a short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0110/43	• 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

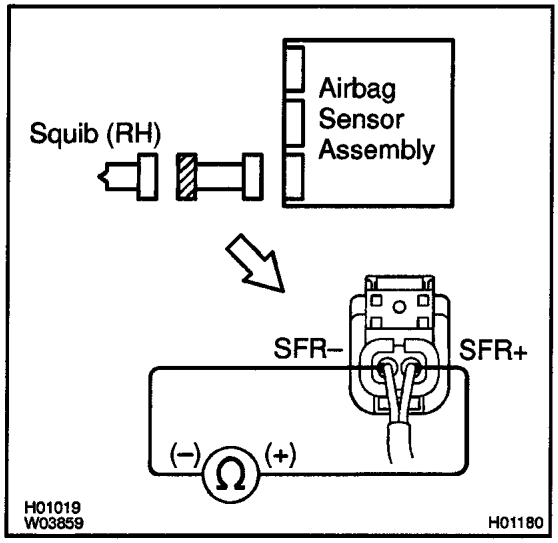
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check side squib (RH) circuit.**



PREPARATION:
Release the 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–102)

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–.

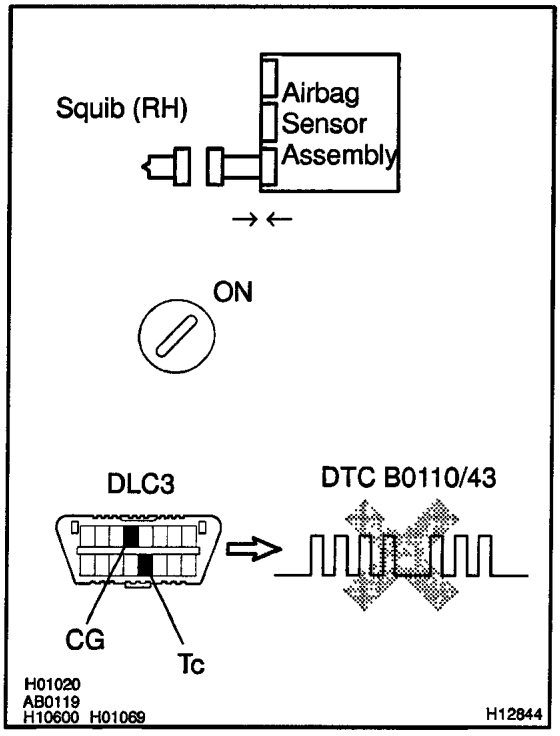
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side airbag assembly (RH) and airbag sensor assembly.**

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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0110/43 is not output.

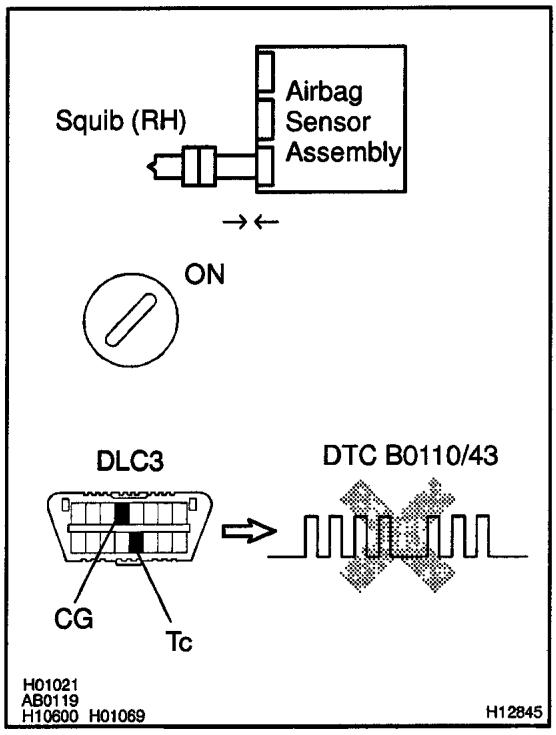
HINT:

Codes other than code B0110/43 may be output at this time, but they are not relevant to this check.

NG → **Replace 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 ON and wait at least for 20 seconds.
(c) Clear DTC stored in memory. (See page DI–102)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ON and wait at least for 20 seconds.
(f) Check DTC. (See page DI–102)

OK:

DTC B0110/43 is not output.

HINT:

Codes other than code B0110/43 may be output at this time, but they are not relevant to this check.

NG	Replace 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.

DI1ND-10

DTC	B0111/44	Open 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 B0111/44 is recorded when an open is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0111/44	• Open circuit in SFR+ wire harness or SFR– wire harness of squib • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

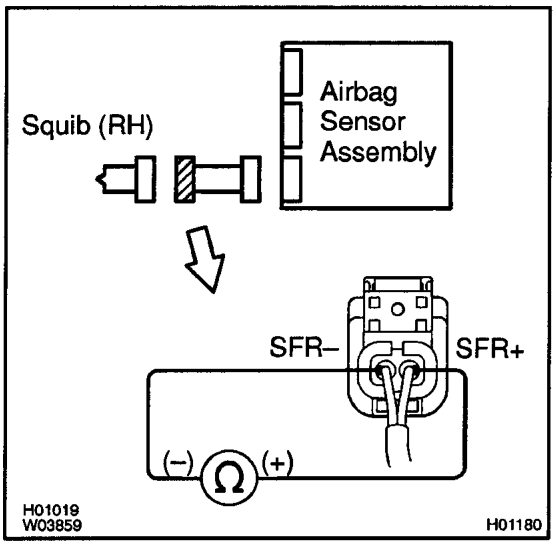
WIRING DIAGRAM

See page DI–143.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

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–.

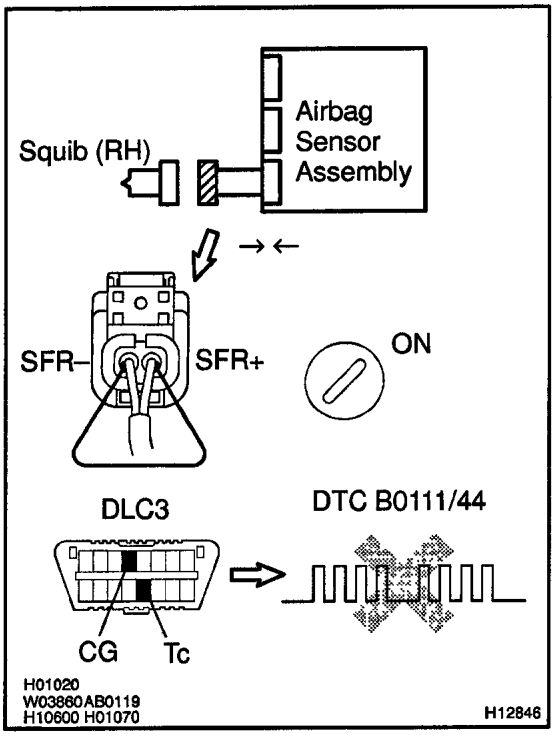
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side 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 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 ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory. (See page DI–102)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ON and wait at least for 20 seconds.

(e) Check DTC. (See page DI–102)

OK:

DTC B0111/44 is not output.

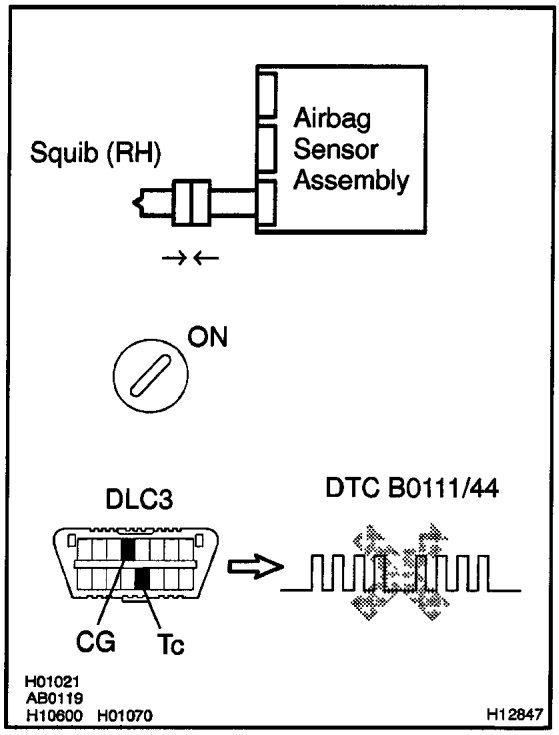
HINT:

Codes other than code B0111/44 may be output at this time, but they are not relevant to this check.

NG → **Replace 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0111/44 is not output.

HINT:

Codes other than code B0111/44 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DTC	B0112/41	Short in Side Squib (RH) Circuit (to Ground)

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 B0112/41 is recorded when a ground short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0112/41	• 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

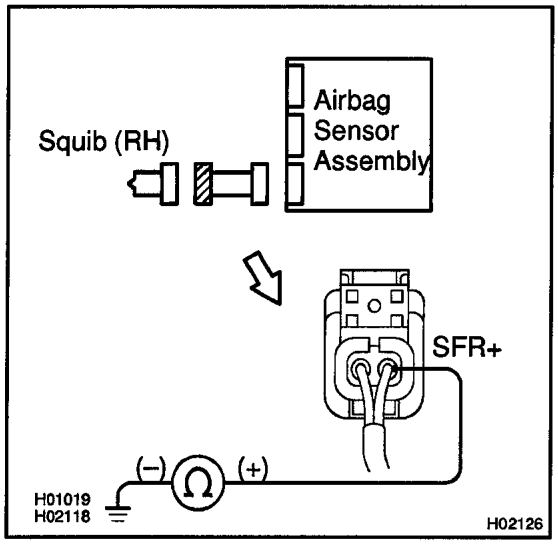
WIRING DIAGRAM

See page DI–143.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check side squib (RH) circuit.**

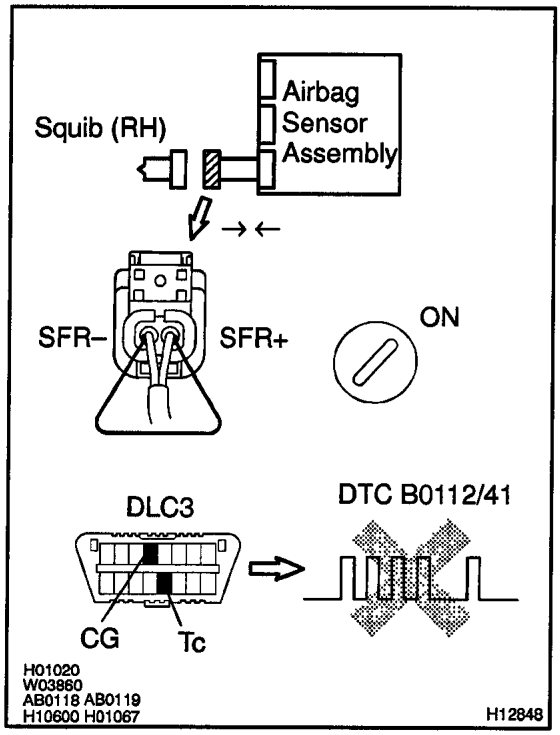


CHECK:
For the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the resistance between SFR+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side 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 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 ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–102)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ON and wait at least for 20 seconds.

(e) Check DTC. (See page DI–102)

OK:

DTC B0112/41 is not output.

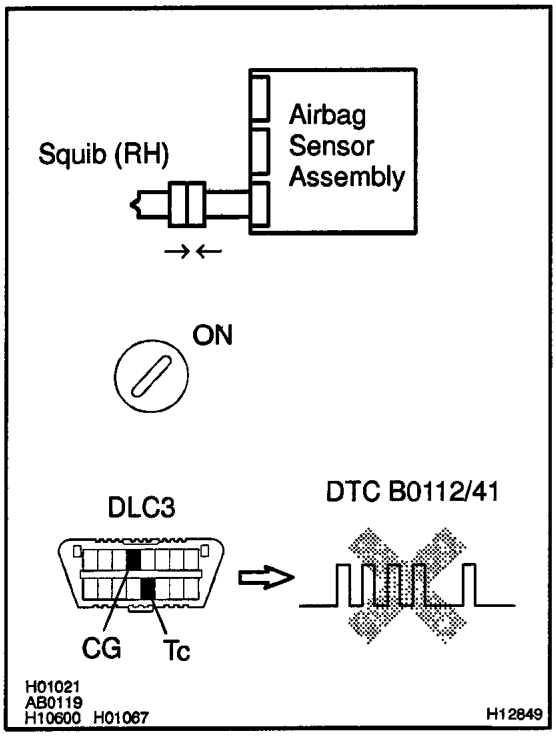
HINT:

Codes other than code B0112/41 may be output at this time, but they are not relevant to this check.

NG → **Replace 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0112/41 is not output.

HINT:

Codes other than code B0112/41 may be output at this time, but they are not relevant to this check.

NG	Replace 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.

DI1NF-11

DTC	B0113/42	Short in Side Squib (RH) Circuit (to B+)

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 B0113/42 is recorded when a B+ short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0113/42	• 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

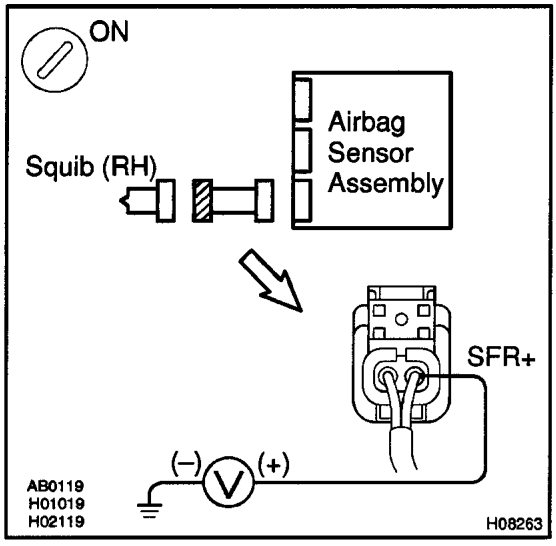
WIRING DIAGRAM

See page DI–143.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

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 SFR+ and body ground.

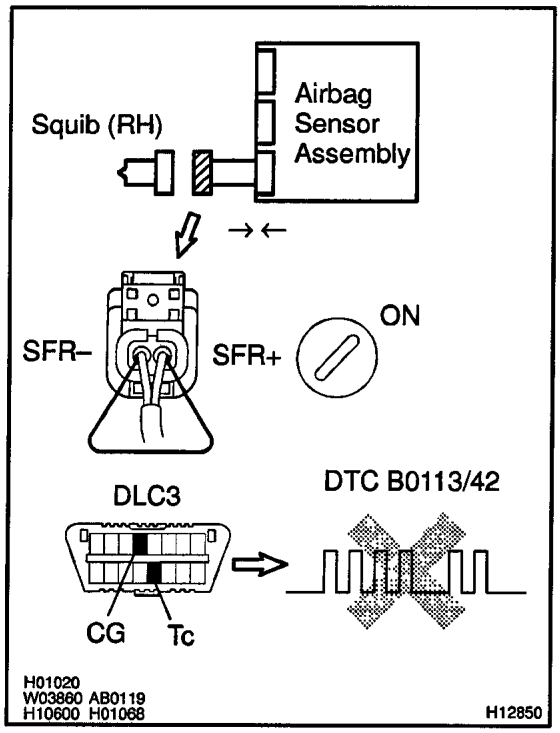
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between side 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 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 ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–102)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ON and wait at least for 20 seconds.

(e) Check DTC. (See page DI–102)

OK:

DTC B0113/42 is not output.

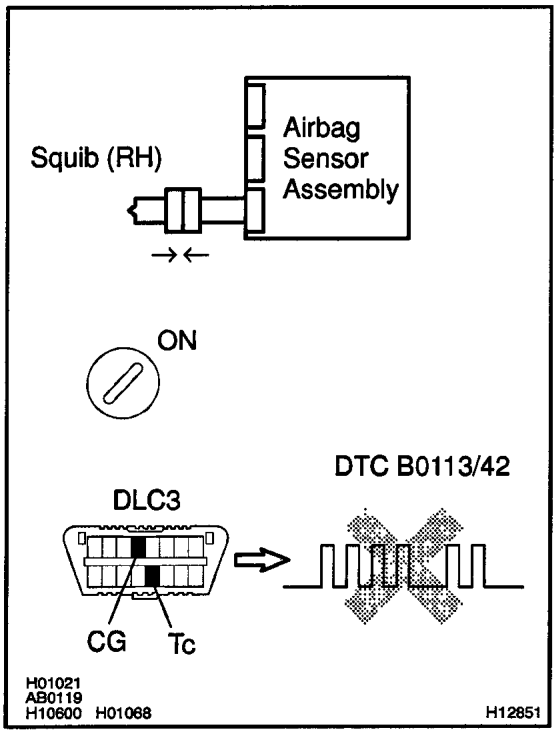
HINT:

Codes other than code B0113/42 may be output at this time, but they are not relevant to this check.

NG → **Replace 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0113/42 is not output.

HINT:

Codes other than code B0113/42 may be output at this time, but they are not relevant to this check.

NG	**Replace 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.

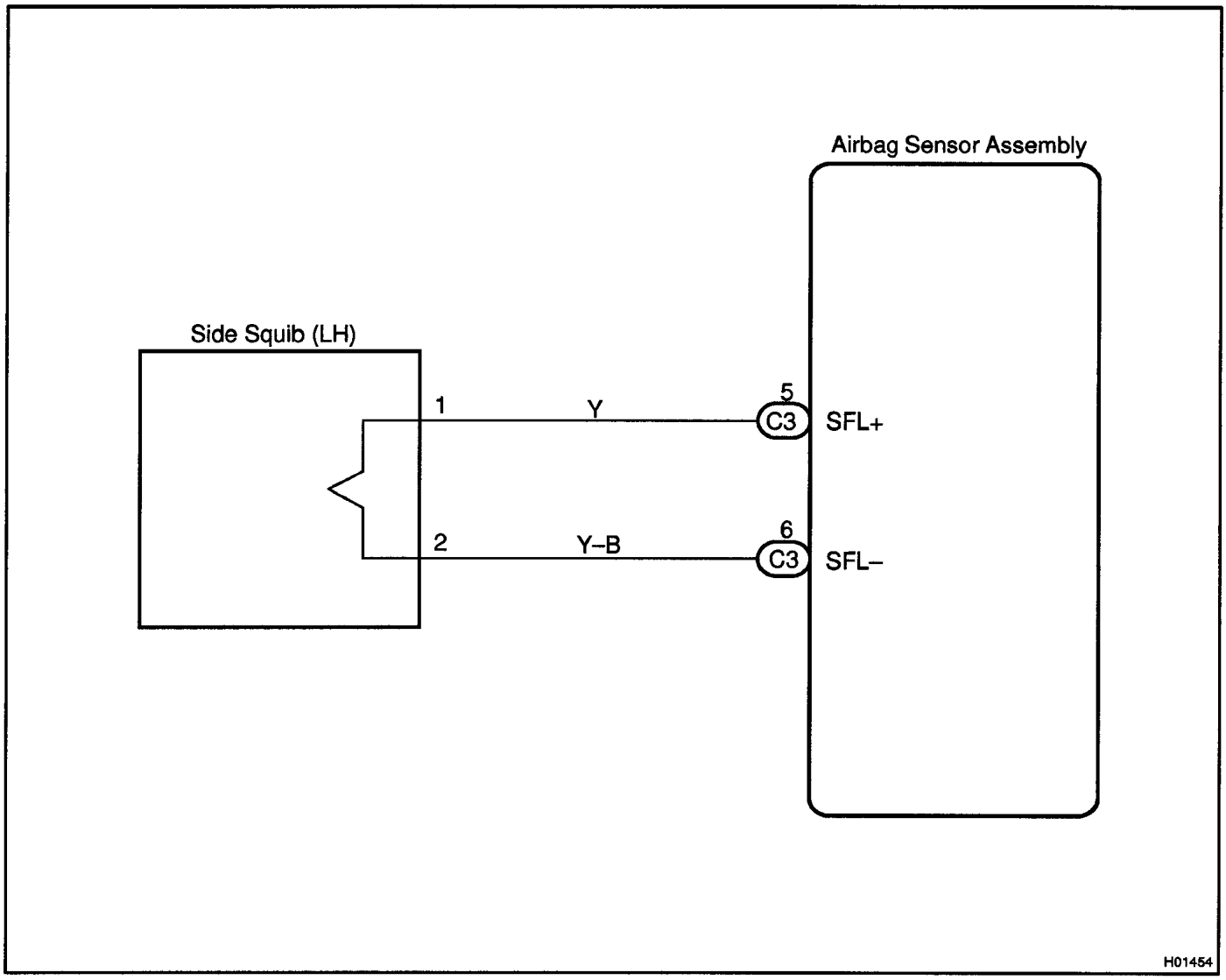
DTC	B0115/47	Short in Side Squib (LH) Circuit

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 B0115/47 is recorded when a short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0115/47	• 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

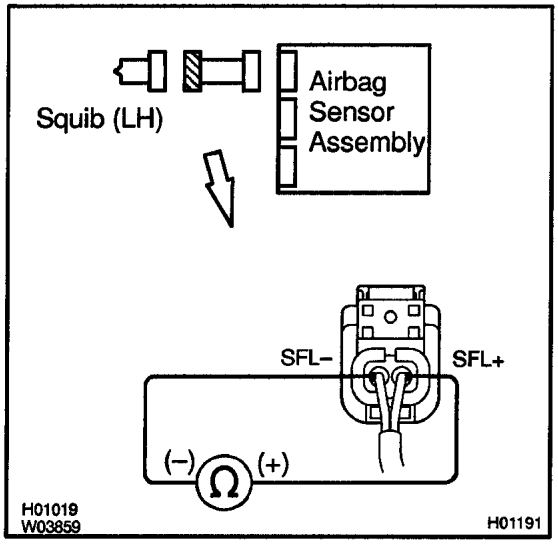
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check side squib (LH) circuit.**



PREPARATION:
Release the 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–102)

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–.

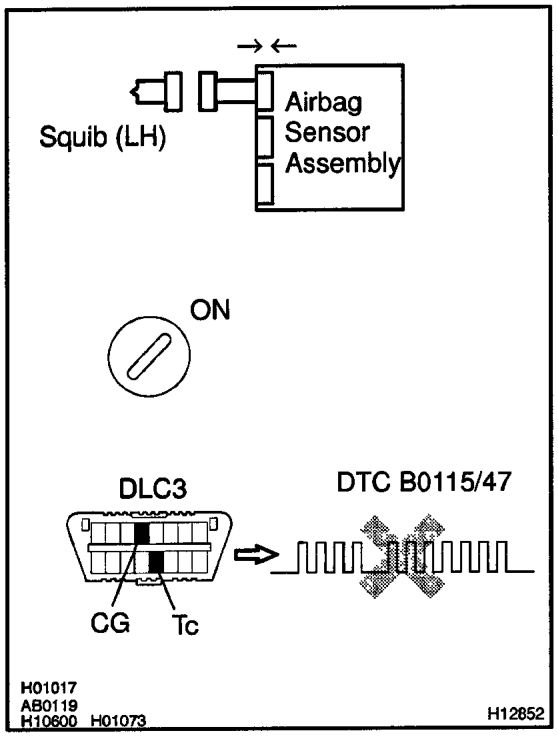
OK:

Resistance: 1 MΩ or Higher

NG → **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) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0115/47 is not output.

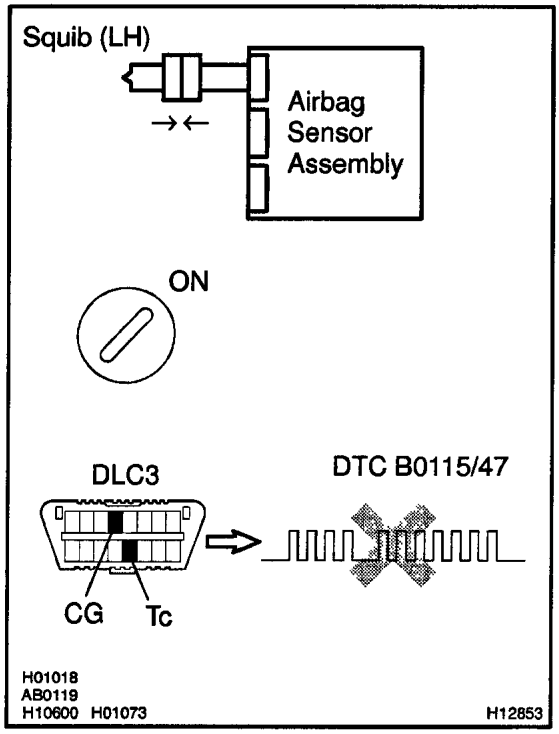
HINT:

Codes other than code B0115/47 may be output at this time, but they are not relevant to this check.

NG → **Replace 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 ON and wait at least for 20 seconds.
(c) Clear DTC stored in memory. (See page DI–102)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn ignition switch to ON and wait at least for 20 seconds.
(f) Check DTC. (See page DI–102)

OK:

DTC B0115/47 is not output.

HINT:

Codes other than code B0115/47 may be output at this time, but they are not relevant to this check.

NG	Replace 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.

DI1NH–11

DTC	B0116/48	Open 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 B0116/48 is recorded when an open is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0116/48	• 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

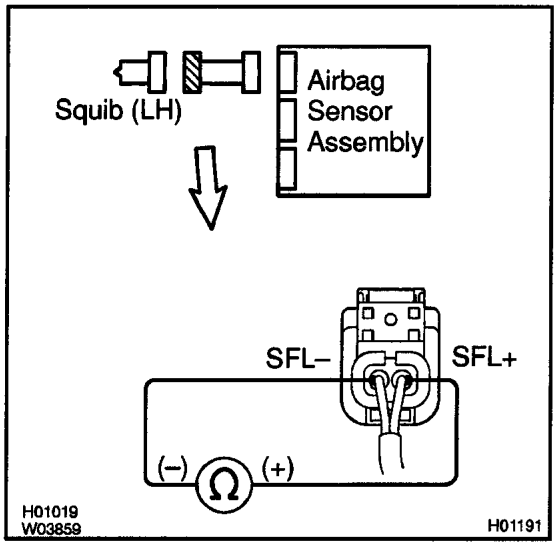
WIRING DIAGRAM

See page DI–156.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–228)

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–.

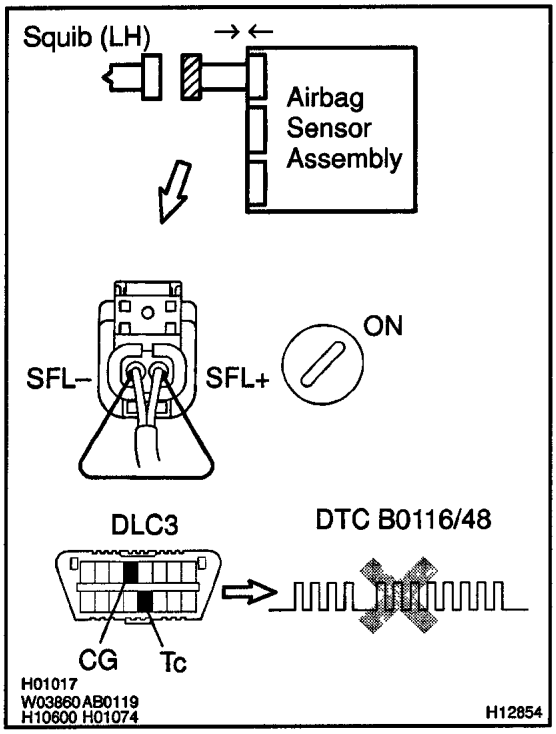
OK:

Resistance: Below 1 Ω

NG → **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 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0116/48 is not output.

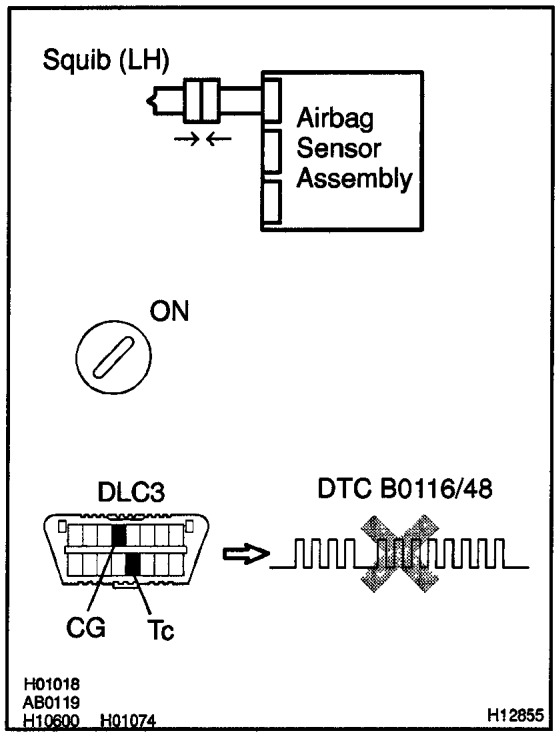
HINT:

Codes other than code B0116/48 may be output at this time, but they are not relevant to this check.

NG	Replace 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0116/48 is not output.

HINT:

Codes other than code B0116/48 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DTC	B0117/45	Short in Side Squib (LH) Circuit (to Ground)

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 B0117/45 is recorded when a ground short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0117/45	• 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

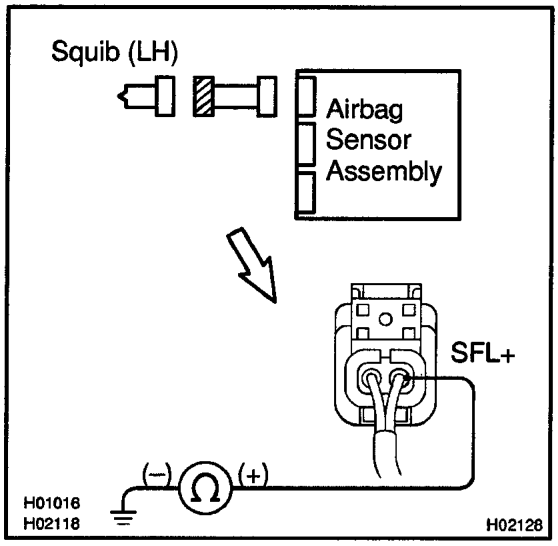
WIRING DIAGRAM

See page DI–156.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check side squib (LH) circuit.**

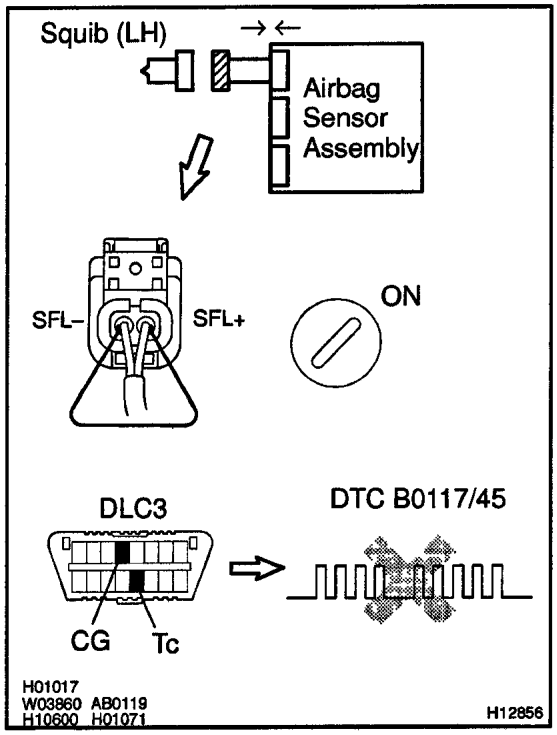


CHECK:
For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the resistance between SFL+ and body ground.
OK:
Resistance: 1 MΩ or Higher

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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0117/45 is not output.

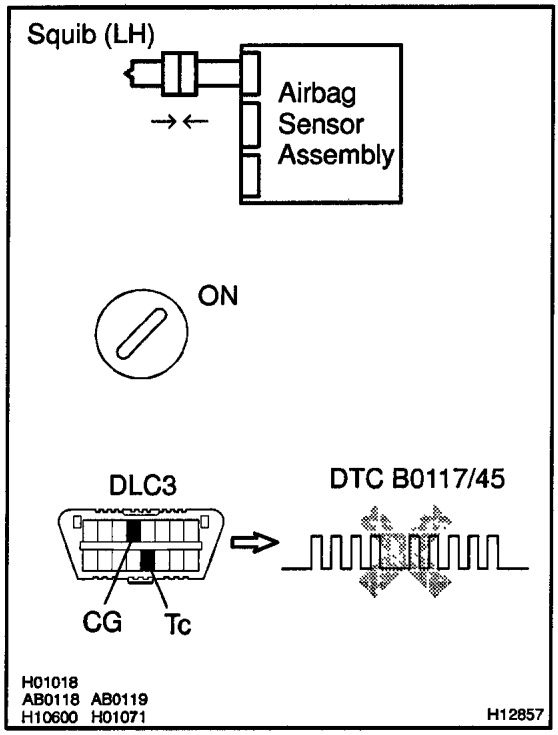
HINT:

Codes other than code B0117/45 may be output at this time, but they are not relevant to this check.

NG	Replace 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0117/45 is not output.

HINT:

Codes other than code B0117/45 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DTC	B0118/46	Short in Side Squib (LH) Circuit (to B+)

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 B0118/46 is recorded when a B+ short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0118/46	• 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

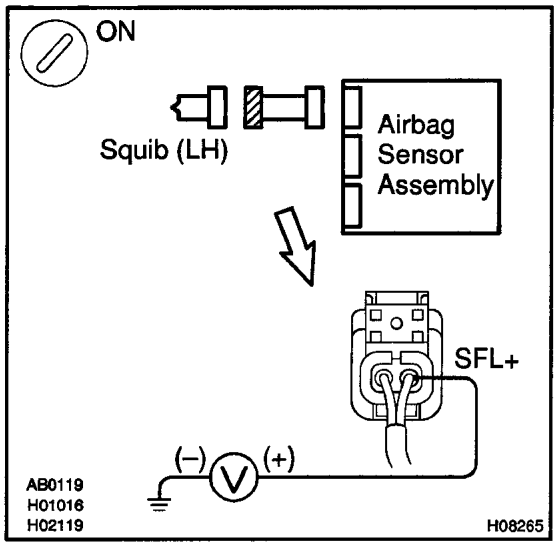
WIRING DIAGRAM

See page DI–156.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–228)

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.

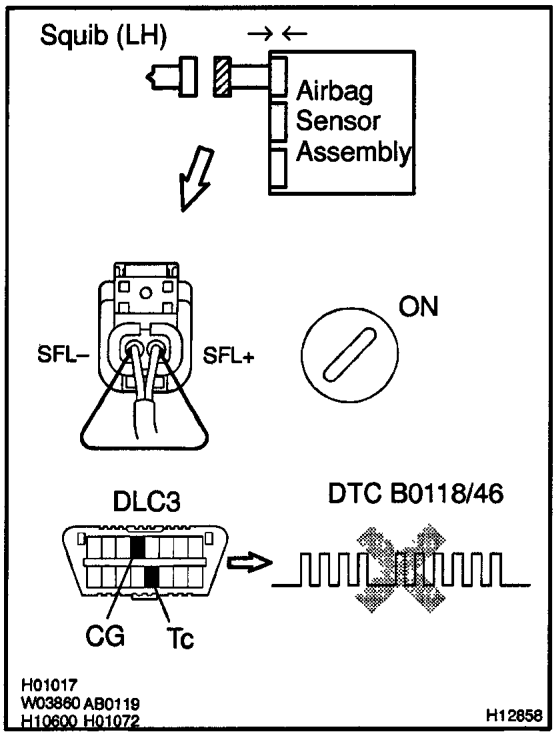
OK:

Voltage: 0 V

NG → **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 ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–102)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ON and wait at least for 20 seconds.

(e) Check DTC. (See page DI–102)

OK:

DTC B0118/46 is not output.

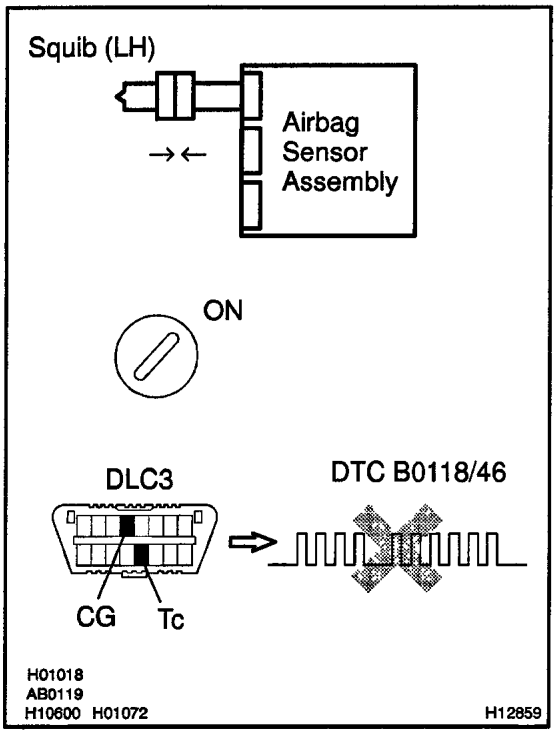
HINT:

Codes other than code B0118/46 may be output at this time, but they are not relevant to this check.

NG	**Replace 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0118/46 is not output.

HINT:

Codes other than code B0118/46 may be output at this time, but they are not relevant to this check.

NG	Replace 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.

DI16S–29

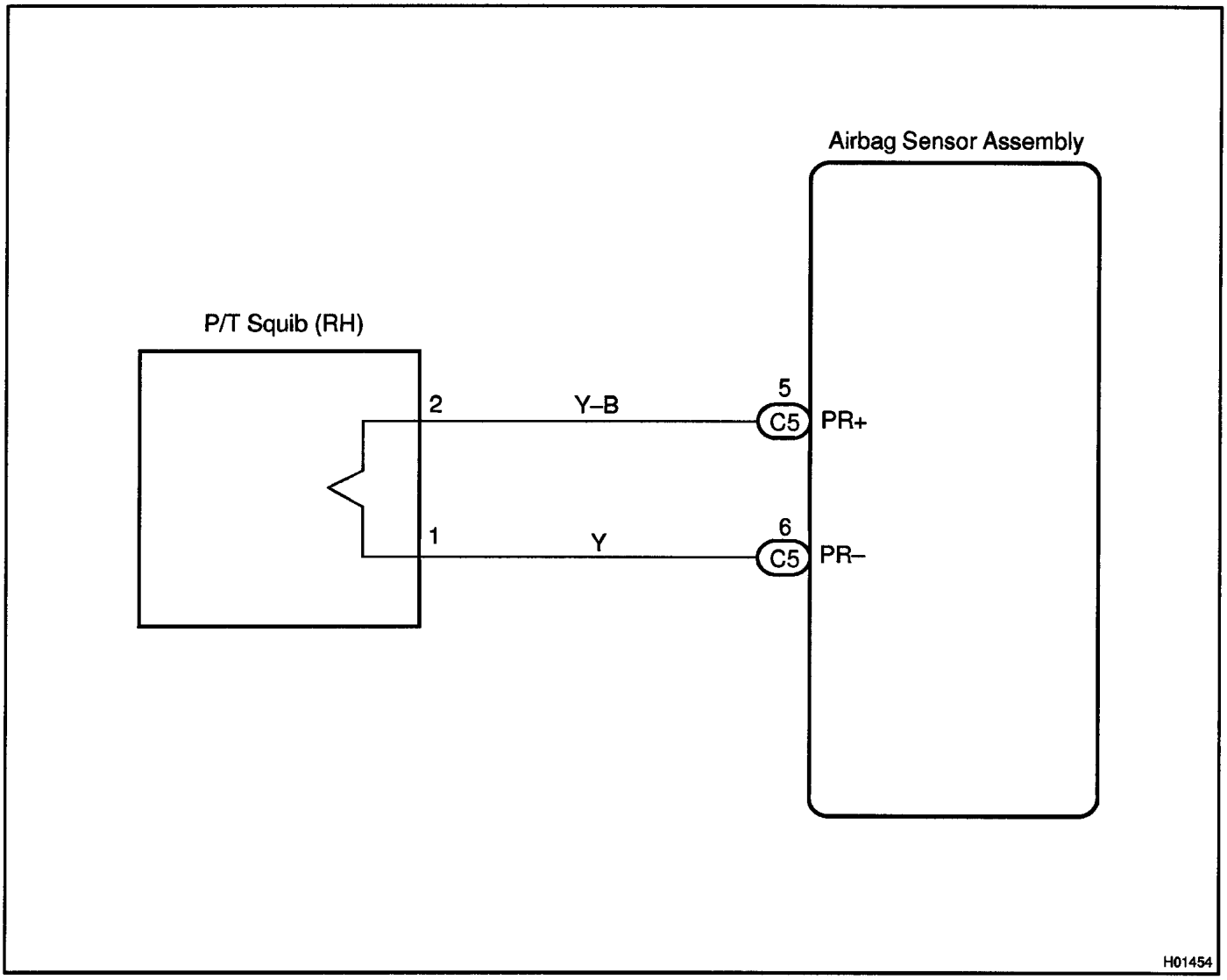
DTC	B0130/63	Short in P/T Squib (RH) Circuit

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the 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 B0130/63 is recorded when a short is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0130/63	• 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

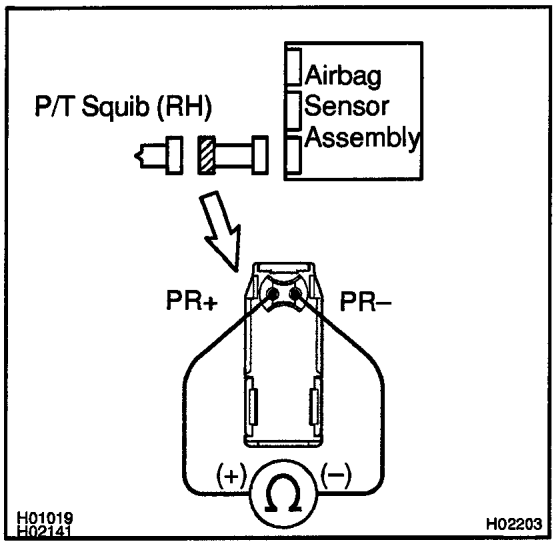
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check P/T squib (RH) circuit.**



PREPARATION:
Release the 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–102)

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–.

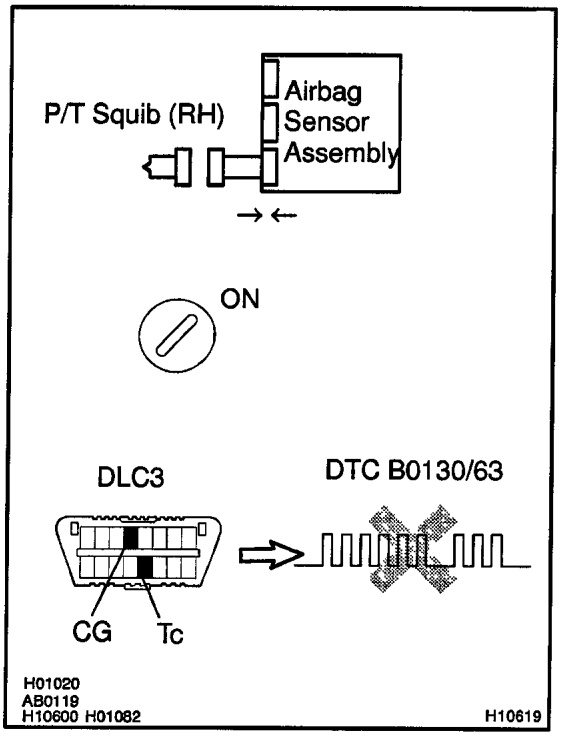
OK:

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) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0130/63 is not output.

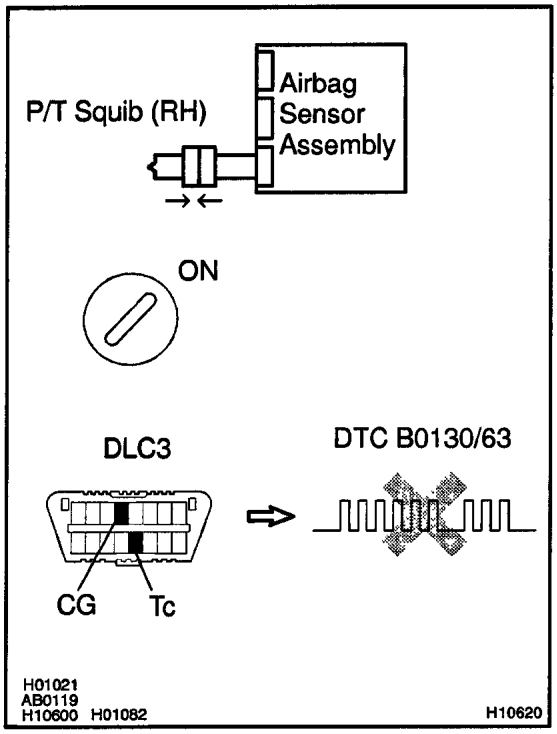
HINT:

Codes other than code B0130/63 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (RH).



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory. (See page DI–102)
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check DTC. (See page DI–102)

OK:

DTC B0130/63 is not output.

HINT:
Codes other than code B0130/63 may be output at this time, but they are not relevant to this check.

NG	Replace 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.

DI1BG-24

DTC	B0131/64	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 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 B0131/64 is recorded when an open is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0131/64	• Open circuit in PR+ wire harness or PR– wire harness of squib • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

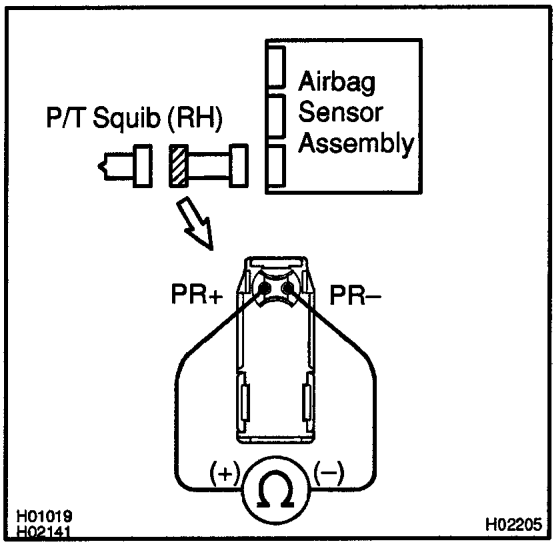
WIRING DIAGRAM

See page DI–169.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check P/T squib (RH) circuit.**

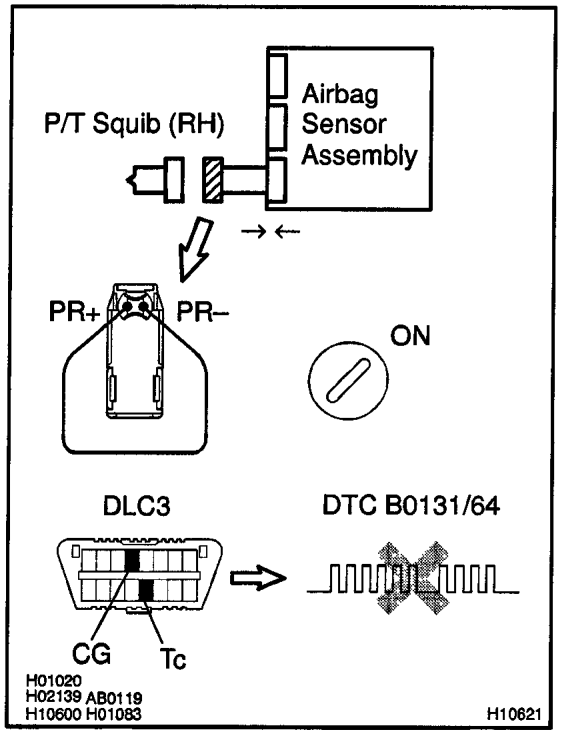


CHECK:
For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the resistance between PR+ and PR–.
OK:
Resistance: Below 1 Ω

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 the ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0131/64 is not output.

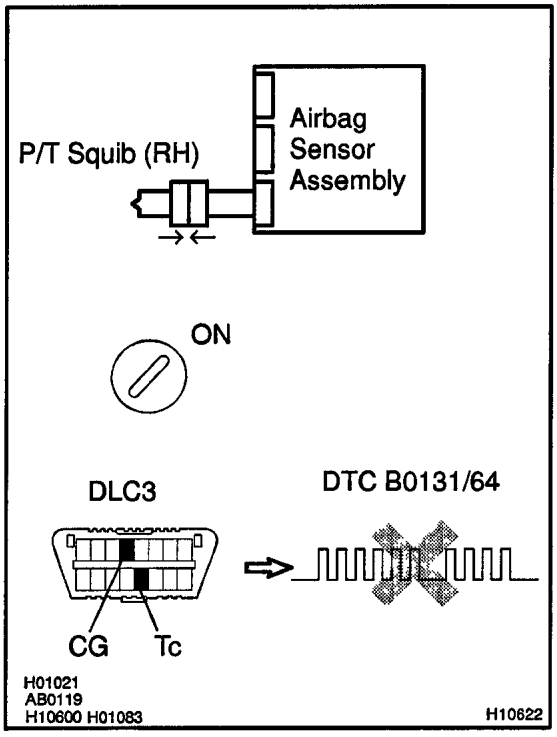
HINT:

Codes other than code B0131/64 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (RH).



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0131/64 is not output.

HINT:

Codes other than code B0131/64 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DI244-05

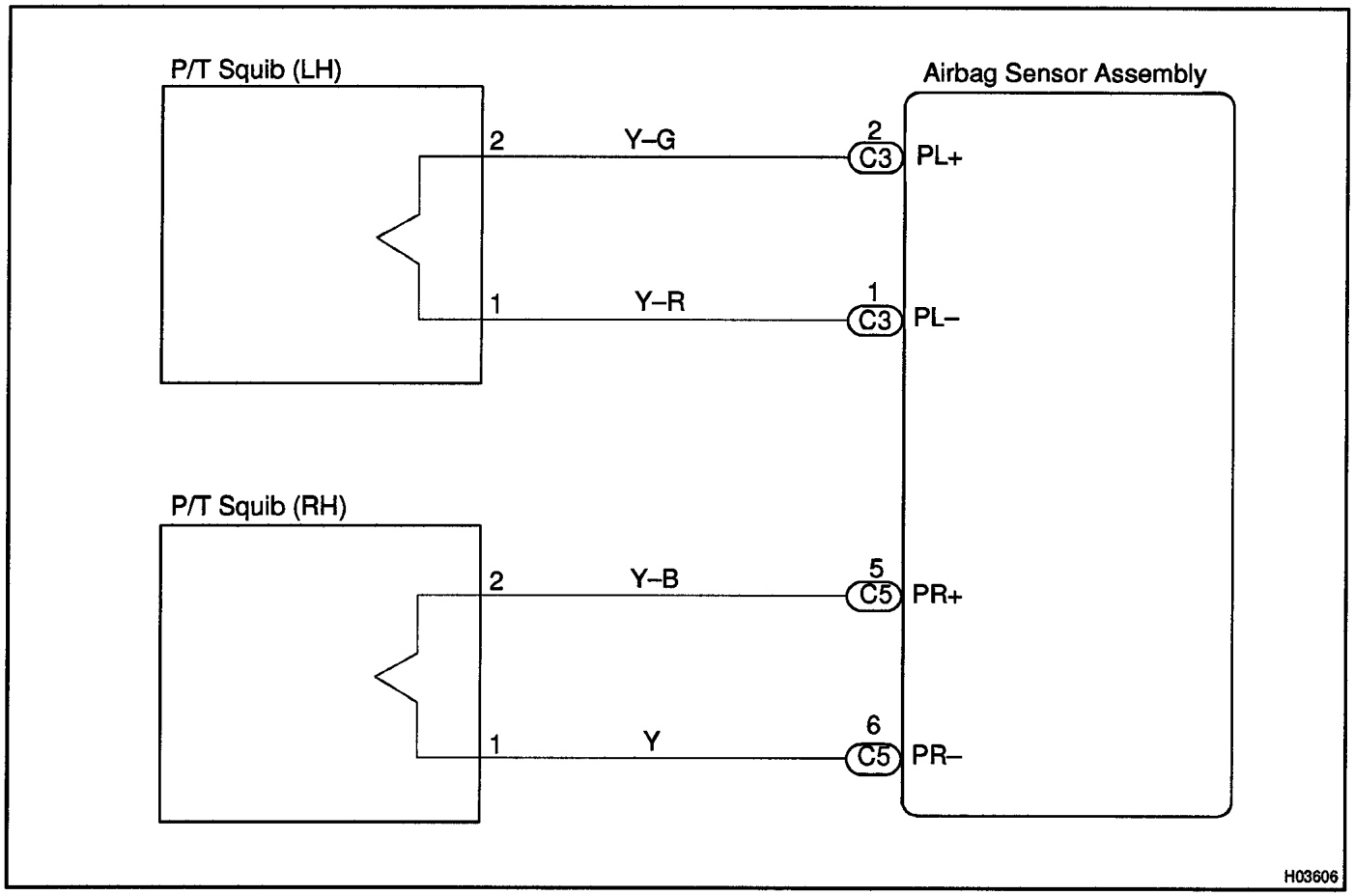
DTC	B0132/61	Short in P/T Squib (RH) Circuit (to Ground) (possible for P/T squib (LH))

CIRCUIT DESCRIPTION

The LH and RH P/T squib circuits consist of the airbag sensor assembly and LH and RH seat belt pretensioners.
It causes the pretensioner to activate when the pretensioner activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0132/61 is recorded when ground short is detected in the LH and RH P/T squib circuits.

DTC No.	DTC Detecting Condition	Trouble Area
B0132/61	• Short circuit in P/T squib (LH) wire harness (to ground) • Short circuit in P/T squib (RH) wire harness (to ground) • P/T squib (RH) malfunction • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

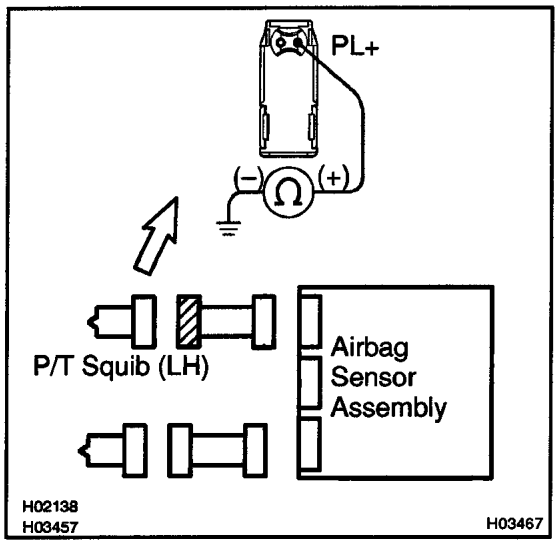
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check P/T squib (LH) circuit.**



CHECK:
For the connector (on the airbag sensor assembly side) between the seat belt pretensioner and airbag sensor assembly, measure the resistance between PL+ and body ground.

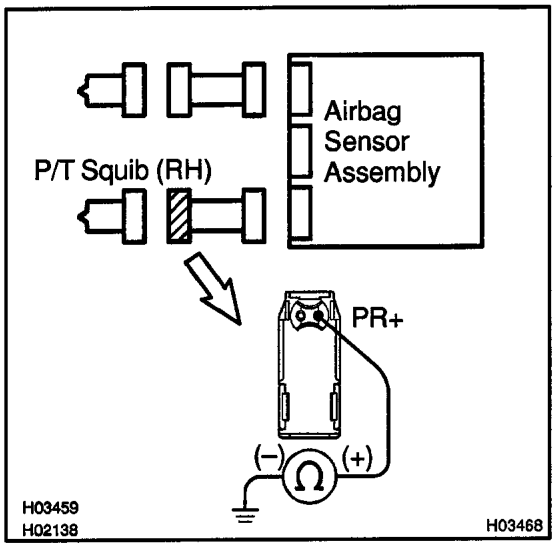
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between the seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	Check P/T squib (RH) circuit.



CHECK:

For the connector (on the airbag sensor assembly side) between the seat belt pretensioner and airbag sensor assembly, measure the resistance between PR+ and body ground.

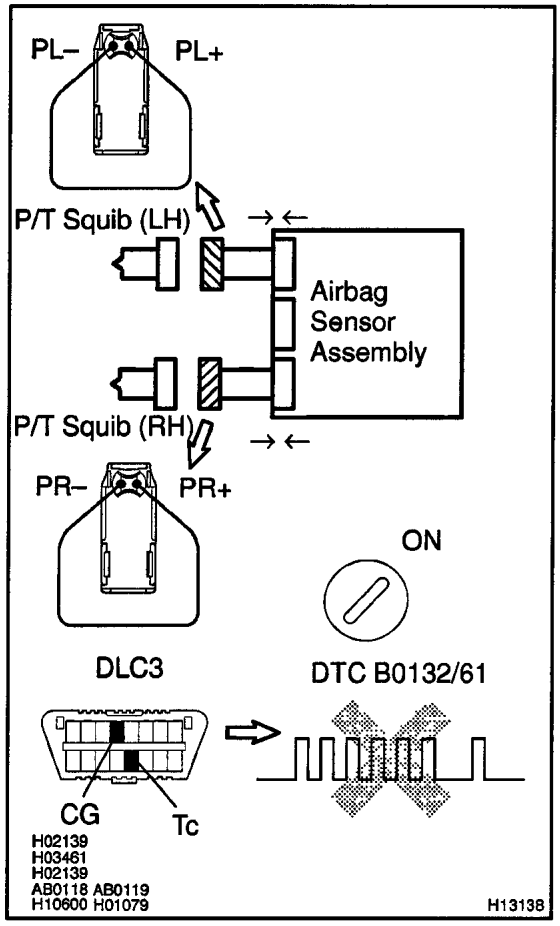
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between the seat belt pretensioner (RH) and airbag sensor assembly.**

OK

4	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connectors 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 airbag sensor assembly.

(c) Using a service wire, connect PR+ and PR– of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and airbag sensor assembly.

(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–102)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ON, and wait at least for 20 seconds.

(e) Check DTC. (See page DI–102)

OK:

DTC B0132/61 is not output.

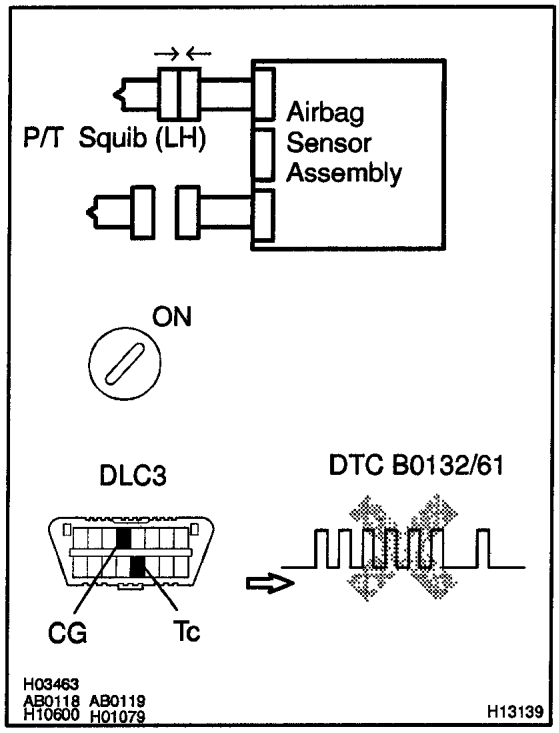
HINT:

Codes other than DTC B0132/61 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

5	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 ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

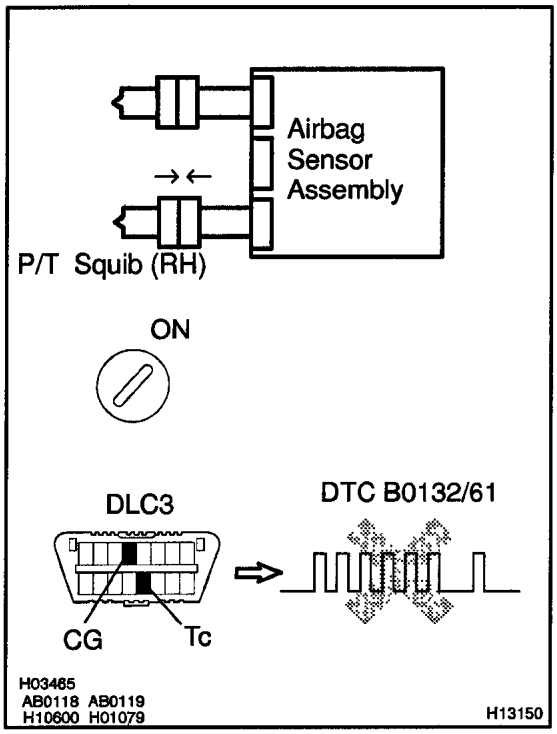
DTC B0132/61 is not output.

HINT:
Codes other than DTC B0132/61 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (LH).**

OK

6	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 (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0132/61 is not output.

HINT:
Codes other than DTC B0132/61 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.

DI242-05

DTC	B0133/62	Short in P/T Squib Circuit (to B+) (possible for D, P, side and P/T squib (LH))

CIRCUIT DESCRIPTION

The LH and RH P/T squib circuits consist of the airbag sensor assembly and LH and RH seat belt pretensioners.
It causes the pretensioner to activate when the pretensioner activation conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0133/62 is recorded when B+ is detected in the LH and RH P/T squib circuits.

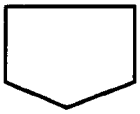
DTC No.	DTC Detecting Condition	Trouble Area
B0133/62	• Short circuit in D squib wire harness (to B+) • Short circuit in P squib wire harness (to B+) • Short circuit in side squib (LH) wire harness (to B+) • Short circuit in side squib (RH) wire harness (to B+) • Short circuit in seat belt pretensioner (LH) wire harness (to B+) • Short circuit in seat belt pretensioner (RH) wire harness (to B+) • D squib malfunction • P squib malfunction • Spiral cable malfunction • Side squib (LH) malfunction • Side squib (RH) malfunction • P/T squib (LH) malfunction • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Front passenger airbag assembly (P squib) • Spiral cable • Side airbag assembly (LH) • Side airbag assembly (RH) • Seat belt pretensioner (LH) • Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

WIRING DIAGRAM

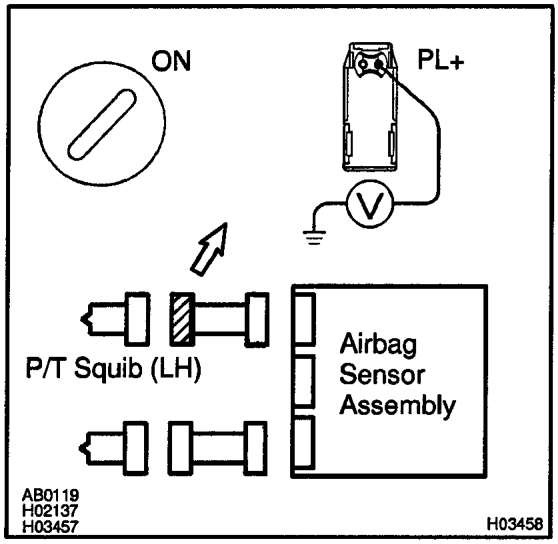
See page DI–176.

INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**



2	Check P/T squib (LH) circuit.

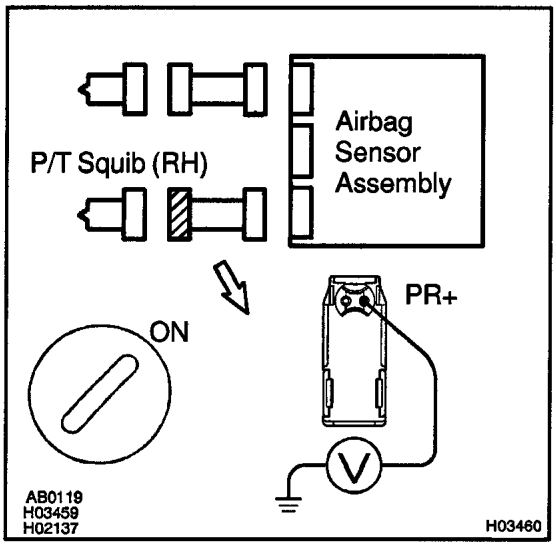


PREPARATION:
Turn ignition switch ON.
CHECK:
For the connector (on the airbag sensor assembly side) between the seat belt pretensioner (LH) and airbag sensor assembly, measure the voltage between PL+ and body ground.
OK:
Voltage: Below 1 V

NG → **Repair or replace harness or connector between the seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	Check P/T squib (RH) circuit.

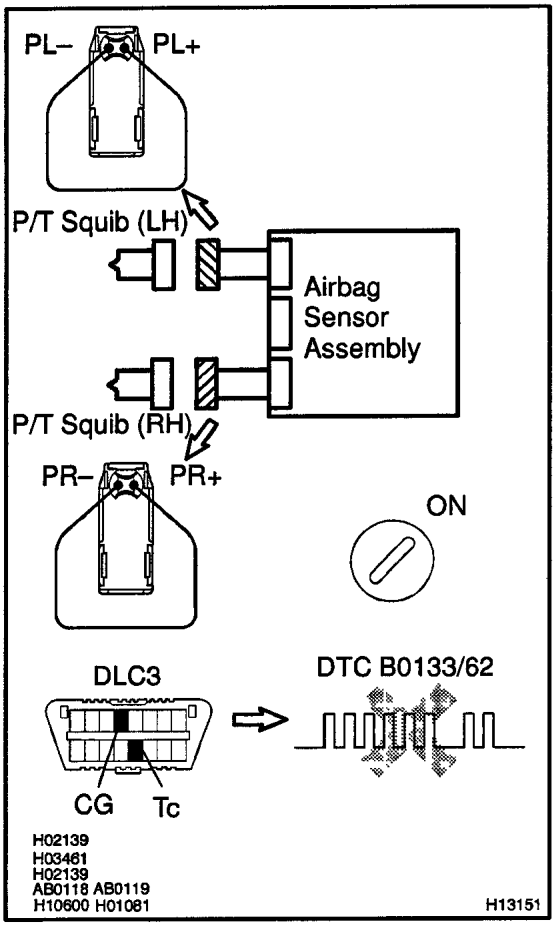


PREPARATION:
Turn ignition switch ON.
CHECK:
For the connector (on the airbag sensor assembly side) between the seat belt pretensioner (RH) and airbag sensor assembly, measure the voltage between PR+ and body ground.
OK:
Voltage: Below 1 V

NG → **Repair or replace harness or connector between the seat belt pretensioner (RH) and airbag sensor assembly.**

OK

4	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 pretensioner side) between the seat belt pretensioner (LH) and airbag sensor assembly.

(c) Using a service wire, connect PR+ and PR– of the connector (on the pretensioner side) between the seat belt pretensioner (RH) and airbag sensor assembly.

(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.

(b) Clear DTC stored in memory.
(See step 5 on page DI–102)

(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn ignition switch to ON, and wait at least for 20 seconds.

(e) Check DTC. (See page DI–102)

OK:

DTC B0133/62 is not output.

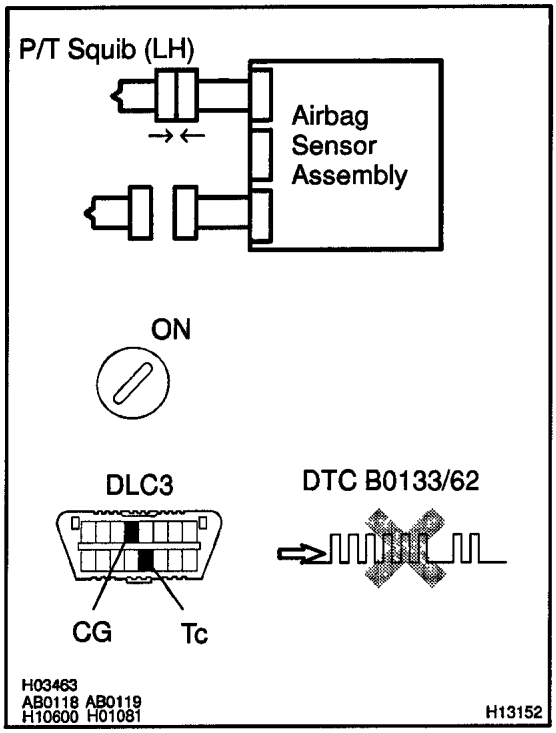
HINT:

Codes other than DTC B0133/62 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

5	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 ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0133/62 is not output.

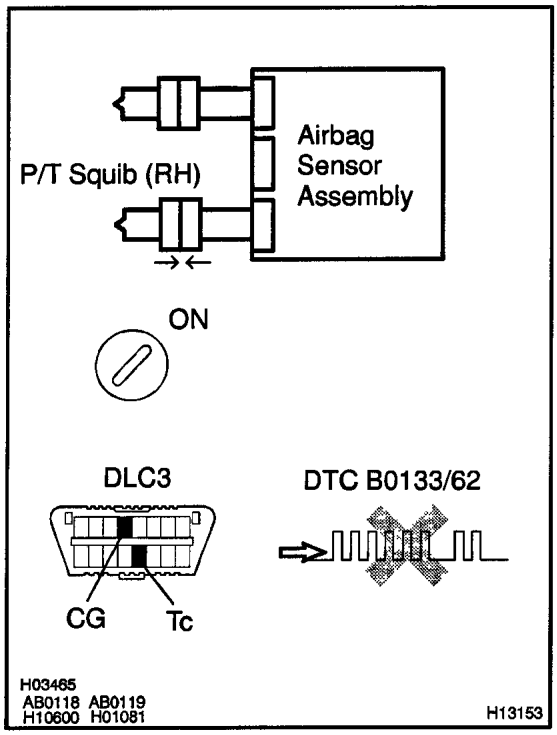
HINT:

Codes other than DTC B0133/62 may be output at this time, but they are not relevant to this check.

NG → **There is possibility that D, P and side airbags except for pretensioner are damaged, so check DTC B0103/12, B0113/42 and B0118/46.**

OK

6	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 ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0133/62 is not output.

HINT:
Codes other than DTC B0133/62 may be output at this time, but they are not relevant to this check.

NG → **There is possibility that D, P and side airbags except for pretensioner are damaged, so check DTC B0103/12, B0113/42 and B0118/46.**

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.

DI16W-29

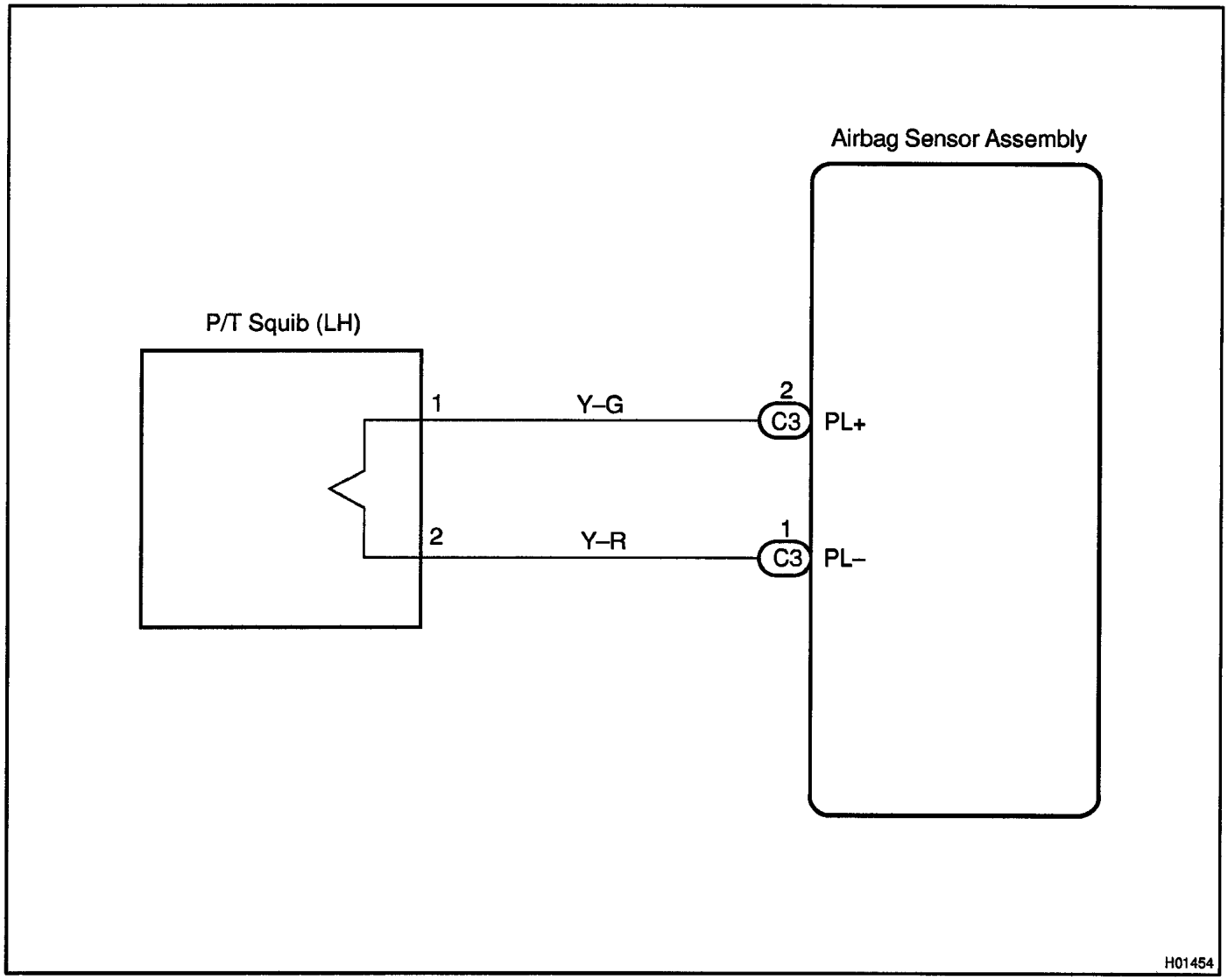
DTC	B0135/73	Short in P/T Squib (LH) Circuit

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the 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 B0135/73 is recorded when a short is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0135/73	• 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

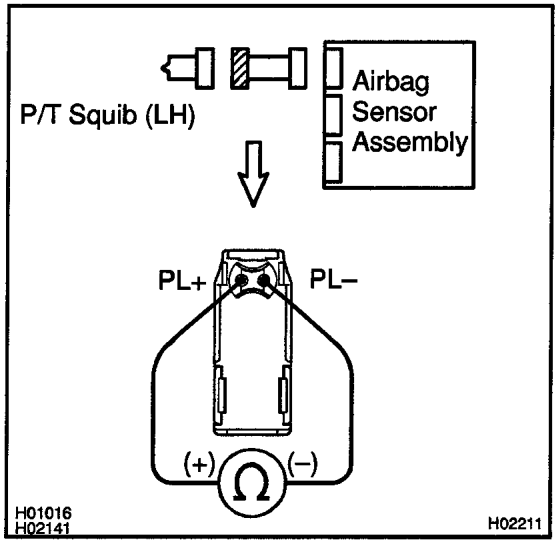
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check P/T squib (LH) circuit.**



PREPARATION:
Release the 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–102)

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–.

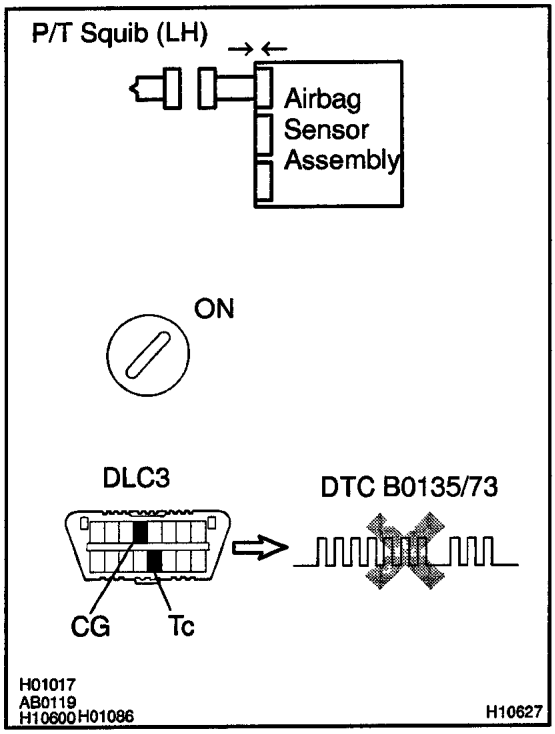
OK:

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) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0135/73 is not output.

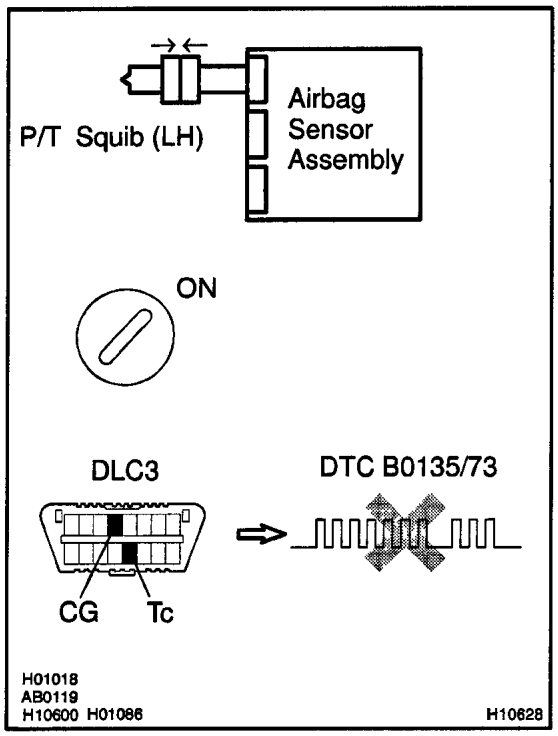
HINT:

Codes other than code B0135/73 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (LH).



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear DTC stored in memory. (See page DI–102)
(d) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check DTC. (See page DI–102)

OK:

DTC B0135/73 is not output.

HINT:
Codes other than code B0135/73 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DI1BJ-25

DTC	B0136/74	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 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 B0136/74 is recorded when an open is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0136/74	• 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

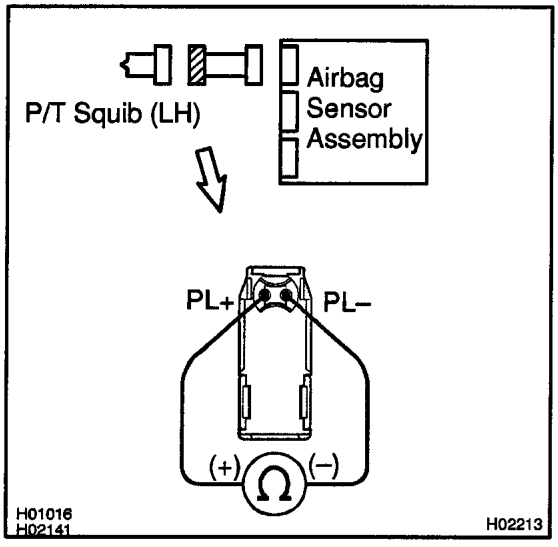
WIRING DIAGRAM

See page DI–187.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–228)

2	Check P/T squib (LH) circuit.

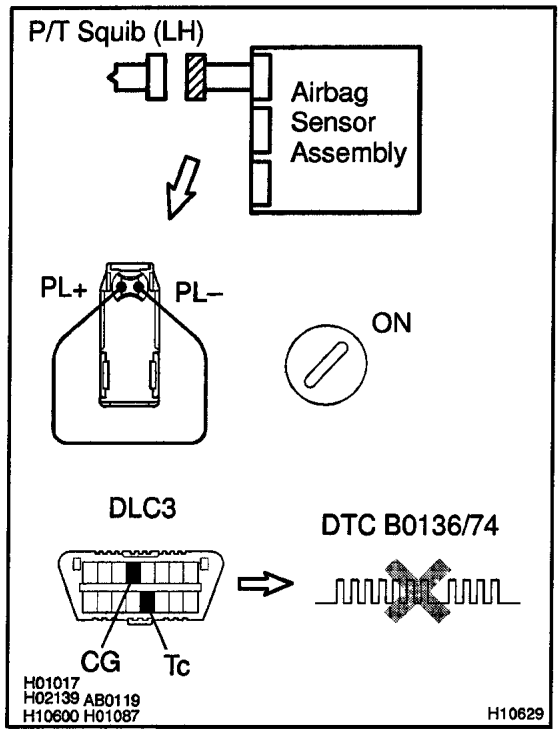


CHECK:
For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the resistance between PL+ and PL–.
OK:
Resistance: Below 1 Ω

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 the ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0136/74 is not output.

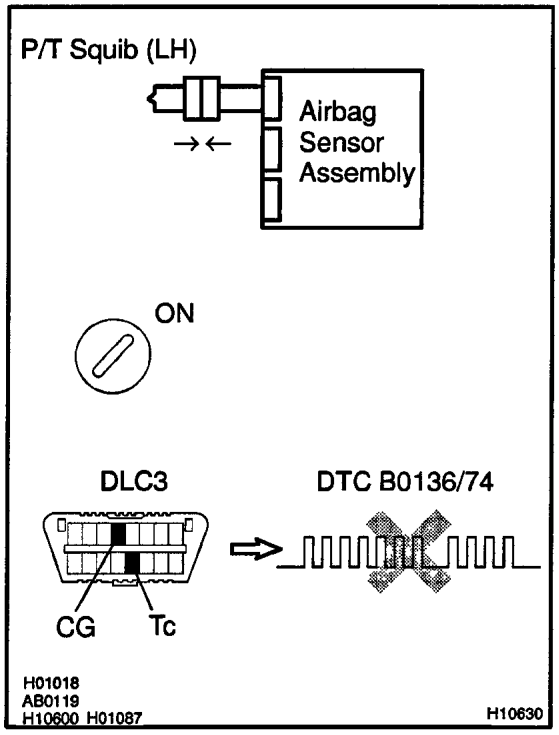
HINT:

Codes other than code B0136/74 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check P/T squib (LH).



PREPARATION:

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

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory. (See page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B0136/74 is not output.

HINT:

Codes other than code B0136/74 may be output at this time, but they are not relevant to this check.

NG → **Replace 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.

DTC	B1100/31	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 B1100/31 is recorded when occurrence of a malfunction in the airbag sensor assembly is detected.

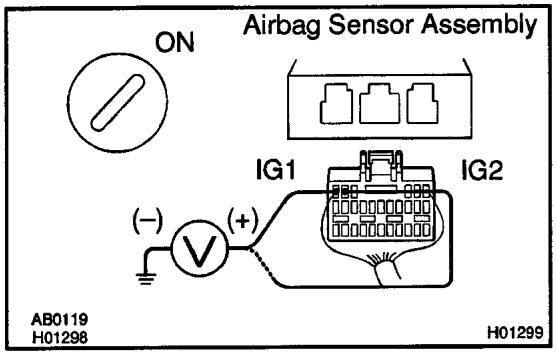
DTC No.	DTC Detecting Condition	Trouble Area
B1100/31	• Airbag sensor assembly malfunction	• Airbag sensor assembly

INSPECTION PROCEDURE

HINT:
When a malfunction code other than code B1100/31 is displayed at the same time, first repair the malfunction indicated by the malfunction code other than code B1100/31.

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check voltage at IG1 and IG2 of airbag sensor assembly.**



CHECK:

(a) Turn the ignition switch to ON.
(b) Measure the voltage between body ground and each of terminals IG1 and IG2 of the airbag sensor assembly connector.

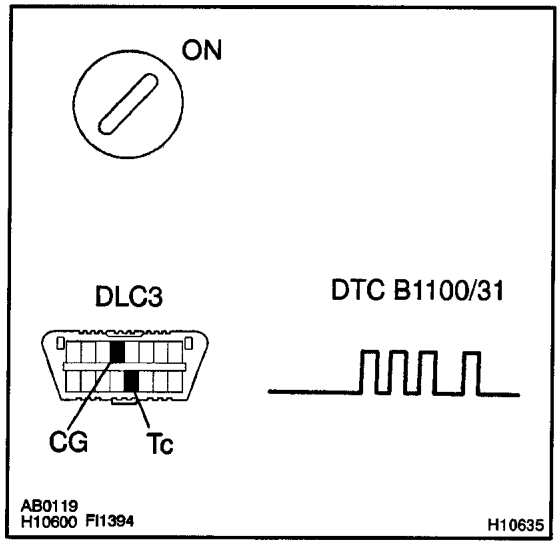
OK:

Voltage: 10 – 14 V

NG → **Check that an abnormality occurs on the battery and charging system.**

OK

3	Is DTC B1100/31 output again?



PREPARATION:

Clear DTC. (See step 5 on page DI–102)

CHECK:

(a) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(b) Turn the ignition switch to 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–102)

HINT:

Codes other than code B1100/31 may be output at this time, but they are not relevant to this check.

NO → **Using simulation method, reproduce malfunction symptoms. (See page IN–19)**

YES

Replace airbag sensor assembly.

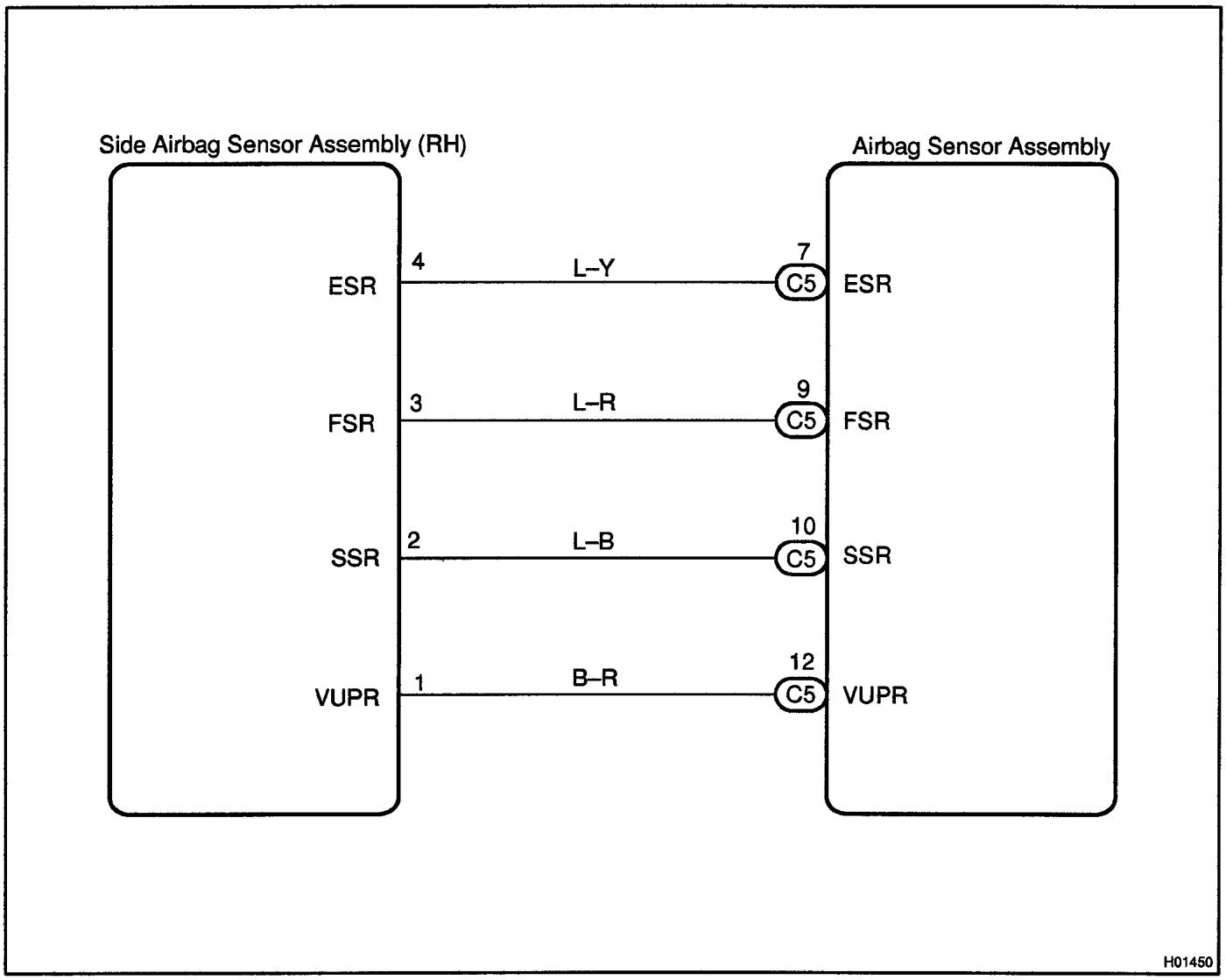
DTC	B1140/32	Side Airbag Sensor Assembly (RH) Malfunction

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 B1140/32 is recorded when occurrence of a malfunction in the side airbag sensor assembly (RH) is detected.

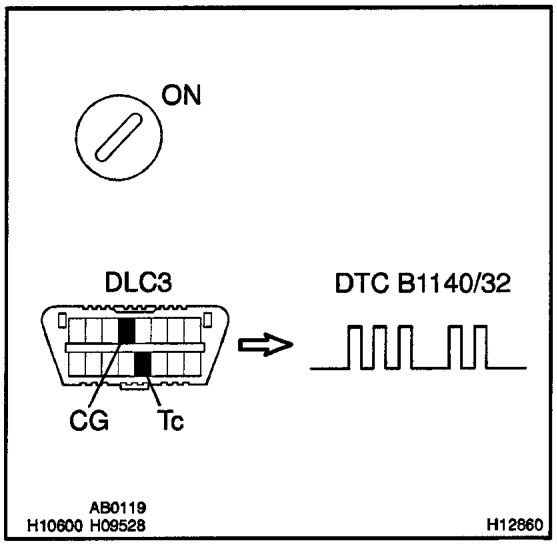
DTC No.	DTC Detecting Condition	Trouble Area
B1140/32	• Side airbag sensor assembly (RH) malfunction	• Side airbag sensor assembly (RH) • Wire harness • Airbag sensor assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Is DTC B1140/32 output?



CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

HINT:
Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

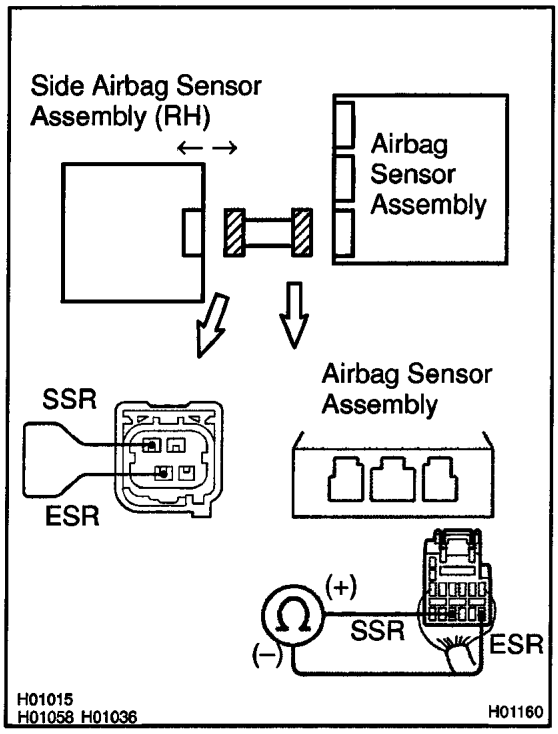
YES → **The malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.**

NO

2	Is connector of side airbag sensor assembly (RH) properly connected?

3	Prepare for inspection. (See step 1 on DI–228)

4	Check wire harness.



PREPARATION:

(a) Disconnect the side airbag sensor assembly (RH) connector.

(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 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.

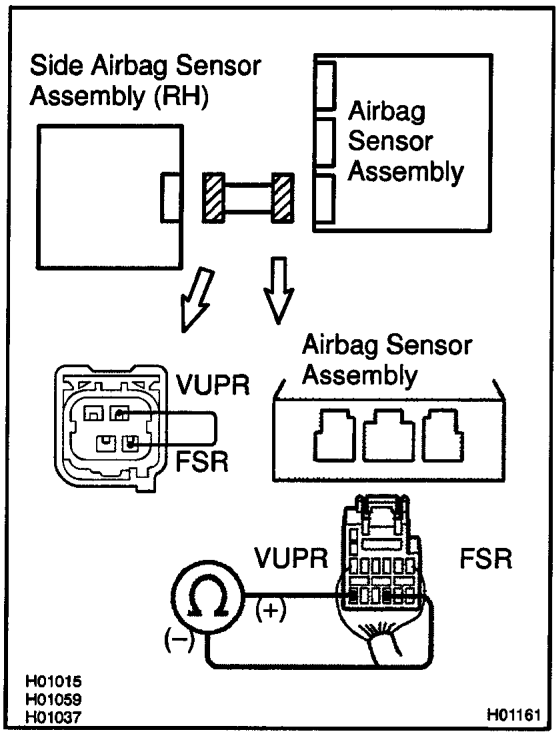
OK:

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 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.

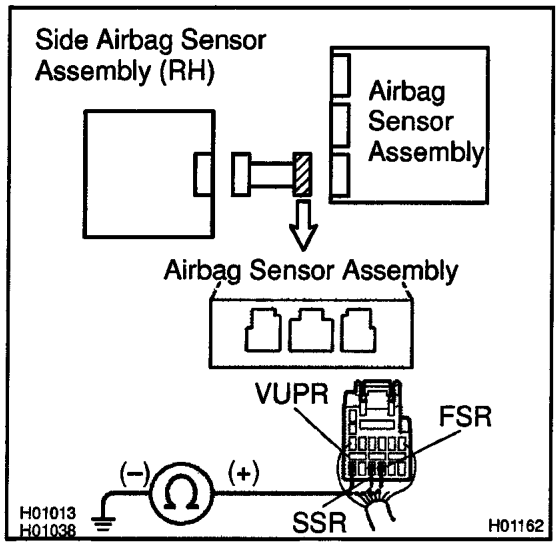
OK:

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.

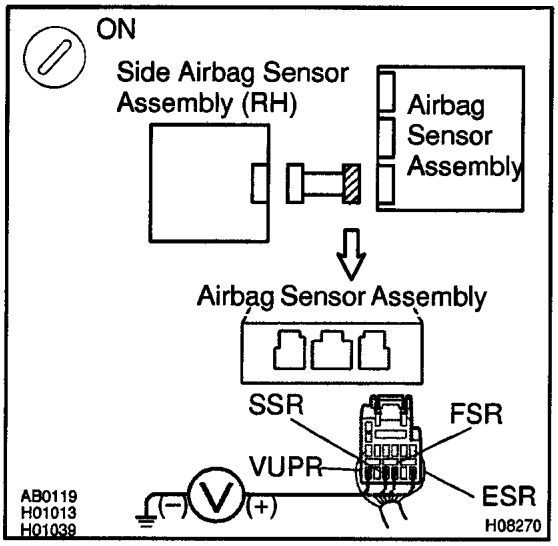
OK:

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 the body ground and each of SSR, VUPR, ESR and FSR.

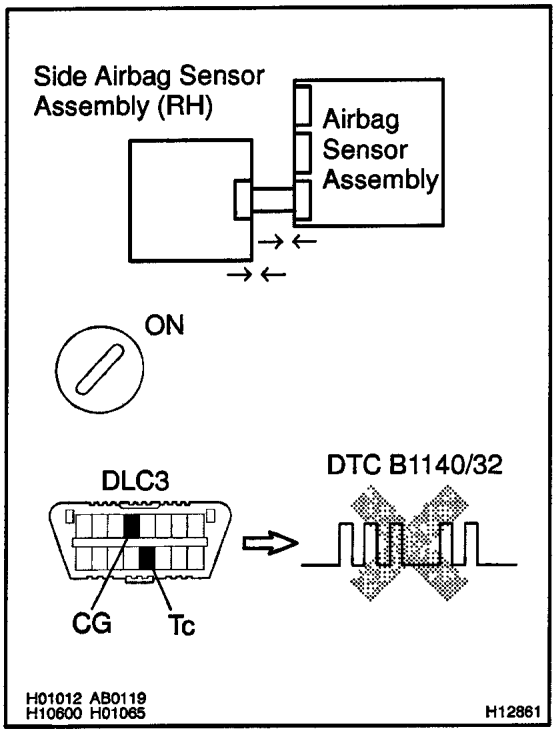
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.**

OK

8	Is DTC B1140/32 output 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B1140/32 is not output.

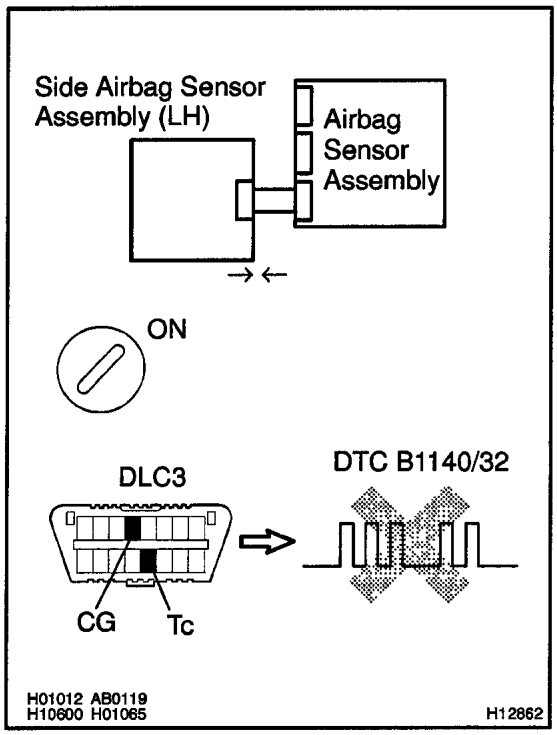
HINT:
Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

NG → **Go to step 9.**

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.

9	**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 side airbag sensor (RH) from the connector and connect the side airbag sensor (LH) to the connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B1140/32 is not output.

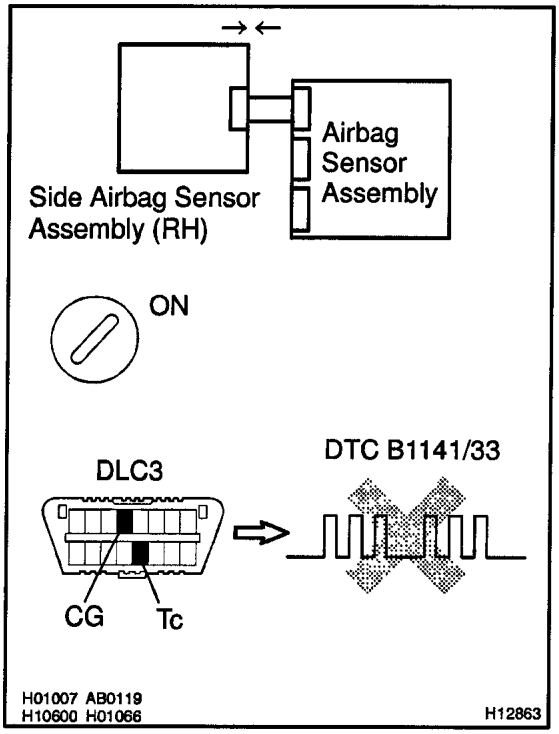
HINT:

Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

10	Check side airbag sensor assembly (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 sensor (RH) to the connector that the side airbag sensor (LH) was connected to.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B1141/33 is not output.

HINT:
Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag sensor 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.

DI4L9-05

DTC	B1141/33	Side Airbag Sensor Assembly (LH) Malfunction

CIRCUIT DESCRIPTION

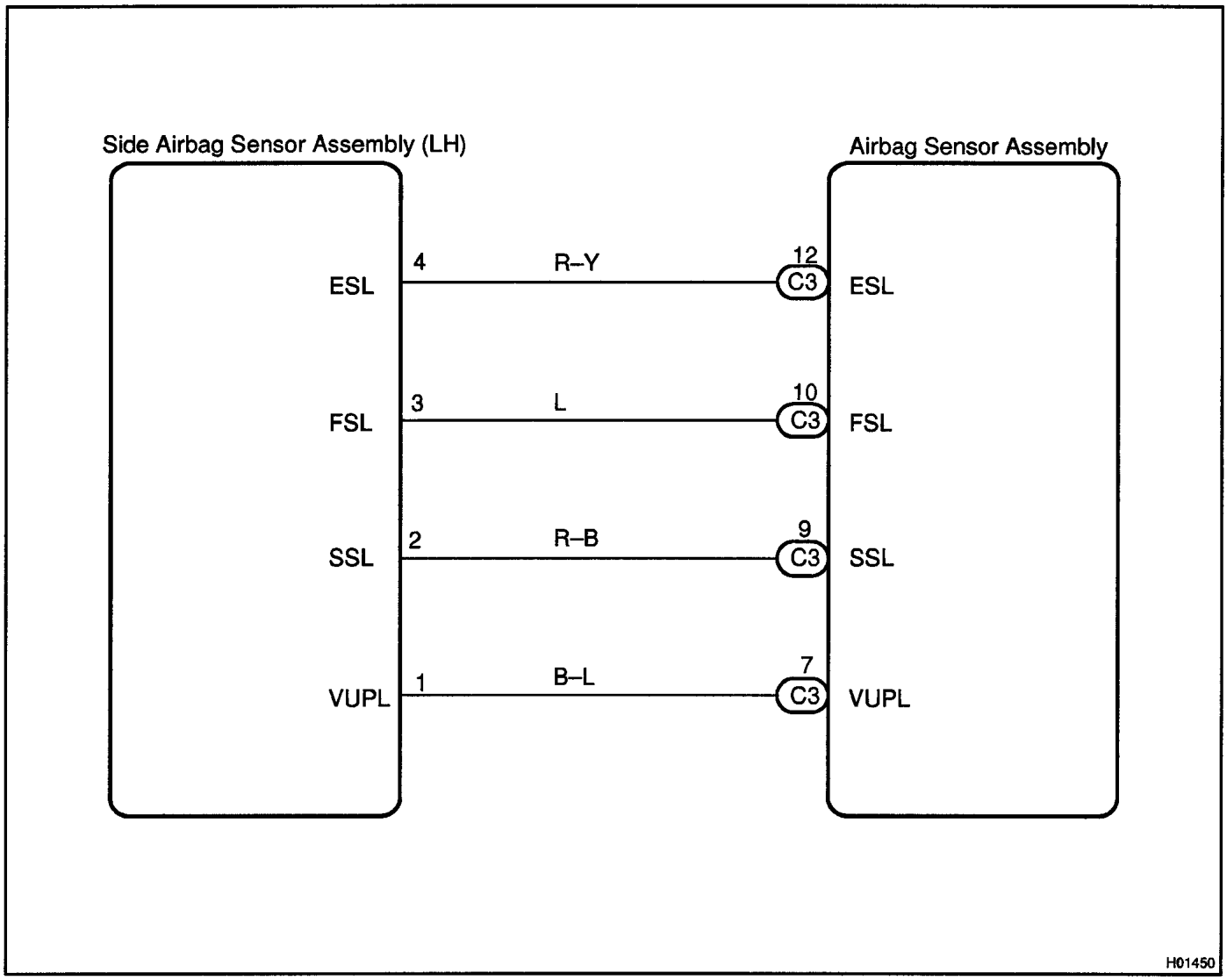
The side airbag sensor assembly (LH) consists of the safing sensor, diagnosis circuit and lateral deceleration sensor, etc.

It receives signals from the lateral deceleration sensor, judges whether or not the SRS must be activated, and detects diagnosis system malfunction.

DTC B1141/33 is recorded when occurrence of a malfunction in the side airbag sensor assembly (LH) is detected.

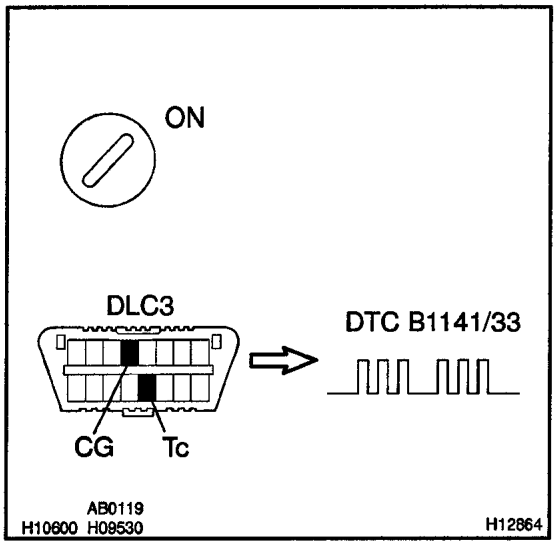
DTC No.	DTC Detecting Condition	Trouble Area
B1141/33	• Side airbag sensor assembly (LH) malfunction	• Side airbag sensor assembly (LH) • Wire harness • Airbag sensor assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Is DTC B1141/33 output?



CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

HINT:

Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

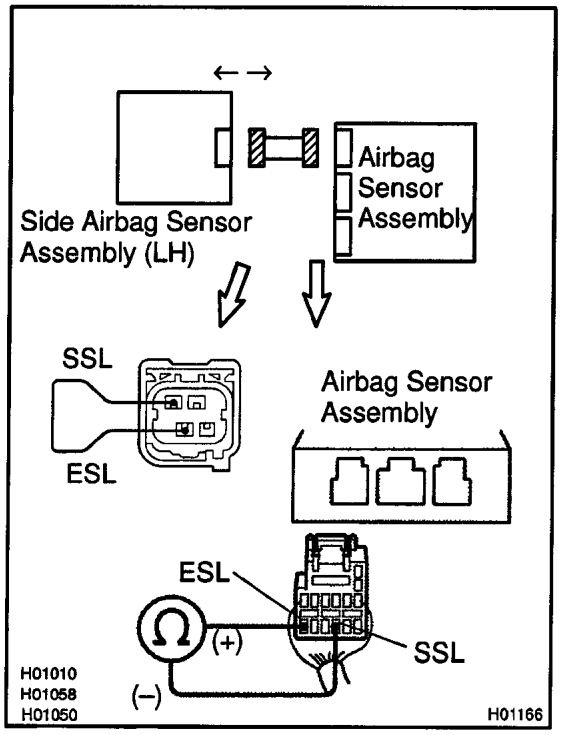
YES → **The malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.**

NO

2	Is connector of side airbag sensor assembly (LH) properly connected?

3	Prepare for inspection. (See step 1 on page DI–228)

4	Check wire harness.



PREPARATION:

(a) Disconnect the side airbag sensor assembly connector (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.

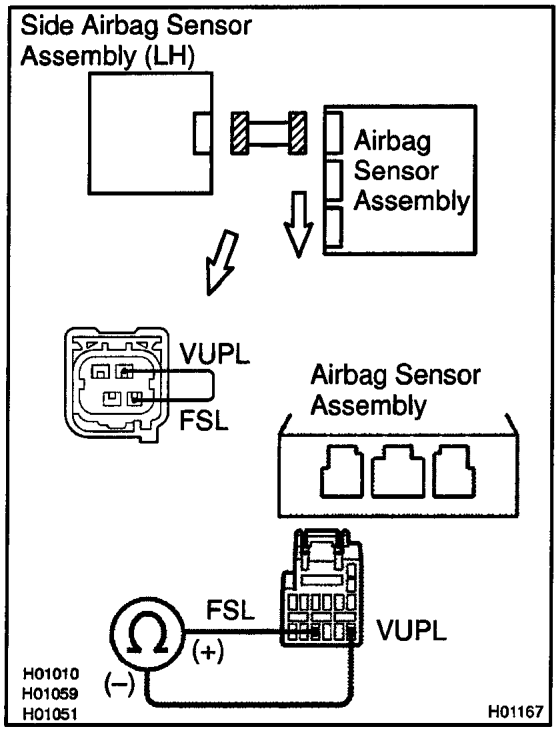
OK:

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.

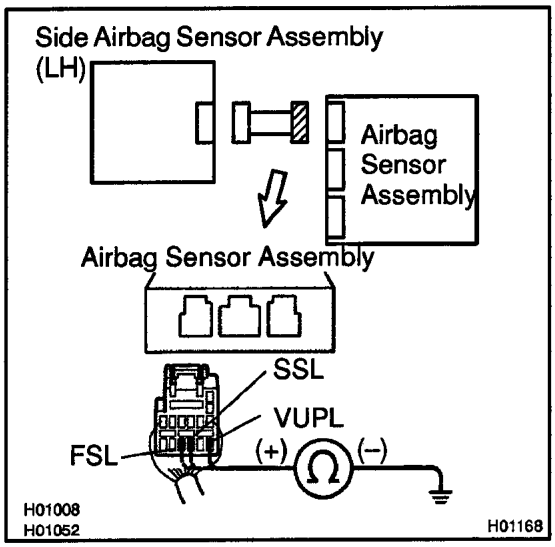
OK:

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.

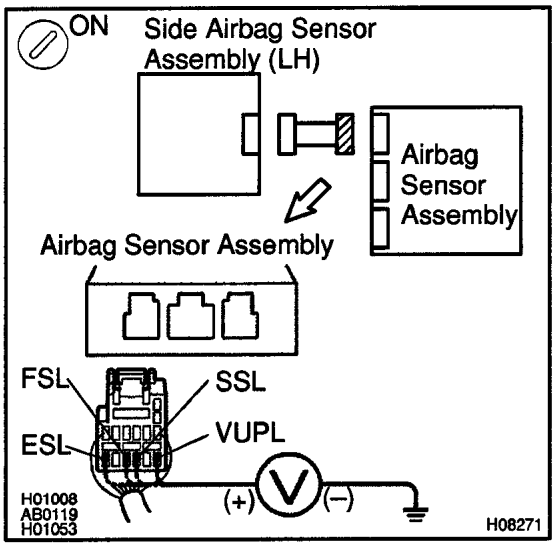
OK:

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.

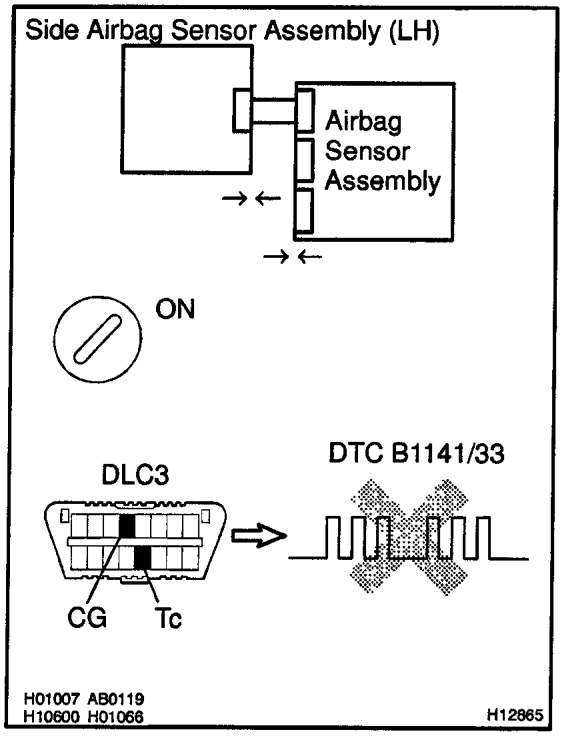
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

8	Is DTC B1141/33 output 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 ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B1141/33 is not output.

HINT:

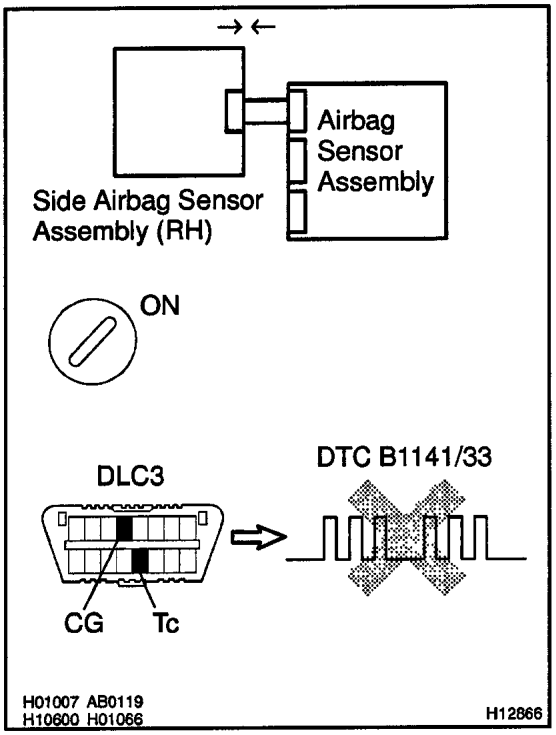
Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

NO → **Go to step 9.**

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.

9	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 side airbag sensor (LH) from the connector and connect the side airbag sensor (RH) to the connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

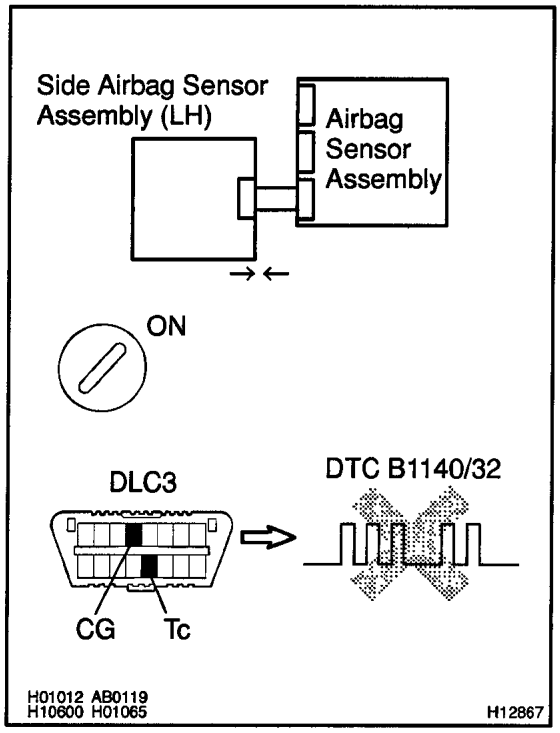
DTC B1141/33 is not output.

HINT:
Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

10	Check side airbag sensor assembly (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 sensor (LH) to the connector that the side airbag sensor (RH) was connected to.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn ignition switch to ON and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn ignition switch to ON and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B1140/32 is not output.

HINT:

Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag sensor 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.

DI4LA-07

DTC	B1156/B1157/15	Front Airbag Sensor (RH) Malfunction

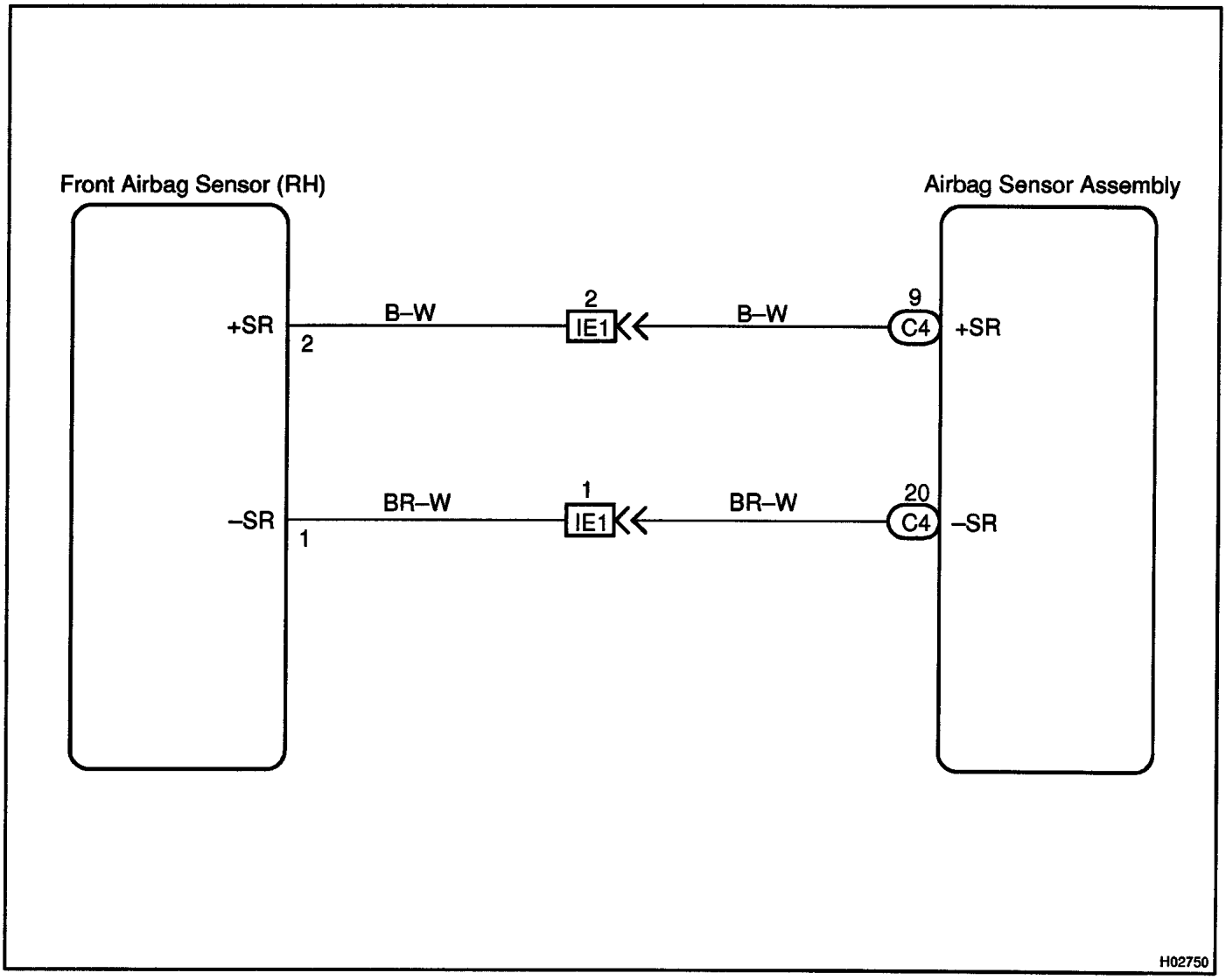
CIRCUIT DESCRIPTION

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 B1156/B1157/15 is recorded when a malfunction is detected in the front airbag sensor (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1156/B1157/15	• Front airbag sensor (RH) malfunction	• Front airbag sensor (RH) • Wire harness • Engine room main wire harness • Airbag sensor assembly

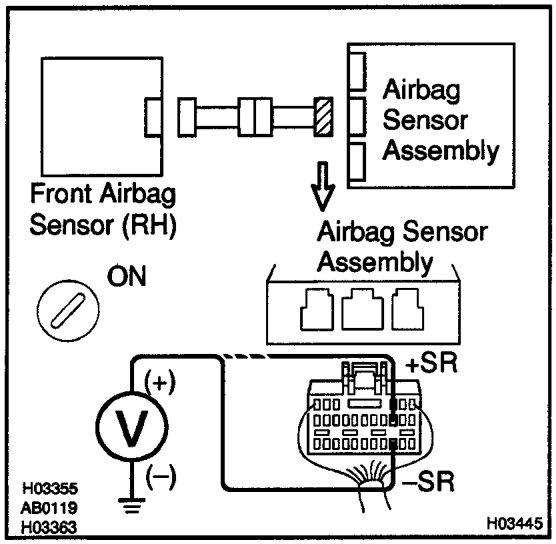
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Check wire harness (to B+).**



CHECK:

(a) Turn the ignition switch to ON.

(b) 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.

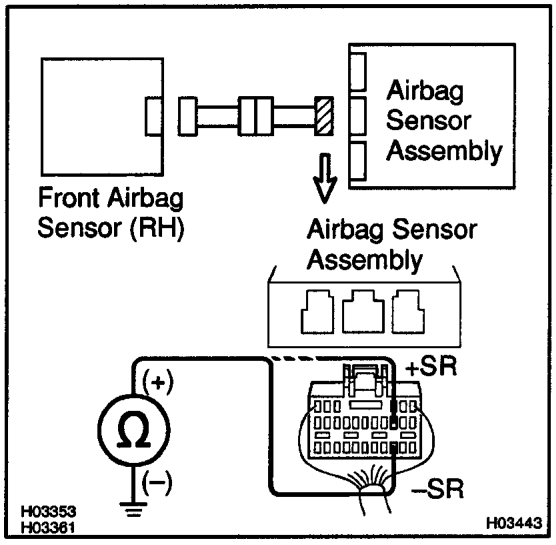
OK:

Voltage: Below 1 V

NG → **Go to step 8.**

OK

3	**Check wire harness (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 body ground and each of +SR and –SR.

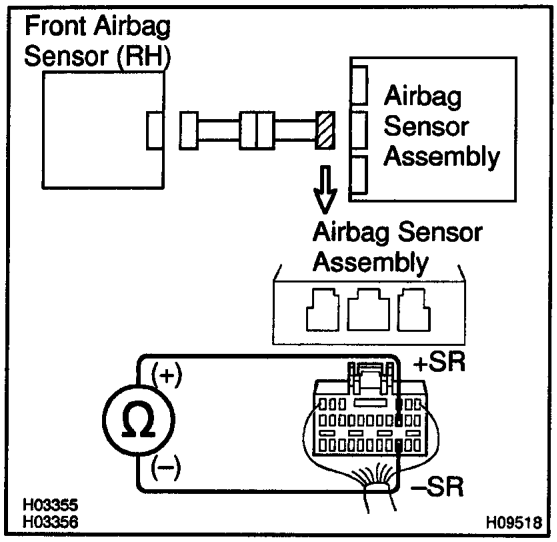
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 9.**

OK

4	Check wire harness.

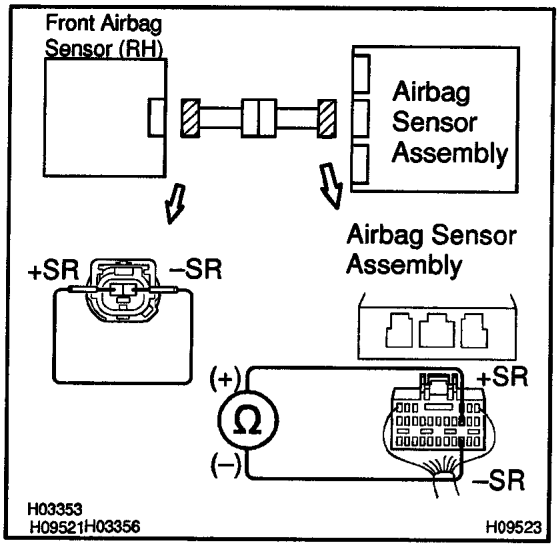


CHECK:
For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between +SR and –SR.
OK:
Resistance: 1 MΩ or Higher

NG → **Go to step 10.**

OK

5	Check wire harness.

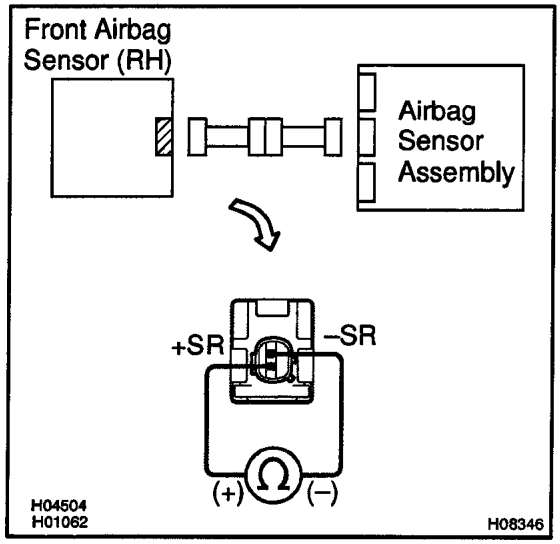


PREPARATION:
Using a service wire, connect +SR and –SR of the connector (on the front airbag sensor (RH) side) between the airbag sensor assembly and the front airbag sensor (RH).
CHECK:
For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between +SR and –SR.
OK:
Resistance: Below 1 Ω

NG → **Go to step 11.**

OK

6	Check front airbag sensor (RH).



CHECK:

For the connector of the front airbag sensor (RH), measure the resistance between +SR and –SR.

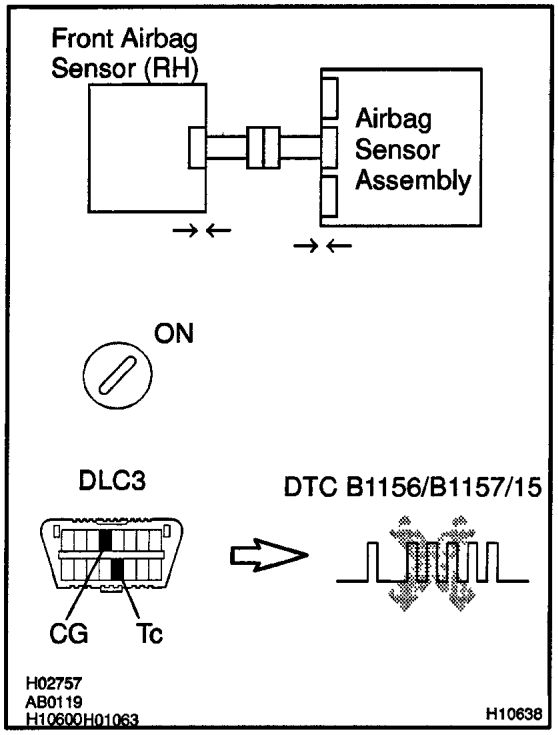
OK:

Resistance: 300 – 1500 Ω

NG → **Replace front airbag sensor (RH).**

OK

7	Check airbag sensor assembly.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the 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 the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B1156/B1157/15 is not output.

HINT:

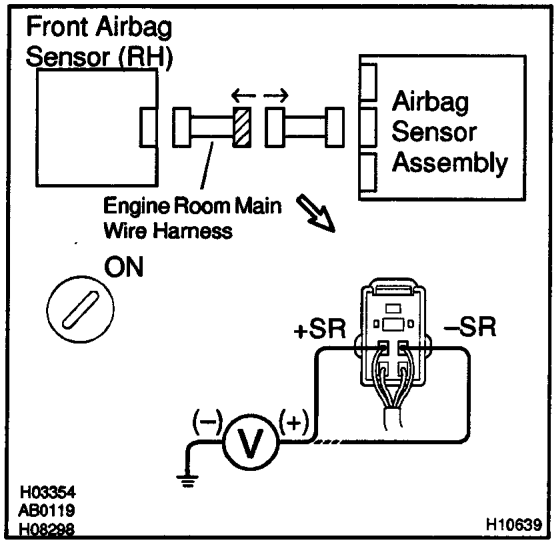
Codes other than code B1156/B1157/15 may be output at this time, but they are not relevant to this check.

NG	Replace 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.

8	Check engine room main wire harness (to B+).



PREPARATION:
Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:
(a) Turn the ignition switch to ON.
(b) For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the voltage between body ground and each of +SR and –SR.

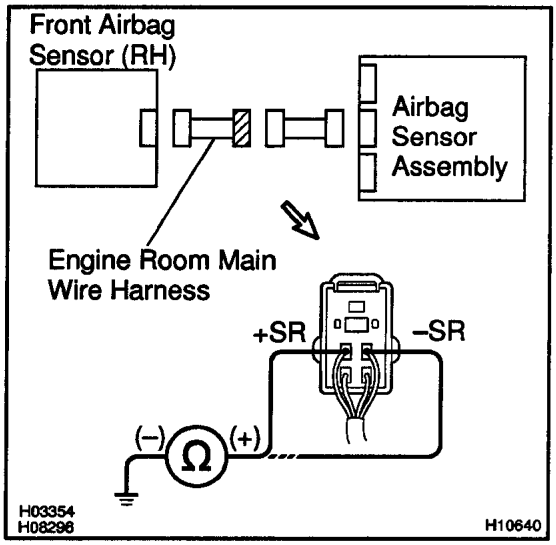
OK:
Voltage: Below 1 V

NG	Repair or replace engine room main wire harness.

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

9	Check engine room main wire harness (to ground).



PREPARATION:
Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:
For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between body ground and each of +SR and –SR.

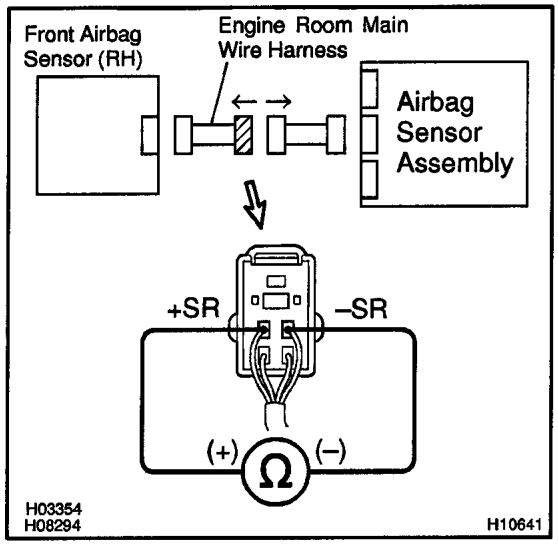
OK:
Resistance: 1 MΩ or Higher

NG	Repair or replace engine room main wire harness.

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

10	Check engine room main wire harness.



PREPARATION:
Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:
For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SR and –SR.

OK:

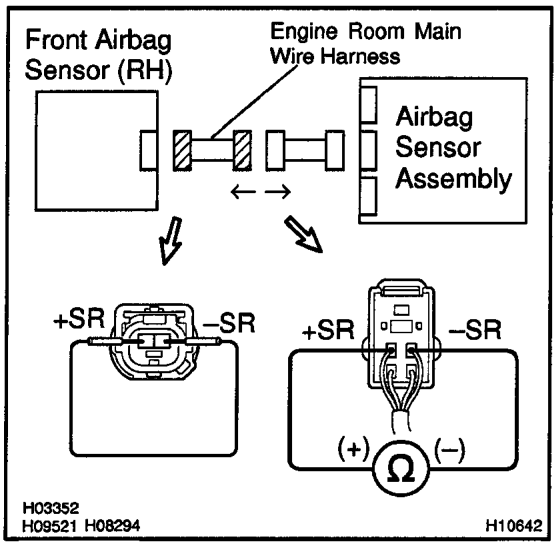
Resistance: 1 MΩ or Higher

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

11	Check engine room main wire harness.



PREPARATION:

(a) Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

(b) Using a service wire, connect +SR and –SR of the connector (on the engine room main wire harness side) between the engine room main wire harness and the front airbag sensor (RH).

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SR and –SR.

OK:

Resistance: Below 1 Ω

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

DI4LA-08

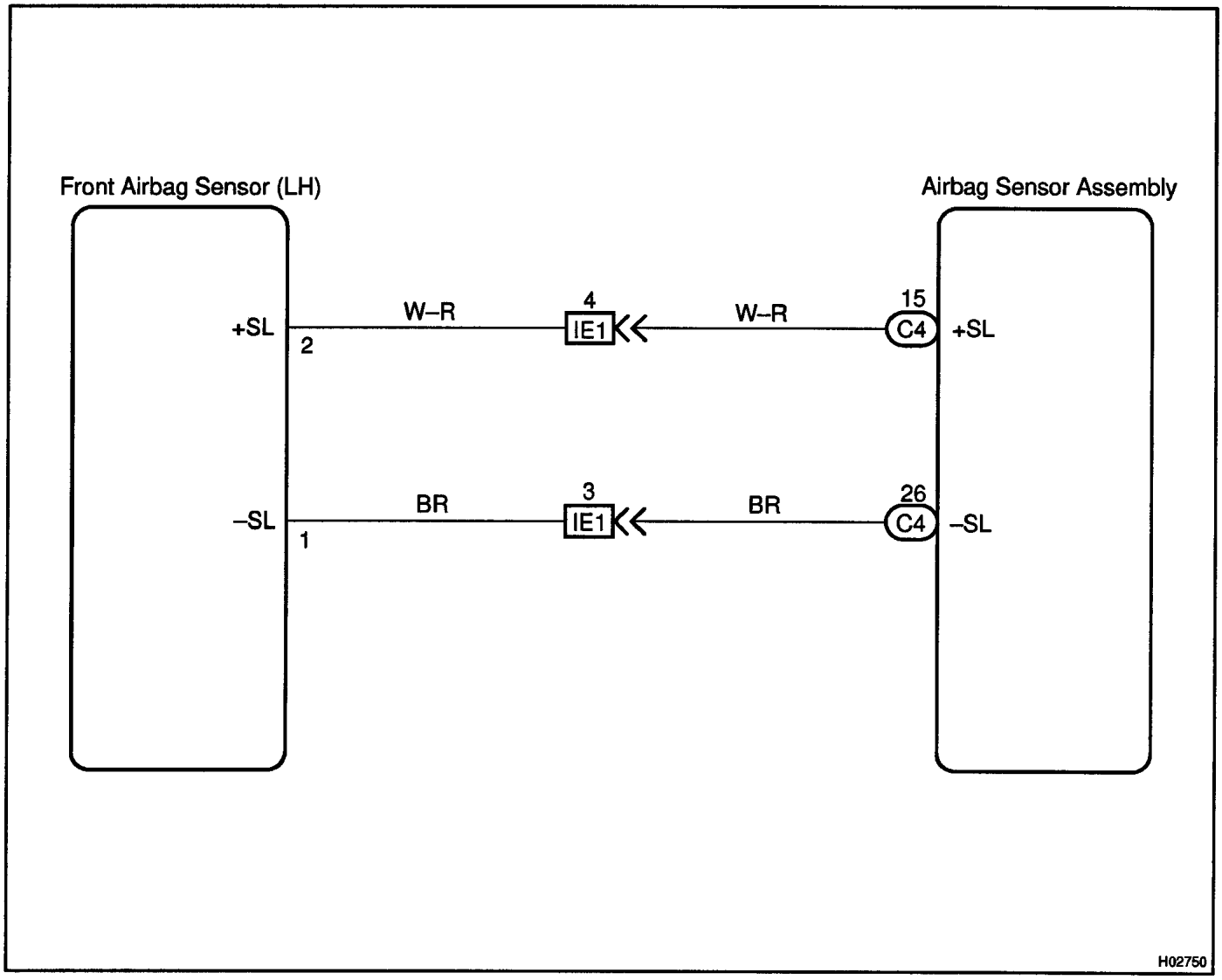
DTC	B1158/B1159/16	Front Airbag Sensor (LH) Malfunction

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 B1158/B1159/16 is recorded when malfunction is detected in the front airbag sensor (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1158/B1159/16	• Front airbag sensor (LH) malfunction	• Front airbag sensor (LH) • Wire harness • Engine room main wire harness • Airbag sensor assembly

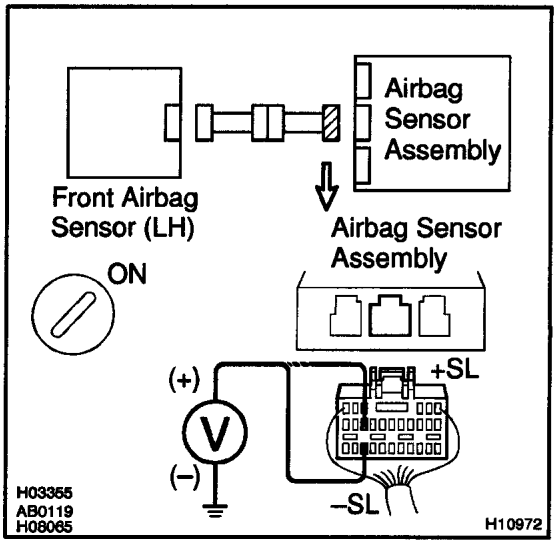
WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for Inspection. (See step 1 on page DI–228)**

2	**Check wire harness (to B+).**



CHECK:

(a) Turn the ignition switch to ON.

(b) 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.

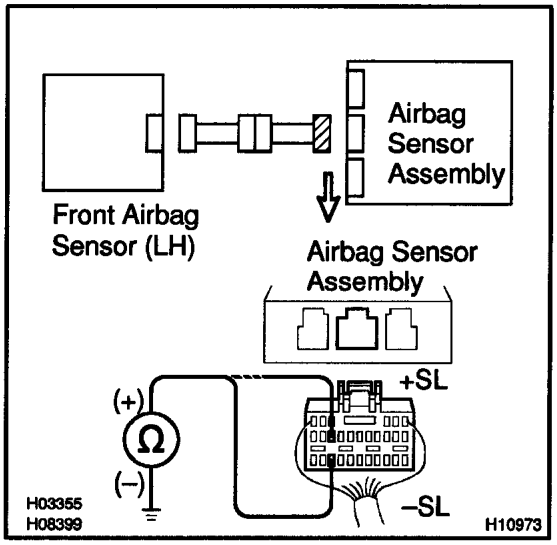
OK:

Voltage: Below 1 V

NG → **Go to step 8.**

OK

3	**Check wire harness (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 body ground and each of +SL and –SL.

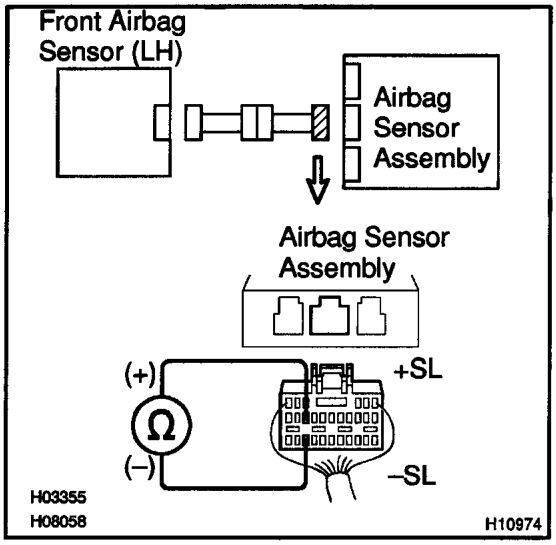
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 9.**

OK

4	Check wire harness.

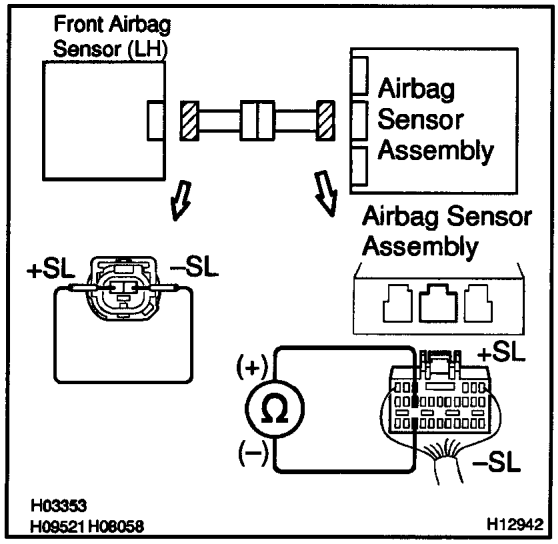


CHECK:
For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between +SL and –SL.
OK:
Resistance: 1 MΩ or Higher¥

NG → **Go to step 10.**

OK

5	Check wire harness.

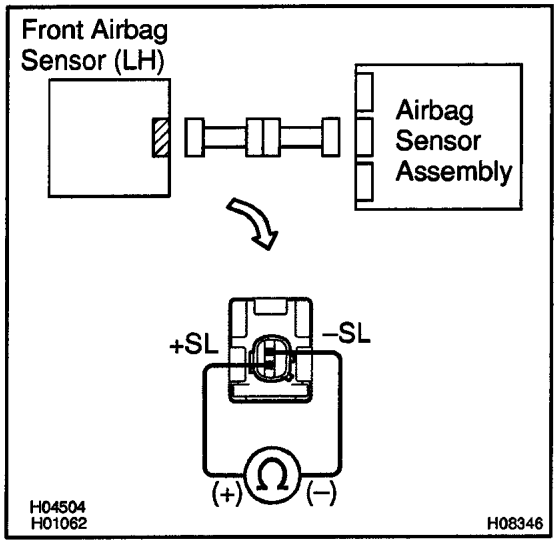


PREPARATION:
Using a service wire, connect +SL and –SL of the connector (on the front airbag sensor (LH) side) between the airbag sensor assembly and the front airbag sensor (LH).
CHECK:
For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between +SL and –SL.
OK:
Resistance: Below 1 Ω

NG → **Go to step 11.**

OK

6	Check front airbag sensor (LH).



CHECK:

For the connector of the front airbag sensor (LH), measure the resistance between +SL and –SL.

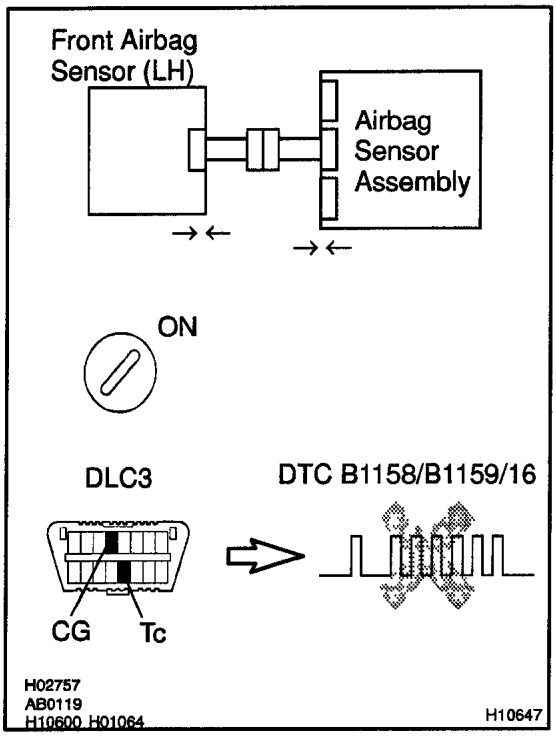
OK:

Resistance: 300 – 1500 Ω

NG → **Replace front airbag sensor (LH).**

OK

7	Check airbag sensor assembly.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the 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 the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear DTC stored in memory.
(See step 5 on page DI–102)
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check DTC. (See page DI–102)

OK:

DTC B1158/B1159/16 is not output.

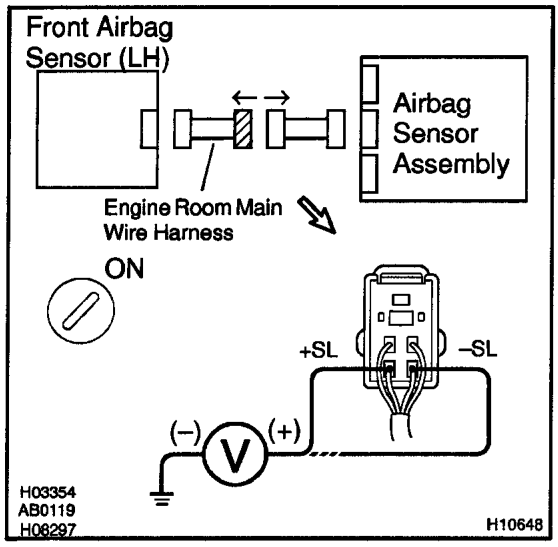
HINT:
Codes other than code B1156/B1157/15 may be output at this time, but they are not relevant to this check.

NG	Replace 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.

8	Check engine room main wire harness (to B+).



PREPARATION:
Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:
(a) Turn the ignition switch to ON.
(b) For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the voltage between body ground and each of +SL and –SL.

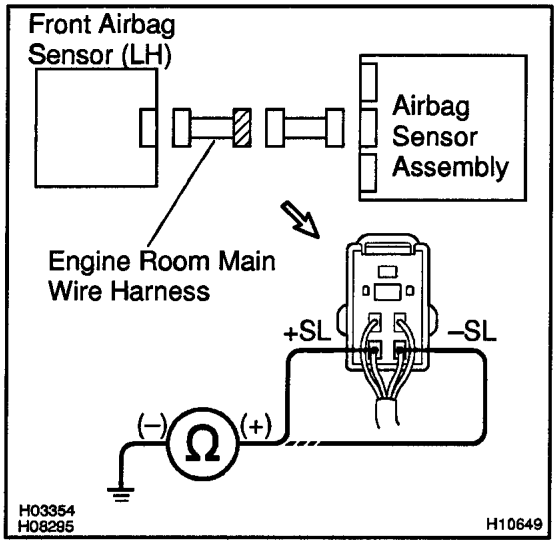
OK:
Voltage: Below 1 V

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

9	Check engine room main wire harness (to ground).



PREPARATION:
Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:
For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between body ground and each of +SL and –SL.

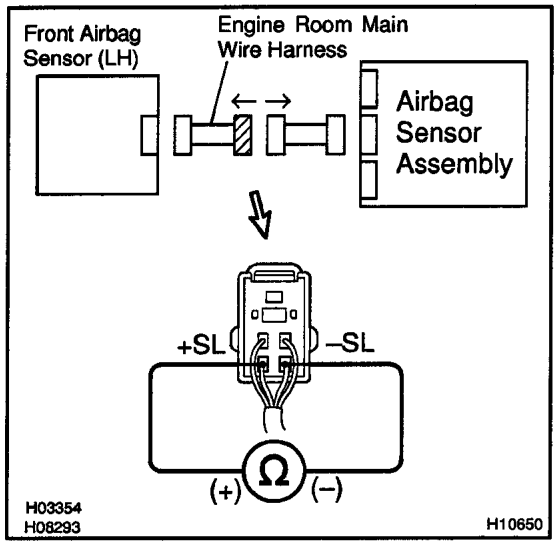
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

10	Check engine room main wire harness.



PREPARATION:
Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:
For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SL and –SL.

OK:

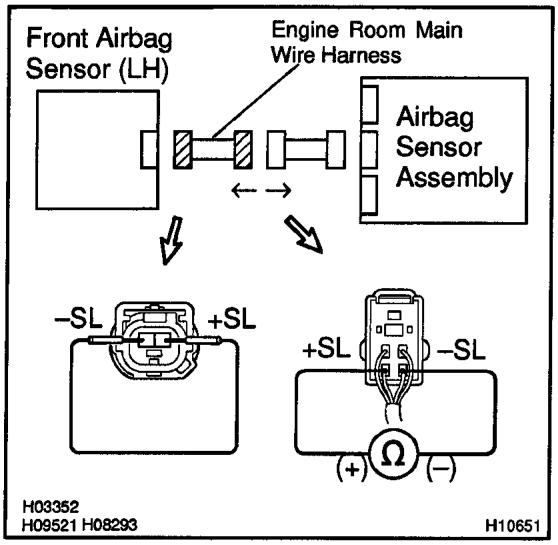
Resistance: 1 MΩ or Higher

NG → **Repair or replace engine room main wire harness.**

OK →

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

11	Check engine room main wire harness.



PREPARATION:

(a) Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

(b) Using a service wire, connect +SL and –SL of the connector (on the engine room main wire harness side) between the engine room main wire harness and the front airbag sensor (LH).

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SL and –SL.

OK:

Resistance: Below 1 Ω

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

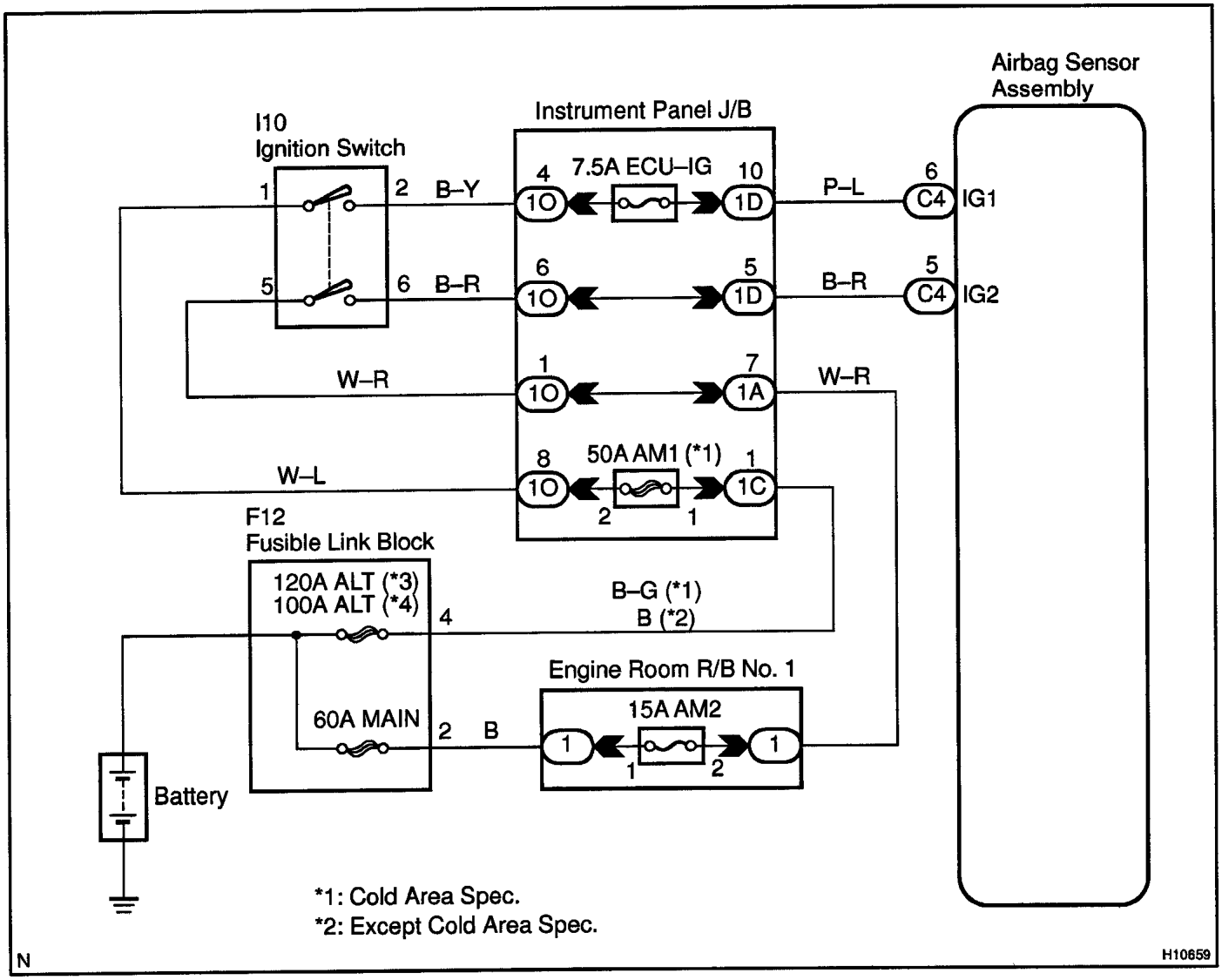
DTC	Normal	Source Voltage Drop

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.

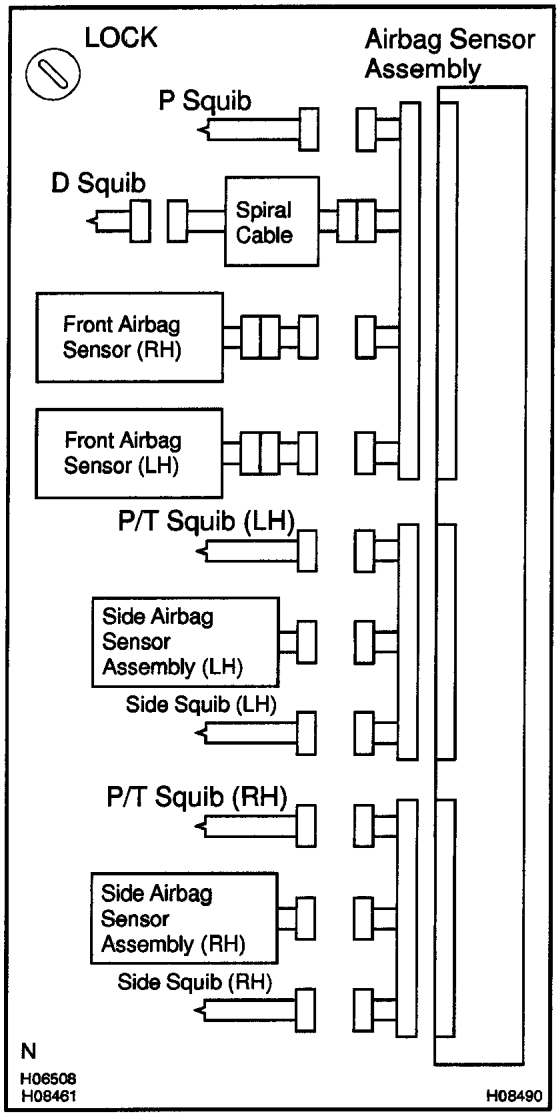
DTC No.	Diagnosis
(Normal)	Source voltage drop

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection.**

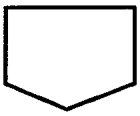


PREPARATION:

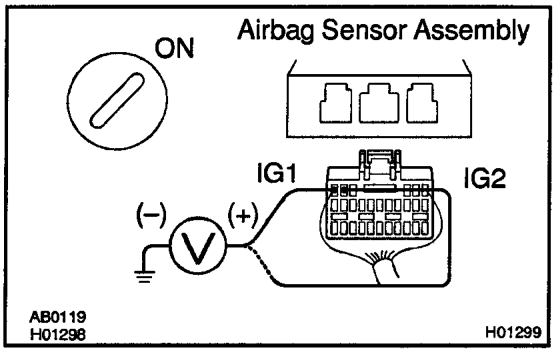
(a) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(b) Remove the steering wheel pad. (See page SR–12)
(c) Disconnect the connector of the front passenger airbag assembly. (See page RS–29)
(d) Disconnect the connectors of the side airbag assembly RH and LH. (See page RS–40)
(e) Disconnect the connectors of the seat belt pretensioner RH and LH. (See page BO–124)
(f) Disconnect the connectors of the airbag sensor assembly. (See page RS–53)
(g) Disconnect the connectors of the front airbag sensor RH and LH. (See page RS–58)
(h) Disconnect the connectors of the side airbag sensor assembly RH and LH. (See page RS–64)

CAUTION:

Store the steering wheel pad, front passenger airbag assembly and seatback assembly (with side airbag assembly) with the front surface facing upward.



2	Check source voltage.

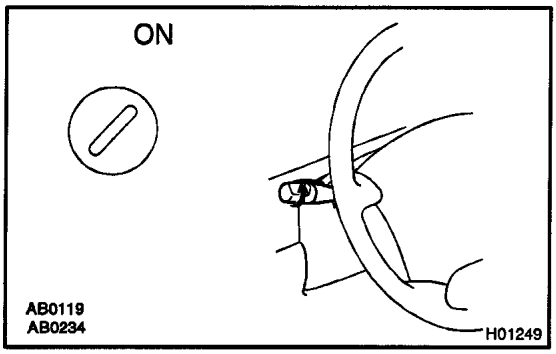


PREPARATION:
Connect negative (–) terminal cable to the battery.
CHECK:
(a) Turn the ignition switch ON.
(b) Measure the voltage between body ground and each of terminals IG1 and IG2 and operate electric system. (defogger, wiper, headlight, heater blower, etc.)
OK:
Voltage: 10 – 14 V

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 side airbag assembly connectors.
(f) Connect the seat belt pretensioner connectors.
(g) Connect the side airbag sensor assembly connectors.
(h) Connect the front airbag sensor connectors.
(i) Turn ignition switch to 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.

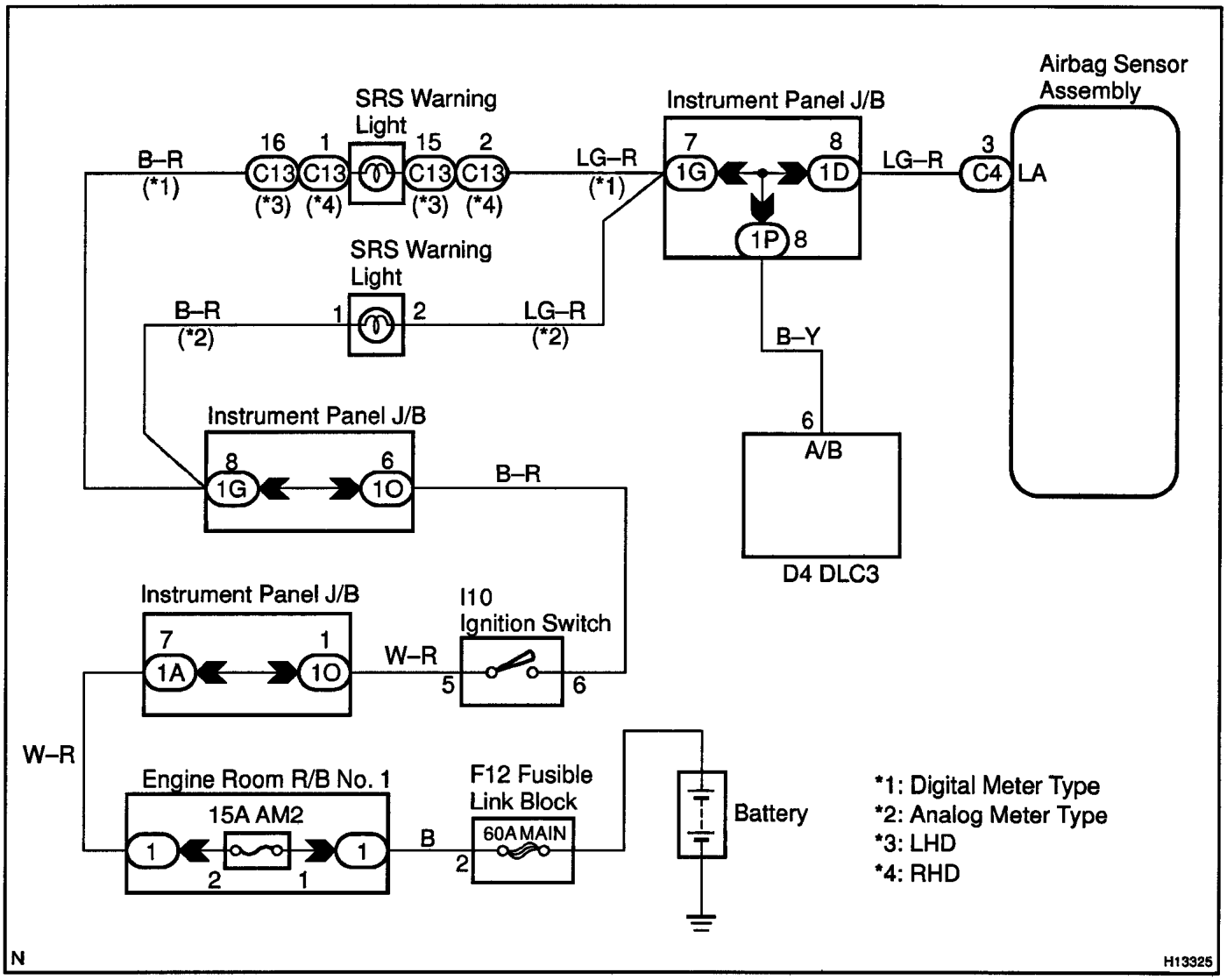
D6RJ-05

SRS Warning Light Circuit Malfunction

CIRCUIT DESCRIPTION

The SRS warning light is located on the combination meter.
When the SRS is normal, the SRS warning light lights up for approx. 6 seconds after the ignition switch is turned from the LOCK position to ON position, and then turns off automatically.
If there is a malfunction in the SRS, the SRS warning light lights up to inform the driver of the abnormality.
When terminals Tc and CG of the DLC3 are connected, the DTC is displayed by blinking the SRS warning light.

WIRING DIAGRAM

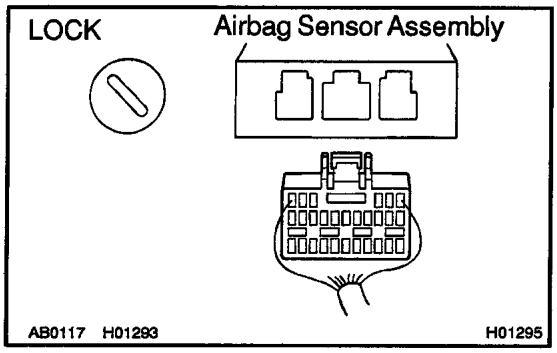


INSPECTION PROCEDURE

Always lights up, when ignition switch is in LOCK position

1	**Prepare for inspection. (See step 1 on page DI–228)**

2	**Does SRS warning light turn off?**



PREPARATION:

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

CHECK:

Check operation of SRS warning light.

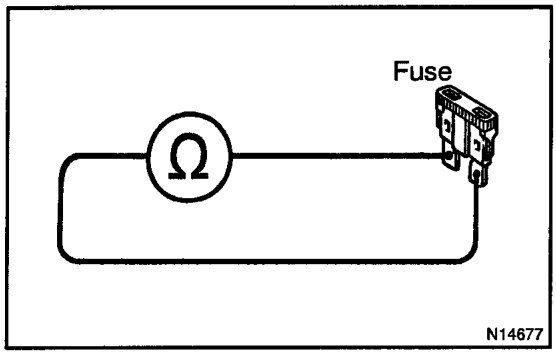
NO → **Check SRS warning light circuit or terminal A/B circuit of DLC3.**

YES

Replace airbag sensor assembly.

Does not light up, when ignition switch is turned to ON

1	**Check AM2 Fuse.**

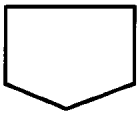


PREPARATION:
Remove AM2 fuse.
CHECK:
Check continuity of AM2 fuse.
OK:
Continuity
HINT:
- Fuse may be burnt out even if it appears to be OK during visual inspection.
- If fuse is OK, install it.

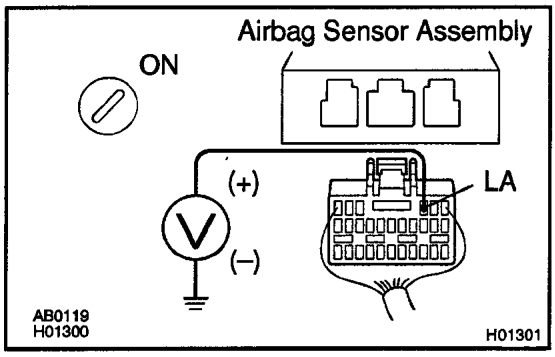
NG	**Go to step 5.**

OK

2	**Prepare for inspection. (See step 1 on page DI–228)**



3	**Check SRS warning light circuit.**



PREPARATION:
(a) Connect negative (–) terminal cable to the battery.
(b) Turn the ignition switch to ON.
CHECK:
Measure the voltage between body ground and 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

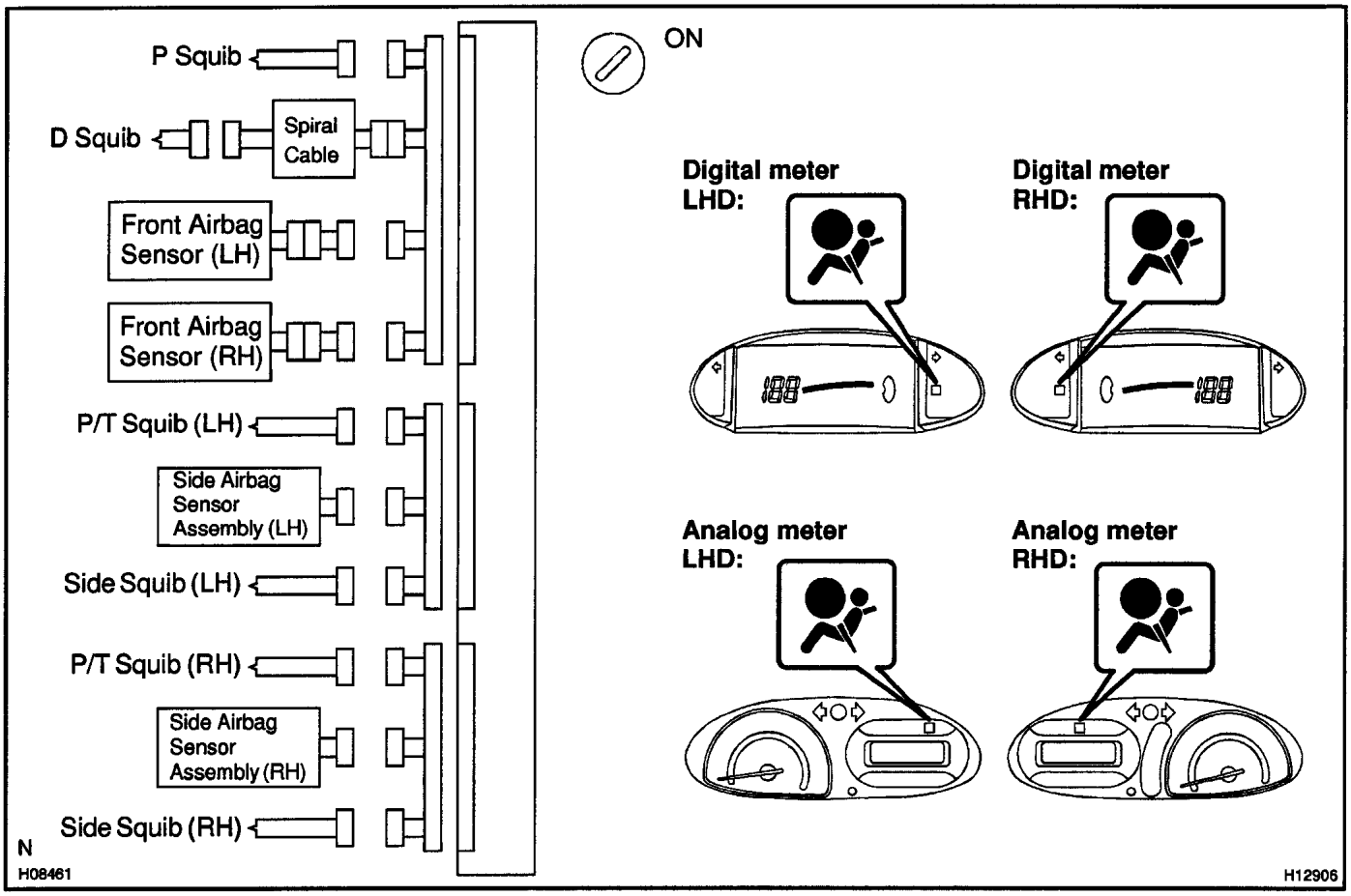
4	Does SRS warning light come on?

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 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 AM2 fuse burnt out again?

NO → Using simulation method, reproduce malfunction symptoms. (See page IN–19)

YES

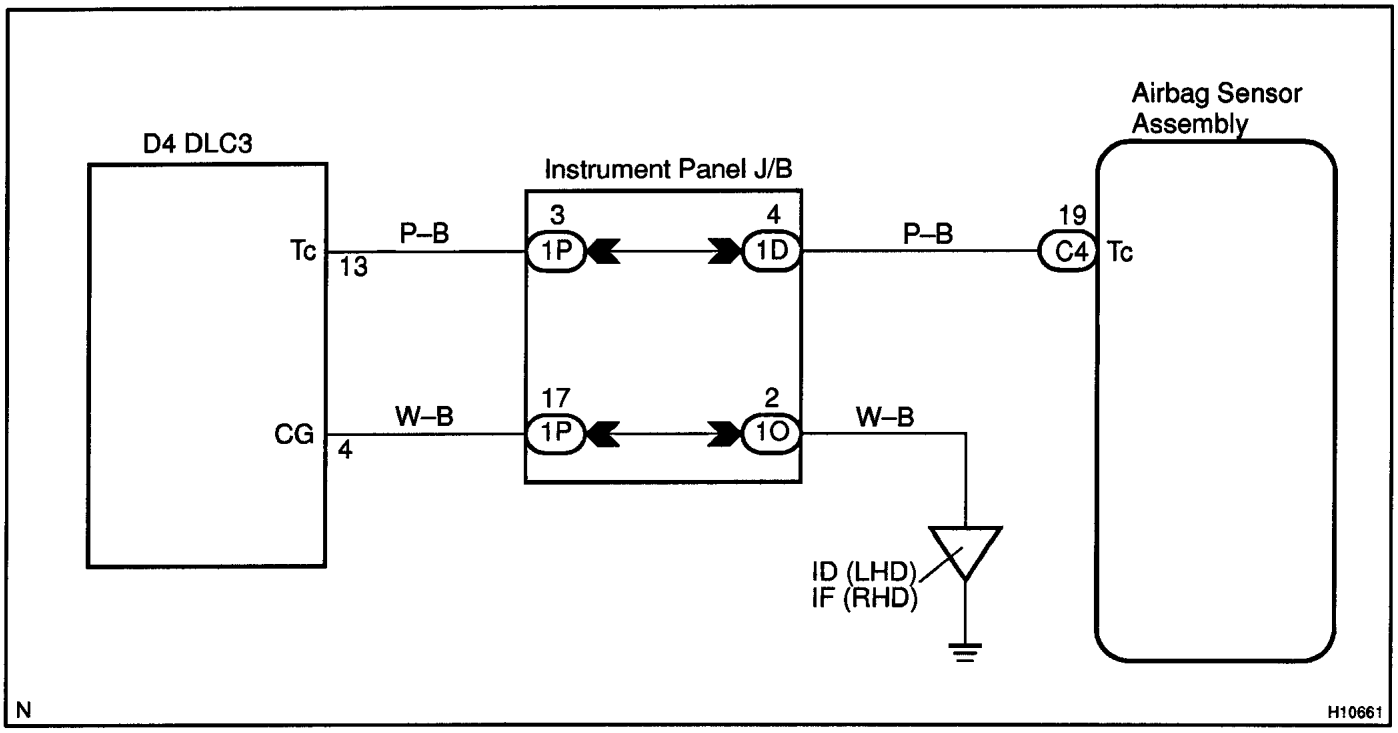
Check harness between AM2 fuse and SRS warning light.

Tc Terminal Circuit

CIRCUIT DESCRIPTION

By connecting terminals Tc and CG of the DLC3 the airbag sensor assembly is set in the DTC output mode. The DTCs are displayed by blinking the SRS warning light.

WIRING DIAGRAM



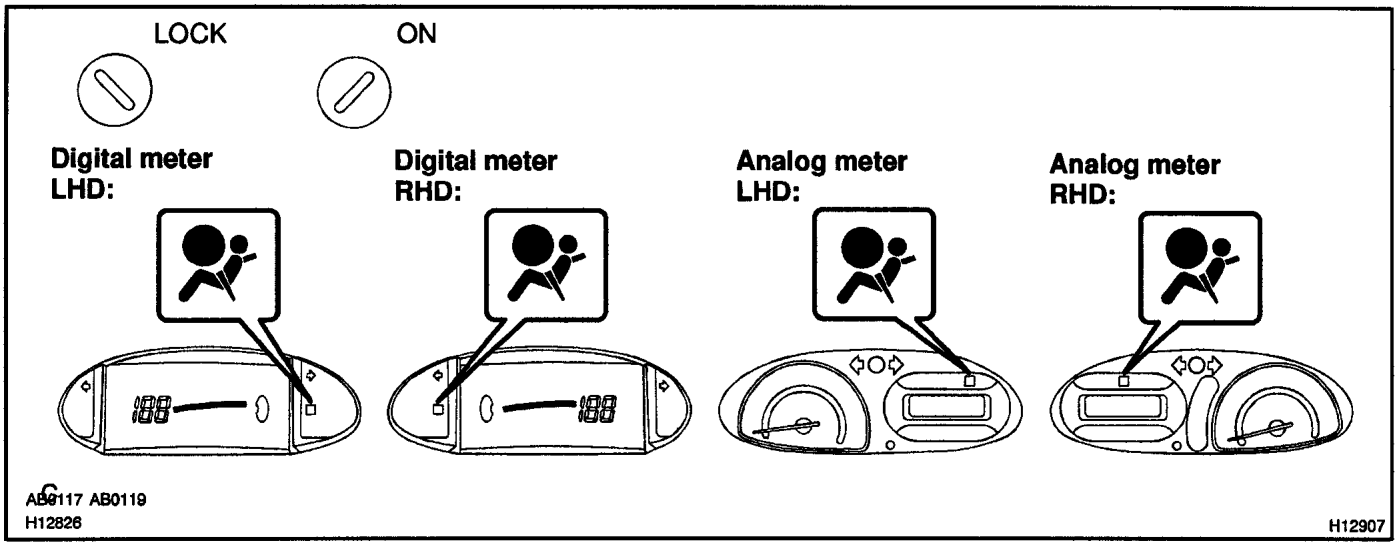
INSPECTION PROCEDURE

If the DTC is not displayed, do the following troubleshooting.

1	**Does SRS warning light light up for approx. 6 seconds?**

PREPARATION:

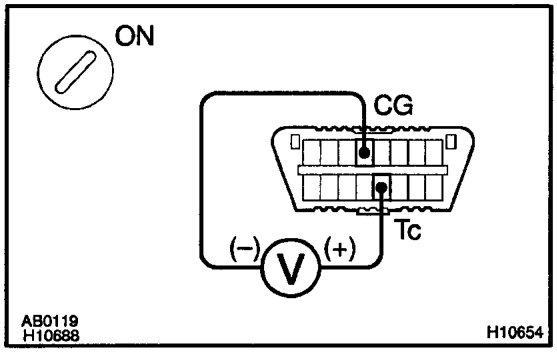
Check operation of the SRS warning light after ignition switch is turned from LOCK position to ON position.



NO → **Check SRS warning light system (See page DI–231).**

YES

2	Check voltage between terminals Tc and CG of DLC3.

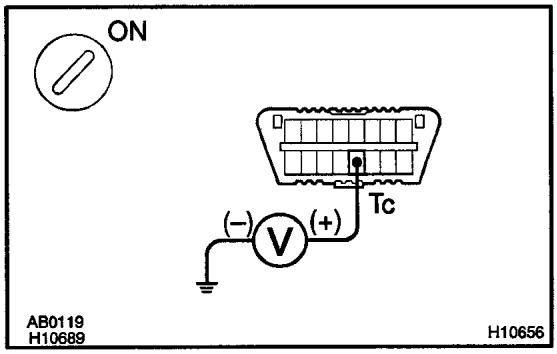


PREPARATION:
Turn ignition switch to ON.
CHECK:
Measure the voltage between terminals Tc and CG of DLC3.
OK:
Voltage: 4 – 14 V

OK	Go to step 4.

NG

3	Check voltage between terminal Tc of DLC3 and body ground.

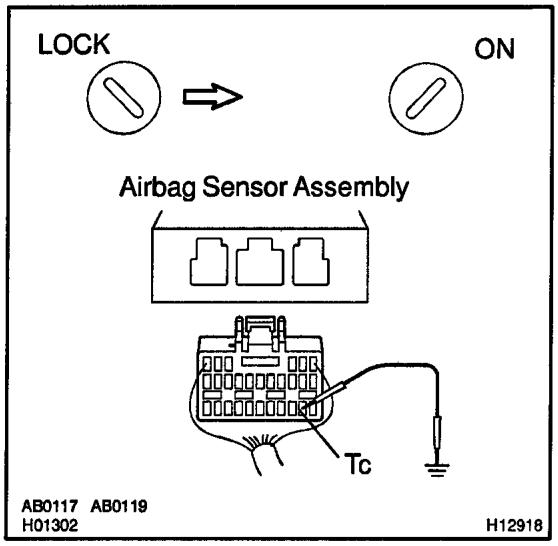


CHECK:
Measure the voltage between terminal Tc of DLC3 and body ground.
OK:
Voltage: 4 – 14 V

OK	Check harness between terminal CG of 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 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:

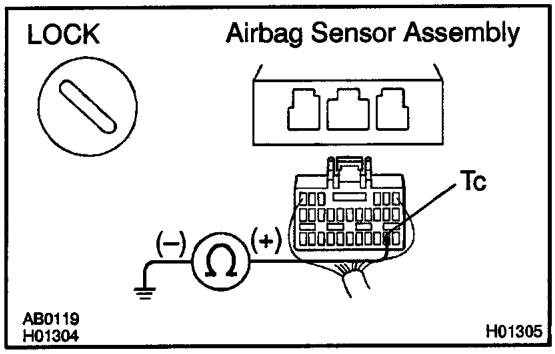
Pay due attention to the terminal connecting position to avoid a malfunction.

OK → **Check harness between the airbag sensor assembly and 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 the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Disconnect the airbag sensor assembly connector.

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

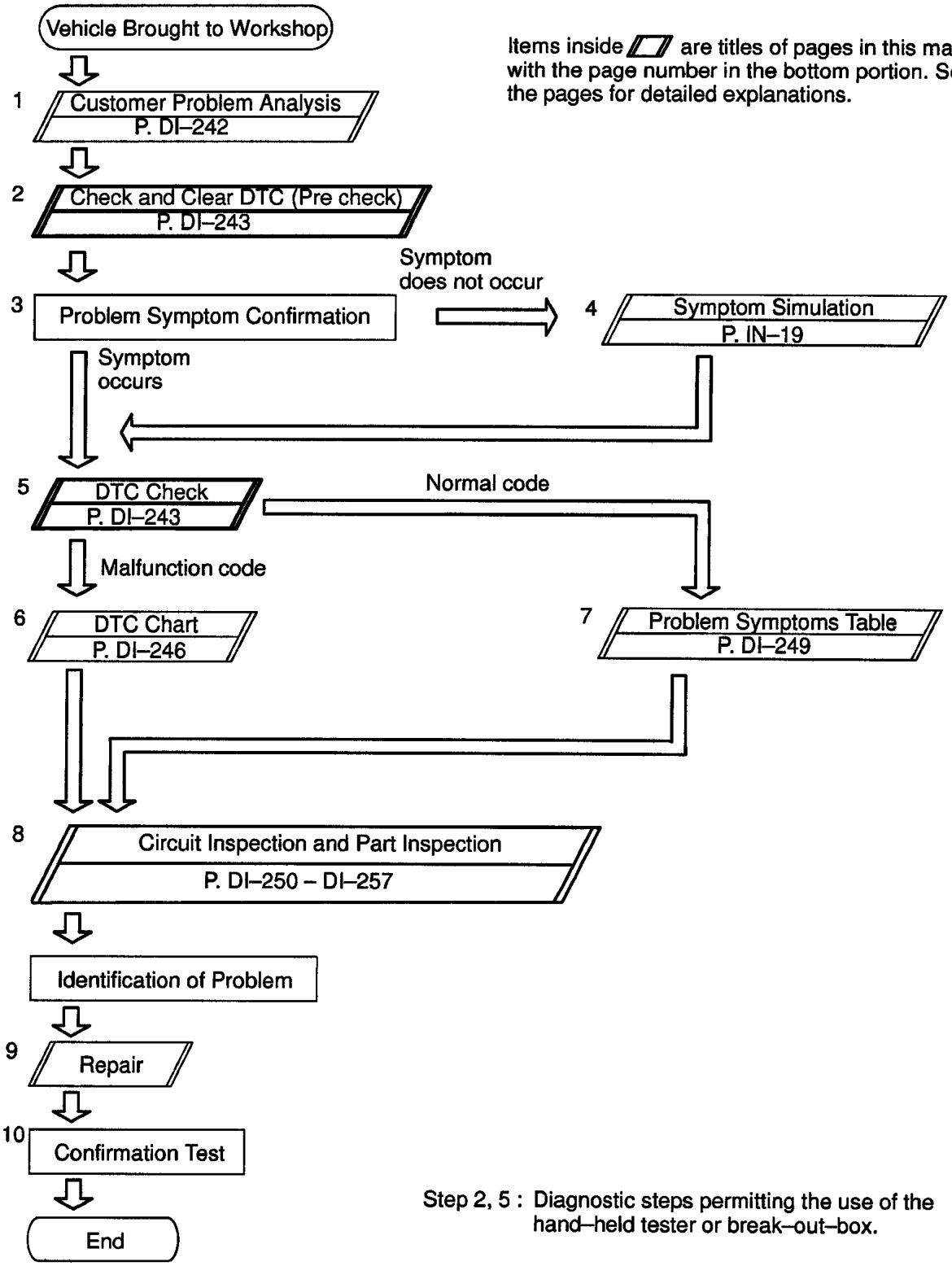
Replace airbag sensor assembly.

ENGINE IMMOBILISER SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI67Z-01

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 : Diagnostic steps permitting the use of the hand–held tester or break–out–box.

DI680-01

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 Lamp**	☐ Normal ☐ Remains ON ☐ Does not Light Up

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

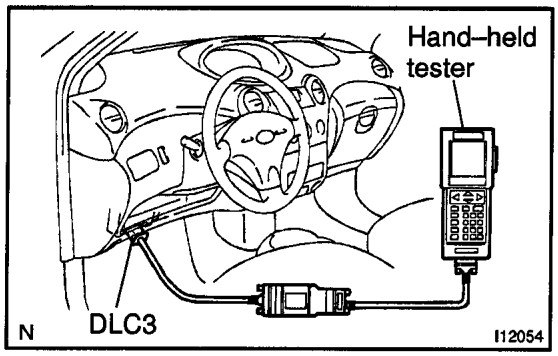
DI681-01

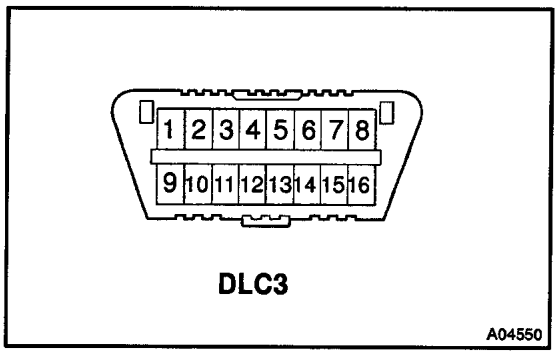
PRE–CHECK

1. DIAGNOSIS SYSTEM

(a) Description

ECM controls the function of immobiliser on this vehicle. Data of the immobiliser or DTC can be read form DLC3 of the vehicle. When a trouble occurs on immobiliser, MIL does not light up but DTC inspection is performed. Therefore when there seems to be a trouble on immobiliser, use hand–held tester or SST to check and troubleshoot it.





(b) Check the DLC3.

The vehicle's engine & 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 the 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.

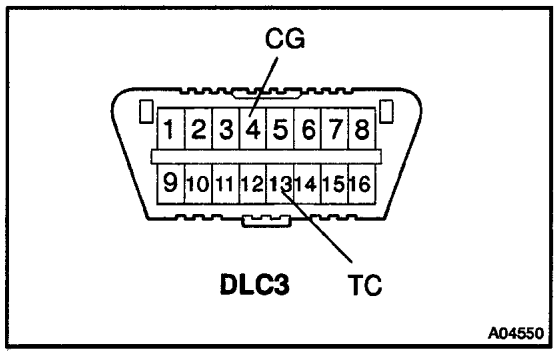
2. INSPECT DIAGNOSIS (Normal Mode)

(a) Check the DTC using hand–held tester.

NOTICE:

Hand–held tester only: When the diagnosis system is switched from normal mode to check mode, it erases all DTCs and freezed frame data recorded in normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

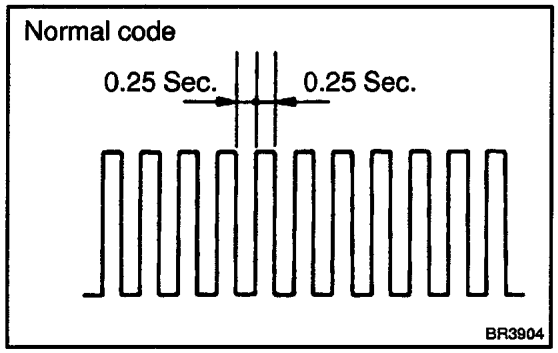
(1) Prepare the hand–held tester.
(2) Connect the hand–held tester to DLC3.
(3) Turn the ignition switch ON and push the hand–held tester main switch ON.
(4) Use the hand–held tester to check the DTCs and freezed frame data, note them down. (For operating instructions, see the hand–held tester instruction book.)
(5) See page DI–246 to confirm the details of the DTCs.



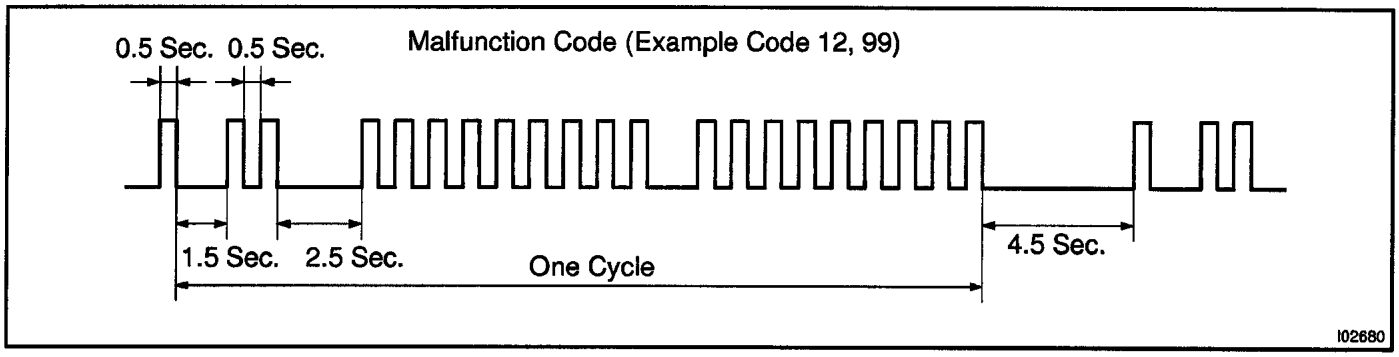
(b) Check the DTC (Using diagnosis check wire)
(1) Turn ignition switch ON.
(2) Using SST, connect between terminals 4 (CG) and 13 (TC) of DLC3.
SST 09843–18040
(3) Read the diagnostic trouble code from malfunction indicator lamp.

HINT:

- If a diagnostic trouble code is not output, check the TC terminal circuit.
- Engine & ECT ECU controls the immobiliser function on this vehicle, DTC is out put with engine data.



- As an example, the blinking patterns for codes; normal, 12 and 99 are shown in the charts.



(4) When DTC "99" is output, there is a trouble of immobiliser. Start troubleshooting referring to PROBLEM SYMPTOMS TABLE.

(5) After completing the check, disconnect terminals 13 (TC) and 4 (CG) and turn off the display.

HINT:

In the event of 2 or more malfunction codes, indication will begin from the smaller numbered code and continue in order to the larger.

(c) Clear the DTC.

The following operations will erase the DTCs and freeze frame data.

(1) Operating the OBD II scam tool (complying with SAEJ1978) or hand–held tester to erase the codes. (See the OBD II scan tool's instruction book for operating instructions.)

(2) Disconnecting the battery terminals or EFI fuse.

DI6B2-01

DIAGNOSTIC TROUBLE CODE CHART

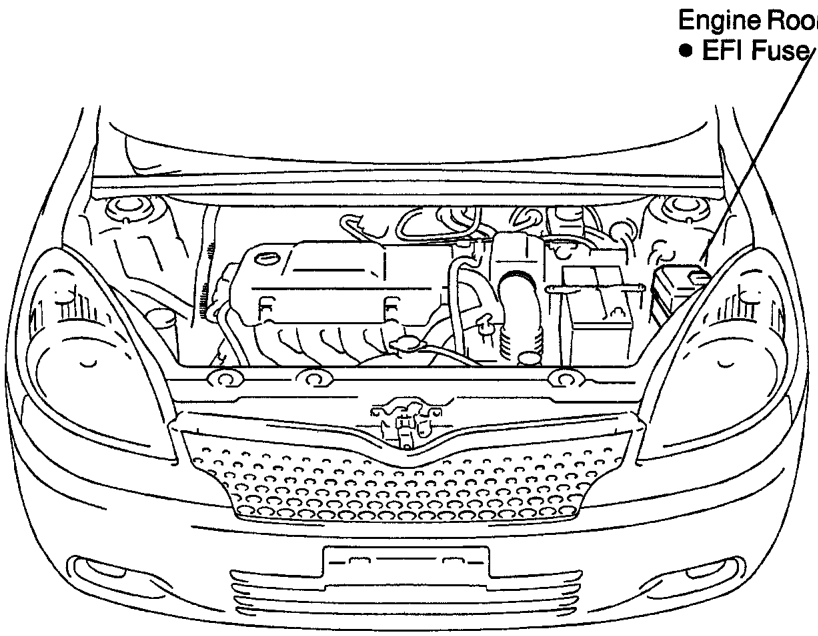
DTC No. (See Page)	Detection Item	Trouble Area
B2795 (DI–250)	Unmatched key code	• Key • Unregistered key inserted before
B2796 (DI–251)	No communication in immobiliser system	• Key • Transponder key amplifier • Wirehaness • Engine & ECT ECU
B2797 (DI–253)	Communication malfunction No.1	• Communication contents • Unregistered key inserted before
B2798 (DI–255)	Communication malfunction No.2	• Key • Transponder key amplifier • Wire haness • Engine & ECT ECU

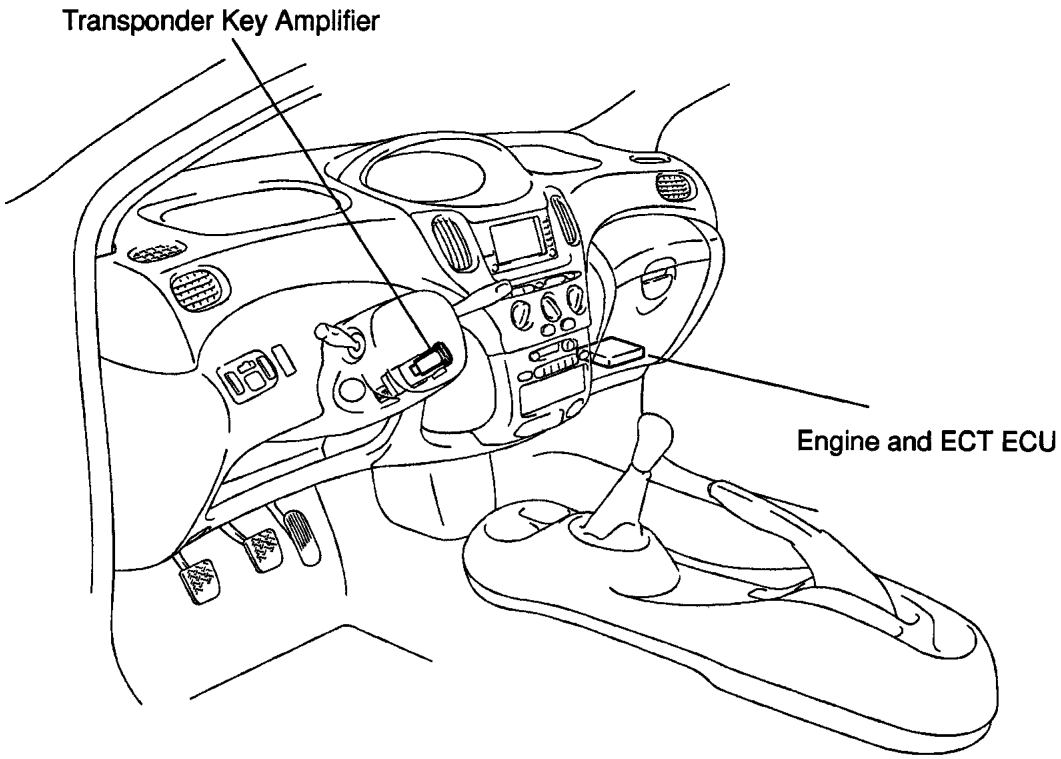
HINT:

To reduce the unnecessary exchange of Engine & ECT ECU, check that a trouble occurs with the original Engine & ECT ECU at the time of excanging Engine & ECT ECU and the trouble will disappear with a new Engine & ECT ECU.

DI6S3-02

PARTS LOCATION



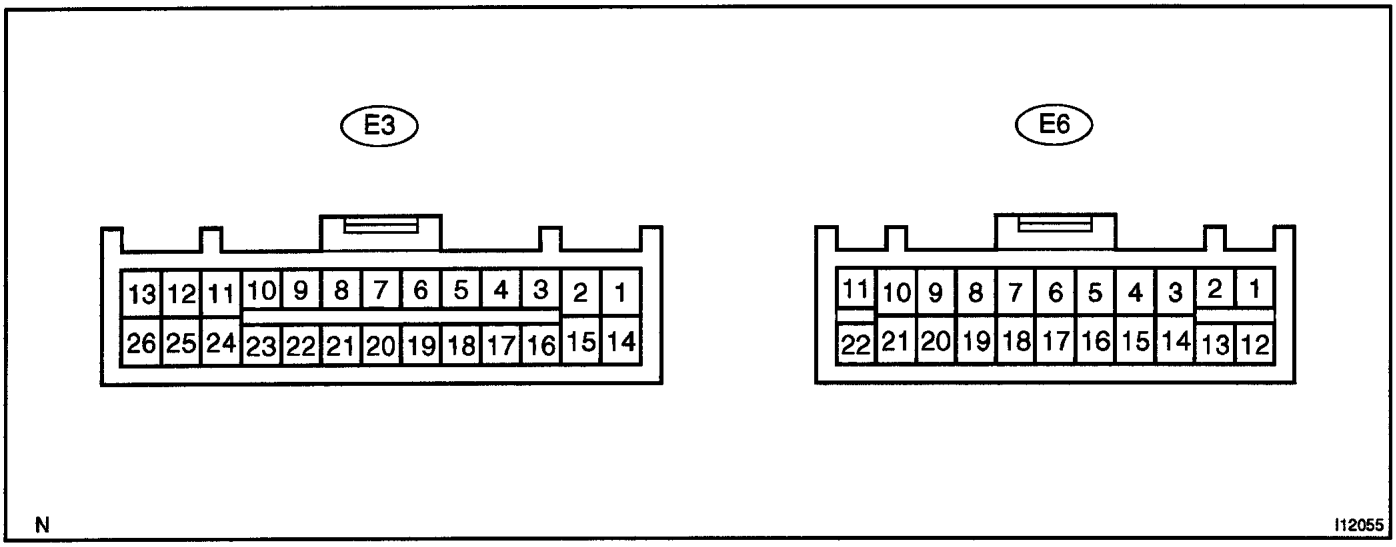


P

I13513

DI584-01

TERMINALS OF ECU



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
TXCT – E1 (E6 – 3 ↔ E3 – 14)	L–B ↔ BR	Ignition Switch ON	10 – 14
CODE – E1 (E6 – 15 ↔ E3 – 14)	Y ↔ BR	Ignition Switch ON	10 – 14
RXCK – E1 (E6 – 4 ↔ E3 – 14)	Y–B ↔ BR	Ignition Switch ON	10 – 14

DI685-01

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Immobiliser is not set. (Engine starts with key codes other than the registered key code.)	1. Engine and ECT ECU	IN–29
Engine does not start.	1. Key 2. Wire harness 3. Transponder key amplifier 4. Engine and ECT ECU	*1 IN–29 – IN–29
Security indicator is always ON.	1. Security indicator 2. Wire harness 3. Engine and ECT ECU	*2 IN–29 IN–29
Security indicator is always ON. (Although code has been registered in the automatic registration mode, indicator is not OFF.)	1. Wire harness 2. Transponder key amplifier 3. Engine and ECT ECU	IN–29 – IN–29
Security indicator is OFF. (When DTC of immobiliser is output)	1. Wire harness 2. Transponder key amplifier 3. Engine and ECT ECU	IN–29 – IN–29
Security indicator is OFF. (When DTC of immobiliser is not output)	1. Wire harness 2. Engine and ECT ECU	IN–29 IN–29
Security indicator is abnormally blinking.	1. Wire harness 2. Engine and ECT ECU	IN–29 IN–29

*1 : 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.

*2 : Finish the automatic registration mode because the mode might still remain.

D1606-01

CIRCUIT INSPECTION

DTC	B2795/99	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 that a customer keeps to check that B2795 is output.
When a key that outputs B2795 is found, register this key. when B2795 is not output, there is a possibility that the unregistered key has been inserted before. (Engine and ECT ECU is normal.)
Inquire 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 Detecting Condition	Trouble Area
B2795/99	No communication	• Key

INSPECTION PROCEDURE

1	**Delete DTC and insert all the presently available keys to check whether the engine starts or not.**

HINT:
When inserting the key that does not start the engine, DTC (B 2795) is stored in memory.

RESULT:

OK	All keys starts the engine.
NG	A specific key does not start the 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 the key that does not start the engine.

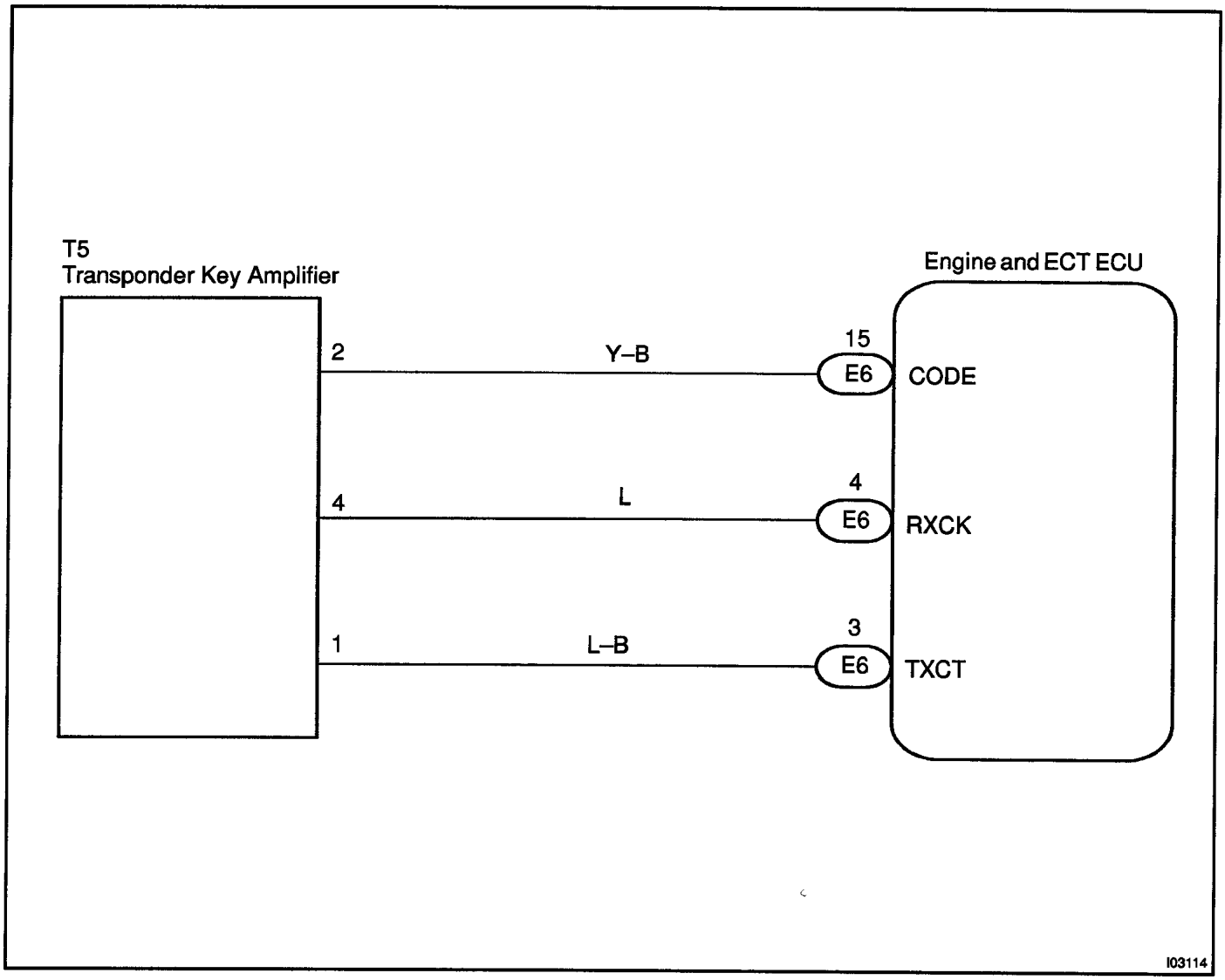
DI687-02

DTC	B2796/99	No Communication in Immobiliser system

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
B2796/99	No communication	• Key • Transponder Key Amplifier • Wire Harness • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Delete DTC and insert all the presently available keys to check whether the engine starts or not.**

RESULT:

A	All keys start the engine.
B	A specific key does not start the engine. In this case, DTC (B 2796) is stored in memory.
C	All keys do not start the engine. In this case, DTC (B 2796) 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 → **The transponder chip of a specific key is defective. Replace the key.**

C

2	**Check harness and connector between transponder key amplifier and Engine and ECT ECU.**

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

OK

3	**Does it operate normally after replacement of transponder key amplifier?**

Yes → **Replace transponder key amplifier.**

No

Replace Engine and ECT ECU.

DI686-02

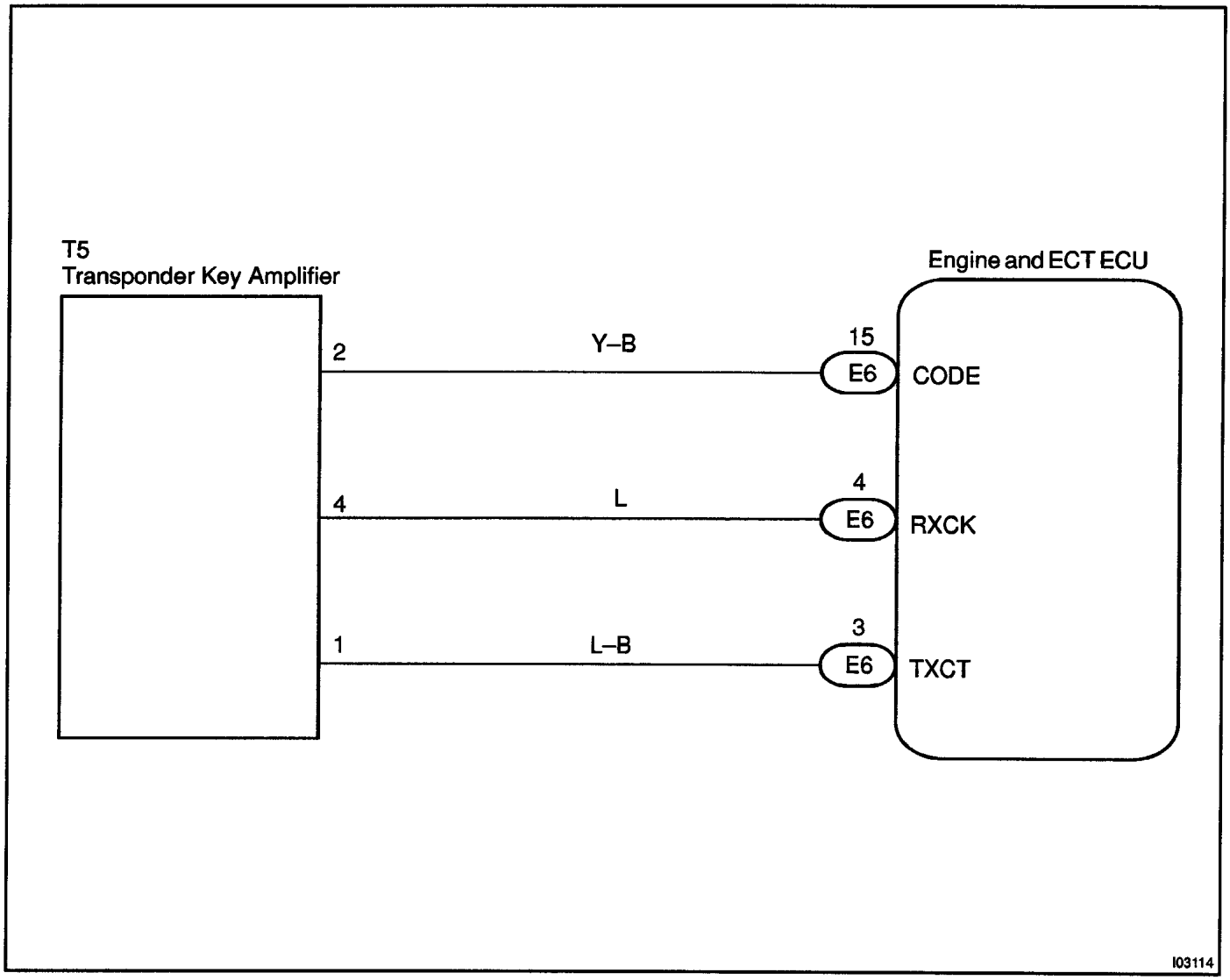
DTC	B2797/99	Communication Malfunction No.1

CIRCUIT DESCRIPTION

This code is detected when although the communication has been performed normally, an error occurs. (Example. Some noise is included in communication line.)

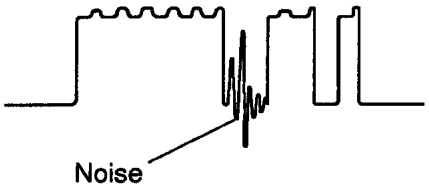
DTC No.	DTC Detecting Condition	Trouble Area
B2797/99	Communication error	• Wire Harness • Transponder Key Amplifier • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Noise check



PREPARATION:
Insert the already registered master key in the key cylinder.
CHECK:
Using an oscilloscope or hand–held tester, check that noise is included in the signals sent to the CODE terminal of Engine and ECT ECU.
OK:
No noise is detected.

NG → **Try to find the cause of the noise and remove it.**

OK ↓

2	Does the system operate normally after replacement of transponder key amplifier?

Yes → **Replace transponder key amplifier.**

No ↓

Replace Engine and ECT ECU.

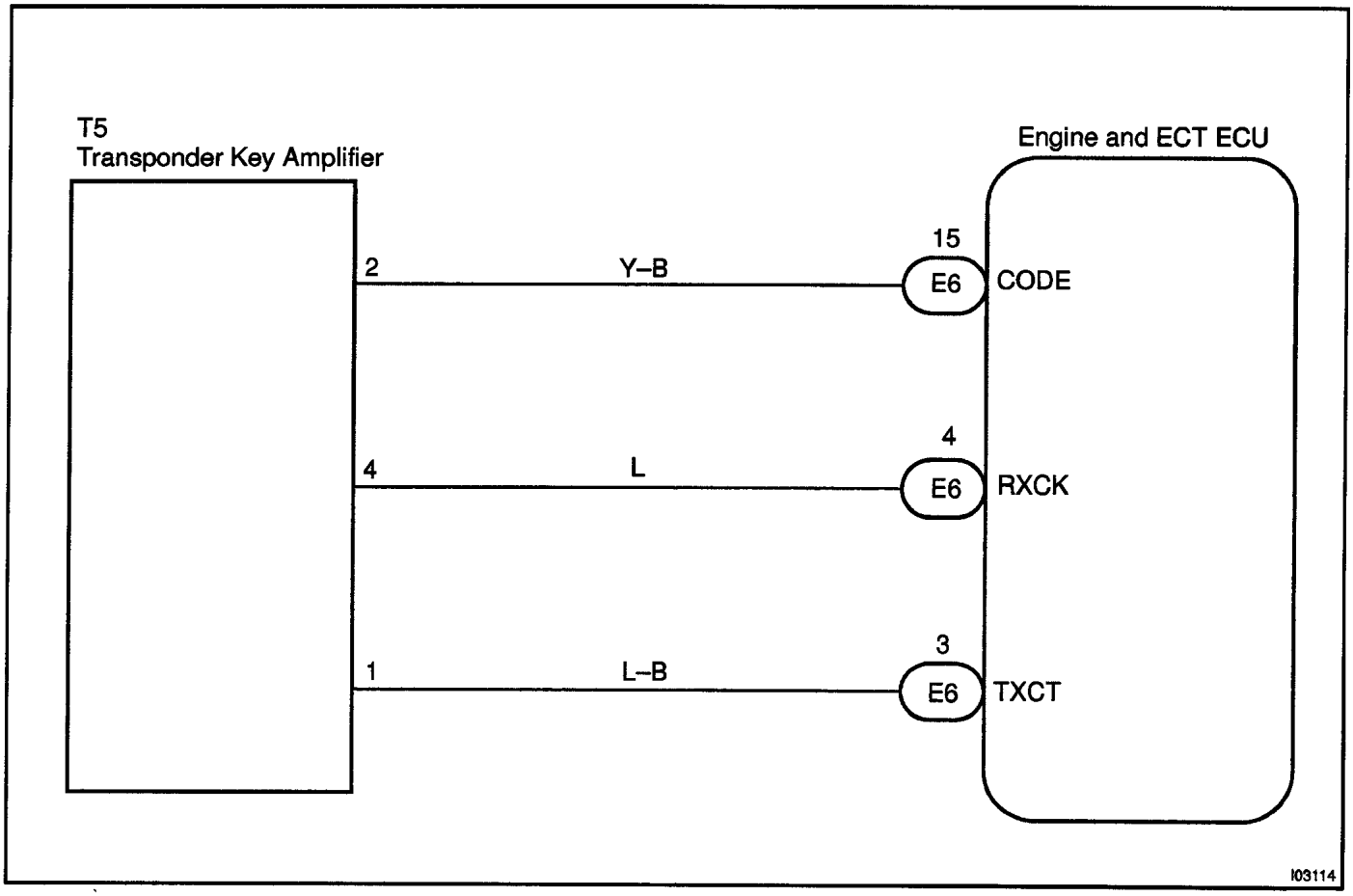
DI589-02

DTC	B2798/99	Communication malfunction No.2

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
B2798/99	Communication error	• Key • Transponder Key Amplifier • Wire harness • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check harness and connector between transponder key amplifier and Engine and ECT ECU.

NG → Repair or replace harness and connector.

OK ↓

2	Does it operate normally after replacement of transponder key amplifier?

Yes → Replace transponder key amplifier.

No ↓

Replace Engine and ECT ECU.

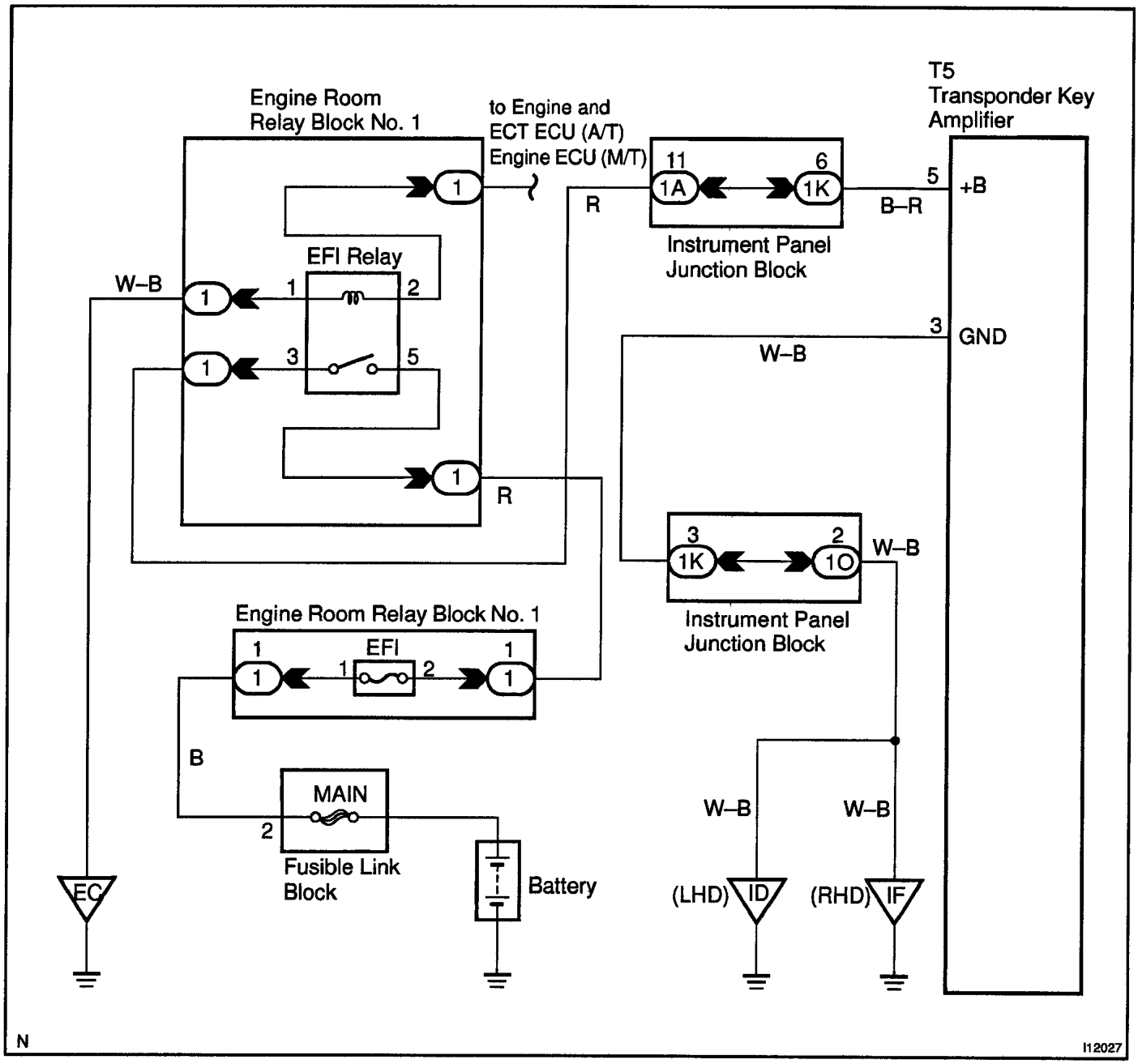
DI68A-02

Power source circuit

CIRCUIT DESCRIPTION

This circuit provides power to operate the Transponder Key Amplifier.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check EFI fuse.**

CHECK:
Check continuity of EFI fuse.
OK:
Continuity

NG → **Replace the failure fuse.**

OK

2	**Check voltage between terminals EFI and GND of Transponder Key Amplifier connector.**

PREPARATION:
(a) Turn ignition switch OFF.
(b) Disconnect the Transponder Key Amplifier connector.
CHECK:
Measure voltage between terminals +B and GND.
OK:
Voltage: 10 – 14 V

OK → **Proceed to next circuit inspection shown on problem symptoms table. (See page DI–249)**

NG

3	**Check wire harness and connector between Transponder Key Amplifier and body ground.**

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

OK

Check and repair wire harness and connector between Transponder Key Amplifier and Battery.

CLUTCH

TROUBLESHOOTING CL–1
CLUTCH PEDAL CL–2
CLUTCH MASTER CYLINDER CL–4
CLUTCH RELEASE CYLINDER CL–9
CLUTCH UNIT CL–14

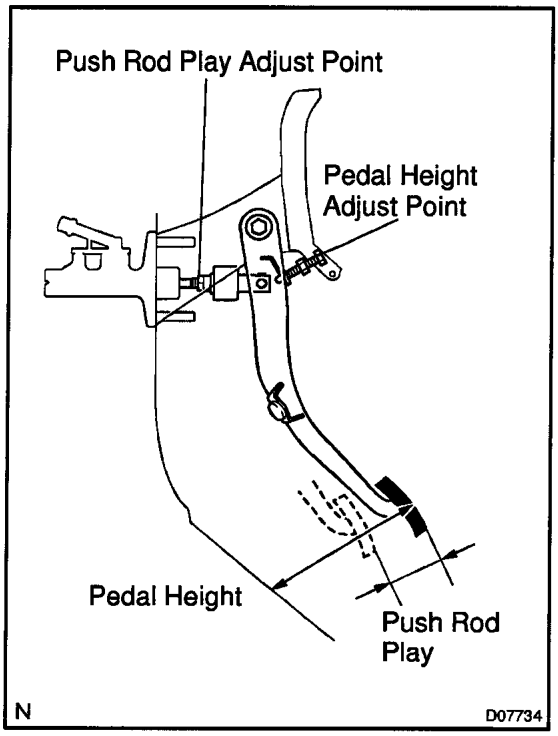
TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

CL02N-05

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Clutch grabs/chatters	1. Engine mounting (Loosen)	–
	2. Clutch disc (Runout is excessive)	CL–14
	3. Clutch disc (Oily)	CL–14
	4. Clutch disc (Worn out)	CL–14
	5. Clutch disc torsion rubber (Damaged)	CL–14
	6. Clutch disc (Glazed)	CL–14
	7. Diaphragm spring (Out of tip alignment)	CL–14
Clutch pedal spongy	1. Clutch line (Air in line)	–
	2. Master cylinder cup (Damaged)	CL–4
	3. Release cylinder cup (Damaged)	CL–9
Clutch noisy	1. Release bearing (Worn, dirty, or damaged)	CL–14
	2. Clutch disc torsion rubber (Damaged)	CL–14
Clutch slips	1. Clutch pedal (Free play out of adjustment)	CL–2
	2. Clutch disc (Oily)	CL–14
	3. Clutch disc (Worn out)	CL–14
	4. Diaphragm spring (Damaged)	CL–14
	5. Pressure plate (Distortion)	CL–14
	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–9
	5. Clutch disc (out of true)	CL–14
	6. Clutch disc (Runout is excessive)	CL–14
	7. Clutch disc (Lining broken)	CL–14
	8. Clutch disc (Dirty or burned)	CL–14
	9. Clutch disc (Oily)	CL–14
	10.Clutch disc (Lack of spline grease)	CL–14
	11.Diaphragm spring (Damaged)	CL–14
	12.Diaphragm spring (Out of tip alignment)	CL–14
	13.Pressure plate (Distortion)	CL–14



CLUTCH PEDAL

CL087-02

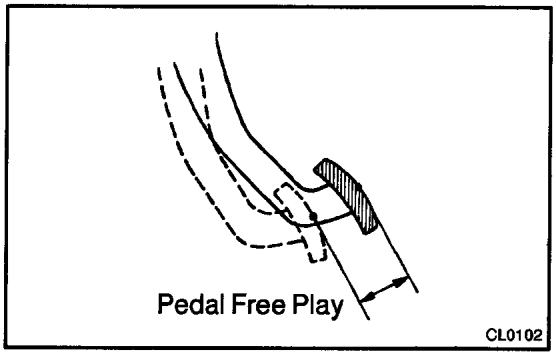
INSPECTION

1. CHECK THAT PEDAL HEIGHT IS CORRECT

Pedal height from dash panel:
RHD: 139.3 – 149.3 mm (5.484 – 5.878 in.)
LHD: 134.3 – 144.3 mm (5.287 – 5.681 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 THAT PEDAL FREE PLAY AND PUSH ROD PLAY ARE CORRECT

(a) Push in on the pedal until the beginning of clutch resistance is felt.

Pedal free play: 5.0 – 15.0 mm (0.197 – 0.591 in.)

(b) Gently push on the pedal until the resistance begins to increase a little.

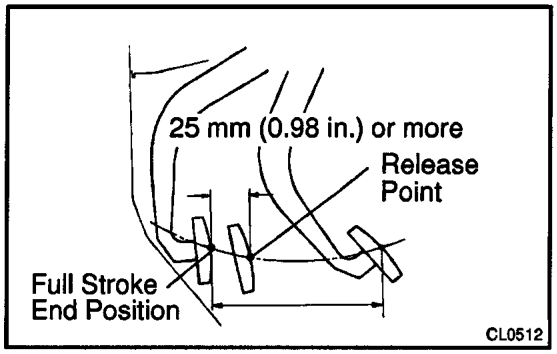
Push rod play at pedal top:
1.0 – 5.0 mm (0.039 – 0.197 in.)

4. IF NECESSARY, ADJUST PEDAL FREE PLAY AND PUSH ROD PLAY

(a) Loosen the lock nut and turn the push rod until the free play and push rod play are correct.
(b) Tighten the lock nut.
(c) After adjusting the pedal free play, check the pedal height.

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 contact.



(d) Gradually depress the clutch pedal and measure the stroke distance from where the gear noise stops (release point) up to the full stroke end position.

Standard distance:
25 mm (0.98 in.) or more
(From pedal stroke end position to release point)

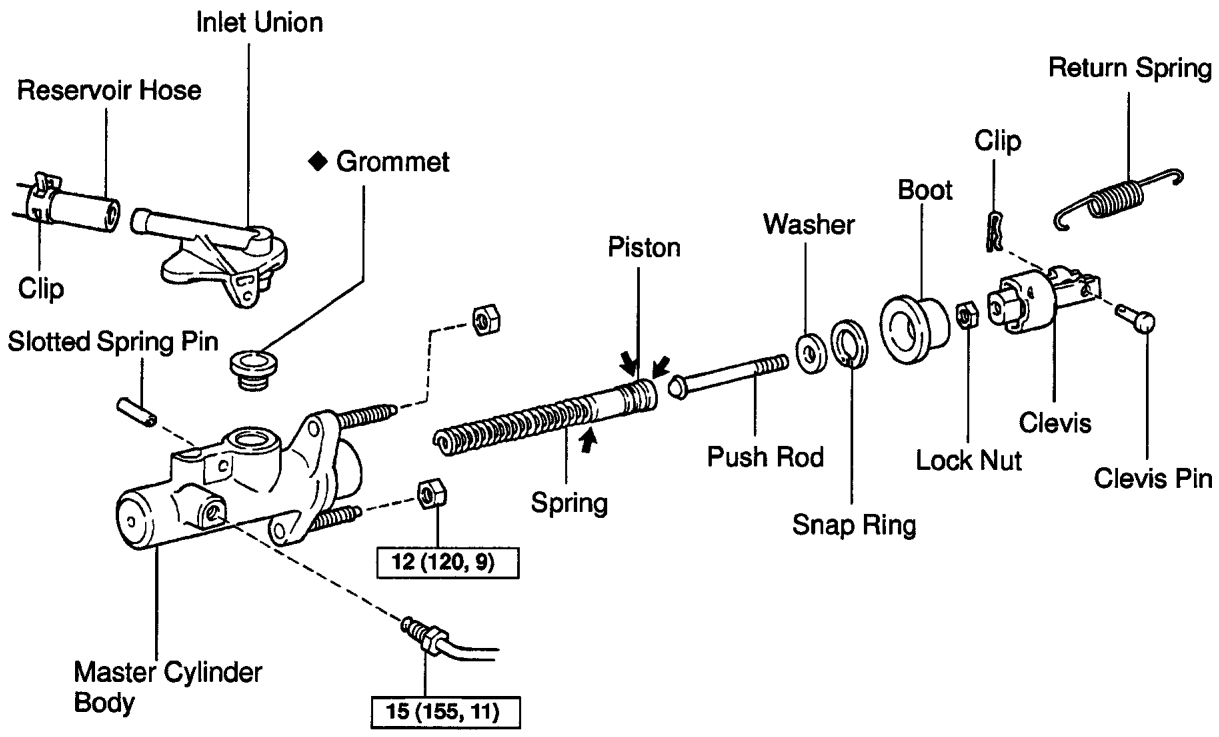
If the distance is not as specified, perform the following operation.

- Check pedal height.
- Check push rod play and pedal free play.
- Bleed clutch line.
- Check clutch cover and disc.

CLUTCH MASTER CYLINDER

COMPONENTS

CL088-02



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
N Lithium soap base glycol grease

D07746

CL069-02

REMOVAL

1. REMOVE FILLER CAP FROM RESERVOIR

2. DRAW OUT BRAKE FLUID WITH SYRINGE

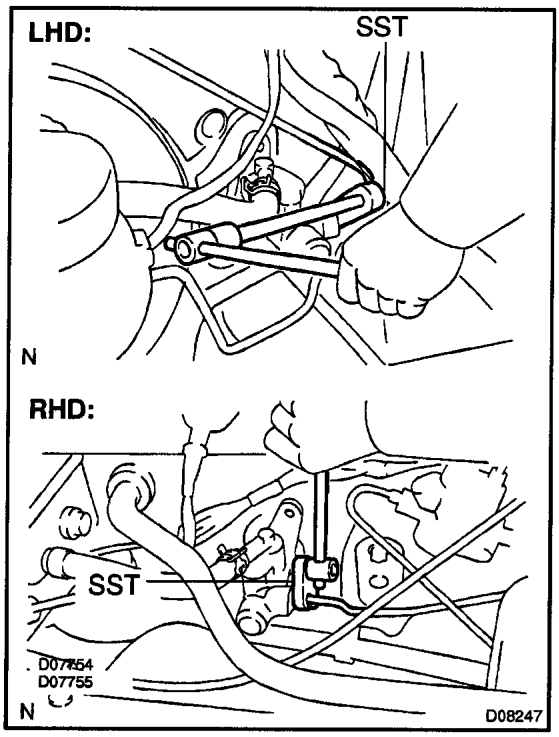
NOTICE:

Do not let brake fluid remain on a painted surface. Wash it off immediately.

3. LHD of w/ ABS:
REMOVE ABS ACTUATOR (See page BR–56)

4. DISCONNECT RESERVOIR HOSE FROM MASTER CYLINDER

Using pliers, slide the clip toward the reservoir and disconnect the reservoir hose. Use a container to catch the fluid.



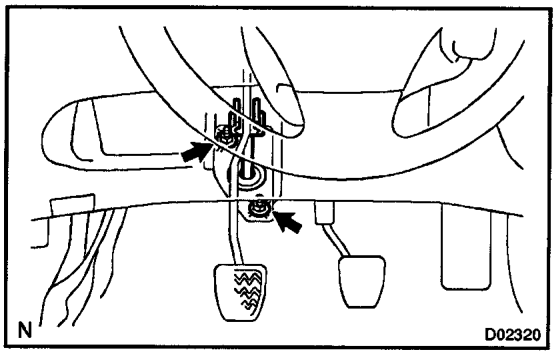
5. DISCONNECT CLUTCH LINE FROM MASTER CYLINDER

Using SST, disconnect the line. Use a container to catch the fluid.

SST 09023–00100

6. REMOVE RETURN SPRING, CLIP AND CLEVIS PIN

(a) Using needle–nose pliers, remove the return spring.
(b) Using needle–nose pliers, remove the clip.
(c) Remove the clevis pin.

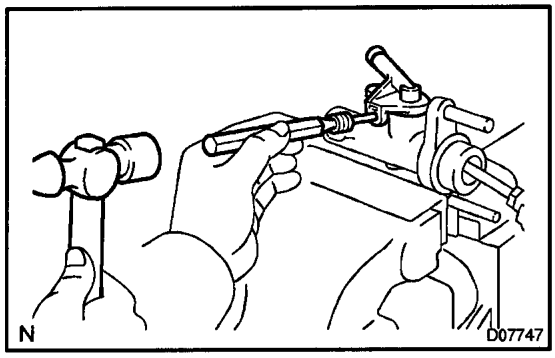


7. REMOVE MASTER CYLINDER

Remove the 2 nuts and master cylinder from the body.

CL08A-02

DISASSEMBLY



1. REMOVE INLET UNION

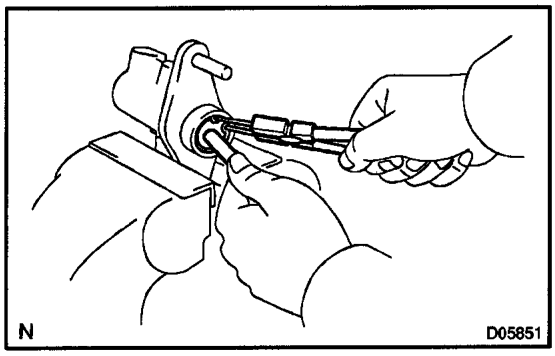
(a) Using a pin punch (3 mm) and hammer, drive out the slotted spring pin.

(b) Remove the inlet union and grommet.

2. REMOVE CLEVIS AND BOOT

(a) Loosen the lock nut to remove the clevis and remove the lock nut.

(b) Remove the boot.



3. REMOVE PUSH ROD

(a) While pushing the push rod, using snap ring pliers, remove the snap ring.

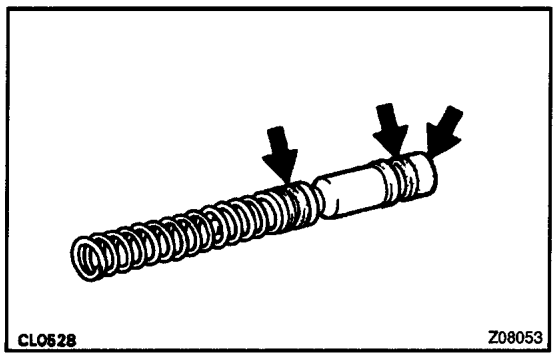
(b) Remove the push rod and washer.

4. REMOVE PISTON WITH SPRING

CL

CL068-02

REASSEMBLY



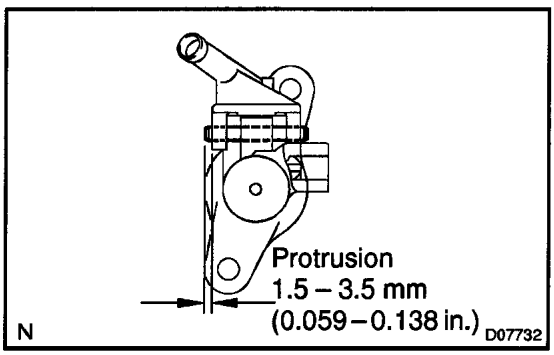
1. **COAT PARTS WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN**
2. **INSERT PISTON WITH SPRING INTO CYLINDER**
3. **INSTALL PUSH ROD AND BOOT**

(a) Install the washer to the push rod.

(b) Push the push rod to the piston, using snap ring pliers, install the snap ring.

(c) Install the boot.

4. **TEMPORARILY INSTALL LOCK NUT AND CLEVIS**



5. **INSTALL INLET UNION**

(a) Install the inlet union and a new grommet.

(b) Using a pin punch (3 mm) and hammer, drive in the slotted spring pin.

CL08C-02

INSTALLATION

1. INSTALL MASTER CYLINDER

Install the master cylinder to the body with the 2 nuts.

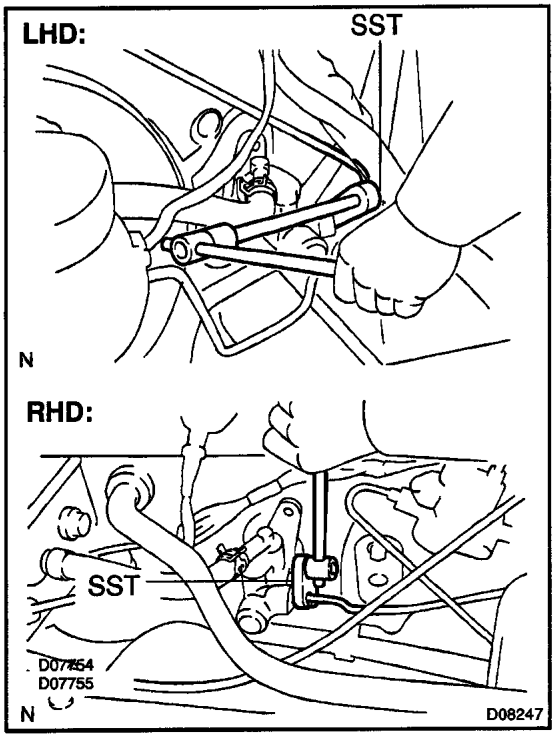
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

2. INSTALL CLEVIS PIN, CLIP AND RETURN SPRING

(a) Install the clevis pin.

(b) Using needle–nose pliers, install the clip.

(c) Using needle–nose pliers, install the return spring.



3. CONNECT CLUTCH LINE TO MASTER CYLINDER

Using SST, connect the clutch line.

SST 09023–00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

4. CONNECT RESERVOIR HOSE TO MASTER CYLINDER

Connect the reservoir hose to the inlet union and using pliers, install the clip.

5. LHD of w/ ABS:
INSTALL ABS ACTUATOR (See page BR–57)

6. FILL RESERVOIR WITH BRAKE FLUID AND BLEED CLUTCH SYSTEM

7. CHECK FOR LEAKS

8. ADJUST CLUTCH PEDAL (See page CL–2)

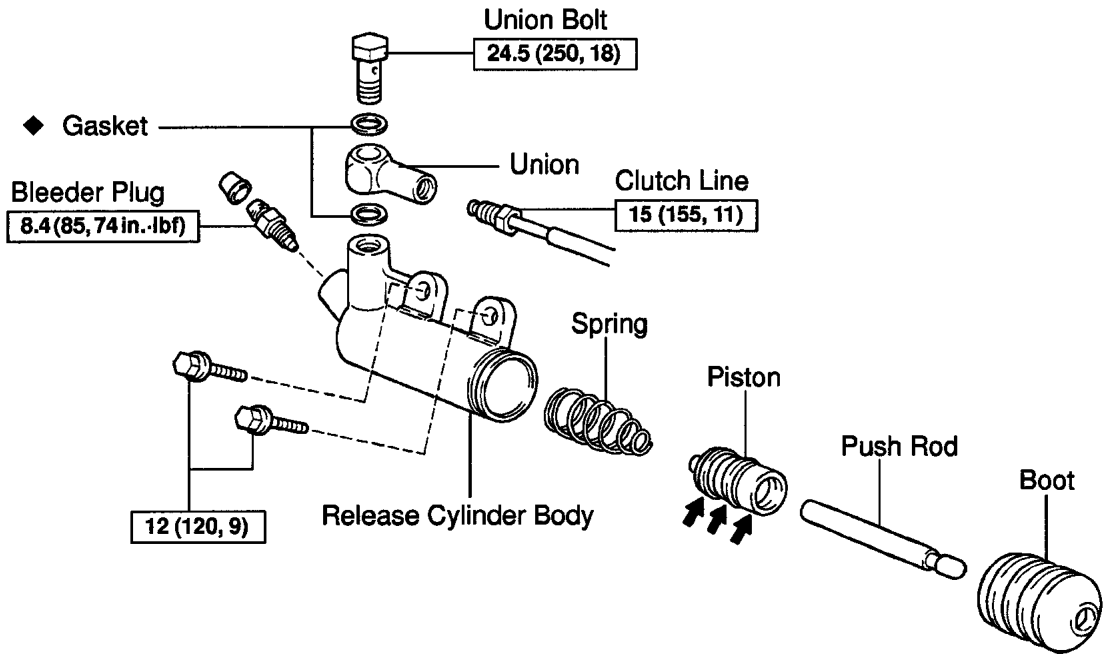
9. FILL BRAKE FLUID UP TO MAX. LINE ON RESERVOIR

10. INSTALL FILLER CAP TO RESERVOIR

CLUTCH RELEASE CYLINDER

COMPONENTS

CL02U-05

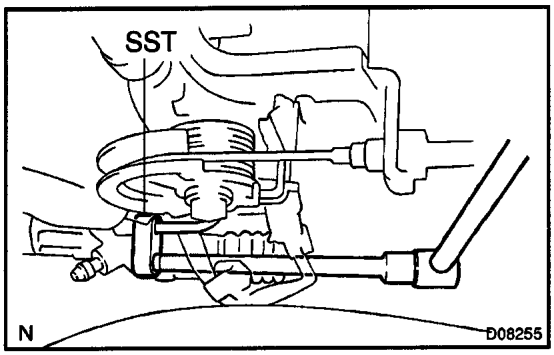


N·m (kgf·cm, ft·lbf) : Specified torque
◆Non–reusable part
⬅ Lithium soap base glycol grease

D00198

CL

CL02V-03



REMOVAL

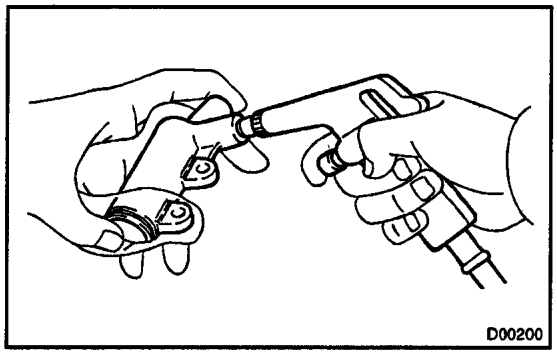
1. DISCONNECT CLUTCH LINE

(a) Using SST, disconnect the clutch line.
SST 09023–00100

(b) Use a container to catch the fluid.

2. REMOVE 2 BOLTS AND PULL OUT RELEASE CYLINDER

CL02W–03



DISASSEMBLY

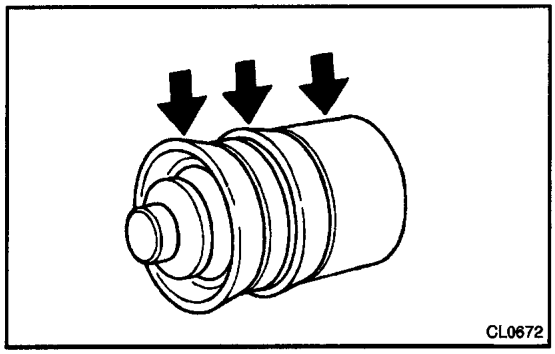
1. **REMOVE BLEEDER PLUG**
2. **REMOVE UNION BOLT, 2 GASKETS AND UNION**
3. **PULL OUT BOOT WITH PUSH ROD**
4. **REMOVE PISTON WITH SPRING**

Using compressed air, remove the piston with the spring from the cylinder.

NOTICE:

- **Blowing off the air may cause the piston's jump–out. When removing the piston, hold it with your hand using a waste cloth.**
- **Take care not to splash brake fluid when air–blowing.**

CL02X-03


CL0672

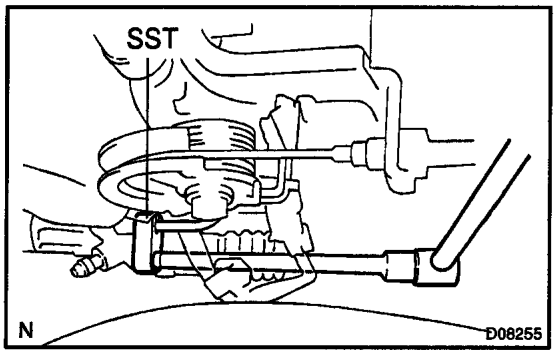
REASSEMBLY

1. COAT PISTON WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN
2. INSTALL PISTON WITH SPRING INTO CYLINDER
3. INSTALL BOOT WITH PUSH ROD TO CYLINDER
4. INSTALL UNION AND 2 NEW GASKETS WITH UNION BOLT
   Torque: 24.5 N·m (250 kgf·cm, 18 ft·lbf)
5. INSTALL BLEEDER PLUG
   Torque: 8.4 N·m (85 kgf·cm, 74 in.·lbf)

CL07E–02

INSTALLATION

1. **INSTALL RELEASE CYLINDER WITH 2 BOLTS**
   Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



2. **CONNECT CLUTCH LINE**

Using SST, connect the clutch line.

SST 09023–00100

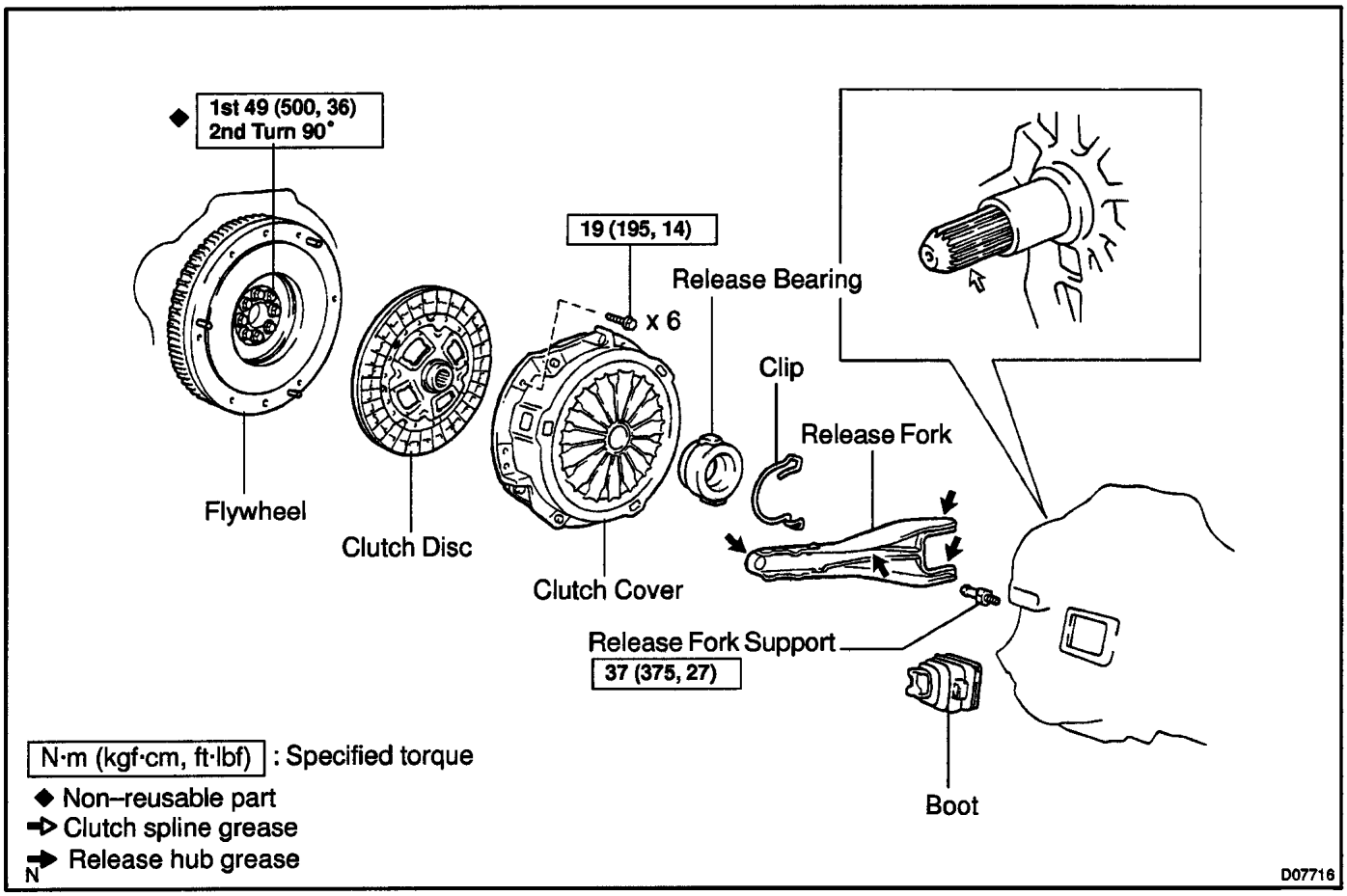
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

3. **FILL CLUTCH RESERVOIR WITH BRAKE FLUID AND BLEED CLUTCH SYSTEM**
4. **CHECK FOR LEAKS**

CLUTCH UNIT

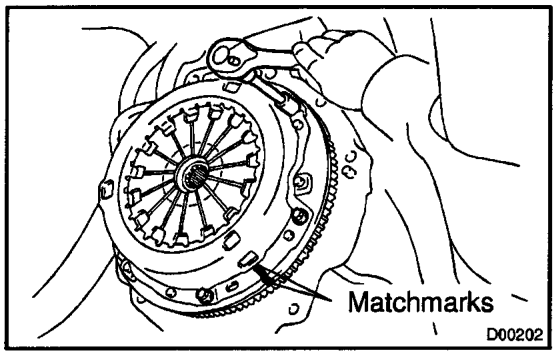
COMPONENTS

CL09N–01



CL090-01

REMOVAL



1. REMOVE TRANSAXLE FROM ENGINE
(See page MX–4)

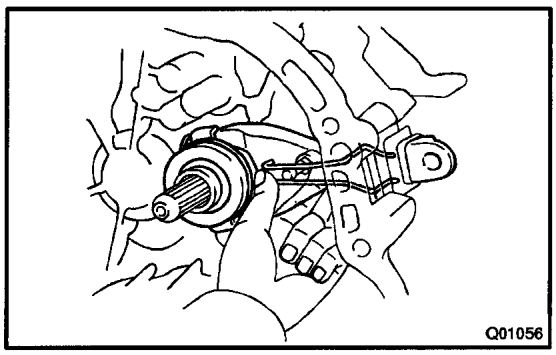
2. REMOVE CLUTCH COVER AND DISC

(a) Align the matchmark on the clutch cover with the one on the flywheel.

(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.



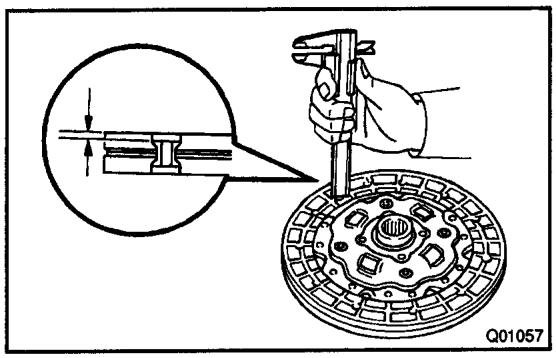
3. REMOVE RELEASE BEARING AND FORK FROM TRANSAXLE

Remove the release bearing with the fork together and then separate them.

4. REMOVE RELEASE FORK SUPPORT AND BOOT

CL09P-01

INSPECTION

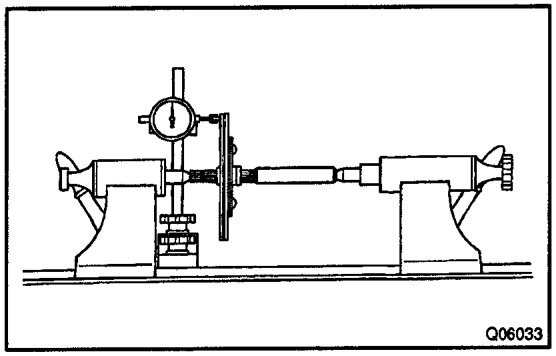


1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using vernier calipers, measure the rivet head depth.

Minimum rivet depth: 0.3 mm (0.012 in.)

If necessary, replace the clutch disc.

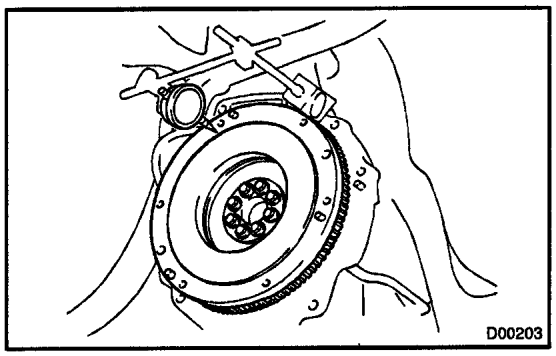


2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator, check the disc runout.

Maximum runout: 0.8 mm (0.031 in.)

If necessary, replace the clutch disc runout.



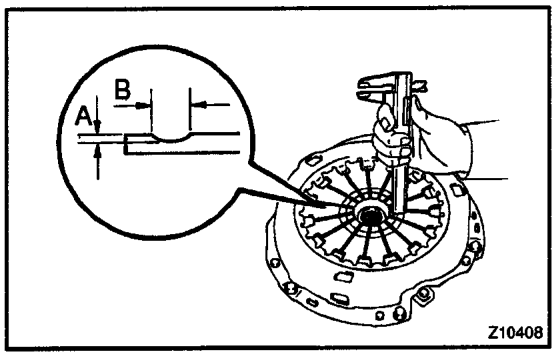
3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator, check the flywheel runout.

Maximum runout: 0.1 mm (0.004 in.)

If necessary, replace the flywheel.

Torque:
1st: 49 N·m (500 kgf·cm, 36 ft·lbf)
2nd: Turn 90°

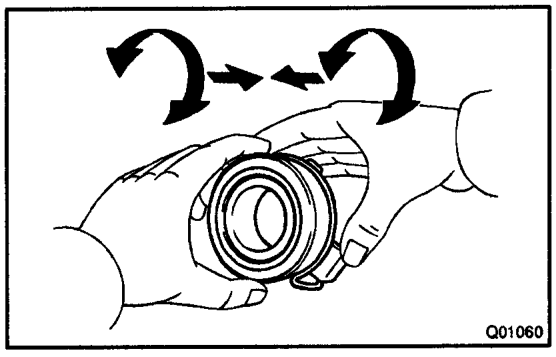


4. INSPECT DIAPHRAGM SPRING FOR WEAR

Using vernier calipers, measure the diaphragm spring for depth and width of wear.

Maximum:
A (Depth): 0.5 mm (0.020 in.)
B (Width): 6.0 mm (0.236 in.)

If necessary, replace the clutch cover.



5. INSPECT RELEASE BEARING

Turn the bearing by hand while applying force in the axial direction.

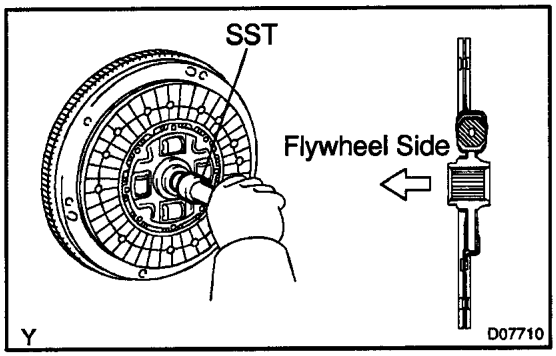
HINT:

The bearing is permanently lubricated and requires no cleaning or lubrication.

If necessary, replace the release bearing.

CL09Q-01

INSTALLATION



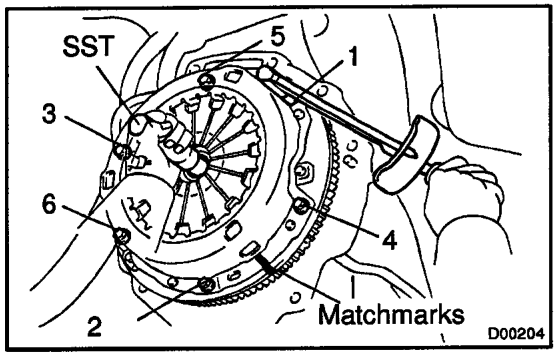
1. INSTALL CLUTCH DISC AND CLUTCH COVER ON FLYWHEEL

(a) Insert SST in the clutch disc, then insert them in the flywheel.

SST 09301–00210

HINT:

Take care not to insert clutch disc in the wrong direction.



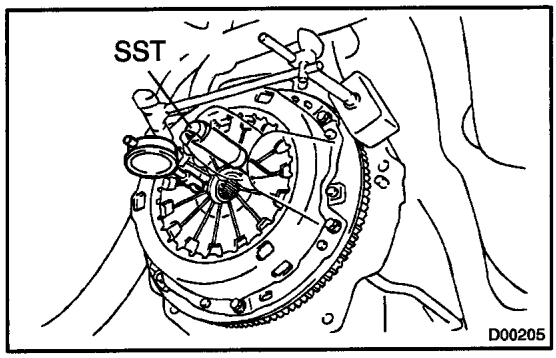
(b) Align the matchmarks on the clutch cover and flywheel.

(c) Following the procedures shown in the illustration, tighten the 6 bolts in the order starting the bolt locating near the knock pin on the top.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

HINT:

- Following the order in the illustration, tighten the bolts at a time evenly.
- Move SST up and down, right and left lightly, after checking that the disc is in the center, tighten the bolts.



2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT

Using a dial indicator with roller instrument, check the diaphragm spring tip alignment.

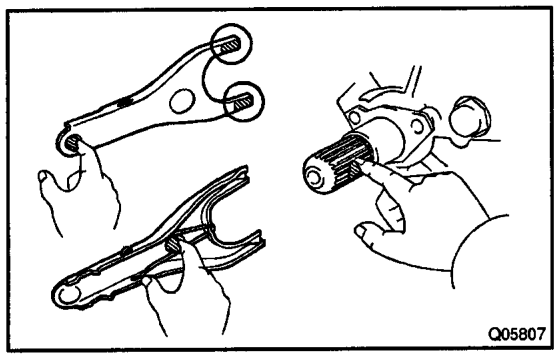
Maximum non–alignment: 0.5 mm (0.020 in.)

If alignment is not as specified, using SST, adjust the diaphragm spring tip alignment.

SST 09333–00013

3. INSTALL BOOT AND RELEASE FORK SUPPORT TO TRANSAXLE

Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



4. APPLY RELEASE HUB GREASE

Apply release hub grease to the release fork and hub contact, release fork and push rod contact and release fork pivot points.

Sealant:

Part No. 08887–01806, RELEASE HUB GREASE or equivalent

5. APPLY CLUTCH SPRING GREASE

Apply clutch spline grease to the input shaft spline.

Sealant:

Part No. 08887–01706, CLUTCH SPLINE GREASE or equivalent

6. INSTALL RELEASE BEARING AND FORK TO TRANSAXLE

Install the bearing to the release fork, and then install them to the transaxle.

7. INSTALL TRANSAXLE TO ENGINE

(See page MX–8)

MANUAL TRANSAXLE

TROUBLESHOOTING MX–1
MANUAL TRANSAXLE UNIT MX–2
MANUAL TRANSAXLE ASSEMBLY MX–9
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–44

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

MX06R–03

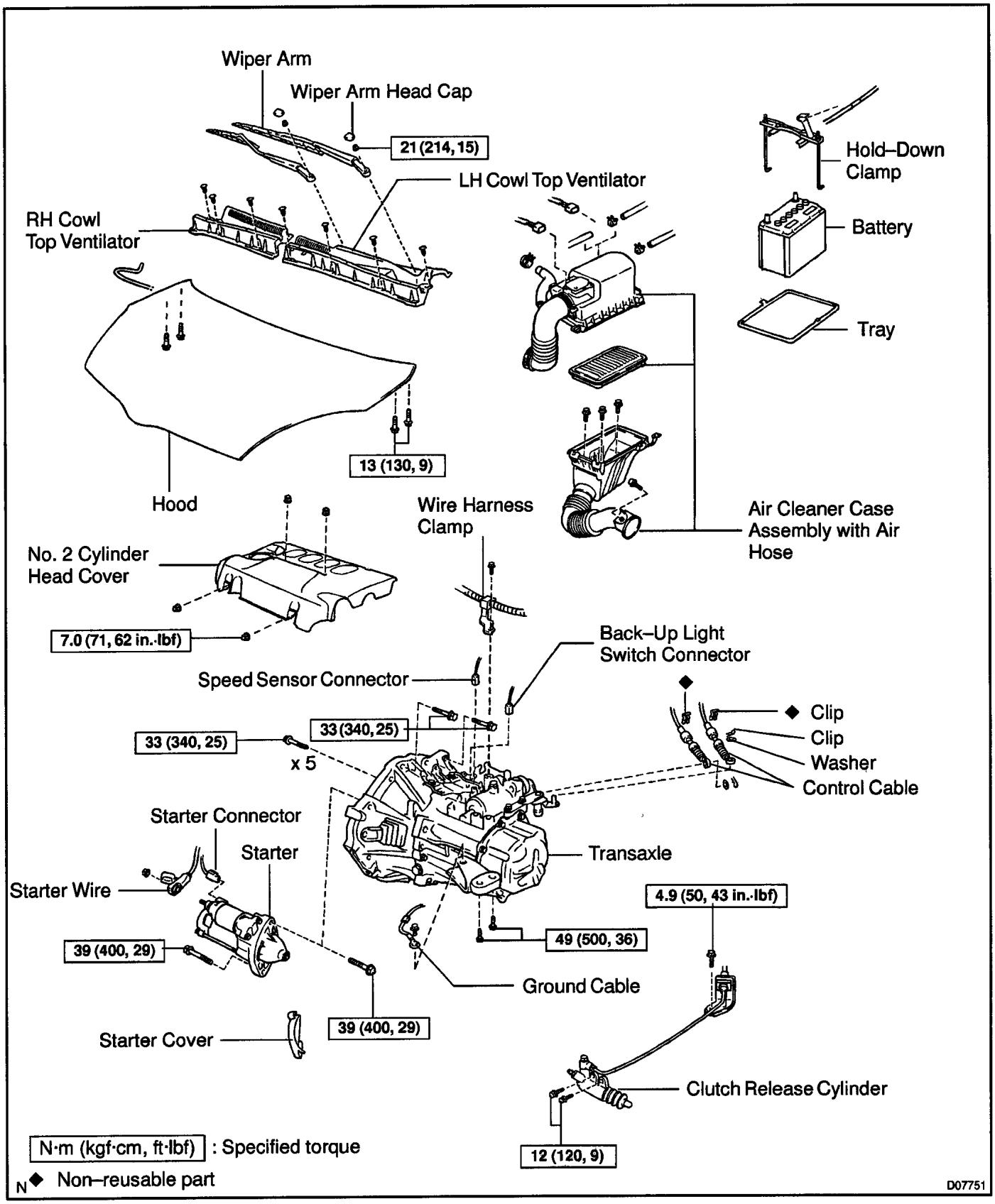
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

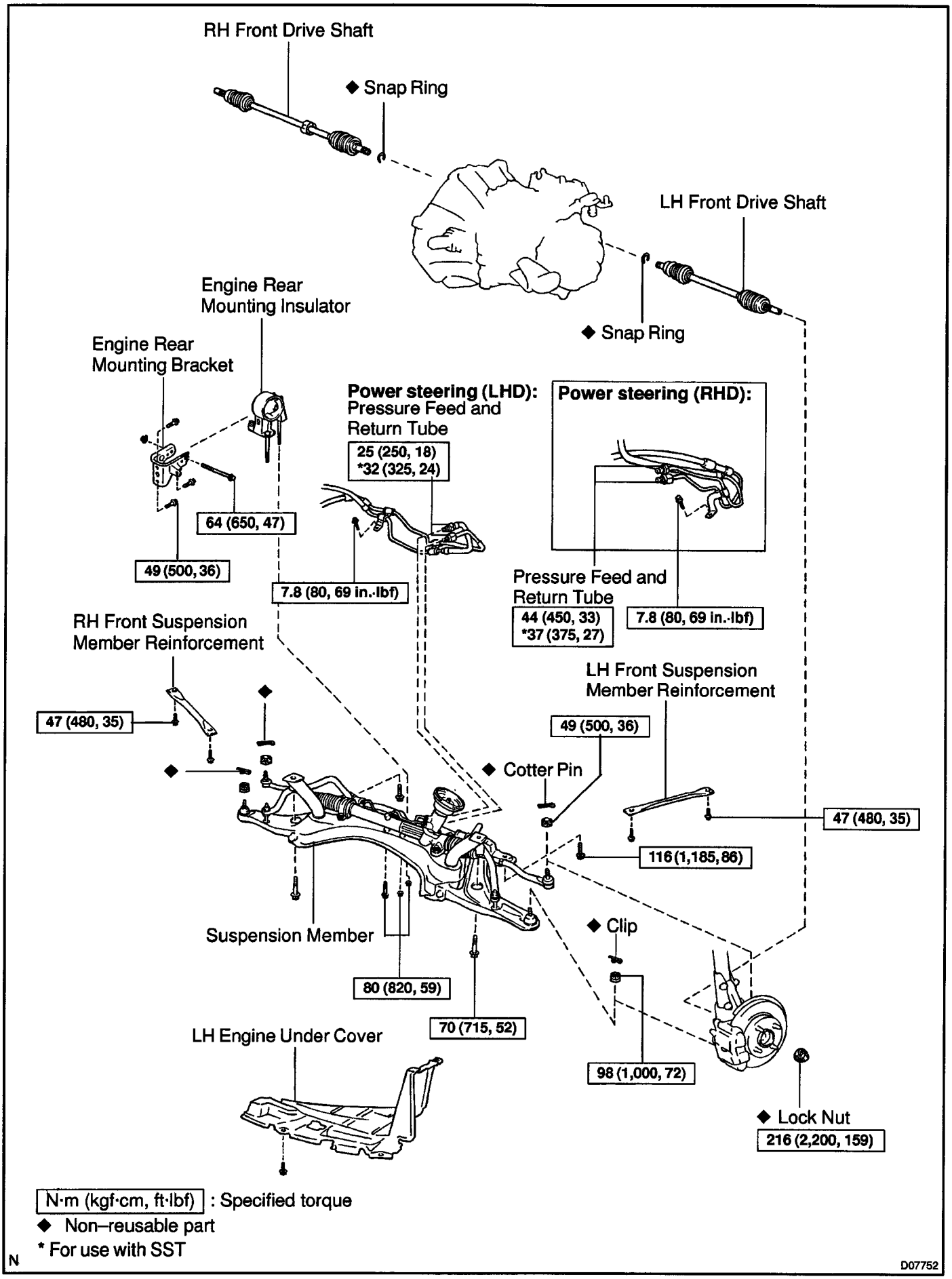
Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–4
	2. Oil (Wrong)	MX–4
	3. Gear (Worn or damaged)	MX–9
	4. Bearing (Worn or damaged)	MX–9
Oil leakage	1. Oil (Level too high)	MX–4
	2. Gasket (Damaged)	MX–9
	3. Oil seal (Worn or damaged)	MX–9
	4. O–Ring (Worn or damaged)	MX–9
Hard to shift or will not shift	1. Control cable (Faulty)	MX–44
	2. Synchronizer ring (Worn or damaged)	MX–23 MX–30
	3. Shift key spring (Damaged)	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

MX0A8–01





N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
* For use with SST

N

D07752

MX

MX0A9-01

REMOVAL

1. REMOVE HOOD

HINT:

At the time of installation, please refer to the following item.

Adjust the hood (See page BO–10).

2. REMOVE WIPER ARM (See page BO–33)

HINT:

At the time of installation, please refer to the following item.

Adjust the installation position of the wiper arms (See page BO–35).

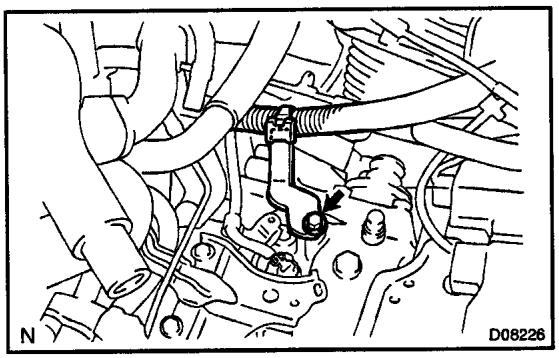
3. REMOVE RH AND LH COWL TOP VENTILATOR LOUVERS (See page BO–33)

4. REMOVE NO. 2 CYLINDER HEAD COVER

Remove the 4 nuts and No. 2 cylinder head cover.

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

5. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE



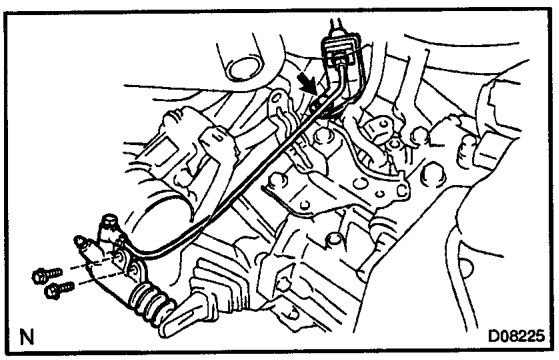
6. DISCONNECT WIRE HARNESS FROM TRANSAXLE

Remove the set bolt of the wire harness clamp.

7. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips and disconnect the control cables from the transaxle.



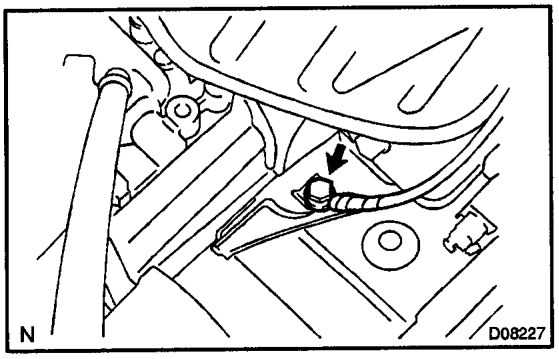
8. DISCONNECT CLUTCH RELEASE CYLINDER

(a) Remove the set bolt of the clutch line.

Torque: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

(b) Remove the 2 set bolts of the clutch release cylinder.

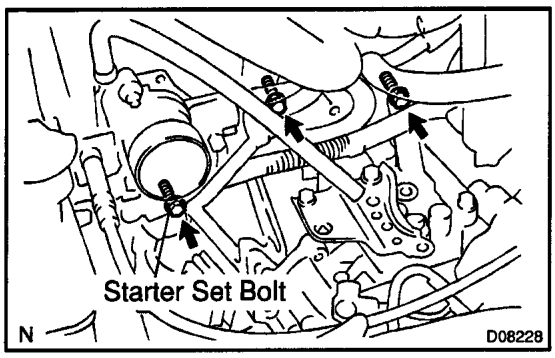
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



9. DISCONNECT GROUND CABLE

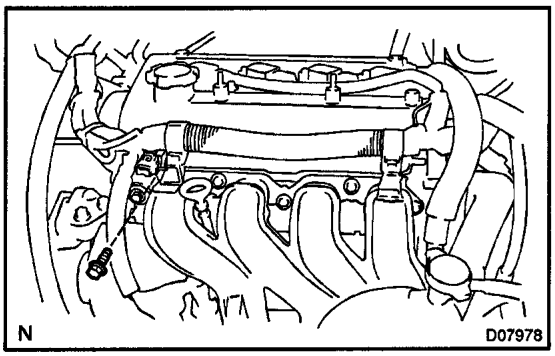
Remove the set bolt of the ground cable from the engine left mounting bracket.

10. DISCONNECT BACK–UP LIGHT SWITCH AND SPEED SENSOR CONNECTORS



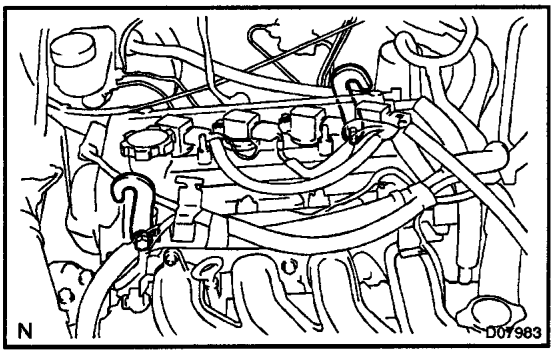
11. REMOVE 2 TRANSAXLE UPPER SIDE MOUNTING BOLTS
Torque: 33 N·m (340 kgf·cm, 25 ft·lbf)

12. REMOVE STARTER SET BOLT
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



13. ATTACH ENGINE SLING DEVICE TO ENGINE HANGER

(a) Remove the bolt.



(b) Install the 2 No. 1 engine hangers with the bolts in the correct direction.
Parts No.:
No. 1 engine hanger: 12281–21010
Bolt: 91642–81025
Torque: 40 N·m (400 kgf·cm, 29 ft·lbf)

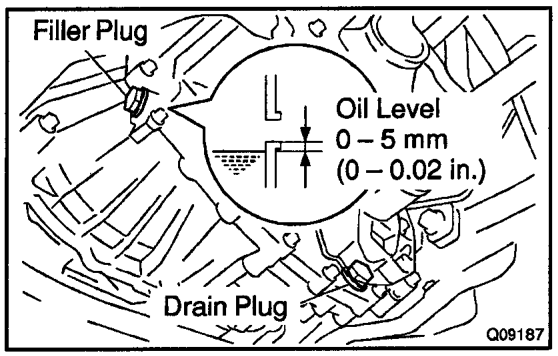
(c) Attach the engine chain hoist to the engine hangers.

CAUTION:
Do not attempt to hang the engine by hooking the chain to any other part.

14. RAISE VEHICLE

CAUTION:
Make sure that the vehicle is securely supported.

