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2023 Ford F-250 Super Duty Service and Repair Manual

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1. **NOTE**

Make sure that new fuel injector O-ring seals are installed.

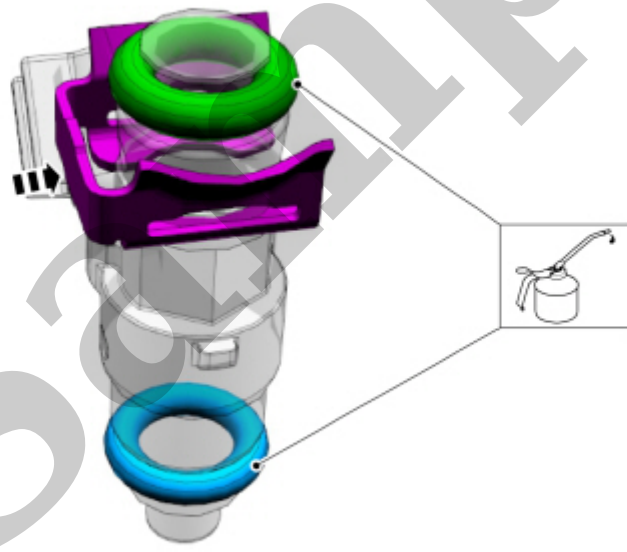
1. **NOTE**

The fuel injector clip can be reused if it is not damaged during removal.

If the clip is reused, the 2 sides of the clip should be squeezed back into shape by placing it between index finger and thumb.

2. Install the new fuel injector O-ring seals and the fuel injector retaining clips onto the fuel injectors. Lubricate the new fuel injector O-ring seals with clean engine oil.

Refer to: [Specifications](#)(303-01D Engine - 3.5L V6 PowerBoost (CN), Specifications).



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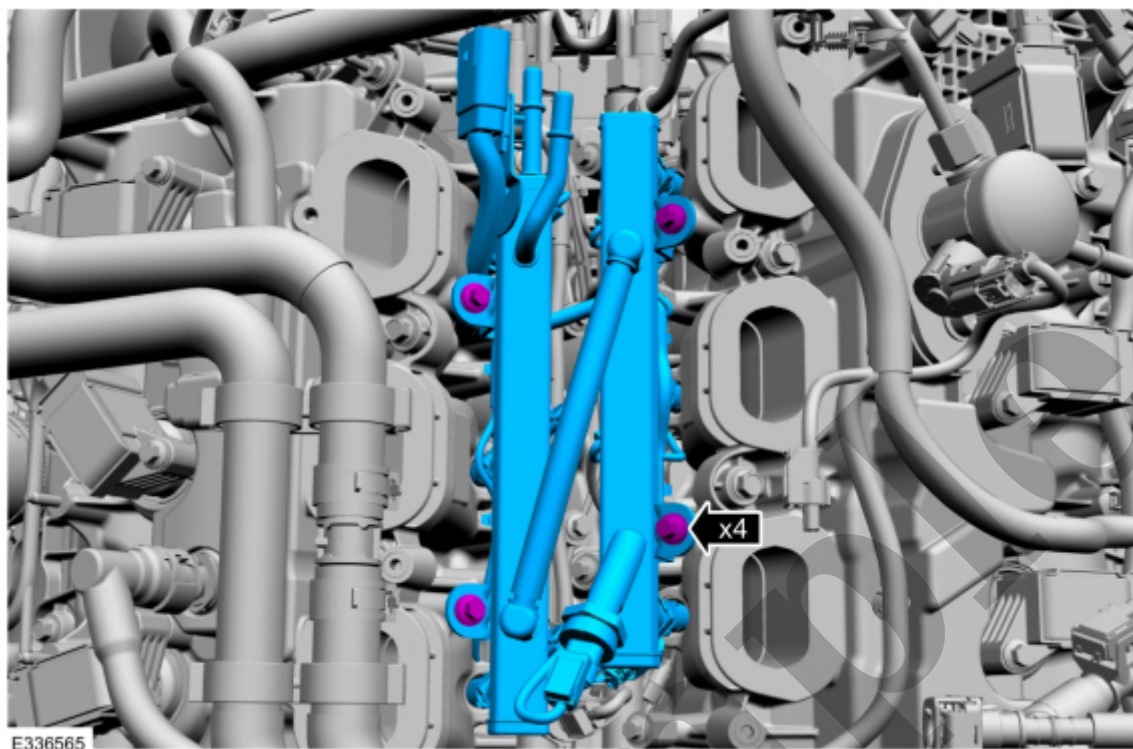
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2. Install the fuel injectors into the fuel rail.

