

# HOW TO USE THIS MANUAL

## 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.

## 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.

## 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.

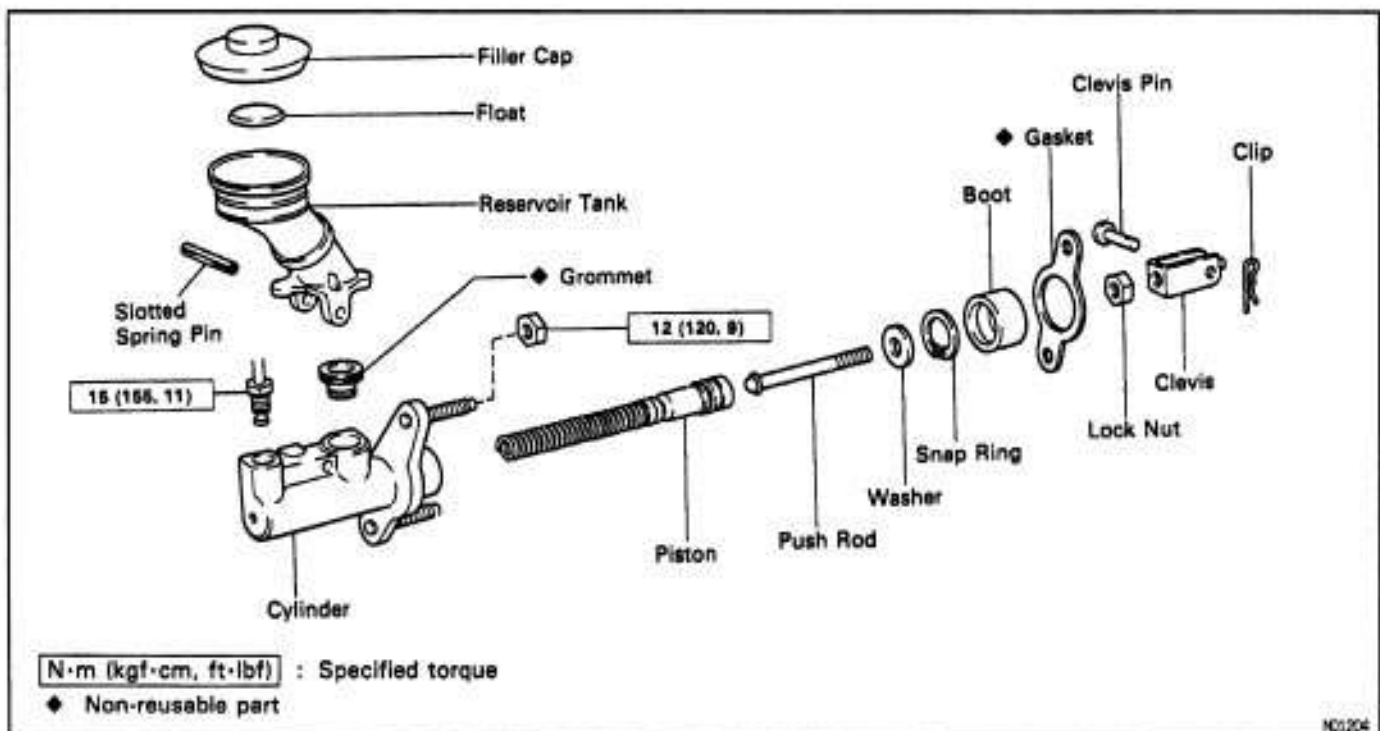
## PREPARATION

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.

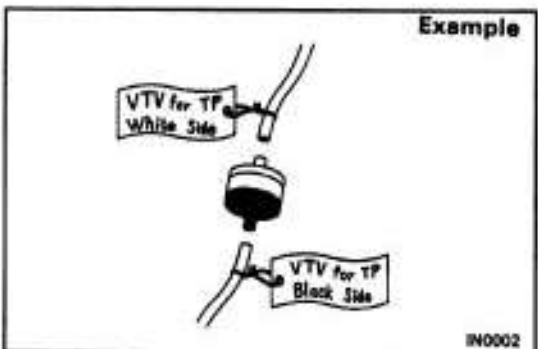
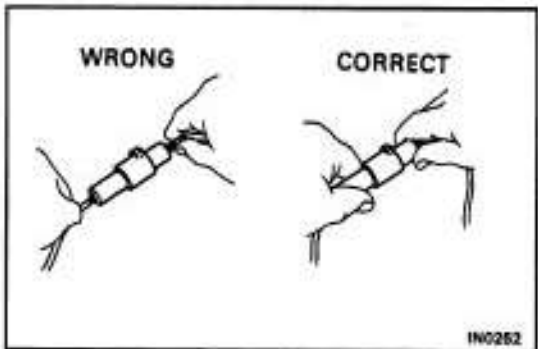
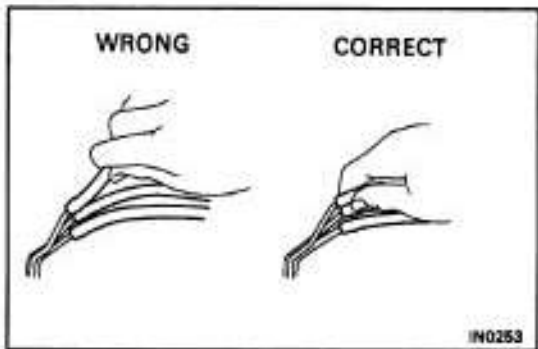
## REPAIR PROCEDURES

