



HYUNDAI

Elantra

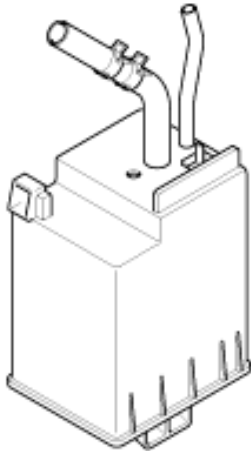


*Workshop Manual*  
*2001 - 2006*

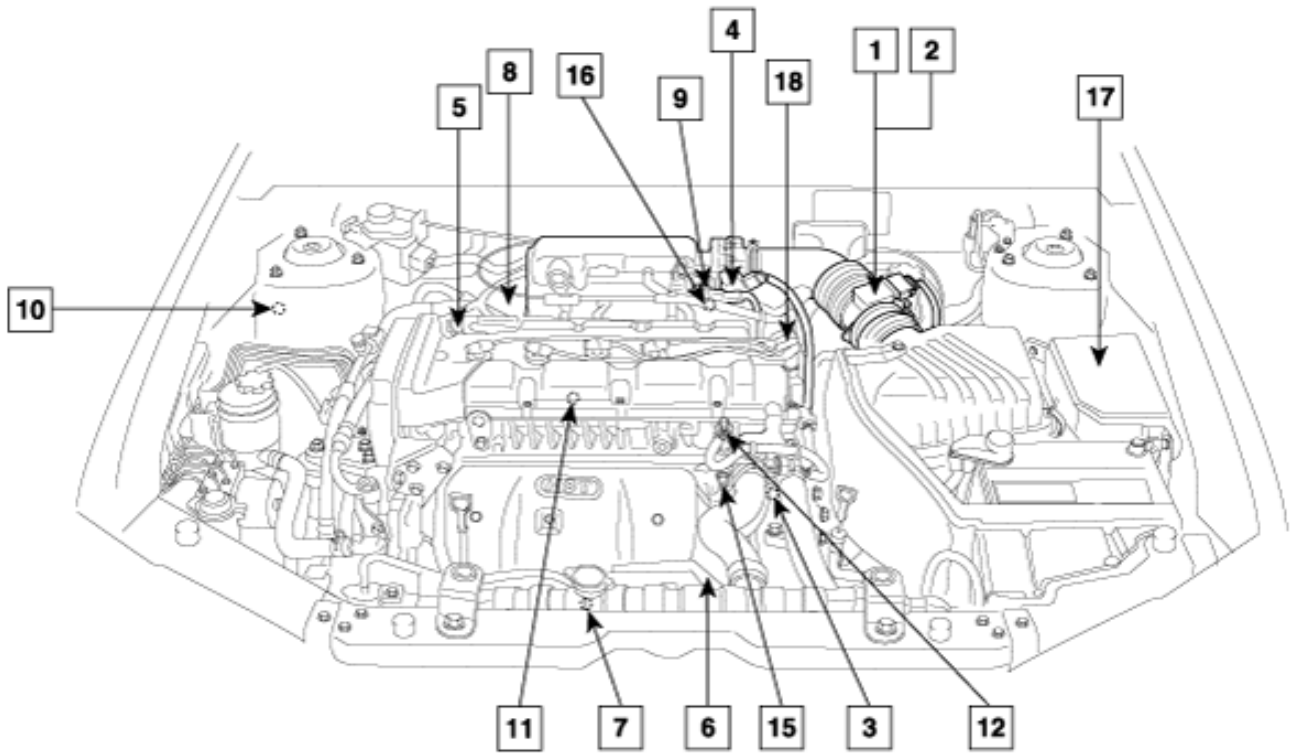


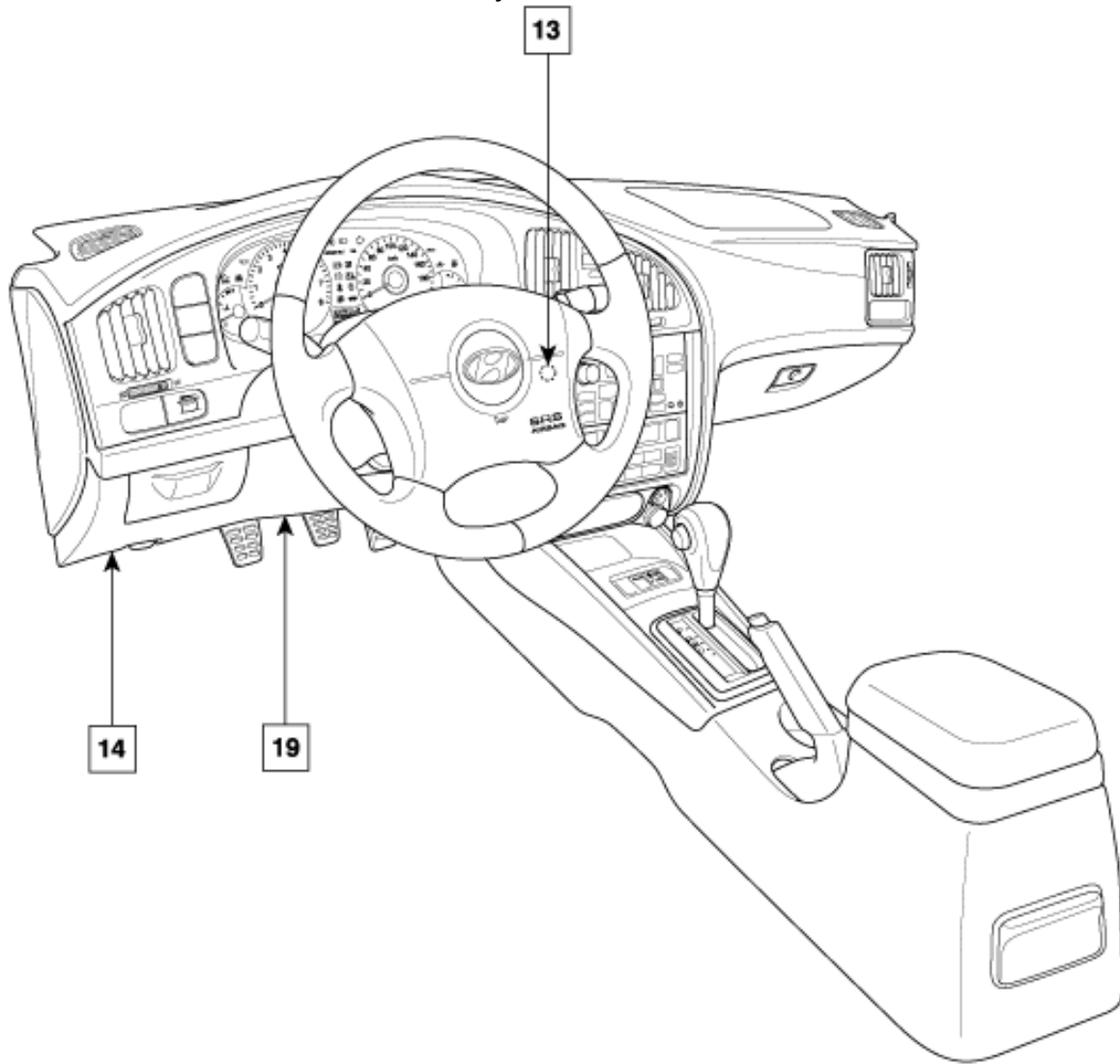
## INSPECTION

1. Look for loose connections, sharp bends or damage to the fuel vapor lines.
2. Look for distortion, cracks or fuel leakage.
3. After removing the EVAP canister, inspect for cracks or damage.



# COMPONENTS





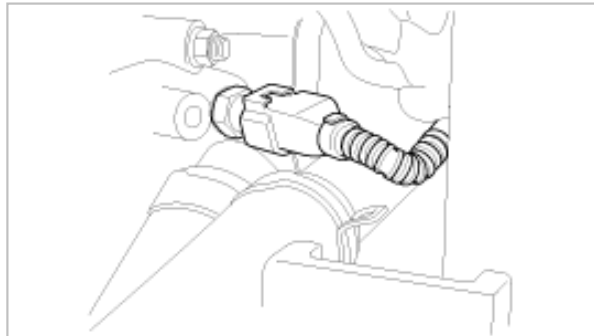
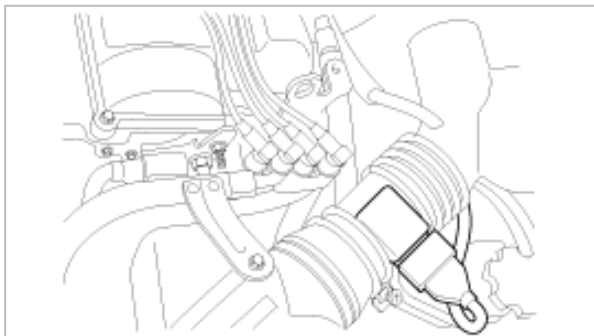
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|--|---|
| <b>1</b> Mass Air Flow (MAF) Sensor        | <b>11</b> Knock Sensor                        |
| <b>2</b> Intake Air Temp. (IAT) Sensor     | <b>12</b> Oil Control Valve (OCV)             |
| <b>3</b> Engine Coolant Temp. (ECT) Sensor | <b>13</b> Ignition Switch                     |
| <b>4</b> Throttle Position Sensor (TPS)    | <b>14</b> ECM                                 |
| <b>5</b> Camshaft Position (CMP) Sensor    | <b>15</b> Oil Temp. Sensor (OTS)              |
| <b>6</b> Crankshaft Position (CKP) Sensor  | <b>16</b> Purge Control Solenoid Valve (PCSV) |
| <b>7</b> Heated Oxygen Sensor              | <b>17</b> Control Relay                       |
| <b>8</b> Injector                          | <b>18</b> Ignition Coil                       |
| <b>9</b> Idle Speed Actuator (ISA)         | <b>19</b> Data Link Connector (DLC)           |
| <b>10</b> Vehicle Speed Sensor (VSS)       | <b>20</b> Inhibitor Switch                    |