Torque :

Stage 1: Tighten to: : 89 lb.in (10 Nm)

Stage 2: Tighten an additional: : 45°



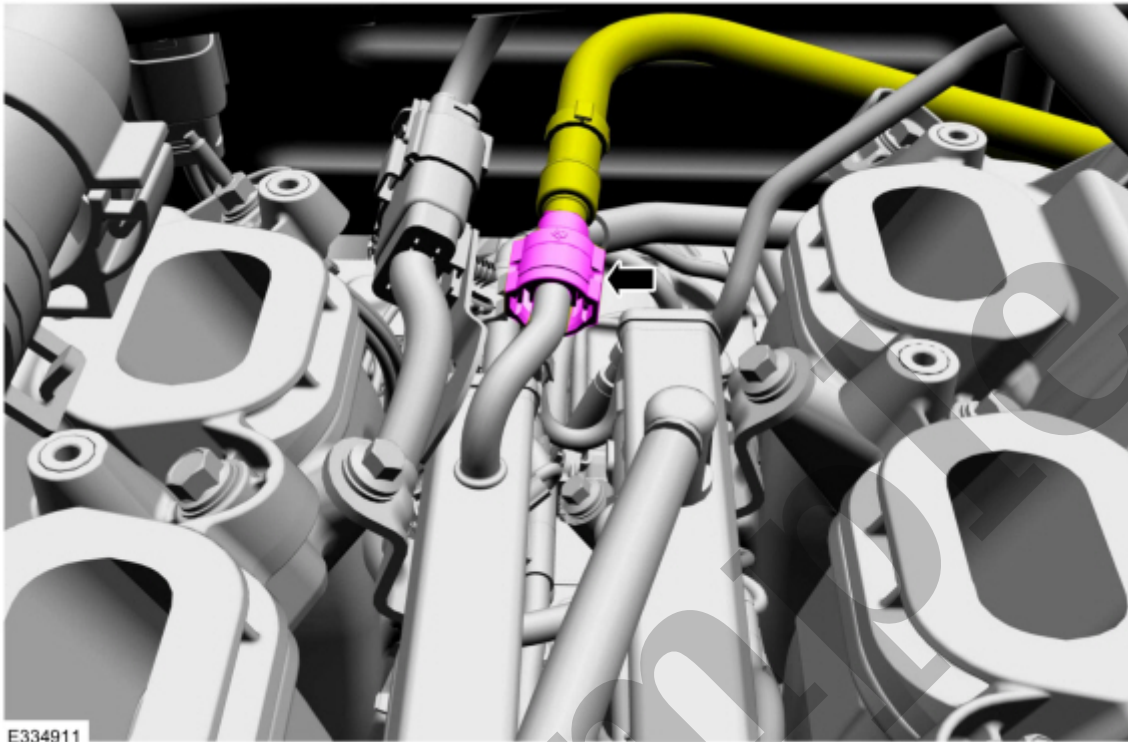
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5. Connect the main fuel injector harness electrical connector.

[Click here to learn about symbols, color coding, and icons used in this manual.](#)

7. Connect the fuel rail fuel tube quick release coupling.

Refer to: [Quick Release Coupling](#)(310-00D Fuel System - General Information - 3.5L V6 PowerBoost (CN), General Procedures).



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8. Install the intake manifold.

