

2016.0 RANGE ROVER (LG), 303-01

ENGINE - TDV6 3.0L DIESEL - GEN 2/TDV6 3.0L DIESEL

ENGINE (G2059648)

ASSEMBLY

ASSEMBLY

SPECIAL TOOL(S)

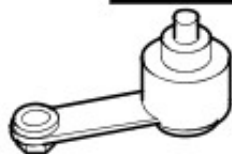


303-021

Engine support
bracket



303-1117



E54540

303-1117

Timing Peg,
Automatic
Transmission



E52717

303-1121

Installer,
Crankshaft Seal



303-1122



E54545

303-1122

Installer, Crankshaft
Front Seal



303-1123



E 54546

303-1123

Locking Tool,
Flywheel



303-1124

Holding Tool,
Camshaft Front
Pulley



303-1126

Timing Peg,
Camshaft Pulley



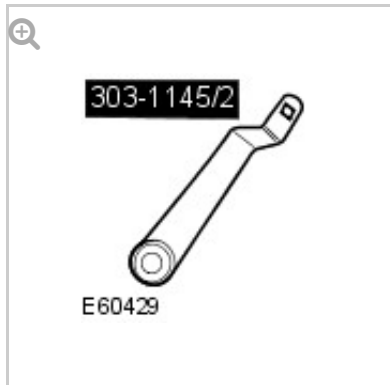
303-1130

Installer -
Crankshaft Position
(CKP) Sensor Ring



303- 1141

Engine lifting
kit



303- 1145/2

Remover, Camshaft
Rear Pulley Bolt



JLR-303- 1523

Remover/Installer,
Camshaft Rear
Pulley

PART(S)

STEP	REPLACE PART / RENEW PART	PART NAME
Step 2	Renew Part	Oil pan gasket
Step 4	Renew Part	Oil pump gasket
Step 7	Renew Part	Crankshaft front oil seal
Step 10	Renew Part	Crankshaft front oil seal
Step 16	Renew Part	Crankshaft pulley bolt
Step 18	Renew Part	Rear crankshaft seal
Step 32	Renew Part	Engine coolant pump gasket
Step 36	Renew Part	Crankshaft pulley friction washer
Step 37	Renew Part	Crankshaft pulley bolt

Step 45	Renew Part	Oil cooler O-ring seals
Step 49	Renew Part	Cylinder head gasket
Step 49	Renew Part	Cylinder head bolts
Step 60	Renew Part	Camshaft seal
Step 89	Renew Part	Camshaft cover gasket
Step 95	Renew Part	Camshaft cover gasket
Step 102	Renew Part	Timing belt and tensioner kit
Step 119	Renew Part	Fuel injector O-ring seals
Step 119	Renew Part	Fuel injector washers
Step 122	Renew Part	Brake vacuum pump seal
Step 126	Renew Part	Fuel injector high pressure pipes
Step 129	Renew Part	Fuel rail balance pipe
Step 130	Renew Part	Fuel injector high pressure pipes
Step 146	Renew Part	Turbocharger oil supply tube to engine O-rings
Step 147	Renew Part	Exhaust manifold gasket
Step 147	Renew Part	Exhaust manifold to cylinder head nuts
Step 148	Renew Part	Turbocharger oil feed pipe banjo bolt washers
Step 148	Renew Part	Turbocharger oil feed pipe banjo bolt
Step 149	Renew Part	Turbocharger oil return pipe gasket
Step 153	Renew Part	Exhaust manifold gasket
Step	Renew Part	Exhaust manifold to cylinder head nuts

153		
Step 154	Renew Part	Turbocharger to exhaust manifold gasket
Step 154	Renew Part	Exhaust manifold to turbocharger nuts
Step 155	Renew Part	Turbocharger oil feed pipe banjo bolt washers
Step 155	Renew Part	Turbocharger oil feed pipe banjo bolt
Step 156	Renew Part	Turbocharger oil return pipe gasket
Step 156	Renew Part	Oil return pipe O-ring seal
Step 159	Renew Part	Exhaust gas recirculation pipe gasket
Step 193	Renew Part	Engine mount to engine mount bracket nut
Step 194	Renew Part	Engine mount to engine mount bracket nut
Step 211	Renew Part	Air conditioning pipe to compressor O-ring seals
Step 214	Renew Part	Steering column lower shaft lower bolt

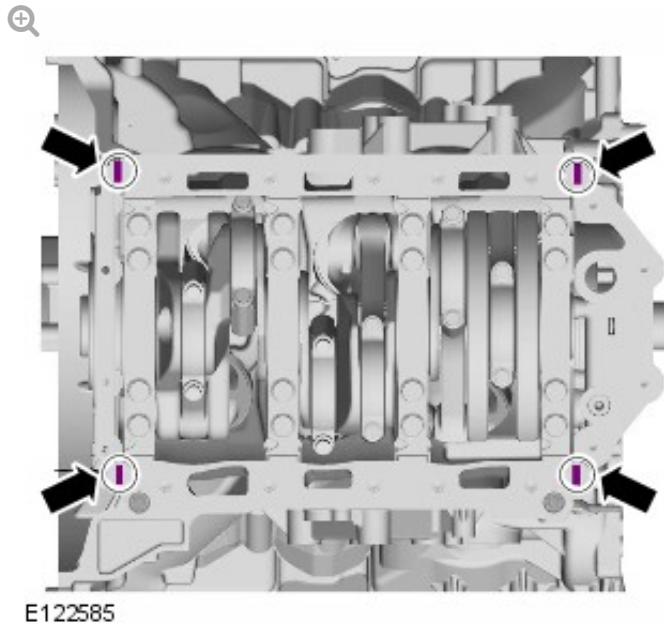
NOTES:

- This procedure contains illustrations showing certain components removed to provide extra clarity.
- Some variation in the illustrations may occur, but the essential information is always correct.

1.

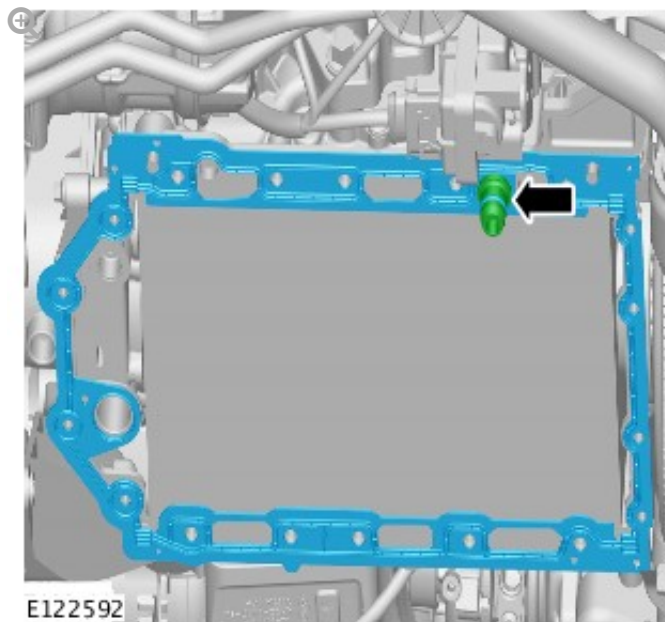
CAUTIONS:

- Installation of the oil pan and tightening must be carried out within 7 minutes of applying the sealant.
- Make sure that the mating faces are clean and free of corrosion and foreign material.



Apply sealant WSE-M4G323-A5 in an 8mm bead to the cylinder block in the area illustrated.

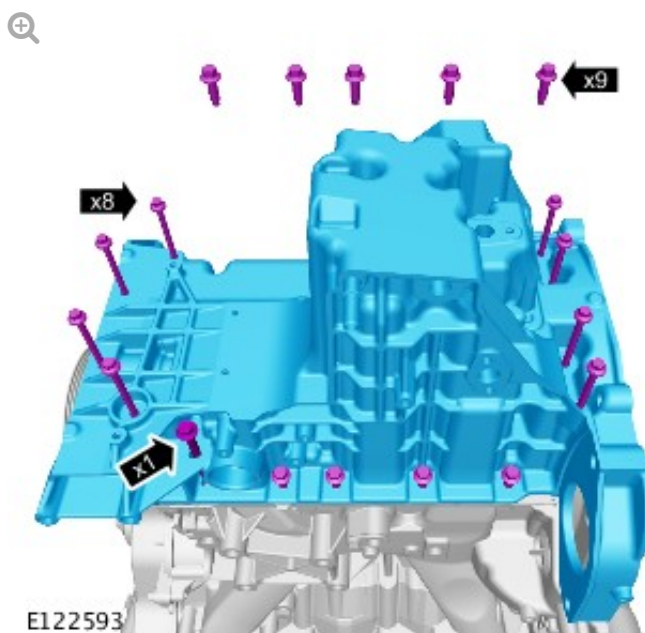
2.



Install a new gasket.

Renew Part: [Oil pan gasket](#).

3.



- Install the oil pan.

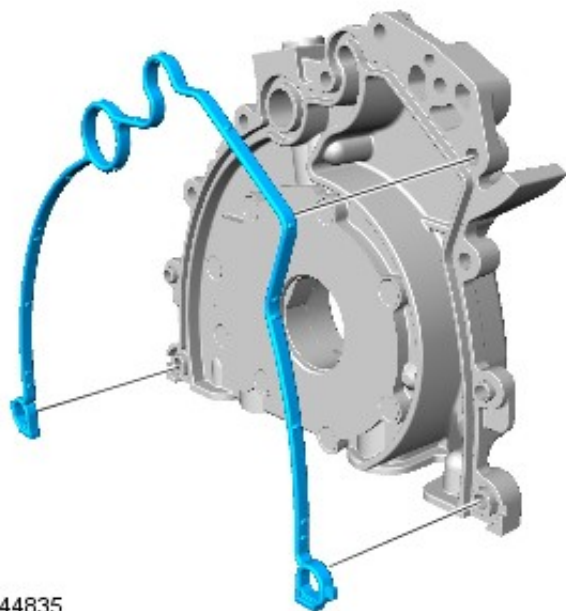
- Torque:

M6 10 Nm

- Torque:

M8 23 Nm

4.

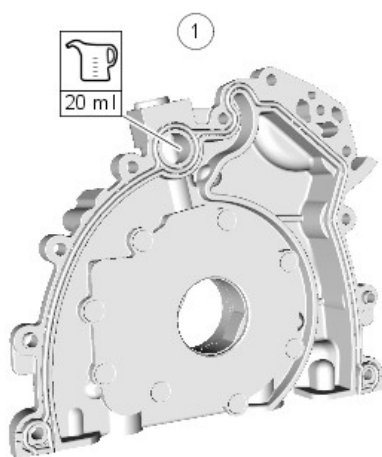


E144835

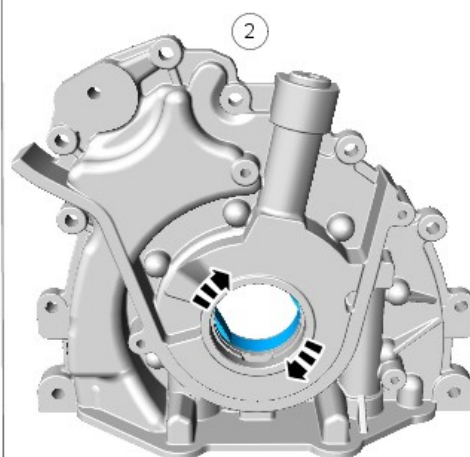
Install a new gasket.

Renew Part: *Oil pump gasket.*

5.



E144763

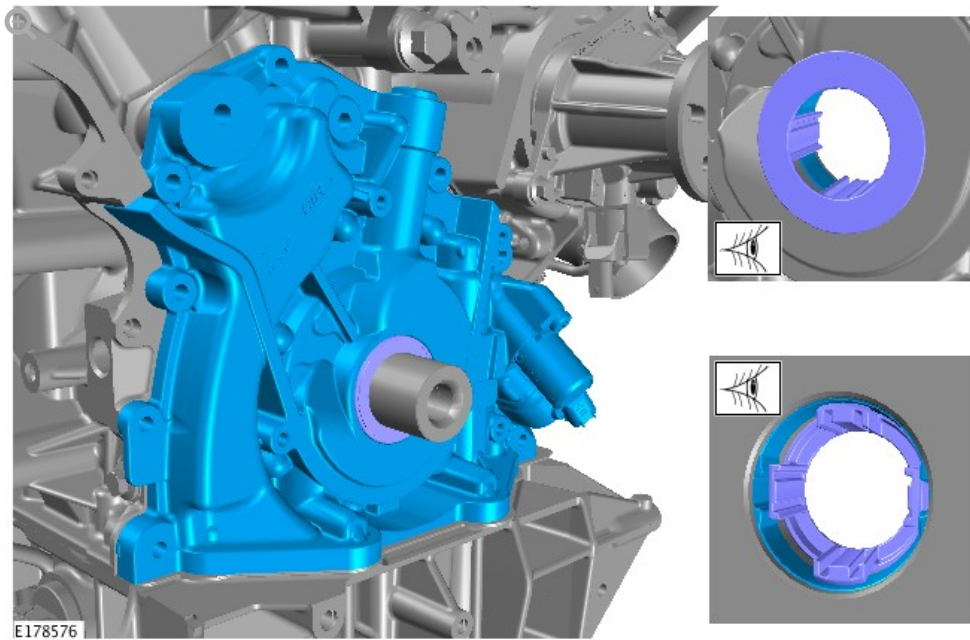


- Prime the oil pump.
- Fill the orifice shown with 20 ml of engine oil.
- Rotate the oil pump drive 2 complete turns.

6.

CAUTIONS:

- Make sure that the mating faces are clean and free of foreign material.
- Make sure the gasket is installed correctly.

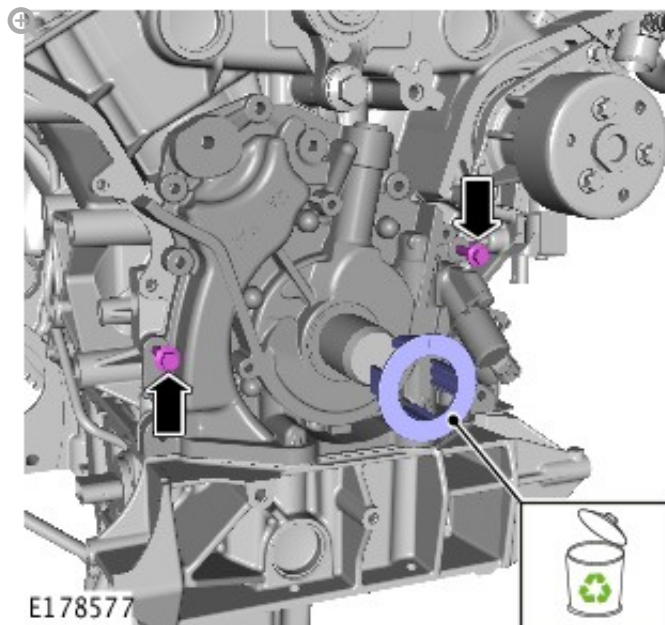


Install the oil pump.

7.

CAUTIONS:

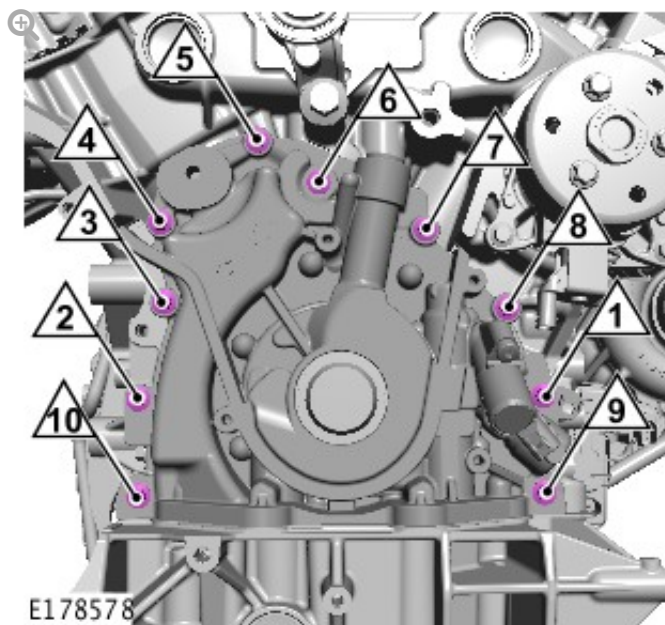
- Make sure that the mating faces are clean and free of foreign material.
- Make sure the gasket is installed correctly.



Install but do not fully tighten the 2 bolts.

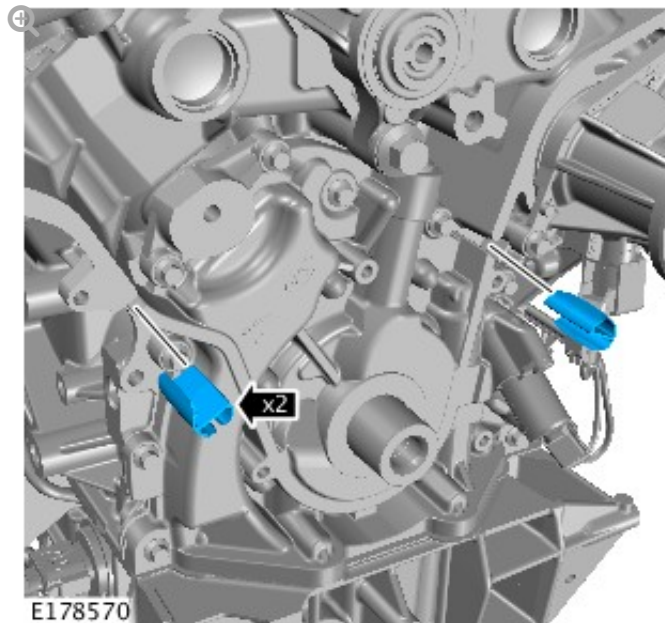
Renew Part: [Crankshaft front oil seal](#).

8.



- Secure the oil pump.
- **Torque: 10 Nm**

9.



Install new oil pump sealing strips.

10.

CAUTION:

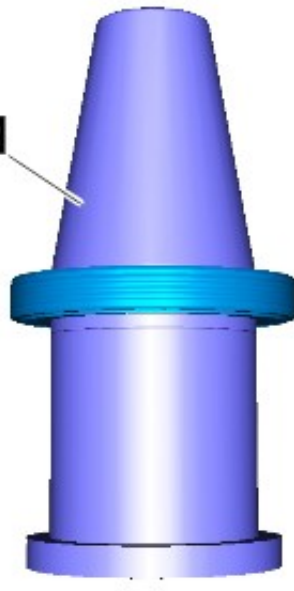
Do not use any lubricant on the crankshaft front seal, special tools or the crankshaft. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Make sure that all the component mating faces are clean.



303-1122



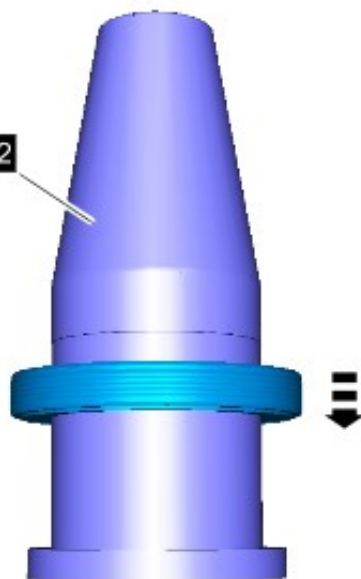
E116752

- Install a new crankshaft front seal to the special tool.
Renew Part: [Crankshaft front oil seal](#).
- *Special Tool(s):* [303-1122](#)

11.



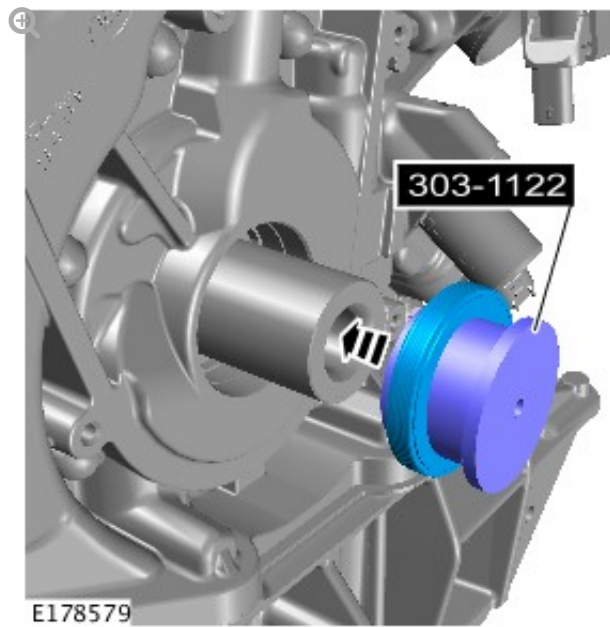
303-1122



E116753

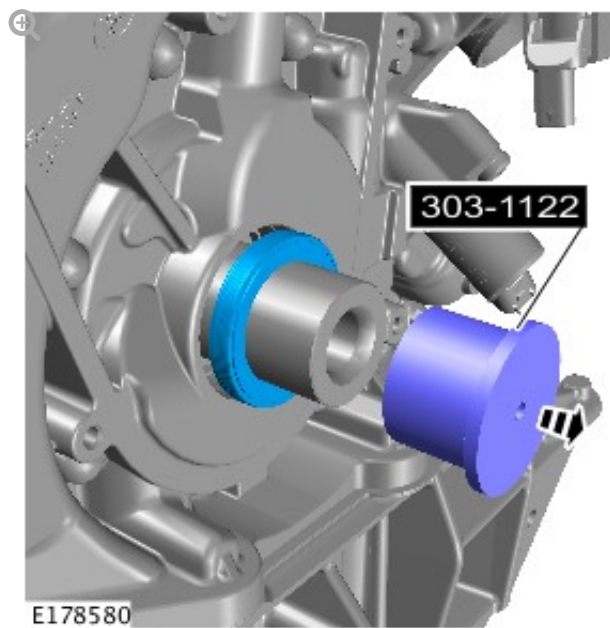
Position the crankshaft front seal along the special tool.

12.



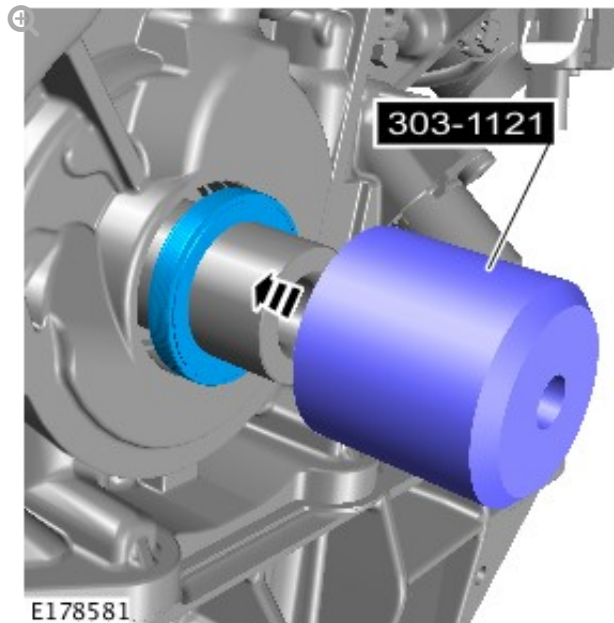
Install the special tool to the crankshaft.

13.



Remove the special tool.

14.

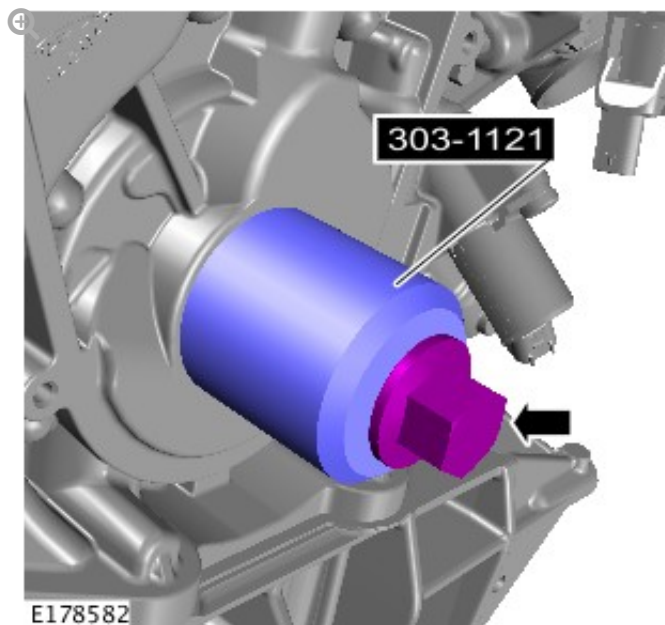


- Install the special tool to the crankshaft.
- *Special Tool(s):* 303-1121

15.

NOTE:

Use the crankshaft bolt with the service tool.

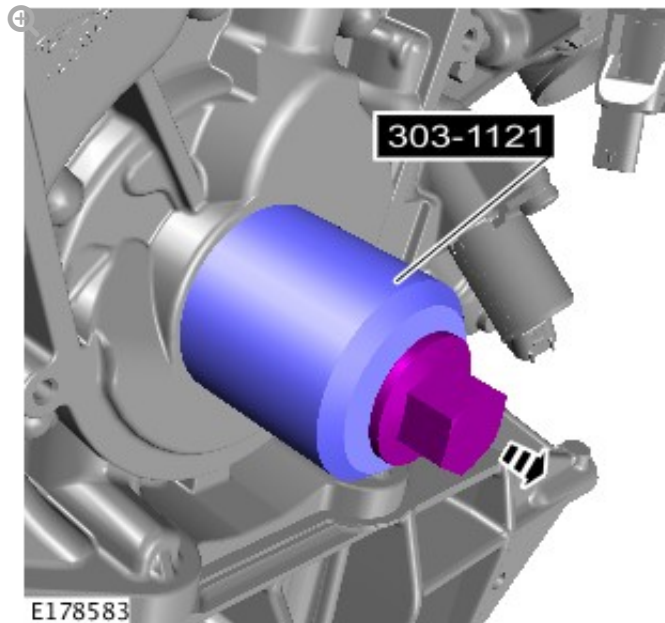


Using the special tool, install the crankshaft front oil seal.

16.

CAUTIONS:

- Make sure the seal is installed correctly.
- Wait 10 seconds before removing the crankshaft seal installation tool.

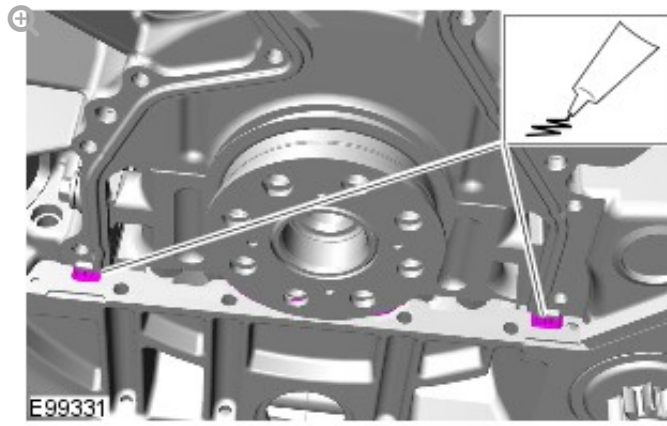


- Remove and discard the crankshaft pulley retaining bolt.
Renew Part: [Crankshaft pulley bolt](#).
- Remove the special tool.

17.

CAUTION:

Make sure the crankshaft seal mating faces are clean and dry.

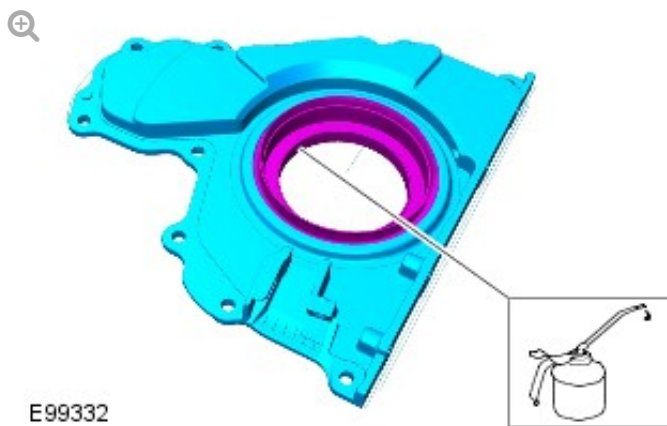


Apply an 8 mm bead of sealant to the cylinder block in the areas shown.

18.

NOTE:

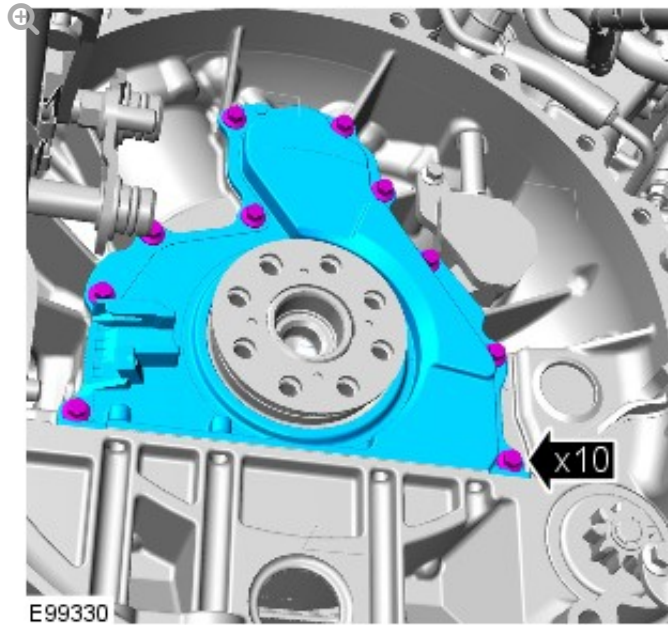
Make sure a new rear crankshaft oil seal is used.



Lubricate the seal with clean engine oil.

Renew Part: [Rear crankshaft seal](#).

19.

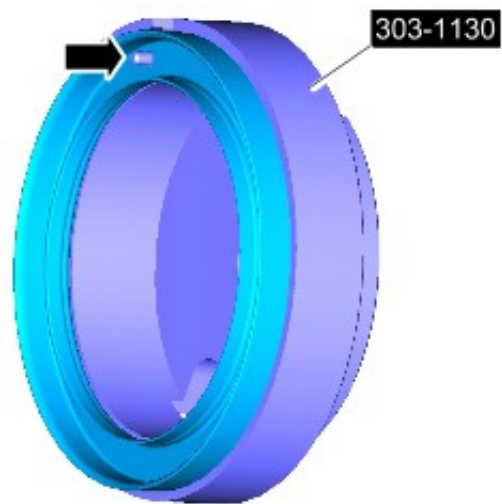


- Tighten the retaining bolts working diagonally.
- *Torque: 10 Nm*

20.

CAUTION:

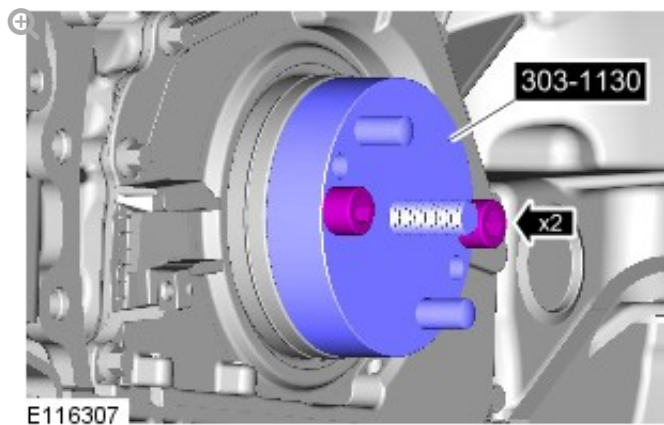
Make sure that the CKP sensor ring is aligned correctly with the special tool pip and that both mating surfaces are fully seated.



E116306

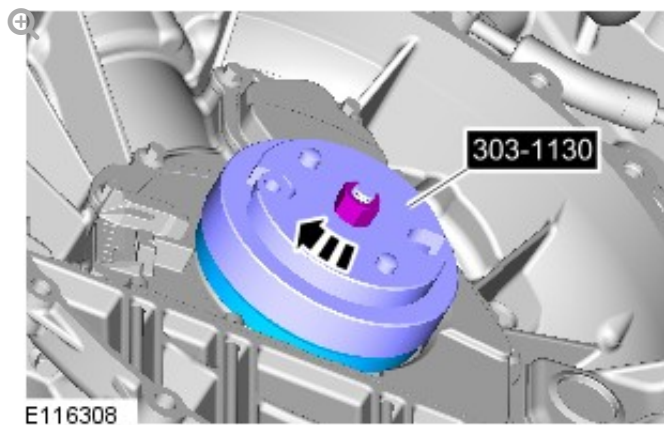
Special Tool(s): 303-1130

21.



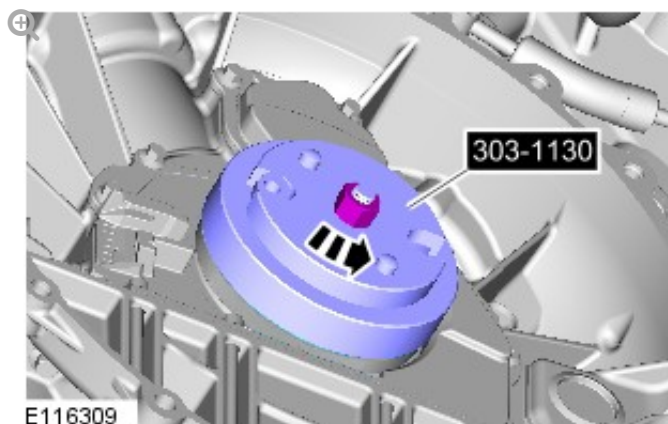
Install the special tool.

22.



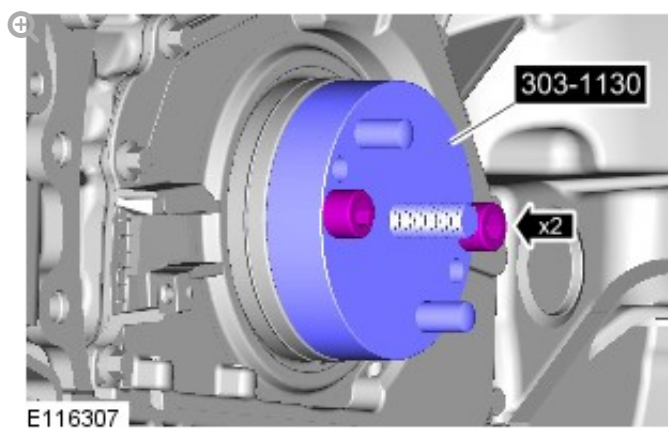
Fully install the CKP sensor ring using the special tool.

23.



Remove the nut.

24.

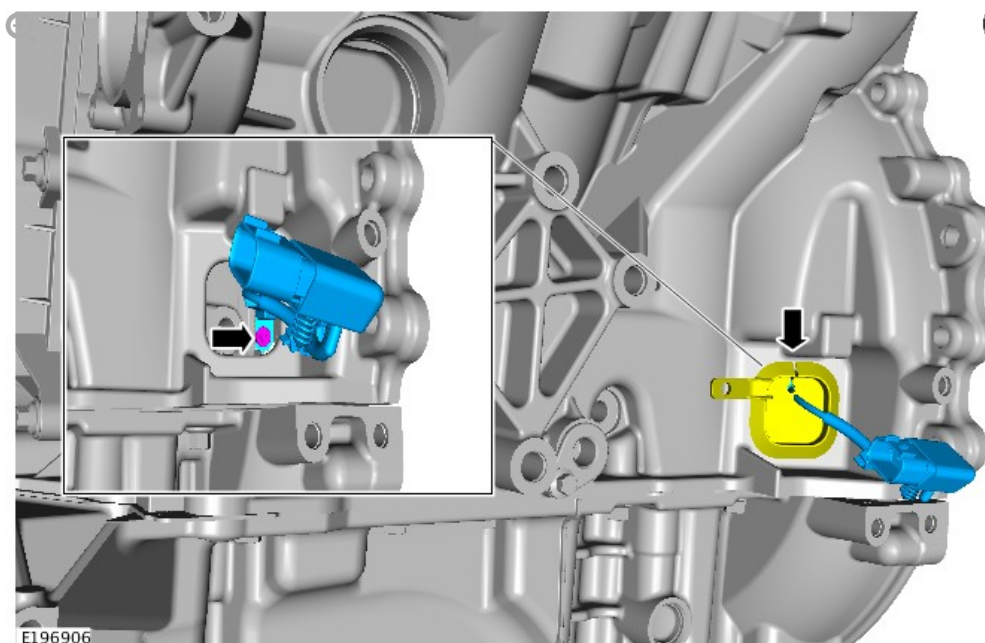


Remove the special tool.

25.

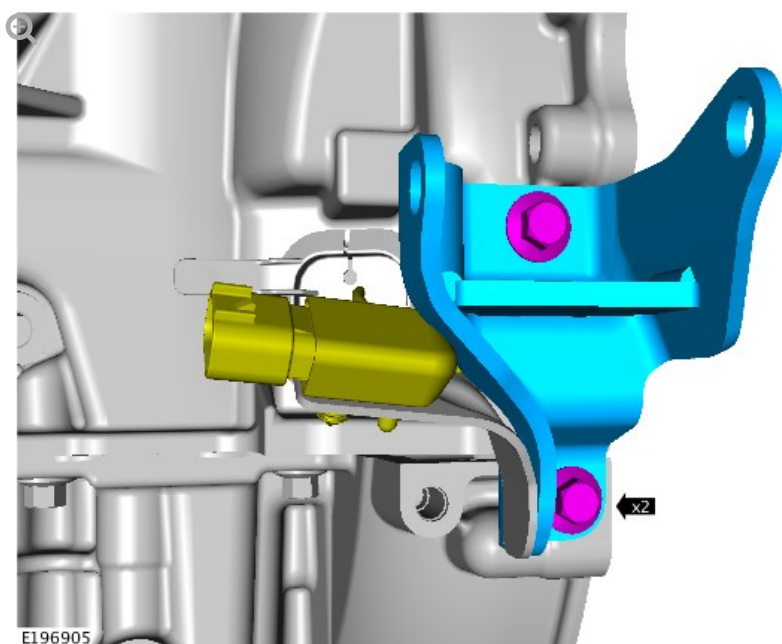
CAUTION:

Make sure that the component is clean, free of foreign material and lubricant.



- Install the CKP sensor.
- *Torque: 5 Nm*

26.

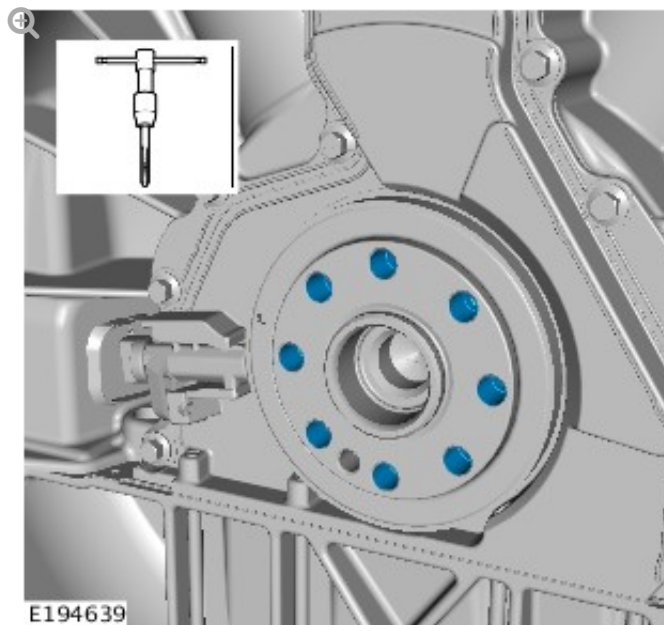


- *Torque: 32 Nm*

27.

