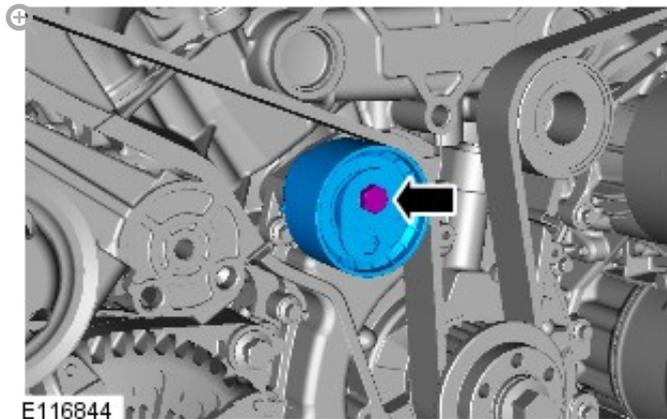


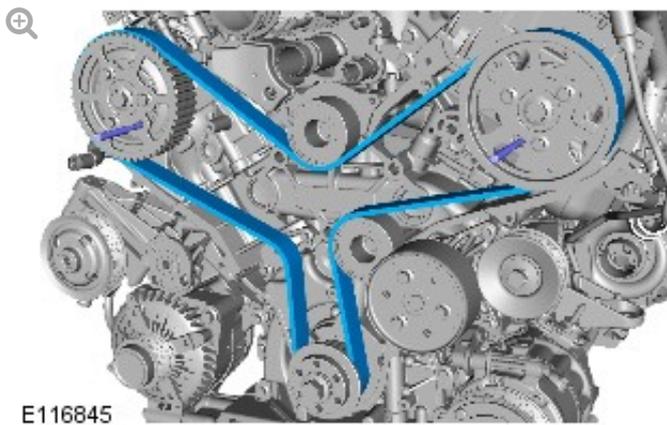
11.

- Discard the component.
- Discard the bolt.

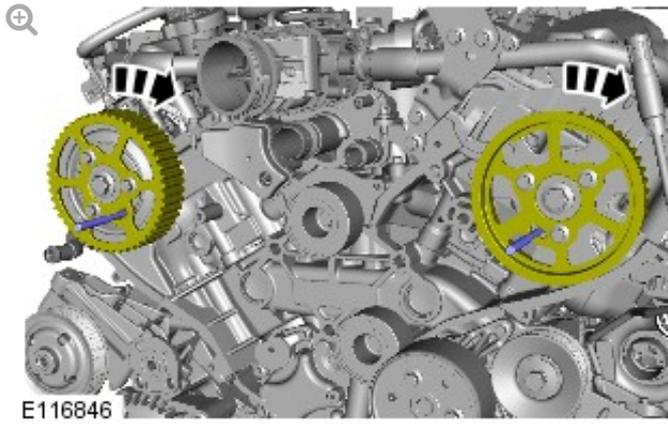


12.

Discard the component.

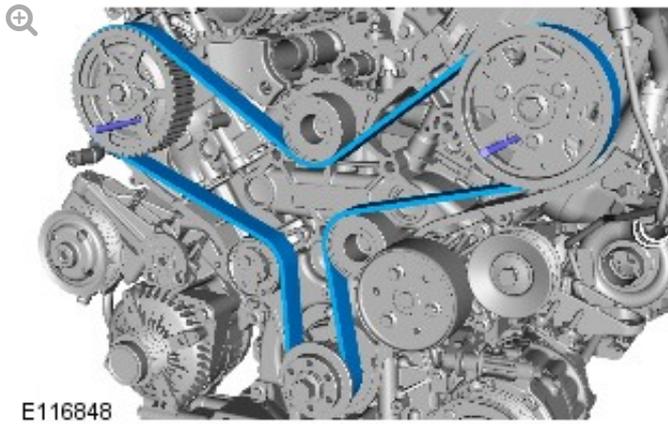


1.



2.

Make sure the camshaft pulleys remain in the clockwise position.

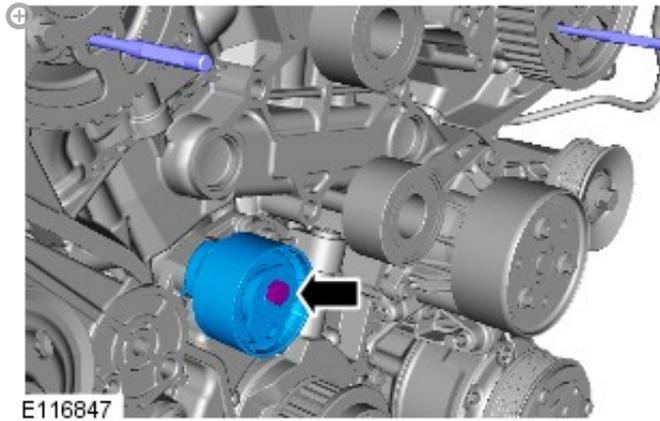


- Install the new timing belt.
- Starting at the crankshaft pulley, install the timing belt in a counter-clockwise direction, in the sequence shown.
- Stage one: Attach the timing belt to the crankshaft pulley.
- Stage two: Attach the timing belt to the idler pulley.
- Stage three: Attach the timing belt to the left-hand camshaft pulley.
- Stage four: Attach the timing belt to the idler pulley.

- Stage five: Attach the timing belt to the RH camshaft pulley.

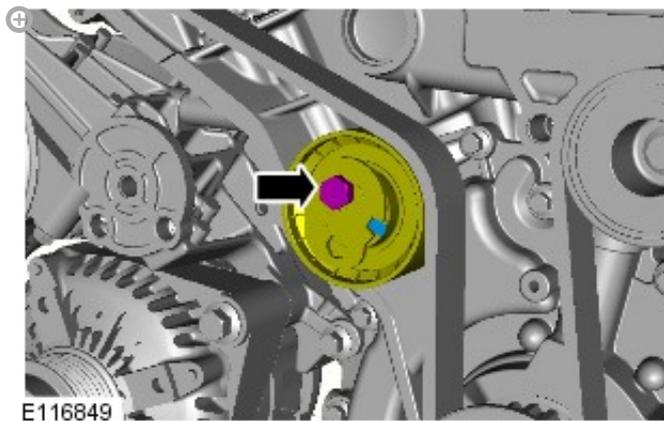
3.

- Make sure that a new bolt is installed.
- Only tighten the bolts finger-tight at this stage.



4.

Make sure the timing belt tensioner window is aligned with the groove as illustrated.

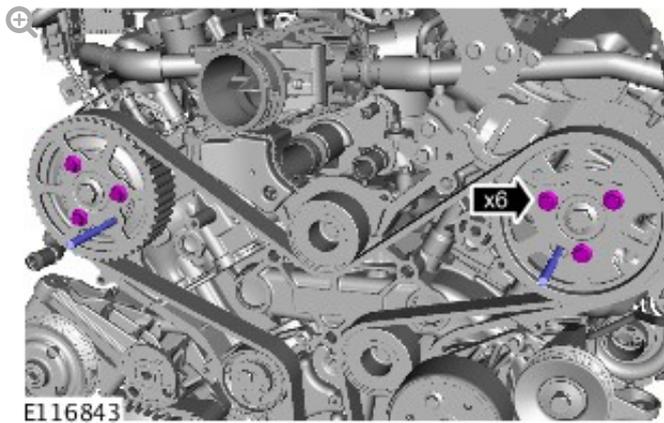


- Tension the timing belt.

- Rotate the tensioner assembly counter-clockwise.
- *Torque: 26 Nm*

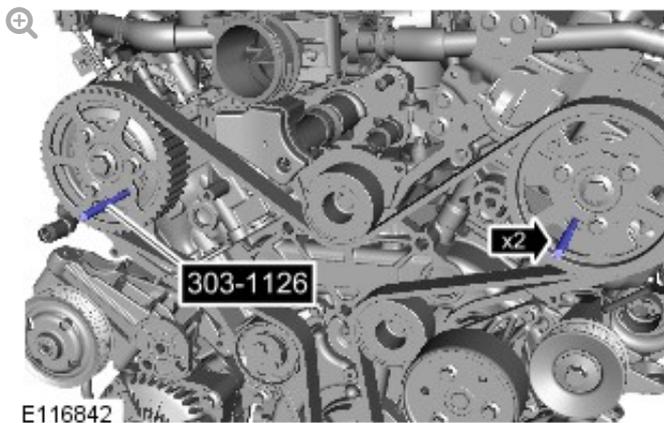
5.

Do not use the special tools to lock the camshafts. Failure to follow this instruction may result in damage to the engine or the special tools.



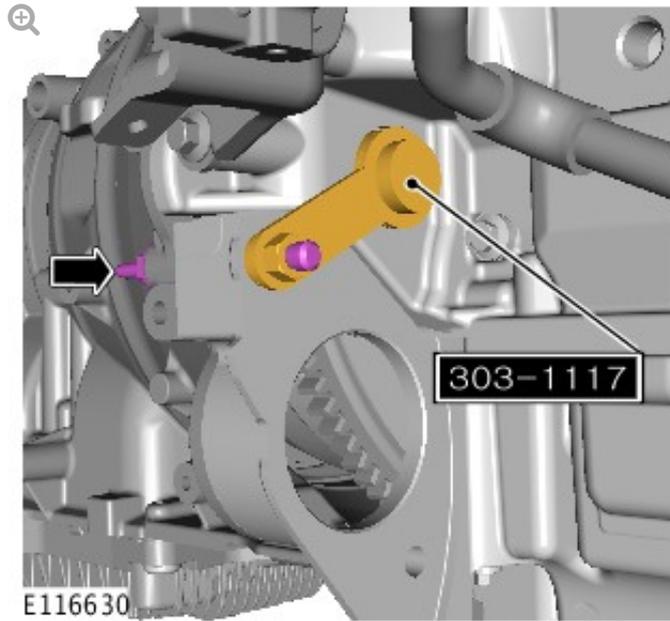
- Using a suitable tool, counterhold the camshaft pulley center retaining bolts.
- *Torque: 23 Nm*

6.



Remove the special tool.

7.



