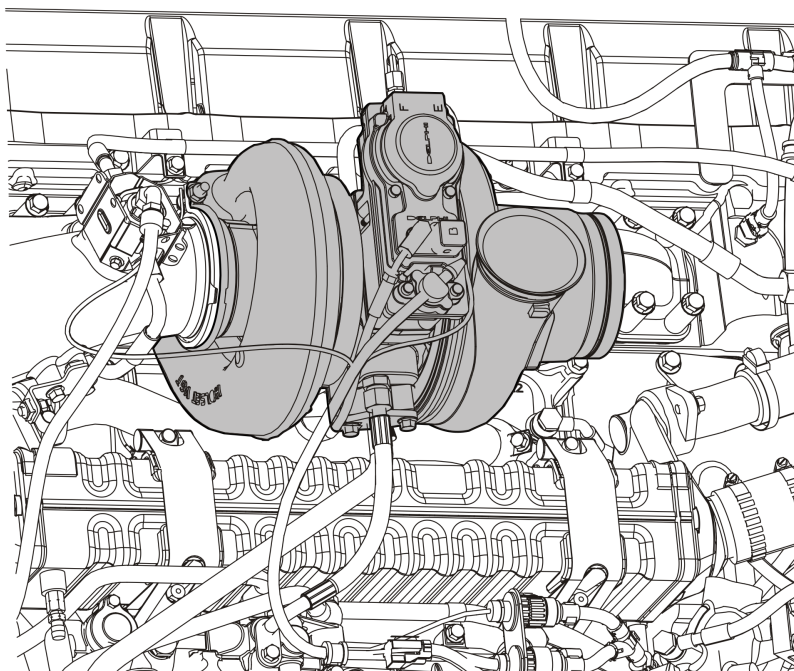


**Turbocharger
Replacement
D16F****Turbocharger, Replacement**

W2005653

This information covers the proper replacement procedure for the turbocharger on the Volvo D16F engine.

Contents

- "Special Tools" page 2.
- "Turbocharger, Replacement" page 3.

Note: Information is subject to change without notice.
Illustrations are used for reference only and can differ slightly from the actual vehicle being serviced. However, key components addressed in this information are represented as accurately as possible.

Special Tools

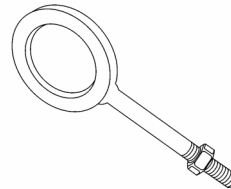
For special tools ordering information, refer to Tool Information, group 08.



W0001795

9996049

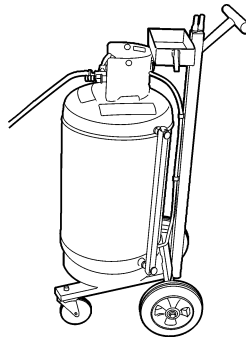
Coolant Drain Hose



W0002266

85108575

Turbocharger Lifting Tool



W2004191

DBT2V700

Coolant Extractor

2551-03-02-02 Turbocharger, Replacement

You must read and understand the precautions and guidelines in Service Information, group 20, "General Safety Practices, Engine" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

Special tools: 9996049, DBT2V700, 85108575

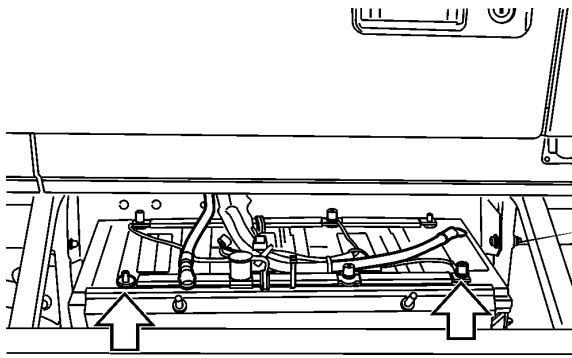
Removal

1

Apply the parking brake and place the shift lever in neutral.

2

Remove all cables from ground (negative) battery terminals to prevent personal injury from electrical shock.



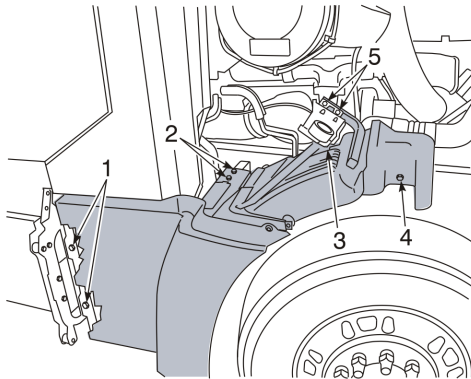
W2003815

3

Connect the coolant extractor to the drain fitting at the bottom of the radiator and drain the coolant.

Note: An alternate method is to connect the drain hose to the drain fitting and drain the coolant into a suitable container.

DBT2V700, 9996049



W2005189

- | | |
|---|---|
| 1. Two rear fender extender bolts at bracket | 4. One lower splash guard bolt at frame |
| 2. Two fender extender bolts at brace | 5. Two upper brace splash guard bolts |
| 3. One fender extender brace nut and bolt at hood release | |

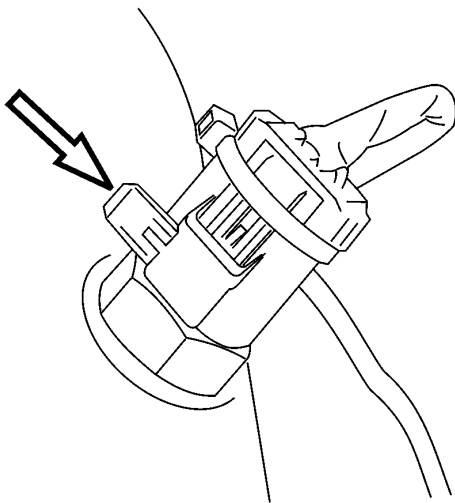
4

Remove inner splash guard as an assembly.

Note: Some models may be equipped with fender extenders, attached to the inner splash guard. Remove these as an assembly.