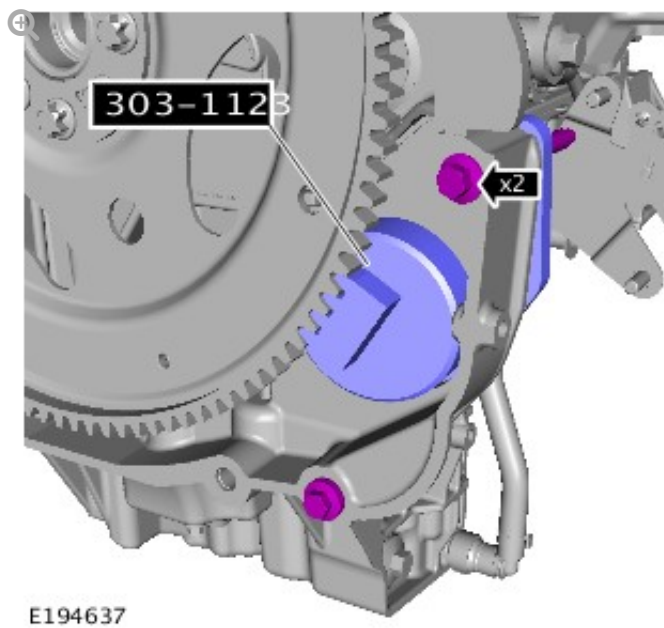
NOTE:

Use an M10 X 1mm tap to clean the threads.



Using a suitable tool, clean out the threads.

28.



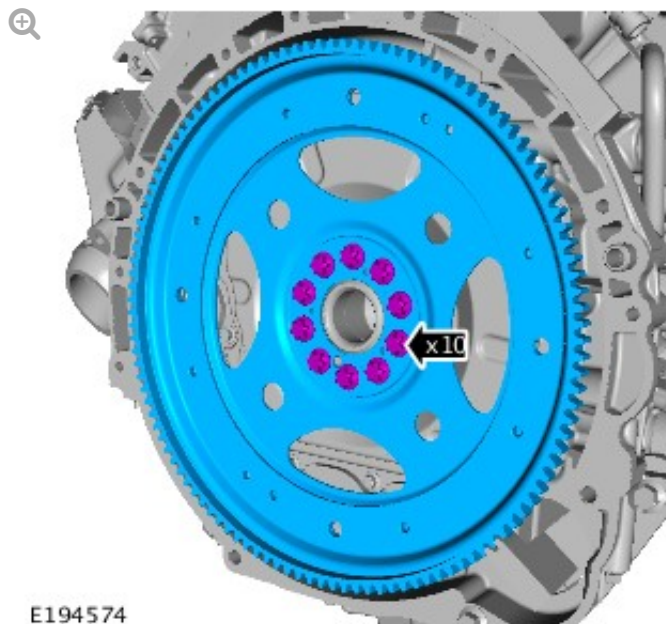
- Install the special tool.
- *Special Tool(s):* [303-1123](#)

CAUTIONS:

- Apply Loctite 243 to the bolts.
- Install all the bolts finger tight before final tightening.

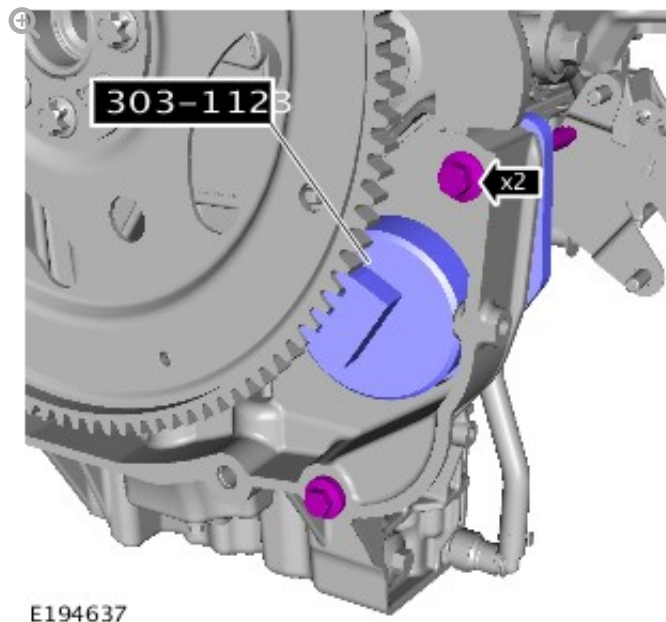
NOTE:

Make sure that all the component mating faces are clean.



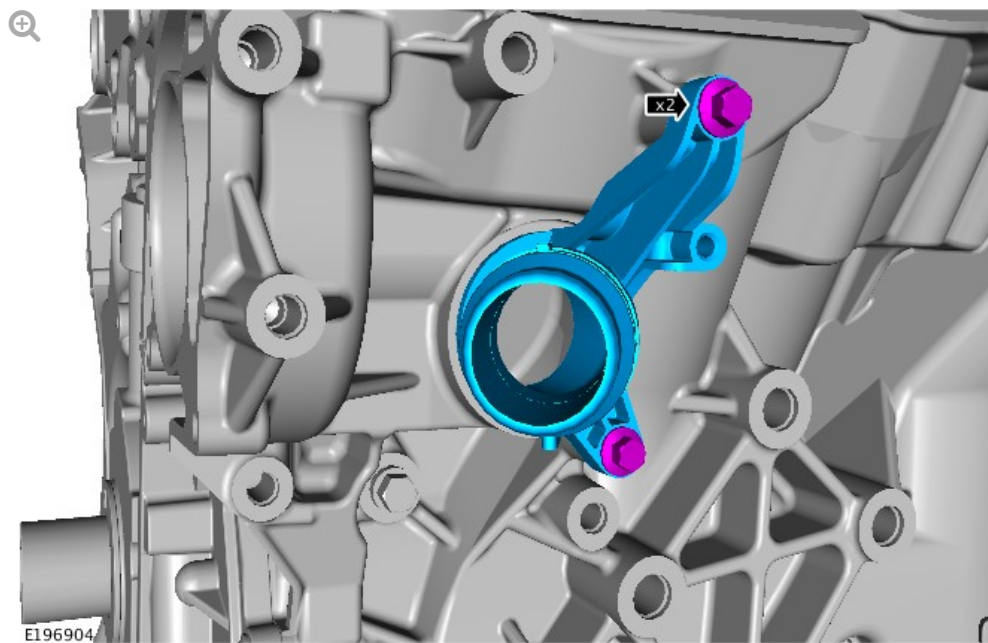
- Install new bolts.
- Tighten the retaining bolts working diagonally.
- *Torque:*
 - Stage 1: **45 Nm**
 - Stage 2: **90°**

30.



- Remove the special tool.

31.

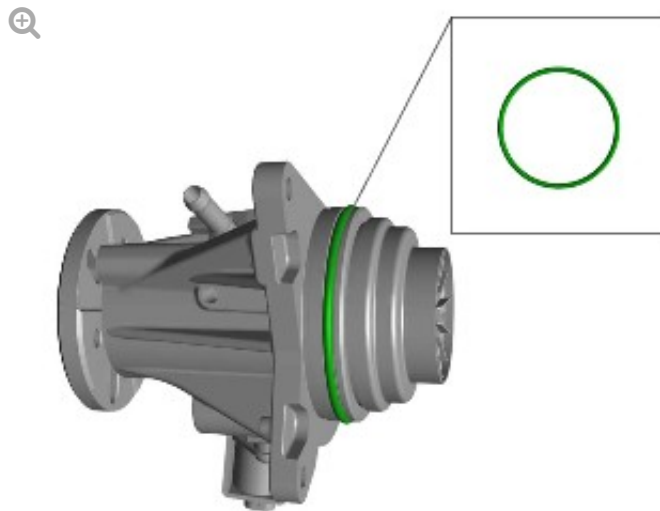


- Install the coolant outlet channel.
- *Torque: 10 Nm*

32.

CAUTION:

Make sure that the mating faces are clean and free of corrosion and foreign material.

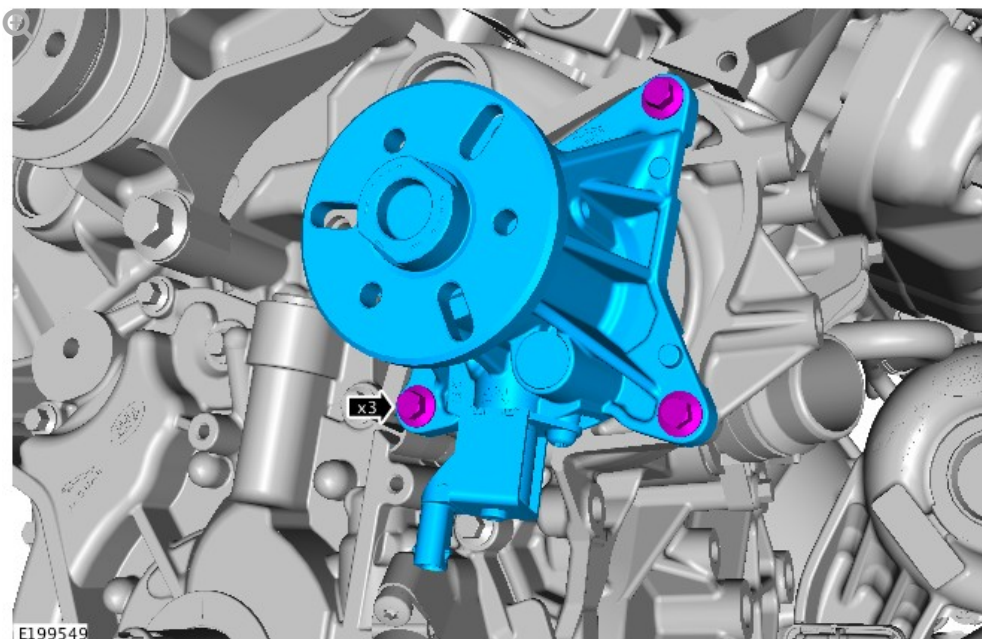


E167284

Install a new O-ring seal.

Renew Part: [Engine coolant pump gasket](#).

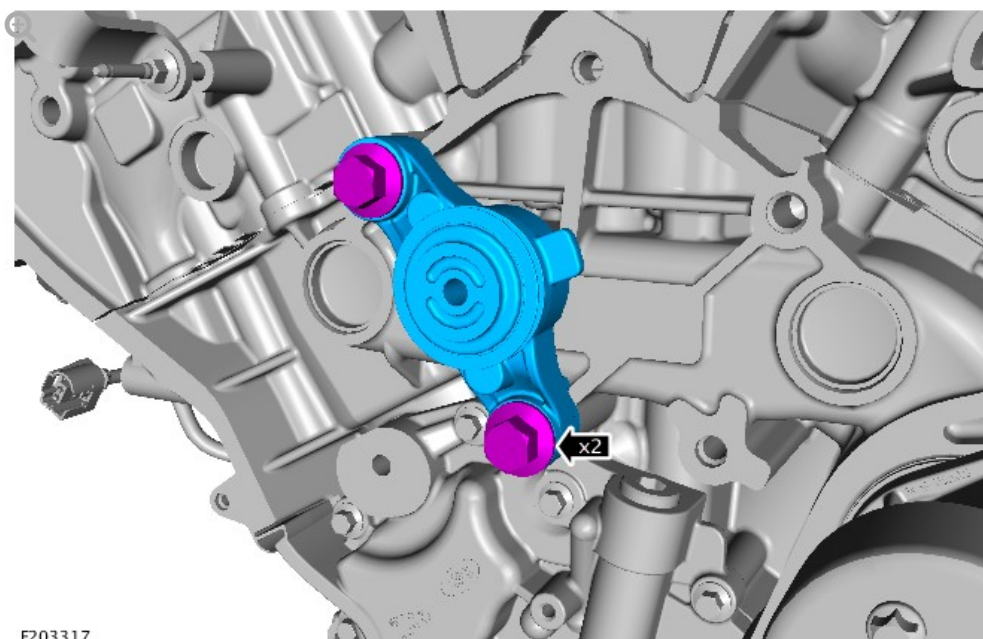
33.



- Install the coolant pump.

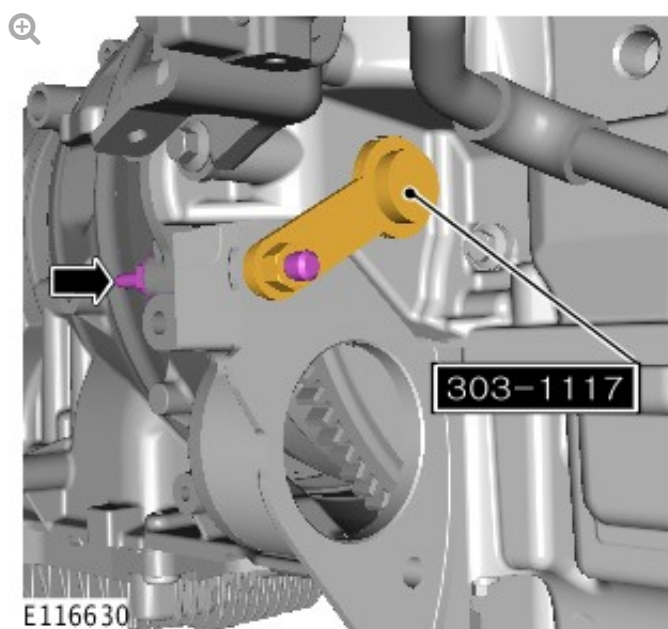
- **Torque: 10 Nm**

34.



- Install the viscous fan drive pulley.
- **Torque: 85 Nm**

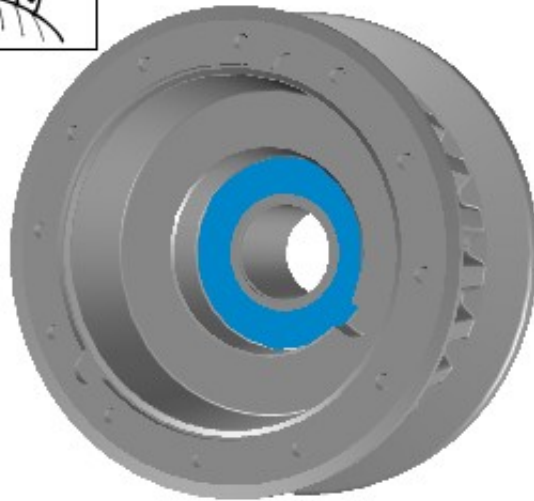
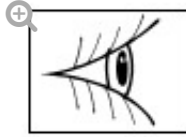
35.



Install the special tool.

Special Tool(s): [303-1117](#)

36.



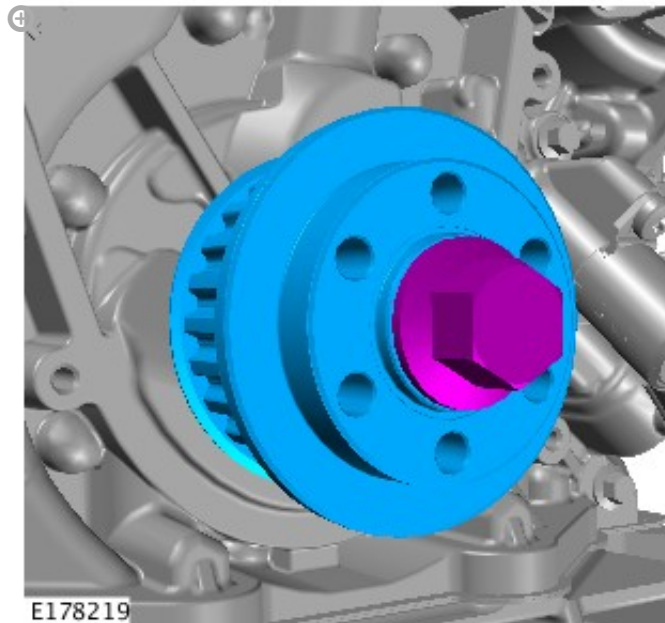
E178218

- Install the new friction washer.
Renew Part: [Crankshaft pulley friction washer](#).
- Make sure that the pulley washer is correctly seated before installing the pulley.

37.

CAUTION:

Do not lubricate the components.

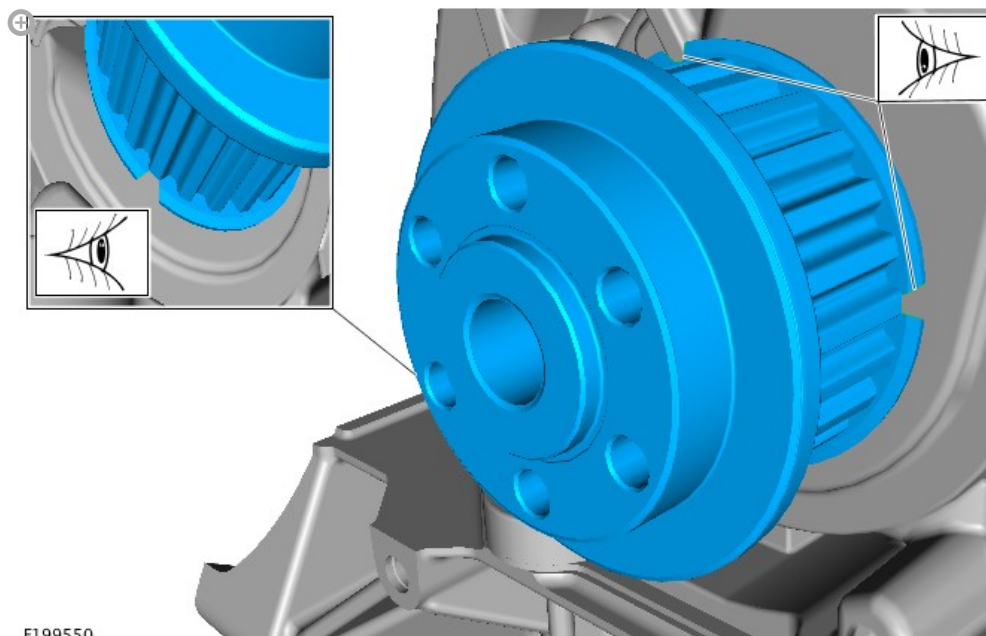


- Install the crankshaft pulley.
- Install a new bolt.
Renew Part: [Crankshaft pulley bolt](#).
- Do not fully tighten at this stage.

38.

NOTES:

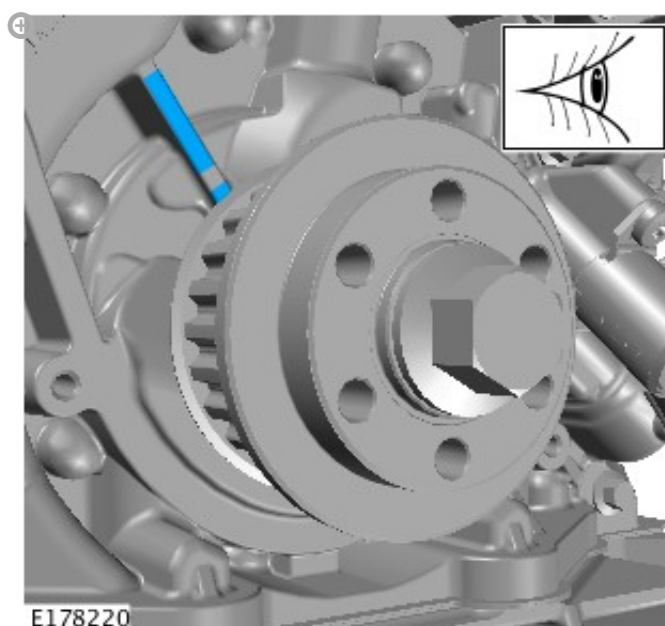
- 16 MY vehicles only.
- Any of the 3 notches on the crankshaft pulley sprocket can be used to correctly time the engine.



E199550

Align the timing marks.

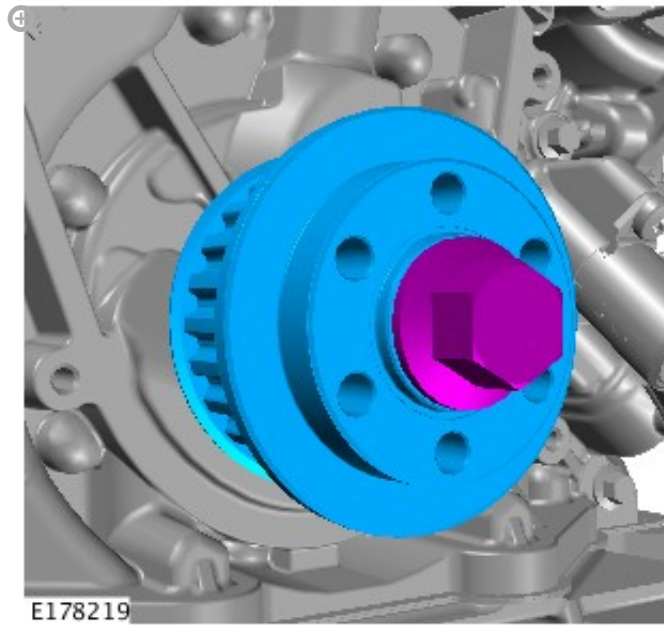
39.



E178220

Align the timing marks.

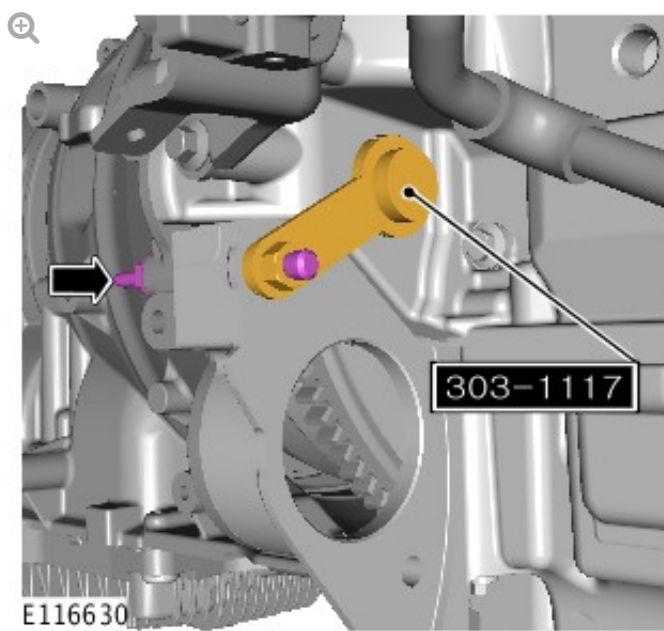
40.



Do not fully tighten the crankshaft pulley bolt at this stage.

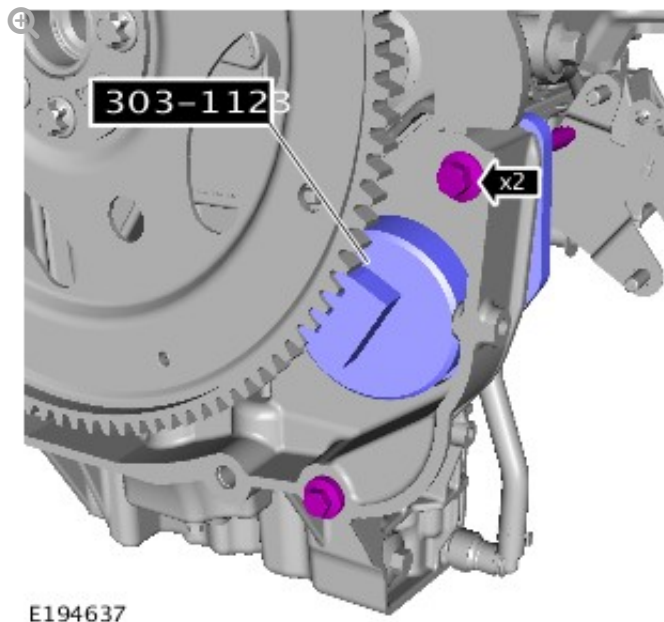
Torque: 25 Nm

41.



Remove the special tool.

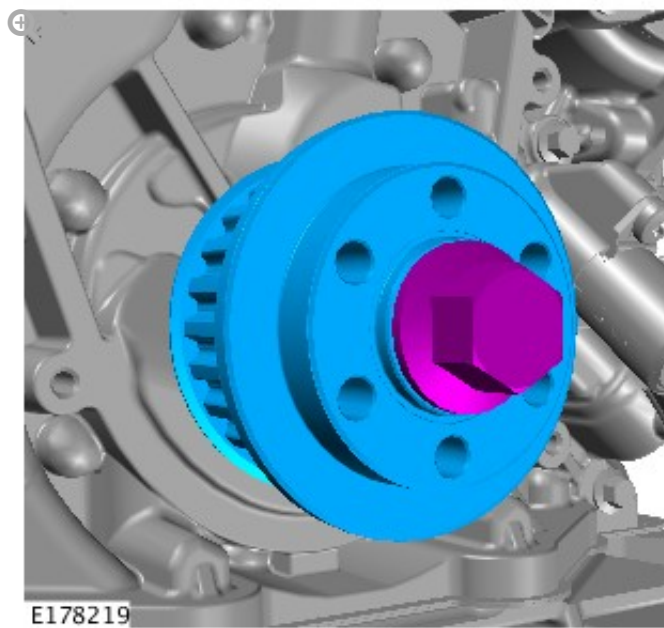
42.



Install the special tool.

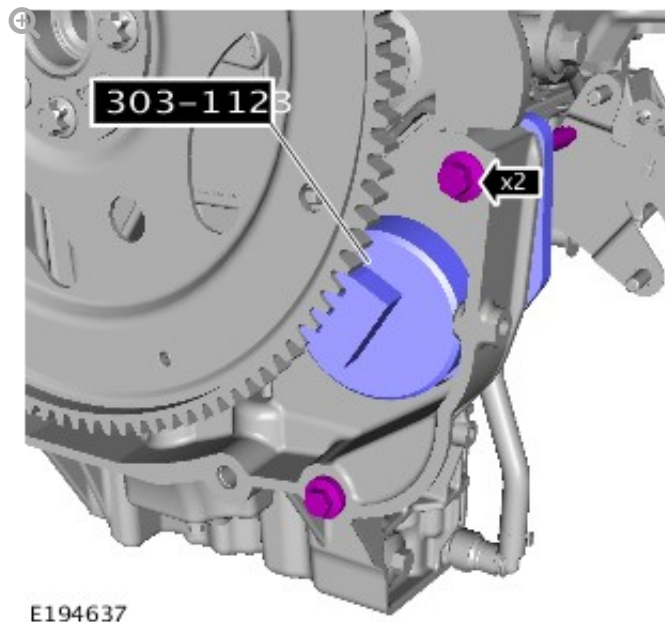
Special Tool(s): [303-1123](#)

43.



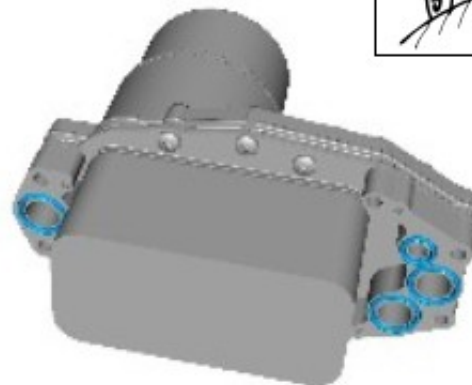
- Tighten the crankshaft pulley bolt.
- *Torque:*
 - Stage 1: **150 Nm**
 - Stage 2: **300 Nm**
 - Stage 3: **90°**

44.



Remove the special tool.

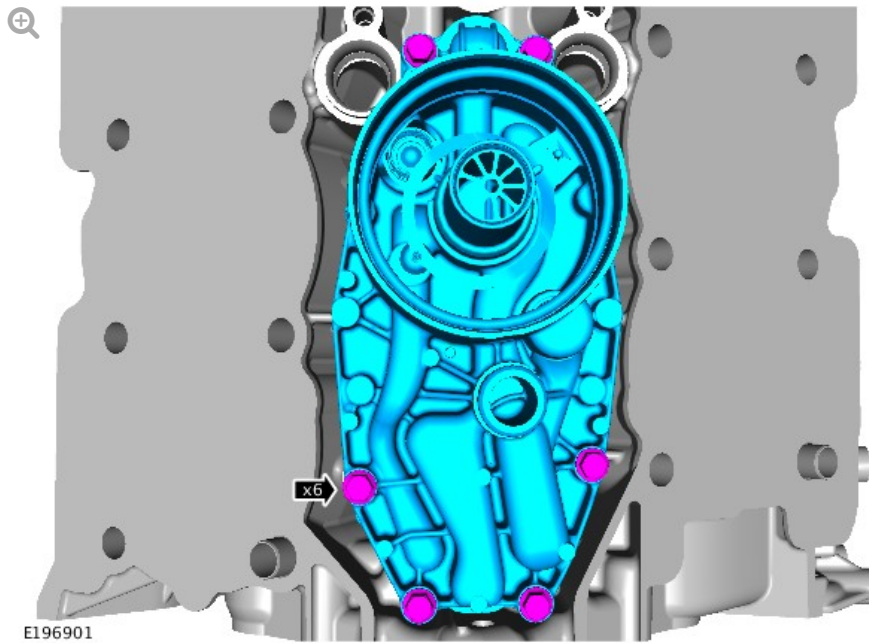
45.



Install new O-ring seals.

Renew Part: [Oil cooler O-ring seals](#).

46.



- Install the oil cooler.
- *Torque: 10 Nm*

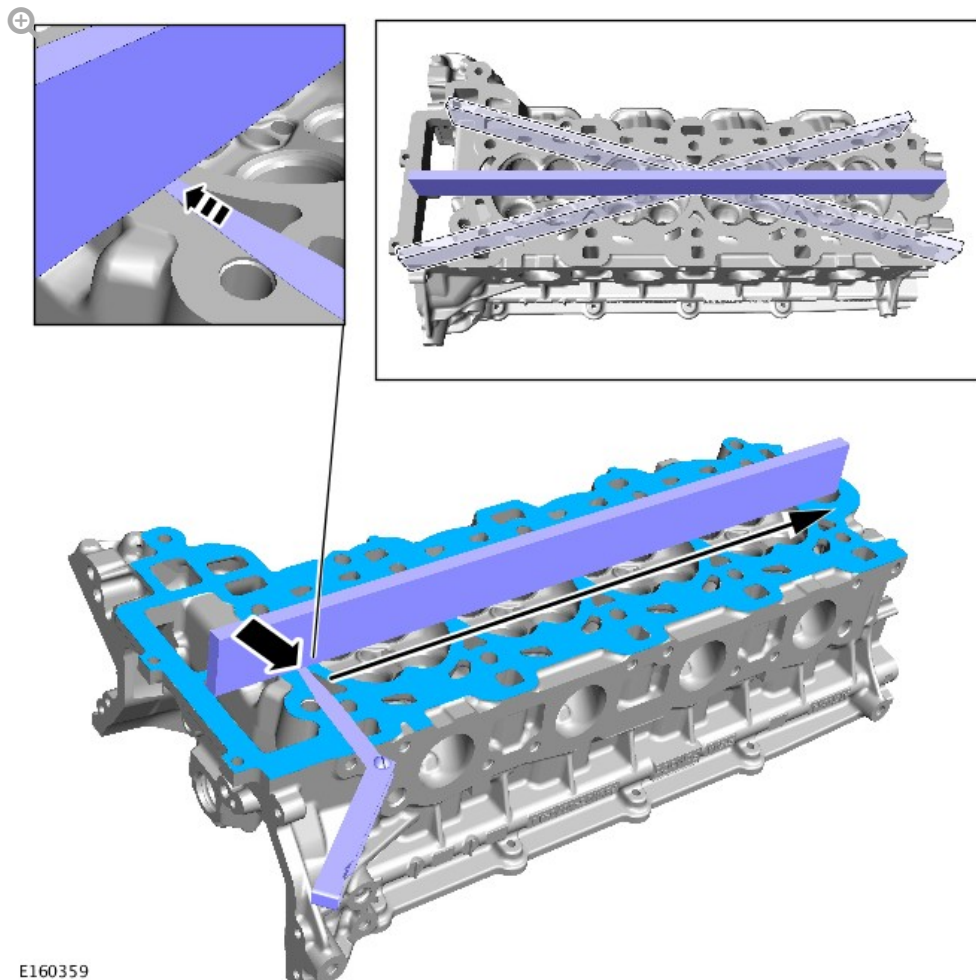
47.

CAUTION:

Make sure that the mating faces are clean and free of foreign material.

NOTES:

- An acceptable flatness of the cylinder head is 0.2mm.
- Repeat this step for the other side.



- Clean and inspect the cylinder head and cylinder block.

48.

NOTE:

Repeat the step for the other side.

Check cylinder head face for distortion, across the center and from corner to corner.

Refer to: [Cylinder Head Gasket Selection - TDV6 3.0L Diesel](#) (303-00 Engine System - General Information, General Procedures).

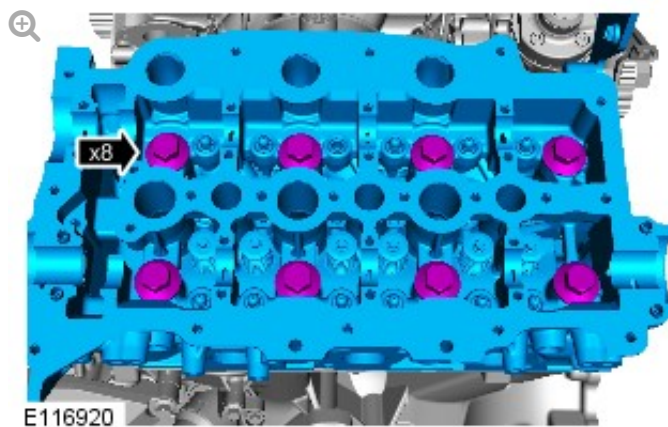
Refer to: [Cylinder Head Distortion](#) (303-00 Engine System - General Information, General Procedures).

CAUTIONS:

- Use care when installing the cylinder head. Damage to the cylinder block, cylinder head or cylinder head gasket may result.
- The head gasket must be installed over the cylinder block dowels.

NOTE:

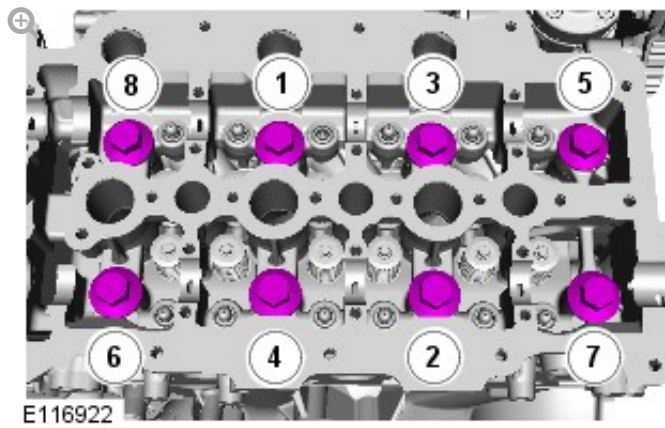
Repeat the step for the other side.



- Install a new cylinder head gasket.
Renew Part: [Cylinder head gasket](#).
- Install new bolts by hand.
Renew Part: [Cylinder head bolts](#).

NOTES:

- Repeat the step for the other side.
- Tighten the bolts in the indicated sequence.

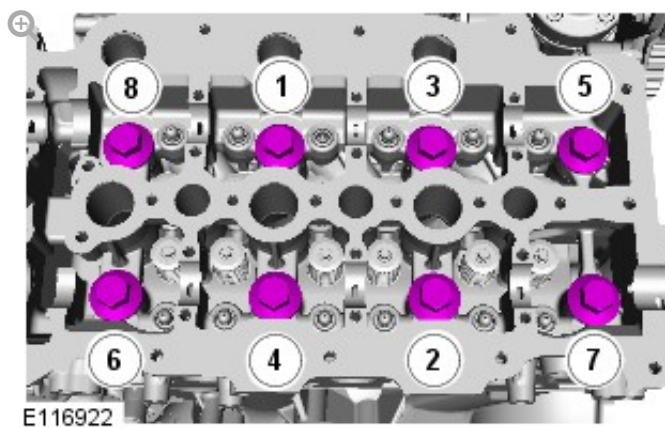


- *Torque: 80 Nm*

51.

NOTES:

- Tighten the bolts in the indicated sequence.
- Repeat the step for the other side.

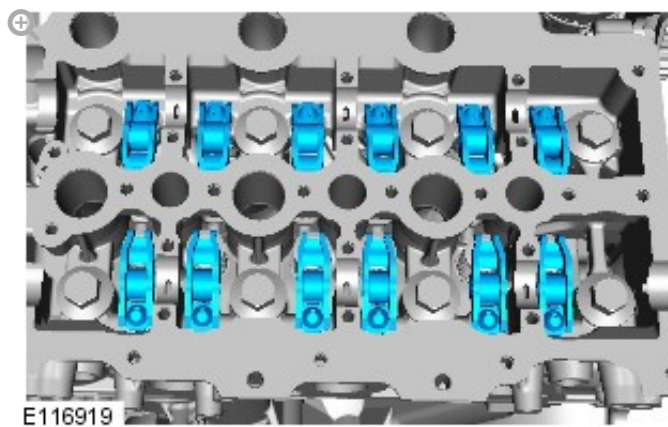


Torque: 180°

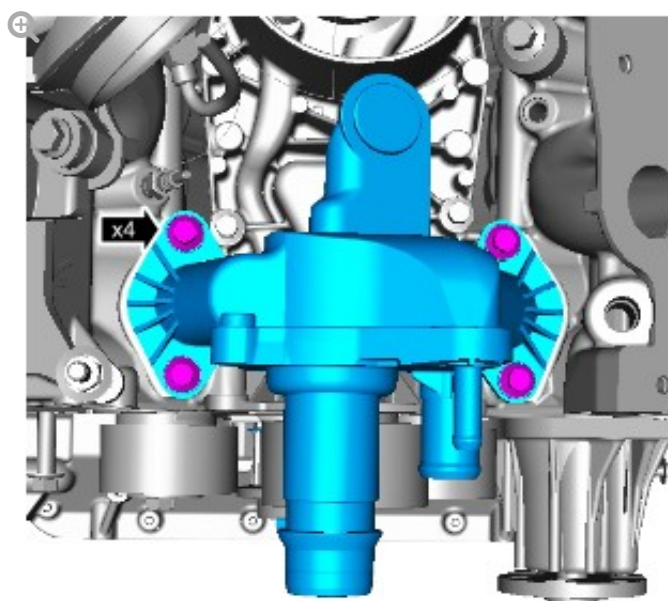
52.

NOTE:

Repeat the step for the other side.



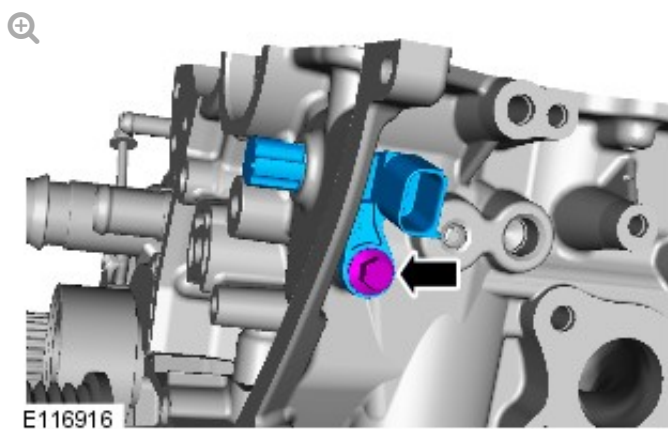
53.



Install the coolant outlet assembly.

Torque: 10 Nm

54.



Install the Camshaft Position (CMP) sensor.

Torque: 10 Nm

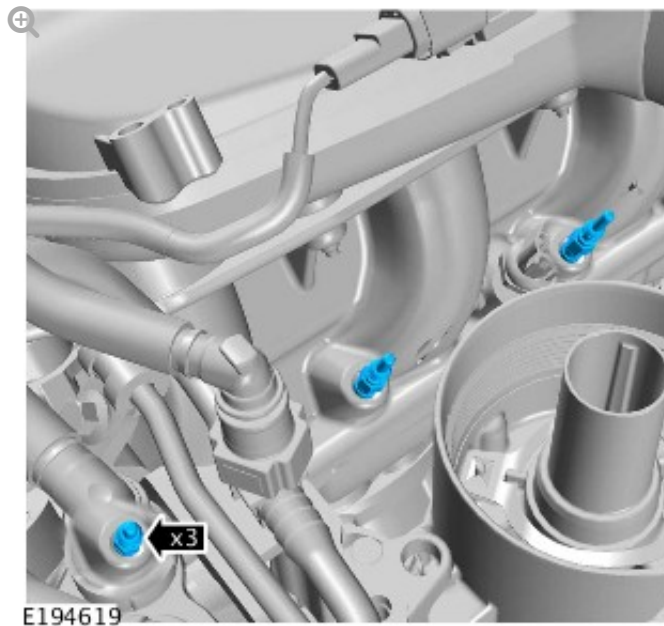
55.

CAUTIONS:

- Take extra care not to damage the component.
- If accidentally dropped or knocked install a new glow plug.
- Make sure that the area around the component is clean and free of foreign material.

