Turbocharger Installation

M-255-001

(August 2009)

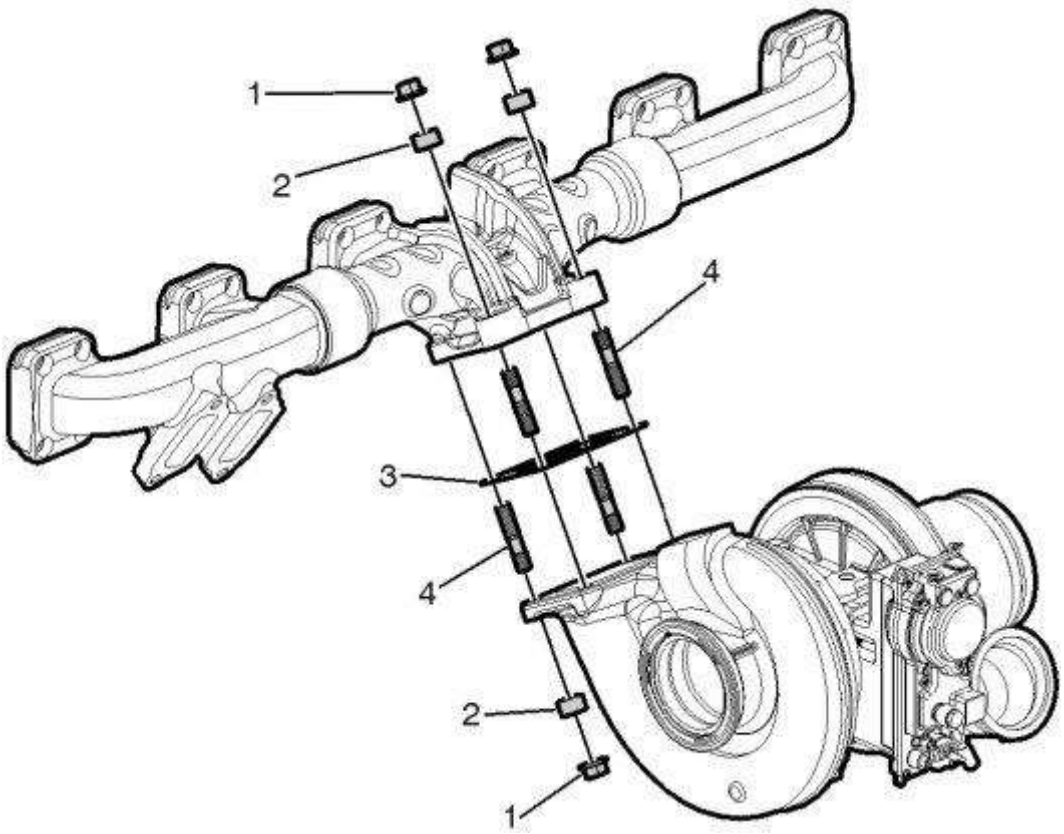
Valid for

All TD models with an MP10

Case description

When replacing or reinstalling a turbocharger on a Mack MP10 engine, the existing mounting hardware (studs, gasket, spacer sleeves and flange nuts) must be replaced. The old stud is stainless steel and have "SD" marked in the nut end, the new stud is Inconel and has no marking on the nut end. The old spacer is stainless steel and non-magnetic, the new spacer is cast iron, magnetic and 2 mm shorter. The old gasket was single layer, the new gasket is multilayer. Once the hardware has been upgraded to the new parts, the hardware does not need to be replaced unless it is damaged. Additionally, the torque specification for the turbocharger mounting nuts has been changed to 120 Nm (88 lb-ft).Turbocharger mounting kit 85121583 contains all the parts needed to upgrade the mounting hardware:

Turbocharger Mounting Hardware



Key	Description
1	Nuts, flanged, turbocharger mounting
2	Spacer, turbocharger mounting, cast iron, magnetic
4	Gasket, turbocharger mounting flange, multi-Layer
5	Stud, turbocharger mounting, Inconel

Note: Does not apply to Mack Trucks Australia.

Procedure

You must read and understand the precautions and safety guidelines in "Safety Information" section, Mack MP10 Diesel Engine service manual before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

Turbocharger removal and installation procedures are as follows:

Note: The turbocharger removal and installation procedures outlined below differ from the procedures outlined in the MP10 engine service manuals dated January 2009 and earlier. It is recommended that this service bulletin be photocopied and inserted in your MP10 engine service manual.

