

Operating manual & book of parts Single Height Shift System Light



Order code:	RE6018GB (rev. 1)
Publishing date:	27-04-2010
Language:	GB

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1. Comments

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2. Quality Standards/Norms and Directives

MSE-Forks complies with the following quality standards: ISO 9001:2008

KOOI Reachforks® comply with the following norms/directives:

1. ISO 13284 – Fork Arm Extensions and Telescopic Fork Arms
2. ISO 4406 – Hydraulic Fluid Power – Fluids – Method for Coding the Level of Contamination by Solid Particles
3. ISO 2328 – Fork-Lift Trucks – Hook-On Type Fork Arms and Fork Arm Carriages
4. CE (2006/42/EC) – Machinery Directive
5. NEN-EN-ISO 3834-2 – Quality Requirements for Fusion Welding of Metallic Materials – Part 2: Comprehensive Quality Requirements
6. CE (94/9/EC) – ATEX (protective systems intended for use in potentially explosive atmospheres, ATEX-forks only)

Height Shift Systems are randomly subjected to dynamic testing in accordance with ISO 2330.

3. Introduction

MSE-Forks reserves the right to make changes to its specifications without prior notice. As we constantly strive to improve the product, it is possible that images in this manual do not corres-

pond to the product that you have purchased. It is therefore important to state the type and serial number when ordering parts or requesting information. Drawings and specification sheets for all types of Height Shift System have been included in the appendices so that you can indicate the relevant product number when ordering.

4. Identification

4.1 Type Details

The following information should be specified when ordering components or requesting information. The serial number and type are shown on each Height Shift System's type plate (see Fig. 4.1). This information can also be found engraved into the Height Shift System's top block.

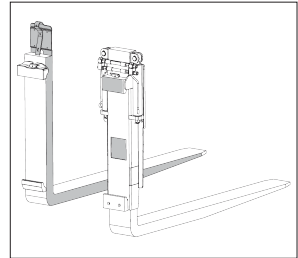


Figure 4.1 Type details

4.2. Type Plate Explanation

The vertically adjustable fork's type plate is mounted on the rear of the Height Shift System and on the other fork's type plate. Left and Right refer to the position as viewed from the driver's seat in the forklift truck. The type plate contains important technical information about the Height Shift System. Fig. 4.2 shows an example of a type plate. The letters on the left-hand plate can be found in Table 4.1, which also provides a description and units of measurement. The right-hand plate gives an example of the details that can be included on a type plate.

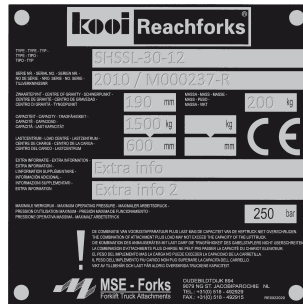
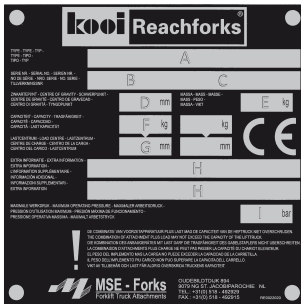


Figure 4.2 Type plate

4.3 Type Code Explanation

Section A in Fig. 4.2 indicates the type of Height Shift System. Various pieces of information can also be derived from the type code. Table 4.2 gives a description of the various sections of the type code.

Character	Description	Unit
A	Height Shift System type	
B	Build year	
C	Serial no.	
D	Centre of gravity	mm
E	Dead mass	kg
F	Load capacity	kg
G	Load centre	mm
H	Additional information	
I	Maximum operating pressure	bar

Table 4.1 Description of the details given on a Height Shift System's type plate.



The capacity indicated on the type plate only applies to the Height Shift System and not to the combination of Height Shift System plus forklift truck. For a combination of Height Shift System and forklift truck, please contact your forklift truck dealer.

5. Safety

Safety remains the responsibility of the forklift truck driver. We strongly advise that your forklift truck drivers receive proper training and recognized certification.