15. REMOVE LH ENGINE UNDER COVER



16. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75 W–90
Capacity: 1.9 liters (2.0 US qts, 1.7 Imp. qts)
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

17. REMOVE RH AND LH FRONT DRIVE SHAFTS
(See page SA–17)

18. REMOVE SUSPENSION MEMBER

(a) Remove the 4 bolts, RH and LH front suspension member reinforcements.
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)

(b) Remove the 2 set nuts and bolt of the engine rear mounting insulator from the suspension member (See page SA–36).

(c) Disconnect the sliding yoke (See page SR–12).

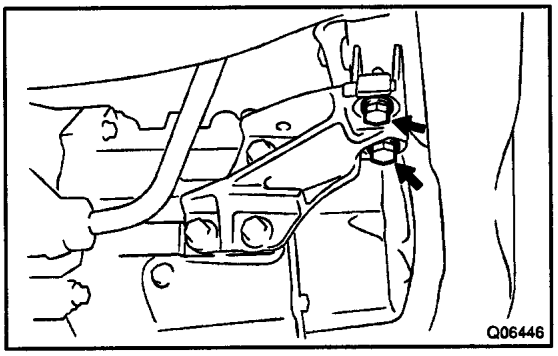
(d) Power steering:
Disconnect the pressure feed and return tubes (See page SR–52).

(e) Power steering:
Disconnect the tube clamp (See page SR–52).

(f) Remove the suspension member (See page SA–36).

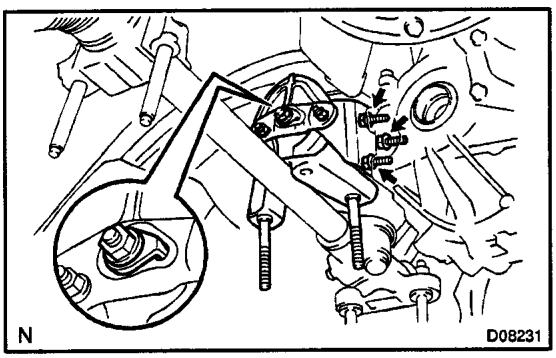
19. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



20. DISCONNECT ENGINE LEFT MOUNTING BRACKET FROM ENGINE LEFT MOUNTING INSULATOR

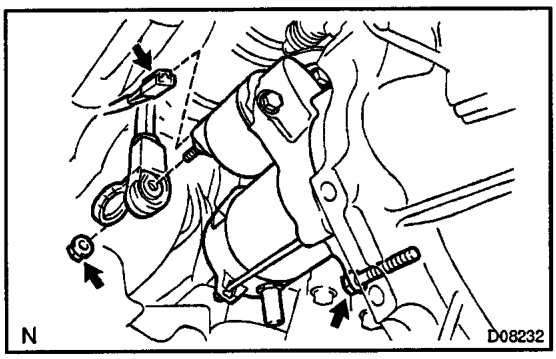
Remove the 2 bolts.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



21. REMOVE ENGINE REAR MOUNTING INSULATOR AND BRACKET

(a) Remove the bolt, nut and engine rear mounting insulator.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

(b) Remove the 3 bolts and engine rear mounting bracket.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

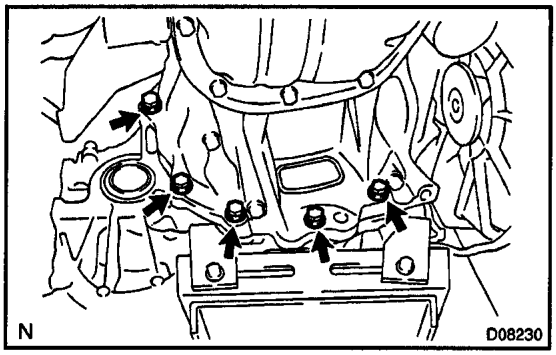


22. REMOVE STARTER

(a) Remove the bolt, starter cover and starter.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(b) Disconnect the starter connector.

(c) Remove the nut and starter wire.



23. REMOVE 5 TRANSAXLE LOWER SIDE MOUNTING BOLTS

Torque: 33 N·m (340 kgf·cm, 25 ft·lbf)

24. 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.

MX06U–03

INSTALLATION

Installation is in the reverse order of removal (See page MX–4).

HINT:

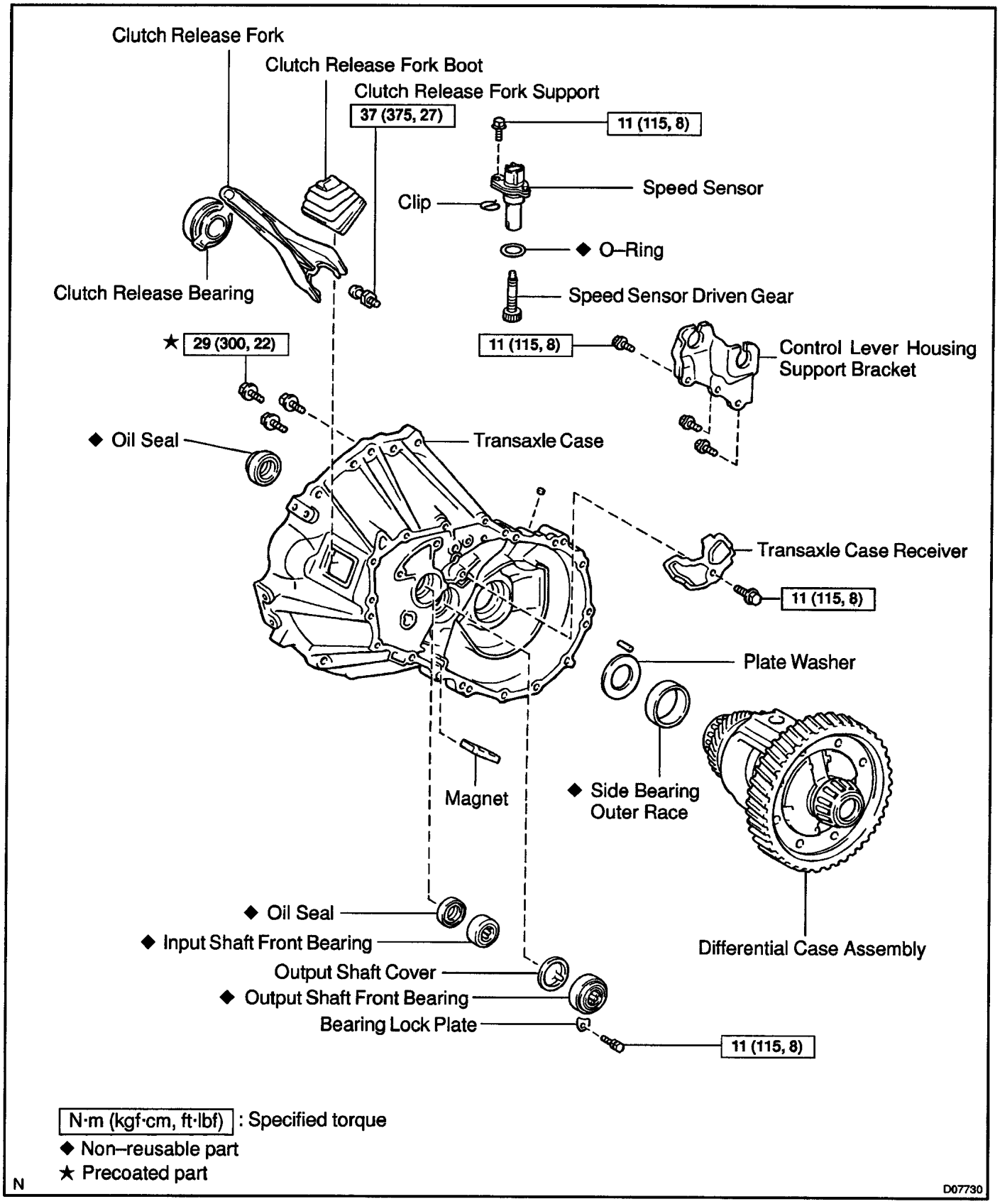
After installation, check and inspect items as follows.

- Front wheel alignment (See page SA–4).
- Do the road test.

MANUAL TRANSAXLE ASSEMBLY

COMPONENTS

MX06V-03

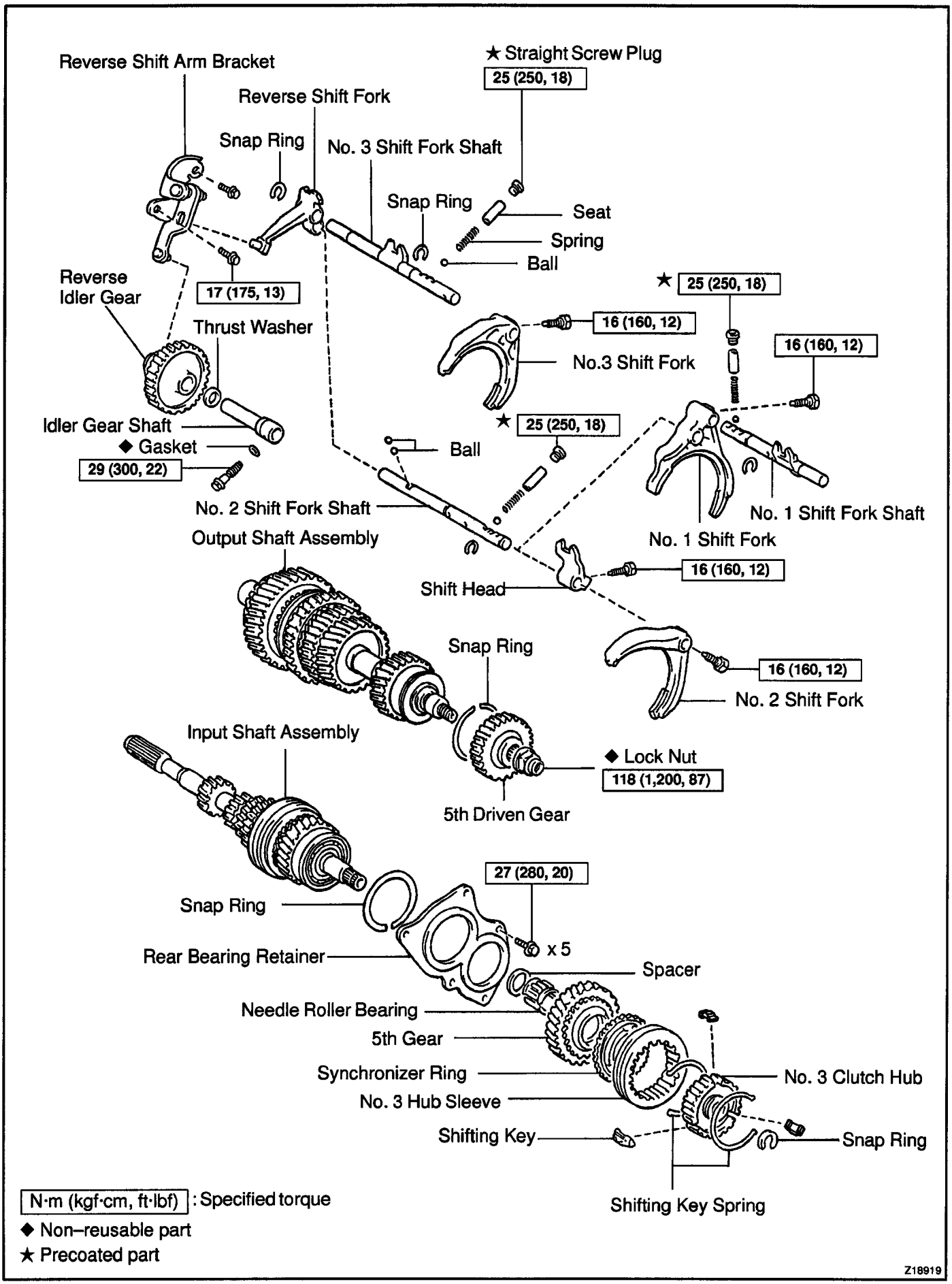


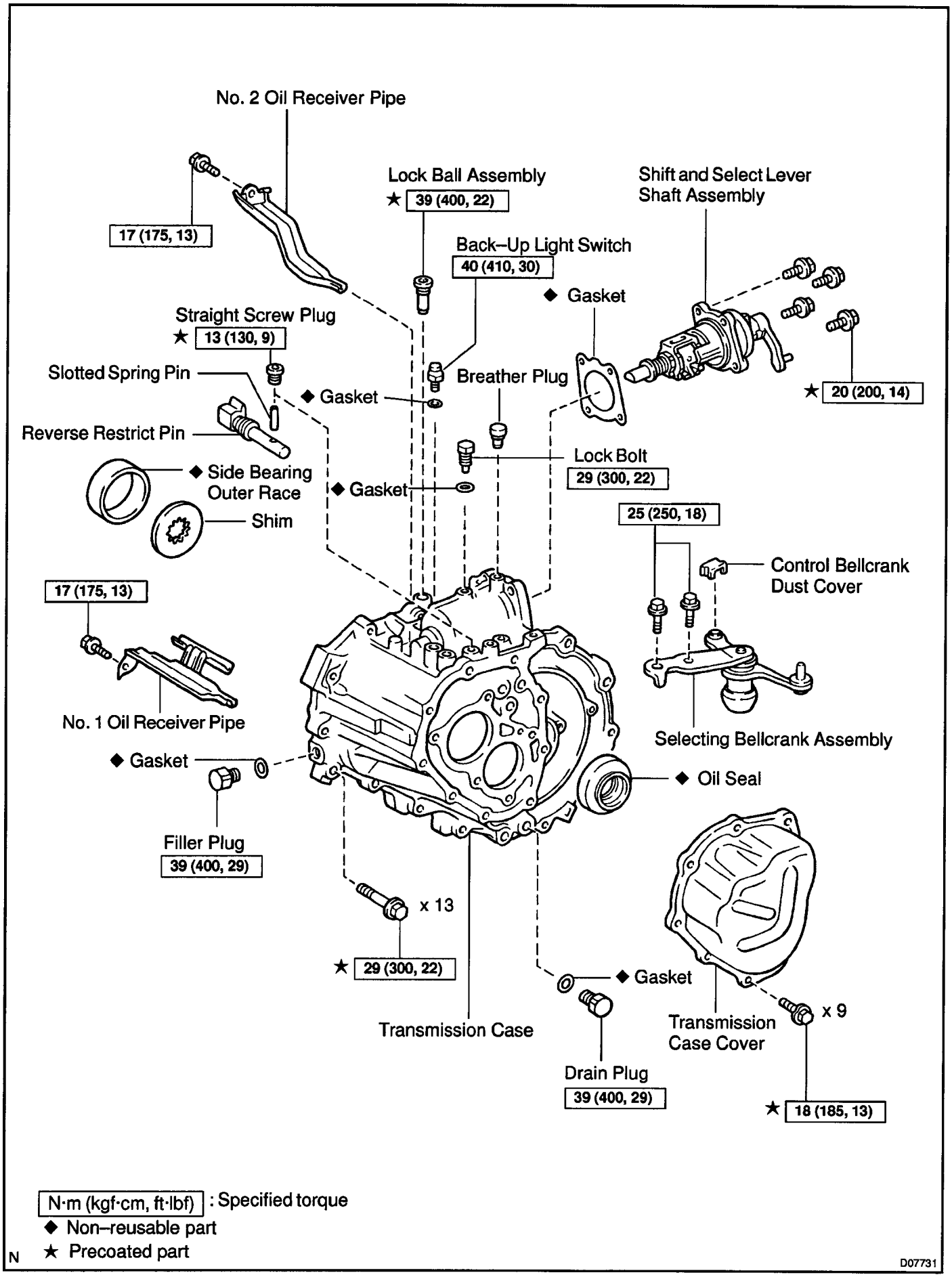
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part

N

D07730

MX


Reverse Shift Arm Bracket
★ Straight Screw Plug
25 (250, 18)
Reverse Shift Fork
Snap Ring
No. 3 Shift Fork Shaft
Snap Ring
Seat
Spring
Ball
17 (175, 13)
Reverse Idler Gear
★ 25 (250, 18)
16 (160, 12)
Thrust Washer
16 (160, 12)
No.3 Shift Fork
Idler Gear Shaft
◆ Gasket
29 (300, 22)
★ 25 (250, 18)
Ball
No. 2 Shift Fork Shaft
No. 1 Shift Fork Shaft
Output Shaft Assembly
No. 1 Shift Fork
16 (160, 12)
Shift Head
Snap Ring
16 (160, 12)
No. 2 Shift Fork
Input Shaft Assembly
◆ Lock Nut
118 (1,200, 87)
5th Driven Gear
27 (280, 20)
Snap Ring
x 5
Rear Bearing Retainer
Spacer
Needle Roller Bearing
5th Gear
Synchronizer Ring
No. 3 Clutch Hub
No. 3 Hub Sleeve
Shifting Key
Snap Ring
Shifting Key Spring
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
Z18919


No. 2 Oil Receiver Pipe
17 (175, 13)
Lock Ball Assembly
★ 39 (400, 22)
Back–Up Light Switch
40 (410, 30)
◆ Gasket
Shift and Select Lever Shaft Assembly
★ 20 (200, 14)
Straight Screw Plug
★ 13 (130, 9)
Slotted Spring Pin
◆ Gasket
Breather Plug
Reverse Restrict Pin
◆ Side Bearing Outer Race
Shim
◆ Gasket
Lock Bolt
29 (300, 22)
25 (250, 18)
Control Bellcrank Dust Cover
17 (175, 13)
No. 1 Oil Receiver Pipe
Selecting Bellcrank Assembly
◆ Gasket
Filler Plug
39 (400, 29)
◆ Oil Seal
x 13
★ 29 (300, 22)
Transmission Case
◆ Gasket
Drain Plug
39 (400, 29)
Transmission Case Cover
x 9
★ 18 (185, 13)
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
N
D07731

MX0AA–01

DISASSEMBLY

1. REMOVE CLUTCH 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–17).

2. REMOVE FILLER PLUG AND DRAIN PLUG WITH 2 GASKETS

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

3. REMOVE SPEED SENSOR

(a) Remove the bolt and speed sensor.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

(b) Using a small screwdriver, remove the clip from the speed sensor.

(c) Remove the speed sensor driven gear from the speed sensor.

(d) Using a small screwdriver, remove the O–ring from the speed sensor.

4. REMOVE BACK–UP LIGHT SWITCH WITH GASKET

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

5. REMOVE CONTROL LEVER HOUSING SUPPORT BRACKET

Remove the 3 bolts and control lever housing support bracket.

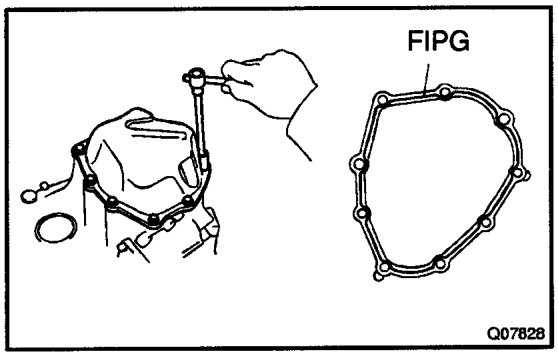
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

6. REMOVE SELECTING BELLCRANK ASSEMBLY

(a) Remove the 2 bolts and selecting bellcrank assembly.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Remove the control bellcrank dust cover from the selecting bellcrank assembly.



7. REMOVE TRANSMISSION CASE COVER

(a) Remove the 9 bolts.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(b) Carefully tap the projection of the transmission case cover with a brass bar and hammer and remove it.

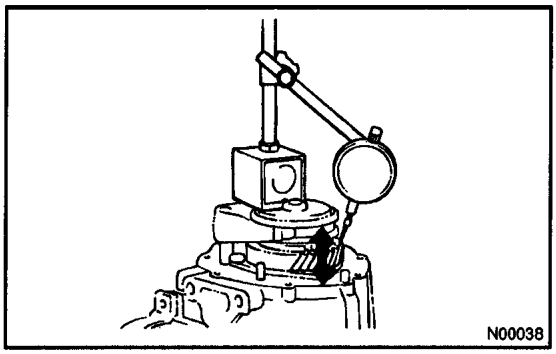
HINT:

At the time of reassembly, please refer to the following item.

Apply FIPG to the transmission case cover, as shown in the illustration.

FIPG:

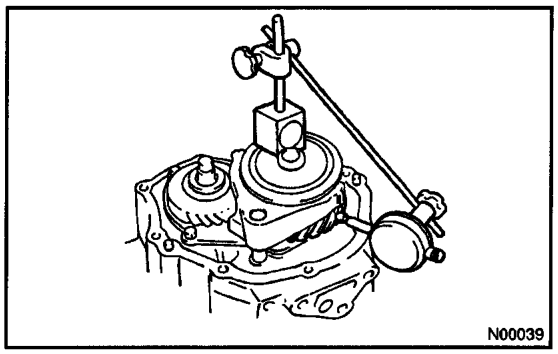
Part No. 08826–00090, THREE BOND 1281 or equivalent



8. INSPECT 5TH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.

Standard clearance:
0.10 – 0.57 mm (0.0039 – 0.0224 in.)
Maximum clearance:
0.57 mm (0.0224 in.)

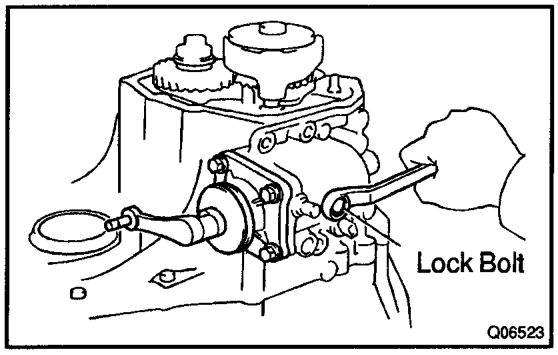


9. INSPECT 5TH GEAR RADIAL CLEARANCE

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.)

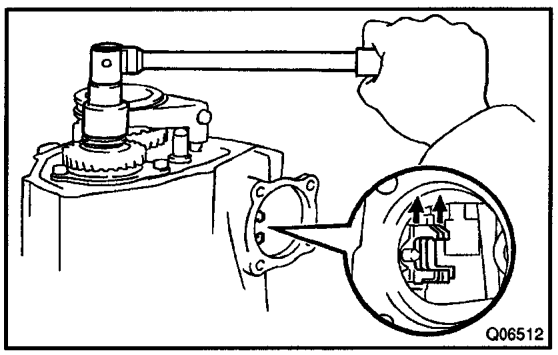
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



10. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY

(a) Remove the lock bolt and gasket.
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)



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 double meshing of the gear.

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)

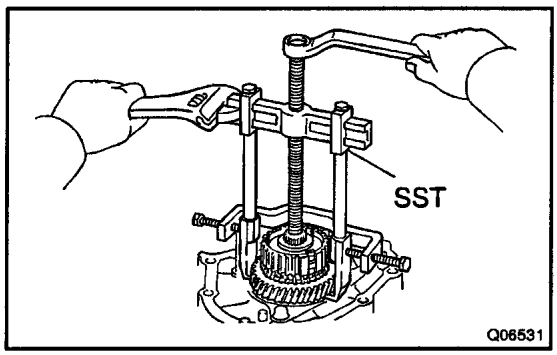
(b) Remove the No. 3 hub sleeve and No. 3 shift fork.

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.

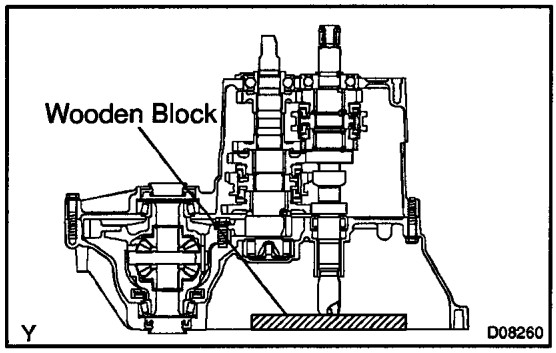
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.25 (0.0886)	E	2.49 (0.0980)
B	2.31 (0.0909)	F	2.55 (0.1004)
C	2.37 (0.0933)	G	2.61 (0.1028)
D	2.43 (0.0957)	–	–



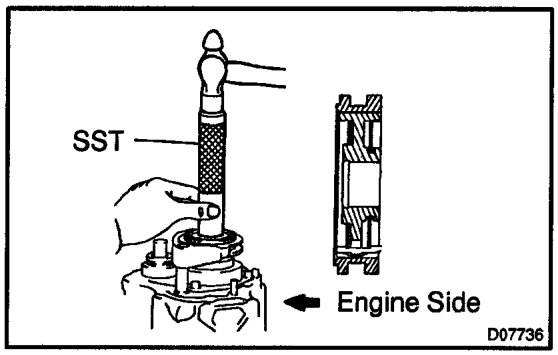
(b) Using SST, remove the No. 3 clutch hub assembly, 5th gear and synchronizer ring.
SST 09950–40011

HINT:
At the time of reassembly, please refer to the following items.

- Install the No. 3 clutch hub assembly to the No. 3 hub sleeve.



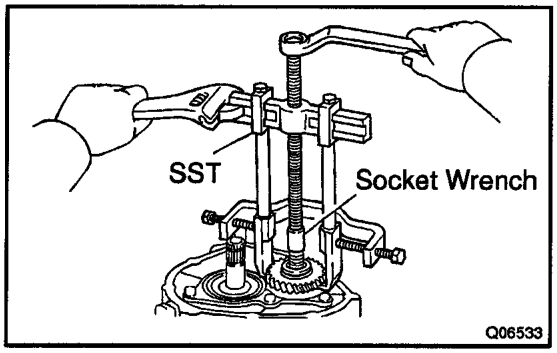
- Before driving in the No. 3 clutch hub assembly, place the suitable sized wooden block on the rear side of the input shaft, as shown in the illustration. When driving it in, fix the input shaft firmly so that it is not pushed downward. Otherwise the input shaft rear bearing is overloaded, it might be damaged.



- Using SST and a hammer, drive in the No. 3 hub sleeve assembly with the No. 3 shift fork.
  SST 09612–22011

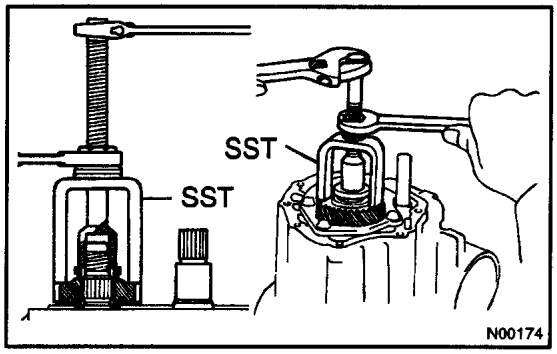
NOTICE:
Align the synchronizer ring slots with the shifting keys.

(c) Remove the needle roller bearings and spacer.

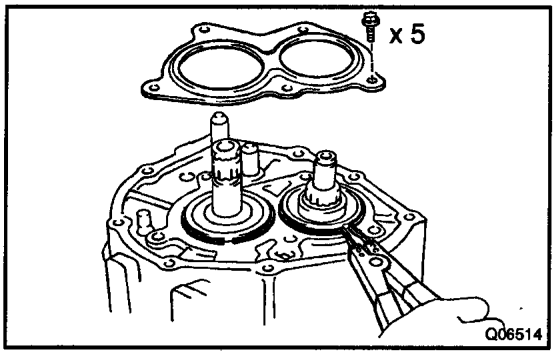


14. REMOVE 5TH DRIVEN GEAR

Using SST and a socket wrench, remove the 5th driven gear.
SST 09950–40011



HINT:
At the time of reassembly, please refer to the following item.
Using SST, install the 5th driven gear.
SST 09309–12020

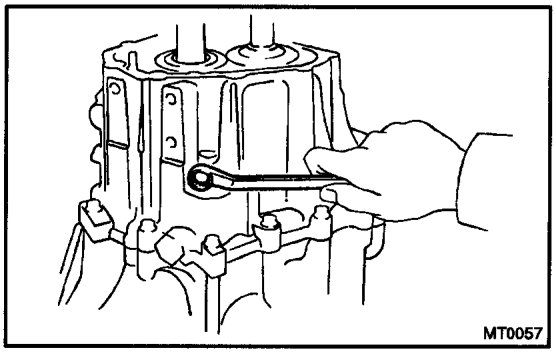


15. REMOVE REAR BEARING RETAINER

Remove the 5 bolts and rear bearing retainer.
Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)

16. REMOVE BEARING SNAP RING

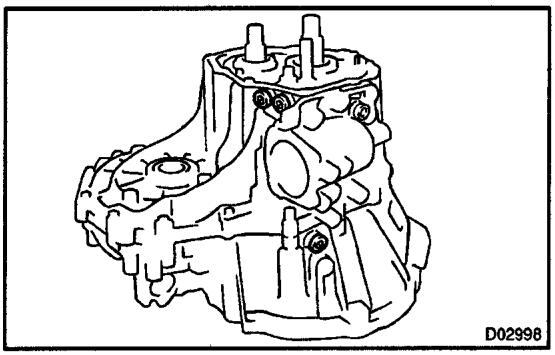
Using a snap ring expander, remove the 2 snap rings.
HINT:
If it is difficult to remove and install the snap rings, pull up the shafts.



17. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND GASKET
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.

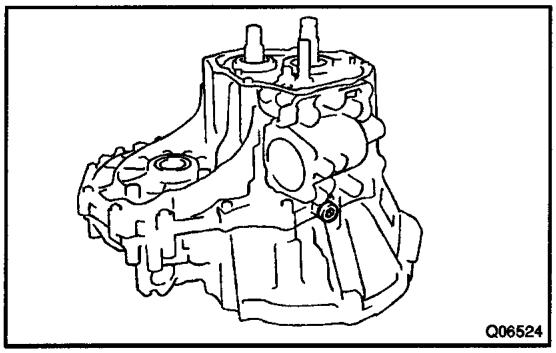


19. REMOVE STRAIGHT SCREW PLUG, SEAT, SPRING AND BALL

(a) Using a hexagon wrench, remove the 3 straight screw plugs.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

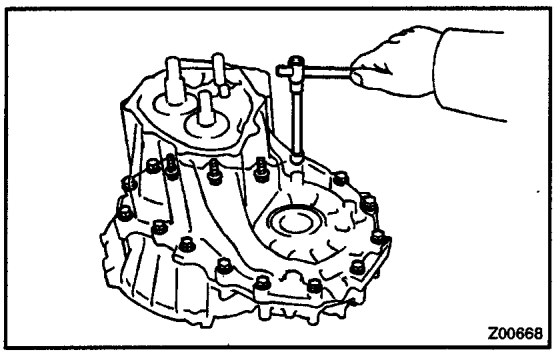
(b) Using a magnetic finger, remove the 3 seats, springs and balls.



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)

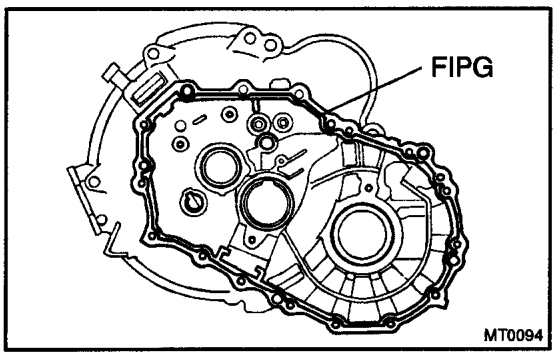


21. REMOVE TRANSMISSION CASE

(a) Remove the 16 bolts.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Carefully tap the transmission case with a plastic hammer and remove it.

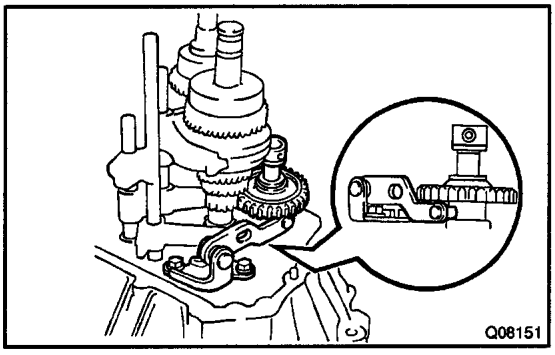


HINT:
At the time of reassembly, please refer to the following item.
Apply FIPG to the transaxle case, as shown in the illustration.

FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent

(c) Remove the 2 bolts, No. 1 and No. 2 oil receiver pipes from the transmission case.

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)



22. REMOVE REVERSE IDLER GEAR, THRUST WASHER AND SHAFT

23. REMOVE REVERSE SHIFT ARM BRACKET

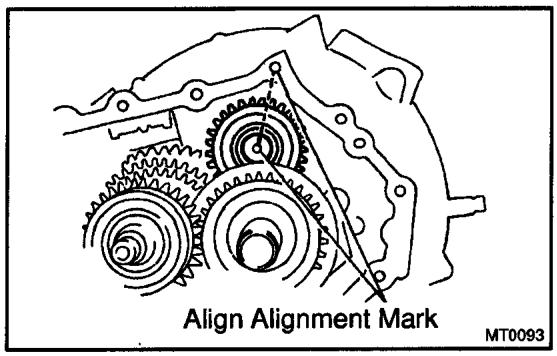
Remove the 2 bolts and reverse shift arm bracket.

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

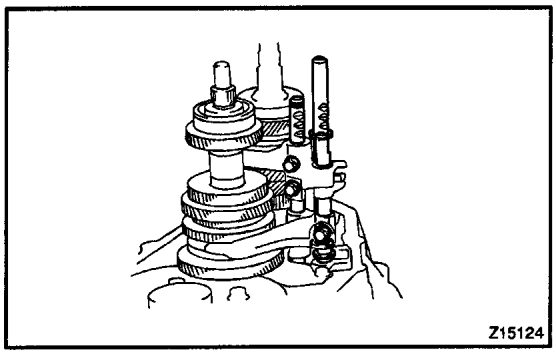
NOTICE:
At the time of reassembly, please refer to the following items.

- **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.**

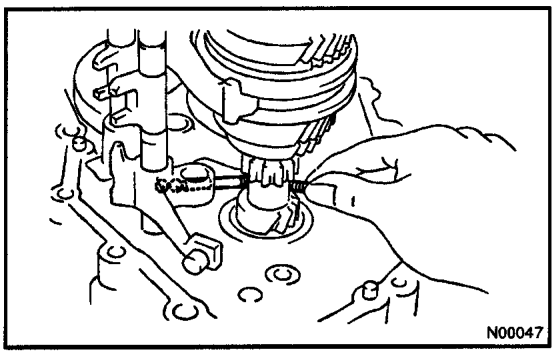


24. REMOVE SHIFT FORK AND SHIFT FORK SHAFT

(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) 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

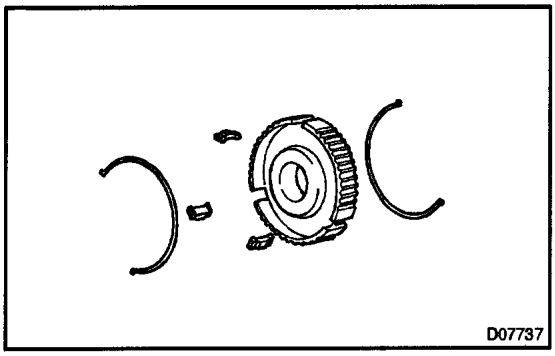
26. REMOVE DIFFERENTIAL CASE ASSEMBLY

NOTICE:

At the time of reassembly, please refer to the following item.

Before reassembly, inspect the differential side bearing preload (See page MX–41).

27. REMOVE MAGNET FROM TRANSAXLE CASE



28. DISASSEMBLE NO. 3 CLUTCH HUB ASSEMBLY

(a) Using a screwdriver, remove the 2 shifting key springs from the No. 3 clutch hub.

NOTICE:

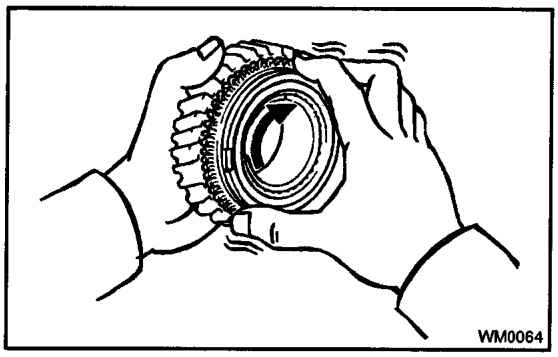
At the time of reassembly, please refer to the following item.

Position the shifting key springs so that their end gaps are not aligned.

(b) Remove the 3 shifting keys from the No. 3 clutch hub.

MX0AB-01

INSPECTION



1. INSPECT 5TH GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

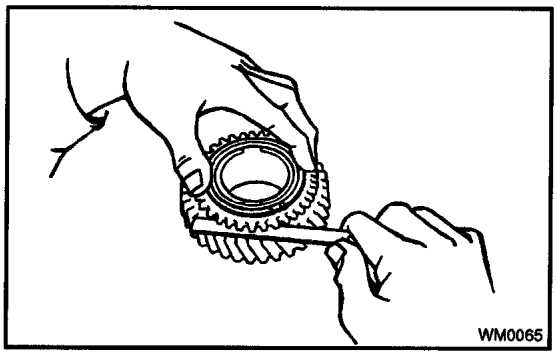
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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.



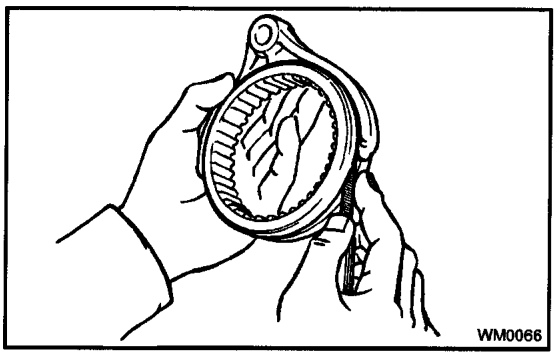
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.75 mm (0.0295 in.)

If the clearance is less than the minimum, replace the synchronizer ring and gear cone by applying a small amount of the fine lapping compound.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.



2. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

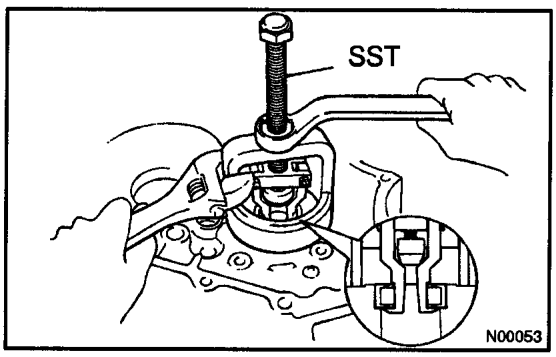
Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

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

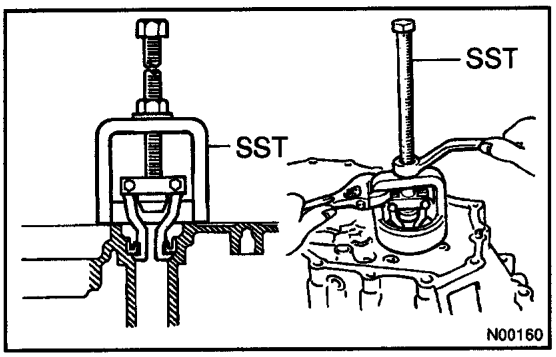
Remove the bolt and transaxle case receiver.



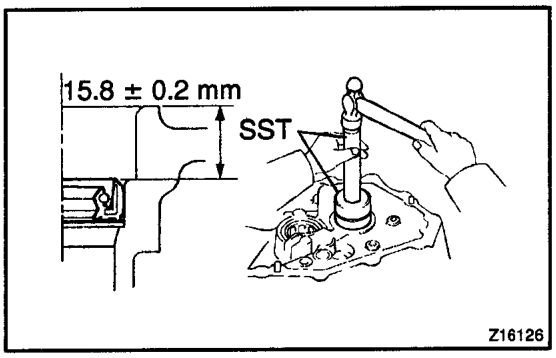
4. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING AND OIL SEAL

(a) Using SST, remove the input shaft front bearing.

SST 09612–65014

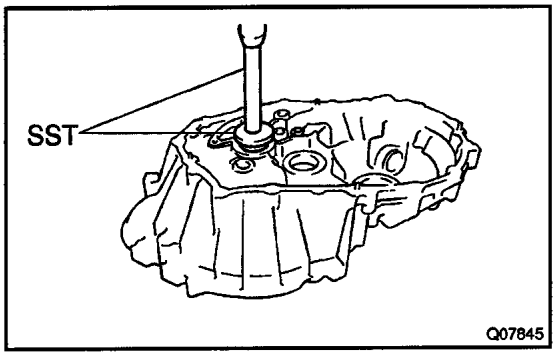


(b) Using SST, remove the oil seal.
SST 09612–65014

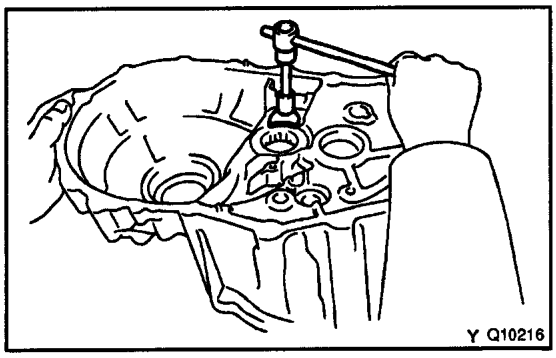


(c) Using SST and a hammer, install a new oil seal.
SST 09950–60010 (09951–00360), 09950–70010 (09951–07150)
Drive in depth: 15.8 ± 0.2 mm (0.622 ± 0.008 in.)

(d) Coat the lip of the oil seal with MP grease.

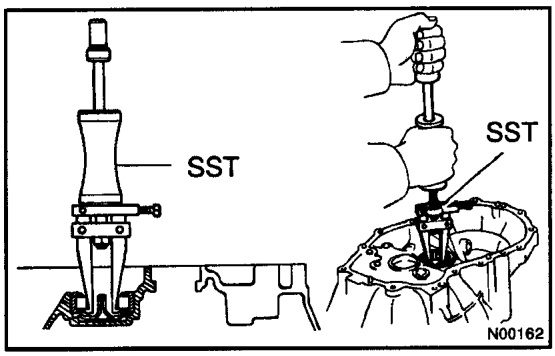


(e) Using SST and a press, install a new input shaft front bearing.
SST 09950–60010 (09951–00460), 09950–70010 (09951–07150)

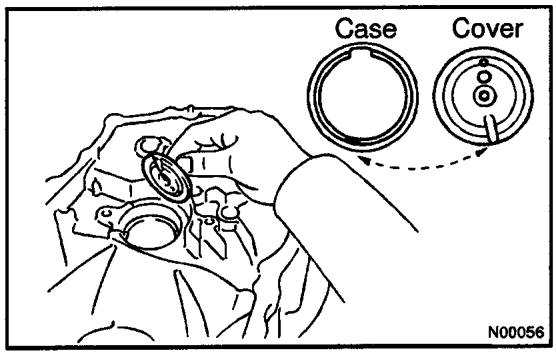


5. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING AND OUTPUT SHAFT COVER

(a) Remove the bolt and bearing lock plate.

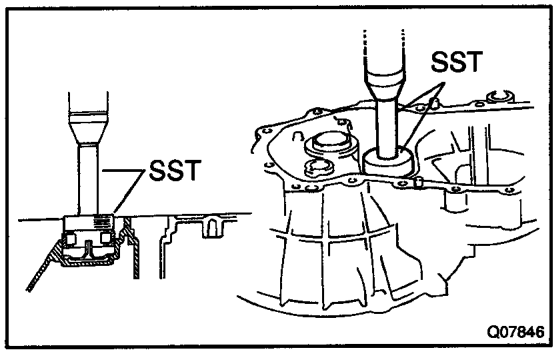


(b) Using SST, pull out the output shaft front bearing.
SST 09308–00010



(c) Remove the output shaft cover.
(d) Install the output shaft cover.

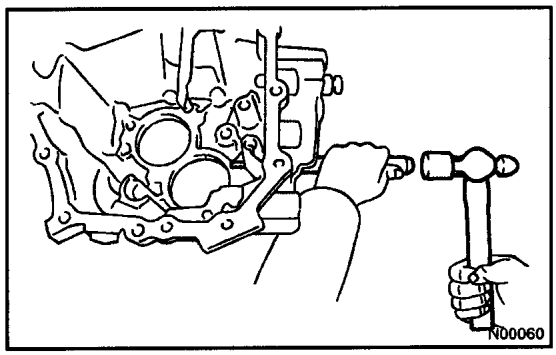
NOTICE:
Install the output shaft cover projection into the case side hollow.



(e) Using SST and a press, install a new output shaft front bearing.
SST 09950–60010 (09951–00620), 09950–70010 (09951–07150)
(f) Install the bearing lock plate with the bolt.
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

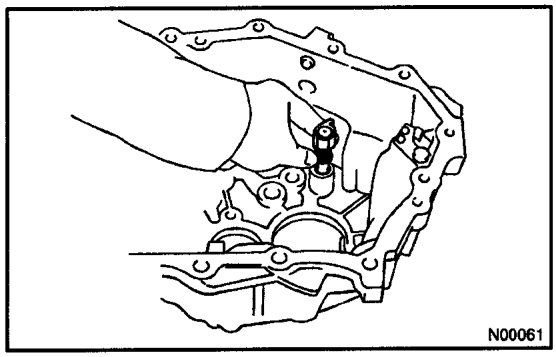
6. INSTALL TRANSAXLE CASE RECEIVER

Install the transaxle case receiver with the bolt.
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)



7. 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 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)

MX06Y–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.**
- **Part must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

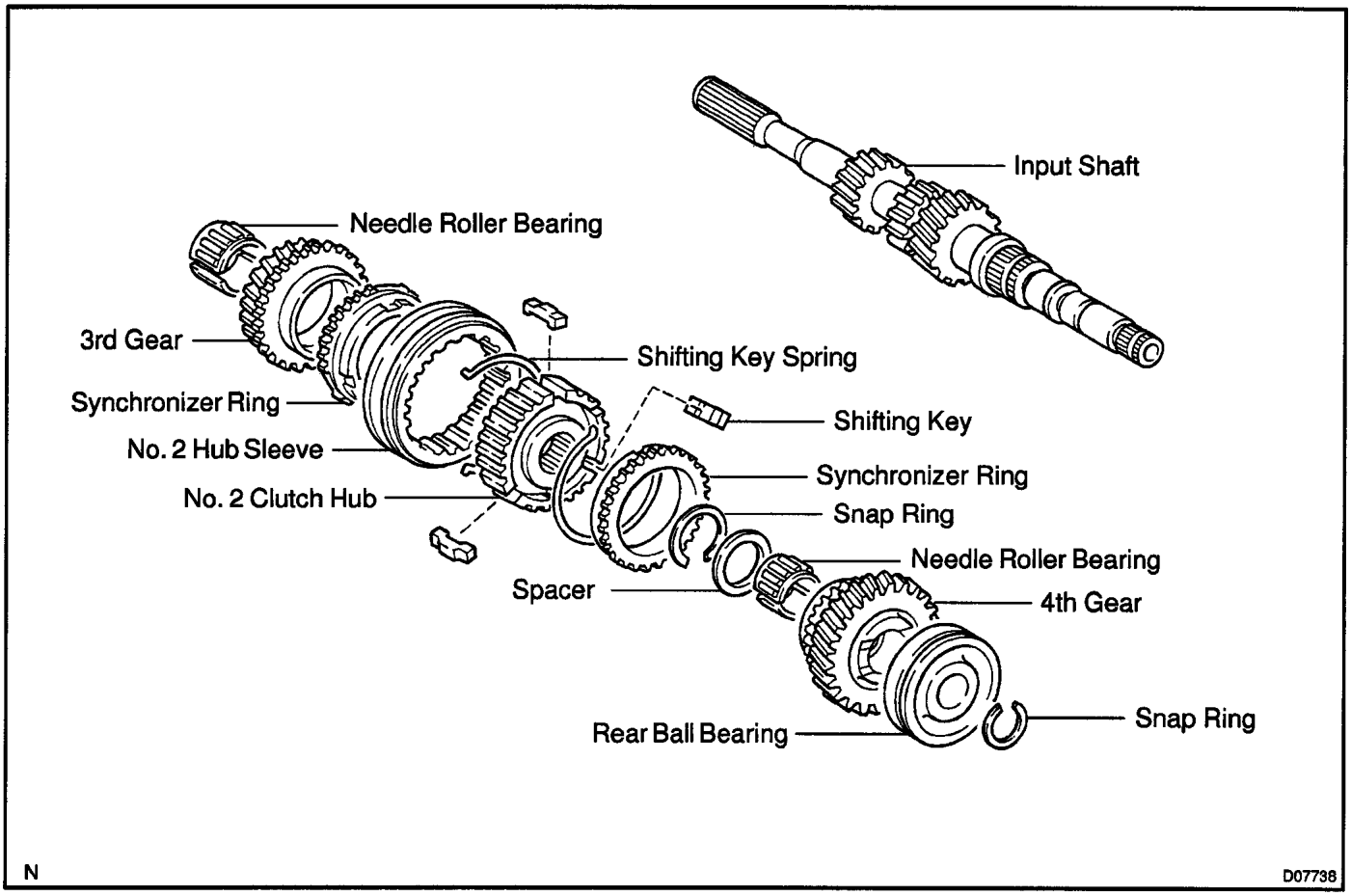
HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

INPUT SHAFT

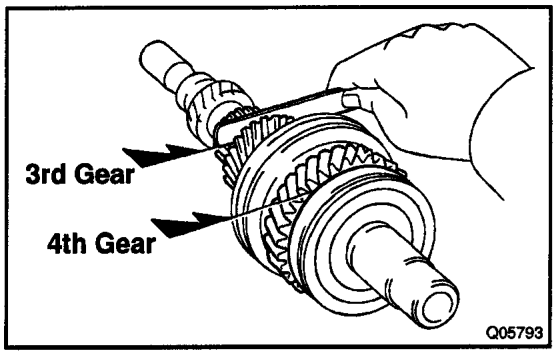
COMPONENTS

MX06Z–03



MX070-03

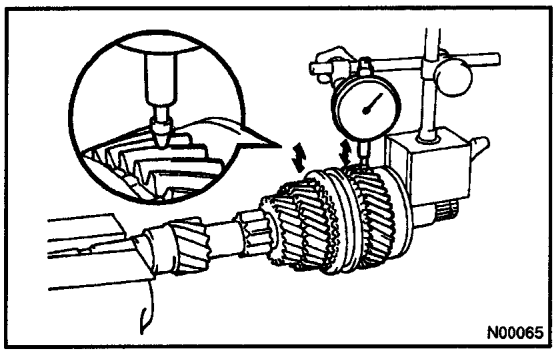
DISASSEMBLY



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 (0.0217 in.)



2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCE

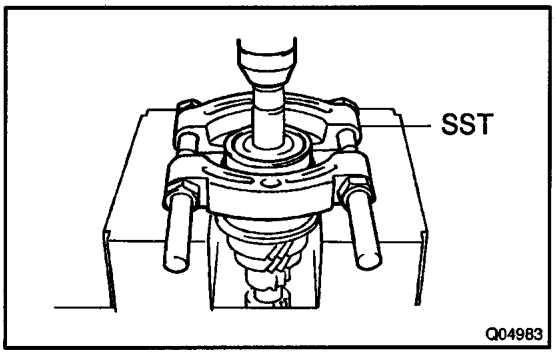
Using a dial indicator, measure the radial clearance between the gear and shaft.

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.



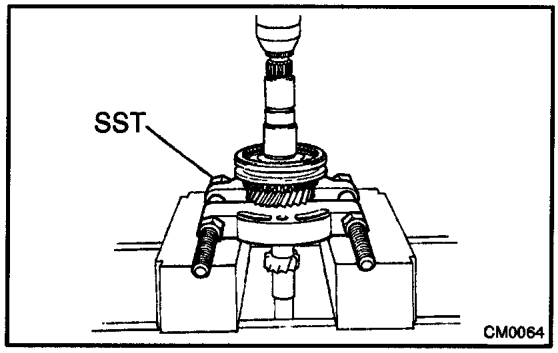
4. REMOVE REAR BALL BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING FROM INPUT SHAFT

(a) Using SST and a press, remove the rear ball bearing and 4th gear.
SST 09950–00020

(b) Remove the needle roller bearings, spacer and synchronizer ring.

5. REMOVE SNAP RING

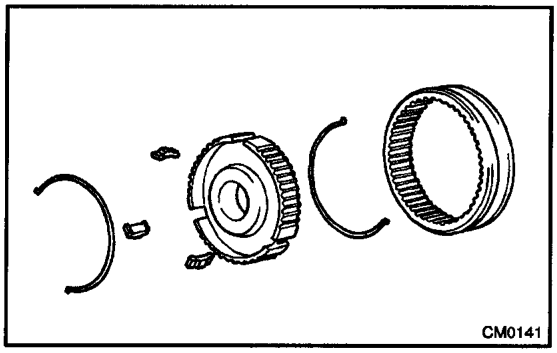
Using 2 screwdrivers and a hammer, tap out the snap ring.



6. REMOVE NO. 2 HUB SLEEVE ASSEMBLY, 3RD GEAR, SYNCHRONIZER RING AND NEEDLE ROLLER BEARING

(a) Using SST and a press, remove the No. 2 hub sleeve assembly, 3rd gear and synchronizer ring.
SST 09950–00020

(b) Remove the needle roller bearings.

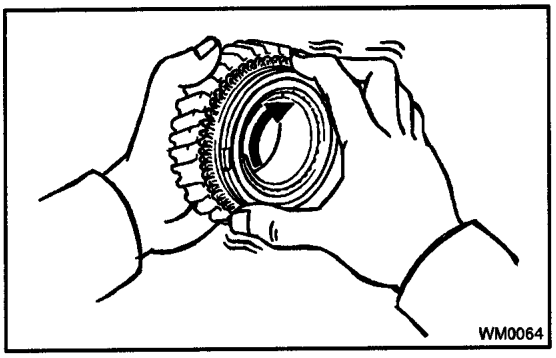


7. DISASSEMBLE NO. 2 HUB SLEEVE ASSEMBLY

(a) Using a screwdriver, remove the 2 shifting key springs and 3 shifting keys from the No. 2 clutch hub.

(b) Remove the No. 2 hub sleeve from the No. 2 clutch hub.

MX071-03



INSPECTION

1. INSPECT SYNCHRONIZER RING

(a) Check for wear or damage.

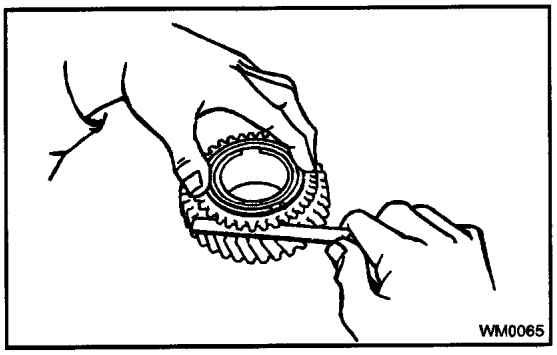
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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.



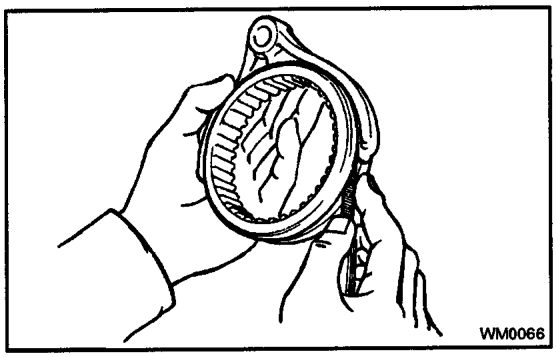
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

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.

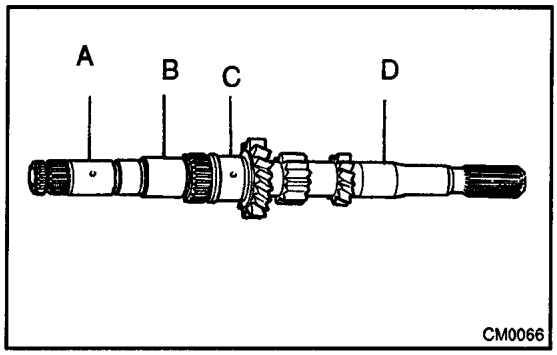


2. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

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.



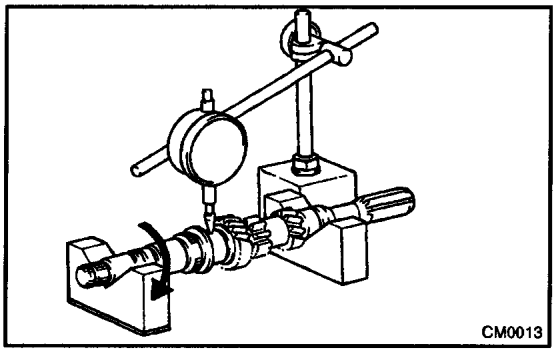
3. INSPECT INPUT SHAFT

(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: 24.967 mm (0.9830 in.)

If the outer diameter is less than the minimum, replace the input shaft.

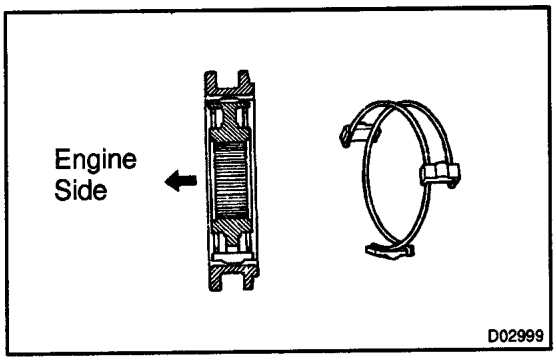


(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

If the runout exceeds the maximum, replace the input shaft.

MX072-03



REASSEMBLY

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

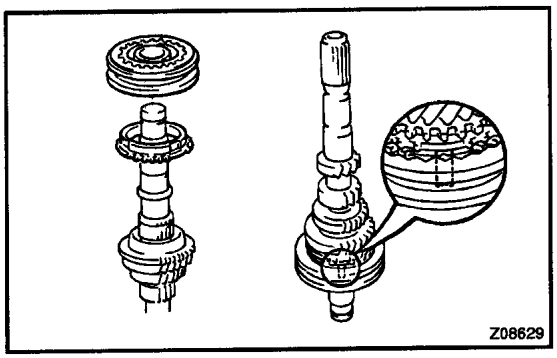
1. ASSEMBLE NO. 2 HUB SLEEVE ASSEMBLY

(a) Install the 3 shifting keys and No. 2 hub sleeve to the No. 2 clutch hub.

(b) Install the 2 shifting key springs under the shifting keys.

NOTICE:

Position the shifting key springs so that their end gaps are not in line.

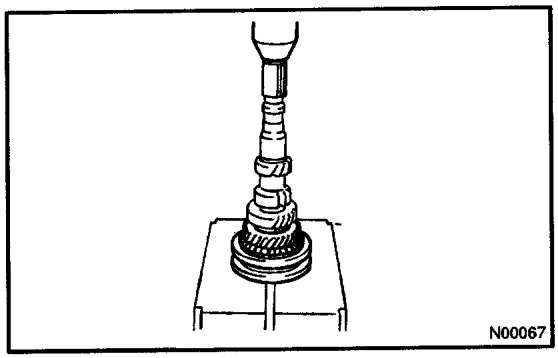


2. INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, SYNCHRONIZER RING AND NO. 2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

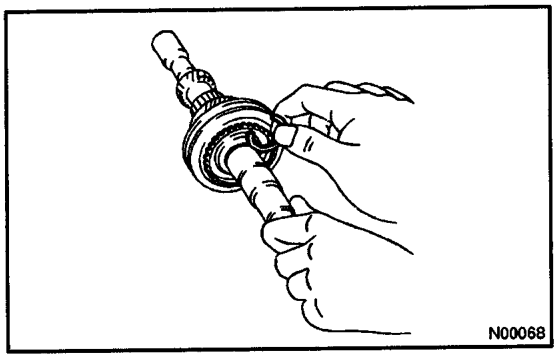
(a) Apply gear oil to the needle roller bearings and install it.

(b) Install the 3rd gear and synchronizer ring.

(c) Install the No. 2 hub sleeve assembly so that the synchronizer ring slots and shifting keys are aligned.



(d) Using a press, install the No. 2 hub sleeve assembly.



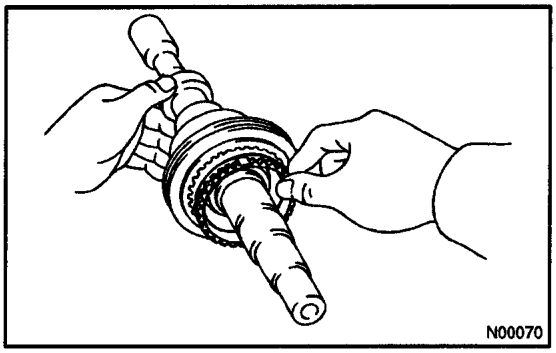
3. INSTALL SNAP RING

(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)



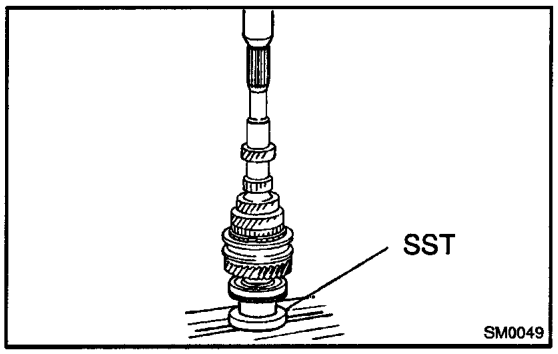
5. INSTALL SPACER, NEEDLE ROLLER BEARING, SYNCHRONIZER RING, 4TH GEAR AND REAR BALL BEARING

(a) Install the spacer.

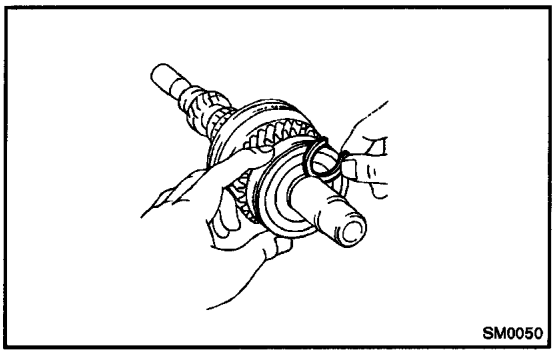
(b) Apply gear oil to the needle roller bearings and install it.

(c) Place the synchronizer ring on the No. 2 hub sleeve assembly and align the synchronizer ring slots with the shifting keys.

(d) Install the 4th gear.



(e) Using SST and a press, install the rear ball bearing.
SST 09608–00071



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)

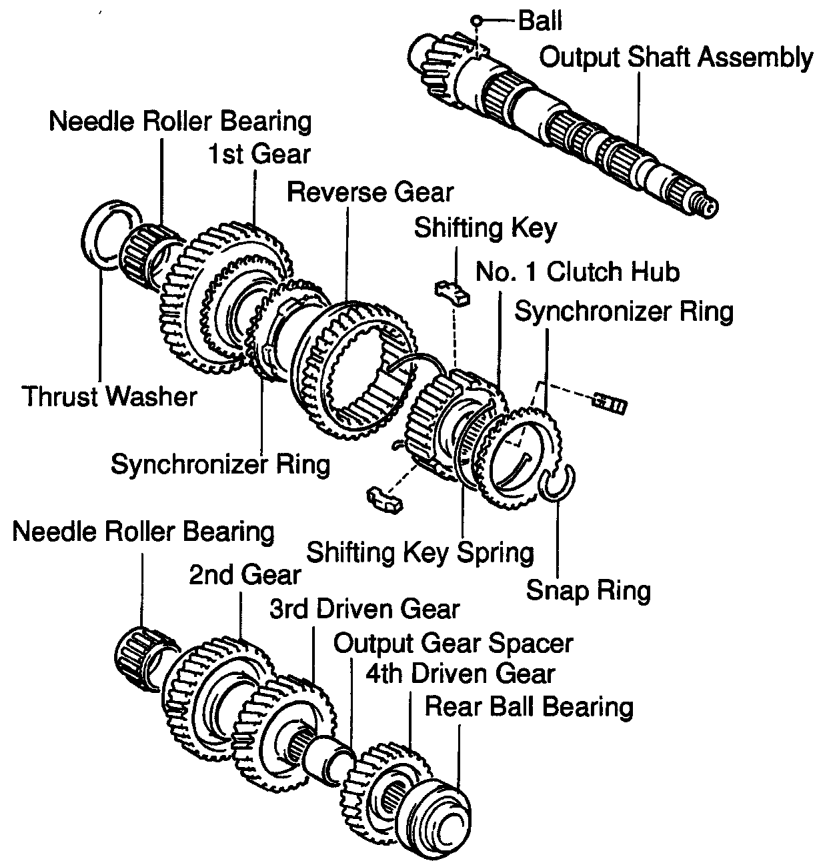
(b) Using a screwdriver and hammer, tap in the snap ring.

7. INSPECT 4TH GEAR THRUST CLEARANCE
(See page MX–24)

OUTPUT SHAFT

COMPONENTS

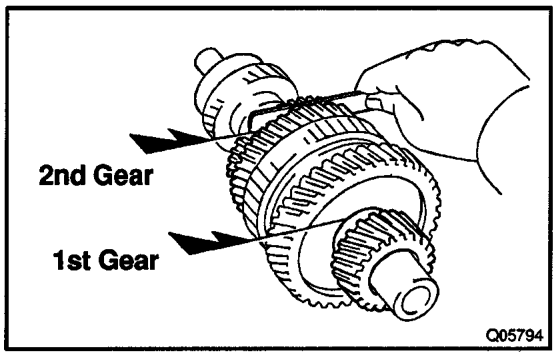
MX073-03



Q06509

MX074–03

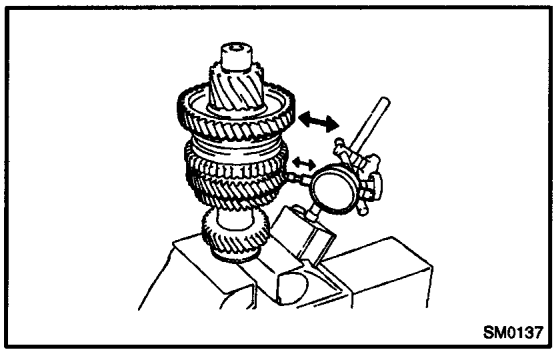
DISASSEMBLY



1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:
1st gear: 0.10 – 0.40 mm (0.0039 – 0.0157 In.)
2nd gear: 0.10 – 0.55 mm (0.0039 – 0.0217 in.)
Maximum clearance:
1st gear: 0.40 mm (0.0157 in.)
2nd gear: 0.55 mm (0.0217 in.)

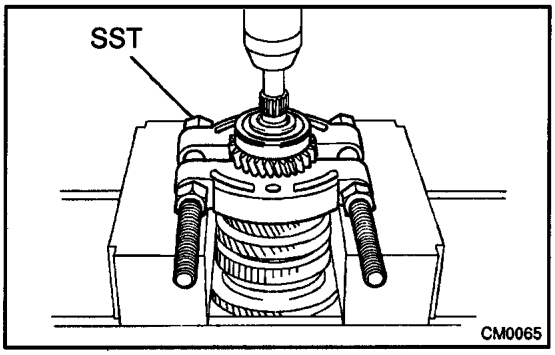


2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCE

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.)
KOYO made: 0.058 mm (0.0023 in.)
NSK made: 0.056 mm (0.0022 in.)

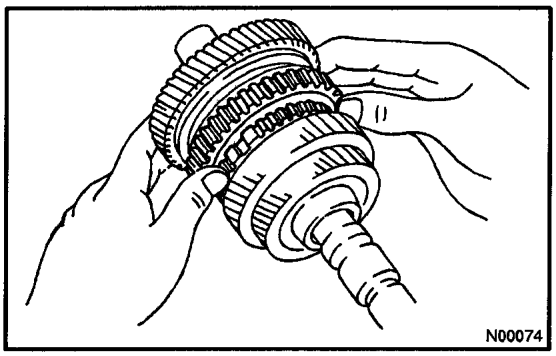
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE REAR BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER FROM OUTPUT SHAFT

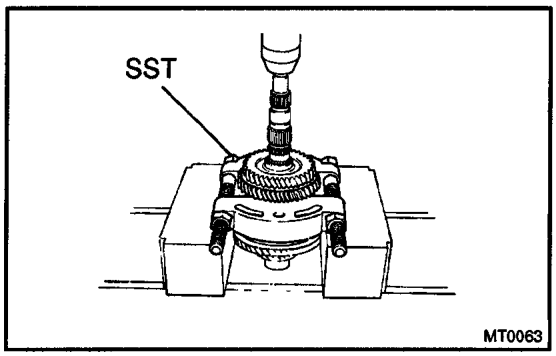
(a) Using SST and a press, remove the rear ball bearing and 4th driven gear.
SST 09950–00020

(b) Remove the output gear spacer.



4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING AND SYNCHRONIZER RING

(a) Shift the reverse gear into the 1st gear.

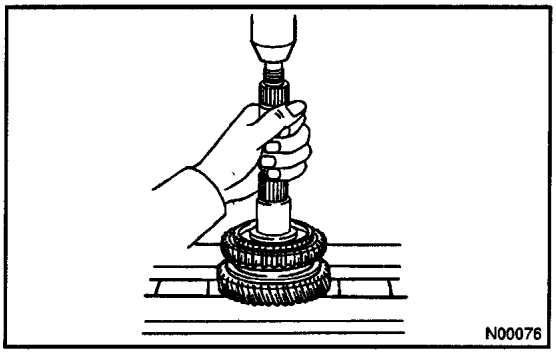


(b) Using SST and a press, remove the 3rd driven gear and 2nd gear.
SST 09950–00020

(c) Remove the needle roller bearing and synchronizer ring.

5. REMOVE SNAP RING

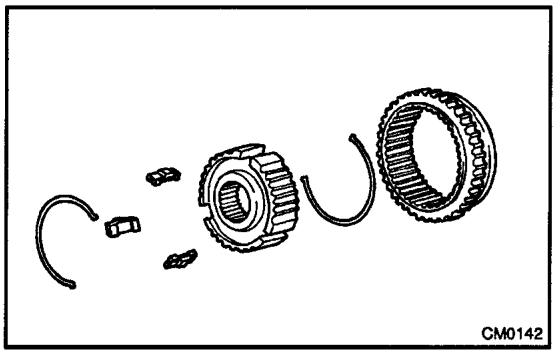
Using 2 screwdrivers and a hammer, tap out the snap ring.



6. REMOVE REVERSE GEAR ASSEMBLY, 1ST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, THRUST WASHER AND BALL

(a) Using a press, remove the reverse gear assembly, 1st gear and synchronizer ring.

(b) Remove the needle roller bearing, thrust washer and ball.



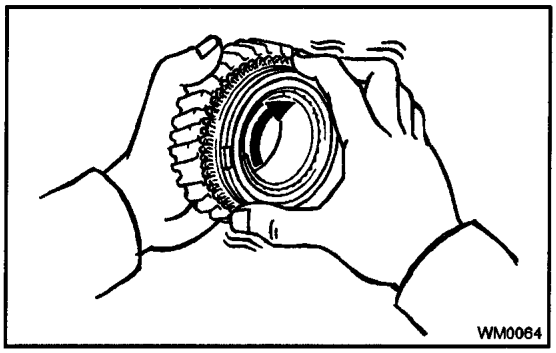
7. DISASSEMBLE REVERSE GEAR ASSEMBLY

(a) Using a screwdriver, remove the 2 shifting key springs and 3 shifting keys from the No. 1 clutch hub.

(b) Remove the reverse gear from the No. 1 clutch hub.

MX075-04

INSPECTION


WM0064

1. INSPECT SYNCHRONIZER RING

(a) Check for wear or damage.

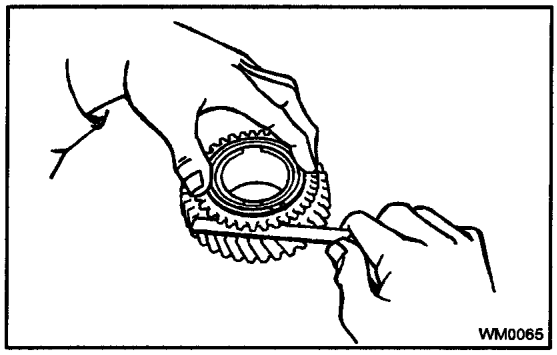
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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.


WM0065

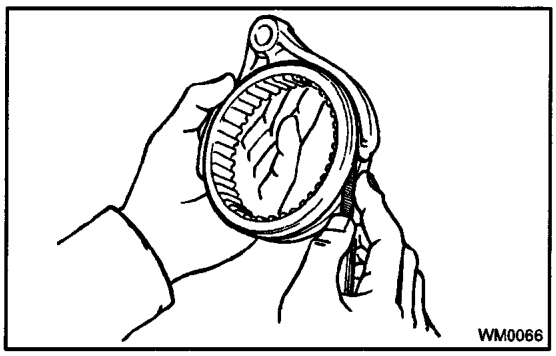
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

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.

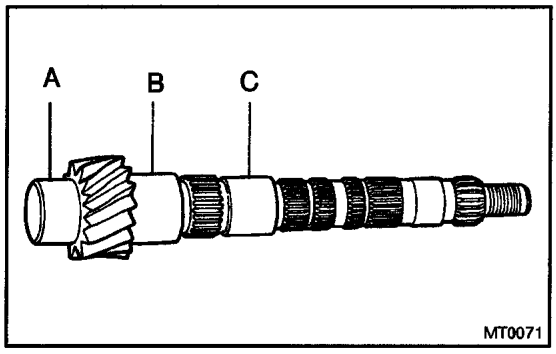

WM0066

2. INSPECT SHIFT FORK AND REVERSE GEAR CLEARANCE

Using a feeler gauge, measure the clearance between the reverse gear and shift fork.

Maximum clearance: 0.35 mm (0.014 in.)

If the clearance exceeds the maximum, replace the shift fork or reverse gear.



MT0071

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.

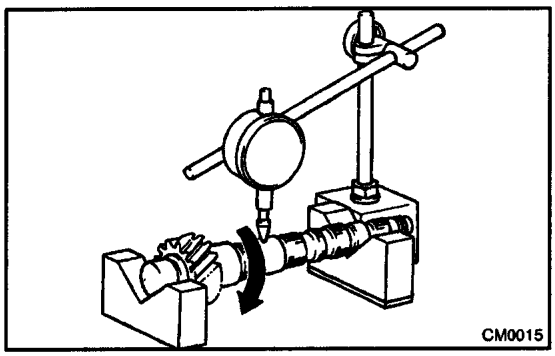
Minimum outer diameter:

Part A: 32.985 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.

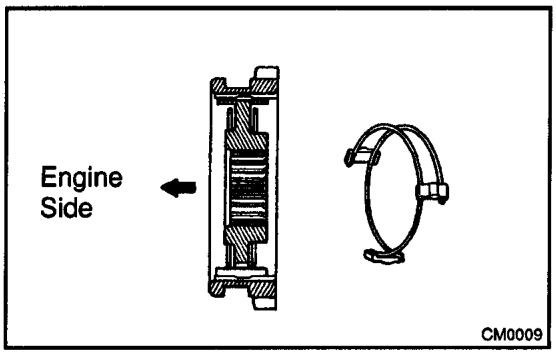


(c) Using a dial indicator, check the shaft runout.
Maximum runout: 0.03 mm (0.0012 in.)

If the runout exceeds the maximum, replace the output shaft.

MX076-03

REASSEMBLY



HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

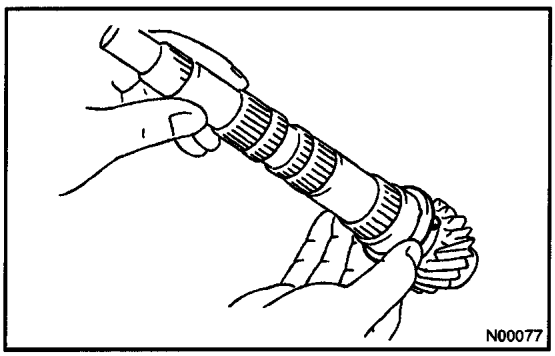
1. ASSEMBLE REVERSE GEAR ASSEMBLY

(a) Install the 3 shifting keys and reverse gear to the No. 1 clutch hub.

(b) Install the 2 shifting key springs under the shifting keys.

NOTICE:

Position the shifting key springs so that their end gaps are not in line.



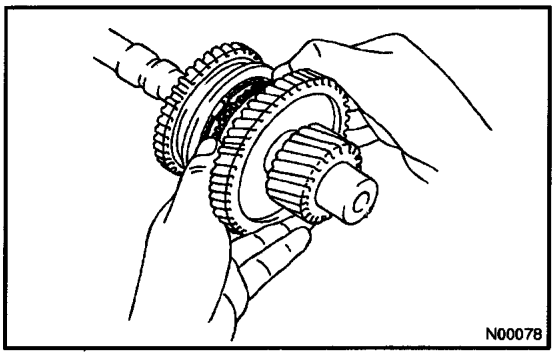
2. INSTALL BALL, THRUST WASHER, NEEDLE ROLLER BEARING, 1ST GEAR, SYNCHRONIZER RING AND REVERSE GEAR ASSEMBLY TO OUTPUT SHAFT

(a) Install the ball to the output shaft.

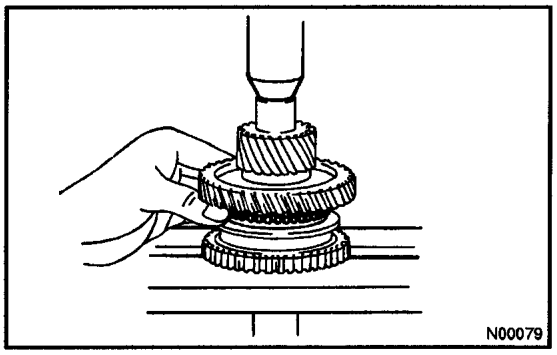
(b) Fit the thrust washer groove securely over the locking ball when installing the thrust on the output shaft.

(c) Apply gear oil to the needle roller bearing and install it.

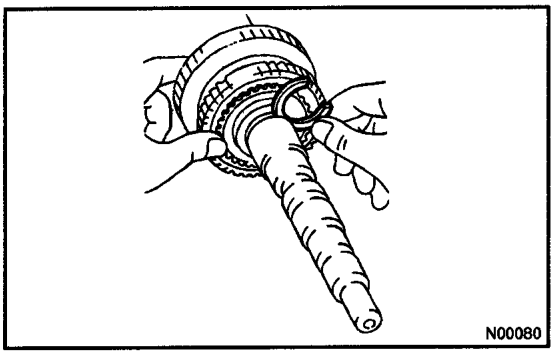
(d) Install the 1st gear and synchronizer ring.



(e) Place the reverse gear assembly and align the synchronizer ring slots with the shifting keys.



(f) Using a press, install the reverse gear assembly.



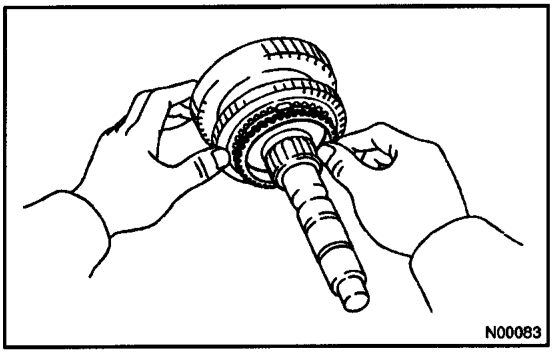
3. INSTALL SNAP RING

(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)

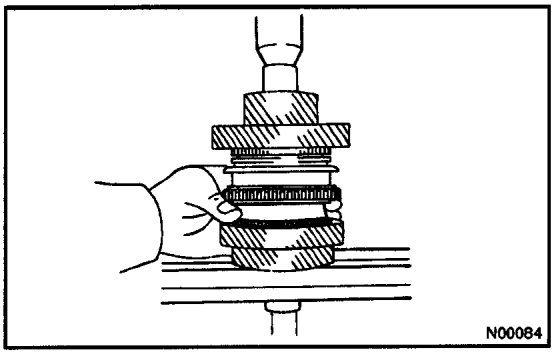


5. INSTALL NEEDLE ROLLER BEARING, SYNCHRONIZER RING, 2ND GEAR AND 3RD DRIVEN GEAR

(a) Apply gear oil to the needle roller bearing and install it.

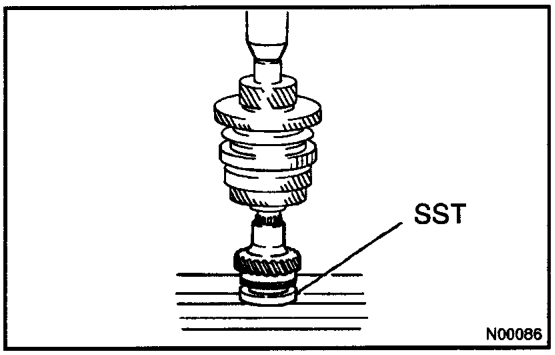
(b) Place the synchronizer ring on the reverse gear assembly and align the ring slots with the shifting keys.

(c) Install the 2nd gear.



(d) Using a press, install the 3rd driven gear.

6. INSPECT 2ND GEAR THRUST CLEARANCE
(See page MX–31)



7. INSTALL OUTPUT GEAR SPACER, 4TH DRIVEN GEAR AND REAR BALL BEARING

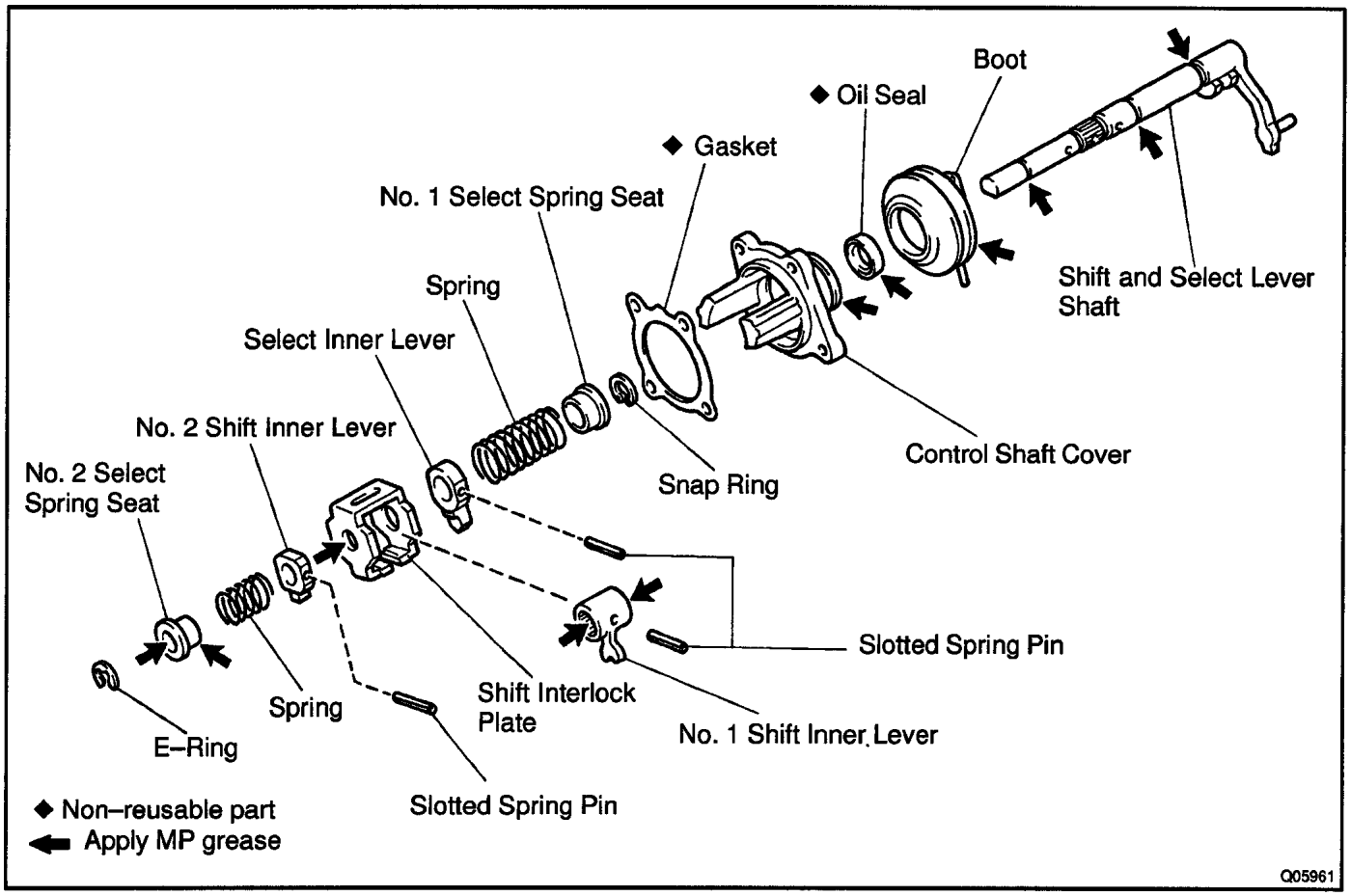
(a) Install the output gear spacer.

(b) Using SST and a press, install the 4th driven gear and rear ball bearing.
SST 09608–00071

SHIFT AND SELECT LEVER SHAFT

COMPONENTS

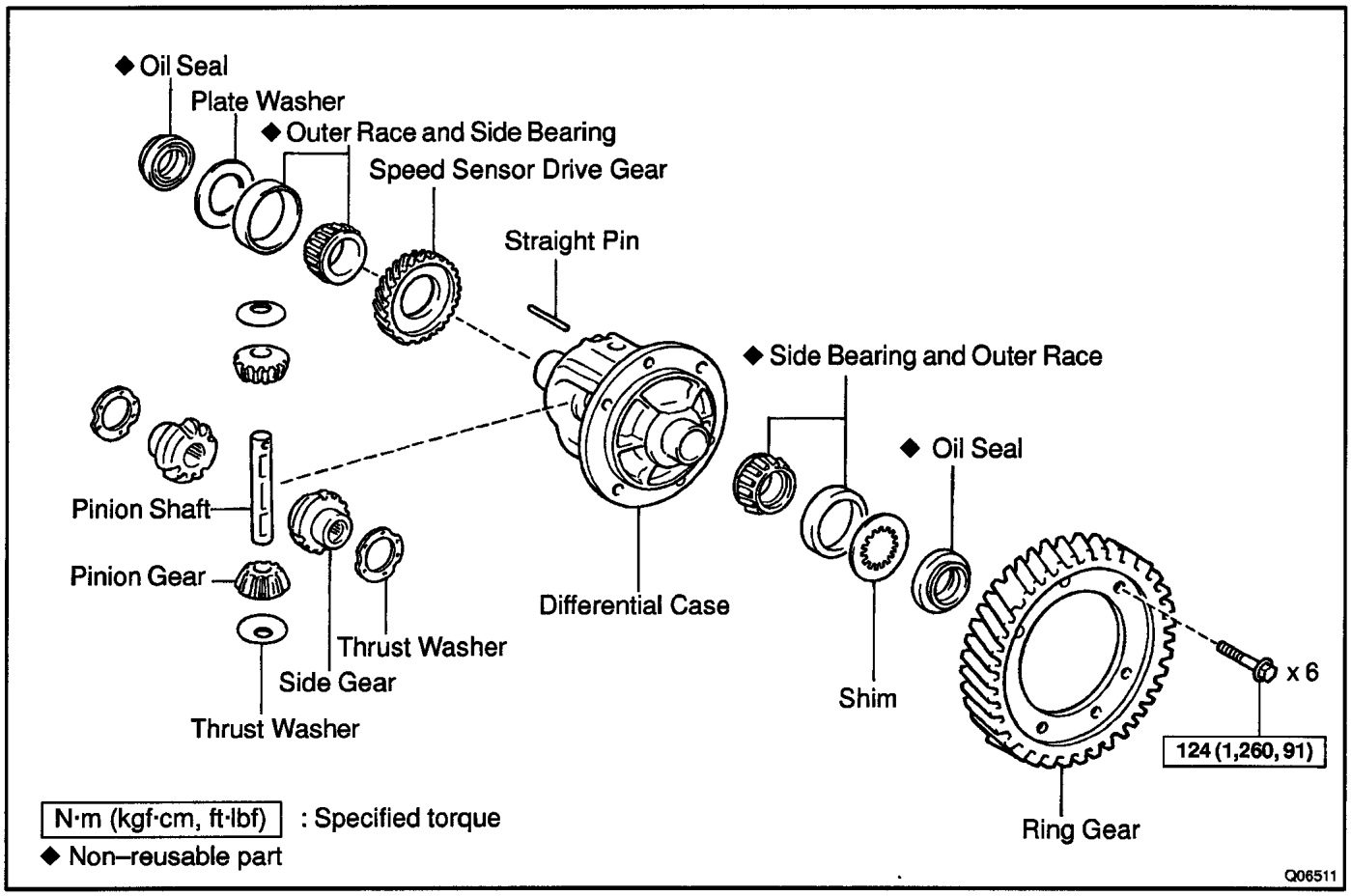
MX077–03



DIFFERENTIAL CASE

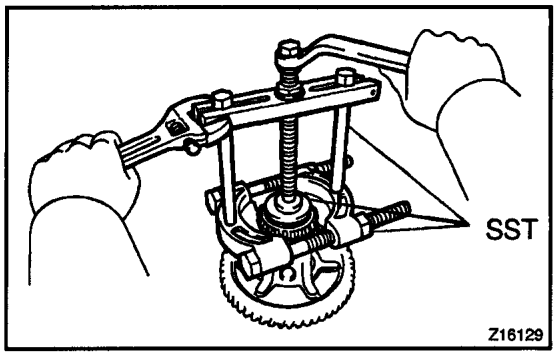
COMPONENTS

MX078-03



MX079–03

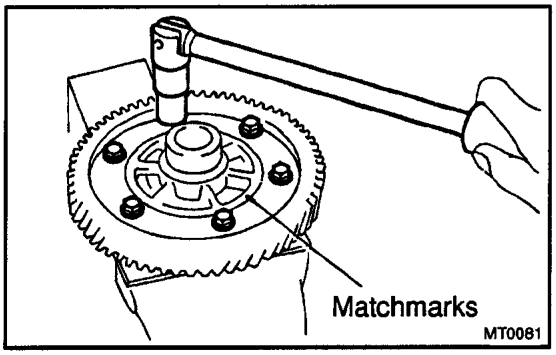
DISASSEMBLY



1. REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

(a) Using SST, remove the bearings from both sides of the differential case.
SST 09950–00020, 09950–00030, 09950–60010 (09951–00360)

(b) Remove the speed sensor drive gear from the RH side.

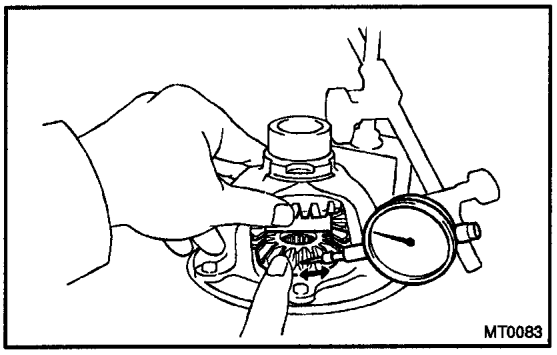


2. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and differential case.

(b) Remove the 6 bolts.

(c) Using a plastic hammer, tap on the ring gear to remove it from the differential case.

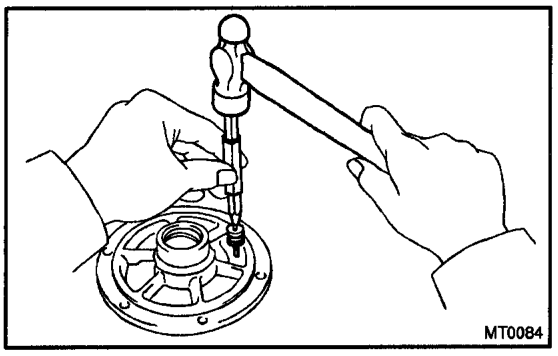


3. INSPECT SIDE GEAR BACKLASH

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.

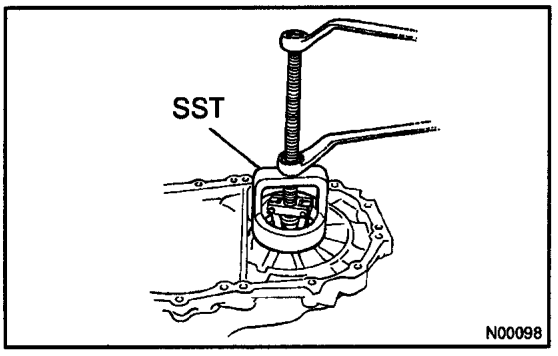


4. DISASSEMBLE DIFFERENTIAL CASE

(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 pinion gears and side gears with the 4 thrust washers from each gear.

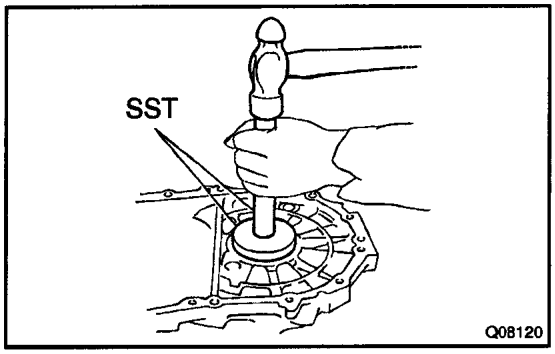


5. Transmission case side:
IF NECESSARY, REPLACE OIL SEAL AND SIDE BEARING OUTER RACE

(a) Using a screwdriver and hammer, drive out the oil seal.

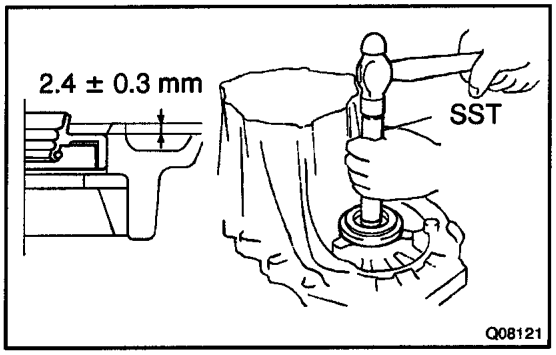
(b) Using SST, pull out the outer race and shim.
SST 09612–65014

(c) Place the shim into the differential case.



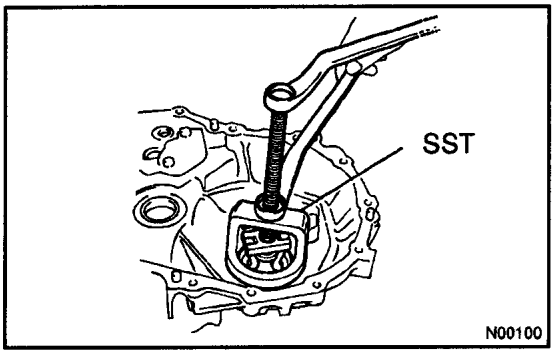
(d) Using SST and a hammer, drive in a new outer race.
SST 09950–60020 (09951–00710), 09950–70010 (09951–07150)

NOTICE:
When replacing the side bearing outer race, replace the side bearing along with it.



(e) Using SST and a hammer, drive in a new oil seal.
SST 09350–32014 (09351–32111), 09950–70010 (09951–07150)
Drive in depth: 2.4 ± 0.3 mm (0.094 ± 0.012 in.)

(f) Coat the lip of the oil seal with MP grease.

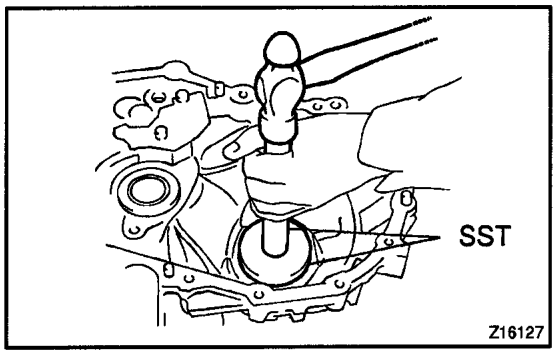


6. Transaxle case side:
IF NECESSARY, REPLACE OIL SEAL AND SIDE BEARING OUTER RACE

(a) Using a screwdriver and hammer, drive out the oil seal.

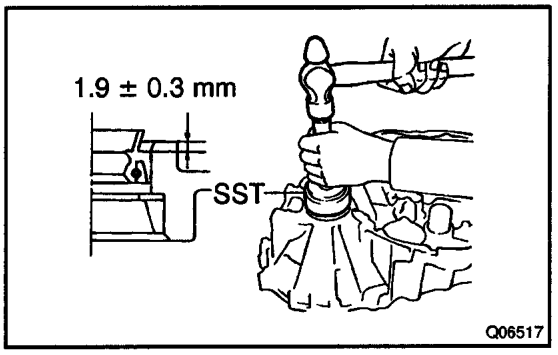
(b) Using SST, pull out the outer race and plate washer.
SST 09612–65014

(c) Place the plate washer into the differential case.



(d) Using SST and a hammer, drive in a new outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

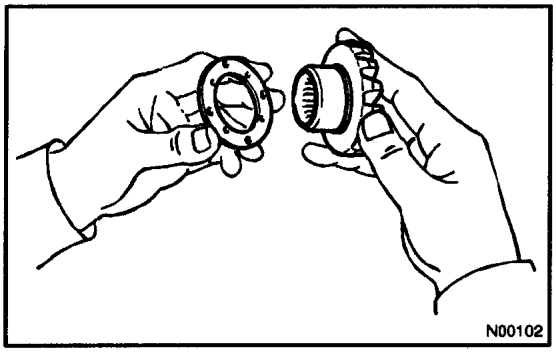
NOTICE:
When replacing the side bearing outer race, replace the side bearing along with it.



(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.

MX07A-04



REASSEMBLY

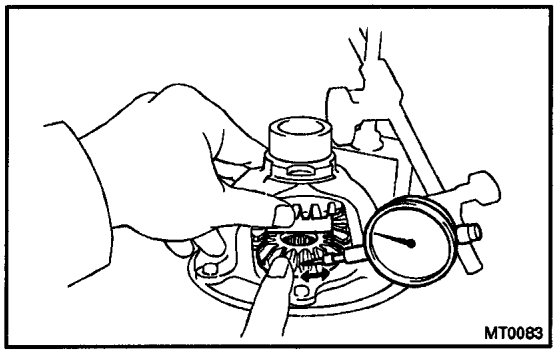
1. ASSEMBLE DIFFERENTIAL CASE

(a) Install the correct thrust washers and side gears.
Refer to the table below, select thrust washers which will 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.)
1.50 (0.0591)	1.65 (0.0650)
1.55 (0.0610)	1.70 (0.0669)
1.60 (0.0630)	1.75 (0.0689)

(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 gear 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.

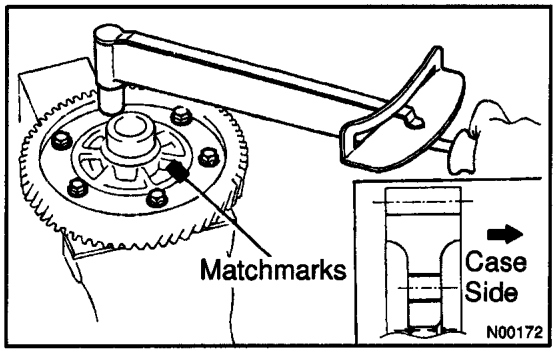
2. INSTALL RING GEAR ON DIFFERENTIAL CASE

(a) Clean the contact surface of the differential case.

(b) Heat the ring gear in boiling water.

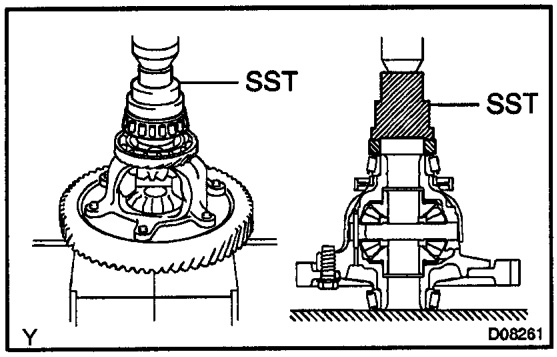
(c) Carefully remove the ring gear from the water.

(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) Install the 6 set bolts. Tighten each set bolt uniformly, a little at a time in succession. Torque the bolts.
Torque: 124 N·m (1,260 kgf·cm, 91 ft·lbf)



3. INSTALL SIDE BEARING

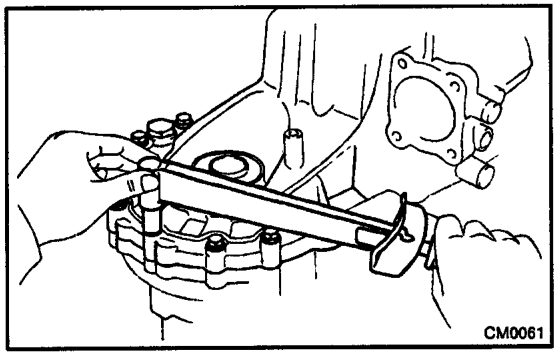
(a) Install the speed sensor drive gear to the RH side.

(b) Using SST and a press, install new side bearings to the both sides of the differential case.

SST 09350–32014 (09351–32090, 09351–32120)

NOTICE:

When replacing the side bearing outer race, replace the side bearing along with it.



4. INSPECT DIFFERENTIAL SIDE BEARING PRELOAD

NOTICE:

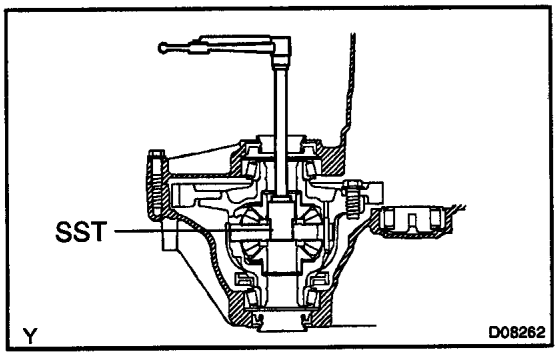
Perform this only when replacing the side bearing and outer race of the differential case.

(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, turn the differential case assembly right and left 2 or 3 times to allow the bearings to settle.

SST 09564–32011

(e) 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).

(f) Select an appropriate shim.

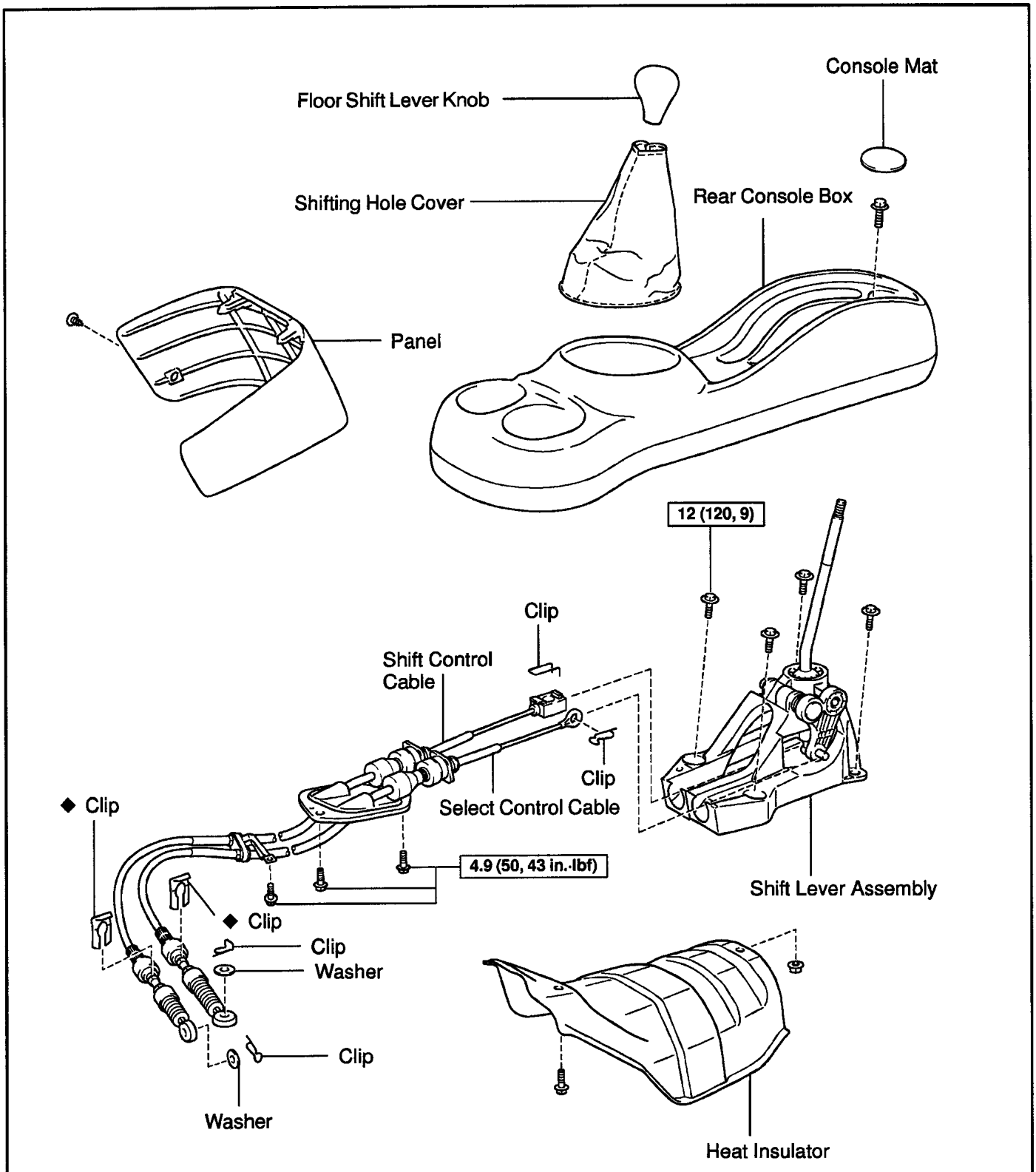
HINT:
The preload will change by about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 in.·lbf) corresponding to a change of 0.05 mm (0.0020 in.) in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
AA	2.10 (0.0827)	LL	2.60 (0.1024)
BB	2.15 (0.0846)	MM	2.65 (0.1043)
CC	2.20 (0.0866)	NN	2.70 (0.1063)
DD	2.25 (0.0886)	PP	2.75 (0.1083)
EE	2.30 (0.0906)	QQ	2.80 (0.1102)
FF	2.35 (0.0925)	RR	2.85 (0.1122)
GG	2.40 (0.0945)	SS	2.90 (0.1142)
HH	2.45 (0.0965)	TT	2.95 (0.1161)
JJ	2.50 (0.0984)	UU	3.00 (0.1181)
KK	2.55 (0.1004)	–	–

SHIFT LEVER AND CONTROL CABLE

MX07B–03

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

N

D07753

AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE SYSTEM AX–1
VEHICLE SPEED SENSOR AX–3
DIRECT CLUTCH SPEED SENSOR AX–4
NEUTRAL START SWITCH AX–5
VALVE BODY ASSEMBLY AX–6
DIFFERENTIAL OIL SEAL AX–10
SHIFT LOCK SYSTEM AX–11
FLOOR SHIFT ASSEMBLY AX–13
AUTOMATIC TRANSAXLE UNIT AX–23
TORQUE CONVERTER
AND DRIVE PLATE AX–31

AUTOMATIC TRANSAXLE SYSTEM

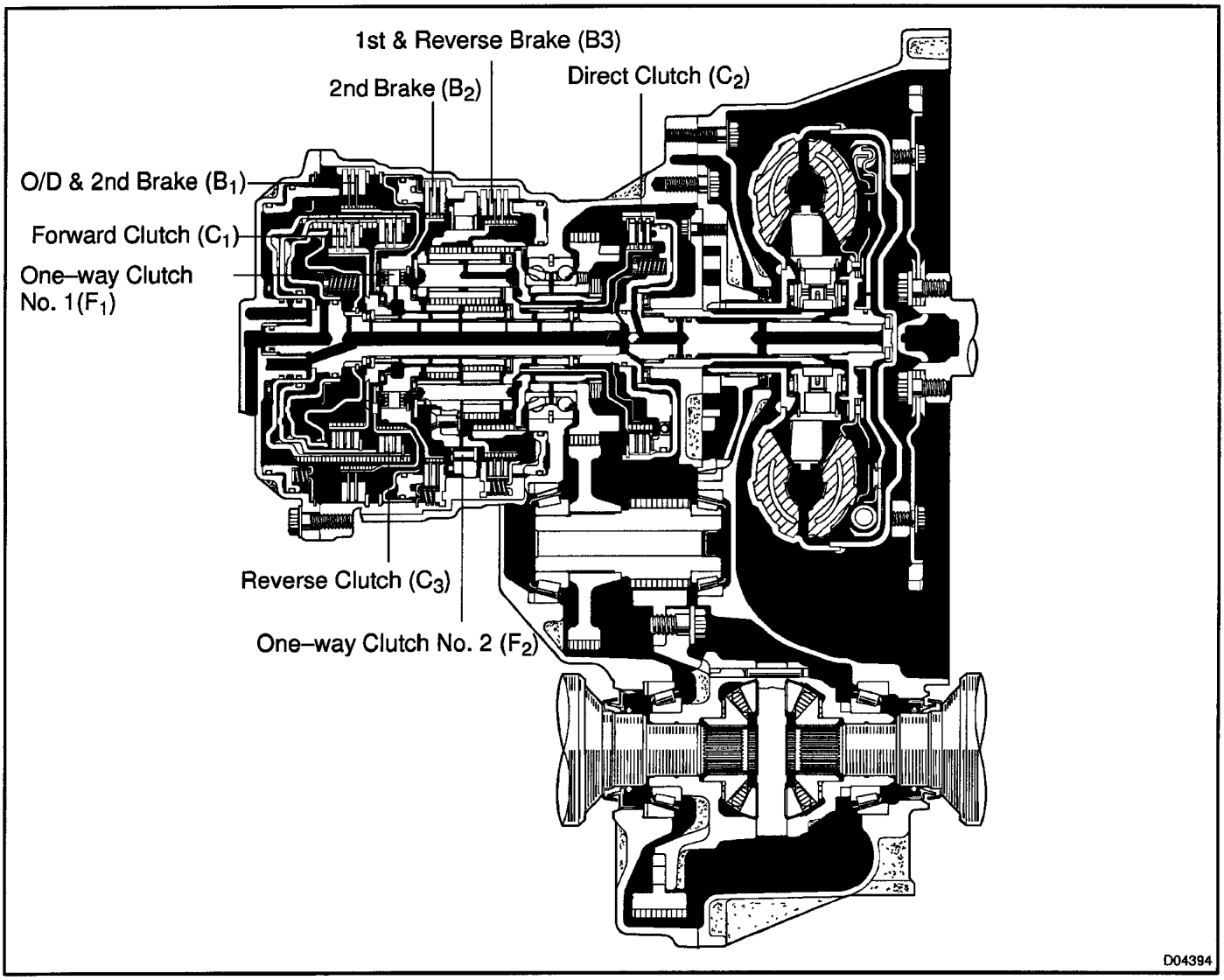
AX03L-04

PRECAUTION

If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

AX0CZ-02

OPERATION



AX

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	○					○		○

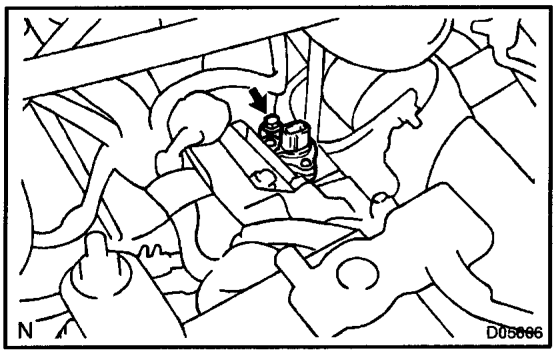
○ : Operating

VEHICLE SPEED SENSOR

AX03N–06

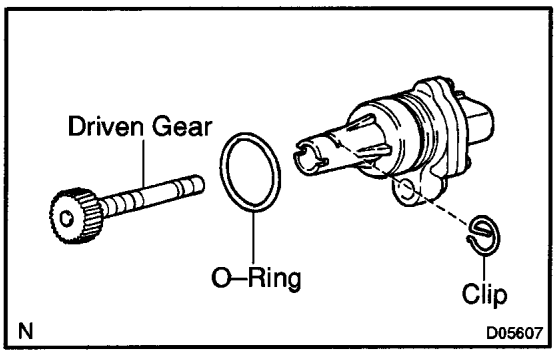
ON–VEHICLE REPAIR

1. **REMOVE AIR CLEANER ASSEMBLY**
2. **DISCONNECT VEHICLE SPEED SENSOR CONNECTOR**



3. **REMOVE VEHICLE SPEED SENSOR ASSEMBLY**

(a) Remove the bolt and vehicle speed sensor assembly.



(b) Remove the clip and driven gear from the vehicle speed sensor.

(c) Remove the O–ring from the vehicle speed sensor.

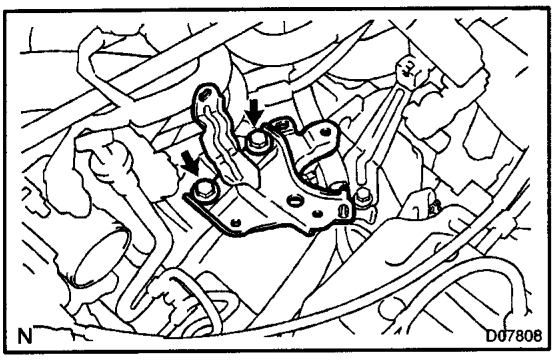
4. **INSTALL VEHICLE SPEED SENSOR ASSEMBLY**

(a) Coat a new O–ring with ATF and install it to the vehicle speed sensor.

(b) Install the driven gear to the vehicle speed sensor with the clip.

(c) Install the vehicle speed sensor assembly with the bolt.
Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)

5. **CONNECT VEHICLE SPEED SENSOR CONNECTOR**
6. **INSTALL AIR CLEANER ASSEMBLY**



DIRECT CLUTCH SPEED SENSOR

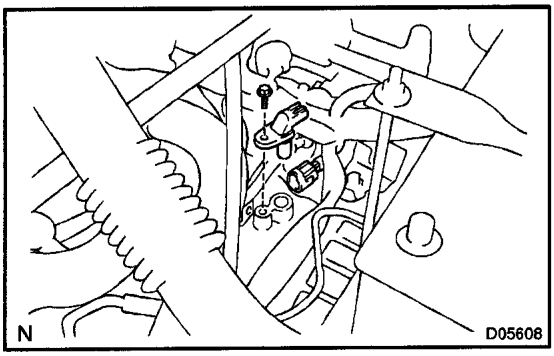
AX0KR-01

ON–VEHICLE REPAIR

1. REMOVE AIR CLEANER ASSEMBLY

2. REMOVE AIR CLEANER BRACKET

Remove the 2 bolts and bracket.



3. REMOVE DIRECT CLUTCH SPEED SENSOR

(a) Disconnect the connector.

(b) Remove the bolt and direct clutch speed sensor.

(c) Remove the O–ring from the direct clutch speed sensor.

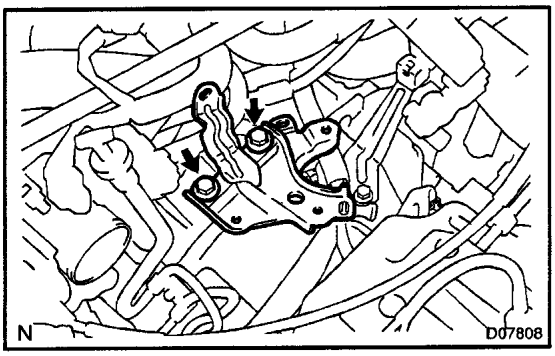
4. INSTALL DIRECT CLUTCH SPEED SENSOR

(a) Coat a new O–ring with ATF and install it to the direct clutch speed sensor.

(b) Install the direct clutch speed sensor with the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(c) Connect the connector.



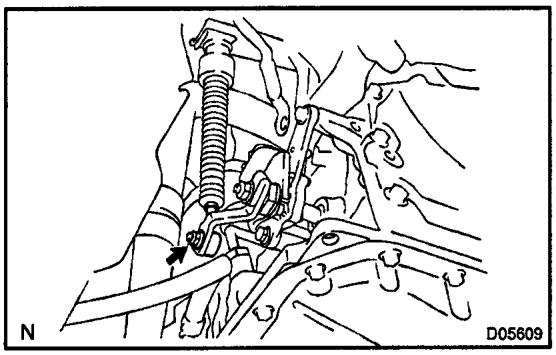
5. INSTALL AIR CLEANER BRACKET

Install the bracket with the 2 bolts.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

6. INSTALL AIR CLEANER ASSEMBLY

AX



NEUTRAL START SWITCH

AX0D1-02

ON–VEHICLE REPAIR

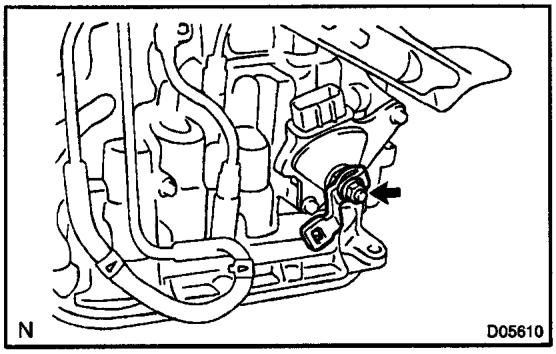
1. REMOVE LH ENGINE UNDER COVER

2. DISCONNECT TRANSAXLE CONTROL CABLE

Remove the nut and disconnect the transaxle control cable.

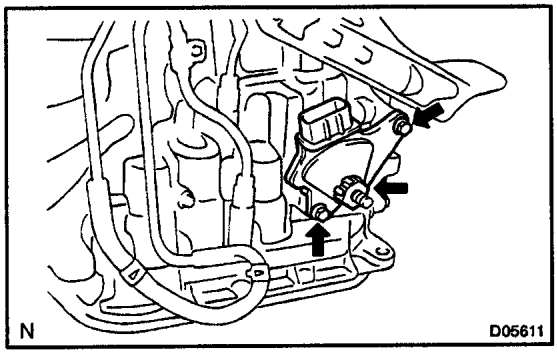
3. REMOVE NEUTRAL START SWITCH

(a) Disconnect the neutral start switch connector.



(b) Remove the nut, washer and control shaft.

(c) Using a screwdriver, unstake the washer.



(d) Remove the 2 bolts, nut, washer and neutral start switch.

4. INSTALL NEUTRAL START SWITCH

(a) Install the neutral start switch and washer with the 2 bolts and nut.

Torque:
Bolt: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
Nut: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

(b) Using a screwdriver, stake a new washer.

(c) Install the control shaft and washer with the nut.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

(d) Connect the neutral start switch connector.

5. CONNECT TRANSAXLE CONTROL CABLE

Connect the transaxle control cable, and install the nut.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

6. ADJUST NEUTRAL START SWITCH

(See page DI–4)

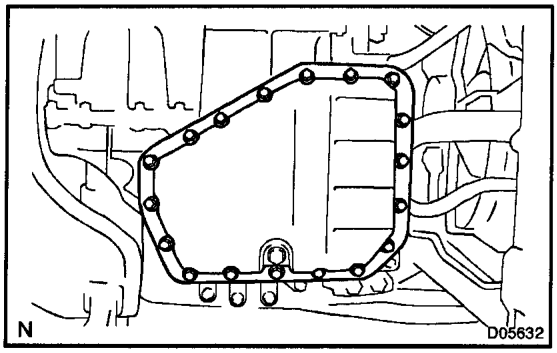
7. INSTALL LH ENGINE UNDER COVER

VALVE BODY ASSEMBLY

AX0D2-02

ON–VEHICLE REPAIR

1. **REMOVE LH ENGINE UNDER COVER**
2. **REMOVE DRAIN PLUG AND DRAIN ATF**

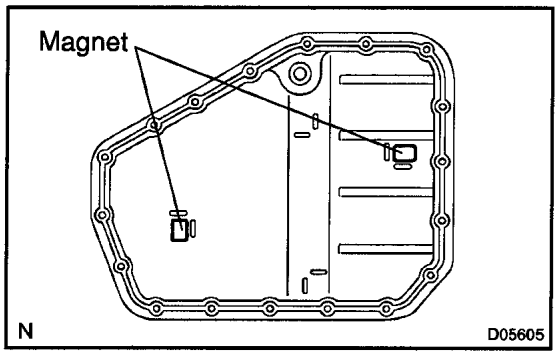


3. **REMOVE OIL PAN AND GASKET**

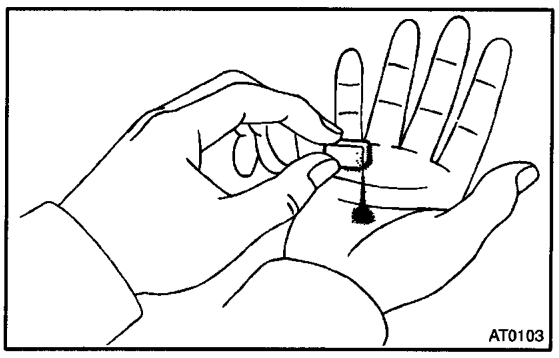
Remove the 18 bolts, oil pan and gasket.

NOTICE:

Some fluid will remain in the oil pan. Remove all pan bolts, and carefully remove the oil pan assembly. Discard the gasket.



4. **REMOVE 2 MAGNETS FROM OIL PAN**

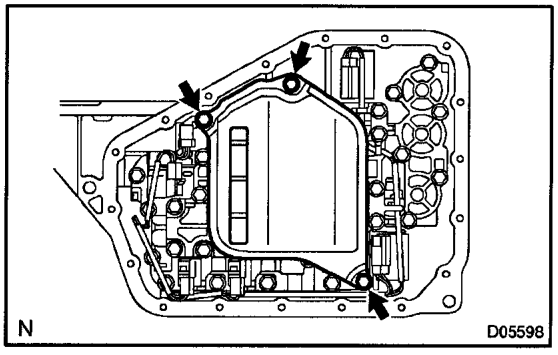


5. **EXAMINE PARTICLES IN PAN**

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): bearing wear

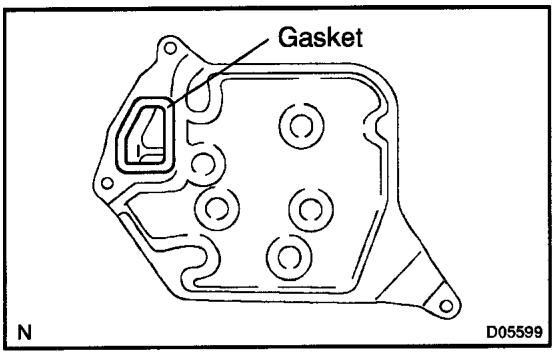


6. **REMOVE OIL STRAINER**

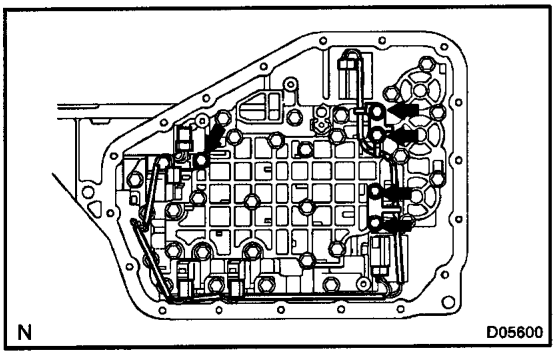
NOTICE:

Be careful as some fluid will come out with the oil strainer.

(a) Remove the 3 bolts and oil strainer.



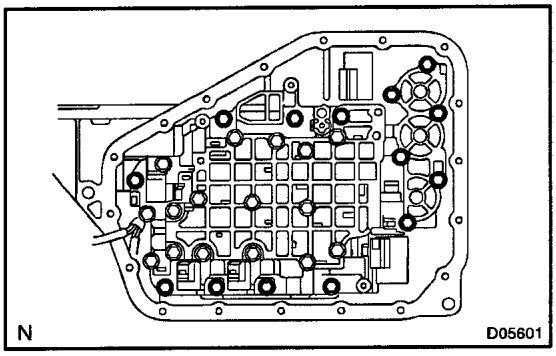
(b) Remove the gasket from the oil strainer.



7. DISCONNECT CONNECTOR AND ATF TEMPERATURE SENSOR

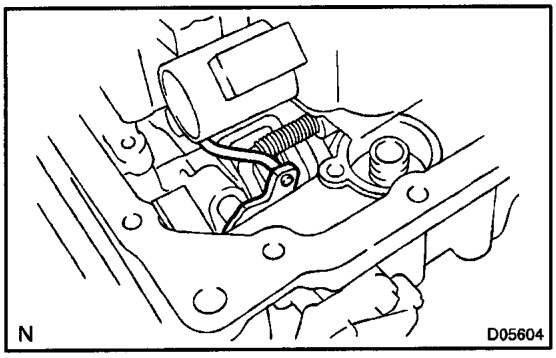
(a) Remove the 5 bolts, ATF temperature sensor and clamp.

(b) Disconnect the 5 connectors.

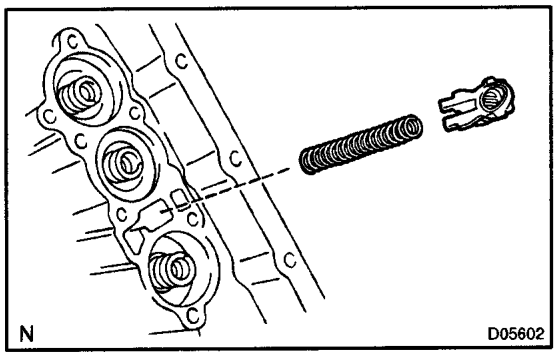


8. REMOVE VALVE BODY

(a) Remove the 14 bolts.

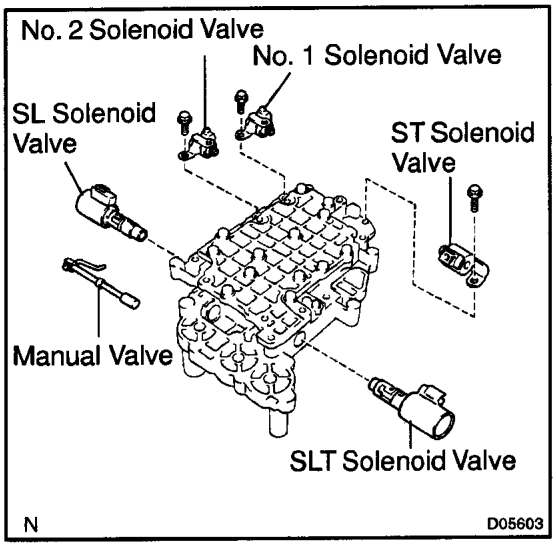


(b) While disconnecting the manual valve connecting rod from the manual valve lever, remove the valve body.



9. REMOVE CHECK BALL BODY

Remove the check ball body and spring.



10. REMOVE SOLENOID VALVE

(a) Remove the 3 bolts and 5 solenoid valves.

(b) Remove the O–rings from each of the solenoid valve.

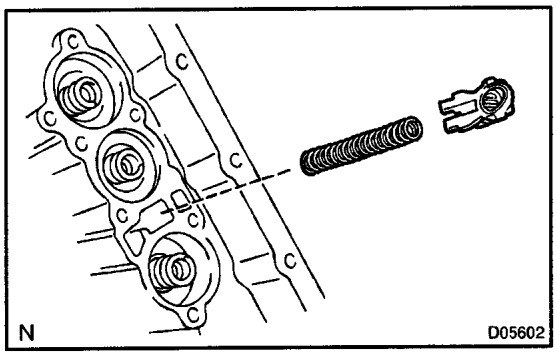
(c) Remove the manual valve.

11. INSTALL SOLENOID VALVE

(a) Coat new O–rings with ATF and install them to each of the solenoid valve.

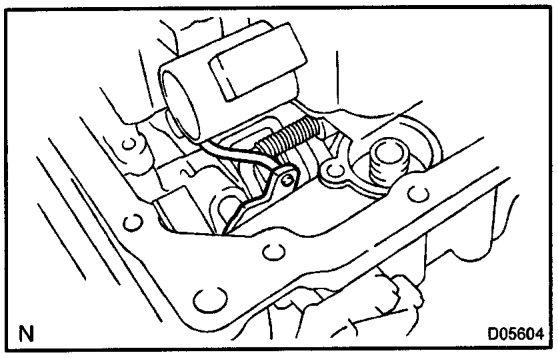
(b) Install the 5 solenoid valves with the 3 bolts.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

(c) Install the manual valve.



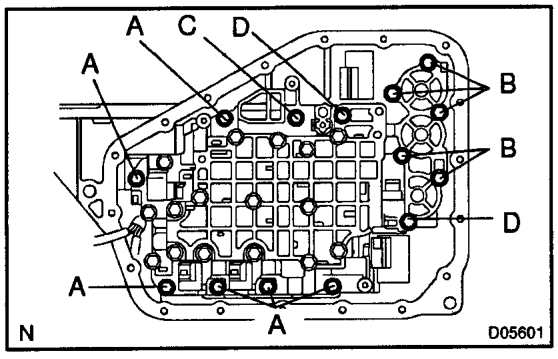
12. INSTALL CHECK BALL BODY

Install the spring and check ball body.

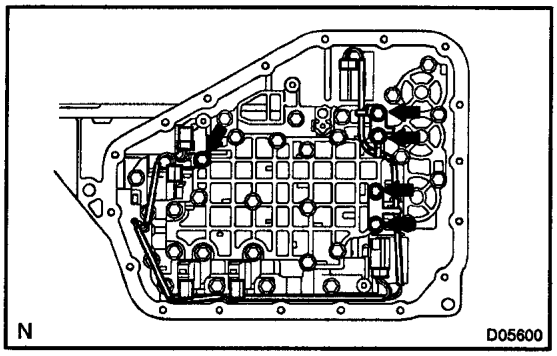


13. INSTALL VALVE BODY

(a) Connect the connecting rod to the manual valve lever.



(b) Install the valve body with the 14 bolts.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)
Bolt length:
Bolt A: 20 mm (0.79 in.)
Bolt B: 28 mm (1.10 in.)
Bolt C: 36 mm (1.42 in.)
Bolt D: 40 mm (1.57 in.)
Bolt E: 49 mm (1.93 in.)

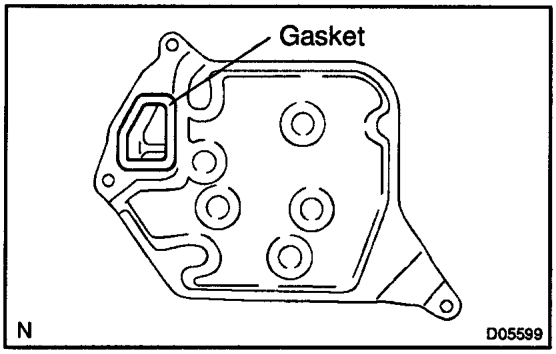


14. CONNECT CONNECTOR AND ATF TEMPERATURE SENSOR

(a) Connect the 5 connectors.

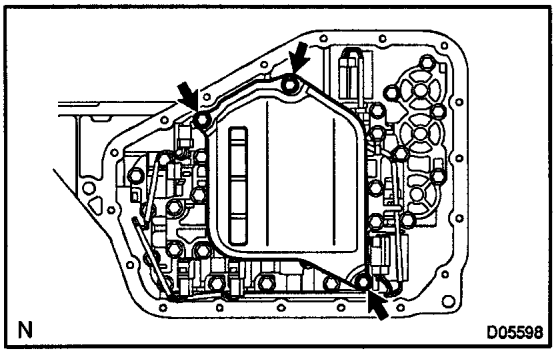
(b) Install the ATF temperature sensor with the valve body.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

(c) Install the 2 clamps with the 4 bolts.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

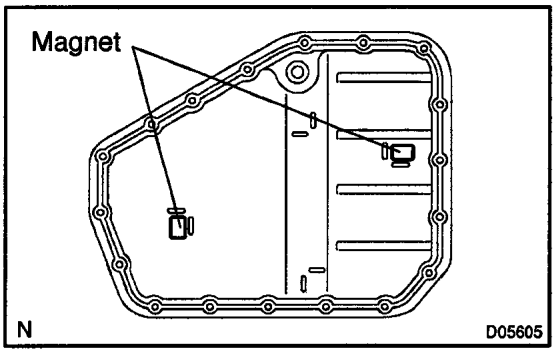


15. INSTALL OIL STRAINER

(a) Install a new gasket to the oil strainer.



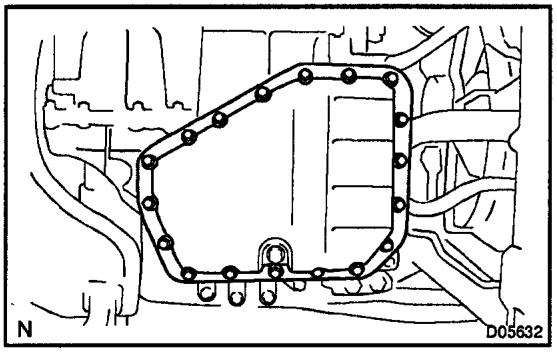
(b) Install the oil strainer with the 3 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



16. INSTALL 2 MAGNETS IN OIL PAN

17. INSTALL OIL PAN AND GASKET

(a) Install a new gasket to the oil pan.



(b) Install the oil pan with the 18 bolts.
Torque: 9.0 N·m (91 kgf·cm, 80 in.·lbf)

18. INSTALL DRAIN PLUG

Install a new gasket with the drain plug.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

19. FILL ATF AND CHECK ATF LEVEL (See page DI–4)

20. INSTALL LH ENGINE UNDER COVER

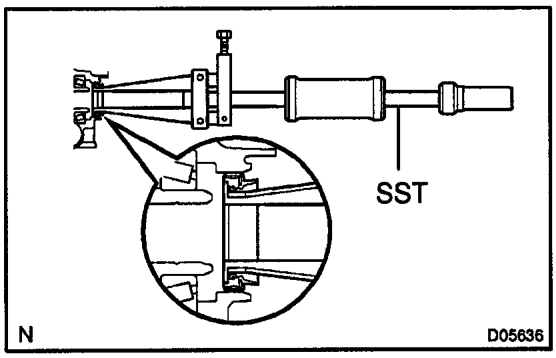
AX

DIFFERENTIAL OIL SEAL

AX03S–06

ON–VEHICLE REPAIR

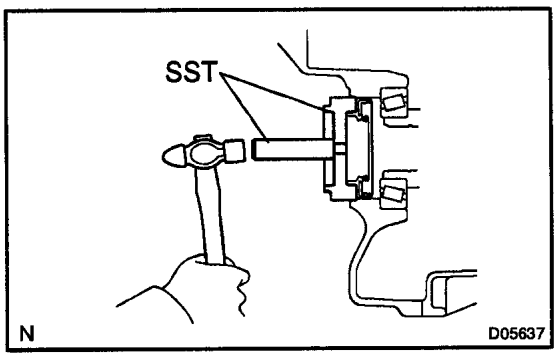
1. REMOVE FRONT DRIVE SHAFT (See page SA–17)



2. REMOVE SIDE GEAR SHAFT OIL SEAL

Using SST, pull out the oil seal.

SST 09308–00010



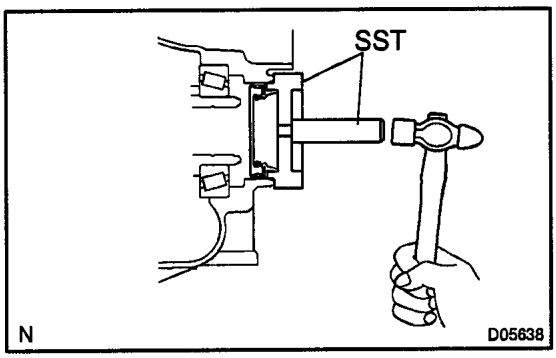
3. INSTALL LEFT SIDE GEAR SHAFT OIL SEAL

(a) Using SST and a hammer, drive in a new oil seal.

SST 09350–32014 (09351–32150), 09950–70010 (09951–07150)

Oil seal depth: 4.3 ± 0.5 mm (0.169 ± 0.02 in.)

(b) Coat the lip of the oil seal with MP grease.



4. INSTALL RIGHT SIDE GEAR SHAFT OIL SEAL

(a) Using SST and a hammer, drive in a new oil seal.

SST 09350–32014 (09351–32150), 09950–70010 (09951–07150)

Oil seal depth: 3.1 ± 0.5 mm (0.122 ± 0.02 in.)

(b) Coat the lip of the oil seal with MP grease.

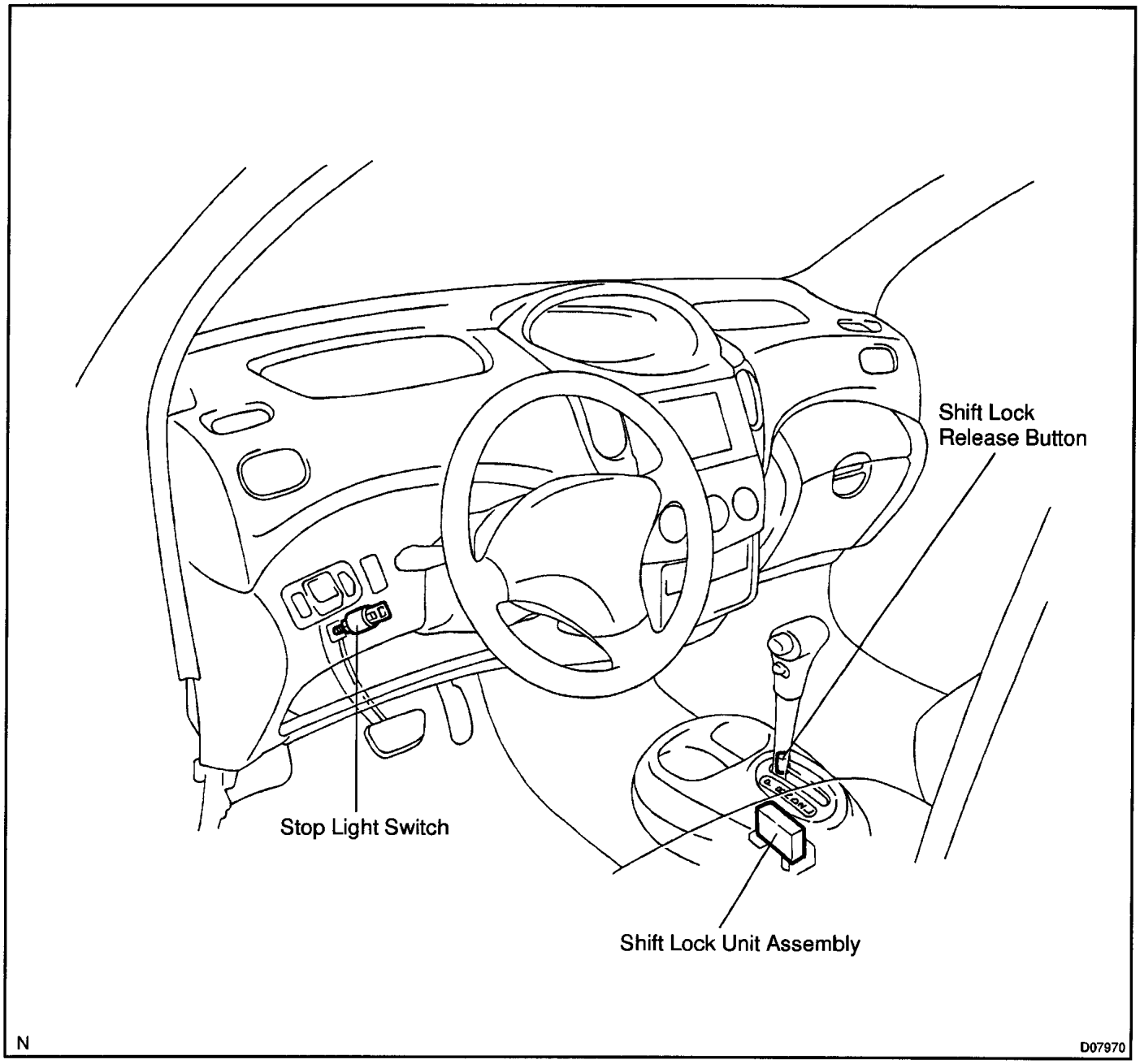
5. INSTALL FRONT DRIVE SHAFT (See page SA–23)

6. CHECK ATF LEVEL (See page DI–4)

SHIFT LOCK SYSTEM

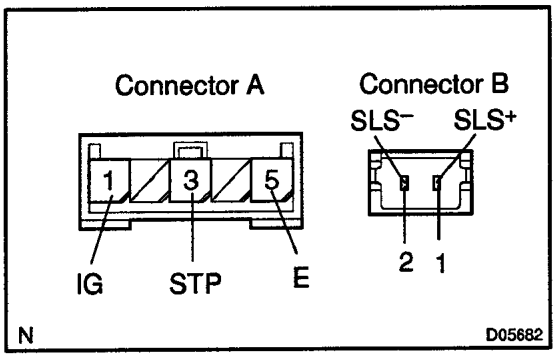
LOCATION

AX0D3-02



AX0D4–02

INSPECTION



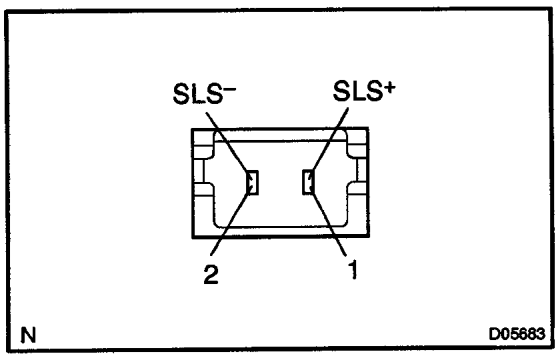
1. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift lock control unit assembly connector.

Terminal	Measuring Condition	Voltage (V)
A1 (IG) – A5 (E)	Ignition switch ON	10 – 14
A3 (STP) – A5 (E)	Depressing brake pedal	10 – 14
B1 (SLS+) – B2 (SLS–)	(1) Ignition switch ON and P range (2) Depressing brake pedal (3) Except P range	0 10 – 14 0



2. INSPECT SHIFT LOCK SOLENOID

(a) Disconnect the solenoid connector.

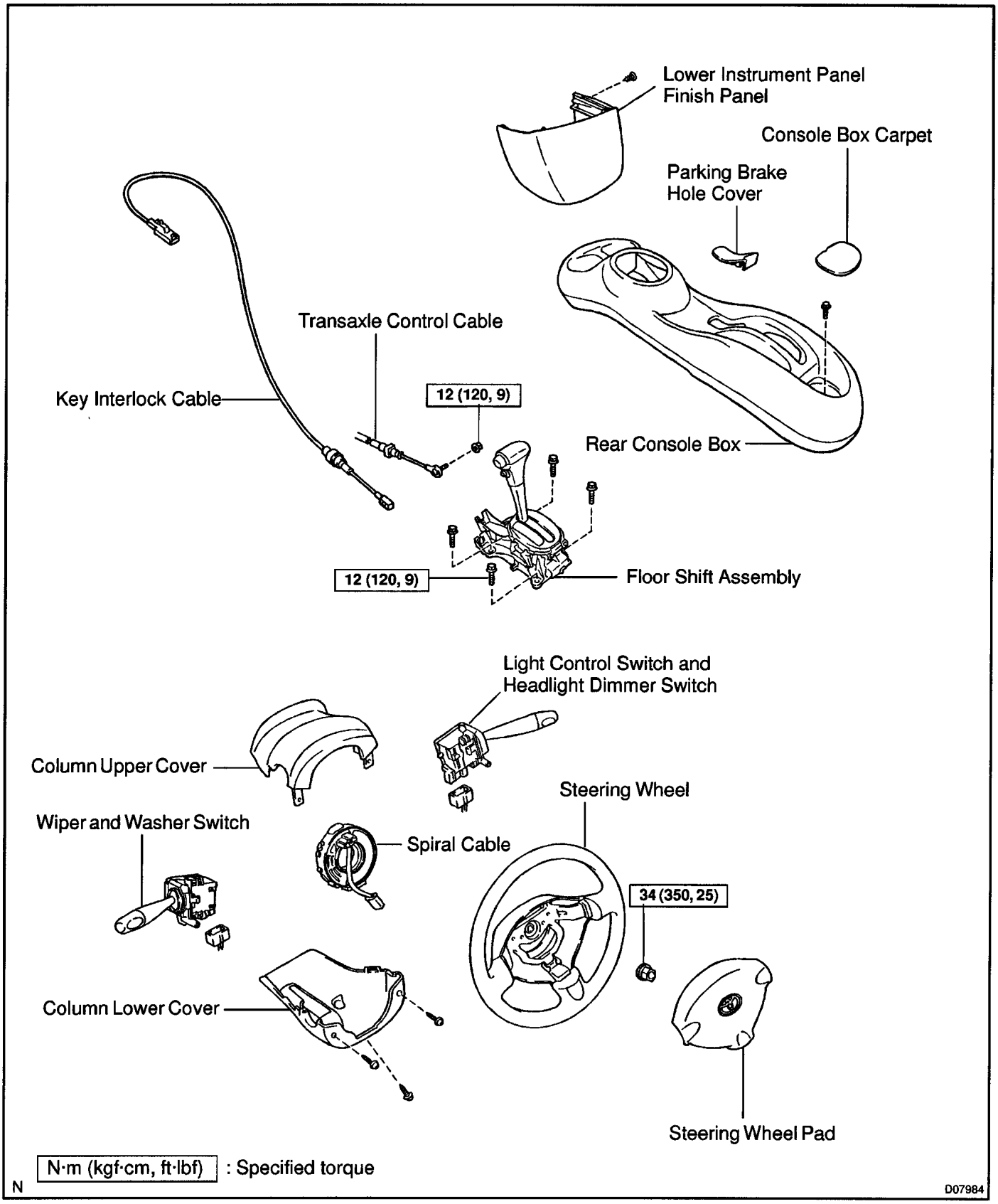
(b) Apply battery positive voltage between terminals 1 and 2. Check that operation noise can be heard from the solenoid.

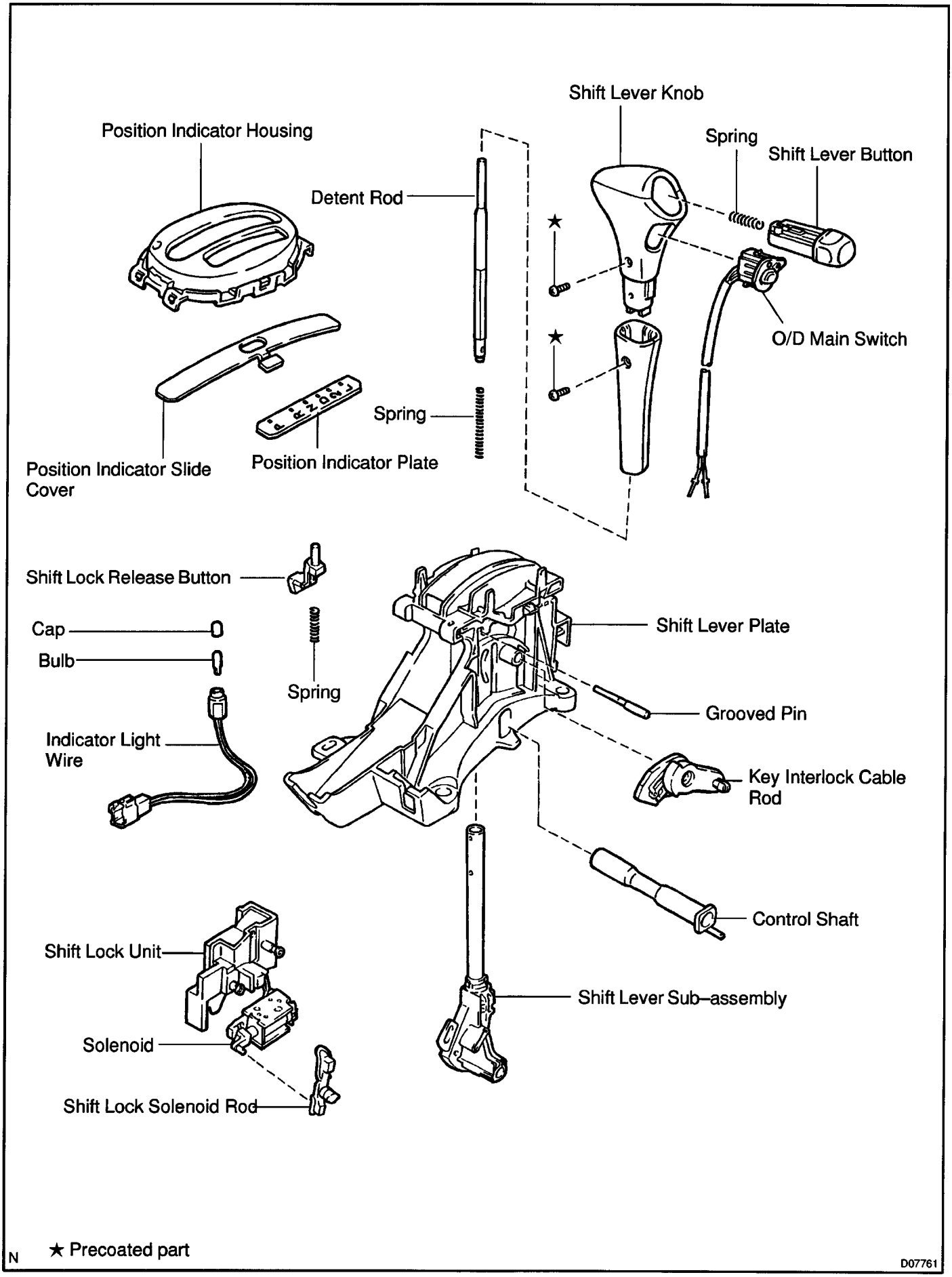
If the solenoid does not operate, replace the solenoid.

FLOOR SHIFT ASSEMBLY

COMPONENTS

AX0D5-02





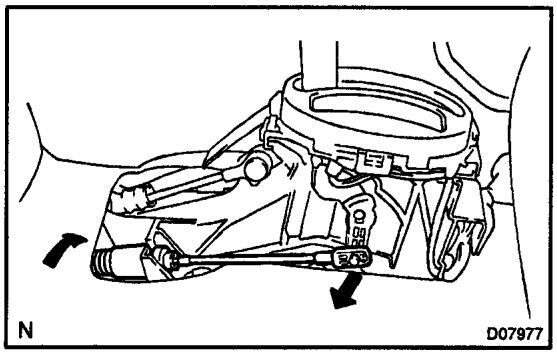
N ★ Precoated part

D07761

AX0D6-02

REMOVAL

1. **REMOVE REAR CONSOLE BOX (See page BO–86)**
2. **REMOVE COLUMN COVER (See page BO–86)**



3. **REMOVE KEY INTERLOCK CABLE**

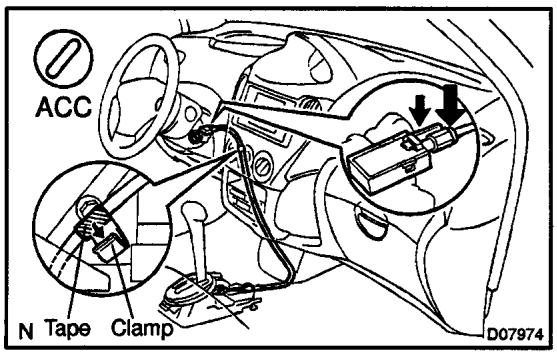
(a) Release the adjust lock cap.

HINT:

Rotate it clockwise by 90° facing to the front of the vehicle.

(b) Remove the cable end from the rod on the shift lever side.

(c) Remove the cable on the shift lever side.

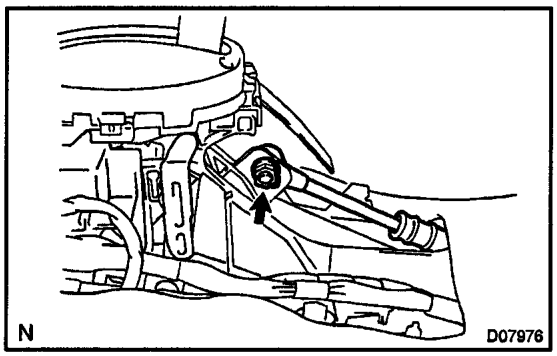


(d) Remove the cable from the clamp for No. 1 instrument panel box.

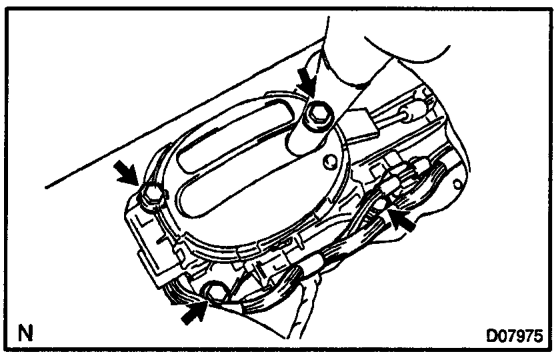
(e) With the key in ACC, remove the cable cap claw from the key interlock and pull it.

4. **REMOVE FLOOR SHIFT ASSEMBLY**

(a) Disconnect the 2 connectors.



(b) Remove the nut and disconnect the transaxle control cable.

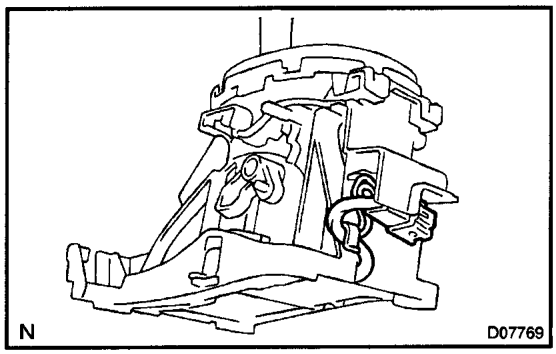


(c) Remove the 2 wire harness clamps from the shift lever assembly.

(d) Remove the 4 bolts and floor shift lever assembly.

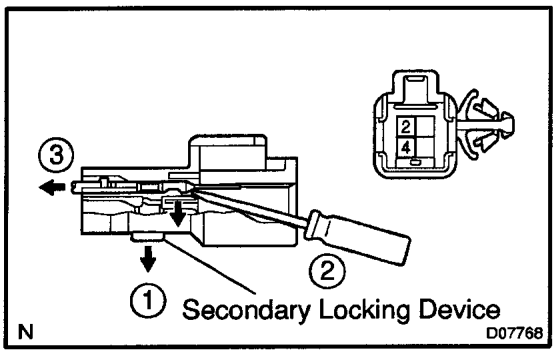
AX0KG-01

DISASSEMBLY

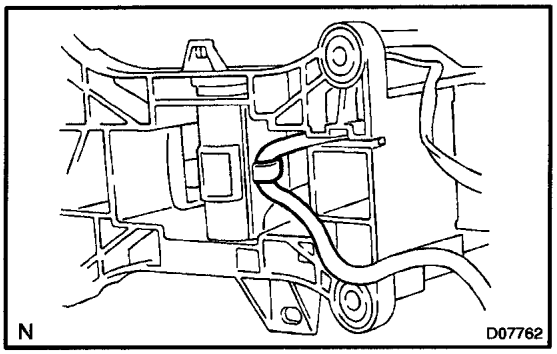


1. REMOVE O/D MAIN SWITCH TERMINAL

(a) Remove the connector from the shift lever plate.

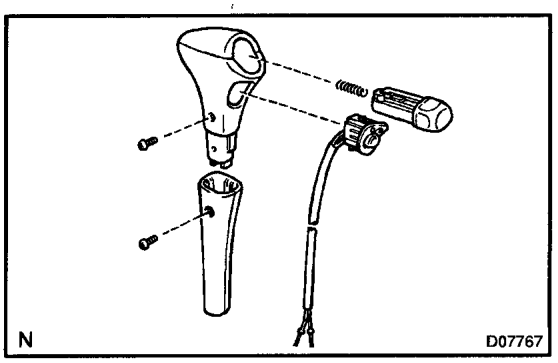


(b) Remove the O/D main switch connector from the shift lever plate.
(c) Disengage the secondary locking device.
(d) Release the locking lug of the terminals 2 and 4, and pull the terminals out from the rearward.



2. REMOVE SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Remove the wire harness of the O/D main switch from the shift lever plate.

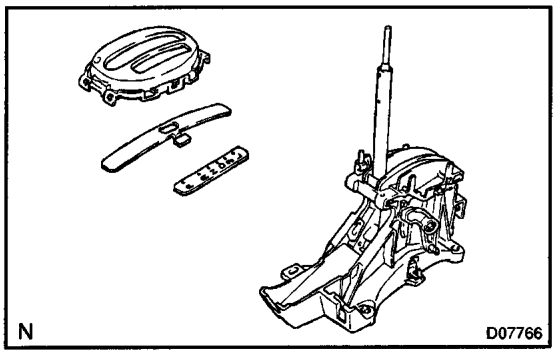


(b) Remove the 2 screws and shift lever knob sub–assembly.

NOTICE:

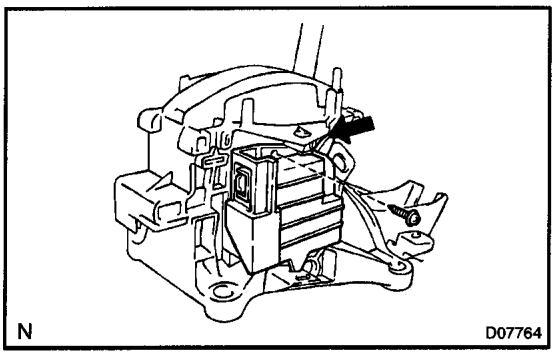
Pay attention not to apply unnatural load to O/D main switch wire harness.

(c) Remove the shift lever knob cover.
(d) Remove the shift lever button and spring.
(e) Remove the O/D main switch.



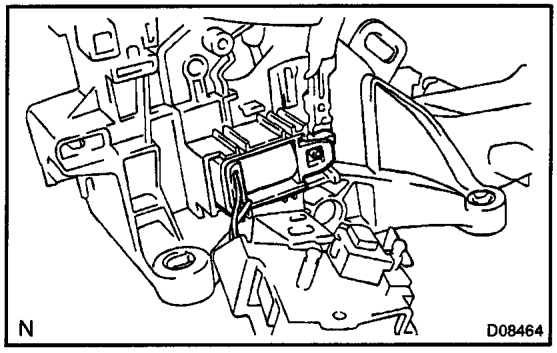
3. REMOVE POSITION INDICATOR HOUSING

(a) Remove the position indicator housing from the shift lever plate.
(b) Remove the position indicator slide cover from the shift lever plate.
(c) Remove the position indicator plate from the position indicator housing.

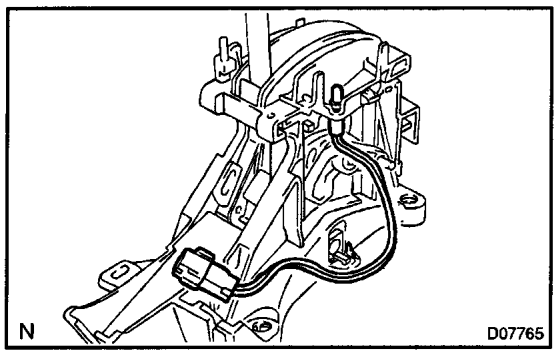


4. REMOVE SHIFT LOCK UNIT

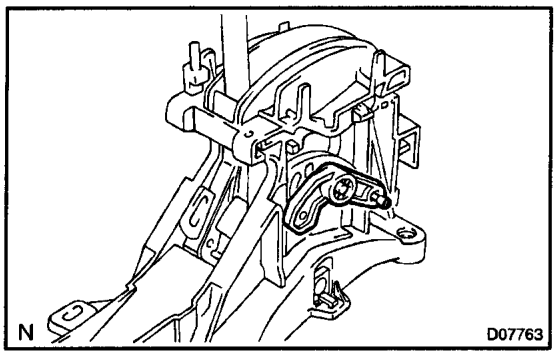
(a) Remove the screw and shift lock unit.



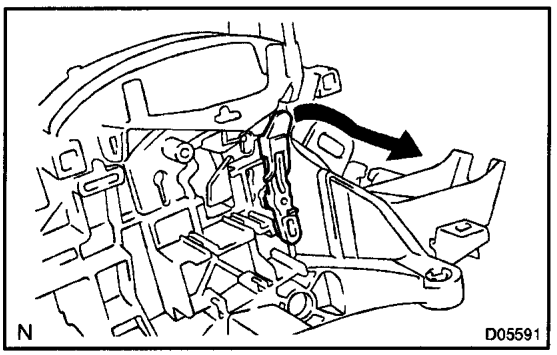
(b) Remove the solenoid from the shift lever plate.



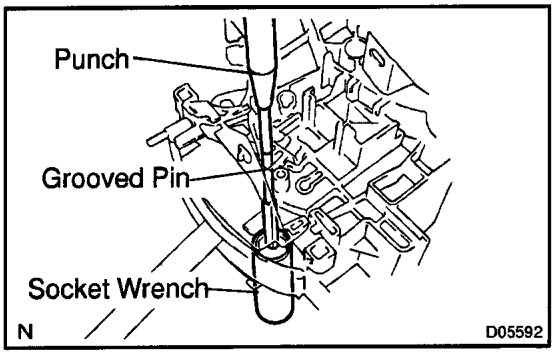
5. REMOVE INDICATOR LIGHT WIRE



6. REMOVE KEY INTERLOCK CABLE ROD



7. REMOVE SHIFT LOCK SOLENOID ROD

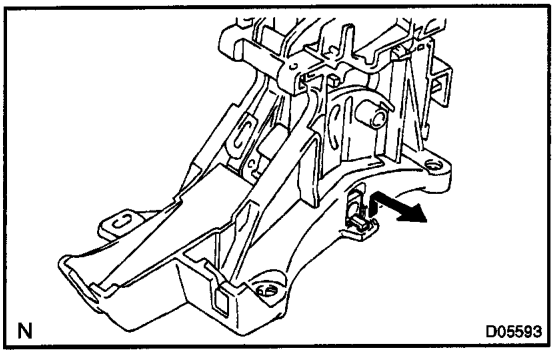


8. REMOVE SHIFT LEVER SUB–ASSEMBLY

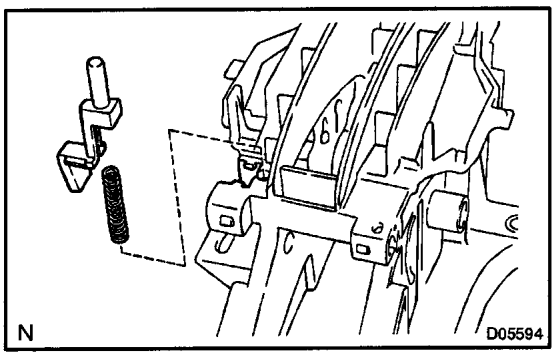
(a) Set a 14 mm deep socket wrench.

(b) Using a punch and hammer, remove the grooved pin.

(c) Remove the detent rod and spring.



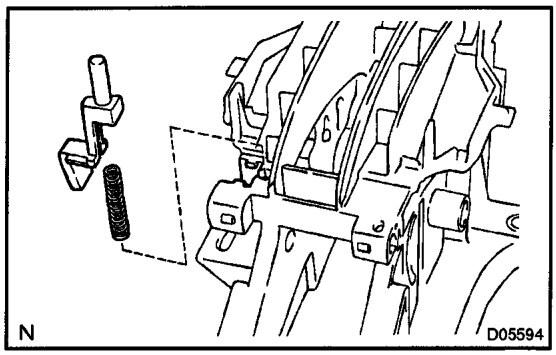
(d) Using a screwdriver, remove the control shaft and shift lever sub–assembly.



9. REMOVE SHIFT LOCK RELEASE BUTTON AND SPRING

AX0KH–01

REASSEMBLY



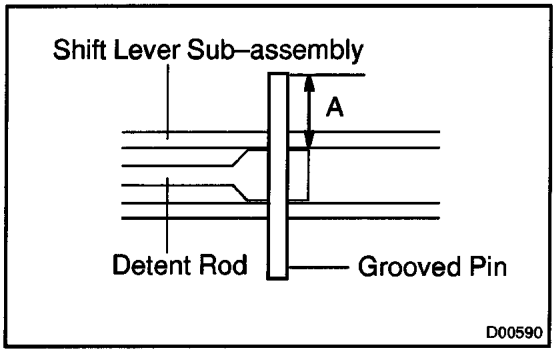
1. INSTALL SPRING AND SHIFT LOCK RELEASE BUTTON

2. INSTALL SHIFT LEVER SUB–ASSEMBLY

(a) Apply MP grease on the control shaft, shift lever sub–assembly, grooved pin, spring and detent rod.

(b) Install the shift lever sub–assembly and control shaft to the shift lever plate.

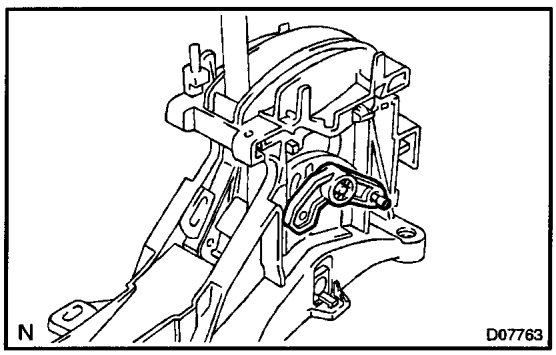
(c) Install the spring and detent rod.



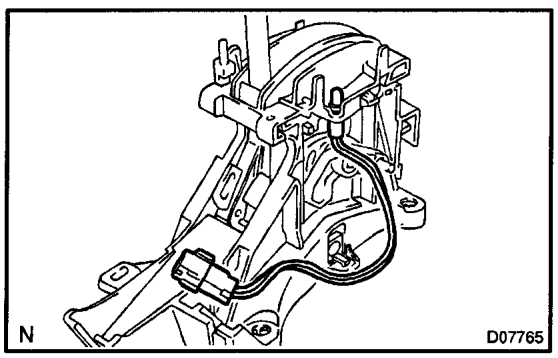
(d) Using a punch and hammer, install the grooved pin to the detent rod pin hole.
A: 29.5 ± 0.5 mm (1.161 ± 0.020 in.)

(e) Check the detent rod operation.

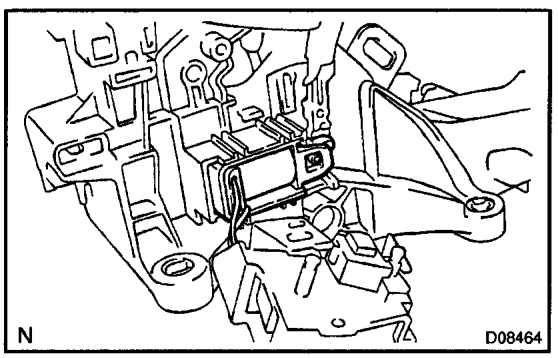
3. INSTALL SHIFT LOCK SOLENOID ROD



4. INSTALL KEY INTERLOCK CABLE ROD

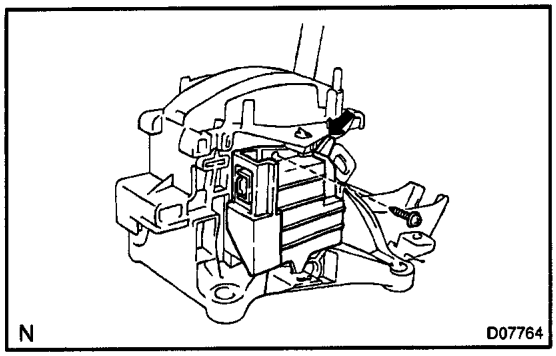


5. INSTALL INDICATOR LIGHT WIRE

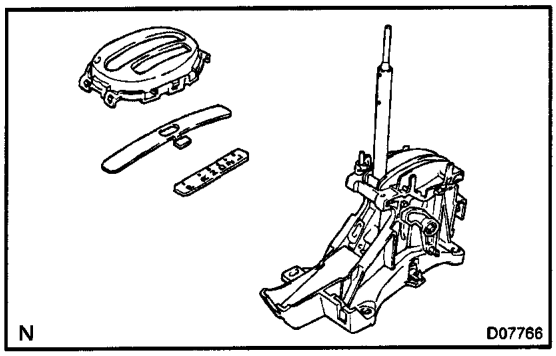


6. INSTALL SHIFT LOCK UNIT

(a) Install the solenoid.



(b) Install the shift lock unit with the screw.

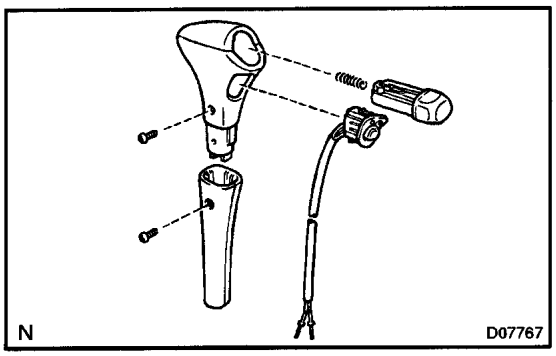


7. INSTALL POSITION INDICATOR HOUSING

(a) Install the position indicator plate to the position indicator housing.

(b) Install the position indicator slide cover to the shift lever plate.

(c) Install the position indicator housing to the shift lever plate.



8. INSTALL SHIFT LEVER KNOB SUB–ASSEMBLY

(a) Apply MP grease on the shift lever knob button and spring.

(b) Install the O/D main switch.

(c) Install the spring and shift lever knob button.

(d) Install the shift lever knob cover.

(e) Install the shift lever sub–assembly with the 2 screws.

HINT:

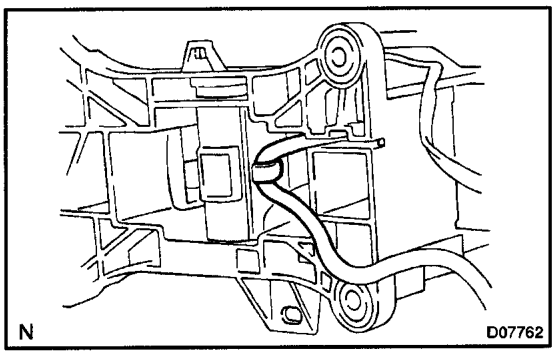
Coat the threads of screws with sealant.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

NOTICE:

Make sure not to catch O/D main switch wire harness.

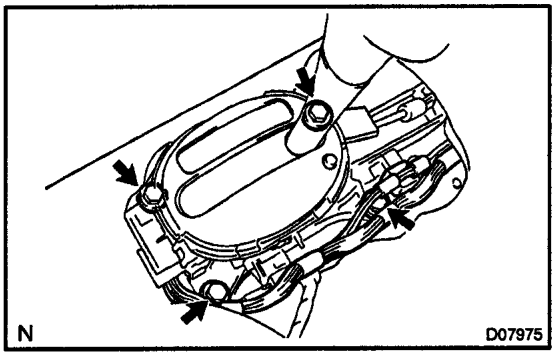


(f) Clamp the wire harness to the shift lever plate.

9. INSTALL O/D MAIN SWITCH TERMINAL

AX0D9-02

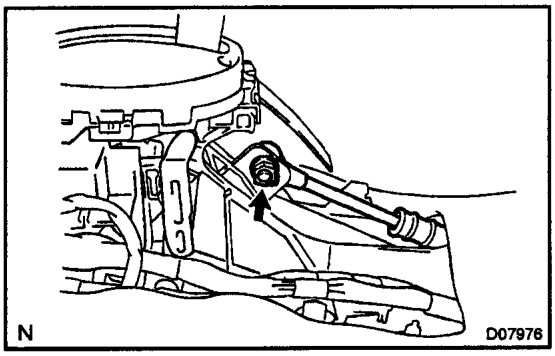
INSTALLATION



1. INSTALL FLOOR SHIFT ASSEMBLY

(a) Install the floor shift assembly with the 4 bolts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

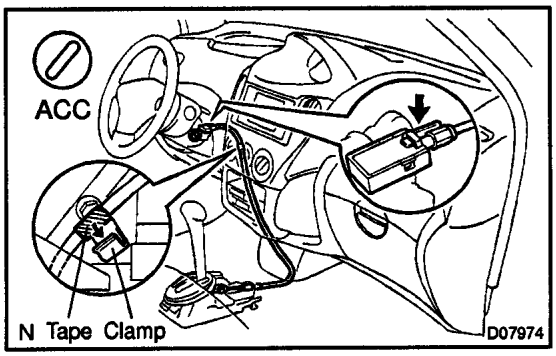
(b) Install the 2 wire harness clamps to the shift lever plate.



(c) Shift the shift lever in N range, push the lever to the R range side and hold it there.

(d) While pulling the cable, install the cable with the nut.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

(e) Connect the 2 connectors.



2. INSTALL KEY INTERLOCK CABLE

(a) With the key in ACC, install the cable cap claw to the key interlock.

(b) Install the cable to the clamp for No.1 instrument panel box.

(c) Insert the cable end rod (ø4) from the slit of the shift lever plate.

(d) Insert the slide cap into the through hole and install.

(e) Insert the lever pin into the hole in the cable end.

HINT:

- At this time, ensure that the shift lever is in N range.
- After installation, make sure that the lever pin is pulled by the cable and is stopped with a stopper.

(f) To check that the spring for automatic adjustment works properly, hold the slide cap and move it back and forth.

(g) Lock the adjust lock cap.

HINT:

Rotate it counterclockwise by 90° facing to the front of the vehicle.

HINT:

- Install the cable on the shift lever side with the key in ACC.
- Make sure the slide amount for the spring for automatic adjustment is 8 mm (0.31 in.).

3. INSTALL REAR CONSOLE BOX, INSTRUMENT CLUSTER PANEL AND COLUMN COVER
(See page BO–95)

4. INSPECT KEY INTERLOCK AND SHIFT LOCK OPERATION

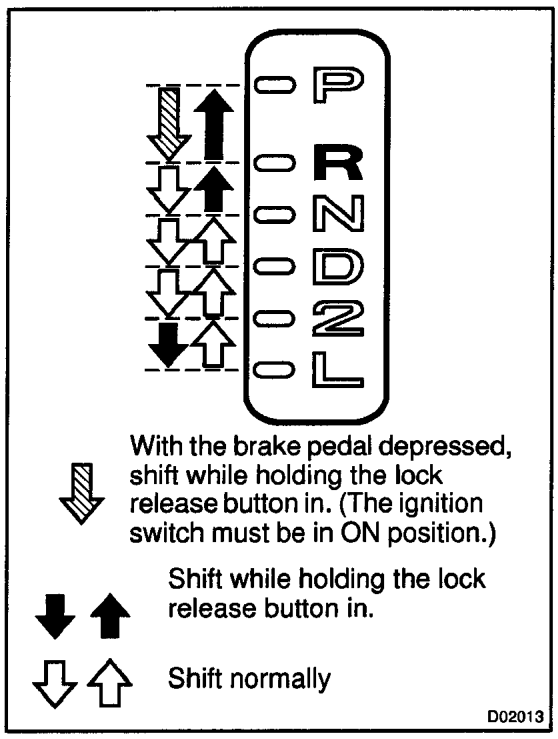
(a) Check that the starter operates when the shift lever is in only P and N range and does not operate in the other ranges.

(b) Operate the shift lever and check that the reading on the indicator conforms to the actual range.

(c) Check that the ignition key can be pulled out in P range.

(d) Check that the ignition key does not turn to LOCK position in any other range than P range.

(e) Check that the shift lever can be shifted from P range to another range when the shift release button is pressed.



(f) When shifting it to each range, make sure that the shifting lever moves smoothly, can be moderately operated and the position indicator displays correctly.

Ranges which can be operated without pressing the shift lever knob button

R → N → D → 2, L → 2 → D → N

Ranges which can be operated only while pressing the shift lever knob button

2 → L, N → R → P

Ranges which can be operated only while pressing the shift lever knob button, ignition switch ON and brake pedal depressed

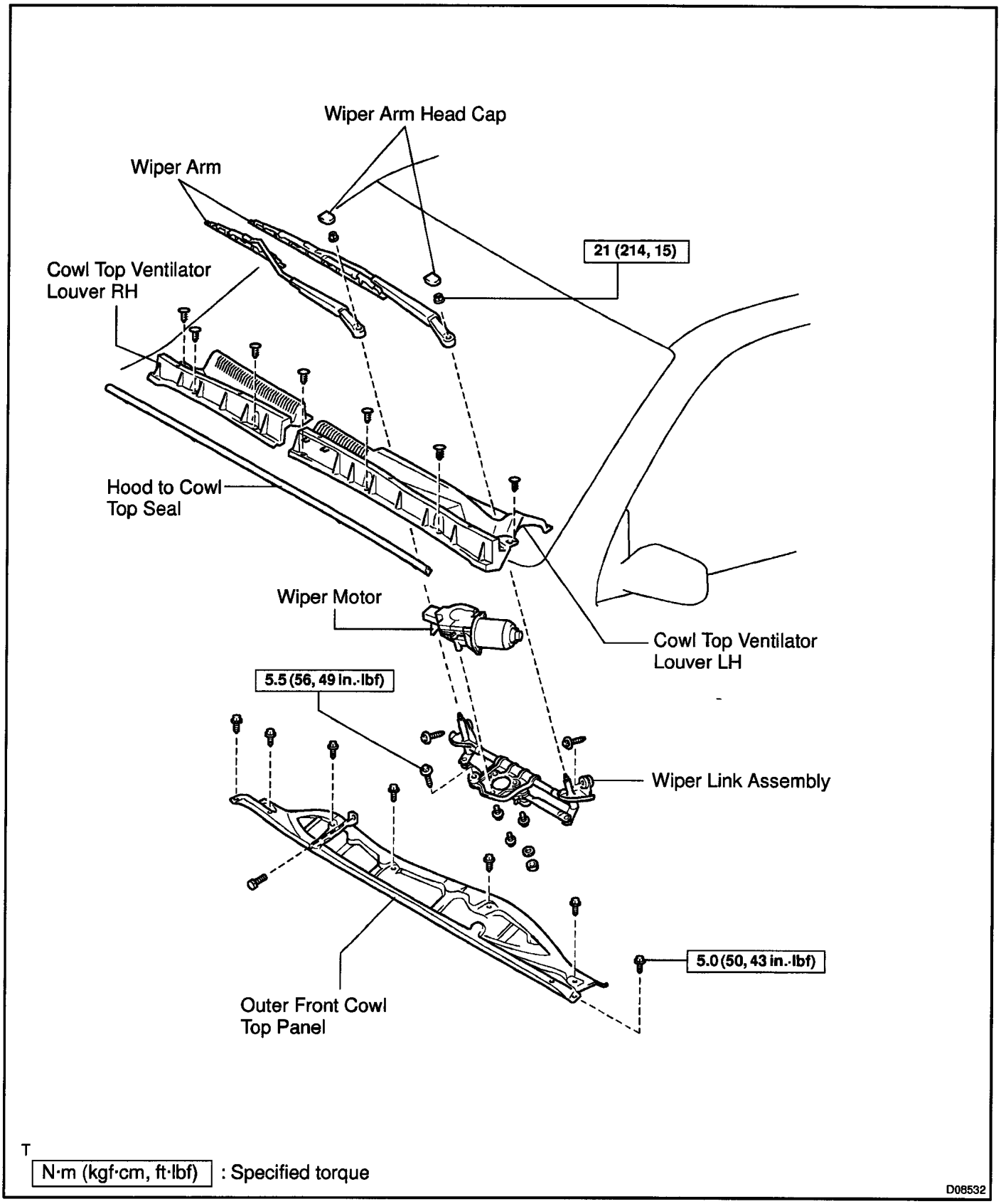
P → R

(g) 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

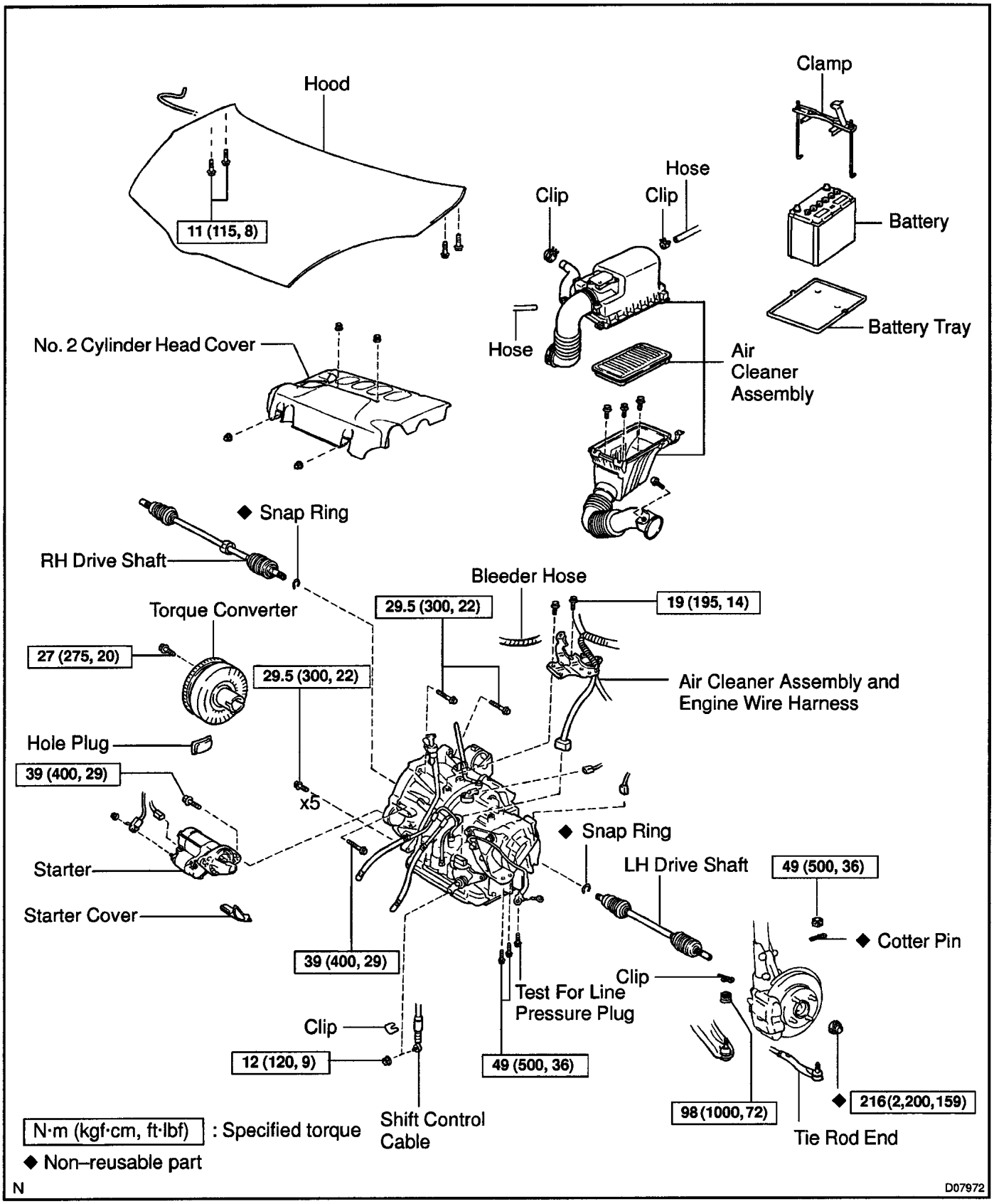
AX0KT–01

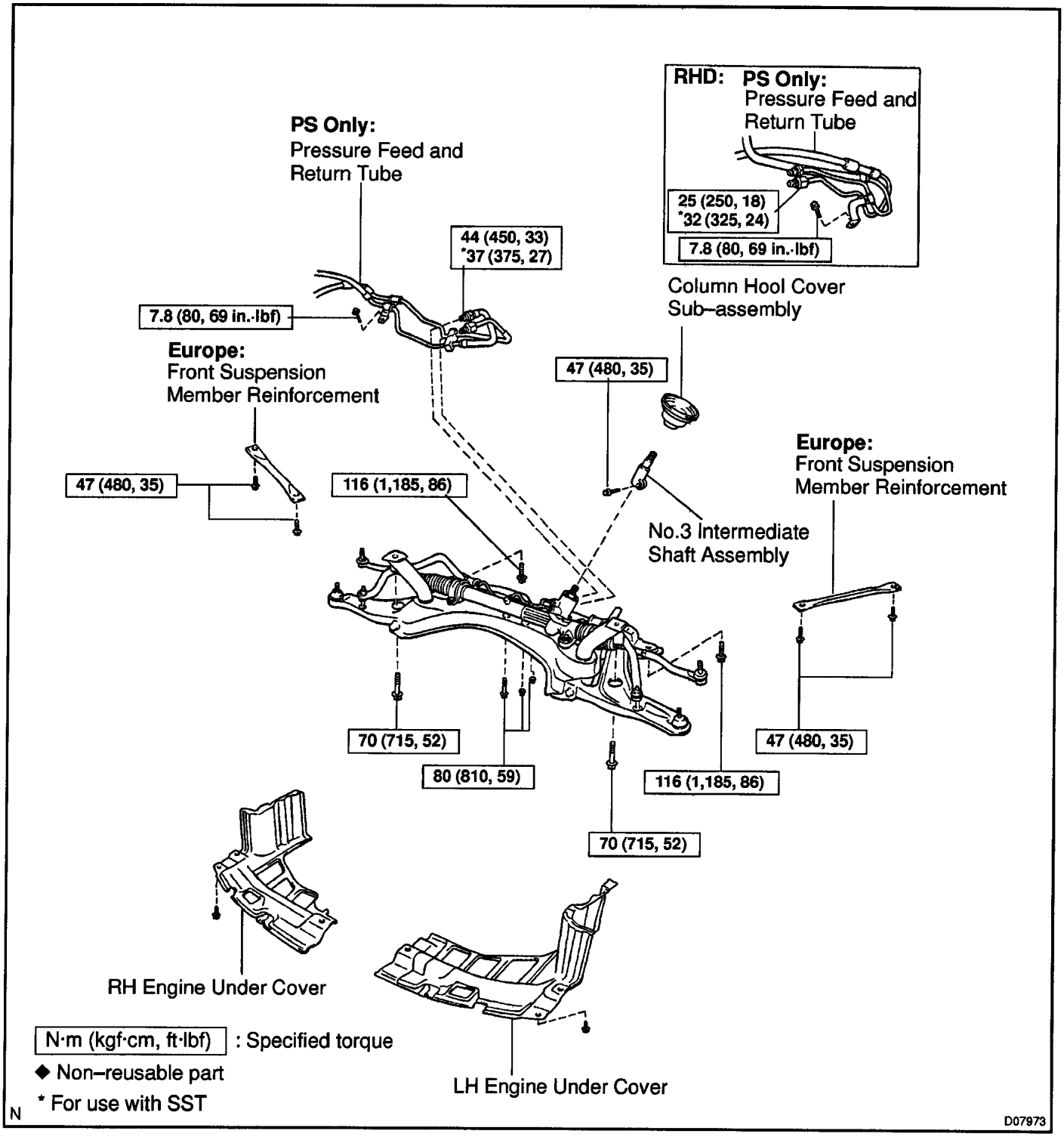


T

N·m (kgf·cm, ft·lbf) : Specified torque

D08532

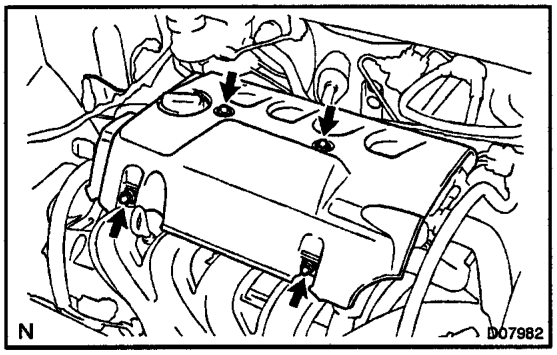

Hood
11 (115, 8)
Clamp
Hose
Clip
Clip
Battery
Hose
Air Cleaner Assembly
Battery Tray
No. 2 Cylinder Head Cover
◆ Snap Ring
RH Drive Shaft
Bleeder Hose
29.5 (300, 22)
19 (195, 14)
Torque Converter
27 (275, 20)
29.5 (300, 22)
Air Cleaner Assembly and Engine Wire Harness
Hole Plug
39 (400, 29)
x5
◆ Snap Ring
LH Drive Shaft
49 (500, 36)
Starter
Starter Cover
◆ Cotter Pin
39 (400, 29)
Clip
Test For Line Pressure Plug
Clip
12 (120, 9)
49 (500, 36)
98 (1000, 72)
◆ 216 (2,200, 159)
Shift Control Cable
Tie Rod End
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
N
D07972


RHD: PS Only:
Pressure Feed and
Return Tube
25 (250, 18)
*32 (325, 24)
7.8 (80, 69 in.-lbf)
PS Only:
Pressure Feed and
Return Tube
44 (450, 33)
*37 (375, 27)
7.8 (80, 69 in.-lbf)
Column Hool Cover
Sub–assembly
Europe:
Front Suspension
Member Reinforcement
47 (480, 35)
47 (480, 35)
116 (1,185, 86)
No.3 Intermediate
Shaft Assembly
Europe:
Front Suspension
Member Reinforcement
70 (715, 52)
80 (810, 59)
116 (1,185, 86)
47 (480, 35)
70 (715, 52)
RH Engine Under Cover
LH Engine Under Cover
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
* For use with SST
N
D07973

AX0KS–01

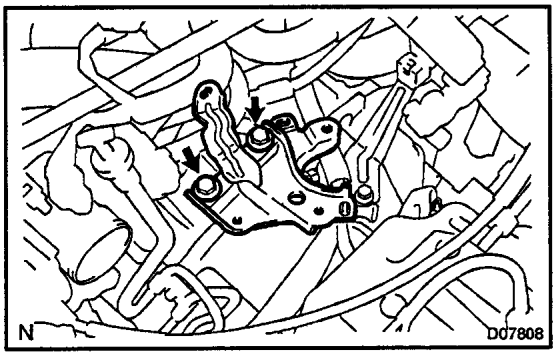
REMOVAL

1. **REMOVE ENGINE HOOD**
   Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)
2. **REMOVE BATTERY**
3. **REMOVE FRONT WIPER, COWL TOP VENTILATOR LOUVER LH AND RH, AND OUTER FRONT COWL TOP PANEL (See page BO–33)**



4. **REMOVE NO. 2 CYLINDER HEAD COVER**

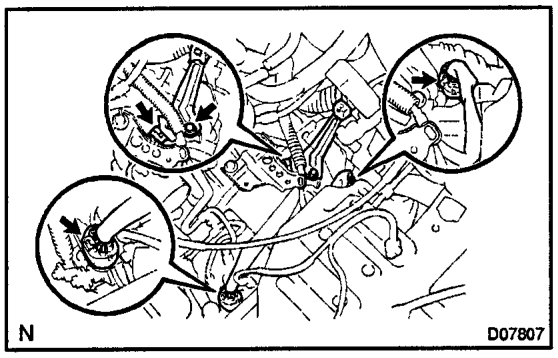
Remove the 4 nuts and No. 2 cylinder head cover.



5. **REMOVE AIR CLEANER BRACKET**

Remove the 2 bolts and air cleaner bracket.

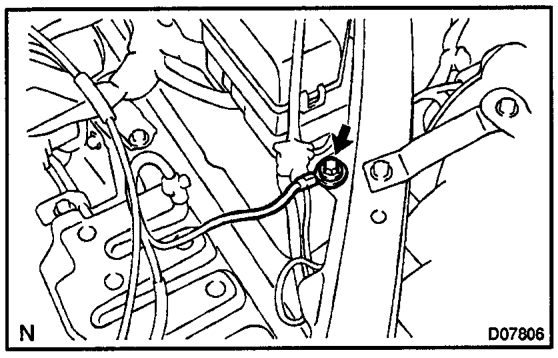
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)



6. **SEPARATE ENGINE WIRE HARNESS FROM TRANSAXLE**

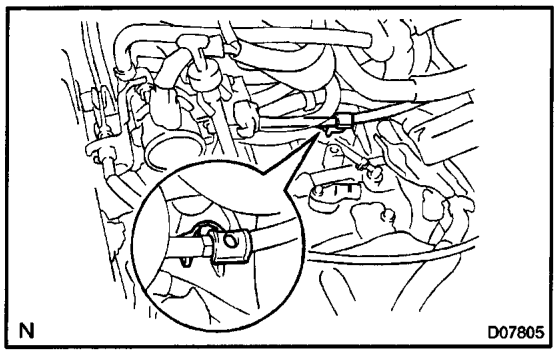
Remove the bolt and engine wire harness bracket.

7. **DISCONNECT NEUTRAL START SWITCH, SOLENOID WIRE, DIRECT CLUTCH SPEED SENSOR CONNECTOR**

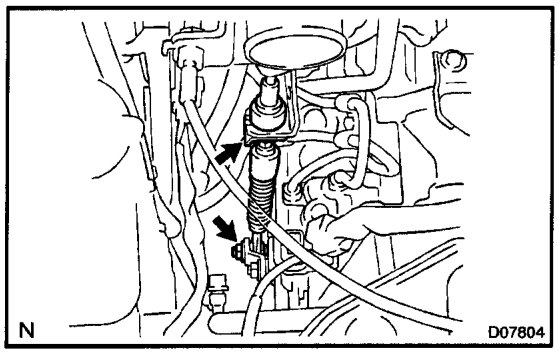


8. **DISCONNECT GROUND TERMINAL**

Remove the bolt and ground terminal.



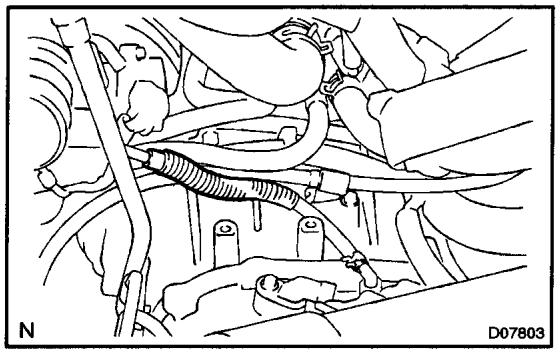
9. DISCONNECT SHIFT CONTROL CABLE FROM CLAMP



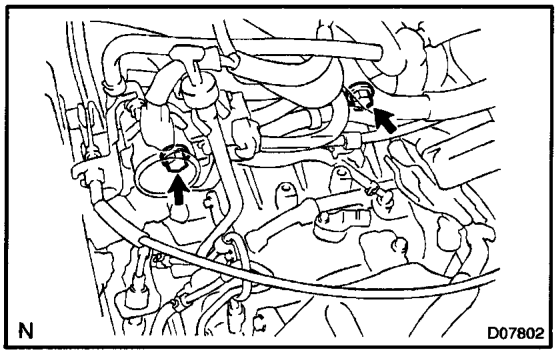
10. DISCONNECT SHIFT CONTROL CABLE FROM BRACKET AND CONTROL SHAFT LEVER

(a) Remove the nut and disconnect the shift control cable from the control shaft lever.

(b) Remove the clip and disconnect the shift control cable from the bracket.



11. DISCONNECT HOSE FROM FILLER PIPE

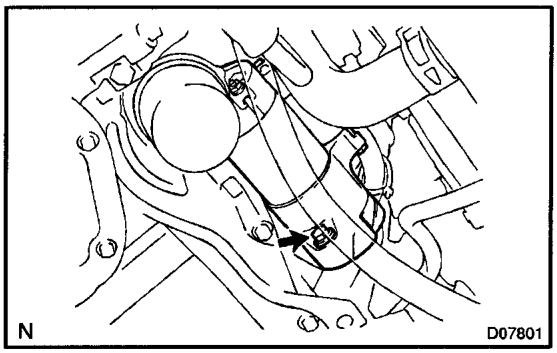


12. REMOVE 2 TRANSAXLE TO ENGINE UPPER SIDE BOLTS
Torque: 29.5 N·m (300 kgf·cm, 22 ft·lbf)

13. REMOVE STARTER UPPER SIDE BOLT
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

14. RAISE VEHICLE

15. REMOVE LH AND RH ENGINE UNDER COVER



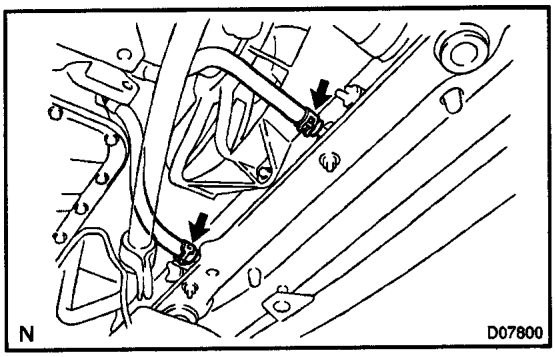
16. REMOVE STARTER

(a) Remove the nut and disconnect the starter wire.

(b) Disconnect the connector.

(c) Remove the bolt and starter.

(d) Remove the starter cover.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

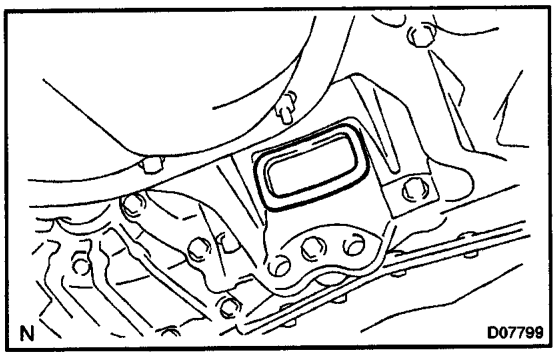


17. REMOVE OIL COOLER HOSE

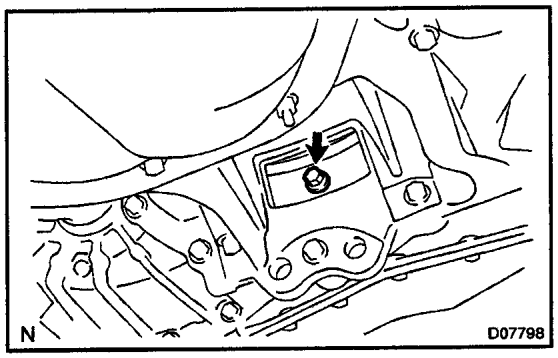
Loosen the 2 clips and disconnect the 2 oil cooler hoses.

18. REMOVE LH AND RH DRIVE SHAFTS

(See page SA–17)



19. REMOVE HOLE PLUG



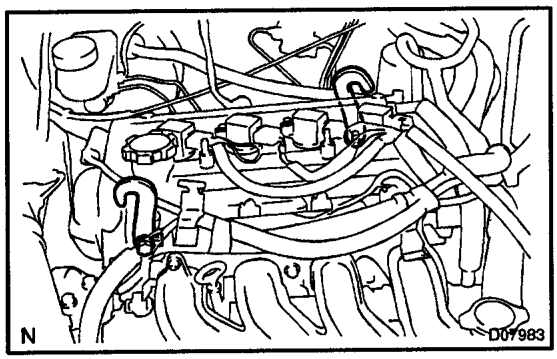
20. REMOVE TORQUE CONVERTER MOUNTING BOLT

Turn the crankshaft to gain access and remove the 6 bolts while holding the crankshaft pulley bolt with a wrench.

Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)

HINT:

At the time of installation, please refer to the following item. First install gray colored bolt and then the 5 bolts.



21. ATTACH ENGINE SLING DEVICE TO ENGINE HANGERS

(a) Install the 2 No. 1 engine hangers with the bolt in the correct direction.

Parts No.:

No. 1 engine hanger: 12281–21010

Bolt: 91511–60818

Torque: 40 N·m (400 kgf·cm, 29 ft·lbf)

(b) Attach the engine chain hoist to the engine hangers.

CAUTION:

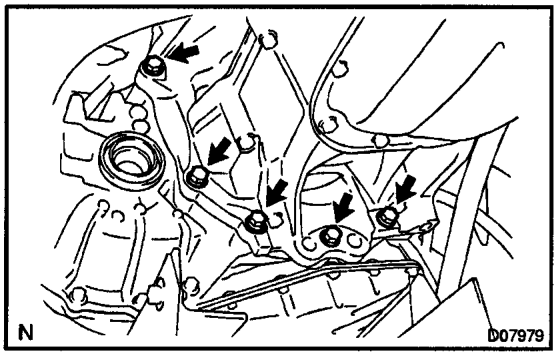
Do not attempt to hang the engine by hooking the chain to any other part.

22. REMOVE FRONT SUSPENSION MEMBER REINFORCEMENT

Remove the 4 bolts and LH and RH front suspension member reinforcement.

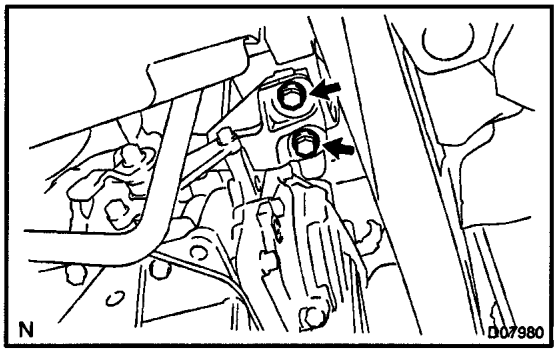
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)

23. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM, FRONT STABILIZER BAR AND STEERING GEAR ASSEMBLY
(MS: See page SR–36, PS: See page SR–52)



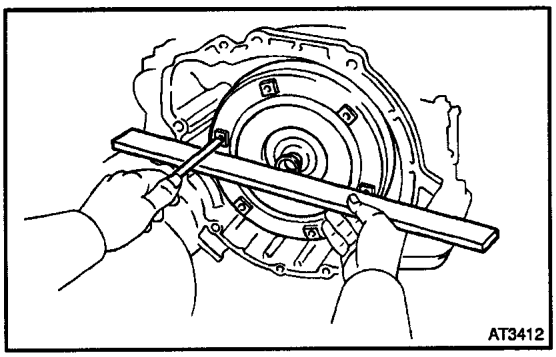
24. REMOVE TRANSAXLE

(a) Remove the 5 bolts.
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)



(b) Remove the 2 bolts, and disconnect the LH engine mounting.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(c) Separate and remove the transaxle.



AX03Z–06

INSTALLATION

1. CHECK TORQUE CONVERTER INSTALLATION

Using calipers and a straight edge, measure the distance from the installed surfaced of the transaxle housing to the torque converter.

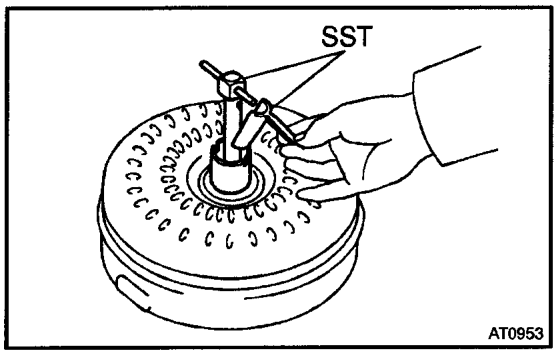
Correct distance: 9.3 mm (0.366 in.)

2. TRANSAXLE INSTALLATION

Installation is in the reverse order of removal (See page AX–26).

HINT:

- After installation, adjust the throttle cable and neutral start switch (See page DI–4).
- Fill ATF and check fluid level (See page DI–4).
- Do test to drive the vehicle (See page DI–4).
- Adjust the hood (See page BO–10).



TORQUE CONVERTER AND DRIVE PLATE

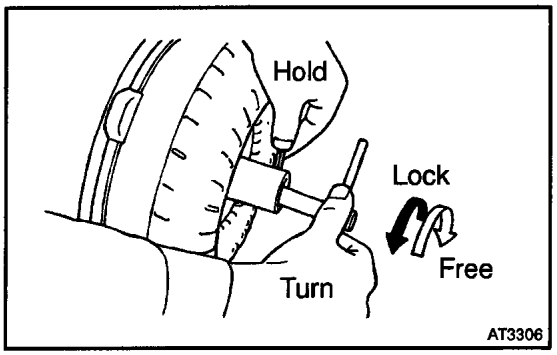
INSPECTION

AX0DC–02

1. INSPECT ONE–WAY CLUTCH

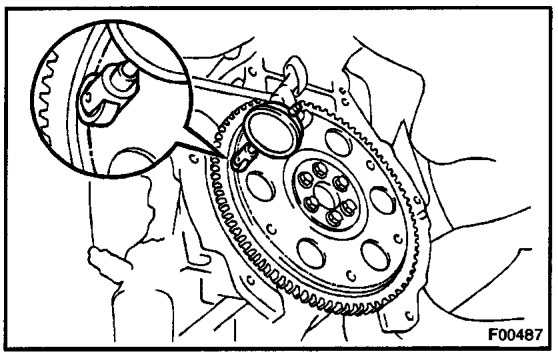
(a) Install SST into the inner race of the one–way clutch.
SST 09350–32014 (09351–32020)

(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 (09351–32010)



(c) With the torque converter clutch standing on its side, the clutch locks when turned counterclockwise, and rotates freely and smoothly clockwise.

If necessary, clean the converter and retest the clutch.
Replace the converter if the clutch still fails the test.

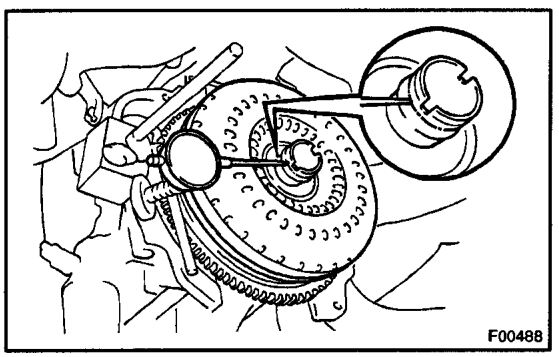


2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

(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: 88 N·m (900 kgf·cm, 65 ft·lbf)



3. MEASURE TORQUE CONVERTER SLEEVE RUNOUT

(a) 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.

(b) Remove the torque converter.

SUSPENSION AND AXLE

TROUBLESHOOTING SA–1
TIRE AND WHEEL SA–2
FRONT WHEEL ALIGNMENT SA–4
REAR WHEEL ALIGNMENT SA–7
FRONT AXLE HUB SA–8
FRONT WHEEL HUB BOLT SA–15
FRONT DRIVE SHAFT SA–16
FRONT SHOCK ABSORBER SA–24
FRONT LOWER SUSPENSION ARM SA–31
FRONT STABILIZER BAR SA–35
REAR AXLE HUB SA–40
REAR WHEEL HUB BOLT SA–45
COIL SPRING AND
REAR SHOCK ABSORBER SA–46
REAR AXLE BEAM SA–51

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

SA0CB-04

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Wander/pulls	1. Tire (Worn or improperly inflated)	SA–2
	2. Wheel alignment (Incorrect)	SA–4
		SA–7
	3. Steering linkage (Loose or worn)	–
	4. Hub bearing (Worn)	SA–9
		SA–41
	5. Steering gear (Out of adjustment or broken)	SR–34
		SR–47
	6. Suspension parts (Worn)	–
Bottoming	1. Vehicle (Overloaded)	–
	2. Spring (Weak)	SA–24
		SA–46
	3. Shock absorber (Worn)	SA–27
		SA–48
Sways/pitches	1. Tire (Worn or improperly inflated)	SA–2
	2. Stabilizer bar (Bent or broken)	SA–35
	3. Shock absorber (Worn)	SA–27
		SA–48
Front wheel shimmy	1. Tire (Worn or improperly inflated)	SA–2
	2. Wheel (Out of balance)	SA–2
	3. Shock absorber (Worn)	SA–27
	4. Wheel alignment (Incorrect)	SA–4
	5. Ball joint (Worn)	SA–33
	6. Hub bearing (Worn)	SA–9
	7. Steering linkage (Loose or worn)	–
	8. Steering gear (Out of adjustment or broken)	SR–34
		SR–47
Abnormal tire wear	1. Tire (Worn or improperly inflated)	SA–2
	2. Wheel alignment (Incorrect)	SA–4
	3. Shock absorber (Worn)	SA–27
		SA–48
	4. Suspension parts (Worn)	–

TIRE AND WHEEL

SA0CC-05

INSPECTION

1. INSPECT TIRE

(a) Check the tires for wear and proper inflation pressure.

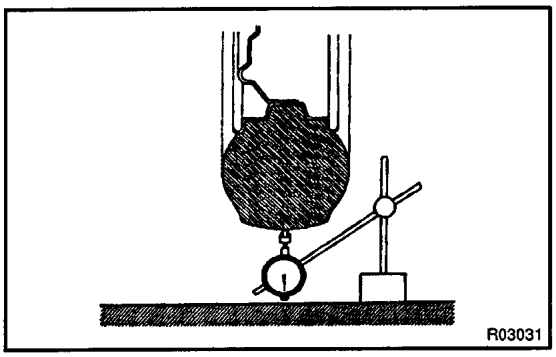
Cold tire inflation pressure:
(Tire size: 175/65R14 82T)
Vehicle load up to 4 passengers:

Vehicle speed	Front kPa (kgf/cm^2, psi)	Rear kPa (kgf/cm^2, psi)
Vehicle speed is not concerned	220 (2.2, 32)	220 (2.2, 32)

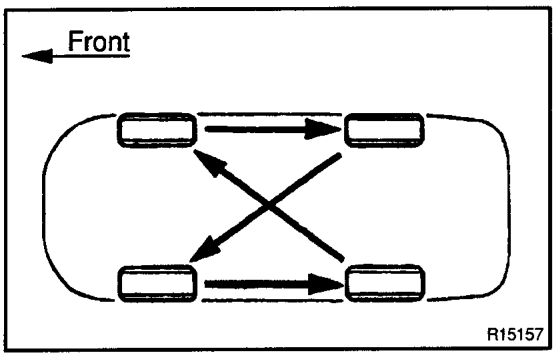
Vehicle load up to 5 passengers and full rated loads:

Vehicle speed	Front kPa (kgf/cm^2, psi)	Rear kPa (kgf/cm^2, psi)
Under 160 km/h (100 mph)	220 (2.2, 32)	220 (2.2, 32)
160 km/h (100 mph) or over	240 (2.4, 35)	240 (2.4, 35)

SA

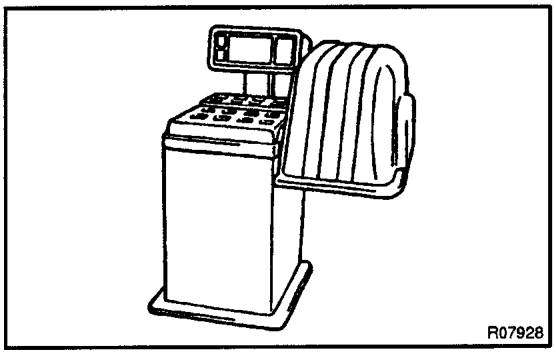


(b) Using a dial indicator, check the tire runout.
Tire runout: 1.0 mm (0.039 in.) or less



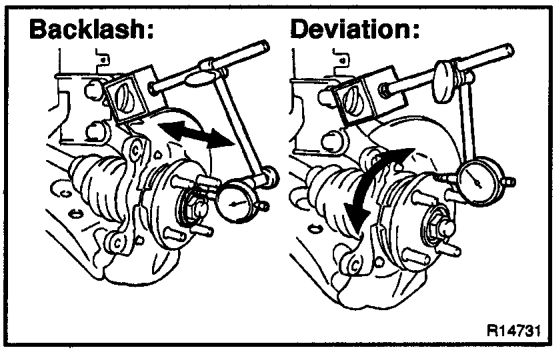
2. ROTATING TIRES

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) Using a dial indicator, check the backlash near the center of the axle hub.

Maximum: 0.05 mm (0.0020 in.)

If the backlash exceeds the maximum, replace the bearing.

(b) 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 axle hub.

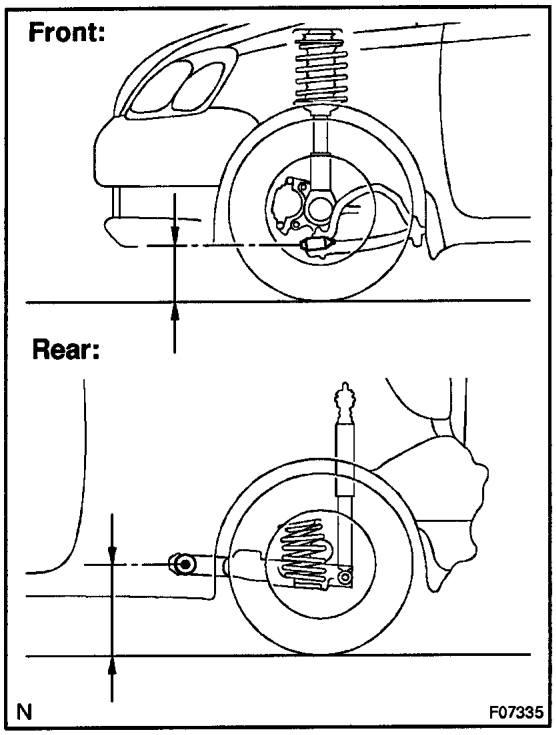
5. CHECK FRONT SUSPENSION FOR LOOSENESS

6. CHECK STEERING LINKAGE FOR LOOSENESS

7. CHECK BALL JOINT FOR LOOSENESS

8. CHECK SHOCK ABSORBER WORKS PROPERLY

- Check if oil leaks
- Check mounting bushings for wear
- Bounce front and rear of the vehicle



FRONT WHEEL ALIGNMENT

SA1CK–03

INSPECTION

1. MEASURE VEHICLE HEIGHT

Vehicle height:

Rear Brake Type	Front*1 mm (in.)	Rear*2 mm (in.)
Drum brake	187 (7.36)	257 (10.12)
Disc brake	187 (7.36)	256 (10.08)

*1: Front measuring point

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

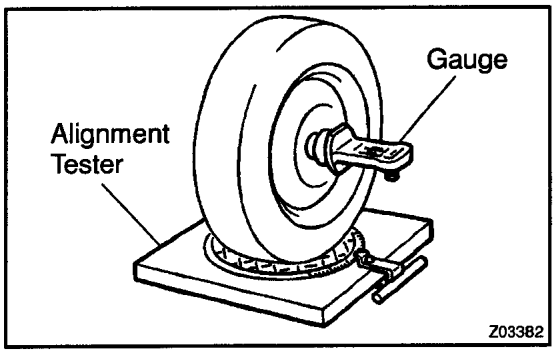
*2: Rear measuring point

Measure the distance from the ground to the center of the rear axle beam mounting bolt.

NOTICE:

Before inspecting the wheel alignment, adjust the vehicle height to the specified value.

If the vehicle height is not the specified value, try to adjust it by pushing down on or lifting the body.



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

Camber, caster and steering axis inclination:

Camber	–0°35' ± 45' (–0.58° ± 0.75°)
Right–left error	45' (0.75°) or less
Caster (Rear drum brake)	
Manual steering	0°55' ± 45' (0.92° ± 0.75°)
Power steering	1°54' ± 45' (1.90° ± 0.75°)
Right–left error	45' (0.75°) or less
Caster (Rear disc brake)	
Manual steering	0°57' ± 45' (0.95° ± 0.75°)
Power steering	1°56' ± 45' (1.93° ± 0.75°)
Right–left error	45' (0.75°) or less
Steering axis inclination	10°05' ± 45' (10.08° ± 0.75°)
Right–left error	45' (0.75°) or less

If the caster and steering axis inclination are not within the specified values, after the camber has been correctly adjusted, recheck the suspension parts for damaged and/or worn out parts.

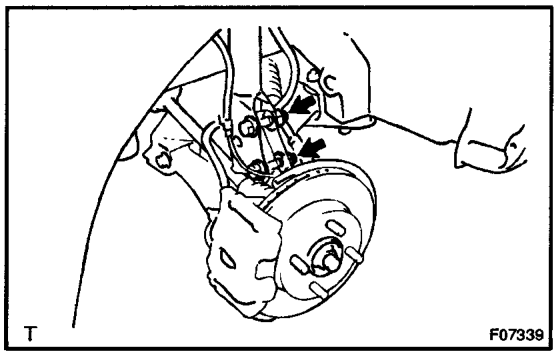
4. ADJUST CAMBER

NOTICE:

After the camber has been adjusted, inspect the toe–in.

(a) Remove the front wheel.

SA

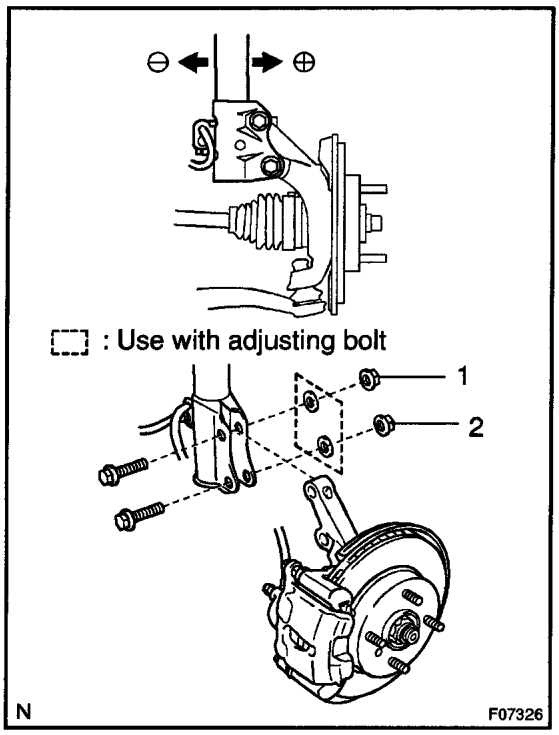


(b) Remove the 2 nuts on the lower side of the shock absorber.

If reusing the bolts and/or nuts, coat the threads of nuts with engine oil.

(c) Clean the installation surfaces of the shock absorber and the steering knuckle.

(d) Temporarily install the 2 nuts.



(e) Adjust the camber by pushing or pulling the lower side of the shock absorber in the direction in which the camber adjustment is required.

(f) Tighten the nuts.

Torque: 132 N·m (1,350 kgf·cm, 97 ft·lbf)

(g) Install the front wheel.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(h) Check the camber.

HINT:

- Try to adjust the camber to the center of the specified value.
- Adjusting value for the set bolts is 6' – 30' (0.1° – 0.5°).

If the camber is not within the specified value, using the following table, estimate how much additional camber adjustment will be required, and select the camber adjusting bolt.

NOTICE:

Tighten the adjusting bolt with a washer and a new nut.

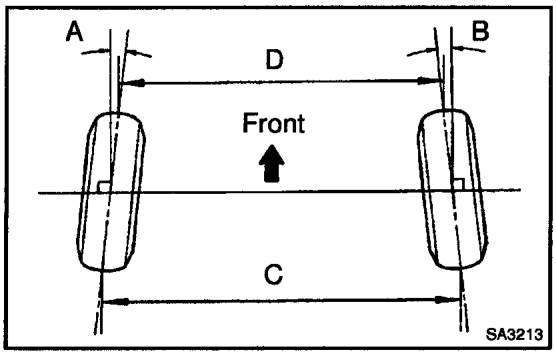
Bolt / Adjusting Value	Set Bolt		Adjusting Bolt			
	90105–14140		90105–14146		90105–14147	
			1 Dot		2 Dots	
	1	2	1	2	1	2
15'	●			●		
30'	●					●
45'			●			●
1°00'			●		●	●

N
F07372

(i) Do the steps mentioned above again. At step (b), replace 1 or 2 selected bolts.

SA

HINT:
When replacing the 2 bolts, replace 1 bolt for each time.



5. INSPECT TOE–IN

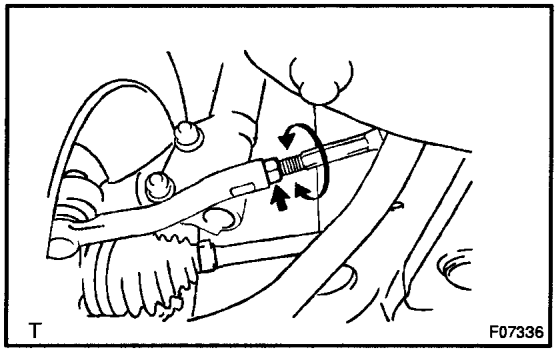
Toe–in:

Toe–in (total)	A + B: 0° ± 12' (0° ± 0.2°) C – D: 0 ± 2 mm (0 ± 0.08 in.)

If the toe–in is not within the specified value, adjust it at the rack ends.

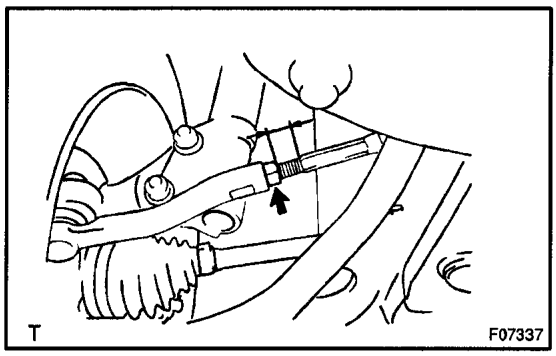
6. ADJUST TOE–IN

(a) Remove the rack boot set clips.



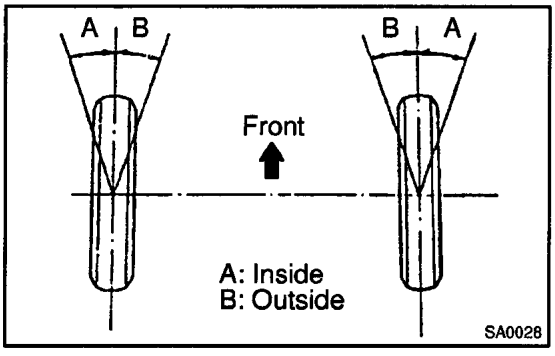
(b) Loosen the tie rod end lock nuts.
(c) Turn the right and left rack ends by an equal amount to adjust the toe–in.

HINT:
Try to adjust the toe–in to the center of the specified value.



(d) Make sure that the lengths of the right and left rack ends are the same.
Rack end length difference: 1.5 mm (0.059 in.) or less
(e) Torque the tie rod end lock nuts.
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)
(f) Place the boots on the seats and install the clips.

HINT:
Make sure that the boots are not twisted.



7. INSPECT WHEEL ANGLE

Turn the steering wheel fully and measure the turning angle.

Wheel turning angle:

	Manual steering	Power steering
Inside wheel	36°59' ± 2° (36.98° ± 2°)	36°58' ± 2° (36.97° ± 2°)
Outside wheel: Reference	32°09' (32.15°)	32°19' (32.32°)

If the right and left inside wheel angles differ from the specified value, check the right and left rack end lengths.

SA

REAR WHEEL ALIGNMENT

SA0QR-03

INSPECTION

1. MEASURE VEHICLE HEIGHT (See page SA–4)

NOTICE:

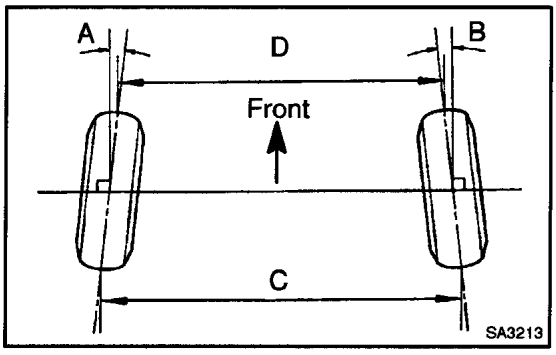
Before inspecting the wheel alignment, adjust the vehicle height to the specified value.

2. INSPECT CAMBER

Camber:

Camber	–0°57' ± 45' (–0.95° ± 0.75°)
Right–left error	45' (0.75°) or less

If the measured value is not within the specified value, inspect the suspension parts for damage and/or wear and replace them if necessary because camber is not adjustable.



3. INSPECT TOE–IN

Toe–in:

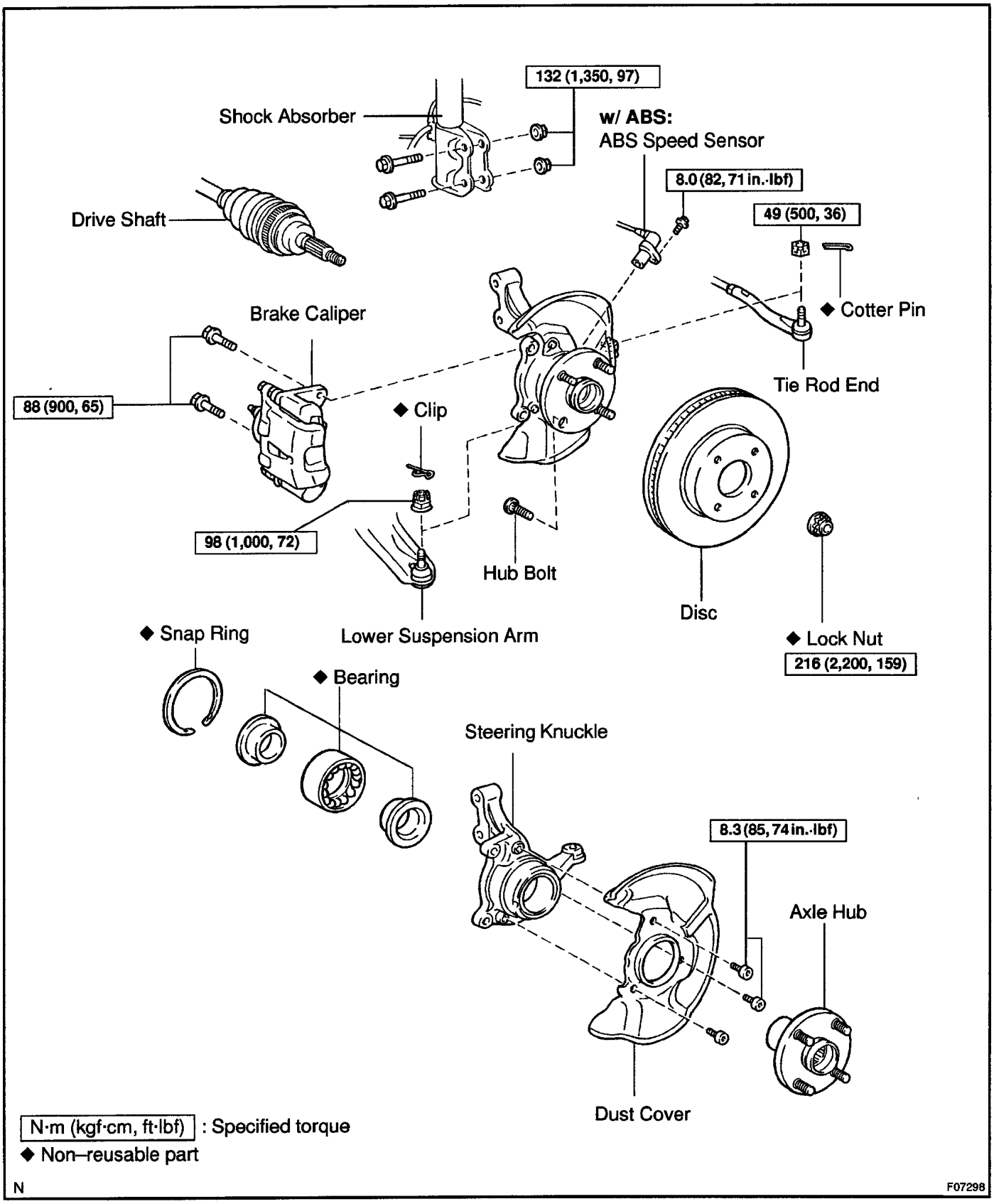
Toe–in (total)	A + B: 0°21' ± 15' (0.35° ± 0.25°) C – D: 3.3 ± 2.3 mm (0.13 ± 0.09 in.)

If the toe–in is not within the specified value, inspect and replace the suspension parts as necessary.

FRONT AXLE HUB

COMPONENTS

SA0CF–04



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

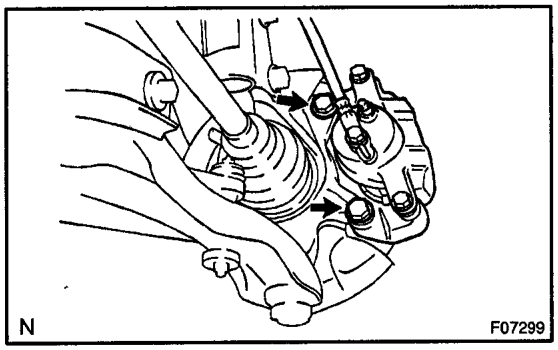
N

F07298

SA1CL-02

REMOVAL

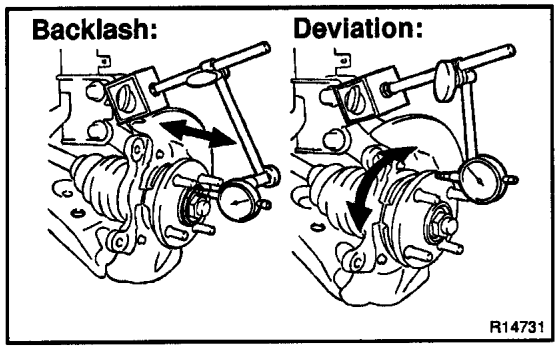
1. REMOVE FRONT WHEEL



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: 0.05 mm (0.0020 in.)

If the backlash exceeds the maximum, replace the bearing.

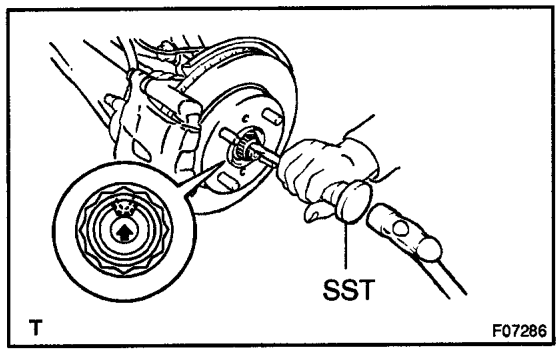
(d) Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.

Maximum: 0.05 mm (0.0020 in.)

If the deviation exceeds the maximum, replace the axle hub.

(e) Install the disc, brake caliper and 2 bolts.

Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)



3. REMOVE DRIVE SHAFT LOCK NUT

(a) Using SST and a hammer, unstake the staked part of the lock nut.

SST 09930–00010

(b) While applying the brakes, remove the lock nut.

(c) Remove the 2 bolts, brake caliper and disc.

(d) Support the brake caliper securely.

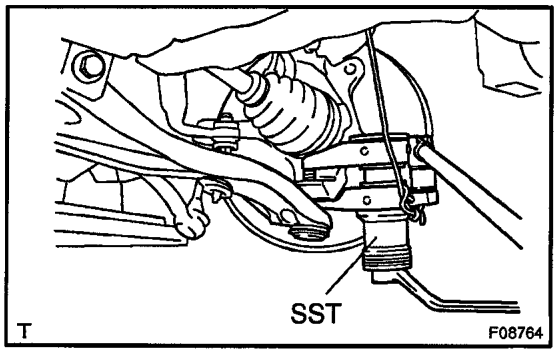
4. w/ ABS:

DISCONNECT ABS SPEED SENSOR

Remove the bolt and disconnect the ABS speed sensor.

5. DISCONNECT STEERING KNUCKLE FROM LOWER SUSPENSION ARM

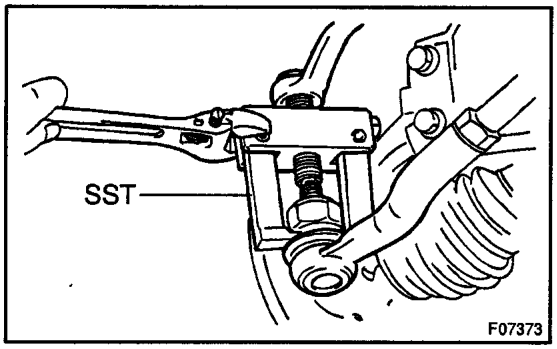
(a) Remove the clip and nut.



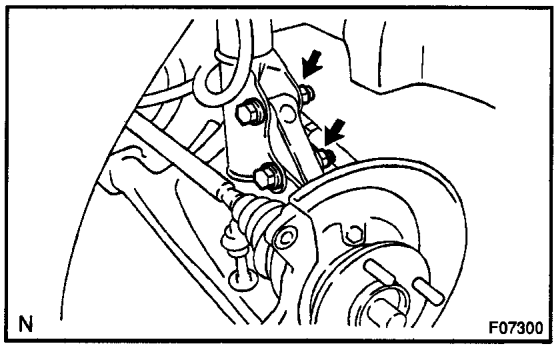
(b) Using SST, disconnect the steering knuckle.
SST 09628–00011

6. DISCONNECT TIE ROD END FROM STEERING KNUCKLE

(a) Remove the cotter pin and nut.



(b) Using SST, disconnect the tie rod end.
SST 09628–62011



7. REMOVE STEERING KNUCKLE WITH AXLE HUB

Remove the 2 nuts, bolts and steering knuckle with the axle hub from the shock absorber.

NOTICE:

Be careful not to damage the boot and ABS speed sensor rotor.

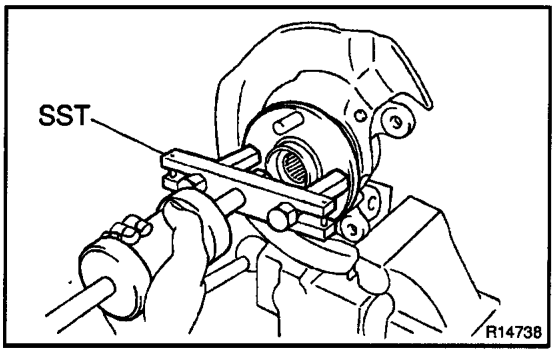
SA

SA1KU–01

DISASSEMBLY

1. REMOVE SNAP RING

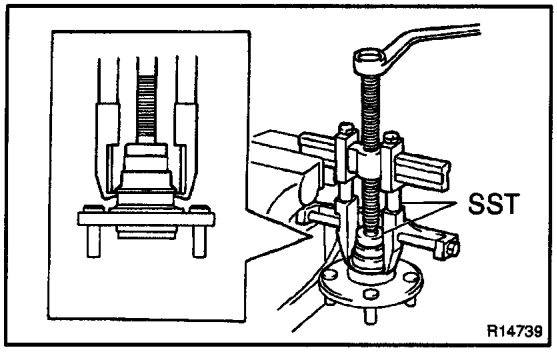
Using snap ring pliers, remove the snap ring.



2. REMOVE AXLE HUB

(a) Using SST, remove the axle hub.

SST 09520–00031 (09520–00040, 09521–00010 09521–00020)



(b) Using SST, remove the inner race (outside) from the axle hub.

SST 09950–40011 (09951–04020, 09952–04010, 09953–04020, 09954–04010, 09955–04011, 09957–04010, 09958–04011), 09950–60010 (09951–00370)

3. REMOVE DUST COVER

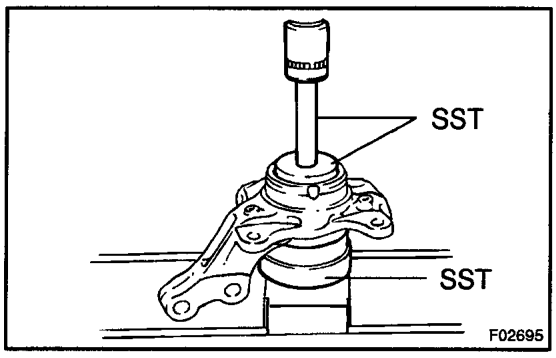
Using a torx wrench (T30), remove the 3 bolts and dust cover.

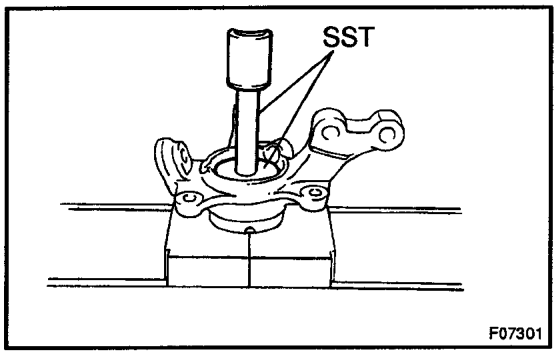
4. REMOVE BEARING FROM STEERING KNUCKLE

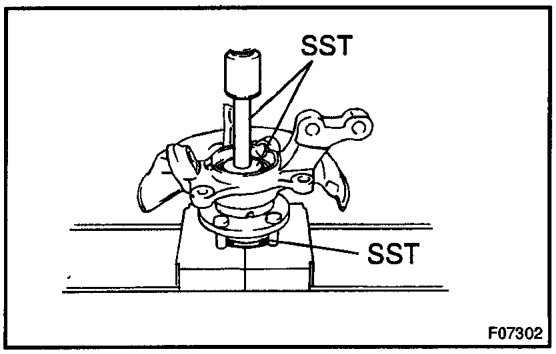
(a) Place the inner race (outside) on the bearing.

(b) Using SST and a press, remove the bearing from the steering knuckle.

SST 09527–17011, 09950–60010 (09951–00600), 09950–70010 (09951–07150)







SA1KV–01

REASSEMBLY

1. INSTALL BEARING

Using SST and a press, install a new bearing to the steering knuckle.

SST 09950–60020 (09951–00680),
09950–70010 (09951–07150)

2. INSTALL DUST COVER

Using a torx wrench (T30), install the dust cover with the 3 bolts.

Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)

3. INSTALL AXLE HUB

Using SST and a press, install the axle hub.

SST 09608–32010, 09950–60020 (09951–00680),
09950–70010 (09951–07150)

NOTICE:

Be careful not to damage the bearing.

4. INSTALL SNAP RING

Using snap ring pliers, install a new snap ring.

SA1KW-01

INSTALLATION

1. INSTALL STEERING KNUCKLE WITH AXLE HUB TO SHOCK ABSORBER

(a) Install the steering knuckle with the axle hub.

NOTICE:

Be careful not to damage the boot and ABS speed sensor rotor.

(b) Coat the threads of the 2 nuts with engine oil.

(c) Install the 2 bolts and nuts on the lower side of the shock absorber.

Torque: 132 N·m (1,350 kgf·cm, 97 ft·lbf)

2. CONNECT TIE ROD END TO STEERING KNUCKLE

(a) Connect the tie rod end to the steering knuckle with the nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(b) Install a new cotter pin.

If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.

3. CONNECT STEERING KNUCKLE TO LOWER SUSPENSION ARM

(a) Connect the steering knuckle to the lower suspension arm with the nut.

Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

(b) Install a new clip.

If the holes for the clip are not aligned, tighten the nut further up to 60°.

4. w/ ABS:

CONNECT ABS SPEED SENSOR

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

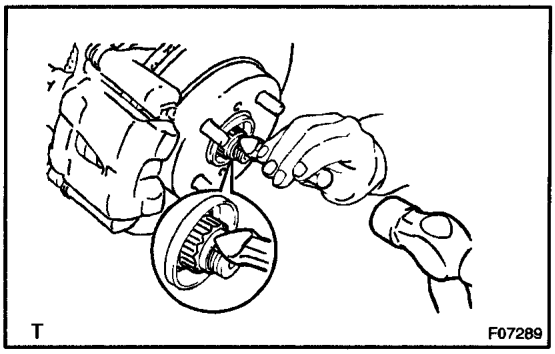
5. INSTALL DRIVE SHAFT LOCK NUT

(a) Install the disc, brake caliper and 2 bolts.

Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

(b) While applying the brakes, install a new lock nut.

Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)



(c) Using a chisel and hammer, stake the lock nut.

6. CHECK BEARING BACKLASH AND AXLE HUB DEVIATION (See page SA–9)

7. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

8. DEPRESS BRAKE PEDAL SEVERAL TIMES

9. CHECK FRONT WHEEL ALIGNMENT (See page SA–4)

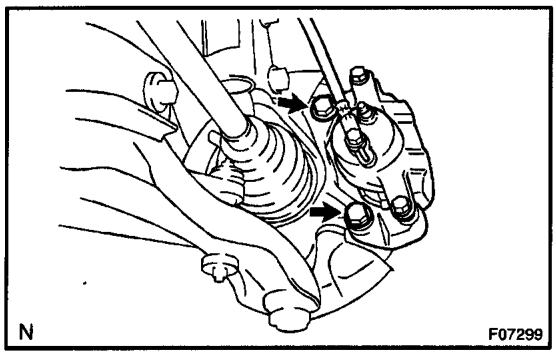
10. **w/ ABS:**
CHECK ABS SPEED SENSOR SIGNAL
(See page DI–60)

FRONT WHEEL HUB BOLT

SA1CN-02

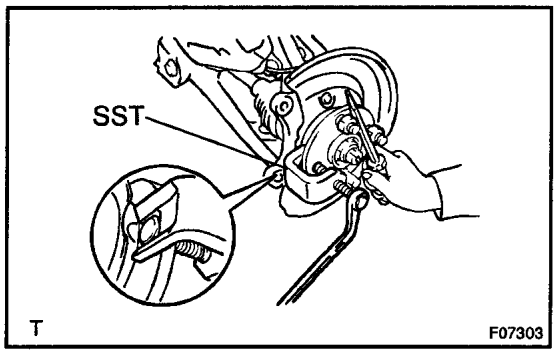
REPLACEMENT

1. REMOVE FRONT WHEEL



2. REMOVE BRAKE CALIPER AND DISC

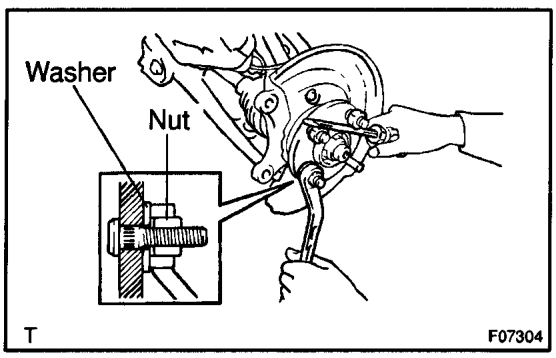
(a) Remove the 2 bolts, brake caliper and disc.
(b) Support the brake caliper securely.



3. REMOVE HUB BOLT

Using SST, 2 nuts and a screwdriver or an equivalent, remove the hub bolt.

SST 09628–10011



4. INSTALL HUB BOLT

(a) Install a washer and nut to a new hub bolt as shown in the illustration.
(b) Using a screwdriver or an equivalent to hold, install the hub bolt by torquing the nut.
(c) Remove the 3 nuts and washer.

5. INSTALL DISC AND BRAKE CALIPER

Install the disc, brake caliper and 2 bolts.

Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

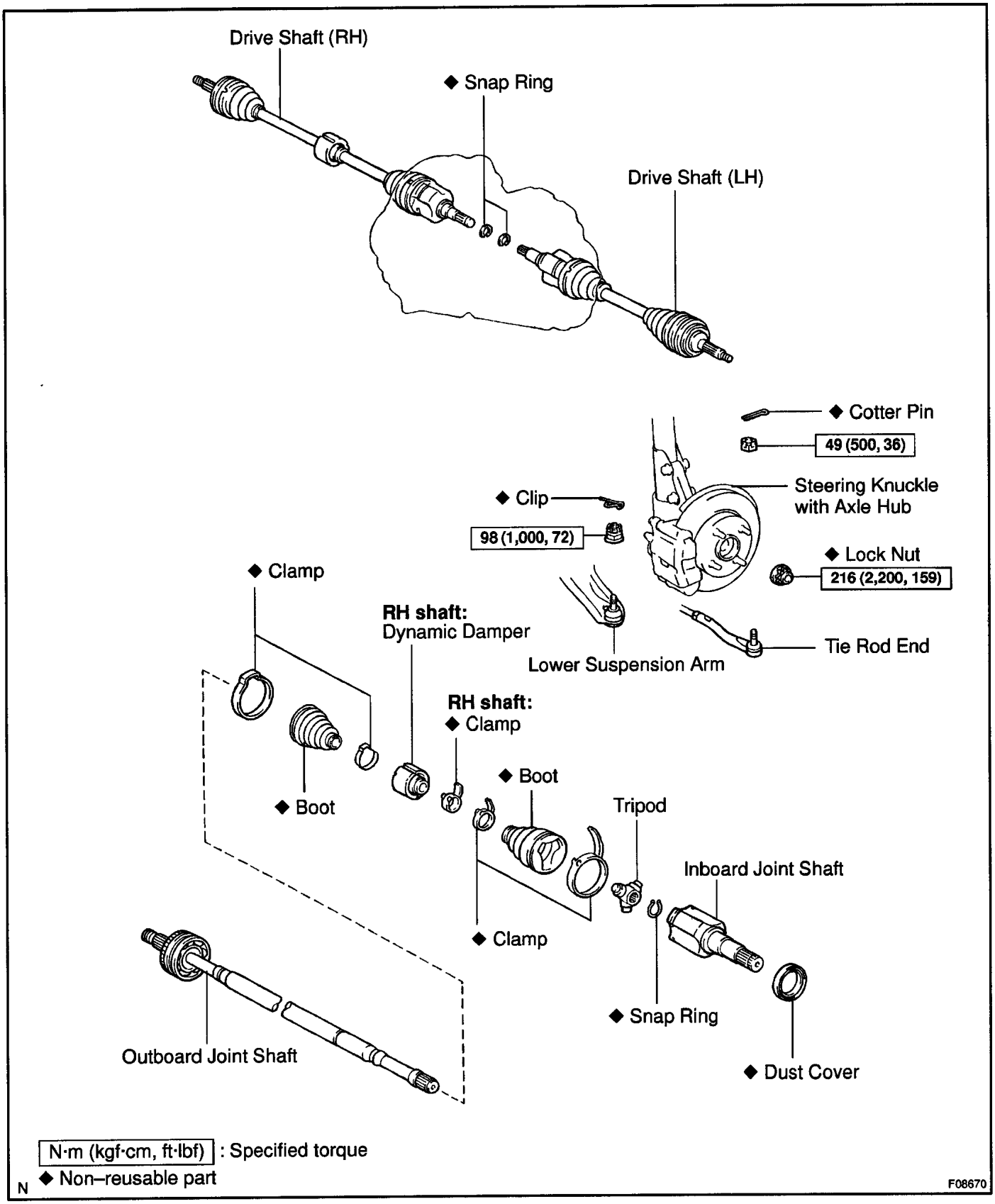
6. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

FRONT DRIVE SHAFT

SADCL–05

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

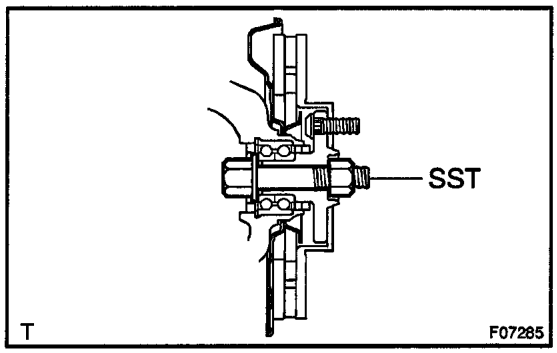
◆ Non–reusable part

N

F08670

SA1PL–01

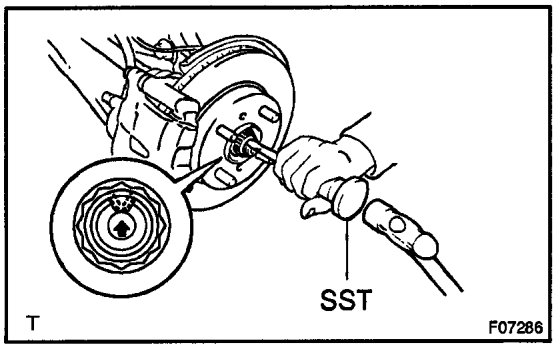
REMOVAL



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 SST.
  SST 09608–16042 (09608–02021, 09608–02041)
- **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 GEAR OIL (M/T) or ATF (A/T)**



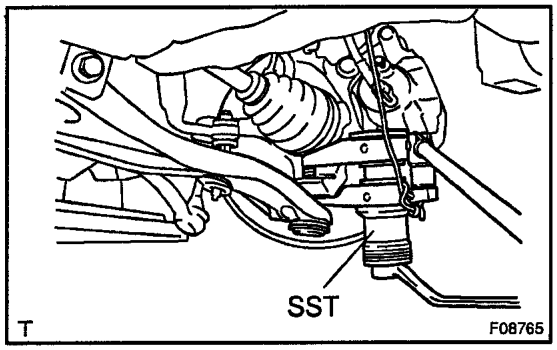
3. **REMOVE DRIVE SHAFT LOCK NUT**

(a) Using SST and a hammer, unstake the staked part of the lock nut.
SST 09930–00010

(b) While applying brakes, remove the lock nut.

4. **DISCONNECT STEERING KNUCKLE FROM LOWER SUSPENSION ARM**

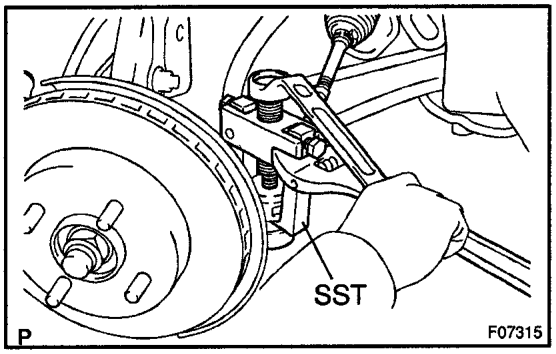
(a) Remove the clip and nut.



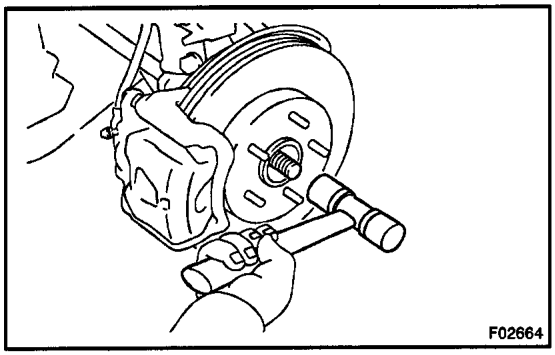
(b) Using SST, disconnect the steering knuckle.
SST 09628–00011

5. **DISCONNECT TIE ROD END FROM STEERING KNUCKLE**

(a) Remove the cotter pin and nut.



(b) Using SST, disconnect the tie rod end from the steering knuckle.
SST 09628–62011

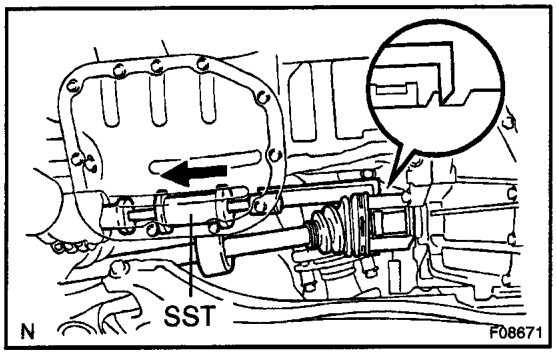


6. DISCONNECT DRIVE SHAFT FROM AXLE HUB

Using a plastic hammer, disconnect the drive shaft from the axle hub.

NOTICE:

Be careful not to damage the boot and ABS speed sensor rotor.



7. REMOVE DRIVE SHAFT

Using SST, remove the drive shaft from the transaxle.

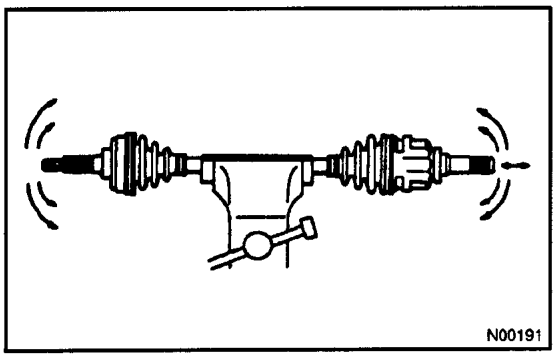
SST 09520–01010, 09520–24010 (09520–32040)

NOTICE:

Be careful not to damage the dust cover and oil seal.

SA129-02

DISASSEMBLY



1. CHECK DRIVE SHAFT

(a) Check to see that there is no remarkable play in the outboard joint.

(b) Check to see that the inboard joint slides smoothly in the thrust direction.

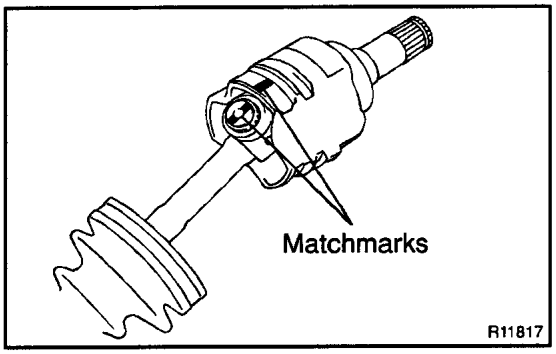
(c) Check to see that there is no remarkable play in the radial direction of the inboard joint.

(d) Check the boots for damage.

2. REMOVE INBOARD JOINT SHAFT

(a) Using a screwdriver, disclamp the 2 inboard joint boot clamps.

(b) Slide the inboard joint boot toward the outboard joint.



(c) Place matchmarks on the inboard joint shaft and tripod.

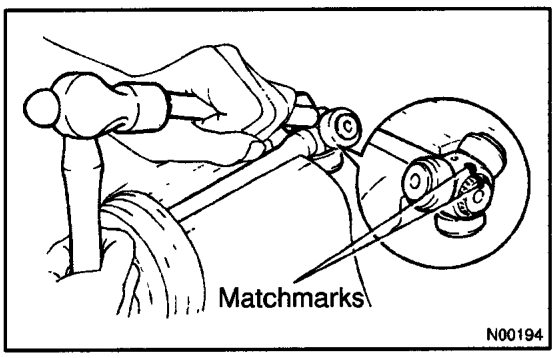
NOTICE:

Do not punch the marks.

(d) Remove the inboard joint shaft from the outboard joint shaft.

3. REMOVE TRIPOD

(a) Using a snap ring expander, remove the snap ring.



(b) Place matchmarks on the outboard joint shaft and tripod.

NOTICE:

Do not punch the marks.

(c) Using a brass bar and hammer, tap out the tripod from the outboard joint shaft.

NOTICE:

Do not tap the roller.

4. REMOVE INBOARD JOINT BOOT AND 2 CLAMPS

5. RH drive shaft:
REMOVE DYNAMIC DAMPER

(a) Using a screwdriver, remove the dynamic damper clamp.

(b) Remove the dynamic damper.

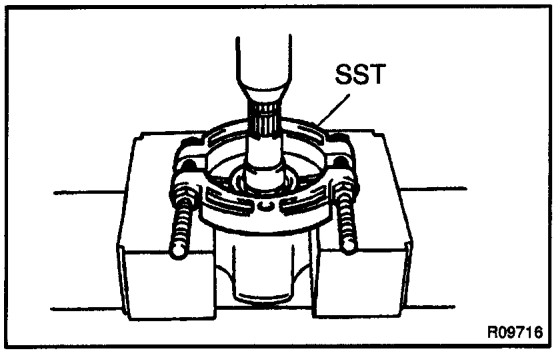
6. REMOVE OUTBOARD JOINT BOOT

(a) Using a side cutter, cut the 2 outboard joint boot clamps and remove them.

(b) Remove the outboard joint boot from the outboard joint shaft.

NOTICE:

Do not disassemble the outboard joint.



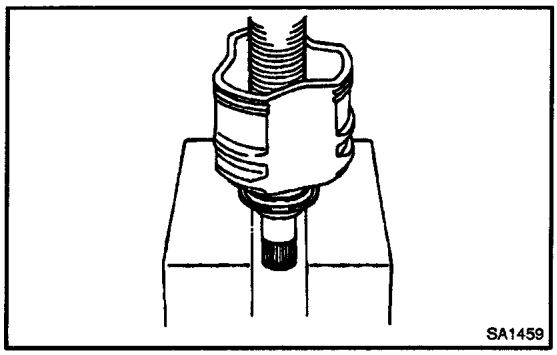
7. REMOVE DUST COVER

Using SST and a press, remove the dust cover from the inboard joint shaft.

SST 09950–00020

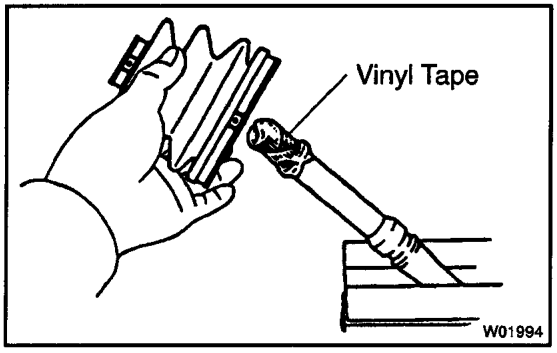
SA1PM-01

REASSEMBLY



1. INSTALL DUST COVER

Using a press, install a new dust cover to the inboard joint shaft.



2. TEMPORARILY INSTALL BOOTS, CLAMPS AND DYNAMIC DAMPER (RH DRIVE SHAFT)

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.

(a) Place 2 new clamps on a new outboard joint boot and install them to the outboard joint shaft.

(b) RH drive shaft:
Place a new clamp on the dynamic damper and install them to the outboard joint shaft.

(c) Place 2 new clamps on a new inboard joint boot and install them to the outboard joint shaft.

3. 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 outboard joint shaft.

NOTICE:

Do not tap the roller.

(d) Using a snap ring expander, install a new snap ring.

4. INSTALL BOOT TO OUTBOARD JOINT

Before assembling the boot, pack the outboard joint and boot with grease in the boot kit.

Grease capacity: (Color = Black)
155 – 170 g (5.5 – 6.0 oz.)

5. INSTALL INBOARD JOINT SHAFT TO OUTBOARD JOINT SHAFT

(a) Pack the inboard joint and boot with grease in the boot kit.
Grease capacity: (Color = Yellow ocher)
125 – 135 g (4.4 – 4.8 oz.)

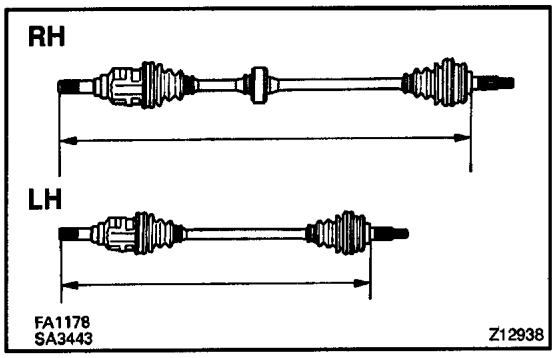
(b) Align the matchmarks placed before removal.

(c) Install the inboard joint shaft to the outboard joint shaft.

(d) Temporarily install the boot to the inboard joint shaft.

6. ASSEMBLE BOOT CLAMPS TO BOTH BOOTS

(a) Make sure that the 2 boots are on the shaft grooves.

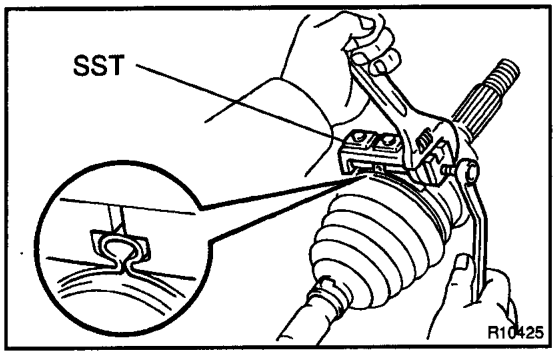


(b) Make sure that the 2 boots are not stretched or contracted when the drive shaft is at standard length.

Drive shaft standard length:

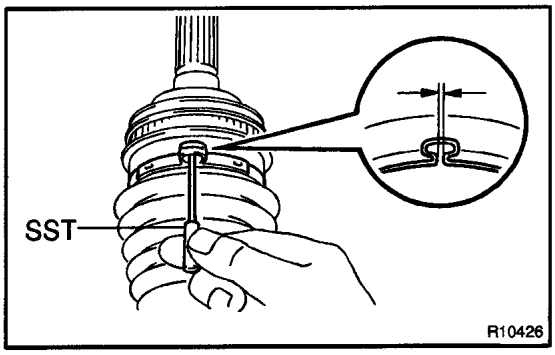
RH	813.3 ± 5.0 mm (32.020 ± 0.197 in.)
LH	574.3 ± 5.0 mm (22.610 ± 0.197 in.)

(c) Bend the band and lock the inboard joint boot clamps with a screwdriver.

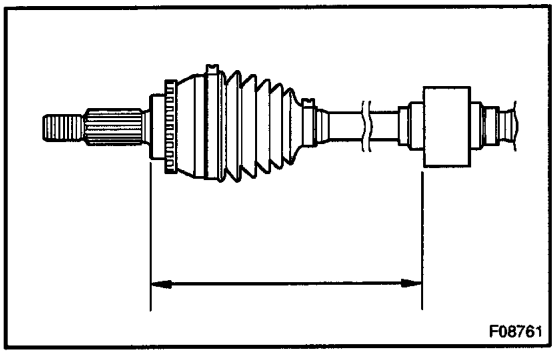


(d) Secure the 2 outboard joint boot clamps onto the boot.
(e) Place SST onto the outboard joint large boot clamp.
SST 09521–24010
(f) Tighten the SST so that the large clamp is pinched.

NOTICE:
Do not overtighten the SST.



(g) Using SST, adjust the clearance of the large clamp.
SST 09240–00020
Clearance: 0.8 mm (0.031 in.) or less
(h) Employ the same manner to the outboard joint small boot clamp.



7. RH drive shaft:
ASSEMBLE DYNAMIC DAMPER CLAMP
(a) Set the distance, as described below.
Distance: 427.6 ± 2.0 mm (16.835 ± 0.079 in.)
(b) Bend the band and lock the dynamic damper clamp with a screwdriver.

8. CHECK DRIVE SHAFT (See page SA–19)

SA1KZ-03

INSTALLATION

1. 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 transaxle sliding surface.

(c) Set the snap ring with opening side facing downward.

(d) Using a brass bar and hammer, tap the snap ring and install the drive shaft.

NOTICE:

Be careful not to damage the dust cover and oil seal.

HINT:

Whether the inboard joint shaft is in contact with the pinion shaft or not can be known from the sound or feeling when driving it in.

(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. CONNECT DRIVE SHAFT TO AXLE HUB

NOTICE:

Be careful not to damage the boot and ABS speed sensor rotor.

3. CONNECT TIE ROD END TO STEERING KNUCKLE

(a) Connect the tie rod end to the steering knuckle with the nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(b) Install a new cotter pin.

If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.

4. CONNECT STEERING KNUCKLE TO LOWER SUSPENSION ARM

(a) Connect the steering knuckle to the lower suspension arm with the nut.

Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

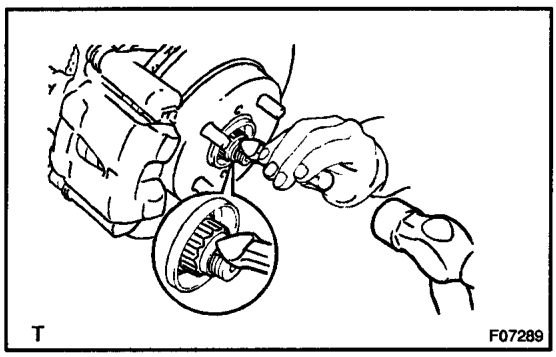
(b) Install a new clip.

If the holes for the clip are not aligned, tighten the nut further up to 60°.

5. INSTALL DRIVE SHAFT LOCK NUT

(a) While applying brakes, install a new lock nut.

Torque: 216 N·m (2,200 kgf·cm, 159 ft·lbf)



(b) Using a chisel and hammer, stake the lock nut.

6. FILL AND CHECK GEAR OIL (M/T) or ATF (A/T) (See page MX–8 or DI–4)

7. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

8. CHECK FRONT WHEEL ALIGNMENT (See page SA–4)

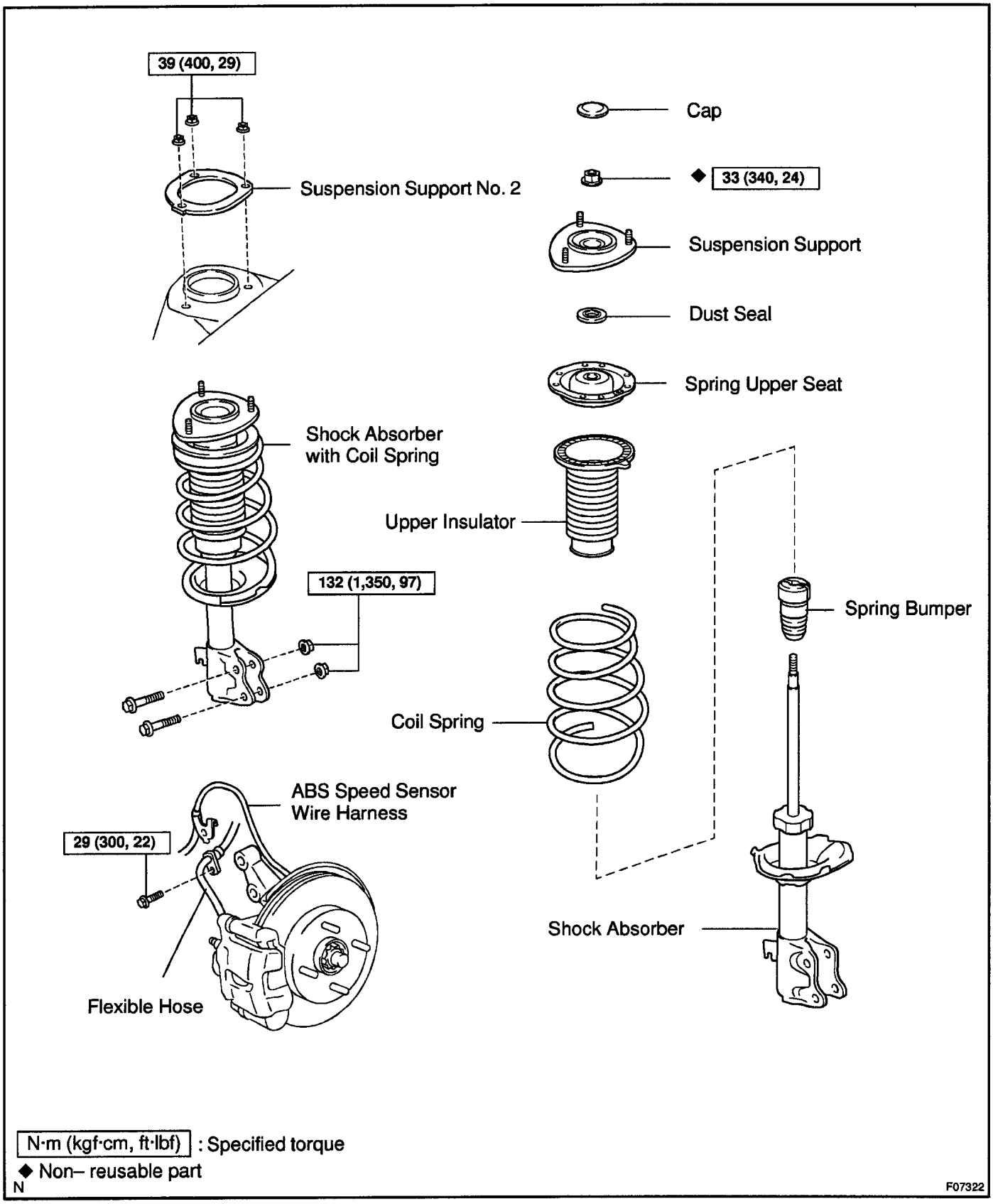
9. w/ ABS:

CHECK ABS SPEED SENSOR SIGNAL (See page DI–60)

FRONT SHOCK ABSORBER

SA0CQ-05

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non– reusable part

N

F07322

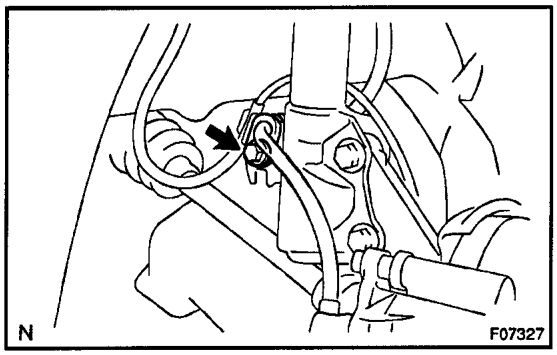
SA1L0-02

REMOVAL

NOTICE:

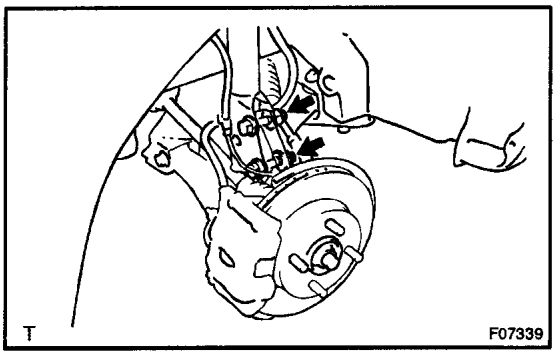
Face the front wheel straight ahead to prevent damage to the steering gear.

