CONTENTS

ENGINE DESCRIPTION D 2876 CR

GENERAL

The inline engines of the D 2876 LF series underwent major modification for the heavy-duty MAN Trucknology Generation (TGA):

- New grading with higher power and torque plus high torque gradients
- Substantial improvement of engine efficiency and fuel consumption over wide ranges of the operating map through an increase of engine peak pressure and the new common rail (CR) technique
- Adaptation of the cylinder head, cylinder head packing, cylinder liner and crank case bolt fit to the higher gas pressures
- Reduced engine weight through omission of the secondary acoustic measures and use of a lighter crank case yoke
- Use of the second-generation Bosch common rail injection system (1600 bar)
- Engine management by EDC 7 and communication with the vehicle management computer on the CAN bus
- Depending on conditions of use and lubricants, oil change intervals of maximally 100,000 km can be achieved and thus lower operating costs for the user
- High reliability through adherence to the proven D 2876 LF 12.8 liter engine concept
- Increase of exhaust brake performance in conjunction with the upgraded, pressure-controlled exhaust valve brake (EVB) as special equipment
- Further increase of exhaust brake performance through use of the entirely new, innovative primary braking system water retarder (PriTarder) in conjunction with the pressure-controlled EVB as special equipment

Changes compared to earlier D 28.. Euro 3 engines

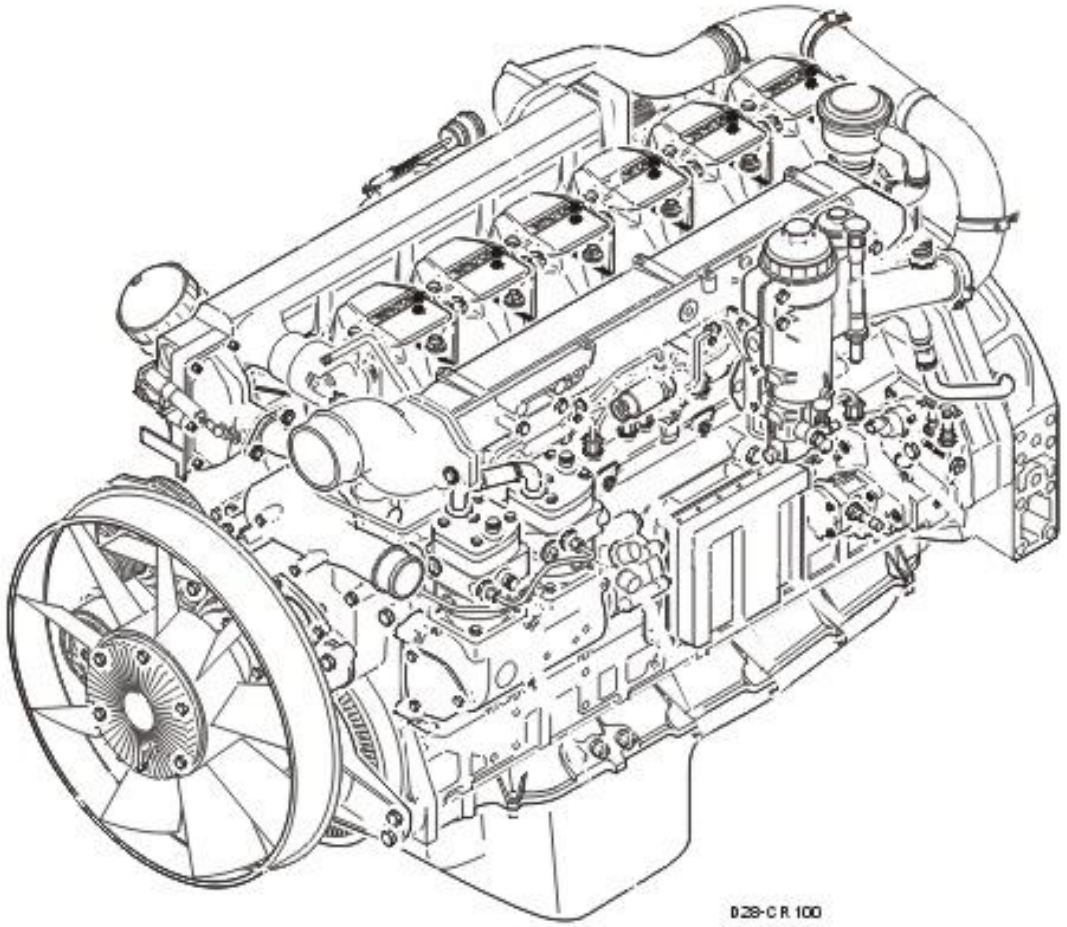
Engine

- **Crank case**
- **Crank shaft**
- **Connecting rods**
- **Pistons**
- **Cylinder liners**
- **Cylinder heads**
- **Cylinder head packing**
- **Rocker arm case with rocker arm**
- **Exhaust manifold packing**
- **Oil pump**
- **Oil circulation**
- **Water pump**
- **MAN PriTarder**
- **Fan bearing**
- **Visco fan Eaton**

Common rail injection system

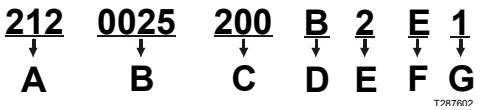
- **EDC 7**
- **Injectors (7-jet)**
- **High-pressure pump with rail distribution**
- **Sensor technology**
- **New fuel connector system**

D 28.. EURO 3 COMMON RAIL



ENGINE IDENTIFICATION NUMBER

Example:



A ..... **212** ..... Engine type code

B ..... **0025** ..... Date of assembly

C ..... **200** ..... Assembly sequence (progress figure on date of assembly)

D ..... **B** ..... Overview flywheel

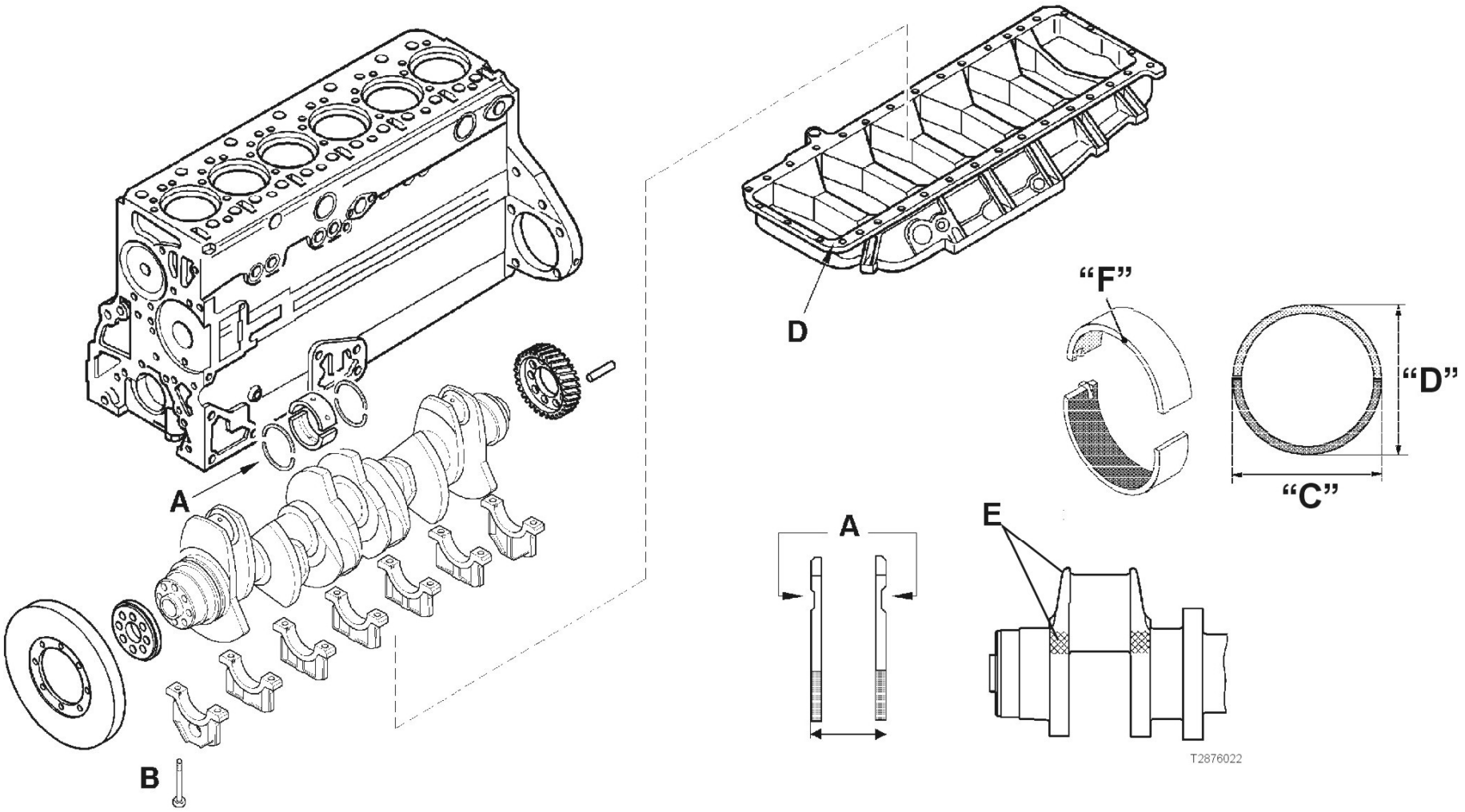
E ..... **2** ..... Overview injection pump/regulation