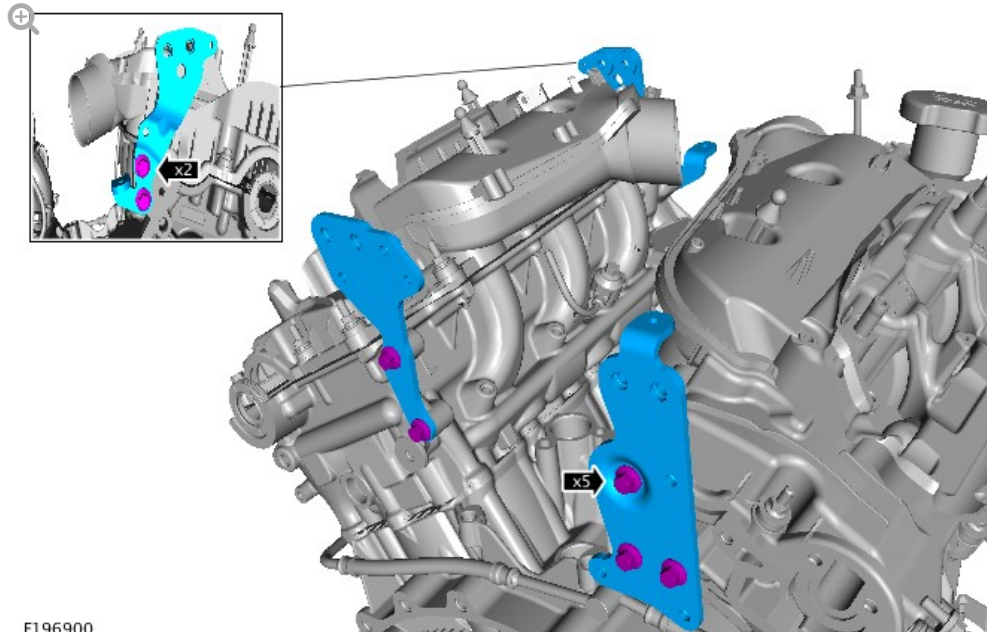
NOTE:

Repeat the step for the other side.



- Install the glow plugs by hand.
- *Torque: 10 Nm*

56.



E196900

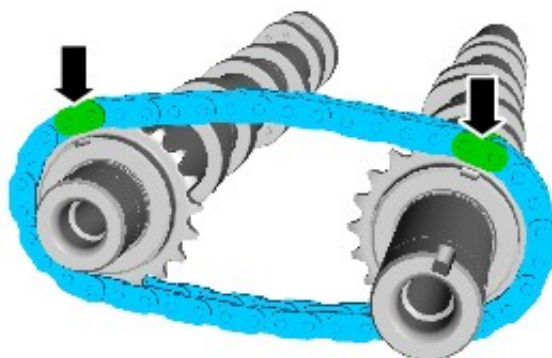
Install the engine lift brackets.

Torque: 23 Nm

57.

CAUTION:

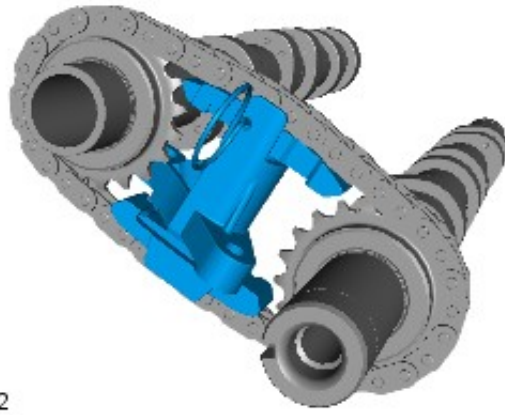
Make sure the camshaft timing marks are positioned as illustrated.



E194993

Install the secondary timing chain onto the camshafts.

58.



E116782

Install the secondary timing chain tensioner assembly.

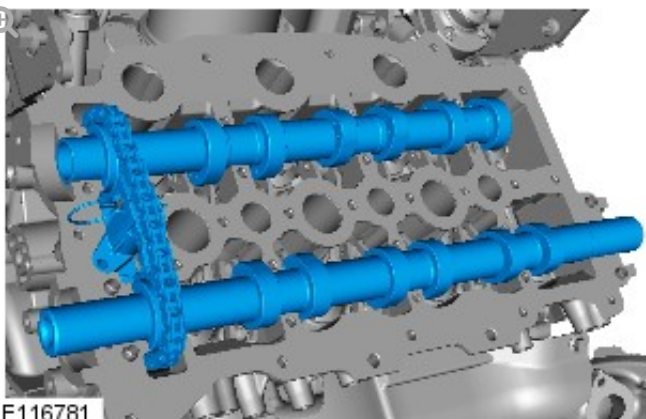
59.

CAUTION:

Make sure that the dots on the camshafts are aligned at the 12 o'clock position. Failure to follow this instruction may result in damage to the engine.

NOTES:

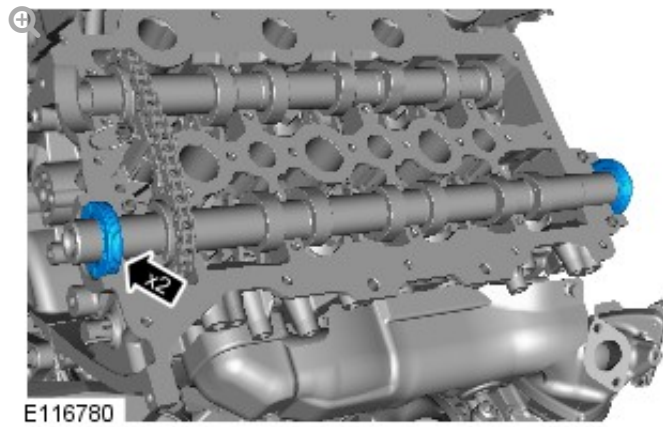
- Lubricate the camshafts and the camshaft bearing caps with oil meeting Jaguar specification prior to installation.
- Use hypoid oil to lubricate the camshafts.



E116781

Install the camshafts.

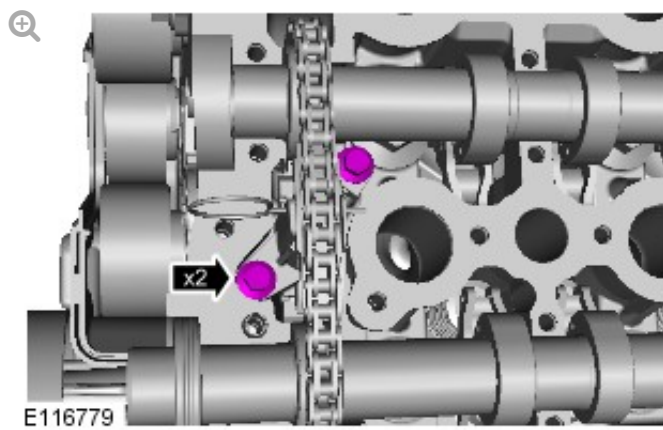
60.



Install new camshaft seals.

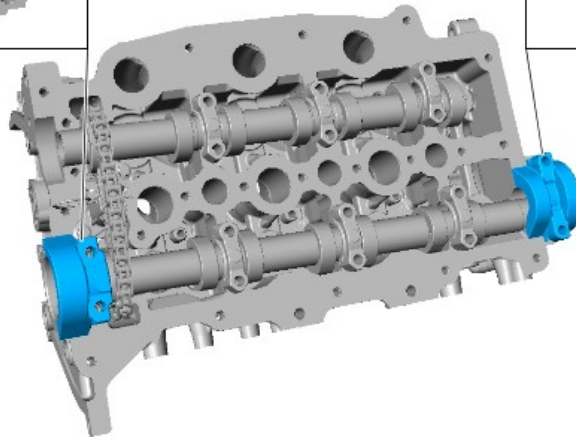
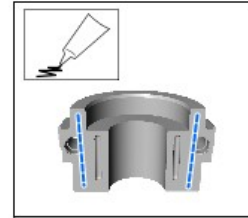
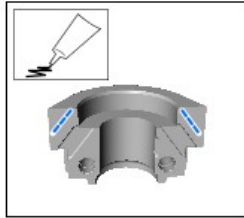
Renew Part: [Camshaft seal](#).

61.



Torque: 10 Nm

62.



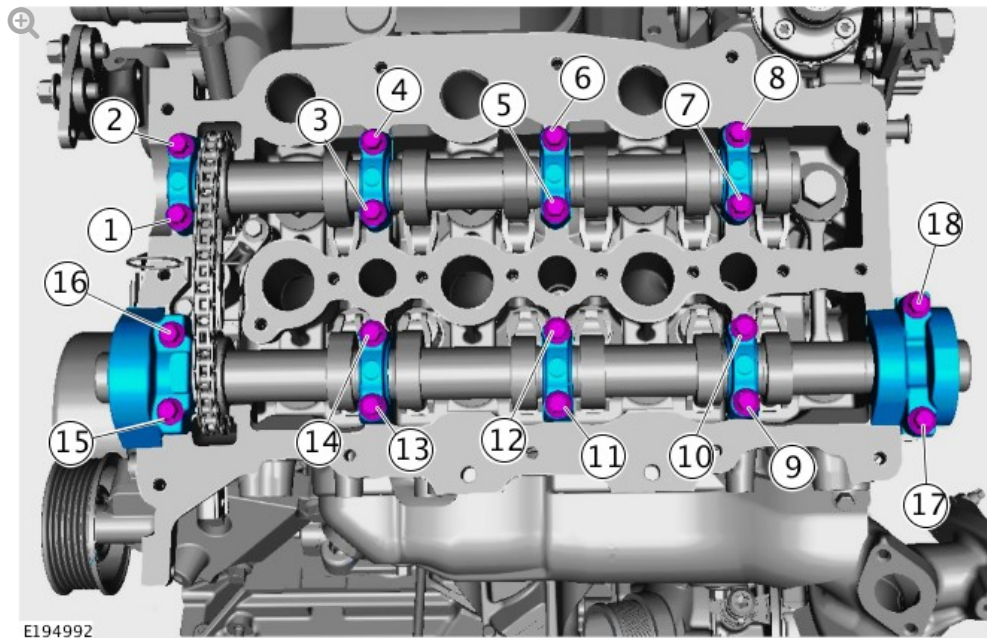
E195492

- Apply Loctite 518 sealant to the exhaust camshaft seal bearing caps.
- Apply Loctite 518 sealant, 2 mm wide, to the LH rear and RH front camshaft bearing caps.
- Apply Loctite 518 sealant, 7 mm diameter, to the LH front and RH rear camshaft bearing caps.

63.

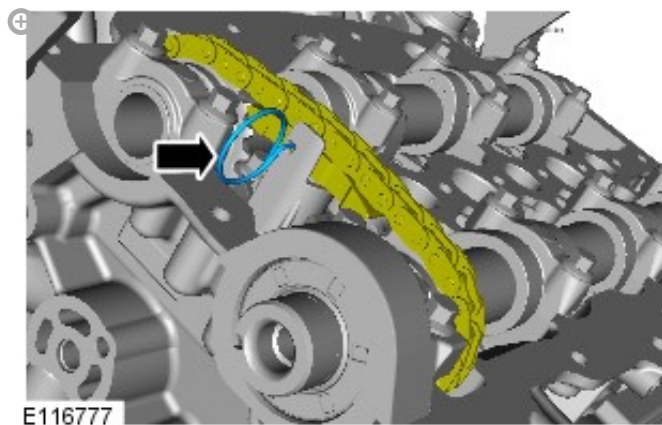
NOTE:

Tighten the bolts in the indicated sequence.



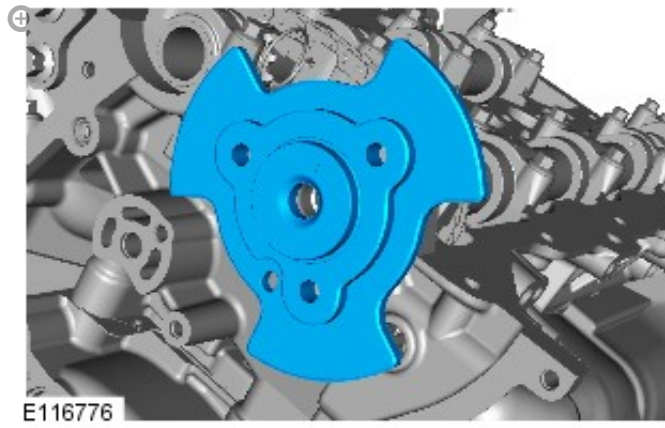
- Install the camshaft bearing caps in their original positions.
- Stage 1: Bolts 1 to 14, 1 Nm.
- Stage 2: Bolts 1 to 14, 5 Nm.
- Stage 3: Bolts 1 to 14, 10 Nm.
- Stage 4: Bolts 15 to 18, 1 Nm.
- Stage 5: Bolts 15 to 18, 5 Nm.
- Stage 6: Bolts 15 to 18, 10 Nm.

64.



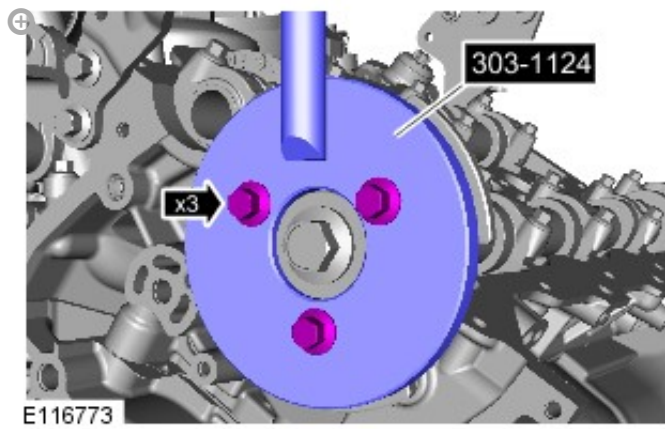
Remove the secondary timing chain tensioner retaining pin.

65.



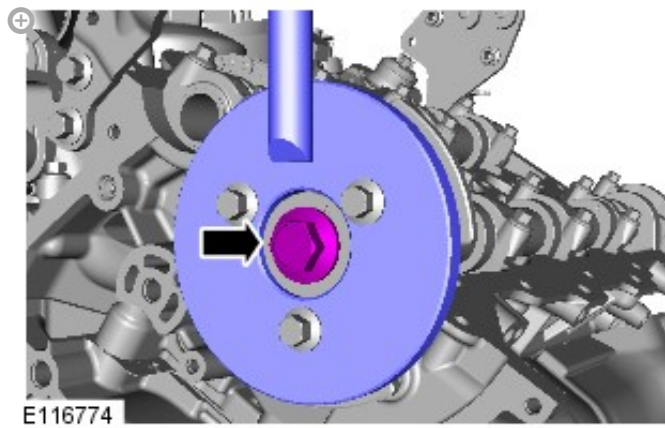
Install the camshaft hub.

66.

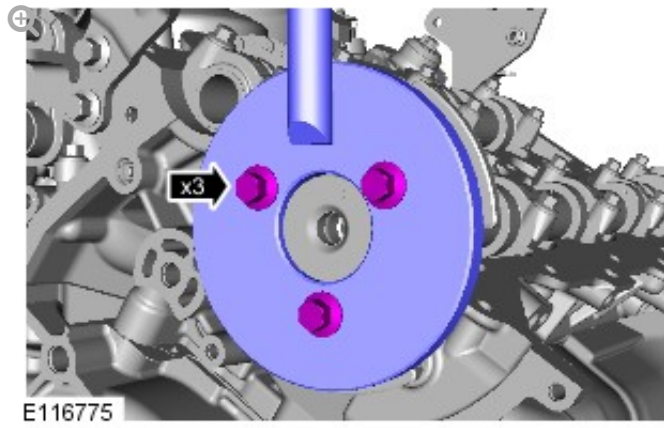


- Install the special tool.
- *Special Tool(s):* 303-1124

67.



68.

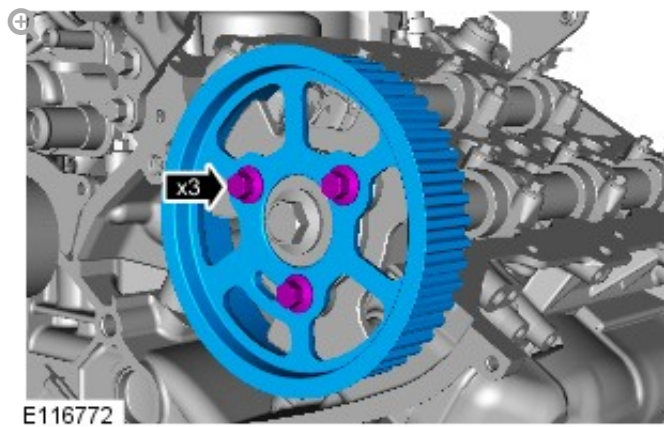


Remove the special tool.

69.

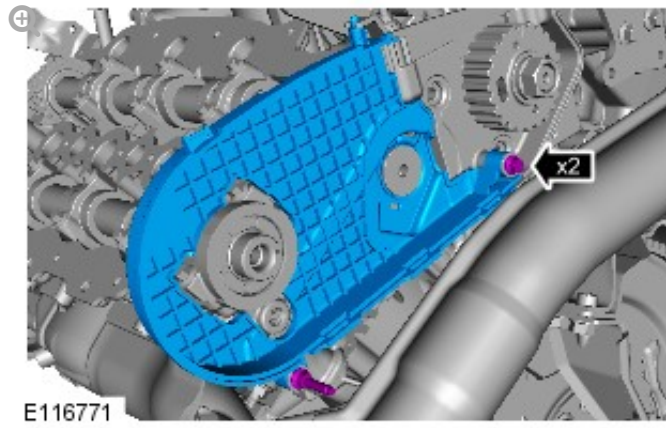
CAUTION:

Only tighten the bolts finger-tight at this stage.



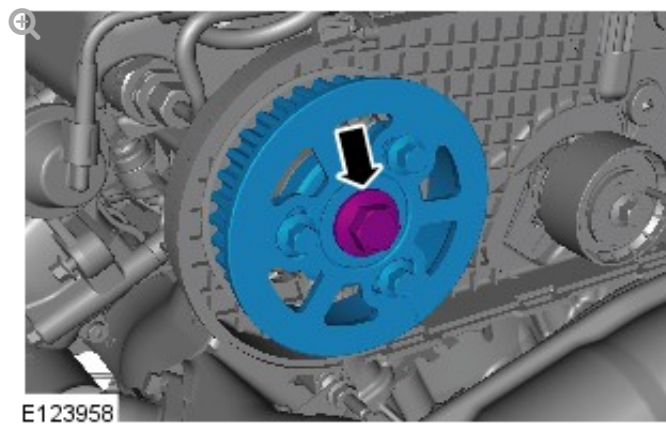
Fully tighten the bolts after the camshaft timing belt is installed.

70.



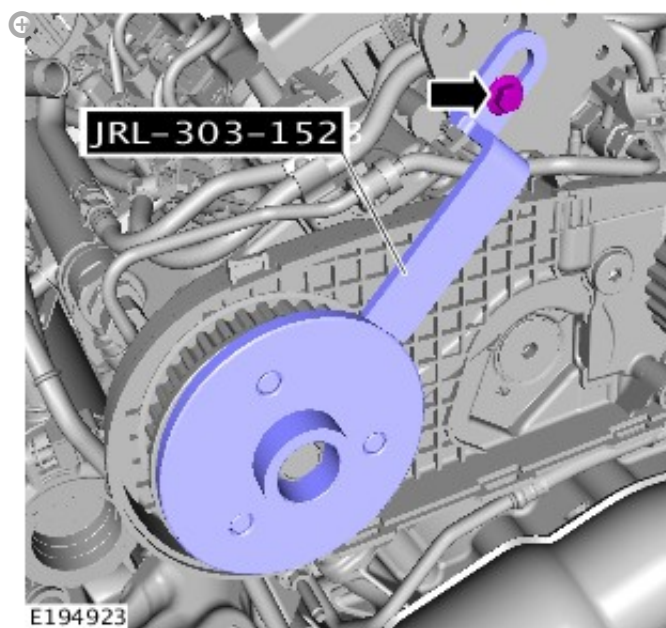
Torque: 10 Nm

71.



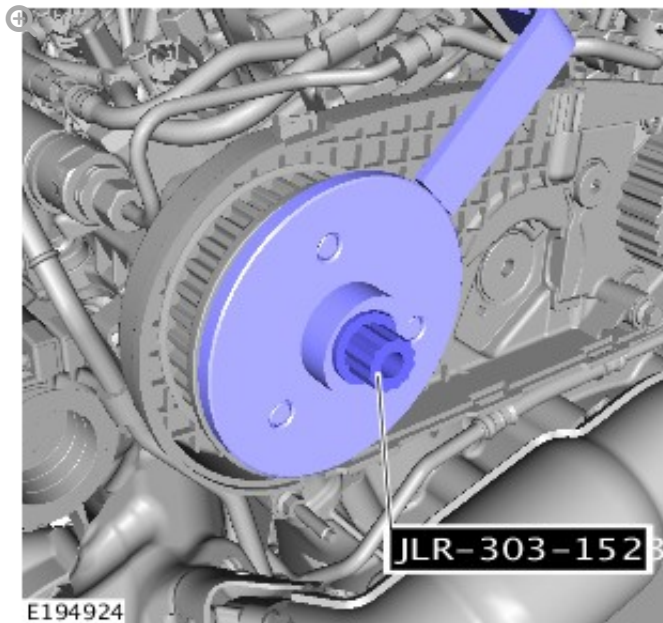
Only tighten the bolts finger tight at this stage.

72.



- Install the special tool.
- *Special Tool(s):* [JLR-303-1523](#)

73.

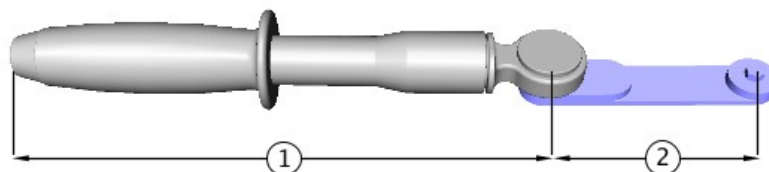


- Install the special tool.
- *Special Tool(s):* [JLR-303-1523](#)

74.

CAUTION:

Make sure the torque wrench setting procedure is followed correctly. Failure to follow this instruction may result in damage to the vehicle.



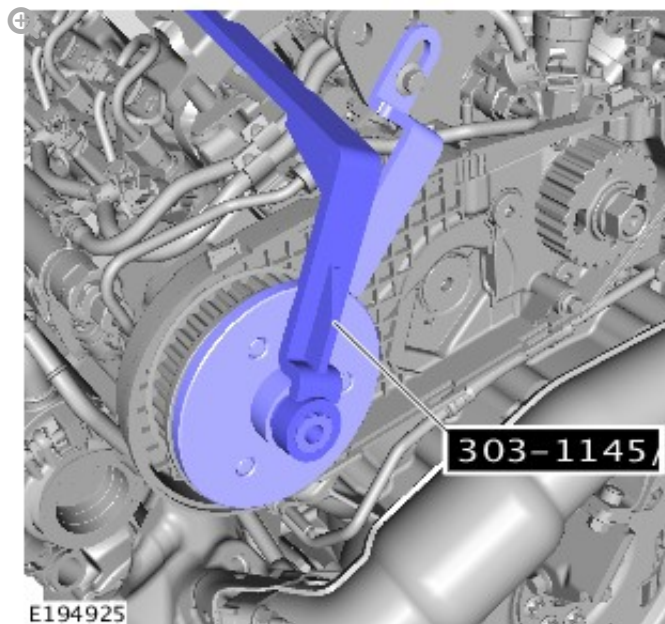
E194197

- Stage 1: Multiply the required torque by the effective length of the torque wrench (1).
- Stage 2: Add the effective length of the special tool (2) to the effective length of the torque wrench.
- Stage 3: Divide the total of stage 1 by the total of stage 2.
- Stage 4: Set the torque wrench to the figure arrived at in stage 3.

75.

CAUTION:

Make sure the torque wrench setting procedure is followed correctly. Failure to follow this instruction may result in damage to the vehicle.

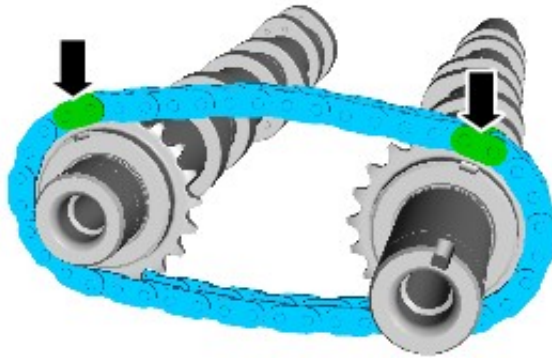


- Install the special tool.
- *Special Tool(s):* [303-1145/2](#)

76.

CAUTION:

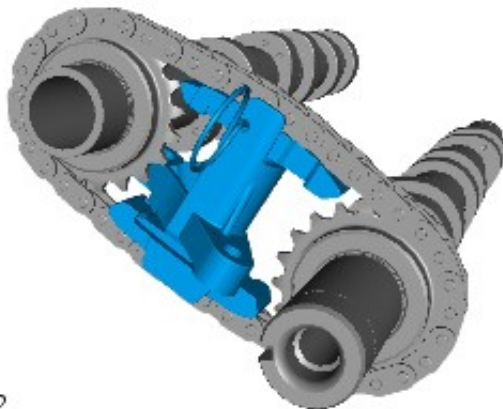
Make sure the camshaft timing marks are positioned as illustrated.



E194993

Install the secondary timing chain onto the camshafts.

77.



E116782

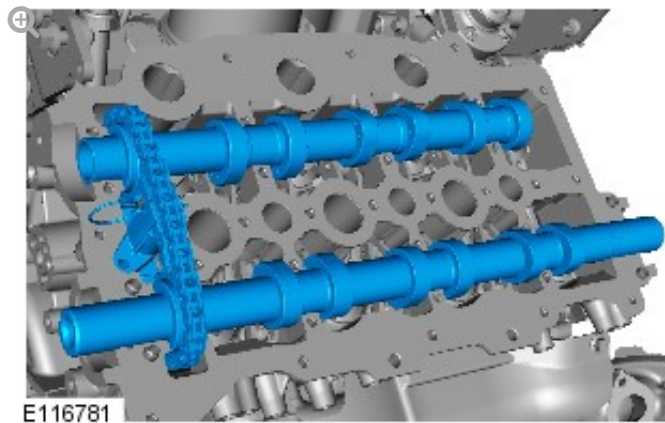
Install the secondary timing chain tensioner assembly.

CAUTION:

Make sure that the dots on the camshafts are aligned at the 12 o'clock position. Failure to follow this instruction may result in damage to the engine.

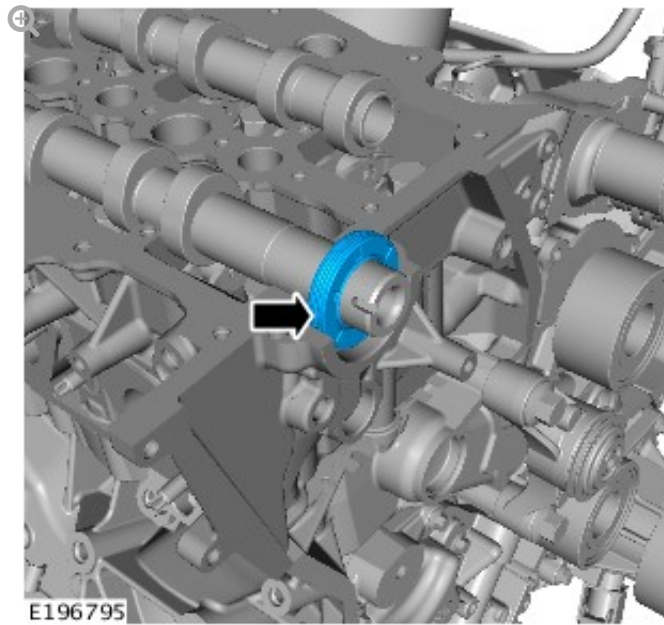
NOTES:

- Lubricate the camshafts and the camshaft bearing caps with oil meeting Jaguar specification prior to installation.
- Use hypoid oil to lubricate the camshafts.



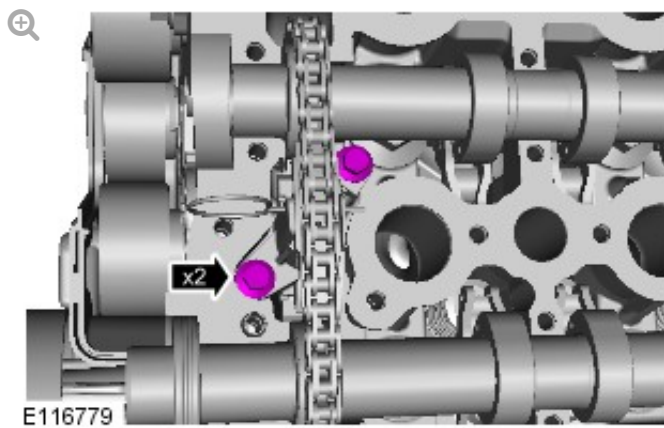
Install the camshafts.

79.



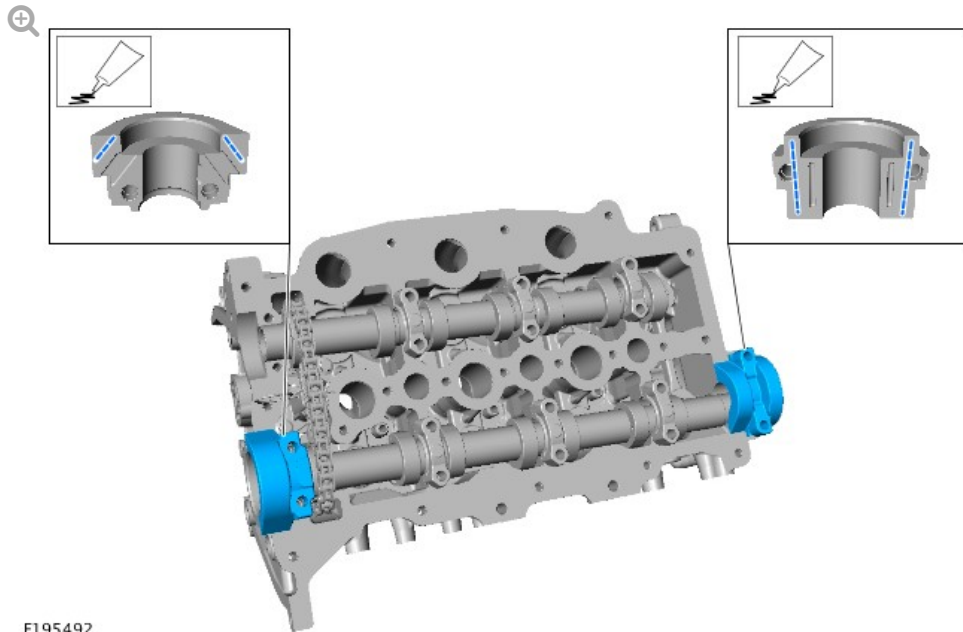
Install a new camshaft seal.

80.



Torque: 10 Nm

81.



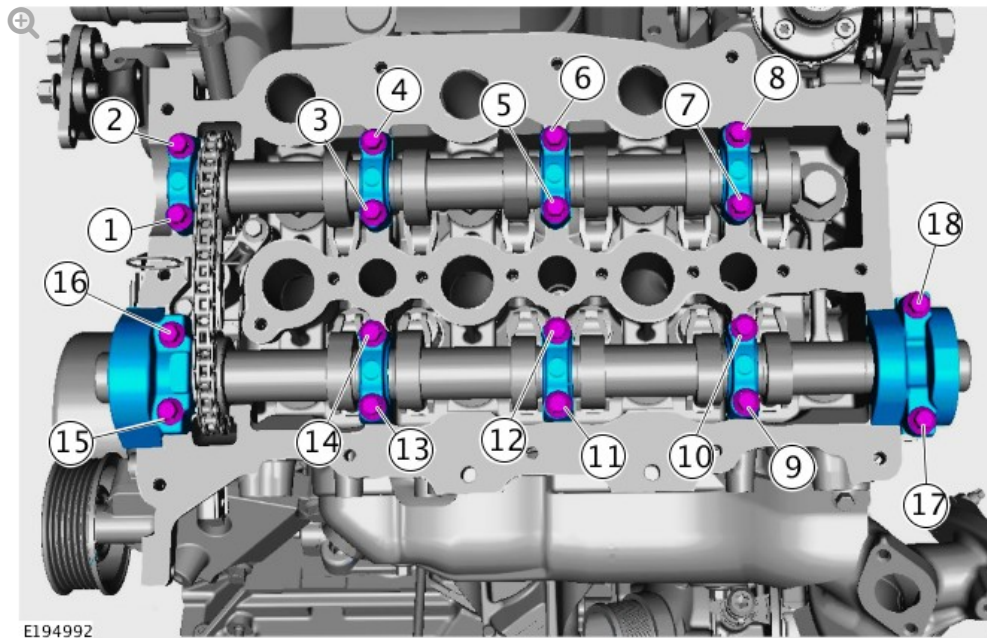
E195492

- Apply Loctite 518 sealant to the exhaust camshaft seal bearing caps.
- Apply Loctite 518 sealant, 2 mm wide, to the LH rear and RH front camshaft bearing caps.
- Apply Loctite 518 sealant, 7 mm diameter, to the LH front and RH rear camshaft bearing caps.

82.

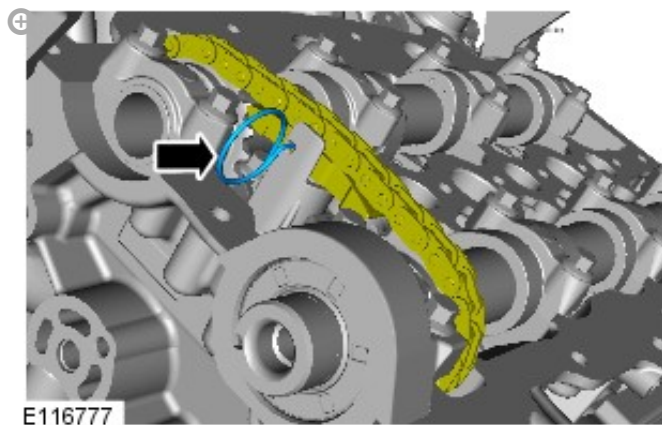
NOTE:

Tighten the bolts in the indicated sequence.



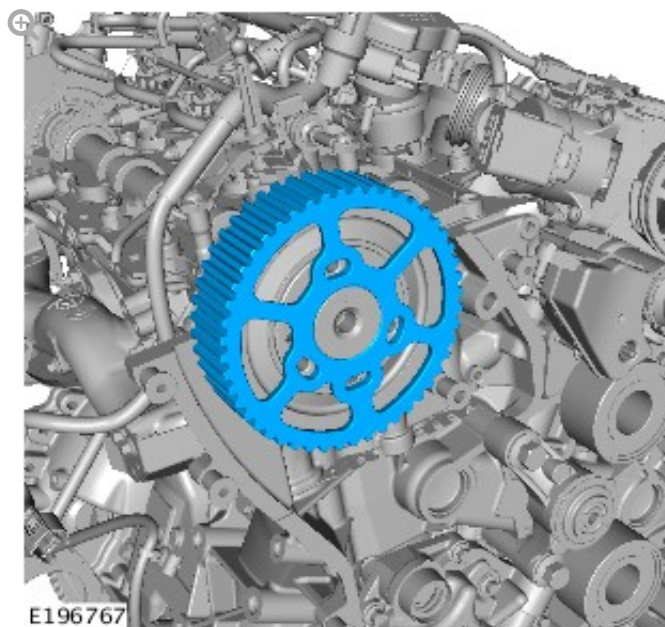
- Install the camshaft bearing caps in their original positions.
- Stage 1: Bolts 1 to 14, 1 Nm.
- Stage 2: Bolts 1 to 14, 5 Nm.
- Stage 3: Bolts 1 to 14, 10 Nm.
- Stage 4: Bolts 15 to 18, 1 Nm.
- Stage 5: Bolts 15 to 18, 5 Nm.
- Stage 6: Bolts 15 to 18, 10 Nm.

83.



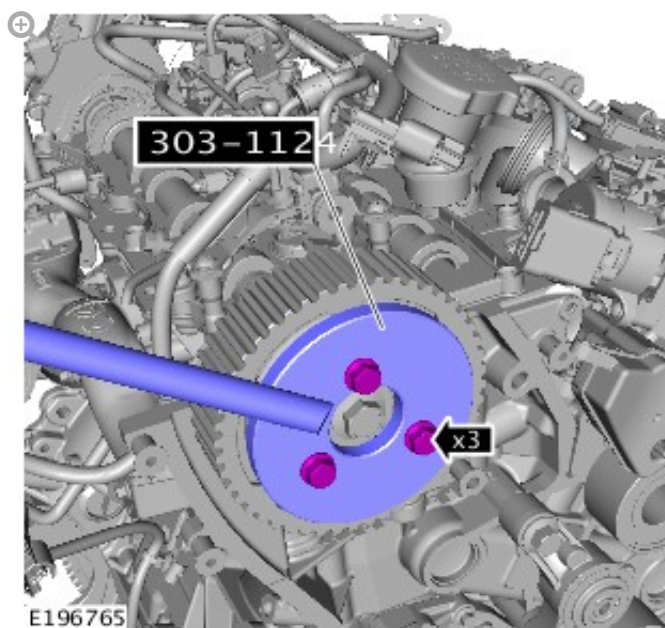
Remove the secondary timing chain tensioner retaining pin.

84.



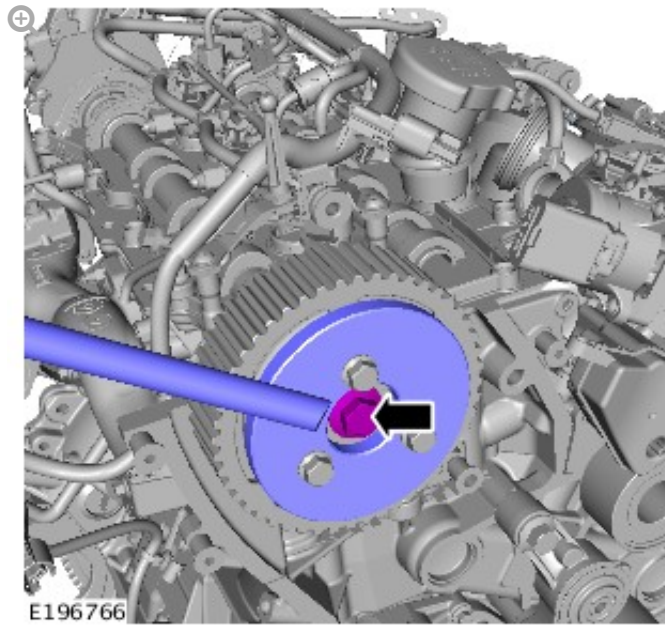
Install the camshaft front pulley.

85.

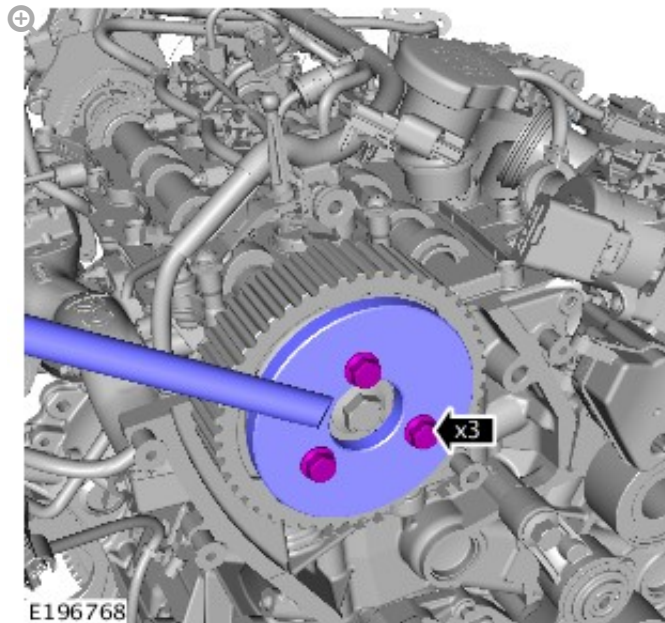


- Install the special tool.
- *Special Tool(s):* [303-1124](#)

86.



87.