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Ebay User ID: reveleus1

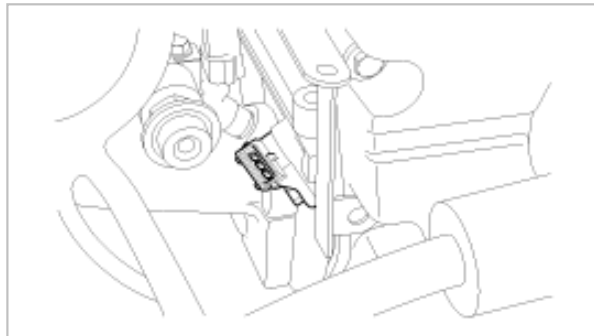
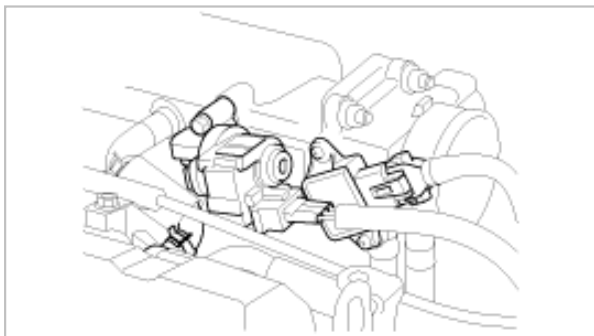
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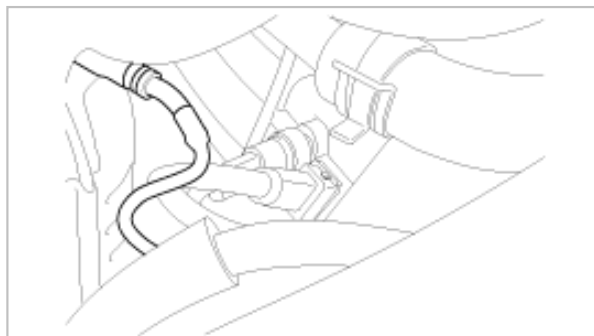
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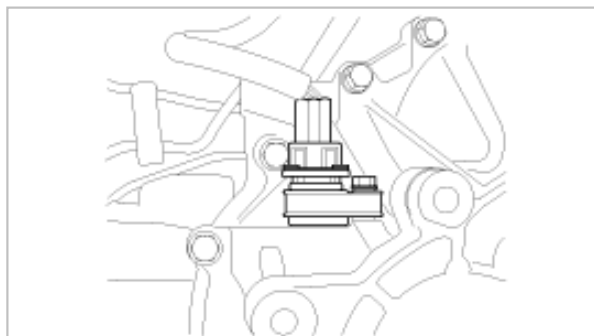
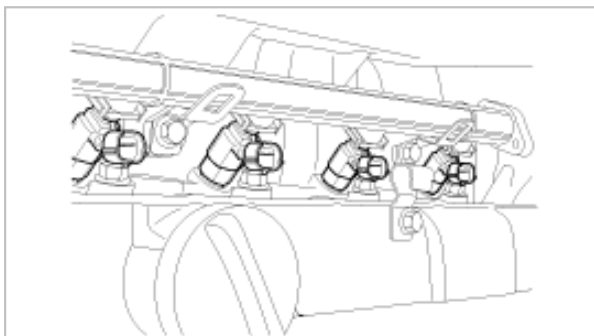
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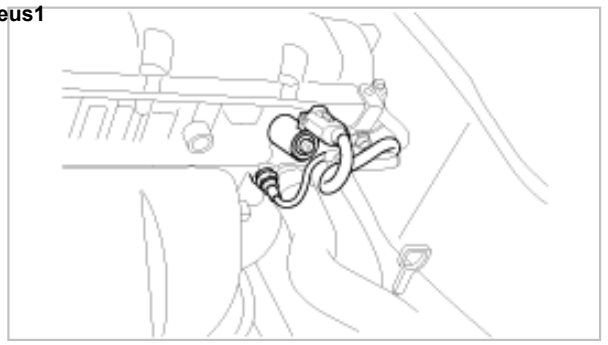
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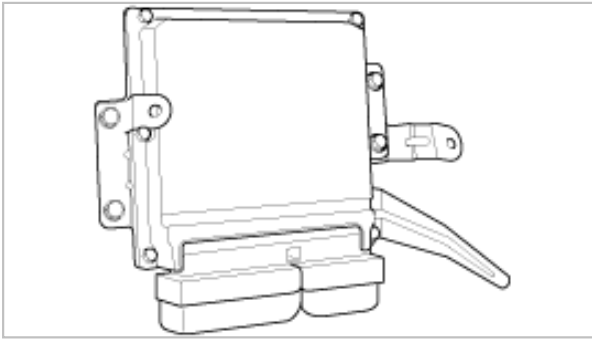
