



<p>506-01.15 Edition 01</p>	<p>Connecting Rod</p>	<p>Work Card Page 2 (4)</p>
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L23/30H



**Cleaning of connecting rod**

- 1) Clean all machined surfaces on the connecting rod.
- 2) Degrease the serrated joint faces, tapped holes and connecting rod screws with a volatile solvent and blow dry with working air.

**Visual inspection of serrated faces**

- 1) Inspect the joint faces.  
Damages, in the form of visible wear marks and pittings or even cracks, may be in the joint faces due to relative movements between the surfaces.  
Wear marks and cracks are visible, but not perceptible with a fingernail. Pittings and impact marks are both visible and perceptible.  
**Note:** Handle the piston rod and marine head with care. In case of damaged joint faces caused by improper handling, the marine head bearing caps can no longer be tightened without ovalness of the big-end bore.
- 2) Register observed damages in the scheme „Marine Head Inspection“ for historic use only. *Please see page 4.*
- 3) Carefully smooth single raised spots in the joint faces caused by pitting and impact marks with a filesmall.

**Inspection of connecting rod screws**

- 1) Inspect the connecting rod screws for seizures in the threads and pittings on the contact surfaces of the screwheads.
- 2) Turn the connecting rod screw into bottom position of the threaded screw holes by hand.

If bolts/nuts	Then
have seizures in threads or pittings on contact surface	renew the screws
cannot be turned onto bottom position by hand	renew the screws

**Measurement of big-end bore**

For check of ovalness the bearing cap has to be mounted onto the big-end bore without bearing shells.

**Note:** The ident. No on the connecting rod and the bearing cap must always be the same, *see fig 3.*

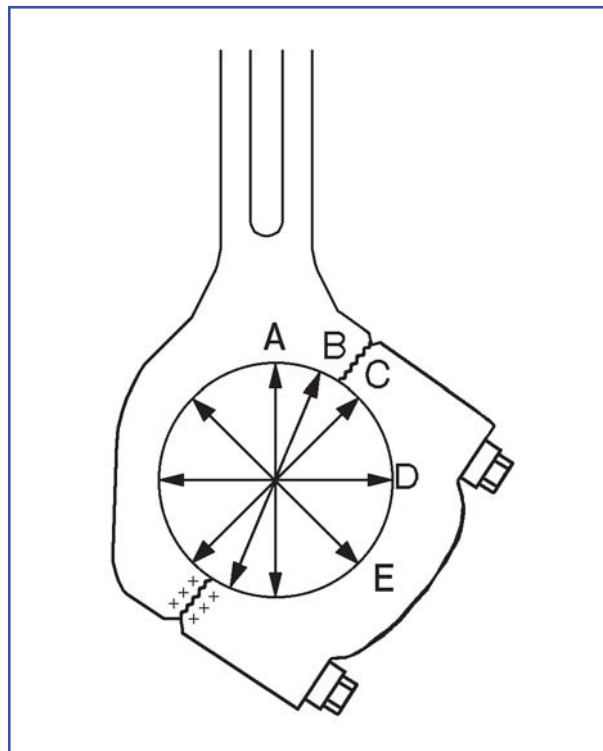


Figure 1: Point of measurement


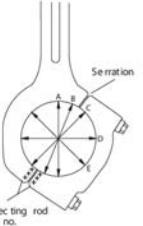
- 1) Mount the bearing cap onto the connecting rod by means of the connecting rod screws.
- 2) Tighten the screws with the prescribed torque, *please see working card 506-01.25.*
- 3) Measure five different diameters in the middle of the boring, *see fig 1.*
- 4) Register the measurements in the scheme „Connecting Rod Inspection“. *Please see page 4.*

- 5) Calculate the maximum ovalness as the difference between largest and smallest diameter measured.
- 6) Check if maximum ovalness is exceeded, please see page 500.35.

If	Then
maximum ovalness is exceeded	renew the complete connecting rod screws and bearing shells
maximum ovalness is not exceeded	reuse the connecting rod

**Example of measurement results**

**Connecting Rod Inspection for L23/30H**

Cylinder no.	1	2			
Connecting rod ident no.					
Running hours for connecting rod					
 0,01 mm 1/100 mm Nominal diameter Ø195 mm	A	- 0,5	- 3,0		
	B	- 2,0	- 7,0		
	C	- 1,5	- 5,0		
	D	+ 5,0	+ 5,5		
	E	+ 3,0	+ 3,5		
Ovalness: Diff. between min./max.	7,0	12,5			
Condition of serration	<input type="checkbox"/> Serration OK	<input type="checkbox"/> Serration OK	<input type="checkbox"/> Serration OK		
Tightening for measurement see instruction.	<input type="checkbox"/> Wear	<input type="checkbox"/> Wear	<input type="checkbox"/> Wear		
	<input type="checkbox"/> Cracks	<input type="checkbox"/> Cracks	<input type="checkbox"/> Cracks		
	<input type="checkbox"/> Corrosion/ Pitting	<input type="checkbox"/> Corrosion/ Pitting	<input type="checkbox"/> Corrosion/ Pitting		
	<input type="checkbox"/> Impact mark	<input type="checkbox"/> Impact mark	<input type="checkbox"/> Impact mark		
 Serration Connecting rod ident no.	Remarks: to be reused	Remarks: to be rejected	Remarks:		

Note! The ident no. on the connecting rod and on the bearing cap, must always be the same

Figure 2: Connecting rod inspection

The example, see fig 2, shows measurements and damage observations for two connecting rods on the scheme "Connecting rod inspection" (in case the specified maximum ovalness is exceeded, contact MAN Diesel & Turbo for overhaul).

For connecting rod No 1 the maximum ovalness is 0.07 mm and thus reuse is acceptable.

