

MANUAL FOR LEFFER CASING OSCILLATOR

Type : VRM 1520/900 HD

Project - no. : 40-010137

Job - no. : 11-002633

Month/Year built : 10/2007

**PAY SPECIAL ATTENTION TO THE SAFETY INSTRUCTIONS BEFORE
USE!**

**In the course of further development of our products we reserve the right to
effect technical modifications without notice to the client.**

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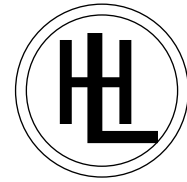
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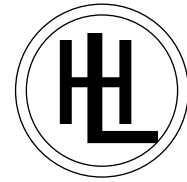
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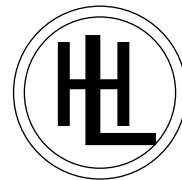
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1.0 Foreword

THESE INSTRUCTIONS FOR USE

- shall facilitate acquiring a knowledge of the oscillator and exploiting the range of use it is provided for,
- contain important recommendations to operate the oscillator and power pack safely, suitable and economically. Compliance with such recommendations will help to avoid risks, reduce repair costs and shut-down times and to increase reliability and lifetime of the oscillator and power pack,
- must be supplemented by procedures emanating from the applicable national provisions for accident prevention and protection of the environment,
- must always be available at the working site of the oscillator and power pack,
- must be read and implemented by any person charged with working with or on the oscillator and/or the power pack.

Such work comprises

- operation
- preparation / tooling
- troubleshooting during work
- care and maintenance
- inspection
- repair
- transport



In addition to the INSTRUCTIONS FOR USE and the mandatory regulations for accident prevention applicable in the country of use and at the working site, the recognized specialist provisions for safe and professional working must be respected.

!!! MIND HIGHLIGHTS IN THE TEXT !!!

NOTE

**Under this heading you will find suggestions and advice about particularities.
The negligence of which has no influence on safety whatsoever.**

WARNING

**Under this heading you will find details and explanations of particularities.
The negligence of which can endanger health and life of the personnel and of
third parties and also cause damages to the equipment.**

WARNING SIGNS



Read Instructions First



**DANGER ZONE !
Moving machine parts.
Risk of getting crushed.**



**DANGER ZONE !
Edge.
Risk of falling down.**



**DANGER ZONE !
Slippery floor.**

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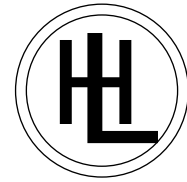
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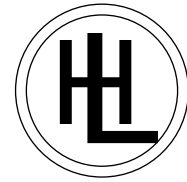


1.1 Personnel Protection

- **Use gloves as often as practical to avoid minor cuts, abrasions and splinters. When handling steel, always wear leather gloves.**
- **During wet days, be certain of footing to avoid slips, especially on hard surfaces such as steel.**
- **Wear comfortable but fairly tight fitting clothing to avoid snagging on construction material or equipment.**
- **Wear hard hats at all times!**
- **Wear ear plugs to reduce the effects of noise!**
- **Stay alert to the work around you. Do not get into hurry and forget the hazards that exist around you, such as traffic and construction equipment.**
- **Use only tools designed for the job.**
- **Inspect tools for damages. Do not use any tool if it appears to be in less than perfect condition.**
- **If using a pry tool, think about where the tool will go if it slips, to avoid being hit or pinched.**
- **When working in an area where a ladder is required, a hand line must be used to hoist tools and objects up or down.**
- **Before using power tools inspect them for damages.**
- **Hold tools firmly so if they bind, you are ready for the action.**
- **Position your body so to not loose grip.**
- **Keep cords and hoses, not in use, out of the working area.**



- **Inspect all rigging daily for broken or frayed wires.**
- **Make sure that there are latches on all hooks.
Replace any missing latches.**
- **Use tag lines on all hoisted loads.**
- **Do not go under suspended loads.**
- **Before hoisting any loads, you must know the weight of the load(s).**
- **Only designated operators are allowed to use the equipment.**
- **Visual checks must be complete on the equipment prior to use.**
- **Keep your hands out of pinch points when landing loads.
Never stand in front of the load(s).**
- **Only one person will be designated to give the operator signals.**
- **Always be aware of where your hands, fingers, feet and other
Body parts are.**
- **Be aware of stored energy when prying materials during
stripping.**
- **When working in pairs, always communicate with your
co-worker, so that both of you know what each other is doing.**



2.0 BASIC SAFETY INSTRUCTIONS

2.1 GENERAL PROVISIONS

2.1.1

LEFFER machines are fabricated according to the latest technological developments and the recognized technical safety rules.

