

Action code: AT FIRST OPPORTUNITY

### Tightening of Roller Guide Housing

Replaces SL2016-622/MIKA

SL2016-627/MIKA  
September 2016

#### Concerns

Owners and operators of  
MAN four-stroke diesel engines.

Type:  
L23/30H Tier I and II, L23/30H Mk2,  
L23/30S

#### Reason of replacement:

Wrong plate mentioned in text.  
Should be **P50801-20**

Enclosure:  
Description 500.50 (03)  
Work card 507-01.20 (16)  
Work card 508-01.02 (01)  
Plate P50801-20



Dear Sirs

MAN Diesel & Turbo has received reports of incidents of the roller guide housing in service. Such incidents often lead to consequential damage to the frame surface on which the housing is fixed.

The root cause of these incidents is the bolt connection between the housing and frame. Our investigation revealed that bolts were touching the bottom of the threaded holes, leading to improper fastening of the housing and eventually an incident.

These incidents have occurred in service due to an incorrect combination of the bolt connection.

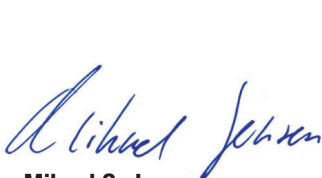
We have experienced variation in flange thickness, bolt length and size of washers from various makers and suppliers.

As a precaution we have introduced a 10-mm washer to be installed instead of the lock washer in the bolt connection.

For further information about installation and preventive measures please see page 2.

New 10-mm washers can be ordered via PrimeServ Holeby. Use the enclosed plate **P50801-20** and fill in the enclosed "Ordering of Spare Parts", 500.50, and send it to [PrimeServ-hol@mandieselturbo.com](mailto:PrimeServ-hol@mandieselturbo.com)

Yours faithfully



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Vice President  
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**Jens Christensen**  
Manager Maturing & Testing  
Four-stroke

When installing the new washer we recommend verification of the following dimensions:

- Depth of the threaded hole must be 35 mm with 30 mm M12 thread size.
- Flange thickness of the housing must be 22 mm. We have seen housings deviating from the thickness of 22 mm, and thus with the bolt either touching the bottom of the threaded hole or having improper connection to the threads.
- Hexagon bolts should be M12 and 55 mm long.

Before installation, the following measures must be verified: that is the housing and threaded hole must be longer than the bolt length and the bolt must go at least 20 mm into the thread. Depending on measurement the bolt must be longer or shorter. The correct tightening torque for the bolt connection is 60 Nm.

If damage is found, the damaged hole in the frame can often be repaired by applying the helicoil in the threaded hole.

At first opportunity, when the cylinder heads are dismantled from the engine, it is recommended to check the measurements and tightening of the bolts.

With dismantled cylinder heads there is good access to the roller guide housing connection bolts.

During installation of the new washer we recommend to check the alignment of the roller guide housing, please see enclosed work card 508-01.02.

In addition to the alignment procedure we recommend measuring the “x-measurement” for the fuel pump and adjust if necessary, please see enclosed work card 507-01.20.



*Frame surface damaged*

Description Page 1 (3)	<b>Ordering of spare parts</b>	<b>500.50</b> <b>Edition 03</b>
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**L16/24, L23/30H, V28/32S, L21/31, L27/38, L28/32DF, L23/30DF, L16/24S,  
L21/31S, L23/30S, L27/38S, L28/32S**

**Ordering of spare parts**

Spare parts can be ordered from MAN Diesel & Turbo, PrimeServ.

When spare parts are ordered or inquired, the following data must be indicated, in order to ensure correct identification of the required parts:

- Name of customer
- Name of plant /vessel
- Vessel IMO No
- Engine type
- Engine serial No
- Engine builder
- Plate No and edition No
- Item No
- Quantity
- Designation of the item No

Note:

- Components from different engine builders cannot be considered as interchangeable.
- A wide number of spare parts can be orders as spare part kits.
- Selected components may be available in both original and upgraded version.

