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# EMISSION CONTROL

## CONTENTS

|  |          |   |    |
|--|----------|---|----|
| <b>GENERAL</b> .....   | <b>2</b> | Cautions on Inspection .....  | 6  |
| Outline of Changes .....   | 2        | Crankcase Emission Control System<br><6G72-SOHC 24 Valve Engine,<br>6G74-SOHC 24 Valve Engine> .....      | 7  |
| <b>SPECIFICATIONS</b> .....  | <b>2</b> | Evaporative Emission Control System<br><6G72-SOHC 24 Valve Engine,<br>6G74-SOHC 24 Valve Engine> .....    | 8  |
| Service Specifications .....   | 2        | Exhaust Emission Control System .....   | 10 |
| <b>SERVICE ADJUSTMENT PROCEDURES</b> .....   | <b>3</b> | Exhaust Gas Recirculation (EGR) System<br><6G72-SOHC 24 Valve Engine,<br>6G74-SOHC 24 Valve Engine> ..... | 11 |
| Component Layout <6G72-SOHC 24 Valve<br>Engine, 6G74-SOHC 24 Valve Engine> .....   | 3        | Exhaust Gas Recirculation (EGR) System<br><4G56 Engine> .....   | 14 |
| Vacuum Hose Piping Diagram<br><6G74-SOHC 24 Valve Engine> .....                    | 5        |   |    |
| Vacuum Hose Layout <6G72-SOHC 24 Valve<br>Engine, 6G74-SOHC 24 Valve Engine> ..... | 6        |   |    |

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# EMISSION CONTROL

## GENERAL

### OUTLINE OF CHANGES

- A 6G74-SOHC 24-valve engine has been added. To correspond to this, the maintenance service procedures are given below.
- The specifications for 6G72-SOHC 24-valve engine has been changed. To correspond to this, the maintenance service procedures are given below.
- The lever position sensor (LPS) for 4D56 engine (some models) has been changed. To correspond to this, the maintenance service procedures which are different from the previous type of emission control system are given below.

## SPECIFICATIONS

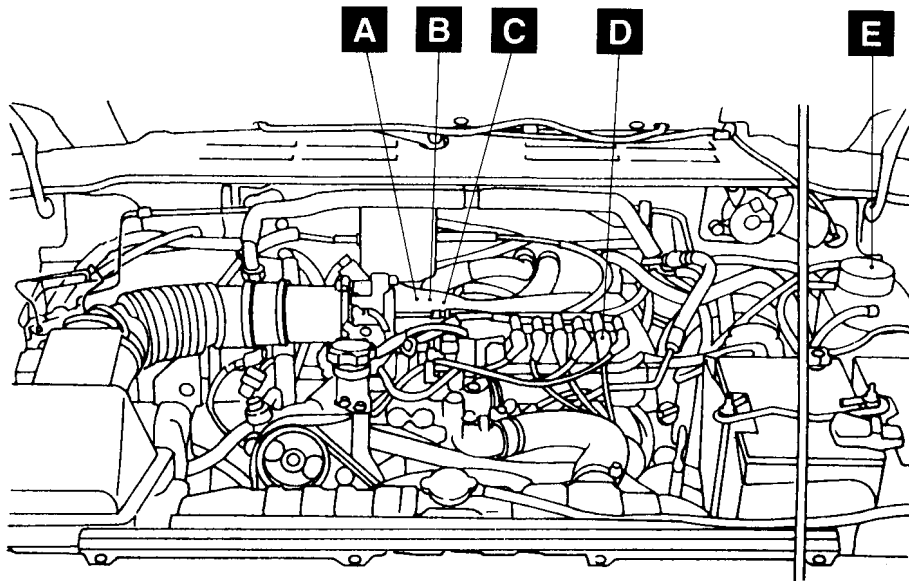
### SERVICE SPECIFICATIONS

| Item  | Standard value |
|---|----------------|
| <6G72-SOHC 24 Valve, 6G74-SOHC 24 Valve><br>Purge control solenoid valve coil resistance<br>[at 20°C] Ω | 21 – 27        |
| EGR solenoid valve coil resistance<br>[at 20°C] Ω   | 28 – 36        |
| <4D56><br>Lever position sensor output voltage V  |                |
| Idle position   | 0.8 – 1.0      |
| Fully open  | 3.7 – 5.0      |