It is also important to observe the following safety instructions:

1. Do not load the Height Shift System in excess of the manufacturer's specifications with regard to lifting capacity and load centre (see Chapter 4).
2. Always drive with the forks in the lowest possible position, but do not allow them to drag on the ground.
3. Never let anyone hitch a ride on the forks or the load.
4. Working on the Height Shift System is not permitted while raising or lowering forks.
5. Defective Height Shift Systems are not to be used until they have been repaired or replaced by a qualified technician.
6. Before working on a Height Shift System, ensure that the forklift truck is switched off and that the hydraulic system is depressurized (take key out of ignition).
7. The load must always be distributed as evenly as possible between the two forks.
8. Never use the Height Shift System in temperatures below -30°C , unless otherwise specified by the manufacturer.
9. When driving with a Height Shift System, pay attention to the top of the frame (especially in its highest position) to avoid overhead collisions.
10. Depending on the type of Height Shift System, the forward view from the truck may be severely restricted. Take this into account when driving.

All the above points should be read and understood by the forklift truck driver.



Never exceed the maximum load capacity of the forklift truck, regardless of the load capacity of the Height Shift System.



Never walk underneath the Height Shift System.



The combined descent speed of the Height Shift System and the forklift truck mast should never exceed 0.6 m/s.



If a hose ruptures, then the fork may descend fully into the Single Height Shift System. This may cause the load to shift or fall off the forks.

6. Usage Instructions

The Height Shift System is easy to assemble and disassemble, and can be laterally adjusted without dismantling. However, it is important to check that the locking pin drops back into the fork attachment plate so that the forks re-engage. The Height Shift System should be compatible with the forklift truck for the purpose for which it is intended. The combined load capacity should be calculated by an accredited forklift truck dealer. The load capacity shown on the forklift truck's type plate should be modified to reflect the new combination of forklift truck and Height Shift System.

7. Assembly Instructions

7.1 Commissioning

In order to achieve the best results from your Single Height Shift System following assembly, you should follow the assembly instructions given below:



1. Ensure that the forklift truck is switched off and that the key is out of the ignition. The hydraulic system should also be depressurized.
2. There is an 'L' and an 'R' on the fork's type plate. Mount the forks accordingly – left and right, as viewed from the driver's seat in the forklift truck.
3. Slide the forks onto the fork attachment plate, ensuring that the locking pin drops into one of the recesses in the fork attachment plate.
4. Connect hydraulics as shown in Appendix 3.
5. Ensure that hydraulic connections have been carefully tightened.
6. The maximum permitted working pressure on the Height Shift fork is 250 bar.
7. Raise and lower the fork a few times to bleed any air from the system.
8. Check that hoses are unobstructed at all points and that the system has no leaks.

Please refer to Appendix 3 for connection diagrams.

Where the Height Shift System makes use of telescopic forks, refer to the relevant user manual (see Appendix 3) for more information about the telescopic forks.

The fork will remain stationary if the IO valve is operated on a Height Shift System with telescopic forks and an independent operation (IO) option.

7.2 Height Shift System Protection

To prevent the Height Shift System coming into contact with the ground, we recommend that you place a plastic tube on the forklift cylinder in such a way that the forks cannot touch the ground. Forklift truck lifting chains may also be shortened slightly, which has the same effect. Always consult your dealer or manufacturer before carrying out such modifications.

8. Inspection and Maintenance

The Height Shift System operates based on an enclosed, self-lubricating hydraulic system. The forks are delivered with hydraulic oil that conforms to standard ISO 4406 17/12.

Very little maintenance is required to keep the forks in good working condition. However, it is important that maintenance be performed in a timely and correct fashion.

Check the Height Shift System daily for damage and oil leaks. Any damage or leaks found should be reported to the person in charge. When carrying out work on the forks, the forklift truck must be switched off with the key removed from the ignition and the system depressurized.

Consult the maintenance schedule for additional inspection work. Under some circumstances, e.g. in exceptionally dirty environments, it may be necessary to amend the maintenance schedule. In such cases, seals should be replaced more often, in particular, the wiper ring.

The Height Shift System should be retested every year by a specialist in accordance with ISO 5057 standards. The results of the test should be recorded in a logbook.



Never overtighten the castellated nuts beneath the cylinders when replacing parts (see Fig. 8.1). Use the point at which the split pin can be inserted through the threaded end as a reference point for tightening the nut.