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

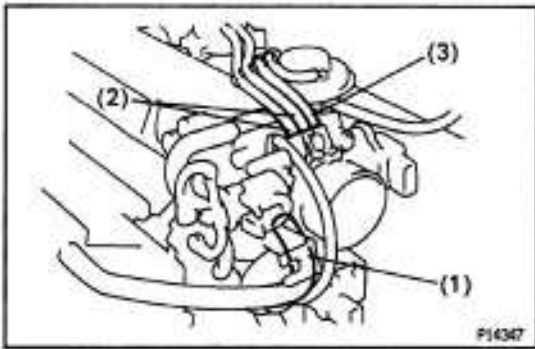
Example:



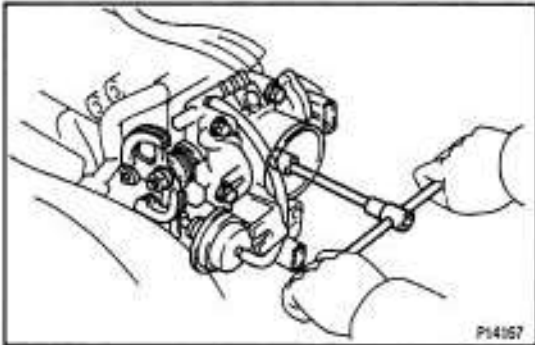
11. Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations (See page [IN-37](#))
  - (a) If the vehicle is to be jacked up only at the front or rear end, be sure to block the wheels at the opposite end in order to ensure safety.
  - (b) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.
12. Observe the following precautions to avoid damage to the parts:
  - (a) Do not open the cover or case of the ECU, ECM, PCM or TCM unless absolutely necessary. (If the IC terminals are touched, the IC may be destroyed by static electricity.)



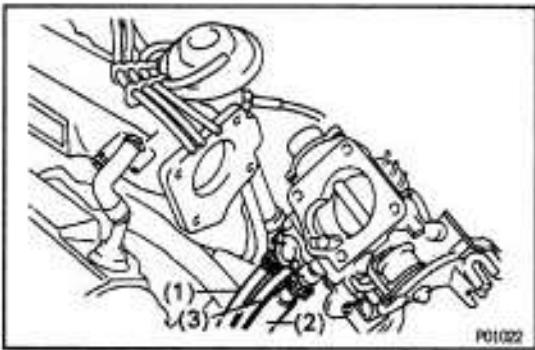
- (b) To disconnect vacuum hoses, pull on the end, not the middle of the hose.
  - (c) To pull apart electrical connectors, pull on the connector itself, not the wires.
  - (d) Be careful not to drop electrical components, such as sensors or relays. If they are dropped on a hard floor, they should be replaced and not reused.
  - (e) When steam cleaning an engine, protect the distributor, air filter, and VCV from water.
  - (f) Never use an impact wrench to remove or install temperature switches or temperature sensors.
  - (g) When checking continuity at the wire connector, insert the tester probe carefully to prevent terminals from bending.
  - (h) When using a vacuum gauge, never force the hose onto a connector that is too large. Use a step-down adapter instead. Once the hose has been stretched, it may leak.
13. Tag hoses before disconnecting them:
    - (a) When disconnecting vacuum hoses, use tags to identify how they should be reconnected.
    - (b) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.



