Emissions Control System (G4HD/G4EE/G4ED - GSL 1.1/1.4/1.6)

GENERAL

SPECIFICATIONS ED045925

Item	Specification	
Purge Control Solenoid Valve (PCSV)	Type	Duty Control type
	Resistance (Ω)	26.0Ω at 20 °C (68 °F)

TIGHTENING TORQUES E2C1BDF3

Item	N·m	kgf·m	lbf·ft
Positive Crankcase Ventilation Valve	7.8 ~ 11.8	0.8 ~ 1.2	5.8 ~ 8.7

TROUBLESHOOTING EF1D103F

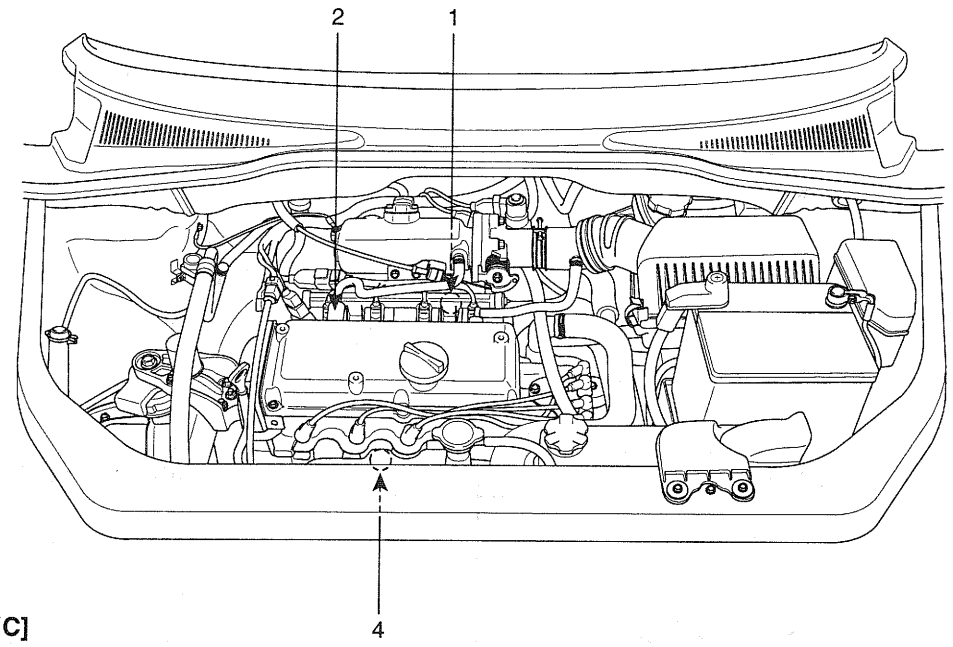
Symptom	Suspect area	Remedy
Engine will not start or hard to start	Vacuum hose disconnected or damaged	Repair or replace
	Malfunction of the EVAP. Canister Purge Solenoid Valve	Repair or replace
Rough idle or engine stalls	Vacuum hose disconnected or damaged	Repair or replace
	Malfunction of the PCV 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 E26FDF5D

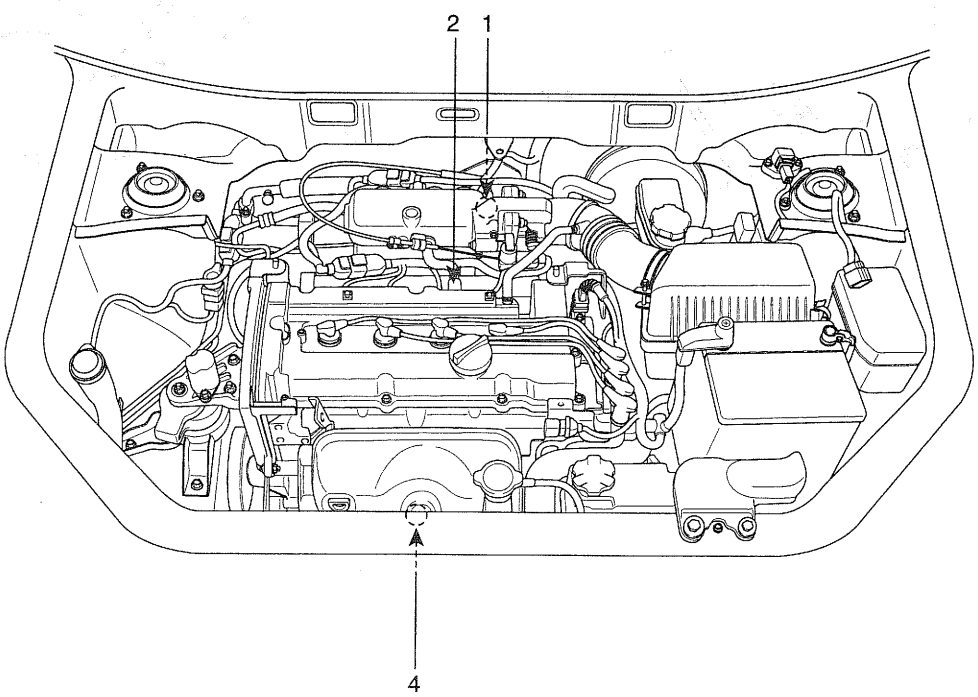
Components	Function	Remarks
Crankcase Emission System - Positive Crankcase Ventilation (PCV) valve	HC reduction	Variable flow rate type
Evaporative Emission System - Evaporative emission canister - Purge Control Solenoid Valve (PCSV)	HC reduction HC reduction	Duty control solenoid valve
Exhaust Emission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

