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2022 Ford Transit-150 Service and Repair Manual

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If the vapor generation is high, where the monitor does not pass, the result is treated as a no test. Therefore, the test is complete for the day.

Engine On EVAP Leak Check Monitor

The engine on EVAP (evaporative emission) leak check monitor is executed by the individual components of the EVAP (evaporative emission) system as follows:

- The EVAP (evaporative emission) purge valve controls the flow of vacuum from the engine and creates a target vacuum on the fuel tank.
- The EVAP (evaporative emission) canister vent valve seals the EVAP (evaporative emission) system from the atmosphere. It is closed by the PCM (powertrain control module) (100% duty cycle) to allow the EVAP (evaporative emission) purge valve to achieve the target vacuum on the fuel tank.
- The FTP sensor is used by the engine on EVAP (evaporative emission) leak check monitor to determine if the target vacuum necessary to carry out the leak check on the fuel tank is reached. Once the target vacuum on the fuel tank is achieved, the change in fuel tank vacuum over a calibrated period of time determines if a leak exists.
- If the initial target vacuum cannot be reached, DTC P0455 (gross leak detected) sets. The engine on EVAP (evaporative emission) leak check monitor aborts and does not continue with the leak check portion of the test. If the initial target vacuum cannot be reached after a refueling event and the purge vapor flow is excessive, DTC P0457 (fuel cap off) sets.
- If the initial target vacuum is exceeded, a system flow concern exists and DTC P1450 (unable to bleed up fuel tank vacuum) is set. The engine on EVAP (evaporative emission) leak check monitor aborts and does not continue with the leak check portion of the test.
- If the vacuum increase is quicker than expected, a blocked fuel vapor tube is suspected and if confirmed after an intrusive test, DTC P144A sets.
- If the target vacuum is achieved on the fuel tank, the change in the fuel tank vacuum (bleed up) is calculated for a calibrated period of time. The calculated change in fuel tank vacuum is compared to a calibrated threshold for a leak from an opening of 1.0 mm (0.040 inch) in the EVAP (evaporative emission) system. If the calculated bleed up is less than the calibrated threshold, the EVAP (evaporative emission) system passes. If the calibrated bleed up exceeds the calibrated threshold, the test aborts. The test can be repeated up to 3 times.
- If the bleed up threshold is still being exceeded after 3 tests, a vapor generation test is carried out before DTC P0442 (small leak detected) sets. This is accomplished by returning the EVAP (evaporative emission) system to atmospheric pressure by closing the EVAP (evaporative emission) purge valve and opening the EVAP (evaporative emission) canister vent valve. Once the FTP sensor observes the fuel tank is at

- The EONV EVAP (evaporative emission) leak check monitor uses the naturally occurring change in fuel tank pressure as a means to detect a leak in the EVAP (evaporative emission) system. At ignition OFF, a target pressure and vacuum is determined by the PCM (powertrain control module) . These target values are based on the fuel level and the ambient temperature at ignition OFF. As the fuel tank temperature increases, the pressure in the tank increases and as the temperature decreases a vacuum develops. If a leak is present in the EVAP (evaporative emission) system the fuel tank pressure or vacuum does not exceed the target value during the testing time period. The EONV EVAP (evaporative emission) leak check monitor begins at ignition OFF. After ignition OFF the normally open EVAP (evaporative emission) canister vent valve remains open for a calibrated amount of time to allow the fuel tank pressure to stabilize with the atmosphere. During this time period the FTP sensor is monitored for an increase in pressure. If pressure remains below a calibrated limit the EVAP (evaporative emission) canister vent valve is closed by the PCM (powertrain control module) (100% duty cycle) and seals the EVAP (evaporative emission) system from the atmosphere.

- If the pressure on the fuel tank decreases after the EVAP (evaporative emission) system is sealed, the EONV EVAP (evaporative emission) leak check monitor begins to monitor the fuel tank pressure. When the target vacuum is exceeded within the calibrated amount of time the test completes and the fuel tank pressure and time since ignition OFF information is stored. If the target vacuum is not reached in the calibrated amount of time, a leak is suspected and the fuel tank pressure and time since ignition OFF information is stored.

