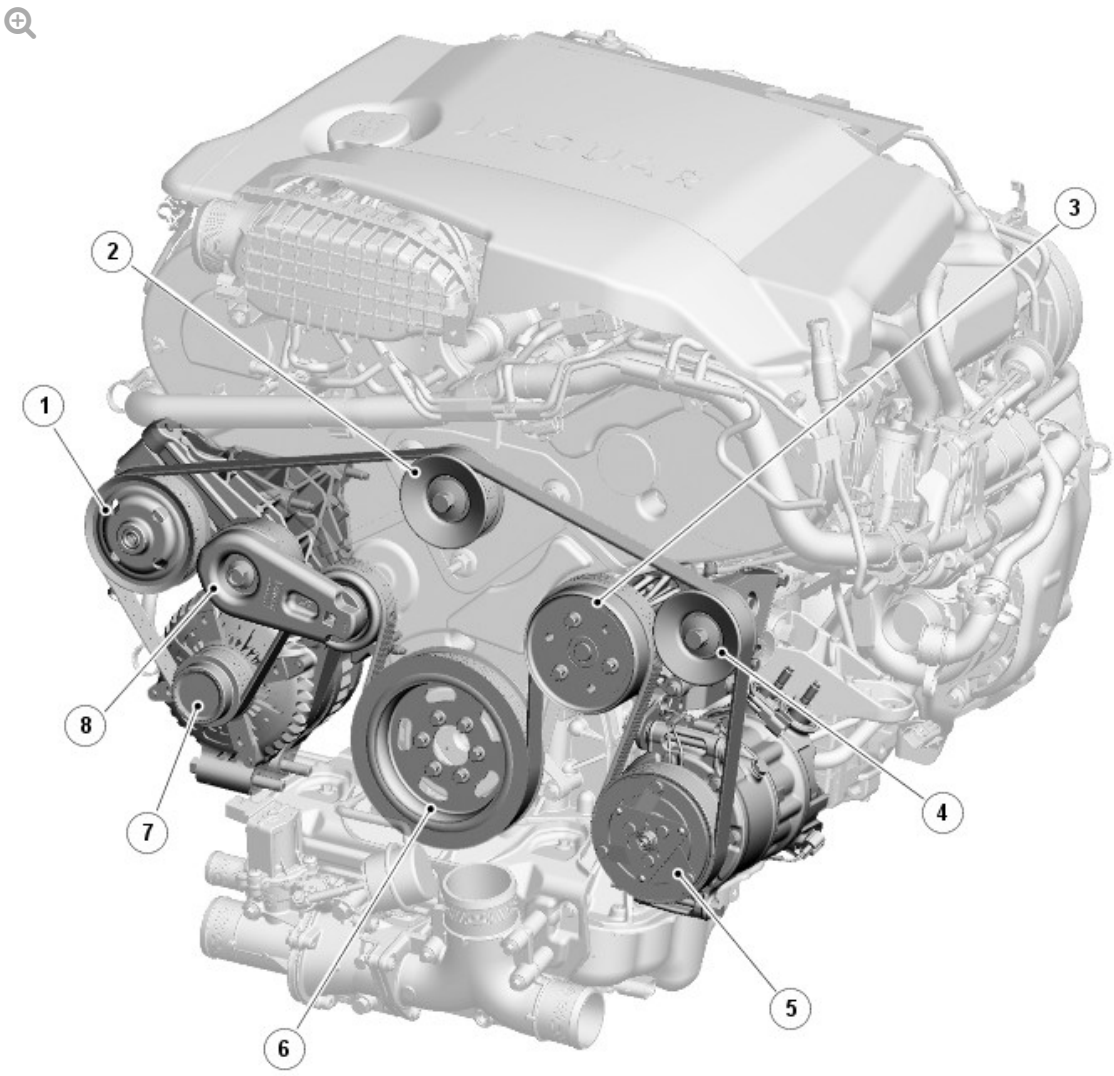
ACCESSORY DRIVE - COMPONENT LOCATION [G1245384]



1	Power steering pump
2	Idler
3	Coolant pump
4	Idler
5	A/C (air conditioning) compressor
6	Crankshaft pulley
7	Generator
8	Belt tensioner

ACCESSORY DRIVE - TDV6 3.0L DIESEL

ACCESSORY DRIVE - OVERVIEW [G1245385]

OVERVIEW

The crankshaft pulley drives a single ribbed belt which in turn drives all of the engine mounted accessories.

ACCESSORY DRIVE - SYSTEM OPERATION AND COMPONENT DESCRIPTION

[G1245386]

SYSTEM OPERATION

OPERATION

The crankshaft pulley is attached to and rotates with the crankshaft. The pulley provides the drive for the accessory drive vee belt which in turn provides rotational power for the front mounted accessories such as the generator, power steering pump, coolant pump and the A/C (air conditioning) compressor.

The crankshaft pulley is a combined pulley and torsional vibration damper.

COMPONENT DESCRIPTION

DESCRIPTION

The accessory drive belt, which is a maintenance free poly-V type belt, is automatically pre-loaded by the belt tensioner and routed over idlers in order

to maintain sufficient friction around the drive wheels. This ensures slip-free drive of the accessory components.

The torsional vibration damper incorporates compressed rubber between its inner and outer diameters to absorb vibration and shock loads.

The belt tensioner is calibrated to provide the correct amount of tension to the belt for a given drive system. Unless a spring within the tensioner assembly breaks, or some other mechanical part of the tensioner fails, there is no need to check the tensioner for correct tension.

The accessory drive belt should be inspected at every routine service for excessive wear and damage.

The belt tensioner consists of an idler pulley, which is free to rotate on a bearing located at the end of a spring-loaded pivot arm. The accessory drive belt has wear indicators which are incorporated on the bottom of the accessory drive belt tensioner. When the indicators are aligned the accessory drive belt requires replacing.

ACCESSORY DRIVE - TDV6 3.0L DIESEL

PRINCIPLES OF OPERATION

For a detailed description of the drive belt and operation, refer to the relevant Description and Operation section in the Workshop Manual. REFER to: (303-05A Accessory Drive - TDV6 3.0L Diesel)

Accessory Drive (Description and Operation),
Accessory Drive (Description and Operation),
Accessory Drive (Description and Operation).

INSPECTION AND VERIFICATION

Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault and may also cause additional faults in the vehicle being checked and/or the donor vehicle.

Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

Verify the customer concern.

Visually inspect for obvious signs of mechanical damage.

- Drive belt condition (cracking/damage/contamination)
- Idler assembly
- Generator
- Engine cooling fan
- Tensioner assembly
- Engine coolant pump
- Power steering pump
- Air conditioning (A/C) compressor
- Torsional vibration damper
- Tensioner assembly
- Primary front drive belt
- Security/correct installation of the fuel injection pump cover
- Fuel injection pump belt condition (cracking/damage/contamination)
- Fuel injection pump belt tensioner assembly
- Fuel injection pump
- Fuel injection pump belt

If an obvious cause for an observed or reported condition is found, correct the cause (if possible) before proceeding to the symptom chart.

If the engine is run without the drive belt(s) connected to eliminate driven components, diagnostic trouble codes, (DTCs) may be set which must be cleared before the vehicle is returned to the owner. The engine should not be run for more than 2-3 minutes with the belts disconnected. Failure to follow this instruction may result in damage to the vehicle

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 [PRIMARY DRIVE BELT]

Noise	▪ Belt condition ▪ Belt tension ▪ Pulleys misaligned ▪ Driven components (including tensioners)	▪ Check the belt condition (see visual inspection). Check the tensioner function. Check the pulley alignment. Check the driven components for excessive resistance to rotation. Rectify as necessary ▪ Using the manufacturer approved diagnostic system, perform routine - Noise, vibration and harshness sensor diagnostic test - Accessory drive belt.
Drive belt does not hold tension	▪ Belt condition ▪ Tensioner fault	▪ Check the belt condition (see visual inspection). Check the tensioner function. Rectify as necessary

SYMPTOM CHART [FUEL INJECTION PUMP BELT]

Noise	▪ Belt condition ▪ Belt fouling cover ▪ Tensioner bearing failure ▪ Fuel injection pump failure	Check the belt condition (see visual inspection). Check the belt cover for indications of fouling (this may indicate a pump misalignment), refer to the relevant workshop manual section. The belt tensioner must be renewed if the belt is removed, making a check of the bearing impractical. Remove the belt, check the fuel injection pump pulley for security. Check the fuel injection pump for excessive resistance to rotation (excessive resistance in the pump will cause the pulley securing nut to loosen as a design feature). Check for diagnostic trouble codes (DTCs) indicating a pump malfunction
Drive belt does not hold tension	▪ Belt condition ▪ Tensioner fault	Check the belt condition (see visual inspection). Check the tensioner function. Rectify as necessary
Loss of drive (with no drive to the fuel injection pump, the engine will not run)	▪ Belt broken/stripped teeth ▪ Drive pulley(s) loose	Investigate the cause of the belt breakage/damage (a belt broken at a 45 degree angle normally indicates a shear, a break straight across the belt normally indicates that the belt has been crimped). Check the fuel injection pump for excessive resistance to rotation (excessive resistance in the pump will cause the pulley securing nut to loosen as a design feature). Check for DTCs indicating a pump malfunction

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 (DTC) Index - TDV6 3.0L Diesel , DTC: Engine Control Module (100-00 General Information, Description and Operation).

ACCESSORY DRIVE - TDV6 3.0L DIESEL

Accessory drive belt tensioner retaining bolt	47	35	-
Accessory drive belt central idler pulley retaining bolt	47	35	-
Accessory drive belt idler pulley retaining bolt	47	35	-
Fuel injection pump sprocket retaining nut	50	37	-
Rear end accessory drive belt (READ) cover retaining bolts	9	-	80
Camshaft rear hub bolt	Stage 1 - 80 Stage 2 - 80 degrees	Stage 1 - 59 Stage 2 - 80 degrees	-
Camshaft rear pulley retaining bolts	23	16	-
READ belt tensioner retaining bolt	23	16	-

ACCESSORY DRIVE - TDV6 3.0L DIESEL

ACCESSORY DRIVE BELT [G1269305]

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).