For connecting rod No 2 the maximum ovalness is 0.125 mm and therefore the connecting rod is rejected.

**Inspection of connecting rod bush**

- 1) Inspect the surface of the piston pin and the connecting rod bush.
- 2) Measure the clearance between the piston pin and bush.
- 3) Check if max. clearance is exceeded, see page 500.35.

If the specified clearance is exceeded, contact MAN Diesel & Turbo for replacement.

**Inspection of bearing shells for big-end**

Criteria for replacement of connecting rod big-end bearing, see working card 506-01.16.

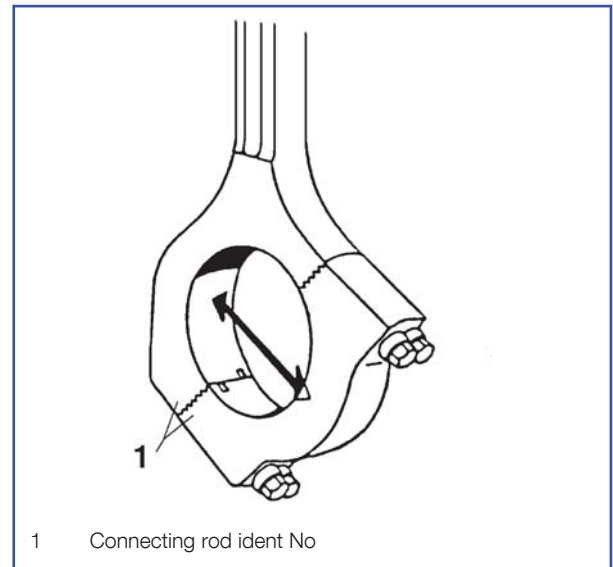

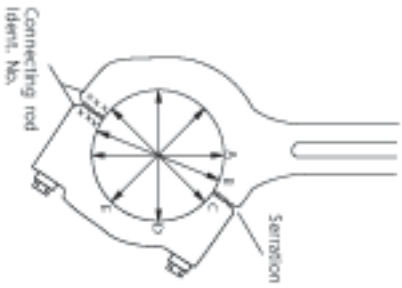


Figure 3: .

<p>506-01.15 Edition 01</p>	<p>Connecting Rod</p>	<p>Work Card Page 4 (4)</p>
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L23/30H

<p>Connecting Rod Inspection for L23/30H</p>		Plan/Ship:		Engine Type:			
		Engine No.:		Running Hours:			
Cylinder No.		Sign:		Insp. Date:			
1	2	3	4	5	6	7	8
<p>Running hours for connecting rod</p>							
							
<p>0.01 mm 1/100 mm</p>							
<p>Nominal diameter Ø195 mm</p>							
<p>Condition of serration</p>							
<p>Tightening for measurement see instruction.</p>							
<p>Crabtree Diff. between min./max.</p>							
<p>Condition of serration</p>							
<p>Wear</p>							
<p>Cracks</p>							
<p>Corrosion/ pitting</p>							
<p>Impact mark</p>							
<p>Remarks:</p>							



Note! The Ident. No. on the connecting rod and on the bearing cap must always be the same.

Work Card Page 1 (5)	<b>Criteria for Replacement of Connecting Rod Big-end and Main Bearing Shells</b>	<b>506-01.16 Edition 02</b>
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**L16/24, L23/30H, L21/31, L27/38**

<p><b>Safety precautions</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Engine stopped</li> <li><input type="checkbox"/> Shut-off starting air</li> <li><input type="checkbox"/> Shut off cooling water</li> <li><input type="checkbox"/> Shut off fuel oil</li> <li><input type="checkbox"/> Shut-off cooling oil</li> <li><input type="checkbox"/> Stop lub. oil circulation</li> <li><input type="checkbox"/> Press Blocking - Reset</li> </ul> <p><b>Short Description</b></p> <p>Inspection of bearing shells.</p> <p><b>Starting Position</b></p> <p>Bearing shells removed from engine:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Big-end bearing</td> <td style="width: 20%;">506-01.30</td> </tr> <tr> <td>Main bearing and guide bearing</td> <td>510-01.05</td> </tr> </table> <p><b>Related Procedure</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Big-end bearing,</td> <td style="width: 20%;">506-01.30</td> </tr> <tr> <td>Main bearing and guide bearing</td> <td>510-01.05</td> </tr> </table> <p><b>Qualified Manpower</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Duration in h</td> <td style="width: 10%;">:</td> <td style="width: 30%;">1/4</td> </tr> <tr> <td>Number</td> <td>:</td> <td>1</td> </tr> </table> <p><b>Data</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Data for pressure and tolerance</td> <td style="width: 40%;">(Page 500.35)</td> </tr> <tr> <td>Data for tightening torque</td> <td>(Page 500.40)</td> </tr> <tr> <td>Declaration of weight</td> <td>(Page 500.45)</td> </tr> </table>	Big-end bearing	506-01.30	Main bearing and guide bearing	510-01.05	Big-end bearing,	506-01.30	Main bearing and guide bearing	510-01.05	Duration in h	:	1/4	Number	:	1	Data for pressure and tolerance	(Page 500.35)	Data for tightening torque	(Page 500.40)	Declaration of weight	(Page 500.45)	<p><b>Special tools</b></p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="width: 20%;">Plate No.</th> <th style="width: 30%;">Item No.</th> <th style="width: 50%;">Note</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p><b>Hand Tools</b></p> <p>Magnifier</p> <p><b>Replacement and wearing parts</b></p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="width: 20%;">Plate No.</th> <th style="width: 30%;">Item No.</th> <th style="width: 50%;">Quantity</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Plate No.	Item No.	Note				Plate No.	Item No.	Quantity			
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