

PUBLISHED: 26-FEB-2018  
2010.0 RANGE ROVER SPORT (LS), 303-01

ENGINE - V8 S/C 5.0L PETROL

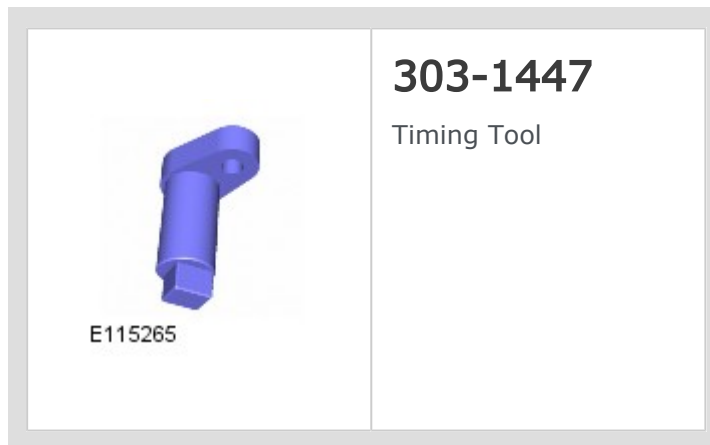
# FUEL PUMP CAMSHAFT TIMING CHECK

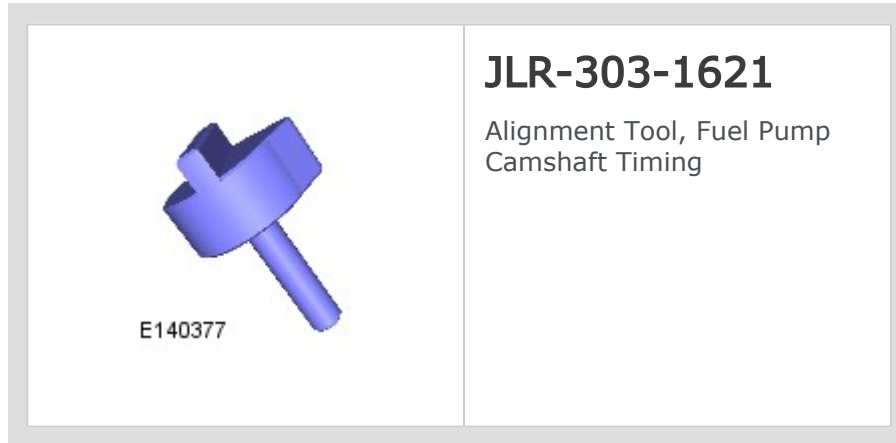
(G1473740)

GENERAL PROCEDURES

19.90.16	HIGH PRESSURE FUEL TIMING CHECK	5000 CC, AJ V8	0.90	USED WITHINS
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SPECIAL TOOL(S)





**PART(S)**

STEP	PART NAME	QUANTITY
Check Step 14	Brake vacuum pump seal	1
Check Step 17	Oil pan drain plug	1

**CHECK**

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

2.



**WARNING:**

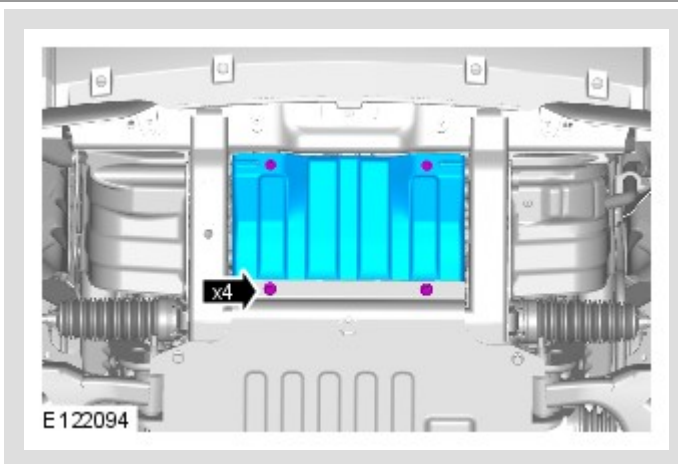
Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

3.

Refer to: Engine Undershield (501-02 Front End Body Panels, Removal and Installation).

4.



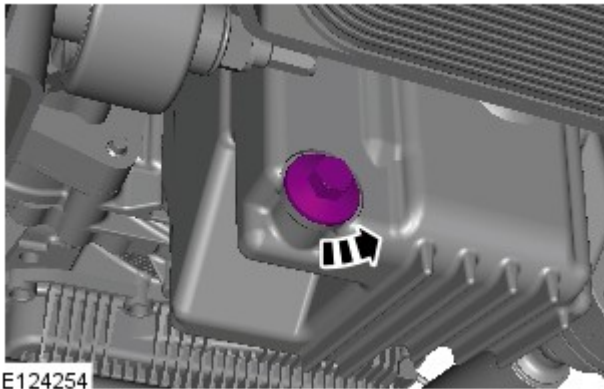
5.

**⚠ CAUTION:**

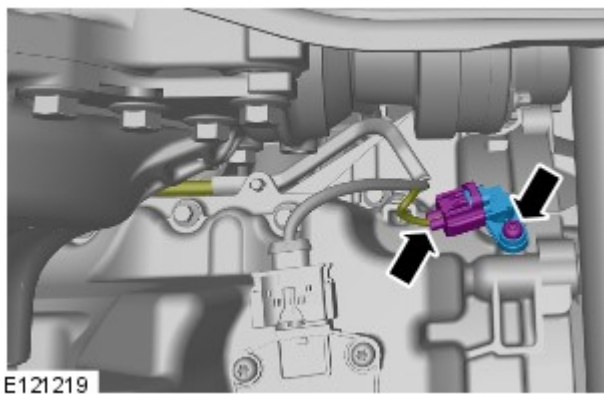
Be prepared to collect escaping oil.

**🔄 NOTES:**

- Discard the sealing washer.
- Collect the engine oil in a clean container.



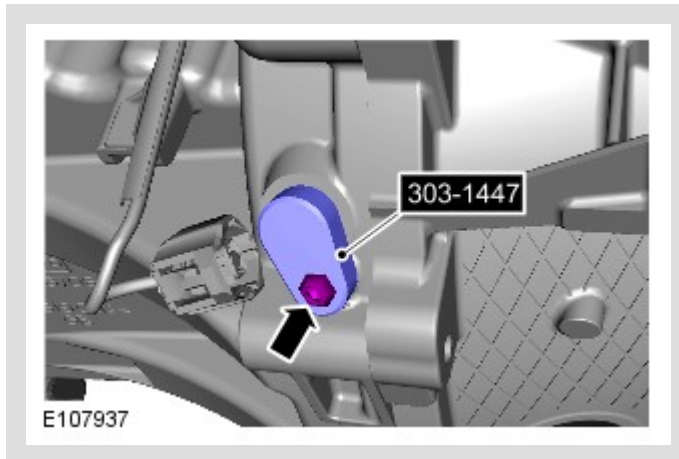
6.



7.

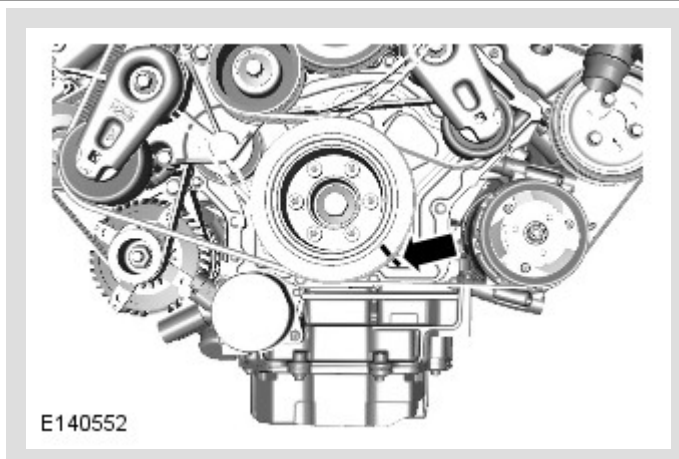
⚠ CAUTIONS:

- Only rotate the crankshaft clockwise.
- Make sure that the crankshaft is fully locked.




Install the Special Tool(s): [303-1447](#)

8.

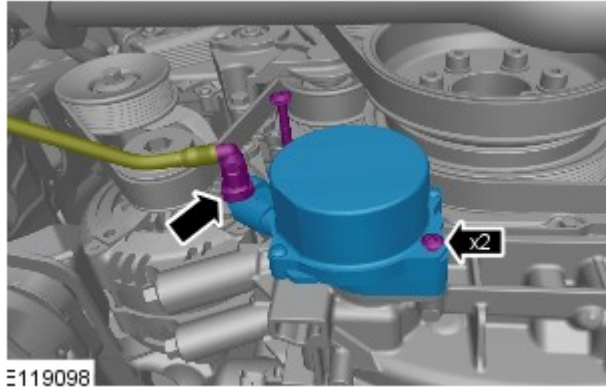


Using a suitable marker, mark the position of the crankshaft pulley as illustrated.

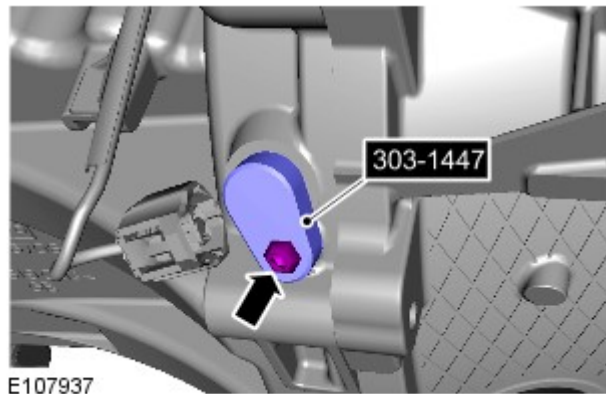
9.

