

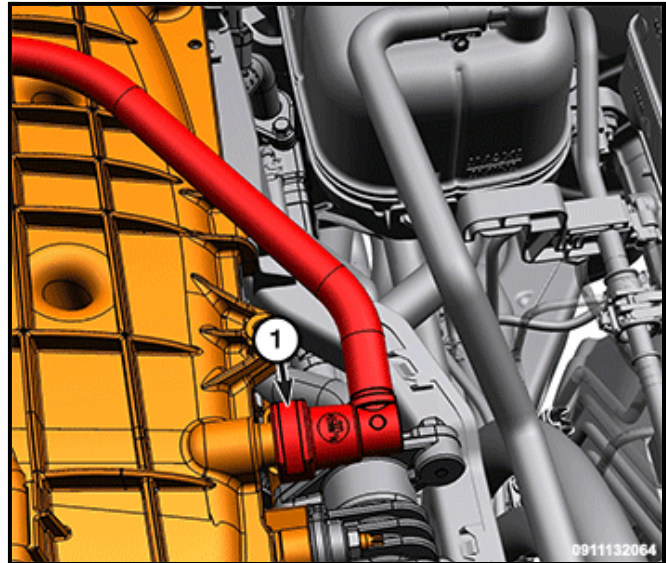
09 - Engine, 3.6L / Manifolds / MANIFOLD, Intake/Removal and Installation

UPPER INTAKE MANIFOLD

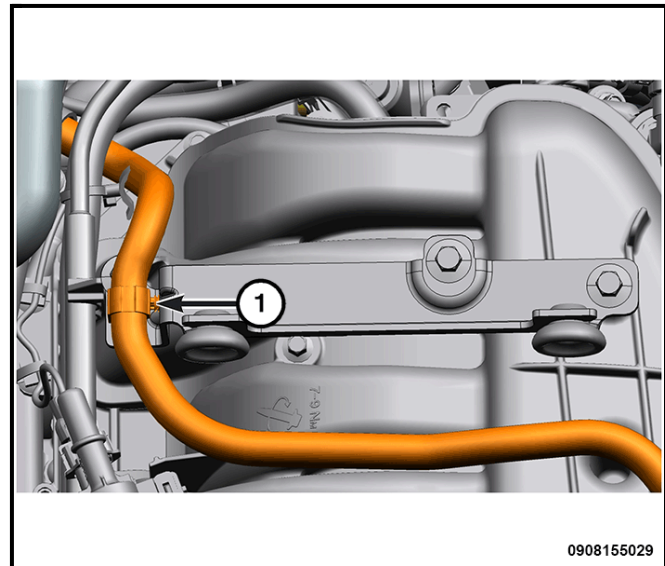
✚ **Labor Operations:** Click to display a list of Labor Operations associated with this procedure

REMOVAL

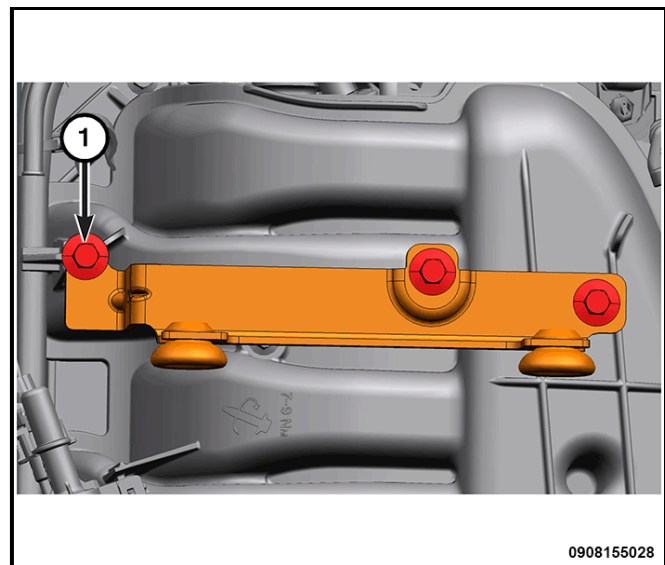
1. Disconnect and isolate the negative battery cable(s) (Refer to 08 - Electrical/Battery System/Standard Procedure) .
2. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
3. Remove the air cleaner resonator (Refer to 09 - Engine/Air Intake System/RESONATOR, Air Cleaner/Removal and Installation) .
4. Disconnect the Positive Crankcase Ventilation (PCV) hose (1) from the upper intake manifold.



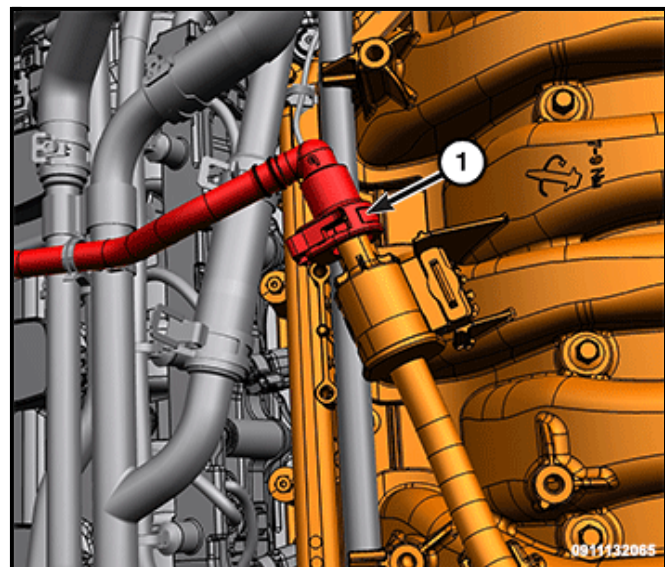
5. Disconnect the PCV hose (1) from the engine cover bracket.



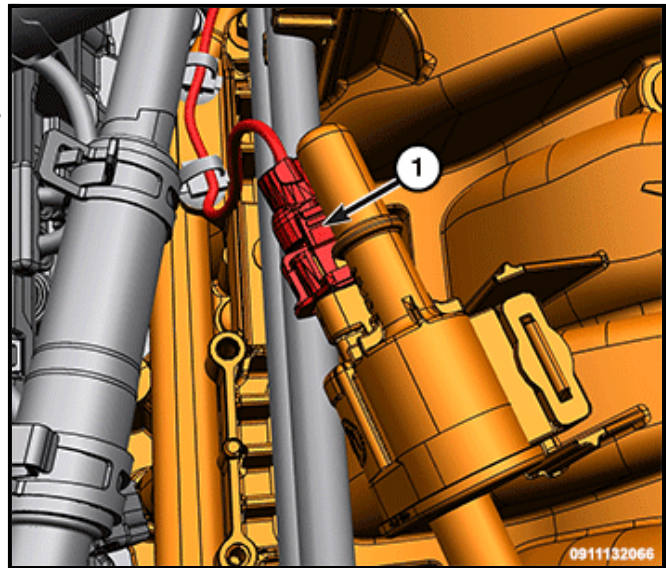
- 6. Remove the bolts (1) and the engine cover bracket.



