Dear Sirs

MAN Diesel & Turbo changed the hydraulic tightening pressure for connecting rods from 700 to 750 bar back in 2005 as a result of a service review.

At that time, only the instruction manual for the L23/30H engine type was updated, and consequently not all variants and applications were updated. Occasionally, this has generated some unintended confusion in service.

We therefore introduced the tightening pressure of 750 bar for all hydraulically tightened connecting rods on the L23/30 series to equalise service work for all variants of this engine type.

The increased tightening force only increases the safety margin of the bolt connection and does not jeopardise the design in any way.

The increase from 700 bar to 750 bar should be introduced in addition to assembly of the connecting rod during major overhaul.

Correct marking of the hydraulic tool must be carried out.

The hydraulic tool is marked with “working pressure 700 bars” and has to be re-marked to “working pressure 750 bars”.

Note: The tool can be used safely with the higher pressure, and the tool will work as regards function and operation.

In order to ensure that the instruction manual is updated, we kindly ask you to replace the page ‘Data for Tightening Torque’ with the enclosed page.

Yours faithfully

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Vice President
Engineering

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Four-stroke
<table>
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<th>Thread</th>
<th>Tightening Torque Nm</th>
<th>Pressure bar</th>
<th>Lubricant</th>
</tr>
</thead>
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<td>Stud M48 Stud M45 Stud M33 x 2</td>
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<td>750 750</td>
<td>Loctite 243 oil/ Molykote (Unimol gl 82)</td>
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<td>-</td>
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<td>- - - -</td>
<td>-</td>
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<td>60 150</td>
<td>- -</td>
<td>-</td>
</tr>
<tr>
<td>510</td>
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<td>Stud M 48 Stud M45 x 3 Screw M 24 Screw M30 x 2 Nut M 27 Nut M 24 Nut M 20 Screw M 12 Nut M 10</td>
<td>200 300 200 + 60° turn 400 500 200 34 40</td>
<td>750 - - - -</td>
<td>- Molykote (Unimol gl 82)</td>
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<tr>
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<td>25 - 30 55 - 65 100 - 120 150 100 - 120 40 70 100 40</td>
<td>- - - - - - -</td>
<td>-</td>
</tr>
<tr>
<td>515</td>
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<td>Nut</td>
<td>300</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>Conical elements mounting Upper mounting, Cast Iron Upper mounting, Aluminium Lower mounting</td>
<td>Screw M 20 Screw M 20 Nut M 20</td>
<td>400 250 320</td>
<td>- - -</td>
<td>-</td>
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</table>
Tightening of bolted connections by the torque

If bolted connections other than those listed above are to be tightened using a torque wrench, table 1 should be used for reference. The following should be observed:

- The load acting on a bolted connection depends on the tightening torque applied, on the lubricant used, on the finished condition of the surfaces and threads, and on the materials paired. It is, therefore, of great importance that all these conditions are met.
- Table 1 lists the tightening torques, when using different bolt strength classes and applying either normal Molykote or high temperature Molykote grease or normal oil.

<table>
<thead>
<tr>
<th>Thread nominal size</th>
<th>Tightening torque in Nm Bolt strength class</th>
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<tbody>
<tr>
<td></td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>M/MH</td>
</tr>
<tr>
<td>M 6</td>
<td>7</td>
</tr>
<tr>
<td>M 8</td>
<td>17</td>
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<td>M 10</td>
<td>35</td>
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<td>M 12</td>
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<tr>
<td>M 14</td>
<td>90</td>
</tr>
<tr>
<td>M 16</td>
<td>140</td>
</tr>
<tr>
<td>M 18</td>
<td>200</td>
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<tr>
<td>M 20</td>
<td>270</td>
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<td>M 22</td>
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<td>M 24</td>
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</tr>
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<td>M 27</td>
<td>670</td>
</tr>
<tr>
<td>M 30</td>
<td>940</td>
</tr>
</tbody>
</table>

Table 1: Tightening torques for bolted connections
Safety precautions

- Engine stopped
- Shut-off starting air
- Shut off cooling water
- Shut off fuel oil
- Shut-off cooling oil
- Stop lub. oil circulation
- Press Blocking - Reset

Short Description

Tightening procedure for connecting rod screws. Check of connecting rod screws, tightening condition.

Starting Position

Piston, connecting rod, bearing shells and bearing cap preassembled

Related Procedure

Qualified Manpower

- Duration in h : ½
- Number : 2

Data

- Data for pressure and tolerance (Page 500.35)
- Data for tightening torque (Page 500.40)
- Declaration of weight (Page 500.45)

Special tools

- Plate No. 52021
- Item No. -

Hand Tools

- Replacement and wearing parts

Data for pressure and tolerance (Page 500.35)
Data for tightening torque (Page 500.40)
Declaration of weight (Page 500.45)
Hydraulic tightening of connecting rod screws

1) Screw the studs pos. 3 down by hand into the connecting rod body pos. 1.
2) Fit the upper part of the connecting rod pos. 2 and hold it with nuts pos. 4.

3) Screw the studs to the bottom. Check the distance 81 mm from surface of upper part pos. 2 to the end of the studs pos. 3 and hand-tighten the nuts pos. 4.
4) Fix the hydraulic jacks pos. 5.

5) Connect the jacks to the hydraulic system/pump by using the angle piece pos. 7.
6) Load the studs with the hydraulic pressure and tighten the nuts with the ball handle pos. 6.

7) Relieve the tool pressure.
8) Re-apply the tool pressure.
9) Tighten the nuts again.

If the hydraulic pressure reaches above 775 bar during assembling or disassembling the connecting rod, the studs must be changed regardless any elongation.

Figure 1: Hydraulic tightening of connecting rod
NOTICE

Item 8 and 9 are carried out in order to eliminate any harmful stresses.

10) If any clearance is still visible and the nut can be turned, then repeat item 7, 8 and 9.
11) The pressure to be relieved and the tool to be dismantled.