

Action code: AT FIRST OPPORTUNITY

Tightening of Roller Guide Housing

SL2016-619/MIKA
June 2016

Concerns

Owners and operators of
MAN four-stroke diesel engines.
Type: L23/30AK

Enclosure:.....
Description D100-01
Work card M114A2-02-L2330AK
Work card M114C1-02-L2330AK
Work card M114D1-02-L2330AK
Plate P11414-03-L2330AK

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.

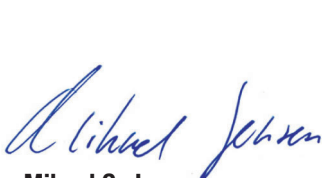
We have experienced variation in flange thickness, bolt length and size of washers from various makers and suppliers.

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 Frederikshavn. Use the enclosed plate P11414-03-L2330AK and follow the instructions in the enclosed "Preface", D100-01 for ordering of spare parts, and send it to PrimeServ-frh@mandieselturbo.com

Yours faithfully



Mikael C. Jensen
Vice President
Engineering



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 M114D1-02-L2330AK.

In addition to the alignment procedure we recommend measuring the “x-measurement” for the fuel pump and adjust if necessary, please see enclosed work cards M114A2-02-L2330AK and M114C1-02-L2330AK.



Frame surface damaged

Preface

General

This instruction book will provide general guidance as regards operation and maintenance, and gives a description of the design of the standard version of the described engine type.

Therefore on specific plants deviations may be found.

The book should also be used for reference purposes when ordering spare parts.

The sections of the book comprise the following: Guide on the operation of the engine, technical descriptions, overhauling procedures, spare part illustrations (plate item) with pertaining spare part lists, as well as tools.

The engine is divided into a number of main components/assemblies, each of which is described in specific sections in this book. Each of these sections starts with a short technical description and overhaul procedures.

Relevant spare part illustrations and spare part lists are also shown in these sections. All overhaul procedures are numbered in accordance with the scheduled "Checking and Maintenance Programme."

Reliable and safe and economic operation of the diesel engine is dependent on correct operation and maintenance.

It is therefore important that the engine room personnel is fully acquainted with the content of this book.

The propulsion plant is delivered including a warranty clause which has been contractual agreed upon.

It is of course a precondition for the validity of such a warranty that the propulsion plant is operated in accordance with agreed requirements and recommendations.

Spare parts purchased have to be original spare parts purchased directly from Alpha or from one of Alpha's authorized workshops or agents.

A. Propulsion plants In Service running on Gas Oil or Marine Diesel Oil (MGO - MDO)

1. The fuel on which the engine is operated shall as a minimum requirement be of a quality and fulfil the specification BSI4A 100: 1982 class 142 and M3 (equivalent to ISO 8217-F class DMB and DMC). Above requirement is stated in the Instruction book.
2. Lubricating oil shall be of a make (brand and type) which is included In MAN B&W Alpha's list of approved lub oils. Any other lub oil will only be allowed provided a written acceptance is given by MAN B&W Alpha Diesel.
3. All maintenance instruction as given In the Instruction book shall be strictly adhered to.
4. Every 1000 running hours MAN B&W Alpha Diesel shall receive a copy of the lub oil analysis report. Any comments will be sent as soon as possible after receiving this report.
5. Every 1000 running hours Alpha shall receive a complete set of recorded engine data. This data shall be taken down on Alpha standard register form. The data shall be recorded at MCR output or at an output equivalent to

the vessel's normal service.

Provided that Alpha has comments as regards the performance of the engine, the owner will as soon as possible receive Alpha's written comments to the engine condition.

The owner commits himself to implement any recommendations as given in these reports.