These data are necessary to ensure supply of the correct spare parts for a particular engine, even though the spare part illustrations contained in this book may not always be in complete accordance with the individual components of a specific engine.

For ordering of spare parts for governor, turbocharger and alternator, please see the special chapter in the instruction book for these components.

<p>500.50 Edition 03</p>	<p>Ordering of spare parts</p>	<p>Description Page 2 (3)</p>
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**L16/24, L23/30H, V28/32S, L21/31, L27/38, L28/32DF, L23/30DF, L16/24S, L21/31S, L23/30S, L27/38S, L28/32S**

**Information found on the nameplate of the engine(s)**

*Example:*

Name of customer	Name of Plant/Vessel	IMO No	Engine type	Engine serial No	Engine builder
Mercy Ship	Africa Mercy	L7803188	5L21/31	SB5L21-10799	MAN Diesel & Turbo or Licensee

**Information found on each plate at the instruction manual:**

Plate No	Edition No	Item No	Qty.	Description
51435	13	440	1	Leak oil pipe

MAN Diesel & Turbo

Plate Page 1 (2)	<b>Fuel Injection Pump Connections</b>	51435-13
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L21/31

MAN Diesel & Turbo

51435-13	<b>Fuel Injection Pump Connections</b>	Plate Page 2 (2)
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L21/31

Item no	Qty	Designation	Beskrivelse	Item no	Qty	Designation	Beskrivelse
025	3/E	Cylindrical screw	Cylindrisk skrue	440	1/E	Leak oil pipe	Lækagerør
037	1/E	Connection socket	Forbindelseblok	452	1/E	Plate	Plade
049		Seal ring	Tætningring	464	2/E	Screw	Skrue
	22/E	5 cyl. engine	5 cyl. motor				
	26/E	6 cyl. engine	6 cyl. motor	476	3/E	Screw	Skrue
	30/E	7 cyl. engine	7 cyl. motor				





## L23/30H, L23/30S



### Measure of fuel pump lead

- 1) Dismantle covers for fuel camshaft and fuel pump and covers for gear wheel.
- 2) Check the mobility of the regulating device. Turn engine to pos. cylinder No. 1 until the cambase circle is reached (approx. 40° BTDC).
- 3) Position the support of the measuring tool on the two bolts of the camshaft covering. Slip on the distance sleeves and fasten to the cylinder crankcase by means of hexagon nuts.

NOTICE

During attaching, pay attention to the correct fitting position of the contact point, see Fig. 1.

- 4) Insert the dial gauge into the support.
- 5) Set the dial gauge to "Zero".
- 6) Turn the engine until the TDC mark (ignition DC) for the actual cylinder is reached. Read the dial gauge and note down the gauge value.
- 7) Determine the values for the other cylinders in the same way. Calculate the average value of all measurements.
- 8) Compare the calculated value determined with the value mentioned below.
- 9) If the values exceeds the limits, an adjustment must be done in order to correct the errors, on the X-measure or reset the gear wheel, see following text for changing "X"-measuring.

To get a consistent lifting values on the plunger/ combustion pressure on the different cylinders the "X"-measure can be changed.

When changing "X" it must be ensured that the distance between the upper edge of the roller guide housing and the thrust piece on the roller guide is not exceeded, when the roller is resting on the circular part of the fuel cam, please see description 500.35.

In all cases "X" must be checked and adjusted, if necessary, when fuel oil pump, roller guide, roller guide housing and/or camshaft section have been replaced/dismantled.

