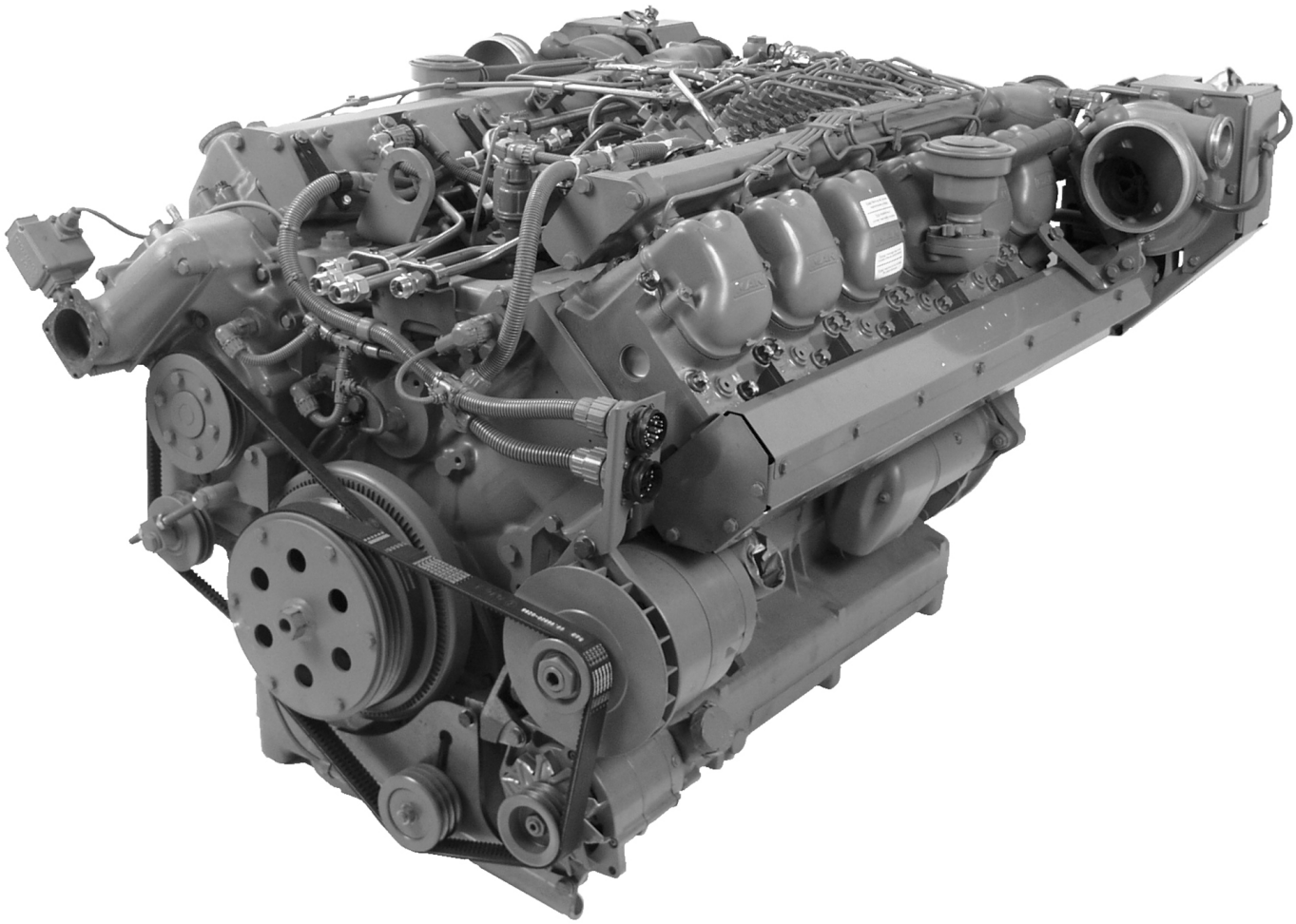

Operating Instruction

MAN Industrial Diesel Engines

D2842 LE602/604/606/607

MAN Engines
A Division of MAN Truck & Bus

Operating Instruction

MAN Industrial Diesel Engines

D2842 LE602/604/606/607

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Version 03

"Translation of the original operating instructions"

Subject to technical alterations in the interests of further development.

MAN Truck & Bus AG
Vogelweiherstraße 33
90441 Nürnberg
Germany

Tel.: +49 911 / 420-1745
Fax: +49 911 / 420-1932

Email: Engine-Documentation@man.eu
Internet: www.man-engines.com

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Dear Customer,

these Operating Instructions are intended to familiarize you with your new MAN Diesel engine and how it operates.
This manual is supplemented by the publication "Fuels, Lubricants and Coolants for MAN Diesel Engines" and the "Service record".

Note:
All three publications belong to the engine and must always be kept ready to hand near the engine in the engine room.
Comply in full with instructions relating to operation, prevention of accidents and environmental protection.

MAN Diesel engines are developed and manufactured in line with the latest state of the art. However, trouble-free operation and high performance can only be achieved if the specified maintenance intervals are observed and only approved fuels, lubricants and coolants are used.

It is imperative and in your own interest to entrust your MAN Local Service Centre with the removal of any disturbances and with the performance of checking, setting, and repair work.

Note:
Only use fuels, lubricants etc. in accordance with MAN's regulations.
Otherwise the manufacturer's liability for defects will not apply!
For basic information on the fuels see the publication “Fuels, Lubricants and Coolants for MAN Diesel Engines".
You can find the approved products in the internet under:
https://mmrepro.mn.man.de/bstwebapp/BSTServlet

Best regards
MAN Truck & Bus AG
Nuremberg Plant

Important instructions which concern technical safety and protection of persons are emphasised as shown below.

Danger:
This refers to working and operating procedures which must be complied with in order to rule out the risk to persons.

Caution:
This refers to working and operating procedures which must be complied with in order to prevent damage to or destruction of material.

Note:
Explanations useful for understanding the working or operating procedure to be performed.

In all your correspondence please always quote engine model, serial number and job number (Order number).

For this reason it is advisable to read off the data from the engine type plates before putting the engine into operation and to enter them in the appropriate spaces.

The engine type plates are on the crankcase.

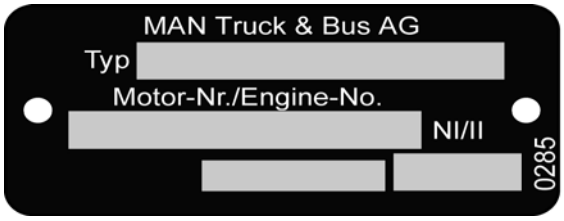
Model . . . . . .

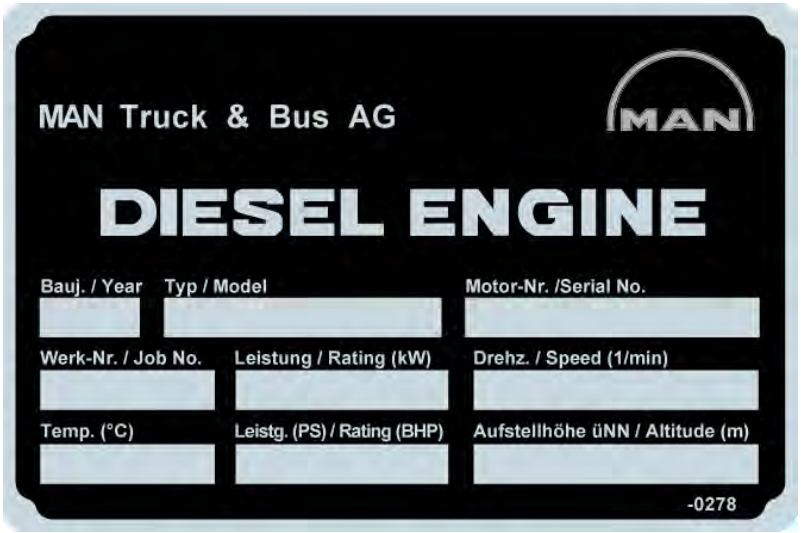
delivered on . . . . . .

installed on . . . . . .

Engine serial number . . . . . .

Order number . . . . . .





General notes

Day-to-day use of power engines and the service products (fuels, lubricants, coolants) necessary for running them presents no problems if the persons occupied with their operation, maintenance and care are given suitable training and think as they work.

This summary is a compilation of the most important regulations. These are broken down into main sections which contain the information necessary for preventing injury to persons, damage to property and pollution. In addition to these regulations those dictated by the type of engine and its site are to be observed also.

Important:
If, despite all precautions, an accident occurs, in particular through contact with caustic acids, fuel penetrating the skin, scalding from hot oil, anti-freeze being splashed in the eyes etc., ***consult a doctor immediately.***

1. Regulations designed to prevent accidents with injury to persons

During commissioning, starting and operation

- Before putting the engine into operation for the first time, read the operating instructions carefully and familiarize yourself with the “critical" points. If you are unsure, ask your MAN representative.

- For reasons of safety we recommend you attach a notice to the door of the engine room prohibiting the access of unauthorized persons and that you draw the attention of the operating personal to the fact that they are responsible for the safety of persons who enter the engine room.
- The engine must be started and operated only by authorized personnel.
  Ensure that the engine cannot be started by unauthorized persons.

- When the engine is running, do not get too close to the rotating parts. Wear close-fitting clothing.

- Do not touch the engine with bare hands when it is warm from operation - risk of burns.
- Exhaust gases are toxic. Comply with the instructions for the installation of MAN Diesel engines which are to be operated in enclosed spaces. Ensure that there is adequate ventilation and air extraction.
- Keep vicinity of engine, ladders and stairways free of oil and grease.
  Accidents caused by slipping can have serious consequences.

During maintenance and care

- Always carry out maintenance work when the engine is switched off.
  If the engine has to be maintained while it is running, e.g. changing the elements of change-over filters, remember that there is a risk of scalding. Do not get too close to rotating parts.

- Change the oil when the engines is warm from operation.
  Caution:
  There is a risk of burns and scalding. Do not touch oil drain plugs or oil filters with bare hands.

- Take into account the amount of oil in the sump. Use a vessel of sufficient size to ensure that the oil will not overflow.
- Open the coolant circuit only when the engine has cooled down.
  If opening while the engine is still warm is unavoidable, comply with the instructions in the chapter entitled “Maintenance and Care".