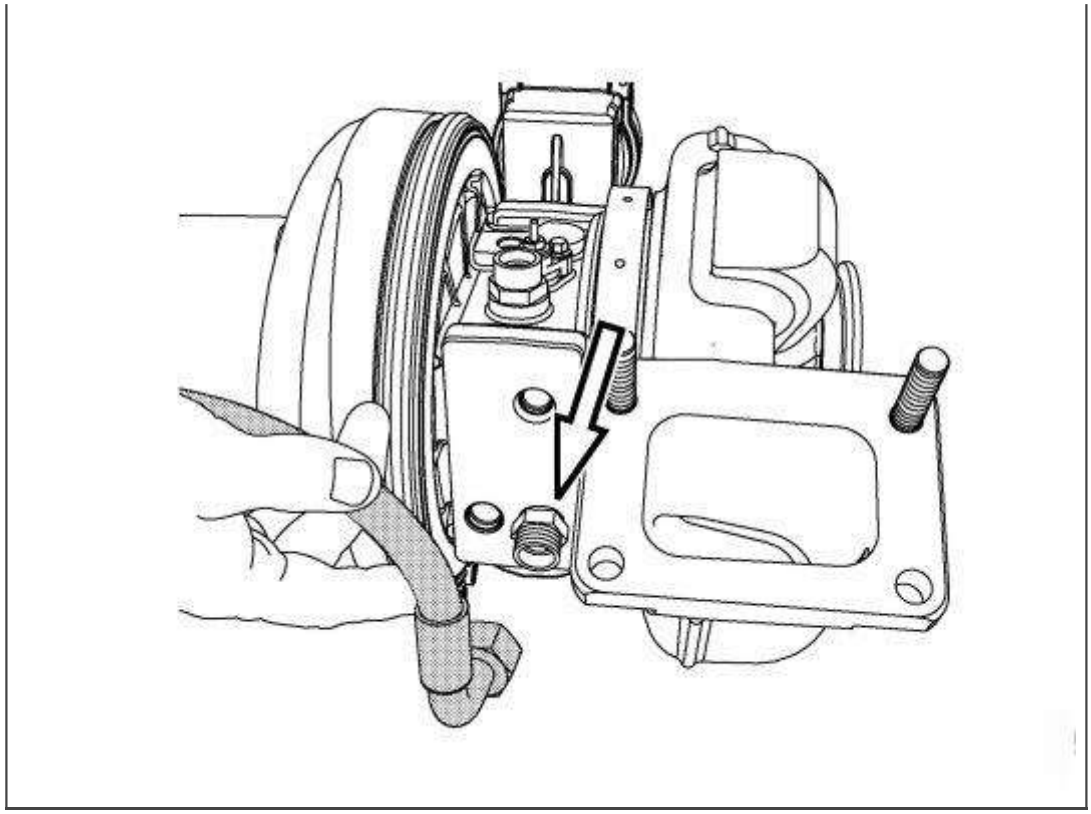
Note: The turbocharger drain line must be completely removed from the engine before the turbocharger is replaced.

1. Remove the existing studs from the exhaust manifold and the turbocharger mounting flanges.
2. Clean the turbocharger mounting surface on the exhaust manifold. Also clean the turbocharger oil return pipe and spacer block.
3. With the turbocharger positioned upside down (oil supply fitting facing up), pour a small quantity of clean engine oil into the oil supply fitting, and then spin the turbocharger compressor wheel so that the bearings will be coated with oil.

Caution
Failure to sufficiently pre-lube the turbocharger as described above can result in damaged turbocharger bearings when the engine is started.