5

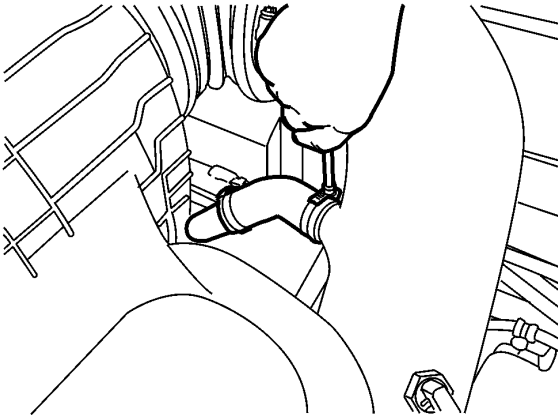
Disconnect the air temperature sensor connector from the sensor. Remove the tie strap securing the harness to the sensor and disengage the lock tab. Remove the clamp securing the sensor harness to the main fresh air pipe.



W2004720

6

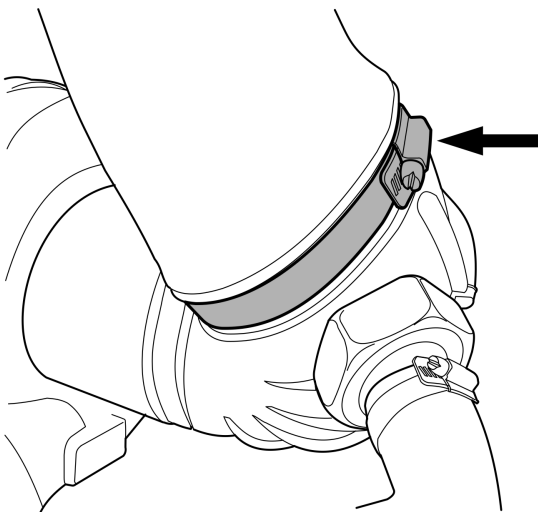
Loosen the clamp and remove the air compressor fresh air hose from the main fresh air pipe.



W2004719

7

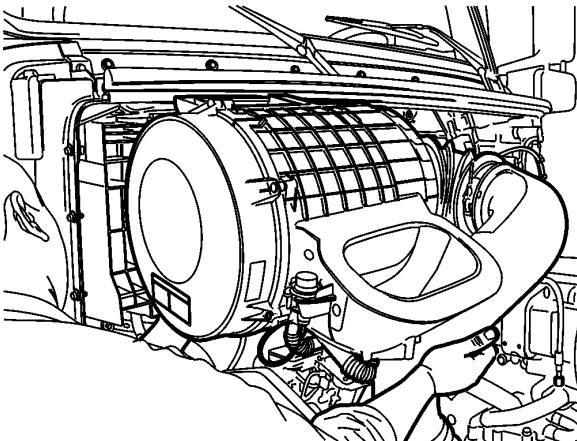
Loosen the clamp of the main fresh air pipe at the turbocharger inlet elbow. Disconnect the main fresh air pipe from the turbocharger inlet elbow.



W2006004

8

Loosen the clamp at the air filter housing and remove the main fresh air pipe.



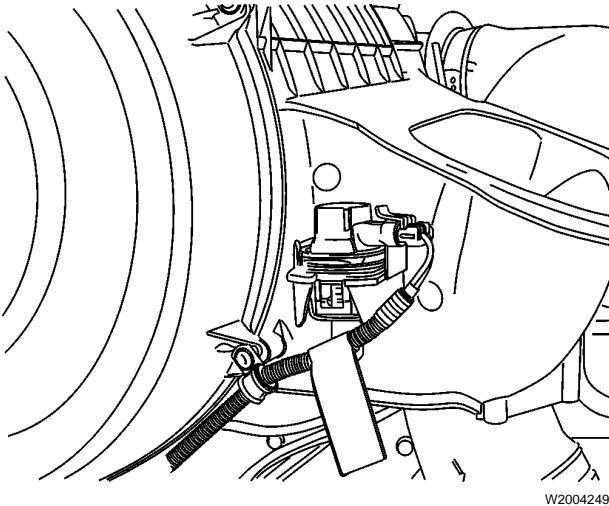
W2003859

9

Disconnect the Discharge Recirculation Valve (DRV) air line, bypass hose clamp and remove the DRV and charge air pipe from between the turbocharger and the charge air cooler.

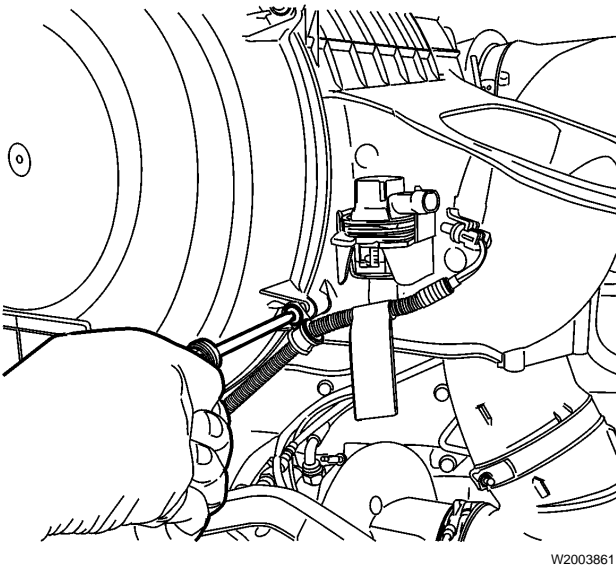
10

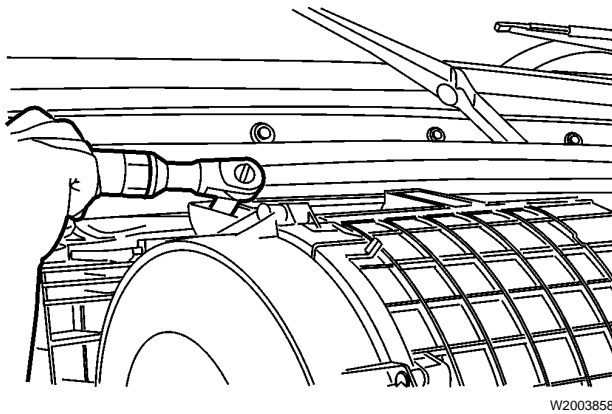
Disconnect the air filter housing air restriction gauge connector.



