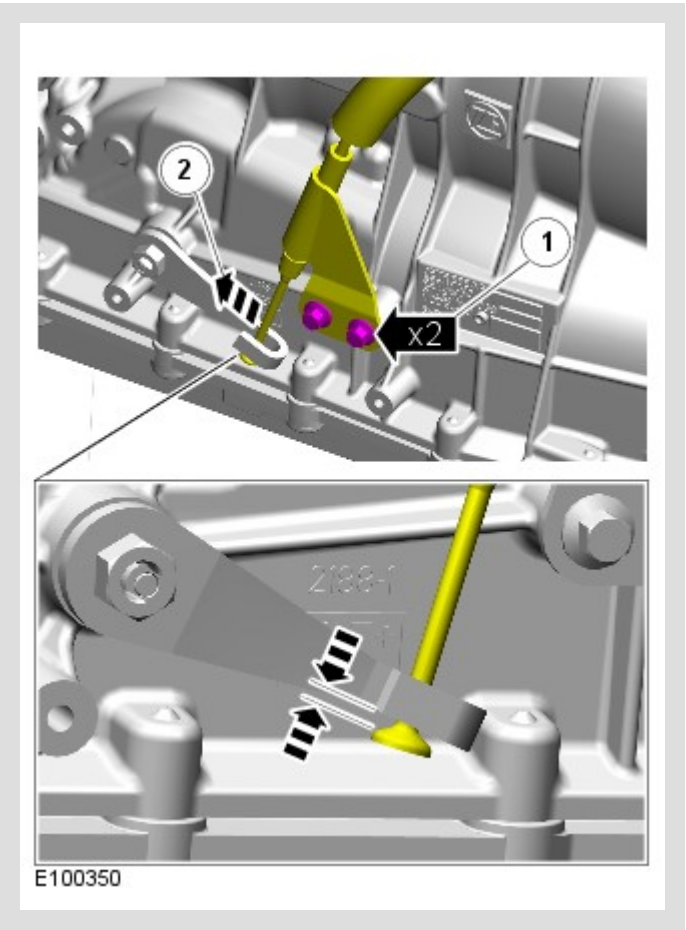
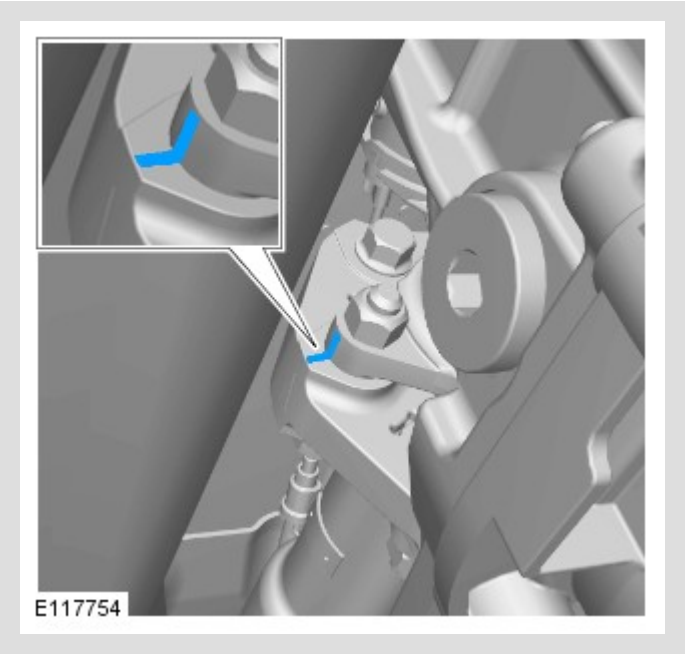


E100350

19.

NOTE:

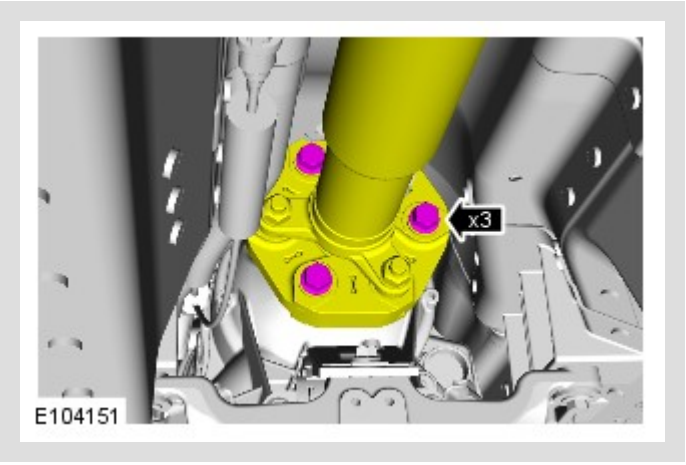
Mark the position of the driveshaft on the transmission flange.



20.

CAUTION:

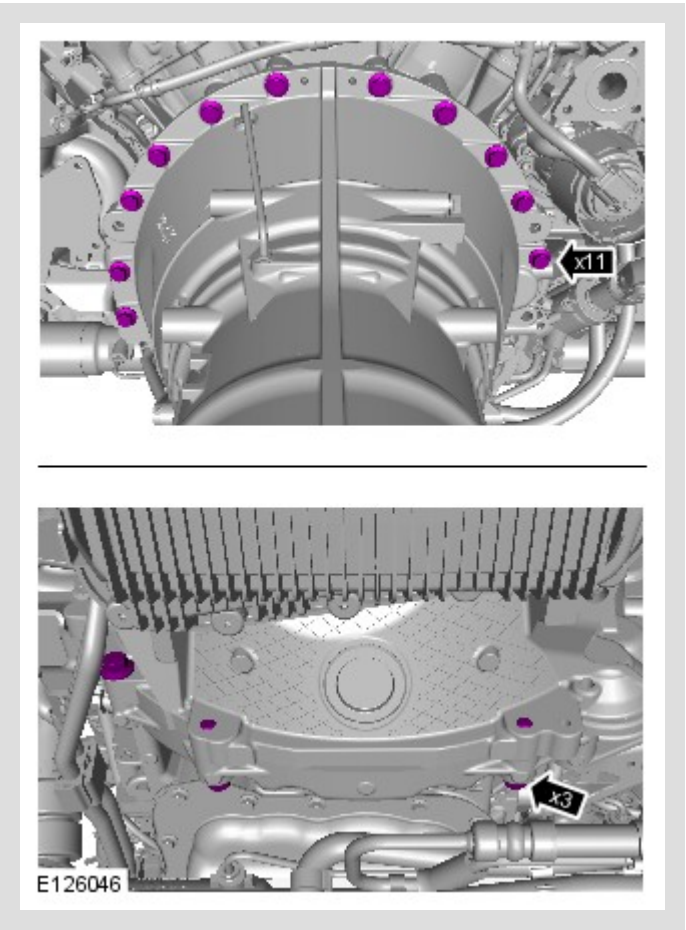
Under no circumstances must the flexible coupling (or it's fixings) be loosened or removed from the driveshaft.



21.

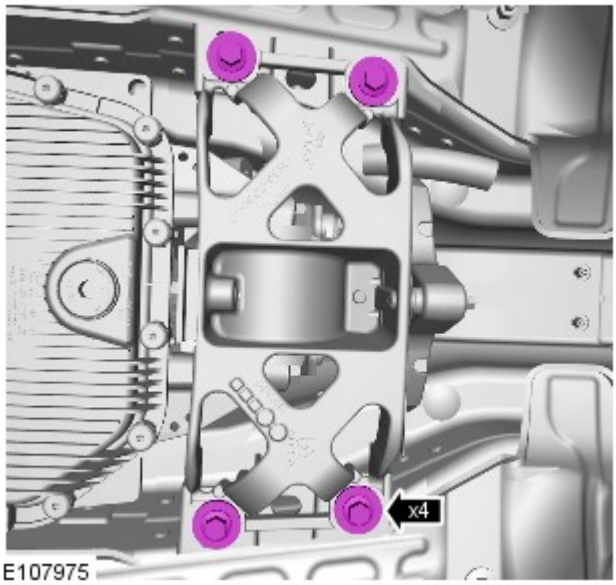
WARNING:

Make sure that the transmission is secured with suitable retaining straps.



Align the powertrain assembly jack to the transmission.

22.



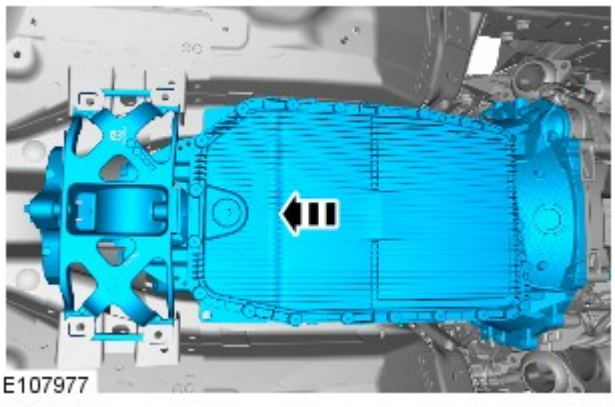
23.

CAUTION:

Make sure that the torque converter remains in the transmission.