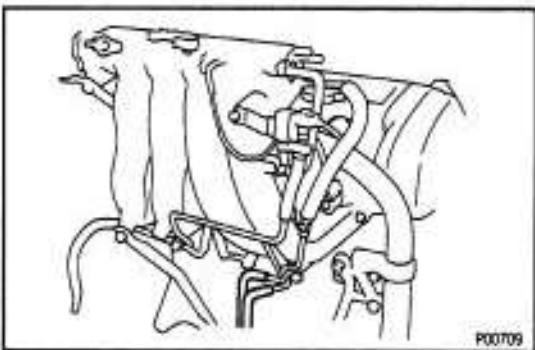
- (c) Disconnect the following hoses from the throttle body.
- (1) PCV hose
  - (2) 2 vacuum hoses from EGR vacuum modulator
  - (3) Vacuum hose from TVV (for EVAP)



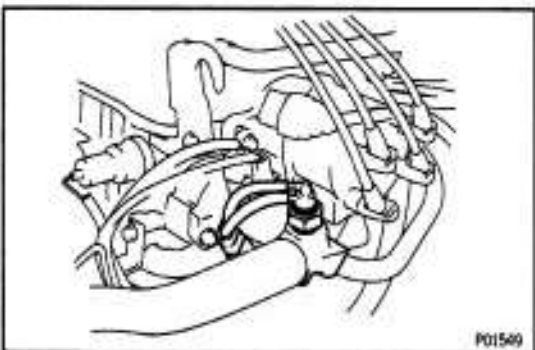
- (d) Type A:  
Remove the 4 bolts.
- (e) Type B:  
Remove the 2 bolts and 2 nuts.



- (f) Disconnect the following hoses from the throttle body, and remove the throttle body.
- (1) Water bypass hose from water outlet
  - (2) Water bypass hose from water bypass pipe
  - (3) California:  
Air hose from cylinder head
  - Except California:  
Air hose from air tube



## 7. DISCONNECT PS VACUUM HOSES

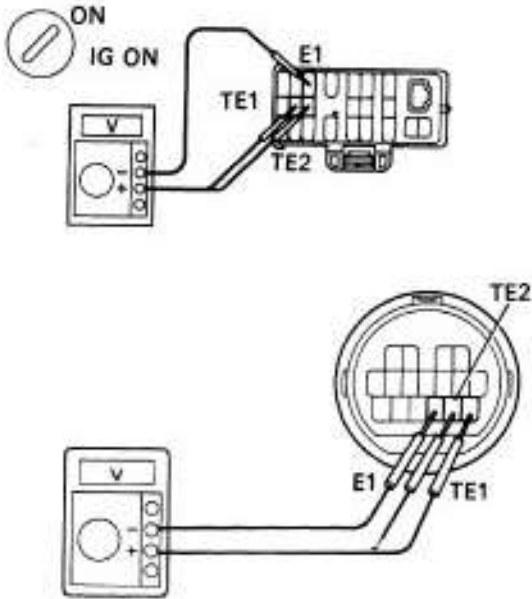


## 8. DISCONNECT VACUUM HOSES FROM TVV (FOR EVAP)

## INSPECTION PROCEDURE

1

Check voltage between terminals TE1, TE2, and E1 of data link connector 1 and 2.

BE6653  
F16592 F14412

**P** Turn ignition switch ON.

**C** Measure voltage between terminals TE1, TE2 and E1 of data link connector 1 and 2.

**OK** Voltage: 9 -14 v

NG

OK

Check and replace engine control module.

2

Check continuity between terminal E1 of data link connector 1, 2 and body ground.

OK

NG

Repair or replace harness or connector.

3

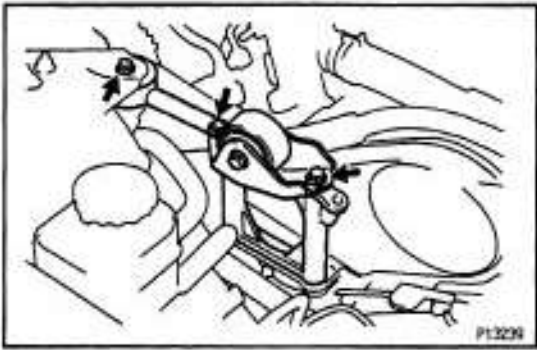
Check for open and short in harness and connector between engine control module and data link connector 1, 2 (See page [IN-31](#)).

OK

NG

Repair or replace harness or connector.

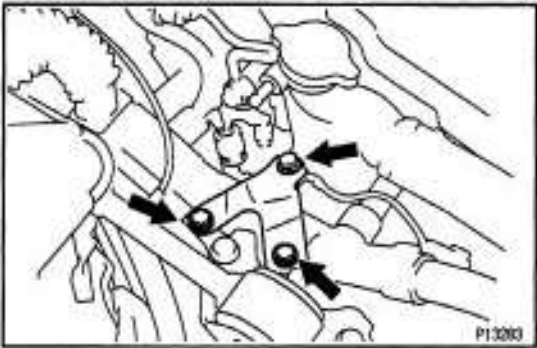
Check and replace engine control module.



#### 5. INSTALL NO.2 ENGINE MOUNTING BRACKET AND ENGINE MOVING CONTROL ROD

Install the engine moving control rod and No.2 engine mounting bracket with the 3 bolts.

