

The oil cooler is designed to ensure good control of engine oil temperature under all operating conditions. Cooled oil is distributed through a series of internal galleries to the engine's critical bearing surfaces before draining back into the sump.

Synthetic oil is specified; this is more resistant to temperature-related degradation than conventional mineral oil. It also has lower viscosity at low temperatures and improved lubrication performance at higher temperatures.

The specification of SLX Professional A1 5W-20 synthetic oil is an important part of new engine's oil change strategy as it permits longer oil-change intervals than conventional lubricants.

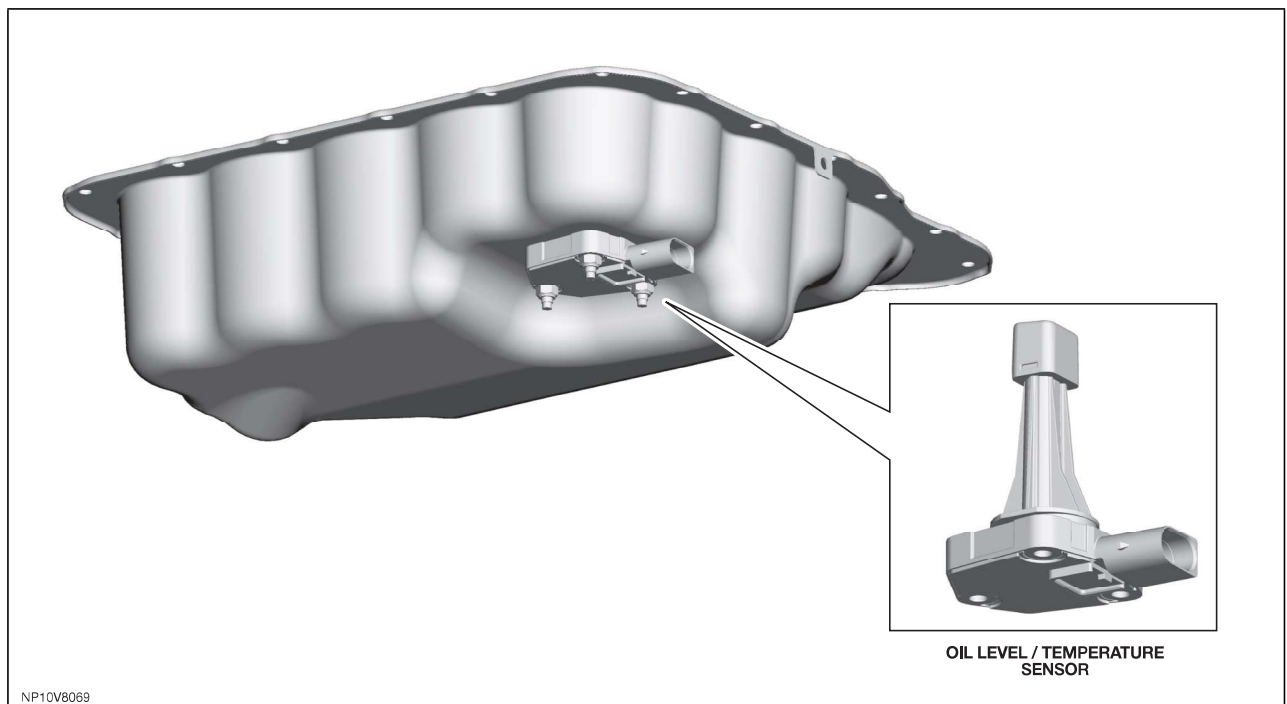
Oil Level / Temperature Sensor

The new ultrasonic sensor, a first for JLR, provides an electronic indication as to when the oil in the engine's sump is low or high. This allows for the deletion of the mechanical dipstick.

The sensor maps the fill level of the oil continually during trips. An advantage in comparison with the static 'dipstick' method is that all marginal influences are compensated for by averaging. Marginal influences include the vehicle being on a slope, the oil flowing back at the end of a journey, lateral and longitudinal acceleration, or even dipstick tolerances.

The values determined can be used to signal that the minimum oil level has been reached or to display the current oil level if required.