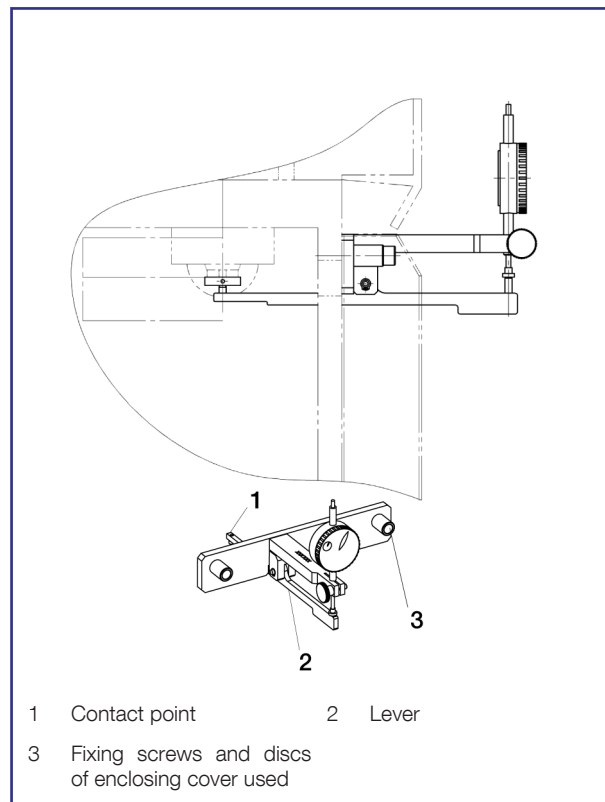


Figure 1: .

Cylinder	kW/cyl	rpm	Average value
5-6-7-8	130	720	<i>See section 500, Description 500.35</i>
5-6-7-8	135	750	
6-7-8	160	900	

Table 1: Plunger lift (average value)



L23/30H, L23/30S

**NOTICE**

If several fuel oil pumps, roller guides, roller guide housings and/or camshaft sections are dismantled at the same time it is advisable to number the parts in order to facilitate remounting and adjustment.

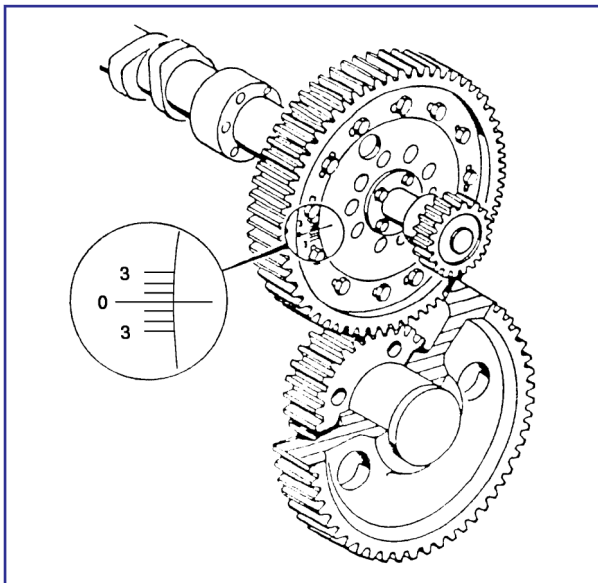


Figure 2: .

The gear wheel is provided with an engraved scale, see fig 2, and the hub of the cam shaft is provided with a mark.

When the screws, which fasten the gear wheel, are loosened the gear wheel is turned (by turning the crankshaft) in relation to the camshaft.

If the crankshaft is turned in the engines normal direction of rotation the injection timing is retarded (closer to TDC).

If the crankshaft is turned against the engines normal direction of rotation the injection timing is advanced (away from TDC).

After the adjustment the screws are fastened with a torque wrench, please see description 500.40, and secured.

The injection timing can be altered on each cylinders by inserting or removing shims under the thrust piece on the roller guide, thus changing the measure "X", see Fig 3.

Thinner and/or fewer shims (increase of the distance "X") results in a retarded injection timing.

Thicker and/or more shims (reduction of the distance "X") results in an advanced injection.

If the distance "X" is to be changed the trigger (1) is used for dismantling of the thrust piece (2), whereafter the thickness and/or the number of shims (3) can be changed.

After replacement of shims the thrust piece is remounted, see fig 4, in the roller guide (4) with a soft hammer (5).