COMPONENTS LOCATION E4072391

[1.1 SOHC]



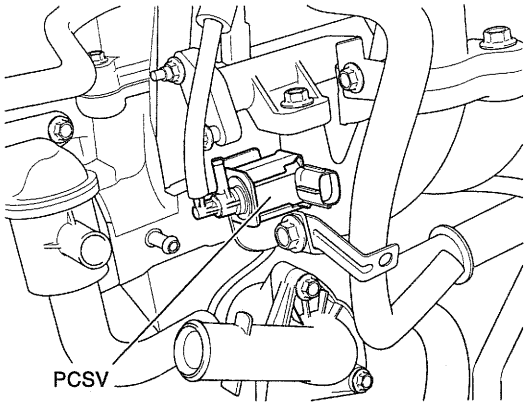
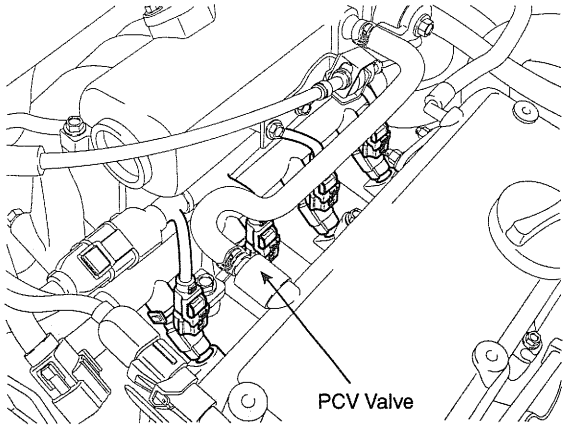
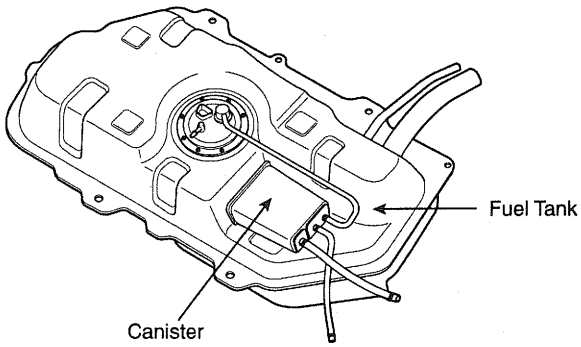
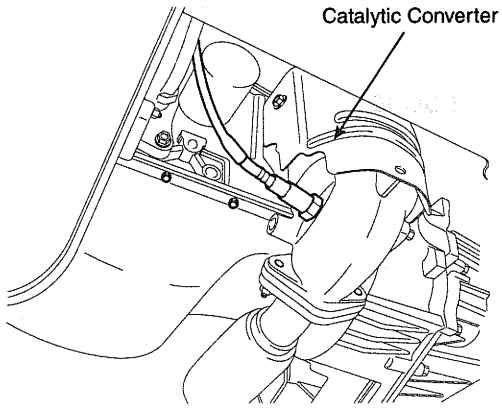
[1.4/1.6 DOHC]