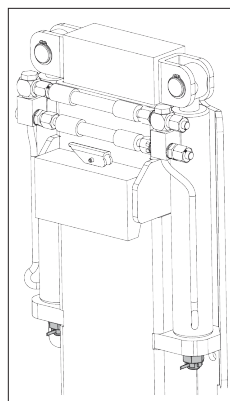


Figure 8.1 Castellated nut

8.1 Maintenance Schedule

Table 8.1 shows which components require inspection, what action should be taken and how frequently this should be performed.

Description	Weekly	Half-yearly or every 1,000	Yearly or every 2,000 hours
Hydraulic leakage	X		
Check cylinders		X	
Check hoses	X		
Complete Height Shift			X

Table 8.1 Maintenance schedule

Below is a more detailed explanation of the maintenance schedule given in Table 8.1:

1. In the event of a cylinder housing leakage, disconnect the forks from the forklift truck immediately and contact your supplier. In the event of connector leaks, either tighten and/or replace attachments.
2. Inspect the wiper rings and cylinder heads at the top of the cylinder for signs of wear and leakage.
3. Inspect hoses for signs of wear. Replace ageing hoses immediately or if the insert is visible, otherwise every six years.
4. The Height Shift System should be inspected thoroughly by a specialist once a year in accordance with ISO 5057 standards.

8.2 Fault Table

Symptom	Possible cause	Possible solutions
Forks move on their own	Leaking operating valve	Check with your forklift truck supplier
	Air in system	Operate several times
Leaking fork	Leaking coupling	Retighten
	Damaged cylinder head	Replace cylinders
	Damaged hose	Replace hoses
Angles of left and right fork are not the same	Fork(s) deformed due to overload	Check with your forklift truck supplier
Fork drops when loaded	Leaking piston seal(s)	Replace cylinders

Table 8.2 Fault table

8.3 Ordering Components

Before ordering components, look up the product numbers in the appendices and quote these with your order.

8.4 Instructions for Replacing Hydraulic Cylinders



1. Set the forks on the ground.
2. Remove the split pins from the castellated nuts on the base of the cylinders.
3. Suspend the SHSSL frame from a crane.
4. Unscrew the castellated nut at the base of the cylinder.
5. Lower the SHSSL frame until the cylinders are free at the bottom.
6. Unscrew and remove the hydraulic hoses.
7. Remove the lock rings at the base of the cylinder.
8. Pull out the pin from the fork at the top of the cylinder. The cylinder is now disconnected.
9. Replace the cylinder.
10. Suspend the cylinder from its pin in the fork at the top of the fork's back.
11. Secure the lock rings at the base of the cylinder.
12. Raise the SHSSL frame until the cylinders are inside the frame and the screw th-

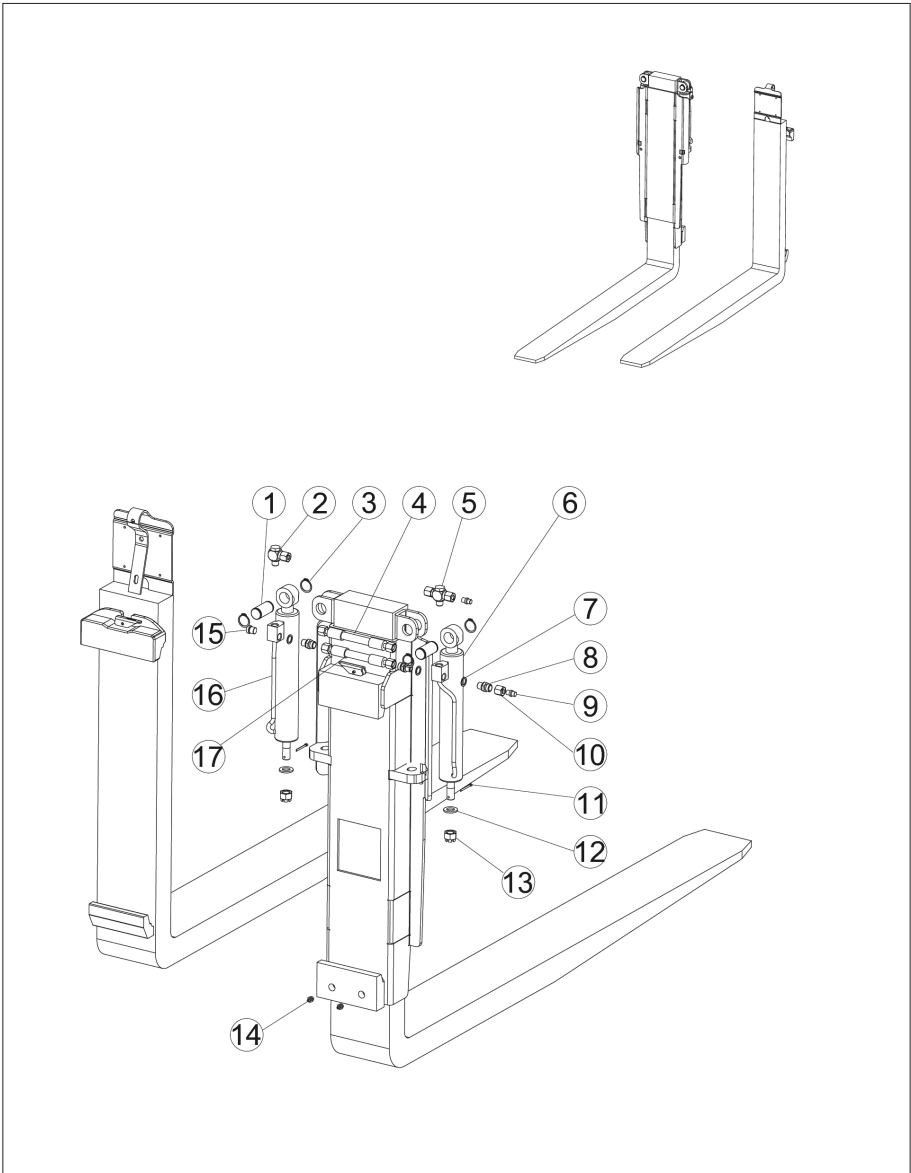
read emerges through the slots at the bottom.