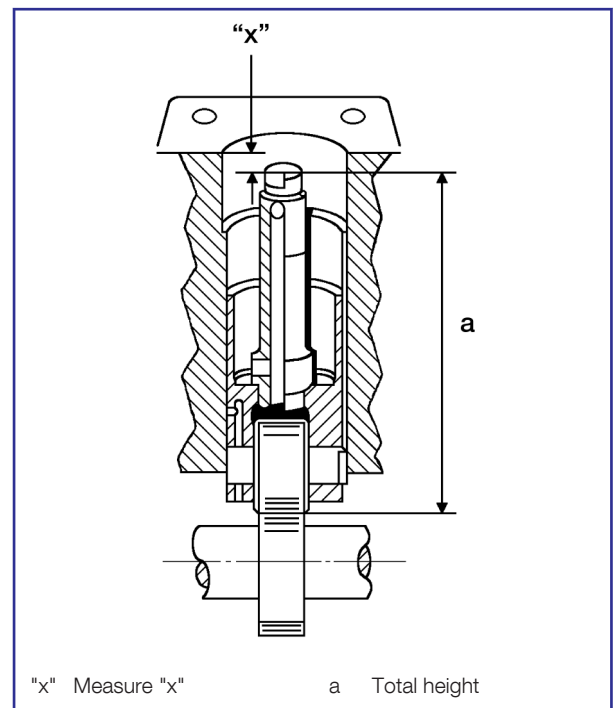


Figure 3: .



<p>507-01.20 Edition 16</p>	<p>Adjustment of camshaft for valve and injection timing</p>	<p>Work Card Page 4 (4)</p>
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**L23/30H, L23/30S**

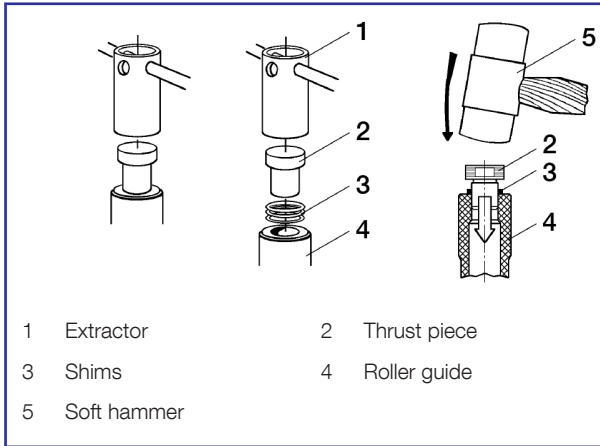


Figure 4: .

- 10) Remove the complete measuring tool.
- 11) Mount all camshaft covers.
- 12) Plunger lift value, please see description 500.35.

Action	Results		
Total height on roller guide	Distance "x"	Injection timing	Max combustion pressure
Increased ↑	Reduced ↓	Advanced ↑	Increased ↑
Reduced ↓	Increased ↑	Delayed ↓	Reduced ↓



<p>508-01.02 Edition 01</p>	<p><b>Alignment of the roller guide housing</b></p>	<p>Work Card Page 2 (4)</p>
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**L23/30H, L23/30S, L23/30DF**



**Check the alignment**

For installation of the roller guide housing, this is important to control the parallelism between the camshaft centerline and roller guide housing centerline.

1. Make sure that all surfaces are clean prior to measurement and alignment. Find C-CS on the fore and aft camshaft section. With these two measurements, it is possible to judge the alignment between the camshaft and the front of the engine.
2. Find C-RG on the roller guides for the “fuel oil pump and exhaust valves” on all the cylinders. If the difference between C-RG Fuel Oil and C-RG Exhaust is more than 0.1 mm, realignment is necessary, See fig. 3.