B. Propulsion plant In service running on Heavy Fuel Oil (HFO)

1. The fuel used should at least be within the limits specified in Quality Requirements for Heavy Fuel 011 D365692E/1.22-6.
Above requirement is stated in the instruction book.
It is a precondition that proper HFO treatment equipment is installed and that this installation has been approved by MAN B&W Alpha Diesel.
2. At every bunkering of HFO a sample of about 1 litre of HFO should be taken from the bunkering line leading on board the vessel (continuous drip sample).
These samples fitted with information of quality and date and place of bunkering shall be kept in store for at least 6 months and sent to MAN B&W Alpha Diesel on their request.
Alternatively Alpha accepts contracts with Veritas Petroleum Service or equivalent services from other recognized classification societies.
A copy of such analysis reports shall be given to MAN B&W Alpha Diesel immediately after receipt.
3. Lubricating oil shall be of a make (brand and type) which is included in MAN B&W Alpha's list of approved lub oils.
Any other lub oil will only be allowed provided a written acceptance is given by MAN B&W Alpha Diesel.
4. All maintenance instruction as given in the instruction book shall be strictly adhered to.
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Provided that Alpha has comments as regards the performance of the engine, the owner will as soon as possible receive Alpha's written comments to the engine condition.
The owner commits himself to implement any recommendations as given in these reports.

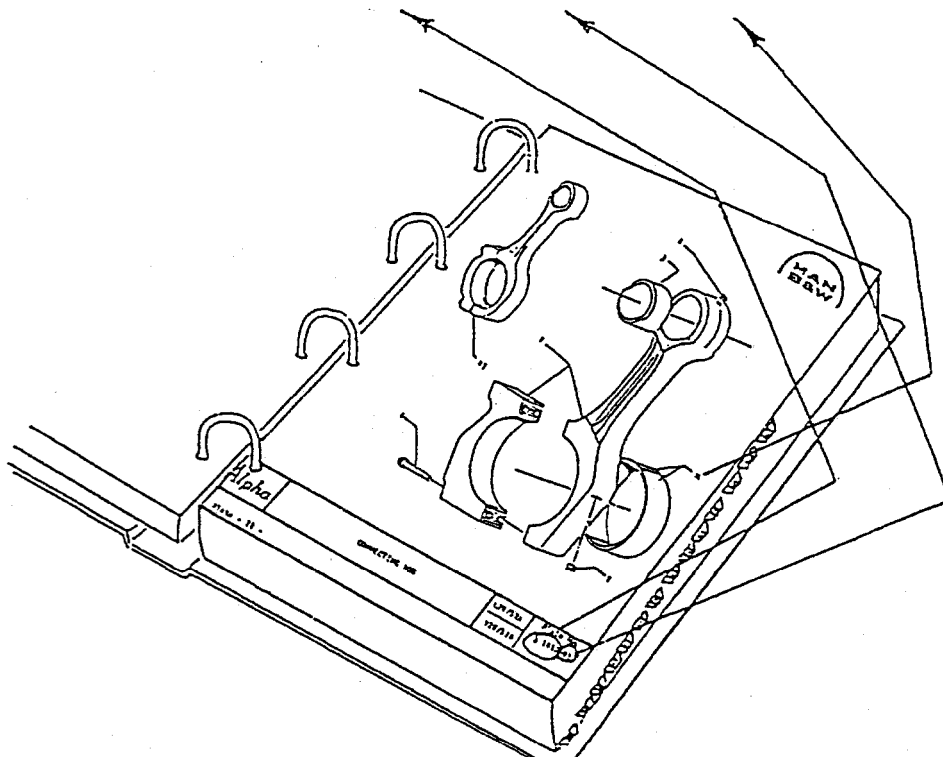
Spare Part Ordering

Whenever spare parts are ordered (or references are made in correspondence) the following data shall be indicated for the specific engine:

1. Name of vessel
2. Engine type
3. Engine no
4. Illustration plate number (Complete including number of edition etc)
5. Item no
6. Description of part and quantity required

Example

Name	Engine Type	Engine No.	Plate No.	Edition	Item No.	Quantity
M/S "NYBO"	6L28/32A	17001	1 1612	- 01	- 14	6 off(Connecting rod Bearing shell)