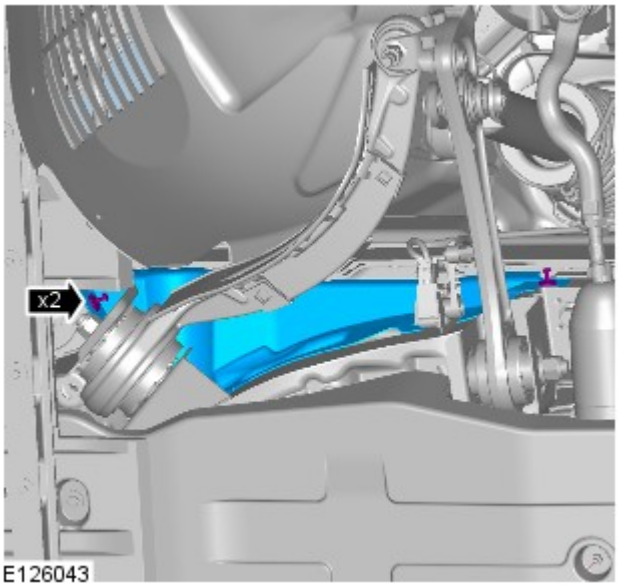
NOTE:

This step requires the aid of another technician.

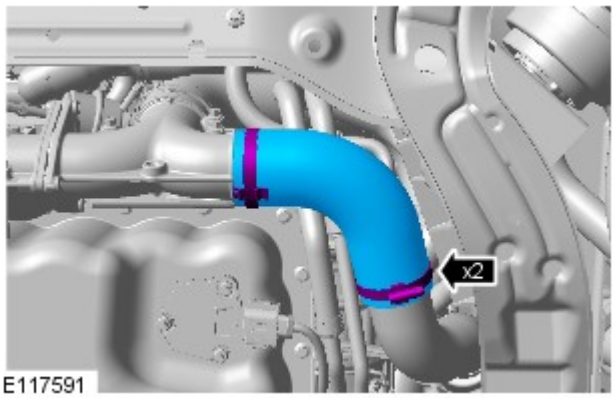


- Install the torque converter retainer.

24.



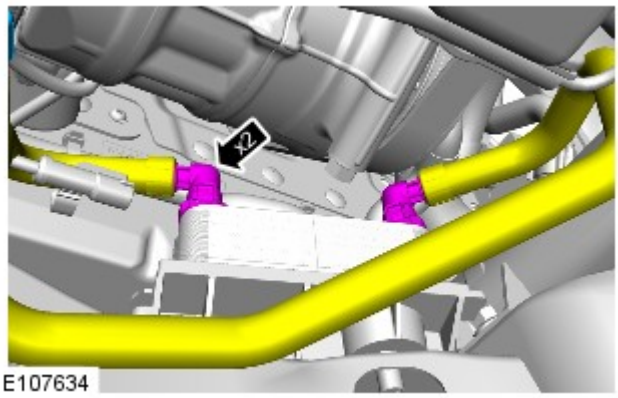
25.



26.

CAUTIONS:

- Be prepared to collect escaping fluids.
- Make sure that all openings are sealed. Use new blanking caps.



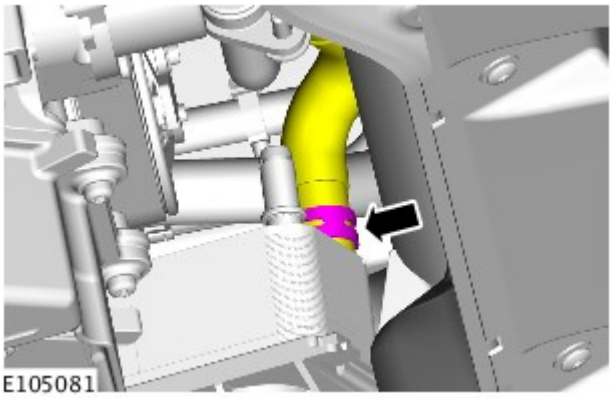
27.

CAUTION:

Be prepared to collect escaping coolant.

NOTE:

Clamp the hoses to minimize coolant loss.



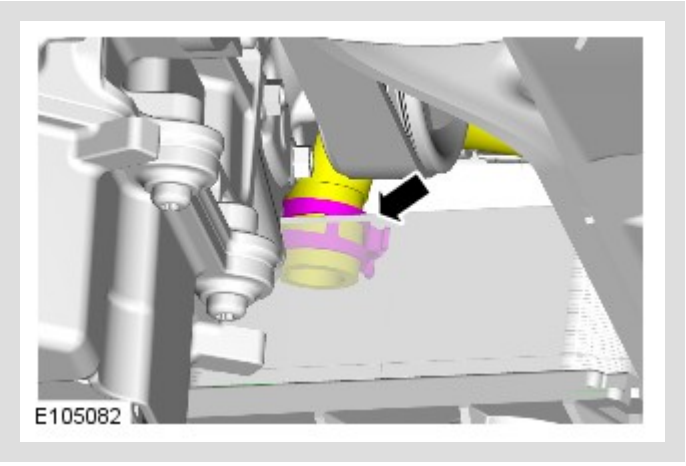
28.

CAUTION:

Be prepared to collect escaping coolant.

NOTE:

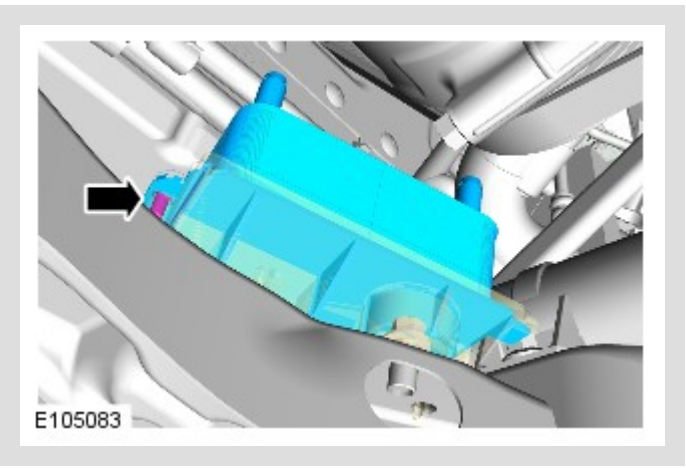
Clamp the hoses to minimize coolant loss.



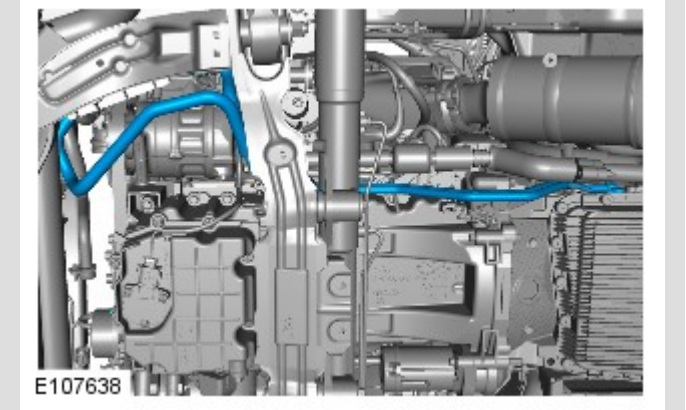
29.

CAUTION:

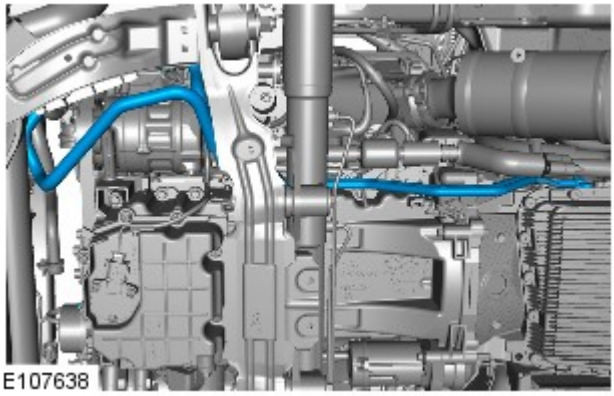
Be prepared to collect escaping fluids.



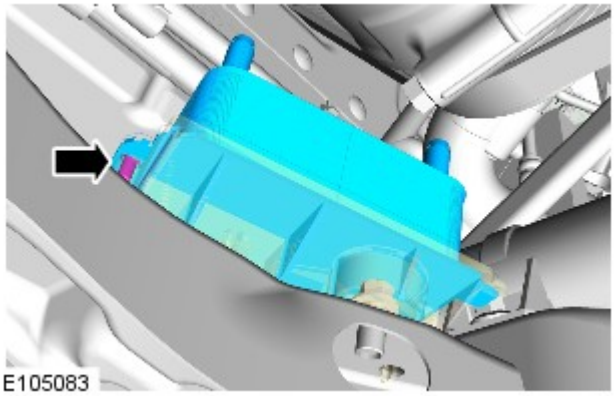
30.



1.