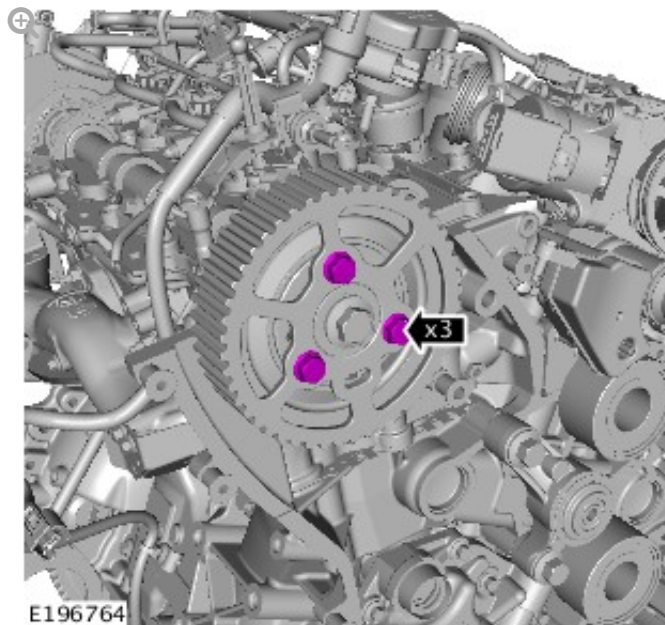


Remove the special tool.

88.

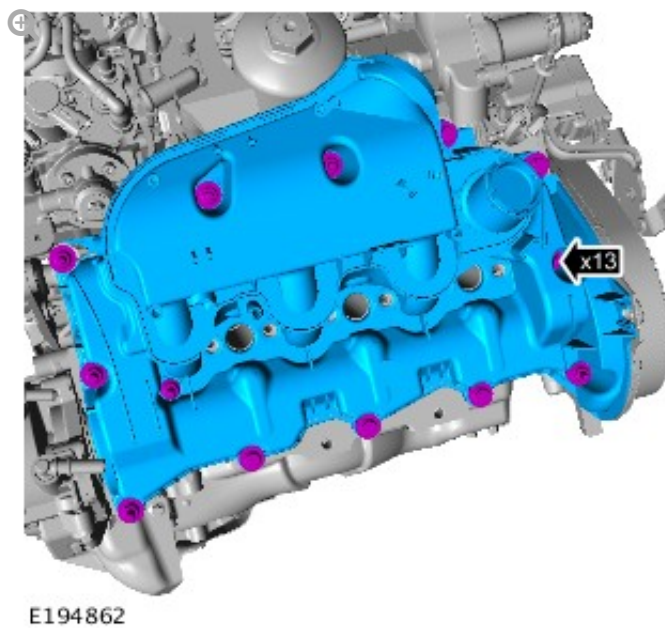
CAUTION:

Only tighten the bolts finger-tight at this stage.



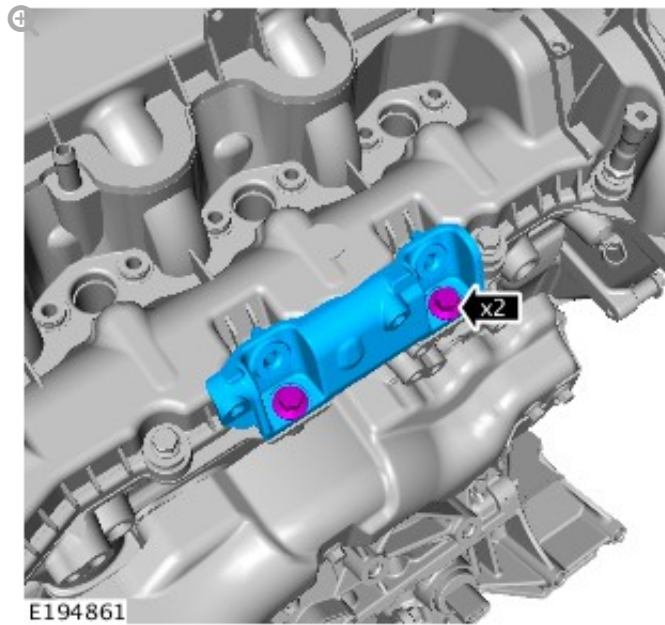
Fully tighten the bolts after the camshaft timing belt is installed.

89.



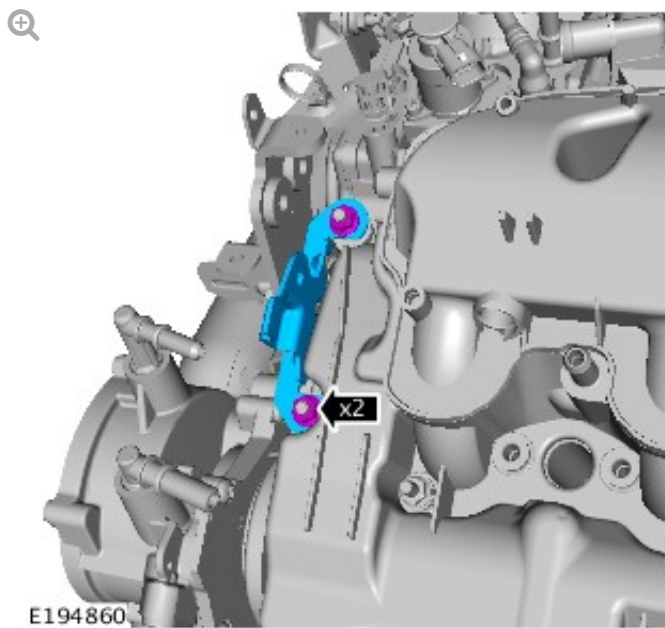
- Install a new gasket.
Renew Part: [Camshaft cover gasket](#).
- Tighten the bolts.
- *Torque: 10 Nm*

90.



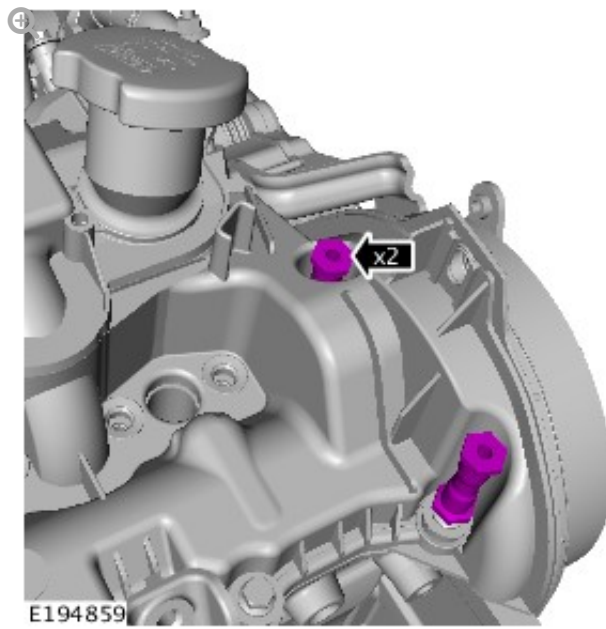
Torque: 24 Nm

91.

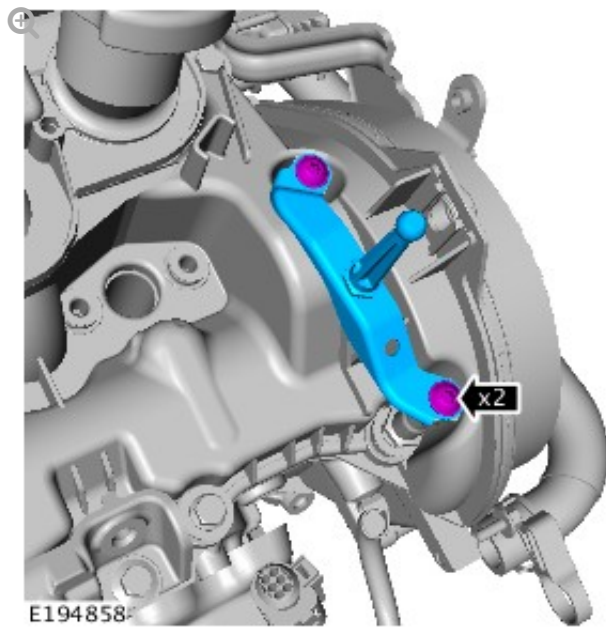


Torque: 9 Nm

92.

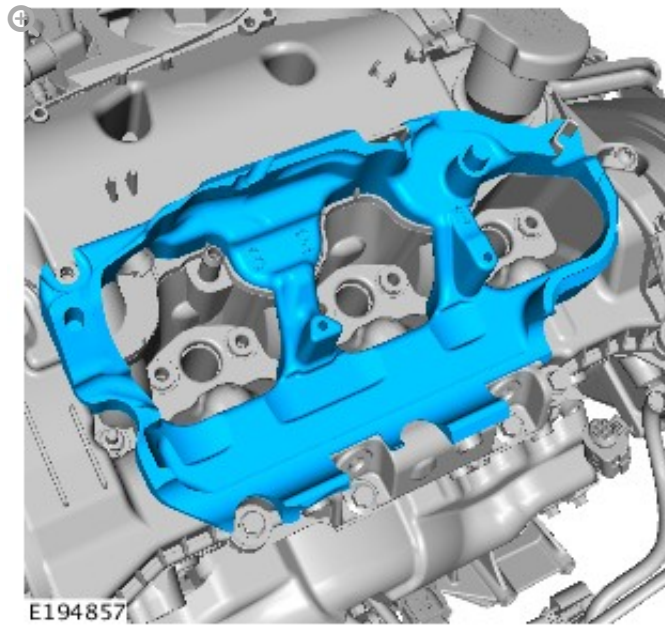


93.



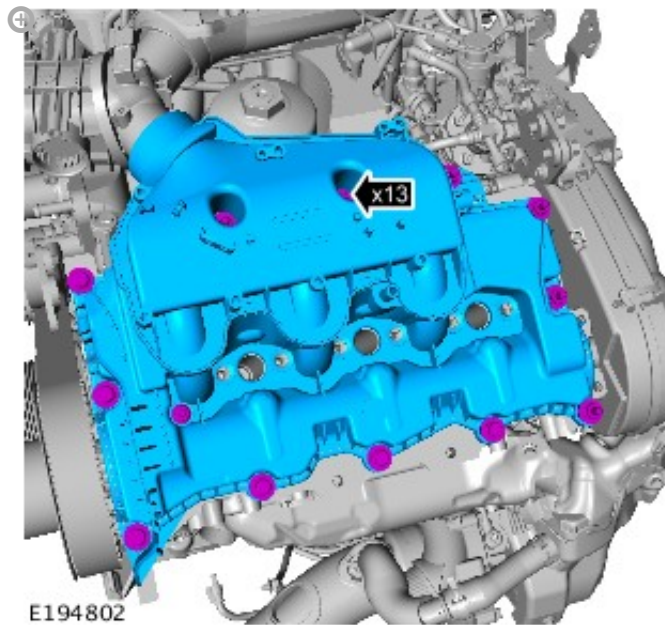
Torque: 9 Nm

94.



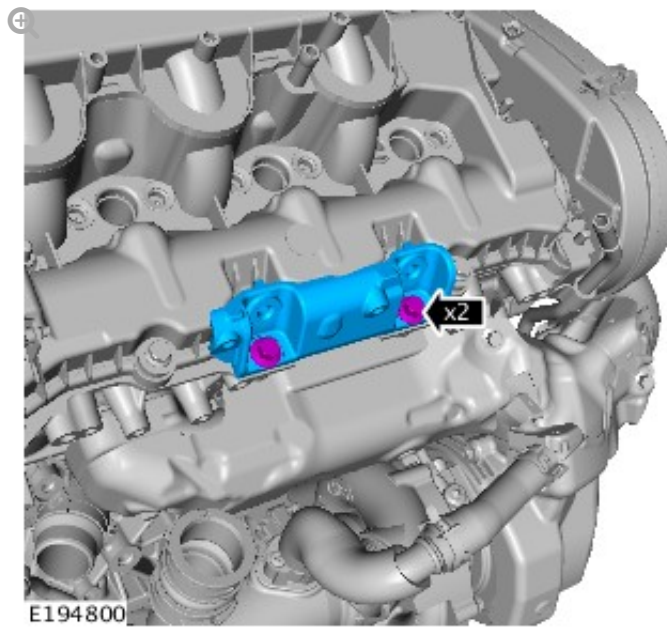
Install the valve cover insulation.

95.



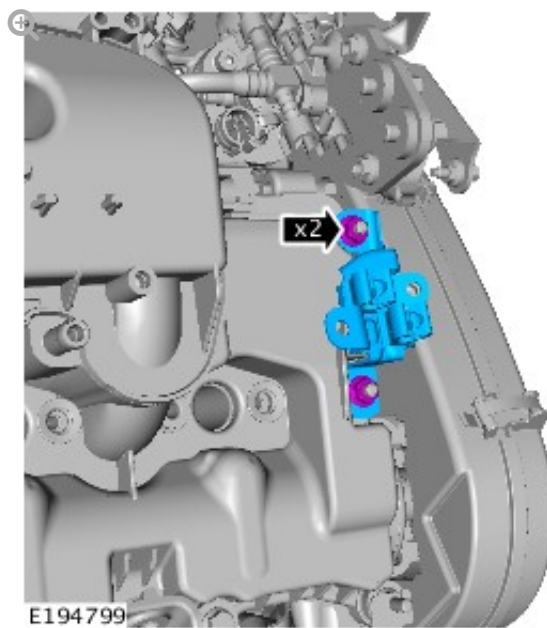
- Install a new gasket.
Renew Part: [Camshaft cover gasket](#).
- **Torque: 10 Nm**

96.



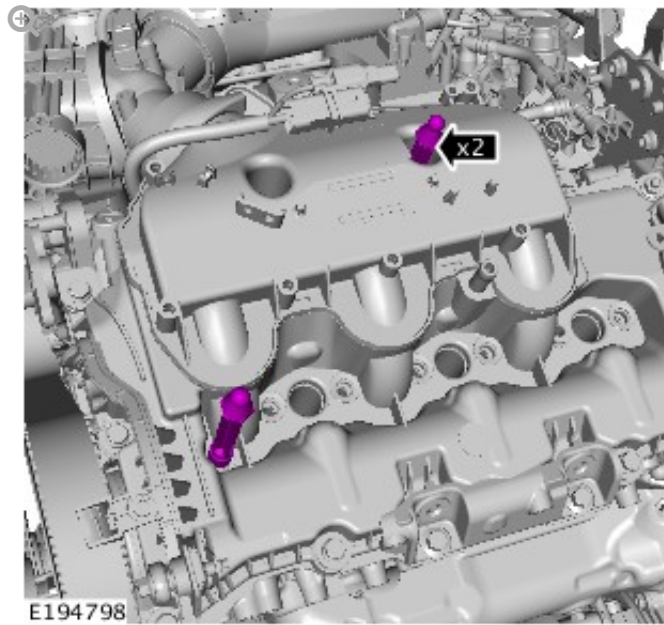
Torque: 24 Nm

97.

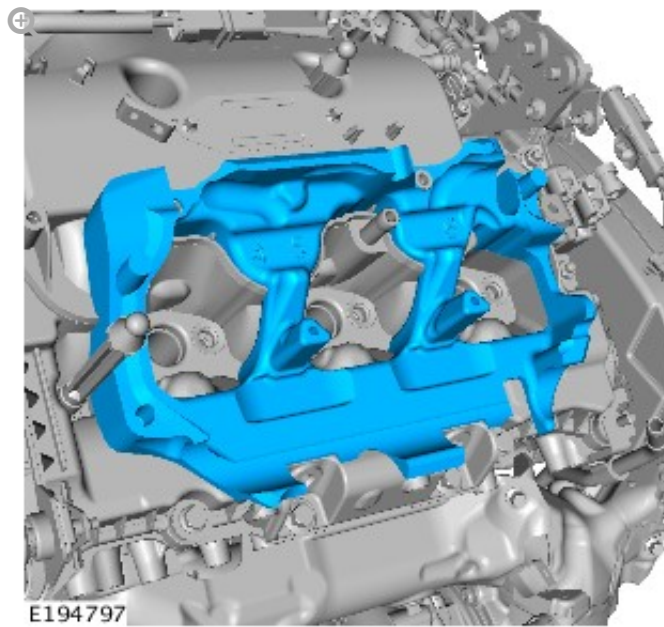


Torque: 10 Nm

98.

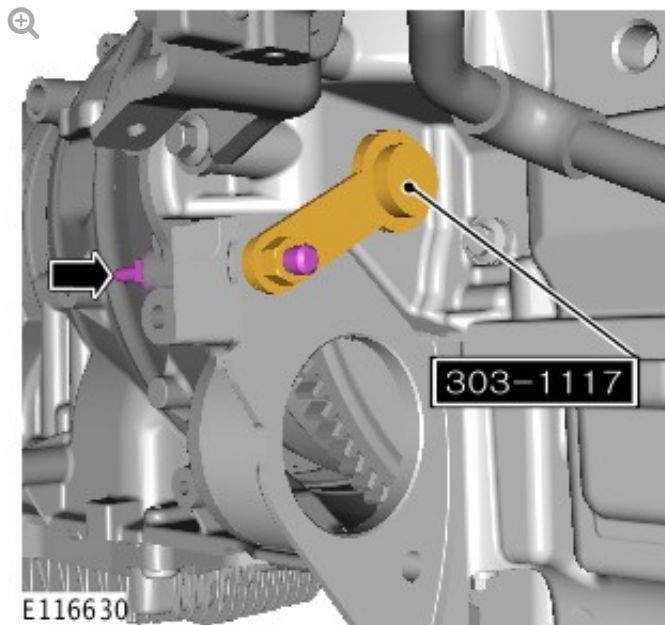


99.



Install the valve cover insulation.

100.



Install the special tool.

Special Tool(s): [303-1117](#)

101.

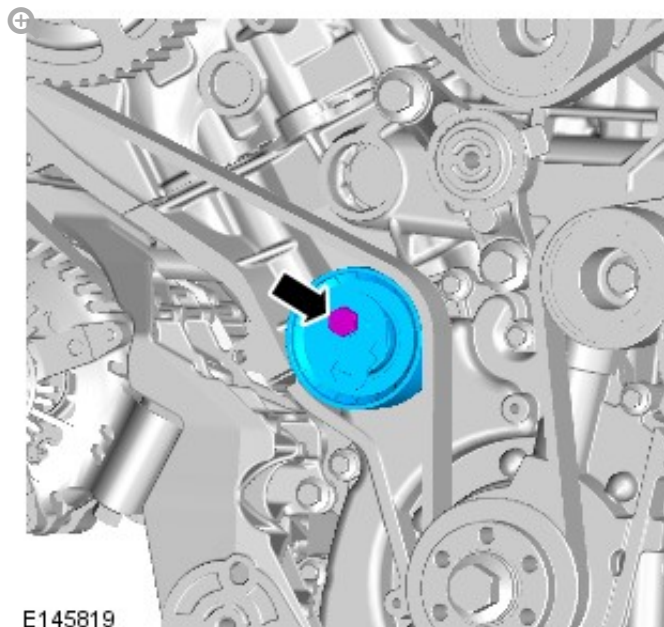


- Install the special tools.
- *Special Tool(s):* [303-1126](#)

102.

CAUTIONS:

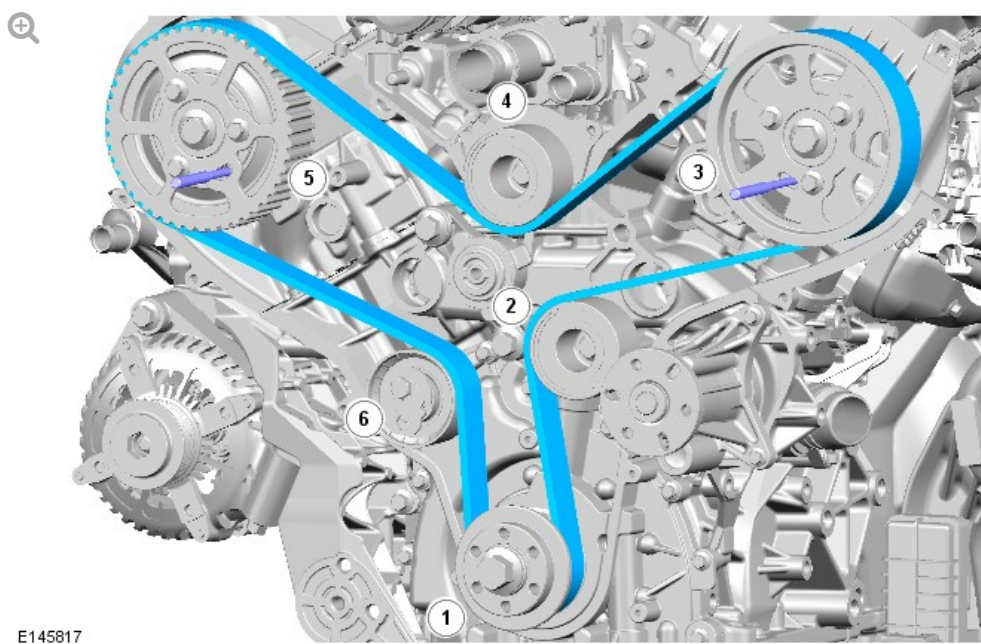
- Make sure that a new bolt is installed.
- Make sure that new componets are installed.



Only tighten the bolts finger tight at this stage.

Renew Part: *Timing belt and tensioner kit.*

103.



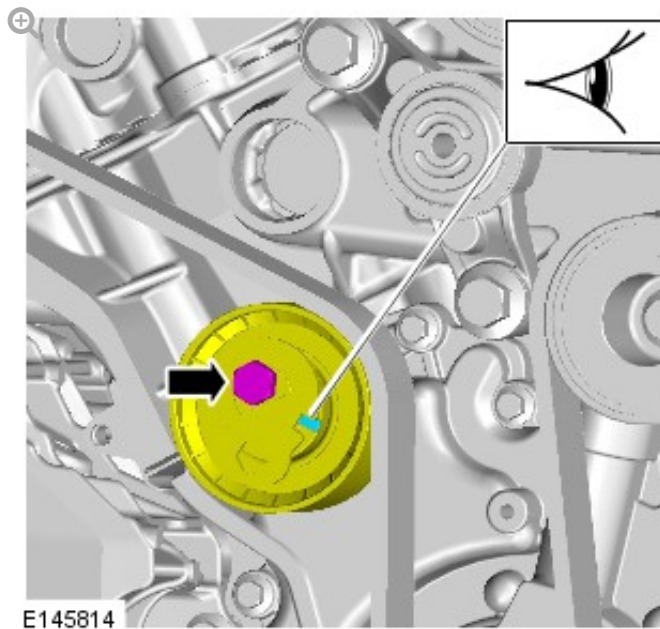
- Install the new timing belt.
- Starting at the crankshaft pulley, install the timing belt in a counter-clockwise direction, in the sequence shown.
- Stage one: Attach the timing belt to the crankshaft pulley.
- Stage two: Attach the timing belt to the idler pulley.

- 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.
- Stage six: Attach the timing belt to the timing belt tensioner.

104.

CAUTION:

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

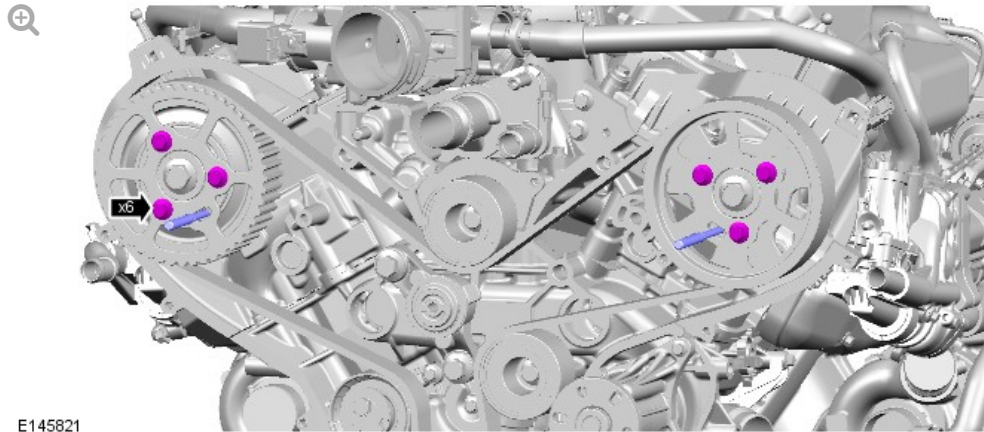


- Tension the timing belt.
- Rotate the tensioner assembly counter-clockwise.
- **Torque: 26 Nm**

105.

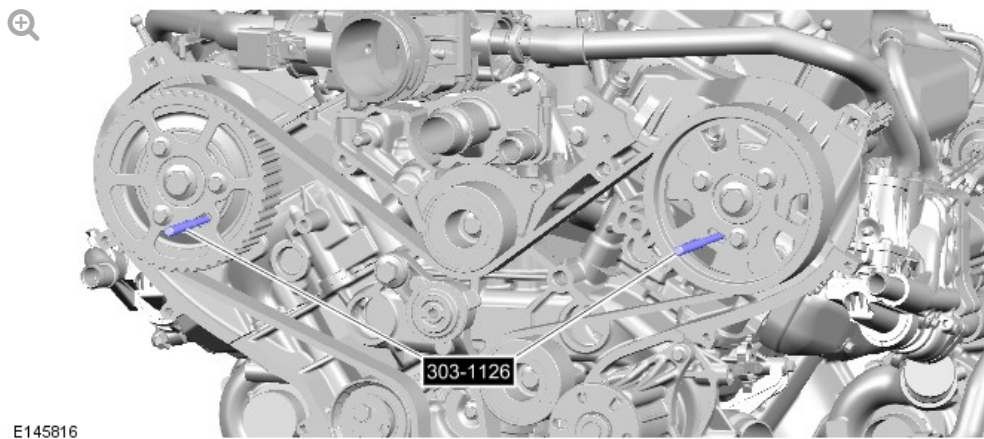
CAUTION:

Do not rotate camshafts against locking peg. Failure to follow this instruction may result in damage to the engine or the special tools.



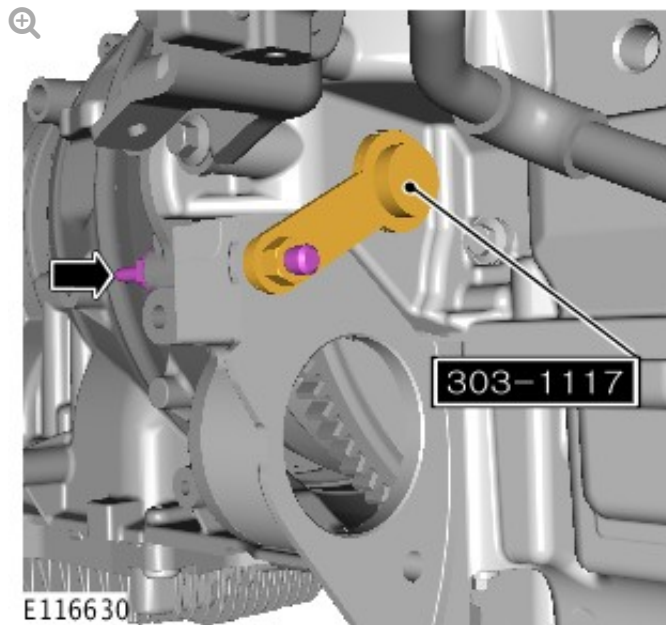
- Using a suitable tool, counterhold the camshaft pulley center retaining bolts.
- **Torque: 23 Nm**

106.



Remove the special tools.

107.



Remove the special tool.

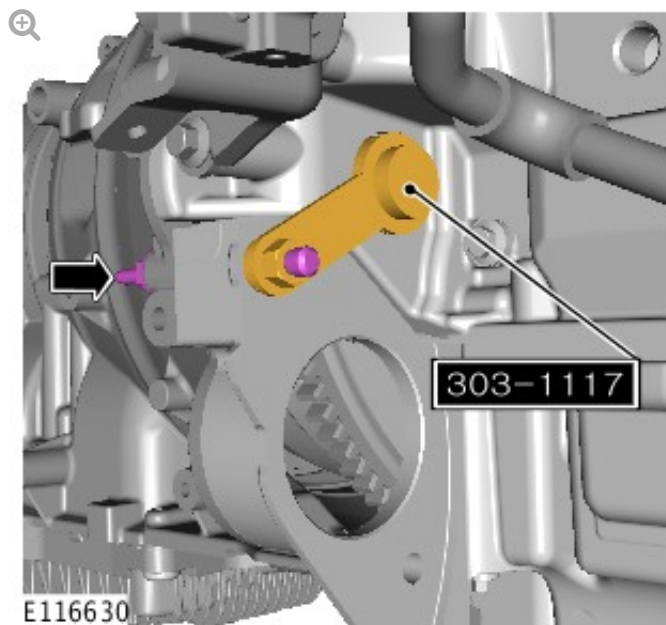
108.

CAUTION:

Only rotate the crankshaft clockwise.

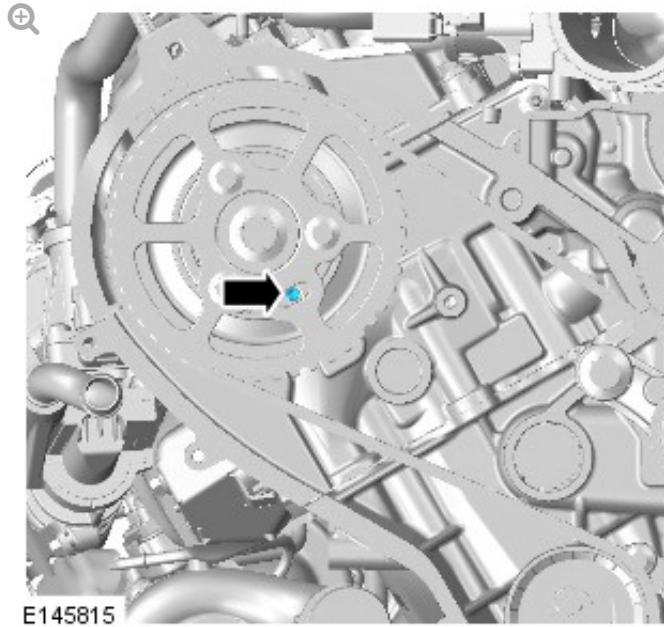
Rotate the engine two complete turns clockwise.

109.



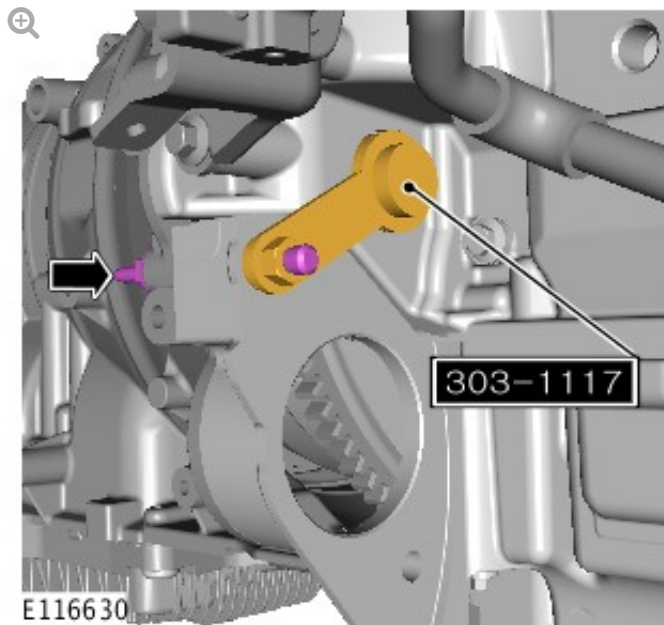
Install the special tool.

110.



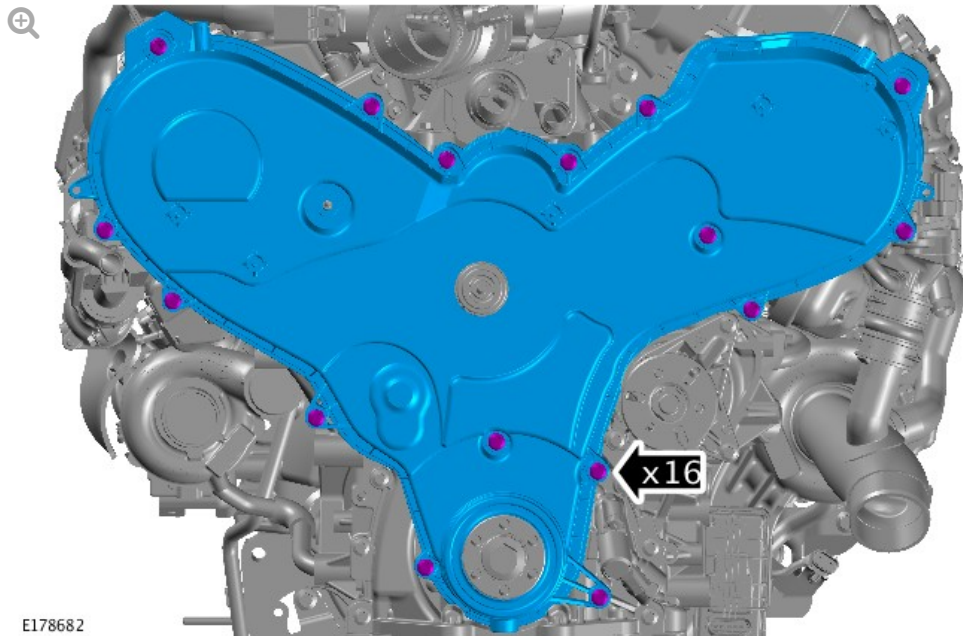
- Install the special tools to the exhaust camshaft pulleys.
- If the special tool does not fit correctly, repeat the timing belt installation procedure.
- Remove the special tools from the camshaft pulleys.

111.



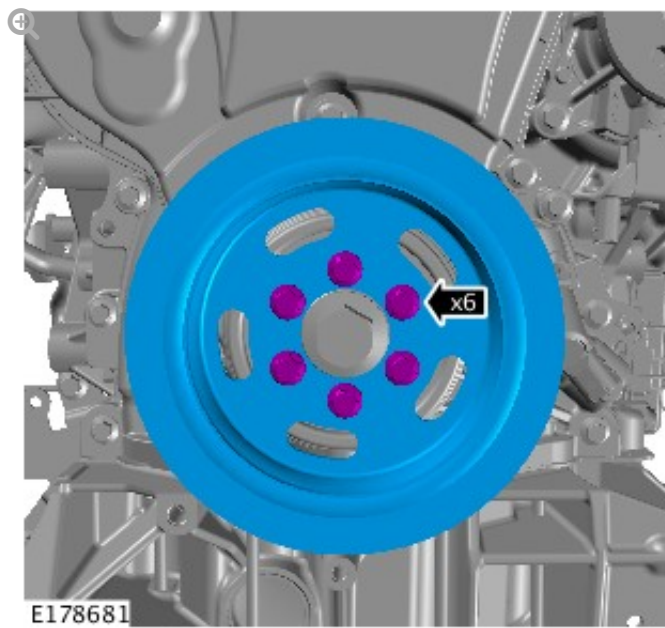
Remove the special tool.

112.



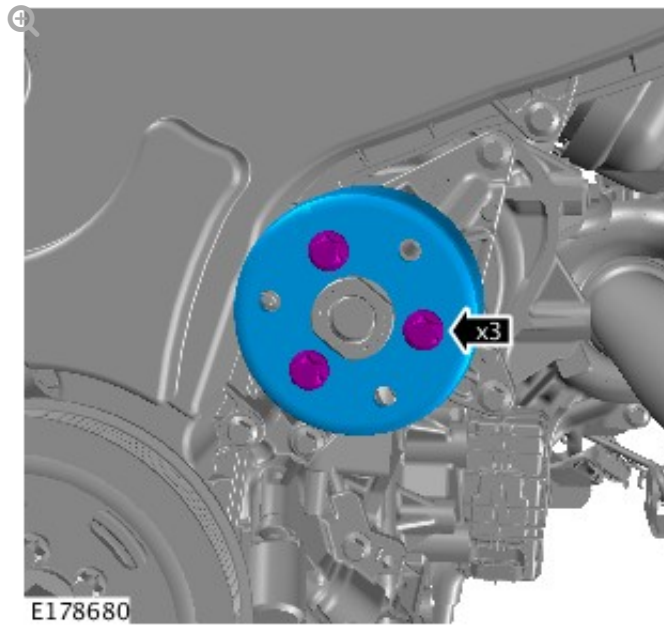
- Install the timing belt cover.
- **Torque: 10 Nm**

113.



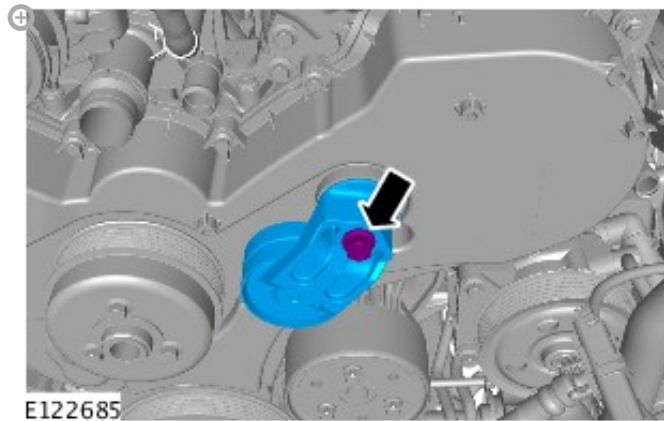
- Install the crankshaft pulley.
- **Torque: 25 Nm**

114.



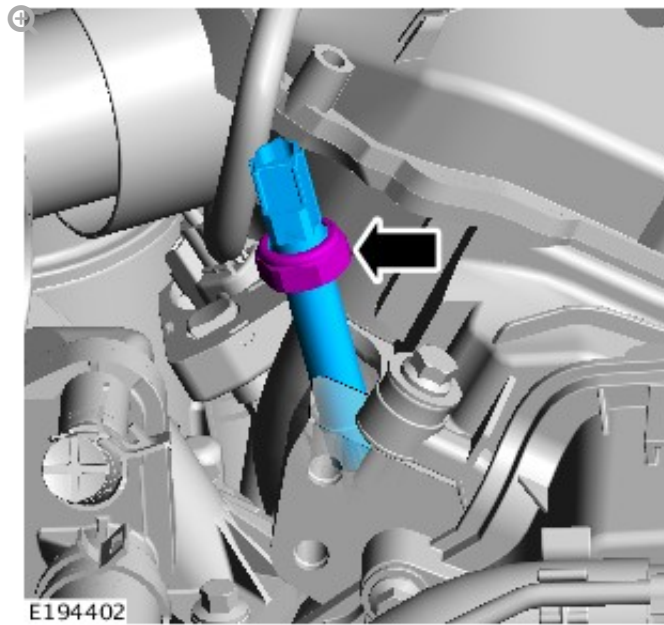
- Install the coolant pump pulley.
- *Torque: 25 Nm*

115.



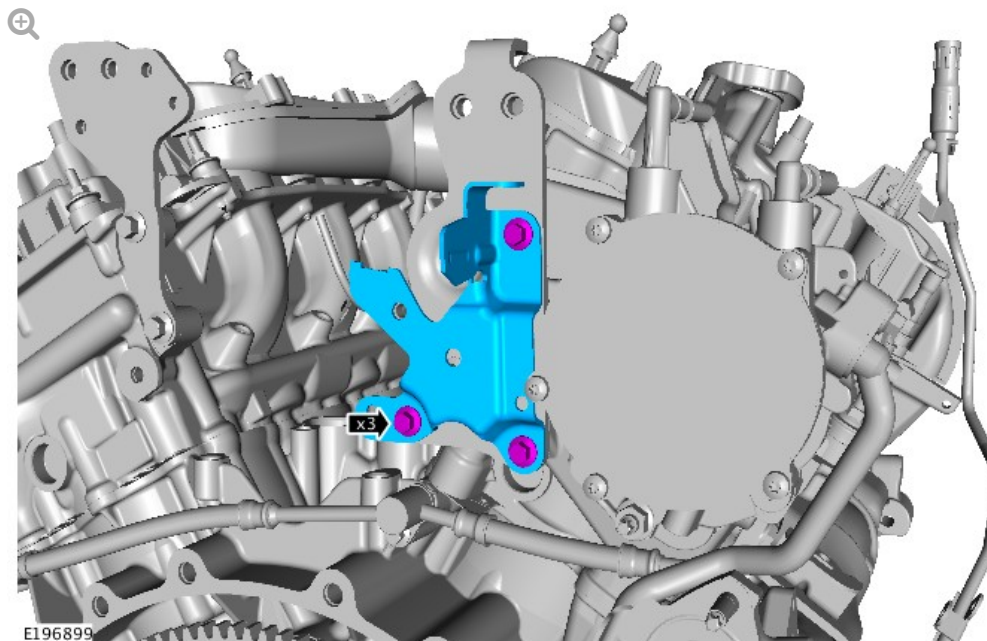
- Install the accessory drive belt idler pulley.
- *Torque: 50 Nm*

116.



