



INSTRUCTION BOOK

FARMA
C 4,6 S

SERVICE AND SPARE PARTS



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1 INTRODUCTION

This manual deals with forest crane **C 4,6S** and contains all the operating and maintenance instructions you need for using the loader safely and correctly.

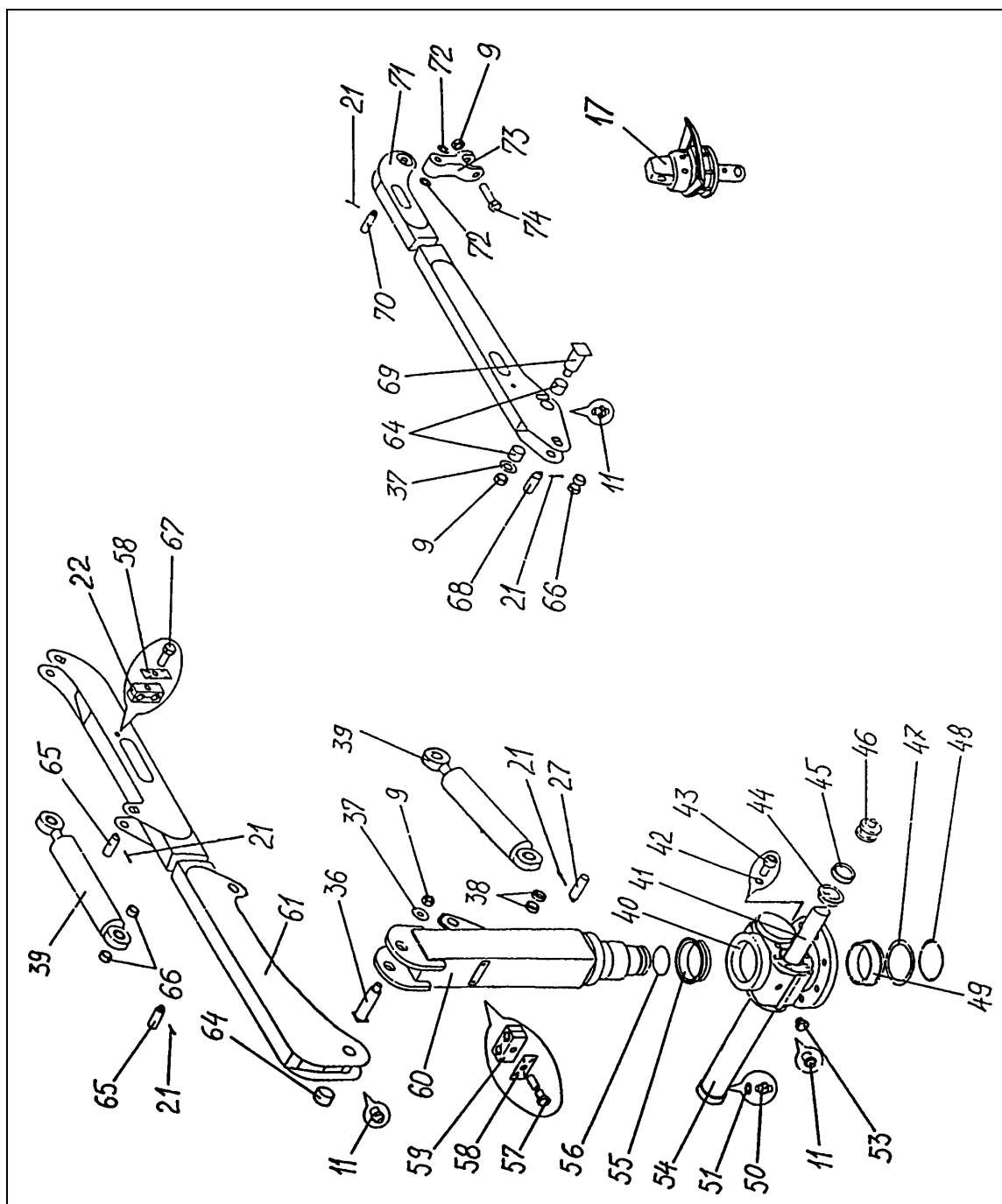
Even if you are experienced user of this kind of equipment, read this manual carefully. It contains information that enables the loader to be used efficiently and safely.

Regular maintenance is essential for troublefree, efficient and economical utilization. The loader delivered testrun and testloaded. The control valve and hydraulic cylinders are tested separately. Test operation at the factory is performed by using universal hydraulic oil (see lubricating instructions).

It is the operator duty to familiarize and obey all safety precautions and instructions carefully.