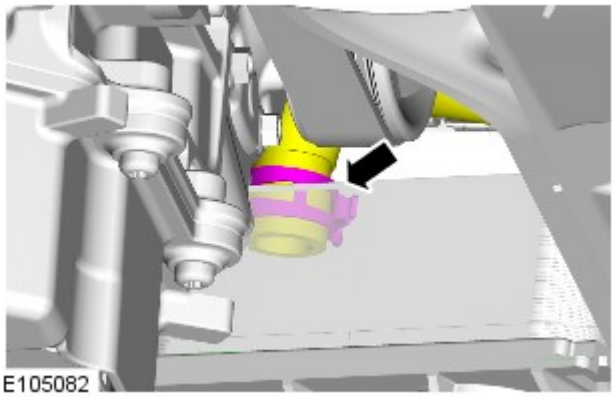


2.



Torque: **5 Nm**

3.



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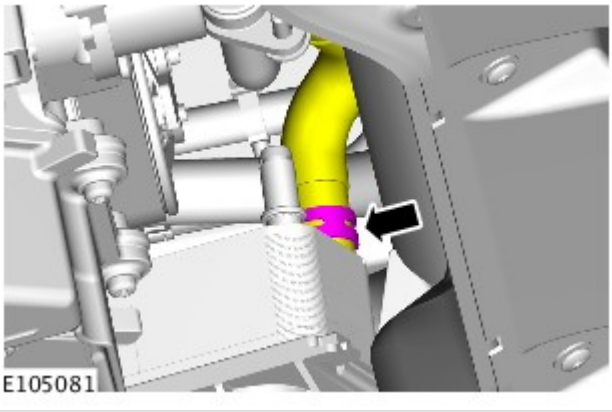

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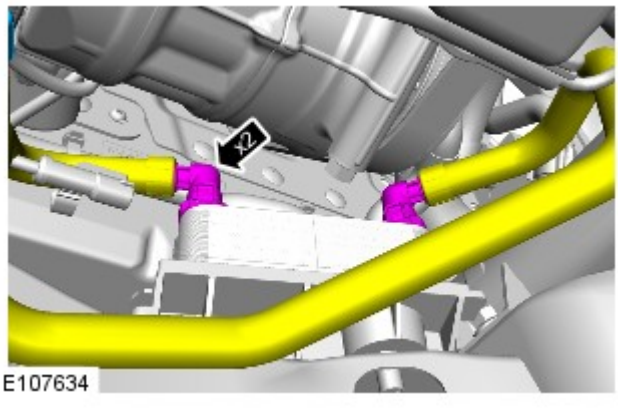
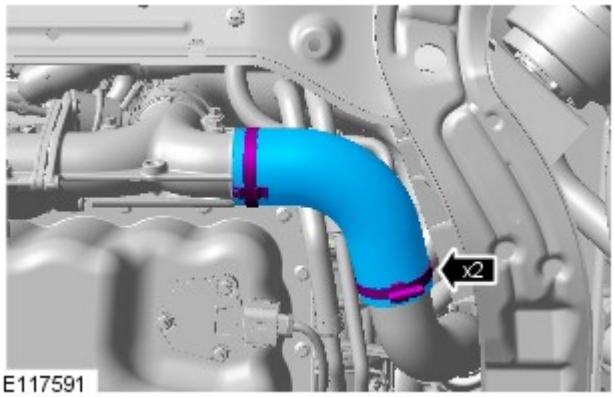
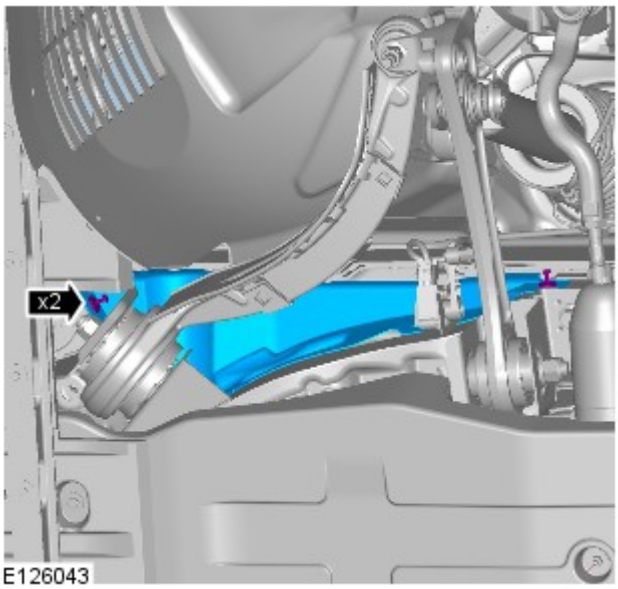


6.

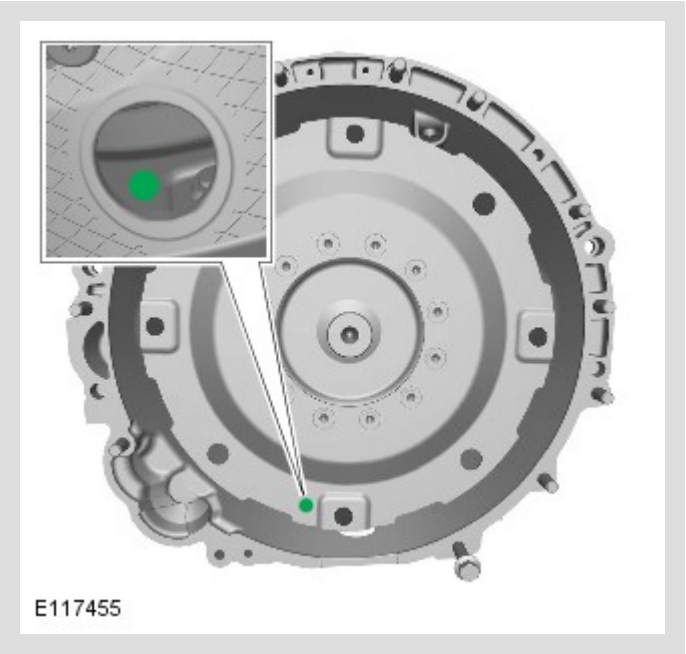


Torque: **5 Nm**

7.



8.

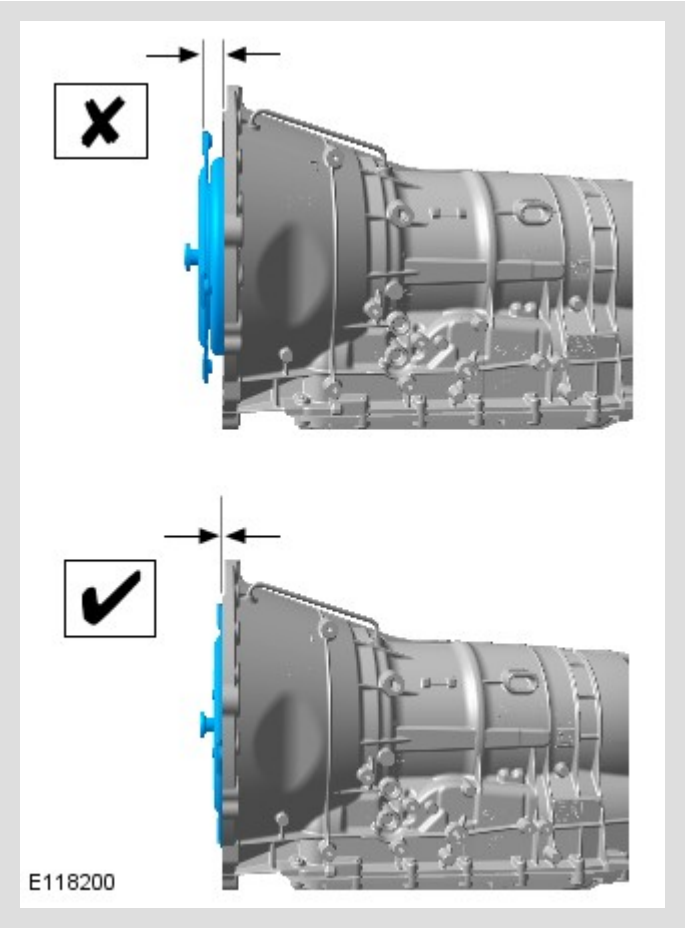


Make sure that the alignment mark is visible through the inspection hole on installation of the first torque converter bolt.

9.

CAUTION:

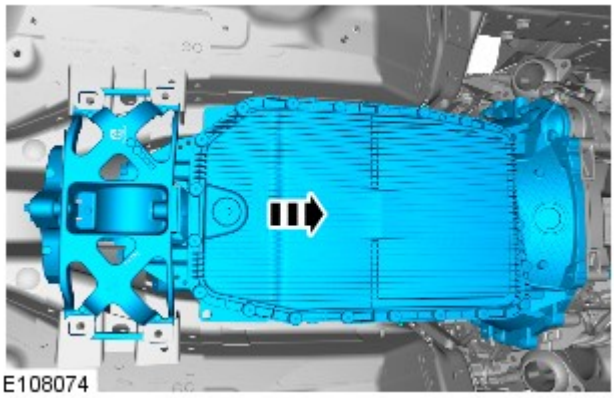
Make sure the torque converter is fully located into the oil pump drive.



10.