Nevertheless, undue application can cause risks to health and life of the user or third parties and/or damages to the equipment and other material goods.

To preclude such risks and avoid premature wear and overloading, it is indispensable to proceed in accordance with this operating manual.

2.1.2

This operating manual must always be on hand on the oscillator and accessible for the respective personnel.

WARNING

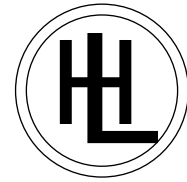
This is of particular importance with personnel who is not permanently working with the oscillator, such as maintenance staff!!

2.1.3

In addition to these operating manual, generally applicable legal and other mandatory provisions regarding the prevention of accidents and protection of the environment remain in force.

2.1.4

Devices relevant for safety must always be kept in good order, and these devices and corresponding recommendations must always be respected.



2.1.5

WARNING

Modifications, attachments to and reconditioning of the equipment, which tend to interfere with safety, are only permitted after written acceptance of the manufacturer.

2.1.6

Spare parts shall comply with the technical requirements laid down by the manufacturer.

This is always guaranteed with original spare parts. In case of queries, the data indicated on the nameplate are governing.

These data are important for procurement of spare parts.

2.1.7

Periods and intervals for inspections and examinations stipulated or indicated in the operating manual must be considered mandatory.

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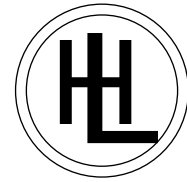
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2.2 PERSONNEL-RELATED PROVISIONS

WARNING

2.2.1

The oscillator must only be operated by the personnel assigned to and instructed for this work.

2.2.2

Ranges of responsibilities must be defined clearly.

2.2.3

Personnel to be taught, introduced or instructed, or undergoing general training shall only work on the oscillator under permanent supervision of a person experienced in handling the oscillator.

2.2.4

Work on the hydraulic system must only be carried out by persons having the knowledge required.

2.2.5

**Work on the electrical system must only be carried out by persons having the knowledge required.
Furthermore the special rules for work on electrical systems shall be considered.**

2.3 Operation-Related Provisions

2.3.1

The casing oscillator and pertaining power pack are exclusively intended for driving down or recovering casings of various diameters in accordance with the instructions given in this manual.

Any application different from or exceeding such provisions shall be deemed undue. The manufacturer will not be liable for damages resulting from undue application. Compliance with the operating instructions and the inspection and maintenance conditions also belong to the said due application.

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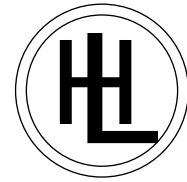
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WARNING

Any kind of work that is doubtful with regard to safety must be refrained from!

2.3.2

To ensure faultless operation of the equipment, a visual check must be performed every day before start of work. Special attention must be paid to damages and defects impairing safe operation.

For checking purposes it is indispensable to keep the equipment in a clean general condition.

2.3.3

In case of operating troubles the equipment must be shut down immediately and the appropriate professional personnel shall remedy the troubles.

2.3.4

NOTE

The manufacturer recommends to wear ear protectors when working close to the running power pack or crane for a longer time!

2.4 EXTRAORDINARY WORK, TROUBLESHOOTING AND MAINTENANCE ACTIVITIES

2.4.1

A workshop equipped adequately to the work to be performed is absolutely necessary to carry out maintenance and repair work.

2.4.2

As a matter of principle, only lubricants and hydraulic fluids of the specifications indicated shall be used.

When the machine is shut down for maintenance and repair work, it shall be secured against inadvertent restart.

If necessary, warning signs have to be put up.

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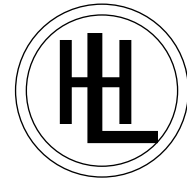
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2.4.3

In case of fire, the fire extinguishers of the respective carrier device shall be used. The operating personnel shall inform themselves about the location of these fire extinguishers before starting work. Fire extinguishers are subject to meticulous inspection intervals, which shall be complied with under any circumstances.

2.4.4

Where, for technical reasons, maintenance and repair work cannot be carried out when the machine is shut down, precautions shall be taken which are suitable to enable safe working.