2 TECHNICAL SPECIFICATION

2.1 CONSTRUCTION OF THE LOADER



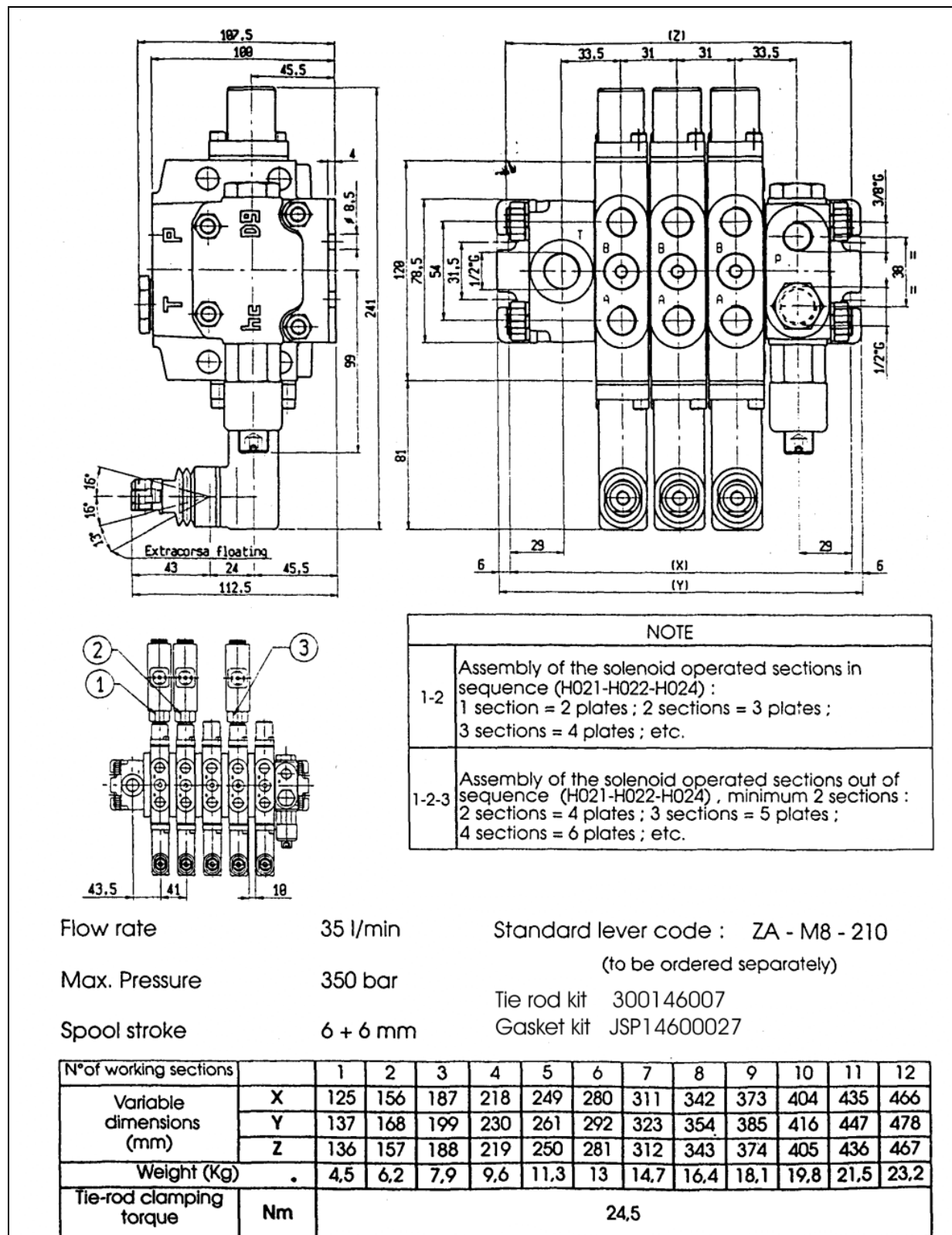
2.2 FOREST CRANE C 4,6S SPECIFICATION

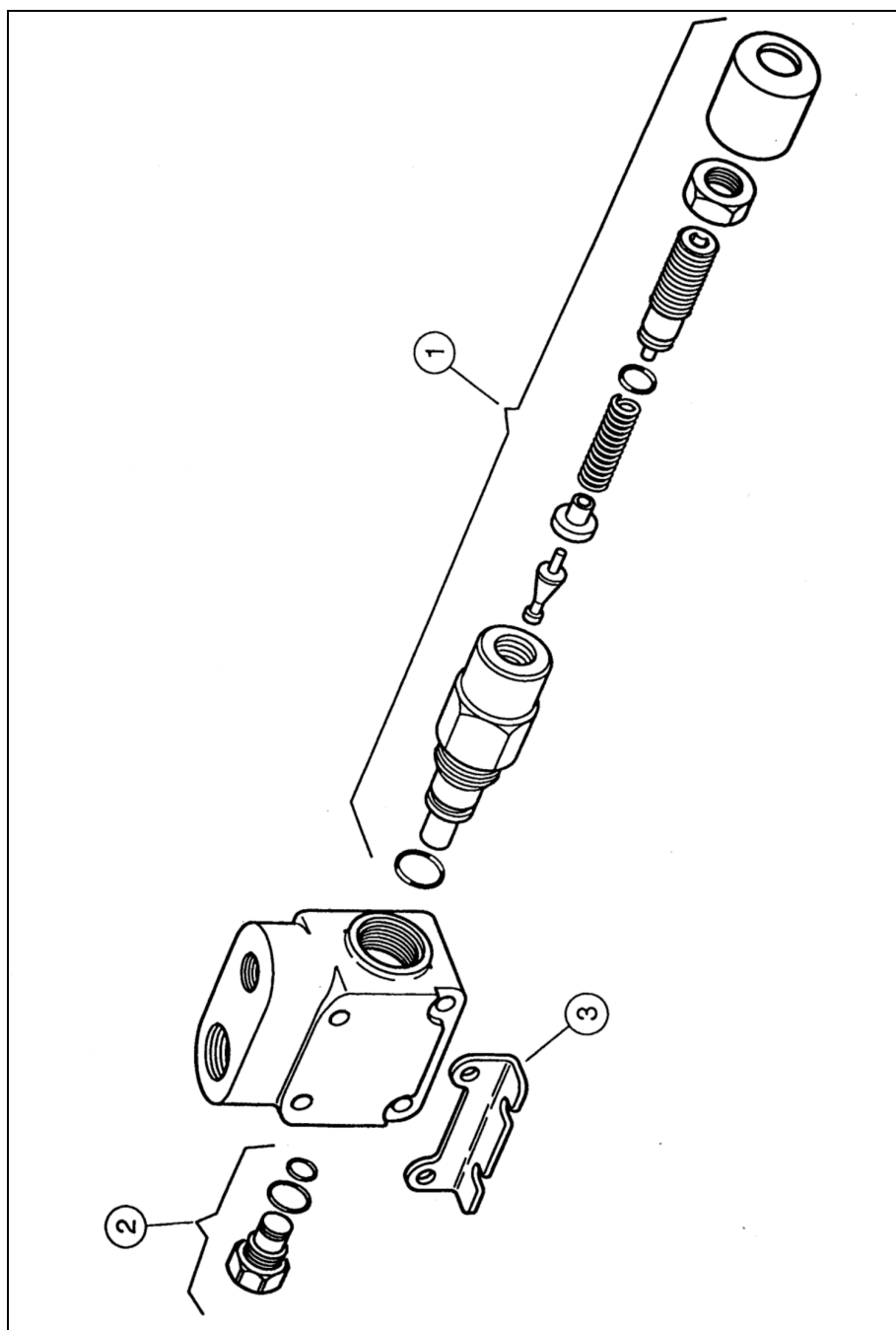
Production no FMW 22

Pos no	Art no	Number	Sparepart	Dimension	Pcs
9	22001		Nut	M24	3
11	22002		Grease nipple	1/8"	4
17	22003		Rotator	MTR 30	1
21	22004		Split pin	Ø4×60	5
22	22005		Clamp		8
27	22006	M13-000000.002-030	Axle bolt		1
36	22007	M13-000030.001-010	Axle bolt		1
37	22008	M13-000000.001	Plane washer	70x25x8	2
38	22009	M13-000000.017-010	Distance ring		2
39	22010	M13-100200.000	Hydraulic cylinder	90x40-400	2
40	22011	M13-130100.000	Turnhouse (body)		1
41	22012	M13-130000.001	Racks		1
42	22013		Spring washer	Ø10	12
43	22014		Bolt	M10×35 Insex	12
44	22015	M13-130000.002	Glide bearing		2
45	22016		Sealing	5×2 80-60-33,8	2
46	22017	M13-130000.005	Piston		2
47	22018	M13-130000.006	Cover-ring		1
48	22019		Lock-ring	SGA 115	1
49	22020	M13-130000.004	Glide bearing		1
50	22021		Adapter		2
51	22022		Seal washer		2
53	22023	M13-130000.007	Plug		1
54	22024	M13-130200.000	Hydraulic cylinder	90/80-500 turn	2
55	22025	M13-130000.003	Glide bearing		1
56	22026		O-ring	104,0×5,7	1
57	22027		Bolt	M8×65	8
58	22028		Cover plate	E394-12-01	10
59	22029		Clamp	E390-42-18	1
60	22030	F13-130004.000	Column		1
61	22031	F13-041000.000	Crane beam		1
64	22032		Glide bearing	PAP5040P10	4
65	22033	M13-000000.002-040	Axle bolt		2
66	22034	M13-000000.017	Distance ring		6
67	22035		Bolt	M8×40	6
68	22036	M13-000000.002	Axle bolt		1
69	22037	M13-000030.000	Axle bolt		1
70	22038	M13-000000.003	Axle bolt rot-fork		1
71	22039	F13-030000.000-010	Crane arm		1
72	22040	M13-000000.023	Plane washer		2
73	22041	M13-020000.000	Rotator fork		1
74	22042	M13-000000.004-010	Axle bolt rotator		1
75	22043	L22.46-40S	H-hose to turnhouse	L=2650	2
76	22044	L22.46-40S	H-hose to stick	L=5780	2
77	22045	L22.46-40S	H-hose to beam	L=3370	1
78	22046	L22.46-40S	H-hose to beam	L=3700	1
79	22047	L22.46-40S	H-hose to rotator	L=8760	4
80	22048	L22.46-40S	H-hose to valve	L=1500	2
81	22049	G. 0,16	H-hose to grapple	L=500	2



