

# ENGINE AND EMISSION CONTROL

## CONTENTS

17109000193

<b>ENGINE CONTROL SYSTEM</b> .....	<b>3</b>	<b>ACCELERATOR PEDAL POSITION SENSOR</b> .....	<b>7</b>
<b>GENERAL INFORMATION</b> .....	<b>3</b>	<b>AUTO-CRUISE CONTROL SYSTEM</b> .....	<b>8</b>
<b>SERVICE SPECIFICATIONS</b> .....	<b>3</b>	<b>GENERAL INFORMATION</b> .....	<b>8</b>
<b>ON-VEHICLE SERVICE</b> .....	<b>3</b>	<b>SPECIAL TOOL</b> .....	<b>8</b>
Accelerator Cable Check and Adjustment ....	3		
Accelerator Pedal Position Sensor Check ....	4		
<b>ACCELERATOR CABLE AND PEDAL</b> ....	<b>5</b>		

CONTINUED ON NEXT PAGE

### WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

#### WARNING!

- (1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).
- (2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
- (3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.

#### NOTE

The SRS includes the following components: SRS-ECU, SRS warning lamp, air bag module, clock spring, side impact sensors and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (\*).

<b>TROUBLESHOOTING</b> .....	<b>9</b>	<b>EXHAUST GAS RECIRCULATION (EGR) SYSTEM</b> .....	<b>42</b>
<b>ON-VEHICLE SERVICE</b> .....	<b>27</b>	General Information .....	42
Auto-cruise Control Main Switch Check ....	27	Operation .....	42
Auto-cruise Control Switch Check .....	27	System Diagram .....	42
Auto-cruise Control Component Check ....	28	Component Location .....	43
<b>AUTO-CRUISE CONTROL*</b> .....	<b>30</b>	Exhaust Gas Recirculation (EGR) Control system Check .....	43
<b>EMISSION CONTROL SYSTEM (MPI)</b> .....	<b>33</b>	EGR Valve Check .....	44
<b>GENERAL INFORMATION</b> .....	<b>33</b>	EGR Port Vacuum Check <4G6> .....	44
Emission Control Device Reference Table .....	33	EGR Port Vacuum Check <6A1> .....	45
<b>SERVICE SPECIFICATIONS</b> .....	<b>34</b>	EGR Control Solenoid Valve Check <4G6> .....	45
<b>SPECIAL TOOL</b> .....	<b>34</b>	EGR Control Solenoid Valve Check <6A1> .....	46
<b>VACUUM HOSE</b> .....	<b>34</b>	<b>CATALYTIC CONVERTER</b> .....	<b>47</b>
Vacuum Hose Piping Diagram .....	34	General Information .....	47
Vacuum Circuit Diagram .....	35	<b>CANISTER</b> .....	<b>48</b>
Vacuum Hose Check .....	36	<b>EMISSION CONTROL SYSTEM &lt;DIESEL&gt;</b> .....	<b>49</b>
Vacuum Hose Installation .....	36	<b>GENERAL INFORMATION</b> .....	<b>49</b>
<b>CRANKCASE EMISSION CONTROL SYSTEM</b> .....	<b>37</b>	<b>SERVICE SPECIFICATION</b> .....	<b>49</b>
General Information .....	37	<b>EXHAUST GAS RECIRCULATION SYSTEM (EGR) SYSTEM</b> .....	<b>49</b>
System Diagram .....	37	System Check .....	49
Component Location .....	37	EGR Solenoid Valve Check .....	50
Positive Crankcase Ventilation System Check .....	38	Accelerator Pedal Position Sensor Check ....	50
PCV Valve Check .....	38	Pump Operation Sensor Check .....	50
<b>EVAPORATIVE EMISSION CONTROL SYSTEM</b> .....	<b>39</b>	Engine Coolant Temperature Sensor Check ...	50
General Information .....	39	Intake Air Temperature Sensor Check .....	51
System Diagram .....	39	Barometric Pressure Sensor Check .....	51
Component Location .....	39	A/C Switch Check .....	51
Purge Control System Check .....	40	Check at the Engine-ECU Terminals .....	51
Purge Port Vacuum Check .....	40	<b>CATALYTIC CONVERTER</b> .....	<b>51</b>
Purge Control Solenoid Valve Check .....	41	General Information .....	51

# ENGINE CONTROL SYSTEM

17100010102

## GENERAL INFORMATION

A cable-type accelerator mechanism and a suspended-type pedal have been adopted.

Accelerator pedal position sensor is used for vehicles with 4D6 engine which is equipped with the electronically-controlled fuel injection system.

## SERVICE SPECIFICATIONS

17100030139

Items		Standard value
Accelerator cable play mm		1 - 2
Engine idle speed r/min	4G6	750±50
	6A1	650±50
	4D6	800±30

## ON-VEHICLE SERVICE

17100090243

### ACCELERATOR CABLE CHECK AND ADJUSTMENT

1. Turn A/C and lamps OFF.  
Inspect and adjust at no load.
2. Warm engine until stabilized at idle.
3. Confirm idle speed is at prescribed value.

**Standard value:**

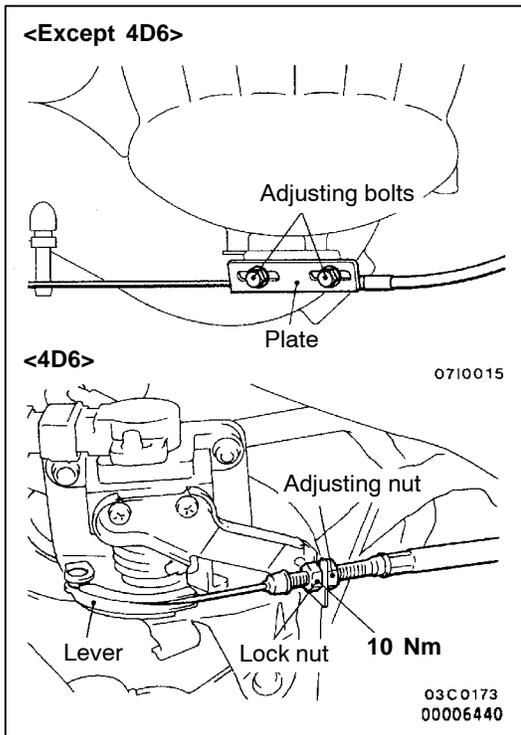
<4G6> 750±50 r/min

<6A1> 650±50 r/min

<4D6> 800±30 r/min

4. Stop engine (ignition switch OFF).
5. Confirm there are no sharp bends in accelerator cable.
6. Check inner cable for correct slack.

**Standard value: 1-2 mm**



7. If there is too much slack or no slack, adjust play by the following procedures.

<Except 4D6>

- (1) Loosen the adjusting bolt to release the cable.
- (2) Move the plate until the inner cable play is at the standard value, and then tighten the adjusting bolt.
- (3) After adjusting, check that the throttle lever is touching the stopper.

<4D6>

- (1) Loosen the adjusting nut, and then move the lever to throttle fully-closed position.
- (2) Tighten the adjusting nut until the lever start to move, turn back one turn, and then tighten the lock nut to the specified torque.

## ACCELERATOR PEDAL POSITION SENSOR CHECK

17100190011

Refer to GROUP 13E - On-vehicle Service.

## ACCELERATOR CABLE AND PEDAL

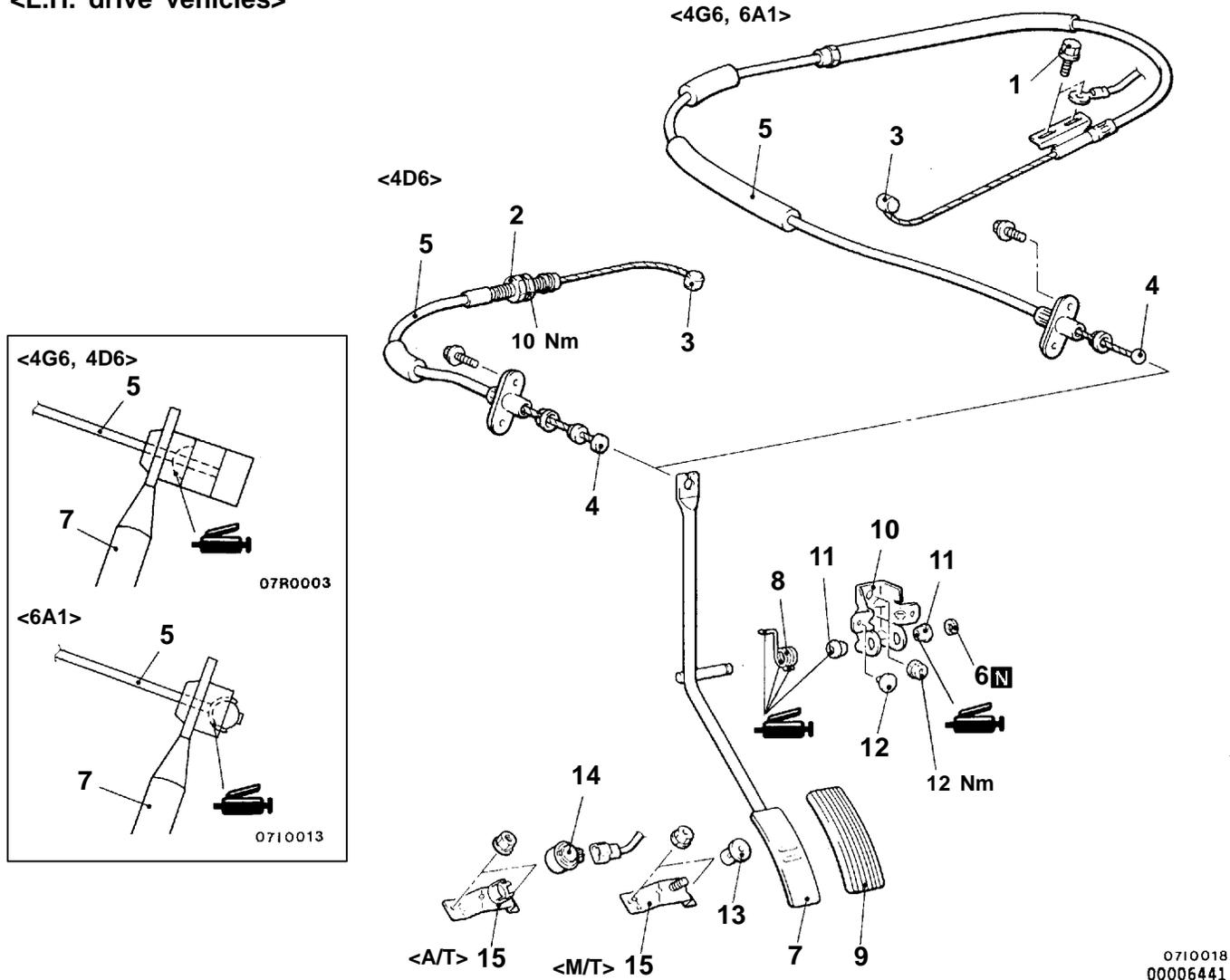
17100120256

## REMOVAL AND INSTALLATION

## Post-installation Operation

Adjusting the Accelerator Cable (Refer to P.17-3.)

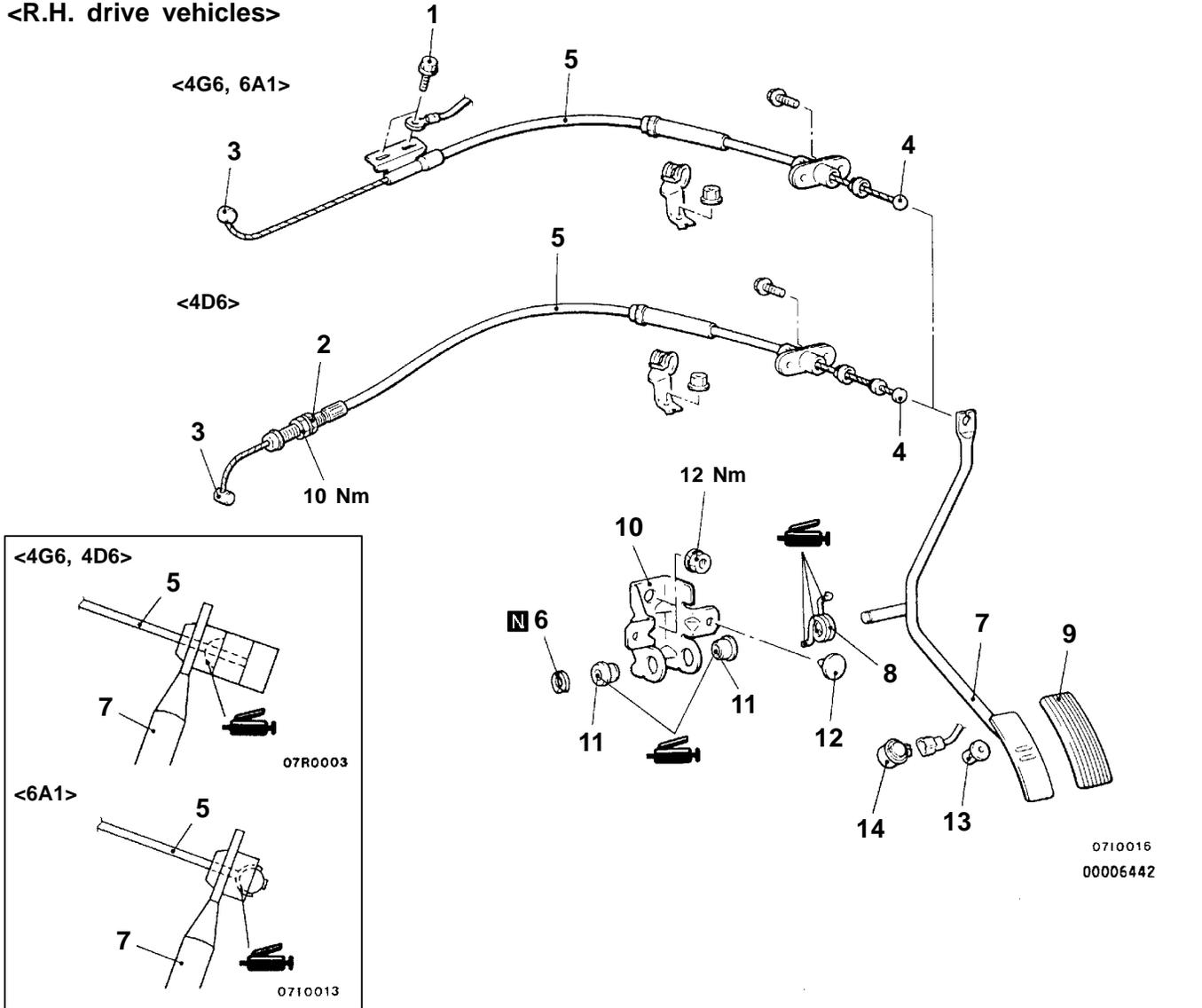
&lt;L.H. drive vehicles&gt;

0710018  
00006441

## Removal steps

1. Adjusting bolt
2. Adjusting nut
3. Inner cable connection
4. Inner cable connection
5. Accelerator cable
6. Snap ring
7. Accelerator arm assembly
8. Spring
9. Pedal pad
10. Accelerator pedal bracket
11. Bushing
12. Stopper
13. Accelerator pedal stopper <M/T>
14. Wide open throttle switch <A/T>
15. Bracket

&lt;R.H. drive vehicles&gt;

**Removal steps**

- |                             |                                     |
|-----------------------------|-------------------------------------|
| 1. Adjusting bolt           | 8. Spring                           |
| 2. Adjusting nut            | 9. Pedal pad                        |
| 3. Inner cable connection   | 10. Accelerator pedal bracket       |
| 4. Inner cable connection   | 11. Bushing                         |
| 5. Accelerator cable        | 12. Stopper                         |
| 6. Snap ring                | 13. Accelerator pedal stopper <M/T> |
| 7. Accelerator arm assembly | 14. Wide open throttle switch <A/T> |

## ACCELERATOR PEDAL POSITION SENSOR

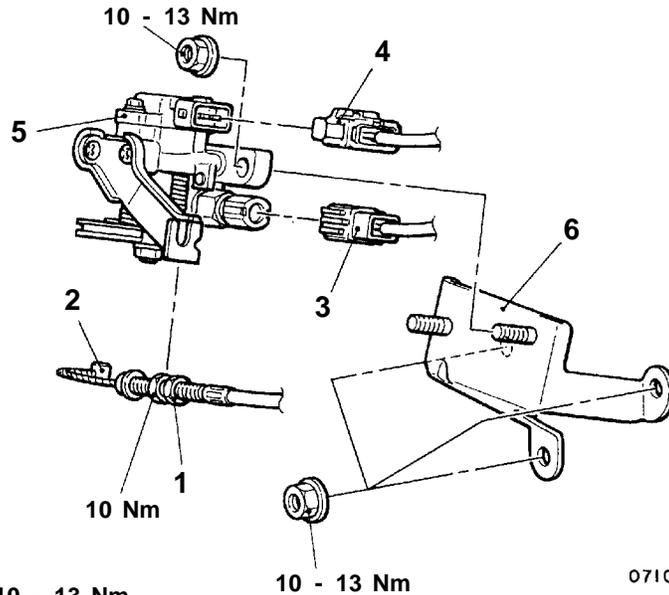
17100180018

## REMOVAL AND INSTALLATION

**Post-installation Operation**

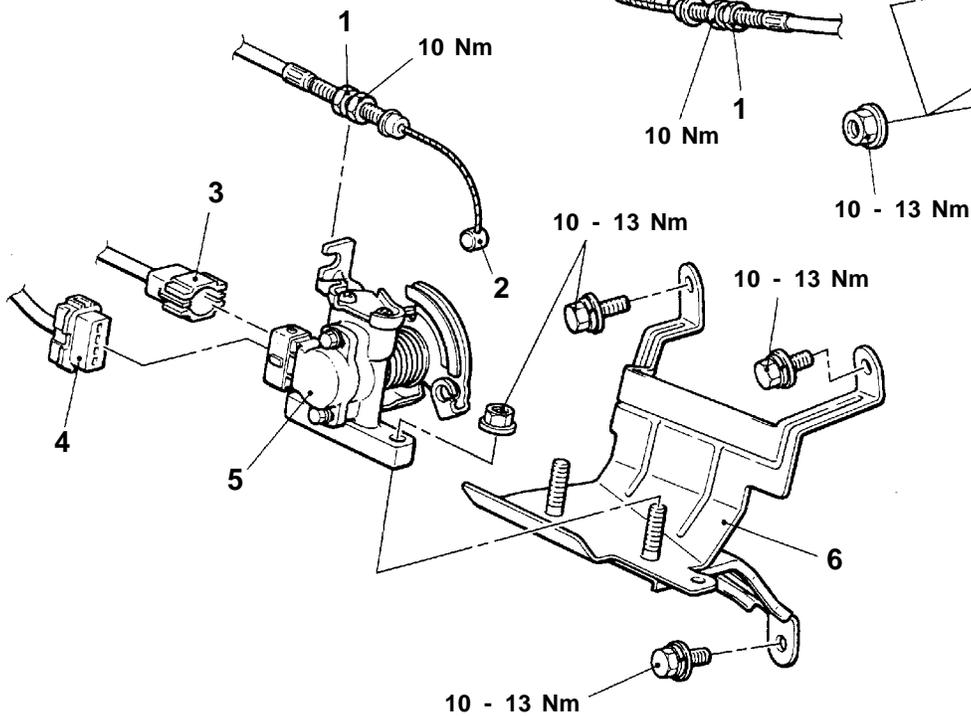
Adjusting the Accelerator Cable (Refer to P.17-3.)