11

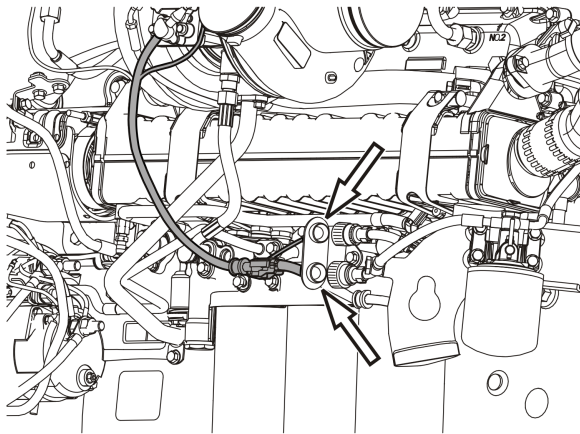
Remove the clamps securing the wiring harness to the air filter housing.





12

Remove the bolts at the top of the air filter housing and remove the housing assembly.

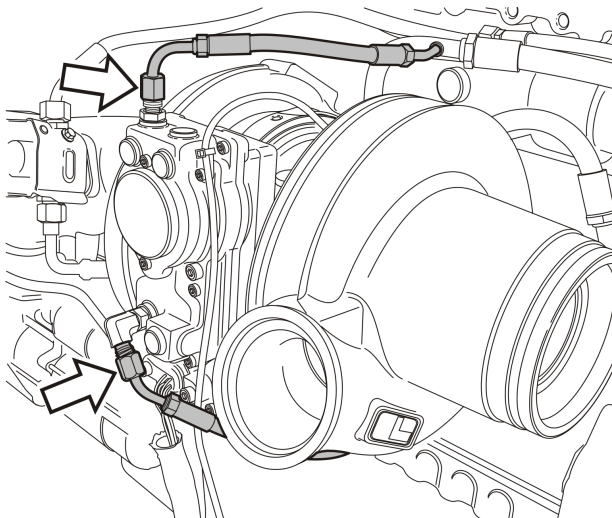


13

Loosen the inlet elbow clamp and remove the elbow from the turbocharger.

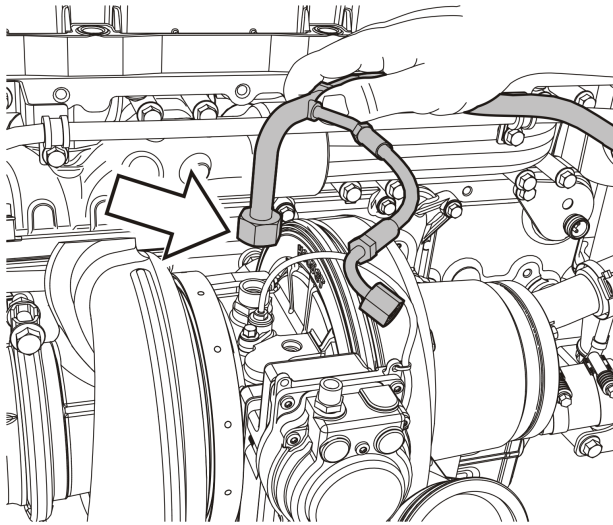
14

Release the actuator and turbocharger speed sensor wiring harnesses by cutting the nylon tie straps to free the harnesses. Disconnect the connectors located on the right side of the engine above the oil filter housing. Mark the connectors for proper reassembly.



15

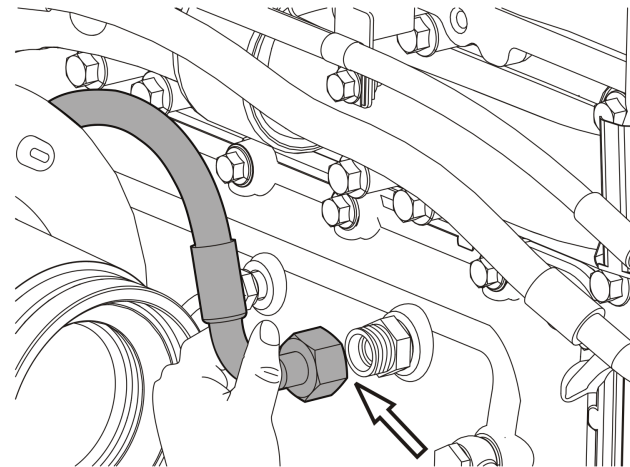
Disconnect the coolant inlet and outlet lines from the turbocharger actuator.



W2005622

16

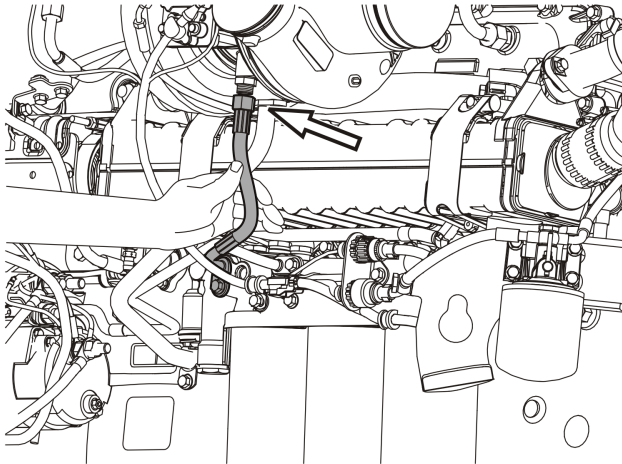
Disconnect the coolant line from the top of the turbocharger bearing housing.



W2005623

17

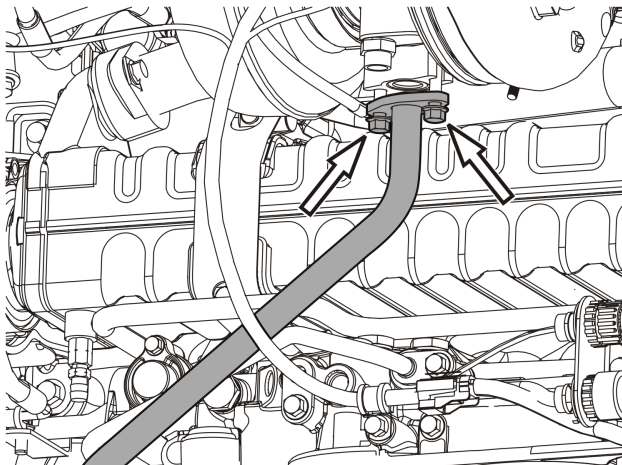
Disconnect the turbocharger coolant line at the oil cooler cover.



