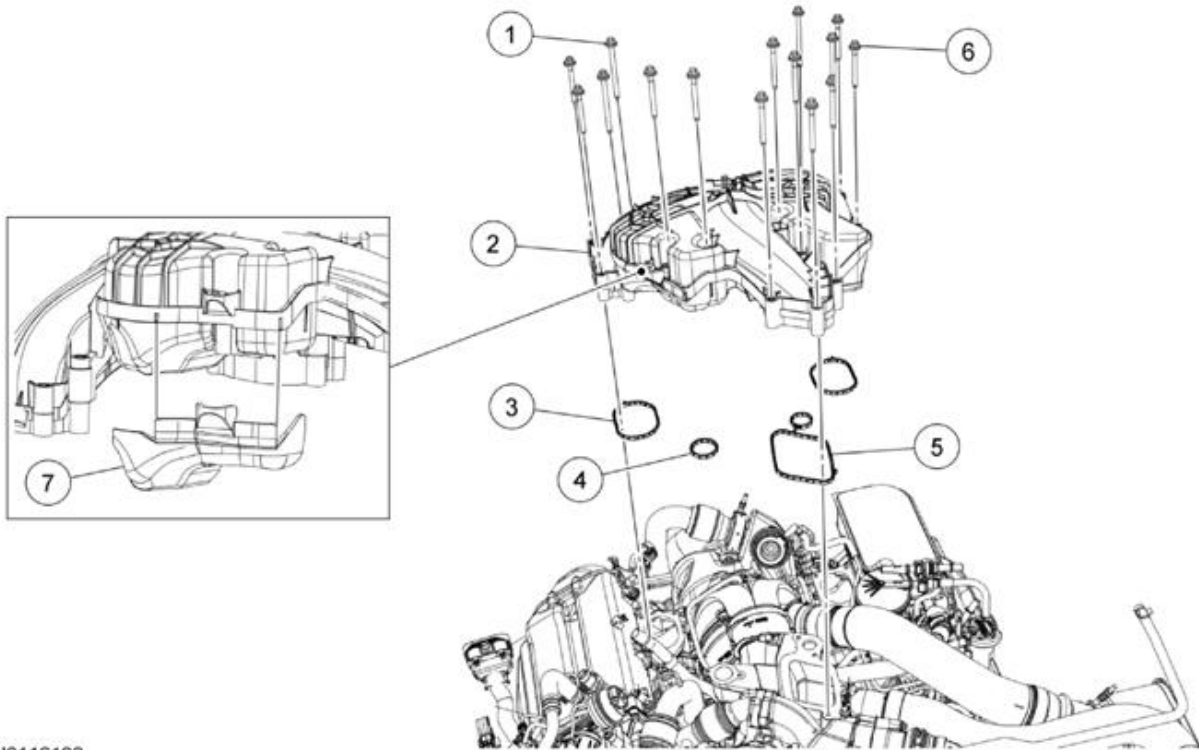


## 1. Intake Manifold – Upper Removal

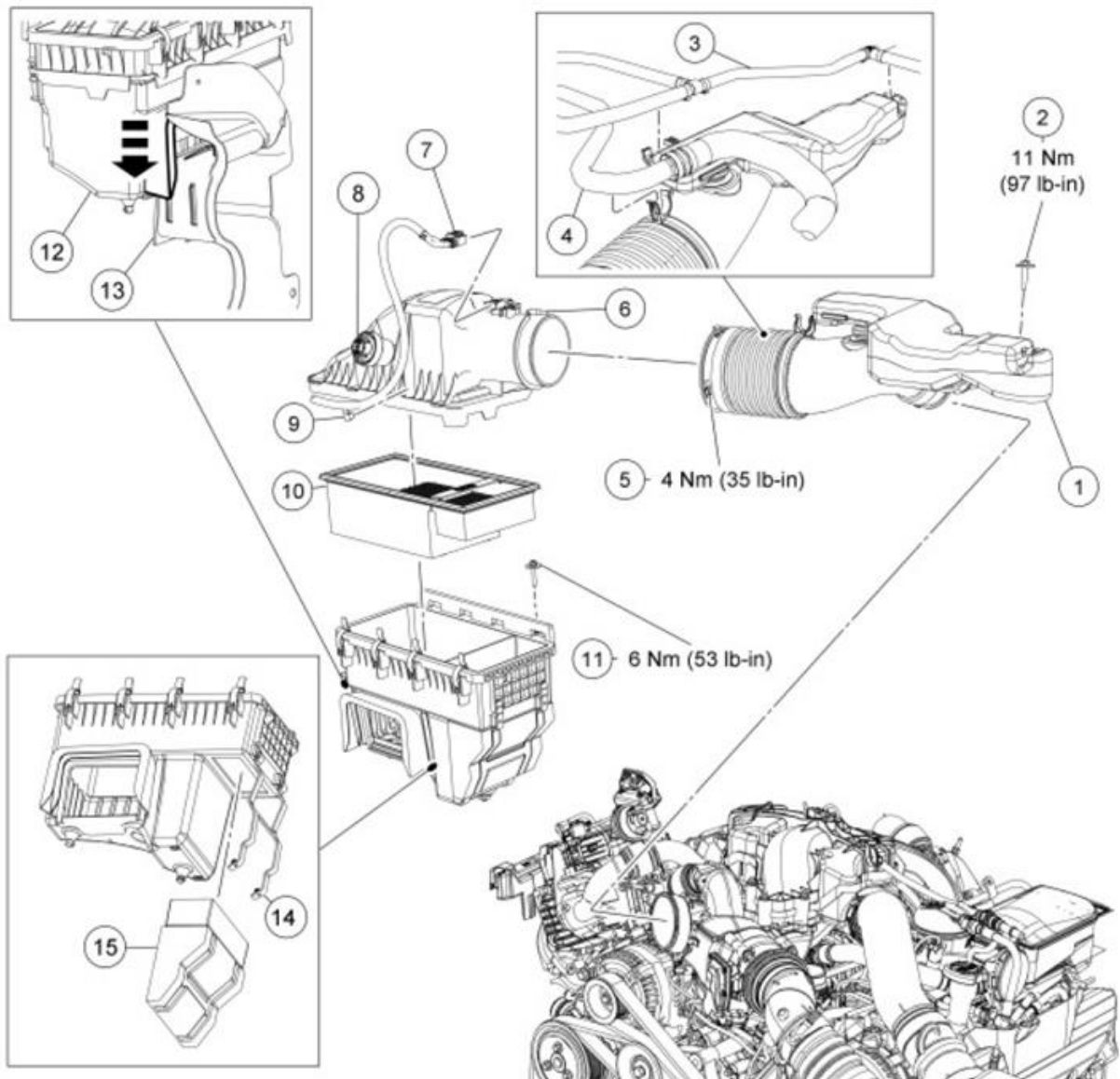


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- A. Remove the air cleaner Air Cleaner (ACL) outlet tube.
- B. Disconnect the Manifold Absolute Pressure (MAP) sensor electrical connector and wire harness retainers.
- C. Disconnect the coolant hose retainer from the upper intake manifold.
- D. Remove the transmission fluid level indicator tube bolt and the engine oil level indicator tube bolt.
- E. If equipped, disconnect the vacuum hose retainer from the upper intake manifold.
- F. Remove heater inlet tube top retainer.
- G. Remove the 15 bolts and apply outward pressure on metal pipe to remove the upper intake manifold.
  - Cover or tape the opening on the valve covers and lower intake manifold.
  - Remove and discard the gaskets.

