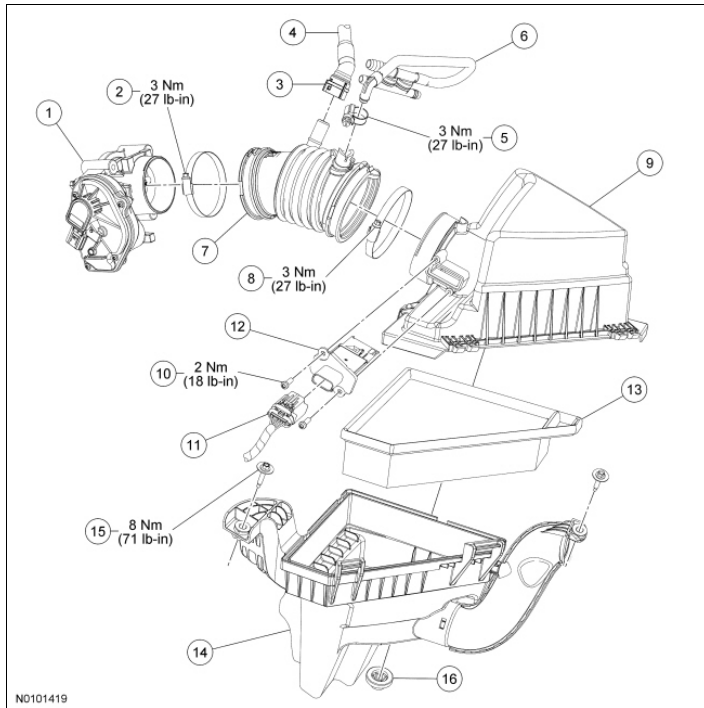


Intake Air System Components - Exploded View



Item	Part Number	Description
1	9F991	Throttle Body (TB)
2	9628	Air Cleaner (ACL) outlet pipe-to- TB clamp
3	-	Crankcase ventilation tube-to- ACL outlet pipe quick connect coupling (part of 6853)
4	6853	Crankcase ventilation tube
5	9628	Power brake booster aspirator tube-to- ACL outlet pipe clamp
6	2420	Power brake booster aspirator tube
7	9R504	ACL outlet pipe
8	9628	ACL outlet pipe-to- ACL cover clamp
9	-	ACL cover (part of 9600)
10	W711655	Mass Air Flow (MAF) screw (2 required)
11	14A464	MAF sensor electrical connector
12	12B579	MAF sensor
13	9601	ACL element
14	9600	ACL assembly
15	W701389	ACL assembly bolt (2 required)
16	9B929	ACL -to-body isolator

1. For additional information, refer to the procedures in this section.

Air Cleaner

1. Disconnect the Mass Air Flow (MAF) sensor electrical connector.
2. Loosen the clamp and disconnect the Air Cleaner (ACL) outlet pipe from the ACL cover.
 - To install, tighten to 3 Nm (27 lb-in).
3. Remove the 2 ACL assembly bolts.
 - To install, tighten to 8 Nm (71 lb-in).
4. **NOTE:** No tools are required to remove the ACL assembly. Removal should be carried out using hands only.

Release the ACL assembly from the body isolator.

- Remove the ACL assembly.
5. **NOTE:** Make sure the ACL assembly is seated into the body isolator.

NOTE: The ACL outlet pipe should be securely sealed to prevent unmetered air from entering the engine.

To install, reverse the removal procedure.

Air Cleaner Outlet Pipe

1. Disconnect the crankcase ventilation tube-to-Air Cleaner (ACL) outlet pipe quick connect coupling.
For additional information, refer to [Section 310-00](#).
2. Loosen the clamp and disconnect the power brake booster aspirator tube-to- ACL outlet tube.
 - To install, tighten to 3 Nm (27 lb-in).
3. Loosen the clamp and disconnect the ACL outlet pipe from the ACL cover.
 - To install, tighten to 3 Nm (27 lb-in).
4. Loosen the clamp and disconnect the ACL outlet pipe from the Throttle Body (TB).
 - To install, tighten to 3 Nm (27 lb-in).
5. **NOTE:** The ACL outlet pipe should be securely sealed to prevent unmetered air from entering the engine.

To install, reverse the removal procedure.

Torque Specifications

Description	Nm	lb-ft	lb-in
Evaporative Emission (EVAP) canister nuts	2	-	18
Fuel tank strap bolt	25	18	-

Evaporative Emissions

The Evaporative Emission (EVAP) system consists of the:

- EVAP canister purge valve.
- EVAP canister.
- EVAP canister vent solenoid.
- Fuel Tank Pressure (FTP) sensor (part of 9002).
- fuel tank filler cap.

The EVAP system:

- utilizes an On-Board Refueling Vapor Recovery (ORVR) system that captures the fuel vapors from the vehicle's fuel tank during refueling.
- prevents hydrocarbon emissions from reaching the atmosphere.
- stores fuel vapors in the EVAP canister, that are generated during vehicle operation or hot soak, 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 PCM which, using various sensor inputs, calculates the desired amount of purge flow. The PCM regulates the purge flow, induced by the application of intake manifold vacuum, by varying the duty cycle applied to the EVAP canister purge valve.

The fuel vapors are routed:

- from the fuel tank through the fill limit valve and fuel vapor vent valve.
- to the EVAP canister through the fuel vapor tube assembly.
- to the engine when the EVAP canister purge valve is opened by the PCM.

The EVAP canister:

- is mounted on the top of the fuel tank.
- contains activated carbon.
- stores fuel vapors.

The fuel tank filler cap:

- relieves system vacuum below 5.4 kPa (22.642 in H₂O) and system pressure above 23.3 kPa (93.54 H₂O).