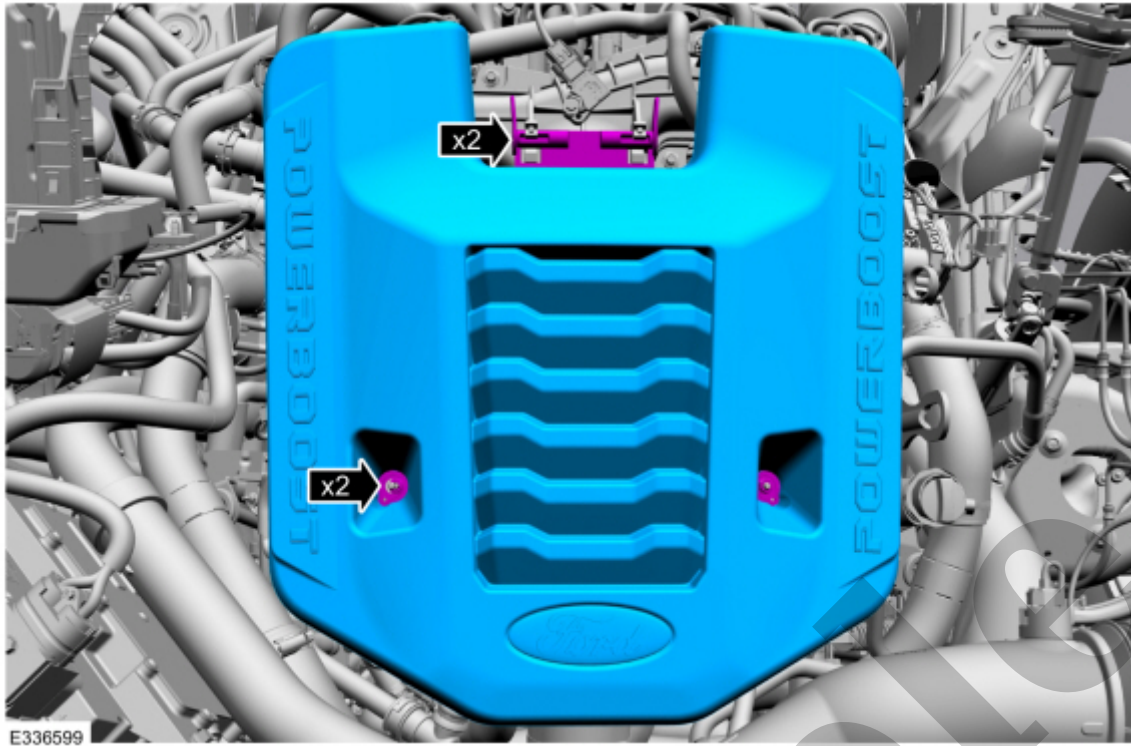
Refer to: [Intake Manifold](#)(303-01C Engine - 3.5L EcoBoost (BM), Removal and Installation).

9. Connect the battery negative cable.

Refer to: [Battery Disconnect and Connect - Electric](#)(414-01 Battery, Mounting and Cables, General Procedures).

10. Pressurize the fuel system.

Refer to: [Fuel System Pressure Release](#)(310-00C Fuel System - General Information - 3.5L EcoBoost (BM), General Procedures).