F ..... **E**..... Overview air compressor

G ..... **1** ..... Special equipment like engine-governed power takeoff

D 2876 LF 13 Euro 3

Model	**R6 TI-EDC (4 V)**
Cylinder arrangement	**6 cylinders inline**
Max. power	**390 kW / 530 hp**
Rated speed	**1900 1/min**
Max. torque	**2400 Nm**
Speed at max. torque	**1000 to 1400 1/min**
Capacity	**12,816 cm^3**
Bore / stroke	**128 / 166**
Ignition sequence	**1-5-3-6-2-4**
Cylinder 1 location	**fan side**
Combustion process, injector	**7-jet**
Compression	**18**
Idling speed	**600 1/min**
Valve play on cold engine	**IV 0.50 mm**
Valve play exhaust with EVB	**EV 0.80 mm / 0.60 mm**
Compression pressure	**> 28 bar**
Admissible pressure difference between cylinders	**max. 4 bar**
Coolant	**50 (l/R 58) liters**
Oil charge	**42 liters**
Fuel system	**Bosch EDC 7**
Fan coupling actuation	**hydroelectric**
Weight (dry) without WR	**1049 kg**
K factor	**1.3 m^{-1}**


A
B
D
"F"
"D"
"C"
A
E
T2876022

Pistons (technical data from Kolben Schmidt)

1 Piston diameter, measured across boss:
KS measured 20 mm
above piston bottom edge (2)..... **127.561 to 127.570 mm**

4 Compression height:
Standard dimension: D 2876 LF..... **79.25 mm**
Undersize: 0.2 mm / 0.4 mm / 0.6 mm

A Piston projection under/over crank case top edge:
- 0.03 to +0.30 mm

Piston ring flutes

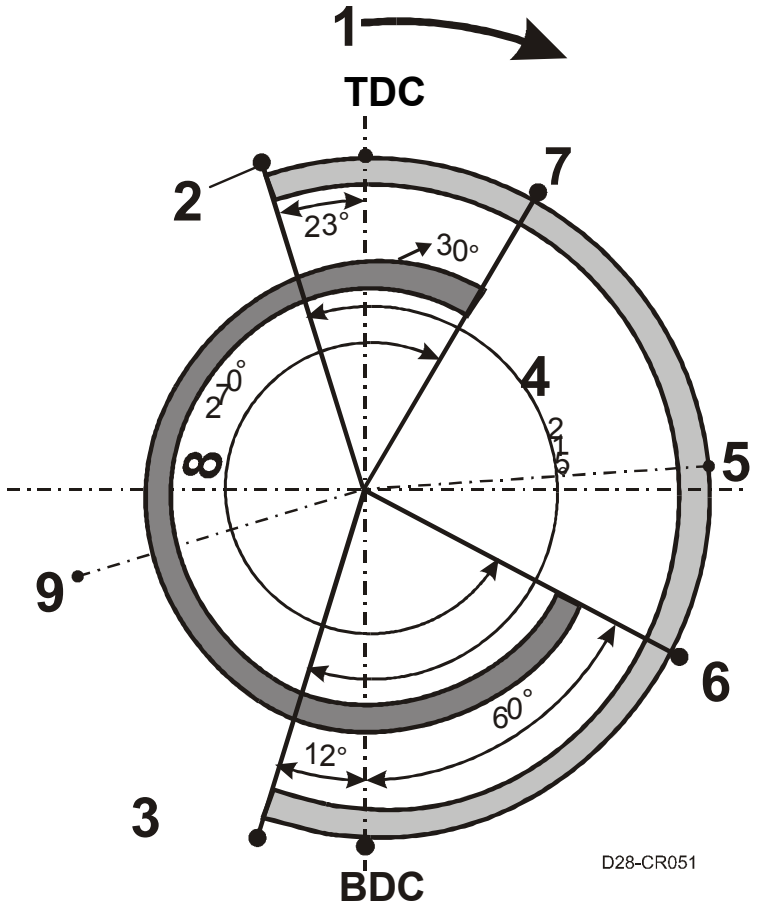
(5) Compression ring 1 ..... **4 to 4.05 mm**
(6) Compression ring 2 ..... **3.04 to 3.06 mm**
(7) Oil scraper ring..... **4.04 to 4.06 mm**