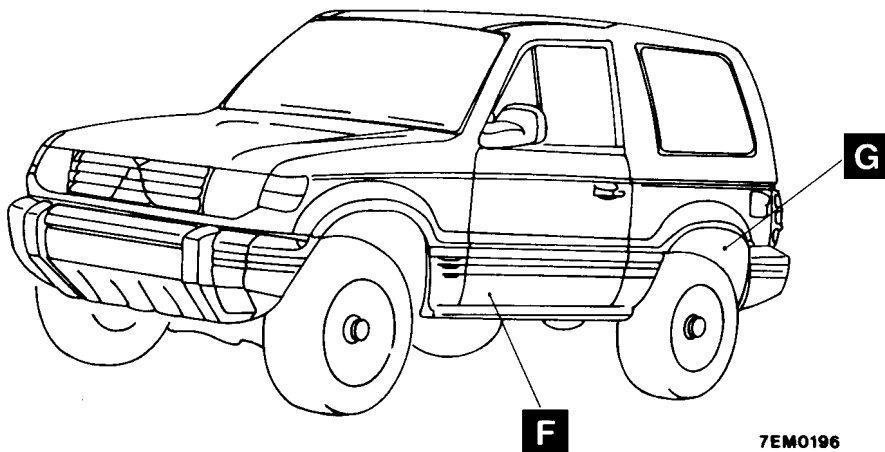
# SERVICE ADJUSTMENT PROCEDURES

## COMPONENT LAYOUT

<6G72-SOHC 24 Valve Engine, 6G74-SOHC 24 Valve Engine>

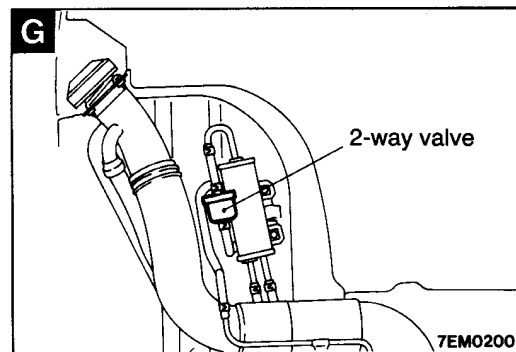
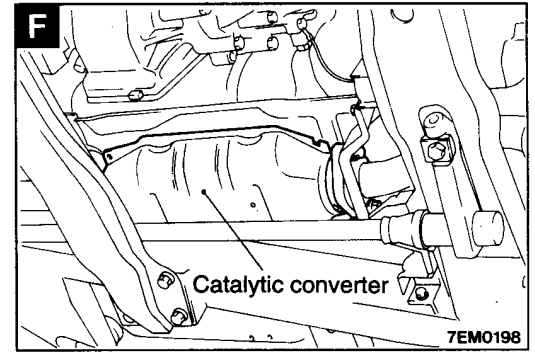
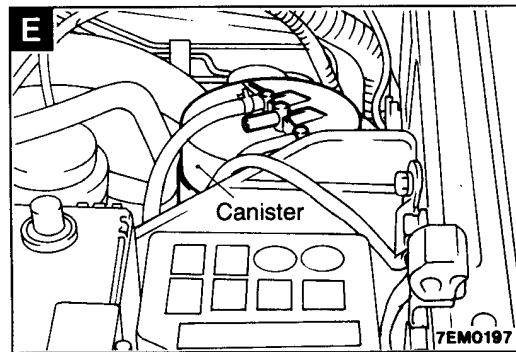
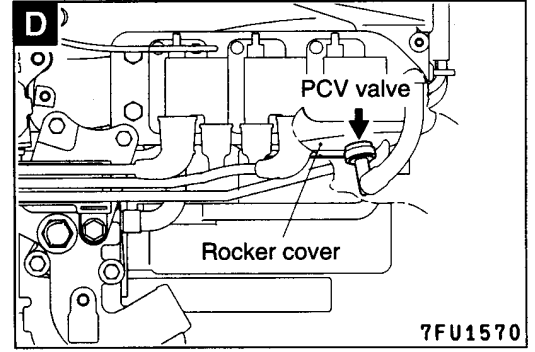
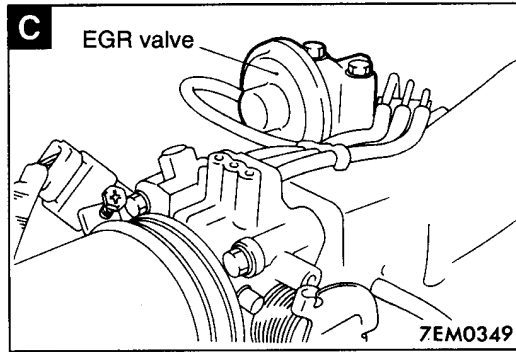
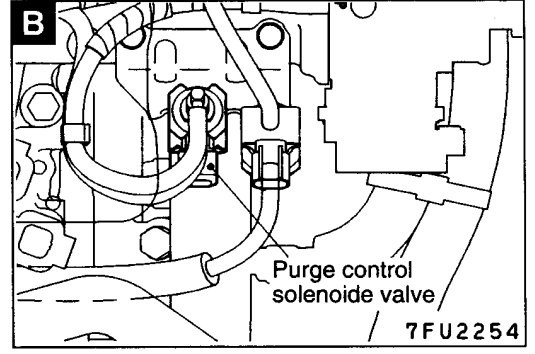
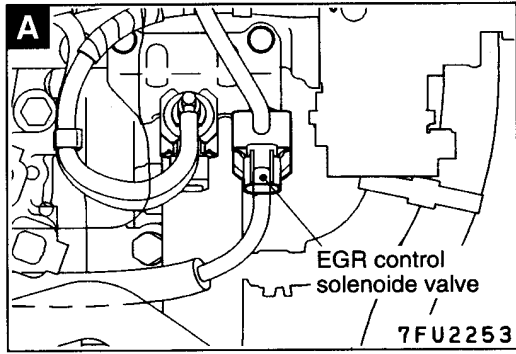