- If the pressure on the fuel tank increases after the EVAP (evaporative emission) system is sealed, but does not exceed the target pressure within a calibrated amount of time, the EVAP (evaporative emission) canister vent valve is opened to allow the fuel tank pressure to again stabilize with the atmosphere. After a calibrated amount of time the EVAP (evaporative emission) canister vent valve is closed by the PCM (powertrain control module) and seals the EVAP (evaporative emission) system. When the fuel tank pressure exceeds either the target pressure or vacuum within the calibrated amount of time, the test completes and the fuel tank pressure and time since ignition OFF information is stored. If the target pressure or vacuum is not reached in the calibrated amount of time, a leak is suspected and the fuel tank pressure and time since ignition OFF information is stored.

- On ISO 14229 vehicles, a fast initial response occurs during the first 4 tests after the battery is disconnected or the DTCs are cleared. The PCM (powertrain control module) processes unfiltered data to quickly indicate a fault is present. The MIL (malfunction indicator lamp) illuminates if the PCM (powertrain control module) suspects a leak within 2 consecutive trips after a DTC clear or a battery disconnect using the fast initial response logic. A step change logic becomes active after the 4th EONV EVAP (evaporative emission) monitor test. The step change logic detects an abrupt change from a no leak condition to a suspected leak condition. The MIL (malfunction indicator lamp) illuminates if the PCM (powertrain control module) suspects a leak within 2 consecutive trips using the step change logic. During the EONV EVAP (evaporative emission) monitor test the PCM (powertrain control module) uses an exponentially weighted moving average to filter test data. The PCM (powertrain control module) uses

Evaporative Emissions

303-13B Evaporative Emissions - 3.3L Duratec-V6	***2022 F-150***
Diagnosis and Testing	***Procedure revision date: 08/4/2021***

Evaporative Emissions

Diagnostic Trouble Code (DTC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

Diagnostic Trouble Code Chart

Module	DTC (diagnostic trouble code)	Description	Action
PCM (powertrain control module)	P00FE:00	EVAP System Tank Vapor Line Restricted/Blocked: No Sub Type Information	GO to Pinpoint Test HX
PCM (powertrain control module)	P0442:00	EVAP System Leak Detected (Small Leak): No Sub Type Information	GO to Pinpoint Test HX
PCM (powertrain control module)	P0443:00	EVAP System Purge Control Valve A Circuit: No Sub Type Information	GO to Pinpoint Test HX
PCM (powertrain control module)	P0446:00	EVAP System Vent Control Circuit: No Sub Type Information	GO to Pinpoint Test HX

PCM (powertrain control module)	P1450:00	Unable To Bleed Up Fuel Tank Vacuum: No Sub Type Information	GO to Pinpoint Test HX
PCM (powertrain control module)	P2418:00	EVAP System Switching Valve Control Circuit/Open: No Sub Type Information	GO to Pinpoint Test HX
PCM (powertrain control module)	P2450:00	EVAP System Switching Valve Performance/Stuck Open: No Sub Type Information	GO to Pinpoint Test HX
PCM (powertrain control module)	P260F:00	EVAP System Monitoring Processor Performance: No Sub Type Information	GO to Pinpoint Test HX

Global Customer Symptom Code (GCSC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

Global Customer Symptom Code Chart

Customer Symptom	Action
Driving Performance > Idle Quality > Rough > Always	GO to Pinpoint Test HX
Driving Performance > Stalls/Quits > At Idle > Always	GO to Pinpoint Test HX
Driving Performance > Engine Surge > At Idle > Always	GO to Pinpoint Test HX