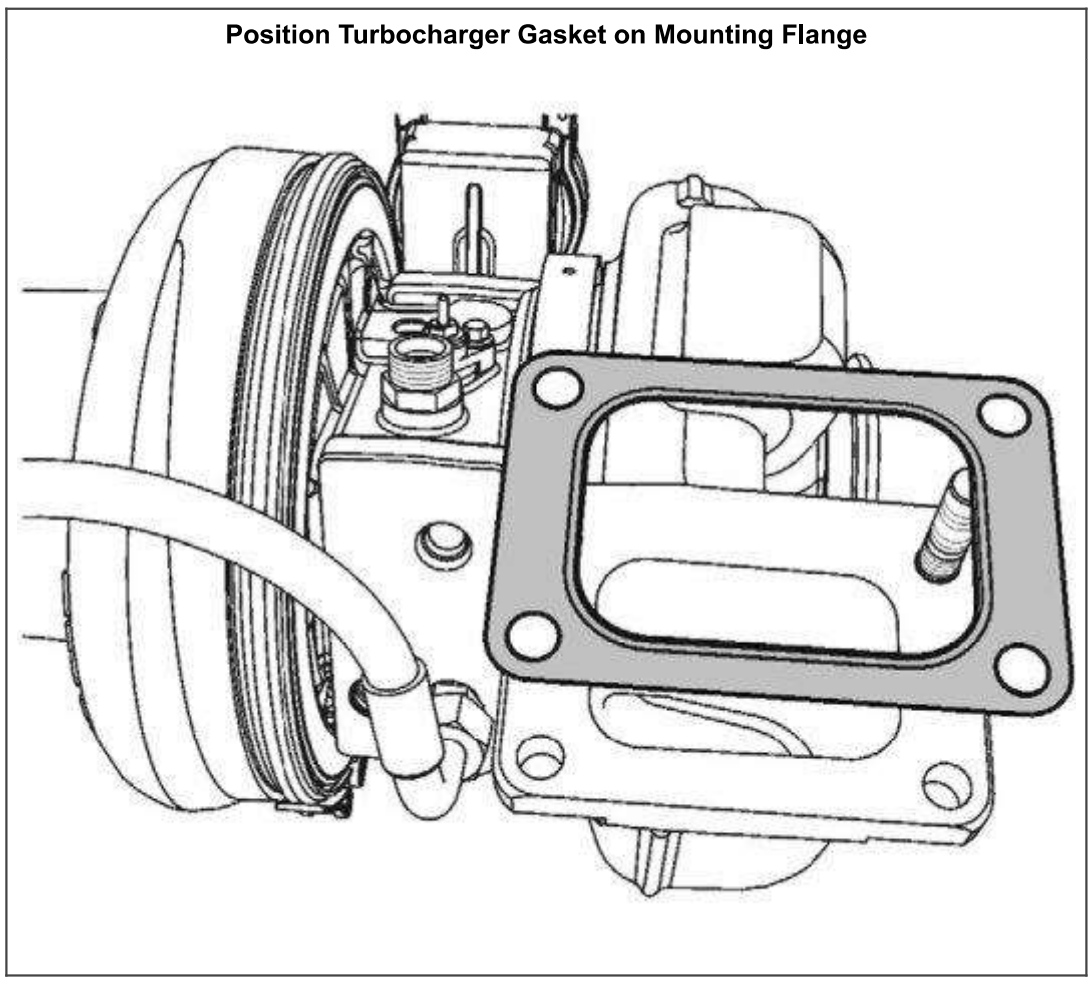
4. Install the new studs in the exhaust manifold and turbocharger mounting flanges. Using a stud driver and an accurately calibrated torque wrench, tighten the studs to 20 Nm (15 ft-lbs).

Install Turbocharger Mounting Studs



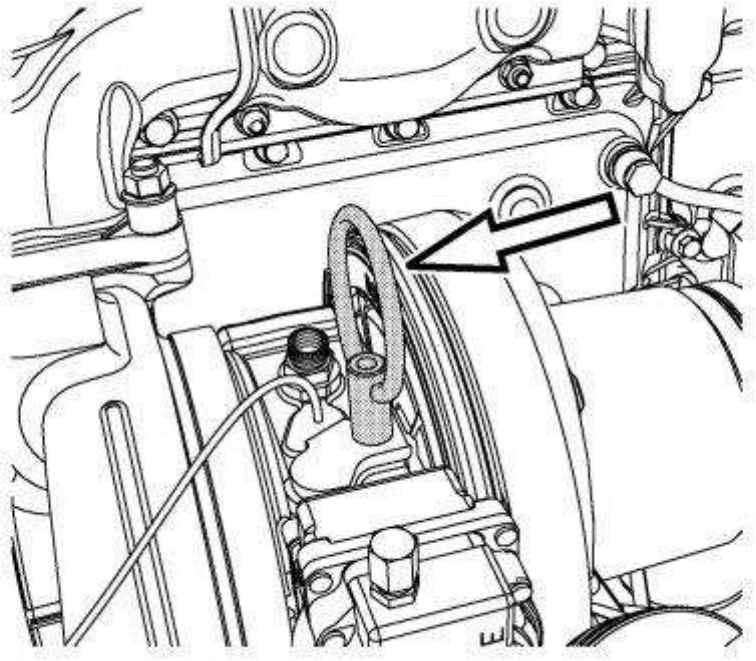
5. If the coolant supply line had been removed from the back of the turbocharger, reinstall the line. Position a new turbocharger-to-exhaust manifold gasket over the two studs on the turbocharger mounting flange. Tighten the fitting 48 ±5 NM (35 ±4 ft-lb).

