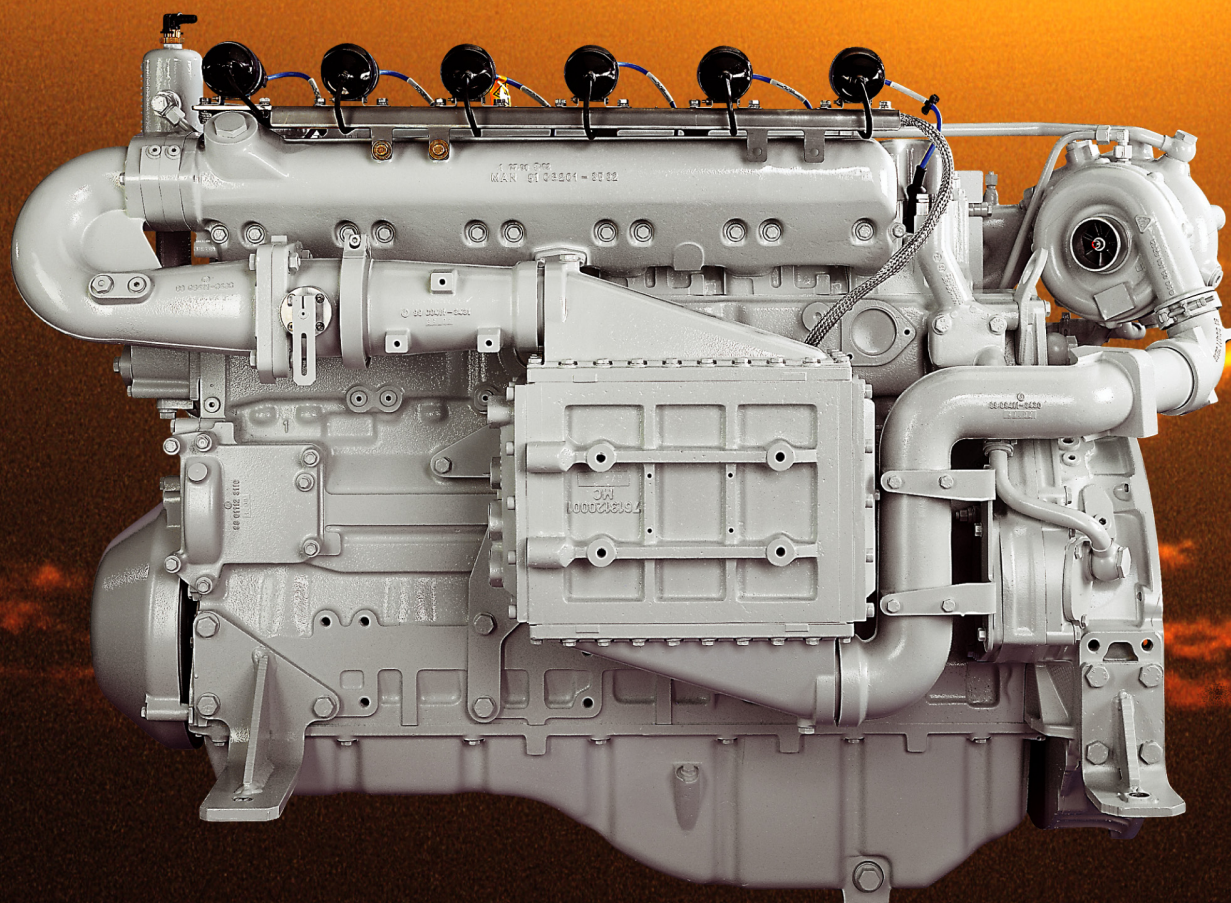




Repair Manual

MAN Industrial Gas Engines

E 2876 LE 302



Foreword

These instructions are intended to help perform repairs properly on the engine described here. The illustrations and associated descriptions are typical for the current state of development. It is compulsory that the engine be removed before performing any of the work describe in this Repair Manual.

The expert knowledge necessary for handling diesel engines was taken for granted when this publication was compiled.

**Note:**

Only use fuel, coolants and lubricants in accordance with MAN regulations, otherwise the manufacturer's warranty will not apply!

For basic information on the fuels see the publication "Fuels, Lubricants and Coolants for MAN Industrial Gas Engines".

You can find the approved products on the Internet at:

–<http://www.man-mn.com/> → **Products & Solutions** → **E-Business**–

Repairs to drive units are to be performed by our customer service or the customer service of the manufacturer.

Best regards

MAN Nutzfahrzeuge Aktiengesellschaft

Nuremberg Plant

Since our products are in continuous development, we reserve the right to make technical modifications.

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Instructions

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:**

Explanatory descriptions which help in understanding the relevant work or operating procedure to be carried out.