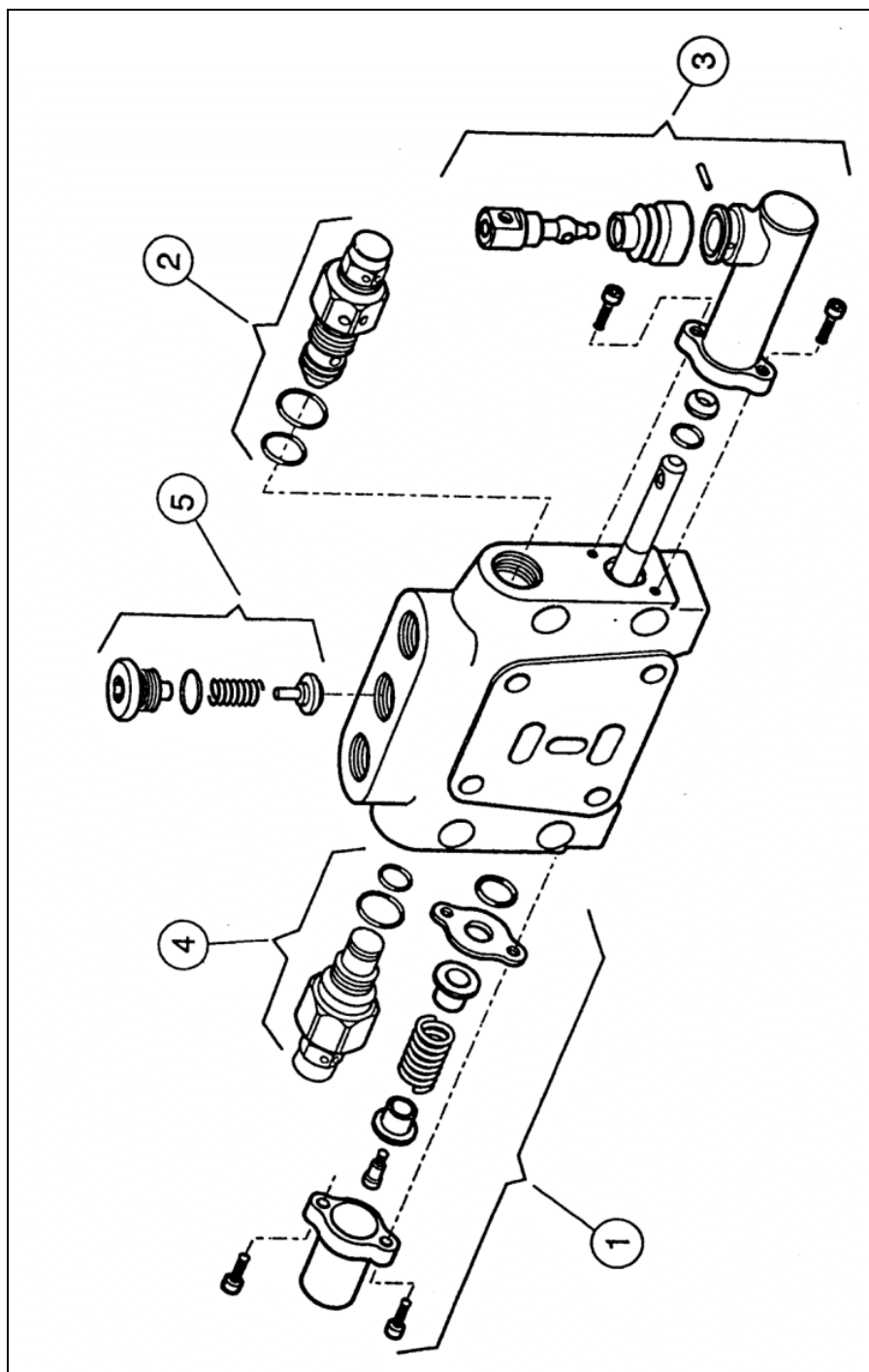
2.3 HYDRAULIC DISTRIBUTOR HC-D9





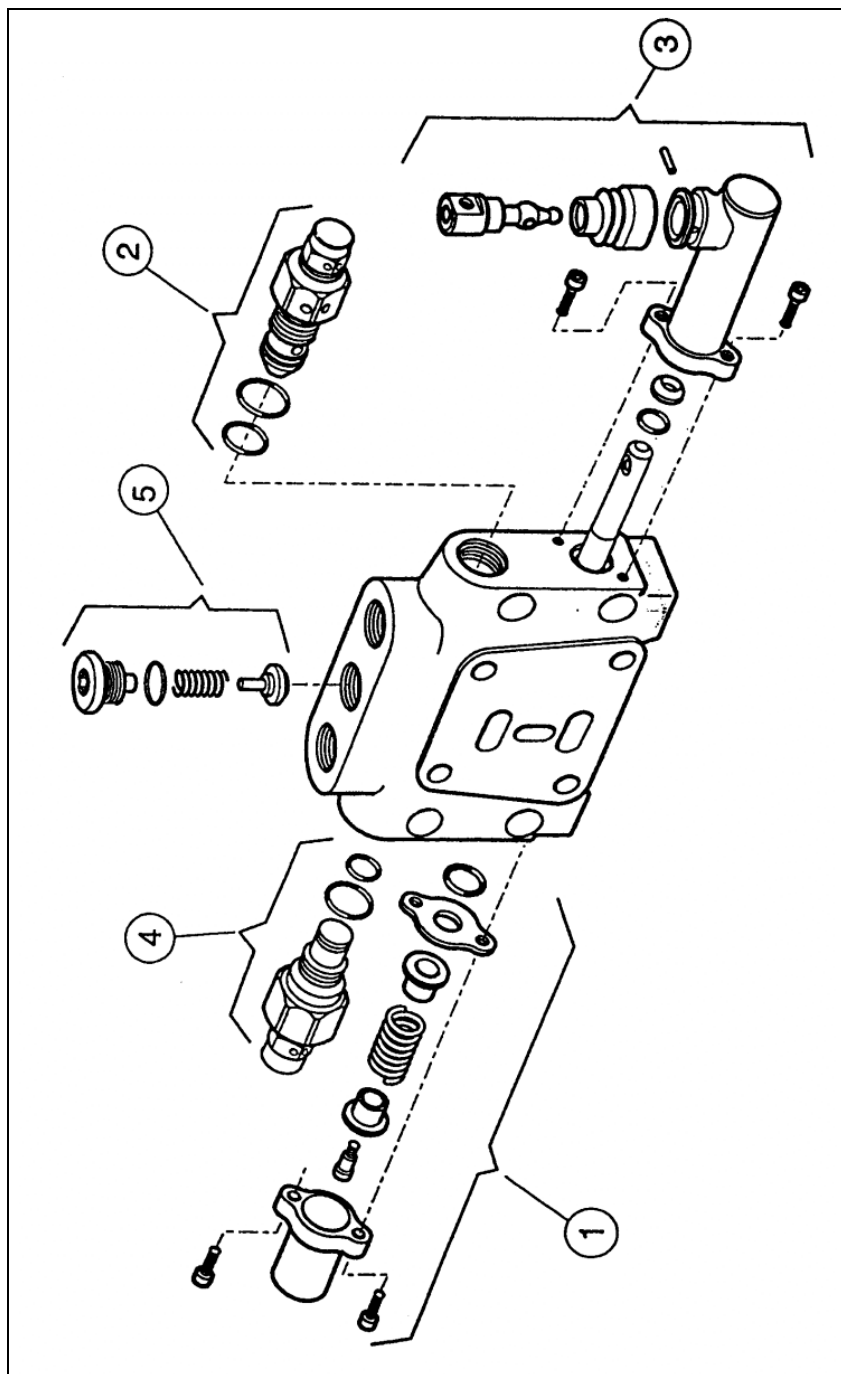
Inlet section - 15912

Pos.	Quantity	Code	Description	Dimension
1	1	14037	Pilot operated pressure relief valve (175) bar	
2	1	430146001	Relief valve plugged	
3	1	423410041	Bracket	