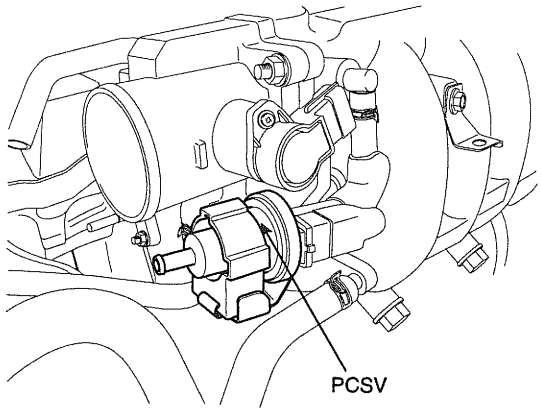
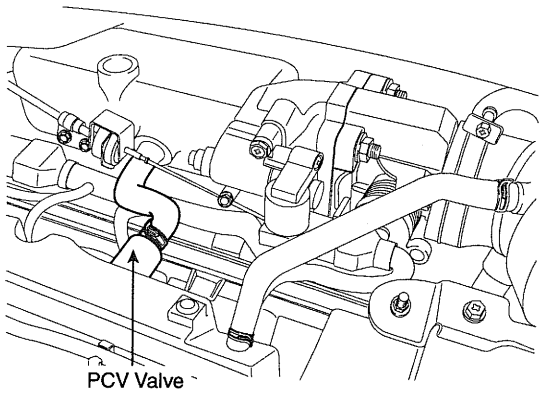
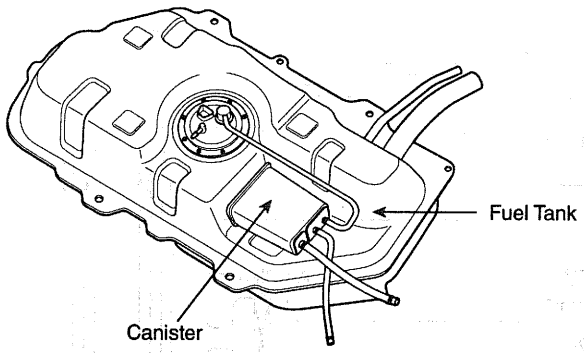
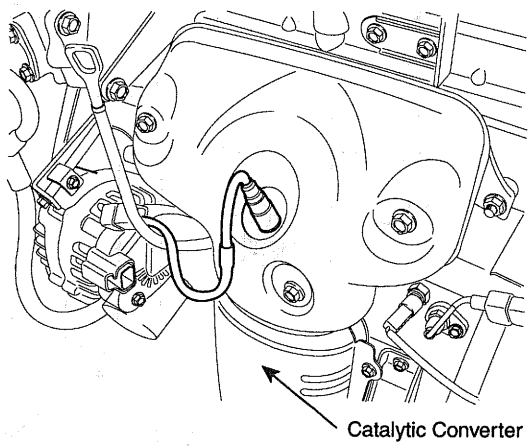
1. Purge Control Solenoid Valve (PCSV)
2. PCV Valve
3. Canister
4. Catalytic Converter

EEPF001A

[1.1 SOHC]

1	Purge Control Solenoid Valve (PCSV)	2	Positive Crankcase Ventilation (PCV) Vave
 LEHE001Q		 EEPF002A	
3	Canister	4	Catalytic converter
 EEPF003A		 EEPF004A	

[1.4/1.6 DOHC]