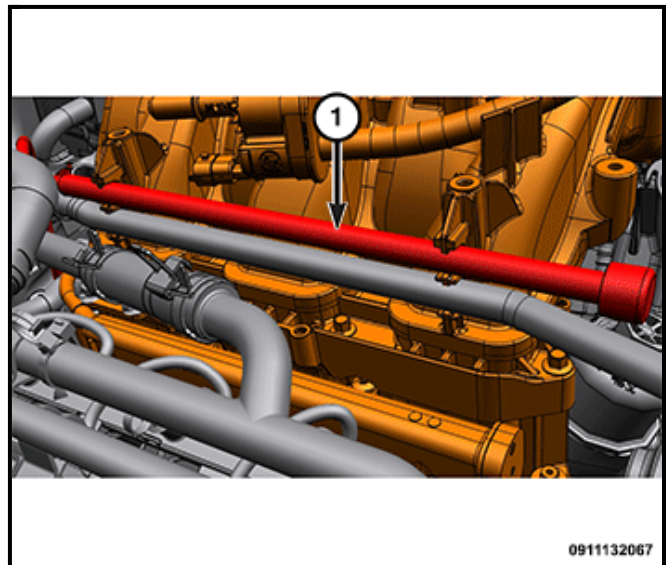
- 7. Disconnect the vapor purge line (1).



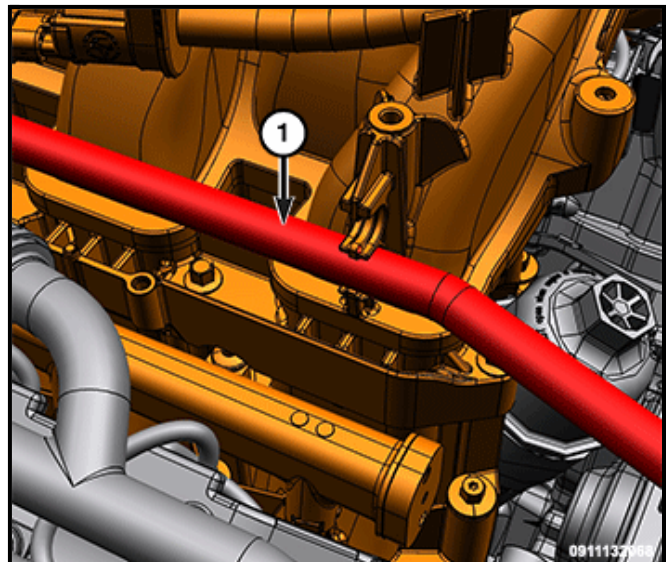
8. Disconnect the evaporative purge solenoid wire harness connector and detach the wire harness retainer from the manifold.



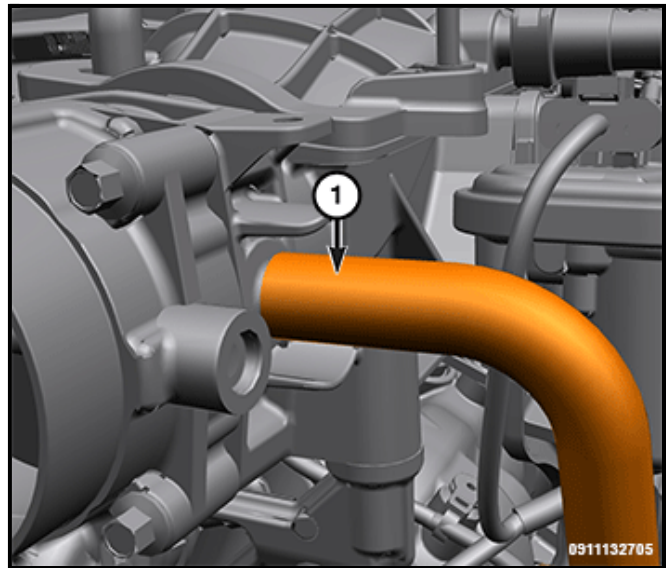
9. Remove the transmission vent hose (1) from the upper intake manifold retaining brackets and move aside.



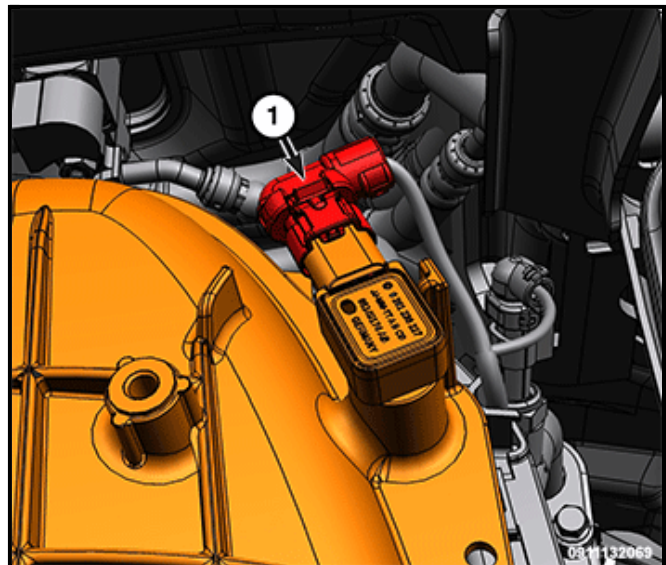
10. Remove the make-up air hose (1) from the lower intake manifold retaining brackets and move aside.



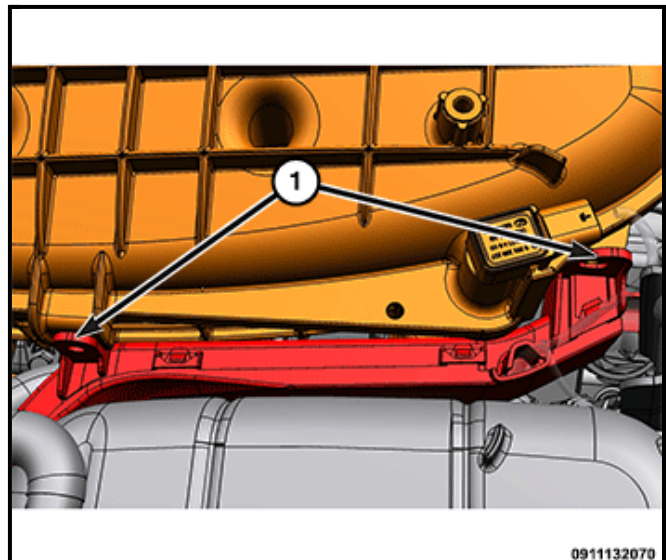
11. Disconnect the brake booster vacuum hose (1).