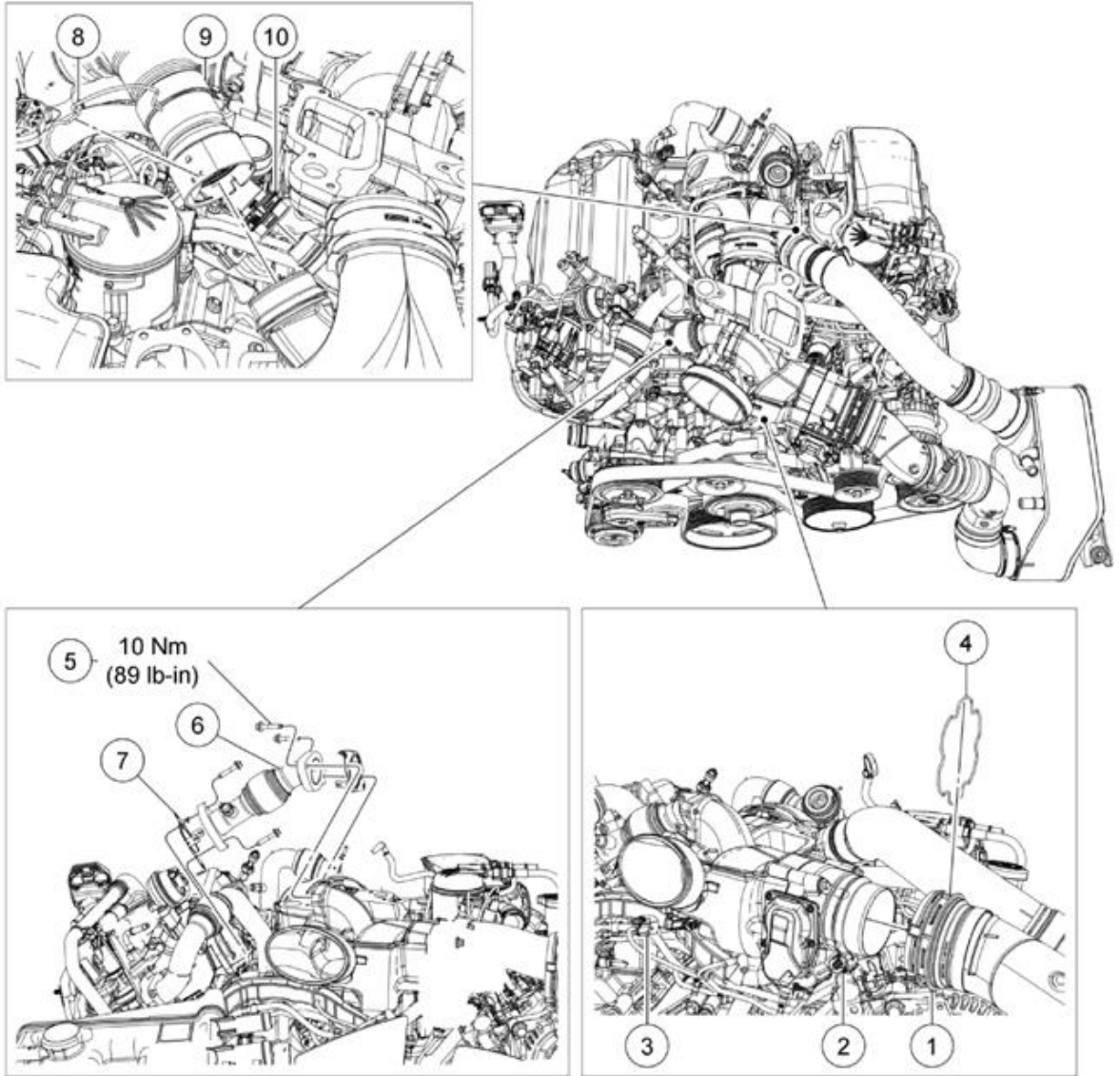
## 1. Remove Lower Intake Manifold

A. Remove the air cleaner Air Cleaner (ACL) outlet tube.



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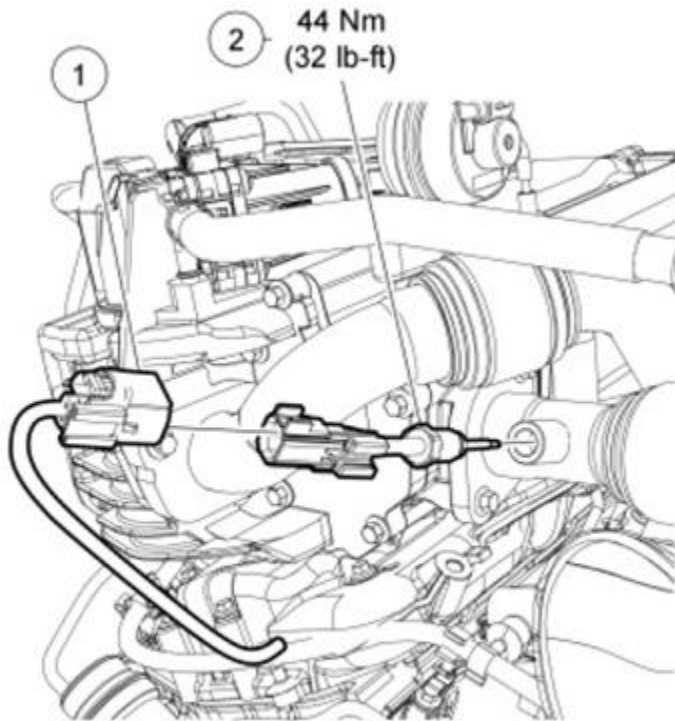
B. Release the clip and disconnect the Charge Air Cooler (CAC) outlet tube from the Throttle Body (TB).