 NOTE:

Discard the seal.

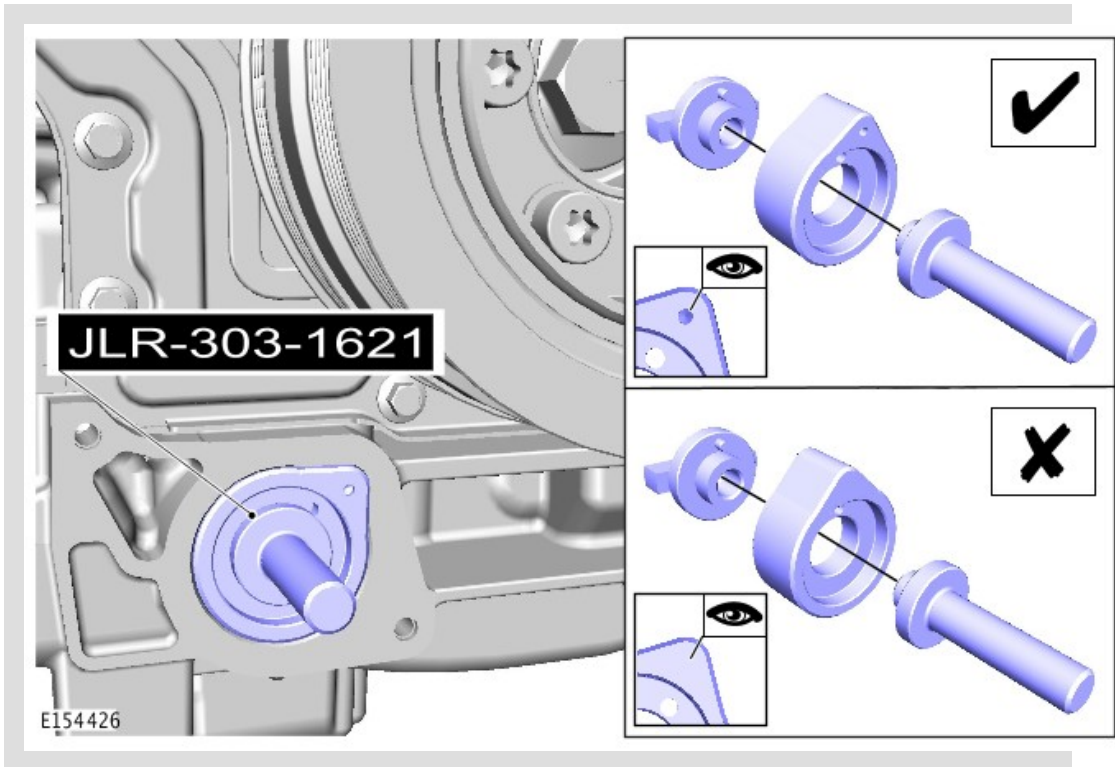


10.



Remove the Special Tool(s): [303-1447](#)

11.



If required, carefully adjust the crankshaft position to allow correct installation of the special tool.

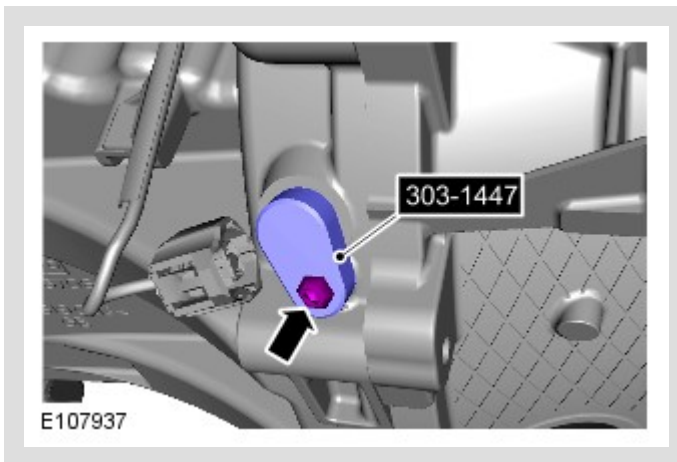
Install the Special Tool(s): [JLR-303-1621](#)

**⚠ CAUTION:**

Do not use excessive force when adjusting the crankshaft position.

**△ NOTE:**

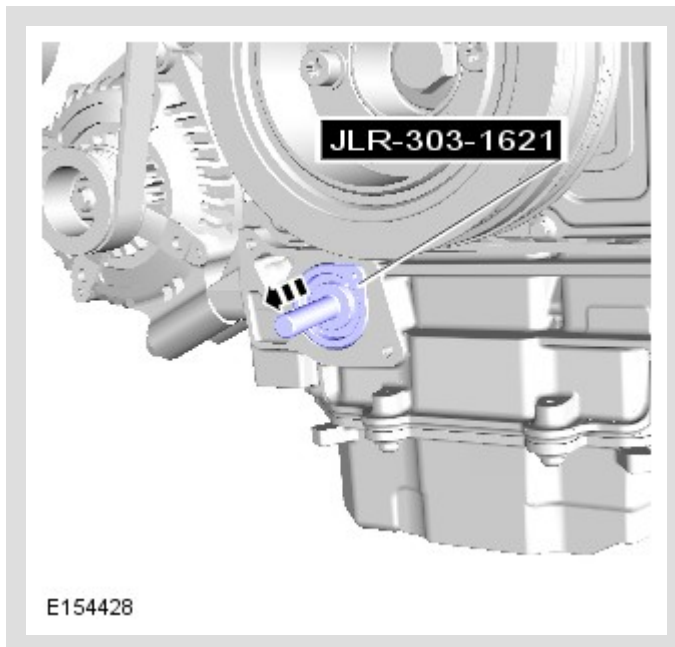
If the crankshaft timing tool cannot be installed, adjustment of the fuel pump camshaft timing will be required.



- If required, carefully adjust the crankshaft position to allow correct installation of the special tool.  
*Install the Special Tool(s):* [303-1447](#)
  - If the crankshaft timing tool cannot be installed, adjustment of the fuel pump camshaft timing will be required.  
Refer to: Fuel Pump Camshaft Timing Adjustment (303-01 Engine - V8 N /A 5.0L Petrol, General Procedures).
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13.

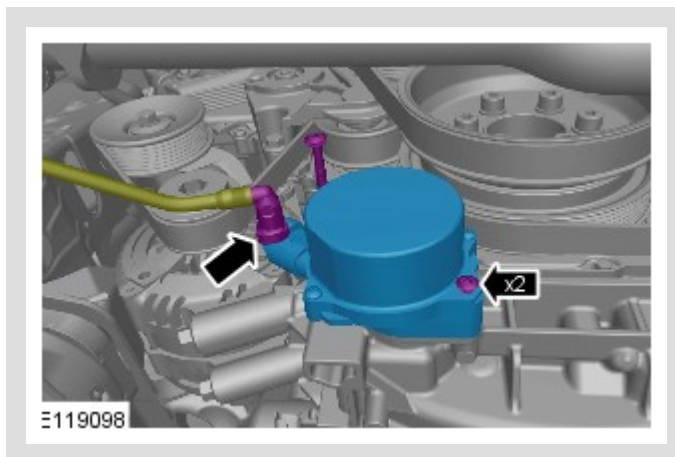


Remove the Special Tool(s): [JLR-303-1621](#)

14.

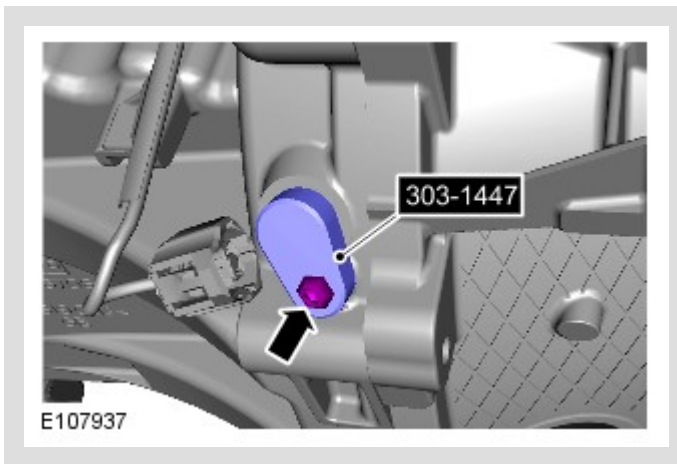
 NOTE:

Install a new seal.



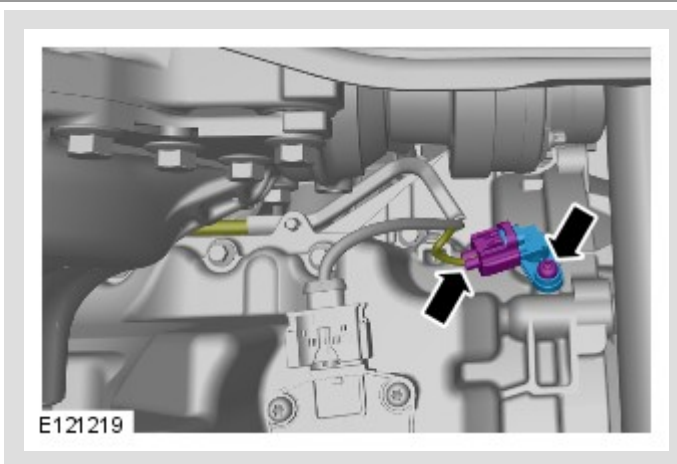
Renew Part: [Brake vacuum pump seal](#) Quantity: 1 .  
Torque: 12 Nm

15.