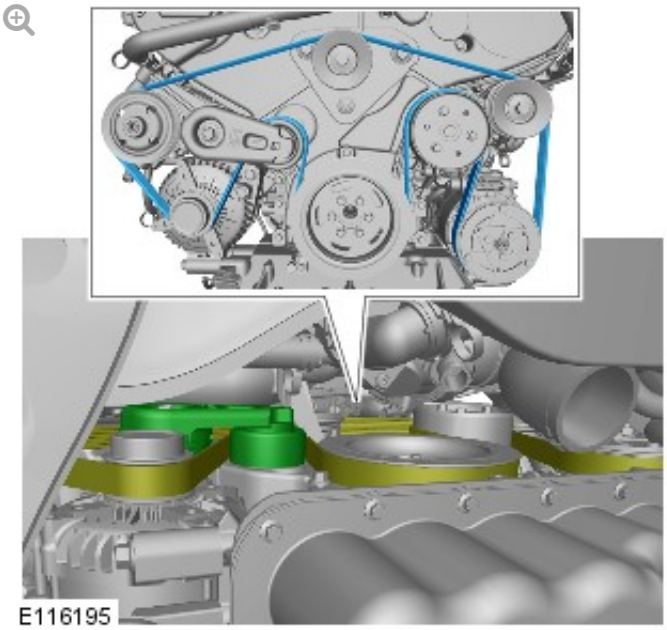
2.

   Make sure to support the vehicle with axle stands.

   Raise and support the vehicle.

3. Refer to: Turbocharger Bypass Valve (303-04B Fuel Charging and Controls - Turbocharger - TDV6 3.0L Diesel, Removal and Installation).

4.



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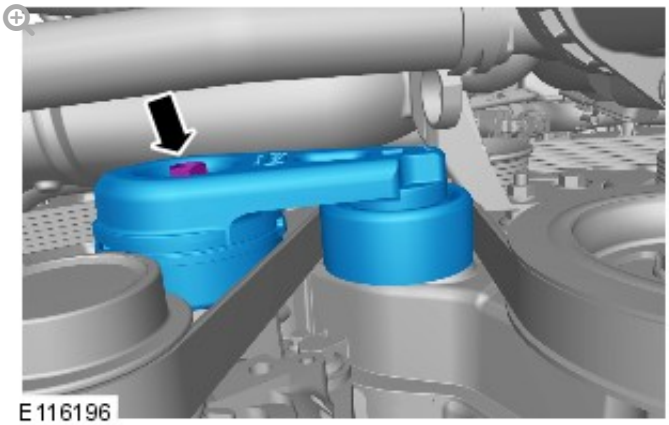
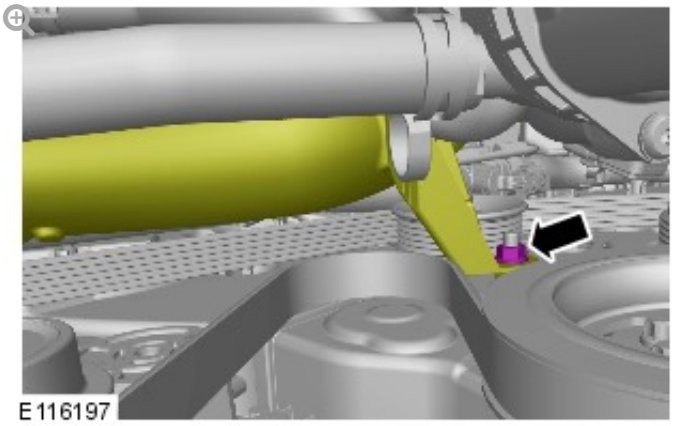


Torque: **47 Nm**

6.

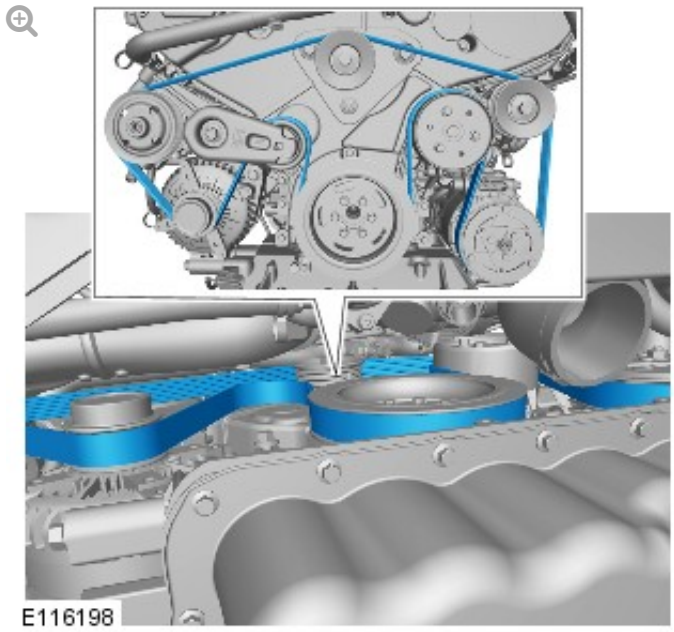


Torque: **25 Nm**

7.

Clean and inspect the accessory drive belt pulleys for damage.

- Note the fitted position of the accessory drive belt.
- Engine shown removed for clarity.



INSTALLATION

1. To install, reverse the removal procedure.

ACCESSORY DRIVE BELT IDLER PULLEY [G1269306]

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.

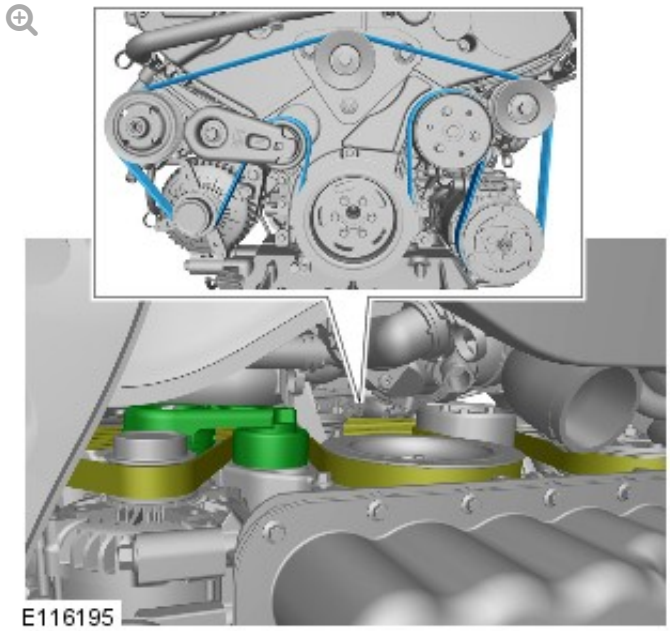
2. Refer to: Air Cleaner (303-12A Intake Air Distribution and Filtering - TDV6 3.0L Diesel, Removal and Installation).

3. Refer to: Turbocharger Bypass Valve (303-04B Fuel Charging and

Controls - Turbocharger - TDV6 3.0L Diesel, Removal and Installation).

4.

Note the fitted position of the accessory drive belt.



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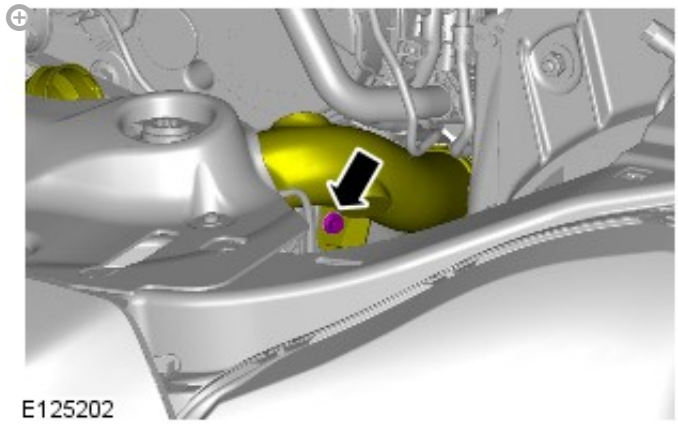
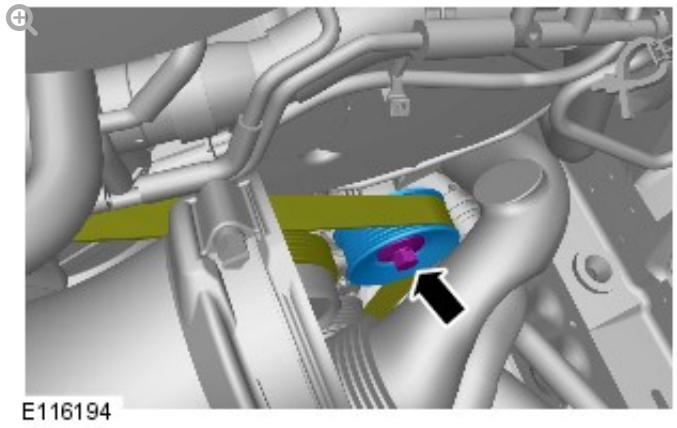


Torque: **8 Nm**

6.



Torque: **47 Nm**

INSTALLATION

1.

- Make sure that the accessory drive belt is correctly located on each pulley.
- Clean and inspect the accessory drive belt pulleys for damage.

To install, reverse the removal procedure.

ACCESSORY DRIVE BELT TENSIONER [G1269307]

REMOVAL

Removal steps in this procedure may contain installation details.

1.

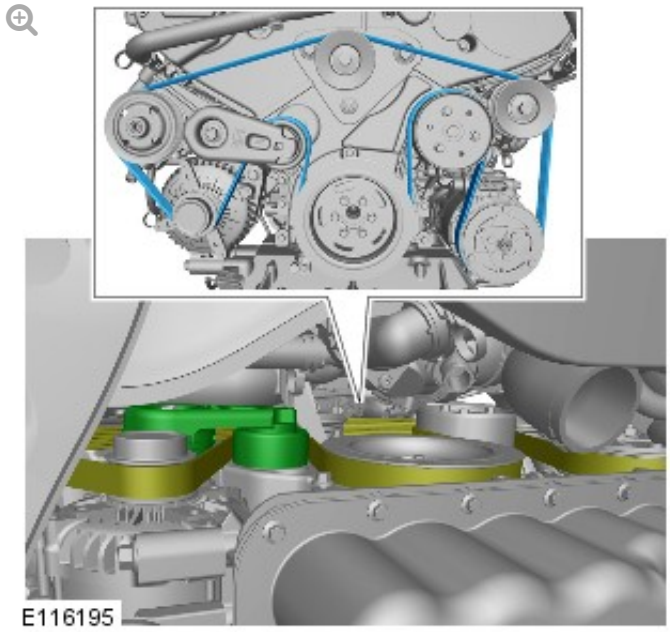
Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Refer to: Turbocharger Bypass Valve (303-04B Fuel Charging and Controls - Turbocharger - TDV6 3.0L Diesel, Removal and Installation).