## &lt;L.H. drive vehicles&gt;



0710038

## &lt;R.H. drive vehicles&gt;



0710039

00006443

**Removal steps**

1. Adjusting nut
2. Inner cable connection
3. Idle position switch connector
4. Accelerator pedal position sensor connector
5. Accelerator pedal position sensor assembly
6. Accelerator pedal position sensor bracket

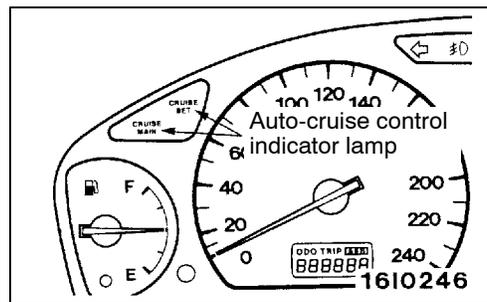
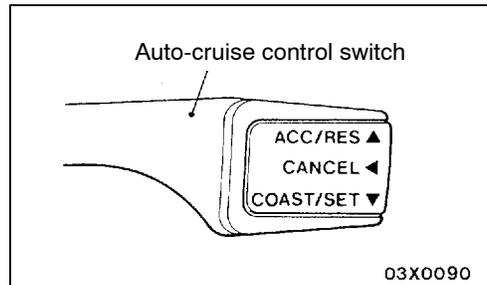
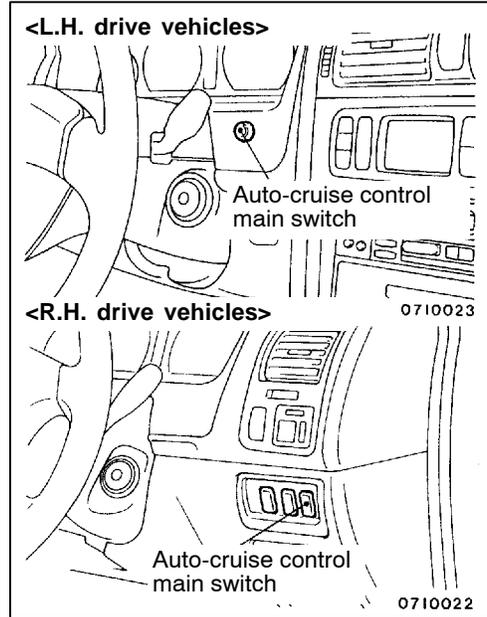
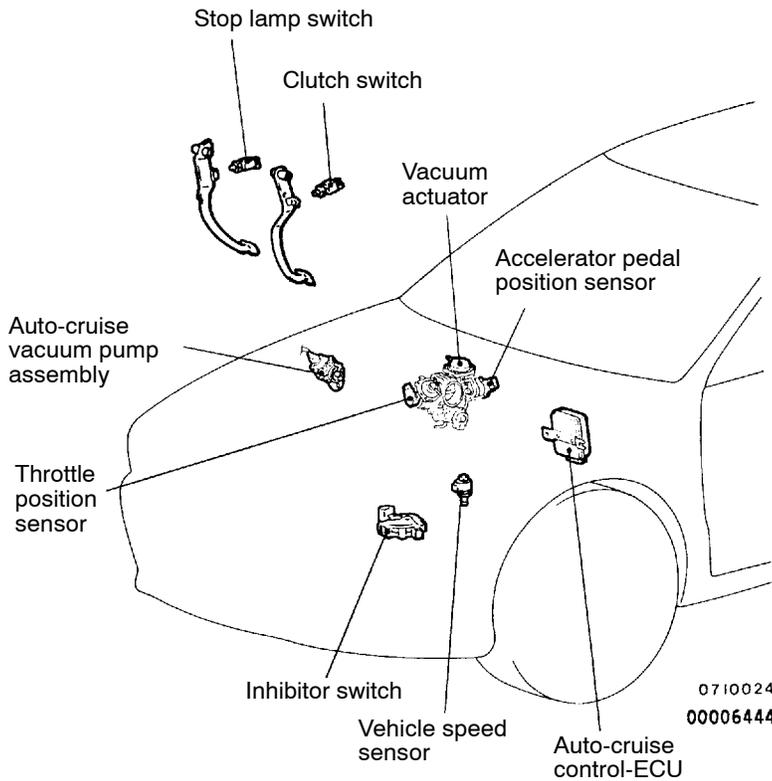
# AUTO-CRUISE CONTROL SYSTEM

17200010143

## GENERAL INFORMATION

By using the auto-cruise control, the driver can drive at the speed he/she likes (in a range of

approximately 40-200 km/h) without depressing the accelerator pedal.



## SPECIAL TOOL

17200060179

Tool	Number	Name	Use
	MB991502	MUT-II sub assembly	<ul style="list-style-type: none"> <li>• Reading diagnosis codes</li> <li>• Auto-cruise control system check</li> </ul>

## TROUBLESHOOTING

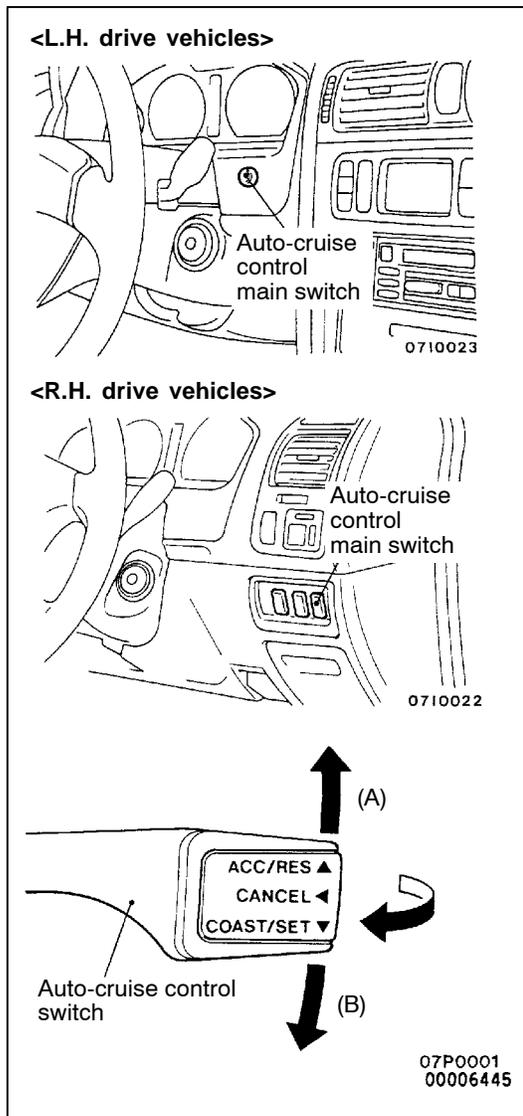
17200200236

### STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points.

#### NOTE

Check that the vacuum hose is connected correctly and is not damaged, and then carry out the diagnosis.



### DIAGNOSIS FUNCTION

17200210161

#### METHOD OF READING THE DIAGNOSIS CODES

1. Connect the MUT-II to the diagnosis connector (16-pin) under the instrument under cover. (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points.)
2. With the ignition switch in the ON position, turn the auto-cruise control main switch to ON and take a reading of the diagnosis codes.

#### METHOD OF ERASING THE DIAGNOSIS CODES

The diagnosis codes can be erased by disconnecting the (-) cable from the battery for 10 seconds or more and then re-connecting it, or by the following procedure.

1. Turn the ignition switch to ON.
2. After pushing the auto-cruise control switch in the direction of arrow (B) in the illustration, press the cruise control main switch to the ON position, and within 1 second after doing this, push the cruise control switch back in the direction of arrow (A).
3. After pushing the auto-cruise control switch once more in the direction of arrow (A) in the illustration and keeping it in this position, press the stop lamp switch to the ON position for 5 seconds or more.

#### INPUT SWITCH CODE CHECK METHOD

1. Connect the MUT-II to the diagnosis connector (16-pin) under the instrument under cover.
2. Turn the ignition switch to ON.
3. After pushing the auto-cruise control switch in the direction of arrow (B) in the illustration, press the cruise control main switch to the ON position, and within 1 second after doing this, push the cruise control switch back in the direction of arrow (A).
4. Operate each switch listed in the input check table and take a reading of the input switch codes with the MUT-II.

# 17-10 ENGINE AND EMISSION CONTROL - Auto-cruise Control System

## Input Check Table

Code No.	Input operation	Operation judgement
21	SET switch ON	Auto-cruise control-ECU judges that SET switch is ON
22	RESUME switch ON	Auto-cruise control-ECU judges that RESUME switch is ON
23	Stop lamp switch (ON when brake pedal depressed)	Auto-cruise control-ECU judges that stop lamp switch is ON
24	Vehicle speed signal	Auto-cruise control-ECU judges that vehicle speed is 40 km/h or higher
25		Auto-cruise control-ECU judges that vehicle speed is lower than 40 km/h
26	<ul style="list-style-type: none"><li>• Clutch switch &lt;M/T&gt; (ON when clutch pedal depressed)</li><li>• Inhibitor switch &lt;A/T&gt; (ON when select lever in N range)</li></ul>	Auto-cruise control-ECU judges that clutch switch <M/T> or inhibitor switch <A/T> is ON
27	CANCEL switch ON	Auto-cruise control-ECU judges that CANCEL switch is ON
28	Throttle position sensor (accelerator pedal position sensor*) signal	Auto-cruise control-ECU judges that throttle position sensor (accelerator pedal position sensor*) voltage is 1.5 V or more
29	Idle switch	Auto-cruise control-ECU judges that idle switch is OFF

### NOTE

\* : Vehicles with TCL

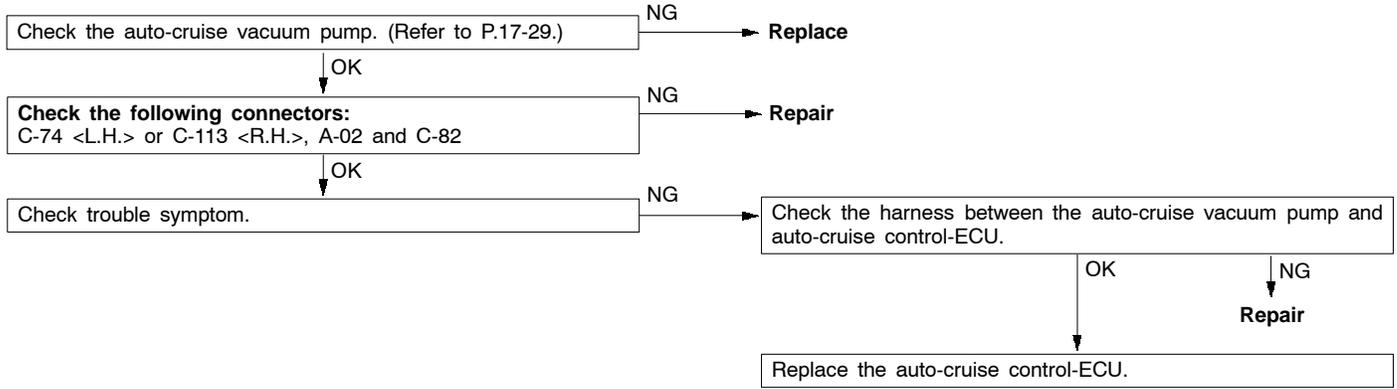
## INSPECTION CHART FOR DIAGNOSIS CODES

17200220249

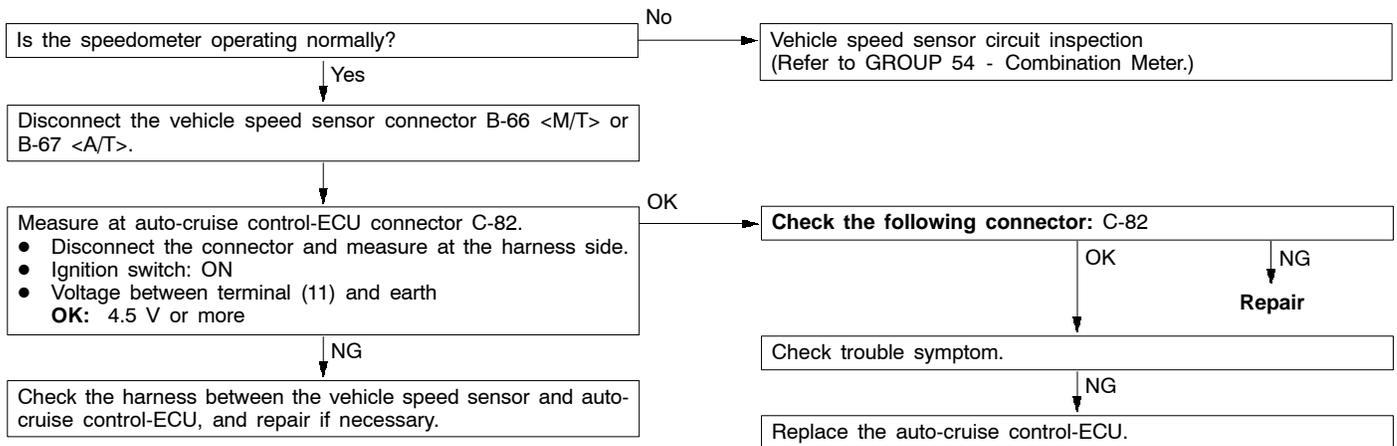
Code No.	Diagnosis item	Reference page
11	Auto-cruise vacuum pump drive system	17-11
12	Vehicle speed signal system	17-11
14	Auto-cruise vacuum pump power supply system	17-12
15	Auto-cruise control switch	17-12
16	Auto-cruise control-ECU	17-12
17	Throttle position sensor system <Vehicles without TCL> or accelerator pedal position sensor system <Vehicles with TCL>	17-13

**INSPECTION PROCEDURE FOR DIAGNOSIS CODES**

Code No. 11 Auto-cruise vacuum pump drive system	Probable cause
This diagnosis code is output if the release valve, control valve or motor drive signals from the auto-cruise vacuum pump are not input to the auto-cruise control-ECU.	<ul style="list-style-type: none"> <li>● Malfunction of the auto-cruise vacuum pump</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>

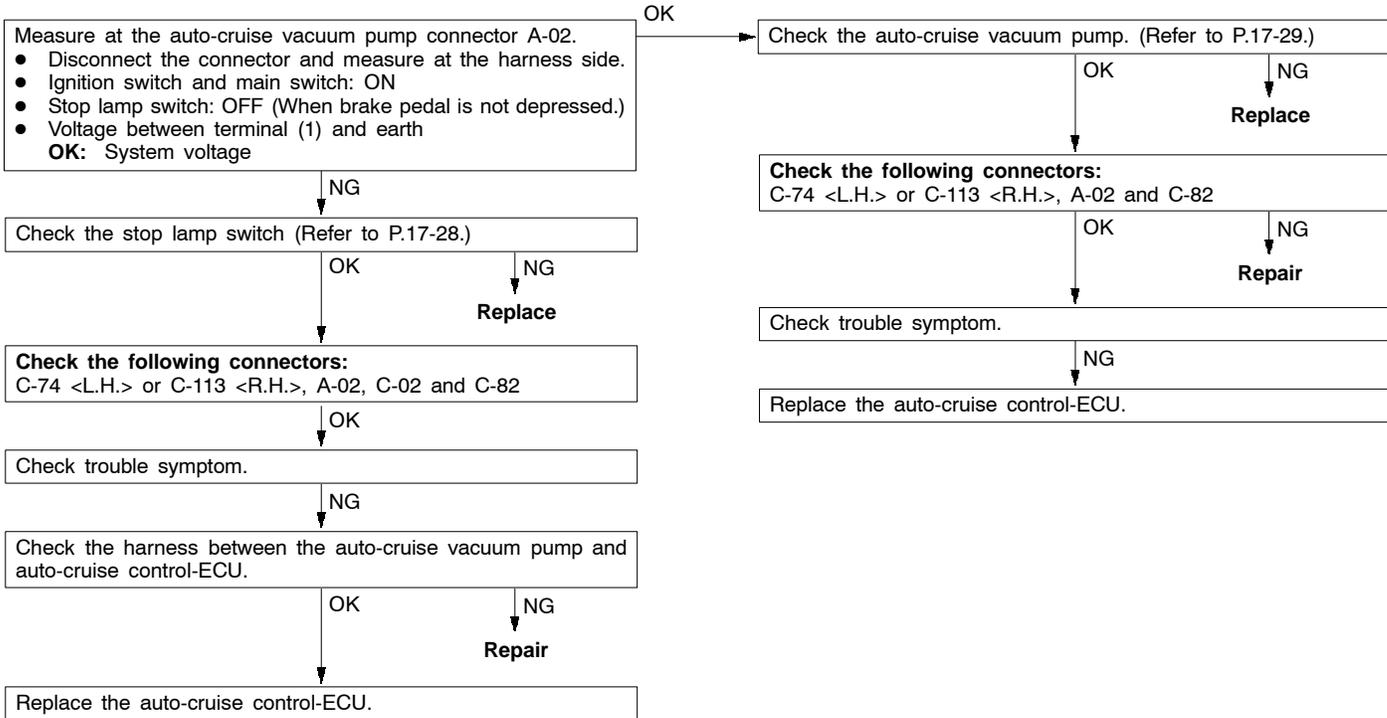


Code No. 12 Vehicle speed signal system	Probable cause
This diagnosis code is output if the vehicle speed signals from the vehicle speed sensor are not input to the auto-cruise control-ECU when the vehicle speed is 40 km/h or more.	<ul style="list-style-type: none"> <li>● Malfunction of the vehicle speed sensor</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>



# 17-12 ENGINE AND EMISSION CONTROL - Auto-cruise Control System

Code No. 14 Auto-cruise vacuum pump power supply system	Probable cause
This diagnosis code is output when none of the drive signals from the release valve, control valve and motor of the auto-cruise vacuum pump are input to the auto-cruise control-ECU.	<ul style="list-style-type: none"> <li>● Malfunction of the stop lamp switch</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> <li>● Malfunction of the auto-cruise vacuum pump</li> </ul>



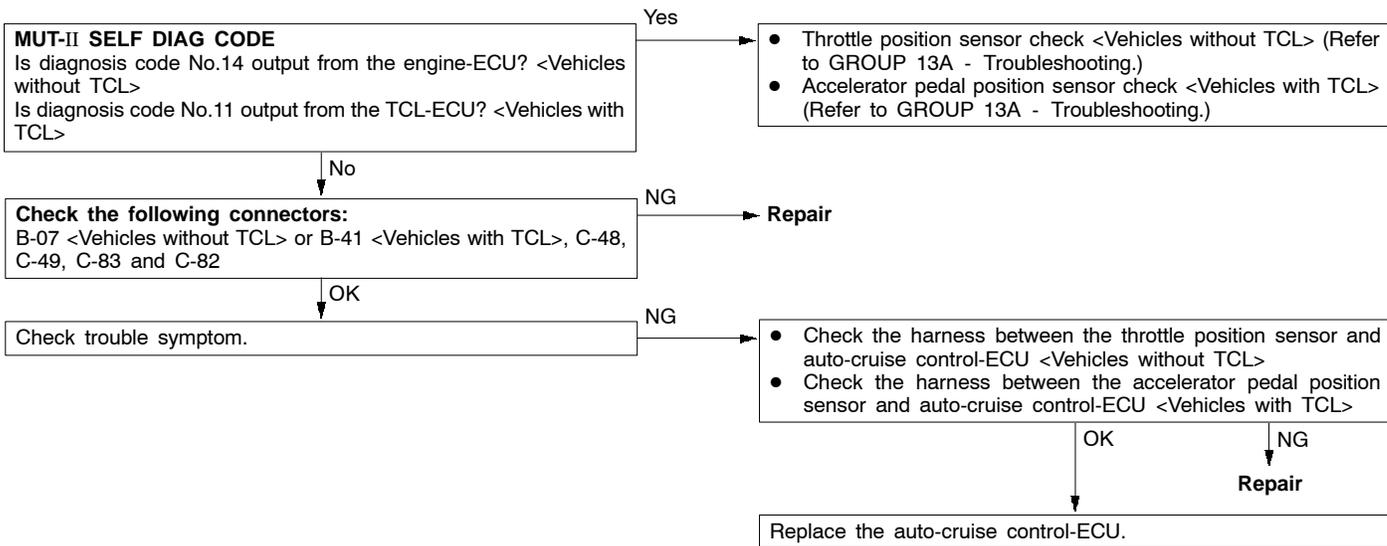
Code No. 15 Auto-cruise control switch	Probable cause
This diagnosis code is output if the cruise control RESUME switch or SET switch remains ON.	<ul style="list-style-type: none"> <li>● Malfunction of the auto-cruise control switch</li> </ul>

Replace the auto-cruise control switch.

Code No. 16 Auto-cruise control-ECU	Probable cause
This diagnosis code is output if there is an abnormality in the CANCEL hold circuit or the microprocessor monitor circuit in the auto-cruise control-ECU.	<ul style="list-style-type: none"> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>

Replace the auto-cruise control-ECU.