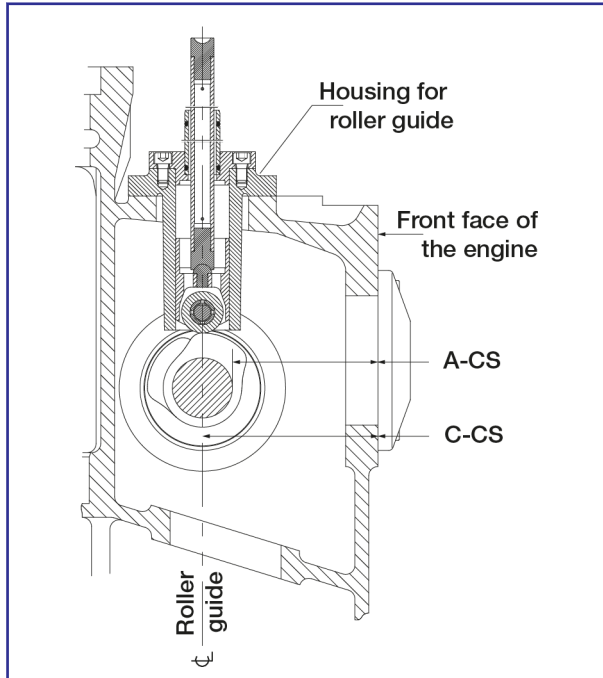


Figure 2: Camshaft

D-CS	Camshaft diameter see fig. 1
A-CS	See fig. 2
C-CS	= A-CS + (D-CS/2)

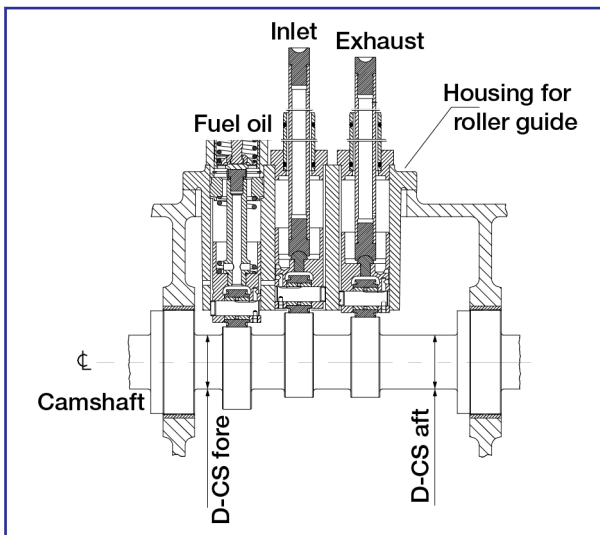


Figure 1: Camshaft and roller guide housing

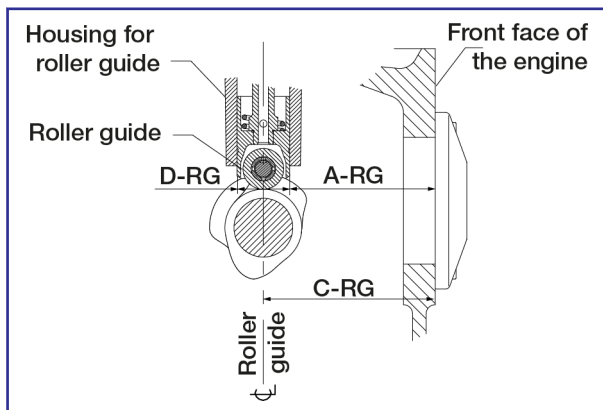


Figure 3: Roller guide

D-RG	Roller guide diameter
A-RG	See fig. 3
C-RG	= A-RG + (D-RG/2)

### L23/30H, L23/30S, L23/30DF

**If realignment is necessary, it should be done via following instruction:**

1. Dismount the roller guide housing and remove the guide pin.
2. Mount the housing and the roller guides and tighten the screws, so that it still will be possible to move the housing by means of a plastic hammer, See fig. 4.
3. Align the housing in axial direction, so that the whole surface of the rollers is running on the cams.
4. Check the parallelism between the roller guide housing and camshaft centerlines by measuring C-RG Fuel Oil and C-RG Exhaust. The difference between the two latter should not exceed 0.1 mm.
5. Tighten the screws by means of a torque spanner according to the instruction book. Then, drill holes for the guide pin and mount these.
6. After having carried out a realignment of the roller guide housing, it will be necessary to check (adjust) the X-measuring according to the instruction book.

