

Repair Manual

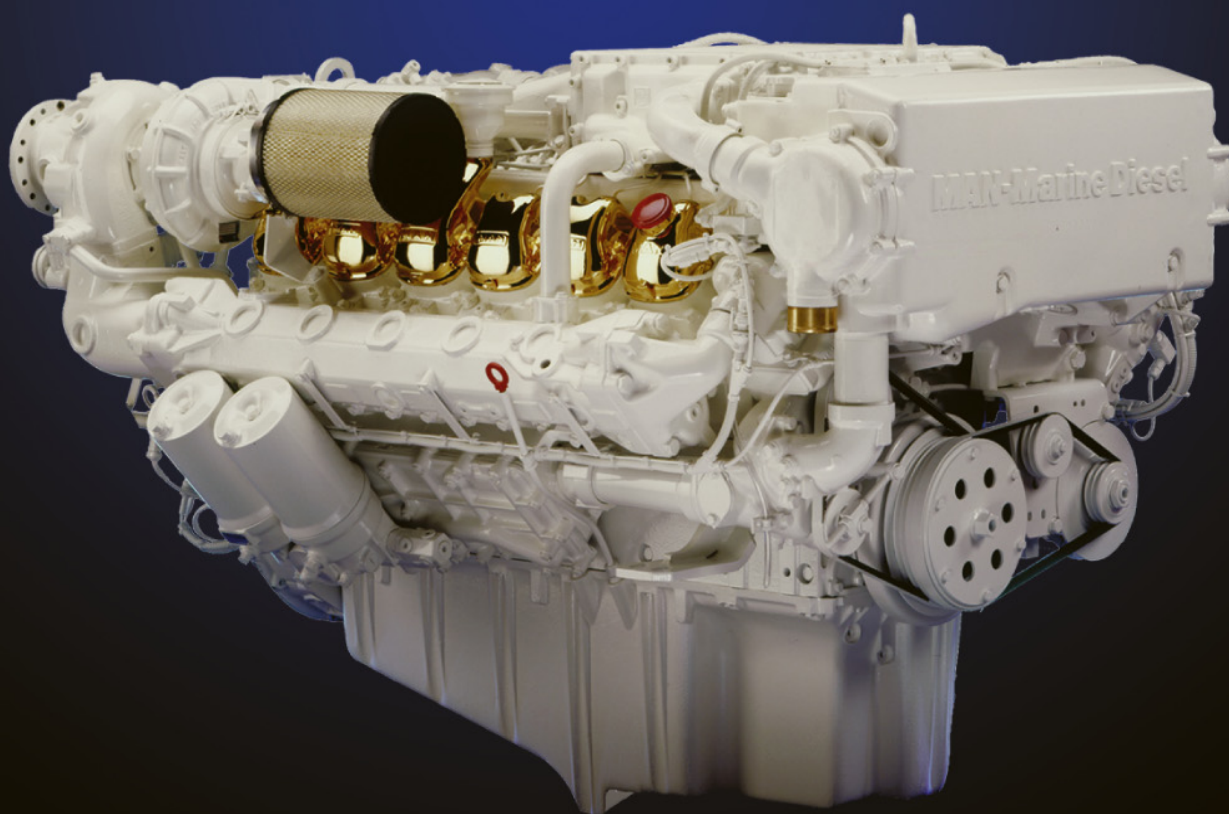


MAN-Marine Diesel Engines

D 2848 LE 403 / 405

D 2840 LE 403

D 2842 LE 404 / 407 / 410 / 414 / 415 / 416 / 417



This Repair Manual is designed to facilitate proper repair of the engines listed here.

In addition to this Repair Manual the following publications are available:

- Engineering • Data • Setting values
- Operating Instructions
- Fuels, Lubricants and Coolants for MAN-Diesel Engines
- Spare-parts catalogue
- Service record book with maintenance plan

The pictures and associated descriptions show typical work that may not always be applicable to the engine in hand, which nevertheless does not mean that they are not correct.

In such cases, the repair work is to be planned and carried out in a similar way.

It is compulsory that the engine be removed before performing any of the work described 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 Diesel Engines".

You can find the approved products on the Internet at:

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

Any repair of components such as injection pump, alternator etc. ought to be left to our or the manufacturer's service department.

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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Important instructions concerning technical safety and personal protection are, as shown below, especially highlighted.

**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.

Assembly of pipes

**Danger:**

No pipes may be bent.
Risk of breakage!

Fitting flat seals / gaskets

Gaskets are frequently used with sealants or adhesives as an aid to assembly or to achieve a better seal. Above all when parts with different levels of thermal expansion (e.g. aluminium and cast iron) are bonded, this can mean that the gasket is shifted during operation by the so-called stitching or sewing machine effect and leaks 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.