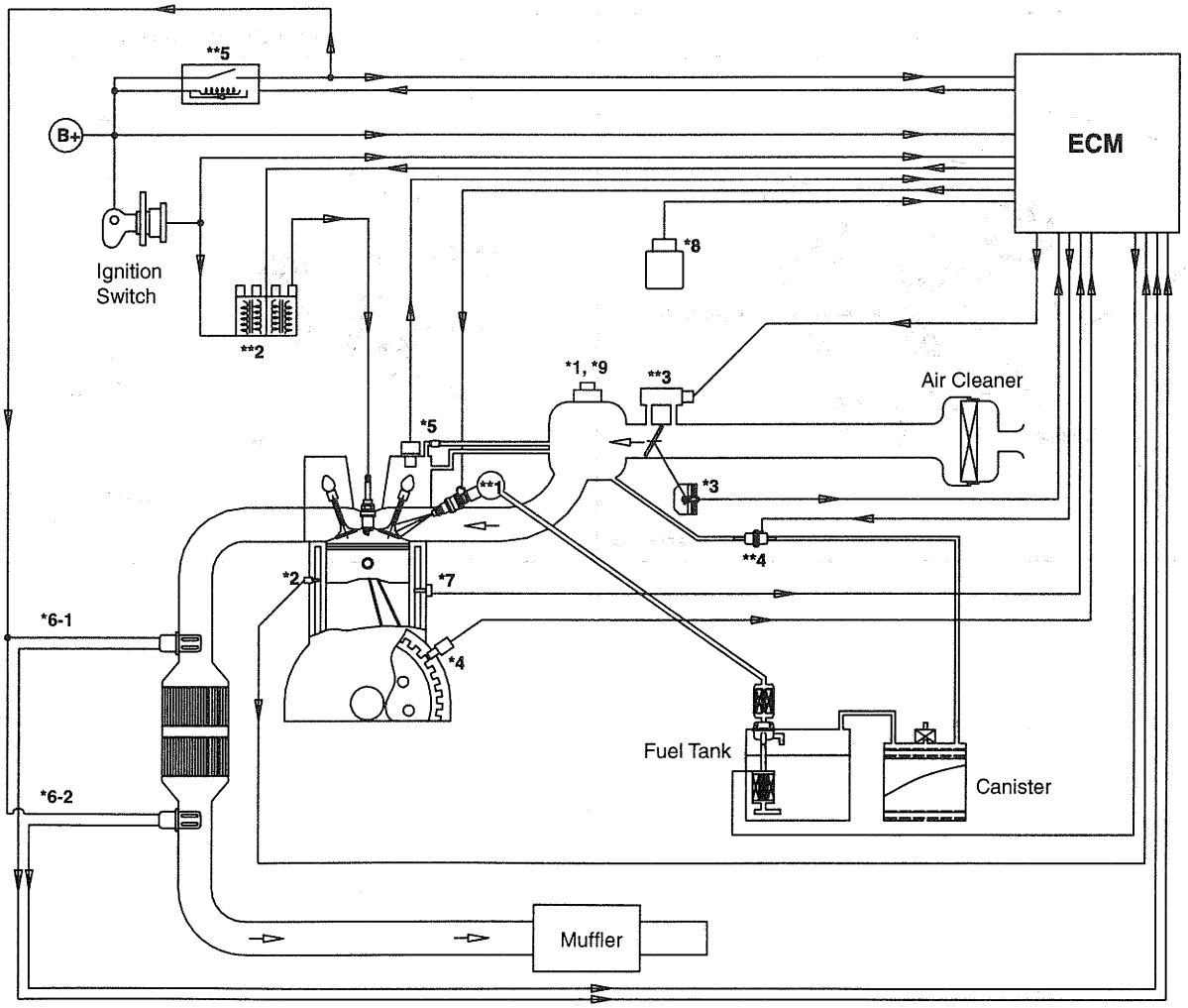
1	Purge Control Solenoid Valve (PCSV)	2	Positive Crankcase Ventilation (PCV) Vave
 EEPF005A		 EEPF006A	
3	Canister	4	Catalytic converter
 EEPF003A		 LEJF004A	

SCHEMATIC DIAGRAM EF3B6D68

*1. Manifold Absolute Pressure Sensor (MAPS)
*2. Engine Coolant Temperature Sensor (ECTS)
*3. Throttle Position Sensor (TPS)
*4. Crankshaft Position Sensor (CKPS)
*5. Camshaft Position Sensor (CMPS)
*6-1. Heated Oxygen Sensor (HO2S, Sensor 1)[Except LEADED]
*6-2. Heated Oxygen Sensor (HO2S, Sensor 2)[EOBD ONLY]
*7. Knock Sensor
*8. Vehicle Speed Sensor (VSS)
*9. Intake Air Temperature Sensor (IATS)
· Switch Input Signals