In such cases the safety of the person carrying out the work shall be monitored by a second person who must have immediate access to an emergency stop switch. Communication between these two persons must be ensured.

2.4.5

When performing erection or installation work above body height, access equipment and working platforms to be provided for such purposes or otherwise ensuring safety.

2.4.6

When performing electric welding operations, disconnect the battery of the power pack or the crane – first the negative terminal, then the positive terminal.

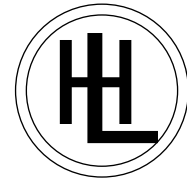
When reconnecting the battery, connect the positive terminal first.

Always attach the welding ground wire to the component to be welded in the vicinity of the welding area!

Before any welding is done near heat-sensitive components, these components must either be removed or be shielded from exposure to heat.

WARNING

Electric lines or hydraulic hoses that have been damaged during welding must be replaced immediately.



2.5 INFORMATION ABOUT PARTICULAR DANGERS (HERE: HYDRAULICS)

2.5.1

When working on hydraulic systems, a maximum of cleanness shall be ensured.

2.5.2

Any hydraulic fluid discharged or bleeding off shall be collected and disposed without polluting the environment.

2.5.3

Hydraulic hoses are subject to replacement intervals, which have to be complied with under any circumstances, even if no defects are visible.

2.5.4

Hydraulic components, although relatively small, transmit great forces. This fact causes heating up of the components under normal operating conditions. The temperature of the medium shall be permanently checked and must not exceed the manufacturer's specifications.

2.5.6

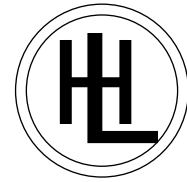
Hydraulic pipes, hoses and screwed couplings shall be regularly checked for leaks and externally visible damages. Damages shall be removed immediately. Squirting oil can cause injuries and fires.

2.5.7

Hydraulic system sections and pressure pipes that have to be opened shall be depressurized in accordance with the hydraulic circuit diagram before starting any repair work.

2.5.8

Pipe and install hydraulic pipework and hoses professionally, exclude squeezing. Do not mix up the connections! Fittings as well as length and quality of hydraulic hoses have to meet the manufacturer's requirements.



2.5.9

When laying the feed lines from the power pack to the respective machine, care shall be taken that the hose supports on the power pack are used correspondingly. If required, such support devices shall also be provided for the machine.

2.5.10

When using a power pack, the hydraulic hoses and electric cables shall be protected from running over.

If the oscillator is powered by a drilling rig, the hydraulic hoses and the electric cables must be layout carefully.

2.6 INFORMATION ABOUT PARTICULAR DANGER AREAS

2.6.1

When displacing the oscillator, particular attention shall be paid to provide sufficient clearance within the travelling route of the equipment.

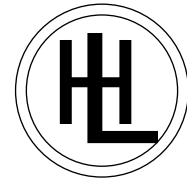
WARNING

During the boring procedure it is forbidden to stay within the turning radius of the crane or on the machine itself!

It is strictly prohibited to stand or sit on the machine during operation or transportation!

WARNING

The remote control cable must be fully extended and the operator has to operate clear off the machine!



2.7 DISPLACING AND TRANSPORTATION OF THE OSCILLATOR

2.7.1

When choosing the lifting device, mind the weight of the oscillator.
Only use lifting devices approved for the respective purpose.

2.7.2

If the oscillator is powered by a power pack, prior to any transport of the oscillator, all external feed and pressure hoses as well as electric wiring must be removed and transported separately.

2.7.3

Only use the specified sling points to attach the lifting device.

NOTE

The sling points are coloured marked!

2.7.4

During transportation of the oscillator on public roads, weight, height and width of the oscillator with respect to the respective provisions and regulations shall be taken into account. If necessary, exemptions shall be obtained accordingly.

