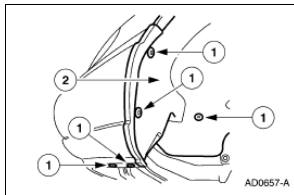


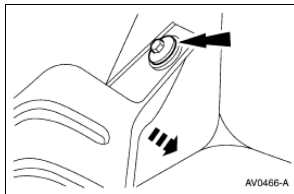
Resonator Engine Air Intake

Removal

1. Raise the vehicle; refer to [Section 100-02](#) .
2. Remove the LH front wheel and tire assembly; refer to [Section 204-04](#) .
3. Remove the LH front fender splash shield (16103).
 1. Remove the screws.
 2. Remove the inner wall.

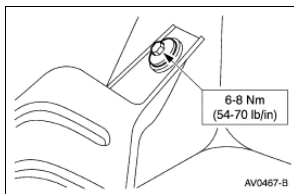


4. Remove the bolts and the engine intake air resonator (9F763) from the vehicle.

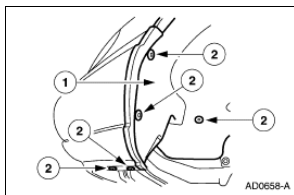


Installation

1. Follow the removal procedure in reverse order.



2. Install splash shield.
 1. Replace splash shield.
 2. Tighten screws.

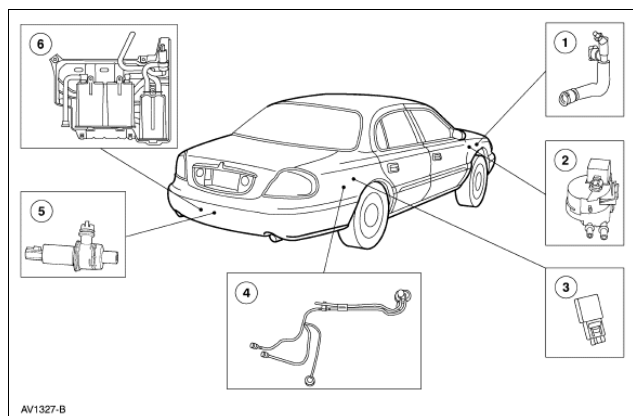


General Specifications

Item	Specification
Lubricants	
MERPOL® O-Ring Seal Lubricant	ESE-M99B144-B
P80 Rubber Lubricant Emulsion	WSE-M99C45-A2

Torque Specifications

Description	Nm	lb-ft	lb-in
Evaporative emission canister retaining bolts and nuts	10		89
Evaporative canister purge valve retaining bolts	13	10	
Evaporative canister purge valve bracket bolts	8-15		71-132
Fuel tank strap bolts	35	26	
Evaporator emission canister purge valve bolts	8-15		71-132

Evaporative Emissions**Component Location**

Item	Part Number	Description
1	9F980	Evaporative emission (EVAP) test port
2	9C915	EVAP emissions canister purge valve
3	9C052	Inline fuel tank pressure (FTP) sensor (part of fuel vapor control valve tube assembly)
4	9C047	Fuel vapor control valve tube assembly
5	9F945	Canister vent solenoid
6	9E857	Evaporative emission canister with bracket assembly

The evaporative emission system:

- prevents hydrocarbon emissions from reaching the atmosphere.
- stores fuel vapors that are generated during vehicle operation or hot soak, or vehicle refueling in the evaporative emissions (EVAP) canister until they can be consumed by the engine during normal engine operation.
- routes the stored fuel vapors to the engine during engine operation.
- is controlled by the powertrain control module (PCM) which, using various sensor inputs, calculates the desired amount of EVAP purge flow. The PCM regulates the purge flow, induced by the application of intake manifold vacuum, by varying the duty cycle applied to the canister purge valve.
- has an evaporative emission test port for test purposes.

The fuel vapors are routed:

- from the fuel tank (9002) through the fill limit valve and fuel vapor vent valve.
- to the evaporative emissions (EVAP) canister(s) (9D653) through a vapor line.
- to the engine when the evaporative emission (EVAP) canister purge valve (9C915) is opened by the powertrain control module (PCM) (12A650).

The fuel tank pressure (FTP) sensor (9C052):

- monitors the pressure level in the fuel tank.
- communicates the pressure reading to the PCM during the OBD II leak test.

The evaporative emissions (EVAP) canister (9E857):

- is located under the rear of the vehicle.
- contains activated carbon.
- stores fuel vapors.

The fuel tank filler cap (9030):

- relieves system pressure above 14 kPa (56.21 inches H₂O).
- relieves system vacuum below 3.8 kPa (15.26 inches H₂O).

The canister vent solenoid (9F945):

- is normally open.
- seals the evaporative emissions system for the inspection and maintenance (I/M 240) test and OBD II leak and pressure tests.
- is mounted to the evaporative emissions canister bracket.

The evaporative emission canister purge valve (9C915):

- is normally closed.
- regulates the purging of the evaporative emissions (EVAP) canister.
- is controlled by the powertrain control module (PCM).