NOTE: Jaguar Sump Shown



The continuous-mode sensor measures engine oil level and temperature. The oil level and oil temperature readings are taken and turned into a pulse-width modulated output signal.

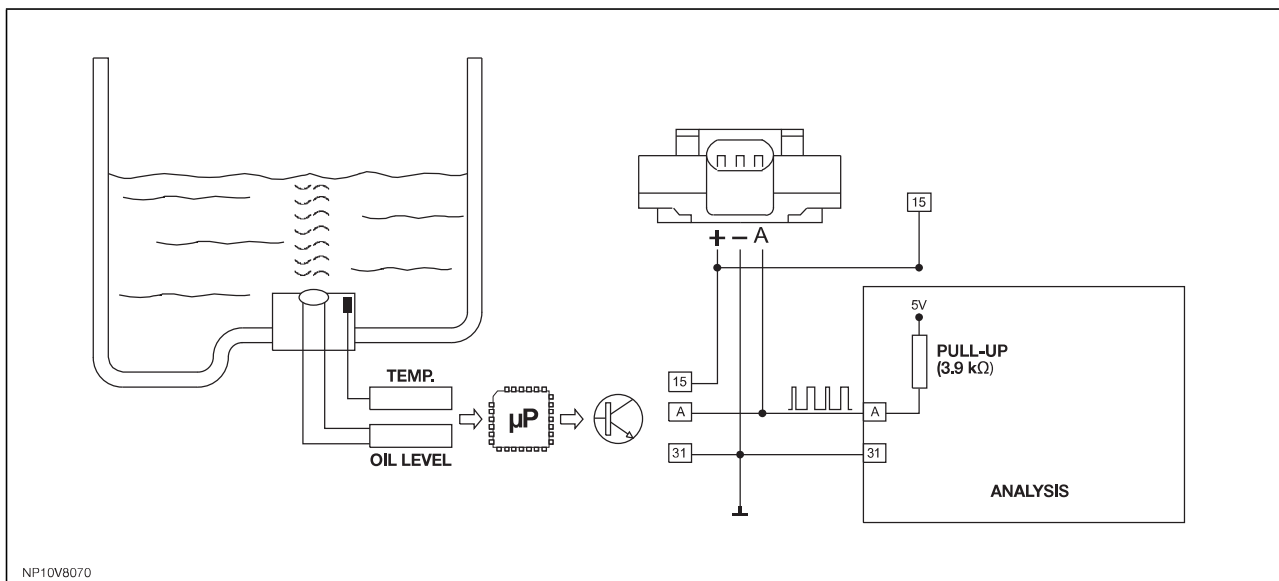
The measuring system consists of a flange, connector, electronic circuitry and the temperature and oil level sensor. Oil level metering is determined by the oil-to-air interface layer.

The oil level sensor has the following technical properties:

- Linear measuring range
- Continuous measuring under static and dynamic conditions
- Temperature signal and oil level signal 0.3s after switch-on
- Measuring frequency > 10 Hz
- Customer-specific output signal
- Installs at bottom of oil sump
- Temperature measuring

The sensor is mounted to the underside of the sump, from where it sends an ultrasonic pulse vertically upward (engine position). It then measures the time for the pulse to be reflected back from the top surface of the oil.

It compares this time period with a time period of a second pulse which travels within the sensor across a reference distance. With both time periods it can calculate the oil height from the sensor flange, negating the noise factors which affect the speed of the pulse through the oil.



Specification	Function
Power source	Battery voltage
Level Accuracy	±2mm (±4mm < -30°C)
Temperature Accuracy	±2°C (35°F)
Operating Level Range	18mm – 116mm (Dynamic) 116mm – 147mm (Static)
Operating Temp. Range	-40°C – 160°C (-40°F – 320°F)
Pin 1	Power Supply
Pin 2	Ground
Pin 3	Output Signal

Oil Pressures

Engine Speed	Temperature	Pressure
Idle	20°C (68°F)	2 bar (29 psi)
1500 rpm	20°C (68°F)	6 bar (87 psi)
3000 rpm	40°C (104°F)	6.2 bar (90 psi)
3000 rpm	110°C (230°F)	5 bar (72.5 psi)
3000 rpm	130°C (266°F)	4 bar (58 psi)