Remove the Special Tool(s): [303-1447](#)

16.

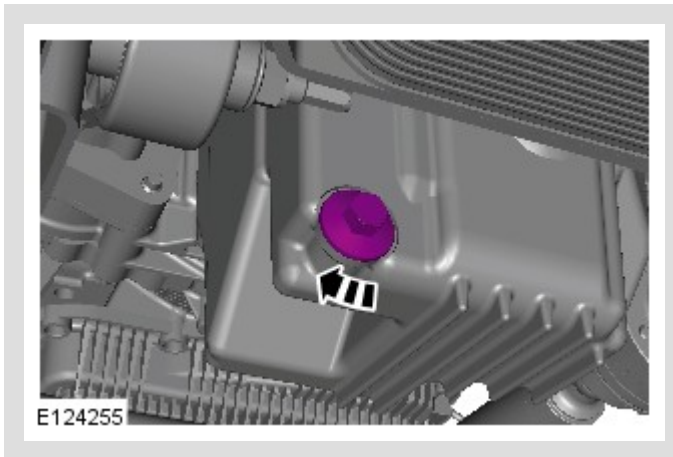


Torque: 10 Nm

17.

 **NOTE:**

Install a new sealing washer.



Renew Part: *Oil pan drain plug* Quantity: *1* .

Torque: **24 Nm**

18.

Connect the battery ground cable.

Refer to: Specifications (414-01 Battery, Mounting and Cables, Specifications).

19.

 **CAUTION:**

Make sure that the vehicle is left for 5 minutes from filling with oil and that the engine oil level is reading at least minimum (by following Steps 22-28), before starting the engine.

- Fill the engine with oil - for filling values on vehicles without supercharger:  
Refer to: Specifications (303-01 Engine - V8 N/A 5.0L Petrol, Specifications).
- Fill the engine with oil - for filling values on vehicles with supercharger:  
Refer to: Specifications (303-01 Engine - V8 S/C 5.0L Petrol, Specifications).
- Clean any residual engine oil from the oil filler cap area.

20.

 **CAUTION:**

Make sure that the vehicle has been left for 5 minutes from filling with oil.

Follow the Steps 22-28 before starting the engine.


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21.

- Start the engine and allow to run for 10 minutes, stop the engine.
- Check for leaks.

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22.

 **CAUTIONS:**

- Make sure that the selector lever and the gearshift mechanism are in the park (P) position.
- Make sure that the hood is open.

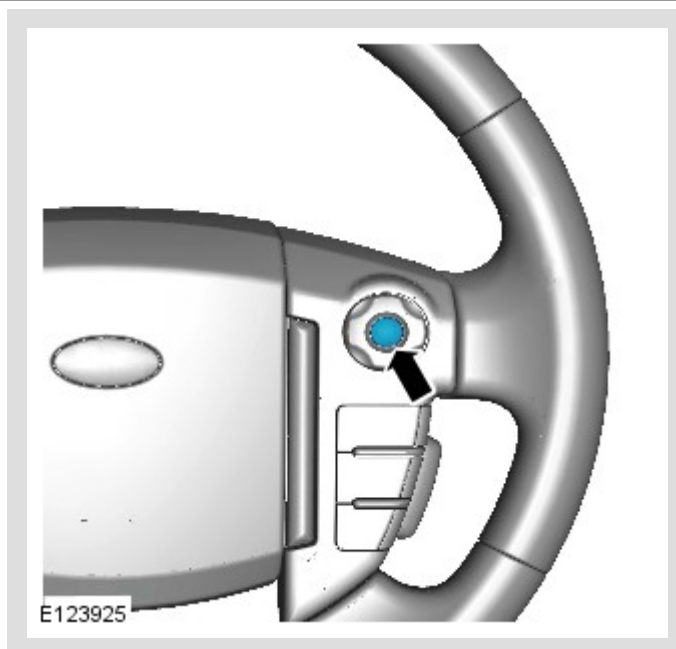
- Turn the ignition on.
-

23.

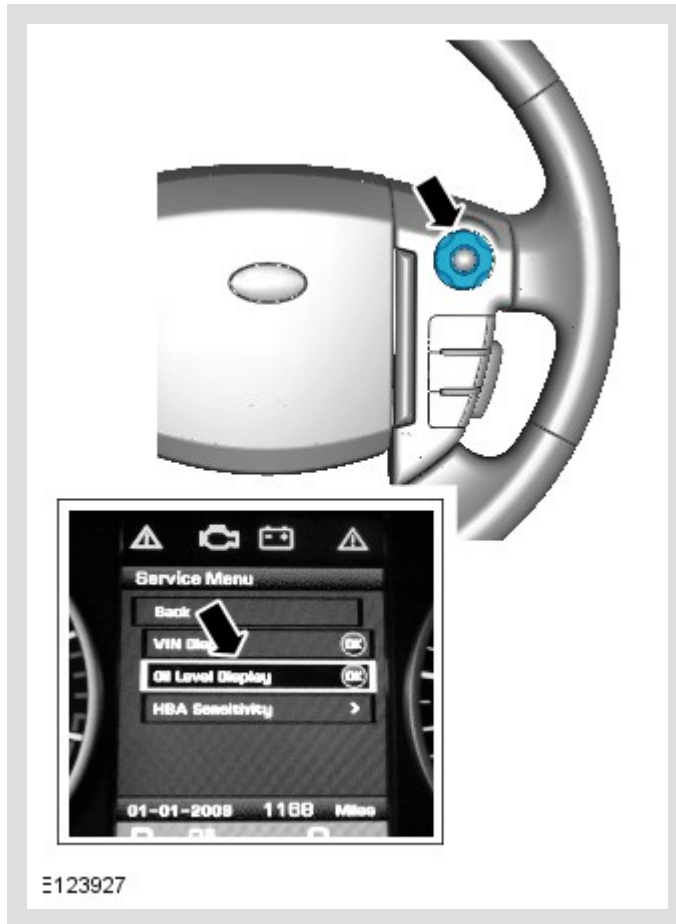


- Press the right-hand directional button to access the instrument cluster menu.

24.



- Press the right-hand OK button.



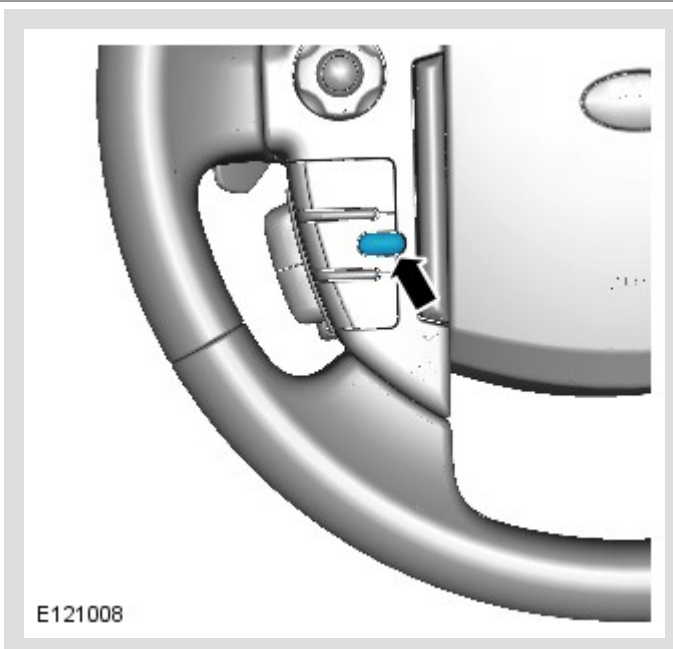
- Press the right-hand directional button to access the Oil Level Display.
-

26.



- Press the right-hand OK button and follow the instructions.

27.




- Press the cruise control cancel button twice within 2 seconds.

28.



- The message center display will revert to the normal display in the trip computer.
- Press the right-hand OK button and follow the instructions.
- Check that the oil level display shows an oil level reading.
- Only after having started and run the engine for 10 minutes (as indicated in Step 21), switch off the engine, then stabilizing for 10 minutes, take a reading from the oil level display and, if necessary top up with engine oil.

29.

 **NOTE:**

If instructed to follow Steps 22-28 in a previous step, return to Step 21 and continue the procedure.


Turn the ignition off.

30.

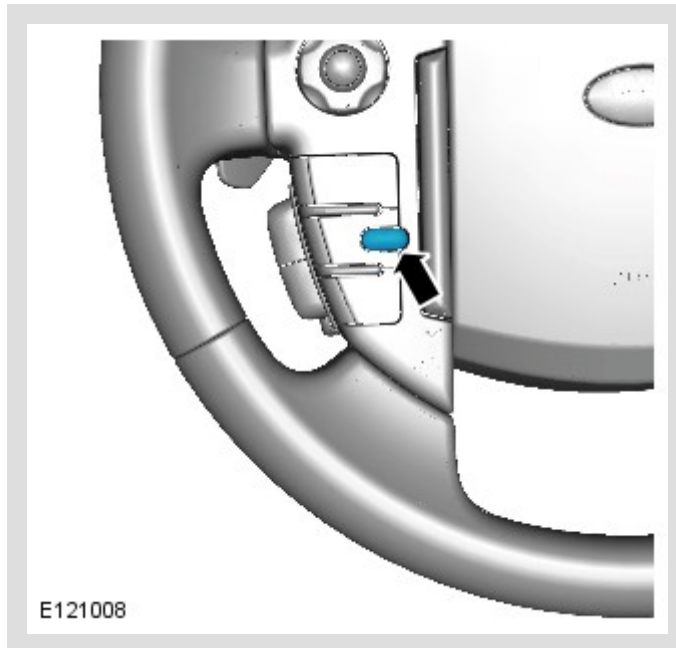
Allow 10 minutes for the engine oil level to stabilize if there has been additional oil top up.