12. Disconnect the Manifold Absolute Pressure (MAP) sensor wire harness connector (1) and detach the wire harness retainer from the manifold.

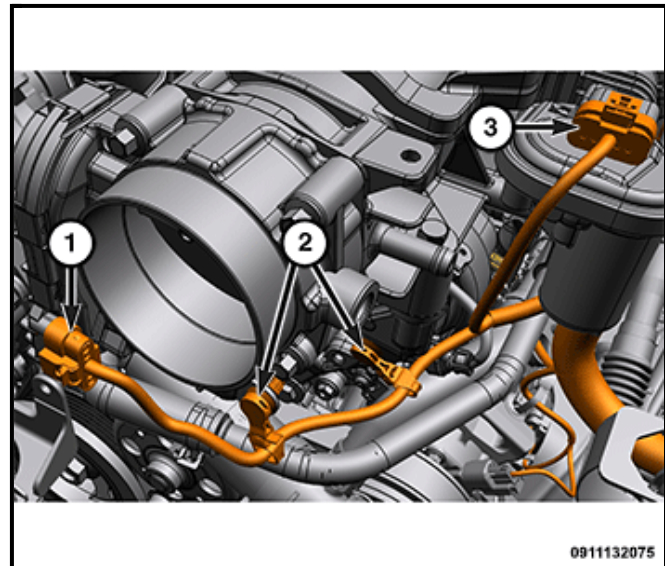


13. Remove the wire harness retainers (1) from the upper intake manifold and position the harness aside.

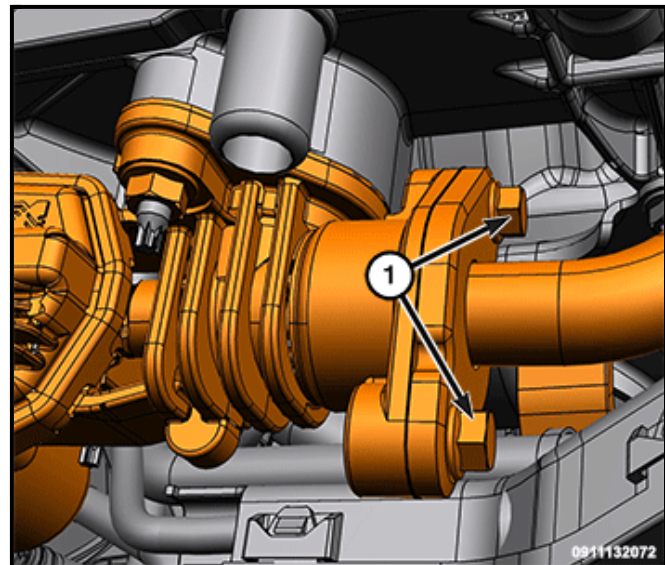


14. Disconnect the throttle body wire harness connector (1) and detach the wire harness retainers (2) from the throttle body.

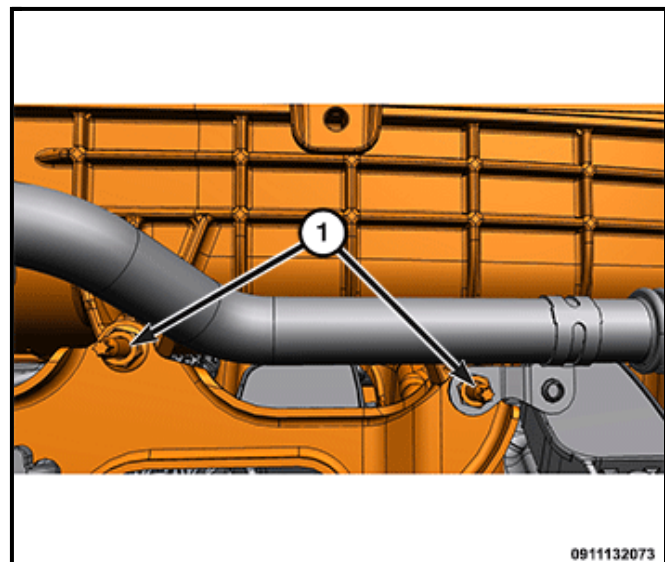
15. Disconnect the Exhaust Gas Recirculation (EGR) valve wire harness connector (3).



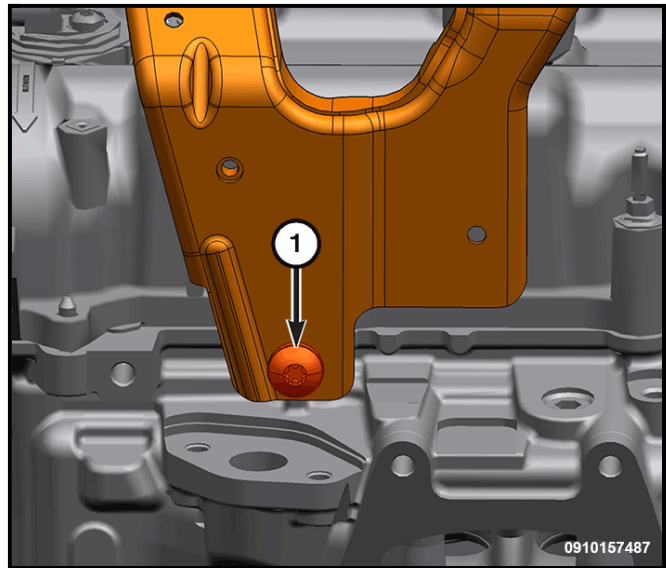
16. Remove the EGR valve to EGR tube retaining bolts (1).



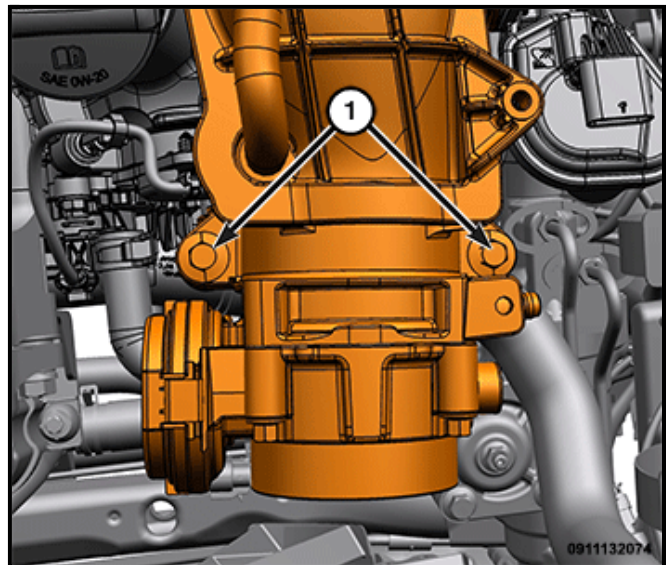
17. Remove the two upper intake manifold support bracket nuts (1).