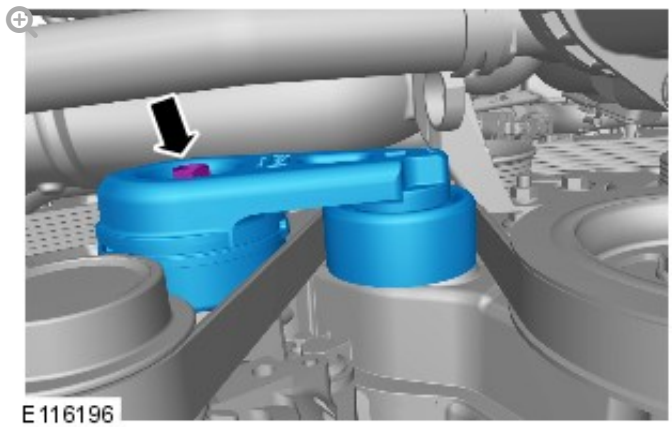
3.

- Note the fitted position of the accessory drive belt.
- Engine shown removed for clarity.



4.

Clean and inspect the accessory drive belt pulleys for damage.



Torque: **47 Nm**

INSTALLATION

1.

> Make sure that the accessory drive belt is correctly located on each pulley.

To install, reverse the removal procedure.

ACCESSORY DRIVE - TDV6 3.0L DIESEL

FUEL INJECTION PUMP PULLEY [G1269308]

SPECIAL TOOL(S)

310-138A

Holding Tool, Fuel Pump Pulley

310-139A

Holding Tool, Fuel Pump Pulley

REMOVAL

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).

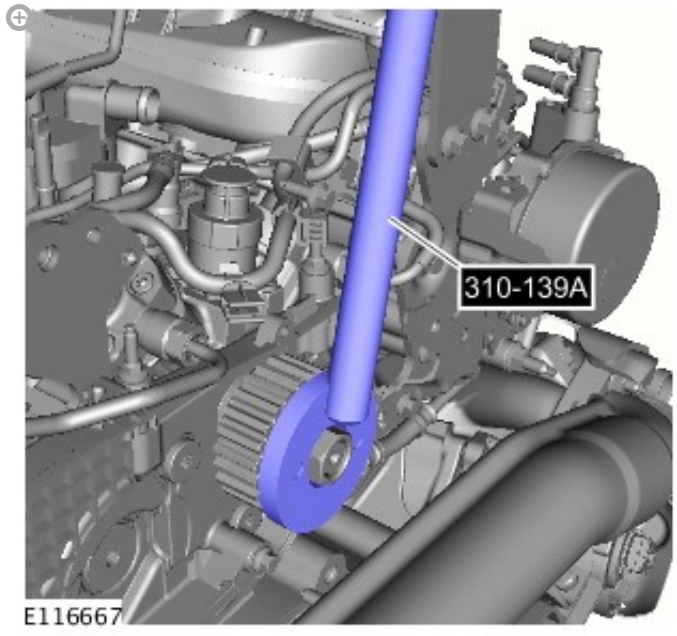
2.

   Make sure to support the vehicle with axle stands.

   Raise and support the vehicle.

3. Refer to: Rear End Accessory Drive (303-05A Accessory Drive - TDV6 3.0L Diesel, Removal and Installation).

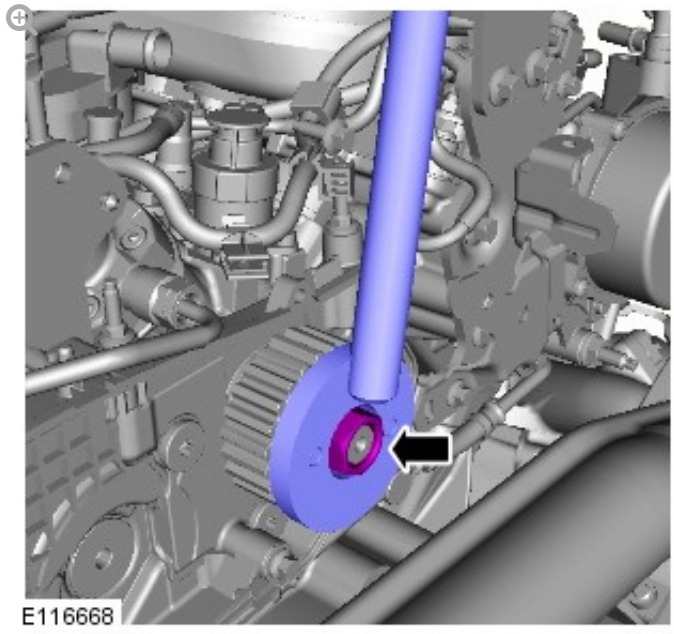
4.



Install the special tool.

Special Tool(s): 310-139A

5.



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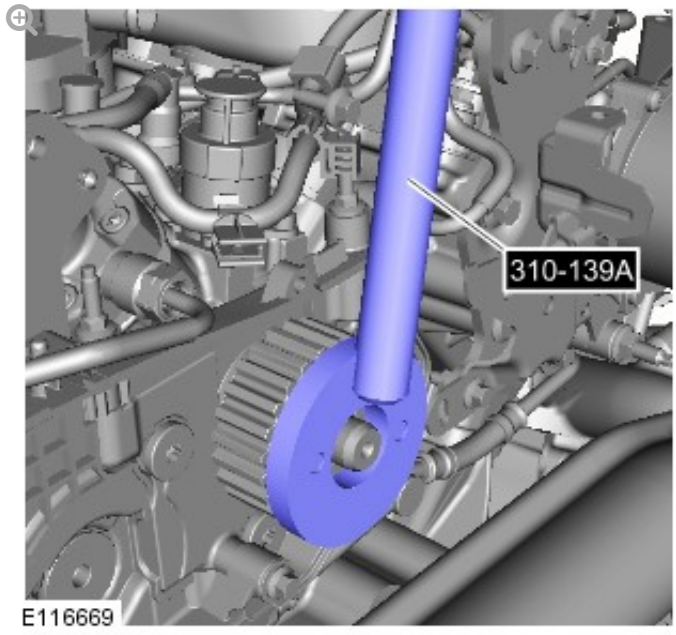
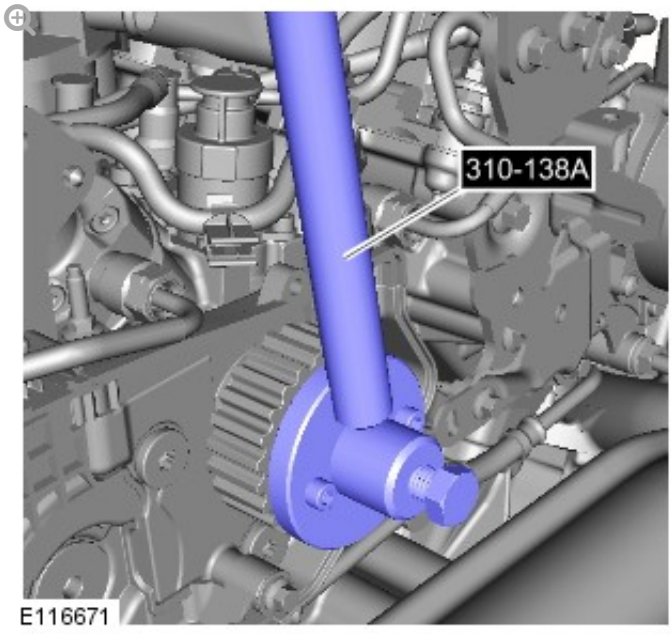


Remove the special tool.

Special Tool(s): 310-139A

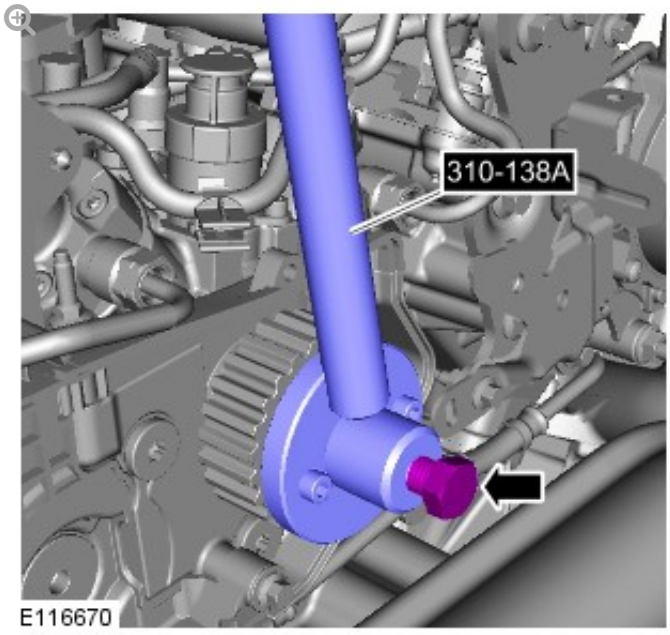
7.



Install the special tool.

Special Tool(s): 310-138A

8.