31.

 NOTE:

The following steps are to update the average oil level value.



- Turn the ignition on.
- Press and hold the cruise control cancel button for more than 2 seconds.

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32.

- The message center display will revert to the normal display in the trip computer.

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33.

Turn the ignition off.

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34.

Turn the ignition on.

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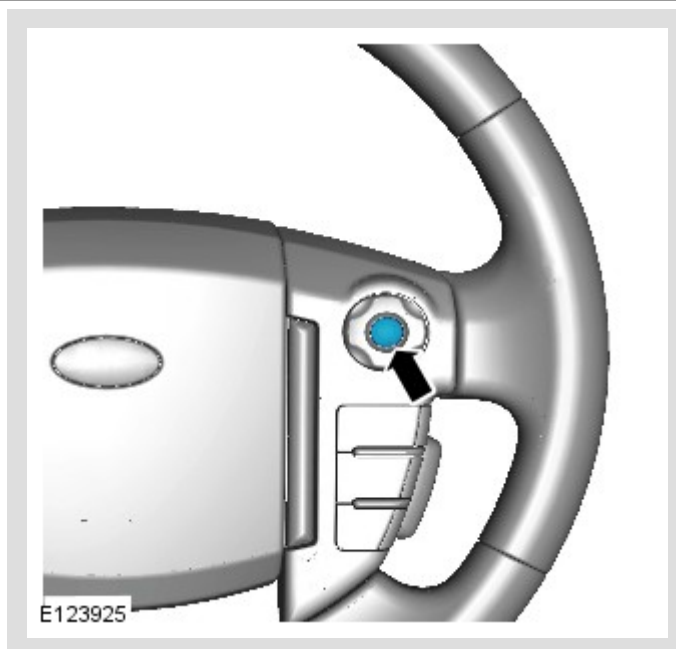
35.



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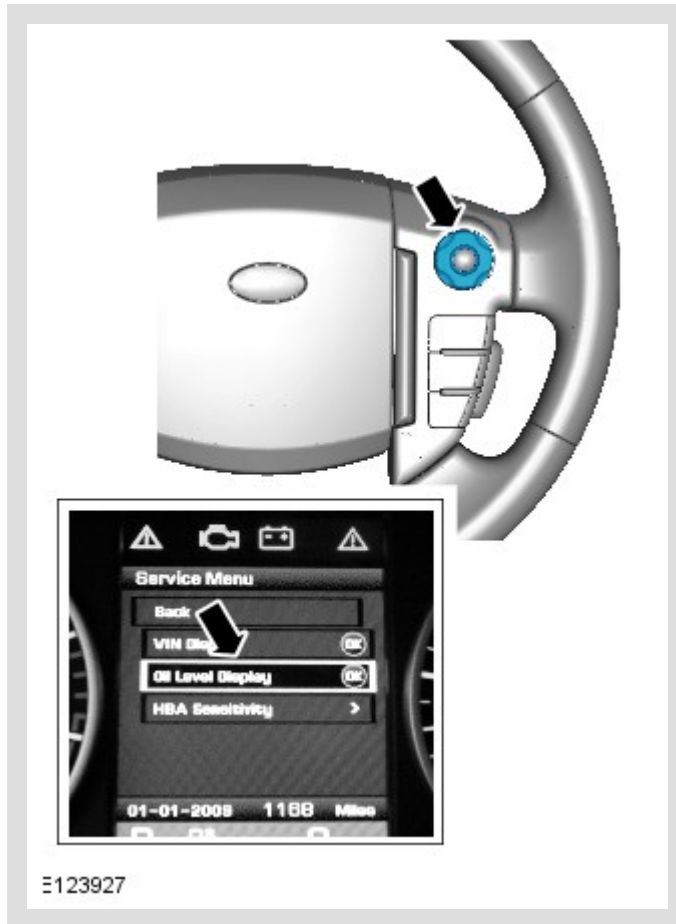
- Press the right-hand directional button to access the instrument cluster menu.

36.



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- Press the right-hand OK button.



- Press the right-hand directional button to access the Oil Level Display.
-

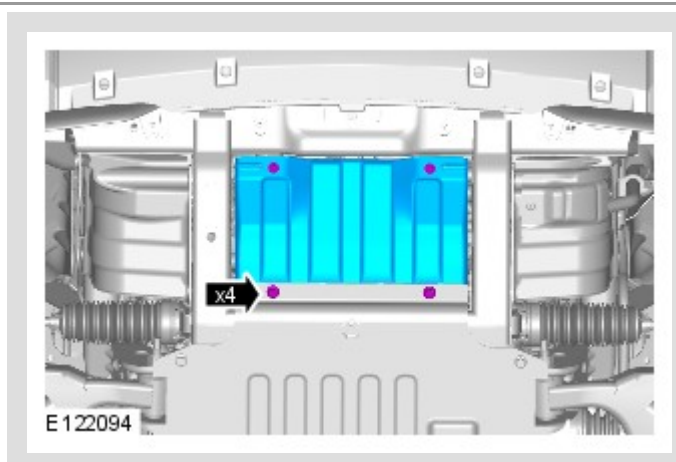
38.



- Press the right-hand OK button and follow the instructions.
- Make sure that the average oil level value has now been updated.

39. Refer to: Engine Undershield (501-02 Front End Body Panels, Removal and Installation).

40.



*Torque: 10 Nm*

PUBLISHED: 10-OCT-2017  
2010.0 RANGE ROVER SPORT (LS), 303-01

ENGINE - V8 N/A 5.0L PETROL

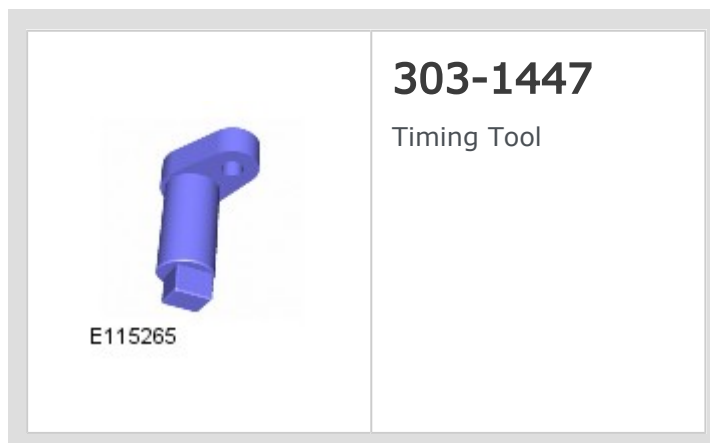
# FUEL PUMP CAMSHAFT TIMING ADJUSTMENT (G1473741)

GENERAL PROCEDURES

19.90.17	HIGH PRESSURE FUEL TIMING CHECK AND ADJUST	5000 CC, AJ V8, NATURALLY ASPIRATED	6.00	USED WITHINS
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19.90.17	HIGH PRESSURE FUEL TIMING CHECK AND ADJUST	5000 CC, AJ V8, SUPERCHARGED	6.70	USED WITHINS
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SPECIAL TOOL(S)





## ADJUSTMENT

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

2.



### WARNING:

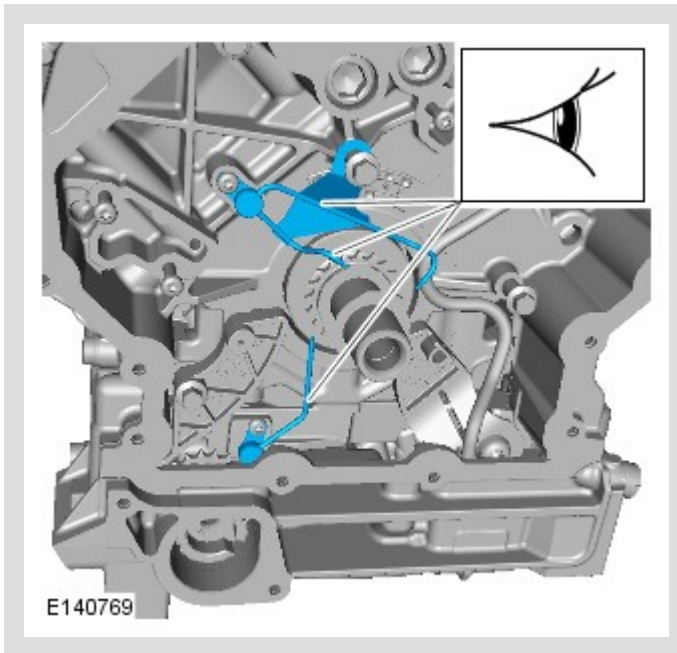
Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.


3. Refer to: Fuel Pump Camshaft Timing Check (303-01 Engine - V8 S/C 5.0L Petrol, General Procedures).
4. Refer to: Lower Timing Cover (303-01 Engine - V8 N/A 5.0L Petrol, Removal and Installation).  
Refer to: Lower Timing Cover (303-01 Engine - V8 S/C 5.0L Petrol, Removal and Installation).