W2005624

18

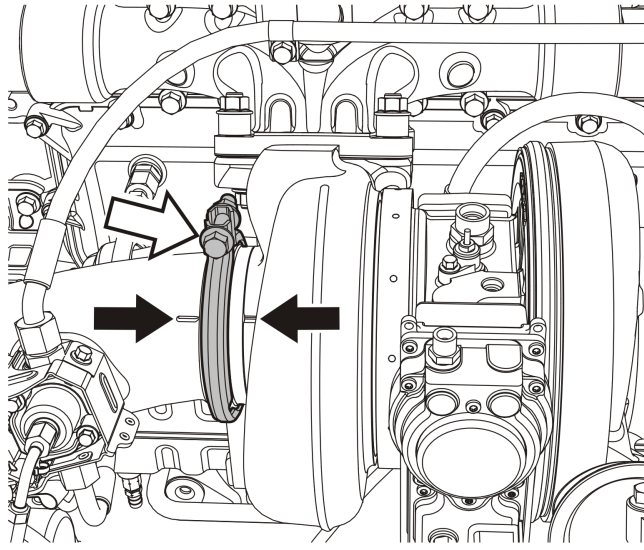
Disconnect the oil supply line from the bottom of the turbocharger bearing housing.



W2005628

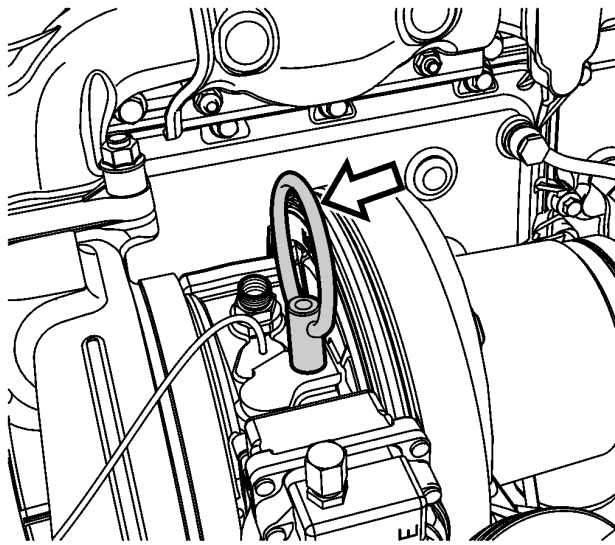
19

Remove the capscrews securing the oil return pipe to the bottom of the turbocharger bearing housing. Disconnect the pipe from the spacer block. Discard the gasket and O-ring from the spacer block.



20

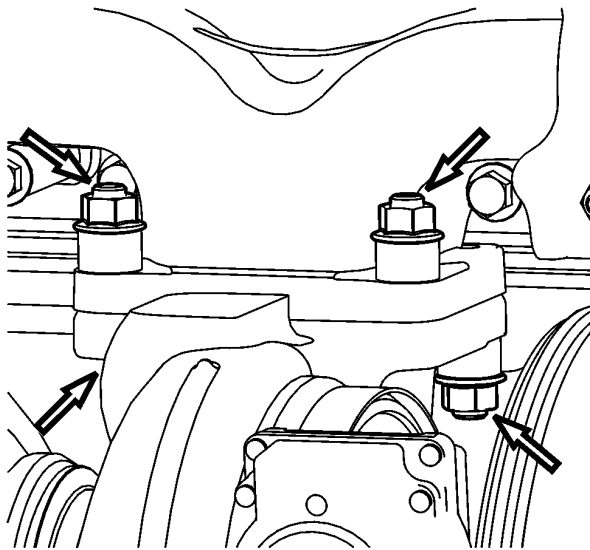
Loosen the clamp at the turbocharger diffuser and slide the diffuser slightly away from the turbocharger.



21

Remove the plug at the top of the turbocharger bearing housing and install the turbocharger lifting tool into the threaded hole.

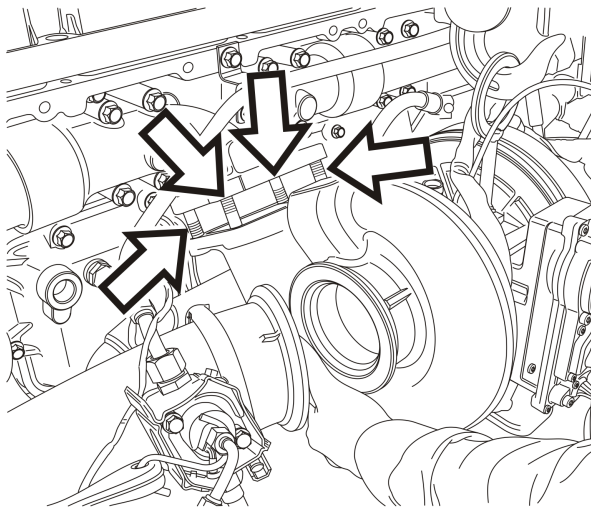
85108575



W2005011

22

Support the weight of the turbocharger using a mobile floor crane such as OTC 16-1815 or equivalent. Remove the turbocharger flange mounting nuts and spacers.



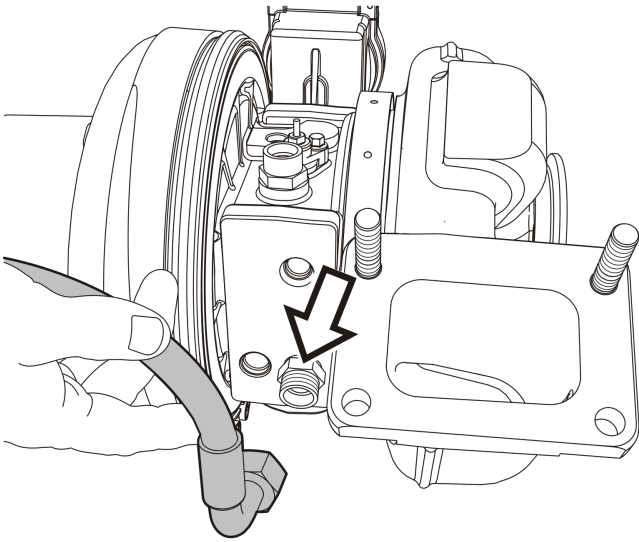
W2005629

23

With the aid of an assistant, lower the turbocharger away from the exhaust manifold studs and remove it from the engine.

