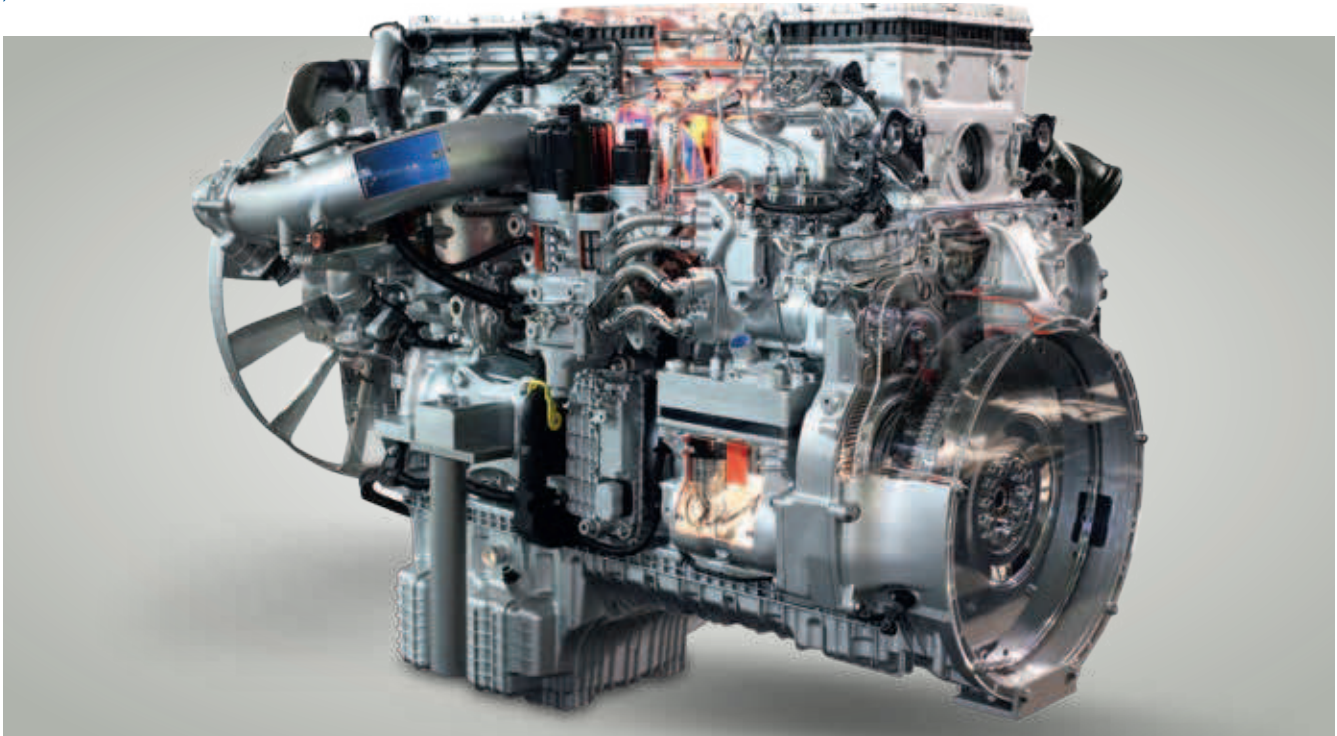




Tips and tricks ...