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C. Disconnect the TB electrical connector.

- D. Disconnect the Exhaust Gas Recirculation Temperature (EGRT) sensor electrical connector and the wire harness retainer.



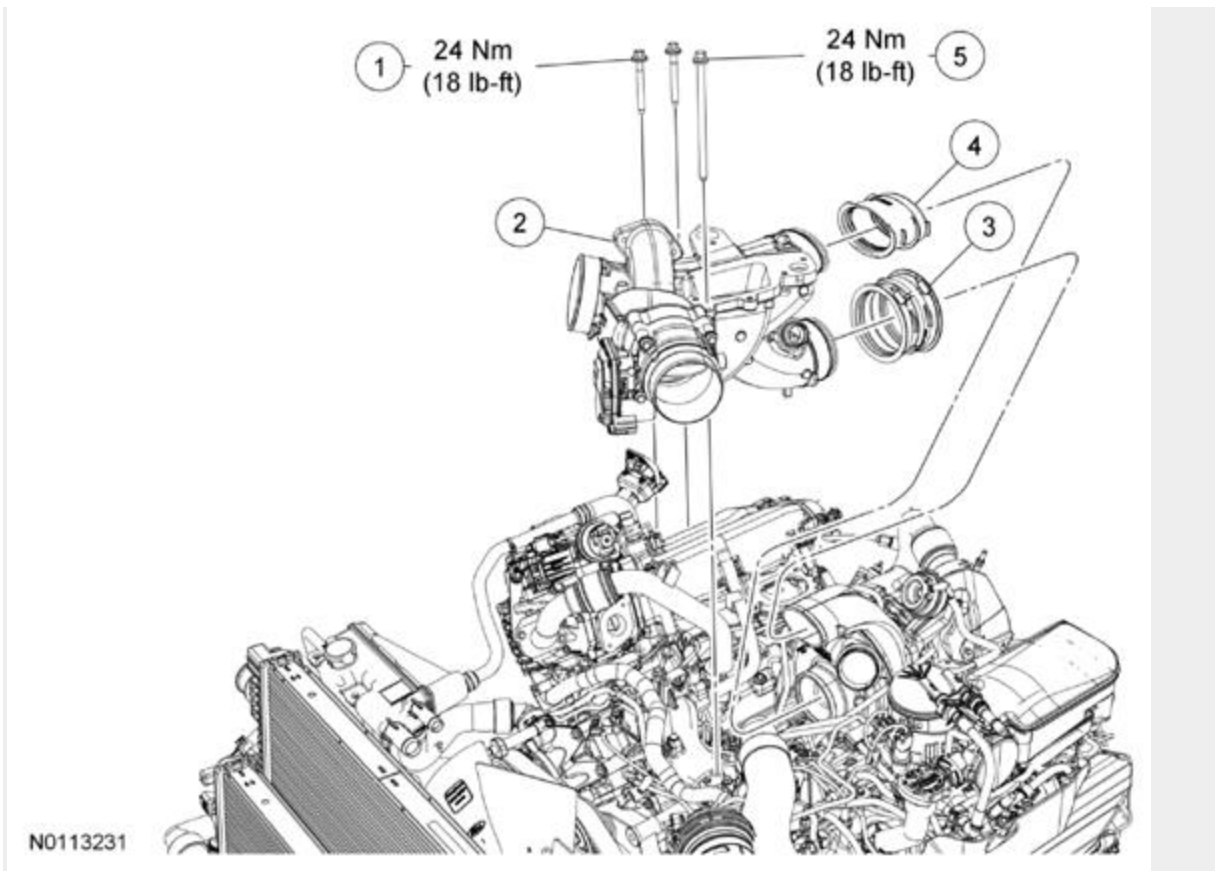
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- E. Remove the 4 bolts and the EGR bypass outlet pipe.

