Emissions Control System (1.1 SOHC)

GENERAL

SPECIFICATIONS

Item	Specification	
Purge Control Solenoid Valve (PCSV)	Type	Duty Control type
	Resistance (Ω)	32.0 at 20°C (68°F)

TIGHTENING TORQUE

Item	N•m	kg•cm	lb•ft
Positive Crankcase Ventilation Valve	8 ~ 12	80 ~ 120	6 ~ 8

TROUBLESHOOTING

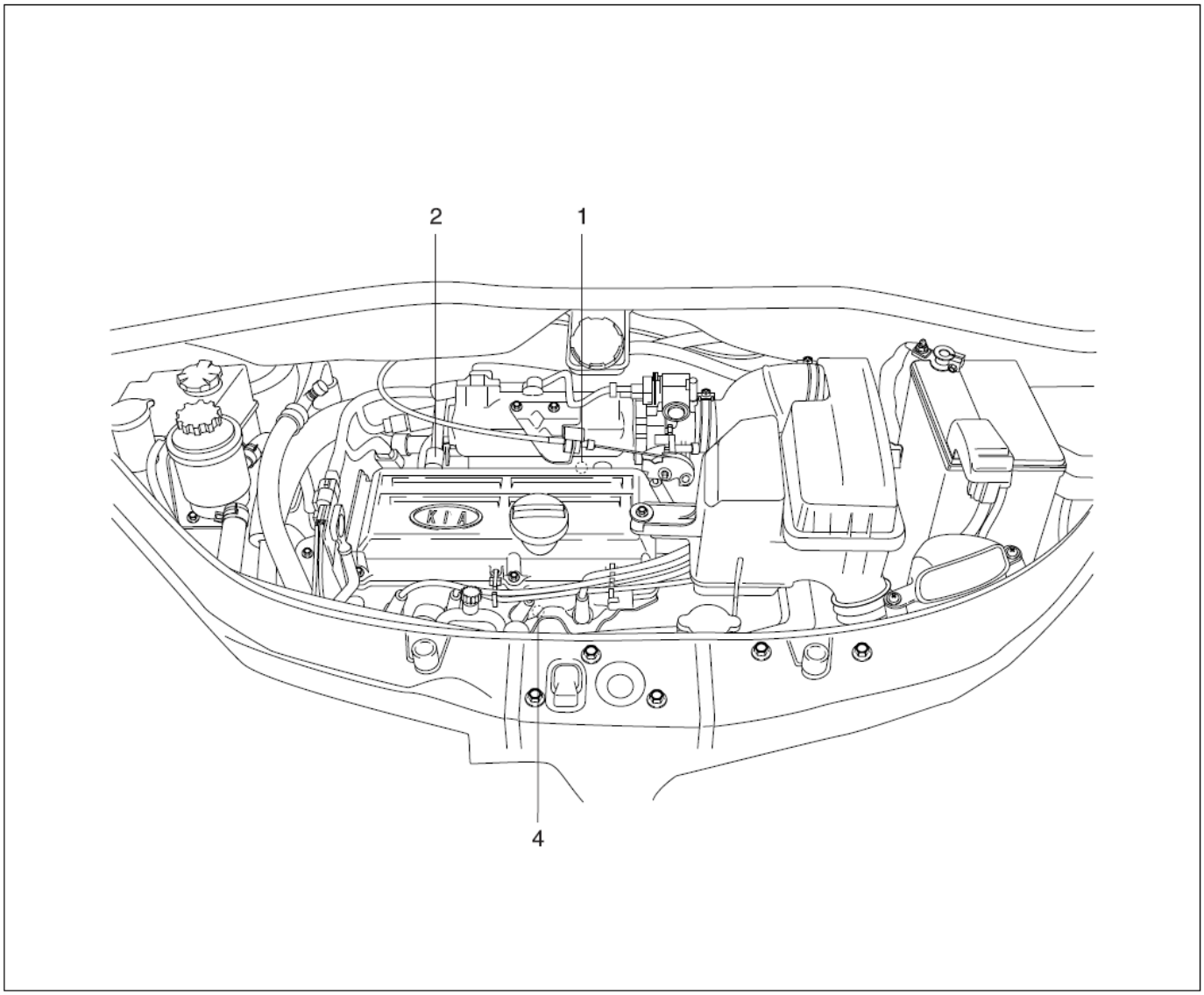
Symptom	Suspect area	Remedy (See page)
Engine will not start or hard to start	Vacuum hose disconnected or damaged	Repair or replace
	Malfunction of the EVAP. Canister Purge Solenoid Valve	Repair or replace
Rough idle or engine stalls	Vacuum hose disconnected or damaged	Repair or replace
	Malfunction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

