

Technical information

MAN industrial Gas engines Repair Manual



E 2876 TE 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. Please note that all work in these repair instructions was performed with the engine removed. The expert technical knowledge required for handling gas engines has been assumed in creation of this publication. 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:**

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

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.

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The type designation, consisting of a sequence of letters and numbers, indicates some characteristics of each engine, provided you are familiar with the basic terminology.

The system is explained here using the type E 2876 TE 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

- T The “T” stands for turbo charged

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

- 302 This is a factory-internal development number.



General

This brief overview summarises important instructions and is structured into areas of main concern in order to impart the knowledge necessary to prevent accidents involving injury to persons, damage to the engine or other property and harm to the environment. Additional notes are included in the operator's manual for 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.
- Wenn der Motor läuft, nicht zu nahe an drehende Teile kommen.
Wear tight-fitting work clothes.
- Do not touch hot engine with bare hands: risk of burning yourself.
- Keep engine vicinity, ladder and steps free of oil and grease. Accidents resulting from slipping may have serious consequences.
- Work only with tools that are in good condition. Worn spanners slip: risk of injuries.
- Persons must not stand under an engine suspended from a crane hook. Keep lifting gear in good order.
- Open coolant circuit only after 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.
- Neither retighten nor open pressurised pipelines and hoses (lube oil circuit, coolant circuit and downstream hydraulic oil circuit if fitted): risk of injuries resulting from emerging fluids.
- When working on the electrical system, first disconnect the earth cable of the battery and reconnect this last to prevent short circuits.
- Observe manufacturer's instructions for handling batteries.
Caution:
Battery acid is toxic and caustic. Battery gases are explosive.
- When performing welding work, observe the "Notes for welders".





Safety instructions

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” not originating 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). Ensure cleanliness at all times.
- **Do not fill engine oil beyond the max. notch on the dipstick. Do not exceed the maximum permitted operating inclination of the engine.**
Nonobservance can lead to severe engine damage.
- 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
 - connectors 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.