**⚠ CAUTIONS:**

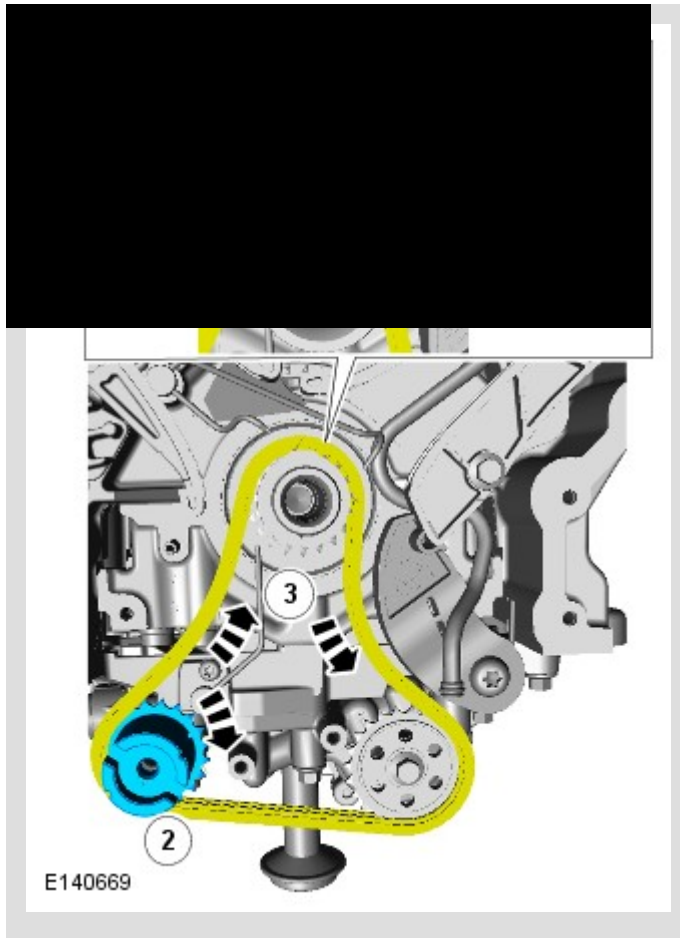
- Make sure that the area around the component is clean and free of foreign material.
- Inspect the 3 timing chain oil nozzles for signs of damage, install as necessary.



6.

 NOTE:

Using a suitable tie strap, position the tensioner to one side.



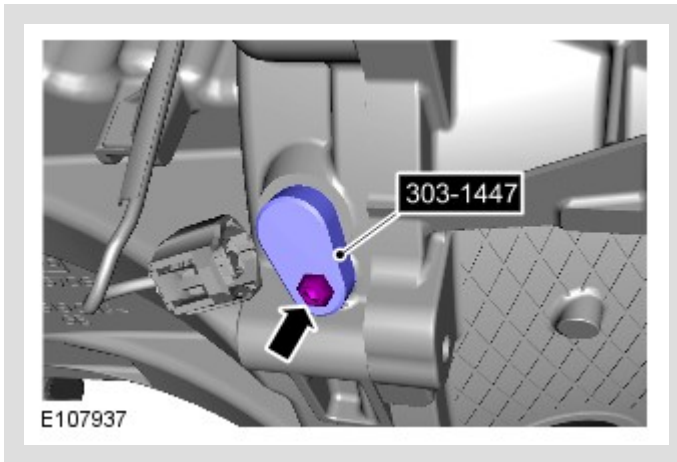
*Special Tool(s):* [JLR-303-1621](#)

*Torque:* 12 Nm

- 
7. Refer to: Lower Timing Cover (303-01 Engine - V8 N/A 5.0L Petrol, Removal and Installation).  
Refer to: Lower Timing Cover (303-01 Engine - V8 S/C 5.0L Petrol, Removal and Installation).
-

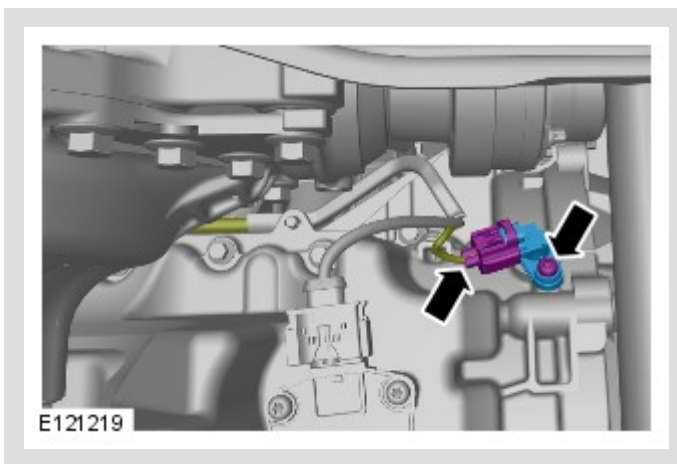


8.




Remove the Special Tool(s): 303-1447

9.

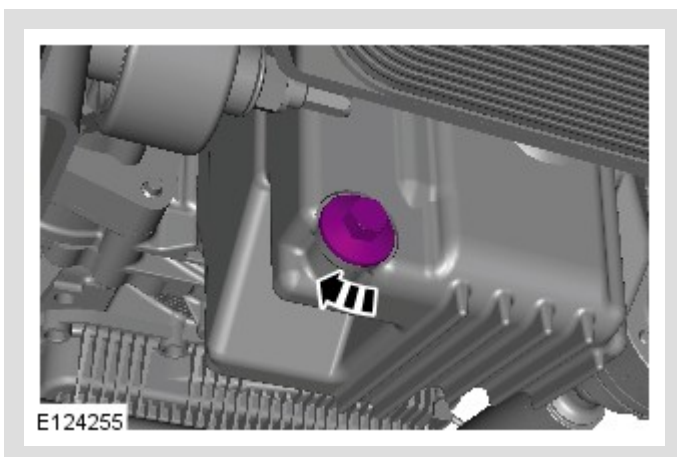


Torque: 10 Nm

10.

 NOTE:

Install a new sealing washer.



Torque: 24 Nm


---

11. Connect the battery ground cable.

Refer to: Specifications (414-01 Battery, Mounting and Cables, Specifications).

---

12.

 **CAUTION:**

Make sure that the vehicle is left for 5 minutes from filling with oil and that the engine oil level is reading at least minimum (by following Steps 15-21), before starting the engine.

- Fill the engine with oil - for filling values on vehicles without supercharger:  
Refer to: Specifications (303-01 Engine - V8 N/A 5.0L Petrol, Specifications).
- Fill the engine with oil - for filling values on vehicles with supercharger:  
Refer to: Specifications (303-01 Engine - V8 S/C 5.0L Petrol, Specifications).
- Clean any residual engine oil from the oil filler cap area.

---

13.

 **CAUTION:**

Make sure that the vehicle has been left for 5 minutes from filling with oil.

Follow the Steps 15-21 before starting the engine.

---

14.

- Start the engine and allow to run for 10 minutes, stop the engine.
- Check for leaks.

---

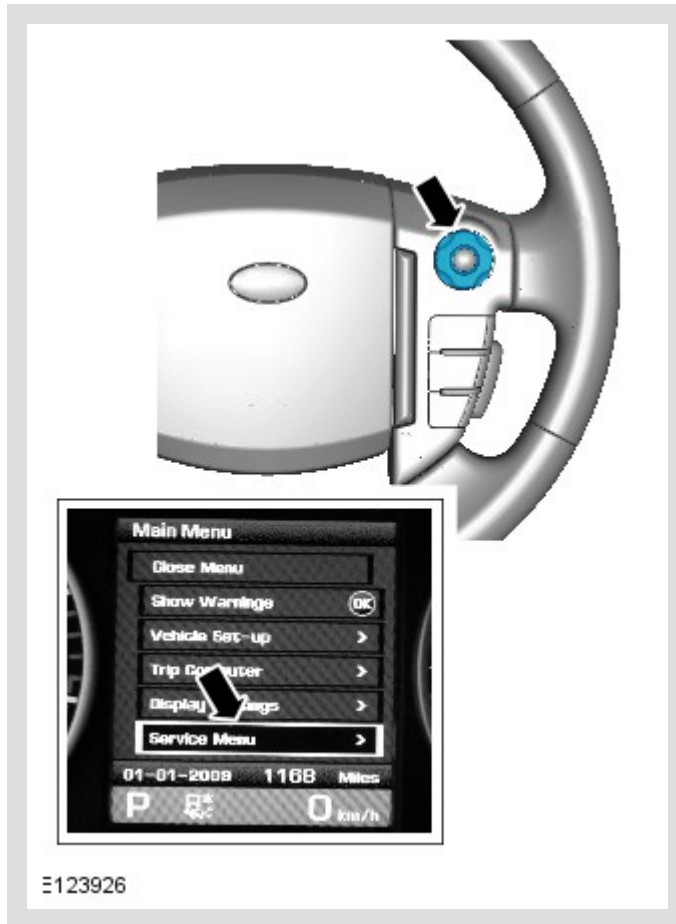
15.

 **CAUTIONS:**

- Make sure that the selector lever and the gearshift mechanism are in the park (P) position.
- Make sure that the hood is open.