13. Thread the castellated nuts onto the threaded ends of the cylinders, ensuring that the cylinders can move freely (do not overtighten the castellated nuts).
14. Insert the split pins through the castellated nuts.
15. Reconnect the hydraulic hose.
16. The SHSSL should be raised and lowered a few times before use.

Appendices

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Appendix 1. Spare part drawing



Appendix 2. Spare parts list

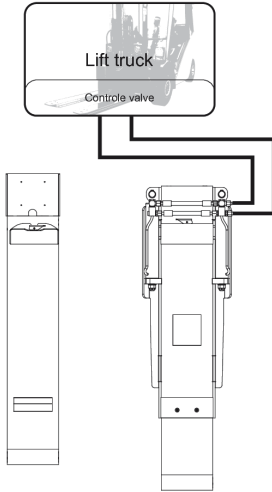
Part no.	Part description	Article code	Quantity
1	Axle	RE0069045053	2
2	Banjo L coupling 10L	RE0017026	1
3	Retaining ring	36000 25	4
4	Upper hydraulic hose	*	1
5	Banjo T coupling 10L	RE0017025	1
6	Right cylinder	RE00702830200	1
7	Copper ring	RE0018000	3
8	Straight male stud coupling	RE0017003	3
9	Plug 10L	RE0017041	2
10	Nut coupling 10L	RE0017040	1
11	Split pin	39350 4x32	2
12	Washer	38130 M16	2
13	Castle nut	12010 M16	2
14	Grease nippel	72210 R1/8-180	2
15	Plug	RE0016006	1
16	Left cylinder	RE00702820200	1
17	Lower hydraulic hose	*	1

* Hydraulic hoses:

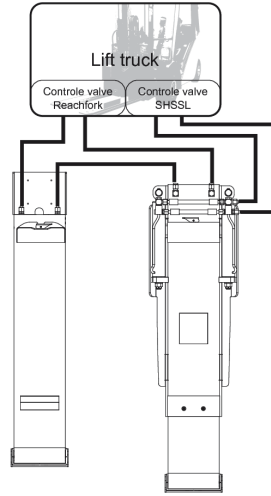
Article numbers depend of the width of the fork back of the fork in the SHSSL.

Width fork back	Article number upper hydraulic hose	Article number lower hydraulic hose
120	RE00580530180	RE00580530170
150	RE00580530210	RE00580530200
200	RE00580530260	RE00580530250

Appendix 3. Hydraulic connection diagram



SHSSL with RE KOOI-Reachforks



SHSSL with RG KOOI-Reachforks with controlled unequal movement