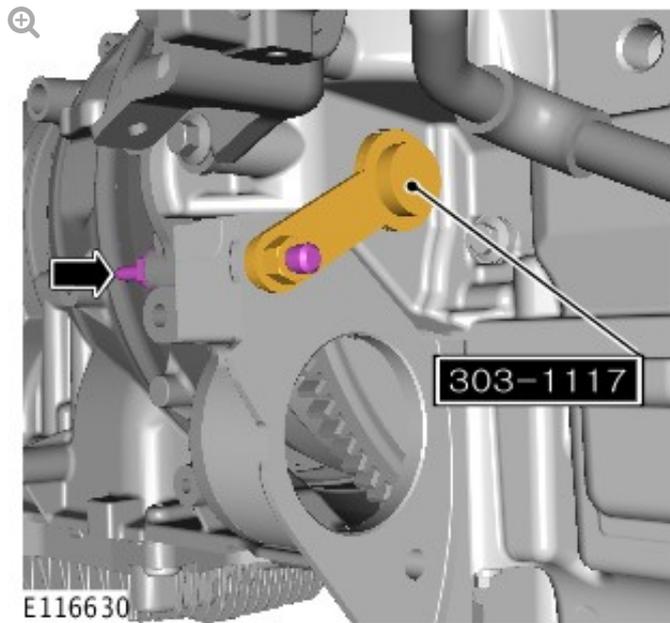
Remove the special tool.

8.

Only rotate the crankshaft clockwise.

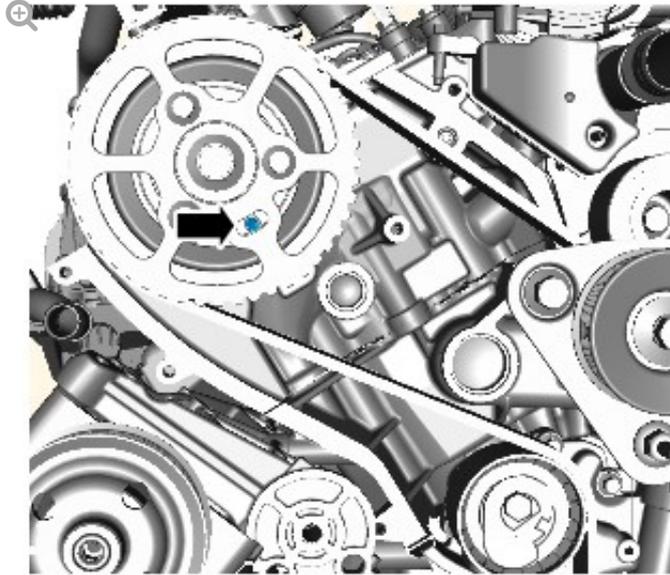
Rotate the engine two complete turns clockwise.

9.



Install with the special tool.

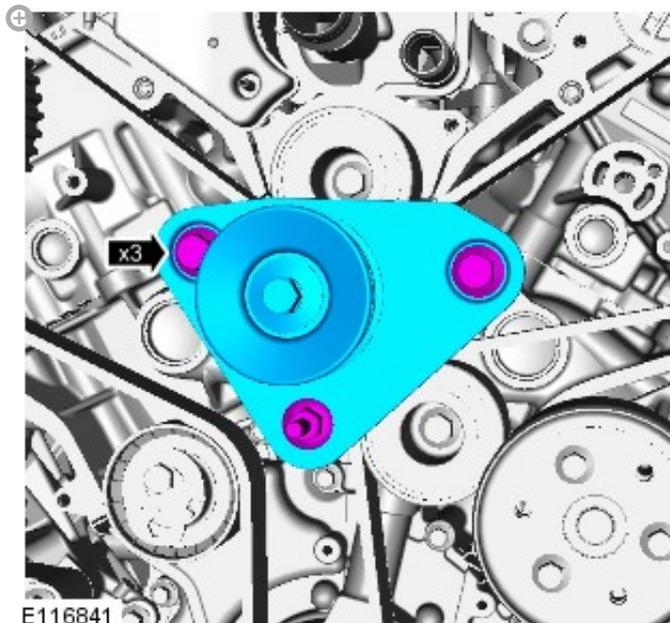
10.



E116840

- Install the special tools to the exhaust camshaft pulleys.
- If the special tool does not fit correctly, repeat the timing belt installation procedure.
- Remove the special tools from the camshaft pulleys.

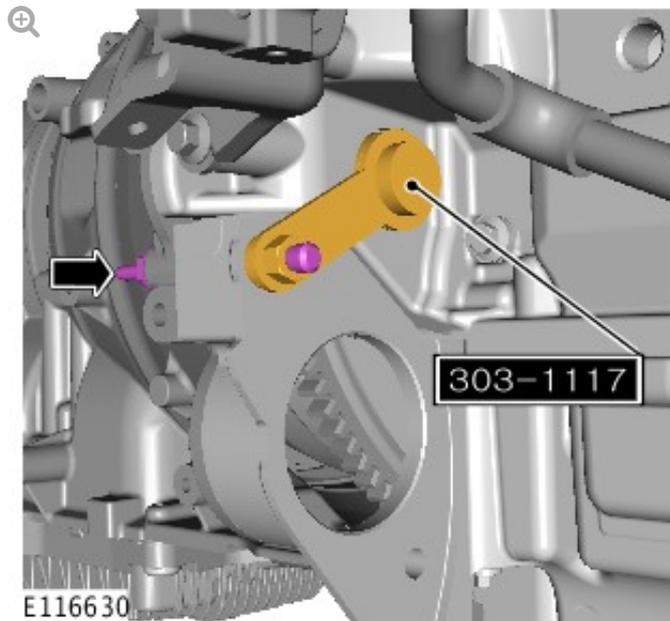
11.



E116841

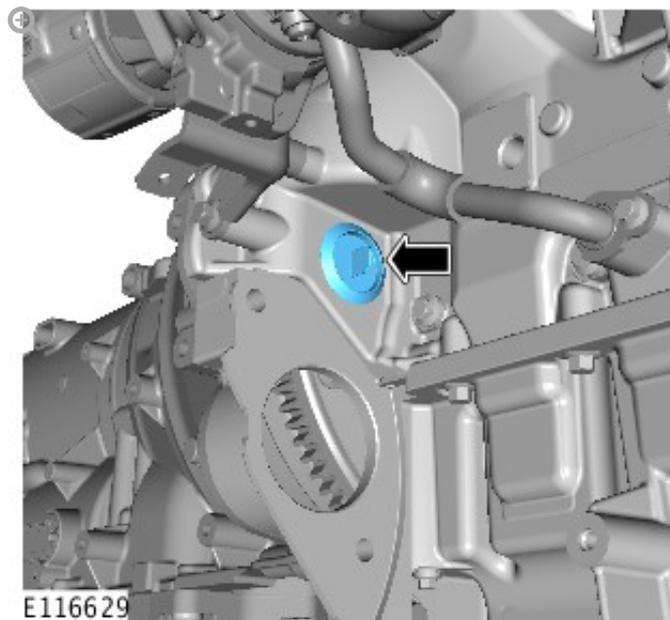
**Torque: 80 Nm**

12.



Remove the special tool.

13.



14. Refer to: [Starter Motor](#) (303-06A Starting System - TDV6 3.0L Diesel, Removal and Installation).
15. Refer to: [Timing Cover](#) (303-01A Engine - TDV6 3.0L Diesel, Removal and Installation).



# ENGINE - TDV6 3.0L DIESEL

## TIMING COVER (G1272052)

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### REMOVAL

- Removal steps in this procedure may contain installation details.
- Some variation in the illustrations may occur, but the essential information is always correct.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

2.

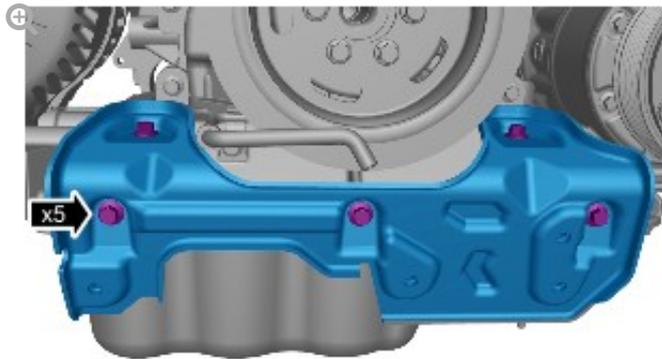
Do not work on or under a vehicle supported only by a jack.  
Always support the vehicle on safety stands.

Raise and support the vehicle.

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

4. Refer to: [Accessory Drive Belt \(303-05A Accessory Drive - TDV6 3.0L Diesel, Removal and Installation\)](#).

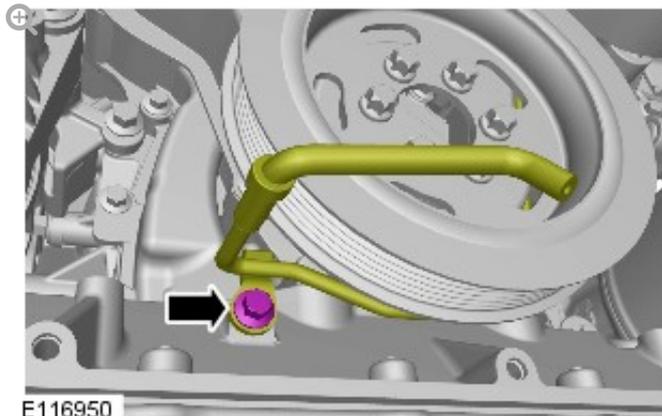
5.



E116949

*Torque: 14 Nm*

6.