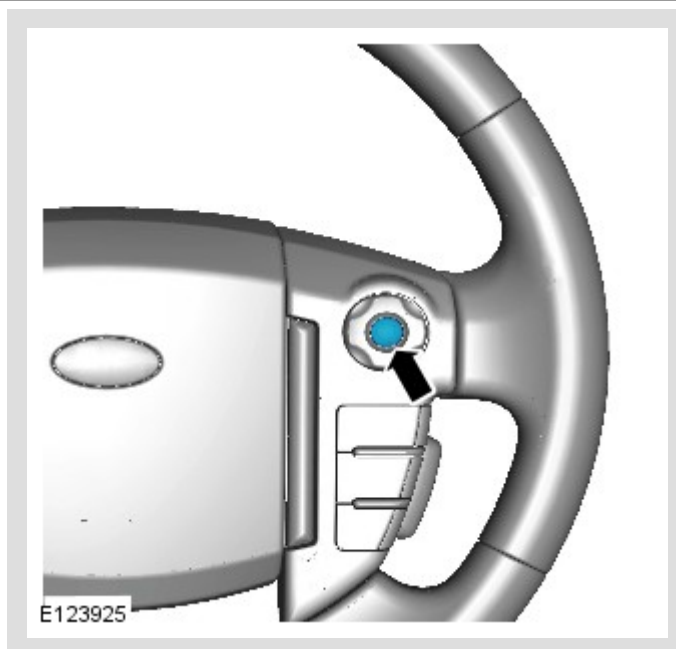
- Turn the ignition on.
-

16.

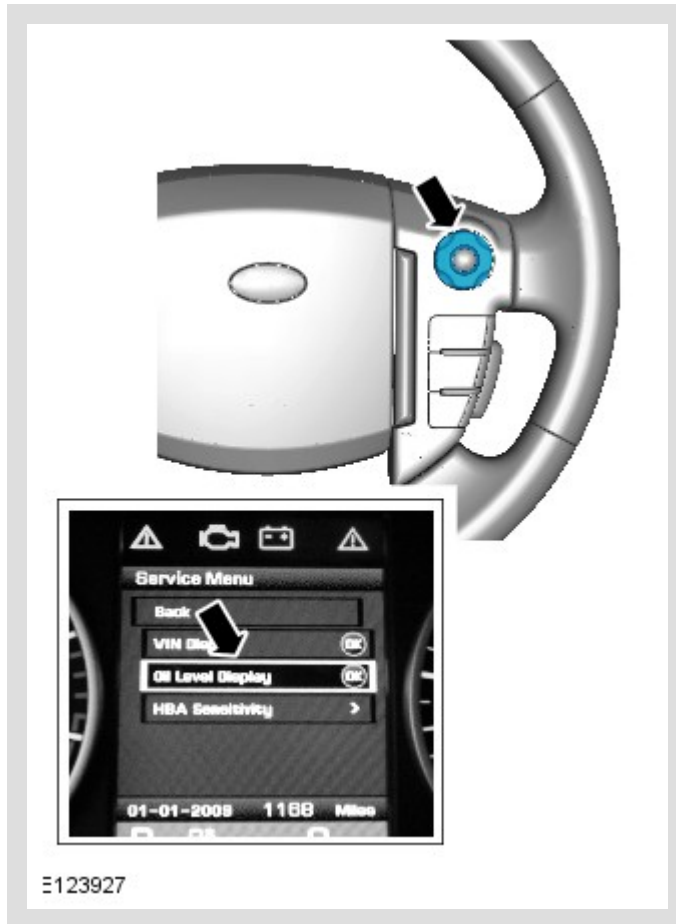


- Press the right-hand directional button to access the instrument cluster menu.

17.



- Press the right-hand OK button.



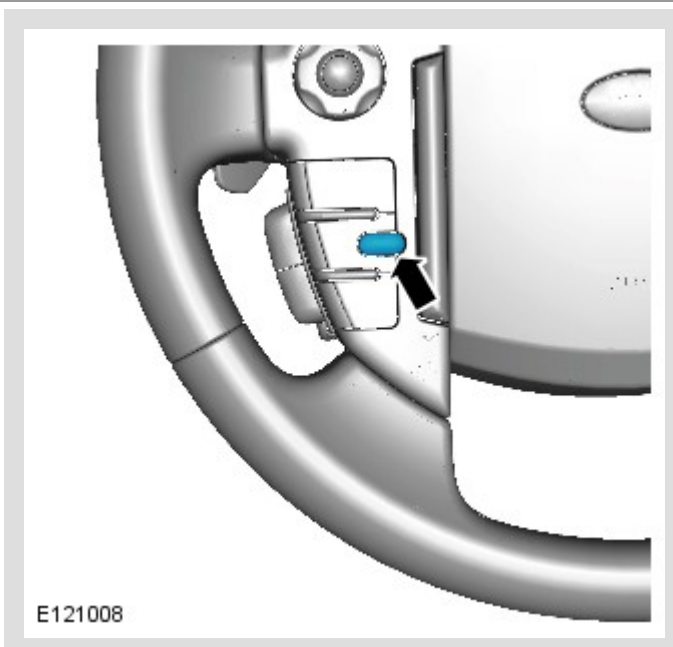
- Press the right-hand directional button to access the Oil Level Display.
-

19.



- Press the right-hand OK button and follow the instructions.

20.




- Press the cruise control cancel button twice within 2 seconds.

21.



- The message center display will revert to the normal display in the trip computer.
- Press the right-hand OK button and follow the instructions.
- Check that the oil level display shows an oil level reading.
- Only after having started and run the engine for 10 minutes (as indicated in Step 14), switch off the engine, then stabilizing for 10 minutes, take a reading from the oil level display and, if necessary top up with engine oil.

22.

 **NOTE:**


If instructed to follow Steps 15-21 in a previous step, return to Step 14 and continue the procedure.

Turn the ignition off.

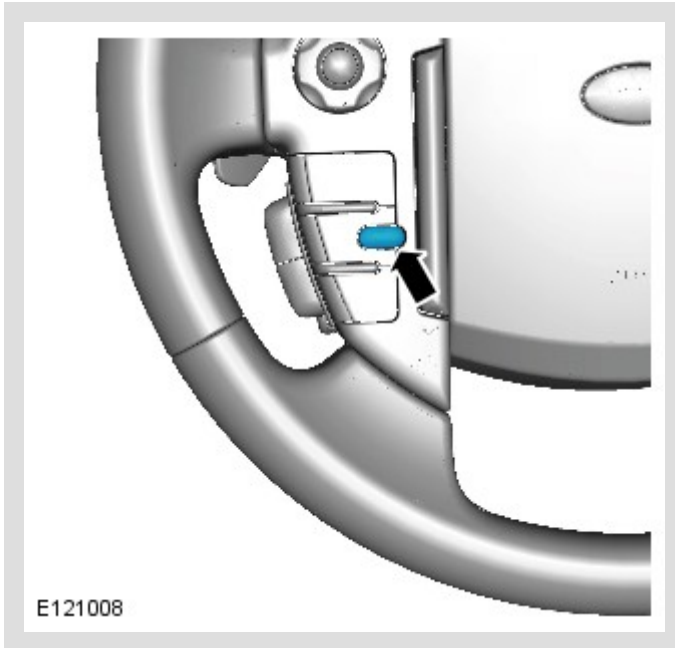
23.

Allow 10 minutes for the engine oil level to stabilize if there has been additional oil top up.

24.

 NOTE:

The following steps are to update the average oil level value.



- Turn the ignition on.
- Press and hold the cruise control cancel button for more than 2 seconds.

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25.

- The message center display will revert to the normal display in the trip computer.

---

26.

Turn the ignition off.

---

27.

Turn the ignition on.

---

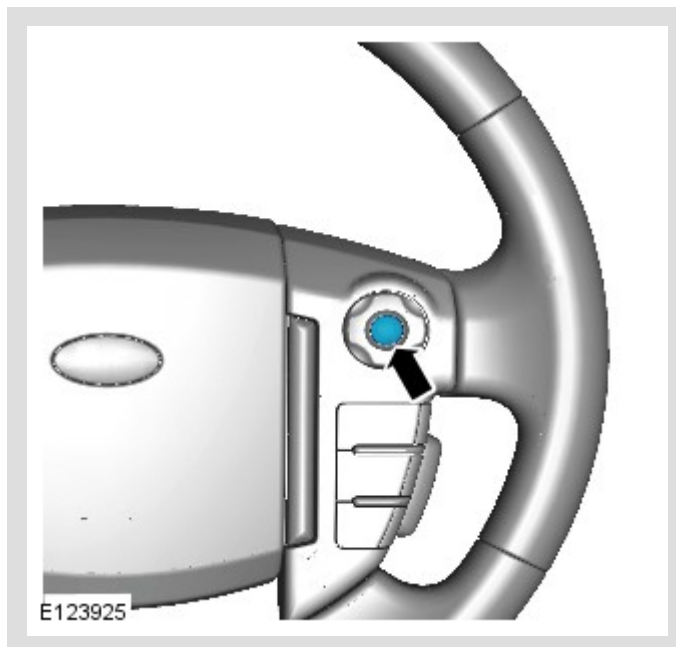
28.



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- Press the right-hand directional button to access the instrument cluster menu.