Piston ring height

Double-faced trapezoidal compression ring
Height ..... **3.99 to 4.025 mm**
Gap..... **0.35 to 0.55 mm**
Second compression ring ..... **2.97 to 3.0 mm**
Gap..... **0.7 to 0.9 mm**
Oil scraper ring
KS..... **3.975 to 3.99 mm**
Gap..... **0.25 to 0.55 mm**

Piston weight difference per engine set..... **max. 50 g**

Fit with arrow pointing to the frontend


1
TDC
2
7
23°
30°
240°
4
215°
8
5
9
6
60°
12°
3
BDC
D28-CR051

REPAIR OF ROCKER ARM BEARING

To disassemble, first knock out the rocker arm axle (3) on the exhaust valve side with the extractor (4) (thread), and then press out the rocker arm axle (1) of the inlet valve.

Fitting of rocker arm axles

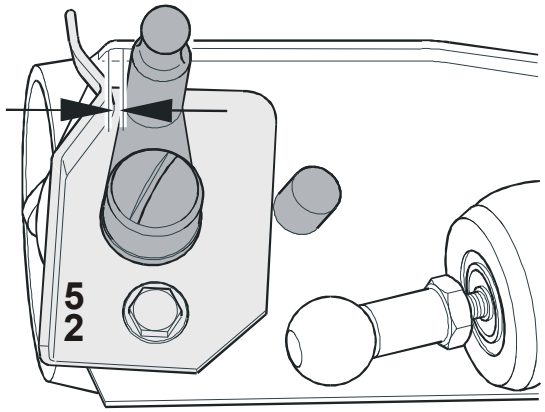
When pressing in the rocker arm axles (09.16012-0117 paste), make sure that the openings (5) for the cylinder head screws are correctly positioned.

Press the rocker arm axle of the inlet and exhaust valve side flush into the rocker arm case using the appropriate special-purpose tool.

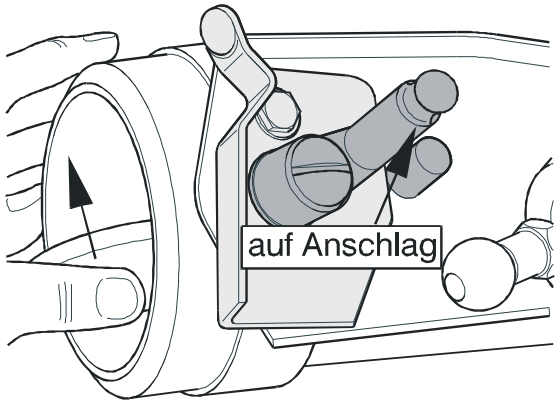
Do NOT forget the O-ring (2) (06.56936-1200).

Setting of gap of exhaust brake flap

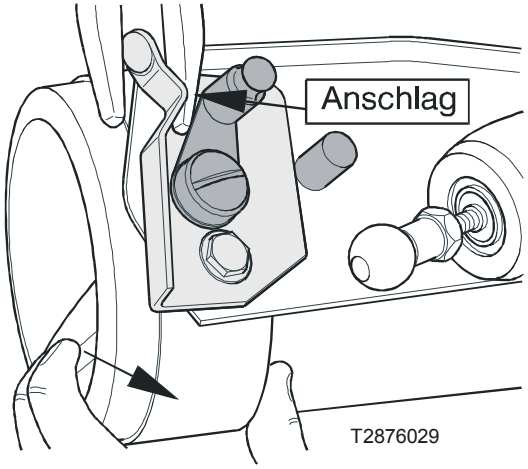
Check and set the gap with the operating cylinder detached