Pinpoint Tests

PINPOINT TEST HX : EVAPORATIVE EMISSION (EVAP) SYSTEM AND MONITOR

WARNING

Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high

		than expected, a restricted fuel vapor tube is suspected and an intrusive test is carried out in the final phase of the EVAP (evaporative emission) monitor. Check the fuel vapor tube for a restriction between the fuel tank pressure sensor and the fuel tank.
PCM (powertrain control module) P0442:00	EVAP System Leak Detected (small leak): No Sub Type Information	Sets when the PCM (powertrain control module) detects a small fuel vapor leak by the EVAP (evaporative emission) running loss monitor test. Check for a missing fuel filler cap or the integrity of the cap (if equipped). Verify the capless fuel tank filler pipe is sealed correctly (if equipped). Install and remove the supplemental fueling adapter five times in the capless fuel tank filler pipe to clear debris on the seal. Refer to the Owner Literature for the location of the supplemental fueling adapter in the vehicle. Check for loose or damaged vapor hoses. Visually inspect the EVAP (evaporative emission) canister inlet port, EVAP (evaporative emission) canister vent valve filter, and canister vent hose assembly for contamination or debris.
PCM (powertrain control module) P0443:00	EVAP System Purge Control Valve 'A' Circuit: No Sub Type Information	Sets when the PCM (powertrain control module) detects the signal moves outside the minimum or maximum limit for the commanded state. To verify normal function, monitor the EVMV PID (parameter identification) or EVAP canister pressure PID (parameter identification) and the signal voltage (PCM (powertrain control module) control side). With the valve closed, the EVMV indicates 0 mA (0% duty cycle for EVAP (evaporative emission) canister pressure) and voltage approximately equal to battery voltage. When the valve is commanded fully open, EVMV indicates 1,000 mA (100% duty cycle for EVAP (evaporative emission) canister pressure) and a voltage drop of 3 volts minimum is normal.
PCM (powertrain control module) P0446:00	EVAP System Vent Control Circuit: No Sub Type Information	Sets when the PCM (powertrain control module) detects the signal moves outside the minimum or maximum allowable calibrated parameters for a specified EVAP (evaporative emission) canister vent valve duty cycle by PCM (powertrain control module) command. To verify normal function, monitor the EVAP canister vent valve signal PID (parameter identification) EVAP (evaporative emission) canister vent and the signal voltage (PCM (powertrain control module) control side). With the valve open, EVAP (evaporative emission) canister vent indicates 0% duty cycle and a

module) P0455:00	No Sub Type Information	(evaporative emission) running loss monitor test with the engine running, but not at idle. The PCM (powertrain control module) monitors the complete EVAP (evaporative emission) control system for no purge flow, the presence of a large fuel vapor leak, or multiple small fuel vapor leaks. Check for audible vacuum noise or significant fuel odor in the engine compartment or near the EVAP (evaporative emission) canister and fuel tank. Verify the capless fuel tank filler pipe is sealed correctly. Install and remove the supplemental fueling adapter five times in the capless fuel tank filler pipe to clear debris on the seal. Refer to the Owner's's Literature for the location of the supplemental fueling adapter in the vehicle.
PCM (powertrain control module) P0456:00	EVAP System Leak Detected (very small leak): No Sub Type Information	Sets when the PCM (powertrain control module) detects a very small fuel vapor leak by the engine off natural vacuum leak check monitor. Refer to the EVAP (evaporative emission) Leak Check Monitor, Engine Off Natural Vacuum Leak Check Monitor description for additional information. Check for a missing fuel filler cap or the integrity of the cap (if equipped). Verify the capless fuel tank filler pipe is sealed correctly (if equipped). Install and remove the supplemental fueling adapter five times in the capless fuel tank filler pipe to clear debris on the seal. Refer to the Owner's's Literature for the location of the supplemental fueling adapter in the vehicle. Check for loose or damaged vapor hoses. Visually inspect the EVAP (evaporative emission) canister inlet port, EVAP (evaporative emission) canister vent valve filter, and EVAP (evaporative emission) canister vent hose assembly for contamination or debris.
PCM (powertrain control module) P0457:00	EVAP System Leak Detected (fuel cap loose/off): No Sub Type Information	Sets when the PCM (powertrain control module) detects a gross leak while the refueling flag is set and a loose fuel filler cap (if equipped) or an incorrectly sealed capless fuel tank filler pipe (if equipped) is suspected. On most vehicles, a message on the IPC (instrument panel cluster) displays to instruct the driver to check the fuel cap or capless fuel tank filler pipe (if equipped). The PCM (powertrain control module) continuously monitors the fuel level and retains the last updated value prior to the ignition being placed in the OFF mode. After the ignition is placed in the ON mode, a new fuel level is taken and compared to the level recorded at ignition OFF. If the fuel level has increased, a flag is set in the PCM (powertrain control module) indicating the vehicle was