1. REMOVE FRONT WHEEL



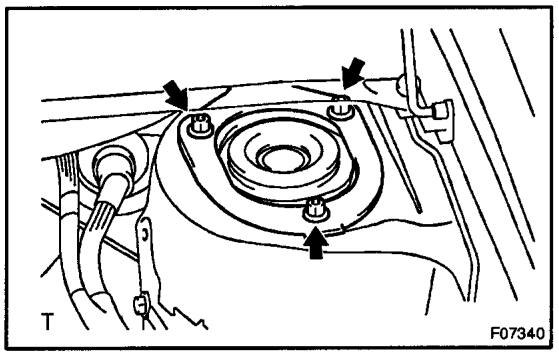
2. DISCONNECT FLEXIBLE HOSE AND ABS SPEED SENSOR WIRE HARNESS CLAMP

Remove the bolt and disconnect the flexible hose and ABS speed sensor wire harness clamp from the shock absorber bracket.



3. REMOVE SHOCK ABSORBER WITH COIL SPRING

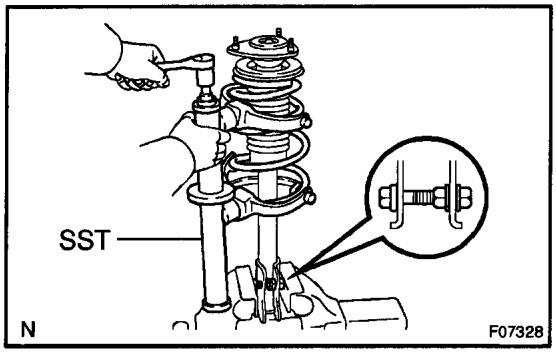
(a) Remove the 2 nuts and bolts, and disconnect the shock absorber from the steering knuckle.



(b) Remove the 3 nuts and shock absorber with the coil spring.

(c) Remove the suspension support No. 2.

SA0CS-04



DISASSEMBLY

REMOVE COIL SPRING

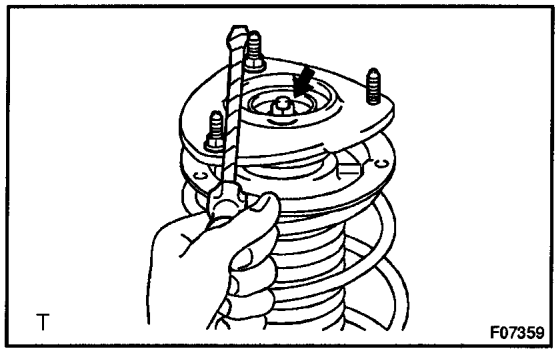
(a) Install 2 nuts and a bolt to the bracket at the lower side of the shock absorber and secure it in a vise.

(b) Using SST, compress the coil spring.
SST 09727–30021 (09727–00010, 09727–00021, 09727–00031)

NOTICE:

Do not use an impact wrench. It will damage the SST.

(c) Remove the cap from the suspension support.



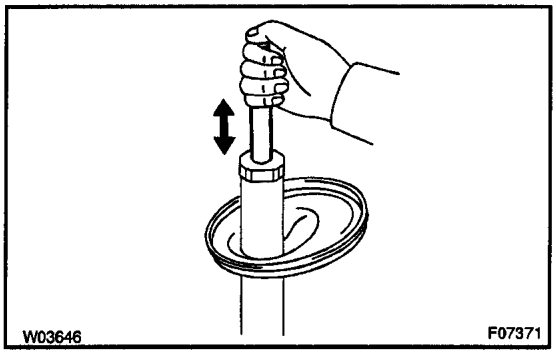
(d) Using 2 nuts and a screwdriver or an equivalent to hold, remove the center nut.

NOTICE:

Do not damage the suspension support stud bolts.

(e) Remove the suspension support, dust seal, spring upper seat, upper insulator, spring bumper and coil spring.

SA0CT–04



INSPECTION

INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual sound during operation.

If there is any abnormality, replace the shock absorber with a new one.

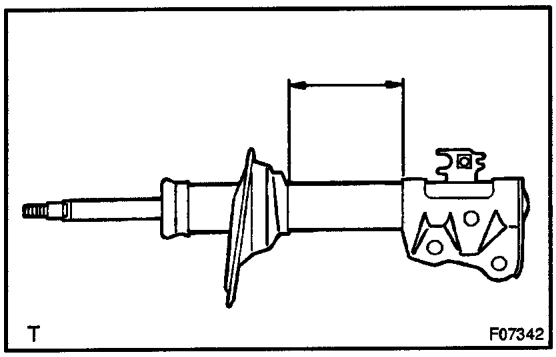
NOTICE:

When disposing of the shock absorber, see DISPOSAL on page SA–28.

SA0L8-04

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.

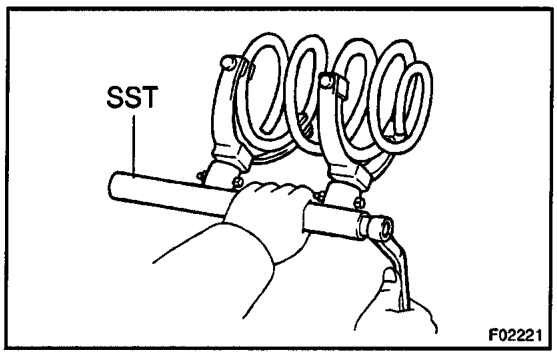
CAUTION:

- **When drilling, chips may fly out, work carefully.**
- **The gas is colorless, odorless and non–poisonous.**

SA1CR-02

REASSEMBLY

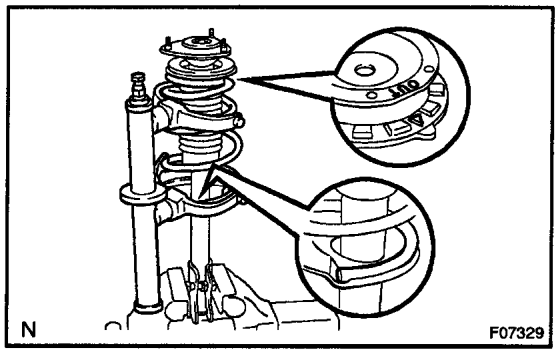
1. INSTALL SPRING BUMPER TO PISTON ROD



2. INSTALL COIL SPRING

(a) Using SST, compress the coil spring.
SST 09727–30021 (09727–00010, 09727–00021, 09727–00031)

NOTICE:
Do not use an impact wrench. It will damage the SST.

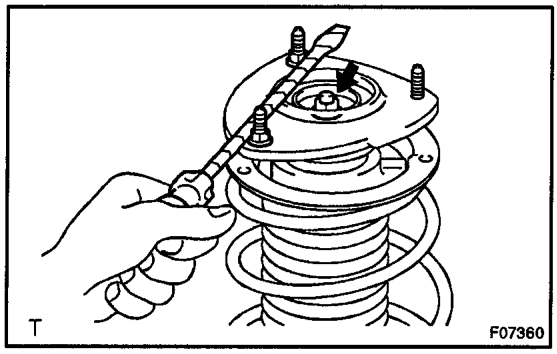


(b) Install the coil spring to the shock absorber.
HINT:
Fit the lower end of the coil spring into the gap of the spring lower seat.

(c) Install the upper insulator with the "△" mark facing to the outside of the vehicle.

(d) Install the spring upper seat with the "OUT" mark facing to the outside of the vehicle.

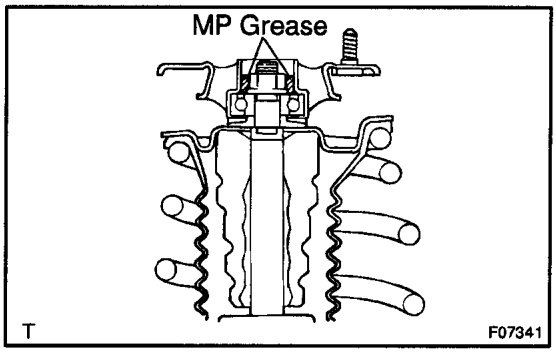
(e) Install the dust seal and suspension support.



(f) Using 2 nuts and a screwdriver or an equivalent to hold, install a new center nut.
Torque: 33 N·m (340 kgf·cm, 24 ft·lbf)

NOTICE:
Do not damage the suspension support stud bolts.

(g) Remove the SST.
SST 09727–30021 (09727–00010, 09727–00021, 09727–00031)



(h) Apply MP grease into the suspension support.

(i) Install the cap.

SA1CS-03

INSTALLATION

1. **INSTALL SHOCK ABSORBER WITH COIL SPRING**

(a) Install the suspension support No. 2.

(b) Install the shock absorber with coil spring and 3 nuts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(c) Connect the shock absorber to the steering knuckle.

(d) Coat the threads of the 2 nuts with engine oil.

(e) Install the 2 bolts and nuts.
Torque: 132 N·m (1,350 kgf·cm, 97 ft·lbf)

2. **CONNECT ABS SPEED SENSOR WIRE HARNESS CLAMP AND FLEXIBLE HOSE TO SHOCK ABSORBER**
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

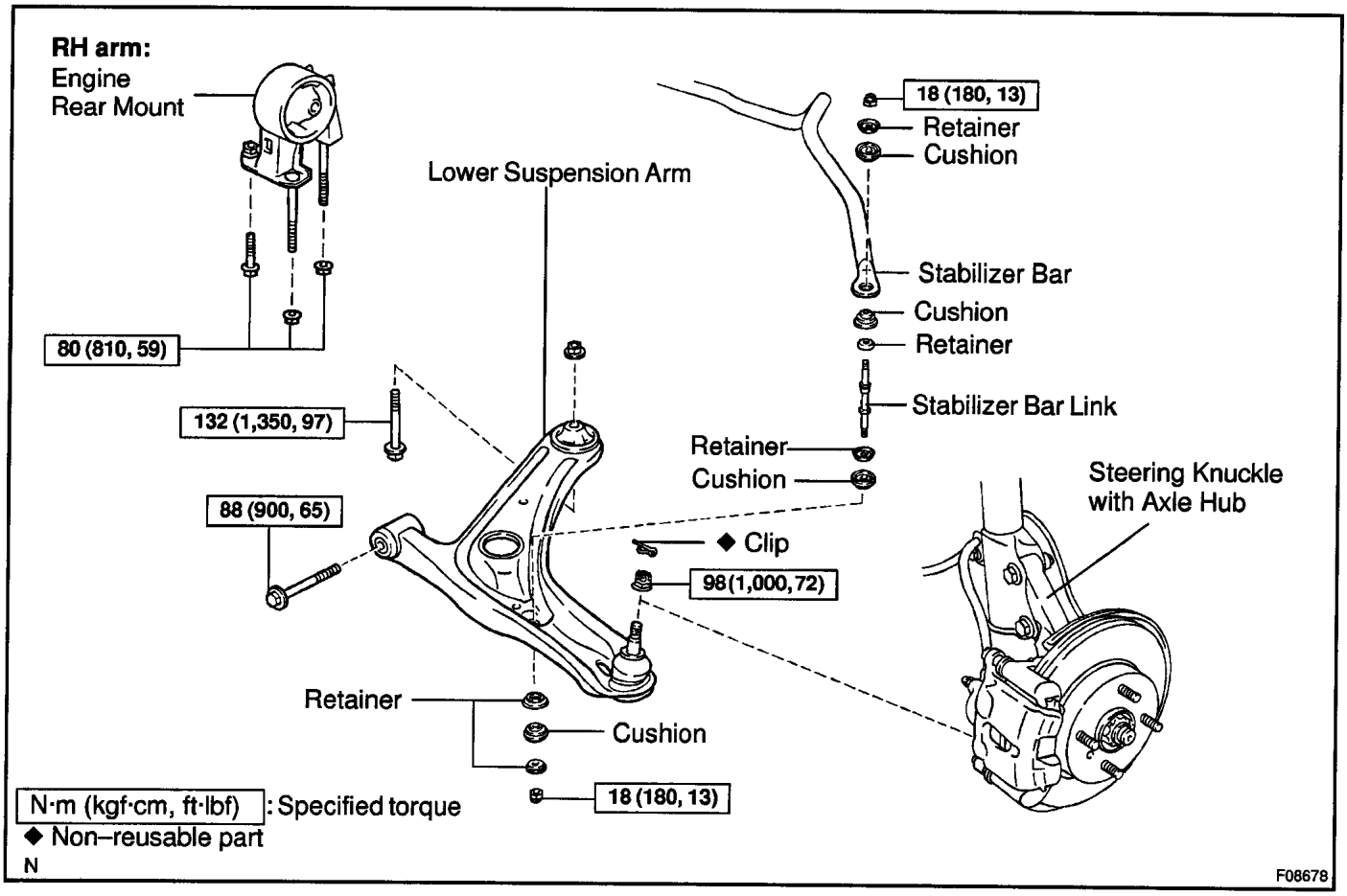
3. **INSTALL FRONT WHEEL**
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

4. **CHECK FRONT WHEEL ALIGNMENT (See page SA–4)**

FRONT LOWER SUSPENSION ARM

COMPONENTS

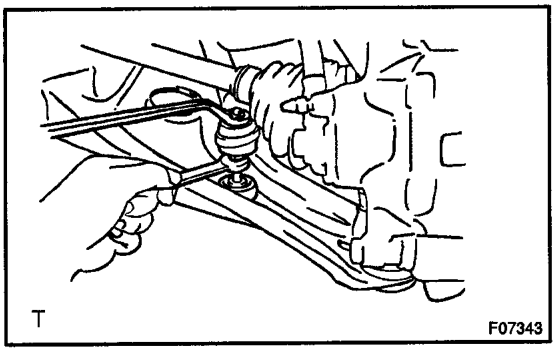
SA1L1-02



SA1PO-01

REMOVAL

1. REMOVE FRONT WHEEL

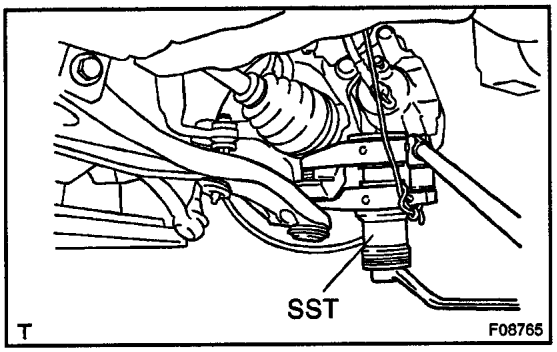


2. REMOVE STABILIZER BAR LINK

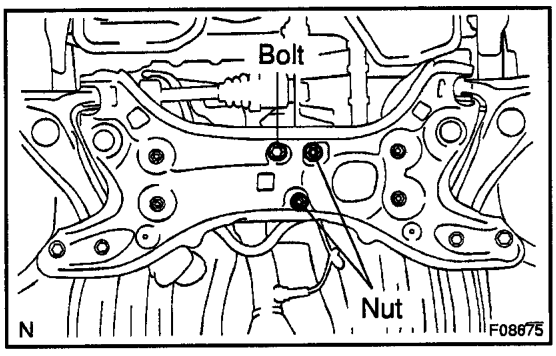
While holding the stabilizer bar link, remove the 2 nuts, 5 retainers, 4 cushions and the stabilizer bar link.

3. DISCONNECT LOWER SUSPENSION ARM FROM STEERING KNUCKLE

(a) Remove the clip and nut.



(b) Using SST, disconnect the lower suspension arm from the steering knuckle.
SST 09628–00011



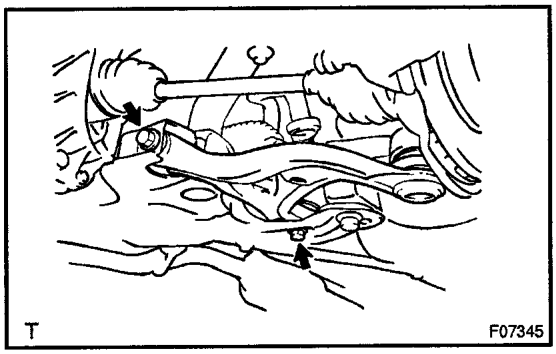
4. RH arm: SLIGHTLY JACK UP ENGINE

(a) Remove the bolt and 2 nuts, and disconnect the engine rear mount.

(b) Using a transmission jack and wooden block, slightly jack up the engine.

NOTICE:

Do not jack up the engine at the oil pan.



5. REMOVE LOWER SUSPENSION ARM

Remove the 2 bolts, nut and lower suspension arm.

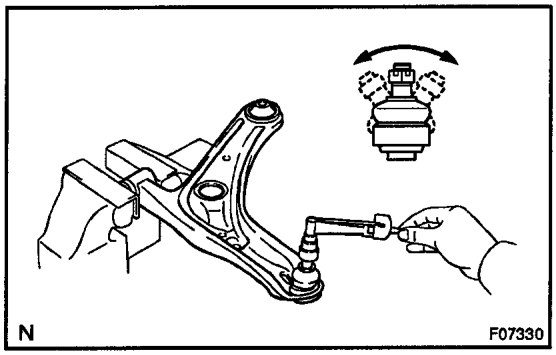
NOTICE:

Do not turn the nut.

SA1L3-01

INSPECTION

1. INSPECT LOWER SUSPENSION ARM BALL JOINT BOOT FOR DAMAGE



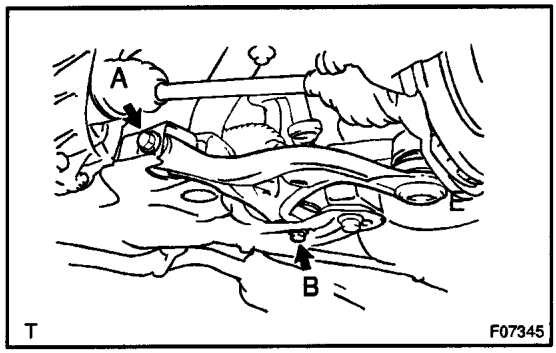
2. INSPECT LOWER SUSPENSION ARM BALL JOINT FOR ROTATION CONDITION

(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 at a rate of 2 – 4 seconds per 1 turn and take the torque reading on the 5th turn.

Turning torque:
0.59 – 3.43 N·m (6 – 35 kgf·cm, 5.2 – 30 in.·lbf)

SA1PP–01



INSTALLATION

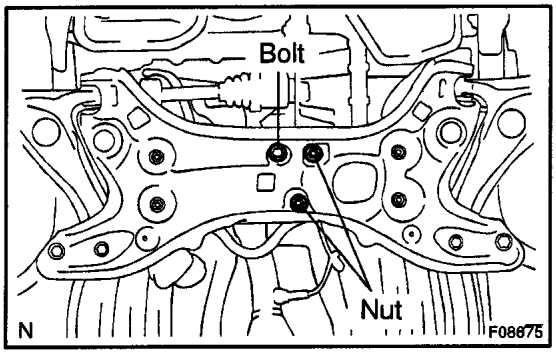
1. INSTALL LOWER SUSPENSION ARM

Install the lower suspension arm with the 2 bolts.

Torque:
Bolt A: 88 N·m (900 kgf·cm, 65 ft·lbf)
Bolt B: 132 N·m (1,350 kgf·cm, 97 ft·lbf)

NOTICE:
Do not turn the nut.

HINT:
After stabilizing the suspension, torque the 2 bolts.



2. RH arm:
CONNECT ENGINE REAR MOUNT

Connect the engine rear mount with the bolt and 2 nuts.

Torque: 80 N·m (810 kgf·cm, 59 ft·lbf)

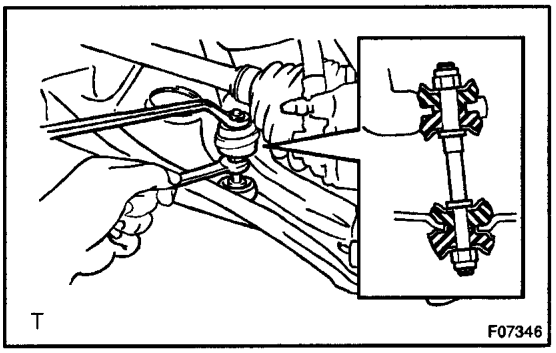
3. CONNECT LOWER SUSPENSION ARM TO STEERING KNUCKLE

(a) Connect the lower suspension arm to the steering knuckle with the nut.

Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

(b) Install a new clip.

If the holes for the clip are not aligned, tighten the nut further up to 60 °.



4. INSTALL STABILIZER BAR LINK

Install the stabilizer bar link, 4 cushions and 5 retainers with the 2 nuts.

Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

5. INSTALL FRONT WHEEL

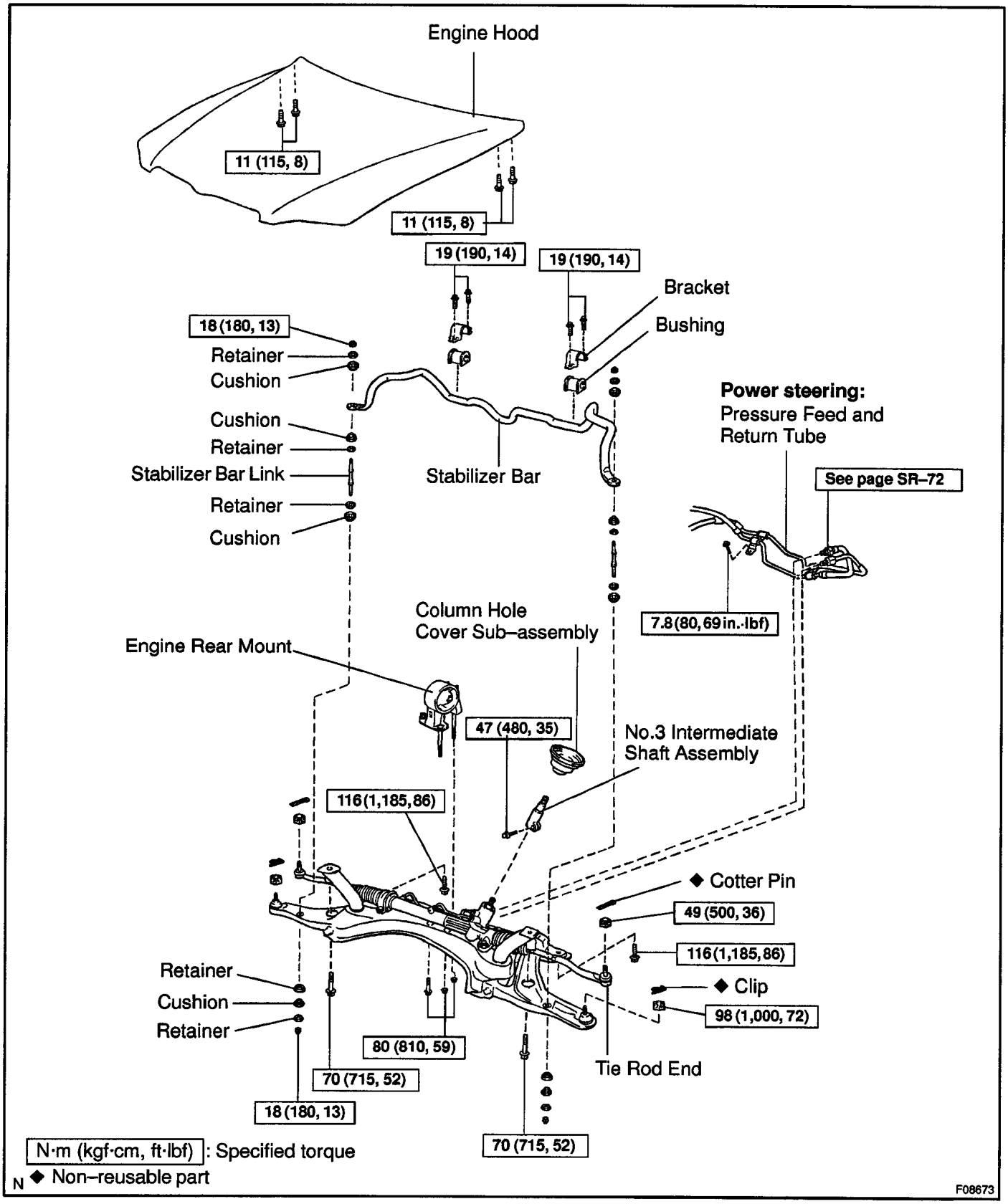
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

6. CHECK FRONT WHEEL ALIGNMENT (See page SA–4)

FRONT STABILIZER BAR

COMPONENTS

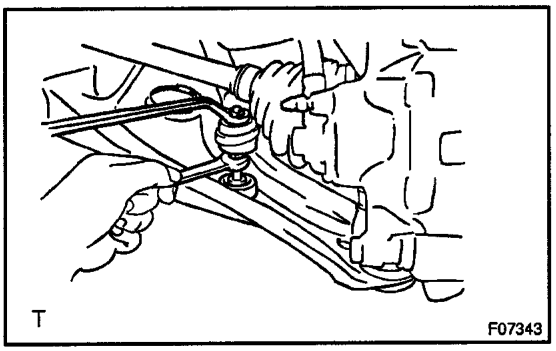
SA1ER-03



SA1PQ-01

REMOVAL

1. **REMOVE FRONT WHEELS**



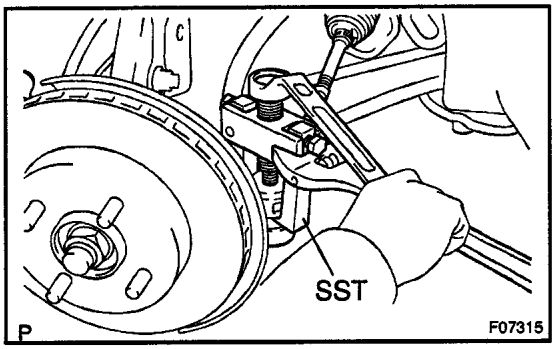
2. **REMOVE STABILIZER BAR LINKS**

(a) While holding the stabilizer bar link, remove the 2 nuts, 5 retainers, 4 cushions and the stabilizer bar link.

(b) Employ the same manner described above to the other side.

3. **DISCONNECT TIE ROD ENDS FROM STEERING KNUCKLES**

(a) Remove the cotter pin and nut.

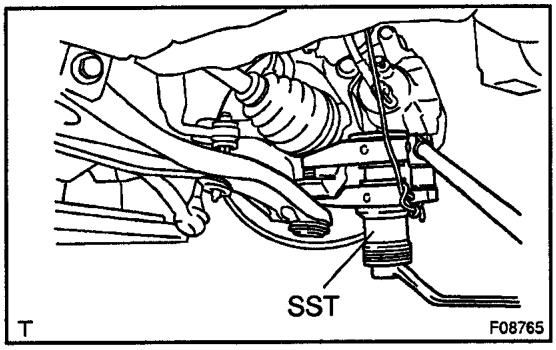


(b) Using SST, disconnect the tie rod end from the steering knuckle.
SST 09628–62011

(c) Employ the same manner described above to the other side.

4. **DISCONNECT LOWER SUSPENSION ARMS FROM STEERING KNUCKLES**

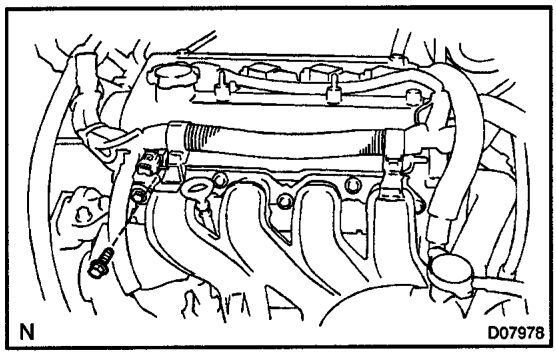
(a) Remove the clip and nut.



(b) Using SST, disconnect the steering knuckle.
SST 09628–00011

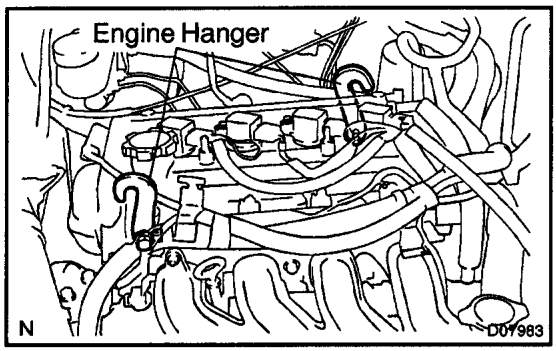
(c) Employ the same manner described above to the other side.

5. **REMOVE ENGINE HOOD (See page BO–10)**



6. **ATTACH ENGINE SLING DEVICE TO ENGINE HANGERS**

(a) Remove the bolt.



(b) Install the 2 No. 1 engine hangers with the bolts in the correct direction.

Parts No.:
No. 1 engine hanger: 12281–21010
Bolt: 91511–60818
Torque: 40 N·m (400 kgf·cm, 29 ft·lbf)

(c) Attach the engine chain hoist to the engine hangers.

CAUTION:
Do not attempt to hang the engine by hooking the chain to any other part.

7. DISCONNECT ENGINE REAR MOUNT

Remove the bolt and 2 nuts, and disconnect the engine rear mount.

8. DISCONNECT SLIDING YOKE (See page SR–12)

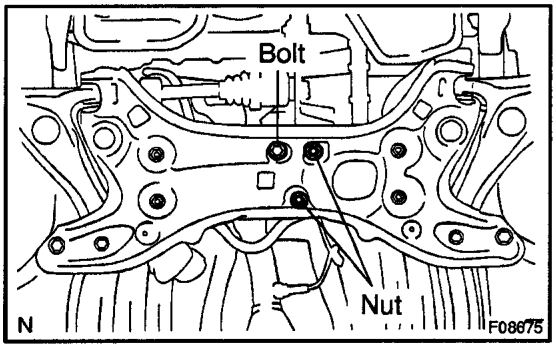
9. Power steering:
DISCONNECT PRESSURE FEED AND RETURN TUBES (See page SR–52)

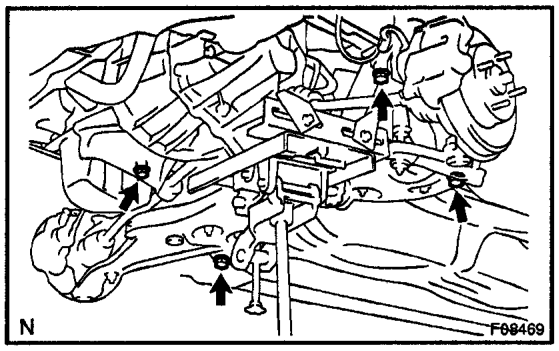
10. Power steering:
DISCONNECT TUBE CLAMP

Remove the bolt and disconnect the tube clamp.

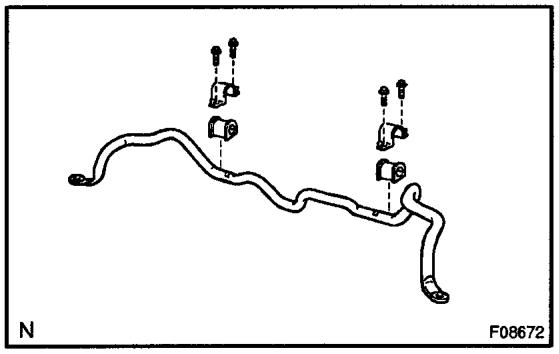
11. LOWER SUSPENSION MEMBER

(a) Support the suspension member with a transmission jack.





(b) Remove the 4 bolts and lower the suspension member.

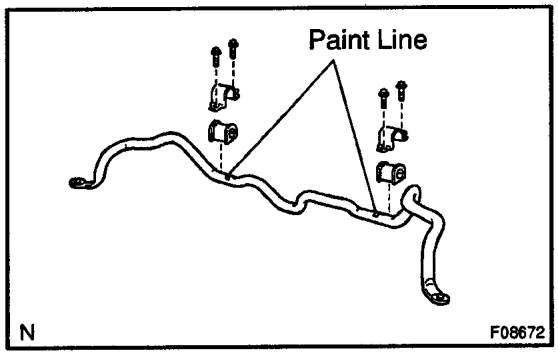


12. REMOVE STABILIZER BAR

Remove the 4 bolts, 2 brackets, bushings and stabilizer bar.

SA1PR-01

INSTALLATION



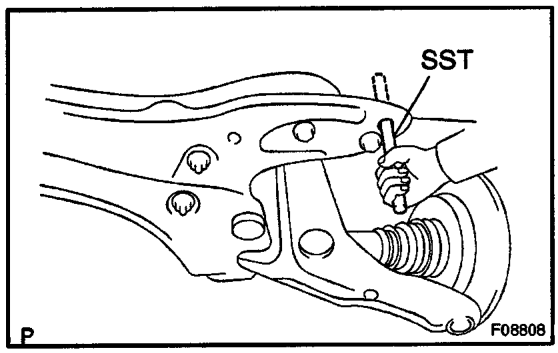
1. INSTALL STABILIZER BAR

Install the stabilizer bar, 2 bushings, brackets and 4 bolts.

Torque: 19 N·m (190 kgf·cm, 14 ft·lbf)

HINT:

Install the bushings to the outside of the each paint line.

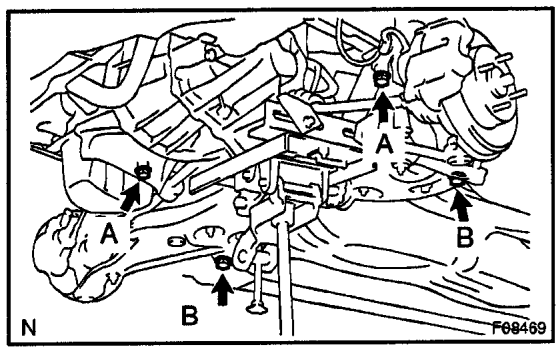


2. INSTALL SUSPENSION MEMBER

(a) Using SST, align the holes of the suspension member and body.

SST 09670–00010

(b) Employ the same manner described above to the other side.



(c) Install the suspension member with the 4 bolts.

Torque:

Bolt A: 70 N·m (715 kgf·cm, 52 ft·lbf)

Bolt B: 116 N·m (1,185 kgf·cm, 86 ft·lbf)

3. Power steering:

CONNECT TUBE CLAMP

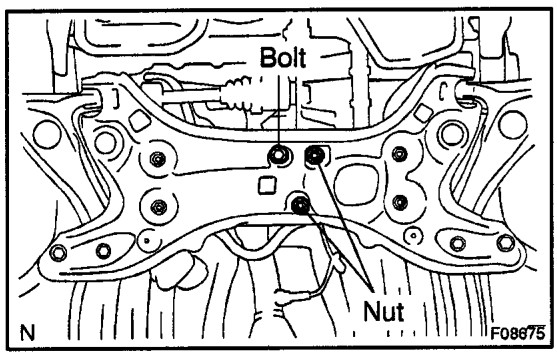
Connect the tube clamp with the bolt.

Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

4. Power steering:

CONNECT PRESSURE FEED AND RETURN TUBES (See page SR–72)

5. CONNECT SLIDING YOKE (See page SR–20)



6. CONNECT ENGINE REAR MOUNT

Connect the engine rear mount with the bolt and 2 nuts.

Torque: 80 N·m (810 kgf·cm, 59 ft·lbf)

7. DISENGAGE ENGINE SLING DEVICE

8. INSTALL ENGINE HOOD (See page BO–10)

9. CONNECT LOWER SUSPENSION ARMS TO STEERING KNUCKLES

(a) Connect the lower suspension arm to the steering knuckle with the nut.
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

(b) Install a new clip.

If the holes for the clip are not aligned, tighten the nut further up to 60°.

(c) Employ the same manner described above to the other side.

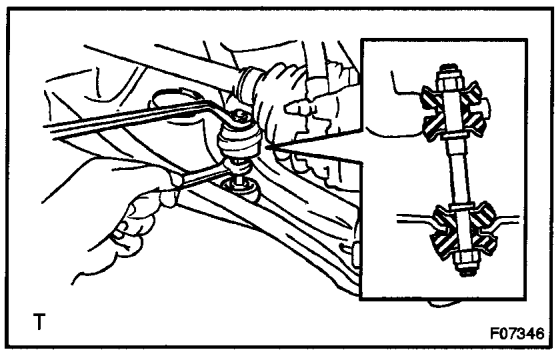
10. CONNECT TIE ROD ENDS TO STEERING KNUCKLES

(a) Connect the tie rod end to the steering knuckle with the nut.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(b) Install a new cotter pin.

If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.

(c) Employ the same manner described above to the other side.



11. INSTALL STABILIZER BAR LINKS

(a) Install the stabilizer bar link, 4 cushions and 5 retainers with the 2 nuts.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

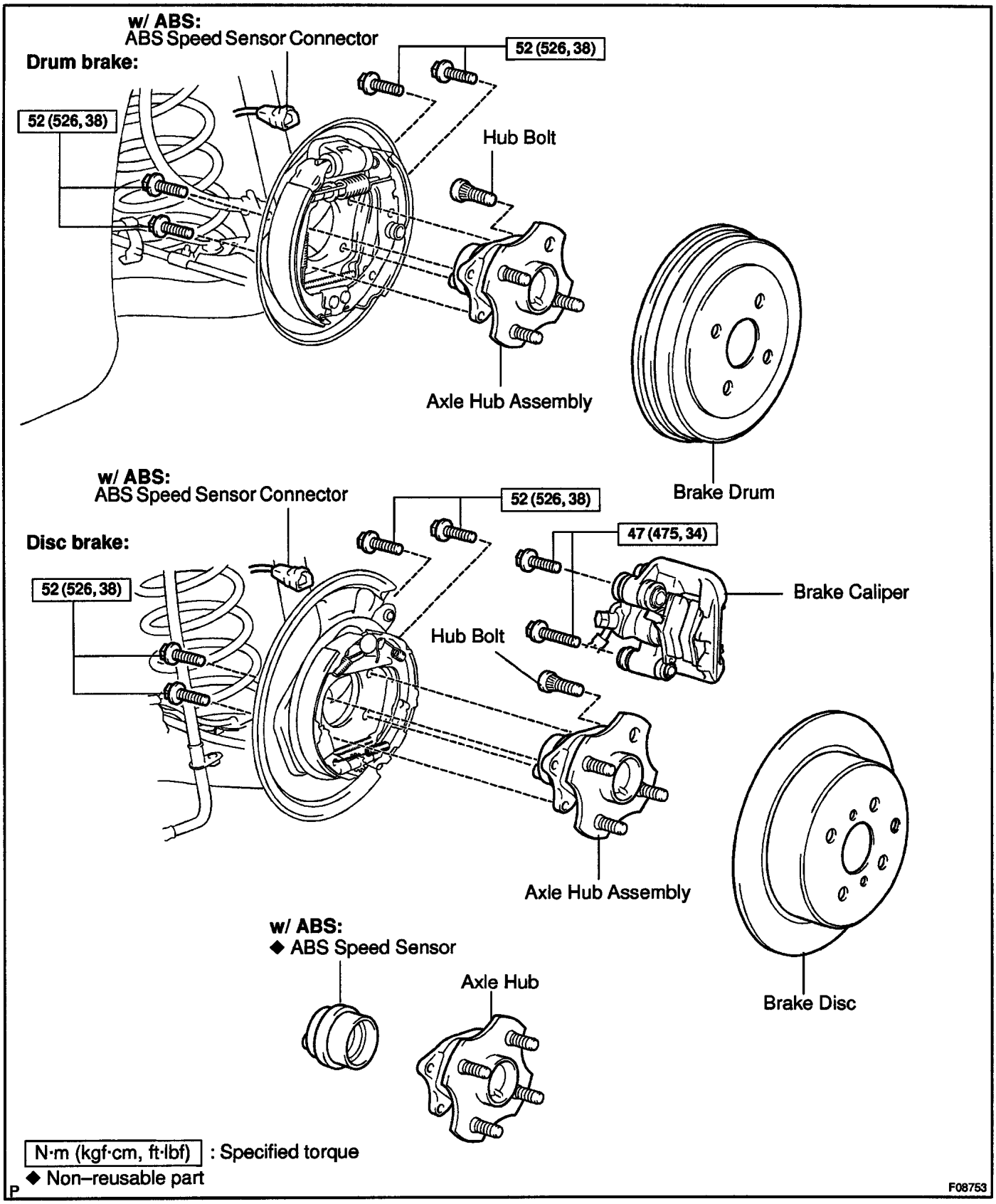
(b) Employ the same manner described above to the other side.

12. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR AXLE HUB

COMPONENTS

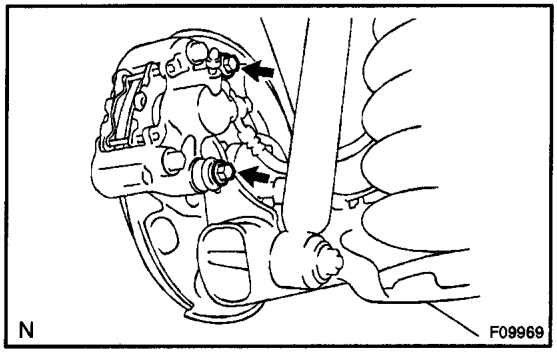
SA085-06



F08753

REMOVAL

1. REMOVE REAR WHEEL

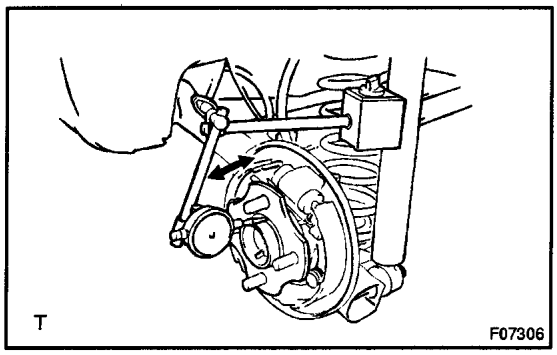


2. w/ Disc brake:
REMOVE BRAKE CALIPER AND DISC

(a) Remove the 2 bolts, brake caliper and disc.

(b) Support the brake caliper securely.

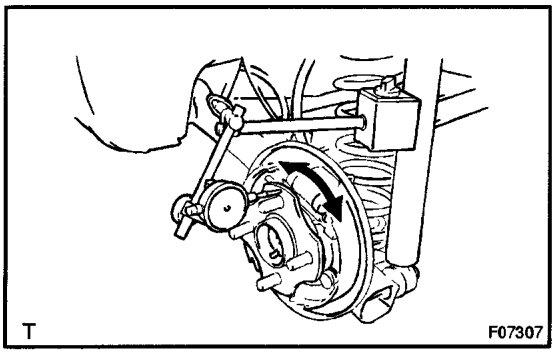
3. w/ Drum brake:
REMOVE BRAKE DRUM



4. CHECK BEARING BACKLASH AND AXLE HUB DEVIATION

(a) Set a dial indicator near the center of the axle hub and check the backlash in the bearing shaft direction.
Maximum: 0.05 mm (0.0020 in.)

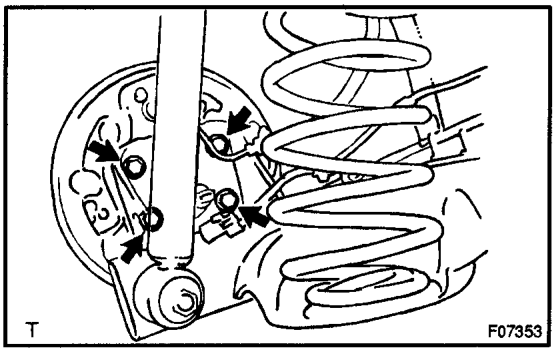
If the backlash exceeds the maximum, replace the axle hub assembly.



(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 assembly.

5. w/ ABS:
DISCONNECT ABS SPEED SENSOR CONNECTOR



6. REMOVE AXLE HUB ASSEMBLY

(a) Remove the 4 bolts and axle hub assembly.

(b) Support the rear brake assembly securely.

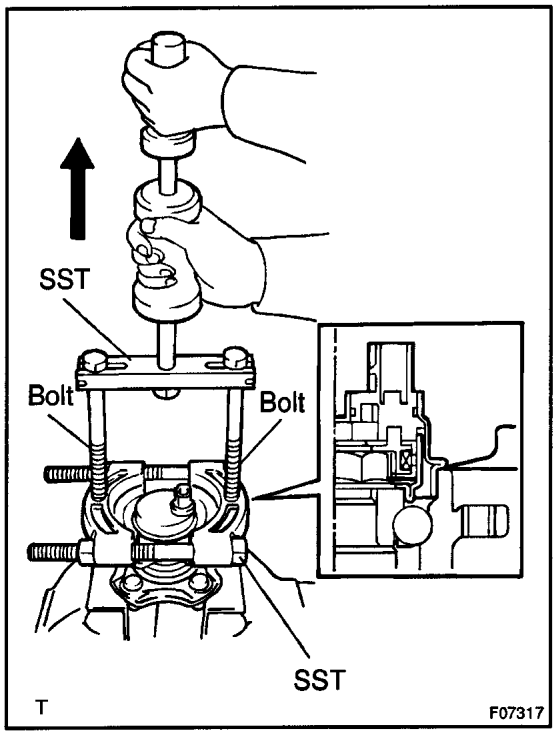
SA1L8-01

DISASSEMBLY

w/ ABS:

REMOVE ABS SPEED SENSOR

(a) Using a pin punch and hammer, drive out the 2 pins and remove the 2 attachments from SST.
SST 09520–00031 (09520–00040, 09521–00020)



(b) Mount the axle hub assembly in a soft jaw vise.

NOTICE:

Replace the axle hub assembly if it is dropped or a strong shock is given to it.

(c) Using SST and 2 bolts (Diameter: 12 mm, Pitch: 1.5 mm), remove the ABS speed sensor.
SST 09520–00031 (09520–00040, 09521–00020), 09950–00020

NOTICE:

- **Do not allow any foreign matter sticking to the sensor rotor.**
- **Pull out the ABS speed sensor straightly not to damage the sensor rotor.**
- **If damage has occurred to the sensor rotor, replace the axle hub assembly.**
- **Do not scratch the contacting surface of the axle hub and speed sensor.**

SA1L9-01

REASSEMBLY

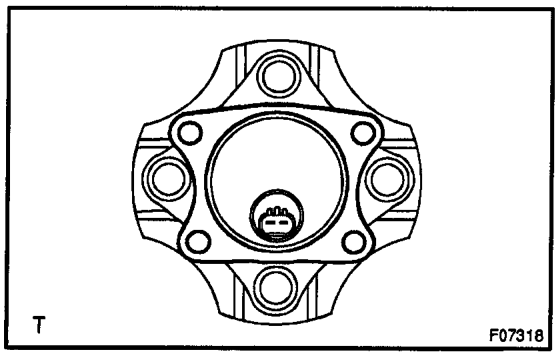
w/ ABS:

INSTALL NEW ABS SPEED SENSOR

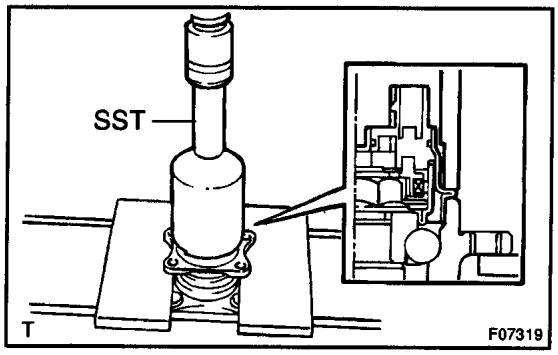
(a) Clean the contacting surface of the axle hub and a new ABS speed sensor.

NOTICE:

Do not allow any foreign matter sticking to the sensor rotor.



(b) Place the ABS speed sensor on the axle hub so that the connector is set at the bottom under the on–vehicle condition.



(c) Using SST and a press, install a new ABS speed sensor to the axle hub.
SST 09214–76011

NOTICE:

- **Do not tap the speed sensor with a hammer directly.**
- **Check that there should be no foreign matter on the speed sensor detection portion.**
- **Press in the ABS speed sensor straightly and slowly.**

SA087-06

INSTALLATION

1. **INSTALL AXLE HUB ASSEMBLY**

Install the axle hub assembly with the 4 bolts.

Torque: 52 N·m (526 kgf·cm, 38 ft·lbf)

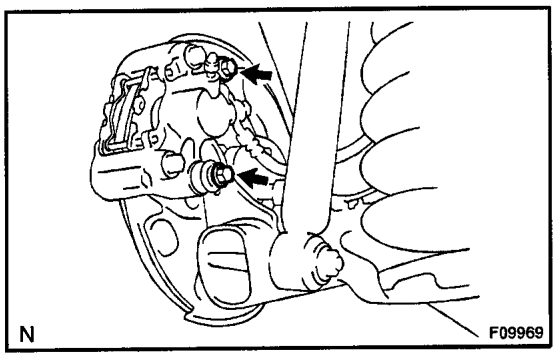
2. **w/ ABS:**
   CONNECT ABS SPEED SENSOR CONNECTOR TO AXLE HUB ASSEMBLY
3. **CHECK BEARING BACKLASH AND AXLE HUB DEVIATION (See page SA–41)**
4. **w/ Drum brake:**
   INSTALL BRAKE DRUM
5. **w/ Disc brake:**
   INSTALL BRAKE CALIPER AND DISC
   Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)
6. **INSTALL REAR WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
7. **w/ ABS:**
   CHECK ABS SPEED SENSOR SIGNAL (See page DI–60)

REAR WHEEL HUB BOLT

SA1QP–01

REPLACEMENT

1. REMOVE REAR WHEEL

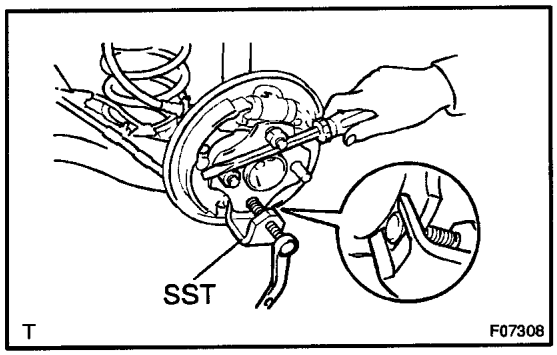


2. w/ Disc brake:
REMOVE BRAKE CALIPER AND DISC

(a) Remove the 2 bolts, brake caliper and disc.

(b) Support the brake caliper securely.

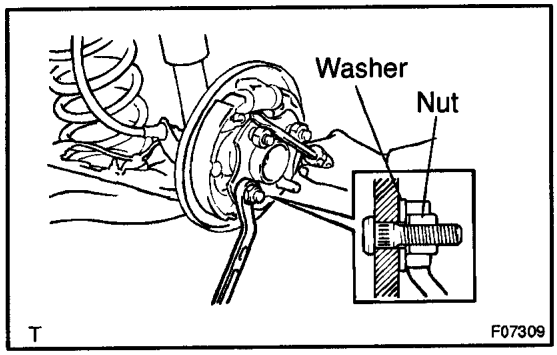
3. w/ Drum brake:
REMOVE BRAKE DRUM



4. REMOVE HUB BOLT

Using SST, 2 nuts and a screwdriver or an equivalent, remove the hub bolt.

SST 09628–10011



5. INSTALL HUB BOLT

(a) Install a washer and nut to a new hub bolt as shown in the illustration.

(b) Using a screwdriver or an equivalent to hold, install the hub bolt by torquing the nut.

(c) Remove the 3 nuts and washer.

6. w/ Drum brake:
INSTALL BRAKE DRUM

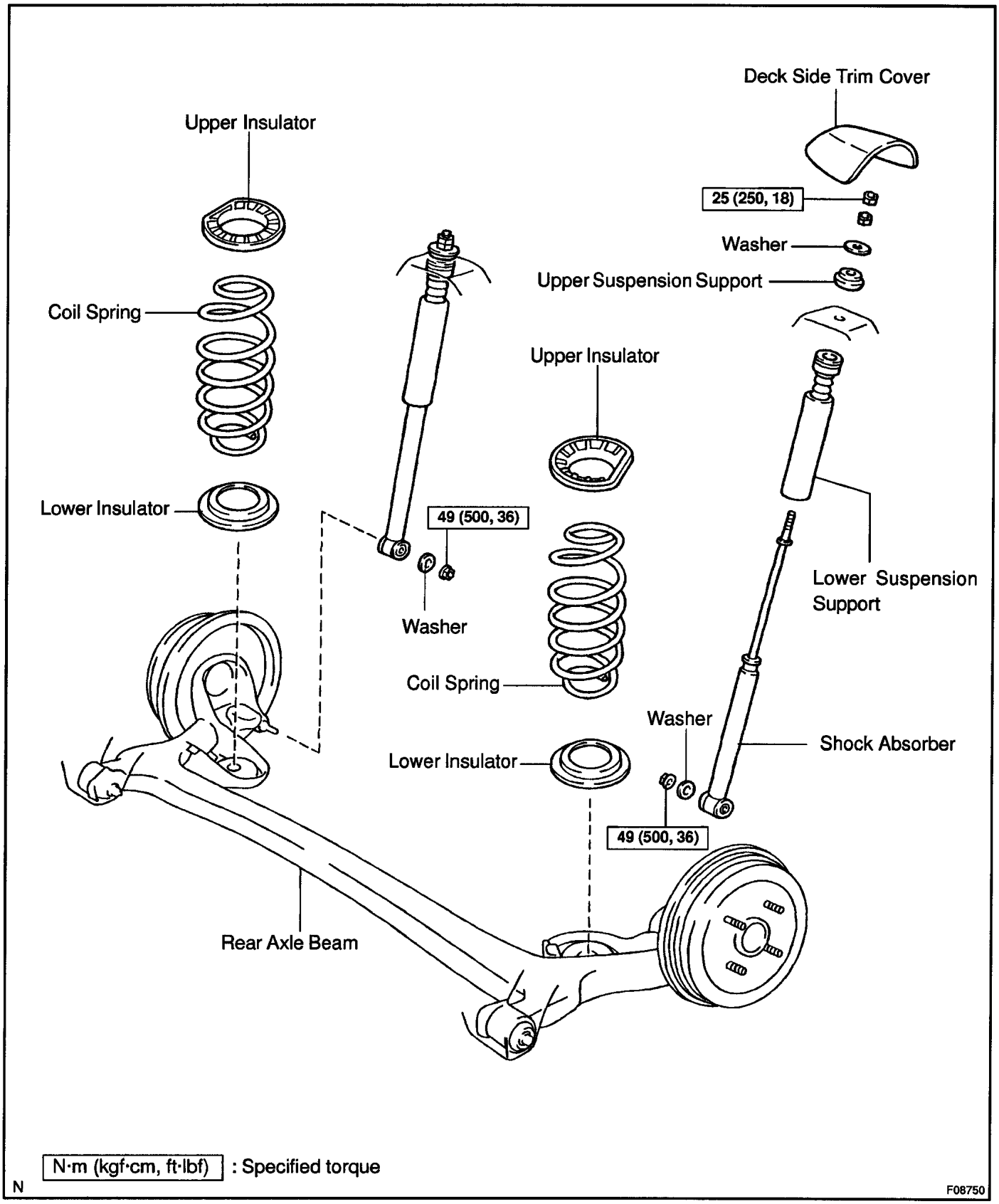
7. w/ Disc brake:
INSTALL BRAKE CALIPER AND DISC
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

8. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

COIL SPRING AND REAR SHOCK ABSORBER

COMPONENTS

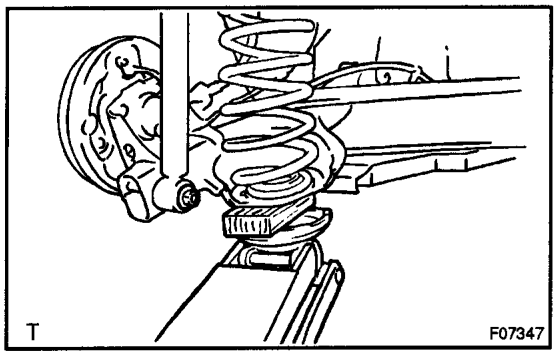
SA1LA-02



SA08A-05

REMOVAL

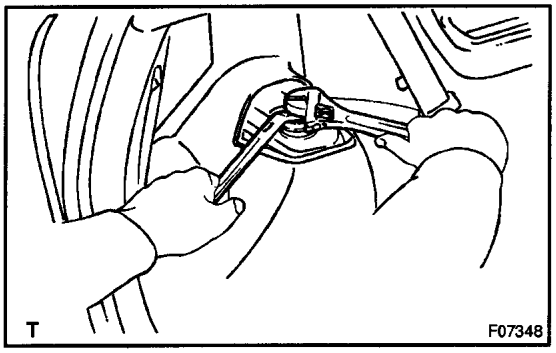
1. REMOVE REAR WHEELS



2. SUPPORT REAR AXLE BEAM AT RIGHT AND LEFT SIDES WITH JACKS

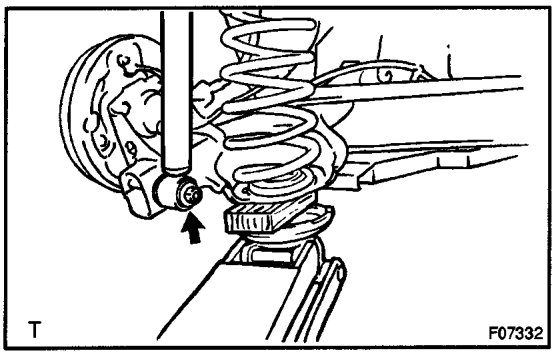
3. REMOVE SHOCK ABSORBER

(a) Remove the deck side trim cover.



(b) While holding the piston rod, remove the 2 nuts.

(c) Remove the washer and upper suspension support.



(d) Remove the nut, washer and shock absorber.

(e) Remove the lower suspension support.

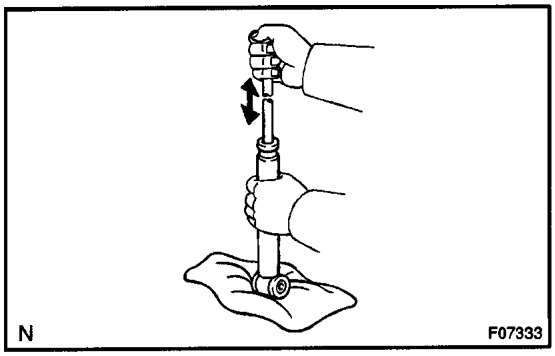
4. REMOVE COIL SPRING

(a) Remove the opposite shock absorber lower side set nut and washer, and disconnect the shock absorber from the axle beam.

(b) Lower the jacks gradually.

(c) Remove the coil spring, upper and lower insulators.

SA05C–03



INSPECTION

INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual sound during operation.

If there is any abnormality, replace the shock absorber with a new one.

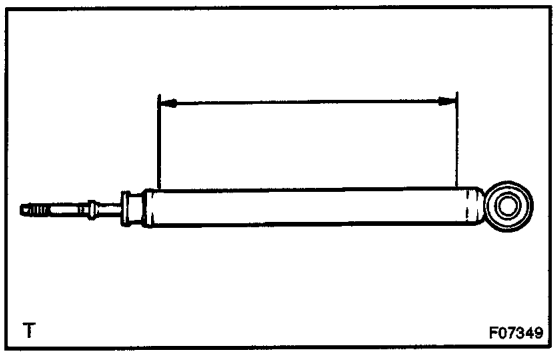
NOTICE:

When disposing of the shock absorber, see DISPOSAL on page SA–49.

SA08D-03

DISPOSAL

1. FULLY EXTEND SHOCK ABSORBER ROD



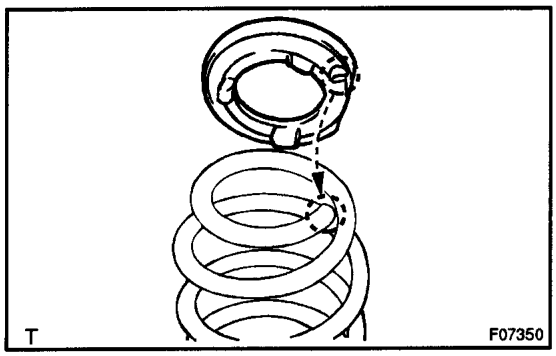
2. DRILL HOLE TO DISCHARGE GAS FROM CYLINDER

Using a drill, make a hole in the cylinder as shown in the illustration to discharge the gas inside.

CAUTION:

- **When drilling, chips may fly out, work carefully.**
- **The gas is colorless, odorless and non–poisonous.**

SA1LB-02



INSTALLATION

1. INSTALL COIL SPRING

(a) Install the upper insulator so that its gap fits to the end of coil spring.

(b) Install the lower insulator and coil spring to the axle beam.

2. INSTALL SHOCK ABSORBER

(a) While lifting the jacks, connect both shock absorbers to axle beam with the washers and nuts.

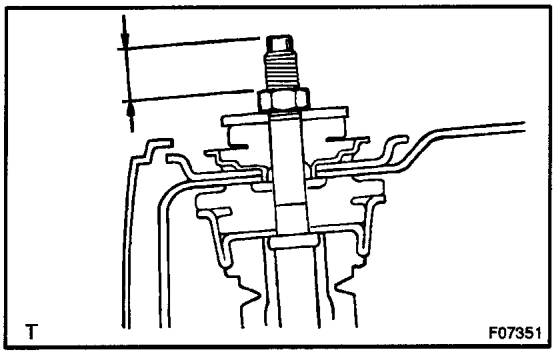
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

HINT:

After stabilizing the suspension, torque the nuts.

(b) Install the lower suspension support to the shock absorber.

(c) Install the shock absorber, upper suspension support and washer to the body.



(d) While holding the piston rod, install the lower nut so that the piston rod protrudes 15 – 18 mm (0.591 – 0.709 in.) from the lower nut.

(e) Install the upper nut and torque it against to the lower one.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(f) Install the deck side trim cover.

3. REMOVE JACKS

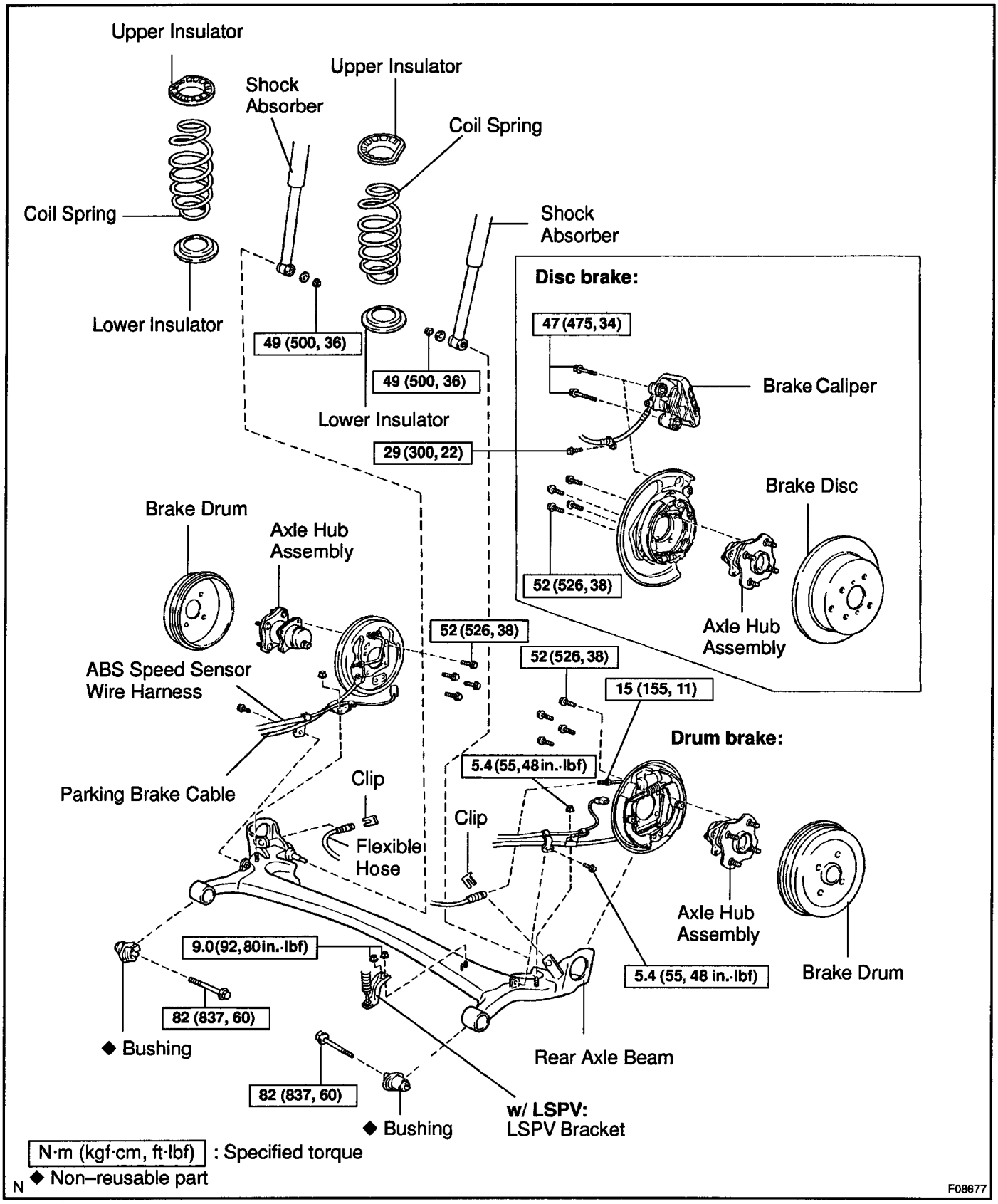
4. INSTALL REAR WHEELS

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR AXLE BEAM

COMPONENTS

SA0CW-04



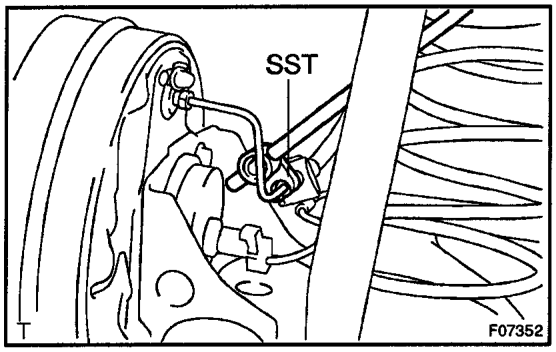
SA1OQ-01

REMOVAL

1. **REMOVE REAR WHEELS**
2. **w/ Disc brake:**
   DISCONNECT FLEXIBLE HOSE FROM AXLE BEAM BRACKET

(a) Remove the bolt and disconnect the flexible hose from the axle beam bracket.

(b) Employ the same manner described above to the other side.

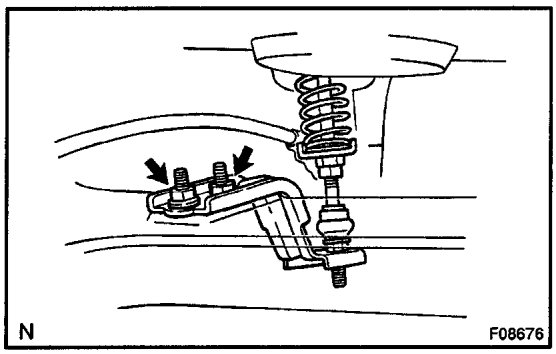


3. **w/ Drum brake:**
   DISCONNECT BRAKE LINES

(a) Using SST, disconnect the brake lines from the flexible hose. Use a container to catch brake fluid as it drains out.
SST 09023–00100

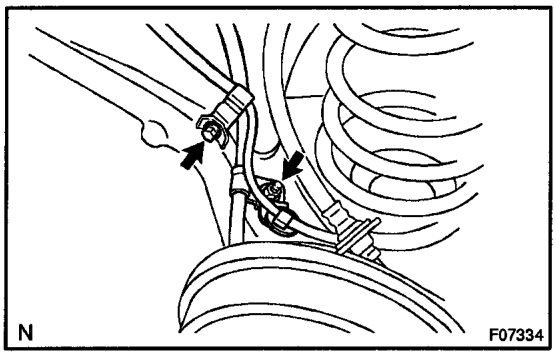
(b) Remove the clip.

(c) Employ the same manner described above to the other side.



4. **w/ LSPV:**
   DISCONNECT LSPV BRACKET

Remove the 2 nuts and disconnect the LSPV bracket from the axle beam.



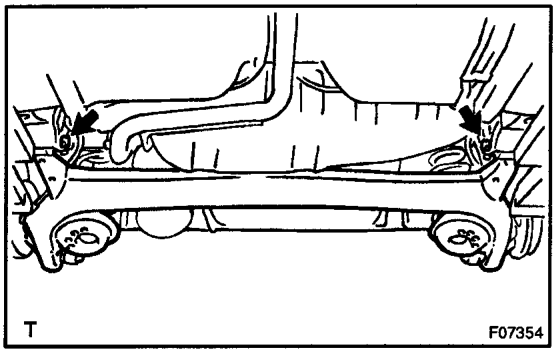
5. **DISCONNECT ABS SPEED SENSOR WIRE HARNESS AND PARKING BRAKE CABLE CLAMPS**

(a) Remove the bolt and nut, and disconnect the ABS speed sensor wire harness and parking brake cable clamps from the axle beam.

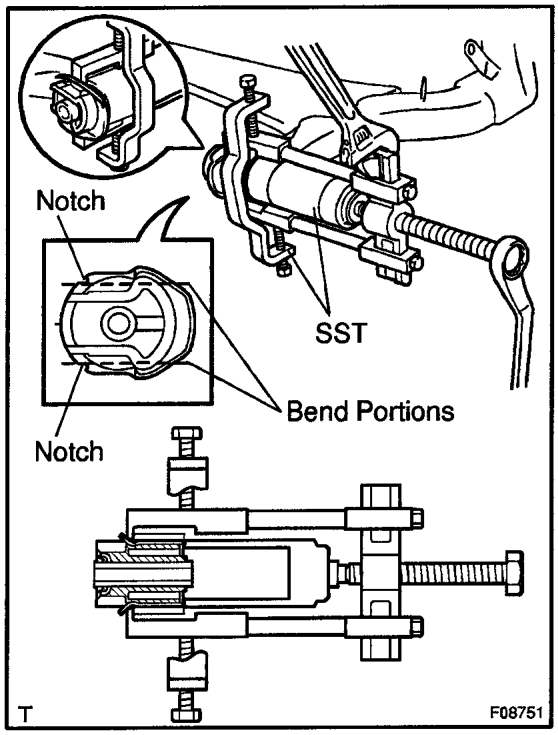
(b) Employ the same manner described above to the other side.

6. **REMOVE AXLE HUB ASSEMBLES (See page SA–41)**
7. **REMOVE REAR COIL SPRINGS (See page SA–47)**
8. **REMOVE REAR AXLE BEAM**

Remove the 2 bolts and rear axle beam.



SA0QY-04



REPLACEMENT

1. REMOVE BUSHING

(a) Place matchmarks on the 2 notches of the bushing and axle beam.

(b) Using a chisel and hammer, bend the 2 portions of the bushing rib.

HINT:

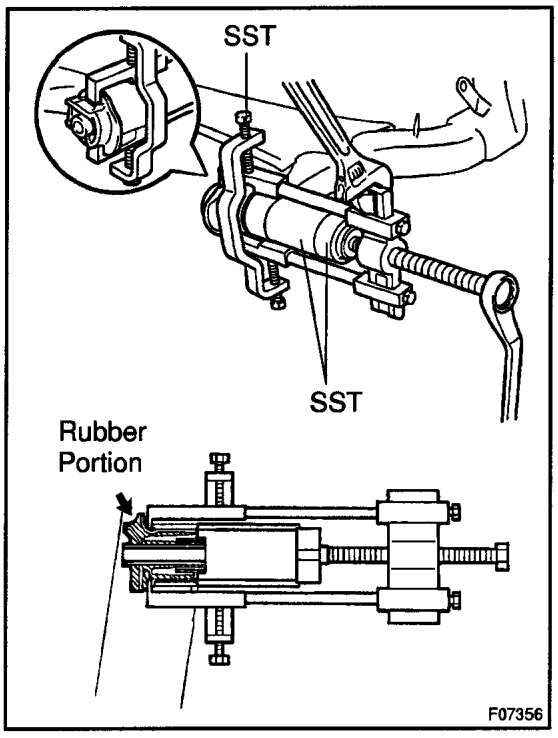
Bend the bushing rib until the claw of SST can be hung.

(c) Using SST, remove the bushing from the axle beam.

SST 09309–37010, 09950–40011 (09951–04010, 09952–04010, 09953–04010, 09954–04020, 09955–04051, 09957–04010, 09958–04011)

NOTICE:

If the axle beam has been scratched, apply the paint.



2. INSTALL BUSHING

(a) Align the matchmarks on the axle beam with the 2 notches of a new bushing and temporarily install the bushing to the axle beam.

(b) Using SST, install the bushing to the axle beam.

SST 09710–14013 (09710–00021), 09950–40011 (09951–04010, 09952–04010, 09953–04030, 09954–04020, 09955–04031, 09957–04010, 09958–04011), 09950–60010 (09951–00560)

NOTICE:

- **Hang the claw of SST to the bushing deeply and firmly.**
- **Do not scratch the rubber portion of the bushing.**
- **Do not deform the bushing rib.**

SA1LD-03

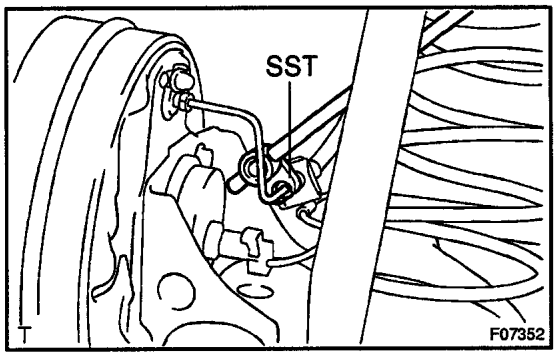
INSTALLATION

1. **INSTALL REAR AXLE BEAM**
   Torque: 82 N·m (837 kgf·cm, 60 ft·lbf)

HINT:
After adjusting the vehicle height by pushing down or lifting up the body, torque the 2 bolts.

2. **INSTALL REAR COIL SPRINGS (See page SA–50)**
3. **INSTALL AXLE HUB ASSEMBLES (See page SA–44)**
4. **CONNECT ABS SPEED SENSOR WIRE HARNESS AND PARKING BRAKE CABLE CLAMPS**
   Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
5. **w/ LSPV:**
   CONNECT LSPV BRACKET
   Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
6. **w/ Drum brake:**
   CONNECT BRAKE LINES

(a) Install the flexible hose with the clip.



(b) Using SST, connect the brake line to the flexible hose.
SST 09023–00100
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

(c) Employ the same manner described above to the other side.

7. **w/ Disc brake:**
   CONNECT FLEXIBLE HOSE TO AXLE BEAM BRACKET
   Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
8. **w/ Drum brake:**
   BLEED BRAKE SYSTEM (See page BR–4)
9. **INSTALL REAR WHEELS**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
10. **CHECK ABS SPEED SENSOR SIGNAL (See page DI–60)**

BRAKE

BRAKE SYSTEM BR–1
TROUBLESHOOTING BR–2
BRAKE FLUID BR–4
BRAKE PEDAL BR–6
PARKING BRAKE LEVER BR–9
BRAKE MASTER CYLINDER BR–10
BRAKE BOOSTER ASSEMBLY BR–14
FRONT BRAKE PAD BR–20
FRONT BRAKE CALIPER BR–23
REAR DRUM BRAKE BR–29
REAR BRAKE PAD BR–34
REAR BRAKE CALIPER BR–37
PARKING BRAKE BR–43
LOAD SENSING PROPORTIONING VALVE (LSPV) BR–48
ABS ACTUATOR BR–53
FRONT SPEED SENSOR BR–58
REAR SPEED SENSOR BR–61

BRAKE SYSTEM

PRECAUTION

BR0B-01

- **Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with parts having the same part number or equivalent.**
- **It is very important to keep parts and the area clean when repairing the brake system.**
- **If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.**

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

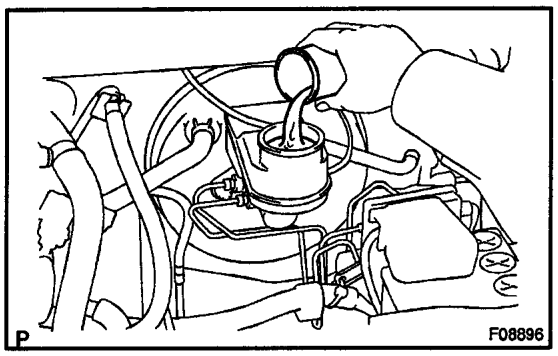
BR0AA-04

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	Page
Low pedal or spongy pedal	1. Fluid leaks for brake system	DI-98
	2. Air in brake system	BR-4
	3. Piston seal (Worn or damaged)	BR-23
		BR-29
		BR-37
	4. Rear brake shoe clearance (Out of adjustment)	BR-33
		BR-47
	5. Master cylinder (Faulty)	BR-10
	6. Booster push rod (Out of adjustment)	BR-18
Brake drag	1. Brake pedal freeplay (Minimal)	BR-6
	2. Parking brake lever travel (Out of adjustment)	BR-9
	3. Parking brake wire (Sticking)	–
	4. Rear brake shoe clearance (Out of adjustment)	BR-33
		BR-47
	5. Pad or lining (Cracked or distorted)	BR-20
		BR-29
		BR-34
	6. Piston (Stuck or frozen)	BR-23
		BR-29
		BR-37
	7. Anchor or return spring (Faulty)	BR-29
		BR-43
	8. Booster push rod (Out of adjustment)	BR-18
	9. Vacuum leaks for booster system	BR-15
	10.Master cylinder (Faulty)	BR-10
Brake pull	1. Piston (Stuck or frozen)	BR-23
		BR-29
		BR-37
	2. Pad or lining (Oily)	BR-20
		BR-29
		BR-34
	3. Disc (Scored)	BR-26
		BR-40
	4. Pad or lining (Cracked or distorted)	BR-20
		BR-29
		BR-34

BR

Hard pedal but brake inefficient	1. Fluid leaks for brake system	DI–98
	2. Air in brake system	BR–4
	3. Pad or lining (Worn)	BR–20 BR–29 BR–34
	4. Pad or lining (Cracked or distorted)	BR–20 BR–29 BR–34
	5. Rear brake shoe clearance (Out of adjustment)	BR–33 BR–47
	6. Pad or lining (Oily)	BR–20 BR–29 BR–34
	7. Pad or lining (Glazed)	BR–20 BR–29 BR–34
	8. Disc (Scored)	BR–26 BR–40
	9. Booster push rod (Out of adjustment)	BR–18
	10.Vacuum leaks for booster system	BR–15
Noise from brakes	1. Pad or lining (Cracked or distorted)	BR–20 BR–29 BR–34
	2. Installation bolt (Loose)	BR–23 BR–37
	3. Disc (Scored)	BR–26 BR–40
	4. Pad support plate (Loose)	BR–20
	5. Sliding pin (Worn)	BR–26 BR–40
	6. Pad or lining (Dirty or glazed)	BR–20 BR–29 BR–34
	7. Anchor or return spring (Faulty)	BR–29 BR–43
	8. Anti–squeal shim (Damaged)	BR–29 BR–43
	9. Shoe hold–down spring (Damaged)	BR–29 BR–43



BRAKE FLUID

BLEEDING

BR0RA-04

HINT:

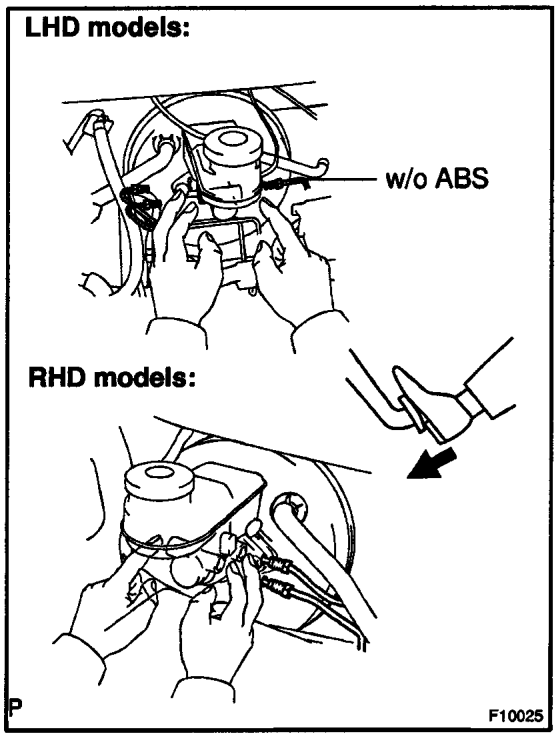
If any work is done on the brake system or air in the brake lines is suspected, bleed the air from the system.

NOTICE:

- **Do not let brake fluid remain on a painted surface. Wash it off immediately.**
- **RHD models:**
  Be careful not to let the brake fluid splash over the alternator.

1. **FILL BRAKE RESERVOIR WITH BRAKE FLUID**
   Fluid: SAE J1703 or FMVSS No. 116 DOT3

BR



2. **BLEED MASTER CYLINDER**

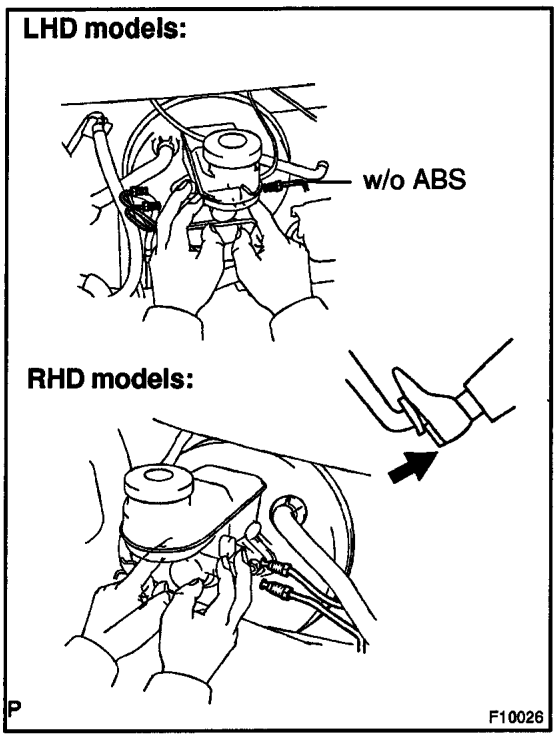
HINT:

If the master cylinder has been disassembled or the reservoir becomes empty, bleed the master cylinder.

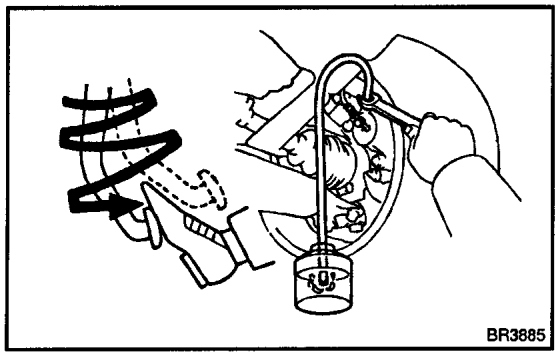
(a) LHD models:
Disconnect the 2 or 3 brake lines from the master cylinder.

(b) RHD models:
Disconnect the 2 brake lines from the master cylinder.

(c) Slowly depress the brake pedal and hold it.



(d) Block off the outer plug with your finger and release the brake pedal.
(e) Repeat (c) and (d) 3 or 4 times.



3. BLEED BRAKE LINE

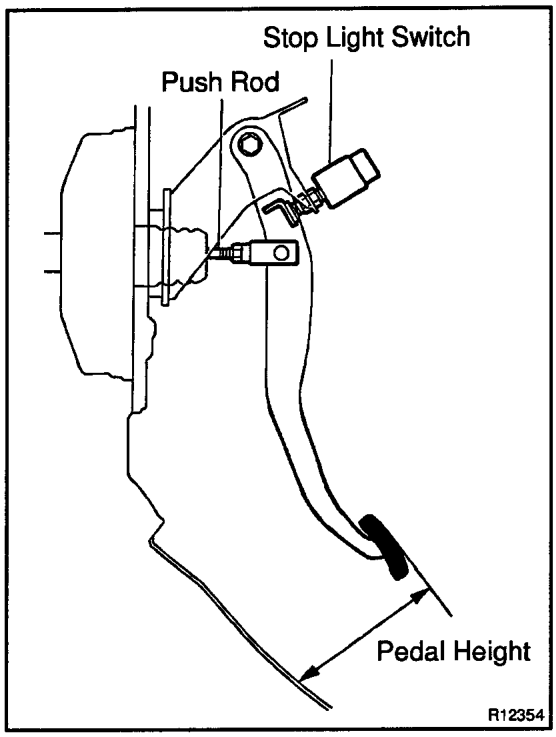
(a) Connect the vinyl tube to the caliper or wheel cylinder.
(b) Depress the brake pedal several times, then loosen the bleeder plug with the pedal held down.
(c) At the point when fluid stops coming out, tighten the bleeder plug, then release the brake pedal.
(d) Repeat (b) and (c) until all the air in the fluid has been bled out.
(e) Repeat the above procedure to bleed the brake line for each wheel.

Torque: (Bleeder plug) 8.3 N·m (85 kgf·cm, 73 in.·lbf)

4. CHECK FLUID LEVEL IN RESERVOIR

Check the fluid level and add fluid if necessary.

Fluid: SAE J1703 or FMVSS No. 116 DOT3



BRAKE PEDAL

BR0RB-06

ON–VEHICLE INSPECTION

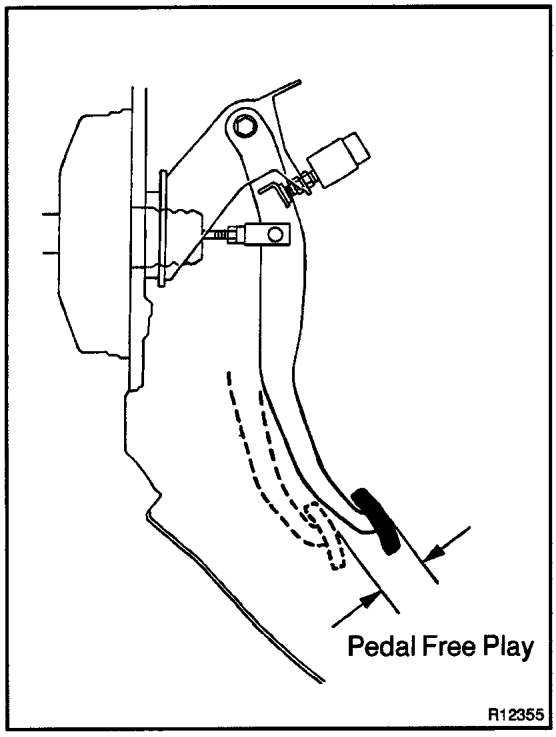
1. CHECK PEDAL HEIGHT

Pedal height from dash panel:
LHD: 124.3 – 134.3 mm (4.894 – 5.287 in.)
RHD: 129.3 – 139.3 mm (5.091 – 5.482 in.)

If the pedal height is incorrect, adjust it.

2. 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: 26 N·m (260 kgf·cm, 20 ft·lbf)
(f) Install the stop light switch.
(g) Connect the connector to the stop light switch.
(h) Push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), turn the stop light switch to lock the nut in the position where the stop light goes off.
(i) 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 free play.

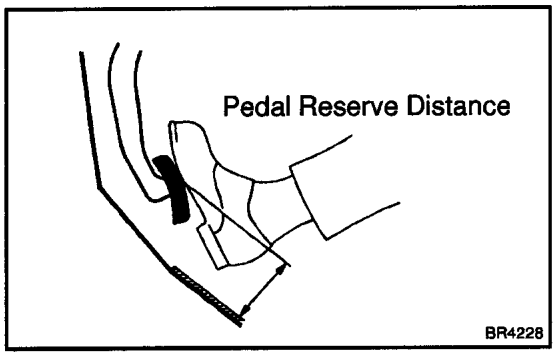


3. CHECK PEDAL FREE PLAY

(a) Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.
(b) Push in the pedal by hand until the resistance begins to be felt, then measure the distance, as shown.
Pedal free play: 1 – 3 mm (0.04 – 0.12 in.)

If incorrect, check the stop light switch clearance. If the clearance is OK, then troubleshoot the brake system.

Stop light switch clearance:
0.5 – 2.4 mm (0.020 – 0.094 in.)



4. CHECK PEDAL RESERVE DISTANCE

Release the parking brake lever.

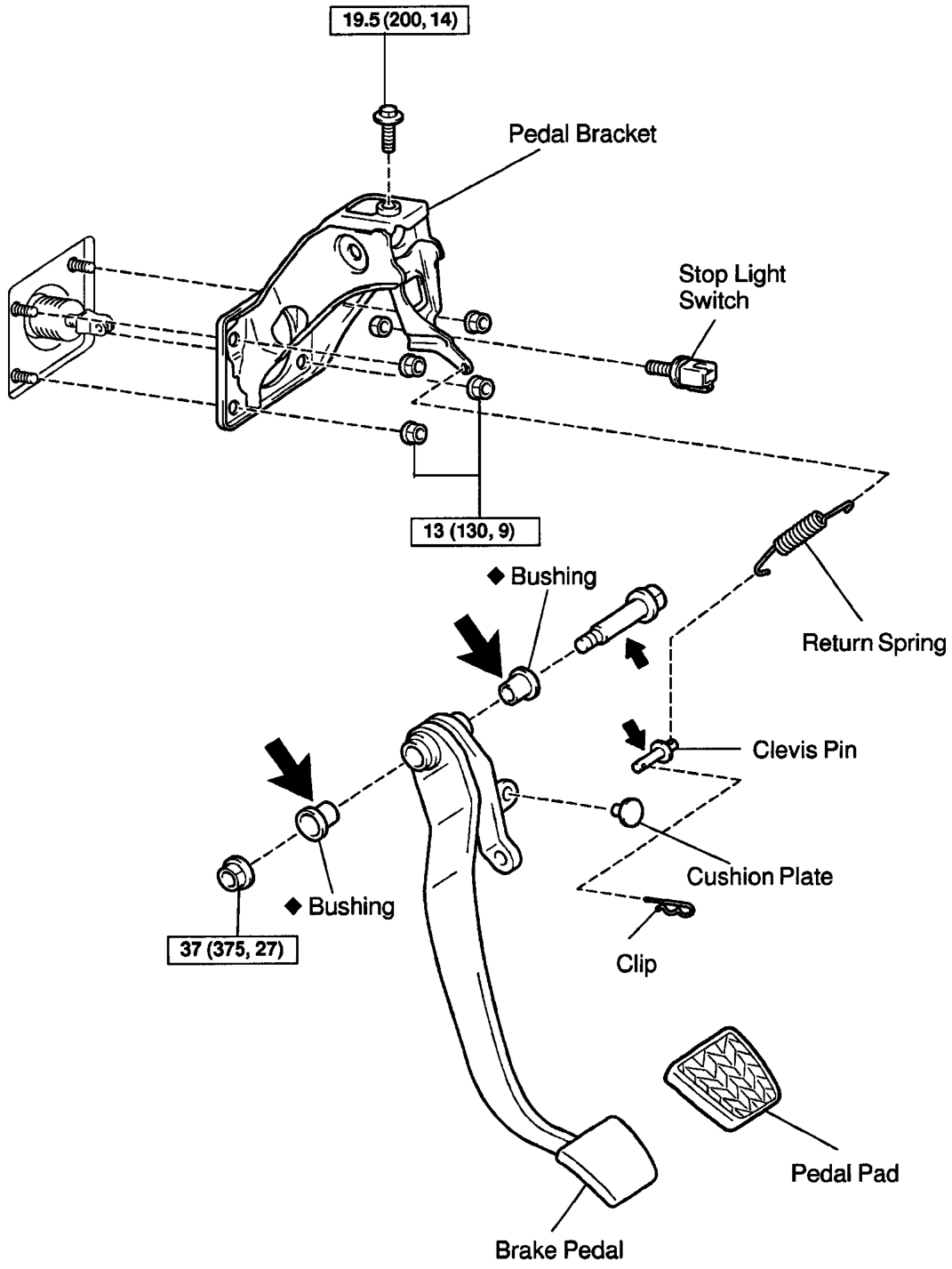
With the engine running, depress the pedal and measure the pedal reserve distance, as shown.

Pedal reserve distance from dash panel at 490 N (50 kgf, 110.2 lbf):
More than 48 mm (1.89 in.)

If the reserve distance is incorrect, troubleshoot the brake system.

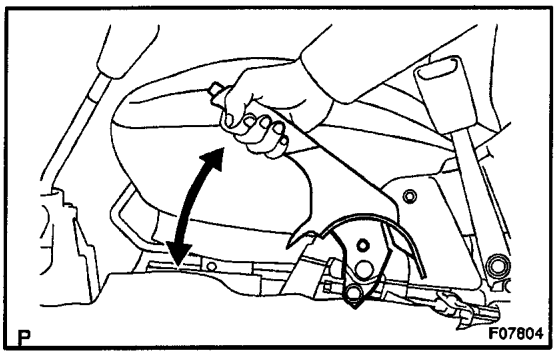
BR18I-01

COMPONENTS



N·m (kgf·cm, ft·lbf): Specified torque
◆ Non–reusable part
⬅ Lithium soap base glycol grease

F07807



PARKING BRAKE LEVER

BR0RC-04

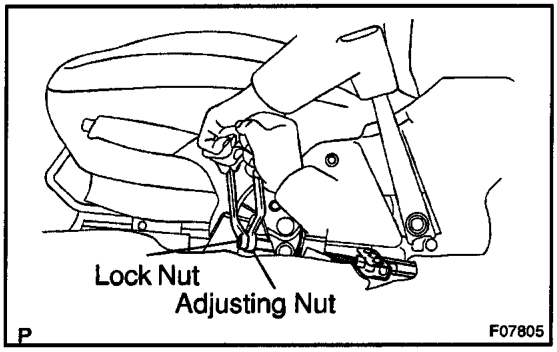
ON–VEHICLE INSPECTION

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): 6 – 9 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 page BR–33 or BR–47.

(a) Remove the console box.

(b) Loosen the lock nut and turn the adjusting nut until the lever travel is correct.

(c) Tighten the lock nut.

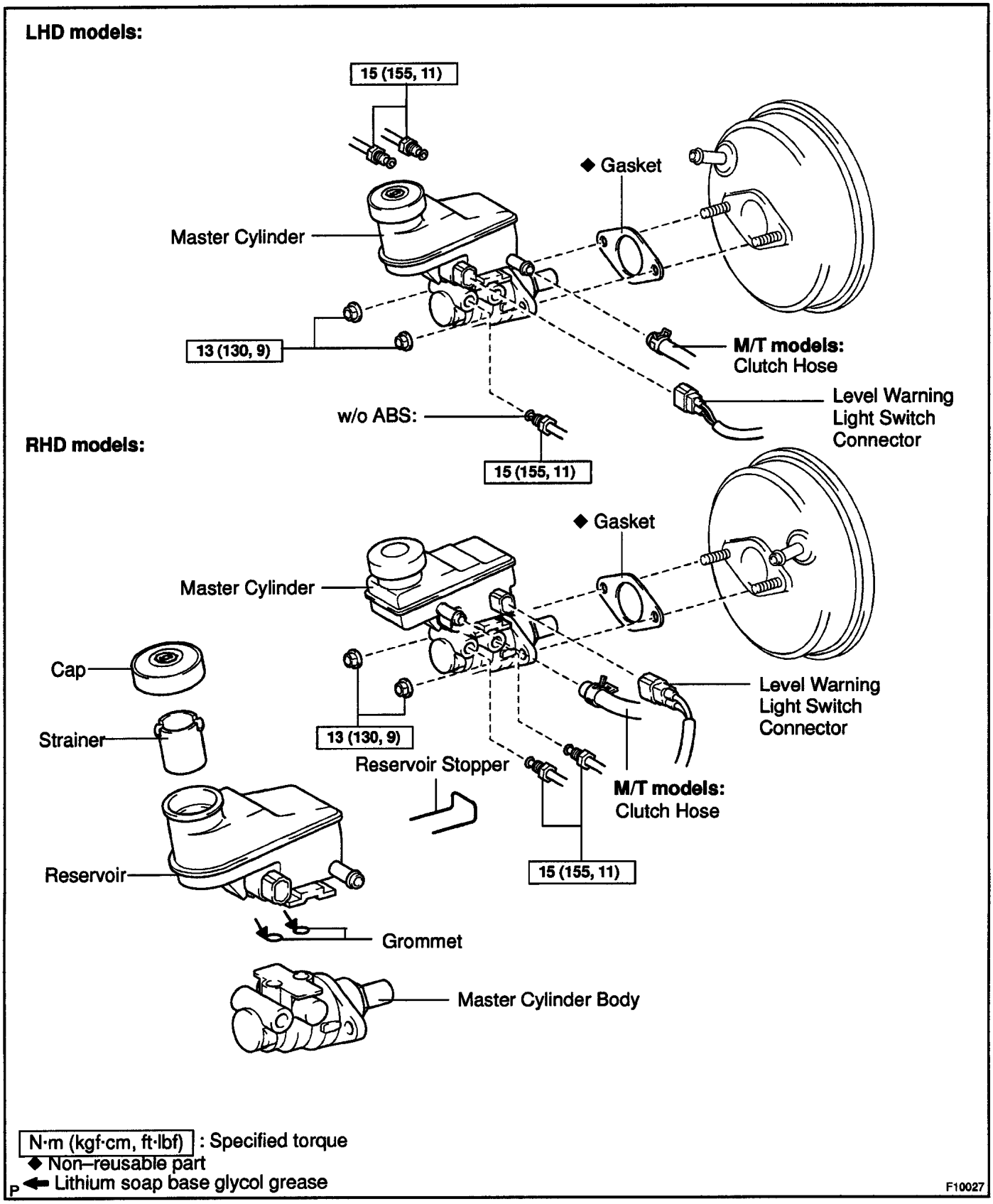
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(d) Install the console box.

BR112-02

BRAKE MASTER CYLINDER

COMPONENTS



BR

N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
P ⬅ Lithium soap base glycol grease

F10027

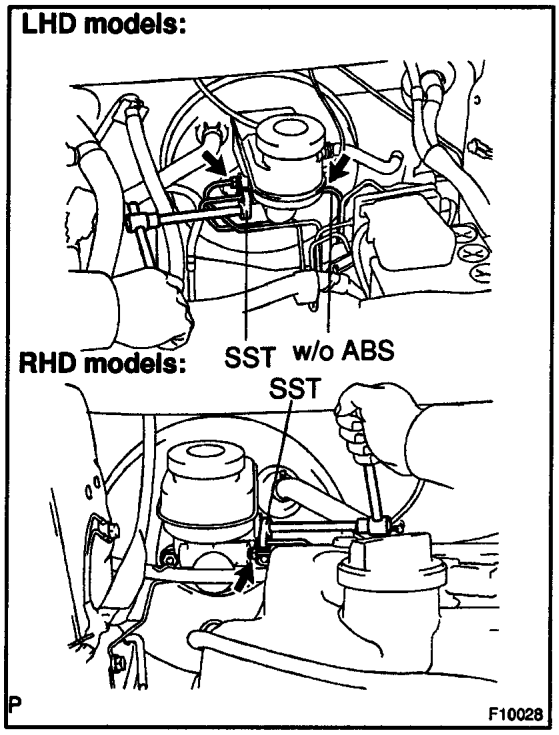
BR18A-01

REMOVAL

NOTICE:

- **Do not let brake fluid remain on a painted surface. Wash it off immediately.**
- **RHD models:**
  Be careful not to the brake fluid splash over the alternator.

1. **DISCONNECT LEVEL WARNING SWITCH CONNECTOR**
2. **DRAW OUT FLUID WITH SYRINGE**
3. **M/T models:**
   DISCONNECT CLUTCH HOSE FROM RESERVOIR

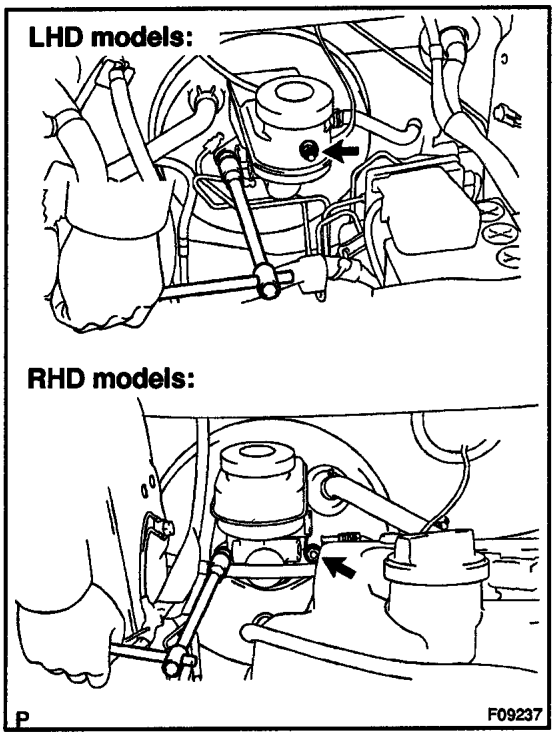


4. **DISCONNECT BRAKE LINES**

Using SST, disconnect the 2 or 3 brake lines from the master cylinder.

SST 09023–00100

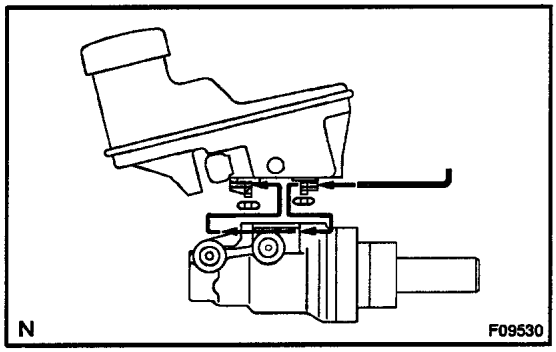
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)



5. REMOVE MASTER CYLINDER

Remove the 2 mounting nuts, and pull out the master cylinder and gasket.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



6. REMOVE RESERVOIR

(a) Pull out the reservoir stopper.

HINT:

At the time of installation, make sure to insert the reservoir stopper through holes of the reservoir and the master cylinder groove.

(b) Remove the reservoir and 2 grommets.

(c) Remove the cap and strainer from the reservoir.

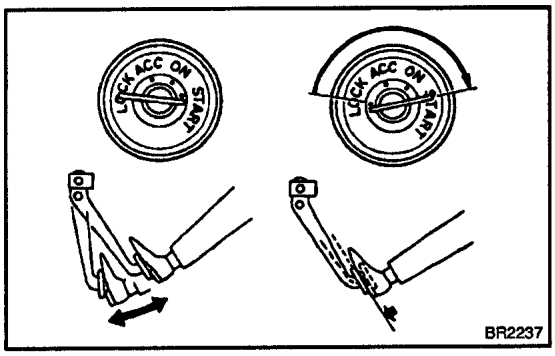
BR114-02

INSTALLATION

Installation is in the reverse order of removal (See page BR–13).

HINT:

- Before installation, adjust length of brake booster push rod (See page BR–18).
- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR–4).
- Check for leaks, check and adjust brake pedal (See page BR–6).



BRAKE BOOSTER ASSEMBLY

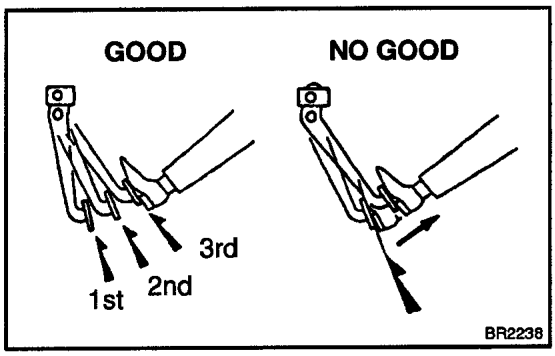
BR0RJ-03

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.

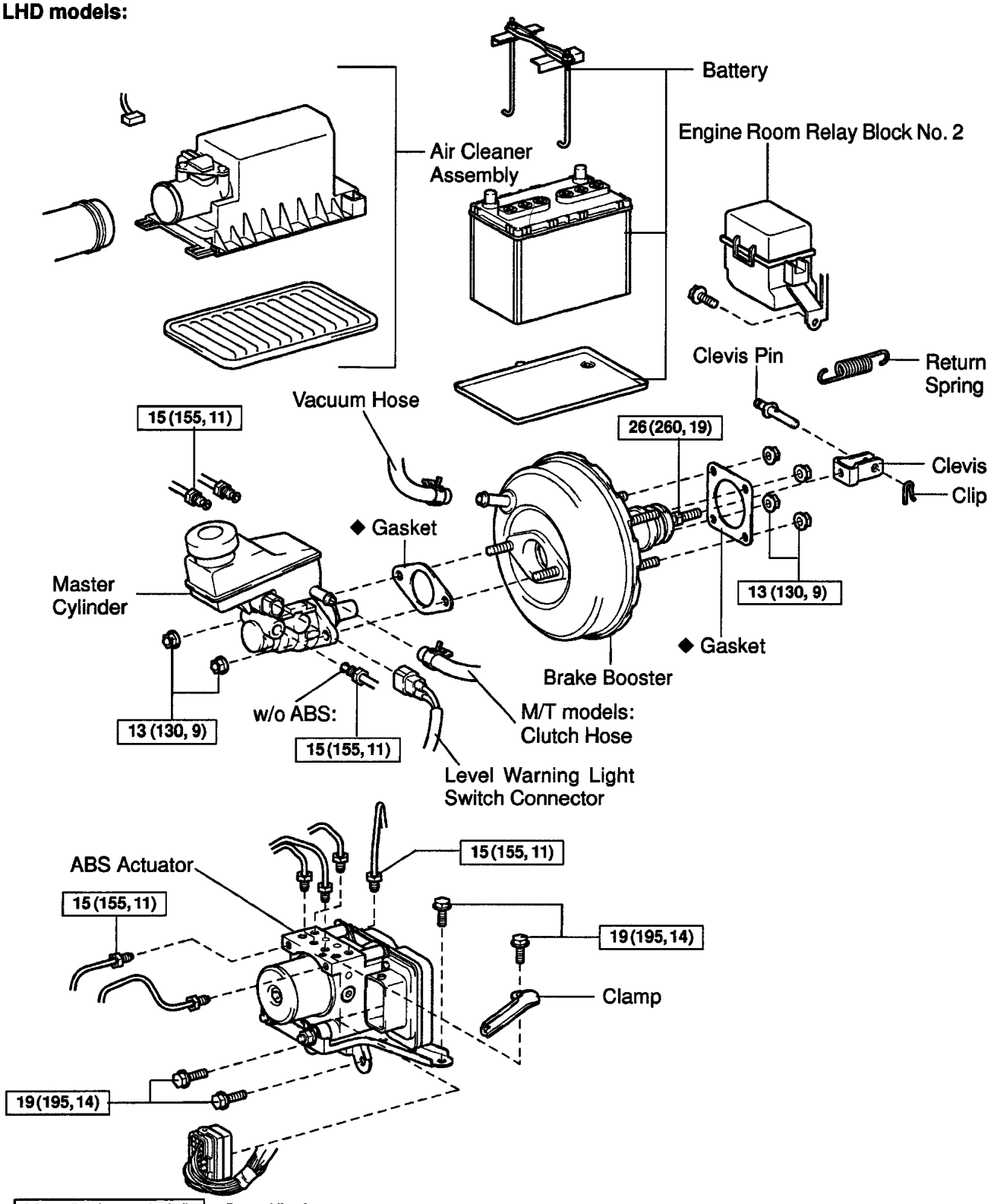
If the pedal goes down farthest the 1st time, but gradually rises after the 2nd or 3rd time, the booster is air tight.

(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 reserve travel after holding the pedal for 30 seconds, the booster is air tight.

BR183-01

COMPONENTS

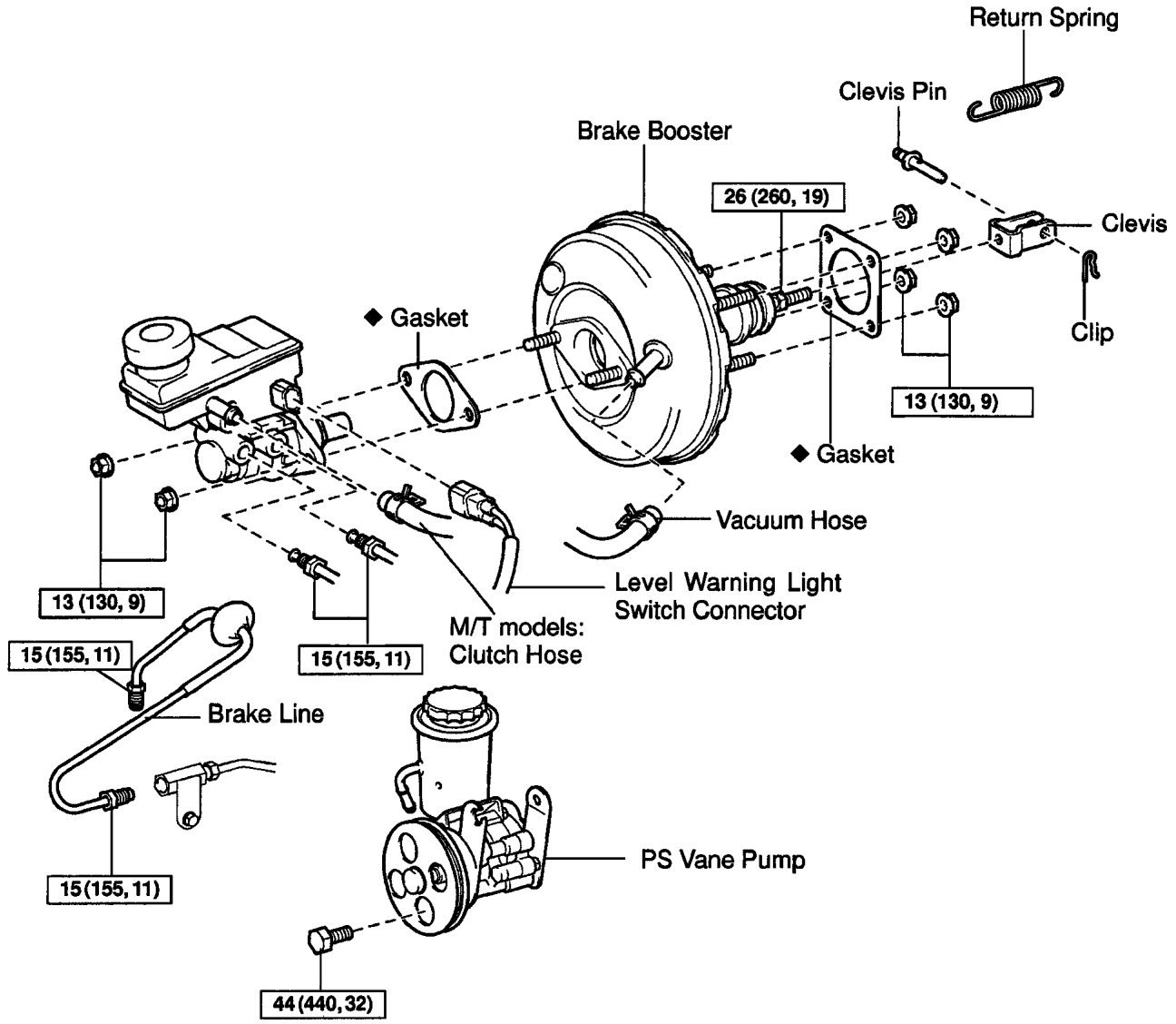
LHD models:



P N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

F09246

RHD models:



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

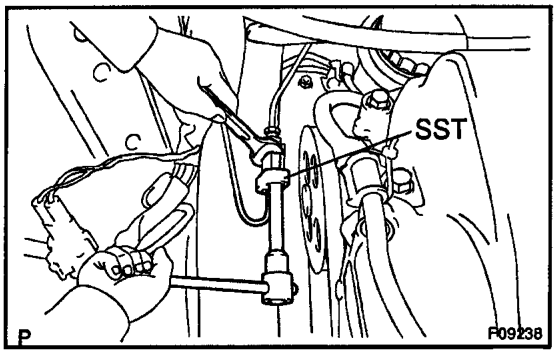
P

F10029

BR184-01

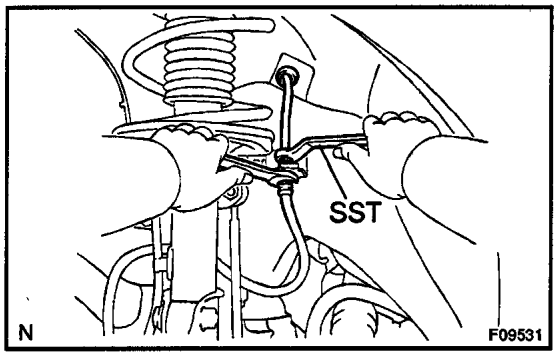
REMOVAL

1. **REMOVE MASTER CYLINDER (See page BR–11)**
2. **LHD models: REMOVE AIR CLEANER ASSEMBLY**
3. **LHD models: REMOVE ABS ACTUATOR (See page BR–56)**



4. **RHD models: REMOVE BRAKE LINE**

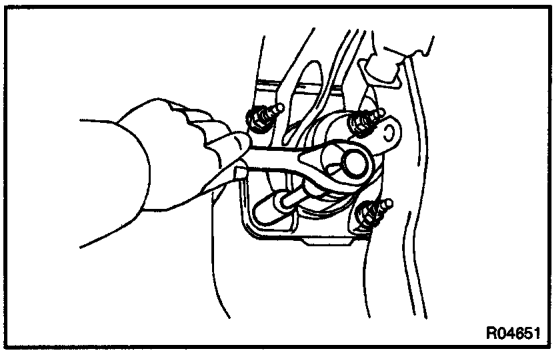
(a) Using SST and spanner, disconnect the brake line.
SST 09023–00100



(b) Using SST and spanner, disconnect the brake line from the flexible hose of RH front brake.

(c) Remove the brake line with grommet from the body.
SST 09751–36011

5. **RHD models: REMOVE 2 BOLTS OF PS VANE PUMP, AND MOVE PS VANE PUMP ASIDE (See page SR–25)**
6. **DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER**
7. **REMOVE RETURN SPRING**
8. **REMOVE CLIP AND CLEVIS PIN**



9. **REMOVE BRAKE BOOSTER**

(a) Remove the 4 nuts and clevis.

(b) Pull out the brake booster and gasket.

BR185-01

INSTALLATION

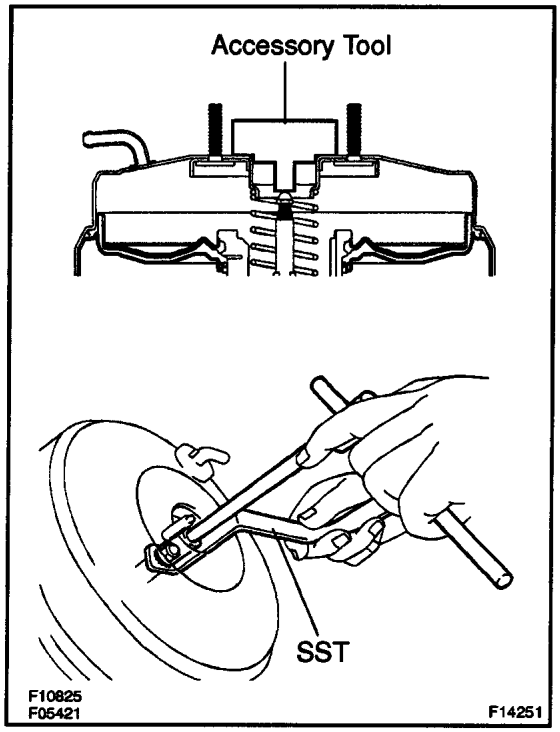
1. INSTALL BRAKE BOOSTER

(a) Install the booster and a new gasket.

(b) Install and torque the booster installation nuts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(c) Install the clevis, and torque the lock nut.
Torque: 26 N·m (260 kgf·cm, 19 ft·lbf)

(d) Insert the clevis pin into the clevis and brake pedal, and install the clip to the clevis pin and install the return spring.



2. When replacing the brake master cylinder only: ADJUST LENGTH OF BRAKE BOOSTER PUSH ROD

(a) Apply chalk to the tip of an accessory tool.

(b) Place the accessory tool to the brake booster.

(c) Measure the clearance between the brake booster push rod and accessory tool.
Clearance: 0 mm (0 in.)

HINT:

Adjust the clearance in following cases:

- If there is a clearance between the accessory tool and the shell of the booster (floating accessory tool), the clearance is small.
- If the chalk does not stick on the tip of the push rod, the clearance is large.

(d) If the clearance is outside of the specified range, fix the push rod using SST and adjust the length of the protruding adjusting bolt.
SST 09737–00020

NOTICE:

Make an adjustment with the booster having no vacuum. (Depress the brake pedal several times with the engine stopped.)

3. CONNECT VACUUM HOSE TO BRAKE BOOSTER

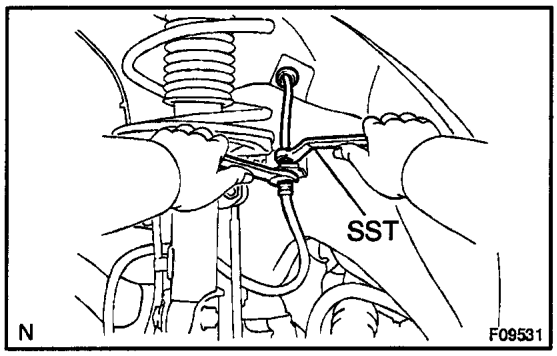
4. LHD models:
INSTALL ABS ACTUATOR (See page BR–56)

5. LHD models:
INSTALL AIR CLEANER ASSEMBLY

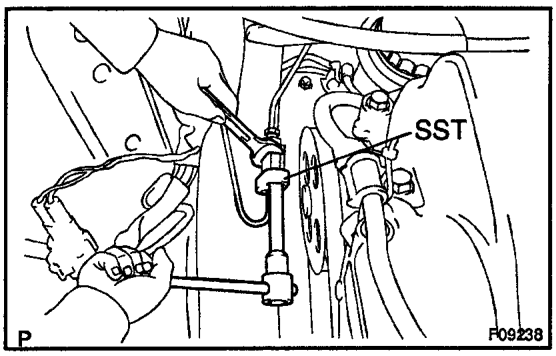
6. RHD models:
INSTALL PS VANE PUMP (See page SR–25)

7. RHD models:
INSTALL BRAKE LINE

(a) Install the brake line with grommet to the body.



(b) Using SST and spanner, disconnect the brake line to the flexible hose of RH front brake.
SST 09751–36011



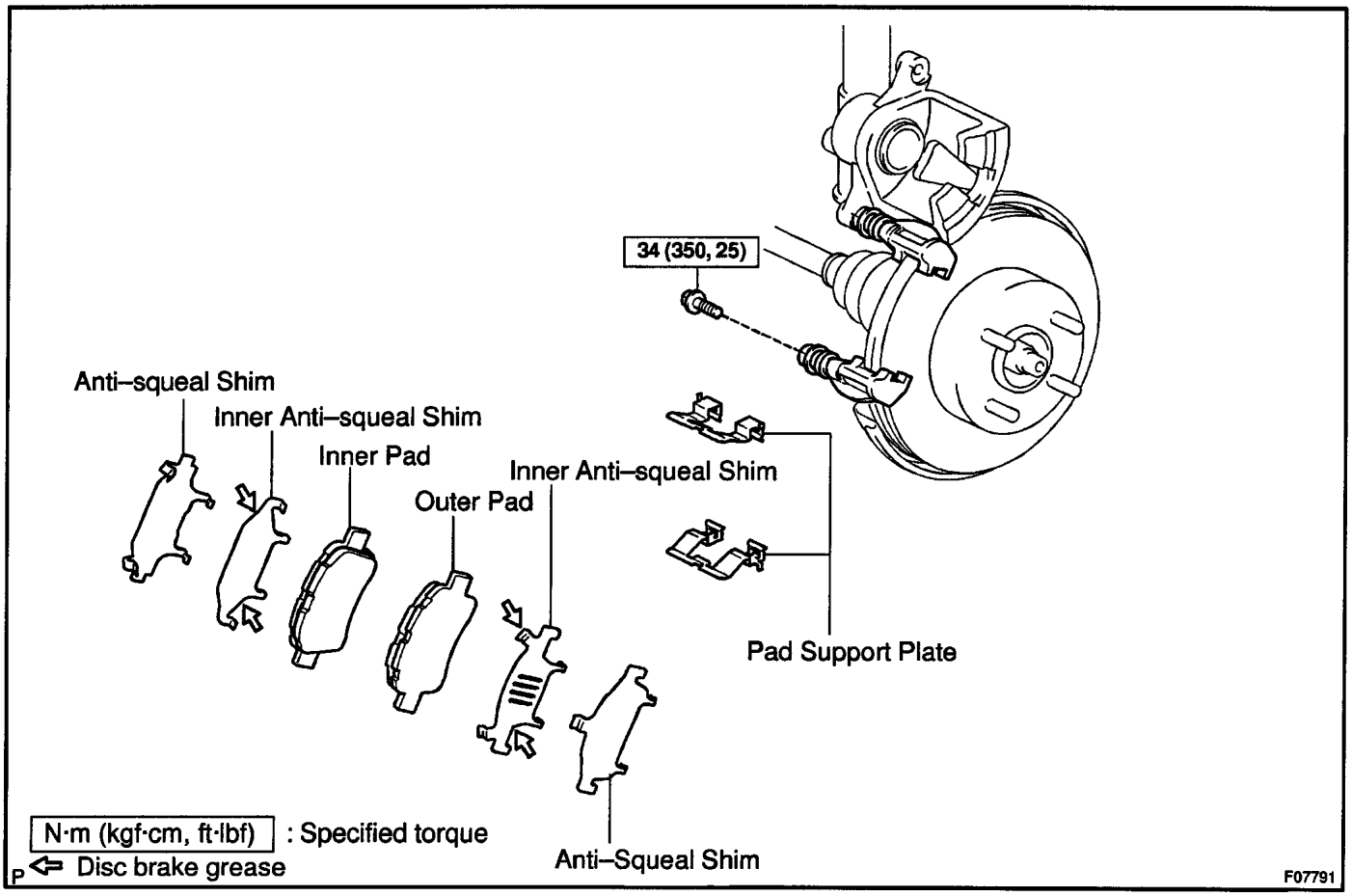
(c) Using SST and spanner, disconnect the brake line.
SST 09023–00100

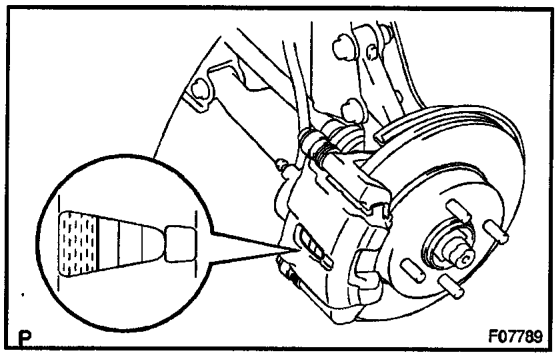
8. **INSTALL MASTER CYLINDER (See page BR–13)**
9. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR–4)**
10. **CHECK FOR LEAKS**
11. **CHECK AND ADJUST BRAKE PEDAL (See page BR–6)**
12. **DO OPERATIONAL CHECK (See page BR–14)**

FRONT BRAKE PAD

COMPONENTS

BR0RN-04





BR11D-02

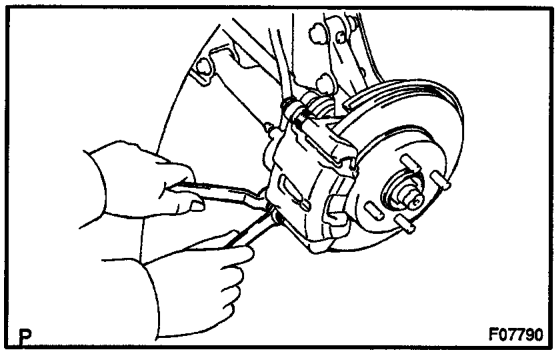
REPLACEMENT

1. REMOVE FRONT WHEEL

2. INSPECT PAD LINING THICKNESS

Check the pad thickness through the caliper inspection hole and replace the pads if they are not within the specification.

Minimum thickness: 1.0 mm (0.039 in.)



3. LIFT UP CALIPER

(a) Hold the sliding pin on the bottom and loosen the installation bolt, and remove the installation bolt.

(b) Lift up the caliper and suspend it securely.

HINT:

Do not disconnect the flexible hose from the caliper.

4. REMOVE BRAKE PADS WITH ANTI–SQUEAL SHIMS

5. REMOVE 2 PAD SUPPORT PLATES

NOTICE:

The support plates can be used again provided that they have sufficient rebound, no deformation, cracks or wear, and have had all rust, dirt and foreign particles cleaned off.

6. CHECK DISC THICKNESS AND RUNOUT

(See page BR–26)

7. INSTALL 2 PAD SUPPORT PLATES

8. INSTALL NEW PADS

NOTICE:

When replacing worn pads, the anti–squeal shims and pad wear indicator plates must be replaced together with the pads.

(a) Apply disc brake grease to the anti–squeal shims (See page BR–23).

(b) Install the 2 anti–squeal shims on the outer pad.

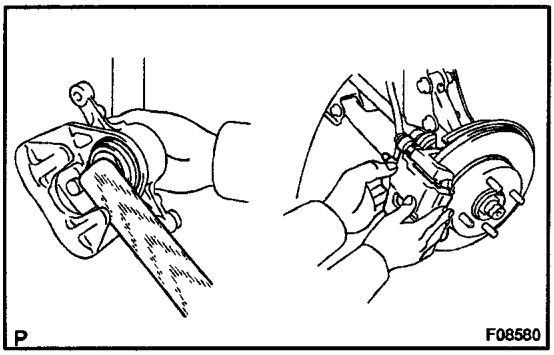
(c) Install the 2 anti–squeal shims on the inner pad.

(d) Install the inner pad with the pad wear indicator plate facing upward.

(e) Install the outer pad.

NOTICE:

There should be no oil or grease adhering to the friction surfaces of the pads or the disc.



9. INSTALL CALIPER

(a) Draw out a small amount of brake fluid from the reservoir.

(b) Press in the piston with a hammer handle 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.

(d) Hold the sliding pin and install the installation bolt.

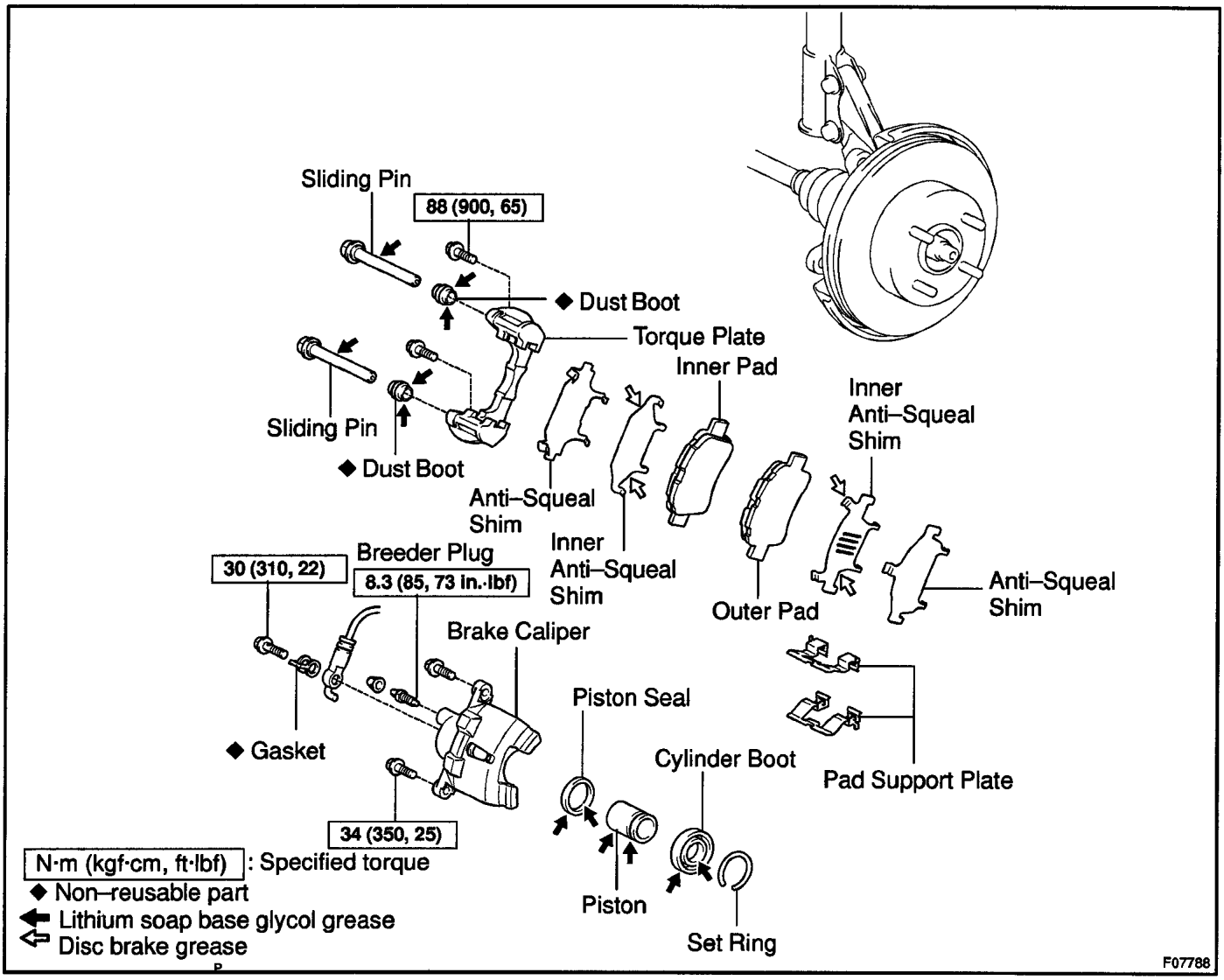
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

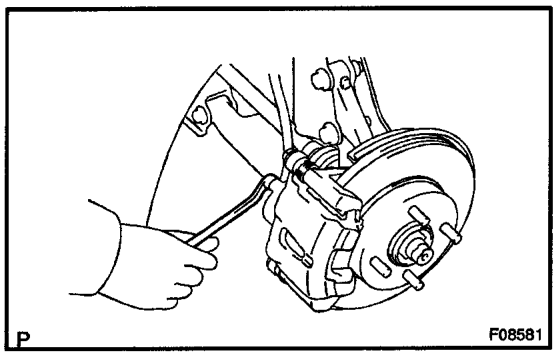
10. INSTALL FRONT WHEEL
11. CHECK THAT FLUID LEVEL IS AT MAX LINE

FRONT BRAKE CALIPER

COMPONENTS

BR0RP-05





BR0RQ-04

REMOVAL

1. REMOVE FRONT WHEEL

Remove the wheel and temporarily fasten the disc with hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. DISCONNECT FLEXIBLE HOSE

(a) Remove the union bolt and gasket 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 BRAKE CALIPER

(a) Hold the sliding pin and loosen the 2 installation bolts, and remove the 2 installation bolts.

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(b) Remove the caliper from the torque plate.

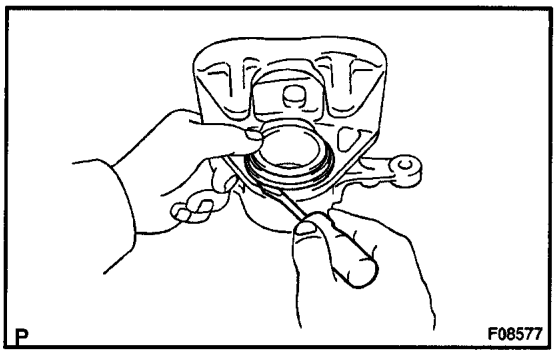
(c) Remove the 2 dust boots from the torque plate.

4. REMOVE BRAKE PADS WITH ANTI–SQUEAL SHIMS

5. REMOVE 2 PAD SUPPORT PLATES

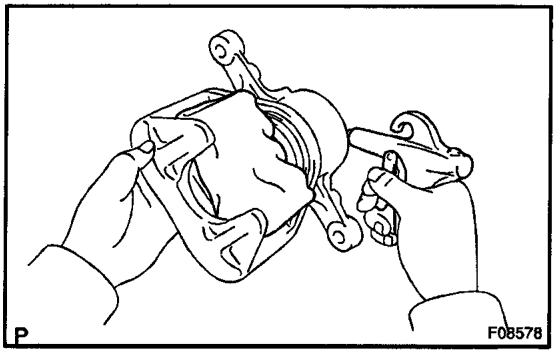
BR11E-02

DISASSEMBLY



1. REMOVE SET RING AND CYLINDER BOOT

Using a screwdriver, remove the set ring and cylinder boot from the caliper.



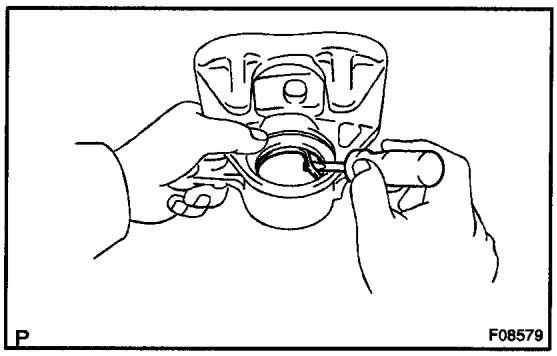
2. REMOVE PISTON

(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.

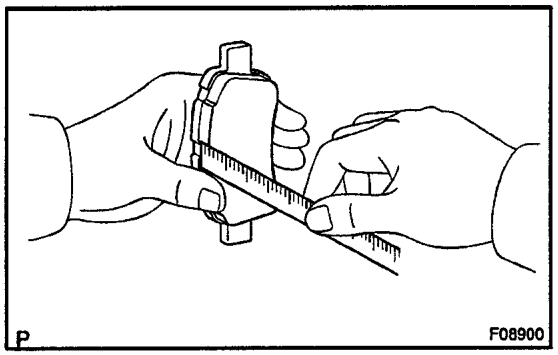


3. REMOVE PISTON SEAL

Using a screwdriver, remove the piston seal from the cylinder.

BR0RS-04

INSPECTION



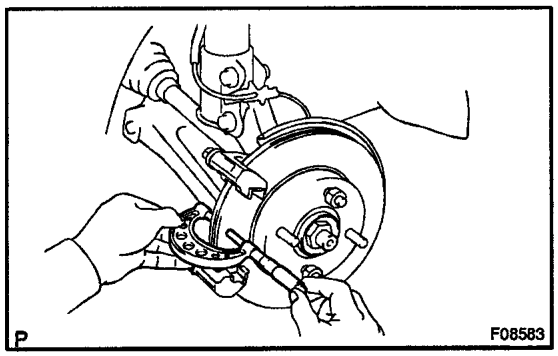
1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness: 11.0 mm (0.433 in.)

Minimum thickness: 1.0 mm (0.039 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.



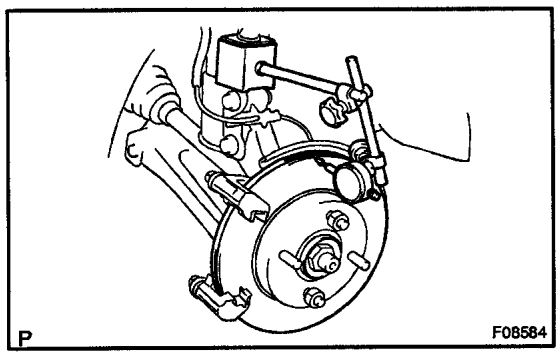
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 20.0 mm (0.787 in.)

Minimum thickness: 18.0 mm (0.709 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.

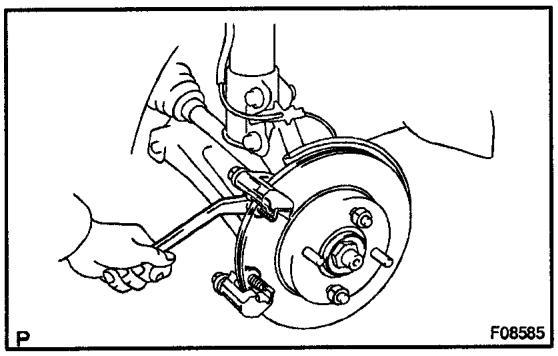


3. MEASURE DISC RUNOUT

Using a dial indicator, measure 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 the maximum value or greater, check the bearing play is in the axial direction and check the axle hub runout (See page SA–9). If the bearing play and axle hub runout are not abnormal, adjust the disc runout or grind it on a "On–car" brake late.



4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the 2 mounting bolts and torque plate from the knuckle.

(b) Remove the hub nuts and the disc. Reinstall the disc in the position turned 1/4 from its original position on the hub. Install and torque the hub nuts.

Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

(c) Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

Repeat (b) until the disc has been installed on the 2 remaining hub positions.

If the minimum runout recorded in (b) and (c) is less than 0.05 mm (0.0020 in.), install the disc in that position.

If the minimum runout recorded in (b) and (c) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.

(d) Install the torque plate and 2 mounting bolts.

Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

8RORT-03

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–25).

NOTICE:

Apply lithium soap base glycol grease and disc brake grease to the parts indicated by arrows (See page BR–23).

BR0RU–02

INSTALLATION

Installation is in the reverse order of removal (See page BR–24).

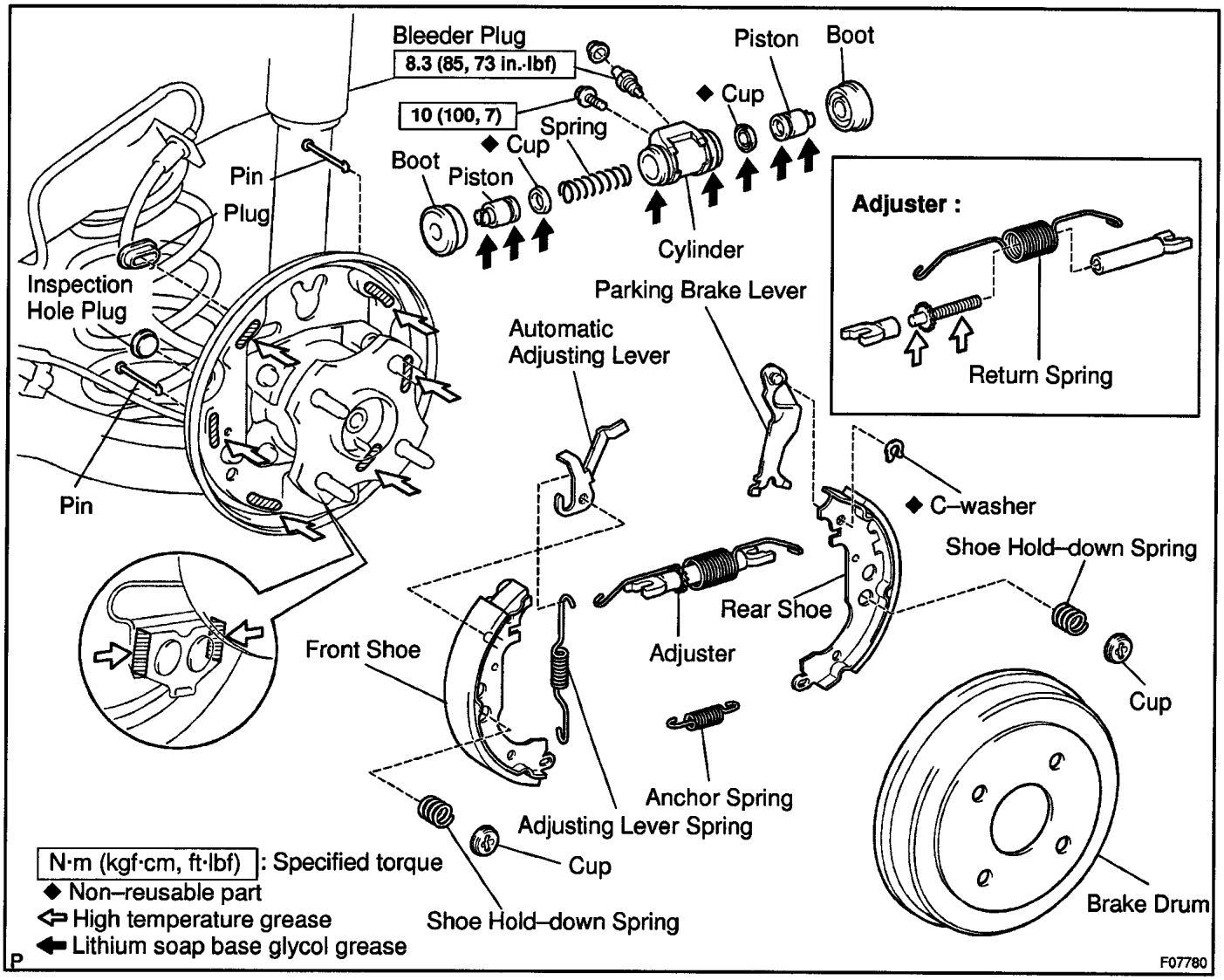
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed the brake system (See page BR–4).
- Check for leaks.

REAR DRUM BRAKE

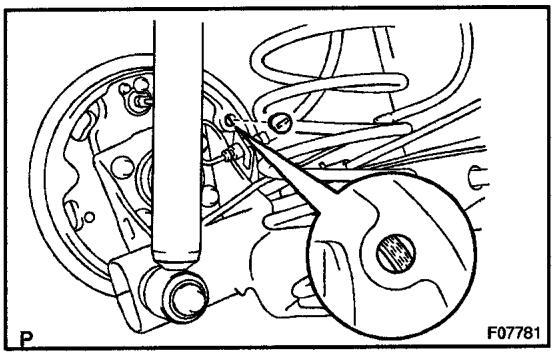
COMPONENTS

BR14L–01



BR14M–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

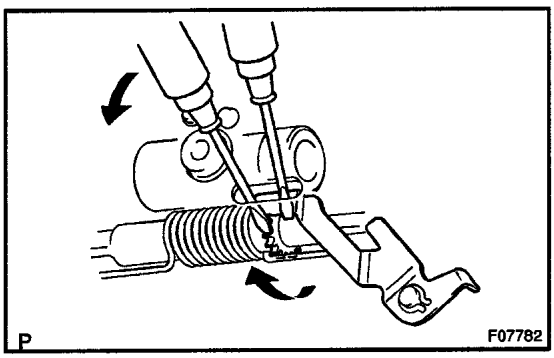
3. RELEASE PARKING BRAKE LEVER

4. REMOVE BRAKE DRUM

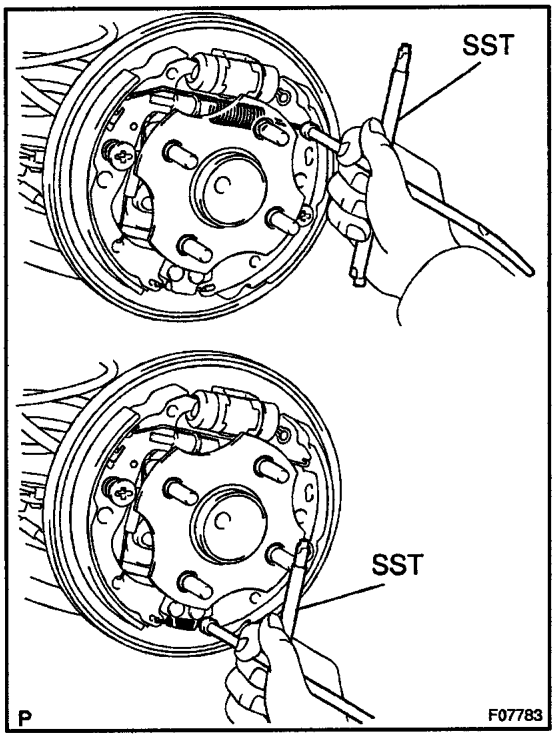
HINT:

If the brake drum cannot be removed easily, do the following steps.

(a) Remove the plug and insert a screwdriver through the hole in the backing plate.



(b) Using another screwdriver, reduce the brake shoe adjuster by turning the adjusting wheel.



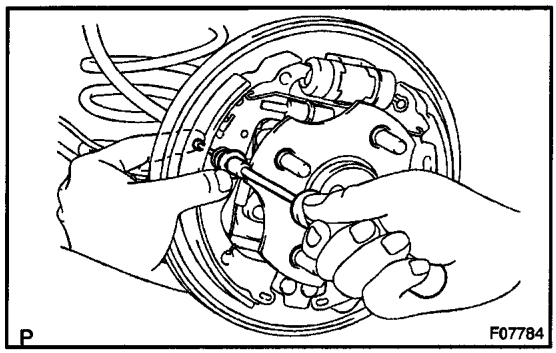
5. REMOVE FRONT SHOE

(a) Using SST, disconnect the return spring from the rear shoe.

SST 09703–30010

(b) Using SST, remove the anchor spring.

SST 09703–30010



(c) Using SST, remove the cup, shoe hold–down spring and pin.
SST 09718–00010

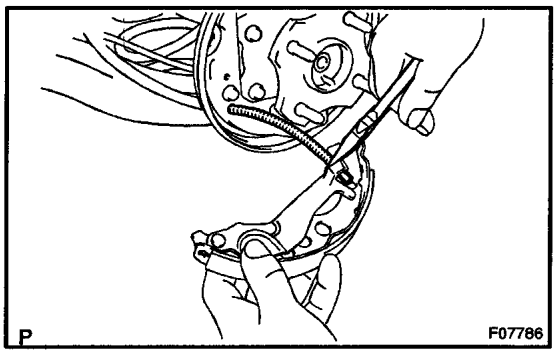
(d) Remove the adjuster together with the adjuster spring from the front shoe.

(e) Using needle–nose pliers, remove the adjusting lever spring.

(f) Remove the automatic adjusting lever from the front shoe.

6. REMOVE REAR SHOE

(a) Using SST, remove the cup, shoe hold–down spring and pin.
SST 09718–00010

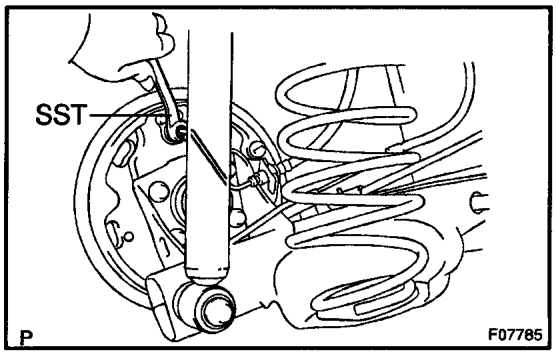


(b) Using needle–nose pliers, disconnect the parking brake cable from the parking brake lever, and remove the rear shoe.

7. REMOVE PARKING BRAKE LEVER

(a) Remove the C–washer.

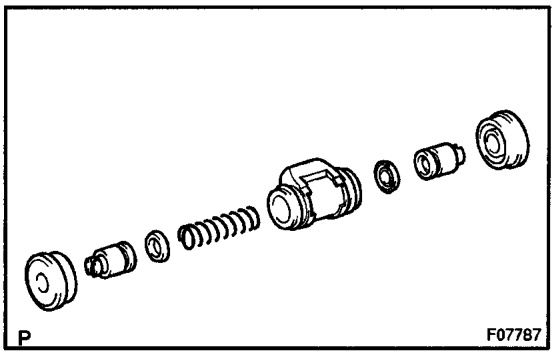
(b) Remove the parking brake lever from rear shoe.



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 wheel cylinder.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



9. DISASSEMBLE WHEEL CYLINDER

(a) Remove the 2 boots from the wheel cylinder.

(b) Remove the 2 pistons from the wheel cylinder.

(c) Remove the spring from the wheel cylinder.

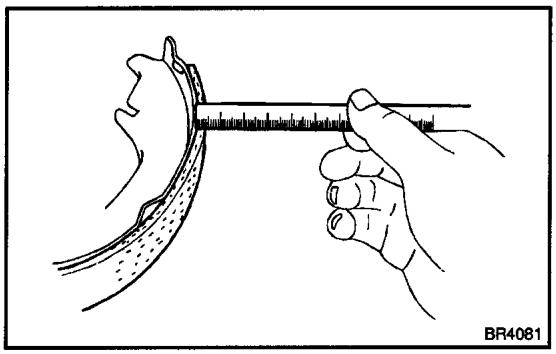
(d) Remove the 2 piston cups from the each piston.

BR0RX-06

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.

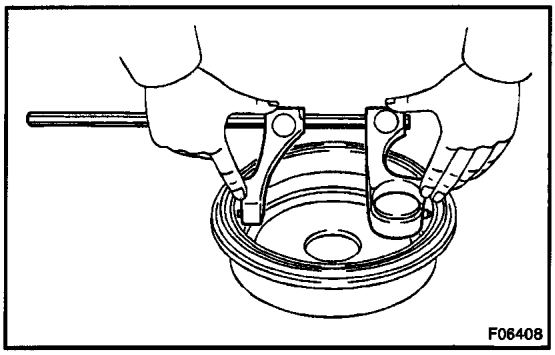
Standard thickness: 4.0 mm (0.157 in.)

Minimum thickness: 1.0 mm (0.039 in.)

If the thickness is less than the minimum or shoe lining shows signs of uneven wear, replace the brake shoes.

HINT:

If a brake shoes needs replacing, the brake shoes must be replaced as a set



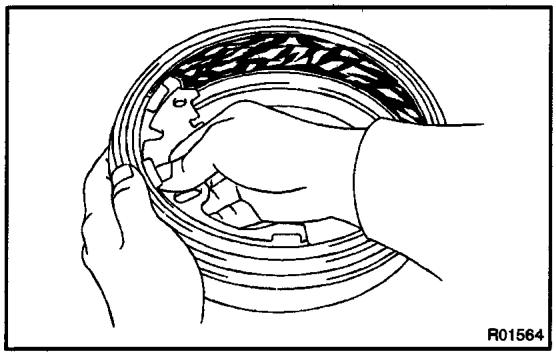
3. MEASURE BRAKE DRUM INSIDE DIAMETER

Using a brake drum gauge or equivalent, measure the inside diameter of the drum.

Standard inside diameter: 200.0 mm (7.874 in.)

Maximum inside diameter: 201.0 mm (7.913 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.

BR11H-03

INSTALLATION

Installation is in the reverse order of removal (See page BR–30).

NOTICE:

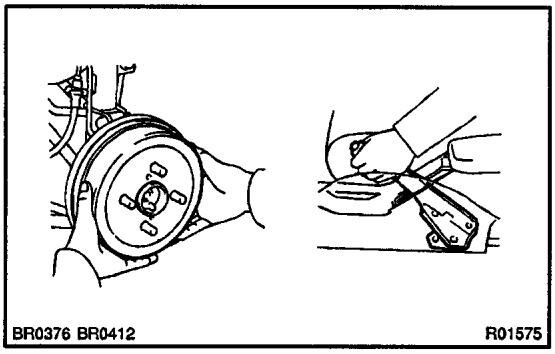
Apply lithium soap base glycol grease and high temperature grease to the parts indicated by the arrows (See page BR–29).

1. CHECK OPERATION OF AUTOMATIC ADJUSTING MECHANISM

(a) Move the parking brake lever of the rear shoe back and forth. Check that the adjuster turns.

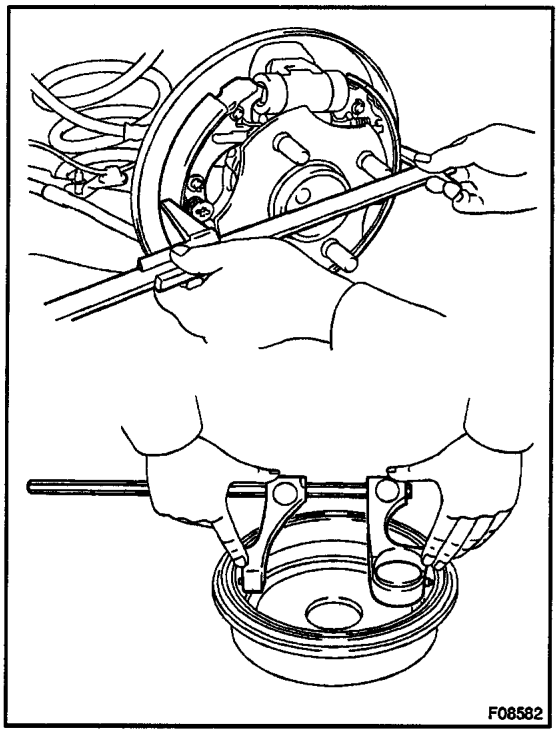
If the adjuster does not turn, check for incorrect installation of the rear brake.

(b) Adjust the adjuster length to the as short as possible.



(c) Install the brake drum.

(d) Pull the parking brake lever all the way up until a clicking sound can no longer be heard.



2. CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM

(a) Remove the brake drum.

(b) 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.

(c) Install the brake drum.

3. FILL BRAKE RESERVOIR WITH BRAKE FLUID

4. BLEED BRAKE SYSTEM (See page BR–4)

5. CHECK FOR LEAKS

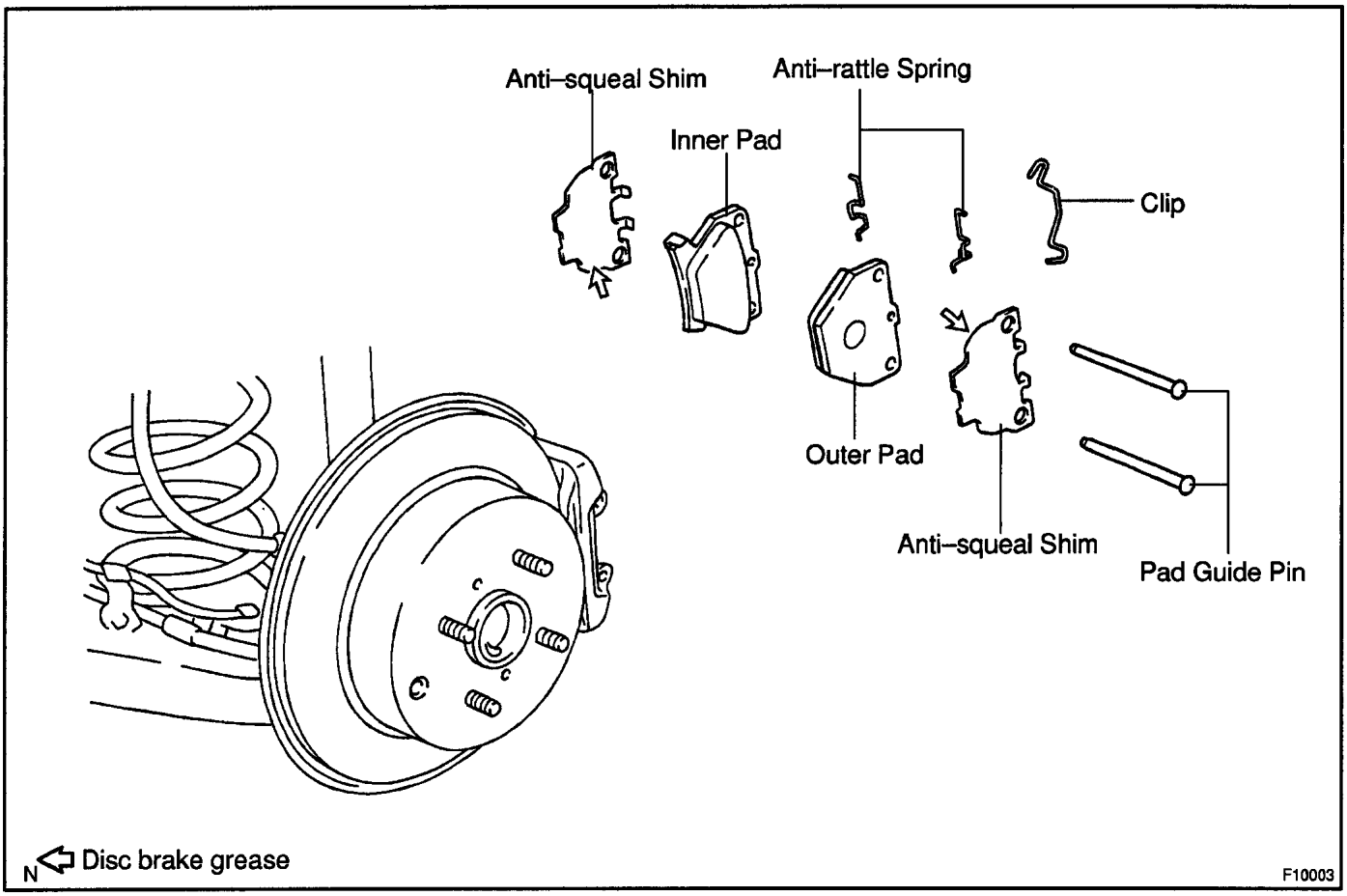
6. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR BRAKE PAD

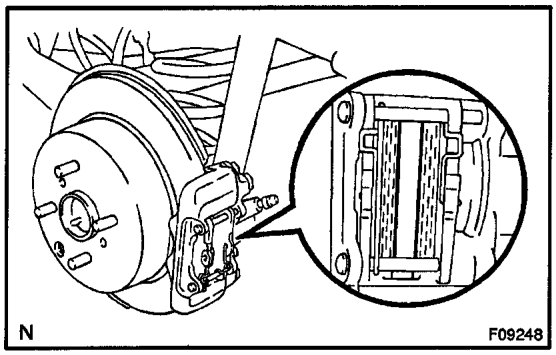
COMPONENTS

BR14N–01



BR14O-01

REPLACEMENT

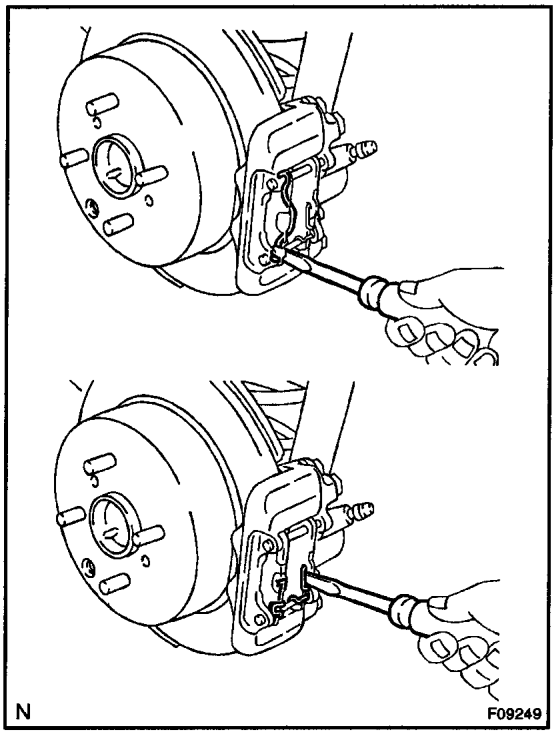


1. REMOVE REAR WHEEL

2. INSPECT PAD LINING THICKNESS

Check the pad thickness.

Minimum thickness: 1.0 mm (0.039 in.)



3. REMOVE CLIP, 2 ANTI–RATTLE SPRINGS AND 2 PAD GUIDE PINS

(a) Using a screwdriver, remove the clip and 2 anti–rattle springs.

NOTICE:

- **Do not deform the clip and anti–rattle spring.**
- **The clip and anti–rattle spring can be used again provided that they have sufficient rebound, no deformation, cracks or wear, and have had all rust, dirt and foreign particles cleaned off.**

(b) Remove the 2 pad guide pins.

4. REMOVE PADS AND ANTI–SQUEAL SHIMS

(a) Remove the 2 pads.

(b) Remove the anti–squeal shim from each pad.

5. CHECK DISC THICKNESS AND RUNOUT
(See page BR–40)

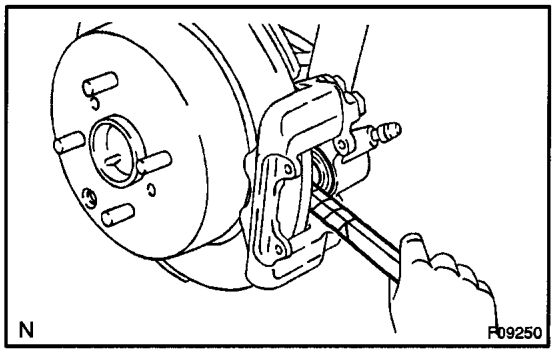
6. INSTALL NEW PADS

NOTICE:

When replacing worn pads, the anti–squeal shims must be replaced together with the pads.

(a) Apply disc brake grease to inside of anti–squeal shims (See page BR–34).

(b) Install the anti–squeal shim on each pad.



(c) Draw out a small amount of brake fluid from the reservoir.

(d) Press in the piston with a monkey wrench handle or equivalent.

HINT:

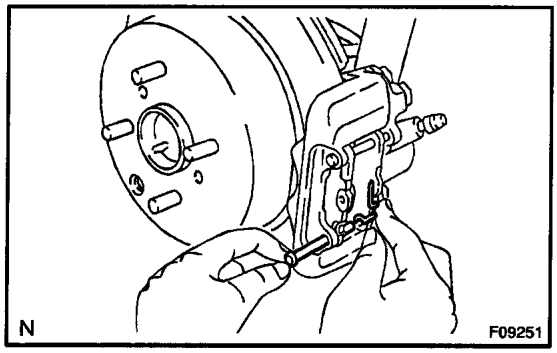
- Tape the monkey wrench handle before use.
- If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

(e) Install the inner pad with the pad wear indicator plate facing upward, and install the outer pad.

NOTICE:
There should be no oil or grease adhering to the friction surfaces of the pads and the disc.

7. INSTALL 2 ANTI–RATTLE SPRINGS, 2 PAD GUIDE PINS AND CLIP

(a) Install the 2 anti–rattle spring on the each pad.



(b) While pressing the anti–rattle spring, and install the pad guide pin.

(c) Install the clip to the pad guide pin.

8. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

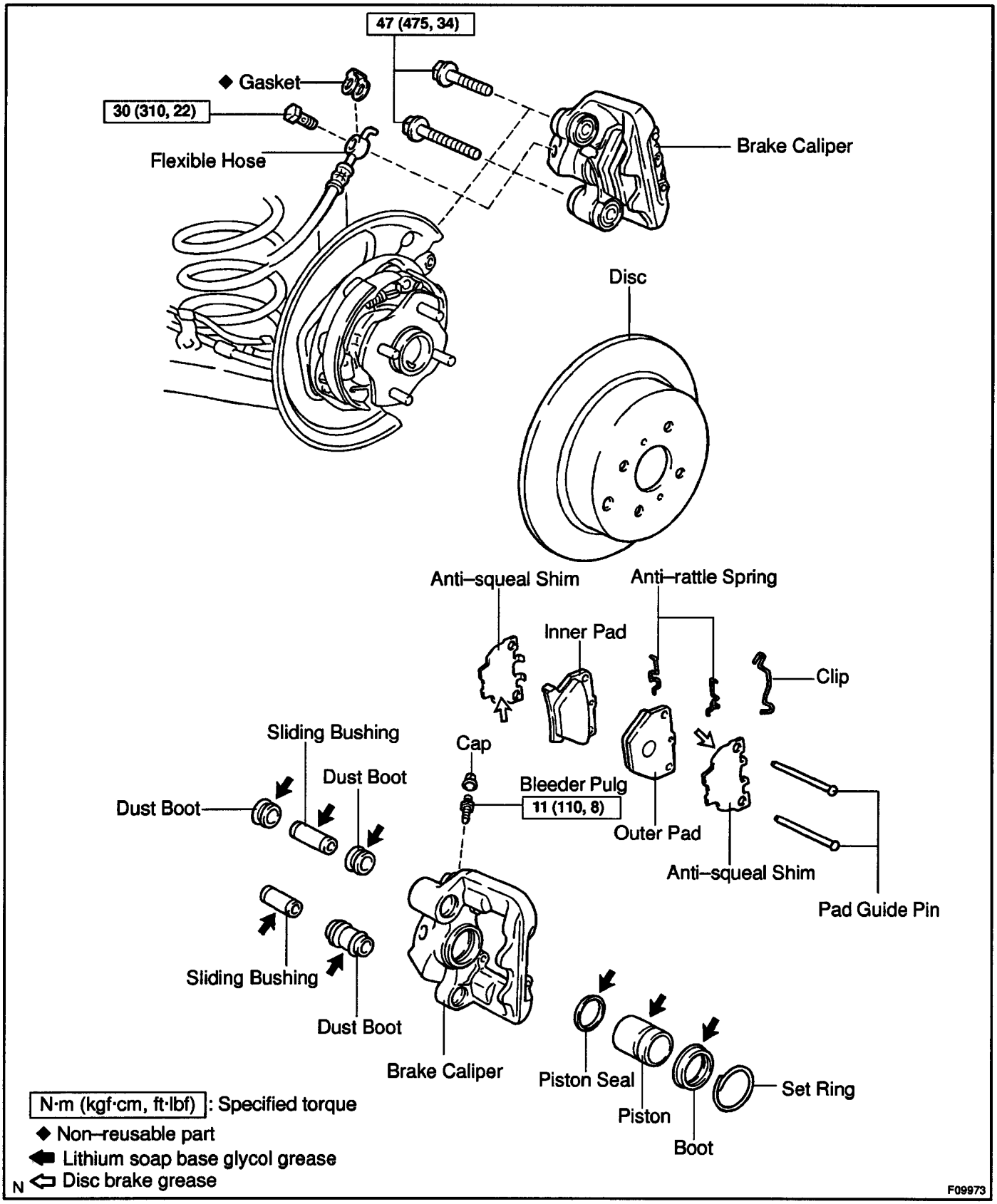
9. DEPRESS BRAKE PEDAL SEVERAL TIMES

10. CHECK THAT FLUID LEVEL IS AT MAX LINE

REAR BRAKE CALIPER

COMPONENTS

BR14P-01

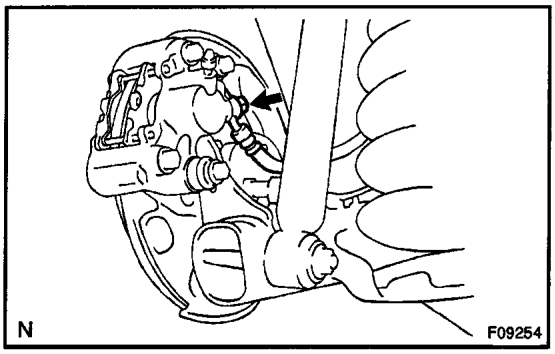


BR14Q-01

REMOVAL

1. REMOVE REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



2. DISCONNECT FLEXIBLE HOSE

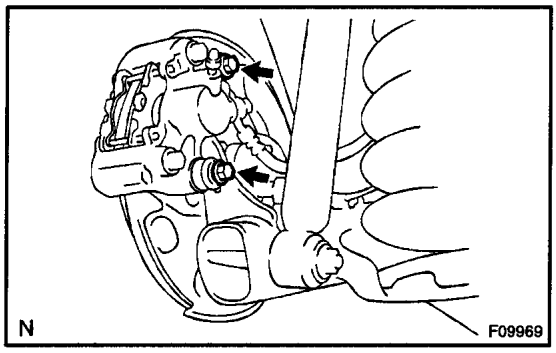
(a) Remove the union bolt and gasket from the caliper, then disconnect the flexible hose from the caliper.

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

HINT:

At the time of installation, insert 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 BRAKE CALIPER

(a) Remove the 2 installation bolts and caliper.

(b) Remove the caliper from the torque plate.

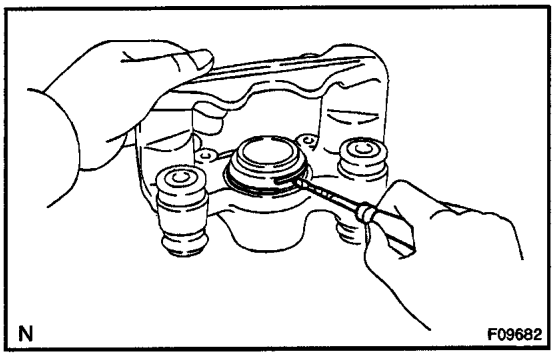
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

4. REMOVE 2 PADS WITH ANTI–SQUEAL SHIMS

(See page BR–35)

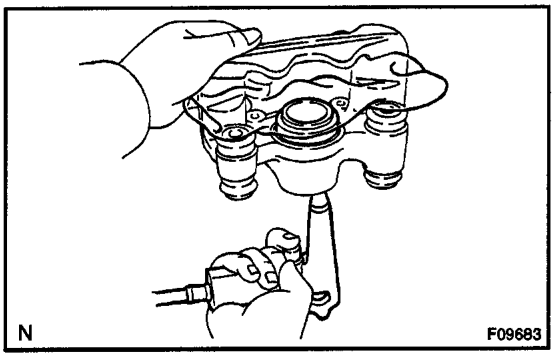
BR14R-01

DISASSEMBLY



1. REMOVE SET RING AND CYLINDER BOOT

Using a screwdriver, remove the set ring and cylinder boot.



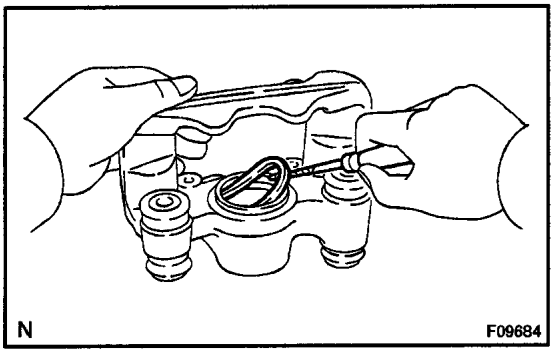
2. REMOVE PISTON

(a) Put a piece of cloth or an equivalent between the piston and 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.



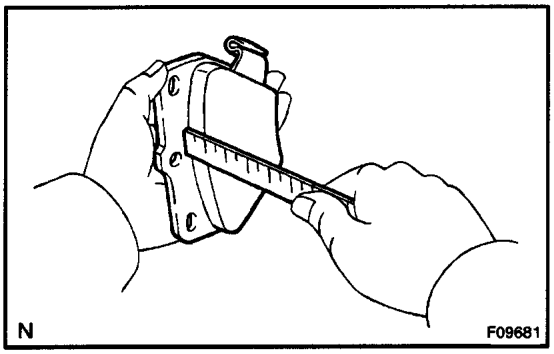
3. REMOVE PISTON SEAL FROM CYLINDER

Using a screwdriver, remove the piston seal.

4. REMOVE 2 SLIDING BUSHING AND 3 DUST BOOTS

BR14S-01

INSPECTION



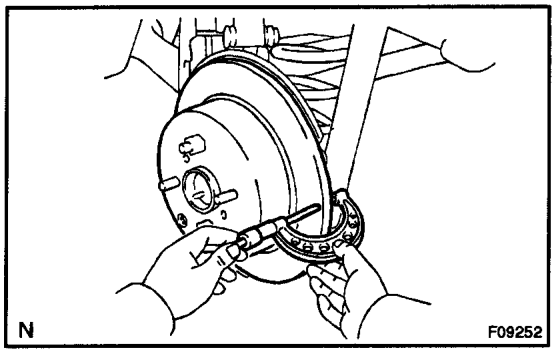
1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness: 10.0 mm (0.394 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pad if the pad's thickness is at the minimum thickness or less, or if the pad has severe, uneven wear.



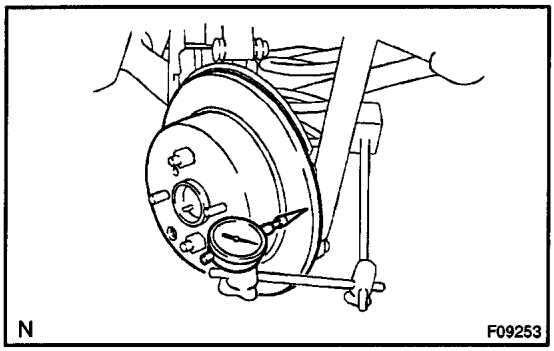
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 9.0 mm (0.354 in.)

Minimum thickness: 8.0 mm (0.315 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 scored or worn unevenly.



3. MEASURE DISC RUNOUT

Using a dial indicator, measure disc runout at a position 10 mm (0.39 in.) from the outside edge.

Maximum disc runout: 0.15 mm (0.0059 in.)

If the disc's runout is at the maximum value or greater, check the bearing play is in the axial direction and check the axle hub runout (See page SA–41). 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 in the position turned 1/4 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 2 remaining hub positions.

(c) If the minimum runout recorded in (a) and (b) is less than 0.15 mm (0.0059 in.), install the disc in that position.

(d) If the minimum runout recorded in (a) and (b) is greater than 0.15 mm (0.0059 in.), replace the disc and repeat step 3.

BR147–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–39).

NOTICE:

Apply lithium soap base glycol grease and disc brake grease to the parts indicated by the arrows (See page BR–37).

BR14U–01

INSTALLATION

Installation is in the reverse order of removal (See page BR–38).

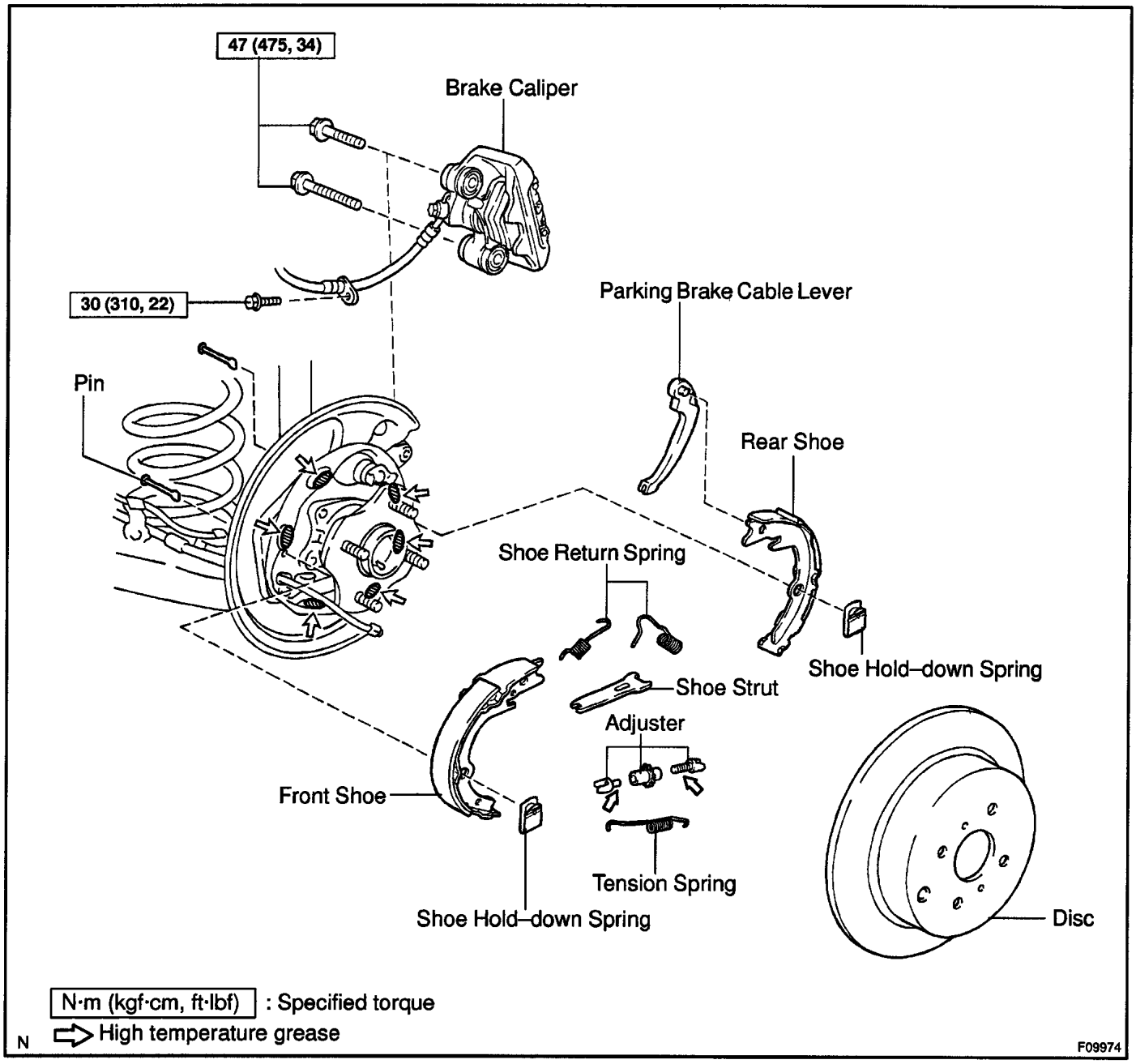
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed the brake system (See page BR–4).
- Check for leaks.

PARKING BRAKE

COMPONENTS

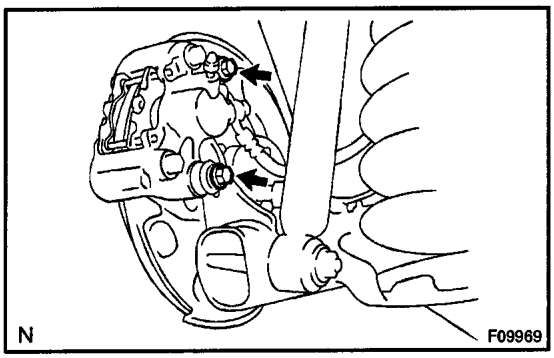
BR14V-01



BR14W-01

DISASSEMBLY

1. **REMOVE REAR WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
2. **REMOVE FLEXIBLE HOSE FROM REAR AXLE BEAM**
   Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

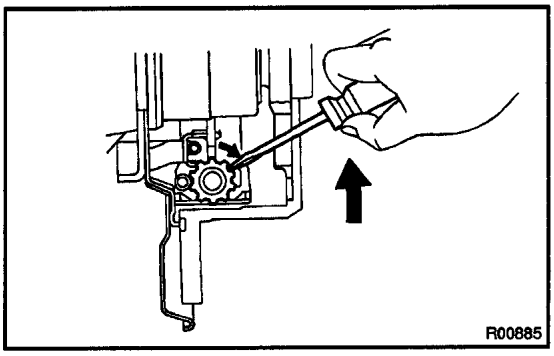


3. **REMOVE BRAKE CALIPER**

(a) Remove the 2 installation bolts and caliper.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

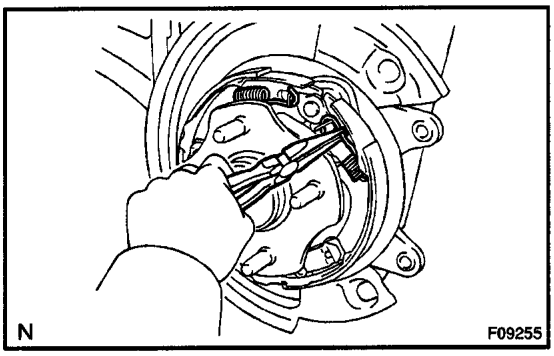
(b) Remove the caliper from the torque plate.

(c) Suspend the disc brake securely. Ensure that the hose is not stretched.



4. **REMOVE DISC**

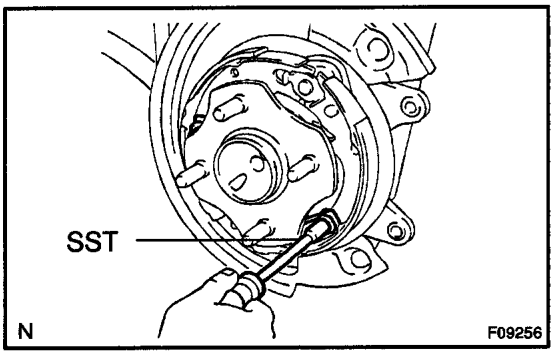
Release the parking brake lever, and remove the disc.
HINT:
If the disc cannot be removed easily, turn the shoe adjuster until the wheel turns freely.



5. **REMOVE SHOE RETURN SPRINGS AND TENSION SPRING**

Using needle–nose pliers, remove the 2 shoe return springs and tension spring.

6. **REMOVE SHOE STRUT**



7. **REMOVE FRONT SHOE AND ADJUSTER**

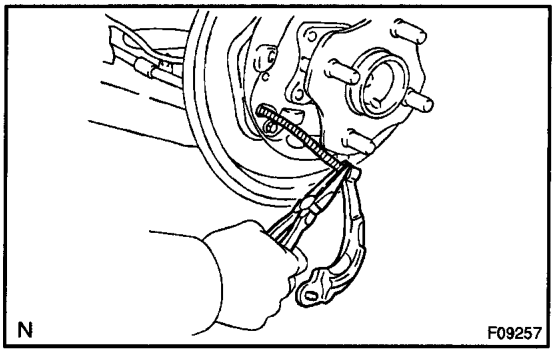
(a) Using SST, remove the shoe hold–down spring and pin from the front shoe.
SST 09718–00010

(b) Remove the front shoe and adjuster.

8. REMOVE REAR SHOE

(a) Using SST, remove the shoe hold–down spring and pin from the rear shoe.
SST 09718–00010

(b) Disconnect the rear shoe from the parking brake shoe lever, and remove rear shoe.



9. REMOVE PARKING BRAKE SHOE LEVER

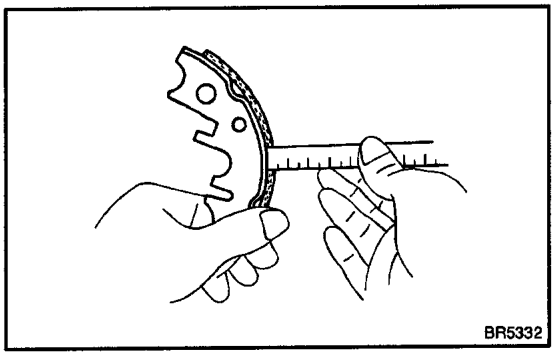
Using needle–nose pliers, disconnect the parking brake cable from the parking brake shoe lever.

BR14X-01

INSPECTION

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.



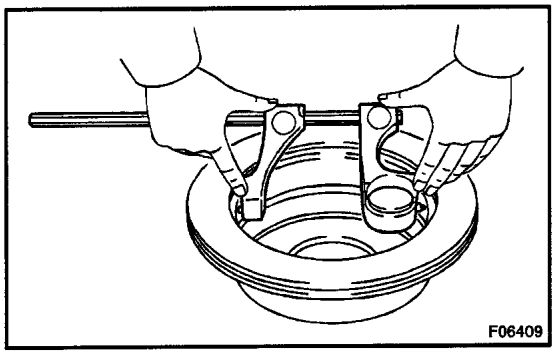
2. MEASURE BRAKE SHOE LINING THICKNESS

Using a ruler, measure the thickness of the shoe lining.

Standard thickness: 4.0 mm (0.157 in.)

Minimum thickness: 1.0 mm (0.039 in.)

If the lining thickness is at the minimum thickness or less, or if there is severe, uneven wear, replace the brake shoe.



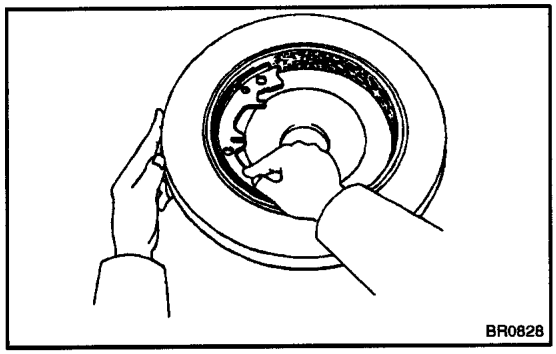
3. MEASURE DISC INSIDE DIAMETER

Using a brake drum gauge or equivalent, measure the inside diameter of the disc.

Standard inside diameter: 173.0 mm (6.811 in.)

Maximum inside diameter: 174.0 mm (6.850 in.)

Replace the disc if the inside diameter is at the maximum value or more. Replace the disc or grind it with a lathe if the disc is scored or is worn unevenly.



4. INSPECT PARKING BRAKE LINING AND DISC FOR PROPER CONTACT

Apply chalk to the inside surface of the disc, then grind down the brake shoe lining to fit. If the contact between the disc and the brake shoe lining is improper, repair it using a brake shoe grinder or replace the brake shoe assembly.

BR14Y-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–44).

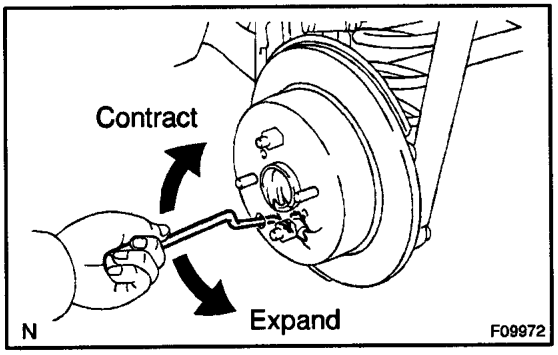
NOTICE:

Apply high temperature grease to the parts indicated by the arrows (See page BR–43).

1. ADJUST PARKING BRAKE SHOE CLEARANCE

(a) Temporarily install the hub nuts.

(b) Remove the hole plug.



(c) Turn the adjuster and expand the shoes until the disc locks.

(d) Return the adjuster 8 notches.

(e) Install the hole plug.

2. SETTLING PARKING BRAKE SHOES AND DISC

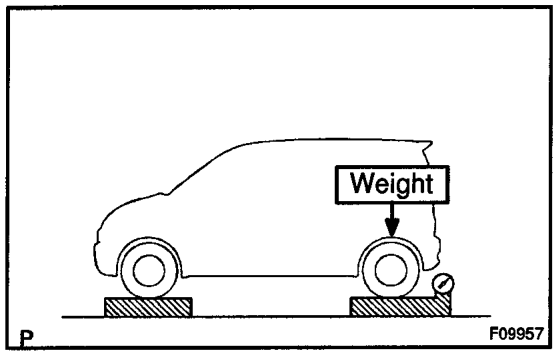
(a) Drive the vehicle at about 50 km/h (31 mph) on a safe, level and dry road.

(b) With the parking brake release button pushed in, pull on the lever with 98 N (10 kgf, 19.8 lbf) of force.

(c) Drive the vehicle for about 400 meters (0.25 mile) in this condition.

(d) Repeat this procedure 2 or 3 times.

3. CHECK AND ADJUST PARKING BRAKE LEVER TRAVEL (See page BR–9)



LOAD SENSING PROPORTIONING VALVE (LSPV)

BR186-01

ON–VEHICLE INSPECTION

1. SET REAR AXLE LOAD

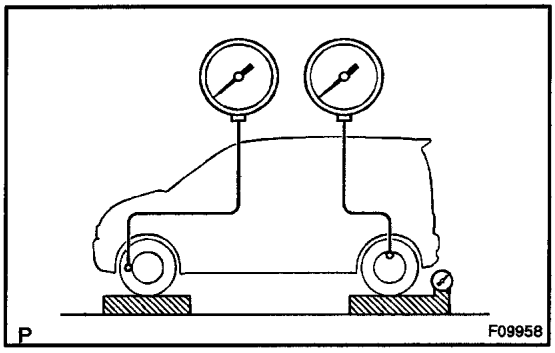
(a) Set the vehicle to its curb weight.

(b) Measure the rear axle load and note the value.

(c) Set the rear axle load.

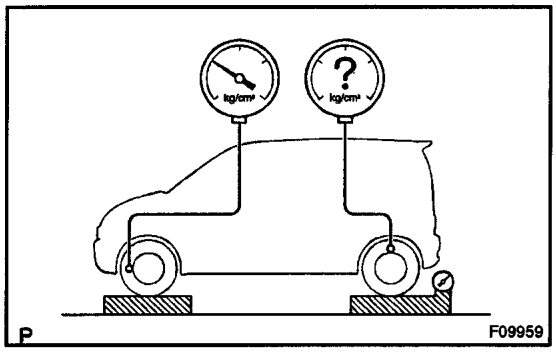
Rear axle load:

Rear axle curb weight + 42 kgf (93 lb)



2. INSTALL LSPV GAUGE (SST) AND BLEED BRAKE SYSTEM

SST 09709–29018



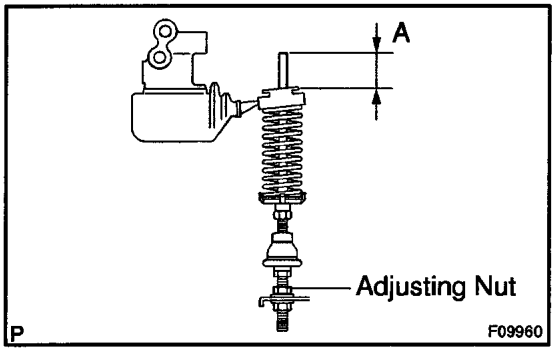
3. RAISE FRONT BRAKE FLUID PRESSURE TO 9,806 kpa (100 kgf/cm², 1,422 psi) AND CHECK REAR BRAKE FLUID PRESSURE

Rear axle pressure:

5,198 ± 588 kpa (53 ± 6 kgf/cm², 754 ± 85 psi)

HINT:

The brake pedal should not be depressed twice and/or returned while setting to the specified pressure. Read the value of rear pressure after holding the specified fluid pressure for 2 seconds after adjusting the specified fluid pressure.



4. IF NECESSAR, ADJUST FLUID PRESSURE

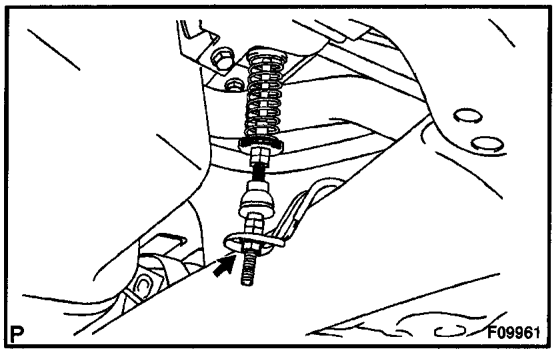
(a) Set the shaft length A to initial set length and tighten the adjusting bolt lock nut.

Initial set length: 12.2 mm (0.48 in.)

(b) Check the rear brake pressure.

(c) If not within the specification, adjust the fluid pressure by changing the shaft length.
Low pressure – Shorten A
High pressure – Lengthen A

HINT:
The fluid pressure is adjusted 304 kpa (3.1 kgf/cm^2, 44.1 psi) per each turn of the adjusting nut.

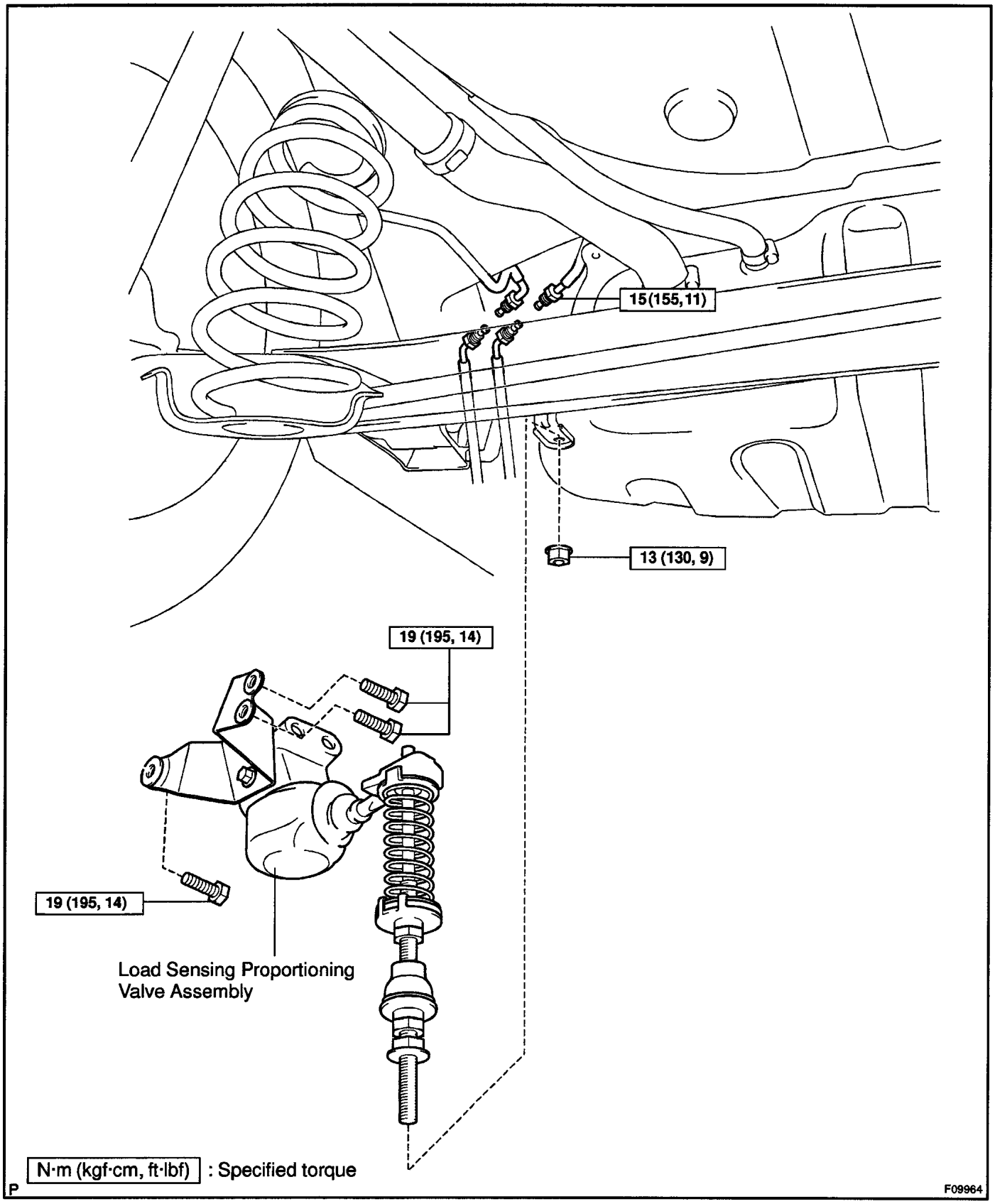


(d) Torque the lock nut.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

If it cannot be adjusted, replace the valve body.

COMPONENTS

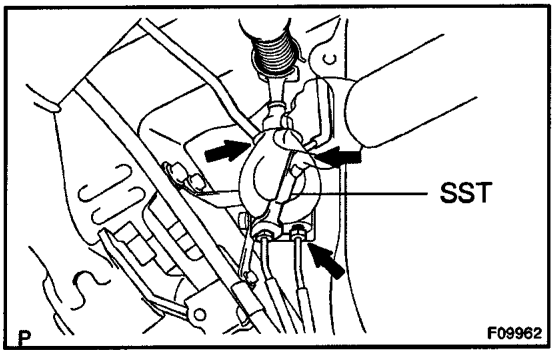
BR187-01



BR188-01

REMOVAL

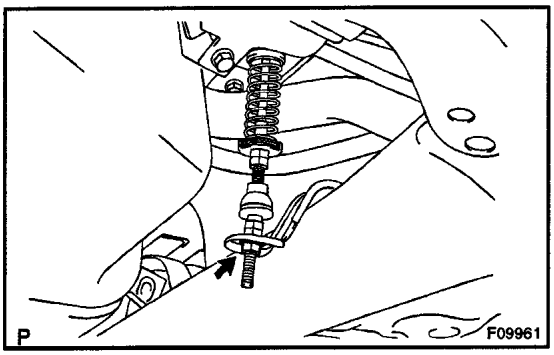
1. REMOVE BOLT AND DISCONNECT PARKING BRAKE CABLE CLAMP



2. DISCONNECT BRAKE LINES

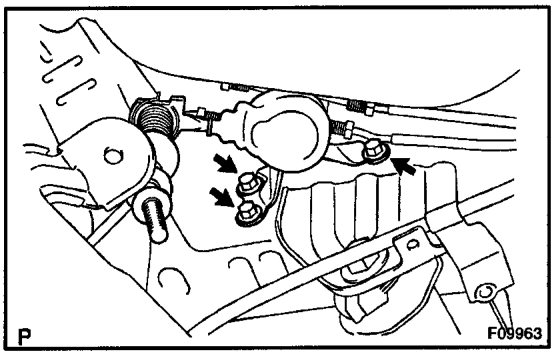
Using SST, disconnect the 4 brake lines from the valve body.

SST 09751–36011



3. REMOVE LSPV ASSEMBLY

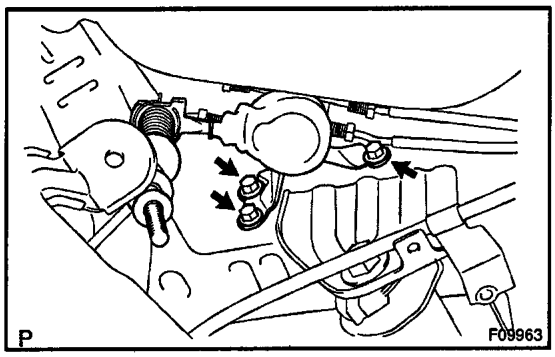
(a) Remove the lock nut and disconnect the adjusting bolt from the rear axle beam.



(b) Remove the 3 bolts and LSPV assembly.

BR189-01

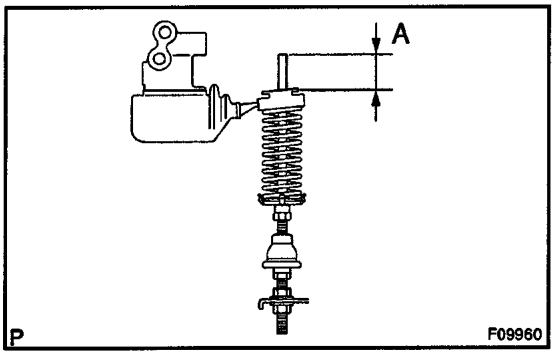
INSTALLATION



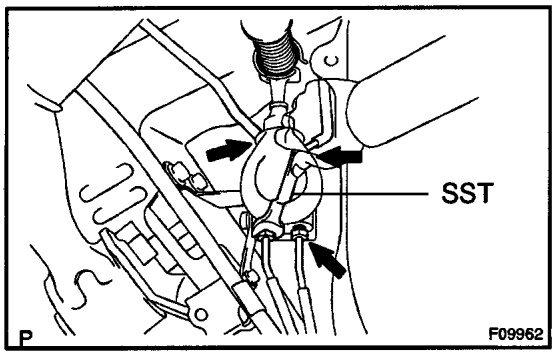
1. INSTALL LSPV ASSEMBLY

(a) Install the LSPV assembly with the 3 bolts.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

(b) Install the LSPV assembly to the rear axle beam with the lock nut.



(c) Set shaft length A to initial set length and temporarily tighten the lock nut.
Initial set length (Unladen): 12.2 mm (0.48 in.)
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



2. CONNECT BRAKE LINES

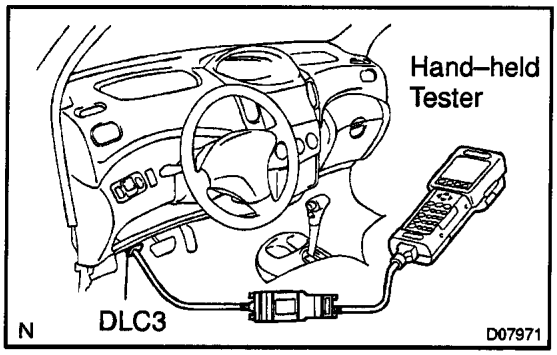
Using SST, connect the 4 brake lines.
SST 09751–36011
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

3. CONNECT PARKING BRAKE CABLE CLAMP WITH BOLT

4. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR–4)

5. CHECK FOR LEAKS

6. CHECK AND ADJUST FLUID PRESSURE (See page BR–48)



ABS ACTUATOR

BR0WF-04

ON–VEHICLE INSPECTION

1. CONNECT HAND–HELD TESTER

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

(b) Start the engine and run it at idle.

(c) Select the ACTIVE TEST mode on the hand–held tester.

HINT:

Please refer to the hand–held tester operator's manual for further details.

2. INSPECT ABS ACTUATOR MOTOR OPERATION

(a) Check that the operation sound of the ABS actuator motor can be heard when the motor relay is turned ON by the hand–held tester.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If the operation sound can not be heard, replace the ABS actuator because the motor operation is in failure.

(b) Turn the motor relay OFF.

3. INSPECT RIGHT FRONT WHEEL SOLENOID

(a) Depress the brake pedal and hold it for about 15 seconds, and check that the brake pedal does not go down further.

If the brake pedal goes down, replace the ABS actuator because the sealing condition of the reduction solenoid valve is abnormal.

(b) Check that the brake pedal does not pulsate when the motor relay is turned ON by the hand–held tester.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If there is a pulsation in the brake pedal, replace the ABS actuator because the sealing condition of the reduction solenoid valve is abnormal.

(c) Turn the motor relay OFF.

(d) Depress the brake pedal and hold it until the step (g) is completed.

(e) Check that the brake pedal does not go down further when the SFRH and SFRR solenoids are turned ON by the hand–held tester.

NOTICE:

Do not keep solenoid ON for more than 2 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If the brake pedal goes down, replace the ABS actuator because the holding solenoid valve operation is abnormal.

HINT:
To prevent the solenoids, hand–held tester turns OFF automatically 2 secs. after has been turned ON simultaneously.

(f) Check that the brake pedal goes down further when the solenoids are turned OFF.

If the brake pedal does not go down, replace the ABS actuator because the reduction solenoid valve operation is abnormal.

(g) Check that the brake pedal returns when the motor relay is turned ON by the hand–held tester.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If the brake pedal does not return, replace the ABS actuator because the motor operation is in failure.

(h) Turn the motor relay OFF and release the brake pedal.

4. INSPECT OTHER WHEEL SOLENOIDS OPERATION

Check the solenoids of the other wheels with the same inspection procedure as the right front wheel solenoids.

HINT:
Left front wheel: SFLH and SFLR
Right rear wheel: SRRH and SRRR
Left rear wheel: SRLH and SRLR

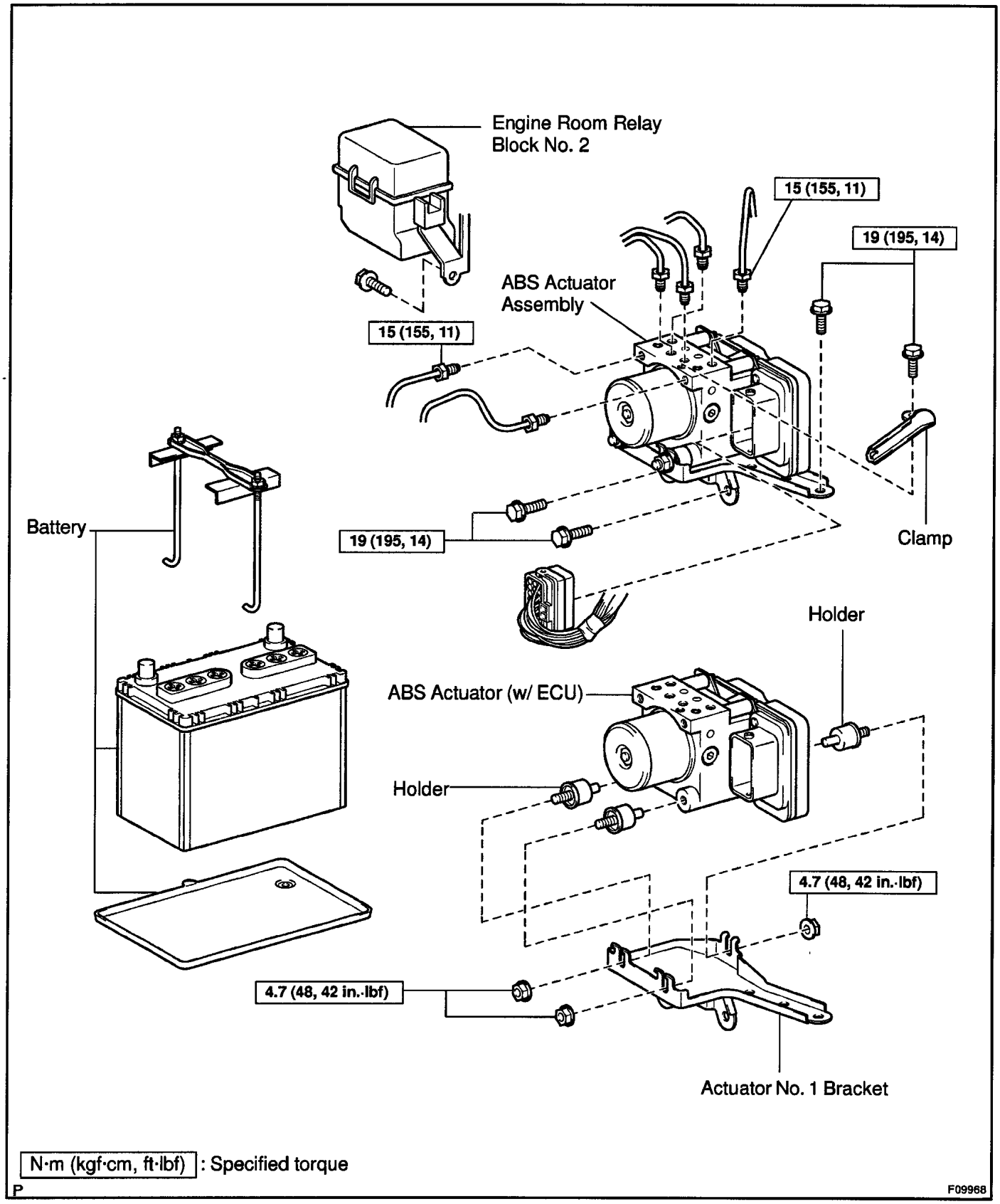
NOTICE:

Never depress the brake pedal under the condition that the reduction solenoid alone is turned ON as ABS ECU is reset.

5. CLEAR DTC (See page DI–60)

BR0S1-06

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

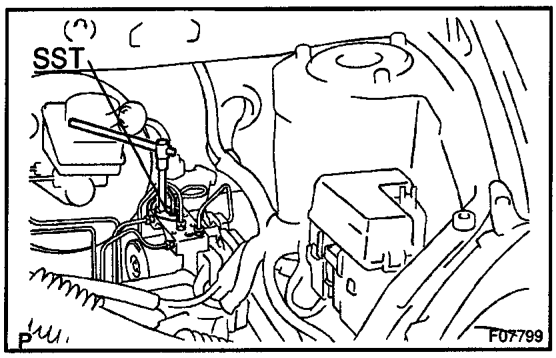
P

F09968

BR0S2-05

REMOVAL

1. **DISCONNECT CONNECTOR FROM ABS ACTUATOR ASSEMBLY**
2. **REMOVE BATTERY**
3. **REMOVE NUTS OF ENGINE ROOM RELAY BLOCK NO. 2, AND MOVE ENGINE ROOM RELAY BLOCK NO. 2 ASIDE**



4. **DISCONNECT BRAKE LINES**

Using SST, disconnect the 6 brake lines from the ABS actuator assembly.

SST 09023–00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

5. **REMOVE ABS ACTUATOR ASSEMBLY**

Remove the 3 bolts and ABS actuator assembly.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

6. **REMOVE ABS ACTUATOR**

(a) Remove the 3 nuts and ABS actuator from the actuator No. 1 bracket.

Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)

(b) Remove the 3 holders from the ABS actuator.

7. **REMOVE BOLT AND CLAMP FROM ABS ACTUATOR**

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

BR0S3-05

INSTALLATION

Installation is in the reverse order of removal (See page BR–56).

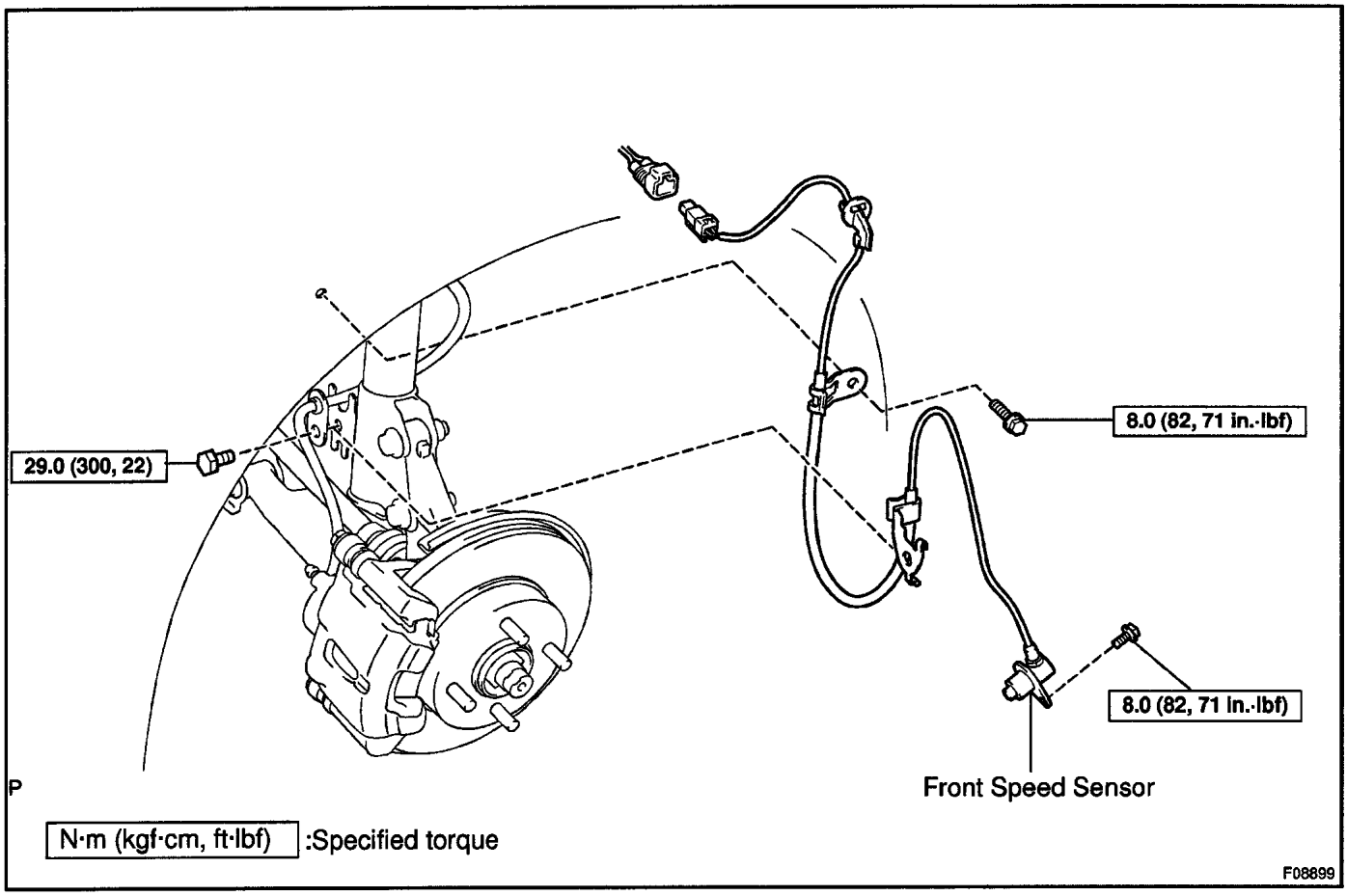
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR–4).
- Check for leaks.

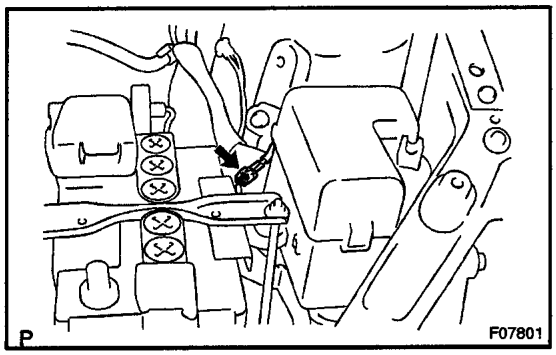
FRONT SPEED SENSOR

COMPONENTS

BR0S4-03



BR0S5-03



REMOVAL

1. DISCONNECT SPEED SENSOR CONNECTOR

Disconnect the speed sensor connector.

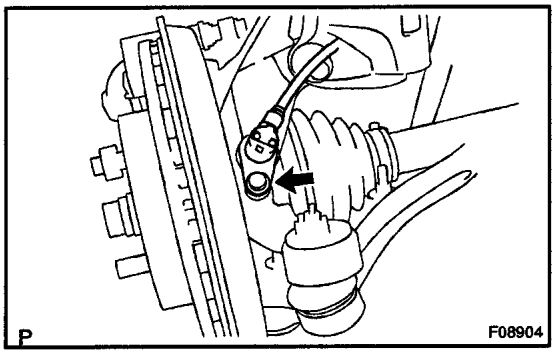
2. REMOVE FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

3. REMOVE SPEED SENSOR

(a) Remove the 2 clamp bolts and a clip holding the sensor harness to the body and shock absorber.

Torque:
Harness clamp x Body:
8.0 N·m (82 kgf·cm, 71 in.·lbf)
Harness clamp x Shock absorber:
29.0 N·m (300 kgf·cm, 22 ft·lbf)



(b) Remove the bolt and speed sensor from the steering knuckle.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

BR0S6-03

INSTALLATION

Installation is in the reverse order of removal (See page BR–59).

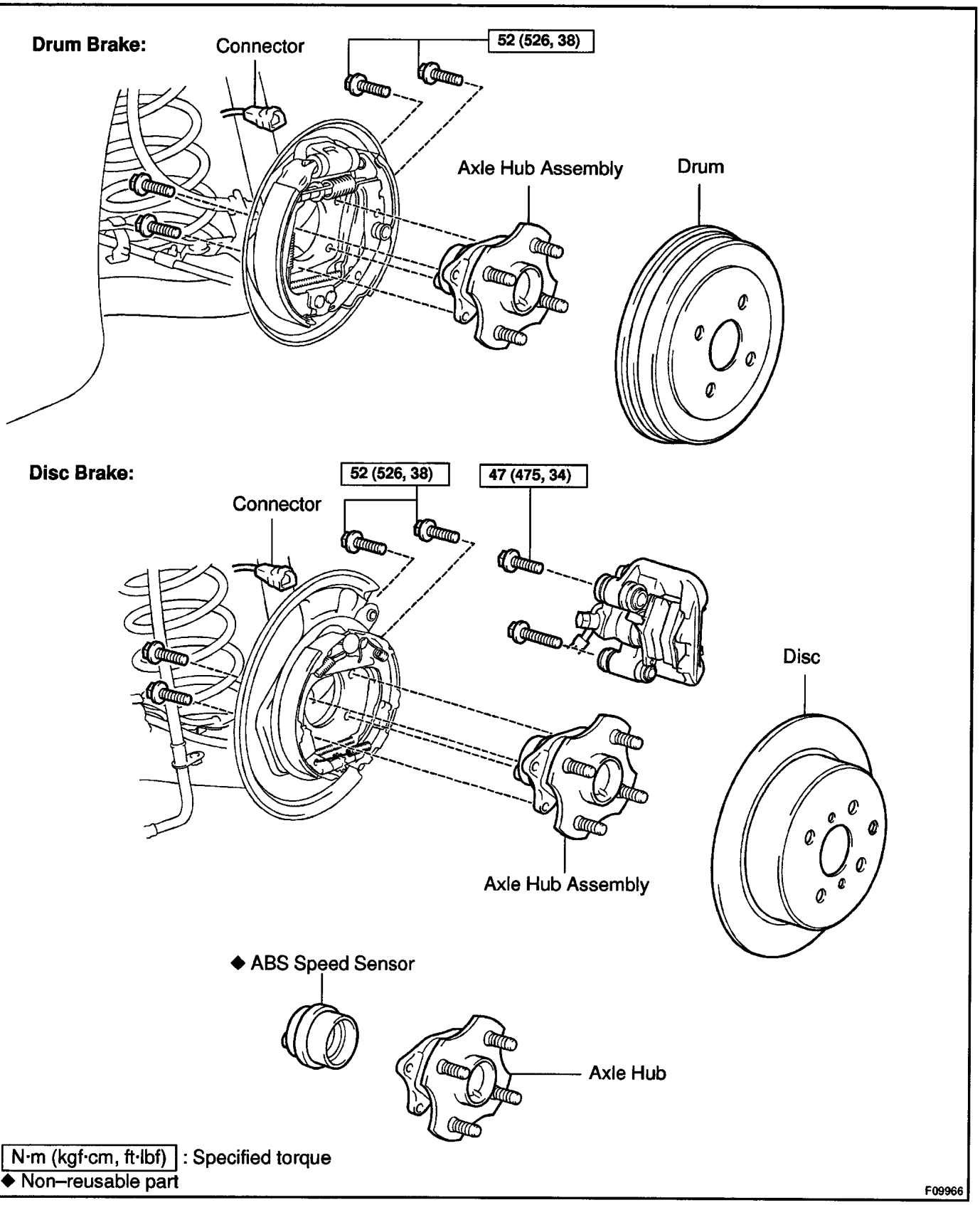
HINT:

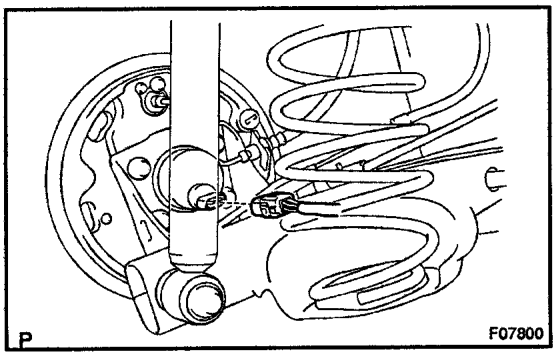
After installation, check the speed sensor signal (See page DI–60).

REAR SPEED SENSOR

COMPONENTS

BR0S7-03



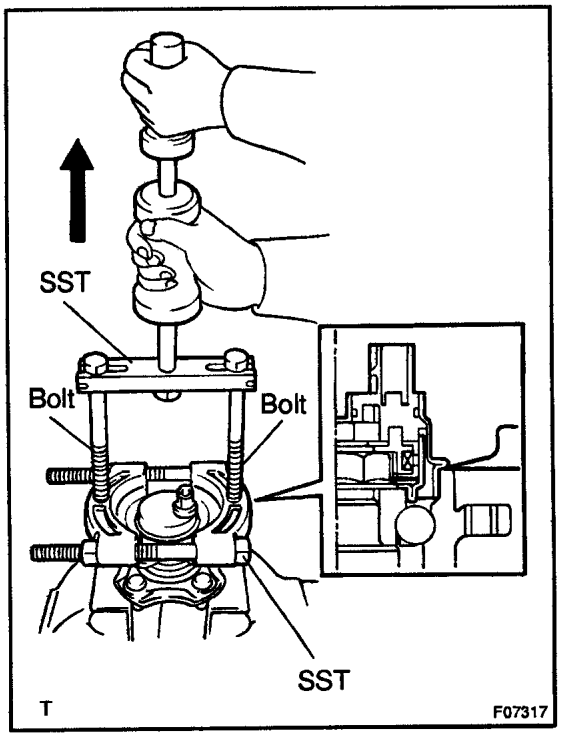


BR0S6-04

REMOVAL

1. **REMOVE REAR WHEEL**
2. **DISCONNECT SPEED SENSOR CONNECTOR**
3. **REMOVE SPEED SENSOR WITH REAR AXLE HUB (See page SA–41)**
4. **REMOVE ABS SPEED SENSOR**

(a) Using a pin punch and hammer, drive out the 2 pins and remove the 2 attachments from SST.
SST 09520–00031 (09520–00040, 09521–00020)



(b) Mount the axle hub assembly in a soft jaw vise.

NOTICE:

Replace the axle hub assembly if it is dropped or a strong shock is given to it.

(c) Using SST and 2 bolts (Diameter: 12 mm, Pitch: 1.5 mm), remove the ABS speed sensor.
SST 09520–00031 (09520–00040, 09521–00020), 09950–00020

NOTICE:

- **Do not allow any foreign matter sticking to the sensor rotor.**
- **Pull out the ABS speed sensor straightly not to damage the sensor rotor.**
- **If damage has occurred to the sensor rotor, replace the axle hub assembly.**
- **Do not scratch the contacting surface of the axle hub and speed sensor.**

BR11I-03

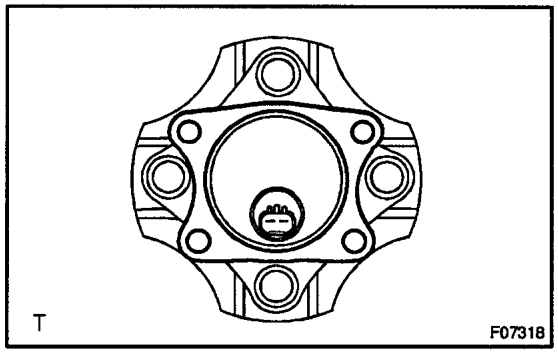
INSTALLATION

1. INSTALL NEW ABS SPEED SENSOR

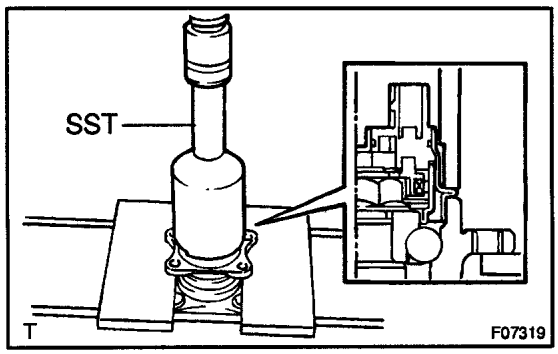
(a) Clean the contacting surface of the axle hub and a new ABS speed sensor.

NOTICE:

Do not stick any foreign objects to the sensor rotor.



(b) Place the ABS speed sensor on the axle hub so that the connector is set at the bottom under the on–vehicle condition.



(c) Using SST and a press, install a new ABS speed sensor to the axle hub.

SST 09214–76011

NOTICE:

- **Do not tap the speed sensor with a hammer directly.**
- **Check that there should be no foreign objects on the speed sensor detection portion.**
- **Press in the ABS speed sensor straight and slowly.**

2. INSTALL SPEED SENSOR WITH REAR AXLE HUB (See page SA–44)

3. CONNECT SPEED SENSOR CONNECTOR

4. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

5. CHECK SPEED SENSOR SIGNAL (See page DI–60)

STEERING

STEERING SYSTEM SR–1
TROUBLESHOOTING SR–2
DRIVE BELT SR–3
POWER STEERING FLUID SR–5
STEERING WHEEL SR–9
TILT STEERING COLUMN SR–10
POWER STEERING VANE PUMP SR–23
MANUAL STEERING GEAR SR–34
POWER STEERING GEAR SR–47

STEERING SYSTEM

PRECAUTION

SR0L4-06

- **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 YARIS VERSO/ECHO VERSO 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.**

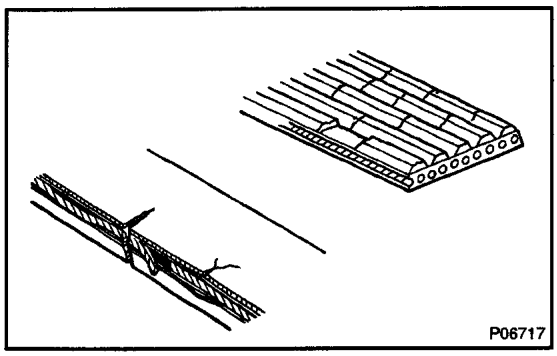
TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

SR0L5-09

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–33
	7. Steering column (Binding)	–
	8. Power steering vane pump	SR–23
	9. Power steering gear	SR–47
Poor return	1. Tires (Improperly inflated)	SA–2
	2. Front wheel alignment (Incorrect)	SA–4
	3. Steering column (Binding)	–
	4. Power steering gear	SR–47
Excessive play	1. Steering system joints (Worn)	–
	2. Suspension arm ball joints (Worn)	SA–33
	3. Intermediate shaft, Sliding yoke (Worn)	–
	4. Front wheel bearing (Worn)	SA–9
	5. Power steering gear	SR–47
Abnormal noise	1. Power steering fluid level (Low)	SR–6
	2. Steering system joints (Worn)	–
	3. Power steering vane pump	SR–23
	4. Power steering gear	SR–47



DRIVE BELT

INSPECTION

SR0QZ-05

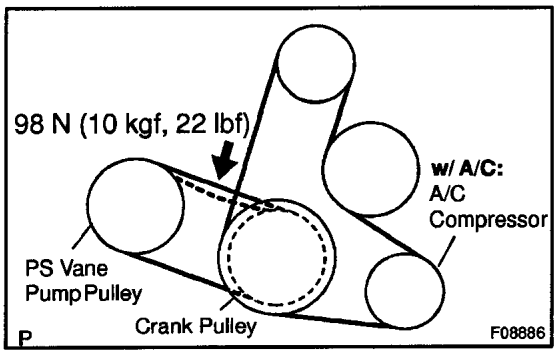
INSPECT DRIVE BELT

(a) 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.



(b) Measure the drive belt deflection.

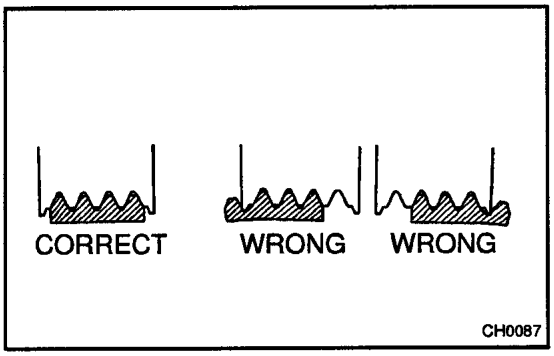
Drive belt tension: at 98 N (10 kgf, 22 lbf)

New belt: 8 – 10 mm (0.315 – 0.394 in.)

Used belt: 11 – 13 mm (0.433 – 0.512 in.)

If the belt deflection is not as specified, adjust it.

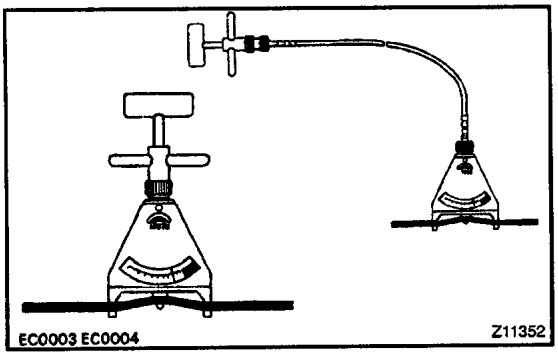
SR



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.

SR



Reference:

Using a belt tension gauge, measure the drive belt tension.

Drive belt tension:

New belt: 440 – 540 N (45 – 55 kgf)

Used belt: 240 – 340 N (25 – 35 kgf)

If the belt tension is not as specified, adjust it.

POWER STEERING FLUID BLEEDING

SR05P–09

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**

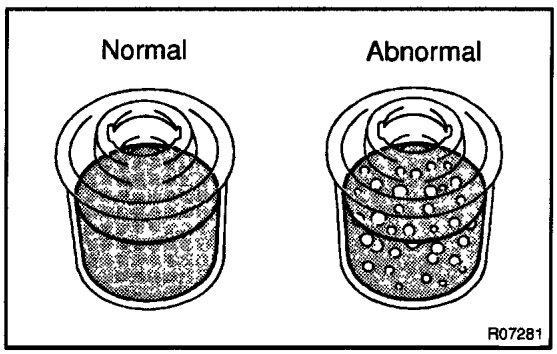
Run the engine at idle for a few minutes.

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**



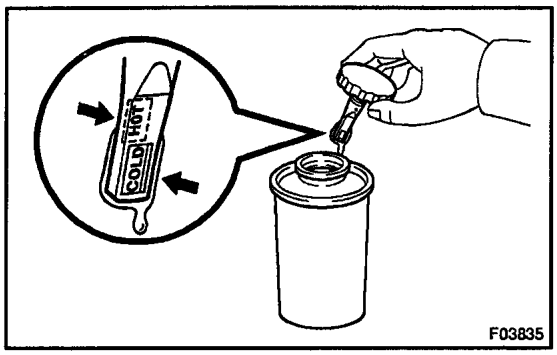
8. **CHECK FOR FOAMING OR EMULSIFICATION**

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)**

SR

SR05Q-08



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:

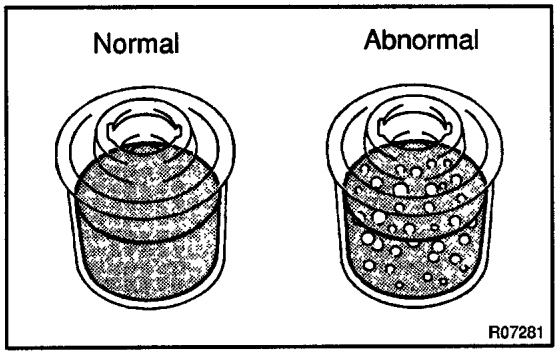
Check that the fluid level is within the HOT LEVEL range on the reservoir cap dipstick. If the fluid is cold, check that it is within the COLD LEVEL range.

(c) Start the engine and run it at idle.

(d) Turn the steering wheel from lock to lock several times to boost fluid temperature.

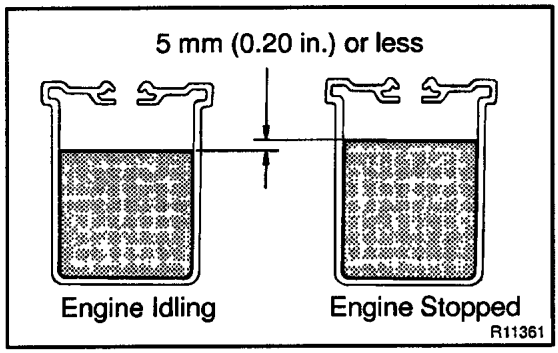
Fluid temperature: 80°C (176°F)

SR



(e) Check for foaming or emulsification.

If there is foaming or emulsification, bleed power steering system (See page SR–5).



(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).

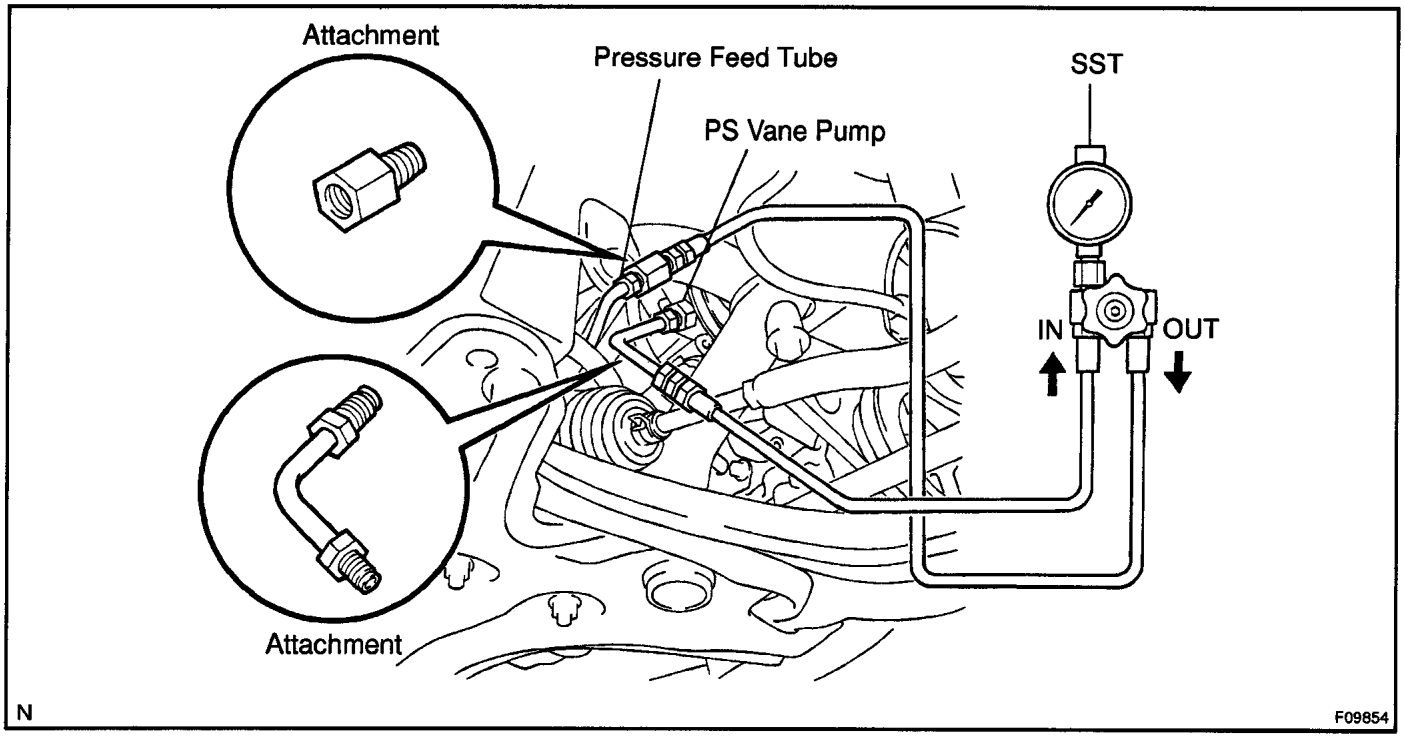
(i) Check the fluid level.

2. CHECK STEERING FLUID PRESSURE

(a) Disconnect the pressure feed tube from the PS vane pump (See page SR–25).

(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.

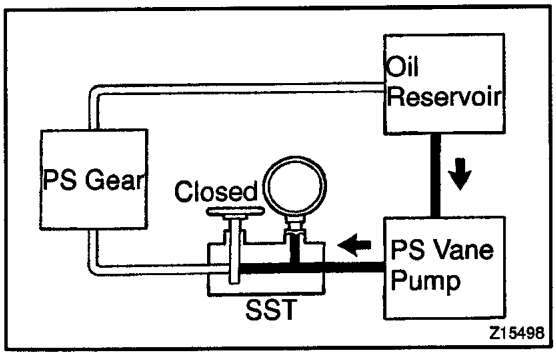


(c) Bleed the power steering system (See page SR–5).

(d) Start the engine and run it at idle.

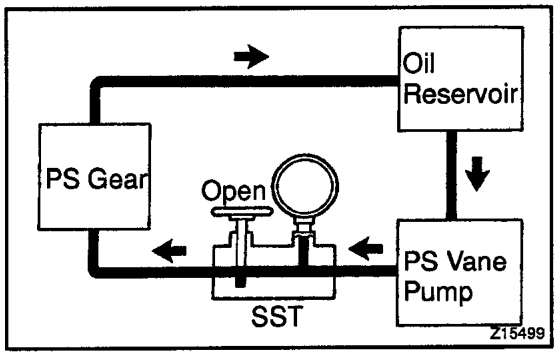
(e) Turn the steering wheel from lock to lock several times to boost fluid temperature.
Fluid temperature: 80 °C (176 °F)

SR



(f) With the engine idling, close the valve of the SST and observe the reading on the SST.
Minimum fluid pressure:
5,900 kPa (60 kgf/cm², 852 psi)

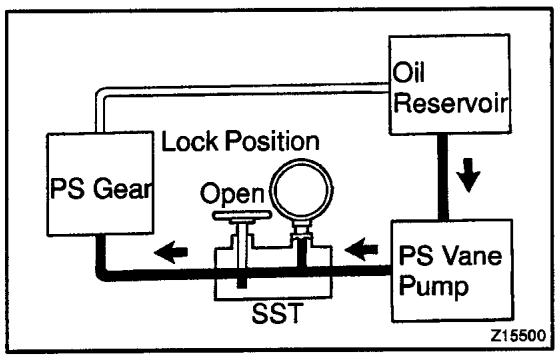
NOTICE:
- **Do not keep the valve closed for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**



(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.

SR



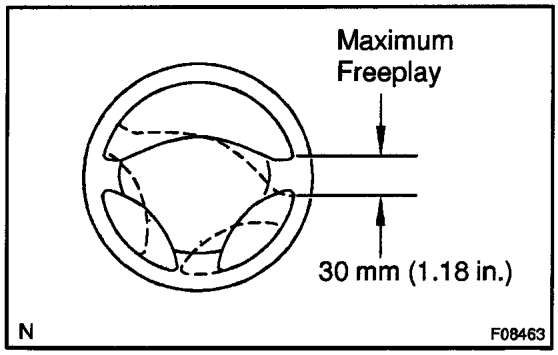
(i) With the engine idling and valve fully opened, turn the steering wheel to full lock position.
Minimum fluid pressure:
5,900 kPa (60 kgf/cm², 852 psi)

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 (See page SR–33).

(l) Bleed the power steering system (See page SR–5).



STEERING WHEEL

INSPECTION

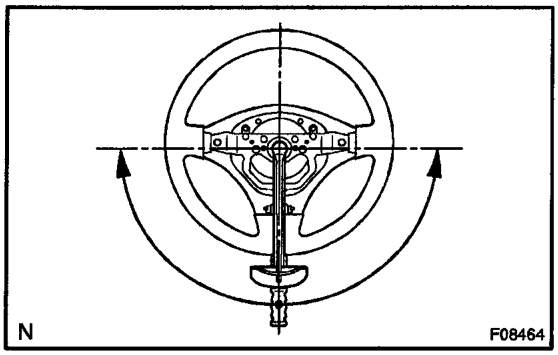
SR05R-09

1. CHECK STEERING WHEEL FREEPLAY

(a) Stop the vehicle and face the tires straight ahead.

(b) Rock the steering wheel gently up and down with a finger lightly, check the steering wheel freeplay.

Maximum freeplay: 30 mm (1.18 in.)



2. CHECK STEERING EFFORT

(a) Center the steering wheel.

(b) Remove the steering wheel pad (See page SR–12).

(c) Start the engine and run it at idle.

(d) Measure the steering effort in both directions.

Steering effort (Reference):

Manual steering: 28 N·m (285 kgf·cm, 21 ft·lbf)

Power steering: 6.5 N·m (65 kgf·cm, 58 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)

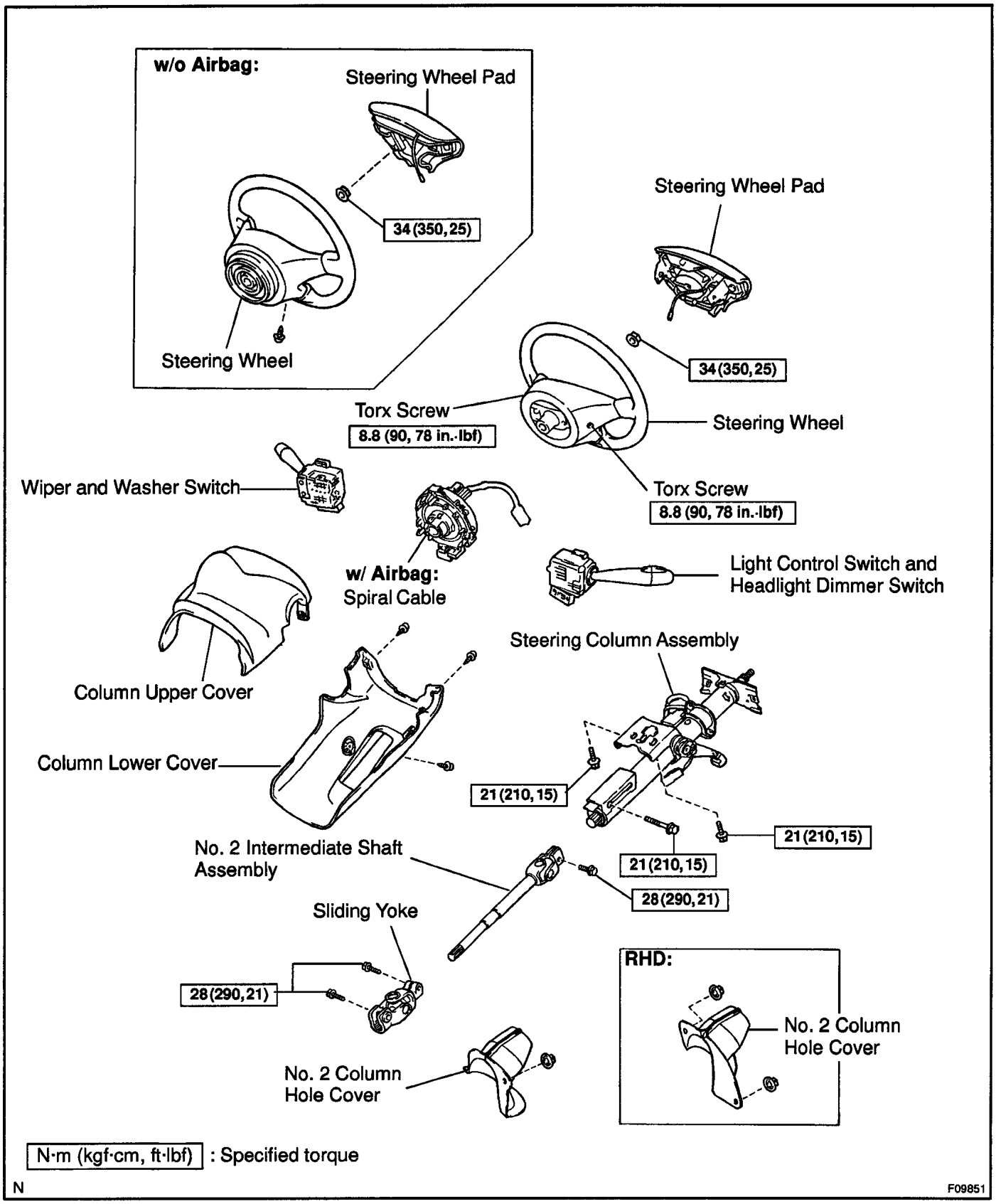
(f) Install the steering wheel pad (See page SR–20).

SR

TILT STEERING COLUMN

COMPONENTS

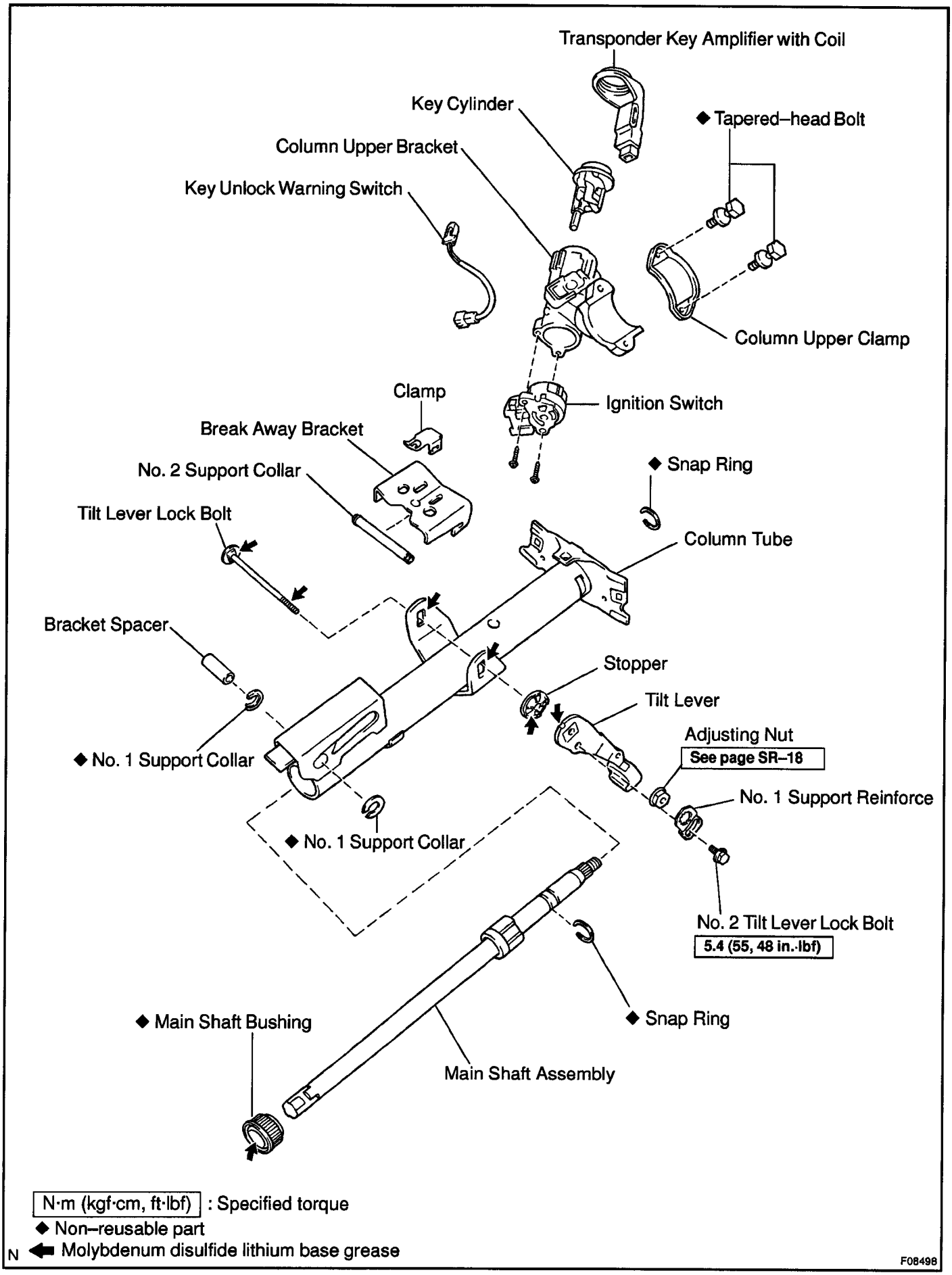
SR0VK-02



N·m (kgf·cm, ft·lbf) : Specified torque

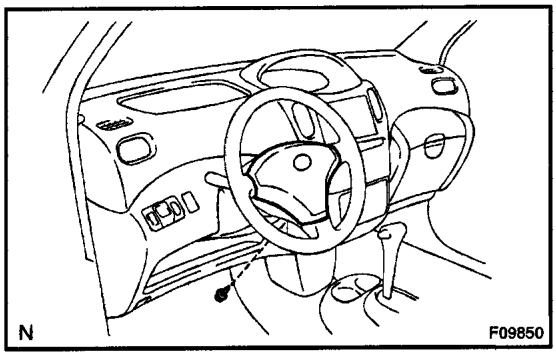
N

F09851



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
N ⬅ Molybdenum disulfide lithium base grease

F08498



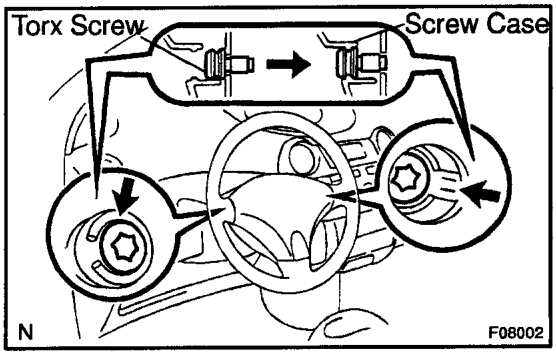
REMOVAL

1. w/o Airbag

REMOVE STEERING WHEEL PAD

(a) Remove the screw.

(b) Disconnect the terminal and remove the steering wheel pad.



2. w/ Airbag:

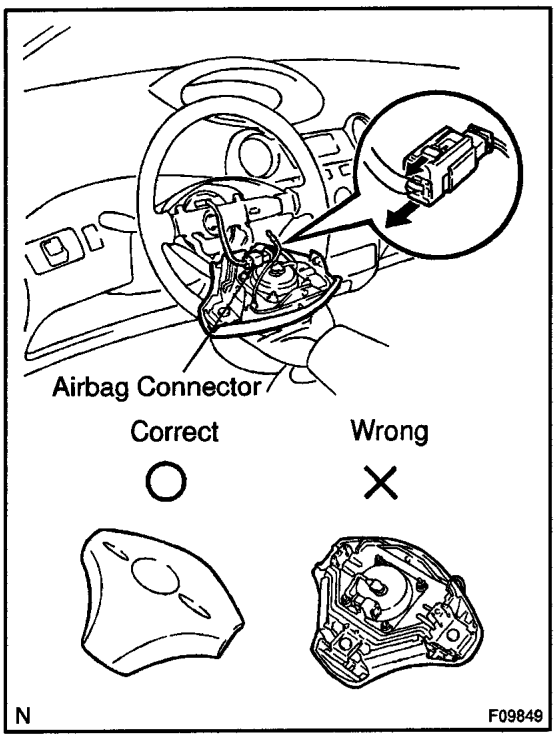
REMOVE STEERING WHEEL PAD

NOTICE:

If the airbag connector is disconnected with the ignition switch at ON, DTCs will be recorded.

(a) Place the front wheels facing straight ahead.

(b) Using a torx socket wrench, loosen the 2 torx screws until the groove along the screw circumference catches on the screw case.



(c) Pull out the wheel pad from the steering wheel and disconnect the airbag connector.

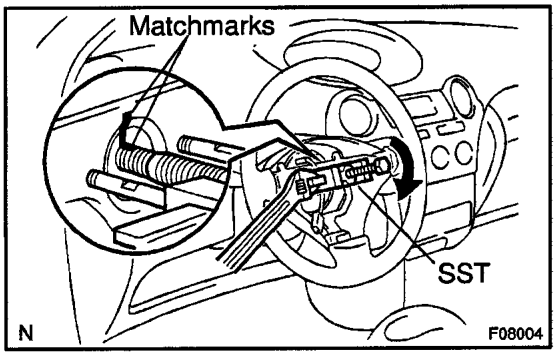
(d) Except sports type steering wheel:
Disconnect the connector.

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.



3. REMOVE STEERING WHEEL

(a) Sports type steering wheel:
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 steering wheel.
SST 09950–50012 (09951–05010, 09952–05010, 09953–05020, 09954–05020)

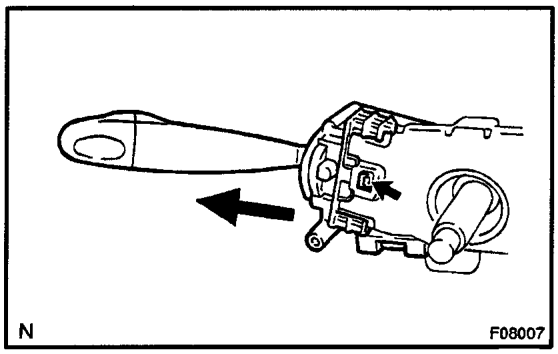
4. REMOVE COLUMN LOWER COVER

Remove the 3 screws and column lower cover.

5. w/o Airbag:

REMOVE LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH, WIPER AND WASHER SWITCH AND COLUMN UPPER COVER

(a) Disconnect the 2 connectors from the light control switch and headlight dimmer switch and wiper and washer switch.



(b) Push the claw and pull out the light control switch and headlight dimmer switch.

(c) Employ the same manner described above to the wiper and washer switch.

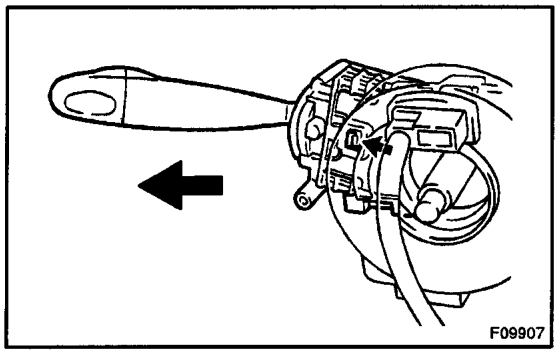
(d) Remove the column upper cover.

6. w/ Airbag:

REMOVE SPIRAL CABLE, LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH, WIPER AND WASHER SWITCH AND COLUMN UPPER COVER

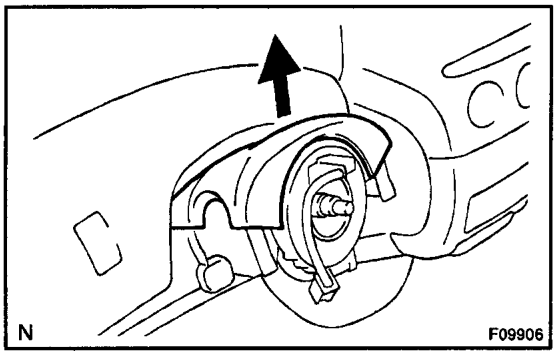
(a) Disconnect the 3 connectors from the spiral cable, light control switch and headlight dimmer switch and wiper and washer switch.

(b) Disconnect the airbag connector from the spiral cable.



(c) Push the claw and pull out the light control switch and headlight dimmer switch.

(d) Employ the same manner described above to the wiper and washer switch.



(e) Slide the column upper cover and remove the spiral cable.

NOTICE:

Do not disassemble the spiral cable or apply oil to it.

(f) Remove the column upper cover.

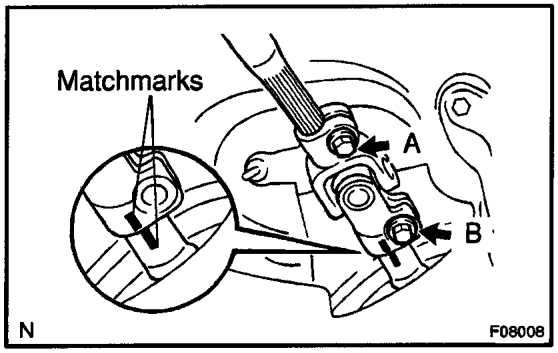
7. A/T:

REMOVE KEY INTERLOCK CABLE

(See page AX–15)

8. REMOVE NO. 2 COLUMN HOLE COVER

- LHD:
  Remove the clip and No. 2 column hole cover.
- RHD:
  Remove the 2 clips and No. 2 column hole cover.



9. DISCONNECT SLIDING YOKE

(a) Place matchmarks on the sliding yoke and No. 3 intermediate shaft assembly.

(b) Loosen the bolt A and remove the bolt B, then disconnect the sliding yoke.

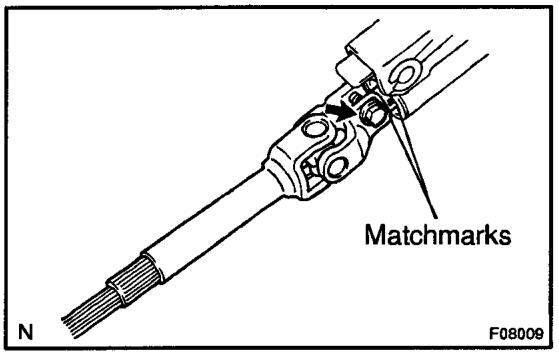
10. REMOVE STEERING COLUMN ASSEMBLY

(a) Disconnect the connectors.

(b) Remove the lower mount bolt, 2 upper mount bolts and steering column assembly.

11. REMOVE SLIDING YOKE

Remove the bolt A and sliding yoke.



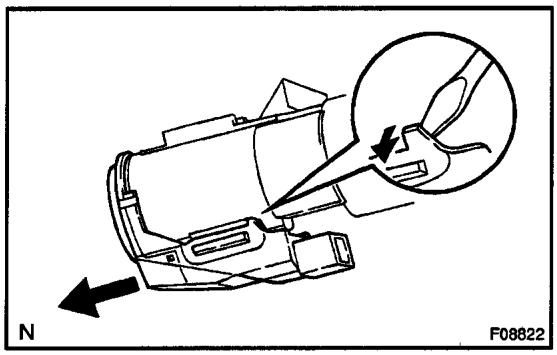
12. REMOVE NO. 2 INTERMEDIATE SHAFT ASSEMBLY

(a) Place matchmarks on the No. 2 intermediate shaft assembly and main shaft assembly.

(b) Remove the bolt and No. 2 intermediate shaft assembly.

SR0VM-02

DISASSEMBLY



NOTICE:

When using a vise, do not overtighten it.

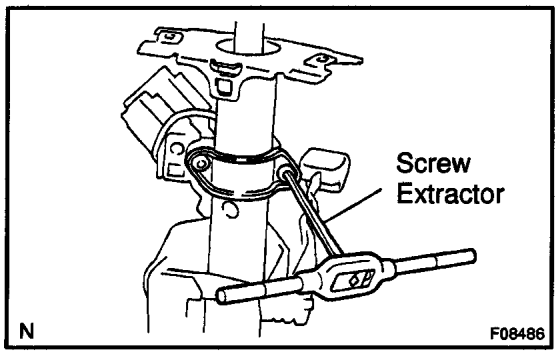
1. REMOVE TRANSPONDER KEY AMPLIFIER WITH COIL

(a) Widen the claw hung on the upper bracket by approx. 1.0 mm (0.039 in.) using a screwdriver.

(b) Pull the transponder key amplifier toward the rear of the vehicle with the claw open.

NOTICE:

Take care not to use excessive force to prevent the case from being damaged.

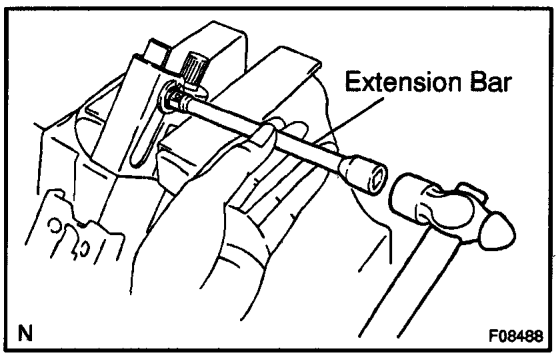


2. REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

(a) Using a centering punch, mark the center of the 2 tapered–head bolts.

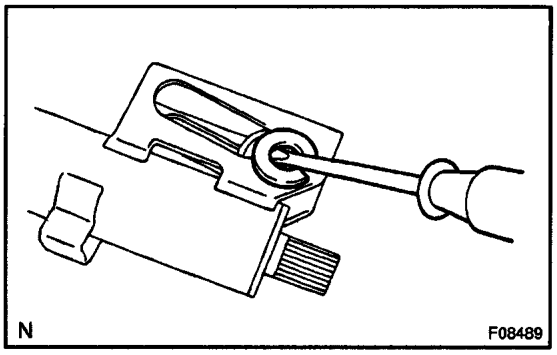
(b) Using a 3 – 4 mm (0.12 – 0.16 in.) drill, drill into the 2 bolts.

(c) Using a screw extractor, remove the 2 bolts, column upper bracket and column upper clamp.

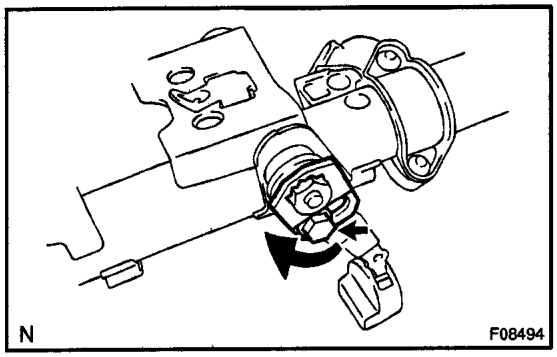


3. REMOVE BRACKET SPACER AND 2 NO. 1 SUPPORT COLLARS

(a) Using an extension bar and a hammer, tap out the bracket spacer.



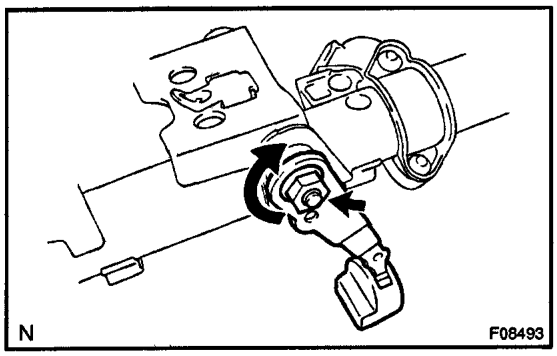
(b) Using a screwdriver, remove the 2 No. 1 support collars.



4. REMOVE TILT LEVER AND BREAK AWAY BRACKET

(a) Remove the No. 2 tilt lever lock bolt and No. 1 support reinforce.

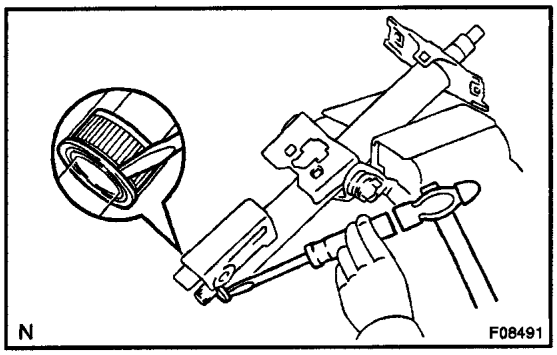
HINT:
This bolt is left–handed one.



(b) Remove the adjusting nut, tilt lever, stopper, tilt lever lock bolt and break away bracket.

HINT:
This nut is left–handed one.

(c) Remove the clamp and No. 2 support collar from the break away bracket.



5. REMOVE MAIN SHAFT BUSHING

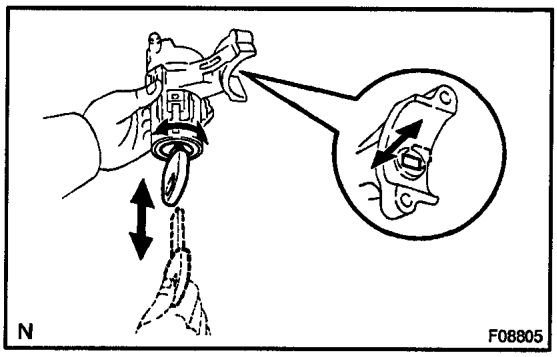
Using a screwdriver and hammer, tap out the main shaft bushing.

6. REMOVE MAIN SHAFT ASSEMBLY

(a) Using a snap ring expander, remove the snap ring on the upper side.

(b) Remove the main shaft assembly.

(c) Using a snap ring expander, remove the snap ring on the lower side.

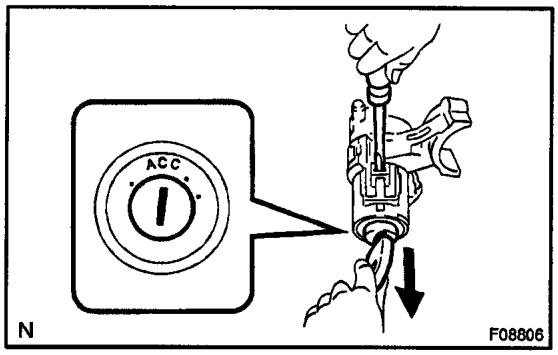


INSPECTION

SR0VN–03

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–16)

4. IF NECESSARY, REPLACE IGNITION SWITCH

(a) Remove the 2 screws and ignition switch from the column upper bracket.

(b) Install a new ignition switch with the 2 screws.

5. INSPECT KEY UNLOCK WARNING SWITCH (See page BE–16)

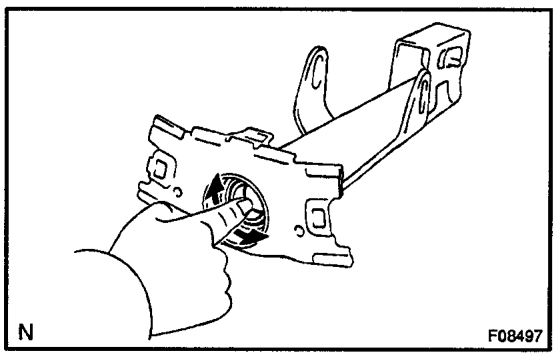
6. IF NECESSARY, REPLACE KEY UNLOCK WARNING SWITCH

(a) Slide the key unlock warning switch out of the column upper bracket.

(b) Slide a new key unlock warning switch in the column upper bracket.

7. INSPECT TRANSPONDER KEY AMPLIFIER WITH COIL (See page DI–249)

8. IF NECESSARY, REPLACE TRANSPONDER KEY AMPLIFIER WITH COIL



9. INSPECT BEARING

Check the bearing rotation condition and check for abnormal noise.

If the bearing is worn or damaged, replace the column tube.

