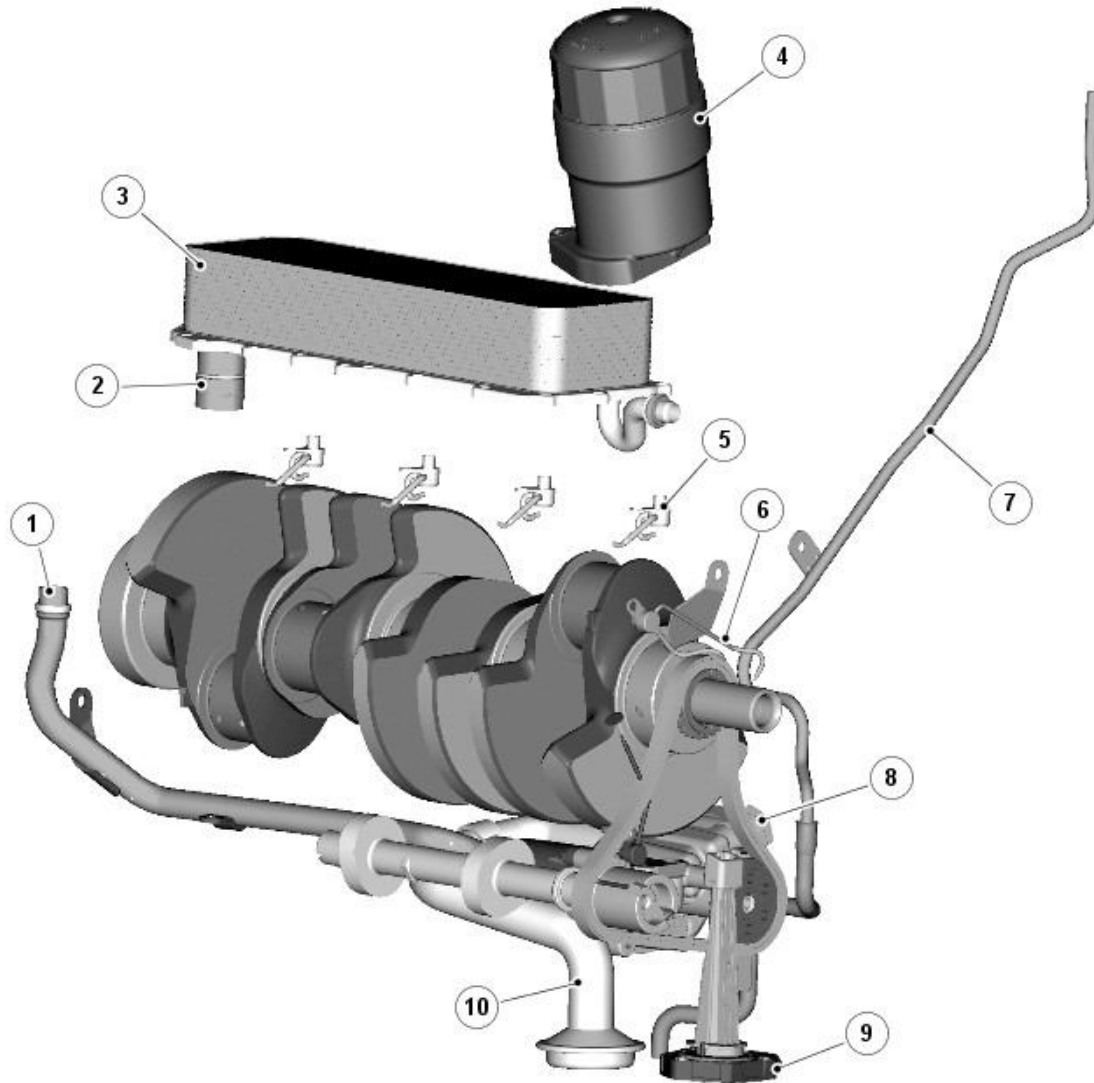


LUBRICATION SYSTEM



E106742

Item	Part Number	Description
1	-	Oil pump outlet tube
2	-	Anti-drain valve
3	-	Oil cooler
4	-	Oil filter
5	-	Piston cooling jets
6	-	Timing chain lubrication jets
7	-	Oil evacuation tube
8	-	Oil pump
9	-	Oil temperature and level sensor
10	-	Oil pick-up

The oil pump is attached to the underside of the windage tray. The input shaft of the oil pump is driven from the front of the crankshaft, by the auxiliary chain, at 0.87 engine speed.

The oil pump draws oil from the sump pan through a centrally mounted pick-up pipe. The oil is pressurized and pumped through an output tube to the cylinder block. After passing through an anti-drain valve and a plate type oil cooler, the oil is filtered by a replaceable cartridge installed on the front of the RH cylinder head.

The output from the oil filter is distributed through oil galleries in the cylinder heads and cylinder block. All moving parts are lubricated by pressure or splash oil. Pressurized oil is also provided for the VCT system, the timing chain tensioners, the piston cooling jets and the timing chain lubrication jets.