18. If upper intake manifold support bracket removal or replacement is necessary, remove the lower intake support bracket bolt (1).



19. Remove the two upper intake manifold to throttle body support bracket bolts (1).

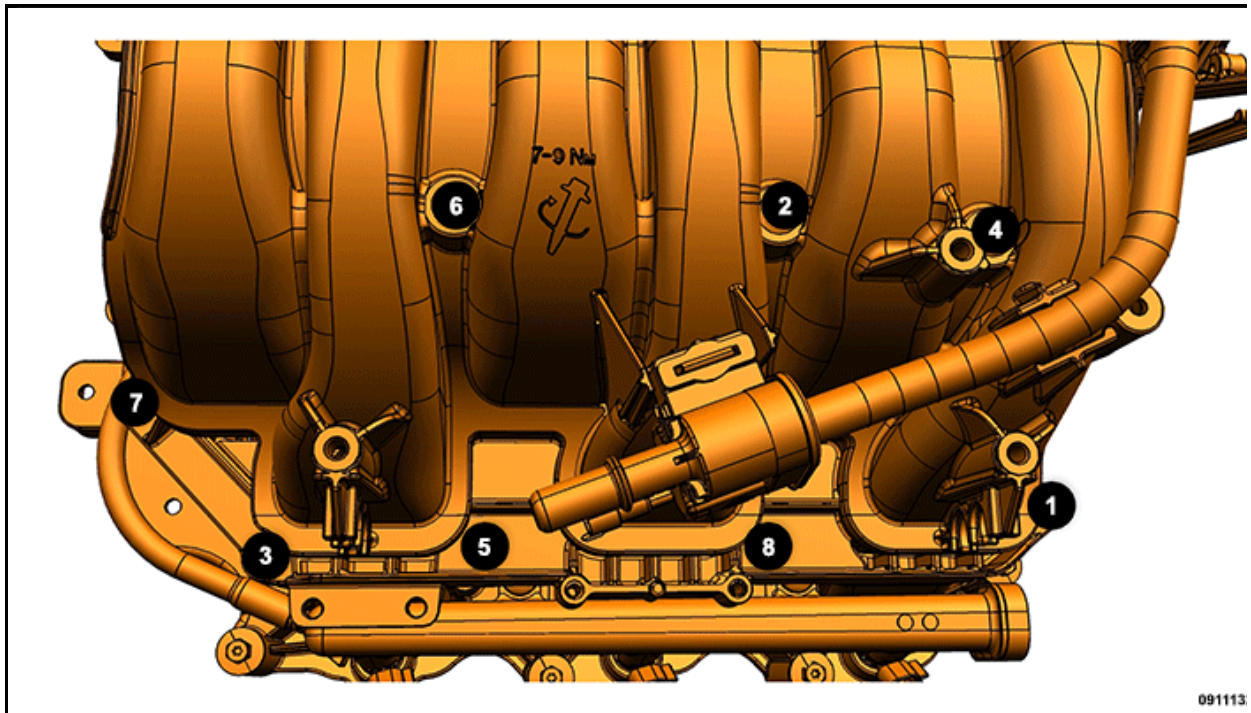


NOTE:

The upper intake manifold attaching bolts are captured in the upper intake manifold. Once loosened, the bolts will have to be lifted out of the lower intake manifold and held while removing the upper intake manifold.

NOTE:

Exercise care not to inadvertently loosen the two fuel rail attachment bolts that are in close proximity of the upper intake manifold attaching bolts.



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20. Remove the eight bolts and the upper intake manifold.

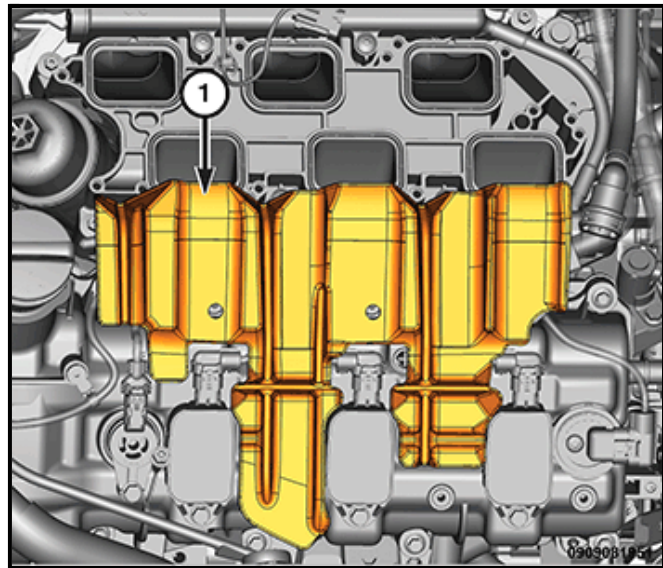
21. Inspect and reuse if acceptable, the six upper to lower intake manifold gaskets.

22. Cover the open intake ports to prevent debris from entering the engine.



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23. If necessary, remove the insulator (1) from the left cylinder head cover.



INSTALLATION

NOTE:

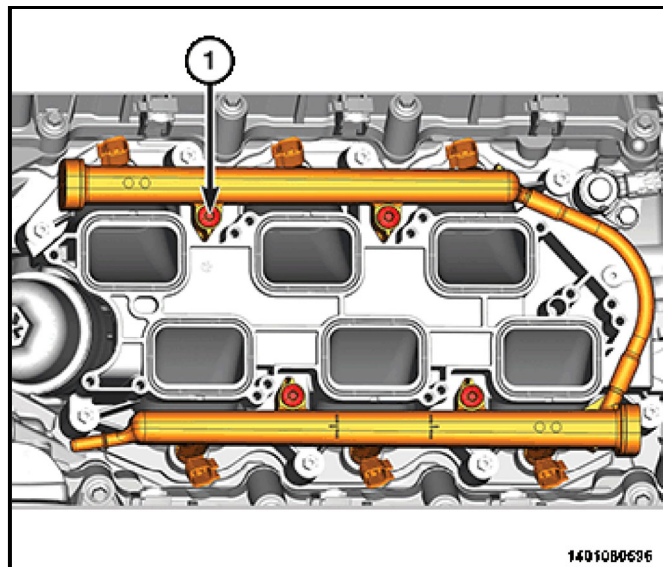
Prior to installing the upper intake manifold, verify that the four fuel rail bolts (1) were not inadvertently loosened. If loosened, the bolts must be installed to the proper specification (Refer to 14 - Fuel System/Fuel Delivery/RAIL, Fuel/Removal and Installation) .