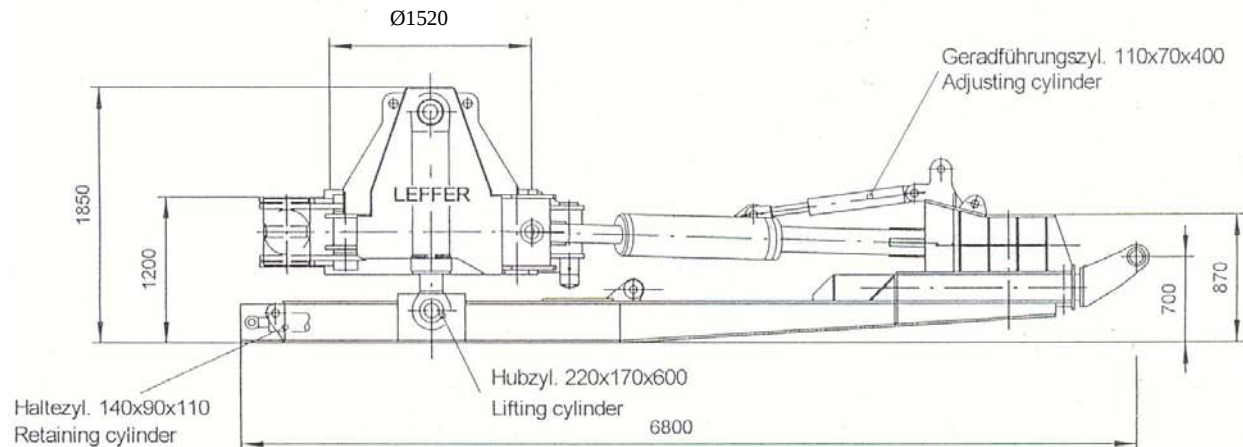
2.7.5

Parts removed for transport purposes shall be carefully re-installed and fixed before starting up again.

2.7.6

Re-starting shall be carried out in accordance with the manual.

3.0 DESIGN AN TECHNICAL DATA

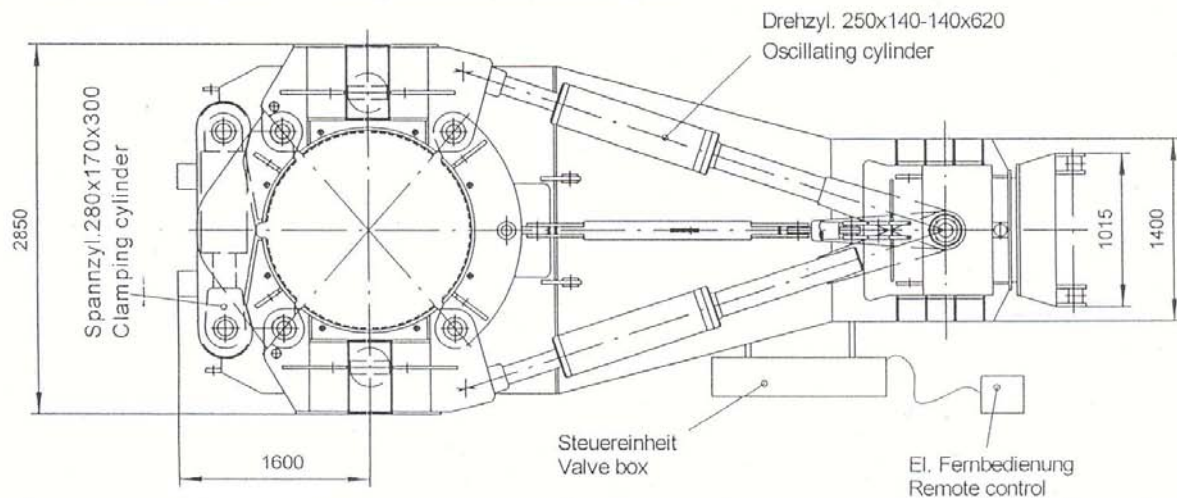


Grundfläche: 50000 cm²

max. Bodenpressung: 5,8 kg/cm²

ground surface: 50000 cm²

max. ground compression: 5,8 kg/cm²



The base frame is a stress relieved welded construction with holding fixtures for lifting cylinders, retaining cylinders (option) and the stabilator. Below the stabilator the excavator attachment arm is mounted in a rectangular guide box.

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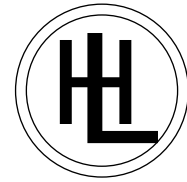
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The clamping collar is a stress relieved welded construction with holding fixtures for lifting cylinders, clamping cylinders, oscillating cylinders and the center rod.