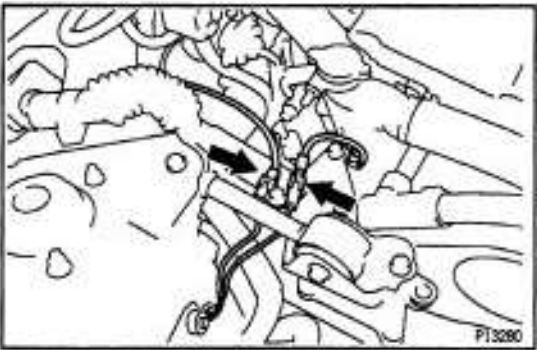
**Torque: 63.7 N-m (650 kgf-cm, 47 ft-lbf)**



#### 6. INSTALL RH ENGINE MOUNTING STAY

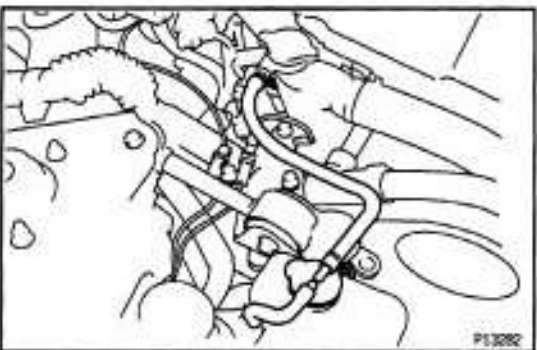
Install the RH mounting stay with the 3 bolts.

**Torque: 31.4 N-m (320 kgf-cm, 23 ft-lbf)**



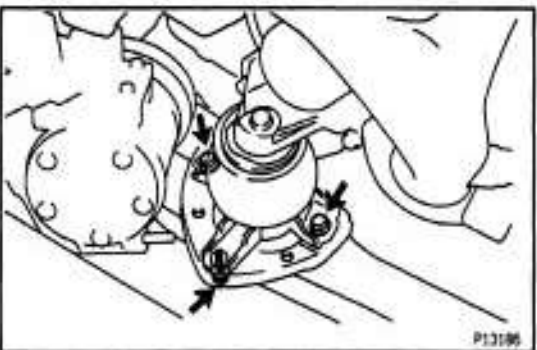
#### 7. CONNECT GROUND STRAPS

Connect the 2 straps.



#### 8. INSTALL COOLANT RESERVOIR TANK

- (a) Install the reservoir tank.
- (b) Connect the reservoir hose.



#### 9. CONNECT FR ENGINE MOUNTING INSULATOR

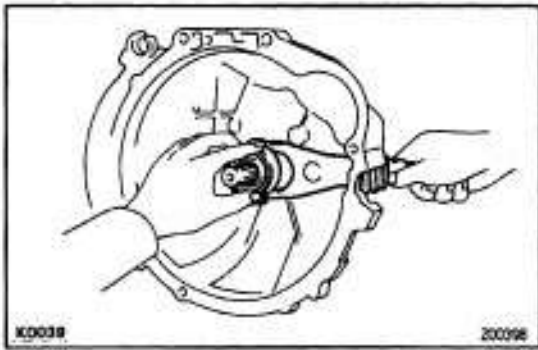
Connect the mounting insulator with the 3 bolts.

**Torque: 80.4 N-m (820 kgf-cm, 59 ft-lbf) for TMC made**

**Torque: 65.7 N-m (670 kgf-cm, 48 ft-lbf) for TMM made**

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

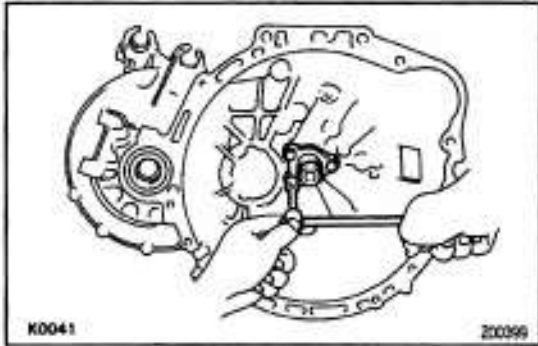
Trouble Area	MIL	Memory	See Page
<ul style="list-style-type: none"> <li>• Open or short in mass air flow meter circuit.</li> <li>• Mass air flow meter</li> <li>• ECM</li> </ul>	○	○	<a href="#">EG2-444</a>
<ul style="list-style-type: none"> <li>• Mass air flow meter</li> </ul>	○	○	<a href="#">EG2-450</a>
<ul style="list-style-type: none"> <li>• Open or short in intake air temp. sensor circuit.</li> <li>• Intake air temp. sensor</li> <li>• ECM</li> </ul>	○	○	<a href="#">EG2-451</a>
<ul style="list-style-type: none"> <li>• Open or short in engine coolant temp. sensor circuit.</li> <li>• Engine coolant temp. sensor</li> <li>• ECM</li> </ul>	○	○	<a href="#">EG2-457</a>
<ul style="list-style-type: none"> <li>• Engine coolant temp. sensor</li> <li>• Coolant system</li> </ul>	○	○	<a href="#">EG2-462</a>
<ul style="list-style-type: none"> <li>• Open or short in throttle position sensor circuit.</li> <li>• Throttle position sensor.</li> <li>• ECM</li> </ul>	○	○	<a href="#">EG2-463</a>
<ul style="list-style-type: none"> <li>• Throttle position sensor</li> </ul>	○	○	<a href="#">EG2-472</a>
<ul style="list-style-type: none"> <li>• Open or short in heated oxygen sensor circuit.</li> <li>• Heated oxygen sensor.</li> </ul>	○	○	<a href="#">EG2-473</a>
<ul style="list-style-type: none"> <li>• Heated oxygen sensor</li> <li>• Fuel trim malfunction</li> </ul>	○	○	<a href="#">EG2-476</a>
<ul style="list-style-type: none"> <li>• Heated oxygen sensor</li> </ul>	○	○	<a href="#">EG2-480</a>