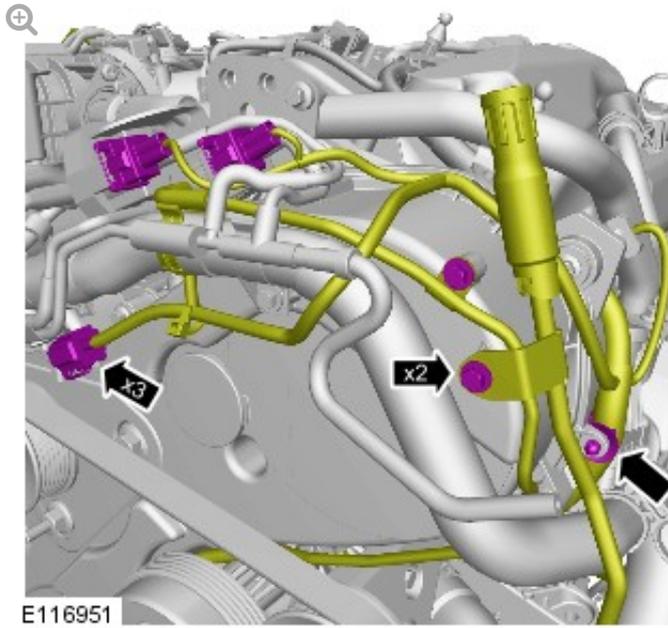


E116950

*Torque: 8 Nm*

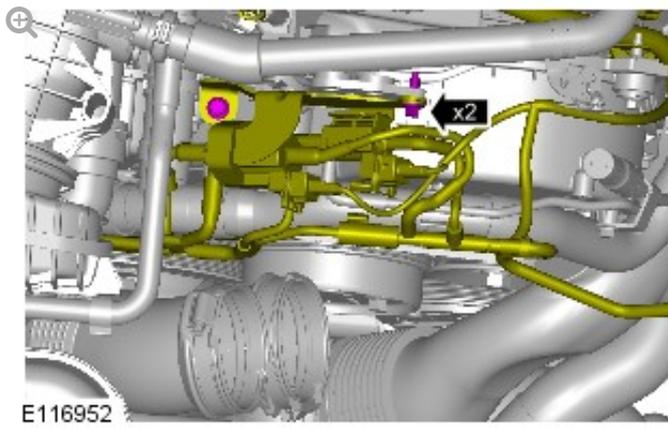
7. Lower the vehicle on the lift.
8. Refer to: [Engine Cover - TDV6 3.0L Diesel \(501-05 Interior Trim and Ornamentation, Removal and Installation\)](#).

9.



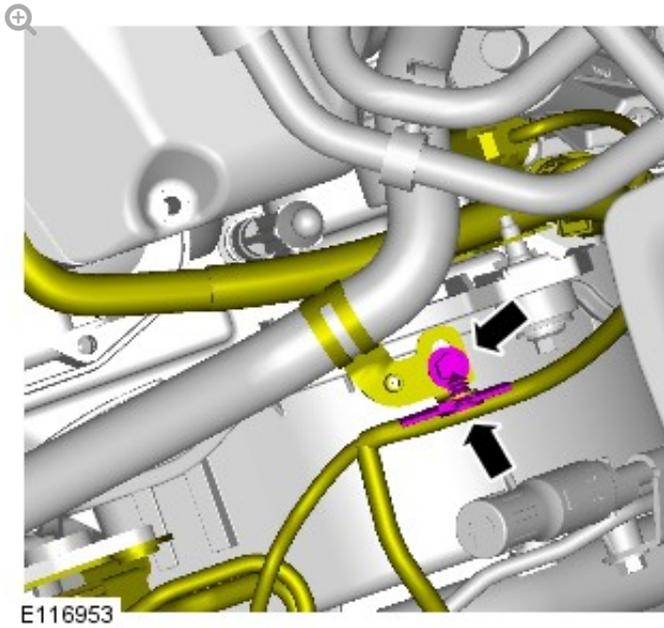
*Torque: 3 Nm*

10.



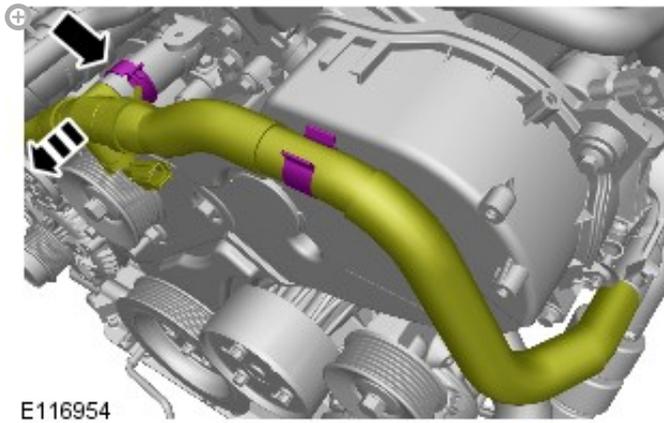
*Torque: 8 Nm*

11.



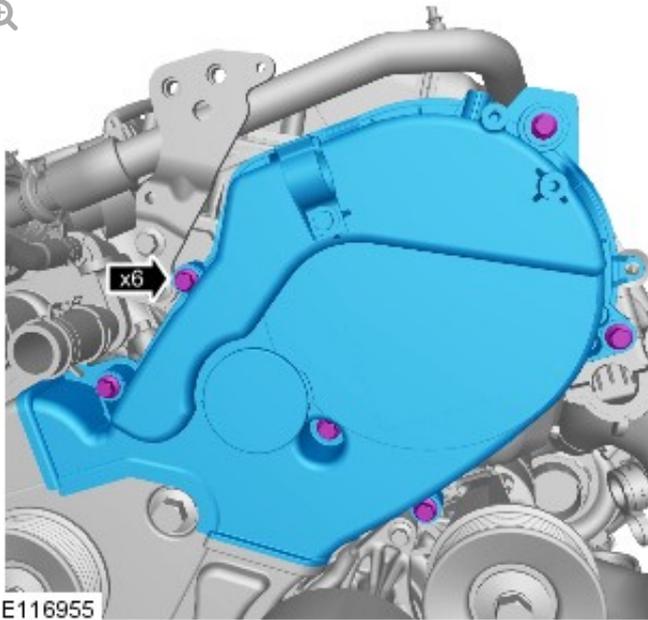
*Torque: 3 Nm*

12.



13.

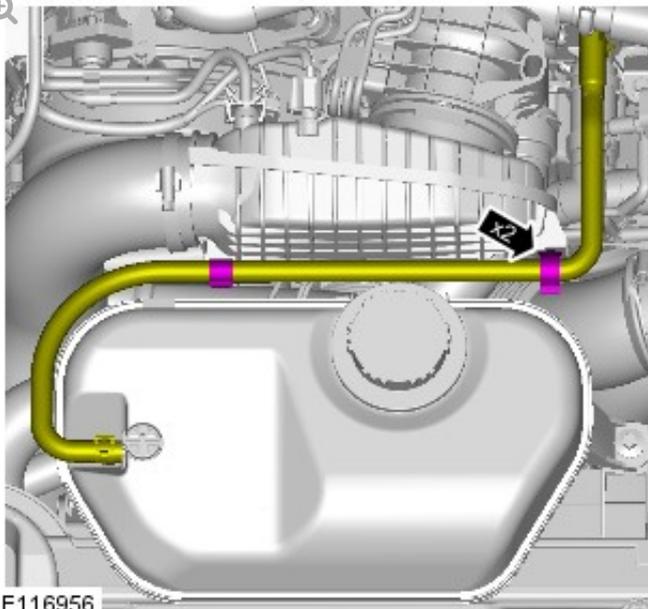
Discard the gasket.



E116955

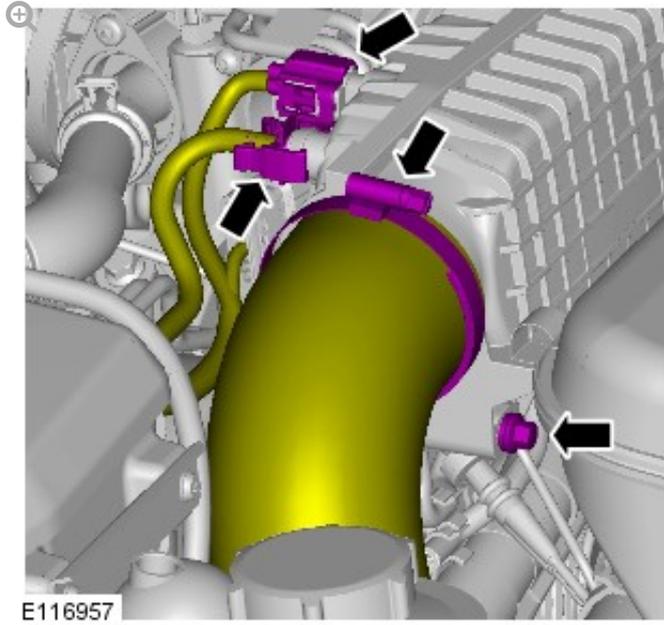
*Torque: 10 Nm*

14.



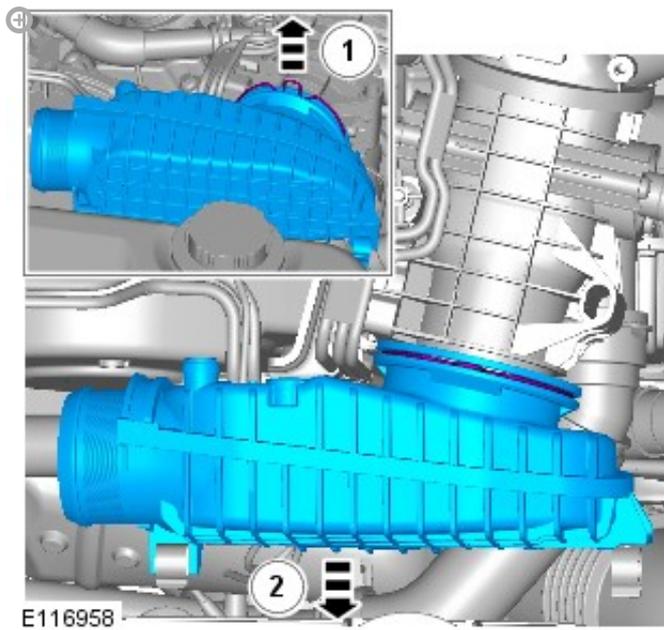
E116956

15.

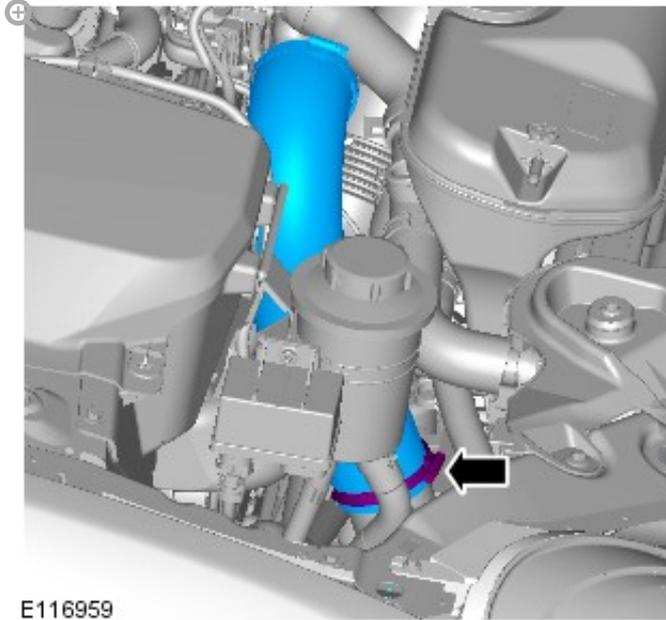


*Torque:* **8 Nm**

16.