1. Clean and inspect the upper seals of the lower intake manifold assembly, and replace only if necessary.

NOTE:

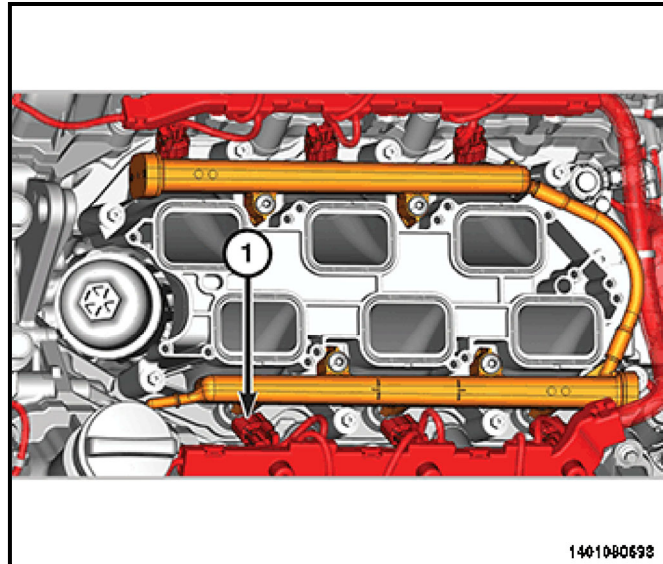
FKM gaskets should not be cleaned with acetone, ketone (like MEK), organic acids (formic acid/acetic acid), toluene and benzene.

2. Clean and inspect the sealing surfaces. Install the upper to lower intake manifold gaskets.

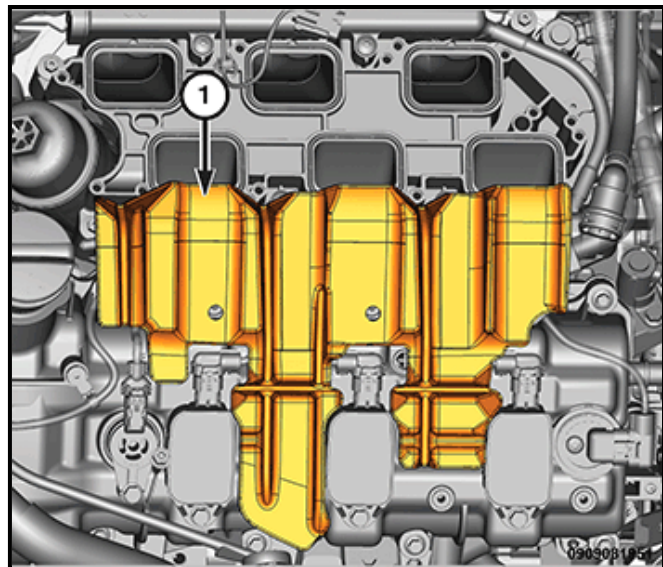


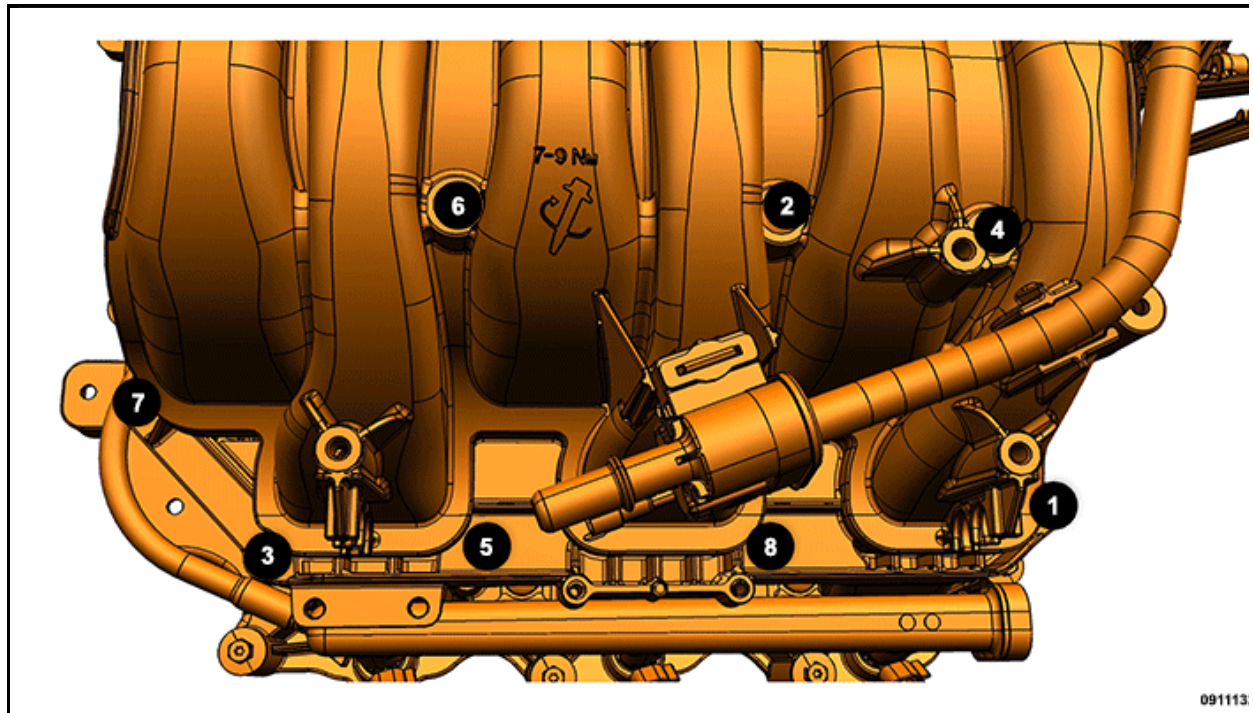


3. Make sure the fuel injectors and wiring harnesses (1) are in the correct position so that they do not interfere with the upper intake manifold installation.