24

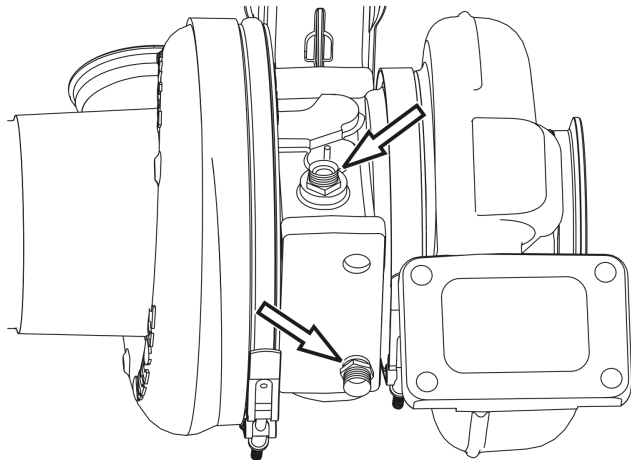
Remove the remaining coolant line connected to the rear of the turbocharger.



W2005635

25

Transfer all coolant and oil fittings to the replacement turbocharger.



W2005637

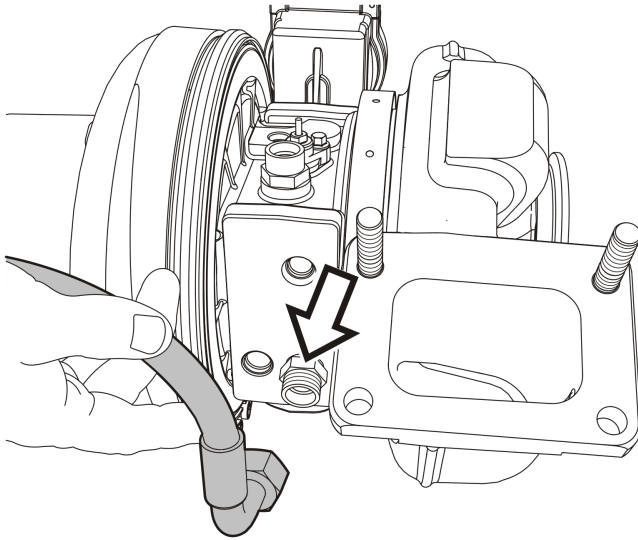
Installation

1

Clean the contact surface on the exhaust manifold and the turbocharger oil return pipe and spacer block.

2

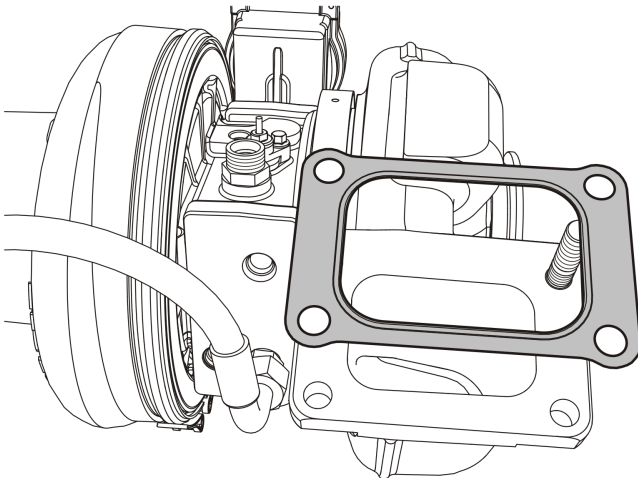
Install the coolant line to the rear of the turbocharger.



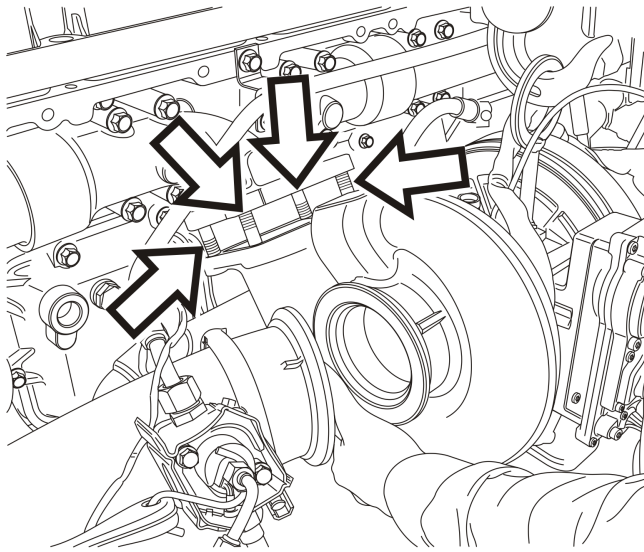
W2005635

3

Replace the turbocharger-to-manifold metal gasket and install it onto the two studs of the turbocharger exhaust opening.



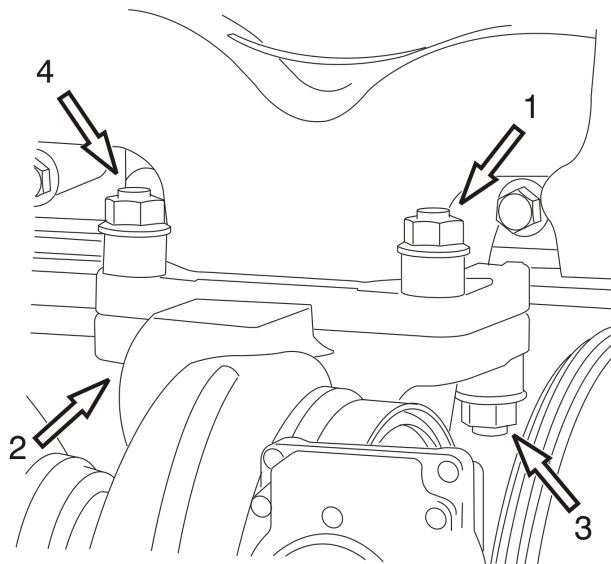
W2005636



W2005629

4

Support the weight of the turbocharger using a mobile floor crane such as OTC 16-1815 or equivalent. With the aid of an assistant, position the turbocharger against the exhaust manifold. Align the turbocharger studs and the exhaust manifold studs.