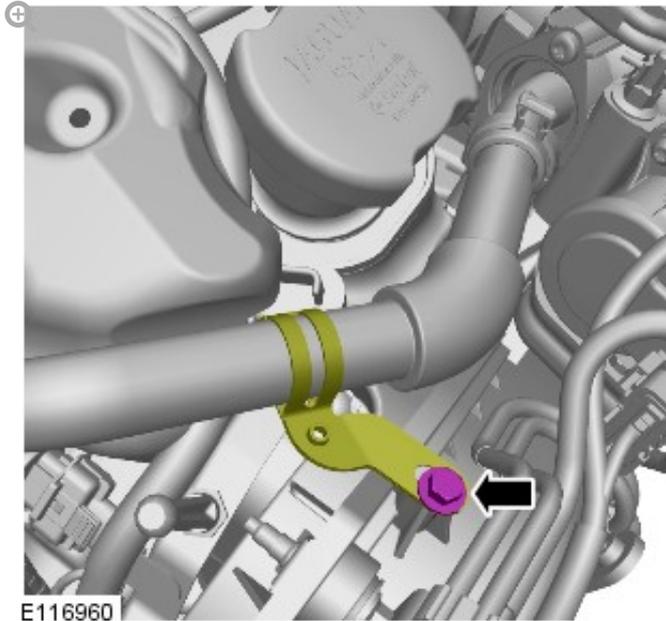


17.



E116959

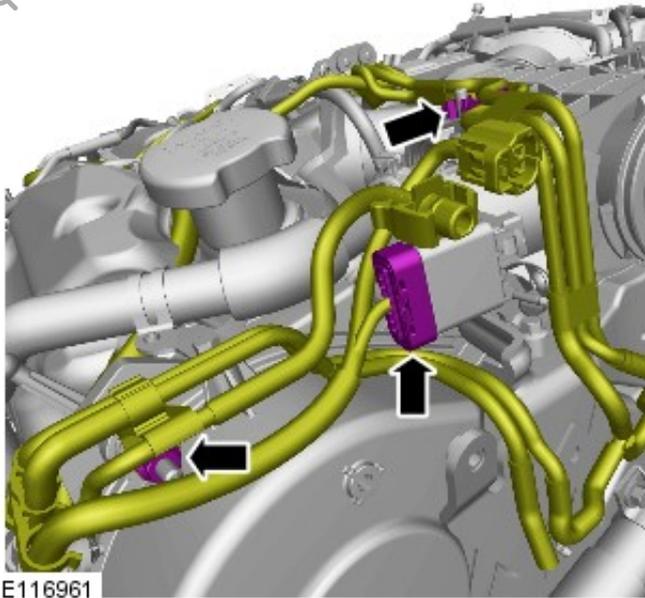
18.



E116960

*Torque: 3 Nm*

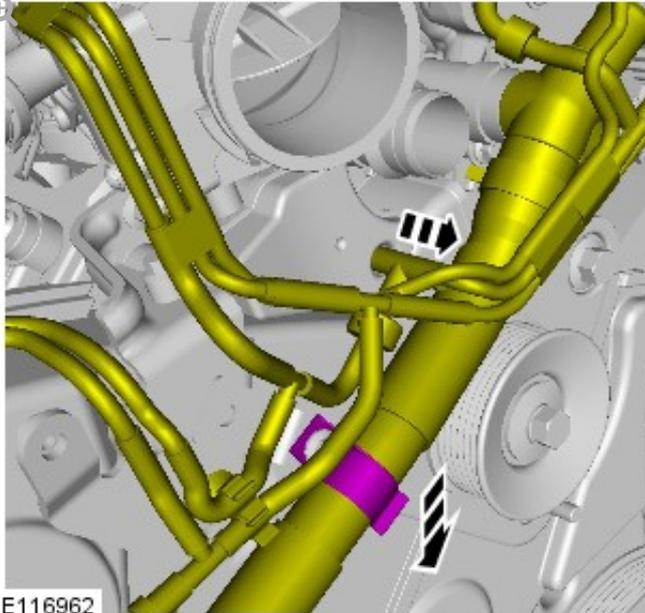
19.



E116961

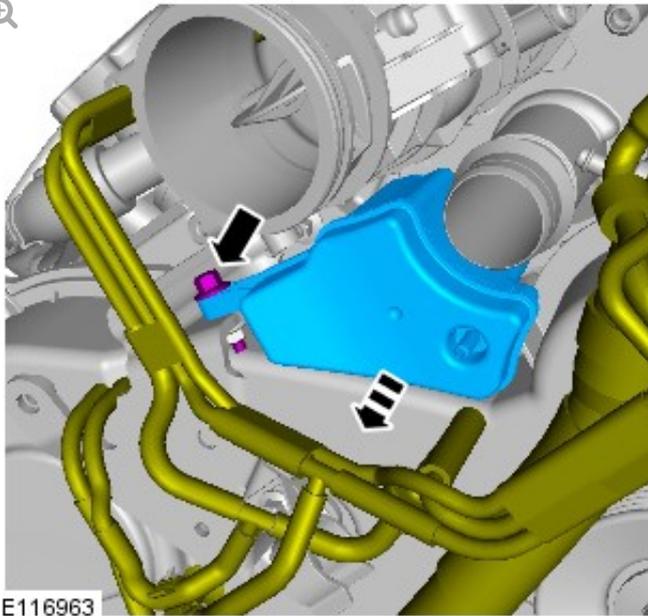
*Torque: 10 Nm*

20.



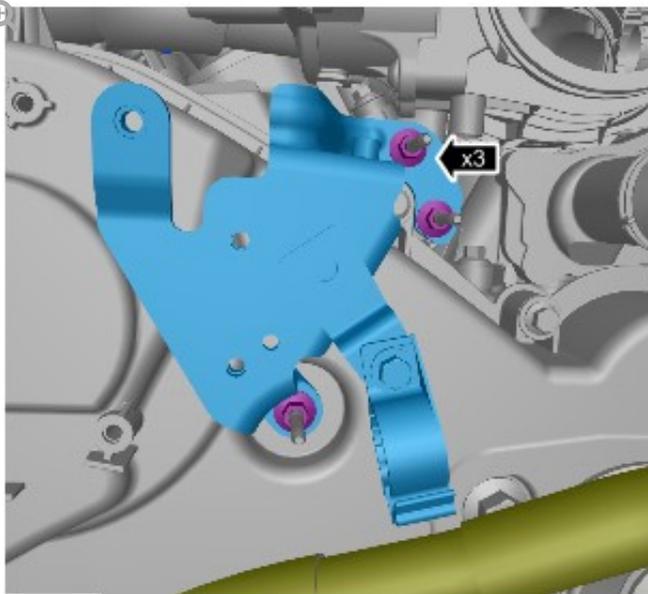
E116962

21.



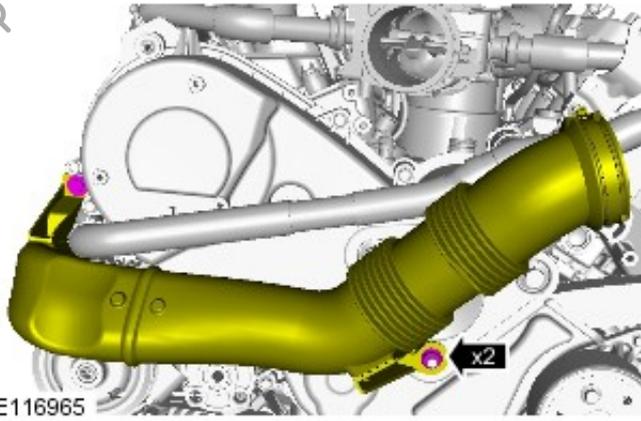
*Torque:* **8 Nm**

22.



*Torque:* **8 Nm**

23.

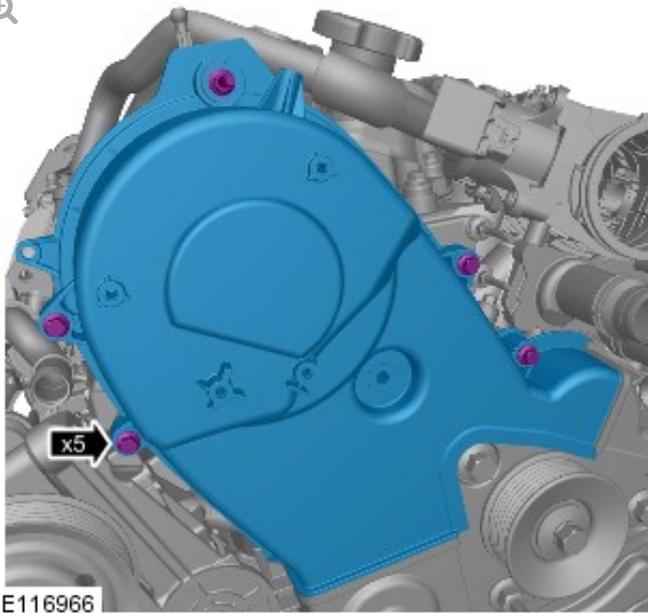


E116965

*Torque: 8 Nm*

24.

Discard the gasket.



E116966

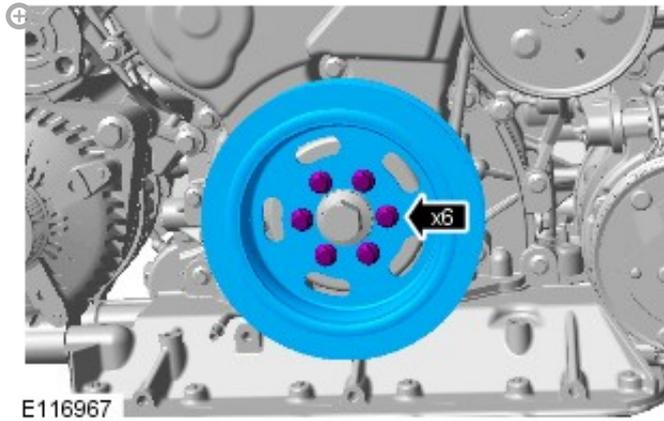
*Torque: 10 Nm*

25.

Do not work on or under a vehicle supported only by a jack.  
Always support the vehicle on safety stands.

Raise and support the vehicle.