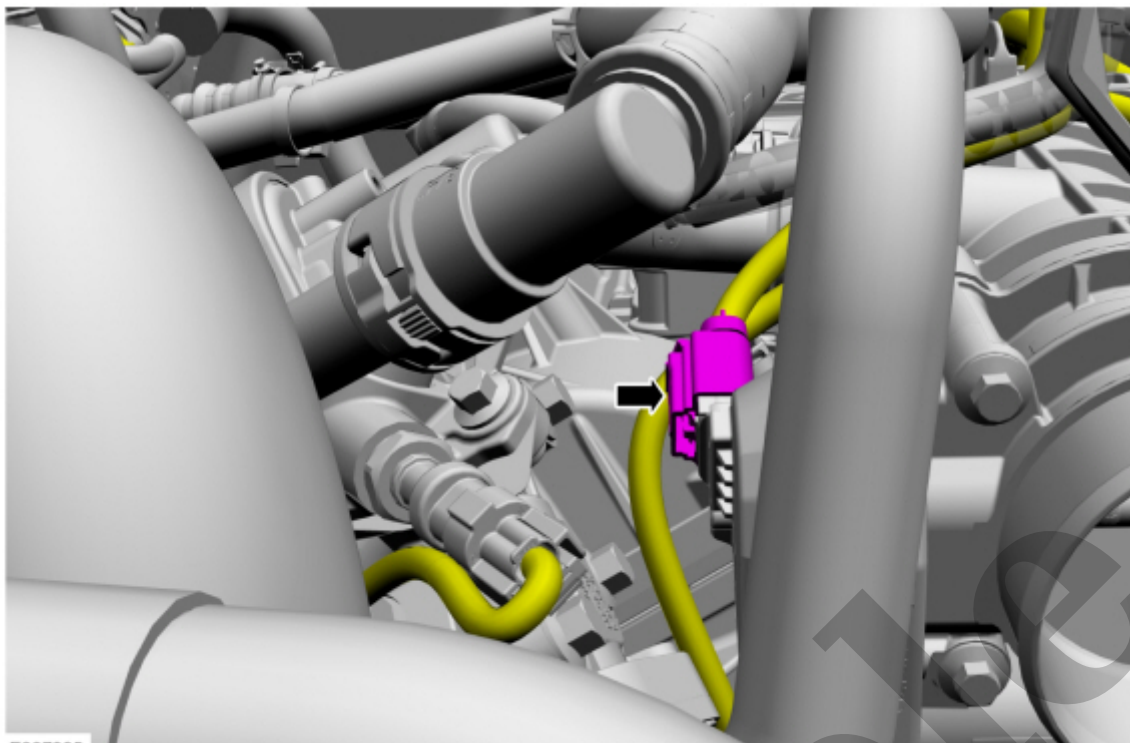


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2. Remove the charge air cleaner outlet pipe RH.

Refer to: [Air Cleaner Outlet Pipe RH\(303-12D Intake Air Distribution and Filtering - 3.5L V6 PowerBoost \(CN\), Removal and Installation\)](#).

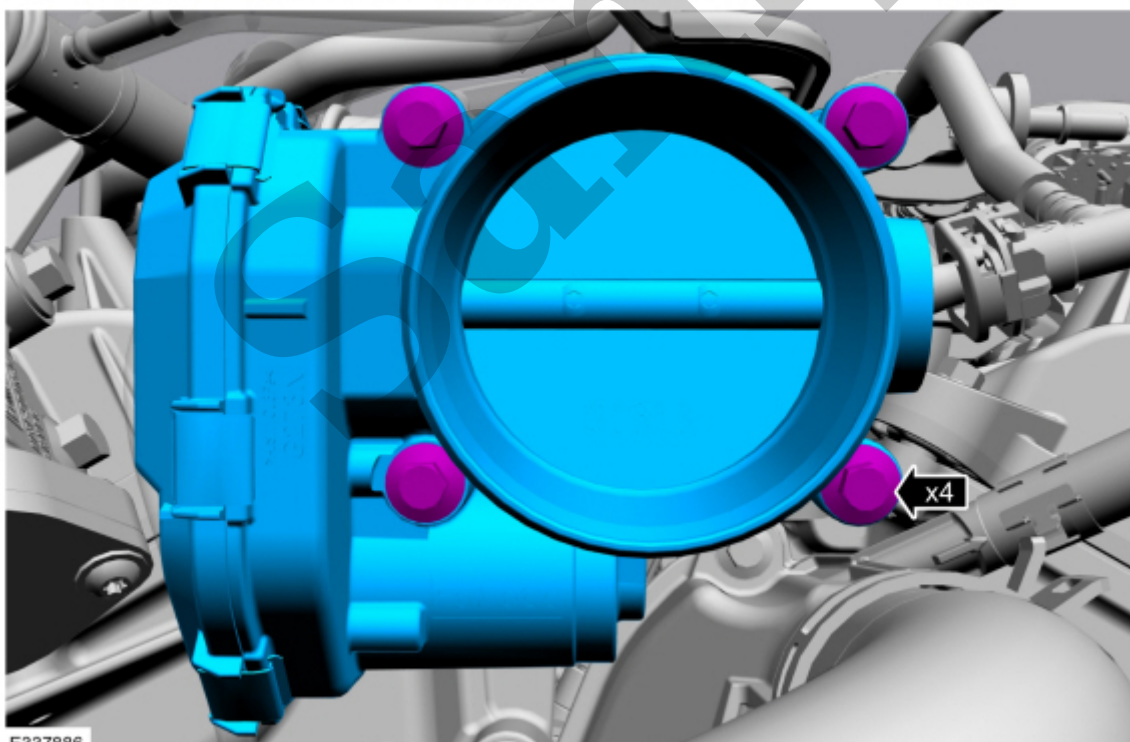
3. Loosen the clamp, then disconnect the charge air cooler outlet pipe and move out of the way..