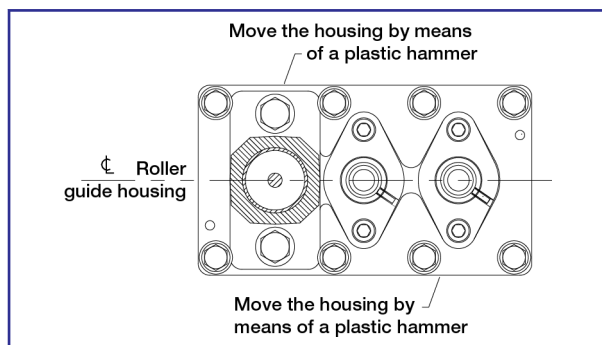


Figure 4: Housing for roller guide, top view

<p><b>508-01.02</b> <b>Edition 01</b></p>	<p><b>Alignment of the roller guide housing</b></p>	<p>Work Card Page 4 (4)</p>
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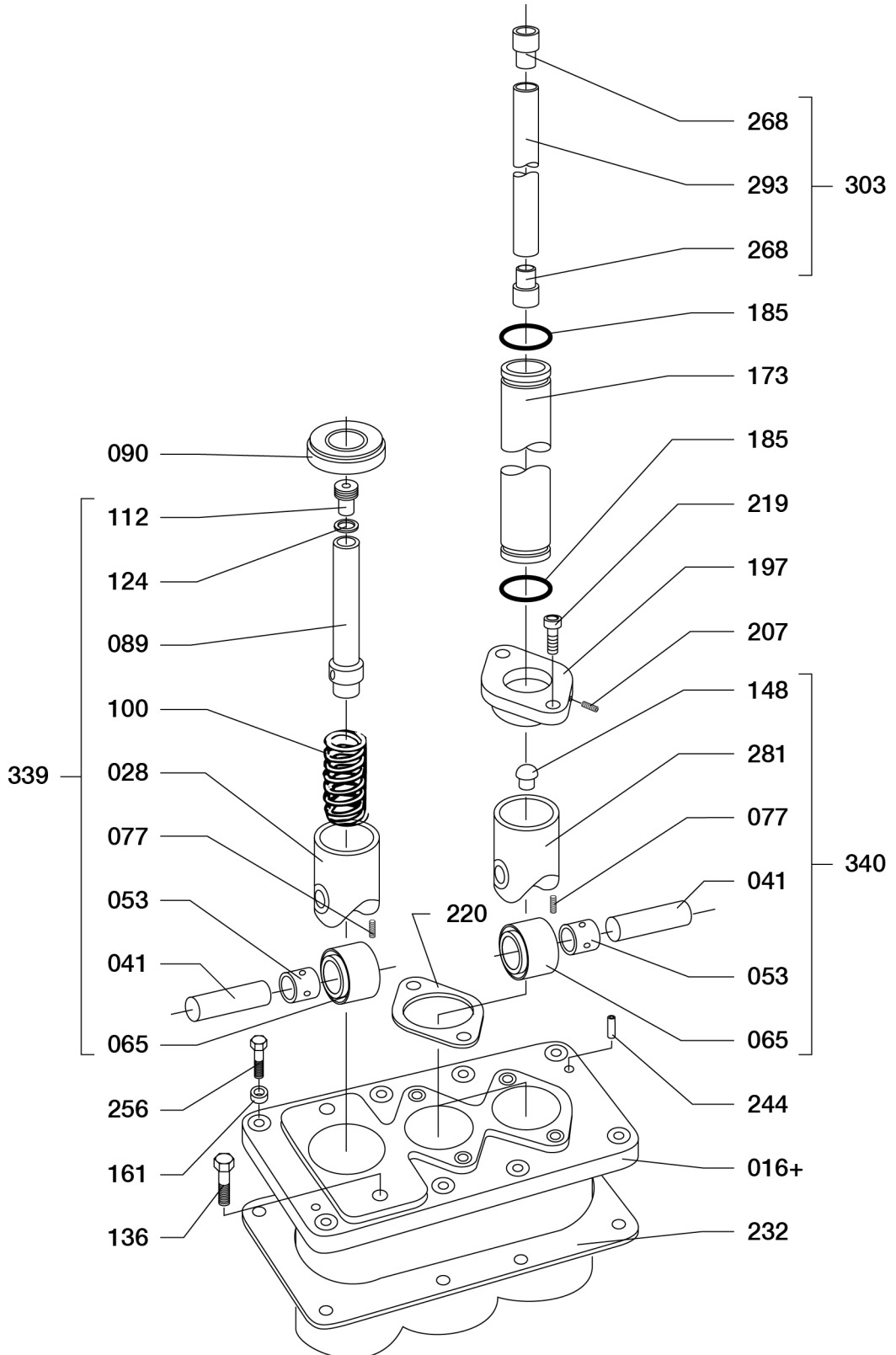
**L23/30H, L23/30S, L23/30DF**