- Neither tighten up nor open pipes and hoses (lube oil circuit, coolant circuit and any additional hydraulic oil circuit) during the operation.
  The fluids which flow out can cause injury.

- Fuel is inflammable. Do not smoke or use naked lights in its vicinity. The tank must be filled only when the engine is switched off.

- When using compressed air, e.g. for cleaning the radiator, wear goggles.

- Keep service products (anti-freeze) only in containers which can not be confused with drinks containers.

- Comply with the manufacturer's instructions when handling batteries.
  Caution:
  Accumulator acid is toxic and caustic. Battery gases are explosive.

2. Regulations designed to prevent damage to engine and premature wear

Do not demand more from the engine than it is able to supply in its intended application. Detailed information on this can be found in the sales literature. The injection pump must not be adjusted without prior written permission of MAN Nürnberg.

If faults occur, find the cause immediately and have it eliminated in order to prevent more serious damage.

Use only genuine MAN spare parts. MAN will accept no responsibility for damage resulting from the installation of other parts which are supposedly “just as good".

In addition to the above, note the following points:

- Never let the engine run when dry, i.e. without lube oil or coolant.
- When starting do not use any additional starting aids (e.g. injection with starting pilot).
- Use only MAN-approved service products (fuel, engine oil, anti-freeze and anti-corrosion agent). Pay attention to cleanliness. The Diesel fuel must be free of water. See “Maintenance and care".
- Have the engine maintained at the specified intervals.
- Do not switch off the engine immediately when it is warm, but let it run without load for about 5 minutes so that temperature equalization can take place.
- Never put cold coolant into an overheated engine. See “Maintenance and care".
- ***Do not add so much engine oil that the oil level rises above the max. marking on the dipstick. Do not exceed the maximum permissible tilt of the engine.***
  Serious damage to the engine may result if these instructions are not adhered to.
- Always ensure that the testing and monitoring equipment (for battery charge, oil pressure, coolant temperature) function satisfactorily.
- Comply with instructions for operation of the alternator. See “Maintenance and care".

3. Regulations designed to prevent pollution

Engine oil and filter elements / cartridges, fuel / fuel filter

- Take old oil only to an old oil collection point.
- Take strict precautions to ensure that no oil or Diesel fuel gets into the drains or the ground. The drinking water supply could be contaminated.
- Filter elements are classed as dangerous waste and must be treated as such.

Coolant

- Treat undiluted anti-corrosion agent and / or anti-freeze as dangerous waste.
- When disposing of spent coolant comply with the regulations of the relevant local authorities.

4. Notes on safety in handling used engine oil *

Prolonged or repeated contact between the skin and any kind of engine oil decreases the skin. Drying, irritation or inflammation of the skin may therefore occur. Used engine oil also contains dangerous substances which have caused skin cancer in animal experiments. If the basic rules of hygiene and health and safety at work are observed, health risks are not to the expected as a result of handling used engine oil.

Health precautions:

- Avoid prolonged or repeated skin contact with used engine oil.
- Protect your skin by means of suitable agents (creams etc.) or wear protective gloves.
- Clean skin which has been in contact with engine oil.
  - Wash thoroughly with soap and water. A nailbrush is an effective aid.
  - Certain products make it easier to clean your hands.
  - Do not use petrol, Diesel fuel, gas oil, thinners or solvents as washing agents.
- After washing apply a fatty skin cream to the skin.
- Change oil-soaked clothing and shoes.
- Do not put oily rags into your pockets.

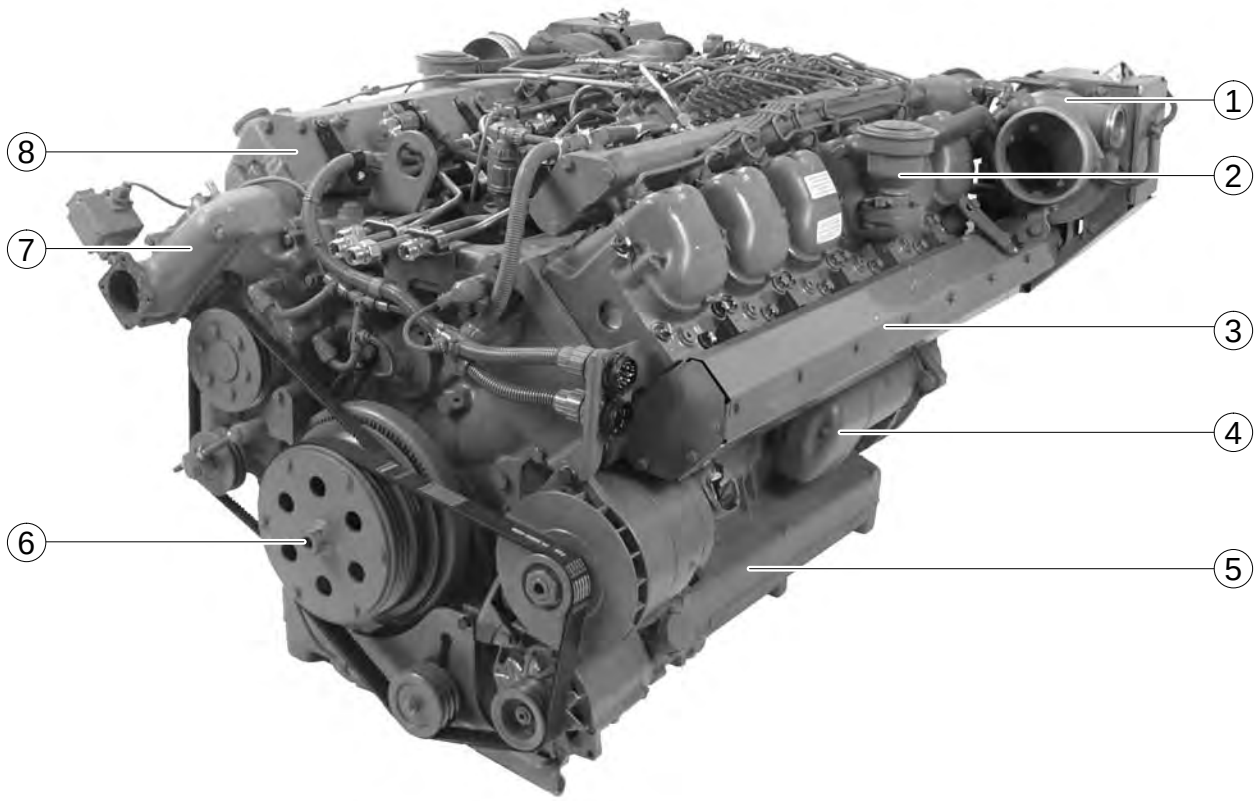
Ensure that used engine oil is disposed of properly
- Engine oil can endanger the water supply -

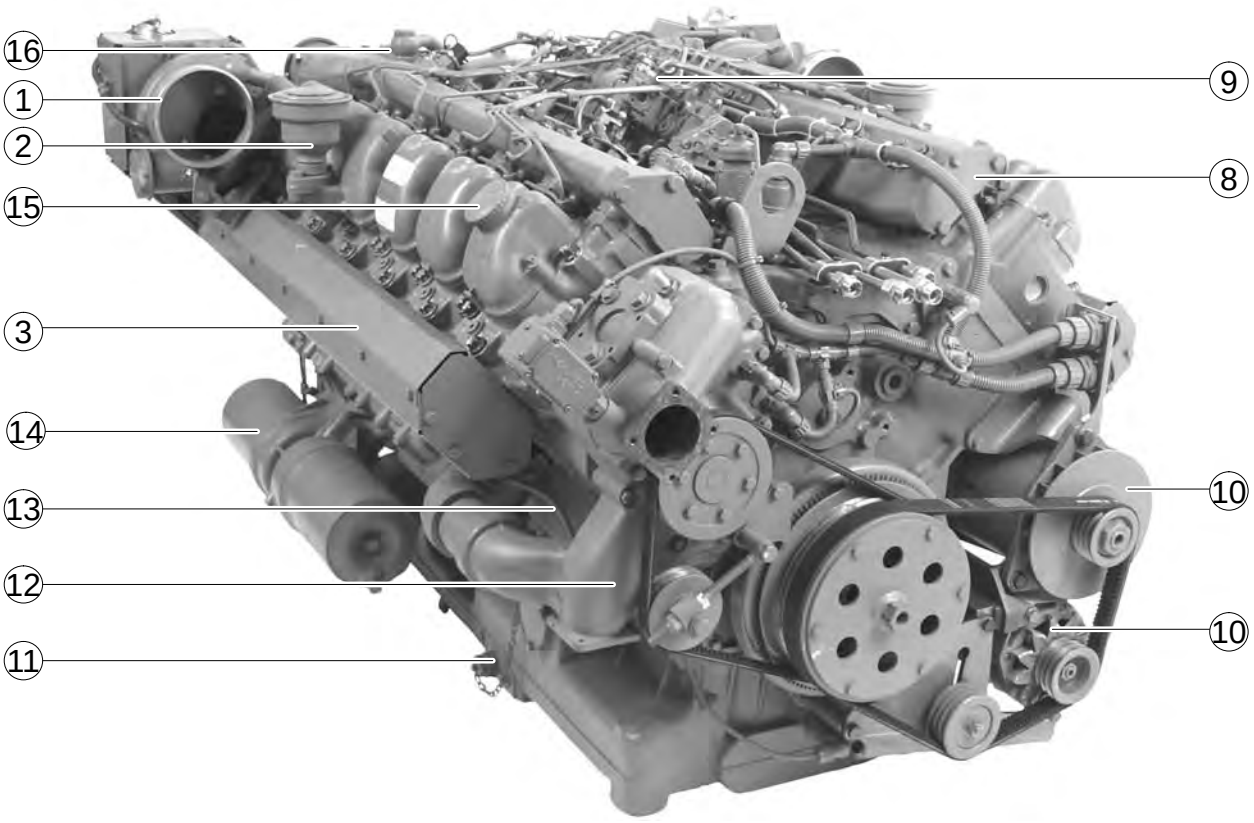
For this reason do not let engine oil get into the ground, waterways, the drains or the sewers. Violations are punishable.

Collect and dispose of used engine oil carefully. For information on collection points please contact the seller, the supplier or the local authorities.

* Adapted from “Notes on handling used engine oil".