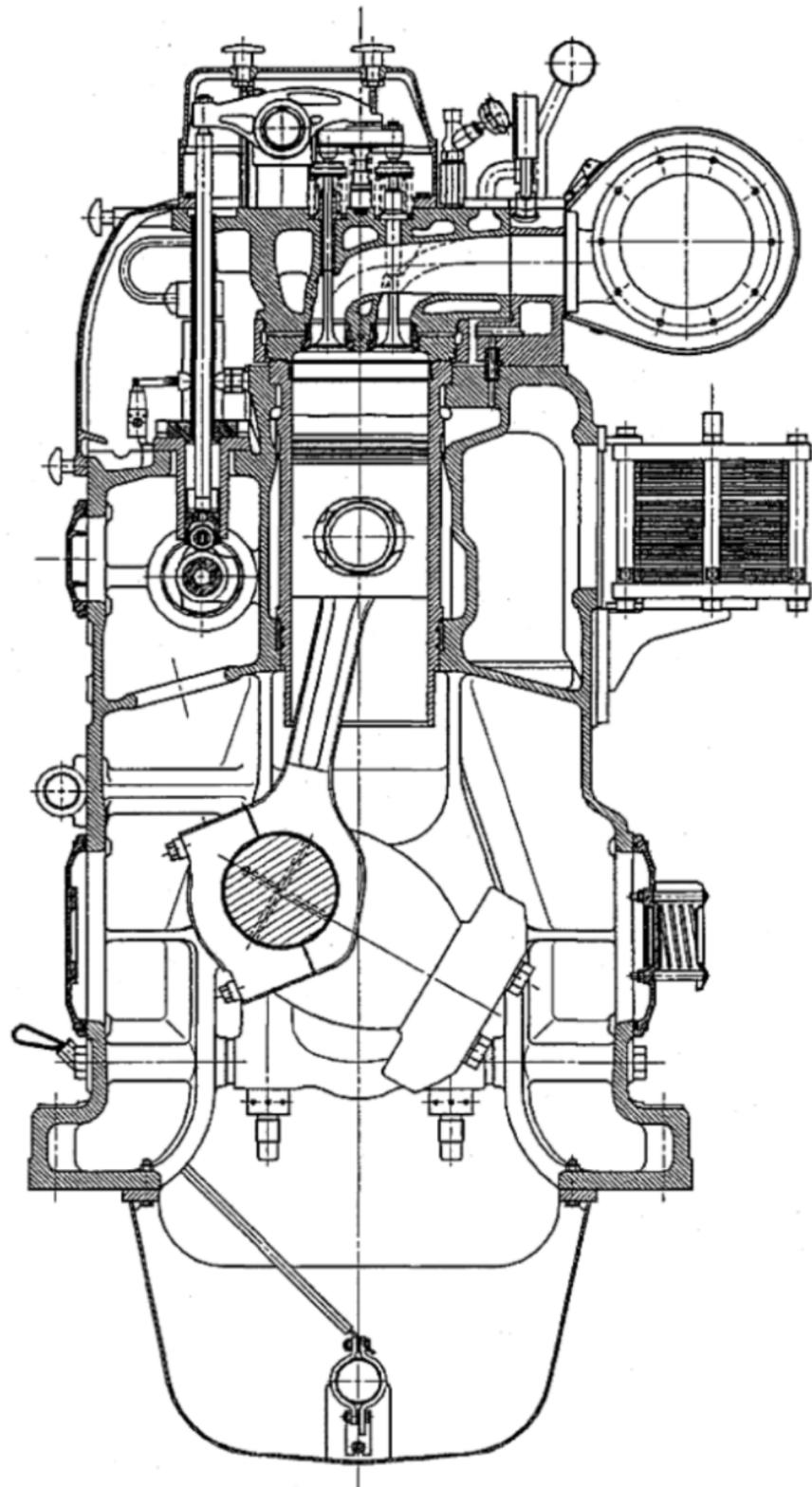
These data are used in order to ensure correct supply of spare parts for the individual propulsion plants sold. Although the spare part illustration contained in this book may not be in complete accordance with a specific propulsion plant, the book contained in Alpha Diesel Service Department on engine number, which is used as a reference, always illustrate the actual sold specific propulsion plant and thereby ensure that the correct spares are being forwarded.