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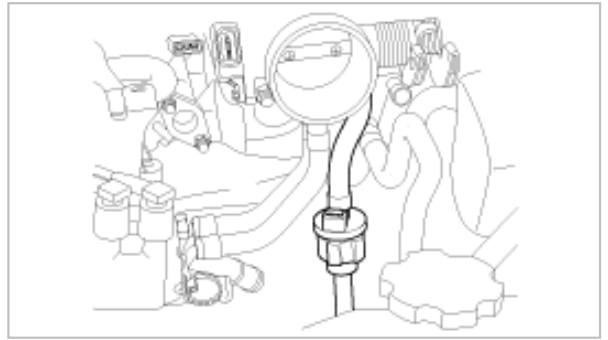
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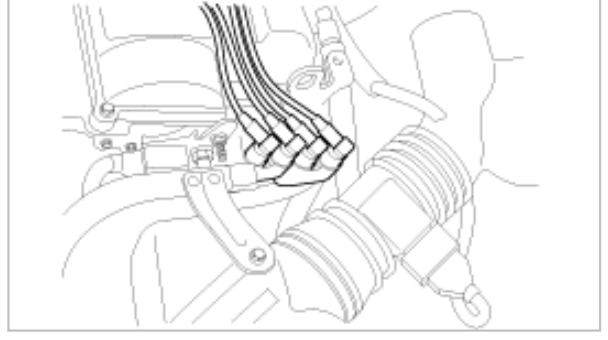
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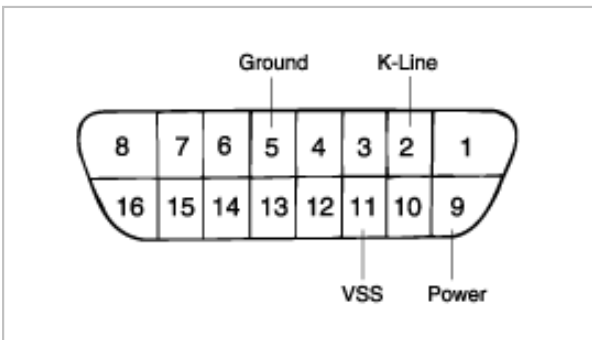
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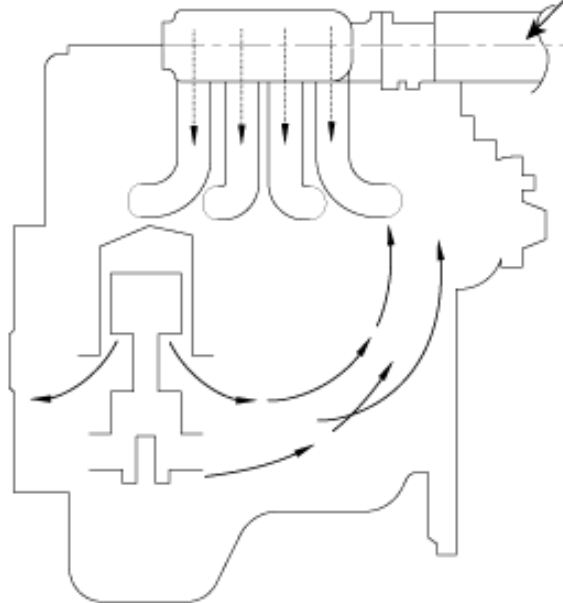
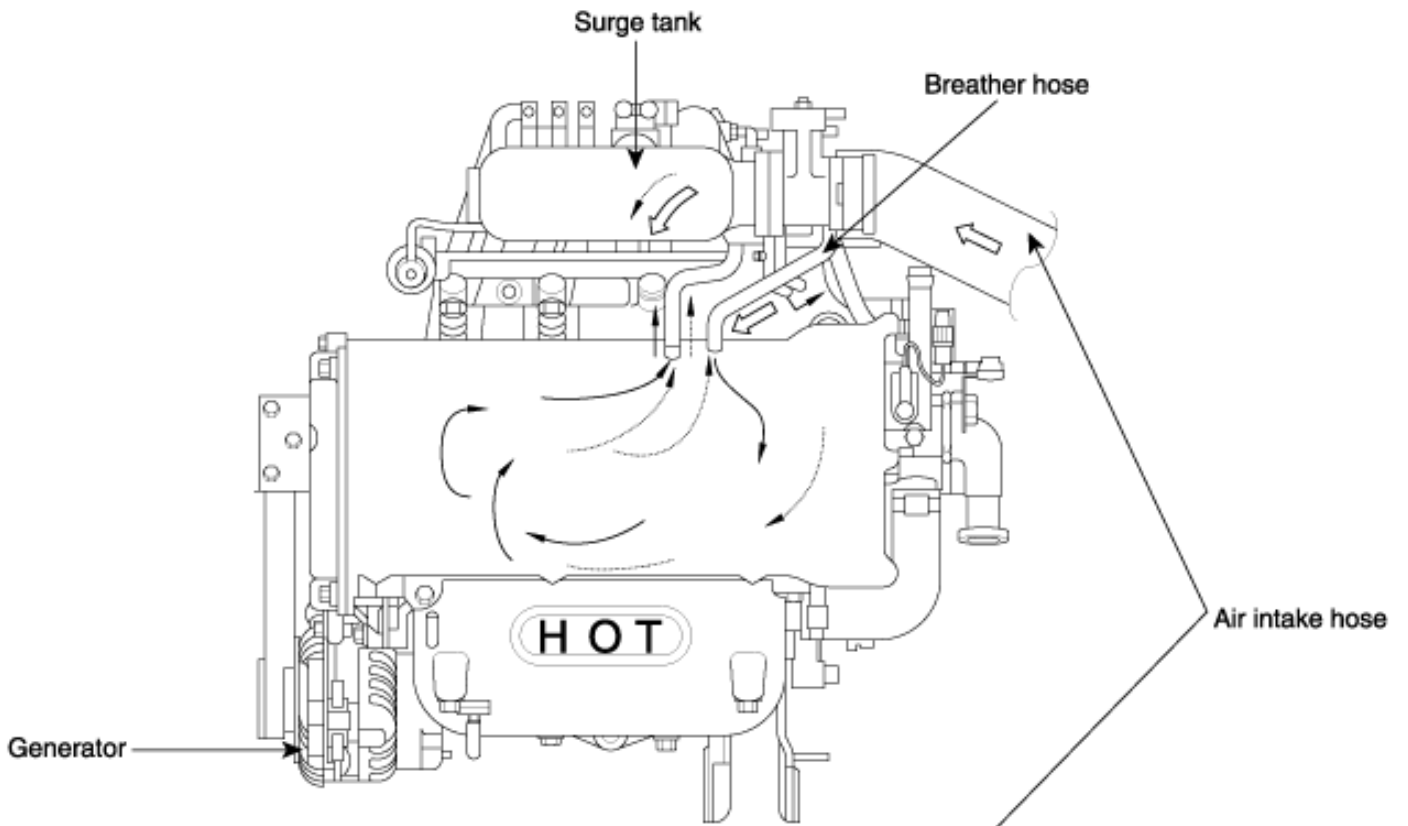
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# COMPONENTS