Engine views D 2842 LE 602





(1) Turbocharger

(2) Oil separator valve for crankcase breather

(3) Exhaust manifold

(4) Starter motor

(5) Oil sump

(6) Engine cranking device

(7) Cooling water pipe

(8) In take pipe

(9) Injection pump

(10) Alternator

(11) Oil drain plug

(12) Water pump

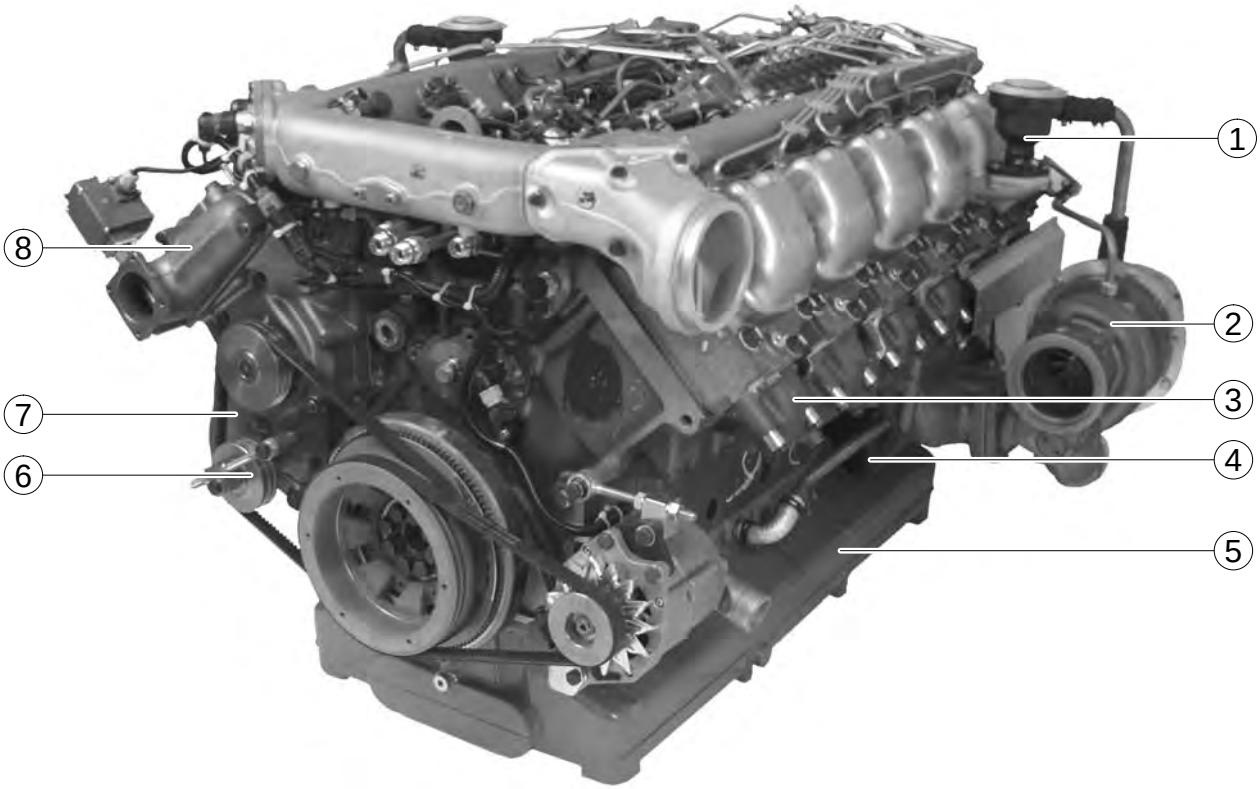
(13) Oil dipstick

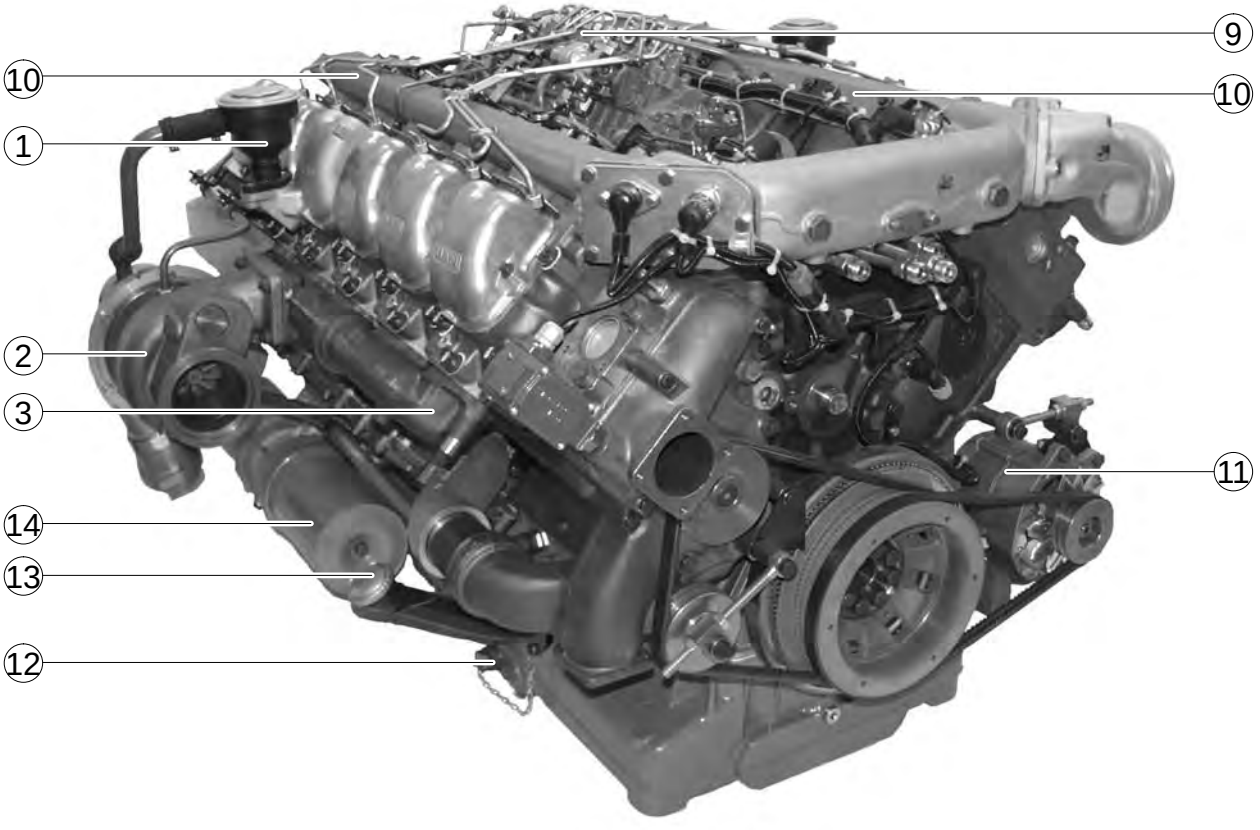
(14) Oil filter

(15) Oil filler neck

(16) Air compressor

Engine views D 2842 LE 604





(1) Oil separator valve for crankcase breather

(2) Turbocharger

(3) Exhaust manifold

(4) Starter motor

(5) Oil sump

(6) Tension pulley

(7) Water pump

(8) Cooling water pipe

(9) Injection pump

(10) In take pipe

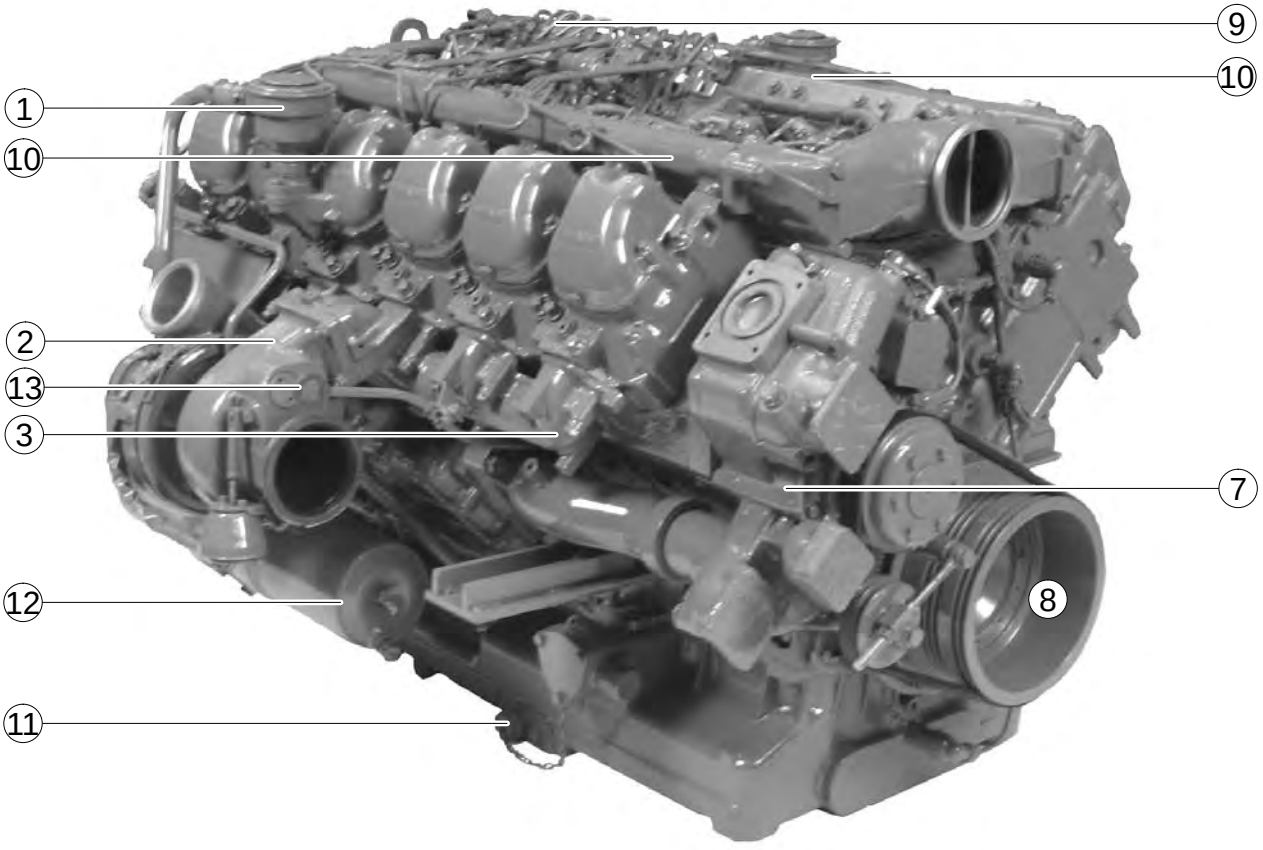
(11) Alternator

(12) Oil drain plug

(13) Oil filler neck

(14) Oil filter

Engine views D 2842 LE 606



(1) Oil separator valve for crankcase breather

(2) Turbocharger

(3) Exhaust manifold

(4) Starter motor

(5) Oil sump

(6) Tension pulley

(7) Water pump

(8) Cooling water pipe

(9) Injection pump

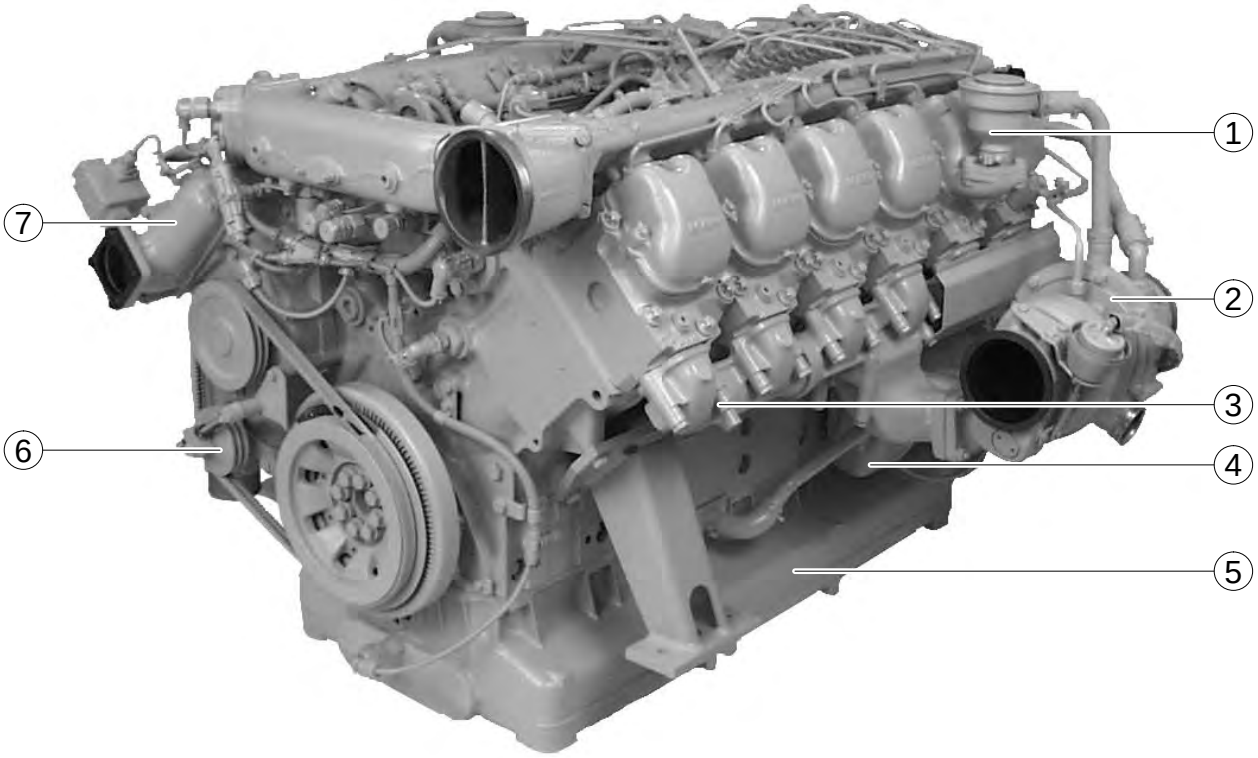
(10) In take pipe

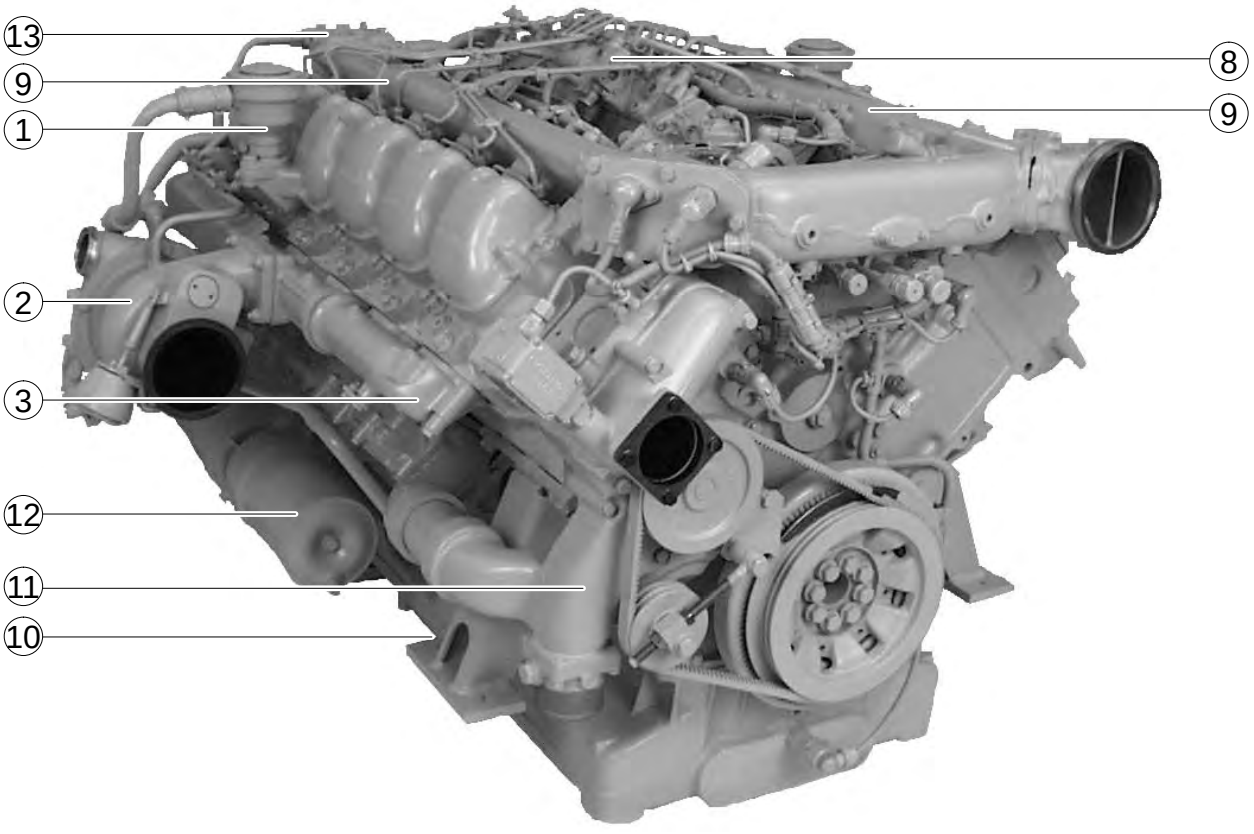
(11) Oil drain plug

(12) Oil filter

(13) Oil dipstick

Engine views D 2842 LE 607





(1) Oil separator valve for crankcase breather

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(8) Injection pump

(9) In take pipe

(10) Oil drain plug

(11) Water pump

(12) Oil filter

(13) Air compressor

First commissioning

At the time of initial commissioning of a new or overhauled engine make sure to have observed the “Technical Information for the installation of MAN Diesel engines".

It is recommended that new or overhauled engines should not be operated at a load higher than about 75% maximum load during the first few hours of operation. Initial run-in should be at varying speeds.