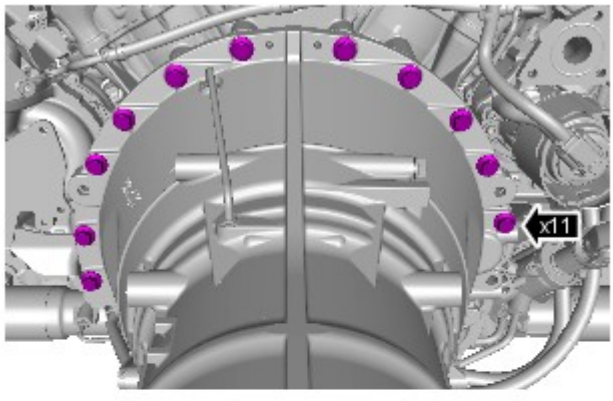
CAUTION:

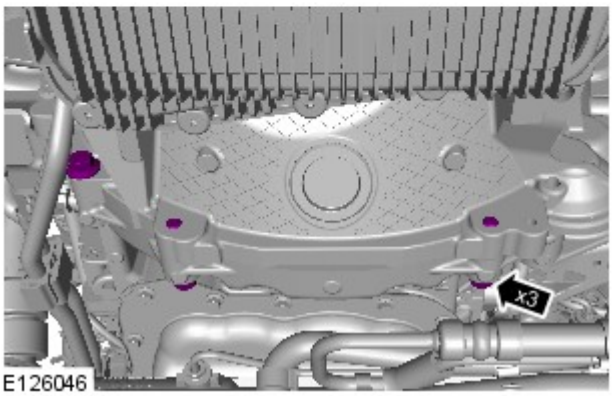
Make sure that the torque converter remains in the transmission.



Raise the powertrain assembly jack and transmission assembly.

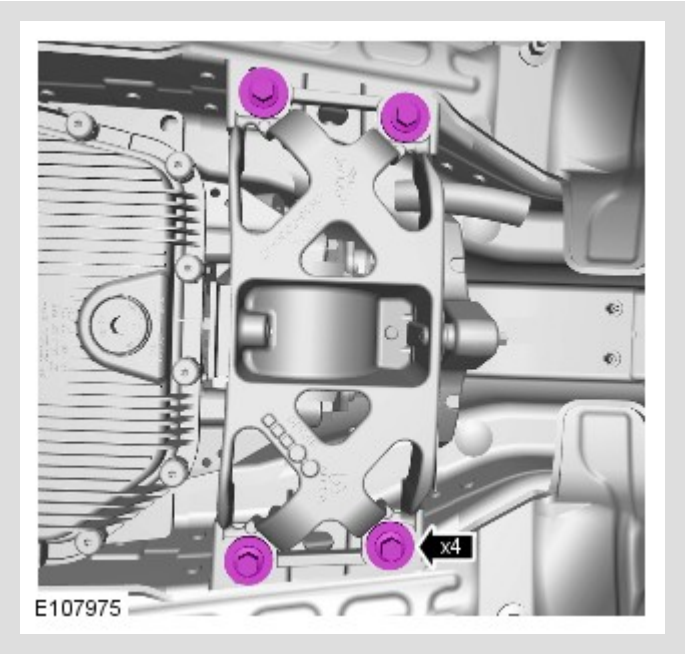
11.





Torque: **48 Nm**

12.

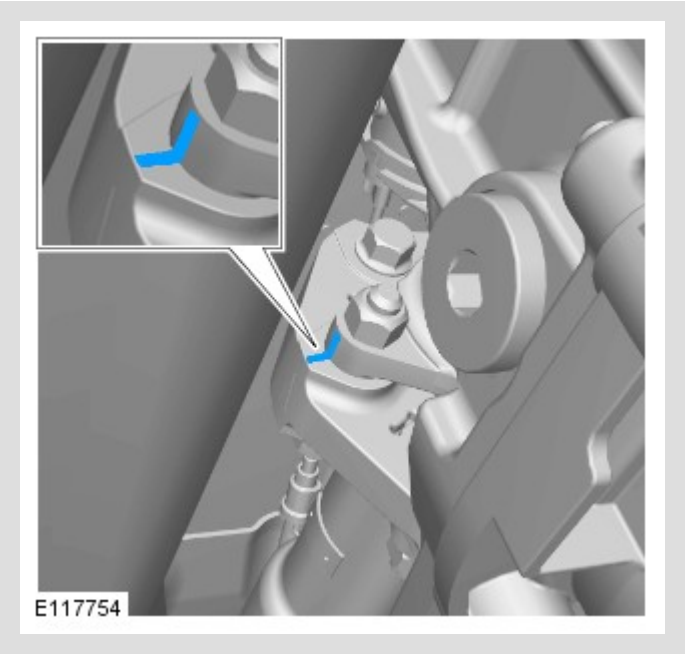


Torque: 48 Nm

13. Remove the transmission jack.

14. NOTE:

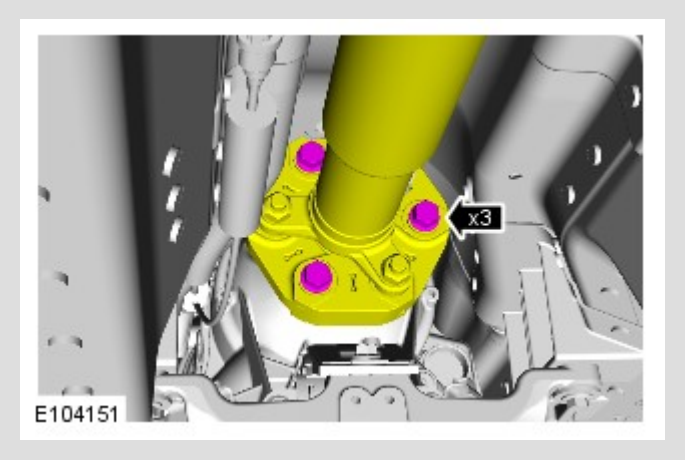
Make sure that you re-align the driveshaft to the transmission flange using the alignment mark.



15.

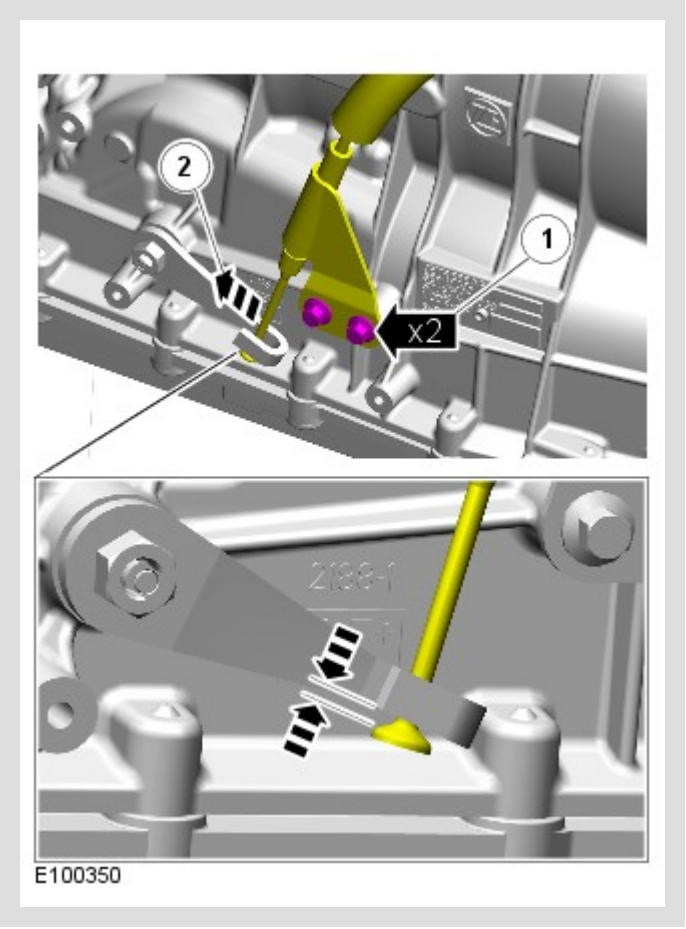
CAUTION:

Under no circumstances must the flexible coupling (or it's fixings) be loosened or removed from the driveshaft.



Torque: **127 Nm**

16.

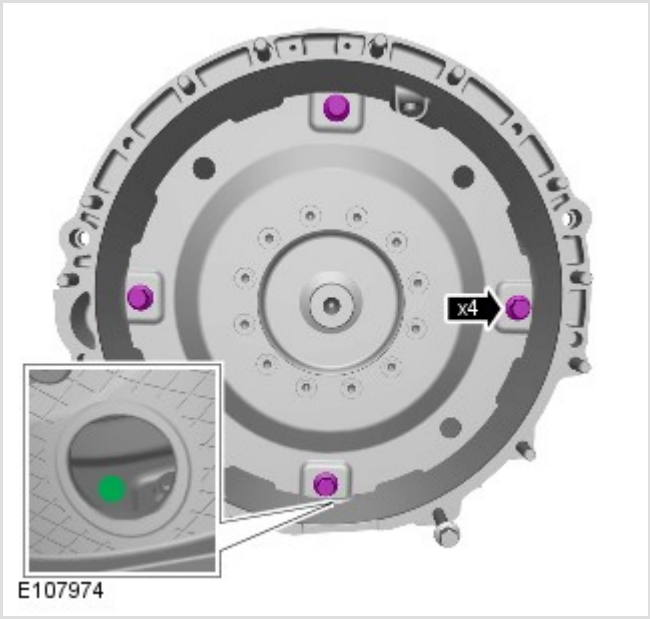


Torque: **10 Nm**

17.