COMPONENTS

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

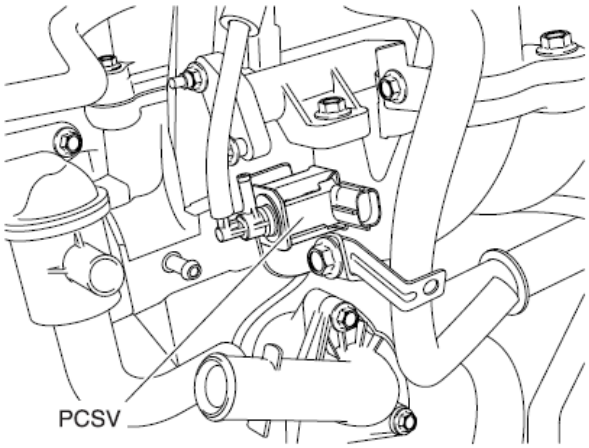
MFI : Multiport Fuel Injection
EVAP : Evaporative Emission

COMPONENTS LOCATION

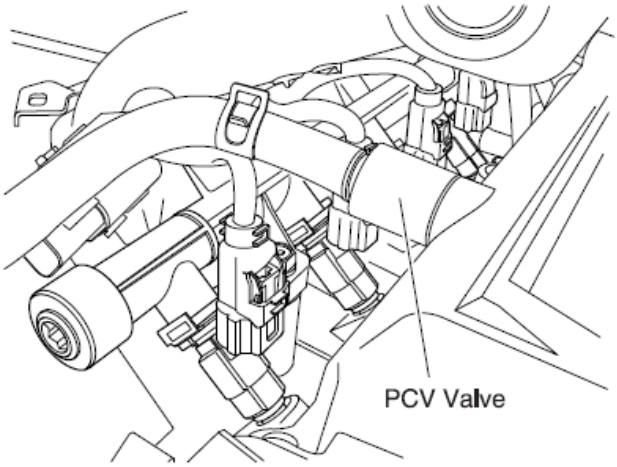


1. Purge Control Solenoid Valve (PCSV)
2. PCV Valve
3. Canister
4. Catalytic Converter
5. Two-Way Valve

1. Purge Control Solenoid Valve (PCSV)

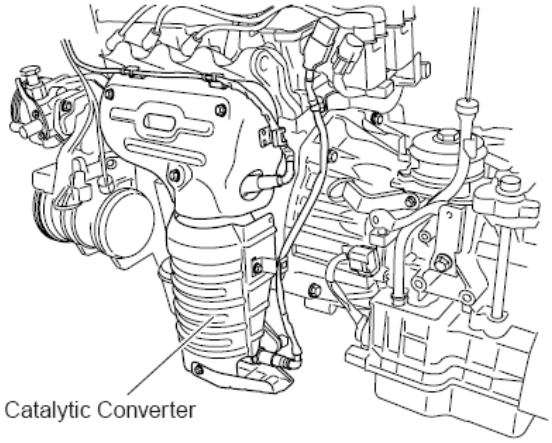


2. PCV Valve

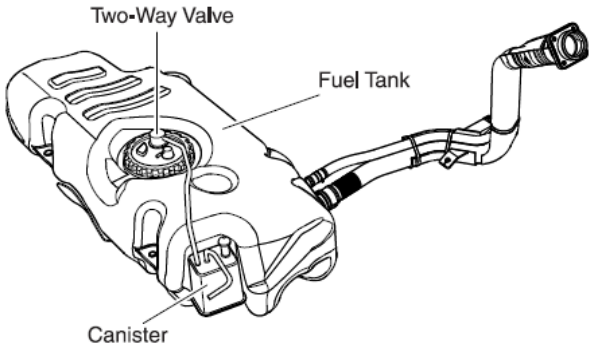


3. Canister

4. Catalytic Converter



5. Two-Way Valve



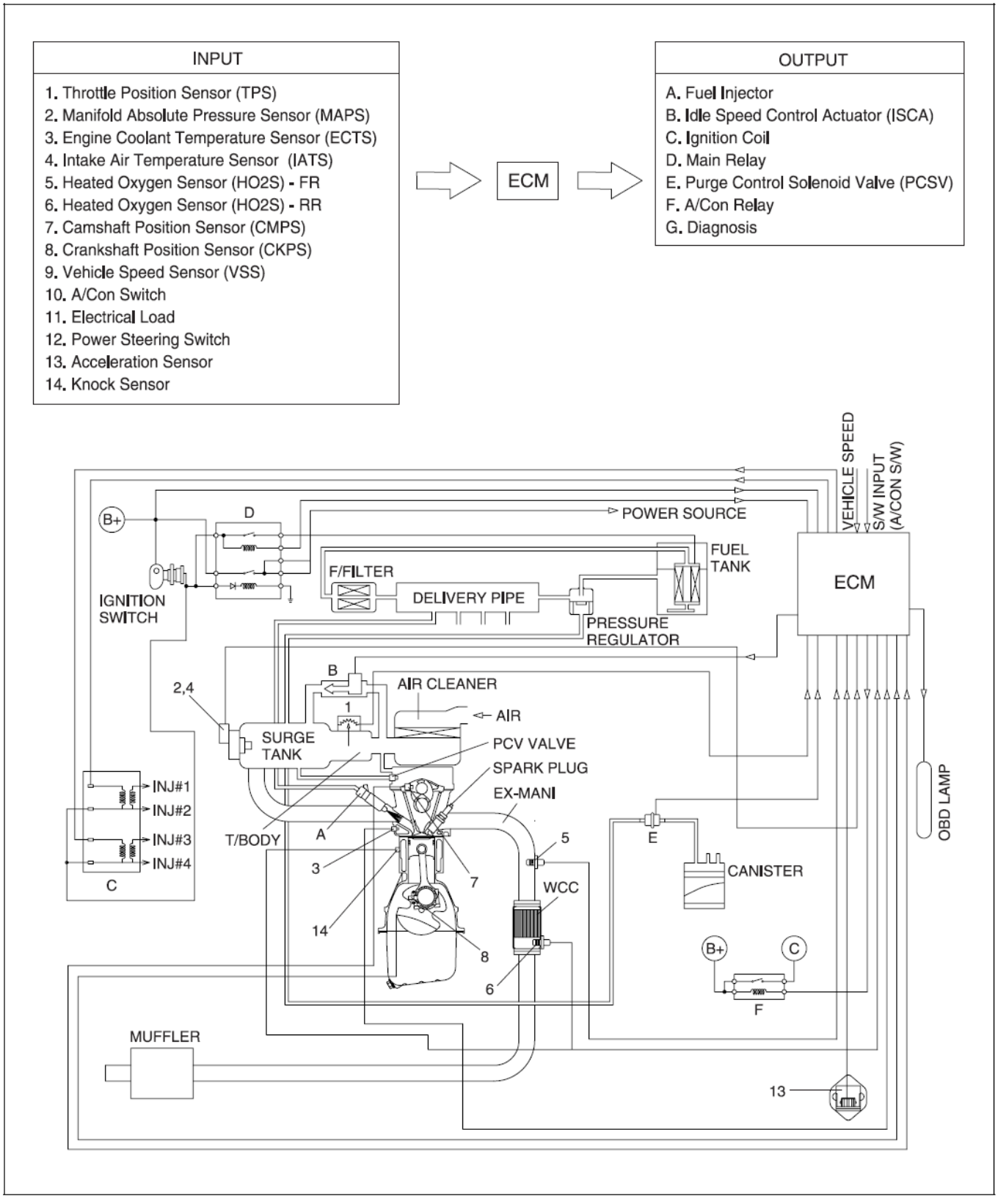
SCHEMATIC DIAGRAM

[1.1 SOHC, EOBD]

INPUT
1. Throttle Position Sensor (TPS)
2. Manifold Absolute Pressure Sensor (MAPS)
3. Engine Coolant Temperature Sensor (ECTS)
4. Intake Air Temperature Sensor (IATS)
5. Heated Oxygen Sensor (HO2S) - FR
6. Heated Oxygen Sensor (HO2S) - RR
7. Camshaft Position Sensor (CMPS)
8. Crankshaft Position Sensor (CKPS)
9. Vehicle Speed Sensor (VSS)
10. A/Con Switch
11. Electrical Load
12. Power Steering Switch
13. Acceleration Sensor
14. Knock Sensor

ECM

OUTPUT
A. Fuel Injector
B. Idle Speed Control Actuator (ISCA)
C. Ignition Coil
D. Main Relay
E. Purge Control Solenoid Valve (PCSV)
F. A/Con Relay
G. Diagnosis