Position Turbocharger Gasket on Mounting Flange



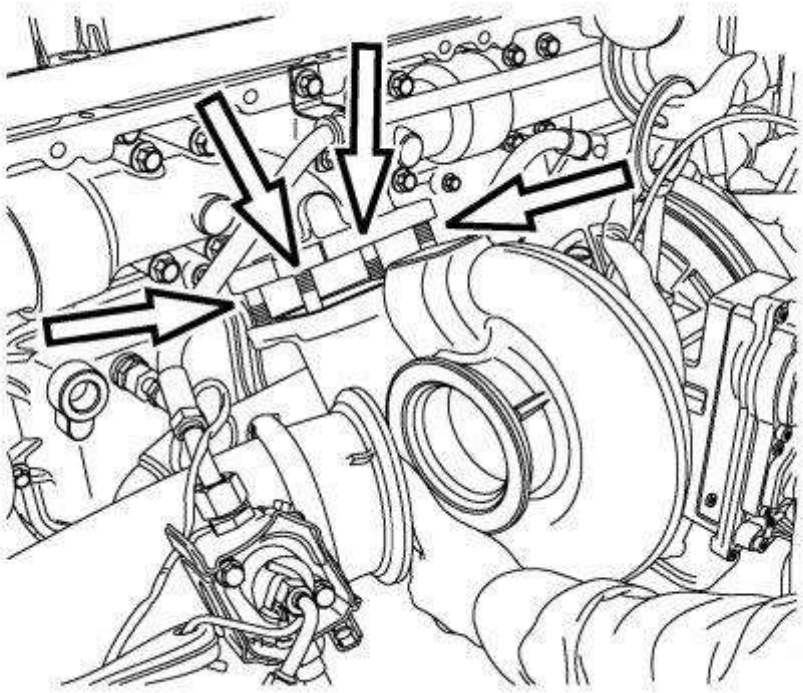
6. Remove the plug from the hole located in the turbocharger bearing housing for installation of the turbocharger lifting tool, and then install the tool (tool No. 85108575).

Lifting Tool Installed in Turbocharger Bearing Housing



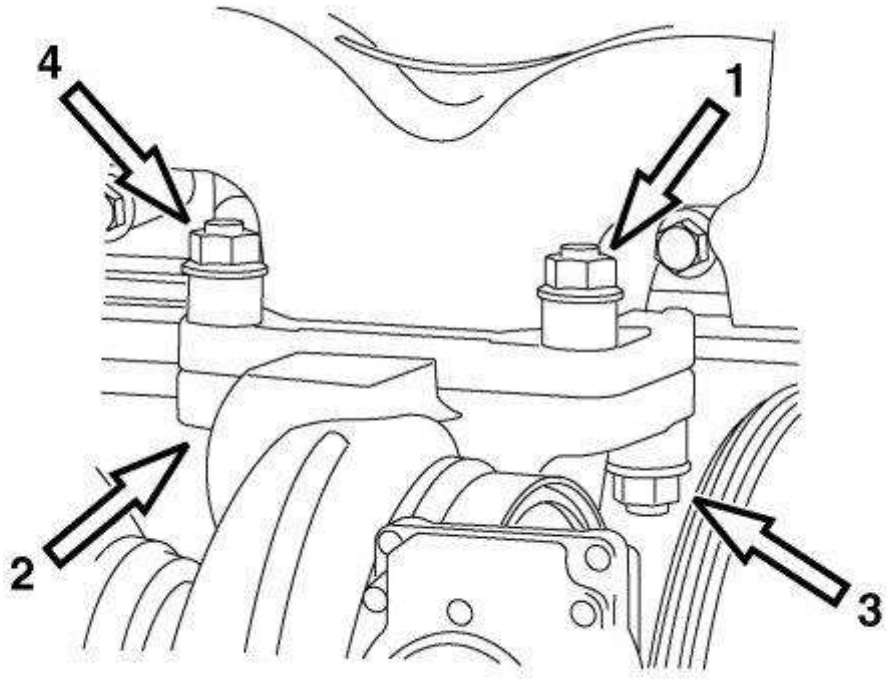
7. Insert the hook of mobile floor crane (such as OTC16-1815 or equivalent) into the lifting tool. Raise the turbocharger. With the aid of an assistant, position the turbocharger against the exhaust manifold mounting surface, aligning the studs on the turbocharger and manifold with the corresponding mounting holes in the opposing mounting surface.