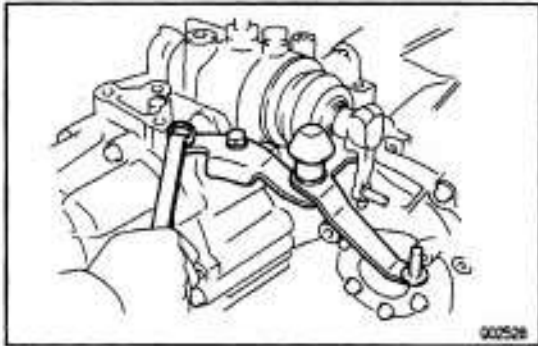
## BASIC SUBASSEMBLY SEPARATION<sup>MSRPY-08</sup>

(See page [MX-20](#) and [MX-21](#))

1. REMOVE RELEASE FORK, BEARING BACK – UP LIGHT SWITCH AND VEHICLE SPEED SENSOR

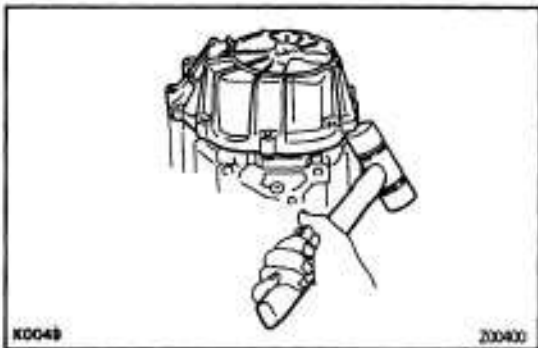


2. REMOVE RELEASE BEARING RETAINER



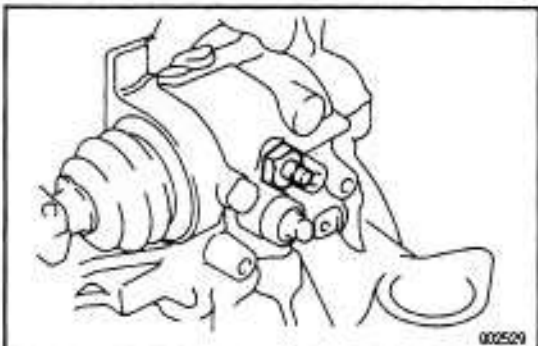
3. REMOVE ENGINE MOUNT BRACKET AND SELECTING BELLCRANK

- (a) Remove the 3 bolts and engine mount bracket.
- (b) Remove the 2 bolts and selecting bellcrank.



