

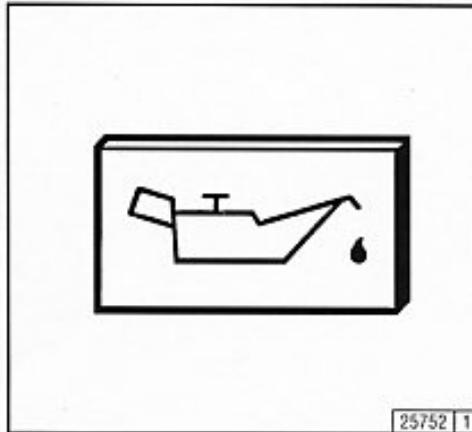
Operation/Maintenance BFM 1015

Engine Operation: Monitoring Systems



3.3.1 Engine Oil Pressure

Oil Pressure Pilot Lamp



- The oil pressure pilot lamp lights up with operating voltage applied and engine shut off.
- The oil pressure pilot lamp must go out when the engine is running.

Oil Pressure Gauge



- The pointer of the oil pressure gauge must indicate the minimum oil pressure (see 9.1).

3.3.2 Coolant Temperature



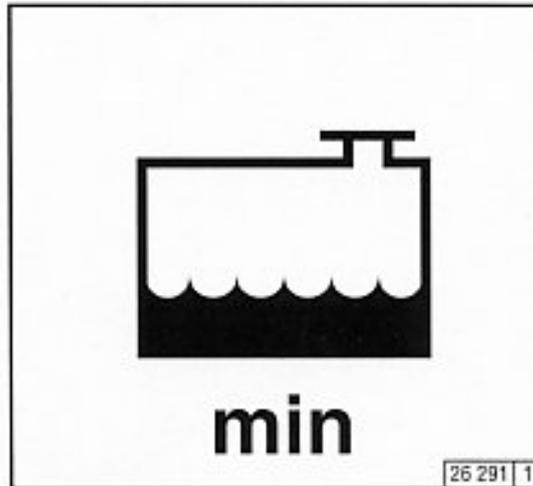
- The pointer of the temperature indicator should remain in the green sector and enter the yellow-green sector only in exceptional cases. If the pointer enters the orange sector, the engine is overheating. Turn it off and establish the cause from the Diagnosis Chart (see 7.1).

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Engine Operation: Monitoring Systems

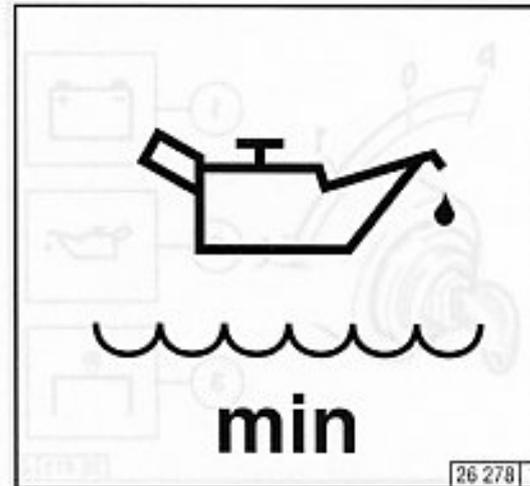


3.3.3 Coolant Level



- Lamp of coolant level indicator lights up (contact via float switch/level sensor when min. coolant level has been reached):
Turn engine off and establish cause from the Diagnosis Chart (see 7.1)
- Functional check of coolant level:
Insert key in position 1 or 2
(Float switch or level sensor)
Pilot lamp lights up for about 2 seconds
 - Coolant level o.k.: lamp goes out
 - Coolant level not o.k.: lamp does not go out.

3.3.4 Lube Oil Level



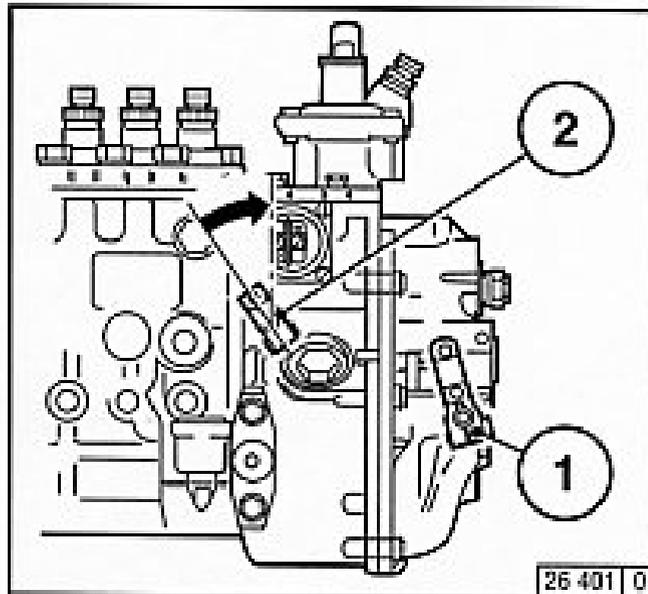
- Lamp of lube oil level indicator lights up (contact via float switch/level sensor when min. lube oil level has been reached):
Turn engine off and establish cause from the Diagnosis Chart (see 7.1)
- Functional check of lube oil level:
Insert key in position 1 or 2
(Float switch or level sensor)
Pilot lamp lights up for about 2 seconds
 - Lube oil level o.k.: lamp goes out
 - Lube oil level not o.k.: lamp does not go out.