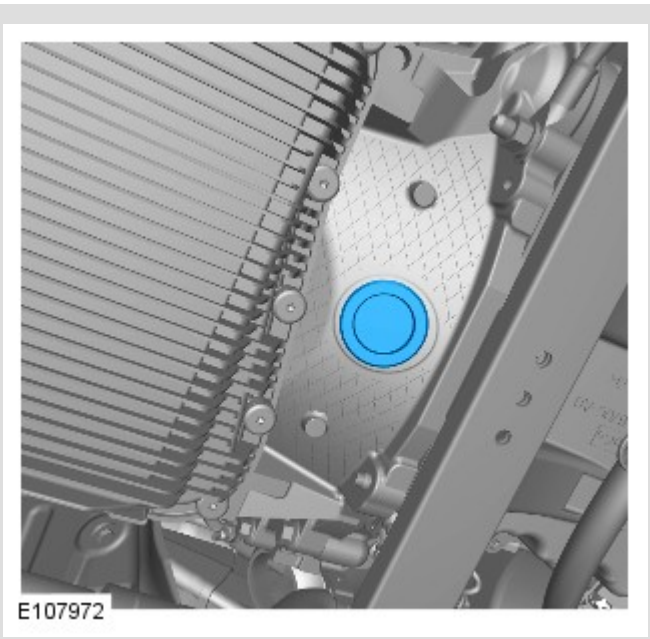
CAUTION:

Only rotate the crankshaft clockwise.

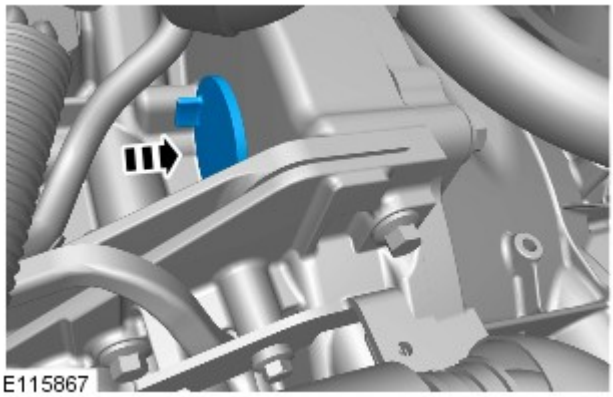


Torque: **63 Nm**

18.



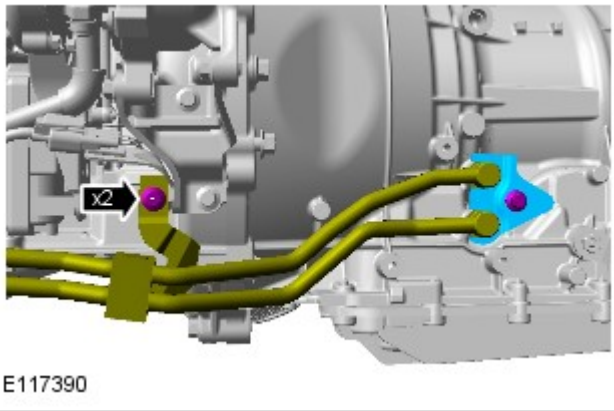
19.



20.

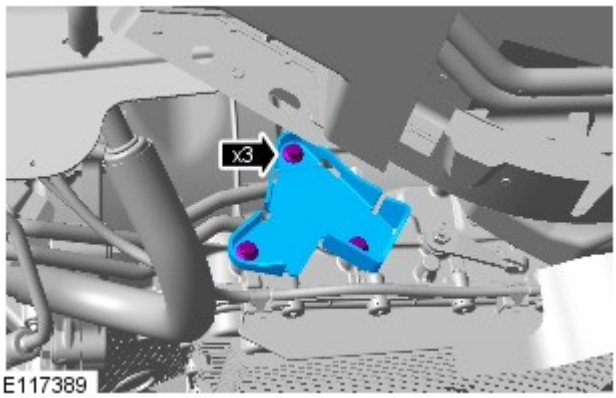
CAUTION:

Install new o-ring seals



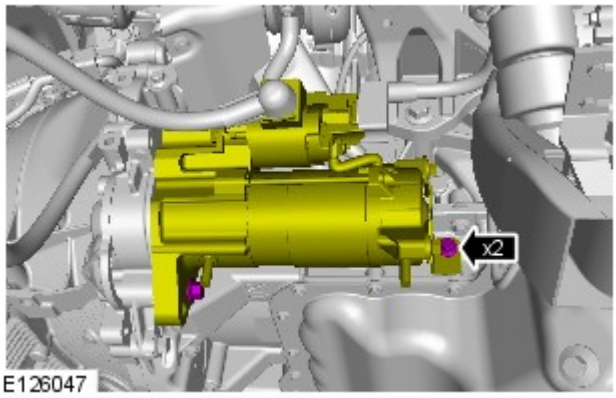
Torque: **10 Nm**

21.



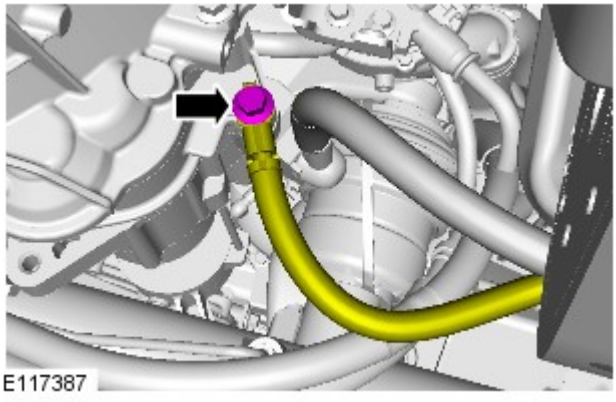
Torque: **23 Nm**

22.



Torque: **48 Nm**

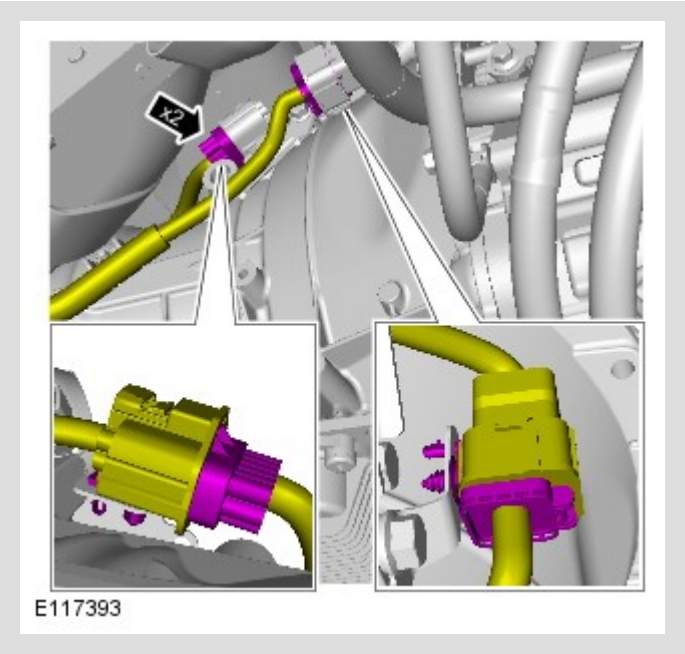
23.



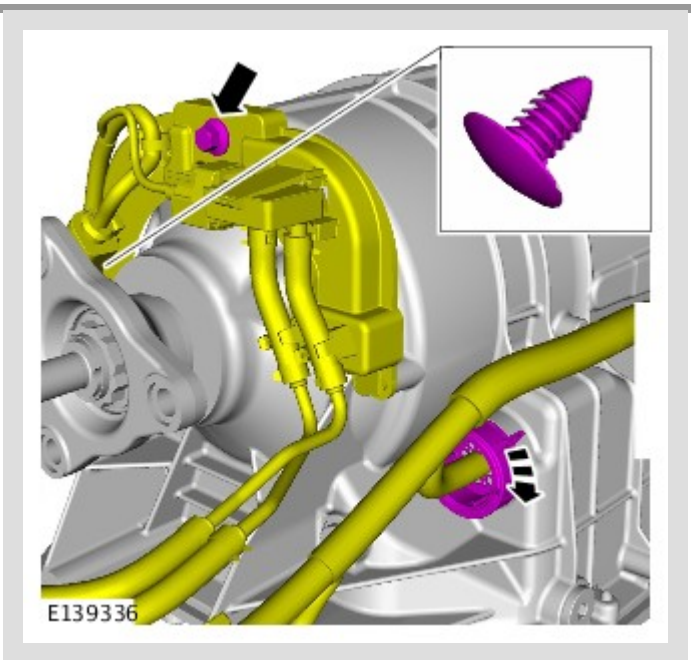
Torque: **30 Nm**

24. Refer to: Exhaust Manifold Cross-over Pipe (303-01A Engine - TDV6 3.0L Diesel, Removal and Installation).

25.