Fitting flat seals / gaskets

Flat seals / gaskets are often inserted with sealing agents or adhesives to make fitting them easier or to achieve better sealing. Flat seals may slip in operation due to the "sewing –machine" effect, in particular if they are used between parts with different rates of linear expansion under heat (e.g. aluminium and cast iron), and leaks may then occur.

Example:

The cap of the front crankshaft seal. If a sealing agent or an adhesive is used here the flat seal will move inwards in the course of time as a result of the different expansion rates of the materials. Oil will be lost, for which the shaft seal may be thought to be responsible.

Flat seals / gaskets can be fitted properly only if the following points are observed:

- Use only genuine MAN seals / gaskets.
- The sealing faces must be undamaged and clean.
- Do not use any sealing agent or adhesive – as an aid to fitting the seals a little grease can be used if necessary so that the seal will stick to the part to be fitted.
- Tighten bolts evenly to the specified torque.

Fitting round sealing rings

- Use only genuine MAN round sealing rings.
- The sealing faces must be undamaged and clean.
- Always wet round sealing rings with engine oil before fitting them.

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The type classification, which is made up of a series of letters and numbers, reveals some of the features of the engine in question provided the reader is familiar with the underlying nomenclature.

The system is explained here using the type E 2876 LE 302 as an example:

- E The “E” at the start of the type designation stands for natural gas (German: Erdgas)

- 28 The numbers “28” indicate that this is a power unit with **128** mm bore

- 7 The “7” means 170 mm stroke This figure is, however, only approximate for this model. The actual stroke is 166 mm.

- 6 The “6” indicates the number of cylinders 6

- L stands for “**charge-air cooling**” (German: Ladeluftkühlung)

- E The “E” stands for “**fitted engine**” (German: Einbaumotor) and is intended to distinguish MAN vehicle engines

- 302 This is a factory-internal development number

General

Important safety regulations are summarized in this quick-reference overview and arranged by topic to effectively convey the knowledge necessary to avoid accidents causing injury, damage or environmental hazard. Additional information can be found in the operating instructions of the engine.

Important:

Should an accident occur despite all precautionary measures, particularly one involving contact with corrosive acid, penetration of fuel under the skin, scalding by hot oil, antifreeze splashing into the eyes etc. **you must seek medical assistance immediately.**

1. Regulations for the prevention of accidents with personal injury

Inspection, adjustment and repair work may only be performed by authorised and skilled personnel.

- The engine may only be started and operated by authorised personnel.
- When the engine is running, do not get too close to the rotating parts.
Wear close-fitting clothing.
- Do not touch hot engine with bare hands: Risk of burns.
- Keep area surrounding engine, ladders and stairways free of oil and grease. Accidents caused by slipping can have serious consequences.
- Only work with tools which are in good condition. Worn spanners/wrenches slip: Danger of injury.
- Persons must not stand under an engine suspended on a crane hook. Keep lifting gear in order.
- Open the coolant circuit only when the engine has cooled down. If it is unavoidable that the circuit be opened with the engine at operating temperature, observe the instructions in the chapter "Maintenance and care" in the operating instructions.
- Do not tighten or undo pipes and hoses under pressure (lubricating oil circuit, coolant circuit and any downstream hydraulic oil circuits). The fluids which flow out can cause injury.



- When working on the electrical system, first disconnect the earth cable of the battery and reconnect this last to prevent short circuits.
- Follow the manufacturer's instructions for handling batteries.
Caution:
Accumulator acid is toxic and caustic. Battery gases are explosive.
- When performing welding work, observe the "Notes for welders".





2. Regulations for the prevention of engine damage and premature wear

- ***The engine must be cleaned thoroughly prior to repair. Ensure that during repair work no dirt, sand or foreign bodies enter the engine.***
- If engine operation is disrupted, immediately determine the cause and have it remedied to prevent additional damage.
- In every case, use only original MAN spare parts. The installation of parts that are “just as good” but do not originate from MAN can under certain circumstances cause severe damage – for which the workshop performing the repair must bear responsibility.
- Never allow the engine to run dry, i.e. without lubricant or coolant.
Appropriate notices must be attached to engines that are not ready for operation.
- Only use lubricants, fluids and fuel approved by MAN (gas, engine oil, antifreeze and corrosion protection agents). Pay attention to cleanliness.
- ***Do not fill engine oil beyond the max. notch 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.
- Control and monitoring devices (charge control, oil pressure, coolant temperature) must be in perfect working order.

3. Safety instructions for handling the ignition system

- When the engine is in operation, the following parts of the ignition system must not be touched or disconnected under any circumstances:
 - Ignition coils and caps
 - Cables of the high-voltage circuit
 - Cables of the low-voltage circuit
 - Plugs of the output and input wiring harness
- For all work related to set-up, operation, conversion, customisation, maintenance and repairs, the power must be disconnected from the ignition system and secured against inadvertent reactivation.