Guiding Turbocharger into Position



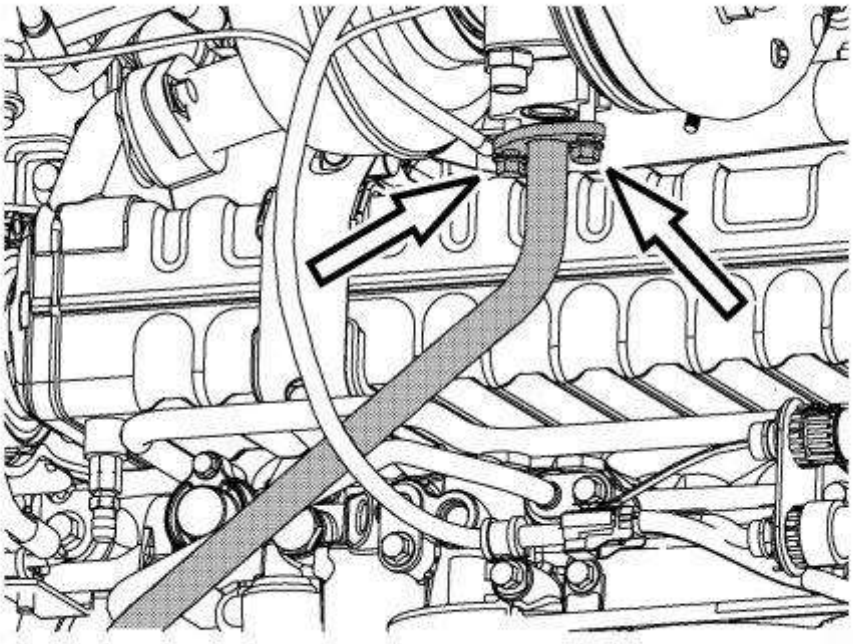
8. Apply Permatex® high-temperature nickel-graphite anti-seize compound (part number 5166–77124) to the threads on the studs and the contact surfaces on the flange nuts. The high-temperature anti-seize compound helps prevent oxidation corrosion and reduces friction to help achieve the intended clamp load when tightening the fasteners to specifications.
9. Install the new spacers and new flange nuts to the mounting studs. In the criss-cross pattern shown in the illustration below, use an accurately calibrated torque wrench to tighten the fasteners to an initial torque specification of 20 Nm(15 ft-lbs) to snug the joint, and then, using the same criss-cross pattern, tighten the fasteners to a final torque specification of 120 Nm (88 ft-lbs).

Turbocharger Mounting Fastener Tightening Sequence



10. Disengage the mobile floor crane from the turbocharger lifting eye, and then remove the lifting eye from the bearing housing. Reinstall the plug into the threaded hole in the bearing housing.
11. Lubricate and install a new O-ring in the engine block end of the oil return pipe. Connect the pipe to the engine block and tighten the fasteners 24 Nm (18 ft-lbs). Lubricate a new turbocharger oil return pipe O-ring with clean engine oil. Position the lubricated O-ring and gasket (part number 470993) on the spacer block, and then install the oil return pipe and spacer block to the bottom of the turbocharger. Tighten the fasteners to 24 Nm (18 ft-lbs).