INPUT → ECM → OUTPUT

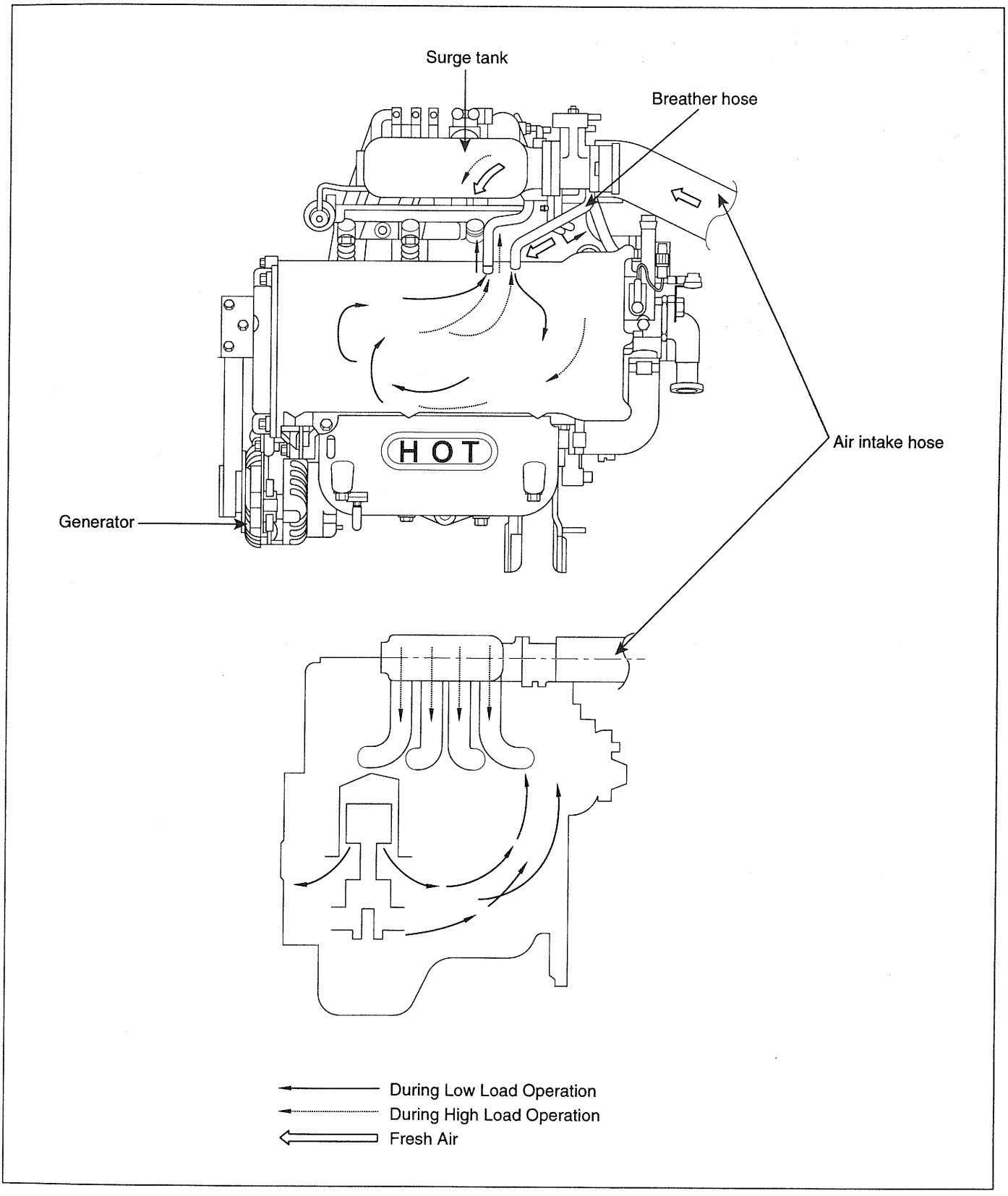
**1. Injector
**2. Ignition Coil
**3. Idle Speed Control Actuator (ISCA)
**4. Purge Control Solenoid Valve (PCSV)
**5. Main Relay
**6. Fuel Pump Relay



EEPF007A

CRANKCASE EMISSION CONTROL SYSTEM

COMPONENT EF1A1ED6



LEJF603I

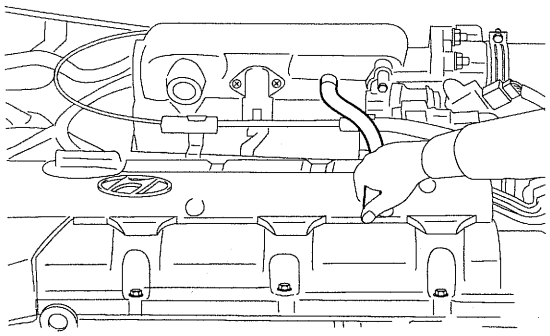
INSPECTION EB3AD343

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.