The evaporative emission system monitor:

- is a self-test strategy within the powertrain control module (PCM) which tests the integrity of the EVAP system.
- monitors the EVAP system for leaks.
- monitors electronic EVAP components for irrationally high or low voltages.
- monitors for correct EVAP system operation.
- uses negative and positive leak test methods to test and activate the EVAP system.

The evaporative emission (EVAP) system test port:



- is located on the EVAP canister purge outlet tube near the canister purge valve.
- is used to connect the Evaporative Emissions System Leak Tester to the EVAP system.

The EVAP Running Loss System leak test:

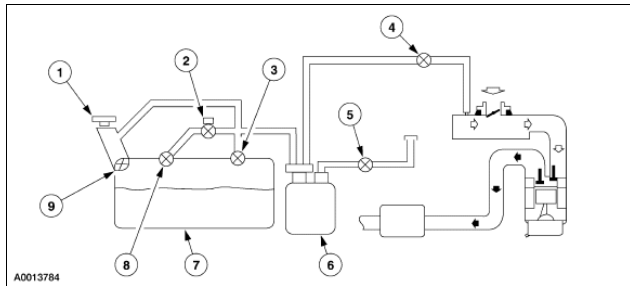
- utilizes intake manifold vacuum to test the system and involves several stages.
-

Evaporative Emissions

Special Tool(s)

	Evaporative Emission System Leak Tester 310-F007 (134-00056) or equivalent
	Worldwide Diagnostic System (WDS) 418 F224 New Generation STAR (NGS) Tester 418 F052, or equivalent scan tool

Evaporative Emission System



Item	Part Number	Description
1	9030	Fuel filler cap
2	9B593	Fuel vapor vent valve
3	9C052	Fuel tank pressure sensor
4	9C915	Evaporative emission canister purge valve
5	9F945	Canister vent solenoid
6	9D653	Evaporative emission canister
7	9002	Fuel tank
8	9B190	Fuel vapor control valve
9	9189	Fuel filler pipe check valve

Principles of Operation

Evaporative Emission Canister Purge Valve

The EVAP canister purge valve is controlled by the powertrain control module (PCM). The EVAP canister purge valve controls the flow of fuel vapors from the EVAP canister to the engine intake manifold during various engine operating modes. The EVAP canister purge valve is normally closed.

Evaporative Emission Canister

Fuel vapors from the fuel tank are stored in the EVAP canister. When the engine is running, the vapors are purged from the EVAP canister for combustion. OBD II vehicles sometimes use multiple canisters, which is

dependent upon the size and number of the fuel tanks used on a specific vehicle.

Canister Vent Solenoid

During the Evaporative Emission Running Loss System test monitor, Evaporative Emissions Repair Verification Drive Cycle, and the Evaporative Emission System Leak Test, the canister vent solenoid is closed to allow either a vacuum to be drawn on the fuel tank or to hold a specified pressure in the system. The canister vent solenoid is normally open.

Fuel Tank Pressure (FTP) Sensor

The fuel tank pressure sensor is used to measure the fuel tank pressure during the Evaporative Emissions monitor test. It is also used to control excessive fuel tank pressures by forcing the EVAP system to purge. The fuel tank pressure sensor can be either tank mounted or remotely mounted in the fuel vapor control valve hose (tube) as it crosses over the fuel tank.

Fuel Vapor Control Valve

The fuel vapor control valve is normally between the EVAP canister and the fuel vapor vent valve. Its function is to prevent the flow of liquid fuel into the EVAP canister or up to the canister purge valve during refueling, and to prevent the collection of liquid fuel in the fuel vapor hoses by overfilling the fuel tank.

Fuel Vapor Vent Valve (FVV) Assembly

The fuel vapor vent valve (FVV) assembly is mounted on the top of the fuel tank. It is used to control the flow of fuel vapors entering the EVAP system. The head portion of the assembly prevents the fuel tank from overfilling during refueling. The assembly also has a spring float, which prevents liquid fuel from entering the vapor delivery system under severe handling or vehicle roll over conditions. In the upright position, the open bottom of the float will lift and shut off the orifice. Under severe handling conditions, the spring will push the float closed when angles allow liquid fuel to reach the orifice. In a roll over condition, the weight of the open bottom float and spring pressure will close the orifice.

Fuel Filler Pipe Check Valve

The fuel filler pipe check valve is an intricate part of the fuel tank or the fuel filler pipe. It is intended to prevent liquid fuel from re-entering the fuel filler pipe from the fuel tank on refueling or roll over conditions.

Fuel Filler Cap

The fuel filler cap is used to prevent fuel spill and to close the EVAP system to atmosphere.

Evaporative Emission System Monitor

When a fault occurs, the EVAP system monitor is reset to NO and a diagnostic trouble code (DTC) is set in the PCM memory. After the DTC is repaired, the vehicle drive cycle must be completed to reset the monitor in preparation for inspection and maintenance testing.