The oil returns to the oil pan under gravity. Large drain holes through the cylinder heads and cylinder block ensure the rapid return of the oil to the sump pan. System replenishment is through the oil filler cap on the LH cylinder head cover.

An oil evacuation tube is installed to allow oil to be drawn from the sump pan. The upper end of the oil evacuation tube is located under the oil filler cap.

An oil drain plug is installed in the RH side of the sump pan.

Oil Pump Nominal Operating Pressures

Engine Speed, rev/min	Temperature, °C (°F)	Pressure, bar (lbf/in ²)
Idle	20 (68)	2.0 (29.0)
1500	20 (68)	6.0 (87.0)
3000	40 (104)	6.2 (90.0)
3000	110 (230)	5.0 (72.5)
3000	130 (266)	4.0 (58.0)

Oil Level Monitoring

Oil level monitoring is provided by an oil level and temperature sensor that measures the oil level in the sump pan. The oil level can be displayed in the message center of the instrument cluster.

Oil Level and Temperature Sensor



E115936

The oil level and temperature sensor supplies the ECM with a signal containing the level and temperature of the oil in the sump pan. The oil level and temperature sensor is secured to the bottom of the sump pan with three screws and sealed with a gasket.

The oil level and temperature sensor sends an ultrasonic pulse vertically upward and measures the time taken for the pulse to be reflected back from the top surface of the oil. This time is compared with the time taken for an ultrasonic pulse to travel a reference distance within the oil level and temperature sensor to determine the oil level. The oil level reading is combined with the oil temperature reading and transmitted in a PWM signal to the ECM.

Oil Level and Temperature Sensor Specifications

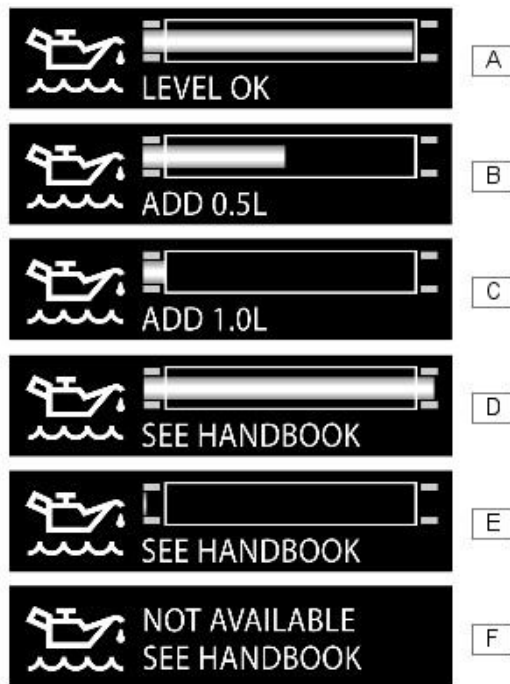
Feature	Details
Power source	Battery Voltage
Level Accuracy	±2 mm (±0.08 in.) at temperatures of -30 °C (-22 °F) and above; (±4 mm (±0.16 in.) at temperatures below -30 °C (-22 °F))
Temperature Accuracy	±2 °C (±3.6 °F)
Operating Level Range	116 to 147 mm (4.57 to 5.79 in.)
Operating Temperature Range	-40 to 160 °C (-40 to 320 °F)

Oil Level Check

For additional information, refer to: [Engine Oil Draining and Filling](#) (303-01A Engine - V8 S/C 5.0L Petrol, General Procedures).

For accuracy, oil level checks should be performed with the vehicle on level ground when the oil is hot. The vehicle needs to stand for approximately 10 minutes, after the engine is switched off, to allow the oil to drain back into the sump pan and the oil level to stabilize. The oil level system will not give a reading until the oil level has stabilized.

With the ignition on, the engine stopped and the transmission in P (park), repeatedly press the trip button on the end of the LH multifunction switch until the oil level icon and applicable message are displayed in the fuel gage/trip computer area of the message center, as shown below:



E107571

Item	Part Number	Description
A	-	Oil level is between 50% and 100% of recommended level. No top-up required.
B	-	Oil level is between 12.5% and 50% percent of recommended level. Add 0.5 liter (0.53 US quart) of oil.
C	-	Oil level is between 0% and 12.5% of recommended level. Add 1 liter (1.06 US quarts) of oil.
D	-	Oil level is above maximum for safe operation. Reduce oil level to recommended level.
E	-	Oil level is below minimum for safe operation. Add 1.5 liters (1.59 US quarts) of oil, then recheck level.
F	-	Oil level is stabilizing. Wait 10 minutes and then recheck level. If this display is accompanied by the message ENGINE OIL LEVEL MONITOR SYSTEM FAULT, a fault with the oil level monitoring system is indicated.

System Fault Warning

If there is a fault with the system, in addition to being displayed during an oil level check, the message ENGINE OIL LEVEL MONITOR SYSTEM FAULT will be temporarily displayed when the ignition is first switched on.