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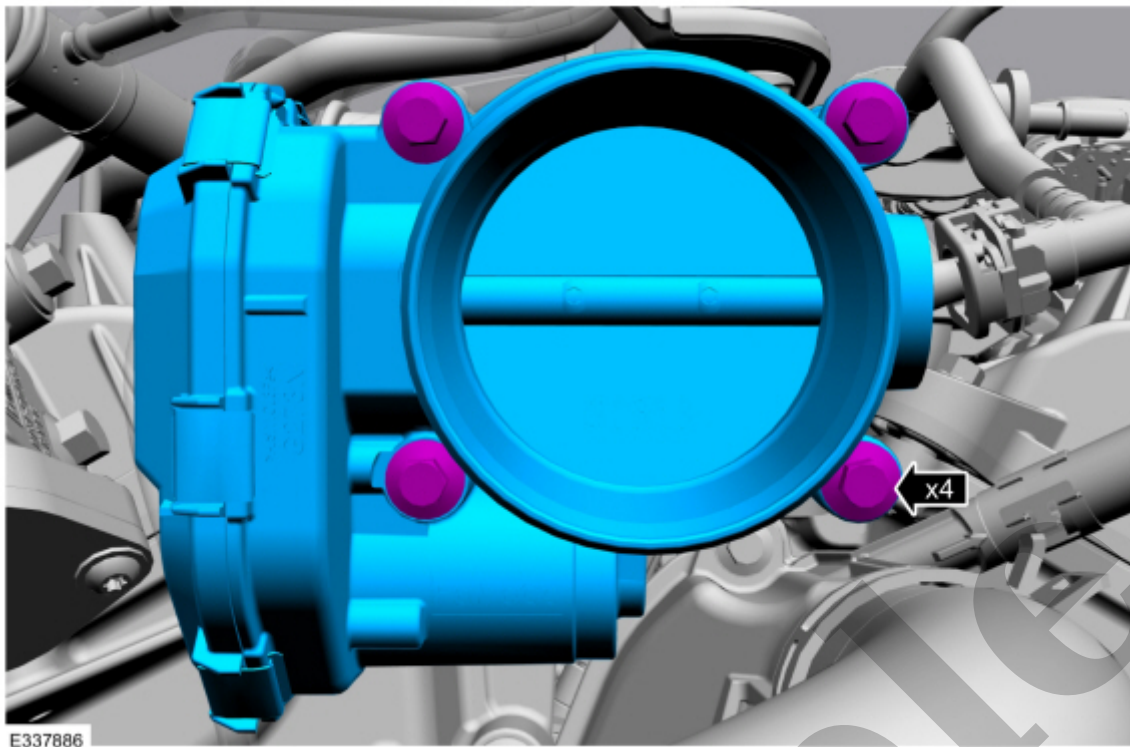
5. Remove the throttle body bolts, then remove the throttle body.



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Installation



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4. **NOTE**

When connecting the throttle body electrical connector engage the red connector locking tab after fully installing the throttle body electrical connector. The red tab will not slide forward unless the throttle body electrical connector is fully installed.

Connect the throttle body electrical connector.