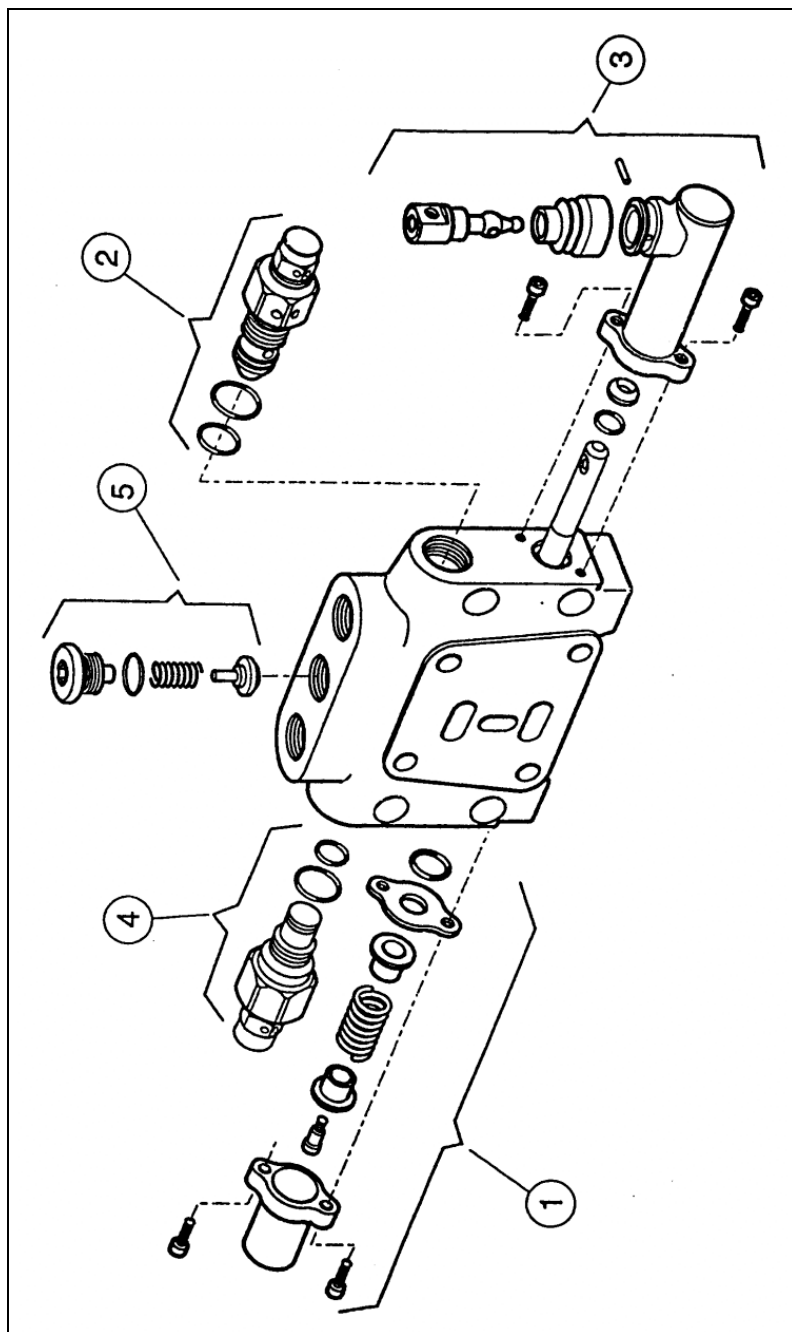
First working section - 15913

Pos.	Quantity	Code	Description	Dimension
1	1	320746002	Spool return action kit	
2	1	8999	Anti-shock valve (130-A) bar	
3	1	320346001	Handle kit	
4	1	8999	Anti-shock valve (130-A) bar	
5	1	320246001	Check valve kit	



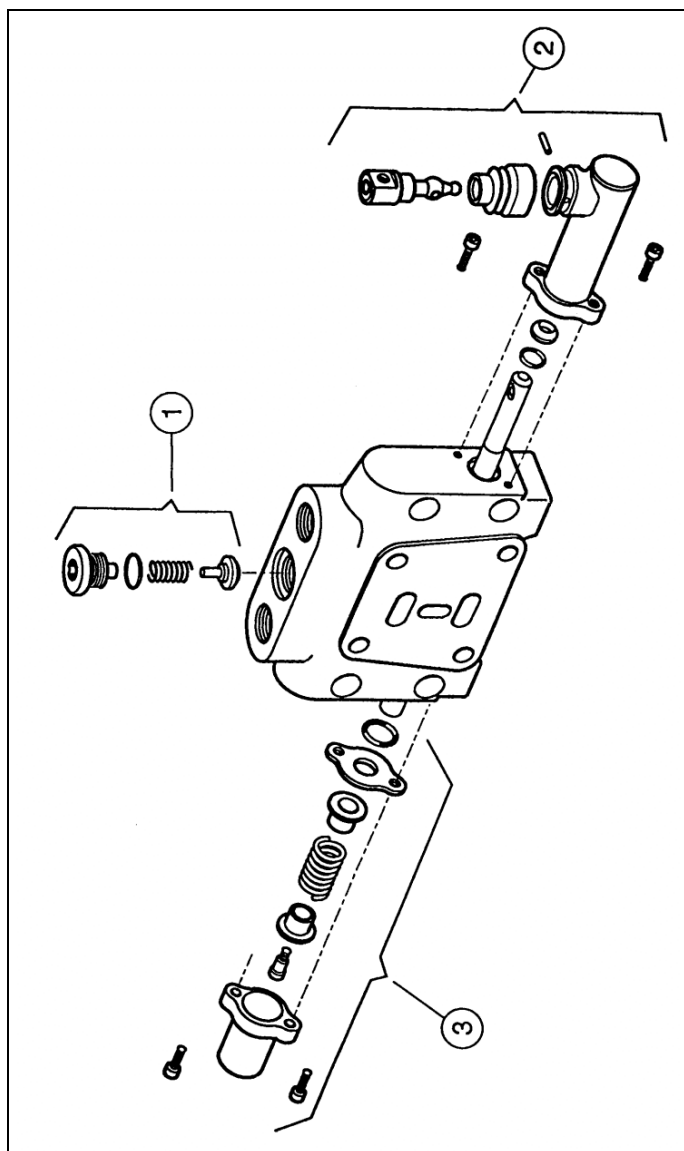
Second working section - 15516

Pos.	Quantity	Code	Description	Dimension
1	1	320746002	Spool return action kit	
2	1	5128	Anti-shock valve (175-A) bar	
3	1	320346001	Handle kit	
4	1	13171	Anti-shock valve (90-A) bar	
5	1	320246001	Check valve kit	