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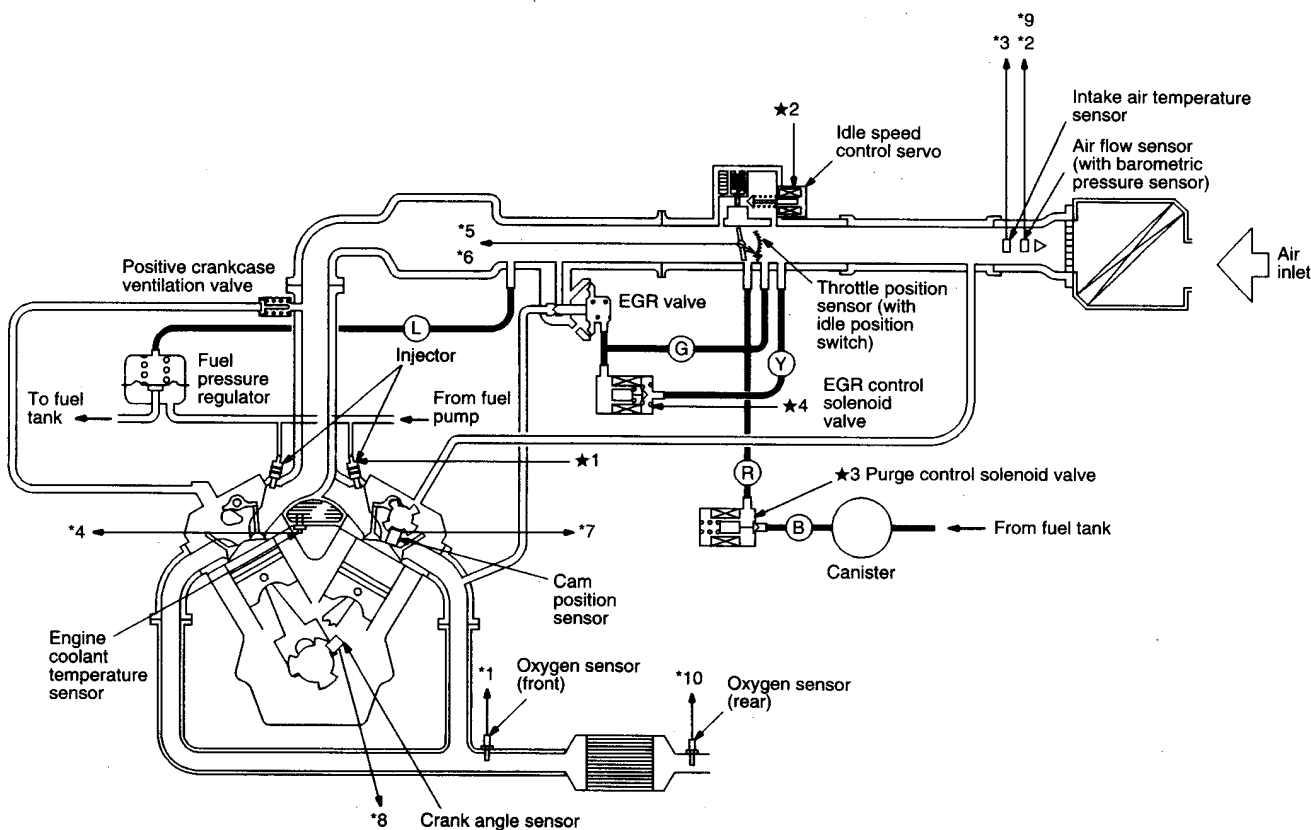
| Parts name                   | Symbol |
|------------------------------|--------|
| Canister                     | E      |
| Catalytic converter          | F      |
| EGR valve                    | C      |
| PCV valve                    | D      |
| Purge control solenoid valve | B      |
| EGR control solenoid valve   | A      |
| 2-way valve                  | G      |



VACUUM HOSE PIPING DIAGRAM

<6G74-SOHC 24 Valve Engine>

|  |   |                                |   |
|--|---|--------------------------------|---|
| <ul style="list-style-type: none"> <li>*1 Oxygen sensor (front)</li> <li>*2 Air flow sensor</li> <li>*3 Intake air temperature sensor</li> <li>*4 Engine coolant temperature sensor</li> <li>*5 Throttle position sensor</li> <li>*6 Idle position switch</li> <li>*7 Cam position sensor</li> <li>*8 Crank angle sensor</li> <li>*9 Barometric pressure sensor</li> <li>*10 Oxygen sensor (rear)</li> </ul> | <ul style="list-style-type: none"> <li>● Ignition switch-ST</li> <li>● Ignition switch-IG1</li> <li>● Power supply</li> <li>● Vehicles speed sensor</li> <li>● Air conditioner switch</li> <li>● Power steering fluid pressure switch</li> <li>● Inhibitor switch</li> <li>● Detonation sensor</li> </ul> | <p>⇒ Engine control unit ⇒</p> | <ul style="list-style-type: none"> <li>★1 Injector</li> <li>★2 Idle speed control motor</li> <li>★3 Purge control solenoid valve</li> <li>★4 EGR control solenoid valve</li> <li>● Fuel pump relay</li> <li>● Control relay</li> <li>● Air conditioner power relay</li> <li>● Ignition coil, Power transistor</li> <li>● Diagnosis signal</li> <li>● Engine warning lamp</li> </ul> |
|--|---|--------------------------------|---|