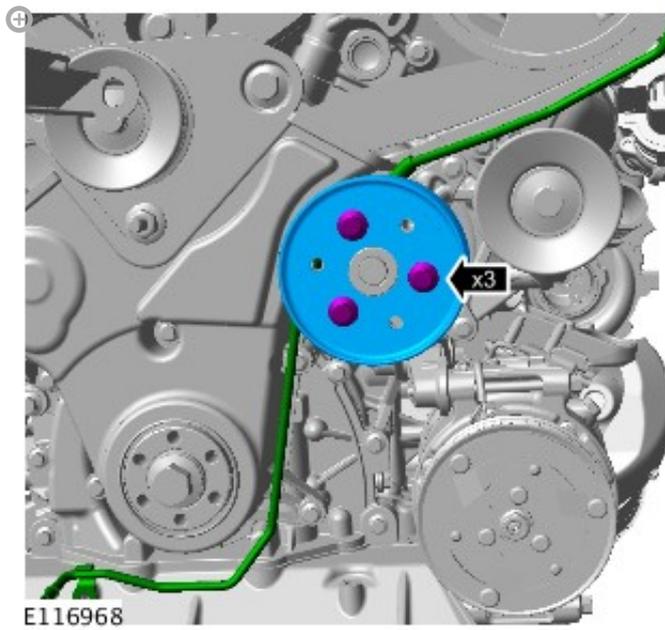
26.



*Torque:* **25 Nm**

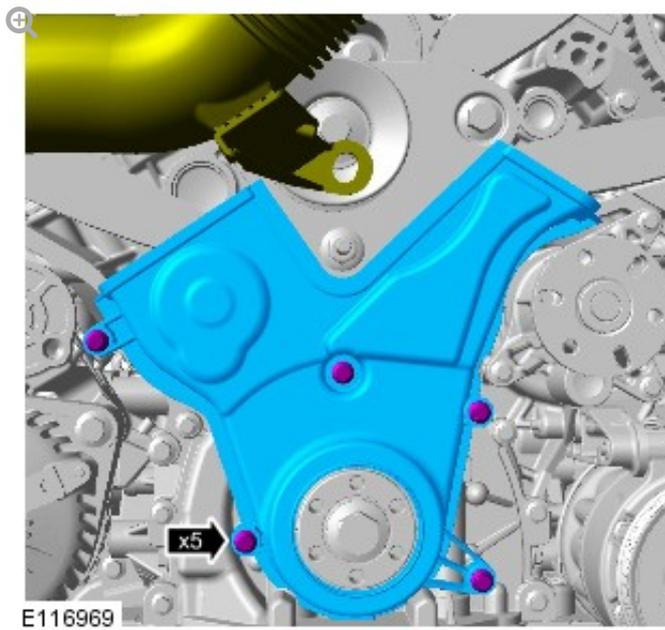
27.

Discard the bolts.



*Torque: 25 Nm*

28.



*Torque: 10 Nm*

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## INSTALLATION

1. To install, reverse the removal procedure.



# ENGINE COOLING - TDV6 3.0L DIESEL AUXILIARY RADIATOR (G1269151)

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## REMOVAL

- Removal steps in this procedure may contain installation details.
- Some variation in the illustrations may occur, but the essential information is always correct.

1.

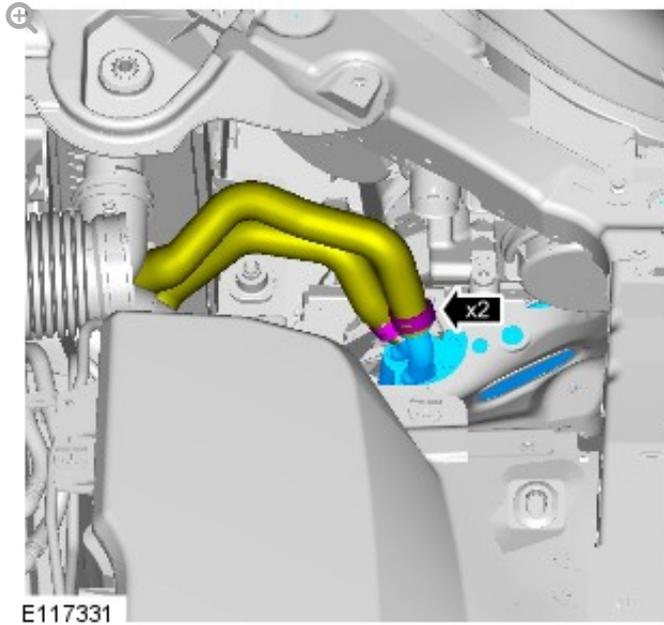
Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

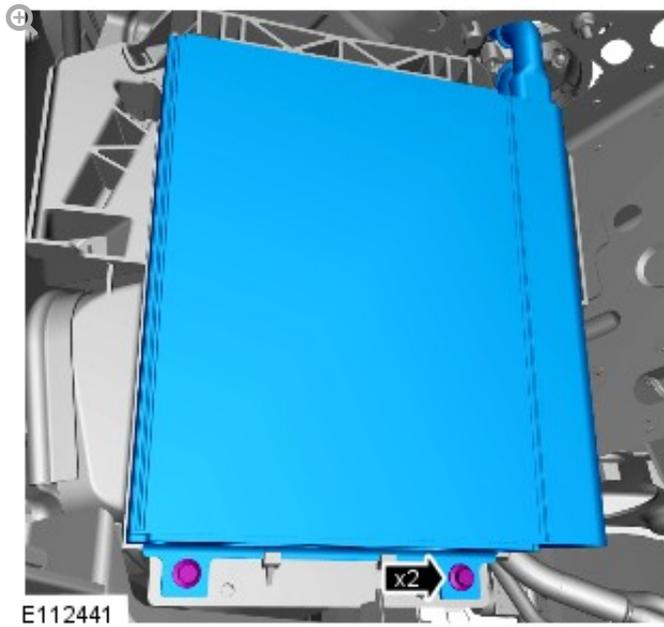
2. Refer to: [Cooling System Partial Draining and Vacuum Filling](#) (303-03A Engine Cooling - TDV6 3.0L Diesel, General Procedures).
3. Refer to: [Fender Splash Shield](#) (501-02 Front End Body Panels, Removal and Installation).

4.

Be prepared to collect escaping coolant.

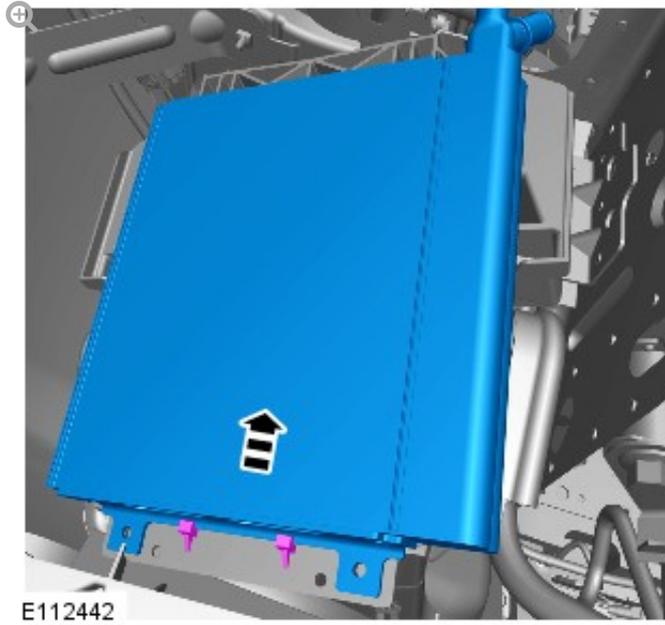


5.



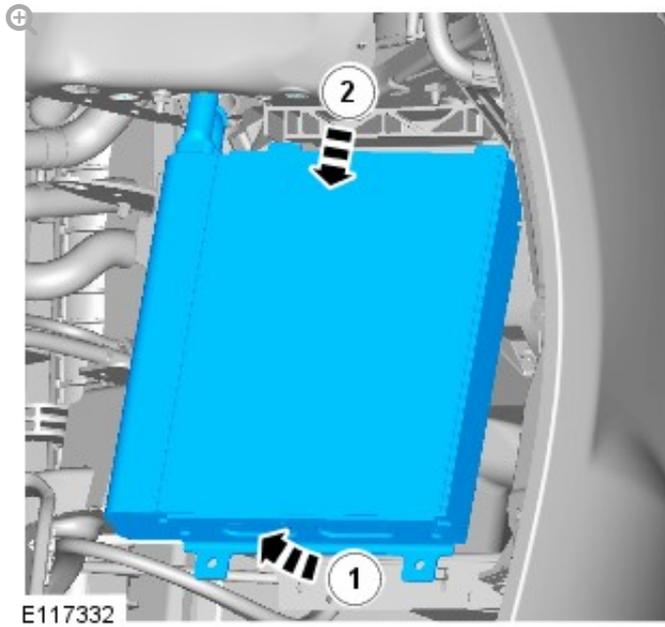
*Torque: 9 Nm*

6.



7.

Be prepared to collect escaping coolant.



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## INSTALLATION

1. To install, reverse the removal procedure.



# ENGINE COOLING - TDV6 3.0L DIESEL COOLANT EXPANSION TANK

[G1085272]

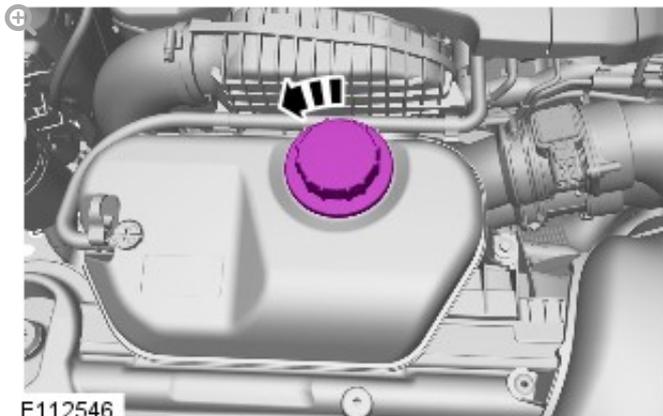


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## REMOVAL

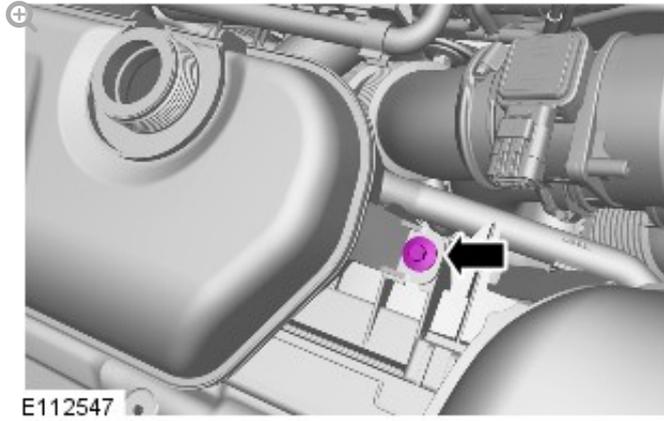
1.