Collar height	:	650 mm	25 ³⁹ / ₆₄ "
Lifting stroke	:	600 mm	23 ⁴¹ / ₆₄ "
Lifting force	:	2050 kN	460858 lbf.
Rotation angle	:	25°	
Clamping force	:	1660 kN	373033 lbf.
Retaining force	:	600 kN	148374 lbf.
Torque	:	2900 kNm	2138924 lbf-ft.
Overall length of machine	:	6800 mm	22' 3 ⁴⁷ / ₆₄ "
Overall width of machine	:	2850 mm	9' 4 ⁷ / ₃₂ "
Overall height of machine	:	1850 mm	6' ²⁷ / ₃₂ "
with upper casing guide	:	3220 mm	10' 6 ²⁵ / ₃₂ "
Total weight of machine	:	17 tons	37485 lb.
Operating pressure	:	270 bar (max. 300 bar)	3915 psi. (max. 4350 psi.)

4.00 OPERATING DESCRIPTION

The collar is divided into 5 segments.

It is opened and closed by a double acting hydraulic clamping cylinder.

stroke	:	300 mm	11 ¹³ / ₁₆ "
piston – Ø	:	280 mm	11 ¹ / ₃₂ "
rod – Ø	:	170 mm	6 ¹¹ / ₁₆ "

The oscillating movement is effected by two oscillating cylinders which are attached to the clamping collar by spherical bearings and to the center of the stabilator by a center bolt.

stroke	:	620 mm	24 ¹³ / ₃₂ "
piston – Ø	:	250 mm	9 ²⁷ / ₃₂ "
rod – Ø	:	140 mm	5 ¹ / ₂ "



The center rod which stabilizes the clamping collar is attached to the rear link of the clamping collar by a cardan joint and to the stabilator by the center bolt. To compensate the difference of length during oscillating, the stabilator is mounted movable to the base frame by two guiding blocks, which are also transferring the torque to the base and consequently to the excavator attachment.

The two lifting cylinders can be operated individually, to make it possible to adjust the casing to the right or left.

Both cylinders are equipped with spherical bearings on the piston and the rod - side. This design guarantees the full movability of the clamping collar during boring.

stroke	:	600 mm	23 ⁴¹ / ₆₄ "
piston- Ø	:	220 mm	8 ²¹ / ₃₂ "
rod- Ø	:	170 mm	6 ¹¹ / ₁₆ "

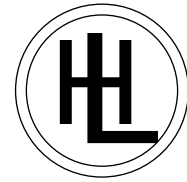
The stroke of the oscillating cylinders and so the oscillating angle is controlled by a 4/2-valve on the left hand oscillating cylinder.

The point of switching and so the stroke of the oscillating cylinders, is given by two stop ends. These stop ends are factory – set!

The base frame is equipped with a retaining device, which consists of two retaining cylinders and a ring segment.

These two retaining cylinder are operated simultaneous to press the ring segment onto the casing while the clamping collar is opened during extracting of casings.

stroke	:	110 mm	4 ²¹ / ₆₄ "
piston- Ø	:	140 mm	5 ¹ / ₂ "
rod – Ø	:	110 mm	4 ²¹ / ₆₄ "



5.0 ASSEMBLY GROUPS

Group

- 001 Base frame with lifting cylinder and center rod support
- 003 Excavator attachment
- 004 Clamping cylinder
- 005 Clamping collar 5 - link
- 006 Center rod with cylinder and walkway
- 007 Lateral rods I and II with cylinder
- 008 Stabilator
- 009 Hydraulic hosing

COMPONENTS SPECIAL DESIGN

- 011 Suspension 4-strand
- 012 Base frame sledge with retaining cylinder
- 055 Upper casing guide (option)
- 081 Cover
- 082 Valve box
- 091 Electric remote control with cable and stand
- 096 Inclinator (Option)
- 099 Hose unit with quick couplings

6.00 PAINTING

1 x prime coat and 1 x final paint coat RAL 1007 yellow

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7.00 SPARE PARTS FOR CASING OSCILLATOR

GROUP 001: BASE FRAME WITH LIFTING CYLINDER

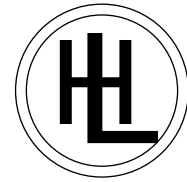
Item No.	Qty.	Description	Code No.	Dwg. No.
2	2	lifting cylinder type 220/170/600	021000113	4.40444 M1480.4
2.1	2	sealing kit		4.40444
3	2	bolt Ø 110 x 323	402000375	4.45981
9	2	cover	402000680	2.46037
16	1	bolt Ø 70 x 310	402000681	2.46037
82	2	half-ring	402000508	4.45987