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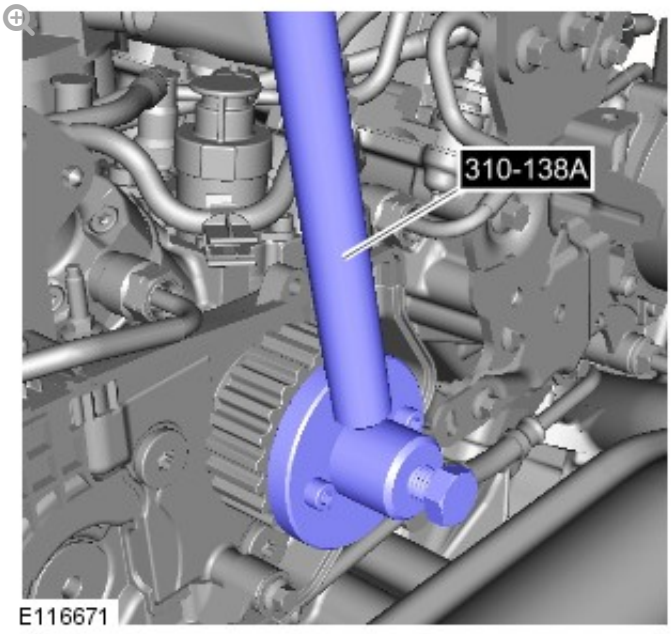
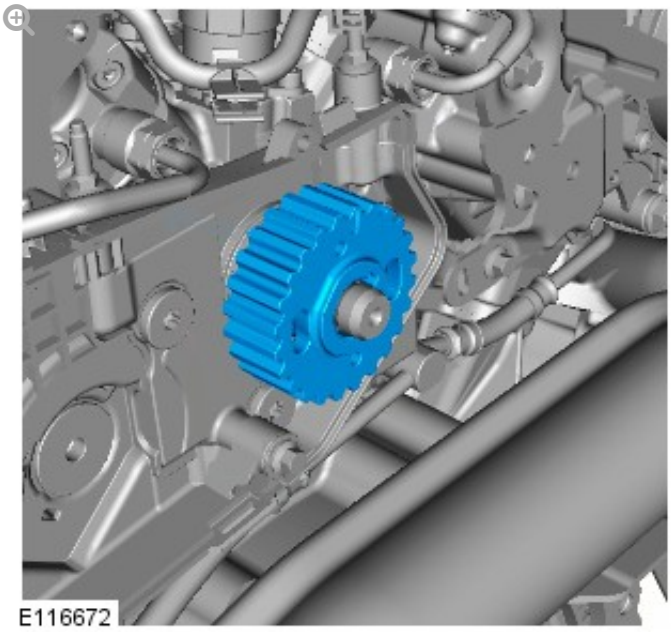


Remove the special tool.

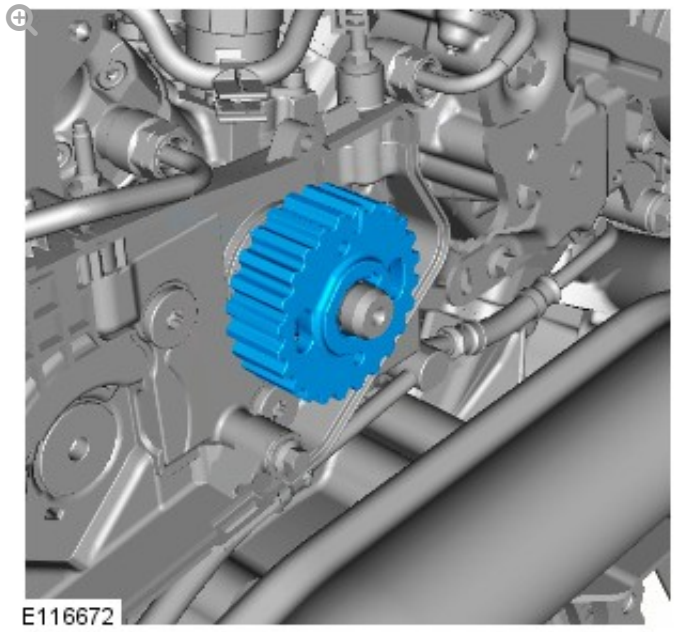
Special Tool(s): 310-138A

10.



INSTALLATION

1.



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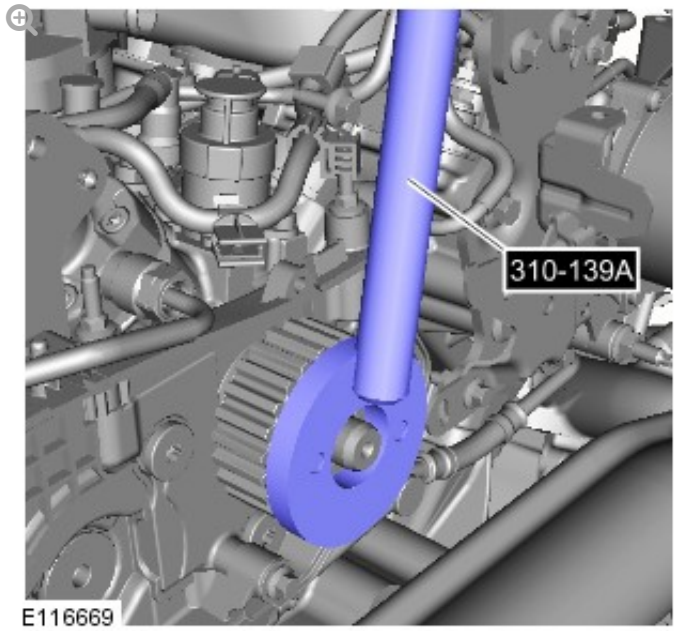
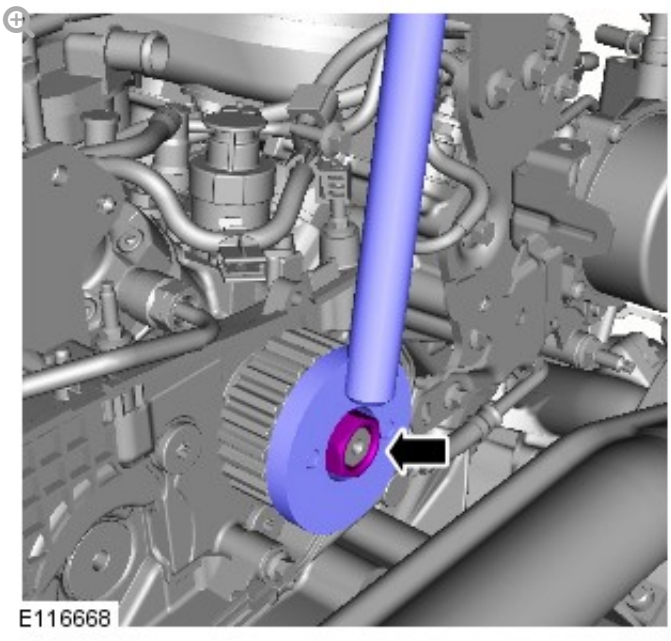


Install the special tool.

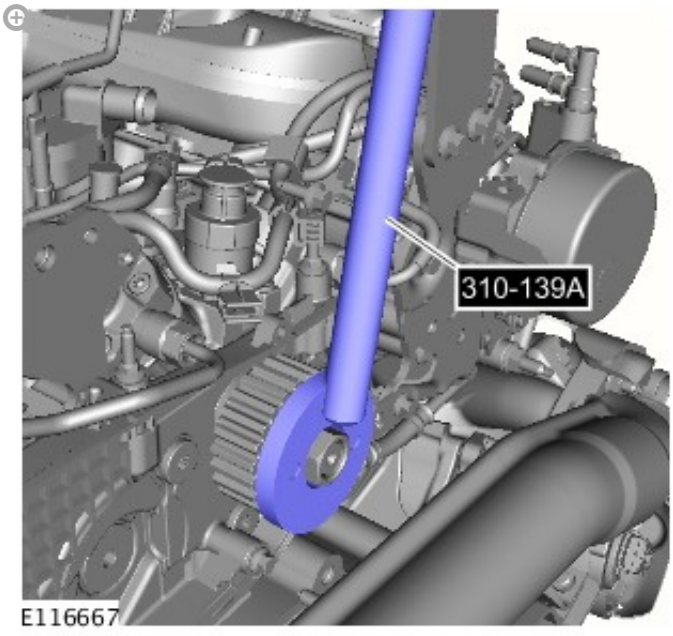
Special Tool(s): 310-139A

3.



Torque: **50 Nm**

4.



Remove the special tool.

Special Tool(s): 310-139A

5. Refer to: Rear End Accessory Drive (303-05A Accessory Drive - TDV6 3.0L Diesel, Removal and Installation).

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

REAR END ACCESSORY DRIVE [G1269309]

SPECIAL TOOL(S)

E54540

303-1117

Timing Peg, Automatic Transmission

310-212

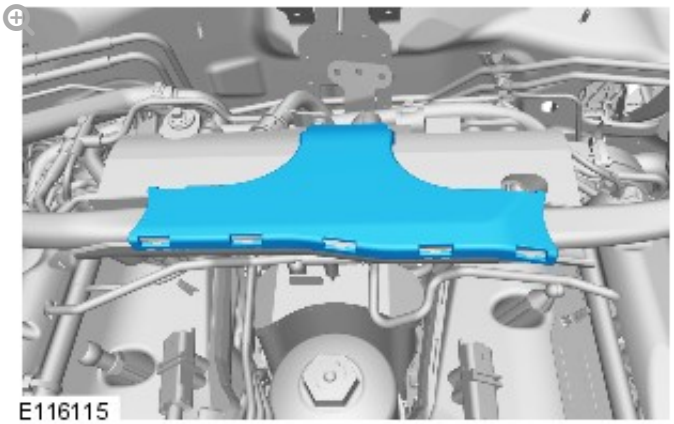
Rear End Accessory Drive (READ) belt Timing Tool

REMOVAL

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. Refer to: Secondary Bulkhead Left Panel (501-02 Front End Body Panels, Removal and Installation).
3. Refer to: Starter Motor (303-06A Starting System - TDV6 3.0L Diesel, Removal and Installation).

4.