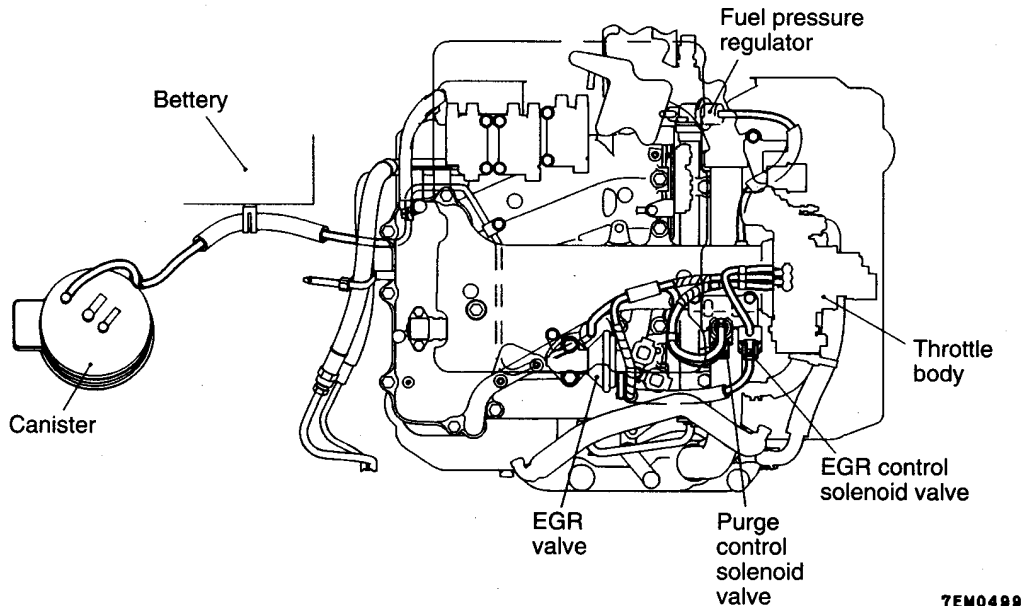


7FU2255

Vacuum hose color  
 B: Black  
 G: Green  
 L: Light blue  
 R: Red  
 Y: Yellow

## VACUUM HOSE LAYOUT

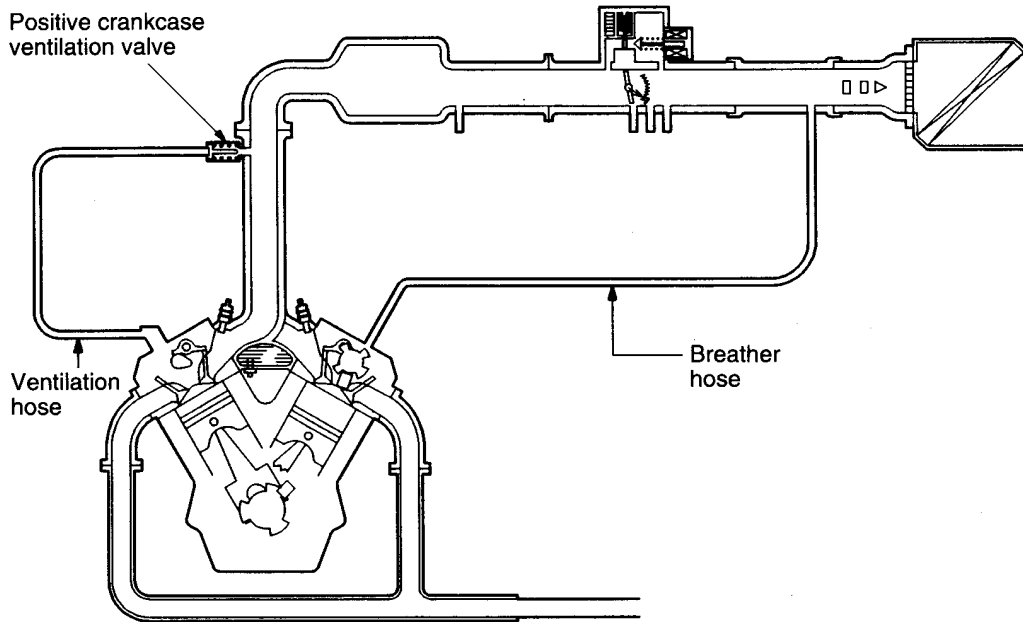
&lt;6G72-SOHC 24 Valve Engine, 6G74-SOHC 24 Valve Engine&gt;

**CAUTIONS ON INSPECTION**

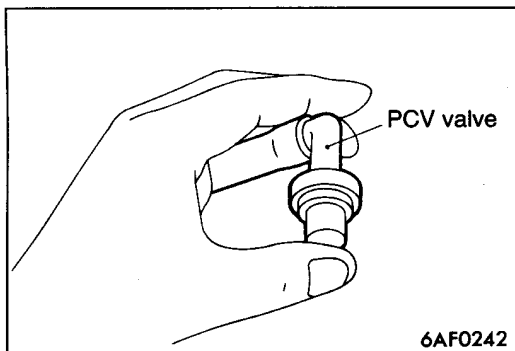
1. Inspect the various devices only after completing engine adjustment.
2. Inspect the hoses to make sure there are no disconnections, connection errors or damage.
3. Make sure there is no hose, pipe or port clogging, or cracks or damage in the hoses and pipes.
4. When replacing device hoses, always mount the replacement hose in the same position (direction) as the original.
5. When finished, check the connections as described in the service manual or service label.

