

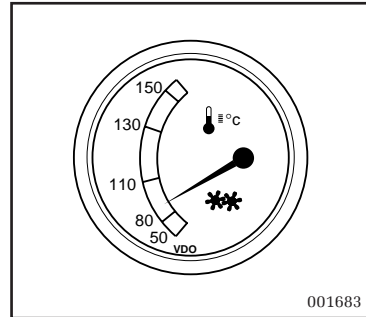


Oil checks

Oil **must** be at correct level!

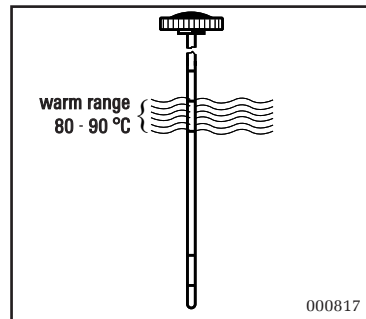
Check weekly!

- Oil level too low → malfunction
- Oil level too high → overheating



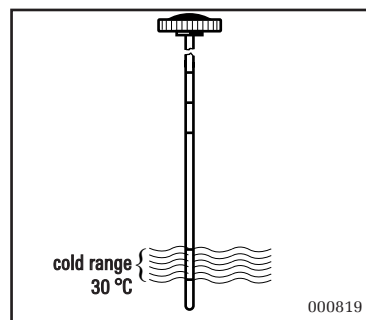
① Transmission oil - temperature gauge

- Read the oil temperature shown on the gauge, check as in ②.



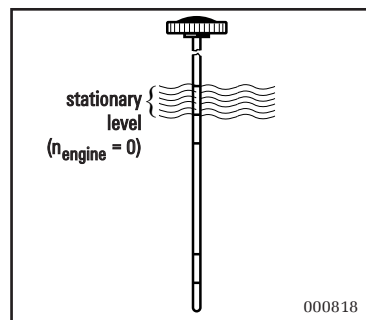
② At operating temperature (this method must be used!)

- Vehicle: on level ground
- Drive range selector: position "N"
- Engine: approx. 2 mins. in idling
- Temperature: approx. + 80 °C



③ When oil is cold

- Vehicle: on level ground
- Drive range selector: position "N"
- Engine: in idling
- Temperature: approx. + 30 °C



④ When engine is switched off

- Vehicle: on level ground
- Oil level within stationary level limits
- Do not drain oil if level too high

Oil changes

Intervals:

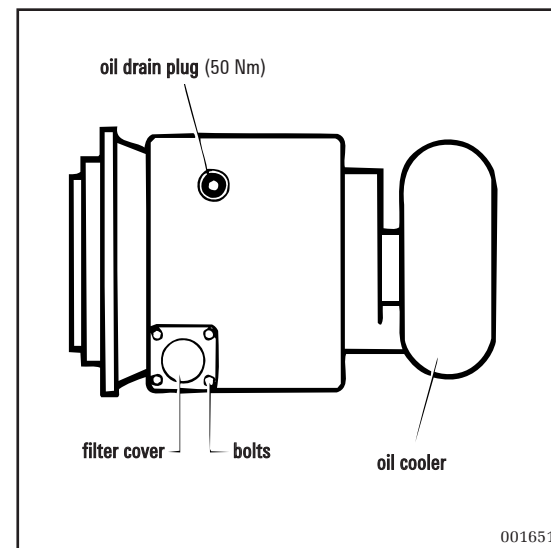
| For new/exchange transmissions and | Mileage in km | Service hours |
|---|--------------------|-----------------|
| Normal operation | 30 000 150 000* | |
| Very high operating temperatures | 20 000 120 000* | |
| Construction machinery, special purpose vehicles (cranes, refuse trucks etc.) | | 1 000 4 000* |

- Renew the oil filter at every oil change
- Change oil at least once a year
- Top up oil through dipstick hole
- Following transmission repair, change oil after 1000 km (50 hours) or fine mesh filtering during test rig operation according to ZF test report

1 litre of oil alters level by 10 mm approx.

