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SERVICE PROCEDURE

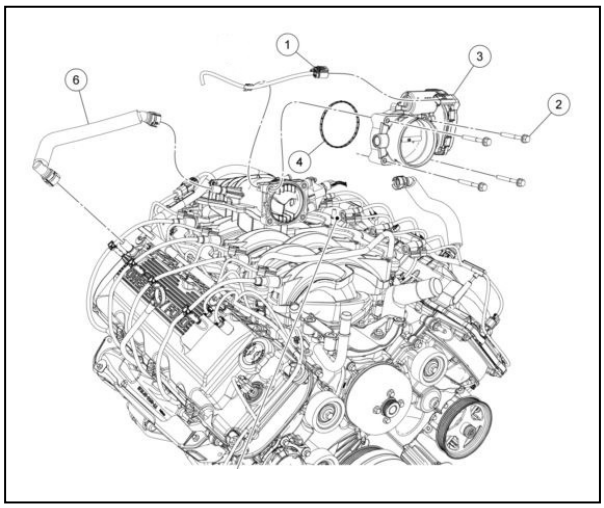
Date: 06/10/14

Alert: SP2015-8 Intake Manifold R&R

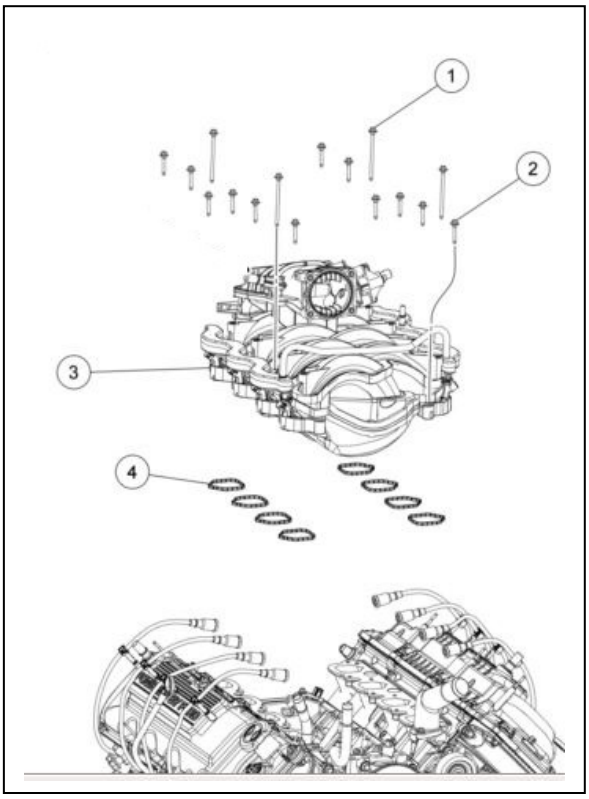
There may be occasions when it is necessary to remove the engine's intake manifold to check for air leaks or to gain access to the cylinder head temperature sensor or the knock sensors. The following procedure describes the steps required to remove and reinstall this major engine component. Do not remove an intake manifold on an in-warranty engine without being told to do so by Indmar Customer Service.

NOTE: Before working on or disconnecting any fuel lines or fuel system components, refer to SA2015-3 and relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the system remains under high pressure even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

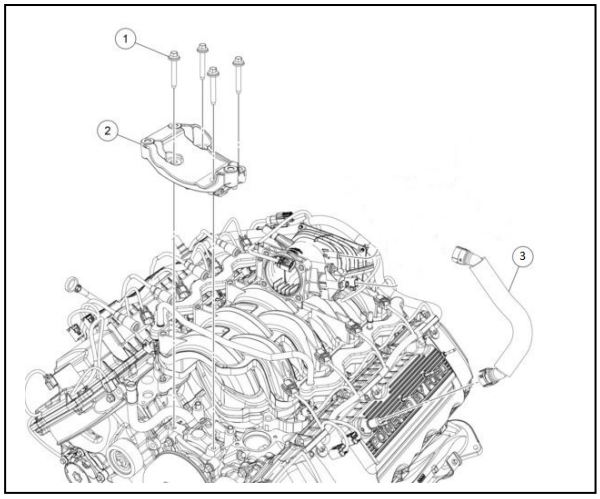
1. Remove the engine's beauty cover and set it aside to avoid damage.
2. Remove the ECM and the ECM Bracket. Refer to SA2015-9
3. Remove the two bolts that attach the Fuse/Relay Box to the engine.
4. Release the fuel pressure in the system.
5. Remove the 8 ignition coils. Refer to SA2015-1.
6. Disconnect the negative battery cable and remove the alternator. Refer to SA2015-2.
7. Remove the 4 bolts and the alternator support bracket.
8. Disconnect the fuel supply line from the fuel rail.
9. Remove the flame arrestor from the throttle body.
10. Disconnect the ETC electrical connector from the throttle body.
11. Remove the 4 bolts and the throttle body.
    a. Inspect the TB O-ring seal for damage and replace if necessary.
12. Disconnect the quick couplings and remove the PCV tube and the crankcase vent tube.
13. Disconnect the 8 fuel injector electrical connectors.
14. Disconnect the MAP sensor electrical connector.
15. Remove the 4 fuel rail bolts but leave the fuel rail in place on the intake manifold.
16. Loosen the 12 intake manifold bolts.
17. Remove the intake manifold.
18. Clean and inspect the cylinder head sealing surfaces.
    a. Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of old sealant.
19. Inspect the 8 intake manifold gaskets for damage and install new gaskets as necessary.



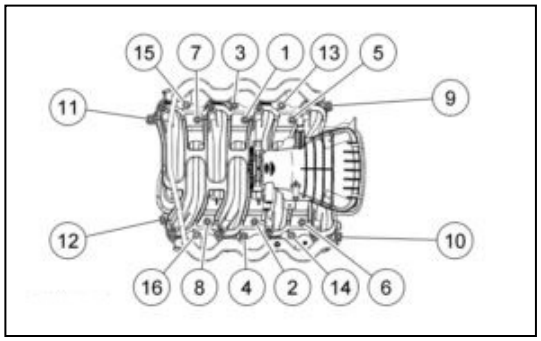
1. ETC electrical connector
2. TB Bolts
3. Throttle Body
6. PCV Tube



1. Fuel Rail Bolts
2. Intake Manifold Bolts
3. Intake Manifold
4. Intake Manifold Gaskets



1. Alternator Mount Bolts
2. Alternator Mount
3. Crankcase Vent Tube



Tighten Sequence
Stage 1 Tighten 12 intake bolts to 89 lb-in (10 Nm)
Stage 2 Tighten 12 intake bolts an additional 45 degrees
Stage 3 Tighten 4 fuel rail bolts to 89 lb-in (10 Nm)
Stage 4 Tighten 4 fuel rail bolts an additional 90 degrees

Installation

1. Position the intake manifold onto the engine.
2. Loosely install the 4 fuel rail bolts.
3. Tighten the 12 intake bolts and the 4 fuel rail bolts in 4 stages in the sequence shown in the diagram on the previous page.
4. Connect the 8 fuel injector electrical connectors.
5. Connect the MAP sensor electrical connector.
6. Position and connect the PCV and Crankcase vent tubes.
7. Position the throttle body and tighten the bolts in 2 stages. Criss-cross pattern.
    a. Stage 1 Tighten to 106 lb-in (12 Nm).
    b. Stage 2 Tighten an additional 60 degrees.
8. Connect the ETC electrical connector.
9. Connect the fuel supply quick connect fitting.
10. Position the alternator support bracket and install the 4 bolts.
    a. Stage 1 Tighten to 177 lb-in (20 Nm).
    b. Stage 2 Tighten an additional 45 degrees.
11. Install the alternator.
12. Install the 8 ignition coils.
13. Install the Fuse/Relay box.
14. Install the ECM bracket and the ECM.
15. Install the engine's beauty cover.