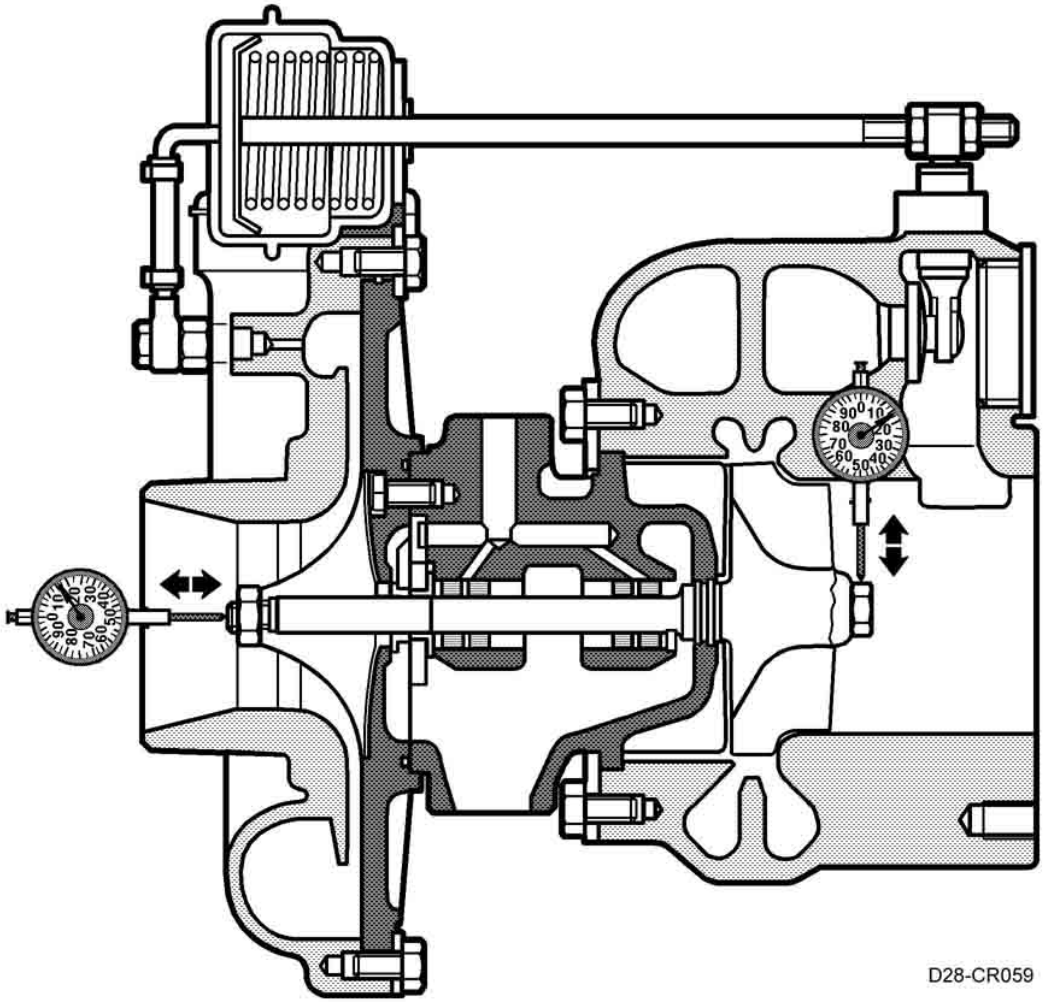
Gap with the operating cylinder detached and the exhaust brake flap closed by hand.