SR0VC-03

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

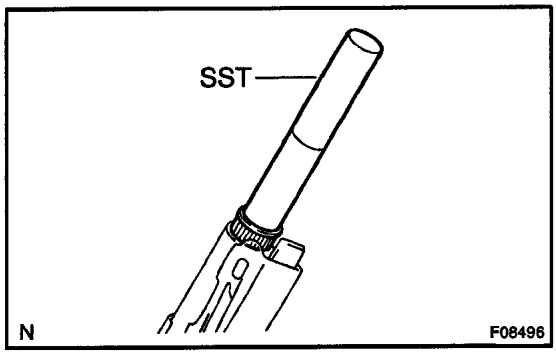
1. **COAT PARTS INDICATED BY ARROWS WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE**
(See page SR–10)

2. **INSTALL MAIN SHAFT ASSEMBLY**

(a) Using a snap ring expander, install a new snap ring on the lower side.

(b) Install the main shaft assembly.

(c) Using a snap ring expander, install a new snap ring on the upper side.



3. **INSTALL MAIN SHAFT BUSHING**

(a) Coat a new bushing with molybdenum disulfide lithium base grease.

(b) Using SST and a hammer, tap in the main shaft bushing.
SST 09612–22011

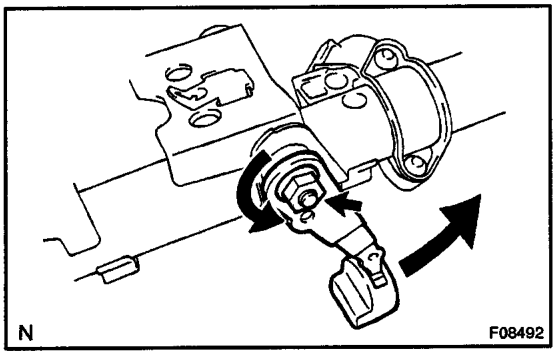
4. **INSTALL BREAK AWAY BRACKET AND TILT LEVER**

(a) Install the clamp and No. 2 support collar to the break away bracket.

(b) Install the break away bracket, tilt lever lock bolt, stopper and tilt lever.

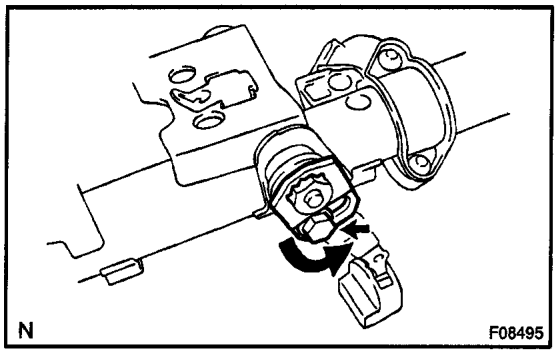
HINT:

Align the holes in the column tube with the projections of the tilt lever lock bolt and stopper.



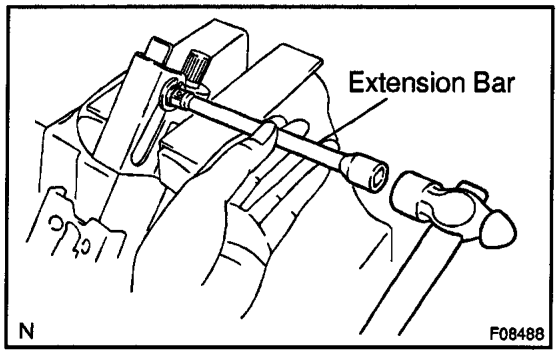
(c) Install the adjusting nut by rotating it counterclockwise in the specified torque so that the locking load (load applied to when a knob is operated) of the tilt lever will be 43 – 91 N (4.4 – 9.3 kgf, 9.7 – 20.5 lbf).

Torque: 9 N·m – 14 N·m (90 kgf·cm – 145 kgf·cm, 80 in.·lbf – 10 ft·lbf)



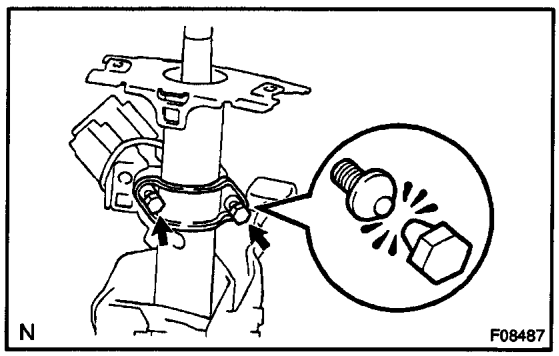
(d) Install the No. 1 support reinforce with the No. 2 tilt lever lock bolt by turning it counterclockwise.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

HINT:
Align the No. 1 support reinforce with the nut to eliminate looseness by turning the No. 1 support reinforce counterclockwise a little, then torque the No. 2 tilt lever lock bolt.



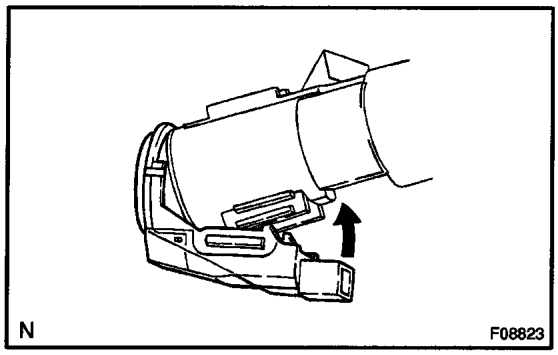
5. INSTALL 2 NO. 1 SUPPORT COLLARS AND BRACKET SPACER

(a) Install 2 new No. 1 support collars.
(b) Using an extension bar and a hammer, drive in the bracket spacer.



6. INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

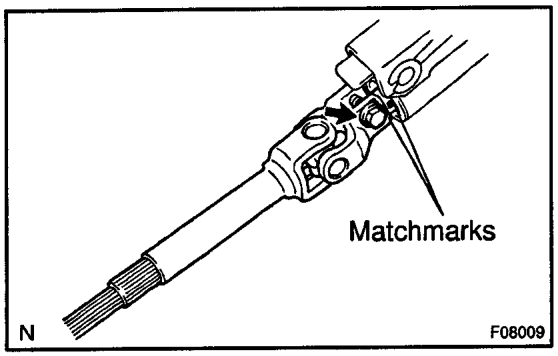
(a) Install the column upper bracket and column upper clamp with 2 new tapered–head bolts.
(b) Tighten the 2 tapered–head bolts until the bolt heads break off.



7. INSTALL TRANSPONDER KEY AMPLIFIER WITH COIL

(a) Align the transponder key amplifier with the installation position of the upper bracket with the amplifier inclined.
(b) Push the transponder key amplifier up and connect it to the upper bracket.

NOTICE:
Take care not to push the amplifier up with excessive force to prevent it from being damaged.



8R0ZA-01

INSTALLATION

1. INSTALL NO. 2 INTERMEDIATE SHAFT ASSEMBLY

(a) Align the matchmarks on the No. 2 intermediate shaft assembly and main shaft assembly.

(b) Install the No. 2 intermediate shaft assembly with the bolt.
Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)

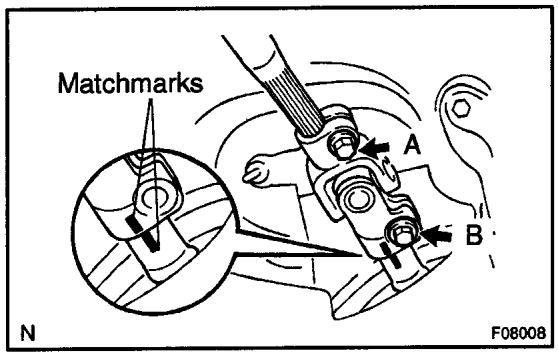
2. INSTALL SLIDING YOKE

Temporarily install the sliding yoke to the No. 2 intermediate shaft assembly with the bolt A.

3. INSTALL STEERING COLUMN ASSEMBLY

(a) Install the steering column assembly with the lower mount bolt and 2 upper mount bolts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(b) Connect the connectors.



4. CONNECT SLIDING YOKE

(a) Align the matchmarks on the sliding yoke and No. 3 intermediate shaft assembly.

(b) Install the bolt B.
Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)

(c) Torque the bolt A.
Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)

5. INSTALL NO. 2 COLUMN HOLE COVER

- LHD:
  Install the No. 2 column hole cover with the clip.
- RHD:
  Install the No. 2 column hole cover with the 2 clips.

6. A/T:
INSTALL KEY INTERLOCK CABLE
(See page AX–21)

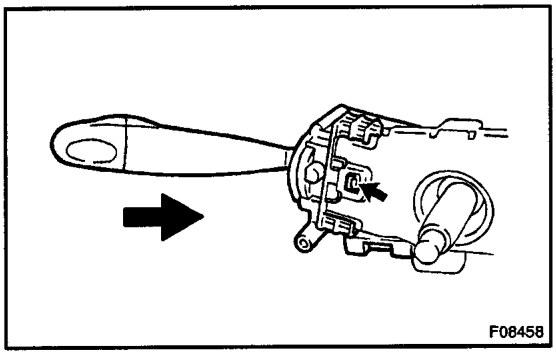
7. w/o Airbag:
INSTALL COLUMN UPPER COVER, LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH AND WIPER AND WASHER SWITCH

(a) Install the column upper cover.

(b) Push into the light control switch and headlight dimmer switch until the claw is latched.

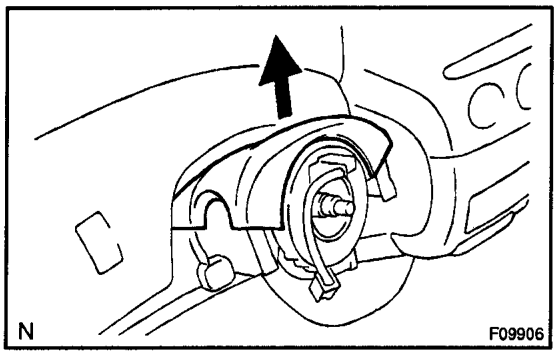
(c) Employ the same manner described above to the wiper and washer switch.

•(d) Connect the 2 connectors to the light control switch and headlight dimmer switch and wiper and washer switch.

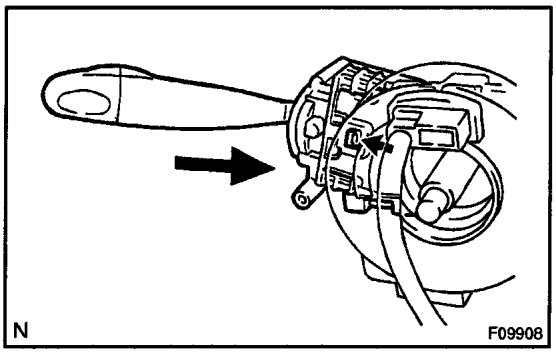


8. w/ Airbag:
INSTALL COLUMN UPPER COVER, LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH, WIPER AND WASHER SWITCH AND SPIRAL CABLE

(a) Install the column upper cover.



(b) Slide the column upper cover and install the spiral cable.



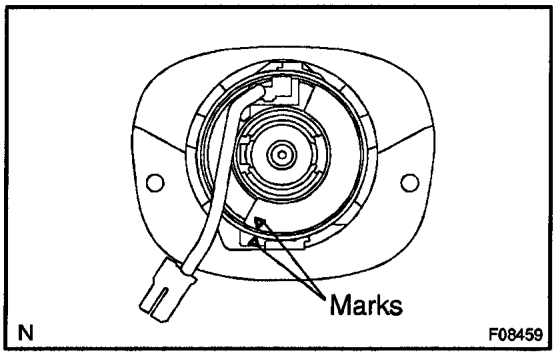
(c) Push into the light control switch and headlight dimmer switch until the claw is latched.
(d) Employ the same manner described above to the wiper and washer switch.
(e) Connect the airbag connector to the spiral cable.
(f) Connect the 3 connectors to the spiral cable, light control switch and headlight dimmer switch and wiper and washer switch.

9. INSTALL COLUMN LOWER COVER

Install the column lower cover with the 3 screws.

10. w/ Airbag:
CENTER SPIRAL CABLE

(a) Check that the front wheels are facing straight ahead.
(b) Turn the cable counterclockwise by hand until it becomes harder to turn.
(c) 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.

11. INSTALL STEERING WHEEL

(a) Align the matchmarks on the steering wheel and main shaft assembly.
(b) Install the steering wheel set nut.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)
(c) Sports type steering wheel:
Connect the connector.

12. w/o Airbag:
INSTALL STEERING WHEEL PAD

(a) Connect the terminal and install the steering wheel pad.

(b) Install the screw.

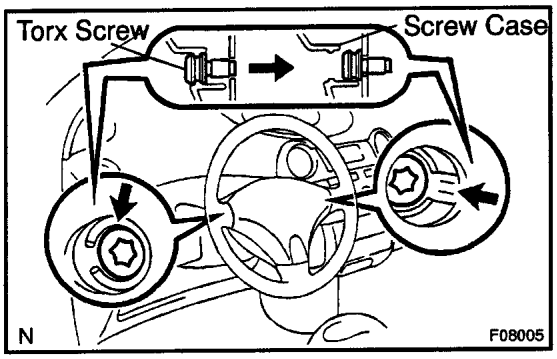
13. w/ Airbag:
INSTALL STEERING WHEEL PAD

NOTICE:

- **Never use airbag parts from another vehicle. When replacing parts, replace with new ones.**
- **Make sure the wheel pad is installed with the specified torque.**
- **If the wheel pad has been dropped, or 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) Except sports type steering wheel:
Connect the connector.

(b) Connect the airbag connector.



(c) Install the steering wheel pad after confirming that the circumference groove of the torx screws is caught on the screw case.

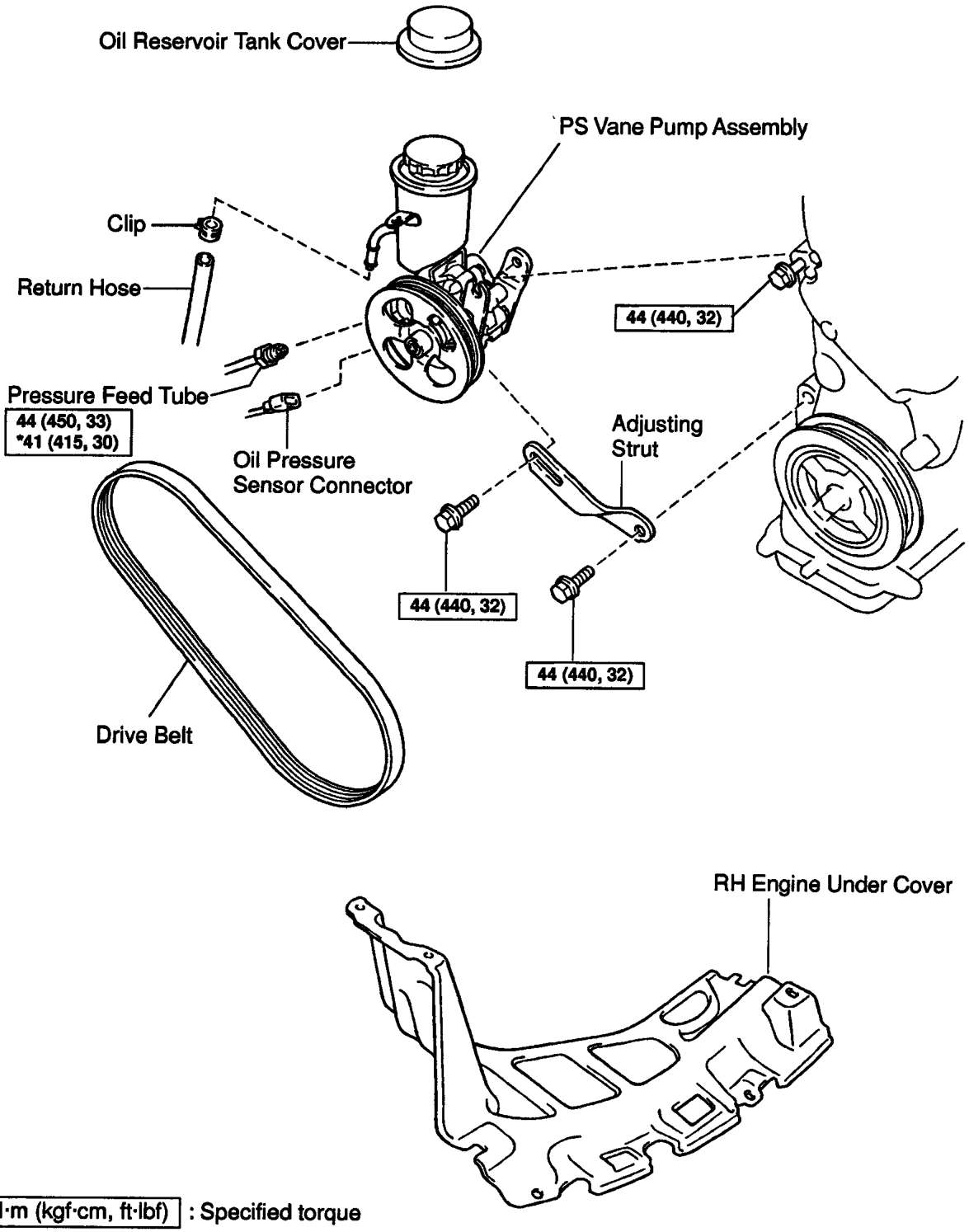
(d) Using a torx socket wrench, torque the 2 screws.
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

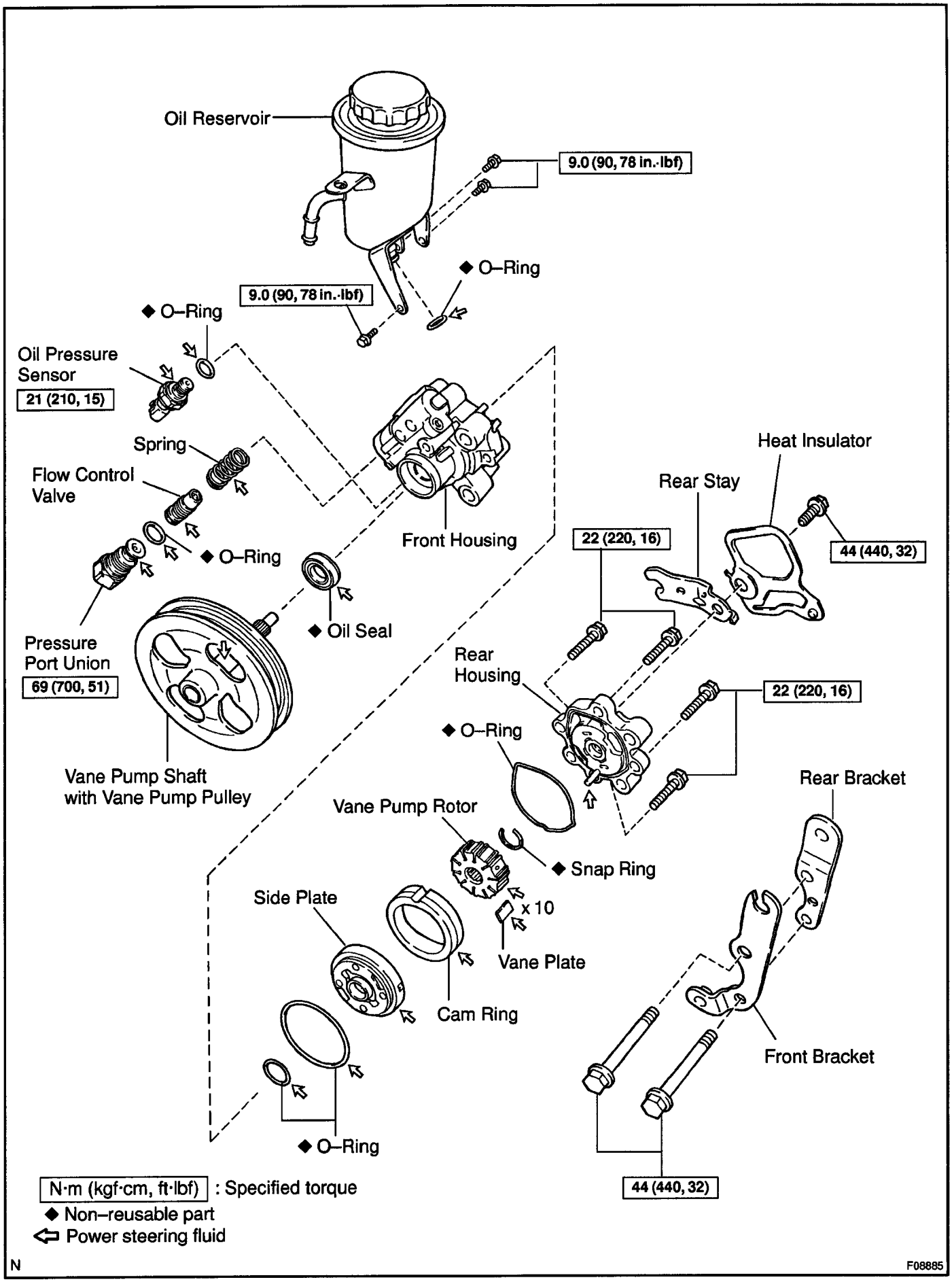
14. CHECK STEERING WHEEL CENTER POINT

POWER STEERING VANE PUMP

COMPONENTS

SR0VQ-02





N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
⇦ Power steering fluid

N

F08885

SR0VR-02

REMOVAL

1. REMOVE RH ENGINE UNDER COVER

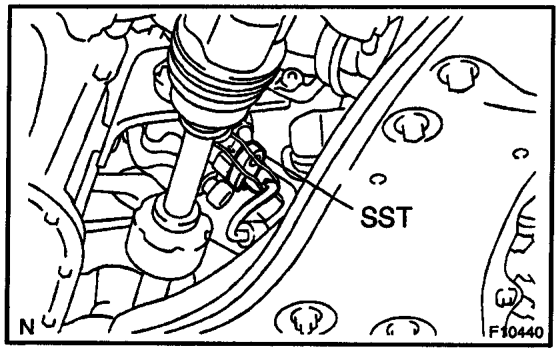
2. REMOVE OIL RESERVOIR TANK COVER

3. DISCONNECT RETURN HOSE

Remove the clip, and disconnect the return hose.

NOTICE:

Take care not to spill fluid on the drive belt.

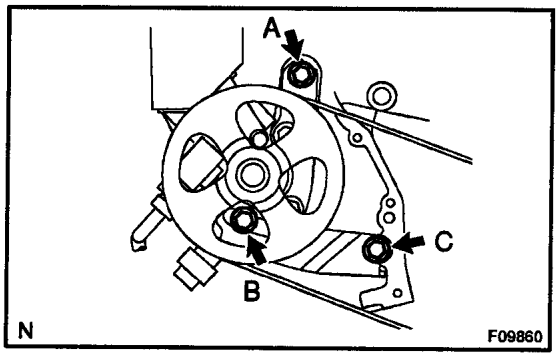


4. DISCONNECT PRESSURE FEED TUBE

Using SST, disconnect the pressure feed tube.

SST 09023–12700

5. DISCONNECT OIL PRESSURE SENSOR CONNECTOR



6. REMOVE DRIVE BELT

Loosen the bolt A and B, and remove the drive belt.

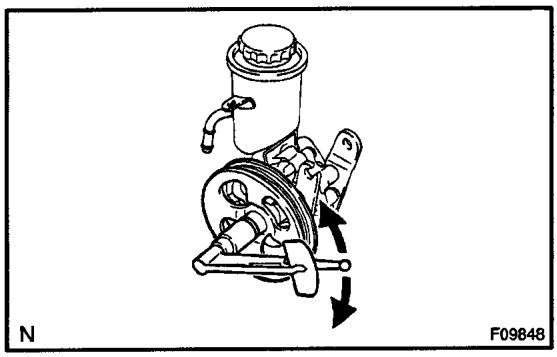
7. REMOVE PS VANE PUMP ASSEMBLY

(a) Remove the bolt B, bolt C and adjusting strut.

(b) Loosen the bolt A sufficiently so that PS vane pump assembly can be removed.

HINT:

Bolt A cannot be removed.



SR0VS-03

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 OIL RESERVOIR

(a) Remove the 3 bolts and oil reservoir.

(b) Remove the O–ring from the oil reservoir.

3. REMOVE HEAT INSULATOR AND REAR STAY

Remove the bolt, heat insulator and rear stay.

4. REMOVE FRONT AND REAR BRACKETS

Remove the 2 bolts, front and rear brackets.

5. 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.

6. REMOVE OIL PRESSURE SENSOR

(a) Remove the oil pressure sensor.

(b) Remove the O–ring from the oil pressure sensor.

7. REMOVE REAR HOUSING

(a) Remove the 4 bolts and rear housing.

(b) Remove the O–ring from the rear housing.

8. REMOVE CAM RING, 10 VANE PLATES, VANE PUMP ROTOR AND SIDE PLATE

(a) Remove the cam ring and 10 vane plates.

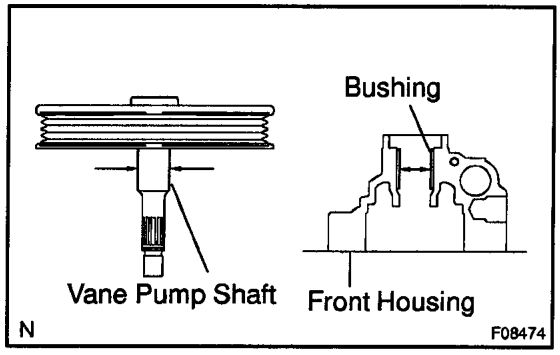
NOTICE:

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.

9. REMOVE VANE PUMP SHAFT WITH VANE PUMP PULLEY



SR0VT-03

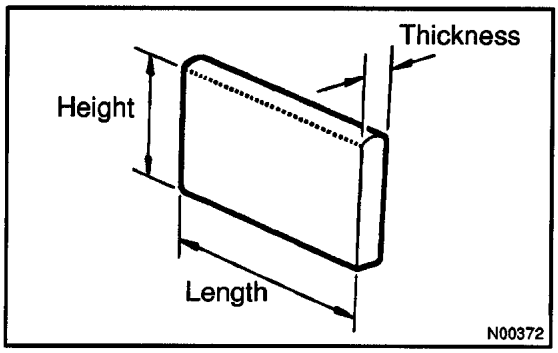
INSPECTION

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.)

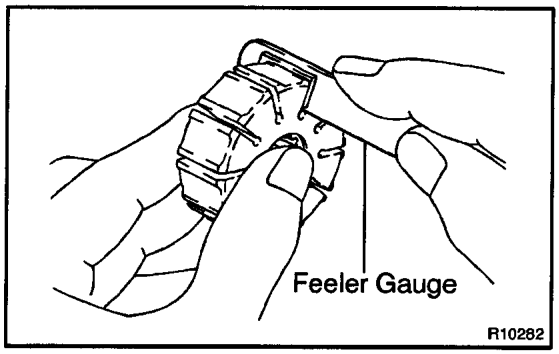
If it is more than the maximum, replace the front housing and vane pump shaft.



2. INSPECT VANE PUMP ROTOR AND VANE PLATES

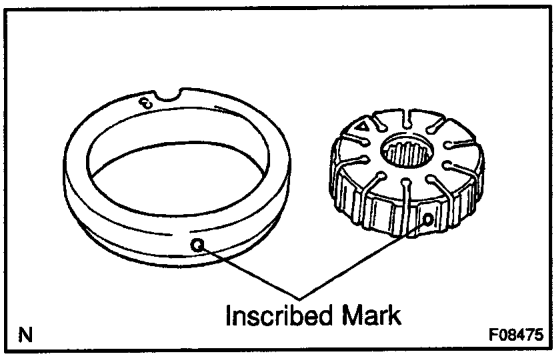
(a) Using a micrometer, measure the height, thickness and length of the 10 vane plates.

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.)



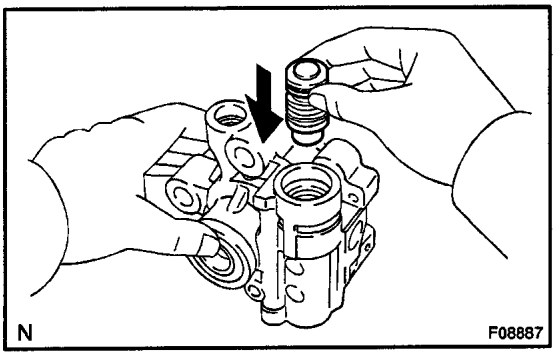
If it is more than the maximum, replace the vane plate and/or vane pump rotor with the one having the same mark stamped on the cam ring.

Inscribed mark: 0, 1, 2, 3, or 4

HINT:

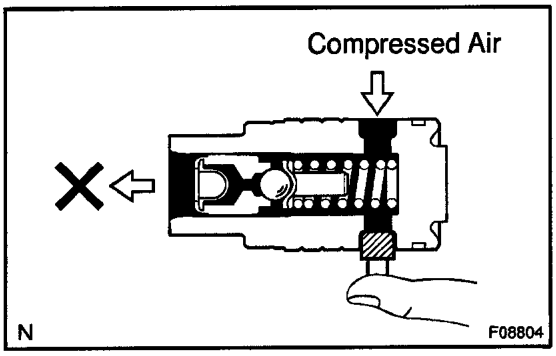
There are 5 vane plate lengths corresponding to the following vane pump rotor and cam ring marks:

Vane pump rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
0	44345 – 32100	12.001 – 12.003 (0.47248 – 0.47256)
1	44345 – 32110	11.999 – 12.001 (0.47240 – 0.47248)
2	44345 – 32120	11.997 – 11.999 (0.47232 – 0.47240)
3	44345 – 32130	11.995 – 11.997 (0.47224 – 0.47232)
4	44345 – 32140	11.993 – 11.995 (0.47216 – 0.47224)

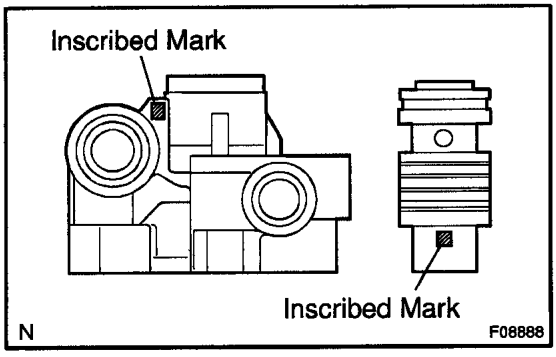


3. INSPECT FLOW CONTROL VALVE

(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.

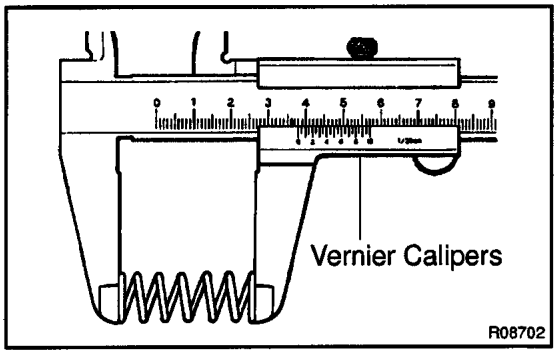


(b) Check the flow control valve for leakage. Close one of the holes and apply compressed air of 392 – 490 kPa (4 – 5 kgf/cm^2, 57 – 71 psi) into the opposite side hole, and confirm that air does not come out from the end hole.



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

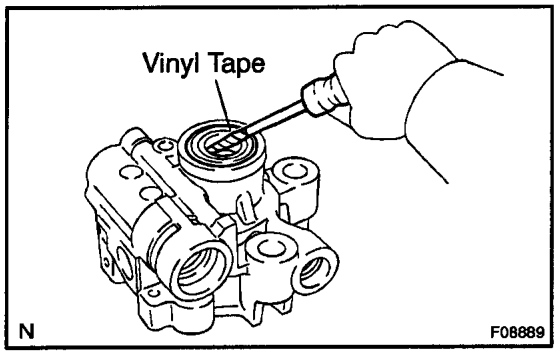
Using vernier calipers, measure the free length of the spring.

Minimum free length: 35.8 mm (1.409 in.)

If it is not within the specification, replace the spring.

SR0VU–03

REPLACEMENT



NOTICE:

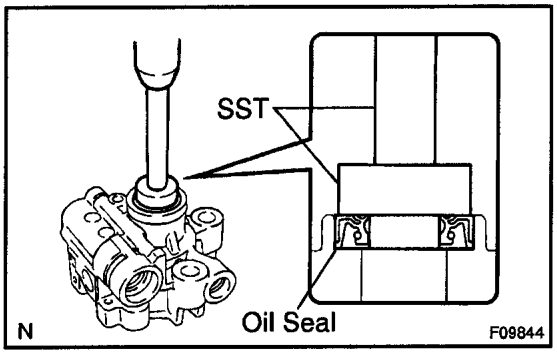
When using a vise, do not overtighten it.

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.

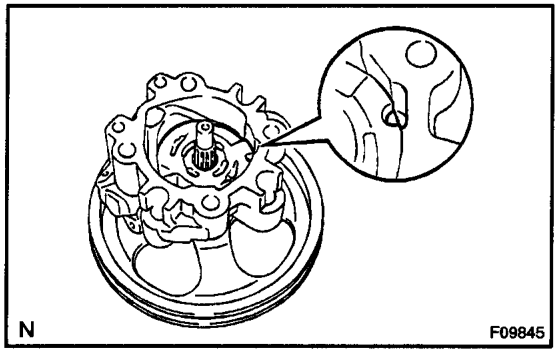
SR0ZB-01

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page SR–23)**
2. **INSTALL VANE PUMP SHAFT WITH VANE PUMP PULLEY**



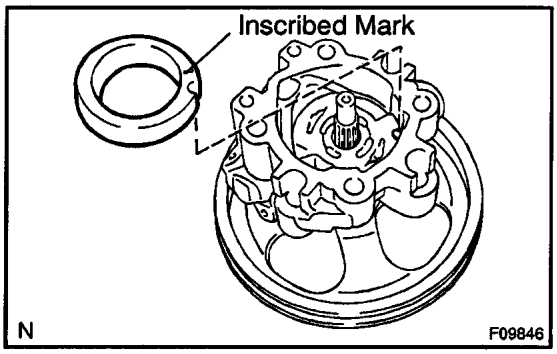
3. **INSTALL SIDE PLATE**

(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.

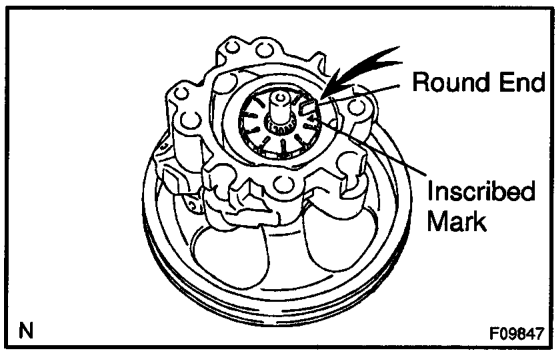
NOTICE:

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 SENSOR**

(a) Coat a new O–ring with power steering fluid, and install it to the oil pressure sensor.

(b) Install the oil pressure sensor.

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–23).

(c) Coat a new O–ring with power steering fluid, and install it to the pressure port union.

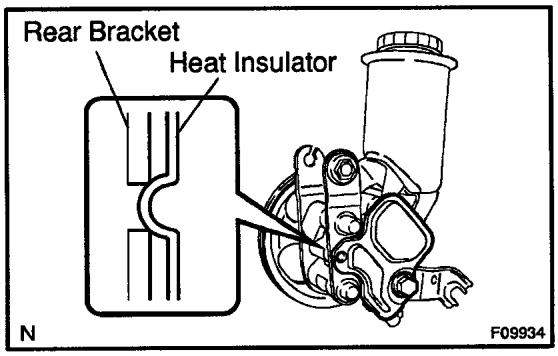
(d) Install the pressure port union.

Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

10. INSTALL FRONT AND REAR BRACKETS

Install the front and rear brackets with the 2 bolts.

Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)



11. INSTALL HEAT INSULATOR AND REAR STAY

Install the heat insulator and rear stay with the bolt.

Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

NOTICE:

Install the heat insulator, pressing its projection into a hole in the rear bracket, as shown in the illustration.

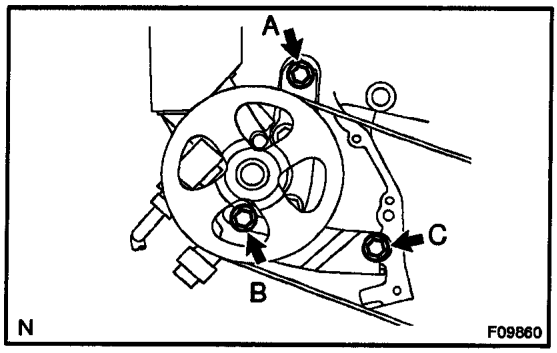
12. INSTALL OIL RESERVOIR

(a) Coat a new O–ring with power steering fluid, and install it to the oil reservoir.

(b) Install the oil reservoir with the 3 bolts.

Torque: 9.0 N·m (90 kgf·cm, 78 in.·lbf)

13. MEASURE PS VANE PUMP ROTATING TORQUE (See page SR–26)



INSTALLATION

SR0VW-02

1. INSTALL PS VANE PUMP ASSEMBLY

(a) Temporarily install the PS vane pump assembly with the bolt A.

(b) Install the adjusting strut with the bolt C.
Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

(c) Temporarily install the bolt B.

2. INSTALL DRIVE BELT

(a) Install the drive belt and adjust the drive belt tension (See page SR–3).

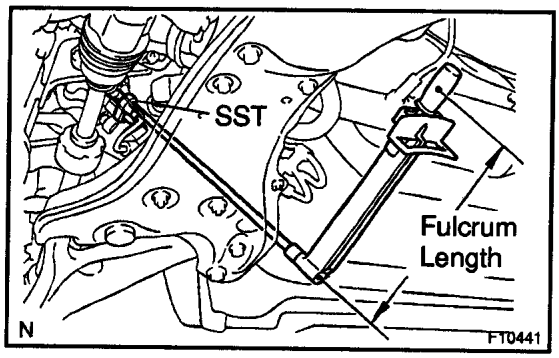
(b) Torque the bolt A.
Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

(c) Torque the bolt B.
Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

3. CONNECT OIL PRESSURE SENSOR CONNECTOR

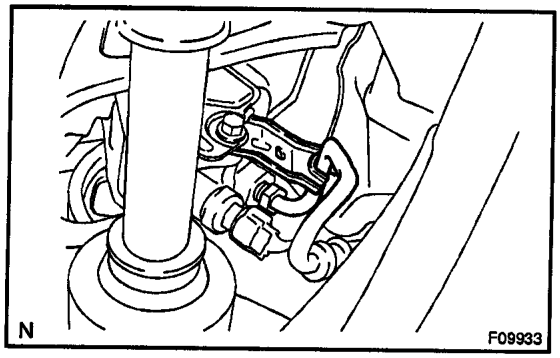
NOTICE:

Be careful to prevent oil from being attached to the connector.



4. CONNECT PRESSURE FEED TUBE

Using SST, connect the pressure feed tube.
SST 09023–12700
Torque: 41 N·m (415 kgf·cm, 30 ft·lbf)



NOTICE:

Check that the pressure feed tube is properly installed to the rear stay.

HINT:

- Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

5. CONNECT RETURN HOSE

Connect the return hose with the clip.

6. INSTALL RH ENGINE UNDER COVER

7. BLEED POWER STEERING SYSTEM
(See page SR–5)

8. INSTALL OIL RESERVOIR TANK COVER

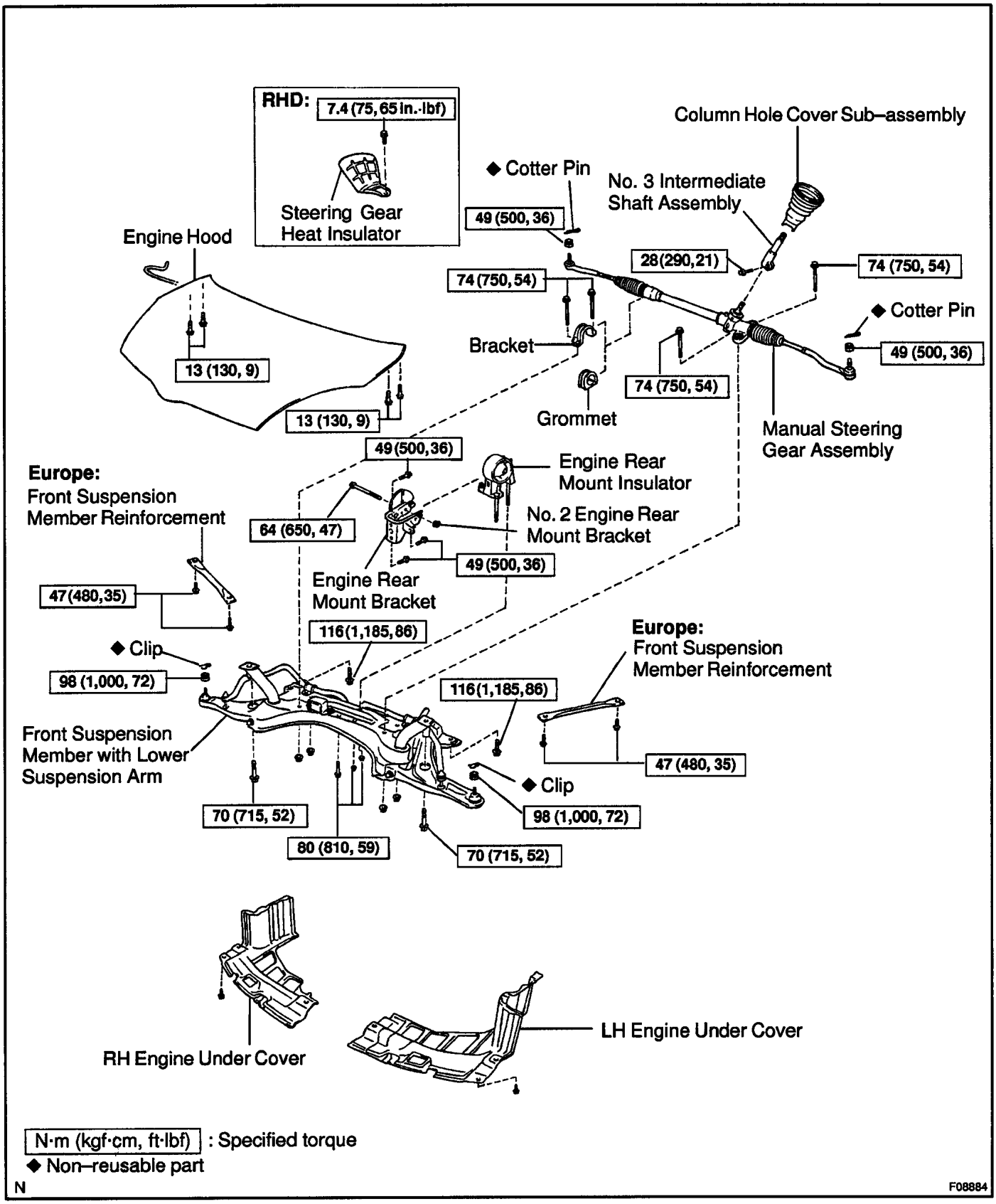
NOTICE:

Push the oil reservoir tank cover completely.

MANUAL STEERING GEAR

COMPONENTS

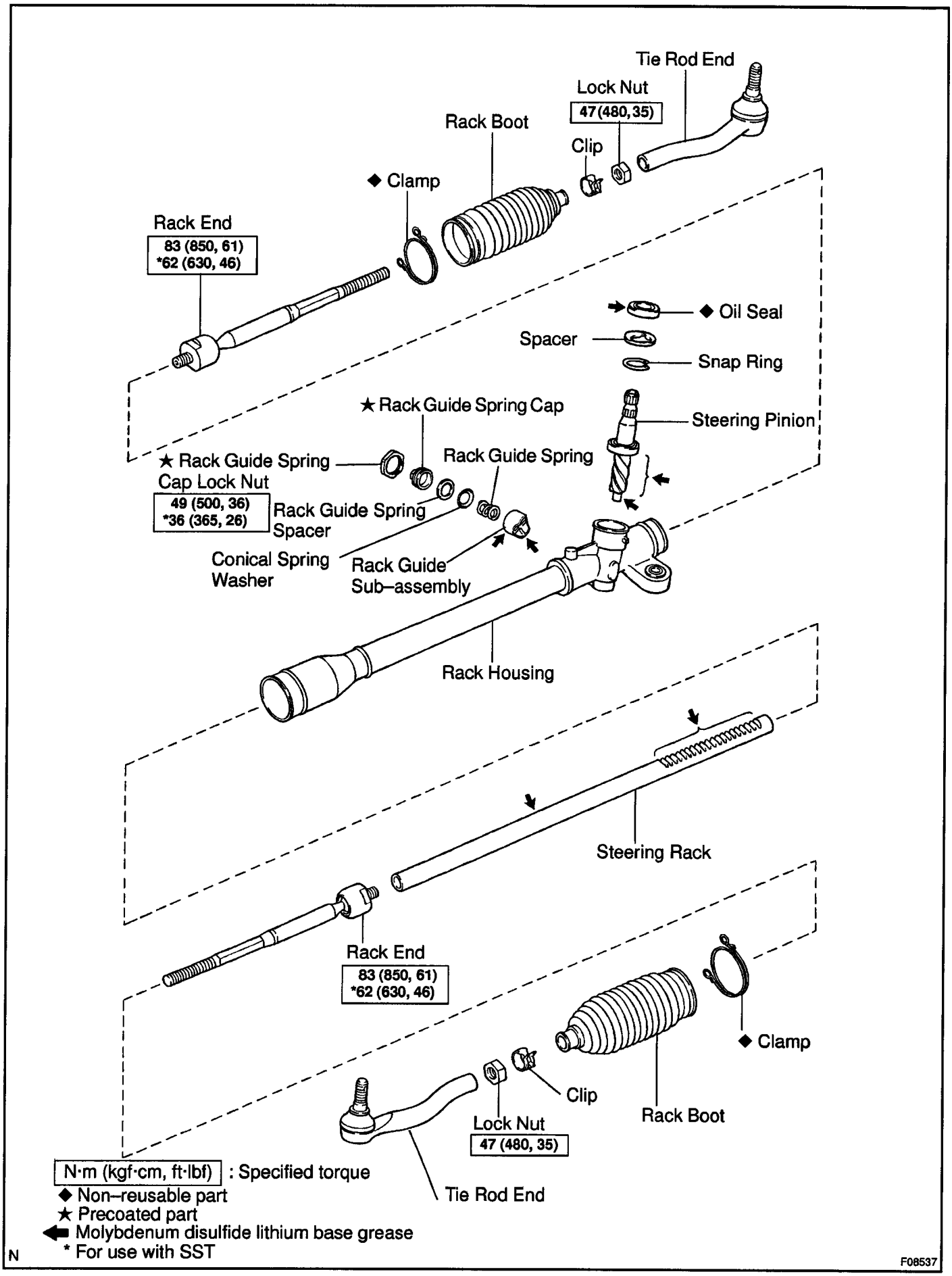
SR0VX-02



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

N

F08884


Tie Rod End
Lock Nut
47 (480, 35)
Rack Boot
Clip
◆ Clamp
Rack End
83 (850, 61)
*62 (630, 46)
◆ Oil Seal
Spacer
Snap Ring
★ Rack Guide Spring Cap
Steering Pinion
★ Rack Guide Spring
Rack Guide Spring
Cap Lock Nut
49 (500, 36)
*36 (365, 26)
Rack Guide Spring Spacer
Conical Spring Washer
Rack Guide Sub–assembly
Rack Housing
Steering Rack
Rack End
83 (850, 61)
*62 (630, 46)
◆ Clamp
Clip
Rack Boot
Lock Nut
47 (480, 35)
Tie Rod End
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
Molybdenum disulfide lithium base grease
* For use with SST
N
F08537

SR0ZC-01

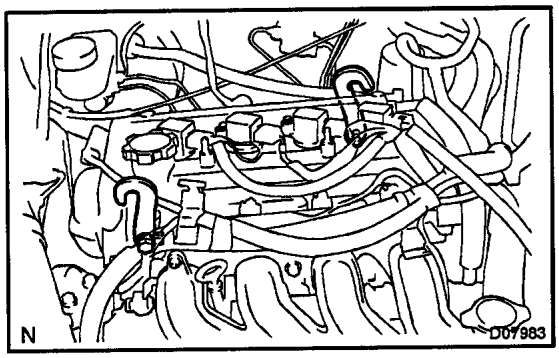
REMOVAL

NOTICE:

w/ Airbag:

Remove the steering wheel assembly before the steering gear removal, because there is possibility of breaking of the spiral cable.

1. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
2. **w/ Airbag:**
   REMOVE STEERING WHEEL PAD (See page SR–12)
3. **w/ Airbag:**
   REMOVE STEERING WHEEL (See page SR–12)
4. **REMOVE RH AND LH ENGINE UNDER COVERS**
5. **DISCONNECT RH AND LH TIE ROD ENDS (See page SA–9)**
6. **REMOVE NO. 2 COLUMN HOLE COVER (See page SR–12)**
7. **DISCONNECT SLIDING YOKE (See page SR–12)**
8. **REMOVE ENGINE HOOD (See page BO–10)**



9. **ATTACH ENGINE SLING DEVICE TO ENGINE HANGERS**

(a) Install the 2 No. 1 engine hangers with the bolt in the correct direction.

Parts No.:
No. 1 engine hanger: 12281–21010
Bolt: 91511–60818
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

(b) Attach the engine chain hoist to the engine hangers.

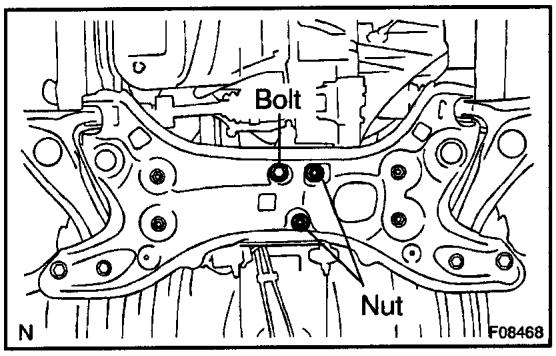
CAUTION:

Do not attempt to hang the engine by hooking the chain to any other part.

10. **DISCONNECT LOWER SUSPENSION ARM FROM STEERING KNUCKLE (See page SA–32)**
11. **Europe:**
    REMOVE RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT

(a) Remove the 2 bolts and front suspension member reinforcement.

(b) Employ the same manner described above to the other side.

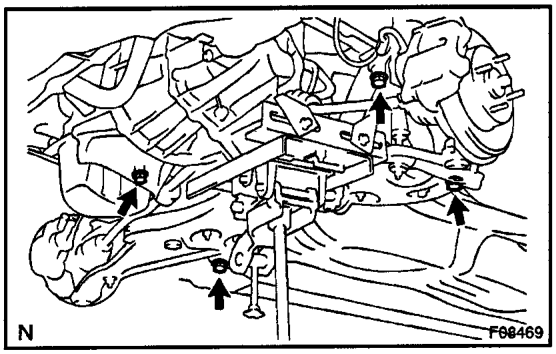


12. DISCONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Remove the bolt and 2 nuts, and disconnect the engine rear mount insulator and front suspension member.

13. SUPPORT FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM

Using a transmission jack, support the front suspension member with lower suspension arm.



14. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND MANUAL STEERING GEAR ASSEMBLY

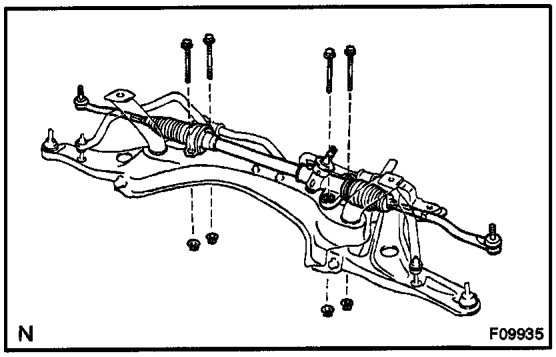
(a) Disconnect the column hole cover sub–assembly.

(b) Remove the 4 bolts and front suspension member with lower suspension arm and manual steering gear assembly.

15. REMOVE MANUAL STEERING GEAR ASSEMBLY

(a) RHD:
Remove the bolt and steering gear heat insulator.

(b) Remove the column hole cover sub–assembly.

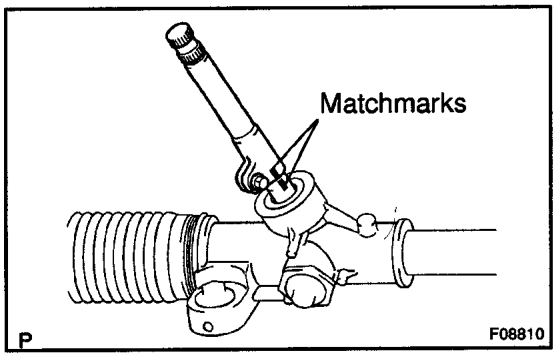


(c) Remove the 4 bolts, nuts and manual steering gear assembly from the front suspension member.

NOTICE:

Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.

(d) Remove the bracket and grommet from the manual steering gear assembly.



(e) Place matchmarks on the No. 3 intermediate shaft assembly and steering pinion.

(f) Remove the bolt and No. 3 intermediate shaft assembly.

16. REMOVE ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET

(a) Remove the through bolt, No. 2 engine rear mount bracket and engine rear mount insulator.

(b) Remove the 3 bolts and engine rear mount bracket.

SR0VZ–02

DISASSEMBLY

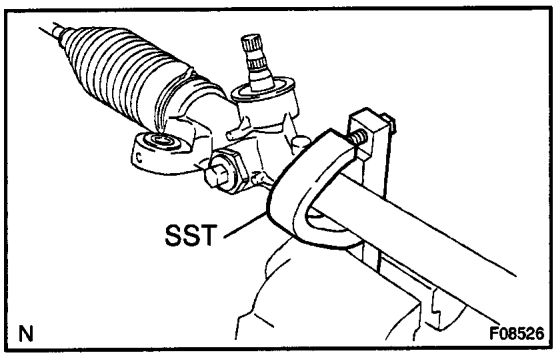
NOTICE:

When using a vise, do not overtighten it.

1. SECURE MANUAL STEERING GEAR ASSEMBLY IN VISE

Using SST, secure the manual steering gear assembly in a vise.

SST 09612–00012

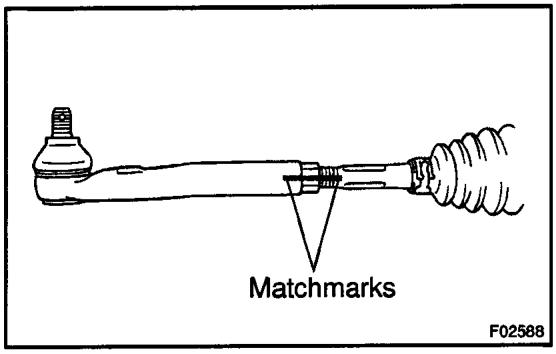


2. REMOVE RH AND LH TIE ROD ENDS AND LOCK NUTS

(a) Place matchmarks on the tie rod end and rack end.

(b) Loosen the lock nut, and remove the tie rod end and lock nut.

(c) Employ the same manner described above to the other side.



3. REMOVE RH AND LH CLIPS, CLAMPS AND RACK BOOTS

(a) Using pliers, loosen the clamp.

(b) Remove the clip, clamp and rack boot.

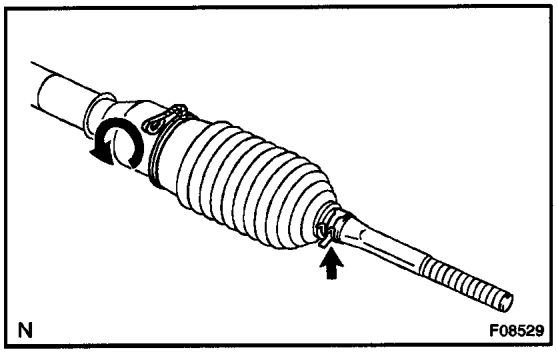
NOTICE:

Be careful not to damage the boot.

HINT:

Mark the RH and LH rack boots.

(c) Employ the same manner described above to the other side.



4. REMOVE RH AND LH RACK ENDS

(a) Using SST, hold the steering rack steadily and using another SST, remove the rack end.

SST 09922–10010

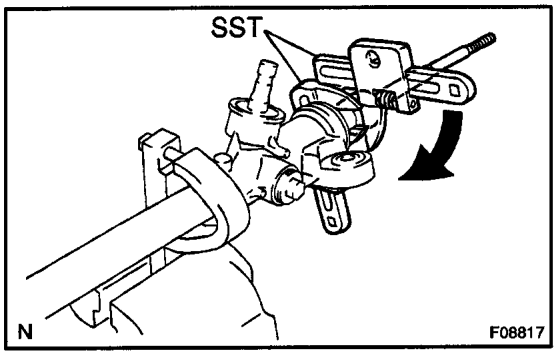
NOTICE:

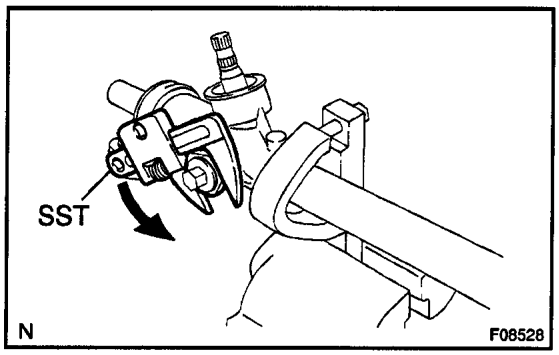
Use SST 09922–10010 in the direction shown in the illustration.

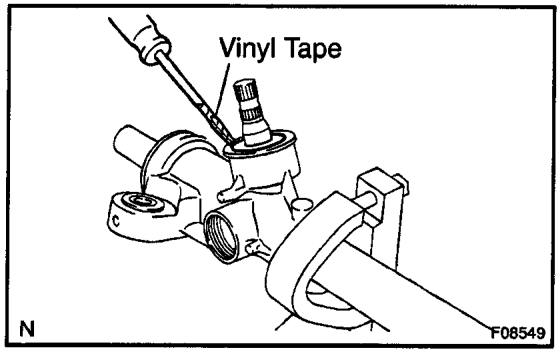
HINT:

Mark the RH and LH rack ends.

(b) Employ the same manner described above to the other side.







5. REMOVE RACK GUIDE SPRING CAP LOCK NUT

Using SST, remove the rack guide spring cap lock nut.

SST 09922–10010

NOTICE:

Use SST 09922–10010 in the direction shown in the illustration.

6. REMOVE RACK GUIDE SPRING CAP, RACK GUIDE SPRING SPACER, CONICAL SPRING WASHER, RACK GUIDE SPRING AND RACK GUIDE SUB–ASSEMBLY

7. REMOVE OIL SEAL, SPACER AND STEERING PINION

(a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal.

NOTICE:

Be careful not to damage the rack housing.

(b) Remove the spacer.

(c) Using snap ring pliers, remove the snap ring and pull out the steering pinion.

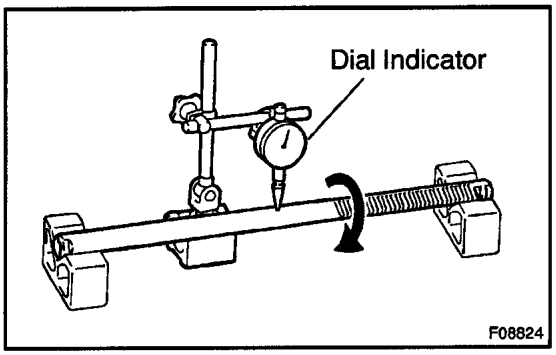
NOTICE:

Be careful not to damage the serrations.

8. REMOVE STEERING RACK

NOTICE:

To avoid damaging the bushing, remove the rack from the steering pinion housing side of the rack housing without revolving it.



SR0W0-02

INSPECTION

NOTICE:

When using a vise, do not overtighten it.

INSPECT STEERING RACK

(a) Using a dial indicator, check the rack for runout, teeth wear and damage.

Maximum runout: 0.15 mm (0.0059 in.)

(b) Check the back surface for wear and damage.

SR0W1-02

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE (See page SR–34)

2. INSTALL STEERING RACK

NOTICE:

To avoid damaging the bushing, install the rack from the steering pinion side of the rack housing without revolving it.

3. INSTALL STEERING PINION, SPACER AND OIL SEAL

(a) Set the notched side of the steering rack so that the pinion can be positioned inside.

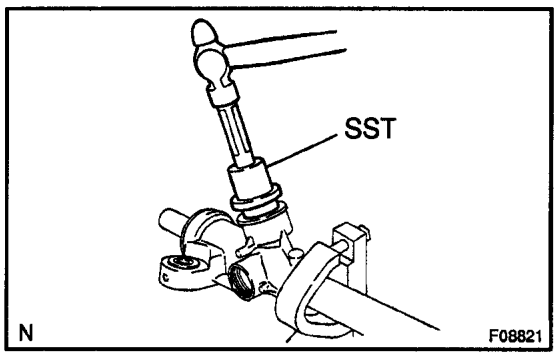
(b) Push in the steering pinion, and using snap ring pliers, install the snap ring.

NOTICE:

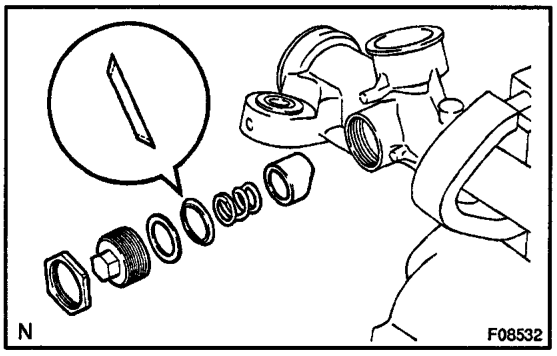
Be careful not to damage the serrations.

(c) Install the spacer.

(d) Coat a new oil seal lip with molybdenum disulfide lithium base grease.



(e) Using SST and a hammer, tap in the oil seal.
SST 09517–12010



4. INSTALL RACK GUIDE SUB–ASSEMBLY, RACK GUIDE SPRING, CONICAL SPRING WASHER, RACK GUIDE SPRING SPACER AND RACK GUIDE SPRING CAP

(a) Install the rack guide sub–assembly, rack guide spring, conical spring washer and rack guide spring spacer.

NOTICE:

Make sure that the conical spring washer is installed facing in the correct direction.

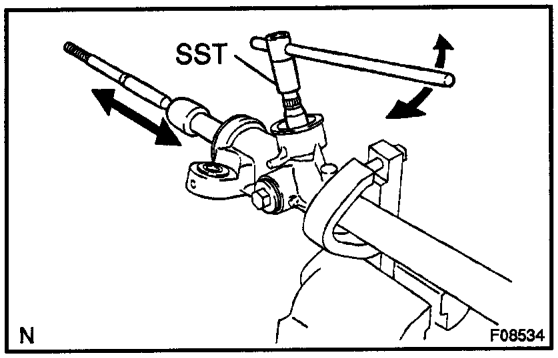
(b) Apply sealant to 2 or 3 threads of the rack guide spring cap.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Temporarily install the rack guide spring cap.

5. ADJUST TOTAL PRELOAD

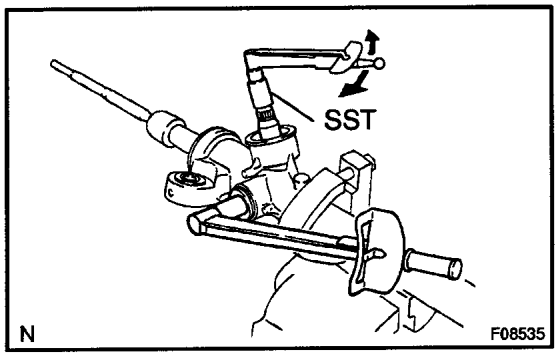
(a) Temporarily install the RH and LH rack ends.

(b) Torque the rack guide spring cap.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

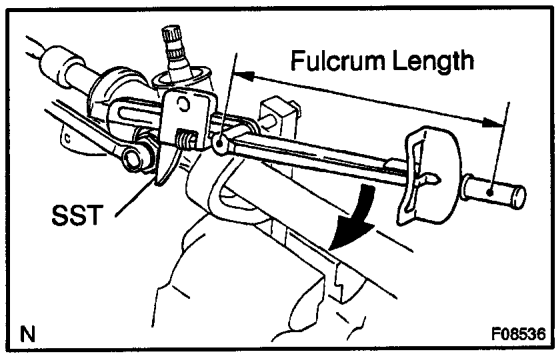


(c) Using SST, turn the pinion shaft right and left 1 or 2 times.
SST 09612–24014 (09616–10010)

(d) Loosen the rack guide spring cap until the rack guide spring is not functioning.



(e) Using SST and a torque wrench, tighten the rack guide spring cap until the preload is within specification.
SST 09612–24014 (09616–10010)
Preload (turning):
0.6 – 1.5 N·m (6 – 15 kgf·cm, 5.2 – 13.0 in.·lbf)



6. INSTALL RACK GUIDE SPRING CAP LOCK NUT

(a) Apply sealant to 2 or 3 threads of the rack guide spring cap lock nut.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

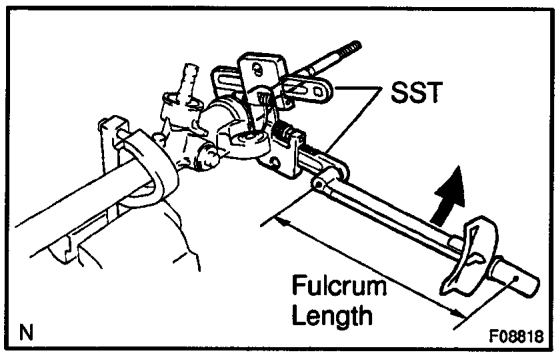
(b) Hold the rack guide spring cap rotating and using SST, torque the rack guide spring cap lock nut.
SST 09922–10010
Torque: 36 N·m (365 kgf·cm, 26 ft·lbf)

NOTICE:
Use SST 09922–10010 in the direction shown in the illustration.

HINT:
Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).

(c) Recheck the total preload.
Preload (turning):
0.6 – 1.5 N·m (6 – 15 kgf·cm, 5.2 – 13.0 in.·lbf)

(d) Remove the RH and LH rack ends.



7. INSTALL RH AND LH RACK ENDS

(a) Using SST, hold the steering rack steadily and using another SST, install the rack end.

SST 09922–10010

Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

NOTICE:

Use SST 09922–10010 in the direction shown in the illustration.

HINT:

Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).

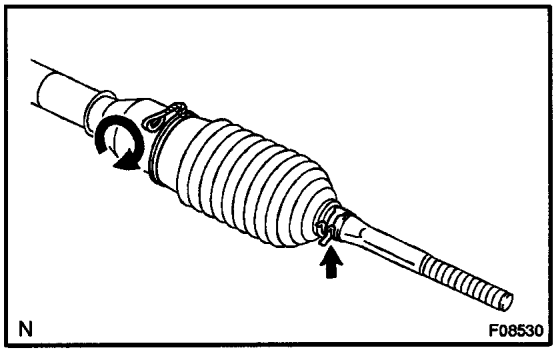
(b) Employ the same manner described above to the other side.

8. INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS

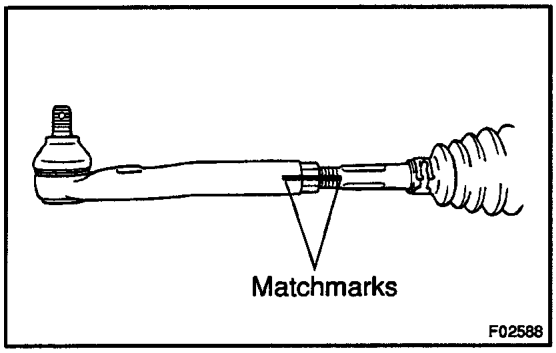
(a) Install the rack boot, clip and a new clamp.

NOTICE:

Be careful not to damage or twist the boot.



(b) After winding and tightening the clamp around the circumference of the boot twice, twist it several times, and install it.



9. 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 lock nut (See page SA–4).

Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)

(c) Employ the same manner described above to the other side.

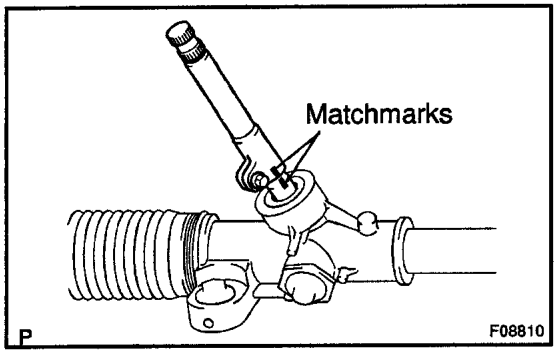
SR0ZD-01

INSTALLATION

1. INSTALL ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET

(a) Install the engine rear mount bracket with the 3 bolts.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(b) Install the engine rear mount insulator with the through bolt and No. 2 engine rear mount bracket.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

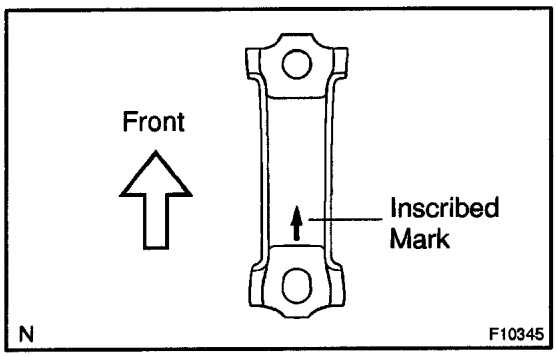


2. INSTALL MANUAL STEERING GEAR ASSEMBLY

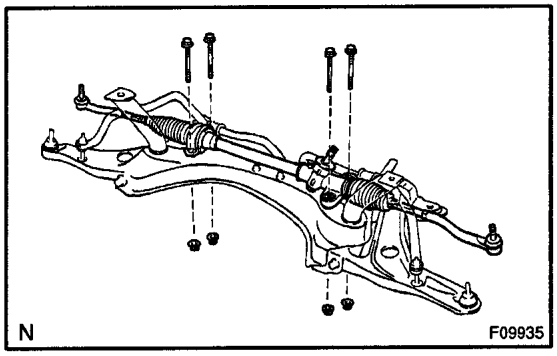
(a) Align the matchmarks on the No. 3 intermediate shaft assembly and steering pinion.

(b) Install the No. 3 intermediate shaft assembly with the bolt.
Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)

(c) Install the grommet and bracket to the manual steering gear assembly.



HINT:
Install the bracket with the inscribed mark facing to the front of the vehicle.



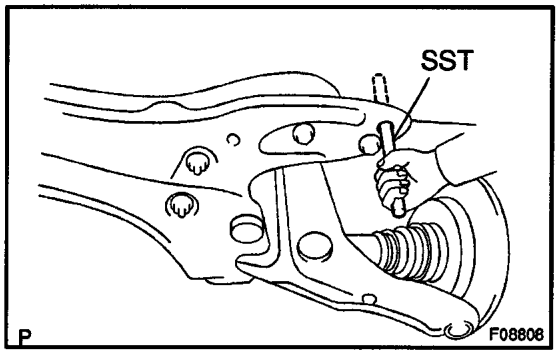
(d) Install the manual steering gear assembly with the 4 bolts and nuts to the front suspension member.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

NOTICE:
Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.

(e) Install the column hole cover sub–assembly.

(f) RHD:
Install the steering gear heat insulator with the bolt.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

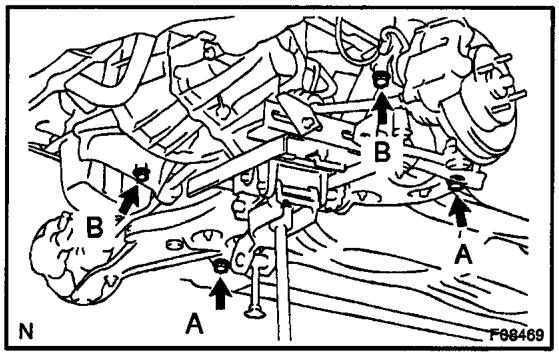
HINT:
When assembling the steering gear heat insulator, set a projection of the column hole cover sub–assembly to the interlocking part of the steering gear heat insulator.



3. INSTALL FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND MANUAL STEERING GEAR ASSEMBLY

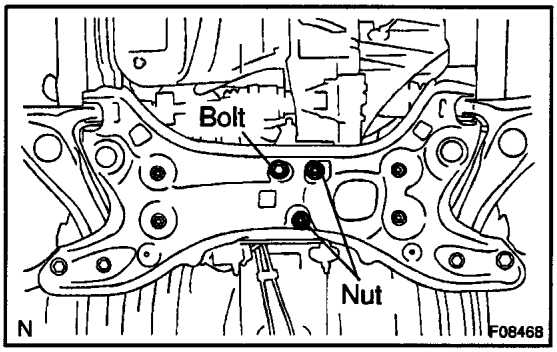
(a) Using SST, align the holes of the front suspension member and body.
SST 09670–00010

(b) Employ the same manner described above to the other side.



(c) Install the front suspension member with lower suspension arm and manual steering gear assembly with the 4 bolts.
Torque:
Bolt A: 116 N·m (1,185 kgf·cm, 86 ft·lbf)
Bolt B: 70 N·m (715 kgf·cm, 52 ft·lbf)

(d) Connect the column hole cover sub–assembly.



4. CONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Connect the engine rear mount insulator and front suspension member with the bolt and 2 nuts.
Torque: 80 N·m (810 kgf·cm, 59 ft·lbf)

5. Europe:
INSTALL RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT

(a) Install the front suspension member reinforcement with the 2 bolts.
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)

(b) Employ the same manner described above to the other side.

6. CONNECT LOWER SUSPENSION ARM TO STEERING KNUCKLE (See page SA–34)

7. DISENGAGE ENGINE SLING DEVICE FROM ENGINE HANGERS

(a) Disengage the engine chain hoist from the engine hangers.

(b) Remove the 2 No. 1 engine hangers.

8. INSTALL ENGINE HOOD (See page BO–10)

9. CONNECT SLIDING YOKE (See page SR–20)

10. INSTALL NO. 2 COLUMN HOLE COVER (See page SR–20)

11. CONNECT RH AND LH TIE ROD ENDS (See page SA–13)

12. INSTALL RH AND LH ENGINE UNDER COVERS

13. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

14. w/ Airbag:
CENTER SPIRAL CABLE (See page SR–20)

15. w/ Airbag:
INSTALL STEERING WHEEL

(a) Align the matchmarks on the steering wheel and steering column main shaft.

(b) Temporarily tighten the steering wheel set nut.

16. w/ Airbag:
CHECK STEERING WHEEL CENTER POINT

17. w/ Airbag:
TORQUE STEERING WHEEL SET NUT
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

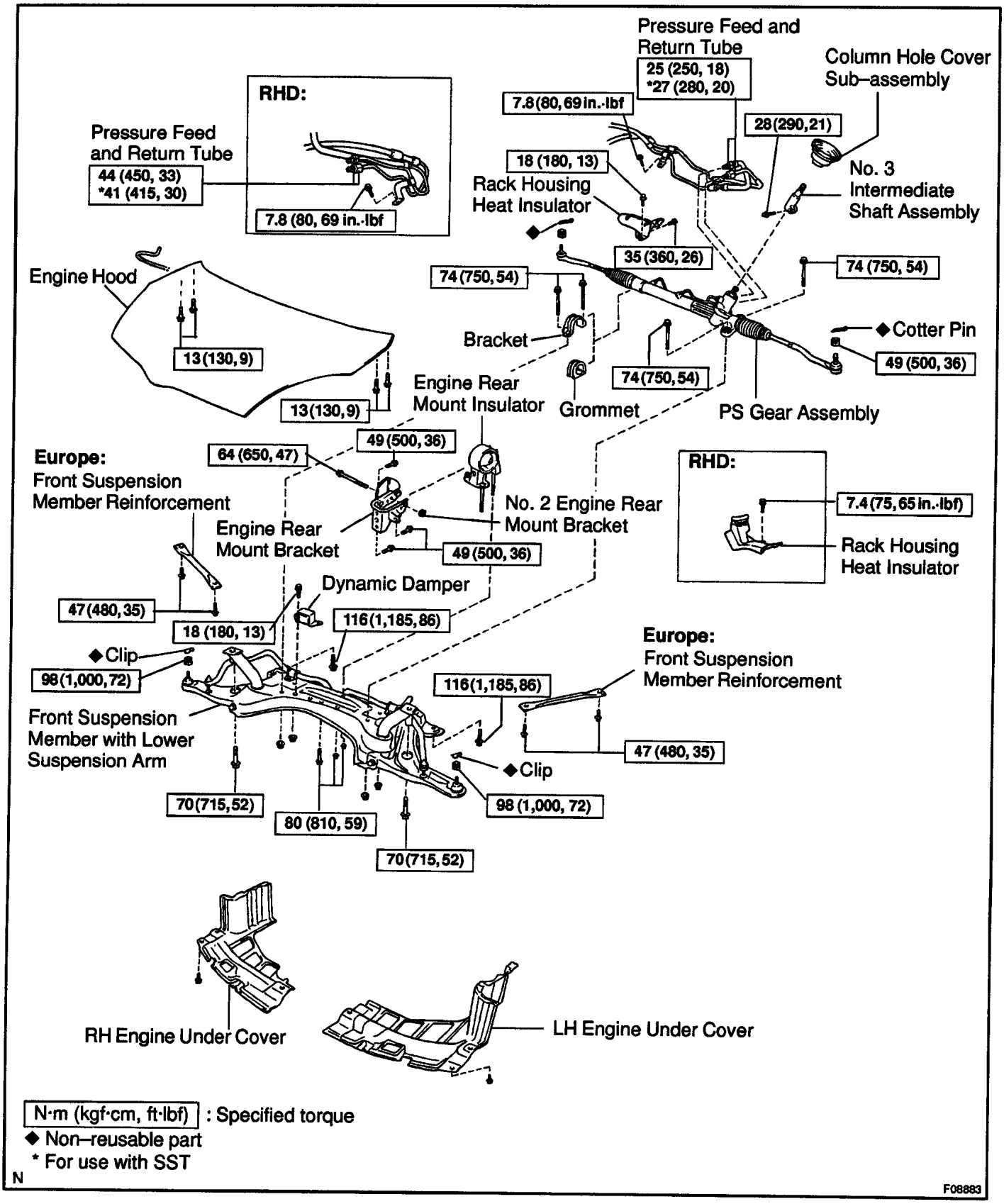
18. w/ Airbag:
INSTALL STEERING WHEEL PAD (See page SR–20)

19. CHECK FRONT WHEEL ALIGNMENT
(See page SA–4)

POWER STEERING GEAR

COMPONENTS

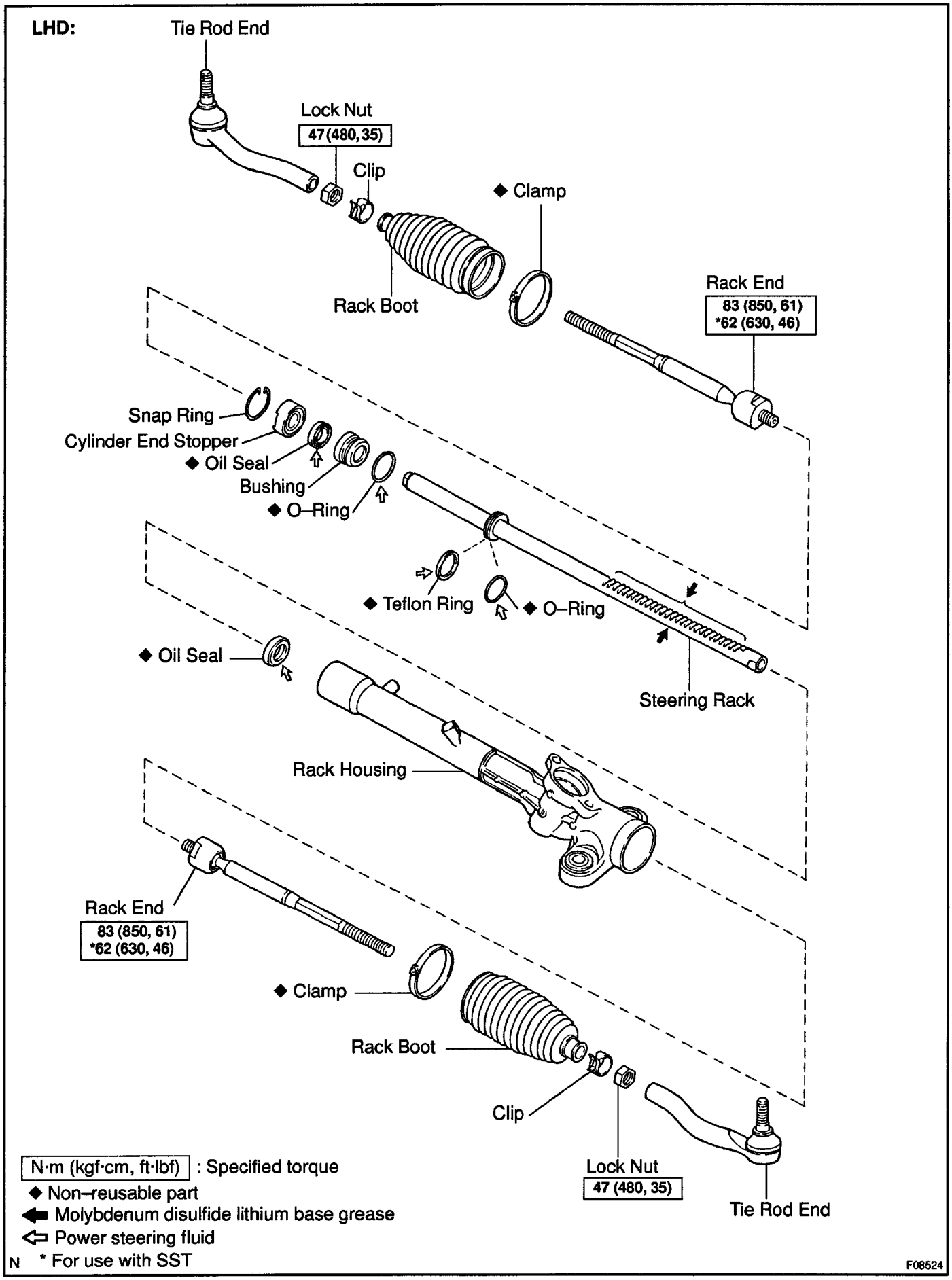
SR0W3-02

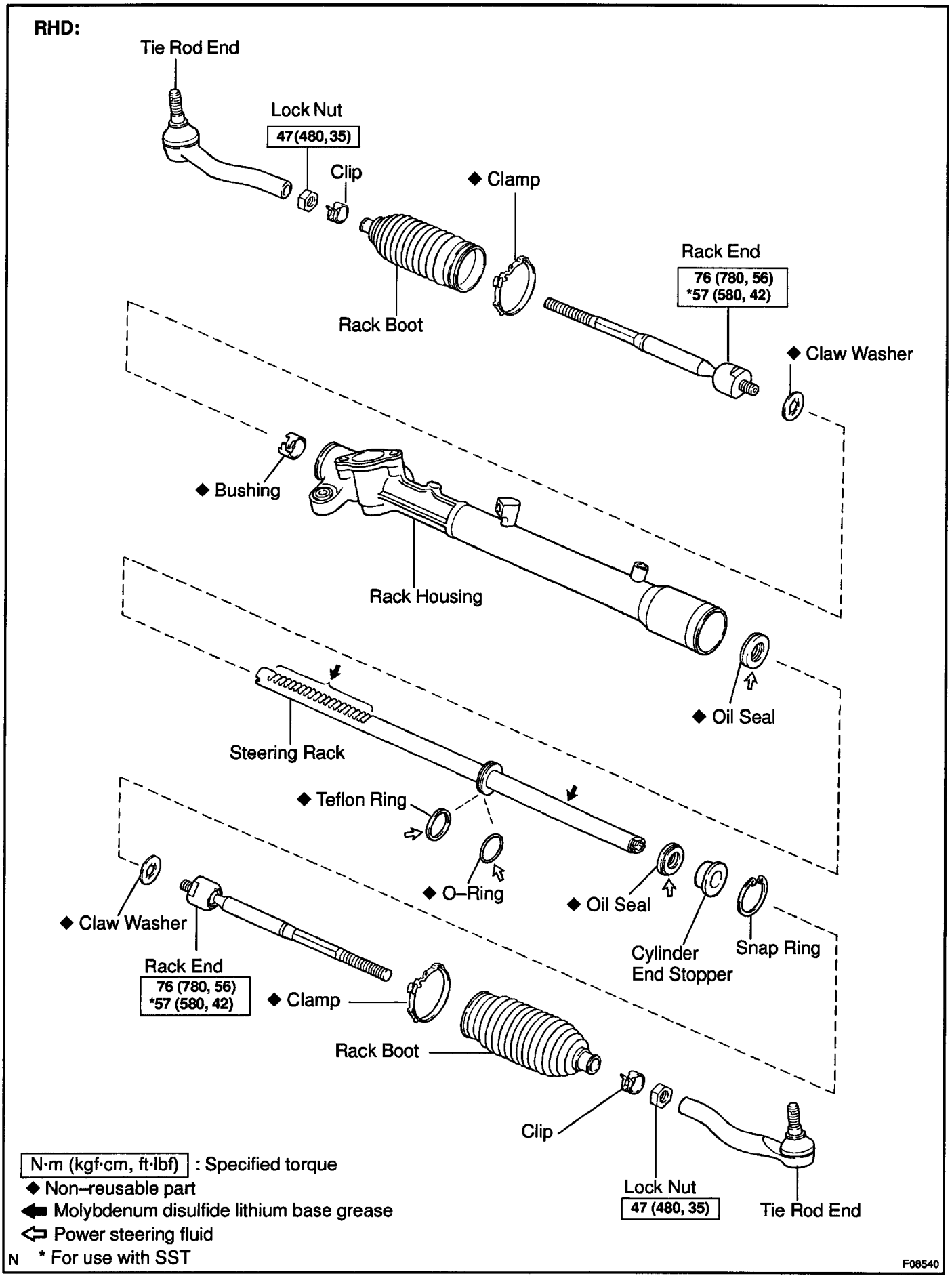


N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
* For use with SST

N

F08883

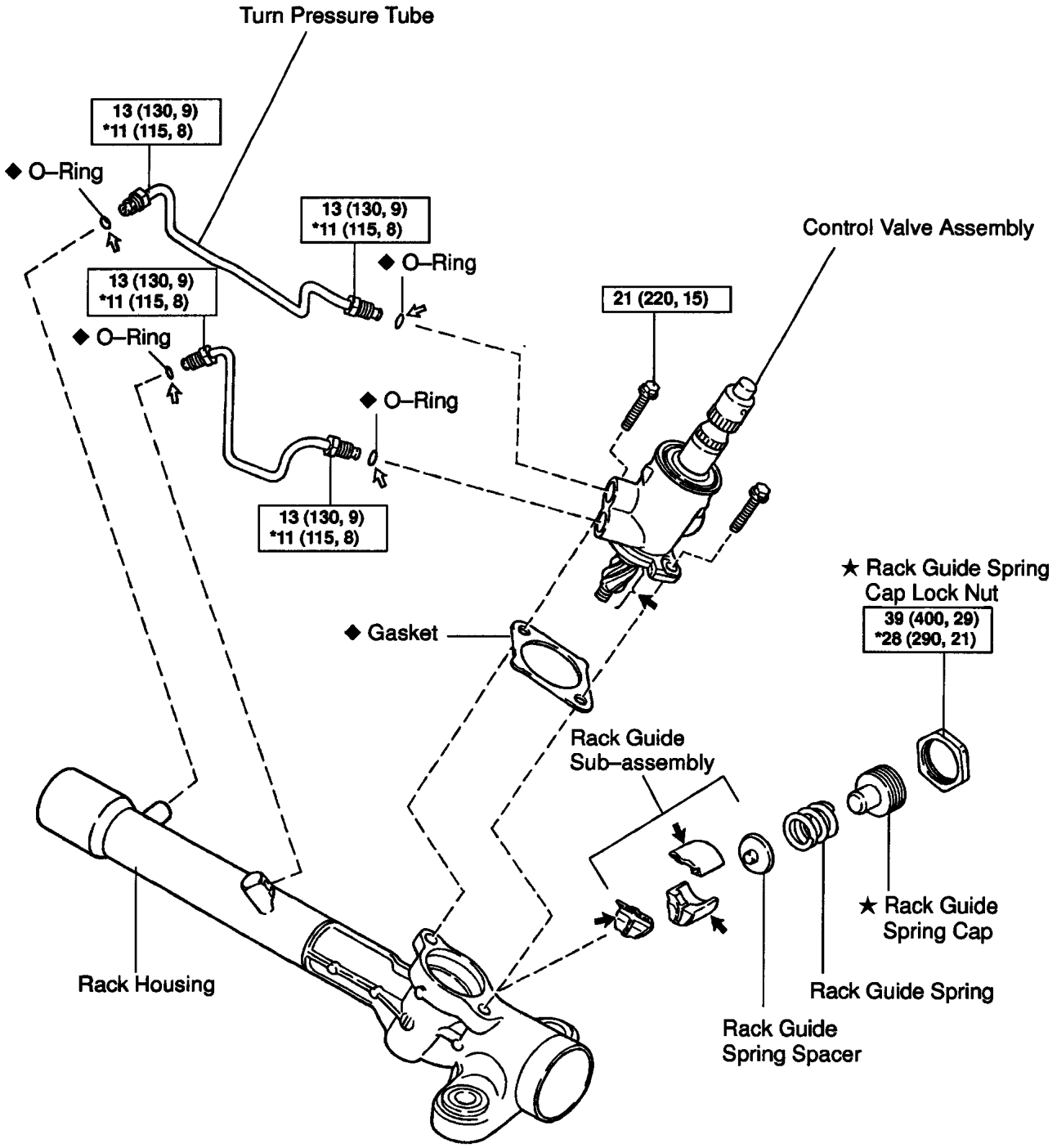

LHD:
Tie Rod End
Lock Nut
47 (480, 35)
Clip
◆ Clamp
Rack Boot
Rack End
83 (850, 61)
*62 (630, 46)
Snap Ring
Cylinder End Stopper
◆ Oil Seal
Bushing
◆ O–Ring
◆ Teflon Ring
◆ O–Ring
◆ Oil Seal
Steering Rack
Rack Housing
Rack End
83 (850, 61)
*62 (630, 46)
◆ Clamp
Rack Boot
Clip
Lock Nut
47 (480, 35)
Tie Rod End
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
Molybdenum disulfide lithium base grease
Power steering fluid
N * For use with SST
F08524



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
⬅ Molybdenum disulfide lithium base grease
⇦ Power steering fluid
N * For use with SST

F08540

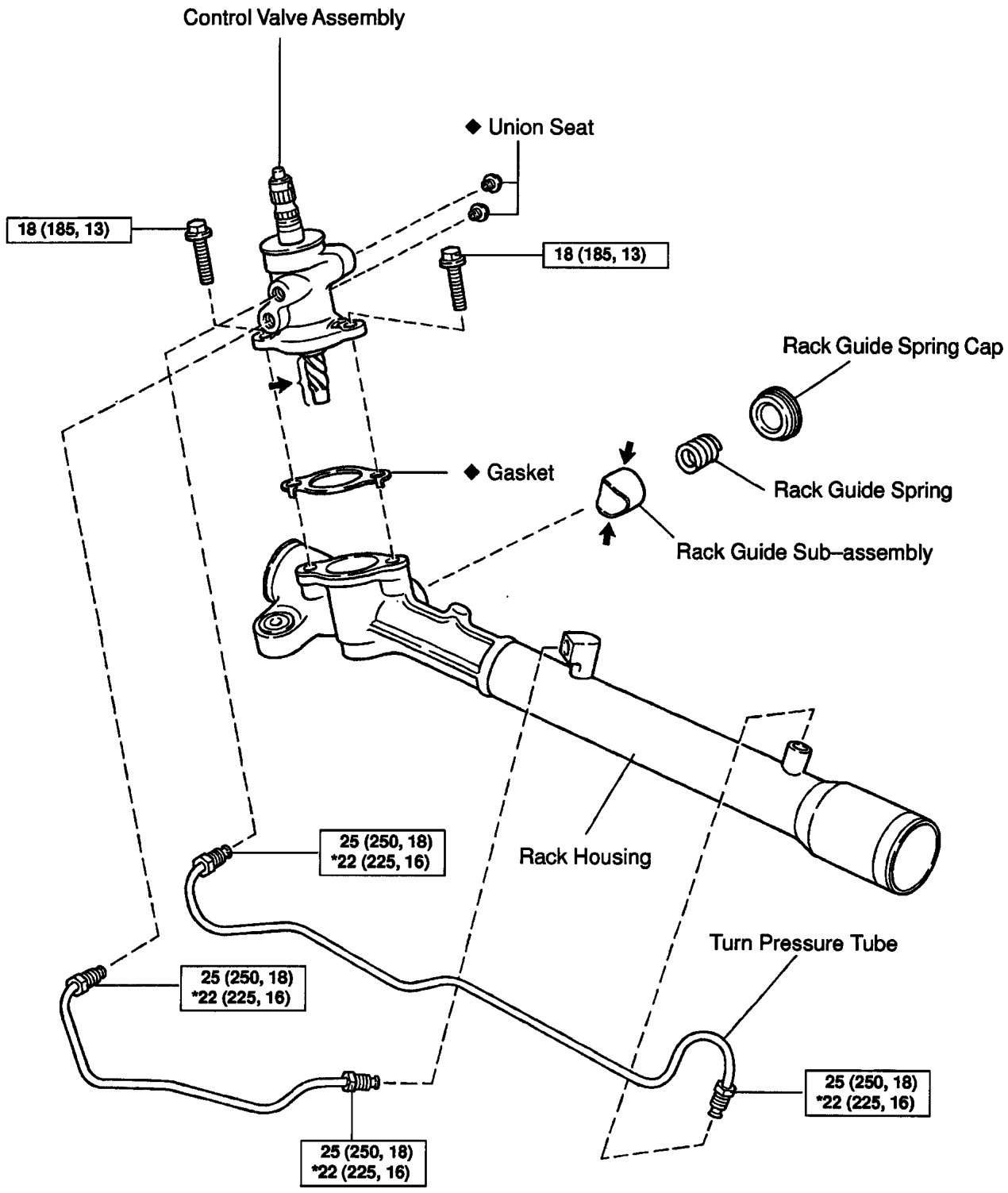
LHD:



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part
⬅ Molybdenum disulfide lithium base grease
⇦ Power steering fluid
N * For use with SST

F08525

RHD:



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
Molybdenum disulfide lithium base grease
Power steering fluid
* For use with SST

N

F08541

SR0W4-02

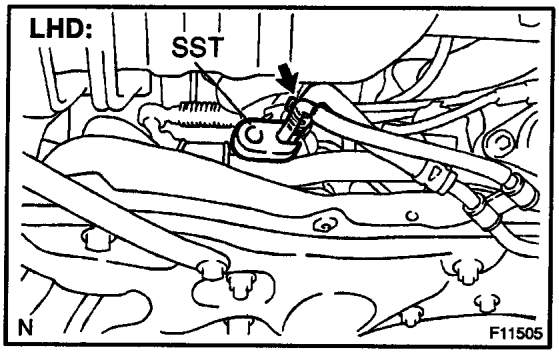
REMOVAL

NOTICE:

w/ Airbag:

Remove the steering wheel assembly before the steering gear removal, because there is possibility of breaking of the spiral cable.

1. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
2. **w/ Airbag:**
   REMOVE STEERING WHEEL PAD (See page SR–12)
3. **w/ Airbag:**
   REMOVE STEERING WHEEL (See page SR–12)
4. **REMOVE RH AND LH ENGINE UNDER COVERS**
5. **DISCONNECT RH AND LH TIE ROD ENDS**
   (See page SA–9)
6. **REMOVE NO. 2 COLUMN HOLE COVER**
   (See page SR–12)
7. **DISCONNECT SLIDING YOKE (See page SR–12)**

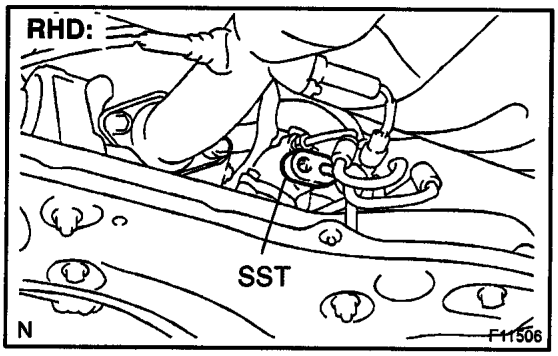


8. **DISCONNECT PRESSURE FEED AND RETURN TUBES**

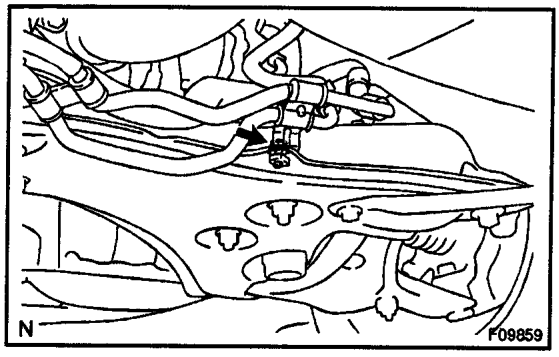
(a) Disconnect the column hole cover sub–assembly.

(b) LHD:
Remove the clip and disconnect the return hose.

(c) LHD:
Using SST, disconnect the pressure feed and return tubes.
SST 09023–12900



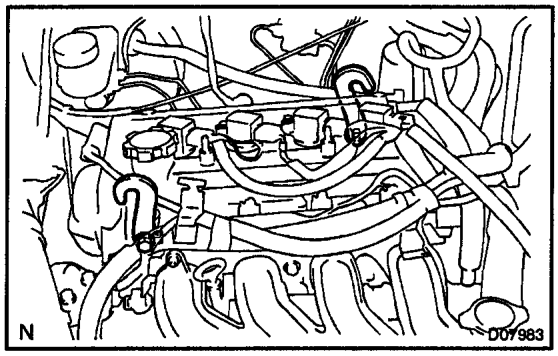
(d) RHD:
Using SST, disconnect the pressure feed and return tubes.
SST 09023–12700



9. **DISCONNECT TUBE CLAMP**

Remove the bolt and disconnect the tube clamp.

10. **REMOVE ENGINE HOOD (See page BO–10)**



11. ATTACH ENGINE SLING DEVICE TO ENGINE HANGERS

(a) Install the 2 No. 1 engine hangers with the bolt in the correct direction.

Parts No.:
No. 1 engine hanger: 12281–21010
Bolt: 91511–60818
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

(b) Attach the engine chain hoist to the engine hangers.

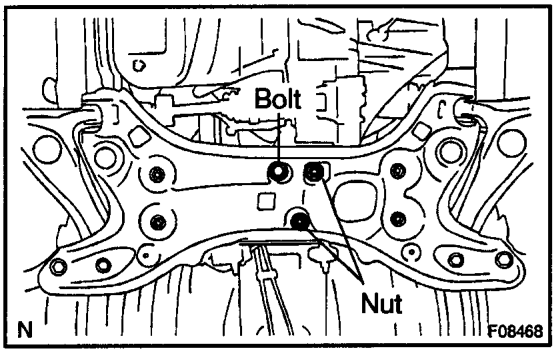
CAUTION:
Do not attempt to hang the engine by hooking the chain to any other part.

12. DISCONNECT LOWER SUSPENSION ARM FROM STEERING KNUCKLE (See page SA–32)

13. Europe:
REMOVE RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT

(a) Remove the 2 bolts and front suspension member reinforcement.

(b) Employ the same manner described above to the other side.

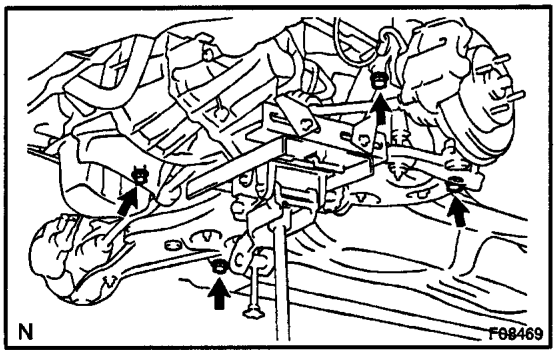


14. DISCONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Remove the bolt and 2 nuts, and disconnect the engine rear mount insulator and front suspension member.

15. SUPPORT FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM

Using a transmission jack, support the front suspension member with lower suspension arm.



16. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND PS GEAR ASSEMBLY

Remove the 4 bolts and front suspension member with lower suspension arm and PS gear assembly.

17. REMOVE PS GEAR ASSEMBLY

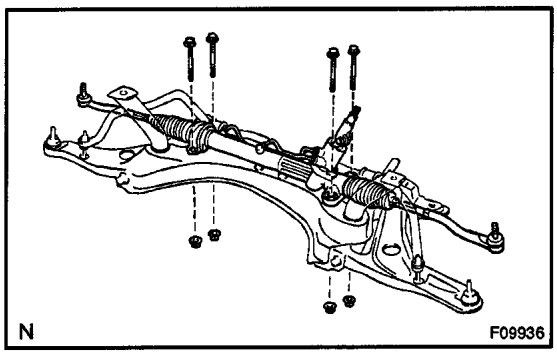
(a) RHD:
Remove the bolt and rack housing heat insulator.

(b) LHD:
Remove the stabilizer bar (See page SA–36).

(c) LHD:
Remove the bolt of the rack housing heat insulator.

(d) LHD:
Remove the 2 bolts, rack housing heat insulator and dynamic damper.

(e) Remove the column hole cover sub–assembly.

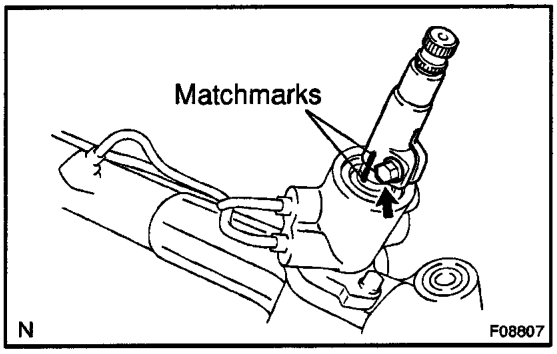


(f) Remove the 4 bolts, nuts and PS gear assembly from the front suspension member.

NOTICE:

Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.

(g) Remove the bracket and grommet from the PS gear assembly.



(h) Place matchmarks on the No. 3 intermediate shaft assembly and control valve shaft.

(i) Remove the bolt and No. 3 intermediate shaft assembly.

18. REMOVE ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET

(a) Remove the through bolt, No. 2 engine rear mount bracket and engine rear mount insulator.

(b) Remove the 3 bolts and engine rear mount bracket.

SR0ZE-01

DISASSEMBLY

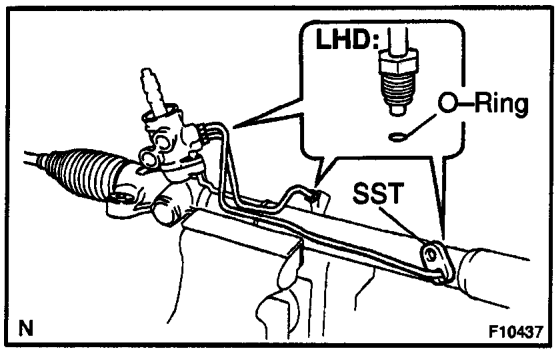
NOTICE:

When using a vise, do not overtighten it.

1. REMOVE 2 TURN PRESSURE TUBES

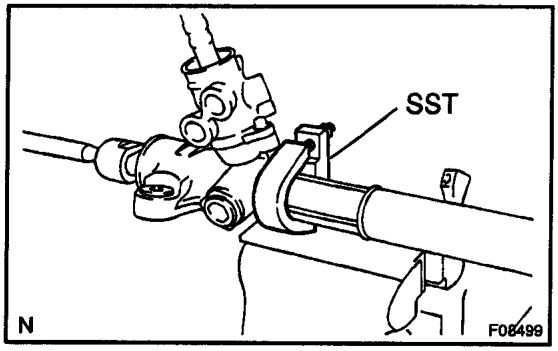
(a) Using SST, remove the 2 turn pressure tubes.
SST 09023–38200

(b) LHD:
Remove the 4 O–rings from 2 turn pressure tubes.



2. SECURE PS GEAR ASSEMBLY IN VISE

Using SST, secure the PS gear assembly in a vise.
SST 09612–00012

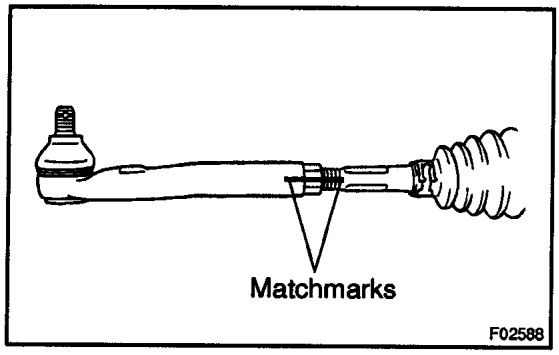


3. REMOVE RH AND LH TIE ROD ENDS AND LOCK NUTS

(a) Place matchmarks on the tie rod end and rack end.

(b) Loosen the lock nut, and remove the tie rod end and lock nut.

(c) Employ the same manner described above to the other side.



4. LHD:
REMOVE RH AND LH CLIPS, CLAMPS AND RACK BOOTS

(a) Using a screwdriver, loosen the clamp.

(b) Remove the clip, clamp and rack boot.

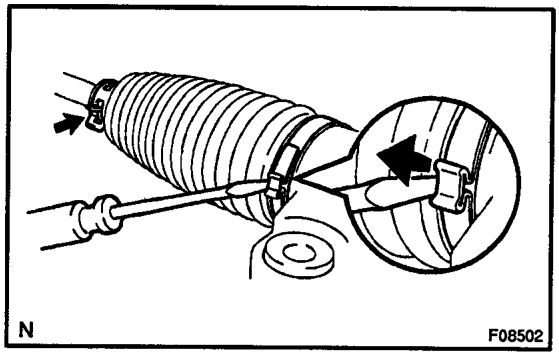
NOTICE:

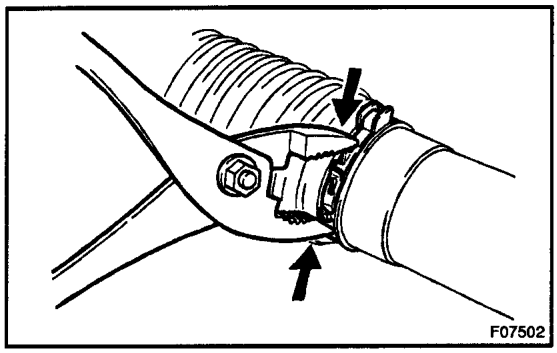
Be careful not to damage the boot.

HINT:

Mark the RH and LH rack boots.

(c) Employ the same manner described above to the other side.





5. **RHD:**
REMOVE RH AND LH CLIPS, CLAMPS AND RACK BOOTS

(a) Using pliers, loosen the clamp.

(b) Remove the clip, clamp and rack boot.

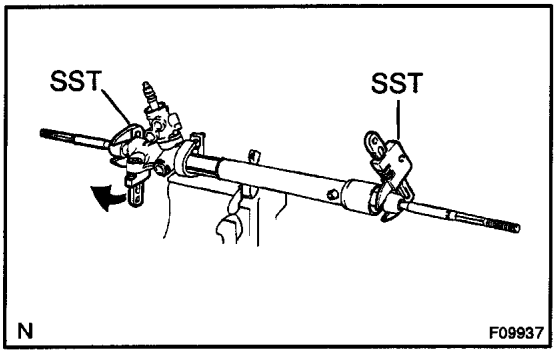
NOTICE:

Be careful not to damage the boot.

HINT:

Mark the RH and LH rack boots.

(c) Employ the same manner described above to the other side.



6. **LHD:**
REMOVE RH AND LH RACK ENDS

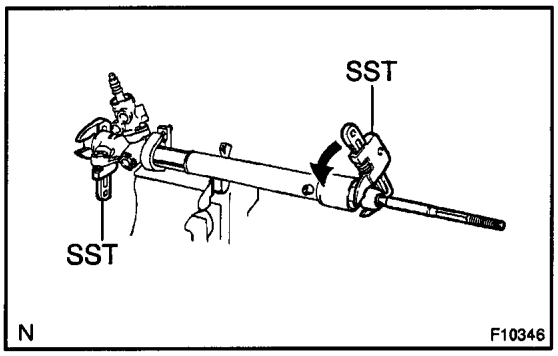
(a) Using SST, hold the RH rack end steadily and using another SST, remove the LH rack end.
SST 09922–10010

NOTICE:

Use SST 09922–10010 In the direction shown in the illustration.

HINT:

Mark the RH and LH rack ends.



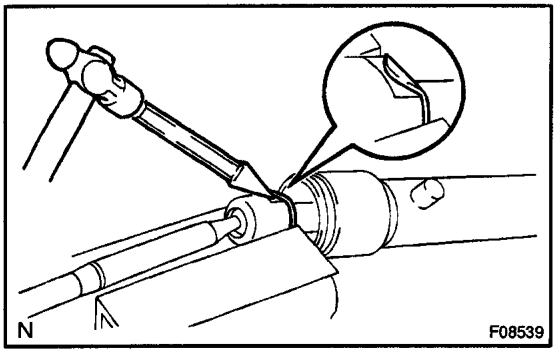
(b) Using SST, hold the steering rack LH side steadily and using another SST, remove the RH rack end.
SST 09922–10010

NOTICE:

Use SST 09922–10010 in the direction shown in the illustration.

HINT:

Mark the RH and LH rack ends.

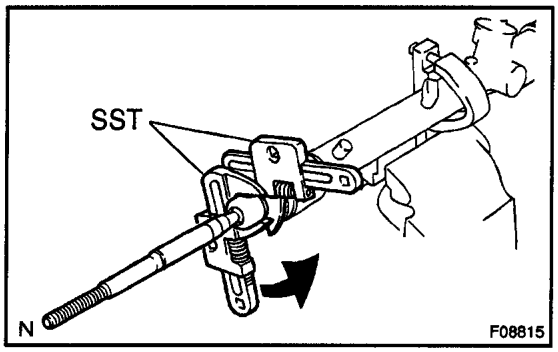


7. **RHD:**
REMOVE RH AND LH RACK ENDS AND CLAW WASHERS

(a) Using a chisel and a hammer, unstake the washer.

NOTICE:

Avoid any impact on the steering rack.

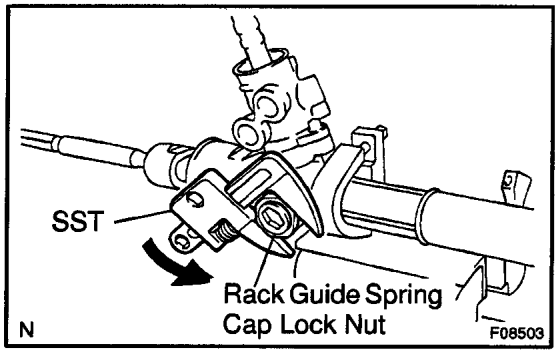


(b) Using SST, hold the steering rack steadily and using another SST, remove the rack end.
SST 09922–10010

NOTICE:
Use SST 09922–10010 in the direction shown in the illustration.

HINT:
Mark the RH and LH rack ends.

(c) Remove the claw washer.
(d) Employ the same manner described above to the other side.



8. LHD:
REMOVE RACK GUIDE SPRING CAP LOCK NUT

Using SST, remove the rack guide spring cap lock nut.
SST 09922–10010

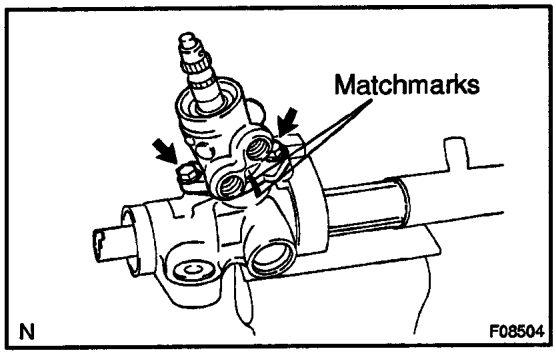
NOTICE:
Use SST 09922–10010 in the direction shown in the illustration.

9. LHD:
REMOVE RACK GUIDE SPRING CAP, RACK GUIDE SPRING, RACK GUIDE SPRING SPACER AND RACK GUIDE SUB–ASSEMBLY

(a) Using a hexagon wrench (19 mm), remove the rack guide spring cap.
(b) Remove the rack guide spring, rack guide spring spacer and rack guide sub–assembly.

10. RHD:
REMOVE RACK GUIDE SPRING CAP, RACK GUIDE SPRING AND RACK GUIDE SUB–ASSEMBLY

(a) Using a hexagon wrench (21 mm), remove the rack guide spring cap.
(b) Remove the rack guide spring and rack guide sub–assembly.



11. REMOVE CONTROL VALVE ASSEMBLY

(a) Place matchmarks on the control valve housing and rack housing.

(b) Remove the 2 bolts.

(c) Pull out the control valve assembly.

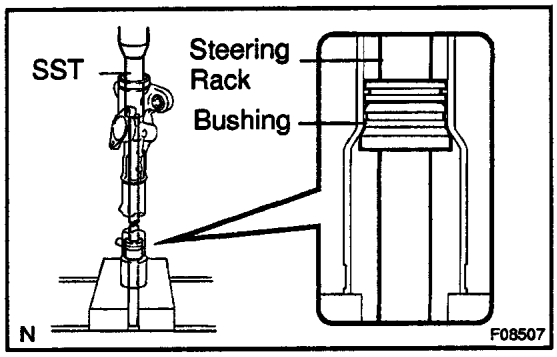
(d) Remove the gasket.

12. REMOVE CYLINDER END STOPPER

(a) LHD:
Using needle nose pliers, remove the snap ring.

(b) RHD:
Using snap ring pliers, remove the snap ring.

(c) Pull out the cylinder end stopper.

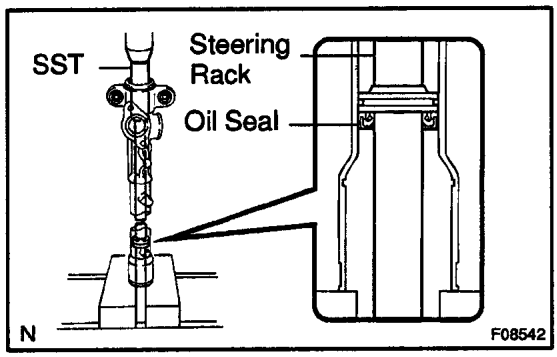


13. LHD:
REMOVE STEERING RACK WITH BUSHING

(a) Using SST, press out the steering rack with the bushing.
SST 09950–70010 (09951–07200)

NOTICE:
Take care not to drop the steering rack.

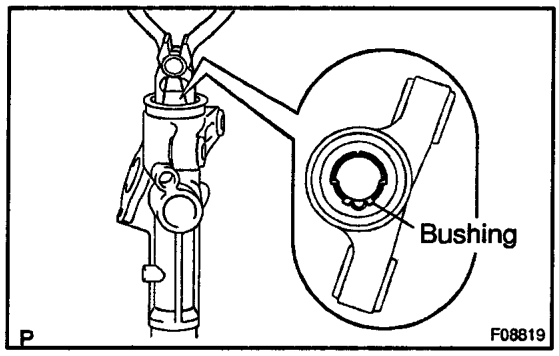
(b) Remove the O–ring from the bushing.



14. RHD:
REMOVE STEERING RACK AND OIL SEAL

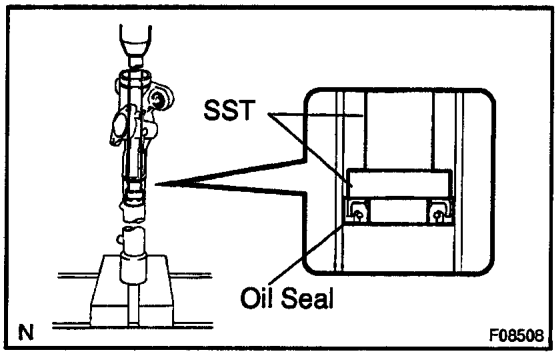
Using SST, press out the steering rack and oil seal.
SST 09950–70010 (09951–07200)

NOTICE:
Take care not to drop the steering rack.



15. RHD:
REMOVE BUSHING

Using needle nose pliers, remove the bushing.



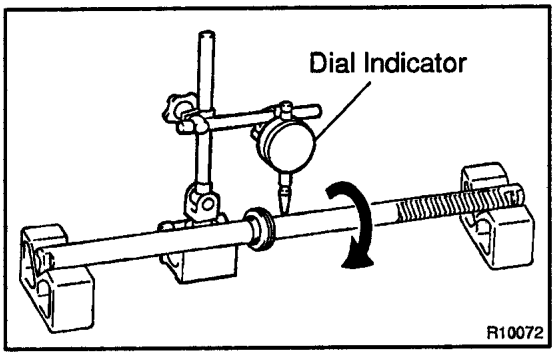
16. REMOVE OIL SEAL

Using SST, press out the oil seal.

SST 09950–60010 (09951–00240),
09950–70010 (09951–07360)

NOTICE:
Do not damage the rack housing.

SR0W6-02



INSPECTION

NOTICE:

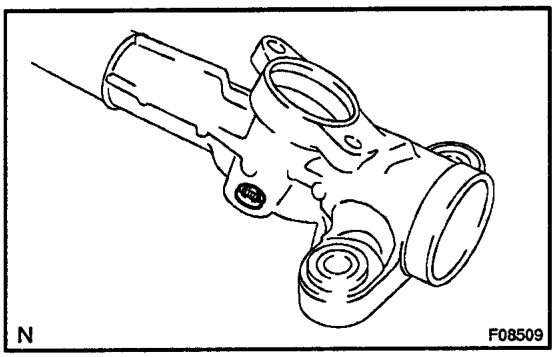
When using a vise, do not overtighten it.

1. INSPECT STEERING RACK

(a) Using a dial indicator, check the rack for runout, teeth wear and damage.

Maximum runout: 0.1 mm (0.004 in.)

(b) Check the back surface for wear and damage.



2. INSPECT BEARING

(a) Check the needle roller bearing for pitmarks or damage.

If faulty, replace the rack housing.

(b) Coat the inside of the bearing with molybdenum disulfide lithium base grease.

SR0W7-02

REPLACEMENT

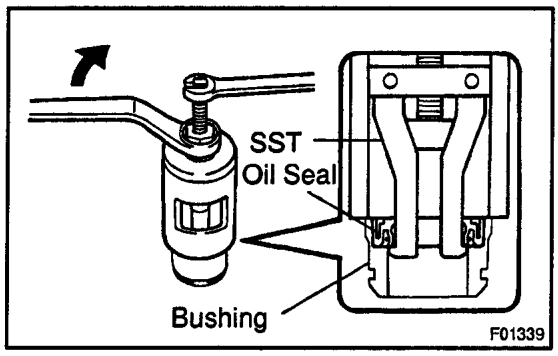
NOTICE:

When using a vise, do not overtighten it.

1. LHD:

IF NECESSARY, REPLACE OIL SEAL

(a) Using SST, remove the oil seal from the bushing.
SST 09612–24014 (09613–22011)

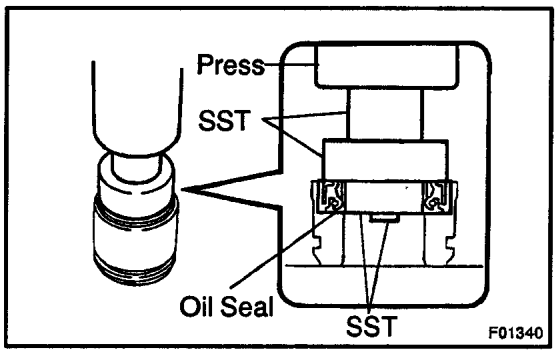


NOTICE:

Be careful not to damage the bushing.

HINT:

As shown in the illustration, from the opposite side of SST confirm that its claws are firmly caught on the oil seal.

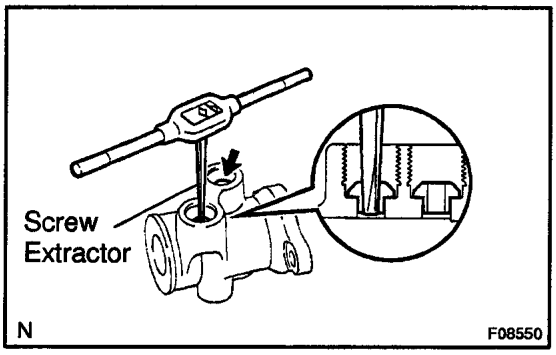


(b) Coat a new oil seal lip with power steering fluid.

(c) Using SST, press in the oil seal.
SST 09950–60010 (09951–00210, 09951–00340, 09952–06010), 09950–70010 (09951–07100)

NOTICE:

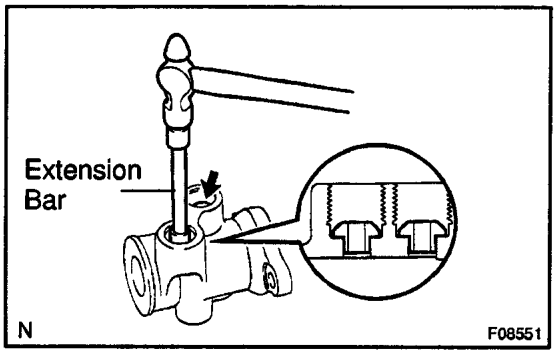
Make sure that the oil seal is installed facing in the correct direction.



2. RHD:

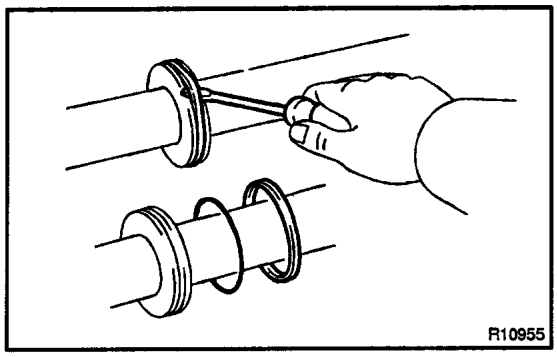
IF NECESSARY, REPLACE 2 UNION SEATS

(a) Using a screw extractor, remove the union seat from the control valve housing.



(b) Using a plastic hammer and an extension bar, lightly tap in a new union seat.

(c) Employ the same manner described above to the other side.



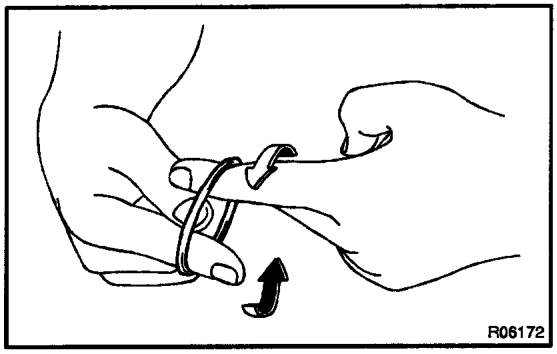
3. IF NECESSARY, REPLACE TEFLON RING AND O–RING

(a) Using a screwdriver, remove the teflon ring and O–ring from the steering rack.

NOTICE:

Be careful not to damage the groove for the teflon ring.

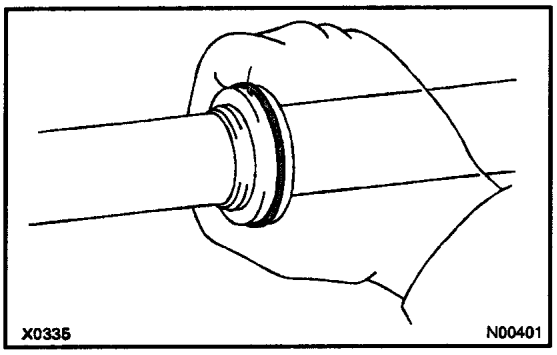
(b) Coat a new O–ring with power steering fluid and install it to the steering rack.



(c) Expand a new teflon ring with your fingers.

NOTICE:

Be careful not to overexpand the teflon ring.



(d) Coat the teflon ring with power steering fluid.

(e) Install the teflon ring to the steering rack and settle it down with your fingers.

MEMO

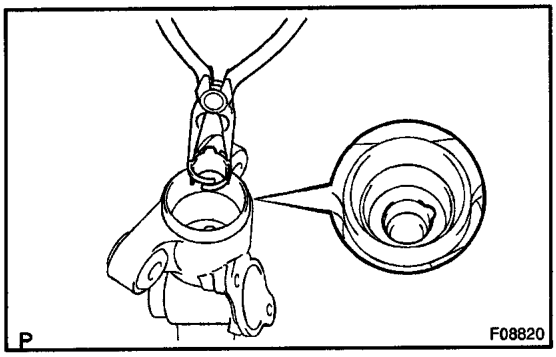
SR0ZF-01

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID OR MOLYBDENUM DISULFIDE LITHIUM BASE GREASE (See page SR–47)**

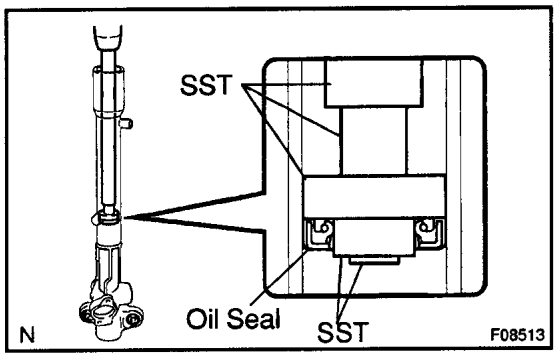


2. **RHD:**
   INSTALL BUSHING

Using needle nose pliers, install a new bushing.

3. **INSTALL OIL SEAL**

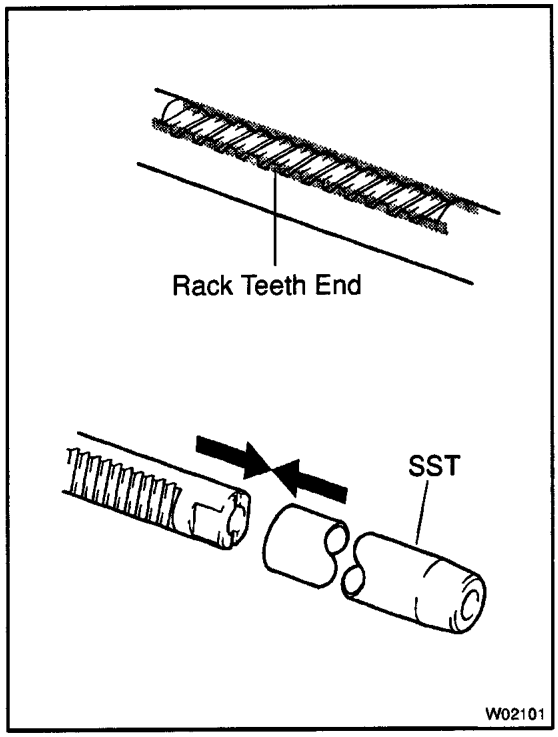
(a) Coat a new oil seal lip with power steering fluid.



(b) Install the oil seal to SST, and press them into the rack housing.
   SST 09950–60010 (09951–00210, 09951–00370, 09952–06010), 09950–70010 (09951–07360)

NOTICE:

- **Make sure that the oil seal is installed facing in the correct direction.**
- **Take care that the oil seal does not get reversed as you install it.**



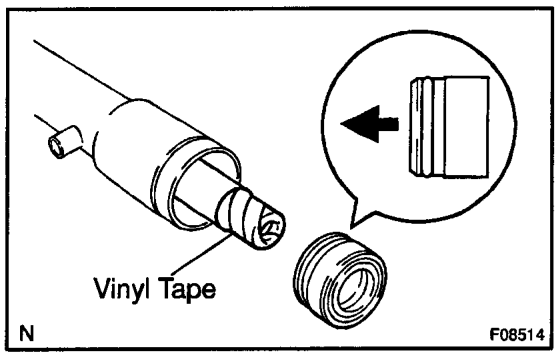
4. **INSTALL STEERING RACK**

(a) Install SST to the rack.
   SST 09631–10041

HINT:

If necessary, scrape the burrs off the rack teeth end and burnish.

(b) Coat SST with power steering fluid.
(c) Install the steering rack into the rack housing.
(d) Remove the SST.
   SST 09631–10041



5. **LHD:**
INSTALL BUSHING

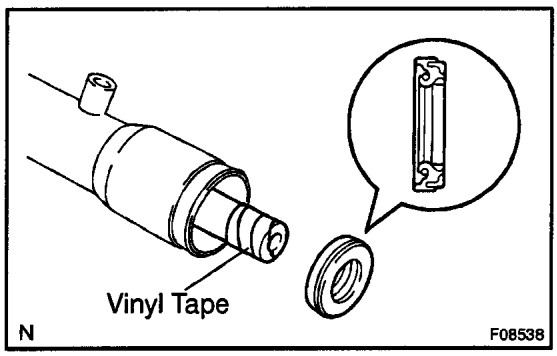
(a) Coat a new O–ring with power steering fluid and install it to the bushing.

(b) To prevent oil seal lip damage, wind vinyl tape on the steering rack end, and apply power steering fluid.

(c) Install the bushing into the rack housing.

NOTICE:

- **Make sure that the bushing is installed facing in the correct direction.**
- **Be careful not to damage the oil seal lip.**



6. **RHD:**
INSTALL OIL SEAL

(a) Coat a new oil seal lip with power steering fluid.

(b) To prevent oil seal lip damage, wind vinyl tape on the steering rack end, and apply power steering fluid.

(c) Install the oil seal by pushing it into the rack housing without tilting.

NOTICE:

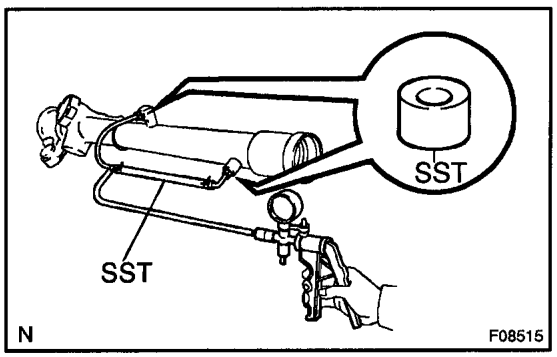
- **Make sure that the oil seal is installed facing in the correct direction.**
- **Be careful not to damage the oil seal lip.**

7. **INSTALL CYLINDER END STOPPER**

(a) Push into the cylinder end stopper.

(b) LHD:
Using needle nose pliers, install the snap ring.

(c) RHD:
Using snap ring pliers, install the snap ring.



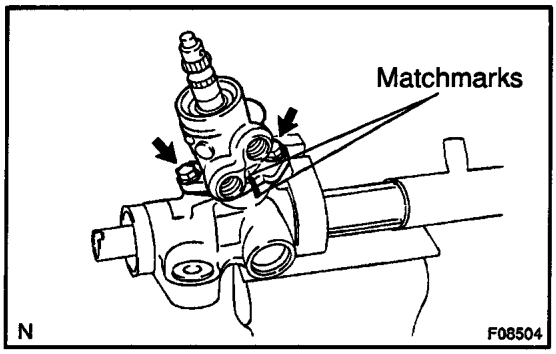
8. **AIR TIGHTNESS TEST**

(a) Install SST to the rack housing.
SST 09631–12071 (09633–00010)

(b) Apply 53 kPa (400 mmHg, 15.75 in.Hg) of vacuum for about 30 seconds.

(c) Check that there is no change in the vacuum.

If there is a change in the vacuum, check the installation of the oil seals.



9. INSTALL CONTROL VALVE ASSEMBLY

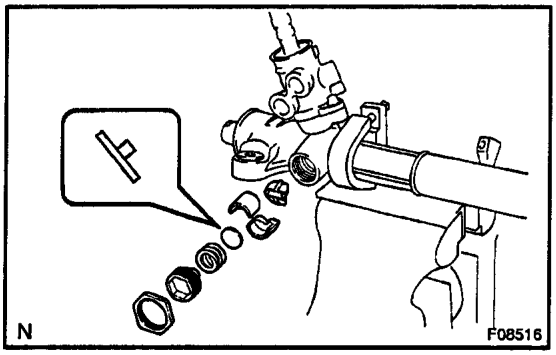
(a) Install a new gasket.

(b) Align the matchmarks on the control valve housing and rack housing.

(c) Push into the control valve assembly.

(d) Install the 2 bolts.

Torque:
LHD: 21 N·m (220 kgf·cm, 15 ft·lbf)
RHD: 18 N·m (185 kgf·cm, 13 ft·lbf)



10. LHD:
INSTALL RACK GUIDE SUB–ASSEMBLY, RACK GUIDE SPRING SPACER, RACK GUIDE SPRING AND RACK GUIDE SPRING CAP

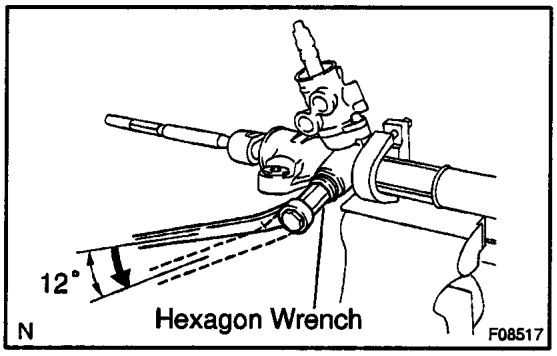
(a) Install the rack guide sub–assembly, rack guide spring spacer and rack guide spring.

NOTICE:
Make sure that the rack guide spring spacer is installed facing in the correct direction.

(b) Apply sealant to 2 or 3 threads of the rack guide spring cap.

Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Temporarily install the rack guide spring cap.



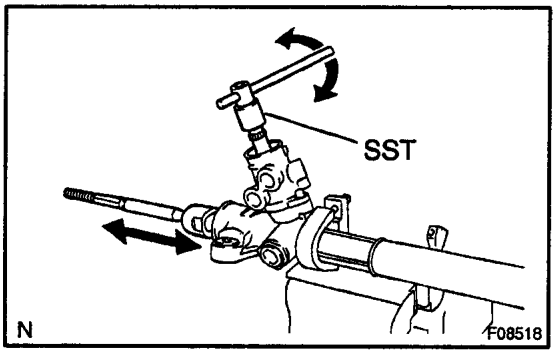
11. LHD:
ADJUST TOTAL PRELOAD

(a) To prevent the steering rack teeth from damaging the oil seal lip, temporarily install the RH and LH rack ends.

(b) Using a hexagon wrench (19 mm), torque the rack guide spring cap.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

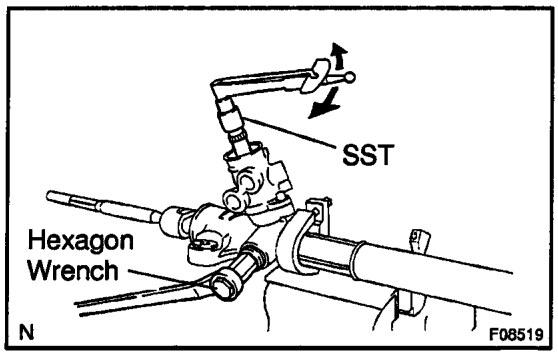
(c) Using a hexagon wrench (19 mm), return the rack guide spring cap 12°.



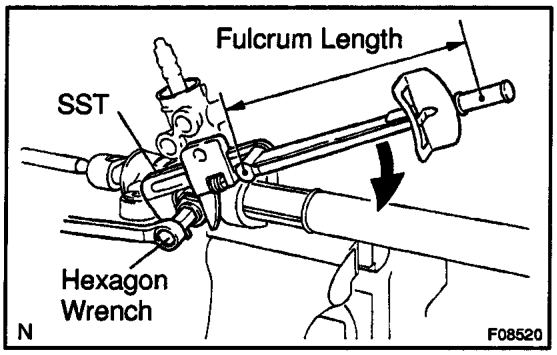
(d) Using SST, turn the control valve shaft right and left 1 or 2 times.

SST 09616–00010

(e) Using a hexagon wrench (19 mm), loosen the rack guide spring cap until the rack guide spring is not functioning.



(f) Using SST, a torque wrench and hexagon wrench (19 mm), tighten the rack guide spring cap until the preload is within the specification.
SST 09616–00010
Preload (turning):
1.2 – 1.4 N·m (12 – 14 kgf·cm, 10.4 – 12.2 in.·lbf)



12. LHD:
INSTALL RACK GUIDE SPRING CAP LOCK NUT

(a) Apply sealant to 2 or 3 threads of the rack guide spring cap lock nut.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Temporarily install the rack guide spring cap lock nut.

(c) Using a hexagon wrench (19 mm), hold the rack guide spring cap and using SST, torque the rack guide spring cap lock nut.
SST 09922–10010
Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)

NOTICE:
Use SST 09922–10010 in the direction shown in the illustration.
HINT:
Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).

(d) Recheck the total preload.
Preload (turning):
1.2 – 1.4 N·m (12 – 14 kgf·cm, 10.4 – 12.2 in.·lbf)

(e) Remove the RH and LH rack ends.

13. RHD:
INSTALL RACK GUIDE SUB–ASSEMBLY, RACK GUIDE SPRING AND RACK GUIDE SPRING CAP

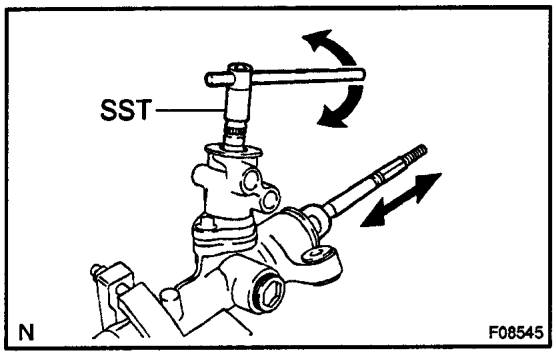
(a) Install the rack guide sub–assembly and rack guide spring.

(b) Temporarily install the rack guide spring cap.

14. RHD:
CHECK TOTAL PRELOAD

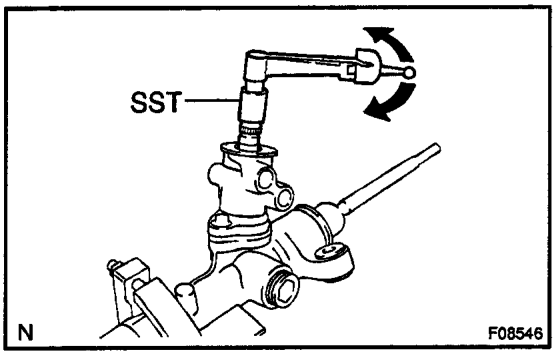
(a) To prevent the steering rack teeth from damaging the oil seal lip, temporarily install the RH and LH rack ends.

(b) Using a hexagon wrench (21 mm), torque the rack guide spring cap.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



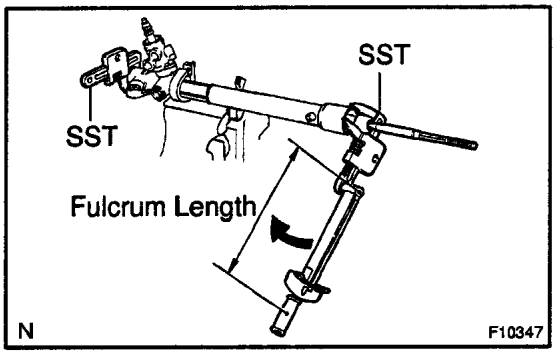
(c) Using SST, turn the control valve shaft right and left 1 or 2 times.
SST 09616–00010

(d) Using a hexagon wrench (21 mm), loosen the rack guide spring cap until the rack guide spring is not functioning.



(e) Using SST and a torque wrench, check the preload.
SST 09616–00010
Preload (turning):
0.8 – 1.5 N·m (8 – 15 kgf·cm, 6.9 – 13.0 in.·lbf)

(f) Remove the RH and LH rack ends.



15. LHD:
INSTALL RH AND LH RACK ENDS

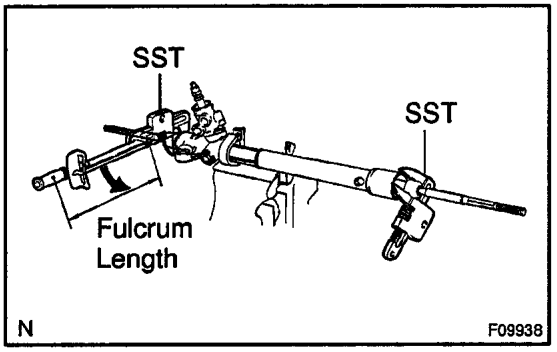
(a) Temporarily install the RH rack end.

(b) Using SST, hold the steering rack LH side steadily and using another SST, torque the RH rack end.
SST 09922–10010
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

NOTICE:
Use SST 09922–10010 in the direction shown in the illustration.

HINT:
Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).

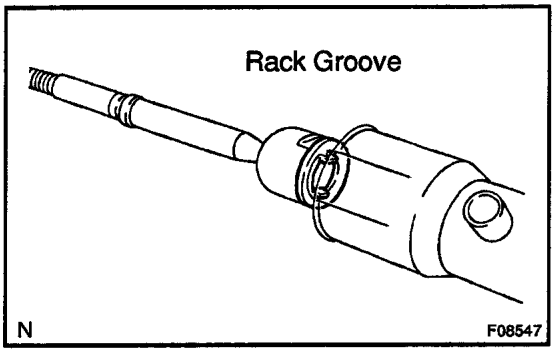
(c) Temporarily install the LH rack end.



(d) Using SST, hold the RH rack end steadily and using another SST, torque the LH rack end.
SST 09922–10010
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

NOTICE:
Use SST 09922–10010 in the direction shown in the illustration.

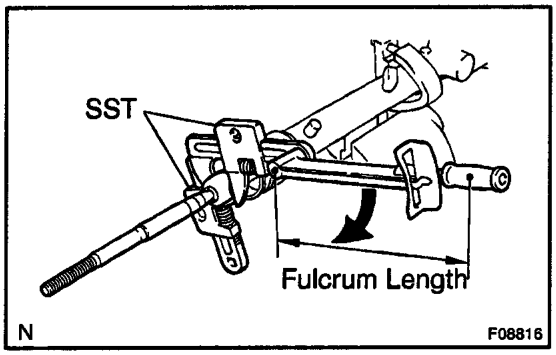
HINT:
Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).



16. RHD:
INSTALL RH AND LH CLAW WASHERS AND RACK ENDS

(a) Install a new claw washer, and temporarily install the rack end.

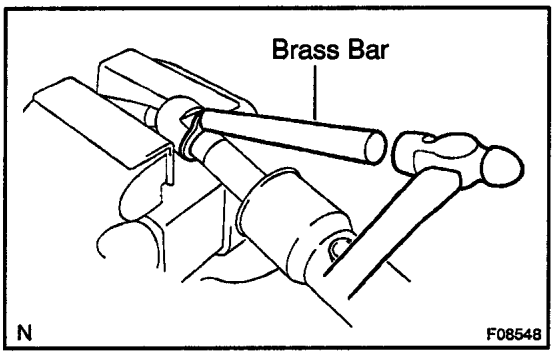
HINT:
Align the claws of the claw washer with the steering rack grooves.



(b) Using SST, hold the steering rack steadily and using another SST, torque the rack end.
SST 09922–10010
Torque: 57 N·m (580 kgf·cm, 42 ft·lbf)

NOTICE:
Use SST 09922–10010 in the direction shown in the illustration.

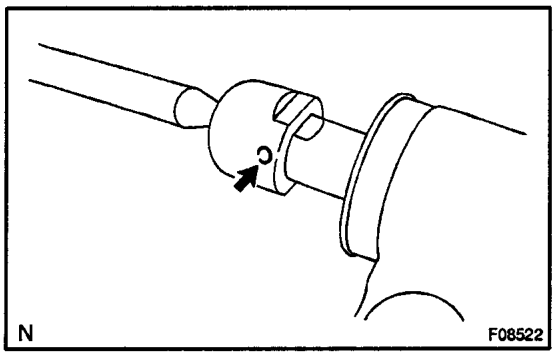
HINT:
Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).



(c) Using a brass bar and a hammer, stake the washer.

NOTICE:
Avoid any impact on the steering rack.

(d) Employ the same manner described above to the other side.



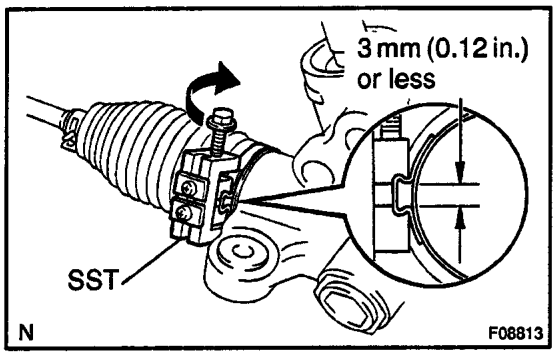
17. LHD:
INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS

(a) Ensure that the steering rack end hole is not clogged with grease.

HINT:
If the hole is clogged, the pressure inside the boot will change after it is assembled and the steering wheel is turned.

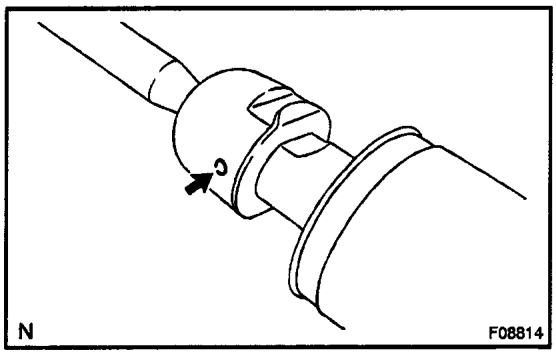
(b) Install the boot, clip and a new clamp.

NOTICE:
Be careful not to damage or twist the boot.



(c) Using SST, tighten the clamp as shown in the illustration.
SST 09521–24010

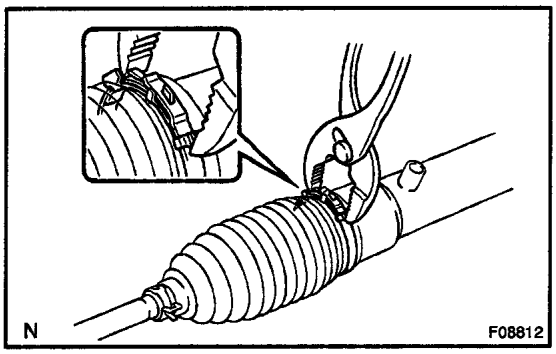
(d) Employ the same manner described above to the other side.



18. RHD:
INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS

(a) Ensure that the steering rack end hole is not clogged with grease.

HINT:
If the hole is clogged, the pressure inside the boot will change after it is assembled and the steering wheel is turned.

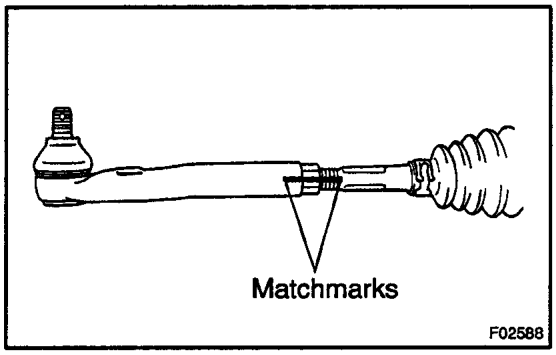


(b) Install the boot, clip and a new clamp.

NOTICE:
Be careful not to damage or twist the boot.

(c) Using pliers, tighten the clamp as shown in the illustration.

(d) Employ the same manner described above to the other side.

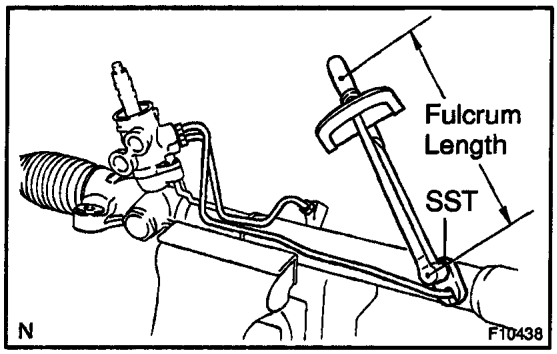


19. INSTALL RH AND LH TIE ROD ENDS AND LOCK NUTS

(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: 47 N·m (480 kgf·cm, 35 ft·lbf)

(c) Employ the same manner described above to the other side.



20. INSTALL 2 TURN PRESSURE TUBES

(a) LHD:
Coat 4 new O–rings with power steering fluid and install them to 2 turn pressure tubes.

(b) Using SST, install the 2 turn pressure tubes.
SST 09023–38200
Torque:
LHD: 11 N·m (115kgf·cm, 8 ft·lbf)
RHD: 22 N·m (225 kgf·cm, 16 ft·lbf)

HINT:

- LHD:
  Use a torque wrench with a fulcrum length of 250 mm (9.84 in.).
- RHD:
  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.

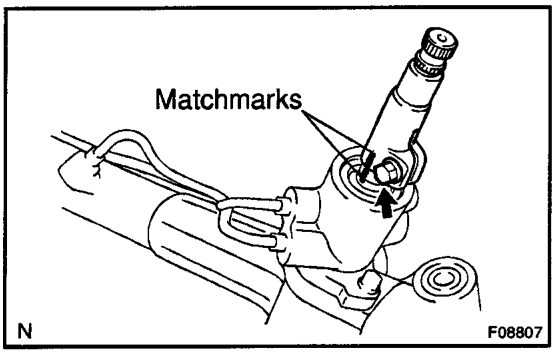
SR0ZG–01

INSTALLATION

1. INSTALL ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET

(a) Install the engine rear mount bracket with the 3 bolts.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(b) Install the engine rear mount insulator with the through bolt and No. 2 engine rear mount bracket.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

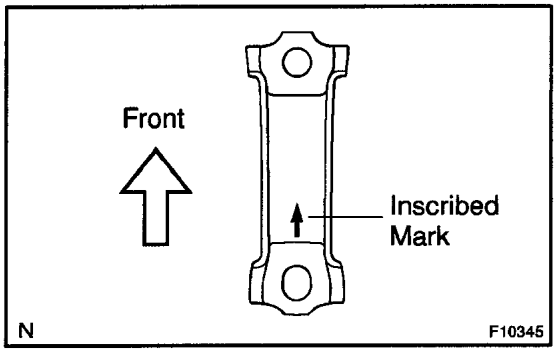


2. INSTALL PS GEAR ASSEMBLY

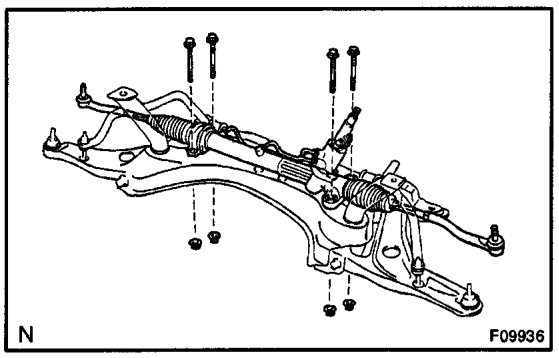
(a) Align the matchmarks on the No. 3 intermediate shaft assembly and control valve shaft.

(b) Install the No. 3 intermediate shaft assembly with the bolt.
Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)

(c) Install the grommet and bracket to the PS gear assembly.



HINT:
Install the bracket with the inscribed mark facing to the front of the vehicle.



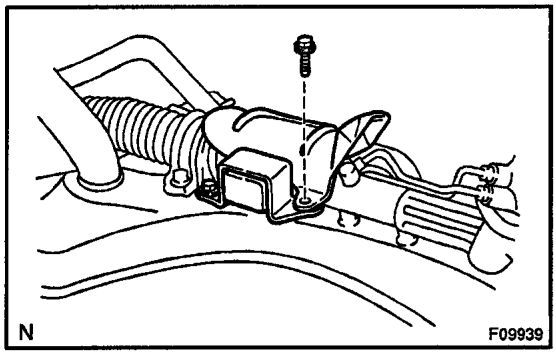
(d) Install the PS gear assembly with the 4 bolts and nuts to the front suspension member.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

NOTICE:
Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.

(e) Install the column hole cover sub–assembly.

(f) RHD:
Install the rack housing heat insulator with the bolt.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

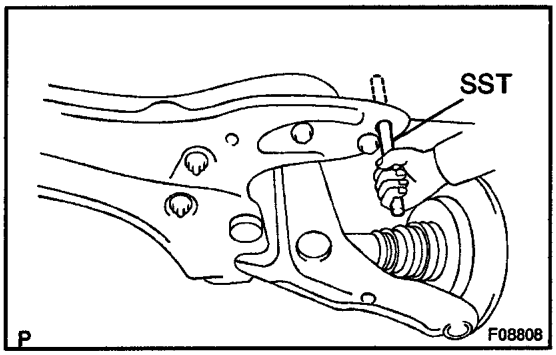
HINT:
When assembling the steering gear heat insulator, set a projection of the column hole cover sub–assembly to the interlocking part of the steering gear heat insulator.



(g) LHD:
Install the dynamic damper and rack housing heat insulator with the 2 bolts as sown in the illustration.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

(h) LHD:
Install the bolt of the rack housing heat insulator.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

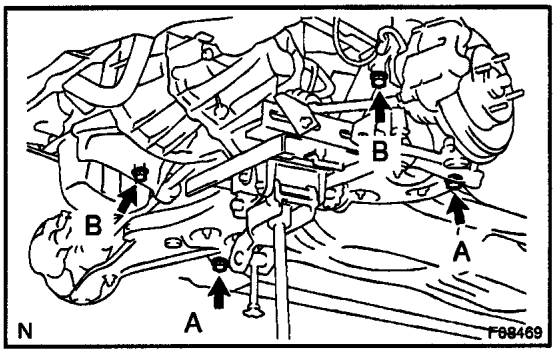
(i) LHD:
Install the stabilizer bar (See page SA–38).



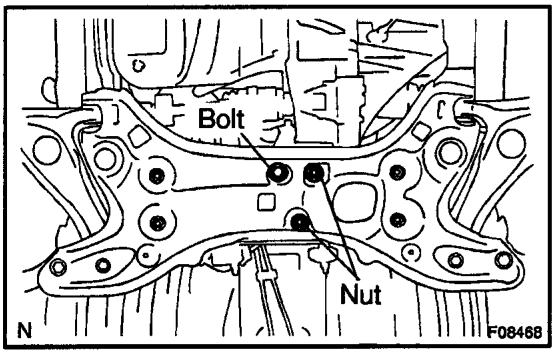
3. INSTALL FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND PS GEAR ASSEMBLY

(a) Using SST, align the holes of the front suspension member and body.
SST 09670–00010

(b) Employ the same manner described above to the other side.



(c) Install the front suspension member with lower suspension arm and PS gear assembly with the 4 bolts.
Torque:
Bolt A: 116 N·m (1,185 kgf·cm, 86 ft·lbf)
Bolt B: 70 N·m (715 kgf·cm, 52 ft·lbf)



4. CONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Connect the engine rear mount insulator and front suspension member with the bolt and 2 nuts.
Torque: 80 N·m (810 kgf·cm, 59 ft·lbf)

5. Europe:
INSTALL RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT

(a) Install the front suspension member reinforcement with the 2 bolts.
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)

(b) Employ the same manner described above to the other side.

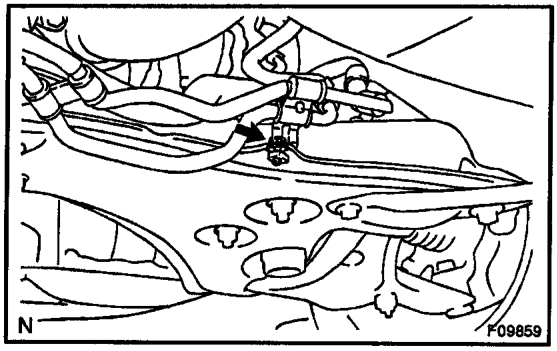
6. CONNECT LOWER SUSPENSION ARM TO STEERING KNUCKLE (See page SA–34)

7. **DISENGAGE ENGINE SLING DEVICE FROM ENGINE HANGERS**

(a) Disengage the engine chain hoist from the engine hangers.

(b) Remove the 2 No. 1 engine hangers.

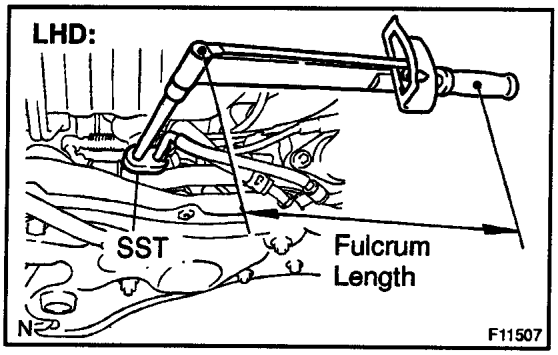
8. **INSTALL ENGINE HOOD (See page BO–10)**



9. **CONNECT TUBE CLAMP**

(a) Temporarily connect the pressure feed and return tubes.

(b) Connect the tube clamp with the bolt.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)



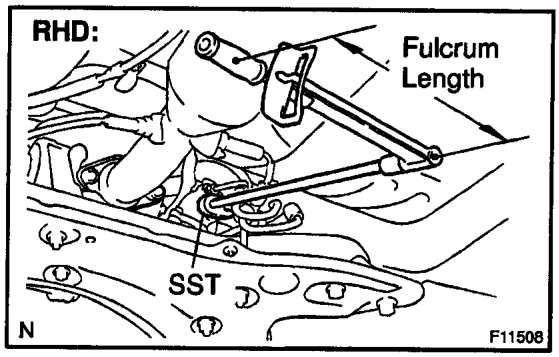
10. **CONNECT PRESSURE FEED AND RETURN TUBES**

(a) LHD:
Using SST, connect the pressure feed and return tubes.
SST 09023–12900
Torque: 27 N·m (280 kgf·cm, 20 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.

(b) LHD:
Connect the return hose with the clip.



(c) RHD:
Using SST, connect the pressure feed and return tubes.
SST 09023–12700
Torque: 41 N·m (415 kgf·cm, 30 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

(d) Connect the column hole cover sub–assembly.

11. CONNECT SLIDING YOKE (See page SR–20)

12. INSTALL NO. 2 COLUMN HOLE COVER (See page SR–20)

13. CONNECT RH AND LH TIE ROD ENDS (See page SA–13)

14. INSTALL RH AND LH ENGINE UNDER COVERS

15. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

16. w/ Airbag: CENTER SPIRAL CABLE (See page SR–20)

17. w/ Airbag: INSTALL STEERING WHEEL

(a) Align the matchmarks on the steering wheel and steering column main shaft.

(b) Temporarily tighten the steering wheel set nut.

18. BLEED POWER STEERING SYSTEM (See page SR–5)

19. w/ Airbag: CHECK STEERING WHEEL CENTER POINT

20. w/ Airbag: TORQUE STEERING WHEEL SET NUT
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

21. w/ Airbag: INSTALL STEERING WHEEL PAD (See page SR–20)

22. 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–28
SIDE AIRBAG ASSEMBLY RS–39
AIRBAG SENSOR ASSEMBLY RS–52
FRONT AIRBAG SENSOR RS–57
SIDE AIRBAG SENSOR ASSEMBLY RS–63
WIRE HARNESS AND CONNECTOR RS–69

SRS AIRBAG

PRECAUTION

RS01Y-33

CAUTION:

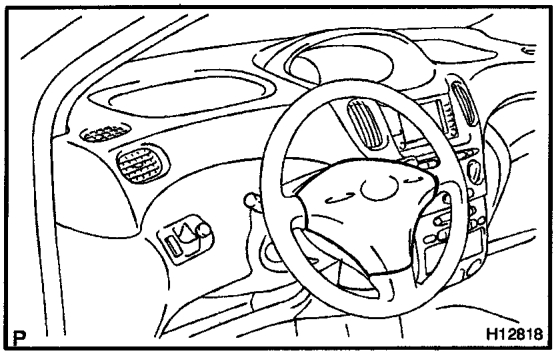
- **The YARIS VERSO/ECHO VERSO is equipped with SRS, which comprises a driver airbag, front passenger airbag and side airbag. Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Further, if a mistake is made in servicing the SRS, it is possible that the SRS may fail to operate when required. Before performing servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedures described in the repair manual.**
- **Work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (–) terminal cable is disconnected from the battery.**
  (The SRS is equipped with a back–up power source so that if work is started within 90 seconds from disconnecting the negative (–) terminal cable of the battery, the SRS may be deployed.)
- **Do not expose the 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.**

NOTICE:

- **Malfunction symptoms of the SRS are difficult to confirm, so the DTCs become the most important source of information when troubleshooting. When troubleshooting the SRS, always inspect the DTCs before disconnecting the battery.**
- **Even in cases of a minor collision where the SRS does not deploy, the 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–30, RS–42, RS–54, RS–59 and RS–65)
- **Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.**
- **Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.**
- **Never disassemble and repair the steering wheel pad, front passenger airbag assembly, side airbag assembly, airbag sensor assembly, front airbag sensor 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–102).**
- **When the negative (–) terminal cable is disconnected from the battery, the memory of the clock and audio system will be canceled. So before starting work, make a record of the contents memorized in the audio memory system. When work is finished, reset the audio systems as they were before and adjust the clock. To avoid erasing the memory in each memory system, never use a back– up power supply from outside the vehicle.**
- **If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.**

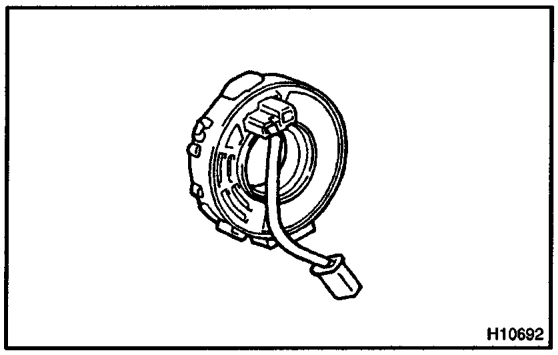
RS0HI-02

OPERATION



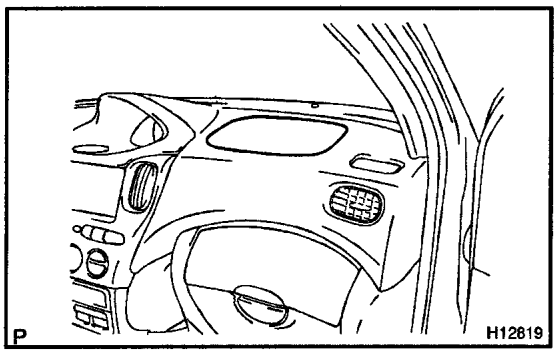
1. STEERING WHEEL PAD (with AIRBAG)

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, gas generant, etc., and inflates the bag when instructed by the airbag sensor assembly.



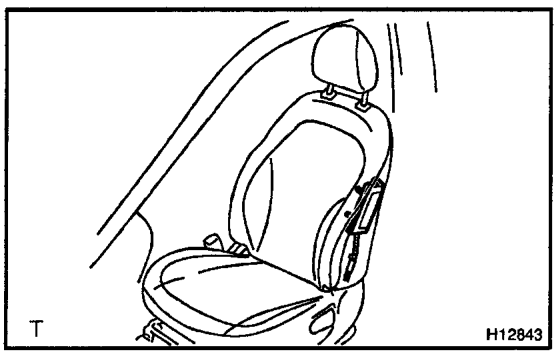
2. SPIRAL CABLE (in COMBINATION SWITCH)

A spiral cable is used as an electrical joint from the vehicle body side to the steering wheel.



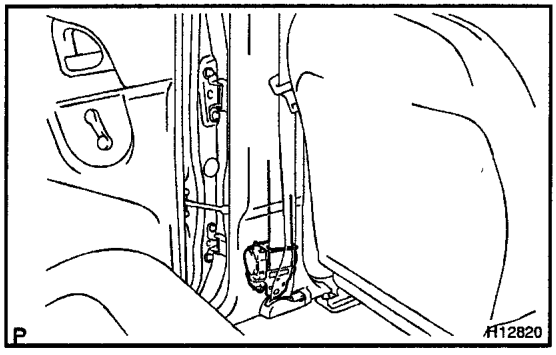
3. FRONT PASSENGER AIRBAG ASSEMBLY

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.

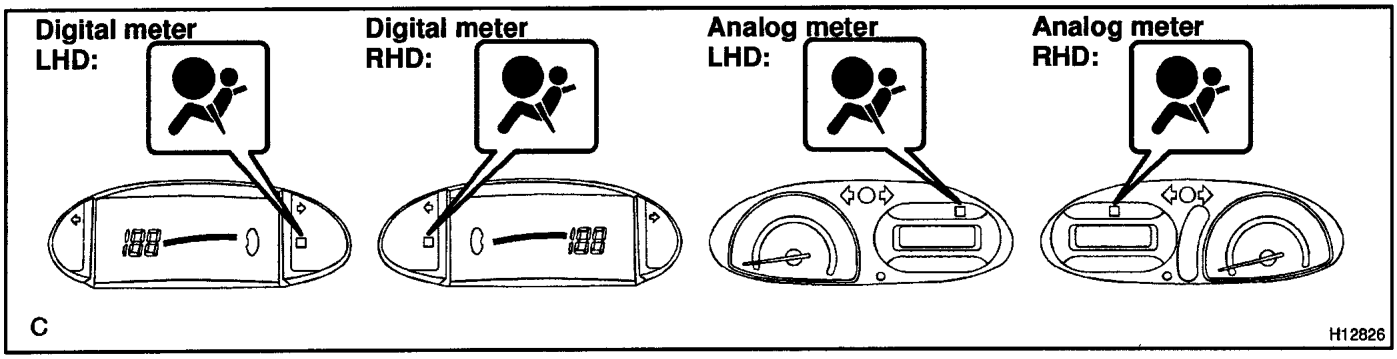


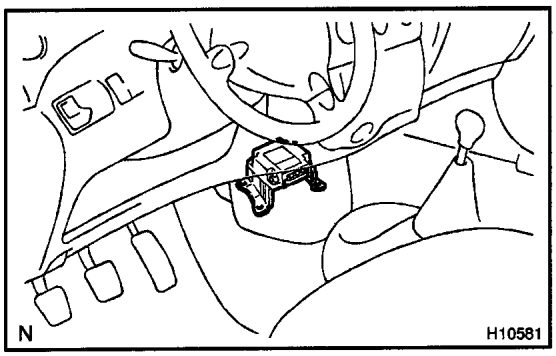
5. SEAT BELT PRETENSIONER

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 self–diagnosis. 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.

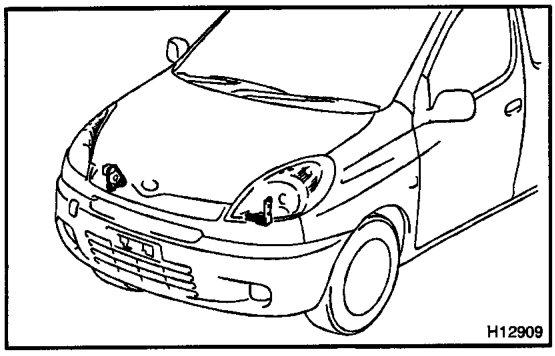




7. AIRBAG SENSOR ASSEMBLY

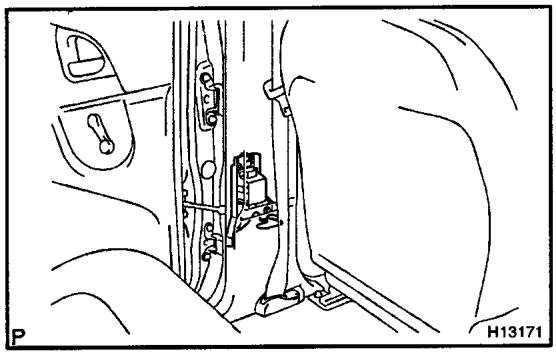
The airbag sensor assembly is mounted on the floor inside the console box. The airbag sensor assembly consists of an airbag sensor, safing sensor, diagnosis circuit, ignition control and drive circuit, etc. It receives signals from the airbag sensor and judges whether the SRS must be activated or not.

RS



8. FRONT AIRBAG SENSOR

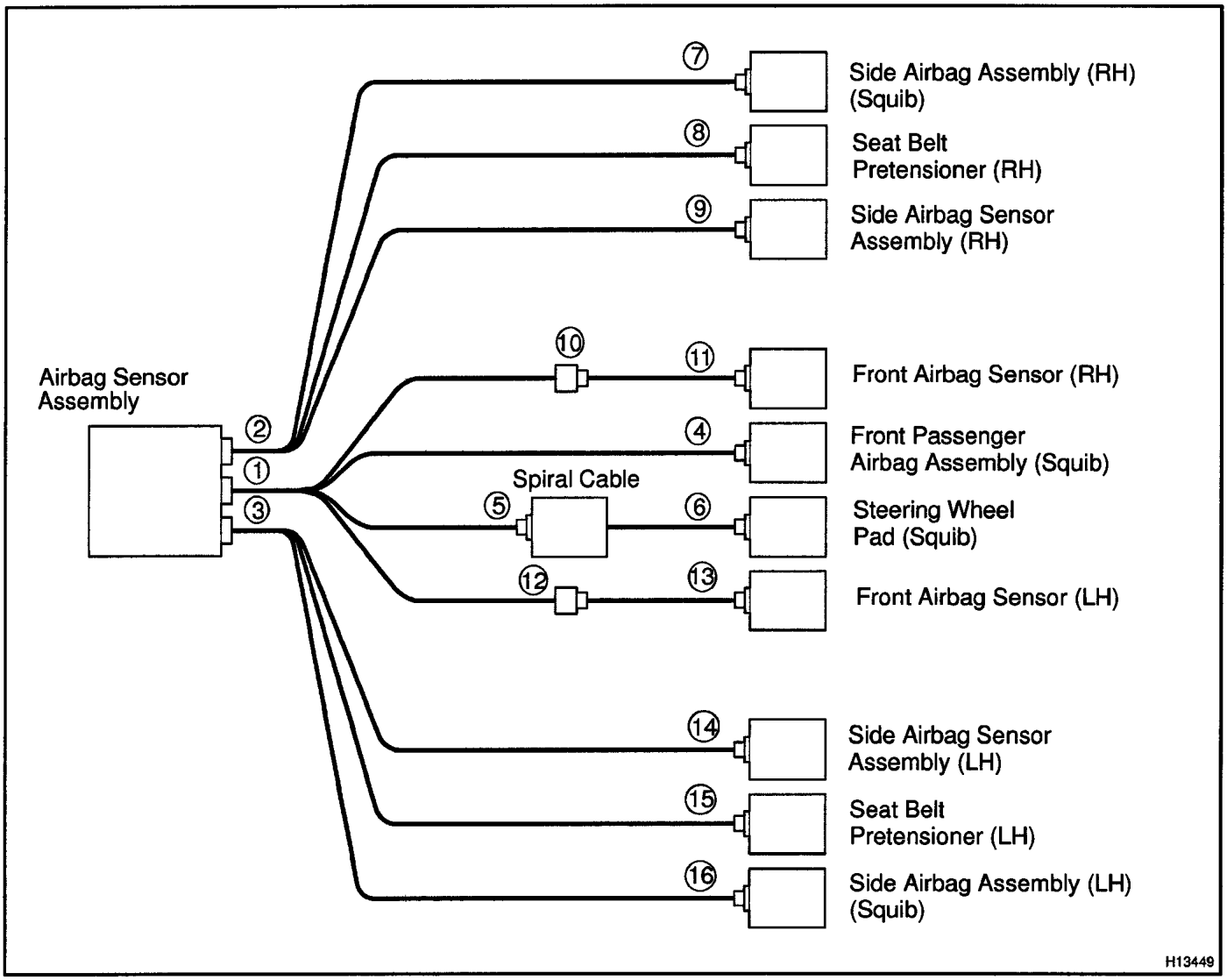
The front airbag sensor is mounted inside each of the side members. The sensor unit is a mechanical type. When the sensor detects deceleration force above a predetermined limit, contact is made in the sensor, sending a signal to the airbag sensor assembly. The sensor cannot be disassembled.



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 lateral deceleration sensor, safing sensor and diagnosis circuit, etc. It receives signals to the airbag sensor assembly to judge from the side airbag sensors whether the SRS side airbag must be activated or not.

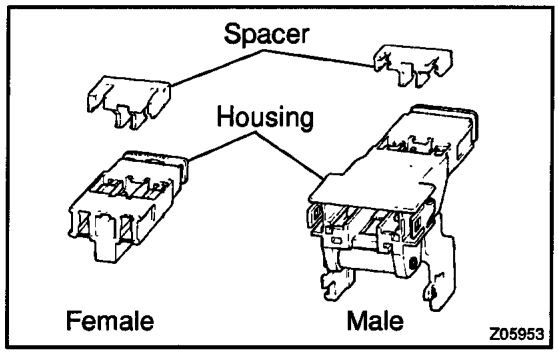
10. SRS CONNECTORS



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
(2)	Airbag Activation Prevention Mechanism	Connectors 1, 2, 3, 4, 5, 6, 7, 8, 15, 16
(3)	Electrical Connection Check Mechanism	Connectors 1, 2, 3

RS

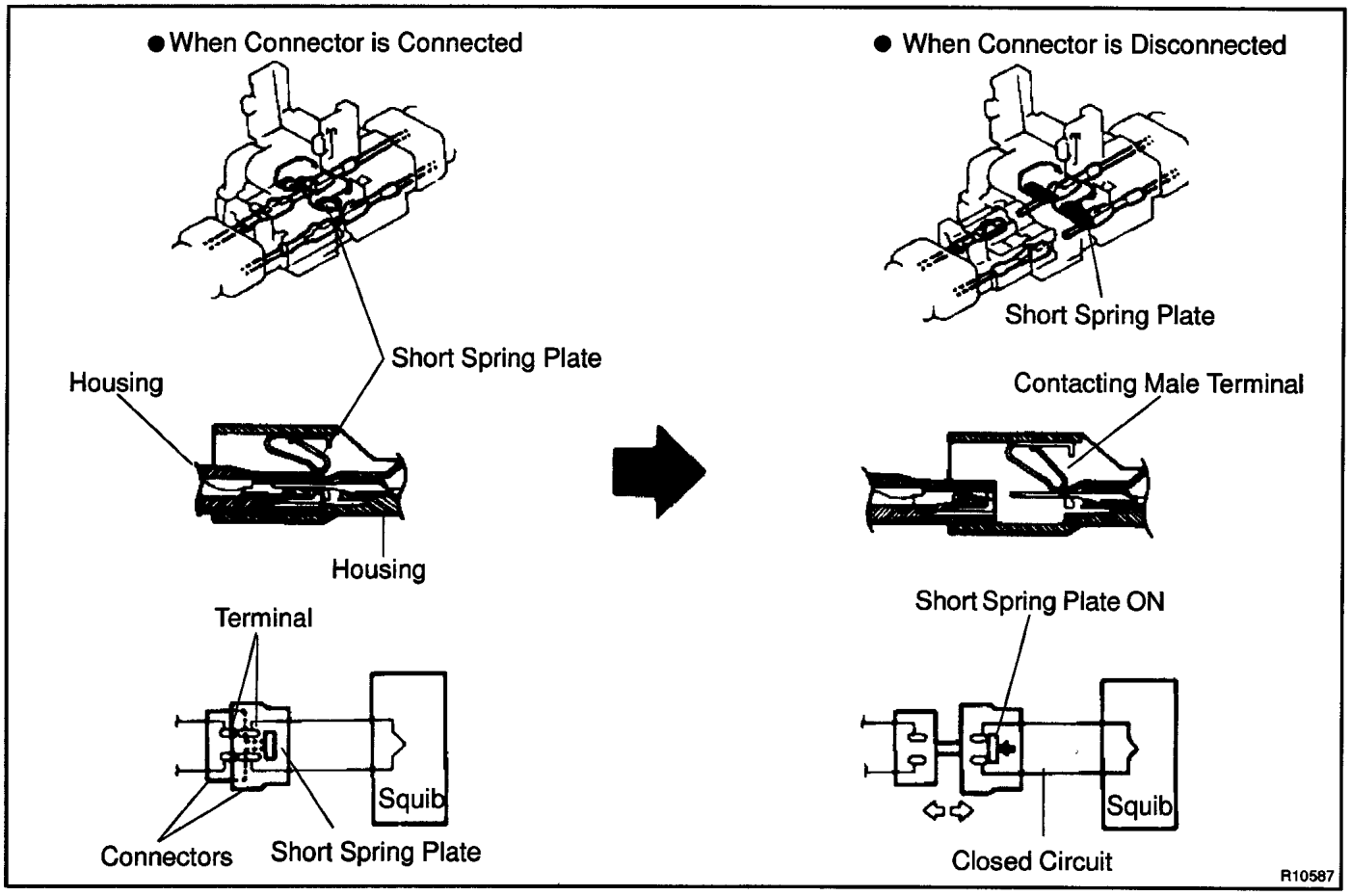
(a) All connectors in the SRS are colored in yellow to distinguish them from other connectors. Connectors having special functions and specifically designed for the SRS are used in the locations shown on the previous page to ensure high reliability. These connectors use durable gold–plated terminals.



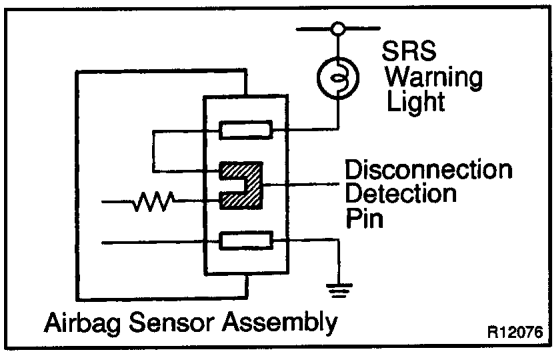
(1) Terminal twin–lock mechanism:
Each connector has a two–piece component consisting of a housing and a spacer. This design enables the terminal to be locked securely by 2 locking devices (the retainer and the lance) to prevent terminals from coming out.

(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.

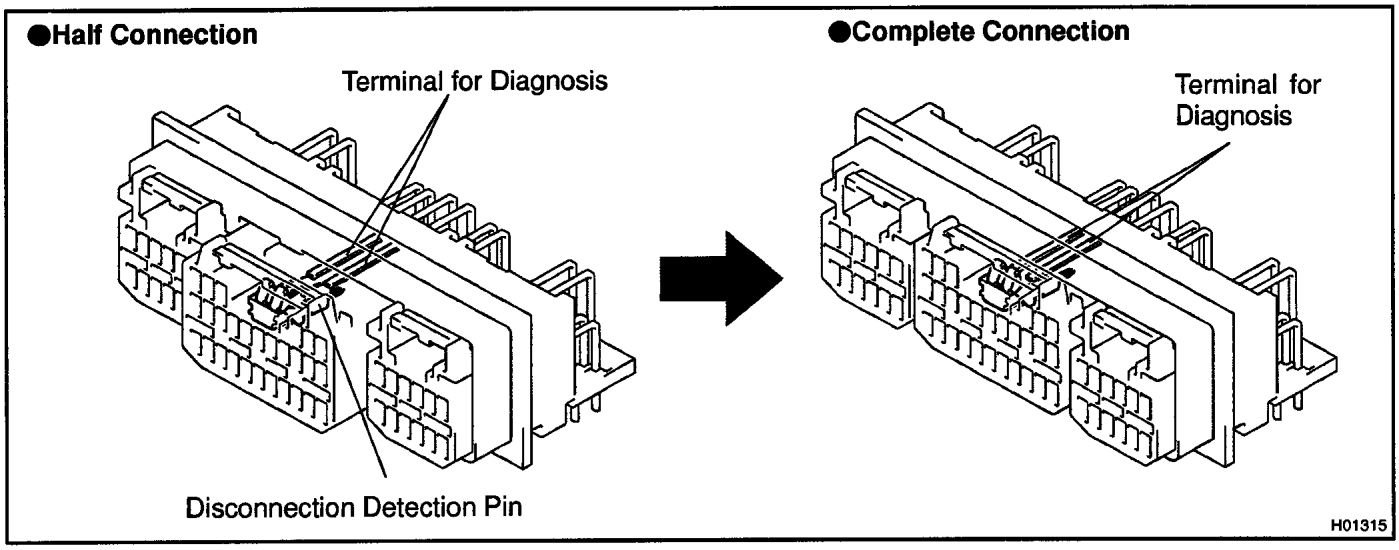
RS



HINT:
The type of connector is shown in the diagram on the previous page.

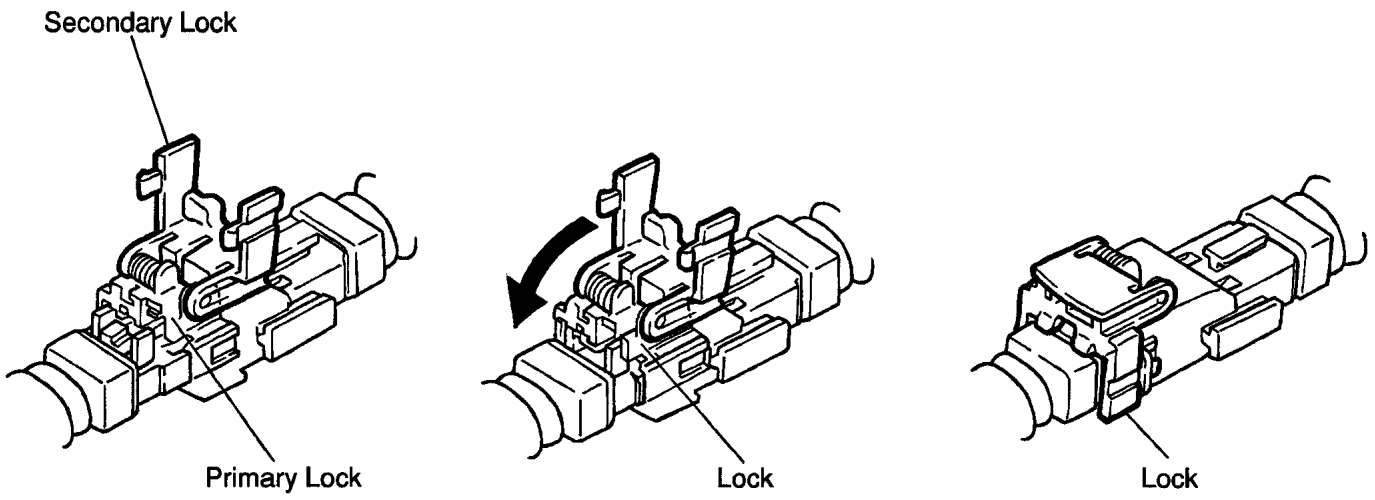


(3) Electrical connection check mechanism:
This mechanism electrically checks that connectors are connected correctly and completely. The electrical connection check mechanism is designed so that the disconnection detection pin connects with the diagnosis terminals when the connector housing lock is 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.



Primary Lock Incomplete (Secondary Lock Prevented)

Primary Lock Complete (Secondary Lock Permitted)

Twin–Lock Completed

H03989

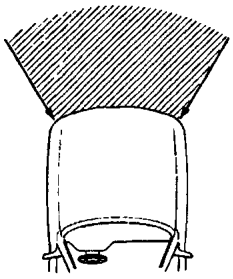


Fig.1

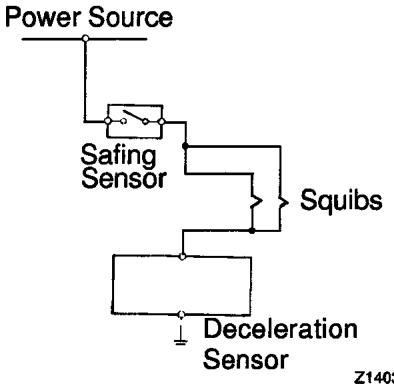
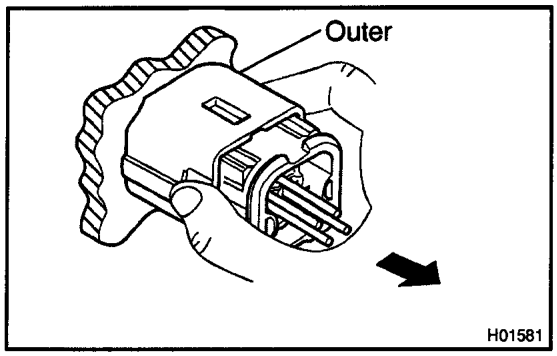


Fig.2

Z14034

(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.



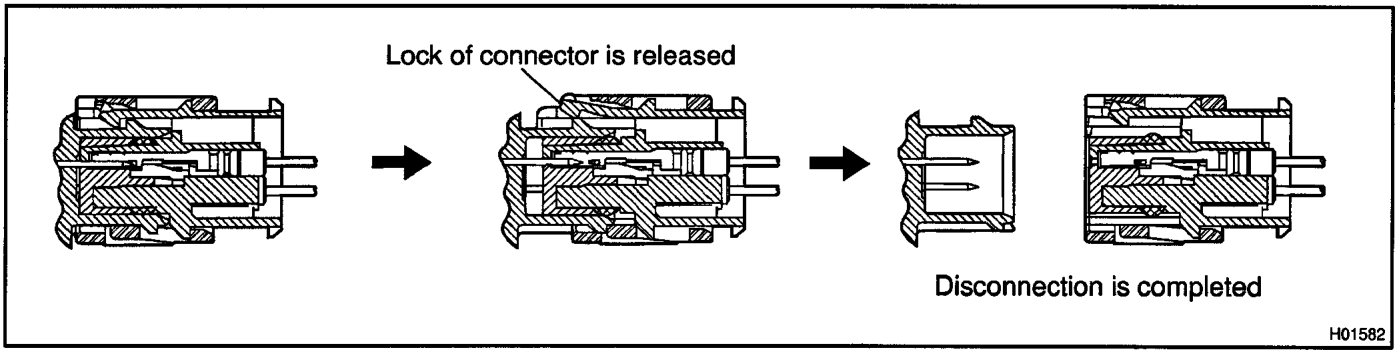
11. DISCONNECTION OF FRONT AIRBAG SENSOR AND SIDE AIRBAG SENSOR ASSEMBLY CONNECTORS

(a) While holding both flank sides of the outer, slide the outer to the direction shown by an arrow.

(b) Lock of the connectors is released, then disconnect the connectors.

HINT:

Be sure to hold both flank sides of the outer. If holding the top and bottom sides, it will obstruct disconnection.



RS

12. CONNECTION OF FRONT AIRBAG SENSOR AND SIDE AIRBAG SENSOR ASSEMBLY CONNECTORS

(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.

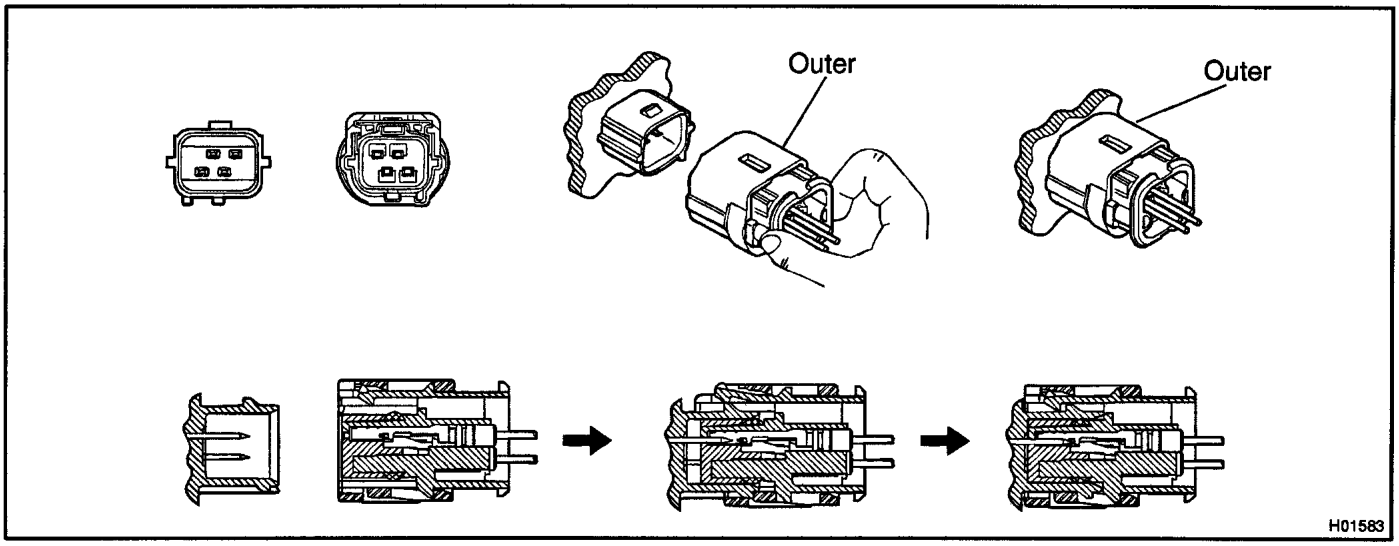
(b) As they are fitted in, the outer slides rearward. Press it until the outer returns to its original position again.

If fitting stops half way, connectors will separate.

(c) Be sure to insert until they are locked. After fitting in, pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

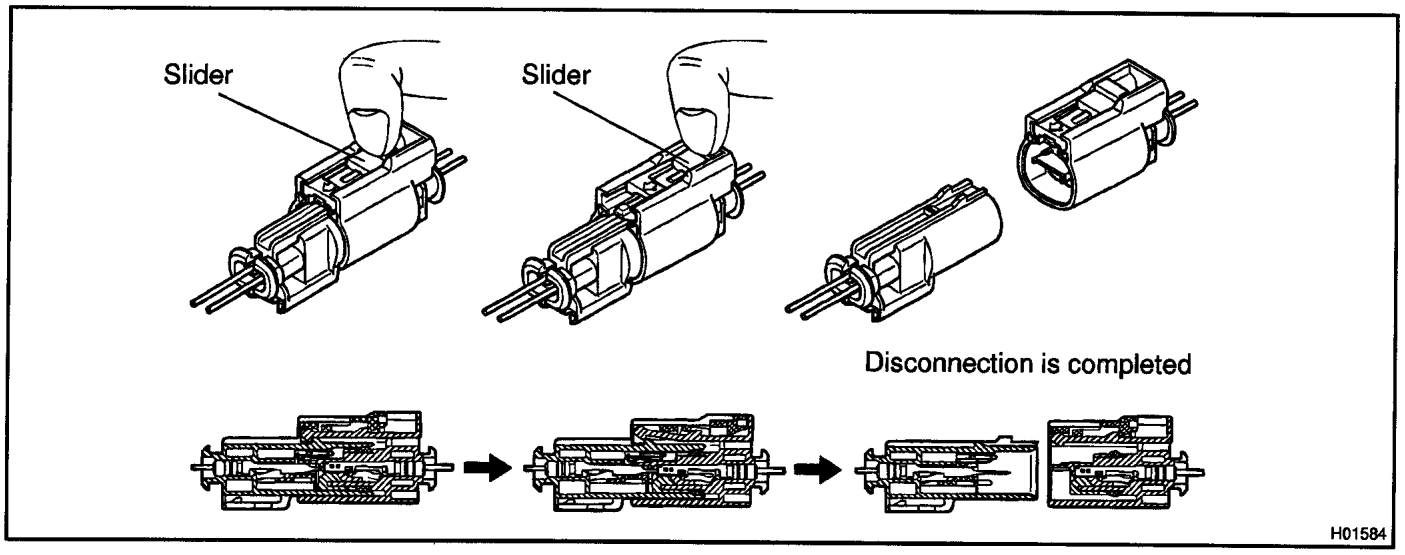
HINT:

- Do not fit in while holding the outer.
- When fitting in, the outer slides. Do not touch it.



13. DISCONNECTION OF SIDE AIRBAG CONNECTOR

(a) Place a finger on the slider.
(b) Slide the slider to release lock.
(c) Disconnect the connector.



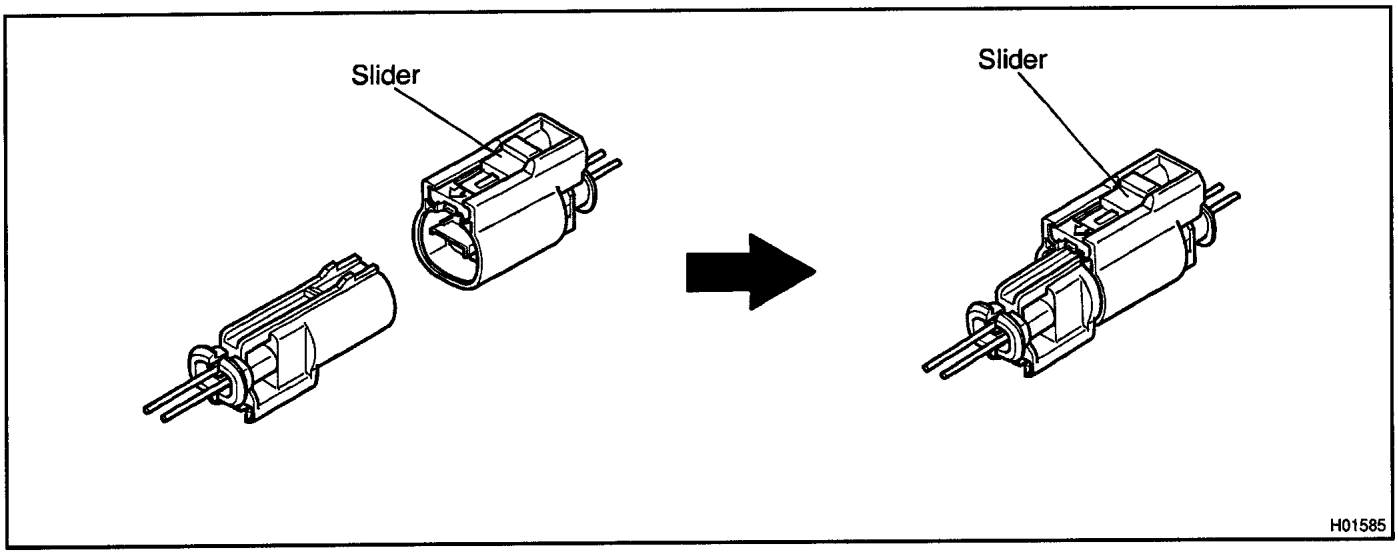
14. CONNECTION OF SIDE AIRBAG CONNECTOR

(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) Be sure to insert until they are locked. After fitting in pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

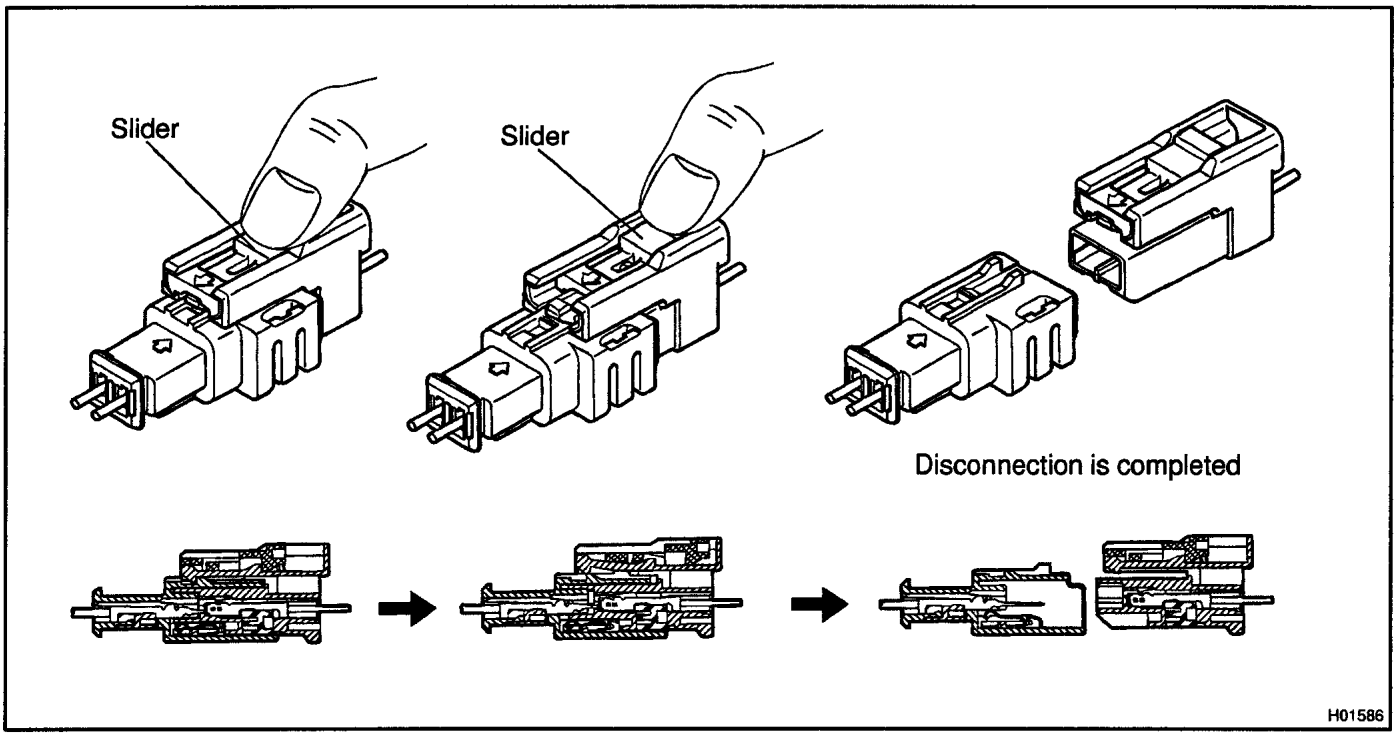
HINT:

- As the slider slides, do not touch it.
- Be careful not to deform the release board. If the release board is deformed, replace it with a new one.



15. DISCONNECTION OF STEERING WHEEL PAD (with AIRBAG) AND FRONT PASSENGER AIRBAG ASSEMBLY CONNECTORS

(a) Place a finger on the slider.
(b) Slide the slider to release lock.
(c) Disconnect the connector.



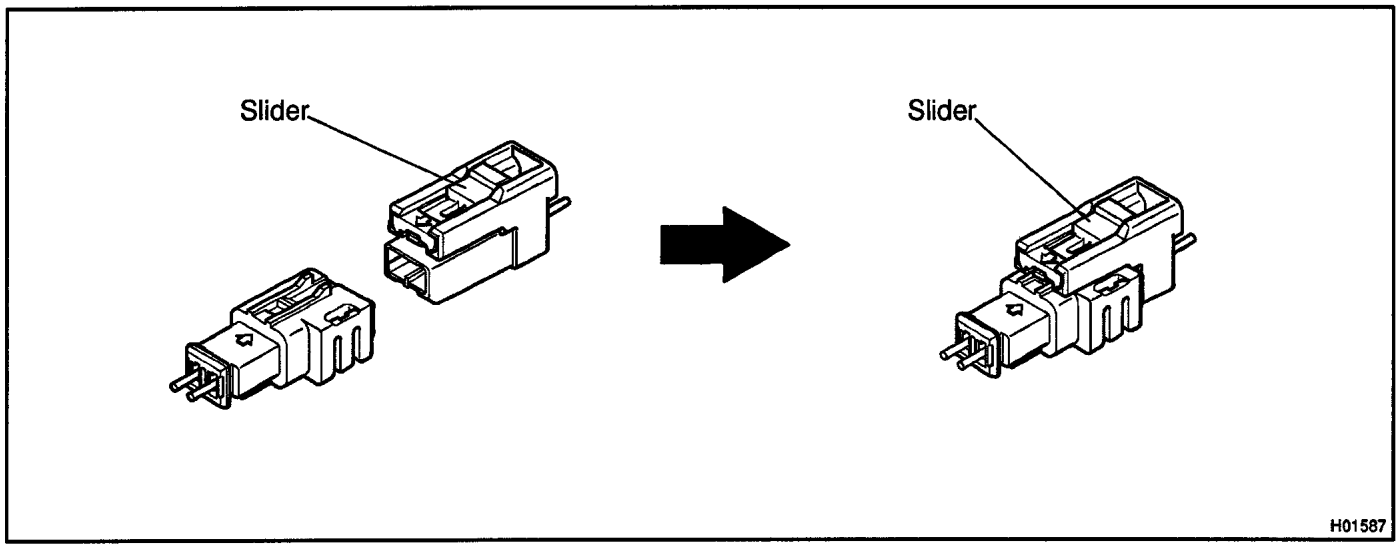
16. CONNECTION OF STEERING WHEEL PAD (with AIRBAG) AND FRONT PASSENGER AIRBAG ASSEMBLY CONNECTORS

(a) Align a lock part of male connector and a slider of female connector in the same direction as shown in the illustration, fit in them without rubbing.

(b) Be sure to insert until they are locked. After fitting in pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

HINT:

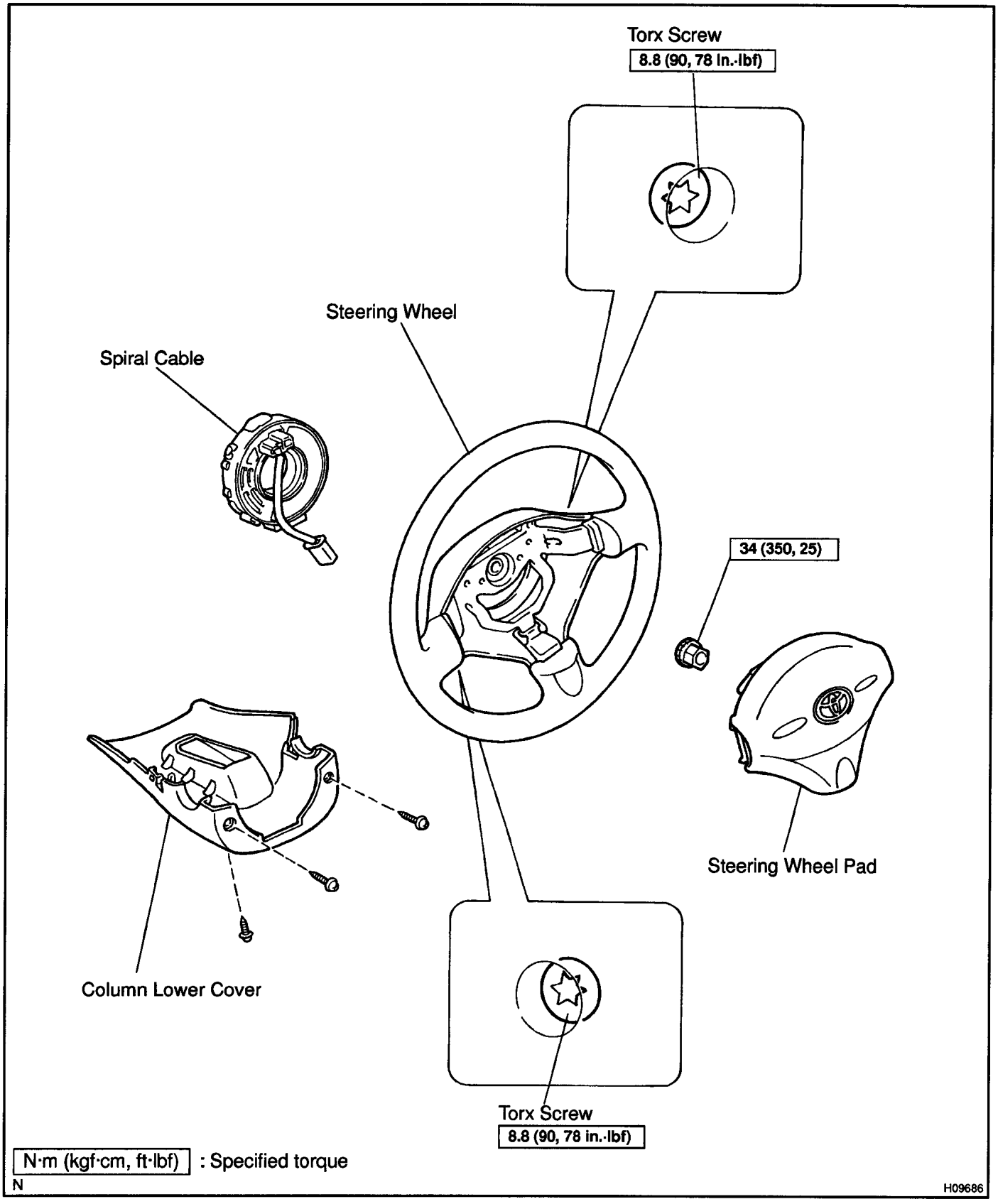
- As the slider slides, do not touch it.
- Be careful not to deform the release board. If the release board is deformed, replace it with a new one.



STEERING WHEEL PAD AND SPIRAL CABLE

COMPONENTS

RS00Y-33



N·m (kgf·cm, ft·lbf) : Specified torque

N

H09686

RS00Z–21

REMOVAL

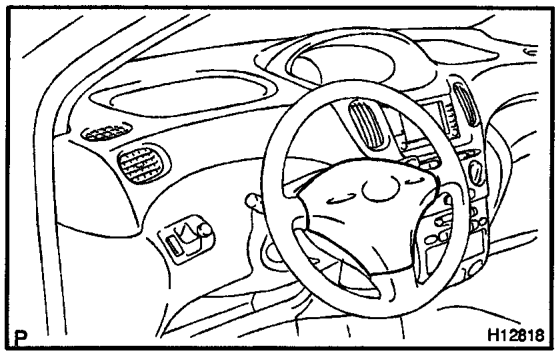
HINT:

For step 1 to 4, refer to page SR–12.

1. **REMOVE STEERING WHEEL PAD**
2. **REMOVE STEERING WHEEL**
3. **REMOVE COLUMN LOWER COVER**
4. **REMOVE SPIRAL CABLE**

RS0KV-01

INSPECTION



1. VEHICLES NOT INVOLVED IN COLLISION

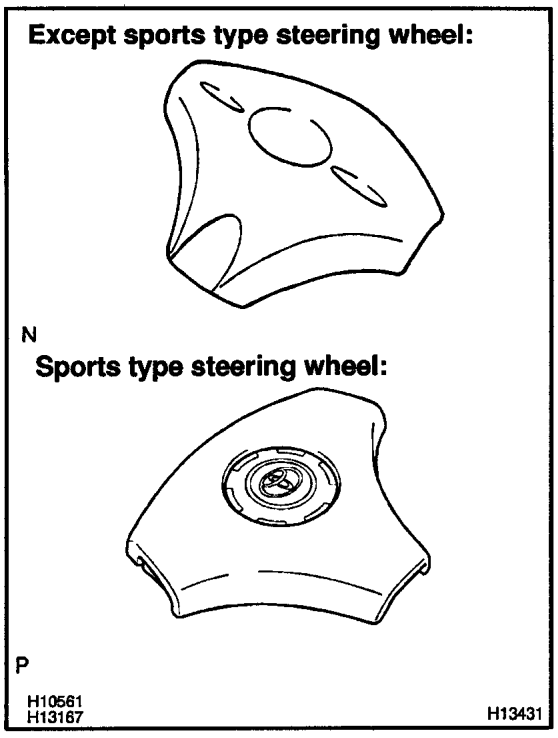
(a) Do a diagnostic system check. (See page DI–102)

(b) Do a visual check which includes the following item 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.

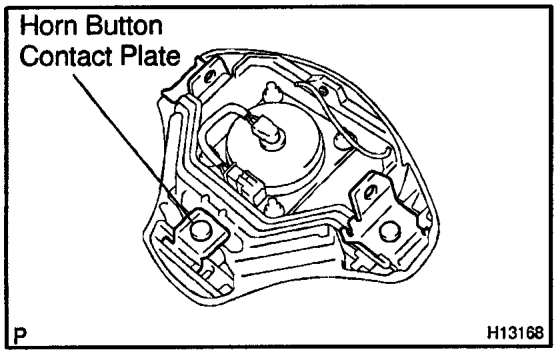
2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

(a) Do a diagnostic system check. (See page DI–102)



(b) Do a visual check which includes the following items with the steering wheel pad (with airbag) removed from the vehicle.

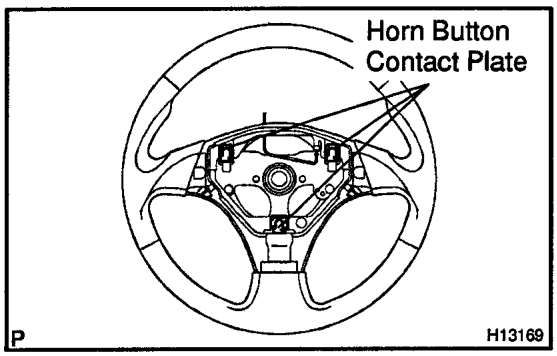
- Check cuts, minute cracks or marked discoloration on the steering wheel pad top surface and in the grooved portion.
- Check cuts and cracks in wire harness, and chipping in connectors.
- Check the deformation on the steering wheel.



- Except sports type steering wheel:
  Check the deformation on the horn button contact plate of the steering wheel pad.

HINT:

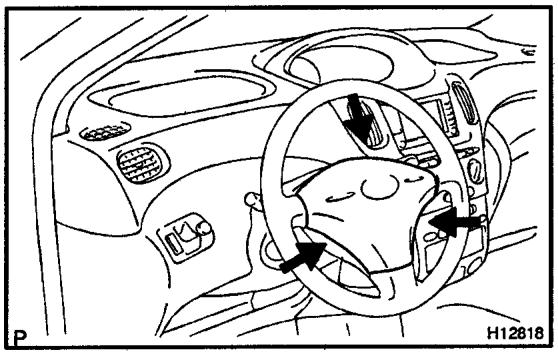
If the horn button contact plate of the steering wheel pad is deformed, never repair it. Always replace the steering wheel pad with a new one.



- Sports type steering wheel:
  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–12 and SR–20, 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–102)

(b) Do a visual check which includes the following item with the steering wheel pad (with airbag) removed from the vehicle.
Check the damage on the spiral cable connector and wire harness.

HINT:
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.

RS0KW-01

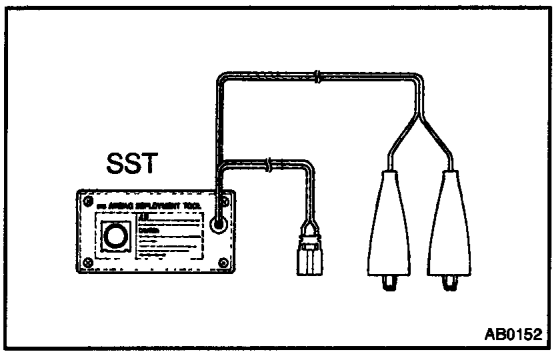
DISPOSAL

HINT:

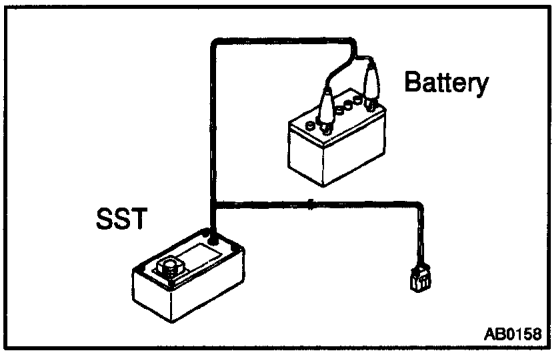
When scrapping vehicle equipped with an SRS or disposing of a steering wheel pad (with airbag), always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of the DISTRIBUTOR.

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.**



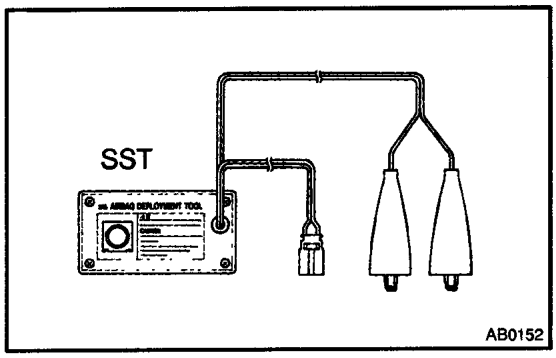
- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool). Perform the operation in a place away from electrical noise.**
  SST 09082–00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the steering wheel pad.**
- **The steering wheel 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.

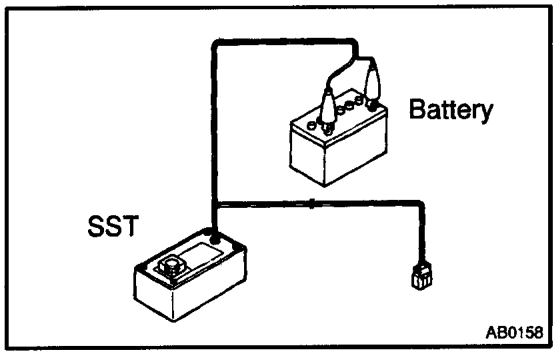


(a) Check functioning of the SST.

CAUTION:

When deploying the airbag, always use the specified SST: SRS Airbag Deployment Tool.

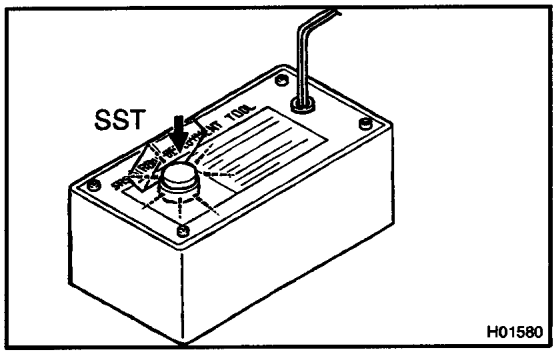
SST 09082–00700



(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.

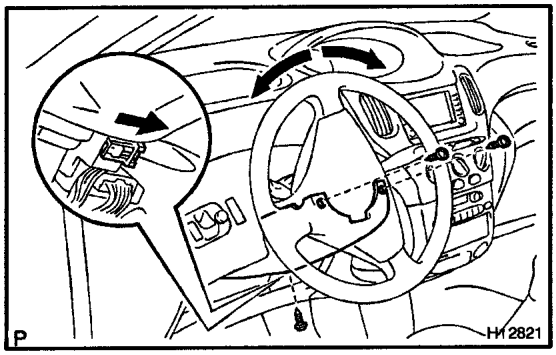


(2) Check functioning of the SST.
Press the SST activation switch, and check that the LED of the SST activation switch lights up.

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.

(3) Disconnect the SST from the battery.



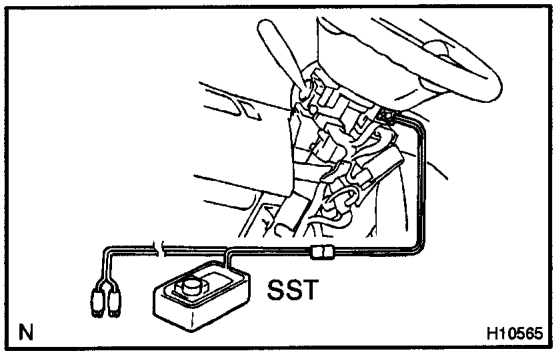
(b) Install the SST.

CAUTION:

Check that there is no looseness in the steering wheel and steering wheel pad.

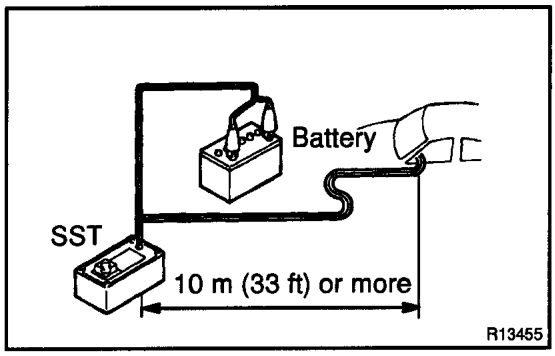
(1) While turning the steering wheel right / left, remove the 3 screws and column lower cover.

(2) Disconnect the airbag connector of the spiral cable.



(3) Connect the connectors of the 2 SST to the airbag connector of the spiral cable back side.

SST 09082–00700, 09082–00760



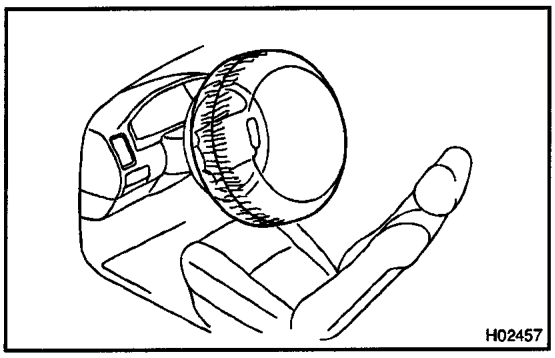
(4) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(5) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(6) Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the negative (–) terminal.



(c) Deploy the airbag.

(1) Confirm that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and deploy the airbag.

HINT:

The airbag deploys simultaneously as the LED of the SST activation switch lights up.

CAUTION:

- **The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **When moving a vehicle for scrapping which has a steering wheel pad with deployed airbag, use gloves and safety glasses.**
- **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.**

HINT:

When scrapping a vehicle, deploy the airbag and scrap the vehicle with the steering wheel pad still installed.

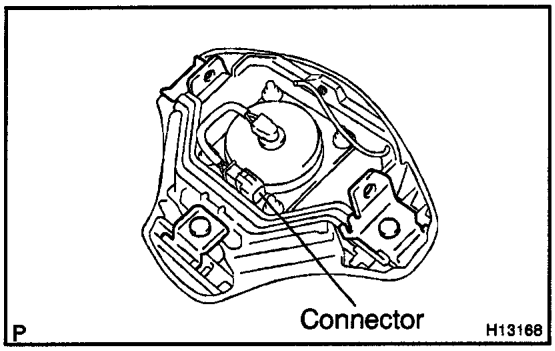
2. DEPLOYMENT WHEN DISPOSING OF STEERING WHEEL PAD ONLY

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.

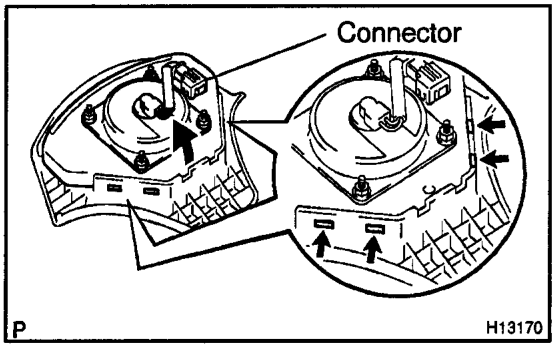


(a) Remove the steering wheel pad. (See page SR–12)

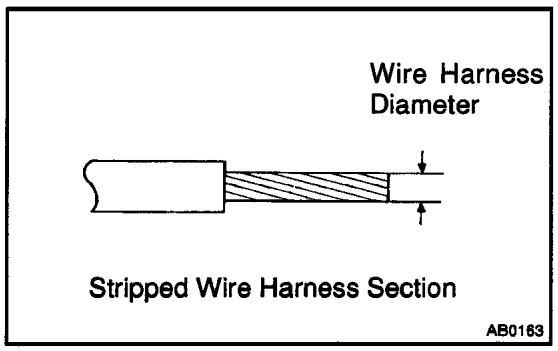
CAUTION:

When storing the steering wheel pad, keep the upper surface of the pad facing upward.

(b) Remove the connector on the rear surface of the steering wheel pad from the bracket.



(c) Sports type steering wheel:
Remove the steering wheel pad cover.



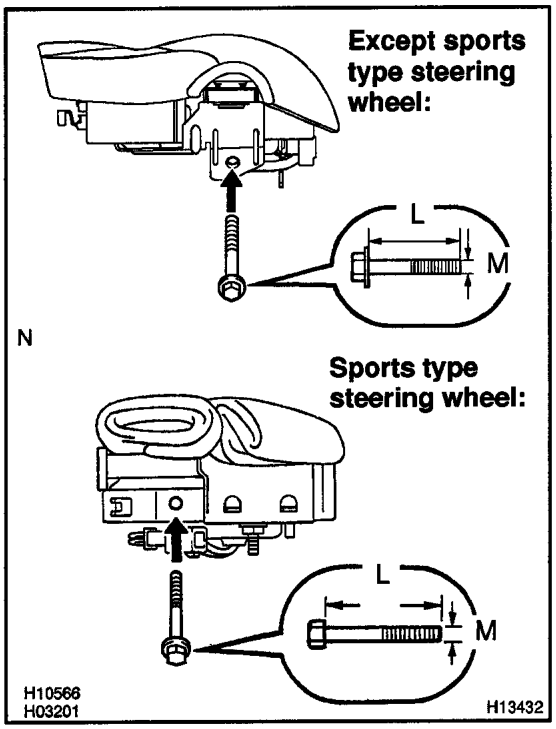
(d) Using a service–purpose wire harness, tie down the steering wheel pad to the disc wheel.
Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2. or more)

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).

HINT:

To calculate the square of the stripped wire harness section:
Square = 3.14 x $(Diameter)^2$ divided by 4



(1) Install the 2 bolts with washers in the 2 bolt holes in the steering wheel pad.

Bolt:
L: 35.0 mm (1.387 in.)
M: 6.0 mm (0.236 in.)
Pitch: 1.0 mm (0.039 in.)

NOTICE:

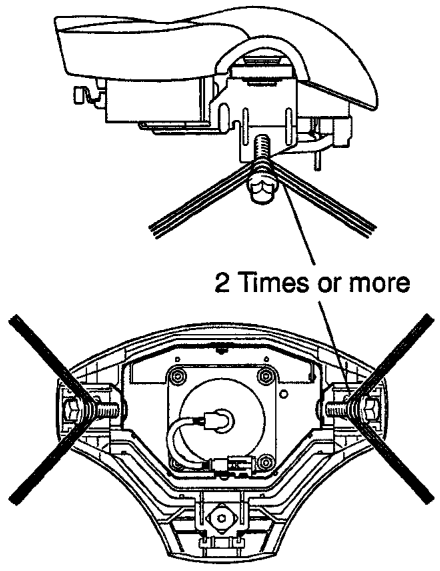
- **Tighten the bolts by hand until the bolts become difficult to turn.**
- **Do not tighten the bolts too much.**

(2) Using 3 wire harness, wind the wire harness at least 2 times each around the bolts installed on the left and right sides of the steering wheel pad.

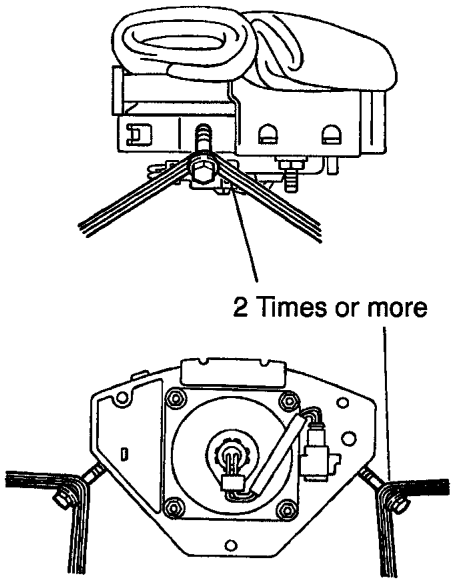
CAUTION:

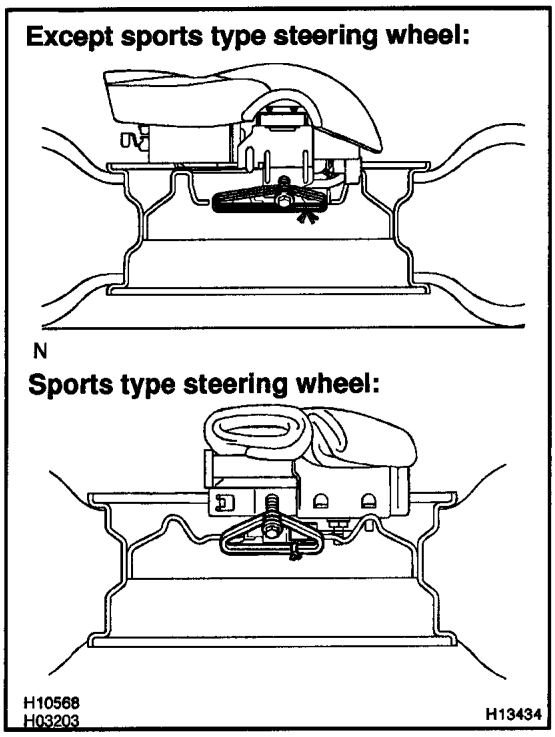
- **Tightly wind the wire harness around the bolts so that there is no slack.**
- **If there is slack in the wire harness, the steering wheel pad may come loose due to the shock when the airbag is deployed. This is highly dangerous.**

Except sports type steering wheel:



Sports type steering wheel:





(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.

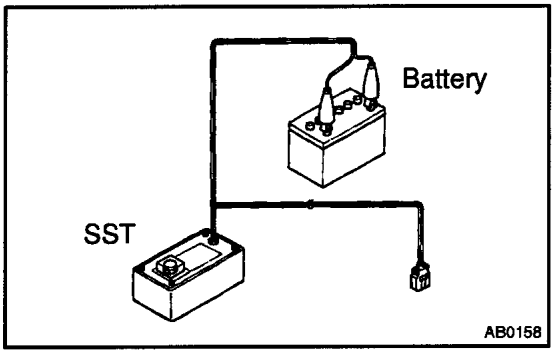
CAUTION:

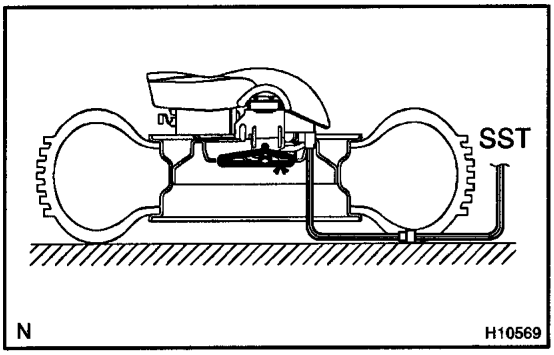
- **Make sure that the wire harness is tight. It is very dangerous when looseness in the wire harness results in the steering wheel pad coming free through the shock from the airbag deploying.**
- **Always tie down the steering wheel pad with the pad side facing upward. It is very dangerous if the steering 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.

(e) Check functioning of the SST. (See step 1–(a))
SST 09082–00700





(f) Install the SST.

CAUTION:

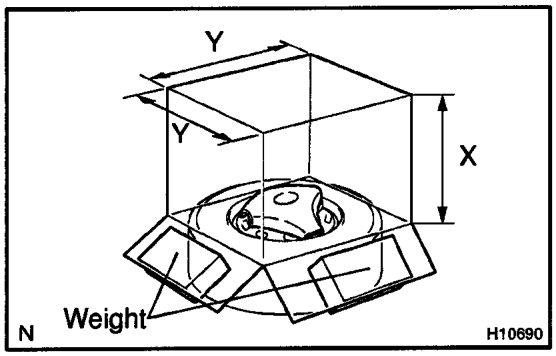
Place the disc wheel on the level ground.

(1) Connect the connectors of the 2 SST to the steering wheel pad connector.
SST 09082–00700, 09082–00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock. Also, secure some slack for the SST wire harness inside the disc wheel.

(2) Move the SST to at least 10 m (33 ft) away from the steering wheel pad tied down on the disc wheel.



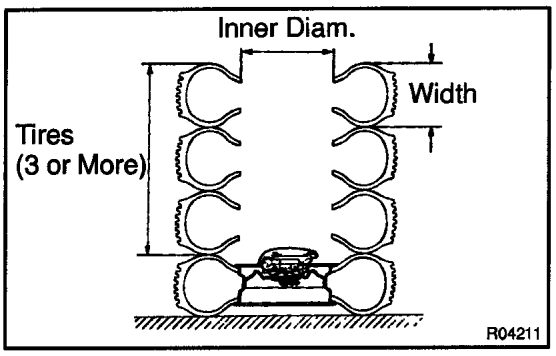
(g) Cover the steering wheel pad with a cardboard box or tires.

- Covering method using a 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.)
Y = 650 mm (25.59 in.)

NOTICE:

- **When dimension Y of the cardboard box exceeds the diameter of the disc wheel with tire to which the steering wheel pad is tied, X should be the following size.**
  X = 460 mm (18.11 in.) + width of tire
- **If a cardboard box smaller than the specified size is used, the cardboard box will be broken by the shock from the airbag deployment.**

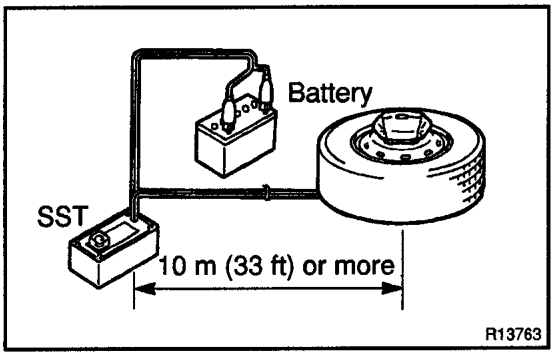


- Covering method using tires:
  Place at least 3 tires without disc wheel on top of the disc wheel with tire to which the steering wheel pad is tied.

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.



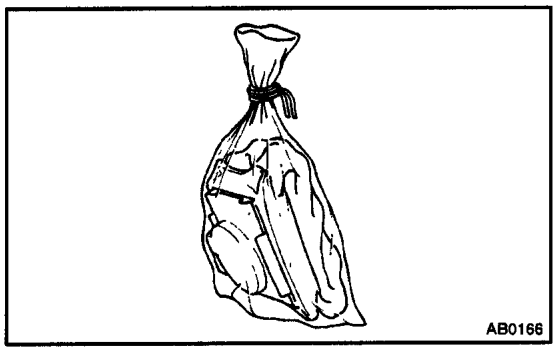
(h) Deploy the airbag.

(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.



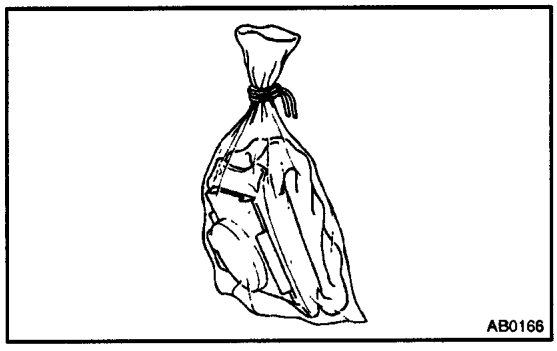
(i) Dispose the steering wheel pad (with airbag).

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 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) 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.



3. DEPLOYMENT WHEN DISPOSING OF STEERING WHEEL PAD WITH AIRBAG DEPLOYED IN COLLISION

Dispose 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.**
- **When moving a vehicle for scrapping which has a steering wheel pad with the deployed airbag, use gloves and safety glasses.**
- **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) Remove the steering wheel pad from the steering wheel (See page SR–12).

(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.

RS012-26

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–12 and SR–20. Be sure to follow the correct procedure.

RS013-22

INSTALLATION

HINT:

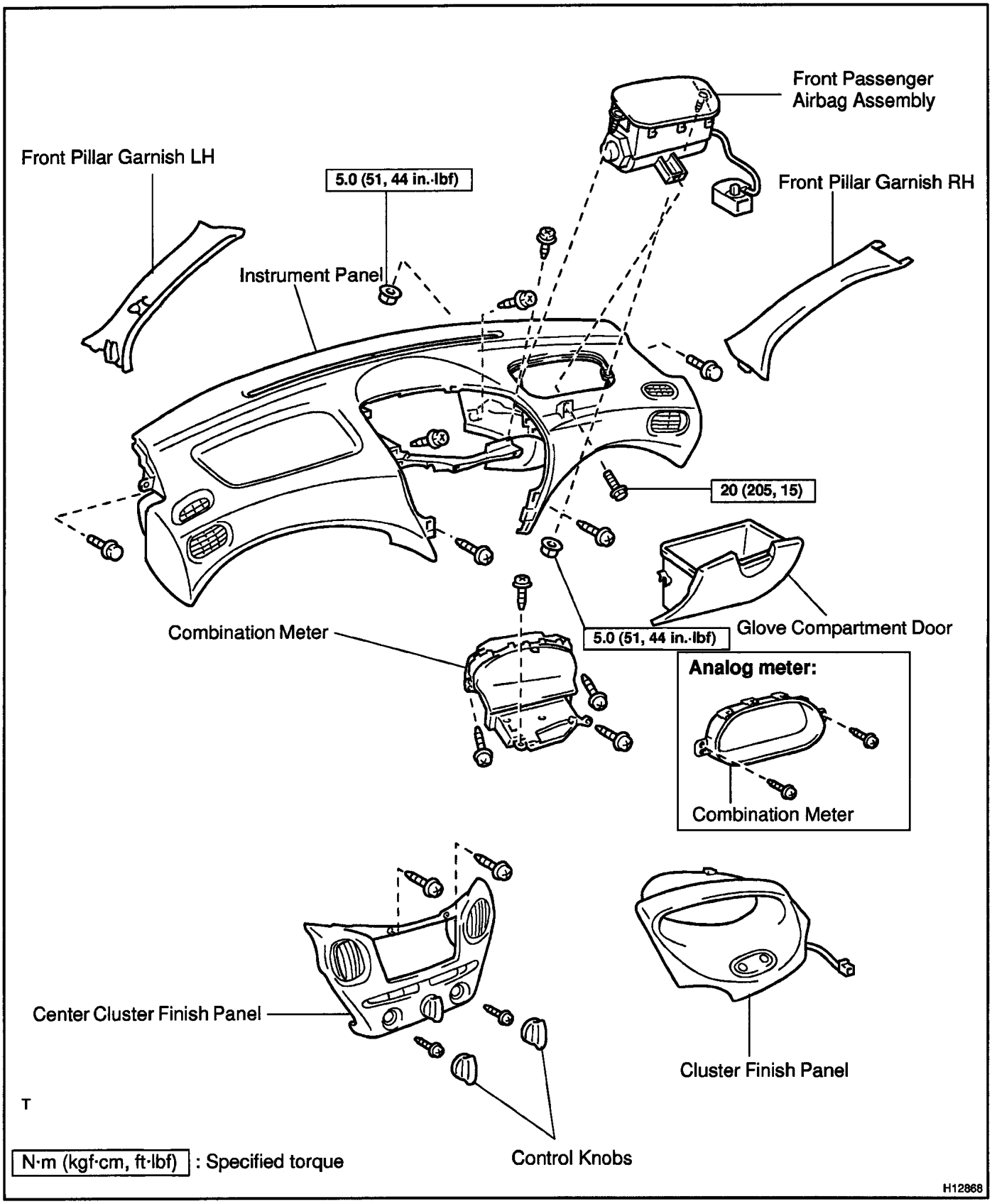
For step 1 to 4, refer to page SR–20.

1. **INSTALL SPIRAL CABLE**
2. **INSTALL LOWER COLUMN COVER**
3. **INSTALL STEERING WHEEL**
4. **INSTALL STEERING WHEEL PAD**

FRONT PASSENGER AIRBAG ASSEMBLY

RS014-31

COMPONENTS



RS0ID-02

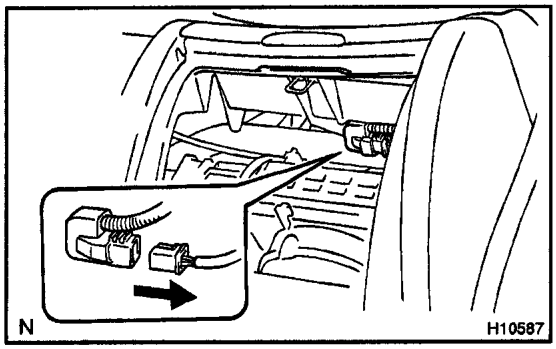
REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is in ON position, DTCs will be recorded.**
- **Never use the airbag parts from another vehicle. When replacing parts, replace them with new parts.**

HINT:

For step 2 to 6, refer to page BO–86.



1. DISCONNECT AIRBAG CONNECTOR

(a) Remove the glove compartment door.

(b) Remove the connector cover from the lower instrument panel.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

(c) Disconnect the front passenger airbag connector.

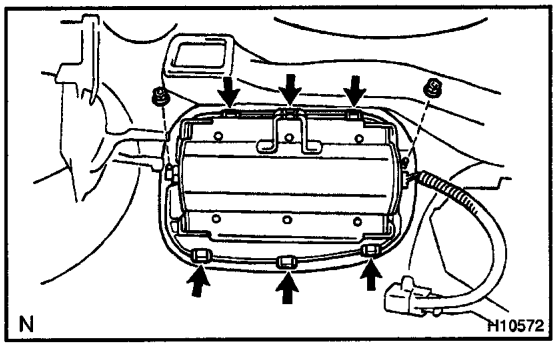
2. REMOVE CLUSTER FINISH PANEL

3. REMOVE COMBINATION METER

4. REMOVE FRONT PILLER GARNISHES

5. REMOVE CENTER CLUSTER FINISH PANEL

6. REMOVE INSTRUMENT PANEL



7. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY

(a) Remove the 2 nuts and pry up the 6 claws.

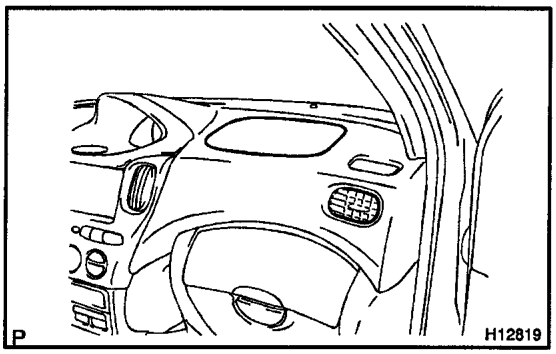
(b) Remove the front passenger airbag assembly.

CAUTION:

- **Do not store the front passenger airbag assembly with the airbag deployment side facing downward.**
- **Never disassemble the front passenger airbag assembly.**

RS02Q–11

INSPECTION

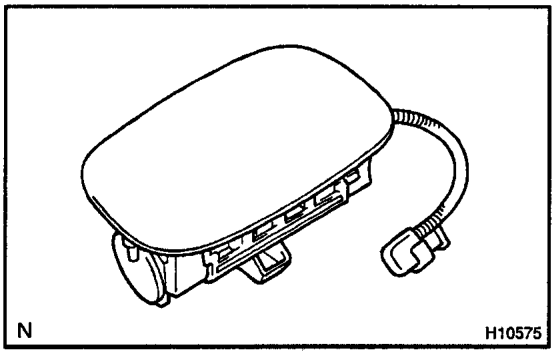


1. VEHICLE NOT INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See page DI–102)

(b) Do a visual check which includes the following item 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

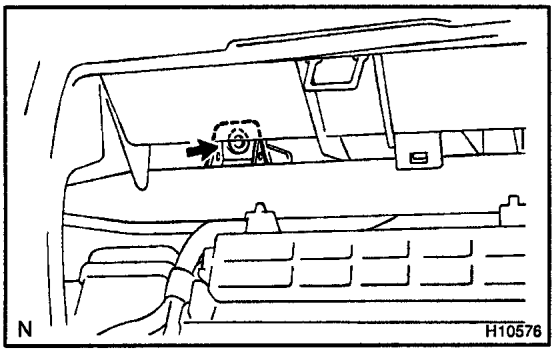
(a) Do a diagnostic system check. (See page DI–102)

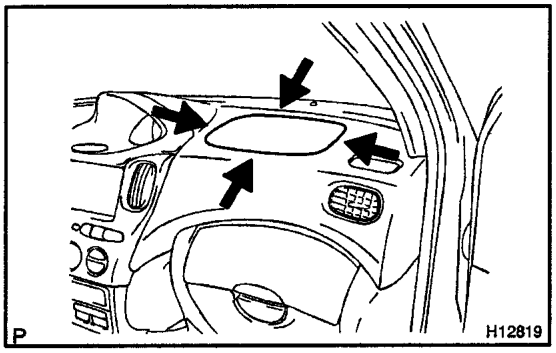
(b) Do a visual check which includes the following items with the front passenger airbag assembly removed from the vehicle.

- Check cuts, minute cracks or marked discoloration on the front passenger airbag assembly.
- Check cuts and cracks in wire harness, 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–29 and RS–38, 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–102)

(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.

RS0H2-03

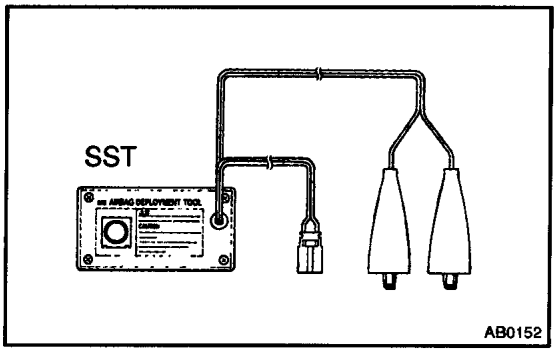
DISPOSAL

HINT:

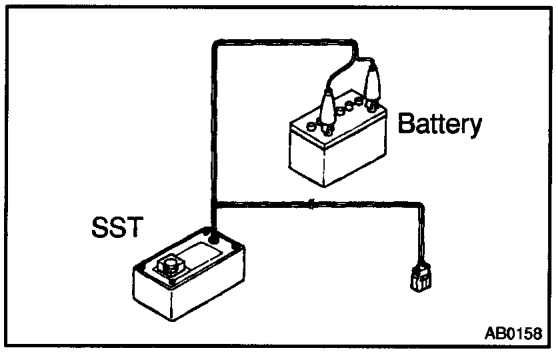
When scrapping vehicle equipped with an SRS or disposing of a front passenger airbag assembly, always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of the DISTRIBUTOR.

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 the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with the deployed airbag.**

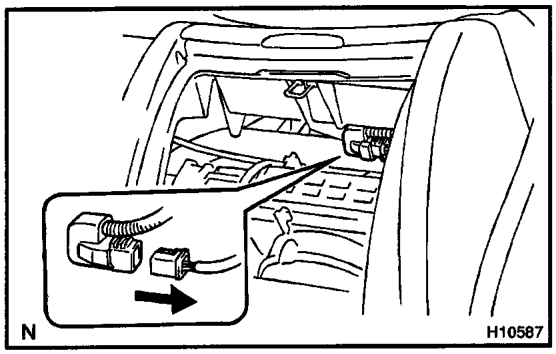


1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

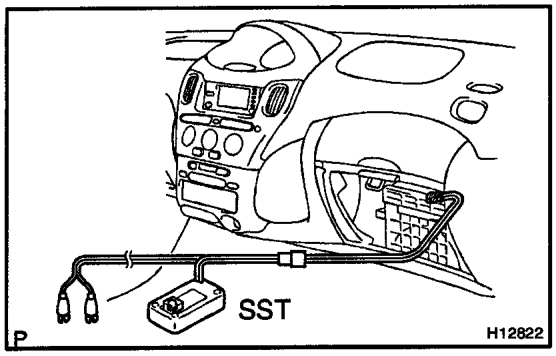
(a) Check functioning of the SST.
(See step 1–(a) on page RS–17)
SST 09082–00700



(b) Disconnect the airbag connector.
(1) Remove the glove compartment door.
(2) Disconnect the connector cover from the lower instrument panel.

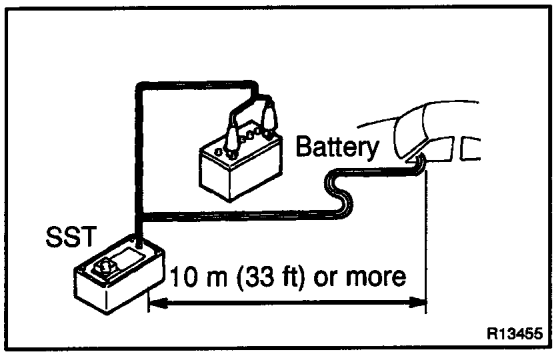
NOTICE:
When handling the airbag connector, take care not to damage the airbag wire harness.

(3) Disconnect the airbag connector.



(c) Install the SST.
(1) Connect the connectors of the 2 SST to the front passenger airbag assembly connector.
SST 09082–00700, 09082–00760

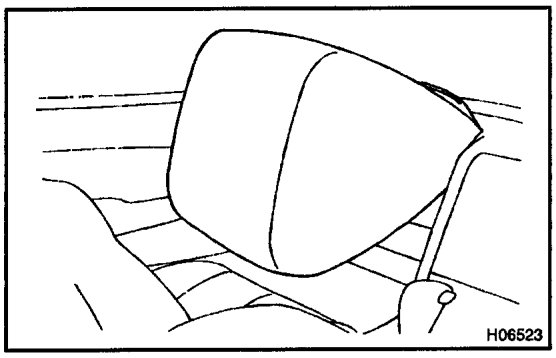
NOTICE:
To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.



(2) Move the SST to at least 10 m (33 ft) away from the front of the vehicle.
(3) Close all the doors and windows of the vehicle.

NOTICE:
Take care not to damage the SST wire harness.

(4) Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the negative (–) terminal.



(d) Deploy the airbag.
(1) Check that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.
(2) Press the SST activation switch and deploy the airbag.

HINT:
The airbag deploys simultaneously as the LED of the SST activation switch lights up.

(e) Dispose the 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 the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with the deployed airbag.**

- **When moving a vehicle for scrapping which has a front passenger airbag assembly with the deployed airbag, use gloves and safety glasses.**

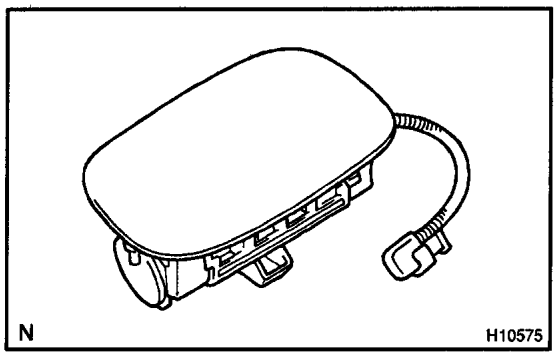
HINT:
When scrapping a vehicle, deploy the airbag and scrap the vehicle with the front passenger airbag assembly still installed.

2. 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.**

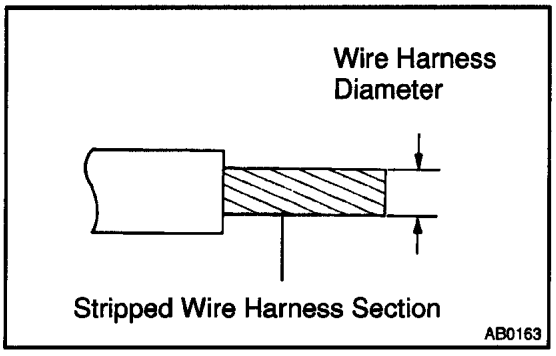
HINT:
Have a battery ready as the power source to deploy the airbag.



(a) Remove the front passenger airbag assembly.
(See page RS–29)

CAUTION:

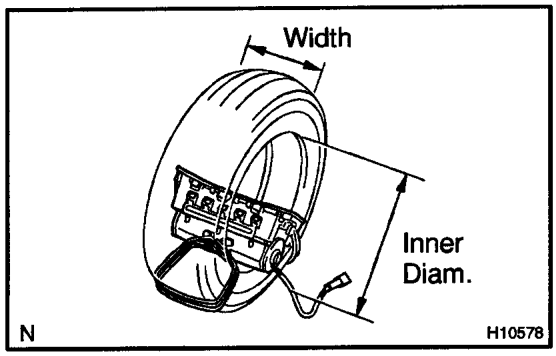
- **When removing the front passenger airbag assembly, work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (–) terminal cable is disconnected from the battery.**
- **Store the front passenger airbag assembly with the airbag deployment side facing 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

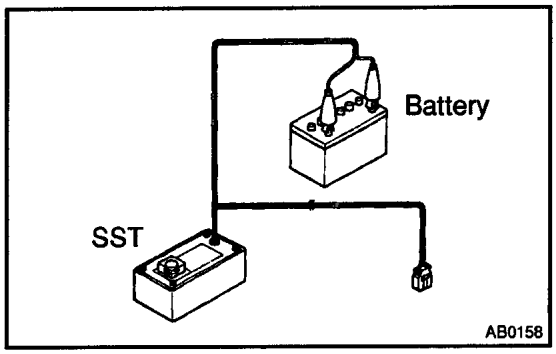


Position the front passenger airbag assembly inside the tire with the airbag deployment side facing inside.
Tire size: Must exceed the following dimensions–
Width: 185 mm (7.28 in.)
Inner diameter: 360 mm (14.17 in.)

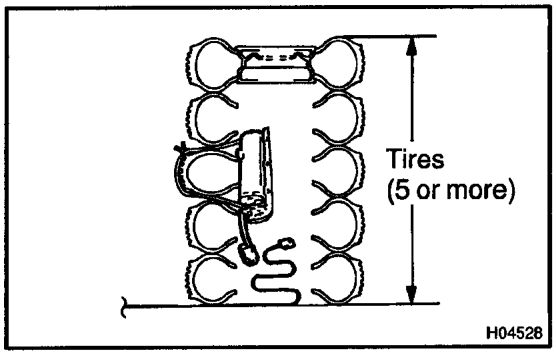
CAUTION:

- **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 deployment side facing inside.**

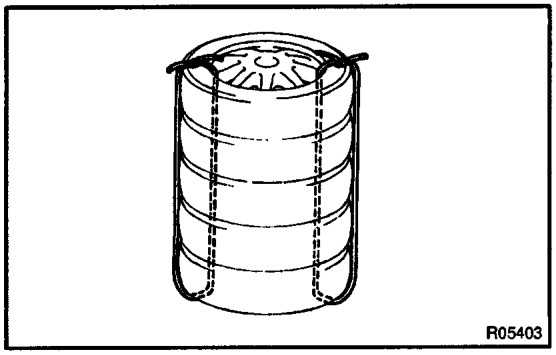
NOTICE:
The tire will be marked by the airbag deployment, so use a redundant tire.



(c) Check functioning of the SST.
(See step 1–(a) on page RS–14)
SST 09082–00700



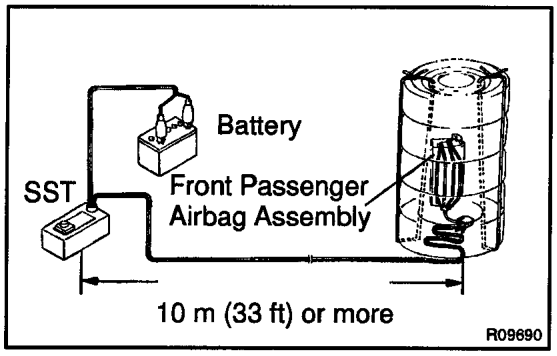
(d) Place tires.
(1) Place at least 2 tires under the tire to which the front passenger airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the front passenger airbag assembly is tied. The top tire should have the wheel installed.



(3) Tie the tires together with 2 wire harness.

CAUTION:
Make sure that the wire harness is tight. It is very dangerous if loose wire harness result in the tires coming free due to the shock from the airbag deploying.

HINT:
Place the SST connector and wire harness inside tires. Secure at least 1 m (3 ft) of slack for the wire harness.



(e) Install the SST.
Connect the connectors of the 2 SST to the front passenger airbag assembly connector.
SST 09082–00700, 09082–00760

NOTICE:
To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.

(f) Deploy the airbag.
(1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (–) terminal.
(2) Check that no one is within 10 m (33 ft) area around the tire which the 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 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 the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with the 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.



3. DEPLOYMENT WHEN DISPOSING OF STEERING WHEEL PAD WITH AND AIRBAG DEPLOYED IN COLLISION

Dispose 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.**

- **When moving a vehicle for scrapping which has a front passenger airbag assembly with the deployed airbag, use gloves and safety glasses.**
- **Use gloves and safety glasses when handling a front passenger airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with the deployed airbag.**
  (1) Remove the front passenger airbag assembly from the vehicle.
  (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.

RS018-22

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–30)	Front passenger airbag assembly
If the instrument panel has been found to be faulty during checking items. (See page RS–30)	Instrument panel
If the instrument panel reinforcement has been found to be faulty during checking items. (See page RS–30)	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–29 and RS–38. Be sure to follow the correct procedure.

RS0H3-03

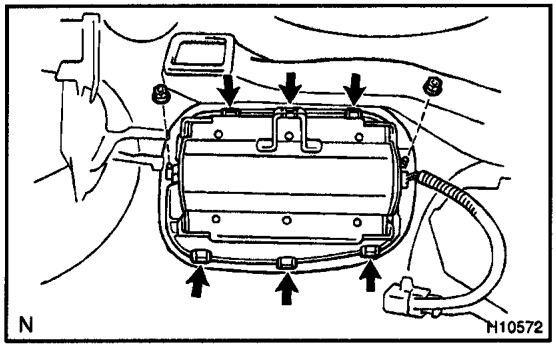
INSTALLATION

NOTICE:

Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.

HINT:

For step 2 to 6, refer to page BO–95.



1. INSTALL FRONT PASSENGER AIRBAG ASSEMBLY

(a) Install the front passenger airbag assembly to the instrument panel.

(b) Install the 2 nuts.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

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.

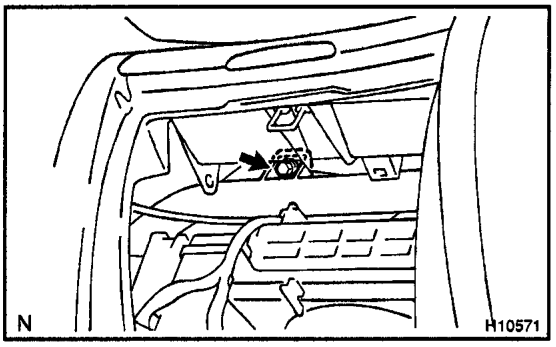
2. INSTALL INSTRUMENT PANEL

3. INSTALL CLUSTER FINISH PANEL

4. INSTALL FRONT PILLER GARNISHES

5. INSTALL COMBINATION METER

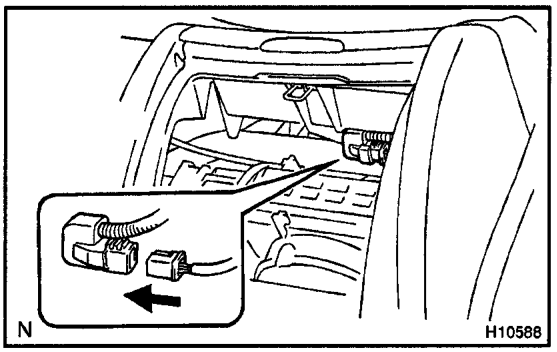
6. INSTALL CLUSTER FINISH PANEL



7. FIX FRONT PASSENGER AIRBAG ASSEMBLY

Install the bolt to the instrument panel reinforcement.

Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)



8. CONNECT AIRBAG CONNECTOR

(a) Connect the connector of the front passenger airbag assembly.

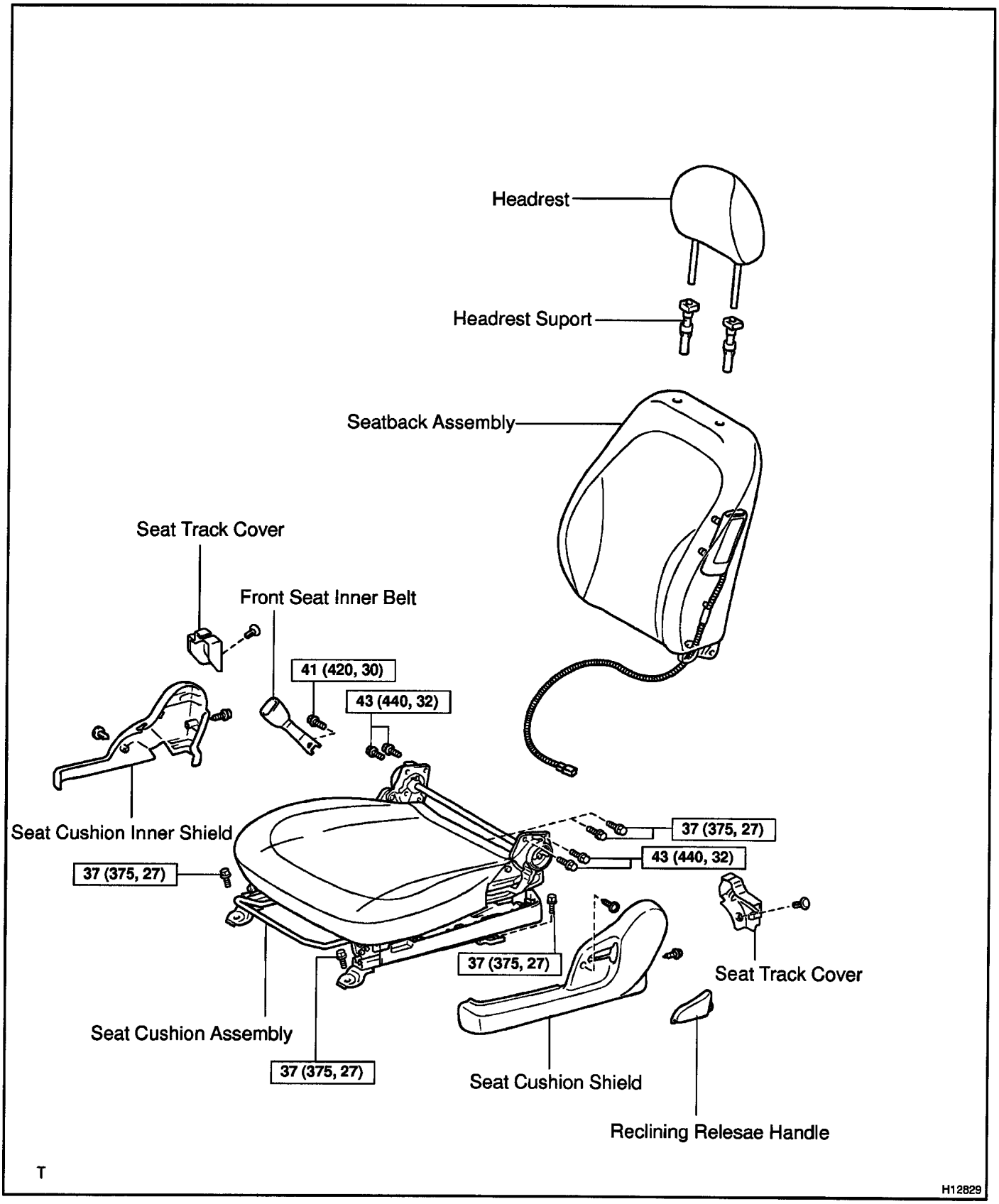
(b) Install the connector cover to the lower instrument panel.

(c) Install the glove compartment door.

SIDE AIRBAG ASSEMBLY

COMPONENTS

RS0KX-01

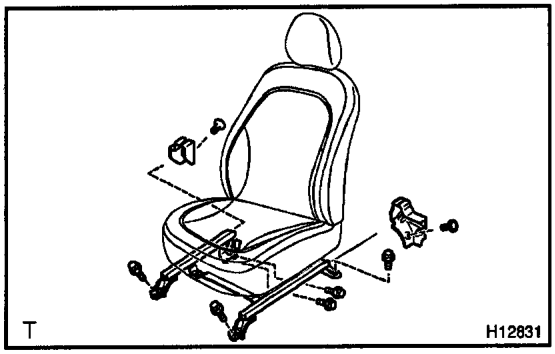


RS0KY-01

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is in 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 2 clips.

(b) Using a screwdriver, remove the seat track covers.

HINT:

Tape the screwdriver tip before use.

(c) Remove the 5 bolts.

(d) Disconnect the connectors.

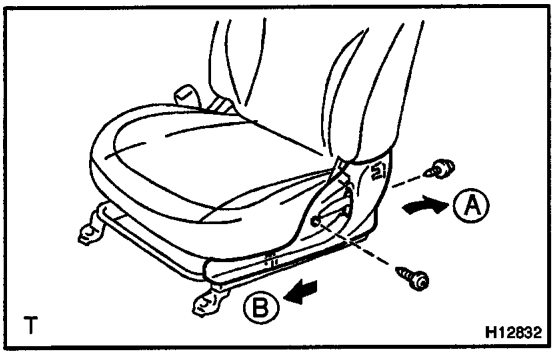
(e) Remove the front seat.

NOTICE:

Be careful not to damage the body.

2. REMOVE HEADREST

3. REMOVE RECLINING RELEASE HANDLE



4. REMOVE SEAT CUSHION SHIELD

Remove the 2 screws and seat cushion shield as shown in the illustration.

HINT:

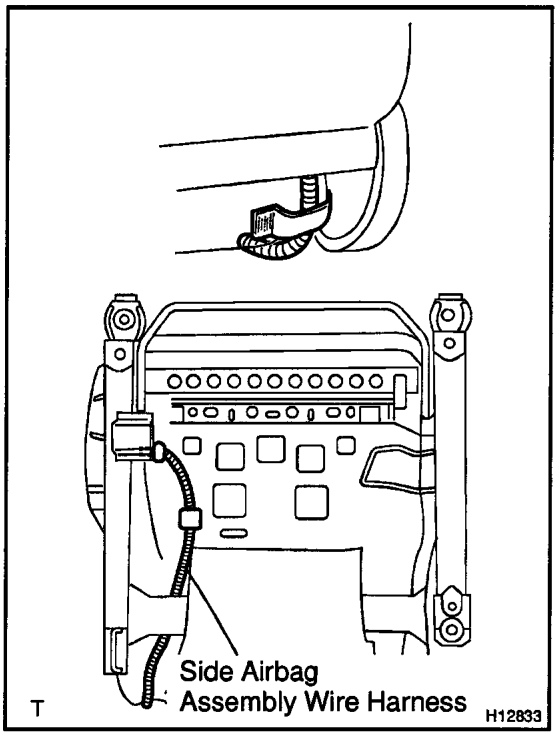
Remove the seat cushion shield in order A, B as shown in the illustration.

5. REMOVE FRONT SEAT INNER BELT

Remove the bolt and front seat inner belt.

6. REMOVE SEAT CUSHION INNER SHIELD

Remove the clip, screw and seat cushion inner shield.

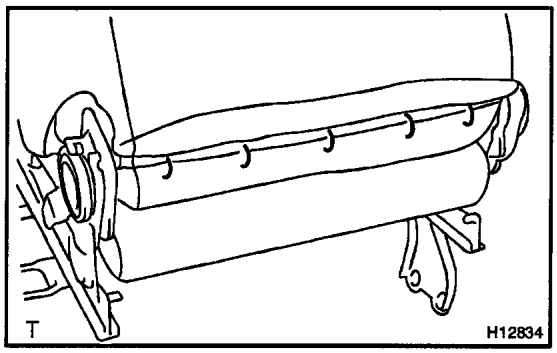


7. REMOVE SEATBACK ASSEMBLY

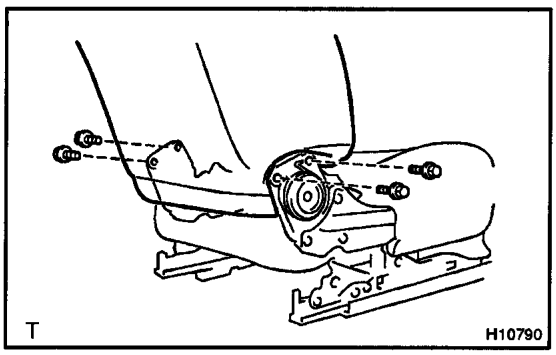
(a) Disconnect and disengase the connector and wire harness.

NOTICE:

Be careful not to damage the connector and wire harness.



(b) Remove the hog rings on the lower part of seatback assembly.



(c) Remove the 4 bolts and seatback assembly.

8. REMOVE HEADREST SUPPORTS

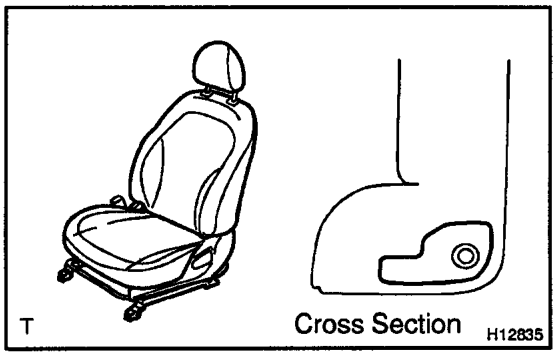
RS050-04

INSPECTION

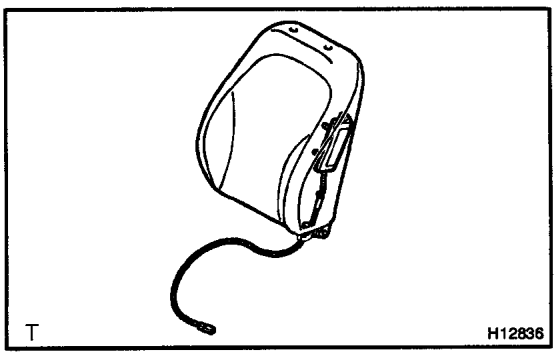
1. VEHICLES NOT INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See page DI–102)

(b) Do a visual check which includes the following items with the seatback assembly installed in the vehicle.



Check that there are no cuts or frayed in seams and outside of seatback cover.



2. VEHICLE INVOLVED IN A COLLISION AND AIRBAG IS NOT DEPLOYED

(a) Do a diagnostic system check. (See page DI–102)

(b) Do a visual check which includes the following items with the seatback assembly removed from the vehicle.

- Check cuts and cracks of the side airbag assembly.
- Check cuts and cracks in wire harnesses, and chipping in connectors.

CAUTION:

For removal and installation of the seatback assembly, see page RS–40 and RS–50. Be sure to follow the correct procedure.

3. VEHICLE INVOLVED IN A COLLISION AND AIRBAG IS DEPLOYED

(a) Do a diagnostic system check. (See page DI–102)

(b) Do a visual check which includes the following items with the seatback assembly removed from the vehicle.

- Check the seatback installation part of the seat adjuster.
- Check the damage to the connector and wire harness.

HINT:

If the seat adjuster is deformed, never repair it. Always replace it with new one.

RS0KZ-01

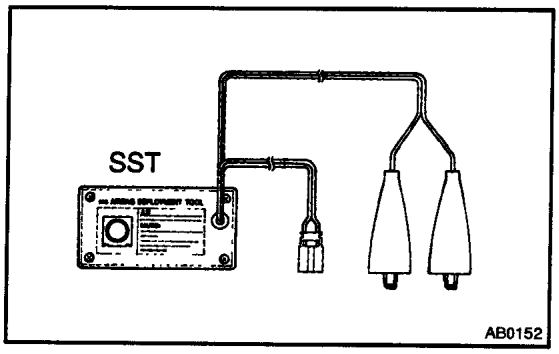
DISPOSAL

HINT:

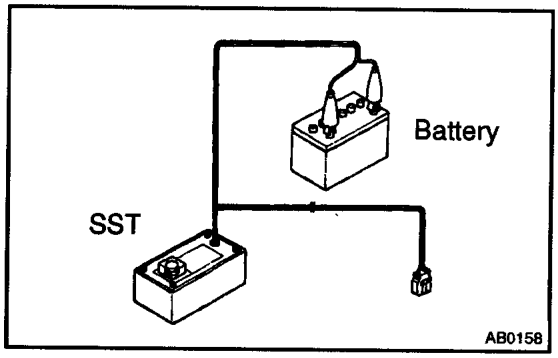
When scrapping vehicles equipped with an SRS or disposing of the side airbag assembly always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT.of the DISTRIBUTOR.