Correct installation of the coolant expansion tank cap can be obtained by tightening the cap until 3 audible clicks are heard.



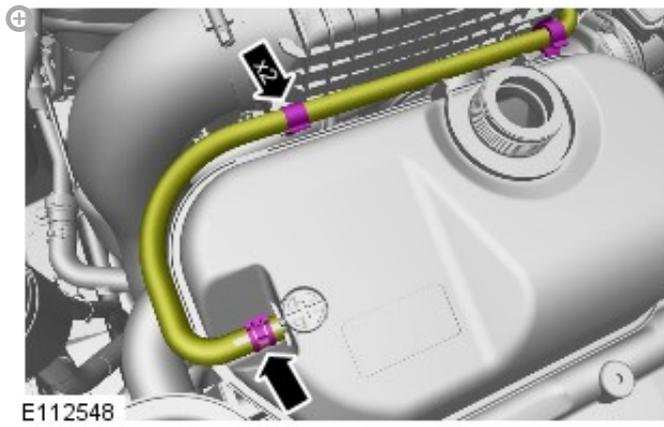
2. Using a syringe, remove the cooling fluid from the expansion tank.

3.

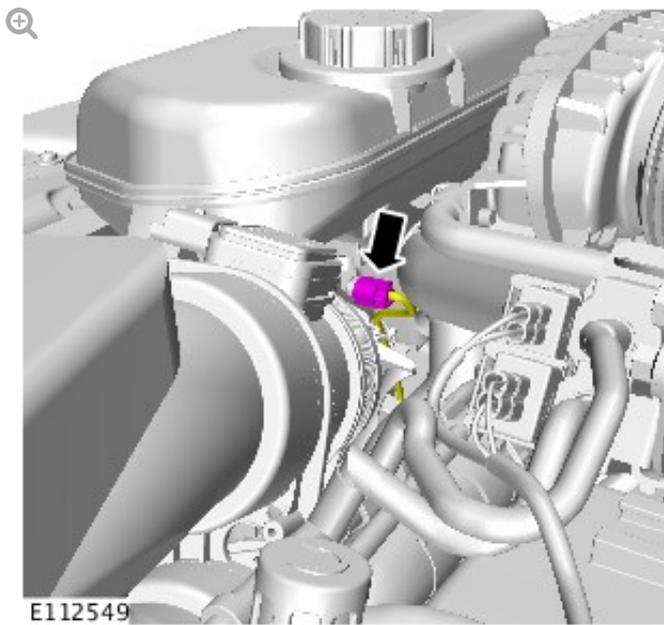


*Torque: 7 Nm*

4.



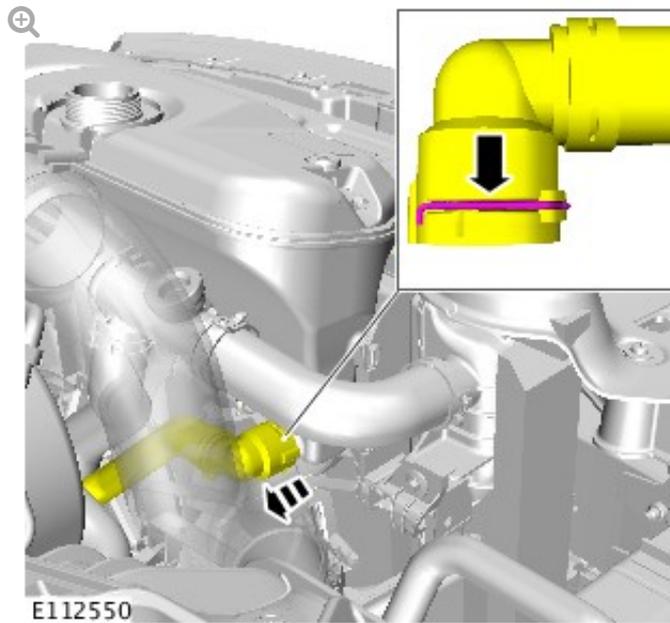
5.



Disconnect the coolant low level sensor electrical connector.

6.

Be prepared to collect escaping coolant.



Release the clip and disconnect the coolant hose.

7.



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## INSTALLATION

1. To install, reverse the removal procedure.
2. Fill the cooling system to the upper level mark of the coolant

expansion tank.

# ENGINE COOLING - TDV6 3.0L DIESEL COOLANT PUMP [G1269302]

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## REMOVAL

Removal steps in this procedure may contain installation details.

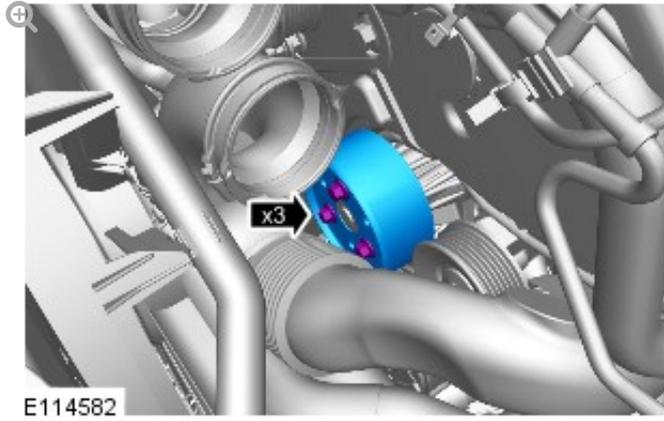
1.

Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Refer to: [Cooling System Partial Draining and Vacuum Filling](#) (303-03A Engine Cooling - TDV6 3.0L Diesel, General Procedures).
3. Refer to: [Accessory Drive Belt](#) (303-05A Accessory Drive - TDV6 3.0L Diesel, Removal and Installation).

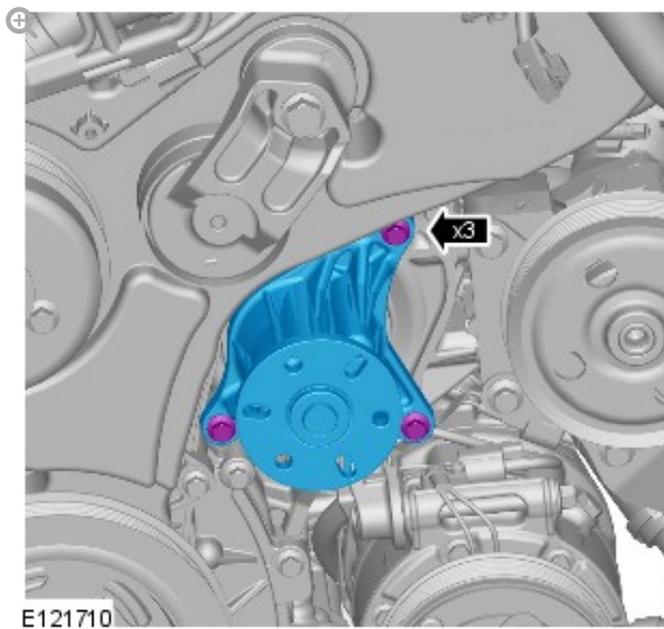
4.



*Torque:* **25 Nm**

5.

- Remove and discard the O-ring seal.
- Some variation in the illustrations may occur, but the essential information is always correct.



*Torque:* **10 Nm**

1.

Lubricate the O-ring seal with clean coolant.

To install, reverse the removal procedure.

# ENGINE COOLING - TDV6 3.0L DIESEL COOLING FAN MOTOR AND SHROUD [G1269152]

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## REMOVAL

Removal steps in this procedure may contain installation details.

1.

Make sure to support the vehicle with axle stands.

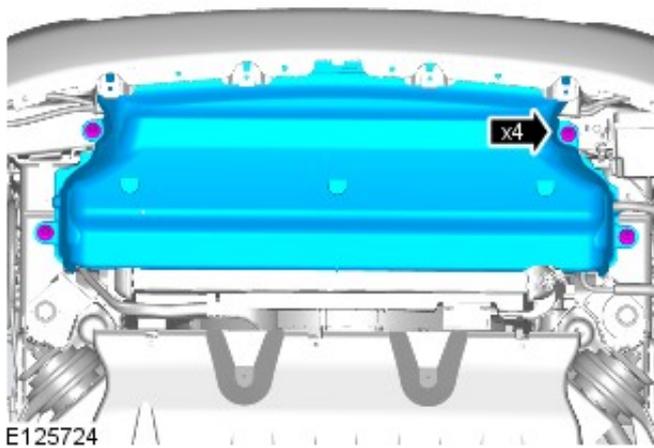
Raise and support the vehicle.

2. Refer to: [Air Cleaner](#) (303-12A Intake Air Distribution and Filtering - TDV6 3.0L Diesel, Removal and Installation).
3. Refer to: [Coolant Expansion Tank](#) (303-03A Engine Cooling - TDV6

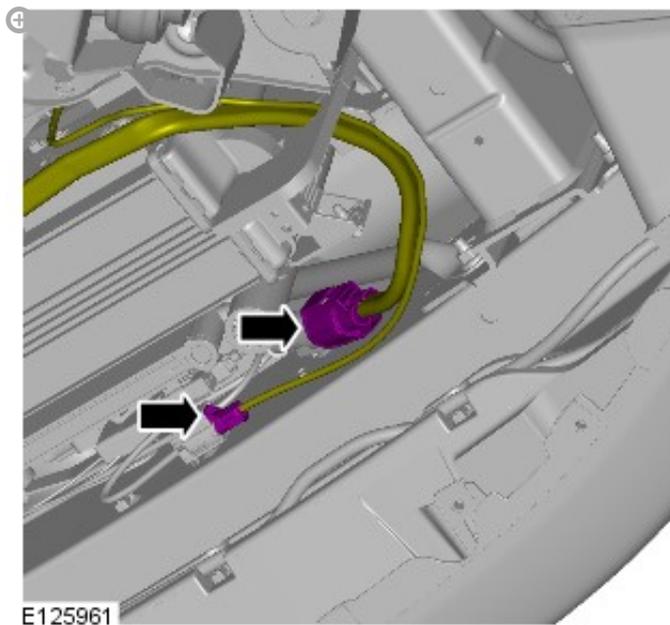
3.0L Diesel, Removal and Installation).