- Install the engine oil pressure (EOP) sensor.
- *Torque: 14 Nm*

117.



Torque: 10 Nm

118.

NOTE:

Please follow this procedure up to step 16.

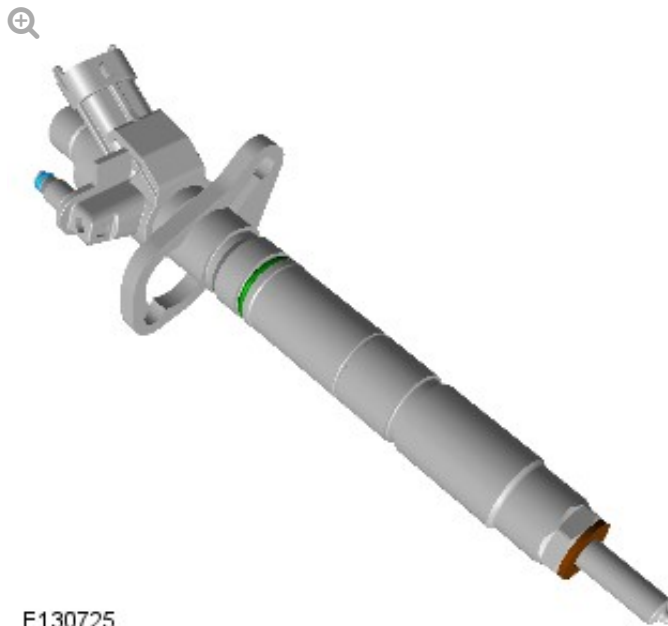
Install the fuel pump.

Refer to: [Intake Air Shutoff Throttle](#) (303-04A Fuel Charging and Controls - TDV6 3.0L Diesel, Removal and Installation).

119.

NOTE:

Repeat this step for the remaining fuel injectors.



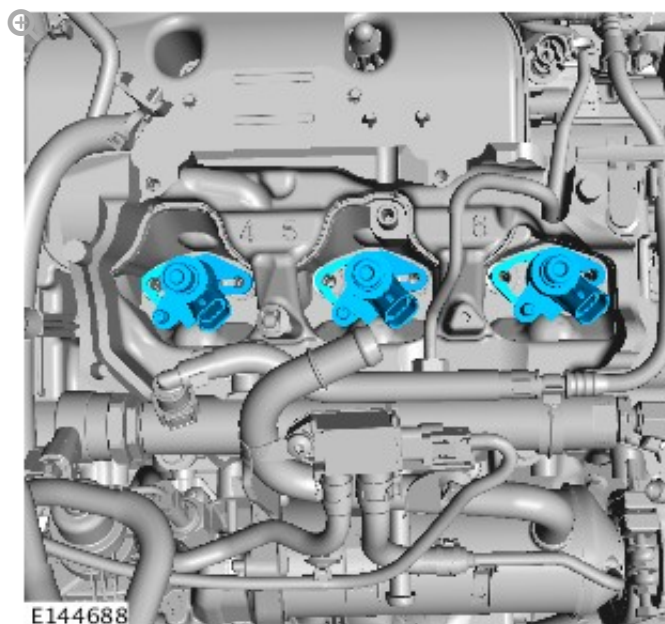
E130725

- Install new O-ring seals.
Renew Part: [Fuel injector O-ring seals](#).
- Install a new sealing washer.
Renew Part: [Fuel injector washers](#).

120.

NOTE:

Repeat this step for the remaining fuel injectors.

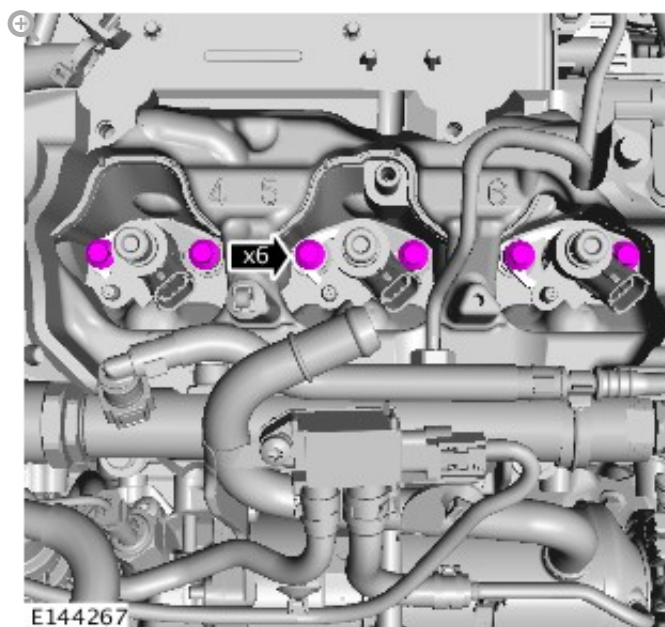


Install the fuel injectors.

121.

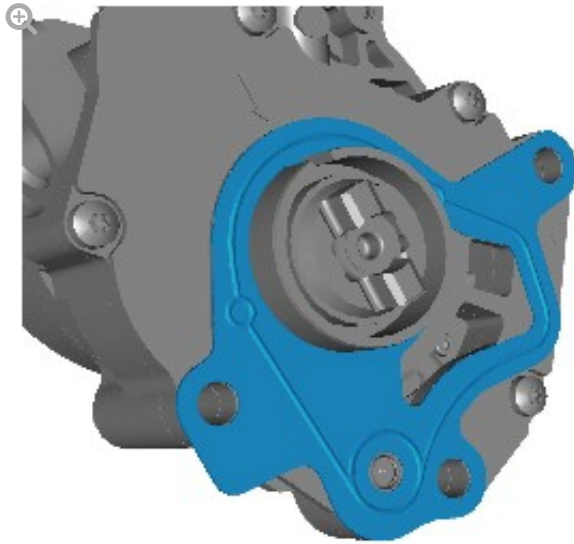
NOTE:

Repeat this step for the remaining fuel injectors.



Torque: 9 Nm

122.



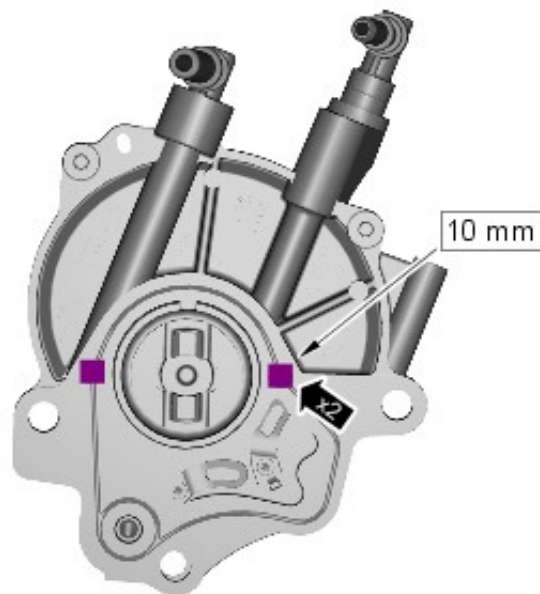
E124399

- Install a new brake vacuum pump seal.
Renew Part: [Brake vacuum pump seal](#).

123.

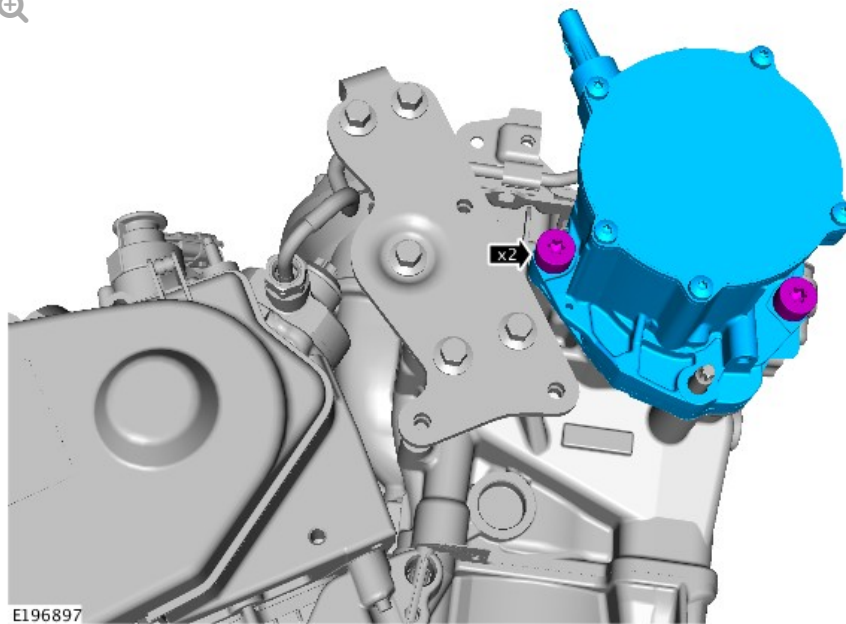
NOTES:

- Apply silicone gasket sealant or equivalent meeting Land Rover specification.
- The application of sealant must be 10 mm square in two places. Install the brake vacuum pump immediately after applying the sealant.
- The brake vacuum pump should be fitted directly to the engine without smearing the sealant.
- Make sure that the drive coupling is aligned with camshaft coupling.



E116820

124.



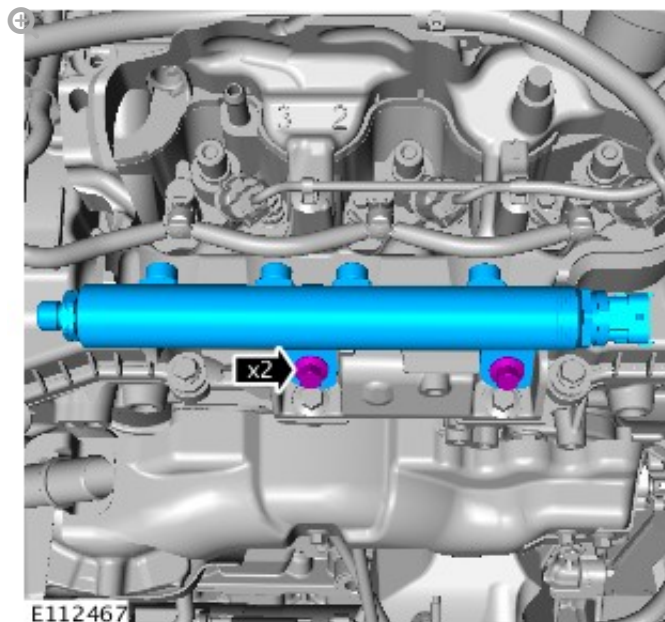
E196897

Torque: 23 Nm

125.

CAUTION:

Only tighten the bolts finger-tight at this stage.

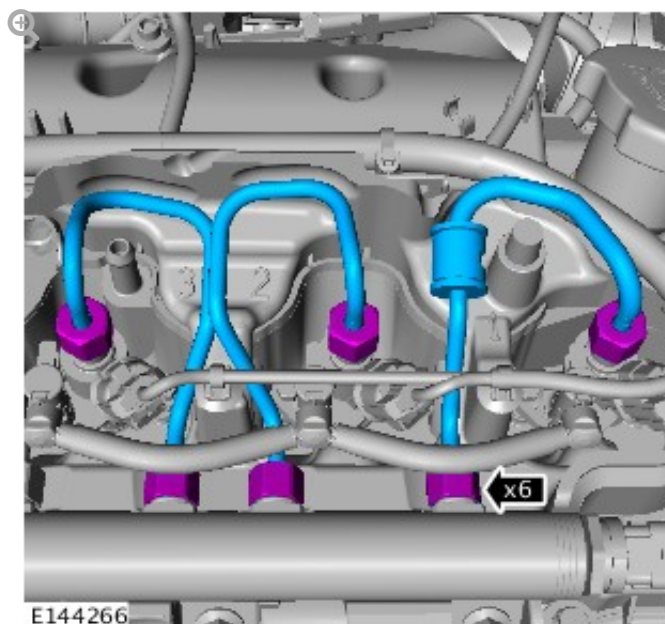


Install the fuel rail.

126.

CAUTIONS:

- Make sure that new components are installed.
- Only tighten the unions finger-tight at this stage.



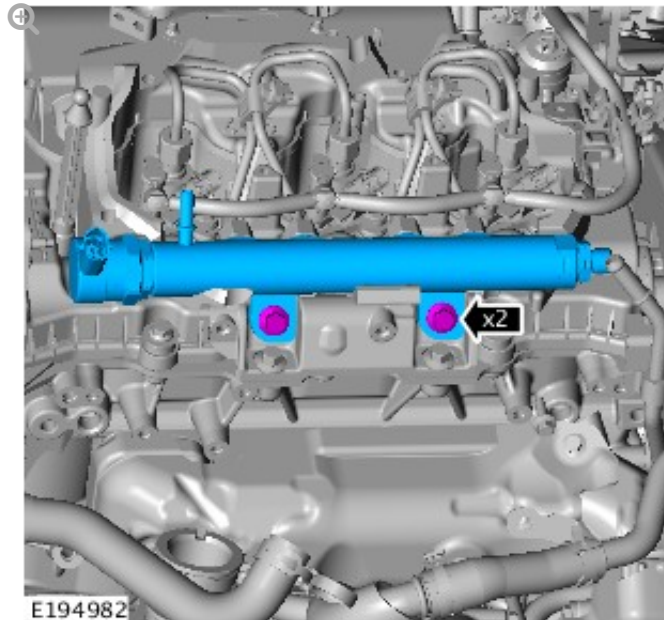
Install the fuel pipes.

Renew Part: *Fuel injector high pressure pipes.*

127.

CAUTION:

Only tighten the bolts finger-tight at this stage.

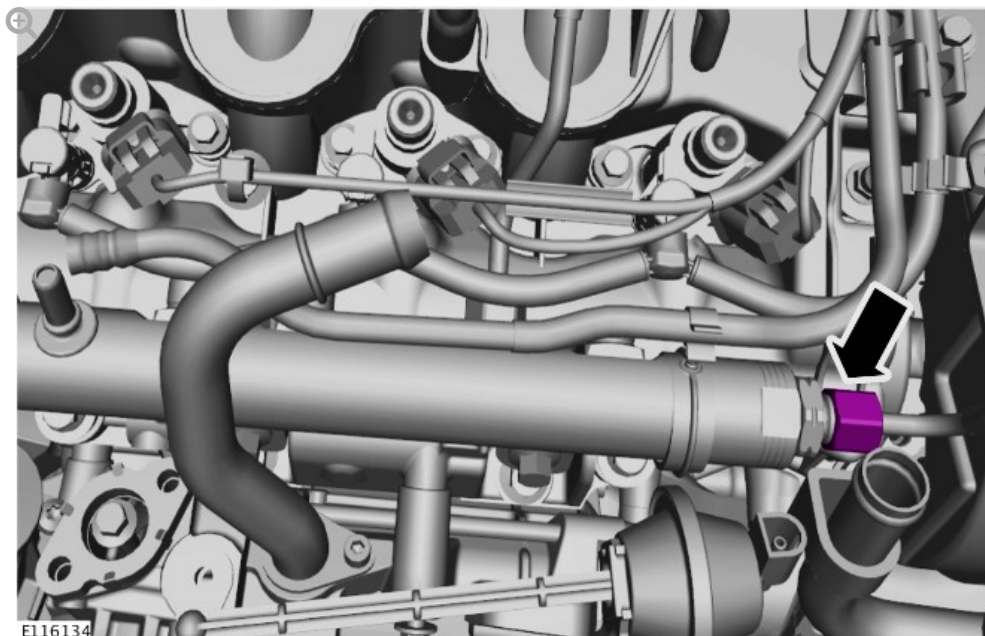


Install the fuel rail.

128.

CAUTION:

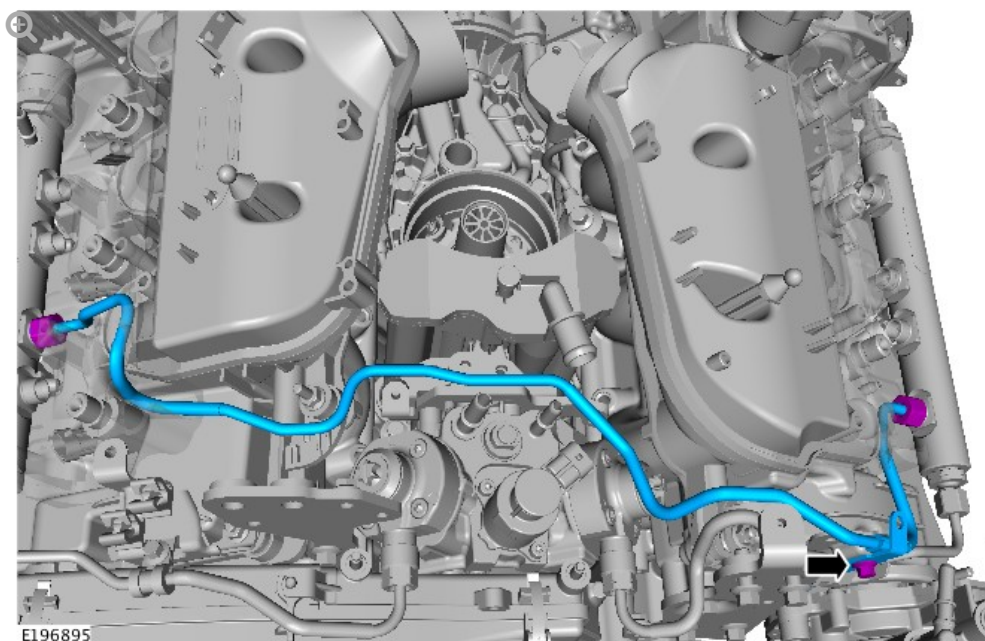
Tighten the fuel supply line unions finger tight.



129.

CAUTIONS:

- Make sure that new components are installed.
- Tighten the fuel supply line unions finger tight.

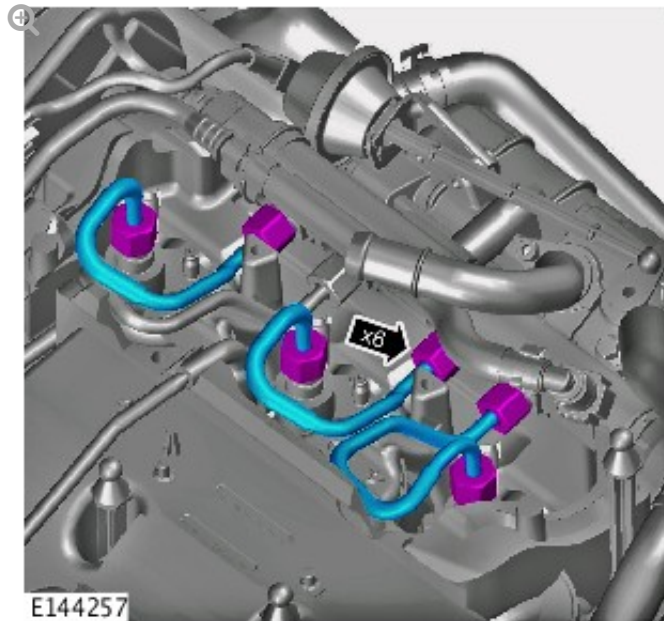


Renew Part: *Fuel rail balance pipe.*

130.

CAUTIONS:

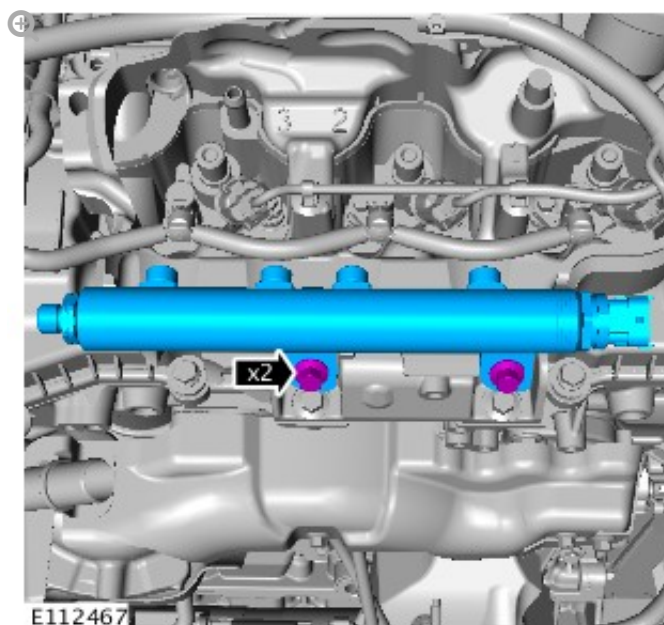
- Make sure that a new component is installed.
- Tighten the fuel supply line unions finger tight.



Install the fuel pipes.

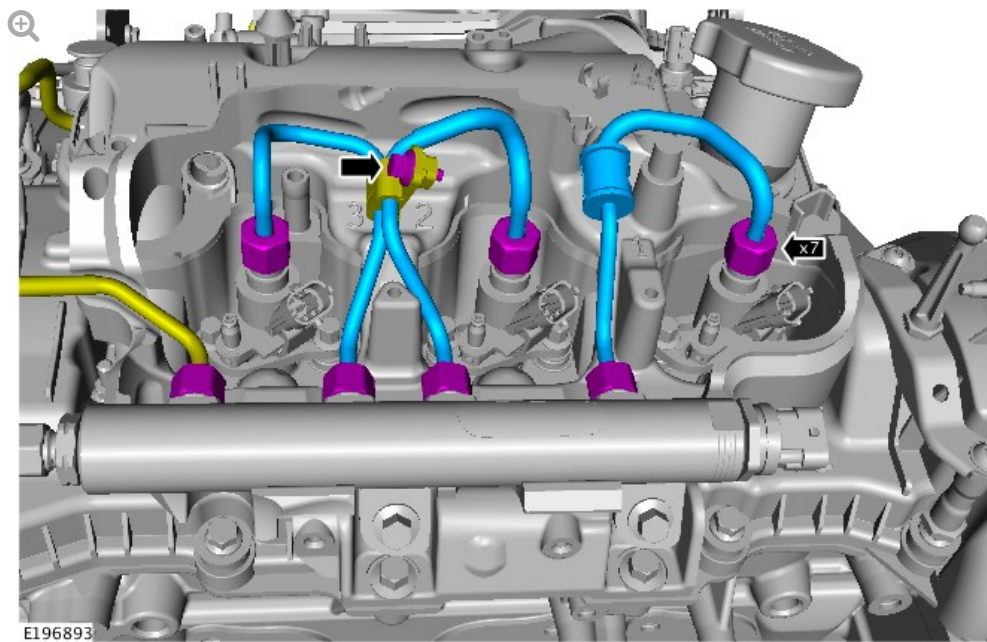
Renew Part: *Fuel injector high pressure pipes.*

131.



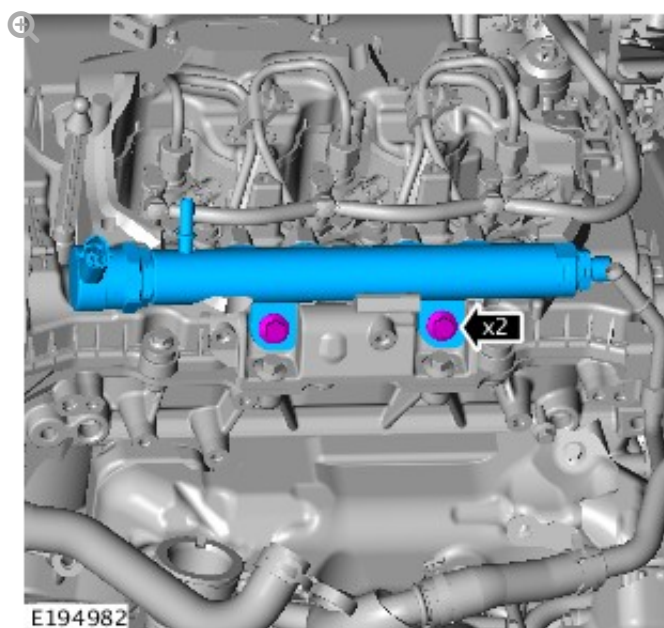
- Tighten the bolts.
- *Torque: 24 Nm*

132.



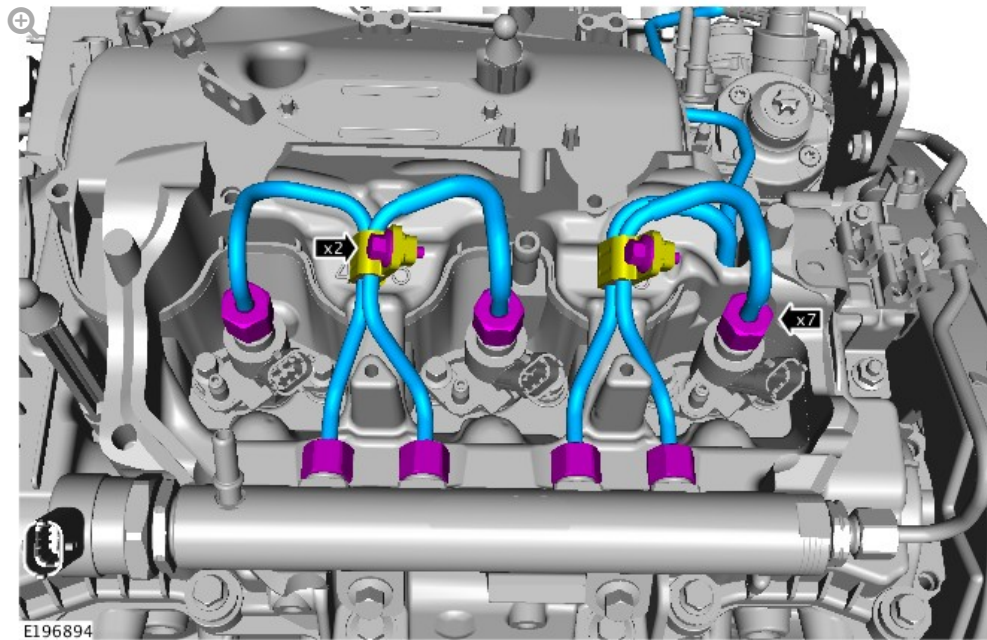
- Install the fuel pipe clamp.
- *Torque: 9 Nm*
- Tighten the high-pressure fuel unions.
- *Torque: 15 Nm*

133.



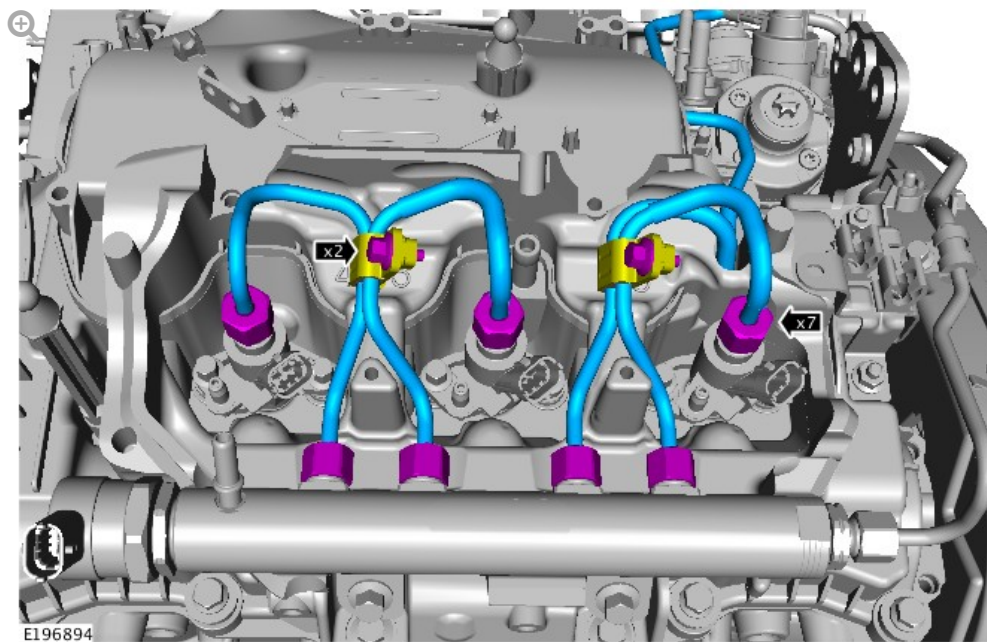
Torque: 24 Nm

134.



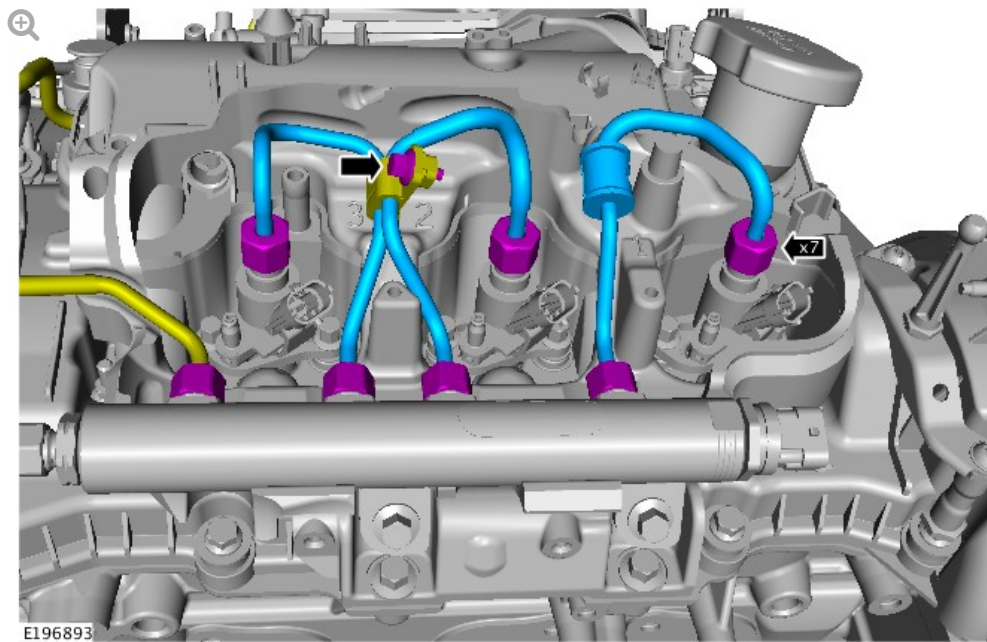
- Install the fuel pipe clamps.
- *Torque: 9 Nm*
- Tighten the high-pressure fuel unions.
- *Torque: 15 Nm*

135.



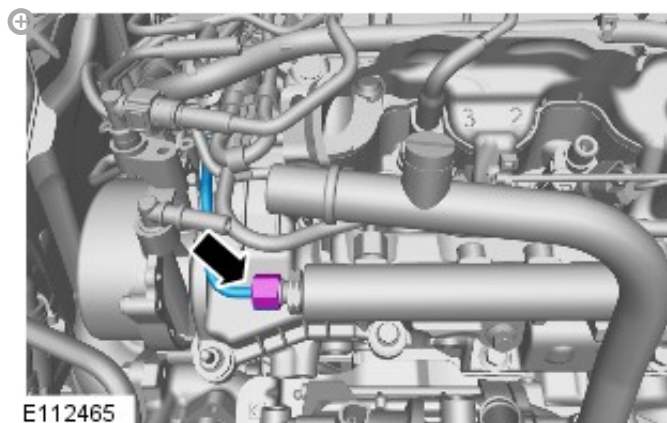
- Tighten the high-pressure fuel unions.
- *Torque: 35 Nm*

136.



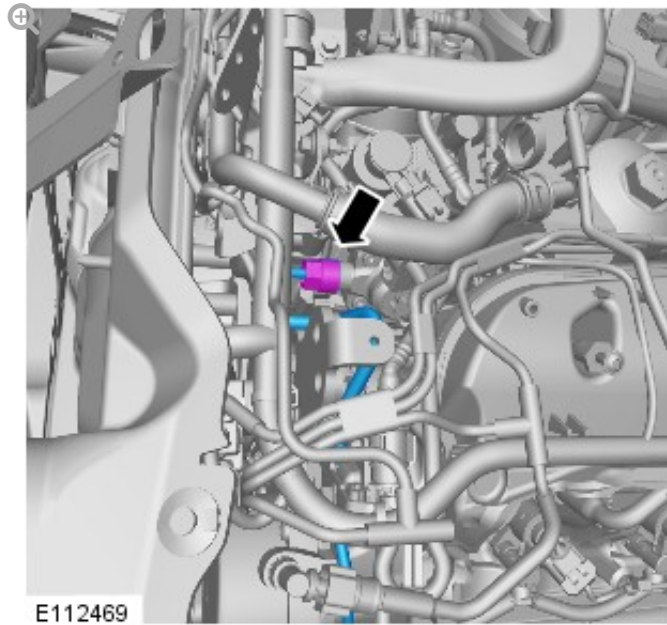
- Tighten the high-pressure fuel unions.
- **Torque: 35 Nm**

137.



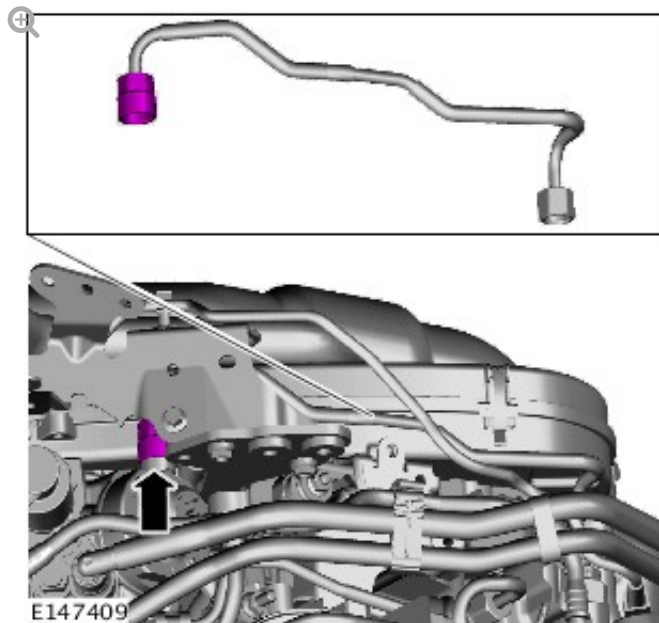
- Tighten the high-pressure fuel unions.
- **Torque: 15 Nm**

138.



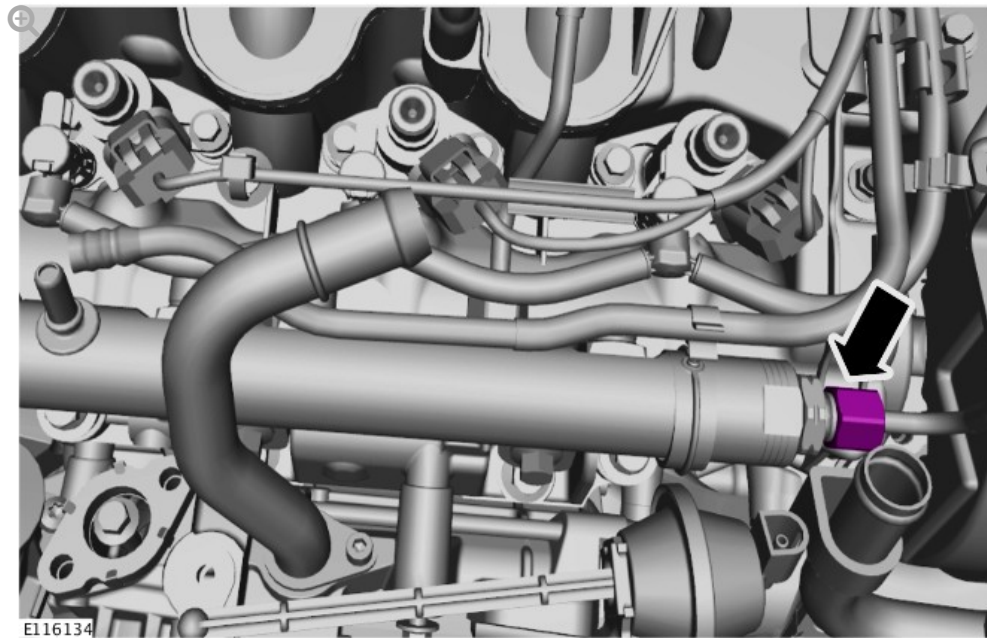
- Tighten the high-pressure fuel unions.
- *Torque: 15 Nm*

139.



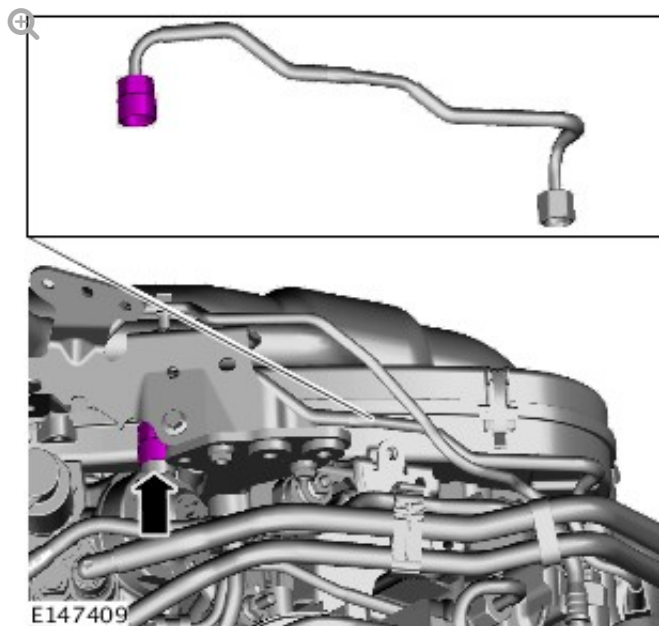
- Tighten the high-pressure fuel unions.
- *Torque: 15 Nm*

140.



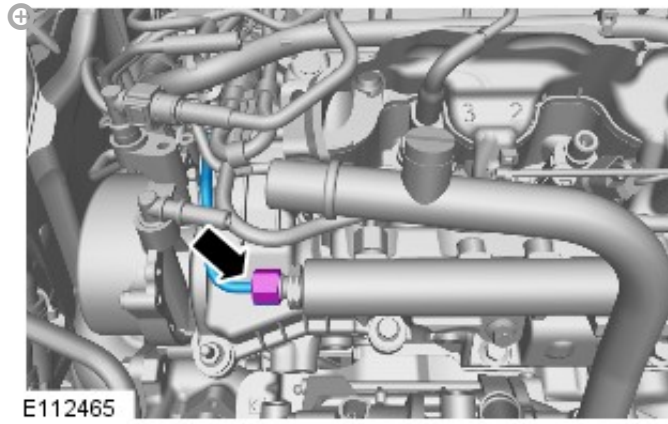
- Tighten the high-pressure fuel unions.
- **Torque: 35 Nm**

141.



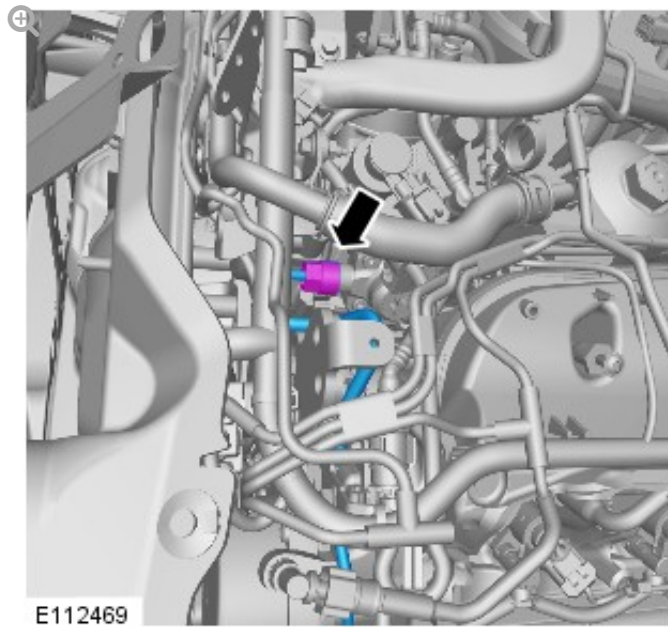
- Tighten the high-pressure fuel unions.
- **Torque: 35 Nm**

142.