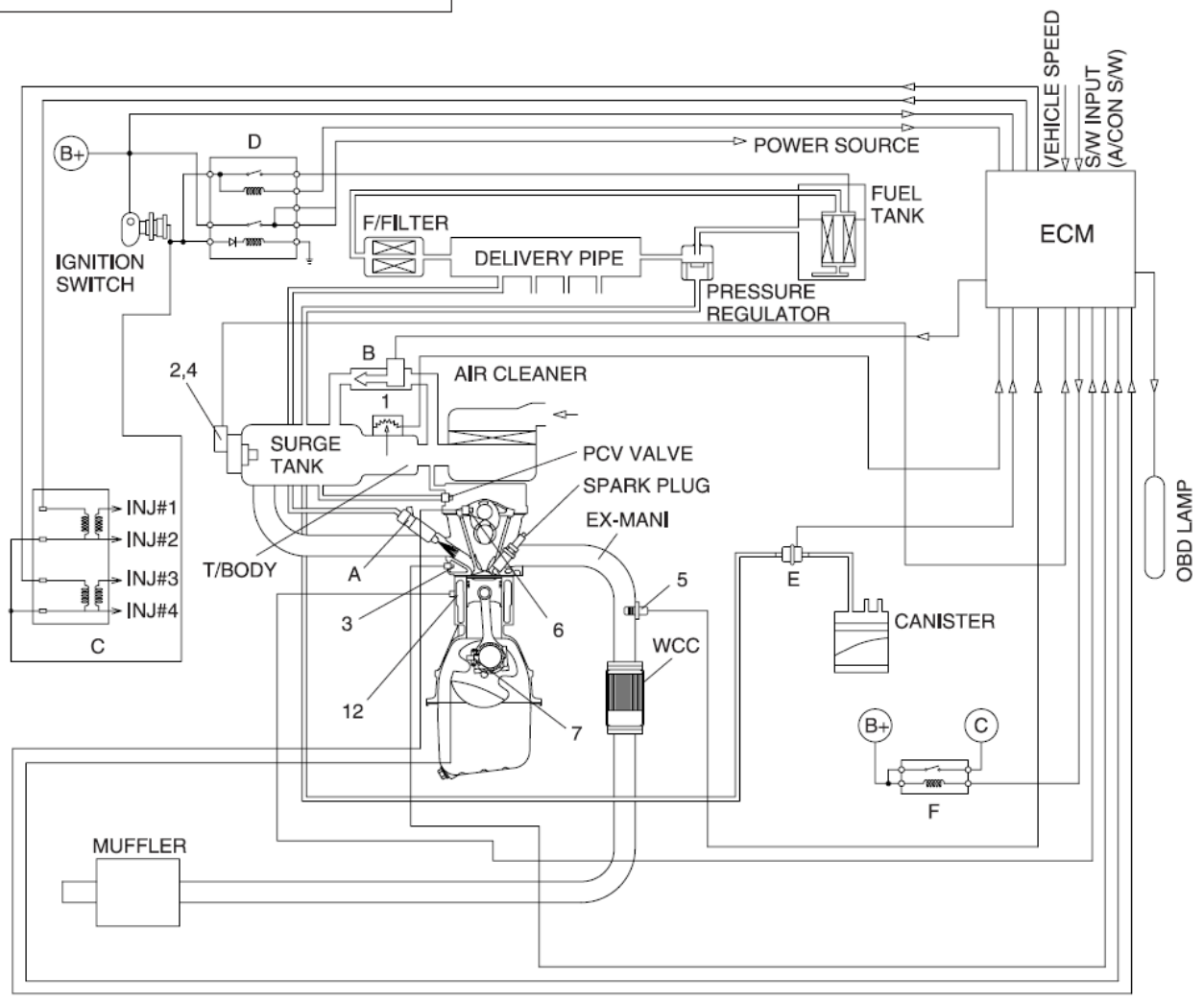


[1.1 SOHC, UNLEADED]

INPUT
1. Throttle Position Sensor (TPS)
2. Manifold Absolute Pressure Sensor (MAPS)
3. Engine Coolant Temperature Sensor (ECTS)
4. Intake Air Temperature Sensor (IATS)
5. Heated Oxygen Sensor (HO2S)
6. Camshaft Position Sensor (CMPS)
7. Crankshaft Position Sensor (CKPS)
8. Vehicle Speed Sensor (VSS)
9. A/Con Switch
10. Electrical Load
11. Power Steering Switch
12. Knock Sensor