- ← During Low Load Operation
- ← During High Load Operation
- ← Fresh Air





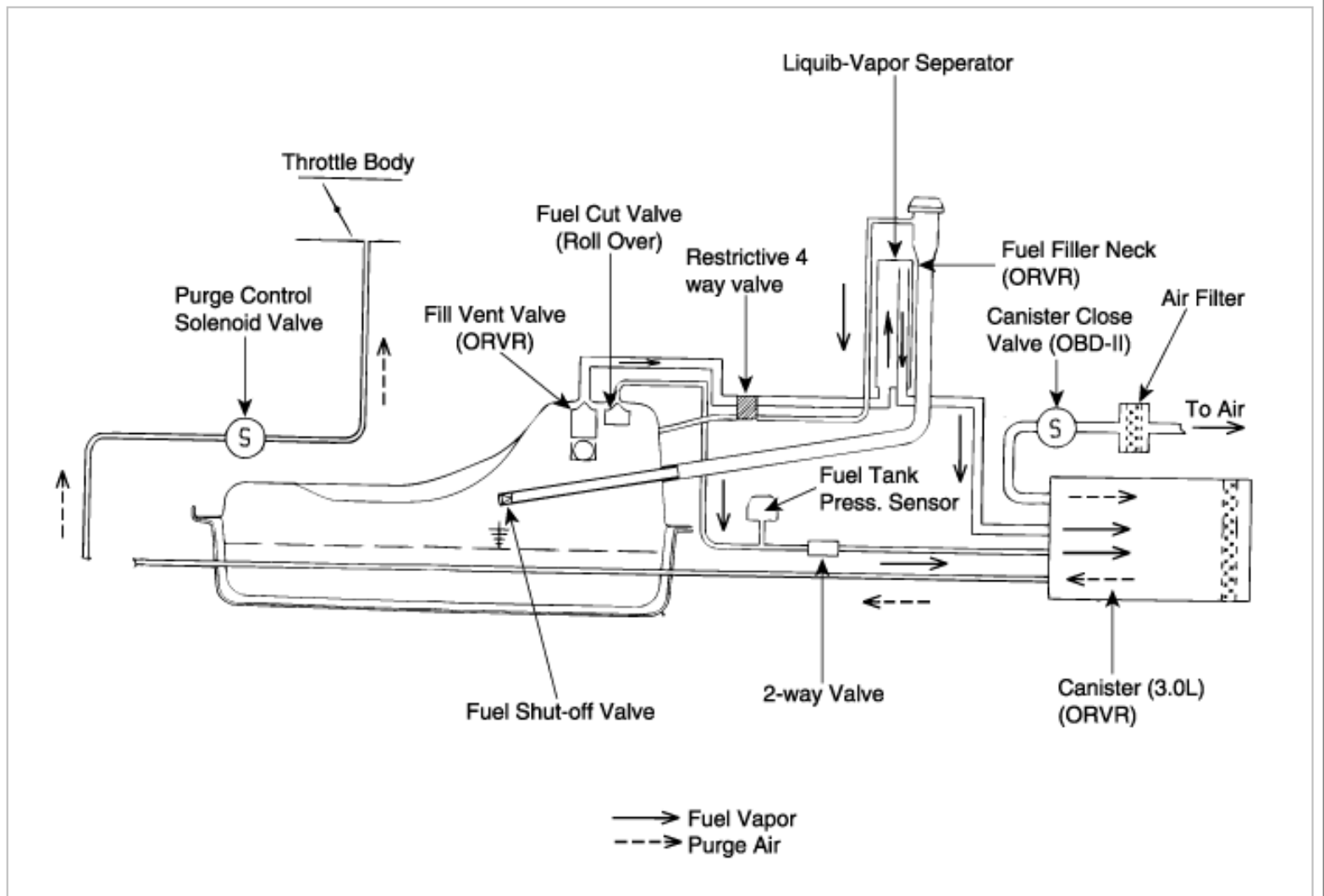
## DESCRIPTION

On-Board Refueling Vapor Recovery (ORVR) system is designed to prevent fuel tank vapor (HC) emissions during refueling at the gas station.