		vacuum increases quicker than expected, a restricted fuel vapor tube is suspected and an intrusive test is carried out in the final phase of the EVAP (evaporative emission) monitor. Check the fuel vapor tube for a restriction between the FTP sensor and the fuel tank.
PCM (powertrain control module) P144C:00	EVAP System Purge Flow Performance During Boost: No Sub Type Information	Sets when the PCM (powertrain control module) detects the fuel tank pressure exceeds a calibrated amount within a specified amount of time during the test (single path check valve), or when the fuel tank vacuum is less than a calibrated amount within a specified amount of time or when the fuel tank pressure exceeds a calibrated amount within a specified amount of time during the test (dual path check valve). The EVAP (evaporative emission) check valve test is carried out during minimal boost conditions, once per drive cycle, when entry conditions are met.
PCM (powertrain control module) P1450:00	Unable to Bleed Up Fuel Tank Vacuum: No Sub Type Information	Sets when the PCM (powertrain control module) detects the EVAP (evaporative emission) running loss monitor detects excessive fuel tank vacuum with the engine running, but not at idle. Visually inspect the EVAP (evaporative emission) canister inlet port, EVAP (evaporative emission) canister vent valve filter, and EVAP (evaporative emission) canister vent hose assembly for contamination or debris. Check EVAP (evaporative emission) purge valve for vacuum leak.
PCM (powertrain control module) P2418:00	EVAP System Switching Valve 'A' Control Circuit/Open: No Sub Type Information	Sets when the PCM (powertrain control module) detects the signal moves outside the minimum or maximum limit for the commanded state of the EVAP (evaporative emission) vapor blocking valve.
PCM (powertrain control module) P2450:00	EVAP System Switching Valve 'A' Perfomance/Stuck Open: No Sub Type Information	Sets when the PCM (powertrain control module) detects the rate of vacuum loss is greater than a calibrated threshold. The PCM (powertrain control module) commands the EVAP (evaporative emission) vapor blocking valve closed while vacuum is present in the fuel tank. If the valve does not close, the vacuum in the tank is quickly lost. Retrieve all continuous memory and on-demand self-test Diagnostic Trouble Codes (DTCs) from the PCM (powertrain control module) . Diagnose any circuit related EVAP (evaporative emission) vapor blocking valve Diagnostic Trouble Codes (DTCs) before diagnosing this performance DTC (diagnostic trouble code)

Evaporative Emission System Leak Test

303-13B Evaporative Emissions - 3.3L Duratec-V6	***2022 F-150***
General Procedures	***Procedure revision date: 06/15/2022***

Evaporative Emission System Leak Test

Check

1. Prior to undertaking leak verification and leak checking, refer to the following video:

   A video version of this procedure is available on-line - FDRS EVAP System Test ***(https://bcove.video/3oRh9OT)***

Activation

Phase 1 - Leak Verification

1. Run the EVAP (evaporative emission) Test with the scan tool.
2. **NOTE**

   Some small leaks may not be detected using the EVAP (evaporative emission) Test. If the system has passed the test but a leak is still suspected, then proceed to Phase 2.

   If the EVAP (evaporative emission) system failed the EVAP (evaporative emission) Test, then proceed to Phase 2.

Phase 2 - System Leak Check

3. Disconnect the fuel vapor tube-to- EVAP (evaporative emission) canister purge valve quick connect coupling.

   Refer to: Quick Release Coupling(310-00A Fuel System - General Information - 2.7L EcoBoost (238kW/324PS), General Procedures).

13. Repair any leaks as necessary.

14. Repeat the leak test until the system passes.