- Discard the gaskets.

- F. Release the clip and disconnect the CAC inlet tube from the turbocharger.

*NOTE: Vehicles with over 14,000 pounds Gross Vehicle Weight Rating (GVWR), will only have the lower turbocharger inlet boot.*



- Loosen the turbocharger inlet hose clamps.
- Loosen the 2 lower turbocharger inlet hose clamps.
- If equipped, loosen the 2 upper turbocharger inlet hose clamps.

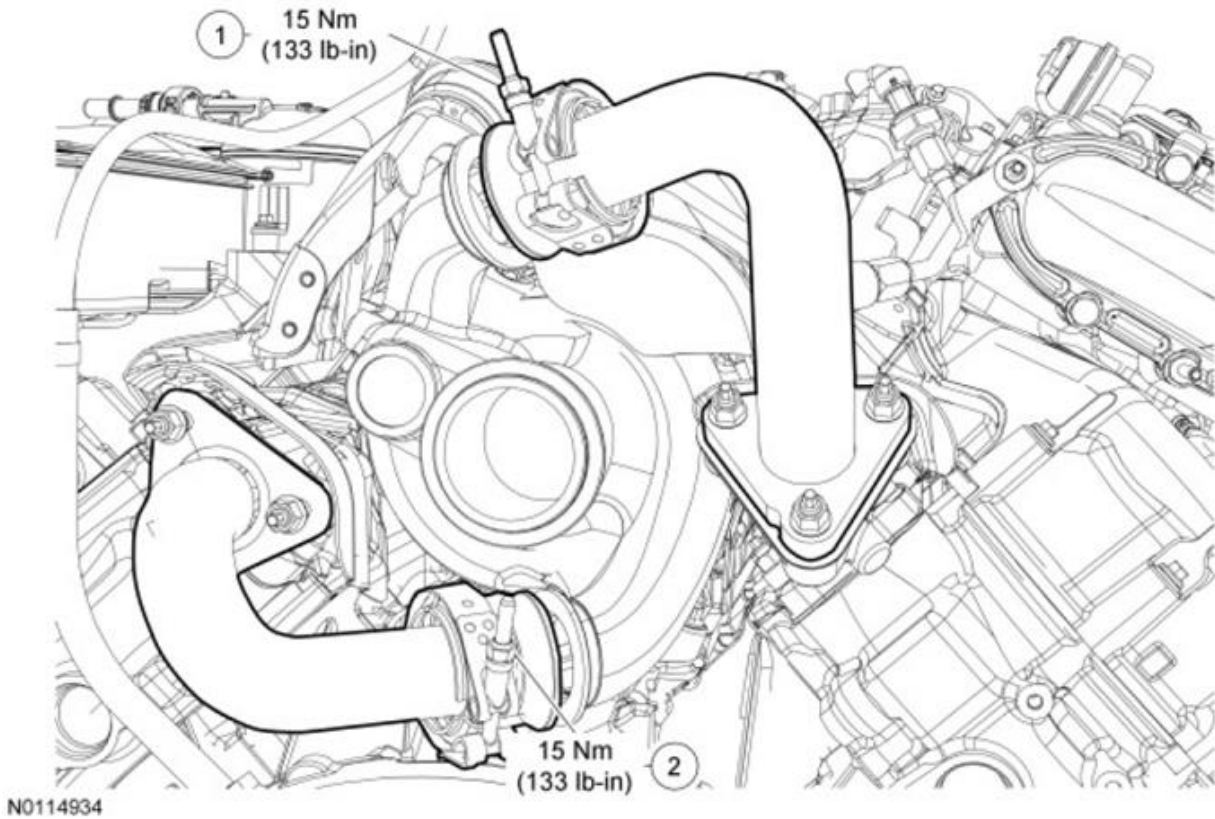
G. Disconnect the crankcase ventilation hose from the lower intake manifold.

H. Remove the 3 bolts and the lower intake manifold.

- Remove the turbocharger inlet hose(s) as needed.