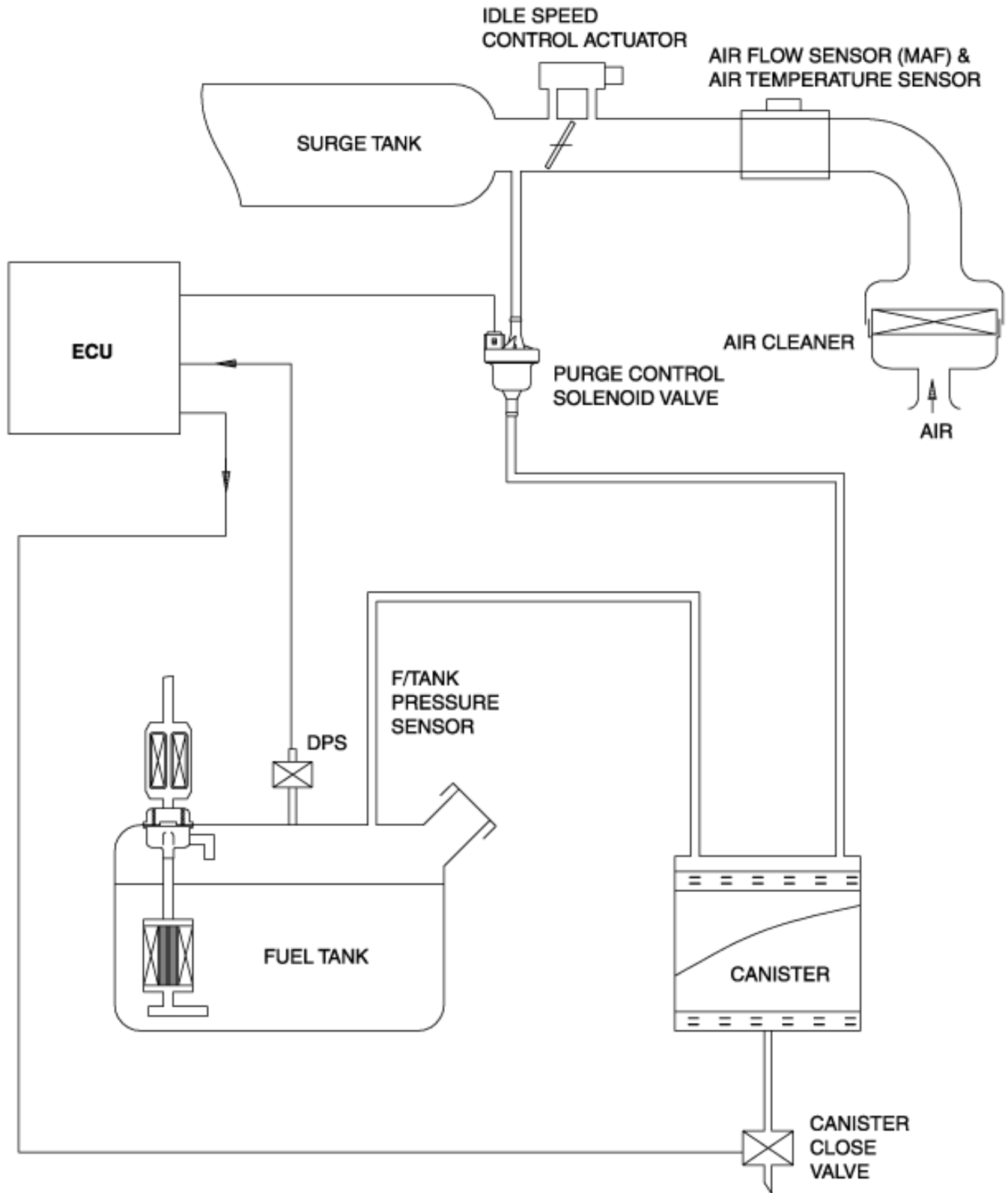
This system consists of a fill vent valve, fuel shut-off valve, fuel cut valve (roll over), two way valve (pressure/vacuum relief), fuel liquid/vapor separator which is installed beside the filler pipe, charcoal canister which is mounted under the rear floor LH side member and protector, tubes and miscellaneous connections.

While refueling, ambient air is drawn into the filler pipe so as not to emit fuel vapors in the air. The fuel vapor in the tank is then forced to flow into the canister via the fill vent valve. The fuel liquid/vapor separator isolates liquid fuel and passes the pure vapor to the charcoal canister.

While the engine is operating, the trapped vapor in the canister is drawn into the intake manifold and then into the engine combustion chamber. According to this purge process, the charcoal canister is purged and recovers its absorbing capability.



# COMPONENTS



Purchased  
from Ebay seller  
Reveleus1

Thank-you for purchasing from me, it  
is much appreciated.

To contact me please email  
[suzlever@gmail.com](mailto:suzlever@gmail.com)



## INSPECTION

1. Disconnect the vacuum hose from the throttle body, and connect a vacuum pump to the vacuum hose.
2. Check the following points when the engine is cold [engine coolant temperature 60°C(140°F) or below] and when it is warm [engine coolant temperature 80°C(176°F) or higher].