After this initial run-in, the engine should be brought up to full output gradually.

Caution:
Use only approved fuels, lubricants etc. (see brochure “Fuels, lubricants etc."). Otherwise the liability for defects will become null and void!

Filling with fuel

Caution:
Fill the tank only when the engine is switched off. Pay attention to cleanliness. Do not spill fuel.
Use only approved fuels, see brochure “Fuels, lubricants etc.".

Filling-in of coolant

Fill the cooling system of the engine with a mixture of drinkable tap water and anti-freeze agent on the ethylene glycole basis or anti-corrision agent.
See Publication “Fuels, Lubricants and Coolants for MAN Diesel Engines".

- Observe / adhere to vehicle manufacturer's filling specifications
- Slowly pour in coolant (max. 10 ltr./min)

Filling with engine oil

Caution:
Do not add so much engine oil that the oil level rises above the max. marking on the dipstick.
Overfilling will result in damage to the engine.

The engines are as a rule supplied without oil.
Pour oil into engine via filler neck, see page 25.
For the quantity required see “Technical Data".

Commissioning

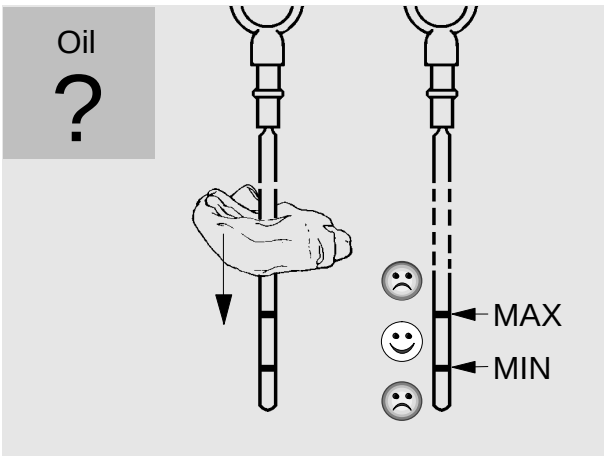
Before daily starting the engine, check fuel level, coolant level and engine oil level and replenish, if necessary.

Caution:
Use only approved fuels, lubricants etc. (see brochure “Fuels, lubricants etc."). Otherwise the liability for defects will become null and void!

Checking oil level

Check the oil level when the engine is horizontal, but only if at least 20 minutes have passed since the machine was switched off.

- Pull out dipstick
- wipe it with a clean, lintfree cloth
- and push it in again up to the stop
- Pull out dipstick again



The oil level should be between the two notches in the dipstick and must never fall below the lower notch. Top up oil as necessary.