2015-07-22 - en

It should be noted that although the illustration in this book shows every item fitted in the engine certain spares which are not defined as consumables or certain component or parts from subsuppliers be it standard component or none standard component will be delivered only as a complete assembled component.

Whenever ordering spare parts please fill in the SPARE PART ORDER sheet(s) delivered together with the instruction manual and forward it to Alpha.

Transverse Section Engine



Preface

Description
D100-01-L2330AK

2015-07-22 - en



Check of gear wheel, bolted connections and lubricating system

Safety precautions

- Shut-off starting air supply
- Shut-off lubrication oil
- Engine stopped
- Block the starting mechanism
- Engage turning gear

Manpower

Number	Qualification	Duration in h
-		-

Special tools

Plate No.	Item No.	Note
-	-	No special tools

Data

Designation	Information
Tightening torques	Chapter 1 00

Replacement and wearing parts

Plate No.	Item No.	Quantity
-	-	

Starting Position

-

Procedure

Remove all covers. Inspect all gear wheels for cracks, wear and deformation. Turn the engine so the inspection includes the whole circumference of all gear wheels.

All internal screws and nuts, including bolt connections with locking devices are to be checked.

The tightening torques are shown on data sheet 1 0004.

Check the gear wheel lubricating oil pipes and nozzles.

Start the electrical lubricating oil pump and check oil flow all over. Take special care that the oil nozzles are correctly directed to the place where the gear wheels are engaging.

Check of roller guide

Safety precautions

- Shut-off starting air supply
- Shut-off lubrication oil
- Engine stopped
- Block the starting mechanism
- Engage turning gear

Manpower

Number	Qualification	Duration in h
-		-

Special tools

Plate No.	Item No.	Note
-	-	No special tools

Data

Designation	Information
-	

Replacement and wearing parts

Plate No.	Item No.	Quantity
-	-	

Starting Position

-

Procedure

1. Remove cylinder head top cover.
2. Dismantle nuts for the rocker arm bracket and lift rocker arm and bracket off.
3. Remove valve push rods.
4. Remove screen for fuel pumps.
5. Loosen stop screw for push rod pipes in cover for roller guide, remove the pipes.
6. Dismantle screws for roller guide covers, and remove the covers. Lift up the roller guides. Remove necessary pipes.

If the roller guide housing has to be removed, the fuel pump with its roller guide must be removed, see 1 14C2. Various lubricating and fuel oil pipes are likewise to be removed.

Examine the roller guide for possible seizing. Look over the roller for marks and other deformations. Test mobility between the roller and the shaft; if necessary repair or replace damaged parts.

Dismantle the stop screw for the roller pin (locked with LOCTITE™) and push the pin out. Roller and shaft can now be replaced if needed.

Clean all lubricate grooves and drillings.

When reassembling, be careful not to damage the O-rings on the push rod protection pipe.

Alignment of the roller guide housing

Safety precautions

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

Manpower

Number	Qualification	Duration in h
1		3 h per cylinder

Hand Tools

Qty	Designation	Number	Status
	Ring and open end spanner, 12 mm		
	Plastic hammer		
	Depth gauge		
	Vernier caliper		

Data

Designation	Information
Tightening torques	Chapter 1 00

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.