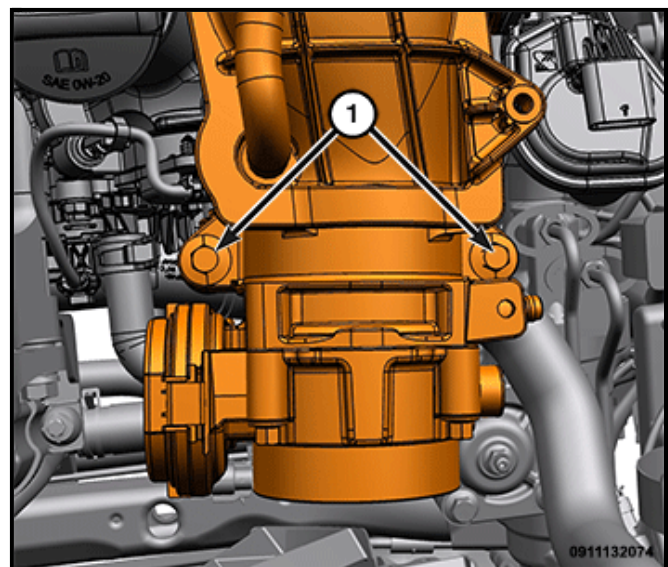


4. If removed, install the insulator (1) on top of the LH cylinder head cover.

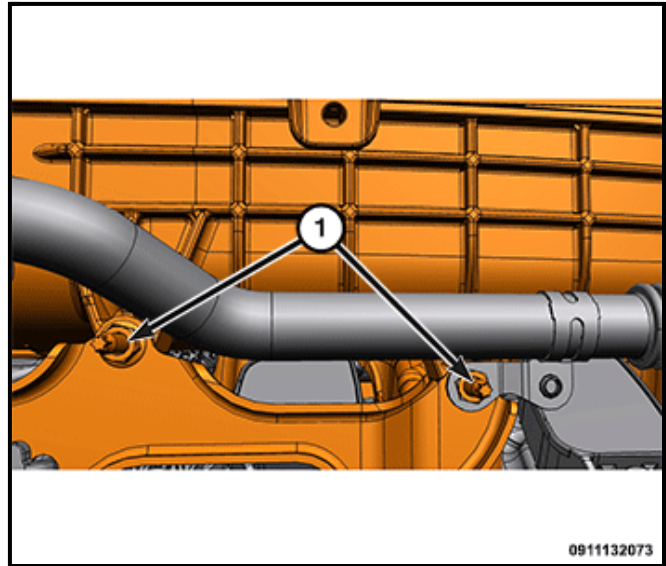




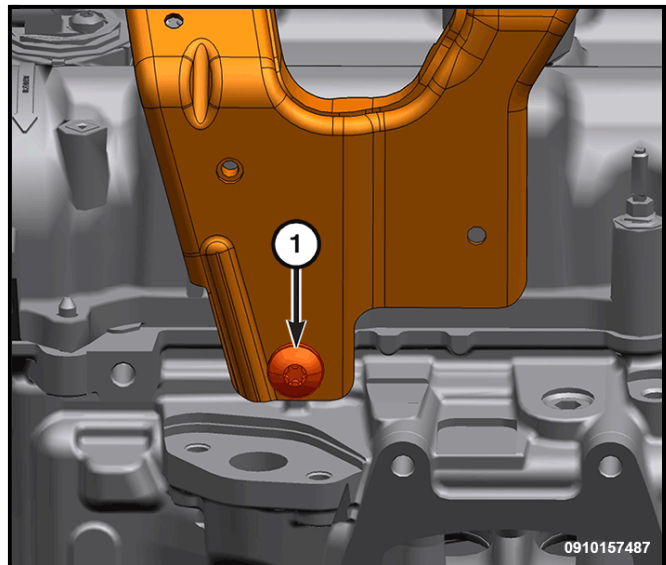
5. Lift and hold the eight upper intake attaching bolts clear of the mating surface. Back the bolts out slightly or if required, use an elastic band to hold the bolts clear of the mating surface.
6. Position the upper intake manifold onto the lower intake manifold so that the two locating posts on the upper intake manifold align with corresponding holes in the lower intake manifold.
7. Install the eight upper intake manifold attaching bolts. Tighten the bolts in the sequence shown to the proper (Torque Specifications) .
8. Install the two upper intake manifold to throttle body support bracket bolts (1) and tighten to the proper (Torque Specifications) .



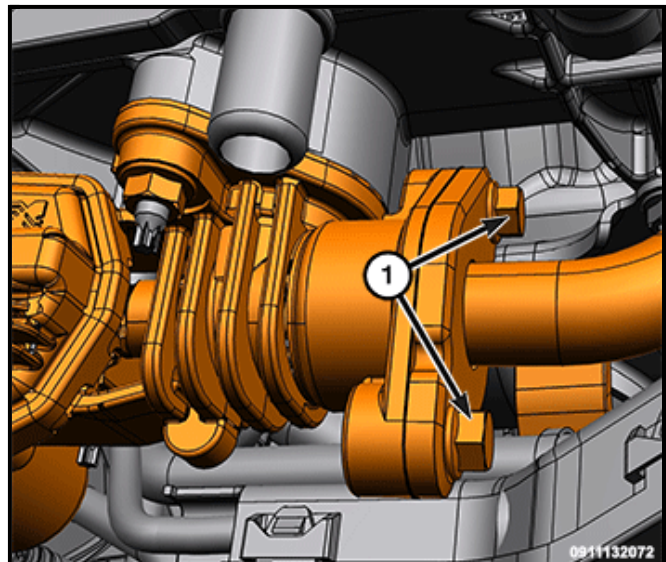
9. Install the support bracket nuts (1) and tighten the nut to the proper (Torque Specifications) .



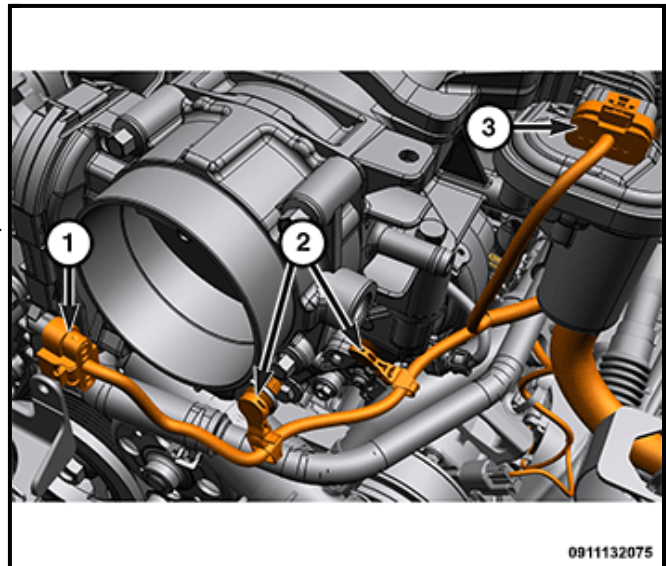
10. If removed, install upper intake manifold support bracket bolt (1) and tighten to the proper (Torque Specifications) .