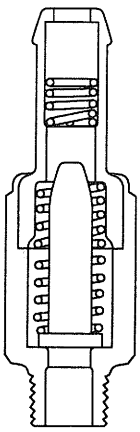


LEJF603E

POSITIVE CRANKCASE VENTILATION (PCV) VALVE

OPERATION EAB738F1

Intake manifold side (No vacuum)

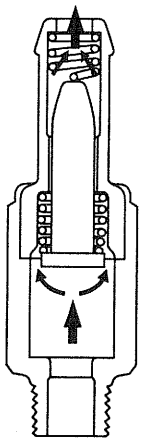


Rocker cover side

BEGE001S

Engine condition	Not running
PCV valve	Not operating
Vacuum passage	Restricted

Intake manifold side (High vacuum)

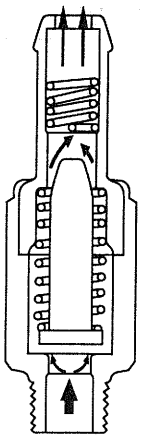


Rocker cover side

BEGE001T

Engine condition	Idling or decelerating
PCV valve	Fully operating
Vacuum passage	Small

Intake manifold side (Moderate vacuum)

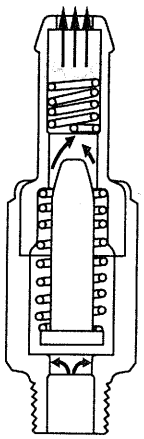


Rocker cover side

BEGE001U

Engine condition	Normal operation
PCV valve	Properly operating
Vacuum passage	Large

Intake manifold side (Low vacuum)



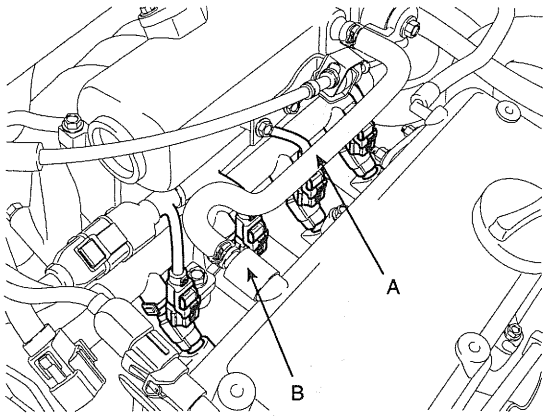
Rocker cover side

BEGE001V

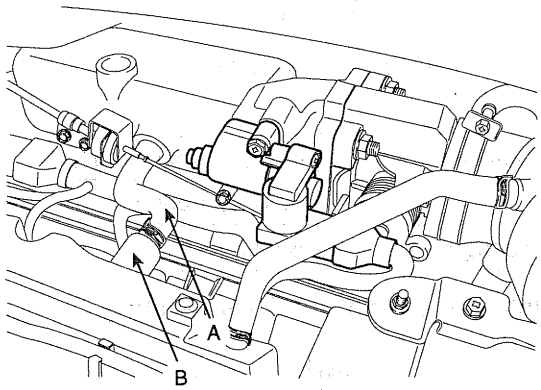
Engine condition	Accelerating and high load
PCV valve	Slightly operating
Vacuum passage	Very large

REMOVAL E12AE1DF

1. Remove the valve pad and disconnect the vacuum hose (A).



[1.1 SOHC]



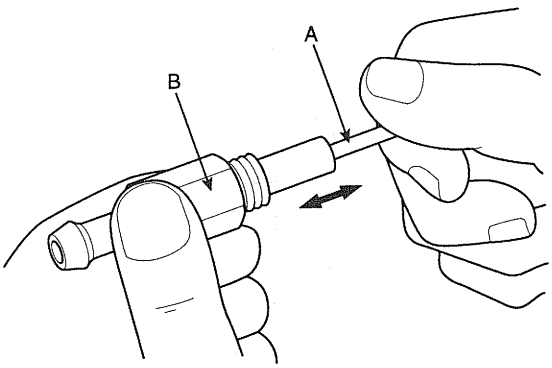
[1.4/1.6 DOHC]

EEPF008A

2. Remove the PCV Valve(B).

INSPECTION EF73431F

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.