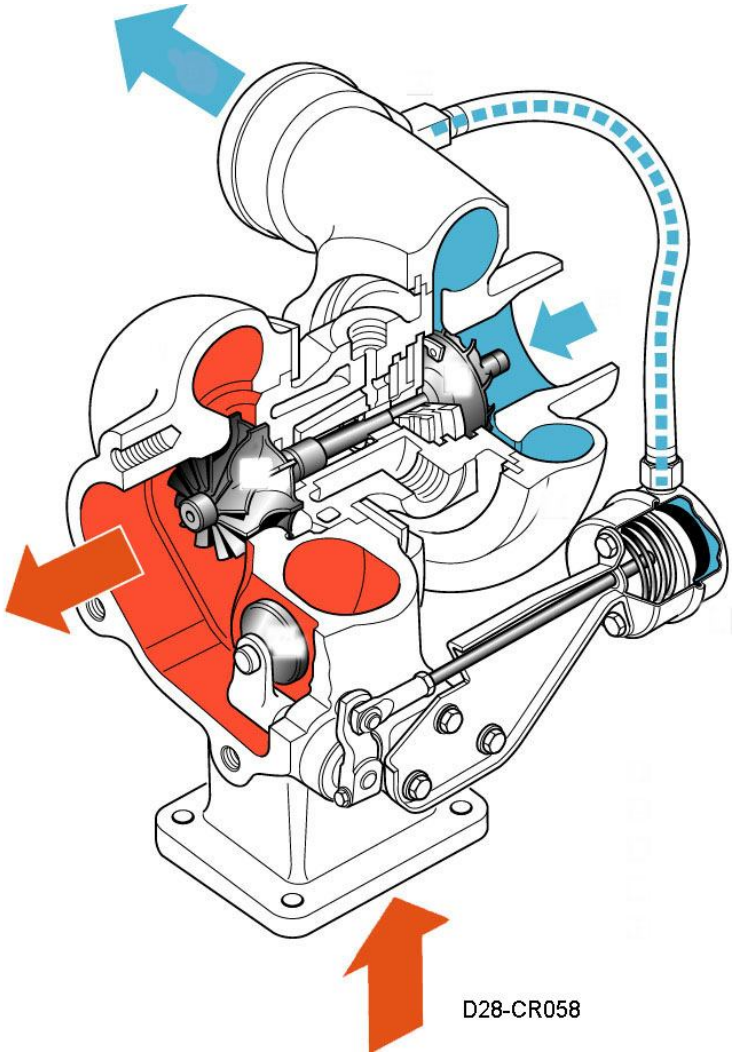


If the gap is **too large**, reduce the initial tension of the torsion bar spring, i.e.
open the flap by hand and **carefully** press the torsion bar spring against the **"open"** stop.



If the gap is **too small**, increase the initial tension of the torsion bar spring, i.e.
place an object between the **"closed"** stop and the flap lever, close the flap by hand and **carefully** press the torsion bar spring against the stop.


D28-CR059


D28-CR058

EXHAUST GAS RECIRCULATION (EGR)

D 2876 LF 12/13 Euro 3 engines are also fitted with externally regulated exhaust gas recirculation for operating economies, high energy utilization and low fuel consumption.

In EGR, part of the burnt gases is recirculated to the cylinder filling (approx. 10%). This produces lower combustion temperatures and thus fewer NOx emissions. Fuel consumption can be reduced by appropriate matching of the commencement of injection. In EGR, the exhaust gas is taken from both channels of the exhaust manifold.

The hot exhaust gases are fed to the EGR module through corrugated tubing compensators. In the EGR module the gases, initially still in two channels, flow through a high-grade steel, bundled tube heat exchanger. In the EGR cooler the exhaust gas is cooled by water from approx. 700°C down to less than 200°C.

Further downstream there is a peak pressure valve for each channel that only allows the pressure peaks of the exhaust gas to pass and cuts off in the reverse direction. This is necessary because of the positive flushing gradient at higher engine loads. The exhaust gas channels are combined after the peak pressure valves. A shutoff flap is provided here to close the EGR in certain engine operating states (e.g. exhaust brake). This flap is actuated by a compressed air cylinder, in which the solenoid valve and limit sensing are integrated. After the shutoff flap, the cooled exhaust gas, now in one channel, is fed across a corrugated tubing compensator to the intake air in the air distributor pipe.

A Air filter

B Intercooler

C Intake manifold, engine

D EGR cooler

E Peak pressure valves

F Electropneumatically controlled shutoff flap

CR HIGH-PRESSURE PUMP

- Fitting the CR high-pressure pump requires no settings in contrast to the conventional diesel engine.

- The CR pump is driven by the camshaft gear and the ratio to crankshaft I 1:1,67.

- When the engine is started, there is an compassing between the signals of the speed sensor on the camshaft gear and those of the flywheel speed sensor.

- After a few rotations, the CR high-pressure pump receives the signal and the engine starts.

A High-pressure area

B Low-pressure area

C Engine oil filling

1 Fuel return to fuel filter

2 To rail

3 To tank

4 To filter

5 Return to tank

6 From filter

7 To rail

8 Rate-proportional valve

NOTE:

Starting CR engines takes a little longer than conventional diesel engines.