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Engine Operation: Starting

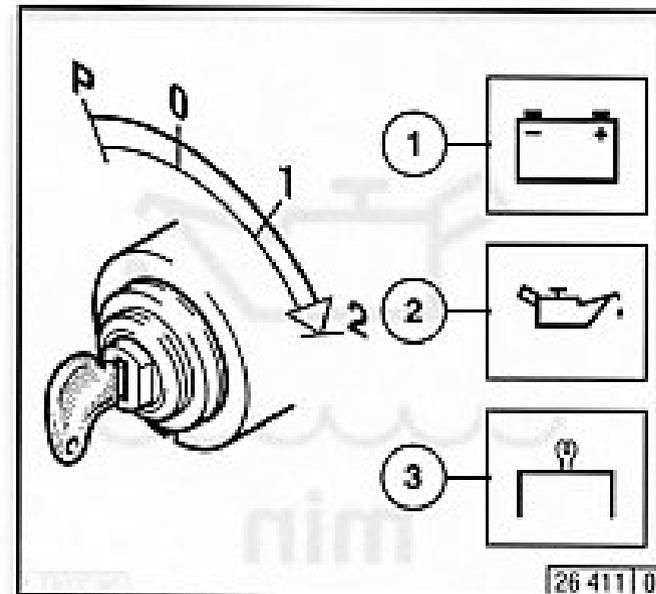


3.4.1 Mechanical Shutdown



- Set speed control lever 1 to low speed position.
- Actuate shutdown lever 2 until engine comes to standstill. Charging-current and oil pressure pilot lamps light up when engine has come to standstill.

3.4.2 Electric Shutdown



- Turn key counter-clockwise (to position 0) and pull off. Pilot lamps go out.

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Engine Operation: Operating Conditions



3.5.1 Winter Operation

● Lube Oil Viscosity

- Select the oil viscosity (SAE grade) according to the ambient temperature prevailing at the time when the engine is started 4.1.2.
- Keep shorter periods between oil changes when operating at temperatures below -10°C ($+14^{\circ}\text{F}$), see 6.1.1.

● Diesel Fuel

- Use winter-grade diesel fuel for operation below 0°C ($+32^{\circ}\text{F}$), see 4.2.2.

● Coolant

- Set the water / antifreeze mix to suit the lowest temperature likely to occur (max. -35°C / -31°F), see 4.3.1.

● Additional Maintenance Jobs

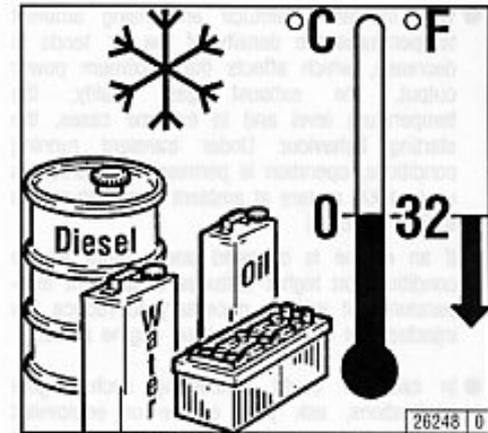
- Drain the sludge from the fuel tank once a week (by undoing the sludge drain plug).
- Adjust the oil filling in the oil bath air cleaner (if fitted) to the prevailing ambient temperature as in the case of engine oil.
- At temperatures below -20°C (-4°F) lubricate the flywheel ring gear with low-temperature grease, e.g. Bosch FT 1 V31, from time to time through the pinion hole (if necessary remove starter).

● Cold-Starting Aids

- At temperatures near or below freezing point start with flame-type heater plug, see 3.2.1. This not only lowers the starting limit temperature, but proves also useful at temperatures normally not requiring a starting aid.

● Battery

- Cold starting requires a good state of charge of the battery, see 6.7.1.
- The starting limit temperature can be lowered by $4\text{-}5^{\circ}\text{C}$ by heating the battery up to $+20^{\circ}\text{C}$ ($+65^{\circ}\text{F}$). To do so, remove the battery and store in a warm place.



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Engine Operation: Operating Conditions



3.5.2 High Ambient Temperature, High Altitude

- With increasing altitude and rising ambient temperatures the density of the air tends to decrease, which affects the maximum power output, the exhaust gas quality, the temperature level and in extreme cases, the starting behaviour. Under transient running conditions, operation is permissible at altitudes up to 1000 meters at ambient temperatures up to 30 °C (86 °F)

If an engine is operated under more severe conditions (at higher altitudes or ambient temperatures) it will be necessary to reduce the injected fuel quantity and thus engine power.

- In case of doubt concerning such engine applications, ask your engine or equipment supplier whether, in the interest of operational reliability, service life and exhaust gas quality (smoke!), an engine derating had been considered necessary, or simply contact your service representative.