## 2. Remove LH Turbocharger Inlet Pipe

### Removal



*NOTE: Exhaust nuts are of a torque prevailing design. Use only new nuts with the same part number as the original. Torque values must be used as specified during reassembly to make sure of correct retention of exhaust components.*

- A. Remove the bracket bolt and position the transmission fluid filler tube aside.
- B. Remove the crankcase vent oil separator.
- C. Remove and discard the 3 LH turbocharger inlet pipe nuts.
- D. Remove the RH fender splash shield.

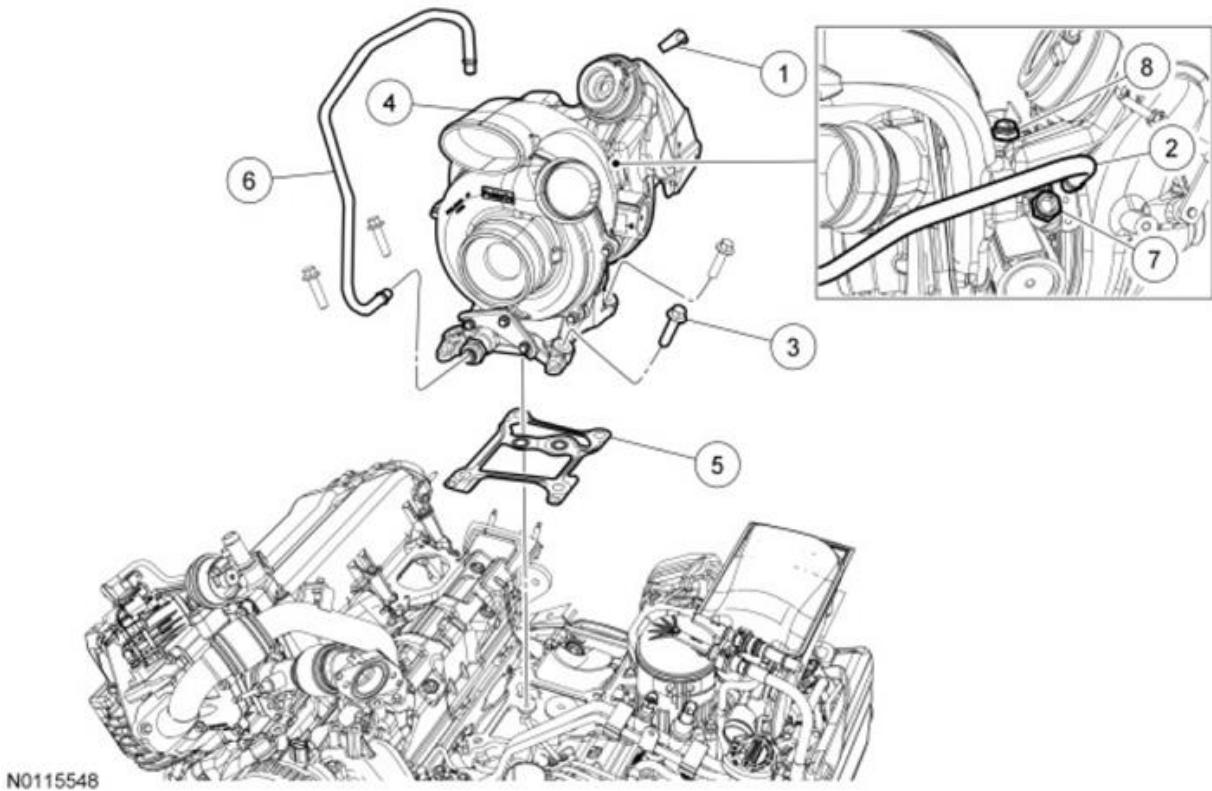
*NOTE: Note the position of the LH turbocharger inlet pipe clamp for installation.*

- Loosen the LH turbocharger inlet pipe clamp.
- Position the clamp on the LH turbocharger inlet pipe.

*NOTE: Do not bend or twist the turbocharger inlet pipes or damage to the bellows on the turbocharger inlet pipes may occur.*

- E. Remove the LH turbocharger inlet pipe.
- Discard the LH turbocharger inlet pipe gasket and clamp.