<b>Code No. 17 Throttle position sensor system &lt;Vehicles without TCL&gt; or accelerator pedal position sensor system &lt;Vehicles with TCL&gt;</b>	<b>Probable cause</b>
This diagnosis code is output if a voltage of 2.5 V or more when the idle switch is ON or 0.2 V or less when the idle switch is OFF is output for a continuous period of 4 seconds or more.	<ul style="list-style-type: none"> <li>● Malfunction of the throttle position sensor &lt;Vehicles without TCL&gt;</li> <li>● Malfunction of the accelerator pedal position sensor &lt;Vehicles with TCL&gt;</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>



**INSPECTION CHART FOR TROUBLE SYMPTOMS**

17200230228

Trouble symptom		Inspection procedure No.	Reference page
Communication with MUT-II is not possible.	Communication with all systems is not possible.	1	17-14
	Communication with auto-cruise control-ECU only is not possible.	2	17-15
Input switch inspection using the MUT-II is not possible. (However, diagnosis inspection is possible.)		3	17-16

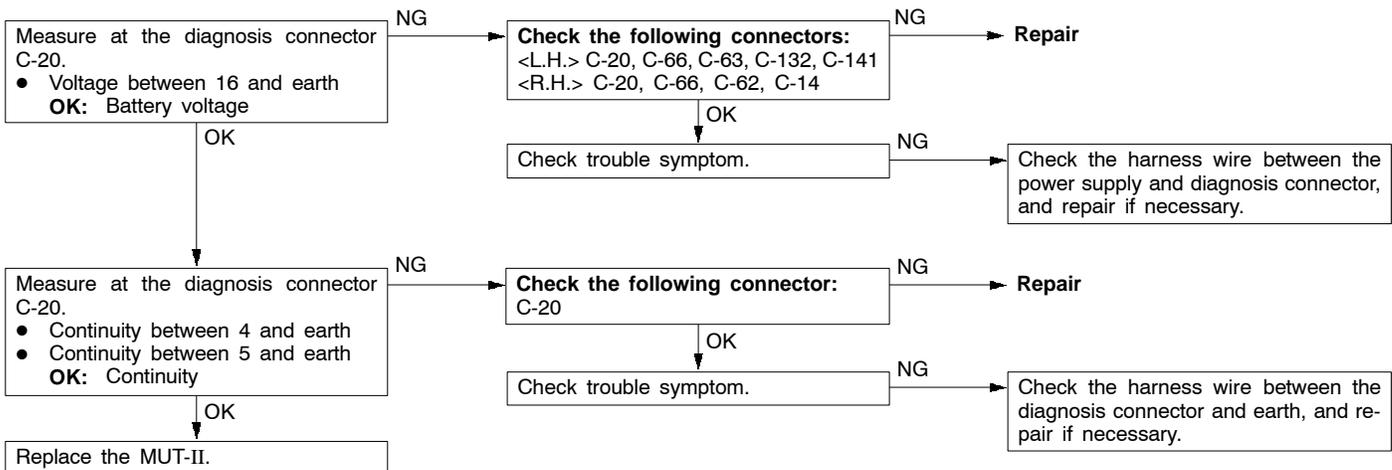
# 17-14 ENGINE AND EMISSION CONTROL - Auto-cruise Control System

Trouble symptom		Inspection procedure No.	Reference page
Auto-cruise control is not cancelled.	Even if brake pedal is depressed	4	17-17
	Even if clutch pedal is depressed <M/T>	5	17-18
	Even if select lever is set to N range <A/T>	6	17-18
	Even if CANCEL switch is set to ON	7	17-19
The diagnosis result displayed on the MUT-II is normal even though auto-cruise control cannot be set.		8	17-19
Auto-cruise control cannot be set.		9	17-20
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed.		10	17-21
Even though auto-cruise control main switch is ON, switch indicator lamp does not illuminate. (However, auto-cruise control is normal.)		11	17-21
Auto-cruise control main switch illumination lamp does not illuminate.		12	17-22
Auto-cruise control indicator lamp (CRUISE MAIN, CRUISE SET) inside combination meter does not illuminate. (However, auto-cruise control is normal.)		13	17-22

## INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

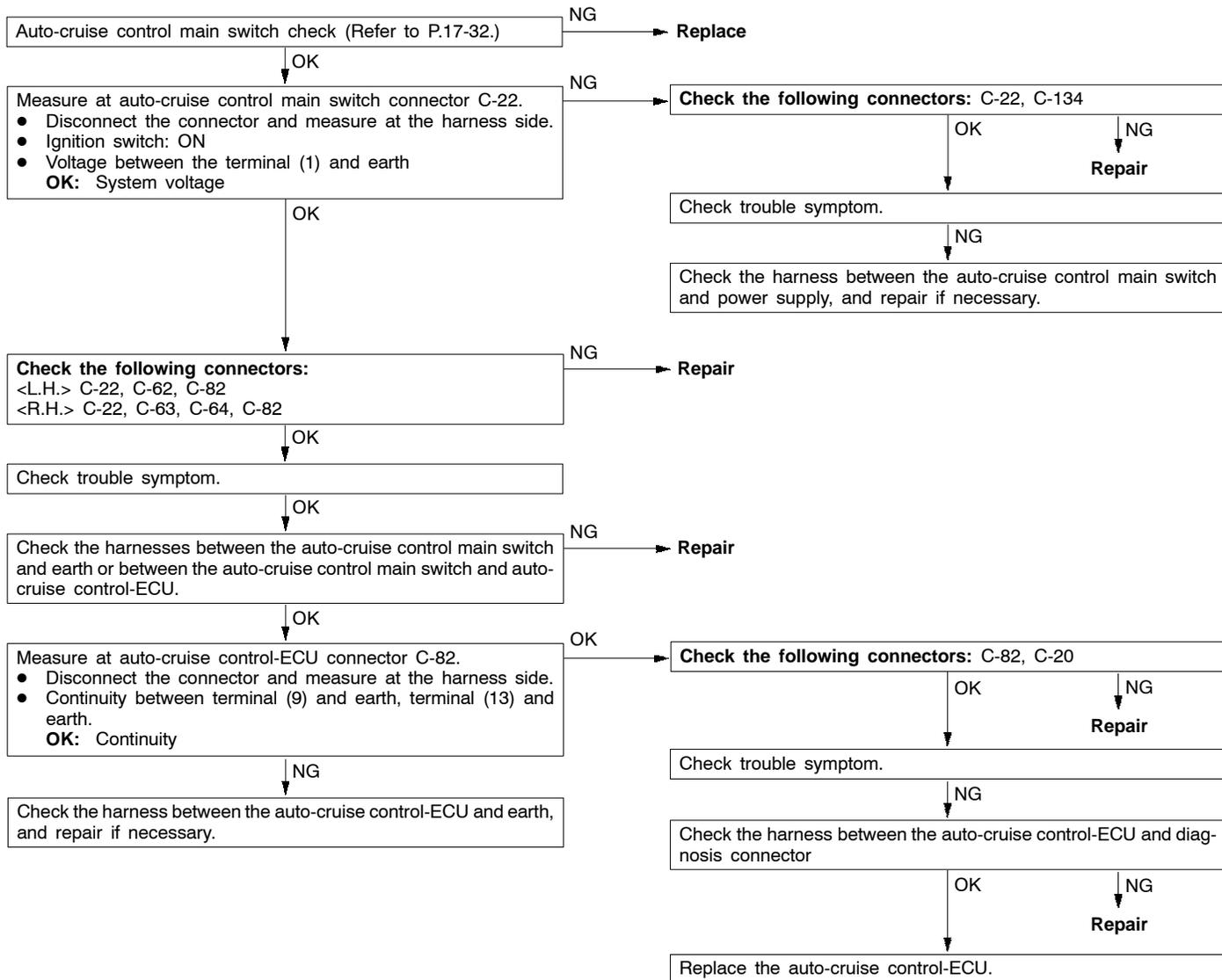
### Inspection Procedure 1

Communication with MUT-II is not possible. (Communication with all system is not possible.)	Probable cause
The reason is probably a defect in the power supply system (including earth) for the diagnosis line.	<ul style="list-style-type: none"> <li>• Malfunction of the connector</li> <li>• Malfunction of the harness</li> </ul>



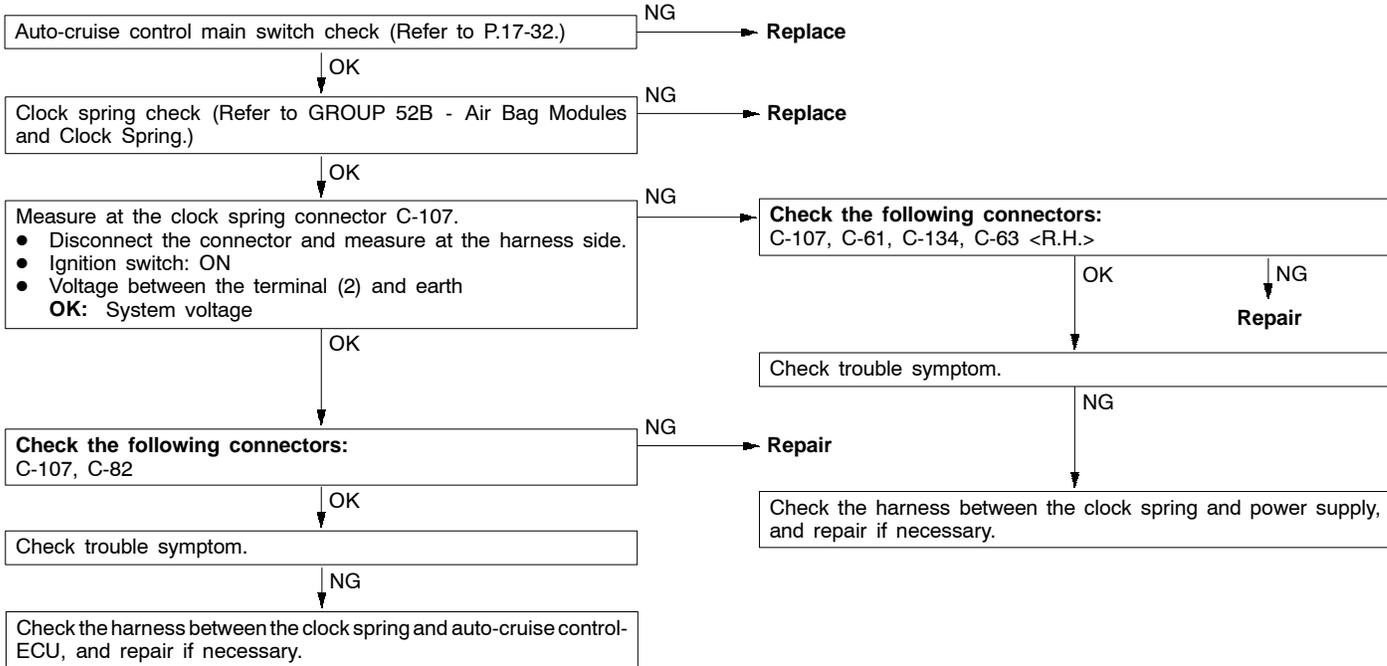
**Inspection Procedure 2**

<b>Communication with MUT-II is not possible. (Communication with auto-cruise control-ECU only is not possible.)</b>	<b>Probable cause</b>
The cause is probably a malfunction of auto-cruise control main switch circuit or a malfunction of auto-cruise control-ECU earth circuit.	<ul style="list-style-type: none"> <li>● Malfunction of the auto-cruise control main switch</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>



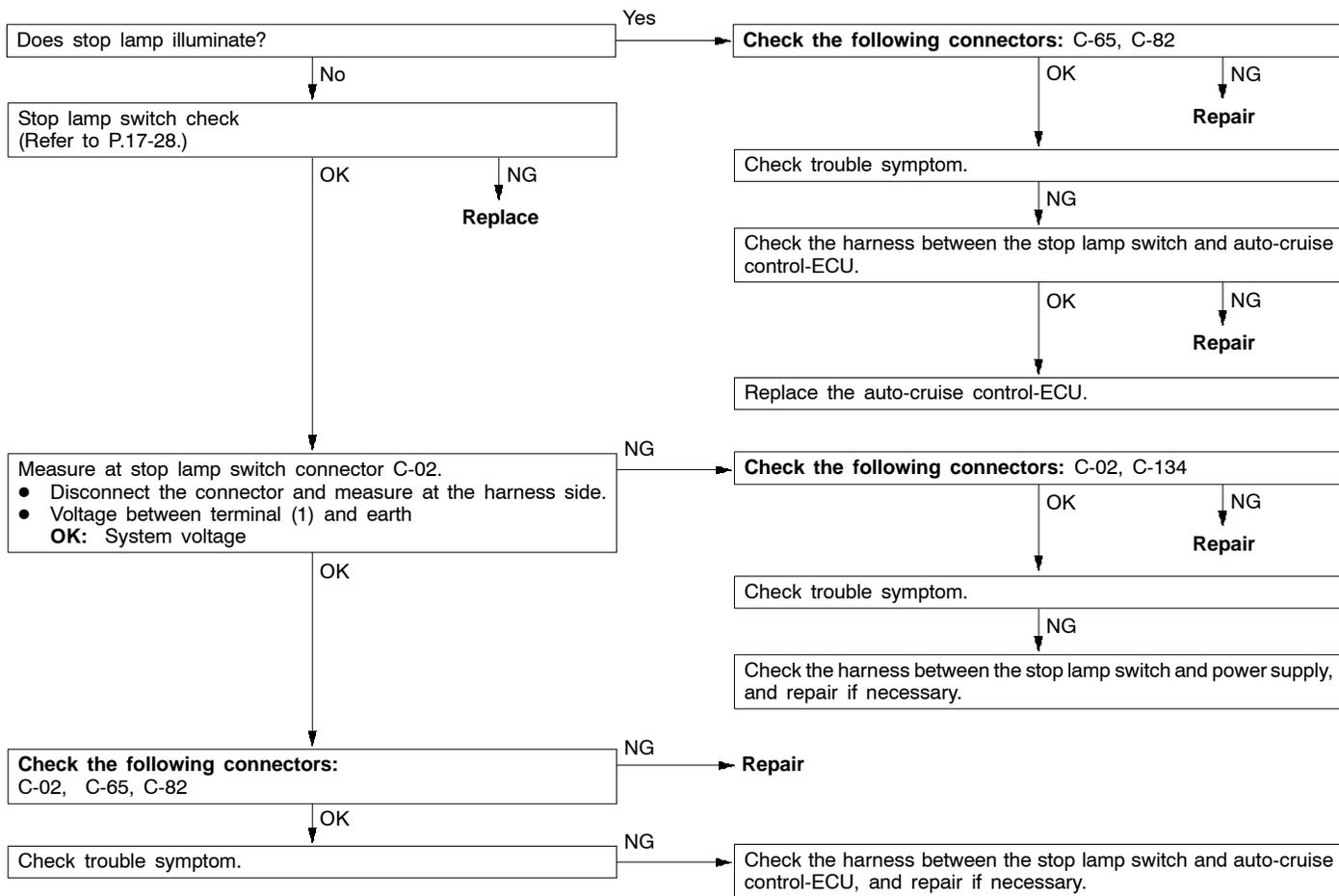
## Inspection Procedure 3

Input switch inspection using the MUT-II is not possible. (However, diagnosis inspection is possible.)	Probable cause
The cause is probably a malfunction of auto-cruise control switch circuit system.	<ul style="list-style-type: none"> <li>● Malfunction of the auto-cruise control switch</li> <li>● Malfunction of the clock spring</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> </ul>



**Inspection Procedure 4**

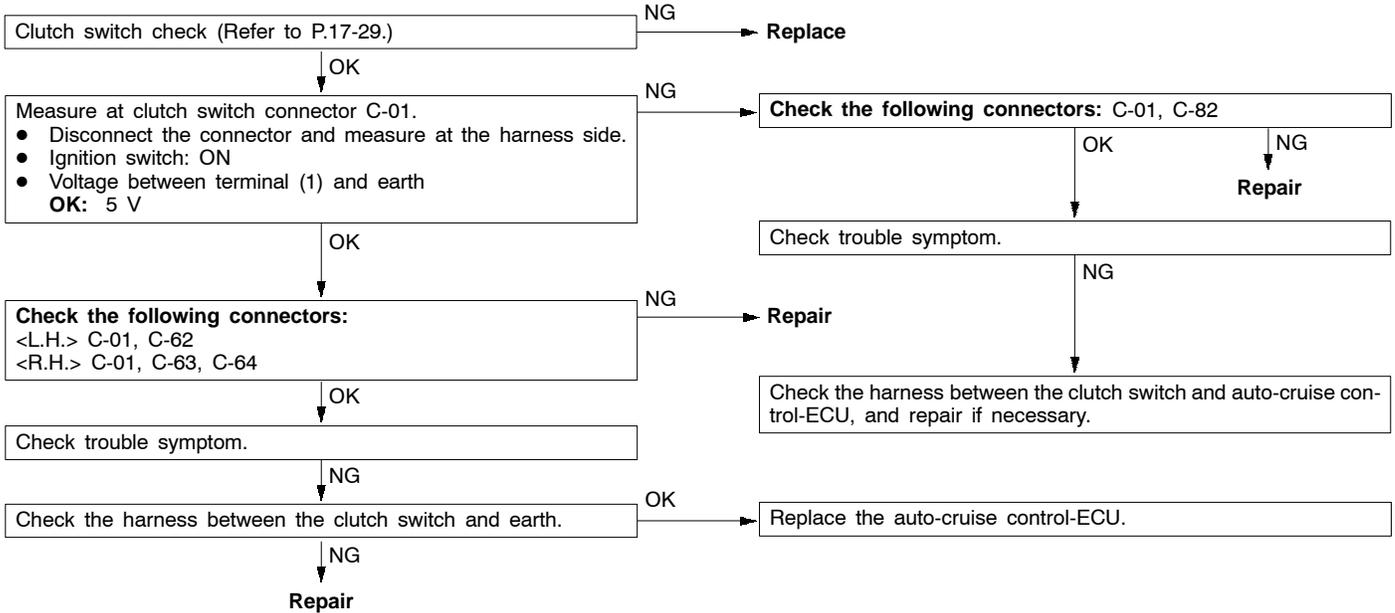
<b>Even if brake pedal is depressed, auto-cruise control is not cancelled.</b>	<b>Probable cause</b>
The cause is probably a malfunction of stop lamp switch or a malfunction of stop lamp circuit.	<ul style="list-style-type: none"> <li>● Malfunction of the stop lamp switch</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>



# 17-18 ENGINE AND EMISSION CONTROL - Auto-cruise Control System

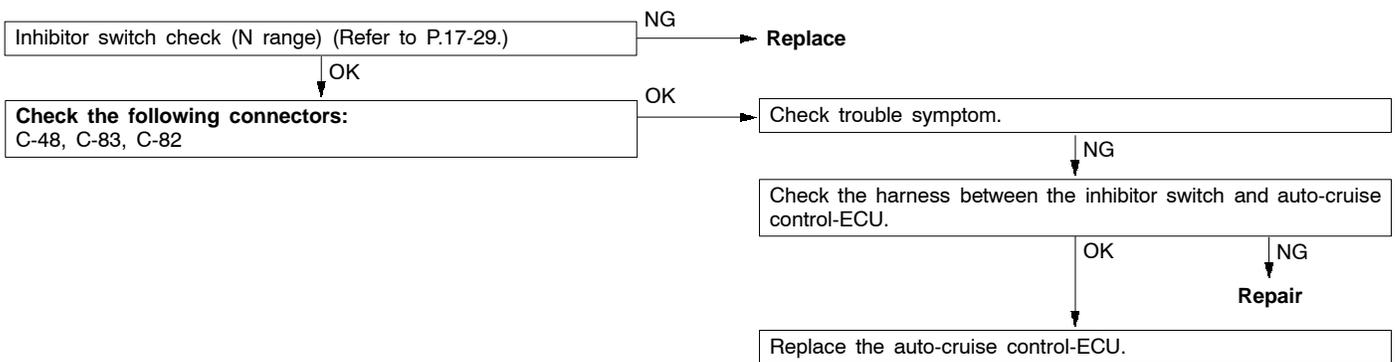
## Inspection Procedure 5

Even if clutch pedal is depressed, auto-cruise control is not cancelled. <M/T>	Probable cause
The cause is probably a malfunction of clutch switch or clutch circuit.	<ul style="list-style-type: none"> <li>● Malfunction of the clutch switch</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>



## Inspection Procedure 6

Even if select lever is set to N range, auto-cruise control is not cancelled. <A/T>	Probable cause
The cause is probably an open-circuit in the output signal circuit in N range.	<ul style="list-style-type: none"> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>



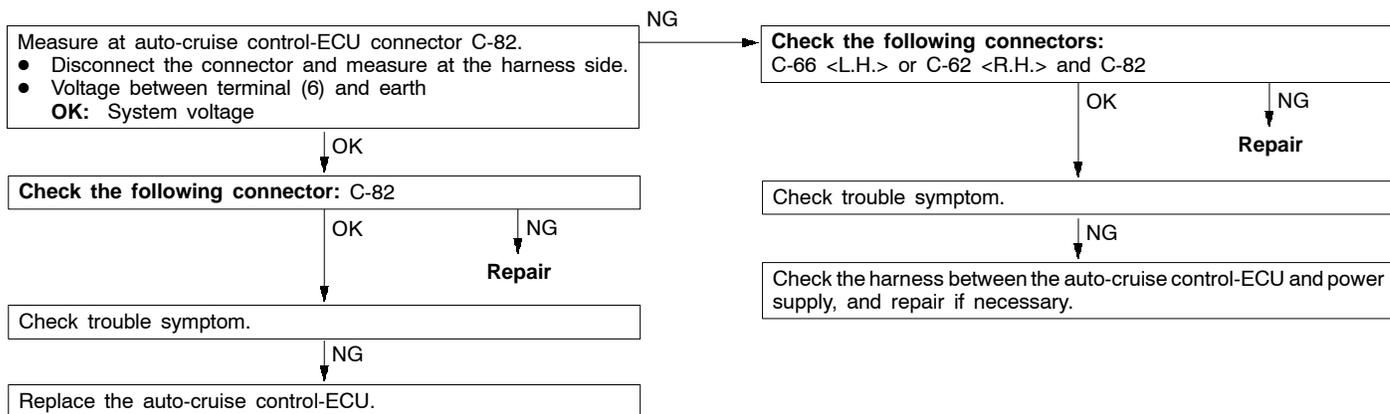
**Inspection Procedure 7**

<b>Even if auto-cruise control CANCEL switch is set to ON, auto-cruise control is not cancelled.</b>	<b>Probable cause</b>
The cause is probably an open-circuit in the circuit inside the CANCEL switch.	<ul style="list-style-type: none"> <li>• Malfunction of the auto-cruise control-ECU</li> </ul>

Replace the auto-cruise control switch.