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.**

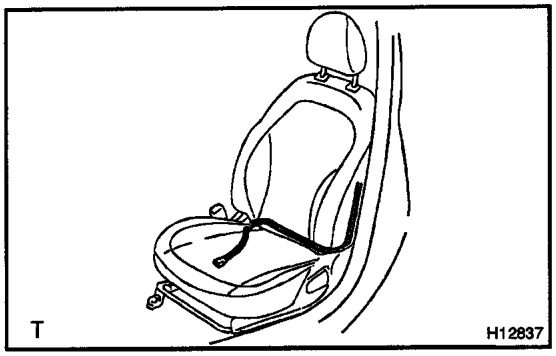


1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

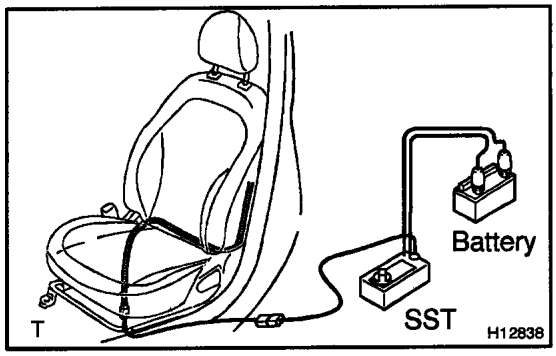
(a) Check functioning of the SST. (See page RS–17)
SST 09082–00700



(b) Disconnect the side airbag connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



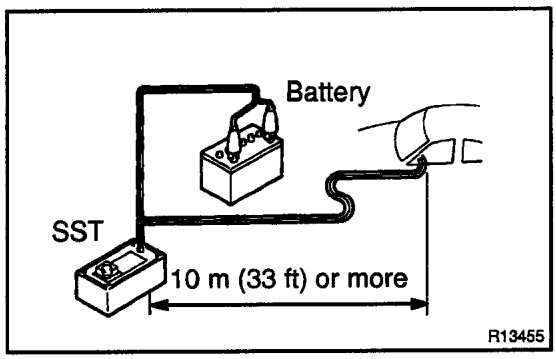
(c) Install the SST.

(1) Connect the connector of 2 SST 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.



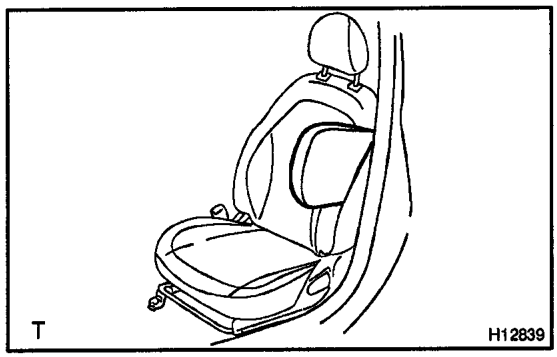
(2) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(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 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

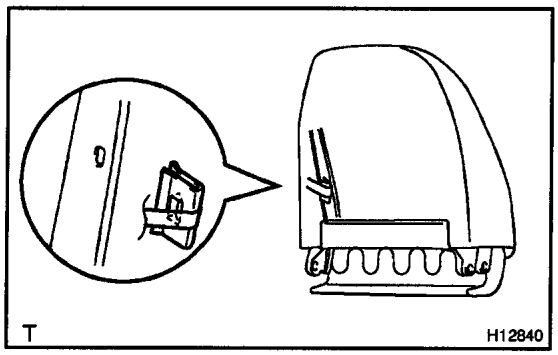
NOTICE:

- **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.

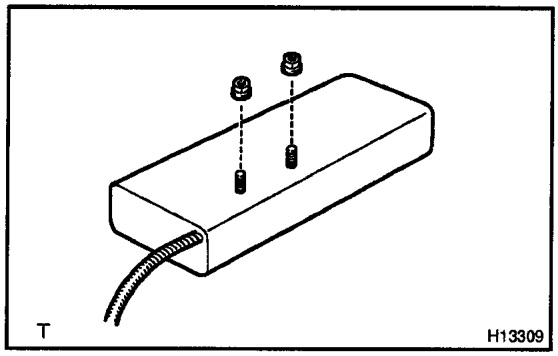
(a) Remove the seatback assembly. (See page RS–40)



(b) Remove the side airbag assembly from the seatback assembly.

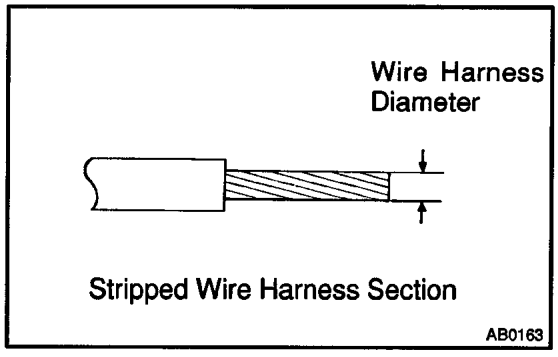
CAUTION:

Store the side airbag assembly with the airbag deployment side facing upward.



(c) Fix the side airbag assembly.

(1) Install the 2 nuts to the side airbag assembly.



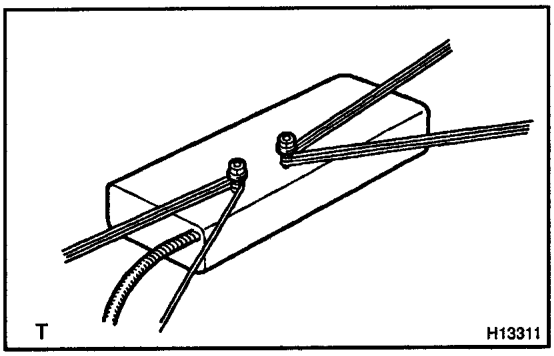
(2) Using a service–purpose wire harness tie down the side airbag assembly.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2 or more)

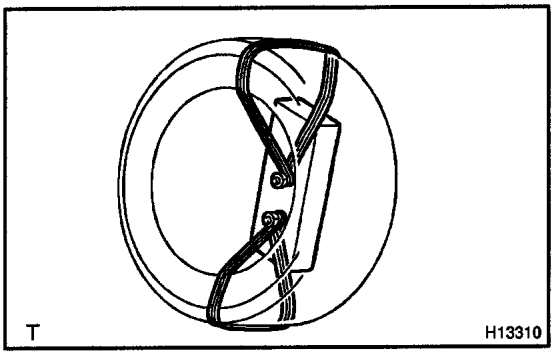
CAUTION:

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).

HINT:
To calculate the square of the stripped wire harness section–
Square = 3.14 x (Diameter)^2 divided by 4



(3) Wind the wire harness around the stud bolts of the side airbag assembly as shown in the illustration.



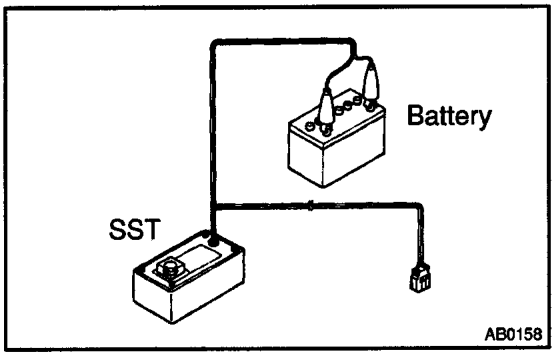
(4) Position the side airbag assembly inside the tire with the airbag deployment direction facing inside.

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.**

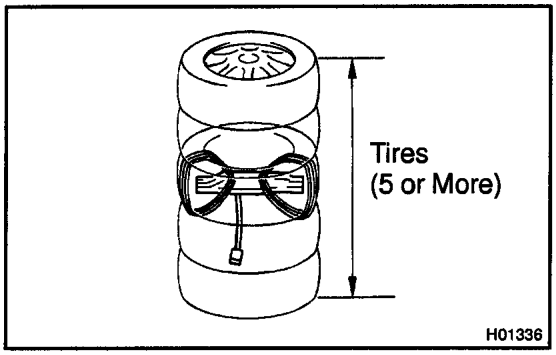
NOTICE:
The tire will be marked by the airbag deployment, so when disposing of the airbag use a redundant tire.



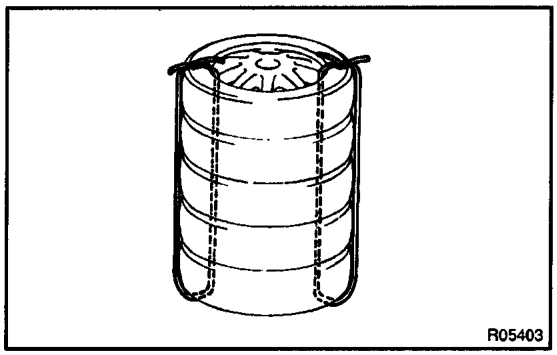
(d) Check functioning of the SST.
SST 09082–00700

(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.



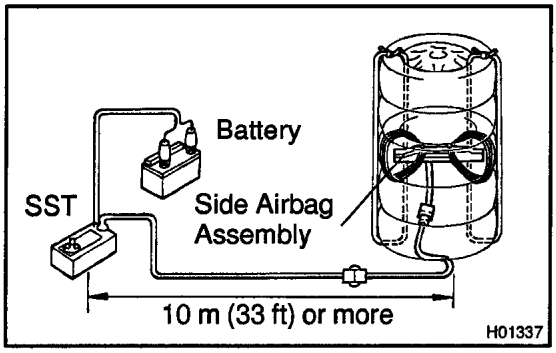
(f) Place the tires.
(1) Place at least 2 tires under the tire to which the side airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the side airbag assembly is tied. The top tire should have the wheel installed.



(3) Tie the tires together with 2 wire harnesses.

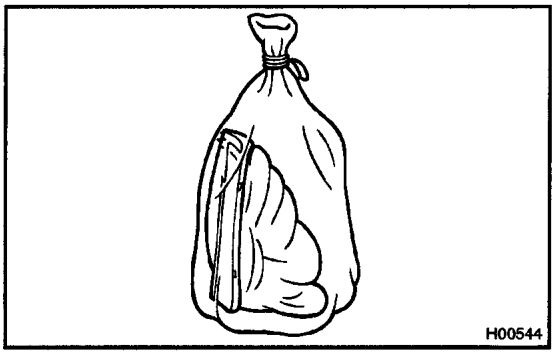
CAUTION:
Make sure that the wire harnesses are tight. It is very dangerous when loose wire harnesses results in the tires coming free due to the shock from the airbag deploying.

HINT:
Place the SST connector and wire harness inside tires. Secure at least 1 m (3 ft) of slack for the wire harness.



(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.

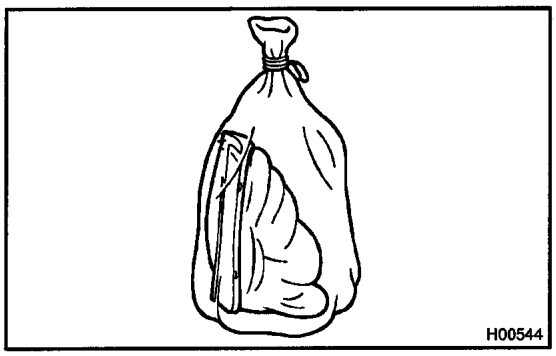
HINT:
The airbag deploys simultaneously as the LED of the SST activation switch lights up.



(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.



3. DEPLOYMENT WHEN DISPOSING OF SIDE AIRBAG ASSEMBLY WITH AIRBAG DEPLOYED IN COLLISION

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 vehicle.
  (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.

RS05Q-04

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the seatback assembly or seat cover.

- If the side airbag assembly has been deployed.
- If the side airbag assembly has been found to be faulty in troubleshooting.
- If the side airbag assembly or seatback cover has cuts and frayed seams during checking item. (See page RS–42)
- If the side airbag assembly or seatback cover has been found to be faulty during checking item. (See page RS–42)
- If the seatback assembly has been dropped.

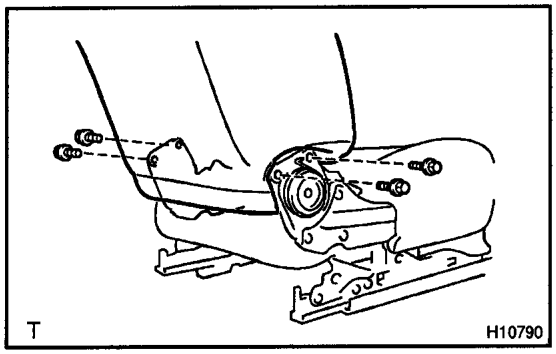
CAUTION:

For removal and installation on the seatback assembly, see page RS–40 and RS–50. Be sure to follow the correct procedure.

RS0L0-01

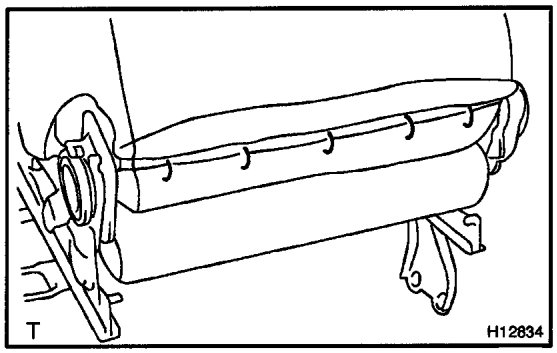
INSTALLATION

1. INSTALL HEADREST SUPPORTS TO SEATBACK ASSEMBLY

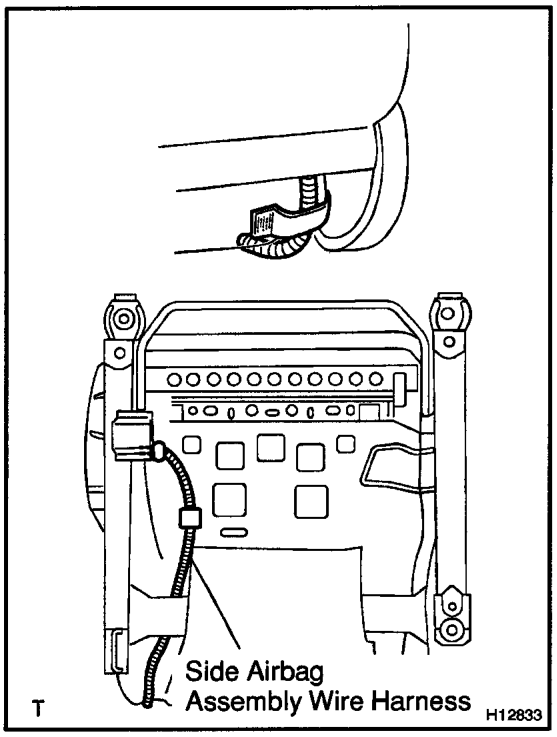


2. INSTALL SEATBACK ASSEMBLY

(a) Install the seatback assembly with the 4 bolts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



(b) Install new hog rings on the lower part of seatback assembly.



(c) Connect and clamp the connecter and wire harness.

NOTICE:

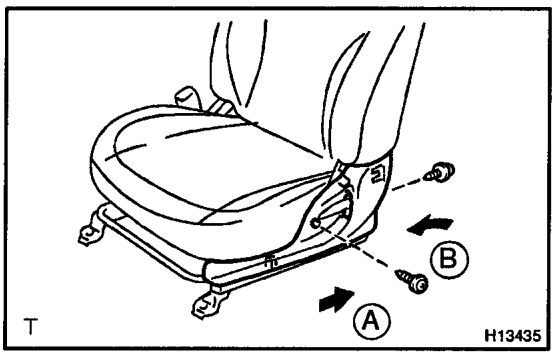
Be careful not to damage the connector and wire harness.

3. INSTALL SEAT CUSHION INNER SHIELD

Install the seat cushion inner shield with the screw and clip.

4. INSTALL FRONT SEAT INNER BELT

Install the front seat inner belt wire the bolt.
Torque: 41 N·m (420 kgf·cm, 30 ft·lbf)



5. INSTALL SEAT CUSHION SHIELD

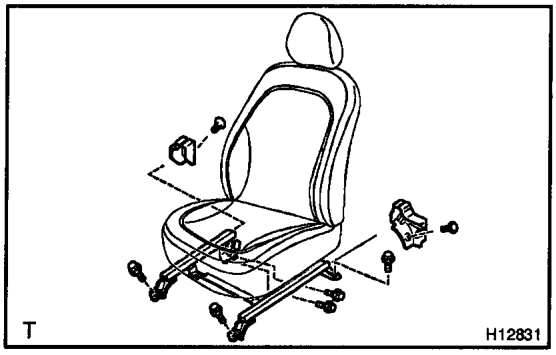
Install the seat cushion shield with the 2 screws.

HINT:

Install the seat cushion shield in order A, B as shown in the illustration.

6. INSTALL RECLINING RELEASE HANDLE

7. INSTALL HEADREST



8. INSTALL FRONT SEAT

(a) Slide the front seat to the most front 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 most front positions slip off.

(c) Connect the connectors.

(d) Tighten the bolts on the rear side temporarily, from the bolt on the inner side tighten them completely.

Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

(e) Slide the seat to the most rear position to install the bolts on the front side.

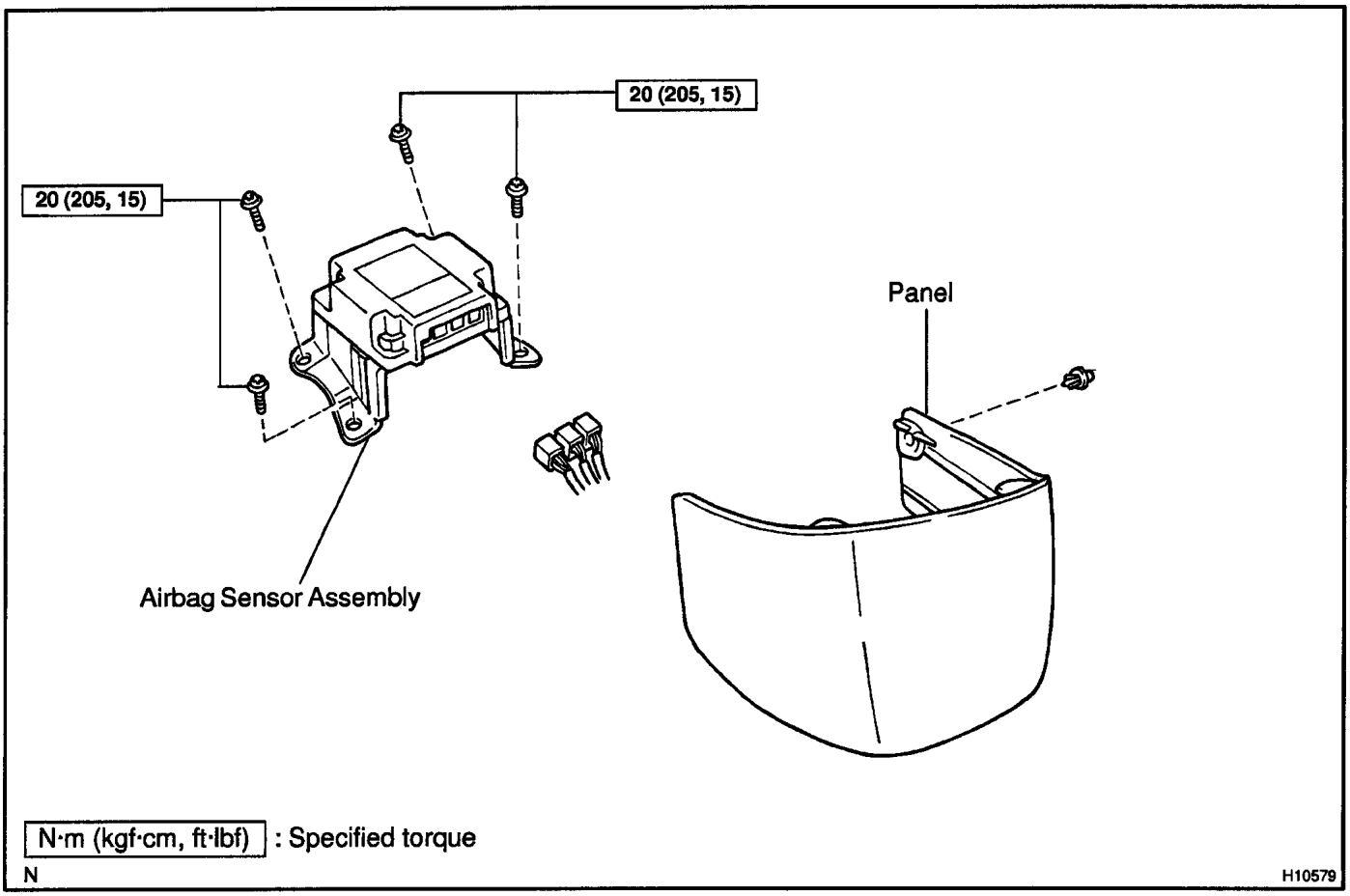
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

(f) Install the seat track covers with the 2 clips.

AIRBAG SENSOR ASSEMBLY

COMPONENTS

RS01G-20



N·m (kgf·cm, ft·lbf) : Specified torque

N

H10579

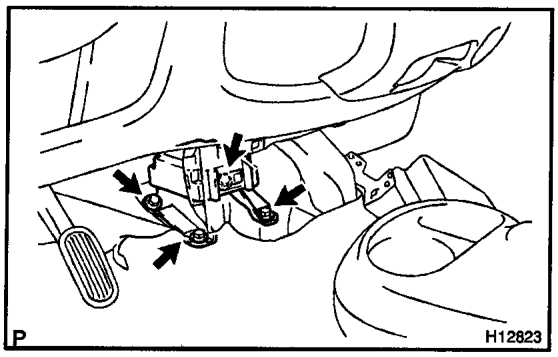
RS0EY-08

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 PANEL



2. REMOVE AIRBAG SENSOR ASSEMBLY

(a) Disconnect the airbag sensor assembly connectors.

NOTICE:

Disconnect the connectors with the sensor assembly installed.

(b) Using a torx wrench, remove the 4 screws and airbag sensor assembly.

Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)

RS05T-02

INSPECTION

1. VEHICLE NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See page DI–102)

2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

Do a diagnostic system check. (See page DI–102)

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

Replace the airbag sensor assembly. (See page RS–53)

RS01J–15

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:

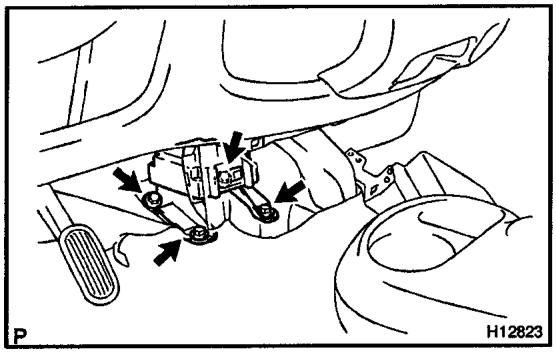
For removal and installation of the airbag sensor assembly, see page RS–53 and RS–56. Be sure to follow the correct procedure.

RS0EZ–08

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 4 screws.

Torx wrench: T40 (Part No.09042–00020 or locally manufactured tool)

Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

(b) Connect the airbag sensor connectors.

NOTICE:

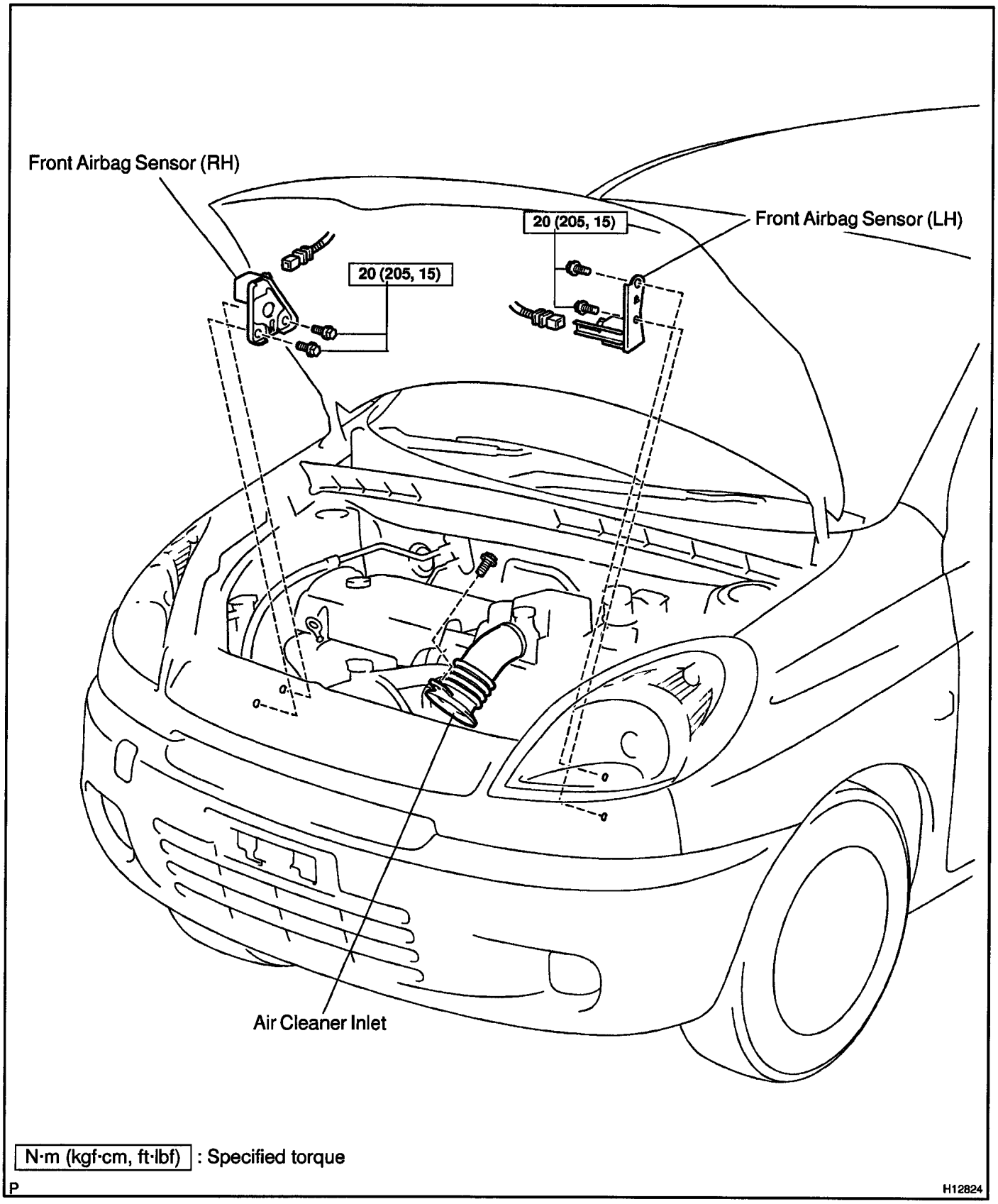
- **Connection of the connector is done after the sensor assembly has been installed.**
- **Make sure the sensor assembly is installed with the specified torque.**
- **If the sensor assembly has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assembly with a new one.**
- **When installing the sensor 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 PANEL

FRONT AIRBAG SENSOR

COMPONENTS

RS01L-26



N·m (kgf·cm, ft·lbf) : Specified torque

P

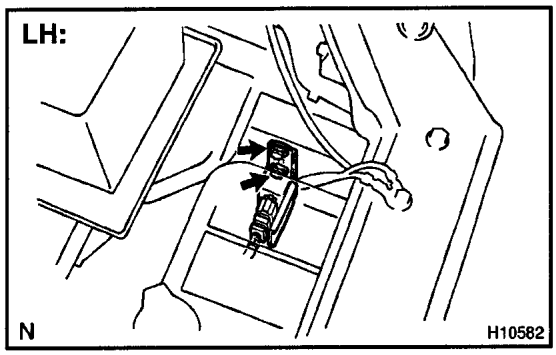
H12824

RS0FO-03

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected with the ignition switch at ON 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

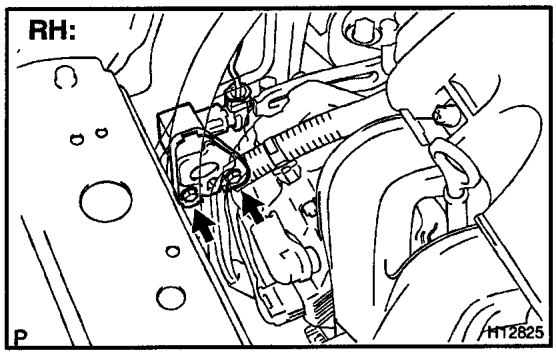
(a) Remove the bolt and air cleaner inlet.

(b) Disconnect the connector.

NOTICE:

Disconnect the connector with sensor assembly installed.

(c) Remove the 2 bolts and front airbag sensor LH.



2. RH:

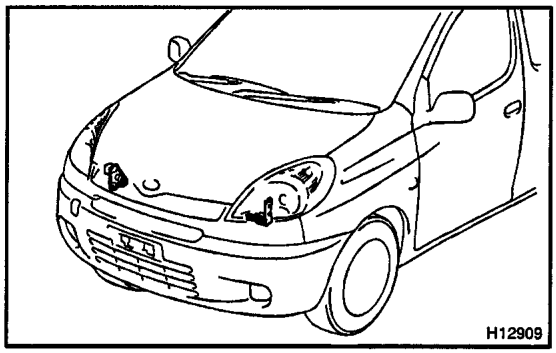
REMOVE FRONT AIRBAG SENSOR

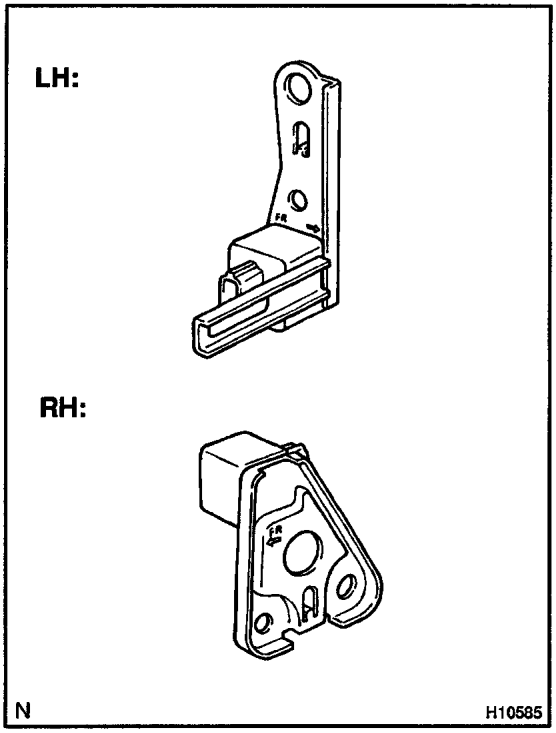
(a) Disconnect the connector.

NOTICE:

Disconnect the connector with sensor assembly installed.

(b) Remove the 2 bolts and front airbag sensor RH.





RS01N–27

INSPECTION

1. VEHICLE NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See page DI–102)

2. VEHICLE INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See page DI–102)

(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–10

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–59)
- If the front airbag sensor has been dropped.

CAUTION:

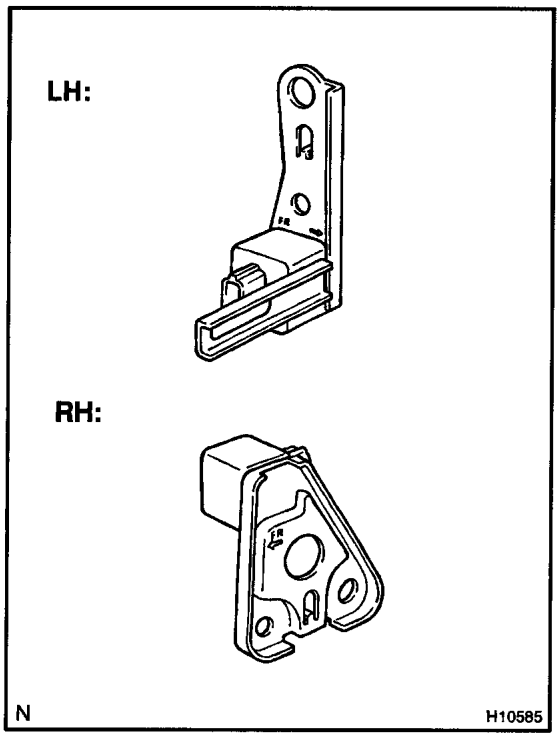
For removal and installation of the front airbag sensor, see page RS–58 and RS–61. Be sure to follow the correct procedure.

RS0L1-01

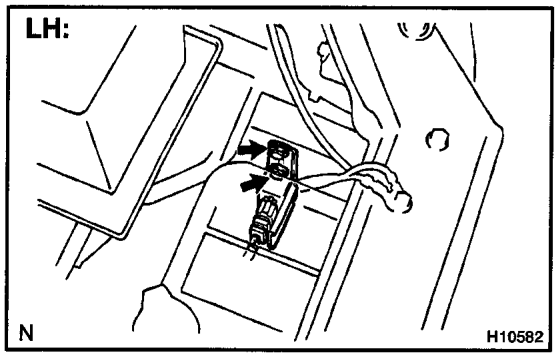
INSTALLATION

NOTICE:

- **Connection of the connector is done after the sensor assembly has been installed.**
- **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 with a new one.**
- **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.**



HINT:
Install the front airbag sensor with the arrow on the sensor facing toward the front of the vehicle.

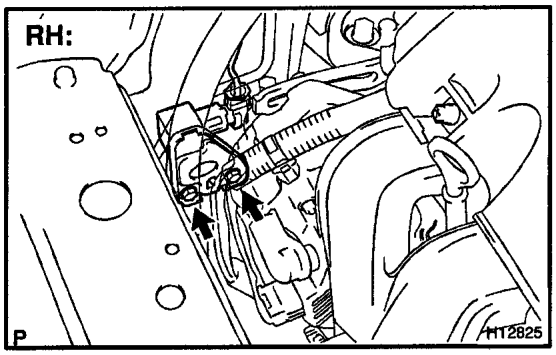


1. LH:
INSTALL FRONT AIRBAG SENSOR

(a) Install the front airbag sensor LH with the 2 bolts.
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

(b) Connect the connector.

(c) Install the air cleaner inlet with the bolt.



2. RH:
INSTALL FRONT AIRBAG SENSOR

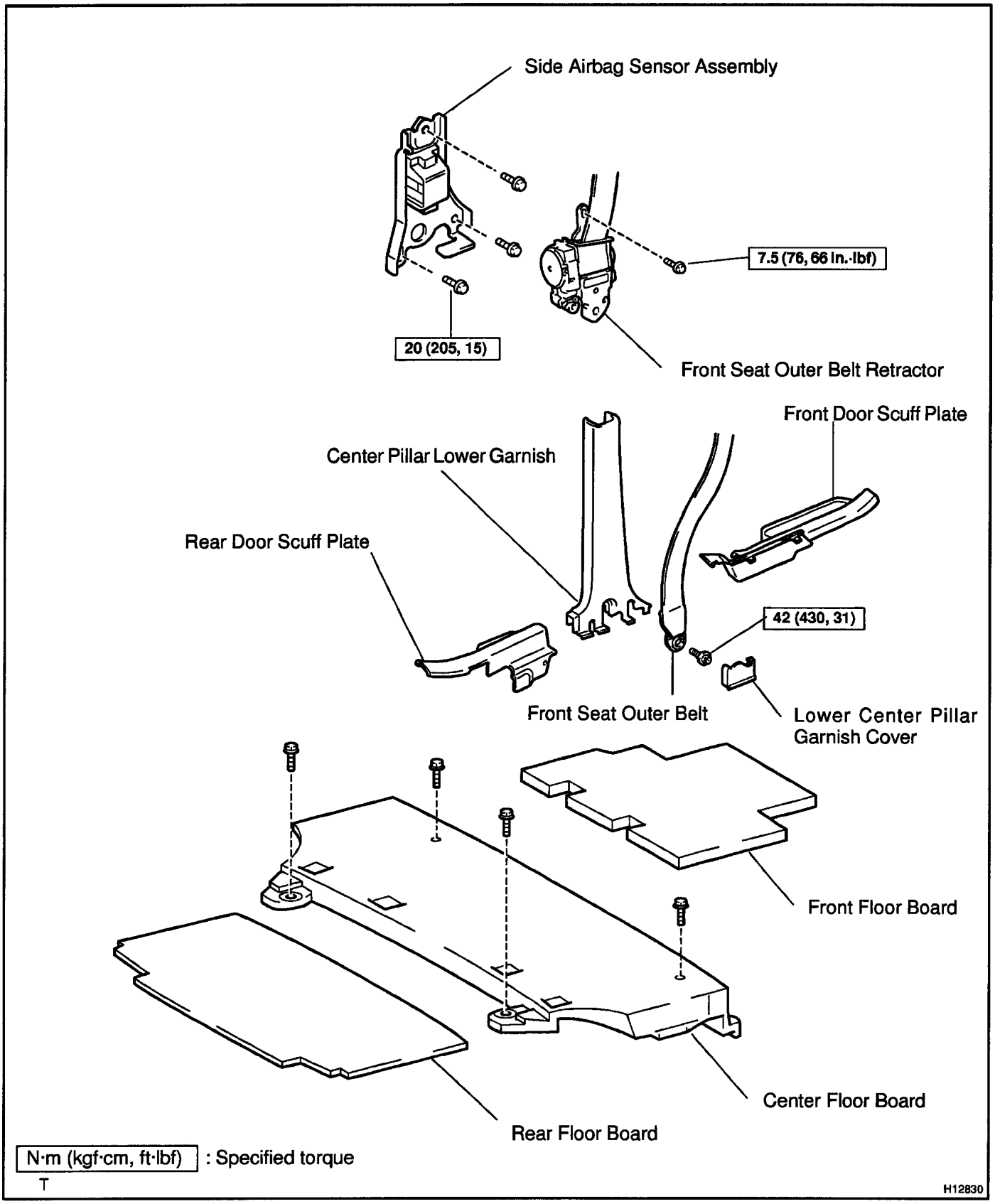
(a) Install the front airbag sensor RH with the 2 bolts.
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

(b) Connect the connector.

SIDE AIRBAG SENSOR ASSEMBLY

COMPONENTS

RS01Q-11



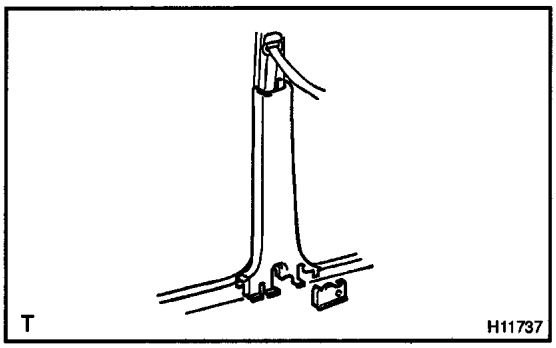
RS0L2-01

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 DOOR SCUFF PLATE**
2. **REMOVE REAR FLOOR BOARD**
3. **REMOVE FRONT FLOOR BOARD**
4. **REMOVE CENTER FLOOR BOARD**
5. **REAR DOOR SCUFF PLATE**



6. **REMOVE CENTER PILLAR LOWER GARNISH**

(a) Using a screwdriver, remove the lower center pillar garnish cover.

HINT:

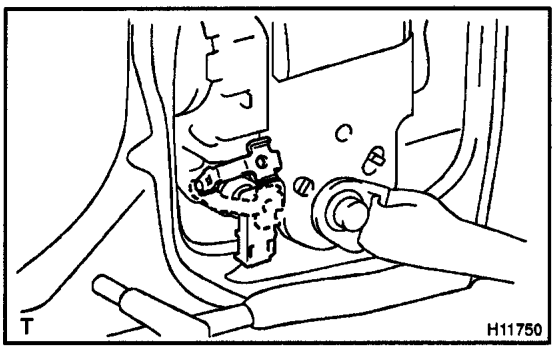
Tape the screwdriver tip before use.

(b) Remove the front seat outer belt floor anchor with bolt.

(c) Using a screwdriver, remove the center pillar lower garnish.

HINT:

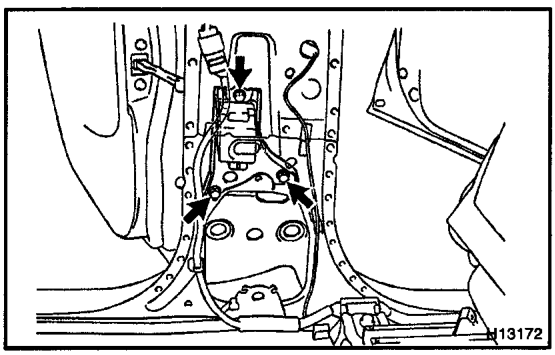
Tape the screwdriver tip before use.



7. **REMOVE FRONT SEAT OUTER BELT RETRACTOR (See page BO–124)**

(a) Disconnect the pretensioner connector.

(b) Remove the bolt and retractor.



8. **REMOVE SIDE AIRBAG SENSOR ASSEMBLY**

(a) Disconnect the side airbag sensor assembly connector.

NOTICE:

Disconnect the connector with the sensor assembly installed.

(b) Remove the 3 bolts and side airbag sensor assembly.

RS05V–03

INSPECTION

1. VEHICLE NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See page DI–102)

2. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS NOT DEPLOYED

Do a diagnostic system check. (See page DI–102)

3. VEHICLE INVOLVED IN COLLISION AND AIRBAG IS DEPLOYED

Replace the side airbag sensor assembly. (See page RS–64)

RS01T-06

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the side airbag sensor assembly.

- If the side airbag sensor 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:

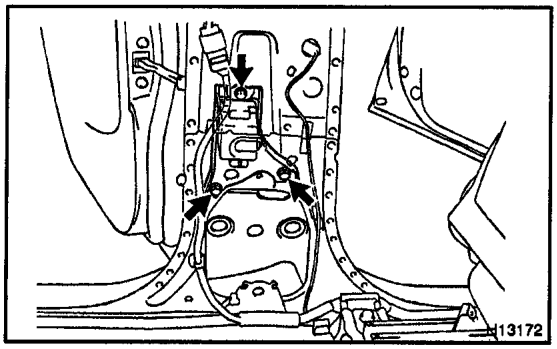
For removal and installation of the side airbag sensor assembly, see page RS–64 and RS–67. Be sure to follow the correct procedure.

RS0L3-01

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 ASSEMBLY

(a) Install the side airbag sensor assembly with the 3 bolts.
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

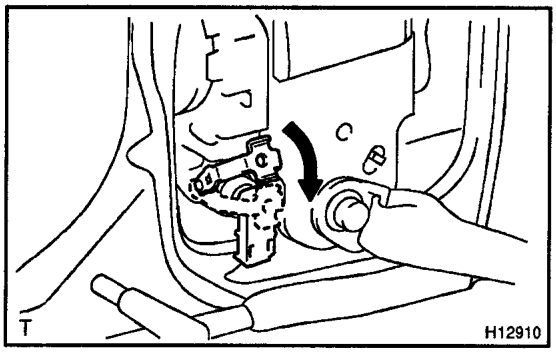
(b) Connect the side airbag sensor assembly connector.

NOTICE:

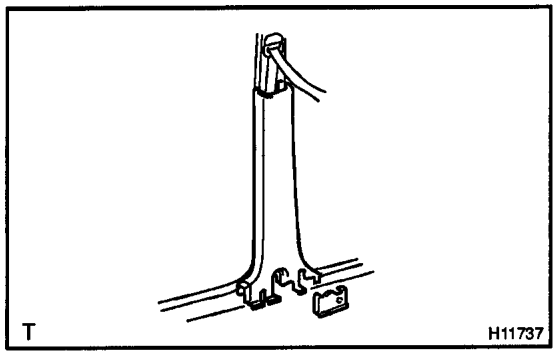
- **Connection of the connector is done after the sensor assembly has been installed. Make sure the sensor assembly is installed with the specified torque.**
- **If the sensor assembly has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assembly with a new one.**
- **When installing the 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–133)

(a) Install the retractor with the bolt.
Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)



(b) Connect the pretensioner connector.



3. INSTALL CENTER PILLAR LOWER GARNISH

(a) Install the center pillar lower garnish.

(b) Install the front seat outer belt floor anchor with the bolt.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(c) Install the lower center pillar garnish cover.

4. INSTALL REAR DOOR SCUFF PLATE

5. INSTALL CENTER FLOOR BOARD

6. INSTALL FRONT FLOOR BOARD

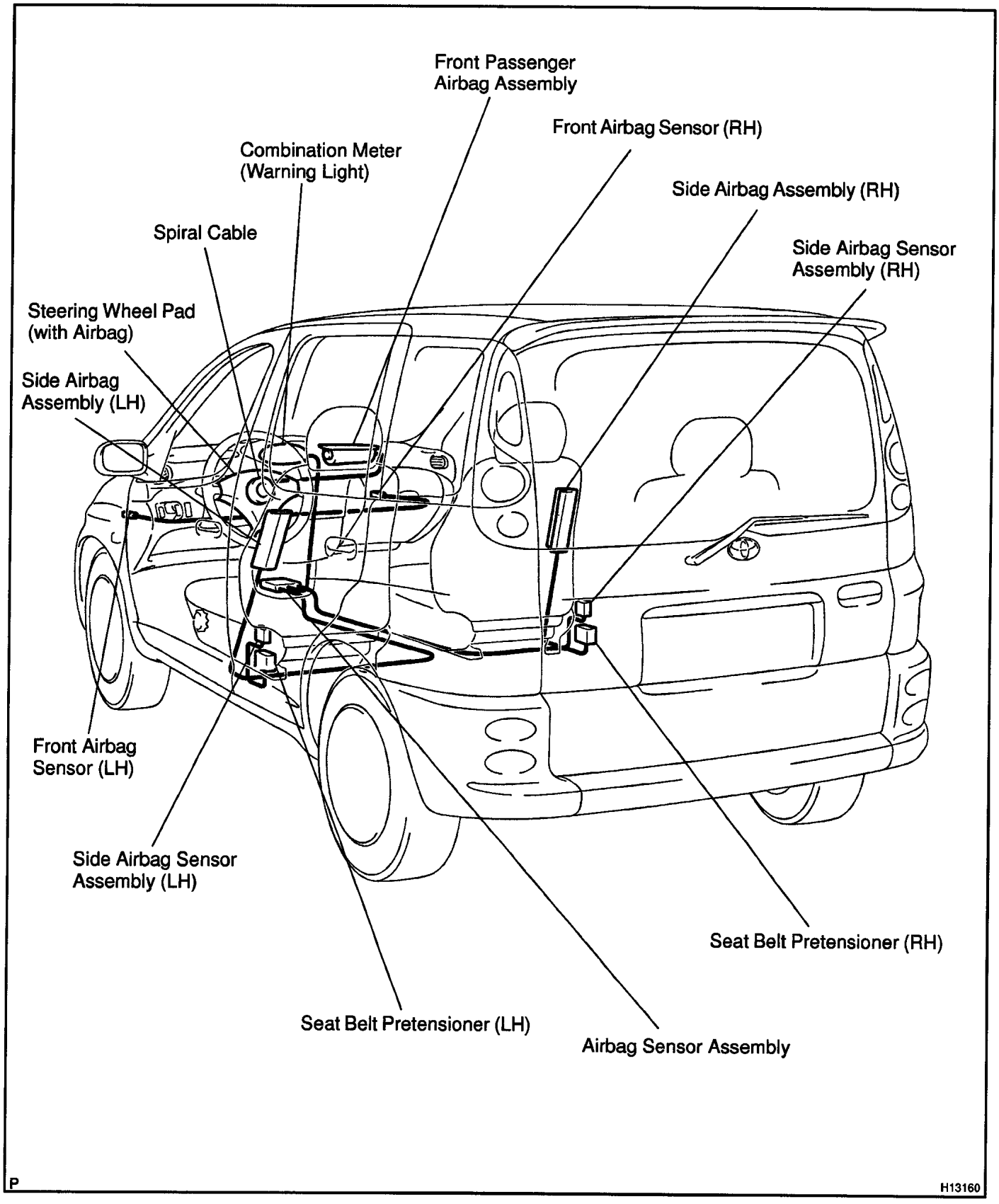
7. INSTALL REAR FLOOR BOARD

8. INSTALL FRONT DOOR SCUFF PLATE

WIRE HARNESS AND CONNECTOR

LOCATION

RS01V-02



RS01W-09

INSPECTION

HINT:

The SRS wire harness is integrated with the instrument panel wire harness assembly. All the connectors in the system are a standard yellow color.

1. VEHICLE NOT INVOLVED IN COLLISION

Do a diagnostic system check. (See page DI–102)

2. VEHICLE INVOLVED IN COLLISION

(a) Do a diagnostic system check. (See page DI–102)

(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.

RS01X-09

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–70)

CAUTION:

If the wire harness used in the SRS is damaged, replace the whole wire harness assembly.

BODY ELECTRICAL

BODY ELECTRICAL SYSTEM BE–1
TROUBLESHOOTING BE–2
POWER SOURCE BE–11
IGNITION SWITCH AND KEY UNLOCK WARNING SWITCH BE–15
HEADLIGHT AND TAILLIGHT SYSTEM BE–17
HEADLIGHT BEAM LEVEL CONTROL SYSTEM BE–29
REAR FOG LIGHT SYSTEM BE–31
TURN SIGNAL AND HAZARD WARNING SYSTEM BE–33
INTERIOR LIGHT SYSTEM BE–36
BACK–UP LIGHT SYSTEM BE–38
STOP LIGHT SYSTEM BE–40
WIPER AND WASHER SYSTEM BE–42
COMBINATION METER BE–50
DEFOGGER SYSTEM BE–80
POWER WINDOW CONTROL SYSTEM BE–83
POWER DOOR LOCK CONTROL SYSTEM BE–98
WIRELESS DOOR LOCK CONTROL SYSTEM BE–107
POWER MIRROR CONTROL SYSTEM BE–123
SEAT HEATER SYSTEM BE–127
AUDIO SYSTEM BE–130
CLOCK BE–154

BODY ELECTRICAL SYSTEM

PRECAUTION

BE181-03

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 YARIS VERSO/ECHO VERSO 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 make sure to note the stations and reset them after the negative (–) terminal cable is reconnected to the battery.
- If the negative (–) terminal cable is disconnected from the battery, the "ANTI–THEFT SYSTEM" will operate when the cable is reconnected, but the radio, tape player and CD player will not operate. Be sure to input the correct ID number so that the radio, tape player and CD player can be operated again.

4. MOBILE COMMUNICATION SYSTEM

If the vehicle is equipped with a mobile communication system, refer to precautions in the IN section.

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

BE182-02

IGNITION SWITCH:

Symptom	Suspect Area	See page
Ignition switch is not set to each position.	1. Ignition Switch 2. Power Source Circuit	BE–16 –

KEY UNLOCK WARNING SWITCH:

Symptom	Suspect Area	See page
Key unlock warning system does not operate. (The buzzer sounds when the ignition key is ACC or ON)	1. Ignition Switch 2. Key Unlock Warning Switch 3. Wire Harness 4. Combination Meter	BE–16 BE–16 – –

w/o Daytime Running Light System:
HEADLIGHT AND TAILLIGHT SYSTEM

Symptom	Suspect Area	See page
Only one headlight comes on.	1. Bulb 2. H–LP LH or RH Fuse 3. Wire Harness	– – –
"LO–Beam" does not light.	1. Headlight Control Relay 2. Wire Harness	BE–21 –
"HI–Beam" does not light.	1. Headlight Dimmer Switch 2. Wire Harness	BE–21 –
"Flash" does not light.	1. Headlight Dimmer Switch 2. Wire Harness	BE–21 –
"Flash" does not light.	1. Bulb 2. Wire Harness	– –
Headlight does not come on.	1. Headlight Control Relay 2. Light Control Switch 3. Wire Harness	BE–21 BE–21 –
Headlight does not come on.	1. Bulb 2. Wire Harness	– –
Headlight flickers.	1. Bulb 2. Wire Harness	– –
Headlight is dark.	1. Bulb 2. Wire Harness	– –
Only one taillight comes on.	1. Bulb 2. Wire Harness	– –
Taillight does not come on. (Headlight is normal)	1. TAIL Fuse 2. Taillight Control Relay 3. Light Control Switch 4. Wire Harness	– BE–21 BE–21 –
Taillight does not come on. (Headlight does not light)	1. Light Control Switch 2. Wire Harness	BE–21 –
Rear combination light does not come on.	1. Wire Harness 2. Bulb	– –

BE

w/ Daytime Running Light System:
HEADLIGHT AND TAILLIGHT SYSTEM

Symptom	Suspect Area	See page
Only one headlight comes on.	1. Headlight Dimmer Relay 2. Daytime Running Light Relay 3. Bulb 4. Wire Harness 5. Combination Meter	BE–21 BE–21 – – –
"LO–Beam" does not light (All).	1. Headlight Dimmer Relay 2. Wire Harness	BE–21 –
"LO–Beam" does not light (One side).	1. Bulb 2. H–LP LO LH Fuse 3. H–LP LO RH Fuse 4. Wire Harness	– – – –
"HI–Beam" does not light (All).	1. Headlight Dimmer Switch 2. Daytime Running Light Relay 3. Wire Harness 4. Combination Meter	BE–21 BE–21 – –
"HI–Beam" does not light (One side).	1. Bulb 2. H–LP LO LH Fuse 3. H–LP LO RH Fuse 4. Headlight Dimmer Relay 5. Wire Harness	– – – BE–21 –
"Flash" does not light.	1. Headlight Dimmer Switch 2. Daytime Running Light Relay 3. Wire Harness 4. Combination Meter	BE–21 BE–21 – –
Headlight does not come on.	1. Headlight Control Relay 2. Daytime Running Light Relay 3. Headlight Dimmer Relay 4. Headlight Dimmer Switch 5. Light Control Switch 6. Wire Harness 7. Bulb 8. Combination Meter	BE–21 BE–21 BE–21 BE–21 BE–21 – – –
Headlight does not come on with light control switch in HEAD.	1. Light Control Switch 2. Wire Harness	BE–21 –
Headlight does not go out with light control switch in OFF.	1. Headlight Control Relay 2. Wire Harness	BE–21 –
Headlight flickers.	1. Bulb 2. Wire Harness	– –
Headlight is dark.	1. Bulb 2. Wire Harness	– –
Taillight does not come on with light control switch in TAIL.	1. Taillight Control Relay 2. Light Control Switch 3. Wire Harness	BE–21 BE–21 –

Taillight does not go out with light control switch in OFF.	1. Taillight Control Relay 2. Light Control Switch 3. Wire Harness	BE–21 BE–21 –
Headlight does not come on with engine running and light control switch in OFF.	1. ECU–B Fuse 2. GAUGE Fuse 3. Daytime Running Light Relay 4. Headlight Dimmer Relay 5. Alternator L Terminal 6. Wire Harness 7. Combination Meter	– – BE–21 BE–21 – – –

HEADLIGHT BEAM LEVEL CONTROL SYSTEM:

HINT:

Troubleshooting of the headlight beam level control system is based on the premise that the headlight system is operating normally. Accordingly, before troubleshooting the headlight system, first make certain that the headlight system is operating normally.

Symptom	Suspect Area	See page
Headlight beam level control system does not operate. (All)	1. Headlight Beam Level Control Switch 2. Headlight Beam Level Control Actuator 3. 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 –

BE

FOG LIGHT SYSTEM:

Symptom	Suspect Area	See page
Front fog light does not light up with light control SW TAIL or HEAD. (Headlight is normal.)	1. Bulbs 2. FR FOG Fuse 3. Front Fog Light Relay 4. Front Fog Light Switch 5. Wire Harness	– BE–11 BE–31 BE–31 –
Front fog light does not light up with light control SW TAIL or HEAD. (Headlight does not light.)	1. Inspect Headlight and Taillight System 2. Wire Harness	BE–2 –
Only one light does not light.	1. Bulbs 2. Wire Harness	– –
Rear fog light does not light with light control SW HEAD. (Headlight is normal.)	1. Bulbs 2. ECU–B2 Fuse 3. Rear Fog Light Switch 4. Wire Harness	– BE–11 BE–31 –
Rear fog light does not light with light control SW HEAD. (Headlight does not light.)	1. Inspect Headlight and Taillight System 2. Wire Harness	BE–2 –
Only one light does not light.	1. Bulbs 2. Wire Harness	– –
Rear fog light does not light with light control switch TAIL or HEAD. (Headlight is normal.)	1. Bulb 2. ECU–B Fuse 3. Rear Fog Light Switch 4. Wire Harness	– – BE–31 –

Rear fog light does not light with light control switch TAIL or HEAD. (Headlight does not light.)	1. Headlight and Taillight System 2. Wire Harness	BE–18 –
Only one rear fog light does not light.	1. Bulb 2. Wire Harness	– –

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–34 BE–34 –
The flashing frequency is abnormal.	1. Bulb 2. Turn Signal Switch 3. Wire Harness	– BE–34 –
Hazard warning light does not light up. (Turn is normal.)	1. HAZ Fuse 2. Wire Harness	– –
Hazard warning light does not light up in one direction.	1. Hazard Warning Switch 2. Wire Harness	BE–34 –
*1Turn signal does not light up.	1. Ignition Switch 2. GAUGE Fuse 3. Turn Signal Switch 4. Wire Harness	BE–16 – BE–34 –
*2Turn signal does not light up.	1. GAUGE Fuse 2. Turn Signal Switch 3. Wire Harness	– BE–34 –
Turn signal does not light up in one direction.	1. Turn Signal Switch 2. Wire Harness	BE–34 –
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.

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 2. Wire Harness	– –
Room light does not light up.	1. Bulb 2. Room Light 3. Wire Harness	– BE–37 –
Only one rear room light does not light up.	1. Bulb 2. Battery 3. Wire Harness	– – –

BACK–UP LIGHT SYSTEM:

Symptom	Suspect Area	See page
Back–Up Light does not light up.	1. GAUGE Fuse 2. Ignition Switch 3. Wire Harness 4. Bulb	– BE–16 – –

Back–Up Light remains always on.	1. Back–Up Light Switch (M/X) 2. Neutral Start Switch (A/X) 3. Wire Harness	BE–40 DI–47 –
Only one light does not light up.	1. Bulb 2. Wire Harness	– –

STOP LIGHT SYSTEM:

Symptom	Suspect Area	See page
Stop light does not light up.	1. STOP Fuse 2. Stop Light Switch 3. Wire Harness	– BE–42 –
Only one light always lights up.	1. Wire Harness	–
Only one light does not light.	1. Bulb 2. Wire Harness	– –

WIPER AND WASHER SYSTEM:

Symptom	Suspect Area	See page
Front wiper and washers do not operate.	1. WIPER Fuse 2. Front Wiper Switch 3. Front Wiper Motor 4. Wire Harness	– BE–44 BE–44 –
Front wipers do not operate in LO or HI.	1. Front Wiper Switch 2. Front Wiper Motor 3. Wire Harness	BE–44 BE–44 –
Front wipers do not operate in INT.	1. Front Wiper Switch 2. Front Wiper Motor 3. Wire Harness	BE–44 BE–44 –
Front Washer motor does not operate.	1. Front Washer Switch 2. Front Washer Motor 3. Wire Harness	BE–44 BE–44 –
Front Wipers do not operate when washer switch in ON.	1. Front Washer Motor 2. Wire Harness	BE–44 –
Rear wiper and washers do not operate.	1. WIPER Fuse 2. Rear Wiper Switch 3. Rear Wiper Motor 4. Wire Harness	– BE–44 BE–44 –
Rear washer motor does not operate.	1. Rear Washer Switch 2. Rear Washer Motor 3. Wire Harness	BE–44 BE–44 –
Rear wipers do not operate when washer switch in ON.	1. Rear Washer Motor 2. Wire Harness	BE–44 –
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–44 –

*1: Inspect wiper arm and blade set position

BE

Meter Gauges and Illumination:
COMBINATION METER

Symptom	Suspect Area	See page
Tachometer, Fuel Gauge and Water Temperature Gauge does not operate.	1. GAUGE Fuse 2. Meter Circuit Plate 3. Wire Harness	– BE–50 –
Speedometer does not operate.	1. Vehicle Speed Sensor 2. Meter Circuit Plate 3. Wire Harness	BE–56 BE–50 –
Tachometer does not operate.	1. Igniter 2. Engine and ECT ECU 3. Meter Circuit Plate 4. Wire Harness	– – BE–50 –
Fuel Gauge does not operate or abnormal operation.	1. Fuel Receiver Gauge 2. Fuel Sender Gauge 3. Meter Circuit Plate 4. Wire Harness	BE–56 BE–56 BE–50 –
All illumination lights do not light up.	1. TAIL Fuse 2. Meter Circuit Plate 3. Wire Harness	– BE–56 –
Only one illumination light does not light up.	1. Bulb 2. Wire Harness	– –

Warning Lights:
COMBINATION METER

Symptom	Suspect Area	See page
Warning light do not light up. (Except Discharge, Open Door and SRS)	1. GAUGE Fuse 2. Meter Circuit Plate 3. Wire Harness	– BE–50 –
Fuel Level warning light does not light up.	1. Bulb 2. Fuel Sender Gauge 3. Meter Circuit Plate 4. Wire Harness	– BE–56 BE–50 –
Water Temperature warning light does not light up.	1. Bulb (Water temperature warning light) 2. Water Temperature Sender Gauge 3. Engine and ECT ECU 4. Meter Circuit Plate 5. Wire Harness	– BE–56 – BE–50 –
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–56 BE–50 –
ABS warning light does not light up.	1. Bulb 2. ABS ECU 3. Wire Harness	– DI–58 –
Seat Belt warning light does not light up.	1. Bulb 2. Buckle Switch 3. Meter Circuit 4. Wire Harness	– BE–56 BE–56 –
Brake warning light does not light up.	1. Bulb 2. Parking Brake Switch 3. Brake Fluid Level Warning Switch 4. Meter Circuit Plate 5. Wire Harness	– BE–56 BE–56 BE–50 –

SRS Warning light does not light up.	1. Bulb 2. Airbag Sensor Assembly 3. Meter Circuit Plate 4. Wire Harness	– DI–100 BE–50 –
Open Door warning light does not light up.	1. DOME Fuse 2. Bulb 3. Door Courtesy Switch 4. Meter Circuit Plate 5. Wire Harness	– – BE–37 BE–50 –

Indicator Lights:

COMBINATION METER

Symptom	Suspect Area	See page
O/D OFF indicator light does not light up.	1. Bulb 2. O/D OFF Switch 3. Meter Circuit Plate 4. Wire Harness	– DI–51 BE–50 –
High beam indicator light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. Headlight System	– BE–50 – BE–18
Turn indicator light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. Turn Signal and Hazard Warning System	– BE–50 – BE–18
Malfunction indicator light does not light up.	1. Bulb 2. Engine and ECT ECU 3. Meter Circuit Plate 4. Wire Harness	– – BE–50 –
Indicator lights do not light up. (Except Turn, Hi–beam and security)	1. GAUGE Fuse 2. Wire Harness	– –

BE

DEFOGGER SYSTEM:

Symptom	Suspect Area	See page
All defogger systems do not operate.	1. DEF Fuse 2. Defogger Switch 3. Wire Harness	– BE–66 –
Rear window defogger does not operate.	1. Defogger Wire 2. Choke Coil 3. Wire Harness	BE–66 – –
Mirror defogger does not operate.	1. Mirror Defogger 2. Wire Harness	BE–66 –

POWER WINDOW CONTROL SYSTEM:

Symptom	Suspect Area	See page
Power window does not operate (ALL). (Power Door Lock does not operate)	1. GAUGE Fuse 2. POWER Fuse 3. Power Main Relay 4. Wire Harness	– – BE–73 –
Power window does not operate (ALL). (Power Door Lock is normal)	1. Ignition Switch 2. Power Window Master Switch 3. Wire Harness	BE–16 BE–73 –

Only one window glass does not move.	1. Power Window Master Switch 2. Power Window Switch 3. Power Window Motor 4. Wire Harness	BE–73 BE–73 BE–73 –
"Window Lock System" does not operate.	1. Power Window Master Switch	BE–73

POWER DOOR LOCK CONTROL SYSTEM:

Symptom	Suspect Area	See page
"Door lock system" does not operate at all.	1. D/L Fuse 2. GAUGE Fuse 3. Door Lock Control Relay 4. Wire Harness	– – BE–87 –
Door lock system does not operate by manual switch.	1. Door Lock Control Relay 2. Door Lock Control Switch 3. Wire Harness	BE–87 BE–87 –
Door lock system does not operate by door key.	1. Door Key Lock and Unlock Switch 2. Wire Harness 3. Door Lock Link Disconnected	BE–87 – –
Fault in 2 – Operation unlock function of Driver's side door key lock and unlock switch.	1. Door Key Lock and Unlock Switch 2. Door Lock Control Relay 3. Wire Harness	BE–87 BE–87 –
Fault in key confine prevention operate.	1. Door Lock Control Relay 2. Door Control Switch 3. Door Courtesy Switch 4. Wire Harness	BE–87 BE–87 BE–37 –
Only one door lock does not operate.	1. Door Lock Motor 2. Wire Harness	BE–87 –

DOUBLE LOCKING SYSTEM:

All the doors double lock system does not operate.	1. MPX–B Fuse 2. DOOR DL Fuse 3. ECU–B Fuse 4. Wire Harness * 5. double Lock ECU 6. Body ECU	BE–11 BE–11 BE–87 – BE–96 –
Only one side double lock system does not operate (or abnormal).	1. Double Lock Motor 2. Double Lock Switch 3. Wire Harness 4. Double Lock ECU	BE–96 BE–96 – BE–96

SEAT HEATER SYSTEM:

Symptom	Suspect Area	See page
Seat heaters do not operate.	1. S–HTR Fuse 2. Wire Harness	– –
Driver's seat heater do not operate.	1. Seat Heater Switch 2. Seat Heater 3. Wire Harness	BE–122 BE–122 –
Seat heater temperature is too high.	1. Seat Heater	BE–122

BE

WIRELESS DOOR LOCK CONTROL SYSTEM:

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.
- If the trouble still reappears even though there are no abnormalities in any of the other circuits, then check and replace the Wireless Door Lock Control Receiver as the last step.

Symptom	Suspect Area	See page
All functions of wireless door lock control system do not operate.	1. Transmitter 2. Wireless Door Lock Control Receiver 3. Wire Harness	BE–105 BE–105 –

SLIDING ROOF SYSTEM

Symptom	Suspect Area	See page
Sliding roof system does not operate. (Door Lock does not operate)	1. POWER Fuse (I/P J/B) 2. Power Main Relay (I/P J/B) 3. GAUGE Fuse 4. Wire Harness	– – – –
Sliding roof system does not operate. (Door Lock is normal)	1. Ignition Switch 2. Sliding Roof Control Relay and Switch 3. Sliding Roof Motor and Limit Switch 4. Wire Harness	BE–16 BE–115 BE–115
Sliding roof system operates abnormally.	1. Sliding Roof Control Relay and Switch 2. Sliding Roof Motor and Limit Switch 3. Wire Harness	BE–115 BE–115
Sliding roof system stops operation half way. (Stones of foreign material trapped in motor assembly)	1. Sliding Roof Control Relay and Switch 2. Sliding Roof Motor and Limit Switch 3. Wire Harness	BE–115 BE–115

BE

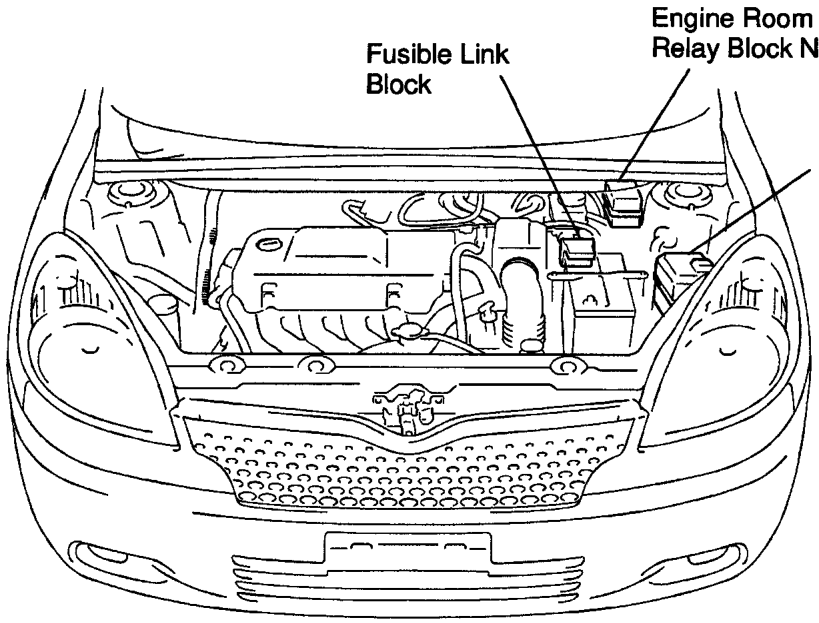
POWER MIRROR CONTROL SYSTEM:

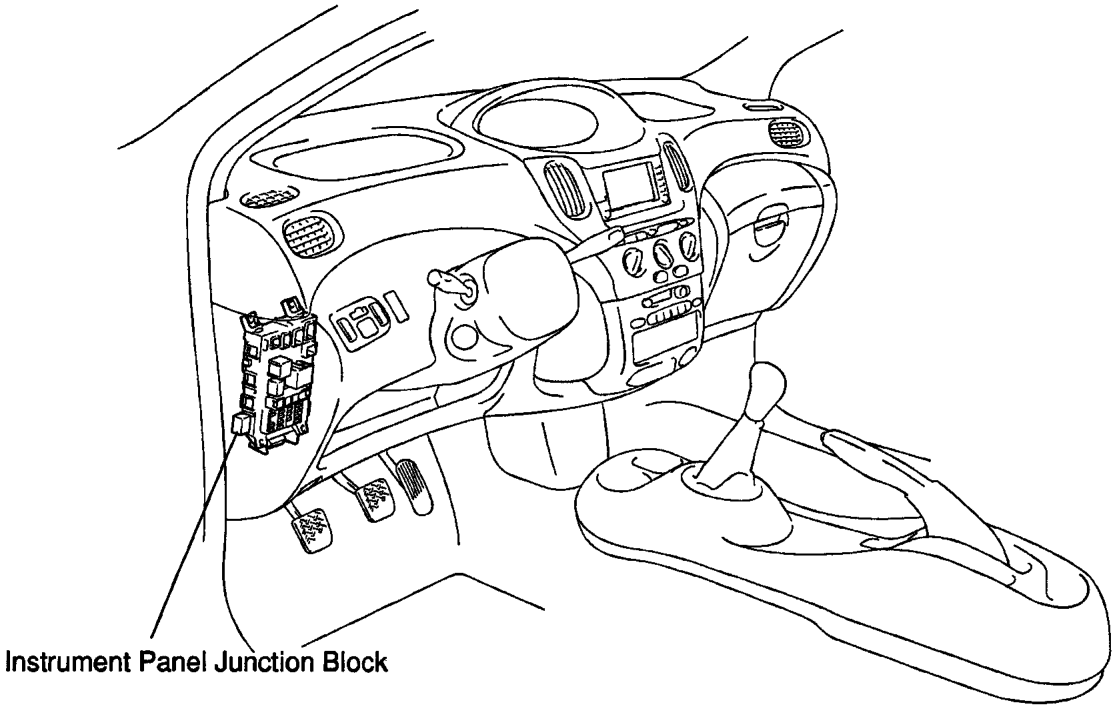
Symptom	Suspect Area	See page
Mirror does not operate.	1. ACC Fuse 2. Mirror Switch 3. Mirror Motor 4. Wire Harness	– BE–119 BE–119 –
Mirror operates abnormally.	1. Mirror Switch 2. Mirror Motor 3. Wire Harness	BE–119 BE–119 –

POWER SOURCE

LOCATION

BE183-02

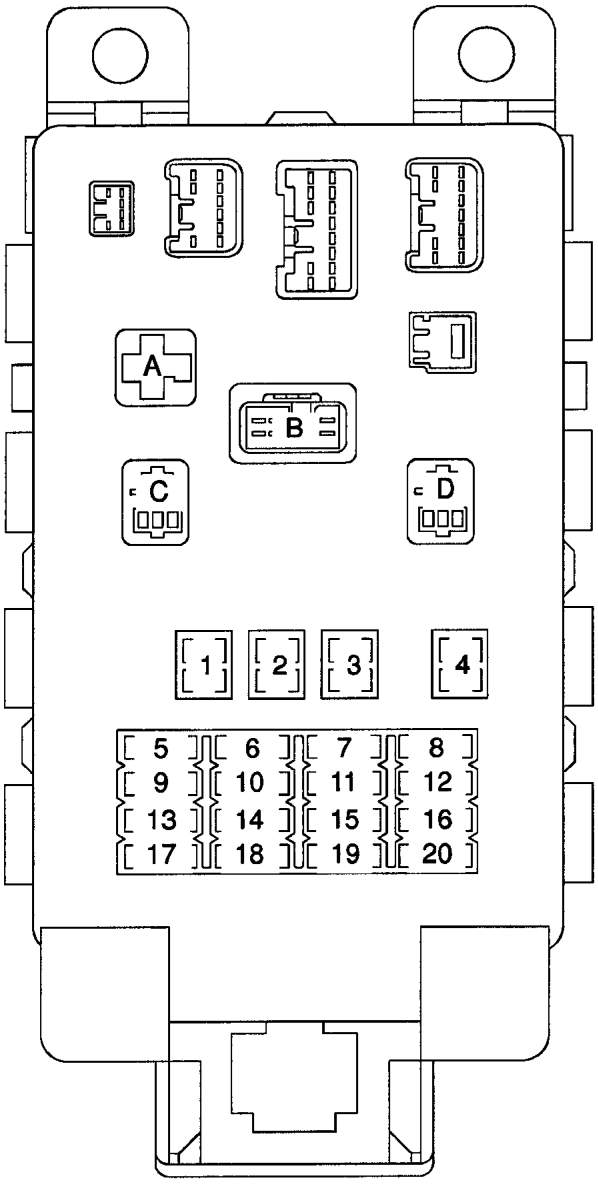




P

I13491

Instrument panel junction block:



Fuses

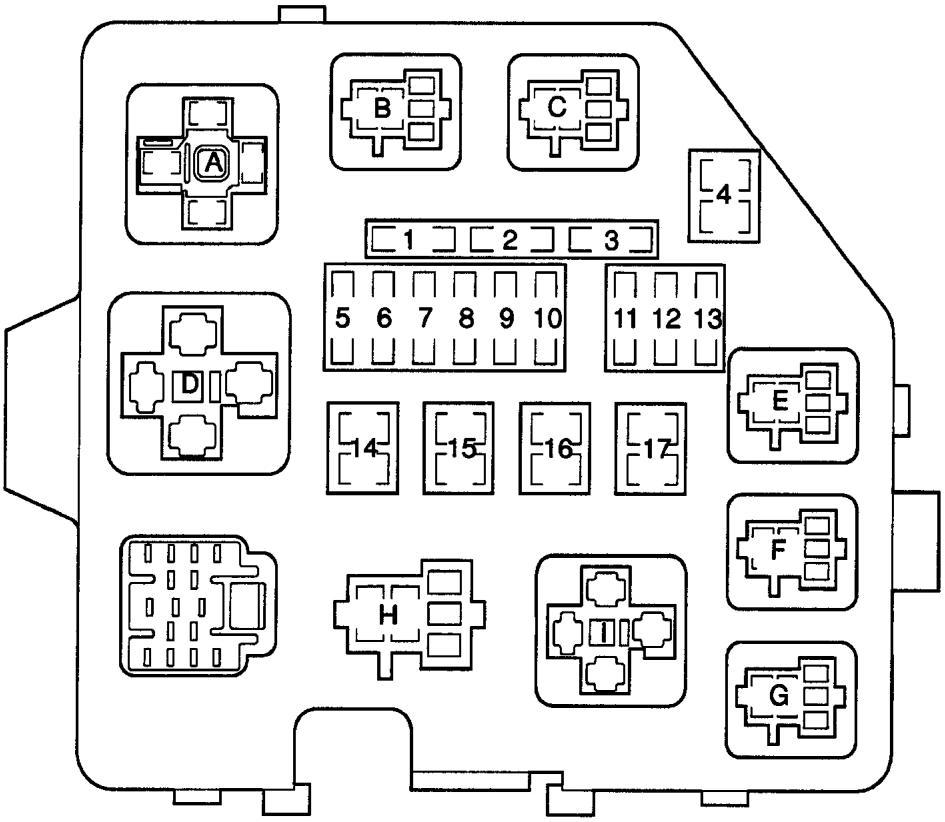
1. AM1 Fuse
2. POWER Fuse *1,2
3. HTR Fuse
4. DEF Fuse *1
5. GAUGE Fuse
6. DEF Fuse
7. D/L Fuse *1,2
8. TAIL Fuse
9. –
10. WIPER Fuse
11. ECU–B Fuse
12. FOG Fuse
13. ACC Fuse
14. ECU–IG Fuse
15. OBD Fuse
16. HAZ Fuse
17. A/C Fuse
18. S–HTR Fuse *1
19. –
20. STOP Fuse

Relays

A. Heater Relay
B. FLASHER Relay
C. Power Main Relay
D. C/OPN Relay

*1: LHD Models (Hi Grade)
*2: RHD Models

Engine room relay block No. 1:



Fuses

1. SPARE Fuse 30A
2. SPARE Fuse 15A
3. –
4. Fuse Puller
5. DOME Fuse
6. EFI Fuse
7. HORN Fuse
8. AM2 Fuse
9. ST Fuse
10. –
11. H–LP LH Fuse (w/o D. R. L.) *1, 2
    H–LP LO LH Fuse (w/ D. R. L.)
12. H–LP RH Fuse (w/o D. R. L.) *1, 2
    H–LP LO RH Fuse (w/ D. R. L.)
13. P/POINT Fuse
14. –
15. RDI Fuse
16. HTR SUB1 Fuse *1
17. –

Relays

A. ST Relay
B. FAN NO. 2 Relay (w/o D.R.L) *1, 2
C. FAN NO. 1 Relay
D. –
E. EFI Relay
F. A/C MG Relay (w/o D.R.L) *1, 2
G. HORN Relay
H. P/POINT Relay
I. HTR SUB 1 Relay (w/ D.R.L) / HTR2 (w/o D.R.L)

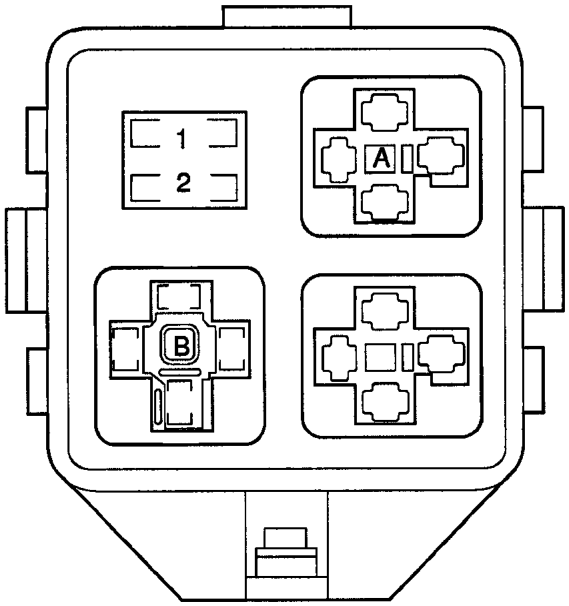
D. R. L. : Daytime Running Light

*1: LHD Models
*2: RHD Models

Y

I14253

Engine room relay block No. 2:



Fuses

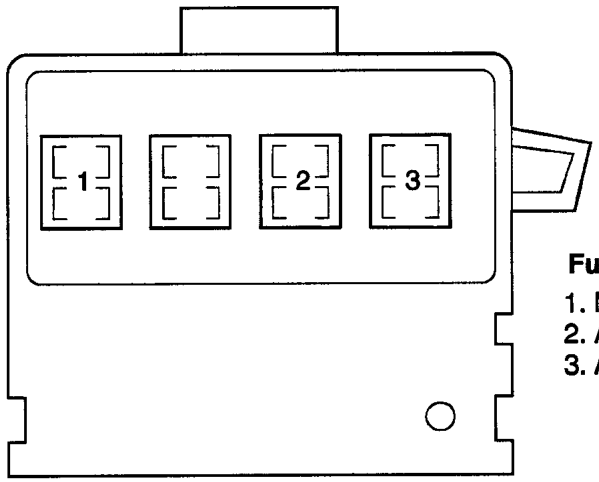
1. H–LP HI RH Fuse (w/ D. R. L.)
2. H–LP HI LH Fuse (w/ D. R. L.)

Relays

A. H–LP Relay (w/ D. R. L.)
B. DIM Relay (w/ D. R. L.)

D. R. L. : Daytime Running Light

Fusible link block:



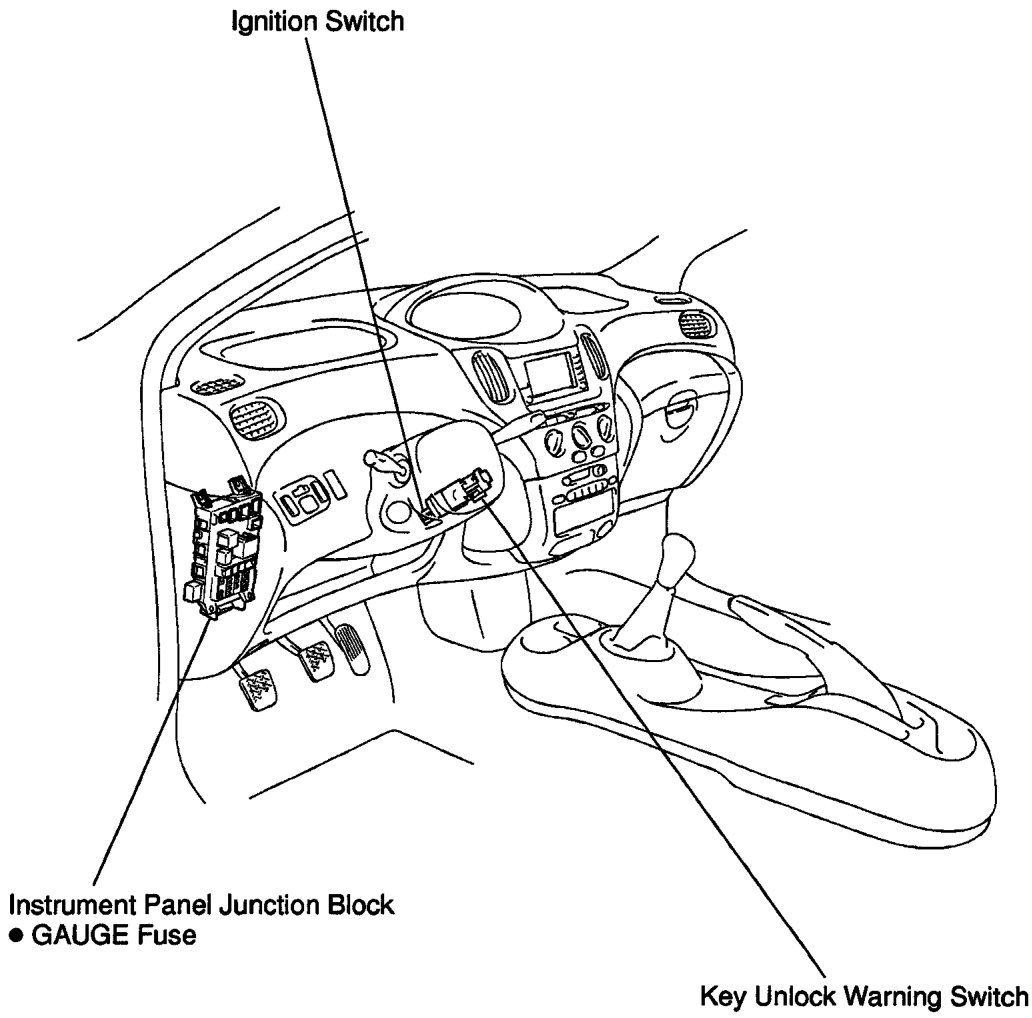
Fuses

1. MAIN FL
2. ALT FL
3. ABS FL

IGNITION SWITCH AND KEY UNLOCK WARNING SWITCH

LOCATION

BE184-02

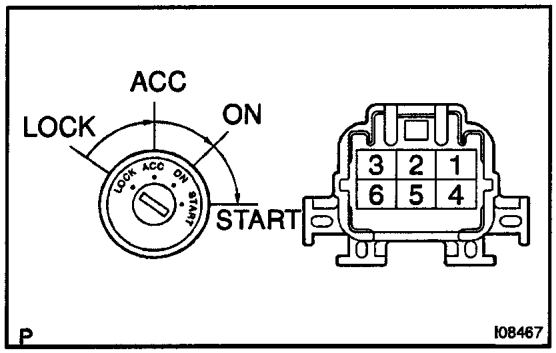


P

I13492

BE185-02

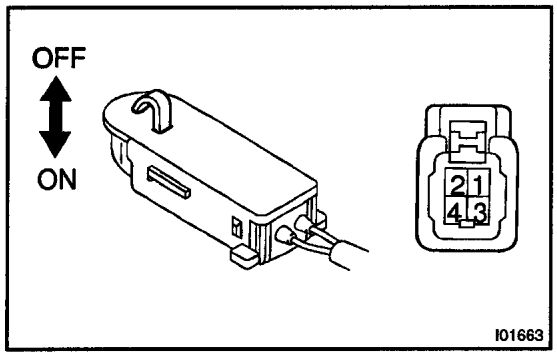
INSPECTION



1. INSPECT IGNITION SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	–	No continuity
ACC	1 – 3	Continuity
ON	1 – 2 – 3 5 – 6	Continuity
START	1 – 2 4 – 5 – 6	Continuity

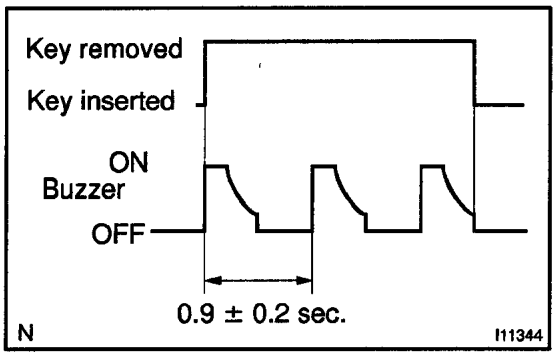
If continuity is not as specified, replace the switch.



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.



3. INSPECT KEY UNLOCK WARNING BUZZER

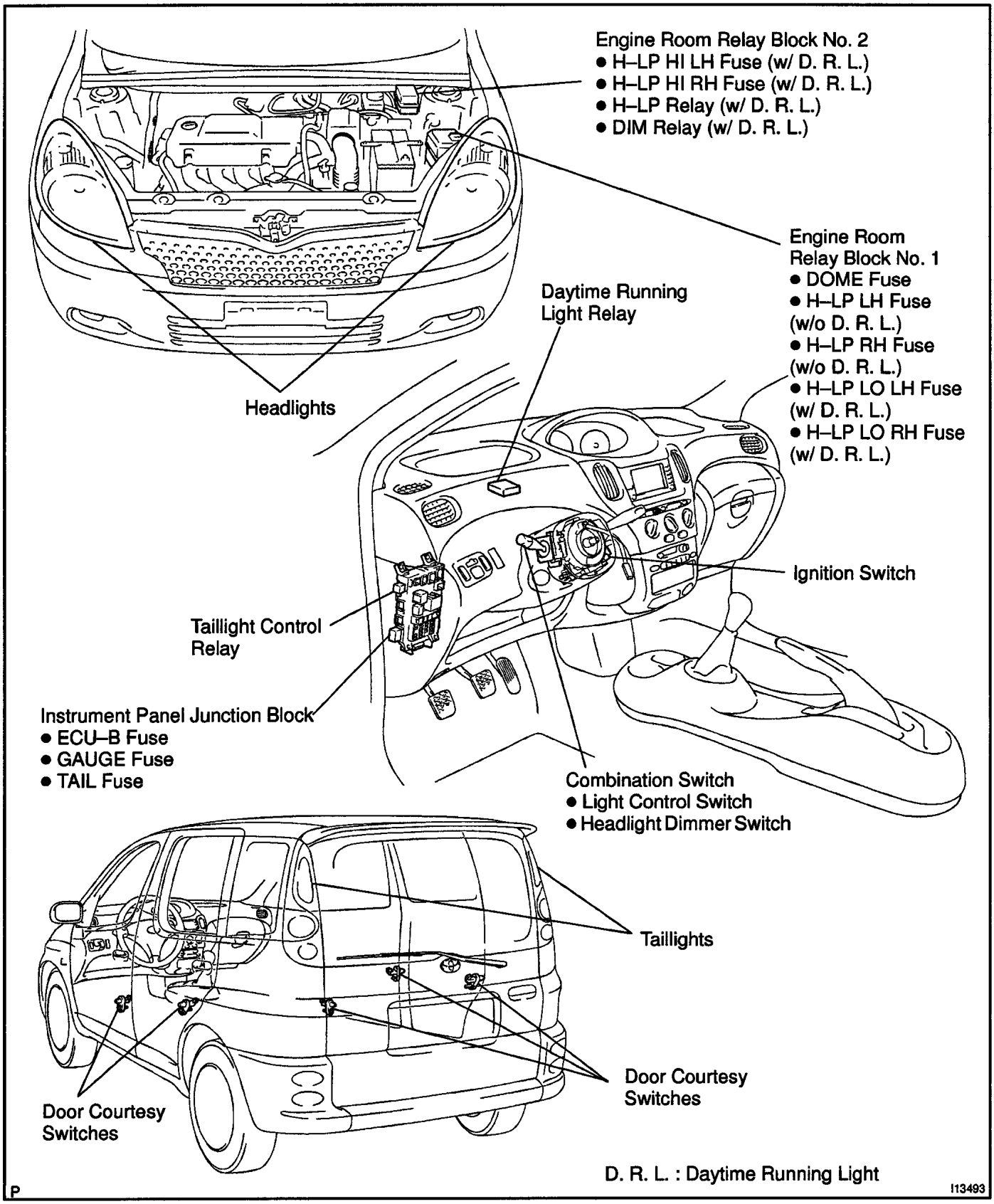
Check that the buzzer sound when driver's door is opened and key inserted.

If operation is not as specified, replace the combination meter. (See page BE–48)

HEADLIGHT AND TAILLIGHT SYSTEM

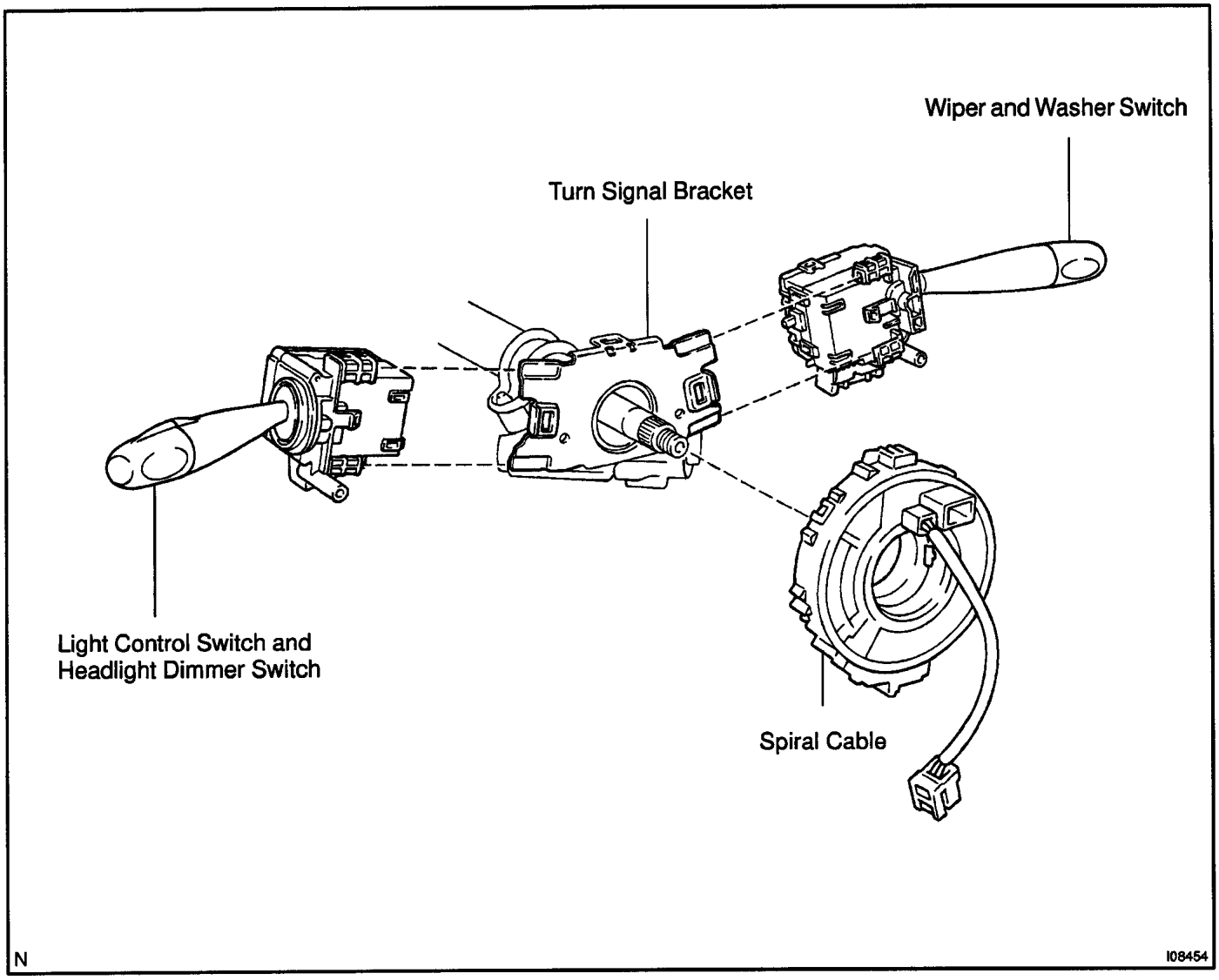
LOCATION

BE1DP–01



BE187-02

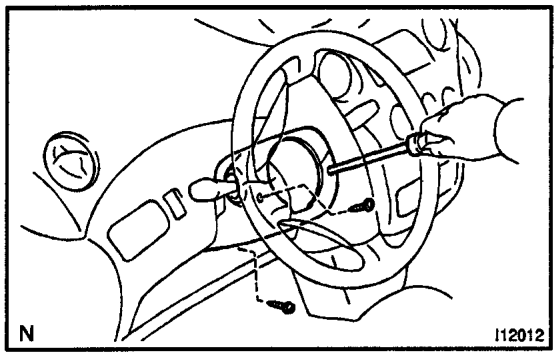
COMPONENTS



BE188-02

REMOVAL

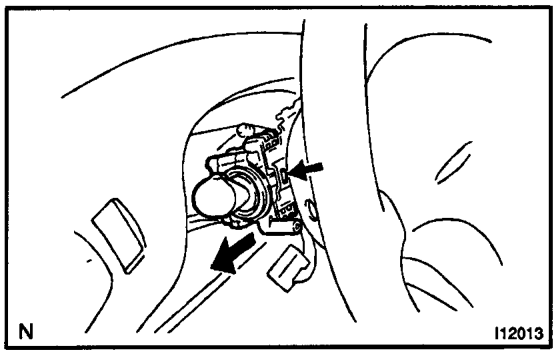
Installation is in the reverse order of removal.



1. REMOVE COLUMN COVER

(a) Remove the 3 screws.

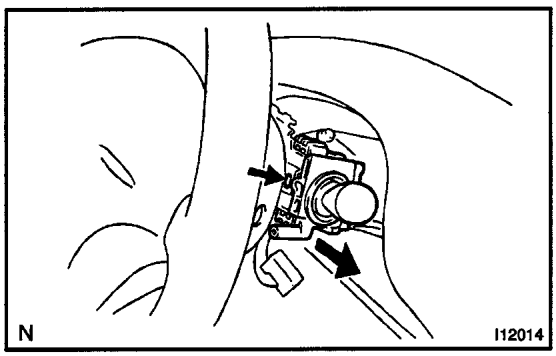
(b) Remove the column cover.



2. REMOVE LIGHT CONTROL SWITCH

(a) Disconnect the light control switch connector.

(b) Remove the switch from the turn signal bracket.



3. REMOVE WIPER AND WASHER SWITCH

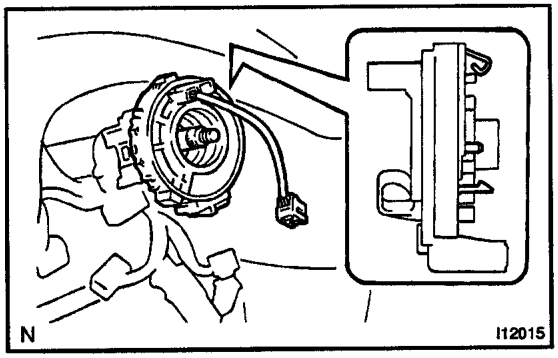
(a) Disconnect the wiper and washer switch connector.

(b) Remove the switch from the turn signal bracket.

BE189-02

DISASSEMBLY

1. REMOVE STEERING WHEEL (See page SR–12)



2. REMOVE SPIRAL CABLE

Remove the spiral cable from the turn signal bracket.

BE18A-02

INSPECTION

1. INSPECT LIGHT CONTROL SWITCH CONTINUITY

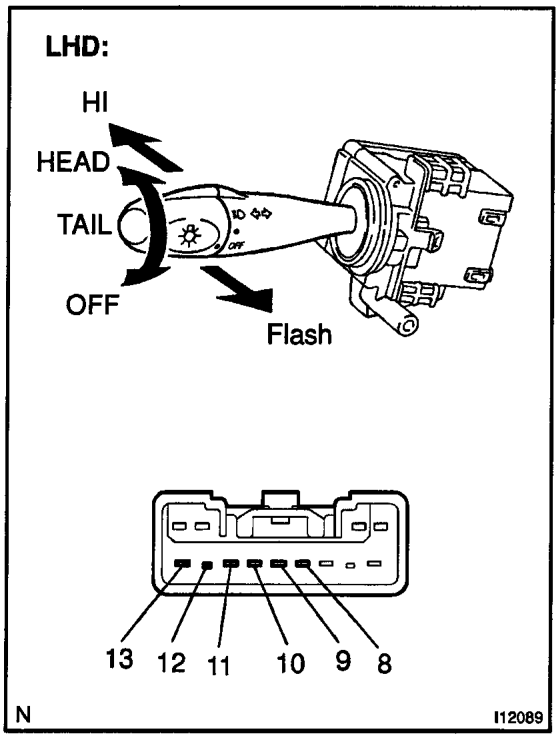
Switch position	Tester connection	Specified condition
OFF	–	No continuity
TAIL	10 – 13	Continuity
HEAD	10 – 13, 11 – 12	Continuity

If continuity is not as specified, replace the switch.

2. INSPECT HEADLIGHT DIMMER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Low beam	–	No. Continuity
HEAD and Low beam	8 – 11 – 12	Continuity
High beam	–	No Continuity
HEAD and High beam	9 – 11 – 12	Continuity
Flash	9 – 11	Continuity
HEAD and Flash	8 – 9 – 11 – 12	Continuity

If continuity is not as specified, replace the switch.



3. INSPECT LIGHT CONTROL SWITCH CONTINUITY

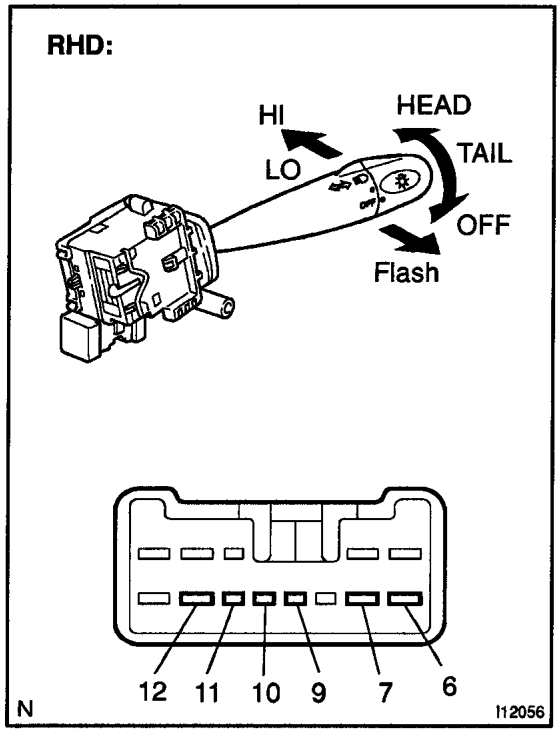
Switch position	Tester connection	Specified condition
OFF	–	No continuity
TAIL	6 – 12	Continuity
HEAD	6 – 12, 7 – 10	Continuity

If continuity is not as specified, replace the switch.

4. INSPECT HEADLIGHT DIMMER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Low beam	–	No continuity
HEAD and Low beam	7 – 9 – 10	Continuity
High beam	–	No continuity
HEAD and High beam	7 – 10 – 11	Continuity
Flash	10 – 11	Continuity
HEAD and Flash	7 – 10 – 11	Continuity

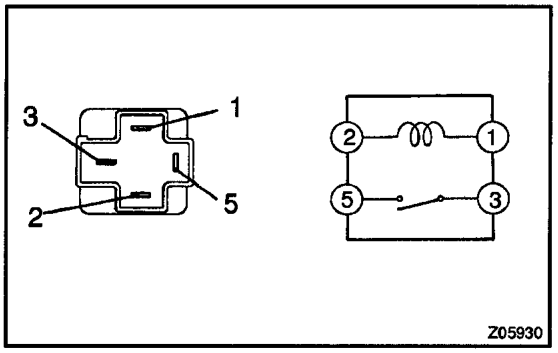
If continuity is not as specified, replace the switch.

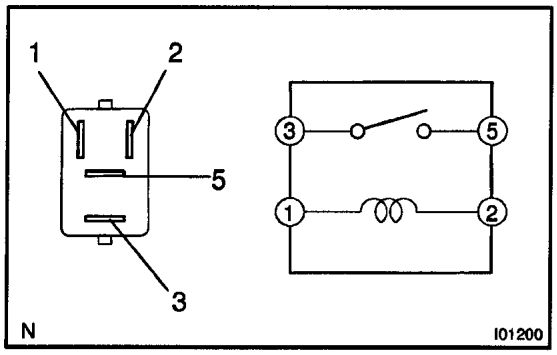


5. INSPECT HEADLIGHT CONTROL RELAY CONTINUITY

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.

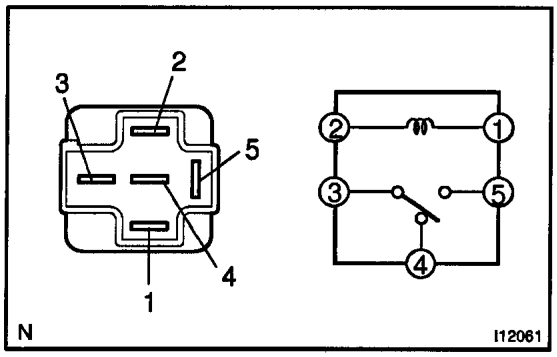




6. INSPECT TAILLIGHT CONTROL RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminal 1 and 2.	3 – 5	Continuity

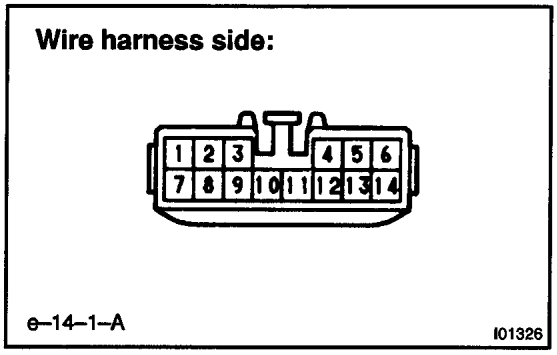
If continuity is not as specified, replace the relay.



7. w/ Daytime running light system: INSPECT HEADLIGHT DIMMER RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2 3 – 4	Continuity
Apply B+ between terminal 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.



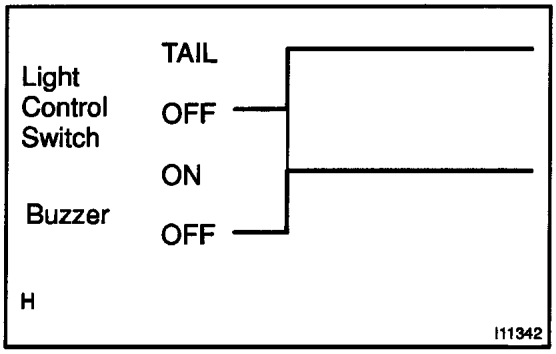
8. w/ Daytime running light system: INSPECT DAYTIME RUNNING LIGHT MAIN RELAY CIRCUIT

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
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.

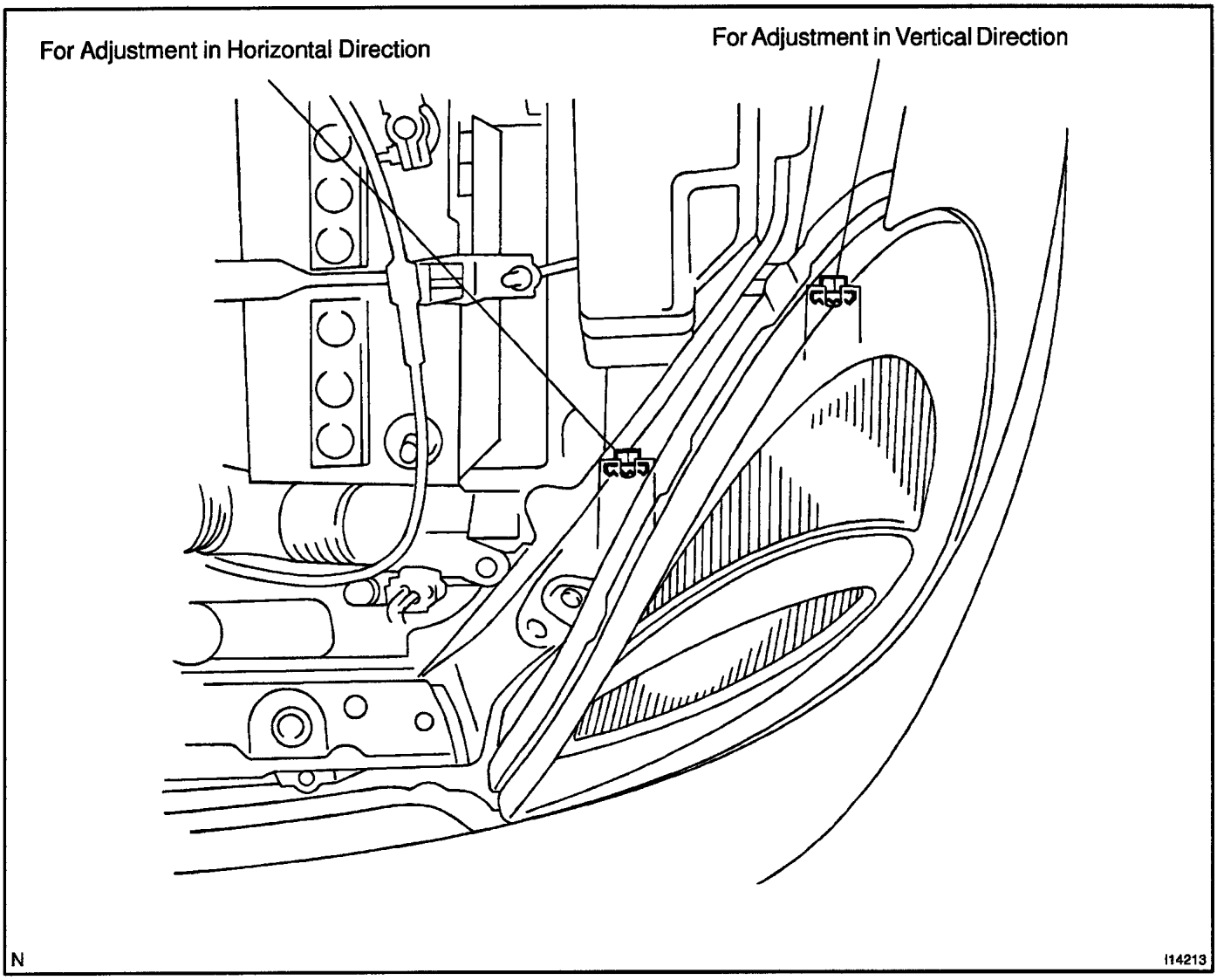


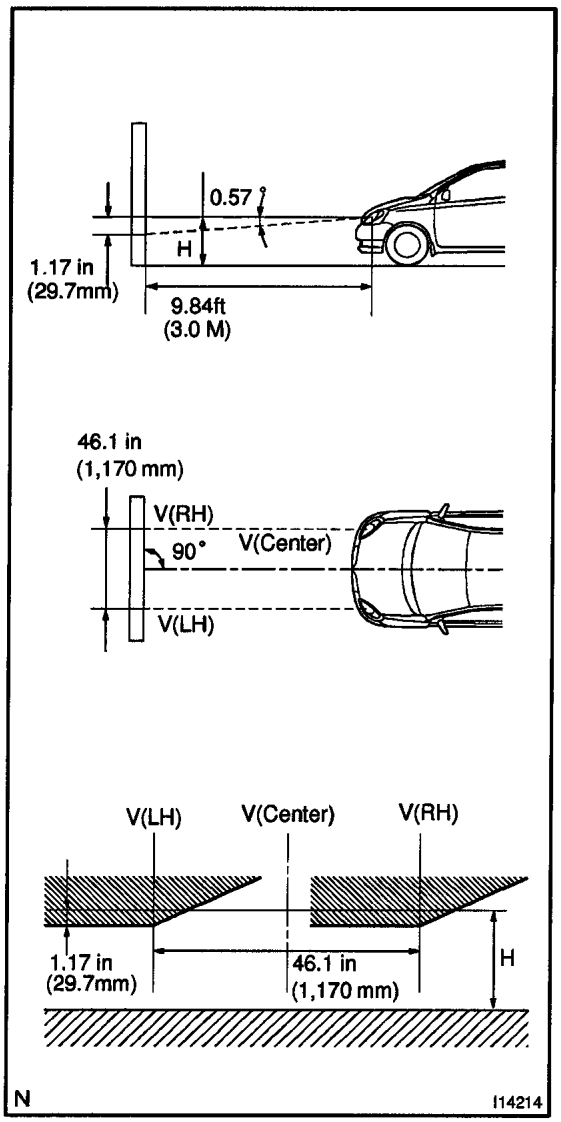
9. INSPECT LIGHT AUTO TURN OFF BUZZER

Check that the buzzer sound when driver's door is opened and turn light control switch position TAIL.
If operation is not as specified, replace the combination meter. (See page BE–48)

BE16B-02

ADJUSTMENT





ADJUSTING HEADLIGHT AIM

(a) Put the vehicle in below conditions.
- Make sure the body around the headlight is not deformed.
- Park the vehicle on a level spot.
- Tire inflation pressure is the specified value.
- Height control operation completes.
- The driver gets into the driver's seat and puts the vehicle in a state ready for driving (with a full tank).
- Bounce the vehicle several times.

(b) Check the headlight aimming.
(1) Prepare the thick white colored paper.
(2) Stand the paper perpendicularly and ensure the distance from it to the head lights is 9.84 ft.
(3) Ensure that the center line of vehicle and the paper are at a 90 degree angle as shown in the illustration.
(4) Engine running.
(5) Draw a horizontal line on the paper where the head lights of the vehicle are to be.
(6) Draw a vertical line on the paper where the center line of the vehicle is to be. (V line)
(7) Draw the vertical lines on the paper where the headlights (low–beam and high–beam center marks) of the vehicle are to be(V RH and V LH lines).
(8) Draw the vertical lines on the paper where the headlights(low beam center marks)of the vehicle are to be.(V RH and LH lines)
(9) Turn the head lights ON.
(10) Check that the head lights light up the paper as shown in the illustration.
(11) When the paper is not lighted up properly, adjust the lights in the vertical or horizontal direction.

HINT:
As shown in the illustration, adjust aiming of the LH and RH lights respectively.

(c) Adjust the headlight in vertical direction.
Using adjusting bolt A, adjust the headlight aim to within the specifications.

(d) Adjust the headlight in horizontal direction.
Using adjusting bolt B, adjust the headlight aim to within the specifications.

BE18C–01

REASSEMBLY

Installation is in the reverse order of disassembly (See page BE–20).

BE18D-01

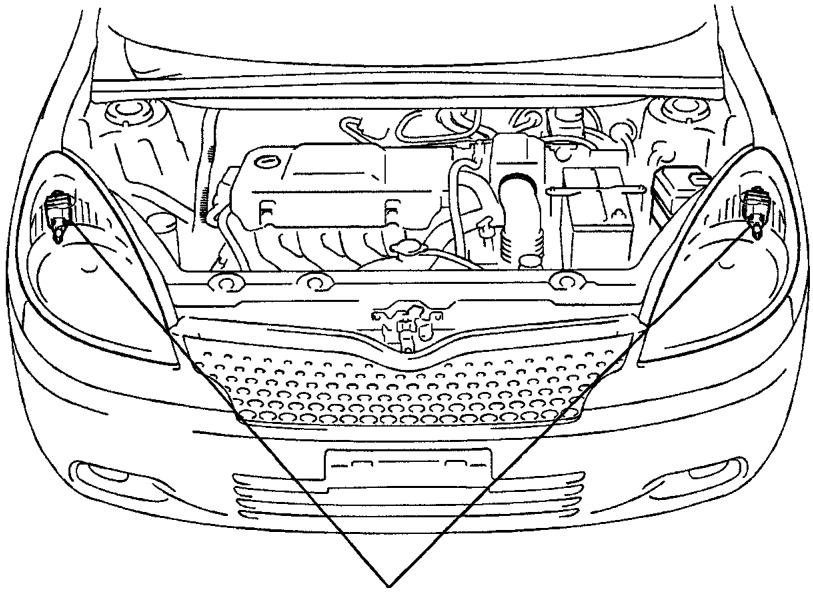
INSTALLATION

Installation is in the reverse order of removal (See page BE–19).

HEADLIGHT BEAM LEVEL CONTROL SYSTEM

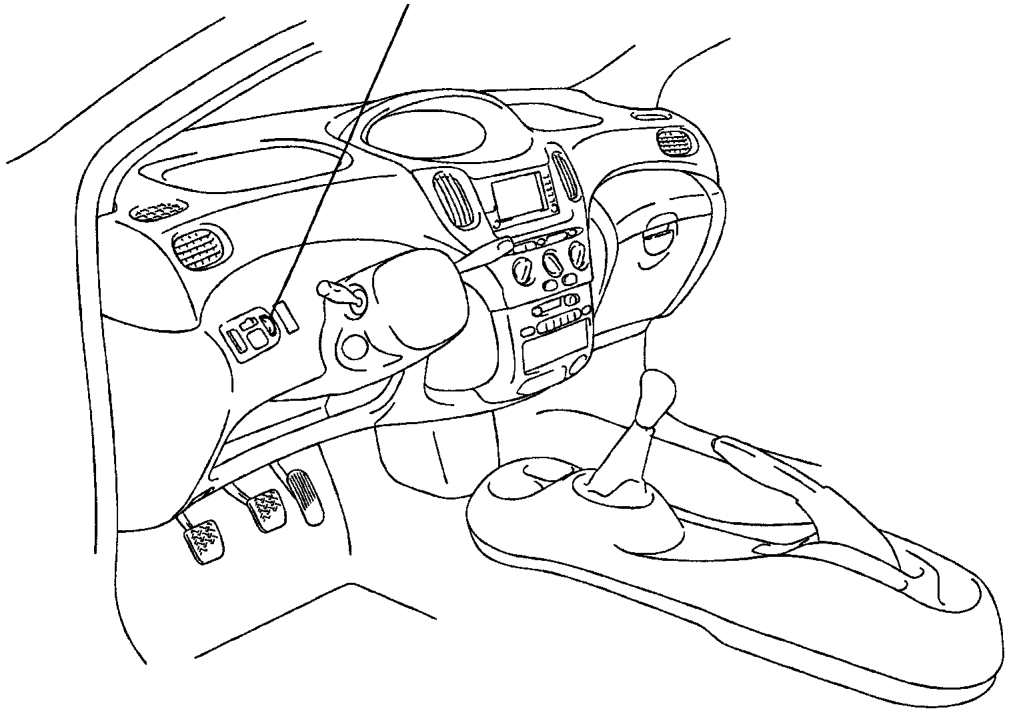
BE18E-02

COMPONENTS



Headlight Beam Level Control Actuator

Headlight Beam Level Control Switch

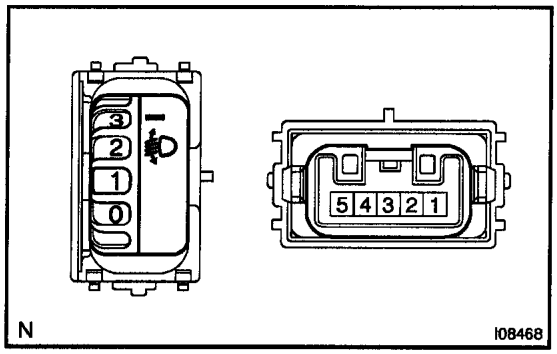


P

I13495

BE01S-04

INSPECTION

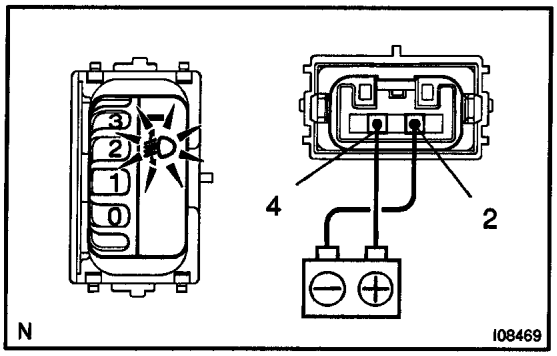


1. INSPECT HEADLIGHT BEAM LEVEL CONTROL SWITCH RESISTANCE

Measure the resistance between terminal 3 and 5.

Switch position	Resistance (Ω)
0	2,500
1	1087
2	702
3	632

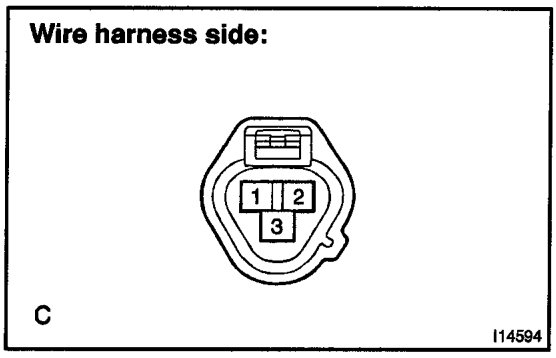
If resistance value is not as specified, replace the switch.



2. INSPECT HEADLIGHT BEAM LEVEL CONTROL SWITCH ILLUMINATION

Connect the positive (+) lead from the battery to terminal 4 and negative (–) lead to terminal 2, 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 chart.

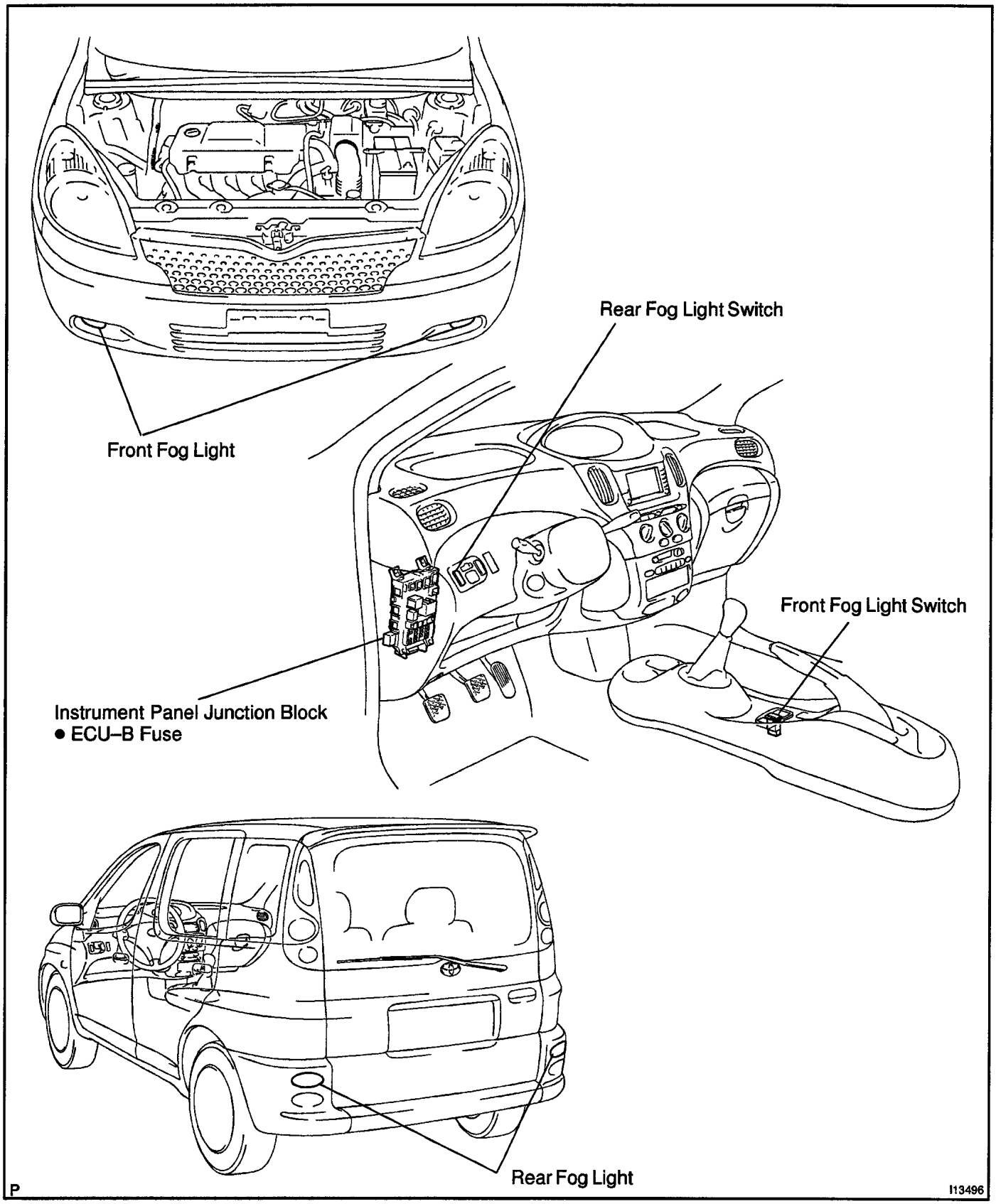
Tester connection	Condition	Specified condition
3 – Ground	Constant	Continuity
2 – Ground	Light control switch TAIL or HEAD	Battery voltage

If the circuit is not as specified, replace the actuator.

FOG LIGHT SYSTEM

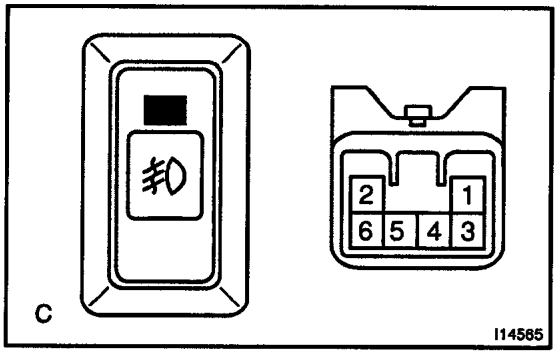
LOCATION

BE1DT–01



BE1DU-01

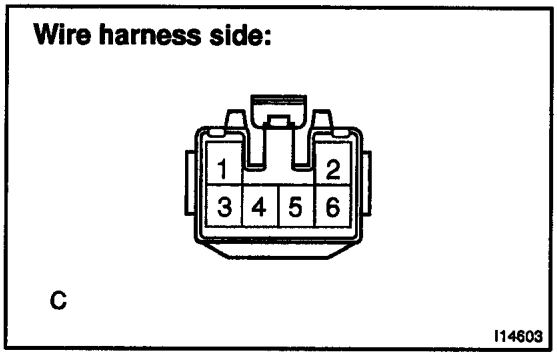
INSPECTION



1. INSPECT FRONT FOG LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	2 – 6	No continuity
ON	2 – 3 – 6	Continuity
Illumination circuit	1 – 4	Continuity

If continuity is not as specified, replace the switch.



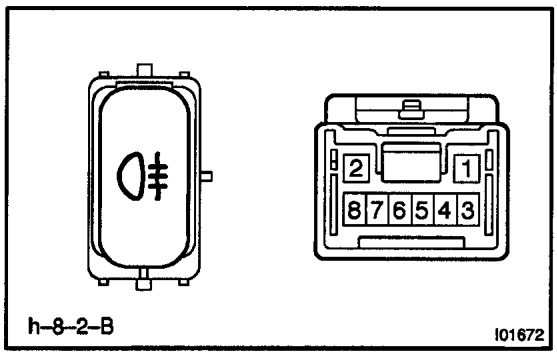
2. INSPECT FRONT FOG LIGHT SWITCH CIRCUIT

Disconnect the connector from the switch and inspect the connector on the wire harness side.

Tester connection	Condition	Specified condition
6 – Ground	Ignition switch ON	* Continuity
2 – Ground	Ignition switch ON	Continuity
4 – Ground	Constant	Continuity
1 – Ground	Light control switch TAIL or HEAD	Battery voltage
3 – Ground	Constant	Battery voltage

*: There is resistance because this circuit is grounded through the bulb.

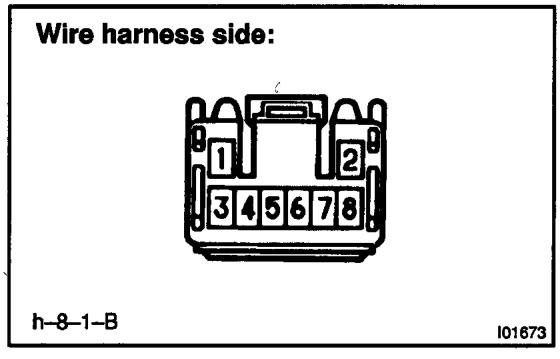
If circuit is not as specified, replace the wire harness.



3. INSPECT REAR FOG LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
ON	2 – 5 – 6	Continuity
Illumination circuit	2 – 7	Continuity

If continuity is not as specified, replace the switch.



4. INSPECT REAR FOG LIGHT SWITCH CIRCUIT

Disconnect the connector from the switch and inspect the connector on the wire harness side.

Tester connection	Condition	Specified condition
1 – Ground	Constant	* Continuity
5 – Ground	Light control switch HEAD	Continuity
7 – Ground	Constant	Continuity
2 – Ground	Light control switch TAIL or HEAD	Battery voltage
3 – Ground	Constant	Battery voltage

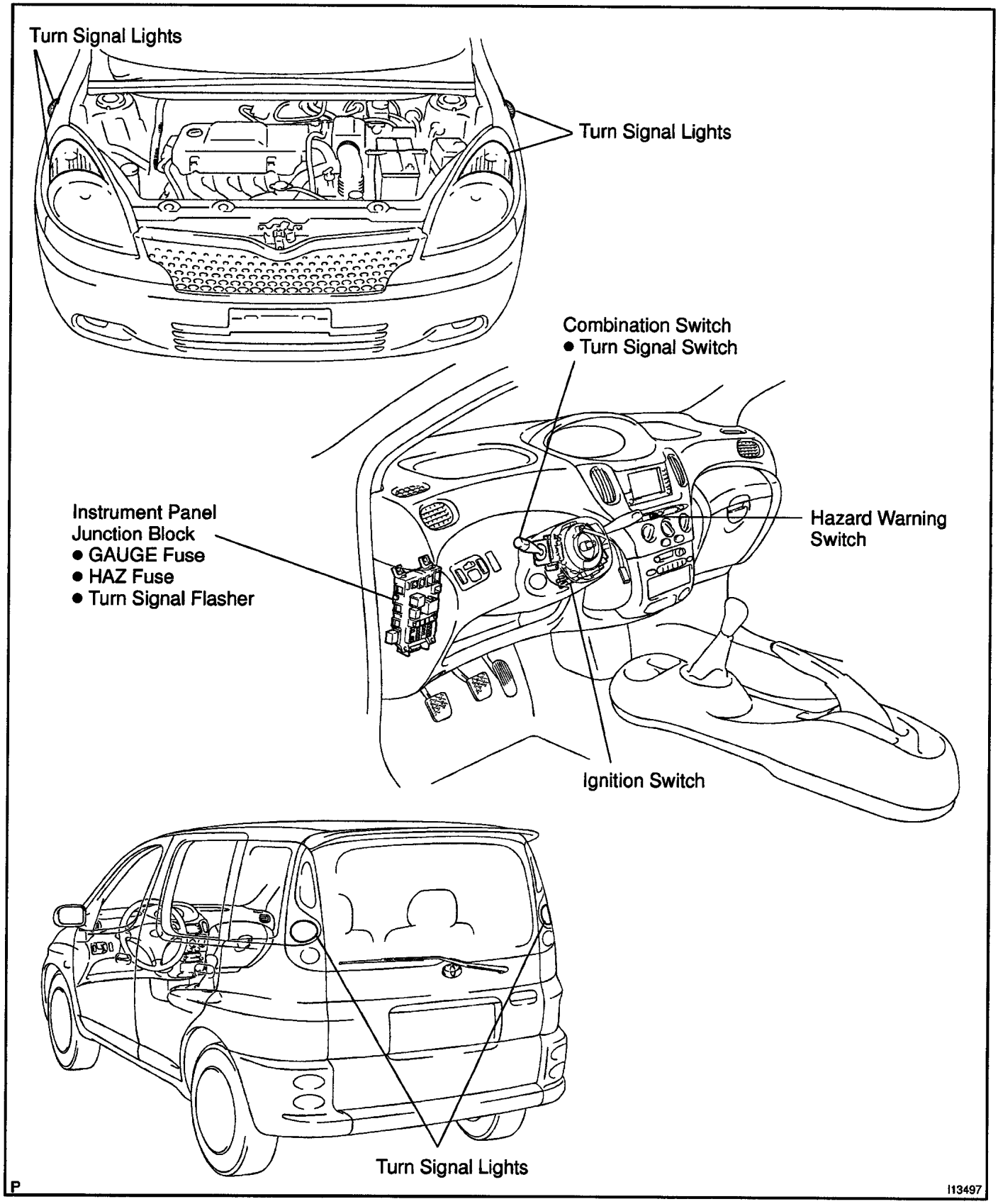
*: There is resistance because this circuit is grounded through the bulb.

If circuit is not as specified, replace the wire harness.

TURN SIGNAL AND HAZARD WARNING SYSTEM

LOCATION

BE18H-02



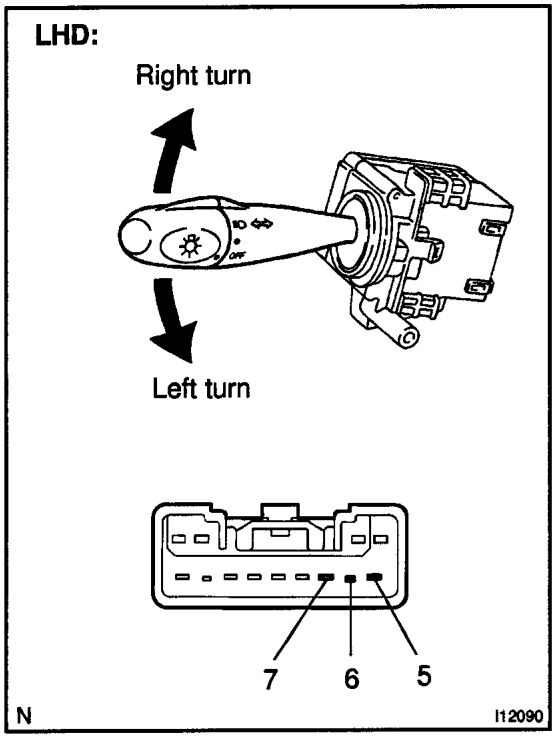
BE01W-03

INSPECTION

1. INSPECT TURN SIGNAL SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Left turn	5 – 6	Continuity
Neutral	–	No continuity
Right turn	6 – 7	Continuity

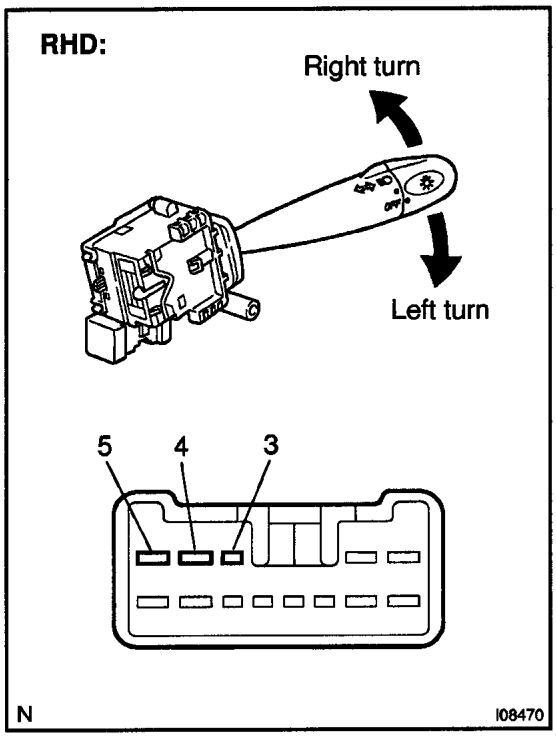
If continuity is not as specified, replace the switch.



2. INSPECT TURN SIGNAL SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Left turn	3 – 4	Continuity
Neutral	–	No continuity
Right turn	4 – 5	Continuity

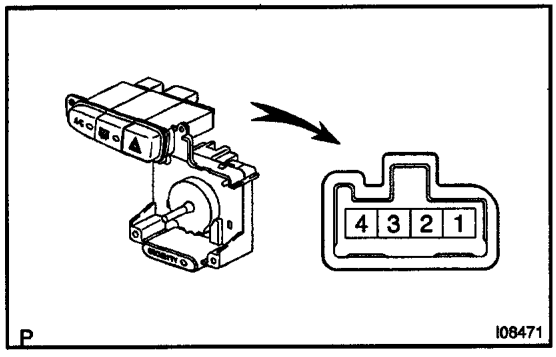
If continuity is not as specified, replace the switch.



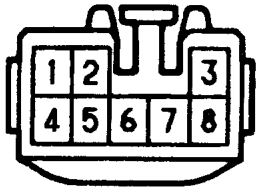
3. INSPECT HAZARD WARNING SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Switch OFF	–	No continuity
Switch ON	1 – 2	Continuity

If continuity is not as specified, replace the switch.



Wire harness side:



I04046

4. INSPECT TURN SIGNAL FLASHER CIRCUIT

Disconnect the connector from the combination switch and inspect the connector on the wire harness side, as shown.

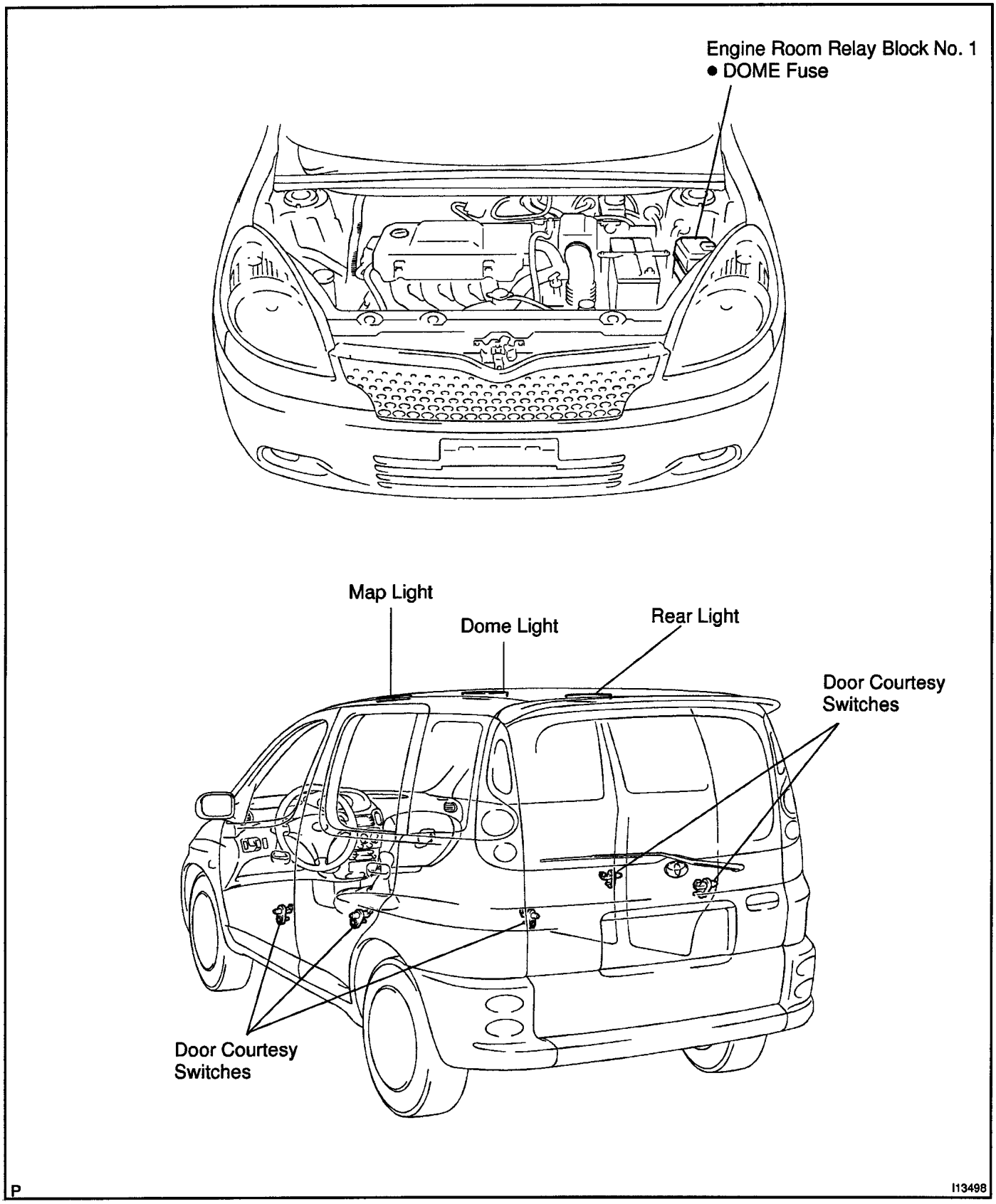
Tester connection	Condition	Specified condition
2 – Ground	Constant	Continuity
3 – Ground	Constant	Continuity
5 – Ground	Turn signal switch RIGHT or OFF	No continuity
5 – Ground	Turn signal switch LEFT	Continuity
6 – Ground	Turn signal switch LEFT or OFF	No continuity
6 – Ground	Turn signal switch RIGHT	Continuity
7 – Ground	Constant	Continuity
8 – Ground	Hazard warning switch OFF	No continuity
8 – Ground	Hazard warning switch ON	Continuity
1 – Ground	Ignition switch LOCK or ACC	No voltage
1 – Ground	Ignition switch ON	Battery voltage
4 – Ground	Constant	Battery voltage

If circuit is as specified, replace the relay.
If circuit is not as specified, inspect the circuits connected to other parts.

INTERIOR LIGHT SYSTEM

LOCATION

BE18I-02



P

I13498

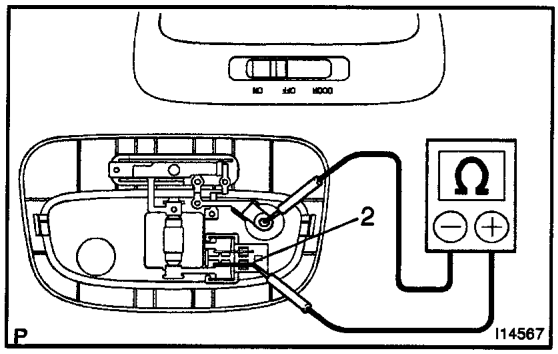
BE1DV-01

INSPECTION

1. INSPECT MAP LIGHT CONTINUITY

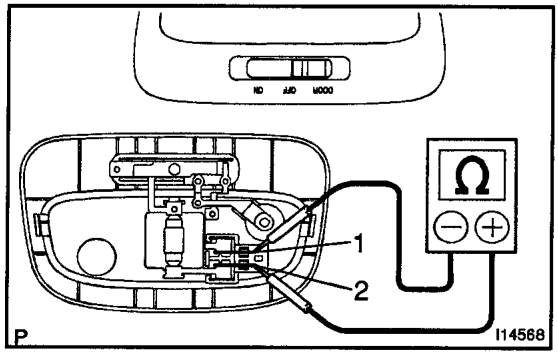
(a) Disconnect the connector from the room light.

(b) Turn the room light switch ON, check that there is continuity between terminal 2 and body ground.



(c) Turn the room light switch DOOR, check that there is continuity between terminals 1 and 2.

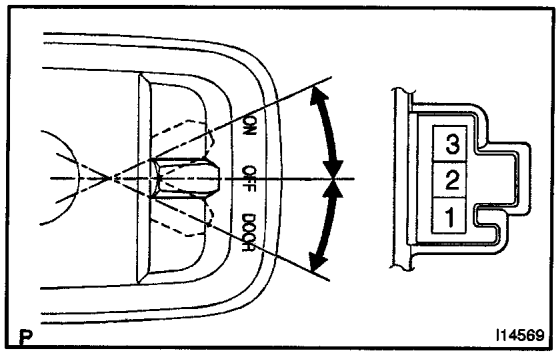
If continuity is not as specified, replace the light assembly or bulb.



2. w/ Sliding roof: INSPECT DOME LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
DOOR	2 – 3	Continuity
ON	1 – 2	Continuity

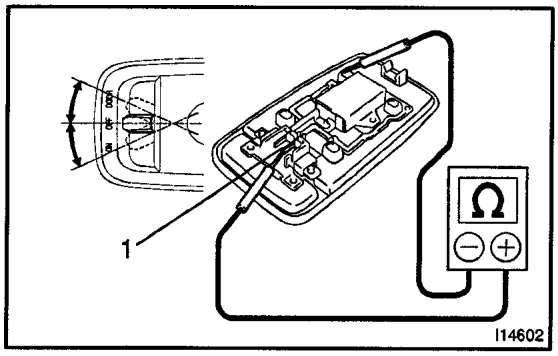
If continuity is not as specified, replace the light assembly or bulb.



3. w/o Sliding roof: INSPECT DOME LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
DOOR	2 – Body Ground	Continuity
ON	1 – 2	Continuity

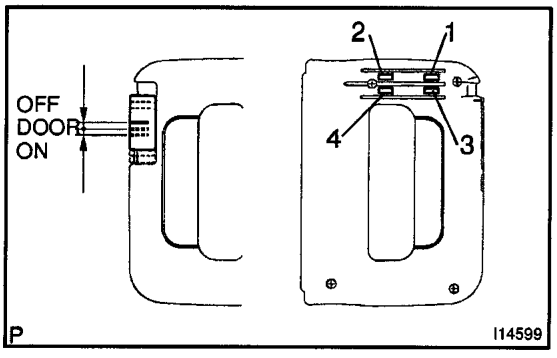
If continuity is not as specified, replace the light assembly or bulb.

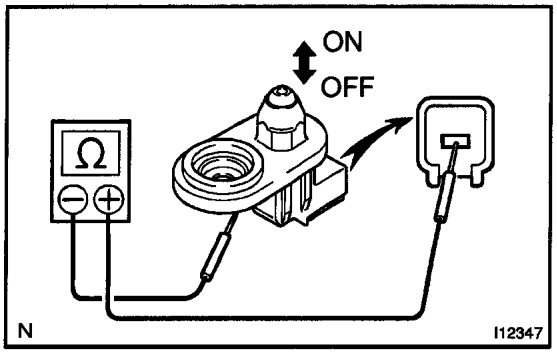


4. INSPECT REAR LIGHT CONTINUITY

Switch position	Tester connection	Specified condition
OFF	–	No continuity
DOOR	2 – 3	Continuity
ON	2 – 4	Continuity

If continuity is not as specified, replace the light assembly or bulb.





5. INSPECT DOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminals and the switch body with the switch ON (switch pin released: opened door).

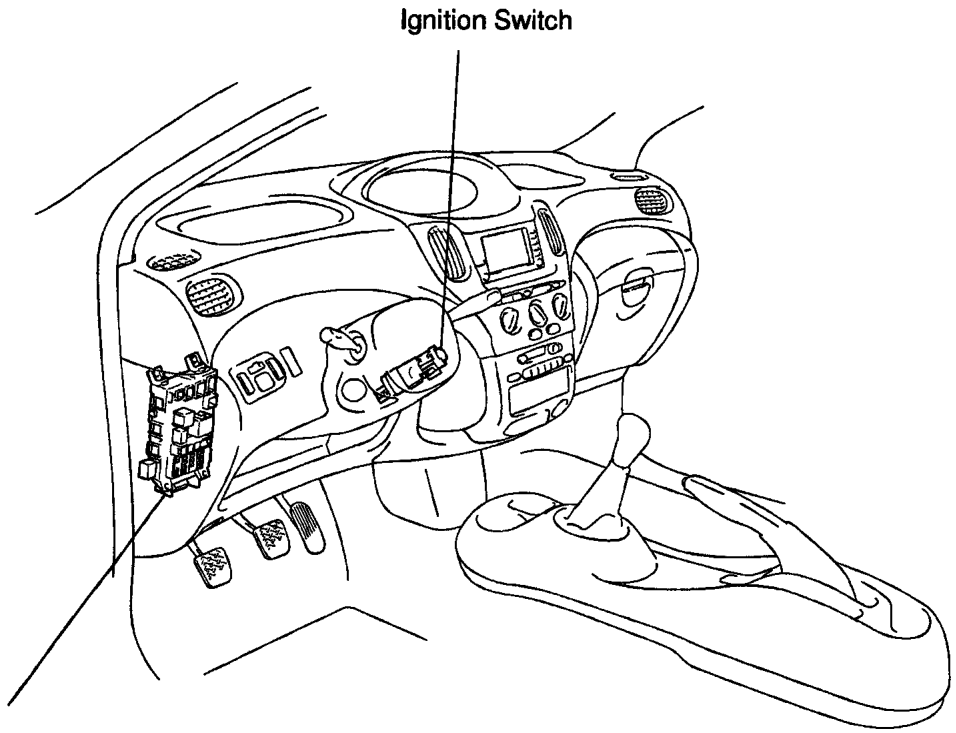
(b) Check that no continuity exists between terminals and the switch body with the switch OFF (switch pin pushed in: closed doors).

If operation is not as specified, replace the switch.

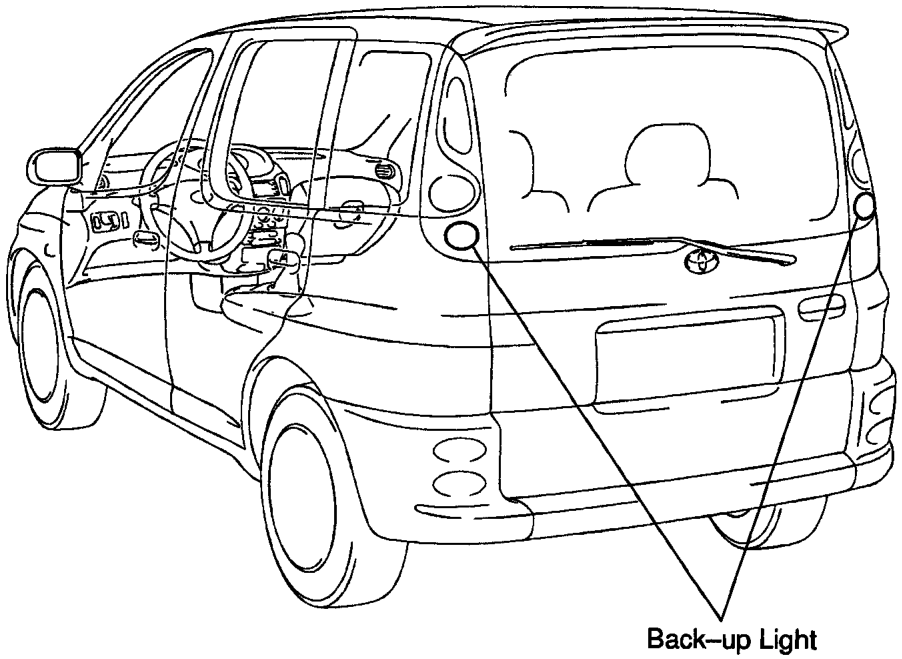
BACK–UP LIGHT SYSTEM

LOCATION

BE19K-02

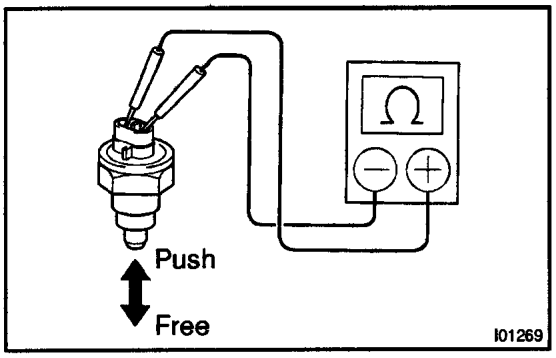


Instrument Panel Junction Block
- GAUGE Fuse



P

I13499



BE020-04

INSPECTION

1. **M/T:**
   INSPECT BACK–UP LIGHT SWITCH CONTINUITY

Switch position	Specified condition
Push	Continuity
Free	No continuity

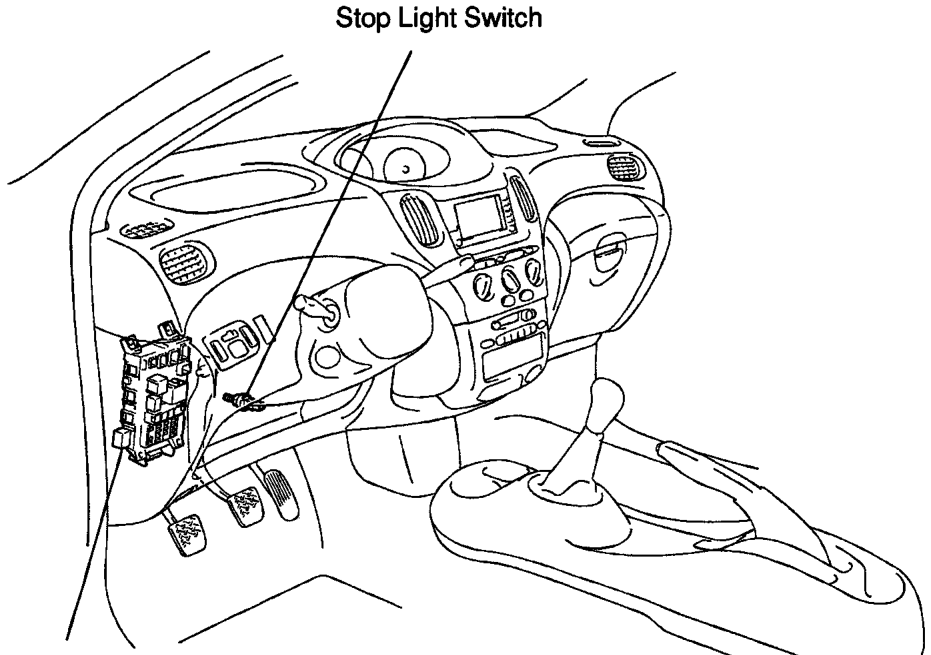
If continuity is not as specified, replace the switch.

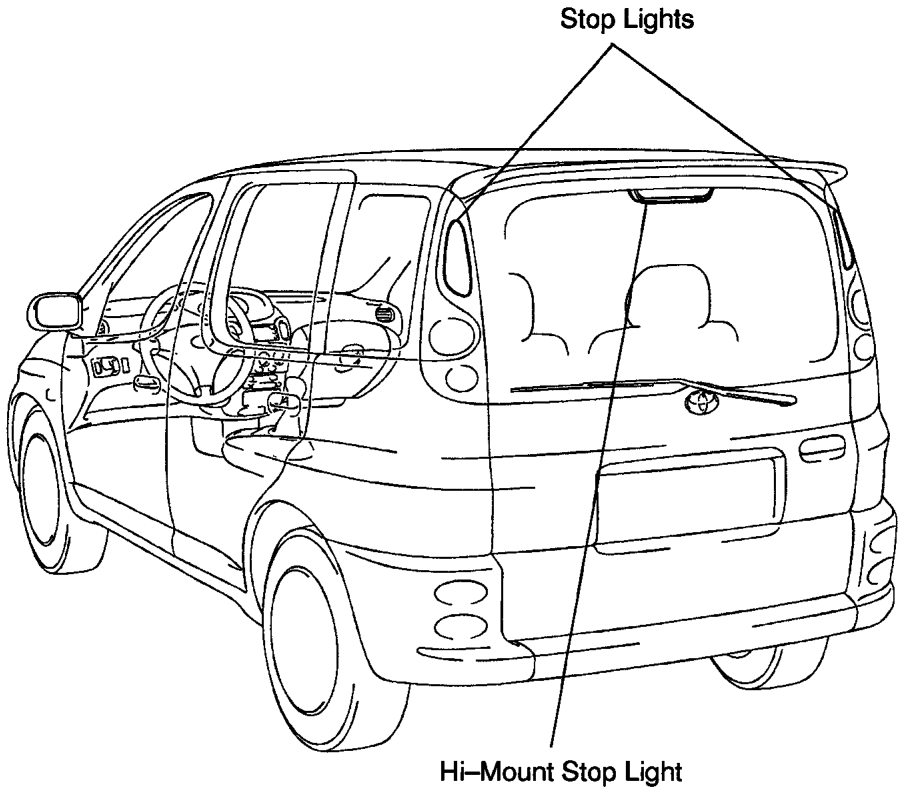
2. **A/T:**
   INSPECT NEUTRAL START SWITCH CONTINUITY
   (See page DI–47)

STOP LIGHT SYSTEM

LOCATION

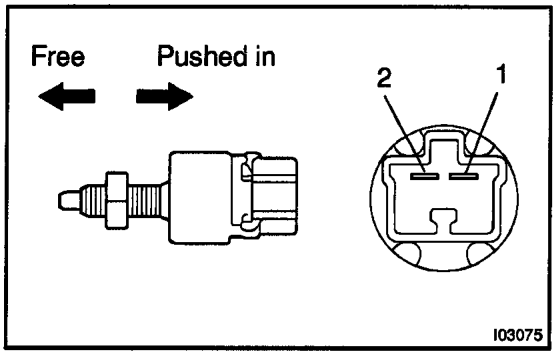
BE18L–02





P

I13500



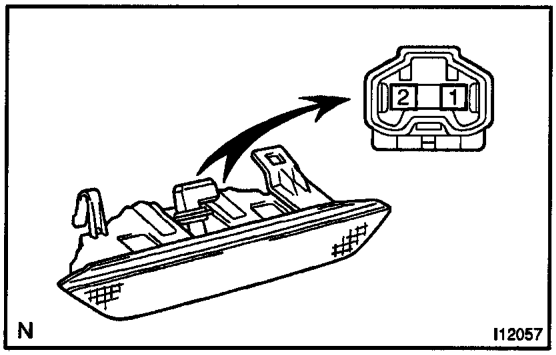
BE022-03

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. INSPECT HI–MOUNTED STOP LIGHT CONTINUITY

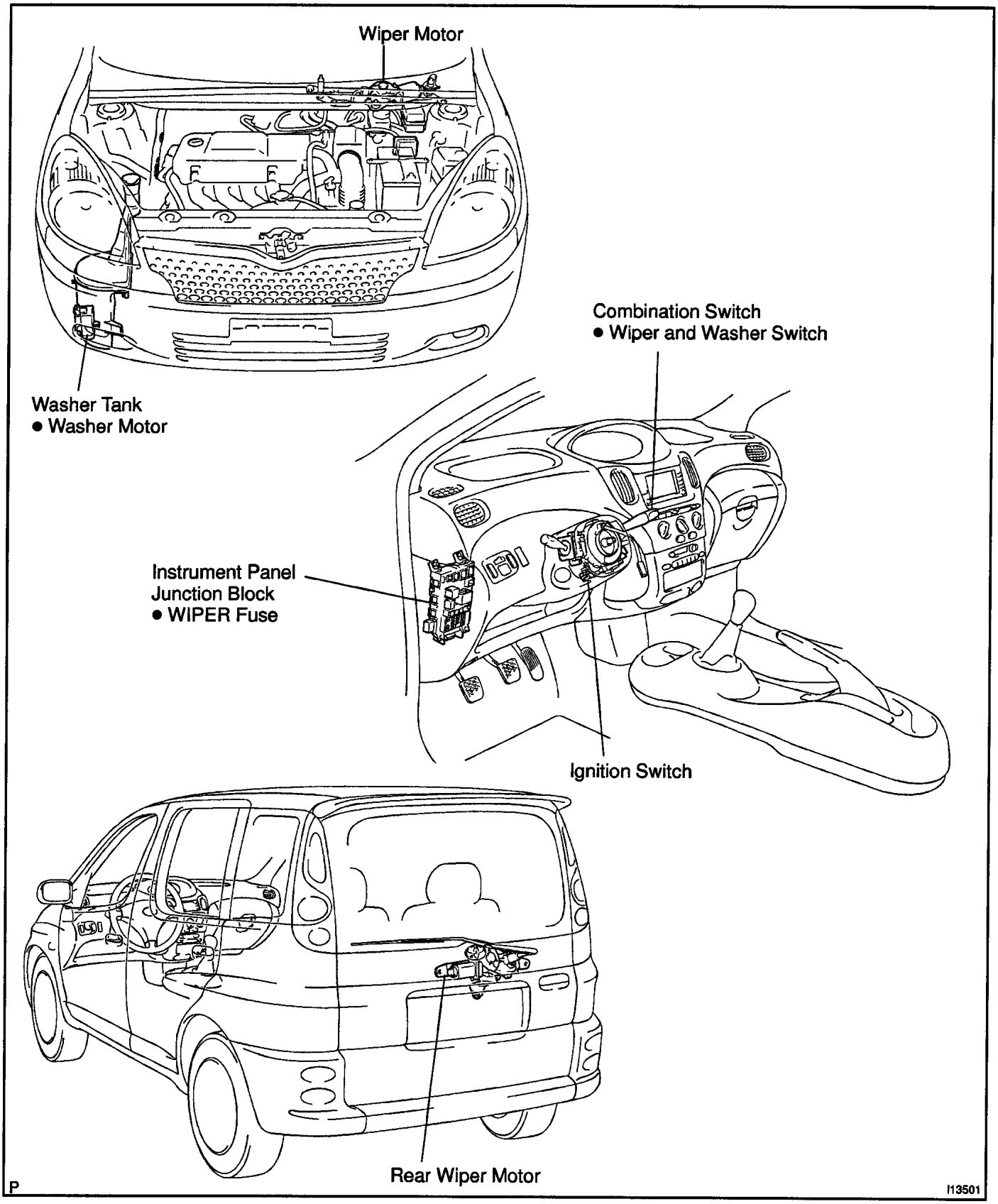
Using the ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the light assembly or bulb.

WIPER AND WASHER SYSTEM

LOCATION

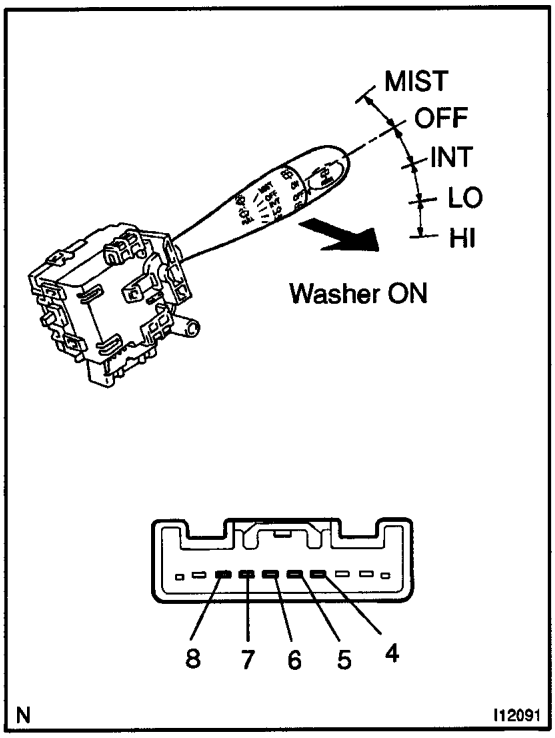
BE18M-02



BE1DX-01

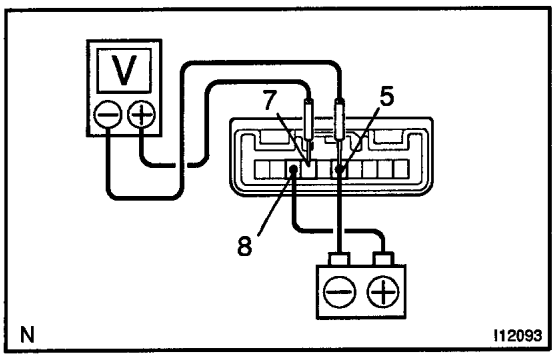
INSPECTION

1. INSPECT FRONT WIPER AND WASHER SWITCH CONTINUITY



Switch position	Tester connection	Specified condition
MIST	7 – 8	Continuity
OFF	6 – 7	Continuity
INT	6 – 7	Continuity
LO	7 – 8	Continuity
HI	8 – 9	Continuity
Washer ON	4 – 5	Continuity

If continuity is not as specified, replace the switch.



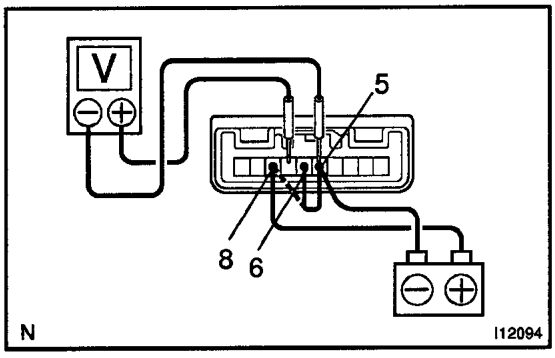
2. INSPECT FRONT WIPER INTERMITTENT OPERATION

(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 8 and the negative (–) lead to terminal 5.

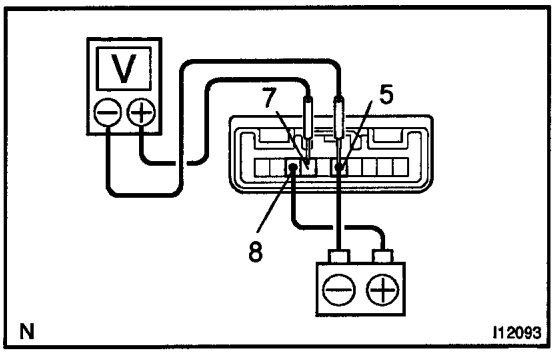
(d) Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (–) lead to terminal 5, check that the meter needle indicates battery voltage.



(e) After connecting terminal 6 to terminal 8, connect to terminal 8 to terminal 5, check the voltage rises from 0 volts to battery voltage with in the times, 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.

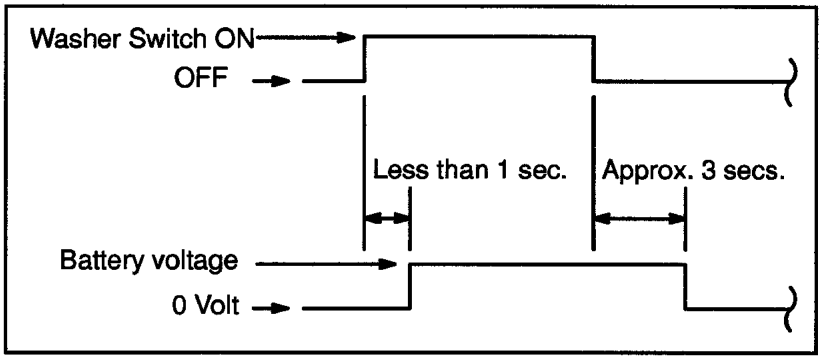


3. INSPECT FRONT WASHER LINKED OPERATION

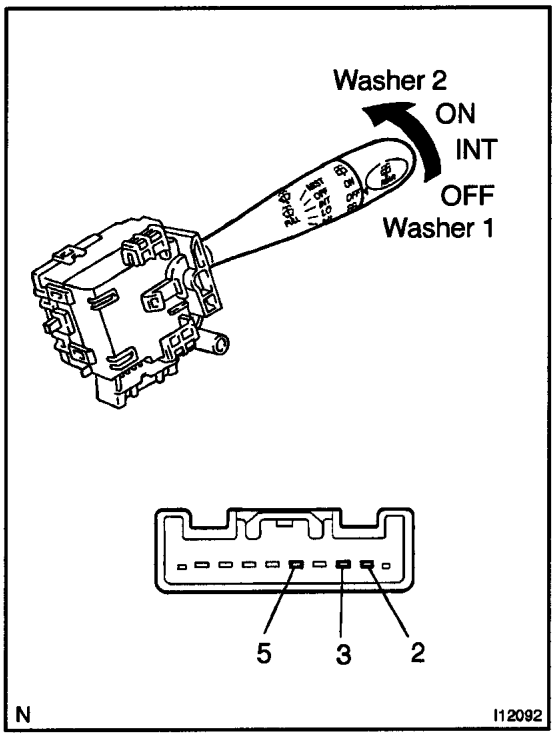
(a) Connect the positive (+) lead from the battery to terminal 8 and the negative (–) lead to terminal 5.

(b) Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (–) lead to terminal 5.

(c) Push in the washer switch, and check that the voltage changes, as shown in the table.



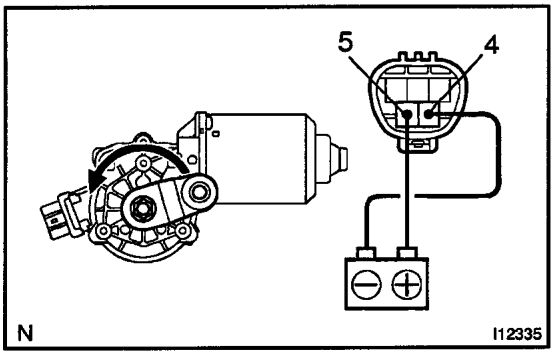
If operation is not as specified, replace the wiper and washer switch.



4. INSPECT REAR WIPER AND WASHER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Washer 1	3 – 5	Continuity
OFF	–	No continuity
ON	2 – 5	Continuity
Washer 2	2 – 3 – 5	Continuity

If continuity is not as specified, replace the switch.

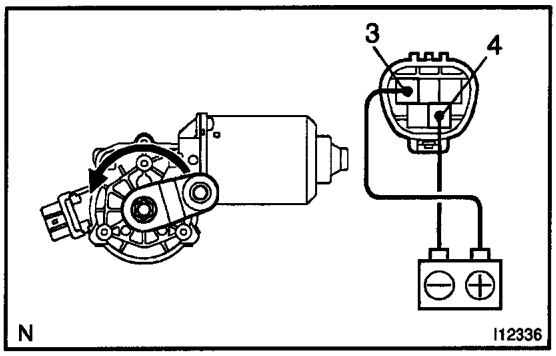


5. LHD models: INSPECT FRONT WIPER MOTOR OPERATION

Low Speed:

Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 4, check that the motor operates at low speed.

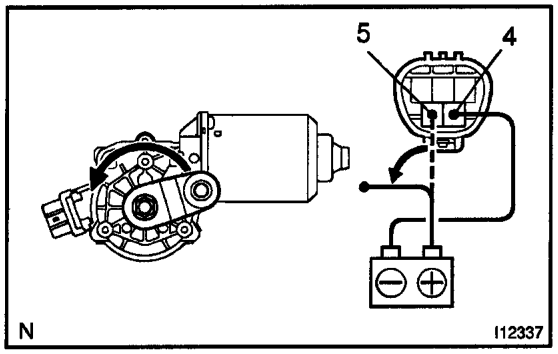
If operation is not as specified, replace the motor.



6. LHD models:
INSPECT FRONT WIPER MOTOR OPERATION
High Speed:

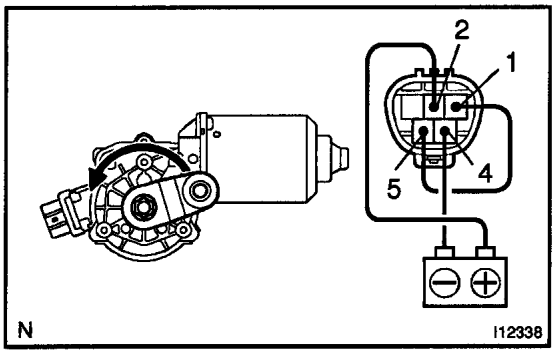
Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 4, check that the motor operates at high speed.

If operation is not as specified, replace the motor.



7. LHD models:
INSPECT FRONT WIPER MOTOR OPERATION
Stopping at Stop Position:

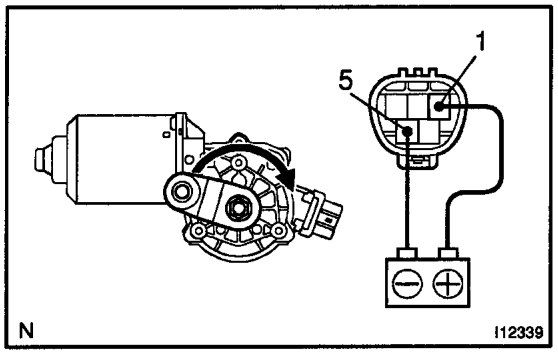
(a) Operate the motor at low speed and stop the motor operation anywhere except at the stop position by disconnecting positive (+) lead from terminal 5.



(b) Connect terminals 1 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.

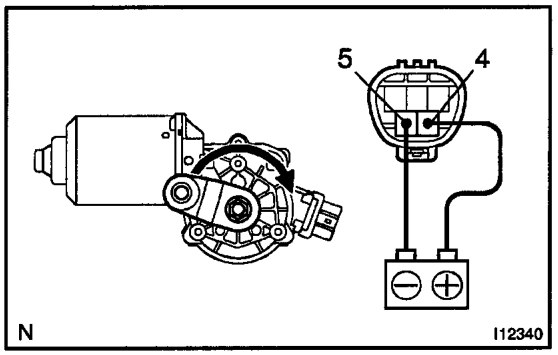
If operation is not as specified, replace the motor.



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.

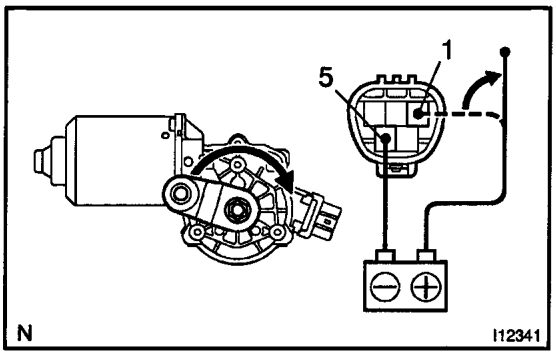
If operation is not as specified, replace the motor.



9. RHD models:
INSPECT FRONT WIPER MOTOR OPERATION
High Speed:

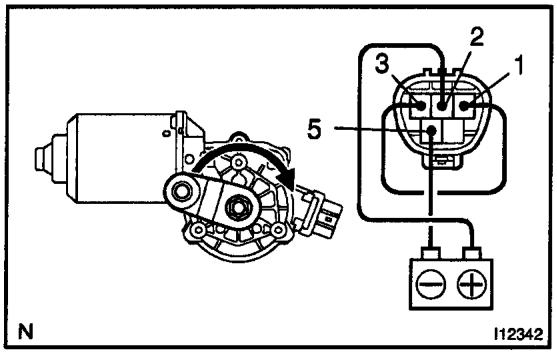
Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5, check that the motor operates at high speed.

If operation is not as specified, replace the motor.



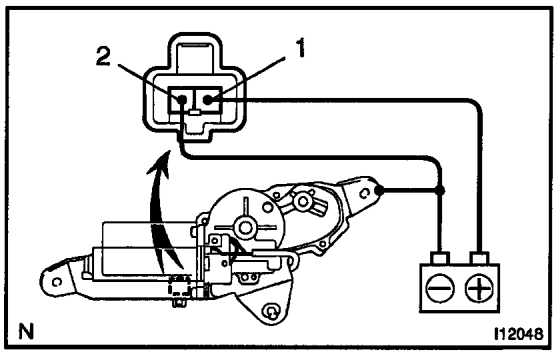
10. RHD models:
INSPECT FRONT WIPER MOTOR OPERATION
Stopping at Stop Position:

(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 3.
(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 operates again.

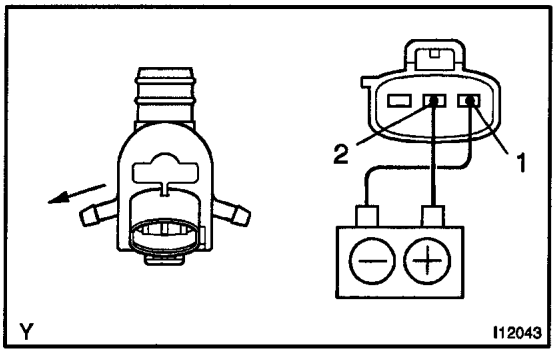
If operation is not as specified, replace the motor.



11. INSPECT REAR WIPER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, check that the motor operates.

If operation is not as specified, replace the motor.



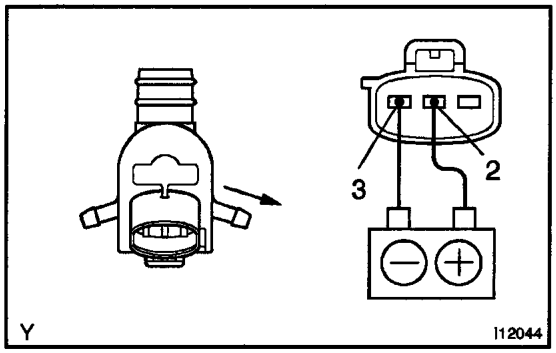
12. INSPECT FRONT WASHER MOTOR OPERATION

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.



13. INSPECT REAR WASHER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 3, check that the motor operates.

NOTICE:

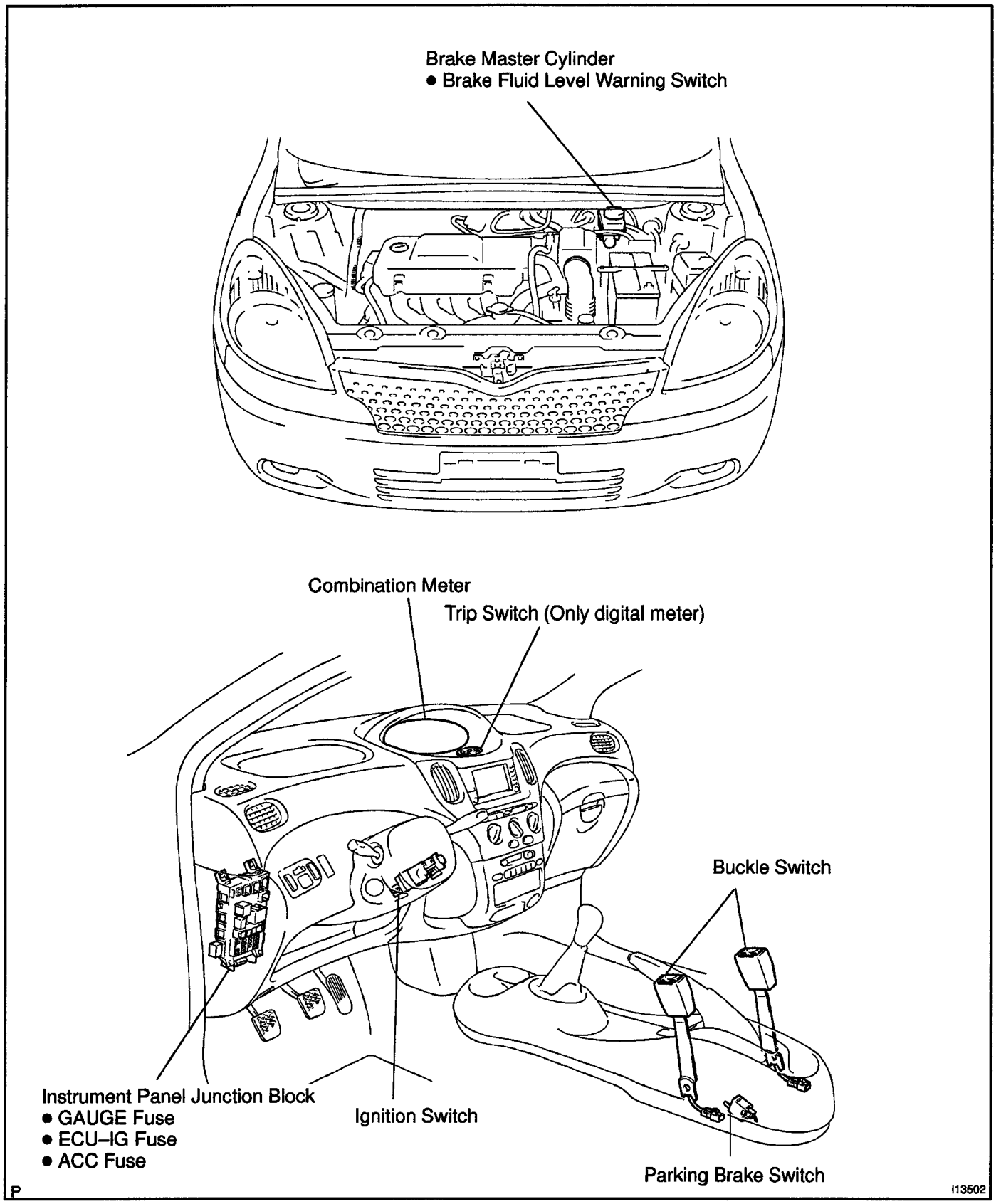
These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

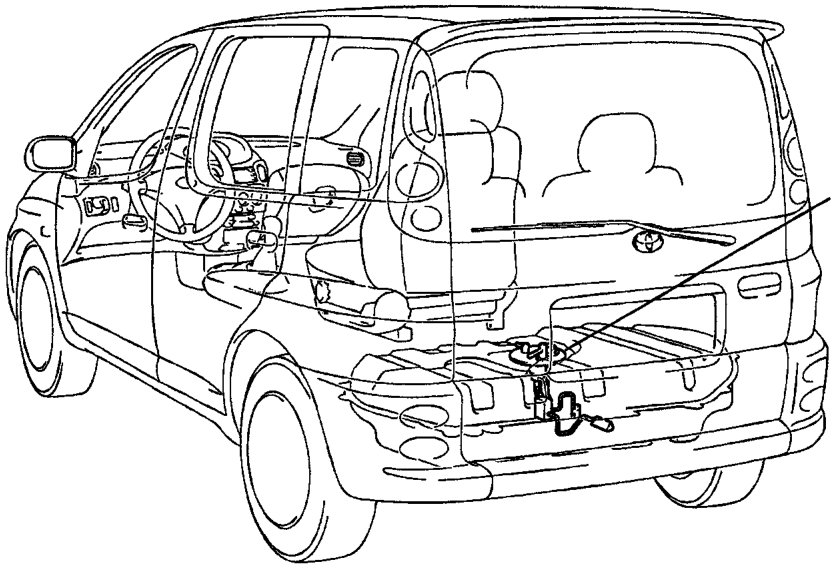
If operation is not as specified, replace the motor.

COMBINATION METER

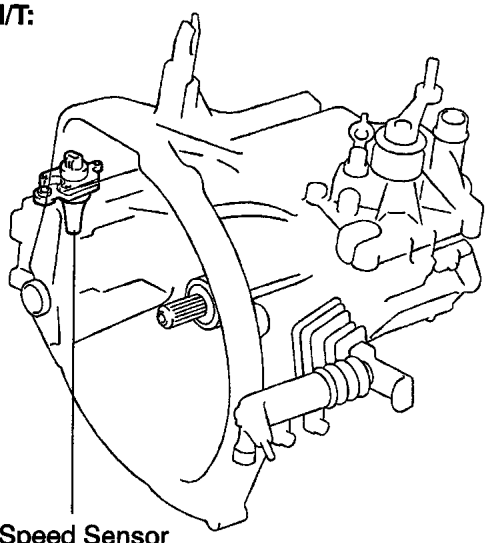
LOCATION

BE180-02

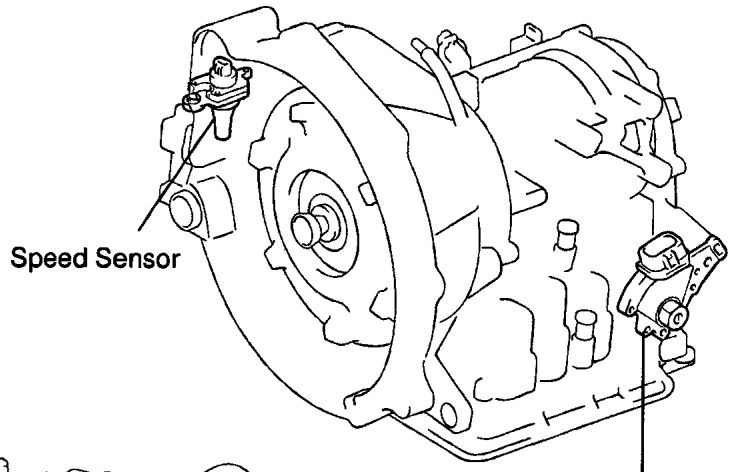


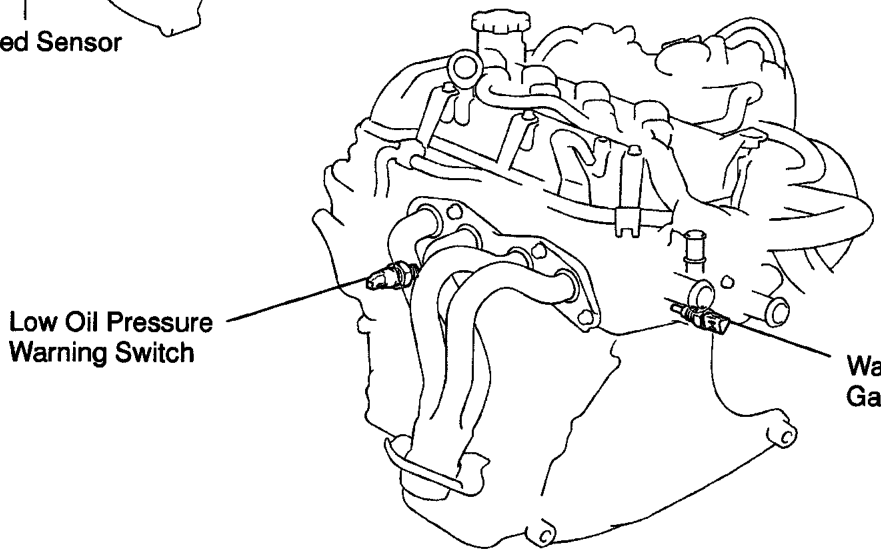


M/T:



A/T:



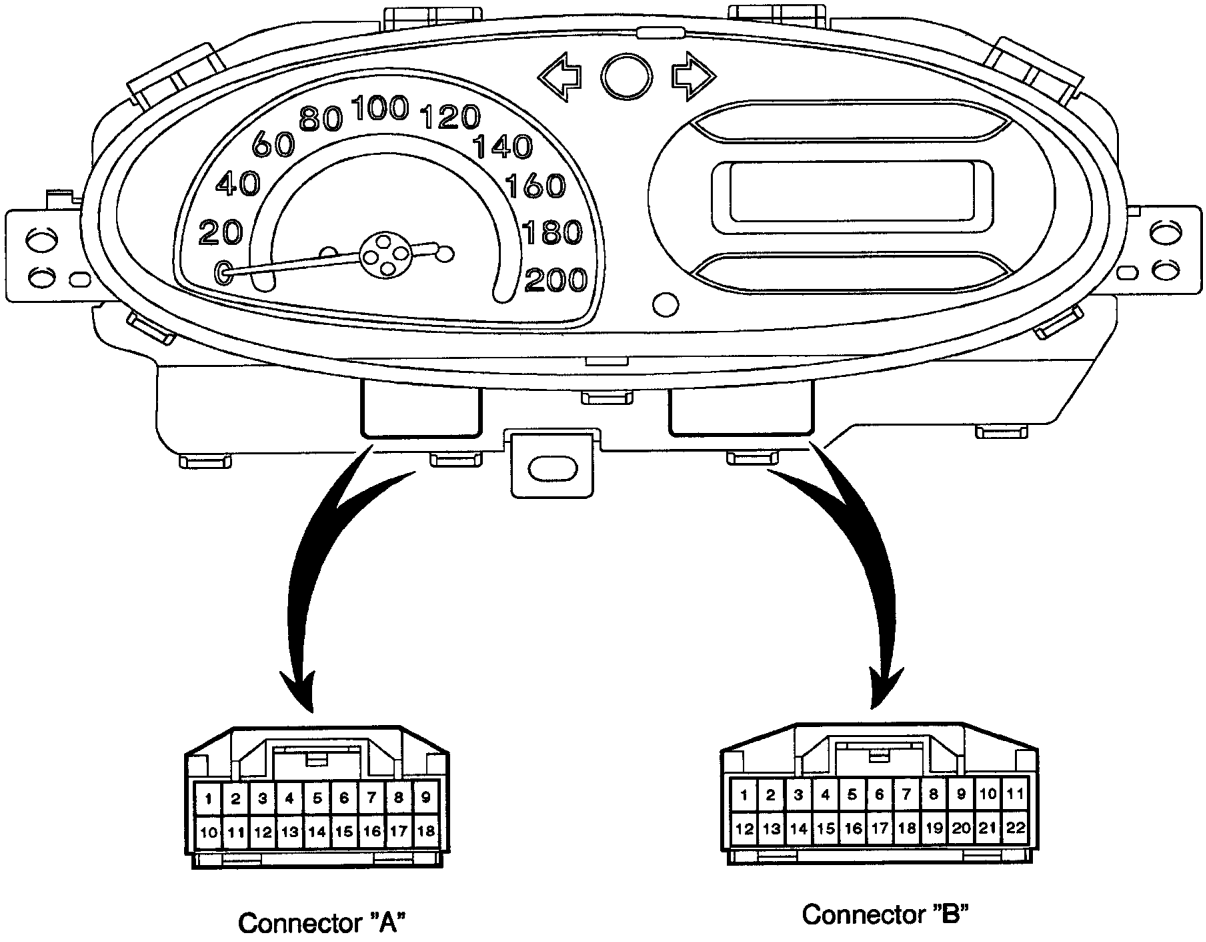


P

I13503

CIRCUIT

Analog meter:



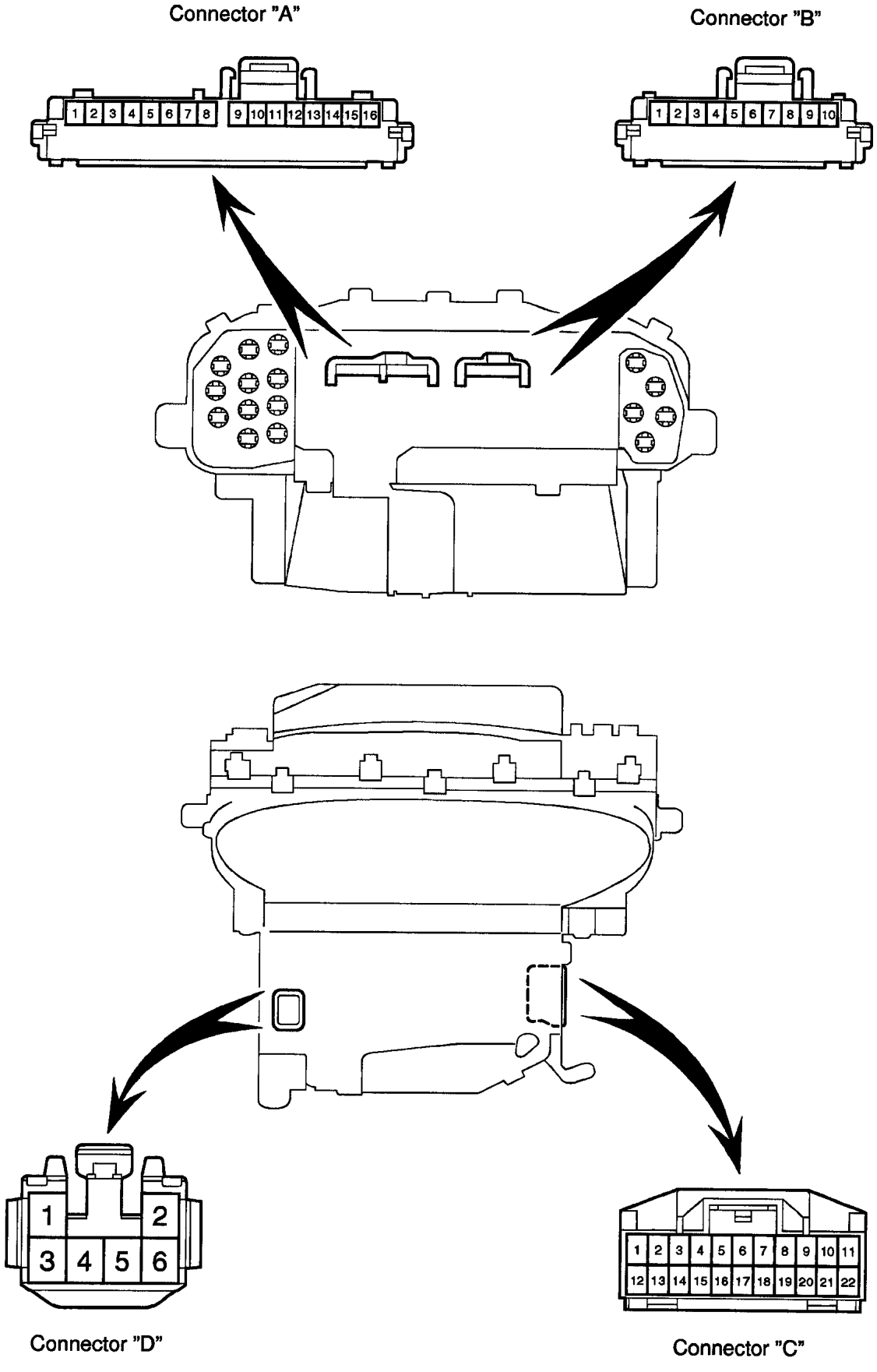
Connector "A"

Connector "B"

N

I14595

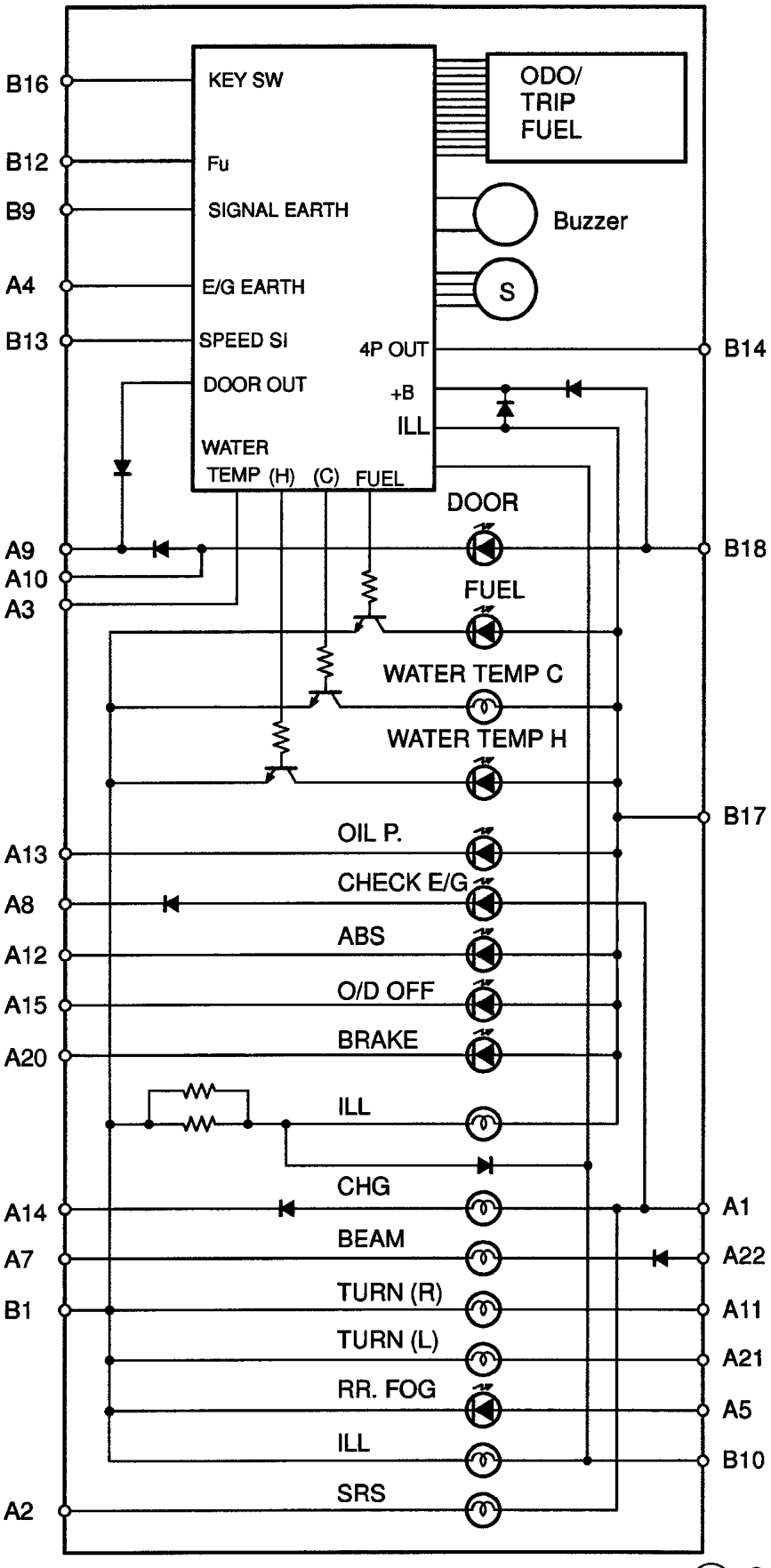
Digital meter:



N

I12071

Analog meter:

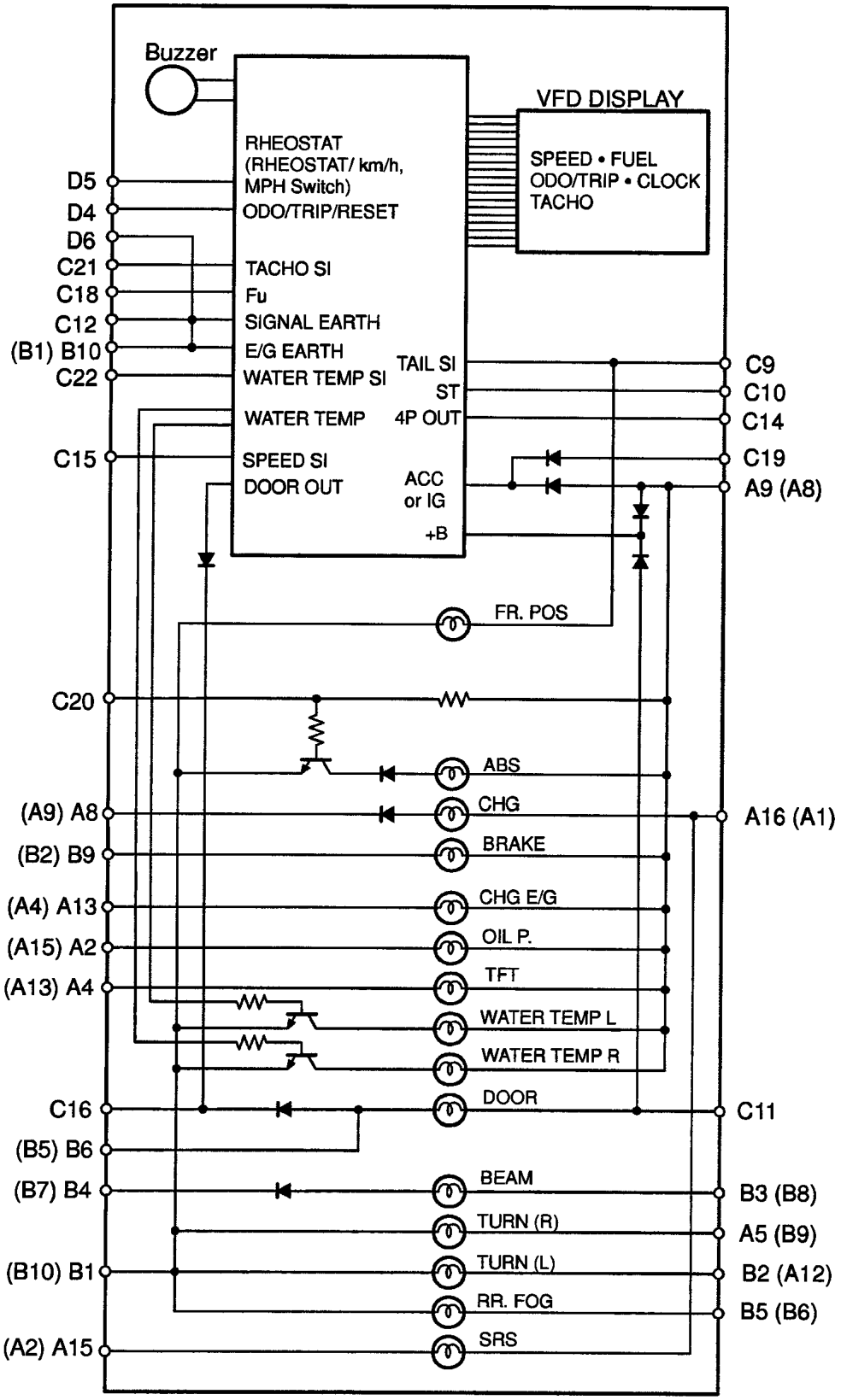


Ⓢ : Speedmeter

P

I14597

Digital meter:



( ): RHD Models

P

I12323

Analog meter:

No.		Wire Harness Side
A	1	IGN Fuse
	2	Airbag Sensor Assembly
	3	Water Temperature Sender Gauge
	4	Ground
	5	Rear Fog Light Switch
	6	–
	7	Headlight Dimmer Switch (w/o D. R. L.) Ground (w/ D. R. L.)
	8	Engine and ECT ECU
	9	Driver Door Courtesy Switch
	10	Except Driver Door Courtesy Switch
	11	Turn Signal Switch (Right)
	12	ABS ECU
	13	Low Oil Pressure Warning Switch
	14	Alternator
	15	O/D off Switch
	16	–
	17	–
	18	–
	19	–
	20	Brake Fluid Level Warning Switch
	21	Turn Signal Switch (Left)
	22	DOME Fuse (w/o D. R. L.) Daytime Running Light Relay (w/ D. R. L.)
B	1	Ground
	2	–
	3	–
	4	–
	5	–
	6	–
	7	–
	8	–
	9	Ground
	10	Light Control Switch
	11	–
	12	Fuel Lever Warning Switch
	13	Vehicle Speed Sensor (SI terminal)
	14	Speed Control Unit
	15	–
	16	–
	17	GAUGE Fuse
	18	DOME Fuse

D. R. L. : Daytime Running Light

Digital meter:

No.		Wire Harness Side
A	2 (15)	Low Oil Pressure Switch
	4 (13)	TFT ECU
	5 (B9)	Turn Signal Switch (Right)
	8 (9)	Alternator
	9 (8)	GAUGE Fuse
	13 (4)	Engine and ECT ECU
	15 (2)	Airbag Sensor Assembly
	16 (1)	IGN Fuse
B	1 (10)	Ground
	2 (A12)	Turn Signal Switch (Left)
	3 (8)	DOME Fuse (w/o D. R. L.) Daytime Running Light Relay (w/ D. R. L.)
	4 (7)	Headlight Dimmer Switch (w/o D. R. L.) Ground (w/ D. R. L.)
	5 (6)	Rear Fog Light Switch
	6 (5)	Except Driver Door Courtesy Switch
	9 (2)	Brake Fluid Level Warning switch
	10 (1)	Ground
C	9	Light Control Switch
	10	Ignition Switch (ST terminal)
	11	DOME Fuse
	12	Ground
	14	Speed Control Unit
	15	Vehicle Speed Sensor (SI terminal)
	16	Driver Door Courtesy Switch
	18	Fuel Sender Gauge
	19	ACC Fuse
	20	ABS ECU
	21	Engine and ECT ECU
	22	Water Temperature Sender Gauge
D	4	Trip Switch (ODO/TRIP/RESET)
	5	Trip Switch (RHEOSTAT) (Trip Switch (RHOSTAT/ km/h, MPH Switch))
	6	Ground

D. R. L. : Daytime Running Light
( ): RHD Models

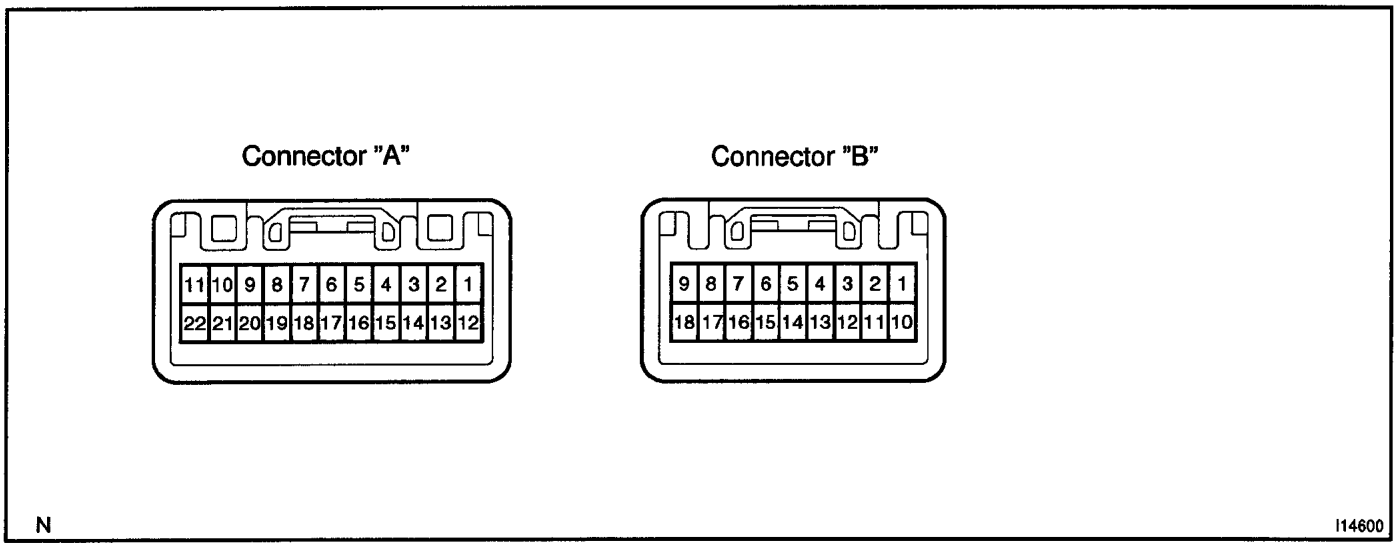
BE1E1–01

INSPECTION

1. INSPECT ANALOG COMBINATION METER CIRCUIT

Connector connected:

Connect the connector "A" and "B" to the combination meter and inspect the wire harness side connectors from the back side as shown in the table.



Tester connection	Condition	Specified condition
A1 – Ground	Ignition switch OFF	No voltage
A1 – Ground	Ignition switch ON	Battery voltage
A2 – Ground	Ignition switch ON and SRS indicator light light up	No voltage
A2 – Ground	Ignition switch ON and SRS indicator does not light up	Battery voltage
A3 – Ground	Ignition switch ON and water temperature warning light light up	No voltage
A3 – Ground	Ignition switch ON and water temperature warning light does not light up	Battery voltage
A4 – Ground	Constant	Continuity
A7 – Ground *2	Constant	Continuity
A9 – Ground	Ignition switch ON and driver door is opened	No voltage
A9 – Ground	Ignition switch ON and driver door is closed	Battery voltage
A10 – Ground	Ignition switch ON and except driver door is opened	No voltage
A10 – Ground	Ignition switch ON and except driver door is closed	Battery voltage
A11 – Ground	Ignition switch ON and turn signal switch OFF or LEFT	No voltage
A11 – Ground	Ignition switch ON and turn signal switch RIGHT	Battery voltage
A12 – Ground	Ignition switch ON and ABS is error	No voltage
A12 – Ground	Ignition switch ON and ABS is normal	Battery voltage
A13 – Ground	Ignition switch ON and engine oil level waning light up	No voltage

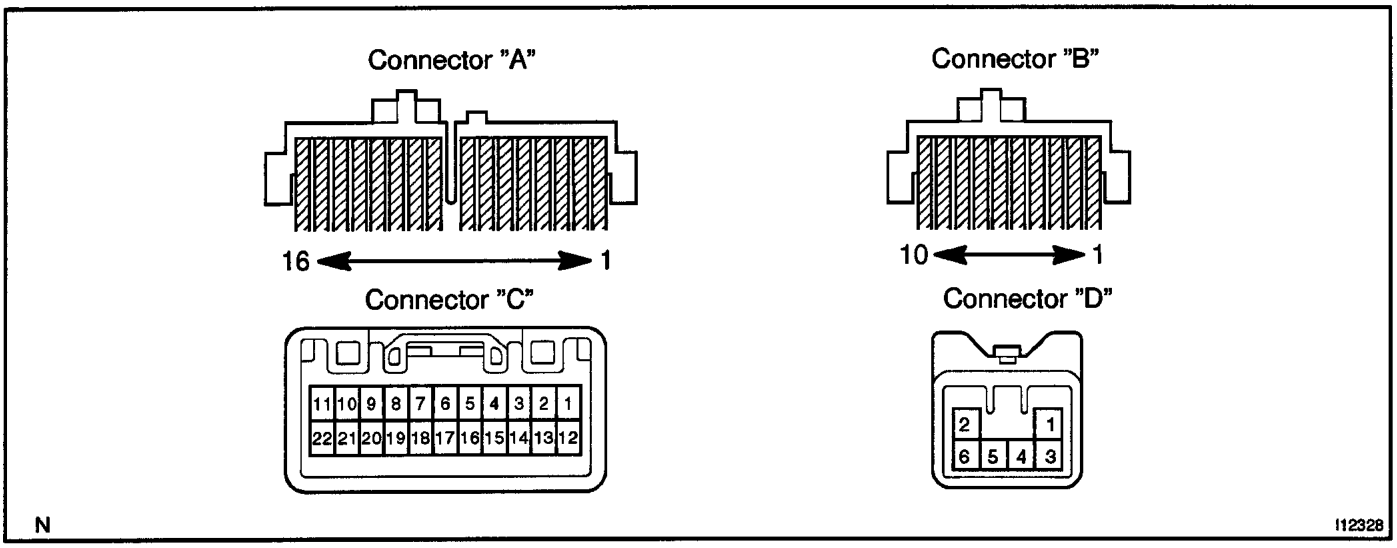
A13 – Ground	Ignition switch ON and engine oil level warning does not light up	Battery voltage
A14 – Ground	Ignition switch ON and engine is stopping	No voltage
A14 – Ground	Ignition switch ON and engine is running	Battery voltage
A15 – Ground	Ignition switch ON and O/D off switch ON	No voltage
A15 – Ground	Ignition switch ON and O/D off switch OFF	Battery voltage
A20 – Ground	Ignition switch ON, parking brake lever is released and brake fluid level warning switch float DOWN	No voltage
A20 – Ground	Ignition switch ON, parking brake lever is released and brake fluid level warning switch float UP	Battery voltage
A21 – Ground	Ignition switch ON and turn signal switch OFF or RIGHT	No voltage
A21 – Ground	Ignition switch ON and turn signal switch LEFT	Battery voltage
B1 – Ground	Constant	Continuity
B9 – Ground	Constant	Continuity
B10 – Ground	Light control switch OFF	No voltage
B10 – Ground	Light control switch TAIL or HEAD	Battery voltage
B13 – Ground	Ignition switch ON and slowly move the wheel	4.5 – 5.5 V
B17 – Ground	Ignition switch OFF	No voltage
B17 – Ground	Ignition switch ACC or ON	Battery voltage
B11 – Ground	Constant	Battery voltage

*1: w/o Daytime running light
*2: w/ Daytime running light
If circuit is not as specified, wiring diagram and inspect the circuits connected to other parts.

2. INSPECT DIGITAL COMBINATION METER CIRCUIT

Connector connected:

Connect the connector "A", "B", "C" and "D" to the combination meter and inspect the wire harness side connectors from the back side as shown in the table.



Tester connection	Condition	Specified condition
A2 (A15) – Ground	Ignition switch ON and engine oil level waning light up	No voltage
A2 (A15) – Ground	Ignition switch ON and engine oil level warning does not light up	Battery voltage
A5 (B9) – Ground	Ignition switch ON and turn signal switch OFF or LEFT	No voltage
A5 (B9) – Ground	Ignition switch ON and turn signal switch RIGHT	Battery voltage
A8 (A9) – Ground	Ignition switch ON and engine is stopping	No voltage
A8 (A9) – Ground	Ignition switch ON and engine is running	Battery voltage
A9 (A8) – Ground	Ignition switch OFF	No voltage
A9 (A8) – Ground	Ignition switch ON	Battery voltage
A13 (A4) – Ground	Ignition switch ON and engine is running	No voltage
A13 (A4) – Ground	Ignition switch ON and engine is stopping	Battery voltage
A15 (A2) – Ground	Ignition switch ON and SRS indicator light light up	No voltage
A15 (A2) – Ground	Ignition switch ON and SRS indicator does not light up	Battery voltage
A16 (A11) – Ground	Ignition switch OFF	No voltage
A16 (A11) – Ground	Ignition switch ON	Battery voltage
B1 – Ground	Constant	Continuity
B2 (A12) – Ground	Ignition switch ON and turn signal switch OFF or RIGHT	No voltage
B2 (A12) – Ground	Ignition switch ON and turn signal switch LEFT	Battery voltage
B4 (B7) – Ground *1	Light control switch OFF	No voltage
B4 (B7) – Ground *1	Light control switch HI	Battery voltage
B4 (B7) – Ground *2	Constant	Continuity

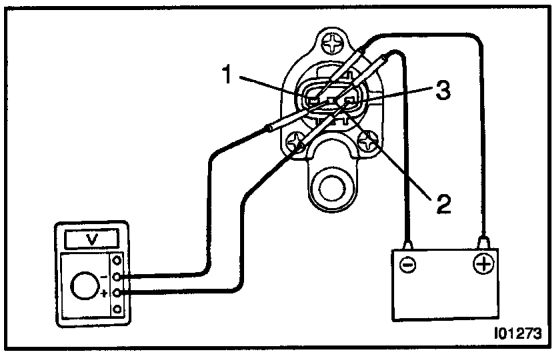
B6 (B5) – Ground	Ignition switch ON and except driver door is opened	No voltage
B6 (B5) – Ground	Ignition switch ON and except driver door is closed	Battery voltage
B9 (B2) – Ground	Ignition switch ON, parking brake lever is released and brake fluid level warning switch float DOWN	No voltage
B9 (B2) – Ground	Ignition switch ON, parking brake lever is released and brake fluid level warning switch float UP	Battery voltage
B10 – Ground	Constant	Continuity
C9 – Ground	Light control switch OFF	No voltage
C9 – Ground	Light control switch TAIL or HEAD	Battery voltage
C10 – Ground	Ignition switch ON	No voltage
C10 – Ground	Ignition switch START	Battery voltage
C11 – Ground	Constant	Battery voltage
C12 – Ground	Constant	Continuity
C14 – Ground	Ignition switch ON and slowly move the wheel	4.5 – 5.5 V
C15 – Ground	Ignition switch ON and slowly move the wheel	Battery voltage
C16 – Ground	Ignition switch ON and driver door is opened	No voltage
C16 – Ground	Ignition switch ON and driver door is closed	Battery voltage
C18 – Ground	Ignition switch ON and fuel sender gauge float UP	0.3 – 0.6 V
C18 – Ground	Ignition switch ON and fuel sender gauge float DOWN	4.9 – 6.9 V
C19 – Ground	Ignition switch OFF	No voltage
C19 – Ground	Ignition switch ACC or ON	Battery voltage
C20 – Ground	Ignition switch ON and ABS is error	No voltage
C20 – Ground	Ignition switch ON and ABS is normal	Battery voltage
C21 – Ground	Ignition switch ON and engine is running	No voltage
C21 – Ground	Ignition switch ON and engine is stopping	Battery voltage
C22 – Ground	Ignition switch ON and Water temperature warning light light up	No voltage
C22 – Ground	Ignition switch ON and Water temperature warning light does not light up	Battery voltage
D4 – Ground	Ignition switch ON and trip switch (ODO/TRIP) OFF	4.5 – 5.5 V
D4 – Ground	Ignition switch ON and trip switch (ODO/TRIP) ON	No voltage
D5 – Ground	Ignition switch ON and trip switch (RHEOSTAT) OFF	4.5 – 5.5 V
D5 – Ground	Ignition switch ON and trip switch (RHEOSTAT) ON	No voltage
D6 – Ground	Constant	Continuity

( ): RHD Models
*1: w/o Daytime running light
*2: w/ Daytime running light
If circuit is not as specified, wiring diagram and inspect the circuits connected to other parts.

3. 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.

(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



4. 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 there is voltage change from approx. 0 V to 11 V or more between terminals 2 and 3.

HINT:
The voltage change should be 4 times for every revolution of the speed sensor shaft.
If operation is not as specified, replace the sensor.

5. INSPECT TACHOMETER/ ON–VEHICLE

(a) Connect a tune–up test tachometer, and start the engine.

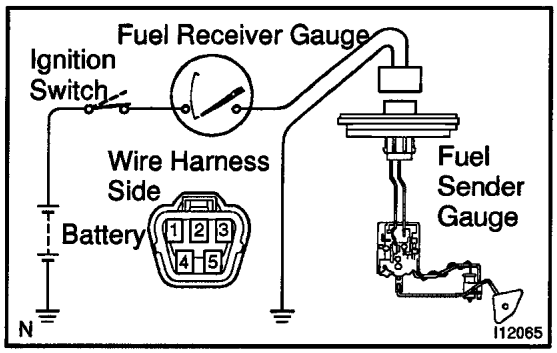
NOTICE:

- **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)

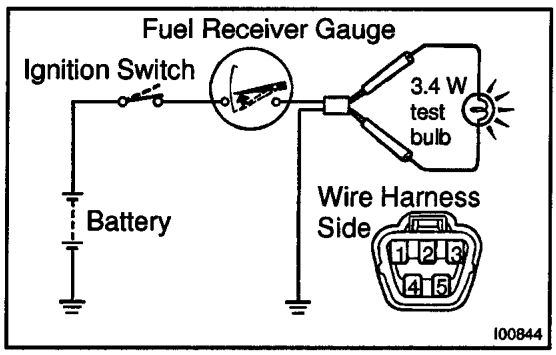
Standard indication	Allowable range
1,000	970 – 1,030
2,000	1,940 – 2,060
3,000	2,910 – 3,090
4,000	3,880 – 4,120
5,000	4,850 – 5,150
6,000	5,820 – 6,180
7,000	6,790 – 7,210



6. 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.



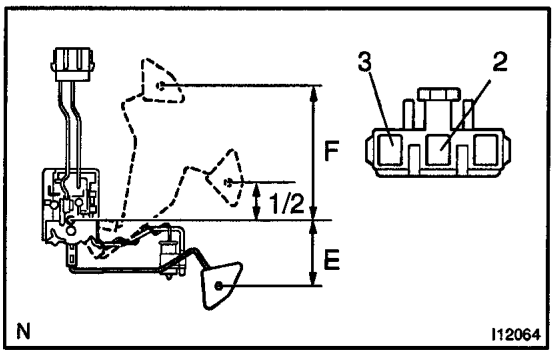
(c) Connect terminals 2 and 3 on the wire harness side connector through a 3.4 W test bulb.

(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.

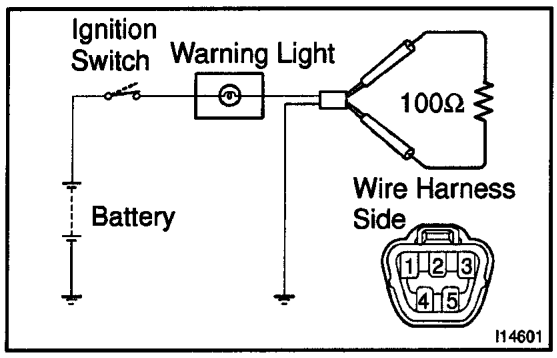


7. INSPECT FUEL SENDER GAUGE RESISTANCE

Measure the resistance between terminals 2 and 3 for each float position.

Float position mm (in.)	Resistance (Ω)
F: Approx. 92.0 (3.62) ± 3 (0.12)	Approx. 4.0 ± 0.5
1/2: Approx. 25.4 (1.00)	Approx. 55.0 ± 1.5
E: Approx. 46.6 (1.84) ± 3 (0.12)	Approx. 107.0 ± 2.5

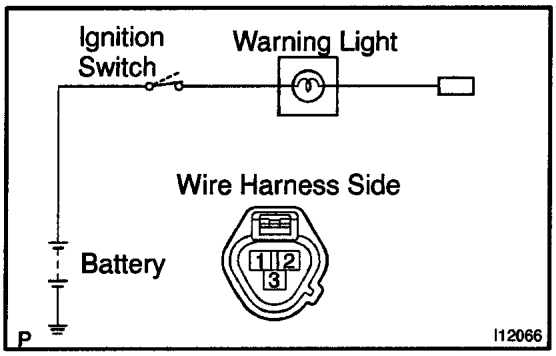
If resistance value is not as specified, replace the sender gauge.



8. INSPECT FUEL LEVEL WARNING LIGHT

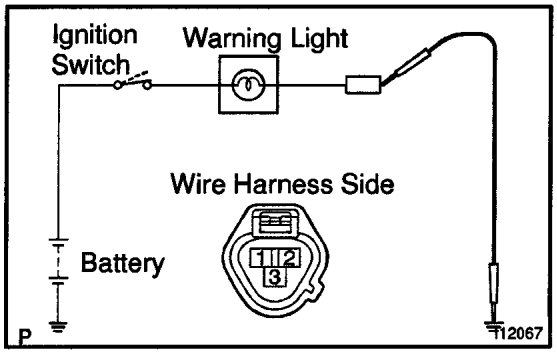
(a) Disconnect the connector from the sender gauge.
(b) Connect terminals 2 and 3 on the wire harness side connector.
(c) Turn the ignition switch ON, check that the warning light lights up.

HINT:
If the warning light does not light up, test the bulb or inspect wire harness.



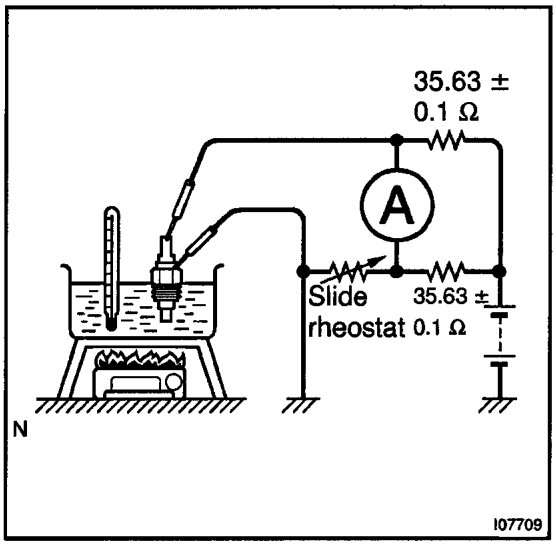
9. INSPECT WATER TEMPERATURE RECEIVER GAUGE WARNING LIGHT

(a) Disconnect the connector from the sender gauge.
(b) Turn the ignition switch ON and check that the COOL warning light lights up.



(c) Ground terminal 2 on the wire harness side, and check that the HOT warning light lights up.

If operation is as specified, replace the sender gauge.
Then recheck the system.
If operation is not as specified, measure the receiver gauge resistance.

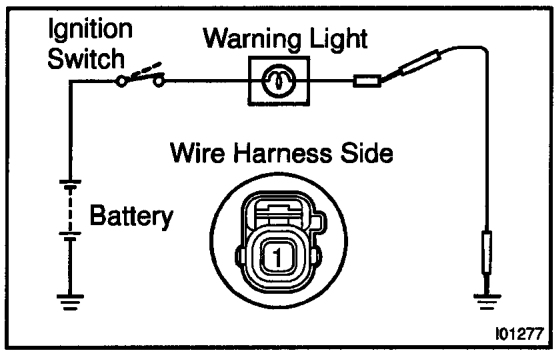


10. INSPECT WATER TEMPERATURE SENDER GAUGE RESISTANCE

Connect the wire harness as shown in the illustration, and adjust the ammeter pointer to indicate "0" using the slide rheostat, then read the rheostat indication.

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 water temperature sender gauge.

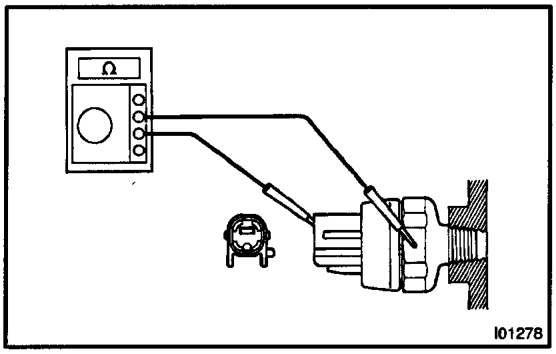


11. INSPECT LOW OIL PRESSURE WARNING LIGHT

(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.

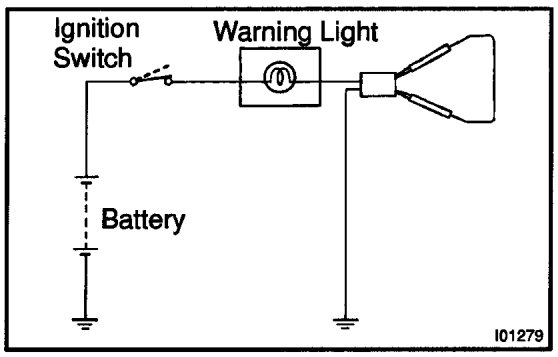
(b) Check that continuity exists between terminal and ground with the engine stopped.

(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. INSPECT BRAKE WARNING LIGHT

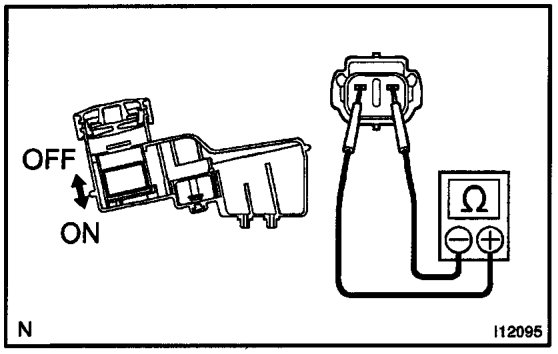
(a) Disconnect the connector from the brake fluid warning switch.

(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. INSPECT BRAKE FLUID LEVEL WARNING SWITCH CONTINUITY

(a) Remove the reservoir tank cap and strainer.

(b) Disconnect the connector.

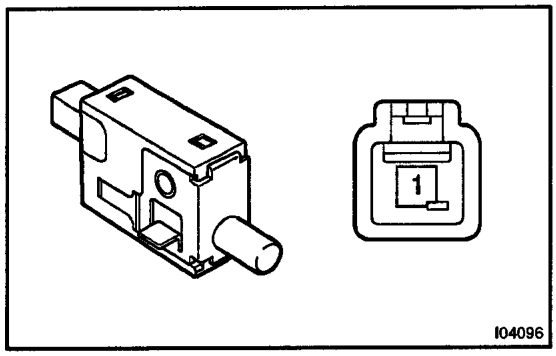
(c) Check that no continuity exists between the terminals with the switch OFF (float up).

(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.

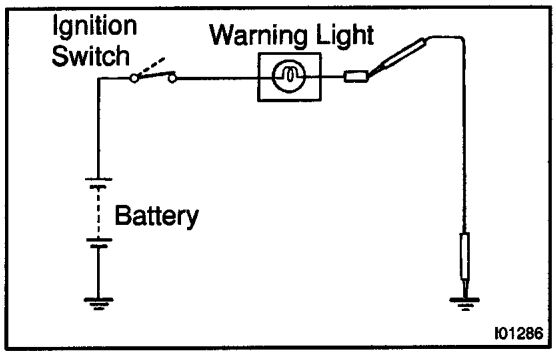


15. INSPECT PARKING BRAKE SWITCH CONTINUITY

(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).

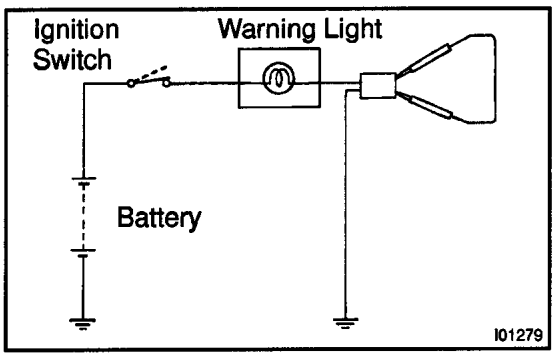
If operation is not as specified, replace the switch or inspect ground point.



16. 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.

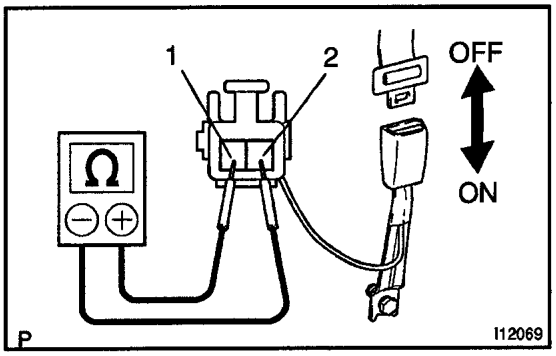


17. INSPECT SEAT BELT WARNING LIGHT

(a) Disconnect the connector from the buckle 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, inspect the bulb or wire harness.

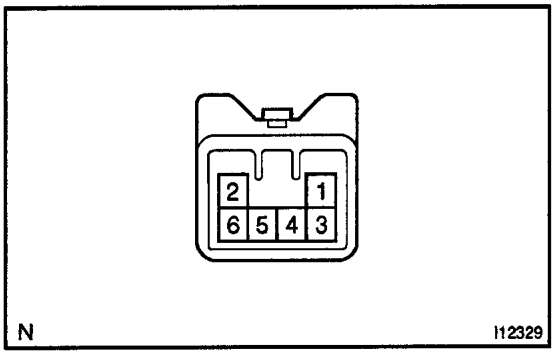


18. INSPECT BUCKLE SWITCH CONTINUITY

(a) Check that continuity exists between the terminals on the switch side connector with the switch ON (belt fastened).

(b) Check that no continuity exists between the terminals on the switch side connector with the switch OFF (belt unfastened).

If operation is not as specified, replace the seat belt inner belt.



19. Digital models (w/o Digital clock): INSPECT TRIP SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
ODO/TRIP	3 – 5	Continuity
RHEOSTAT	3 – 4	Continuity

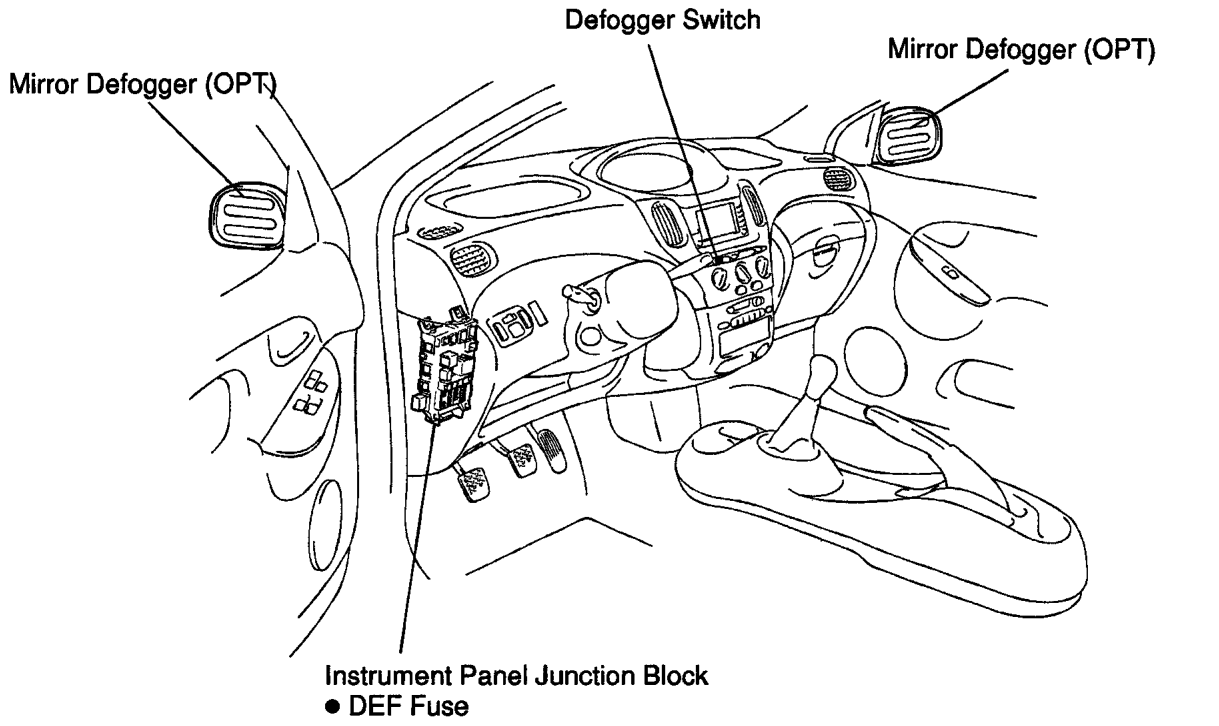
If continuity is not as specified, replace the switch.

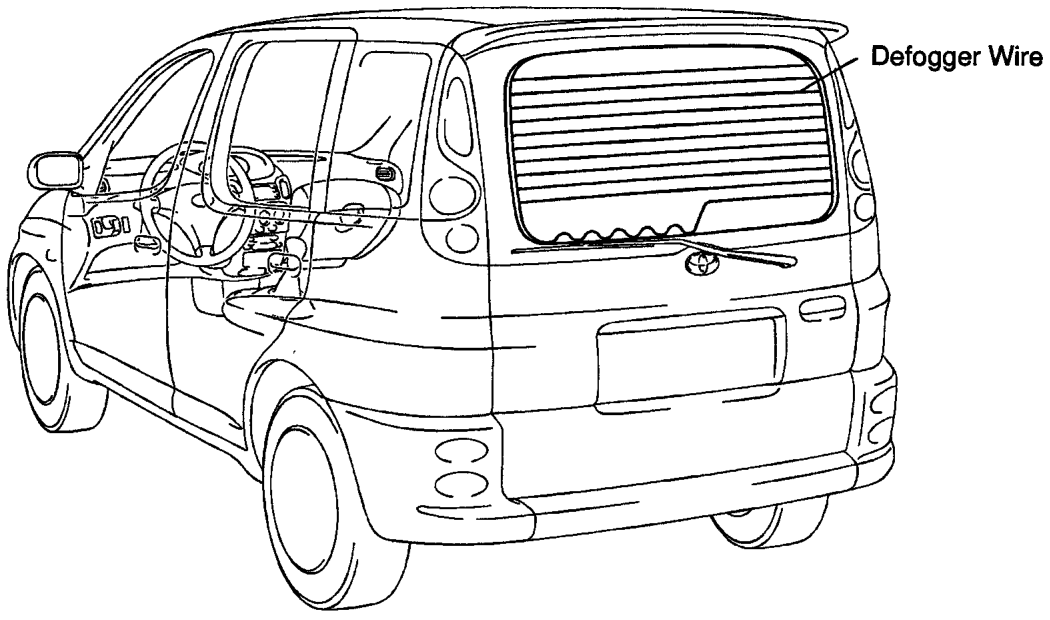
If continuity is not as specified, replace the switch.

DEFOGGER SYSTEM

LOCATION

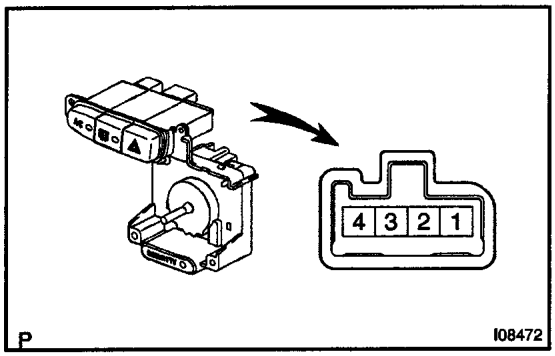
BE18R-02





P

I13504



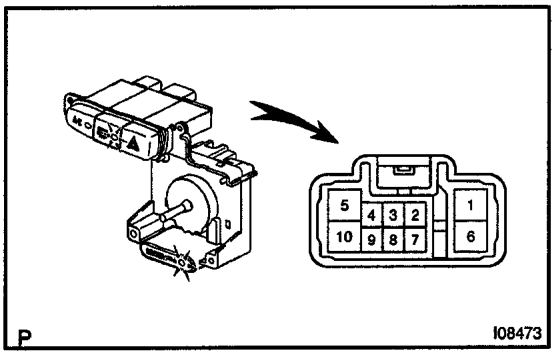
BE1BS-02

INSPECTION

1. INSPECT DEFOGGER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Switch OFF	–	No continuity
Switch ON	3 – 4	Continuity

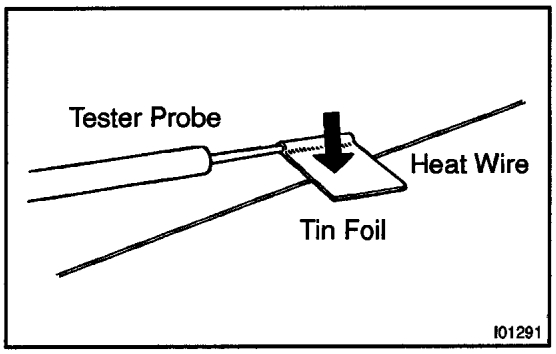
If continuity is not as specified, replace the switch.



2. INSPECT CENTER CLUSTER SWITCH ASSEMBLY ILLUMINATION

Switch position	Tester connection	Specified condition
Illumination circuit	1 – 4	Continuity

If continuity is not as specified, replace the switch.



3. INSPECT DEFOGGER WIRE

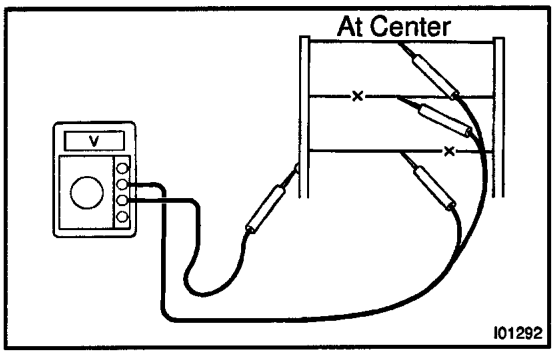
NOTICE:

- **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, wind 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

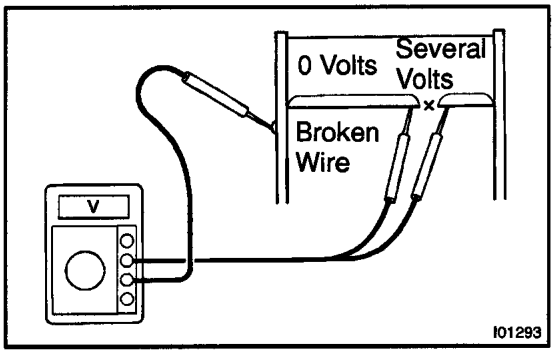
HINT:

If there is approximately 10 V, 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.

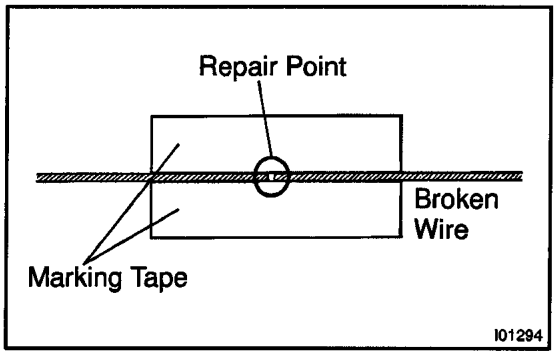
(d) Place the voltmeter positive (+) lead against the defogger positive (+) terminal.

(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 increases to about 12 V as the meter probe is moved to the other end.

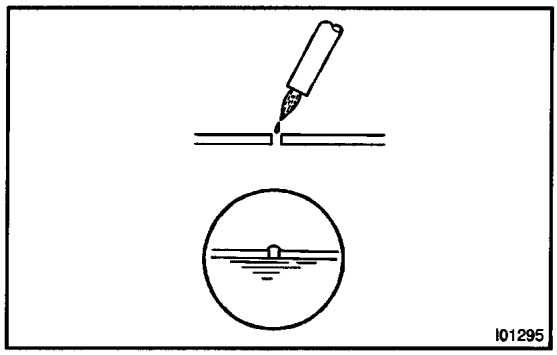


4. IF NECESSARY, REPAIR DEFOGGER WIRE

(a) Clean the broken wire tips with grease, wax and silicone remover.

(b) Place the masking tape along both sides of the wire for repair.

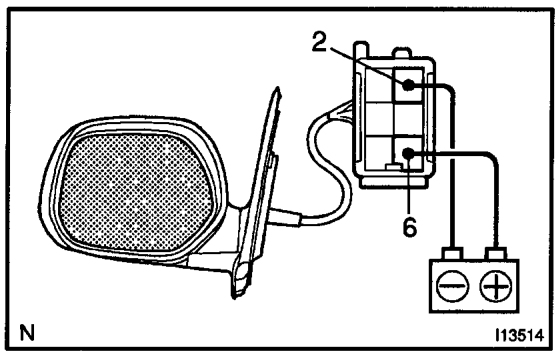
(c) Thoroughly mix the repair agent (Dupont paste No. 4817).



(d) Using a fine tip brush, apply a small amount of the agent to the wire.

(e) After a few minutes, remove the masking tape.

(f) Do not repair the defogger wire for at least 24 hours.



5. w/ Mirror heater:
INSPECT MIRROR DEFOGGER OPERATION

(a) Connect the positive (+) lead from the battery to terminal 6 and the negative (–) lead to terminal 2.

(b) Check that the mirror becomes warm.

HINT:
It will take a short time for the mirror to become warm.

POWER WINDOW CONTROL SYSTEM

TROUBLESHOOTING

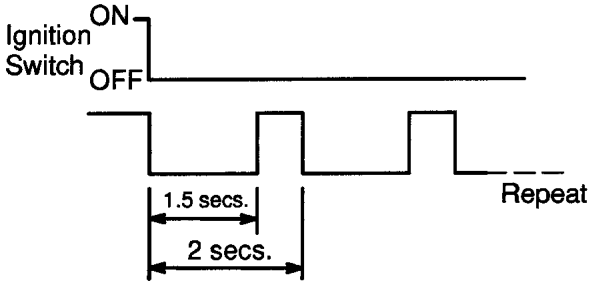
BE1EK-01

1	One touch power window does not move up and down.

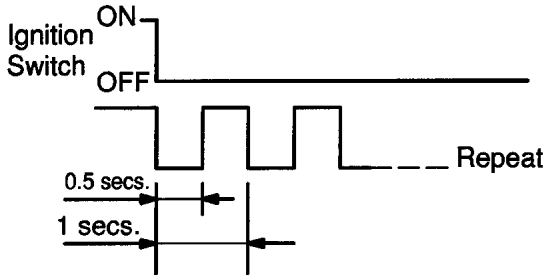
After turning the ignition switch ON and power window switch UP or DOWN check that the master and regulator switch AUTO light blinks.

- Error is classified into the following 3 types according to the way of blinking.

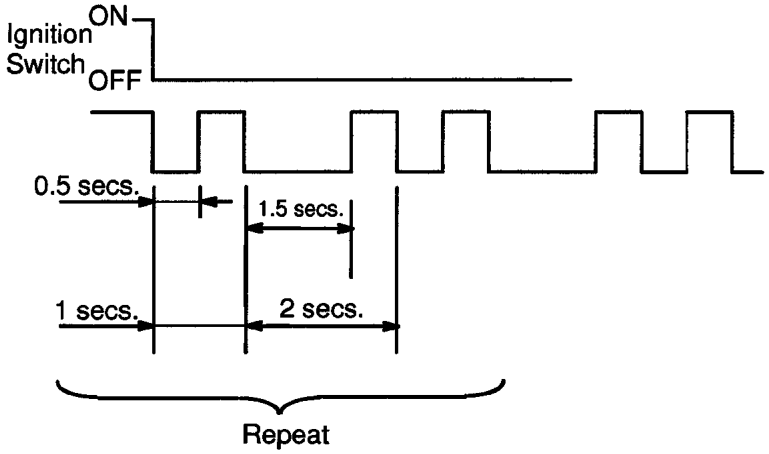
① Limit switch error



② Pulse sensor error



③ Limit switch/Pulse sensor synchronize error



< Reference > • When the ignition switch is turned OFF after the AUTO light starts blinking, the blinking will stop 43 sec. later.
• When the ignition switch is turned ON after that, the AUTO light will start blinking again.

blinks in the ① way

Remove the master switch.
(Connector connection condition)

When the fully closed driver's door is opened, does the voltage between terminal and terminal of master switch change from 0 V to 10 ~ 14 V?

Yes

CONTINUED ON NEXT PAGE

No

blinks in the ② or ③ way

No

Master switch defective

Disconnect the connecters of master switch and driver's power window motor.

CONTINUED ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

Master switch defective

CONTINUED FROM PREVIOUS PAGE

Does continuity exist between connector terminals on the vehicle side?

Master switch side ↔ Motor side
7 (*1) terminal (PLS) ↔ 6 terminal
6 (*8) terminal (LMT) ↔ 2 terminal
5 (*10) terminal (SGND) ↔ 5 terminal

No → Wire harness defective (open)

Yes

Does continuity exist between 7 (*1), 6 (*8) and, 5 (*10) terminals on the master switch side or 2, 5 and 6 terminals on the motor side and body ground?

Yes → Wire harness defective (short)

No

Connect the connector of power window motor.

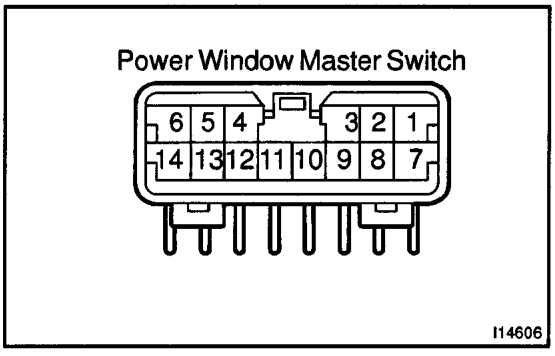
Connect the normal master switch, do AUTO UP and AUTO DOWN operations work?

Yes

No

Power window motor defective.

* : w/o Rear power window



2 During AUTO UP operation, the power window moves down.

When operating AUTO UP with the ignition switch ON, is there a cause of increasing friction resistance at the inverse position?
- Yes → Disassemble the door and repair or replace the applicable part.
- No ↓

Remove the power window regulator assembly. ↓

Does the window operate smoothly when moving the window up manually after assembling?
- No → Check and replace door glass run.
- Yes ↓

Remove the power window motor from the power window regulator assembly. ↓

When operating the power window regulator manually, does the regulator move smoothly? Are gears not damaged?
- No → Power window regulator defective.
- Yes ↓

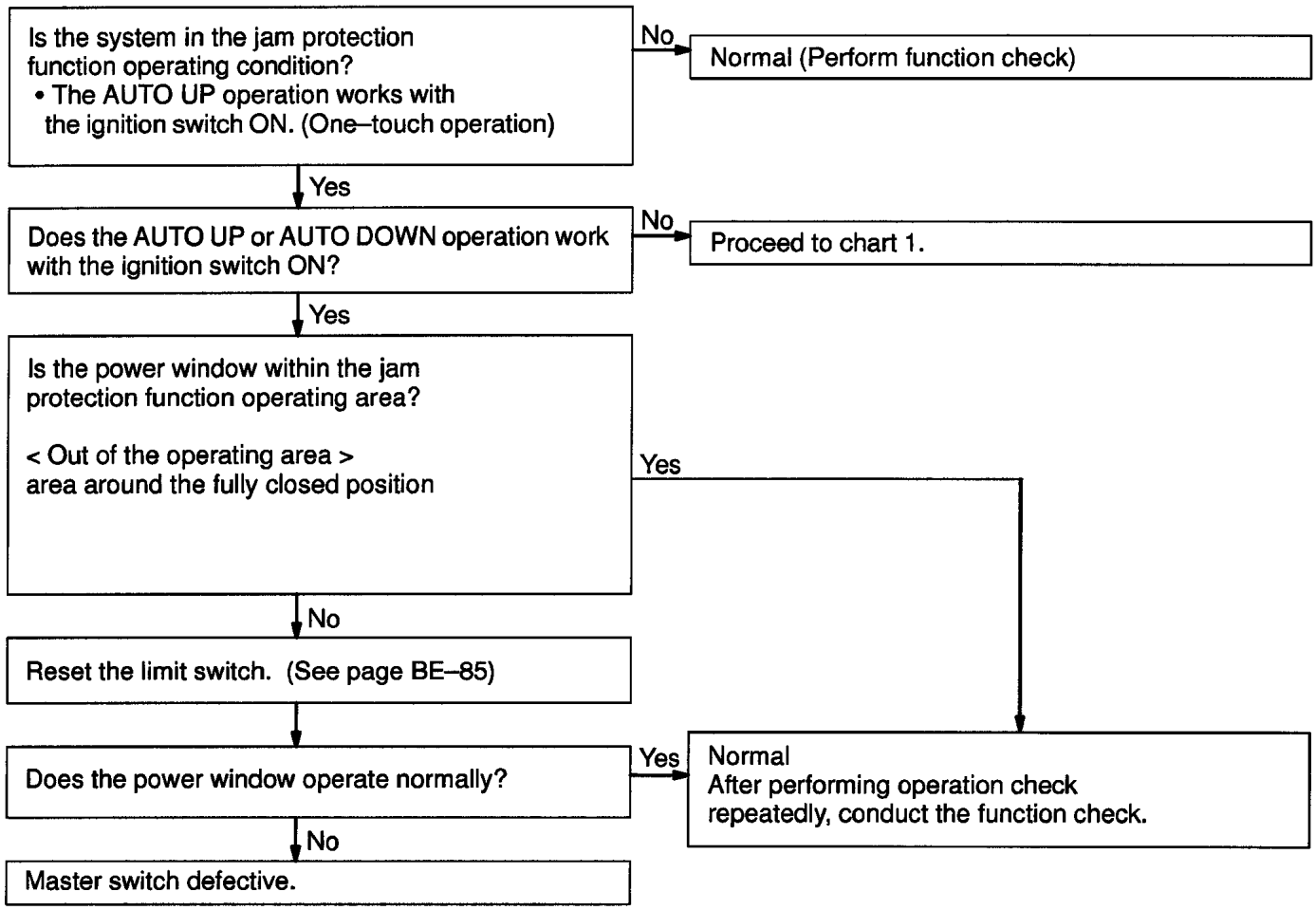
Does window motor rotate smoothly?
- No → Power window motor defective.
- Yes ↓

Reset the limit switch. (See page BE–85) ↓

Does the window move normally?
- Yes → Normal (Check the function.)
- No ↓

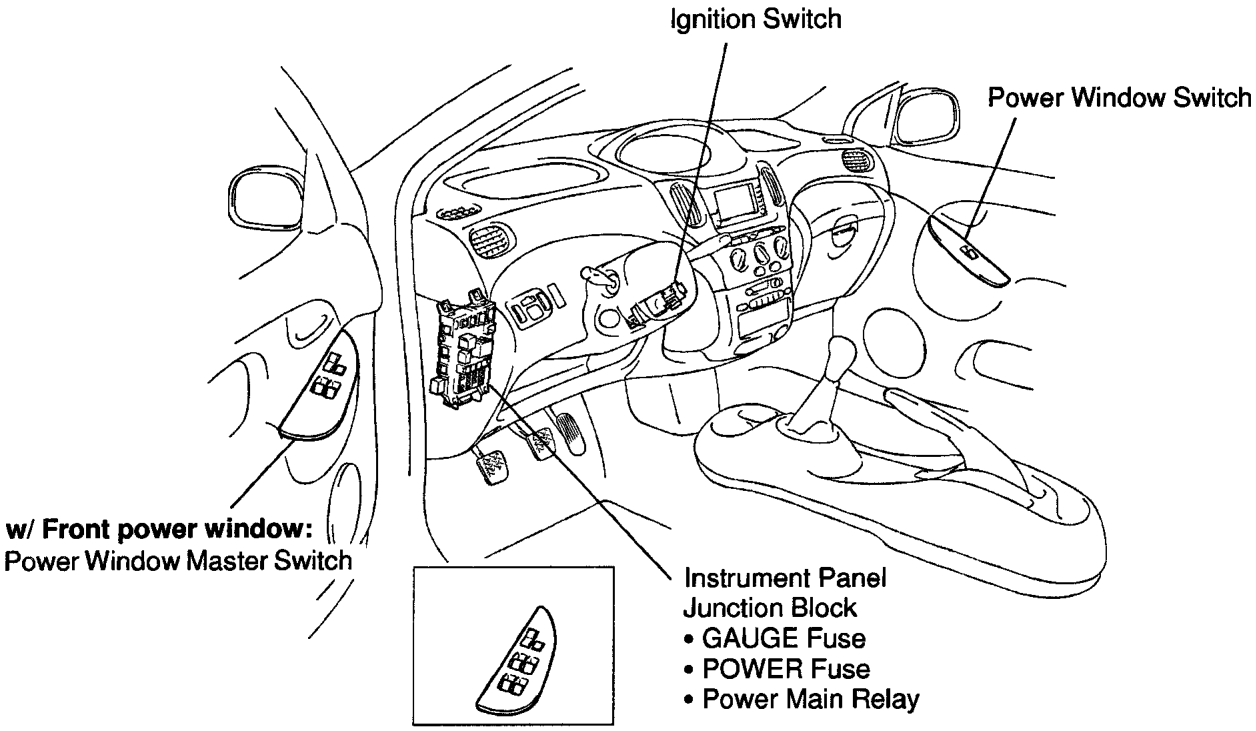
Master switch defective.

3	**The DOWN function does not work though some other objects are caught in the power window glass.**

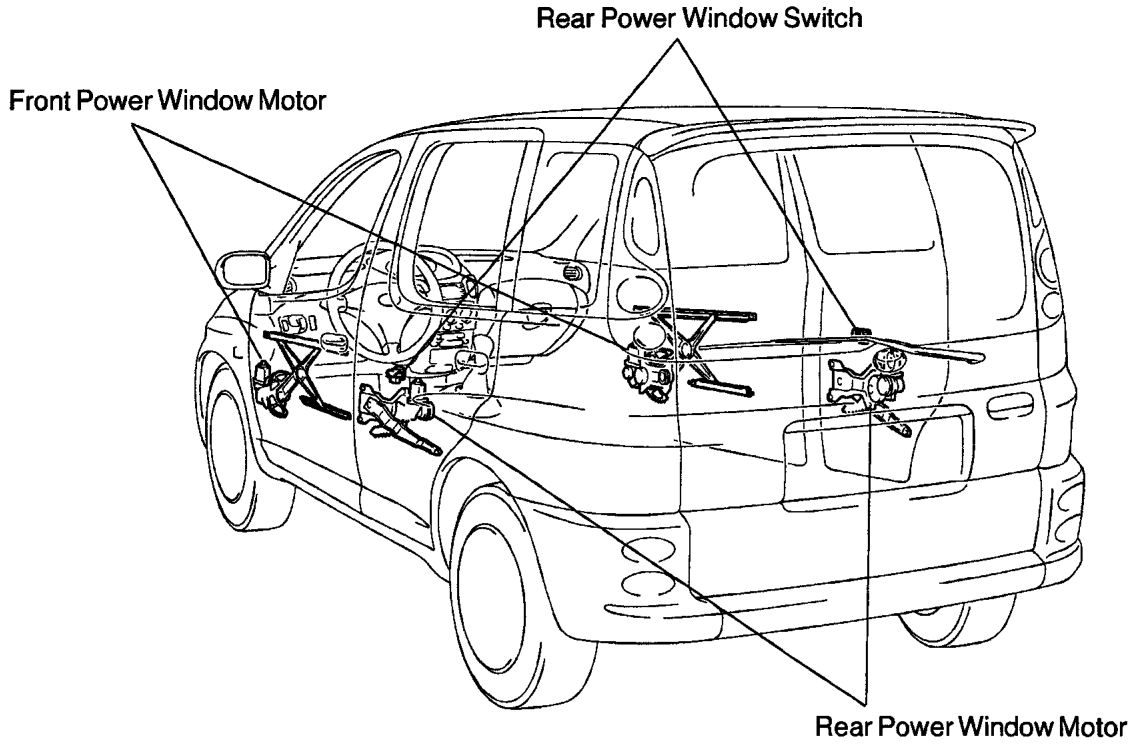


BE18T–02

LOCATION



w/ Front and rear power window:

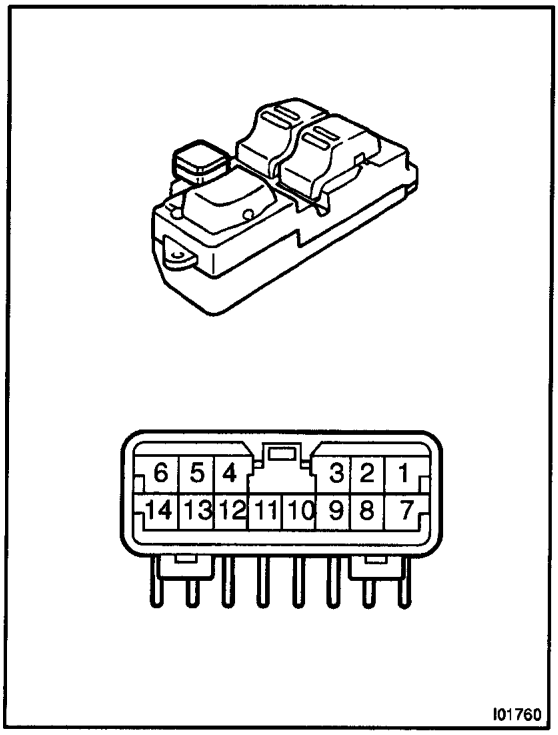


P

I13505

BE1E3-01

INSPECTION



1. LHD models (w/ Front power window): INSPECT POWER WINDOW MASTER SWITCH CONTINUITY

Driver's switch :

Switch position	Tester connection	Specified condition
UP AUTO/UP	4 – 6 3 – 5	Continuity
OFF	3 – 5 3 – 4	Continuity
DOWN	3 – 4 5 – 6	Continuity

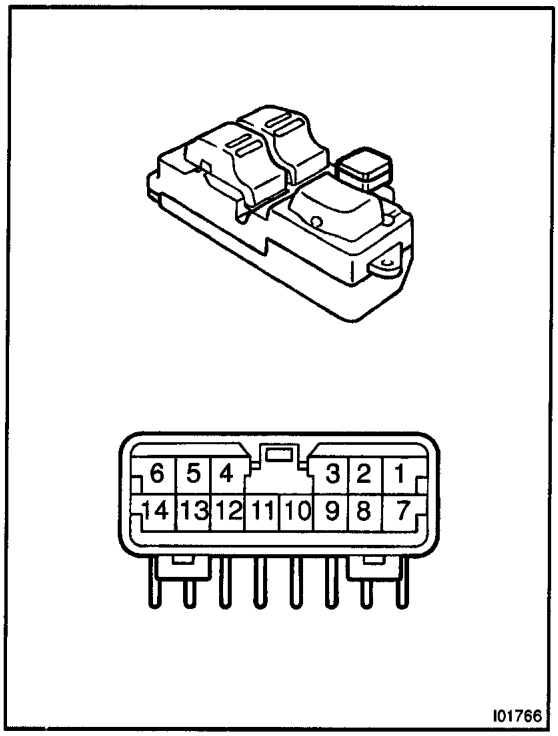
Passenger's switch (Window unlock) :

Switch position	Tester connection	Specified condition
UP	12 – 13 3 – 14	Continuity
OFF	3 – 12 3 – 14	Continuity
DOWN	13 – 14 3 – 12	Continuity

Passenger's switch (Window lock) :

Switch position	Tester connection	Specified condition
UP	12– 13	Continuity
OFF	12 – 14	Continuity
DOWN	13 – 14	Continuity

If continuity is not as specified, replace the switch.



2. RHD models (w/ Front and rear power window): INSPECT POWER WINDOW MASTER SWITCH CONTINUITY

Driver's switch :

Switch position	Tester connection	Specified condition
UP AUTO/UP	1 – 3 2 – 4	Continuity
OFF	3 – 4 2 – 4	Continuity
DOWN AUTO/DOWN	1 – 2 3 – 4	Continuity

Passenger's switch (Window unlock) :

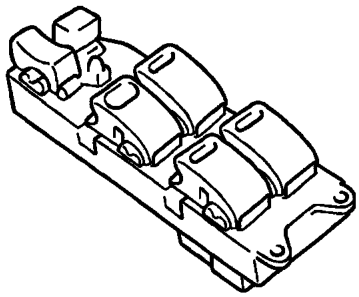
Switch position	Tester connection	Specified condition
UP	4 – 7 8 – 9	Continuity
OFF	4 – 9 4 – 7	Continuity
DOWN	4 – 9 7 – 8	Continuity

Passenger's switch (Window lock) :

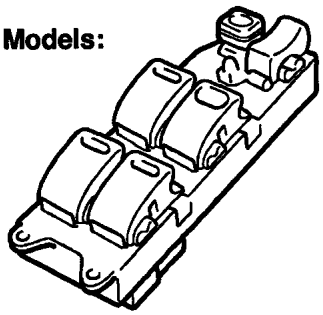
Switch position	Tester connection	Specified condition
UP	8 – 9	Continuity
OFF	7 – 9	Continuity
DOWN	7 – 8	Continuity

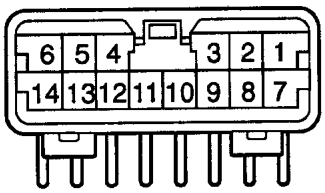
If continuity is not as specified, replace the switch.

LHD Models:



RHD Models:





I01754

3. w/ Front and rear power window :
INSPECT POWER WINDOW MASTER SWITCH CONTINUITY

Front driver's switch :

Switch position	Tester connection	Specified condition
UP AUTO/UP	1 – 3, 2 – 4	Continuity
OFF	1 – 4, 2 – 4	Continuity
DOWN	2 – 3, 1 – 4	Continuity

Front passenger's switch (Window unlock) :

Switch position	Tester connection	Specified condition
UP	4 – 8 7 – 10	Continuity
OFF	4 – 7 4 – 8	Continuity
DOWN	8 – 10 4 – 7	Continuity

Front passenger's switch (Window lock) :

Switch position	Tester connection	Specified condition
UP	7 – 10	Continuity
OFF	7 – 8	Continuity
DOWN	8 – 10	Continuity

Rear left switch (Window unlock) :

Switch position	Tester connection	Specified condition
UP	9 – 10 4 – 11	Continuity
OFF	4 – 9 4 – 11	Continuity
DOWN	10 – 11 4 – 9	Continuity

Rear left switch (Window lock) :

Switch position	Tester connection	Specified condition
UP	9 – 10	Continuity
OFF	9 – 11	Continuity
DOWN	10 – 11	Continuity

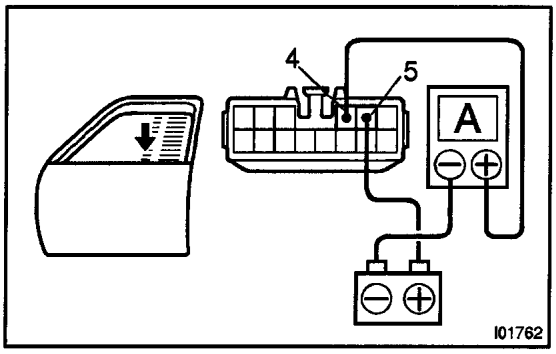
Rear right switch (Window unlock) :

Switch position	Tester connection	Specified condition
UP	10 – 13 4 – 14	Continuity
OFF	4 – 13 4 – 14	Continuity
DOWN	10 – 14 4 – 13	Continuity

Rear right switch (Window lock) :

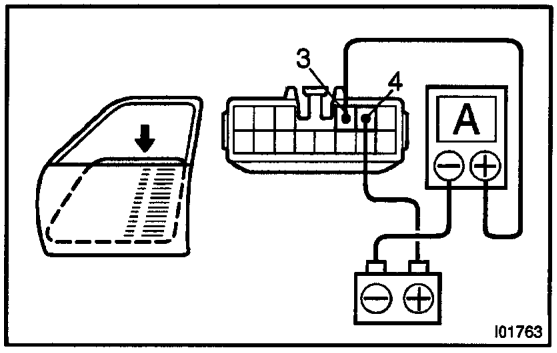
Switch position	Tester connection	Specified condition
UP	10 – 13	Continuity
OFF	13 – 14	Continuity
DOWN	10 – 14	Continuity

If continuity is not as specified, replace the master switch.



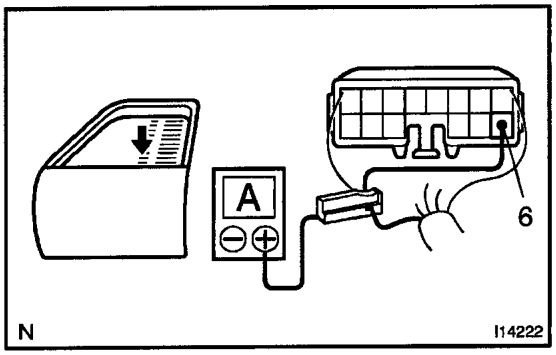
4. LHD w/ Front power window :
INSPECT ONE TOUCH POWER WINDOW SYSTEM (Using an ammeter)

(a) Disconnect the connector from the master switch.
(b) Connect the positive (+) lead from the ammeter to terminal 4 on the wire harness side connector and the negative (–) lead to the negative (–) terminal of the battery.
(c) Connect the positive (+) lead from the battery to terminal 5 on the wire harness side connector.
(d) As the window goes down, check that the current is approximately 7 A.



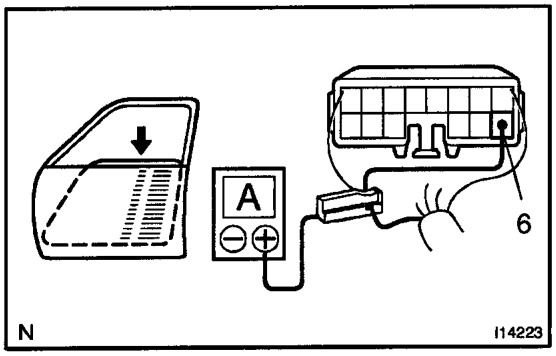
(e) Check that the current increases up to approximately 14.5 A or more when the window stops going down.

HINT:
The circuit breaker opens for 7 – 13 seconds after the window stops going down, so that check must be made before the circuit breaker operates.
If operation is not as specified, replace the master switch.



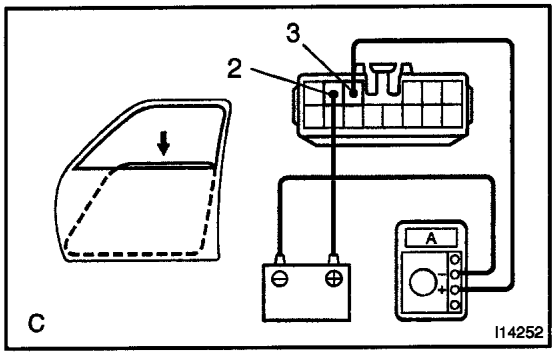
5. LHD w/ Front power window :
INSPECT ONE TOUCH POWER WINDOW SYSTEM
(Using an ammeter with a current – measuring probe)

(a) Remove the master switch with connector connected.
(b) Attach a current – measuring probe to terminal 6 of the wire harness.
(c) Turn the ignition switch ON, and set the power window switch in the down position.



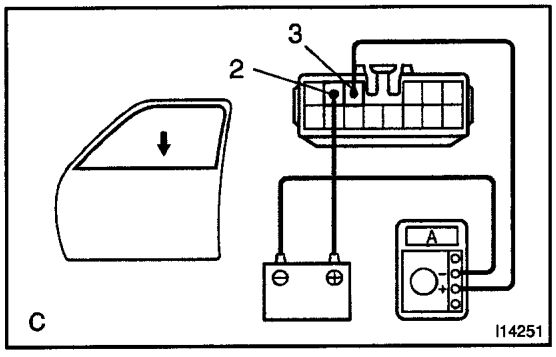
(d) As the window goes down, check that the current is approximately 7 A.
(e) Check that the current increases up to approximately 14.5 A or more when the window stops going down.

HINT:
The circuit breaker opens for 4 – 90 seconds after the window stops going down, so that check must be made before the circuit breaker operates.
If operation is not as specified, replace the master switch.