### **3. Remove Turbocharger**



- A. Drain the primary engine cooling system.
- B. Disconnect the heater core inlet hose from the heater inlet tube.
- C. Remove the lower bolt and heater core inlet tube.
- Inspect O-ring seal for damage, replace if necessary.
- D. Disconnect the turbocharger actuator electrical connector.

- E. If equipped, disconnect the turbocharger wastegate actuator vacuum hose.
- F. Remove the 3 bolts and turbocharger heat shield.

Loosen the exhaust upper downpipe clamp.

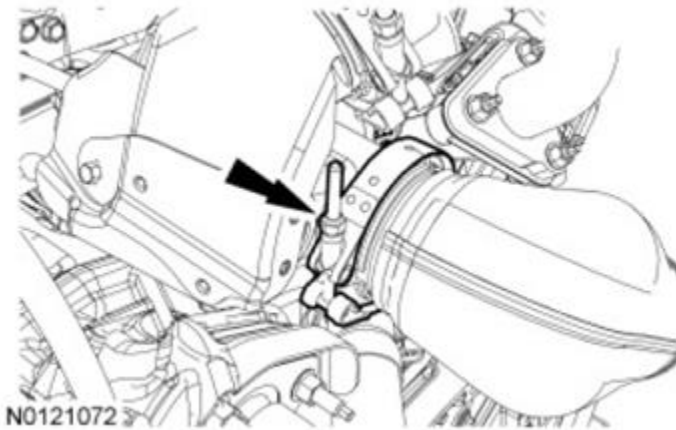


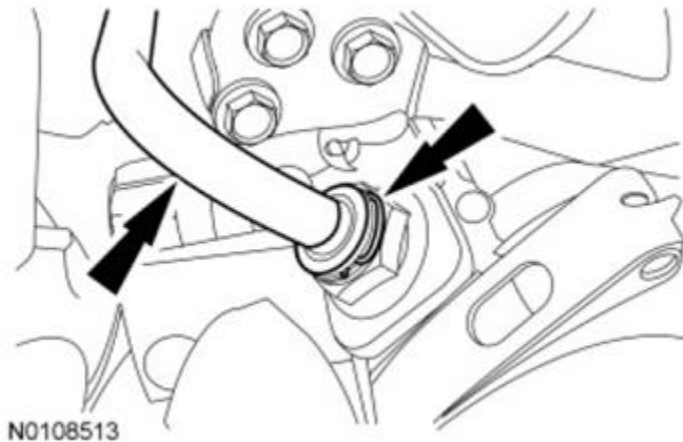
Fig 16: Locating Exhaust Upper Downpipe Clamp

- G. Remove the RH fender splash shield.
- H. Remove the exhaust upper downpipe bracket bolt.
- I. Remove the 2 exhaust lower downpipe-to-catalyst and particulate filter assembly bolts and remove the downpipe assembly.
  - Discard the exhaust upper downpipe clamp.
- J. Loosen the RH turbocharger inlet pipe clamp and slide the clamp off the turbocharger.
  - Discard the clamp after turbocharger is removed.
- K. Loosen the LH turbocharger inlet pipe clamp and slide the clamp off the turbocharger.
  - Discard the clamp after turbocharger is removed.
- L. *NOTE: Use a 3/8 inch Jiffy-tite quick line disconnect tool, such as Snap-on® LDTSP4 or equivalent, to disconnect the turbocharger coolant outlet tube.*

*NOTE: If necessary, remove the turbocharger heat shield and discard the bolts.*



- Disconnect the turbocharger coolant outlet tube from the turbocharger.



M. *NOTE: Lift the turbocharger off locating dowels before positioning forward for removal.*

*NOTE: The turbocharger is a tight fit between cowl and injection pump fuel lines but comes out without removing fuel lines.*

Remove the 4 bolts and the turbocharger.

- Discard the turbocharger gasket and bolts.