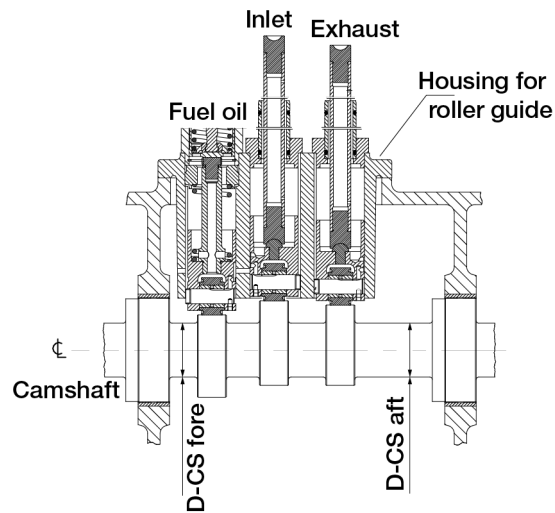


Figure 1: Camshaft and roller guide housing

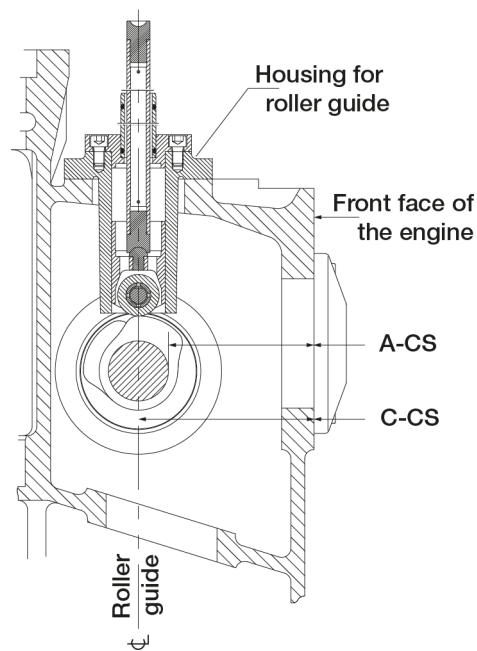


Figure 2: Camshaft

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

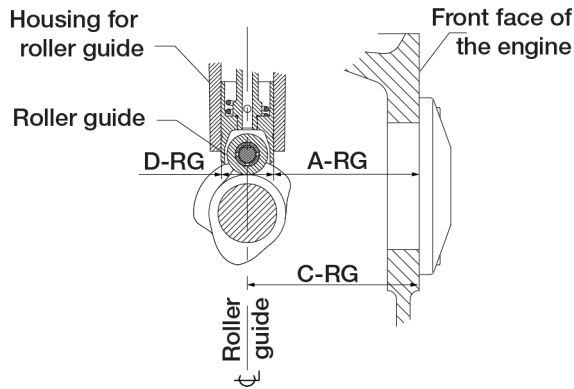


Figure 3: Roller guide

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

Alignment of the roller guide housing

Work Card
M114D1-02-L2330AK

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.