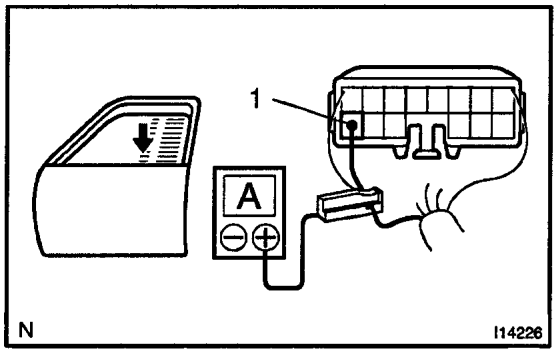
6. RHD w/ Front power window :
INSPECT ONE TOUCH POWER WINDOW SYSTEM
(Using an ammeter)

(a) Disconnect the connector from the master switch.
(b) Connect the positive (+) lead from the ammeter to terminal 3 on the wire harness side connector and the negative (–) lead to the 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 is approximately 7 A.



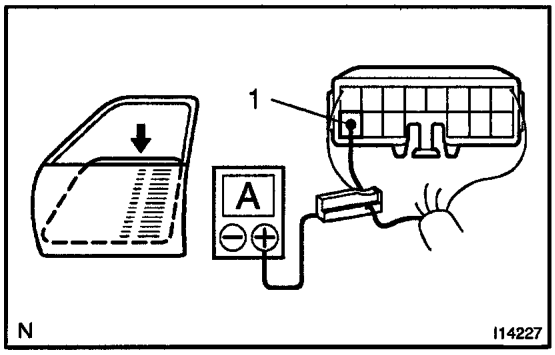
(e) Check that the current increases up to approximately 14.5 A or more when the window stops going down.

HINT:
The circuit breaker opens for 7 – 13 seconds after the window stops going down, so that check must be mate before the circuit breaker operates.
If operation is not as specified, replace the master switch.



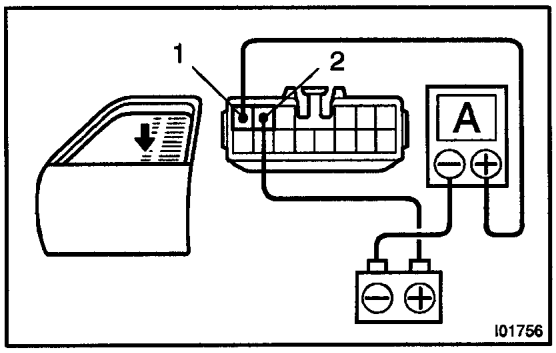
7. RHD w/ Front power window :
INSPECT ONE TOUCH POWER WINDOW SYSTEM (Using an ammeter with a current – measuring probe)

(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 in the down position.



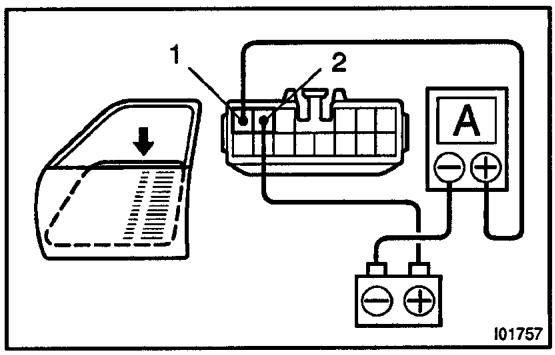
(d) As the window goes down, check that the current is approximately 7 A.
(e) Check that the current increases up to approximately 14.5 A or more when the window stops going down.

HINT:
The circuit breaker opens for 4 – 90 seconds after the window stops going down, so that check must be made before the circuit breaker operates.



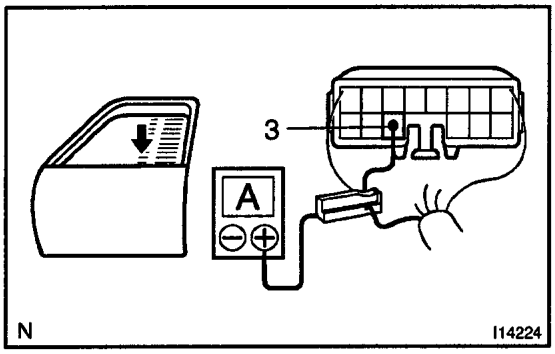
8. w/ Front and rear power window :
INSPECT ONE TOUCH POWER WINDOW SYSTEM (Using an ammeter)

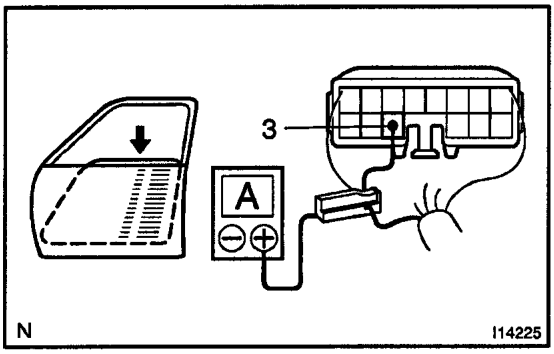
(a) Disconnect the connector from the master switch.
(b) Connect the positive (+) lead from the ammeter to terminal 3 on the wire harness side connector and the negative (–) lead to the negative terminal of the battery.
(c) Connect the positive (+) lead from the battery to terminal 1 on the wire harness 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 some 4 – 90 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.

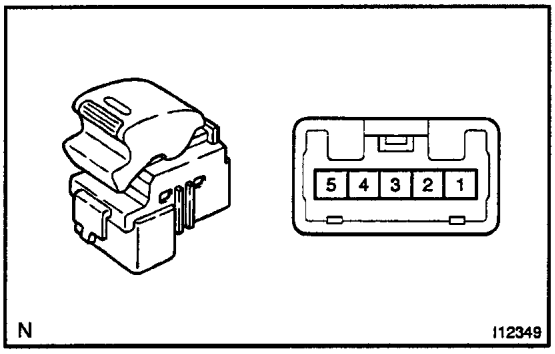




9. w/ Front and rear power window :
INSPECT ONE TOUCH POWER WINDOW SYSTEM (Using an ammeter with a current – measuring probe)

(a) Remove the master switch with connector connected.
(b) Attach a current – measuring probe to terminal 3 of the wire harness.
(c) Turn the ignition switch ON and set the power window switch in 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.

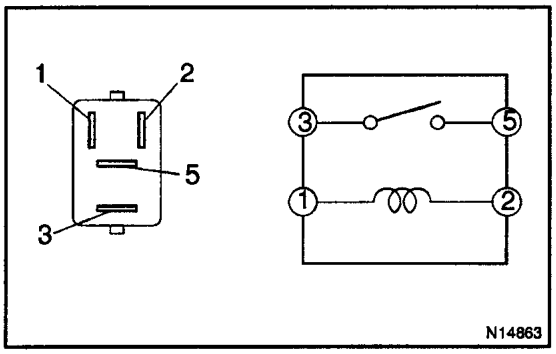
HINT:
The circuit breaker opens for 4 – 90 seconds after the window stops going down, so that check must be made before the circuit breaker operates.
If operation is as specified, replace the master switch.



10. INSPECT PASSENGER AND REAR POWER WINDOW SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
UP	1 – 2, 3 – 4	Continuity
OFF	1 – 2, 3 – 5	Continuity
DOWN	1 – 4, 3 – 5	Continuity

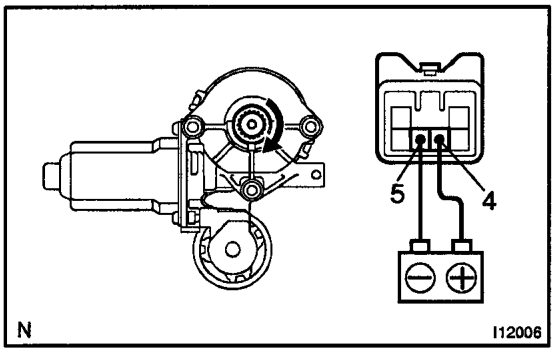
If continuity is not as specified, replace the switch.



11. INSPECT POWER MAIN RELAY CONTINUITY

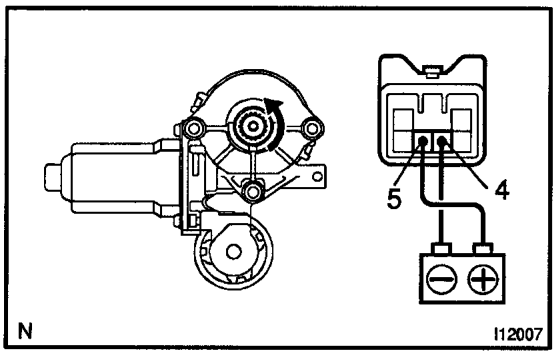
Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B + between terminals 1 and 2	3 – 5	Continuity

If continuity is not as specified, replace the switch.



12. Front left side door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5, and check that the motor turns clockwise.

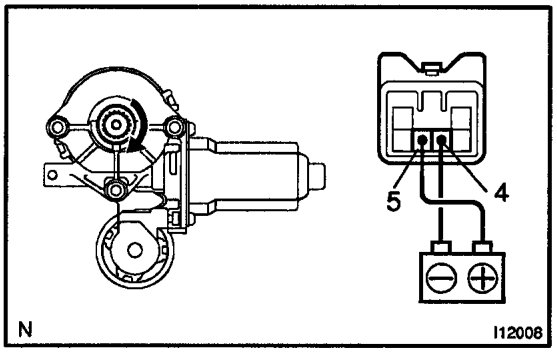


(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.

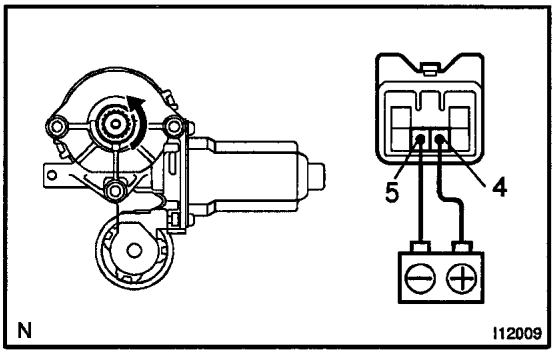
NOTICE:

Since the jam protection may not work properly be sure to conduct procedures described in "HOW TO RESET POWER MOTOR (RESET AND PULSE SWITCH)" after this inspection.



13. Front right side door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 4, and check that the motor turns clockwise.

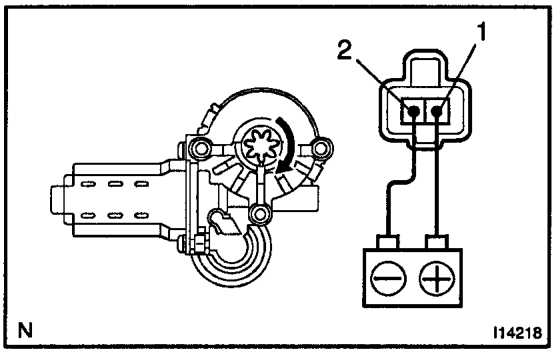


(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.

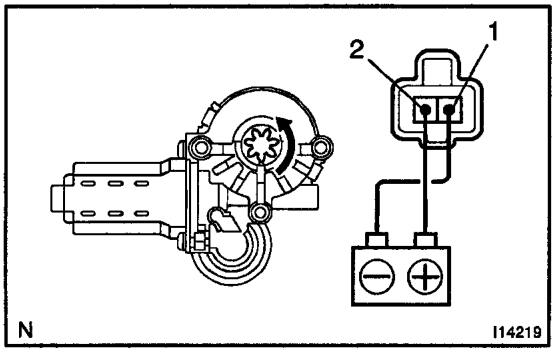
NOTICE:

Since the jam protection may not work properly be sure to conduct procedures described in "HOW TO RESET POWER MOTOR (RESET AND PULSE SWITCH)" after this inspection.



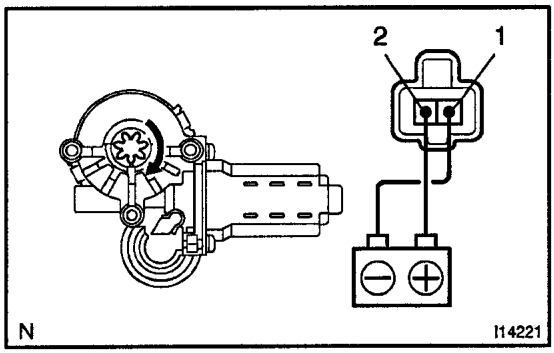
14. Rear right side door:
INSPECT POWER WINDOW MOTOR OPERATION

(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.



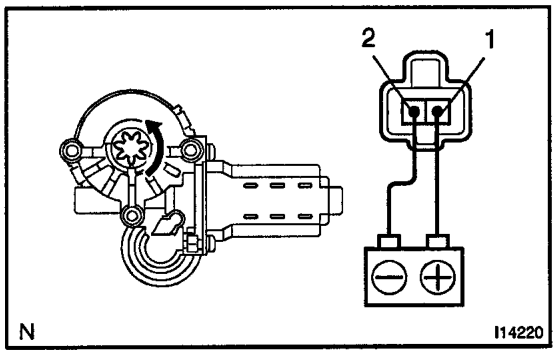
(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.



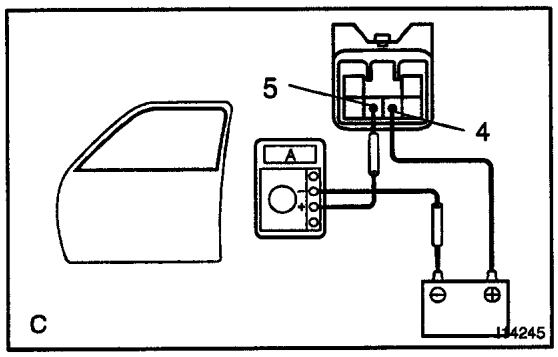
15. Rear left side door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, and check that the motor turns clockwise.



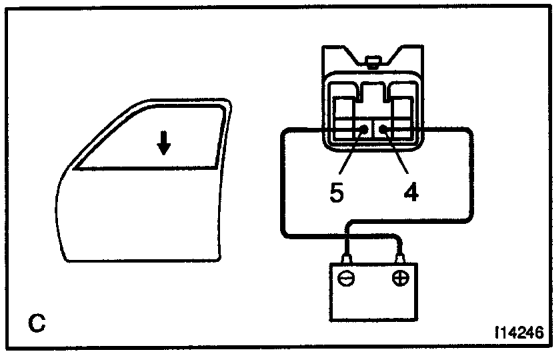
(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.



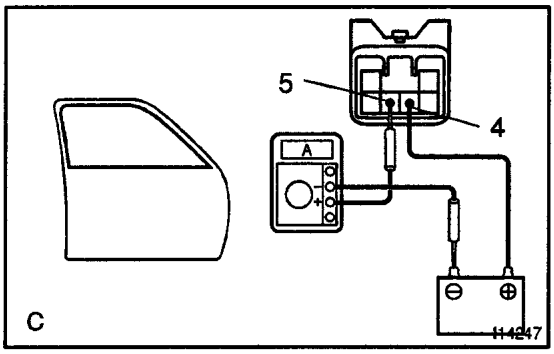
16. FRONT LH door:
INSPECT POWER WINDOW MOTOR PTC THERMISTOR OPERATION

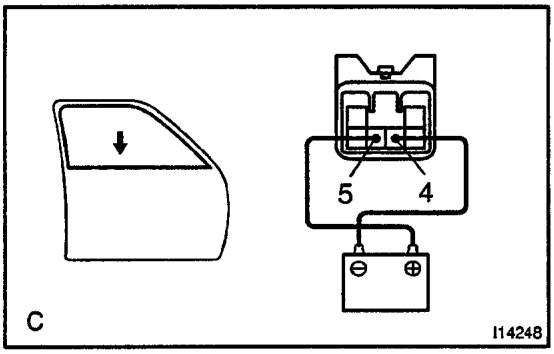
(a) Disconnect the connector from the power window motor.
(b) Connect the positive (+) lead from the ammeter to terminal 5 on the wire harness side connector and the negative (–) lead to negative terminal of the battery.
(c) Connect the positive (+) lead from the battery to terminal 4 on the wire harness side connector, and raise the window to the fully position.
(d) Continue to apply voltage, and check that the current changes to less than 1 A with 4 to 90 seconds.



(e) Disconnect the leads from terminals.
(f) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 5 and negative (–) lead to terminal 4, and check that the window begins to descend.

If operation is not as specified, replace the motor.

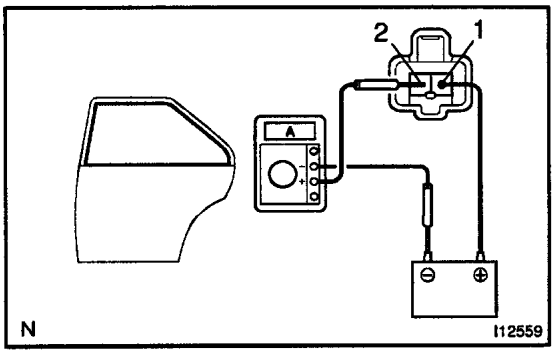


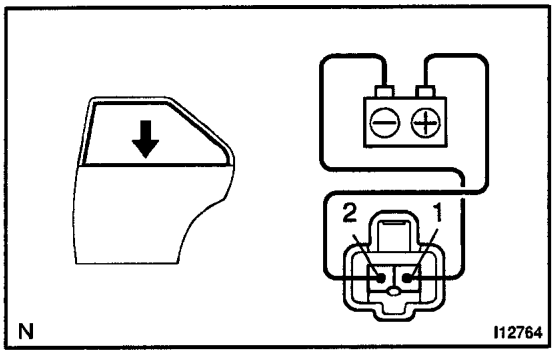


17. Front RH door:
INSPECT POWER WINDOW MOTOR PTC THERMISTOR OPERATION

(a) Disconnect the connector from the power window motor.
(b) Connect the positive (+) lead from the ammeter to terminal 5 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 4 on the wire harness side connector, and raise the window to the fully position.
(d) Continue to apply voltage and check that the current changes to less than 1 A within 4 to 90 seconds.
(e) Disconnect the leads from the terminals.
(f) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 4, and check that the window begins to descend.

If operation is not as specified, replace the motor.

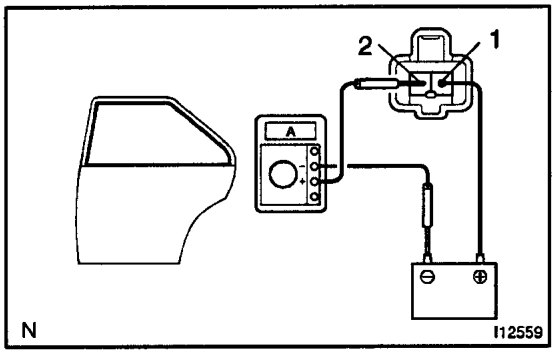




18. Rear LH door:
INSPECT POWER WINDOW MOTOR PTC THERMISTOR OPERATION

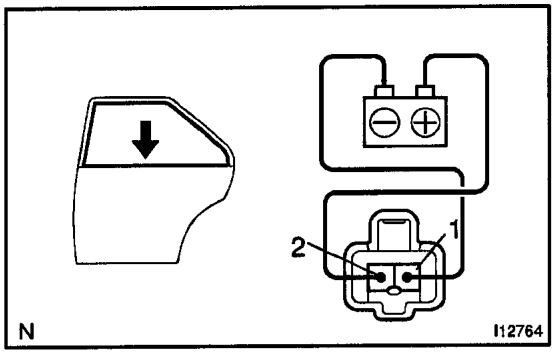
(a) Disconnect the connector from the power window motor.
(b) Connect the positive (+) lead from the ammeter to terminal 2 on the wire harness side connector and the negative (–) lead to negative terminal of the battery.
(c) Connect the positive (+) lead from the battery to terminal 1 on the wire harness side connector, and raise the window to the fully position.
(d) Continue to apply voltage and check that the current changes to less than 1 A within 4 to 40 seconds.
(e) Disconnect the leads from the terminals.
(f) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, and check that the window begins to descend.

If operation is not as specified, replace the motor.



19. Rear RH Door:
INSPECT POWER WINDOW MOTOR PTC THERMISTOR OPERATION

(a) Disconnect the connector from the power window motor.
(b) Connect the positive (+) lead from the ammeter to terminal 2 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 1 on the wire harness side connector, and raise the window to the fully position.



(d) Continue to apply voltage and check that the current changes to less than 1 A within 4 to 40 seconds.
(e) Disconnect the leads from the terminals.
(f) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, and check that the window begins to descend.

If operation is not as specified, replace the motor.

20. INSPECT JAM PROTECTION FUNCTION

NOTICE:

Never, ever be caught any part of your body when checking.

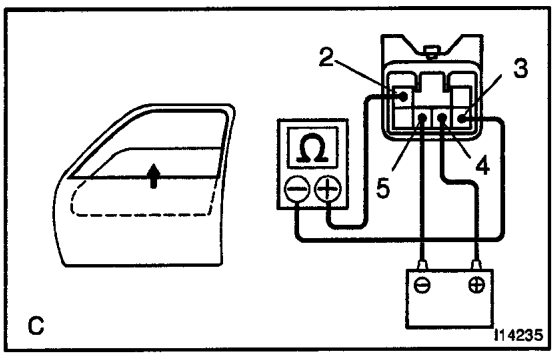
HINT:

In case of performing resetting of the limit switch, do checking after repeating up and down of the glass with automatic operation.

(a) Confirmation of AUTO up operation:
Confirm that the window will be fully close with AUTO up operation.
(b) Checking of the operation of the jam protection function:
(1) Move up the window with AUTO up operation and check that the window will go down when it touches the handle of the hammer stetted.
(2) Confirm that the window will then stop going down about 200 mm .

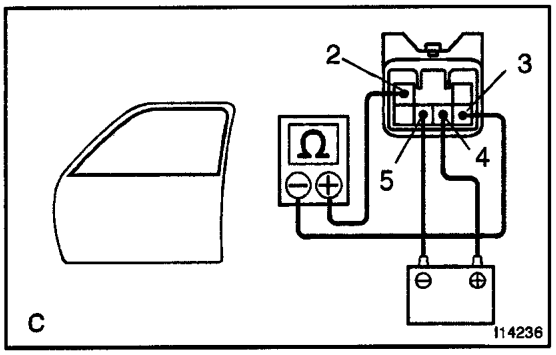
HINT:

In case of removing the glass, glass guide, regulator and etc. be sure to perform checking of the jam protection function.



21. LHD driver's Door (Window Up):
INSPECT JAM PROTECTION LIMIT SWITCH OPERATION

(a) Connect the negative (–) lead from the ohmmeter to terminal 3 and the positive (+) lead to terminal 2.
(b) Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5.
(c) Check that the continuity exists when the window goes up.

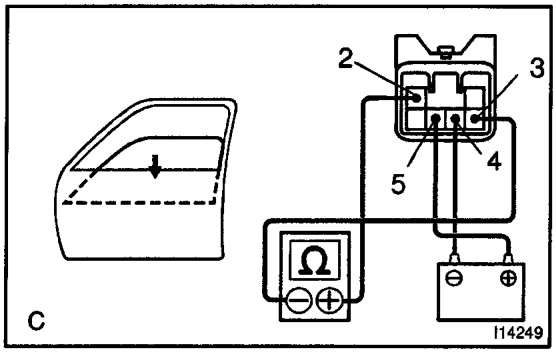


(d) Check that the no continuity exists when the window is in the fully closed position.

If operation is not as specified, replace the motor.

NOTICE:

If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.

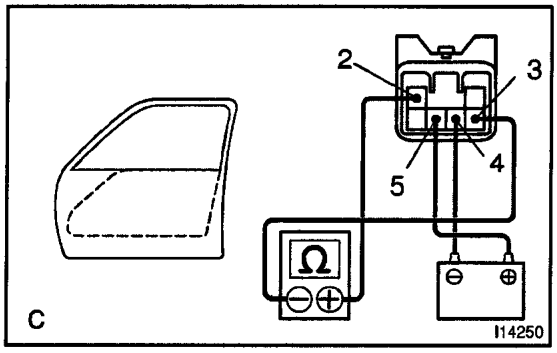


22. LHD driver's Door (Window Down): INSPECT JAM PROTECTION LIMIT SWITCH OPERATION

(a) Connect the negative (–) lead from the ohmmeter to terminal 3 and the positive (+) lead to terminal 2.

(b) Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 4.

(c) Check that the continuity exists when the window goes down.

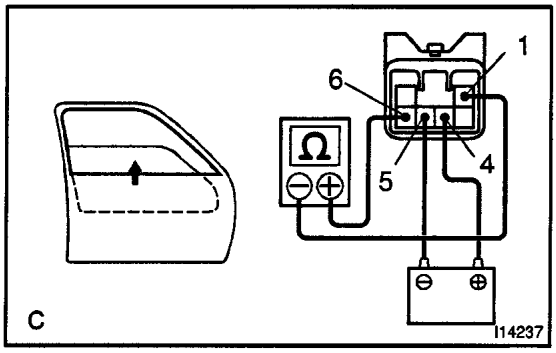


(d) Check that the no continuity exists when the window is in the fully opened position.

If operation is not as specified, replace the motor.

NOTICE:

If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.

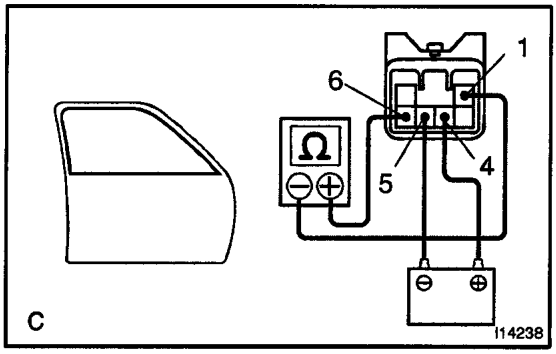


23. RHD driver's Door (Window Up): INSPECT JAM PROTECTION LIMIT SWITCH OPERATION

(a) Connect the negative (–) lead from the ohmmeter to terminal 1 and the positive (+) lead to terminal 6.

(b) Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5.

(c) Check that the continuity exists when the window goes up.

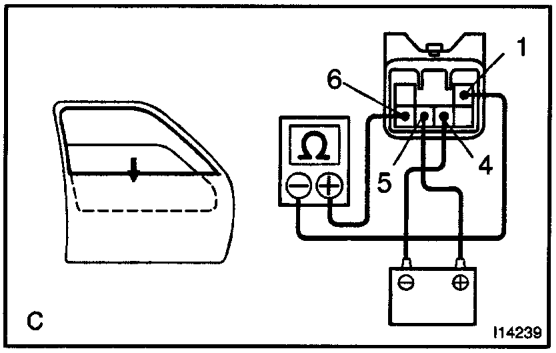


(d) Check that the no continuity exists when the window is in the fully closed position.

If operation is not as specified, replace the motor.

NOTICE:

If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.

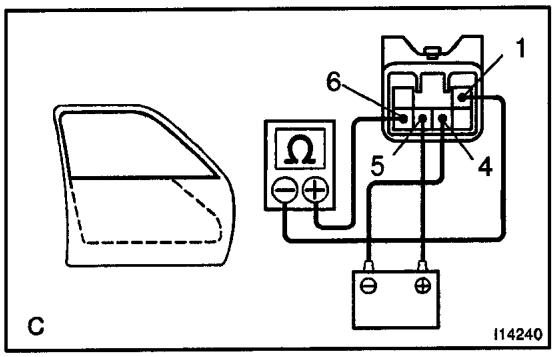


24. RHD driver's Door (Window Down): INSPECT JAM PROTECTION LIMIT SWITCH OPERATION

(a) Connect the negative (–) lead from the ohmmeter to terminal 1 and the positive (+) lead to terminal 6.

(b) Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 4.

(c) Check that the continuity exists when the window goes down.

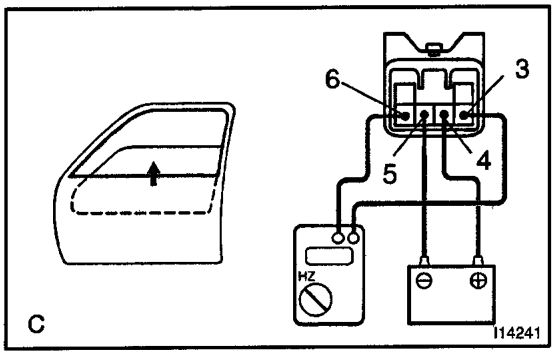


(d) Check that the no continuity exists when the window is in the fully opened position.

If operation is not as specified, replace the motor.

NOTICE:

If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.



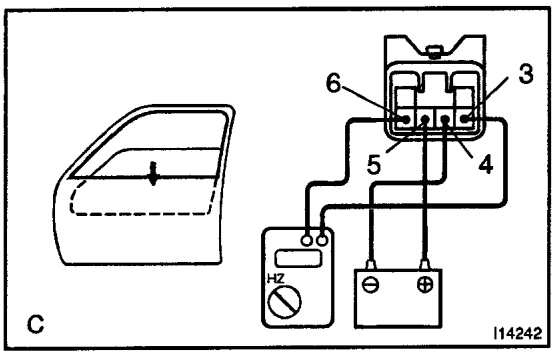
25. LHD driver's Door:

INSPECT JAM PROTECTION PULSE SWITCH OPERATION

(a) Connect the positive (+) lead from the TOYOTA electrical tester to terminal 6 and the negative (–) lead to terminal 3.

(b) Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5.

(c) Check that pulse is generated during the motor running.

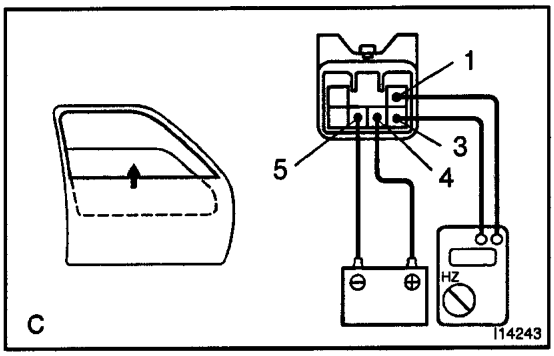


(d) Reverse the polarity and check that pulse is generated.

If operation is not as specified, replace the motor.

NOTICE:

If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.



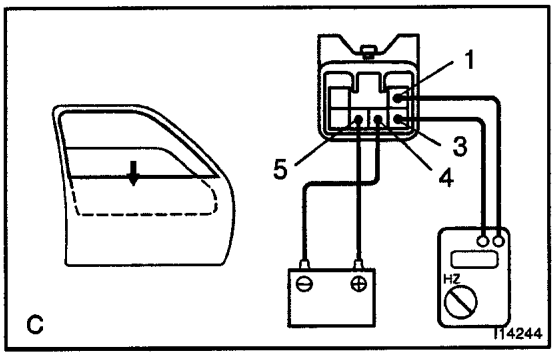
26. RHD driver's Door:

INSPECT JAM PROTECTION PULSE SWITCH OPERATION

(a) Connect the positive (+) lead from the TOYOTA electrical tester to terminal 3 and the negative (–) lead to terminal 1.

(b) Connect the positive (+) lead from the battery to terminal 4 and the negative (–) lead to terminal 5.

(c) Check that pulse is generated during the motor running.



(d) Reverse the polarity and check that pulse is generated.

If operation is not as specified, replace the motor.

NOTICE:

If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.

27. INSPECT JAM PROTECTION FUNCTION

NOTICE:

Never, ever be caught any part of your body when checking.

HINT:

In case of performing resetting of the limit switch, do checking after repeating up and down of the glass with automatic operation.

(a) Confirmation of AUTO up operation:
Confirm that the window will be fully close with AUTO up operation.

(b) Checking of the operation of the jam protection function:
(1) Move up the window with AUTO up operation and check that the window will go down when it touches the handle of the hammer stetted.
(2) Confirm that the window will then stop going down about 200 mm.

HINT:

In case of removing the glass, glass guide, regulator and etc. be sure to perform checking of the jam protection function.
If the jam protection is not function properly, adjust power window motor reset switch and pulse switch.

MEMO

BE0HG-14

ADJUSTMENT

HOW TO RESET POWER WINDOW MOTOR (RESET SWITCH AND PULSE SWITCH)

If the jam protection is not functioned properly, perform the following procedure.

HINT:

It is necessary to reset the power window motor (in initial position for the limit switch) when separating the window regulator from the power window motor or operating the window regulator with the door glass not installed.

(a) Remove the power window motor.

HINT:

Place the matchmarks on the power window motor and window regulator gear.

(b) Connect the power window motor and power window switch to wire harness of the vehicle.

(c) Turn the ignition switch ON and operate the power window switch to idle the power window motor in UP side direction for more than 6 rotations or less than 10 rotates (4 seconds or more).

(d) Assemble the power window motor and regulator.

HINT:

- Install the motor when the regulator arm is below the middle point.
- Align the matchmarks on the power window motor and window regulator gear.

(e) Assemble the power window regulator and door glass.

HINT:

Never rotate the motor to the down direction until the completion of the window glass installation.

(f) Connect power window switch to wire harness and turn the ignition switch ON.

(g) Repeat UP and DOWN operation several times manually.

(h) Check if AUTO UP → AUTO DOWN operates in automatic operation.

HINT:

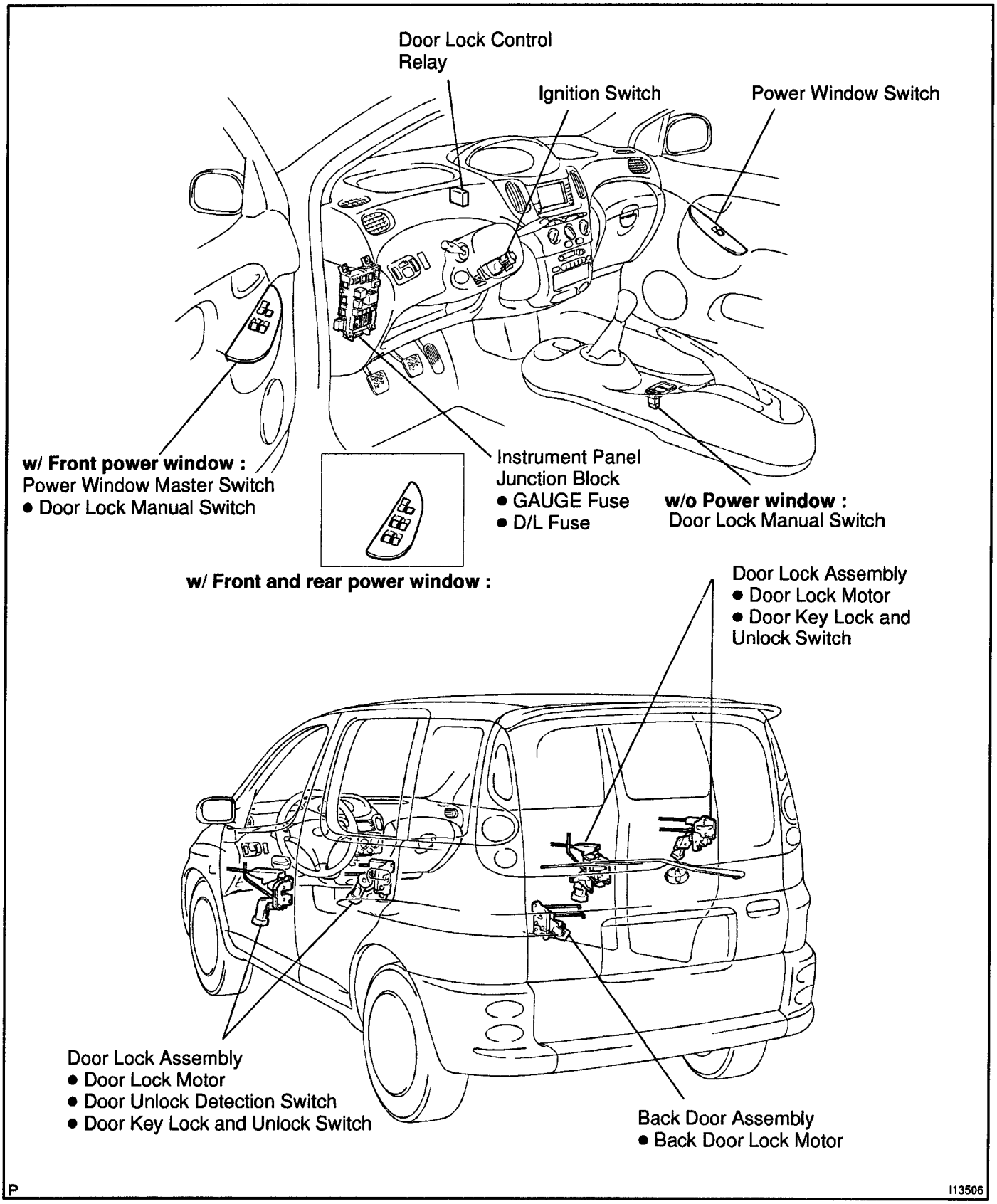
- Take care that the jam protection function does not operate just after resetting.
- Reset the regulator again when performing the reverse operating after closing the window fully by AUTO UP operation.

(i) Check the power window function.

POWER DOOR LOCK CONTROL SYSTEM

LOCATION

BE18V-02



P

I13506

BE1E4-01

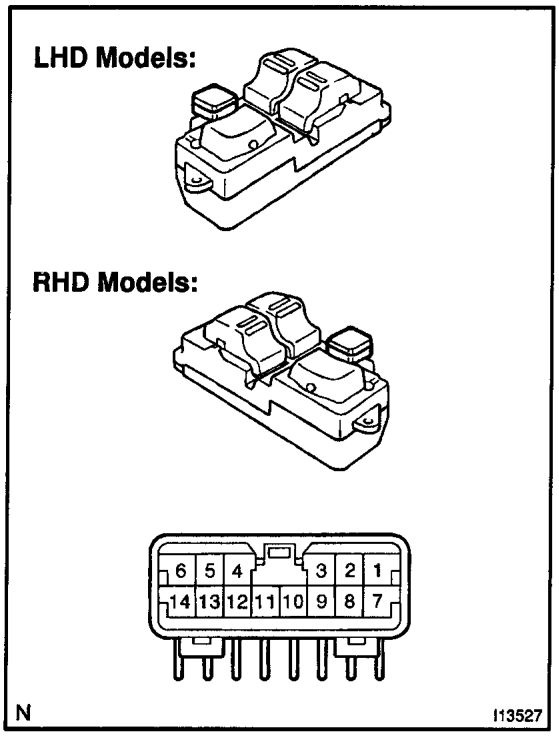
INSPECTION

1. w/ Front power window:
INSPECT DOOR LOCK CONTROL SWITCH CONTINUITY

( ) :LHD mdels

Switch position	Tester connection	Specified condition
LOCK	4 – 12 (2 – 3)	Continuity
OFF	–	No continuity
UNLOCK	4 – 5 (3 – 9)	Continuity

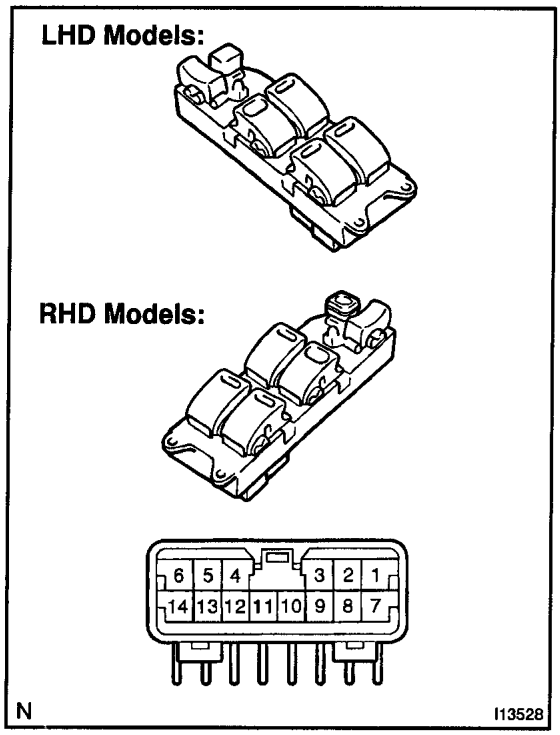
If continuity is not as specified, replace the switch.



2. W/ Front and rear power window:
INSPECT DOOR LOCK CONTROL SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	6 – 4 – 5	Continuity
OFF	–	No continuity
UNLOCK	4 – 5 – 12	Continuity

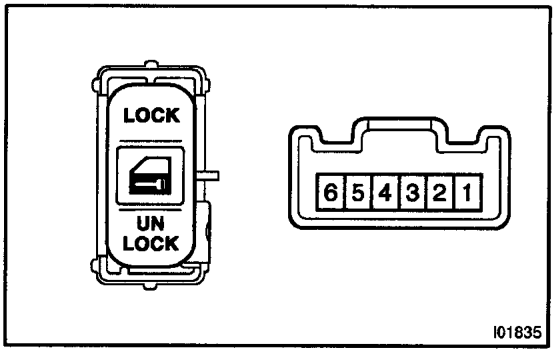
If continuity is not as specified, replace the switch.

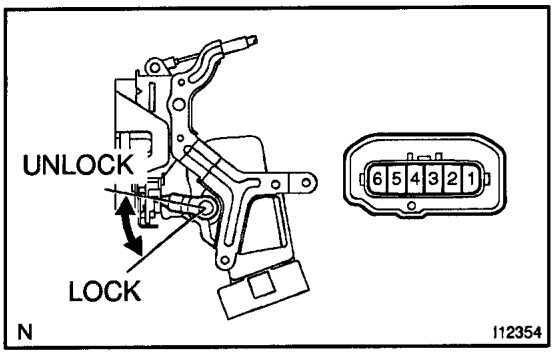


3. w/o Power window:
INSPECT DOOR LOCK MANUAL SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	1 – 3	Continuity
OFF	–	No continuity
UNLOCK	1 – 6	Continuity
Illumination	2 – 4	Continuity

If continuity is not as specified, replace the switch.



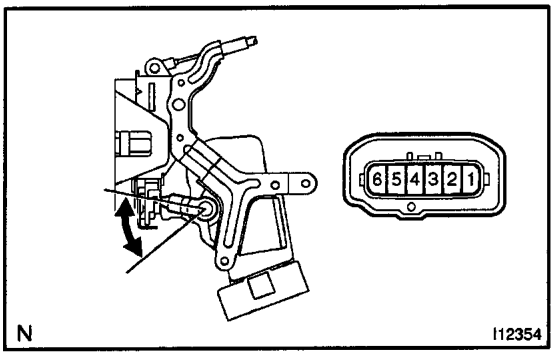


4. w/o Double Lock:
INSPECT FRONT DOOR KEY LOCK AND UNLOCK SWITCH CONTINUITY

( ) : LH side

Switch position	Tester connection	Specified condition
LOCK	2 – 4 (3 – 5)	Continuity
OFF	–	No continuity
UNLOCK	1 – 4 (3 – 6)	Continuity

If continuity is not as specified, replace the door lock assembly.

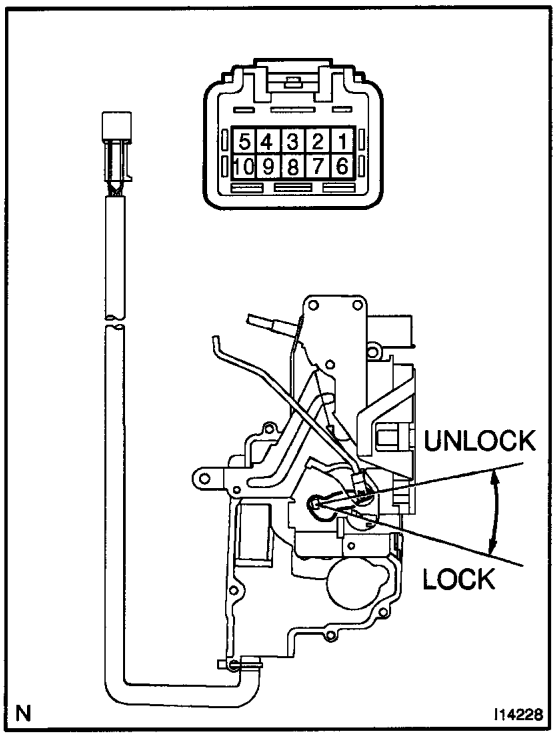


5. Wireless door lock:
INSPECT FRONT DOOR KEY LOCK AND UNLOCK SWITCH CONTINUITY

( ) : LH side

Switch position	Tester connection	Specified condition
LOCK	2 – 4 (3 – 5)	Continuity
OFF	–	No continuity
UNLOCK	1 – 4 (3 – 6)	Continuity

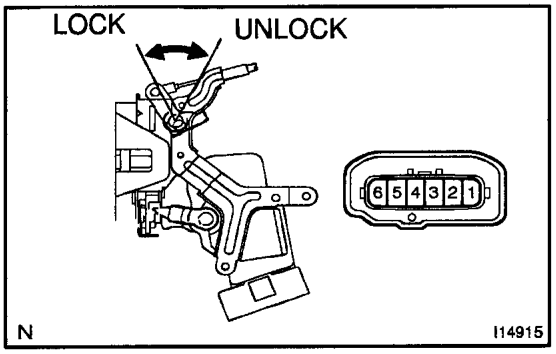
If continuity is not as specified, replace the door lock assembly.



6. w/ Double lock:
INSPECT FRONT DOOR KEY LOCK AND UNLOCK SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	7 – 9	Continuity
OFF	–	No continuity
UNLOCK	8 – 9	Continuity

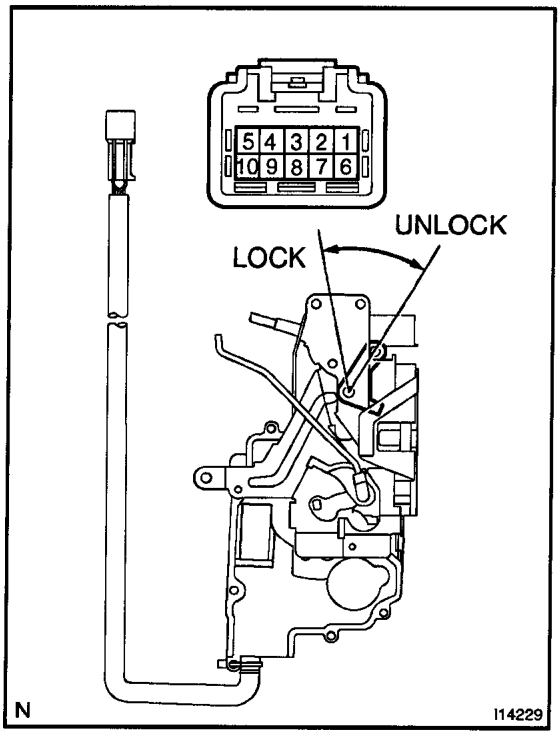
If continuity is not as specified, replace the door lock assembly.



7. Wireless door lock:
INSPECT FRONT 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)	3 – 4	Continuity

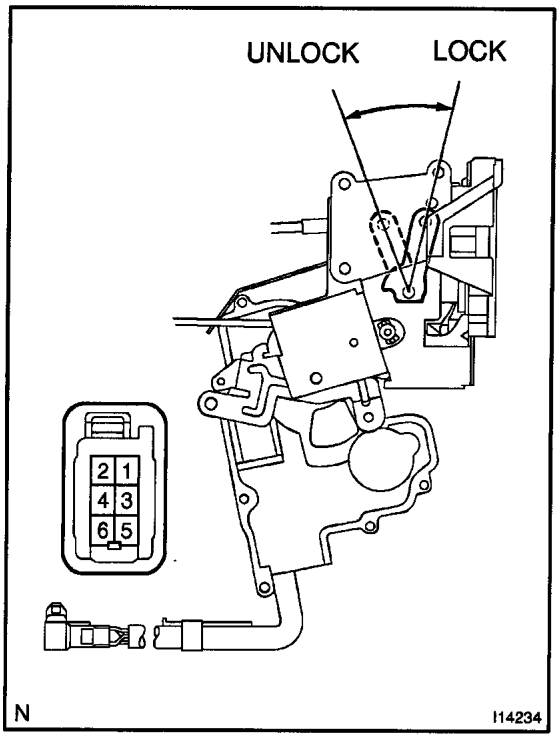
If continuity is not as specified, replace the door lock assembly.



8. w/ Double lock system:
INSPECT FRONT 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)	4 – 9	Continuity

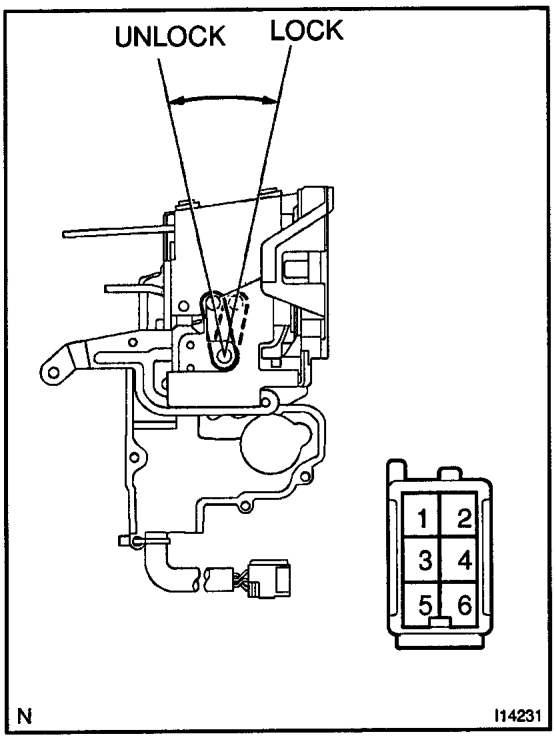
If continuity is not as specified, replace the door lock assembly.



9. w/ Double lock system:
INSPECT REAR 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)	1 – 5	Continuity

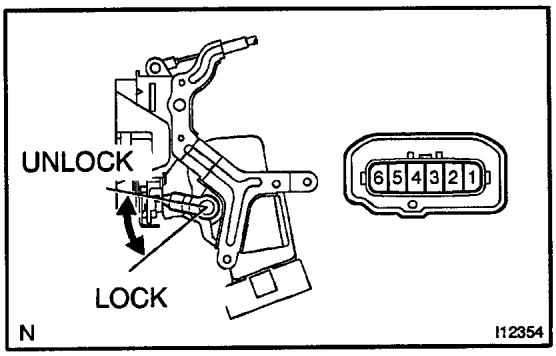
If continuity is not as specified, replace the door lock assembly.



10. w/ Double lock system:
INSPECT BACK 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)	1 – 5	Continuity

If continuity is not as specified, replace the door lock assembly.

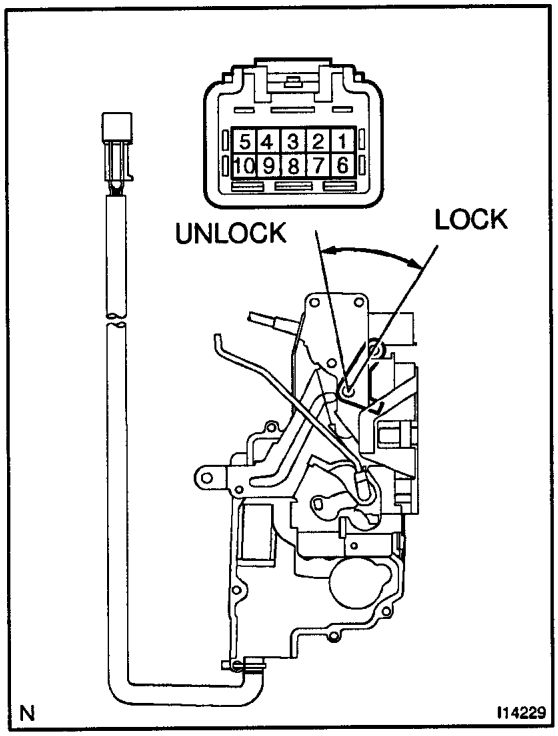


11. w/o Double lock and wireless door lock system:
INSPECT FRONT DOOR LOCK MOTOR OPERATION
( ) :LH side

(a) Connect the positive (+) lead from the battery to terminal 6 (1) and the negative (–) lead to terminal 5 (2), and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If continuity is not as specified, replace the door lock assembly.

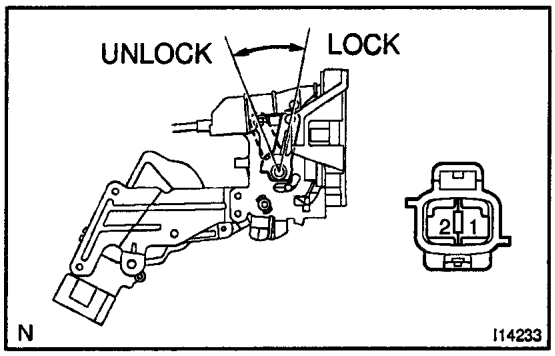


12. w/ Double lock system:
INSPECT FRONT DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If continuity is not as specified, replace the door lock assembly.

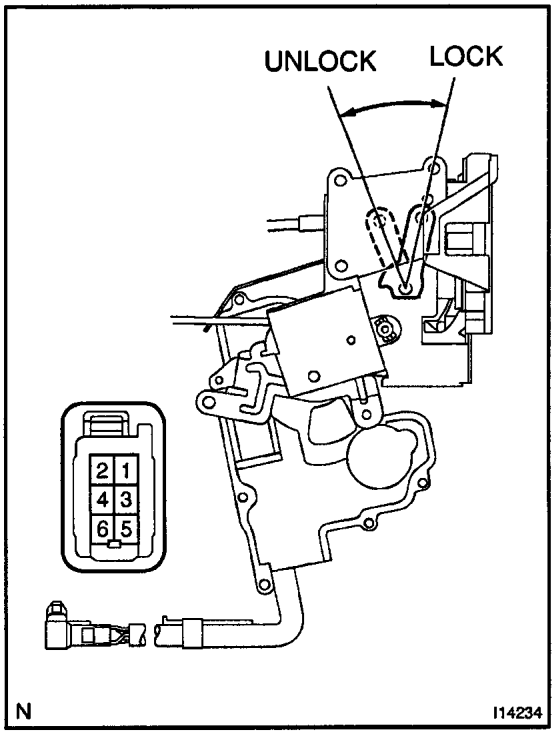


13. w/o Double lock system:
INSPECT REAR DOOR LOCK MOTOR OPERATION
( ) :LHD mdels

(a) Connect the positive (+) lead from the battery to terminal 5 (2) and the negative (–) lead to terminal 6 (1), and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If continuity is not as specified, replace the door lock assembly.

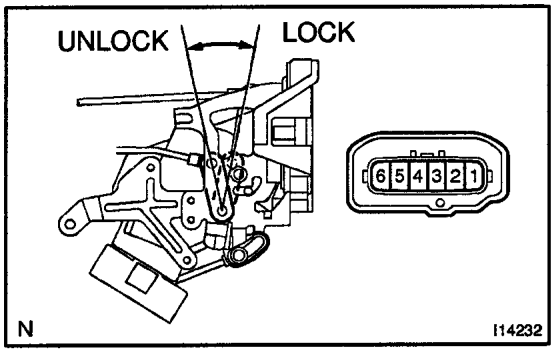


14. w/ Double lock system:
INSPECT REAR DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 4, and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If operation is not as specified, replace the door lock assembly.

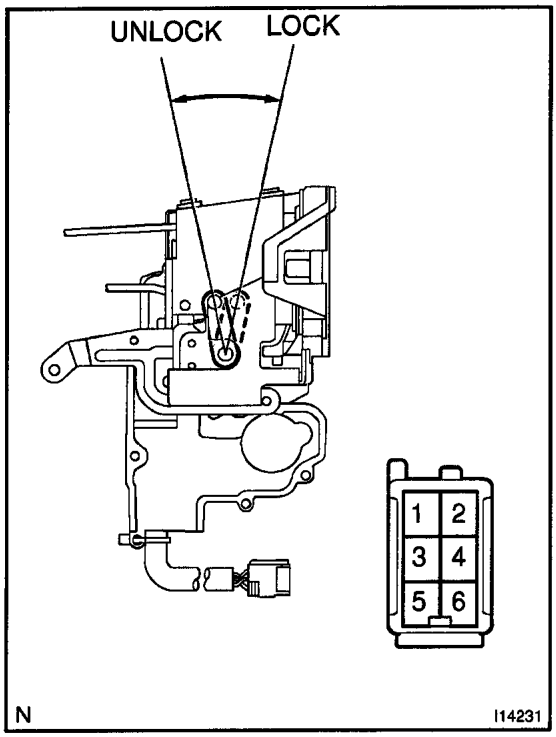


15. w/o Double lock system:
INSPECT BACK DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 6 and the negative (–) lead to terminal 5, and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If operation is not as specified, replace the door lock assembly.

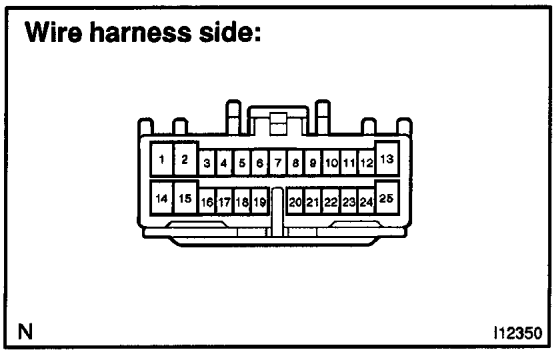


16. w/ Double lock system:
INSPECT BACK DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 4, and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If operation is not as specified, replace the door lock assembly.



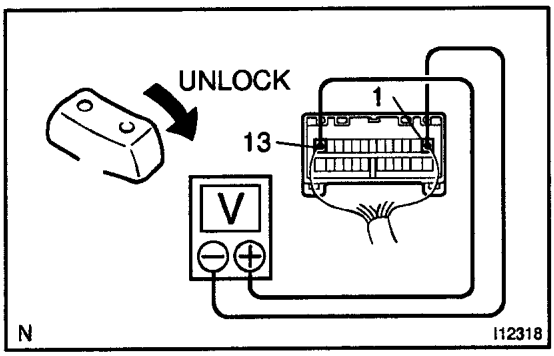
17. INSPECT DOOR LOCK CONTROL RELAY CIRCUIT

Disconnect the connector from the door lock control relay and inspect the connector on the wire harness side, as shown in the chart.

Tester connection	Condition	Specified condition
5 – Ground	Driver door unlock detection switch OFF (door locked)	No continuity
5 – Ground	Driver door unlock detection switch ON (door unlocked)	Continuity
7 – Ground	Driver's door lock control switch UNLOCK or OFF	No continuity
7 – Ground	Driver's door lock control switch LOCK	Continuity
7 – Ground	Back door lock control switch LOCK	Continuity
7 – Ground	Back door lock control switch UNLOCK	No continuity
8 – Ground	Driver's door lock control switch LOCK or OFF	No continuity
8 – Ground	Driver's door lock control switch UNLOCK	Continuity
8 – Ground	Back door lock control switch LOCK	No continuity
8 – Ground	Back door lock control switch UNLOCK	Continuity
9 – Ground	Driver's door key lock and unlock switch UNLOCK or OFF	No continuity
9 – Ground	Driver's door key lock and unlock switch LOCK	Continuity
9 – Ground	Front passenger's door key lock and unlock switch UNLOCK or OFF	No continuity

9 – Ground	Front passenger's door key lock and unlock switch LOCK	Continuity
11 – Ground	Driver's door key lock and unlock switch LOCK or OFF	No continuity
11 – Ground	Driver's door key lock and unlock switch UNLOCK	Continuity
11 – Ground	Front passenger's door key lock and unlock switch LOCK or OFF	No continuity
11 – Ground	Front passenger's door key lock and unlock switch UNLOCK	Continuity
18 – Ground	Driver's door courtesy switch OFF	No continuity
18 – Ground	Driver's door courtesy switch ON	Continuity
19 – Ground	Front passenger's door courtesy switch OFF	No continuity
19 – Ground	Front passenger's door courtesy switch ON	Continuity
19 – Ground	Rear left side door courtesy switch OFF	No continuity
19 – Ground	Rear left side door courtesy switch ON	Continuity
19 – Ground	Rear right side door courtesy switch OFF	No continuity
19 – Ground	Rear right side door courtesy switch ON	Continuity
21 – Ground	Key unlock warning switch OFF	No continuity
21 – Ground	Key unlock warning switch ON	Continuity
25 – Ground	Constant	Continuity
3 – Ground	Ignition switch OFF	No voltage
3 – Ground	Ignition switch ON	Battery voltage
14 – Ground	Constant	Battery voltage

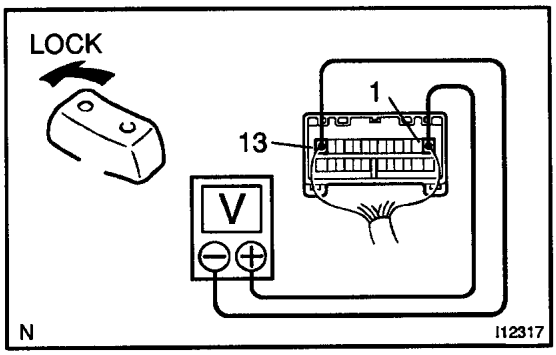
If circuit is as specified, replace the relay.
If circuit is as not specified, wiring diagram and inspect the circuits connected to other parts.



18. Door Lock Signal:
INSPECT DOOR LOCK CONTROL RELAY OPERATION

HINT:
When the relay circuit is as specified, inspect the door lock signal.

(a) Connect the positive (+) lead from the voltmeter to terminal 13 and the negative (–) lead to terminal 1.
(b) Set the door lock control switch to UNLOCK and check that the voltage rises from 0 V to battery voltage for approximately 0.2 seconds.



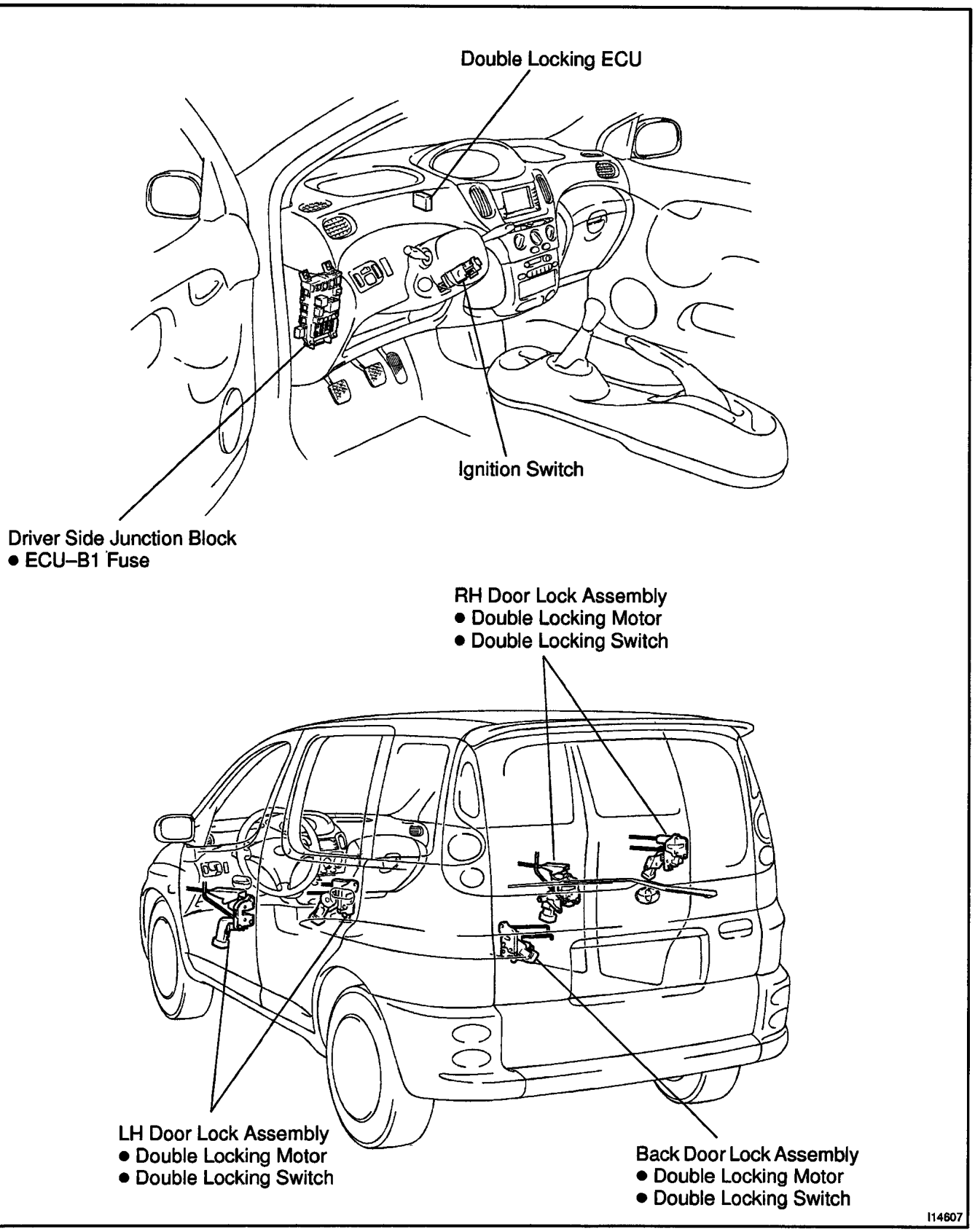
(c) Reverse the polarity of the voltmeter leads.
(d) Set the door lock control switch to LOCK and check that the voltage rises from 0 V to battery voltage for approximately 0.2 seconds.

If operation is not as specified, replace the relay.

DOUBLE LOCKING SYSTEM

LOCATION

BE16H-02



BE1E6-01

INSPECTION

1. INSPECT DOUBLE LOCK SYSTEM FUNCTION

HINT:

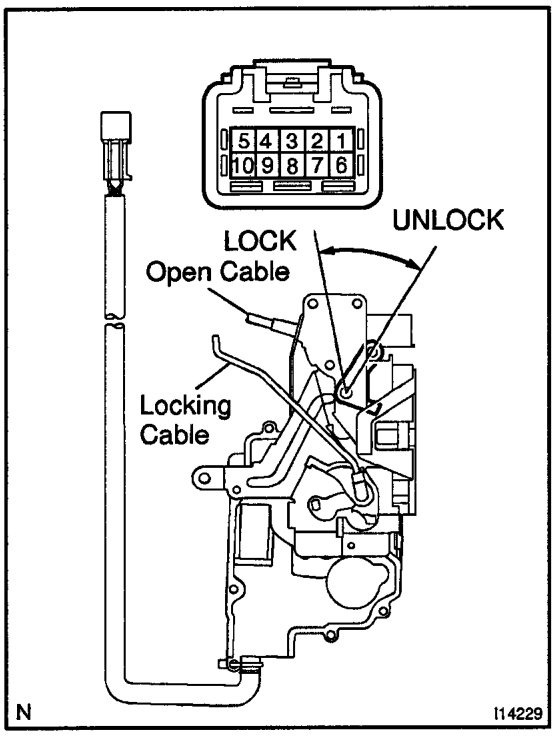
- In case of doing the following inspection, must open one of the windows of the doors.
- To set the double lock, turn the ignition switch OFF, pull out the key, open the driver's door and then perform the lock operation on the wireless transmitter. Locking again within 5 sec, after the first locking 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 FRONT DOUBLE LOCK SWITCH CONTINUITY

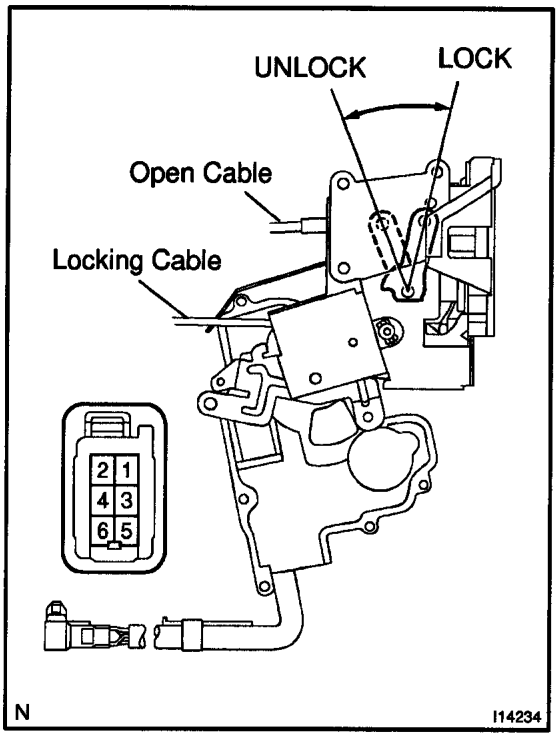
Switch position	Tester connection	Specified condition
OFF (Double lock is released)	–	No continuity
ON (Double lock is set)	5 – 9	Continuity

If continuity is not as specified, replace the door lock assembly.

3. INSPECT FRONT DOUBLE LOCK MOTOR OPERATION

(a) Set the Door Lock to LOCK position by the locking cable.
(b) Connect the positive (+) lead from the battery to terminal 3 and negative (–) lead to terminal 6, and check that the Door Lock will not unlock by pulling the locking cable. (Locking cable must return to LOCK position by the force of spring when 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 REAR DOUBLE LOCK SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Double lock is released)	–	No continuity
ON (Double lock is set)	1 – 5	Continuity

If continuity is not as specified, replace the door lock assembly.

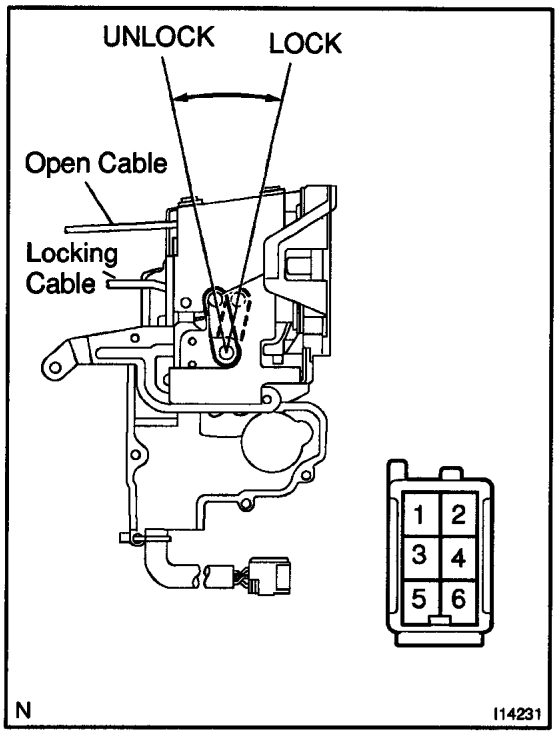
5. INSPECT REAR DOUBLE LOCK MOTOR OPERATION

(a) Set the Door Lock to LOCK position by the locking cable.

(b) Connect the positive (+) lead from the battery to terminal 6 and negative (–) lead to terminal 3, and check that the Door Lock will not unlock by pulling the locking cable. (Locking cable must return to LOCK position by the force of spring when 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 BACK DOUBLE LOCK SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Double lock is released)	–	No continuity
ON (Double lock is set)	1 – 5	Continuity

If continuity is not as specified, replace the door lock assembly.

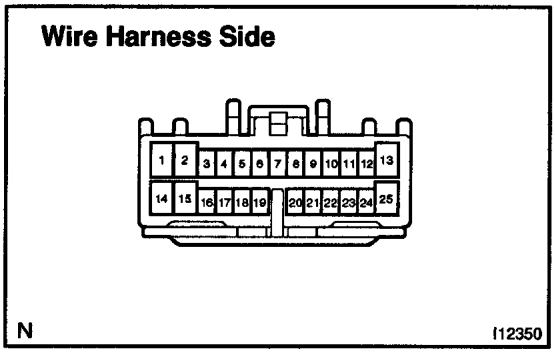
7. INSPECT BACK DOUBLE LOCK MOTOR OPERATION

(a) Set the Door Lock to LOCK position by the locking cable.

(b) Connect the positive (+) lead from the battery to terminal 6 and negative (–) lead to terminal 3, and check that the Door Lock will not unlock by pulling the locking cable. (Locking cable must return to LOCK position by the force of spring when 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.



8. INSPECT DOOR LOCK CONTROL RELAY CIRCUIT

Disconnect connector from the door lock control relay and inspect the connector on the wire harness side, as shown in the chart.

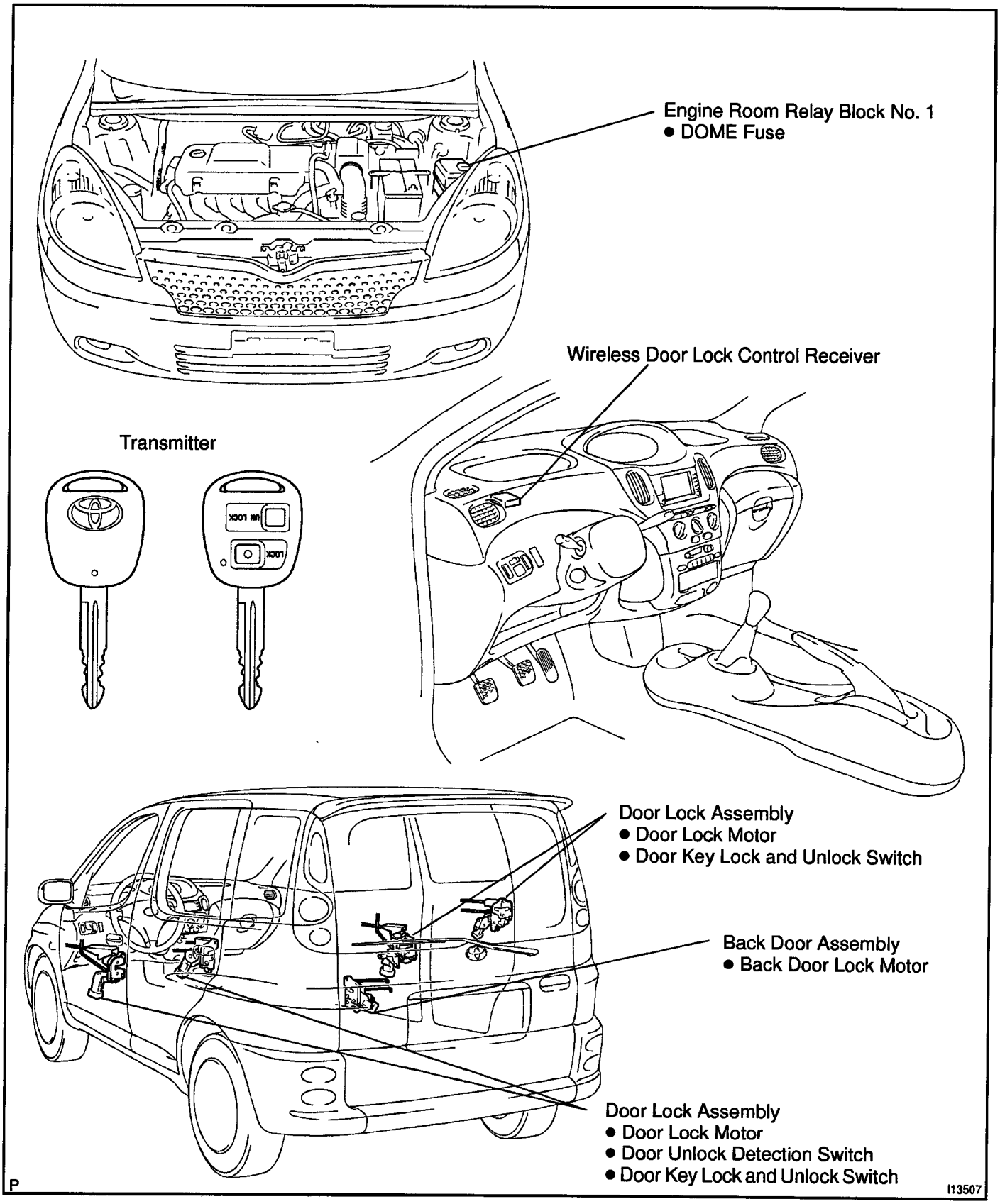
Tester connection	Condition	Specified condition
25 – Ground	Constant	Continuity
14 – Ground	Constant	Battery voltage
3 – Ground	Constant	Battery voltage

If circuit is as specified, replace the door control relay.
If circuit is not as specified, wiring diagram and inspect the circuits connected to other parts.

WIRELESS DOOR LOCK CONTROL SYSTEM

LOCATION

BE1E7-01



BE01M-09

PRE–CHECK

Only wireless function (Remote control) will not operate.
(If a new transmitter or a transmitter of the same type that works properly with the vehicle is not available.)

Make the vehicle in the initialized condition:
The 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:

Under the standard operation, when repeating the operation of UNLOCK and LOCK switch 3 times or more alternately, check the UNLOCK–LOCK operation from 3rd time onward.
- Following procedures are standard operation.

(1) Keep about 1 M away to the right direction from the outside handle of a driver's seat.
(2) Face the transmitter toward the vehicle and press one of transmitter switches for about 1 sec.

No

Yes

Transmitter LED inspection:

Check when pressing UNLOCK switch and LOCK switch under standard operation, that the transmitter LED light up once more.

No

Yes

Normal
<Reference>
- Operative distance may differ according to an operator, the way of holding the transmitter or position.
- Because weak electric wave is used, when there is strong wave or noise in the used frequency ,operation distance might be shortened.

Transmitter battery check:

Replace the transmitter battery with a new or normal one and check UNLOCK–LOCK function works under the standard operation.

<Reference>

- The battery should be replaced by only the shops with sufficient skill as new normal battery is necessary.
- Battery quality can be judged by checking the remnant volume of the battery.

Yes → Battery faulty.

No

Make the vehicle be in the initialized condition.

Inspection start by using self diagnostic mode:

Enter into the self diagnostic mode.

If operating door control receiver in the order of 1 through 2, the mode turns to diagnostic mode.

(1) Insert the key plate in the ignition key cylinder and pull out, then insert it again and turn ignition switch OFF → ON → OFF once within 5 seconds after pulling out.

(2) After completing the procedure within 30 seconds, turn the ignition switch OFF → ON → OFF 9 times.

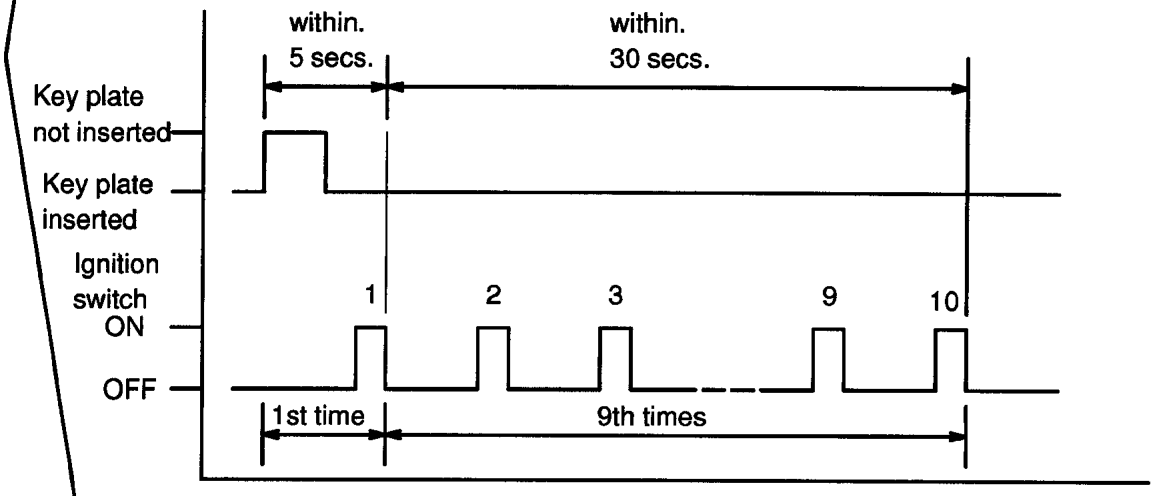
HINT:

In the case that either of (1) and (2) conditions is not satisfied, transfer to normal mode.

<Reference>

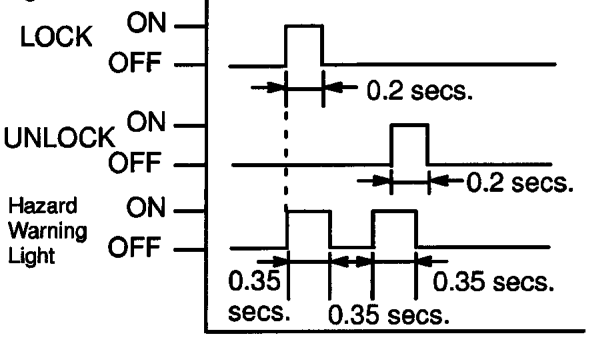
When completing self diagnostic mode, turn the ignition switch ON.

LOCK and UNLOCK operation is not performed under the self diagnostic mode.



Self diagnostic mode operation check:

After the self diagnostic mode input operation has been performed, check that the hazard warning light and door lock.



No
(Not entered in self diagnostic mode)

No

Is the method to enter into the diagnostic mode correct?

Yes

No

Is the lighting function of operation confirmation hazard warning light normal?

Check control hazard warning light.

Yes

Key unlock warning switch inspection:

Check that continuity exists between connector terminal 21 of door lock control relay on the vehicle side and ground by inserting the key plate into the ignition key cylinder.

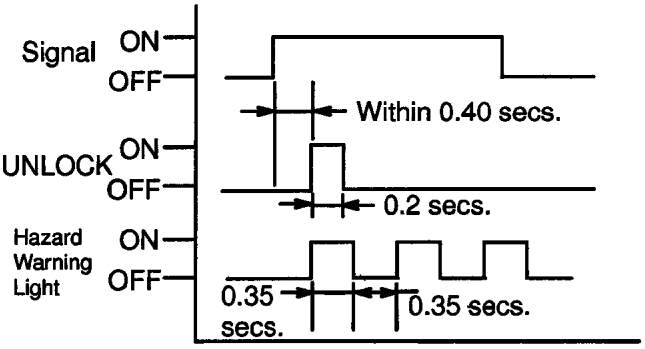
Check key unlock warning switch.

Yes
(Entered in self diagnostic mode)

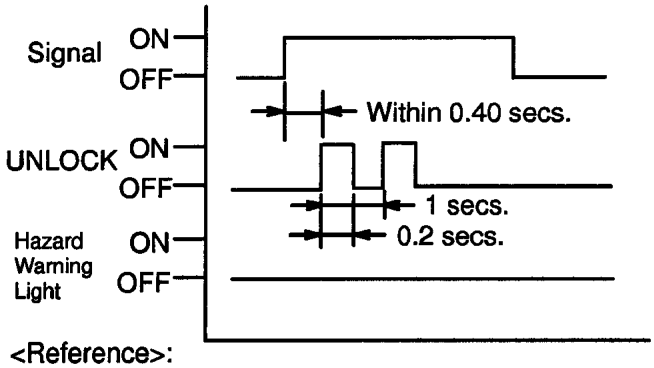
Self diagnostic mode check:

Check that how the hazard warning light and door lock when pressing each transmitter switch.

(1) Receiver normal wave of LOCK and UNLOCK switch.



(2) Incompatibility of the recognition code or out from synchronization of rolling code.



<Reference>:
While turning the ignition switch ON in the self diagnostic mode, the mode returns to normal mode.

(1)

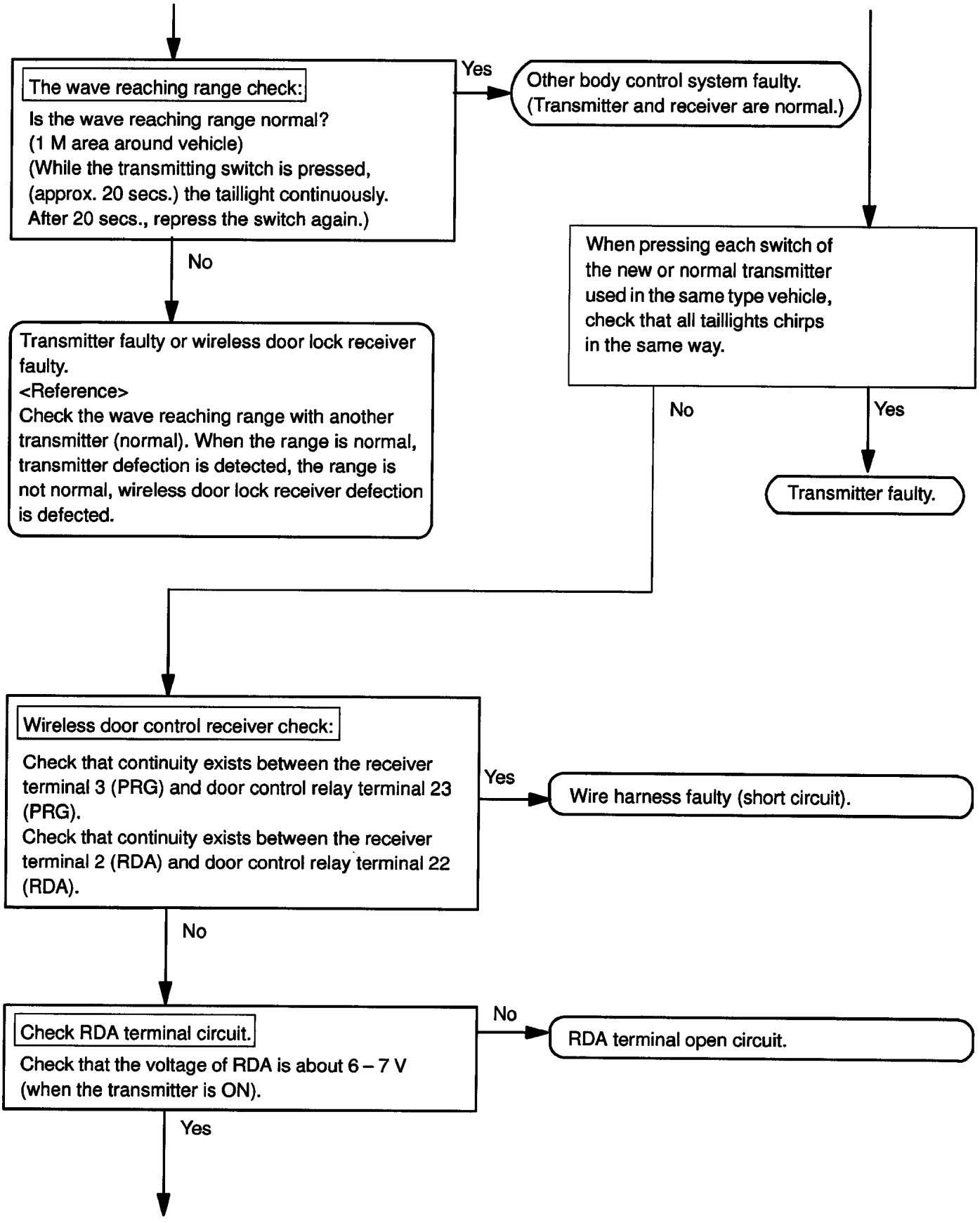
(2) is output.
(Hazard warning light response are same.)

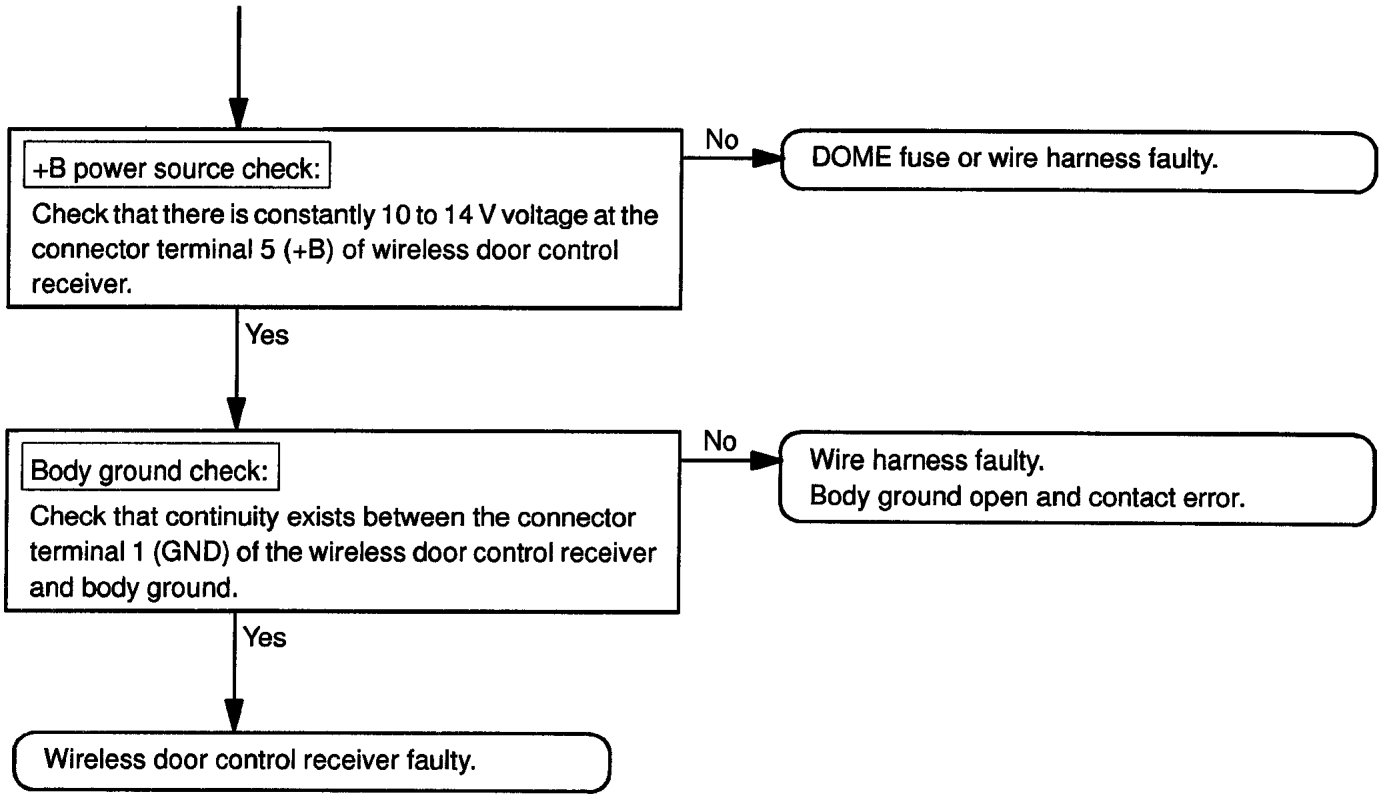
Recognition code registration function check:

Check that it is possible to enter into rewrite mode or add mode.
(Refer to "Wireless door lock receiver and transmitter" – "Recognition code registration".)

Wireless door lock operate normally when recognition code is registered.

No response from hazard warning light.


The wave reaching range check:
Is the wave reaching range normal?
(1 M area around vehicle)
(While the transmitting switch is pressed,
(approx. 20 secs.) the taillight continuously.
After 20 secs., repress the switch again.)
Yes
Other body control system faulty.
(Transmitter and receiver are normal.)
No
Transmitter faulty or wireless door lock receiver faulty.
<Reference>
Check the wave reaching range with another transmitter (normal). When the range is normal, transmitter defection is detected, the range is not normal, wireless door lock receiver defection is defected.
When pressing each switch of the new or normal transmitter used in the same type vehicle, check that all taillights chirps in the same way.
No
Yes
Transmitter faulty.
Wireless door control receiver check:
Check that continuity exists between the receiver terminal 3 (PRG) and door control relay terminal 23 (PRG).
Check that continuity exists between the receiver terminal 2 (RDA) and door control relay terminal 22 (RDA).
Yes
Wire harness faulty (short circuit).
No
Check RDA terminal circuit.
Check that the voltage of RDA is about 6 – 7 V (when the transmitter is ON).
No
RDA terminal open circuit.
Yes


+B power source check:
Check that there is constantly 10 to 14 V voltage at the connector terminal 5 (+B) of wireless door control receiver.
No
DOME fuse or wire harness faulty.
Yes
Body ground check:
Check that continuity exists between the connector terminal 1 (GND) of the wireless door control receiver and body ground.
No
Wire harness faulty.
Body ground open and contact error.
Yes
Wireless door control receiver faulty.

BE0OJ-06

INSPECTION

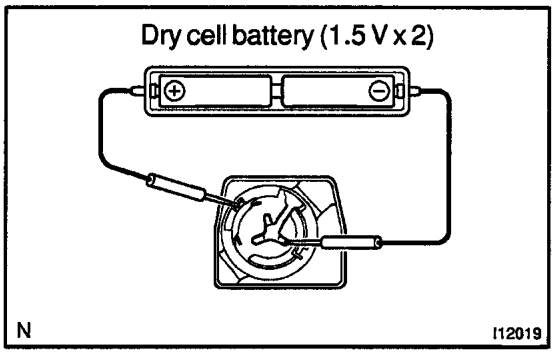
1. INSPECT WIRELESS DOOR LOCK TRANSMITTER OPERATION

HINT:

Refer to "Wireless door lock control receiver and transmitter replacement" on page BE–109.

(a) Using a screwdriver, remove the screw and cover.

(b) Remove the battery (lithium battery).



(c) Install a new or normal battery (lithium battery).

HINT:

When a new or normal battery can not be obtained, connect 2 new 1.5 V batteries in series, connect the battery (+) to the battery receptacle side terminal and battery (–) to the bottom terminal, then apply 3 V voltage to the transmitter.

(d) In the location where is approx. 1 M away from driver's outside handle in the right direction, and check the transmitter operation when pressing transmission switch on the surface of the transmitter body.

Standard:

Remote control of vehicle door lock can be operated.

HINT:

- The minimum operation distance differs according to operator, the way of holding, and location.
- As weak wave is used, operation distance might be shortened when noise is detected in strong wave or used frequency.

(e) Install the battery (lithium battery).

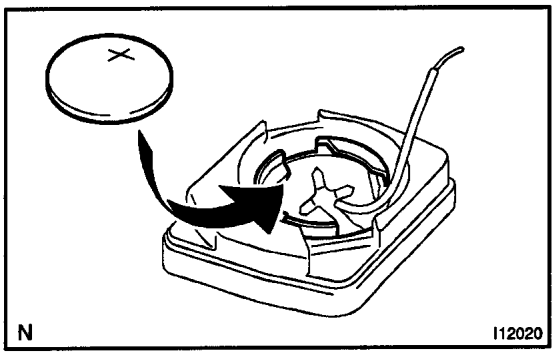
(f) Install a cover so that O–ring is not distorted or slipped off.

(g) Using a screwdriver, tighten the screw.

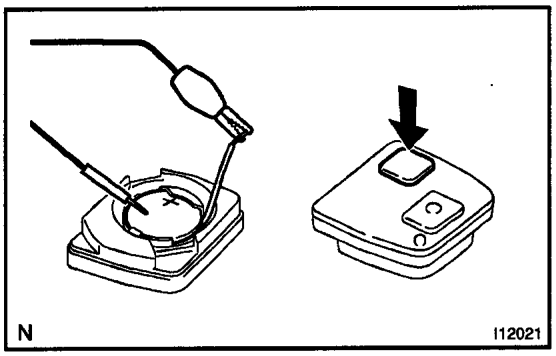
2. CHECK BATTERY CAPACITY

HINT:

- Make sure to use the TOYOTA electrical tester.
- With the battery unloaded, judge can not be made whether the battery is available or not on the test.
- When the transmitter is faulty, the energy amount left in the battery might not be checked correctly.
- On the lithium battery used for the transmitter, the voltage more than 2.5 V with the battery unloaded is shown on the tester until the energy is completely consumed. Accordingly when inspecting the energy amount left in the battery, it is necessary to measure the voltage when the battery is loaded. (1.2 kΩ).



(a) Remove the screw and cover using a (–) driver.
(b) Remove the battery (lithium battery) from the transmitter.
(c) Connect the lead to the (–) terminal of the transmitter and install the battery.



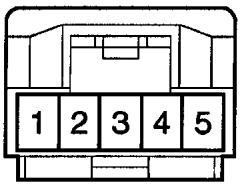
(d) Connect the (+) tester to the (+) battery (lithium battery), and (–) tester to the lead respectively.
(e) Press one of the transmitting switches on the transmitter for approx. 1 second.
(f) Press the transmitting switch on the transmitter again to check the voltage.
Standard: 2.1 V or more

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 2.5 V) condition after 20 seconds from the switch was pressed.
  Make sure to read the voltage before of it.
- High voltage might be shown 1 to 2 times after leaving the battery, judge should be made with the voltage shown at the 3rd time or later.

(g) Disconnect the lead.
(h) Set the battery (lithium battery) in the transmitter.
(i) Install the cover, so that the O–ring is not distorted or slipped off.
(j) Using a screwdriver, tighten the screw.

Wire harness side:



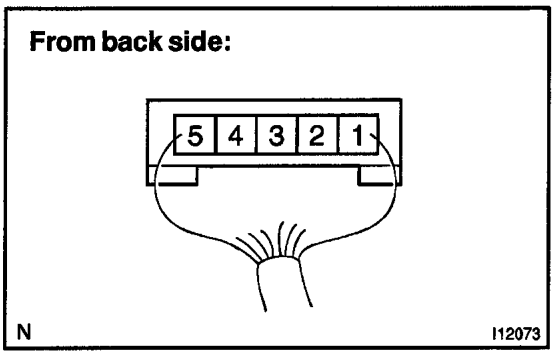
N I12038

3. INSPECT WIRELESS DOOR LOCK CONTROL RECEIVER CIRCUIT

(a) Disconnect the connector from the receiver and inspect the connector on the wire harness side, as shown below.

Tester connection	Condition	Specified condition
1 – Ground	Constant	Continuity
5 – Ground	Constant	Battery voltage

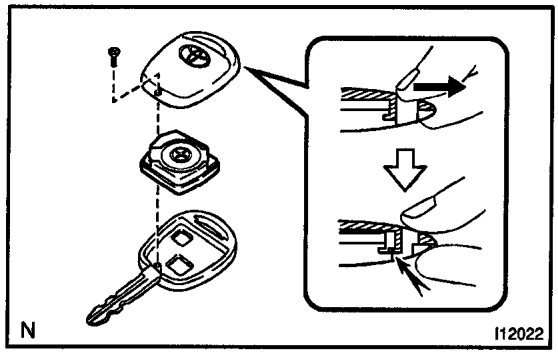
If the circuit is not as specified, inspect the circuit connected to other parts.



(b) Connect the wire harness side connector to the receiver and inspect the wire harness side connector from the back side, as shown below.

Tester connection	Condition	Specified condition
3 – Ground	Normal mode	10 – 14 V
2 – Ground	Ignition switch position OFF Key removed Transmitter ON	About 6 – 7 V

If circuit is as specified, replace the receiver.
If the circuit is not as specified, inspect the circuit connected to other parts.



BE0GP–10

REPLACEMENT

1. REPLACE TRANSMITTER (LITHIUM) BATTERY

NOTICE:

Special caution should be taken for handling each component as they are precision electronic components.

(a) Using a screwdriver, remove the screw and cover.

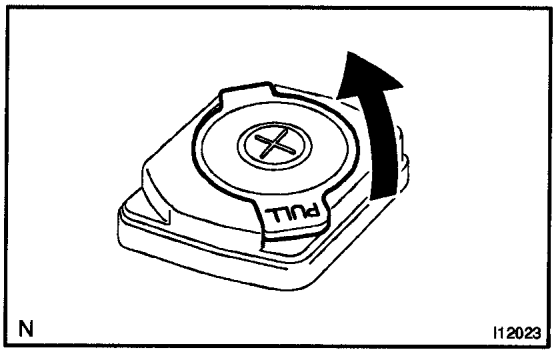
NOTICE:

Do not pry out the cover forcibly.

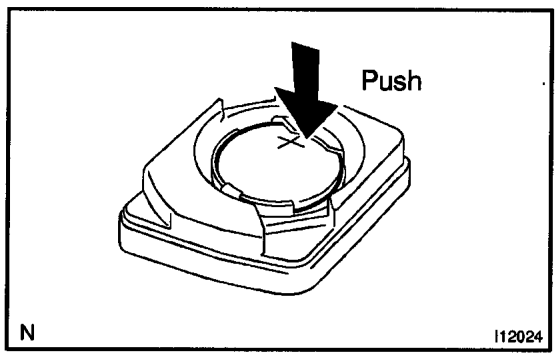
HINT:

Push the cover with a finger as shown in the illustration, so that there becomes clearance, then pry out the cover from that clearance.

(b) Remove the transmitter.



(c) Pull out the battery cover.



(d) Remove the battery (lithium battery) as shown in the illustration.

NOTICE:

- **Do not push the terminals with a finger.**
- **If prying up the battery (lithium battery) forcibly to remove, the terminals are deformed.**

(e) Install a battery (lithium battery).

NOTICE:

Face the battery upward. Take care not to deform the terminals.

(f) Check that O–ring is not distorted or slipped off, and install the cover.

NOTICE:

When the shrews are tightened loosely, it might cause faulty contact of battery (lithium battery) and terminals.

(g) Assemble the transmitter to the key plate and the cover.

(h) Using a screwdriver, tighten the screw.

2. REPLACE DOOR CONTROL RECEIVER AND TRANSMITTER

NOTICE:

When replacing the door control receiver and transmitter, registration of recognition code is necessary because they are provided as single components.

(a) Select which operation mode should be performed from the following modes.
- Add mode
- Rewrite mode
- Prohibition mode
- Confirmation mode

HINT:
- The add mode is used to retain codes already registered while you register new recognition codes. This mode is used when adding a transmitter. However, if the number of registered codes exceeds 4 codes, previously registered codes are correspondingly erased in order, starting from the first registered code.
- The rewrite mode is used to erase all previously registered codes and register only new recognition codes.
- The prohibition mode is used to erase all registered codes and cancels the wireless door lock function. Use this mode when the transmitter is lost.
- The confirmation mode is for confirming how many recognition codes are already registered before you register additional recognition codes.

(b) Follow the chart on the following pages to register the transmitter recognition code at the wireless door lock control receiver.

HINT:
- When procedure is out of the specified, the operation returns to normal operation.
- Maximum 4 recognition codes can be registered.

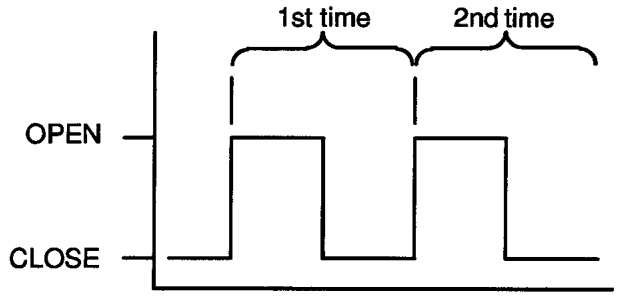
Start registration of recognition code

The vehicle should be in the following conditions.
- The key is not inserted in the ignition key cylinder.
- Driver's door is OPEN. (Other doors are CLOSED)
- Driver's door is UNLOCKED.

Insert the key into the ignition key cylinder, then pull it out. (Rerform this twice within 5 seconds)

Within 40 secs.

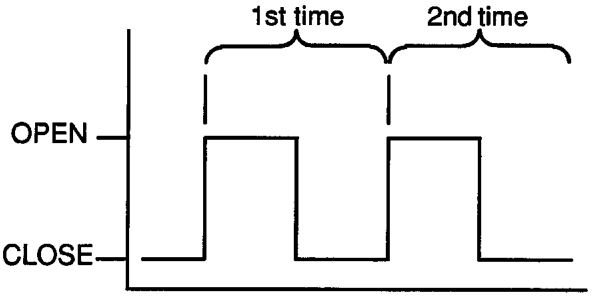
Open and close the door (manual operation) 2 times.



Insert the key into the ignition key cylinder, then pull it out.

Within 40 secs.

Open and close the door (manual operation) 2 times.

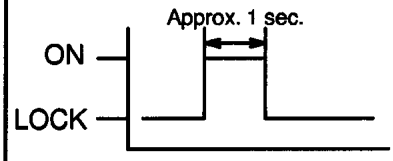


Close the all door and insert the key into the ignition key cylinder.

Turn the ignition switch from ON to LOCK at approx. 1 sec. interval 1 to 5 times to select the mode.

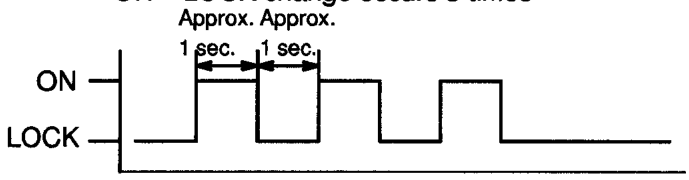
Add mode

ON – LOCK change occurs 1 time



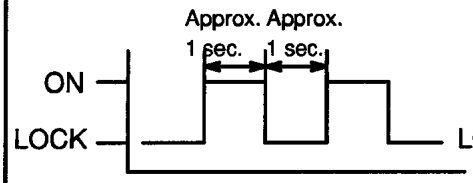
Confirmation mode

ON – LOCK change occurs 3 times



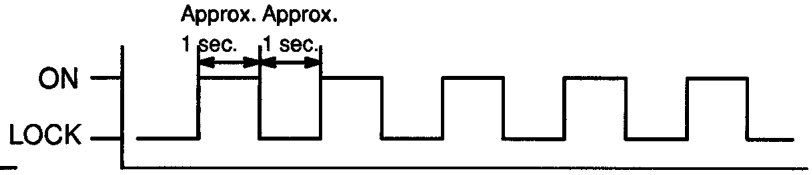
Rewrite mode

ON – LOCK change occurs 2 times



Prohibition mode

ON – LOCK change occurs 5 times



Pull out the key from the ignition key cylinder.

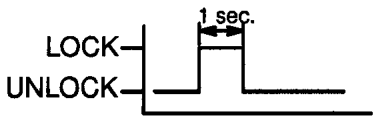
Within 3 secs.

When add mode or rewrite mode is selected.

Door control relay automatically performs the LOCK–UNLOCK operation once or twice at 1 sec. interval to inform the operator that either the add mode or rewrite mode has been selected.

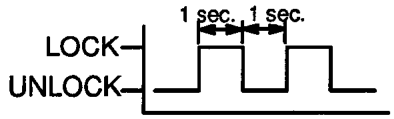
LOCK–UNLOCK occurs once

Indicates that add mode has been selected.



LOCK–UNLOCK occurs twice

Indicates that rewrite mode has been selected.



When prohibition mode is selected.

When confirmation mode is selected.

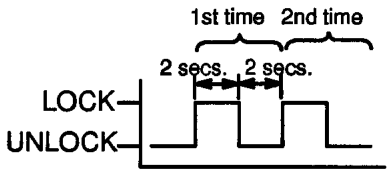
Door control relay automatically performs the LOCK–UNLOCK operation 1 to 4 times at 2 sec. interval to inform the operator of the number of the registered codes.

HINT:

When the number of the registered code is 0, the operation is automatically performed 5 times.

Example:

When the operation is performed twice, it directs that 2 types of recognition code have been registered.

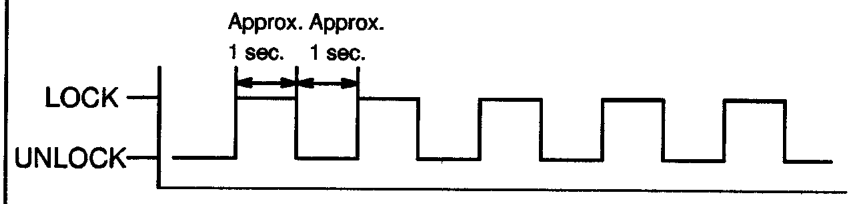


Registration of recognition code (Confirmation mode and prohibition mode) is completed.

When prohibition mode is selected.

Within 20 secs.

Door control relay performs LOCK–UNLOCK operation 5 times at a 1 sec. interval to inform the operator that prohibition mode has been selected.



Press the lock and unlock switches on the transmitter switch simultaneously for more than between 1 sec. or more and 1.5 sec. below.

Within 3 secs.

Press either one of 2 switches on the transmitter.

Within 3 secs.

Door control relay automatically performs LOCK–UNLOCK operation once or twice at a 1 sec. interval to inform the operator that the receiver has received the signal from the transmitter.

LOCK–UNLOCK occurs once

Registration of recognition code is completed

LOCK–UNLOCK occurs twice

Registration of recognition code has not been completed.

- Recognition code received first time and second time did not match.
- When selecting add mode, a registered recognition code was received.

If LOCK–UNLOCK operation can not be performed at all, the mode returns to the normal mode, then start with "Start registration of recognition code".

Proceed to finish registration

Proceed to continue registration

Within 40 secs.

If even one of the following conditions is satisfied, registration of recognition codes is completed.

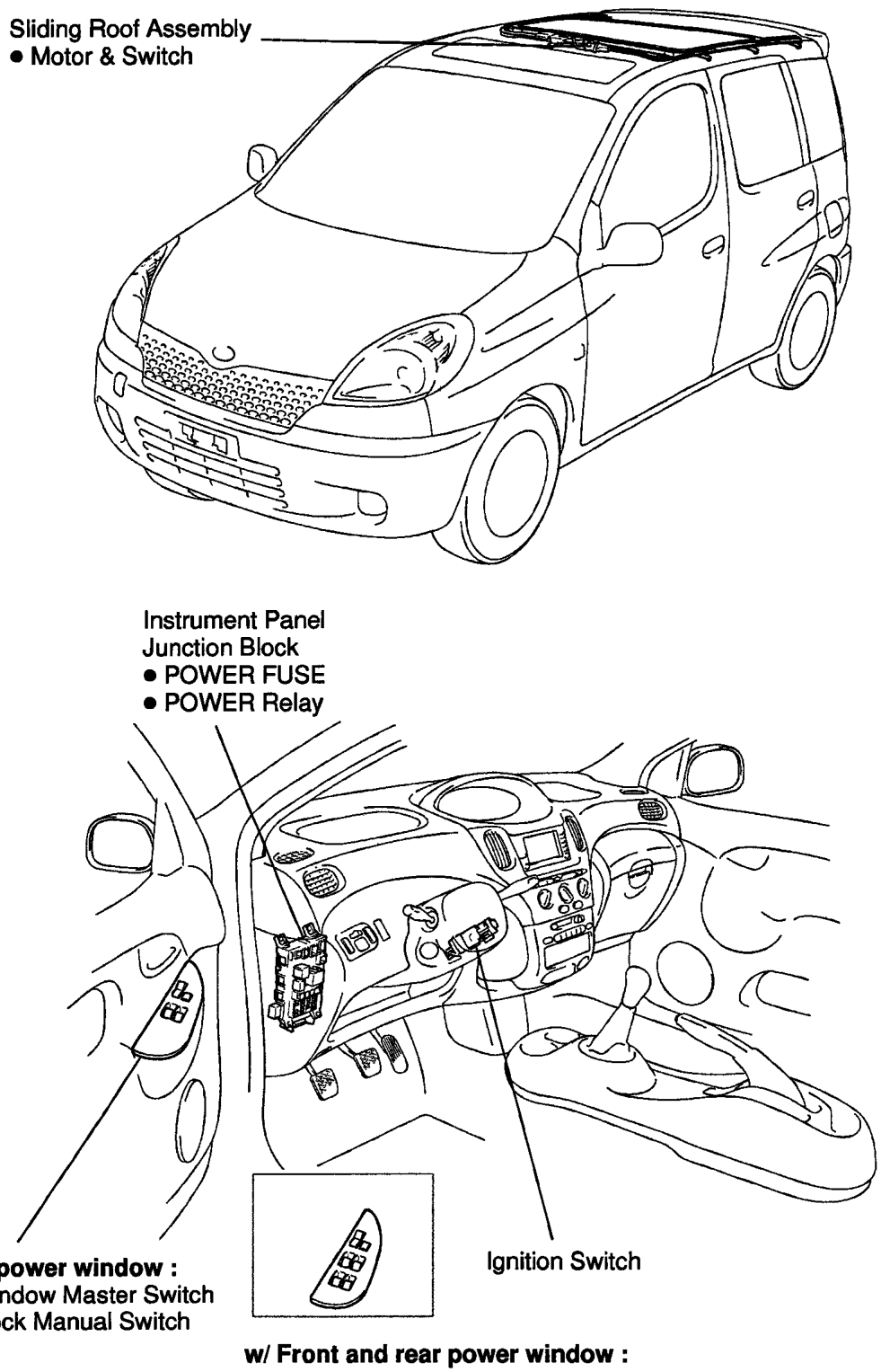
- 40 secs. elapses since the door control relay response.
- The driver's door is opened.
- The key plate is inserted in the ignition key cylinder.
- 4 type recognition codes are registration at one time.

Registration of recognition codes (add mode or rewrite mode) is completed.

SLIDING ROOF SYSTEM

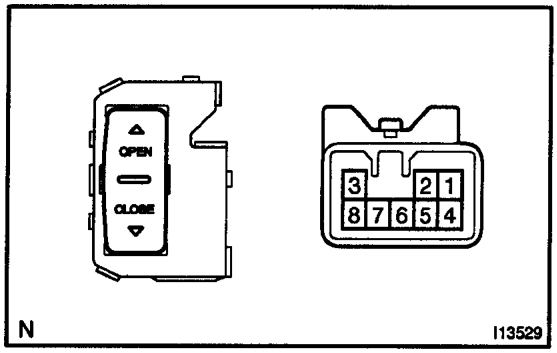
LOCATION

BE1E9-01



P

I13509



BE1EA-01

INSPECTION

1. INSPECT SLIDING ROOF SWITCH CONTINUITY

(a) Connect the positive (+) lead from the battery to terminal 8 and the negative (–) lead to terminal 4 and 7.

(b) Connect the positive (+) lead from the voltmeter to terminal 1 and the negative (–) lead to terminal 4.

HINT:

Tests shall be conducted in a sequence starting from the top.

Condition	Test operation	Test result
No connection between battery and terminal	Sliding roof switch OFF → OPEN	0 → 10 – 14V
Battery (–) connected to 5	Sliding roof switch OFF → OPEN	0 → 10 – 14V
Battery (–) connected to 6	Sliding roof switch OFF → OPEN	0 → 10 – 14V
Battery (–) connected to 5 and 6	Sliding roof switch OFF → OPEN	0 → 10 – 14V
Battery (–) connected to 5 Sliding roof switch OPEN	Connect battery (–) to 6	10 – 14V → 10 – 14V
Battery (–) connected to 5 and 6 Sliding roof switch OPEN	Disconnect battery (–) from 5	10 – 14V → 10 – 14V
No connection between battery and terminal Sliding roof switch OPEN	Disconnect battery (–) from 5	10 – 14V → 10 – 14V
No connection between battery and terminal	Sliding roof switch OFF → CLOSE	0 → 0V
Battery (–) connected to 5	Sliding roof switch OFF → CLOSE	0 → 0V
Battery (–) connected to 6	Sliding roof switch OFF → CLOSE	0 → 0V
Battery (–) connected to 5 and 6	Sliding roof switch OFF → CLOSE	0 → 0V
Battery (–) connected to 5 and 6	Disconnect battery (–) from 6	0 → 0V
Battery (–) connected to 5 Sliding roof switch CLOSE	Disconnect battery (–) from 5	0 → 0V

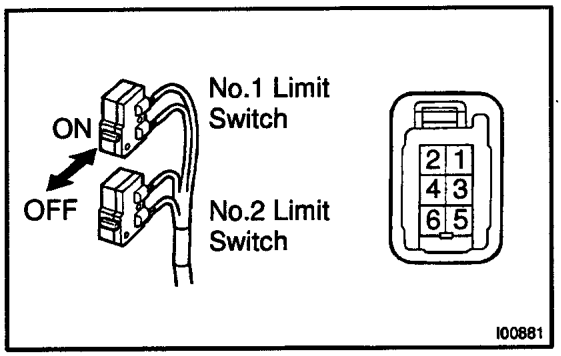
(c) Connect the positive (+) lead from the battery to terminal 8 and the negative (–) lead to terminal 4 and 7.

(d) Connect the positive (+) lead from the voltmeter to terminal 3 and the negative (–) lead to terminal 4.

Condition	Test operation	Test result
No connection between battery and terminal	Sliding roof switch OFF → OPEN	0 → 0V
Battery (–) connected to 5	Sliding roof switch OFF → OPEN	0 → 0V
Battery (–) connected to 6	Sliding roof switch OFF → OPEN	0 → 0V
Battery (–) connected to 5 and 6	Sliding roof switch OFF → OPEN	0 → 0V
Battery (–) connected to 5 Sliding roof switch OPEN	Connect battery (–) to 6	0 → 0V
Battery (–) connected to 5 and 6 Sliding roof switch OPEN	Disconnect battery (–) from 5	0 → 0V
No connection between battery and terminal Sliding roof switch OPEN	Disconnect battery (–) from 5	0 → 0V
No connection between battery and terminal	Sliding roof switch OFF → CLOSE	0 → 0V
Battery (–) connected to 5	Sliding roof switch OFF → CLOSE	0 → 10 – 14V
Battery (–) connected to 6	Sliding roof switch OFF → CLOSE	0 → 10 – 14V
Battery (–) connected to 5 and 6	Sliding roof switch OFF → CLOSE	0 → 10 – 14V
Battery (–) connected to 5 and 6	Disconnect battery (–) from 6	10 – 14 → 0V after approx. 5 sec
Battery (–) connected to 5 Sliding roof switch CLOSE	Connect battery (–) from 5	10 – 14 → 0V

(e) When the terminal 7 is not connected to the battery negative (–) lead, the test result should be 0V for each of the above tests.

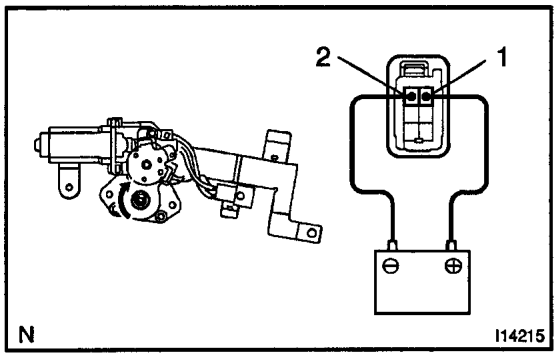
If operation is not as specified, replace the control assembly.



2. INSPECT SLIDING ROOF LIMIT SWITCH CONTINUITY

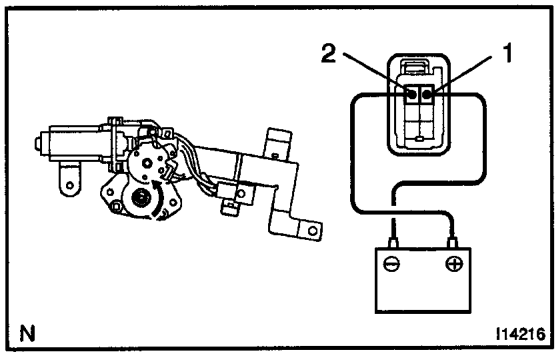
Switch position	Tester connection	Specified condition
No.1 limit switch OFF (SW pin released)	4 – 5	No continuity
No.1 limit switch ON (SW pin pushed in)	4 – 5	Continuity
No.2 limit switch OFF (SW pin released)	4 – 6	No continuity
No.2 limit switch ON (SW pin pushed in)	4 – 6	Continuity

If continuity is not as specified, replace the switch.



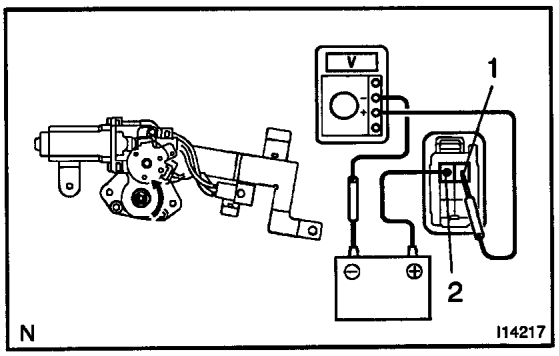
3. INSPECT SLIDING ROOF MOTOR OPERATION

(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 of 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 motor.



4. INSPECT SLIDING ROOF MOTOR PTC THERMISTOR OPERATION

(a) Disconnect the connector from the sliding roof motor.

(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.

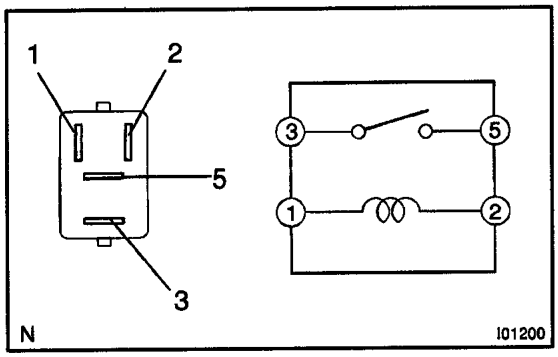
(c) Connect the positive (+) lead from the battery to terminal 2 on the wire harness side connector, and raise the window to the fully position.

(d) Continue to apply voltage and check that the current changes to less than 1 A within 10 to 90 seconds.

(e) Disconnect the leads from the terminals.

(f) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 4 and check that the sliding roof begins to "CLOSE" position.

If operation is not as specified, replace the motor.



5. INSPECT POWER MAIN RELAY CONTINUITY

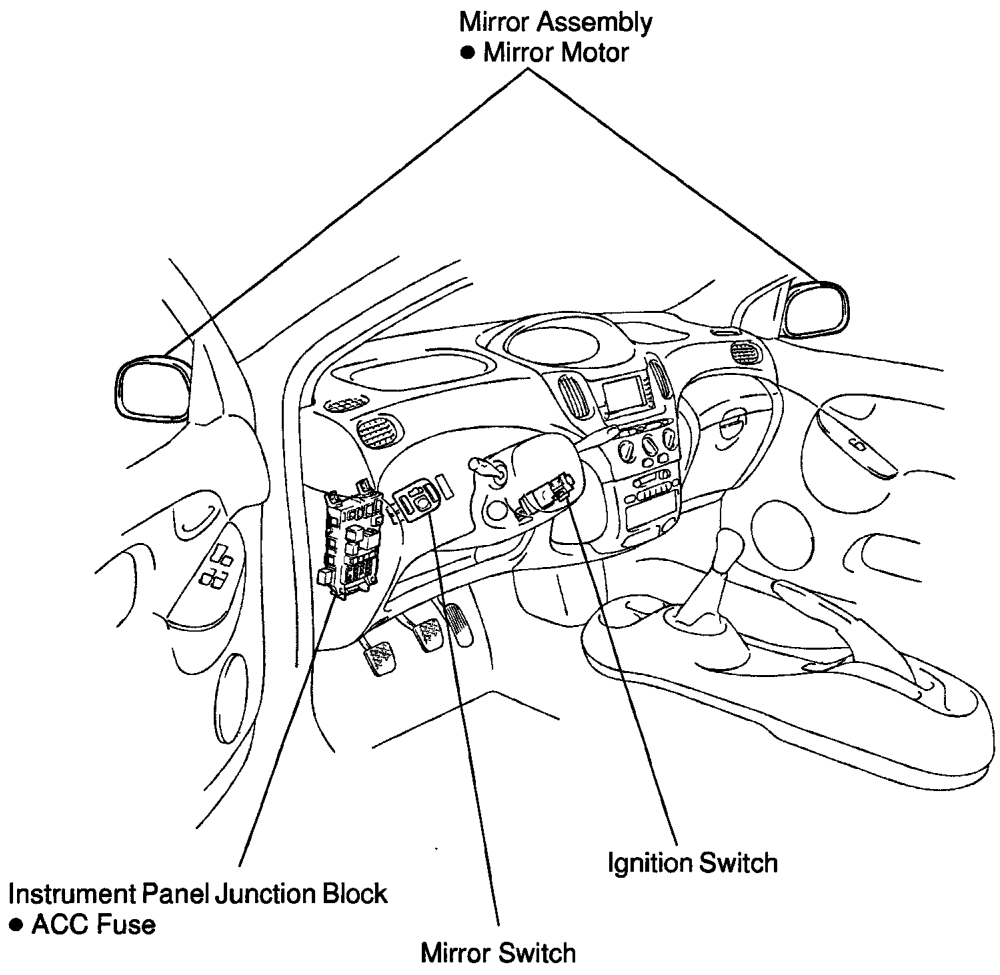
Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.

POWER MIRROR CONTROL SYSTEM

BE18Y-02

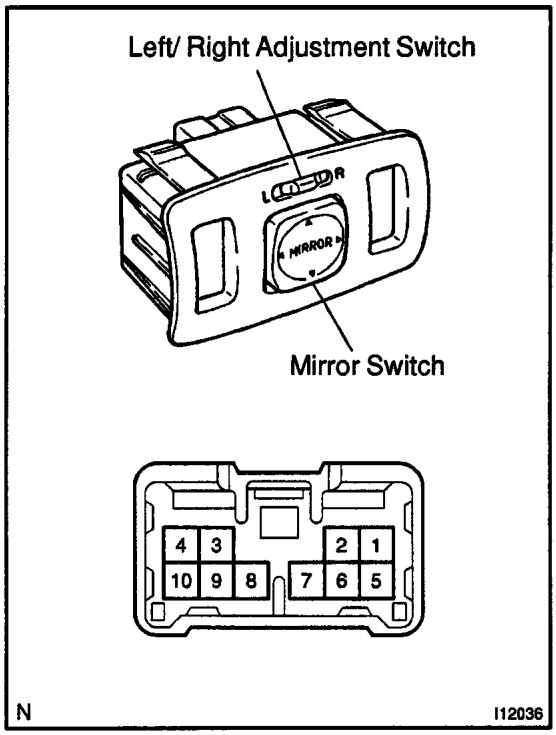
LOCATION



P

I13510

BE1EB-01



INSPECTION

1. INSPECT MIRROR SWITCH CONTINUITY

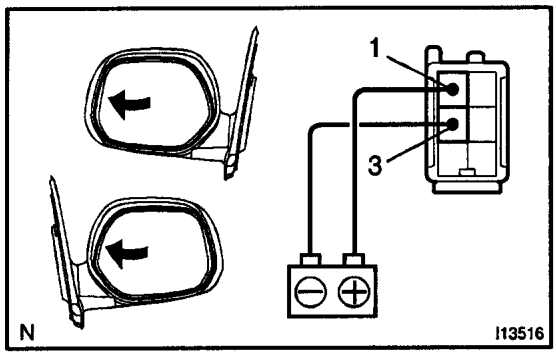
Left side for Left/Right adjustment switch

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

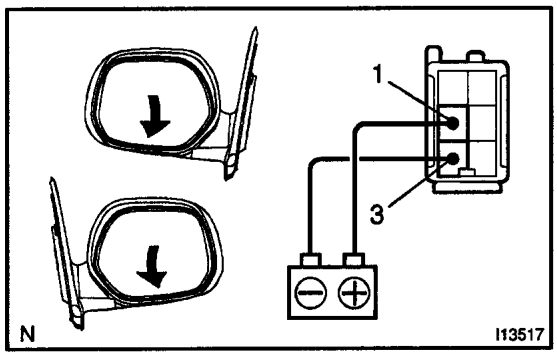
Switch position	Tester connection	Specified condition
OFF	–	No continuity
UP	6 – 10 7 – 9	Continuity
DOWN	6 – 9 7 – 10	Continuity
LEFT	6 – 10 8 – 9	Continuity
RIGHT	6 – 9 8 – 10	Continuity

If continuity is not as specified, replace the switch.

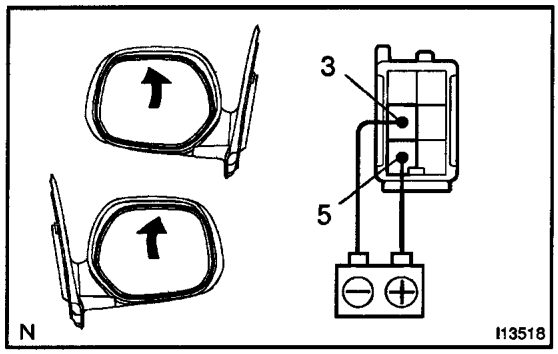


2. INSPECT MIRROR MOTOR OPERATION

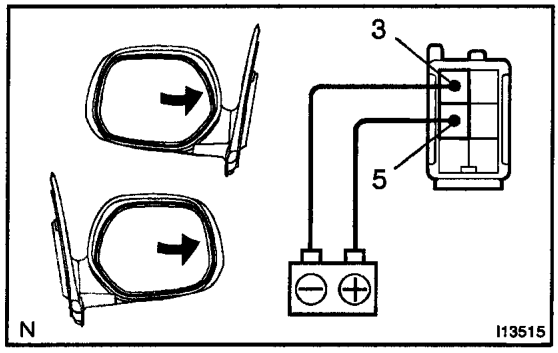
(a) Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 1, and check that the mirror turns right side.



(b) Reverse the polarity, and check that the mirror turns left side.



(c) Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 5, and check that the mirror turns to the downward.



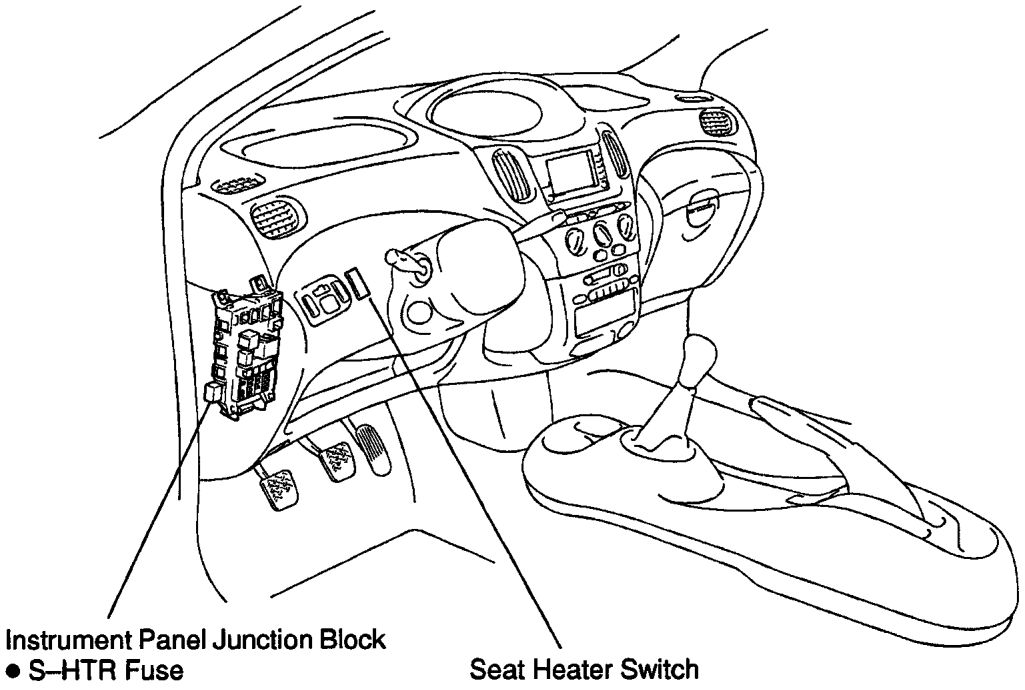
(d) Reverse the polarity, and check that the mirror turns to the upward.

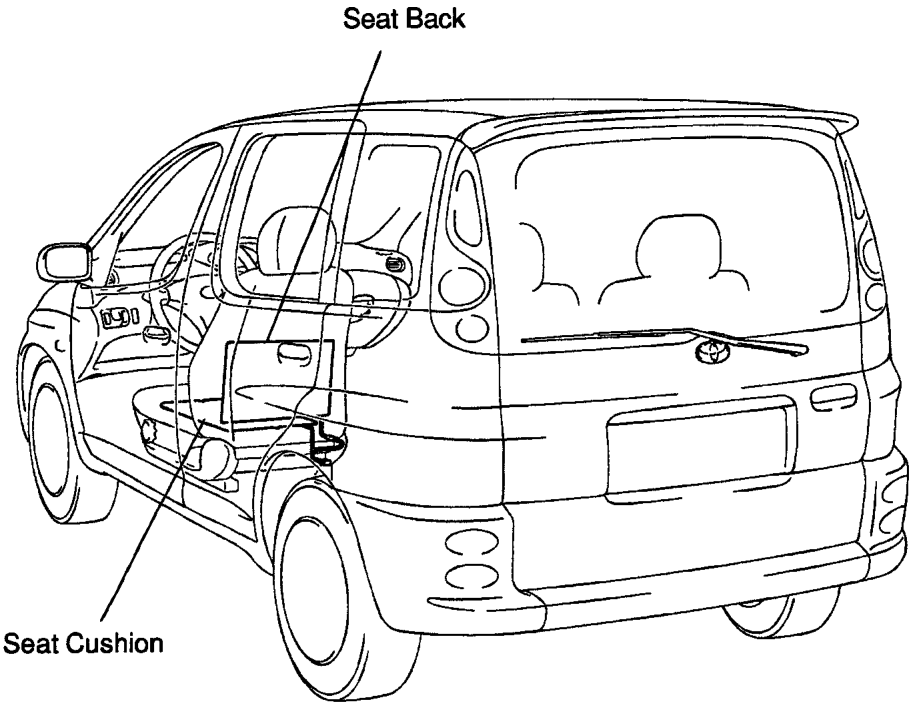
If operation is not as specified, replace the mirror assembly.

SEAT HEATER SYSTEM

LOCATION

BE190-02



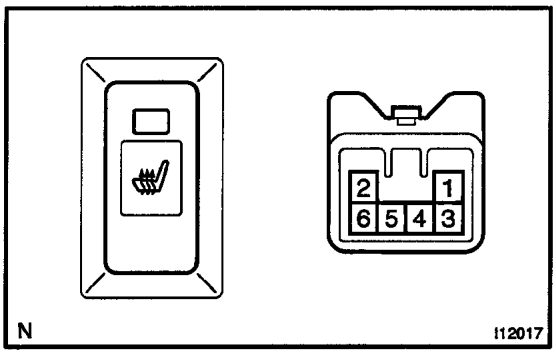


P

I13511

BE02U-05

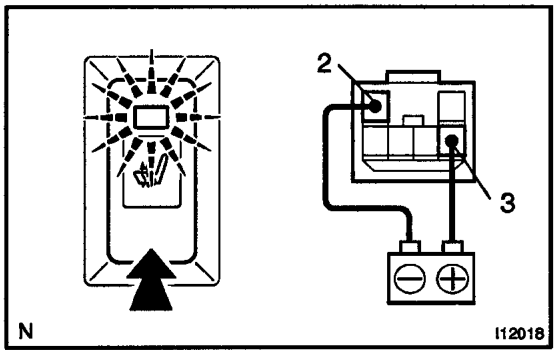
INSPECTION



1. INSPECT SEAT HEATER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	2 – 6	No continuity
ON	2 – 3 – 6	Continuity
Illumination circuit	1 – 4	Continuity

If continuity is not as specified, replace the switch.

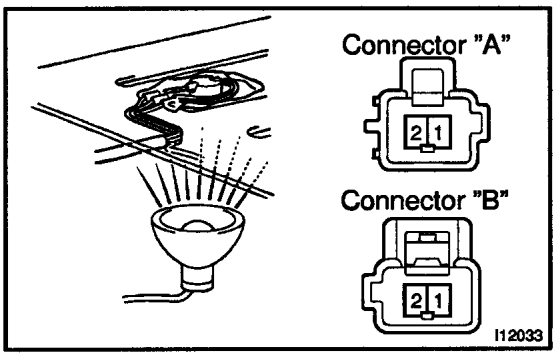


2. INSPECT SEAT HEATER INDICATOR LIGHT OPERATION

(a) Connect the positive (+) lead from the battery to terminal 3 and the negative (–) lead to terminal 2.

(b) Push the seat heater switch and check that the indicator light lights up.

If operation is not as specified, replace the switch and inspect the circuits connected to other parts.



3. INSPECT SEAT HEATER CUSHION CONTINUITY

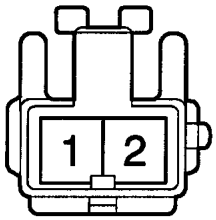
(a) Heat the thermostat with a light.

(b) Inspect the seat heater continuity between terminals, as shown.

Tester connection	Condition	Specified condition
A2 – B1	Constant	Continuity
A2 – B2	Constant	Continuity
A1 – B1	Seat heater temperature below 56 °C (133 °F)	Continuity

If continuity is not as specified, replace the seat cushion pad.

Wire harness side:



N

I12034

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

BE191-02

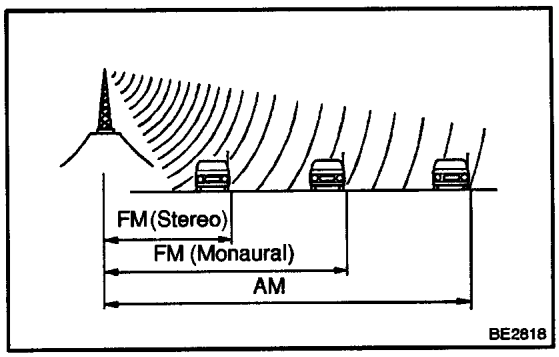
DESCRIPTION

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

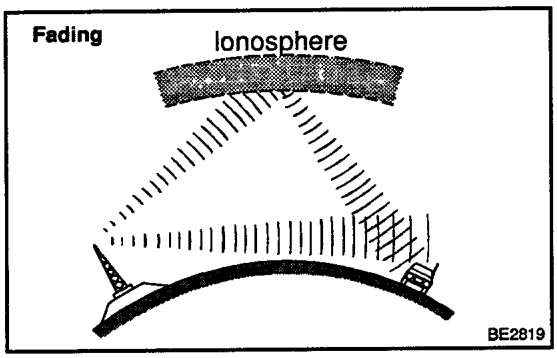


2. SERVICE AREA

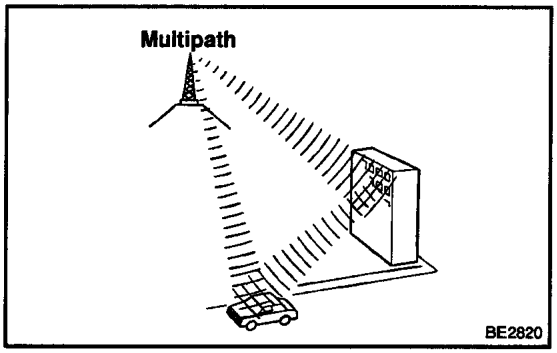
There are great differences in the size of the service area for AM and FM monaural. Sometimes FM stereo broadcasts cannot be received even through AM can be received in very clearly.
Not only does FM stereo have the smallest service area, but it also picks up static and other types of interference ("noise") easily.

3. RECEPTION PROBLEMS

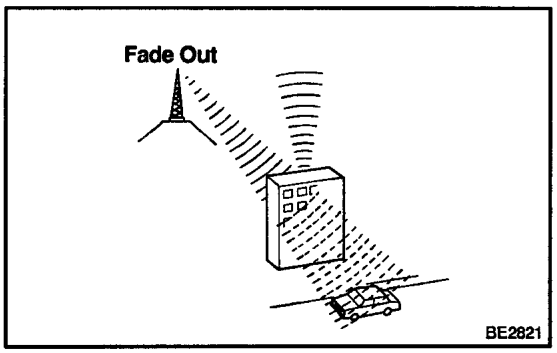
Besides the problem of static, there are also the problems called "fading", "multipath" and "fade out". These problems are caused not by electrical noise but by the nature of the radio waves themselves.



(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

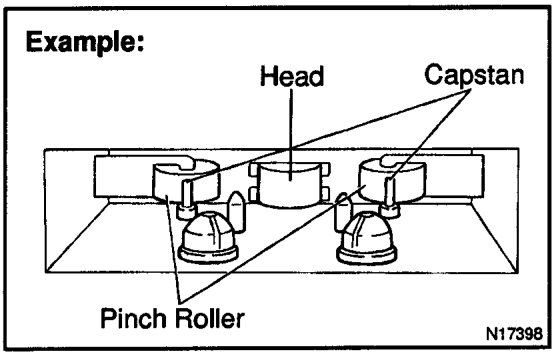
Compact Disc Players use a laser beam pick–up to read the digital signals recorded on the CD and reproduce analog signals of the music, etc.

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:

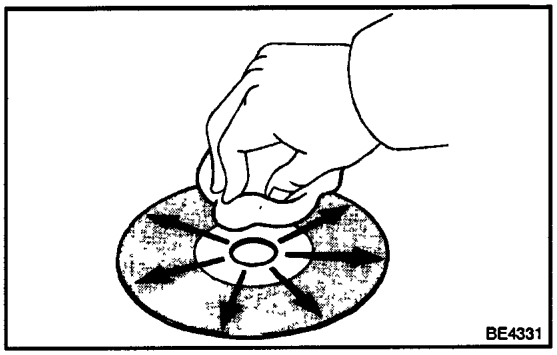
CD players use an invisible laser beam which could cause hazardous radiation exposure. Be sure to operate the player correctly as instructed.



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:

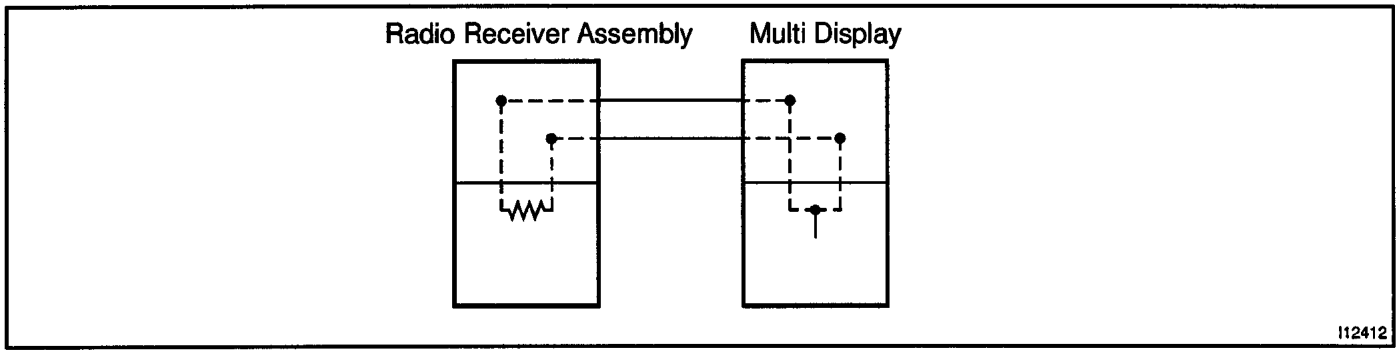
Do not use a conventional record cleaner or anti–static preservative.

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.

(c) 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.

BE1EC-01

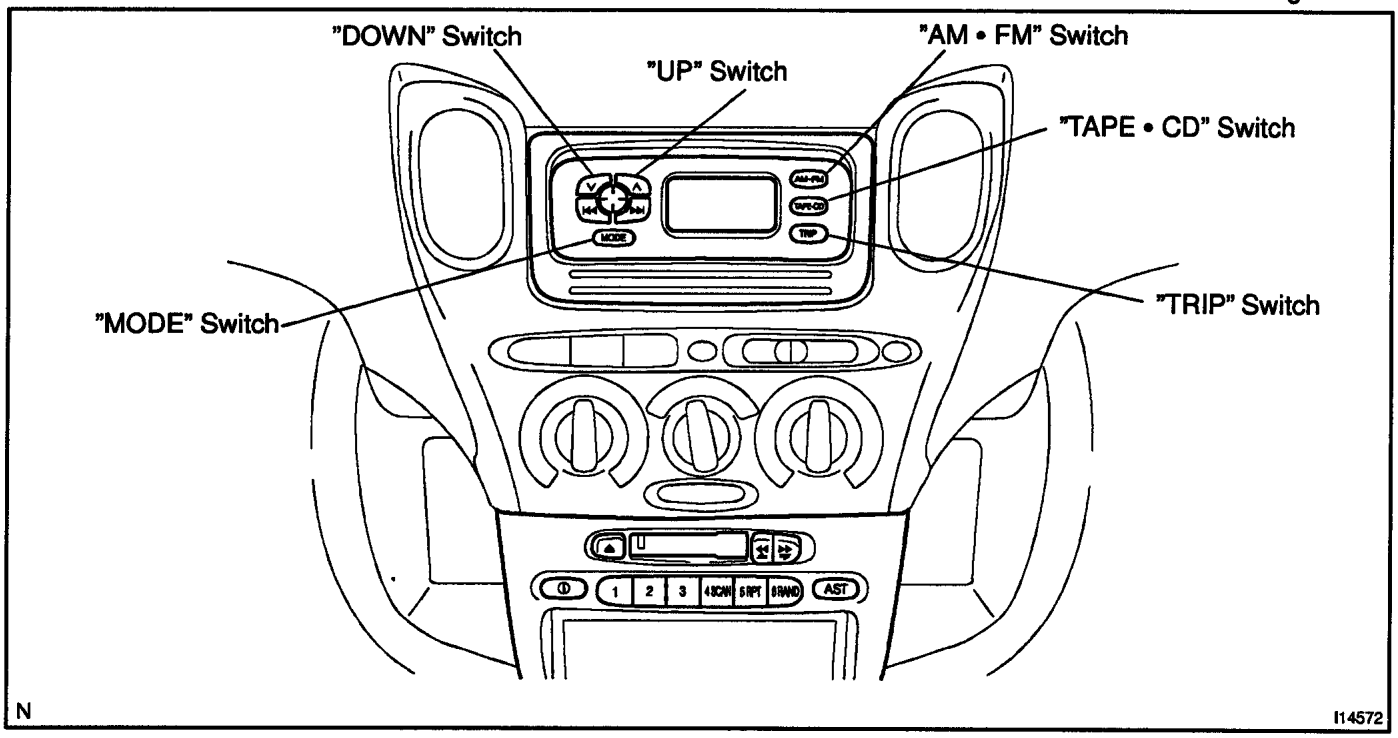
TROUBLESHOOTING

1. DIAGNOSIS FUNCTION (Standard type)

Error codes for connected component are displayed on the screen of display.

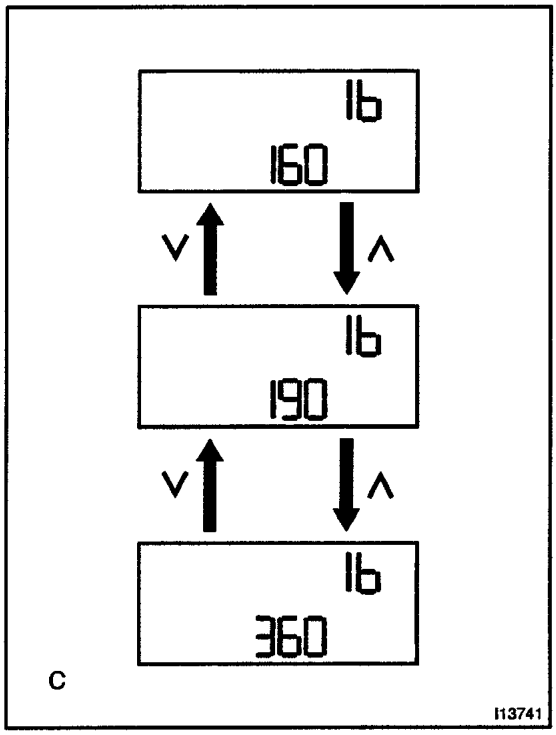
HINT:

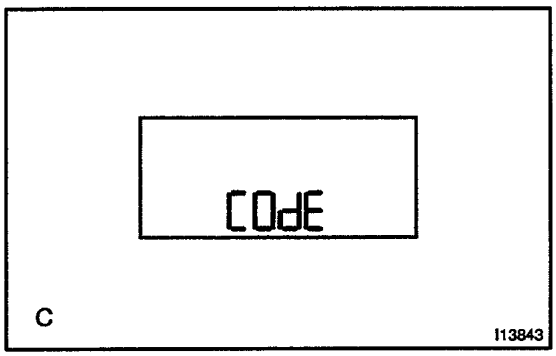
Connection check codes are not in this troubleshooting.



(a) Diagnosis start–up
For shifting to diagnosis mode, press the "MODE" switch 3 times while pressing the "AM•FM" and "TRIP" switch at the same time.(Beep 3 times)

(b) Finishing diagnosis
To exit from diagnosis mode, press the "MODE" switch for 2 seconds or turn the ignition key OFF.





(c) LAN check

(1) In the 1st line, a connection check code is displayed on the right.

(2) In the 2nd line, a registered physical address of the connected component is displayed.

Code No. (physical address) List

Code No. (physical address)	Components name
160	Multi display
190	Radio receiver assembly (Audio head unit)
190	CD tuner

Code No. (physical address) List / Dealer option

Code No. (physical address)	Components name
178	Navigation ECU
320	Casette deck
340	CD player (in-dash type)
360	CD changer
3A0	MD changer

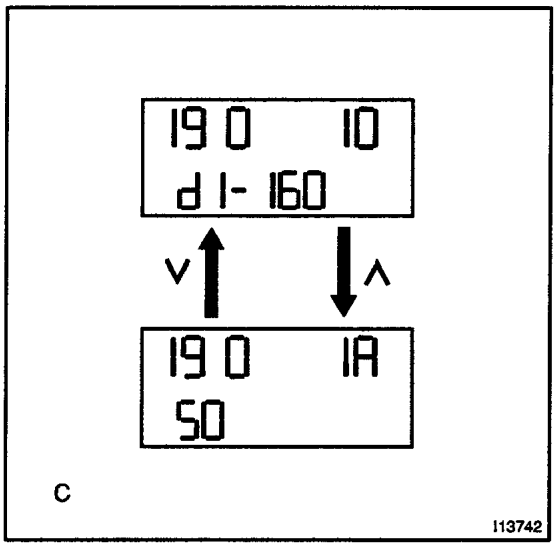
(3) Display screen contains data for only one component at a time.

(4) By pressing TURN "UP" or "DOWN", the displayed code numbers (physical address) is changed in descending or ascending order respectively.

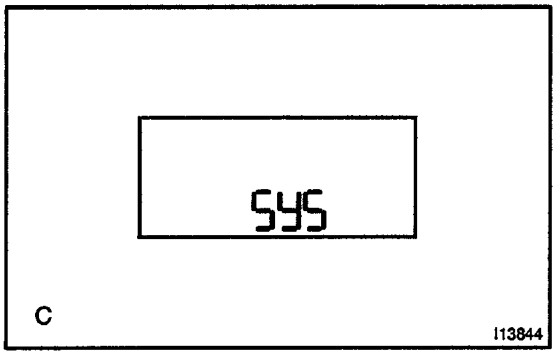
(5) First, current connection check code is displayed, secondly data for a master component and then, those for other slave components are displayed in the order of the physical address.

(d) Diagnosis memory

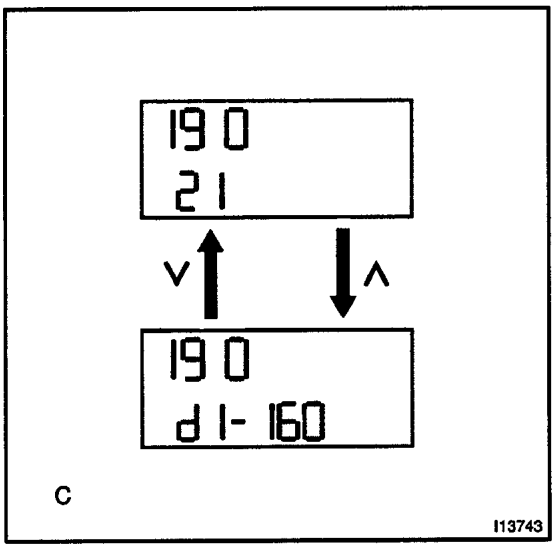
(1) When pressing the "MODE" switch in LAN check mode, the mode turns to the diagnosis memory mode. ("COdE" is displayed.) (Beep 3 times)
The results of self diagnosis performed over a tuner and connected component are memorized and displayed.



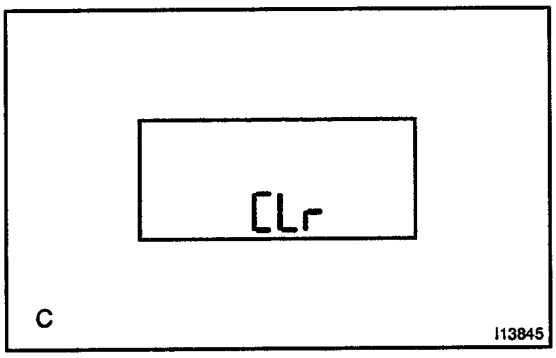
(2) In the 1st line, a physical address of component and the connection check code of DTC are displayed.
(3) In the 2nd line, a stored DTC (excluding connection check code) is displayed.
Displayed contents: DTC – auxiliary code
(4) Display screen contains only one DTC code at a time.
(5) By pressing TURN "UP" or "DOWN", the displayed code numbers (physical address) is changed in descending or ascending order respectively.
(6) Data for a master component is displayed first, and then those for other slave components are displayed in the order of the physical address (component in which DTC is detected only).
(7) The connection check codes are displayed in ascending order. For the same code, they are displayed in the order of priority in the DTCs.
(8) When no error is detected in the system, "00" is displayed.
(9) When pressing the "TRIP" switch, the mode returns to LAN check mode. (Beep 3 times)



(e) System check
(1) When pressing the "AM•FM" switch in LAN check mode, the mode turns to the system check mode in which the system performs self diagnosis of connected component and displays the results.("SyS" (showing the system is under detection) is displayed.) (Beep 3 times)



(2) In the 1st line, a physical address of the component of DTC are displayed.
(3) In the 2nd line, a stored DTC is displayed.
Displayed contents: DTC – auxiliary code
(4) Display screen contains only one DTC code at a time.
(5) By pressing TURN "UP" or "DOWN", the displayed code numbers (physical address) is changed in descending or ascending order respectively.
(6) Data for a master component is displayed first, and then other slave component are displayed in the order of the physical address (component in which DTC is detected only).
(7) When no error is detected in the system, "00" is displayed.
(8) DTCs are displayed in the order of priority.
(9) It sometimes takes approx. 40 sec. till the system inspection is completed.
(10) When pressing the "TRIP" switch in the system check mode, the mode returns to LAN check mode. (Beep 3 times)



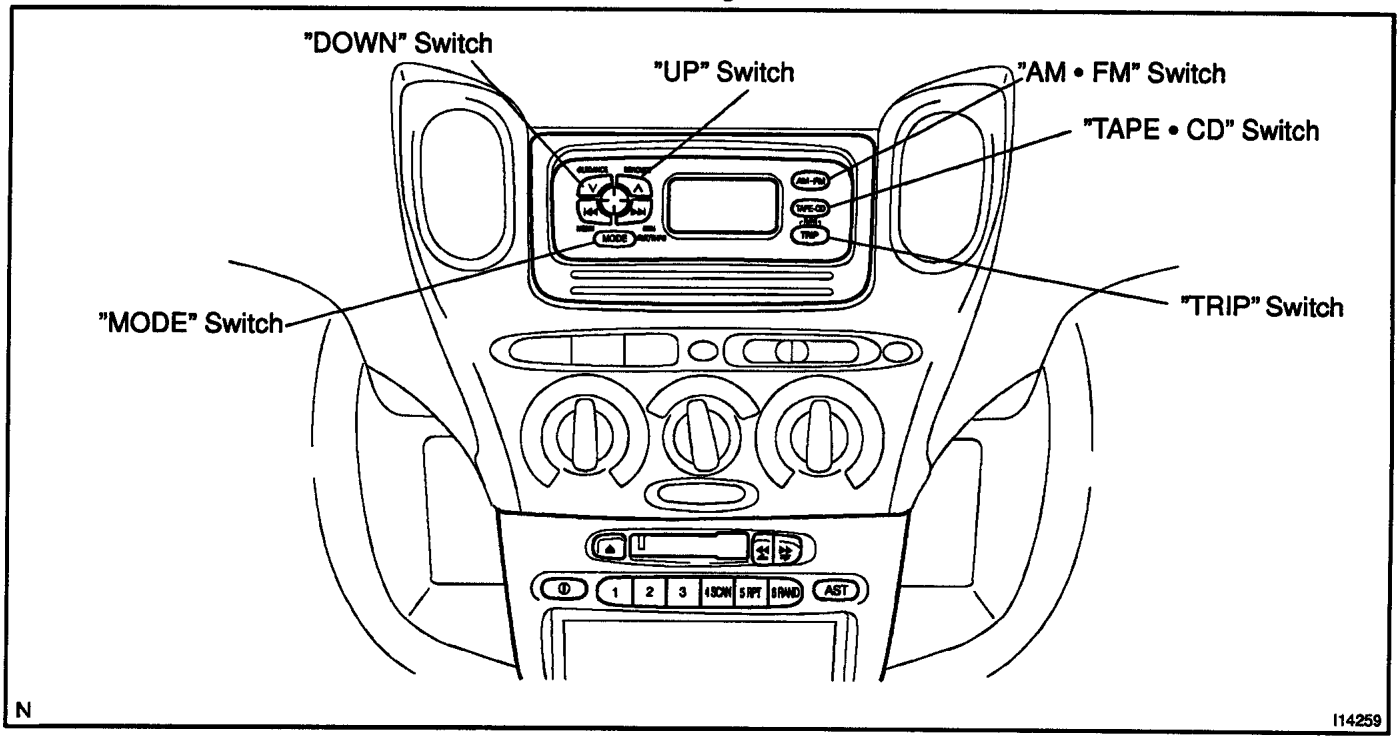
(f) Diagnosis memory clearance
(1) After an error is corrected, start up the diagnosis mode.
(2) Continue pressing the switch, "TAPE•CD" for 2 sec. ("CLr" is displayed.) (Beep 1 time)
(3) Press the "MODE" switch to change to the diagnosis memory mode and check that the normal code (00) is output.

2. DIAGNOSIS FUNCTION (Option–Higrade)

Error codes for a tuner and connected component are displayed on the screen of the tuner.

HINT:

Connection check codes are not specially required in this troubleshooting.

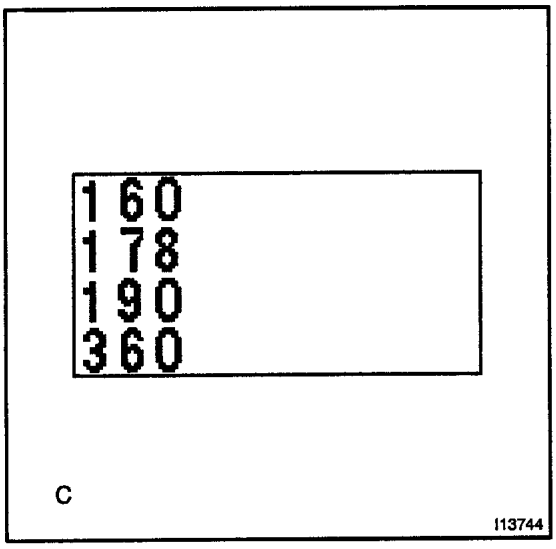


(a) Diagnosis start–up

For shifting to diagnosis mode, push the "MODE" switch 3 times while pressing the "AM•FM" and "TRIP" switch at the same time.(Beep 3 times)

(b) Finishing diagnosis

To exit from diagnosis mode, press the "MODE" switch for 2 seconds or turn the ignition key OFF.



(c) LAN check

(1) Data for up to 4 components are displayed at a time.

(2) By pressing TURN "UP" or "DOWN", the displayed code numbers (physical address) is changed in descending or ascending order respectively.

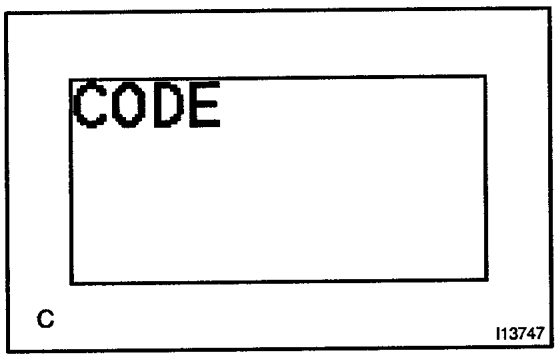
Code No. (physical address) List

Code No. (physical address)	Component name
160	Multi display
190	Radio receiver assembly (Audio head unit)
190	CD tuner

Code No. (physical address) List / Dealer option

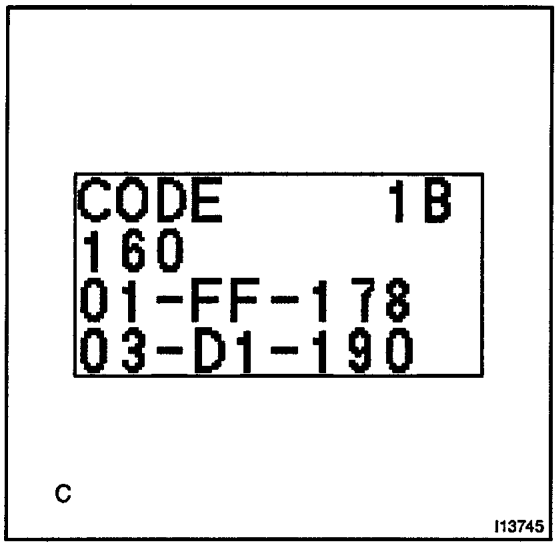
Code No. (physical address)	Component name
178	Navigation ECU
320	Casette deck
340	CD player (in–dash type)
360	CD changer

(3) Data for a master component is displayed first, and then those for other slave components are displayed in the order of the physical address.

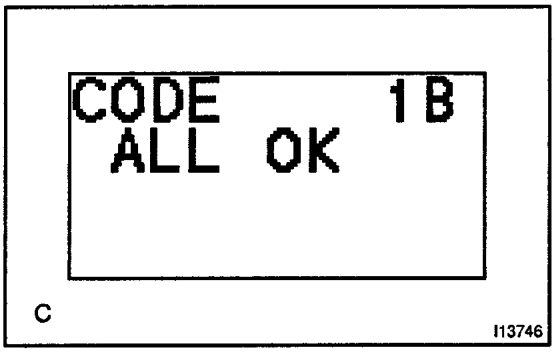


(d) Diagnosis memory

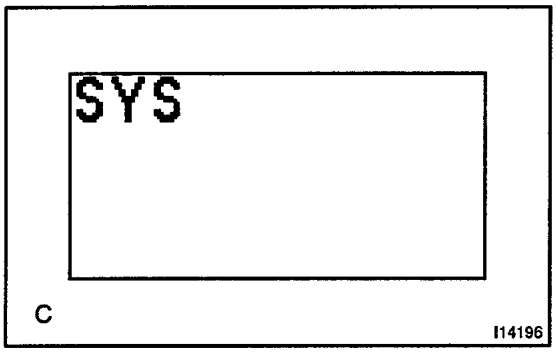
(1) When pressing the "MODE" switch in LAN check mode, the mode turns to the diagnosis memory mode. ("CODE" is displayed.) (Beep 3 times)
The results of self diagnosis performed over a tuner and connected component are memorized and displayed.



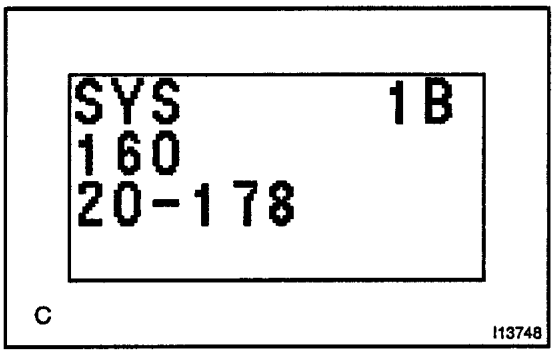
(2) In the 1st line, "CODE" and a current connection check code is displayed.
(3) In the 2nd line, a physical address of the component is displayed.
(4) In the 3rd and 4th lines, stored DTCs are displayed. Displayed contents: connection check code – DTC – auxiliary code
(5) Two DTC codes are displayed at a time.
(6) By pressing TURN "UP" or "DOWN", the displayed code numbers (physical address) is changed in descending or ascending order respectively.
(7) Data for a master component is displayed first, and then those for other slave components are displayed in the order of the physical address (components which DTC is detected only).
(8) The connection check codes are displayed in ascending order. For the same code, they are displayed in the order of priority in the DTCs.



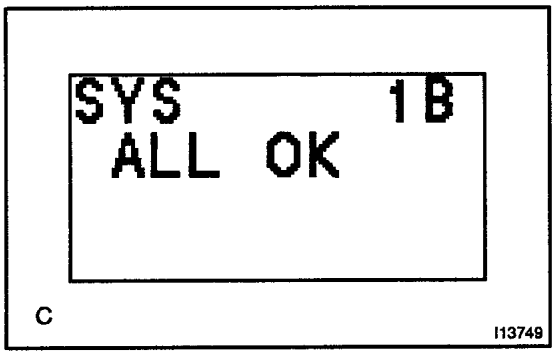
(9) When no error is detected in the system, "ALL OK" is displayed.
(10) When pressing the "TRIP" switch, the mode returns to LAN check mode. (Beep 3 times)



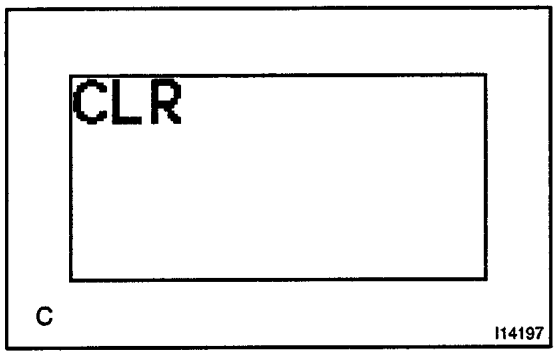
(e) System check
(1) When pressing the "AM•FM" switch in LAN check mode, the mode turns to the system check mode in which the system performs self diagnosis of connected component and displays the results.("SYS" (showing the system is under detection) is displayed.) (Beep 3 times)



(2) In the 1st line, "SYS" and a current connection check code are displayed.
(3) In the 2nd line, a physical address is displayed.
(4) In the 3rd and 4th lines, stored DTCs are displayed.
Displayed contents: DTCs – auxiliary code
(5) Two DTC codes are displayed at a time.
(6) By pressing TURN "UP" or "DOWN", the displayed code numbers (physical address) is changed in descending or ascending order respectively.



(7) When no error is detected in the system, "ALL OK" is displayed.
(8) Data for a master component is displayed first, and then those for other slave components are displayed in the order of the physical address. (only stored DTC connected component)
(9) DTCs are displayed in the order of priority
(10) It sometimes takes approx. 40 secs. till the system inspection is completed.
(11) When pressing the "TRIP" switch in the system check mode, the mode returns to LAN check mode. (Beep 3 times)



(f) Diagnosis memory clearance
(1) After errors are corrected, start up the diagnosis mode.
(2) Continue pressing the switch, "TAPE•CD" for 2 secs. ("CLR" is displayed.) (Beep 1 time)
(3) Press the "MODE" switch to change to the diagnosis memory mode and check that the normal code (ALL OK) is output.

3. DIAGNOSIS CODE LIST

Parts Name	DTC	Diagnosis item	Diagnosis content	Countermeasure and components to be inspected	System Check	Diagnosis memory
Multi Display (160)	D1	Transmitter failure	Communication with component has failed successively.	• Check component in physical address which is shown by auxiliary code. • Wire harness and connecter check.	X	○
	D2	No Response to-Regular Communication	Error in periodic communication.		X	○
	FF	No Response to Diagnosis Mode	Result of diagnosis is not issued from the start to the end.		○	○
	21	ROM error	There is an error in internal ROM.	Multi–display Check	○	○
	22	RAM error	There is an error in internal RAM.		○	○
Head Unit (190)	D1	Transmitter failure	Communication with component has failed successively.	• Check component in physical address which is shown by auxiliary code. • Wire harness and connecter check.	X	○
	D4	Regular Communication Failure	Connection confirmation is not obtained from the component in communication.		X	○
	20	ECU error	There is an error in internal ECU.	Radio receiver assembly Check (Head Unit Check)	○	○
	21	ROM error	There is an error in internal ROM.		○	○
	22	RAM error	There is an error in internal RAM.		○	○
	41	AM tuner error	There is an error in AM tuner.		X	○
	42	FM tuner error	There is an error in FM tuner.		X	○
	50	Cassette error	There is an error in cassette deck.		X	○
	51	EJECT error	Cassette is not ejected		X	○

Parts Name	DTC	Diagnosis item	Diagnosis content	Countermeasure and components to be inspected	System Check	Diagnosis memory
CD tuner (190)	D1	Transmitter failure	Communication with component has failed successively.	• Check component in physical address which is shown by auxiliary code. • Wire harness and connecter check.	X	○
	D4	Regular Communication Failure	Connection confirmation has not come from the component that is communicating.		X	○
	20	ECU error	There is an error in internal ECU.	CD tuner check.	○	○
	21	ROM error	There is an error in internal ROM.		○	○
	22	RAM error	There is an error in internal RAM.		○	○
	41	AM tuner error	There is an error in AM tuner.		X	○
	42	FM tuner error	There is an error in FM tuner.		X	○
	60	CD error	Error codes other than 61, 62 are detected.	CD tuner check.	X	○
	61	EJECT error	CD is not ejected.	CD tuner check.	X	○
	62	DISC upside down/flaw	CD is inserted upside down or it has a flaw.	CD check.	X	○

HINT:

- If there is "O" in the column of system check, the error can be detected the system check mode.
- If there is "O" in the column of diagnosis memory, each unit is monitoring whether or not it has failure. In case of detecting failure, it memorizes DTC.
- When any codes of D1, D2, D4 and FF is detected, check the component which physical address is detected by the diagnosis code, the component corresponding to the auxiliary code, and wire harness connected between these equipments.

- D1: Transmission Failure
  Recorded every time transmission failure to the same physical address occurs 2 times consecutively.
- D2: No Response to Regular Communication: (Recorded only by a node which sends the connection check instruction.)
  Recorded when any physical address is deleted from the system component list.
- D4: Regular Communication Failure: (Recorded only by a node which receives the connection check instruction and the interruption of that.)
  Recorded when the connection check instruction has been interrupted.
- FF: No Response to Diagnosis Mode:.
  Recorded when the response to the diagnosis mode instruction / required commands (08 – 0DH) is not implemented within a fixed time.

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:

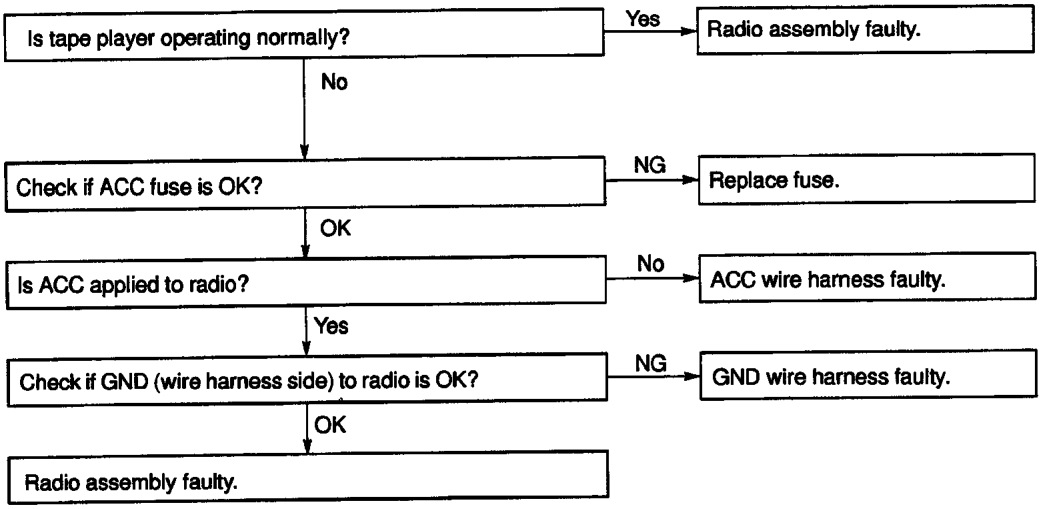
This inspection procedure is a simple troubleshooting which should be carried out on the vehicle during system operation and was prepared on the assumption of system component troubles (except for the wires and connectors, etc.).

Always inspect the trouble taking the following items into consideration.

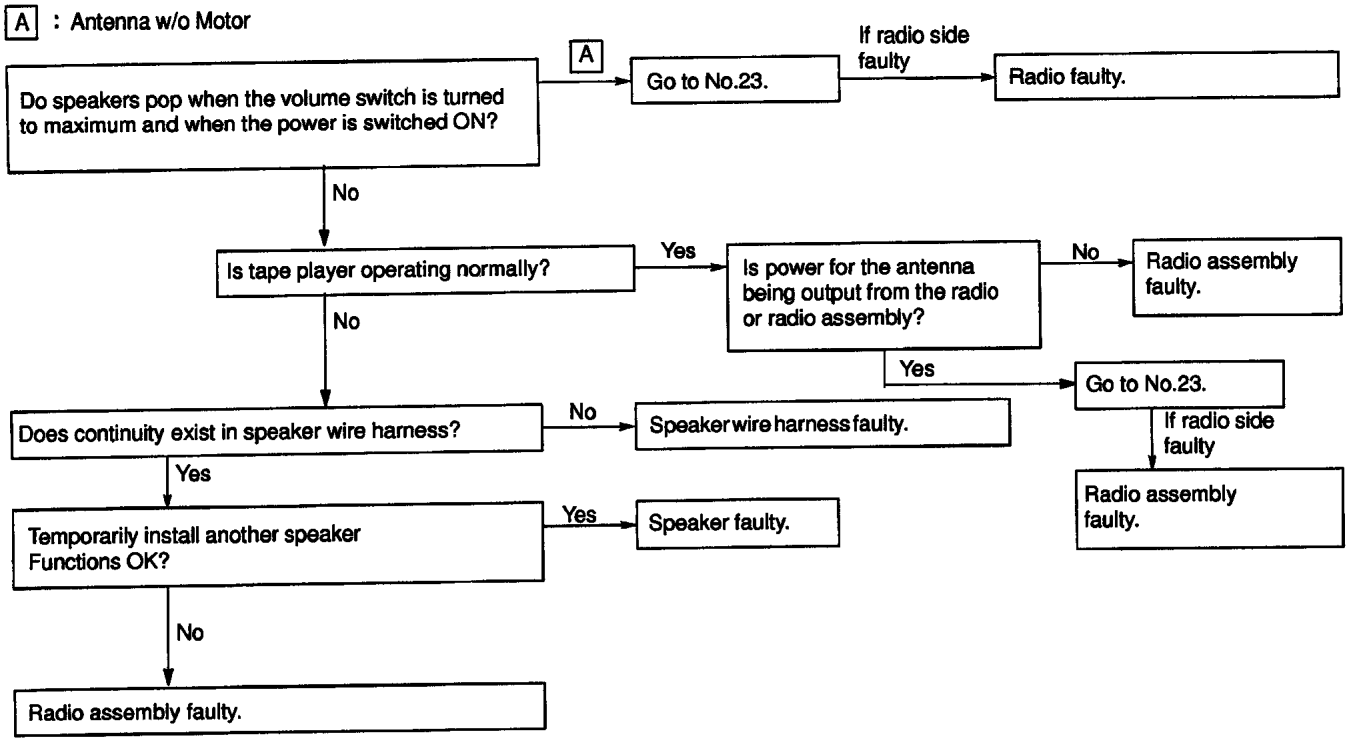
- Open or short circuit of the wire harness
- Connector or terminal connection fault

	Problem	No.
Radio	No power coming in.	1
	Power coming in, but radio not operating.	2
	Noise present, but AM – FM not operating.	3
	Any speaker does not work.	4
	Either AM or FM does not work.	5
	Reception poor (Volume faint).	5
	Few preset tuning bands.	5
	Sound quality poor.	6
	Cannot set station select button.	6
	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
	Any speaker does not work.	11
	Sound quality poor (Volume faint).	12
	Tape jammed, malfunction with tape speed or auto–reverse.	13
	APS, SKIP, RPT buttons not operating.	14
	Cassette tape will not ejected.	15
CD Player	CD cannot be inserted.	16
	CD inserted but no power.	17
	Power coming in, but CD player not operating.	18
	Sound jumps.	19
	Sound quality poor (Volume faint).	20
	Any speaker does not work.	21
	CD will not be ejected.	22
Antenna	Antenna–related.	23
Noise	Noise produced by vibration or shock while driving.	24
	Noise produced when engine starts.	25

1	Radio	NO POWER COMING IN

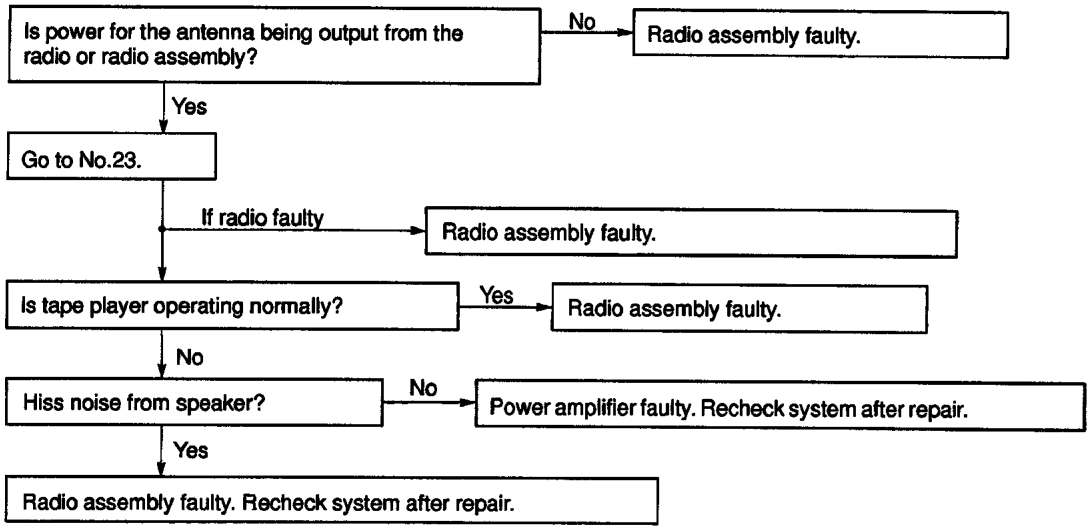


2	Radio	POWER COMING ON, BUT RADIO NOT OPERATING

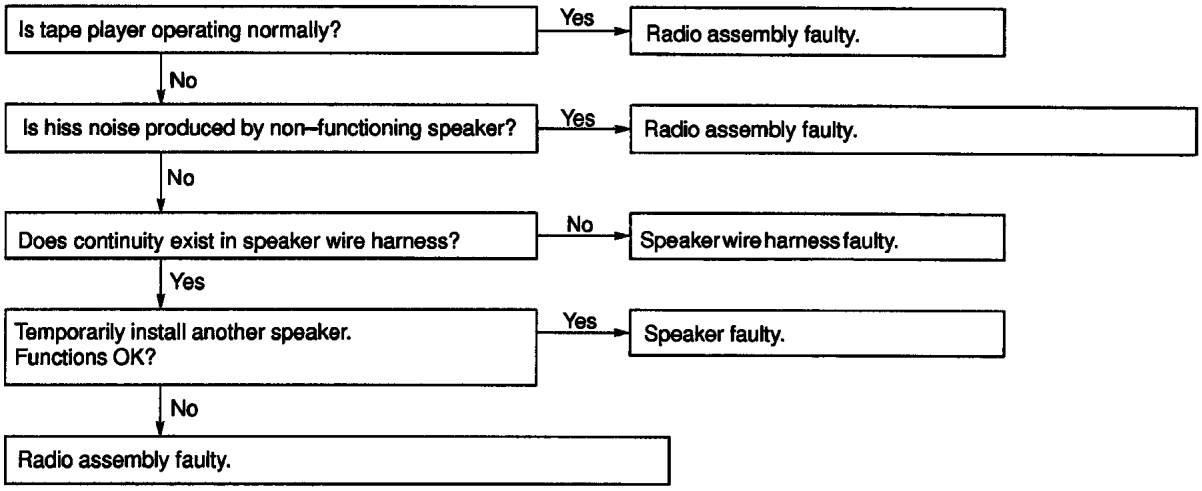


V07430

3	Radio	NOISE PRESENT, BUT AM–FM NOT OPERATING

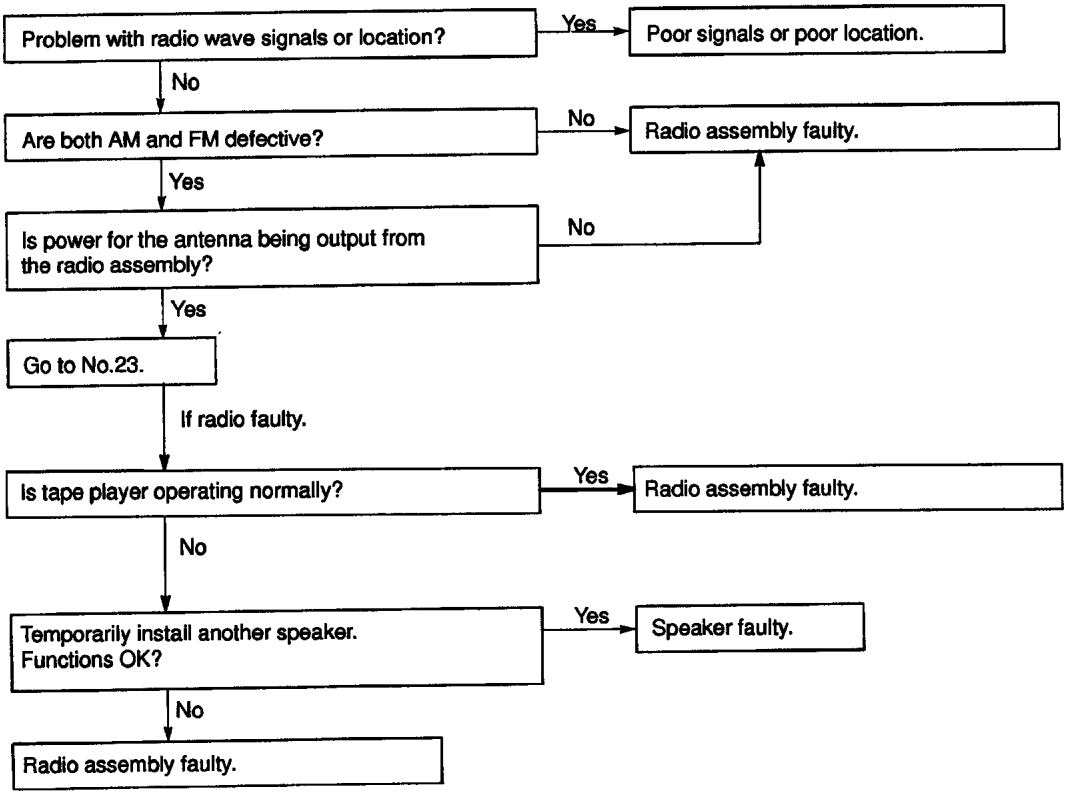


4	Radio	ANY SPEAKER DOES NOT WORK



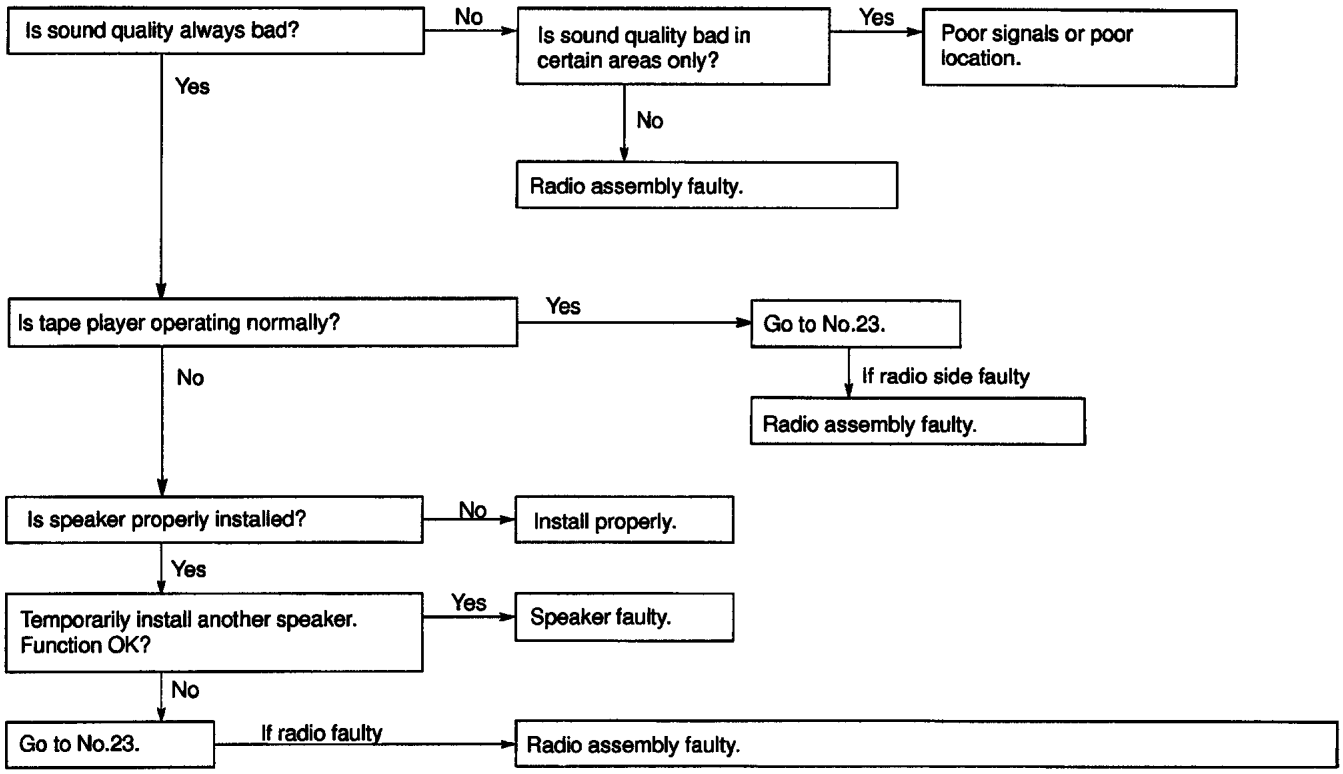
V07431

5	Radio	EITHER AM OR FM DOES NOT WORK, RECEPTION POOR (VOLUME FAINT), FEW PRESET TUNING BANDS

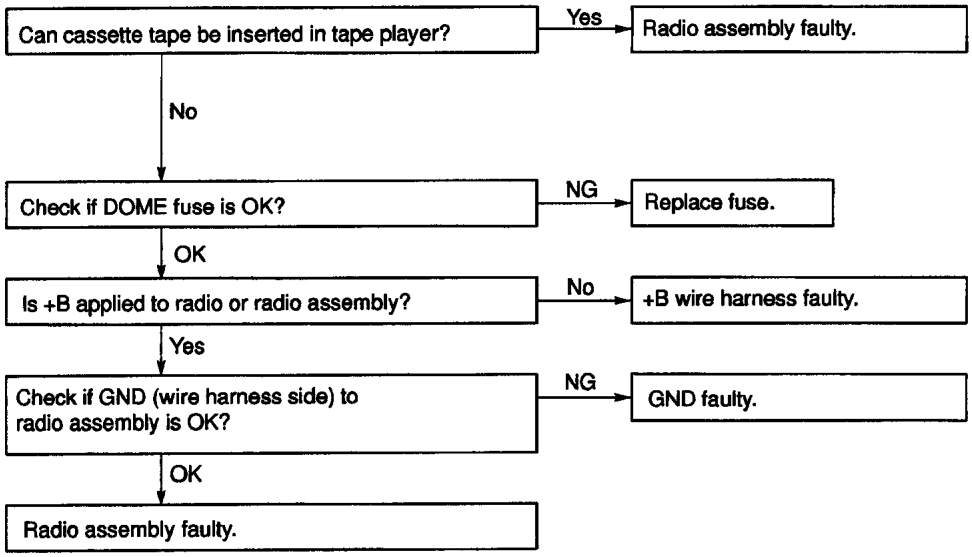


V07432

6	Radio	SOUND QUALITY POOR

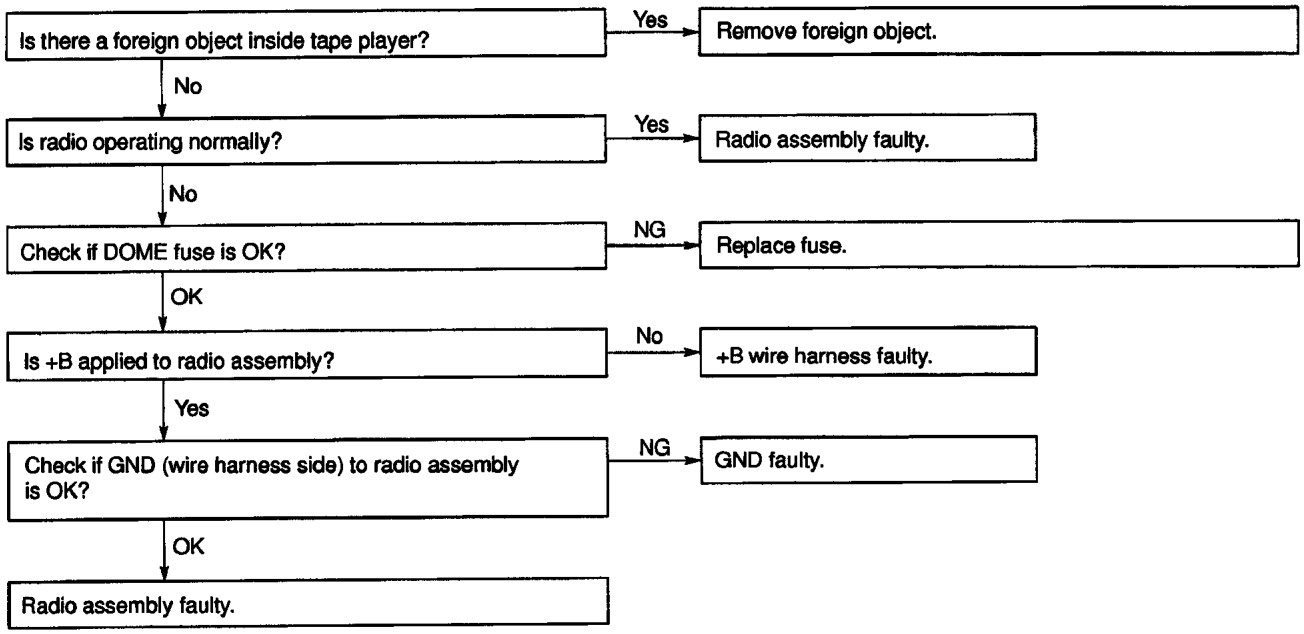


7	Radio	CANNOT SET STATION SELECT BUTTON, PRESET MEMORY DISAPPEARS

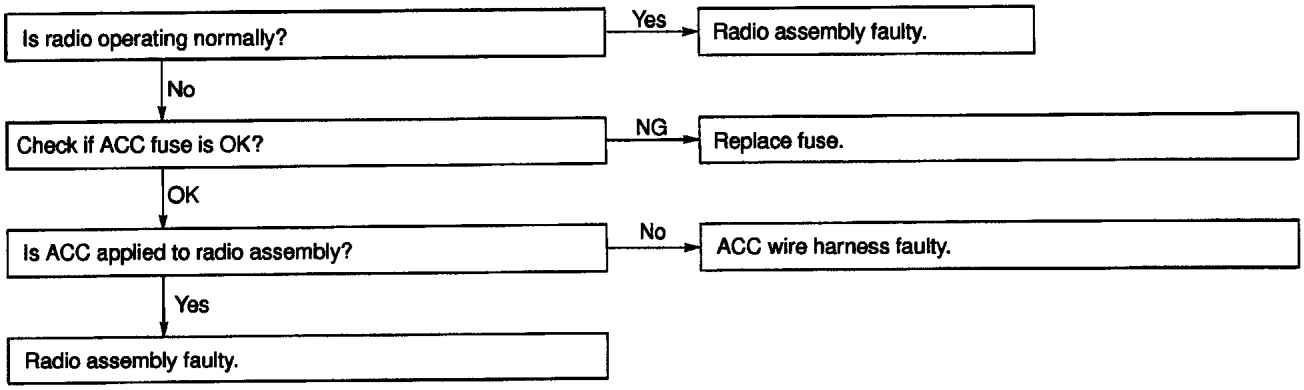


V07433

8 Tape Player — CASSETTE TAPE CANNOT BE INSERTED

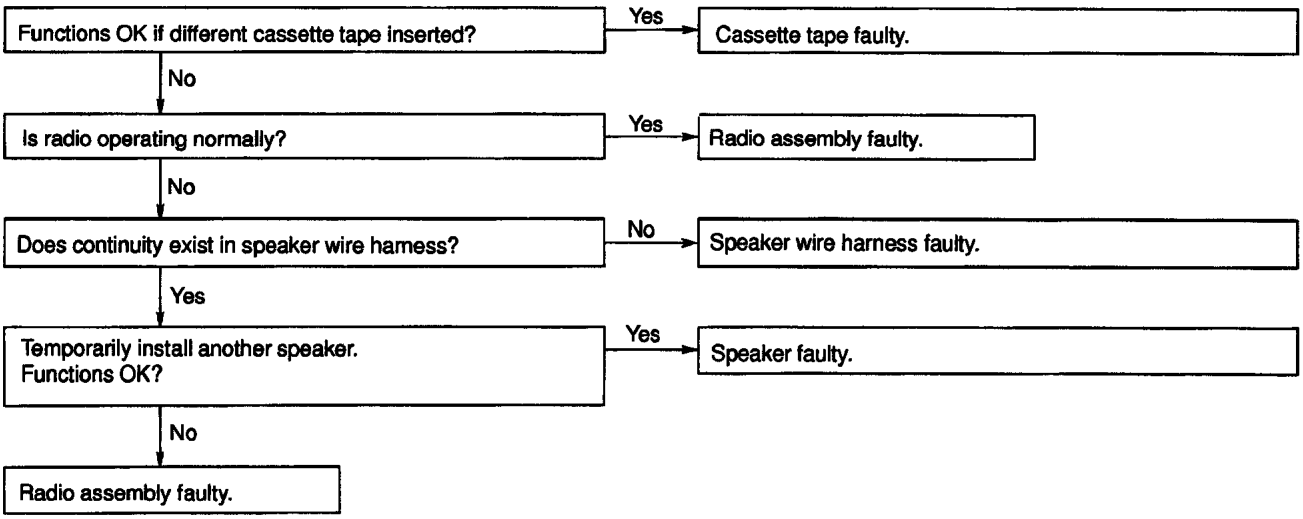


9 Tape Player — CASSETTE TAPE INSERTED, BUT NO POWER

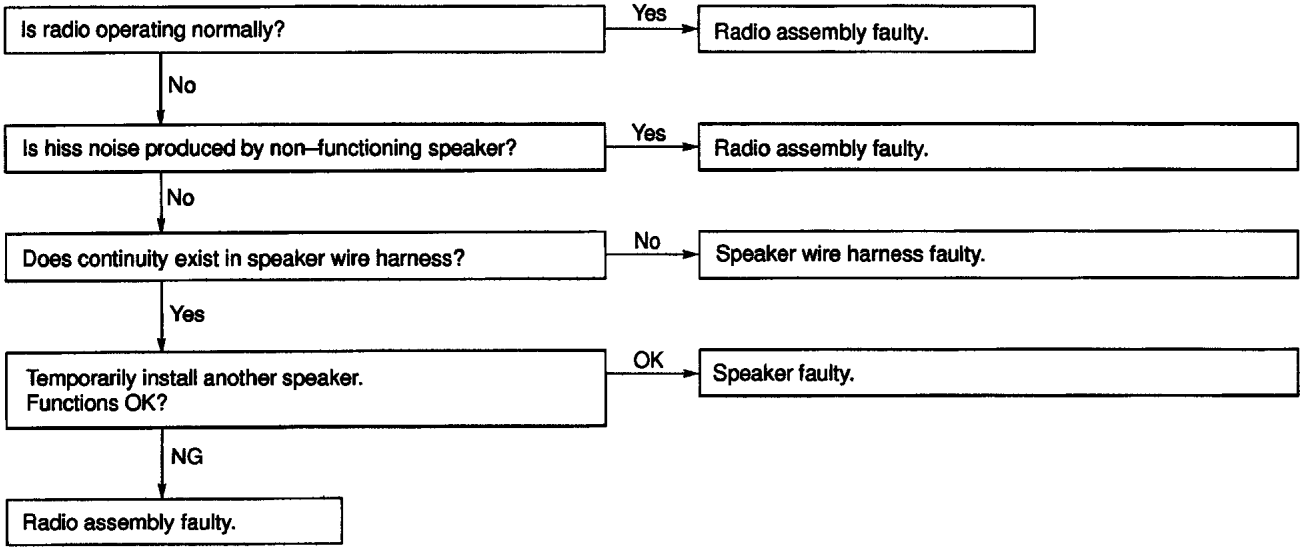


V07434

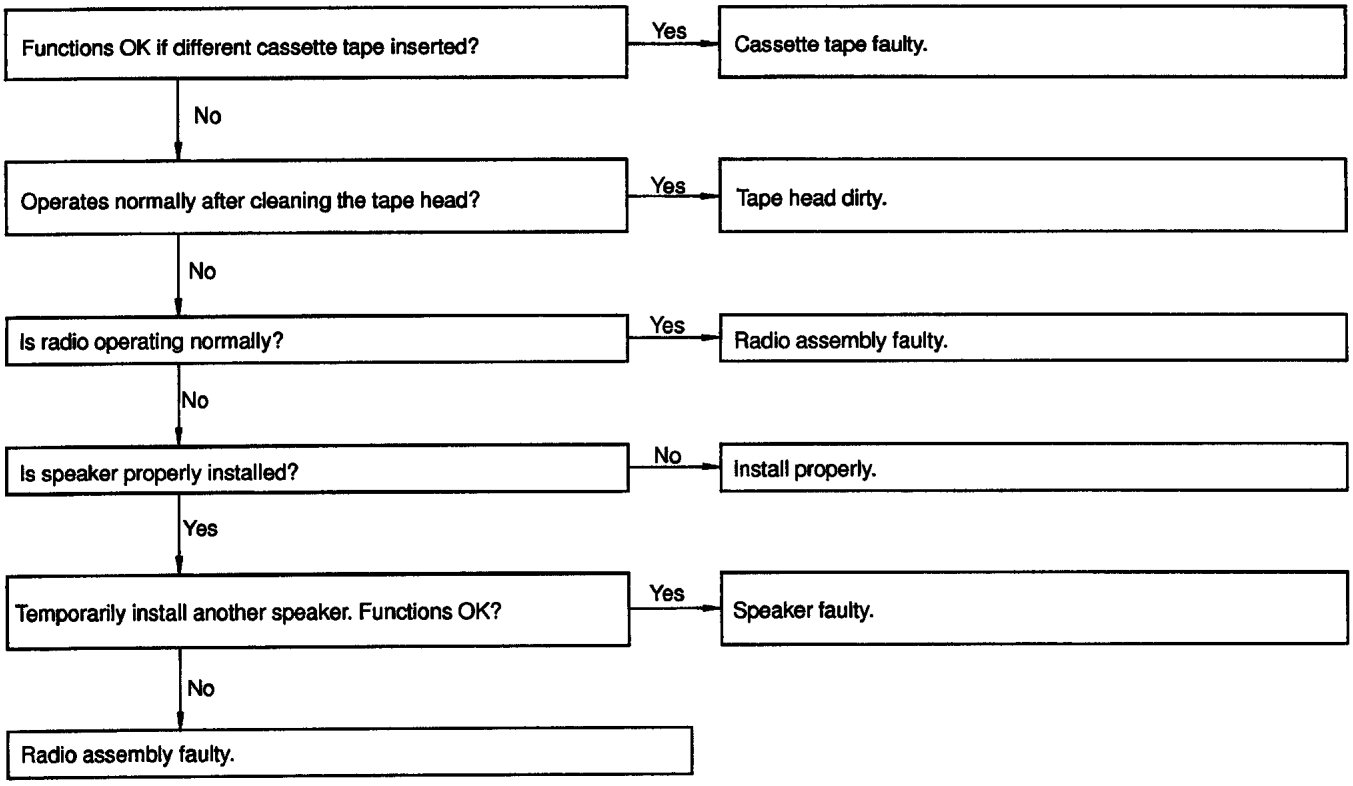
10	Tape Player	POWER COMING IN, BUT TAPE PLAYER NOT OPERATING



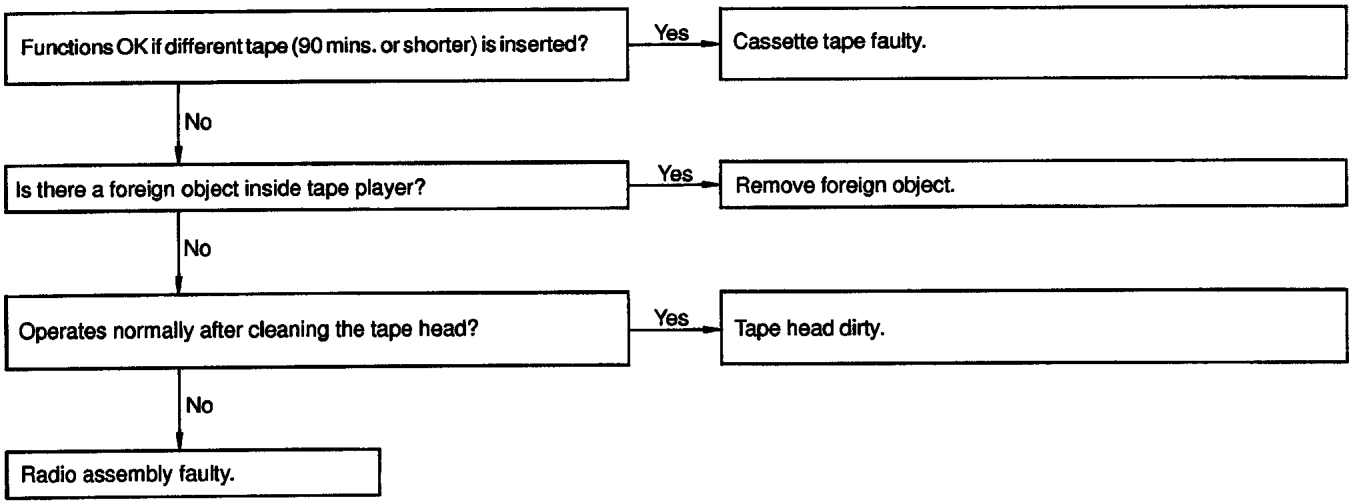
11	Tape Player	ANY SPEAKER DOES NOT WORK



12	Tape player	SOUND QUALITY POOR (VOLUME FAINT)

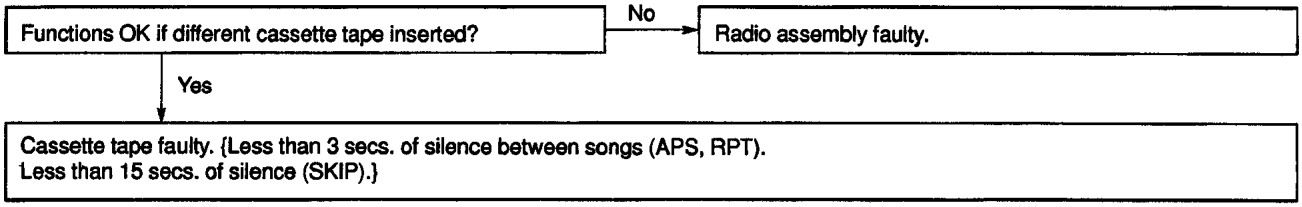


13	Tape Player	TAPE JAMMED, MALFUNCTION WITH TAPE SPEED OR AUTO–REVERSE

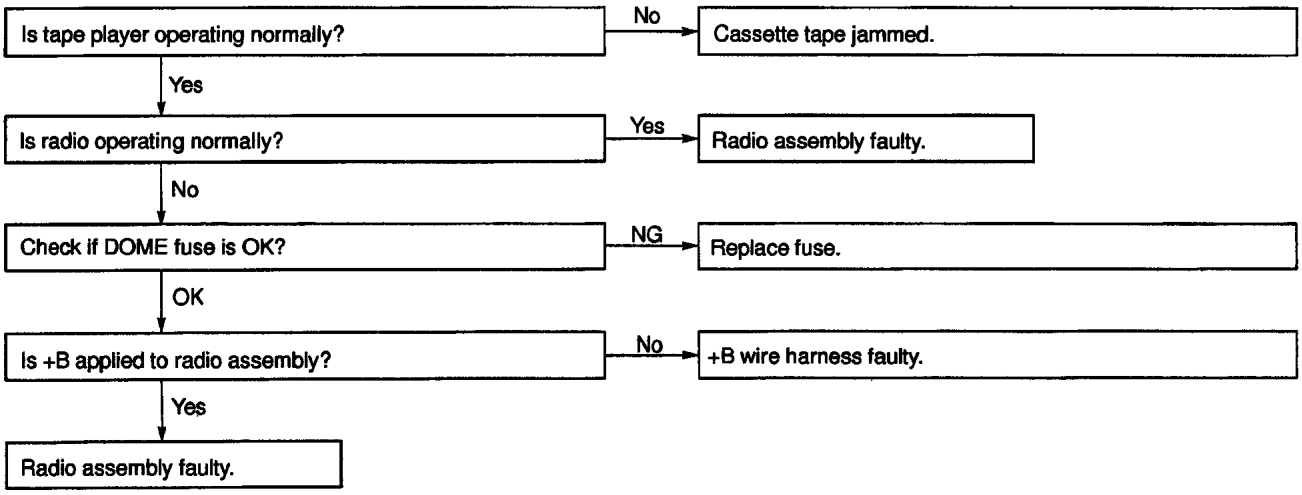


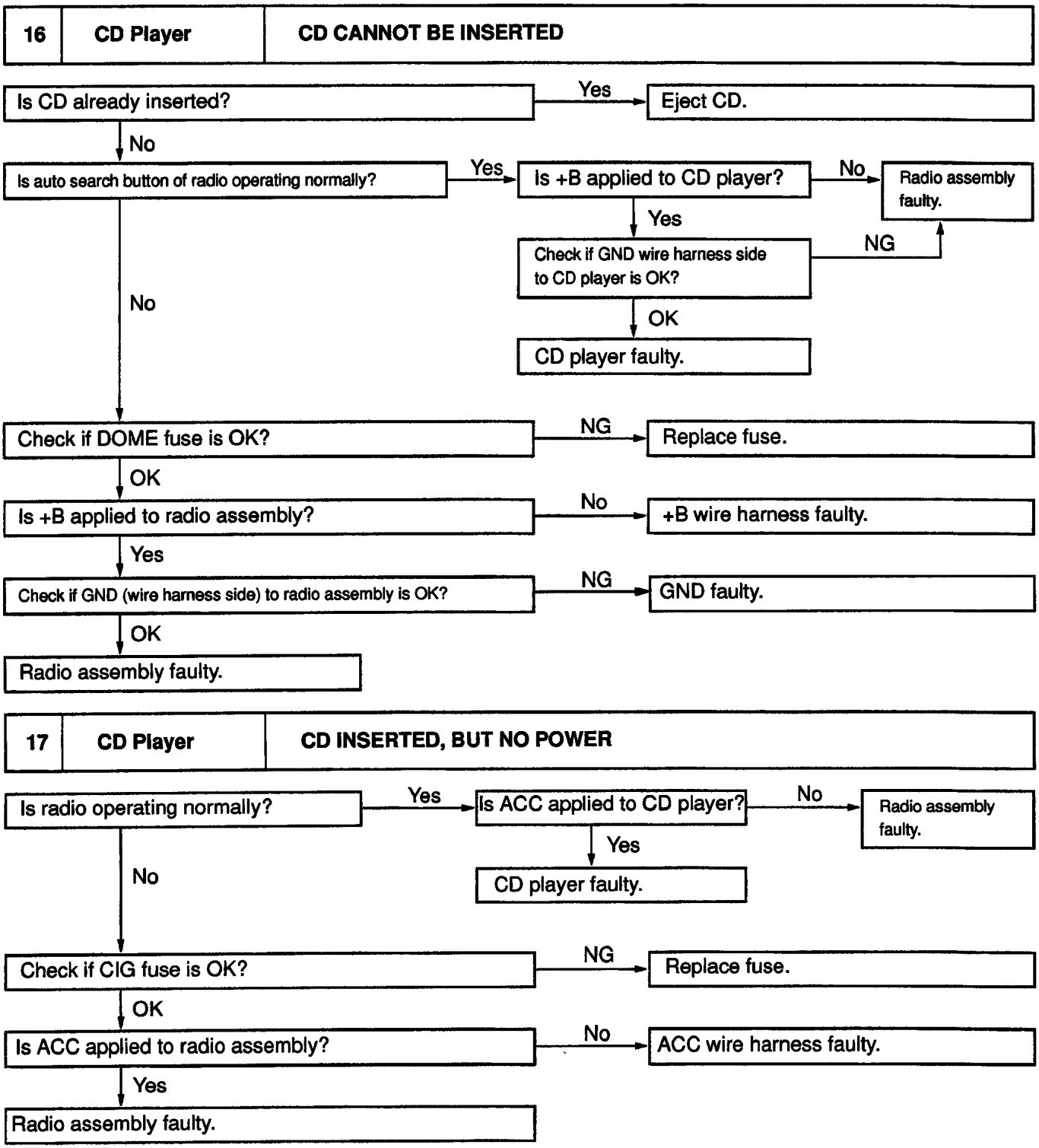
V04922

14	Tape Player	APS, SKIP, RPT BUTTONS NOT OPERATING



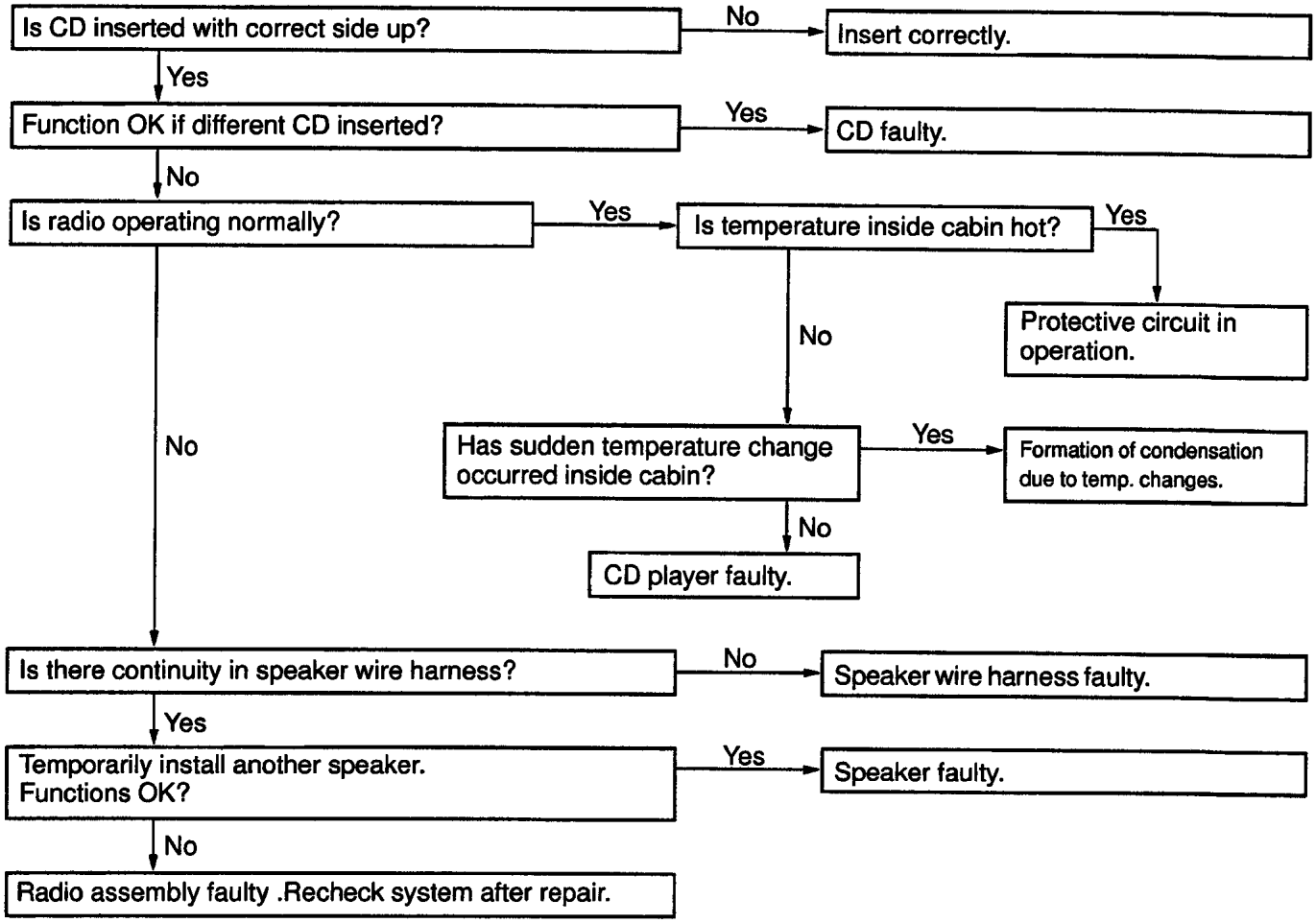
15	Tape Player	CASSETTE TAPE WILL NOT BE EJECTED



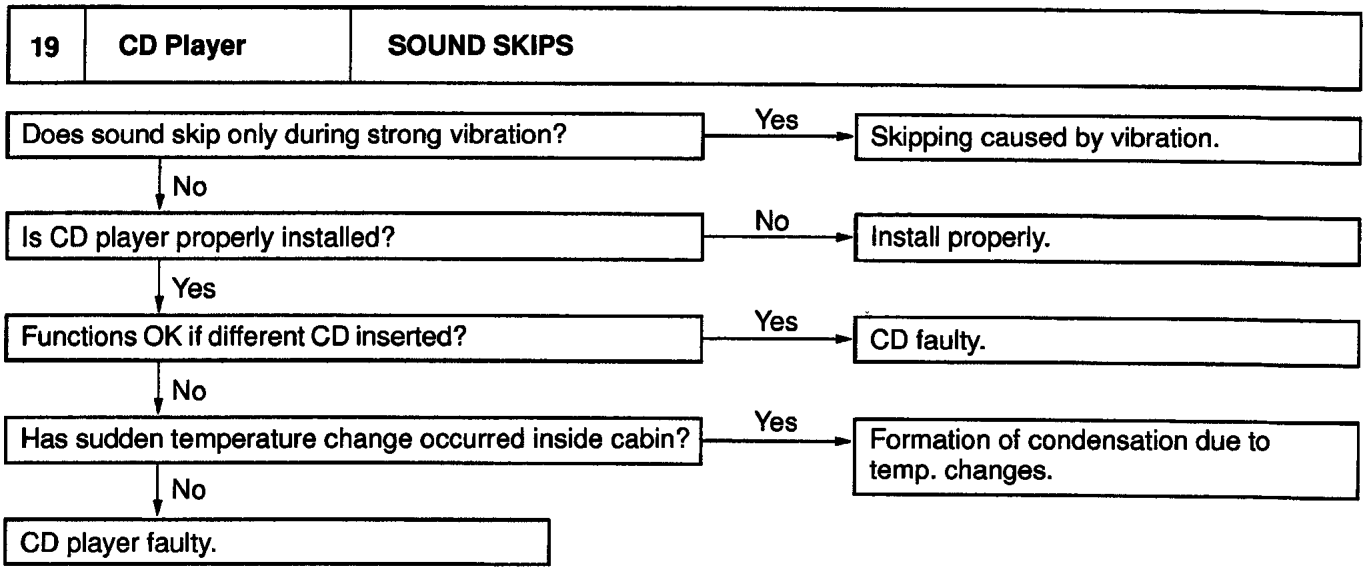

16
CD Player
CD CANNOT BE INSERTED
Is CD already inserted?
Yes
Eject CD.
No
Is auto search button of radio operating normally?
Yes
Is +B applied to CD player?
No
Radio assembly faulty.
Yes
Check if GND wire harness side to CD player is OK?
NG
OK
CD player faulty.
No
Check if DOME fuse is OK?
NG
Replace fuse.
OK
Is +B applied to radio assembly?
No
+B wire harness faulty.
Yes
Check if GND (wire harness side) to radio assembly is OK?
NG
GND faulty.
OK
Radio assembly faulty.
17
CD Player
CD INSERTED, BUT NO POWER
Is radio operating normally?
Yes
Is ACC applied to CD player?
No
Radio assembly faulty.
Yes
CD player faulty.
No
Check if CIG fuse is OK?
NG
Replace fuse.
OK
Is ACC applied to radio assembly?
No
ACC wire harness faulty.
Yes
Radio assembly faulty.

I05488

18 CD Player — POWER COMING IN, BUT CD PLAYER NOT OPERATING

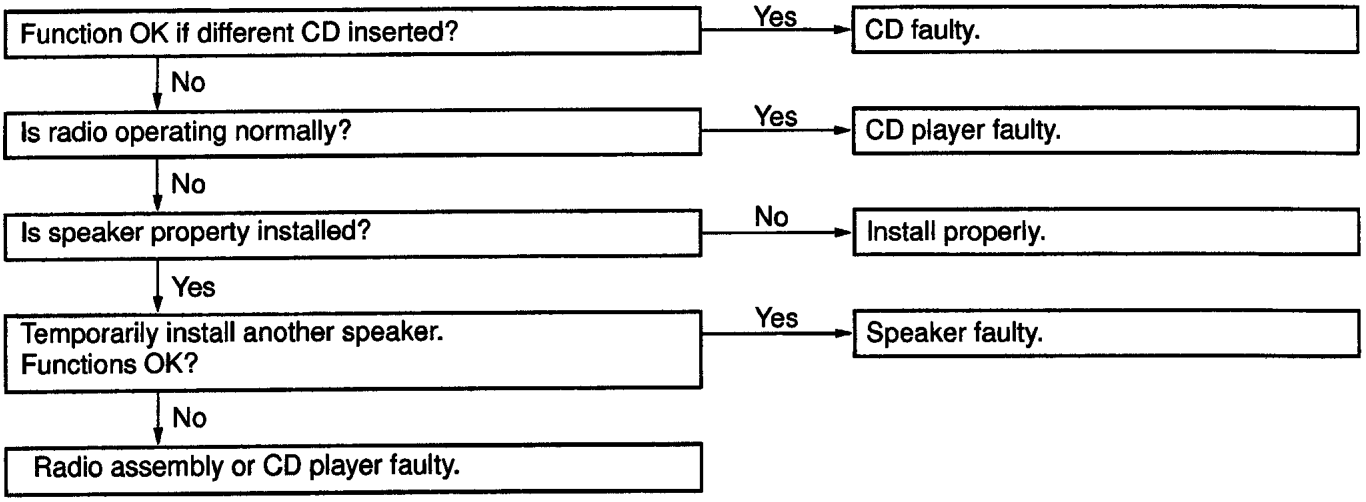


19 CD Player — SOUND SKIPS

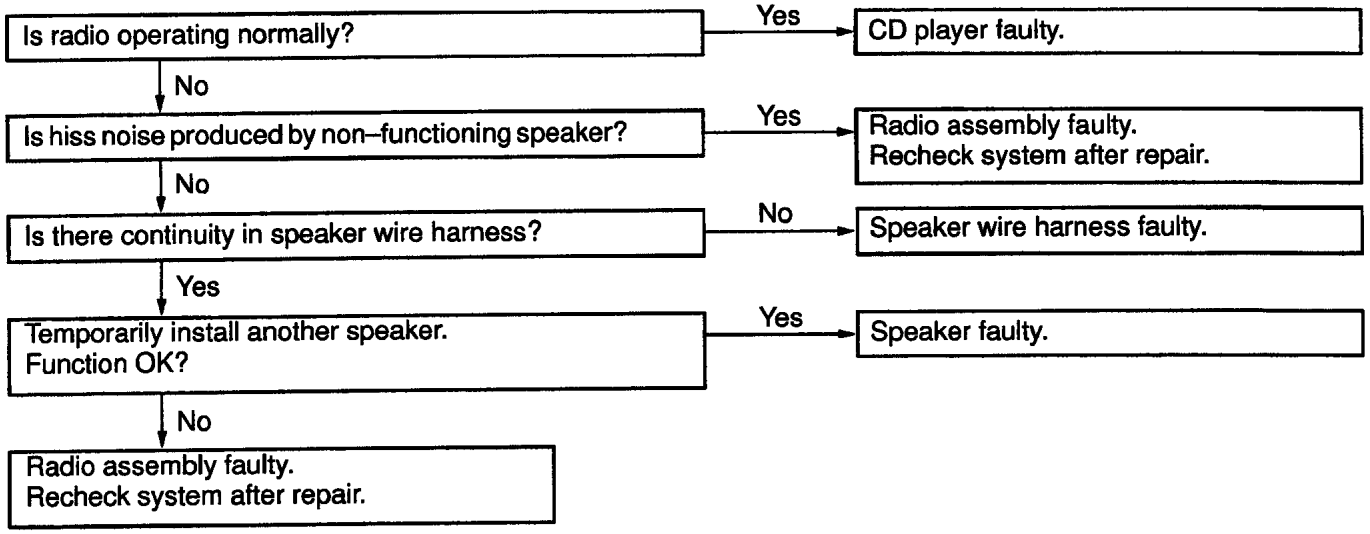


I05489

20	CD Player	SOUND QUALITY POOR (VOLUME FAINT)

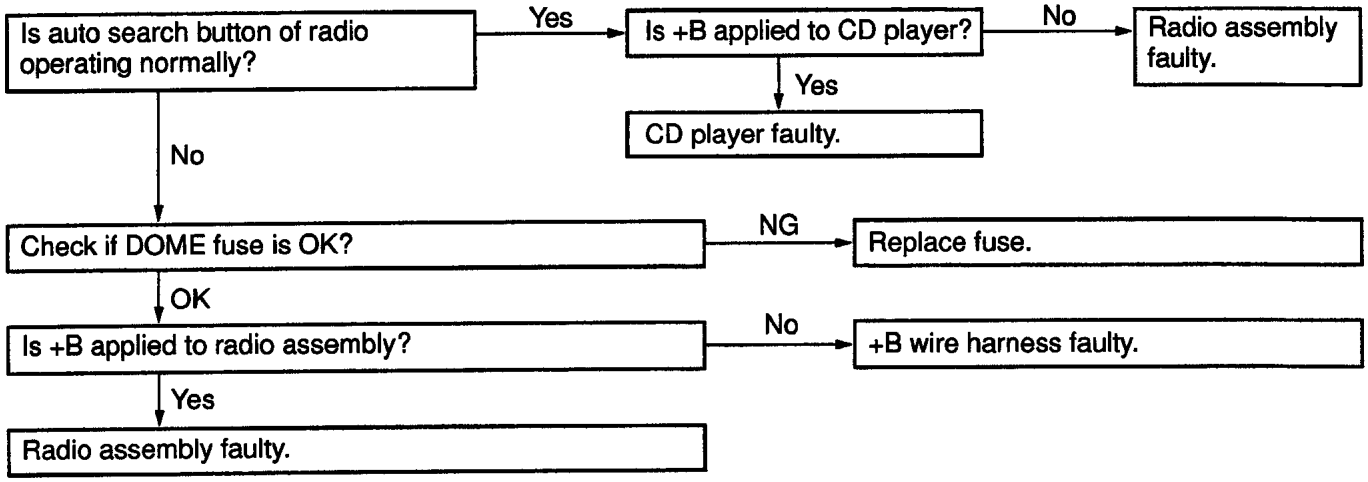


21	CD Player	ANY SPEAKER DOES NOT WORK

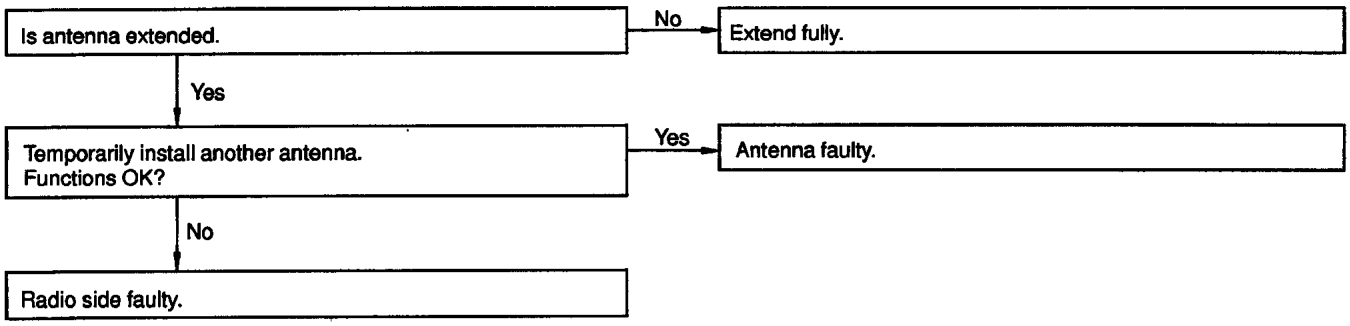


V08551

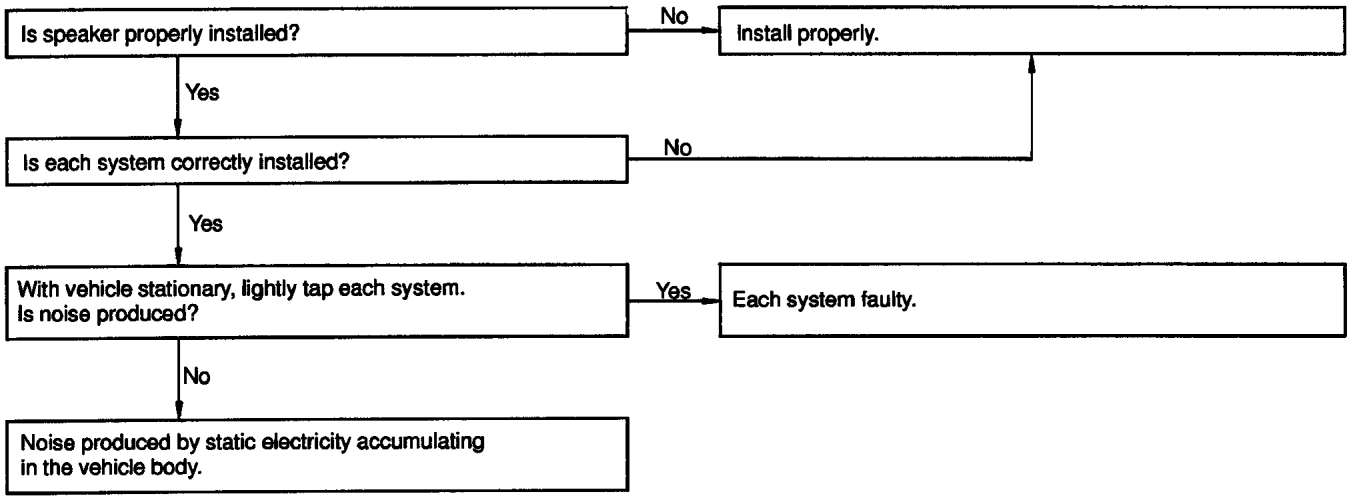
22	CD Player	CD WILL NOT BE EJECTED



23	Antenna	ANTENNA–RELATED

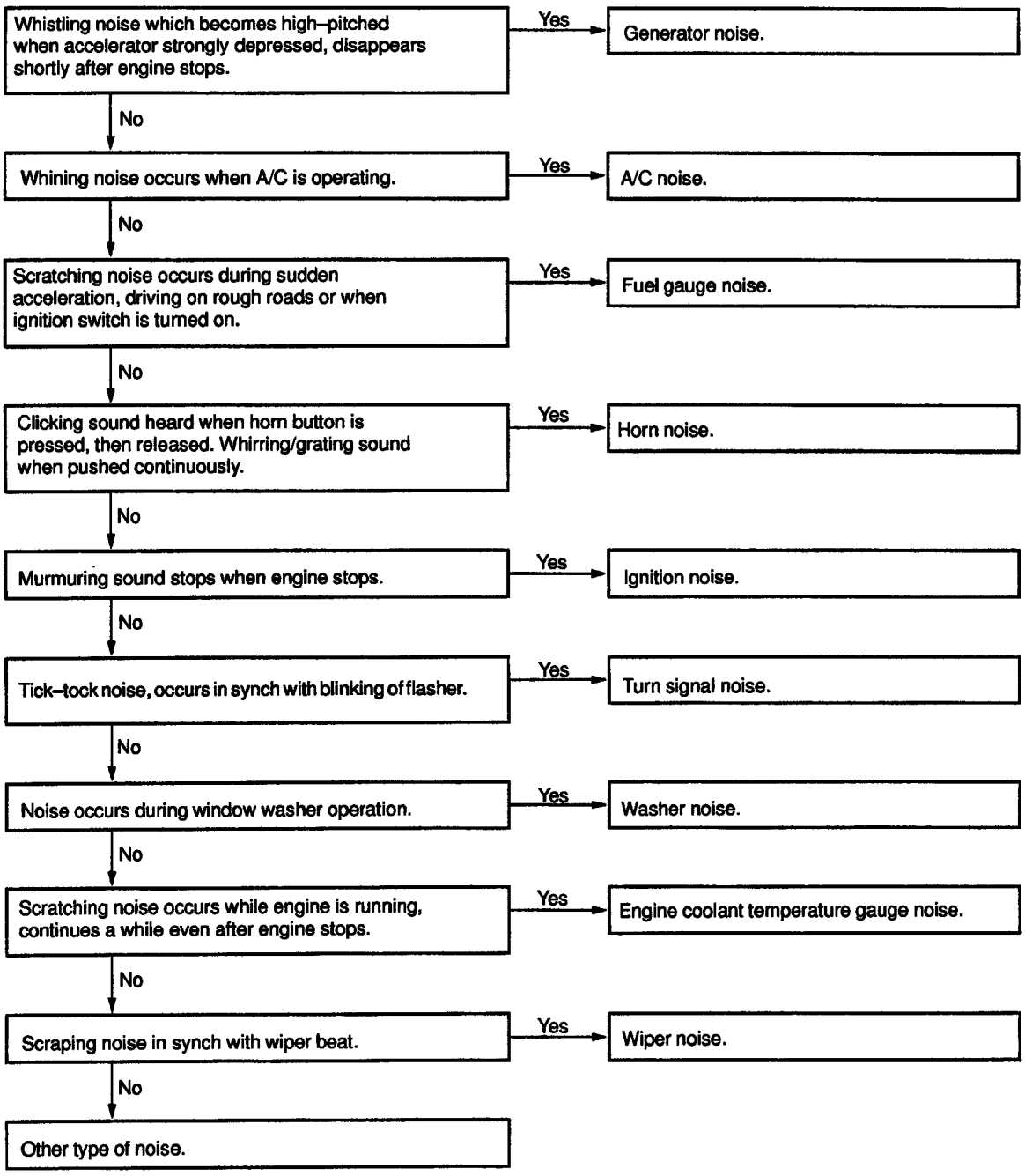


24	Noise	NOISE PRODUCED BY VIBRATION OR SHOCK WHILE DRIVING



V04924

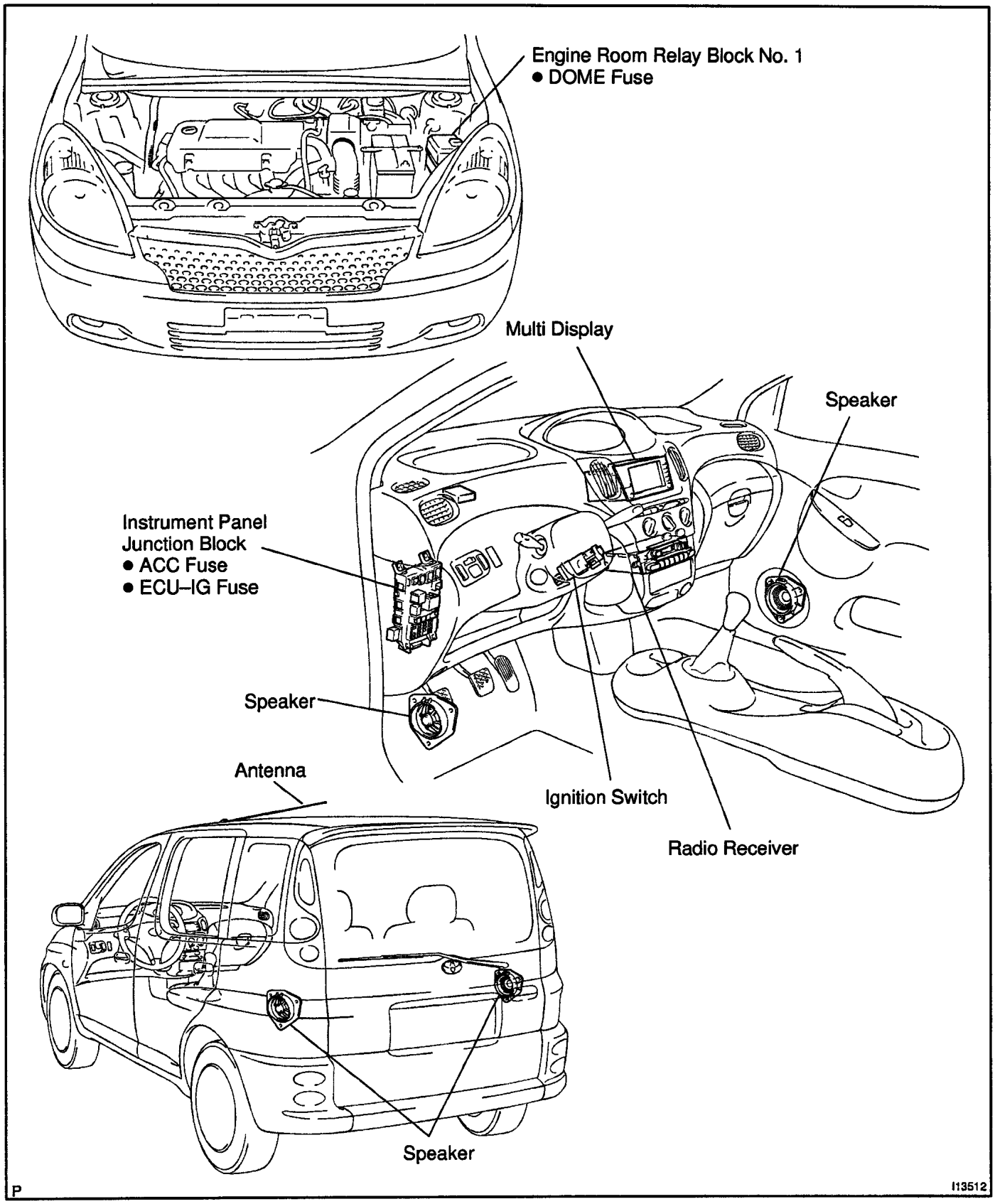
25	Noise	NOISE PRODUCED WHEN ENGINE STARTS



V08467

BE193-02

LOCATION



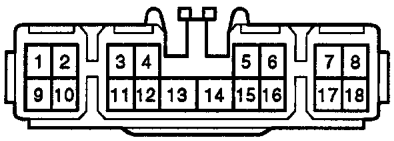
BE194-02

INSPECTION

1. INSPECT MULTI DISPLAY CIRCUIT

Disconnect the connectors from the multi display, and inspect the connector on the wire harness side.

Wire harness side:



N I12076

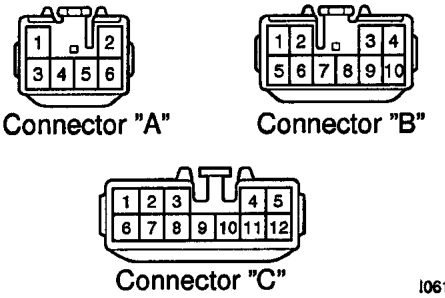
Tester connection	Condition	Specified condition
4 – Ground	Constant	Continuity
7 – Ground	Ignition switch LOCK or ACC	No voltage
7 – Ground	Ignition switch ON	Battery voltage
8 – Ground	Constant	Battery voltage
14 – Ground	Ignition switch LOCK or ACC	No voltage
14 – Ground	Ignition switch ON	Battery voltage
18 – Ground	Ignition switch LOCK	No voltage
18 – Ground	Ignition switch ACC or ON	Battery voltage

If the circuit is not as specified, inspect the circuits connected to other parts.

2. INSPECT RADIO RECEIVER ASSEMBLY CIRCUIT

Disconnect the connectors from the radio receiver assembly, and inspect the connector on the wire harness side.

Wire harness side:



I06198

Tester connection	Condition	Specified condition
B7 – Ground	Constant	Continuity
B3 – Ground	Ignition switch LOCK	No voltage
B3 – Ground	Ignition switch ACC or ON	Battery voltage
B4 – Ground	Constant	Battery voltage

If the circuit is not as specified, inspect the circuits connected to other parts.

CLOCK

TROUBLESHOOTING

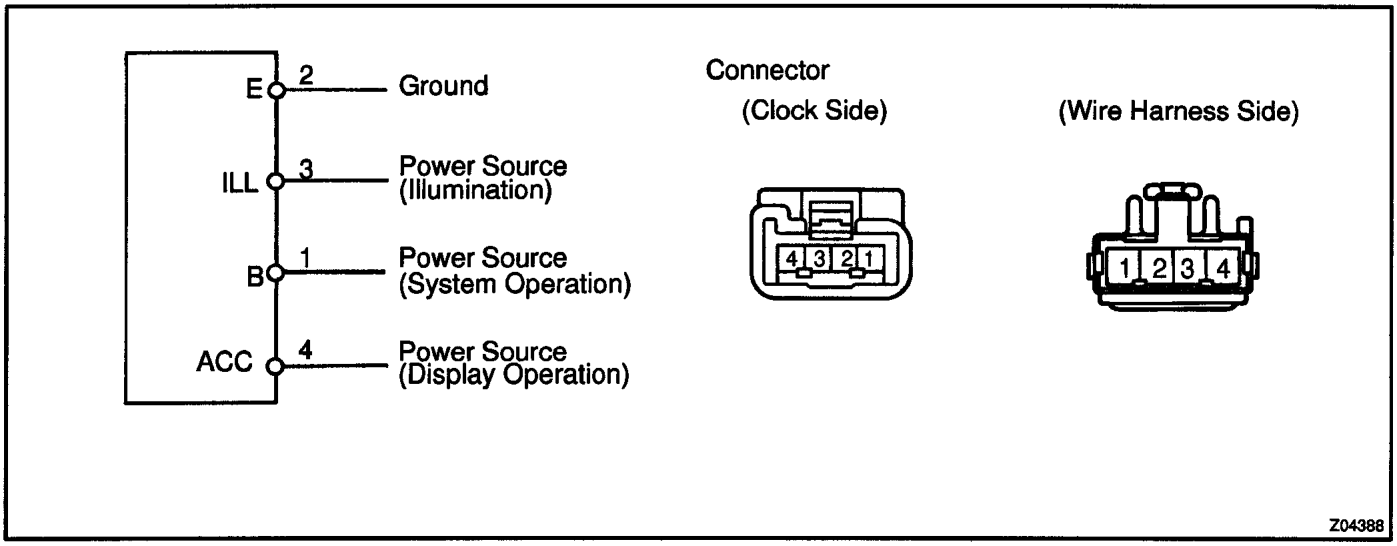
BE066-03

HINT:

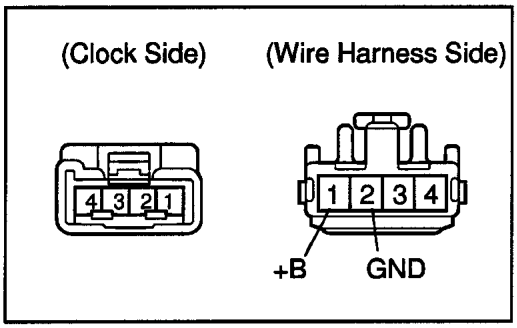
Troubleshoot the clock according to the table below.

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 voltage is 10 –14 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 voltage between terminal +B and body ground?

No → Open or short circuit in wire harness between terminal +B and DOME fuse.

Yes ↓

Does continuity exist between terminal GND and body ground?

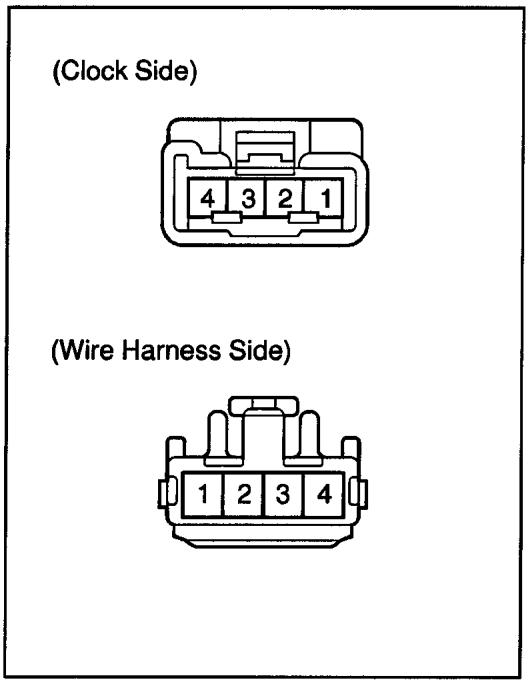
No → Open circuit in wire harness between terminal GND and body ground.

Yes ↓

Replace clock.

I01417

2	CLOCK LOSES OR GAINS TIME



(a) Check that the battery 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 sec.
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 10V → Detect cause and repair, or recharge battery.

Yes ↓

Adjust or replace clock.

I01418

BODY

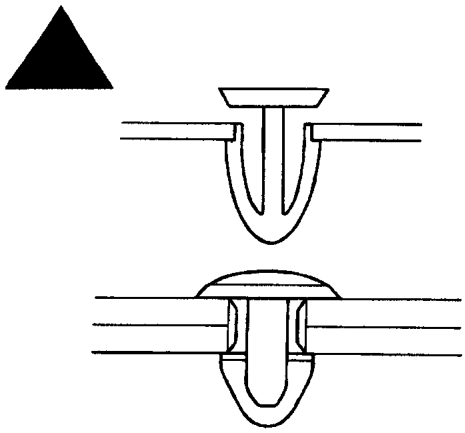
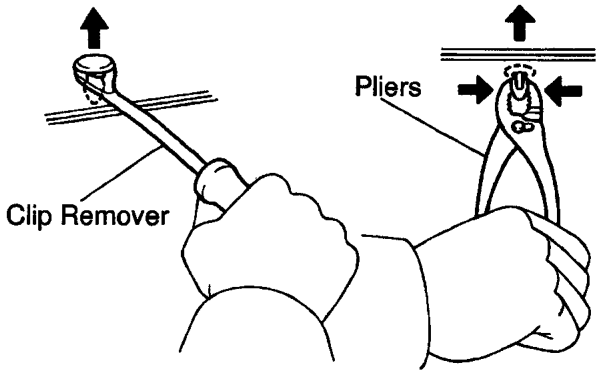
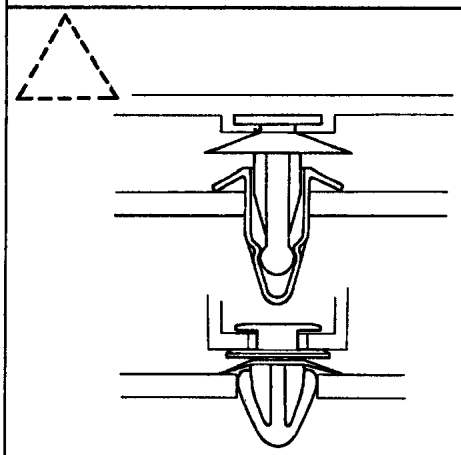
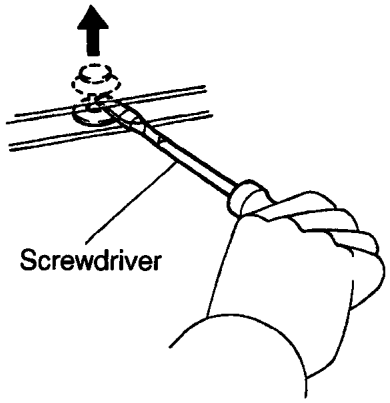
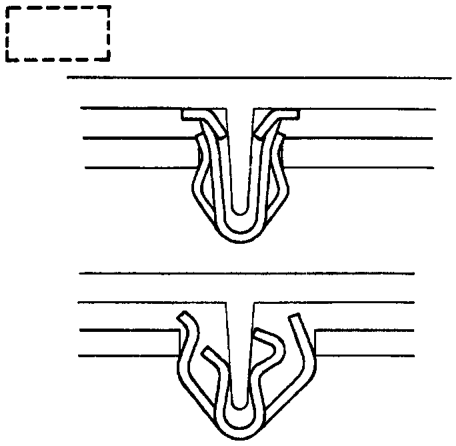
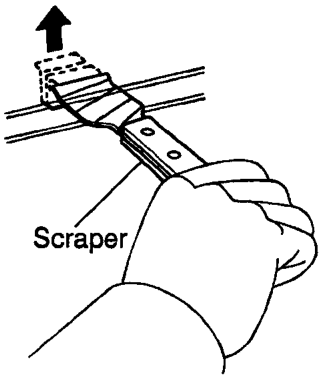
CLIP BO–1
SRS AIRBAG BO–3
FRONT BUMPER BO–4
REAR BUMPER BO–5
HEADLIGHT BO–5–1
REAR COMBINATION LIGHT BO–6
HOOD BO–10
FRONT DOOR BO–11
REAR DOOR BO–19
BACK DOOR BO–26
FRONT WIPER AND WASHER BO–32
REAR WIPER AND WASHER BO–37
BODY OUTSIDE MOULDING BO–42
ROOF DRIP SIDE FINISH MOULDING BO–46
WINDSHIELD BO–49
QUARTER WINDOW GLASS BO–56
BACK DOOR GLASS BO–63
TILT MOON ROOF BO–69
SLIDING ROOF BO–75
INSTRUMENT PANEL BO–83
ROOF HEADLINING BO–96
FRONT SEAT BO–103
REAR SEAT (Outer Side) BO–109
REAR SEAT (Center) BO–116
SEAT BELT BO–121
SEAT BELT PRETENSIONER BO–124
ROOF RAIL BO–135
SPOILER BO–136
FUEL TANK AND LINE BO–137

CLIP

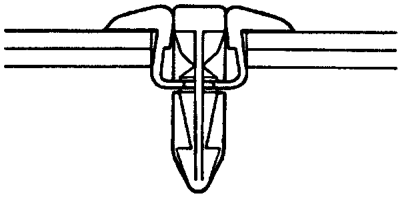
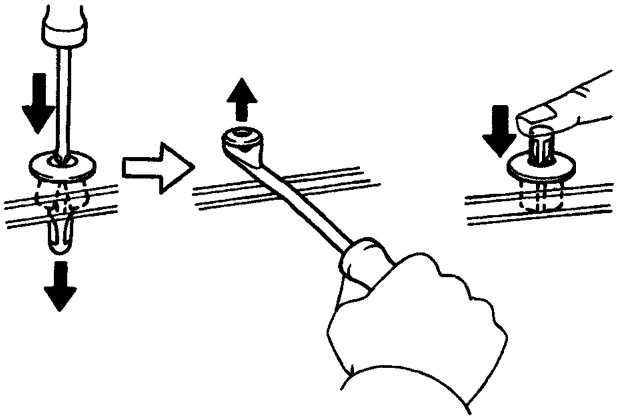
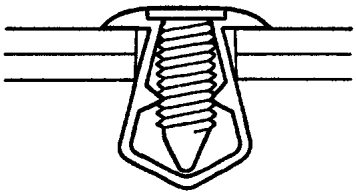
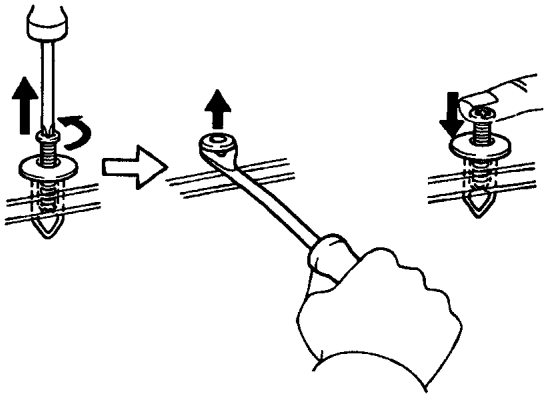
REPLACEMENT

BO2HV-03

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

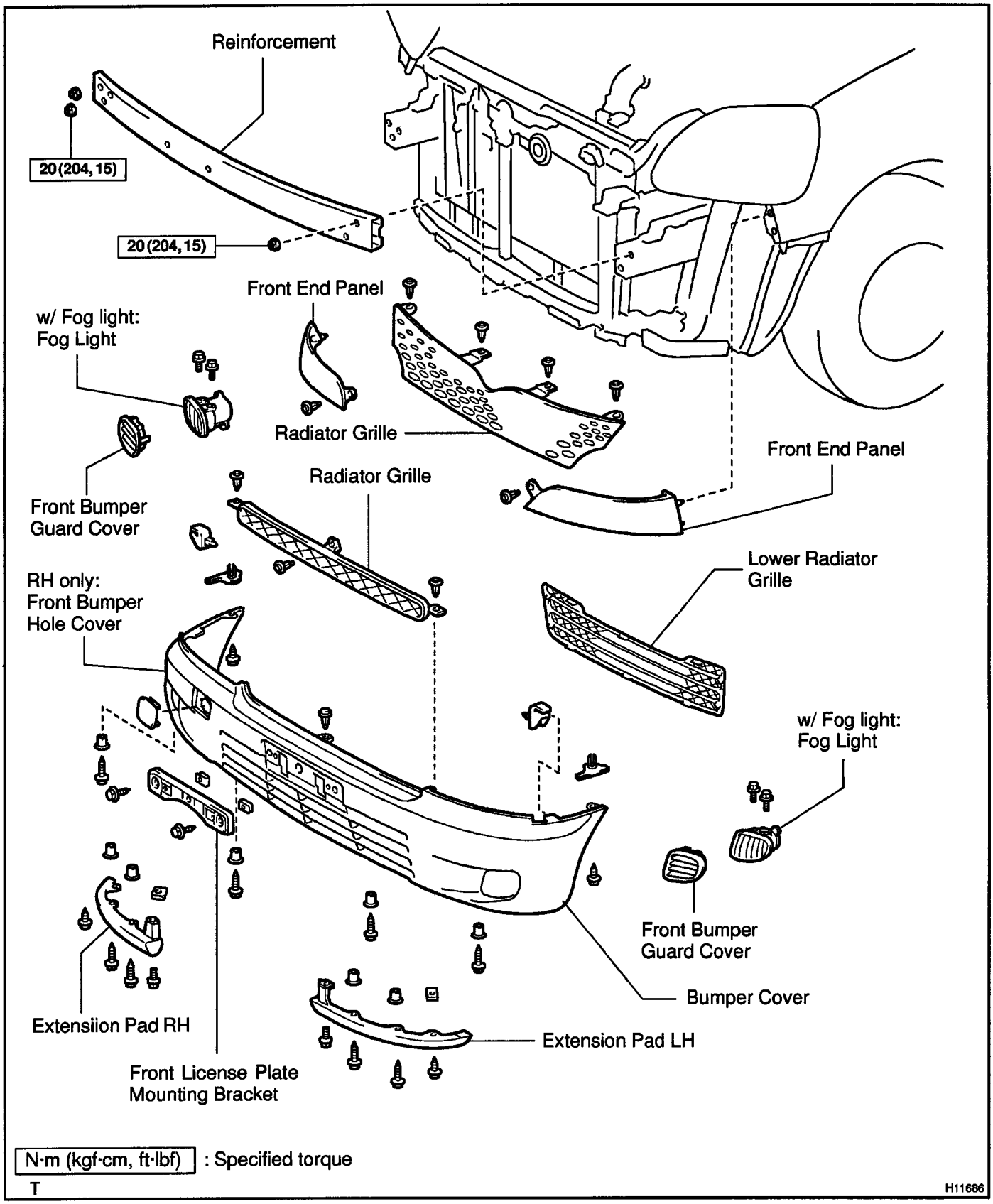
BO2HU-02

The YARIS VERSO/ECHO VERSO is equipped with an SRS (Supplemental Restraint System) such as the driver airbag, front passenger airbag, seat belt pretensioner 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

BO2HW-02



N·m (kgf·cm, ft·lbf) : Specified torque

T

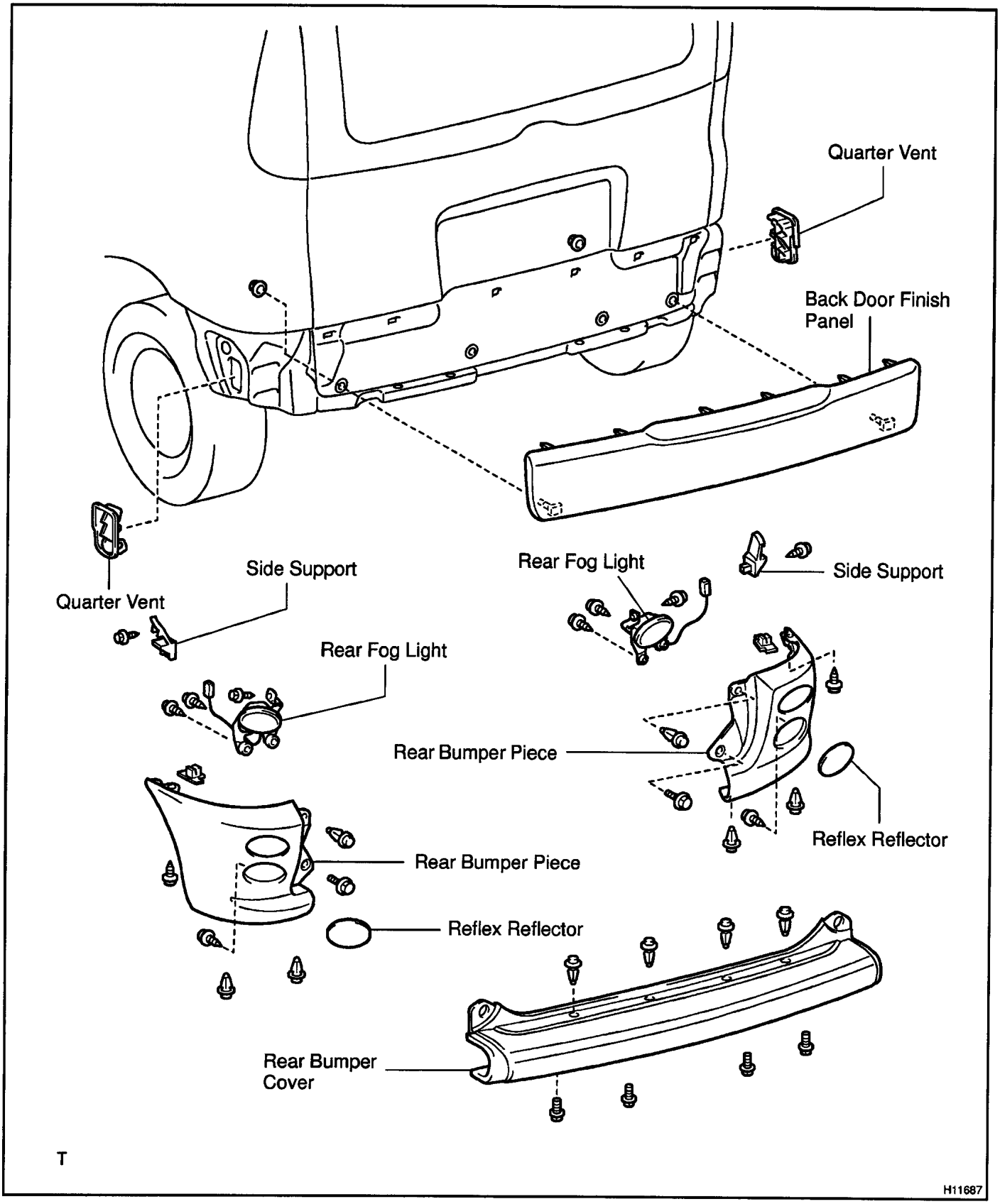
H11686

BO

REAR BUMPER

COMPONENTS

BC2HX-02

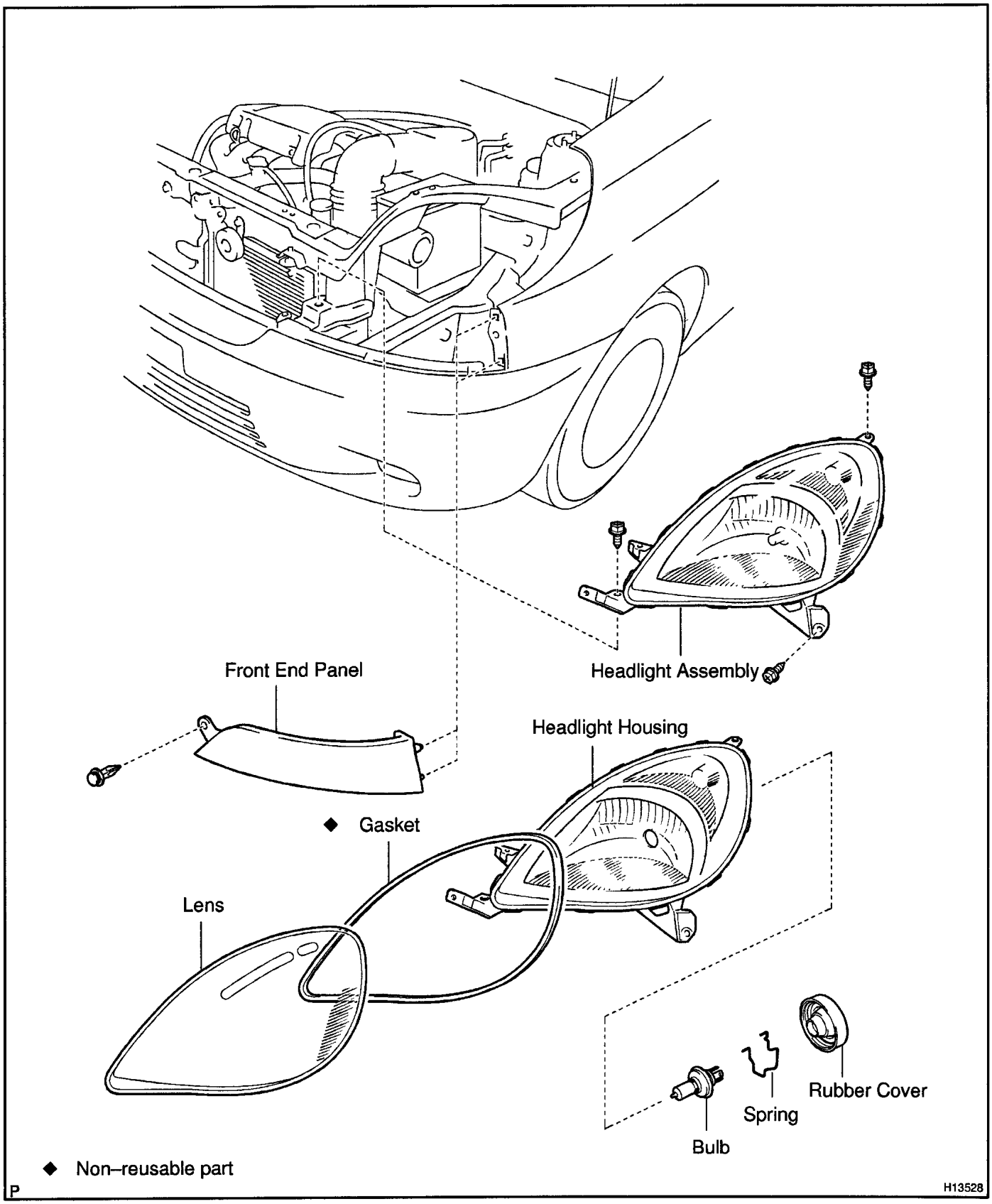


BC

HEADLIGHT

COMPONENTS

BO35F–01



BO

BO35G-01

REMOVAL

1. REMOVE FRONT END PANEL

(a) Remove the clip and front end panel.

2. REMOVE HEADLIGHT ASSEMBLY

(a) Disconnect the connectors.

(b) Remove the 4 screws.

(c) Remove the headlight.

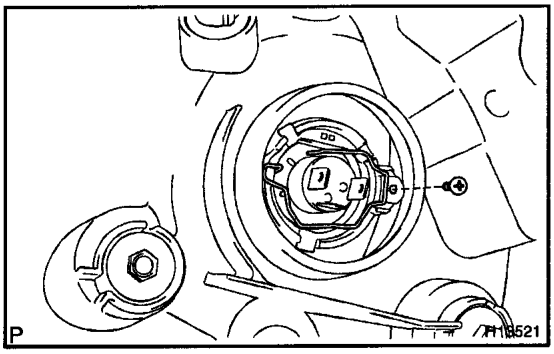
BO35H–01

REPLACEMENT

NOTICE:

When removing the headlight lens, take care not to touch the reflector and inner side of lens.

1. REMOVE RUBBER COVER



2. REMOVE SPRING

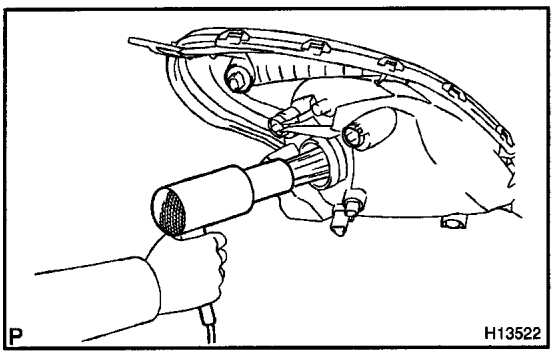
Remove the screw and spring.

3. REMOVE BULB

Remove the bulb.

NOTICE:

Take care not to touch the glass of the bulb.

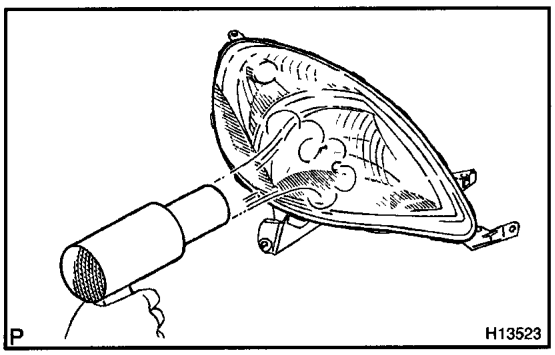


4. REMOVE HEADLIGHT LENS

(a) Using an hair dryer warm up the inside of the headlight from behind the housing.

NOTICE:

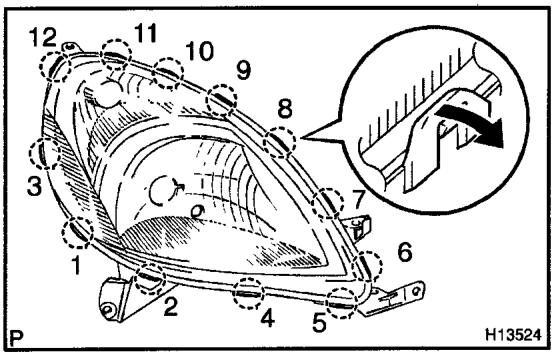
- **Do not heat it to beyond 120 °C (248 °F).**
- **Do not heat one part partially.**



(b) Using a hair dryer, heat the lens from the turn signal light side.

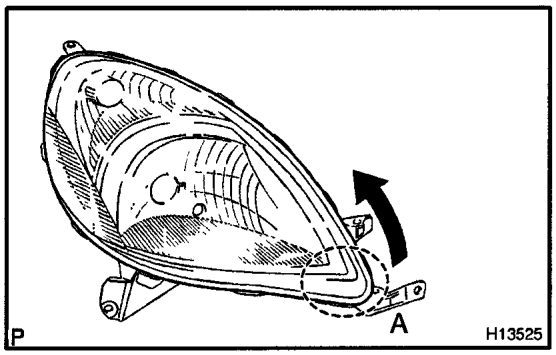
NOTICE:

- **Do not haeat it to beyond 120 °C (248 °F).**
- **Do not heat one part partially.**



(c) Remove the lens.

(1) Release the 12 claws in the order as shown in the illustration.



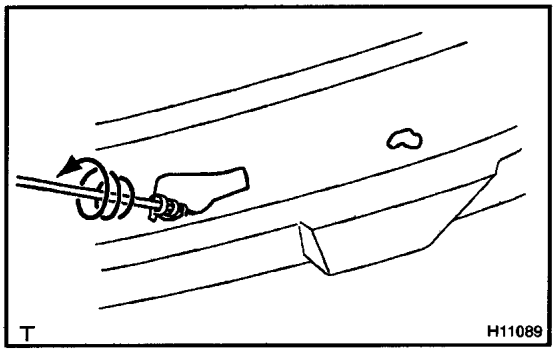
(2) Pull the lens of from the part "A" in the illustration. If the lens cannot be easily removed, heat it further.

HINT:

If the lens still cannto be removed after heating it further, insert a screwdriver and pry the lens loose, taking care not to damage it.

NOTICE:

- **Take care not to pinch your hand between the lens and housing.**
- **Take care not to injure your hand with broken lens.**
- **Be careful not to stain the inside of the light with oil or dirt when remove it.**



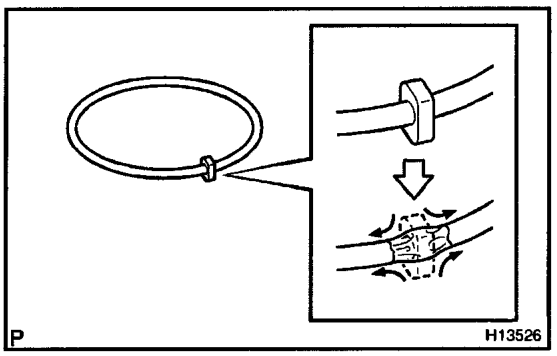
5. CLEAN HOUSING AND LENS

(a) Using an object with the sharp point, remove the adhesive sticking to the housing and lens while rolling the object as shown in the iilustation.

HINT:

Remove the adhesive by heating with the hair dryer.

(1) Clean the contact surface of the housing and lens with a piece of shop rag.



6. INSTALL HEADLIGHT LENS

(a) Join the both ends of the gasket with adhesive.

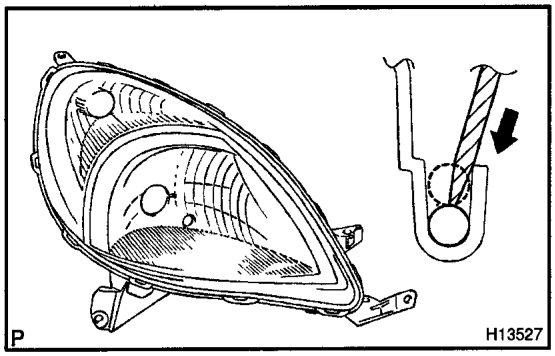
(b) Wind the adhesive around the gasket firmly so that it does not come off.

HINT:

- Wind the adhesive while stretching it.
- The adhesive can be easily wound after being warmed up with a hair dryer.