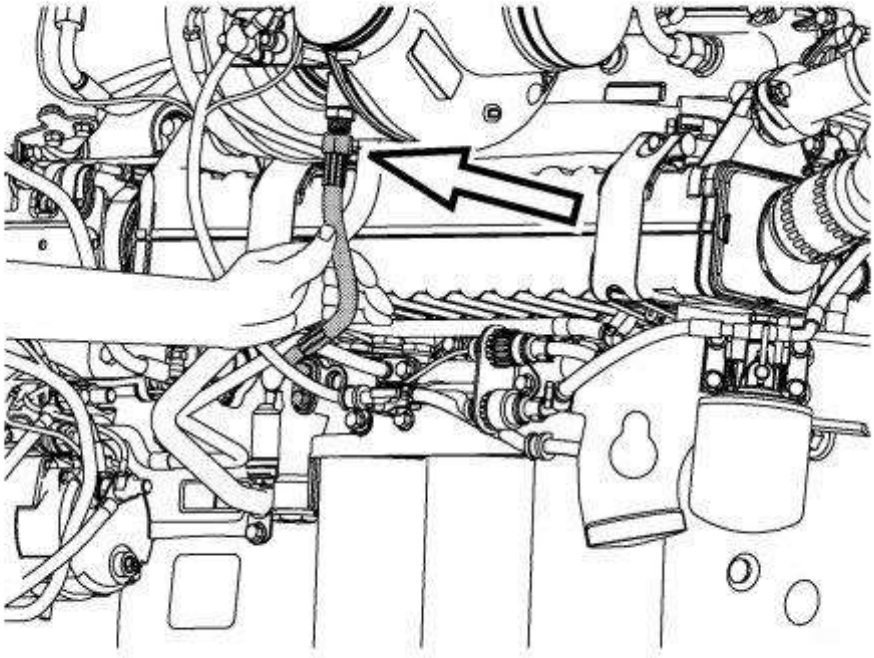
Install Turbocharger Oil Return Tube



12. Connect the oil supply line to the bottom fitting on the turbocharger bearing housing. Tighten the fitting to 28 ±5 Nm (21 ± 4 ft-lbs).

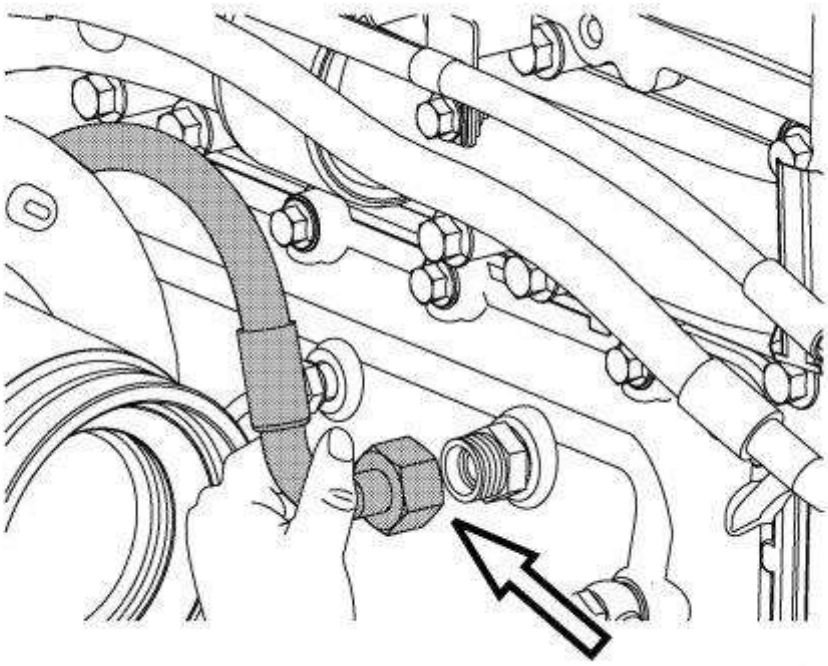
Caution
After turbocharger replacement, ensure the turbocharger is pre-filled with clean engine oil. Starting engine without proper oil pressure and a "dry" turbocharger will cause damage to turbocharger bearings.

Connect Turbocharger Oil Supply Line



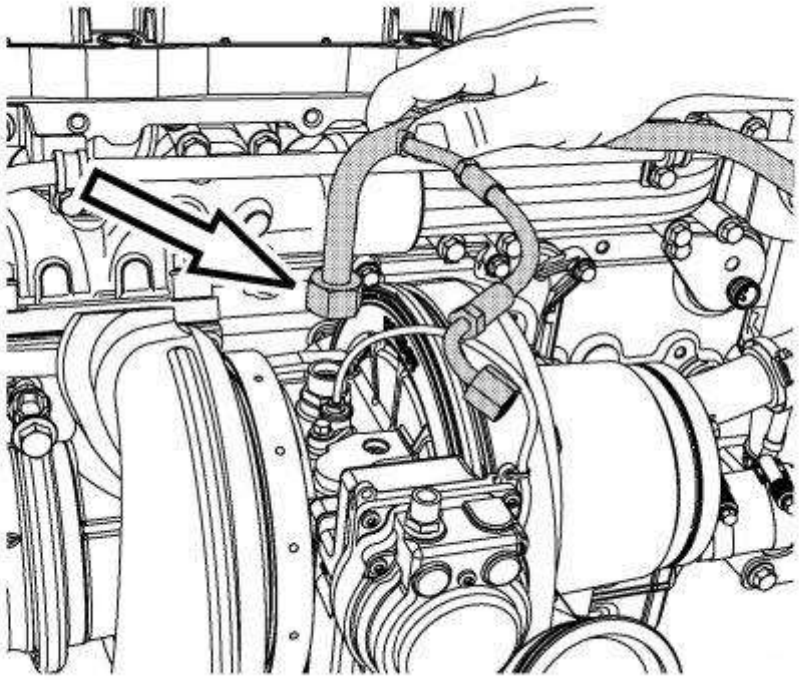
13. Connect the coolant supply line (located at the back of the turbocharger) to the coolant duct cover and tighten the fitting to 48 ±5 nm (35 ±4 ft-lbs).Connect the coolant supply line (located at the back of the turbocharger) to the coolant duct cover and tighten the fitting to 48 ±5 nm (35 ±4 ft-lbs).