Caution:
Do not add so much engine oil that the oil level rises above the max. marking on the dipstick. Overfilling will result in damage to the engine.

Ensure outmost cleanliness when handling fuels, lubricants and coolants.

Starting

Danger:
Before starting make sure that no-one is in the engine's danger area.

Caution:
When starting do not use any additional starting aids (e.g. injection with starting pilot).

Multi-engine systems start via an automatic start-stop system.

This must fulfil the following functions:

- Switch on EDC
- Triggering of flame start system
- Starting procedure initiated after preglowing (start assistance) and interrupted after engine starts at approx. 300-400 rpm
- Should the engine not start - starting time restricted to 10-15 seconds
- Repeat start attempt 3-4 x with 15-20 second pause in between
- Fault indication upon unsuccessful start

Avoid running the cold engine for any length of time since in any internal combustion engine this is liable to cause increased wear due to corrosion. Prolonged idling is harmful to the environment.

Operation monitoring system

Caution:
Do not overload the engine. Do not exceed the maximum permissible engine tilt. If faults occur, find their cause immediately and have them eliminated in order to prevent more serious damage!

Monitor the oil pressure of the engine lubrication and coolant agent temperature during operations.
If the monitoring equipment displays a drop in the pressure of lubrication oil or excess coolant temperature then the engine must be turned off immediately

Shutting down

Set engine to idle speed.

After engine has been under a heavy load let it run idle for approx. 5 minutes.

Turn off engine via EDC.

Danger:
Ensure that the engine cannot be started by unauthorized persons.

Lubrication system

Ensure outmost cleanliness when handling fuels, lubricants and coolants.

Caution:
se only approved fuels, lubricants etc. (see brochure “Fuels, lubricants etc."). Otherwise the liability for defects will become null and void!

Refilling with oil

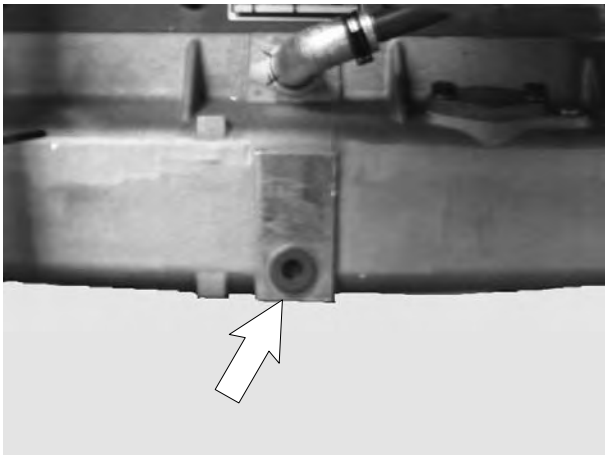
Danger:
The oil is hot-risk of scalding. Do not touch the oil drain plug with bare fingers. Oil is an environmental hazard. Handle it with care!

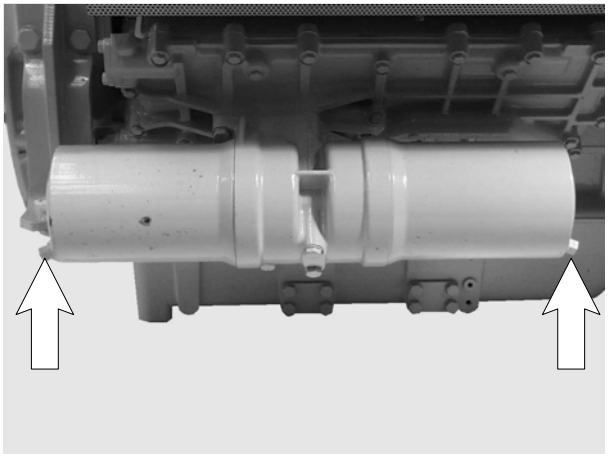
With the engine at operating temperature, remove the oil drain plugs on the oil sump and the oil filter bowl and allow the old oil to drain off completely.

Use a vessel of sufficient size to ensure that the oil does not overflow.

Refit the oil drain plugs with new gaskets.

Note:
Change the oil filter elements every time the engine oil is changed.





Filling with engine oil

> **Caution:**
> Do not add so much engine oil that the oil level rises above the max. marking on the dipstick. Overfilling will result in damage to the engine.

Pour in fresh oil through oil filler neck (1). According to variant, this is either on the cylinder head cover or on the oil pan.

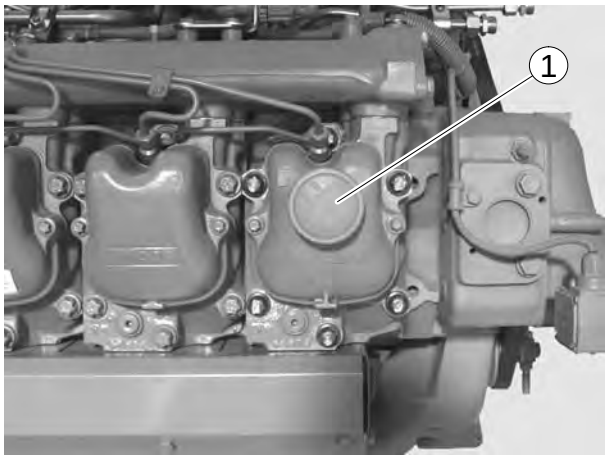
After filling start the engine and let it run for a few minutes at low speed.

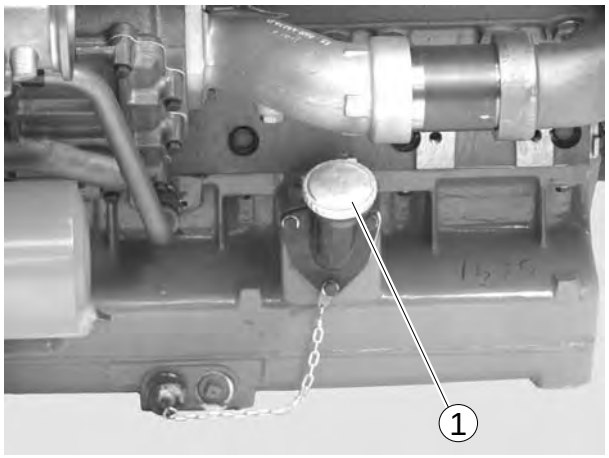
> **Caution:**
> If no oil pressure builds up after approx. 10 seconds switch off the engine immediately.

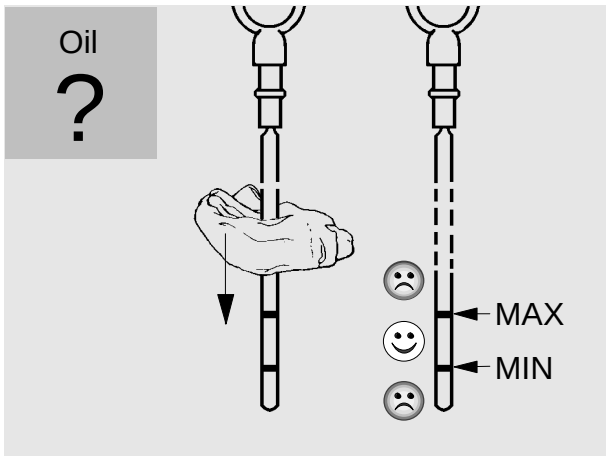
Check oil pressure and check that there is no oil leakage.
Then shut down the engine. After about 20 minutes, check the oil level.

- Pull out dipstick
- wipe it with a clean, lintfree cloth
- and push it in again up to the stop
- Pull out dipstick again

The oil level should be between the two notches in the dipstick and must never fall below the lower notch. Top up oil as necesary. Do not overfill.





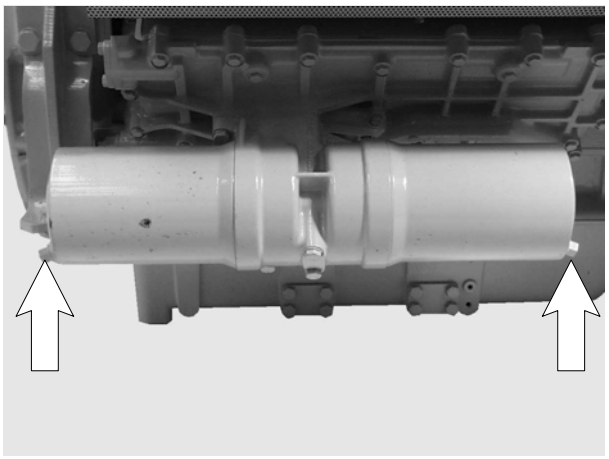


Changing oil filter

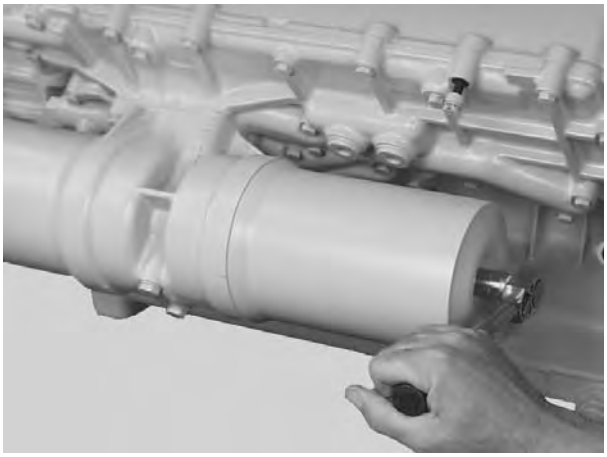
Renewal of filter cartridges

- Allow the filter content to run off along drain plug. Use a vessel of sufficient size to ensure that the oil does not overflow

Danger:
The oil is hot and under pressure when the drain plug is opened. Risk of burns and scalds!