### WHEN ENGINE IS COLD

Engine operating condition	Applied vacuum	Result
Idling	50 kPa (7.3 psi)	Vacuum is held
3,000 rpm		

### WHEN ENGINE IS WARM

Engine operating condition	Applied vacuum	Result
Idling	50 kPa (7.3 psi)	Vacuum is held
Within 3 minutes after engine start at 3,000 rpm	Try to apply vacuum	Vacuum is released
After 3 minutes have passed after engine start at 3,000 rpm	50 kPa (7.3 psi)	Vacuum will be held momentarily, after which, it will be released



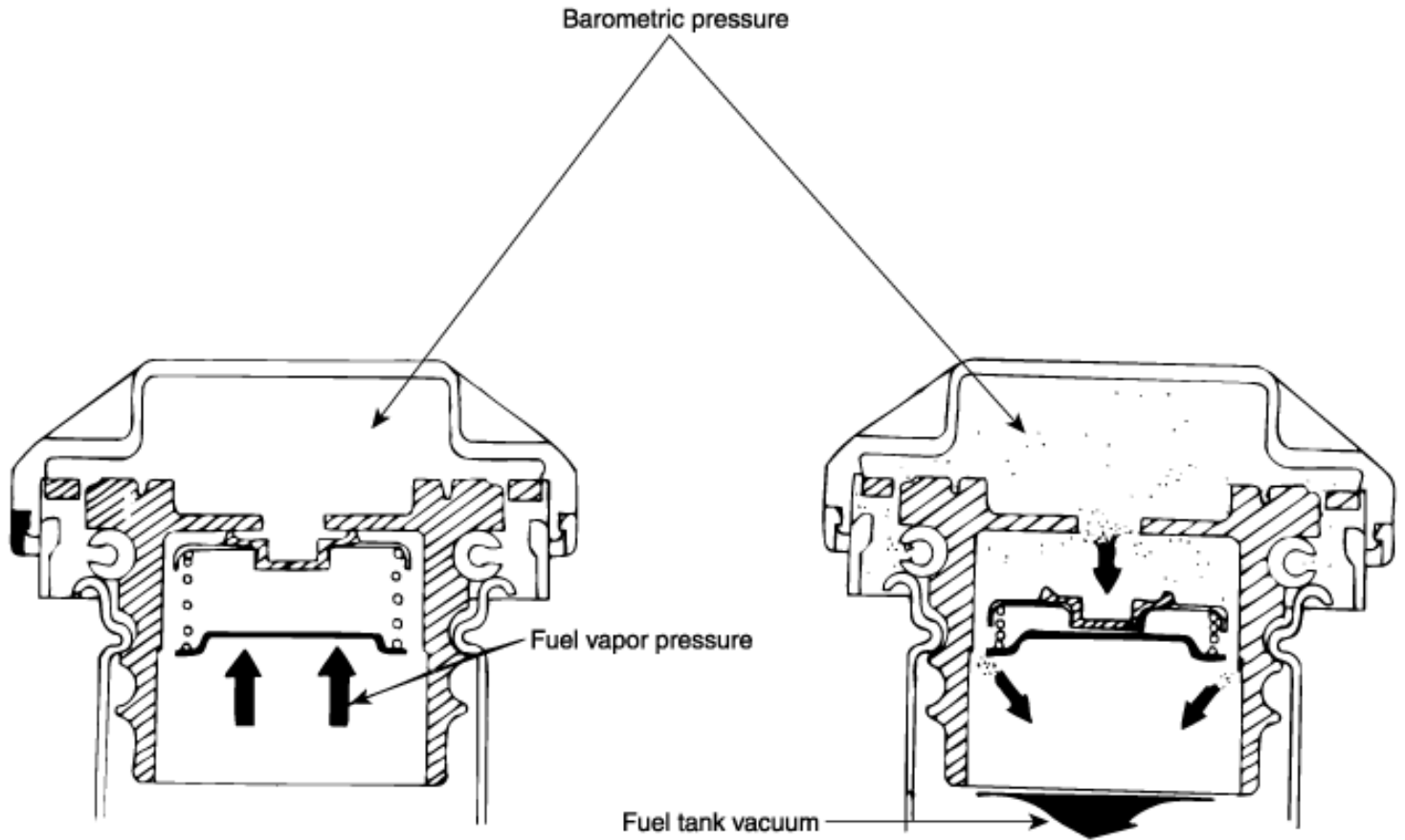
## OPERATION

### **AIR/FUEL MIXTURE CONTROL SYSTEM [MULTIPOINT FUEL INJECTION (MFI) SYSTEM]**

1. Open Loop air/fuel ratio is controlled by information programmed into the ECM.
2. Closed Loop air/fuel ratio is adjusted by the ECM based on information supplied by the oxygen sensor.

# OPERATION

The fuel filler cap is equipped with a vacuum relief valve to prevent the escape of fuel vapor into the atmosphere.

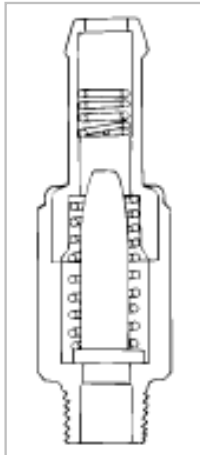


**When fuel tank is under pressure.**

**When fuel tank is under vacuum.**

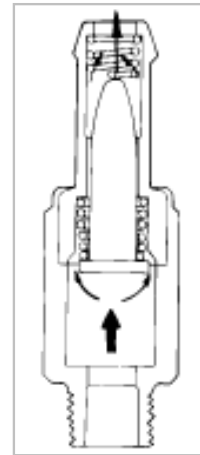
# OPERATION

Intake manifold side (No vacuum)



Rocker cover side

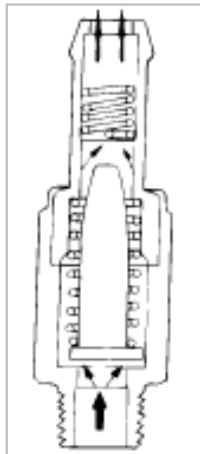
Intake manifold side (High vacuum)



Rocker cover side

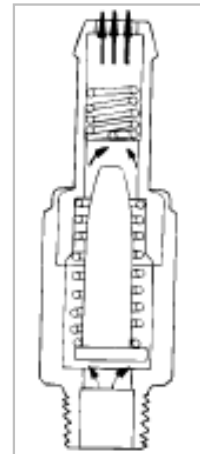
Engine condition	Not running	Engine condition	Idling or decelerating
PCV valve	Not operating	PCV valve	Fully operating
Vacuum passage	Restricted	Vacuum passage	Small

Intake manifold side (Moderate vacuum)



Rocker cover side

Intake manifold side (Low vacuum)



Rocker cover side

Engine condition	Normal operation	Engine condition	Accelerating and high load
PCV valve	Properly operating	PCV valve	Slightly operating
Vacuum passage	Large	Vacuum passage	Very large