Connect Turbocharger Coolant Supply Line



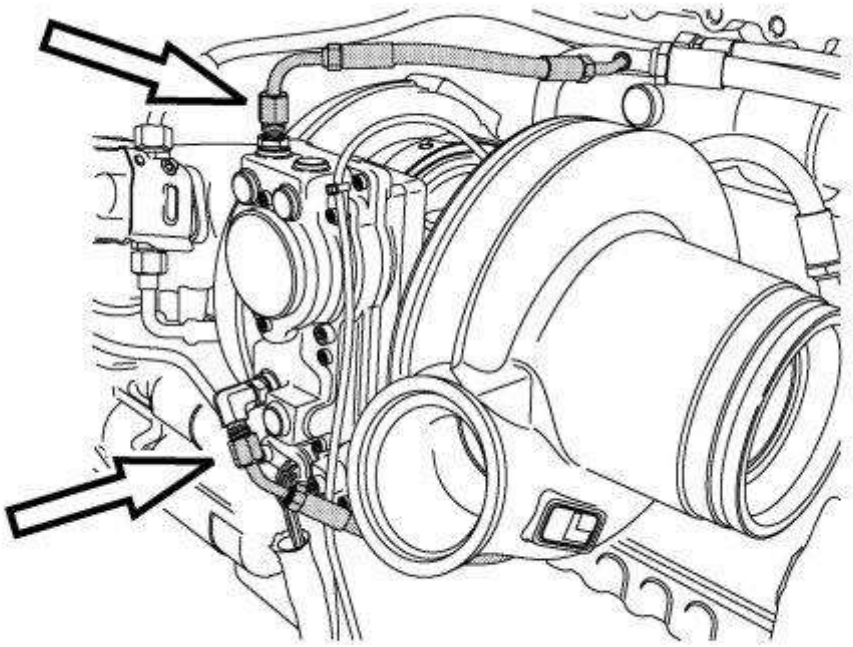
14. Connect the coolant return line to the fitting located at the top of the turbocharger bearing housing. Tighten the fitting to 60 ±6 Nm (44 ±4 ft-lbs).

Connect Turbocharger Coolant Return Line



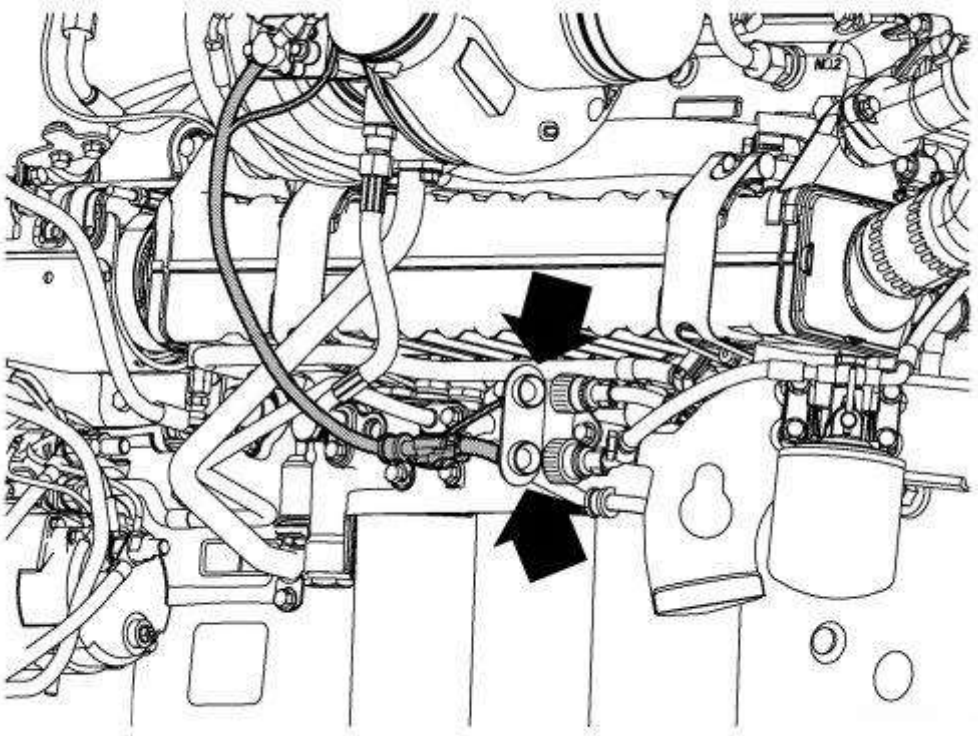
15. Connect the coolant supply and return lines to the smart remote actuator (SRA) and tighten the fittings to 12 ±3 Nm (9 ±2 ft-lbs) .