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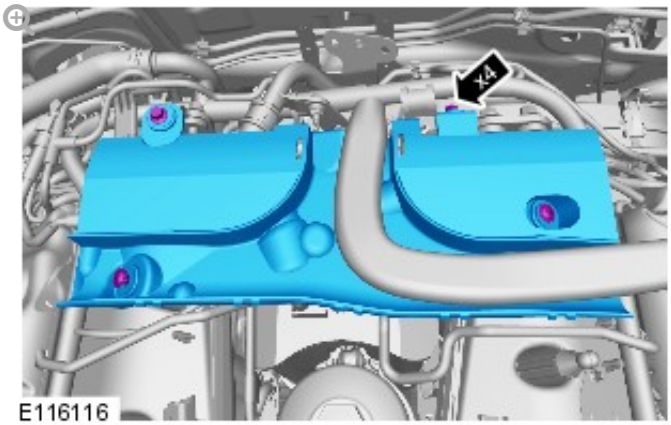

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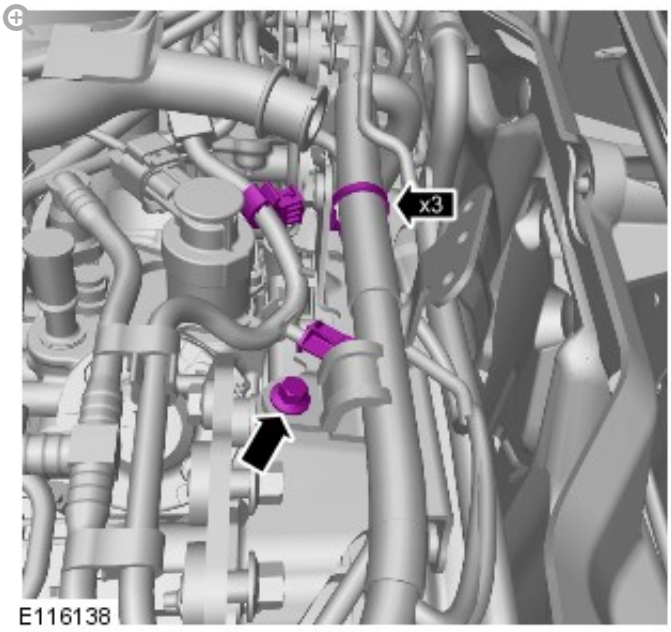

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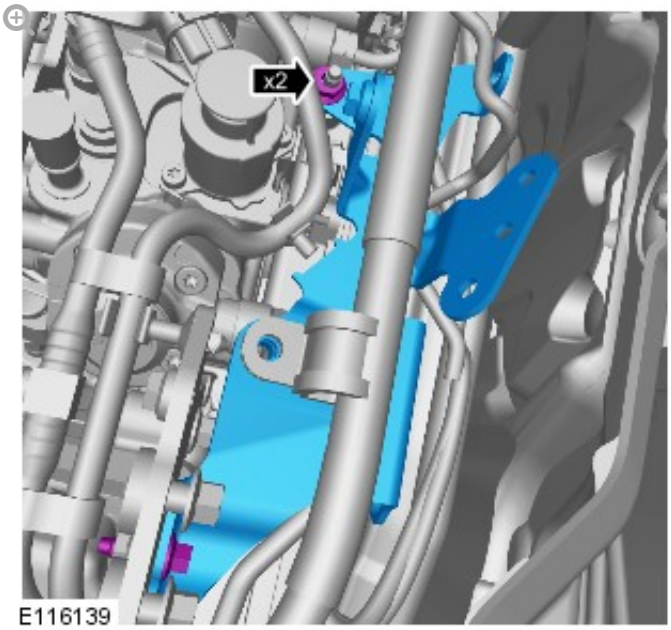

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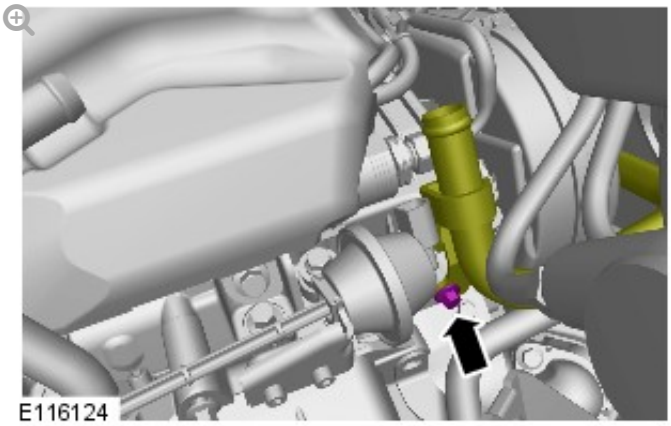

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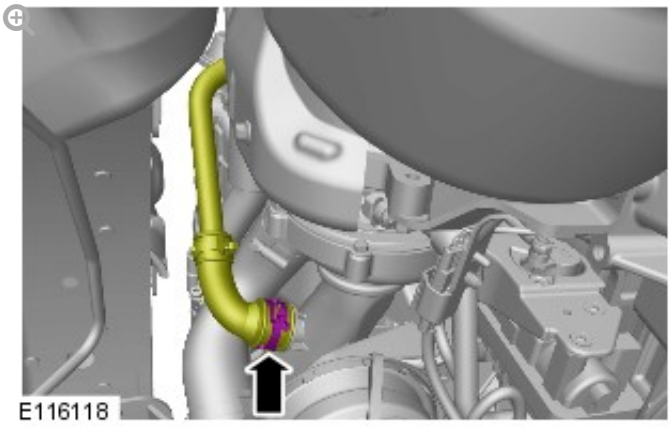

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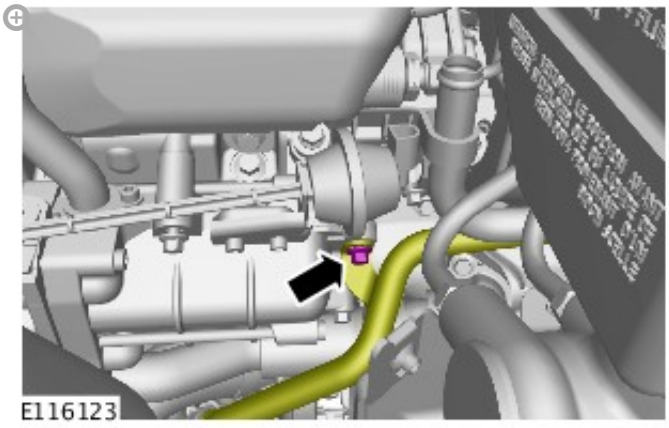

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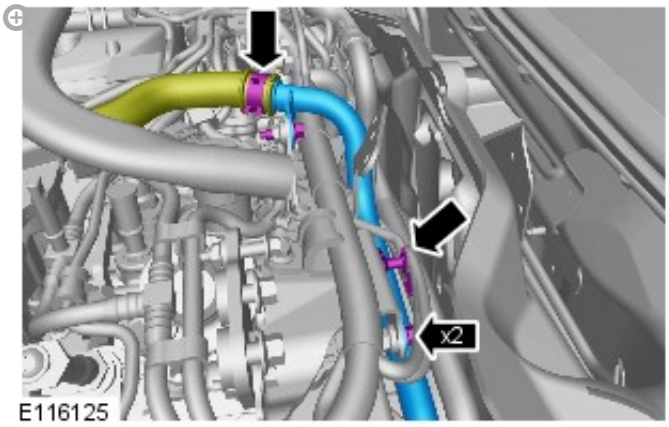

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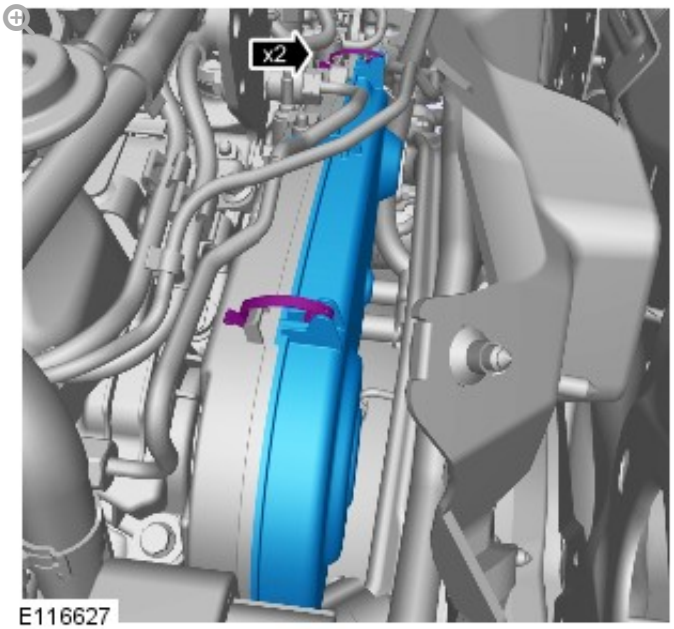
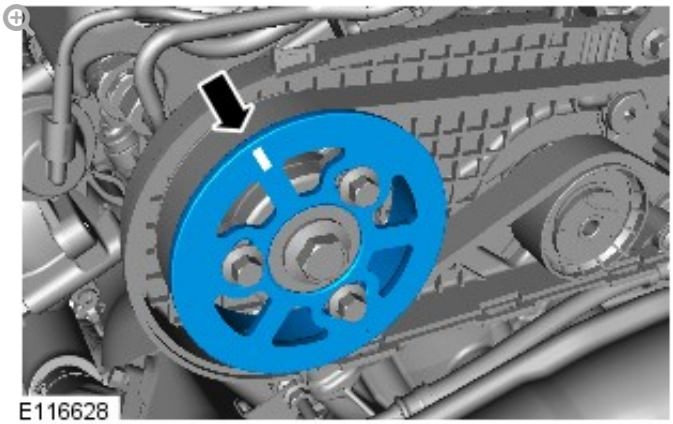


13.

Only rotate the crankshaft clockwise.

- This step requires the aid of another technician.
- Engine shown removed for clarity.



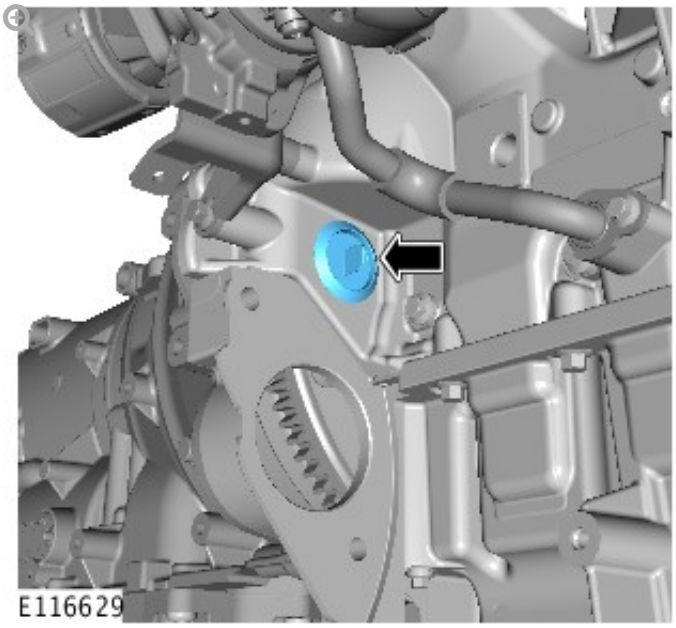
Rotate the crankshaft until the mark on the rear camshaft pulley is in the illustrated position.

14.