GROUP 003: EXCAVATOR ATTACHMENT

Item No.	Qty.	Description	Code No.	Dwg. No.
42	2	bolt Ø 100 x 250	402000581	1.47150
43	2	screw M12x45	016000763	DIN 933

GROUP 004: CLAMPING CYLINDER

Item No.	Qty.	Description	Code No.	Dwg. No.
61	1	clamping cylinder type 280/170/300	021000114	4.40443 M1481.8
61.1	2	sealing kit		4.40443
62	1	bolt Ø 140 x 580	402000668	4.45974/1
63	1	bolt Ø 140 x 480	402000516	4.45975/1
64	2	spacer-ring	402000517	4.45976
66	2	half-ring	402000518	4.47131
67	2	ring	402000519	4.47132



GROUP 005: CLAMPING COLLAR 5-LINK

Item No.	Qty.	Description	Code No.	Dwg. No.
76	4	bolt Ø 110 x 375	402000502	4.45981
77	2	bolt Ø 125 x 687	402000503	4.45982
78	2	bolt Ø 125 x 620	402000504	4.45982
79	1	bolt Ø 90 x 435	402000505	4.45984
80	2	bolt Ø 80 x 400	402000506	4.45985
82	4	half-ring	402000508	4.45987
83	4	half-ring	402000509	4.45988
84	4	ring	402000510	4.45989

GROUP 006: CENTRE ROD / CYLINDER

Item No.	Qty.	Description	Code No.	Dwg. No.
154	1	adjusting cylinder type 110/ 70/400	021000163	4.40440 M1478.6
154.1	1	sealing kit		4.40440
155	1	bolt Ø 85 x 146	402000528	1.46962
156	1	bolt Ø 85 x 146	402000529	1.46962
157	2	half-ring	402000531	1.46962
158	2	ring	402000532	1.46962
159	1	bolt Ø 60 x 168	402000533	4.47287
160	1	bolt Ø 60 x 132	402000534	4.47288
169	2	ring	402000538	4.47285
170	2	half-ring	402000539	4.47286

GROUP 007: LATERAL RODS I AND II WITH OSCILLATING CYLINDERS

Item No.	Qty.	Description	Code No.	Dwg. No.
173	2	oscillating cylinder type 250/140/620	021000124	4.44876 M4041
173.1	2	sealing kit		4.44876
177	2	skid-block	013000148	
178	1	spherical bearing	021000169	GE110FO

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GROUP 008: STABILATOR

Item No.	Qty.	Description	Code No.	Dwg. No.
196	2	skid-block	402001261	1.47657
222	1	bolt Ø 110 x 312	402000556	1.46965A
225	1	cover	402000557	1.46965A
226	4	spacer	402000559	1.46965A

GROUP 009: HYDRAULIC HOSE ACCESSORIES

GROUP 011: SUSPENSION 4-STRAND

GROUP 012: BASE FRAME SLEDGE WITH RETAINING CYLINDER

Item No.	Qty.	Description	Code No.	Dwg. No.
21	2	retaining cylinder type 140/90-110	021000134	4.47587
21.1	2	sealing kit		4.45957
44	2	bolt Ø 60 x 288	402000639	4.47636
45	2	cover	402000641	4.47637
50	2	bolt Ø 60 x 165	402000643	4.47643
52	2	half-ring	402000645	4.47640

GROUP 055: UPPER CASING GUIDE (OPTION)

GROUP 081: COVER

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GROUP 082: VALVE BOX DWG. 1.45709