**CRANKCASE EMISSION CONTROL SYSTEM**

&lt;6G72-SOHC 24 Valve Engine, 6G74-SOHC 24 Valve Engine&gt;



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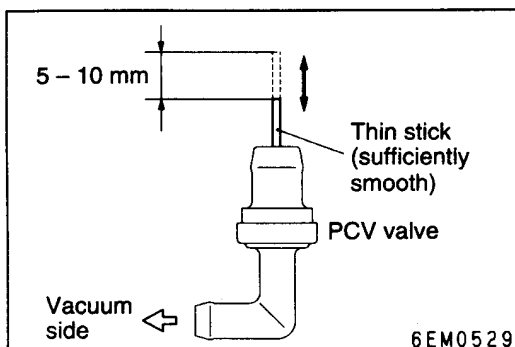
**CRANKCASE VENTILATION SYSTEM****System Inspection**

- (1) Remove the positive crankcase ventilation (PCV) valve from the rocker cover, then reconnect the PCV valve to the vacuum supply hose.
- (2) With the engine idling, put finger on the open end of the PCV valve, and check for negative pressure (vacuum) with finger.

**NOTE**

At this time, the plunger in the PCV valve should move back and forth as the open end is covered and uncovered.

- (3) If negative pressure is not felt, clean or replace the PCV valve. Inspect the vacuum supply hose and vacuum supply hose port for restriction or plugged condition.

**Positive Crankcase Ventilation (PCV) Valve Inspection**

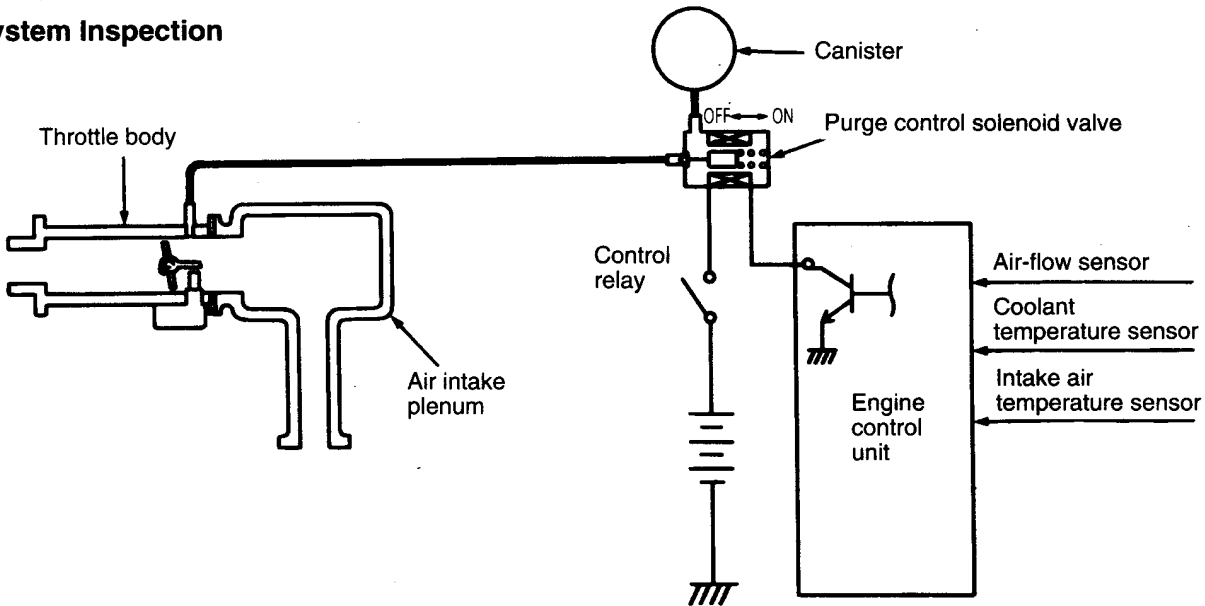
- (1) Hold the PCV valve vacuum side down. Using light pressure, depress the PCV valve spring with the thin stick 5 – 10 mm. Release pressure on the stick to see if the PCV valve spring will lift the stick to its original position.
- (2) If the stick returns quickly to its original position, the PCV valve is OK. If the stick does not return quickly, clean or replace the PCV valve.

**EVAPORATIVE EMISSION CONTROL SYSTEM**

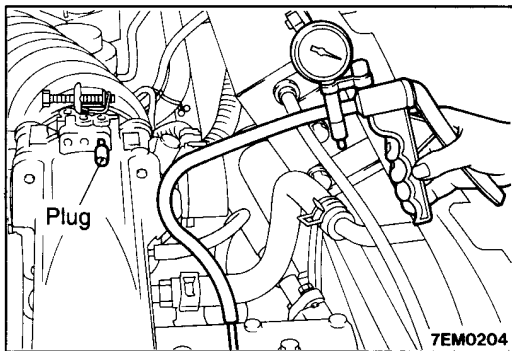
<6G72-SOHC 24 Valve Engine, 6G74-SOHC Engine>

**PURGE CONTROL SYSTEM**

**System Inspection**



6EM153



**INSPECTION**

- (1) Disconnect the vacuum hose (red stripes) from the throttle body and connect it to a hand vacuum pump.
- (2) Plug the nipple from which the vacuum hose was removed.
- (3) Check the following points when the engine is cold [coolant temperature at 40°C or below] and when it is warm [coolant temperature at 80°C or higher].