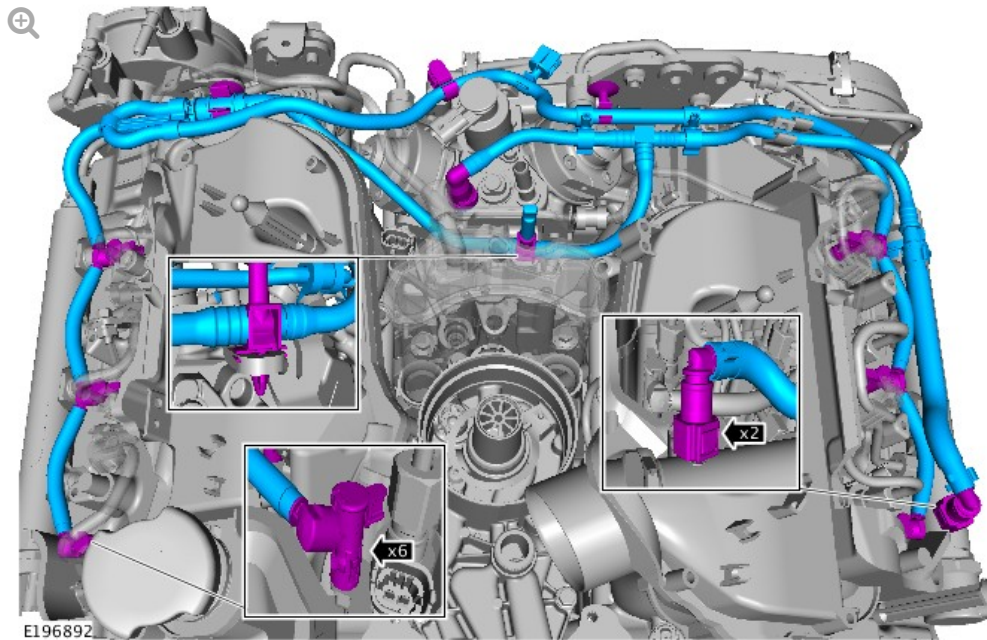
- Tighten the high-pressure fuel unions.
- *Torque: 35 Nm*

143.



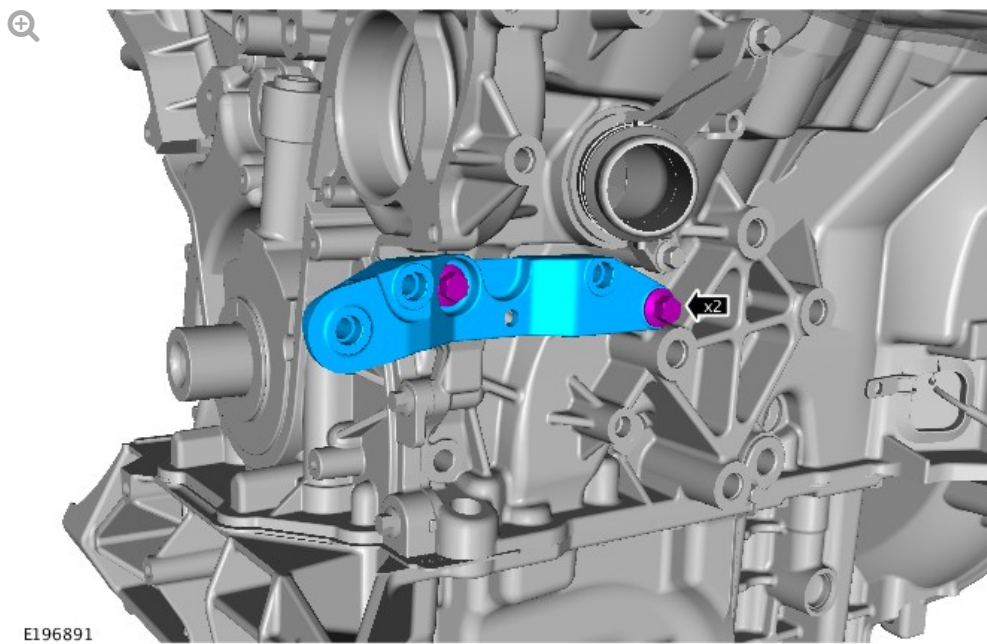
- Tighten the high-pressure fuel unions.
- *Torque: 35 Nm*

144.



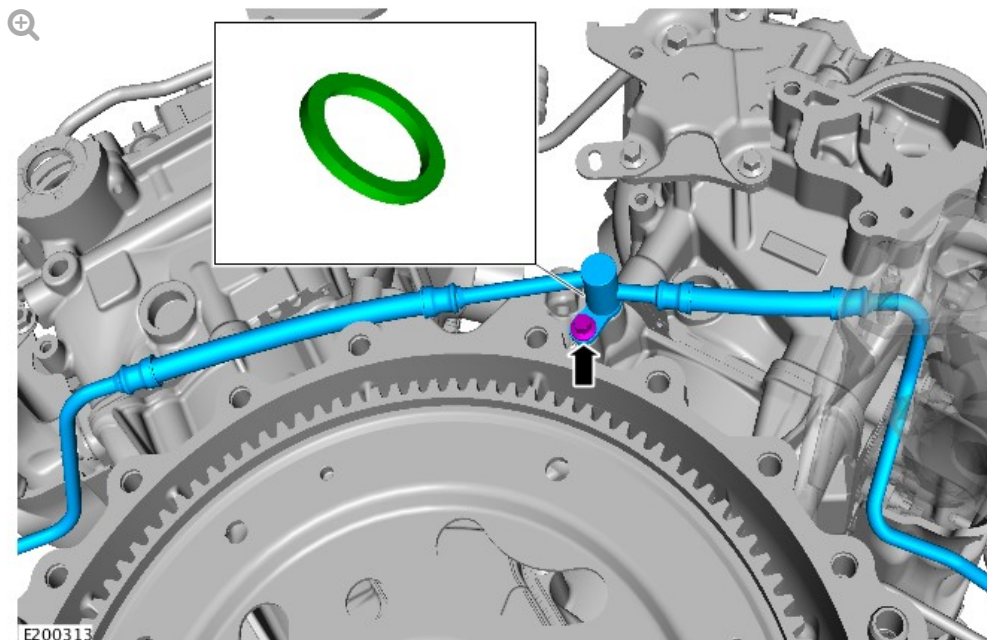
Install the low-pressure fuel supply and return lines.

145.



Install the Air Conditioning (A/C) compressor support bracket.

146.

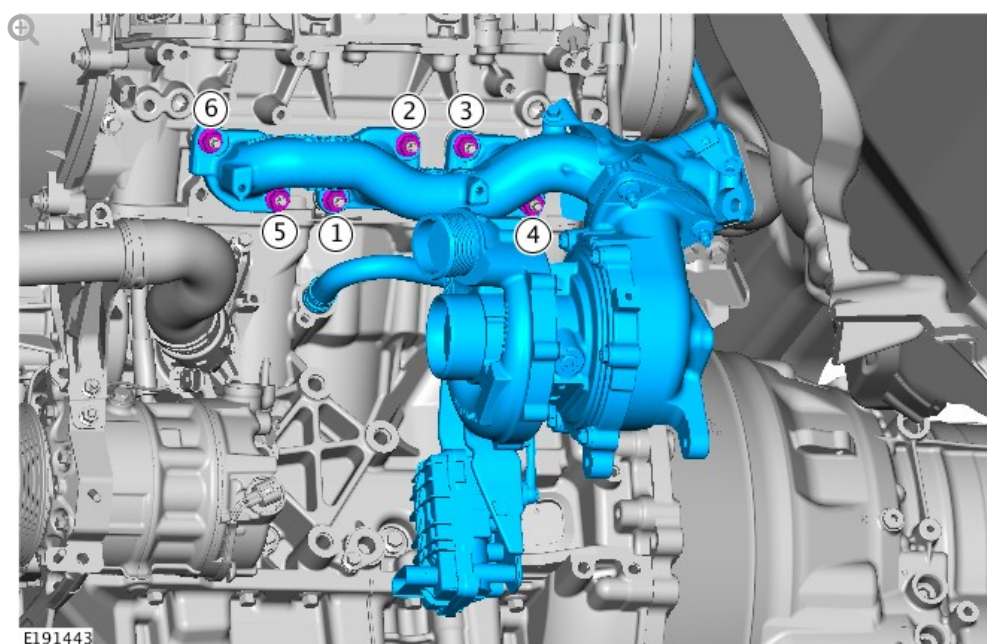


- Install a new O-ring seal.
Renew Part: *Turbocharger oil supply tube to engine O-rings.*
- Torque: 10 Nm

147.

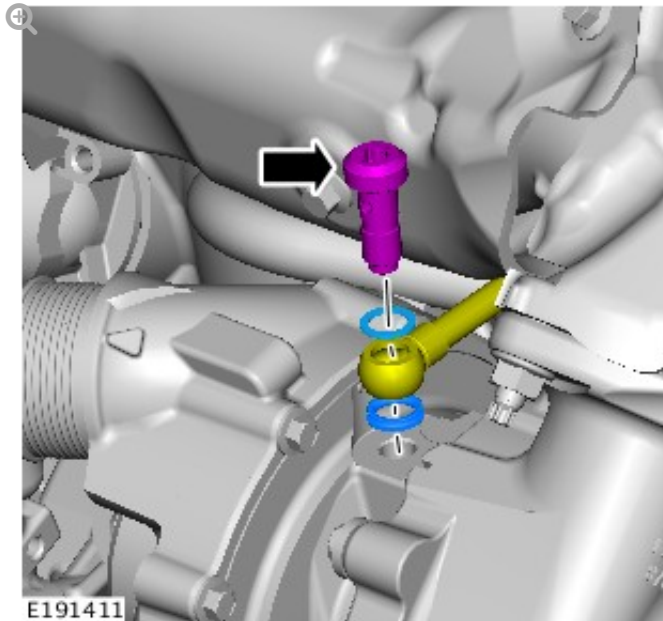
NOTE:

Tighten the retaining nuts in the sequence shown.



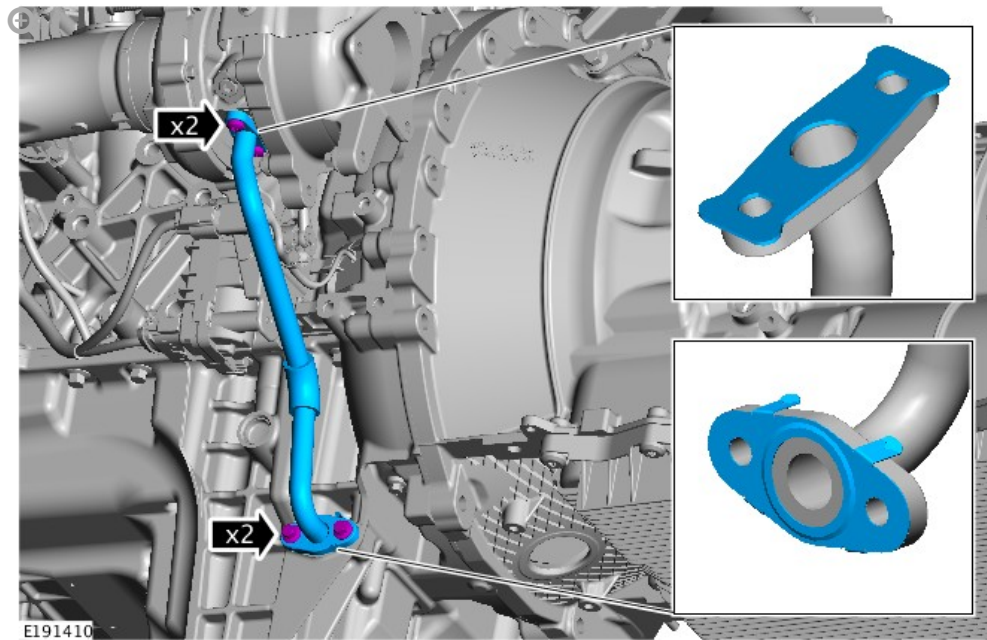
- Install a new exhaust manifold gasket.
Renew Part: [Exhaust manifold gasket](#).
- Install new nuts.
Renew Part: [Exhaust manifold to cylinder head nuts](#).
Torque:
Stage 1: **5 Nm**
Stage 2: **28 Nm**

148.



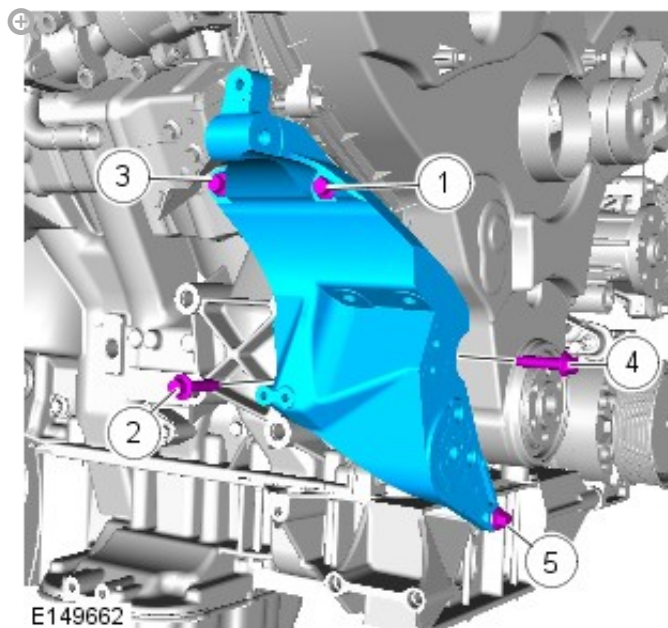
- Install new sealing washers.
Renew Part: [Turbocharger oil feed pipe banjo bolt washers](#).
- Install a new bolt.
Renew Part: [Turbocharger oil feed pipe banjo bolt](#).
- *Torque: **30 Nm***

149.



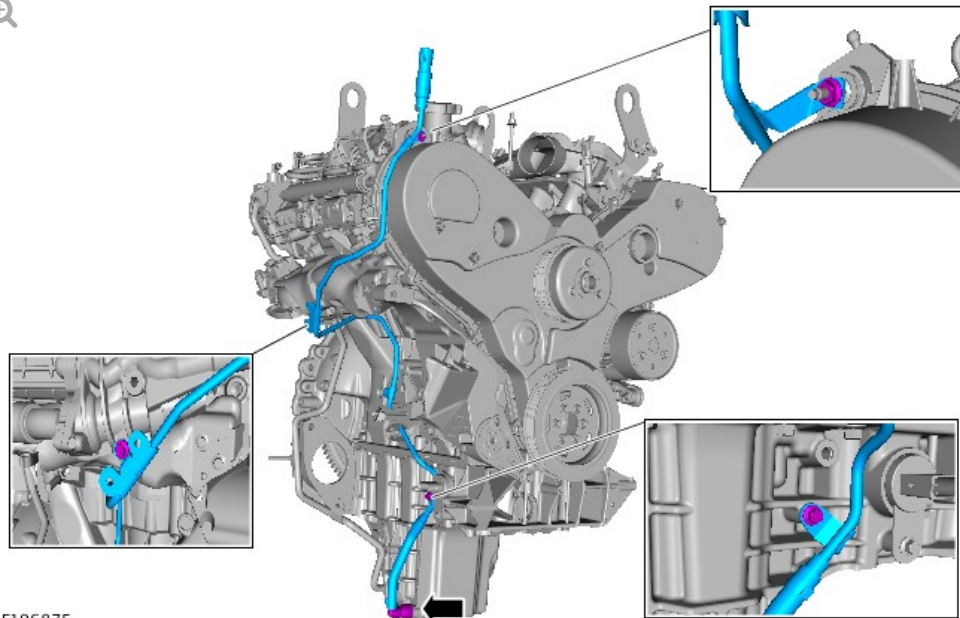
- Install new gaskets.
Renew Part: [Turbocharger oil return pipe gasket](#).
- **Torque: 9 Nm**

150.



- Tighten the retaining bolts in the sequence shown.
- **Torque: 22 Nm**

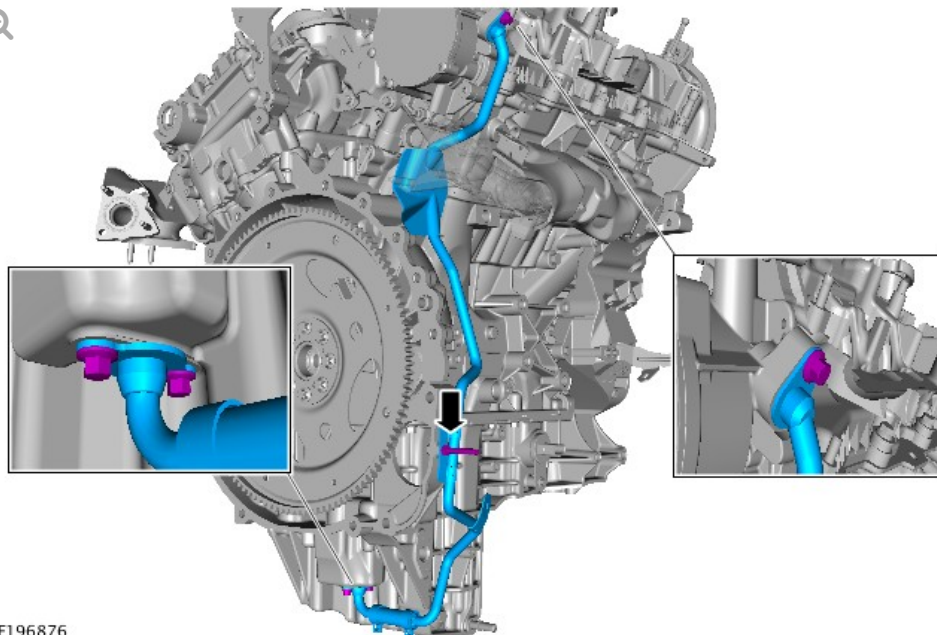
151.



E196875

- Install the oil extraction tube.
- **Torque: 9 Nm**

152.

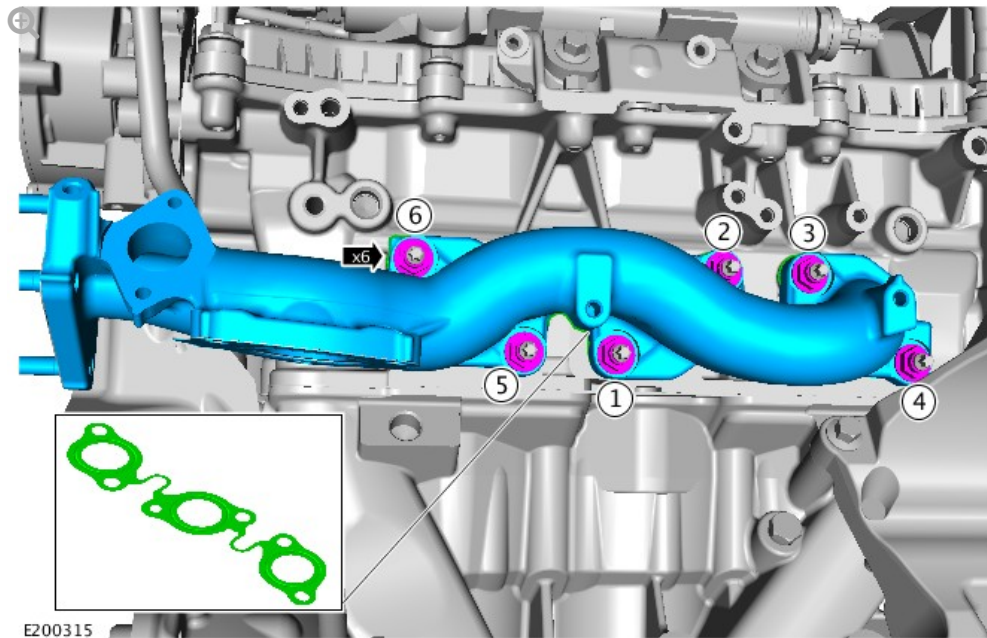


E196876

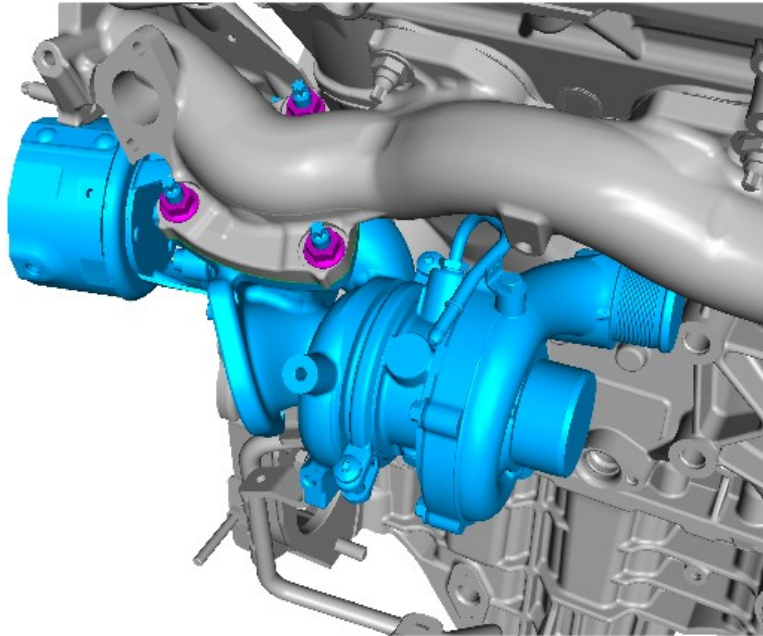
- Install the oil scavenge pipe.
- **Torque: 9 Nm**

NOTE:

Tighten the retaining nuts in the sequence shown.



- Install a new exhaust manifold gasket.
Renew Part: [Exhaust manifold gasket](#).
- Install new nuts.
Renew Part: [Exhaust manifold to cylinder head nuts](#).
Torque: 28 Nm



E196880

- **NOTE:**

If fitted - Replace the turbocharger to exhaust manifold gasket.

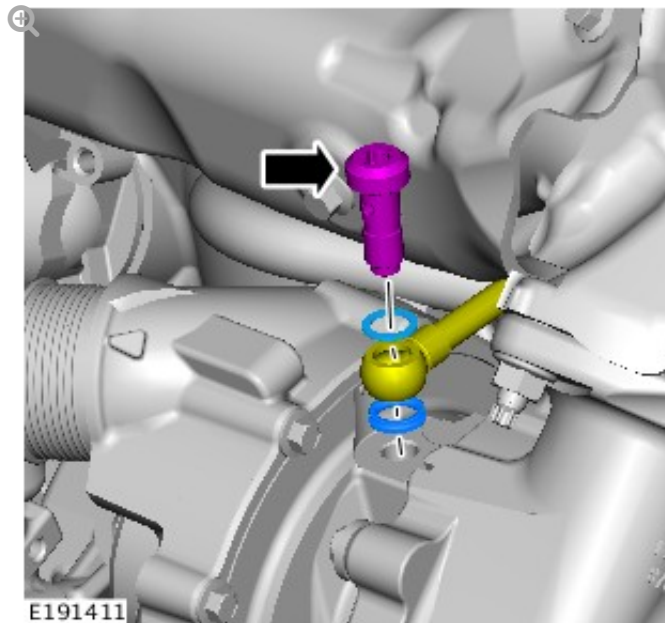
Install the turbocharger.

Renew Part: *Turbocharger to exhaust manifold gasket.*

- Install new nuts.

Renew Part: *Exhaust manifold to turbocharger nuts.*

- Torque: **24 Nm**



■ **NOTE:**

If fitted:

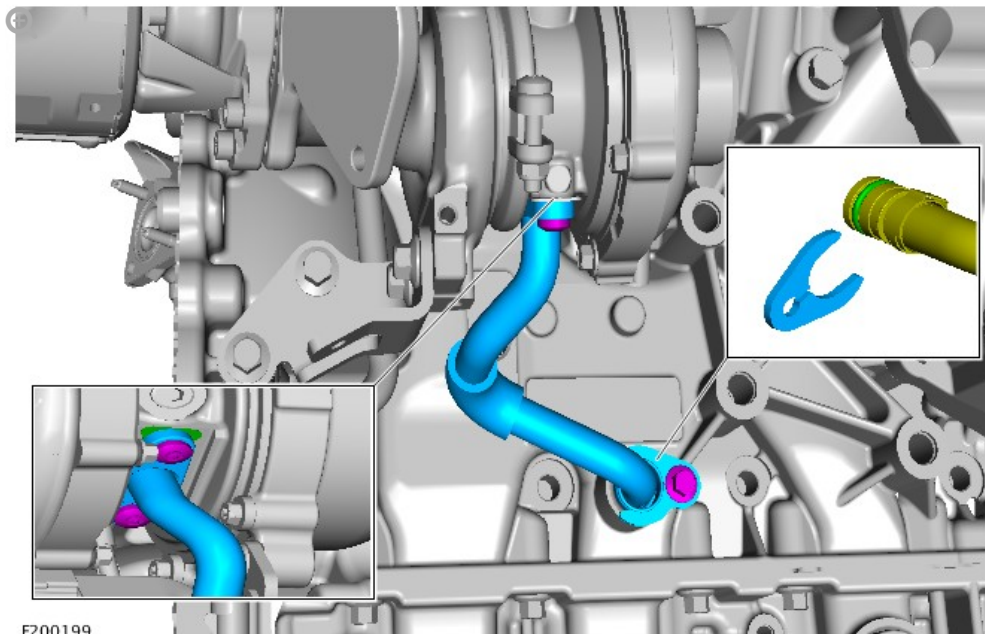
Install new sealing washers.

Renew Part: *Turbocharger oil feed pipe banjo bolt washers.*

- Install a new bolt.

Renew Part: *Turbocharger oil feed pipe banjo bolt.*

- **Torque: 30 Nm**



E200199

- **NOTE:**

If fitted:

Install a new gasket.

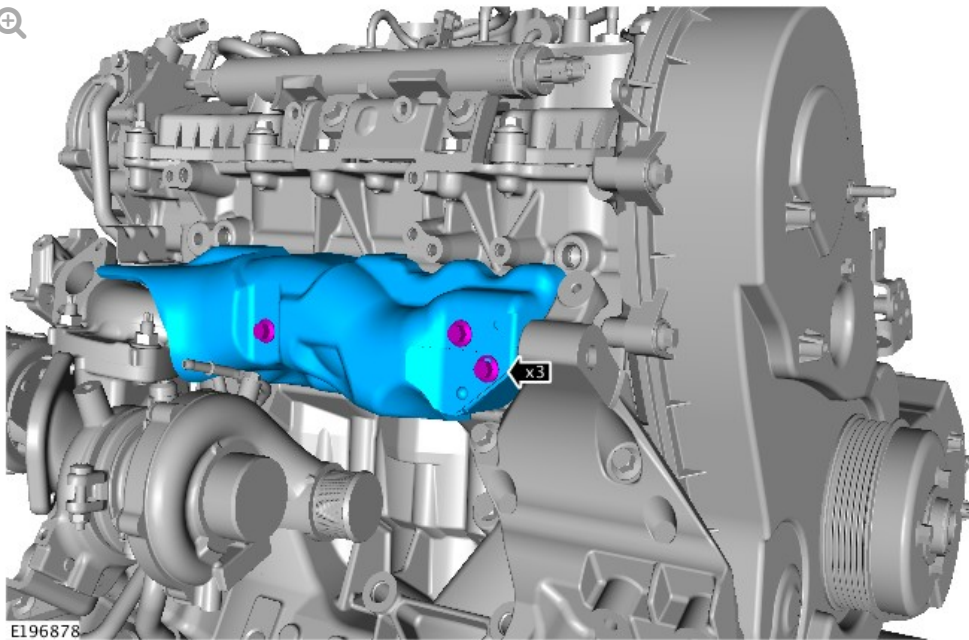
Renew Part: [Turbocharger oil return pipe gasket](#).

- Install a new O-ring seal.

Renew Part: [Oil return pipe O-ring seal](#).

- **Torque: 9 Nm**

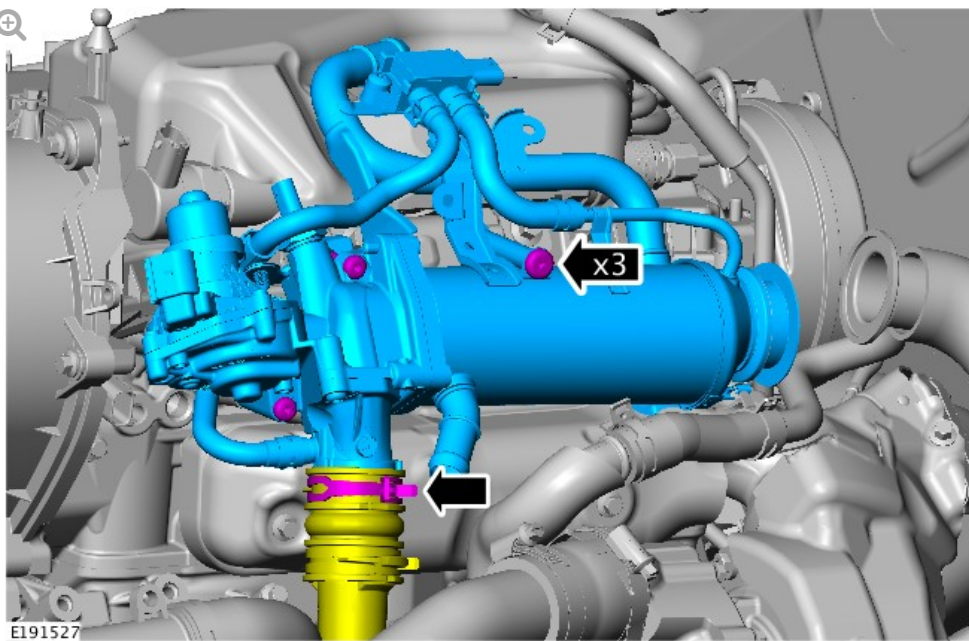
157.



Install the exhaust manifold cover.

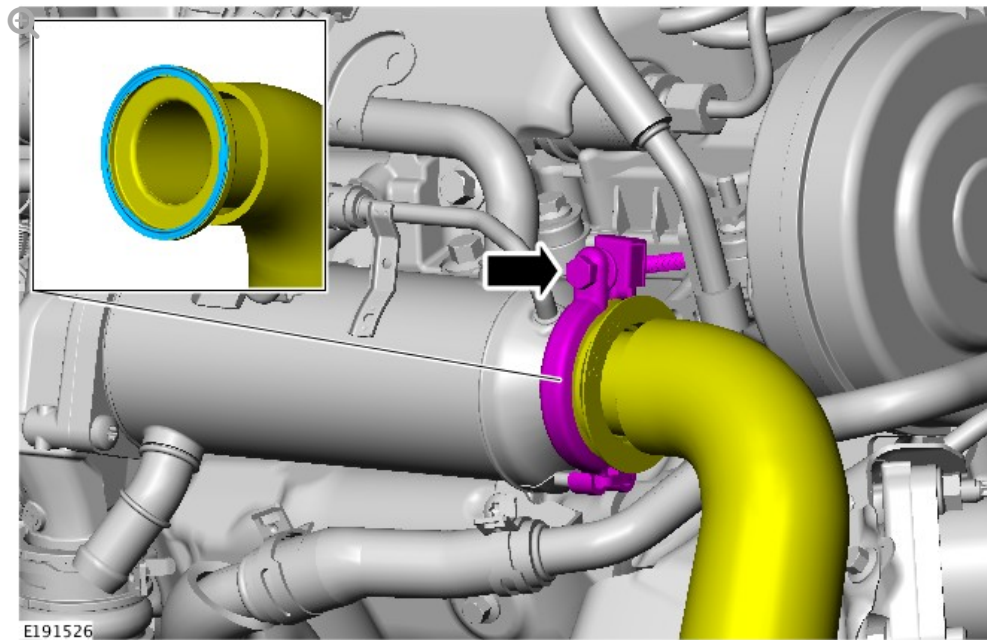
Torque: 10 Nm

158.



Install the EGR valve.

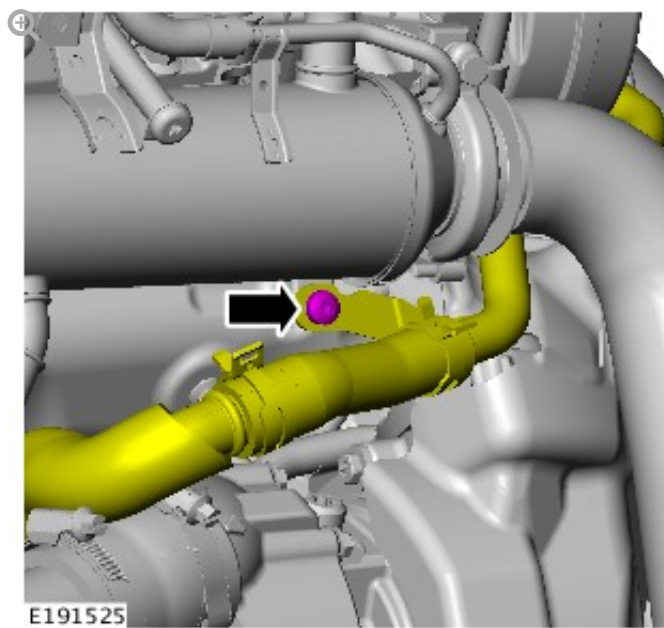
159.



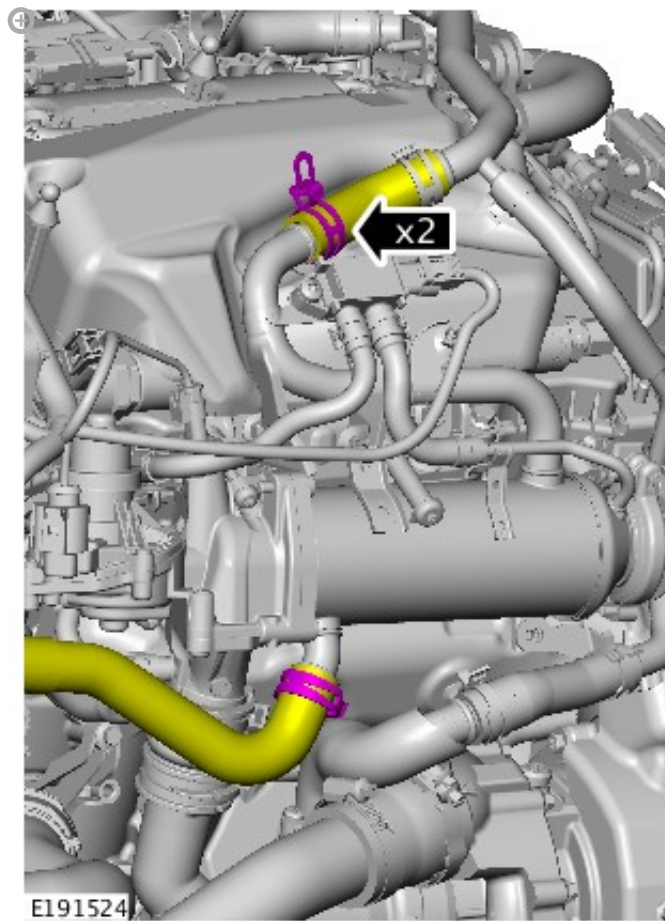
Install a new gasket.

Renew Part: *Exhaust gas recirculation pipe gasket.*

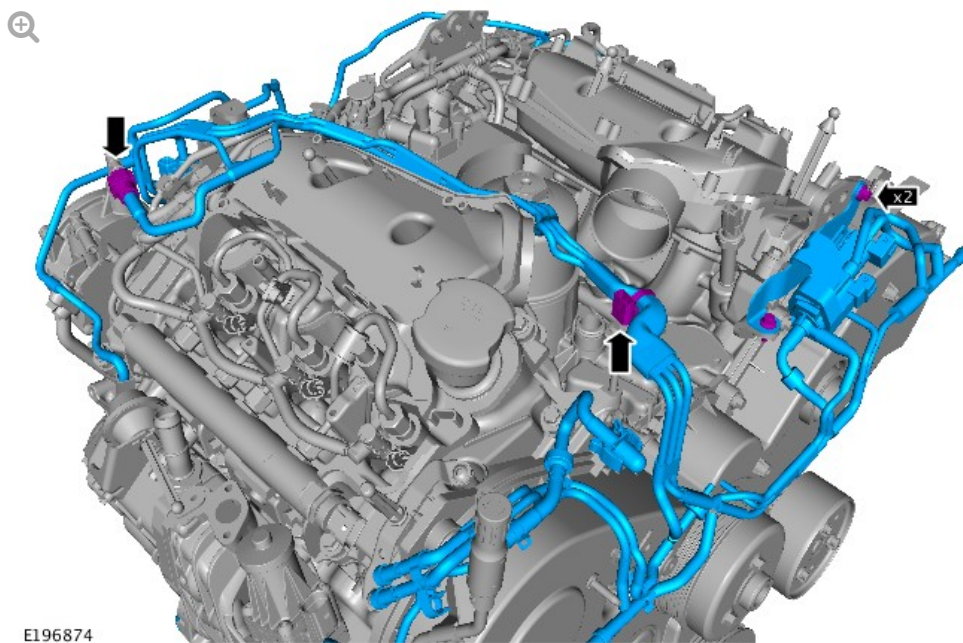
160.



161.

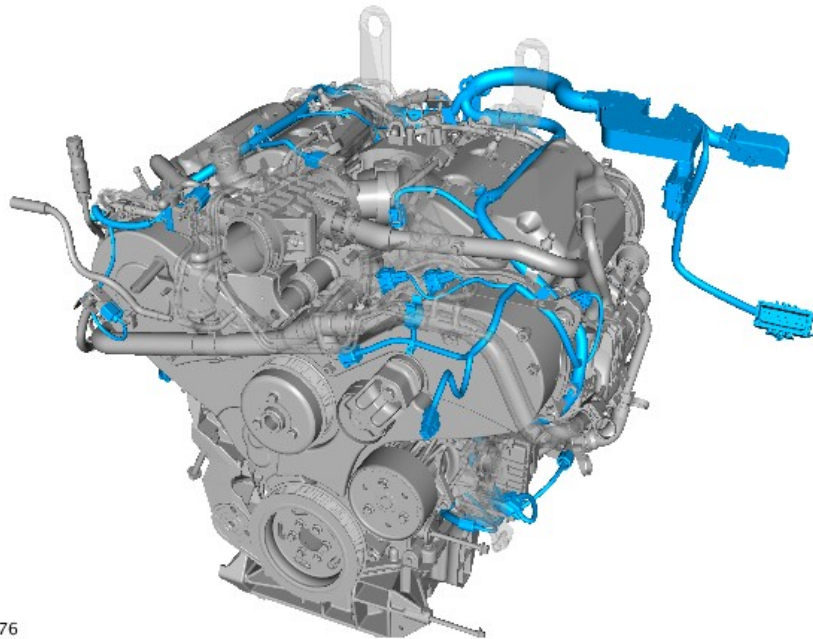


162.



Install the vacuum harness.

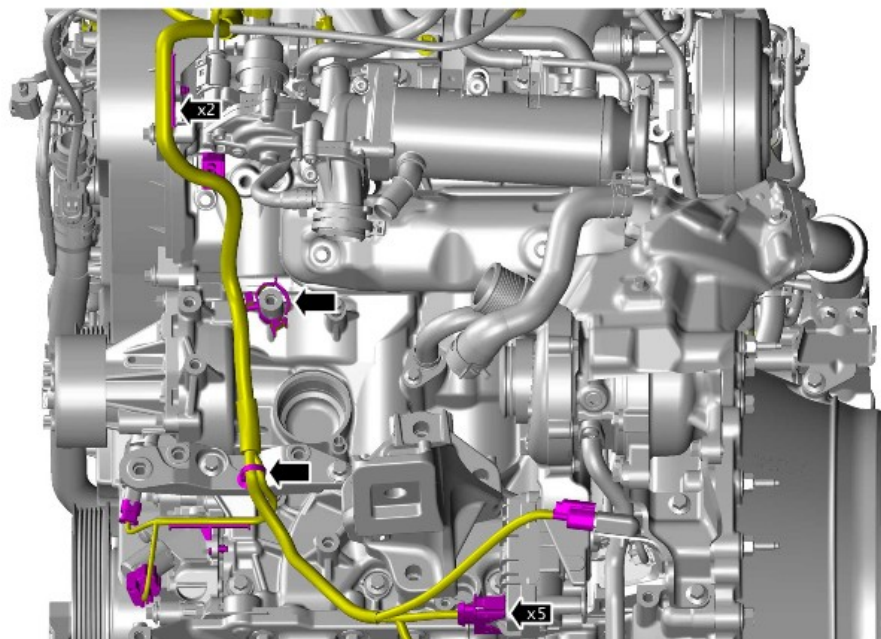
163.