Third working section - 15914

Pos.	Quantity	Code	Description	Dimension
1	1	320746002	Spool return action kit	
2	1	5128	Anti-shock valve (175-A) bar	
3	1	320346001	Handle kit	
4	1	13171	Anti-shock valve (175-A) bar	
5	1	320246001	Check valve kit	



Fourth working section - 14938

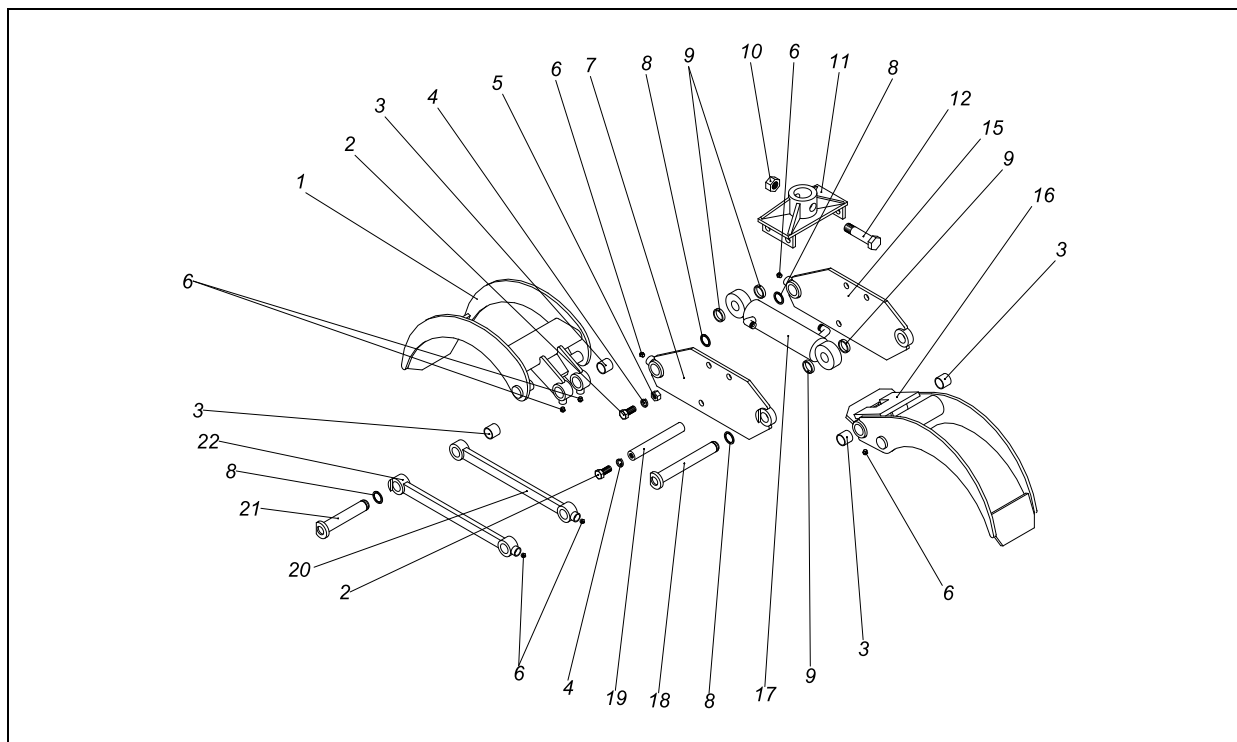
Pos.	Quantity	Code	Description	Dimension
1	1	320246001	Check valve kit	
2	1	320346001	Handle kit	
3	1	320746002	Spool return action kit	

Section	Code
Fifth working section	14938
Sixth working section	14938
Seventh working section	14938
Olutet section	11999
Tie rod kit	300146007
Gasket kit	JSP14600027

2.4 GRAPPLE FARMA 0,16

Produktions nr FMW 19.

Pos no	Art no	Number	Reservdel	Sparepart	Dimension	Pcs
1	37019005	FMW42-010000.000	Gripklo/utv.	Grip outside		1
2	906225		Ledbult	Axlebolt	M16x40	6
3	909140		Bussning	Bush	PM3030DX	10
4	908630		Låsbricka	Spring washer	Ø16	6
5	907234		Mutter	Nut	M16	4
6	930105		Smörjnippel	Grease nipple	1/8"	8
7	37019009	FMW42-030000.000	Godstjok.	Wall		1
8	911260		Låsring	Stopper ring	SGA30	6
9	37019013	FMW42-000000.001	Distansring	Distance ring		4
10	907255		Mutter	Nut	M24	1
11	37019016	FMW42-050000.000	Grapple's hållare	Grapple's holder		1
12	37019020	MAP13-000000.004	Ledbult	Bolt		1
15	37019010	FMW42-030000.000-010	Godstjok.	Wall		1
16	37019006	FMW42-020000.000	Gripklo/inv.	Grip inside		1
17	313116	FMW42-100100.000	Hydraulik cylinder	Hydraulic Cylinder	63x32x160	1
18	37019025	FMW42-060000.000-010	Ledbult	Axlebolt		1
19	37019035	FMW42-000000.002	Stång	Bar		1
20	37019044	FMW42-050000.000	Medbringare	Tie-rod		1
21	37019024	FMW42-060000.000	Ledbult	Axlebolt		1
22	37019045	FMW42-050000.000-010	Medbringare	Tie-rod		1



2.5 HYDRAULIC CYLINDERS

Sparepart list hydraulic cyl 90x40x400

Beam cyl for Farma 60-30; 51-40; 46-40 and lift cyl 46-40 grapple loader

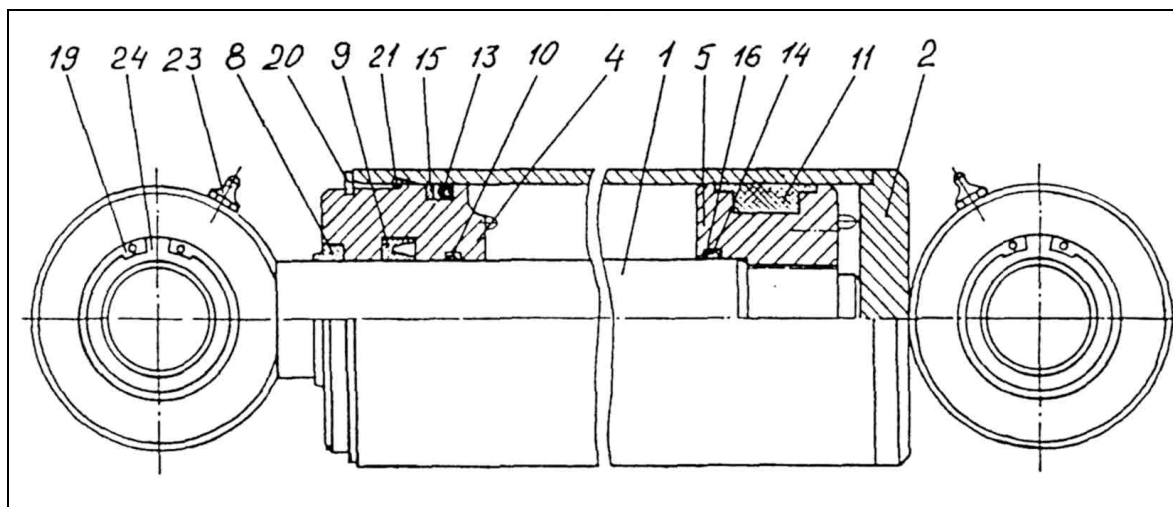
Production no M13-100400.000

Pos no	Art no	Number	Sparepart	Dimension	Pcs
1	56501	M13-100120.000-010	Piston rod		1
2	56502	M13-100210.000	Tube		1
4	56502	F13-100100.001	Front bush		1
5	56503	F13-100100.002	Piston		1
8	56503		Scrape ring	AS40-50-7-10	1
9	56504		Sealing	NI 300 40-55-10	1
10	56504		Buch	DFI 40-45-5,5	1
11	56505		Sealing	SIMKO 5×2 90-70-33,8	1
13	56505		O-ring	79,2×5,7	1
14	56506		O-ring	40,2×3,0	1
15	56506		Sealing	SRA 90-5,1-1,5	1
16	56507		Sealing	SRI 40-2,6-1,5	2
19	56507		Lock ring	SGH 55	2
20	56508		Lock ring	SGA 87	1
21	56508		Lock ring	N° 72290	1
23	56509		Grease nipple	1/8"	2
24	56509		Joint bearing	GE35ES	2