EVAP Running Loss System Leak Test

To start the testing, conditions of stable purging and vehicle speed must be satisfied. During the first stage, the EVAP canister vent solenoid is closed, while the EVAP canister purge valve remains open, applying and building vacuum in the system as indicated by the FTP sensor. This phase checks for major leaks in the EVAP system.

In the second stage, the EVAP canister purge valve closes and the system looks for minimal decay rate in the EVAP vacuum, indicating the absence of any small EVAP system leaks.

The last stage is entered only if stage two of the leak test has failed and checks whether the failed test was due to excess vapor generation. It monitors fuel vapor generation rate. Initially, the canister vent solenoid is opened to equalize EVAP system pressure to atmosphere. Then the canister vent solenoid is closed, allowing pressure to build if vapor generation is present in sufficient quantity. If the rate of generation is found to be too high, the EVAP running loss system leak test is aborted. If not, then a small leak is diagnosed.

On-Board Refueling Vapor Recovery (ORVR) Evaporative Emission (EVAP) System

The basic elements forming the ORVR system are as follows:

- The fuel filler pipe forms a seal to prevent vapors from escaping the fuel tank while liquid is entering the fuel tank. Liquid in the one inch diameter tube blocks vapors from rushing back up the fuel filler pipe.
- A fuel vapor control valve controls the flow of vapors out of the fuel tank. The valve closes when the liquid level reaches a height associated with fuel tank usable capacity. The valve accomplishes the following:
 - ◆ Limits the total amount of fuel that can be dispensed into the fuel tank.
 - ◆ Prevents liquid gasoline from exiting the fuel tank when submerged, as well as when tipped beyond a horizontal plane as part of the vehicle rollover protection in road accidents.
 - ◆ Minimizes vapor flow resistance during anticipated refueling conditions.
- Fuel vapor tubing connects the fuel vapor control valve to the EVAP canister. This routes the fuel tank vapors, displaced by the incoming liquid, to the EVAP canister.
- A check valve in the fuel filling system prevents liquid from rushing back up the fuel filler pipe during the liquid flow variations associated with the filler nozzle shut-off.

Between refueling events, the EVAP canister is purged with fresh air so that it may be used again to store vapors accumulated during engine soaks or subsequent refueling events. The vapors drawn off are consumed by the engine.

Inspection and Verification

1. Verify the customer concern is with the evaporative emission (EVAP) system.
2. Visually inspect for the following obvious signs of mechanical damage.

Visual Inspection Chart

Mechanical
<ul style="list-style-type: none"> • Fuel filler cap • EVAP test port • EVAP canister or vent solenoid • Canister hoses • Vacuum lines or hoses

3. If the concern remains after the inspection, connect the scan tool to the data link connector (DLC) located beneath the instrument panel and select the vehicle to be tested from the scan tool menu. If the scan tool does not communicate with the vehicle:
 - check that the program card is correctly installed.
 - check the connections to the vehicle.
 - check the ignition switch position.
4. If the scan tool still does not communicate with the vehicle, refer to the scan tool manual.
5. Carry out the DATA LINK DIAGNOSTICS test. If the scan tool responds with:
 - CKT914, CKT915 or CKT70 = ALL ECUS NO RESP/NOT EQUIP, refer to [Section 418-00](#) .
 - NO RESP/NOT EQUIP for PCM, refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.
 - SYSTEM PASSED, retrieve and record the continuous diagnostic trouble codes (DTCs), erase the continuous DTCs and carry out the PCM KOEO self-test.
6. If the DTCs retrieved are related to the concern, go to the PCM Diagnostic Trouble Code (DTC) Index to continue diagnostics.
7. If the concern remains after the inspection, determine the symptom. GO to [Symptom Chart](#) .

PCM Diagnostics Trouble Code (DTC) Index

DTC	Description	Source	Action
P0442	Small leak detected in EVAP system (As small as 1.02 mm [0.040 inch])	PCM	Go To Pinpoint Test A .
P0455	Major leak or no flow detected	PCM	Go To Pinpoint Test B .
P1443	Very small or no purge flow detected	PCM	Go To Pinpoint Test B .
P1450	Excessive vacuum detected in the fuel tank	PCM	Go To Pinpoint Test C .
	Any other PCM DTC	PCM	REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

Symptom Chart

SYMPTOM CHART

Pinpoint Tests

NOTE: Reinstall or install new evaporative emission hose clamps removed or damaged during testing procedures.

PINPOINT TEST A: DTC P0442 SMALL LEAK IN EVAP SYSTEM

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PINPOINT TEST B: DTC P0455 MAJOR LEAK OR NO FLOW DETECTED OR DTC P1443 VERY SMALL OR NO PURGE FLOW DETECTED IN SYSTEM

PINPOINT TEST C: DTC P1450 EXCESSIVE VACUUM DETECTED IN THE FUEL TANK

PINPOINT TEST D: HISSING SOUND WHEN REMOVING FUEL CAP

PINPOINT TEST E: EXCESSIVE FUEL ODOR

PINPOINT TEST F: UNABLE TO REFUEL VEHICLE