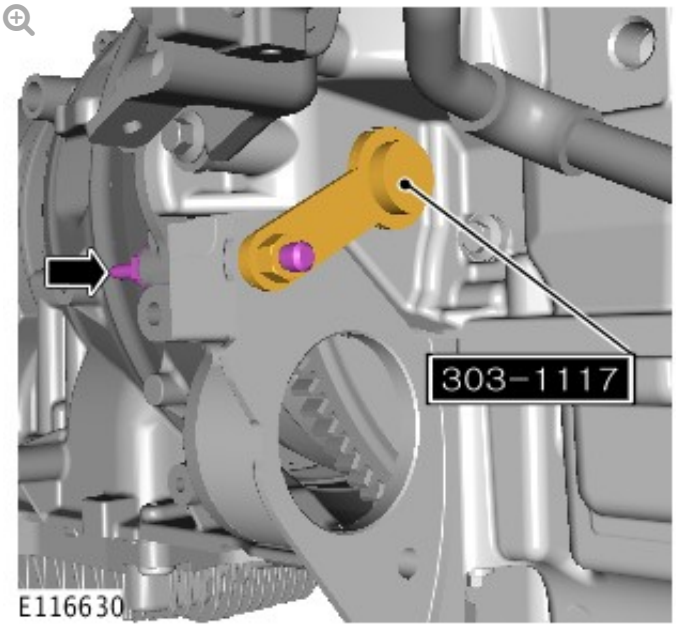
Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

15.



16.

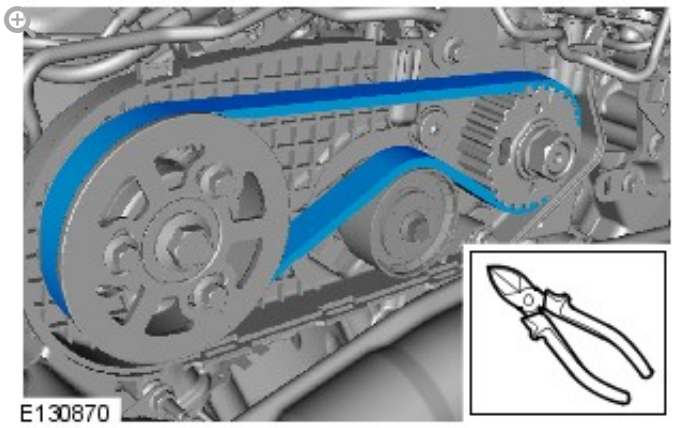


- *Special Tool(s):* 303-1117

17. Lower the vehicle.

18.

Discard the component.



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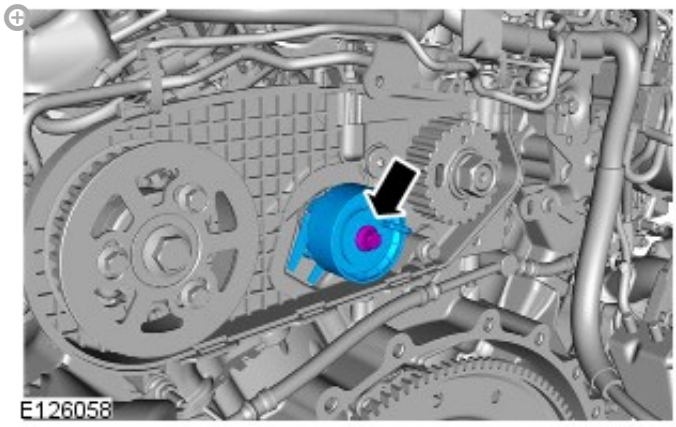
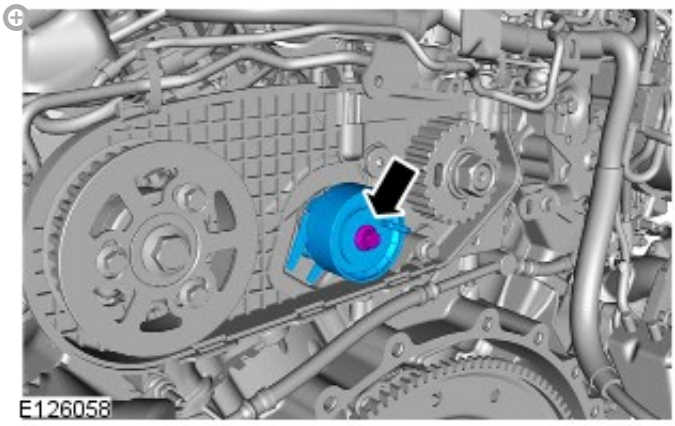


INSTALLATION

1.

Make sure that the READ belt tensioner tang is correctly located to the READ belt rear cover. Failure to follow this instruction may result in damage to the engine.

Make sure that the rear end accessory drive (READ) belt tensioner locking pin is not removed until the READ belt tensioner is fully installed.

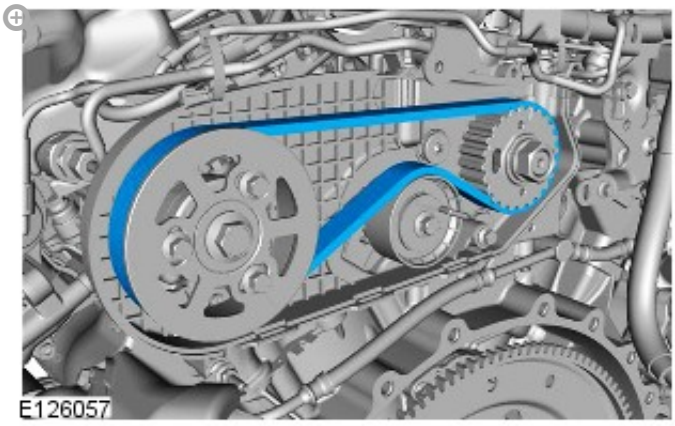


- *Torque:* **23 Nm**

2.

> Do not install the new READ belt to the pulleys with the READ belt tensioner installed. Failure to follow this instruction may result in damage to the READ belt.

> - The READ rotates in a counter-clockwise direction when viewed from the rear of the engine.
> - Make sure the new READ belt is correctly seated onto the camshaft and fuel pump pulleys.



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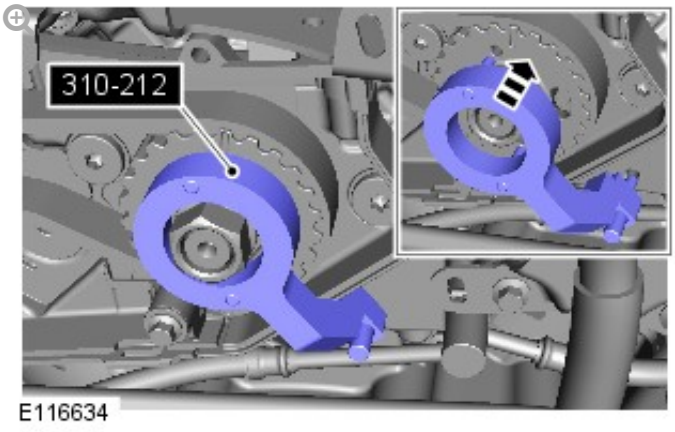
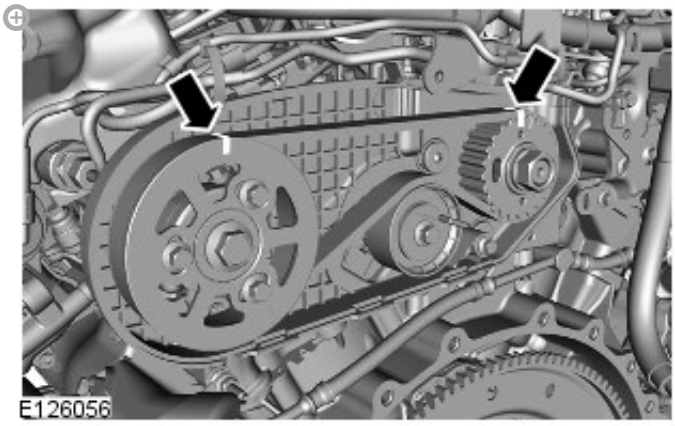


Install the special tool.

Special Tool(s): 310-212

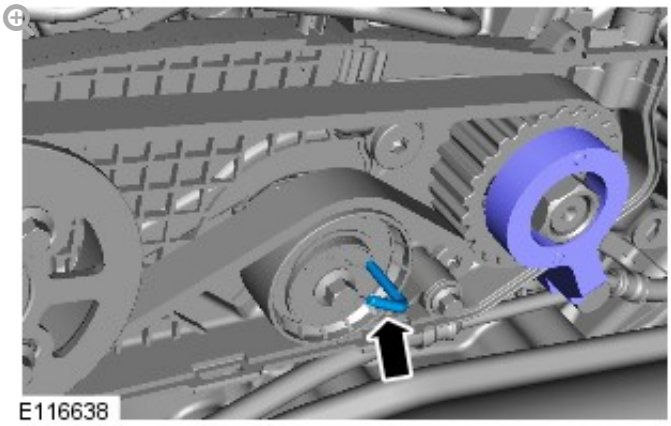
4.

Make sure that the READ belt tensioner locking pin is not removed until the READ belt tensioner is fully installed.

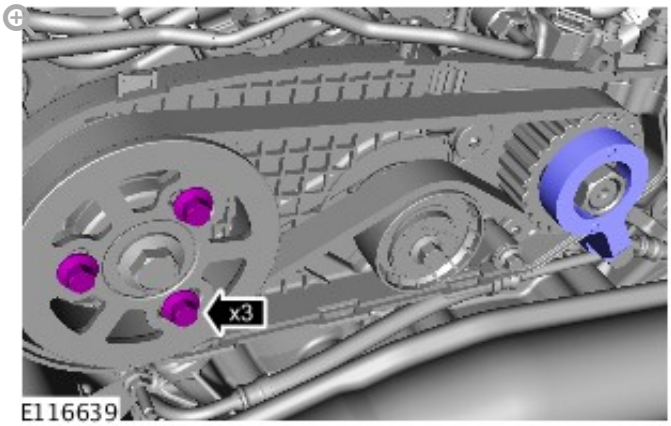


Make sure that the READ belt is aligned with the marks on the rear camshaft pulley and READ pulley as illustrated.

5.