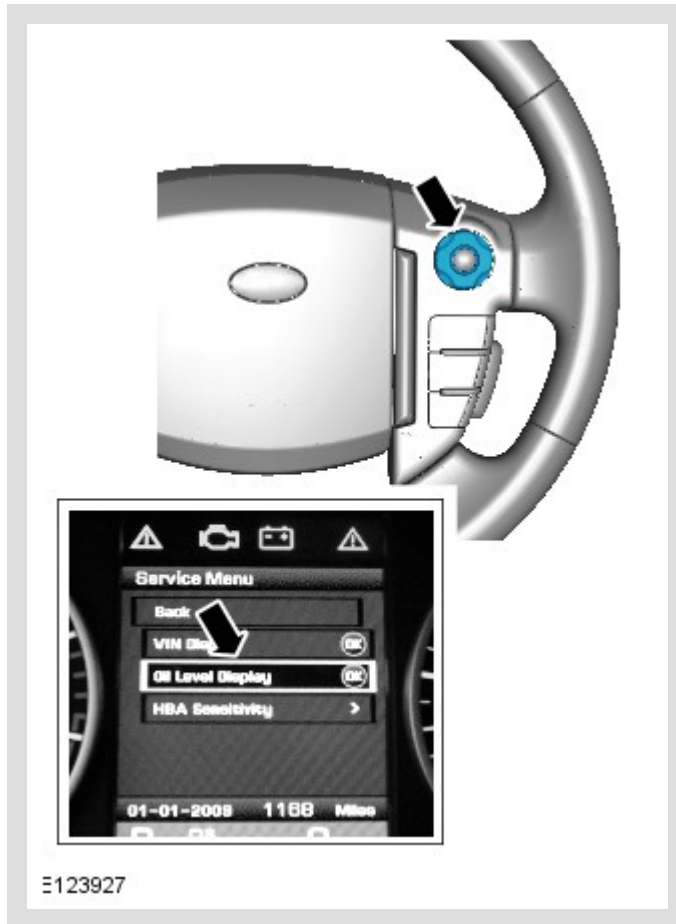
29.



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- Press the right-hand OK button.





- Press the right-hand directional button to access the Oil Level Display.
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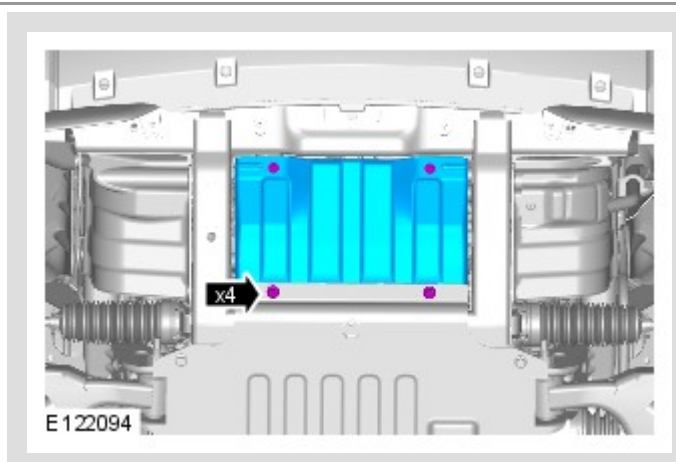
31.



- Press the right-hand OK button and follow the instructions.
- Make sure that the average oil level value has now been updated.

32. Refer to: Engine Undershield (501-02 Front End Body Panels, Removal and Installation).

33.



*Torque: 10 Nm*

PUBLISHED: 04-DEC-2014

2010.0 RANGE ROVER SPORT (LS), 303-01

# ENGINE - V8 N/A 5.0L PETROL

## SPECIFICATIONS

### Engine Data

ENGINE DESCRIPTION	ENGINE CAPACITY	MAXIMUM ENGINE TORQUE (EEC)	MAXIMUM ENGINE POWER (EEC)	COMPRESSION RATIO	BORE	STROKE
• 90° "Vee" • 8 Cylinder • 32 Valves	4.999 ccm	510 Nm at 3.500 RPM	276 kW at 6.500 RPM	11.5 ± 0.5	92.5 mm	93 mm

### Engine Firing Order

FIRING ORDER
1:2:7:3:4:5:6:8

### Engine Valve Clearance (cold)

INTAKE VALVE	EXHAUST VALVE
N/A	0.25 mm ± 0.02

### Spark Plugs

SPECIFICATION	SPARK PLUG GAP
ILKR6C-10	1 mm

### Lubricants, Fluids, Sealers and Adhesives

DESCRIPTION	SPECIFICATION
Engine Oil - Vehicles built up to 2015	SAE 5W20 WSS-M2C925-A <b>or</b> SAE 0W20 STJLR.51.5122
Engine Oil - Vehicles built from 2015	SAE 0W20 STJLR.51.5122
Sealant	WSE-M4G323-A6

## Capacities

DESCRIPTION	LITERS
Engine oil, initial fill	9.5
Engine oil, service fill with oil filter change	8.0

## Cylinder Head and Valve Train

ITEM	SPECIFICATION
Cylinder head <b>maximum</b> permitted warp (flatness specification)	0.2mm (0.008in)
Valve guide inner diameter (mm)	5.51 ± 0.01
Intake valve effective length (mm) (tip to gauge line)	97.63 ± 0.1
Exhaust valve effective length (mm) (tip to gauge line)	94.39 ± 0.1
Valve stem to guide clearance intake diametrical (mm)	0.022 - 0.057
Valve stem to guide clearance exhaust diametrical (mm)	0.03 - 0.065
Valve head diameter intake (mm)	36 ± 0.1
Valve head diameter exhaust (mm)	30 ± 0.1
Intake valve face angle (degrees)	44.875 ± 0.125
Exhaust valve face angle (degrees)	44.875 ± 0.125
Valve stem diameter intake (mm)	5.4705 ± 0.0075
Valve stem diameter exhaust (mm)	5.4625 ± 0.0075
Valve spring free length (mm) - inlet	43.43
Valve spring free length (mm) - exhaust	46.1
Valve spring installed height (mm) - inlet	34.49
Valve spring installed height (mm) - exhaust	35.1
Camshaft lobe lift intake (mm)	5.5 (low) 10.53 (high)
Camshaft lobe lift exhaust (mm)	9.36
Camshaft journal to cylinder head bearing surface clearance diametrical (mm)	0.025 - 0.065
Camshaft journal diameter - all positions	26.965 ± 0.01
Bearing diameter - all positions	27.01 ± 0.01
Camshaft journal maximum run out limit (mm)	

Camshaft journals to end journals	0.03
Camshaft journals to adjacent journals	0.015
Camshaft journal maximum out of round (mm) - all journals	0.005

## Torque Specifications

### NOTE:

**A = Refer to procedure for correct torque sequence.**

DESCRIPTION	NM	LB-FT	LB-IN
Engine cover mounting bolts	10	7	88
Accessory drive belt tensioner retaining bolt	40	30	354
Secondary drive belt idler retaining bolts	40	30	354
Power steering pump pulley retaining bolts	25	18	221
Power steering pump retaining bolts	25	18	221
Power steering pump bracket to engine retaining bolts	25	18	221
Generator retaining bolts	48	35	425
Starter motor retaining bolts	40	30	354
Air conditioning compressor retaining bolts	25	18	221
Engine mounting to engine mounting bracket retaining nuts	100	74	885
Engine mounting to subframe retaining bolts	56	41	496
Engine mounting bracket to engine retaining bolts	45 + 60°	33 + 60°	398 + 60°
Crankshaft damper pulley retaining LH threaded bolt	200 + 270°	148 + 180°	1770 + 270°
Flexplate retaining bolts	45 + 90°	33 + 90°	398 + 90°
Exhaust manifold heat shield retaining bolts	<b>A</b>	-	-
Exhaust manifold retaining bolts	<b>A</b>	-	-
Engine wiring harness bracket retaining bolts	10	7	88
Coolant outlet pipe	10	7	88
Intercooler retaining bolts	25	18	221
Intake manifold retaining bolts	25	18	221
Oil Cooler retaining bolts	13	10	115

Knock sensor (KS) retaining bolt	20	14	177
Ignition coil retaining bolts	8	-	71
Spark plugs	20	15	177
Fuel rail retaining bolts	<b>A</b>	-	-
High pressure fuel pipe retaining bolts	<b>A</b>	-	-
High pressure fuel pump retaining bolts	12	9	106
Oil filter housing assembly retaining bolts	12	9	106
Oil filter cap	25	18	221
Lifting eye bolts	25 + 90°	18 + 90°	221 + 90°
Manifold absolute pressure and temperature (MAPT) sensor sensor retaining bolts	5	-	44
Coolant pump retaining bolts	12	9	106
Variable valve timing (VVT) oil control solenoid retaining bolts	10	7	88
Camshaft position (CMP) sensor retaining bolts	10	7	88
Camshaft cover retaining bolts	13	10	115
Front upper timing cover retaining bolts	12	9	106
Front lower timing cover retaining bolts	<b>A</b>	-	-
Engine rear cover retaining bolts	<b>A</b>	-	-
VVT to camshaft retaining bolts	32	24	283
Camshaft bearing caps retaining bolts	11	8	97
Primary timing chain fixed guide retaining bolts	12	9	106
Primary timing chain tensioner retaining bolts	12	9	106
Primary timing chain tensioner guide blade retaining bolts	25	18	221
Auxiliary chain tensioner guide retaining bolts	21	15	186
Auxiliary chain fixed guide retaining bolt	12	9	106
Oil pump sprocket retaining bolt	21	15	186
Cylinder head retaining bolts	<b>A</b>	-	-
Engine oil level (EOL) sensor retaining bolt	12	9	106
Crankshaft position (CKP) sensor retaining bolt	10	7	88
Oil sump body to engine retaining bolts	25	18	221
Oil pan drain plug	24	18	212
Oil transfer tube to Oil pan body retaining bolts	11	8	97

Oil pump to engine block retaining bolts	25	18	221
Pick-up pipe to oil pump retaining bolts	12	9	106
Windage tray retaining bolts	25	18	221
Piston cooling jet retaining bolts	12	9	106
Engine block coolant draining plug	50	37	442
Cooling fan pulley	25	18	221
<b>Connecting Rod bolts</b>			
Stage 1	10	7	88
Stage 2	50	37	442
<b>Main bearing cap</b>			
<b>M10</b> bolt Stage 1	25	18	221
<b>M10</b> bolt Stage 2	57 + 70°	42 + 70°	504 + 70°
<b>M8</b> bolt Stage 1	15	11	133
<b>M8</b> bolt Stage 2	33 + 75°	24 + 75°	292 + 75°

PUBLISHED: 11-MAY-2011  
2010.0 RANGE ROVER SPORT (LS), 501-02

## FRONT END BODY PANELS

# ENGINE UNDERSHIELD (G354673)

REMOVAL AND INSTALLATION

76.10.50 ENGINE ALL 0.20 USED  
UNDERSHIELD DERIVATIVES WITHINS

REMOVAL

1.