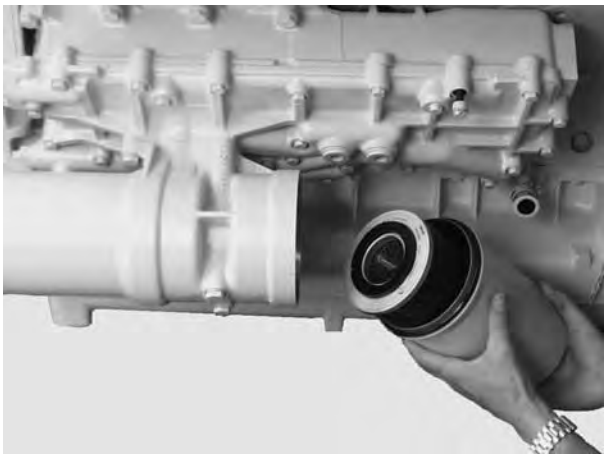


- After releasing the clamping bolts remove filter bowls
- Renew filter cartridges. Thoroughly clean all other parts in cleaning fluid (do not allow cleaning fluid to enter the oil circuit)
- Use new gaskets for reassembly of filter bowls



Note:
To prevent the seal from twisting hold the filter bowl firmly when tightening the tensioning screw

Caution:
Used oil filters are classed as dangerous waste and must be disposed of accordingly.



Fuel system

Fuel

If Diesel fuel which contains moisture is used the injection system and the cylinder liners / pistons will be damaged. This can be prevented to same extent by filling the tank as soon as the engine is switched off while the fuel tank is still warm (formation of condensation is prevented). Drain moisture from storage tanks regularly. Installation of a water trap upstream of the fuel filter is also advisable. Do not use any additives to improve flow properties in winter.

Injection pump

No alterations must be made to the injection pump. If the lead seal is damaged the warranty on the engine will become null and avoid.

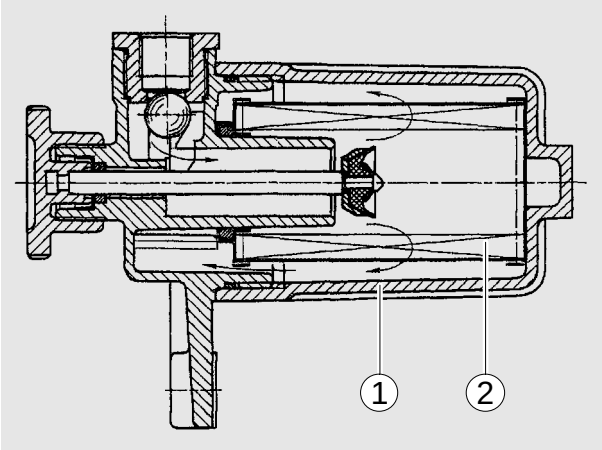
Faults

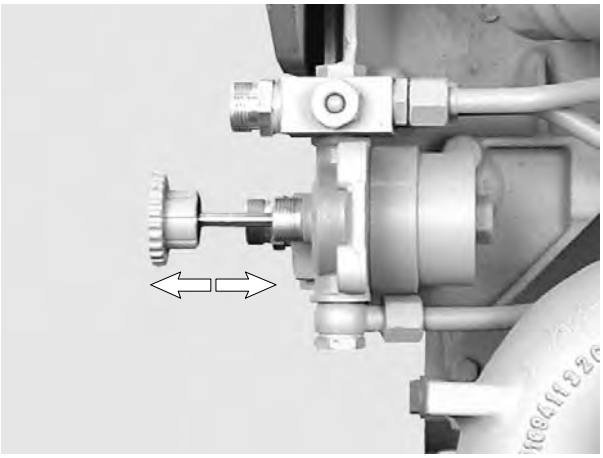
We urgently recommend that you have faults in the injection pump rectified only in an authorised specialist workshop.

Cleaning fuel pre-cleaner

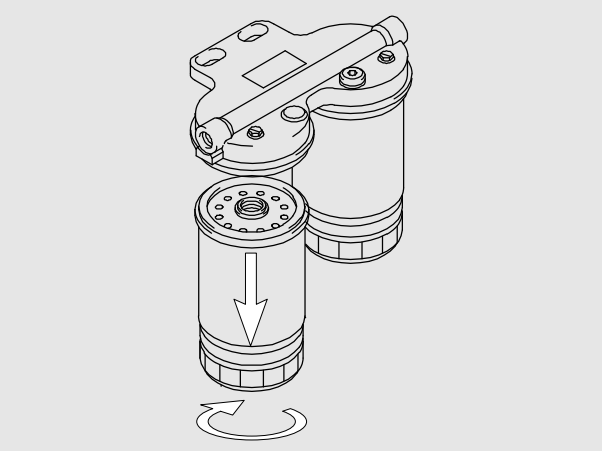
Strip the fuel pre-cleaner:

- Remove filter housing (1)
- Wash out filter housing (1) and gauze filter (2) in clean Diesel fuel and blow them out with compressed air
- Reassemble using new seal
- Screw on filter housing and tighten it to 10-12 Nm
- Actuate plunger of hand priming pump until the overflow valve of the injection pump opens audibly
- Screw in and tighten plunger on hand pump
- Start engine
- Check fuel pre-cleaner for leaks





Fuel filter



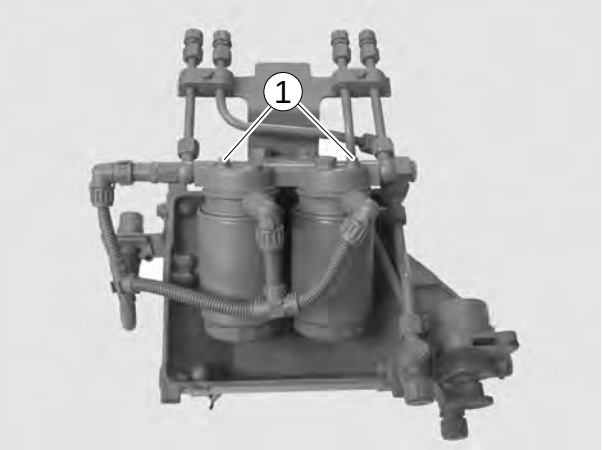
Changing fuel filter

Only when the engine is swiched off.

- Loosen filter cartridge by means of tape wrench, unscrew it by hand and take it off
- Moisten the seals on the new filter cartridge with fuel
- Screw on the filter cartridges and tighten them vigorously by hand
- Bleeding the fuel system
- Check filter for leaks

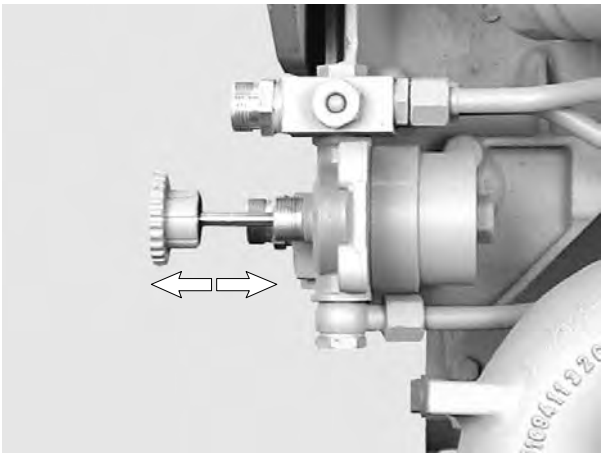
Caution:
Used fuel filters are classed as dangerous waste and must be disposed of accordingly.

Bleeding the fuel system



Note:
To bleed the fuel system switch on the “ignition" so that the EHAB will be open.

- Unscrew bleed screw (1) of first filter in direction of flow by one or two turns
- Actuate tappet of hand primer until fuel emerges without bubbles
- Screw in and tighten plunger on hand pump
- Close bleed screw again
- Repeat this procedure at the second bleed screw
- Check fuel system for leaks



Cooling system

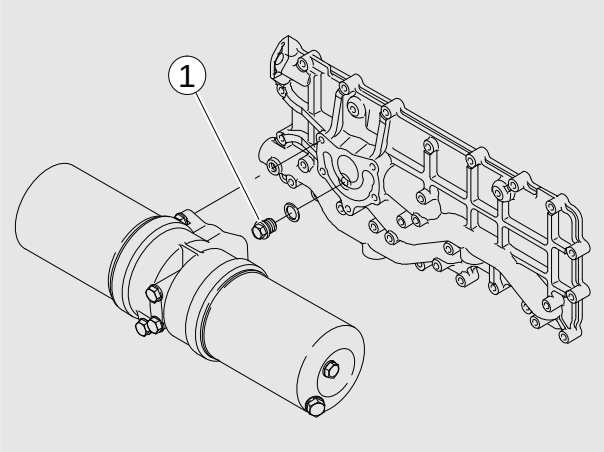
Danger:
Draining hot coolant involves a risk of scalding.

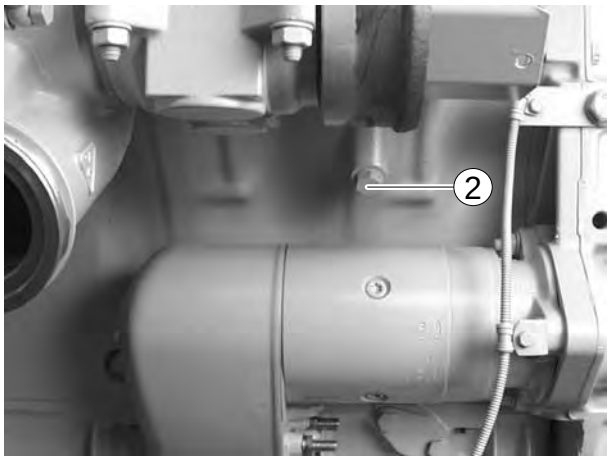
Draining the cooling system

Caution:
Drain coolant into a suitable container and dispose of it in accordance with regulations.

Drain coolant as follows when cooling system has cooled down

- To let off pressure briefly open cap on filler neck of expansion tank.
- Open drain plug in crankcase (1) or in the oil cooler housing (2)
- Then take off the cap
- Drain coolant into a container of adequate size
- Refit screw plugs
- Fill / bleed the cooling system





Fill / bleed the cooling system (only when engine has cooled down)

Fill the cooling system of the engine with a mixture of drinkable tap water and anti-freeze agent on the ethylene glycole basis or anti-corrision agent.
See Publication “Fuels, Lubricants and Coolants for MAN Diesel Engines".

Coolant must be poured in according to the vehicle manufacturer's filling specifications.

Do not pour any cold coolant into an engine which is still warm.

Ensure that the ratio of water to anti-freeze is correct.

- Pour in coolant slowly until the correct coolant level is reached (max. 10 ltr./min.)
- Run the engine briefly and then check coolant level once more

Danger:
If, in **exceptional** cases, the coolant level on warm engines has to be checked or the cooling circuit opened, observe the vehicle manufacturer's safety regulations.