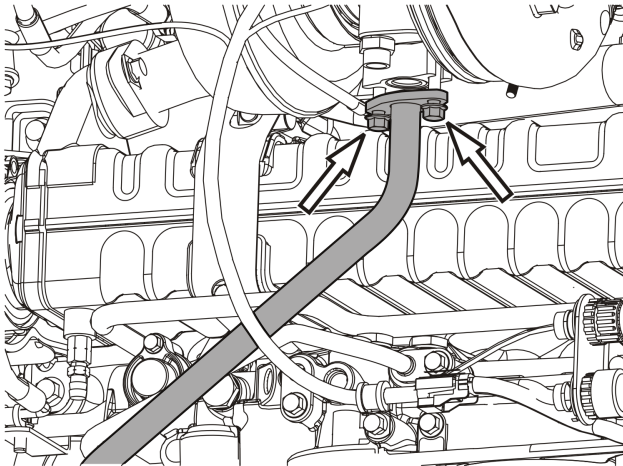
W2005206

5

Install turbocharger flange nuts and spacers to the exhaust manifold and tighten in the sequence shown to 135 Nm (100 ft-lb).

6

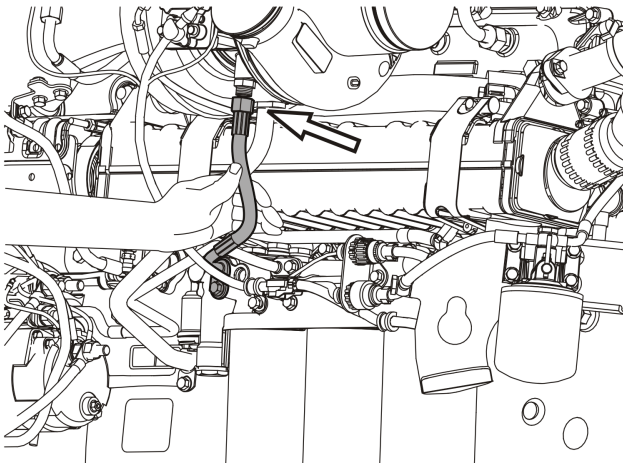
Remove the crane and turbocharger lifting tool. Install the plug into the turbocharger bearing housing.



W2005628

7

Position a new lubricated O-ring and gasket on the spacer block and install the turbocharger oil return pipe with spacer block to the bottom of the turbocharger. Install the capscrews and tighten to 24 ± 4 Nm (18 ± 3 ft-lb).



W2005624

8

Install the oil supply line to the bottom fitting of the turbocharger bearing housing and tighten the fitting.

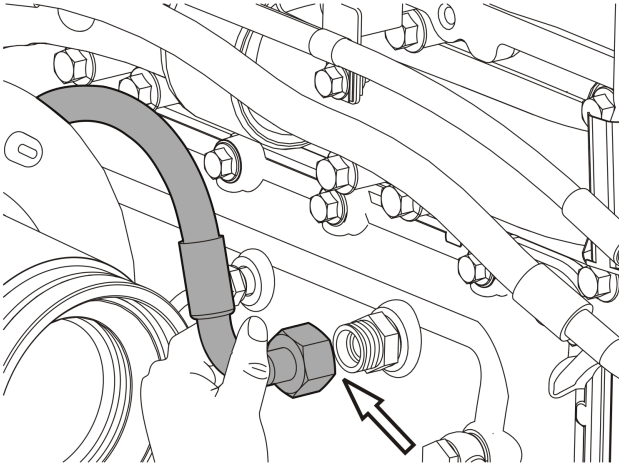


CAUTION

Before starting the engine after turbocharger replacement, make sure the turbocharger is pre-filled with clean engine oil. Starting the engine without oil pressure and a "dry" turbocharger can damage the turbocharger bearings.

9

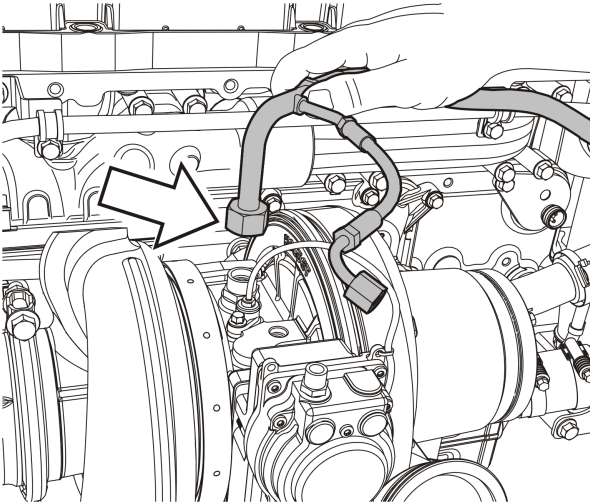
Connect the turbocharger coolant line to the oil cooler cover and tighten the fitting.



W2005623

10

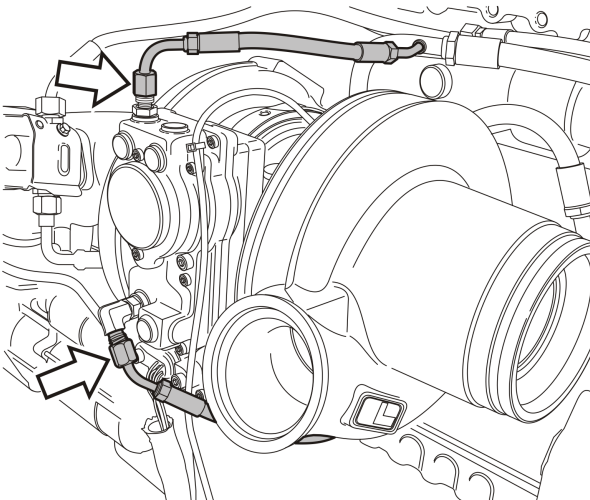
Connect the coolant line to the fitting at the top of the turbocharger bearing housing and tighten the fitting.