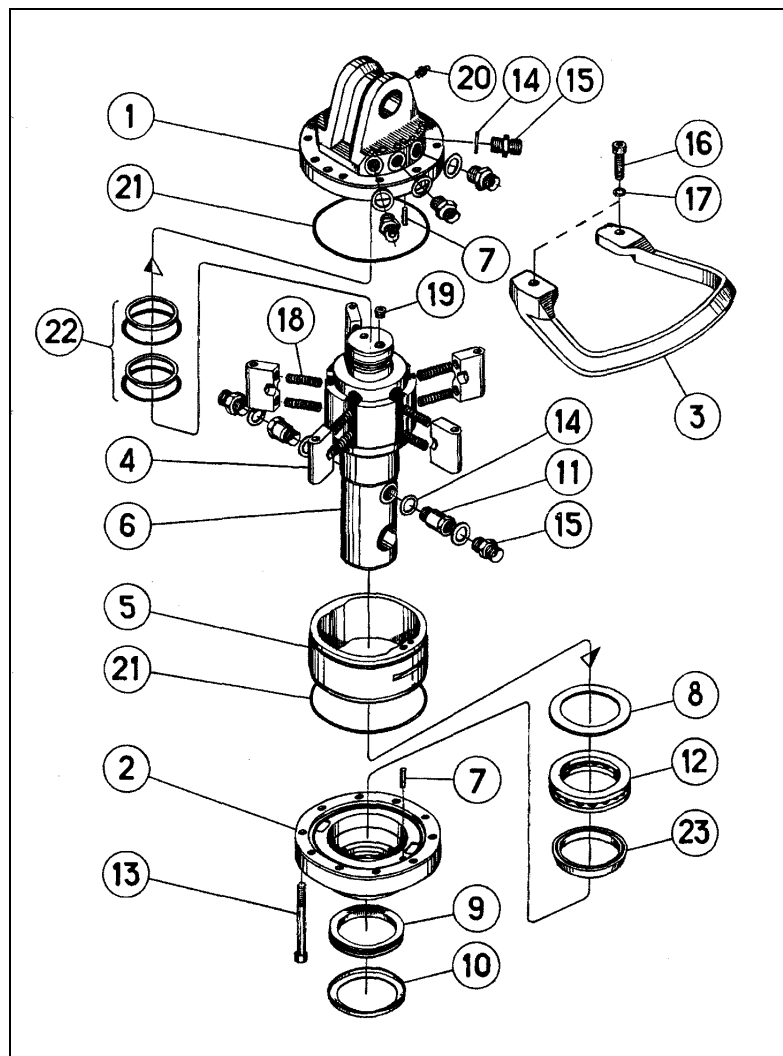
Sparepart list hydraulic cyl 63/32-160

Grapple cyl Farma 0,16

Pos no	Art no	Number	Sparepart	Dimension	Pcs
1	55401	F42-100202.000	Piston rod		1
2	55402	F42-100201.000	Tube		1
4	55402	M13-100300.001	Front bush		1
5	55403	M13-100300.002	Piston		1
8	55403		Scrape ring	AS 32-45-7-10	1
9	55404		Sealing	NI300 32-47-10	1
10	55404		Buch	DFI 32-35,1-4,0	1
11	55405		Sealing	SIMKO 5×2 63-47-29,8	1
13	55405		O-ring	52,2×5,7	1
14	55406		O-ring	32,2-3,0	1
15	55406		Sealing	SRA 63-5,1-1,5	1
16	55407		Sealing	SRI 32-2,6-1,0	2
19	55407		Lock ring	SGH 47	2
20	55408		Lock ring	SGA 60	1
21	55408		Lock ring	N 72240	1
23	55409		Grease nipple	1/8"	2
24	55409		Joint bearing	GE30ES	2



2.6 ROTATOR FMTR 30



Pos	Art no	Sparepart	Pcs
1	MTR 30.01 M	Stator plate, upper	1
2	MTR 30.02 M	Stator plate, lower	1
3	MTR 31.03 LA	Hose guard	1
4	MTR 30.007 M	Vane	5
5	MTR 30.006	Stator frame	1
6	MTR 30.005	Rotator shaft	1
7	MTR 30.015-02	Pin	2
8	MTR 30.011	Shim	1
9	TWVA 00500	V-seal	1
10	MTR 30.013	Washer	1
11	MT 0205	Nipple	2
12	51110	Axial Bearing	1

Pos	Art no	Sparepart	Pcs
13	MC6S 12.9 M8x70	Screw	10
14	GB-6 TREDO	Washer	8
15	0101-6	Nipple	6
16	M6S 8,8 M8x30	Screw	2
17	8.65□	Washer	2
18	MTR 100.009	Spring	10
19	835-02	Tap	1
20	1.2.C6	Grease nipple	1
21	OR 116,00x2,50-N70	O-ring	2
22	GHH/R 40/47,5x3,2	Glide ring	2
23	TS 50/60x8	Seal	1