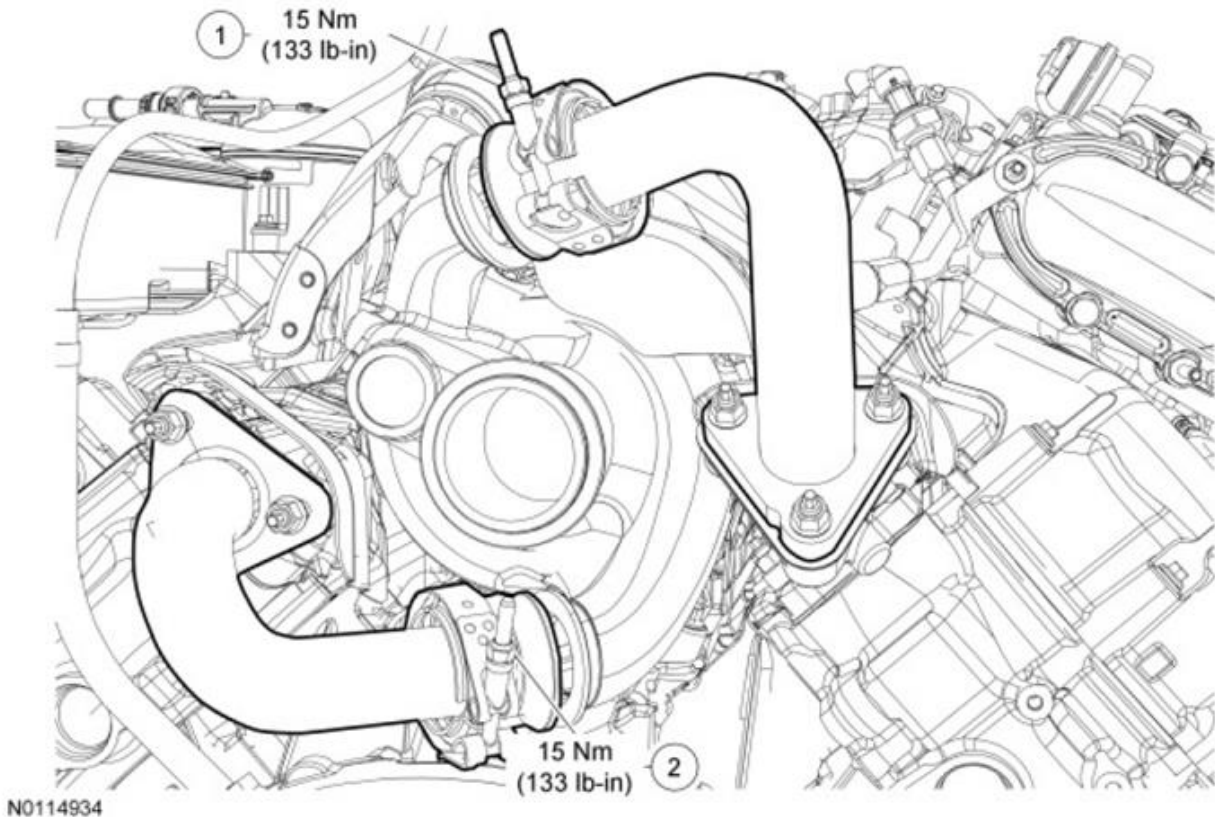
N. *NOTE: Use a 3/8 inch Jiffy-tite quick line disconnect tool, such as Snap-on® LDTSP4 or equivalent.*

- Disconnect the turbocharger coolant outlet tube at the center housing and secure tube off to the side.

O. *NOTE: Use a 3/8 inch Jiffy-tite quick line disconnect tool, such as Snap-on® LDTSP4 or equivalent.*

- If servicing or replacing the turbocharger, disconnect the turbocharger oil supply tube from the turbocharger oil supply fittings.
- Discard the oil supply tube.

## 4. Remove RH Turbocharger Inlet Pipe



- A. Remove the crankcase vent oil separator.

*NOTE: Note the position of the RH turbocharger inlet pipe clamp for installation.*

- B. Loosen the RH turbocharger inlet pipe clamp.
- Position the clamp on the RH turbocharger inlet pipe.
- C. Remove the RH fender splash shield. For additional information, refer to FRONT END BODY PANELS .
- D. Remove the Exhaust Pressure (EP) sensor flare nut from the RH turbocharger inlet pipe.

*NOTE: Do not bend or twist the turbocharger inlet pipes or damage to the bellows on the turbocharger inlet pipes may occur.*

- E. Remove and discard the 3 RH turbocharger inlet pipe nuts and remove the RH turbocharger inlet pipe.
- Discard the RH turbocharger inlet pipe gasket and clamp.