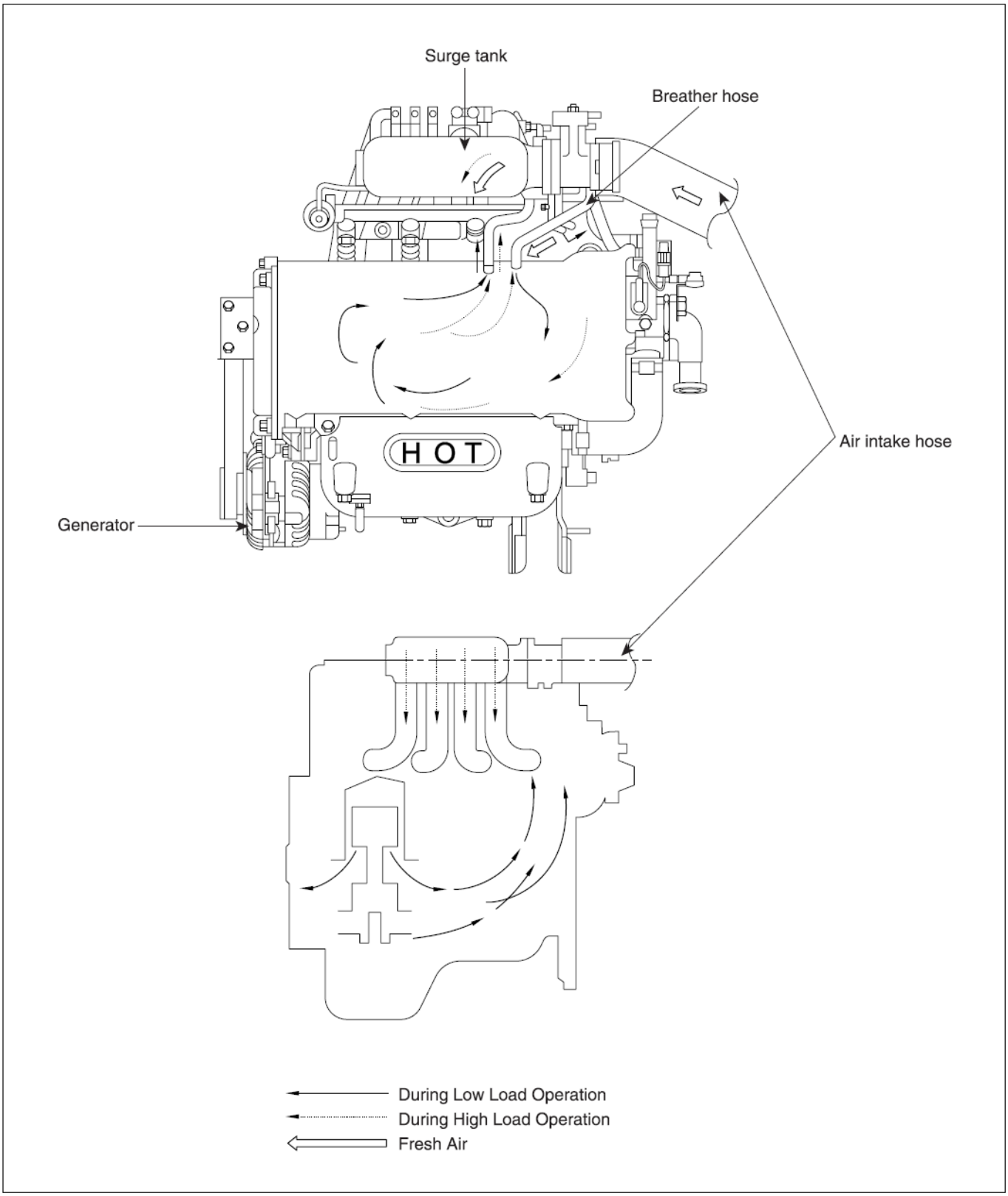
ECM

OUTPUT
A. Fuel Injector
B. Idle Speed Control Actuator (ISCA)
C. Ignition Coil
D. Main Relay
E. Purge Control Solenoid Valve (PCSV)
F. A/Con Relay
G. Diagnosis



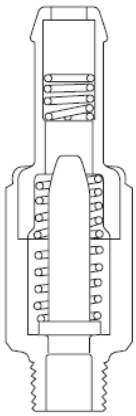
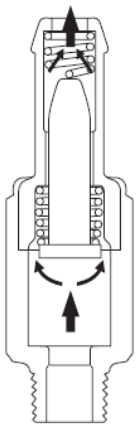
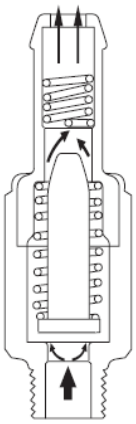
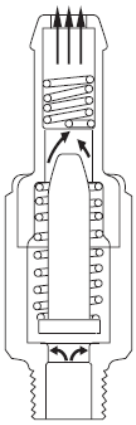
CRANKCASE EMISSION CONTROL SYSTEM

COMPONENTS



POSITIVE CRANKCASE VENTILATION (PCV) VALVE

OPERATION

<table>
<tr>
<td colspan="2">Intake manifold side (No vacuum)
 
Rocker cover side
BEGE001S</td>
<td colspan="2">Intake manifold side (High vacuum)
 
Rocker cover side
BEGE001T</td>
</tr>
<tr><td>Engine condition</td><td>Not running</td><td>Engine condition</td><td>Idling or decelerating</td></tr>
<tr><td>PCV valve</td><td>Not operating</td><td>PCV valve</td><td>Fully operating</td></tr>
<tr><td>Vacuum passage</td><td>Restricted</td><td>Vacuum passage</td><td>Small</td></tr>
<tr>
<td colspan="2">Intake manifold side (Moderate vacuum)
 
Rocker cover side
BEGE001U</td>
<td colspan="2">Intake manifold side (Low vacuum)
 