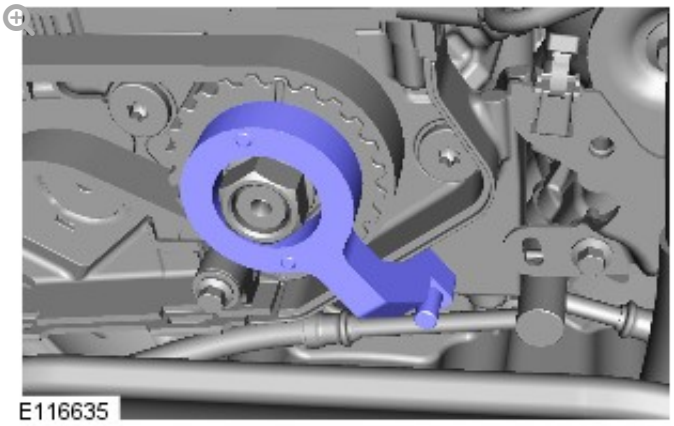


6.



Torque: **23 Nm**

7.



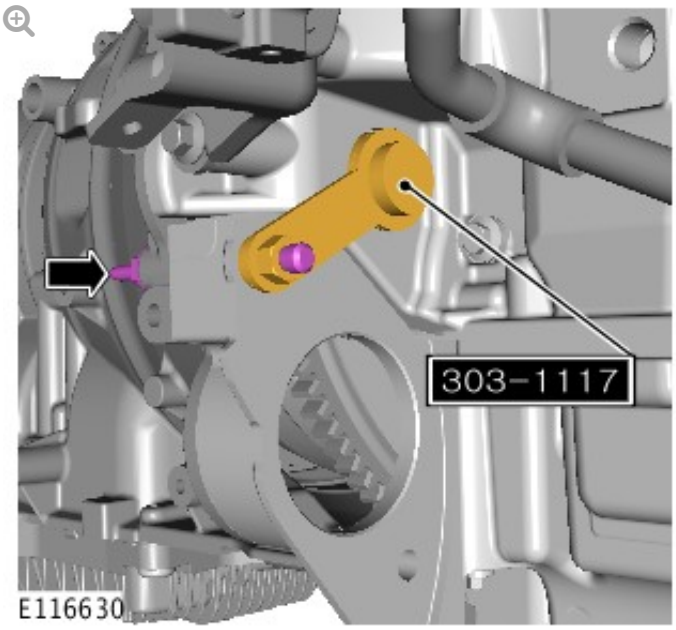
- Remove the special tool.

8.

Make sure to support the vehicle with axle stands.

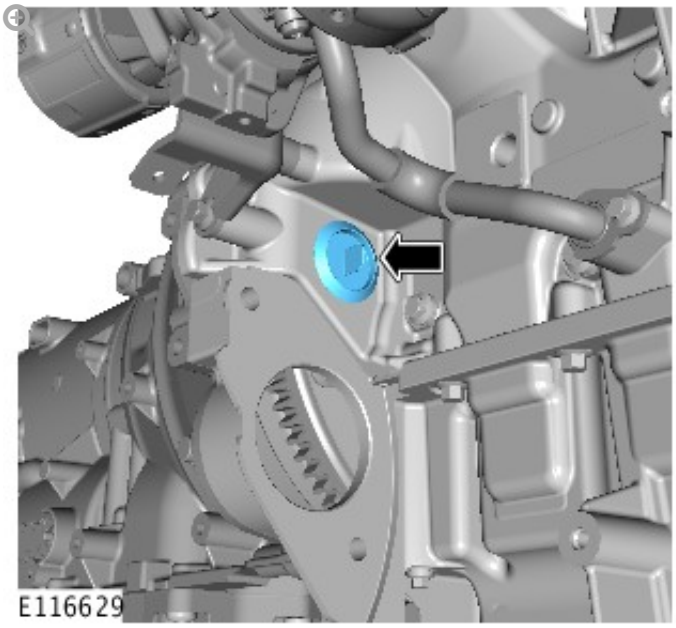
Raise and support the vehicle.

9.



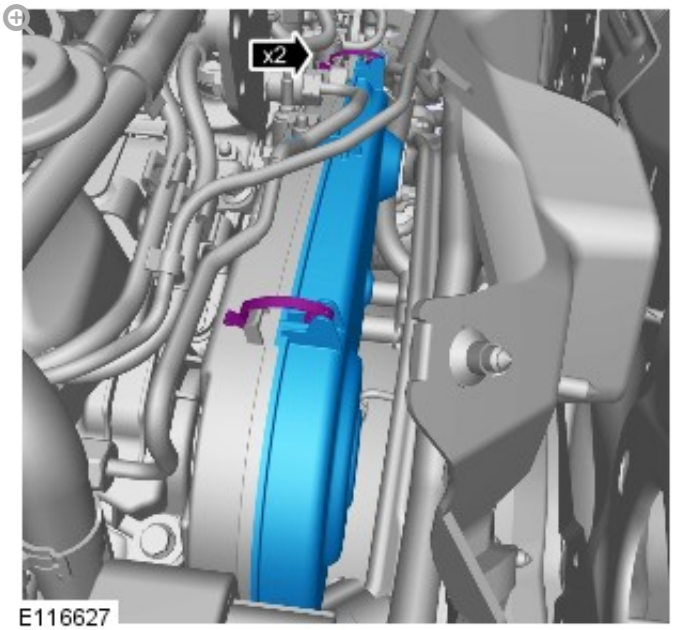
- Remove the special tool.
- *Special Tool(s):* 303-1117

10.

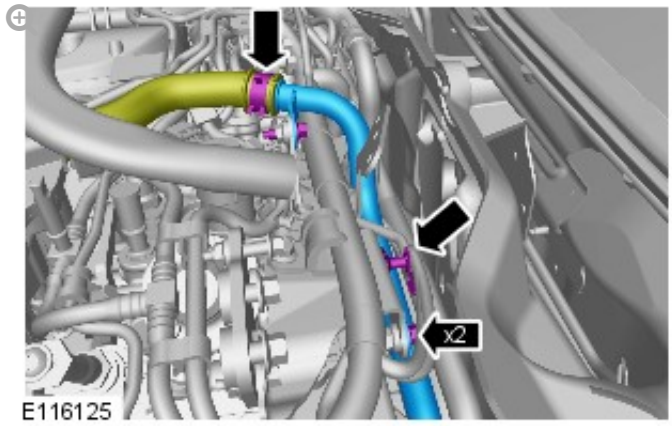


11. Lower the vehicle.

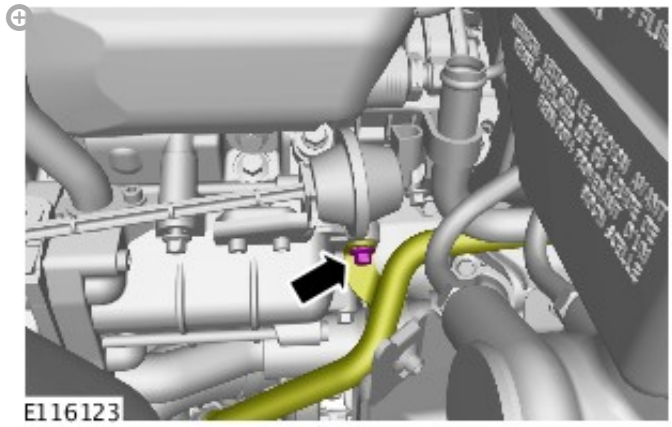
12.



13.

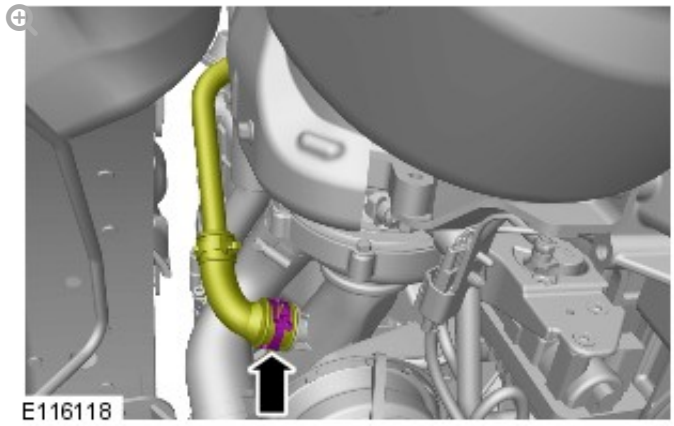


14.

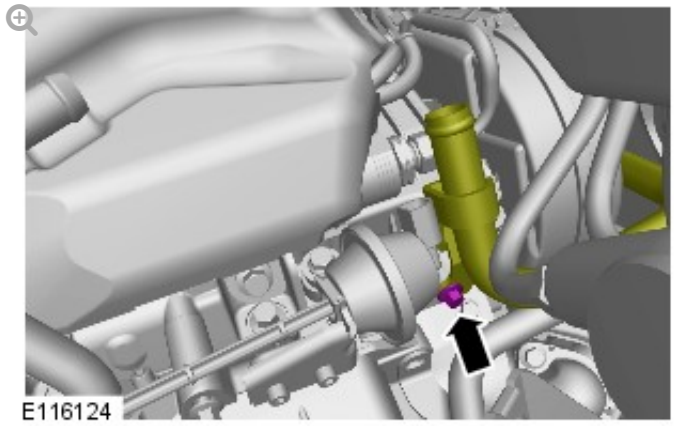


Torque: **10 Nm**

15.

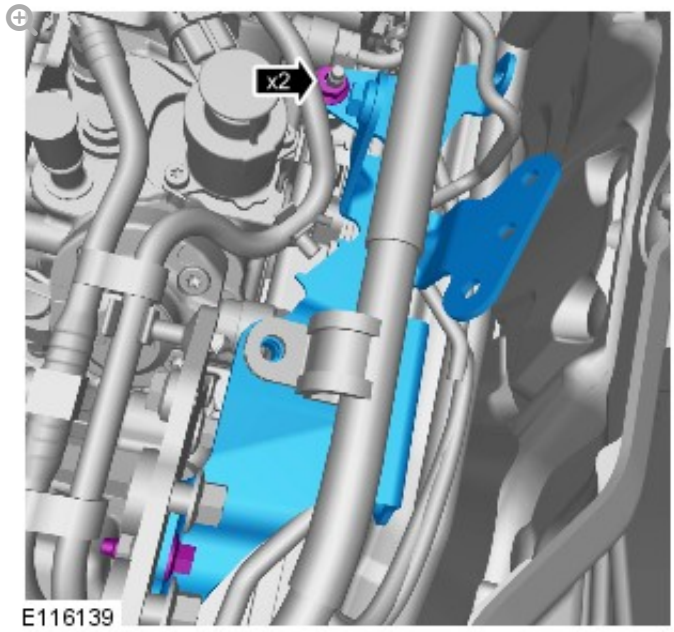


16.