M/V:		Engine type:	
Maker:		Engine No.:	

	1		2		3		4	
	Aft	Fore	Aft	Fore	Aft	Fore	Aft	Fore
D-CS								
A-CS								
C-CS								
	5		6		7		8	
	Aft	Fore	Aft	Fore	Aft	Fore	Aft	Fore
D-CS								
A-CS								
C-CS								

	1		2		3		4	
	Fuel oil	Exhaust	Fuel oil	Exhaust	Fuel oil	Exhaust	Fuel oil	Exhaust
D-RG								
A-RG								
C-RG								
	5		6		7		8	
	Fuel oil	Exhaust	Fuel oil	Exhaust	Fuel oil	Exhaust	Fuel oil	Exhaust
D-RG								
A-RG								
C-RG								

**L23/30H, L23/30S, L23/30DF**



P50801-20

## Roller guide and push rods

Plate  
Page 2 (2)

## L23/30H, L23/30S, L23/30DF

Item No.	Qty	Item Designation	Item No.	Qty	Item Designation
016	1/C	Housing for roller guides <sup>1)</sup>	315	1/C	Valve gear complete, as shown on plate 50801 except item 161, 173, 185, 220, 232, 244, 256, 303, 339, 340
028	1/C	Roller guide for pump	339	1/C	Roller guide for pump complete, incl item 028, 041, 053, 065, 077, 089, 100, 112, 124
041	3/C	Pin	340	2/C	Roller guide for valve complete, incl item 041, 053, 065, 077, 148, 281
053	3/C	Bush			
065	3/C	Roller			
077	3/C	Lock screw			
089	1/C	Thrust pin			
090	1/C	Washer for spring			
100	1/C	Spring			
112	1/C	Thrust pin			
124	1/C	1 set of shims			
136	2/C	Screw			
148	2/C	Ball pin			
161	8/C	Washer			
173	2/C	Protecting tube			
185	4/C	O-ring			
197	2/C	Cover			
207	2/C	Lock screw			
219	4/C	Screw			
220	2/C	Gasket			
232	1/C	Gasket			
244	2/C	Guide pin			
256	8/C	Screw			
268	4/C	Thrust pin			
281	2/C	Roller guide for valve			
293	2/C	Push rod			
303	2/C	Push rod complete, incl. item 288, 293			

When ordering spare parts, see also page 500.50/600.50/Preface.

\* = Only available as part of a spare parts kit/not available separately

Qty/C = Qty/Cylinder

Note

<sup>1)</sup> Require an individual matching before mounting, contact MAN Diesel & Turbo, Holeyb