Rocker cover side
BEGE001V</td>
</tr>
<tr><td>Engine condition</td><td>Normal operation</td><td>Engine condition</td><td>Accelerating and high load</td></tr>
<tr><td>PCV valve</td><td>Properly operating</td><td>PCV valve</td><td>Slightly operating</td></tr>
<tr><td>Vacuum passage</td><td>Large</td><td>Vacuum passage</td><td>Very large</td></tr>
</table>

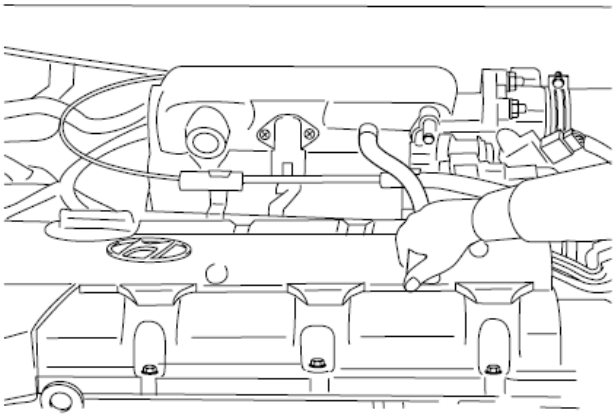
REMOVAL

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.



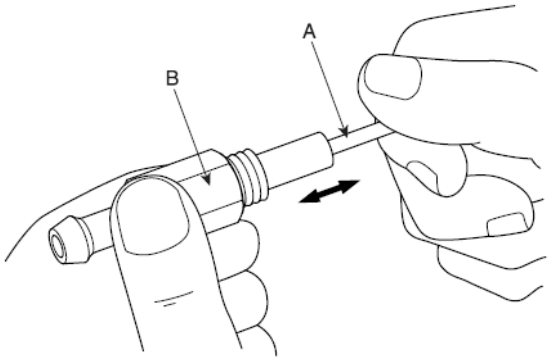
3. If vacuum is not felt, clean the PCV valve and ventilation hose in cleaning solvent, or replace if necessary.

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.



INSTALLATION

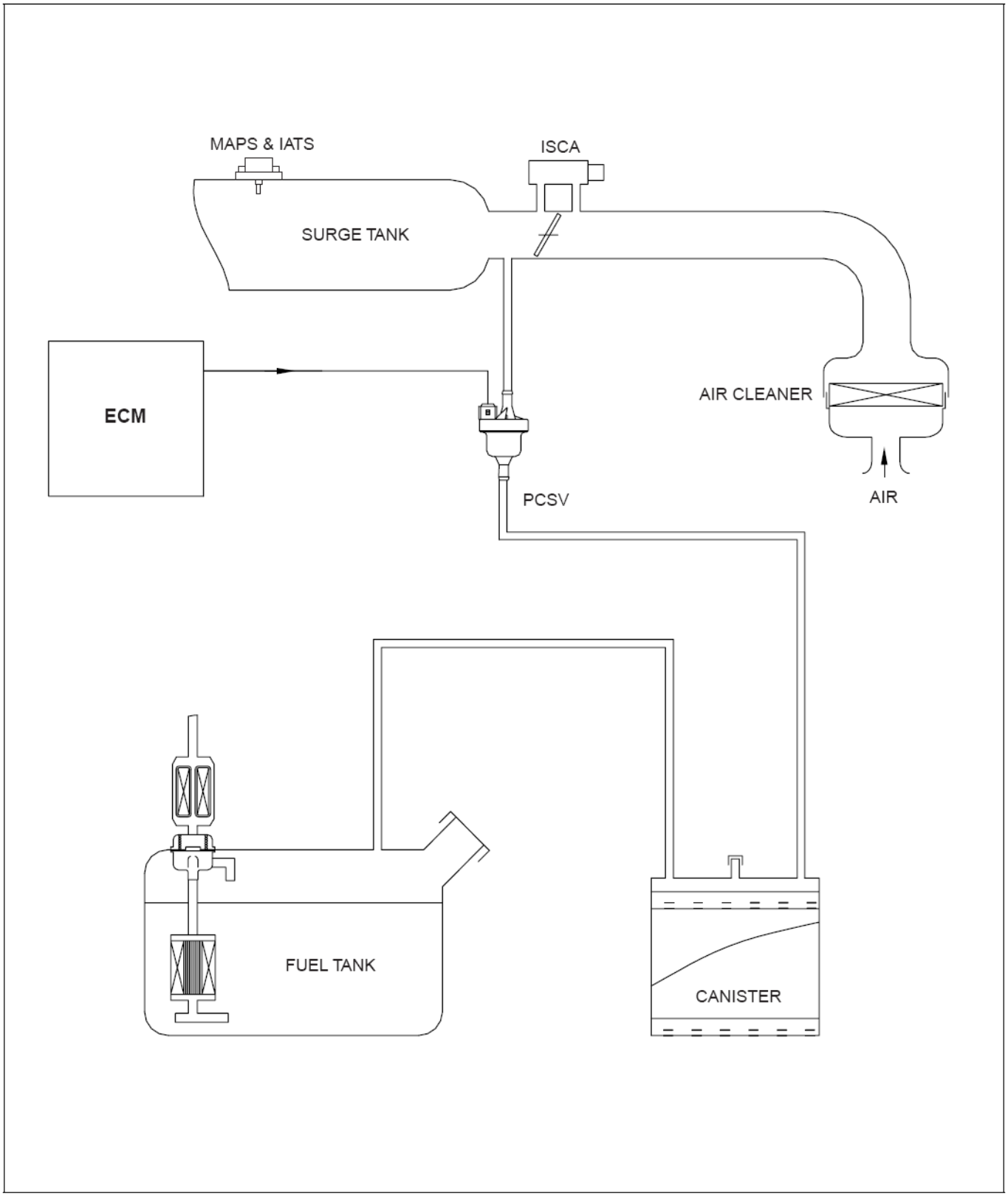
Install the PCV valve and tighten to the specified torque.