6. Install the charge air cleaner outlet pipe RH.

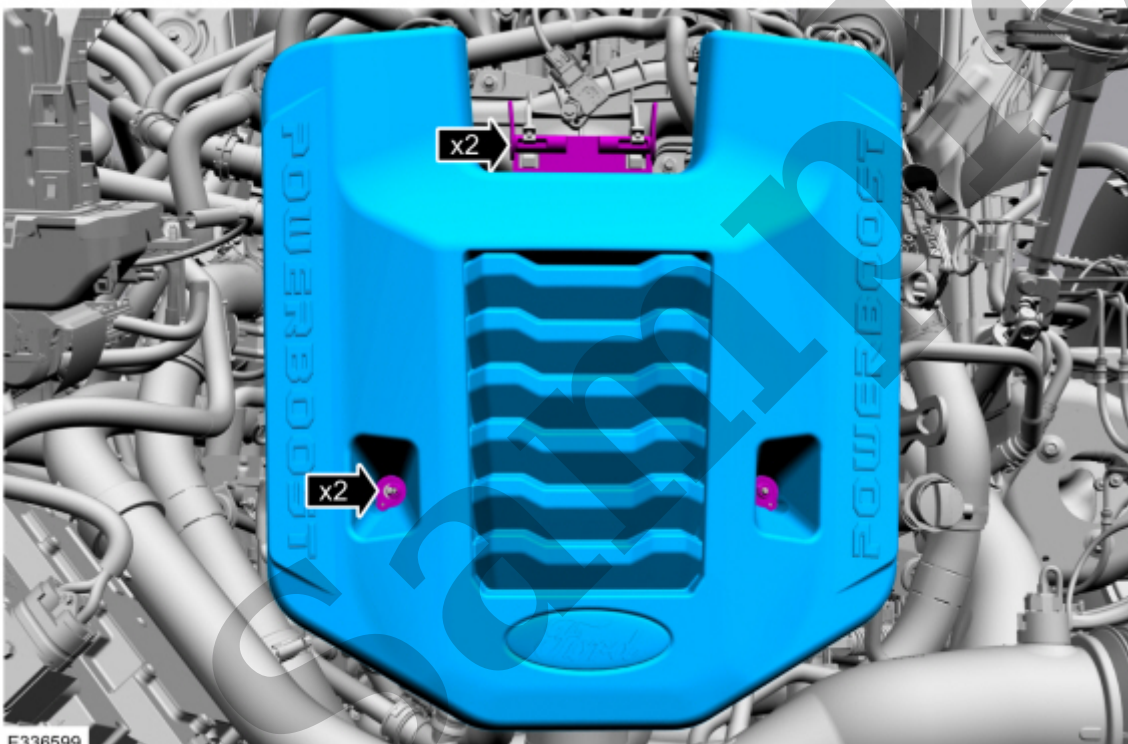
Refer to: [Air Cleaner Outlet Pipe RH](#)(303-12D Intake Air Distribution and Filtering - 3.5L V6 PowerBoost (CN), Removal and Installation).

7. **NOTE**

PowerBoost shown, EcoBoost is similar.

Install the engine appearance cover into the rear retain tabs on the intake manifold, then install and tighten the engine appearance cover retainers.

Torque : 97 lb.in (11 Nm)



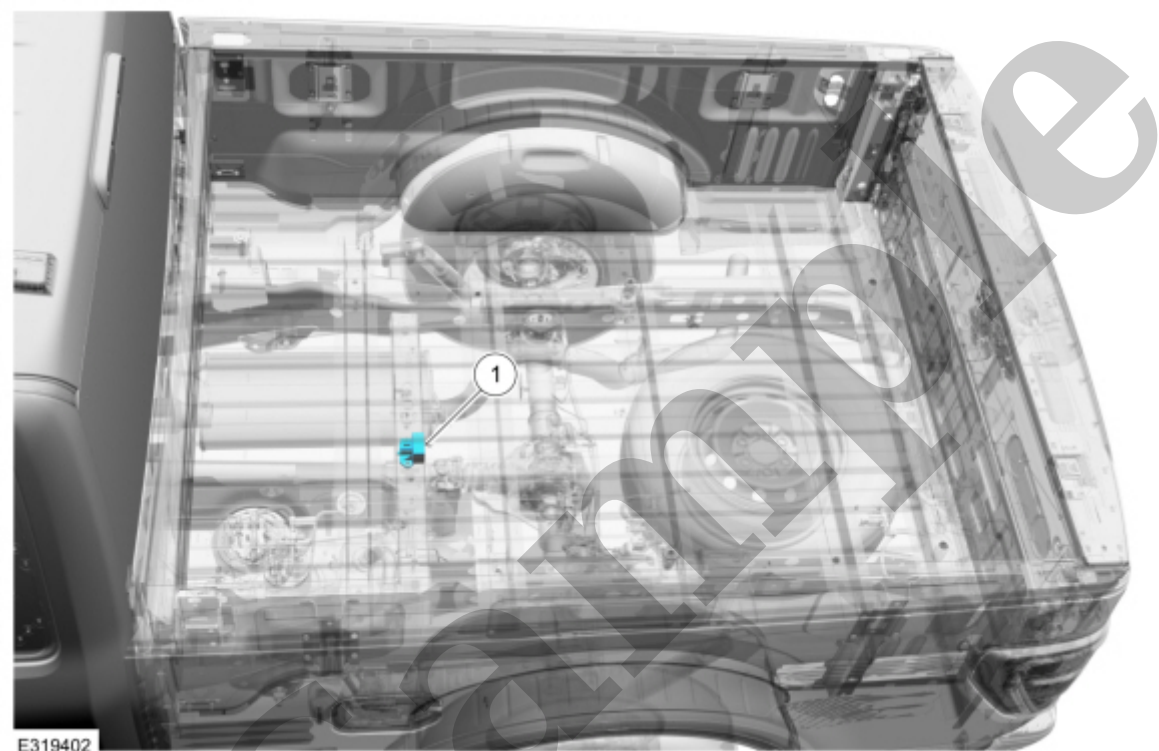
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8. If a new throttle body was installed, road test the vehicle.