4. REMOVE TRANSMISSION CASE COVER

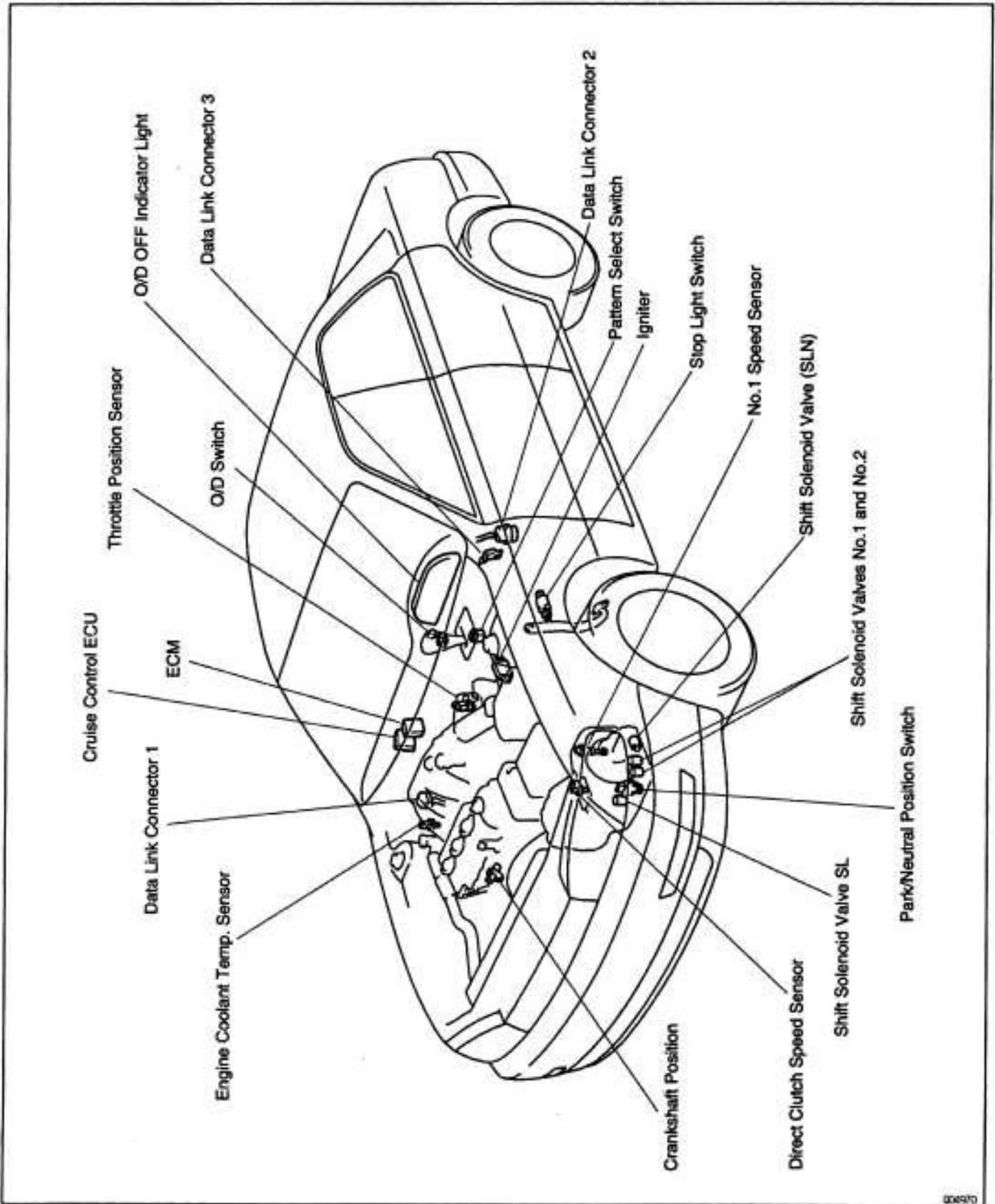
- (a) Remove the 8 bolts.
- (b) Using a plastic hammer, tap off the transmission case cover.



5. REMOVE LOCK BALL ASSEMBLY AND PLUG

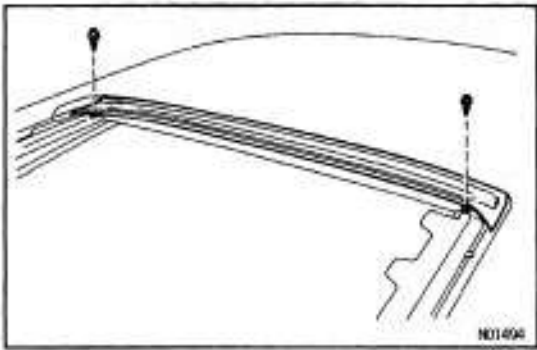
- (a) Remove the lock ball.