Item No.	Qty.	Description	Code No.
1	1	control valve VDP 24 DD-274	015000638
2	1	control valve VDPR 24 CCC- 275	015000637
3	1	control valve VDSP 25 D – 265	015000646
4	2	check valve RHD 38-S 2 bar	015000379
5	2	check valve RHD 30-S 0,5 bar	015000377
6	1	check valve RHD 16-S 0,5 bar	015000374
7	1	pressure relieve valve VPR 10-B-231 R 1/2"	015000048
8	1	pressure gauge 0 - 100 bar	015000676
9	4	pressure gauge 0 - 400 bar	015000677
11	2	accumulator 0,5 l 170 bar	015000654
12	2	double check valve VBSO-DE-NA-34-35	015000329
13	2	restrictor check valve 9 F 1200 - S R 3/4"	015000045
17	2	base plate MSP-6-D23-B-9-10 R 3/8"	015000200
18	5	hand lever valve D1DL4CN	015000144
19	5	pilot valve NG6/24V/D1VW004CNJW	015000189
20	2	pilot valve NG6/24V/D1VW004ENJW	015000190
21	1	hand lever valve D1DL4SN	015000143
22	2	base plate MSP-D23-B-9-10 R 3/8"	015000007
23	1	hand lever valve D1DL20DN	015000142
24	2	SAE flange AFS 106-GU 1 1/2"	015000068
25	3	SAE flange AFS 104-GU 1 1/4"	015000078
26	11	shuttle valve type WV - 10S	015000386
27	1	control valve VS 16-S-252 R 1"	015000057

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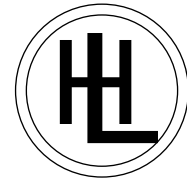
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GROUP 091: ELECTRIC REMOTE CONTROL WITH CABLE AND TRIPOD

GROUP 096: INCLINOMETER (Option)

GROUP 099: HOSE UNIT WITH QUICK COUPLINGS

6 pieces:

2 x NW 32/4 - 4 m ~ 13 ft., SKS7 DN32 CES, code-no.: 015000187

2 x NW 25/4 - 4 m ~ 13 ft., SKM7 DN25 CES, code-no.: 015000174

1 x NW 12/2 - 4 m ~ 13 ft., SKS3 DN12 CES, code-no.: 015000179

1 x NW 12/2 - 4 m ~ 13 ft., SKM3 DN12 CES, code-no.: 015000162

8.0 INSTRUCTIONS FOR MAINTENANCE AND OPERATIONN

- 8.1 The remote control**
- 8.2 Maintenance**
- 8.3 Setup and operation**
- 8.4 Boring procedure**
- 8.5 Special instructions**
- 8.6 Pressure settings**

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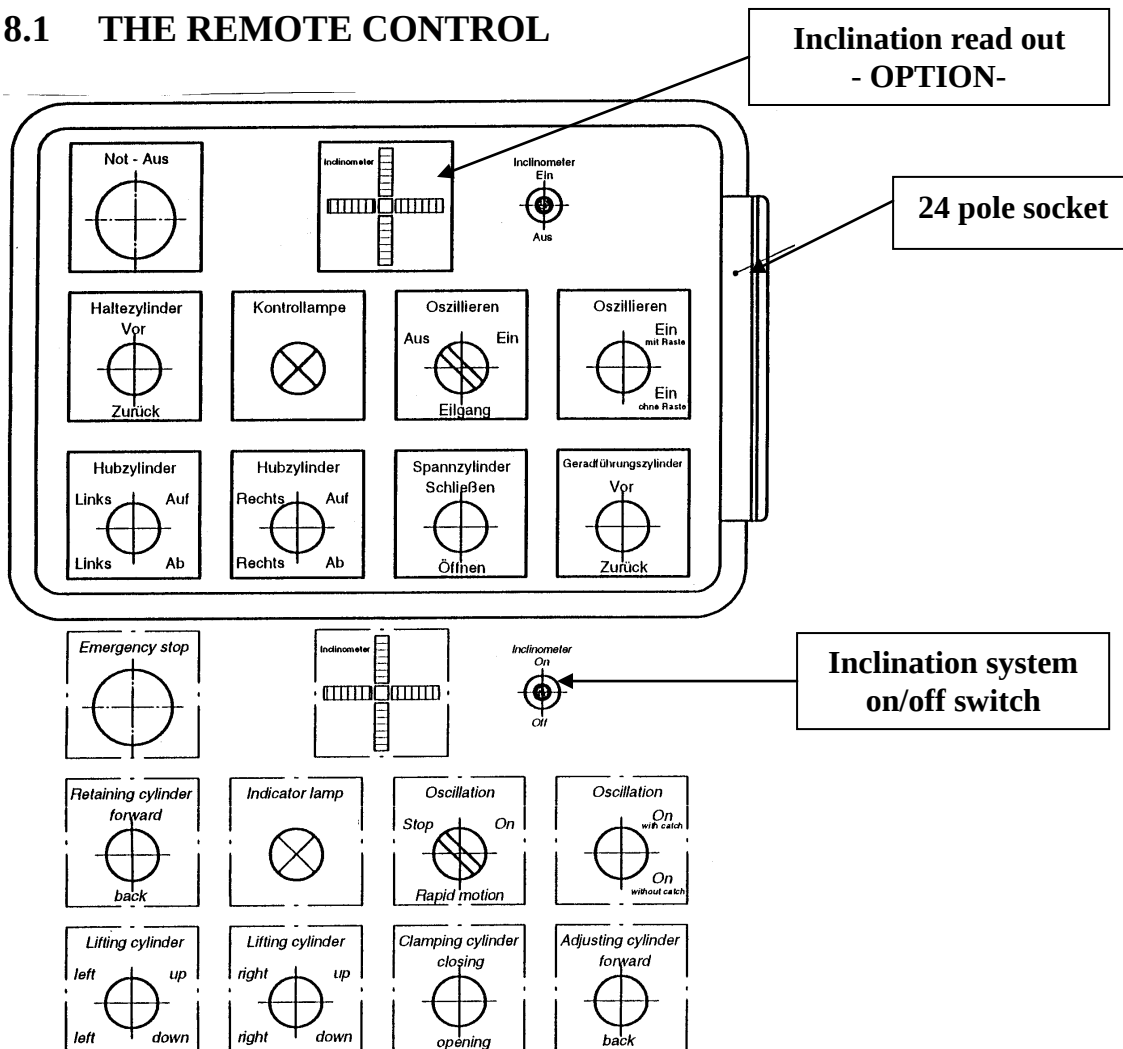
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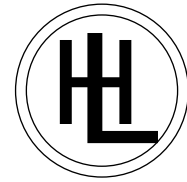
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8.1 THE REMOTE CONTROL