Connect SRA Coolant Supply and Return Lines

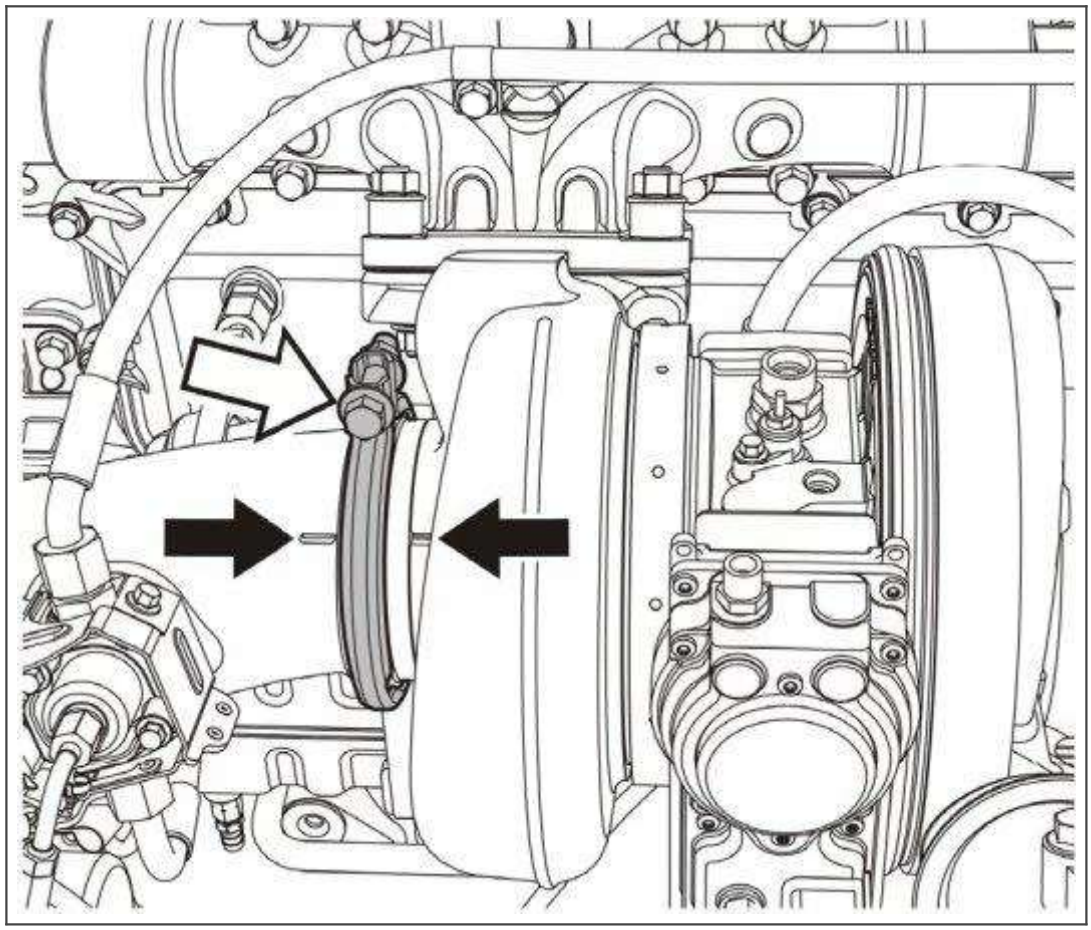


16. Connect the SRA and the turbocharger wheel speed sensor connectors at the sensor connector support bracket to the engine harness connectors. Be sure the connectors are connected correctly. The wheel speed sensor connector is the top connector on the bracket and the SRA connector is the lower connector.

Connect SRA and Wheel Speed Sensor Harness Connectors



17. Using a new gasket and clamp, position the diffuser against the turbocharger outlet. Align the cast alignment mark on the diffuser with the alignment mark on the turbocharger turbine housing, and then tighten the clamp.



18. Install the inlet air and charge air cooler ducts to the turbocharger.

Issued by

Technical Service