

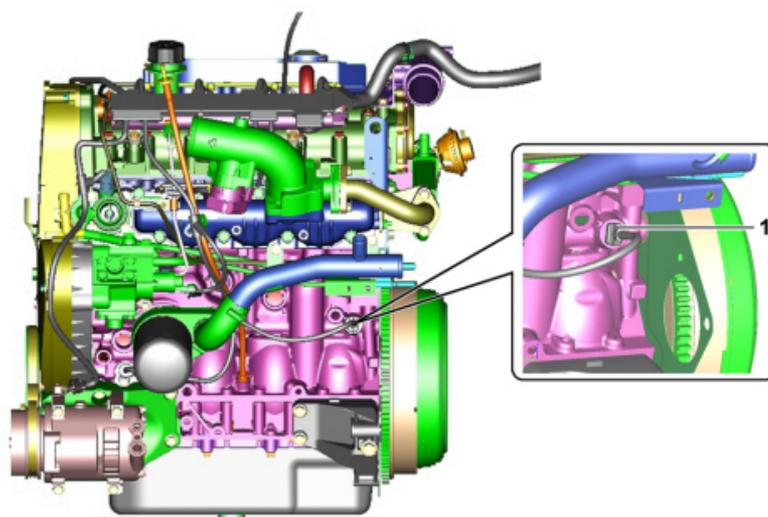
## NUOVO DUCATO X250 2.3 JTD INDICATORS/CHECK DEVICES 1084A

The quantity of oil in the circuit and the pressure are constantly monitored by:

- oil pressure sensor,
- oil level sensor,
- engine oil level measuring control unit.

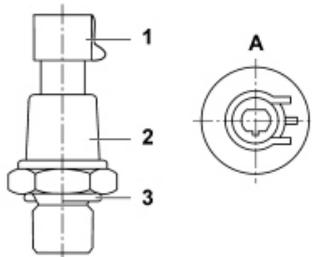
### ENGINE OIL PRESSURE SENSOR

The engine oil pressure detection sensor is located on the crankcase, inlet side, near the flywheel.



1 - Engine oil pressure sensor

The engine oil pressure sensor is illustrated in the diagram below.



A - Connector detail

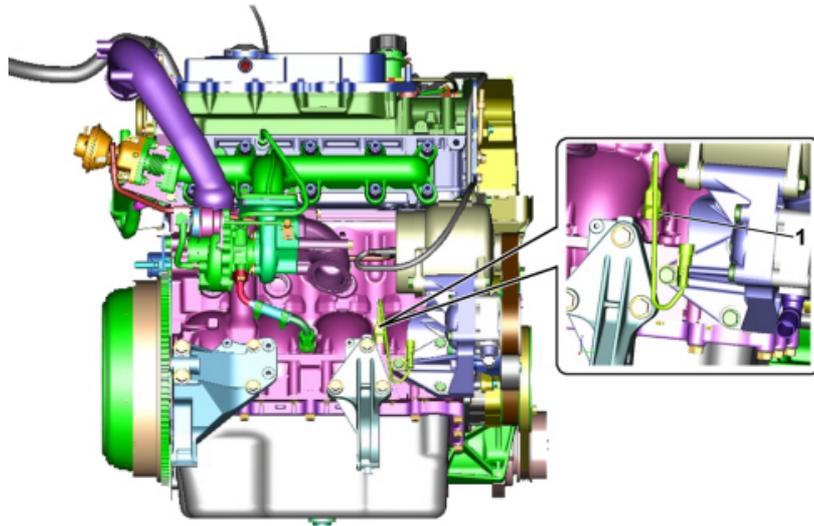
1 - Connector

2 - Engine oil pressure sensor casing

3 - Seal

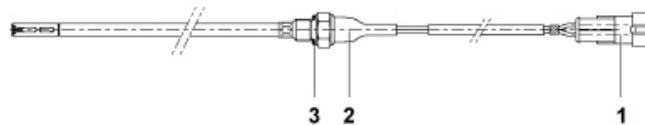
### ENGINE OIL LEVEL SENSOR

The engine oil level detection sensor is located on the crankcase, exhaust side, near the intermediate shaft support.



1 - Engine oil level sensor

The engine oil level detection sensor is the hot wire type.  
The engine oil level sensor is illustrated in the diagram below.



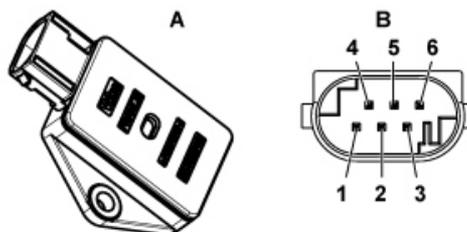
1 - Connector

2 - Engine oil level sensor casing

3 - Seal

### MEASURING ENGINE OIL LEVEL

The system comprises an electronic control unit, located in the engine compartment near the engine management control unit and a hot wire sensor.



A - Oil level control unit

B - Connector detail

1 - +12 Volt

2 - Output signal level

3 - + Oil level sensor

4 - Earth

5 - Earth signal

6 - Oil level sensor earth

The engine oil level is only checked with the engine switched off when the ignition key is turned to the On position.

The system exploits the ability of the oil to dissipate heat.

The flow of a current inside the hot wire causes an increase in its temperature and resistance which produces a drop in voltage.

If the hot wire is submerged in the oil, some of the heat is absorbed by the actual oil; therefore the values for the temperature, resistance and drop in voltage will be lower.

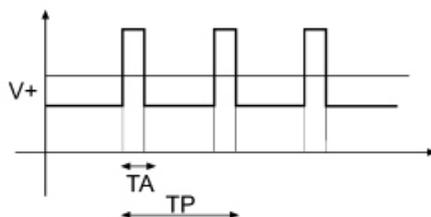
With the ignition on, the control unit sends a 210.5mA current to the sensor hot wire. When an initial supply period has elapsed ( $t_0 - t_1 = 150$  mSec) the control unit makes an initial voltage measurement ( $t_1 - t_2 = 10$  mSec).

When a second period has elapsed  $t_2 - t_3 = 865$  mSec) the control unit makes a second measurement which is compared with the first.

The following conditions can occur:

- if the difference between the two measurements is less than 125mV, the oil level is correct;
- if it is more than 445mV, the oil is at the minimum level;
- if the voltage measured during the second reading is more than 3.5 V, the sensor is broken;
- if the voltage is less than 1V, then the sensor is short circuited.

The measurement taken is transformed into a PWM signal by the oil level control unit which sends it to the engine management control unit. The latter makes the parameter available to the C-CAN to signal the instrument panel.



PWM frequency:  $125 \pm 10$  Hz

Tolerance at ambient temperature PWM  $\pm 3.5\%$

PWM signal for information on oil level represented by duty cycle TA / TP.

At the minimum level the PWM will be at 30% (440mV), whilst at the maximum level it will be 90% (125mV).

The module is in the acquisition stage between 10% and 15%.

Between 3% and 7% means that a measurement error has taken place.