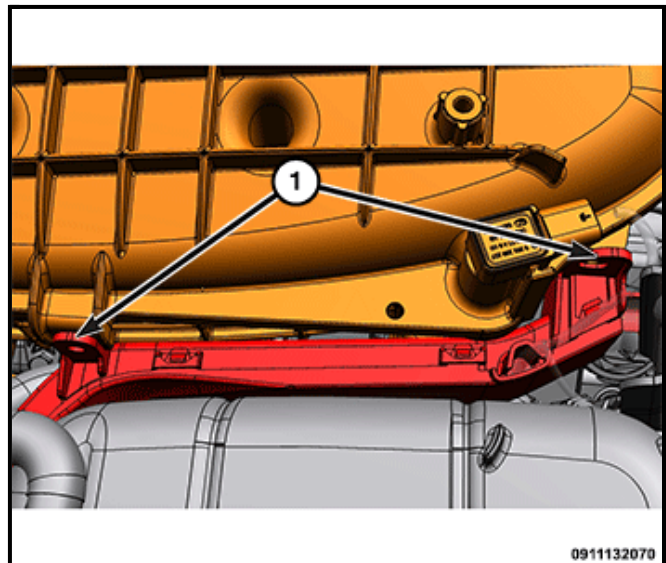
11. Install the Exhaust Gas Recirculation (EGR) valve to EGR tube retaining bolts (1) and tighten to the proper (Torque Specifications) .



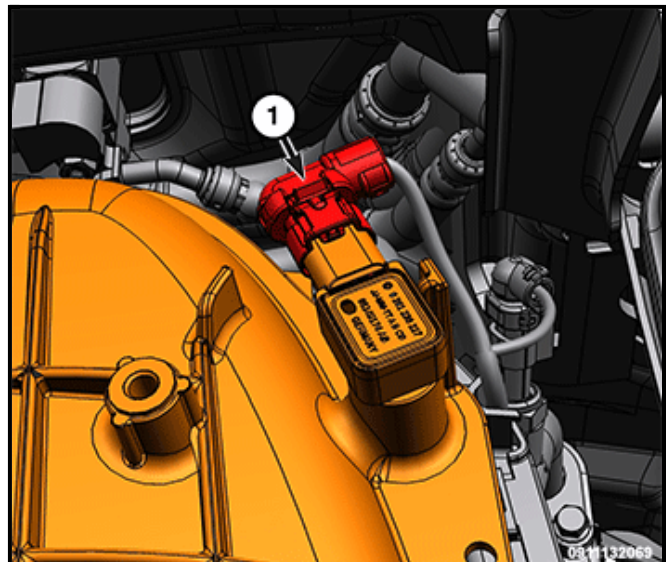
12. Connect the throttle body wire harness connector (1) and attach the wire harness retainers (2) to the throttle body.
13. Connect the EGR valve wire harness connector (3).



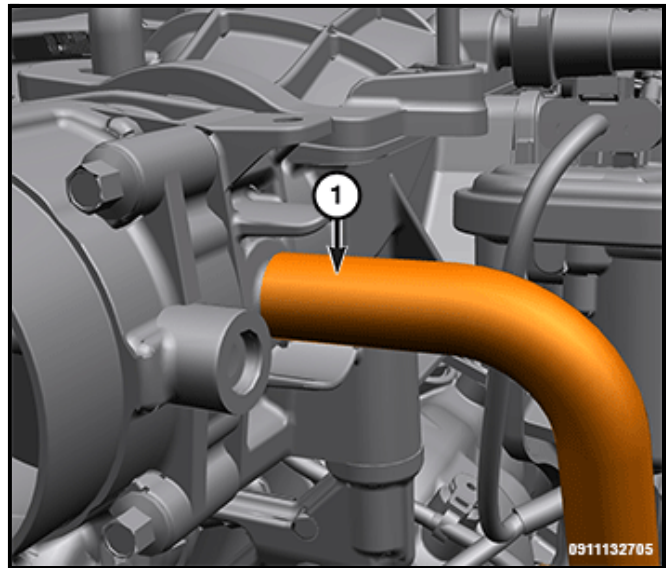
14. Secure the wire harness retainers (1) to the upper intake manifold.



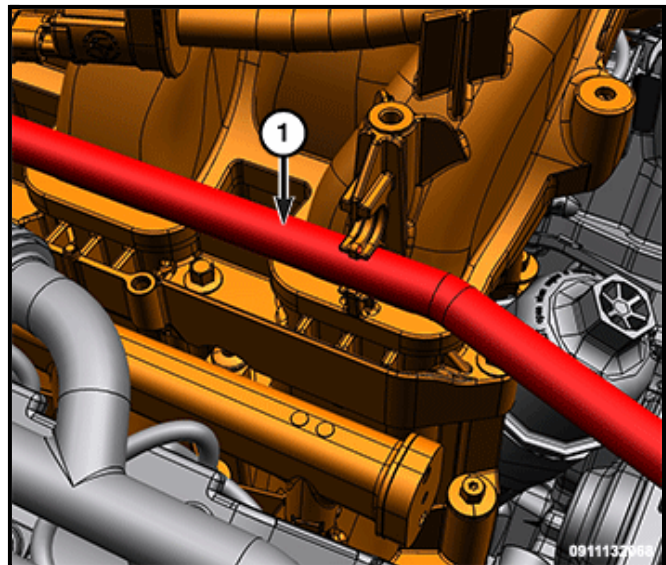
15. Connect the Manifold Absolute Pressure (MAP) sensor (1) wire harness connectors and attach the wire harness retainer.



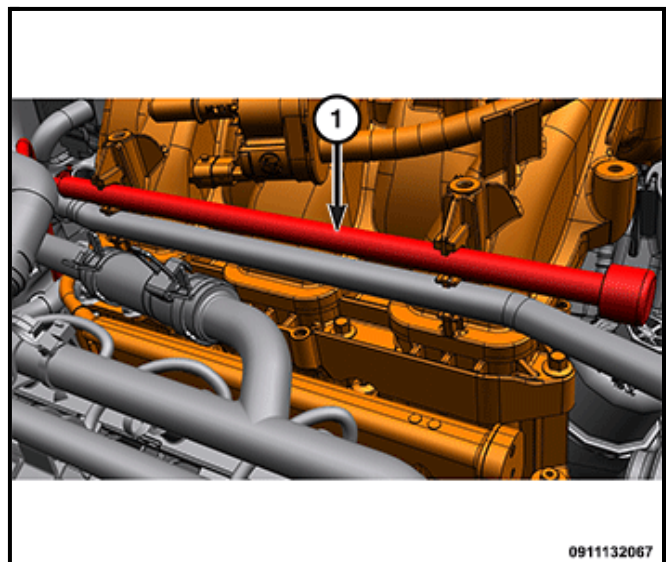
16. Connect the brake booster vacuum hose (1) into the lower intake manifold retaining brackets.