NOTICE:

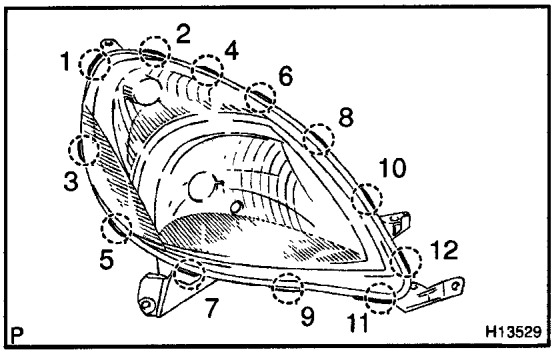
- **Check that the gasket is not twisted.**
- **Do not substitue other materials for the adhesive contained in the package.**
- **Check that there is no foreign substance on the adhesive.**



(c) Install the gasket.
  (1) After inserting the joint of the gasket into the part "A" in the illustration, push it into the seal groove with fingers.
  (2) Using a screwdriver, push it deeper.

HINT:

- Set the gasket on the seal groove before pushing it in. Otherwise, excess or shortage of the gasket might occur at the end.
- Check tat the gasket is not damaged or twisted as it might result in a water leak.
- Tape the screwdrivertip before use.



(d) Install the lens.
  (1) Put the lens.
  (2) Hang the claws properly until they click in the order shown in the illusrtation.

NOTICE:
Check that all the 12 claws are fitted in.

BO

BO351-01

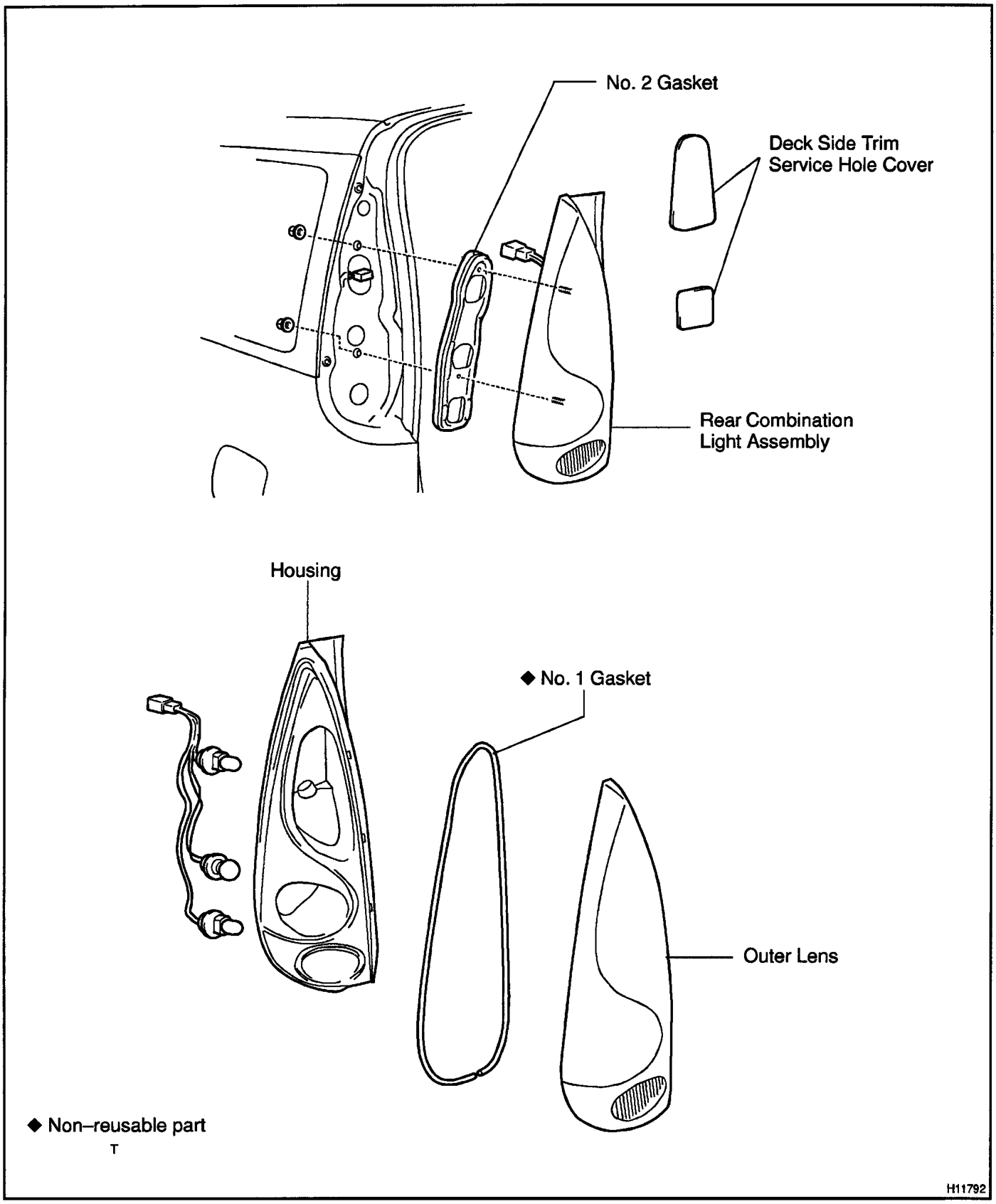
INSTALLATION

Installation is in the reverse order of removal (See page BO–5–2).

REAR COMBINATION LIGHT

COMPONENTS

BO2HQ-02

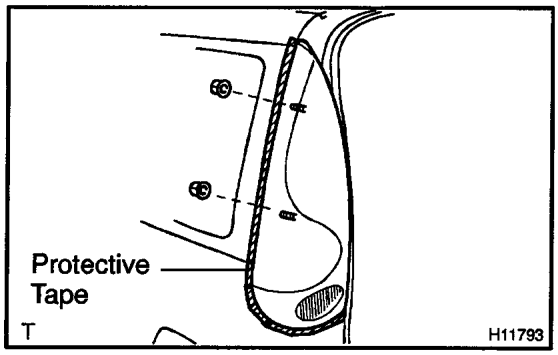


BO2RH-01

REMOVAL

1. REMOVE DECK SIDE TRIM SERVICE HOLE

Remove the deck side trim service hole cover as shown in the illustration.



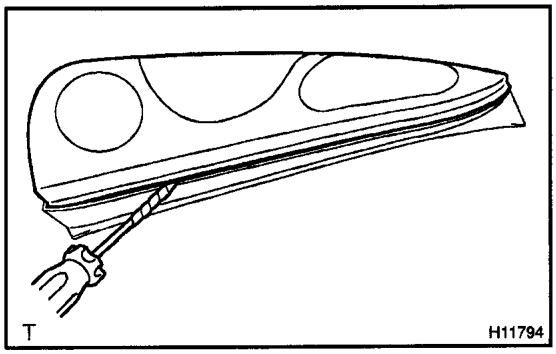
2. REMOVE REAR COMBINATION LIGHT ASSEMBLY

(a) Apply protective tape to the body.
(b) Remove the 2 nuts and disconnect the connector.
(c) Remove the rear combination light.

BO2HS-02

REPLACEMENT

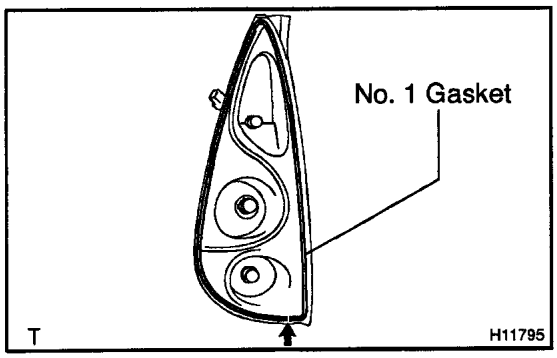
NOTICE:
When replacing the lens, take care not to touch the reflector.



REPLACE LENS

(a) Using a screwdriver, remove the lens from the housing.

HINT:
Tape the screwdriver tip before use.



(b) Install a new No. 1 gasket from the point indicated by the arrow in the illustration.

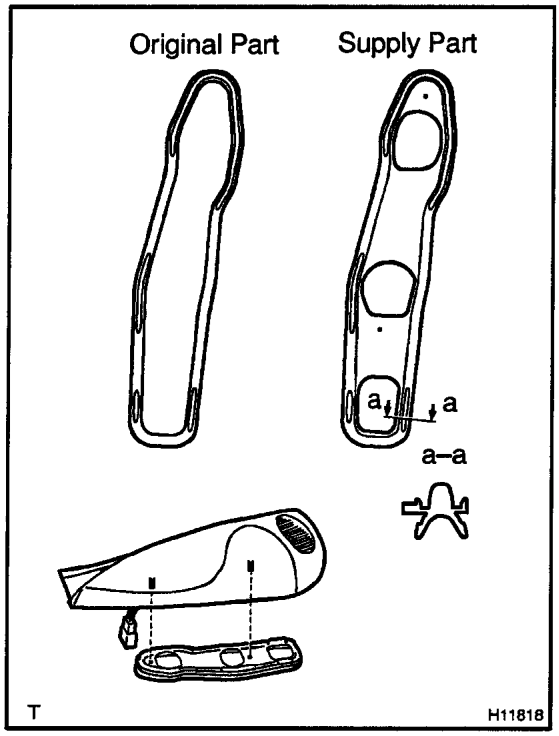
(c) Install a new lens.

BO2HT-02

INSTALLATION

1. INSTALL REAR COMBINATION LIGHT ASSEMBLY

(a) Clean the housing.



(b) Install a new No. 2 gasket to the rear combination light assembly.

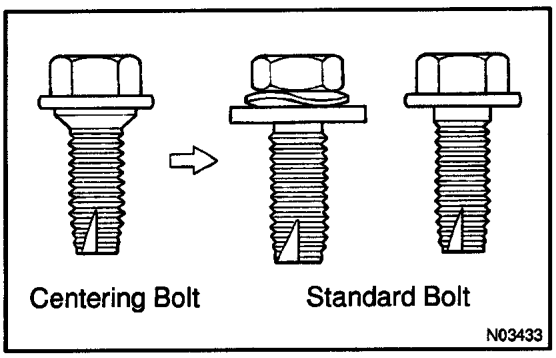
HINT:

Original part is non–reusable, but supply part is reusable.

(c) Install the rear combination light to the body with the 2 nuts.

(d) Connect the connector.

2. INSTALL DECK SIDE TRIM SERVICE HOLE COVER



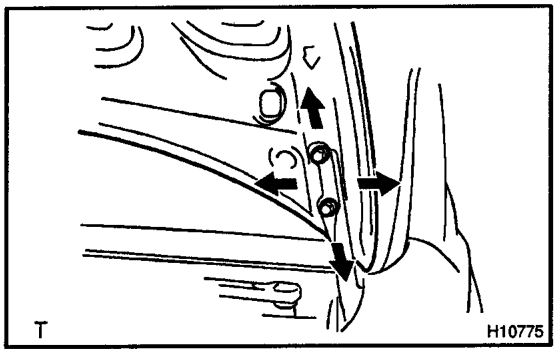
HOOD

ADJUSTMENT

BO2QQ-01

HINT:

Since the centering bolt is used as the hood hinge and lock set bolt, the hood and lock can not be adjusted with it on. Substitute the standard bolt for the centering bolt.



1. ADJUST HOOD IN FORWARD/REARWARD AND LEFT/RIGHT DIRECTIONS

Adjust the hood by loosening the hood side hinge bolts.

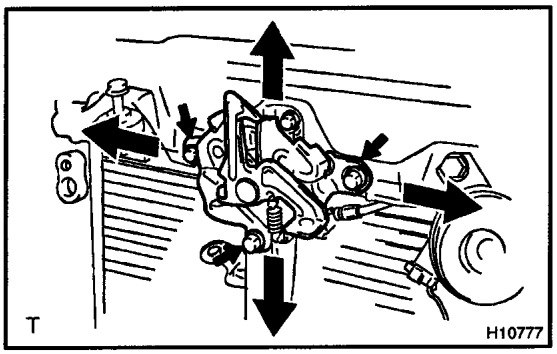
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

2. ADJUST FRONT EDGE OF HOOD IN VERTICAL DIRECTION

Adjust the hood by turning the cushions.

3. ADJUST HOOD LOCK

(a) Remove the 4 clips and radiator grille.



(b) Adjust the hood lock by loosening the 3 bolts.

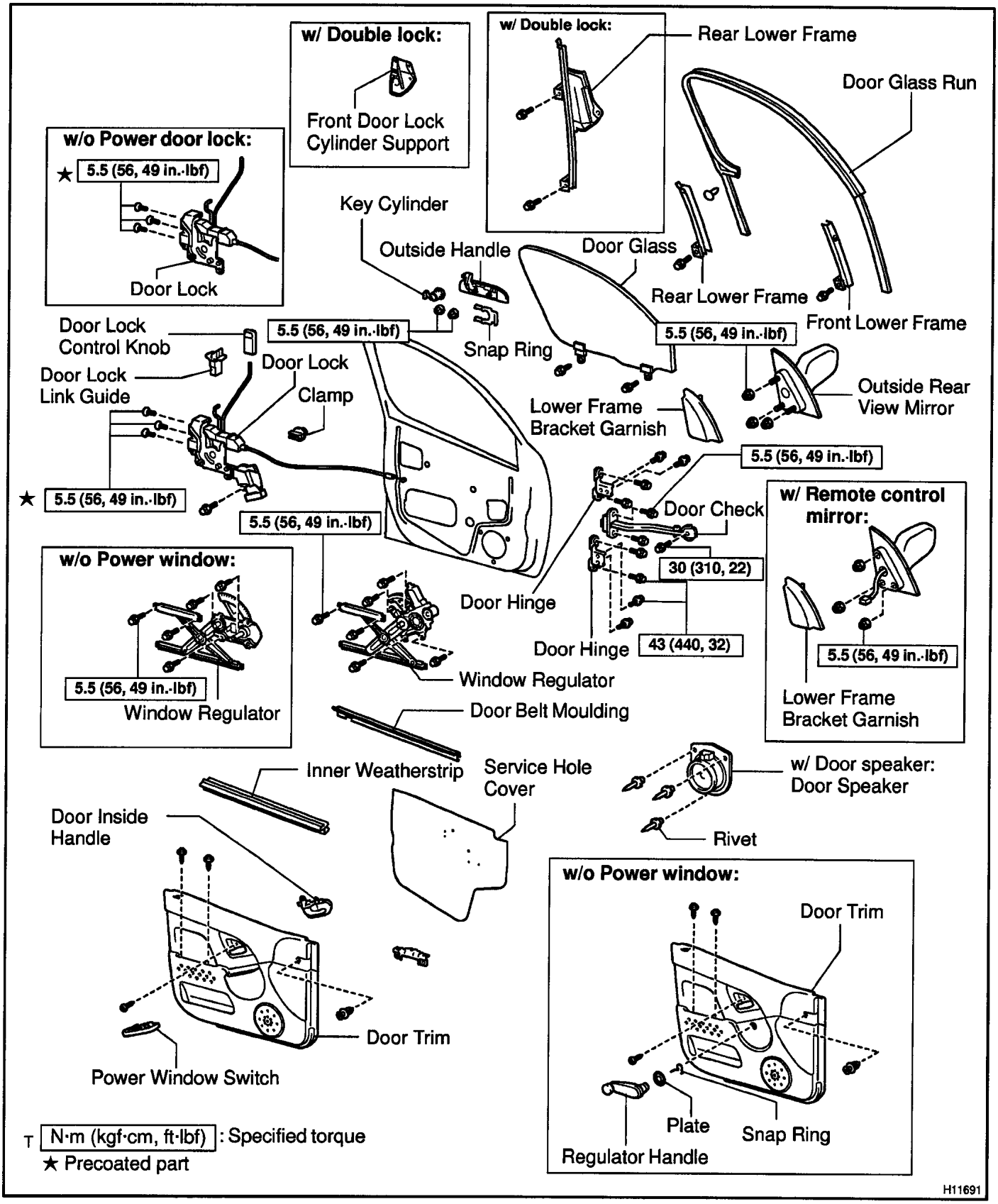
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(c) Install the radiator grille with the 4 clips.

FRONT DOOR

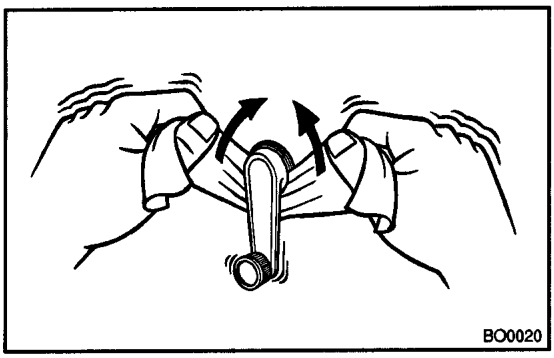
COMPONENTS

BO2HZ-02



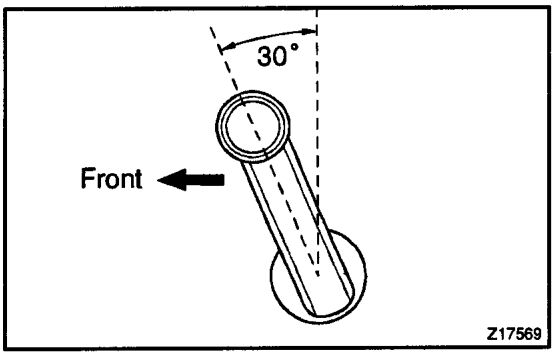
BO2QR-01

DISASSEMBLY

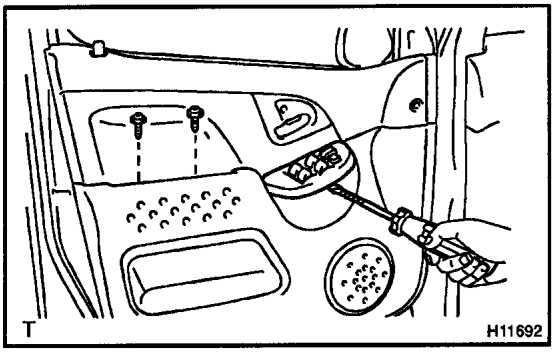


1. **w/o Power window:**
   REMOVE REGULATOR HANDLE

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 the door window fully closed, install the plate and the regulator handle with the snap ring.



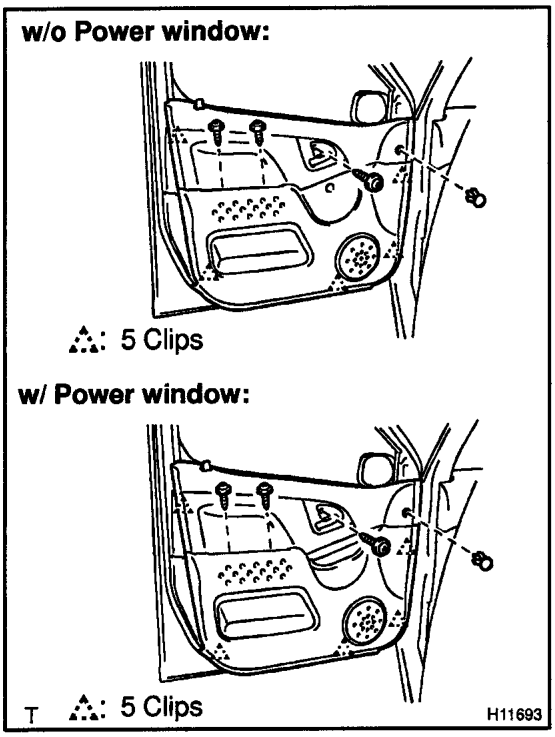
2. **w/ Power window:**
   REMOVE POWER WINDOW SWITCH

(a) Using a screwdriver, remove the power window switch.

HINT:
Tape the screwdriver tip before use.

(b) Disconnect the connector.

3. **REMOVE LOWER FRAME BRACKET GARNISH**



4. **REMOVE DOOR TRIM**

(a) Remove the screw and pull handle.
(b) Remove the 3 screws and clip.
(c) Insert a screwdriver between the door panel and door trim to pry the trim out.

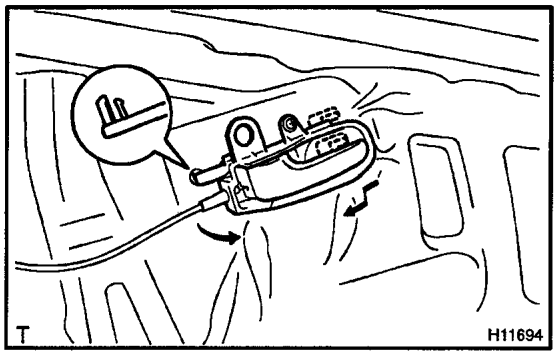
NOTICE:
Be careful not to damage the door panel and trim.

HINT:
Tape the screwdriver tip before use.

(d) Pull the door trim upward to remove it.
(e) Remove the door lock control knob holder.

5. **REMOVE INNER WEATHERSTRIP**
6. **REMOVE OUTSIDE REAR VIEW MIRROR**

(a) w/ Power remote control mirror:
Disconnect the connector.
(b) Remove the 3 nuts and rear view mirror.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



7. REMOVE DOOR INSIDE HANDLE

(a) Remove the door inside handle as shown in the illustration.

(b) Disconnect the door lock cable from the door inside handle.

8. w/o Power window:
REMOVE 2 GROMMETS

9. w/ Power window:
REMOVE ARMREST BRACKET

Remove the 2 bolts and armrest bracket.

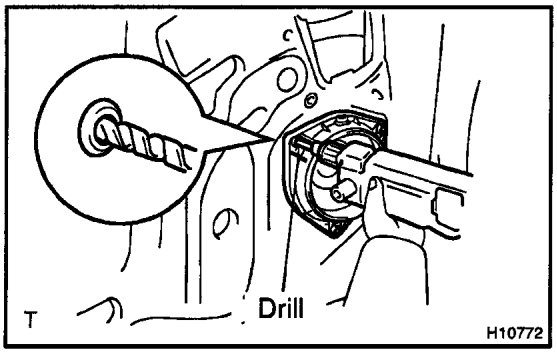
10. REMOVE SERVICE HOLE COVER

Remove the service hole cover.

HINT:

At the time of reassembly, please refer to the following item.

Bring out the cable through the service hole cover.



11. w/ Door speaker:
REMOVE DOOR SPEAKER

(a) Using a drill of less than ø 4.8 mm (0.189 in.), drill out the rivet heads and remove the speaker.

(b) Disconnect the connector.

(c) Using a vacuum cleaner, remove the drilled rivets and associated metallic dust from the inside of the door panel.

CAUTION:

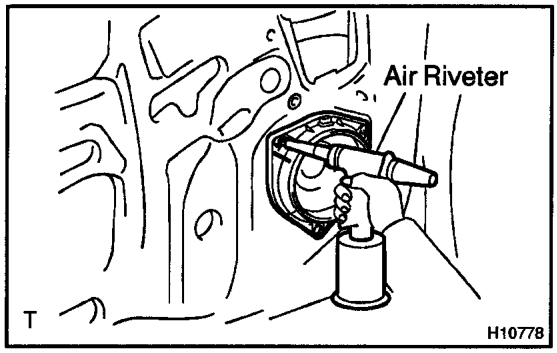
Do not touch the cut rivets and rivet cutter since they will be hot.

NOTICE:

Do not jiggle the rivet cutter while cutting. Otherwise, you may enlarge the rivet hole or damage the rivet cutter.

HINT:

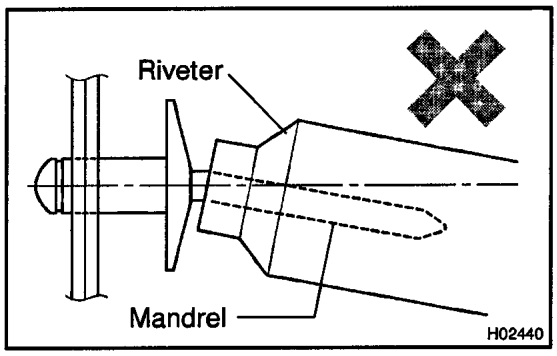
Do not drill the door inner hole.



HINT:

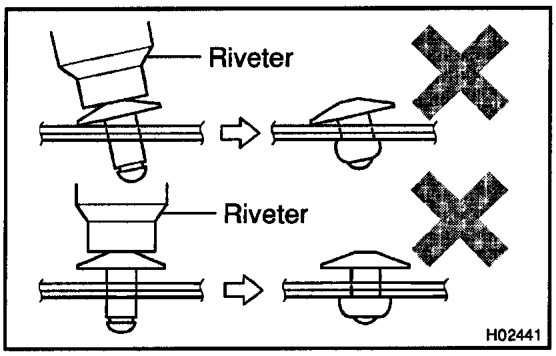
At the time of reassembly, please refer to the following item.

Using an air riveter, strike rivets into the door panel to install the speaker to the door panel.

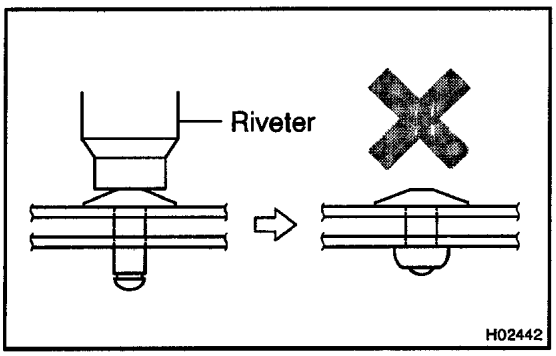


NOTICE:
At the time of reassembly, please refer to the following items.

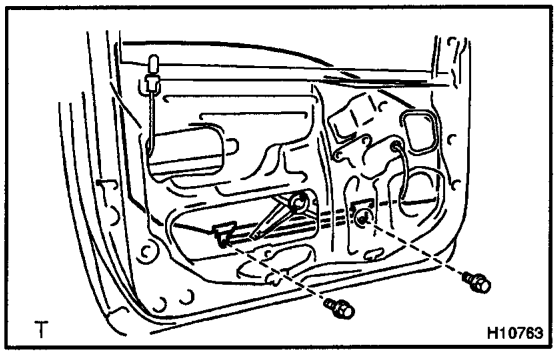
- **Do not prize a riveter. Doing so may cause damage to the riveter, incorrect rivet fastening and a bend of the madrel.**



- **Do no t tilt the riveter while handling it and make sure that the rivet head is attached to the material surface.**



- **Install the rivet so that the materials will securely contact each other. Failure to do so may cause loose rivetting.**



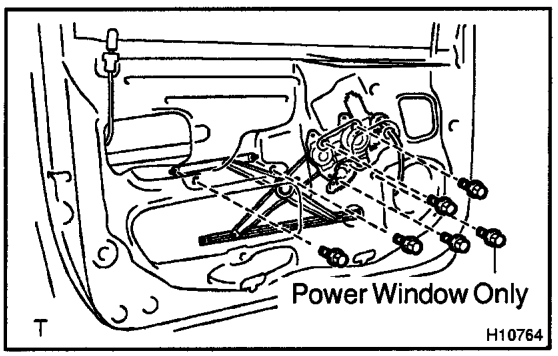
12. REMOVE DOOR GLASS

(a) Open the door glass until the bolts appear in the service holes.

(b) Remove the 2 bolts.

NOTICE:
Be careful not to drop the door glass.

(c) Pull the door glass upward to remove it.



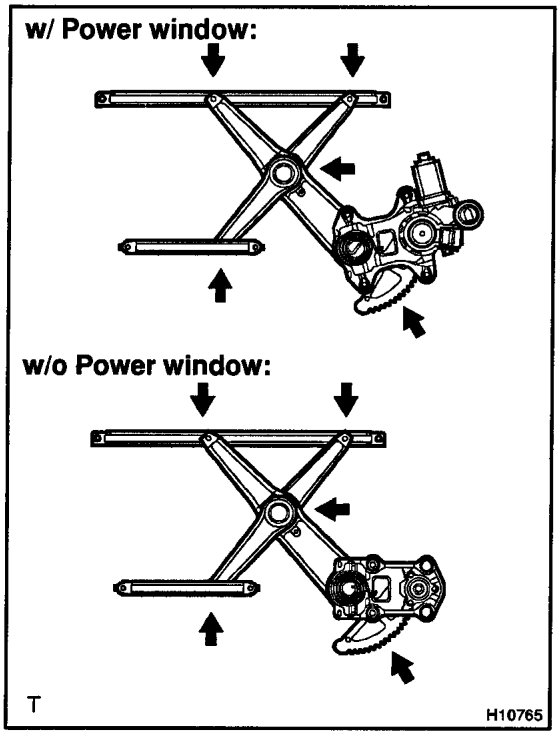
13. REMOVE WINDOW REGULATOR

(a) w/ Power window:
Disconnect the connector.

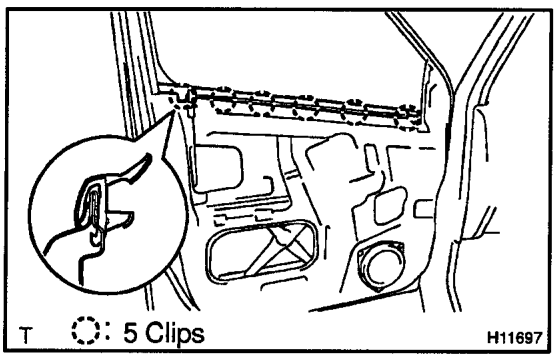
(b) w/ Power window:
Remove the 6 bolts and window regulator.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:
At the time of reassembly, please refer to the following item.
After installing the window regulator, window regulator need to be re–initialized.
Refer to BE–69.

(c) w/o Power window:
Remove the 5 bolts and window regulator.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



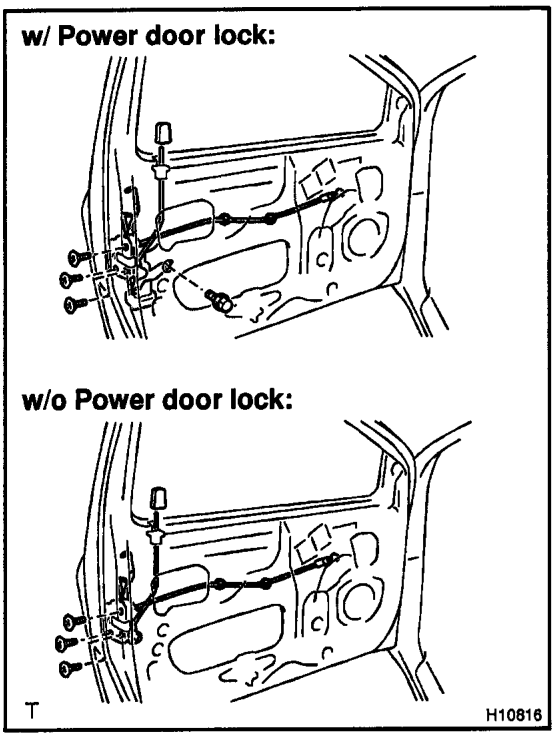
HINT:
At the time of reassembly, please refer to the following item.
Apply MP grease to the window regulator.
NOTICE:
At the time of reassembly, please refer to the following item.
Do not apply grease to the spring of the window regulator.
HINT:
Remove the regulator through the service hole.



14. REMOVE DOOR BELT MOULDING
Using a scraper, remove the door belt moulding.
HINT:
Tape the scraper tip before use.

15. REMOVE DOOR GLASS RUN
(a) Remove the clips and door glass run.
(b) Remove the 2 glass stops.
HINT:
Pull the glass run upward.

16. REMOVE FRONT AND REAR LOWER FRAMES
HINT:
Remove the lower frames through the service hole.



17. REMOVE DOOR LOCK

(a) Remove the door lock control knob.

(b) Disconnect the control cable from the clamp.

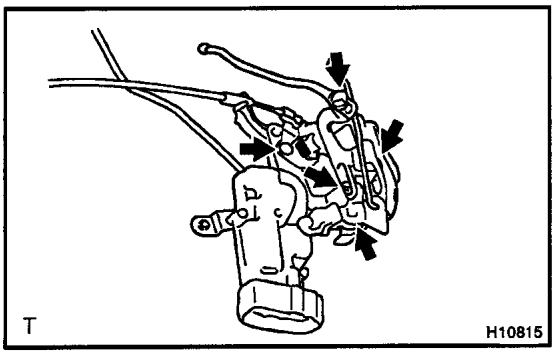
(c) Disconnect the 2 links from the outside handle and key cylinder.

(d) w/ Power door lock:
Disconnect the connector and remove the bolt and 3 screws.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(e) w/o Power door lock:
Remove the 3 screws.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:
At the time of reassembly, please refer to the following item.
Apply adhesive to 3 screws.
Part No. 08833–00070, THREE BOND 1324 or equivalent

(f) Remove the door lock through the service hole.



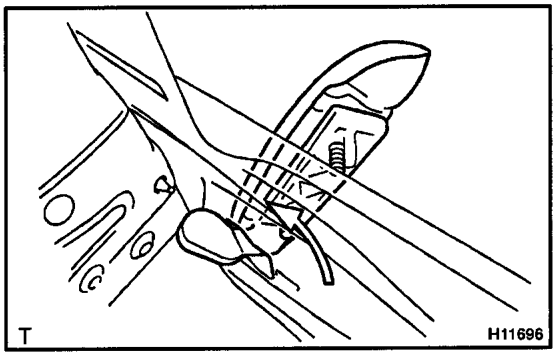
HINT:
At the time of reassembly, please refer to the following item.
Apply MP grease to the sliding and rotating parts of the door lock.

18. REMOVE DOOR LOCK LINK GUIDE AND CLAMP

Using a screwdriver, remove the door lock link guide and clamp.
HINT:
Tape the screwdriver tip before use.

19. REMOVE OUTSIDE HANDLE

(a) Remove the 2 nuts and outside handle as shown in the illustration.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



HINT:
Turn round the outside handle, then remove it as shown in the illustration.

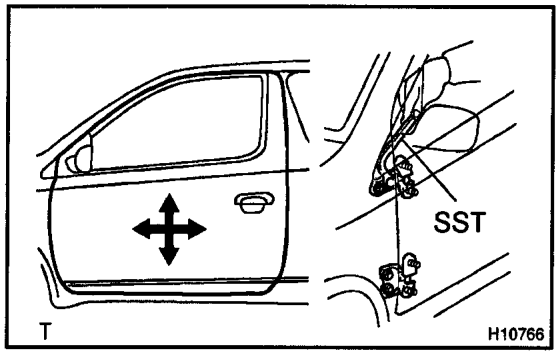
20. REMOVE KEY CYLINDER

(a) Remove the snap ring.

(b) Remove the key cylinder.

BO2I1-02

ADJUSTMENT

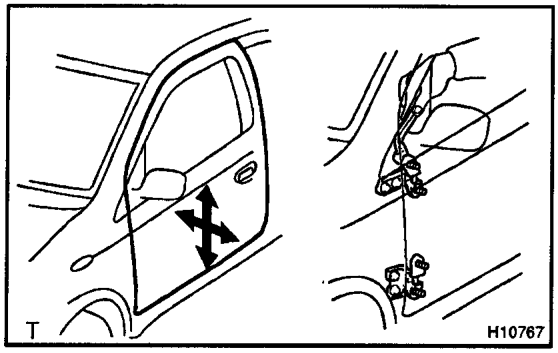


1. ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTIONS

Using SST, adjust the door by loosening the body side hinge bolts.

SST 09812–00010

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



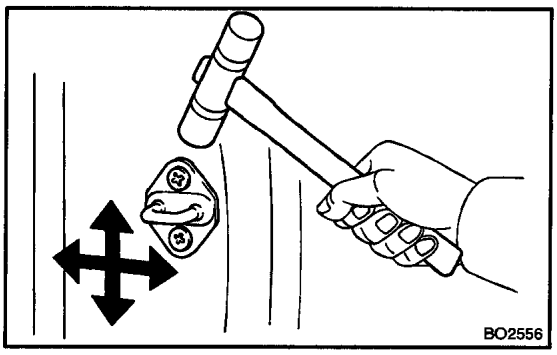
2. ADJUST DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS

Loosen the door side hinge bolts to adjust.

HINT:

Substitute the standard bolt for the centering bolt (See page BO–10).

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



3. ADJUST DOOR LOCK STRIKER

(a) Check that the door fits properly and that the 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.

(d) Tighten the striker mounting screws.

Torque: 23 N·m (230 kgf·cm, 17 ft·lbf)

BO2I2-01

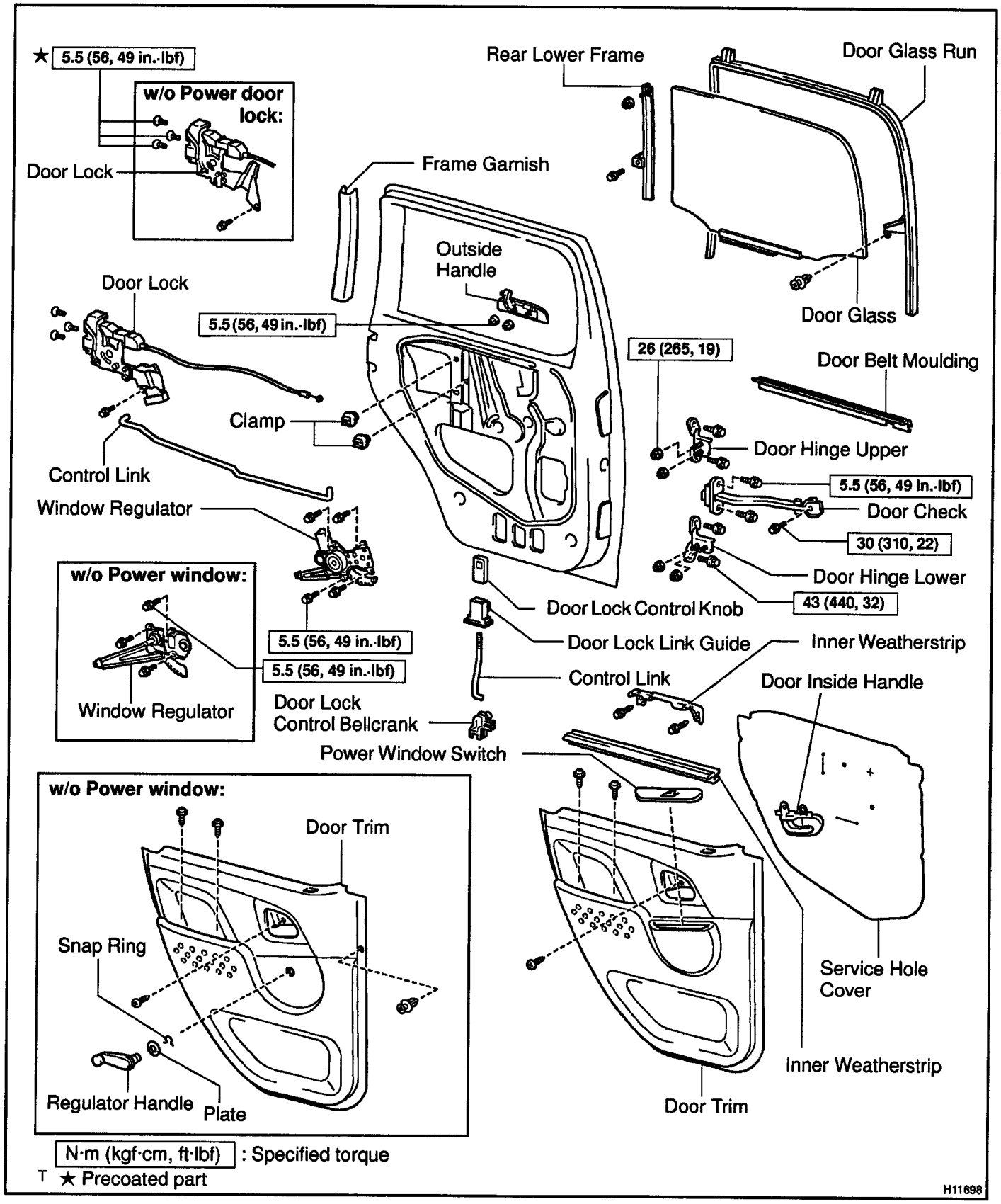
REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–12).

REAR DOOR

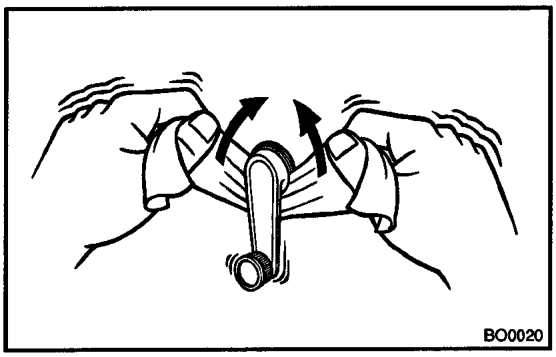
COMPONENTS

BO213-02



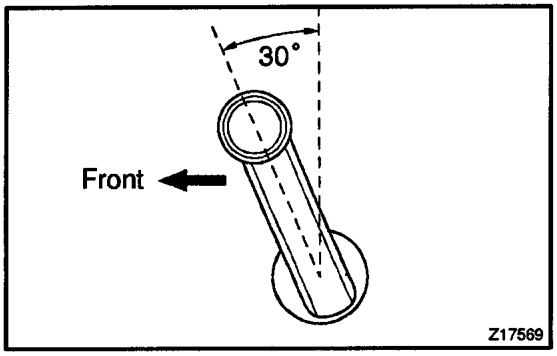
BO2QS-01

DISASSEMBLY

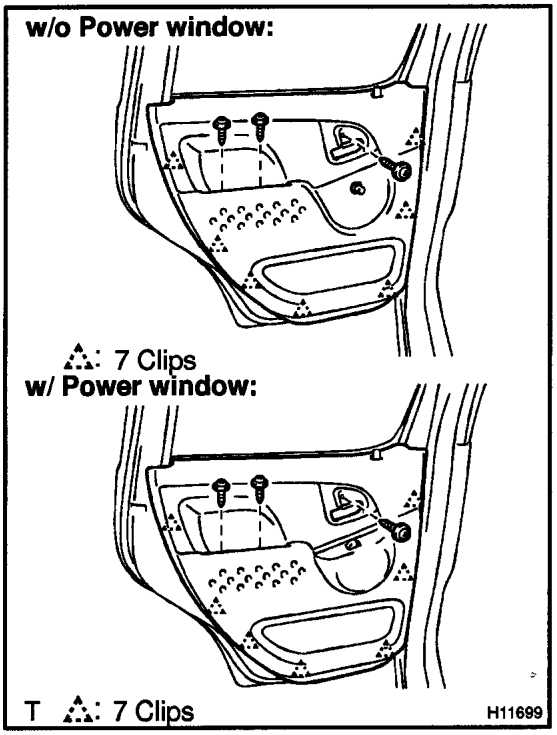


1. w/o Power window:
REMOVE REGULATOR HANDLE

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 the door window fully closed, install the plate and the regulator handle with the snap ring.



2. REMOVE DOOR TRIM

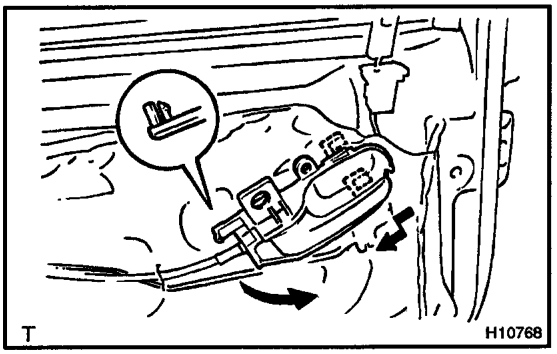
(a) Remove the 3 screws.
(b) Insert a screwdriver between the door panel and door trim to pry the door trim out.

NOTICE:
Be careful not to damage the door panel and trim.

HINT:
Tape the screwdriver tip before use.

(c) Pull the door trim upward to remove it.
(d) w/ Power window:
Disconnect the power window switch connector.
(e) w/ Power window:
Remove the power window switch from the door trim.

3. REMOVE INNER WEATHERSTRIP



4. REMOVE DOOR INSIDE HANDLE

(a) Remove the door inside handle as shown in the illustration.
(b) Disconnect the door lock cable from the door inside handle.

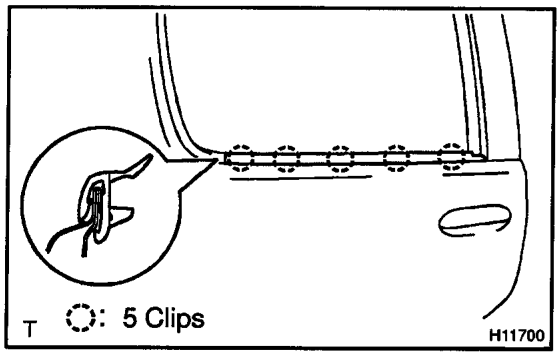
5. w/ Power window:
REMOVE ARMREST BRACKET

Remove the 2 screws and armrest bracket.

6. REMOVE SERVICE HOLE COVER

Remove the 2 grommets and service hole cover.

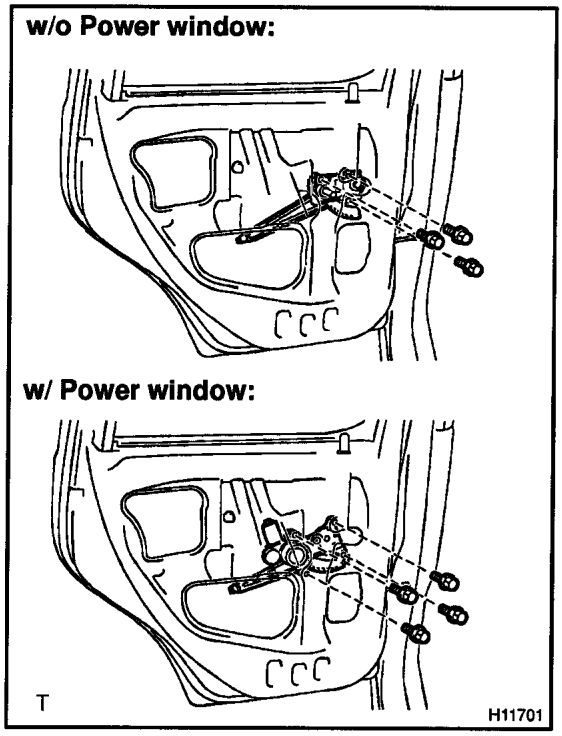
HINT:
At the time of reassembly, please refer to the following item.
Bring out the cable through the service hole cover.



7. REMOVE DOOR BELT MOULDING

Using a scraper, remove the door belt moulding.

HINT:
Tape the scraper tip before use.

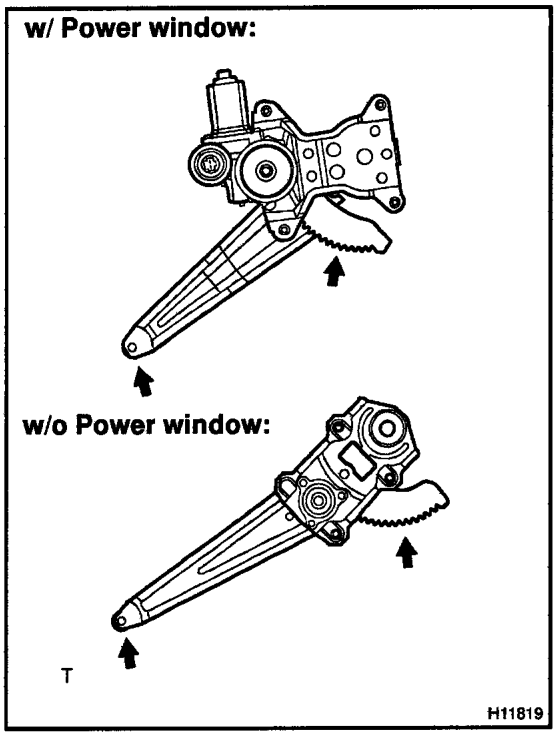


8. REMOVE WINDOW REGULATOR

(a) w/ Power window:
Disconnect the connector, then remove the 4 bolts and window regulator.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) w/o Power window:
Remove the 3 bolts and window regulator.
Torque: 5.5 N·m (56 kgf·cm, 49 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.
NOTICE:
At the time of reassembly, please refer to the following item.
Do not apply grease to the spring of the window regulator.

9. REMOVE REAR DOOR GLASS RUN

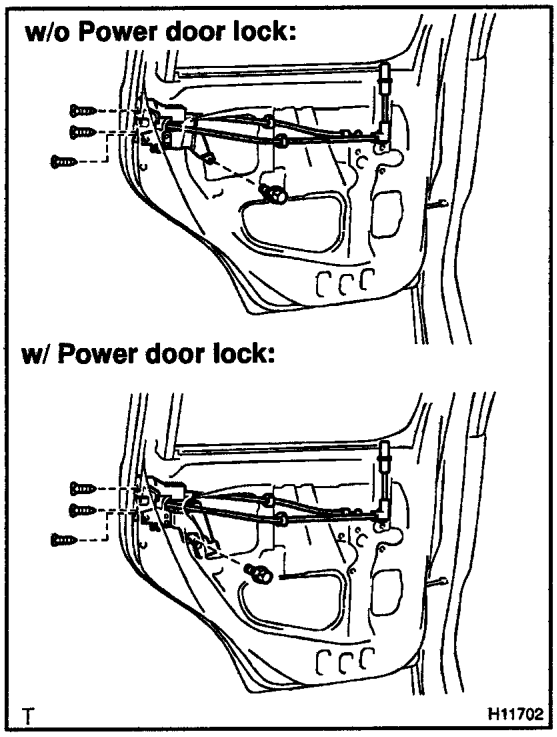
(a) Remove the clip.
(b) Pull the rear door glass run out of the door panel.

10. REMOVE REAR LOWER FRAME

(a) Remove the nut and screw.
(b) Remove the rear lower frame.

11. REMOVE DOOR GLASS

12. REMOVE FRAME GARNISH

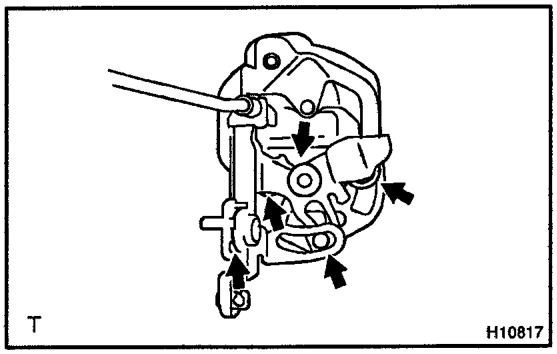


13. REMOVE DOOR LOCK

(a) Remove the door lock control knob.
(b) Remove the door lock control bellcrank and disconnect the door lock control link.
(c) Disconnect the door lock control link and cable from the door lock link clamp.
(d) w/ Power door lock:
Disconnect the connector and remove the bolt, 3 screws and door lock with control links.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(e) w/o Power door lock:
Remove the bolt, 3 screws and door lock control cable.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:
At the time of reassembly, please refer to the following item.
Apply adhesive to 3 screws.
Part No. 08833–00070, THREE BOND 1324 or equivalent

(f) Remove the door lock through the service hole.



HINT:
At the time of reassembly, please refer to the following item.
Apply MP grease to the sliding and rotating part of the door lock.

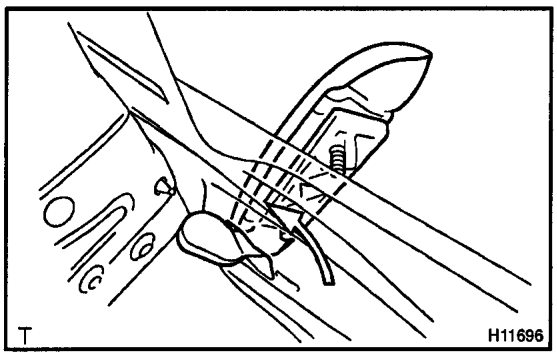
14. REMOVE DOOR LOCK LINK GUIDE AND CLAMP

(a) Using a screwdriver, remove the door lock link guide and clamp.

HINT:
Tape the screwdriver tip before use.

15. REMOVE OUTSIDE HANDLE

Remove the 2 nuts and outside handle.

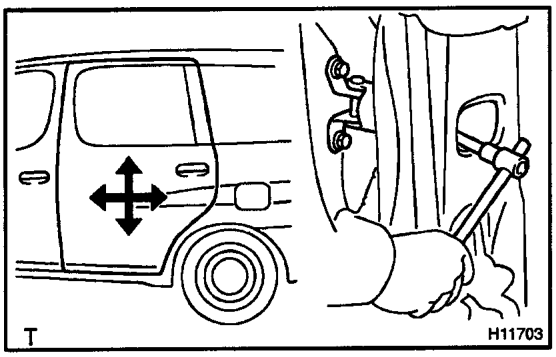


HINT:
Turn round the outside handle, then remove it as shown in the illustration.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

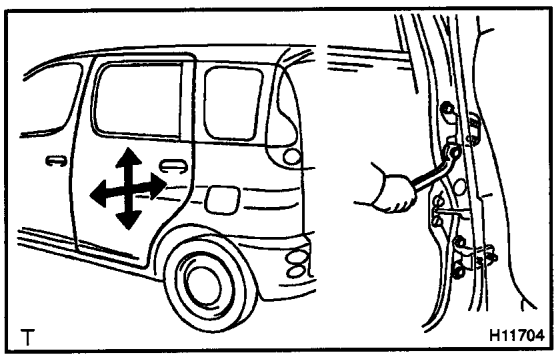
BO25-02

ADJUSTMENT



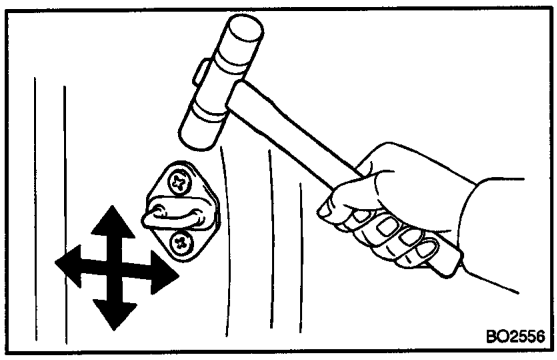
1. ADJUST DOOR IN FORWARD/ REARWARD AND VERTICAL DIRECTIONS

(a) Remove the front and rear door scuff plates.
(b) Remove the center pillar lower garnish.
(c) Remove the front seat outer belt (See page BO–121).
(d) Loosen the body side hinge nuts to adjust.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)
(e) Install the front seat outer belt and center pillar lower garnish (See page BO–121).
(f) Install the front and rear door scuff plates.



2. ADJUST DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS

Loosen the door side hinge bolts to adjust.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



3. ADJUST DOOR LOCK STRIKER

(a) Check that the door fits properly and that the 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.

BC2I6-01

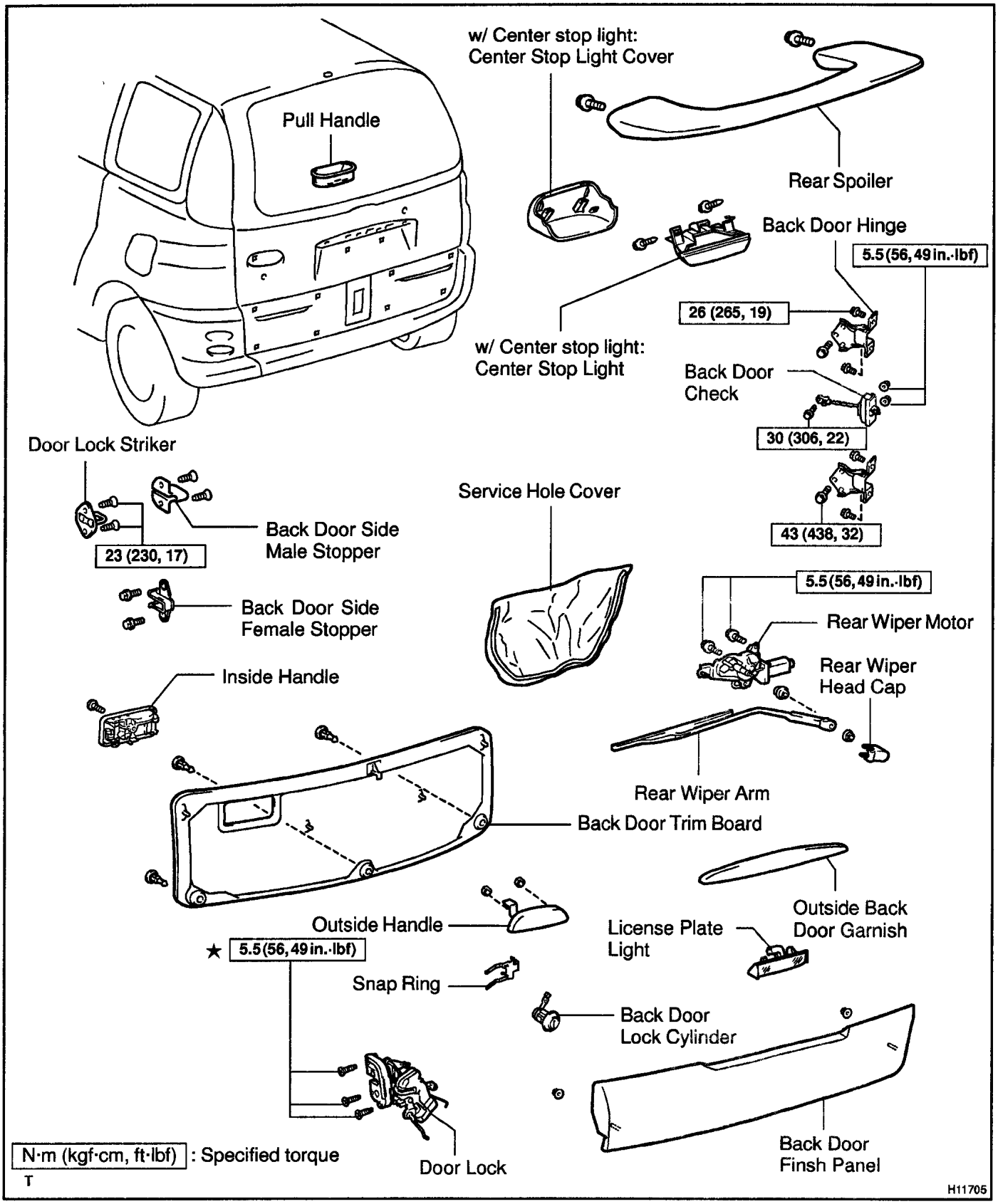
REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–20).

BACK DOOR

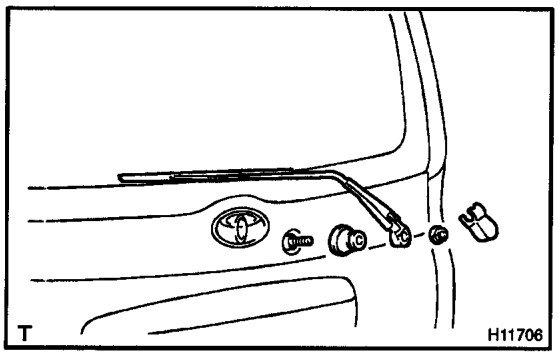
COMPONENTS

BO2GG-02



BO2QT-01

DISASSEMBLY

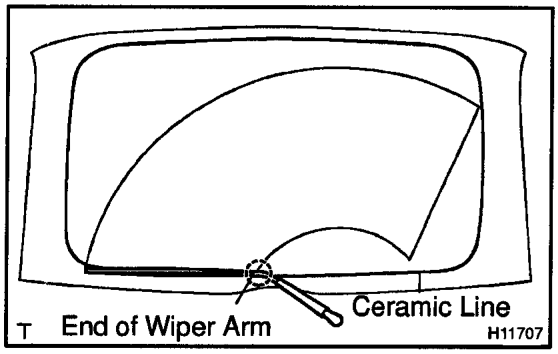


1. REMOVE REAR WIPER ARM

(a) Remove the rear wiper head cap.

(b) Remove the nut and rear wiper arm.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



HINT:

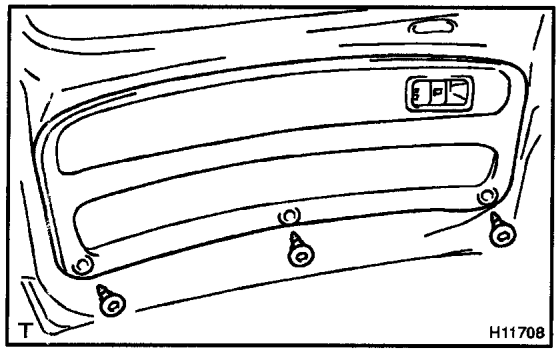
At the time of reassembly, please refer to the following items.

- Operate the wiper motor for one cycle before installing the wiper arm.
- Set the end of wiper arm on the ceramic line.

(c) Remove the grommet.

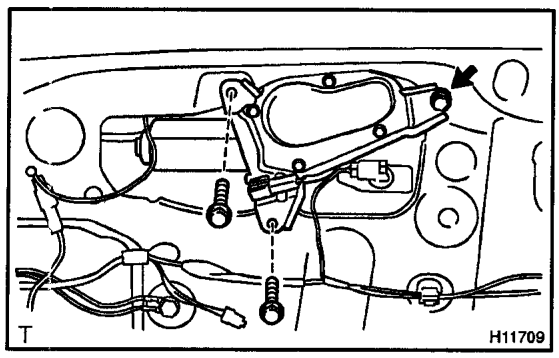
2. REMOVE INSIDE HANDLE

Remove the screw and inside handle.



3. REMOVE BACK DOOR TRIM BOARD

Remove the 3 clips and back door trim board.



4. REMOVE REAR WIPER MOTOR

(a) Remove the 2 bolts and loosen the bolt indicated by the arrow.

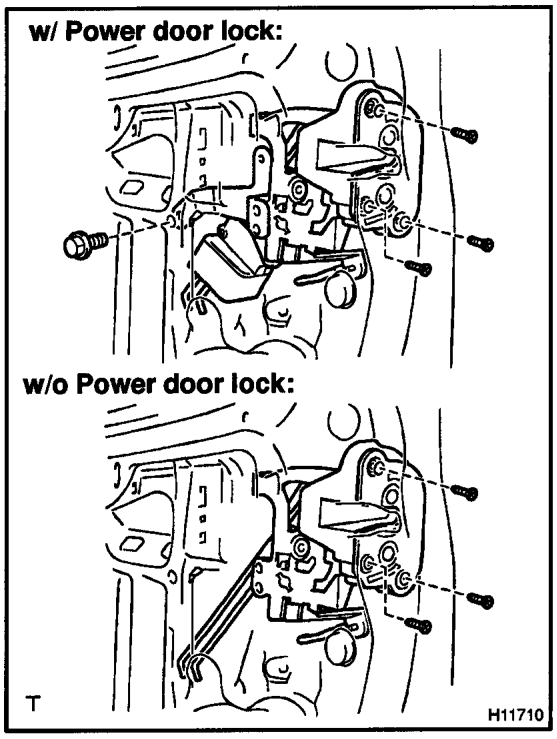
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) Disconnect the connector, then remove the rear wiper motor.

5. REMOVE LICENSE PLATE LIGHT

Disconnect the connector and license plate light.

6. REMOVE SERVICE HOLE COVER



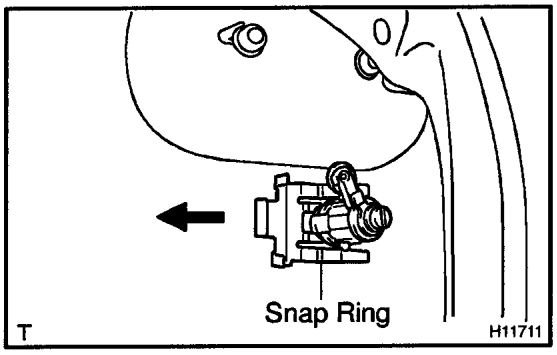
7. REMOVE DOOR LOCK

(a) w/ Power door lock:
Disconnect the connector.

(b) w/o Power door lock:
Remove the 3 screws and door lock.

(c) w/ Power door lock:
Remove the bolt, 3 screws and door lock.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:
Remove the door lock through the service hole.
HINT:
At the time of reassembly, please refer to the following item.
Apply adhesive to 3 screws.
Part No. 08833–00070, THREE BOND 1324 or equivalent



8. REMOVE BACK DOOR LOCK CYLINDER

(a) Remove the snap ring as shown in the illustration.

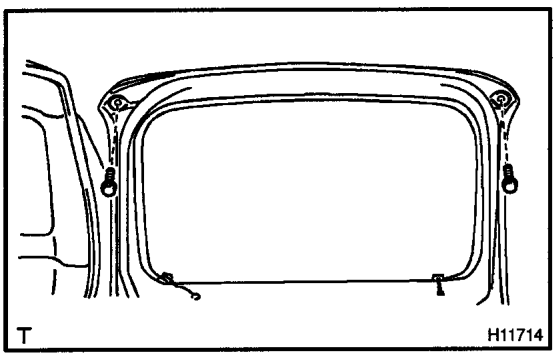
(b) Remove the back door lock cylinder.

9. REMOVE OUTSIDE HANDLE

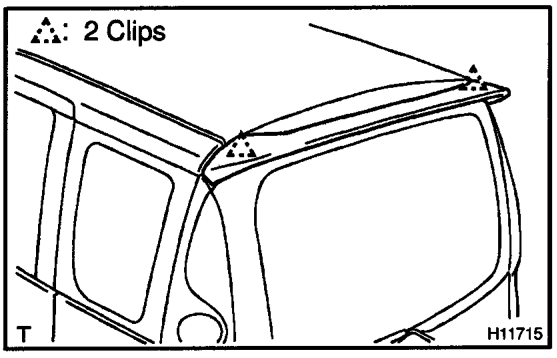
Remove the 2 nuts and outside handle.

10. REMOVE REAR SPOILER

(a) Remove the cushion.



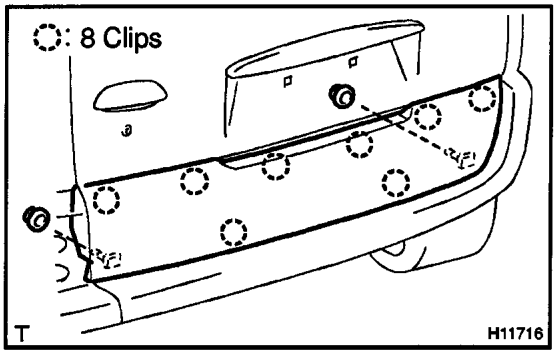
(b) Remove the 2 bolts.



(c) Insert a screwdriver between the rear spoiler and back door panel to remove the rear spoiler.

HINT:
Tape the screwdriver tip before use.

11. REMOVE OUTSIDE BACK DOOR GARNISH



12. REMOVE BACK DOOR FINISH PANEL

Insert a screwdriver between the back door finish panel and door panel to remove the back door finish panel.

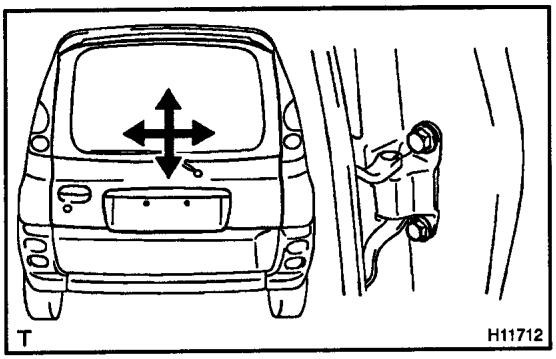
HINT:

Tape the screwdriver tip before use.

BO2QU-01

ADJUSTMENT

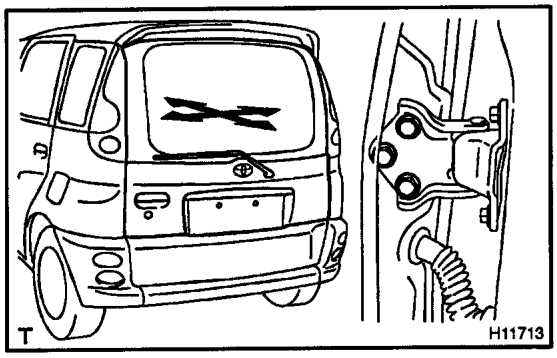
1. ADJUST DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS



Adjust the door by loosening the door side hinge bolts.

Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

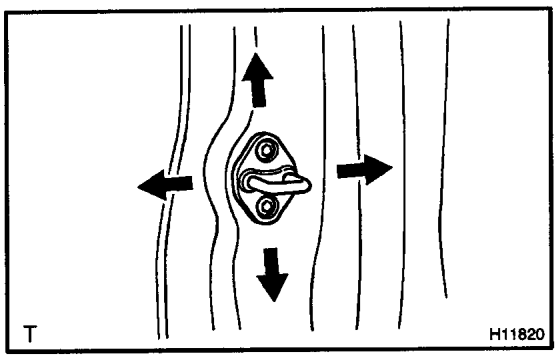
2. ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTIONS



Adjust the door by loosening the body side hinge bolts.

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

3. ADJUST DOOR LOCK STRIKER



(a) Check that the door fits properly and that the door linkage is adjusted correctly.

(b) Adjust the striker by loosening the striker mounting screws.

Torque: 23 N·m (230 kgf·cm, 17 ft·lbf)

(c) Using a plastic hammer, tap the striker to adjust.

BO2GJ-01

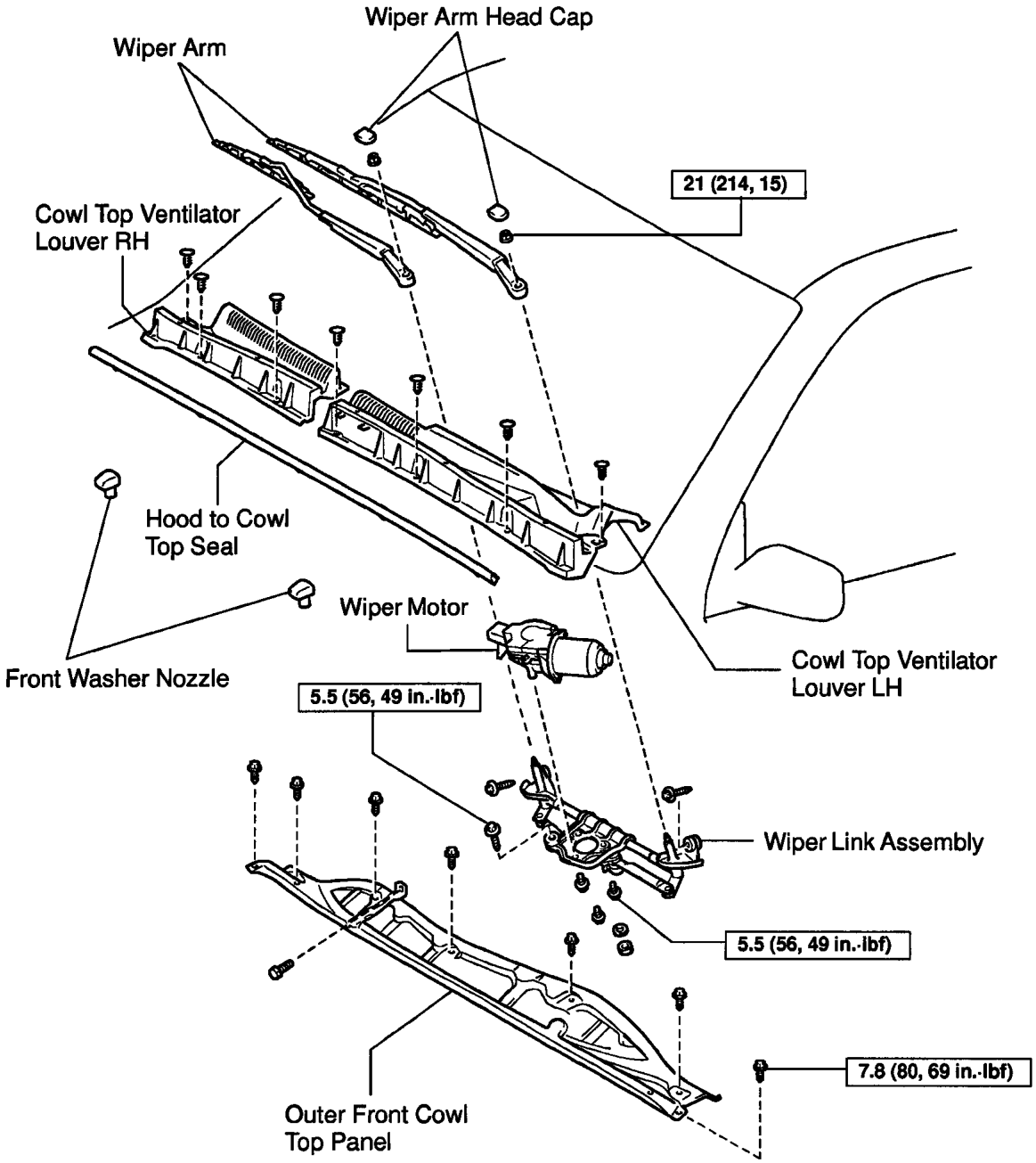
REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–27).

FRONT WIPER AND WASHER

COMPONENTS

BO217-02



T

N·m (kgf·cm, ft·lbf) : Specified torque

H11717

BO2I8-02

REMOVAL

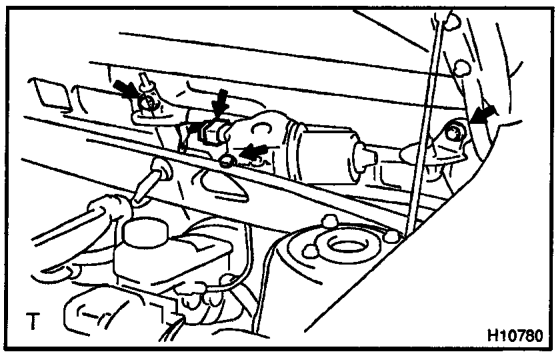
1. REMOVE WIPER ARMS

Remove the 2 wiper arm head caps, 2 nuts and 2 wiper arms.

2. REMOVE COWL TOP VENTILATOR LOUVER

(a) Remove the hood to cowl top seal.

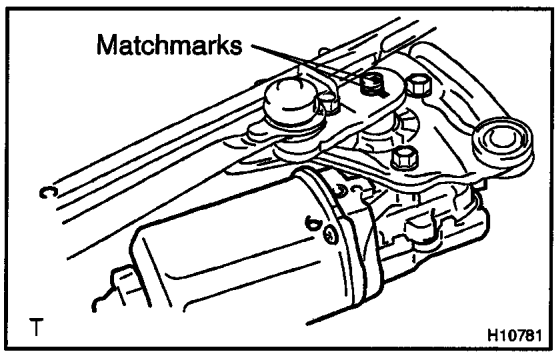
(b) Remove the 7 clips, then pull out the cowl top ventilator louver RH and LH.



3. REMOVE WIPER MOTOR ASSEMBLY

(a) Disconnect the connector.

(b) Remove the 3 bolts and wiper motor assembly.



4. REMOVE WIPER MOTOR

(a) Remove the nut and washer.

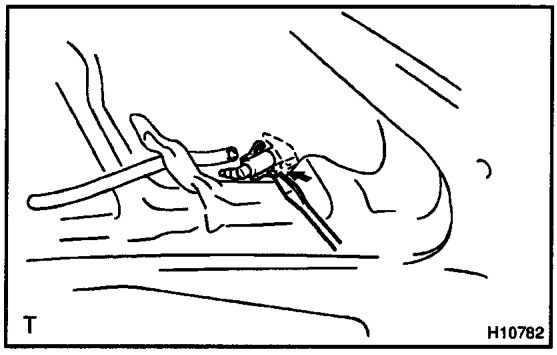
(b) Place the matchmarks on both the wiper link and motor.

(c) Remove the 3 bolts and motor from the wiper link assembly.

5. REMOVE OUTER FRONT COWL TOP PANEL

(a) Pull out the wiper motor wire harness with the grommet.

(b) Remove the 8 bolts and outer front cowl top panel.



6. REMOVE FRONT WASHER NOZZLE

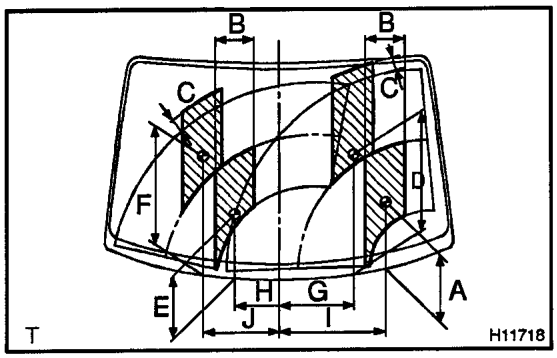
(a) Disconnect the washer hose.

(b) Using a screwdriver, remove the front washer nozzle from the hood.

HINT:

Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other side.

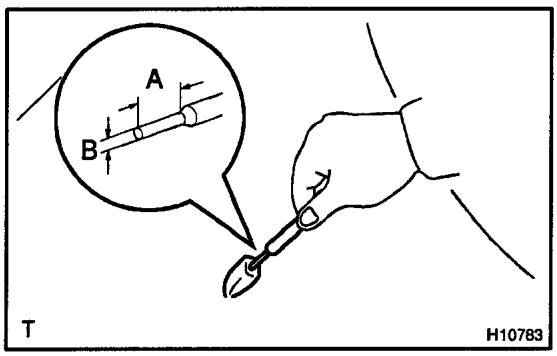


INSPECTION

INSPECT WASHER NOZZLE

While operating the washer, check that points where the washer fluid from the nozzles hits the windshield and the upsurge area are within the range indicated by the hatched line.

A: Approx. 250 mm (9.84 in.)
B: Approx. 150 mm (5.91 In.)
C: Approx. 50 mm (1.97 in.)
D: Approx. 463 mm (18.23 in.)
E: Approx. 250 mm (9.84 in.)
F: Approx. 463 mm (18.23 in.)
G: Approx. 285 mm (11.22 In.)
H: Approx. 172 mm (6.77 in.)
I: Approx. 405 mm (15.94 In.)
J: Approx. 291 mm (11.46 in.)



BO21A-02

ADJUSTMENT

ADJUST FRONT 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 windshield.

A: 2.0 – 2.5 mm (0.079 – 0.098 in.)

B: 0.7 – 0.75 mm (0.028 – 0.0295 in.)

BO2B-02

INSTALLATION

1. INSTALL WASHER NOZZLES

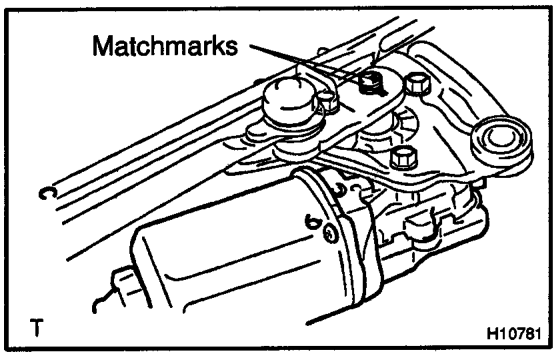
(a) Install the washer nozzles to the hood.

(b) Connect the washer hoses.

2. INSTALL OUTER FRONT COWL TOP PANEL

(a) Install the outer front cowl top panel with 8 bolts.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

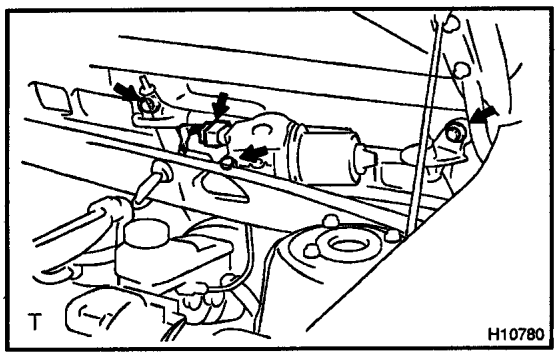
(b) Push in the wiper motor wire harness with the grommet.



3. INSTALL WIPER MOTOR

(a) Install the wiper motor to the wiper link with the 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) Align the matchmarks on both the wiper link and wiper motor, then install the washer and nut.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



4. INSTALL WIPER MOTOR ASSEMBLY

(a) Install the wiper motor assembly with 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) Connect the connector.

5. INSTALL COWL TOP VENTILATOR LOUVER

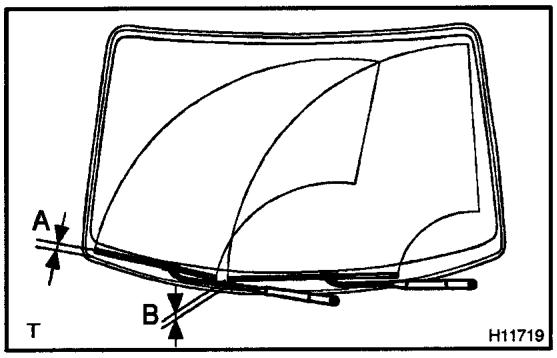
Install the cowl top ventilator louver LH and RH, then install the 7 clips.

6. INSTALL HOOD TO COWL TOP SEAL

7. INSTALL WIPER ARMS

(a) Operate the wiper motor for one cycle.

(b) Install the wiper arms and tighten nuts by hand.



(c) Adjust the installation position of the wiper arms to the positions shown in the illustration.
A: Approx. 20 mm (0.79 in.)
B: Approx. 25 mm (0.98 in.)

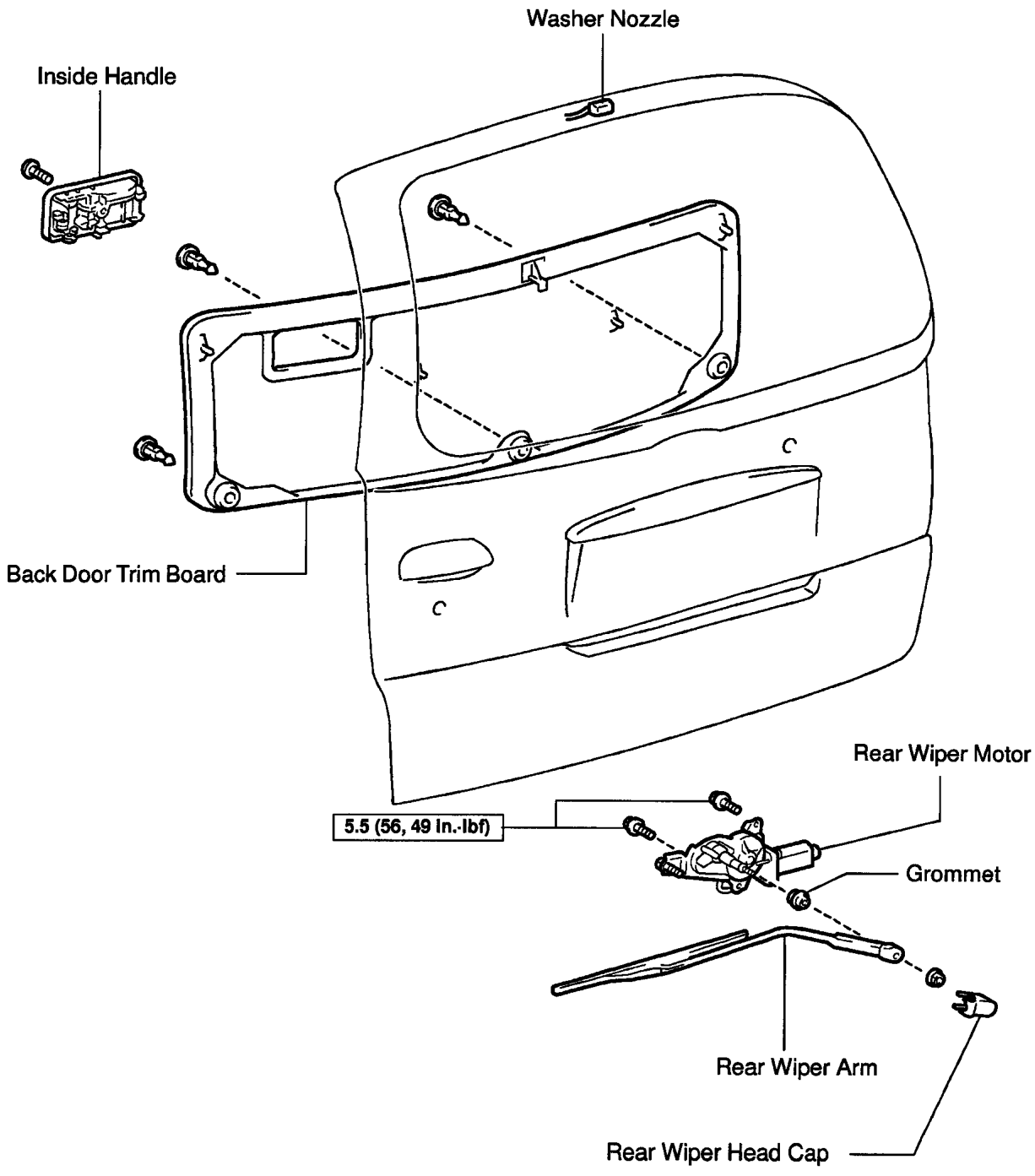
(d) Torque the 2 nuts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(e) Install the 2 wiper arm head caps.

REAR WIPER AND WASHER

COMPONENTS

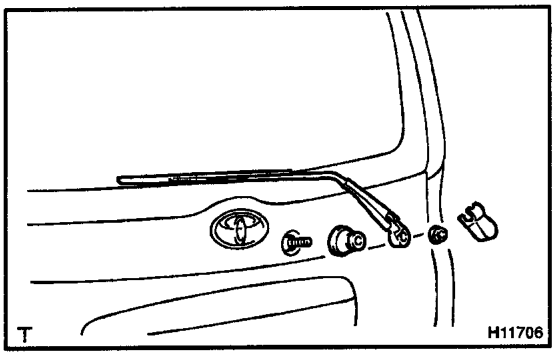
BO2GK-02



N·m (kgf·cm, ft·lbf) : Specified torque

H11720

BC2QV-01



REMOVAL

1. REMOVE REAR WIPER ARM

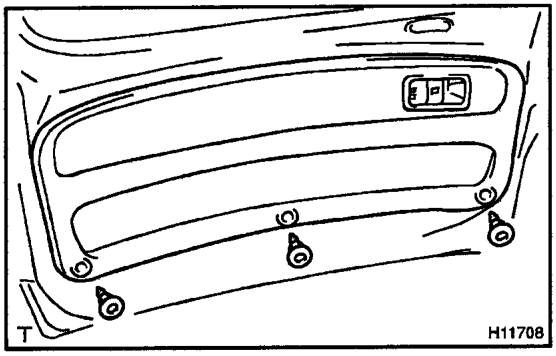
(a) Remove the rear wiper head cap.

(b) Remove the nut and rear wiper arm.

(c) Remove the grommet.

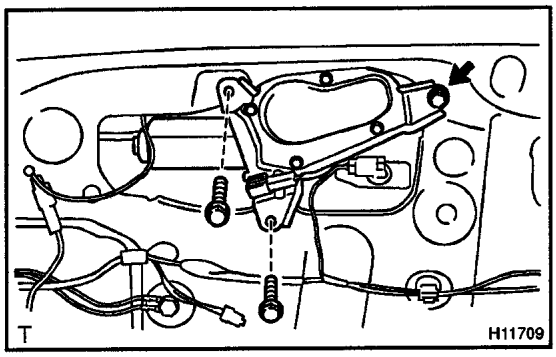
2. REMOVE INSIDE HANDLE

Remove the screw and inside handle.



3. REMOVE BACK DOOR TRIM BOARD

Remove the 3 clips and back door trim board.



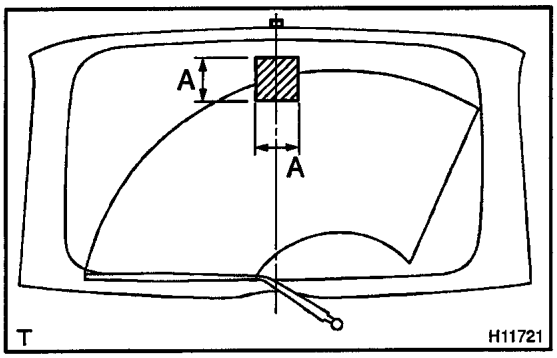
4. REMOVE REAR WIPER MOTOR

(a) Remove the 2 bolts and loosen the bolt indicated by the arrow.

(b) Disconnect the connector, then remove the rear wiper motor.

5. REMOVE WASHER NOZZLE

BO2GN-02



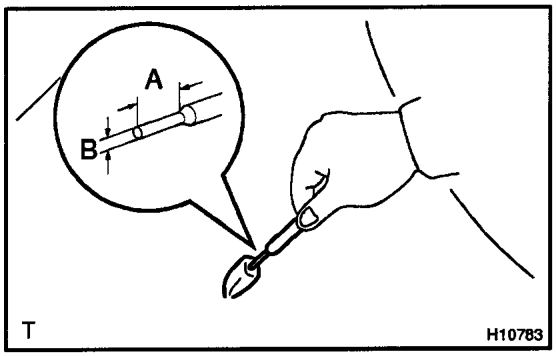
INSPECTION

INSPECT WASHER NOZZLE

While operating the washer, check if the upper point where the washer fluid hits the back door glass and surge area are within the range indicated by the hatched line.

A: Approx. 100 mm (3.94 in.)

BO2QW-01



ADJUSTMENT

ADJUST FRONT WASHER NOZZLE

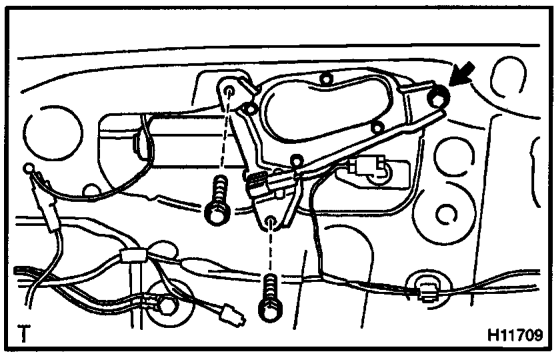
Using a tool like the one shown in the illustration, change the direction of the nozzle hole to adjust the point where washer fluid hits the windshield.

A: 2.0 – 2.5 mm (0.079 – 0.098 in.)

B: 0.7 – 0.75 mm (0.028 – 0.0295 in.)

INSTALLATION

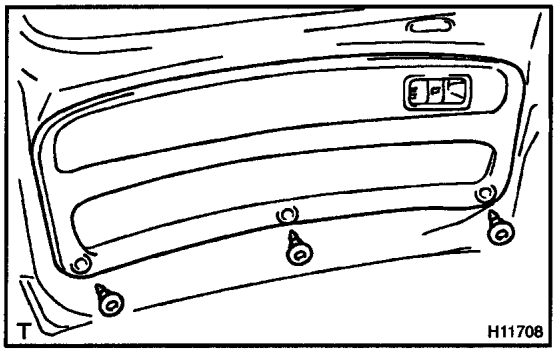
1. INSTALL WASHER NOZZLE



2. INSTALL REAR WIPER MOTOR

(a) Install the rear wiper motor to the door panel with 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) Connect the connector.



3. INSTALL BACK DOOR TRIM BOARD

Install the back door trim board with the 3 clips.

4. INSTALL INSIDE HANDLE

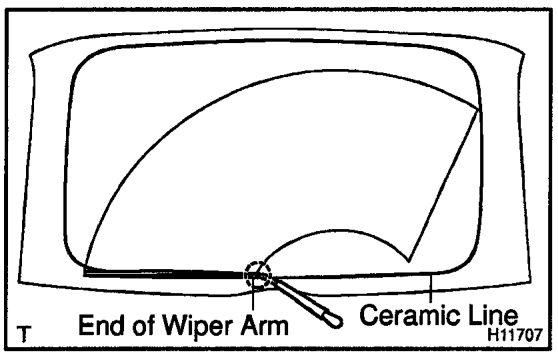
Install the inside handle with the screw.

5. INSTALL REAR WIPER ARM

(a) Install the grommet.

(b) Operate the wiper motor for one cycle.

(c) Install the rear wiper arm and tighten the nut by hand.



(d) Adjust the installation position of the wiper arm to the position shown in the illustration.

HINT:

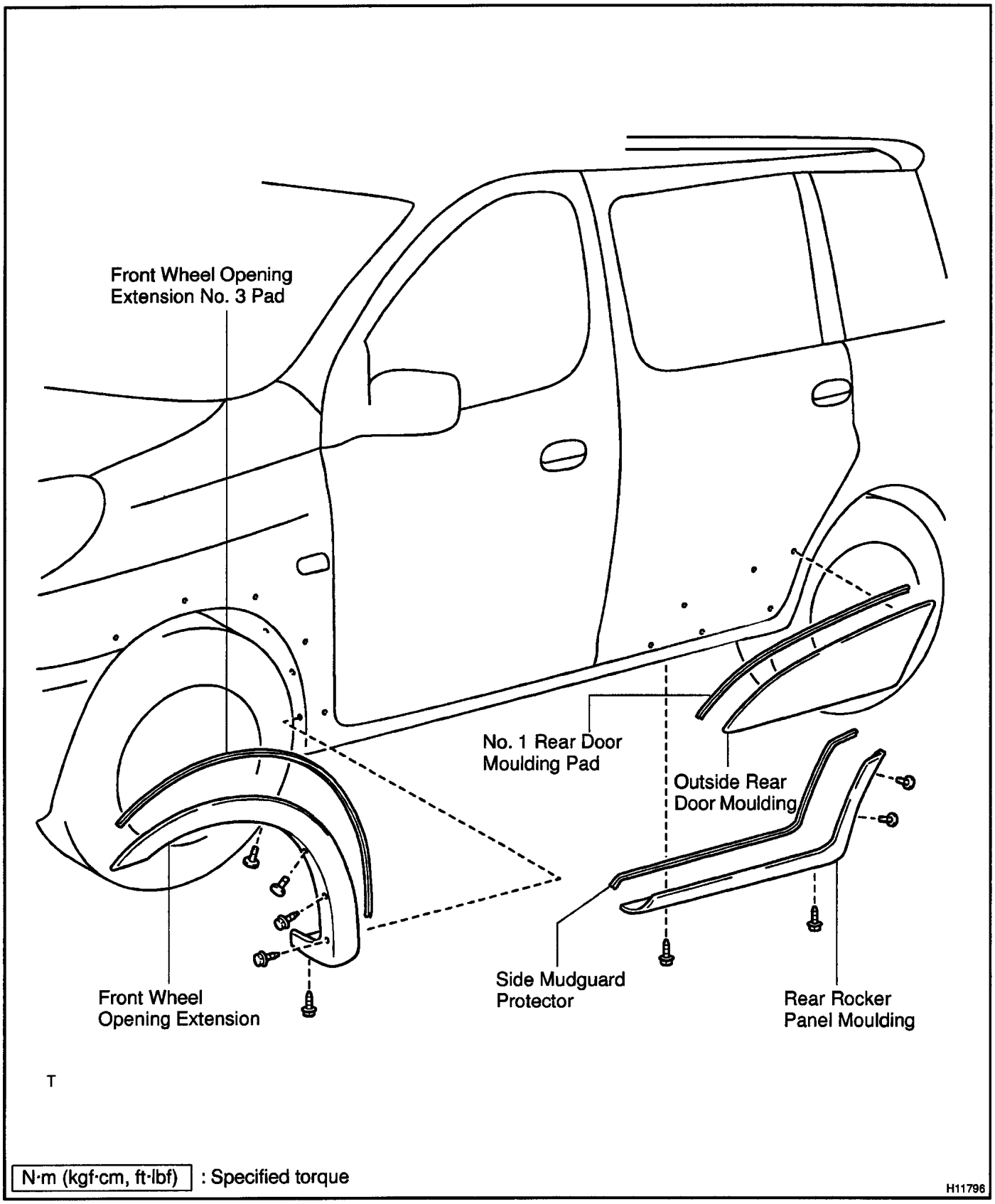
Set the end of wiper arm on the ceramic line.

(e) Tighten the nut.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

BODY OUTSIDE MOULDING

COMPONENTS

BO2RI-01

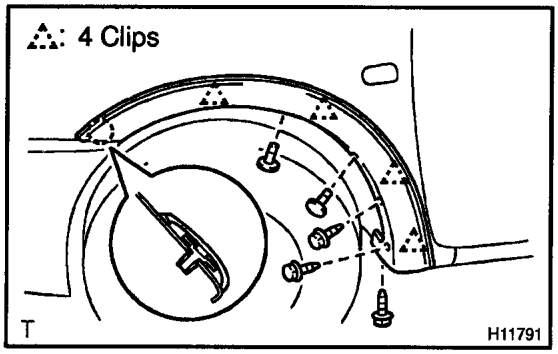


N·m (kgf·cm, ft·lbf) : Specified torque

H11796

BO2RJ-01

REMOVAL



1. REMOVE FRONT WHEEL OPENING EXTENSION

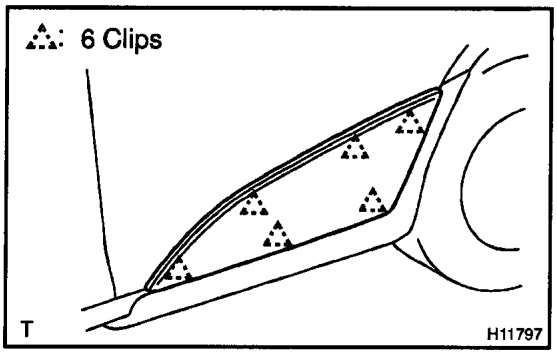
(a) Remove the 3 screws and 2 clips.

(b) Insert a screwdriver between the extension and body to remove the extension.

HINT:

Tape the screwdriver tip before use.

(c) Remove the front wheel opening extension No. 3 pad.



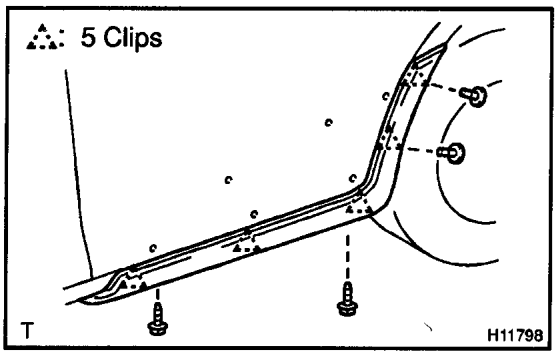
2. REMOVE OUTSIDE REAR DOOR MOULDING

(a) Insert a screwdriver between the moulding and rear door panel to remove the moulding.

HINT:

Tape the screwdriver tip before use.

(b) Remove the No. 1 rear door moulding pad.



3. REMOVE REAR ROCKER PANEL MOULDING

(a) Remove the 2 screws and 2 clips.

(b) Insert a screwdriver between the moulding and body to remove the moulding.

HINT:

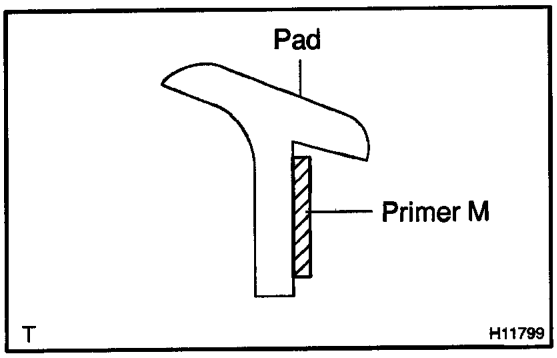
Tape the screwdriver tip before use.

(c) Remove the side mudguard protector.

BO2RK-01

INSTALLATION

1. **CLEAN MOULDING**
2. **If reusing pad:**
   CLEAN PAD

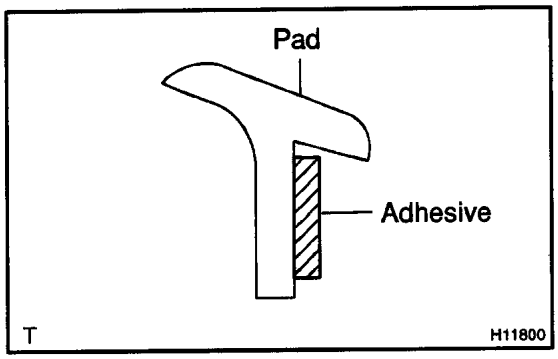


3. **APPLY ADHESIVE TAPE**

(a) Using a brush, coat the contact surface on the pad with Primer M as shown in the illustration.

NOTICE:

- **Allow 3 minutes or more to dry the coated surface.**
- **Do not apply it to the adhesive tape.**
- **Do not keep any of the opened Primer M for later use.**



(b) Apply new adhesive tape to the pad as shown in the illustration.

4. **COAT CONTACT SURFACE OF MOULDING WITH PRIMER "M"**

Using a brush, coat the contact surface on the moulding with Primer M.

NOTICE:

- **Allow 3 minutes or more to dry the coated surface.**
- **Do not apply it to the adhesive tape.**
- **Do not keep any of the opened Primer M for later use.**

5. **INSTALL PAD**

(a) Using a heat light, heat the moulding and pad.

NOTICE:

Do not heat them excessively.

(b) Peel the release sheet from the face of pad.

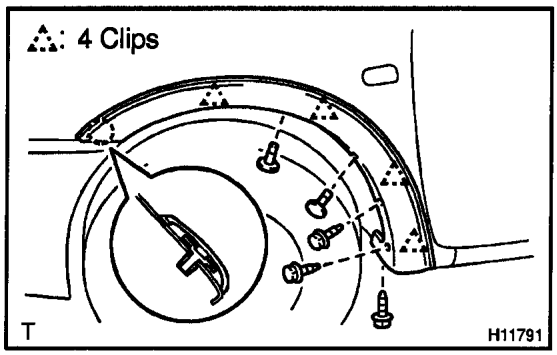
NOTICE:

When the release sheet is removed, make sure that no dirt or dust is stuck to the coated area.

(c) Push the pad to the moulding.

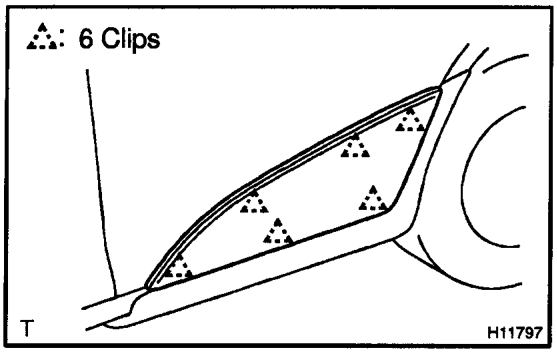
NOTICE:

- **Make sure that the body and moulding are heated to the proper temperature.**
- **Do not depress the adhesive coated parts excessively but just hold them down with your thumb.**
- **After installation, do not wash the vehicle for 24 hours.**



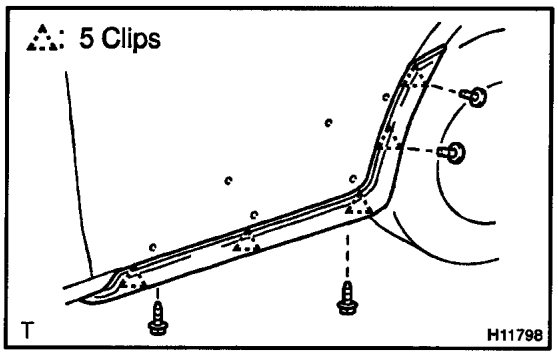
6. INSTALL FRONT WHEEL OPENING EXTENSION

Install the front wheel opening extension with the 3 screws and 2 clips.



7. INSTALL OUTSIDE REAR DOOR MOULDING

Install the outside rear door moulding to the rear door panel.



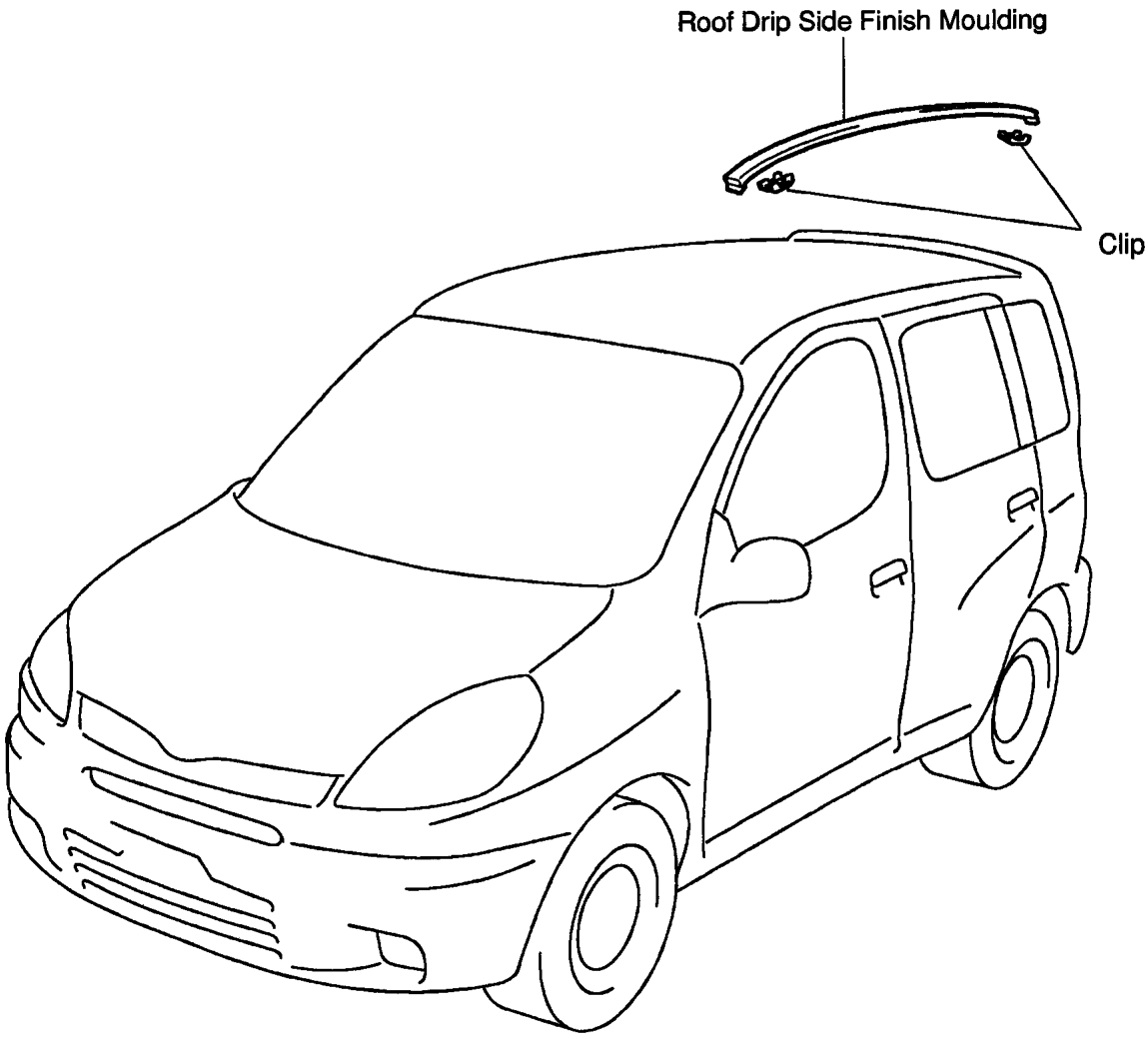
8. INSTALL REAR ROCKER PANEL MOULDING

Install the rear rocker panel moulding to the body with 2 screws and 2 clips.

ROOF DRIP SIDE FINISH MOULDING

BO23O-02

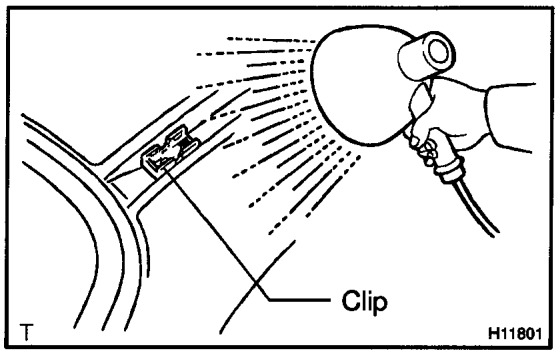
COMPONENTS



T

H11722

BO2QX-01



REMOVAL

1. REMOVE ROOF DRIP SIDE FINISH MOULDING

2. REMOVE CLIP

(a) Using a heat light, heat the clip to 20–30°C (68°F–86°F).

NOTICE:

Do not heat the clip excessively.

(b) Cut the adhesive tape.

NOTICE:

Do not damage the body.

(c) Remove the clip.

B02GQ-02

INSTALLATION

1. INSTALL ROOF DRIP SIDE FINISH CLIP

(a) Using a heat light, heat the body mounting surface to 40 – 60 °C (104 – 140 °F).

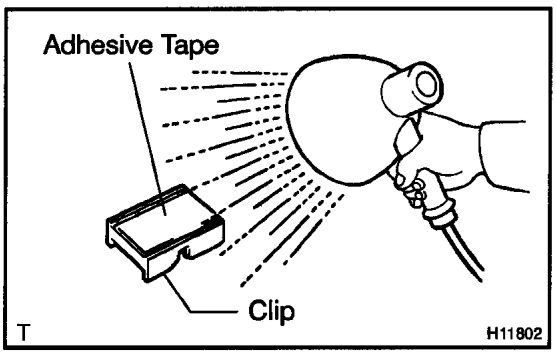
NOTICE:

Do not heat the clip excessively.

(b) Remove the adhesive tape from the body.

(c) Wipe off stains with cleaner.

(d) If reusing the clip:
Clean the clip.



(1) Using a heat light, heat the clip to 20 – 30 °C (68 – 86 °F).

(2) Remove the adhesive tape from the clip.

(3) Wipe off stains with cleaner.

(4) Apply new adhesive tapes to the clip as shown in the illustration.

(e) Using a heat light, heat the body and clip.
Body: 40 – 60 °C (104 – 140 °F)
Clip: 20 – 30 °C (68 – 86 °F)

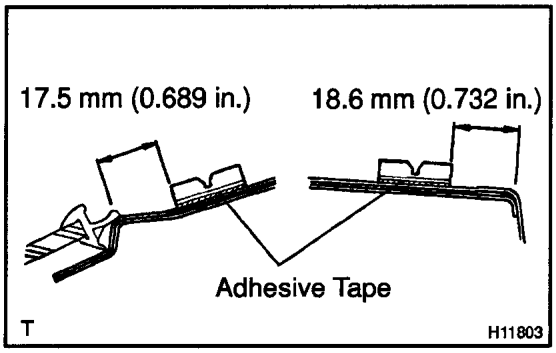
NOTICE:

Do not heat the clip excessively.

(f) Peel the release sheet from the face of adhesive tape.

NOTICE:

When the release sheet is removed, make sure that no dirt or dust is stuck to the coated area.



(g) Install the clip to the body.

NOTICE:

Do not apply excessive force onto the clip, but apply steady pressure with your thumbs.

2. INSTALL ROOF DRIP SIDE FINISH MOULDING

Install the moulding to the body.

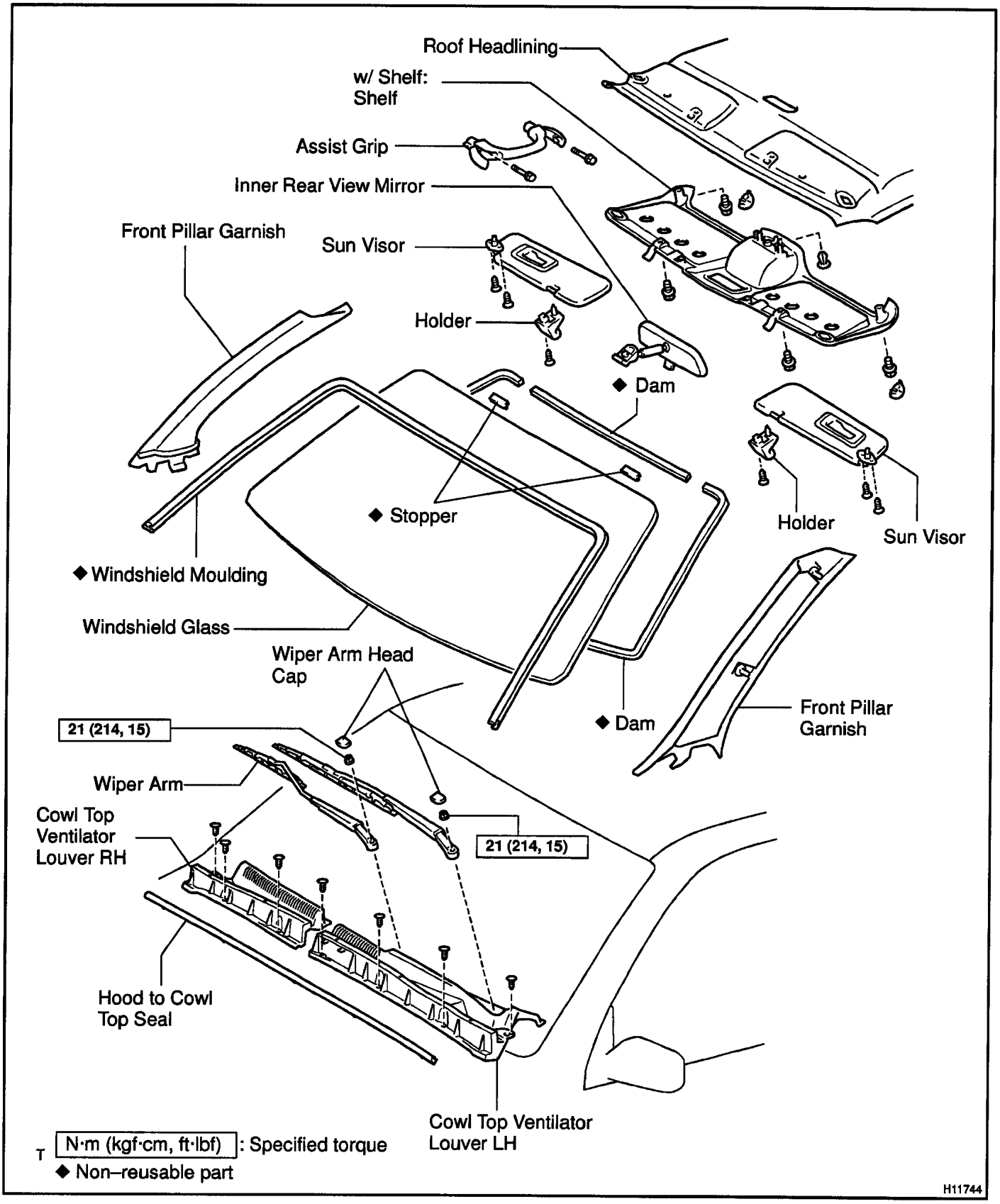
HINT:

Install the front and rear portion of the moulding to the clips.

WINDSHIELD

COMPONENTS

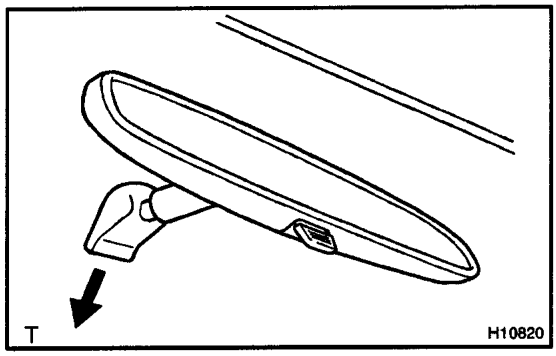
BO2IC-02

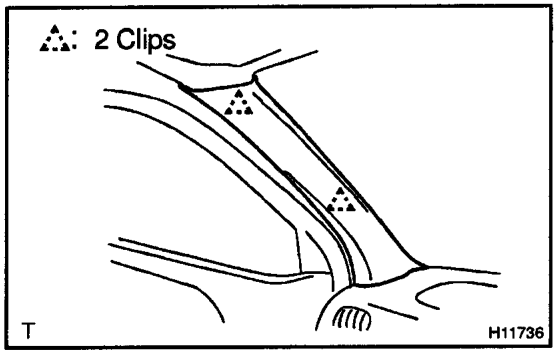


BO2D-02

REMOVAL

1. **REMOVE INNER REAR VIEW MIRROR**
2. **REMOVE SUN VISORS AND HOLDERS**





3. **REMOVE FRONT PILLAR GARNISH**

(a) Using a screwdriver, remove the front pillar garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

4. **REMOVE WIPER ARMS**

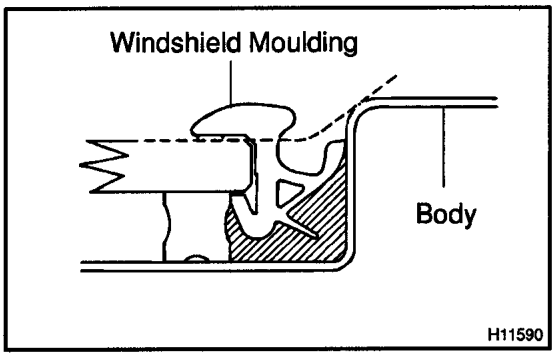
Remove the 2 wiper arm head caps, 2 nuts and 2 wiper arms.

5. **REMOVE COWL TOP VENTILATOR LOUVER**

(a) Remove the hood to cowl top seal.

(b) Remove the 7 clips, then pull out the cowl top ventilator louver RH and LH.

6. **REMOVE ASSIST GRIP**
7. **REMOVE FRONT SIDE OF ROOF HEADLINING**
(See page BO–98)



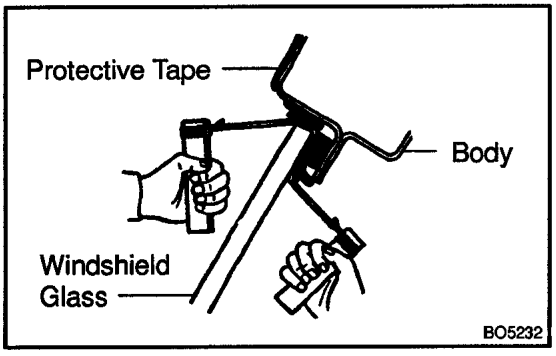
8. **REMOVE WINDSHIELD MOULDING**

(a) Using a knife, cut off the moulding as shown.

NOTICE:

Do not damage the body with the knife.

(b) Remove the remaining moulding.



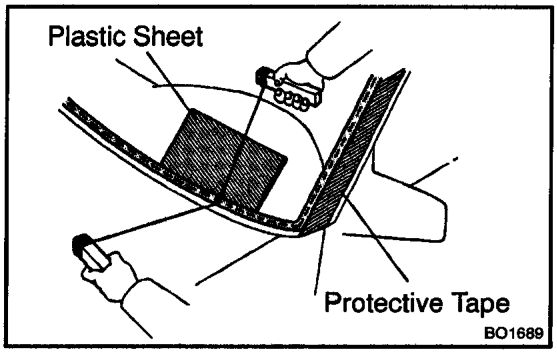
9. **REMOVE WINDSHIELD GLASS**

(a) Push piano wire between the body and glass from the interior.

(b) Tie both ends of the wire to wooden blocks or similar objects.

HINT:

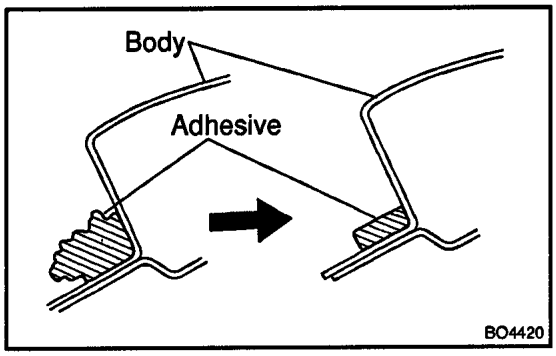
Apply protective tape to the outer surface to keep the surface from being scratched.



NOTICE:
When separating the glass, be careful not to damage the paint and interior and exterior ornaments. To prevent the safety pad from being scratched when removing the windshield, place a plastic sheet between the piano wire and safety pad.

BO2IE-02

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

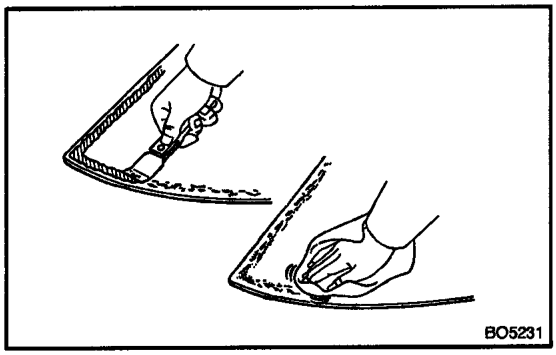
HINT:

Leave the adhesive on the body as much 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.



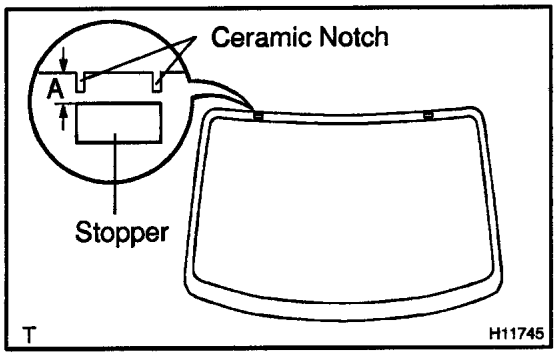
2. CLEAN REMOVED GLASS

(a) Using a scraper, remove the damaged stopper, dam and adhesive sticking to the glass.

(b) Clean the glass with cleaner.

NOTICE:

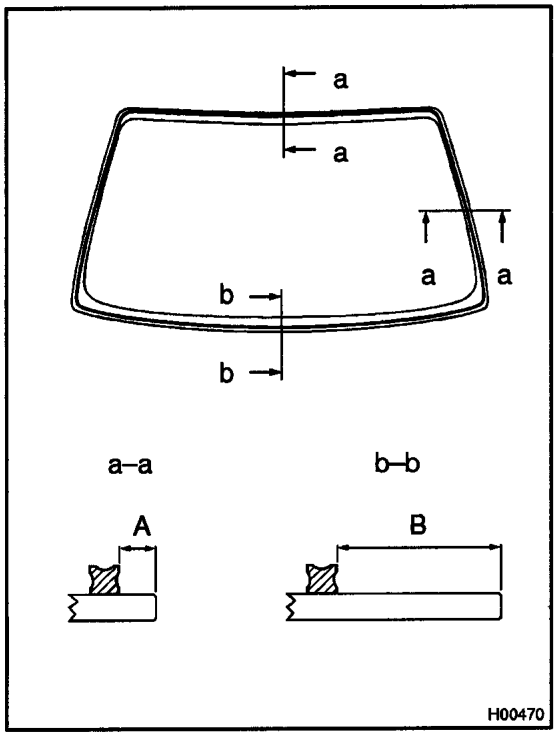
- **Do not touch the glass face after cleaning it.**
- **Be careful not to damage the glass.**



3. INSTALL NEW STOPPERS

Install new stoppers to the position on glass shown in the illustration.

A: 9.0 mm (0.354 in.)

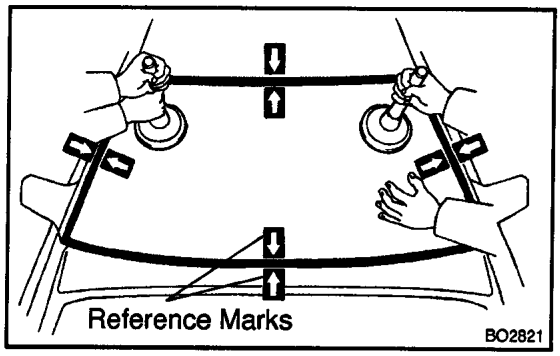


4. INSTALL NEW DAM

Install a new dam with adhesive tape as shown in the illustration.

A: 7.0 mm (0.276 in.)

B: 30.0 mm (1.181 in.)



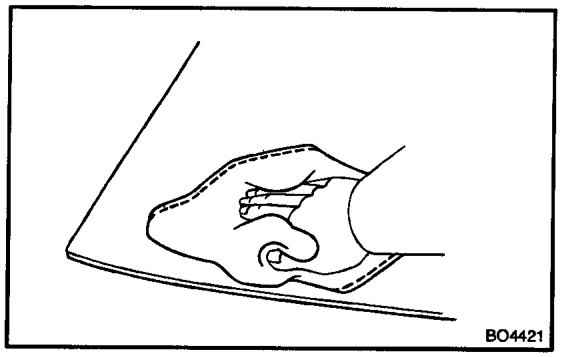
5. POSITION GLASS

(a) Using a suction rubber, place the glass in the correct position.

(b) Check that all contacting parts of the glass rim are set perfectly even.

(c) Place reference marks on both the glass and body.

(d) Remove the glass.

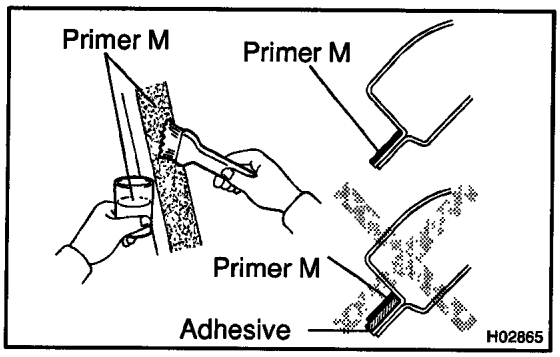


6. CLEAN CONTACT SURFACE OF GLASS

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.

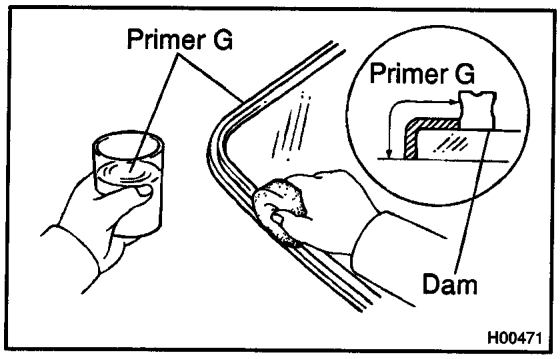


7. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, apply Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Allow 3 minutes or more to dry the primer coated surface.**
- **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 a sponge, coat the edge of the glass and the contact surface with Primer G.

(b) When the primer is applied to the area other than the specified by mistake, wipe it off with a clean shop rag before the primer dries.

NOTICE:

- **Allowe 3 minutes or more to dry the primer coated surface.**
- **Do not keep any of the opened Primer G for later use.**

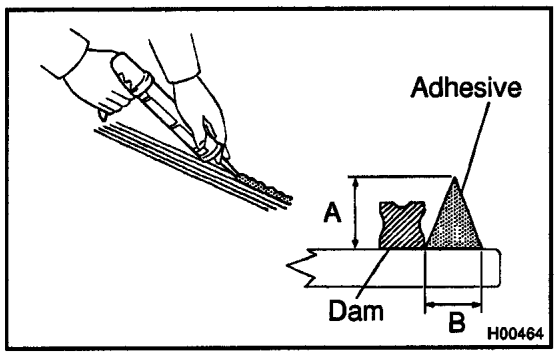
9. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.
Part No. 08850–00801 or equivalent

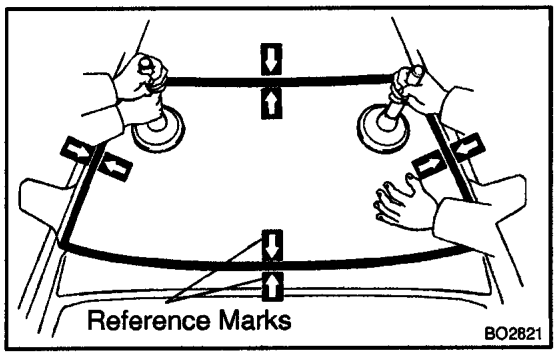
HINT:
After cutting off the tip, use all adhesive within the time described in the table below.

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 in the illustration.
A: 12.5 mm (0.492 in.)
B: 8.0 mm (0.315 in.)

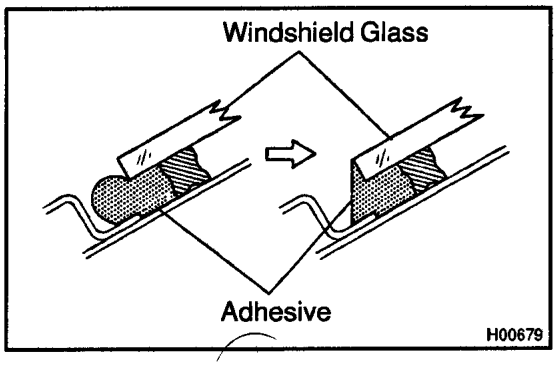


10. INSTALL WINDSHIELD GLASS AND MOULDING

(a) Install the glass, aligning the reference marks using a suction rubber.

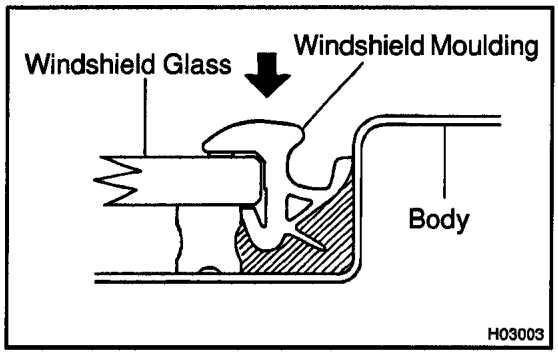
HINT:
Check to see that the stoppers are attached to the body correctly.

(b) Lightly press the glass front surface for close contact.



(c) Correct insufficient or protruded adhesive agent using a spatula.

HINT:
Apply the adhesive agent up to the windshield glass edge.



(d) Install a new windshield moulding to the windshield glass before the adhesive agent hardens.

HINT:

Install the moulding, aligning the center of moulding with the center of body.

(e) Remove any excessive adhesive agent before it hardens.

(f) Hold the glass and moulding in place securely with a protective tape or equivalent until the adhesive hardenes.

NOTICE:

Do not 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 LEAK AND REPAIR

NOTICE:

Conduct a leak test after the hardening time has elapsed.

12. INSTALL FRONT SIDE OF ROOF HEADLINING (See page BO–102)

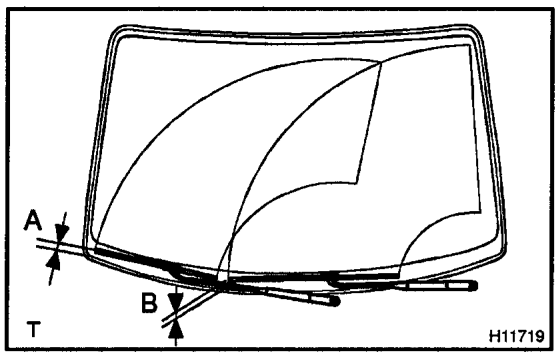
13. INSTALL ASSIST GRIP

14. INSTALL COWL TOP VENTILATOR LOUVERS AND HOOD TO COWL TOP SEAL

15. INSTALL WIPER ARMS

(a) Operate the wiper motor for one cycle.

(b) Install the wiper arms and tighten nuts by hand.



(c) Adjust the installation positions of the wiper arms to the positions shown in the illustration.

A: Approx. 20 mm (0.79 in.)

B: Approx. 25 mm (0.98 in.)

(d) Torque the nuts.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(e) Install the 2 wiper arm head caps.

16. INSTALL FRONT PILLAR GARNISHES

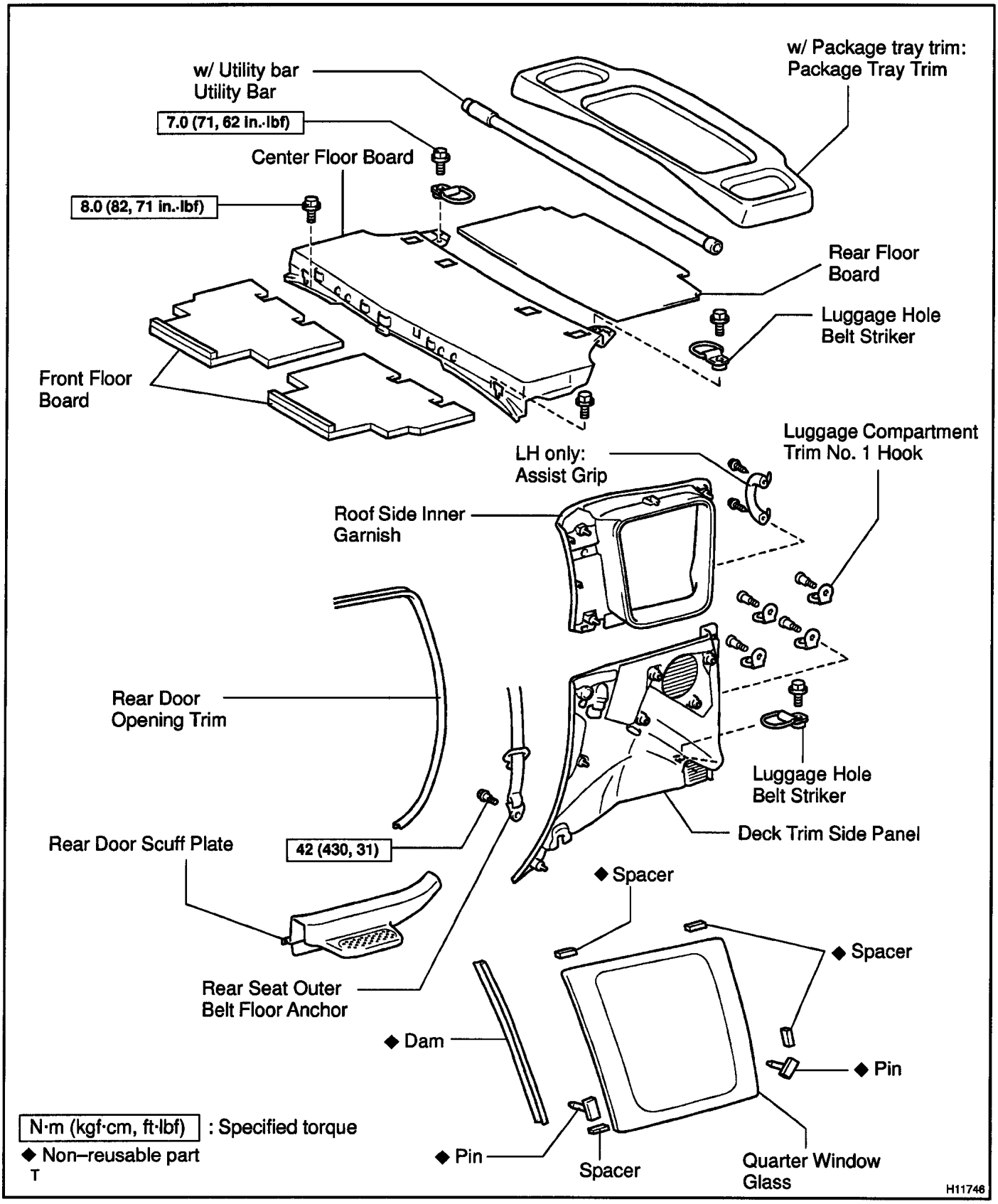
17. INSTALL SUN VISORS AND HOLDERS

18. INSTALL INNER REAR VIEW MIRROR

QUARTER WINDOW GLASS

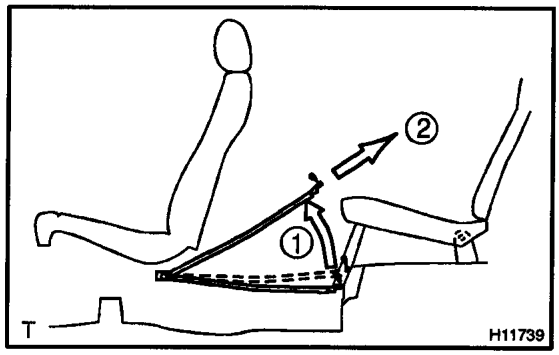
COMPONENTS

BO2GR–02



BO2QY-01

REMOVAL



1. REMOVE FRONT FLOOR BOARD

(a) Slide the front seat to the frontmost position.

(b) Remove the floor board as shown in the illustration.

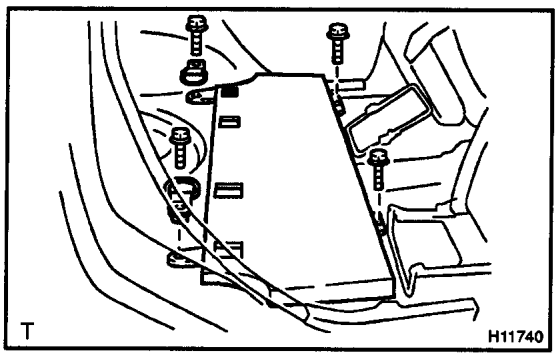
2. REMOVE REAR DOOR SCUFF PLATE

3. REMOVE REAR DOOR OPENING TRIM

4. w/ Package tray trim:
REMOVE PACKAGE TRAY TRIM

5. w/ Utility bar:
REMOVE UTILITY BAR

6. REMOVE REAR FLOOR BOARD

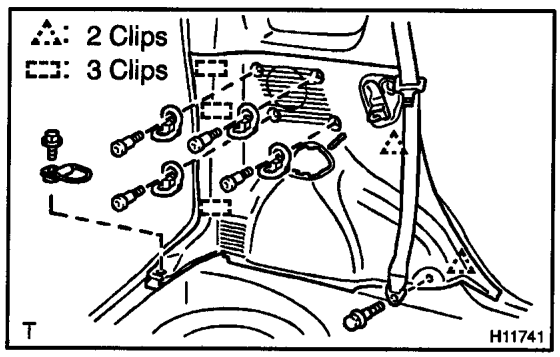


7. REMOVE CENTER FLOOR BOARD

(a) Fold the rear seatback down.

(b) Unlock the seat lock, and swing up the whole seat forward.

(c) Remove the 4 bolts, 2 strikers and center floor board.



8. REMOVE DECK TRIM SIDE PANEL

(a) Remove the bolt and rear seat outer belt floor anchor.

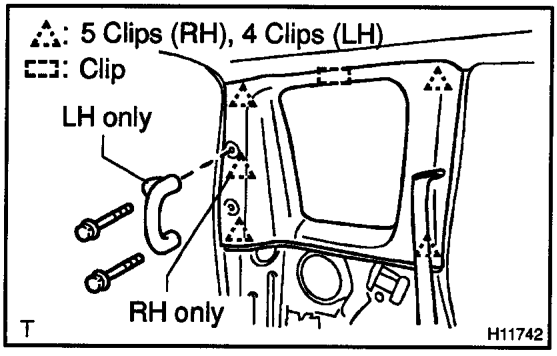
(b) Remove the 4 bolts and 4 luggage hole belt strikers.

(c) RH only:
Disconnect the connector.

(d) Using a screwdriver, remove the deck trim side panel.

HINT:

Tape the screwdriver tip before use.



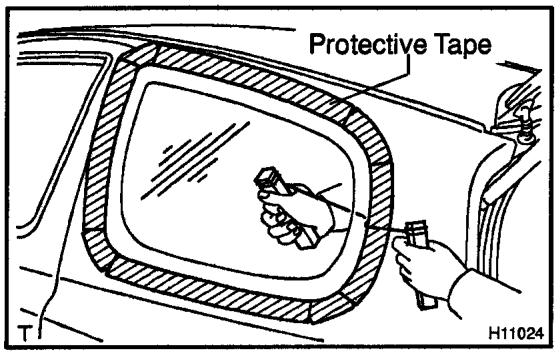
9. REMOVE ROOF SIDE INNER GARNISH

(a) LH side:
Remove the 2 screws and assist grip.

(b) Insert a screwdriver between the roof side inner garnish and body to pry the roof side inner garnish out.

HINT:

- Tape the screwdriver tip before use.
- Let the rear seat outer floor anchor pass through the roof side inner garnish hole to remove the garnish.



10. REMOVE QUARTER WINDOW GLASS

(a) Insert a piano wire from the interior and let it pas through.

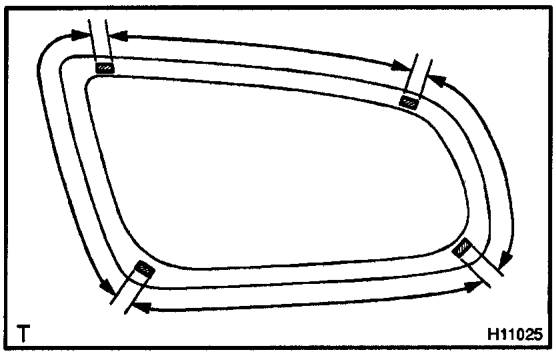
(b) Tie both ends of the wire to wooden blocks or similar objects.

HINT:

Apply protective tape to the outer surface to keep the surface from being scratched.

NOTICE:

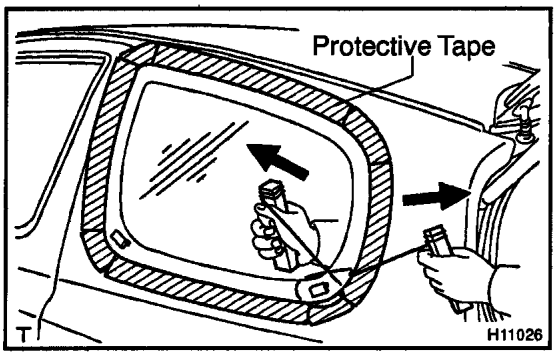
When separating the glass, take care not to damage the paint and exterior.



(c) Cut the adhesive by pulling the piano wire around it.

HINT:

Cut the adhesive in the area shown in the illustration, leaving the adhesive positioned in the place where the spacers are set.



(d) Pass the piano wire through as shown in the illustration, cut off the adhered part to the clips.

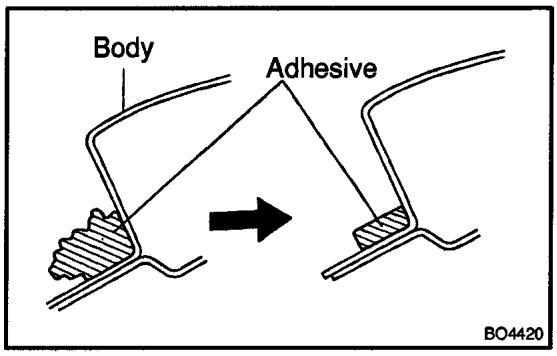
(e) Remove the glass.

NOTICE:

Leave the adhesive on the body as much as possible when cutting off the glass.

BO2QZ-01

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY PANEL

(a) Using a knife, cut away any rough areas on the body.

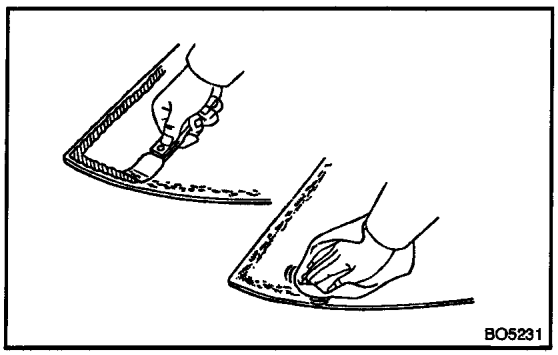
HINT:

Leave the adhesive on the body as much 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

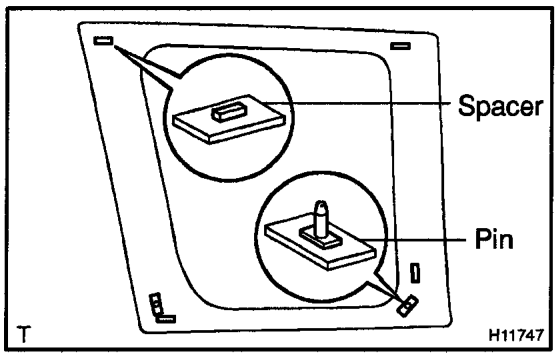
(a) Remove the damaged spacers and pins.

(b) Using a scraper, remove the adhesive sticking to the glass.

(c) Clean the glass with cleaner.

NOTICE:

- **Do not touch the glass after cleaning it.**
- **Be careful not to damage the glass.**



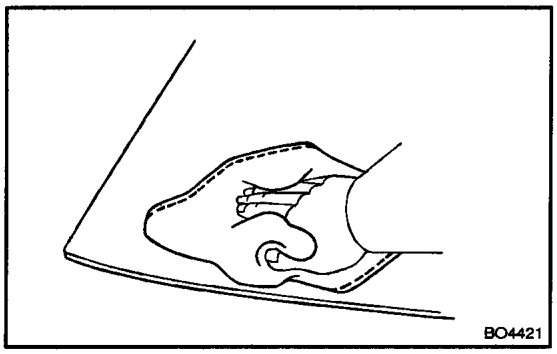
3. INSTALL NEW SPACERS AND PINS

(a) Once place new pins and spacers to the body.

(b) Peel the release sheets from adhesive tapes.

(c) Set the glass in correct position.

(d) Remove the glass.

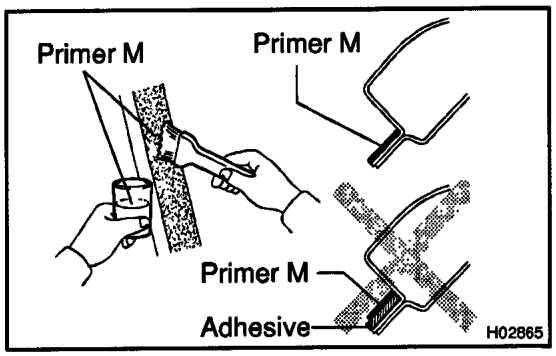


4. CLEAN CONTACT SURFACE OF GLASS

Using 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.

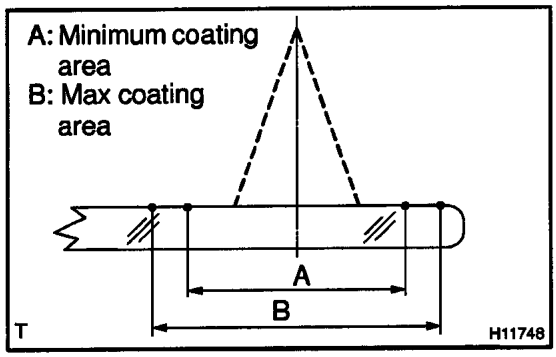


5. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, apply Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Allow 3 minutes or more to dry the primer coated surface.**
- **Do not apply Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**



6. COAT CONTACT SURFACE OF NEW GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G as shown in the illustration.
A: 14 mm (0.55 in.)
B: 19 mm (0.75 in.)

(b) When the primer is applied to the area other than the specified by mistake, wipe it off with a clean shop rag before the primer dries.

NOTICE:

- **Allow 3 minutes or more to dry the primer coated surface.**
- **Do not keep any of the opened Primer G for later use.**

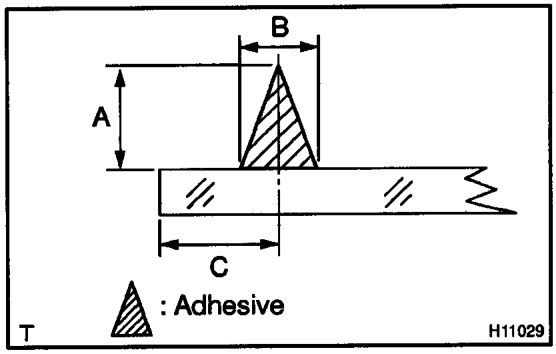
7. APPLY ADHESIVE

(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 in the illustration.
A: 12.0 mm (0.472 in.)
B: 8.0 mm (0.315 in.)
C: 11.5 mm (0.453 in.)

8. INSTALL GLASS

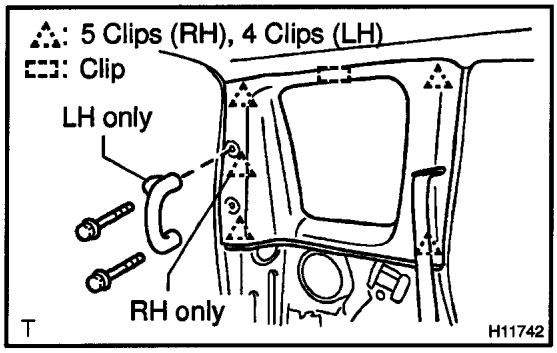
(a) Install glass to the body.

(b) Hold the glass in place securely with a protective tape or equivalent until the adhesive hardens.

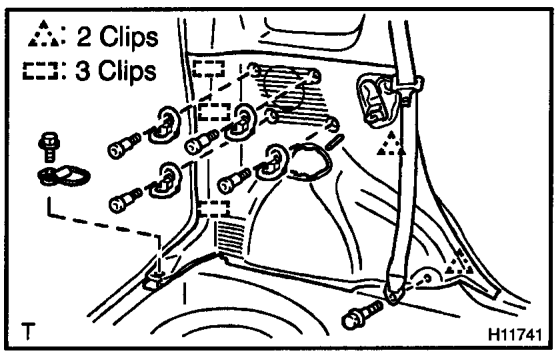
NOTICE:
Do not drive the vehicle during the time described in the table below.

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

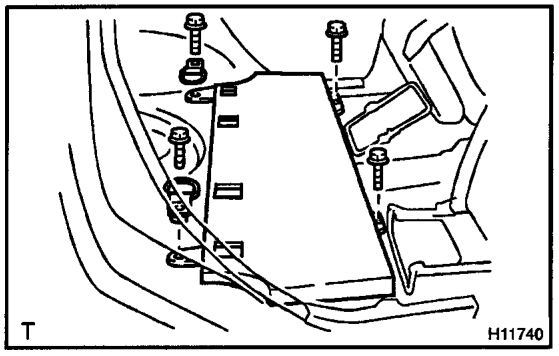
9. INSPECT FOR LEAKS AND REPAIR
NOTICE:
Conduct a leak test after the hardening time has elapsed.



10. INSTALL ROOF SIDE INNER GARNISH
(a) Install the roof side inner garnish to the body.
HINT:
Let the rear seat outer belt floor anchor pass through the roof side inner garnish to install the garnish.
(b) LH side:
Install the assist grip with 2 screws.



11. INSTALL DECK TRIM SIDE PANEL
(a) RH side:
Connect the connector.
(b) Install the deck trim side panel with the 4 bolts.
(c) Install the luggage hole belt striker with the bolt.
(d) Install the rear seat outer belt floor anchor with the bolt.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



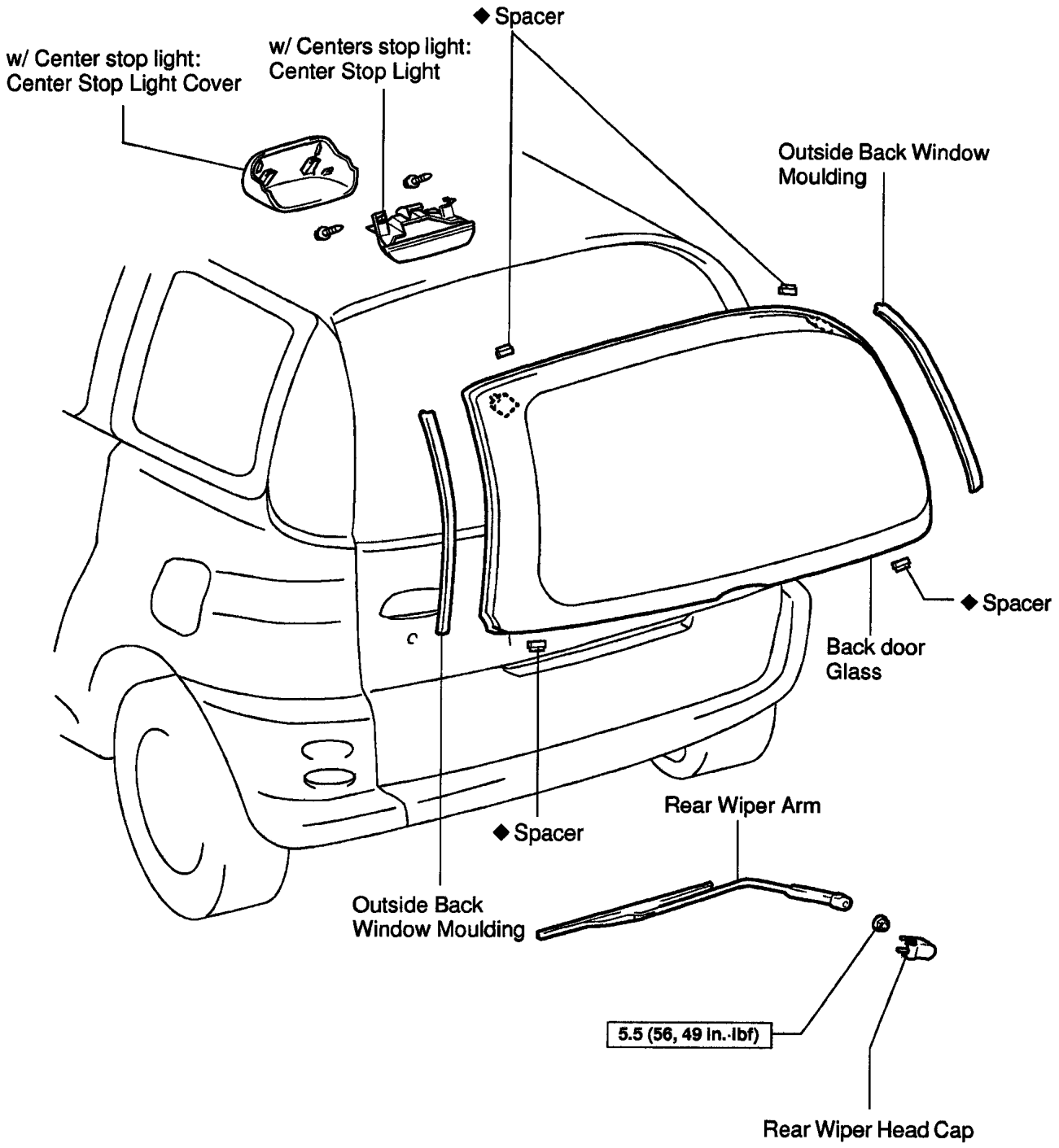
12. INSTALL CENTER FLOOR BOARD
Install the center floor board with the 2 striker and 4 bolts.
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)
13. INSTALL REAR FLOOR BOARD
14. w/ Utility bar:
INSTALL UTILITY BAR
15. w/ Package tray trim:
INSTALL PACKAGE TRAY TRIM
16. INSTALL REAR DOOR OPENING TRIM
17. INSTALL REAR DOOR SCUFF PLATE

18. INSTALL FRONT FLOOR BOARD

BACK DOOR GLASS

COMPONENTS

BO2GU-02



T

N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

H11723

BO2GV-02

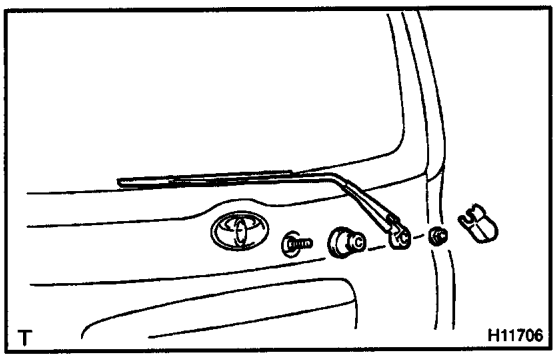
REMOVAL

1. REMOVE REAR WIPER ARM

(a) Remove the rear wiper head cap.

(b) Remove the nut and rear wiper arm.

2. w/ High–mounted stop light:
REMOVE HIGH–MOUNTED STOP LIGHT



3. REMOVE BACK DOOR GLASS

(a) Disconnect the connector.

(b) Insert a piano wire from the interior and let it pass through.

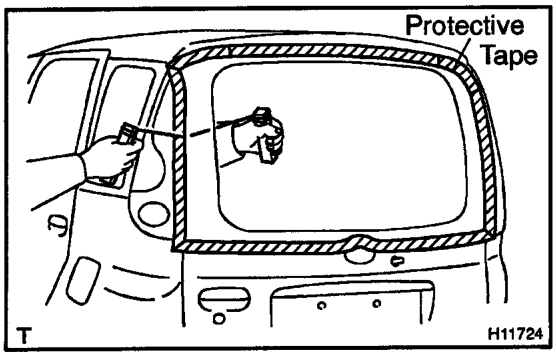
(c) Tie both wire ends to wooden blocks or similar objects.

NOTICE:

When separating the glass, take care not to damage the paint and exterior.

HINT:

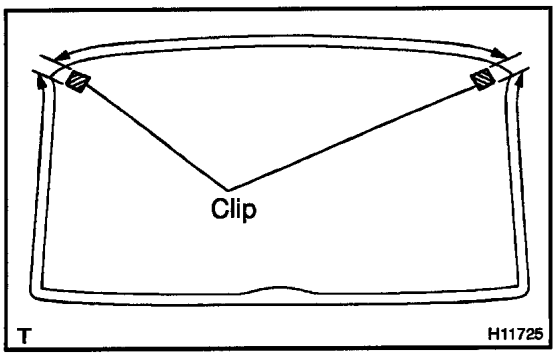
Apply protective tape to the outer surface to keep it from being scratched.



(d) Cut the adhesive by pulling the piano wire around it.

HINT:

Cut the adhesive in the area shown in the illustration, leaving the adhesive positioned in the place where the clips are set.



(e) Let the piano wire pass as shown in the illustration, cut off the adhered part to the clips.

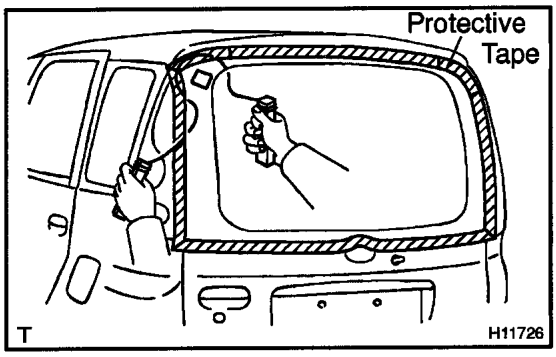
NOTICE:

Do not damage the glass retainers.

(f) Remove the glass.

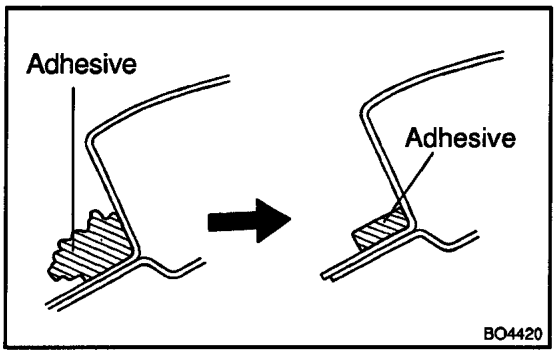
NOTICE:

Leave the adhesive on the body as much as possible when cutting off the glass.



BO2R0-01

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

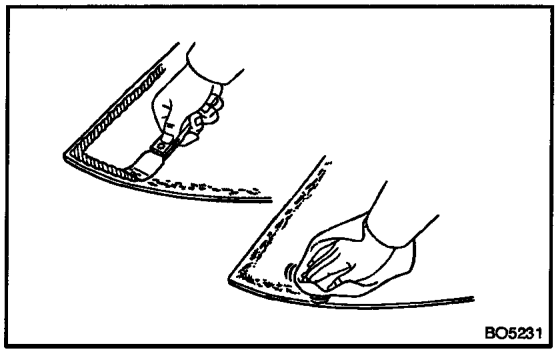
HINT:

Leave the adhesive on the body as much as possible.

(b) Clean the cut 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.



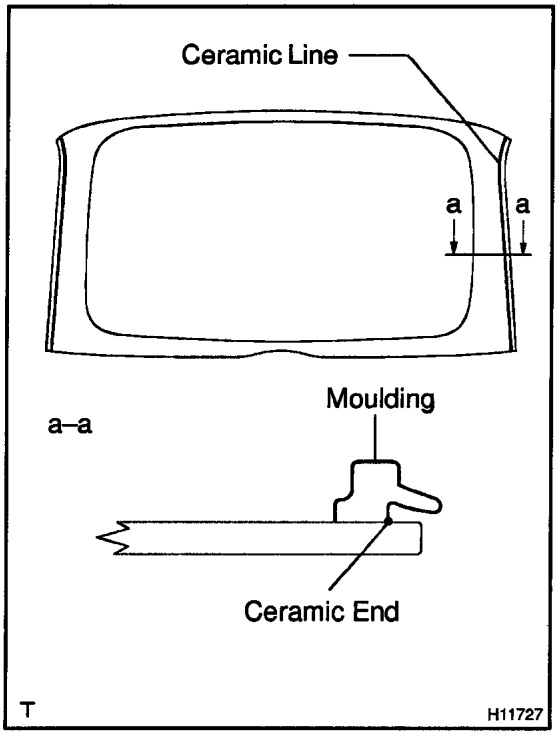
2. CLEAN REMOVED GLASS

(a) Using a scraper, remove the adhesive sticking to the glass.

(b) Clean the glass with cleaner.

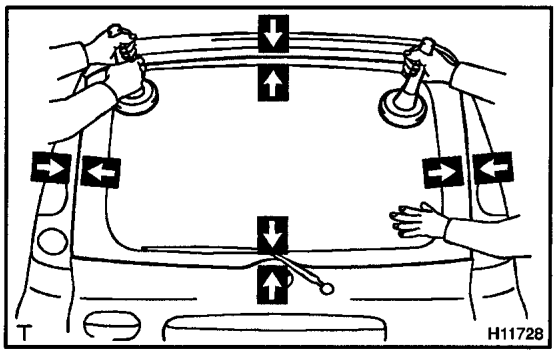
NOTICE:

- **Do not touch the glass after cleaning it.**
- **Be careful not to damage the glass.**



3. INSTALL NEW OUTSIDE BACK WINDOW MOULDING

Install new back window moulding with adhesive tape as shown in the illustration.



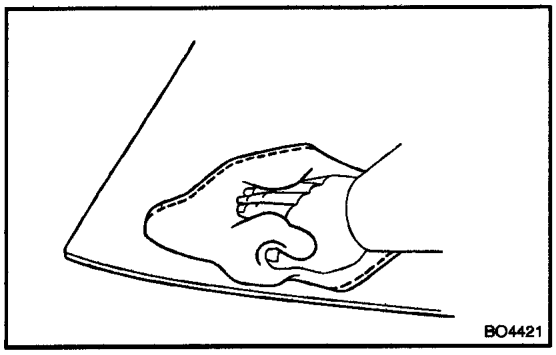
4. POSITION GLASS

(a) Using a suction rubber, place the glass in correct position.

(b) Check that all contacting parts of the glass rim are set perfectly even.

(c) Place reference marks on both the glass and body.

(d) Remove the glass.

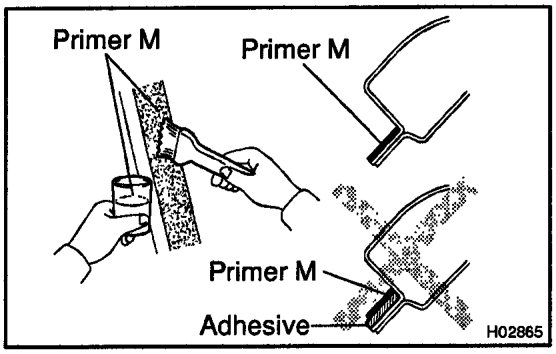


5. CLEAN CONTACT SURFACE OF GLASS

Using 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.

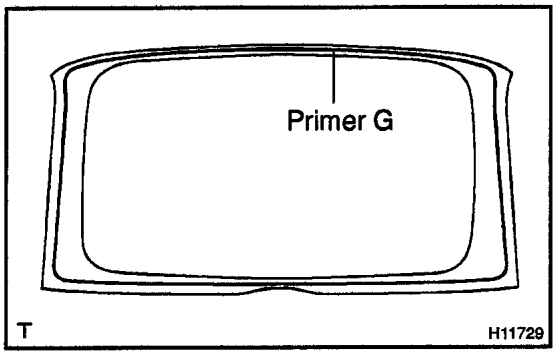


6. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, apply Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Allow 3 minutes or more to dry the primer coated surface.**
- **Do not apply Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**



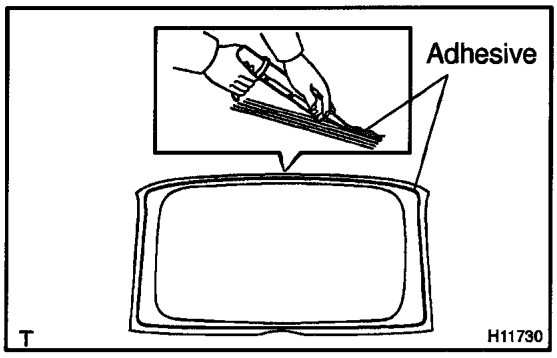
7. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G as shown in the illustration.

(b) When the primer is applied to the area other than the specified by mistake, wipe it off with a clean shop rag before the primer dries.

NOTICE:

- **Allow 3 minutes or more to dry the primer coated surface.**
- **Do not keep any of the opened Primer G for later use.**



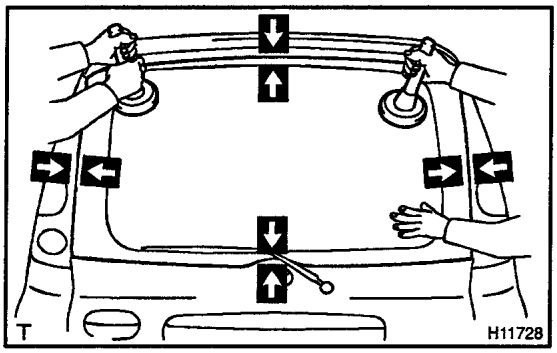
8. APPLY ADHESIVE

(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 in the illustration.



9. INSTALL GLASS

(a) Position the glass so that the reference marks are lined up, and press it gently along the rim.

HINT:
Confirm that the moulding is attached to the body panel.

(b) Hold the back door glass in place securely with a protective tape or equivalent until the adhesive hardens.

NOTICE:
Do not 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

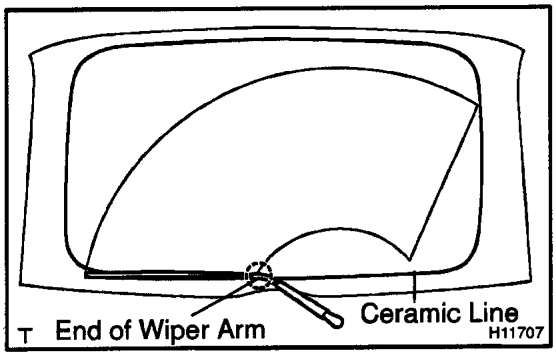
10. INSPECT FOR LEAKS AND REPAIR

NOTICE:
Conduct a leak test after the hardening time has elapsed.

11. w/ High–mounted stop light:
INSTALL HIGH–MOUNTED STOP LIGHT

12. INSTALL REAR WIPER ARM

(a) Install the grommet.
(b) Operate the wiper for one cycle.
(c) Install the rear wiper arm and tighten the nut by hand.



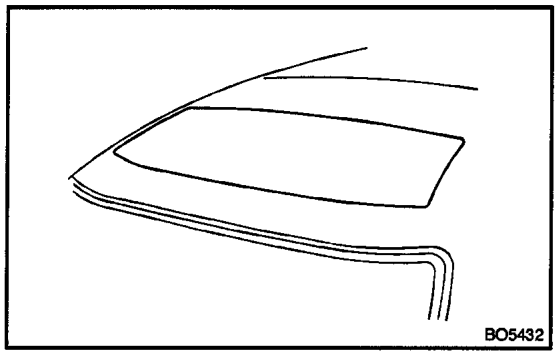
(d) Adjust the installation position of the wiper arm to the position shown in the illustration.

HINT:

Set the end of wiper arm on the ceramic line.

(e) Tighten the nut.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



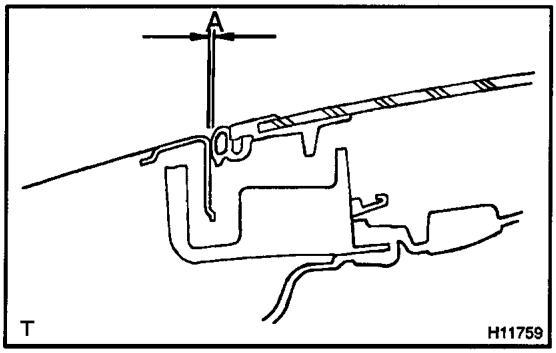
TILT MOON ROOF

ON–VEHICLE INSPECTION

BO2RM–01

INSPECT TILT MOON ROOF ALIGNMENT

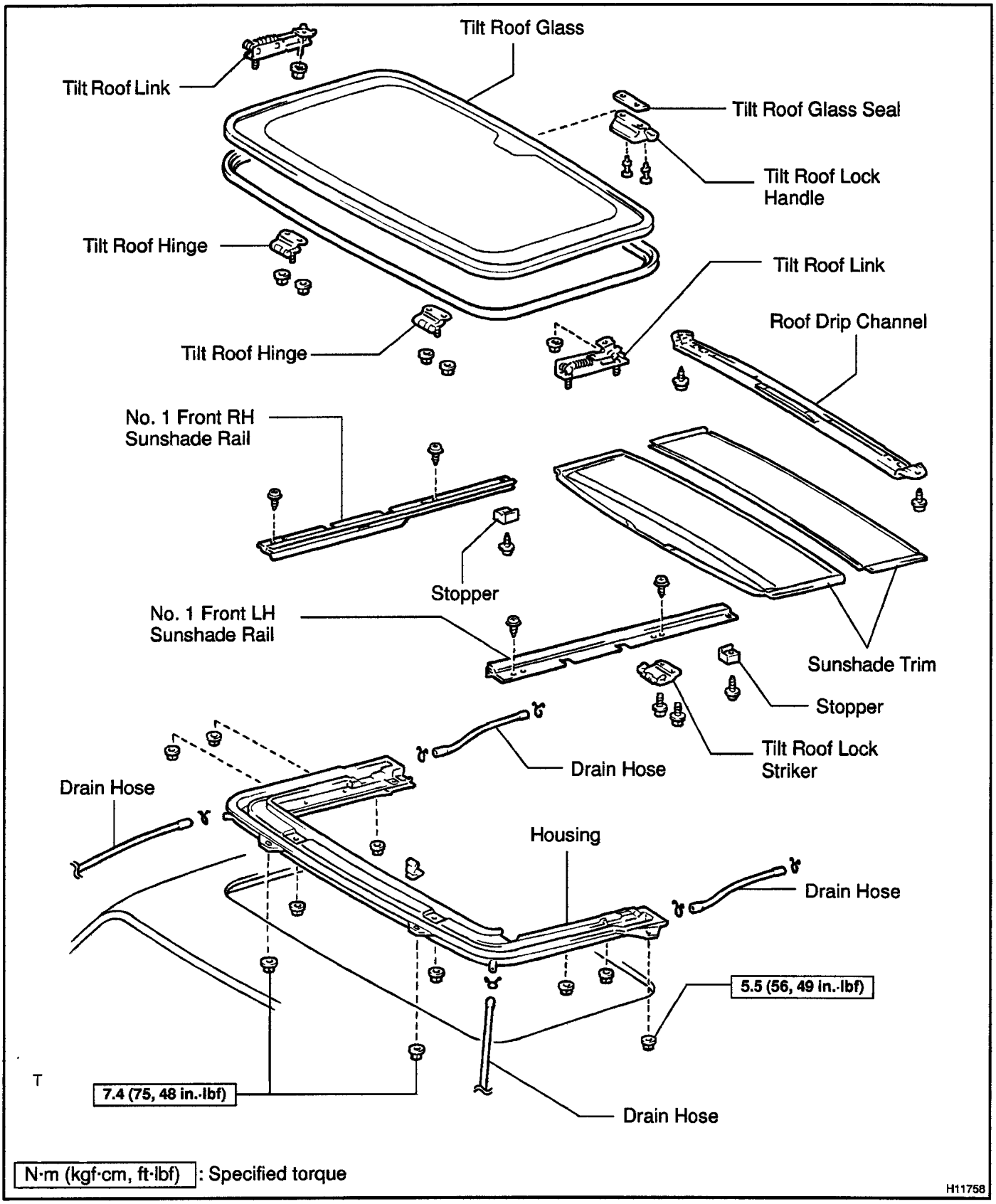
(a) With the tilt moon roof fully closed, check for water leakage.



(b) Check for a difference in clearance between the tilt moon roof and body.
A: 1.2 mm (0.047 in.)

BO2RN-01

COMPONENTS



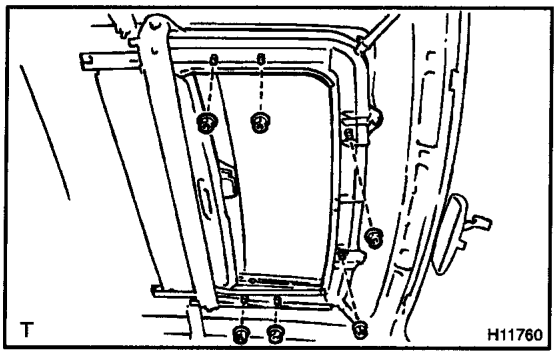
N·m (kgf·cm, ft·lbf) : Specified torque

H11758

BO2RO-01

REMOVAL

1. REMOVE ROOF HEADLINING (See page BO–98)



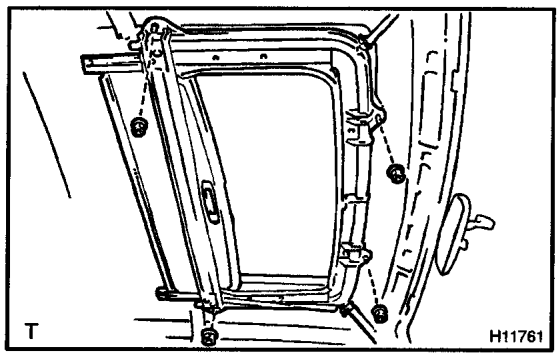
2. REMOVE TILT ROOF GLASS

With the tilt moon roof fully opened, remove the 4 nuts and tilt roof glass.

Torque: 7.4 N·m (75 kgf·cm, 48 in.·lbf)

3. REMOVE TILT ROOF LINK

Remove the 2 nuts and 2 tilt roof links from the tilt roof glass.

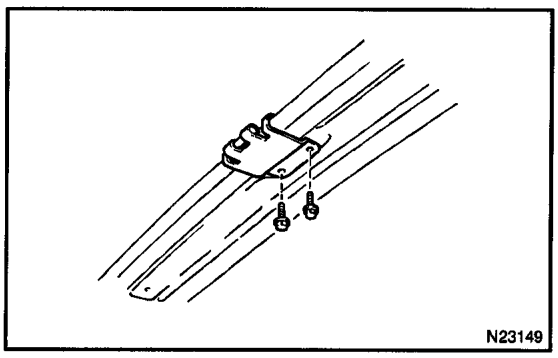


4. REMOVE TILT ROOF HOUSING

(a) Disconnect the 4 drain hoses from the tilt roof housing.

(b) Remove the 4 nuts and tilt roof housing.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

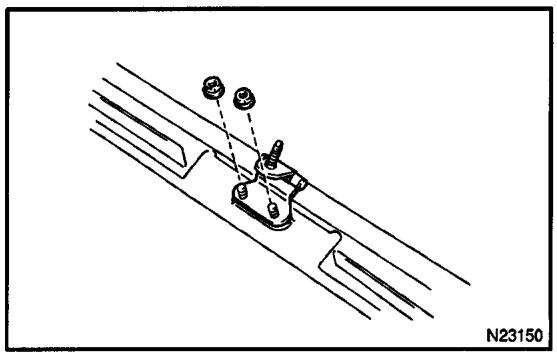


5. REMOVE TILT ROOF LOCK STRIKER

Remove the 2 bolts and lock striker.

BO2RP-01

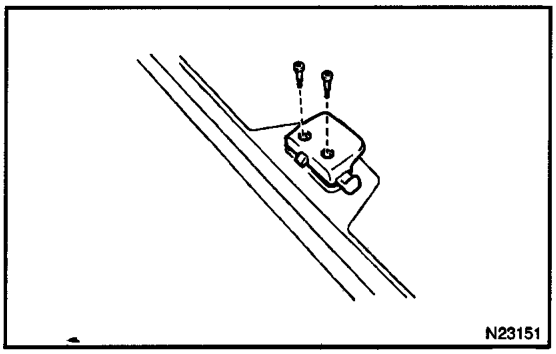
DISASSEMBLY



1. REMOVE TILT ROOF HINGE

(a) Remove the 2 nuts and hinge from the tilt roof glass.

(b) Employ the same manner described above to the other side.



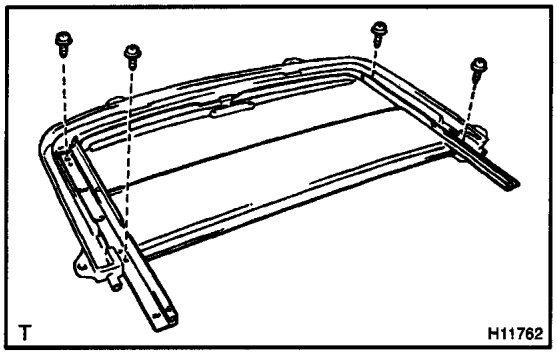
2. REMOVE TILT ROOF LOCK HANDLE

(a) Remove the 2 screws and lock handle from the tilt roof glass.

(b) Remove the tilt roof glass seal.

3. REMOVE ROOF DRIP CHANNEL

4. REMOVE STOPPERS



5. REMOVE NO. 1 FRONT SUNSHADE RAILS AND SUNSHADE TRIMS

Remove the 4 screws, sunshade No. 1 front rails and 2 sunshade trims.

BO2RQ-01

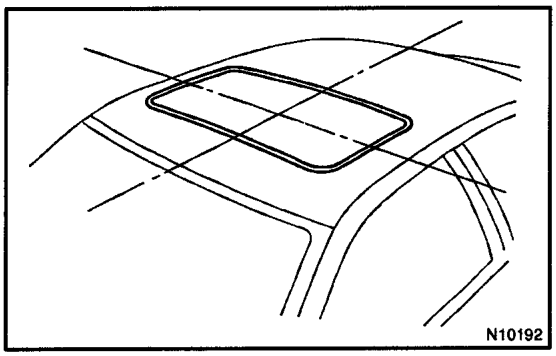
REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–72).

BO2RR-01

INSTALLATION

Installation is in the reverse order of removal (See page BO–71).



SLIDING ROOF

BO2GX-02

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 sec.

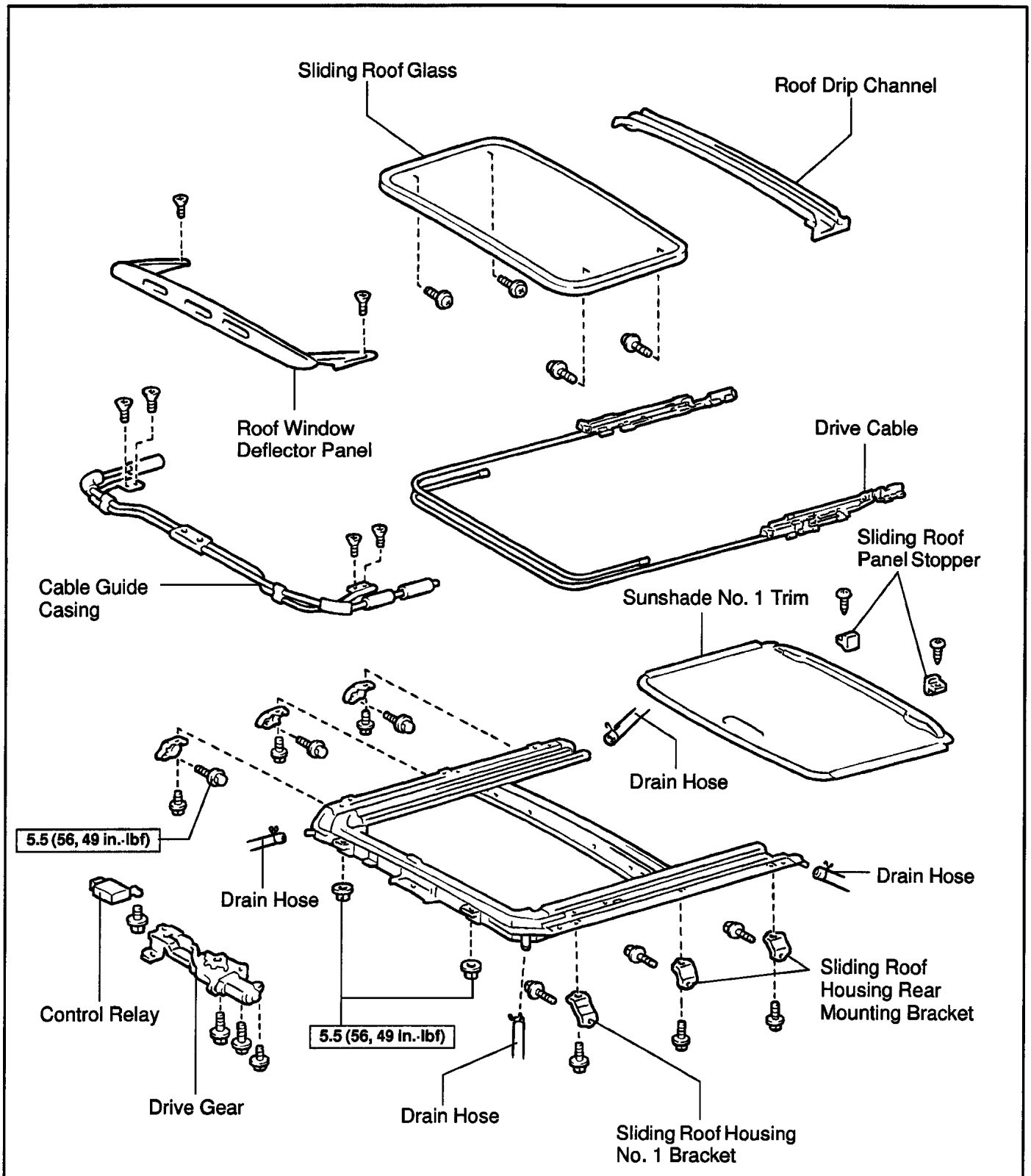
(b) Check for abnormal noise or binding during operation.

(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.
Front end:
0 + 1.5 mm (0 + 0.059 in.)
0 – 1.0 mm (0 – 0.039 in.)
Side end:
0 ± 1.5 mm (0 ± 0.059 in.)

BO2GY–03

COMPONENTS



T

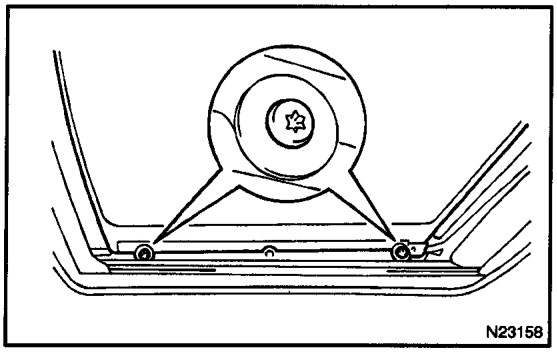
N·m (kgf·cm, ft·lbf) : Specified torque

H11763

BO2RA-01

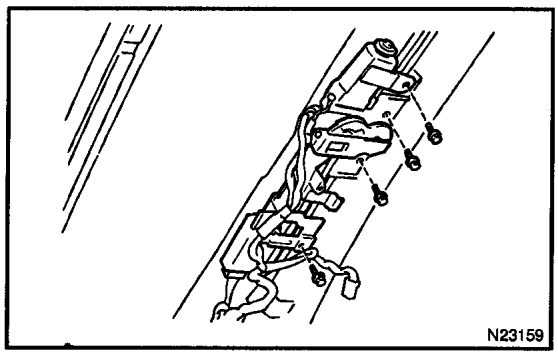
REMOVAL

1. REMOVE ROOF HEADLINING
(See page BO–98)



2. REMOVE SLIDING ROOF GLASS

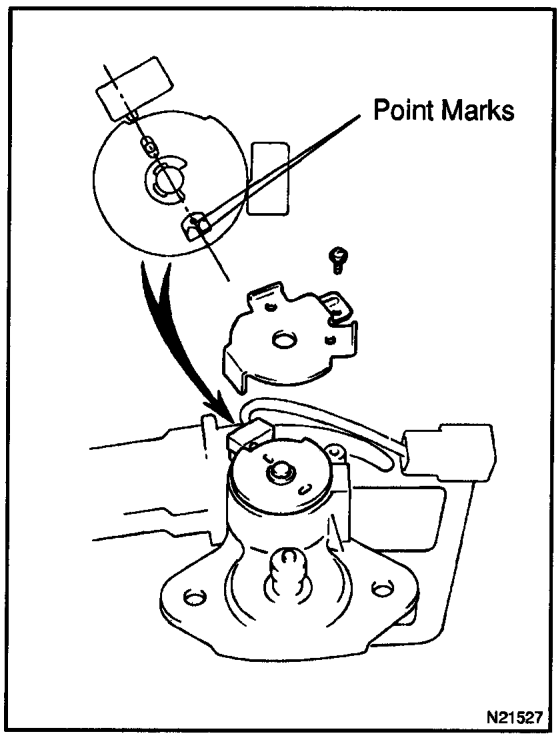
(a) Using a torx wrench, remove the 4 screws.
(b) Pull the glass upward to remove it.



3. REMOVE DRIVE GEAR AND CONTROL RELAY

NOTICE:
Remove the drive gear with the sliding roof is fully closed.

(a) Disconnect the connectors.
(b) Remove the 4 bolts, drive gear and control relay.



(c) Remove the screw and cam plate cover from the drive gear.
(d) Turn the drive gear to align the point marks as shown in the illustration.

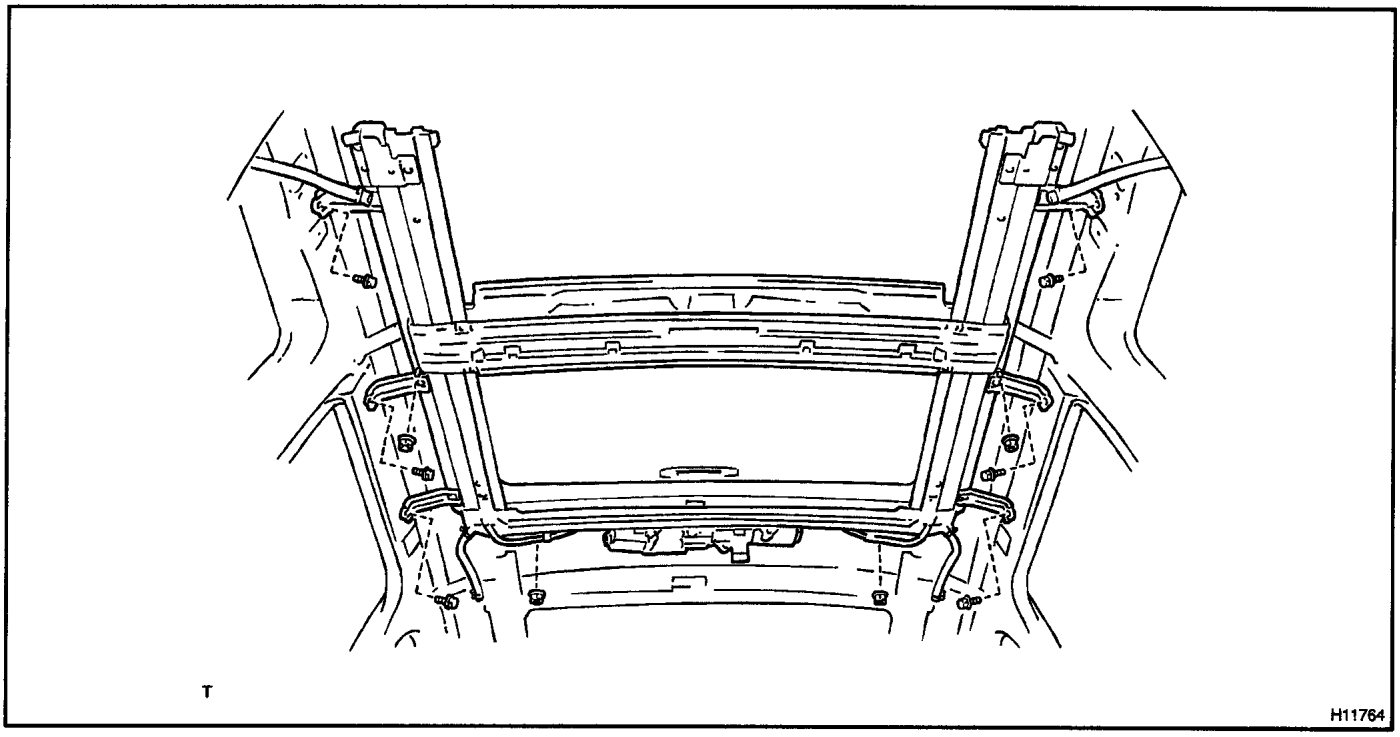
NOTICE:
At the time of installation, please refer to the following item. If the sliding roof position and drive gear fully closed position is not matched, the sliding roof does not operate normally.

4. REMOVE SLIDING ROOF HOUSING

(a) Disconnect the 4 drain hoses from the housing.

(b) Remove the 6 bolts, 4 nuts and housing.

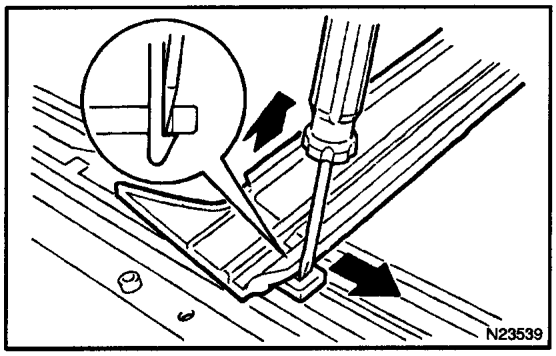
Torque:
Bolt: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
Nut: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



BO2RB-01

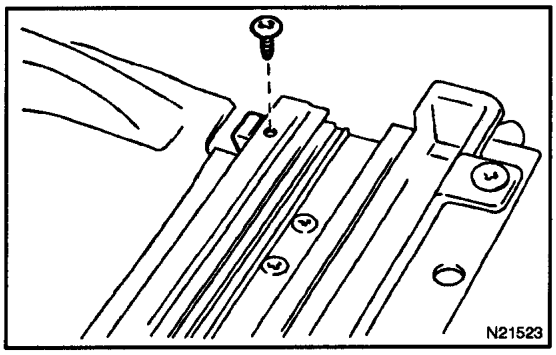
DISASSEMBLY

1. **REMOVE SLIDING ROOF HOUSING NO. 1 BRACKETS**
2. **REMOVE SLIDING ROOF HOUSING REAR MOUNTING BRACKETS**



3. **REMOVE ROOF DRIP CHANNEL**

Using a screwdriver, remove the roof drip channel as shown in the illustration.



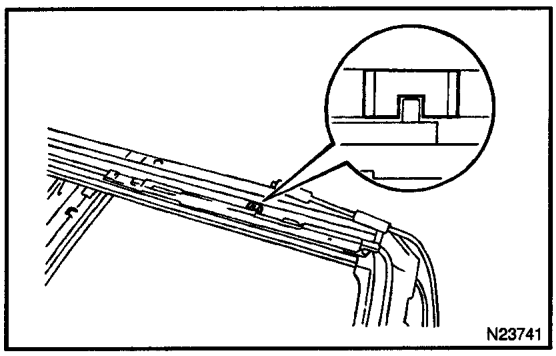
4. **REMOVE SLIDING ROOF PANEL STOPPER**

(a) Remove the screw and stopper.

(b) Employ the same manner described above to the other side.

5. **REMOVE SUNSHADE NO. 1 TRIM**
6. **REMOVE ROOF WINDOW DEFLECTOR PANEL**
7. **REMOVE CABLE GUIDE CASING**

Remove the 4 screws and casing.



8. **REMOVE DRIVE CABLE**

(a) Slide the cable rearward, then remove it.

(b) Employ the same manner described above to the other side.

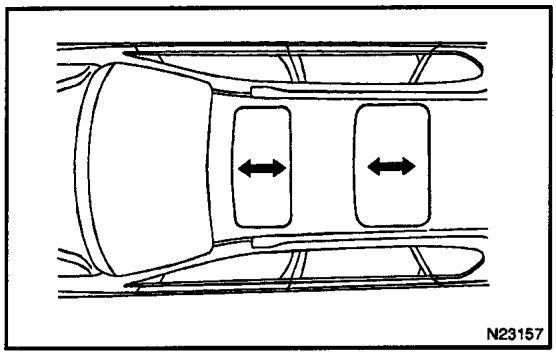
HINT:

At the time of reassembly, please refer to the following item.

Slide the cable forward or backward to align the 2 marks as shown.

BO2RC-01

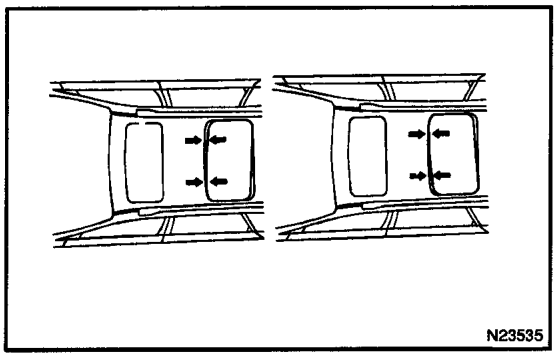
ADJUSTMENT



1. TO ADJUST FORWARD OR REARWARD

(a) Loosen the sliding roof glass installation nuts.

(b) Adjust the sliding roof glass forward or rearward.

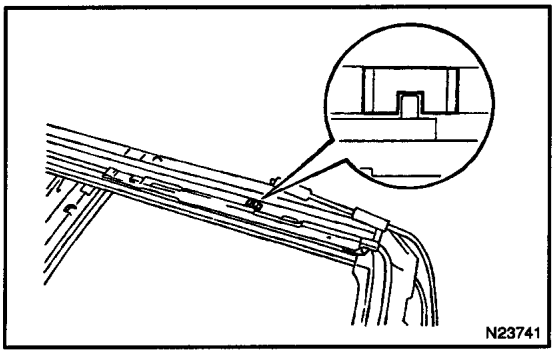


2. TO ADJUST CLEARANCE (Difference in left and right clearance)

(a) When the front or rear alignment is not correct, remove the drive gear and sliding roof glass, and adjust the drive rail.

NOTICE:

Remove the drive gear with the sliding roof fully closed.



(b) Adjust by sliding the cable forward or rearward to align the 2 marks as shown in the illustration.

(c) Install the drive gear and sliding roof glass.

BO2H2–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–79).

BO2H3-01

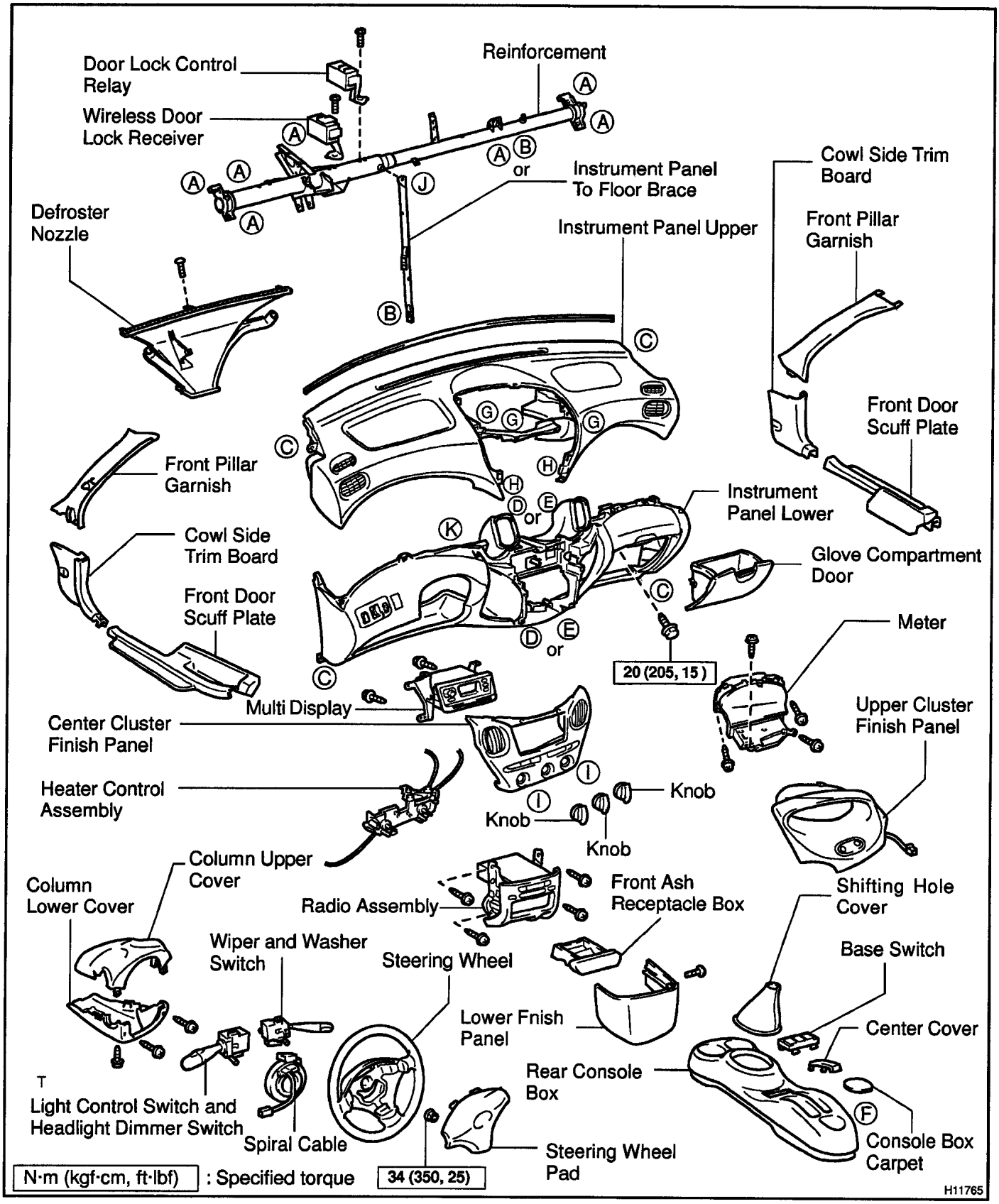
INSTALLATION

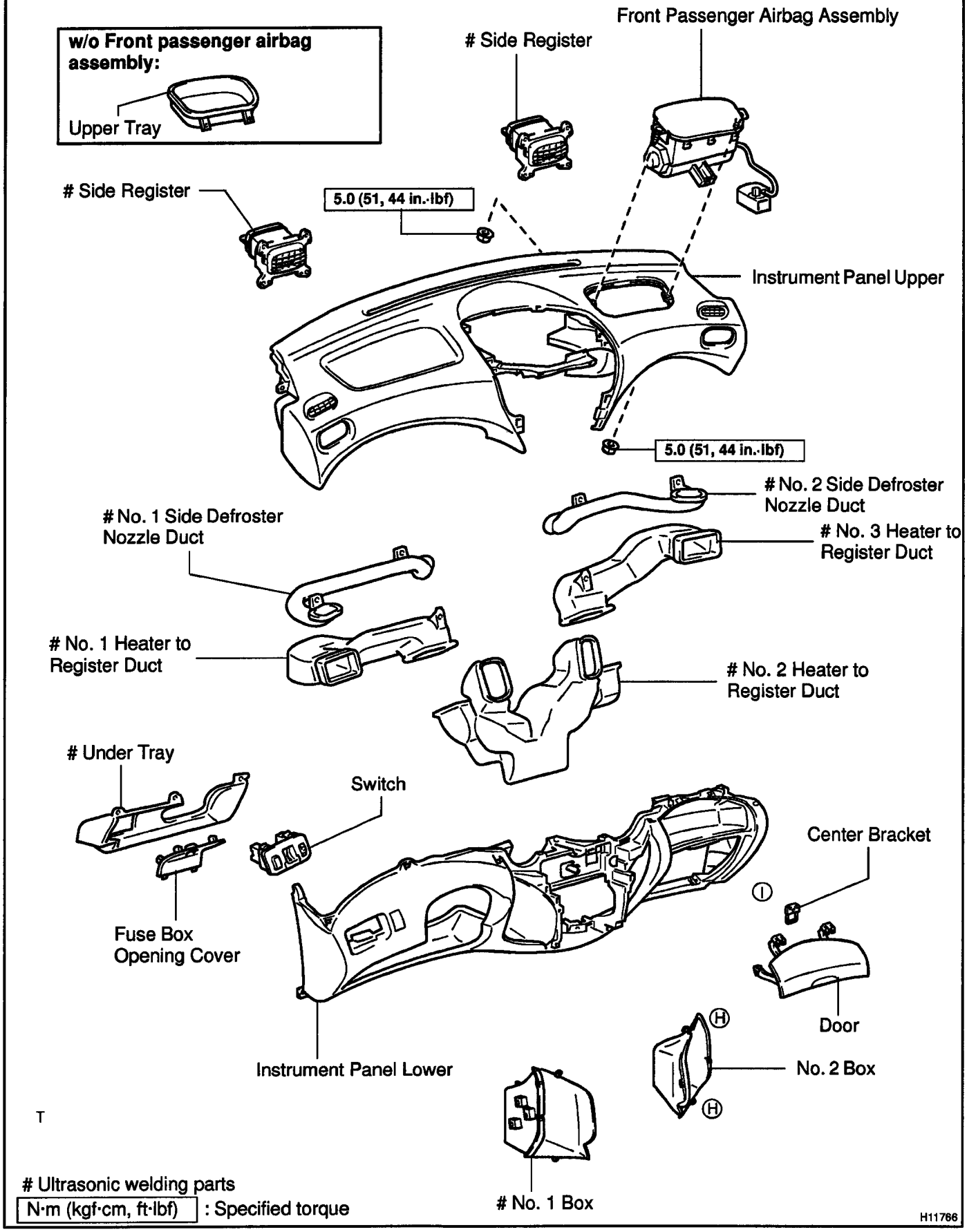
Installation is in the reverse order of removal (See page BO–77).

INSTRUMENT PANEL

COMPONENTS

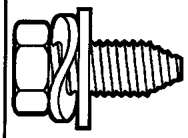
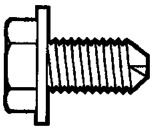
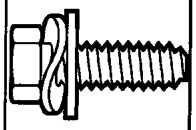
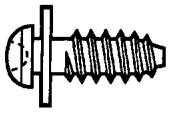
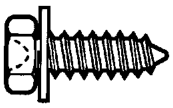
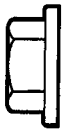
BO2H4-02




w/o Front passenger airbag assembly:
Upper Tray
Side Register
Front Passenger Airbag Assembly
Side Register
5.0 (51, 44 in.·lbf)
Instrument Panel Upper
5.0 (51, 44 in.·lbf)
No. 2 Side Defroster Nozzle Duct
No. 1 Side Defroster Nozzle Duct
No. 3 Heater to Register Duct
No. 1 Heater to Register Duct
No. 2 Heater to Register Duct
Under Tray
Switch
Center Bracket
Fuse Box Opening Cover
Door
Instrument Panel Lower
No. 2 Box
No. 1 Box
T
Ultrasonic welding parts
N·m (kgf·cm, ft·lbf) : Specified torque
H11766

HINT:
Screw shapes and sizes are indicated in the table below. The codes ("A" – "K") correspond to those indicated on the previous pages.

mm (in.)

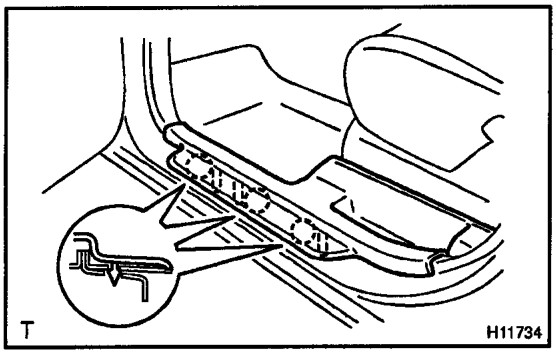
	Shape	Size		Shape	Size		Shape	Size
Ⓐ		ø = 8 (0.31) L = 20 (0.79)	Ⓑ		ø = 8 (0.31) L = 15 (0.59)	Ⓒ		ø = 6 (0.24) L = 22 (0.87)
Ⓓ		ø = 7 (0.28) L = 20 (0.79)	Ⓔ		ø = 6 (0.24) L = 20 (0.79)	Ⓕ		ø = 6 (0.24) L = 19 (0.75)
Ⓖ		ø = 5 (0.20) L = 16 (0.63)	Ⓗ		ø = 5 (0.20) L = 14 (0.55)	Ⓘ		ø = 4 (0.16) L = 14 (0.55)
Ⓙ		ø = 8 (0.31)	Ⓚ		ø = 6 (0.24)			

T

H11767

BO2H5-02

REMOVAL



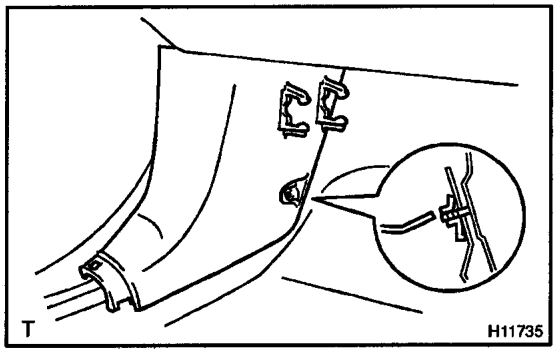
1. REMOVE FRONT DOOR SCUFF PLATE

(a) Insert a screwdriver between the front door scuff plate and body to pry the front door scuff plate out.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



2. REMOVE COWL SIDE TRIM BOARD

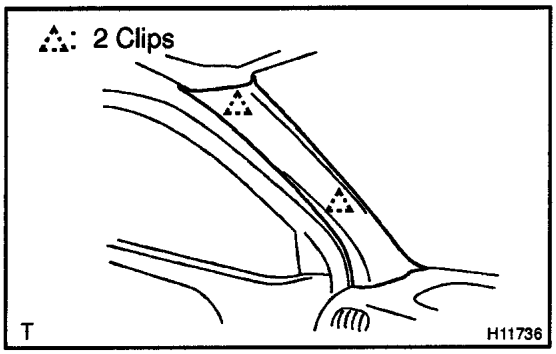
(a) Insert a screwdriver between the cowl side trim board and body to pry the cowl side trim board out.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

3. REMOVE FRONT DOOR OPENING TRIMS



4. REMOVE FRONT PILLAR GARNISH

(a) Using a screwdriver, remove the front pillar garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

5. REMOVE STEERING WHEEL PAD (See page SR–12)

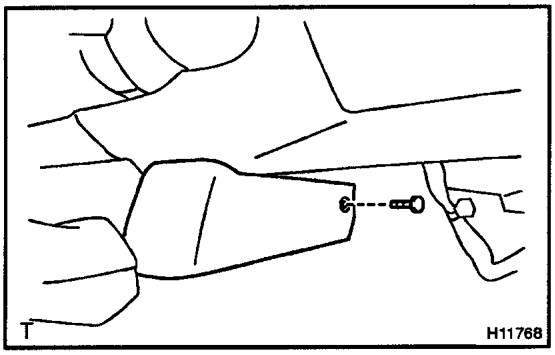
6. REMOVE STEERING WHEEL (See page SR–12)

7. REMOVE COLUMN UPPER AND LOWER COVER (See page SR–12)

8. REMOVE SPIRAL CABLE (See page SR–12)

9. REMOVE WIPER AND WASHER SWITCH

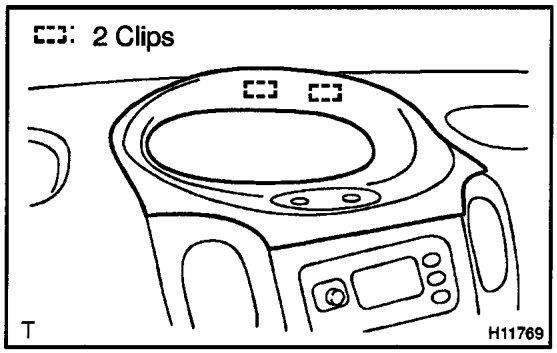
10. REMOVE LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH



11. REMOVE LOWER FINISH PANEL

(a) Remove the clip.

(b) Remove the lower finish panel.



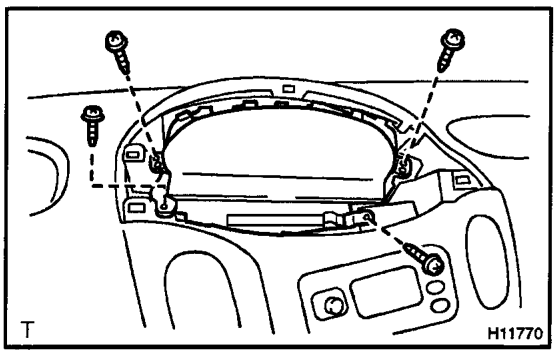
12. REMOVE UPPER CLUSTER FINISH PANEL

(a) Using a screwdriver, remove the upper cluster finish panel as shown in the illustration.

HINT:

Tape the screwdriver tip before use.

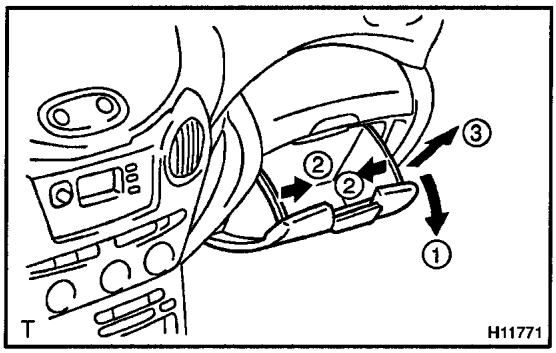
(b) Disconnect the connector.



13. REMOVE METER

(a) Remove the 4 screws.

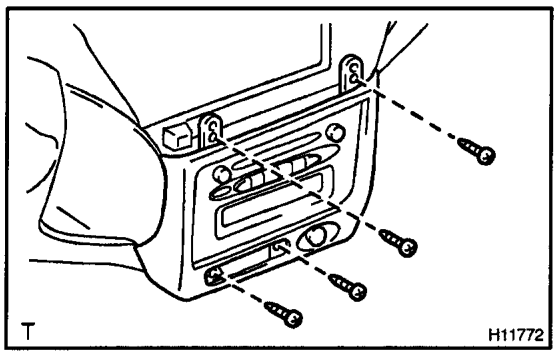
(b) Disconnect the 3 connectors, then remove the meter.



14. REMOVE GLOVE COMPARTMENT DOOR

(a) Open the glove compartment door.

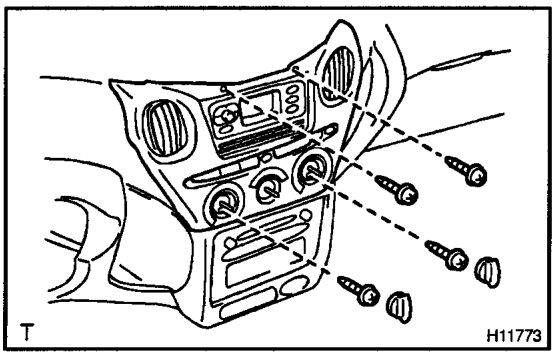
(b) Push both sides inward and pull out the glove compartment door.



15. REMOVE RADIO ASSEMBLY

(a) Remove the 4 screws.

(b) Disconnect the connectors, then remove the radio assembly.



16. REMOVE CENTER CLUSTER FINISH PANEL

(a) Remove the 2 knobs.

(b) Remove the 2 screws.

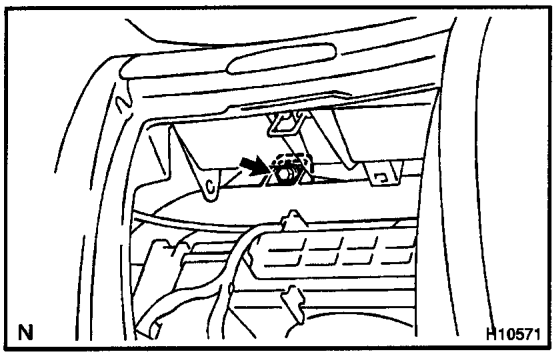
(c) Using a screwdriver, remove the center cluster finish panel.

HINT:

Tape the screwdriver tip before use.

(d) Disconnect the connectors.

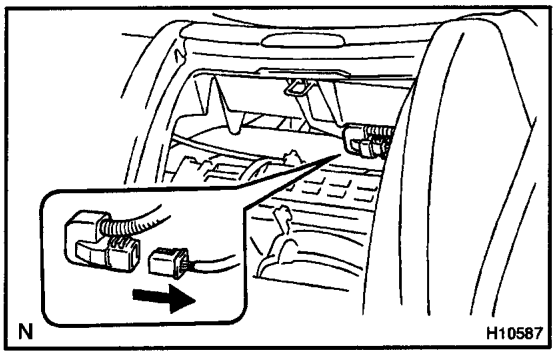
(e) Remove the 2 screws and multi display.



17. REMOVE UPPER INSTRUMENT PANEL

(a) Remove the bolt which is used to fix the front passenger airbag assembly to the reinforcement.
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

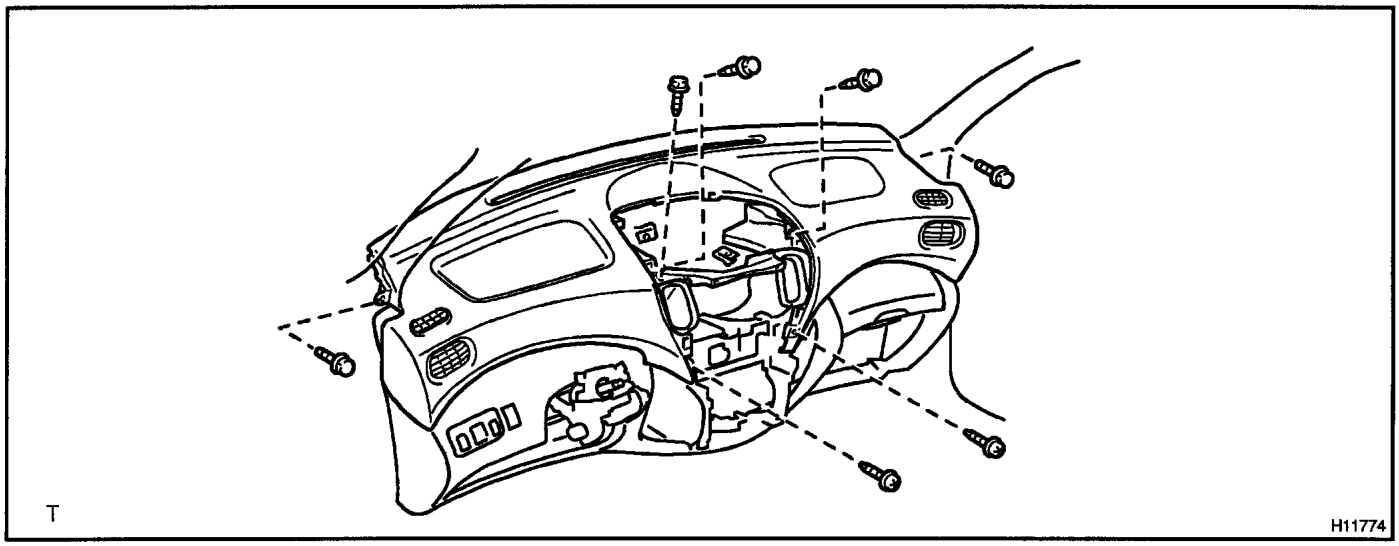
NOTICE:
If the wiring connector of the SRS is disconnected when the ignition switch is in ON or ACC position, DTC will be recorded.



(b) Remove the connector cover from the lower instrument panel.

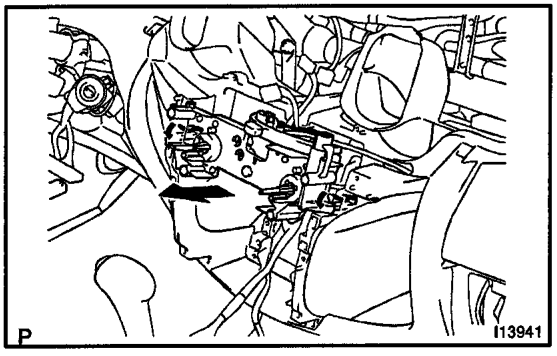
NOTICE:
When handling the airbag connector, take care not to damage the airbag wire harness.

(c) Disconnect the passenger airbag connector.
(d) Remove the screws, nuts and instrument panel as shown in the illustration below.



18. REMOVE FRONT ASH RECEPTACLE BOX

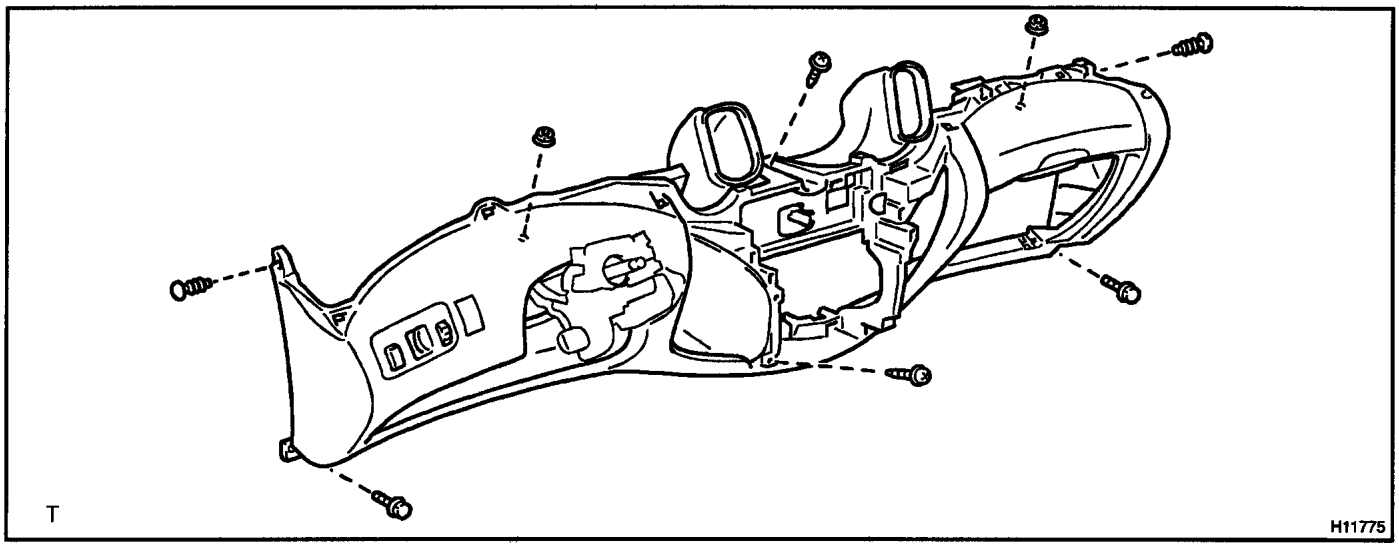
19. REMOVE DEFROSTER NOZZLE



20. REMOVE HEATER CONTROL ASSEMBLY (See page AC–86)

21. REMOVE LOWER INSTRUMENT PANEL

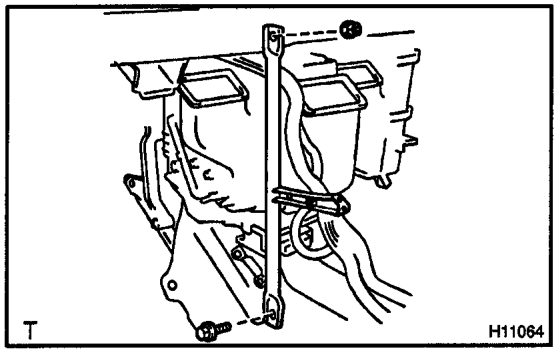
(a) Remove the hood lock release lever.
(b) Remove the screws, bolts and nuts.
(c) Disconnect the connectors.
(d) Remove the lower instrument panel.



22. REMOVE STEERING COLUMN (See page SR–12)

23. REMOVE REAR CONSOLE BOX

(a) Remove the shifting hole cover.
(b) Disconnect the connector of the base switch.
(c) Remove the console carpet.
(d) Remove the screw and rear console box.



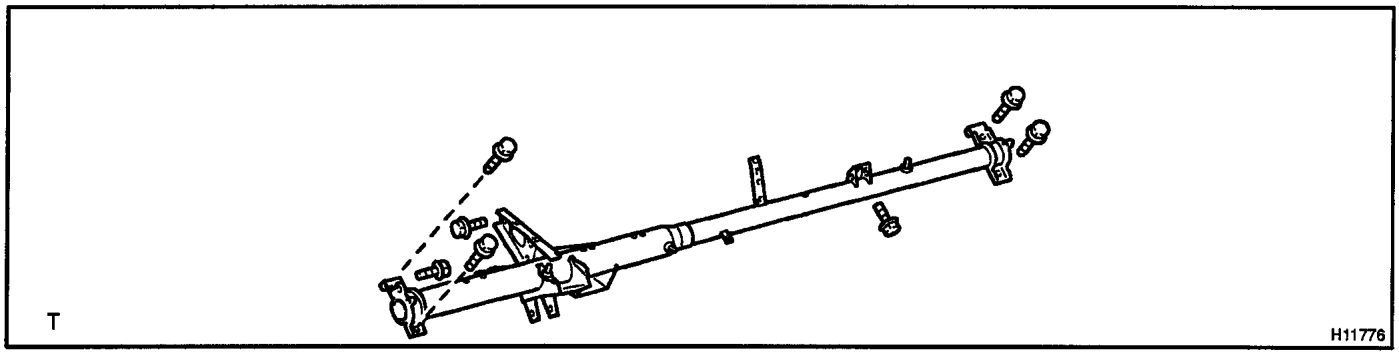
24. REMOVE INSTRUMENT PANEL TO FLOOR BRACE

Remove the bolt and nut, then remove the instrument panel to floor brace.

25. REMOVE REINFORCEMENT

(a) Remove the 6 bolts.
(b) Disengage the wire harness clamps.
(c) Remove the reinforcement.

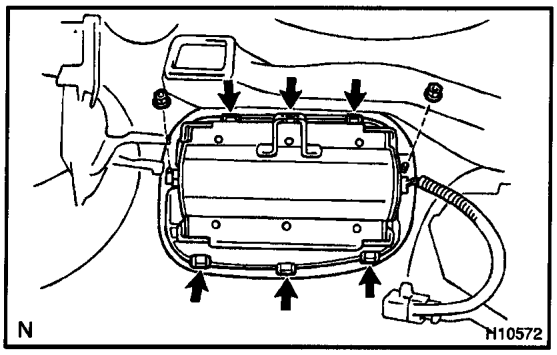
NOTICE:
Be careful not to damage the body and wire harness.



(d) Remove the screw and door lock control.
(e) Remove the screw and wireless door lock control.

BO2RD-01

DISASSEMBLY



1. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY

(a) Remove the 2 nuts which is used to fix the front passenger airbag assembly to the instrument panel.

(b) Pry up the 6 claws shown in the illustration.

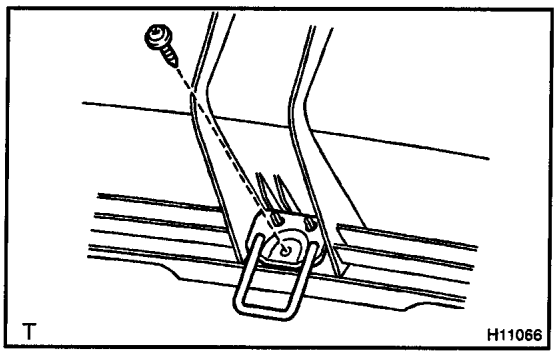
(c) Remove the front passenger airbag assembly from the instrument panel.

CAUTION:

- **Do not store the front passenger airbag assembly with the airbag deployment side facing down.**
- **Never disassemble the front passenger airbag assembly.**

NOTICE:

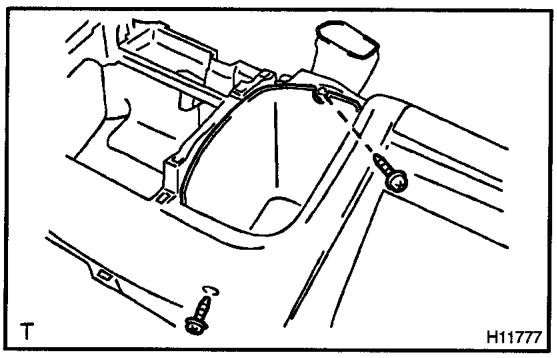
When removing the front passenger airbag assembly, take care not to damage the wire harness.



2. REMOVE CENTER BRACKET

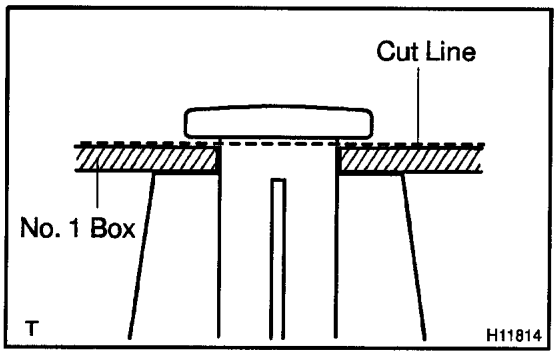
Remove the screw and center bracket.

3. REMOVE DOOR



4. REMOVE NO. 2 BOX

Remove the 2 screws and No. 2 box.



5. REMOVE NO. 1 BOX

(a) When installed by ultrasonic welding:
Using a nipper, cut off the ultrasonic welding portion of the instrument panel along the No. 1 box to remove the No. 1 box from the instrument panel lower.

(b) When installed with screw:
Remove the screw and No. 1 box from the instrument panel lower.

6. REMOVE SIDE REGISTERS

7. REMOVE NO. 1 AND NO. 2 SIDE DEFROSTER NOZZLE DUCT

8. REMOVE NO. 1, NO. 2 AND NO. 3 HEATER TO REGISTER DUCT

9. REMOVE UNDER TRAY

HINT:

For step 6 to 9, remove them in the same way as No.1 box.

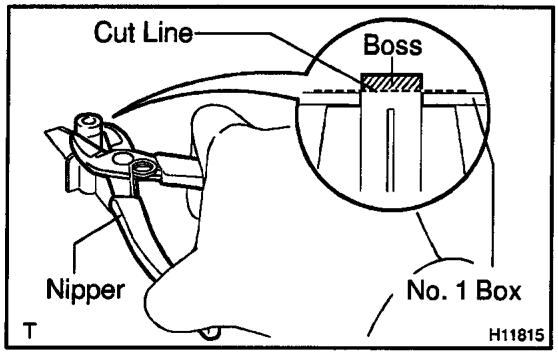
BO2RE-01

REASSEMBLY

NOTICE:

Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.

1. INSTALL UNDER TRAY

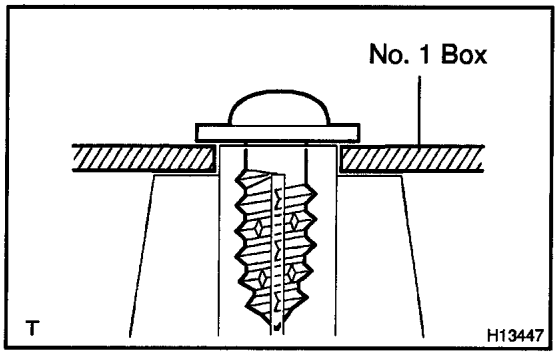


2. When replacing instrument panel lower: INSTALL NO. 1 BOX

(a) Cut off the boss using a nipper to make the level of the surface equal to the No. 1 box.

NOTICE:

Ensure that the cut surface is flush with the surface of No. 1 box to prevent looseness.



(b) Install the No. 1 box securely on the instrument panel with the tapping screw provided in the same packing.
Screw: 93567–15014

HINT:

Employ the same manner to instrument panel upper.

3. When reusing instrument panel lower: INSTALL NO. 1 BOX

Install the No. 1 box to the instrument panel lower with the screw.

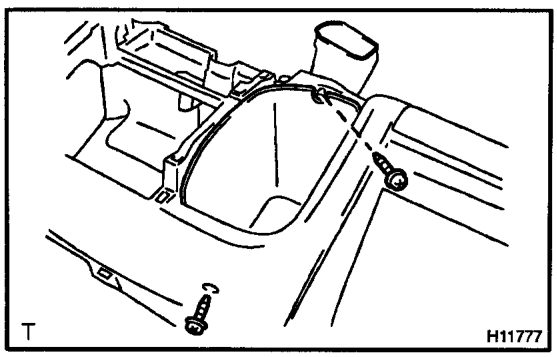
4. INSTALL NO.1, NO. 2 AND NO. 3 HEATER TO REGISTER DUCT

5. INSTALL NO. 1 AND NO. 2 SIDE DEFROSTER NOZZLE DUCT

6. INSTALL REGISTERS

HINT:

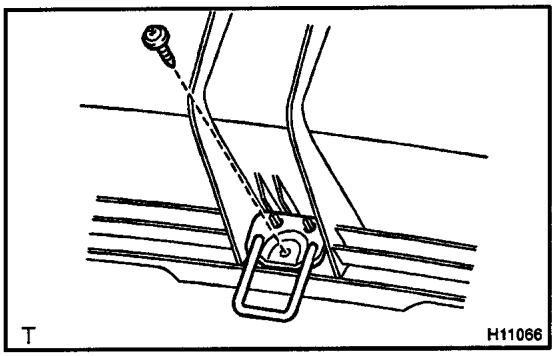
- For step 4 to 6, install them in the same way as No. 1 box.
- Surely install the No. 1 box to the instrument panel lower before installing No. 2 duct.



7. INSTALL NO. 2 BOX

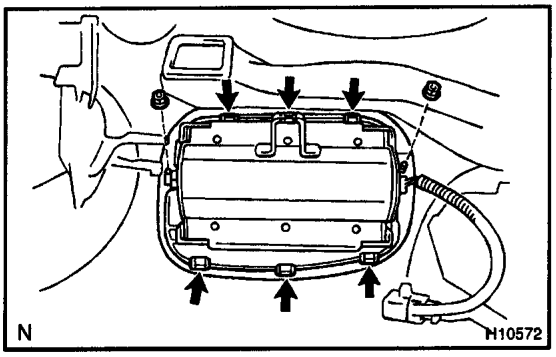
Install the No. 2 box with the 2 screws.

8. INSTALL DOOR



9. INSTALL CENTER BRACKET

Install the center bracket with the screw.



10. INSTALL FRONT PASSENGER AIRBAG ASSEMBLY

(a) Install the front passenger airbag assembly to the instrument panel.

(b) Install the 2 nuts.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

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 withe a new one.

BO2HB-01

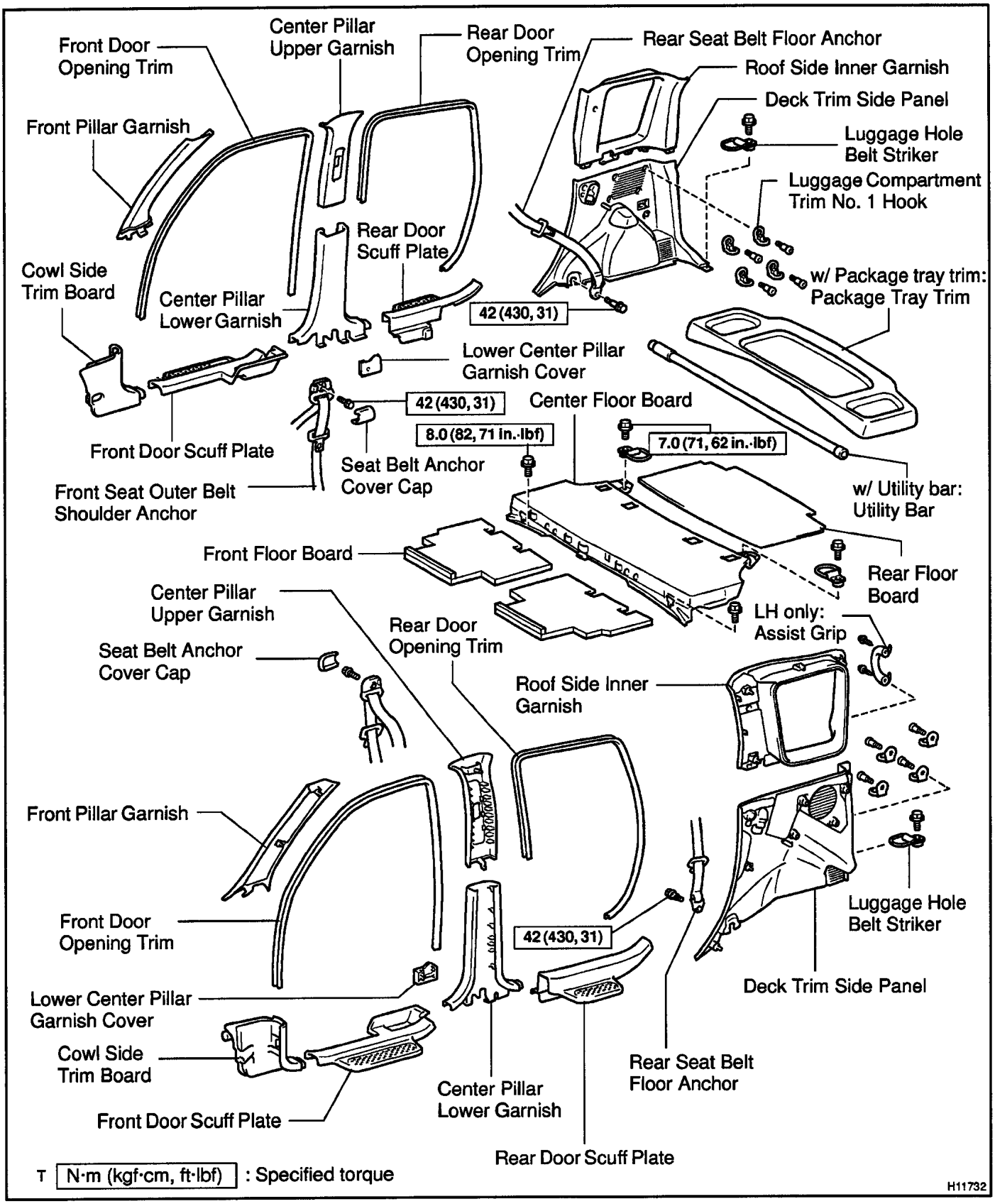
INSTALLATION

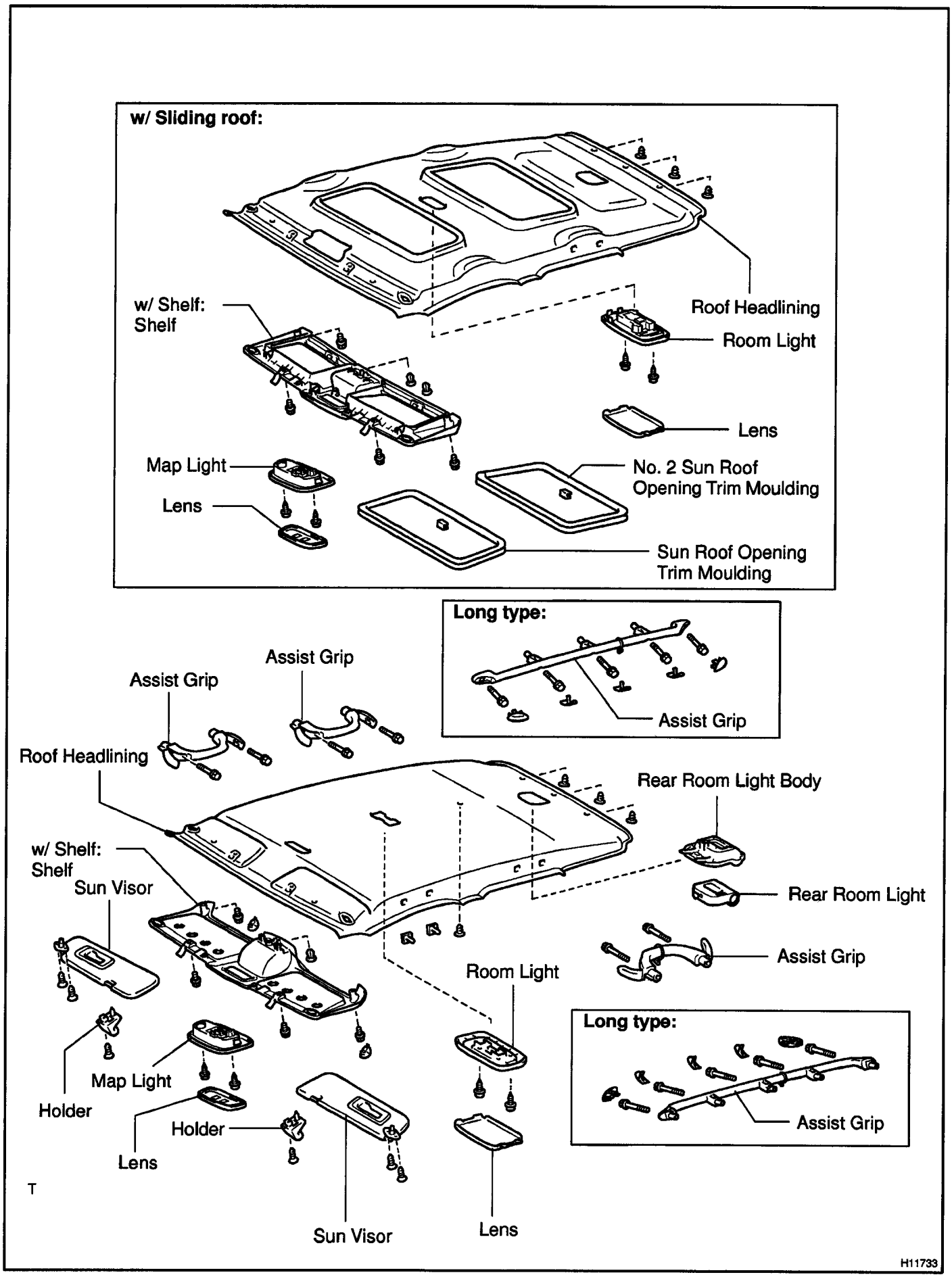
Installation is in the reverse order of removal (See page BO–86).

ROOF HEADLINING

COMPONENTS

BO2HC-03




w/ Sliding roof:
w/ Shelf:
Shelf
Roof Headlining
Room Light
Lens
Map Light
Lens
No. 2 Sun Roof
Opening Trim Moulding
Sun Roof Opening
Trim Moulding
Long type:
Assist Grip
Assist Grip
Assist Grip
Roof Headlining
Rear Room Light Body
w/ Shelf:
Shelf
Sun Visor
Rear Room Light
Assist Grip
Room Light
Long type:
Assist Grip
Map Light
Holder
Holder
Lens
Sun Visor
Lens
T
H11733

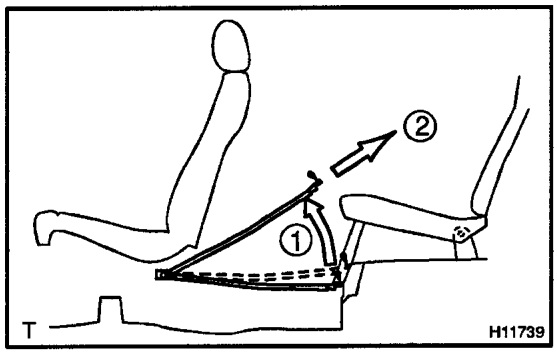
BO2R6-01

REMOVAL

1. REMOVE FRONT FLOOR BOARD

(a) Slide the front seat to the frontmost position.

(b) Remove the floor board as shown in the illustration.



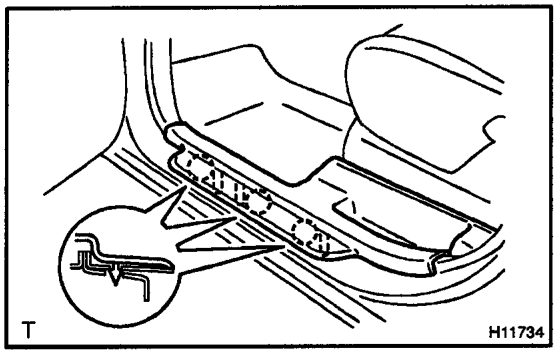
2. REMOVE FRONT DOOR SCUFF PLATE

(a) Insert a screwdriver between the front door scuff plate and body to pry the front door scuff plate out.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



3. REMOVE COWL SIDE TRIM BOARD

(a) Insert a screwdriver between the cowl side trim board and body to pry the cowl side trim board out.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

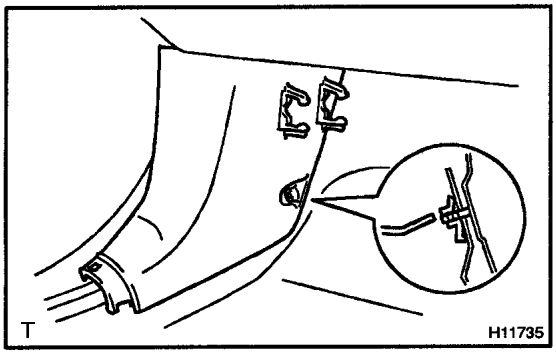
4. REMOVE REAR DOOR SCUFF PLATES

5. REMOVE FRONT DOOR OPENING TRIMS

6. REMOVE REAR DOOR OPENING TRIMS

7. w/ Package tray trim:
REMOVE PACKAGE TRAY TRIM

8. w/ Utility bar:
REMOVE UTILITY BAR



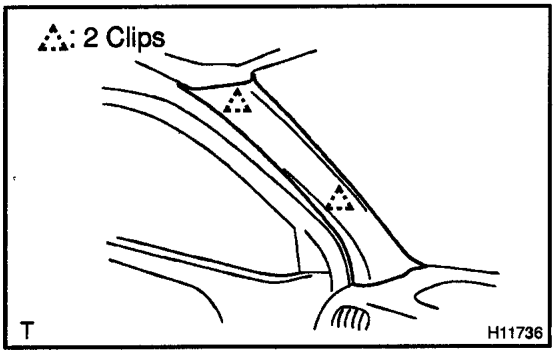
9. REMOVE FRONT PILLAR GARNISH

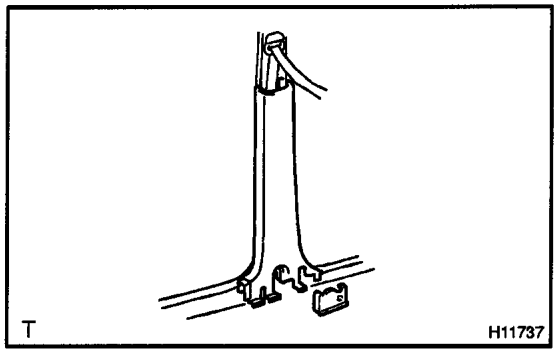
(a) Using a screwdriver, remove the front pillar garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



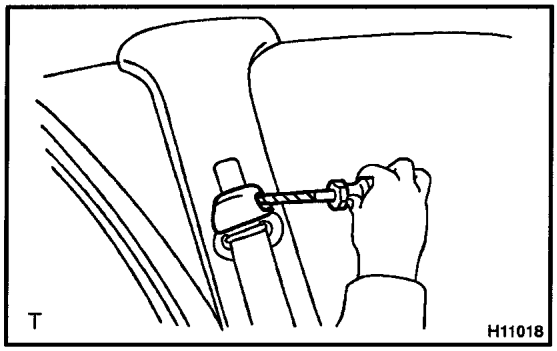


10. REMOVE CENTER PILLAR LOWER GARNISH

(a) Remove the lower center pillar garnish cover.
(b) Remove the floor anchor bolt.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)
(c) Remove the floor anchor.
(d) Insert a screwdriver between the garnish and body to pry the garnish out.

HINT:
Tape the screwdriver tip before use.

(e) Employ the same manner described above to the other side.

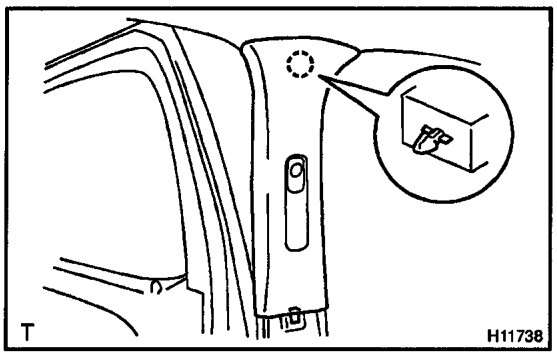


11. REMOVE CENTER PILLAR UPPER GARNISH

(a) Using a screwdriver, remove the seat belt anchor cover cap.

HINT:
Tape the screwdriver tip before use.

(b) Remove the bolt and front seat outer belt shoulder anchor.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

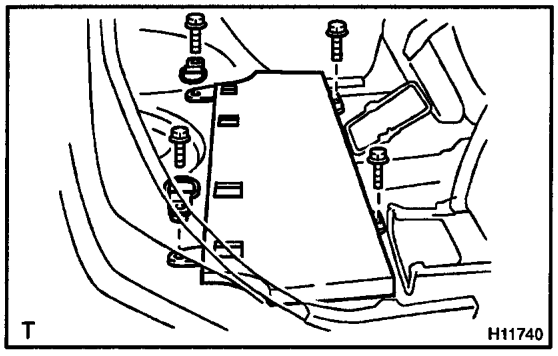


(c) Using a screwdriver, remove the center pillar upper garnish.

HINT:
Tape the screwdriver tip before use.

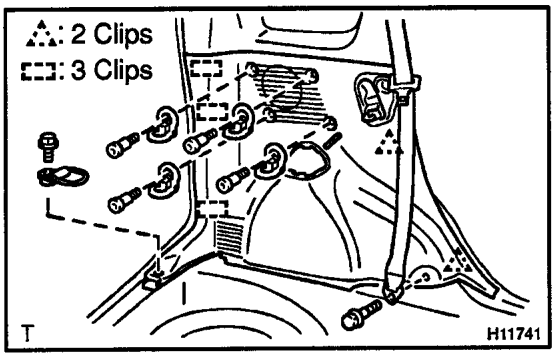
(d) Employ the same manner described above to the other side.

12. REMOVE REAR FLOOR BOARD



13. REMOVE CENTER FLOOR BOARD

(a) Fold the rear seatback down.
(b) Unlock the seat lock, and swing up the whole seat forward.
(c) Remove the 4 bolts, 2 strikers and center floor board.



14. REMOVE DECK TRIM SIDE PANEL

(a) Remove the bolt and rear seat outer belt floor anchor.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

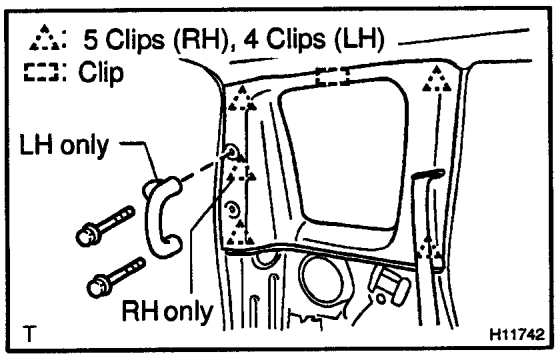
(b) Remove the 4 bolts and 4 luggage hole belt strikers.

(c) RH only:
Disconnect the connector.

(d) Using a screwdriver, remove the deck trim side panel.

HINT:
Tape the screwdriver tip before use.

(e) Employ the same manner described above to the other side.



15. REMOVE ROOF SIDE INNER GARNISH

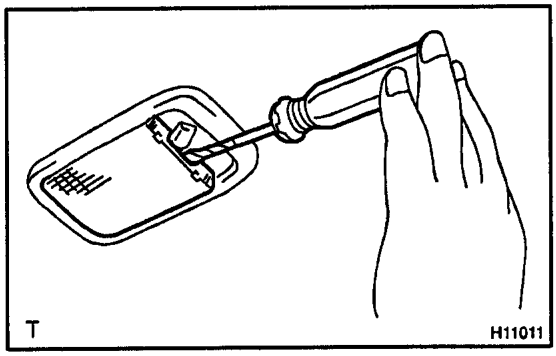
(a) LH side:
Remove the 2 screws and assist grip.

(b) Insert a screwdriver between the roof side inner garnish and body to pry the roof side inner garnish out.

HINT:

- Tape the screwdriver tip before use.
- Let the rear seat outer floor anchor pass through the roof side inner garnish hole to remove the garnish.

(c) Employ the same manner described above to the other side.



16. REMOVE ROOM LIGHT

(a) Using a screwdriver, remove the light cover.

HINT:
Tape the screwdriver tip before use.

(b) Remove the 2 screws and the room light.

(c) Disconnect the connector.

17. w/ Sliding roof:
REMOVE SUN ROOF OPENING TRIM MOULDING

18. REMOVE ASSIST GRIP

(a) Remove the 2 screws.

(b) Remove the assist grip.

(c) Long type:
Remove the 5 screws and assist grip.

HINT:

Remove the other assist grips in the same manner.

19. REMOVE MAP LIGHT

(a) Remove the lens.

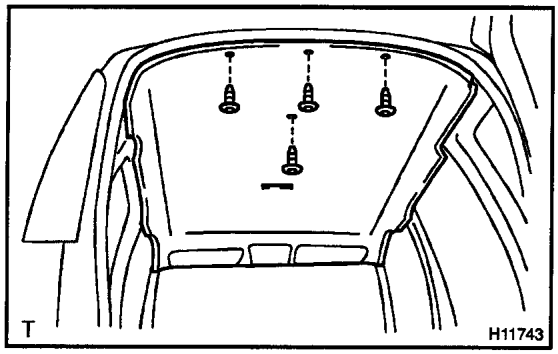
(b) Remove the 2 screws and map light.

20. w/ Shelf:
REMOVE SHELF

21. REMOVE SUN VISORS

(a) Remove the 4 screws and sun visors.

(b) Remove the 2 screws and holders.



22. REMOVE ROOF HEADLINING

Remove the 4 clips and roof headlining.

BO2HE-02

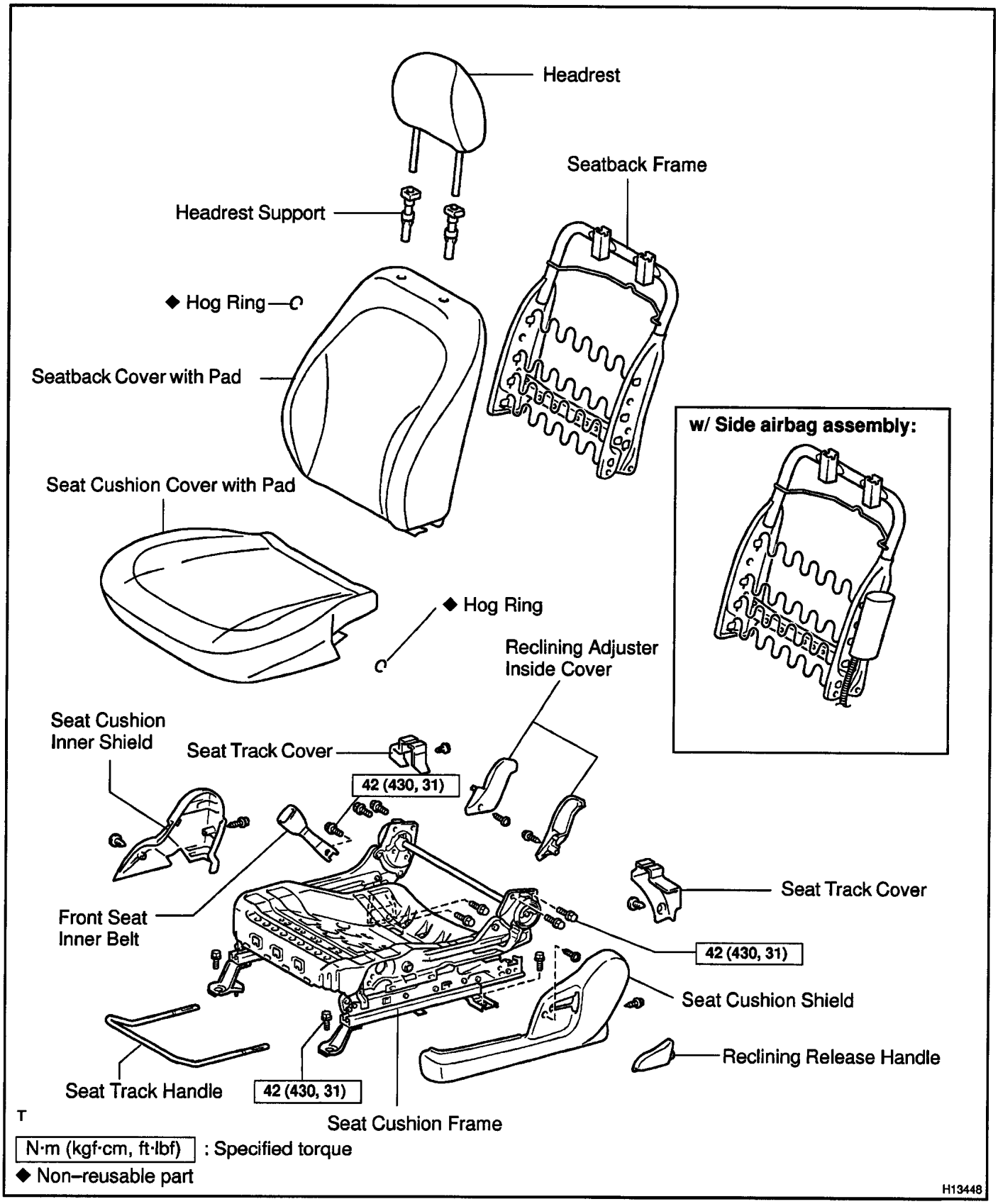
INSTALLATION

Installation is in the reverse order of removal (See page BO–98).

FRONT SEAT

COMPONENTS

BO2F-02



BO2RF-01

REMOVAL

REMOVE FRONT SEAT

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is in ON or ACC position, DTCs will be recorded.**
- **Never use the airbag parts removed from other vehicle. When replacing parts, replace them with new ones.**

(a) Using a screwdriver, remove the seat track covers.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 5 bolts.

(c) w/ Seat heater:
Disconnect the connector.

(d) w/ Side airbag:
Disconnect the connector.

(e) Remove the front seat.

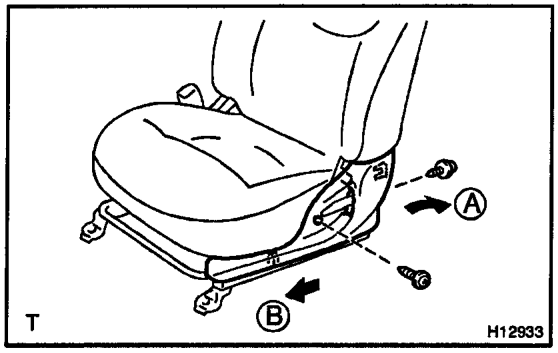
NOTICE:

Be careful not to damage the body.

BO2RG-01

DISASSEMBLY

1. **REMOVE HEADREST**
2. **REMOVE RECLINING RELEASE HANDLE**



3. **REMOVE SEAT CUSHION SHIELD**

Remove the 2 screws and seat cushion shield as shown in the illustration.

HINT:

Remove the seat cushion shield in order A, B as shown in the illustration.

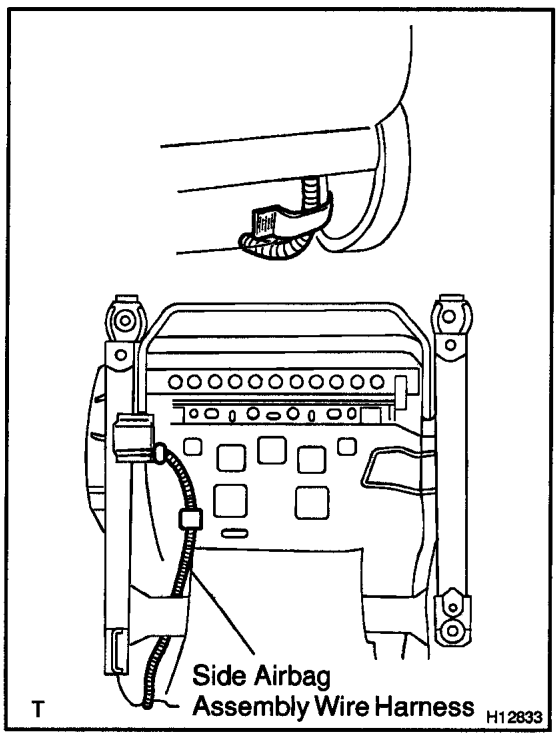
4. **REMOVE SEAT CUSHION INNER SHIELD**

Remove the clip, screw and seat cushion inner shield.

5. **REMOVE FRONT SEAT INNER BELT**

Remove the bolt and front seat inner belt.

Torque: 42 N·m(430 kgf·cm, 31 ft·lbf)

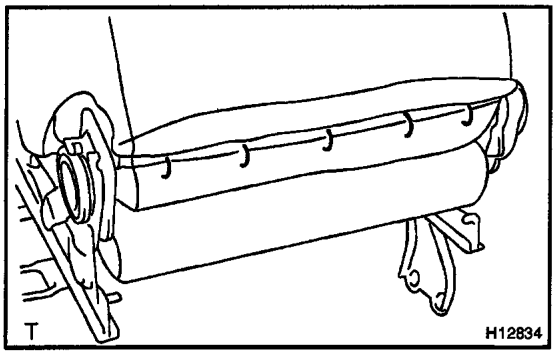


6. **w/ Side airbag:**
   REMOVE SEATBACK ASSEMBLY

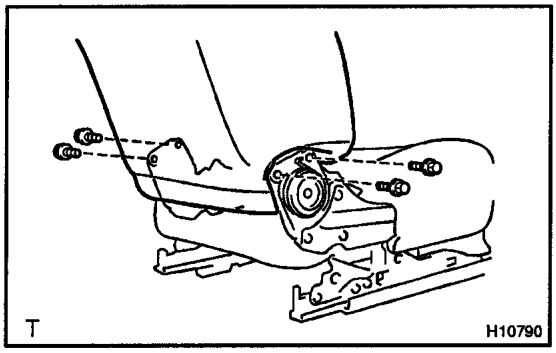
(a) Disconnect and disengage the connector and wire harness.

NOTICE:

Be careful not to damage the connector and wire harness.



(b) Remove the hog rings on the lower part of seatback assembly.



(c) Remove the 4 bolts and seatback assembly.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

7. REMOVE SEATBACK COVER WITH PAD

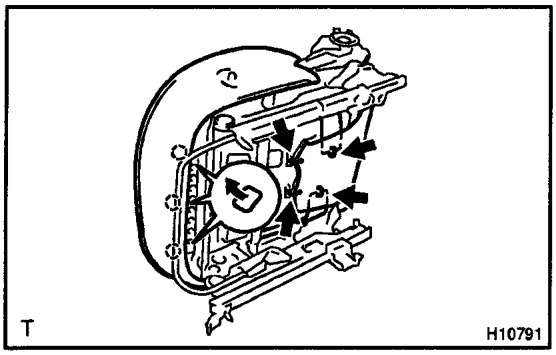
(a) Remove the hog rings.

HINT:

At the time of reassembly, please refer to the following item.
When installing hog rings, take care to prevent wrinkles as much as possible.

(b) Remove the headrest supports.

(c) Remove the seatback cover with pad from the seatback frame.



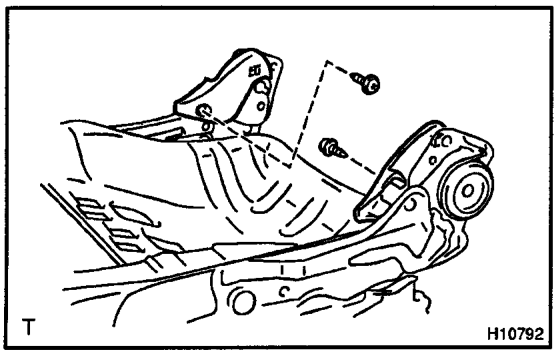
8. REMOVE SEAT CUSHION COVER WITH PAD

(a) Remove the hog rings.

HINT:

At the time of reassembly, please refer to the following item.
When installing hog rings, take care to prevent wrinkles as much as possible.

(b) Disengage the seat cushion cover hooks and remove the seat cushion cover with pad from the seat cushion frame.



9. REMOVE RECLINING ADJUSTER INSIDE COVERS

Remove the 2 screws and 2 reclining adjuster inside covers.

10. REMOVE SEAT TRACK HANDLE

BO2II-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–105).

BO2U-02

INSTALLATION

INSTALL FRONT SEAT

(a) Slide the front seat to the most front position.

NOTICE:

Make sure that the 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 most front positions became detached.

(c) w/ Side airbag:
Connect the connector.

(d) w/ Seat heater:
Connect the connector.

(e) Tighten the bolts on the rear side temporarily, and from the bolt on the inner side tighten them completely.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

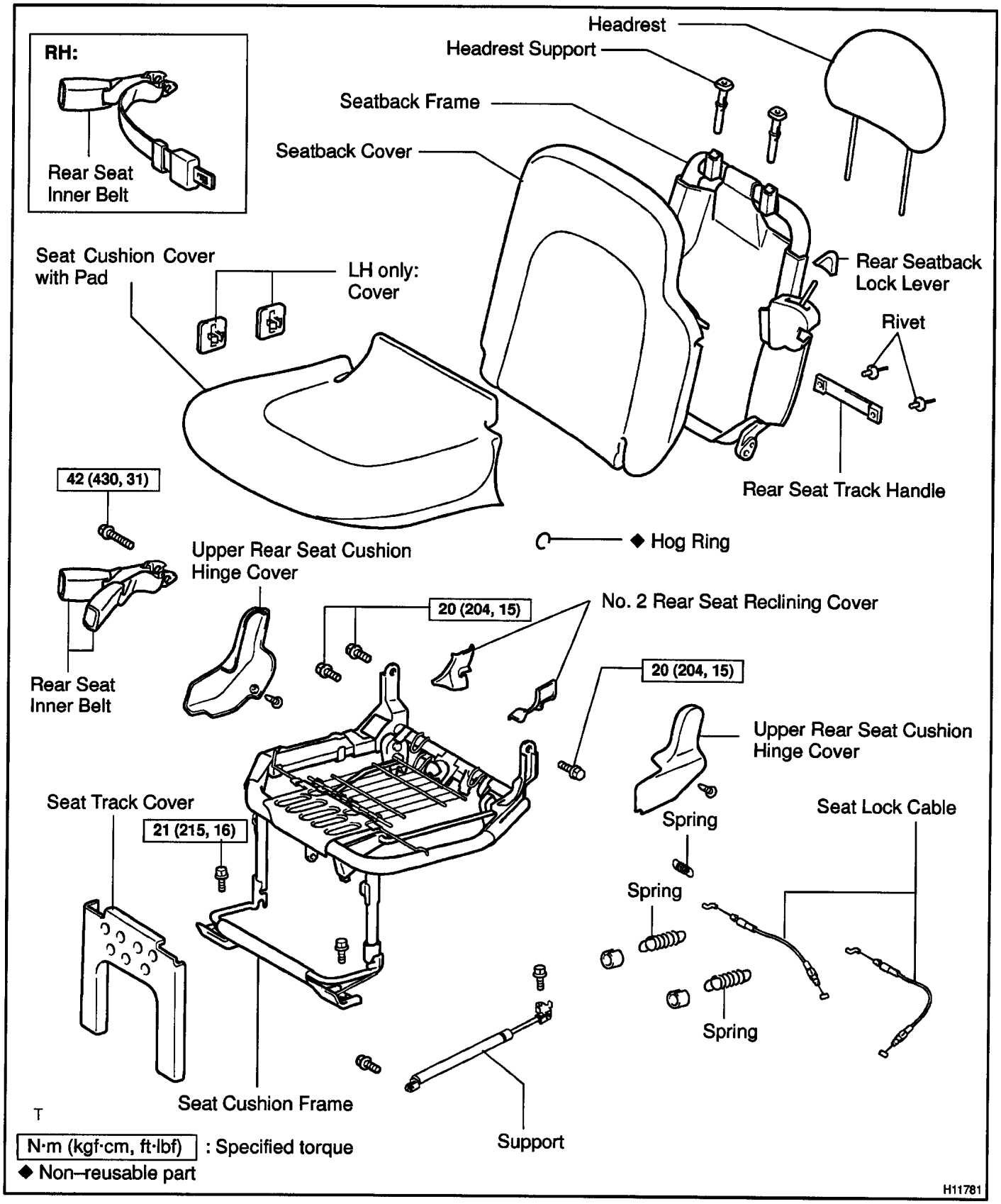
(f) Slide the seat to the most rear position to install the bolts on the front side.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(g) Install the seat track covers.

REAR SEAT (Outer Side)

COMPONENTS

BO2R1-01



BO2R2-01

REMOVAL

REMOVE REAR SEAT

(a) Remove the 2 bolts.
Torque: 21 N·m (215 kgf·cm, 16 ft·lbf)
(b) Fold the seatback down.
(c) Unlock the seat lock, and swing the whole seat up and forward.
(d) Remove the rear seat.

BO2R3-01

DISASSEMBLY

1. REMOVE 2 INSIDE SHIELDS

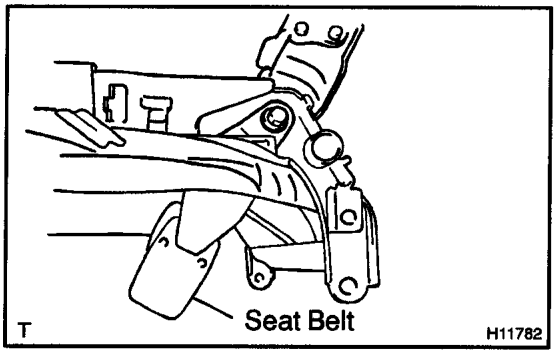
2. REMOVE SHIELD

Remove the 2 screws and 2 shields.

3. REMOVE SEAT CUSHION ASSEMBLY

Remove the 2 bolts and seat cushion assembly.

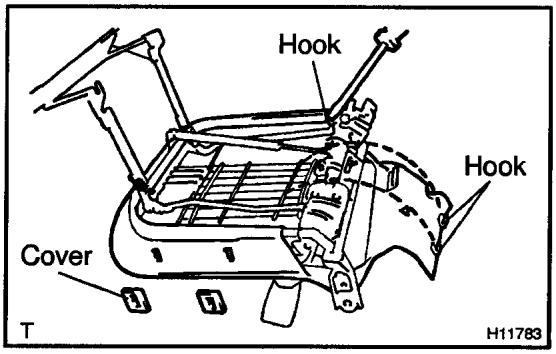
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)



4. REMOVE SEAT BELTS

Remove the bolt and 2 seat belts.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

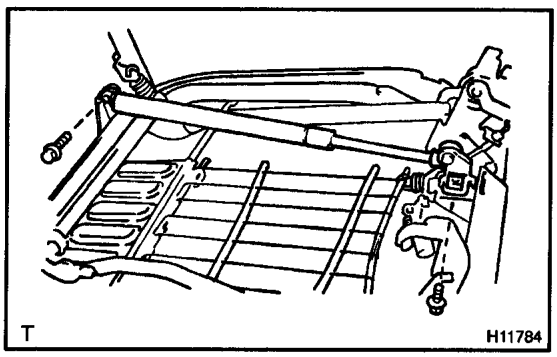


5. REMOVE SEAT CUSHION COVER

(a) Remove the 2 covers.