Perfect assembly of gaskets can only be achieved if the following instructions are adhered to:

- 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.

Assembly of 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.

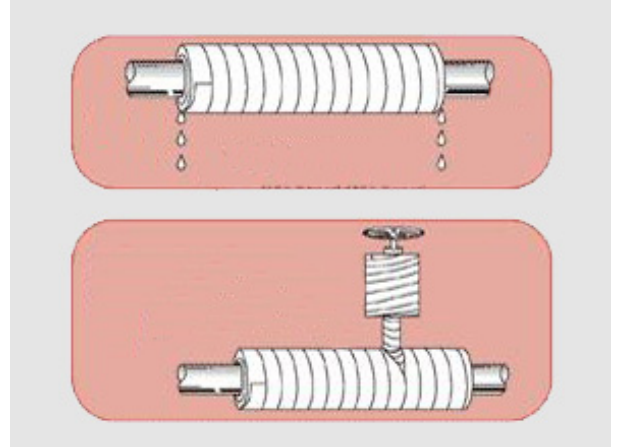
Masking of fuel and lube oil pipe connections (for classified engines only)

The unions of pressurised oil and fuel pipes are masked with a protective tape.

If this tape is removed during a repair, the unions must be masked with protective tape again afterwards.

The following pipes are affected:

- Oil supply pipe to turbochargers
- Fuel pipes between supply pump, filter and injection pump
- Injection pipes protected against leaks



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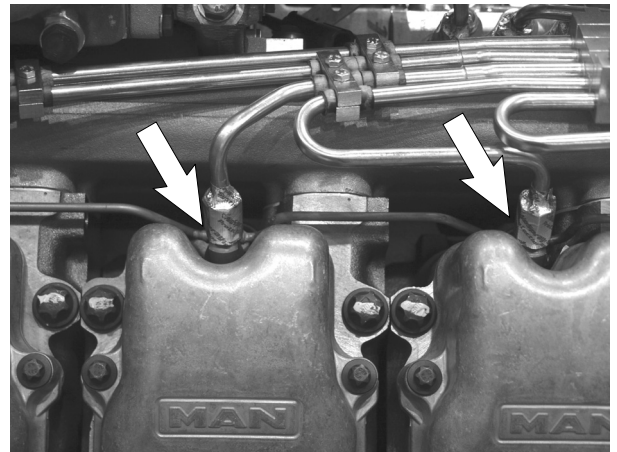
Fig. 1

A protective tape is wound around the unions. Ensure that there is 50 % overlap on every pass.

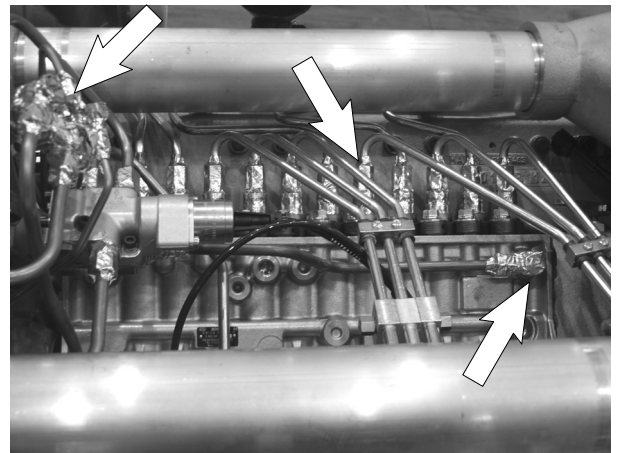
Figs. 2-4

The unions to be masked must be clean and free of oil and grease.

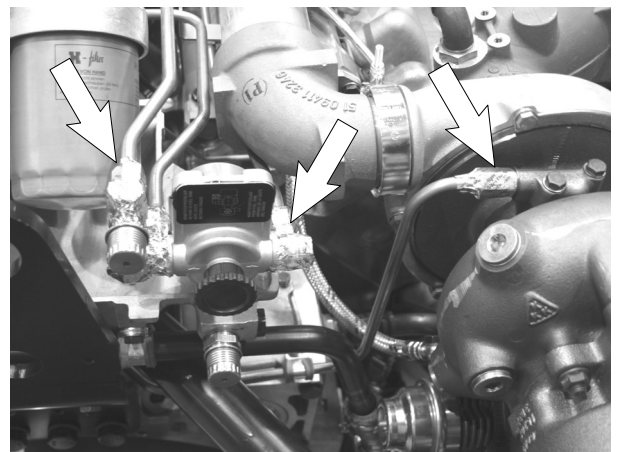
Do not apply the protective tape unless this is the case



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