*if "ZF-Ecofluid A plus" is used

Procedure:



- Engine stationary
- Drain off oil (approx. 15 litres)
- Remove filter cover
- Renew copper ring, filter and o-ring (set no. 4139 298 936)
- Fit filter cover (25 Nm)
- Screw in the oil drain plug (50 Nm)
- Remove dipstick
- Pour in oil (approx. 10 litres)
- Start engine
- Top up oil (4 litres)
- Check and correct the oil level as shown in ③
- Drive until transmission oil reaches 80 °C
- Check and correct the oil level as shown in ②

Oil quantities:

For the initial fill of a dry transmission, approx. 28 liters (dm³)
 After installation of new / replacement transmissions, approx. 20 liters (dm³)
 After oil changes: After approx. 10 minutes, the following oil quantities are setting

| | |
|-------------------------|--------------------------------------|
| Ecomat, flat oil pan: | approx. 12 liters (dm ³) |
| Ecomat, deep oil pan: | approx. 13 liters (dm ³) |
| Ecomat 2, flat oil pan: | approx. 17 liters (dm ³) |
| Ecomat 2, deep oil pan: | approx. 18 liters (dm ³) |

Tools:

| | |
|-----------------------|-----------|
| Torque wrench | 20-100 Nm |
| Socket | 13 mm |
| Socket (internal hex) | 10 mm |

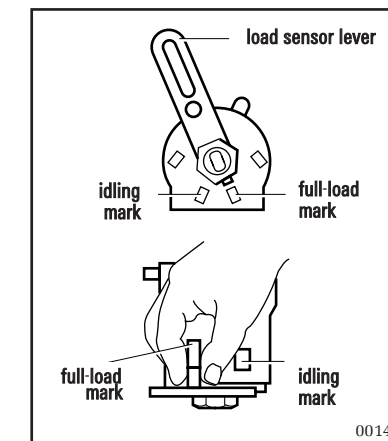
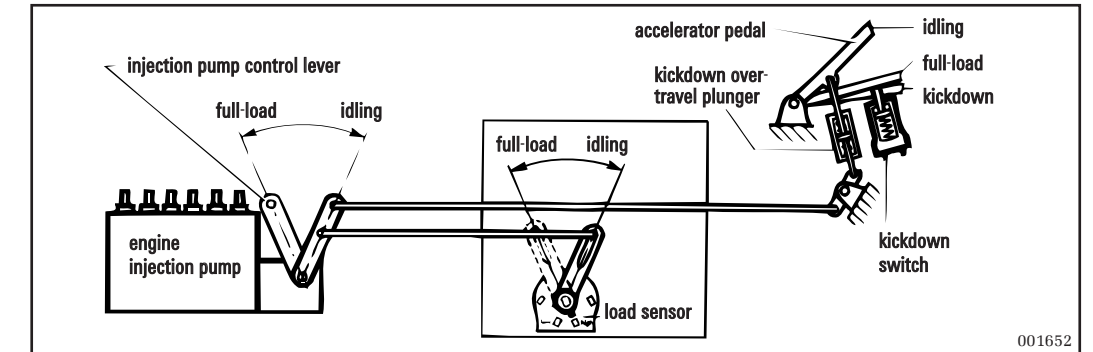
Transmission oil: ATF specifications according to ZF list of lubricants TE-ML 14

Load sensor setting with electric pressure modulation:

(Procedure doesn't apply for transmissions w/o load sensor.)

To be checked at least every three months

If set wrongly, clutches engage too slow or too fast, damaging transmission

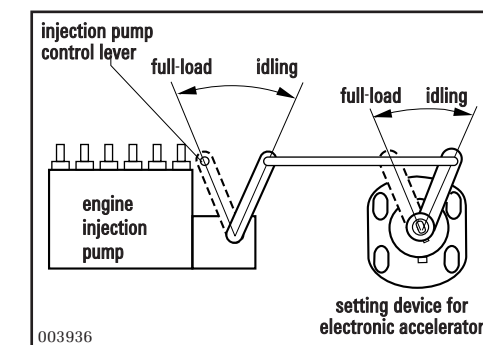


Version supplied from June 1987 onwards

- Switch off engine
- Fully depress accelerator pedal
- Hold it there
- Load sensor lever must make firm contact with the full-load mark
- Release accelerator pedal until idling speed position
- Load sensor lever must make perceptible contact with the idling mark

Do not use the end stop for adjustment purposes!

Check for vehicles with electronic accelerator equipment



Adjustment of idling speed position:

- Ignition ON
- Engine at idling speed, operating temperature
- Electr. accelerator adjusted to idling position

Setting full-load position:

- Ignition ON
- Fully depress accelerator pedal
- Full-load mark on setting device for electronic accelerator must be reached

In some vehicles, the electronic accelerator system has a safety feature which prevents the full-load position being reached when the vehicle is stationary or a break signal is present. In such cases, this test can only be performed when driving.