...for correct installation and long service life of the new short block



- Please note that cylinder heads which may be included in the delivery are not fully assembled. These must be aligned with the exhaust manifold or intake manifold and the cylinder head bolts must be tightened according to the manufacturer's specifications.
- Clean all attachments thoroughly before installation and check for damage.
- Clean oil cooler thoroughly and check for blockages, it is imperative to replace this in the case of previous engine damage.
- Replace air filter cartridge, clean oil bath air filter thoroughly.
- Check connections and intake pipes to the engine for tightness.
- Check injection system, set start of delivery according to manufacturer's specifications.
- Check the correct operation of the viscous fan.
- Clean water cooler and check for blockages. Vent filled cooling system according to manufacturer's specifications. Clean charge air cooler thoroughly and check for blockages, it is imperative to replace this in the case of previous turbocharger damage.
- Check engine monitoring instruments for correct operation and replace in case of defects.
- Never start the engine without oil and coolant.
- Manually supply (inject) the engine oil circuit with oil pressure, or fill engine with oil and crank without injection nozzles (max. 10–15 seconds per sequence to avoid damage to the starter) until oil pressure has built up, so that all bearing points have been supplied with oil before initial start-up.
- Check for correct function in the oil pump, oil pressure control valve, water pump and vibration damper.
- Please observe the fitting instructions and specifications of the engine or vehicle manufacturer.



To-do list before starting the engine for the first time

Any maintenance work on the engine should only be carried out by qualified personnel.

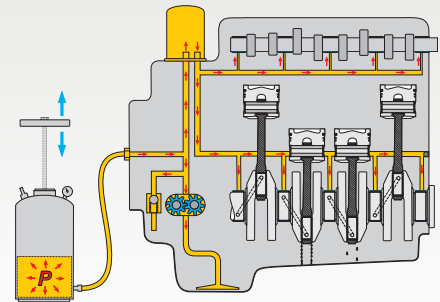
Fill/build pressure in the engine oil circuit with special pumps. Only engine oil approved by the manufacturer should be used here (No HD oil). It is imperative that the manufacturer's engine oil specifications are observed at all times. The engine oil circuit should only be filled by cranking the engine when no special pump is available.

1. Fill the engine correctly with the engine oil approved by the manufacturer (no HD oil) and with coolant.
2. Crank the engine without injection nozzles and with injection pump in the delivery position "0" until the oil pressure gauge displays the correct oil pressure. Attention! Maximum of 10–15 seconds per crank to avoid damage to the starter.
3. Check engine oil level again.

Assemble the engine completely and start. After approx. 10 seconds, the oil pressure gauge should display the oil pressure.



Attention: Do not rev up the engine if oil pressure is not displayed.



How to start your new short block ... running-in the engine

Any maintenance work on the engine should only be carried out by qualified personnel.

General information:

Every new/reconditioned engine has to carry out a run-in. Only by doing so can the new parts (particularly bushes, pistons, piston rings and bearing points) acquire the necessary running smoothness.

The run-in of the engine should take place on an engine test rig. Only when such a test rig is unavailable can the run-in be carried out whilst the engine is mounted in the vehicle. The engine should be fitted with a thermostat and V-belt for the water pump during the run-in.

Either a special running-in oil (first-time operation) or normal engine oil (no HD oil) should be used for the run-in.

During the run-in phase, the coolant must be kept at the optimum operating temperature of 80 °C to 85 °C.

The following work and checks should be carried out before the run-in:

1. Check the oil level in the engine, in the fuel injection pump and in the controller.
2. Check the fluid level in the coolant circuit and in the fuel tank.
3. Clean fuel filter and oil filter, replace inserts.
4. Clean oil bath air filter and fill with engine oil or replace dry filter cartridges.
5. Set fuel injection pump, controller, injection nozzles and start of delivery according to manufacturer's specifications.
6. Clean the aspirator cleaner on the supply pump.
7. Vent the fuel system.

After running-in:

1. Drain running-in oil (also from the oil filter) and fill up HD oil.
2. Replace paper oil filter insert.
3. Carry out first maintenance according to instructions (see short block pass). After running-in the engine, a normal oil consumption quantity is considered to be approx. 0.5 % of the fuel consumption.

Engine in the vehicle/in stationary operation

(only when no engine test rig is available)

1. Run the engine for 2 ½ hours at between n=1200 and 1600 rpm and then for a further 2 hours at n=1500 to 2100 rpm.
2. Stop the engine, tighten the cylinder head bolts according to manufacturer's instructions, set valve clearance, check oil and coolant levels and fill up if necessary.