Air filter

An air filter is installed in the vehicle to purify the air for combustion.

The intervals at which the air cleaner requires servicing depend on the specific operating conditions encountered. Clogged air filters may cause black smoke and reduce power.

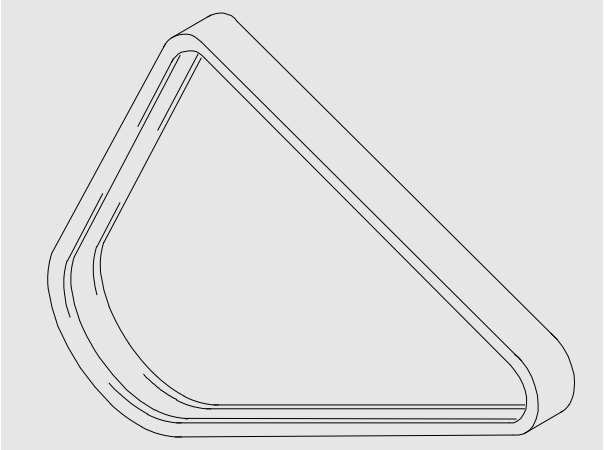
A check should be made from time to time to see that the fastening elements securing the air cleaner to the intake manifold seal the connection tightly. Any ingress of unfiltered air is liable to cause a high rate of cylinder and piston wear.

V-belts

Checking condition

- Check V-belts for cracks, oil, overheating and wear
- Change demaged V-belts

If, in the case of a multiple belt drive, wear or differing tensions are found, always replace the complete set of belts.

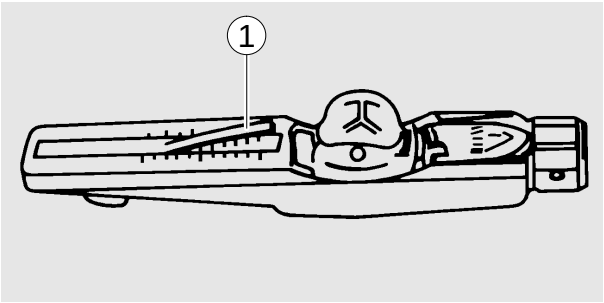


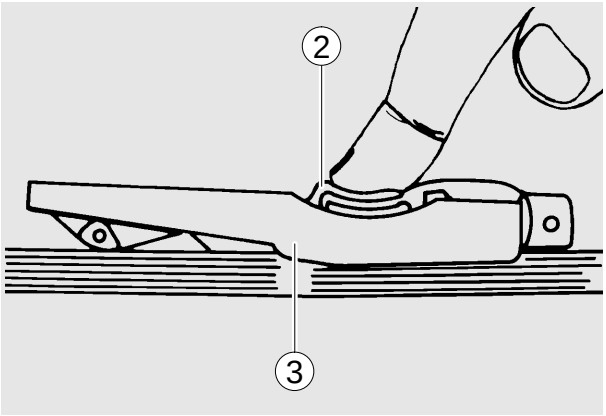
Checking tension

Use V-belt tension tester to check V-belt tension.

- Lower indicator arm (1) into the scale
- Apply tester to belt at a point midway between two pulleys so that edge of contact surface (3) is flush with the V-belt
- Slowly depress pad (2) until the spring can be heard to disengage. This will cause the indicator to move upwards

If pressure is maintained after the spring has disengaged a false reading will be obtained!





Reading of tension

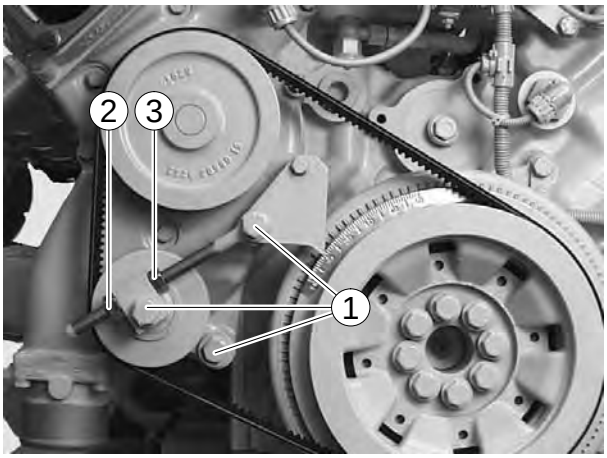
- Read of the tensioning force of the belt at the point where the top surface of the indicator arm (1) intersects with the scale
- Before taking readings make ensure that the indicator arm remains in its position

If the value measured deviates from the setting value specified, the V-belt tension must be corrected.

Drive belt width	Tensioning forces according to the kg graduation on the tester		
	New installation		When servicing after long running time
	Installation	After 10 min. running time	
2/3VX	90-100	70-80	60
3/3VX	135-150	105-120	90

Tensioning and changing V-belt

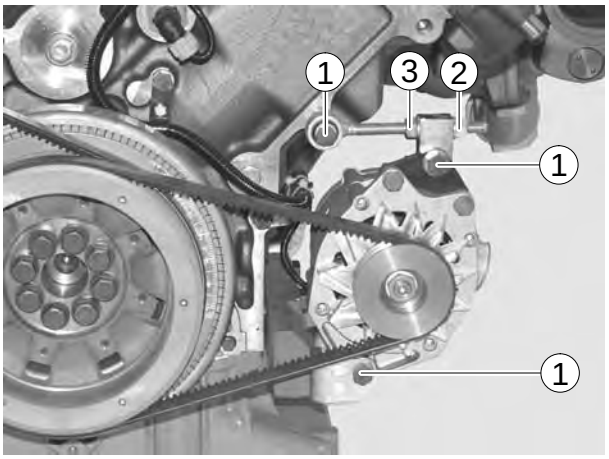
Crankshaft - water pump - tension pulley



- Remove fixing bolts (1)
- Remove lock-nut (2)
- Adjust nut (3) until V-belts have correct tensions
- Retighten lock-nut and fixing bolts

To change the V-belt, turn back the setting nut and swivel the tension pulley inwards.

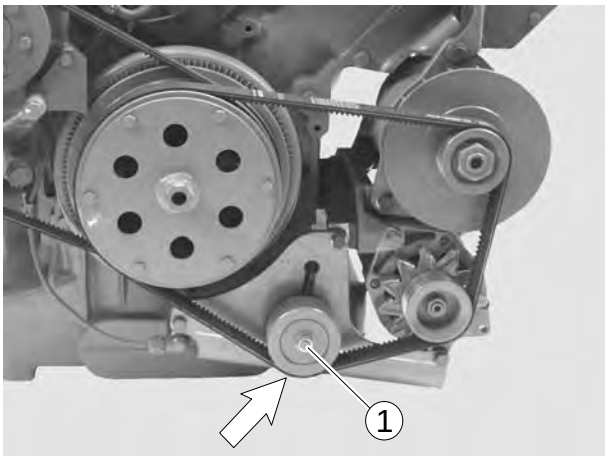
Alternator - bottom left



- Remove fixing bolts (1)
- Remove lock-nut (2)
- Adjust nut (3) until V-belts have correct tensions
- Retighten lock-nut and fixing bolts

To change the V-belt, turn back the setting nut and swivel the alternator inwards.

Alternators (55 A and 140 A) - bottom left



- Loosen tightening nut on the tensioning roll
- Turn mounting block (arrow) clock-wise until V-belt has correct tension
- Retighten mounting nut (1) on tensioning pulley

To change V-belt, loosen mounting nut (1) and turn setting screw (arrow).

Turbocharger

At every engine oil change check the oil pipes for leaks and constrictions.

Furthermore, a regular check should be kept on charge air and exhaust gas pipes.
Any leakages should be attended to at once because they are liable to cause overheating of the engine.

Intercooler

The water / air intercooler is part of the MAN delivery share and does not require any regular cleaning.

Air / air intercooler systems are not part of the MAN delivery share. These are to be cleaned after liasing with the vehicle manufacturer, or according to amount of soiling.

Starter motor

Check that the electric cables are properly fastened and that contacts and plug connections are secure.

In engines fitted with electronic speed pickups at the flywheel (e.g. electronic speed governor and EDC), the speed pickup are to be cleaned too and metal chips that may adhere are to be removed.

Note:
Always disconnect the battery earth cable before starting work on the electrical system. Connect up the earth cable last, as there is otherwise a risk of short-circuits.

Alternator

The alternator is maintenance-free.
Nevertheless, it must be protected against dust and, above all, against moisture.

In order to avoid damage to the alternator, observe the following instructions:

While the engine is running

- Do not de-energize the main battery switch!
- Do not disconnect the battery or pole terminals or the cables!
- If, durig operation, the battery charge lamp suddenly lights up, stop the engine immediately and remedy the fault in the electrical system!
- Do not run the engine unless the battery charge control is in satisfactory order!
- Do not short-circuit the connections of the alternator with those of the regulator or said connections with ground, not even by briefly bringing the connections into contact!
- Do not operate the alternator without battery connection!

Temporary decommissioning of engines

Temporary anti-corrosion protection according to MAN works norm M 3069 is required for engines which are to be put out of service for fairly long periods.

The works norm can be obtained from our After-Sales Service department Nuremberg works.