4. Refer to: [Radiator Splash Shield](#) (501-02 Front End Body Panels, Removal and Installation).
5. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).

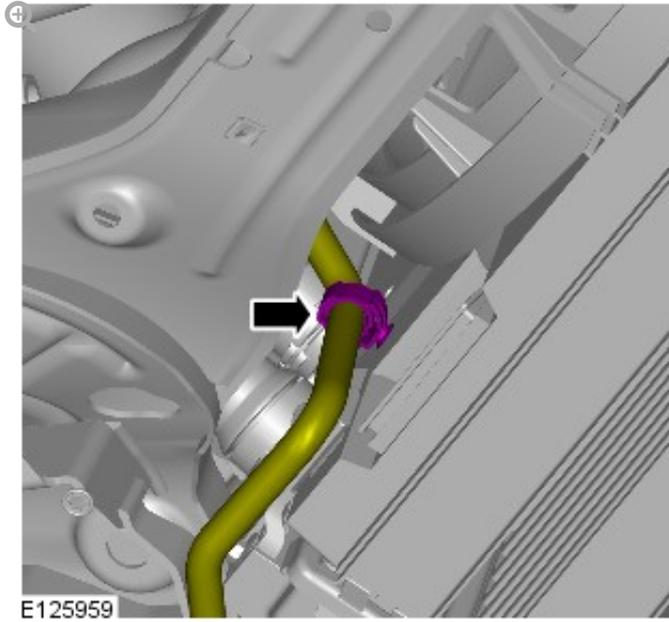
6. 



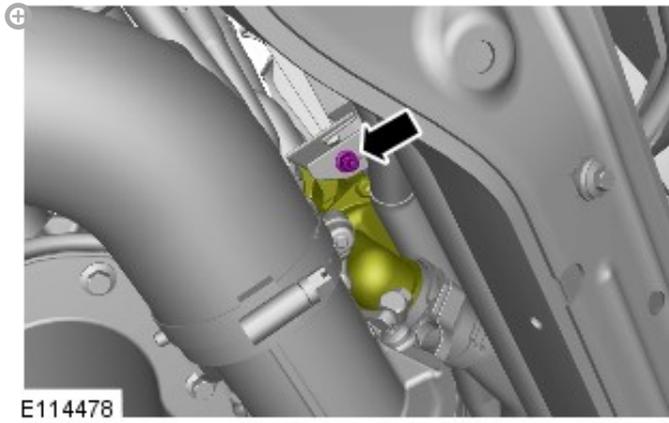
7.



8.

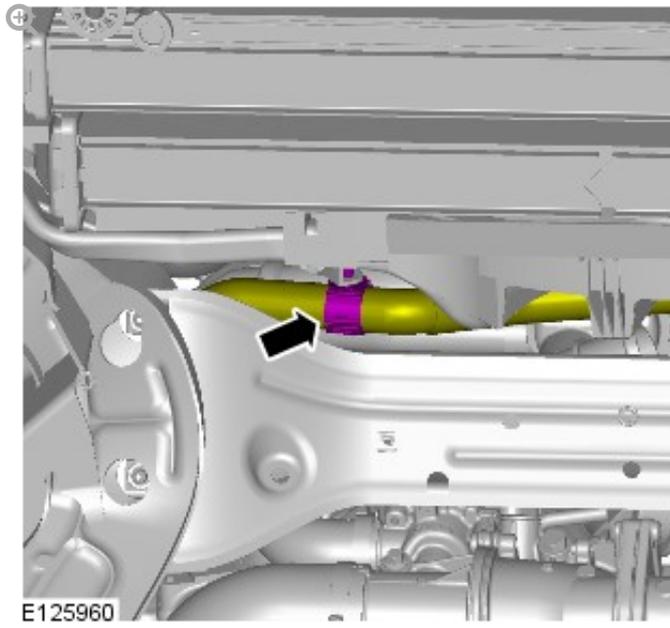


9.

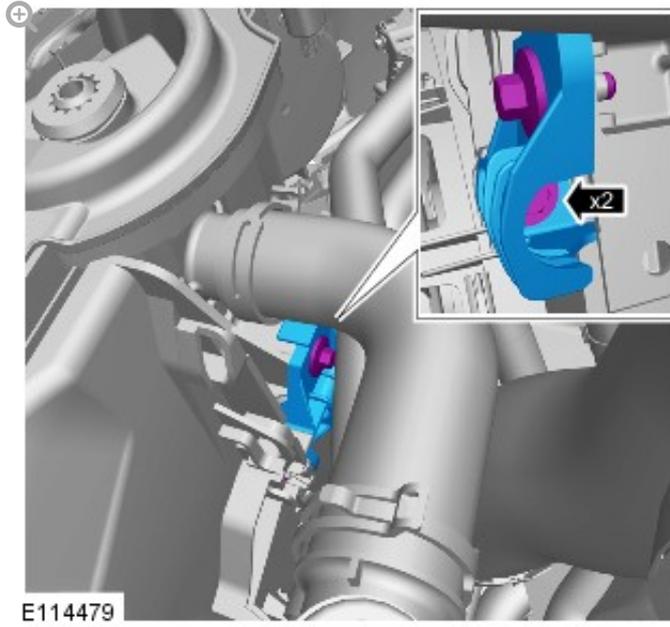


*Torque: 7 Nm*

10.

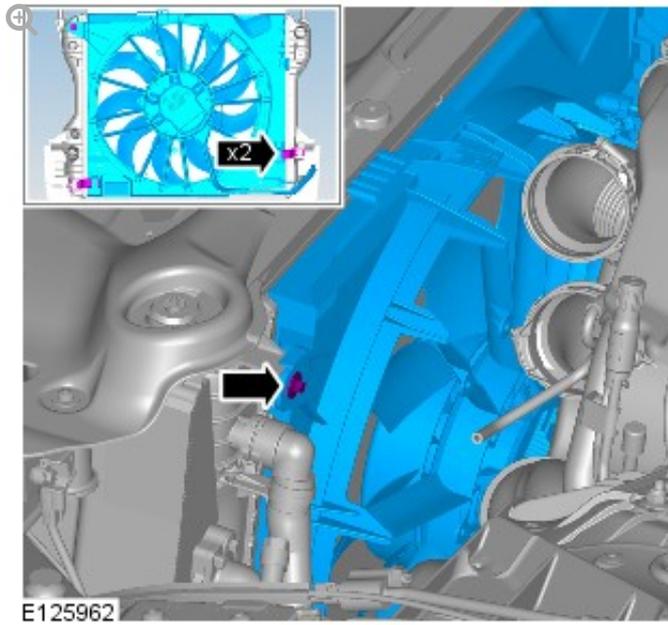


11.



*Torque: 10 Nm*

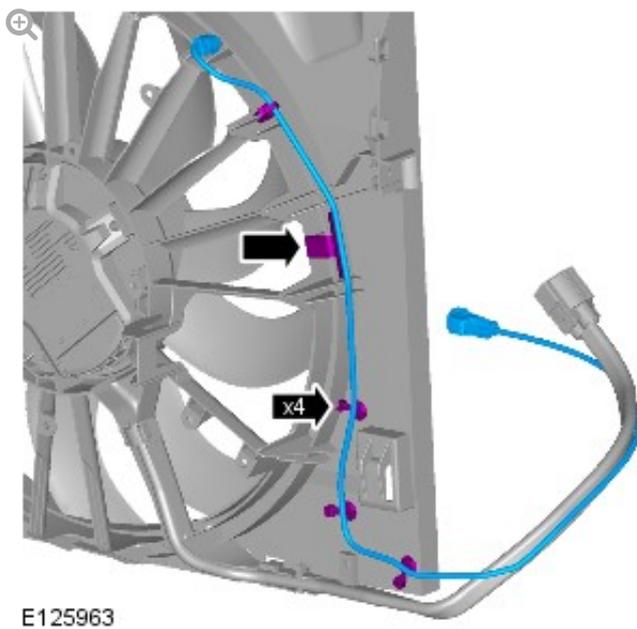
12.



*Torque: 10 Nm*

13.

Do not disassemble further if the component is removed for access only.



## INSTALLATION

1. To install, reverse the removal procedure.

# ENGINE COOLING - TDV6 3.0L DIESEL COOLING SYSTEM CONCENTRATION CHECK [G2154751]

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## GENERAL EQUIPMENT

Refractometer / Hydrometer

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## CHECK

- The engine cooling system must be maintained with the correct concentration and type of anti-freeze solution to prevent corrosion and frost damage.
- Engine coolant will damage the paint finished surfaces. If spilt, immediately remove the coolant and clean the area with water.
- Never remove the coolant expansion tank cap under any circumstances while the engine is operating.

- This procedure contains illustrations showing certain components removed to provide extra clarity.
- This procedure contains some variation in the illustrations depending on the vehicle specification, but the essential information is always correct.

1.

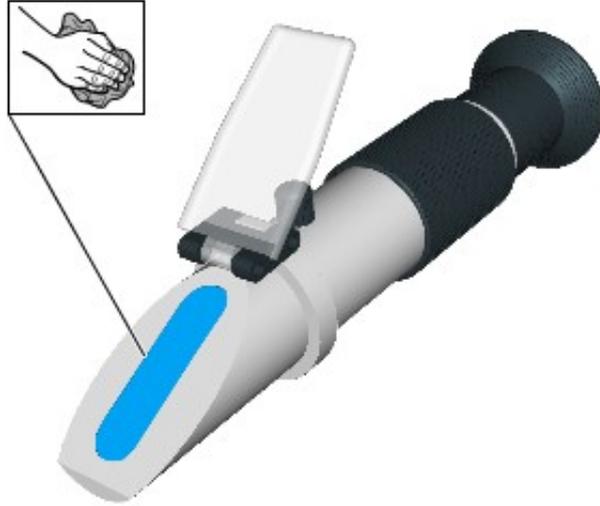


E207352

Raise the cover plate.

*General Equipment:* [Refractometer / Hydrometer](#)

2.



E207353

Clean the prism surface with a soft cloth.

3.



E207386

Put 2 drops of pure distilled water on the prism surface.