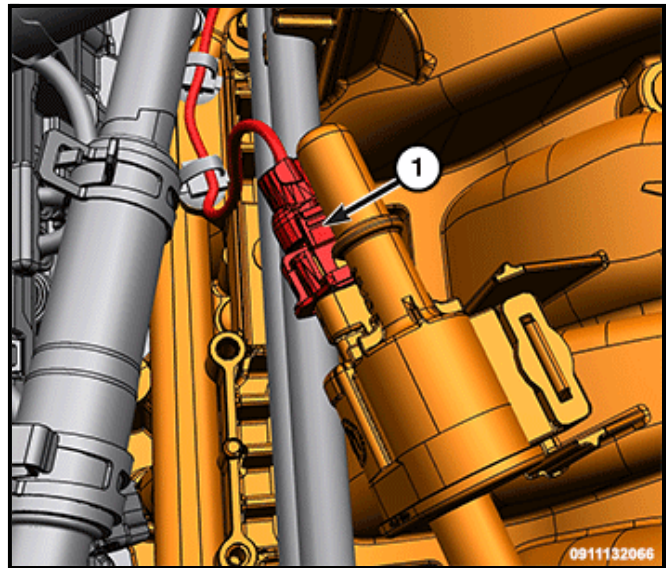
17. Secure the make-up air hose (1) into the upper intake manifold retaining brackets.



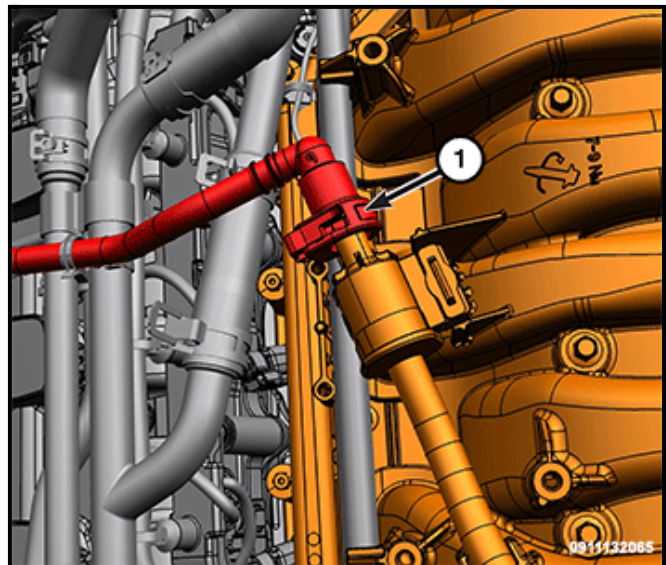
18. Secure the transmission vent hose (1) into the upper intake manifold retaining brackets.



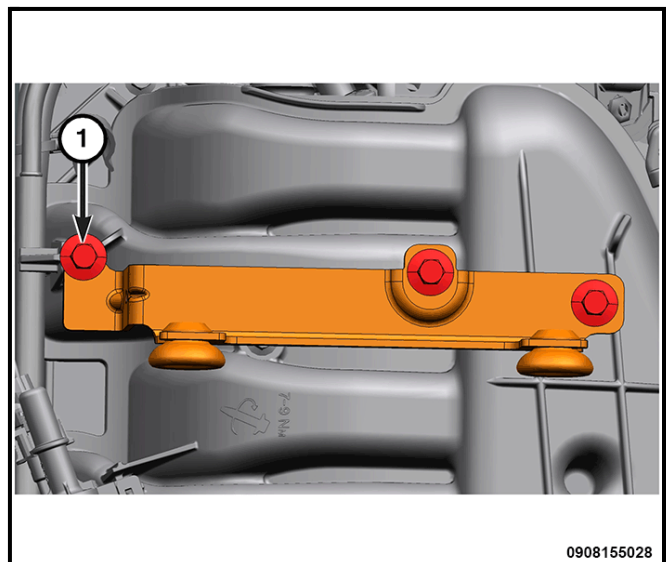
19. Connect the evaporative purge solenoid wire harness connector (1) and attach the wire harness retainer to the manifold.



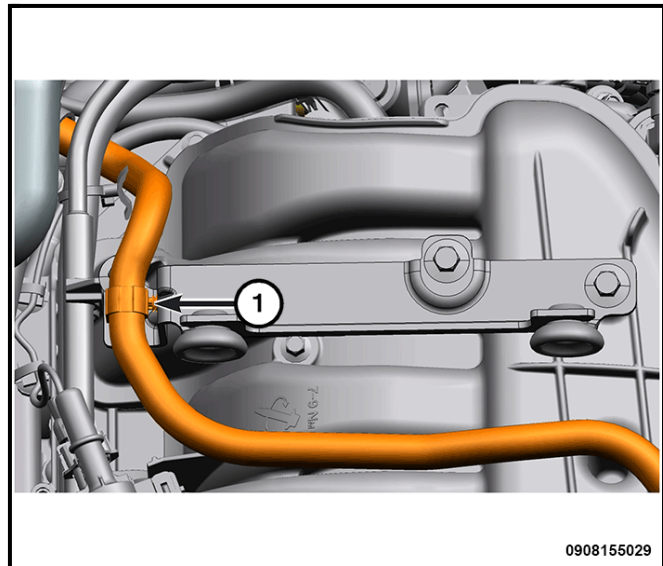
20. Connect the vapor purge line (1).



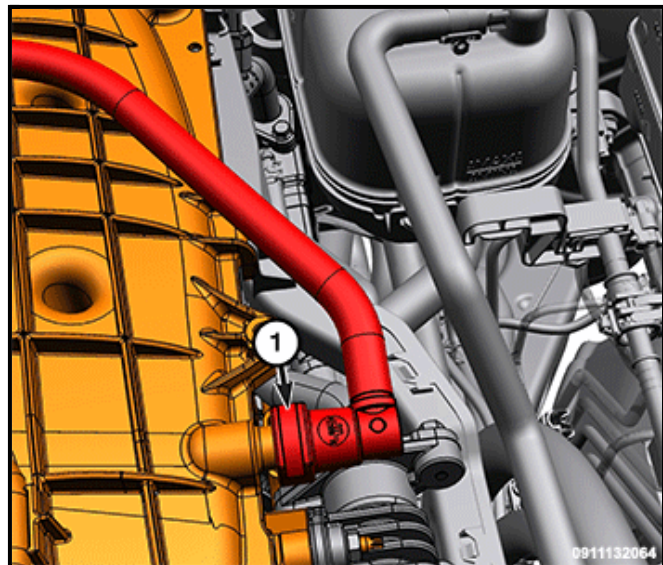
21. Install the engine cover bracket to the upper intake manifold and tighten the bolts (1) to the proper (Torque Specifications) .



22. Connect the Positive Crankcase Ventilation (PCV) hose (1) to the engine cover bracket.



23. Connect the PCV hose (1) to the upper intake manifold.



24. Install the air cleaner resonator (Refer to 09 - Engine/Air Intake System/RESONATOR, Air Cleaner/Removal and Installation) .
25. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
26. Connect the negative battery cable(s) (Refer to 08 - Electrical/Battery System/Standard Procedure) .