Model	**D 2842 LE 602**
Design	V-form, 90°
Cycle	4-stroke Diesel with turbocharger and intercooler
Combustion system	Direct injection
Turbocharging	Turbocharger with intercooler
Number of cylinders	12
Bore	128 mm
Stroke	142 mm
Swept volume	21 930 cm^3
Compression ratio	16,5 : 1
Rating	see engine nameplate
Firing order	1-12-5-8-3-10-6-7-2-11-4-9
Valve clearance (cold engine)	
Intake	0.50 mm
Exhaust	0.60 mm
Valve timing	
Intake opens	24° before TDC
Intake closes	36° after BDC
Exhaust opens	63° before BDC
Exhaust closes	27° after TDC
Fuel system	
Injection pump	In-line pump
Governor	Electronic Diesel Control (EDC) - Model M(S) 5
Injectors	six-hole nozzles
Opening pressure of injector	
New nozzle holder:	335+8 bar
Used nozzle holder:	320+8 bar
Start of delivery	8°+1° before TDC
Fuel filter	Parallel box filter heated

Engine lubrication	Force feed	
Oil capacity in oil sump (litres)	min.	max.
Shallow	35 l	50 l
Oil change quantity (with filter)		
Shallow	53 l	
Oil pressure during operation (depending on oil temperature, oil viscosity class and engine rpm)	must be monitored by oil pressure monitors / gauges	
Oil filter	Full-flow filter with two paper filter elements	
Engine cooling system	Liquid cooling	
Operating temperature	90-95°C	
Electrical equipment		
Starter	24 V; 6.6 kW	
Alternator	28 V; 55 A and 140 A	

Model	**D 2842 LE 604**
Design	V-form, 90°
Cycle	4-stroke Diesel with turbocharger and intercooler
Combustion system	Direct injection
Turbocharging	Turbocharger with intercooler
Number of cylinders	12
Bore	128 mm
Stroke	142 mm
Swept volume	21 930 cm^3
Compression ratio	16,5 : 1
Rating	see engine nameplate
Firing order	1-12-5-8-3-10-6-7-2-11-4-9
Valve clearance (cold engine)	
Intake	0.50 mm
Exhaust	0.60 mm
Valve timing	
Intake opens	24° before TDC
Intake closes	36° after BDC
Exhaust opens	63° before BDC
Exhaust closes	27° after TDC
Fuel system	
Injection pump	In-line pump
Governor	Electronic Diesel Control (EDC) - Model M(S) 5
Injectors	six-hole nozzles
Opening pressure of injector	
New nozzle holder:	335+8 bar
Used nozzle holder:	320+8 bar
Start of delivery	10°+1° before TDC

Engine lubrication	Force feed	
Oil capacity in oil sump (litres)	min.	max.
Shallow	35 l	50 l
Oil change quantity (with filter)		
Shallow	53 l	
Oil pressure during operation (depending on oil temperature, oil viscosity class and engine rpm)	must be monitored by oil pressure monitors / gauges	
Oil filter	Full-flow filter with two paper filter elements	
Engine cooling system	Liquid cooling	
Operating temperature	90-95°C	
Electrical equipment		
Starter	24 V; 6.6 kW	
Alternator	28 V; 55 A	

Model	**D 2842 LE 606**
Design	V-form, 90°
Cycle	4-stroke Diesel with turbocharger and intercooler
Combustion system	Direct injection
Turbocharging	Turbocharger with intercooler
Number of cylinders	12
Bore	128 mm
Stroke	142 mm
Swept volume	21 930 cm^3
Compression ratio	16,5 : 1
Rating	see engine nameplate
Firing order	1-12-5-8-3-10-6-7-2-11-4-9
Valve clearance (cold engine)	
Intake	0.50 mm
Exhaust	0.60 mm
Valve timing	
Intake opens	24° before TDC
Intake closes	36° after BDC
Exhaust opens	63° before BDC
Exhaust closes	27° after TDC
Fuel system	
Injection pump	In-line pump
Governor	Electronic Diesel Control (EDC) - Model M(S) 5
Injectors	six-hole nozzles
Opening pressure of injector	
New nozzle holder:	335+8 bar
Used nozzle holder:	320+8 bar
Start of delivery	12°+1° before TDC

Engine lubrication	Force feed	
Oil capacity in oil sump (litres)	min.	max.
Shallow	35 l	50 l
Oil change quantity (with filter)		
Shallow	53 l	
Oil pressure during operation (depending on oil temperature, oil viscosity class and engine rpm)	must be monitored by oil pressure monitors / gauges	
Oil filter	Full-flow filter with two paper filter elements	
Engine cooling system	Liquid cooling	
Operating temperature	90-95°C	
Electrical equipment		
Starter	24 V; 6.6 kW	

Model	**D 2842 LE 607**
Design	V-form, 90°
Cycle	4-stroke Diesel with turbocharger and intercooler
Combustion system	Direct injection
Turbocharging	Turbocharger with intercooler
Number of cylinders	12
Bore	128 mm
Stroke	142 mm
Swept volume	21 930 cm^3
Compression ratio	16,5 : 1
Rating	see engine nameplate
Firing order	1-12-5-8-3-10-6-7-2-11-4-9
Valve clearance (cold engine)	
Intake	0.50 mm
Exhaust	0.60 mm
Valve timing	
Intake opens	24° before TDC
Intake closes	36° after BDC
Exhaust opens	63° before BDC
Exhaust closes	27° after TDC
Fuel system	
Injection pump	In-line pump
Governor	Electronic Diesel Control (EDC) - Model M(S) 5
Injectors	six-hole nozzles
Opening pressure of injector	
New nozzle holder:	335+8 bar
Used nozzle holder:	320+8 bar
Start of delivery	8°+1° before TDC

Engine lubrication	Force feed	
Oil capacity in oil sump (litres)	min.	max.
Shallow	35 l	50 l
Oil change quantity (with filter)		
Shallow	53 l	
Oil pressure during operation (depending on oil temperature, oil viscosity class and engine rpm)	must be monitored by oil pressure monitors / gauges	
Oil filter	Full-flow filter with two paper filter elements	
Engine cooling system	Liquid cooling	
Operating temperature	90-95°C	
Electrical equipment		
Starter	24 V; 6.6 kW	

ALWAYS COMPLY WITH SAFETY REGULATIONS

Maintenance jobs	Maintenance cycles *								
	1	2	3	4	5	6	7	8	9
Check coolant level and oil level in engine	●								
Check air filter contamination	●								
Change engine oil (see also page 43)		●	○	○	○				
Change oil filter cartridge (see also page 43)		●	○	○	○				
Clean fuel strainer		●	●						
Draining fuel filter / condensation (earlier if severe operating conditions demand it)			●						
Check and if necessary correct V-belt tension		●	●						
1st retightening of cylinder head bolts (with overhauled engine)		●							
Check that removable unions (bolts, hose clips, pipe fittings) are firmly in position and, if necessary, retighten		●	●						
Service the air cleaner (earlier if severe operating conditions demand it)			●						
2nd retightening of cylinder head bolts (with new or overhauled engine)				●					
Check and if necessary adjust valve clearance		●		●	●				
Change disposable fuel filter / filter elements						●			
Check turbocharger							●		
Change coolant								●	
Renew filler cap and working valve of cooling system								●	
Check injection nozzles									●

* 1 - Daily
2 - After the first 10 to 20 hours of operation (with new or overhauled engine)
3 - Every 200 hours of operation
4 - After the first 400 hours of operation
5 - Every 400 hours of operation
6 - Every 1000 hours of operation
7 - Every 3000 hours of operation
8 - Every 2 years
9 - Every 6000 hours of operation

○ Change interval in operating hours depends on quality of oil used, see page 43.

Refilling with oil

Engine oil change intervals in hours of operation, depending on the oil grade used.

Engine	Engine oils according to MAN Works Standard *)			
	MAN 270	MAN 271	M 3275	M 3277
D 2842 LE 602 / 604 / 606 / 607	200 h	200 h	400 h	400 h

*) See Publication “Fuels, Lubricants and Coolants for MAN Diesel Engines".

Note:

- Use only approved engine oils
- Where Diesel fuels with a sulphur content greater than 1% are used, the oil change intervals are to be halved
- Irrespective of the periods stated, the engine oil should be changed at least once every year
- Change the oil filter element every time the engine oil is changed.

Troubleshooting table

Fault												
Engine does not start, or starts only with difficulty												
	Engine starts but does not reach full speed or stalls											
		Engine idles out of true when warm, misfiring										
			Engine speed fluctuates during operation									
				Power output unsatisfactory								
					Coolant temperature too high, coolant being lost							
						Lube oil pressure too low						
							Lube oil pressure too high					
								Black smoke accompanied by loss of power				
									Blue smoke			
										White smoke		
											Knocking in the engine	
												Engine “too loud"
												Reason
●												Fuel tank empty
●												Fuel cock closed
●		●	●	●					●			Air in fuel system
●	●	●		●					●			Fuel pre-filter / pre-cleaner clogged
●												Condensation in fuel
●	●			●				●				Air filter clogged
●												Electric circuit interrupted
●												Batteries flat
●												Starter / solenoid switch defective
●		●						●		●	●	Start of delivery not correct / incorrectly set
●												Injection nozzles clogged
●												Internal damage to engine
	●			●					●			Fuel quality not in accordance with specifications or fueled severely contaminated
		●										Lower idling speed set too low
●		●								●	●	Valve clearance incorrect
		●										Injection nozzles of injection pipes leaking
			●									Intake vacuum before supply pump too high
			●									Rev. counter defective
			●					●		●		Injection nozzles defective or carbonized
				●								Engine being asked to do more than it has to
				●								Fuel supply faulty, fuel too warm
				●				●				Oil level in sump too high
				●								Incorrect rated speed setting
					●							Coolant level too low
					●							Air in coolant circuit
				●								Charge air or coolant temperature too high
					●							Radiator very dirty
					●							Tension of water-pump V-belts incorrect (slip)
					●							Cap with working valves on expansion tank / radiator defective or leaking
					●							Temperature gauge defective

Fault												
Engine does not start, or starts only with difficulty												
	Engine starts but does not reach full speed or stalls											
		Engine idles out of true when warm, misfiring										
			Engine speed fluctuates during operation									
				Power output unsatisfactory								
					Coolant temperature too high, coolant being lost							
						Lube oil pressure too low						
							Lube oil pressure too high					
								Black smoke accompanied by loss of power				
									Blue smoke			
										White smoke		
											Knocking in the engine	
												Engine “too loud"
												Reason
					●							Coolant pipes leaking, blocked or twisted
						●						Oil level in sump too low
						●						Engine temperature too high
						●						Oil filter clogged
						●	●					Oil pressure gauge defective
						●	●					Selected oil viscosity not suitable for ambient temperature (oil too thin)
						●						Oil in sump too thin-bodied (mixed with condensation or fuel)
							●					Engine cold
									●	●		Engine, coolant or intake air still to cold
									●			Lube oil getting into combustion chamber (piston worn, piston rings worn or broken)
									●			Overpressure in crankcase (crankcase breather clogged)
									●			long operation under a low load
										●		Coolant getting into combustion chamber (cylinder head / gasket leaking)
											●	Engine operating temperature incorrect
												Intake or exhaust pipe leaking

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MAN Truck & Bus AG
Vogelweiherstraße 33
90441 Nuremberg
Germany
man-engines@man.eu
www.man-engines.com