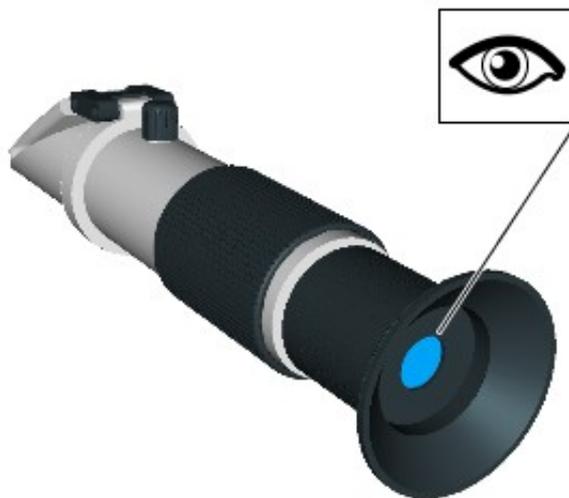
4.



E207354

Lower the cover plate.

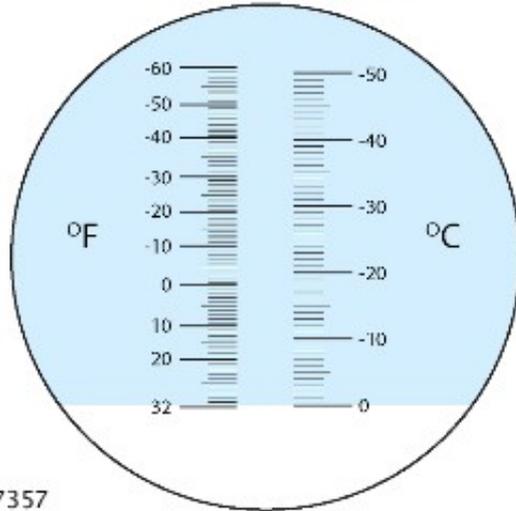
5.



E207356

Observe the shadow line on the scale.

6.



E207357

If required, use the adjustment screw to align the shadow line as shown.

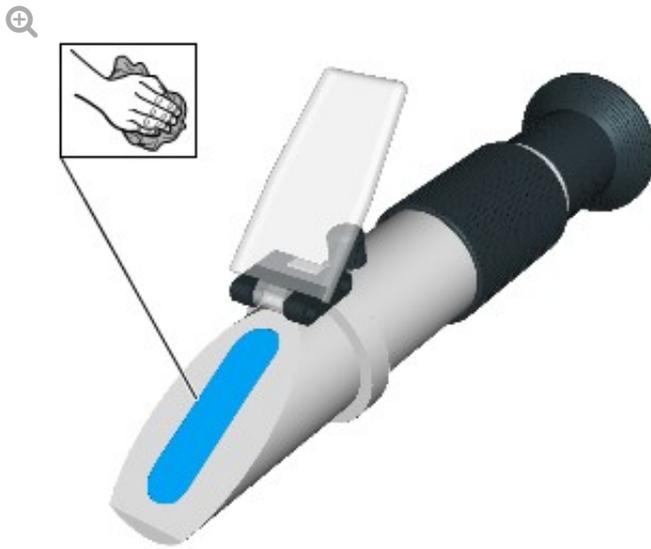
7.



E207352

Raise the cover plate.

8.



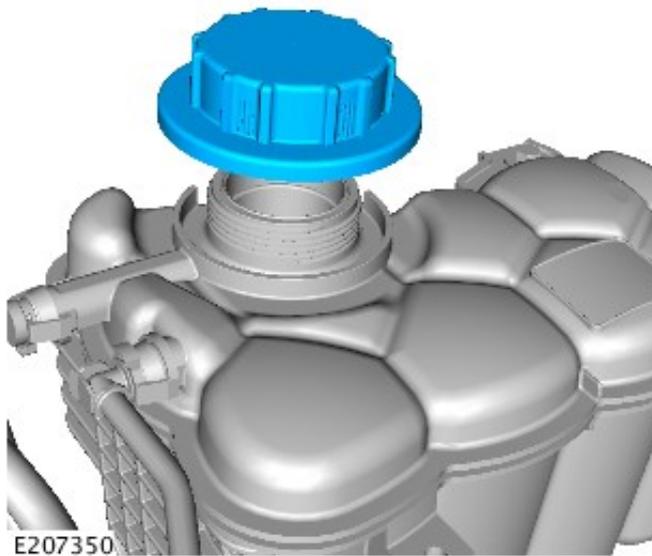
E207353

Clean the prism surface with a soft cloth.

9.

Release the cooling system pressure by slowly turning the coolant expansion tank cap a quarter of a turn. Cover the expansion tank cap with a thick cloth to prevent the possibility of scalding.

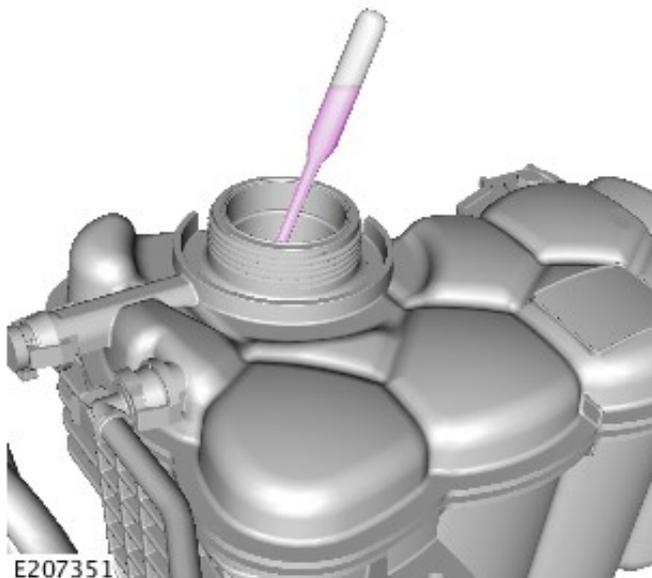
- Be prepared to collect escaping coolant.
- Since injury such as scalding could be caused by escaping steam or coolant, make sure the vehicle cooling system is cool prior to carrying out this procedure.



E207350

Remove the coolant expansion tank cap.

10.



E207351

Use the pipette to extract a coolant sample.

11.



E207352

Raise the cover plate.

12.



E207355

Put 2 drops of coolant on the prism surface.

13.

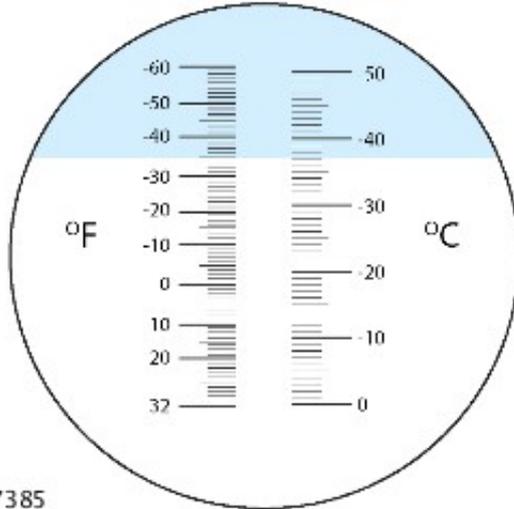


E207354

Lower the cover plate.

14.

50% coolant concentration mix provides a freeze point of  $-37^{\circ}\text{C}$ .



E207385

Observe the shadow line on the scale.

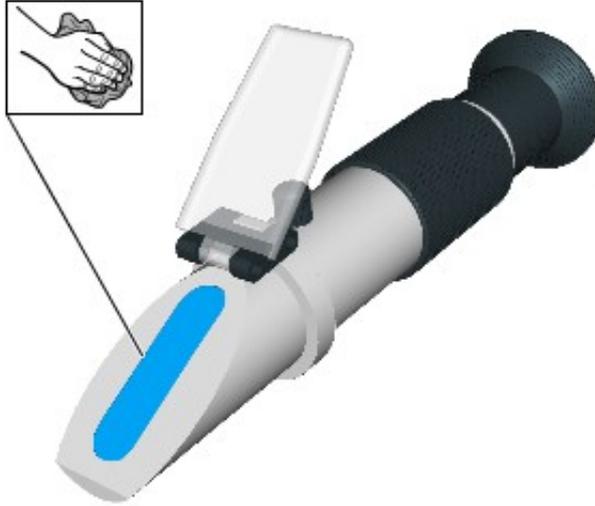
15.



E207352

Raise the cover plate.

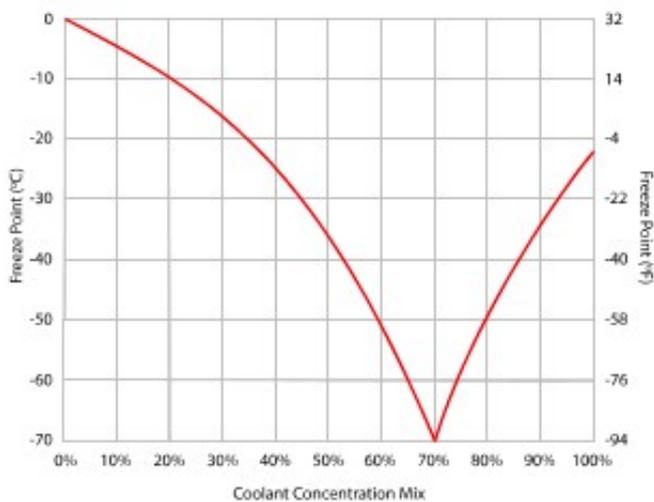
16.



E207353

Clean the prism surface with a soft cloth.

17.



E207515

If the coolant concentration mix is at 50%, proceed to Step 20.

If the coolant concentration mix is below 50%, proceed to Step 18.

If the coolant concentration mix is below 50%, proceed to Step 19.

18.

Coolant concentration mix % must divided by 100. 50% would be calculated as 0.5

If the coolant concentration mix is below 50%, the following calculation steps must be followed.

Step 1. Multiply the required coolant concentration mix % by the cooling system capacity.

Step 2. Multiply the current coolant concentration mix % by the cooling system capacity.

Step 3. Subtract the total of step 1 by total of step 2.

Step 4. Subtract the current coolant concentration mix % from 1.

Step 5. Divide the total of step 3 by the total of step 4.

Drain the coolant quantity given by the calculations and replace with concentrated antifreeze.

Proceed to Step 20.

19.

Coolant concentration mix % must divided by 100. 50% would be calculated as 0.5

If the coolant concentration mix is above 50%, the following calculation steps must be followed.

Step 1. Multiply the current coolant concentration mix % by the cooling system capacity.

Step 2. Multiply the required coolant concentration mix % by the cooling system capacity.