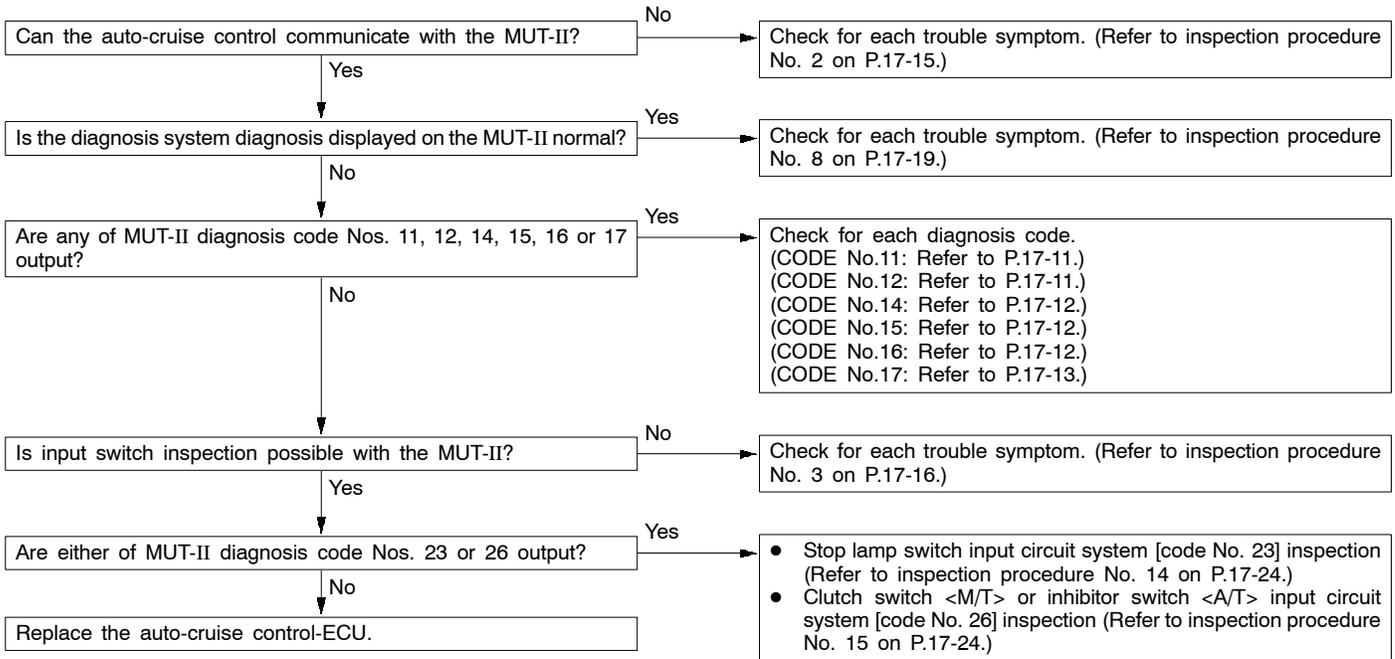
**Inspection Procedure 8**

<b>The diagnosis result displayed on the MUT-II is normal even though auto-cruise control cannot be set.</b>	<b>Probable cause</b>
Because of an open-circuit in the battery backup circuit system, the fail-safe function prevents diagnosis codes from being memorised and displayed even though auto-cruise control is cancelled.	<ul style="list-style-type: none"> <li>• Malfunction of the connector</li> <li>• Malfunction of the harness</li> <li>• Malfunction of the auto-cruise control-ECU</li> </ul>



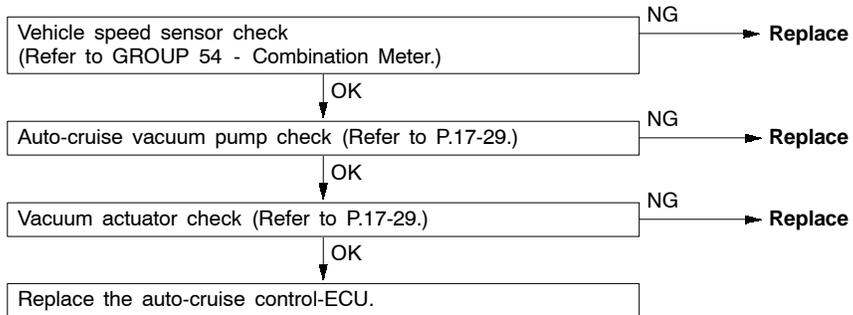
## Inspection Procedure 9

Auto-cruise control cannot be set.	Probable cause
<p>The cause is probably that the fail-safe function is cancelling auto-cruise control. In this case, the MUT-II can be used to check the trouble symptoms in each system by inspecting the diagnosis codes. The MUT-II can also be used to check if the circuits of each input switch are normal or not by inspecting the input switch codes.</p>	<ul style="list-style-type: none"> <li>● Malfunction of the auto-cruise control main switch</li> <li>● Malfunction of the auto-cruise control switch</li> <li>● Malfunction of the clock spring</li> <li>● Malfunction of the harnesses or connectors</li> <li>● Malfunction of the clutch switch &lt;M/T&gt;</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>



**Inspection Procedure 10**

<b>Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed.</b>	<b>Probable cause</b>
The cause is probably a malfunction of vehicle speed sensor or incorrect vacuum in the auto-cruise vacuum pump or vacuum actuator.	<ul style="list-style-type: none"> <li>• Malfunction of the vehicle speed sensor</li> <li>• Malfunction of the auto-cruise vacuum pump</li> <li>• Malfunction of the vacuum actuator</li> <li>• Malfunction of the auto-cruise control-ECU</li> </ul>



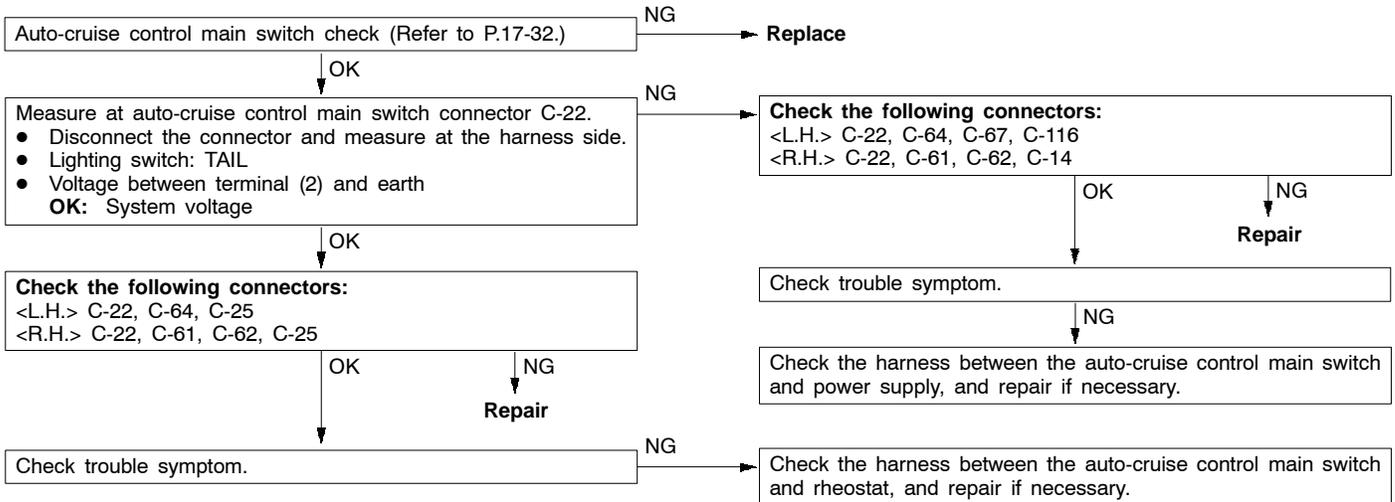
**Inspection Procedure 11**

<b>Even though auto-cruise control main switch is ON, switch indicator lamp does not illuminate. (However, auto-cruise control is normal.)</b>	<b>Probable cause</b>
Blown bulb in auto-cruise control main switch	<ul style="list-style-type: none"> <li>• Malfunction of the auto-cruise control main switch</li> </ul>

Replace the auto-cruise control main switch.

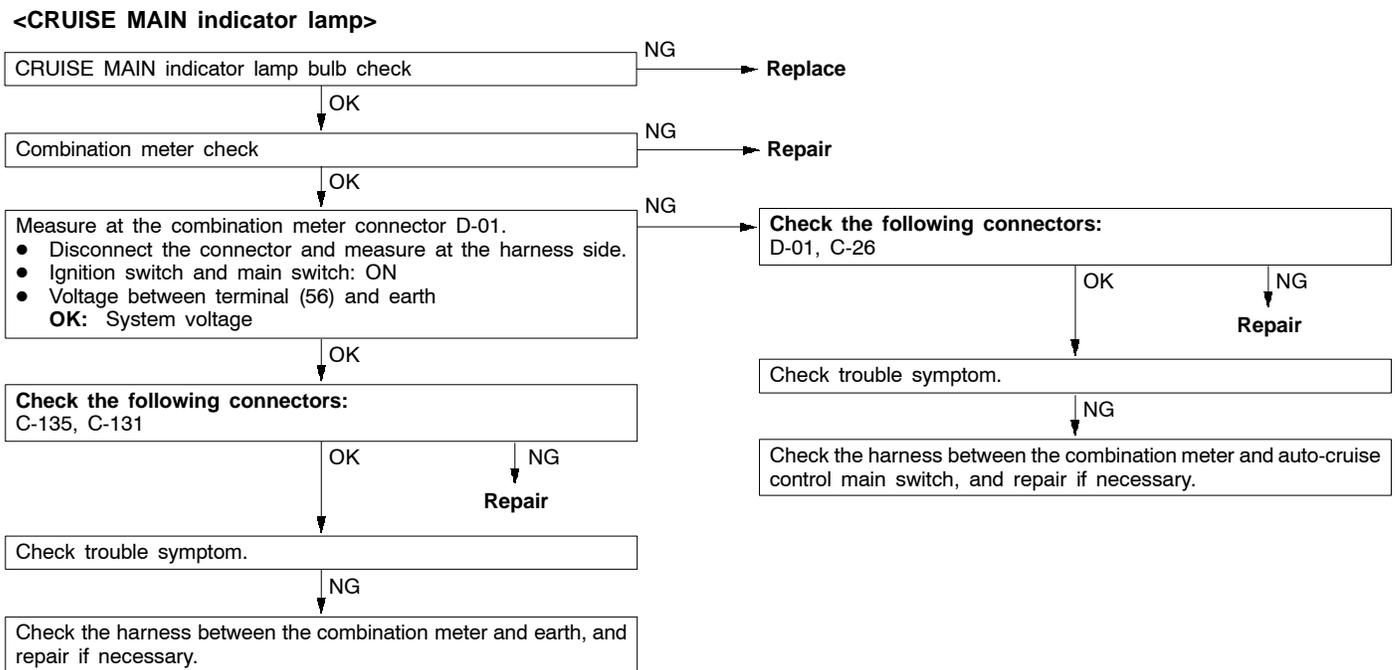
## Inspection Procedure 12

Auto-cruise control main switch illumination lamp does not illuminate.	Probable cause
The cause is probably a malfunction of auto-cruise control main switch or a malfunction of harness or connector.	<ul style="list-style-type: none"> <li>● Malfunction of the auto-cruise control main switch</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the harness</li> </ul>

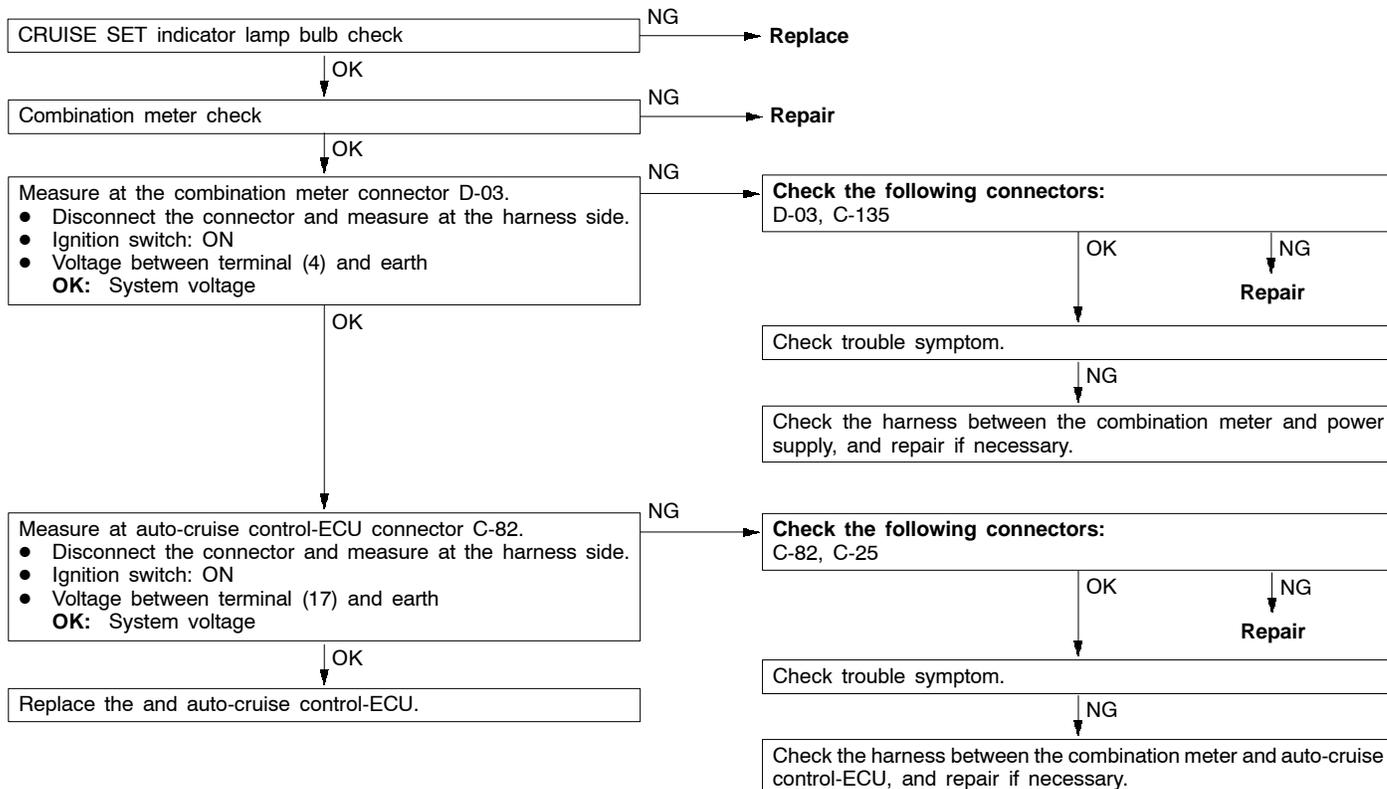


## Inspection Procedure 13

Auto-cruise control indicator lamp (CRUISE MAIN, CRUISE SET) inside combination meter does not illuminate. (However, auto-cruise control is normal.)	Probable cause
The cause is probably a malfunction of bulb or a malfunction of connector or harness.	<ul style="list-style-type: none"> <li>● Malfunction of the bulb</li> <li>● Malfunction of the harness</li> <li>● Malfunction of the connector</li> <li>● Malfunction of the auto-cruise control-ECU</li> </ul>

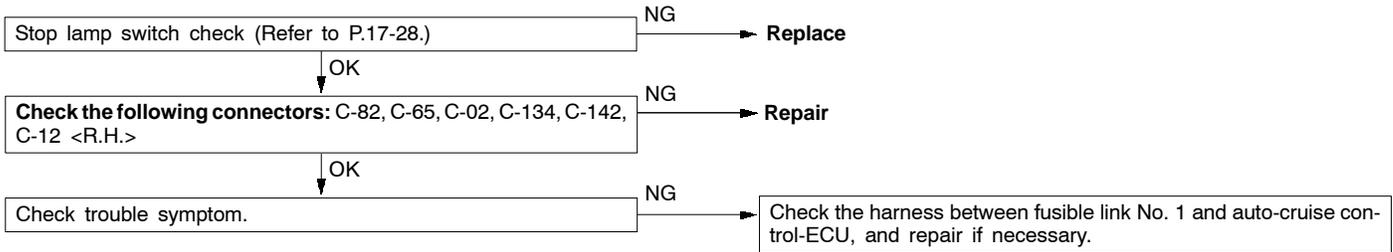


## <CRUISE SET indicator lamp>



## Inspection Procedure 14

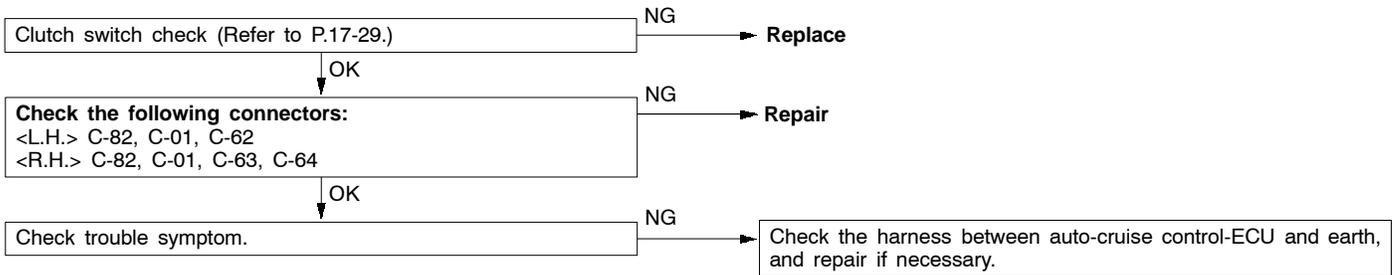
### Stop lamp switch input circuit system inspection (Code No. 23)