LEIF603J

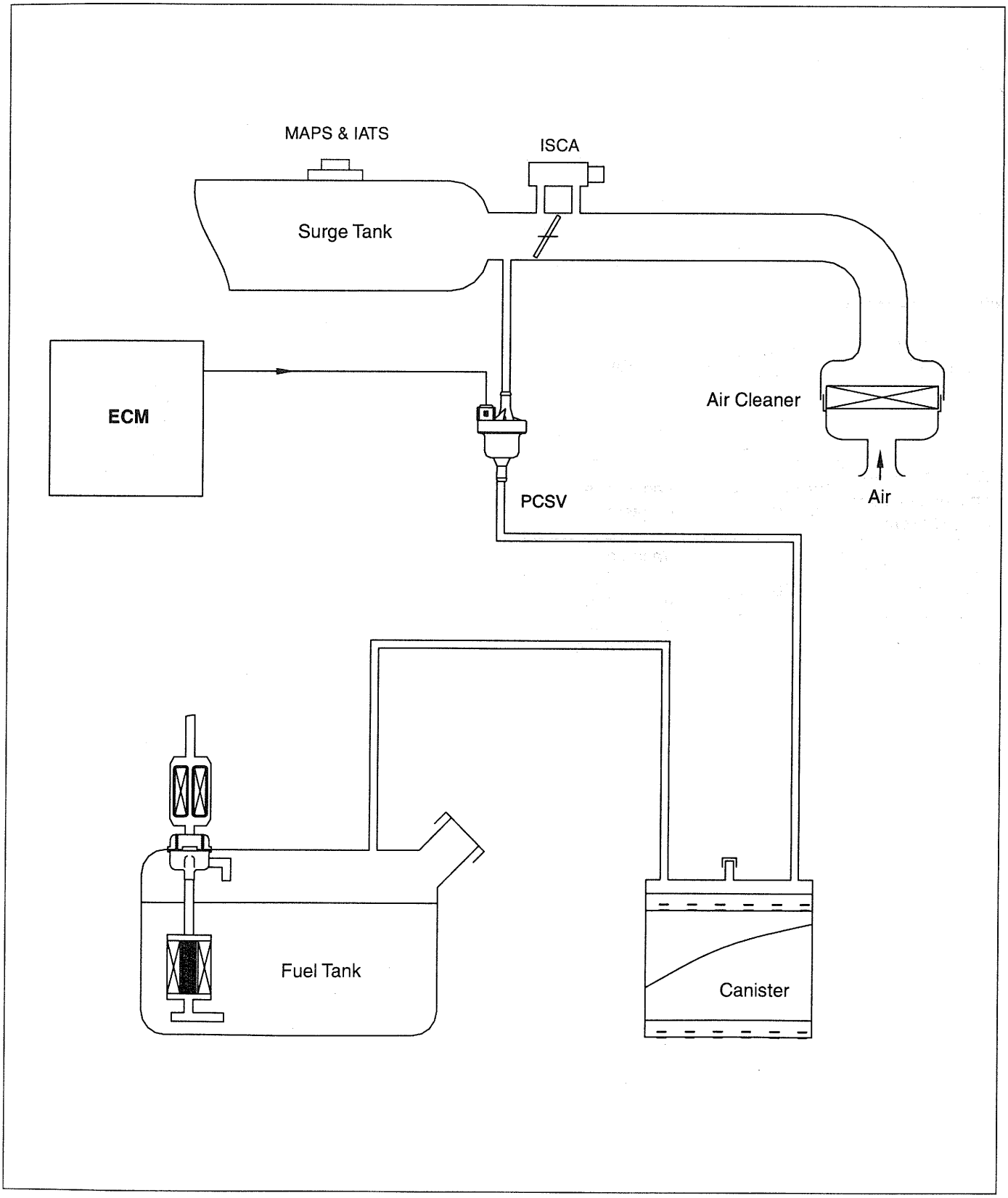
INSTALLATION EBF37FC5

1. Install the PCV valve according to the reverse order of the "REMOVAL" procedure.

PCV Valve Installation : 7.8 ~ 11.8 N·m (0.8 ~ 1.2 kgf·m, 5.8 ~ 8.7 lbf·ft)

EVAPORATIVE EMISSION CONTROL SYSTEM

COMPONENT EDE1DBC9



EEPF009A

INSPECTION E257BCF0

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		

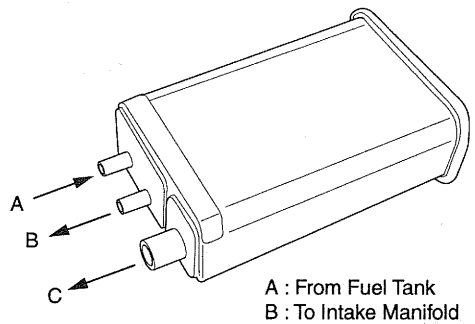
WHEN ENGINE IS WARM

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

EVAPORATIVE (EVAP) CANISTER

INSPECTION EBE4730C

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.