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3	Port injection fuel rail assembly
4	Port injection fuel injector
5	Direct injection fuel injector
6	Direct injection fuel rail

Fuel Pump Driver Module



Item	Description
1	Fuel pump driver module

levels of cylinder to cylinder air fuel ratio imbalance. The monitor uses the CKP (crankshaft position) to calculate an acceleration term during each cylinder firing event. The calculated acceleration value is proportional to engine torque during the firing event. The monitor will modulate each cylinder to generate an air fuel ratio deviation relative to stoichiometric operation. The monitor generates five total torque values for each cylinder. Two torque values richer than stoichiometric, two torque values leaner than stoichiometric and one torque value at stoichiometric. The monitor uses a calibrated torque curve defined by the five generated values compared to an ideal torque curve to estimate each cylinder air fuel ratio deviation. The monitor estimates each cylinder air fuel ratio deviation compared to the other cylinders to determine if a concern exists.

The MIL (malfunction indicator lamp) is activated after a concern is detected during a drive cycle.

Deceleration Fuel Shut Off (DFSO)

During a DFSO event the PCM (powertrain control module) disables the fuel injectors. A DFSO event occurs during closed throttle, deceleration; similar to exiting a freeway. This strategy improves fuel economy, allows for increased rear HO₂S (heated oxygen sensor) concern detection, and allows for misfire profile correction learning. On vehicles with direct fuel injection, the PCM (powertrain control module) may also disable the ignition coils. This strategy extends spark plug life during the fuel shutoff events.

Flex Fuel

Flex fuel vehicles are designed to be compatible with any combination of ethanol and gasoline up to 85% ethanol (E85). The percentage of ethanol content in the fuel is inferred by the PCM (powertrain control module) flex fuel strategy.

The fuel level input (FLI) determines if a refueling event has occurred after an ignition ON or while the engine is running. If a refueling event is detected, the PCM (powertrain control module) saves the current inferred ethanol value. The PCM (powertrain control module) flex fuel strategy recognizes a refueling event as gasoline or E85, and enables the flex fuel learn procedure. The flex fuel strategy will infer the correct air to fuel ratio, based on the oxygen sensor input, to maintain stoichiometry after the vehicle refueling event occurs.

The new fuel is calculated to reach the engine after a calibrated amount of fuel has been consumed from the fuel lines and fuel rails. Normal long term fuel trim learning and EVAP (evaporative emission) purge control are temporarily disabled to allow the new ethanol content to gasoline percentage to be inferred. Ethanol content learning continues until the inference is stabilized within the engine operating conditions.

Typical flex fuel vehicle operation:

- The initial air to fuel ratio and flex fuel percentage is calculated for gasoline after a KAM (keep alive memory) reset. Vehicles that have E85 in the fuel tank after having a KAM (keep alive memory) reset may result in a hard start when cold, or a cold engine acceleration lack of power, until the PCM (powertrain control module) flex fuel strategy calculates the correct percentage of ethanol content in the fuel.