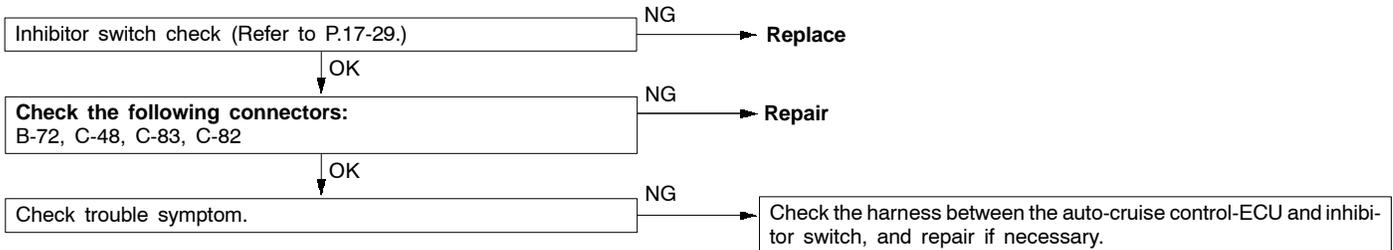
## Inspection Procedure 15

### Clutch switch <M/T> or inhibitor switch <A/T> input circuit system inspection (Code No. 26)

#### <M/T>



#### <A/T>



**CHECK AT THE ECU TERMINALS**

17200270121

1	2	3	4		5	6	7	8	
9	10	11	12	13	14	15	16	17	18

03U0031

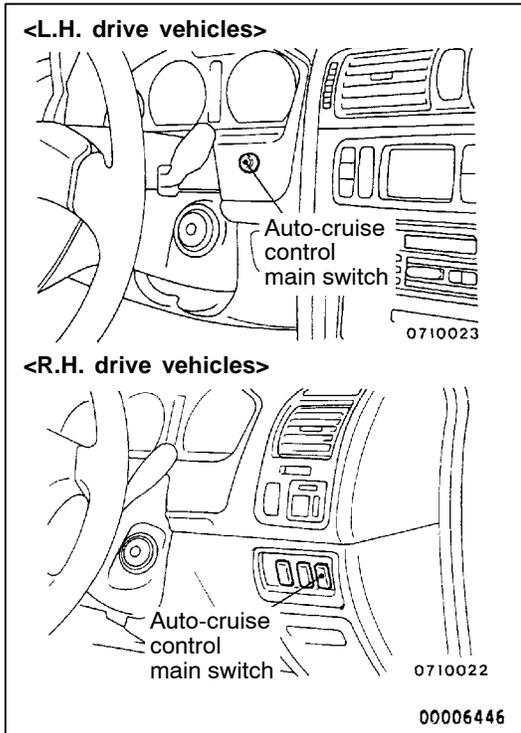
Terminal No.	Check item	Check conditions		Normal condition
1	Throttle position sensor (accelerator pedal position sensor*) input	When accelerator pedal is fully depressed		4.5 - 5.5V
		When accelerator pedal is released		0.3 - 1.0V
2	Idle switch output	When accelerator pedal is depressed	When idle switch is OFF	4.5 - 5.5V
		When accelerator pedal is not depressed	When idle switch is ON	0V
3	ACC power supply	When ignition switch is in ACC position		System voltage
4	Stop lamp switch input	When brake pedal is depressed	When stop lamp switch is ON	System voltage
		When brake pedal is not depressed	When stop lamp switch is OFF	0V
5	Diagnosis control input	When ignition switch is ON		4V or more
6	ECU backup power supply	At any time		System voltage
7	Auto-cruise vacuum pump release valve and control valve input	When decelerating with the SET switch while driving at constant speed	Release valve closed	0V
8			Control valve open/closed	System voltage/0V
7		When cancelling constant speed driving with the CANCEL switch	Release valve open	System voltage
8			Control valve open	System voltage
9	Earth	At any time		Continuity
10	A/T control output	No OD-OFF request		System voltage
		OD-OFF request		0V

**NOTE**

\*: Vehicles with TCL

# 17-26 ENGINE AND EMISSION CONTROL - Auto-cruise Control System

Terminal No.	Check item	Check conditions		Normal condition
11	Vehicle speed sensor input	When vehicle is moved forwards and backwards, sensor turns ON and OFF repeatedly	When sensor is ON	0V
			When sensor is OFF	4.5V or more
12	Auto-cruise control switch input	When input switch has not been operated	When all switches are OFF	0V
		When input switch is pushed down	When SET switch is ON	Approx. 3V
		When input switch is pushed up	When RESUME switch is ON	Approx. 6V
		When input switch is pulled forward	When CANCEL switch is ON	System voltage
13	Earth	At any time		Continuity
14	Clutch switch input <M/T>	When pedal is not depressed	When clutch switch is OFF	5V
		When pedal is depressed	When clutch switch is ON	0V
	Inhibitor switch input <A/T>	When select lever is in a position other than N range	When inhibitor switch is OFF	5V
		When select lever is in N range	When inhibitor switch is ON	0V
15	Pump power supply	Ignition switch : ON Main switch : ON Stop lamp switch : OFF		System voltage
16	ECU power supply	Ignition switch : ON Main switch : ON		System voltage
17	Indicator lamp input (inside combination meter)	When driving at constant speed	When indicator lamp is illuminated	0V
		When constant-speed driving is cancelled	When indicator lamp is switched off	System voltage
18	Auto-cruise vacuum pump motor input	When driving at constant speed using the SET switch	Motor stopped/running	System voltage/0V
		When accelerating with the RESUME switch while driving at constant speed	Motor stopped/running	System voltage/0V
		When decelerating with the SET switch while driving at constant speed	Motor stopped	System voltage
		When cancelling constant speed driving with the CANCEL switch	Motor stopped	System voltage



## ON-VEHICLE SERVICE

17200110133

### AUTO-CRUISE CONTROL MAIN SWITCH CHECK

1. Turn the ignition key to ON.
2. Check to be sure that the indicator lamp within the switch illuminates when the main switch is switched ON.

### AUTO-CRUISE CONTROL SWITCH CHECK

17200120143

#### AUTO-CRUISE CONTROL SETTING

1. Switch ON the main switch.
2. Drive at the desired speed within the range of approximately 40-200 km/h.
3. Push the auto-cruise control switch in the direction of arrow (B).
4. Check to be sure that when the switch is released the speed is the desired constant speed.

#### NOTE

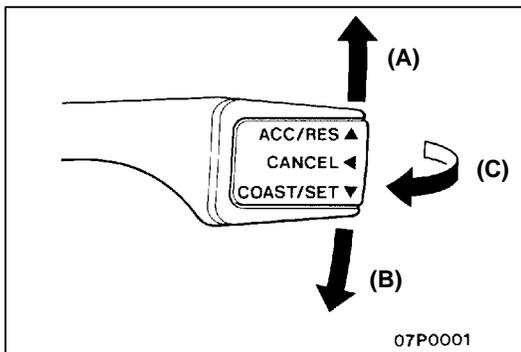
If the vehicles speed decreases to approximately 15 km/h below the set speed because of climbing a hill for example, the auto-cruise control will be cancelled.

#### SPEED-INCREASE SETTING

1. Set to the desired speed.
2. Push the auto-cruise control switch in the direction of arrow (A).
3. Check to be sure that acceleration continues while the switch is hold, and that when it is released the constant speed at the time when it was released becomes the driving speed.

#### NOTE

Acceleration can be continued even if the vehicle speed has passed the high-speed limit (approx. 200 km/h). But the speed when the auto-cruise control switch is released will be recorded as the high-speed limit.



**SPEED-REDUCTION SETTING**

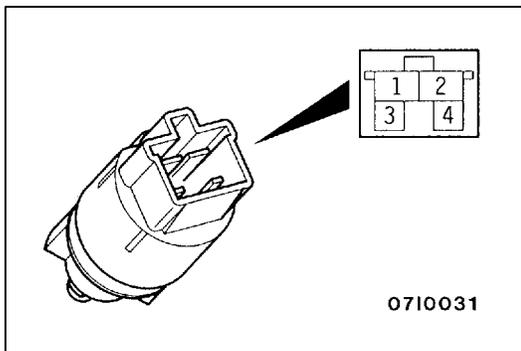
1. Set to the desired speed.
2. Push the auto-cruise control switch in the direction of arrow (B).
3. Check to be sure that deceleration continues while the switch is pressed, and that when it is released the constant speed at the time when it was released becomes the driving speed.

**NOTE**

When the vehicle speed reaches the low limit (approximately 40 km/h) during deceleration, the auto-cruise control will be cancelled.

**RETURN TO THE SET SPEED BEFORE CANCELLATION AND AUTO-CRUISE CONTROL CANCELLATION**

1. Set the auto-cruise speed control.
2. When any of the following operations are performed while at constant speed during auto-cruise control, check if normal driving is resumed and deceleration occurs.
  - a. The auto-cruise control switch is pushed in the direction of arrow (C).
  - b. The brake pedal is depressed.
  - c. The clutch pedal is depressed. <M/T>
  - d. The selector lever is moved to the "N" range. <A/T>
3. When the auto-cruise control switch is pushed in the direction of arrow (A) at a vehicle speed of 40 km/h or higher, check if the vehicle speed returns to the speed before auto-cruise control driving was cancelled, and constant speed driving occurs.
4. When the main switch is turned to OFF while driving at constant speed, check if normal driving is resumed and deceleration occurs.



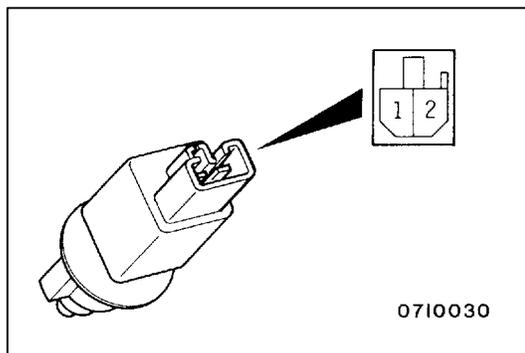
**AUTO-CRUISE CONTROL COMPONENT CHECK**

17200170223

**STOP LAMP SWITCH**

1. Disconnect the connector.
2. Check for continuity between the terminals of the switch.

Measurement conditions	Terminal No.			
	1	2	3	4
When brake pedal is depressed. (for stop lamp circuit)	○	○		
When brake pedal is not depressed. (for auto-cruise control circuit)			○	○



**CLUTCH SWITCH**

1. Disconnect the connector.
2. Check for continuity between the terminals of the switch.

Measurement conditions	Terminal No.	
	1	2
When clutch pedal is depressed.	○—○	○—○
When clutch pedal is not depressed.		

**INHIBITOR SWITCH (“N” POSITION)**

Refer to GROUP 23 - On-vehicle Service.

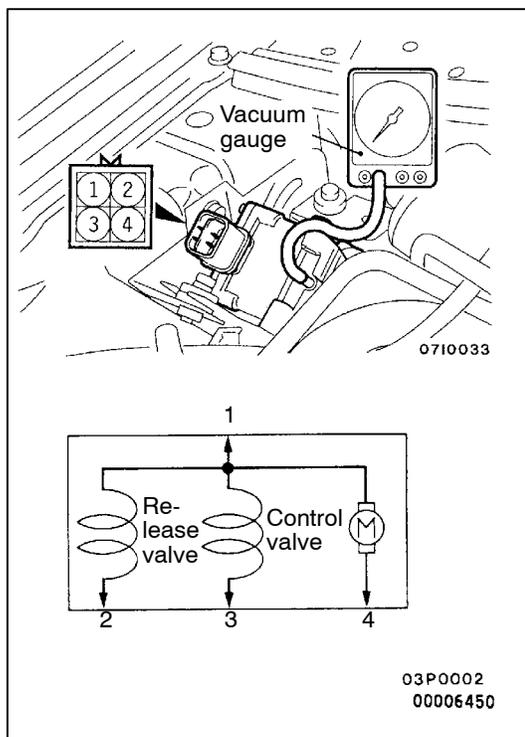
**THROTTLE POSITION SENSOR**

Refer to GROUP 13A - On-vehicle Service.

**ACCELERATOR PEDAL POSITION SENSOR**

<Vehicles with TCL>

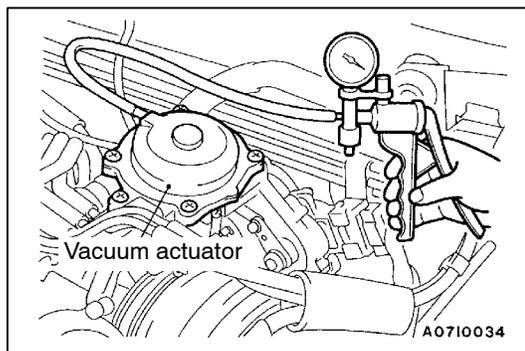
Refer to GROUP 13A - On-vehicle Service.



**AUTO-CRUISE VACUUM PUMP**

1. Disconnect the vacuum hose from the auto-cruise vacuum pump and connect a vacuum gauge to the vacuum pump.
2. Disconnect the vacuum pump connector.
3. Check that the reading on the vacuum gauge matches the values in the table below when the battery is connected to each connector terminal.

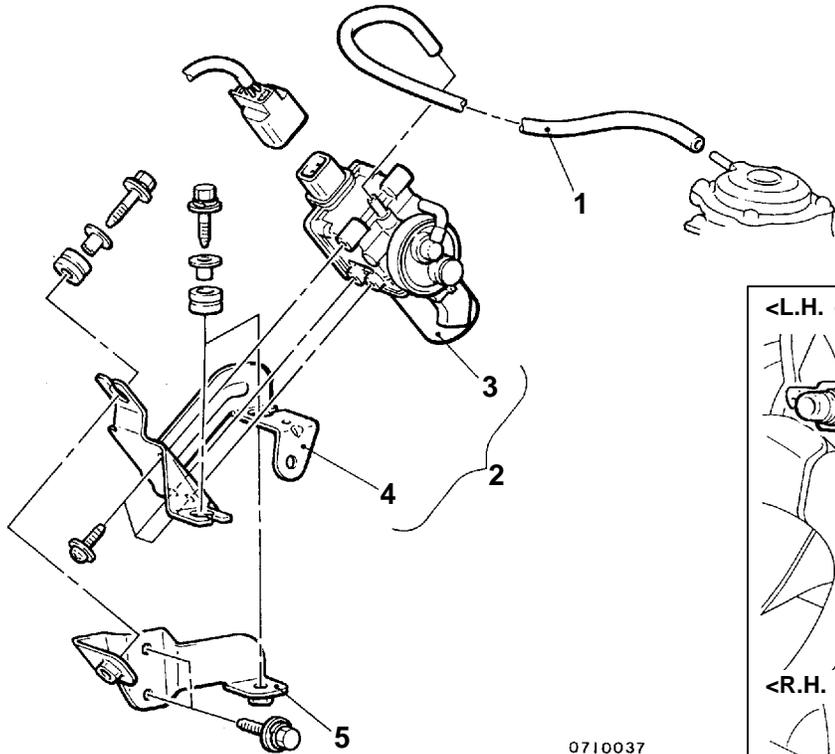
Terminal No.				Valve condition	Vacuum gauge kPa
1	2	3	4		
⊕	⊖	⊖	⊖	Release valve closed Control valve closed	53 or more
⊕		⊖	⊖	Release valve open	20 or less
⊕	⊖		⊖	Control valve open	



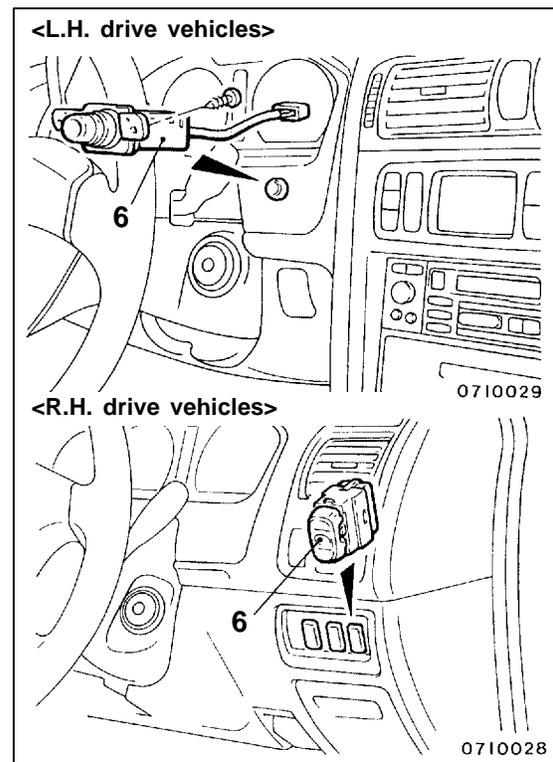
**VACUUM ACTUATOR**

1. Disconnect the vacuum hose from the vacuum actuator, and connect a hand vacuum pump to the actuator.
2. Check that the throttle lever operates when applying vacuum, and the vacuum is kept.

# AUTO-CRUISE CONTROL REMOVAL AND INSTALLATION



0710037  
00006447



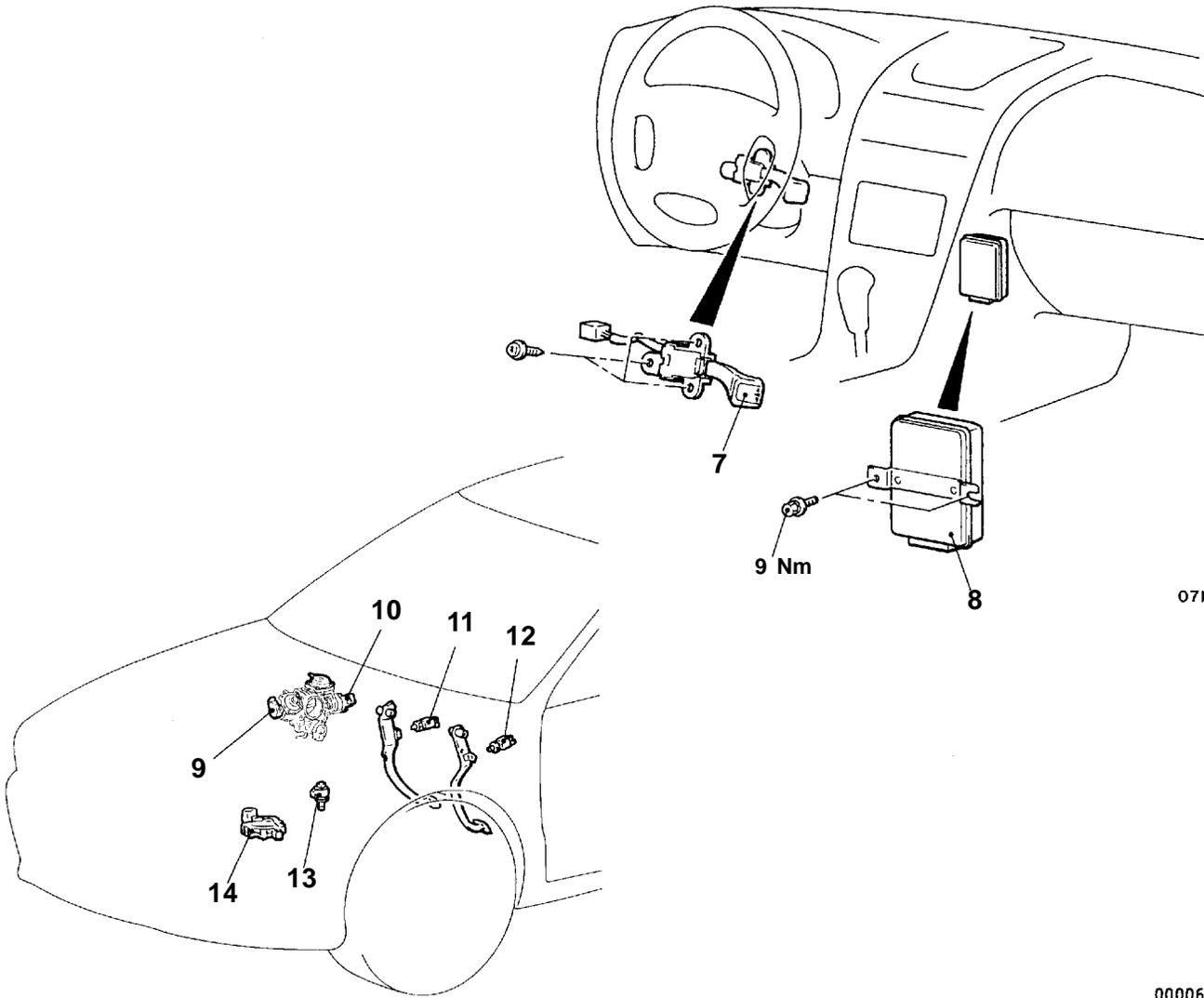
## Auto-cruise vacuum pump removal steps

1. Vacuum hose
2. Auto-cruise vacuum pump and pump bracket assembly
3. Auto-cruise vacuum pump assembly
4. Pump bracket
5. Body pump bracket

## Auto-cruise control main switch removal steps

- Meter bezel assembly <L.H. drive vehicles> (Refer to GROUP 52A.)
- Bezel switch <R.H. drive vehicles> (Refer to GROUP 52A.)
- 6. Auto-cruise control main switch

**CAUTION: SRS**  
 Before removal of air bag module, refer to  
 GROUP 52B - SRS Service Precautions and Air  
 Bag Modules and Clock Spring.



**Auto-cruise control switch removal steps**

- Steering wheel (Refer to GROUP 37A.)
- 7. Auto-cruise control switch

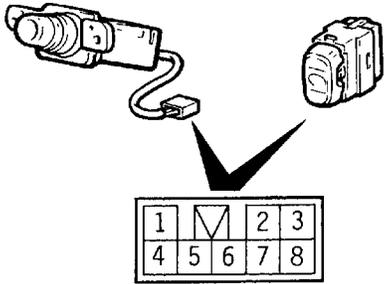
**Auto-cruise control-ECU removal steps**

- Radio and tape player (Refer to GROUP 54.)
- 8. Auto-cruise control-ECU

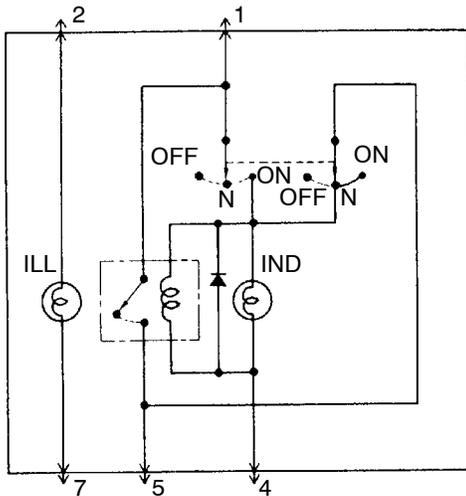
**Sensor removal**

- 9. Throttle position sensor
- 10. Accelerator pedal position sensor <Vehicles with TCL>
- 11. Stop lamp switch
- 12. Clutch switch <M/T>
- 13. Vehicle speed sensor
- 14. Inhibitor switch <A/T>

<L.H. drive vehicles> <R.H. drive vehicles>



0710042



11P0031  
00006449

**INSPECTION**

17200110140

**AUTO-CRUISE CONTROL MAIN SWITCH CHECK**

1. Connect the terminal 1 to the battery (+) side and connect the terminal 4 to the battery (-) side, and then turn the main switch to ON. Check that the voltage between the terminal 5 and earth is battery voltage. Also, check that the indicator lamp illuminates.
2. When the main switch is turned to OFF, check that the voltage between the terminal 5 and earth becomes 0 V.
3. Check the continuity between terminals 2 and 7.