A : From Fuel Tank
B : To Intake Manifold
C : To Atmosphere

EEPF010A

EVAPORATIVE (EVAP) CANISTER PURGE SOLENOID VALVE

INSPECTION E6629CE8

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 PCSV and when the voltage is discontinued.

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

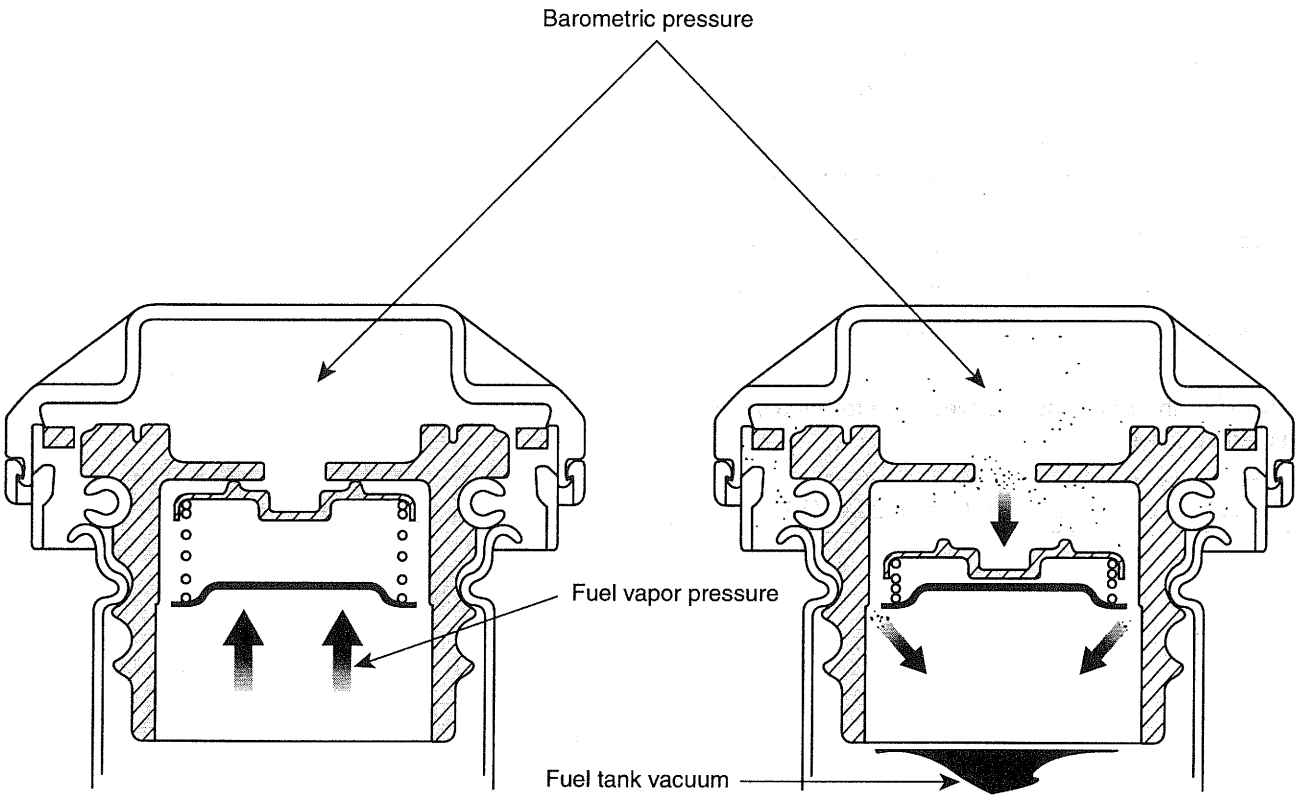
5. Measure the resistance between the terminals of the solenoid valve.

PCSV coil resistance (Ω) : 26.0 Ω at 20℃ (68°F)

FUEL FILLER CAP

DESCRIPTION E94058FB

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 retchet produces a loud clicking noise indicating the seal has been set.



When fuel tank is under pressure. **When fuel tank is under vacuum.**

LEGE015A

EXHAUST EMISSION CONTROL SYSTEM

DESCRIPTION EA34A9DC

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.