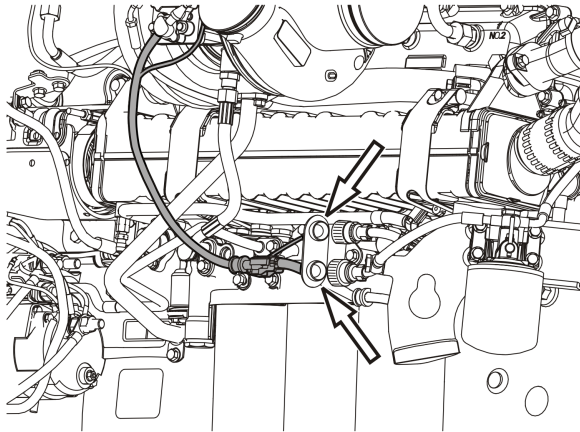
W2005622

11

Connect the coolant inlet and outlet lines to the turbocharger actuator and tighten the fittings.



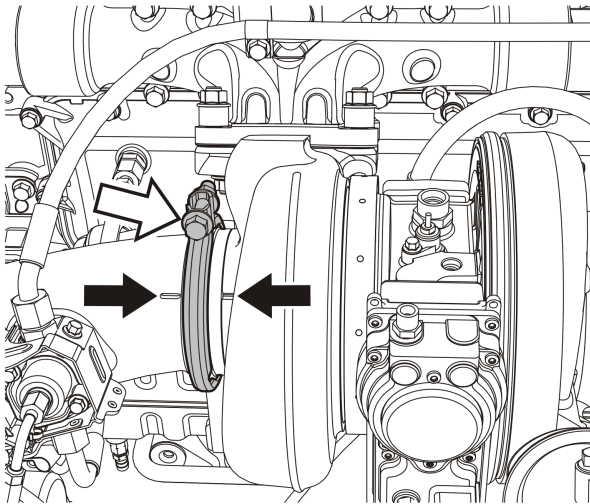
W2005621



W2005620

12

Reconnect the turbocharger actuator and turbocharger speed sensor wiring harnesses. Make sure the connectors are reconnected in the same positions as marked at disassembly and position the connector with the flat side toward the flat in the bracket. Install the cable clamp on the oil filter housing. Using high temperature ties, secure the wiring harness to itself and the turbocharger drain pipe.



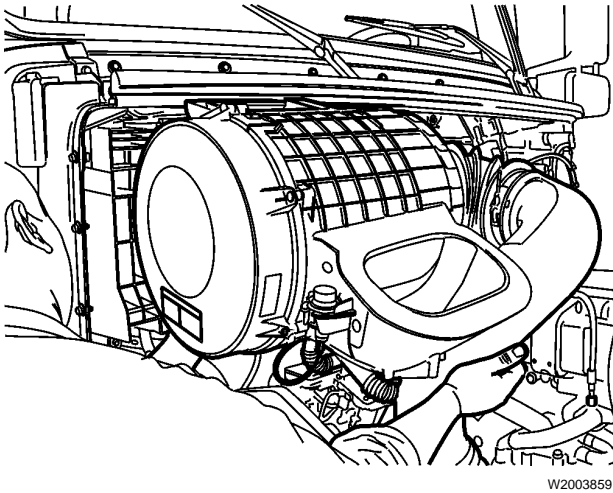
W2005626

13

Position the diffuser against the turbocharger and install a new clamp. Align the cast-in marks on the diffuser with the turbocharger and tighten the clamp to secure.

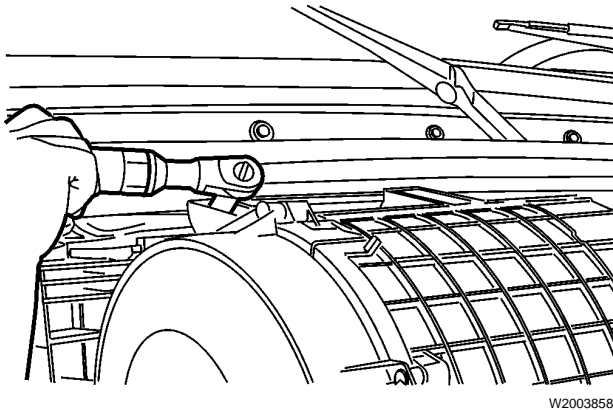
14

Install the turbocharger inlet elbow and tighten the clamp to secure.



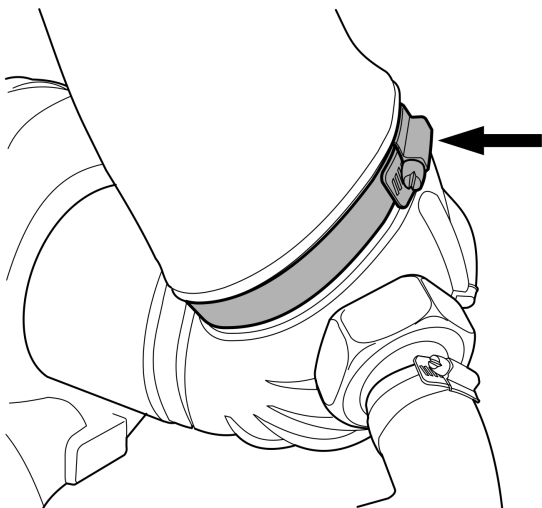
15

Position the air filter housing against the cab.



16

Install the bolts at the top of the air filter housing.

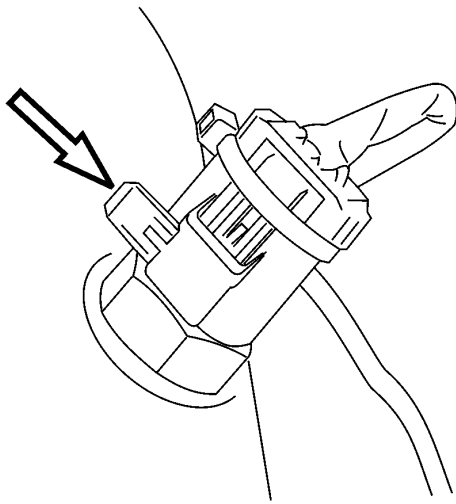


17

Inspect the DRV and charge air cooler inlet pipe for damage; replace as required. Lubricate the clamps and position the assembly between the turbocharger and the charger air cooler. Tighten the clamps to 7 ± 1 Nm (62 ± 9 in-lb). Connect the DRV air line and the bypass hose.

