Engine

Oil Level Measurement

The 9x1 series Sports Cars provide the option of performing a dynamic oil level measurement when the vehicle is moving and a static measurement without the engine running when the vehicle is stationary. If a display is shown in the instrument cluster then it is valid in principle.

The measuring options described below are possible due to the integrated dry-sump lubrication of the engine and the associated structure of the oil pan and sensor. The engine is filled with approx. 10.6 qts (10 liters) of engine oil, the change quantity is approx. 7.9 qts (7.5 liters).

Important!

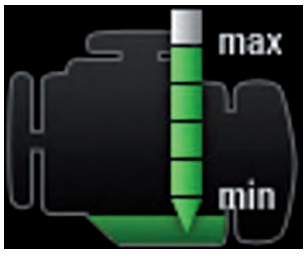
Engine oil must only be added when the engine is switched off.

> When the rear lid is open, the engine-oil level in the instrument cluster is only updated when the engine is switched off.

> When the rear lid is open and the engine is running, the oil level is **not** updated, i.e. the engine can be overfilled.

Oil Sensor

The sensor consists of an ultrasonic sensor with an integrated evaluation unit and a temperature sensor for detecting the engine oil temperature. A measuring cup with an inlet hole at the bottom and a vent hole at the top is placed over the ultrasonic sensor. A meander-shaped element is used at the inlet hole to permit an accurate measurement.



Oil level OK, 100%

Oil level OK, 75%

Oil level OK, 50%

Oil level OK, 25%

Dynamic Measurement

Conditions for recalculation:

- Rear lid closed
- Engine running
- Oil temperature at the sensor > 158° F. (70° C.)
- Engine speed < 2,500 rpm
- Longitudinal and lateral acceleration < 1 m/s^2, and tilt angle < 5.7°

When the vehicle is stationary, the measurement is completed within 2 to 3 minutes, depending on the inclination of the vehicle. The measurement is completed within approx. 3 to 9 miles (5 to 15 km) while driving, depending on driving style.

The measured values are only used for calculation if the conditions are met. The result is then displayed in the instrument cluster via CAN. This value can also be displayed in the instrument cluster when the ignition is on.

Static Measurement

Conditions for recalculation:

- Engine off
- Oil temperature at the sensor > 158° F. (70° C.)
- Longitudinal and lateral acceleration < 1 m/s^2, and tilt angle < 5.7°
- Wait max. 60 seconds

When the ignition is switched on, the result is then transmitted to the instrument cluster via CAN and displayed after 2.5 seconds.

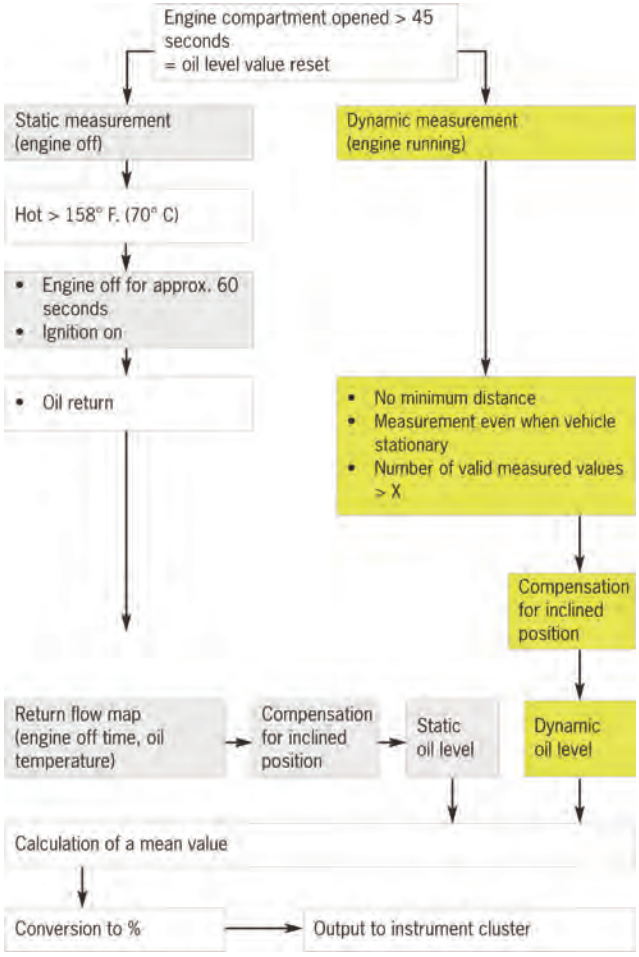
The following applies to both measurements:

If the conditions are not met when the measurement is performed, the last valid value will be displayed. A mean value calculated from the static measurement and dynamic measurement is displayed. If there is no dynamic measurement, the static measurement value is always displayed.

Oil level measurement after opening the engine compartment lid:

When the engine compartment lid is opened for more than 45 seconds, all previously determined measured values are discarded because the DME control unit assumes that oil was added.

The oil level is no longer displayed in the instrument cluster and the message "Display only possible after short time" appears. A new static value is measured 60 seconds after switching off the engine (engine oil temperature > 158° F./70° C.) even if the ignition is switched off.



Minimum oil level reached

Oil level below minimum


Oil level below maximum

Notes: