SCANIA

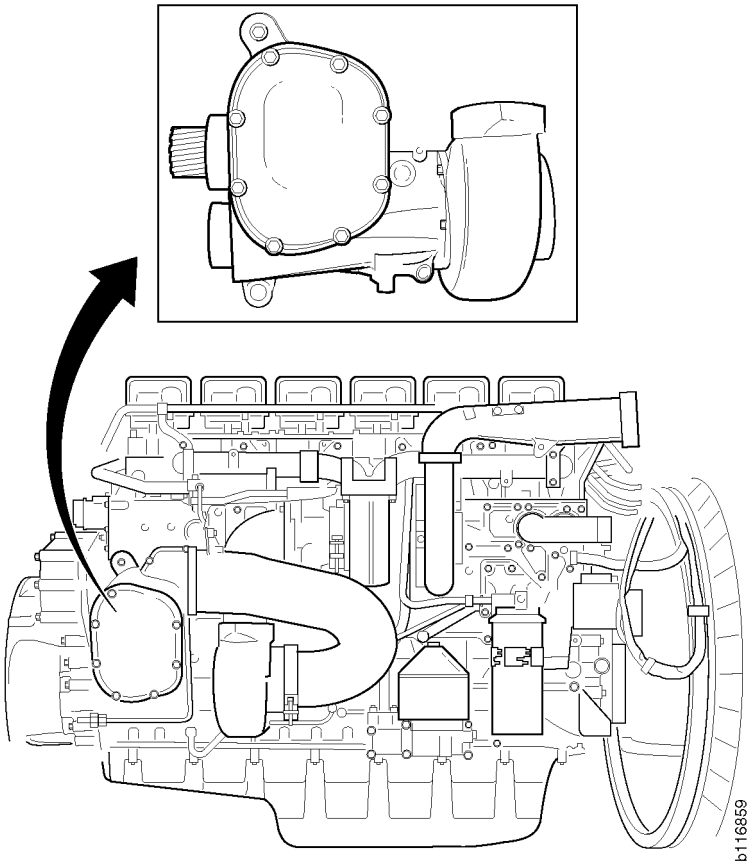
01:03-03

Issue 1 **en**

Turbocompound

DT12

Function Description



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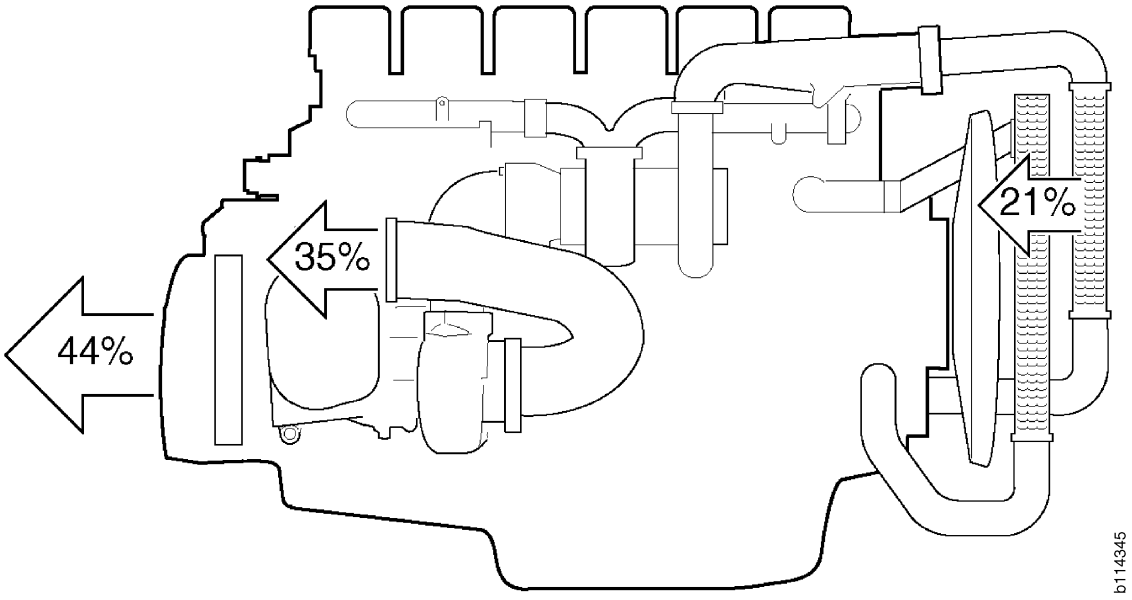
Contents

Function Description

Diesel engine energy losses

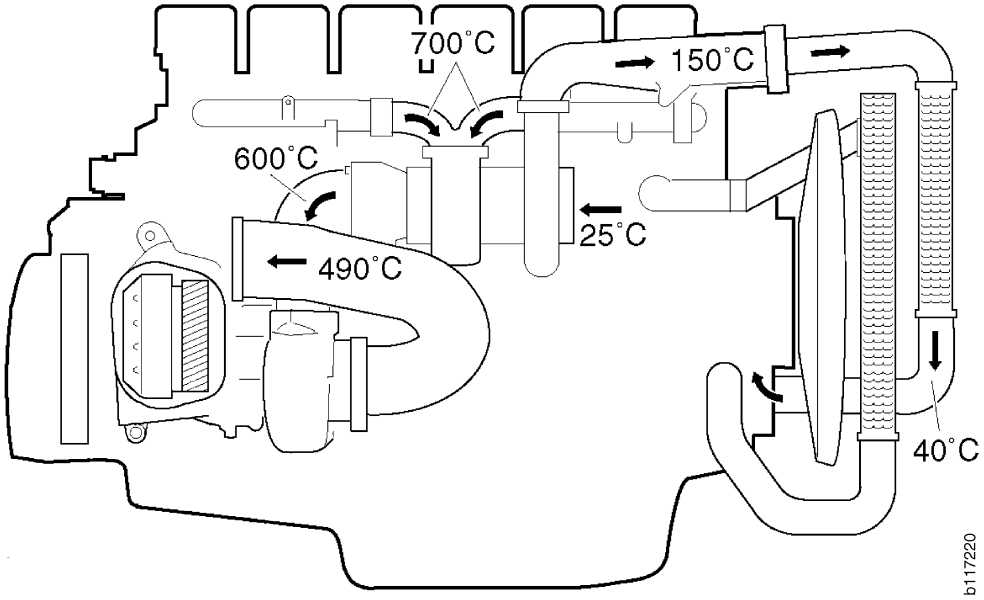
On combustion, diesel fuel generates huge amounts of energy in the form of heat. Approximately 44% of this energy is used to drive the vehicle. 56% is lost and must be cooled off.

The losses are split into appr. 35 % through the exhaust system and appr. 21 % via the rest of the cooling system. Part of the heat in the cooling system is used to heat the cab, but this is only a small proportion.



When the exhaust gases leave the combustion chamber their temperature is appr. 700° C. Downstream from the turbocharger this temperature has dropped to appr. 600° C.

The difference of 100° C means that part of the heat energy is used to force the turbocharger turbine to spin. The remaining heat, 600° C, is evacuated through the exhaust pipe.

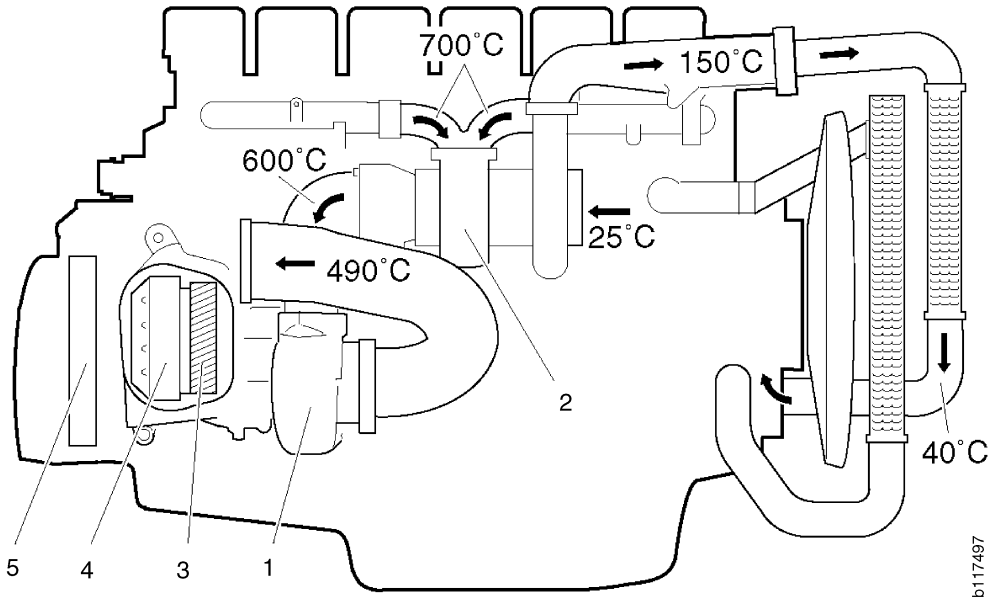


Turbocompounding

Turbocompounding relies on utilising a larger proportion of the heat energy in the exhaust gases by means of a power turbine 1. The power turbine is located in the exhaust pipe downstream from the turbocharger 2 and the exhaust brake. The power turbine is of the same type as the one in the turbocharger.

The exhaust gases from the engine propels the turbocharger turbine at high speed while the compressor side of the turbo supplies air with high oxygen content to the combustion process. The exhaust gases pass the exhaust brake and continue to the power turbine in the turbocompound, which rotates at a speed of appr. 50,000 rpm.

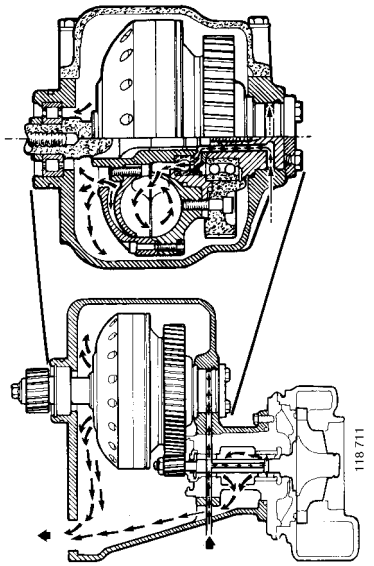
The power is transmitted via the power turbine gear 3 to a hydraulic coupling 4, which evens out speed variations between the crankshaft and the power turbine. Via another set of gears consisting of a hydraulic coupling gear, an intermediate gear and a crankshaft gear, the power is then transmitted to the engine flywheel 5 and on to the gearbox .



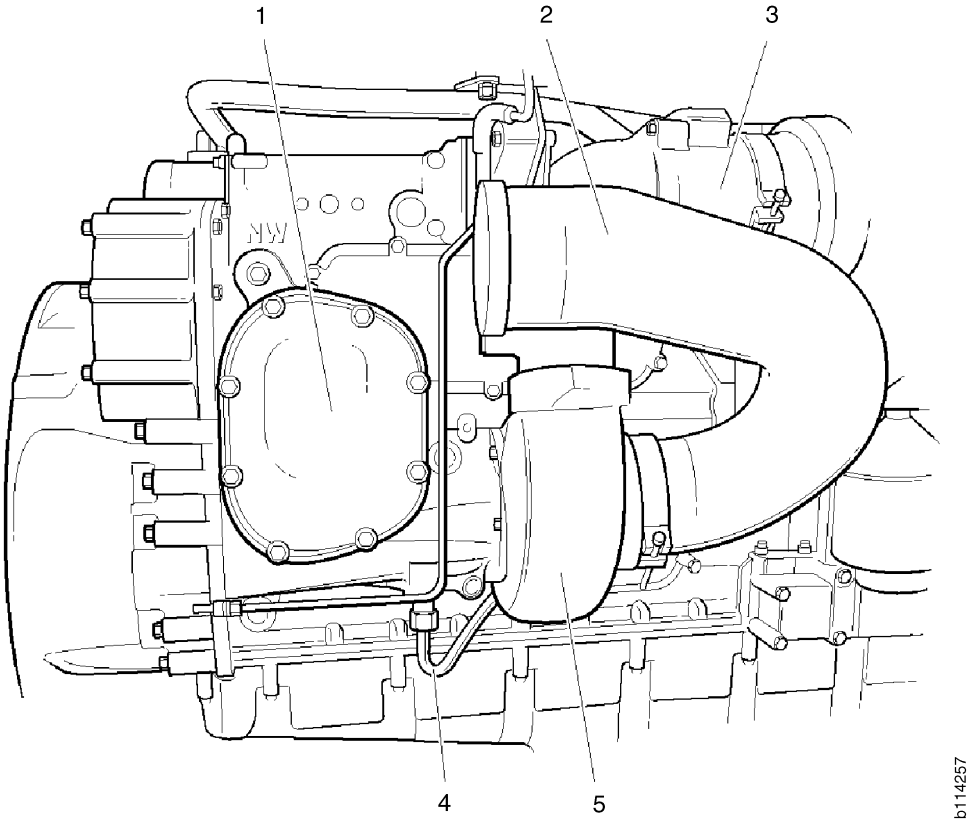
1 Power turbine
2 Turbocharger
3 Power turbine gear
4 Hydraulic coupling
5 Flywheel

In comparison to a conventional engine, turbocompounding offers a number of advantages. The output and the torque is higher and the fuel consumption is lower in comparison to an identical engine without turbocompound.

The oil for the turbocompound unit comes from the engine oil system. Just like the oil used in the turbocharger, the turbocompound unit oil is cleaned in the centrifugal oil cleaner and in the turbo filter.



Turbocompound unit on DT12



1 *Gear housing*
2 *Exhaust pipe*
3 *Valve disc housing for exhaust brake*
4 *Oil pipe*
5 *Power turbine*