18

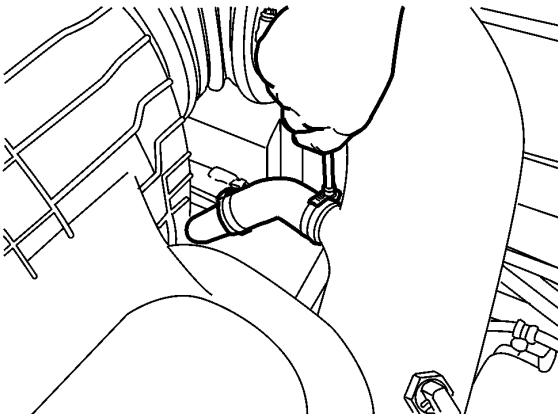
Install the main fresh air pipe to the air filter housing and the turbocharger inlet elbow. Tighten the clamps to secure.



W2004720

19

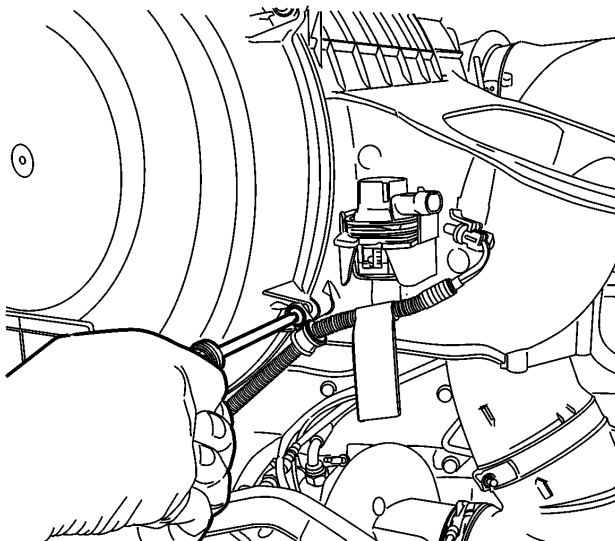
Install the air temperature sensor connector to the sensor. Insert the connector lock tab, push in place. Secure the harness to the connector with a tie strap. Install the clamp to secure the harness to the main fresh air pipe.



W2004719

20

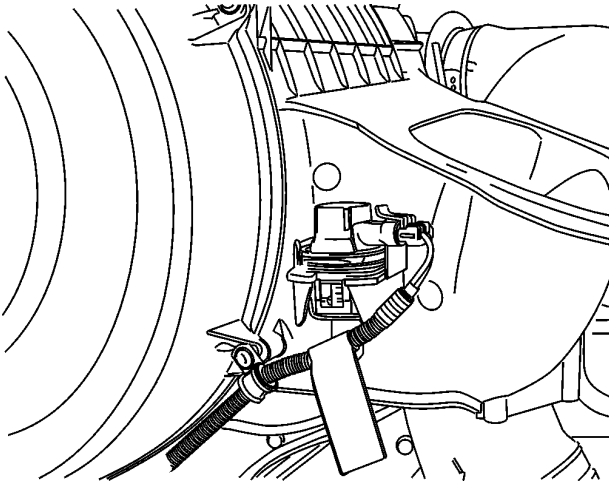
Install the air compressor fresh air hose to the main fresh air pipe, position the clamp and tighten to secure.



W2003861

21

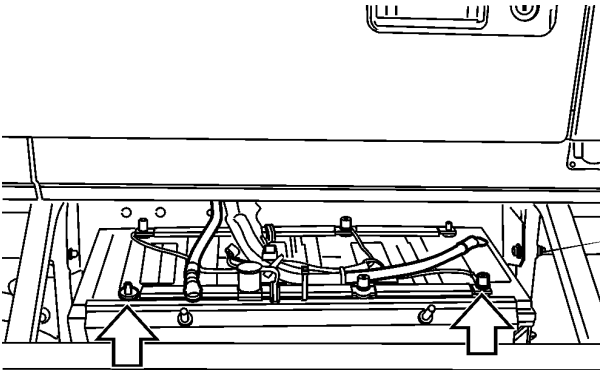
Install the filter restriction gauge wiring harness to the air filter housing and tighten the clamps.



W2004249

22

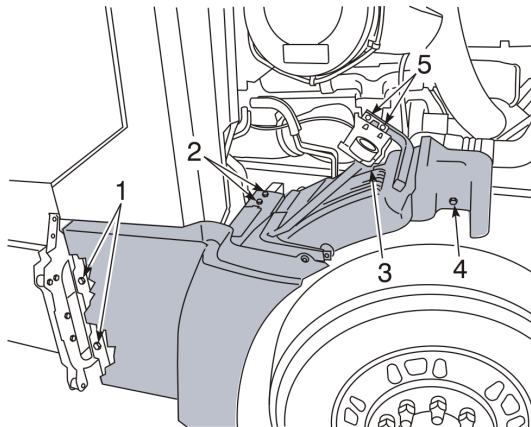
Connect the air restriction gauge electrical harness connector.



W2003815

23

Install all previously removed cables to the ground (negative) battery terminals.



W2005189

- | | |
|--|---|
| 1. Two rear fender
extender bolts at
bracket | 4. One lower
splash guard bolt to
frame |
| 2. Two fender
extender bolts at
brace | 5. Two upper brace
splash guard bolts |
| 3. One fender
extender brace nut
and bolt at hood
release | |

24

Install the inner splash guard assembly.

25

Check the engine oil level and replenish as necessary with approved engine oil.

26

Fill the cooling system with the recommended coolant using the coolant extractor.

DBT2V700

27

Start the engine, check for leaks and proper operation. After shutdown, replenish fluids as necessary.



CAUTION

Before starting the engine after turbocharger replacement, make sure the turbocharger is pre-filled with clean engine oil. Starting the engine without oil pressure and a "dry" turbocharger can damage the turbocharger bearings.