E198076

Install the engine wiring harness.

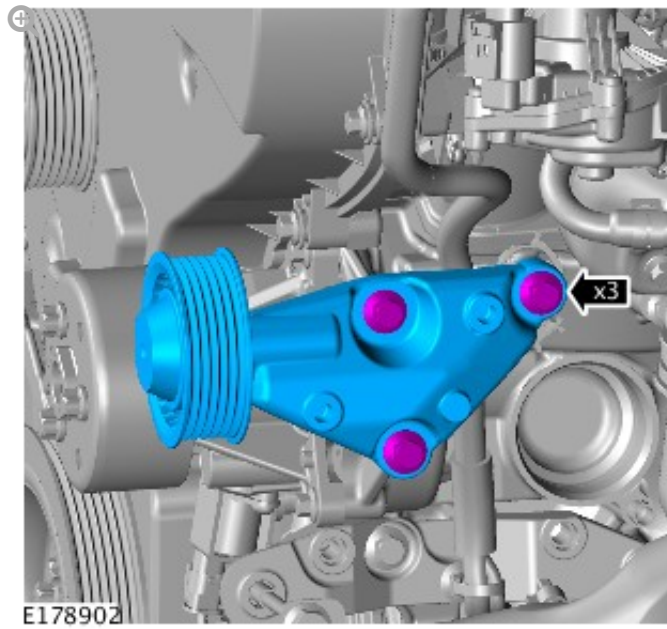
164.



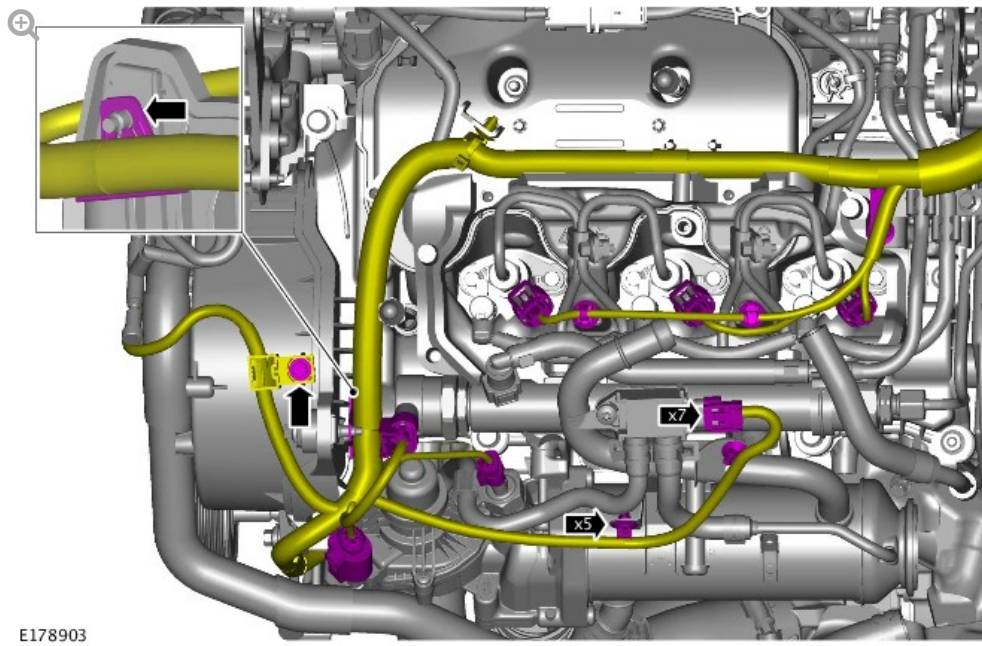
E178901

Install the engine wiring harness as illustrated.

165.

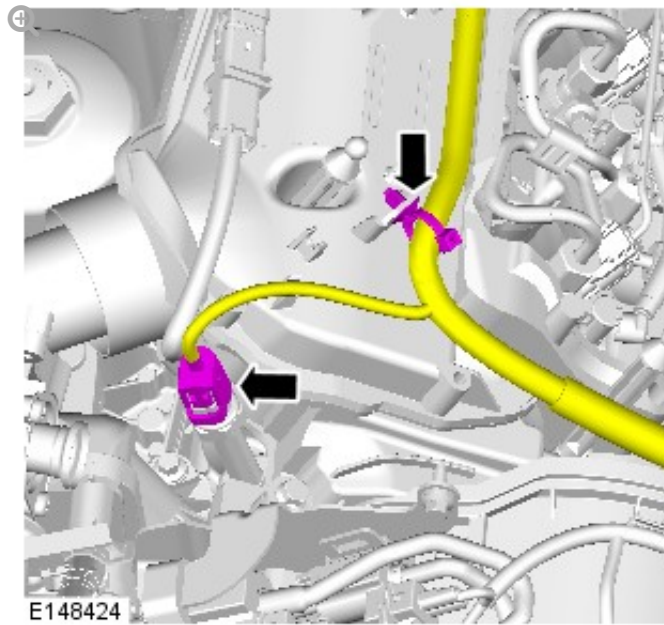


166.



Install the engine wiring harness as illustrated.

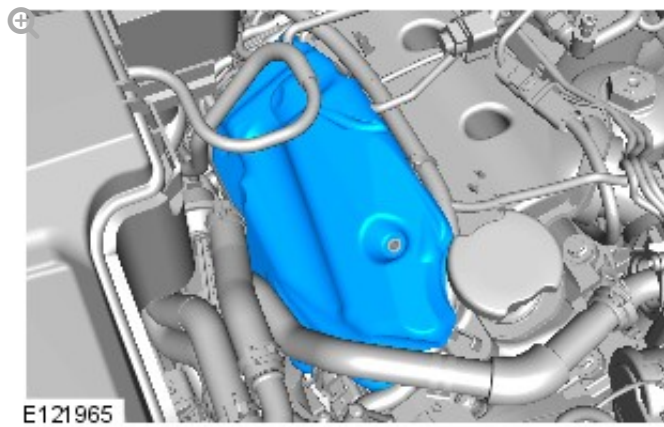
167.



168.

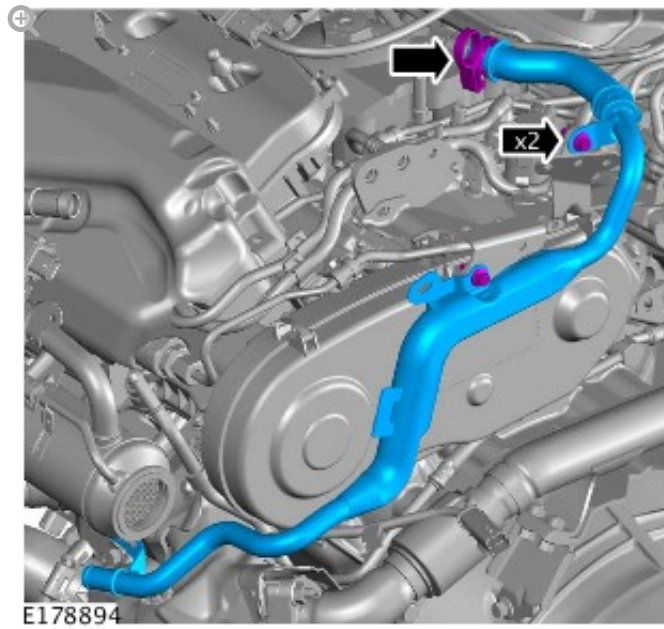
NOTE:

Repeat this step for the LH side.



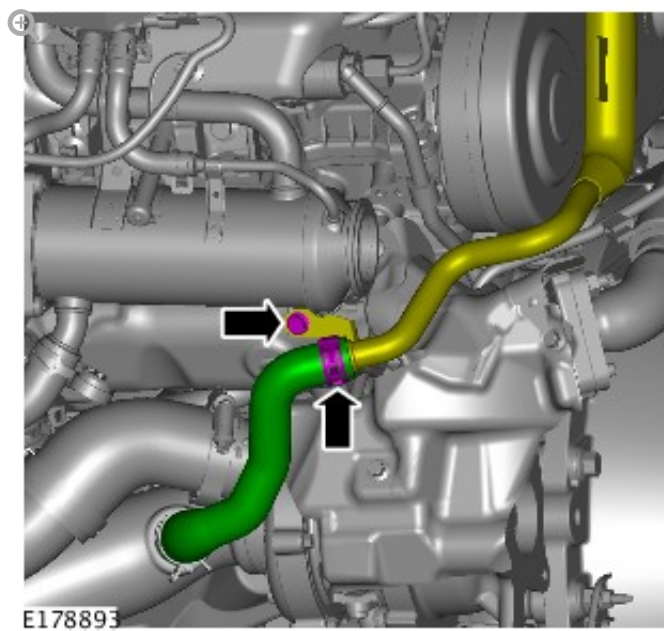
Install the fuel injector insulation.

169.



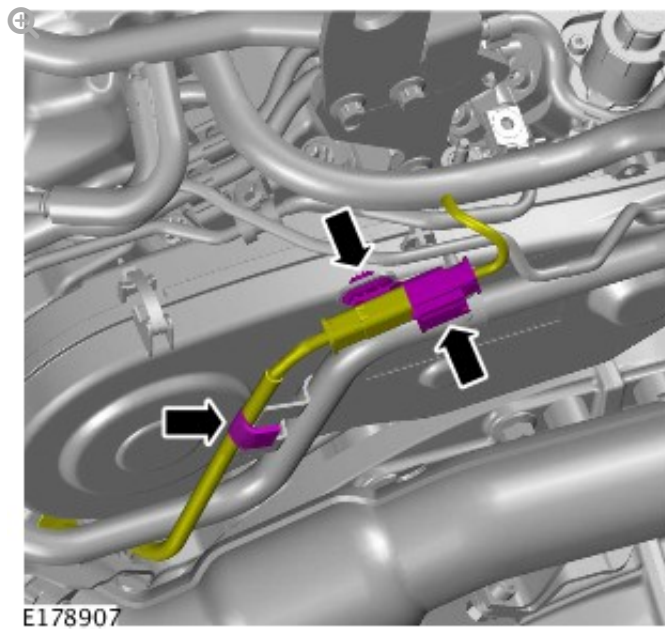
Torque: 10 Nm

170.

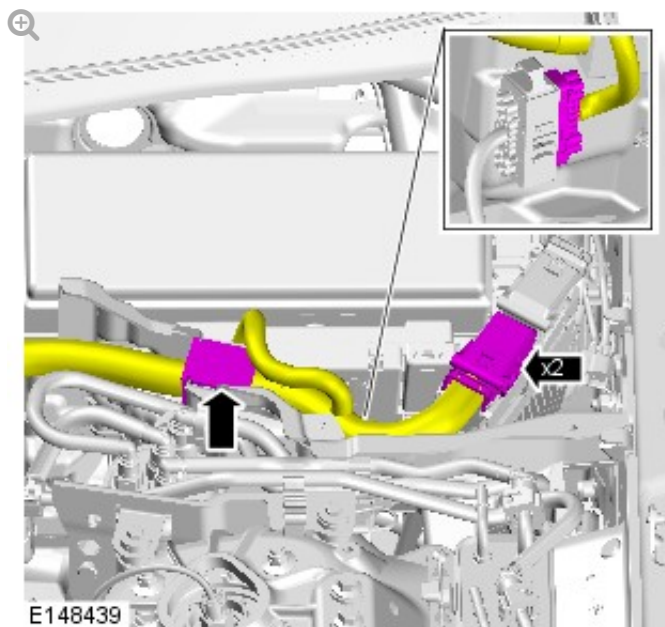


Torque: 10 Nm

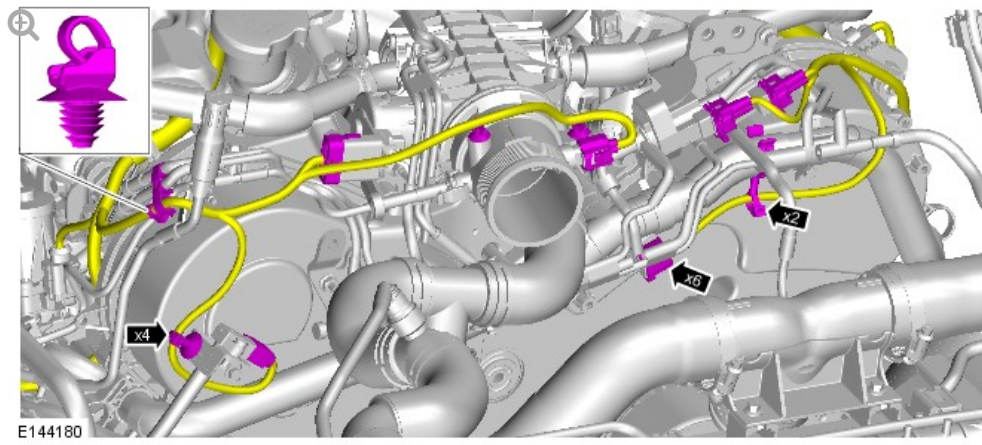
171.



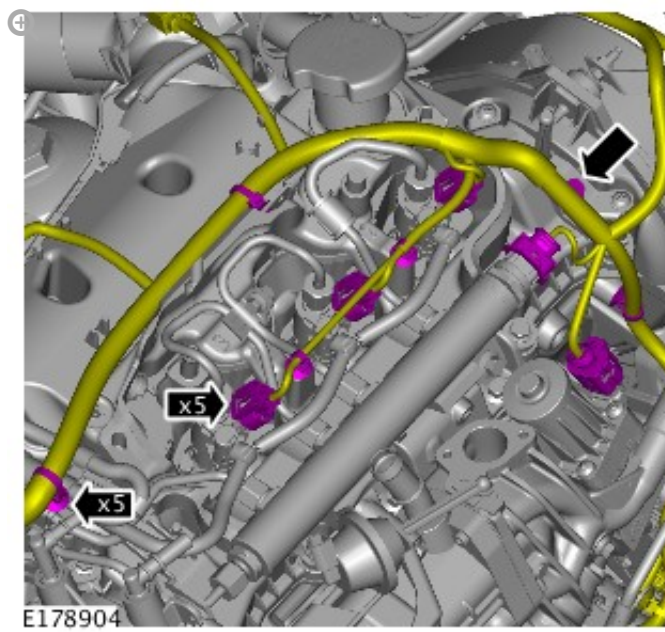
172.



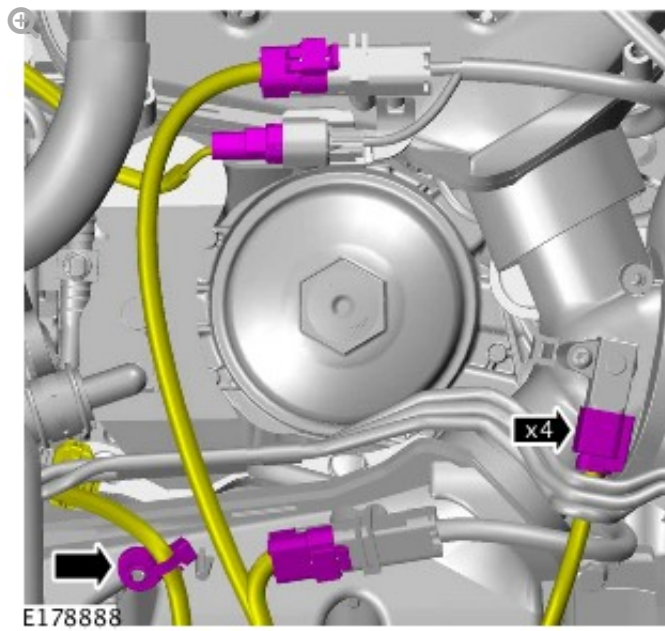
173.



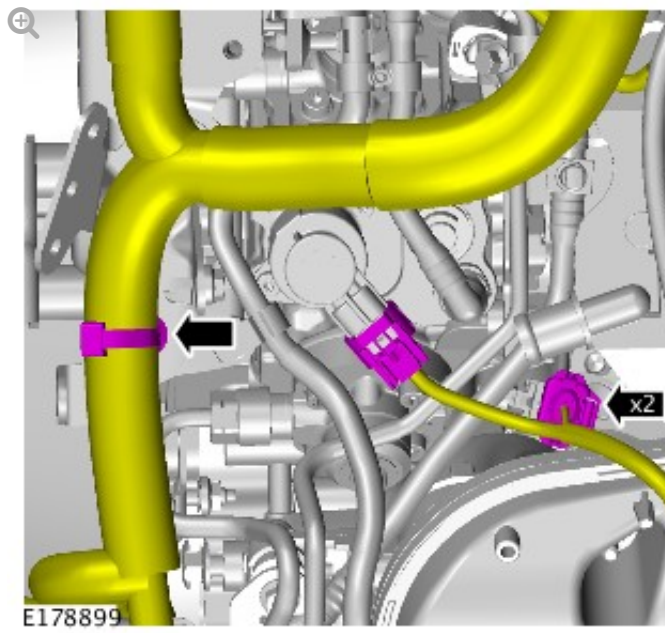
174.



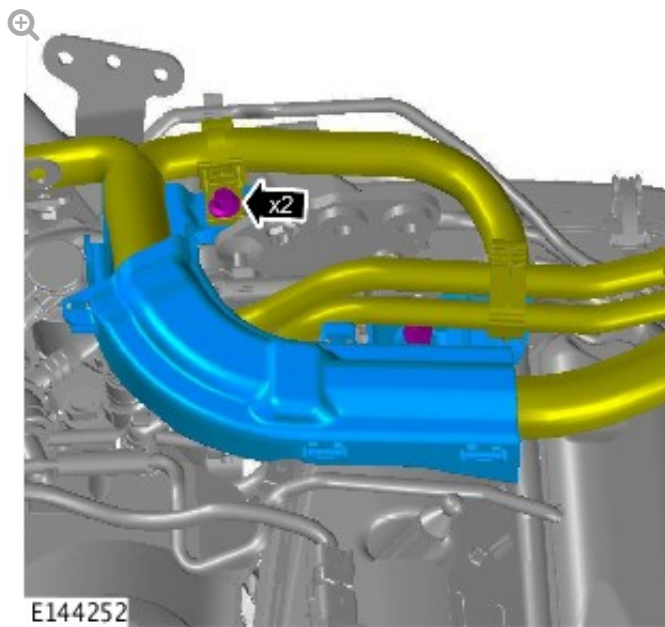
175.



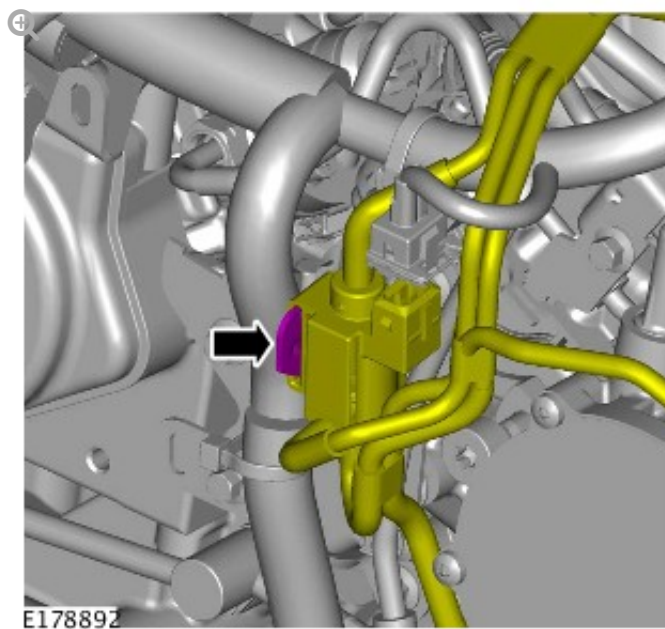
176.



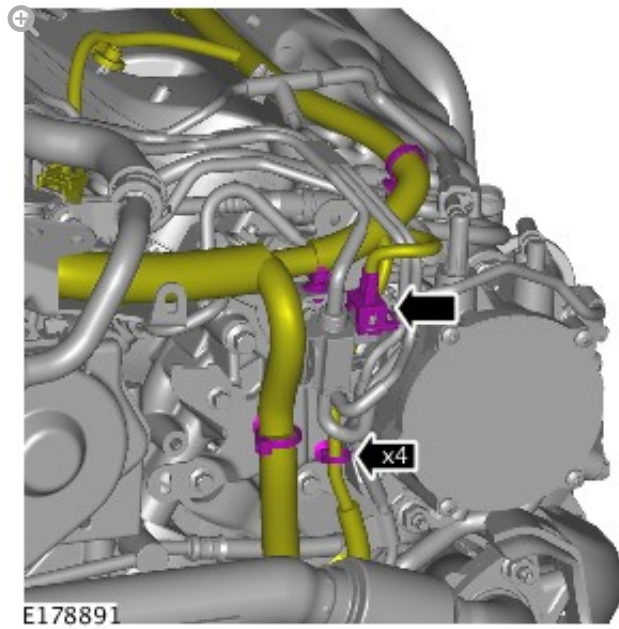
177.



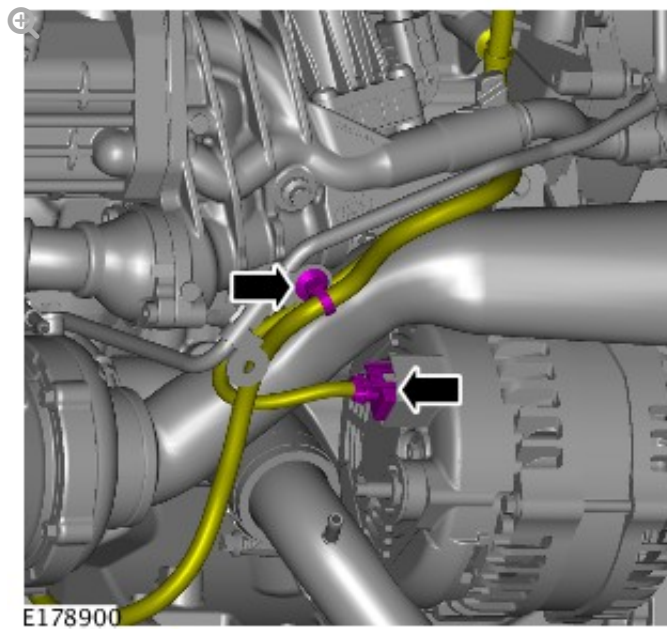
178.



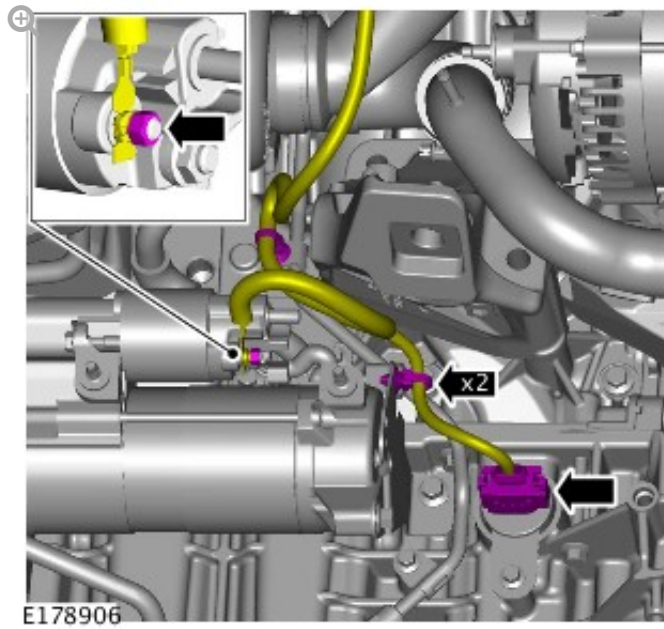
179.



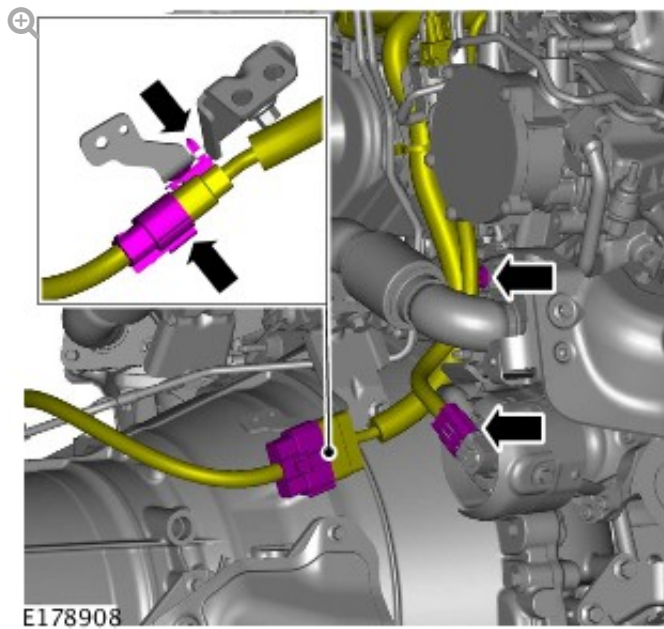
180.



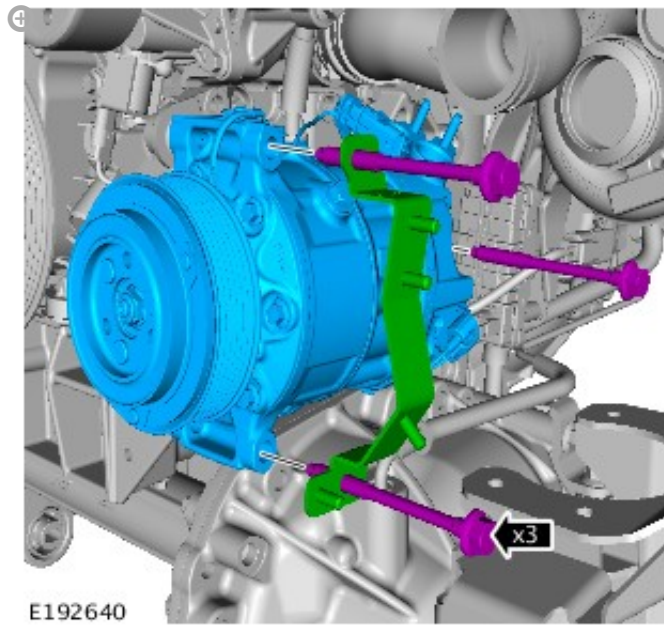
181.



182.

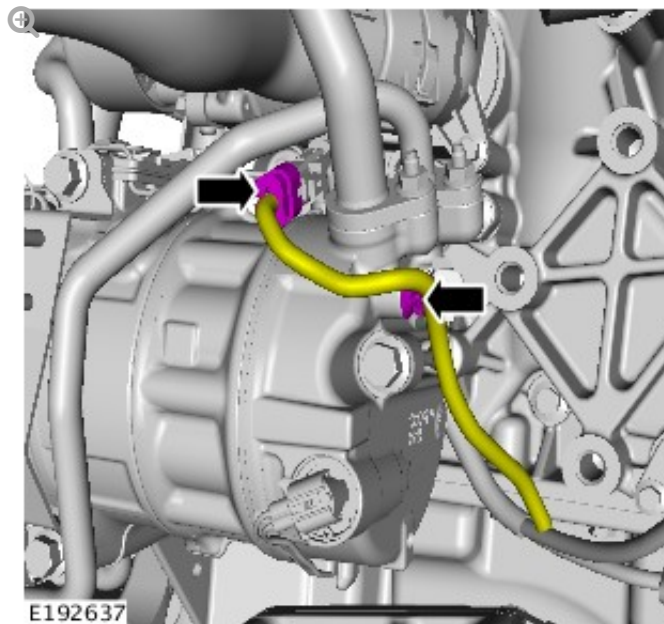


183.



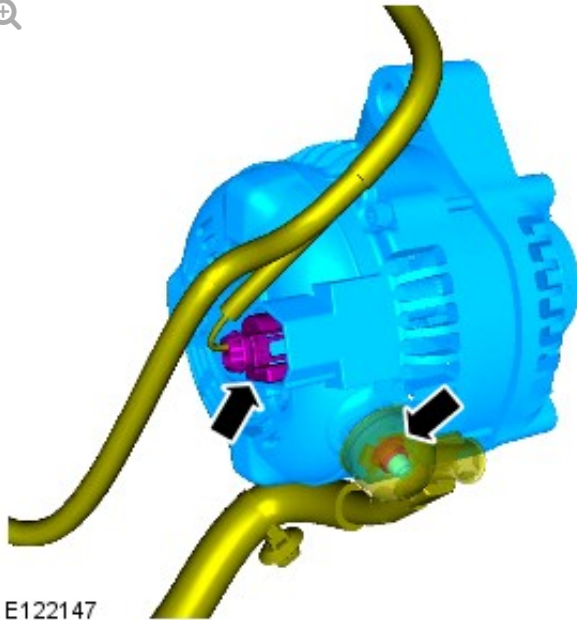
- Install the A/C compressor.
- *Torque: 25 Nm*

184.



Install the A/C compressor harness.

185.

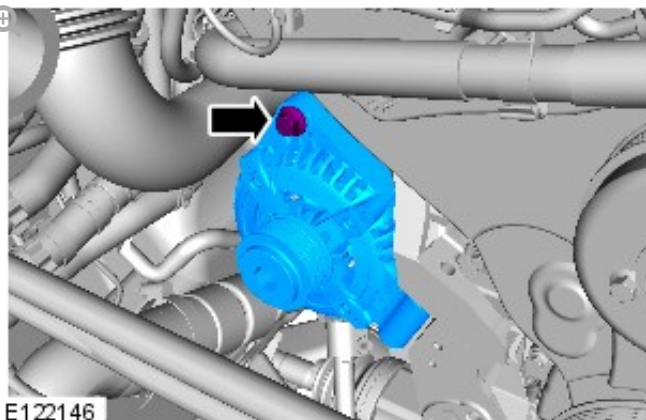


E122147

Connect the generator harness connectors.

Torque: 12 Nm

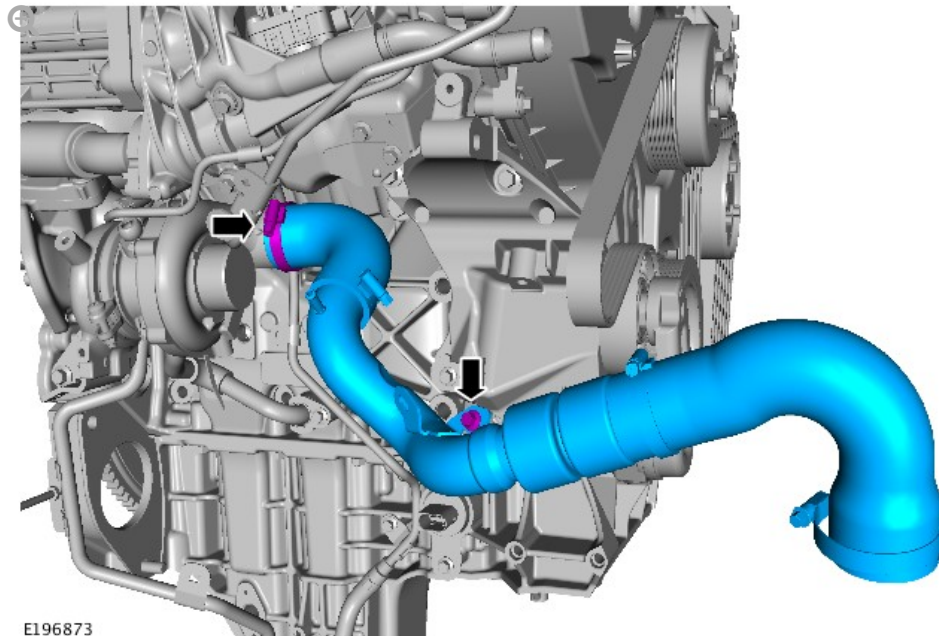
186.



E122146

- Install the generator.
- *Torque: 48 Nm*

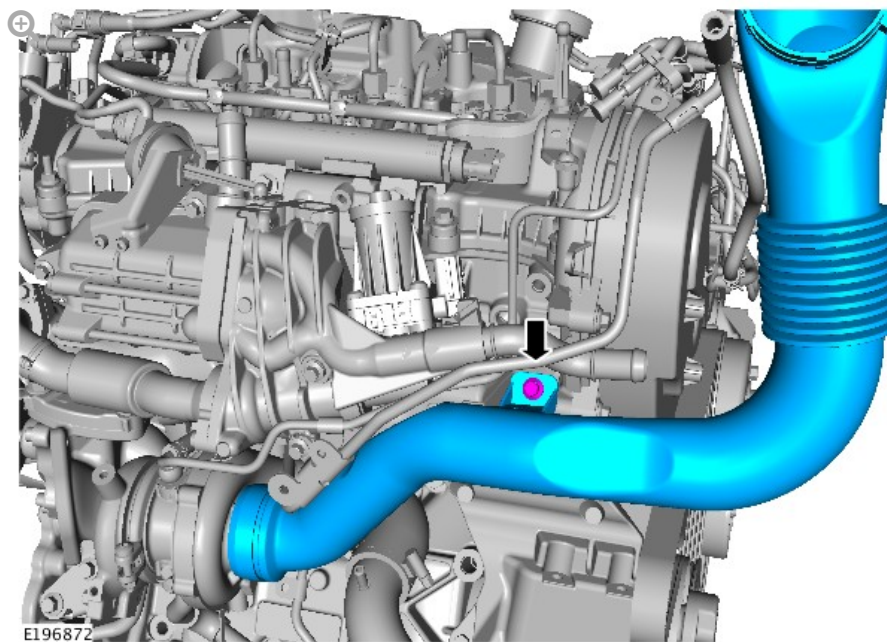
187.



E196873

Torque: 10 Nm

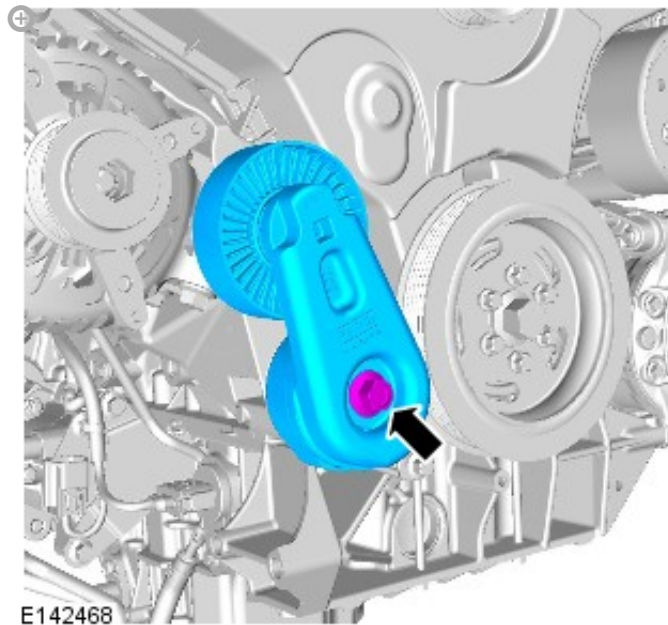
188.



E196872

Torque: 10 Nm

189.

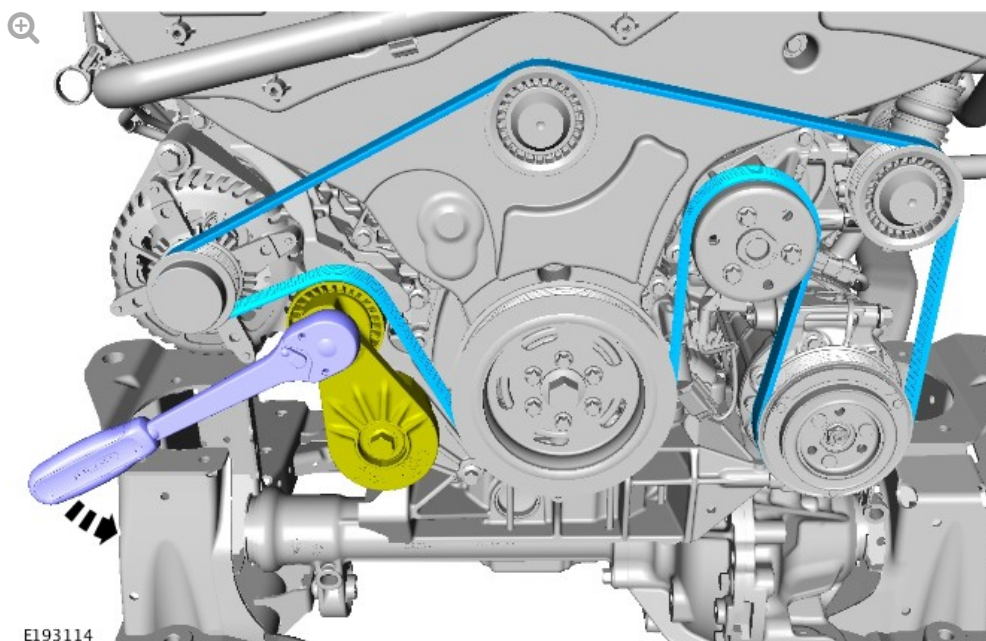


- Install the accessory drive belt tensioner.
- **Torque: 47 Nm**

190.

CAUTION:

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



Install the accessory drive belt.

191.

WARNING:

This step requires the aid of another technician.

CAUTION:

Take care not to damage any components.

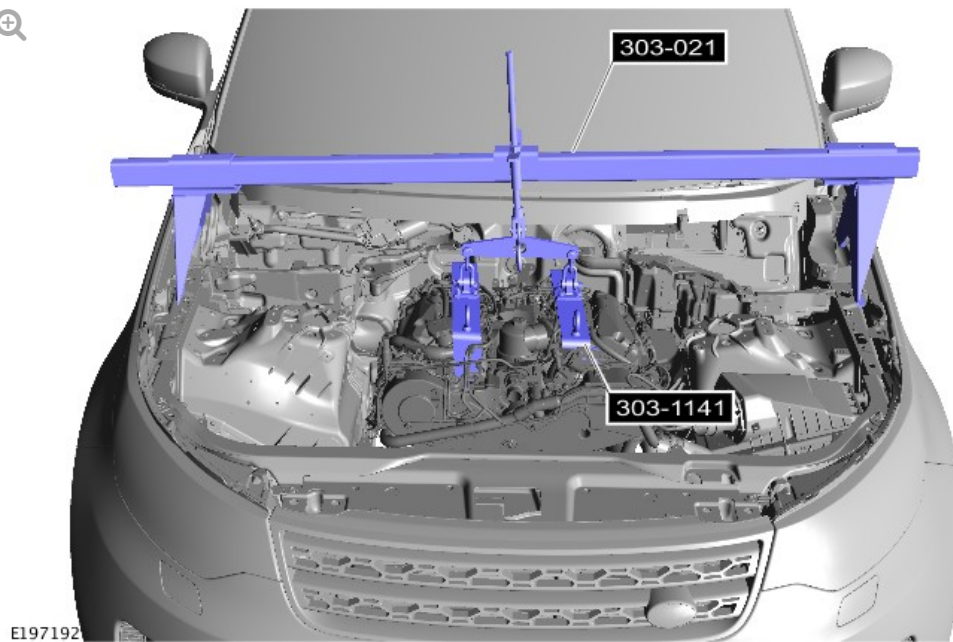


E195664

Install the engine.

Special Tool(s): [303-1141](#)

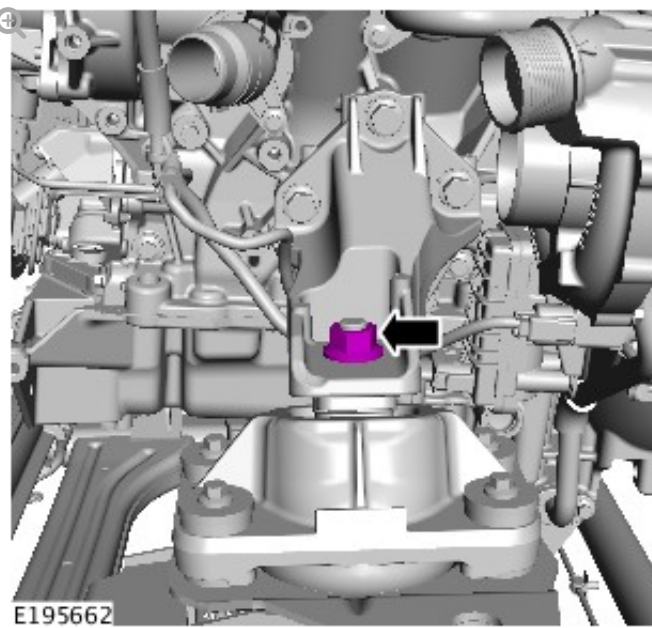
192.