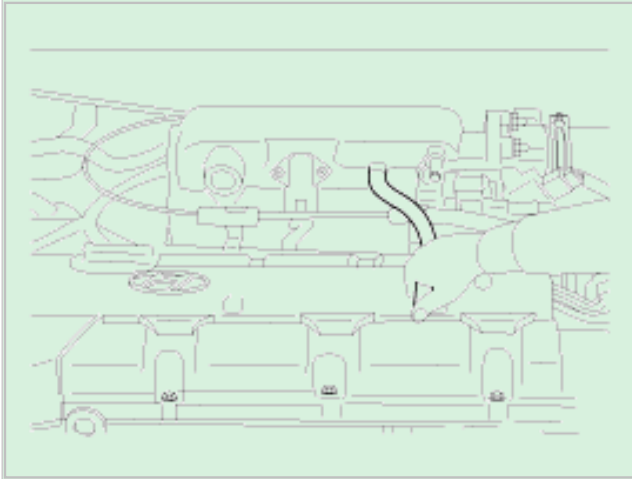


## REMOVAL

1. Disconnect the ventilation hose from the positive crankcase ventilation (PCV) valve. Remove the PCV valve from the rocker cover and reconnect it to the ventilation hose.
2. Run the engine at idle and put a finger on the open end of the PCV valve and make sure that intake manifold vacuum can be felt.

### NOTE

The plunger inside the PCV valve will move back and forth.



3. If vacuum is not felt, clean the PCV valve and ventilation hose in cleaning solvent, or replace if necessary.

## INSTALLATION

Install the PCV valve and tighten to the specified torque.

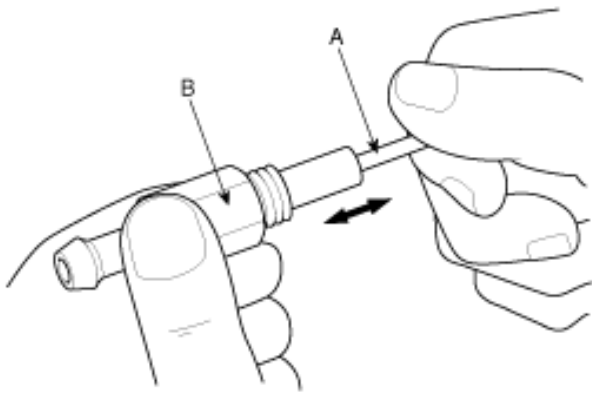
### PCV valve tightening torque:

8~12 Nm (80~120 kg·cm, 5.8 ~8.7 lb·ft)

## INSPECTION

1. Remove the PCV valve.
2. Insert a thin stick(A) into the PCV valve(B) from the threaded side to check that the plunger moves.
3. If the plunger does not move, the PCV valve is clogged. Clean it or replace.





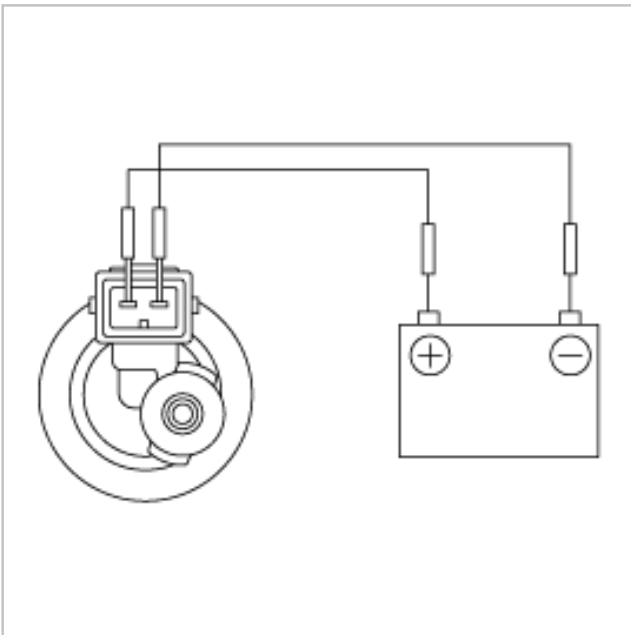
## INSPECTION

### NOTE

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

1. Disconnect the vacuum hose from the solenoid valve.
2. Detach the harness connector.
3. Connect a vacuum pump to the nipple to which the red-striped vacuum hose was connected.
4. Apply vacuum and check when voltage is applied to the evaporative emission canister purge solenoid valve and when the voltage is discontinued.

Battery voltage	Normal condition
When applied	Vacuum is released
When discontinued	Vacuum is maintained



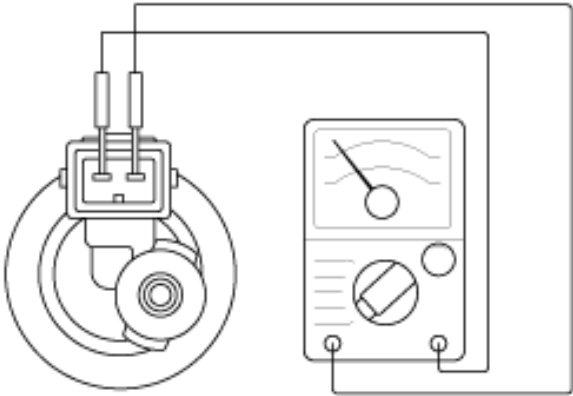
5. Measure the resistance between the terminals of the solenoid valve.