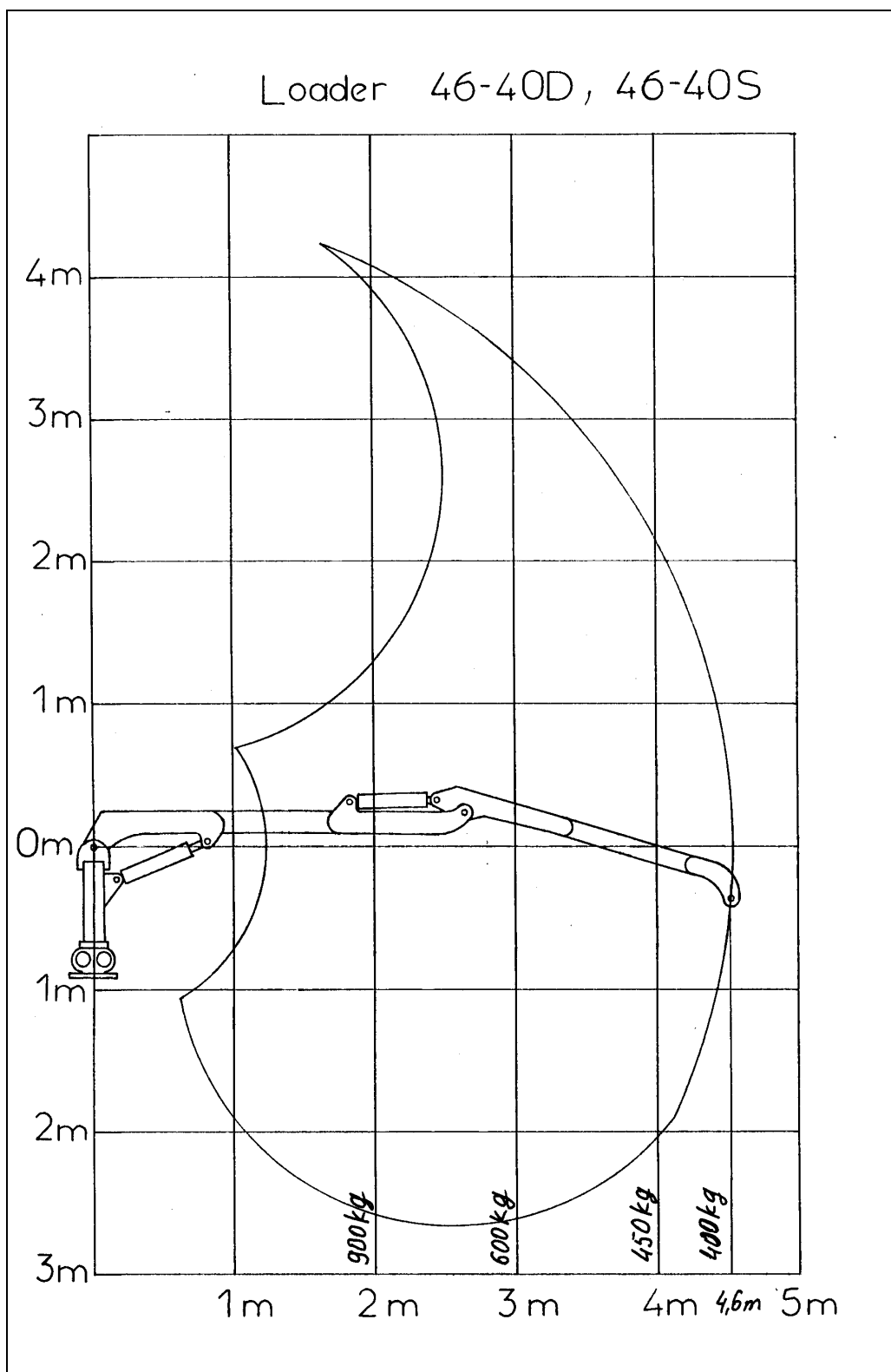
2.7 TECHNICAL DATA

LOADER	C 4,6S
Lifting capacity net, kNm	27
Outreach, m	4,6
Recommended pump capacity, l/min	35-50
Working pressure, bar	180
Lifting power, full reach, kg	400
Revolving moment, kNm	4,4
Turning angle, °	360
Loader weight, kg	420
Valve HC-D9/7, 7 levers	

GRAPPLE, m²	0,16
Opening, max, mm	1150
Opening, min, mm	40
Weight, kg	70

ROTATOR	MTR 30
Revolving moment, Nm	700
Weight, kg	17

2.8 WORKING AREA



3 OPERATING INSTRUCTIONS

3.1 SAFETY

- ❑ Read the manual before operating the loader. Neglecting the instructions can cause danger to operator and machine.
- ❑ Operator must have sufficient training for using this machine.
- ❑ Do not use the loader until you are familiar with the controls.
- ❑ Before loading works, ensure there is no one in danger zone.



DANGER ZONE IS 20 METRES!

- ! Operator must have full visibility all over working area.
- ! The vehicle must be on stable ground and positioned securely. Support legs must be used while loading to prevent the loader tipping over.
- ! **Don't forget to lift the support legs up before moving to another place.**
- ! Use vehicles parking brakes during the loading.
- ! Do not exceed maximum loading values.
- ! Never leave the boom on UP position without supervising. Do not use the loader for personnel lifting.
- ! In installation hoistings take note of booms slow descending.
- ! When working close to live conductors observe the special safety distance.
- ! Take special care when lifting a heavy load from platform and then turning the loader to the side.
- ! Do not use the loader for hauling.
- ! Do not be under a hanging load.



READ AND UNDERSTAND THE OPERATION AND SAFETY INSTRUCTIONS BEFORE USING THE LOADER

3.2 PRACTISING

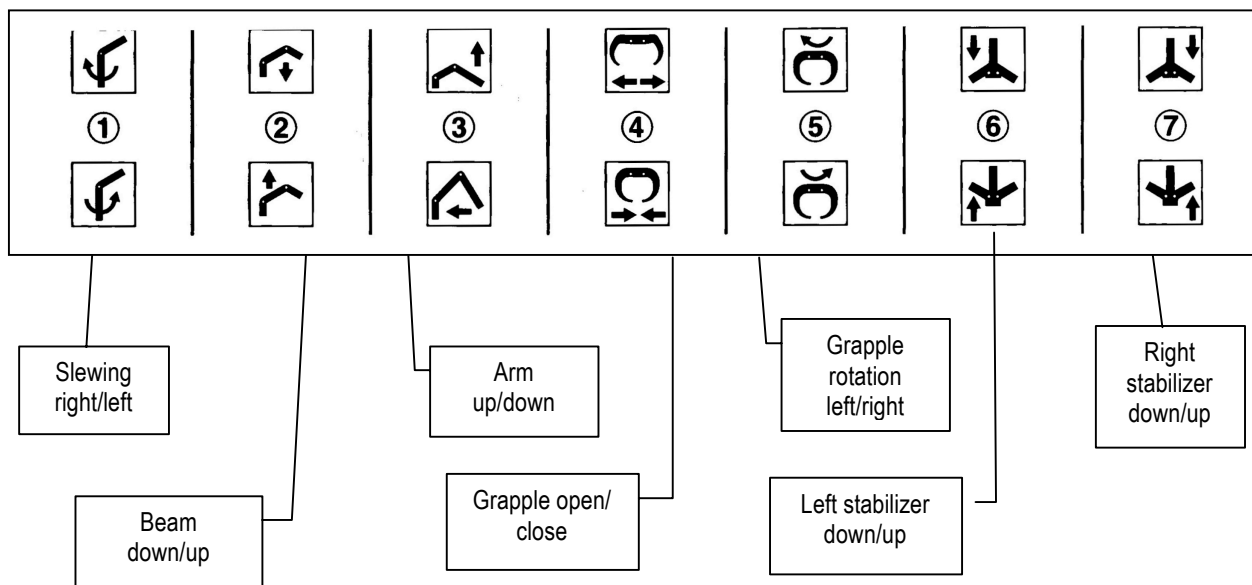
Learn control valves operation. Drive through every function without load.

Learn to use several functions simultaneously. This enables smooth, precise operation and prevents unnecessary strain. Note that movements become slower when the same oil flow is divided to several cylinders.

Move control levers smoothly and steadily, avoid

quick and jerky movements. In practice operation it is beneficial to adjust pumps output as low as possible. This makes avoiding sudden movements easier.

After getting accustomed to loaders movements choose the engine speed so that operation is efficient but you still have movements well under your control.



3.3 INSTRUCTIONS FOR SAFE OPERATION

SUPPORTING THE LOADER

- ❑ Always engage the base machines parking brakes before loading. If necessary put some obstacles in front of wheels.
- ❑ Always use support legs. Make sure the loader is situated at firm terrain.



DO NOT USE SUPPORT LEGS FOR LIFTING THE LOAD. USE SUPPORT LEGS ONLY FOR SUPPORTING THE LOADER

Do not turn the crane before load is sufficiently high.

Take special care when lifting a heavy load from platform while turning the crane sideways.