PCV valve tightening torque:

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

EVAPORATIVE EMISSION CONTROL SYSTEM

COMPONENTS



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 80C(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

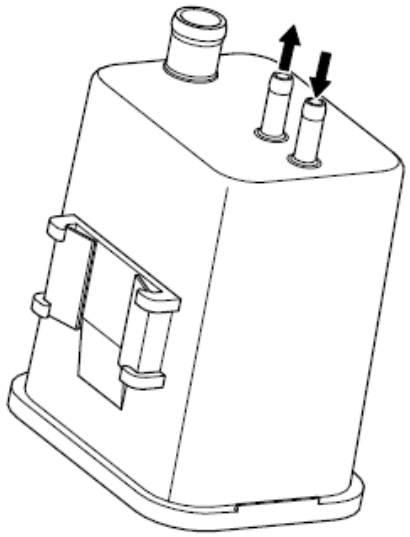
EVAPORATIVE (EVAP) CANISTER

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.



EVAPORATIVE (EVAP) CANISTER PURGE SOLENOID VALVE

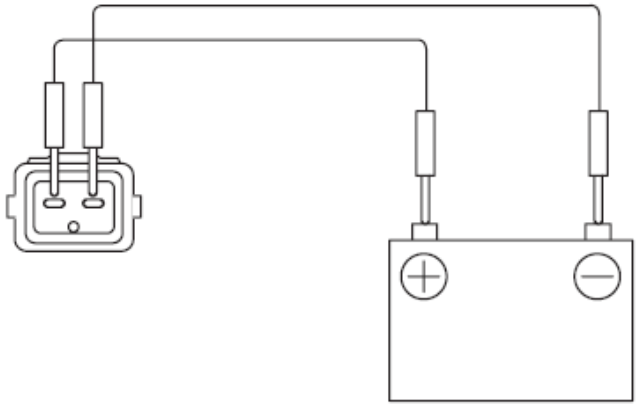
INSPECTION

NOTE

When disconnecting the vacuum hose, make an iden tification 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 PCSV and when the voltage is discontinued.

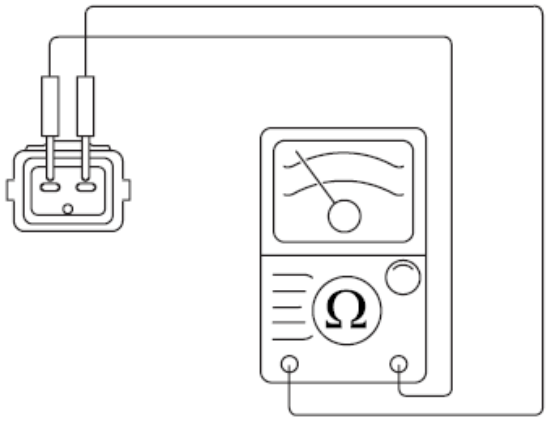
Battery voltage	Normal condition
When applied	Vacuum is released
When discontinued	Vacuum is maintained



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

PCSV coil resistance (Ω):