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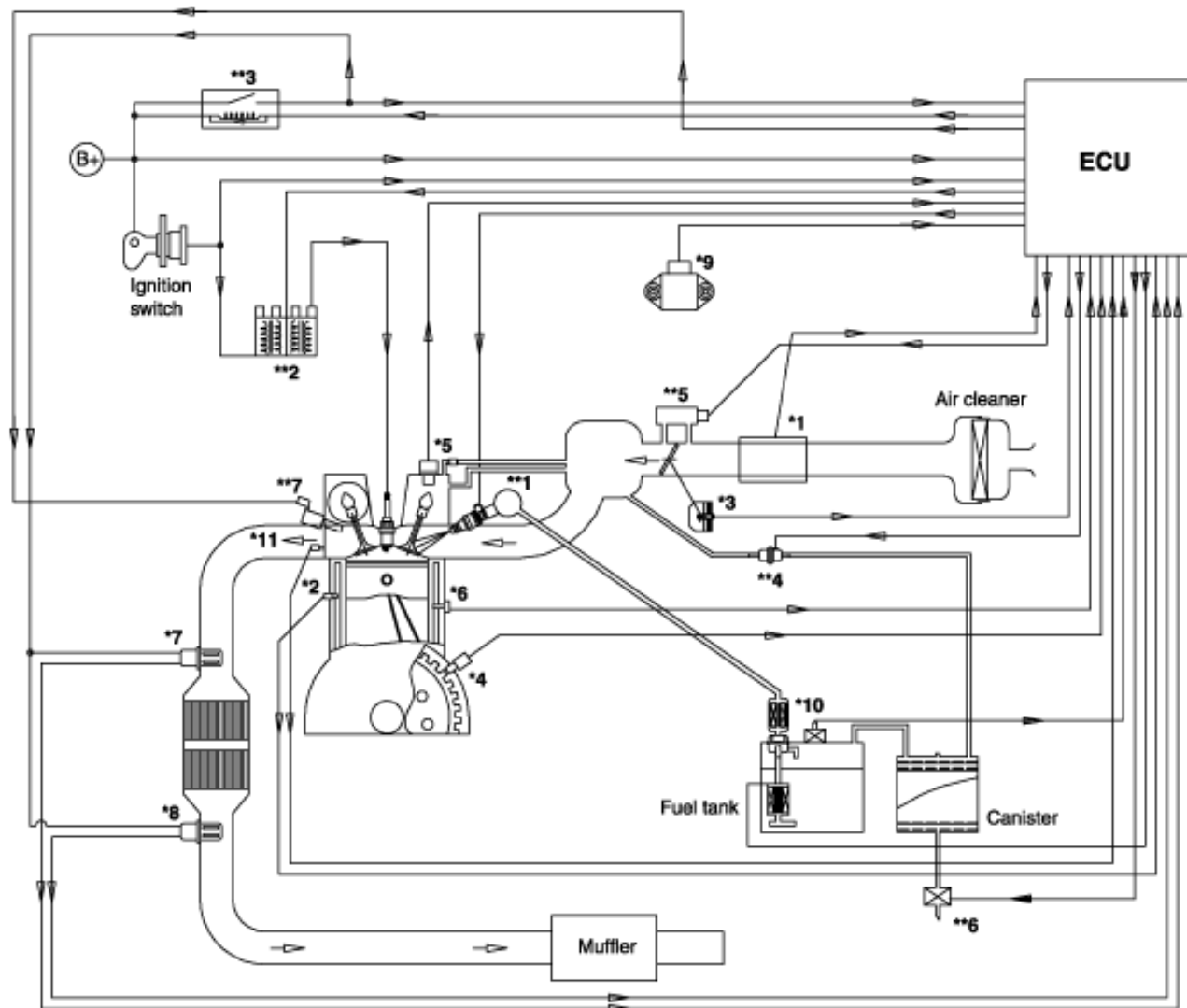
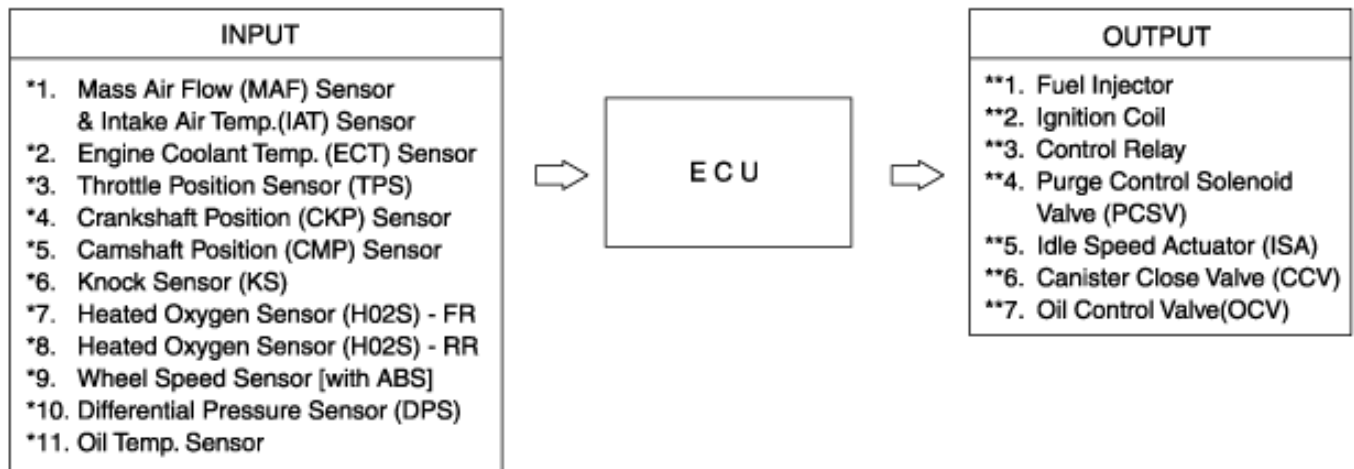
### Evaporative emission canister purge solenoid valve

Coil resistance : 26 [at 20°C(68°F)]

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## SCHEMATIC DRAWING







## SPECIFICATIONS

Components	Function	Remarks
<b>Crankcase Emission System</b> Positive Crankcase Ventilation (PCV) valve	HC reduction	Variable flow rate type
<b>Evaporative Emission System</b> Evaporative emission canister EVAP Canister Purge Solenoid Valve	HC reduction HC reduction	Duty control solenoid valve
<b>Exhaust Emission System</b> MFI system (air-fuel mixture control device) Three-way catalytic converter	CO, HC, NOx reduction CO, HC, NOx reduction	Heated oxygen sensor feedback type Monolithic type

MFI : Multiport Fuel Injection

EVAP : Evaporative Emission

## SERVICE STANDARD

Item	Specifications
<b>Evaporative emission canister purge solenoid valve</b> Coil resistance	26 [at 20°C (68°F)]

## TIGHTENING TORQUE

Item	Nm	kg·cm	lb·ft
Positive Crankcase Ventilation Valve	8 ~ 12	80 ~ 120	6 ~ 8



## TROUBLESHOOTING

Symptom	Suspect area	Remedy (See page)
Engine will not start or hard to start	Vacuum hose disconnected or damaged	Repair or replace
	Malfunction of the EVAP Canister Purge Solenoid Valve	Repair or replace (EC-14)
Rough idle or engine stalls	Vacuum hose disconnected or damaged	Repair or replace
	Malfunction of the PCV valve	Replace (EC-9)
	Malfunction of the evaporative emission canister purge system	Check the system; if there is a problem, check related components parts (EC-13)
Excessive oil consumption	Positive crankcase ventilation line clogged	Check positive crankcase ventilation system (EC-9)