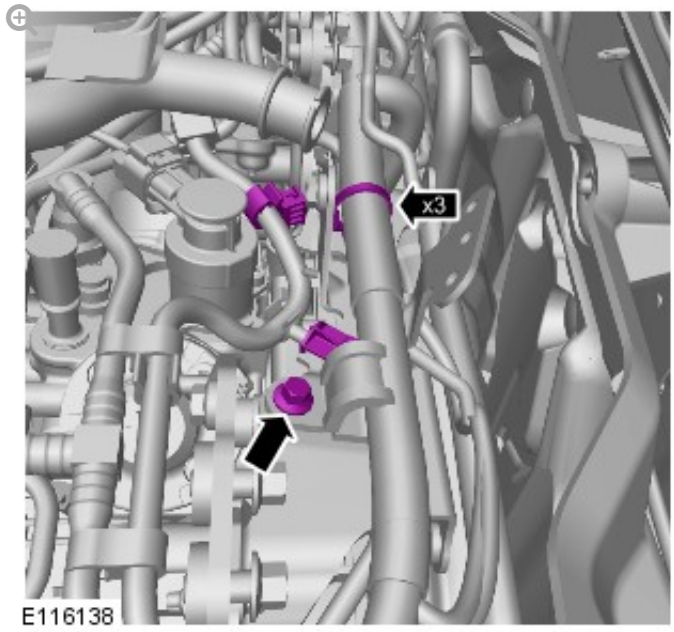
Torque: **10 Nm**

17.



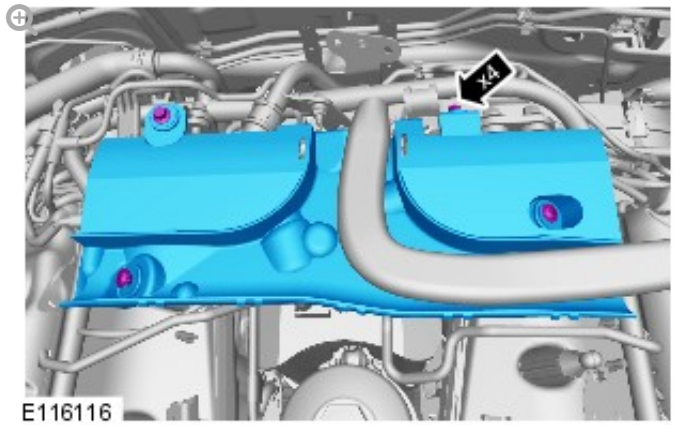
Torque: **10 Nm**

18.



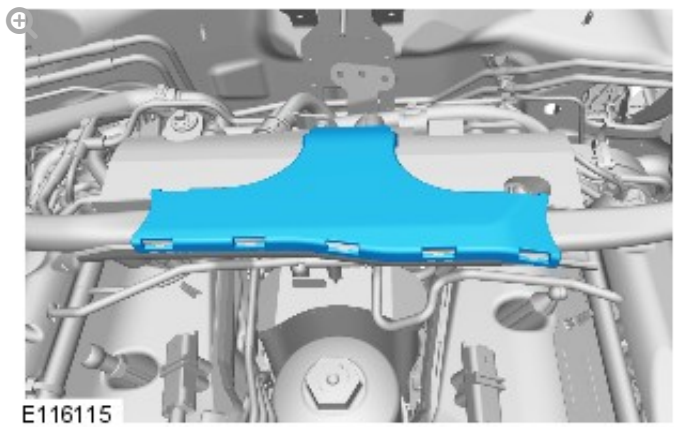
Torque: **5 Nm**

19.



Torque: **10 Nm**

20.



21. Refer to: Starter Motor (303-06A Starting System - TDV6 3.0L Diesel, Removal and Installation).

22. Refer to: Secondary Bulkhead Left Panel (501-02 Front End Body Panels, Removal and Installation).

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

ELECTRONIC ENGINE CONTROLS - TDV6 3.0L DIESEL

CAMSHAFT POSITION SENSOR [G1269235]

REMOVAL

Removal steps in this procedure may contain installation details.

1. Disconnect the battery ground cable.
   Refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

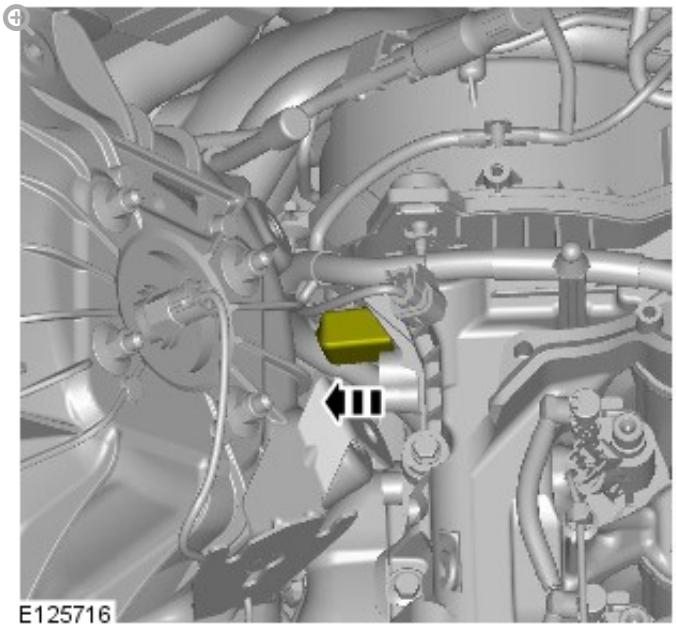
2. Refer to: Left Exhaust Gas Recirculation Valve (303-08A Engine Emission Control - TDV6 3.0L Diesel, Removal and Installation).

3.

Make sure to support the vehicle with axle stands.

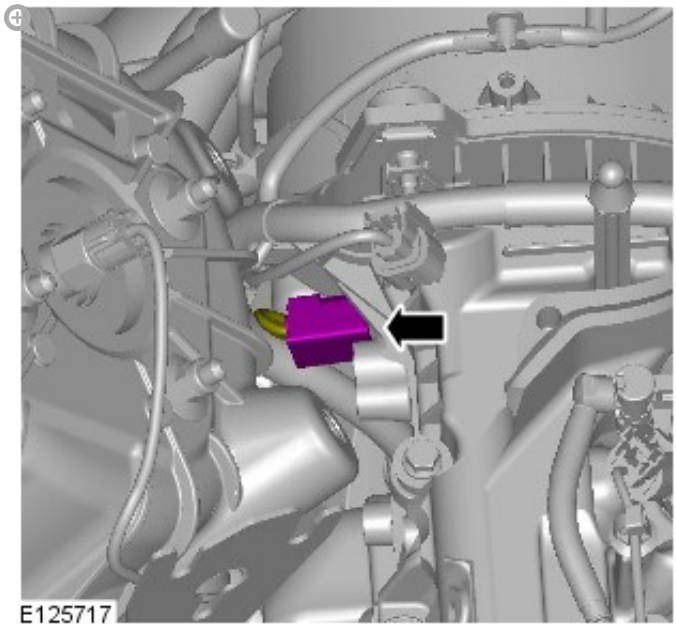
Raise and support the vehicle.

4.



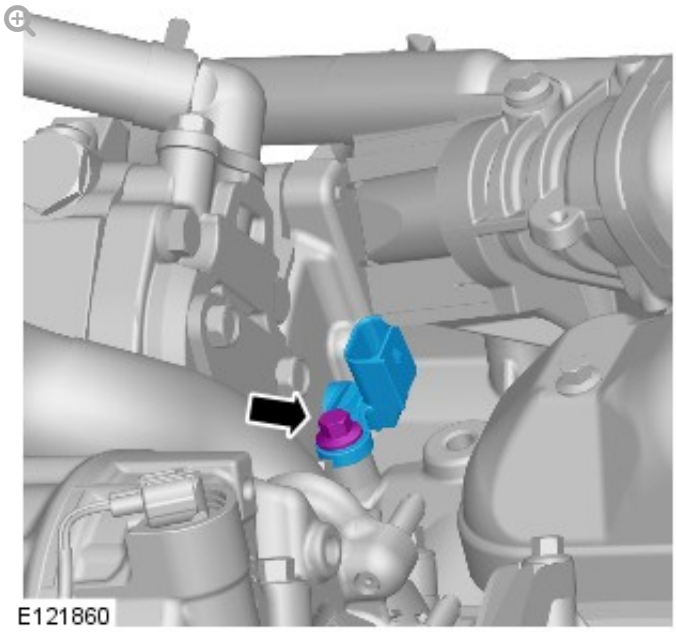
5.

Before the disconnection or removal of any components, make sure the area around joint faces and connections are clean. Plug any open connections to prevent contamination.



6.

- Engine shown removed for clarity.
- Some variation in the illustrations may occur, but the essential information is always correct.

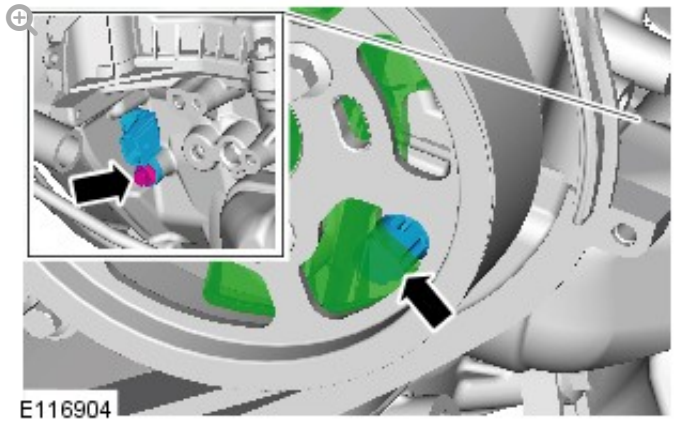


INSTALLATION

1.

- Make sure that the mating faces are clean and free of foreign material.
- The CMP sensor tip must rest on one of the three webs on the back of the camshaft pulley. Incorrect installation may result in the CMP sensor being damaged.

- Only turn the engine in the normal direction of rotation.
- Timing belt left hand cover shown removed for clarity.



Turn the engine until one of the three webs on the back of the camshaft pulley is visible through the CMP sensor housing.
Torque: **10 Nm**

2. To install, reverse the removal procedure.

ELECTRONIC ENGINE CONTROLS - TDV6 3.0L DIESEL

ELECTRONIC ENGINE CONTROLS - COMPONENT LOCATION [G1245434]