ARRANGEMENT OF COMPONENTS

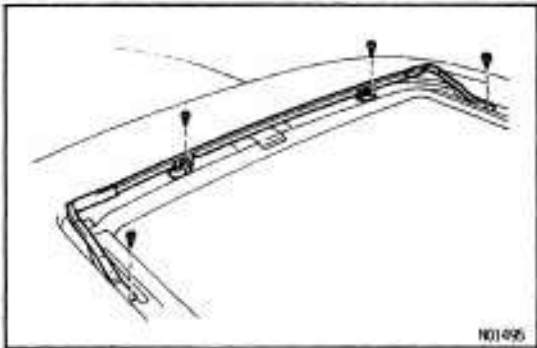




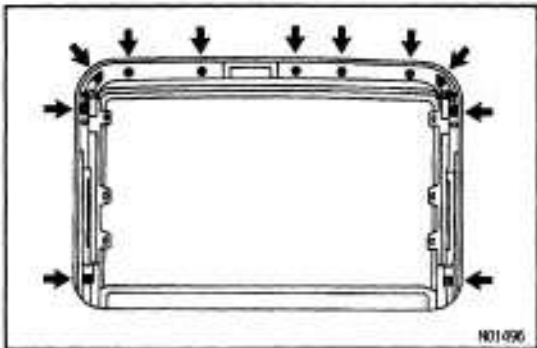


**11. REMOVE ROOF DRIP CHANNEL**

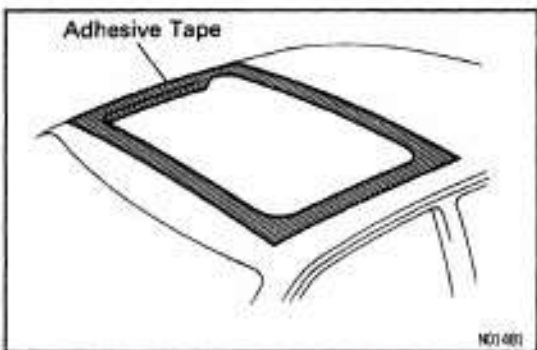
- (a) Remove 2 screws.
- (b) Pull the channel forwards to remove it.

**12. REMOVE WIND DEFLECTOR PANEL**

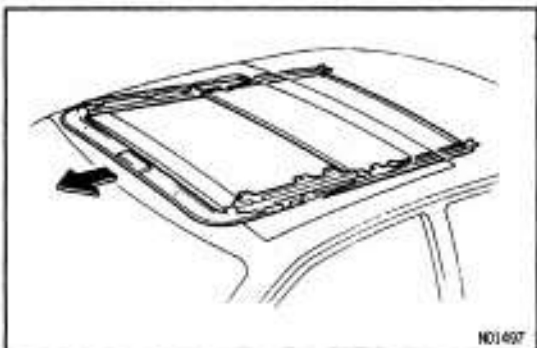
- (a) Slide the drive cable backwards.
- (b) Remove 4 screws and the panel.

**13. REMOVE CABLE GUIDE CASING ASSEMBLY**

- (a) Slide the drive cable forwards.
- (b) Remove 11 screws.



- (c) Apply adhesive tape to protect the body.



- (d) Pull the cable guide casing assembly forwards to remove it.

# INSPECTION PROCEDURE

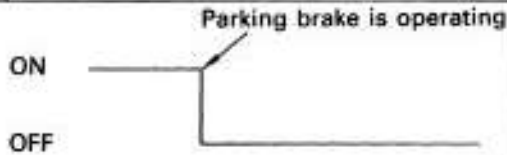
## 1 Check operation of brake warning light.

**C** Check that the brake warning light in the instrument panel comes on when the parking brake is operating with the engine running, and the light goes off when the parking brake is not operating.

**OK**

**NG** Check brake warning light circuit (See page [BE-64](#)).

## 2 Input signal check.



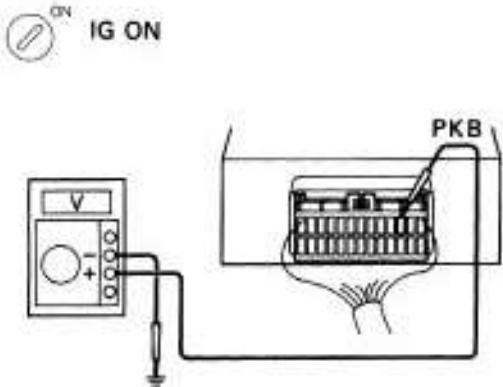
**C** 1. See input signal check on page [BE-172](#).  
2. Check the indicator light when the parking brake is operating.

**OK** The indicator light goes off when the parking brake is operating.

**NG**

**OK** Proceed to next circuit inspection shown on matrix chart (See page [BE-178](#)).

## 3 Check voltage between terminal PKB of cruise control ECU connector and body ground.



**P** Remove cruise control ECU with connectors still connected.

**C** 1. Turn ignition switch ON.  
2. Measure voltage between terminal PKB of cruise control ECU connector and body ground, when the parking brake lever is operating.

**OK**

Switch Position	Voltage
ON (lever pulled)	Below 1 V
OFF (lever released)	10 - 14 V

**NG**

**OK** Proceed to next circuit inspection shown on matrix chart (See page [BE-178](#)).

## 4 Check for open in harness and connector between cruise control ECU and brake warning light. (See page [IN-31](#))

**OK**

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

Check and replace cruise control ECU.

## INSPECTION PROCEDURE

### 1 Check ABS warning light.

See Combination Meter-Troubleshooting on page [BE-1](#) 18.

OK

NG

Replace bulb or combination meter assembly.