**WARNING:**

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

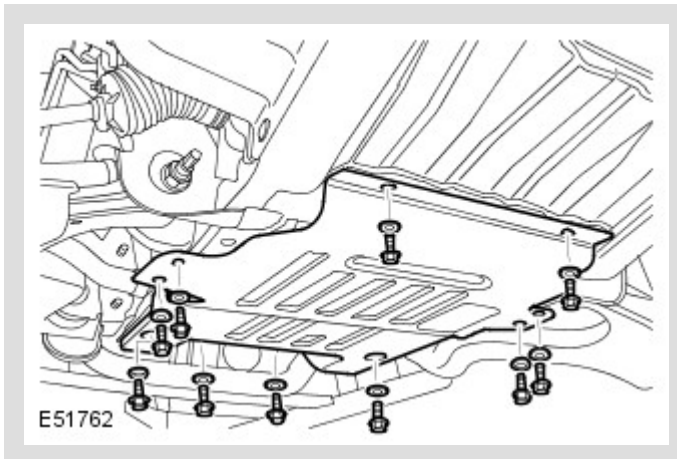
Raise and support the vehicle.

2.



**CAUTION:**

Note the special washer.



Remove the engine undershield.

Remove the 10 bolts.

## INSTALLATION

1. To install, reverse the removal procedure.

Tighten the bolts to 62 Nm (46 lb.ft).



# BATTERY, MOUNTING AND CABLES

## SPECIFICATIONS

### Torque Specifications

DESCRIPTION	NM	LB-FT
Battery clamp bolts	5	4
Battery terminal nuts	5	4
Battery tray nuts	12	9
Auxiliary battery tray nuts	12	9

PUBLISHED: 12-JUN-2014

2010.0 RANGE ROVER SPORT (LS), 303-01

## ENGINE - V8 S/C 5.0L PETROL

## SPECIFICATIONS

### Engine Data

ENGINE DESCRIPTION	ENGINE CAPACITY	MAXIMUM ENGINE TORQUE (EEC)	MAXIMUM ENGINE POWER (EEC)	COMPRESSION RATIO	BORE	STROKE
• 90° "Vee" • 8 Cylinder • 32 Valves	4.999 ccm	625 Nm at 2.500 - 5.500 RPM	375 kW at 6.000 - 6.500 RPM	9.5 ± 0.50	92.5 mm	93 mm

### Engine Firing Order

FIRING ORDER
1:2:7:3:4:5:6:8

## Engine Valve Clearance (cold)

INTAKE VALVE	EXHAUST VALVE
0.20 ±0.02	0.25 ±0.02

## Spark Plugs

SPECIFICATION	SPARK PLUG GAP
ILKR6C-10	1 mm

## Lubricants, Fluids, Sealers and Adhesives

DESCRIPTION	SPECIFICATION
Engine Oil	WSS-M2C925-A
Sealant	WSE-M4G323-A6
Core plug and stub pipe retainer	WSK-M2G349-A7

## Capacities

DESCRIPTION	LITERS
Engine oil, initial fill	9.65
Engine oil, service fill with oil filter change	8.0

## Cylinder Head and Valve Train

ITEM	SPECIFICATION
Cylinder head <b>maximum</b> permitted warp (flatness specification)	0.2
Valve guide inner diameter (mm)	5.51 ± 0.01
Intake valve effective length (mm) (tip to gauge line)	117.21 ± 0.1
Exhaust valve effective length (mm) (tip to gauge line)	94.39 ± 0.1
Valve stem to guide clearance intake diametrical (mm)	0.022 - 0.057
Valve stem to guide clearance exhaust diametrical (mm)	0.03 - 0.065
Valve head diameter intake (mm)	36 ± 0.1
Valve head diameter exhaust (mm)	30 ± 0.1
Intake valve face angle (degrees)	44.875 ± 0.125
Exhaust valve face angle (degrees)	44.875 ± 0.125

Valve stem diameter intake (mm)	5.4705 ± 0.0075
Valve stem diameter exhaust (mm)	5.4625 ± 0.0075
Valve spring free length (mm) - inlet	46.1
Valve spring free length (mm) - exhaust	46.1
Valve spring installed height (mm) - inlet	35.74
Valve spring installed height (mm) - exhaust	35.1
Camshaft lobe lift intake (mm)	10
Camshaft lobe lift exhaust (mm)	9.36
Camshaft journal to cylinder head bearing surface clearance diametrical (mm)	0.025 - 0.065
Camshaft journal diameter - all positions	26.965 ± 0.01
Bearing diameter - all positions	27.01 ± 0.01
Camshaft journal maximum run out limit (mm)	
Camshaft journals to end journals	0.03
Camshaft journals to adjacent journals	0.015
Camshaft journal maximum out of round (mm) - all journals	0.005

## Torque Specifications

### NOTE:

**A = Refer to procedure for correct torque sequence.**

DESCRIPTION	NM	LB-FT	LB-IN
Engine cover mounting bolts	10	7	88
Accessory drive belt tensioner retaining bolt	40	30	354
Supercharger belt idler/tensioner bracket retaining bolts	25	18	221
Secondary drive belt idler retaining bolts	40	30	354
Power steering pump pulley retaining bolts	25	18	221
Power steering pump retaining bolts	25	18	221
Power steering pump bracket to engine retaining bolts	25	18	221
Generator retaining bolts	48	35	425
Starter motor retaining bolts	40	30	354
Air conditioning compressor retaining bolts	25	18	221

Engine mounting to engine mounting bracket retaining nuts	100	74	885
Engine mounting to subframe retaining bolts	56	41	496
Engine mounting bracket to engine retaining bolts	45 + 60°	33 + 60°	398 + 60°
Crankshaft damper pulley retaining LH threaded bolt	200 + 270°	148 + 180°	1770 + 270°
Flexplate retaining bolts	45 + 90°	33 + 90°	398 + 90°
Exhaust manifold heat shield retaining bolts	<b>A</b>	-	-
Exhaust manifold retaining bolts	<b>A</b>	-	-
Engine wiring harness bracket retaining bolts	10	7	88
Coolant outlet pipe	10	7	88
Intercooler retaining bolts	25	18	221
Oil Cooler retaining bolts	13	10	115
Knock sensor (KS) retaining bolt	20	14	177
Ignition coil retaining bolts	8	-	71
Spark plugs	20	15	177
Fuel rail retaining bolts	<b>A</b>	-	-
High pressure fuel pipe retaining bolts	<b>A</b>	-	-
High pressure fuel pump retaining bolts	12	9	106
Oil filter housing assembly retaining bolts	12	9	106
Oil filter cap	25	18	221
Lifting eye bolts	25 + 90°	18 + 90°	221 + 90°
Manifold absolute pressure and temperature (MAPT) sensor sensor retaining bolts	5	-	44
Coolant pump retaining bolts	12	9	106
Variable valve timing (VVT) oil control solenoid retaining bolts	10	7	88
Camshaft position (CMP) sensor retaining bolts	10	7	88
Camshaft cover retaining bolts	13	10	115
Front upper timing cover retaining bolts	12	9	106
Front lower timing cover retaining bolts	<b>A</b>	-	-
Engine rear cover retaining bolts	<b>A</b>	-	-
VVT to camshaft retaining bolts	32	24	283
Camshaft bearing caps retaining bolts	11	8	97

Primary timing chain fixed guide retaining bolts	12	9	106
Primary timing chain tensioner retaining bolts	12	9	106
Primary timing chain tensioner guide blade retaining bolts	25	18	221
Auxiliary chain tensioner guide retaining bolts	21	15	186
Auxiliary chain fixed guide retaining bolt	12	9	106
Oil pump sprocket retaining bolt	21	15	186
Cylinder head retaining bolts	<b>A</b>	-	-
Engine oil level (EOL) sensor retaining bolt	12	9	106
Crankshaft position (CKP) sensor retaining bolt	10	7	88
Oil sump body to engine retaining bolts	25	18	221
Oil pan drain plug	24	18	212
Oil transfer tube to Oil pan body retaining bolts	11	8	97
Oil pump to engine block retaining bolts	25	18	221
Pick-up pipe to oil pump retaining bolts	12	9	106
Windage tray retaining bolts	25	18	221
Piston cooling jet retaining bolts	12	9	106
Engine block coolant draining plug	50	37	442
Cooling fan pulley	25	18	221
<b>Connecting Rod bolts</b>			
Stage 1	10	7	88
Stage 2	50	37	442
<b>Main bearing cap</b>			
<b>M10</b> bolt Stage 1	25	18	221
<b>M10</b> bolt Stage 2	57 + 70°	42 + 70°	504 + 70°
<b>M8</b> bolt Stage 1	15	11	133
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