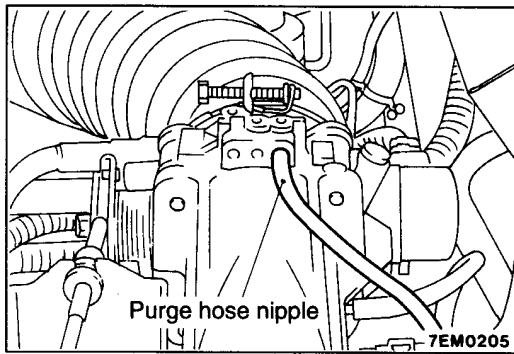
**When engine is cold**

| Engine operating condition | Applying vacuum | Result               |
|----------------------------|-----------------|----------------------|
| Idling                     | 53 kPa          | Vacuum is maintained |
| 3,000 r/min                |                 |                      |

**When engine is warm**

| Engine operating condition                                    | Applying vacuum     | Result  |
|---|---------------------|---|
| Idling  | 53 kPa              | Vacuum is maintained  |
| Within 3 minutes after engine start<br>3,000 r/min            | Try applying vacuum | Vacuum leaks  |
| After 3 minutes have passed after engine start<br>3,000 r/min | 53 kPa              | Vacuum will be maintained momentarily, after which it will leak.<br><b>NOTE</b><br>The vacuum will leak continuously if the altitude is 2,200 m or higher, or the intake air temperature is 50°C or higher. |



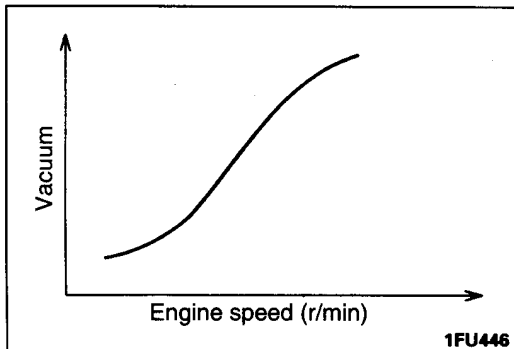


### Purge Port Vacuum Inspection

#### Check Condition

Engine coolant temperature: 80 – 95°C

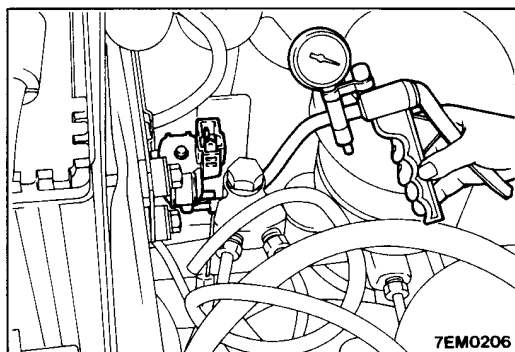
- (1) Disconnect the vacuum hose (red) from the throttle body purge hose nipple and connect a hand vacuum pump to the nipple.



Start the engine and check to see that, after raising the engine speed by racing the engine, 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 port may be clogged and require cleaning.



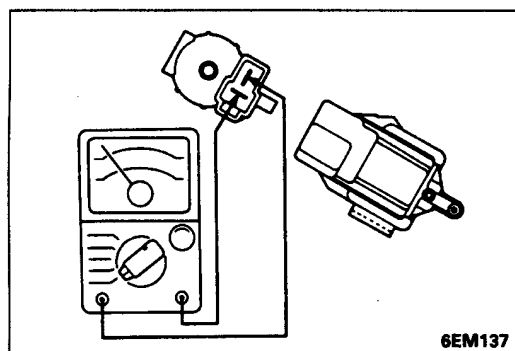
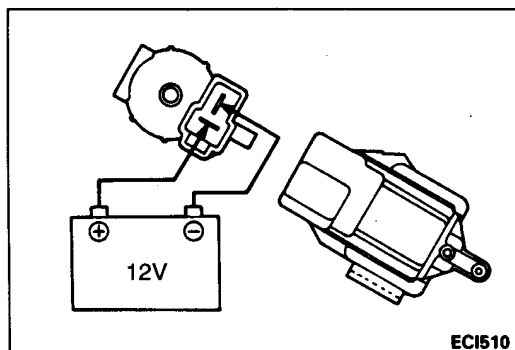
### Purge Control Solenoid Valve Inspection

#### NOTE

When disconnecting the vacuum hose, make an identification mark on it so that it can be reconnected to the original position.

- (1) Disconnect the vacuum hose (black with red stripe) from the solenoid valve.
- (2) Disconnect the harness connector.
- (3) Connect a hand vacuum pump to the nipple to which the red-striped vacuum hose was connected.
- (4) Apply a vacuum and check for air-tightness when voltage is applied directly to the purge-control solenoid valve and when the voltage is discontinued.

|                   |                      |
|-------------------|----------------------|
| Battery voltage   | Normal condition     |
| When applied      | Vacuum leaks         |
| When discontinued | Vacuum is maintained |



- (5) Measure the resistance between the terminals of the solenoid valve.