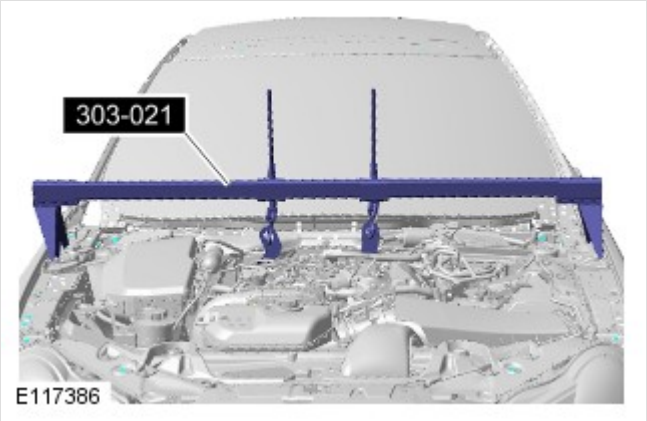


26.



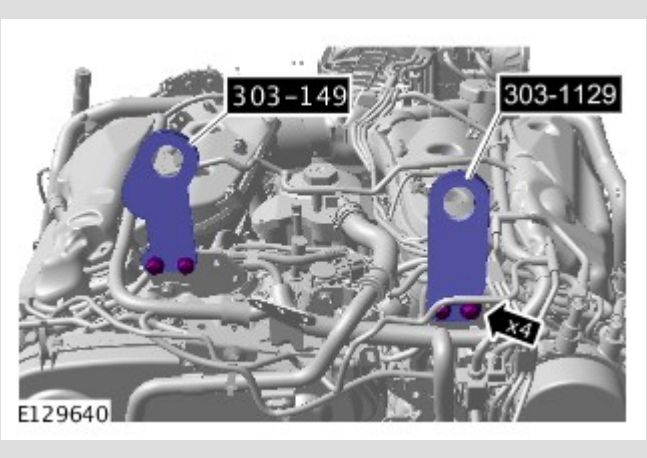
27. Lower the vehicle.

28.



- Remove the special tool supporting the engine.
- *Special Tool(s):* 303-021

29.

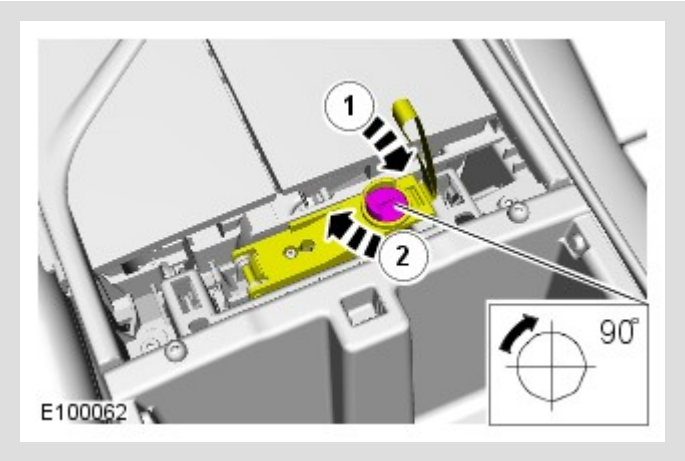


- Remove the special tools from the engine.
- *Special Tool(s):* 303-1129 , 303-1497

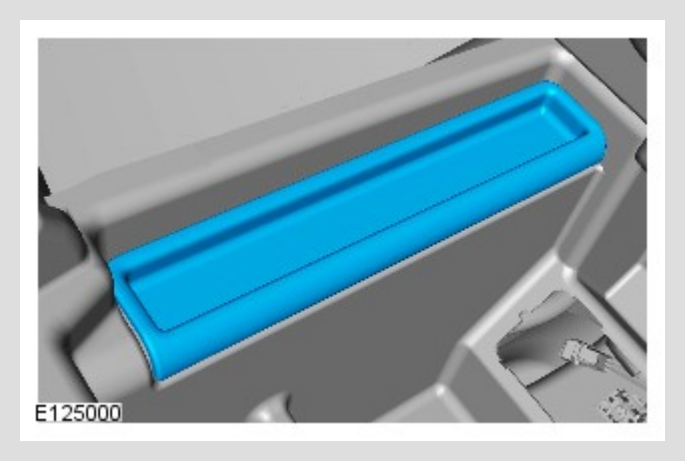
30. Refer to: Engine Cover - TDV6 3.0L Diesel (501-05 Interior Trim and Ornamentation, Removal and Installation).

31. Refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

32.



33.



34. Check and top up the cooling system as required.

35. Set the heater controls to HOT.

36.

CAUTION:

Observe the engine temperature warning light. If the warning light is displayed, switch off immediately and allow to cool. Failure to follow this instruction may cause damage to the vehicle.

Start the engine and allow to idle until hot air is emited at the face registers.

37. **CAUTION:**

Observe the engine temperature warning light. If the warning light is displayed, switch off immediately and allow to cool. Failure to follow this instruction may cause damage to the vehicle.

Raise the engine speed to 2000 RPM and maintain at 2000 RPM until the engine cooling fan operates.

38. **CAUTION:**

Switch off the engine and allow the coolant temperature to go cold.

Switch the engine off and allow to cool.

39. Visually check the engine and cooling system for signs of coolant leakage.

40. **WARNINGS:**

- When releasing the cooling system pressure, cover the coolant expansion tank cap with a thick cloth.
- Since injury such as scalding could be caused by escaping steam or coolant, make sure the vehicle cooling system is cool prior to carrying out this procedure.

CAUTIONS:

- Make sure the coolant level remains above the "COLD FILL RANGE" lower level mark.
- Anti-freeze concentration must be maintained at 50%.

NOTE:

When the cooling system is warm, the coolant will be approximately 10mm above the upper level mark on the expansion tank with the cap removed.

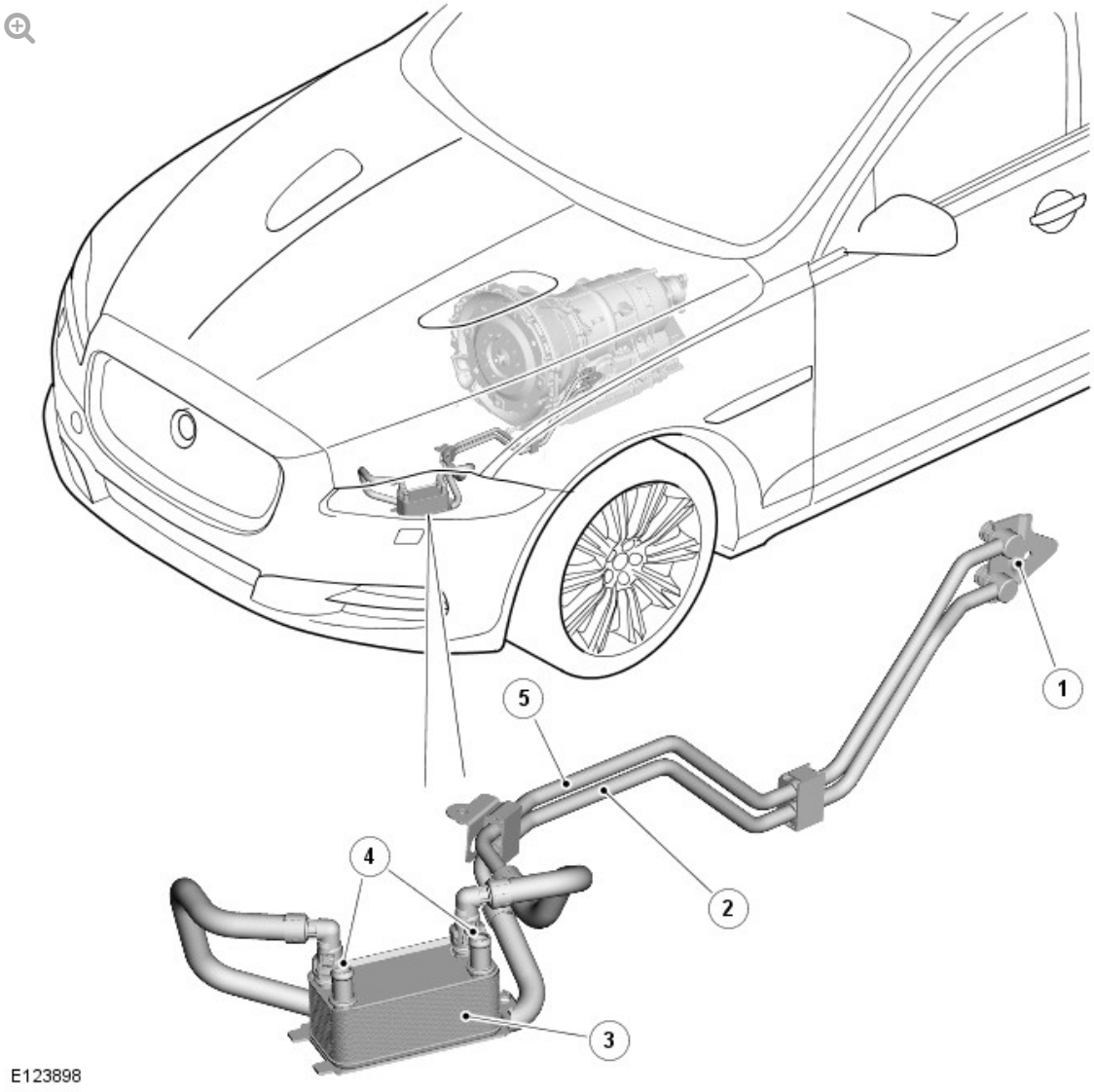
Check and top-up the coolant if required.