**AUTO-CRUISE CONTROL SWITCH CHECK**

17200120150

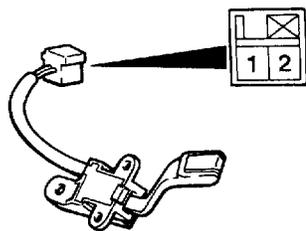
Measure the resistance between the terminals when each of the SET, RESUME and CANCEL switches is pressed. If the values measured at this time correspond to those in the table below, then there is no problem.

Switch position	Resistance between terminals
Switch OFF	No continuity
CANCEL switch ON	Approx. 0 Ω
RESUME switch ON	Approx. 820 Ω
SET switch ON	Approx. 2,700 Ω

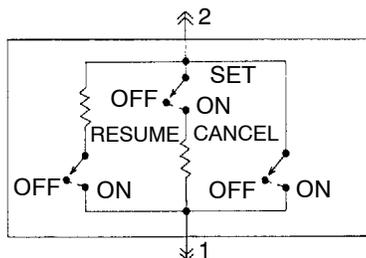
**VEHICLE SPEED SENSOR CHECK**

17200300042

Refer to GROUP 54 - Combination Meters.



07M0020



07X0023  
00004838

**EMISSION CONTROL SYSTEM <MPI>**

17300010252

**GENERAL INFORMATION**

The emission control system consists of the following subsystems:

- Crankcase emission control system
- Evaporative emission control system
- Exhaust emission control system

Items	Name	Specification
Crankcase emission control system	Positive crankcase ventilation (PCV) valve	Variable flow type (Purpose: HC reduction)
Evaporative emission control system	Canister Purge control solenoid valve	Equipped ON/OFF type solenoid valve (Purpose: HC reduction)
Exhaust emission control system	Air-fuel ratio control device-MPI system	Oxygen sensor feedback type (Purpose: CO, HC, NOx reduction)
	Exhaust gas recirculation system <ul style="list-style-type: none"> <li>● EGR valve</li> <li>● EGR control solenoid valve</li> </ul>	Equipped Single type Duty cycle type solenoid valve (Purpose: NOx reduction)
	Catalytic converter	Monolith type (Purpose: CO, HC, NOx reduction)

**EMISSION CONTROL DEVICE REFERENCE TABLE**

Related parts	Crankcase emission control system	Evaporative emission control system	Air/fuel ratio control system	Catalytic converter	Exhaust gas recirculation system	Reference page
PCV valve	×					17-38
Purge control solenoid valve		×				17-41
MPI system component		×	×			GROUP 13A
Catalytic converter				×		17-47
EGR valve					×	17-44
EGR control solenoid valve					×	17-45

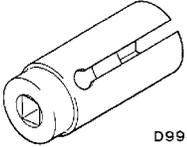
**SERVICE SPECIFICATIONS**

17300030265

Items	Standard value
Purge control solenoid valve coil resistance (at 20°C) Ω	36 - 44
EGR control solenoid valve coil resistance (at 20°C) Ω	36 - 44

**SPECIAL TOOL**

17300060073

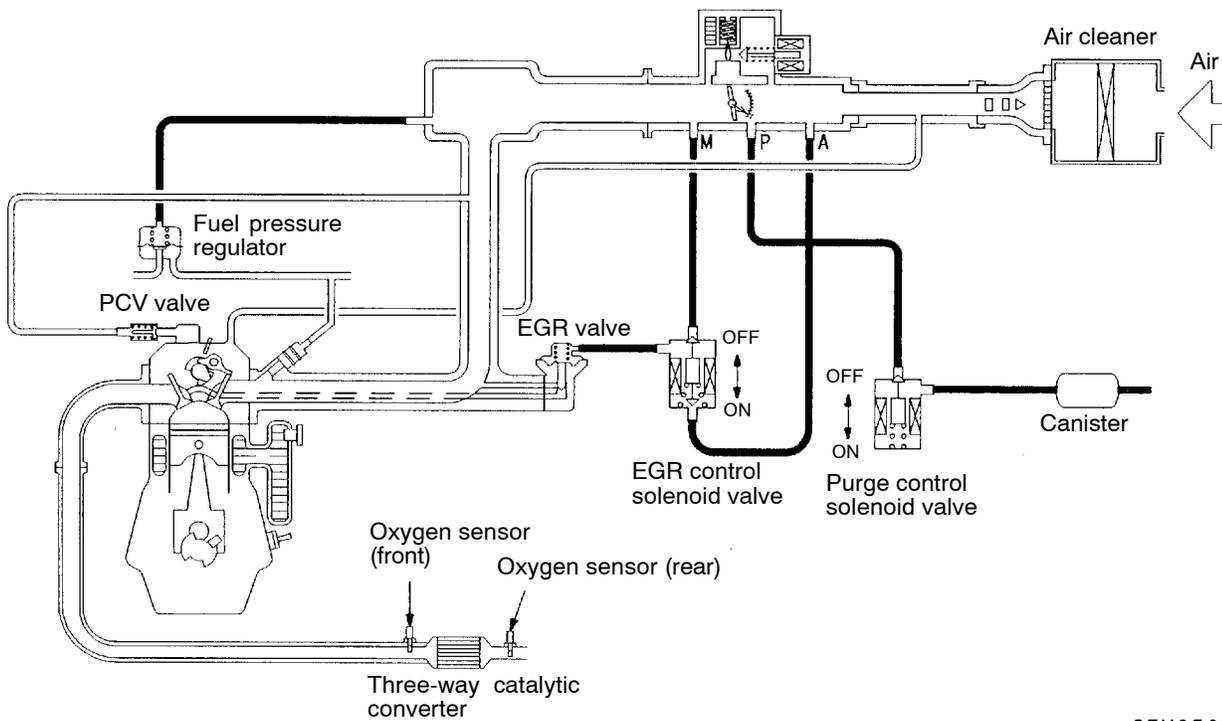
Tool	Number	Name	Use
 D998770	MD998770	Oxygen sensor wrench	Removal/Installation of oxygen sensor

**VACUUM HOSE**

17300090317

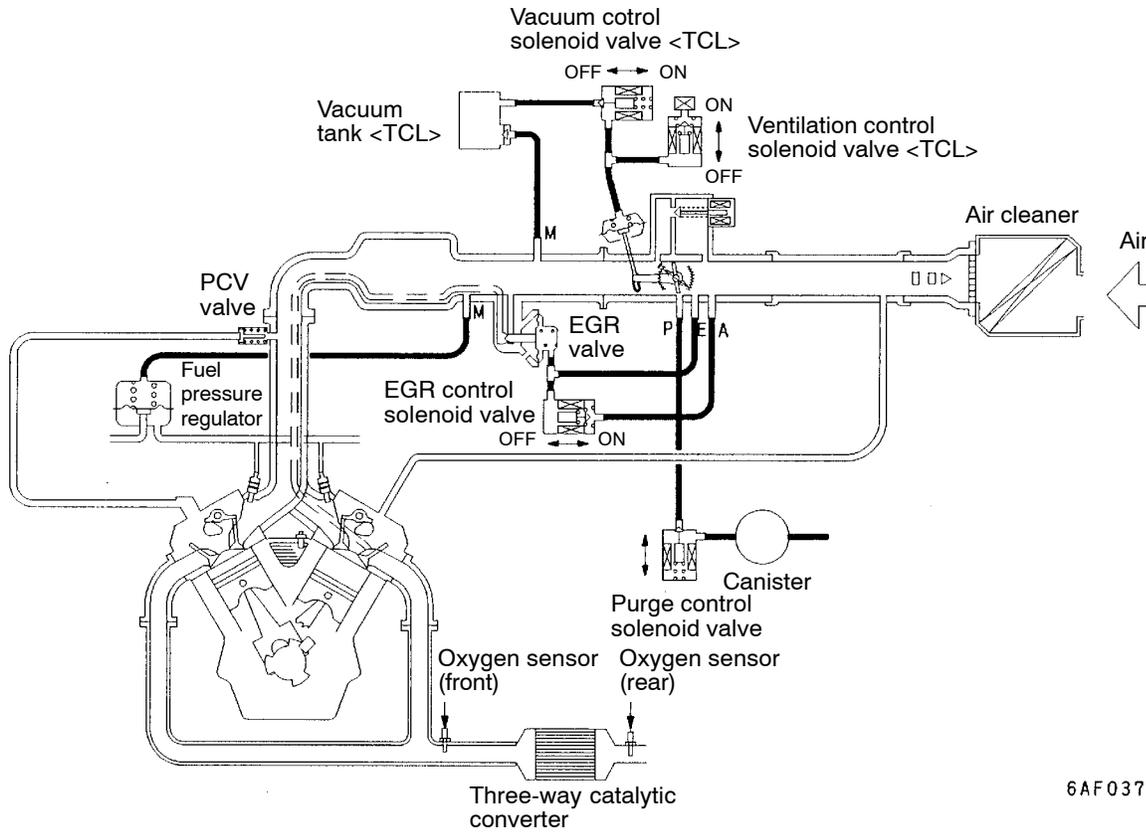
**VACUUM HOSE PIPING DIAGRAM**

<4G6>



6EM0592

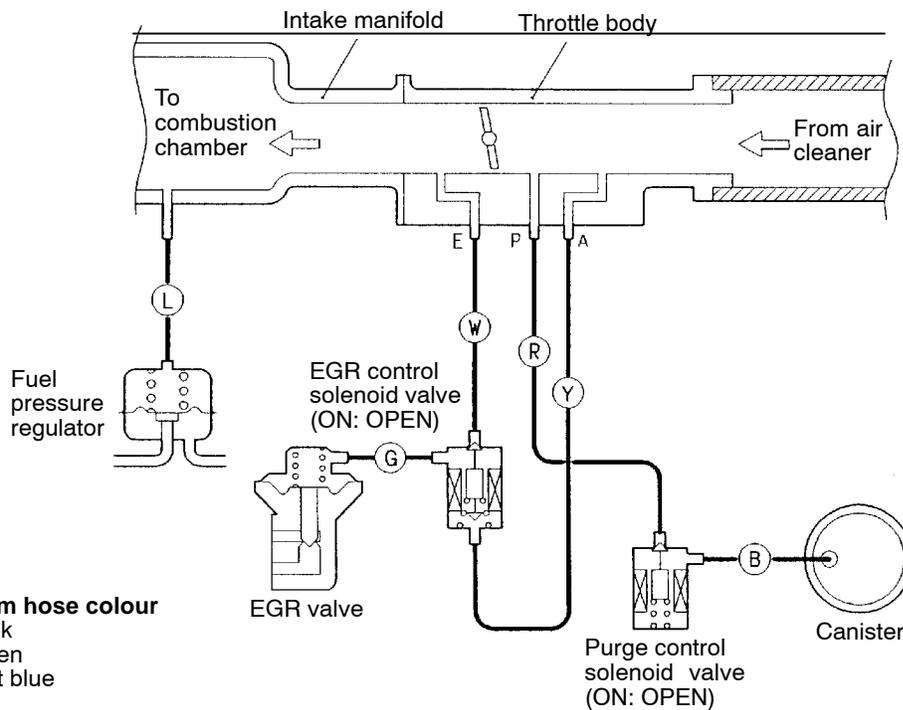
<6A1>



6AF0372

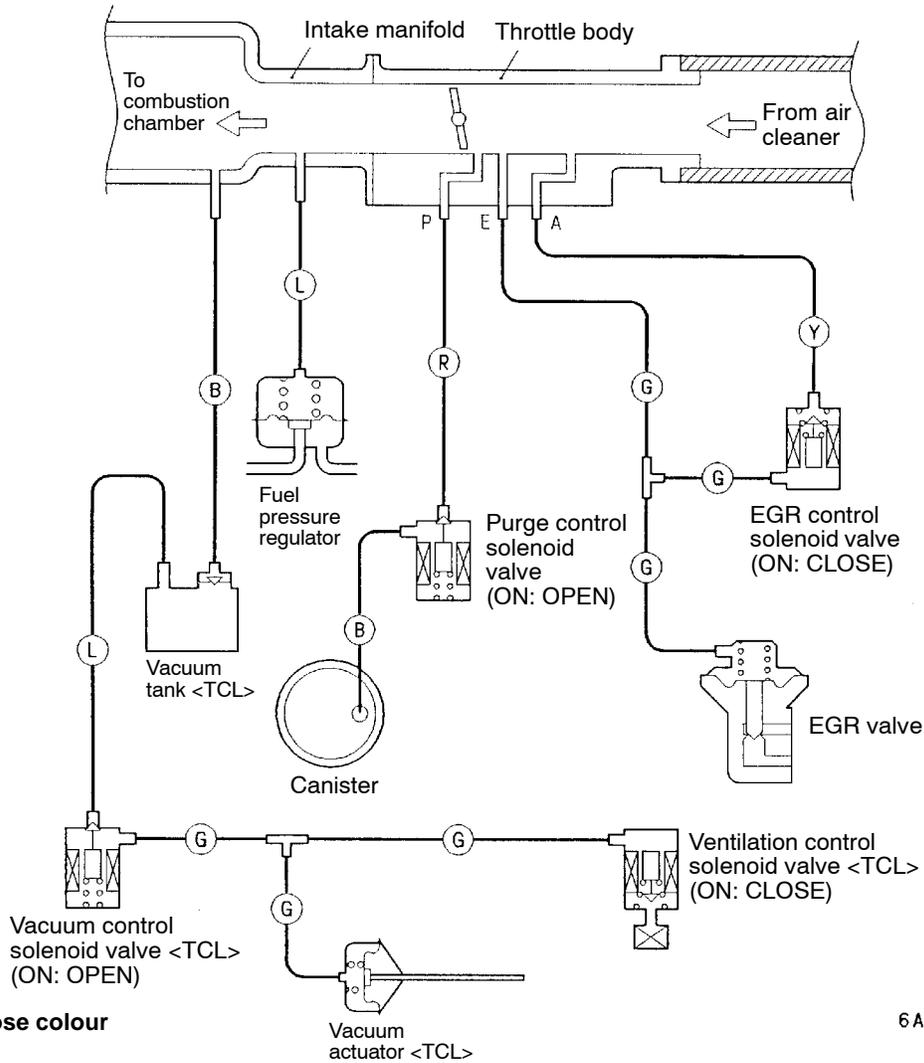
VACUUM CIRCUIT DIAGRAM

<4G6>



6EM0593

<6A1>



6AF0373

### VACUUM HOSE CHECK

1. Using the piping diagram as a guide, check to be sure that the vacuum hoses are correctly connected.
2. Check the connection condition of the vacuum hoses, (removed, loose, etc.) and check to be sure that there are no bends or damage.

### VACUUM HOSE INSTALLATION

1. When connecting the vacuum hoses, they should be securely inserted onto the nipples.
2. Connect the hoses correctly, using the vacuum hose piping diagram as a guide.

## CRANKCASE EMISSION CONTROL SYSTEM

17300500247

### GENERAL INFORMATION

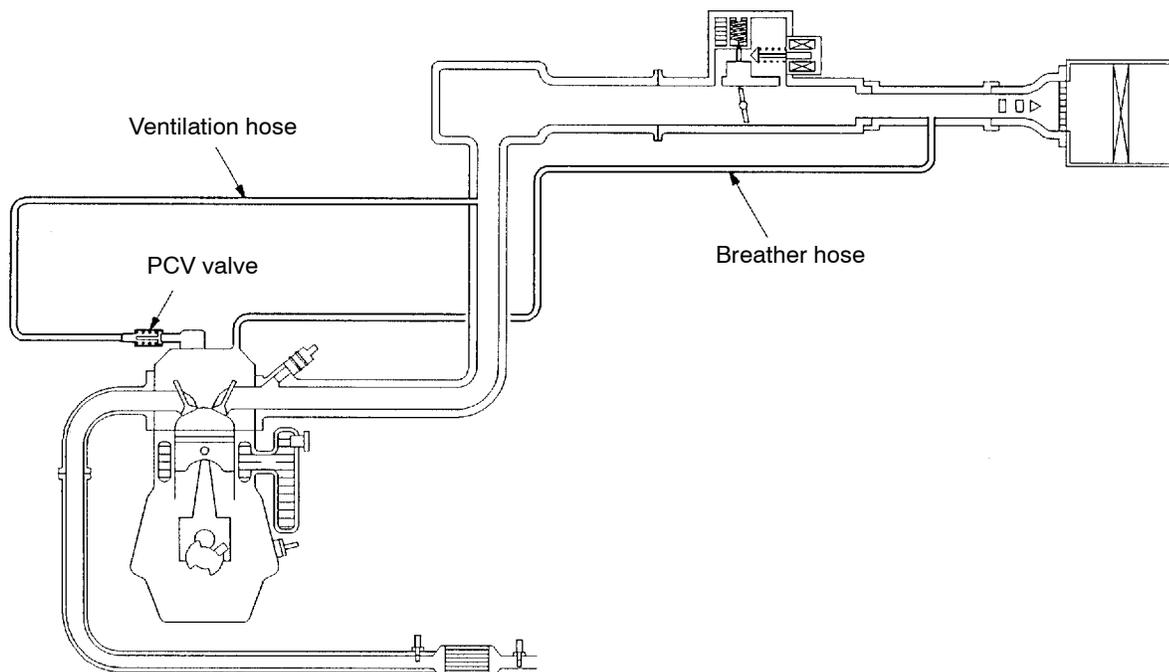
The crankcase emission control system prevents blow-by gases from escaping inside the crankcase into the atmosphere.

Fresh air is sent from the air cleaner into the crankcase through the breather hose. The air becomes mixed with the blow-by gases inside the crankcase.

The blow-by gas inside the crankcase is drawn into the intake manifold through the positive crankcase ventilation (PCV) valve.

The PCV valve lifts the plunger according to the intake manifold vacuum so as to regulate the flow of blow-by gas properly. In other words, the blow-by gas flow is regulated during low load engine operation to maintain engine stability, while the flow is increased during high load operation to improve the ventilation performance.

### SYSTEM DIAGRAM

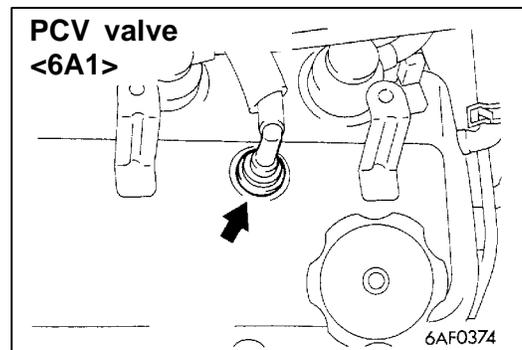
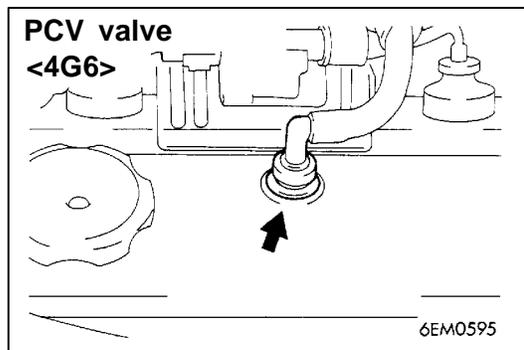


6EM0594

### NOTE

The illustration shows the system for 4G63 engine.