**Standard value: 21 – 27  $\Omega$  [at 20°C]**

## EXHAUST EMISSION CONTROL SYSTEM

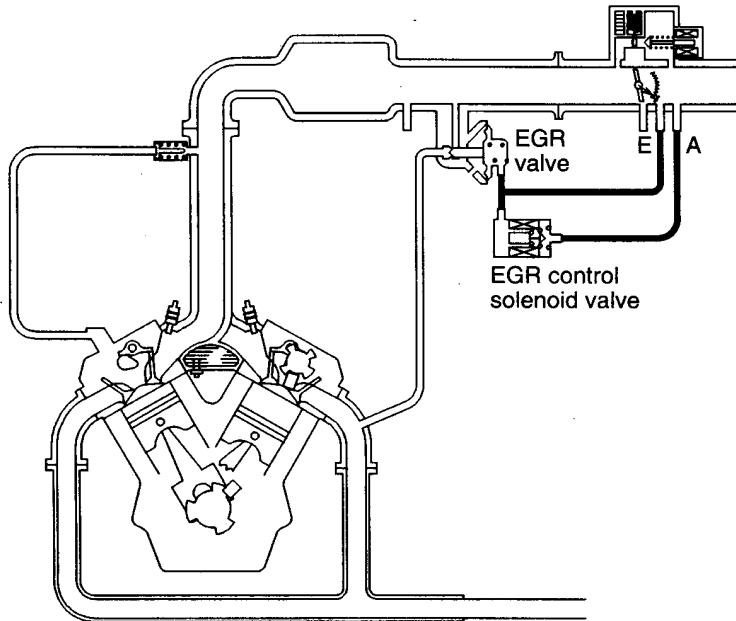
### AIR FUEL RATIO CONTROL SYSTEM

- To inspect the air-fuel ratio control system, refer to GROUP 13.
- For detailed information concerning the illumination pattern of the malfunction-indicator light and other aspects of the self-diagnosis function, refer to GROUP 13.

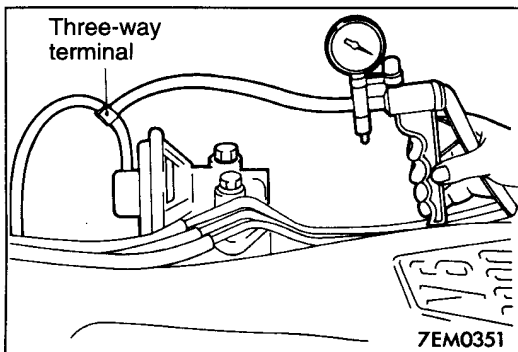
**EXHAUST GAS RECIRCULATION (EGR) SYSTEM**

<6G72-SOHC 24 Valve Engine, 6G74-SOHC 24 Valve Engine>

**System Inspection**



7EM0466



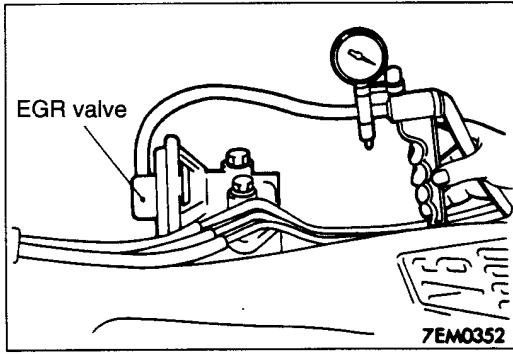
- (1) Disconnect the vacuum hose (green stripe) from the exhaust gas recirculation (EGR) valve, and then connect a hand vacuum pump via the three-way terminal.
- (2) Check the following points when the engine is cold [engine coolant temperature is 20°C or below] and when the engine is warm [engine coolant temperature is 80°C or higher].

**When engine is cold**

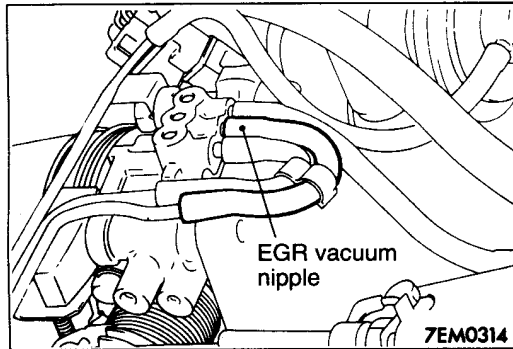
|   |  |
|---|--|
| Engine condition  | Normal condition                         |
| Press the accelerator pedal suddenly and race the engine. | Vacuum: no change (atmospheric pressure) |

**When engine is warm**

|   |                                    |
|---|------------------------------------|
| Engine condition  | Normal condition                   |
| Press the accelerator pedal suddenly and race the engine. | Vacuum rises temporarily to 13 kPa |



- (3) Disconnect the three-way terminal and connect the hand vacuum pump directly to the EGR valve.
- (4) Check whether or not the engine stalls or shows idling instability when a negative pressure (Vacuum) of 30 kPa or higher is applied during idling.

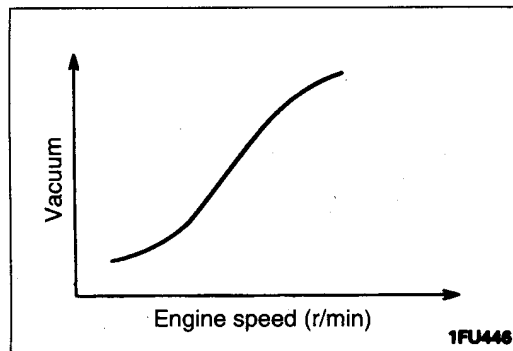


### EGR Valve Control Vacuum Inspection

#### Check Condition

Engine coolant temperature: 80 – 95°C

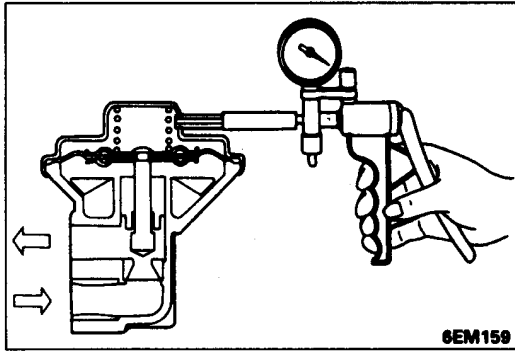
- (1) Disconnect the vacuum hose (green) from the throttle body EGR vacuum nipple and connect a hand vacuum pump to the nipple.