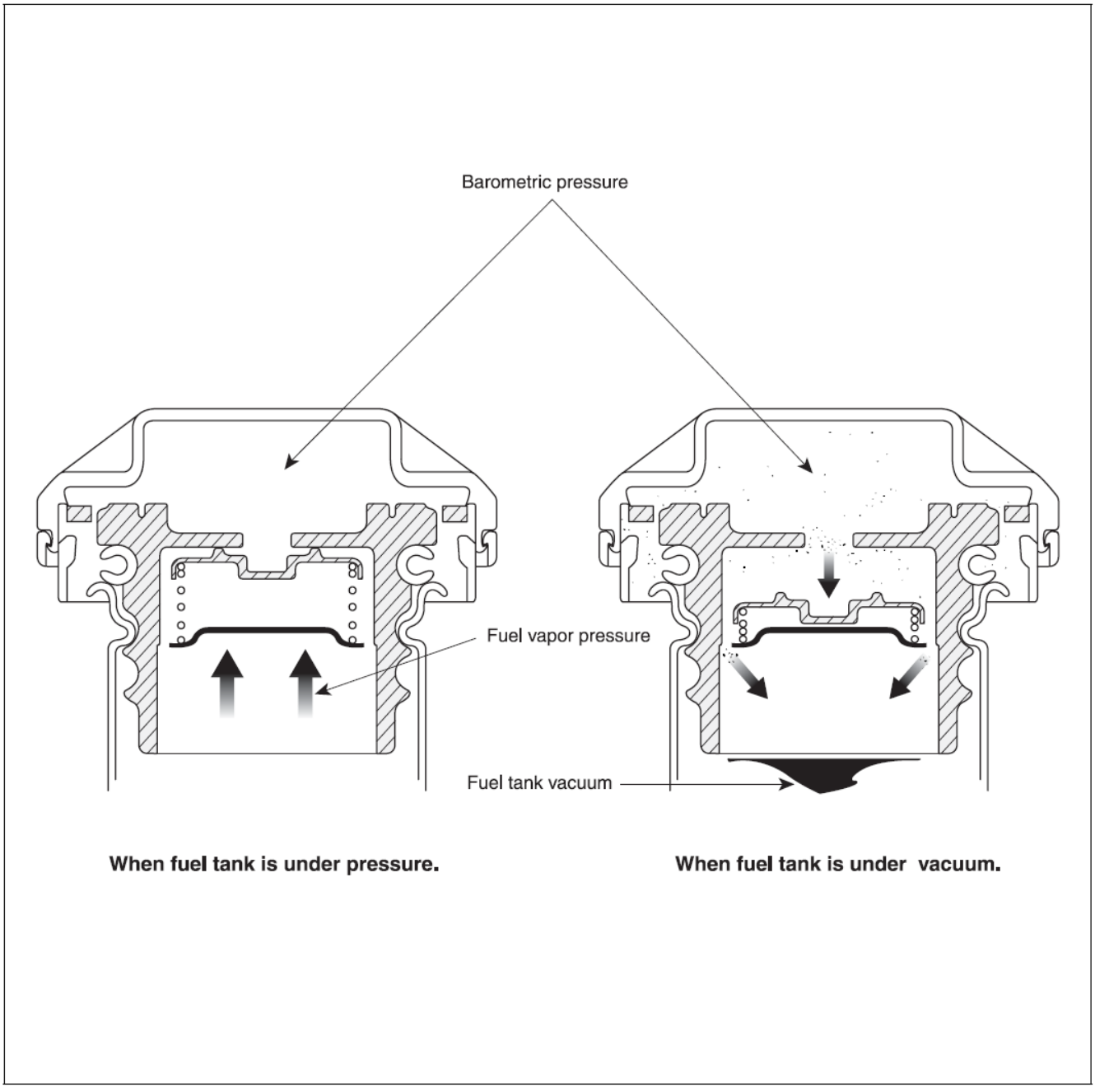
32.0 Ω at 20°C (68°F)



FUEL FILLER CAP

DESCRIPTION

A ratchet tightening device on the threaded fuel filler cap reduces the chances of incorrect installation, which would seal the fuel filler. After the gasket on the fuel filler cap and the filler neck flange contact each other, the ratchet produces a loud clicking noise indicating the seal has been set.



EXHAUST EMISSION CONTROL SYSTEM

DESCRIPTION

Exhaust emissions (CO, HC, NOx) are controlled by a combination of engine modifications and the addition of special control components.

Modifications to the combustion chamber, intake manifold, camshaft and ignition system form the basic control system.

These items have been integrated into a highly effective system which controls exhaust emissions while maintaining good driveability and fuel economy.

AIR/FUEL MIXTURE CONTROL SYSTEM [MULTIPORT FUEL INJECTION (MFI) SYSTEM]

The MFI system is a system which uses the signals from the heated oxygen sensor to activate and control the injector installed in the manifold for each cylinder, thus precisely regulating the air/fuel mixture ratio and reducing emissions.

This in turn allows the engine to produce exhaust gases of the proper composition to permit the use of a three way catalyst. The three way catalyst is designed to convert the three pollutants (1) hydrocarbons (HC), (2) carbon monoxide (CO), and (3) oxides of nitrogen (NOx) into harmless substances. There are two operating modes in the 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.