41. Refer to: Transmission Fluid Level Check (307-01C Automatic Transmission/Transaxle - Vehicles With: 8HP70 8-Speed Automatic Transmission AWD, General Procedures).

TRANSMISSION/TRANSAXLE COOLING

TRANSMISSION COOLING - COMPONENT LOCATION [G1245453]

Installation for 5.0L engines shown; installation for 3.0L diesel similar.



1	Latch-plate
2	Feed hose and pipe (from transmission)
3	Transmission fluid cooler
4	Engine coolant hose connections
5	Return hose and pipe (to transmission)

TRANSMISSION/TRANSAXLE COOLING

PRINCIPLE OF OPERATION

For a detailed description of the automatic transmission cooling system and operation, refer to the relevant Description and Operation sections in the workshop manual. REFER to: (307-02 Transmission/Transaxle Cooling)

Transmission Cooling (Description and Operation),
Transmission Cooling (Description and Operation),
Transmission Cooling (Description and Operation).

INSPECTION AND VERIFICATION

Verify the customer concern by operating the system.

Visually inspect for obvious signs of damage and system integrity.

- Feed and return tubes
- Connections to the automatic transmission and the automatic transmission fluid cooler
- Automatic transmission fluid level

If an obvious cause for an observed or reported concern is found,

correct the cause (if possible) before proceeding to the next step.

If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

SYMPTOM CHART

Over heating of the automatic transmission	Obstruction in the automatic transmission fluid cooler	Flush out the automatic transmission fluid cooler with new automatic transmission fluid. If the flushing is unsuccessful, install a new transmission fluid cooler.
Over heating of the automatic transmission	Obstruction in the automatic transmission fluid tubes	Flush out the automatic transmission fluid cooler tubes with new automatic transmission fluid. If the flushing is unsuccessful install new automatic transmission fluid cooler tubes.
Loss of automatic transmission fluid	Connections to the automatic transmission and the automatic transmission fluid cooler	Check the integrity of the tubes, connections and seals. Check the torque of the tube fixings.
Loss of automatic transmission fluid	Leak at oil cooler	Check the integrity of tubes, connections and seals. Check the torque of the tube fixings.

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00.
REFER to: Diagnostic Trouble Code Index - DTC: Transmission Control Module (TCM) (100-00 General Information, Description and Operation).

TRANSMISSION/TRANSAXLE COOLING

TRANSMISSION COOLING - OVERVIEW [G1245454]

OVERVIEW

Transmission cooling is provided by a transmission fluid cooler, which transfers heat from the transmission to the engine cooling system. The transmission fluid cooler is attached to a mounting bracket on the front subframe, in the front left corner of the engine compartment.

Two hose and pipe assemblies connect the transmission fluid cooler to the automatic transmission. Two engine coolant hose connections are incorporated into the top of the transmission fluid cooler for the supply and return of coolant from the engine cooling system. For additional information, refer to:

Engine Cooling (303-03A Engine Cooling - TDV6 3.0L Diesel, Description and Operation),
Engine Cooling (303-03B Engine Cooling - V8 N/A 5.0L Petrol/V8 S/C 5.0L Petrol, Description and Operation).

TRANSMISSION/TRANSAXLE COOLING

Transmission fluid	ATF Shell M 1375.4

Transmission fluid cooler tube to transmission housing bolt	23	17	-
Transmission fluid cooler tube bracket to engine oil pan retaining bolt	23	17	-
Transmission fluid cooler retaining bolt	5	-	44

Transmission fluid cooler tube to transmission housing bolt	23	17	-
Transmission fluid cooler tube bracket to engine oil pan retaining nut	11	8	-
Transmission fluid cooler retaining bolt	5	-	44

Transmission fluid cooler tube to transmission housing bolt	22	16
Transmission fluid cooler tube bracket to engine oil pan retaining nut	8	6

Transmission fluid cooler tube to cooler unions	20	15

Transmission fluid cooler tube to transmission housing bolt	23	17	-
Transmission fluid cooler tube bracket to engine oil pan retaining nut	11	8	-
Transmission fluid cooler retaining bolt	5	-	44

TRANSMISSION/TRANSAXLE COOLING

TRANSMISSION COOLING - SYSTEM OPERATION AND COMPONENT DESCRIPTION

[G1245455]

SYSTEM OPERATION

Fluid from the pump in the automatic transmission flows through the feed hose and pipe to the transmission fluid cooler. The fluid then flows through the transmission fluid cooler, and the return hose and pipe, to the sump of the automatic transmission.

TRANSMISSION/TRANSAXLE COOLING

TRANSMISSION FLUID COOLER - TDV6 3.0L DIESEL

[G1269286]

REMOVAL

Removal steps in this procedure may contain installation details.

1.

Make sure to support the vehicle with axle stands.

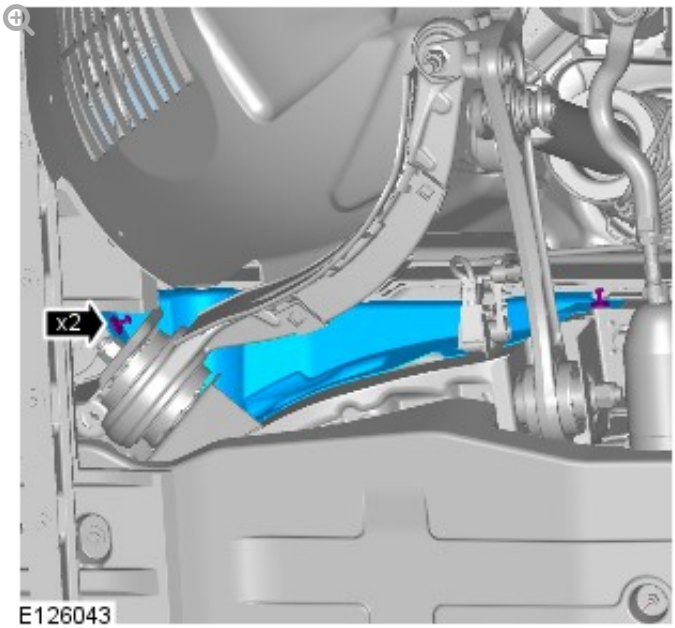
Raise and support the vehicle.

2. Refer to: Transmission Fluid Drain and Refill (307-01 Automatic Transmission/Transaxle, General Procedures).

3. Refer to: Cooling System Partial Draining and Vacuum Filling (303-03A Engine Cooling - TDV6 3.0L Diesel, General Procedures).

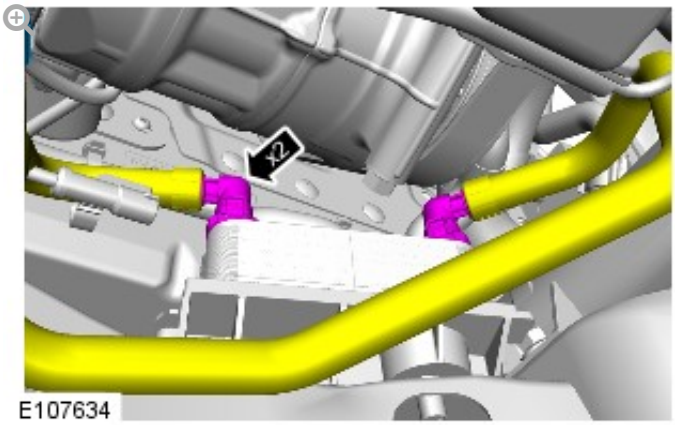
4. Refer to: Air Cleaner (303-12A Intake Air Distribution and Filtering - TDV6 3.0L Diesel, Removal and Installation).

5.



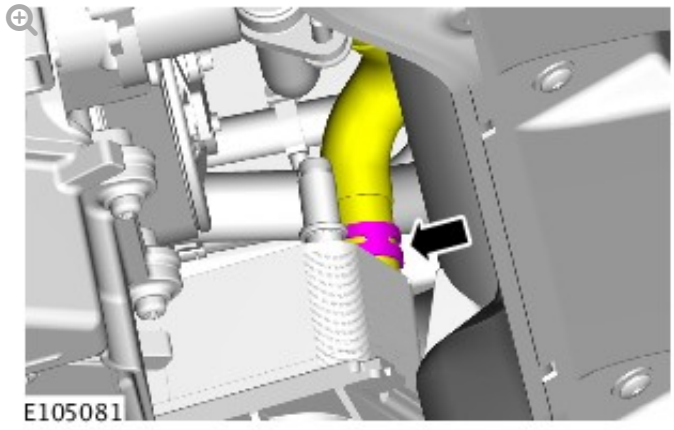
6.

- Be prepared to collect escaping fluids.
- Make sure that all openings are sealed. Use new blanking caps.