The EVAP canister vent solenoid:

- is normally open.
- seals the EVAP system for the inspection and maintenance (I/M 240) test and OBD II leak and pressure tests.
- is mounted to the EVAP canister.
- is serviced as a separate item.

The EVAP canister purge valve:

- is normally closed.
- regulates the purging of the EVAP canister.

- is controlled by the PCM.
- is repaired as a separate item.

The FTP sensor:

- monitors the pressure levels in the fuel tank.
- communicates the pressure reading to the PCM during the OBD II leak test.
- is located in the fuel vapor tube assembly and is serviced as part of the fuel tank.

The EVAP system monitor:

- is a self-test strategy within the 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.

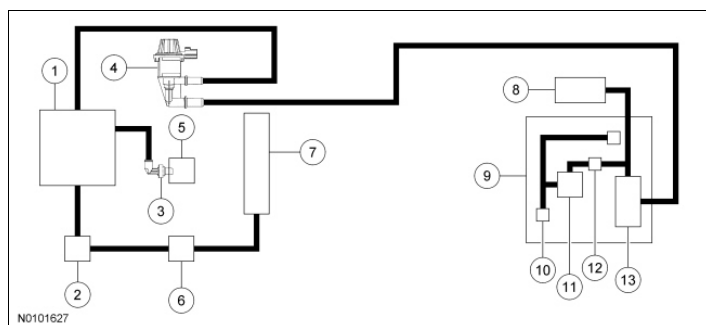
The engine ON EVAP leak-check monitor:

- is executed by the individual components of the enhanced EVAP system. Intake manifold vacuum is utilized to reach a target vacuum on the EVAP system. The FTP sensor is used by the engine ON EVAP leak-check monitor to determine if the target vacuum necessary to carry out the leak-check on the FTP system has been reached. Once target vacuum on the EVAP system is achieved, the change in EVAP system vacuum over a calibrated period of time determines if a leak exists.

The Engine Off Natural Vacuum (EONV) EVAP leak-check monitor is executed:

- once the engine ON EVAP leak-check monitor is completed and the key is turned OFF. The EONV EVAP leak-check monitor determines if a leak is present when the naturally occurring change in the fuel tank pressure or vacuum does not exceed a calibrated limit during a calibrated amount of time. A separate, low-power consuming microprocessor in the PCM manages the EONV leak-check. The engine OFF EVAP leak-check monitor is executed by the individual components of the enhanced EVAP system.

Vehicle Emission Vacuum Routing



Item	Part Number	Description
1	9424	Intake manifold
2	2420	Power brake booster aspirator
3	-	PCV valve (part of 6A785)
4	9G641	Evaporative Emission (EVAP) canister purge valve
5	6A785	Crankcase vent oil separator

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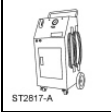

6	9R504	Air Cleaner (ACL) outlet pipe
7	6582	Valve cover
8	9032	Fuel tank filler pipe
9	9002	Fuel tank
10	-	Vapor valve (part of 9002) (2 required)
11	-	Fuel Limit Vent Valve (FLVV) (part of 9002)
12	-	Fuel Tank Pressure (FTP) sensor (part of 9002)
13	9C985	EVAP canister

Evaporative Emissions

Refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

Evaporative Emission System Leak Test

Special Tool(s)

 ST2817-A	VACUTEC Smoke Machine Fuel EVAP Emissions System Tester 218-0002 or equivalent
 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Phase 1 - Leak Verification

1. Run the EVAP Test with the scan tool.
2. **NOTE:** Some small leaks may not be detected using the EVAP Test. If the system has passed the test but a leak is still suspected, then proceed to Phase 2.

If the Evaporative Emission (EVAP) system failed the EVAP Test, then proceed to Phase 2.

Phase 2 - System Leak Check

1. Disconnect the upper vapor tube-to- EVAP canister purge valve quick connect coupling. For additional information, refer to [Section 310-00](#) .
2. Connect the VACUTEC Smoke Machine Fuel EVAP Emissions System Tester to the upper EVAP canister purge valve fitting. For additional information, refer to the manufacturer's instructions.
3. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#) .
4. **NOTE:** The battery ground cable was previously disconnected in the vapor tube quick connect coupling procedure.

Connect the battery ground cable. For additional information, refer to [Section 414-01](#) .

5. **NOTE:** In the scan tool, the EVAP canister purge valve is referred to as the EVAP vapor management valve.

Open the EVAP canister purge valve with the scan tool.

6. Close the canister vent solenoid with the scan tool.
7. Carefully turn the fuel tank filler cap counterclockwise until the thread disengages and position aside.
8. **NOTE:** If smoke does not exit the fuel tank filler pipe neck area after the system is pressurized, open the canister vent solenoid with the scan tool to allow the air to purge. Once smoke is seen at the canister vent solenoid, close the canister vent solenoid with the scan tool.

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Introduce smoke from the VACUTEC Smoke Machine Fuel EVAP Emissions System Tester into the EVAP system and verify that smoke is exiting the fuel tank filler pipe neck area. For additional information, refer to the manufacturer's instructions.

9. Install the fuel tank filler cap once smoke is observed exiting the fuel tank filler pipe neck area.
 10. Continue to enter smoke into the system for 60 seconds to obtain pressure.
 11. Press and release the remote start button in intervals of 15 seconds ON and 15 seconds OFF while checking for exiting smoke.
 12. Use the halogen light provided with the VACUTEC Smoke Machine Fuel EVAP Emissions System Tester to follow the EVAP system path and look for smoke exiting at the source of the leak(s).
 13. Repair any leaks as necessary.
 14. Repeat the leak test until the system passes.
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