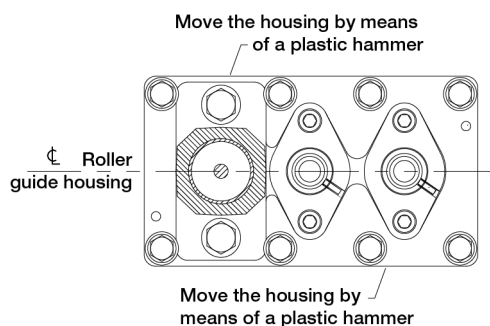


Figure 4: Housing for roller guide, top view

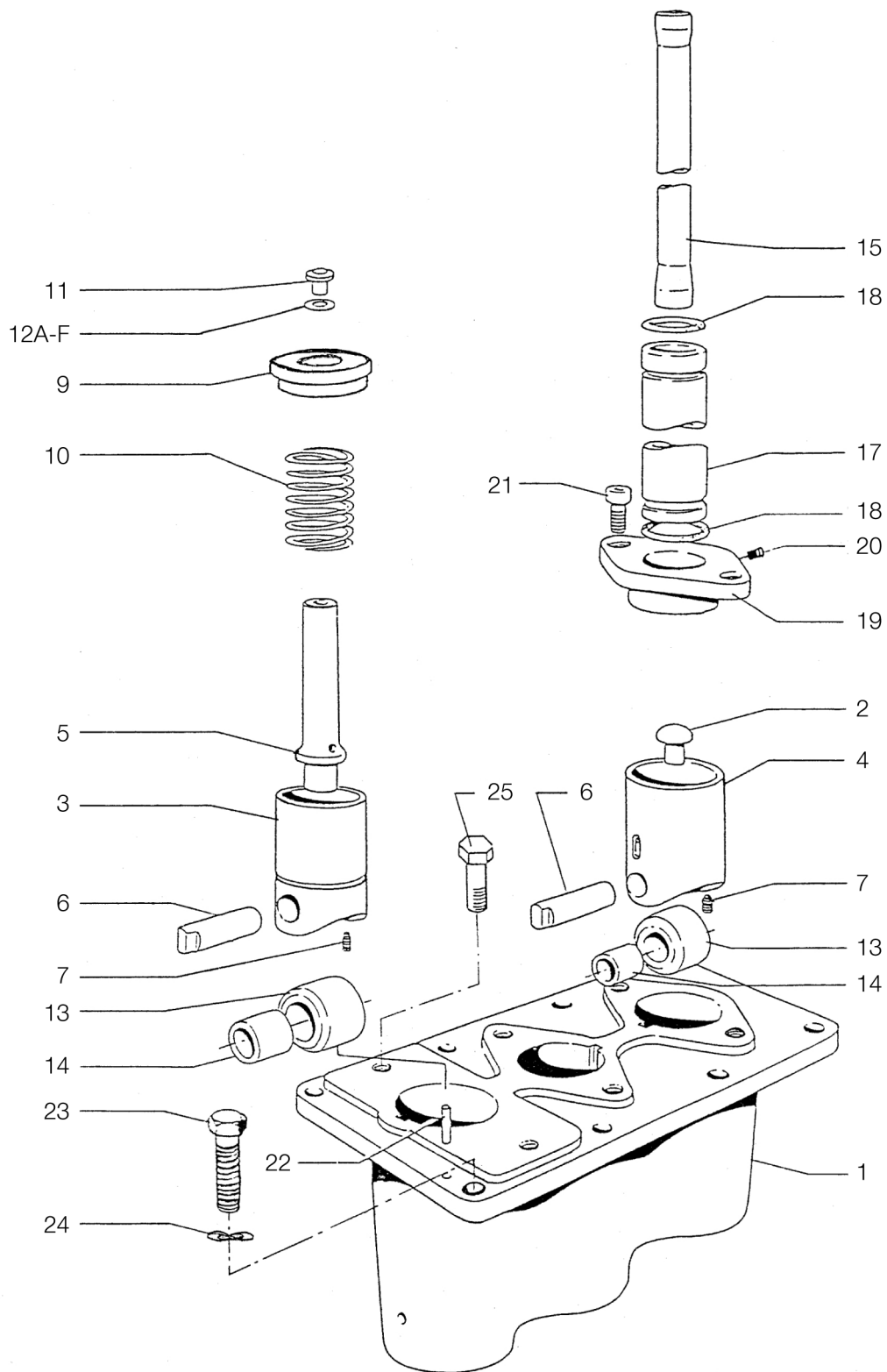
M/V:		Engine type:	
Maker:		Engine No.:	

	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								

Alignment of the roller guide housing

Work Card
M114D1-02-L2330AK



Roller guide for valves & injection pump

Plate
P11414-03-L2330AK

Pos. No.	Qty	Item Designation
1		Housing for roller tappet
2		Thrust piece
3		Incl. items; 5, 6, 7, 13 and 14
4		Incl. items; 2, 6, 7, 13 and 14
5		Thrust pin for roller guide
6		Pin for roller
7		Hex.socket set screw with dog point
9		Washer for spring
10		Spring
11		Thrust piece
12A		Adjusting washer, 1.2 mm
12B		Adjusting washer, 1.4 mm
12C		Adjusting washer, 1.6 mm
12D		Adjusting washer, 1.8 mm
12E		Adjusting washer, 2.0 mm
12F		Adjusting washer, 2.2 mm
13		Roller
14		Bush for cam roller
15		Valve push rod
17		Shield pipe for push rod
18		O-ring
19		Cover
20		Hex.socket set screw with cup point
21		Hexagon socket head cap screw
22		Spring pin
23		Hexagon bolt
24		Spring disc, Ø12
25		Hexagon screw for fuel injection pump