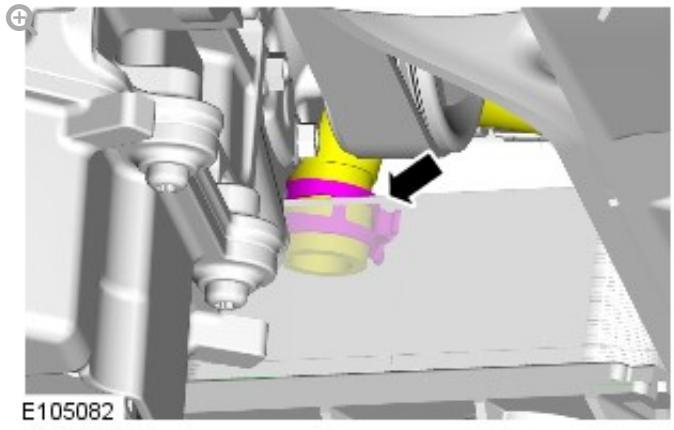
7.

Be prepared to collect escaping coolant.



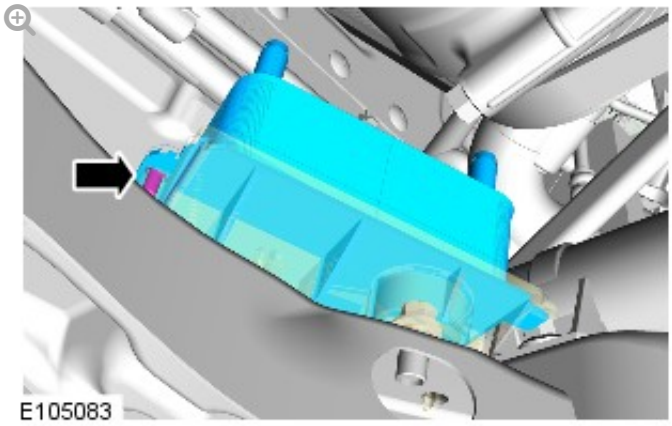
8.

Be prepared to collect escaping coolant.



9.

Be prepared to collect escaping fluids.



Torque: **5 Nm**

INSTALLATION

1. To install, reverse the removal procedure.

TRANSMISSION/TRANSAXLE COOLING

TRANSMISSION FLUID COOLER TUBES - TDV6 3.0L DIESEL [G1269288]

REMOVAL

Removal steps in this procedure may contain installation details.

1. Refer to: Air Cleaner (303-12A Intake Air Distribution and Filtering - TDV6 3.0L Diesel, Removal and Installation).

2.

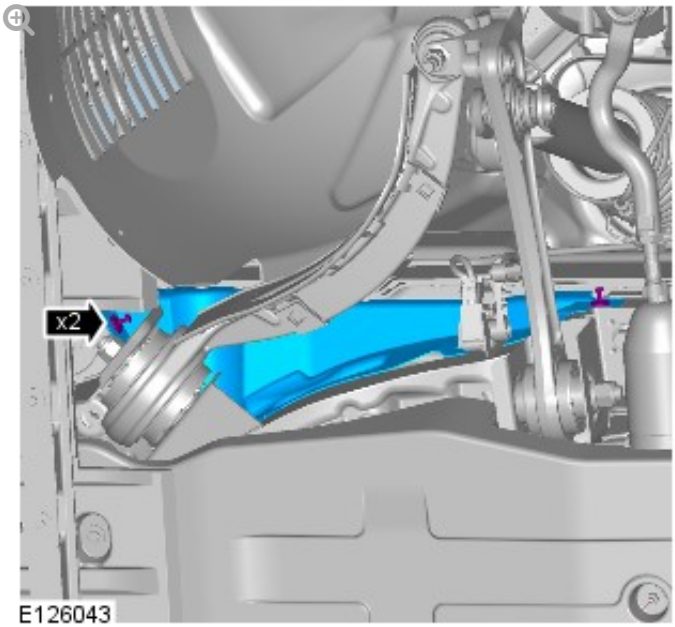
> Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

3. Refer to: Catalytic Converter (309-00A Exhaust System - TDV6 3.0L Diesel, Removal and Installation).

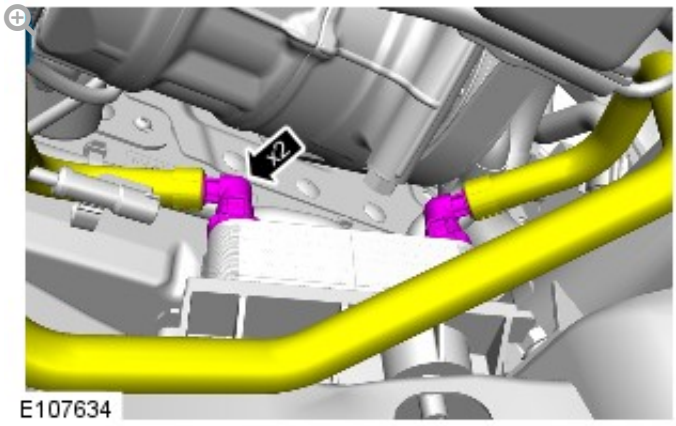
4. Refer to: Transmission Fluid Drain and Refill (307-01 Automatic Transmission/Transaxle, General Procedures).

5.

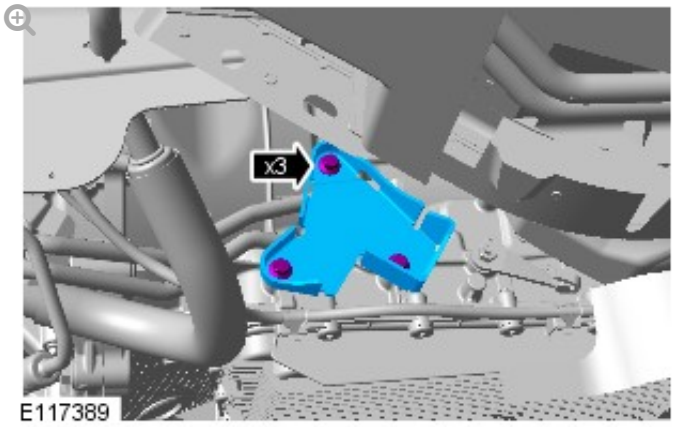


6.

> - Be prepared to collect escaping fluids.
> - Make sure that all openings are sealed. Use new blanking caps.



7.

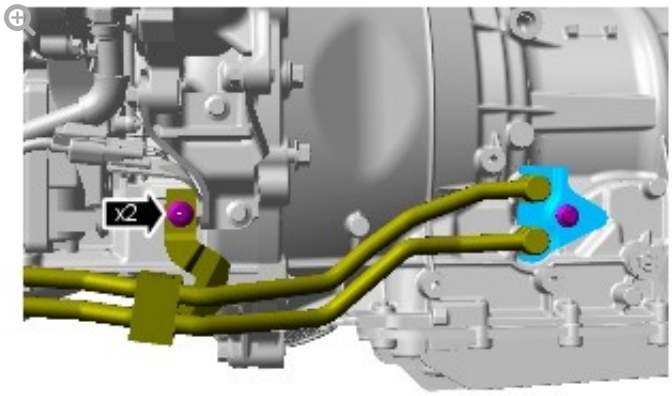


Torque: **23 Nm**

8.

Be prepared to catch escaping fluid.

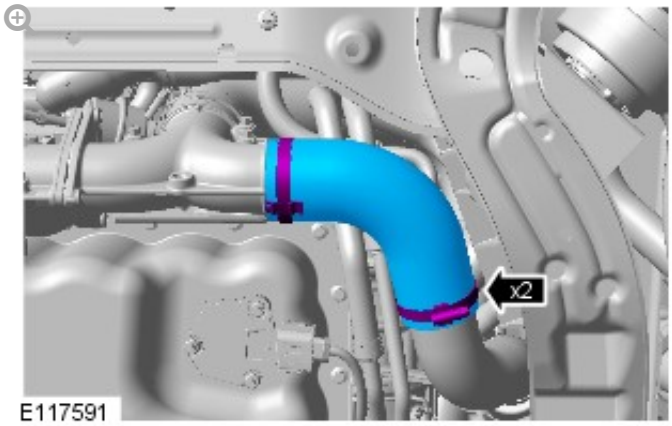
Remove and discard the O-ring seals.



E117390

Torque: **23 Nm**

9.

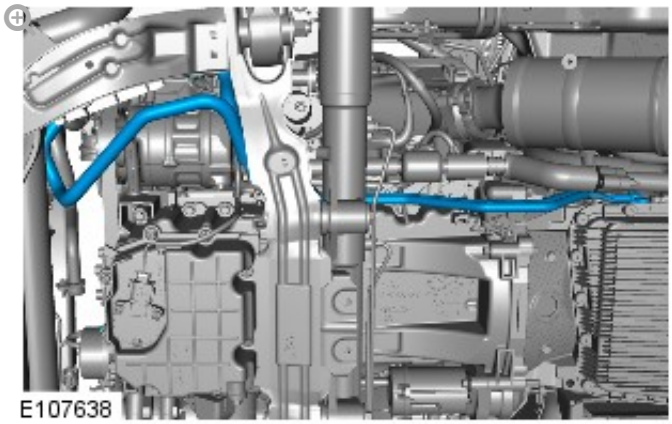


E117591

Torque: **5 Nm**

10.

Some variation in the illustrations may occur, but the essential information is always correct.



INSTALLATION

1. To install, reverse the removal procedure.