GENERAL

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purge Control Solenoid Valve (PCSV)</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Duty Control type</td>
</tr>
<tr>
<td>Resistance (Ω)</td>
<td>32.0 at 20°C (68°F)</td>
</tr>
</tbody>
</table>

TIGHTENING TORQUE

<table>
<thead>
<tr>
<th>Item</th>
<th>N•m</th>
<th>kg•cm</th>
<th>lb•ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Crankcase Ventilation Valve</td>
<td>8 ~ 12</td>
<td>80 ~ 120</td>
<td>6 ~ 8</td>
</tr>
</tbody>
</table>

TROUBLESHOOTING

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

COMPONENTS

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

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

**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

---

ECM

---

POWER SOURCE

---

FUEL TANK

---

DELIVERY PIPE

---

PRESSURE REGULATOR

---

T/BODY

---

PCV VALVE

---

SPARK PLUG

---

EX-MANIF

---

MUFFLER

---

IGNITION SWITCH

---

INJ#1

---

INJ#2

---

INJ#3

---

INJ#4

---

WCC

---

ECM

---

OBD LAMP

---

Vehcle SPEED SW INPUT (A/CON SW)

---

F/Filter

---
[1.1 SOHC, UNLEADED]
CRANKCASE EMISSION CONTROL SYSTEM

COMPONENTS

- Surge tank
- Breather hose
- Air intake hose
- Generator

- Solid line: During Low Load Operation
- Dashed line: During High Load Operation
- Solid line: Fresh Air
POSITIVE CRANKCASE VENTILATION (PCV) VALVE

OPERATION

<table>
<thead>
<tr>
<th>Engine condition</th>
<th>Normal operation</th>
<th>Engine condition</th>
<th>Accelerating and high load</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

Intake manifold side (No vacuum)  Intake manifold side (High vacuum)

Intake manifold side (Moderate vacuum)  Intake manifold side (Low vacuum)
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

ECM

MAPS & IATS

SURGE TANK

ISCA

AIR CLEANER

FUEL TANK

CANISTER

AIR

PCS V
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

<table>
<thead>
<tr>
<th>Engine operating condition</th>
<th>Applied vacuum</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idling</td>
<td>50 kPa (7.3 psi)</td>
<td>Vacuum is held</td>
</tr>
<tr>
<td>3,000 rpm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WHEN ENGINE IS WARM

<table>
<thead>
<tr>
<th>Engine operating condition</th>
<th>Applied vacuum</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idling</td>
<td>50 kPa (7.3 psi)</td>
<td>Vacuum is held</td>
</tr>
<tr>
<td>Within 3 minutes after engine start at 3,000 rpm</td>
<td>Try to apply vacuum</td>
<td>Vacuum is released</td>
</tr>
<tr>
<td>After 3 minutes have passed after engine start at 3,000 rpm</td>
<td>50 kPa (7.3 psi)</td>
<td>Vacuum will be held momentarily, after which, it will be released</td>
</tr>
</tbody>
</table>
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 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.

<table>
<thead>
<tr>
<th>Battery voltage</th>
<th>Normal condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>When applied</td>
<td>Vacuum is released</td>
</tr>
<tr>
<td>When discontinued</td>
<td>Vacuum is maintained</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>PCSV coil resistance (Ω)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32.0 Ω at 20°C (68°F)</td>
<td></td>
</tr>
</tbody>
</table>
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.

When fuel tank is under pressure.  

When fuel tank is under vacuum.
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.