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

#### NOTE

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



**EGR Valve Inspection**

- (1) Remove the EGR valve and check if for sticking, deposit of carbon, etc.  
If such condition exists, clean with adequate solvent to ensure tight valve seat contact.
- (2) Connect a hand vacuum pump to the EGR valve.
- (3) Apply a vacuum of 67 kPa and check air tightness.
- (4) Blow in air from one passage of the EGR to check condition as follows:

| Applying vacuum | Result                    |
|-----------------|---------------------------|
| 40 kPa          | Air does not blow through |
| 31 kPa          | Air blows through         |

**INSTALLATION**

- (1) Install a new gasket and EGR valve, tighten bolts to specified torque.

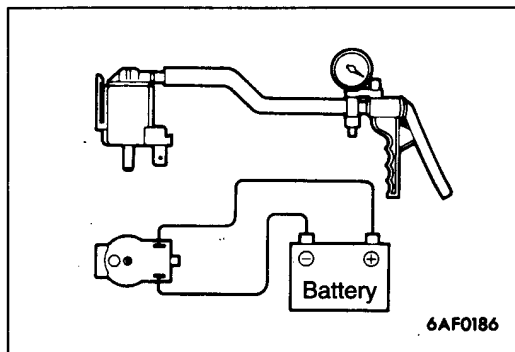
**Specified tightening torque: 22 Nm**

**EGR Control Solenoid Valve Inspection**

**NOTE**

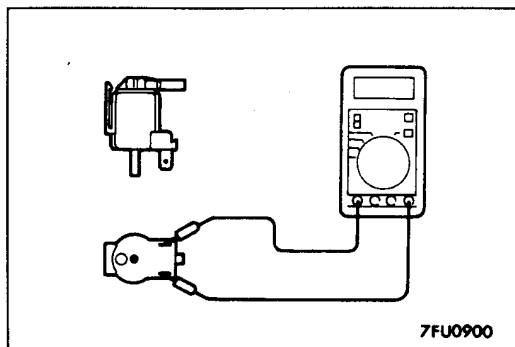
When disconnecting the vacuum hose, always make a mark so that it can be reconnected at original position.

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



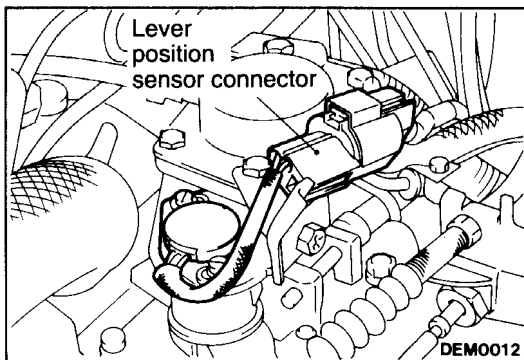
3. Connect a hand vacuum pump to the nipple to which the green-striped vacuum hose was connected.
4. Check airtightness by applying a vacuum with voltage applied directly from the battery to the EGR control solenoid valve and without applying voltage.

|                 |                   |
|-----------------|-------------------|
| Battery voltage | Normal condition  |
| Not applied     | Vacuum leaks      |
| Applied         | Vacuum maintained |



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

**Standard value: 28 – 36Ω (at 20°C)**



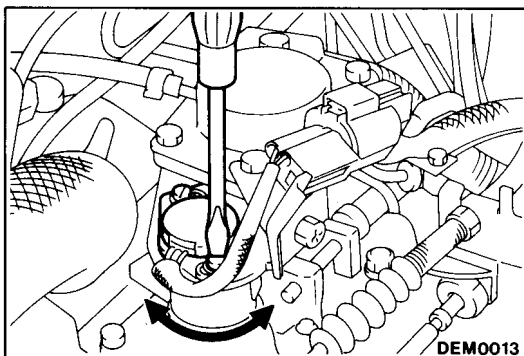
## EXHAUST GAS RECIRCULATION (EGR) SYSTEM

### <4D56 Engine>

#### LEVER POSITION SENSOR (LPS) ADJUSTMENT

##### [Condition before adjustment]

- Engine coolant temperature 80 – 95°C
- (1) Loosen the accelerator cable tension sufficiently
- (2) Connect the special tool to the lever position sensor connector shown in the figure. For 3-pin connector use MD998478, for 4-pin connector use MD998464.
- (3) Connect a digital-type voltmeter between the red clip (output) and blue clip (earth) of the connected special tool.



- (4) Turn the ignition switch to ON. (Do not start the engine.)
- (5) Measure the output voltage of the lever position sensor.

##### Standard value:

| Lever condition | Voltage V |
|-----------------|-----------|
| Idle position   | 0.8 – 1.0 |
| Fully open      | 3.7 – 5.0 |

- (6) If the voltage is outside the standard value, adjust by loosening the lever position sensor mounting screw and turning the lever position sensor body. After adjusting, securely tighten the screw.

##### NOTE

The output voltage will increase if the lever position sensor body is turned in an anti-clockwise direction.

- (7) Turn the ignition switch to "OFF".
- (8) Adjust the accelerator cable play.