(b) Using a screwdriver, disengage the hooks as shown in the illustration.

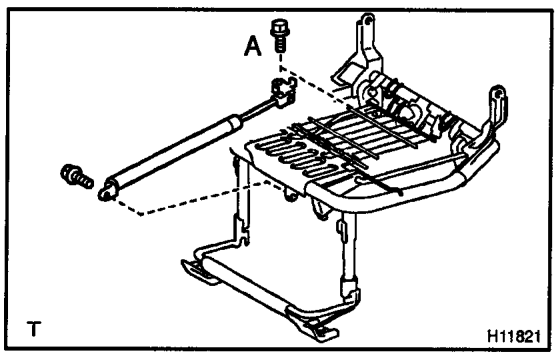
(c) Remove the seat cushion cover with pad from the seat cushion frame.



6. REMOVE SUPPORT

Remove the 2 bolts and support.

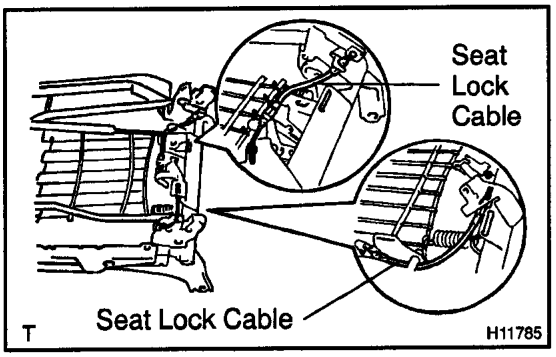
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



HINT:

At the time of reassembly, please refer to the following items.

- Loosen the bolt A by turning 2 rotations in the reverse direction when installing the support.
- Tighten the bolt A completely after installing the rear seat assembly to the body.



7. REMOVE SEAT LOCK CABLES

Remove the seat lock cables from seat cushion frame.

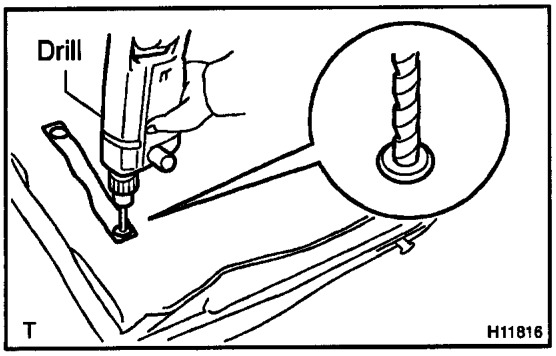
8. REMOVE NO. 2 FRAME

Remove the 2 springs and No. 2 frame.

HINT:

Using a pliers, remove the 2 springs.

9. REMOVE HEADREST



10. REMOVE SEATBACK COVER WITH PAD

(a) Using a drill of less than ø 4.8 mm (0.189 in.), drill out the rivet heads and remove the seatback cover.

(b) Using a vacuum cleaner, remove the drilled rivets and dust.

CAUTION:

Do not touch the cut rivets and rivet cutter since they will be hot.

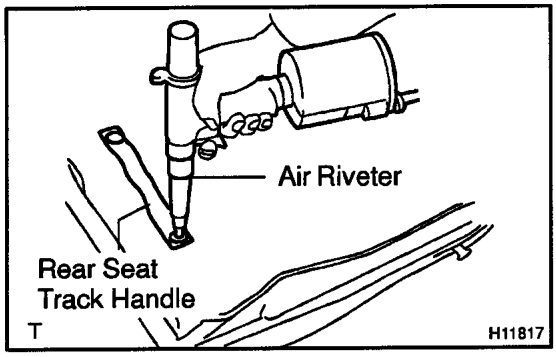
NOTICE:

Do not jiggle the rivet cutter while cutting. Otherwise, you may enlarge the rivet hole or damage the rivet cutter.

HINT:

Do not drill the seatback cover.

(c) Zip the seatback cover's open.



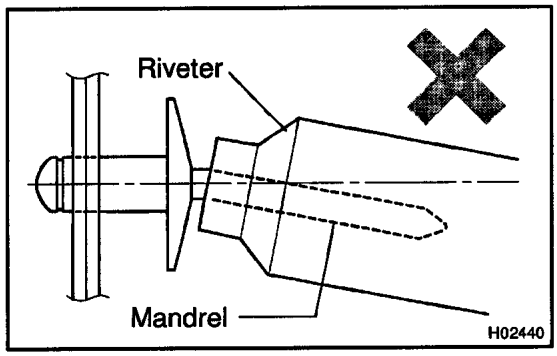
HINT:

At the time of reassembly, please refer to the following item.

Using an air riveter, strike rivets into the rear seat track handle to install the seatback cover.

(d) Remove the 2 headrest supports.

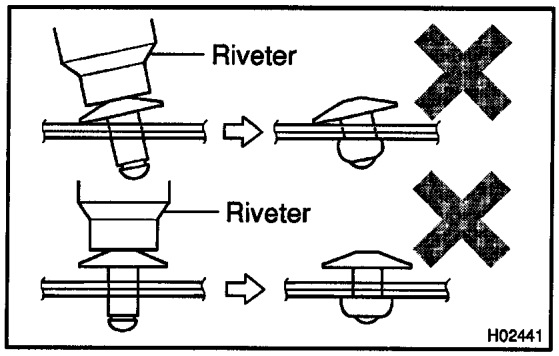
(e) Remove the seatback cover with pad from frame.



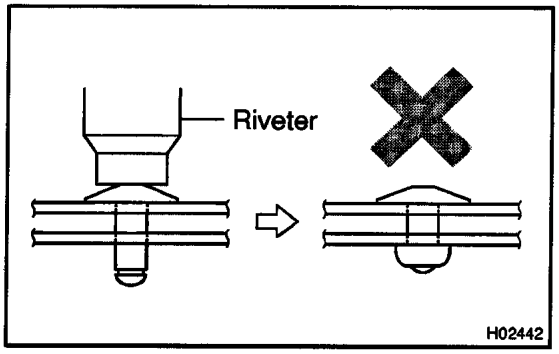
NOTICE:

At the time of reassembly, please refer to the following items.

- **Do not prize a riveter. Doing so may cause damage to the riveter, incorrect rivet fastening and a bend of the mandrel.**



- **Do no t tilt the riveter while handling it and make sure that the rivet head is attached to the material surface.**



- **Install the rivet so that the materials will securely contact each other. Failure to do so may cause loose rivetting.**

BO2R4-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–111).

BO2R5-01

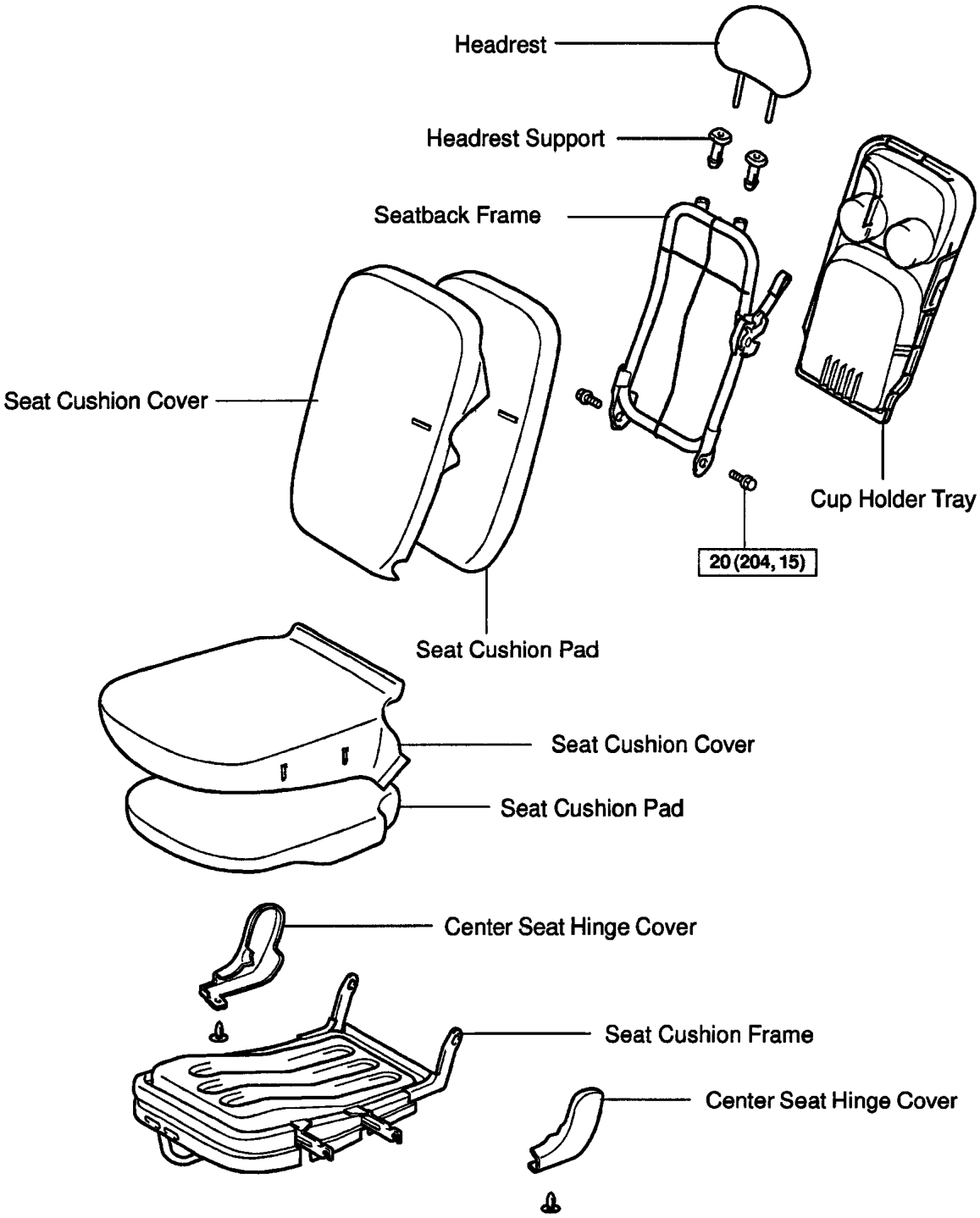
INSTALLATION

Installation is in the reverse order of removal (See page BO–110).

REAR SEAT (Center)

COMPONENTS

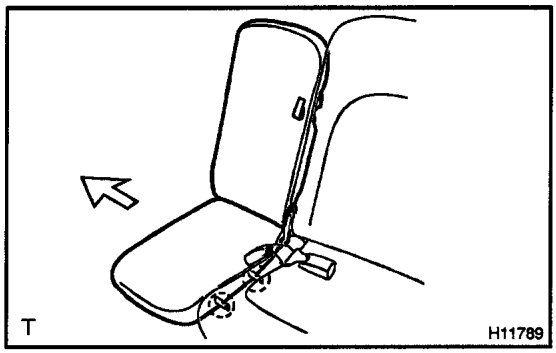
BO2RS-01



N·m (kgf·cm, ft·lbf) : Specified torque

T

H11786



BO2RT-01

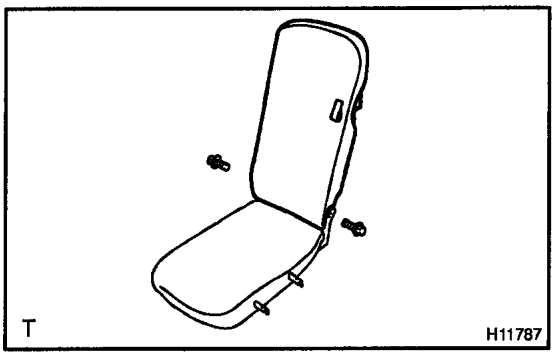
REMOVAL

REMOVE CENTER SEAT

(a) Fold the seatback down.
(b) Fold the leg and tilt the center seat down.
(c) Pull the center seat out from LH seat.

BO2RU-01

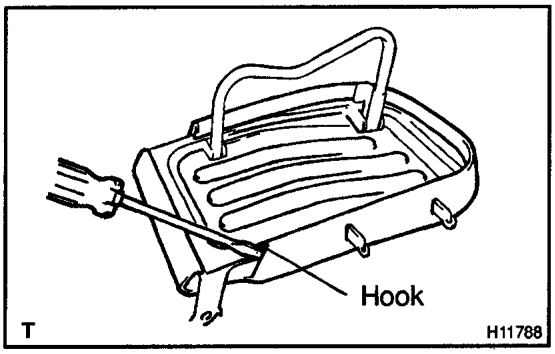
DISASSEMBLY



1. REMOVE SEATBACK ASSEMBLY

Remove the 2 bolts and seatback assembly from the seat cushion assembly.

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)



2. REMOVE SEAT CUSHION COVER

(a) Remove the seat cushion pad with cover from the seat cushion frame.

(b) Remove the seat cushion cover from pad.

3. REMOVE SEATBACK COVER FROM SEATBACK PAD

4. REMOVE SEATBACK PAD FROM FRAME

(a) Remove the seatback cover from pad.

(b) Remove the seatback pad from frame.

HINT:

At the time of reassembly, please refer to the following item.

Let the strap pass through the hole of seatback cover when installing the seatback frame to the seatback pad with cover.

BO2RV–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO–118).

BO2RW–01

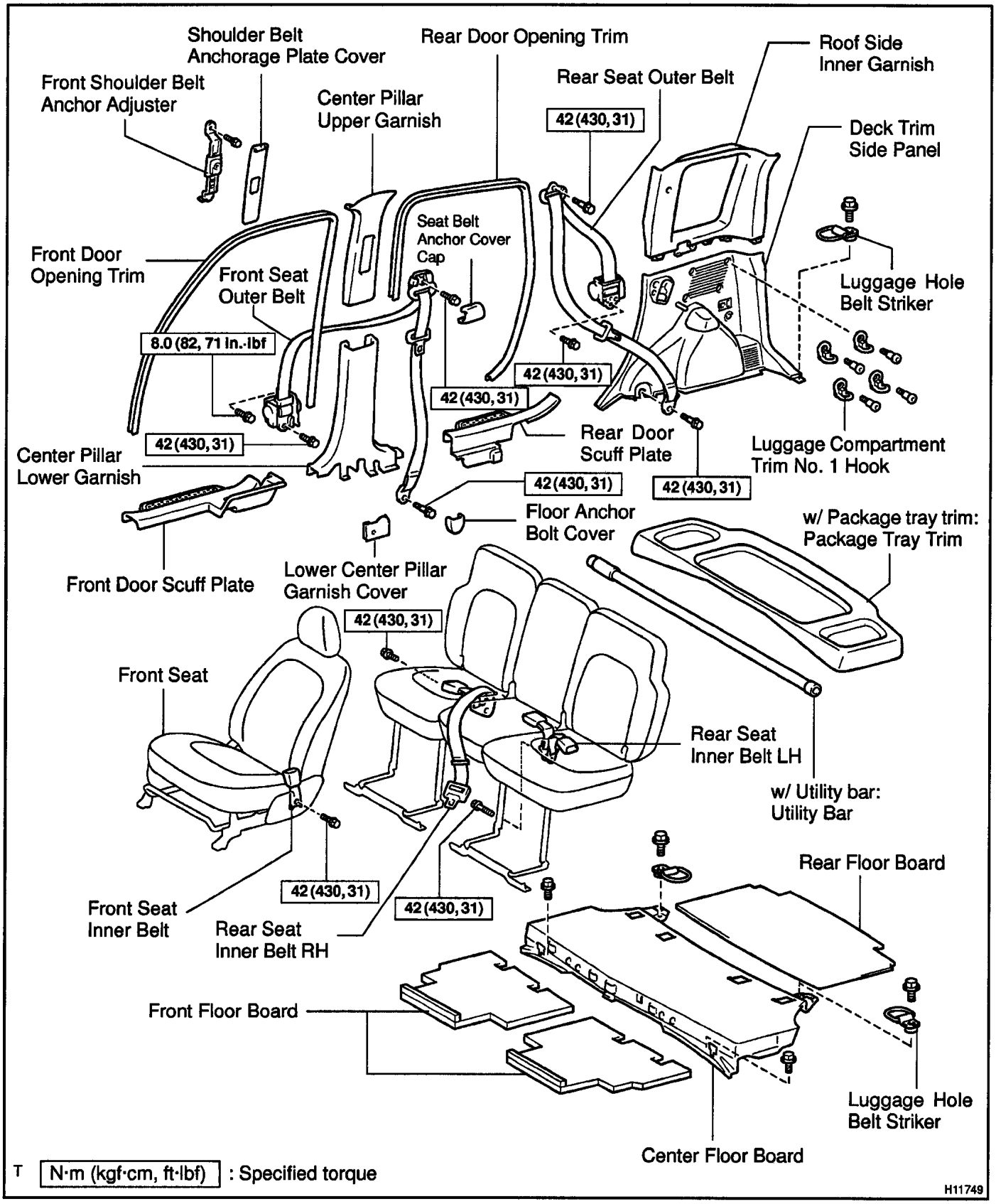
INSTALLATION

Installation is in the reverse order of removal (See page BO–117).

SEAT BELT

COMPONENTS

BO2R7-01



BO2HG-02

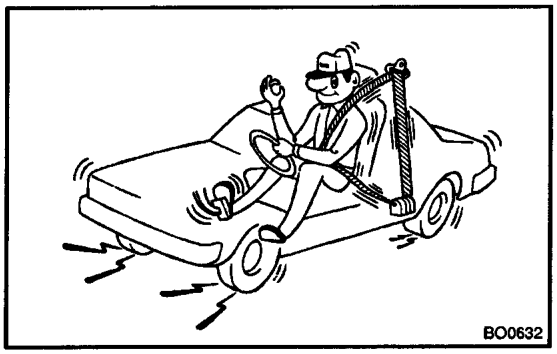
INSPECTION

CAUTION:

Replace the seat belt assembly (outer belt, inner belt or bolts) 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 belt.



(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.

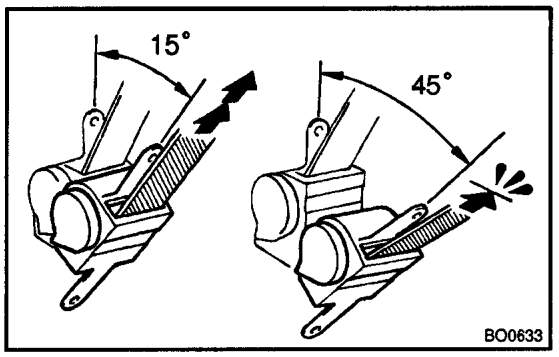
2. Front seat belt (ELR):

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 at over 45 degrees of tilt.

If a problem is found, replace the assembly.

3. Rear seat belt (ELR/ALR):

STATIC TEST

(a) Make sure that the belt locks when pulled out quickly.

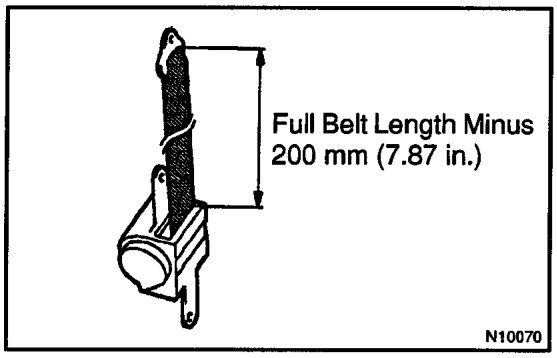
(b) Remove the locking retractor assembly.

(c) Pull out the whole belt and measure the length of the whole belt.

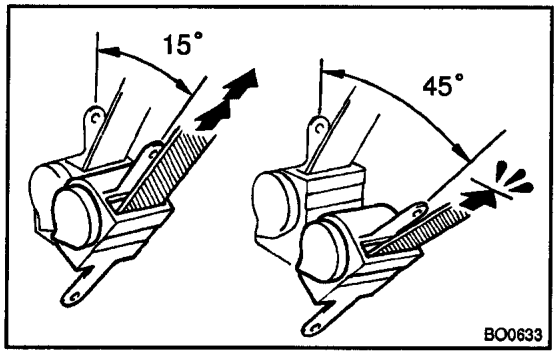
Then retract the belt slightly and pull it out again.

(d) Make sure that the belt cannot be extended further.

If a problem is found, replace the assembly.

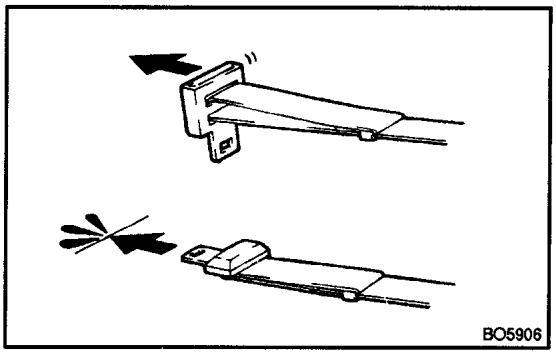


(e) Retract the whole belt, then pull out the belt until 200 mm (7.87 in.) of belt remains retracted.
(f) Tilt the retractor slowly.



(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.



4. Manual type:
TESTING

(a) Adjust the belt to the proper length.
(b) Apply a firm load to the belt.
(c) Make sure that the belt does not extend.

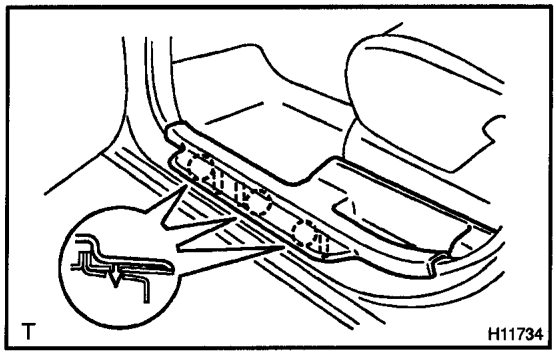
SEAT BELT PRETENSIONER

BO2R9-01

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 removed from other vehicle. When replacing parts, replace them with new ones.**



1. REMOVE FRONT DOOR SCUFF PLATE

Insert a screwdriver between the front door scuff plate and body to pry it out.

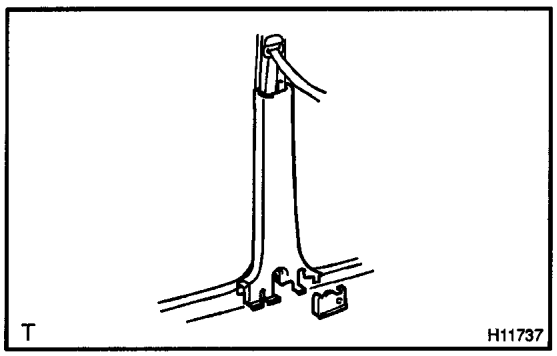
HINT:

Tape the screwdriver tip before use.

2. REMOVE REAR DOOR SCUFF PLATE

3. REMOVE REAR PART OF FRONT DOOR OPENING TRIM

4. REMOVE FRONT PART OF REAR DOOR OPENING TRIM



5. REMOVE CENTER PILLAR LOWER GARNISH

(a) Remove the lower center pillar garnish cover.

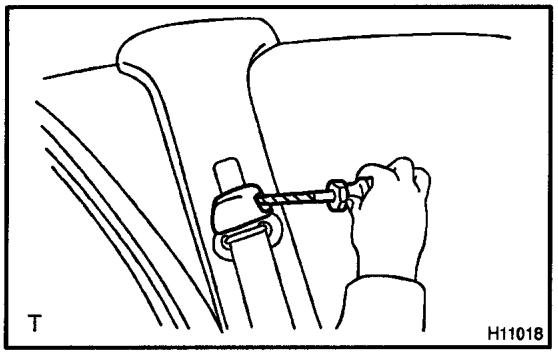
(b) Remove the floor anchor bolt.

(c) Remove the floor anchor.

(d) Insert a screwdriver between the garnish and body to pry the garnish out.

HINT:

Tape the screwdriver tip before use.



6. REMOVE FRONT SEAT OUTER BELT

(a) Using a screwdriver, remove the seat belt anchor cover cap.

HINT:

Tape the screwdriver tip before use.

(b) Remove the bolt and front seat outer belt shoulder anchor.

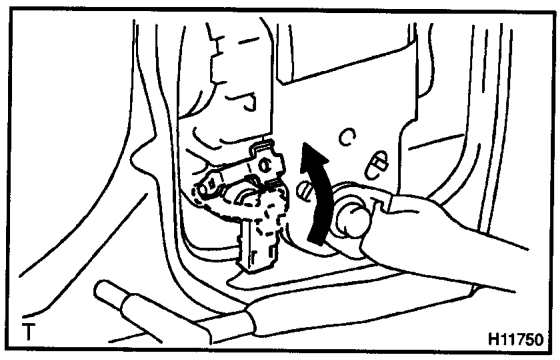
(c) Remove the retractor of front seat outer belt.

CAUTION:

Never disassemble the front seat outer belt.

NOTICE:

When removing the retractor of front seat outer belt, take care not to pull the seat belt pretensioner wire harness.



(1) Disconnect the pretensioner connector as shown in the illustration.

CAUTION:
When removing the seat belt pretensioner, it 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.

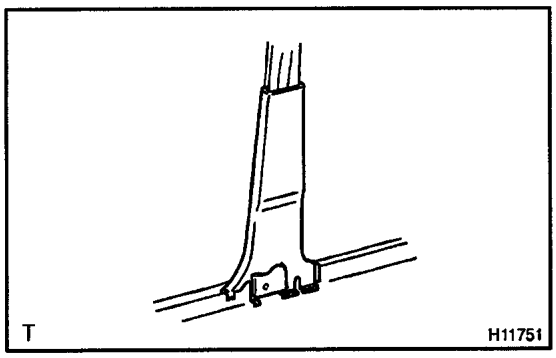
(2) Remove the bolt and retractor of the front seat outer belt.

BO259-03

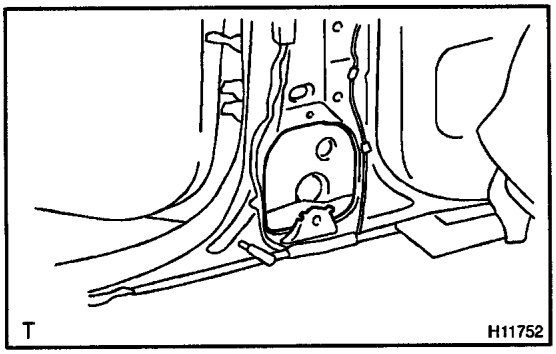
INSPECTION

1. PRETENSIONER IS NOT ACTIVATED

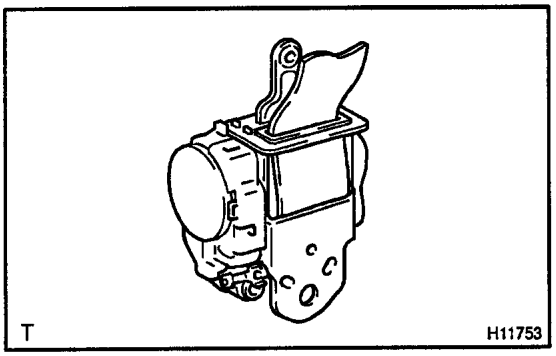
(a) Perform a diagnostic system check.
(See page DI–102)



(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, or marked discoloration on the center pillar lower garnish.
- Check for cuts and cracks in the wire harness, and for chipping in the connectors.



- Check for deformation of the center pillar.



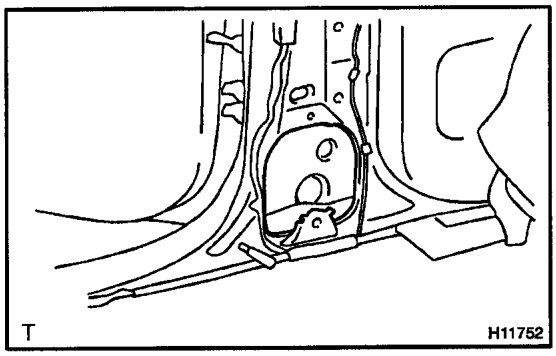
- Check for cuts and minute cracks in the wire harness or marked discoloration on the front seat outer belt.

CAUTION:
For removal and installation of the front seat outer belt, see page BO–124 and BO–133.
Be sure to follow the correct procedure.

2. PRETENSIONER IS ACTIVATED

(a) Perform a diagnostic system check.
(See page DI–102)

(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.

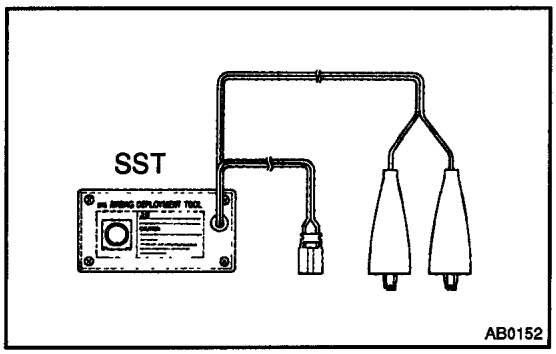


BO2DH-02

DISPOSAL

HINT:

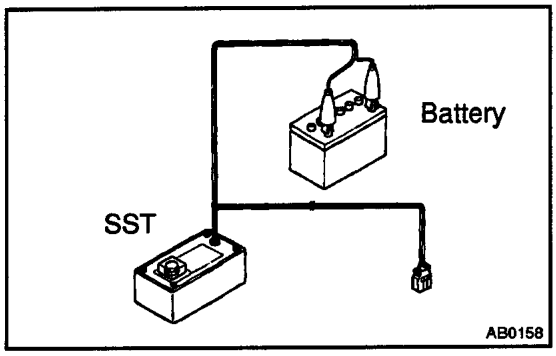
When scrapping vehicles equipped with a seat belt pretensioner or disposing of a front seat outer belt (with seat belt pretensioner), always first activate the seat belt pretensioner in accordance with the procedure described below. If any abnormality occurs in the seat belt pretensioner operation, contact the SERVICE DEPT. of 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–(e) in "DISPOSAL".



CAUTION:

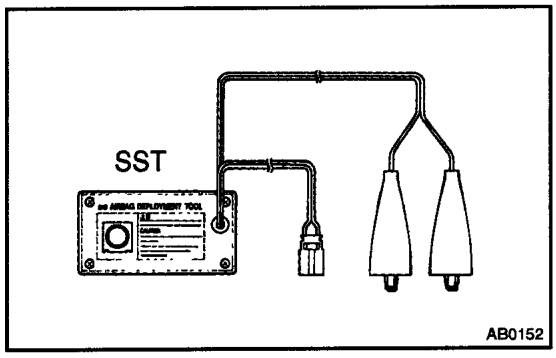
- **Never dispose of front seat outer belt which has an inactivated pretensioner.**
- **The seat belt pretensioner produces a sizeable exploding sound when it activates, so perform the operation out–of–door and where it will not create a nuisance to nearby residents.**
- **When activating the seat belt pretensioner, always use the specified SST. (SRS Airbag Deployment Tool) Perform the operation in a place away from electrical noise.**

  SST 09082–00700, 09082–00740
- **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

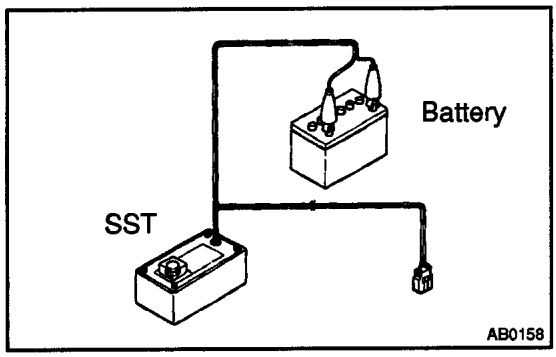
HINT:
Have a battery ready as the power source to activate the seat belt pretensioner.



(a) Check the functioning of SST.

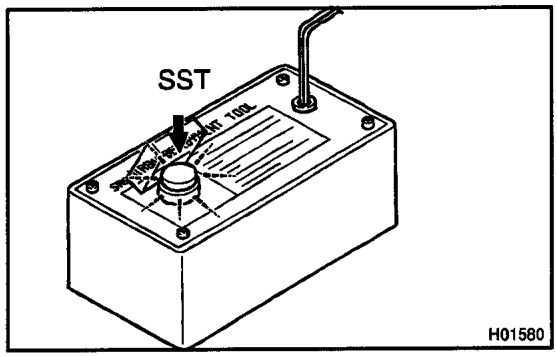
CAUTION:
When activating the seat belt pretensioner, always use the specified SST: SRS Airbag Deployment Tool.

SST 09082–00700, 09082–00740



(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.

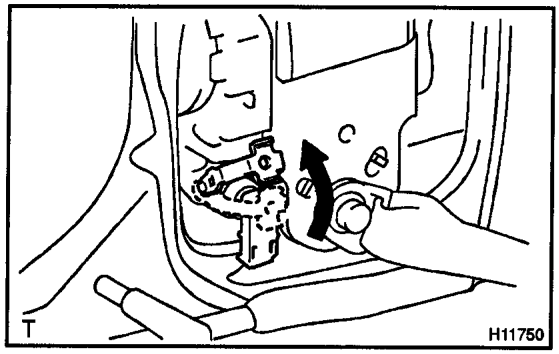
HINT:
Do not connect the yellow connector which will be connected with the seat belt pretensioner.



(2) 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.

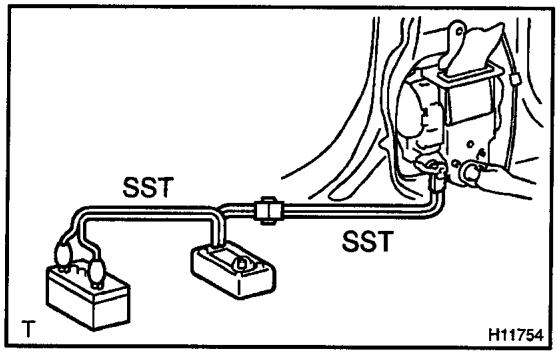
(b) Disconnect the pretensioner connector.
(1) Remove the front door inside scuff plate.
(2) Remove the rear door inside scuff plate.
(3) Remove the rear part of front door opening trim.
(4) Remove the front part of rear door opening trim.
(5) Remove the center pillar lower garnish.



(6) Disconnect the pretensioner connector as shown in the illustration.

(c) Install the SST.

(1) 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.

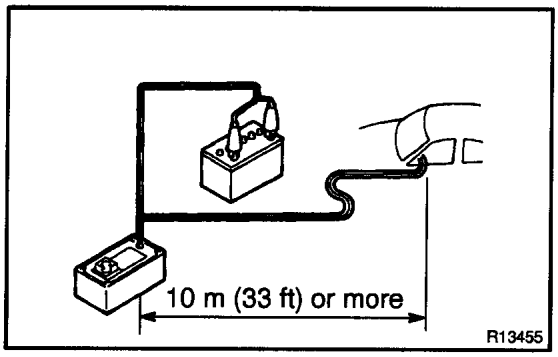


(2) Connect the 2 SST, then connect them to the seat belt pretensioner.

SST 09082–00700, 09082–00740

NOTICE:

To prevent damage to the SST connector and wire harness, do not lock the secondary lock of the twin lock.



(3) Move the SST to at least 10 m (33 ft) away from the front of the vehicle.

(4) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(5) Connect the SST red clip to the battery positive (+) terminal and the black clip to the negative (–) terminal.

(d) Activate the 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.

(e) Dispose of 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.**

HINT:
When scrapping a vehicle, dispose 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

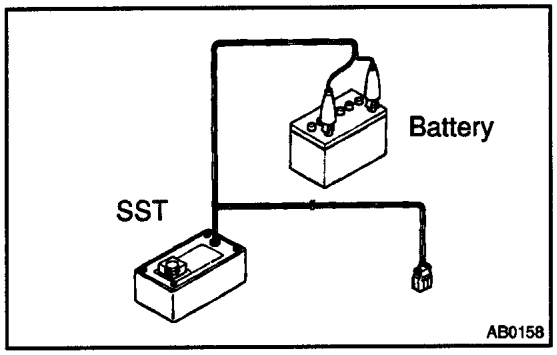
NOTICE:

- **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 on the next page when activating the seat belt pretensioner.**

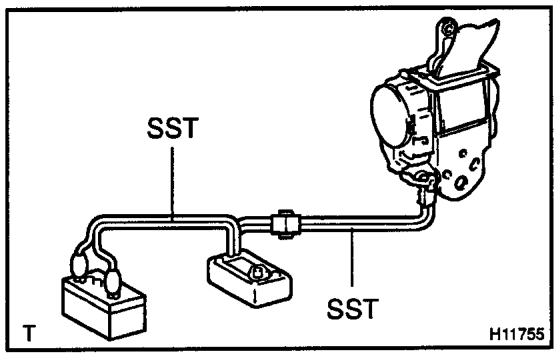
HINT:
Have a battery ready as the power source when activating the seat belt pretensioner.

(a) Remove the front seat outer belt (See page BO–121).

HINT:
Cut the belt near the seat belt retractor.

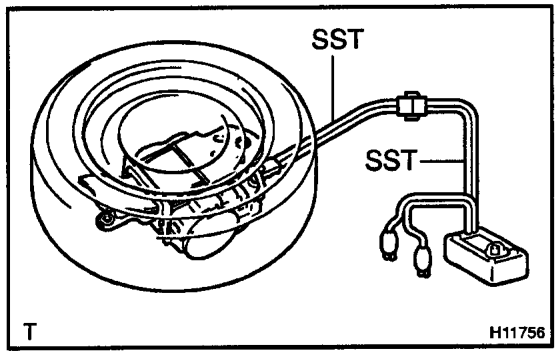


(b) Check functioning of SST (See step 1–(a)).
SST 09082–00700, 09082–00740



(c) Install the SST.
(1) Connect the 2 SST, then connect them to the seat belt pretensioner.
SST 09082–00700, 09082–00740

NOTICE:
To prevent damage to 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.

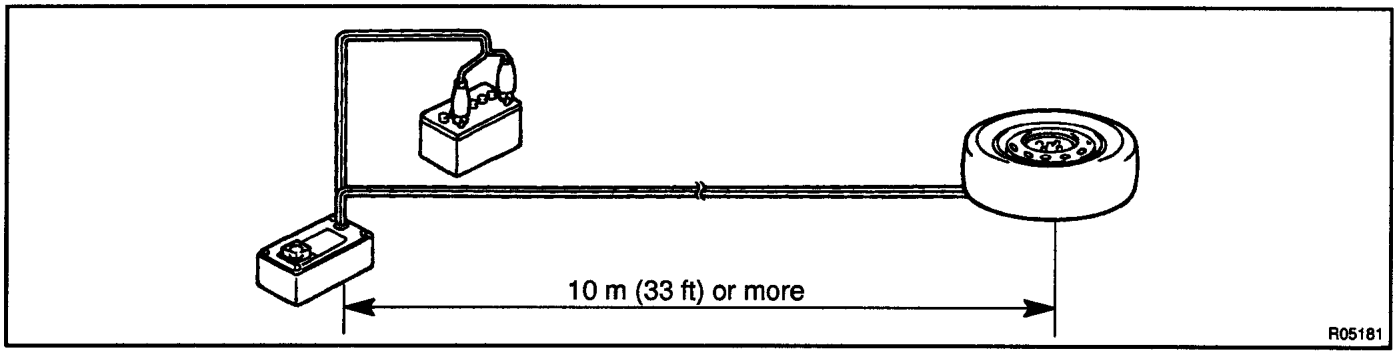
(3) Move the SST as least 10 m (33 ft) away from the disc wheel.

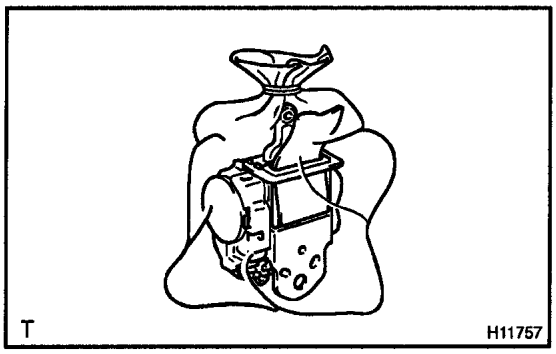
NOTICE:
Take care not to damage the SST wire harness.

(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 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.

BO1QY-06

REPLACEMENT

REPLACEMENT 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 checking items 1–(b) or 2–(b) (See page BO–126).
- If the front seat outer belt has been dropped.

CAUTION:

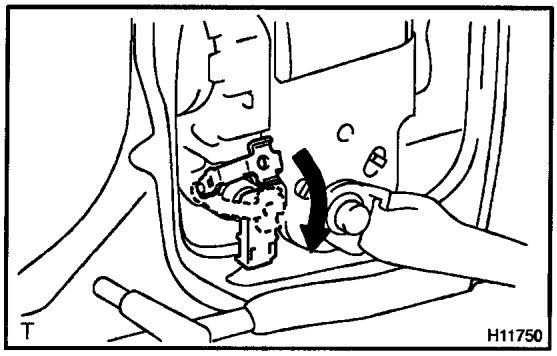
For removal and installation of the seat belt pretensioner, see page BO–124 and BO–133.
Be sure to follow the correct procedure.

BO2R9-01

INSTALLATION

NOTICE:

- **Never use a seat belt pretensioner removed from other vehicle. When replacing parts, replace them with new ones.**
- **Make sure that the front seat outer belt is installed in 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.**



1. INSTALL FRONT SEAT OUTER BELT

(a) Install the retractor of front seat outer belt.

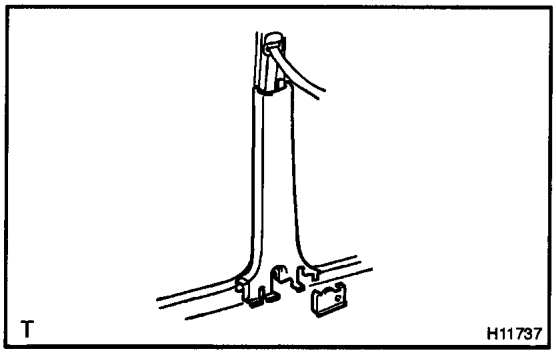
(1) Install the retractor of front seat outer belt with the bolt.

Torque:
Upper: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
Lower: 42 N·m (430 kgf·cm, 31 ft·lbf)

(2) Connect the pretensioner connector as shown in the illustration.

(b) Install the shoulder anchor with the bolt.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(c) Install the shoulder anchor cover.



2. INSTALL CENTER PILLAR LOWER GARNISH

(a) Install the center pillar lower garnish to the body.

(b) Install the floor anchor with bolt.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

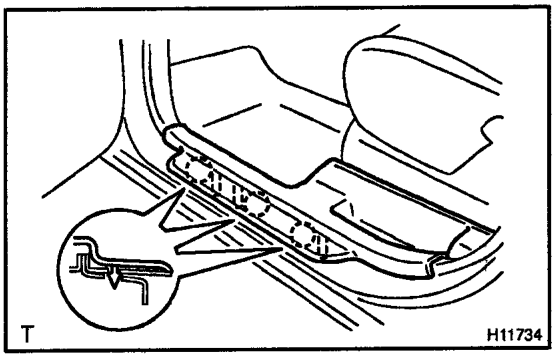
(c) Install the lower center pillar garnish cover.

3. INSTALL FRONT PART OF REAR DOOR OPENING TRIM

4. INSTALL REAR PART OF FRONT DOOR OPENING TRIM

5. INSTALL REAR DOOR SCUFF PLATE

Install the rear door scuff plate to the body.



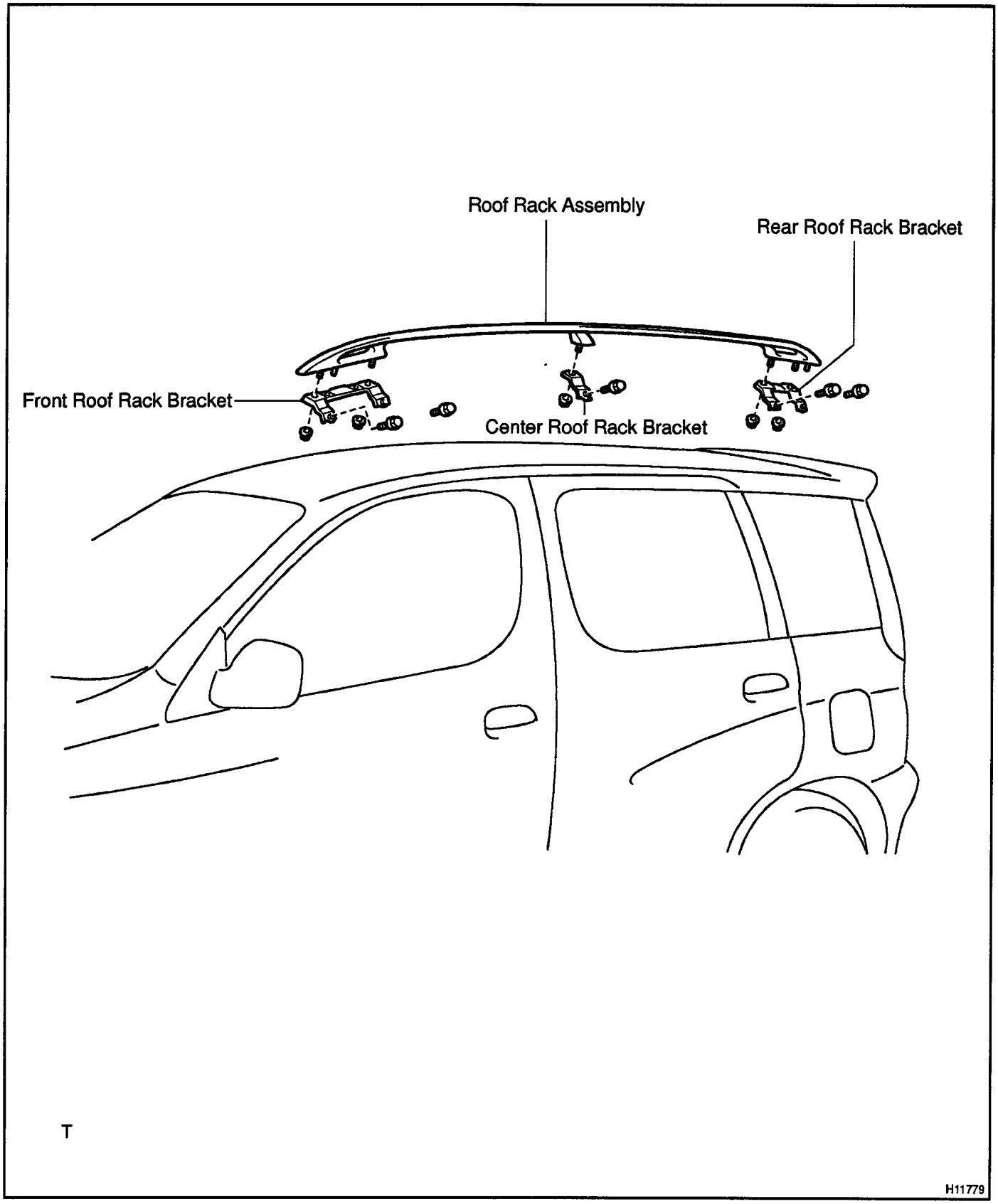
6. INSTALL FRONT DOOR SCUFF PLATE

Install the front door scuff plate to the body.

ROOF RAIL

COMPONENTS

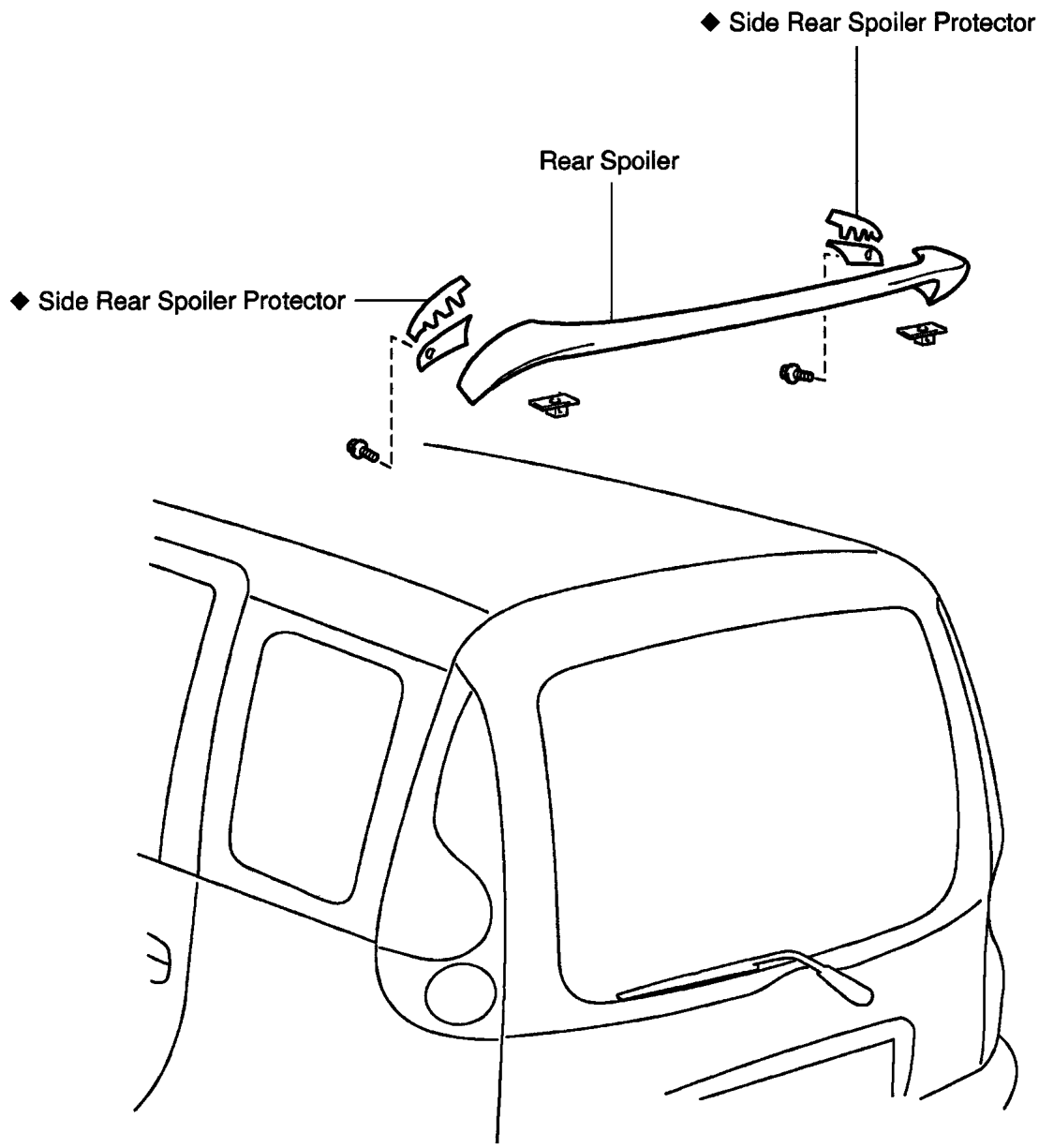
BO1B3-02



SPOILER

COMPONENTS

BO2RL–01



T

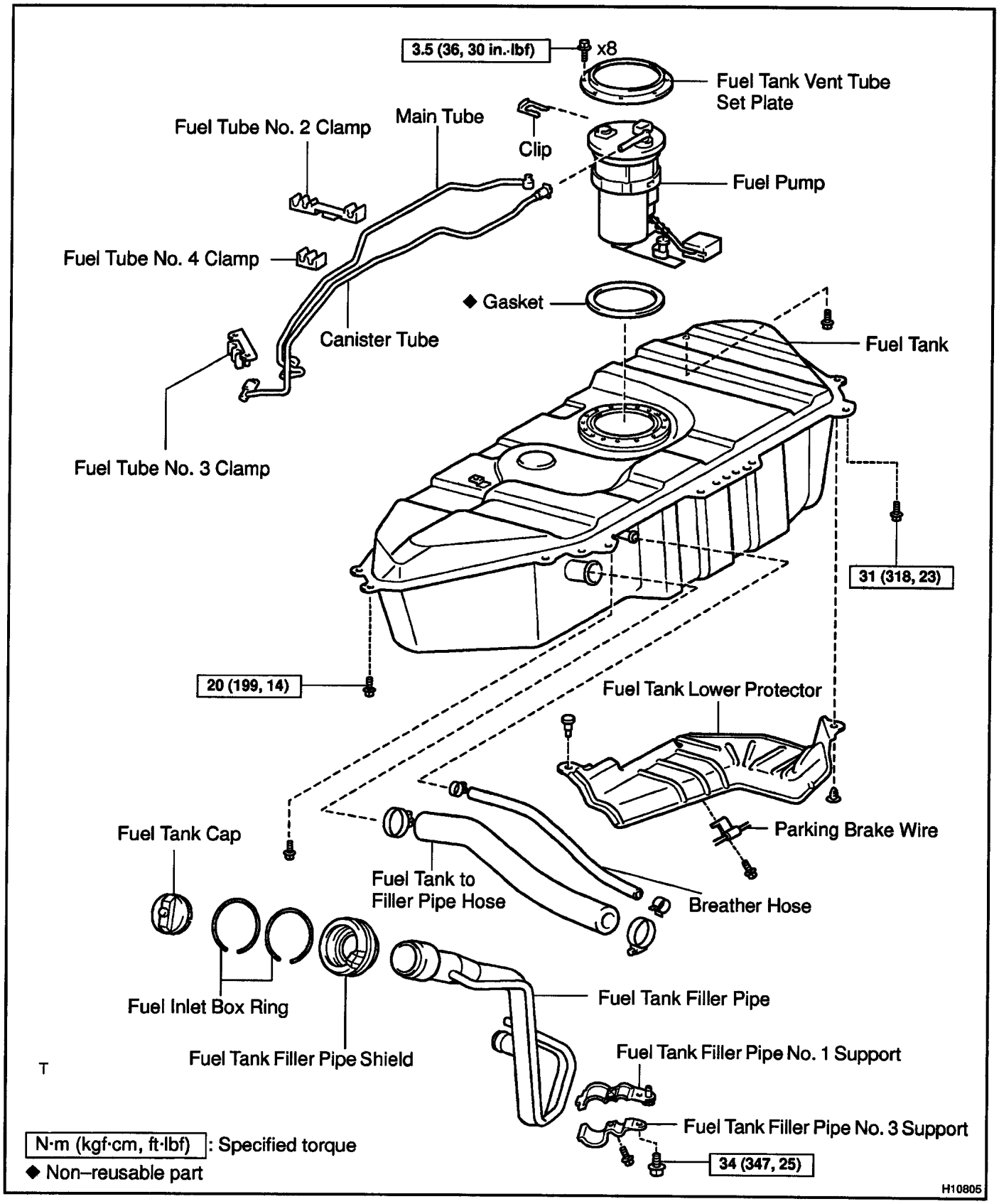
◆ Non–reusable part

H11780

FUEL TANK AND LINE

COMPONENTS

BO2IU-02



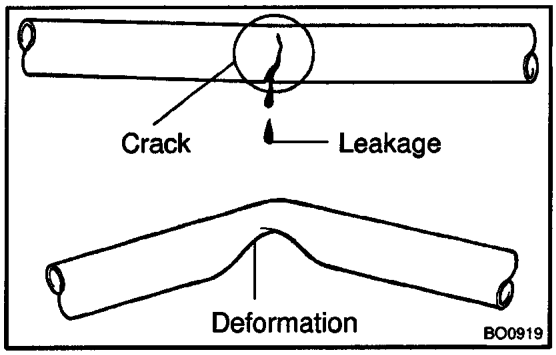
BO2IV-02

INSPECTION

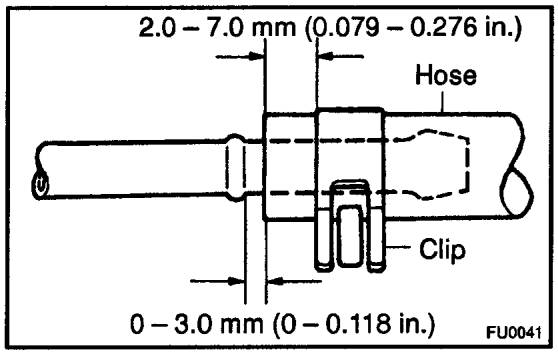
NOTICE:

- **Always use new gaskets when replacing the fuel tank or component 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 bend or damage.
(c) Check the fuel tank for deformation, cracks, fuel leakage or tank band looseness.
(d) Check the inlet pipe for damage or fuel leakage.

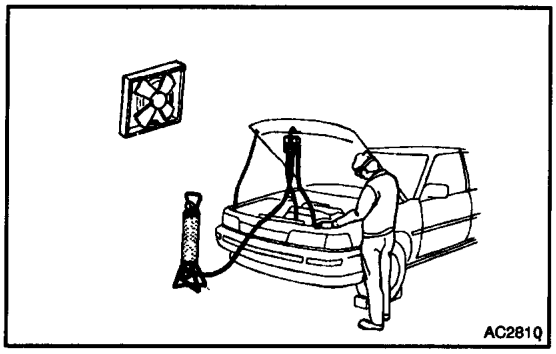


(e) Make sure that the hose clamps do not interfere with the tank, tubes, hoses and other parts.

If a problem is found, repair or replace the parts as necessary.

AIR CONDITIONING

AIR CONDITIONING SYSTEM AC–1
TROUBLESHOOTING AC–14
DRIVE BELT AC–16
MANIFOLD GAUGE SET AC–19
REFRIGERANT LINE AC–21
AIR CONDITIONER UNIT AC–24
HEATER UNIT AC–35
COMPRESSOR AND
MAGNETIC CLUTCH AC–43
CONDENSER AC–50
EXPANSION VALVE AC–56
BLOWER MOTOR AC–58
BLOWER RESISTOR AC–60
AIR INLET SERVOMOTOR AC–61
THERMISTOR AC–62
PRESSURE SWITCH AC–63
HEATER MAIN RELAY AC–66
HEATER SUB RELAY AC–67
MAGNETIC CLUTCH RELAY AC–68
COOLING FAN RELAY AC–69
CONDENSER FAN AC–70
CONDENSER FAN RESISTOR AC–76
AIR CONDITIONER AMPLIFIER AC–77
HEATER CONTROL ASSEMBLY AC–84
HEATER CONTROL ASSEMBLY
(Center Cluster Integration) AC–92
WATER TEMPERATURE SWITCH AC–96
AIR REFINER FILTER AC–97

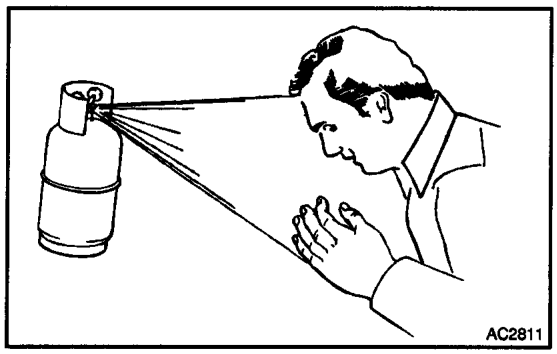


AIR CONDITIONING SYSTEM

PRECAUTION

AC0C1-07

1. **DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR WEAR A NAKED FLAME**
2. **ALWAYS WEAR EYE PROTECTION**



3. **BE CAREFUL NOT TO GET LIQUID REFRIGERANT IN YOUR EYES OR ON YOUR SKIN**

If liquid refrigerant gets in your eyes or on your skin.

(a) Wash the area with lots of cool water.

CAUTION:

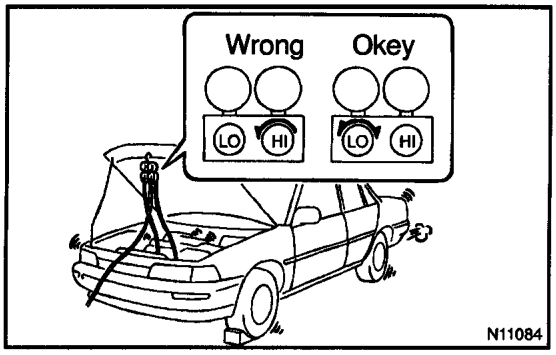
Do not rub your eyes or skin.

(b) Apply clean petroleum jelly to the skin.

(c) Go immediately to a physician or hospital for professional treatment.

4. **NEVER HEAT CONTAINER OR EXPOSE IT TO NAKED FLAME**
5. **BE CAREFUL NOT TO DROP CONTAINER AND NOT TO APPLY PHYSICAL SHOCKS TO IT**

AC



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.

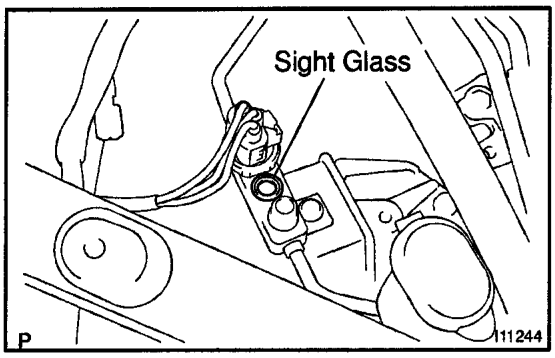
8. **BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT**

If refrigerant is overcharged, it causes problems such as insufficient cooling, poor fuel economy, engine overheating etc.

9. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The YARIS VERSO / ECHO VERSO 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 tn the RS section.

AC22F-04



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: "HI" position
- A/C switch ON
- Temperature control selector: "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 conditioning is turned off, refrigerant in sight glass stays clear	Too much	(1) Discharge refrigerant (2) Evacuate air and charge proper amount or purified refrigerant
6	When air conditioning 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

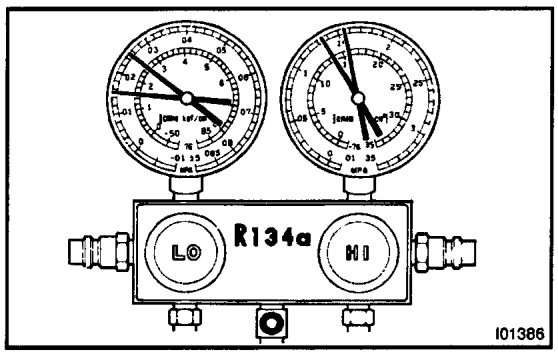
This is a method in witch the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when the these conditions are established.

Test conditions:

- Temperature at the air inlet with the switch set at RECIRC is 30 – 35 °C (86 – 95 °F)
- Engine running at 1500 rpm
- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position

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:

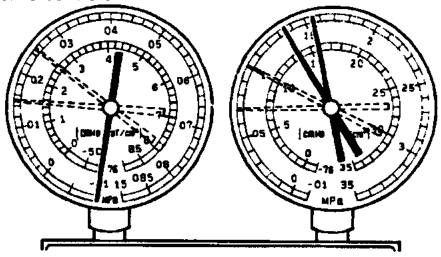
0.15 – 0.25 MPa (1.5 – 2.5 kgf/cm^2)

High pressure side:

1.37 – 1.57 MPa (14 – 16 kgf/cm^2)

(2) Moisture present in refrigeration system.

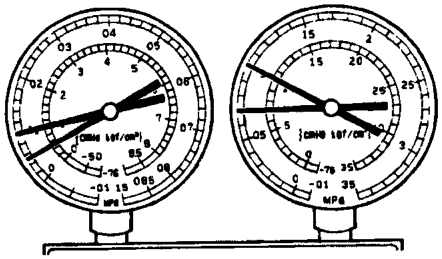
Condition : Periodically cools and then fails to cool



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 oversaturected state • Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	(1) Replace drier (2) Remove moisture in cycle through repeatedly evacuating air (3) Charge proper amount of new refrigerant

(3) Insufficient cooling

Condition: Insufficient cooling

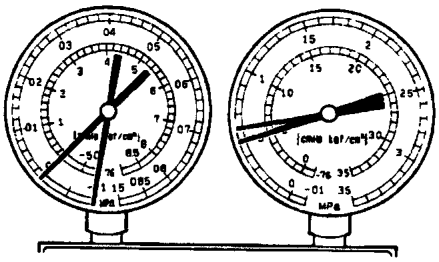


I01388

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



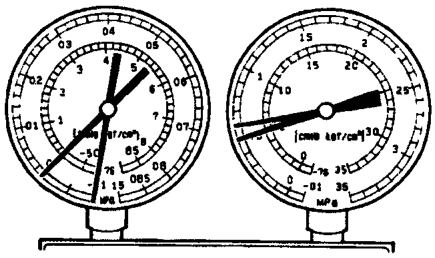
I01389

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low in both low and high pressure sides • Frost on tube from receiver to unit	Refrigerant flow obstructed by dirt in drier	Condenser clogged	Replace drier

AC

(5) Refrigerant does not circulate

Condition: Does not cool (Cools from time to time in some cases)



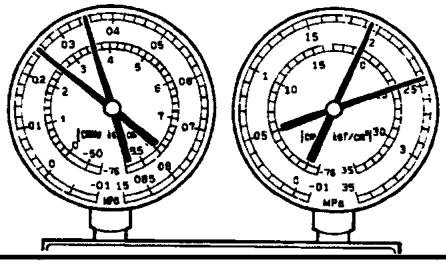
I01449

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 drier (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

AC

Condition: Insufficient cooling

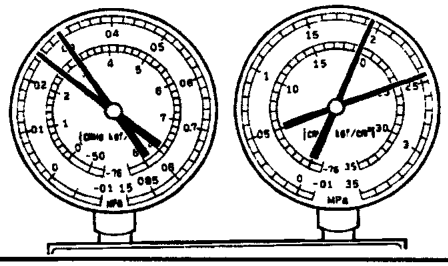


I01390

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • No sir bubbles seen through the sight glass even when the engine rpm is lowered	• Unable to develop sufficient performance due to excessive refrigerant • Insufficient cooling of condenser	• Excessive refrigerant in cycle→refrigerant overcharged • Condenser cooling → condenser fins clogged or condenser fan faulty	(1) Clean condenser (2) Check cooling fan with fluid coupling 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



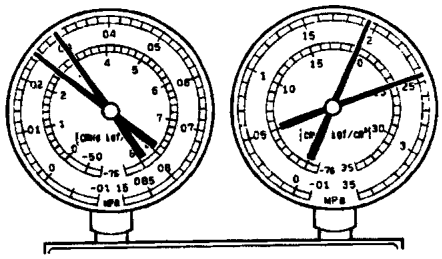
NOTE : These gauge indications are shown when the refrigeration system has been opens and the refrigerant charged without vacuum purging.

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 the 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 see if it is dirty or insufficient (2) Evacuate air and charge new refrigerant

(8) Expansion valve improperly

Condition: Insufficient cooling



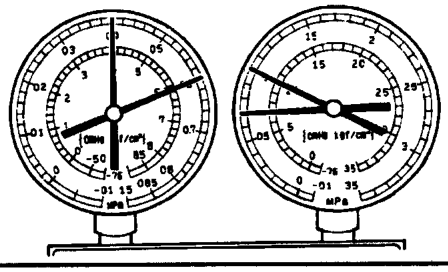
I01450

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

AC

(9) Defective compression compressor

Condition : Does not cool



I01393

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on low high pressure sides • Pressure too low to on high pressure side	Internal leak in compressor	• Compression defective • Valve leaking or broken sliding parts	Repair or replace compressor

3. 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
- Put gear shaft in neutral
- Temperature control dial at "COOL" position

M/T:

Magnetic clutch condition	Idle–up speed
Magnetic clutch not engaged	600 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at low)	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at high)	875 ± 50 rpm

If idle speed is not as specified, check idle control system.

A/T:

Magnetic clutch condition	Idle–up speed
Magnetic clutch not engaged	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at low)	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at high)	875 ± 50 rpm

If idle speed is not as specified, check idle control system.

AC

4. INSPECT FOR LEAKAGE OF REFRIGERANT

(a) Perform in these conditions:
- Stop engine.
- Secure good ventilation (If not the gas leak detector may react to volatile gases witch 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 stopped, leave the cooling unit for more than 15 minutes.
- Expose the gas leak detector sensor the 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.

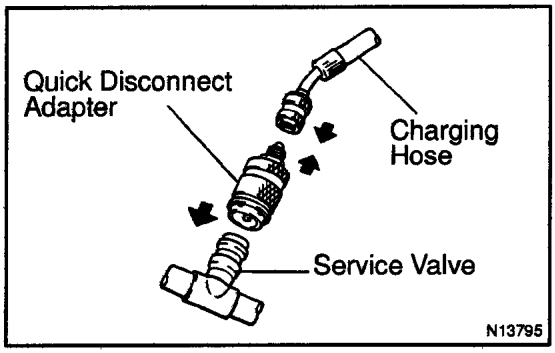
(c) If gas leak is not detected on the drain hose, remove the blower resistor from the cooling unit. Then insert the gas leak detector sensor into the unit and perform the test.

(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 and perform the test.

AC0C4-06

EVACUATING



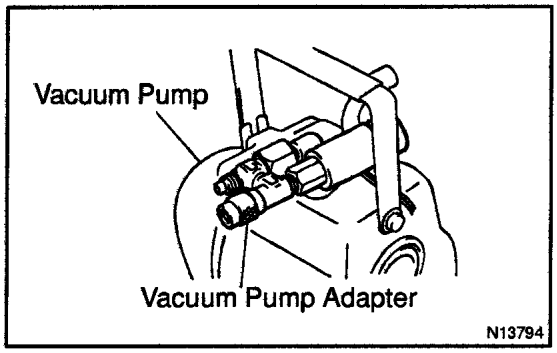
1. CONNECT QUICK DISCONNECT ADAPTER TO CHARGING HOSES

2. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINES

3. SET ON MANIFOLD GAUGE SET

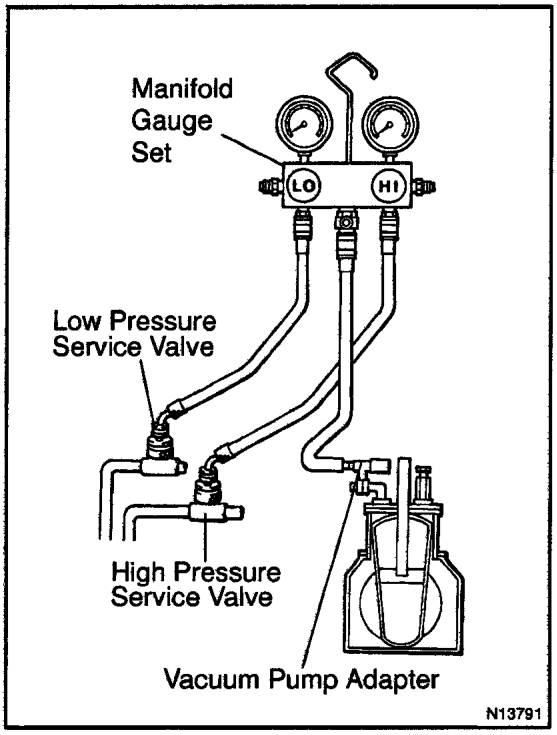
(a) Close both hand valves of manifold gauge set.

(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 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 necessary.

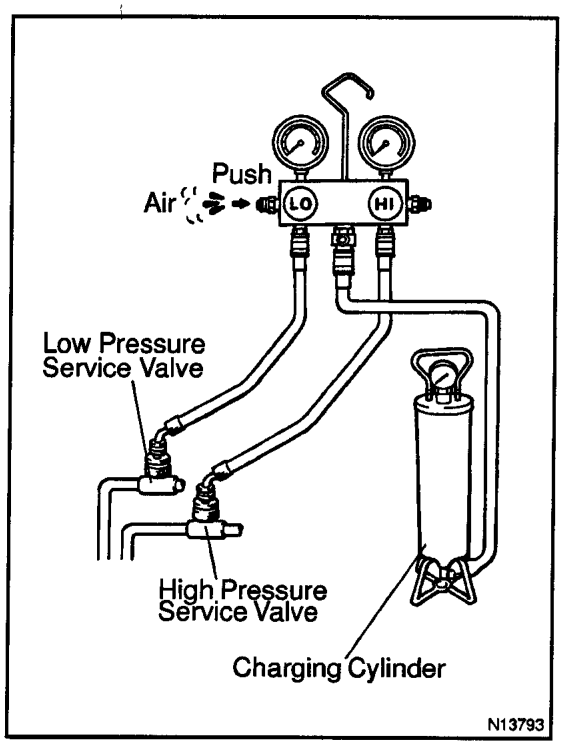
(e) Close both the high and low hand valves and stop the vacuum pump.

(f) Leave the system in this condition for 5 minutes or more and check that there is no gauge indicator.

AC

AC22G-04

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.

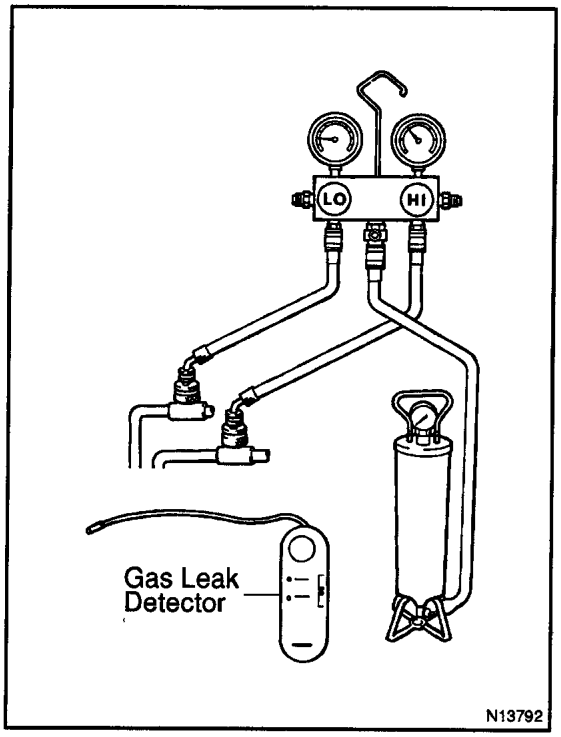
(b) Connect the center hose to the charging cylinder.

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

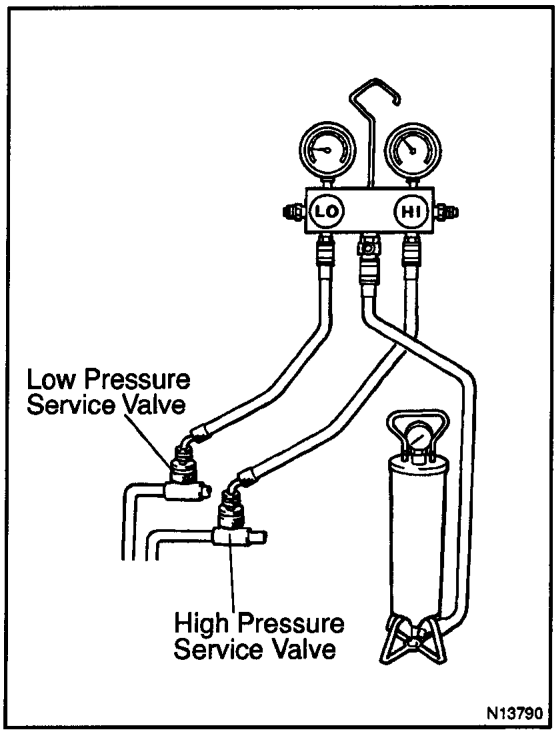
(a) Open the high pressure hand valve and charge refrigerant.

(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.

CAUTION:

Use the refrigerant recovery/ recycling machine to recover the refrigerant whenever replacing parts.



3. CHARGE REFRIGERANT INTO REFRIGERANT SYSTEM

If there is no leak after refrigerant leak check, charge the proper amount of refrigerant into 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 the 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.

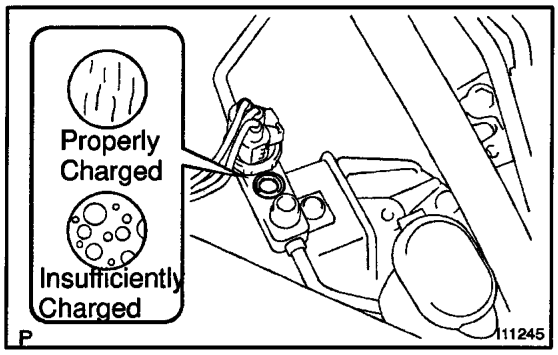
(1) Set vehicle in these condition:

- Running engine at 1,500 rpm
- Blower speed control switch: "HI"
- Temperature control selector: "MAX. COOL"
- Air inlet control selector: "RECIRC"
- Fully open doors (Sliding roof: closed)

(2) Open the low pressure hand valve.

CAUTION:

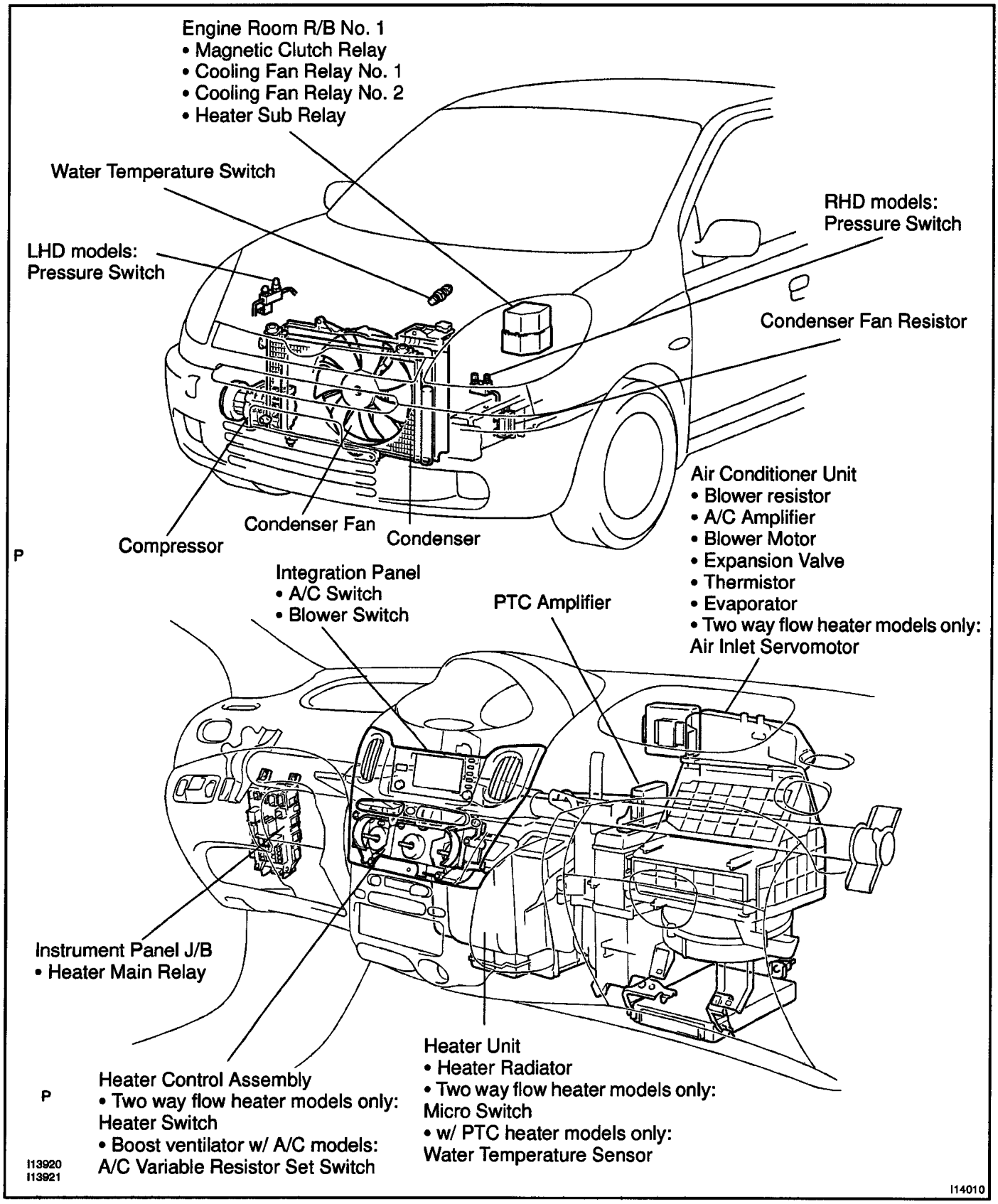
Do not open the high pressure hand valve.



(d) Charge refrigerant until bubbles disappear and check the pressure on the gauge through the sight glass.

AC0C6-07

LOCATION



TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

AC27Y-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.

Standard:

Symptom	Suspect Area	See page
No blower operation	1. HTR Fuse	–
	2. Heater main relay	AC–66
	3. Blower motor	AC–58
	4. Blower resistor	AC–60
	5. Blower speed control switch	AC–94
	6. Wire harness	–
No air temperature control	1. Engine coolant volume	–
	2. Heater control assembly	AC–84
No compressor operation	1. Refrigerant volume	AC–3
	2. A.C Fuse	–
	3. Magnetic clutch relay	AC–68
	4. Magnetic clutch	AC–43
	5. Compressor	AC–43
	6. Pressure switch	AC–63
	7. A/C switch	AC–94
	*1 A/C variable resistor set switch	AC–88
	8. A/C amplifier	AC–77
	9. Thermistor	AC–62
	10.Wire harness	–
No cool air comes out	1. Refrigerant volume	AC–3
	2. Refrigerant pressure	AC–3
	3. Drive belt	AC–16
	4. Magnetic clutch	AC–43
	5. Compressor	AC–43
	6. Pressure switch	AC–63
	7. Thermistor	AC–62
	8. A/C switch	AC–94
	9. A/C amplifier	AC–77
	10.Heater control assembly	AC–84
	11.Wire harness	–
Insufficient cooling	1. Refrigerant volume	AC–3
	2. Drive belt	AC–16
	3. Magnetic clutch	AC–43
	4. Compressor	AC–43
	5. Condenser	AC–50
	6. Expansion valve	AC–56
	7. Evaporator	AC–32
	8. Refrigerant lines	AC–21
	9. Pressure switch	AC–63
	10.A/C amplifier	AC–77
	11.Heater control assembly	AC–84
No engine idle–up when A/C switch ON	1. A/C amplifier	AC–77
	2. Engine (and ECT) ECU	–
	3. Wire harness	–
No air inlet control	Heater control assembly	AC–84
No mode control	Heater control assembly	AC–84

Symptom	Suspect Area	See page
No condenser fan operation	1. ECU – IG Fuse	–
	2. RDI Fuse	–
	3. Fan No. 1 relay	AC–69
	4. Water temperature switch	AC–96
	5. Fan motor	AC–70
	6. A/C amplifier	AC–77
	7. Engine (and ECT) ECU	–
	8. Wire harness	–
No condenser fan speed change	1. Fan No. 2 relay	AC–69
	2. Pressure switch	AC–63
	3. Condenser fan resistor	AC–76
	4. A/C amplifier	AC–77
	5. Wire harness	–

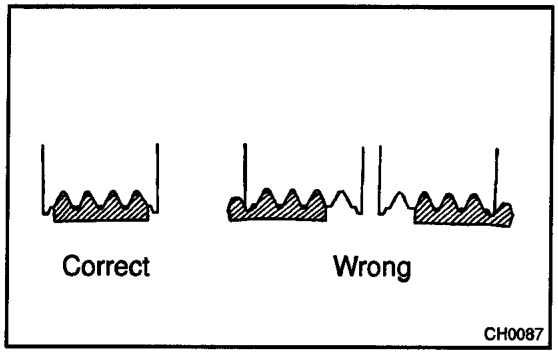
*1: Boost ventilator A/C models

Two way flow heater:

Symptom	Suspect Area	See page
No blower operation	1. GAUGE Fuse	–
	2. HTR Fuse	–
	3. Heater main relay	AC–66
	4. Blower motor	AC–58
	5. Blower resistor	AC–60
	6. Blower speed control switch	AC–94
	7. Wire harness	–
No air inlet control	1. ECU – IG Fuse	–
	2. Air inlet servomotor	AC–61
	3. Heater switch (Heater control assembly)	AC–88
	4. PTC amplifier	AC–77
	5. Wire harness	–
Air inlet door does not operate on the two way flow position, when perform in these conditions: • Air inlet selector: FRESH • Blower switch: ON • Temperature control selector: MAX. WARM • Mode selector: FOOT or FOOT/DEF.	1. A/C Fuse	–
	2. Micro switch (for MAX. WARM)	AC–40
	3. Micro switch (for FOOT, FOOT/DEF.)	AC–40
	4. Heater switch (Heater control assembly)	AC–88
	5. PTC amplifier	AC–77
	6. Air inlet servomotor	AC–61
	7. Wire harness	–

PTC heater:

Symptom	Suspect Area	See page
PTC heater does not operate, when perform in these conditions: • Engine coolant temp.: 60 °C (140 °F) or below • Engine speed: 650 rpm or above • Temperature control selector: MAX. COOL	1. A/C Fuse	–
	2. Micro switch (for MAX. WARM)	AC–40
	3. Micro switch (for FOOT, FOOT/DEF.)	AC–40
	4. Heater switch (Heater control assembly)	AC–88
	5. PTC heater (Heater radiator)	AC–40
	6. PTC amplifier	AC–77
	7. Air inlet servomotor	AC–61
	8. Wire harness	–



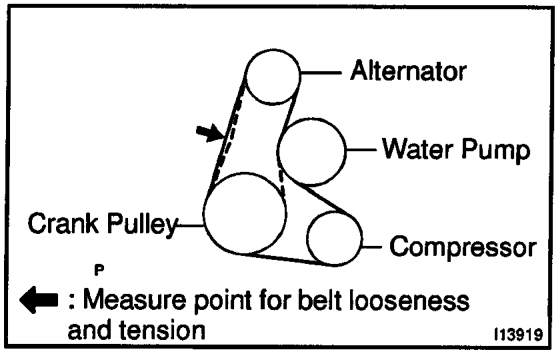
DRIVE BELT

ON–VEHICLE INSPECTION

AC2HJ-01

1. INSPECT DRIVE BELT'S INSTALLATION CONDITION

Check that the drive belt fits properly in the ribbed grooves.



2. INSPECT DRIVE BELT DEFLECTION

(a) Using a belt tension gauge, apply load of 98 N (10 kgf, 22 lbf).

(b) Measure drive belt deflection.

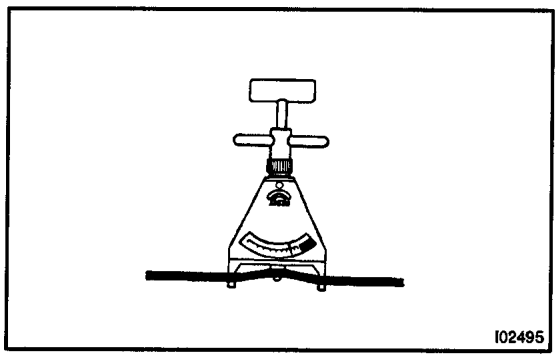
Drive belt deflection:

New belt: 7.0 – 8.5 mm (0.28 – 0.33 in.)

Used belt: 11.0 – 13.0 mm (0.43 – 0.51 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 the drive belt, check that it fits properly in the ribbed grooves.



3. INSPECT DRIVE BELT TENSION (Reference)

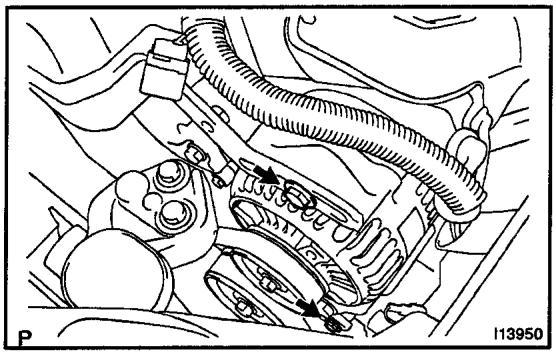
Using a belt tension gauge, check the drive belt tension.

Drive belt tension:

New belt: 540 – 640 N (55 – 65 kgf)

Used belt: 250 – 390 N (25 – 40 kgf)

AC2HK-01



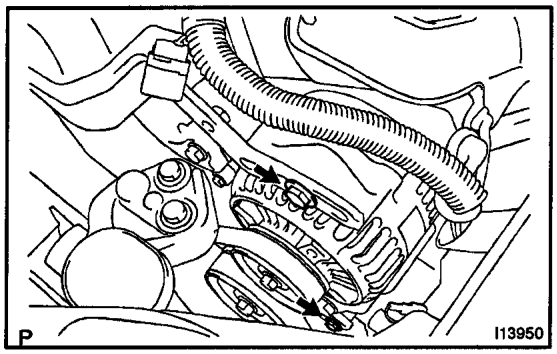
REMOVAL

REMOVE DRIVE BELT

(a) Loosen the pivot bolts.

(b) Loosen the drive belt tension by turning adjusting bolt and remove the drive belt.

AC2HL-01



INSTALLATION

INSTALL DRIVE BELT

(a) Install the drive belt.

(b) Apply drive belt tension by turning adjusting bolt.

Drive belt tension

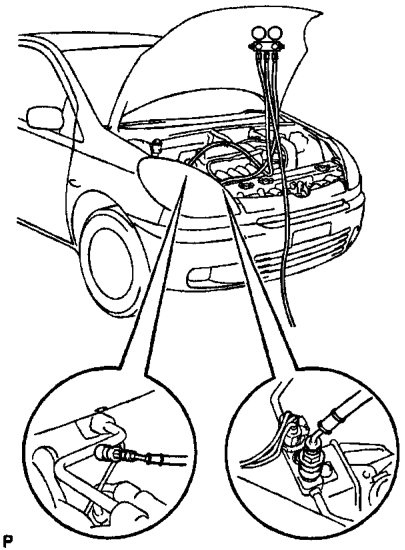
New belt: 7.0 – 8.5 (0.28 – 0.33 in.)

Used belt: 11.0 – 13.0 (0.43 – 0.51 in.)

(c) Tighten the pivot bolts.

Torque: 54 N·m (540 kgf·cm, 39 ft·lbf)

LHD:



MANIFOLD GAUGE SET

AC281-02

SET ON

1. CONNECT CHARGE HOSE TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

CAUTION:

Do not connect the wrong hoses.

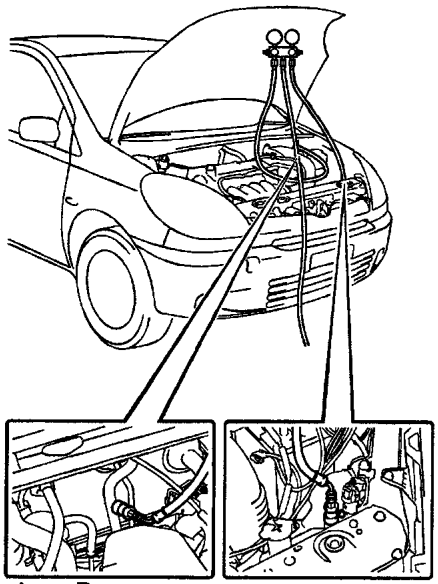
2. CONNECT QUICK DISCONNECT ADAPTERS TO CHARGING HOSES

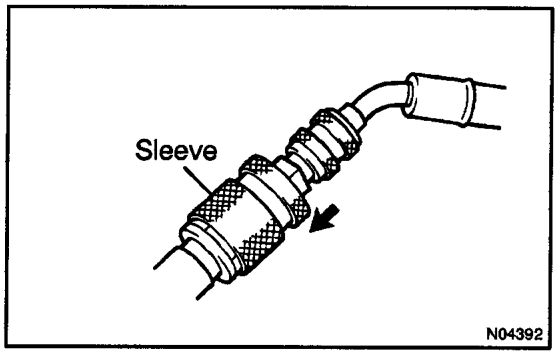
Tighten the nuts by hand.

3. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

4. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINE

RHD:



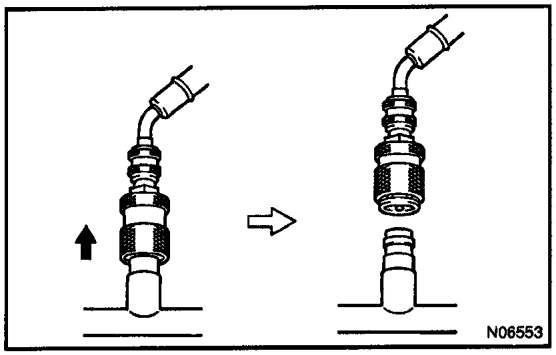


5. CONNECT QUICK DISCONNECT ADAPTERS TO SERVICE VALVES

HINT:

Push the quick disconnect adapter onto the service valve, then slide, then slide the sleeve of the quick disconnect adapter downward to lock it.

AC0CB-04



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

AC0CC-01

ON–VEHICLE INSPECTION

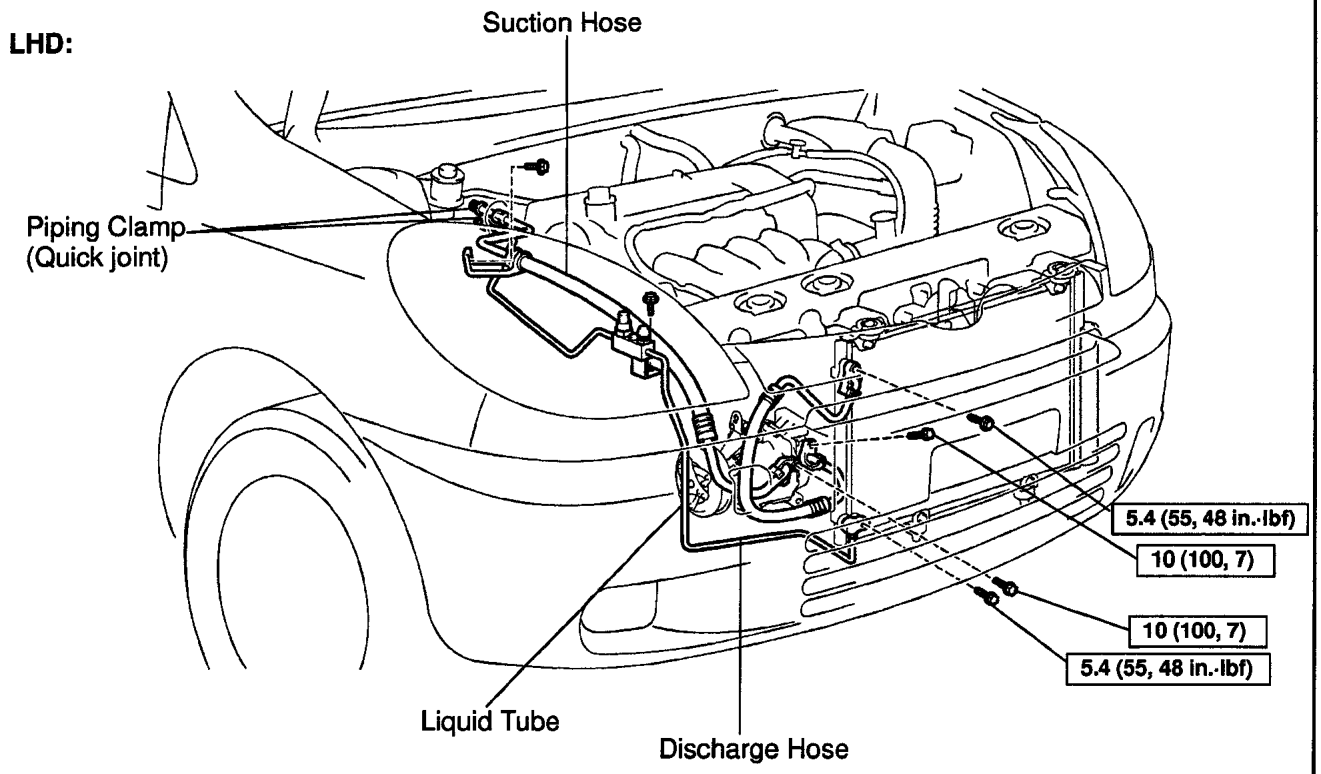
1. INSPECTION HOSE AND TUBE CONNECTIONS FOR LOOSENESS

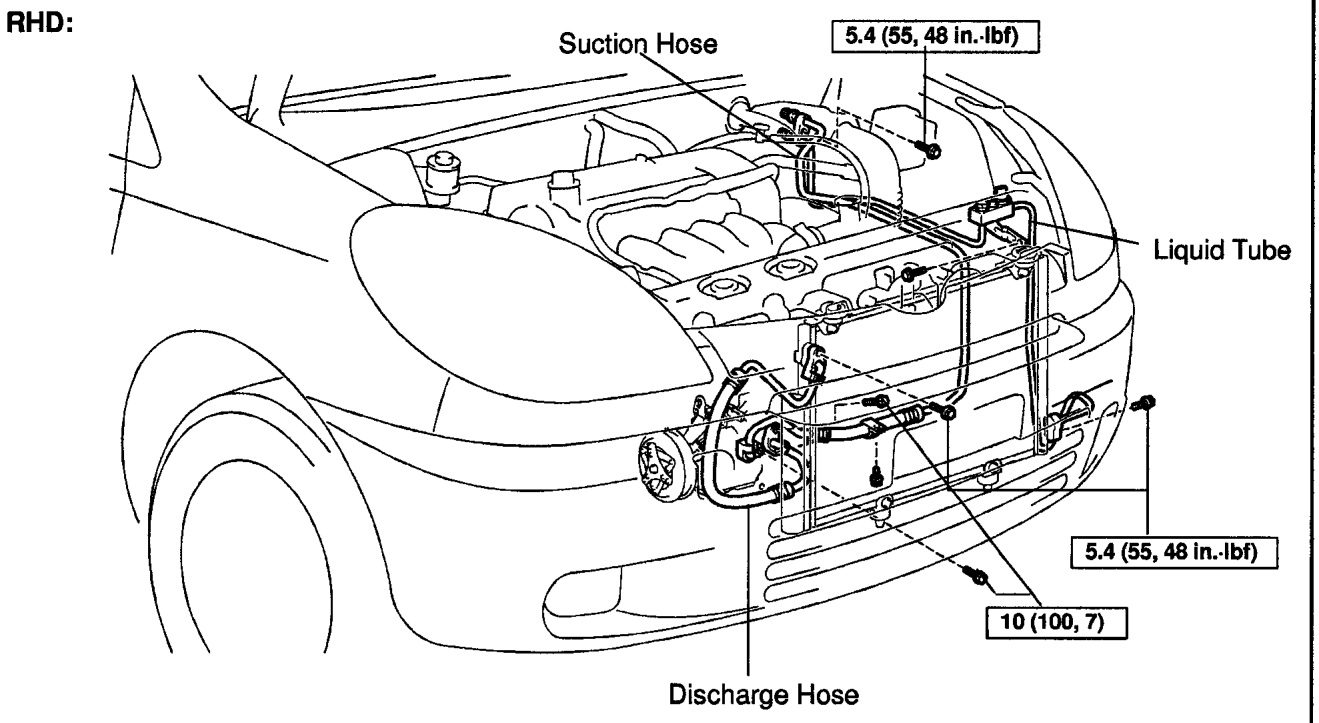
2. INSPECT HOSES AND TUBES FOR LEAKAGE

Using a gas leak detector, check for leakage of refrigerant.

AC282-02

COMPONENTS





N·m (kgf·cm, ft·lbf) : Specified torque

P

I14011

ACDCE-04

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	5.4	55	48 in.·lbf
Condenser x Liquid tube	5.4	55	48 in.·lbf
A/C unit x Liquid and Suction hose (RHD only)	5.4	55	48 in.·lbf

4. EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE SYSTEM WITH REFRIGERANT

Specified amount: 430 ± 30g (15.17 ± 1.06 oz.)

5. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

6. INSPECT AIR CONDITIONING OPERATION

AIR CONDITIONER UNIT

AC283-01

ON–VEHICLE INSPECTION

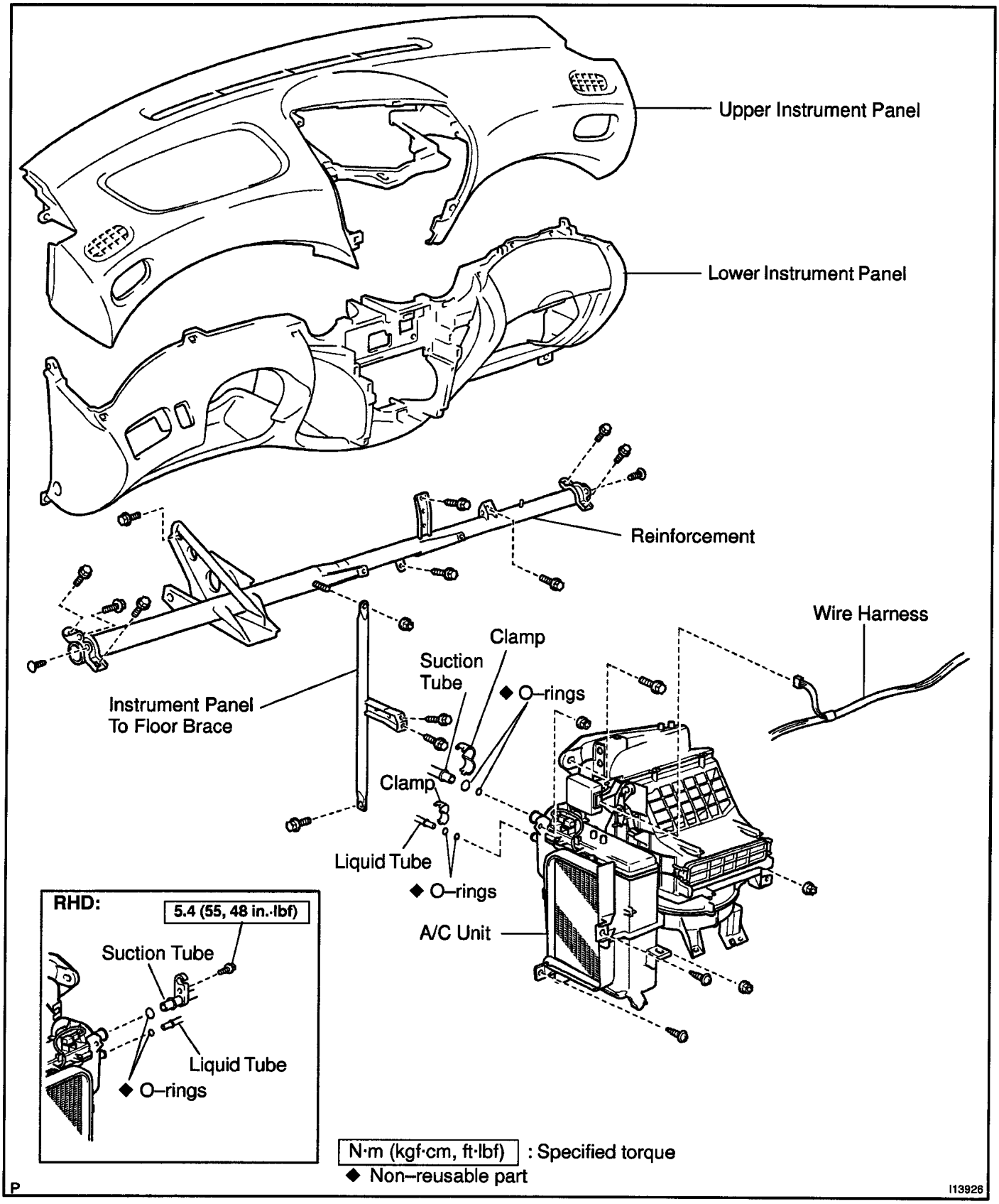
INSPECT FOR LEAKAGE OF REFRIGERANT

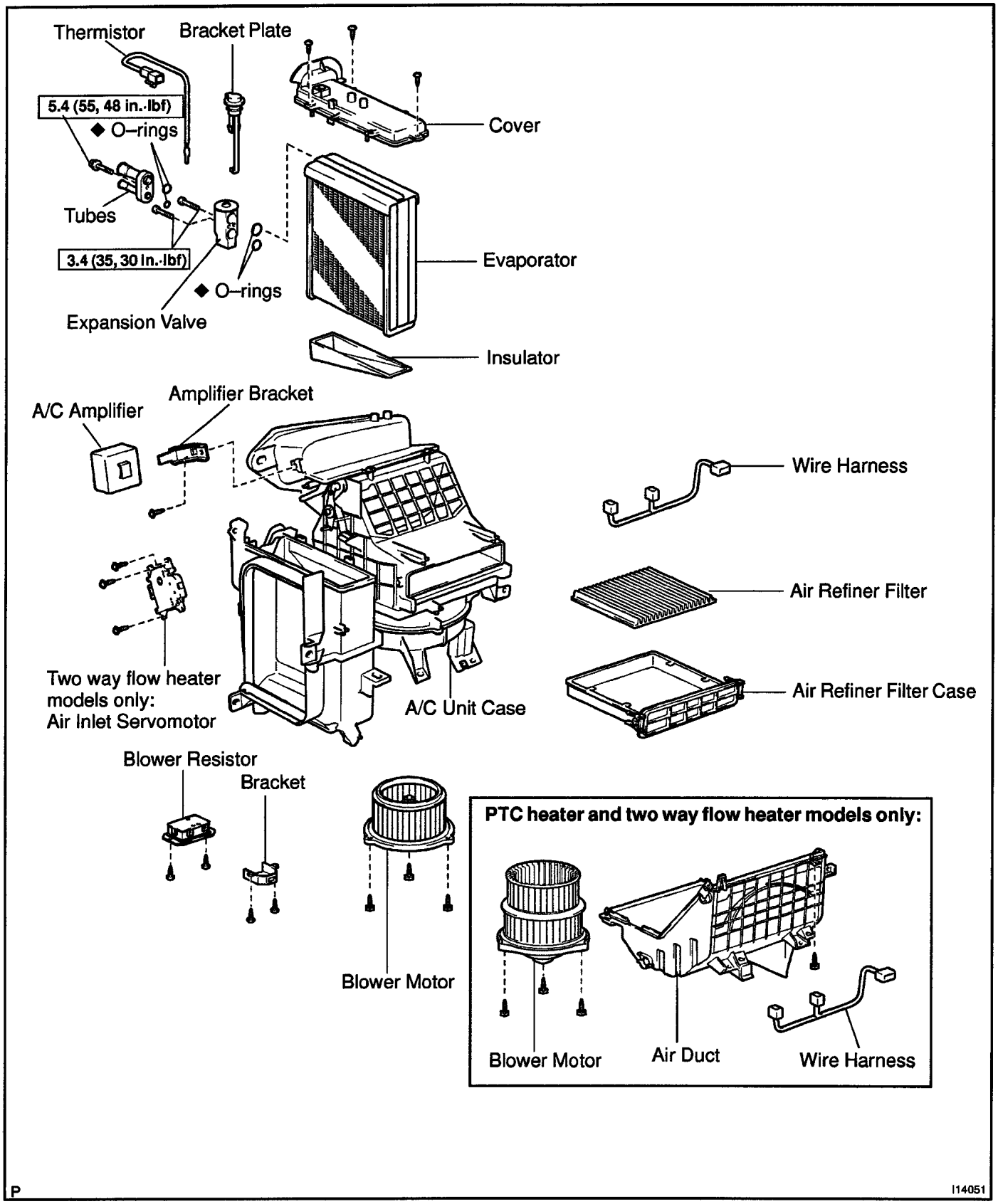
(a) Remove the glove compartment door (See page BO–86).
(b) Remove the blower resister.
(c) Using a gas leak detector, check for leakage of refrigerant.

If there is leakage, check the tightening torque at the joints or check the evaporator.

COMPONENTS

AC2B4-02




Thermistor
Bracket Plate
5.4 (55, 48 in.·lbf)
◆ O–rings
Cover
Tubes
3.4 (35, 30 in.·lbf)
Evaporator
◆ O–rings
Expansion Valve
Insulator
A/C Amplifier
Amplifier Bracket
Wire Harness
Air Refiner Filter
Air Refiner Filter Case
Two way flow heater models only: Air Inlet Servomotor
A/C Unit Case
Blower Resistor
Bracket
Blower Motor
PTC heater and two way flow heater models only:
Blower Motor
Air Duct
Wire Harness

P

I14051

AC2HM-01

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

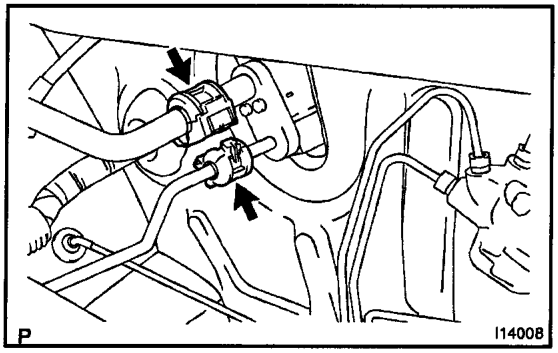
HINT:

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: 430 ± 30 g (15.17 ± 1.06 oz.)

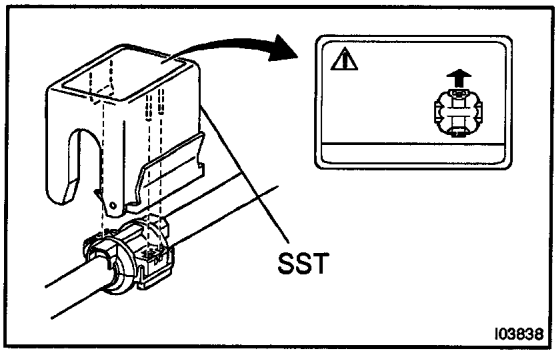


2. LHD models:
DISCONNECT LIQUID TUBE

(a) Remove the grommet.

(b) Using SST, remove the 2 piping clamps.

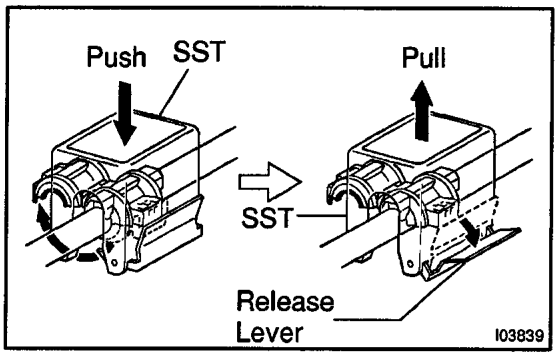
SST 09870–00025 (Liquid tube)
09870–00015 (Suction tube)



(1) Insert SST to piping clamp.

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.

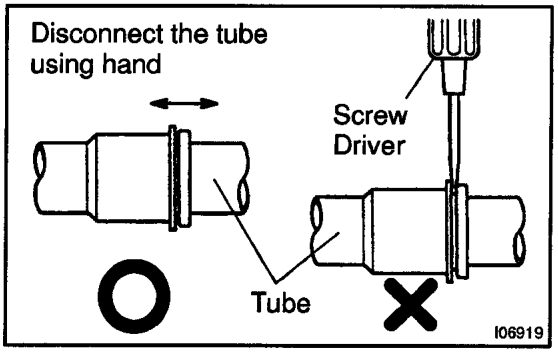
NOTICE:

Be careful not to deform the tubes, when pushing SST.

(3) Pull SST slightly and push the release lever, then remove the piping clamp with SST.

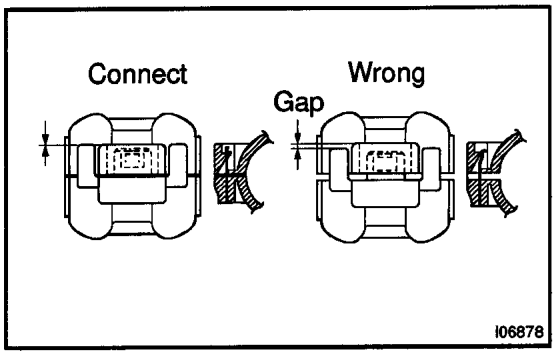
(4) Remove the piping clamp from SST.

(c) Disconnect the both tubes.

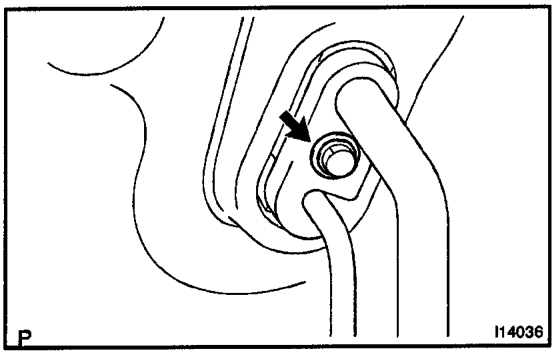


NOTICE:

- **Do not use tools like screwdriver to remove the tube.**
- **Cap the open fittings immediately to keep moisture or dirt out of the system.**



HINT:
At the time of installation, please refer to the following item.
- Lubricate 2 new O–rings with compressor oil and install them to the tubes.
- After connection, check the fitting for claw of the piping clamp.

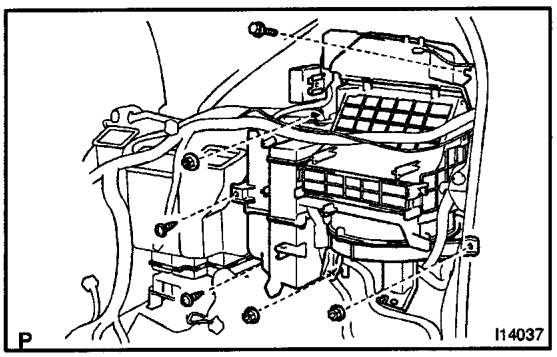


3. RHD models:
DISCONNECT LIQUID TUBE AND SUCTION HOSE
(a) Remove the grommet.
(b) Remove the bolt and slide the plate, then disconnect the both tubes.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

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 2 new O–rings with compressor oil and install them to the tube.

4. REMOVE INSTRUMENT PANEL AND REINFORCEMENT (See page BO–86)

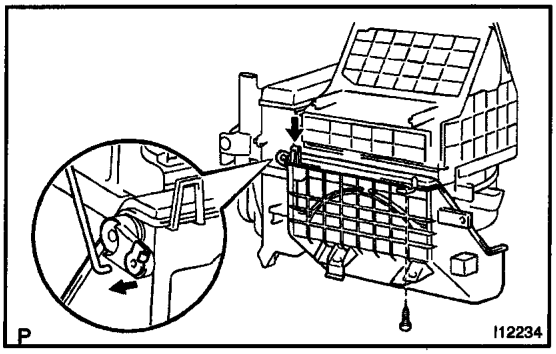


5. REMOVE A/C UNIT
(a) Disconnect the connectors.
(b) Disconnect the wire harness clamps.
(c) Remove the 2 bolts, nut, rivet and A/C unit.

HINT:
At the time of installation, please refer to the following item.
Do not reuse the rivet.

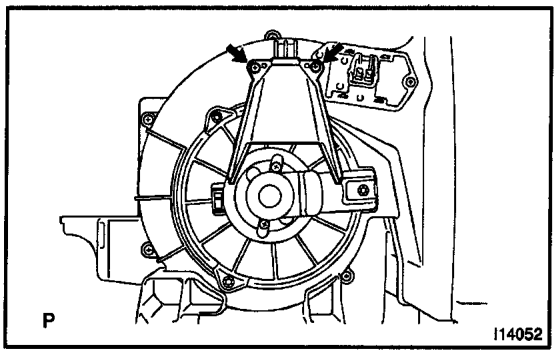
AC286-02

DISASSEMBLY



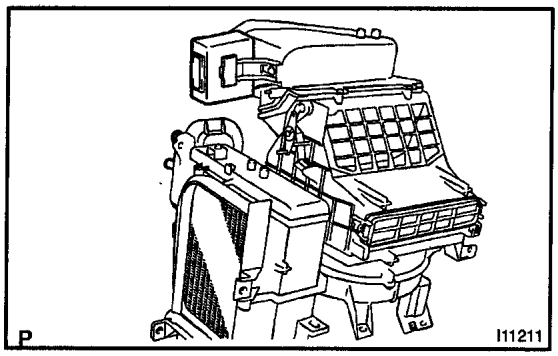
1. PTC heater and two way flow heater models only: REMOVE AIR DUCT (Motor cover)

(a) Disconnect the control link.
(b) Disconnect the connector clamps.
(c) Disconnect the wire harness clamps.
(d) Remove the 3 screws.
(e) Release the claw and remove the air duct.



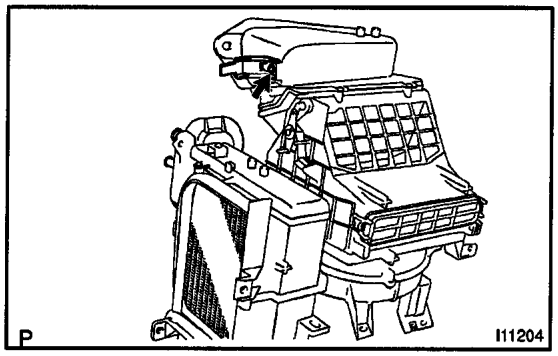
2. REMOVE BLOWER RESISTOR

(a) Standard heater models only:
Remove the 2 screws and bracket.
(b) Disconnect the connector.
(c) Remove the 2 screws and blower resistor.



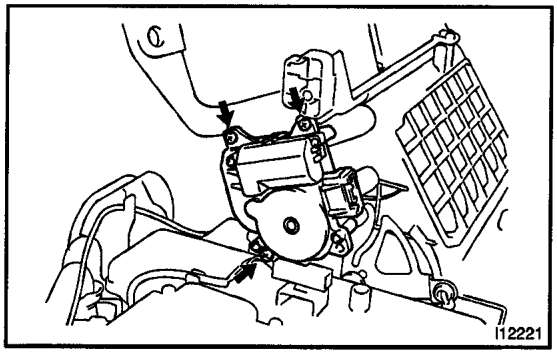
3. REMOVE A/C AMPLIFIER

Using a screwdriver, release the claw and remove the A/C amplifier.



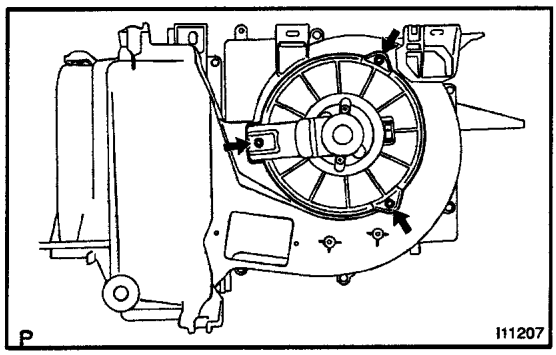
4. REMOVE AMPLIFIER BRACKET

Remove the screw and bracket.



5. Two way flow heater models only: REMOVE AIR INLET SERVOMOTOR

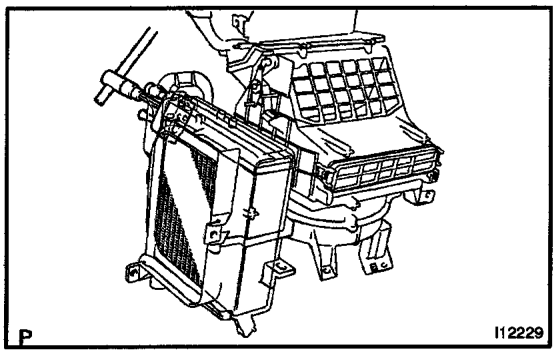
Remove the 3 screws and air inlet servomotor.



6. REMOVE BLOWER MOTOR

(a) Disconnect the connector.

(b) Remove the 3 screws and blower motor.

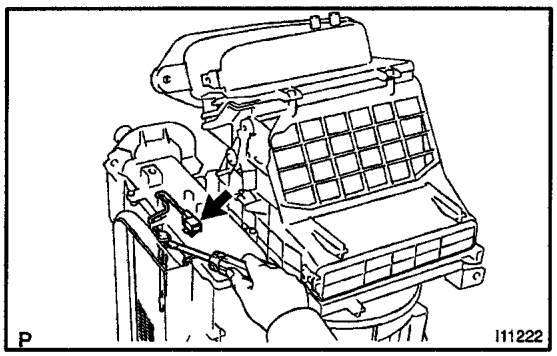


7. REMOVE EXPANSION VALVE

(a) LHD models:
Remove the bolt and A/C tube.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Using a hexagon wrench (5.0 mm, 0.20 in.), remove the 2 bolts and remove the tube and expansion valve.
Torque: 3.4 N·m (35 kgf·cm, 30 in.·lbf)

HINT:
At the time of reassembly, please refer to the following item.
Lubricate 4 new O–rings with compressor oil and install them to the tube.

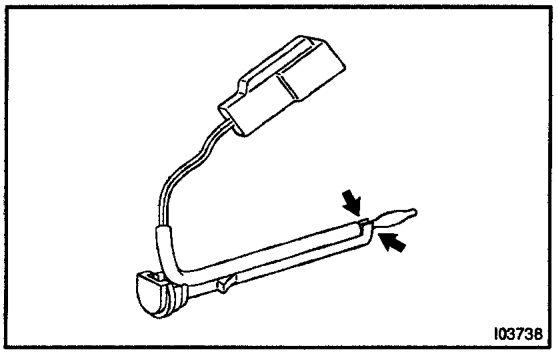


8. REMOVE THERMISTOR

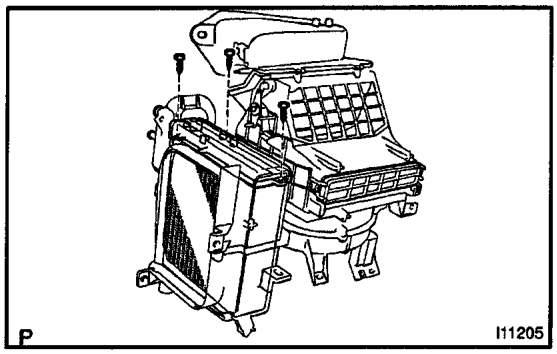
(a) Disconnect the connector clamp.

(b) Using a screwdriver, remove the thermistor.

HINT:
Tape the screwdriver tip before use.



(c) Release the 2 claws and remove the sensor from bracket plate.



9. REMOVE EVAPORATOR

(a) Remove the 3 screws cover.

(b) Pull out the evaporator.

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

AC267-01

INSPECTION

1. CHECK EVAPORATOR FINS FOR BLOCKAGE

If the fins are clogged, clean them with compressed air.

NOTICE:

Never use to clean the evaporator.

2. CHECK FITTING FOR CRACKS FOR SCRATCHES

AC286-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–29).

AC289-01

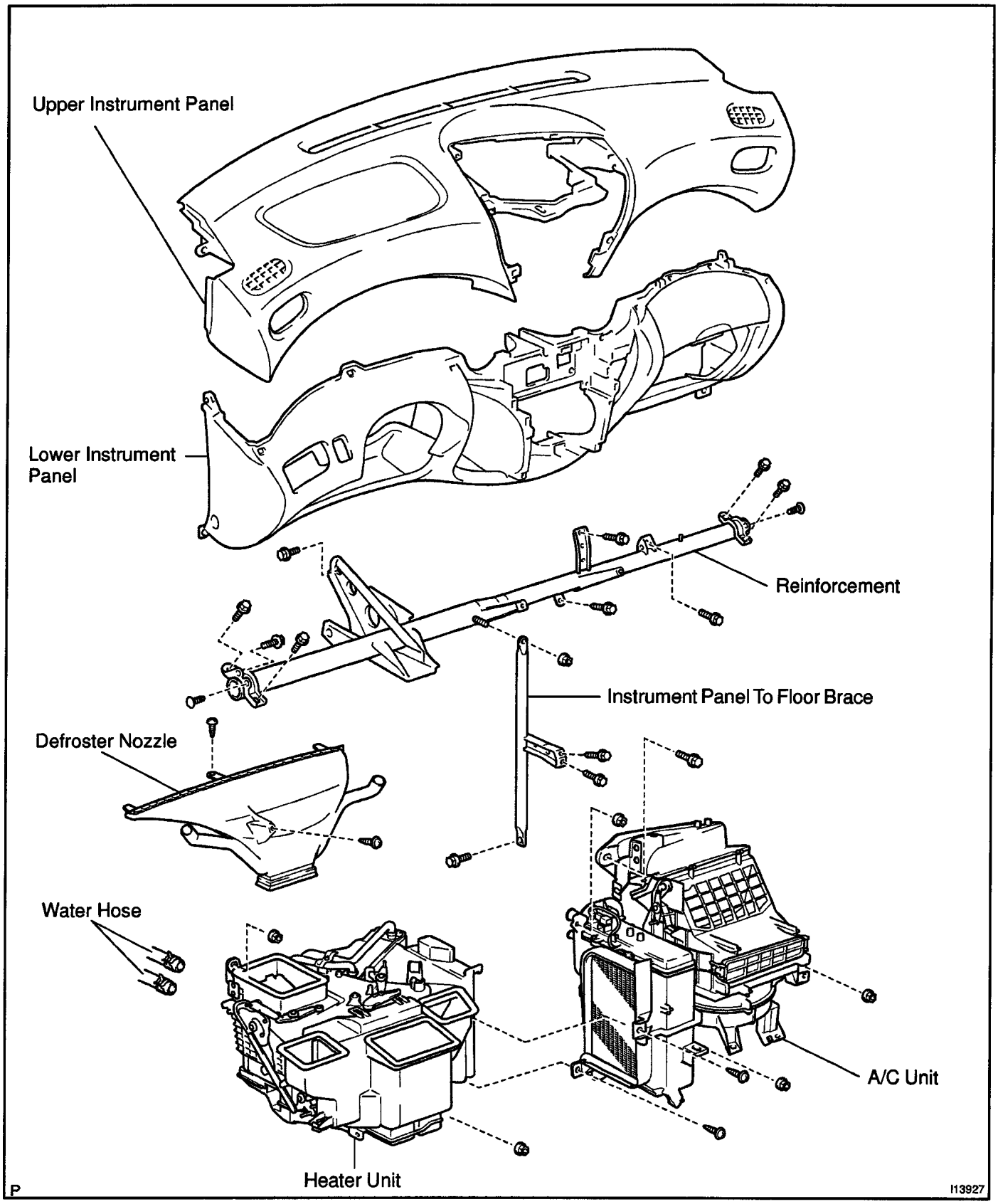
INSTALLATION

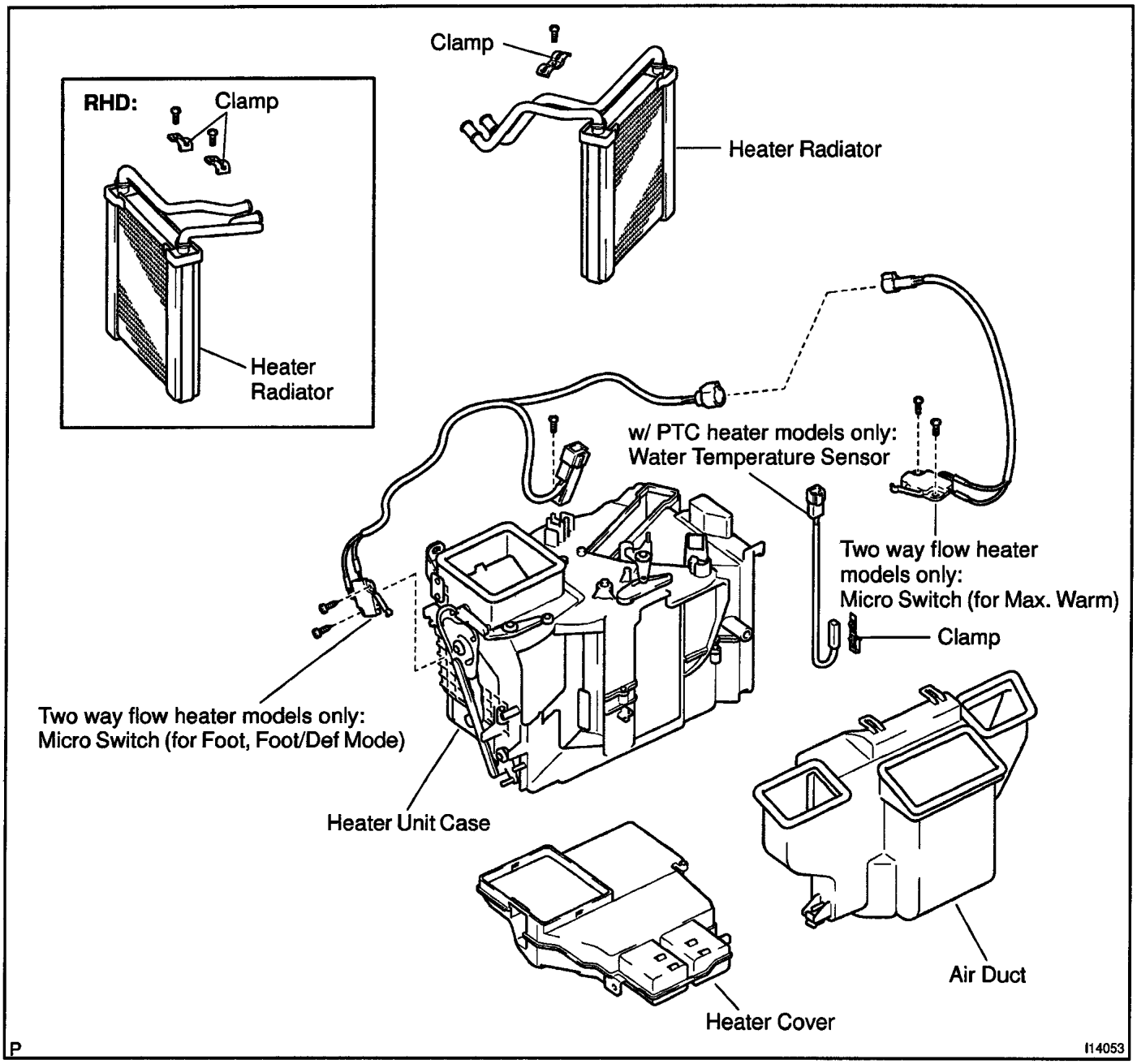
Installation is in the reverse order of removal (See page AC–27).

HEATER UNIT

COMPONENTS

AC28A–02



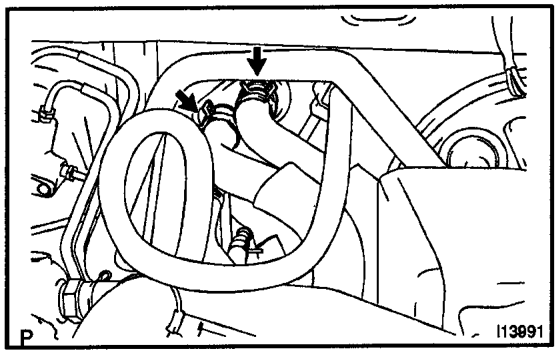

RHD:
Clamp
Heater Radiator
Clamp
Heater Radiator
w/ PTC heater models only:
Water Temperature Sensor
Two way flow heater models only:
Micro Switch (for Max. Warm)
Clamp
Two way flow heater models only:
Micro Switch (for Foot, Foot/Def Mode)
Heater Unit Case
Air Duct
Heater Cover
P
I14053

AC28B-02

REMOVAL

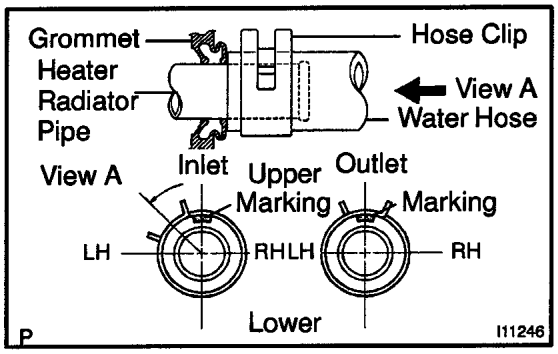
1. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:
It is not necessary to drain out all the coolant.



2. DISCONNECT WATER HOSES FROM HEATER RADIATOR PIPES

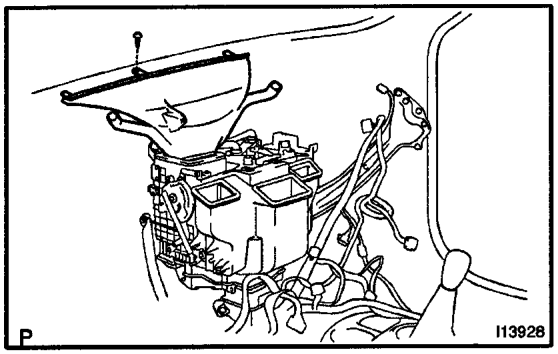
(a) Using pliers, grip the claws of the hose clip and slide the clip along the hose.
(b) Disconnect the water hoses.
(c) Remove the grommet.



HINT:
At the time of installation, please refer to the following items.

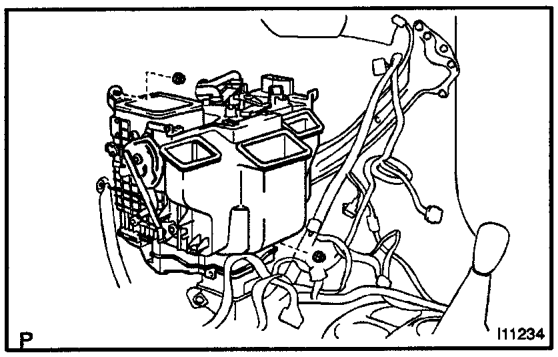
- Push the water hose onto the heater radiator pipe as far as the grommet.
- Install the hose clip in a position, as shown in the illustration.

3. REMOVE A/C UNIT (See page AC–27)



4. REMOVE HEATER UNIT

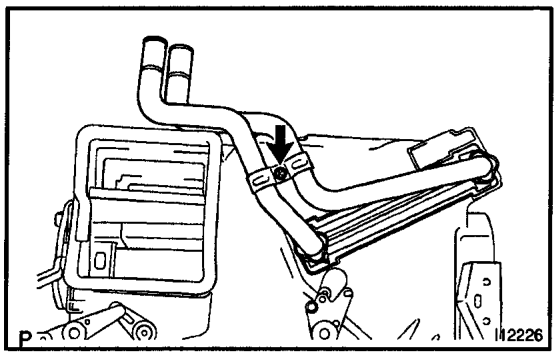
(a) Remove the clip and defroster nozzle.
(b) PTC heater and two way flow heater models only: Disconnect the connectors.



(c) Remove the 2 floor carpet set clips.
(d) Remove the 2 nuts and heater unit.

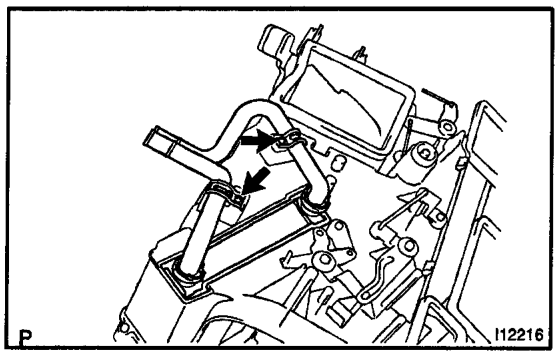
AC28C-02

DISASSEMBLY



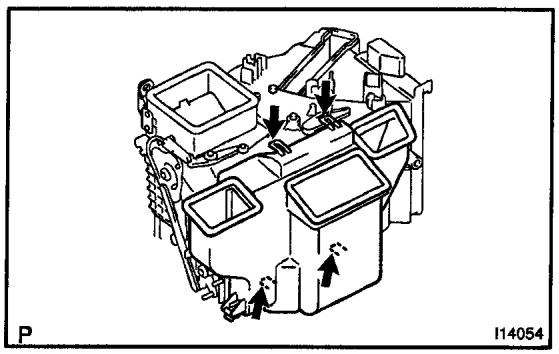
1. LHD models only:
REMOVE HEATER RADIATOR

(a) PTC heater models only:
Disconnect the connector clamp.
(b) Remove the screw and clamp.
(c) Pull out the heater radiator.



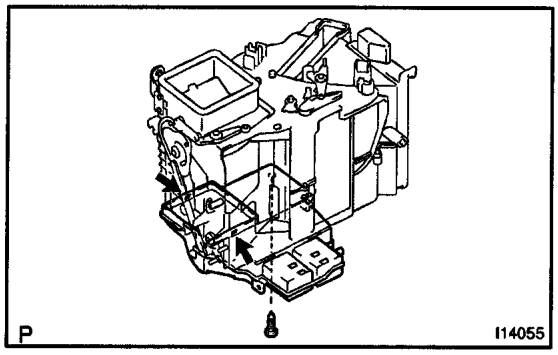
2. RHD models:
REMOVE HEATER RADIATOR

(a) PTC heater models only:
Disconnect the connector clamp.
(b) Remove the 2 screws and 2 clamps.
(c) Pull out the heater radiator.



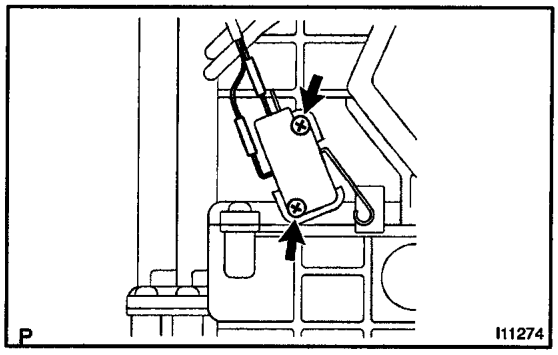
3. REMOVE AIR DUCT

Release the 4 claws and remove the air duct.



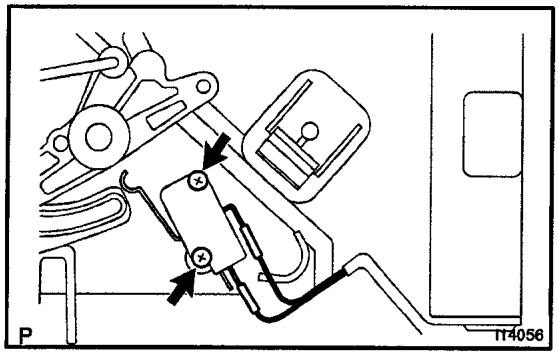
4. REMOVE HEATER COVER

Release the 2 claws, remove the screw and heater cover.



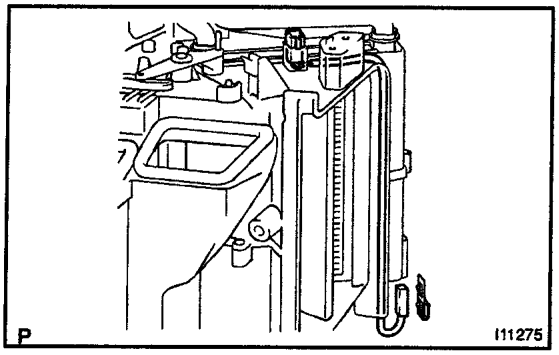
5. Two way flow heater models only:
REMOVE MICRO SWITCH (for FOOT, FOOT / DEF. mode)

(a) Disconnect the connector.
(b) Remove the connector set screw.
(c) Remove the 2 screws and switch.



6. Two way flow heater models only:
REMOVE MICRO SWITCH (for MAX. WARM)

Remove the 2 screws and switch.



7. w/ PTC heater models only:
REMOVE WATER TEMPERATURE SENSOR

(a) Disconnect the connector clamp.
(b) After pulling off the clamp, pull out the sensor.

8. PTC heater and two way flow heater models only:
REMOVE WIRE HARNESS

Remove the screw and wire harness.

AC28D-01

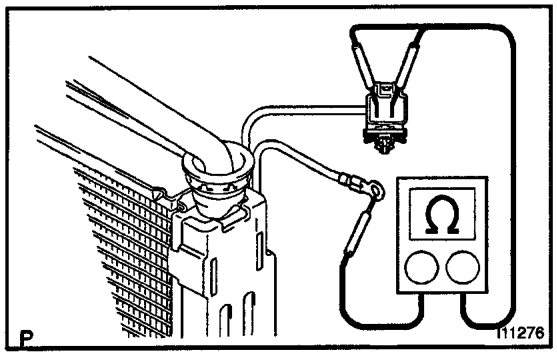
INSPECTION

1. CHECK HEATER RADIATOR FINS FOR BLOCKAGE

If the fins are clogged, clean them with compressed air.

2. CHECK FITTING FOR CRACKS OR SCRATCHES

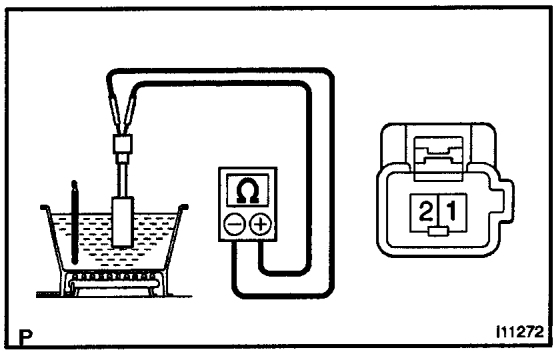
If necessary repair or replace.



3. PTC heater models only:
INSPECT PTC HEATER CONTINUITY

Using an ohmmeter, check continuity exists between each terminal of connector and earth wire.

If no continuity exists, replace the heater radiator.

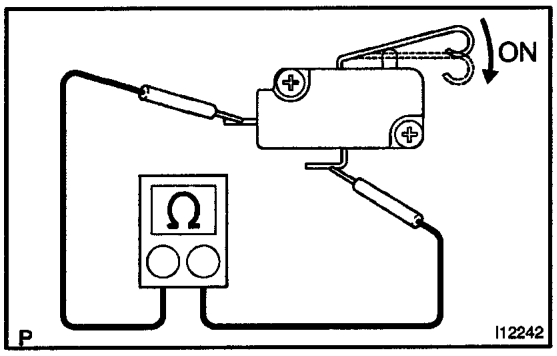


4. PTC heater models only:
INSPECT WATER TEMPERATURE SENSOR

Measure resistance between terminals at each temperature.

Standard resistance:
25 °C (77 °F): 5.0 ± 0.2 kΩ
40 °C (104 °F): 2.7 ± 0.15 kΩ
100 °C (212 °F): 0.3 ± 0.04 kΩ

If resistance is not as specified, replace the sensor.



5. Two way flow heater models only:
INSPECT MICRO SWITCH CONTINUITY

Check the continuity exists between terminals while switch is pressed.

If no continuity exists, replace the switch.

ACDCN–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–38).

AC0CO–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–37).

COMPRESSOR AND MAGNETIC CLUTCH

ON–VEHICLE INSPECTION

AC0CZ-04

1. CHECK FOR LEAKAGE OF GREASE FROM CLUTCH BEARING

2. CHECK FOR SIGNS OF OIL ON PRESSURE PLATE OR ROTOR

3. INSPECT MAGNETIC CLUTCH BEARING FOR NOISE

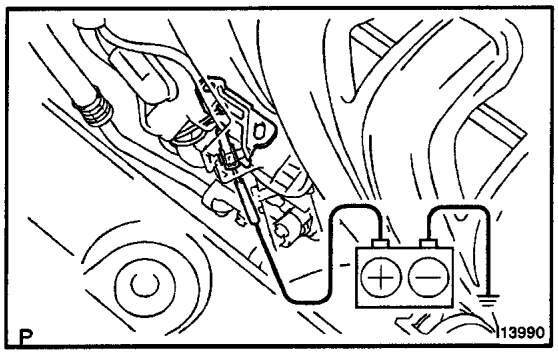
(a) Start engine.

(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.

4. INSPECT MAGNETIC CLUTCH OPERATION

(a) Disconnect the connector.



(b) Connect the positive (+) lead from the battery to terminal of magnetic clutch connector 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.

5. 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.

6. INSPECT REFRIGERANT PRESSURE

(See page AC–3)

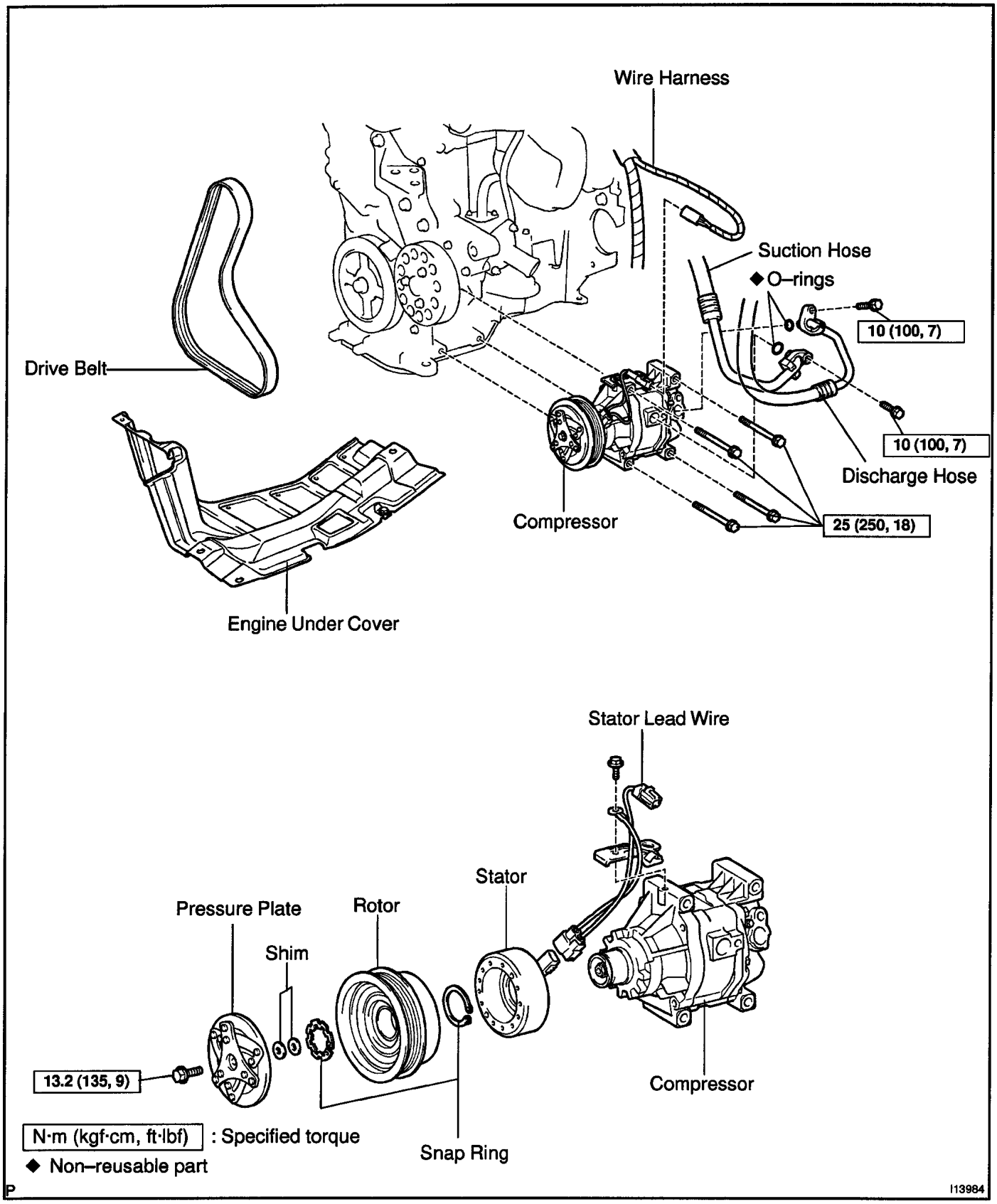
7. INSPECT VISUALLY FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

If there is any leakage, check the tightening torque at joints or replace compressor.

AC28E-02

COMPONENTS



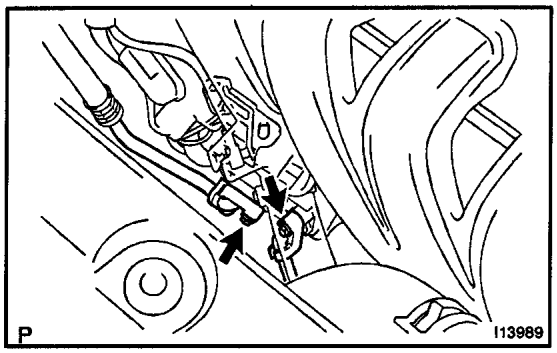
P

I13984

AC2HT-01

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**
6. **DISCONNECT DRIVE BELT (See page AC–17)**

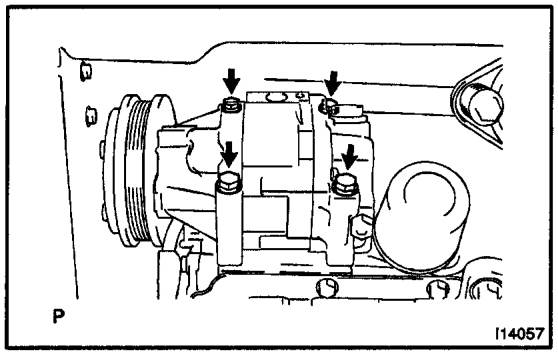


7. **DISCONNECT DISCHARGE AND SUCTION HOSES FROM COMPRESSOR**

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. **REMOVE COMPRESSOR**

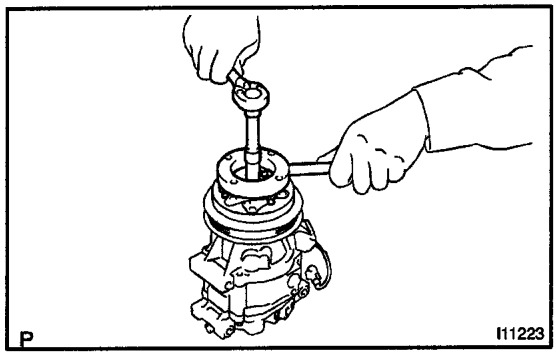
(a) Disconnect the connector.
(b) Disconnect the wire harness clamp.
(c) Remove the 4 bolts and compressor.

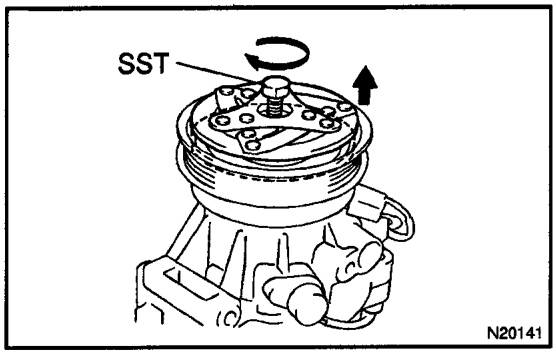
AC28G-02

DISASSEMBLY

1. REMOVE PRESSURE PLATE

(a) Using SST and a socket wrench, remove the shaft bolt.
SST 07112–76050
Torque: 13.2 N·m (135 kgf·cm, 9 ft·lbf)





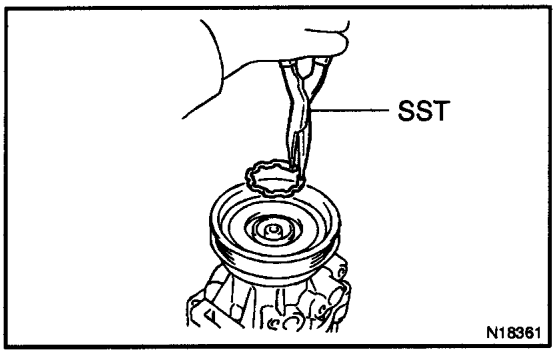
(b) Install SST to the pressure plate.
SST 07112–66040

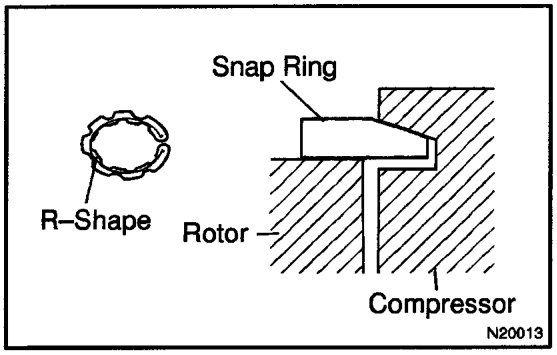
(c) Using SST and a socket wrench, remove the pressure plate.
SST 07112–76050, 07112–66040

(d) Remove the shims from the shaft.

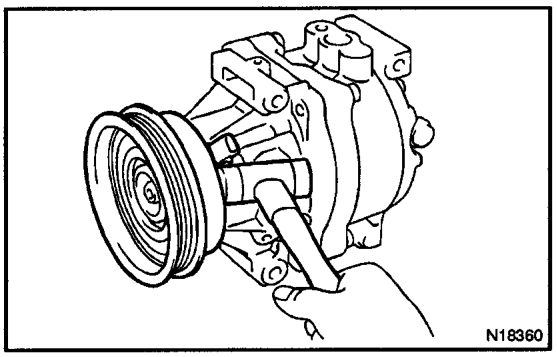
2. REMOVE ROTOR

(a) Using SST, remove the snap ring.
SST 07114–84020



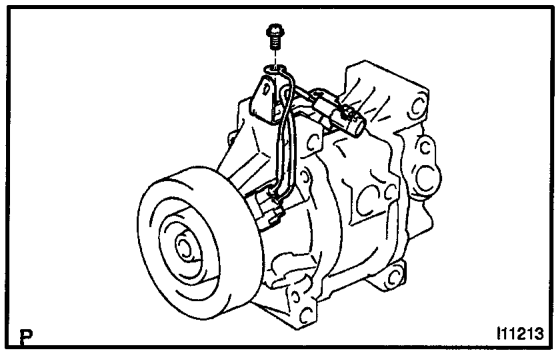


NOTICE:
At the time of reassembly, please refer to the following item.
The snap ring should be installed so that its beveled side faces up.



(b) Using a plastic hammer, tap the rotor off the shaft.

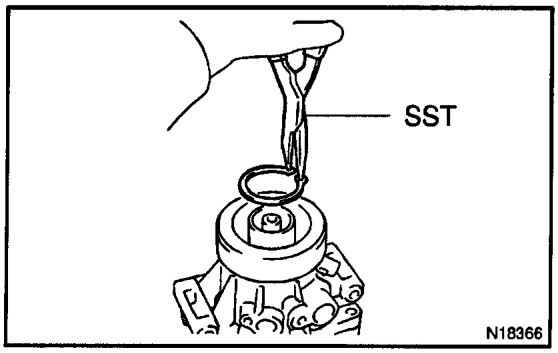
NOTICE:
Be careful not to damage the pulley when tapping on the rotor.



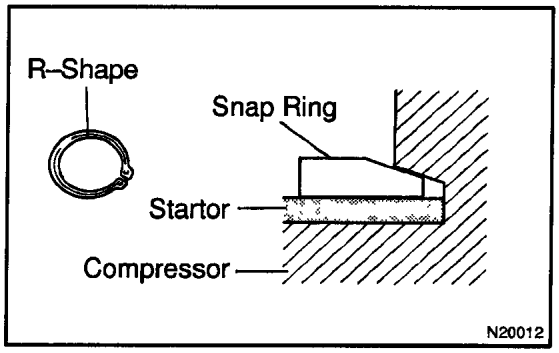
3. REMOVE STATOR

(a) Disconnect the connector from the stator.

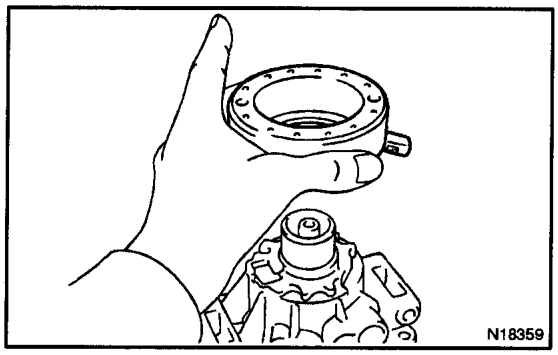
(b) Remove the screw and stator lead wire.



(c) Using SST, remove the snap ring.
SST 07114–84020



NOTICE:
At the time of reassembly, please refer to the following item.
The snap ring should be installed so that its beveled side faces up.

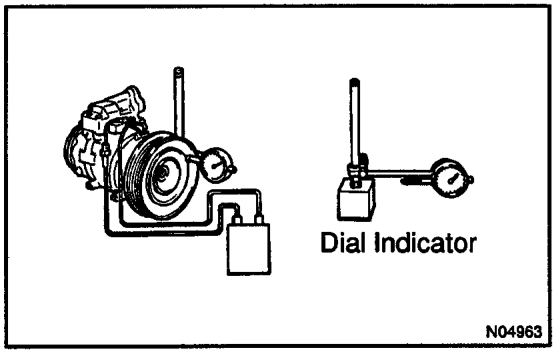


(d) Remove the stator.

AC0D9–05

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–46).



CHECK CLEARANCE OF MAGNETIC CLUTCH

HINT:

After reassembly, check the 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.

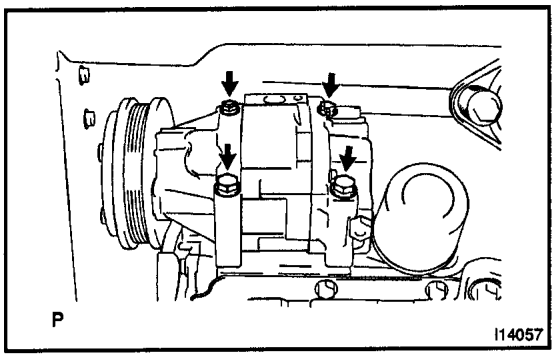
(c) Check the clearance between the pressure plate and rotor when connecting the negative (–) terminal to the battery.

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.)

AC2HU-01

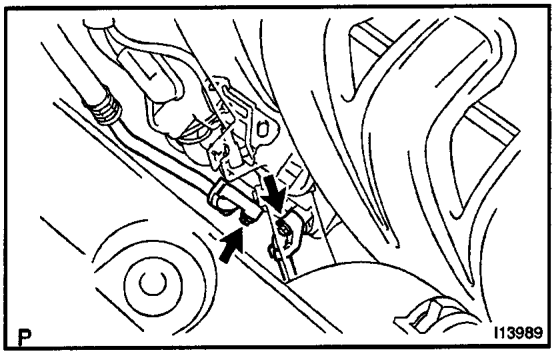


INSTALLATION

1. INSTALL COMPRESSOR

(a) Install the compressor with 4 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.



2. CONNECT DISCHARGE AND SUCTION HOSES FROM COMPRESSOR

(a) Lubricate 2 new O–rings with compressor oil and install them to the both hoses.

(b) Connect the both hoses with 2 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

NOTICE:
Hoses should be connected immediately after the caps have been removed.

3. CONNECT DRIVE BELT (See page AC–18)

4. INSTALL ENGINE UNDER COVER

5. CHARGE SYSTEM WITH REFRIGERANT

(a) Evacuate air from refrigeration system.

(b) Charge system with refrigerant and inspect for leakage of refrigerant.
Specified amount: 430 ± 30 g (15.17 ± 1.06 oz.)

6. 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.

7. INSPECT A/C OPERATION

CONDENSER

AC0D8-02

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.

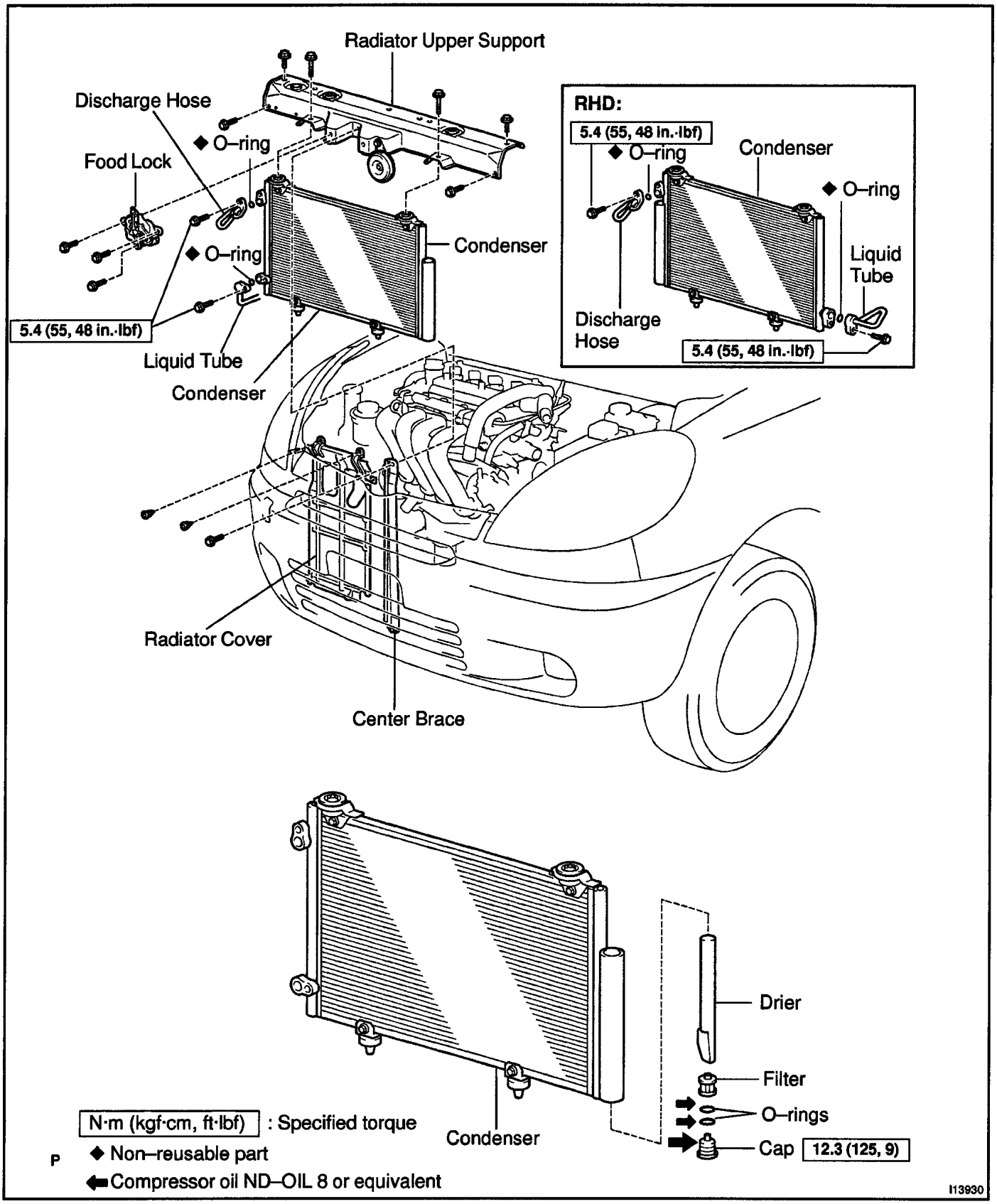
2. INSPECT CONDENSER AND FITTINGS FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

If there is leakage, check the tightening torque at the joints.

AC281-03

COMPONENTS



AC28J-02

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

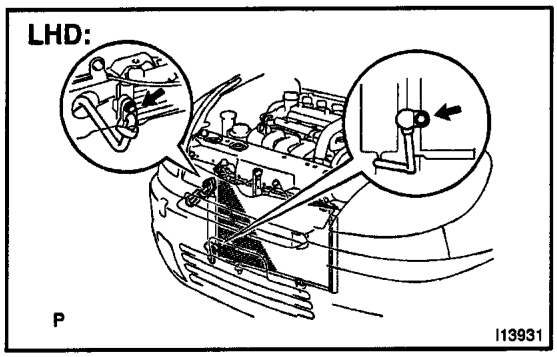
HINT:

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: 430 ± 30 g (15.17 ± 1.06 oz.)



2. DISCONNECT DISCHARGE HOSE AND LIQUID TUBE

Remove the 2 bolts and disconnect the hose and tube.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

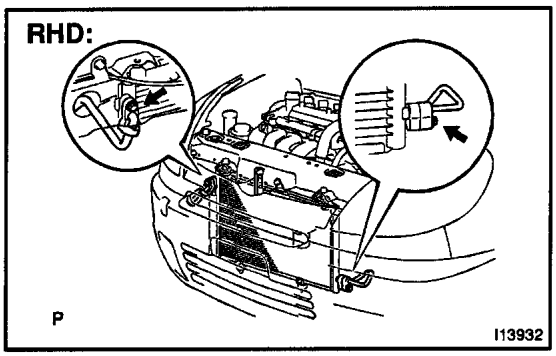
NOTICE:

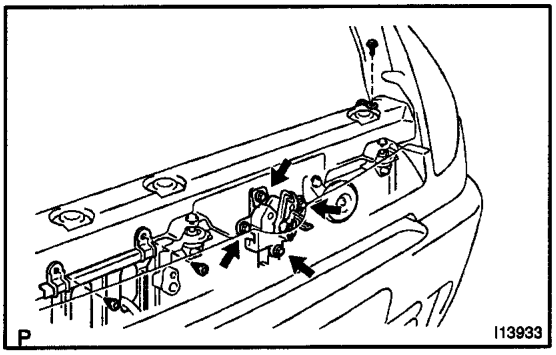
Cap open the fittings immediately to keep moisture or dirt out of the system.

HINT:

At the time of installation, please refer to the following item.

Lubricate 2 new O–rings with compressor oil and install them to the tubes.





3. REMOVE RADIATOR UPPER SUPPORT

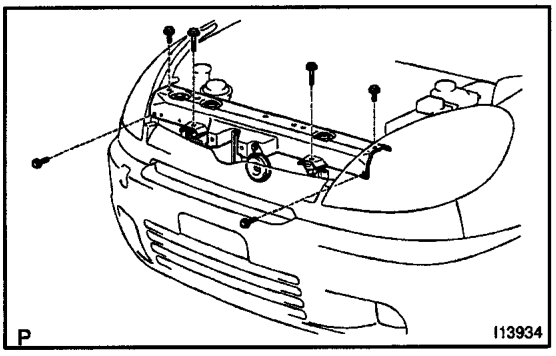
(a) Remove the 3 hood lock set bolts.

(b) Remove the center brace set bolt.

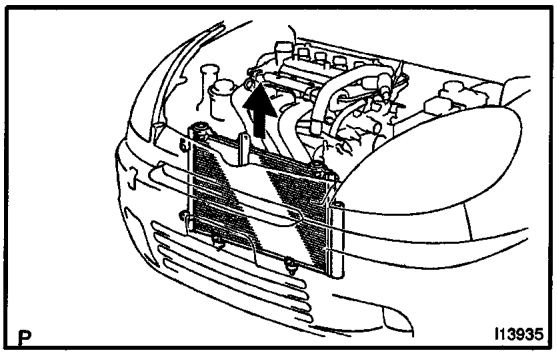
(c) Remove the 2 radiator cover set clips.

(d) Disconnect the connector from the hone.

(e) Remove the earth wire set bolt.



(f) Remove the 6 bolts and radiator upper support.



4. REMOVE CONDENSER

Pull out the condenser 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 cc (1.4 fl.oz.)

Compressor oil: ND–OIL 8 or equivalent

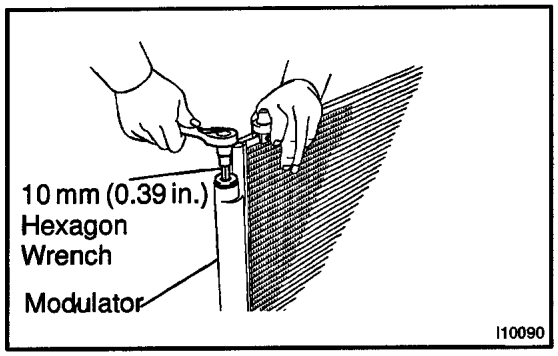
AC28K–03

REPLACEMENT

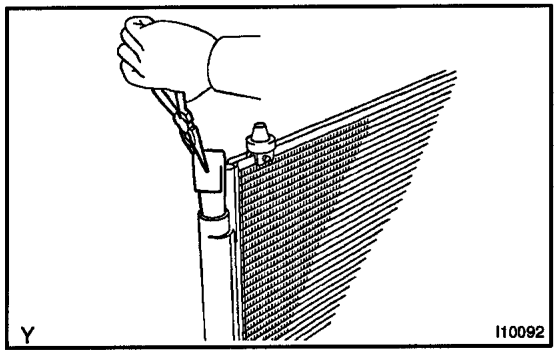
REPLACE DRIER FROM MODULATOR

(a) Using a hexagon wrench (10 mm, 0.39 in.), remove the cap from the modulator.

(b) Remove the filter from the modulator.



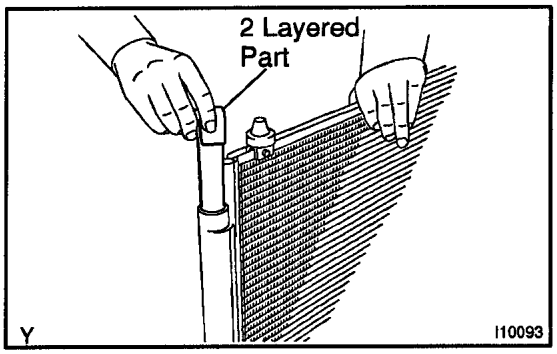
(c) Using pliers, remove the drier.



(d) Insert a new drier into the modulator.

NOTICE:

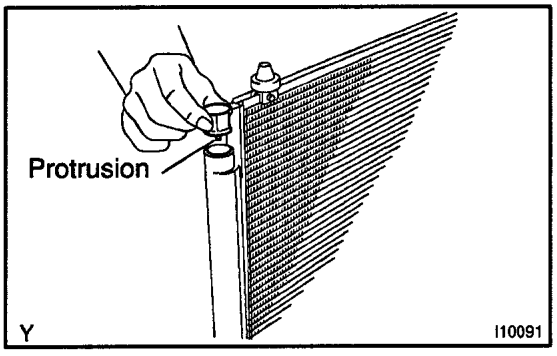
- **Do not remove the drier from a vinyl bag until inserting it into the modulator.**
- **Install the drier with its 2 layered part faced upward to the modulator.**



(e) Insert the filter into the modulator.

NOTICE:

Install the filter with its protrusion faced downward to the modulator.



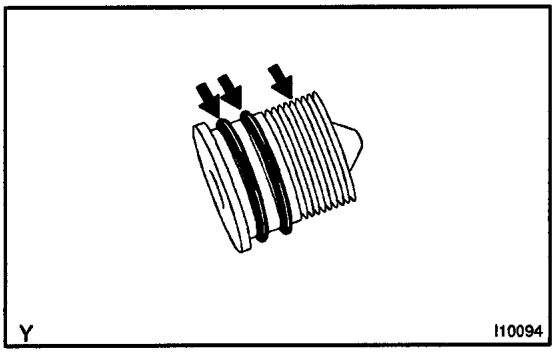
(f) Install the cap to the modulator.

(1) Apply compressor oil to the O–rings and screw part of the cap.

Compressor oil: ND–OIL 8 or equivalent

(2) Using a hexagon wrench (10 mm, 0.39 in.), install the caps.

Torque: 12.3 N·m (125 kgf·cm, 9 ft·lbf)



AC0DA–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–52).

EXPANSION VALVE

AC28L–01

ON–VEHICLE INSPECTION

1. CHECK QUANTITY OF GAS DURING REFRIGERATION CYCLE

2. SET ON MANIFOLD GAUGE SET (See page AC–19)

3. RUN ENGINE

Run the 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).

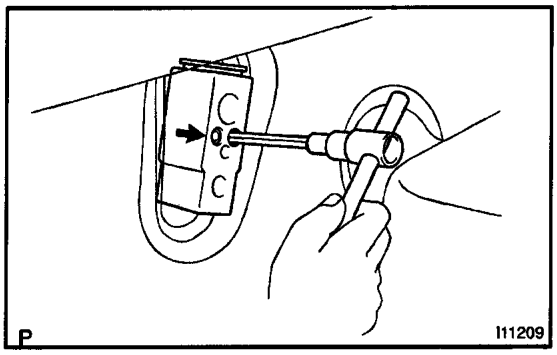
HINT:

When the low pressure drops to 0 kPa (0 kgf/cm^2, 0 psi), check the receiver's IN and OUT sides is no temperature difference.

AC2HN-01

REPLACEMENT

1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM**
2. **DISCONNECT LIQUID TUBE AND SUCTION HOSE FROM A/C UNIT (See page AC–27)**



3. **REMOVE EXPANSION VALVE**

Using a hexagon wrench (5.0 mm, 0.20 in.), remove the 2 bolts and separate the expansion valve and evaporator.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

4. **INSTALL NEW EXPANSION VALVE**

(a) Lubricate 2 new O–rings with compressor oil and install them to the expansion valve.

(b) Install the expansion valve.

(c) Using a hexagon wrench (5.0 mm, 0.20 in.), install the 2 bolts.

Torque: 3.4 N·m (35 kgf·cm, 30 in.·lbf)

5. **CONNECT LIQUID TUBE AND SUCTION HOSE (See page AC–34)**
6. **CHARGE SYSTEM WITH REFRIGERANT**

(a) Evacuate air from refrigeration system.

(b) Charge system with refrigerant and inspect for leakage of refrigerant.

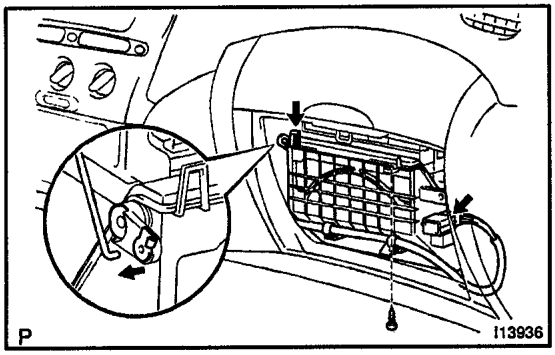
Specified amount: 430 ± 30 g (15.17 ± 1.06 oz.)

BLOWER MOTOR

AC2HV–01

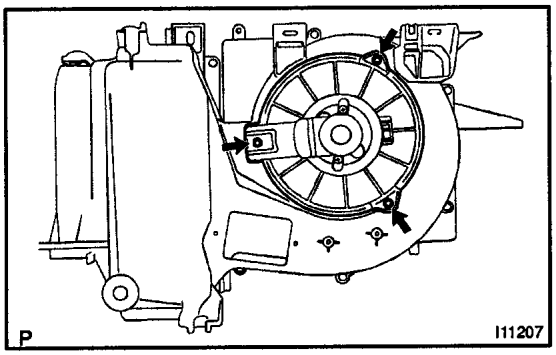
INSPECTION

1. **REMOVE GLOVE COMPARTMENT DOOR (See page BO–86)**



2. **Two way flow heater models only: REMOVE AIR DUCT (Motor cover)**

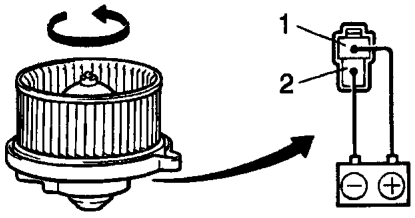
(a) Disconnect the control link.
(b) Disconnect the connectors.
(c) Disconnect the connector clamps.
(d) Disconnect the wire harness clamps.
(e) Remove the screw.
(f) Release the claw and remove the air duct.



3. **REMOVE BLOWER MOTOR**

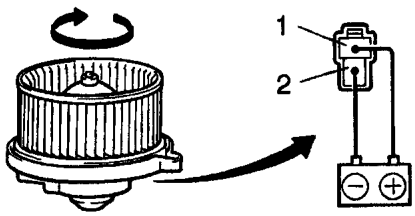
(a) Disconnect the connector.
(b) Remove the 3 screws and blower motor.

Standard heater (LHD):



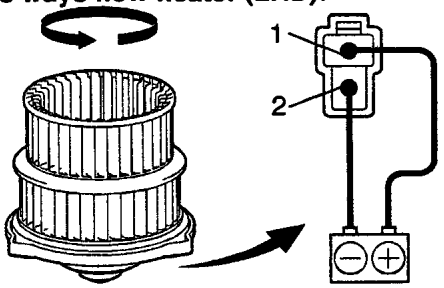
I07284

Standard heater (RHD):



I15051

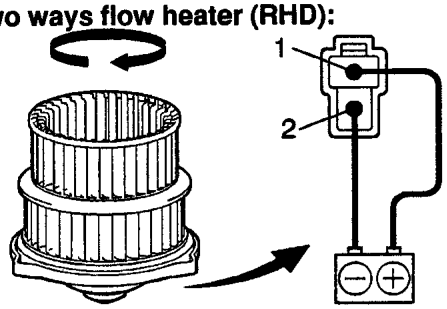
Two ways flow heater (LHD):



P

I12231

Two ways flow heater (RHD):



I15052

4. 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 operations smoothly.

If operation is not as specified, replace the blower motor.

5. INSTALL BLOWER MOTOR

6. Two way flow heater models only:
INSTALL AIR DUCT (Motor cover)

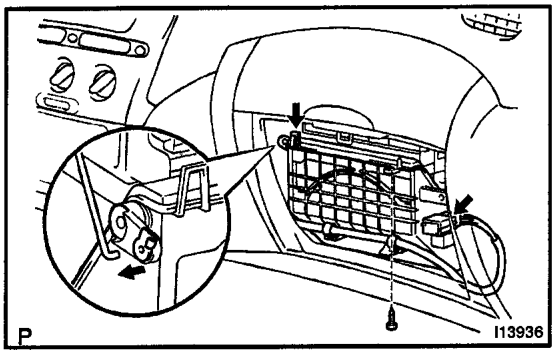
7. INSTALL GLOVE COMPARTMENT DOOR
(See page BO–95)

BLOWER RESISTOR

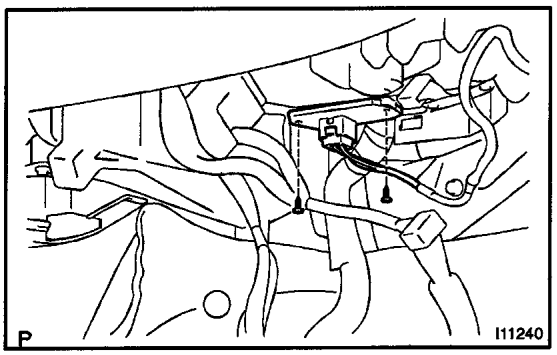
AC2HW–01

INSPECTION

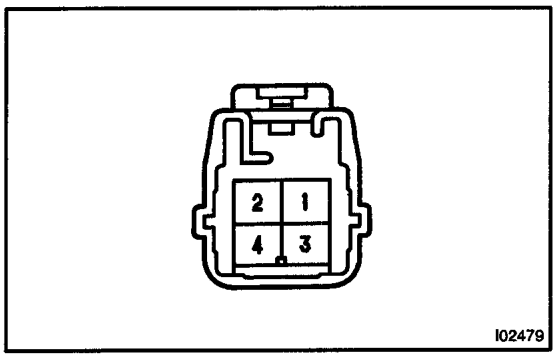
1. **REMOVE GROVE COMPARTMENT DOOR**
   (See page BO–86)



2. **Two way flow heater models only:**
   REMOVE AIR DUCT (Motor cover)
(a) Disconnect the control link.
(b) Disconnect the connector clamps.
(c) Remove the screw.
(d) Release the claw and remove the air duct.



3. **REMOVE BLOWER RESISTOR**
(a) Disconnect the connector.
(b) Remove the 2 screws and blower resistor.



4. **INSPECT BLOWER RESISTOR RESISTANCE**

Tester connection	Condition	Specified condition
1 – 3	Constant	Approx. 0.4 Ω
1 – 2	Constant	Approx. 1.5 Ω
1 – 4	Constant	Approx. 2.8 Ω

If resistance is not as specified, replace the blower resistor.

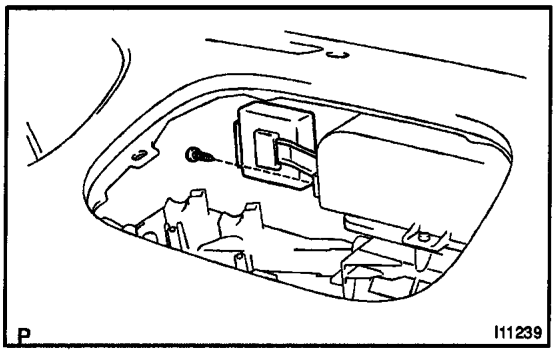
5. **INSTALL BLOWER RESISTOR**
6. **Two way flow heater models only:**
   INSTALL AIR DUCT
7. **INSTALL GLOVE COMPARTMENT DOOR**
   (See page BO–95)

AIR INLET SERVOMOTOR

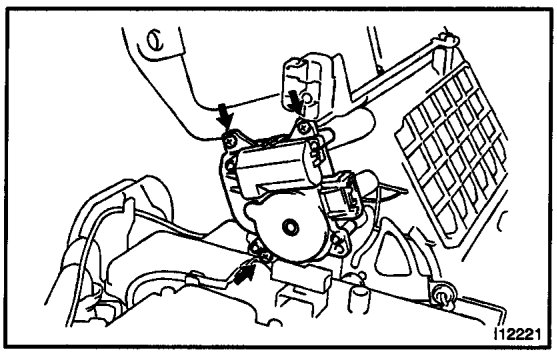
AC28P-02

INSPECTION

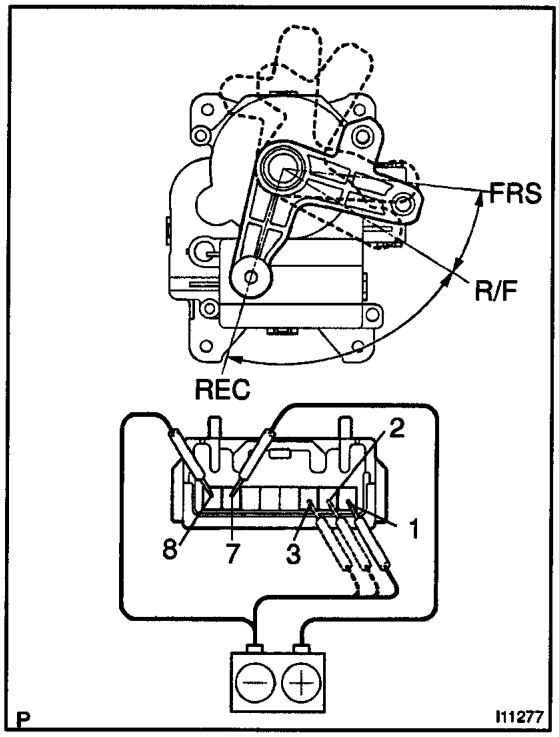
1. **REMOVE FRONT PASSENGER AIRBAG**
(See page RS–29)



2. **REMOVE A/C AMPLIFIER WITH BRACKET**
(a) Disconnect the connector.
(b) Remove the screw and A/C amplifier with bracket.



3. **REMOVE AIR INLET SERVOMOTOR**
(a) Disconnect the connector.
(b) Remove the 3 screws and servomotor.



4. **INSPECT AIR INLET SERVOMOTOR OPERATION**
(a) Connect the positive (+) lead from the battery to terminal 7 and the negative (–) lead to terminal 8.
(b) Connect the negative (–) lead from the battery to each terminal and check that the shaft rotates at each position, as shown in the chart.

Connected terminal	Position
REC	1
R/F	2
FRS	3

If operation is not as specified, replace the servomotor.

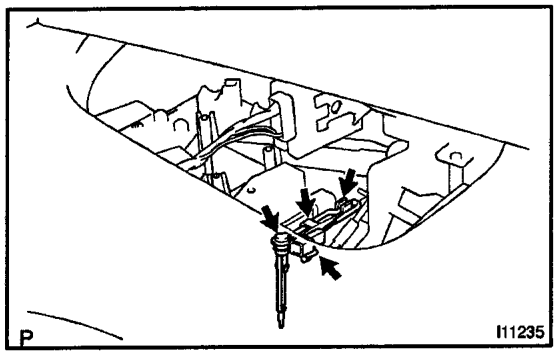
5. **INSTALL AIR INLET SERVOMOTOR**
6. **INSTALL A/C AMPLIFIER WITH BRACKET**
7. **INSTALL FRONT PASSENGER AIRBAG**
(See page RS–38)

THERMISTOR

AC28Q-02

INSPECTION

1. **REMOVE FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–29)**

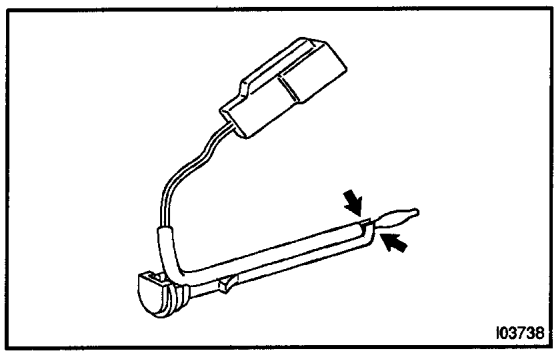


2. **REMOVE THERMISTOR**

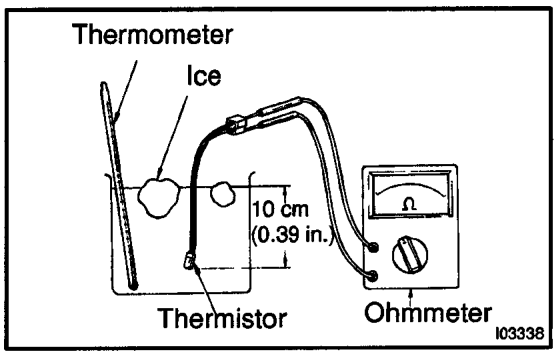
(a) Disconnect the connector.

(b) Disconnect the wire harness clamps.

(c) Using a screwdriver, pull out the thermistor.

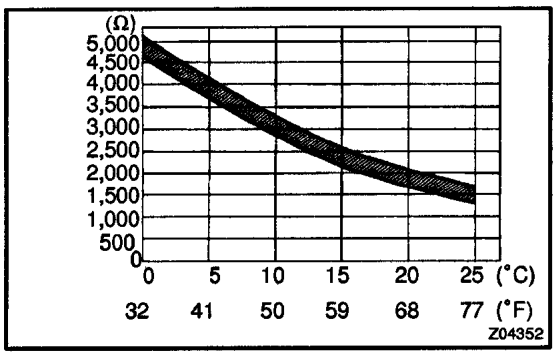


(d) Release the 2 claws and remove the thermistor from bracket plate.



3. **INSPECT THERMISTOR RESISTANCE**

(a) Place the thermistor in cold water and 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 thermistor.

4. **INSTALL THERMISTOR**

(a) Install the thermistor to A/C unit.

(b) Connect the wire harness clamps.

(c) Connect the connector.

5. **INSTALL FRONT PASSENGER AIRBAG (See page RS–38)**

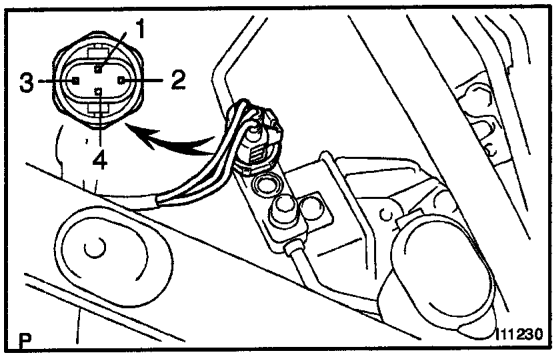
PRESSURE SWITCH

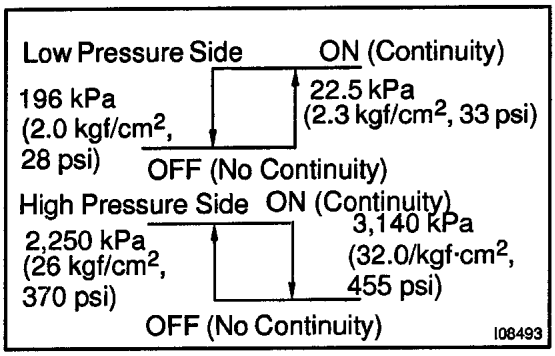
AC28R-02

ON–VEHICLE INSPECTION

1. **START ENGINE**
2. **SET BLOWER SPEED CONTROL SWITCH TO "HI" POSITION**
3. **SET TEMPERATURE CONTROL SELECTOR TO "MAX COOL" POSITION**
4. **PUSH A/C SWITCH**
5. **RACE ENGINE AT 1,500 RPM**
6. **INSPECT PRESSURE SWITCH OPERATION**

(a) Disconnect the connector.



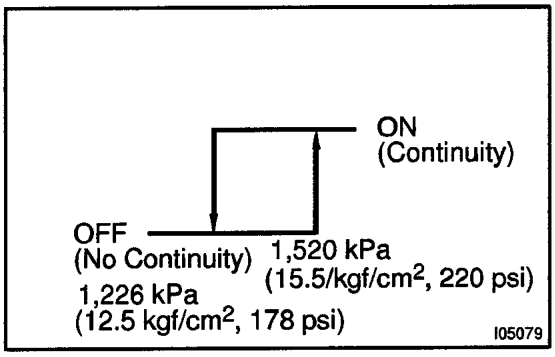


(b) Inspect pressure switch continuity (Magnetic Clutch Control).

(1) Connect the positive (+) lead from the ohmmeter to terminal 4 and the negative (–) lead to terminal 1.

(2) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If continuity is not as specified, replace the pressure switch.



(c) Inspect pressure switch continuity (Condenser Fan Control).

(1) Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (–) lead to terminal 3.

(2) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.

AC0E8-05

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

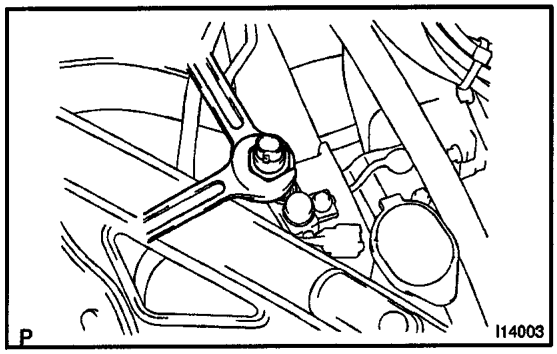
HINT:

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: 430 ± 30 g (15.17 ± 1.06 oz.)



2. REMOVE PRESSURE SWITCH FROM LIQUID TUBE

Disconnect the connector and remove the pressure switch.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

HINT:

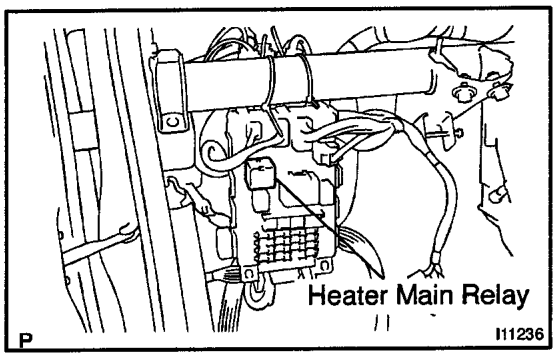
- Lock the switch mount on the tube with an open end wrench, being careful not to deform the tube, and remove the switch.
- At the time of installation, please refer to the following item.

  Lubricate a new O–ring with the compressor oil and install them to the switch.

AC0E9-01

INSTALLATION

Installation is in the reverse order of remval (See page AC–64).

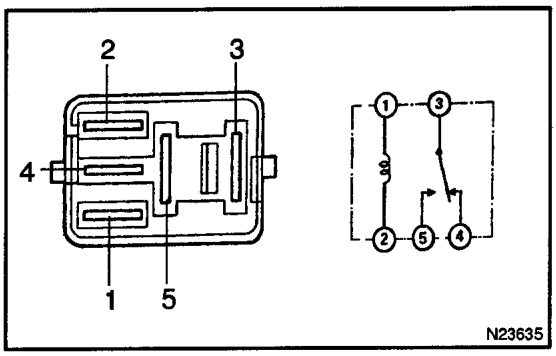


HEATER MAIN RELAY

AC230-04

INSPECTION

1. **REMOVE INSTRUMENT PANEL (See page BO–86)**
2. **REMOVE HEATER MAIN RELAY FROM INSTRUMENT PANEL J / B**

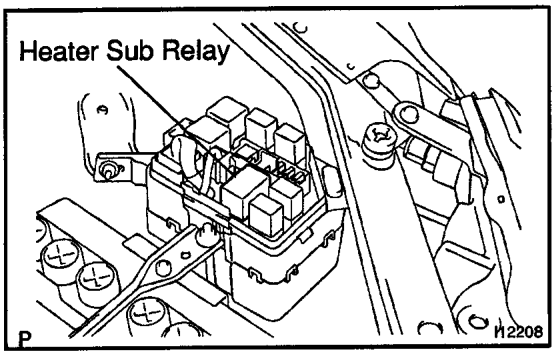


3. **INSPECT HEATER MAIN RELAY CONTINUITY**

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. **INSTALL HEATER MAIN RELAY TO INSTRUMENT PANEL J / B**
5. **INSTALL INSTRUMENT PANEL (See page BO–95)**

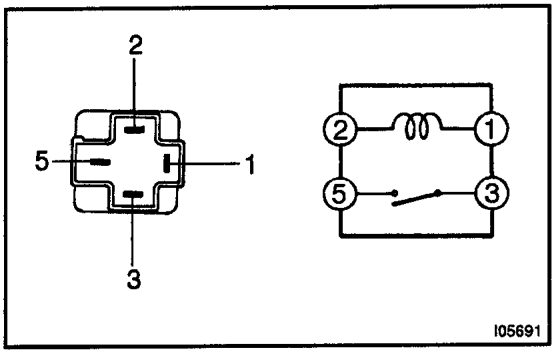


HEATER SUB RELAY

AC2HO-01

INSPECTION

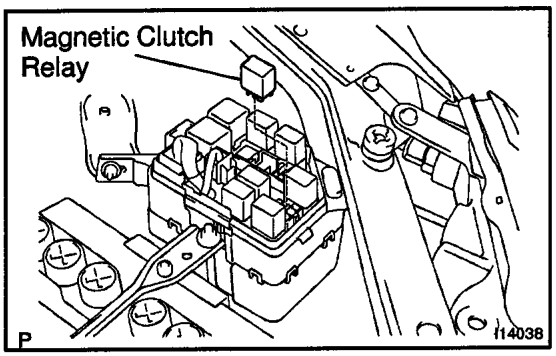
1. REMOVE HEATER SUB RELAY FROM ENGINE ROOM RELAY BLOCK NO. 1



2. INSPECT HEATER SUB 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.

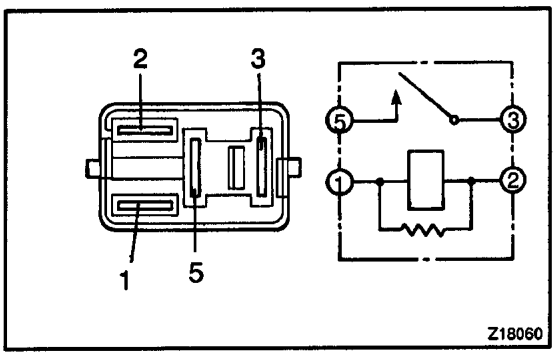


MAGNETIC CLUTCH RELAY

AC28T-02

INSPECTION

1. **REMOVE MAGNETIC CLUTCH RELAY (Marking: A/C MG) FROM ENGINE ROOM RELAY BLOCK**

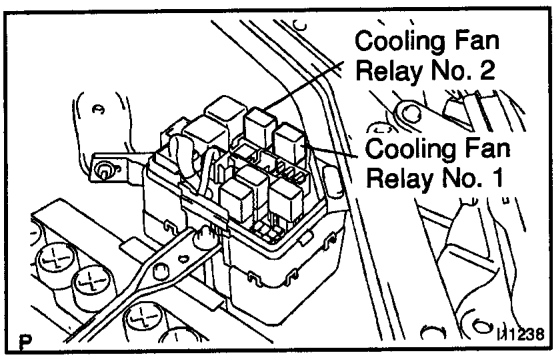


2. **INSPECT MAGNETIC CLUTCH RELAY (Marking: A/C MG) CONTINUITY**

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. **INSTALL MAGNETIC CLUTCH RELAY TO ENGINE ROOM RELAY BLOCK**

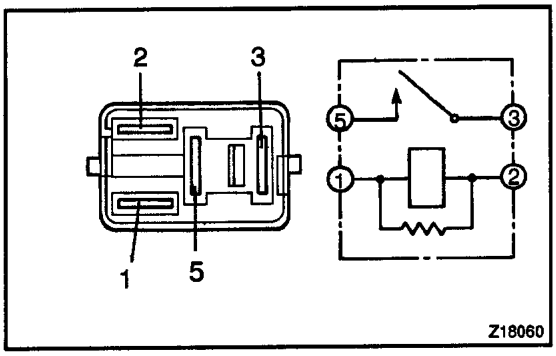


COOLING FAN RELAY

AC28U-02

INSPECTION

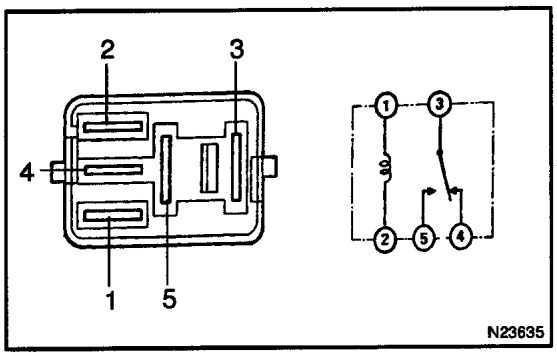
1. **REMOVE COOLING FAN RELAYS NO. 1 AND NO. 2 FROM ENGINE ROOM RELAY BLOCK**



2. **INSPECT NO. 1 COOLING FAN RELAY (Marking: FAN1) 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: FAN2) 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. **INSTALL COOLING FAN RELAYS NO. 1 AND NO. 2 FROM ENGINE ROOM RELAY BLOCK**

CONDENSER FAN

AC28V–02

ON–VEHICLE INSPECTION

1. INSPECT CONDENSER FAN OPERATION

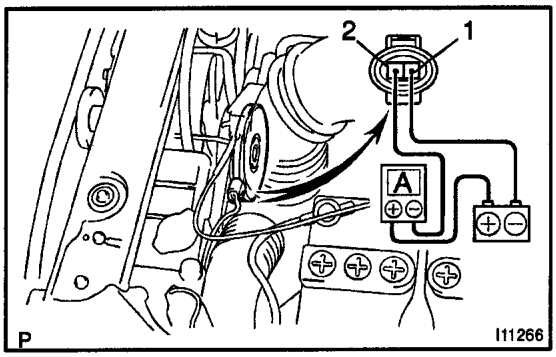
Inspect the fan operation at these conditions, as shown in the chart below.

Test conditions:

- Start engine
- Blower speed control switch position "HI"
- Temperature control dial at "COOL" position
- Set on manifold gauge set
- A/C switch ON

Condition	Fan operation (Fan Speed)
Water temperature below 83 °C (121 °F)	Rotate (Low speed)
Water temperature above 90 °C (194 °F)	Rotate (High speed)
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 fan connector.

(b) Connect battery and ammeter to fan connector, as shown in the illustration.

(c) Check that the fan rotates smoothly, and then check the reading on the ammeter.

Specified amperage:

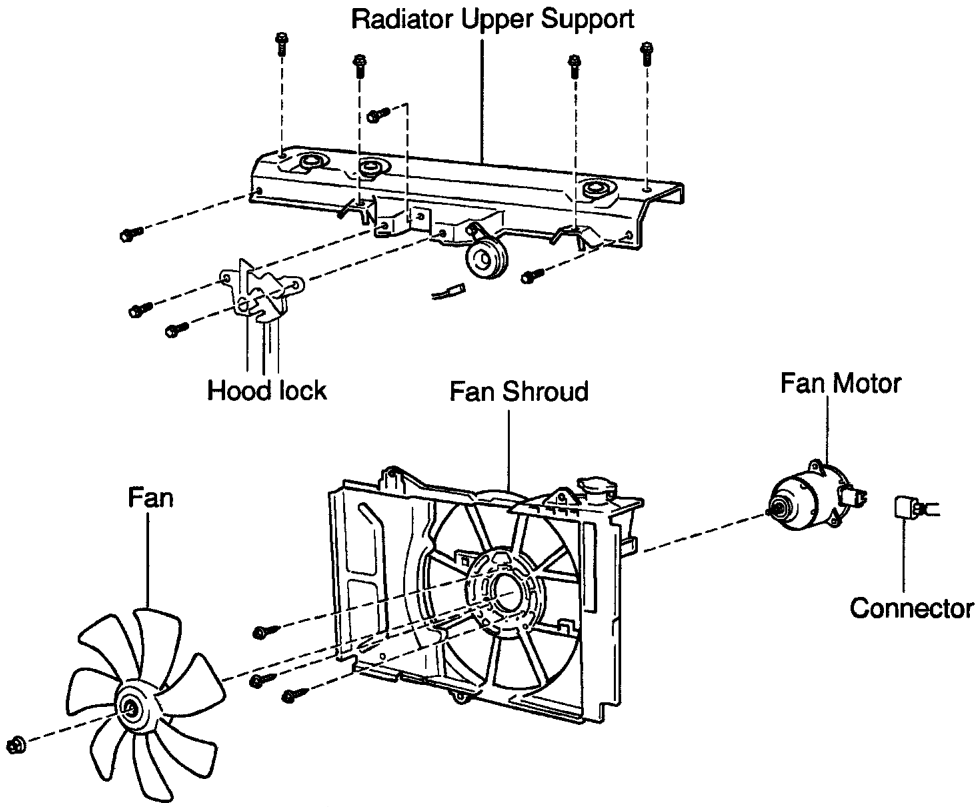
Marking 1 (80 W): 6.5 ± 1.0A at 25 °C (77 °F)

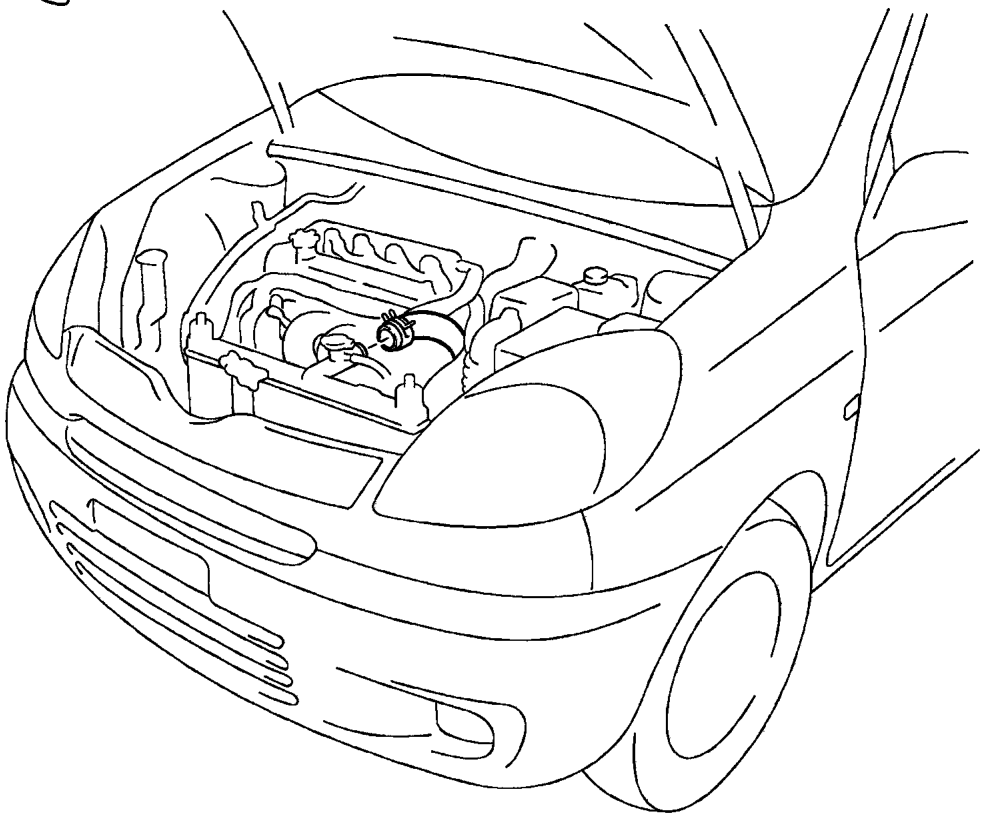
Marking 2 (120 W): 9.8 ± 1.0A at 25 °C (77 °F)

- 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.

AC26W-02

COMPONENTS





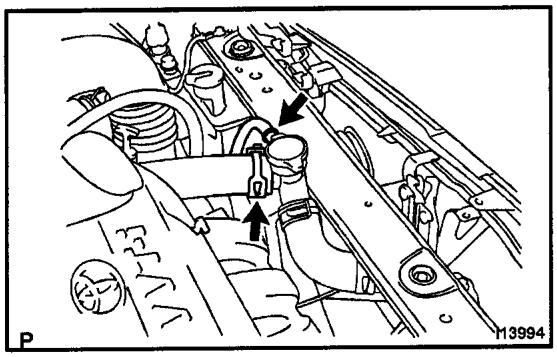
N

I13937

AC28X-02

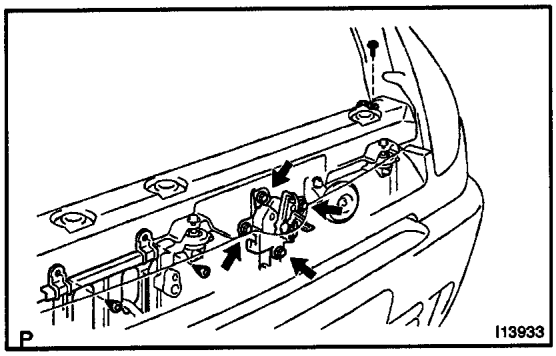
REMOVAL

1. DRAIN ENGINE COOLANT FROM RADIATOR



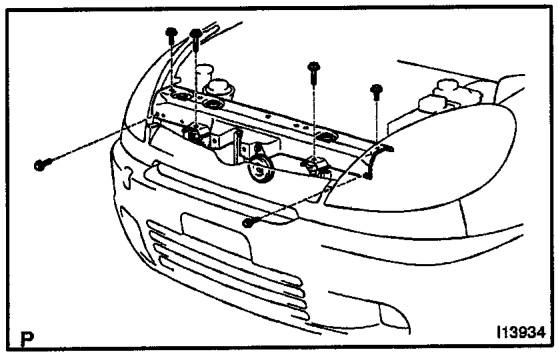
2. DISCONNECT UPPER RADIATOR HOSE

3. DISCONNECT RESERVOIR HOSE

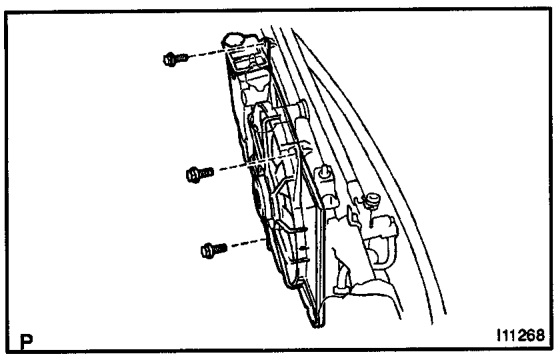


4. REMOVE RADIATOR UPPER SUPPORT

(a) Remove the 3 hood lock set bolts.
(b) Remove the center brace set bolt.
(c) Remove the 2 radiator cover set the hone.
(d) disconnect the connector from the hone.
(e) Remove the earth wire set bolt.



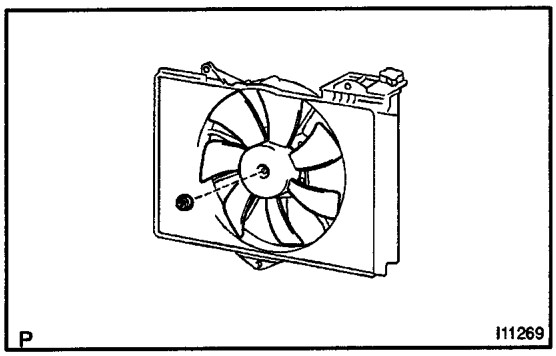
(f) Remove the 6 bolts and radiator upper support.



5. REMOVE CONDENSER FAN

(a) Disconnect the connector.
(b) Remove the 3 bolts and condenser fan.
Torque: 7.5 N·m (80 kgf·cm, 69 in.·lbf)

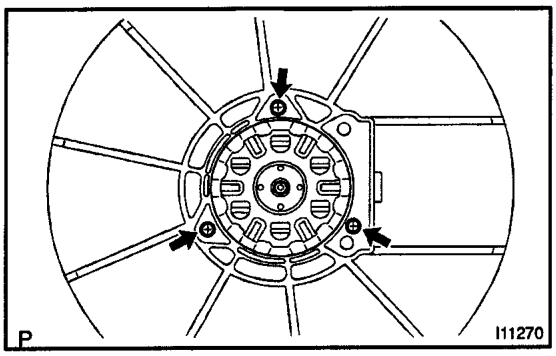
AC28Y-02



DISASSEMBLY

1. REMOVE FAN

Remove the nut and fan.



2. REMOVE FAN MOTOR

Remove the 3 screws and fan motor.

AC28Z-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–73).

AC290-01

INSTALLATION

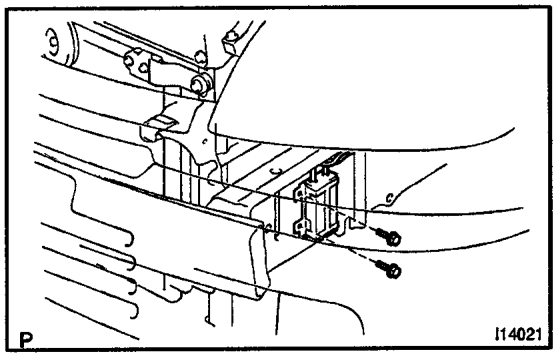
Installation is in thereverse order of removal (See page AC–72).

CONDENSER FAN RESISTOR

AC291-02

INSPECTION

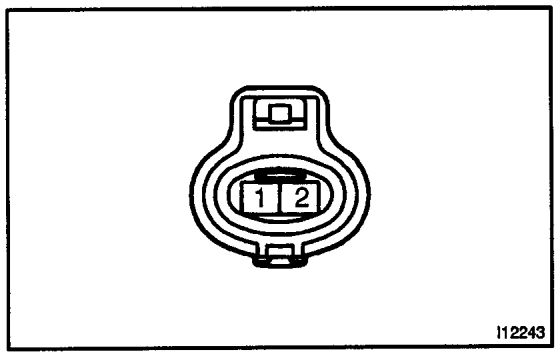
1. REMOVE ENGINE UNDER COVER LH



2. REMOVE CONDENSER FAN RESISTOR

(a) Disconnect the connector.

(b) Remove the 2 bolts and condenser fan resistor.



3. INSPECT CONDENSER FAN RESISTOR RESISTANCE

Measure resistance between terminals.

Standard resistance: 1.3 ± 0.13 Ω

If resistance is not as specified, replace the condenser fan resistor.

4. INSTALL CONDENSER FAN RESISTOR

(a) Install the condenser fan resistor with 2 bolts.

(b) Connect the connector.

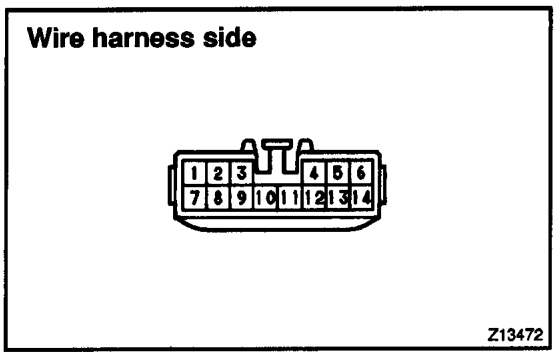
5. INSTALL ENGINE UNDER COVER LH

AIR CONDITIONER AMPLIFIER

AC2HP–01

ON–VEHICLE INSPECTION

1. **REMOVE INSTRUMENT PANEL UPPER SIDE (See page BO–86)**
2. **CONNECT CONNECTORS TO FRONT PASSENGER AIRBAG, COMBINATION METER AND CENTER CLUSTER SWITCH**

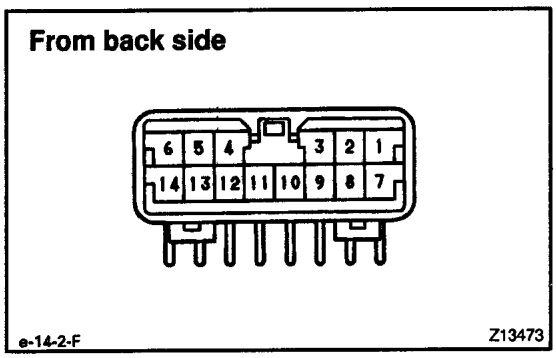


3. **Standard A/C models: INSPECT A/C AMPLIFIER CIRCUIT**

(a) Disconnect the amplifier connector and inspect the connector on wire harness side, as shown in the chart below.

Tester connection	Condition	Specified condition
5 – Ground	Constant	Continuity
3 – 13	Evaporator temp.: 25 °C (77 °F)	1.5 kΩ
3 – 9 (Boost ventilator A/C)	Temperature control selector: OFF	3.0 kΩ
	Temperature control selector: COOL	0 kΩ

If circuit is as specified, try to replace the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.



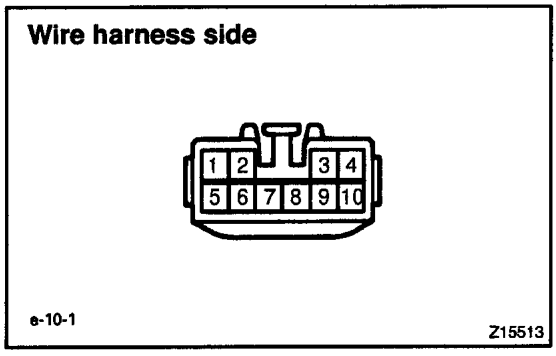
(b) Connect the connector to amplifier and inspect wire harness side connector from the back side, as shown in the chart below.

Test conditions

- Running engine at idle speed
- Blower speed control switch: "HI" position
- A/C switch ON
- Temperature control selector "Max COOL" position
- Set on manifold gauge set

Tester connection	Condition	Specified condition
1 – Ground	Constant	4.0 – 7.0 V
	Engine speed: Idle– up speed	Below 1.0 V
2 – Ground	Refrigerant pressure 196 – 1,340 kPa	Battery positive voltage
	Refrigerant pressure less than 196 or more than 3,140 kPa	No voltage
6 – Ground	Magnetic clutch: ON	Below 2.0 V
	Refrigerant pressure: Above 1,520kPa Water temperature: Above 83 °C (181 °F)	Below 1.0 V
	Condenser fan: OFF	Battery positive voltage
7 – Ground	Magnetic clutch: ON	Below 1.0 V
	Magnetic clutch: OFF	4.0 – 5.0 V
11 – Ground	Refrigerant pressure: Above 1,520kPa (15.5 kgf/cm^2, 220 psi) Water temperature: Above 83 °C (181 °F)	Below 1.0 V
	Refrigerant pressure: Above 1,520kPa (15.5 kgf/cm^2, 220 psi) Water temperature: Below 90 °C (194 °F)	Battery voltage
12 – Ground	Magnetic clutch: ON	Below 2.0 V
	Magnetic clutch: OFF	Battery voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

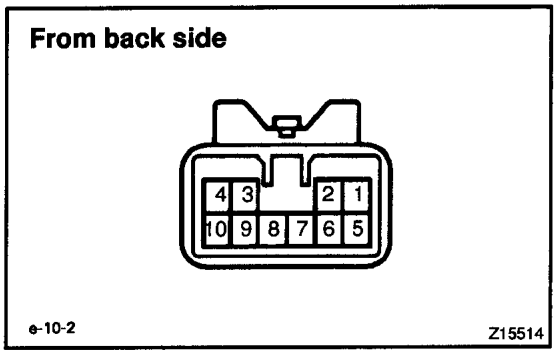


4. Two way flow heater models:
INSPECT PTC AMPLIFIER

(a) Disconnect the connector from the amplifier and inspect the connector on wire harness side, as shown in the chart below.

Tester connection	Condition	Specified condition
1 – Ground	IG ON	Battery voltage
	IG OFF	No voltage
4 – Ground	Constant	Continuity

If the circuit is as specified, try to replace the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

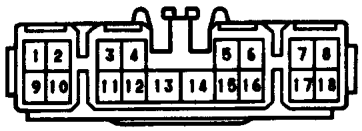


(b) Connect the connector to the amplifier and inspect the wire harness side connector from the back side, as shown in the chart below.
Test conditions
- Ignition switch: ON
- Blower speed control switch: HI

Tester connection	Condition	Specified condition
3 – Ground	Air inlet selector: FRESH	Battery voltage
	Air inlet selector: Except FRESH	Below 1.0 V
5 – Ground	Temperature control selector: MAX. WARM Mode selector: FOOT or FOOT / DEF.	Battery positive voltage
	Temperature control selector: Except MAX. WARM Mode selector: Except FOOT or FOOT / DEF.	No voltage
7 – Ground	Air inlet selector: FRESH Temperature control selector: MAX. WARM Mode selector: FOOT or FOOT / DEF.	Below 1.0 V
	Air inlet selector: RECIRC Temperature control selector: Except MAX. WARM Mode selector: Except FOOT, FOOT / DEF.	No voltage
8 – Ground	Air inlet selector: FRESH Temperature control selector: MAX. WARM Mode selector: FOOT or FOOT /DEF.	Below 1.0 V
	Air inlet selector: Except FRESH Temperature control selector: Except MAX. WARM Mode selector: Except FOOT or FOOT / DEF.	No voltage
9 – Ground	Air inlet selector: RECIRC	Below 1.0 V
	Air inlet selector: FRESH	No voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

Wire harness side



I12240

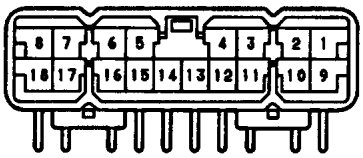
5. PTC heater and two way flow heater models: INSPECT PTC AMPLIFIER CIRCUIT

(a) Disconnect the connector from the amplifier and inspect the connector on wire harness side, as shown in the chart below.

Tester connection	Condition	Specified condition
6 – Ground	Constant	Continuity
12 – 16	Water temperature: 25 °C (77 °F)	5.0 kΩ
3 – Ground	IG ON	Battery voltage
	IG OFF	No voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

From back side



I12241

(b) Connect the connector to amplifier and inspect wire harness side connector from the back side, as shown in the chart below.

Test conditions

- Ignition switch: ON
- Blower speed control switch: HI

Tester connection	Condition	Specified condition
4 – Ground	Temperature control selector: MAX. WARM	Battery voltage
	Temperature control selector: Except MAX. WARM	No voltage
7 – Ground	Running engine: 1,600 rpm Water temp.: 55 °C (131 °F) or below Temperature control selector: MAX. WARM	Below 1.0 V
	Temperature control selector: Except MAX. WARM	Battery voltage
	Water temp.: 65 °C (149 °F) or above	Battery voltage
8 – Ground	Air inlet selector: FRESH	Below 1.0 V
	Air inlet selector: RECIRC	No voltage
9 – Ground	Air inlet selector: RECIRC	Below 1.0 V
	Air inlet selector: FRESH	No voltage
10 – Ground	Air inlet selector: FRESH	Battery voltage
	Air inlet selector: RECIRC	Below 1.0 V
13 – Ground	Air inlet selector: FRESH	Below 1.0 V
	Air inlet selector: RECIRC	No voltage

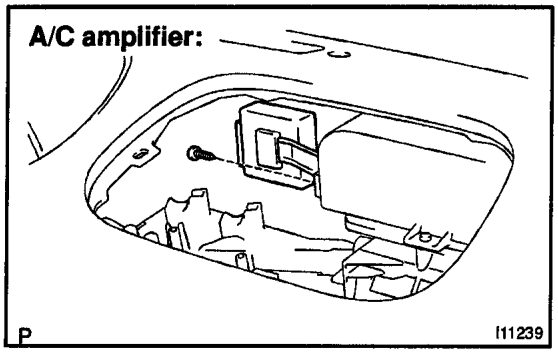
18 – Ground	Mode selector: FOOT or FOOT / DEF. Temperature control selector: MAX. WARM	Below 1.0 V
	Mode selector: Except FOOT or FOOT / DEF.	No voltage
15 – Ground	Running engine: 1,600 rpm Water temp.: 55 °C (131 °F) or below Temperature control selector: MAX. WARM	Below 1.0 V
	Temperature control selector: Except MAX. WARM	Battery voltage
	Water temp.: 65 °C (149 °F) or above	Battery voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

AC293-02

REMOVAL

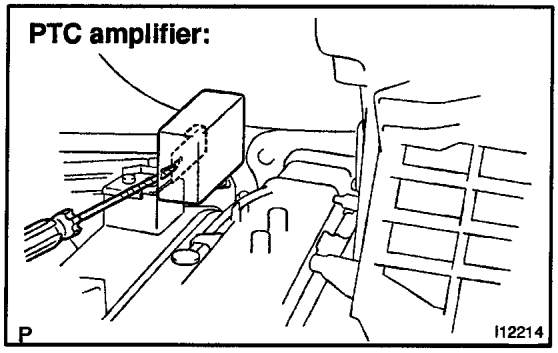
1. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–29)



2. REMOVE A/C AMPLIFIER

(a) Disconnect the connector.

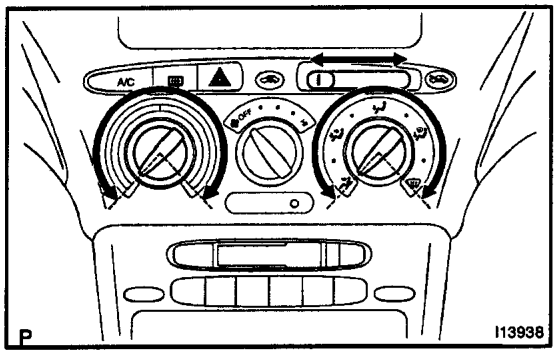
(b) Using a screwdriver, release the claw and remove the A/C amplifier.



AC294-01

INSTALLATION

Installation is in the reverse order of removal (See page AC–82).



HEATER CONTROL ASSEMBLY

AC295-02

ON–VEHICLE INSPECTION

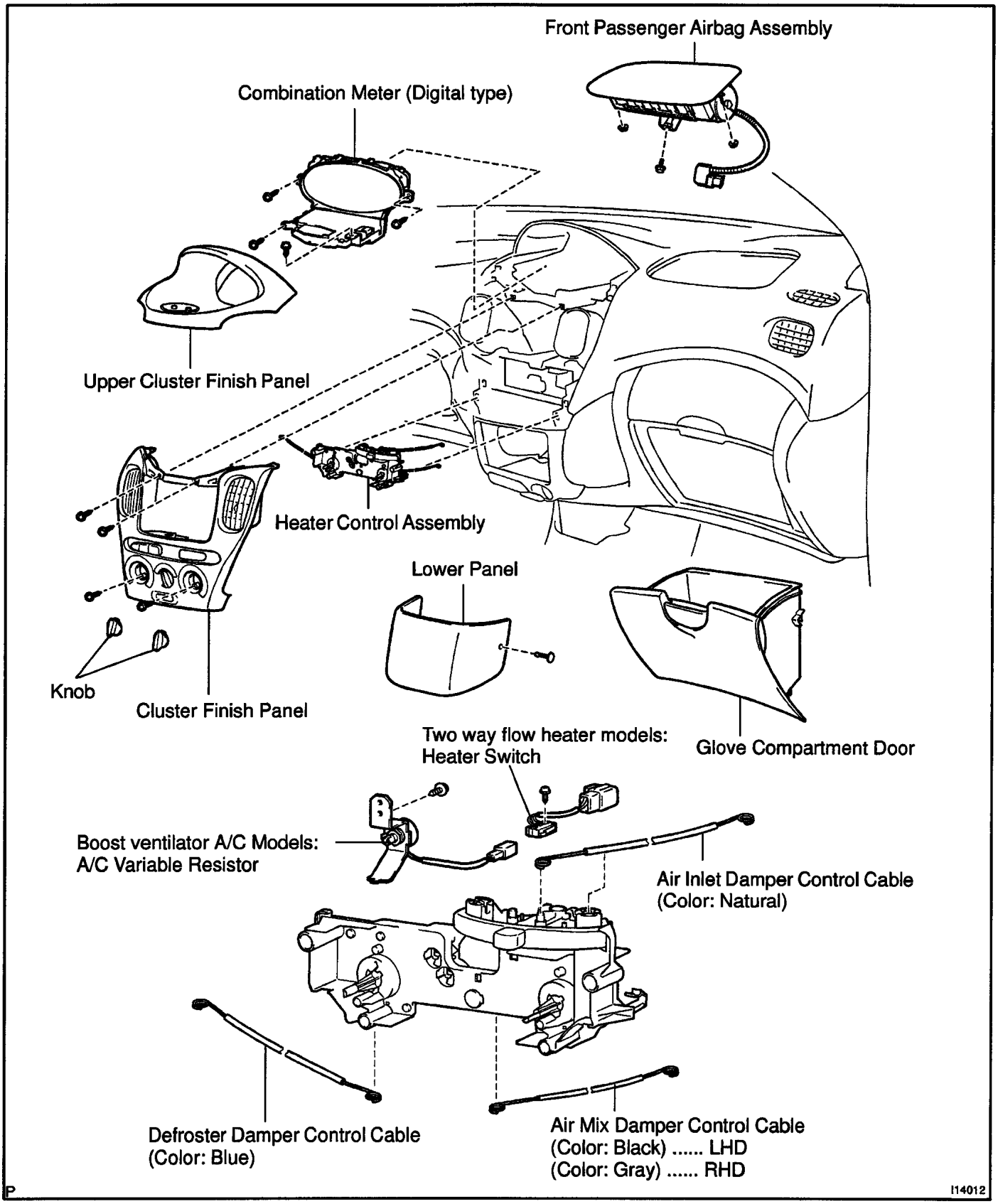
INSPECT HEATER CONTROL DIALS OPERATION

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 not be heard or recoil is felt, adjust the control cable or check control cable and heater control assembly.

AC296-02

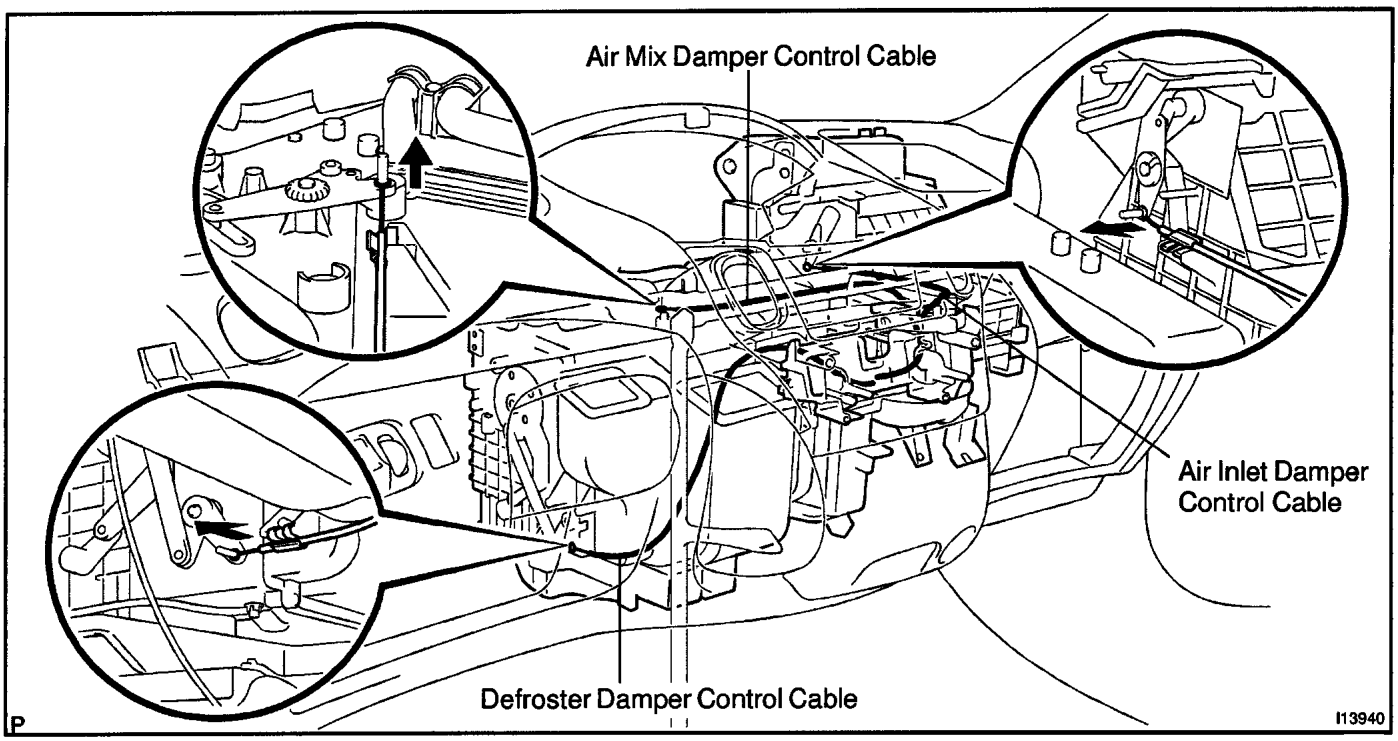
COMPONENTS

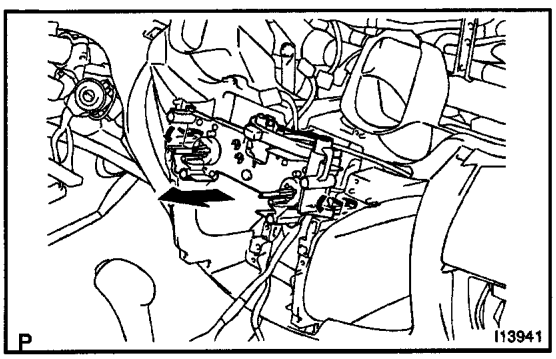


AC2HQ-01

REMOVAL

1. **REMOVE CLUSTER FINISH PANEL (Integration panel) (See page BO–86)**
2. **REMOVE FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–29)**
3. **REMOVE CLUSTER PANEL (Combination meter)**
4. **REMOVE COMBINATION METER**
5. **DISCONNECT HEATER CONTROL CABLES**





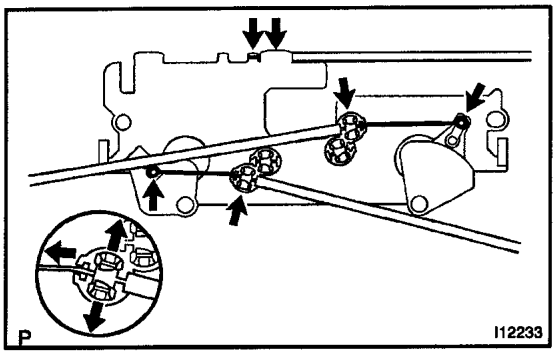
6. **REMOVE HEATER CONTROL ASSEMBLY**

(a) w/ A/C models:
Release the 2 claws and pull out the heater control assembly.

(b) Boost ventilator A/C models:
Release the 2 claws and pull out the heater control assembly, then disconnect the connector.

AC298-02

DISASSEMBLY



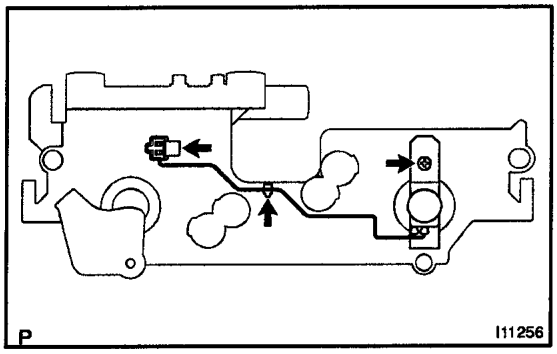
1. REMOVE HEATER CONTROL CABLES

(a) Using a screwdriver, open the claw of the cable clamp and disconnect the outer cable.

HINT:

Tape the screwdriver tip before use.

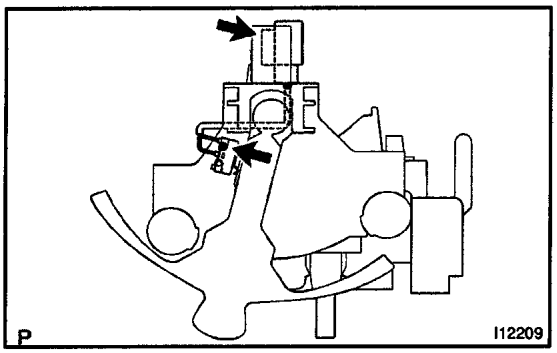
(b) Remove the inner cable from the heater control assembly.



2. Boost ventilator A/C models:
REMOVE A/C VARIABLE RESISTOR SET SWITCH

(a) Disconnect the wire harness clamps.

(b) Remove the screw and A/C variable resistor set switch.



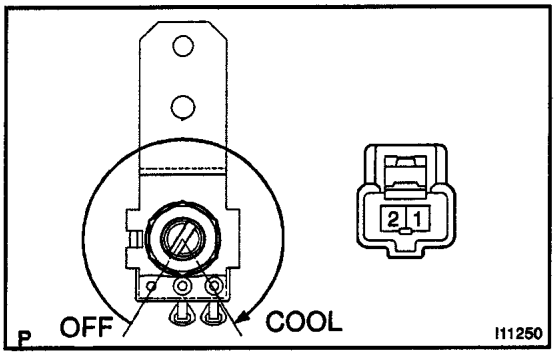
3. Two way flow heater models:
REMOVE HEATER SWITCH

(a) Disconnect the connector clamp.

(b) Remove the screw and heater switch.

AC290-02

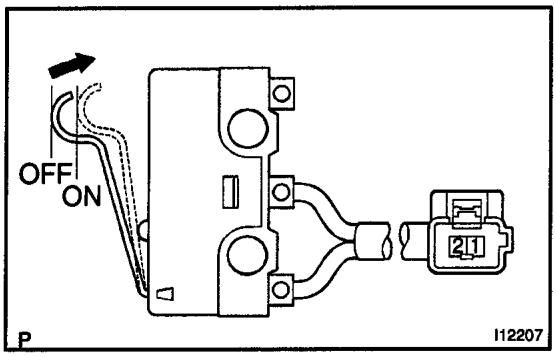
INSPECTION



1. Boost ventilator A/C models:
INSPECT A/C VARIABLE RESISTOR SET SWITCH OPERATION

Gradually turn the switch from "OFF" side to "COOL" side them check that the resistance between terminals decrease from 3 to 0 kΩ.

If operation is not as specified replace the switch.



2. Two way flow heater models:
INSPECT HEATER SWITCH CONTINUITY

Check the continuity exists between terminals while switch is pressed.

If no continuity exists, replace the heater switch.

AC29A-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–87).

AC29B-02

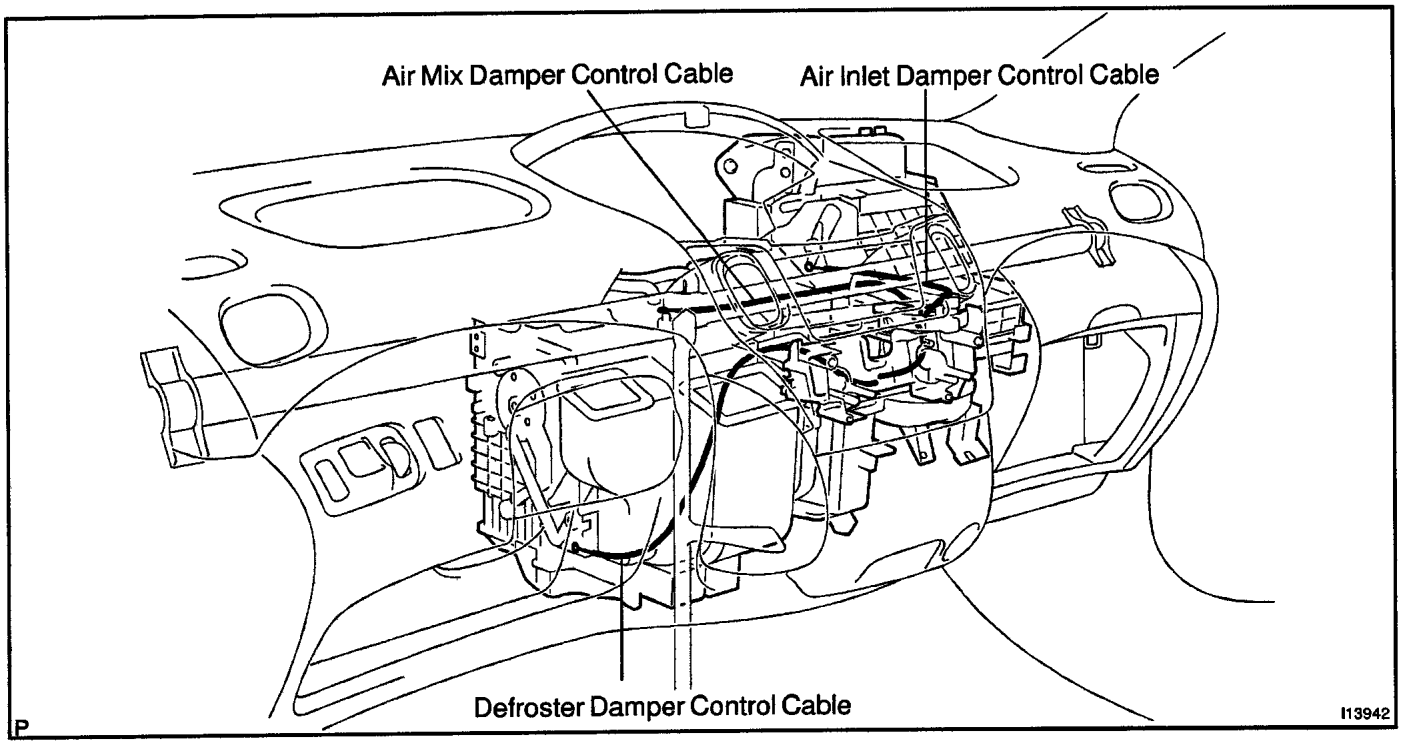
INSTALLATION

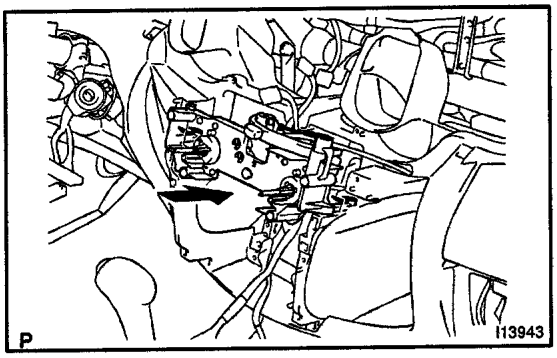
1. INSTALL HEATER CONTROL ASSEMBLY

(a) Boost ventilator A/C models:
Connect the connector.

(b) Install the heater control assembly temporarily.

(c) Pass the heater control cables as shown in the illustration.





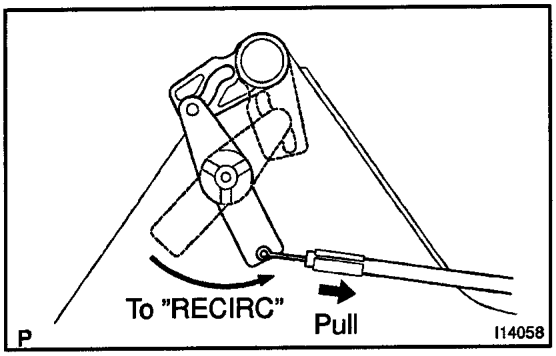
(d) Fit the 2 claws of heater control assembly in the instrument panel hole.

2. CONNECT HEATER CONTROL CABLES

(a) Set air inlet selector to "RECIRC" position.

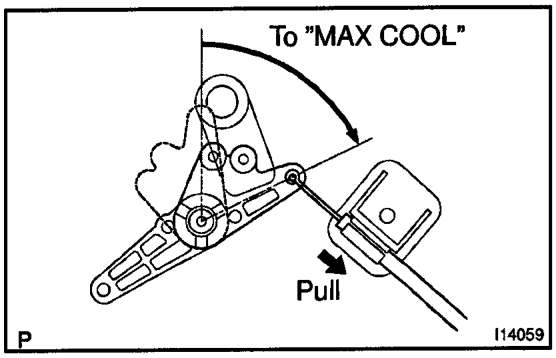
(b) Set temperature control selector to "MAX. COOL" position.

(c) Set mode selector to "FACE" position.



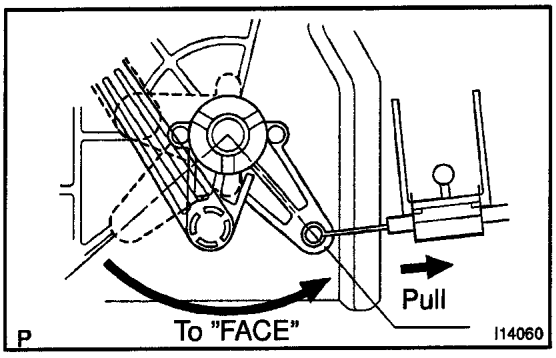
(d) Standard heater models only:
Adjust air inlet control cable.
Set air inlet damper control lever to "RECIRC" position and connect the inner cable to lever pin and clamp the outer cable.

HINT:
Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in the illustration.



(e) Adjust air mix control cable.
Set air mix damper control lever to "MAX. COOL" position and connect the inner cable to lever pin and clamp the outer cable.

HINT:
Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in the illustration.



(f) Adjust defroster control cable.
Pull the air inlet control link to "FACE" position, connect the control cable and lock the clamp.

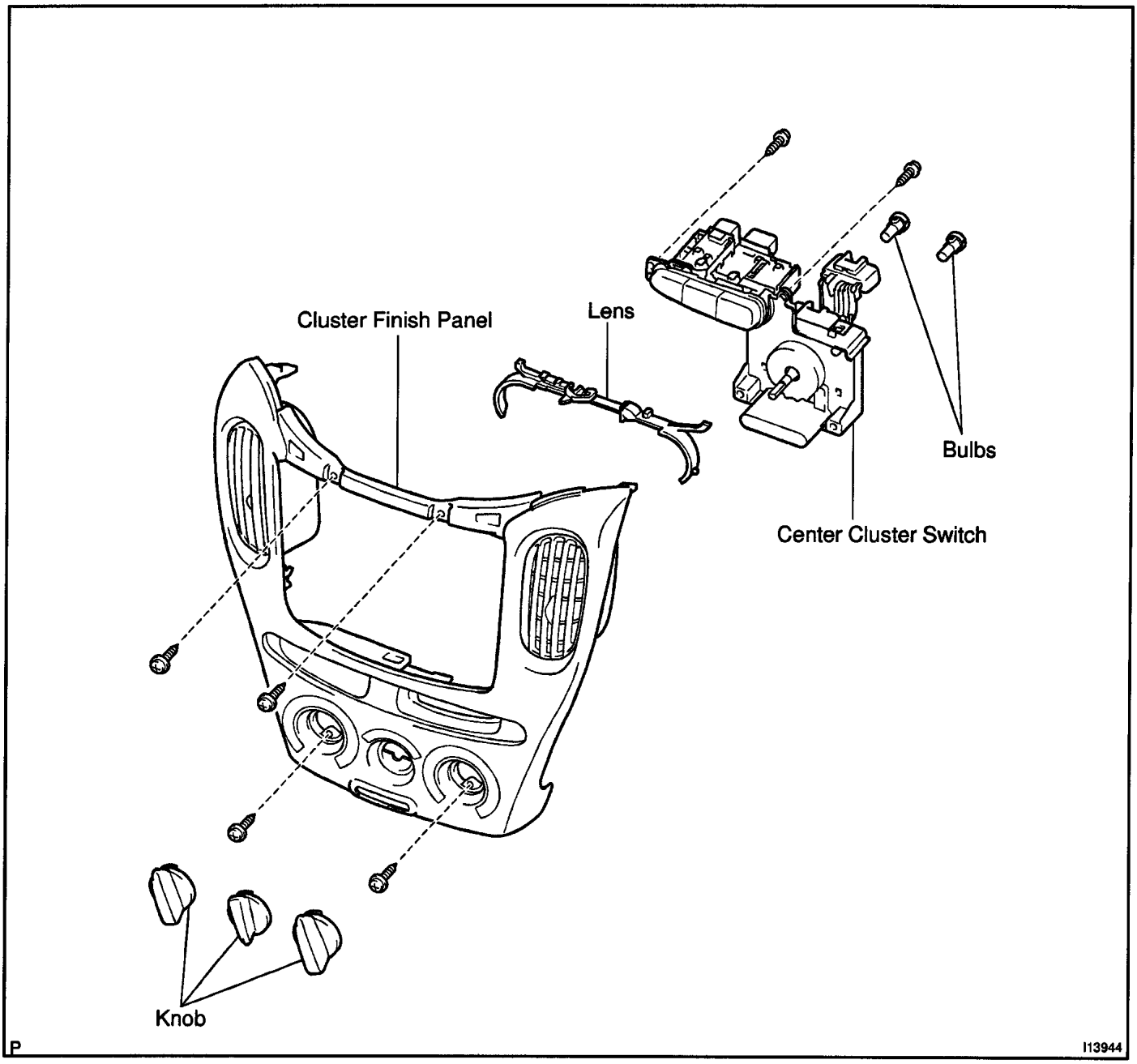
HINT:
Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in the illustration.

3. **INSTALL COMBINATION METER**
4. **INSTALL CLUSTER FINISH PANEL (Combination meter)**
5. **INSTALL FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–38)**
6. **INSTALL CLUSTER FINISH PANEL (See page BO–95)**

HEATER CONTROL ASSEMBLY (Center Cluster Integration)

AC29C-02

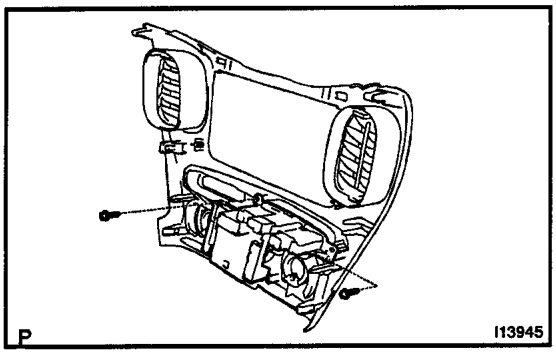
COMPONENTS



AC2HR-01

DISASSEMBLY

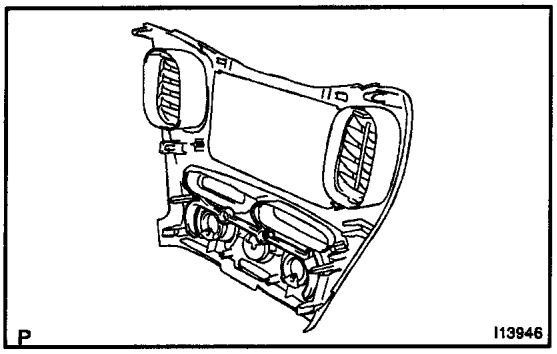
1. REMOVE CLUSTER FINISH PANEL
(See page BO–86)



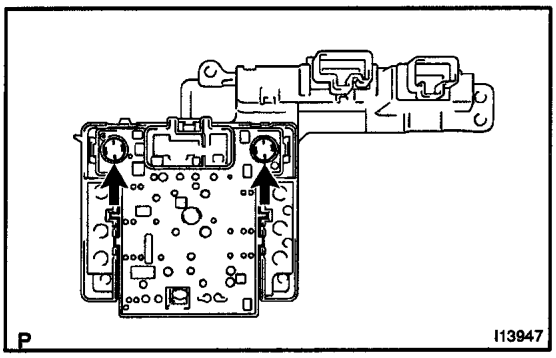
2. REMOVE CENTER CLUSTER SWITCH

(a) Remove the knob.

(b) Release the 2 claws and remove the switch.



3. REMOVE LENS

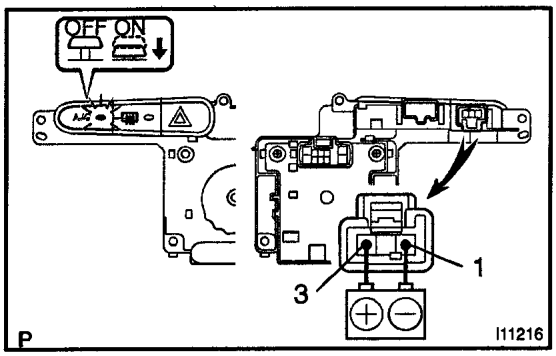


4. REMOVE BULB

Using a screwdriver, turn the bulb to the left and pull out the bulb.

AC29E-02

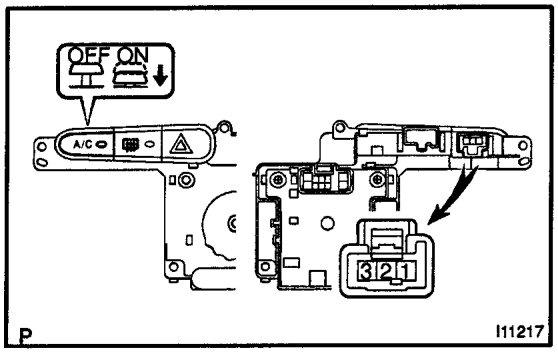
INSPECTION



1. INSPECT A/C INDICATOR OPERATION

Connect the positive (+) lead from the battery to terminal 3 and negative (–) lead to terminal 1, then check that the A/C indicator lights up while A/C switch is pressed.

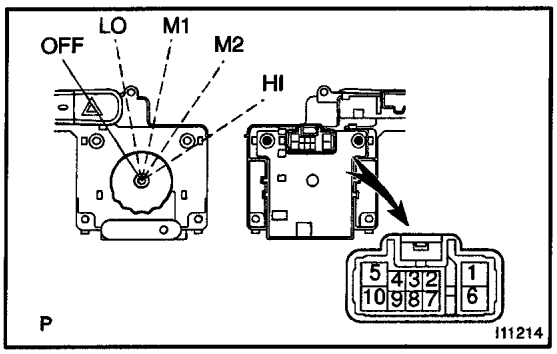
If operation is not as specified, replace the center cluster switch.



2. INSPECT A/C SWITCH CONTINUITY

Check the continuity exists between terminals 2 and 3 while switch is pressed.

If no continuity exists, replace the center cluster switch.



3. INSPECT BLOWER SWITCH CONTINUITY

Position / Circuit	Tester connection	Specified condition
OFF	–	No continuity
LO	1 – 2	Continuity
M1	1 – 2 – 7	Continuity
M2	1 – 2 – 6	Continuity
HI	1 – 2 – 10	Continuity
Illumination circuit	1 – 4	Continuity

Switch continuity:

If continuity is not as specified, replace the center cluster switch.

Illumination circuit:

If continuity is not as specified, replace the bulb.

AC29F-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–93).

WATER TEMPERATURE SWITCH

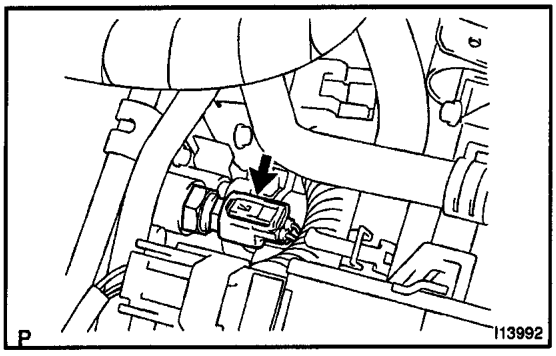
AC29G-02

INSPECTION

1. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

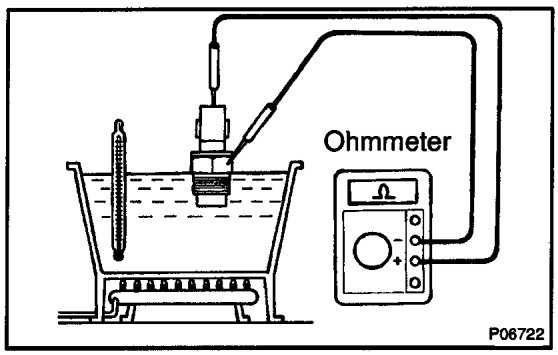
It is not necessary to drain out out all the coolant.



2. REMOVE WATER TEMPERATURE SWITCH

(a) Disconnect the connector.

(b) Remove the water temperature switch.



3. INSPECT SWITCH CONTINUITY

(a) Using an ohmmeter, check that no continuity exists between the terminal and switch body when the coolant temperature is above 83 °C (181 °F).

If continuity exists, replace the switch.

(b) Using an ohmmeter, check that continuity exists between the terminals when the coolant temperature is below 90 °C (194 °F).

If no continuity exists, replace the switch.

4. INSTALL WATER TEMPERATURE SWITCH

(a) Install the water temperature switch.

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(b) Connect the connector.

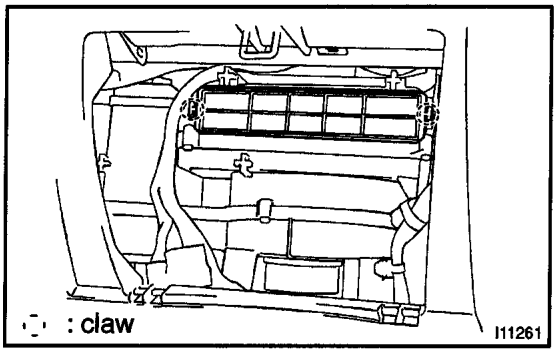
5. FILL WITH ENGINE COOLANT

AIR REFINER FILTER

AC29H-02

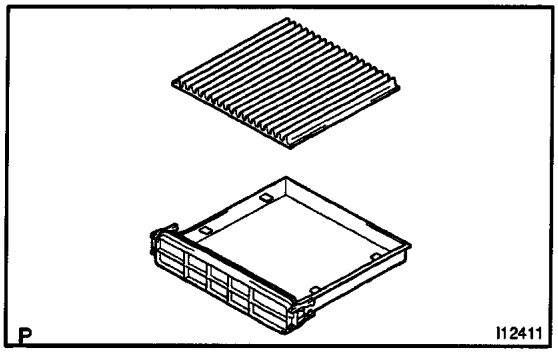
REPLACEMENT

1. REMOVE GLOVE COMPARTMENT DOOR



2. REPLACE AIR REFINER FILTER

(a) Release the 2 claws and pull out the filter case.



(b) Remove the filter.
(c) Install the new filter.
(d) Install the filter case to A/C unit.

3. INSTALL GLOVE COMPARTMENT DOOR

ALPHABETICAL INDEX

A

	Page
ABBREVIATIONS USED IN THIS MANUAL (TERMS)	IN–34
ABS ACTUATOR	BR–53
AIR CONDITIONER AMPLIFIER	AC–77
AIR CONDITIONER UNIT	AC–24
AIR CONDITIONING (PREPARATION)	PP–47
AIR CONDITIONING (SERVICE SPECIFICATIONS)	SS–23
AIR CONDITIONING SYSTEM	AC–1
AIR INLET SERVOMOTOR	AC–61
AIR REFINER FILTER	AC–97
AIRBAG SENSOR ASSEMBLY	RS–52
ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD) (DIAGNOSTICS)	DI–58
AUDIO SYSTEM	BE–124
AUTOMATIC TRANSAXLE (DIAGNOSTICS)	DI–1
AUTOMATIC TRANSAXLE (PREPARATION)	PP–11
AUTOMATIC TRANSAXLE (SERVICE SPECIFICATIONS)	SS–9
AUTOMATIC TRANSAXLE SYSTEM	AX–1
AUTOMATIC TRANSAXLE UNIT	AX–23

B

BACK DOOR	BO–26
BACK DOOR GLASS	BO–63
BACK–UP LIGHT SYSTEM	BE–39
BLOWER MOTOR	AC–58
BLOWER RESISTOR	AC–60
BODY (PREPARATION)	PP–42
BODY (SERVICE SPECIFICATIONS)	SS–21
BODY ELECTRICAL (PREPARATION)	PP–38
BODY ELECTRICAL (SERVICE SPECIFICATIONS)	SS–20
BODY ELECTRICAL SYSTEM	BE–1
BODY OUTSIDE MOULDING	BO–42
BRAKE (PREPARATION)	PP–23
BRAKE (SERVICE SPECIFICATIONS)	SS–14
BRAKE BOOSTER ASSEMBLY	BR–14
BRAKE FLUID	BR–4
BRAKE MASTER CYLINDER	BR–10
BRAKE PEDAL	BR–6
BRAKE SYSTEM	BR–1

C

CIRCUIT INSPECTION (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–69
CIRCUIT INSPECTION (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–22
CIRCUIT INSPECTION (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–250
CIRCUIT INSPECTION (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–114
CLIP	BO–1
CLOCK	BE–154
CLUTCH (PREPARATION)	PP–1
CLUTCH (SERVICE SPECIFICATIONS)	SS–4
CLUTCH MASTER CYLINDER	CL–4
CLUTCH PEDAL	CL–2
CLUTCH RELEASE CYLINDER	CL–9
CLUTCH UNIT	CL–14
COIL SPRING AND REAR SHOCK ABSORBER	SA–46
COMBINATION METER	BE–48
COMPRESSOR AND MAGNETIC CLUTCH	AC–43
CONDENSER	AC–50
CONDENSER FAN	AC–70
CONDENSER FAN RESISTOR	AC–76
COOLING FAN RELAY	AC–69
CUSTOMER PROBLEM ANALYSIS CHECK (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–59
CUSTOMER PROBLEM ANALYSIS CHECK (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–3
CUSTOMER PROBLEM ANALYSIS CHECK (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–242
CUSTOMER PROBLEM ANALYSIS CHECK (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–101

D

DEFOGGER SYSTEM	BE–65
DIAGNOSTIC TROUBLE CODE CHART (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–63
DIAGNOSTIC TROUBLE CODE CHART (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–16
DIAGNOSTIC TROUBLE CODE CHART (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–246
DIAGNOSTIC TROUBLE CODE CHART (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–108
DIFFERENTIAL CASE	MX–38
DIFFERENTIAL OIL SEAL	AX–10
DIRECT CLUTCH SPEED SENSOR	AX–4
DOUBLE LOCKING SYSTEM	BE–95
DRIVE BELT	AC–16
DRIVE BELT	SR–3

E

ENGINE IMMOBILISER SYSTEM (DIAGNOSTICS)	DI–241
EXPANSION VALVE	AC–56

F

FLOOR SHIFT ASSEMBLY	AX–13
FOG LIGHT SYSTEM	BE–30
FOR ALL OF VEHICLES	IN–10
FRONT AIRBAG SENSOR	RS–57
FRONT AXLE HUB	SA–8
FRONT BRAKE CALIPER	BR–23
FRONT BRAKE PAD	BR–20
FRONT BUMPER	BO–4
FRONT DOOR	BO–11
FRONT DRIVE SHAFT	SA–16
FRONT LOWER SUSPENSION ARM	SA–31
FRONT PASSENGER AIRBAG ASSEMBLY	RS–28
FRONT SEAT	BO–103
FRONT SHOCK ABSORBER	SA–24
FRONT SPEED SENSOR	BR–58
FRONT STABILIZER BAR	SA–35
FRONT WHEEL ALIGNMENT	SA–4

	Page
FRONT WHEEL HUB BOLT	SA–15
FRONT WIPER AND WASHER	BO–32
FUEL TANK AND LINE	BO–137

G

GENERAL INFORMATION (HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS)	IN–18
GENERAL INFORMATION (HOW TO USE THIS MANUAL)	IN–1
GENERAL INFORMATION (REPAIR INSTRUCTIONS)	IN–4

H

HEADLIGHT AND TAILLIGHT SYSTEM	BE–17
HEADLIGHT BEAM LEVEL CONTROL SYSTEM	BE–28
HEATER CONTROL ASSEMBLY	AC–84
HEATER CONTROL ASSEMBLY (Center Cluster Integration)	AC–92
HEATER MAIN RELAY	AC–66
HEATER SUB RELAY	AC–67
HEATER UNIT	AC–35
HOOD	BO–10
HOW TO PROCEED WITH TROUBLESHOOTING (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–58
HOW TO PROCEED WITH TROUBLESHOOTING (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–1
HOW TO PROCEED WITH TROUBLESHOOTING (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–241
HOW TO PROCEED WITH TROUBLESHOOTING (HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS)	IN–19
HOW TO PROCEED WITH TROUBLESHOOTING (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–100
HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS	IN–18
HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE (HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS)	IN–29
HOW TO USE THIS MANUAL	IN–1

I

IDENTIFICATION INFORMATION	IN–3
IGNITION SWITCH AND KEY UNLOCK WARNING SWITCH	BE–15
INPUT SHAFT	MX–23
INSTRUMENT PANEL	BO–83
INTERIOR LIGHT SYSTEM	BE–36

L

LOAD SENSING PROPORTIONING VALVE (LSPV)	BR–48

M

MAGNETIC CLUTCH RELAY	AC–68
MANIFOLD GAUGE SET	AC–19
MANUAL STEERING GEAR	SR–34
MANUAL TRANSAXLE (PREPARATION)	PP–5
MANUAL TRANSAXLE (SERVICE SPECIFICATIONS)	SS–6
MANUAL TRANSAXLE ASSEMBLY	MX–9
MANUAL TRANSAXLE UNIT	MX–2

N

NEUTRAL START SWITCH	AX–5

O

OUTPUT SHAFT	MX–30

P

PARKING BRAKE	BR–43
PARKING BRAKE LEVER	BR–9
PARTS LOCATION (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–65
PARTS LOCATION (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–17
PARTS LOCATION (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–247
PARTS LOCATION (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–110
POWER DOOR LOCK CONTROL SYSTEM	BE–86
POWER MIRROR CONTROL SYSTEM	BE–118
POWER SOURCE	BE–11
POWER STEERING FLUID	SR–5
POWER STEERING GEAR	SR–47
POWER STEERING VANE PUMP	SR–23
POWER WINDOW CONTROL SYSTEM	BE–68
PRE–CHECK (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–60
PRE–CHECK (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–4
PRE–CHECK (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–243
PRE–CHECK (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–102
PRECAUTION (FOR ALL OF VEHICLES)	IN–10
PRESSURE SWITCH	AC–63
PROBLEM SYMPTOMS TABLE (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–68
PROBLEM SYMPTOMS TABLE (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–19
PROBLEM SYMPTOMS TABLE (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–249
PROBLEM SYMPTOMS TABLE (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–113

Q

QUARTER WINDOW GLASS	BO–56

R

	Page
REAR AXLE BEAM	SA–51
REAR AXLE HUB	SA–40
REAR BRAKE CALIPER	BR–37
REAR BRAKE PAD	BR–34
REAR BUMPER	BO–5
REAR COMBINATION LIGHT	BO–6
REAR DOOR	BO–19
REAR DRUM BRAKE	BR–29
REAR SEAT (Center)	BO–116
REAR SEAT (Outer Side)	BO–109
REAR SPEED SENSOR	BR–61
REAR WHEEL ALIGNMENT	SA–7
REAR WHEEL HUB BOLT	SA–45
REAR WIPER AND WASHER	BO–37
REFRIGERANT LINE	AC–21
REPAIR INSTRUCTIONS	IN–4
ROOF DRIP SIDE FINISH MOULDING	BO–46
ROOF HEADLINING	BO–96
ROOF RAIL	BO–135

S

SEAT BELT	BO–121
SEAT BELT PRETENSIONER	BO–124
SEAT HEATER SYSTEM	BE–121
SHIFT AND SELECT LEVER SHAFT	MX–37
SHIFT LEVER AND CONTROL CABLE	MX–44
SHIFT LOCK SYSTEM	AX–11
SIDE AIRBAG ASSEMBLY	RS–39
SIDE AIRBAG SENSOR ASSEMBLY	RS–63
SLIDING ROOF	BO–75
SLIDING ROOF SYSTEM	BE–114
SPOILER	BO–136
SRS AIRBAG	BO–3
SRS AIRBAG	RS–1
STANDARD BOLT (SERVICE SPECIFICATIONS)	SS–1
STEERING (PREPARATION)	PP–27
STEERING (SERVICE SPECIFICATIONS)	SS–16
STEERING SYSTEM	SR–1
STEERING WHEEL	SR–9
STEERING WHEEL PAD AND SPIRAL CABLE	RS–13
STOP LIGHT SYSTEM	BE–41
SUPPLEMENTAL RESTRAINT SYSTEM (DIAGNOSTICS)	DI–100
SUPPLEMENTAL RESTRAINT SYSTEM (PREPARATION)	PP–35
SUPPLEMENTAL RESTRAINT SYSTEM (SERVICE SPECIFICATIONS)	SS–19
SUSPENSION AND AXLE (PREPARATION)	PP–16
SUSPENSION AND AXLE (SERVICE SPECIFICATIONS)	SS–12

T

TERMINALS OF ECU (ANTI–LOCK BRAKE SYSTEM WITH ELECTRONIC BRAKE FORCE DISTRIBUTION (EBD)) (DIAGNOSTICS)	DI–67
TERMINALS OF ECU (AUTOMATIC TRANSAXLE) (DIAGNOSTICS)	DI–18
TERMINALS OF ECU (ENGINE IMMOBILISER SYSTEM) (DIAGNOSTICS)	DI–248
TERMINALS OF ECU (SUPPLEMENTAL RESTRAINT SYSTEM) (DIAGNOSTICS)	DI–111
TERMS	IN–34
THERMISTOR	AC–62
TILT MOON ROOF	BO–69
TILT STEERING COLUMN	SR–10
TIRE AND WHEEL	SA–2
TORQUE CONVERTER AND DRIVE PLATE	AX–31
TROUBLESHOOTING	AC–14
TROUBLESHOOTING	BE–2
TROUBLESHOOTING	BR–2
TROUBLESHOOTING	CL–1
TROUBLESHOOTING	MX–1
TROUBLESHOOTING	SA–1
TROUBLESHOOTING	SR–2
TURN SIGNAL AND HAZARD WARNING SYSTEM	BE–33

V

VALVE BODY ASSEMBLY	AX–6
VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER (IDENTIFICATION INFORMATION)	IN–3
VEHICLE LIFT AND SUPPORT LOCATIONS (REPAIR INSTRUCTIONS)	IN–8
VEHICLE SPEED SENSOR	AX–3

W

WATER TEMPERATURE SWITCH	AC–96
WINDSHIELD	BO–49
WIPER AND WASHER SYSTEM	BE–43
WIRE HARNESS AND CONNECTOR	RS–69
WIRELESS DOOR LOCK CONTROL SYSTEM	BE–99

TOYOTA

QUALITY SERVICE

OVERSEAS SERVICE DIVISION
TOYOTA MOTOR CORPORATION

PRINTED IN JAPAN [illegible]