### COMPONENT LOCATION



## POSITIVE CRANKCASE VENTILATION SYSTEM CHECK

17300110136

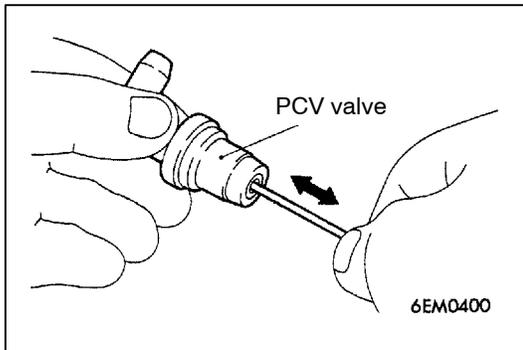
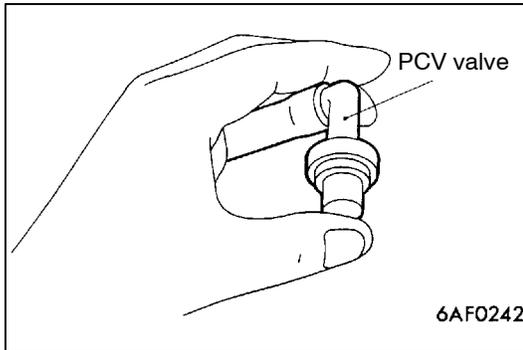
1. Remove the ventilation hose from the PCV valve.
2. Remove the PCV valve from the rocker cover.
3. Reinstall the PCV valve at the ventilation hose.
4. Start the engine and run at idle.

5. Place a finger at the opening of the PCV valve and check that vacuum of the intake manifold is felt.

### NOTE

At this moment, the plunger in the PCV valve moves back and forth.

6. If vacuum is not felt, clean the PCV valve or replace it.



## PCV VALVE CHECK

17300120122

1. Insert a thin rod into the PCV valve from the side shown in the illustration (rocker cover installation side), and move the rod back and forth to check that the plunger moves.
2. If the plunger does not move, there is clogging in the PCV valve. In this case, clean or replace the PCV valve.

# EVAPORATIVE EMISSION CONTROL SYSTEM

17300510363

## GENERAL INFORMATION

The evaporative emission control system prevents fuel vapours generated in the fuel tank from escaping into the atmosphere.

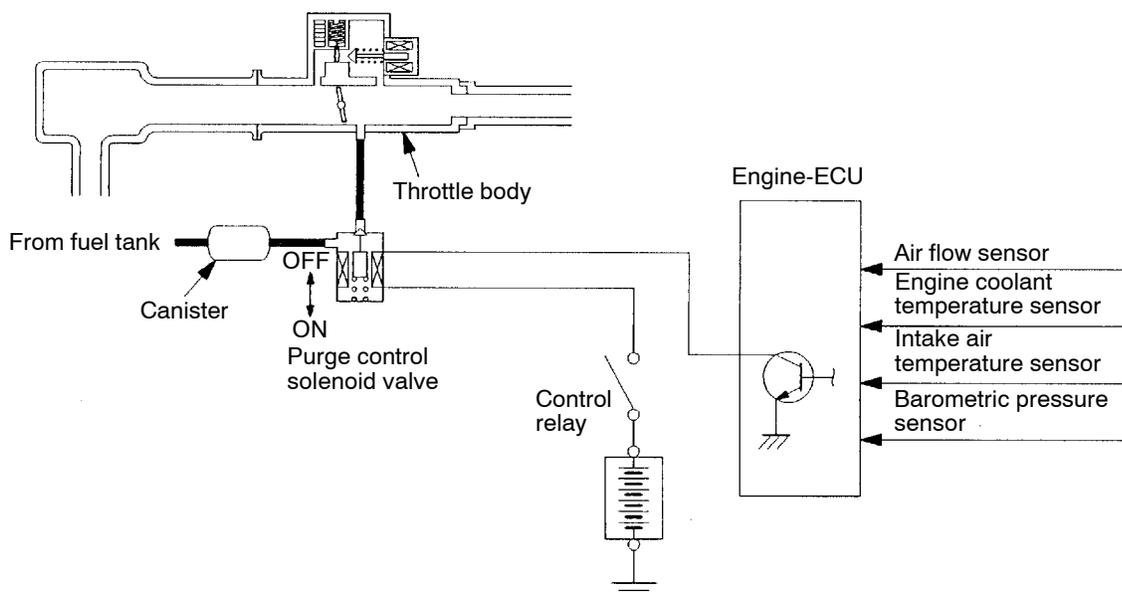
Fuel vapours from the fuel tank flow through the fuel tank pressure control valve and vapour pipe/hose to be stored temporarily in the canister. When driving the vehicle, fuel vapours stored in the canister flow through the purge solenoid and purge port and go into the intake manifold to be

sent to the combustion chamber.

When the engine coolant temperature is low or when the intake air quantity is small (when the engine is at idle, for example), the engine control unit turns the purge solenoid off to shut off the fuel vapour flow to the intake manifold.

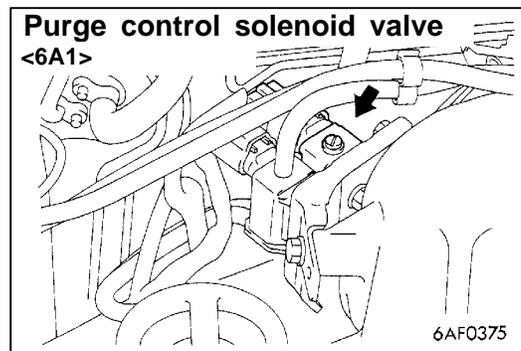
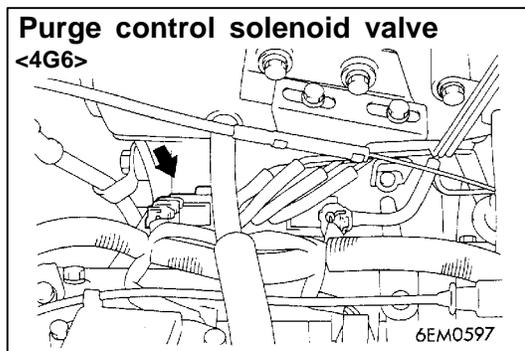
This does not only insure the driveability when the engine is cold or running under low load but also stabilize the emission level.

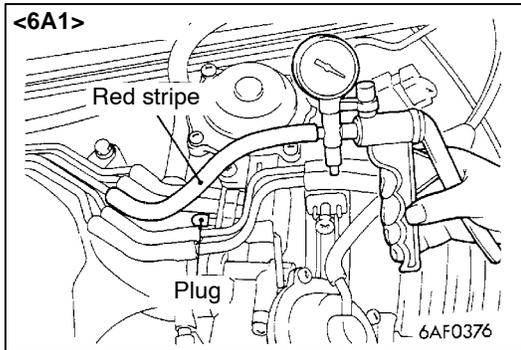
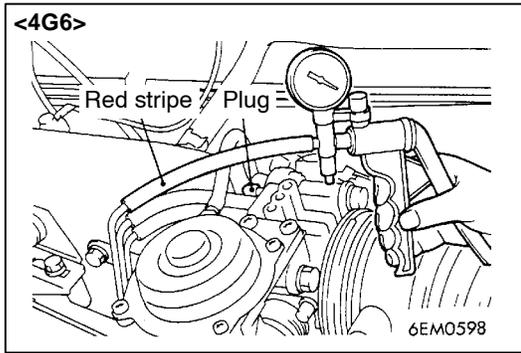
## SYSTEM DIAGRAM



6EM0596

## COMPONENT LOCATION





### PURGE CONTROL SYSTEM CHECK

17300140357

1. Disconnect the vacuum hose (red stripe) from the throttle body and connect it to a hand vacuum pump.
2. Plug the nipple from which the vacuum hose was removed.
3. When the engine is cold or hot, apply a vacuum while the engine is idling, and check the condition of the engine and the vacuum.

**When engine is cold**

**(Engine coolant temperature: 40°C or less)**

Vacuum	Engine condition	Normal condition
53 kPa	3,000 r/min	Vacuum is maintained

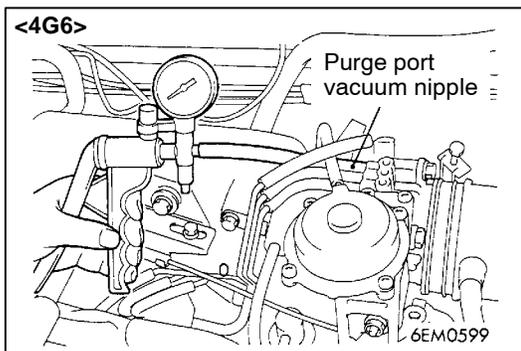
**When engine is hot**

**(Engine coolant temperature: 80°C or higher)**

Vacuum	Engine condition	Normal condition
53 kPa	At idle	Vacuum is maintained
	3,000 r/min	Vacuum will leak for approximately 3 minutes after the engine is started. After 3 minutes have passed, the vacuum will be maintained momentarily, after which it will again leak.*

**NOTE**

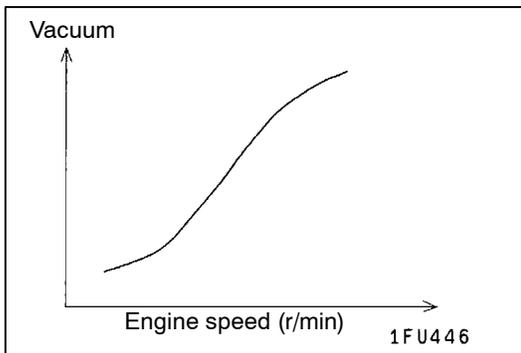
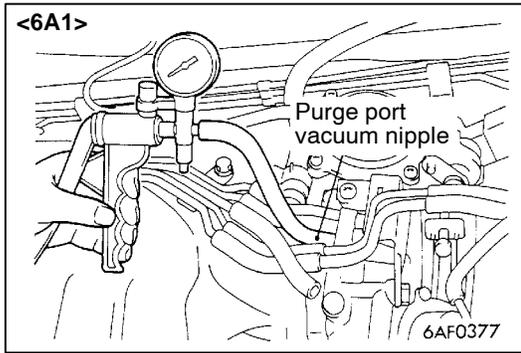
\*: The vacuum will leak continuously if the atmospheric pressure is approximately 77 kPa or less, or the temperature of the intake air is approximately 50°C or higher.



### PURGE PORT VACUUM CHECK

17300150282

1. Disconnect the vacuum hose (red stripe) from the throttle body purge vacuum nipple and connect a hand vacuum pump to the nipple.



2. Start the engine and check that, after raising the engine speed by racing the engine, purge vacuum raises according to engine speed.

**NOTE**

If there is a problem with the change in vacuum, the throttle body purge port may be clogged and require cleaning.

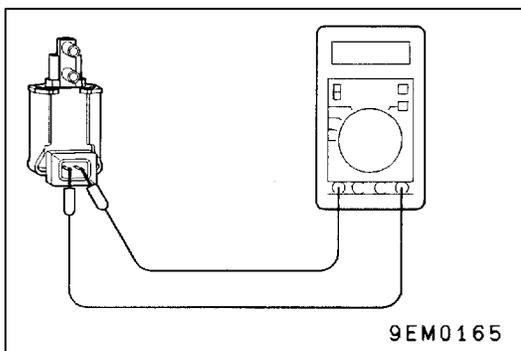
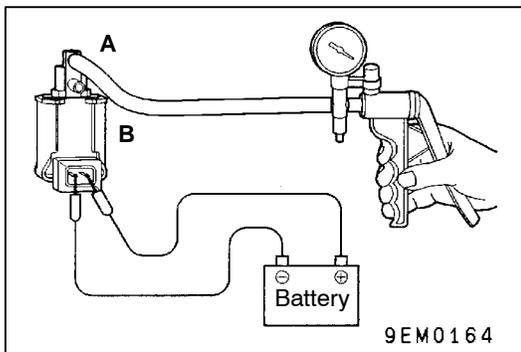
## PURGE CONTROL SOLENOID VALVE CHECK

17300170127

**NOTE**

When disconnecting the vacuum hose, always make a mark so that it can be reconnected at original position.

1. Disconnect the vacuum hose (black stripe, red stripe) from the solenoid valve.
2. Disconnect the harness connector.
3. Connect a hand vacuum pump to nipple (A) of the solenoid valve (refer to the illustration at left).
4. Check airtightness by applying a vacuum with voltage applied directly from the battery to the purge control solenoid valve and without applying voltage.



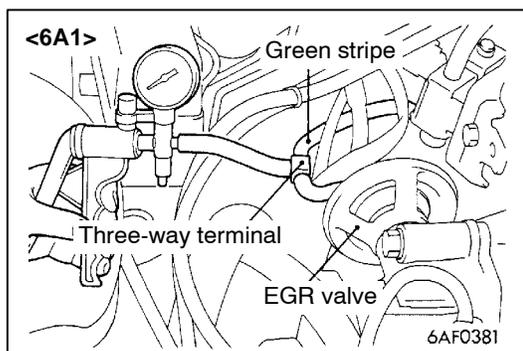
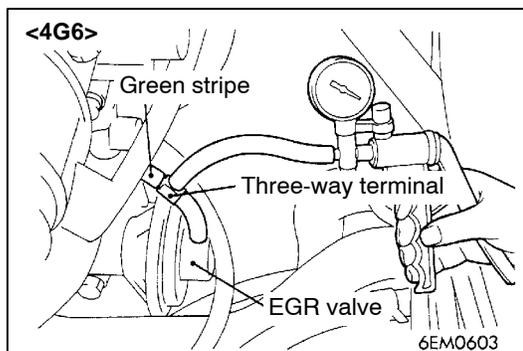
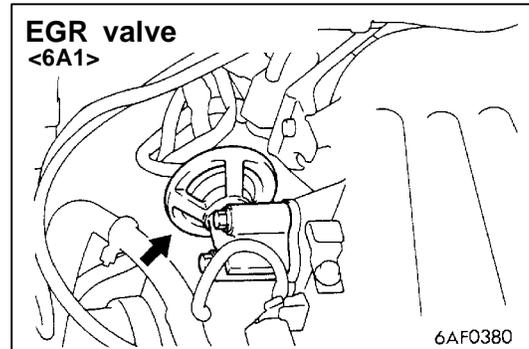
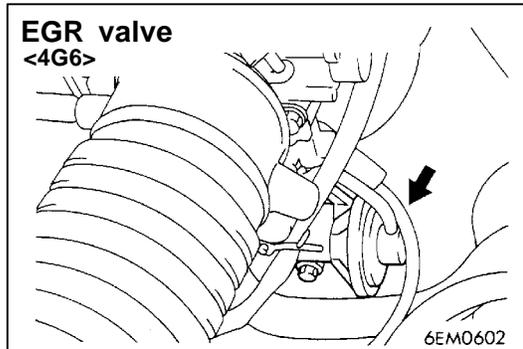
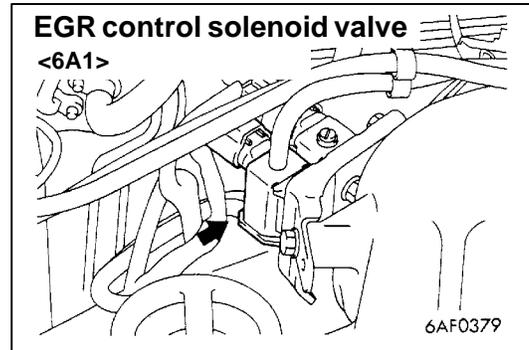
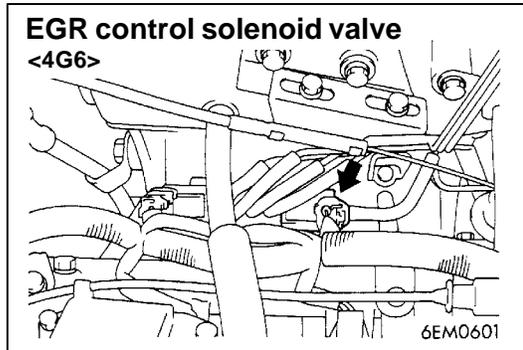
Battery voltage	Normal condition
Applied	Vacuum leaks
Not applied	Vacuum maintained

5. Measure the resistance between the terminals of the solenoid valve.

**Standard value: 36-44  $\Omega$  (at 20°C)**



## COMPONENT LOCATION

**EXHAUST GAS RECIRCULATION (EGR) CONTROL SYSTEM CHECK**

17300260282

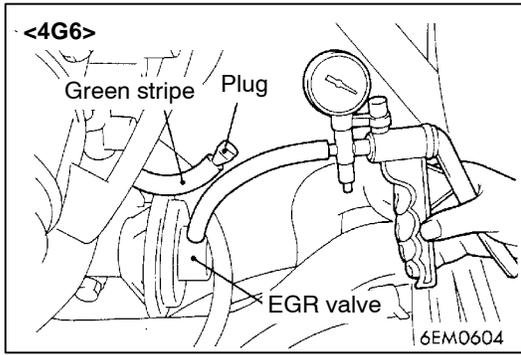
1. Disconnect the vacuum hose (green stripe) from the EGR valve, and then connect a hand vacuum pump via the three-way terminal.
2. When the engine is hot or cold, check the condition of vacuum by racing the engine.

**When engine is cold****(Engine coolant temperature: 20°C or less)**

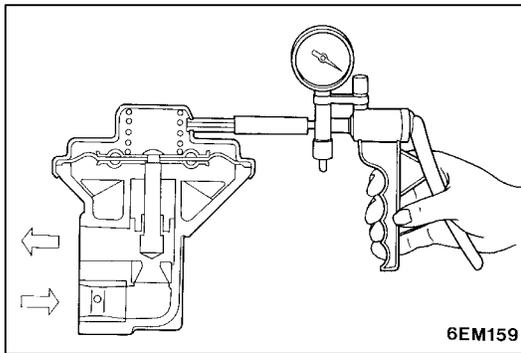
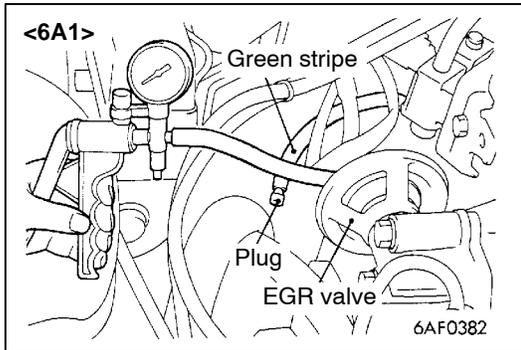
Throttle valve	Normal vacuum condition
Open quickly	No vacuum will generate (the same as barometric pressure.)

**When engine is hot****(Engine coolant temperature: 80°C or higher)**

Throttle valve	Normal vacuum condition
Open quickly	It will momentarily rise over 13 kPa



3. Disconnect the three-way terminal.
4. Connect the hand vacuum pump to the EGR valve.
5. Check whether the engine stalls or the idling is unstable when a vacuum of 30 kPa or higher is applied during idling.



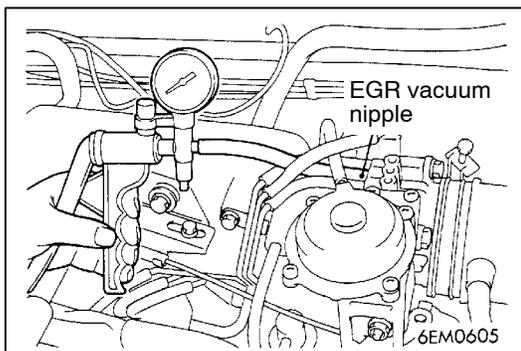
### EGR VALVE CHECK

17300280196

1. Remove the EGR valve and inspect for sticking, carbon deposits, etc. If found, clean with a suitable solvent so that the valve seats correctly.
2. Connect a hand vacuum pump to the EGR valve.
3. Apply 67 kPa of vacuum, and check that the vacuum is maintained.
4. Apply a vacuum and check the passage of air by blowing through one side of the EGR passage.

Vacuum	Passage of air
3.3 kPa or less	Air is not blown out
28 kPa or more	Air is blown out

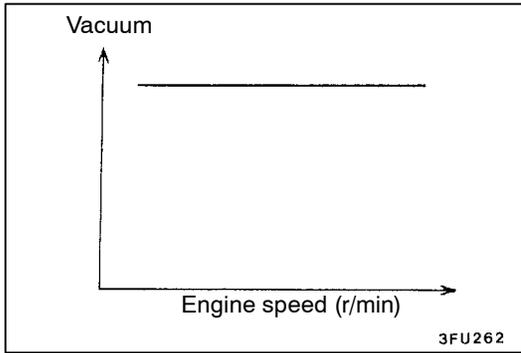
5. Replace the gasket, and tighten to the specified torque.  
**Specified torque: 22 Nm**



### EGR PORT VACUUM CHECK <4G6>

17300290199

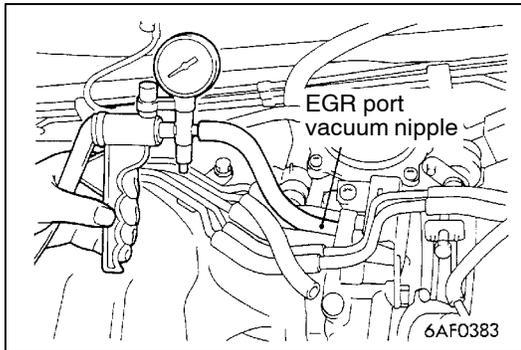
1. Disconnect the vacuum hose (white stripe) from the throttle body EGR vacuum nipple and connect a hand vacuum pump to the nipple.