MANIPULATING THE LOAD



NEVER DRIVE LOADER FROM ONE EXTREME POSITION TO OTHER WITH SPEED! THIS MAY CAUSE OVERTURNING OF VEHICLE AND LOADER AND ALSO DAMAGING OF BEARINGS

Avoid loading on a slanted ground or at least work with extreme cautiousness.

- ❑ When working on a slanted surface do not charge with full lifting moment.



ALWAYS ENGAGE THE BASE MACHINES PARKING BRAKES BEFORE LOADING. IF NECESSARY PUT SOME OBSTACLES IN FRONT OF WHEELS

3.4 DAILY INSPECTIONS

Examine visually the loader. Note defects and failures that might affect safety. Repair possible defects and failures.

Check there is no leakages on hydraulic system, nor damaged hoses.

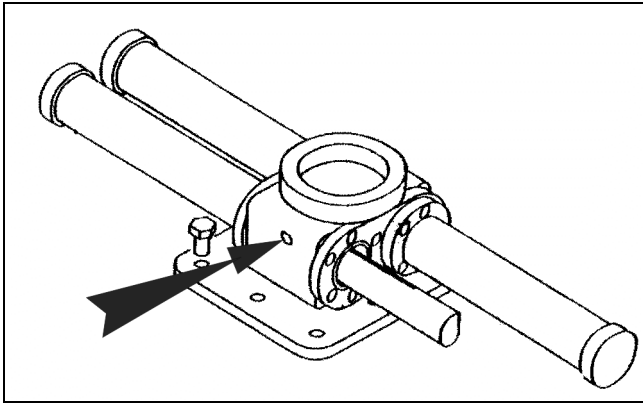
Check loaders fastening bolts, booms

articulations nuts, grapples fastening, loaders.

Grease the loader if necessary (see lubricating instructions).

Drive through every function to its extreme position.

Check that the oil is on level as shown in figure.



The oil level needs to be checked regularly. The oil level needs to be filled up to 1 cm underneath the refilling hole. For direction of plug see arrow above.

3.5 ACTING IN DANGEROUS SITUATION



IF THE LOADER STARTS TO FALL OVER LOWER THE LOAD CAREFULLY TO THE GROUND!

- ❑ Do not drop the load by opening the grapple!
- ❑ Do not jump out from vehicle.
- ❑ If the booms start descending due overloading try to transfer the load closer to the column; do not open the grapple.



IF THE LOADER COMES INTO CONTACT WITH HIGH VOLTAGE ELECTRIC WIRES COMPLY WITH FOLLOWING INSTRUCTIONS:

IF YOU ARE OUTSIDE THE MACHINE

Do not attempt to get into the machine.
Keep everybody out from the machines vicinity.
Do not touch any part of machine.

IF YOU ARE INSIDE THE MACHINE

Get out of it by **JUMPING**. Avoid touching any conducting parts.
Do not make yourself a wire through which electricity may flow.
Get away from the machine by **JUMPING** so that both feet do not touch the ground at the same time. Electric field at ground can cause fatal voltage between legs at about 20 meters away you are safe.

3.6 WORKING AT EXTREME CONDITIONS

Recommended working temperature range for loader is **-30°C up to +40°C**.

Note that working at low temperatures accelerates hydraulic gaskets wearing and increases hydraulic hoses exposure to damages and steel constructions exposure to brittle fracture. When working at lower temperature than it is recommended lift the lighter loads than usual.

Before start working at cold conditions let the oil circulate freely through system a few minutes.

Slowly drive every action through several times so that gaskets come pliable before they receive full pressure.

At exceptionally warm conditions beware of hydraulic oils excessive heating. Too high oil temperature (higher **+80°C**) degrades oil and damages gaskets.

4 MAINTENANCE INSTRUCTIONS

4.1 SAFETY



READ THE MAINTENANCE INSTRUCTIONS BEFORE SERVICE OR MAINTENANCE WORKS. DO NOT ATTEMPT TO PERFORM SUCH MAINTENANCE WORKS WHICH YOU DO NOT FULLY UNDERSTAND

Repair all safety endangering defects immediately.

Check that the loader is on a level and stable ground.

Use vehicles parking brake during maintaining the loader. Make sure that nobody can unnecessarily have access to loaders or vehicles controls.

Never attempt to do maintenance works on the hydraulic system before you are sure there is no pressure.

Do not tighten or repair a leaking hydraulic couplings while the system is pressurized.

Never attempt to localize a leakage from hoses or connections by feeling with hand. The high pressure oil jet can penetrate skin and cause serious burns and damages. High pressure oil is also highly flammable.

Do not work under such device that is sustained only by hydraulics. During maintenance use supports.

Do not detach boom cylinders until booms are lowered, the hydraulic system de-pressurized and loader supported to prevent overturning. Avoid direct skin exposure with oil.

Avoid getting oil into eyes. Use safety goggles and gloves.

4.2 GENERAL

- ☐ Maintenance works must be carried out regularly to ensure safe and malfunction-free operation.
- ☐ Maintenance works do not require any special tools, so most operations can be performed by the user.
- ☐ Use correct tools.
- ☐ Attempt to localize the defects as well as possible, so you don't have to open the system unnecessarily.

- ☐ Keep disassembled parts and repair area protected from dirt.
- ☐ Keep spare parts in their packages until needed for installation.
- ☐ Valve adjustments and repairs are recommended to be performed by dedicated service personnel.

4.3 CHANGING HYDRAULIC COMPONENTS

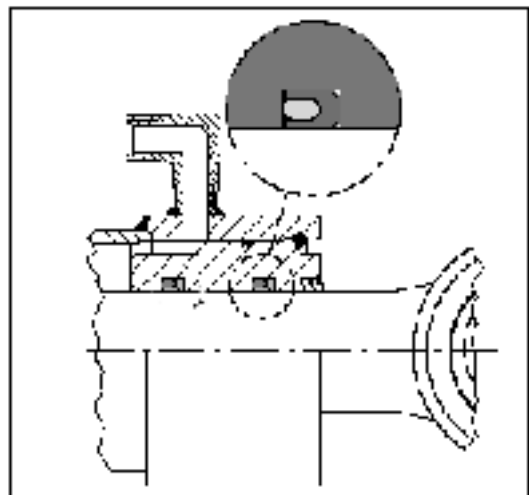
When replacing hydraulic components such as hoses, gaskets etc. make sure they correspond with original parts.

To minimize malfunctions and ensure safe operation use original spareparts.

CHANGING THE SEALS

Change all cylinder seals at the same time. The piston cannot be split. The seals must be slipped over the piston edge. Be careful not to break the seals when fitting them in place.

1. After removing the old seals clean the grooves carefully before fitting the new seals into place.
2. Lubricate the new seals with hydraulic oil.
3. Open the pistons lock nut.
4. Screw the piston off.
5. Withdraw the guide piece from the rod.
6. Change the guide piece seals; make sure that the piston rod seal is the right way round, i.e. the lip against the pressure (see figure).



4.4 LUBRICATION

Lubricating point	Qty	Lubricant	Interval
			(working hours)
1. Slewing bearings	1	Grease	50 h
2. Articulation	3	Grease	50 h
3. Cylinder end	6	Grease	50 h
4. Rotator	1	Grease	50 h
5. Grapple	8	Grease	50 h

Loader model:	Oil volume: Type SAE 90
C 3,2	1 litre
C 3,5	1 litre
C 3,8	1 litre
C 4,6 S	2,5 litre
C 4,6 D	2,5 litre
C 5,1	2,5 litre
C 6,0	2,5 litre
C 6,5	1 litre