Install the special tool.

Special Tool(s): [303-021](#)

193.

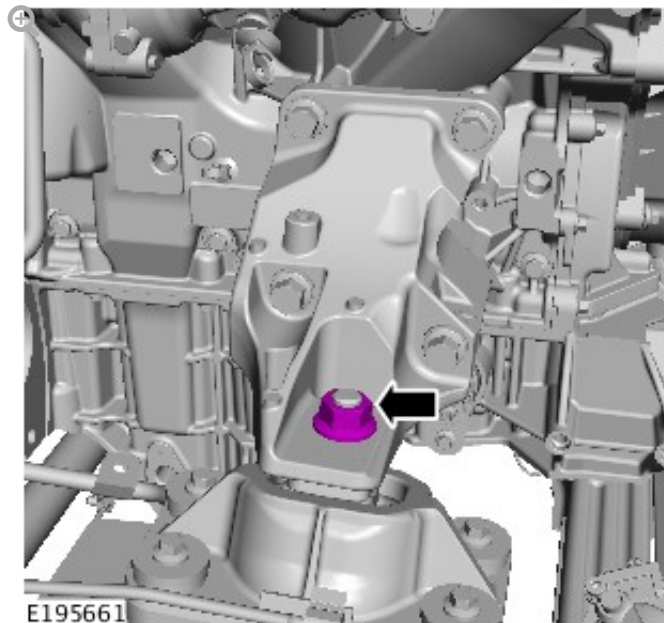


Install an new nut.

Renew Part: [Engine mount to engine mount bracket nut](#).

Torque: 110 Nm

194.

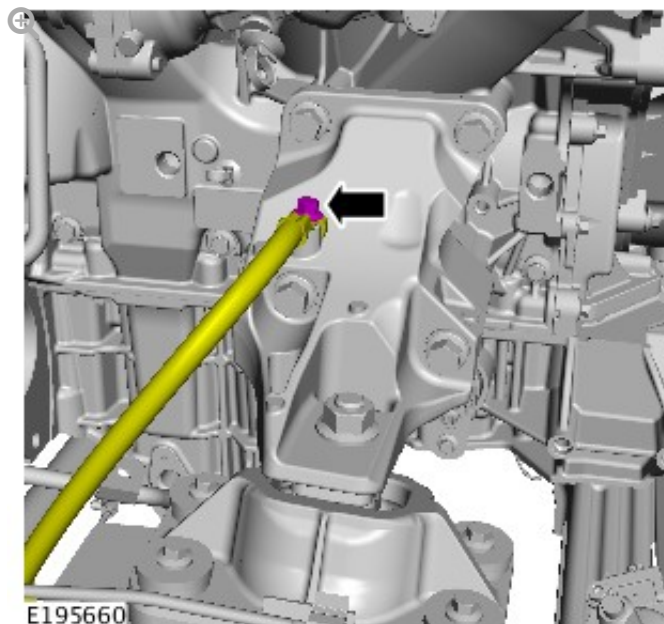


install a new nut.

Renew Part: [Engine mount to engine mount bracket nut](#).

Torque: 110 Nm

195.

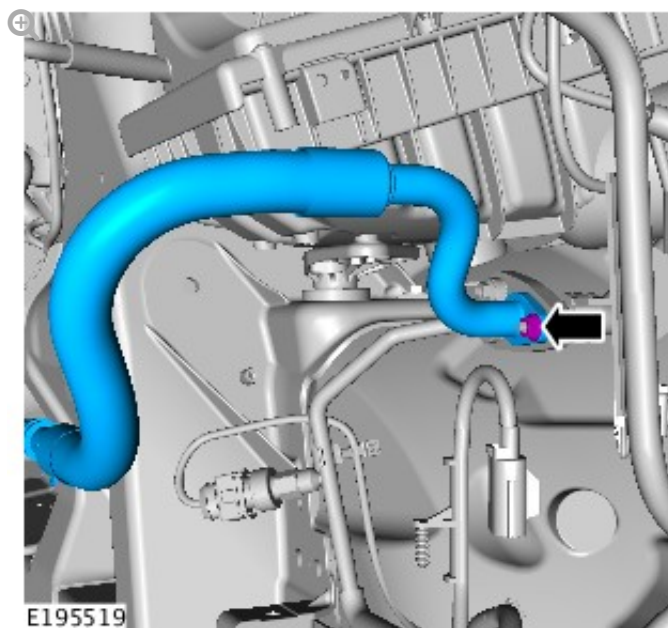


196. Install the transmission and transfer gearbox.

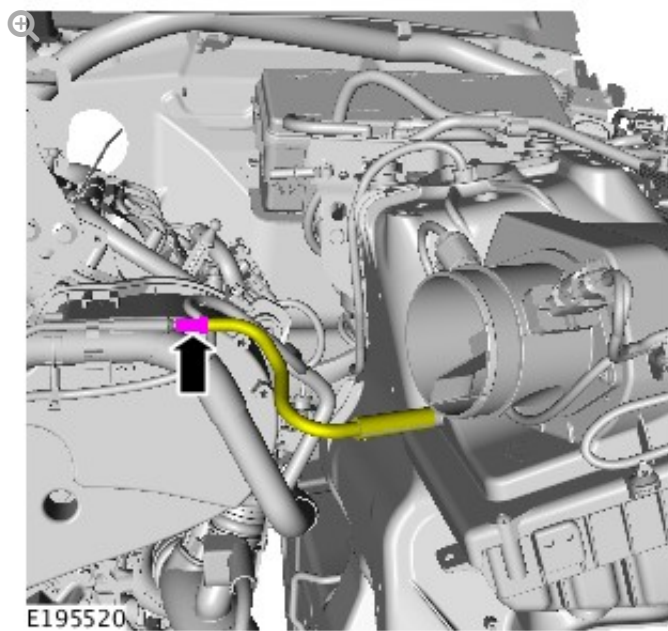
Refer to: [Transmission - TDV6 3.0L Diesel](#) (307-01B Automatic Transmission/Transaxle - Vehicles With: 8HP70 8-Speed Automatic Transmission AWD, Installation).

197. Remove the special tools.

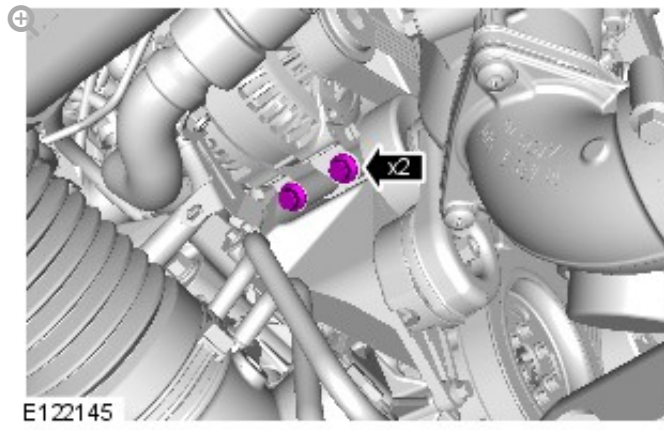
198.



199.

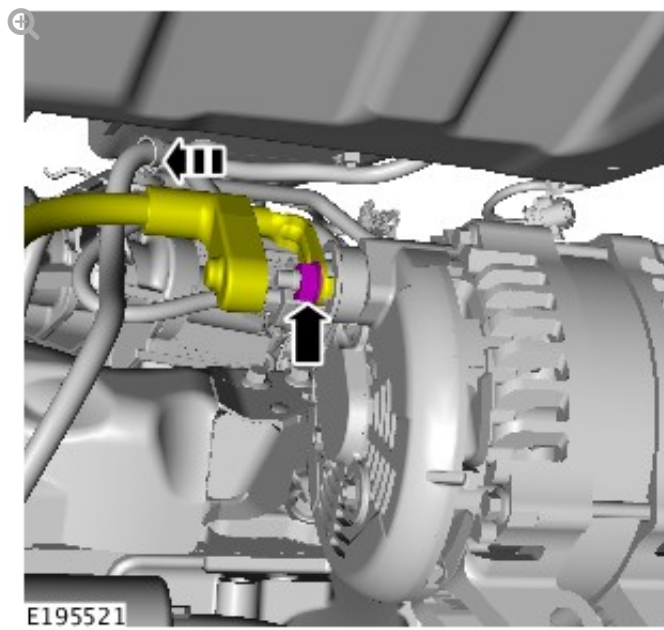


200.

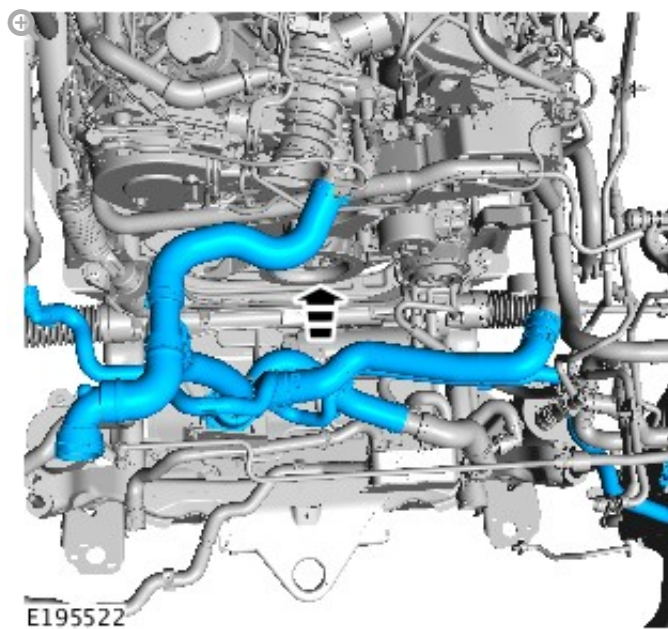


Torque: 48 Nm

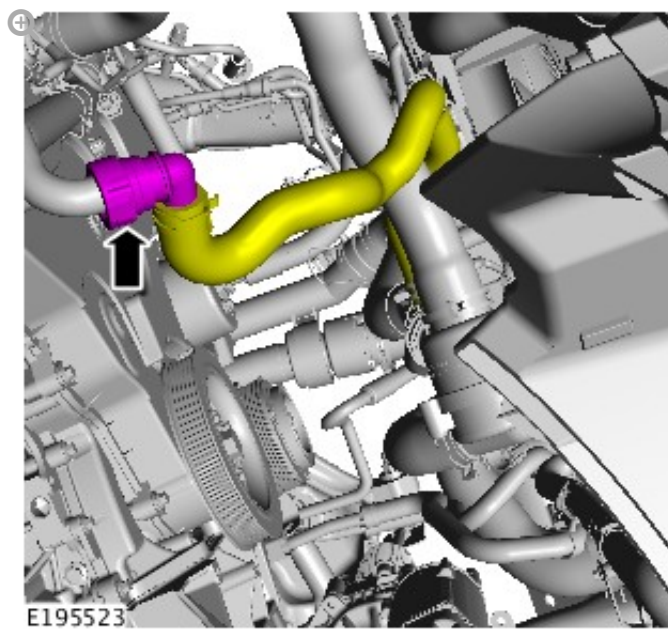
201.



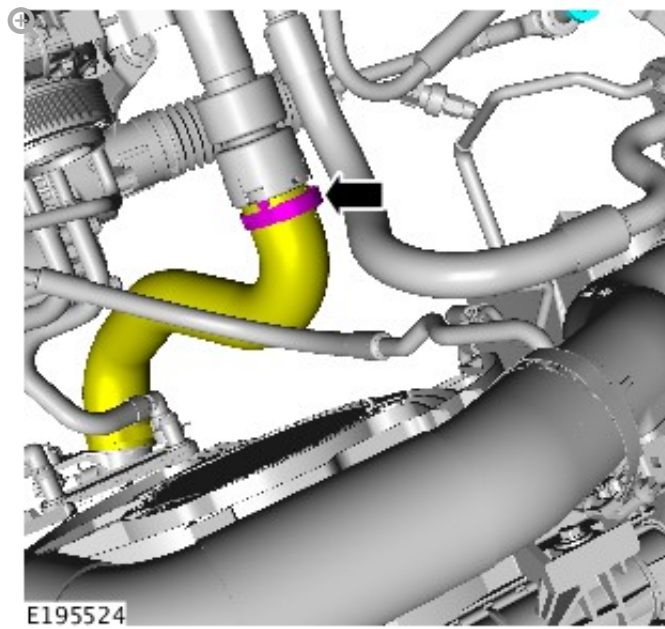
202.



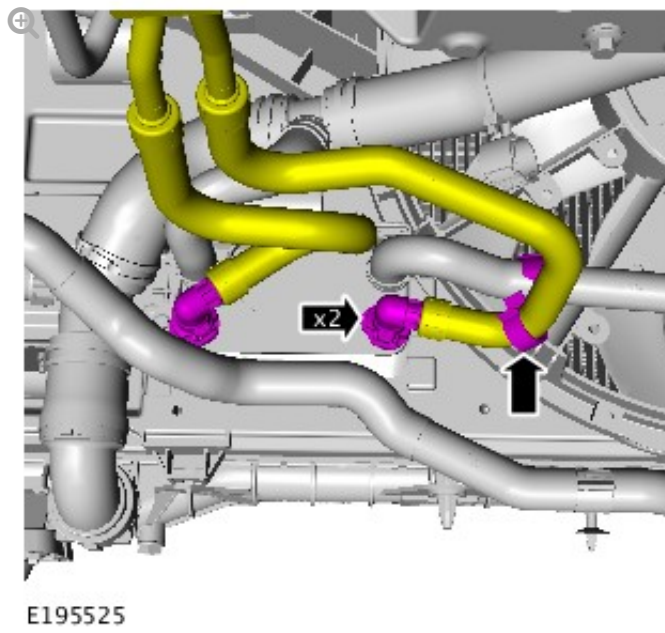
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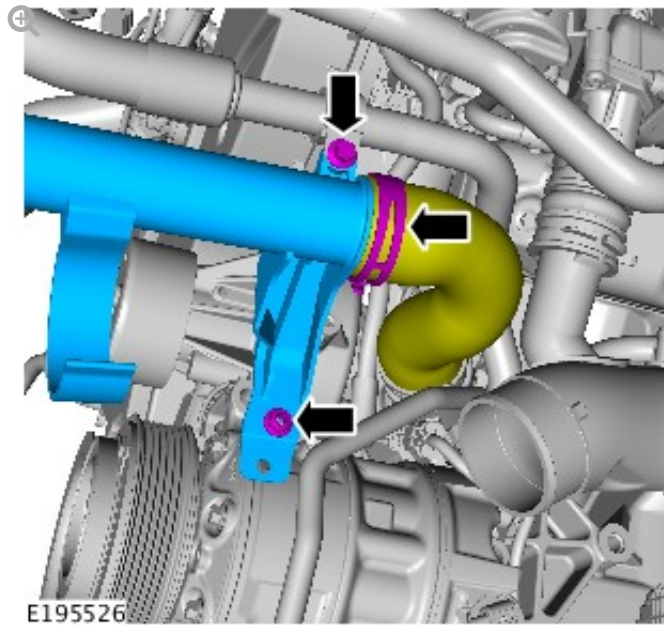
204.



205.

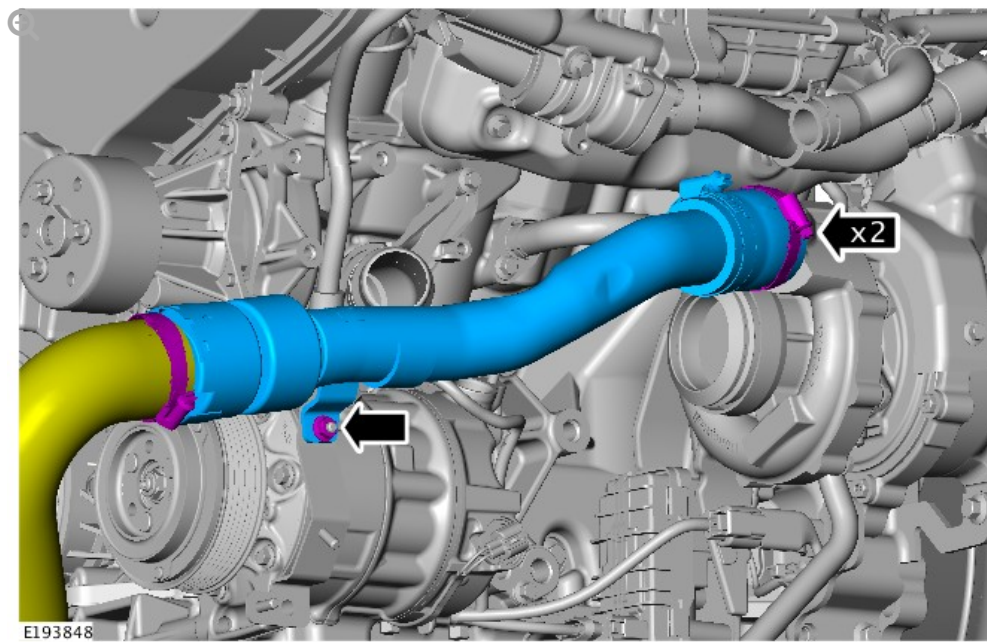


206.



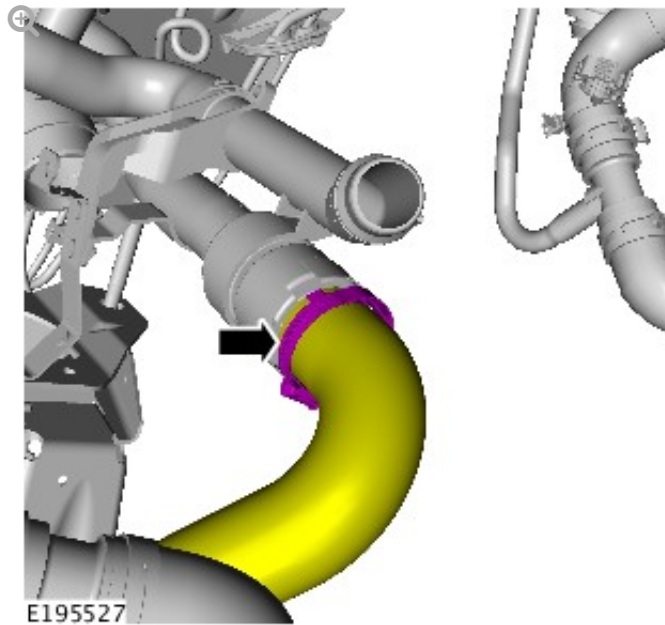
Torque: 10 Nm

207.



Torque: 10 Nm

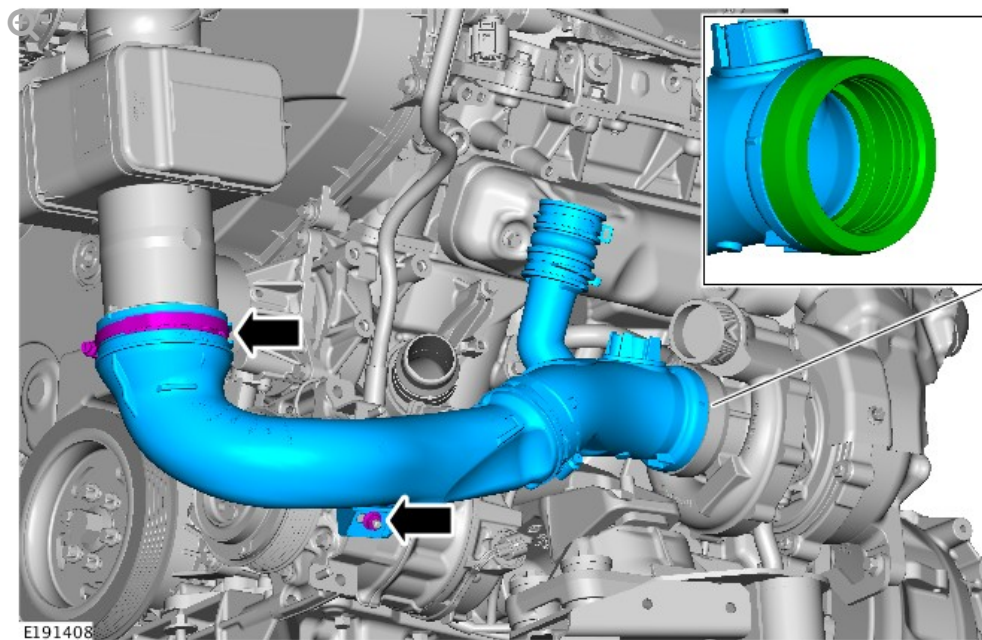
208.



209.

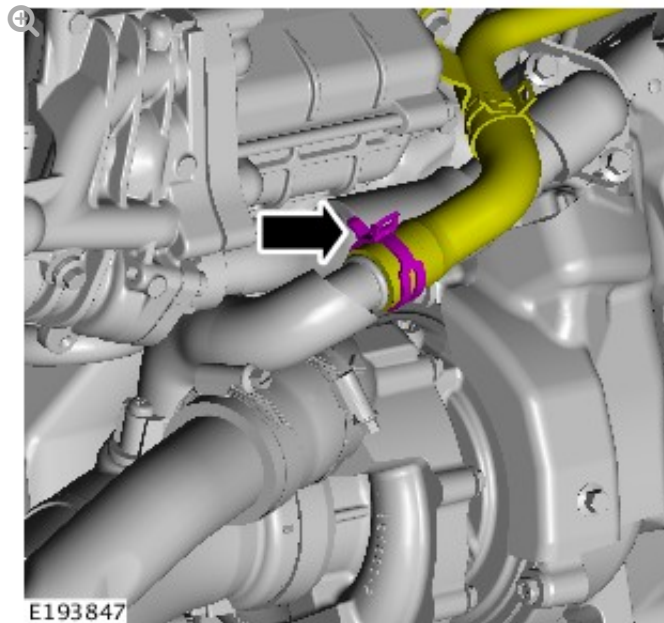
NOTE:

Inspect the seal, replace if damaged.

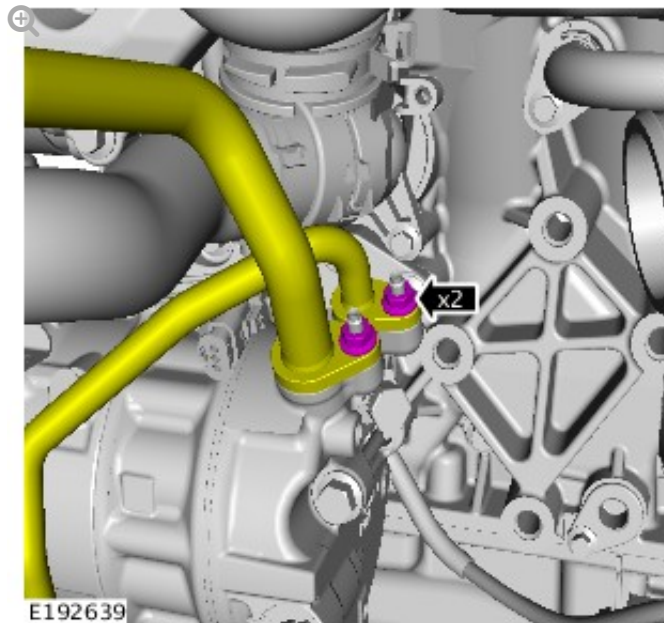


Torque: 10 Nm

210.



211.

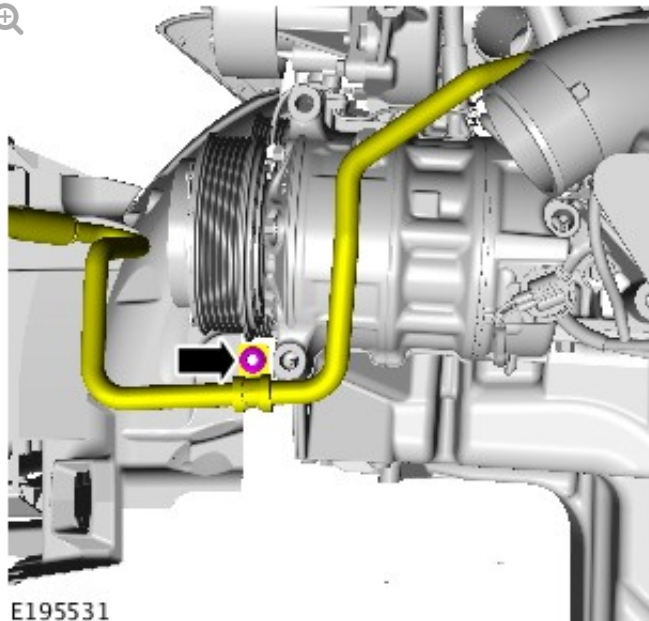


Replace the O-ring seals.

Renew Part: [Air conditioning pipe to compressor O-ring seals.](#)

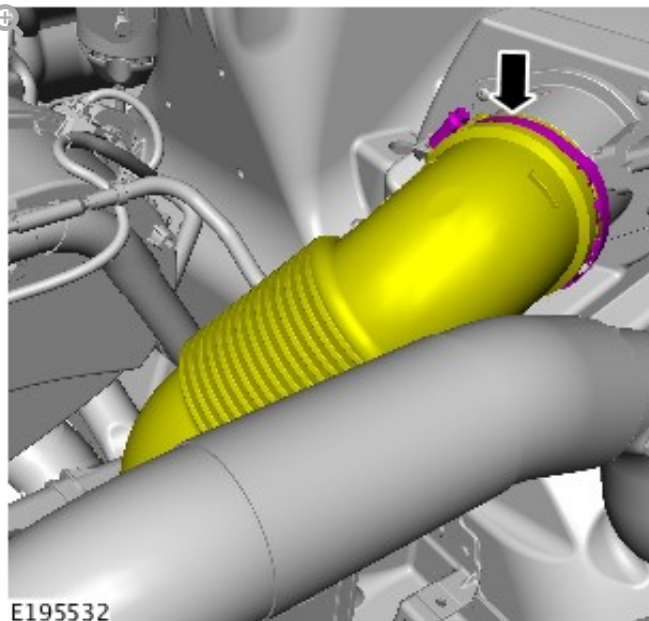
Torque: 18 Nm

212.

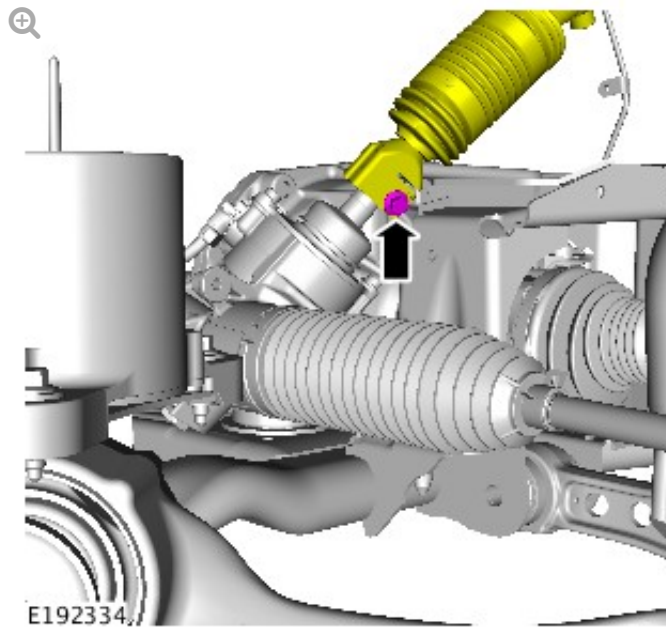


Torque: 10 Nm

213.



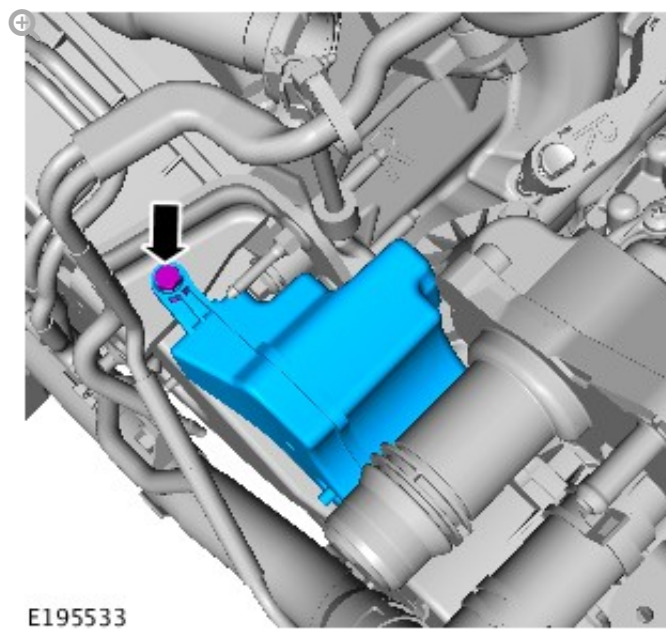
214.



Renew Part: *Steering column lower shaft lower bolt.*

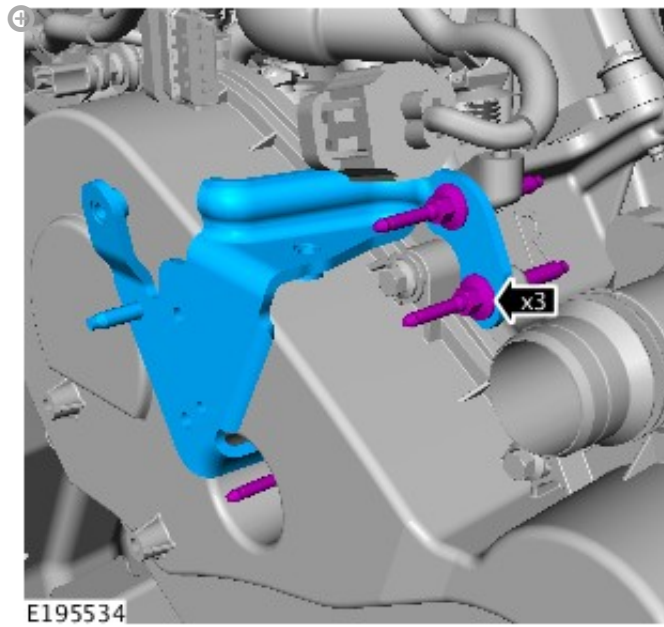
Torque: 30 Nm

215.



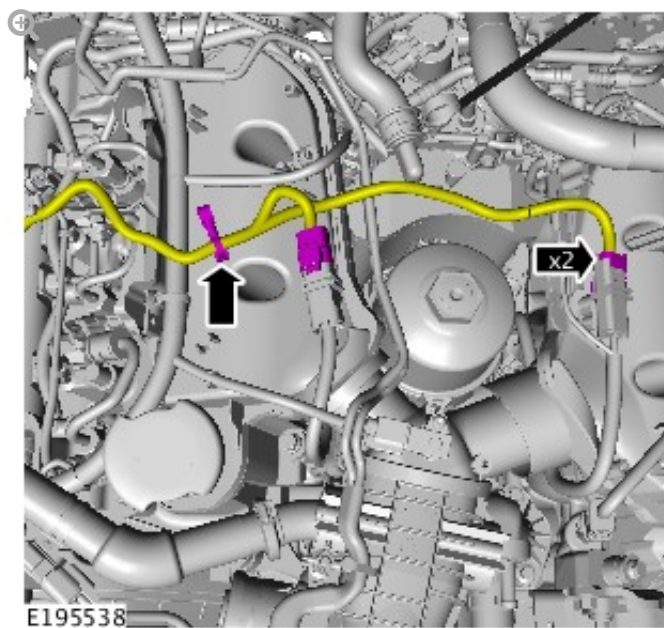
Torque: 10 Nm

216.

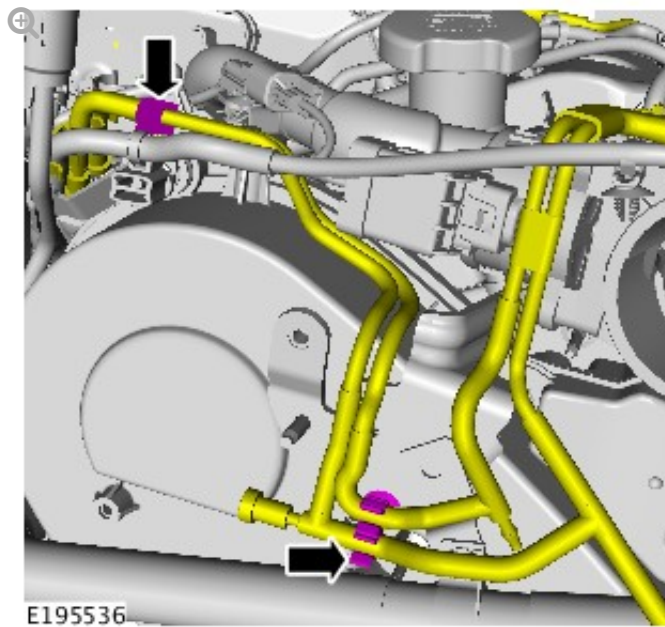


Torque: 10 Nm

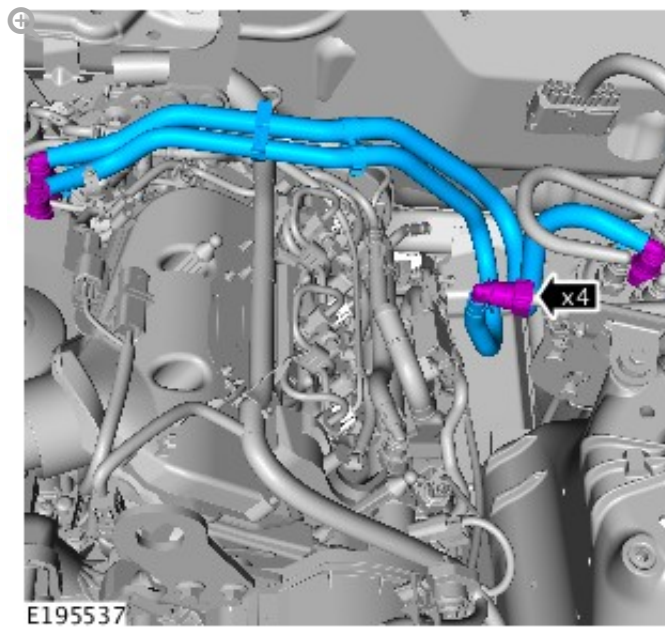
217.



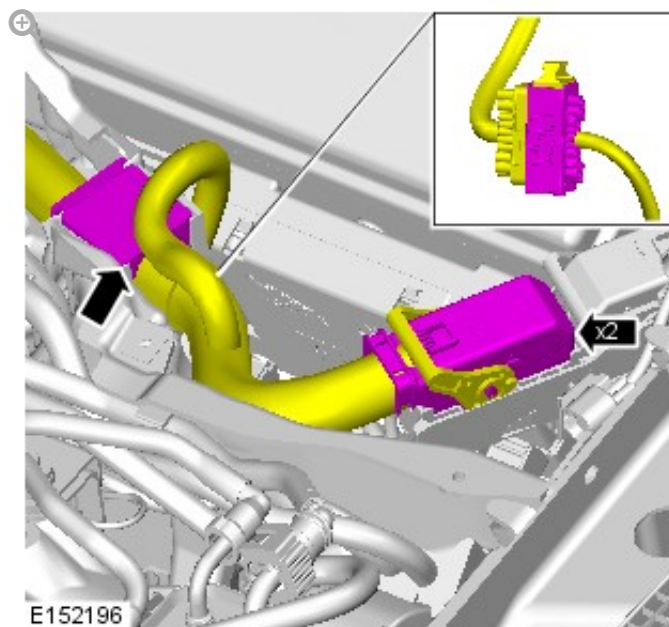
218.



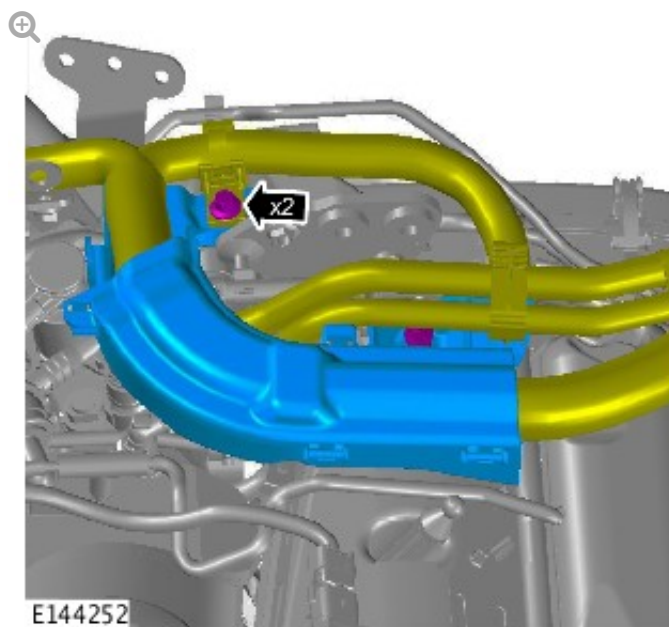
219.



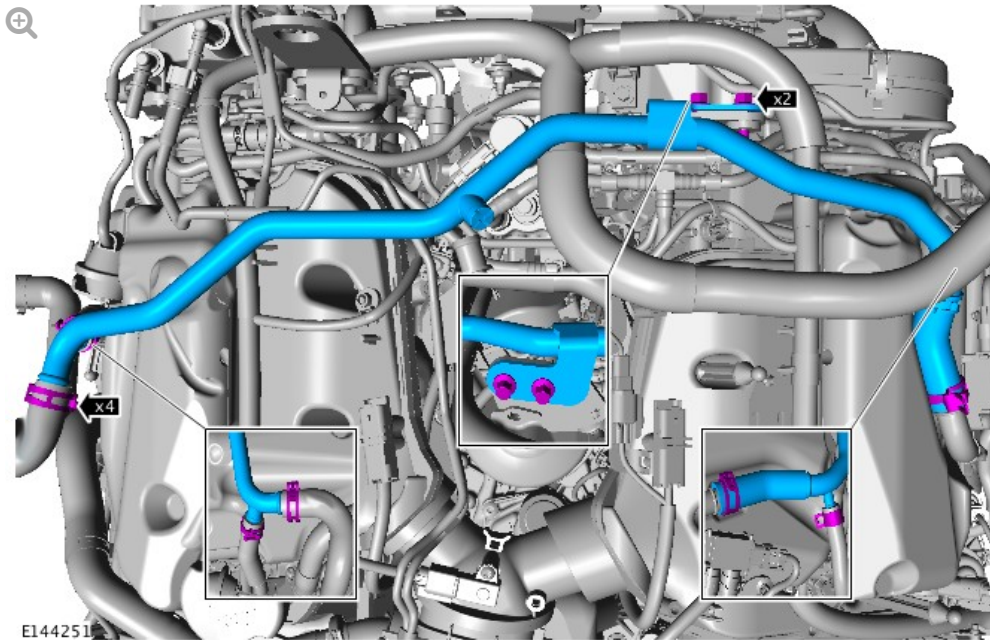
220.



221.



Torque: 10 Nm



Torque: 10 Nm

223. Using the pneumatic vacuum gun, vacuum foreign material from the high-pressure fuel supply lines, the fuel injectors and the fuel rail.
Refer to: [Fuel Injection Component Cleaning](#) (303-04A Fuel Charging and Controls - TDV6 3.0L Diesel, General Procedures).
224. Always follow the Diesel fuel system health and safety precautions, when carrying out any repairs to the fuel system.
Refer to: [Diesel Fuel System Health and Safety Precautions](#) (100-00 General Information, Description and Operation).
225. Install the radiator.
Refer to: [Radiator](#) (303-03A Engine Cooling - TDV6 3.0L Diesel - Gen 2/TDV6 3.0L Diesel, Removal and Installation).
226. Install the throttle body.
Refer to: [Intake Air Shutoff Throttle](#) (303-04A Fuel Charging and Controls - TDV6 3.0L Diesel, Removal and Installation).
227. Install the secondary bulkhead panel.
Refer to: [Secondary Bulkhead Centre Panel - TDV6 3.0L Diesel](#) (501-02 Front End Body Panels, Removal and Installation).

228. Fill the engine with oil.

Refer to: [Engine Oil Draining and Filling](#) (303-01A Engine - TDV6 3.0L Diesel - Gen 2/TDV6 3.0L Diesel, General Procedures).

229. Install the hood.

Refer to: [Hood](#) (501-02 Front End Body Panels, Removal and Installation).

230. Connect the primary battery ground cable.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).