2. Start the engine and check that the vacuum remains fairly constant after racing the engine.

NOTE

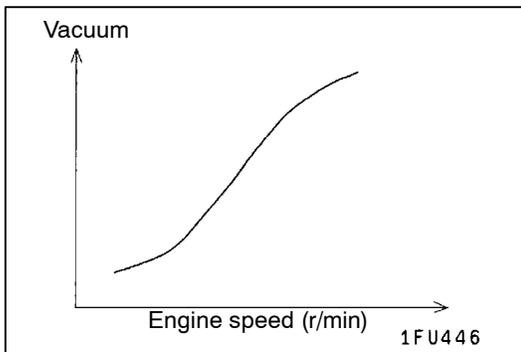
If vacuum changes, it is possible that the throttle body EGR port may be clogged and require cleaning.



**EGR PORT VACUUM CHECK <6A1>**

17300290205

1. Disconnect the vacuum hose (green stripe) from the throttle body EGR vacuum nipple and connect a hand vacuum pump to the nipple.



2. Start the engine and check to see that, after raising the engine speed by racing the engine, EGR vacuum raises proportionately with the rise in engine speed.

NOTE

If there is a problem with the change in vacuum, it is possible that the throttle body EGR port may be clogged and require cleaning.

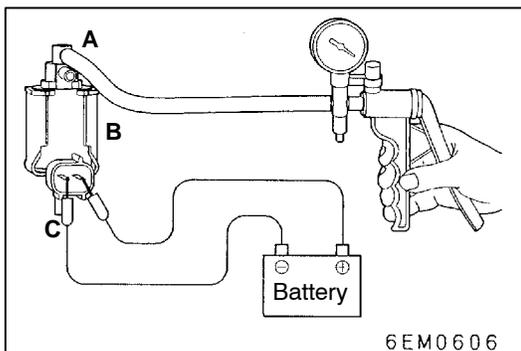
**EGR CONTROL SOLENOID VALVE CHECK <4G6>**

17300310222

NOTE

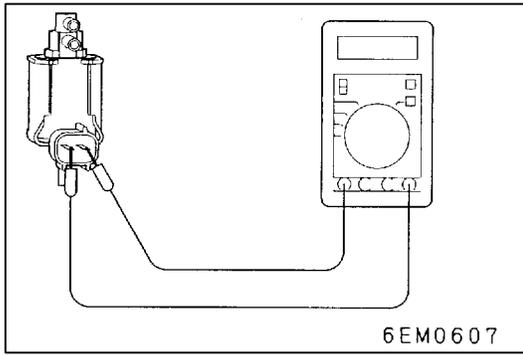
When disconnecting the vacuum hose, always make a mark so that it can be reconnected at original position.

1. Disconnect the vacuum hose (yellow stripe, white stripe, green stripe) from the solenoid valve.
2. Disconnect the harness connector.



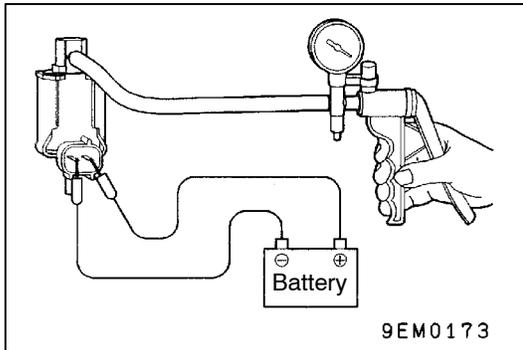
3. Connect a hand vacuum pump to the nipple to which the white-striped vacuum hose was connected.
4. Check airtightness by applying a vacuum with voltage applied directly from the battery to the EGR control solenoid valve and without applying voltage.

Battery voltage	B nipple condition	Normal condition
Not applied	Open	Vacuum maintained
Applied	Open	Vacuum leaks
	Closed	Vacuum maintained



5. Measure the resistance between the terminals of the solenoid valve.

**Standard value: 36 - 44 Ω (at 20°C)**



### EGR CONTROL SOLENOID VALVE CHECK <6A1>

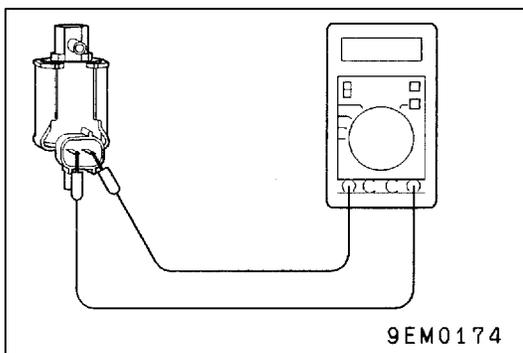
17300310239

#### NOTE

When disconnecting the vacuum hose, always make a mark so that it can be reconnected at original position.

1. Disconnect the vacuum hose (yellow stripe, green stripe) from the solenoid valve.
2. Disconnect the harness connector.
3. Connect a hand vacuum pump to the nipple to which the green-striped vacuum hose was connected.
4. Check airtightness by applying a vacuum with voltage applied directly from the battery to the EGR control solenoid valve and without applying voltage.

Battery voltage	Normal condition
Not applied	Vacuum leaks
Applied	Vacuum maintained



5. Measure the resistance between the terminals of the solenoid valve.

**Standard value: 36 - 44 Ω (at 20°C)**

# CATALYTIC CONVERTER

17300530055

## GENERAL INFORMATION

The three-way catalytic converter, together with the closed loop air-fuel ratio control based on the oxygen sensor signal, oxidizes carbon monoxides (CO) and hydrocarbons (HC) and reduces nitrogen oxides (NOx).

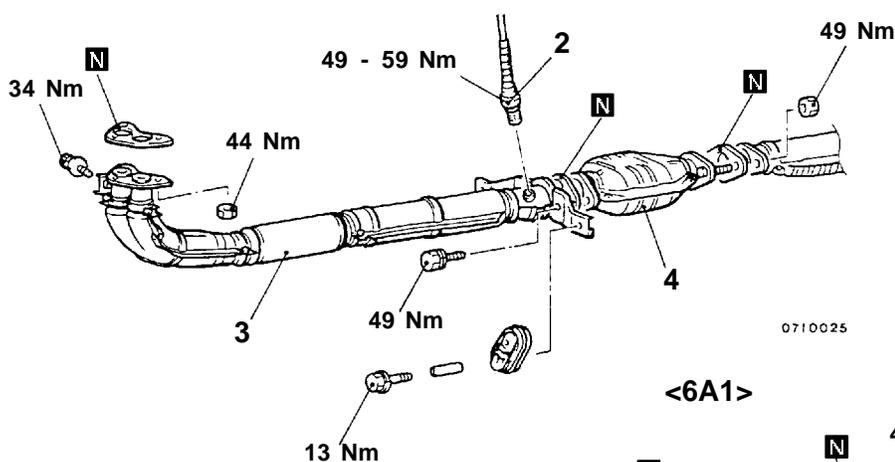
When the mixture is controlled at stoichiometric air-fuel ratio, the three-way catalytic converter provides the highest purification against the three constituents, namely, CO, HC and NOx.

## REMOVAL AND INSTALLATION

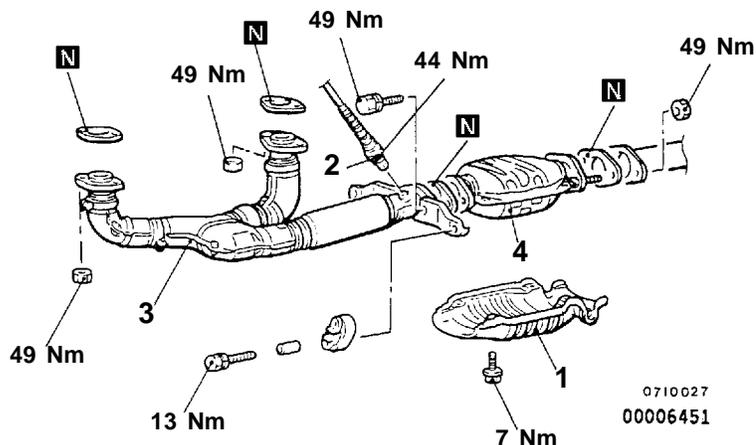
17300390233

**Pre-removal and Post-installation Operation**  
Under Cover Removal and Installation

&lt;4G6&gt;



&lt;6A1&gt;

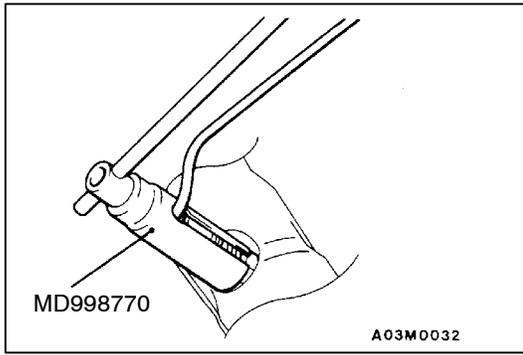


### Removal steps

1. Heat protector
2. Oxygen sensor

3. Front exhaust pipe
4. Catalytic converter





**REMOVAL SERVICE POINT**

◀A▶ OXYGEN SENSOR REMOVAL

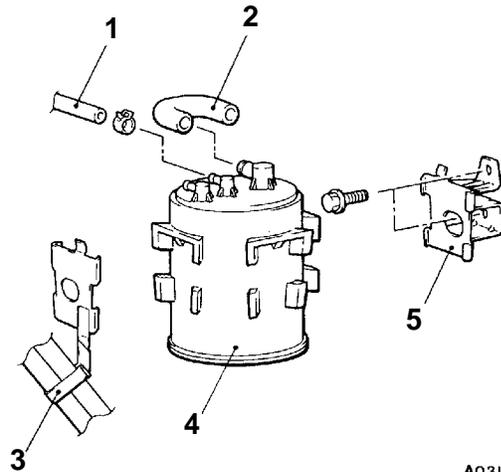
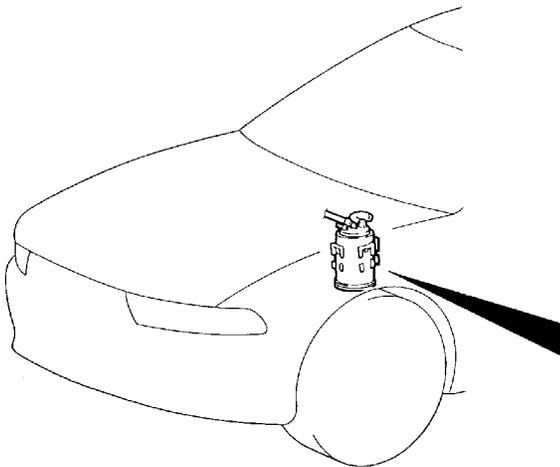
**INSTALLATION SERVICE POINT**

▶A◀ OXYGEN SENSOR INSTALLATION

**CANISTER**

17300420055

**REMOVAL AND INSTALLATION**



A0310064

**Removal steps**

1. Vapor hose connection
2. Vent hose
3. Hose clamp

4. Canister
5. Canister bracket

# EMISSION CONTROL SYSTEM <DIESEL>

17500010036

## GENERAL INFORMATION

Item	Name	Specification
Exhaust emission control system	Exhaust gas recirculation system <ul style="list-style-type: none"> <li>• EGR valve</li> <li>• EGR solenoid valve</li> </ul>	Equipped Single type Duty cycle type solenoid valve

## SERVICE SPECIFICATION

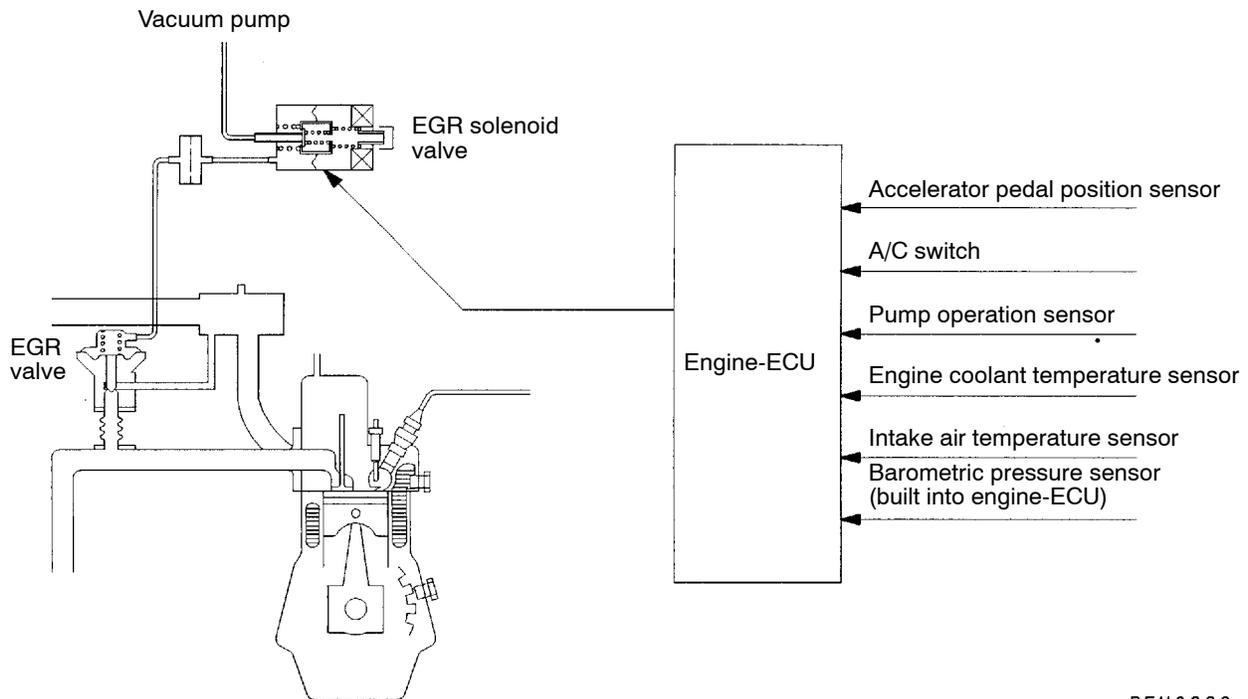
17500030032

Item	Specification
EGR solenoid valve coil resistance $\Omega$	11 - 14 (at 20°C)

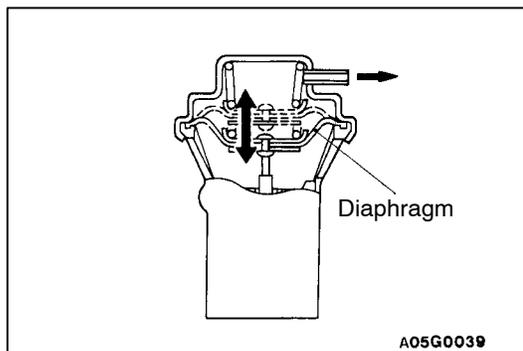
## EXHAUST GAS RECIRCULATION (EGR) SYSTEM

17500010030

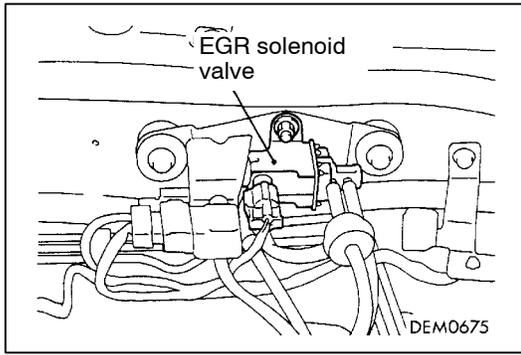
### SYSTEM CHECK



DFU0660



1. Start the engine and let it warm up until the engine coolant temperature is 80°C or above.
2. Check that the diaphragm of the EGR valve moves towards the EGR valve closing direction when the engine is raced by suddenly depressing the accelerator pedal.



## EGR SOLENOID VALVE CHECK

17500290027

### NOTE

When disconnecting the vacuum hose, always make a mark so that it can be reconnected at original position.

1. Disconnect the vacuum hose (yellow stripes green stripe) from the solenoid valve.
2. Disconnect the harness connector.
3. Connect a hand vacuum pump to the nipple to which the yellow-striped vacuum hose was connected.

4. Check that the needle reading rises by 47 kPa or more when negative pressure is applied.

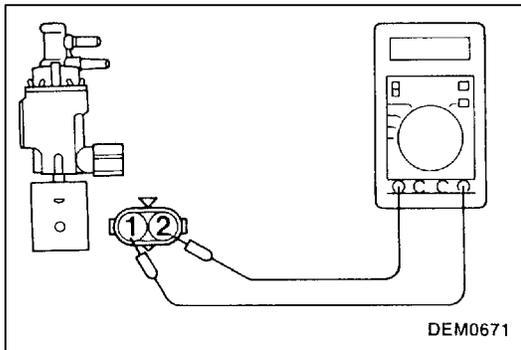
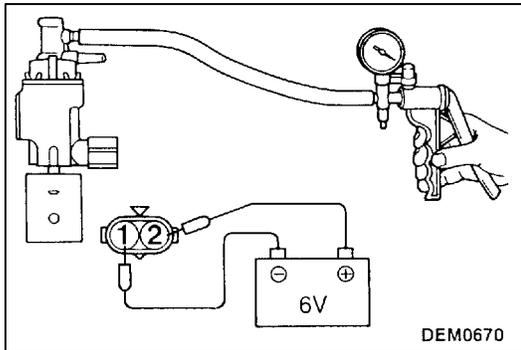
### NOTE

There is no problem if the needle reading rises by 47 kPa or more, even though there is a leak.

5. Apply a voltage of 6 V between the terminals, and check that the pressure leaks at this time even when negative pressure applied.

6. Measure the resistance between the terminals.

**Standard value: 11 - 14Ω (at 20°C)**



## ACCELERATOR PEDAL POSITION SENSOR CHECK

17500340012

Refer to GROUP 13E - Troubleshooting.

## PUMP OPERATION SENSOR CHECK

17500350015

Refer to GROUP 13E - Troubleshooting.

## ENGINE COOLANT TEMPERATURE SENSOR CHECK

17500150028

Refer to GROUP 13E - Troubleshooting.

**INTAKE AIR TEMPERATURE SENSOR CHECK**

17500360018

Refer to GROUP 13E - Troubleshooting.

**BAROMETRIC PRESSURE SENSOR CHECK**

17500370011

Refer to GROUP 13E - Troubleshooting.

**A/C SWITCH CHECK**

17500380014

Refer to GROUP 13E - Troubleshooting.

**CHECK AT THE ENGINE-ECU TERMINALS**

17500300010

Refer to GROUP 13E - Troubleshooting.

**CATALYTIC CONVERTER**

17500270021

**GENERAL INFORMATION**

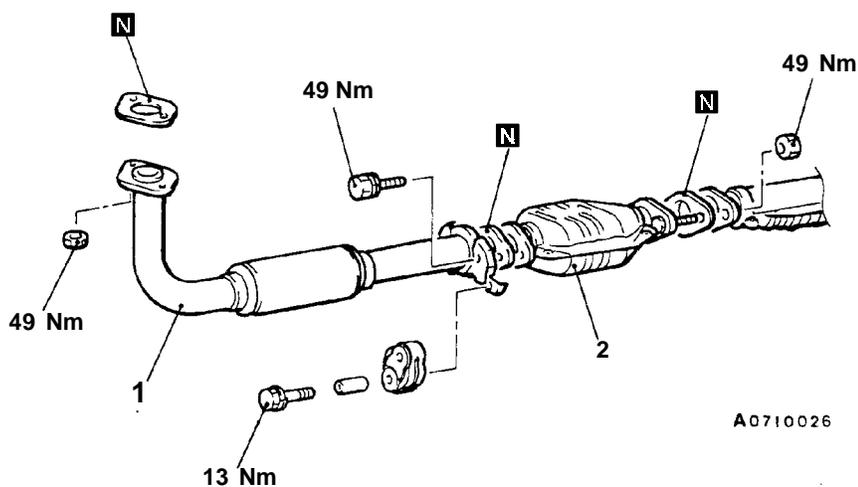
A monolith-type oxidation catalytic converter is located between the front exhaust pipe and the center exhaust pipe. This catalytic converter

reduces the amounts of carbon monoxide (CO) and hydrocarbons (HC) in the exhaust gas.

**REMOVAL AND INSTALLATION**

17500210030

**Pre-removal and Post-installation Operation**  
Under Cover Removal and Installation

**Removal steps**

1. Front exhaust pipe
2. Catalytic converter

---

## NOTES