Check for open in harness and connector between GAUGE fuse and ECU (See page [IN-27](#)).

### 2 Is diagnostic trouble code output?

Perform diagnostic trouble code check on page [BR-143](#).

NO

YES

Repair circuit indicated by the code output.

### 3 Does ABS warning light go off if short pin is removed?

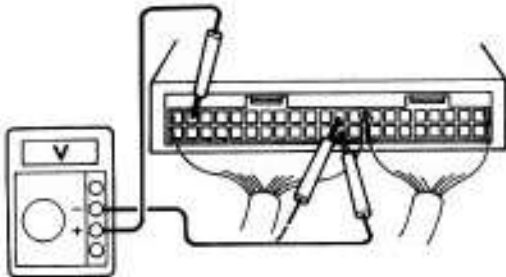
YES

NO

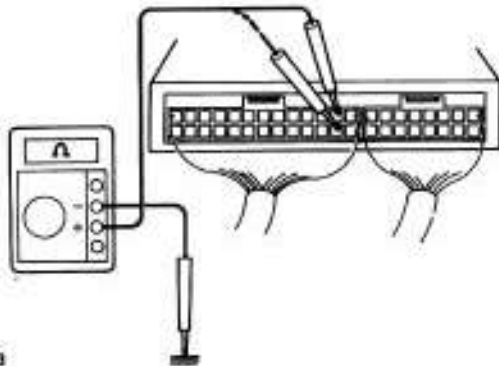
Check for short in harness and connector between warning light and DLC1, DLC2 and ECU terminal WA (See page [IN-28](#)).

Check for short in harness and connector between DLC1 and ECU terminal WB (See page [IN-27](#)).

## INSPECTION PROCEDURE

**1** Check battery positive voltage.**OK** Voltage: 10 - 14 V**OK****NG** Check and repair the charging system.**2** Check voltage between terminals IG1 and GND of ABS ECU connector.ON  
IG ONBE6653  
R06947**P** Remove ABS ECU with connectors still connected.

- C**
1. Turn ignition switch ON.
  2. Measure voltage between terminals IG1 and GND of ABS ECU connector.

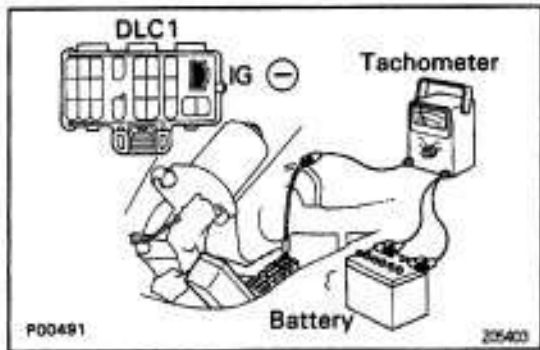
**OK** Voltage: 10-14 V**OK****NG** Check and replace ABS ECU.**3** Check continuity between terminals GND of ABS ECU connector and body ground.OFF  
IG OFFBE6653  
R06937

- C**
- Measure resistance between terminals GND of ABS ECU connector and body ground.

**OK** Resistance: 1Ω or less**OK****NG** Repair or replace harness or connector.

**7. CONNECT AND ADJUST ACCELERATOR CABLE****8. CONNECT NEGATIVE (-) TERMINAL CABLE TO BATTERY****9. WARM UP ENGINE**

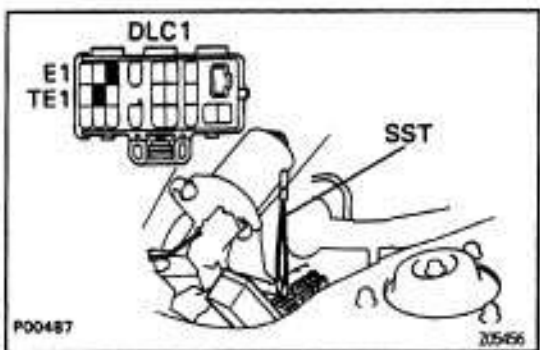
Allow the engine to warm up to normal operating temperature.

**10. CONNECT TACHOMETER AND TIMING LIGHT TO ENGINE**

Connect the test probe of a tachometer to terminal IGE) of the data link connector 1.

**NOTICE:**

- **NEVER** allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or ignition coil.
- As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of yours before use. .

**11. ADJUST IGNITION TIMING**

- (a) Using SST, connect terminals TE1 and E1 of the data link connector 1.

SST 09843-18020

HINT: After engine speed is kept at 1,000-1,300 rpm for 5 seconds, check that it returns to idle speed.



- (b) Using a timing light, check the ignition timing.

**Ignition timing:**

**10° BTDC 0 idle**

**(Transmission in neutral position)**