- By pressing the *emergency stop switch* (part-no. ZB2BS944/ZB2BZ105), the control voltage to the solenoid valves will be cut off, or, if a power pack is used, the engine of the power pack will be shut down.
- The *retaining cylinder switch* (part-no. XD2AC221) has two spring loaded positions, to open and to close the retaining device. If the switch is released, it returns to neutral. This switch also operates the upper casing guide, if the 3-way valves in the back of the hydraulic valve box are set to the respective direction. If the switch is pushed forward, the upper casing guide moves forward. If the switch is pulled backward, the upper casing guide moves backward.

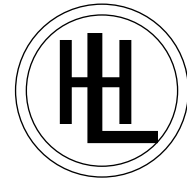


- The *indicator lamp* (part-no. XB2BZ105) shows the orderly condition of the electric system
- The *oscillating rapid motion* (part-no. XB2MD11) switch stays in position after being activated.
In conjunction with the *oscillation* switch, the oscillating speed will be increased by 100 %. To activate this function, turn the switch clockwise.

NOTE

If *oscillating rapid motion* is activated, all other functions (clamping, retaining/upper casing guide, lifting, adjusting) are not supplied with hydraulic oil and will not react, if being switched on! Deactivate *oscillating rapid motion* to get full pressure on the remaining functions!

- The *oscillation* (part-no. XD2AC331) switch has one spring loaded and one fixed position.
To increase the oscillating speed permanently or only for a short time, switch to the respective position.
- The two switches for the left and right *lifting cylinder* (part-no. XD2AC221) are spring loaded.
Pushing the switches forward extends the cylinders, pulling them backward, retracts the cylinders.
If the switches are released, they return to neutral.
- The *clamping cylinder* (part-no. XD2AC221) switch has two spring loaded positions, to open and to close the clamping collar.
Pushing the switch forward, closes the clamping collar, pulling it backward, opens the clamping collar.
If the switch is released, it returns to neutral.



- The *adjusting cylinder* (part-no. XD2AC221) switch operates the cylinder underneath the center rod.
If the switch is pushed forward, the clamping collar and so the casing, moves forward.
If the switch is pushed backward, the clamping collar and so the casing, moves backward.

NOTE

To prevent the cylinder from getting damaged during the oscillating movement of the machine, the cylinder will not stay in position after the switch has been released!

To adjust the verticality of the casing, the adjusting cylinder needs to be activated several times!

NOTE

**Only for emergency reasons, the oscillator is equipped with manual controls!
It is strictly forbidden to operate the oscillator via the manual controls, while the crane is working!**

Pressure Gauges (valve box)



1

2

3

4

5

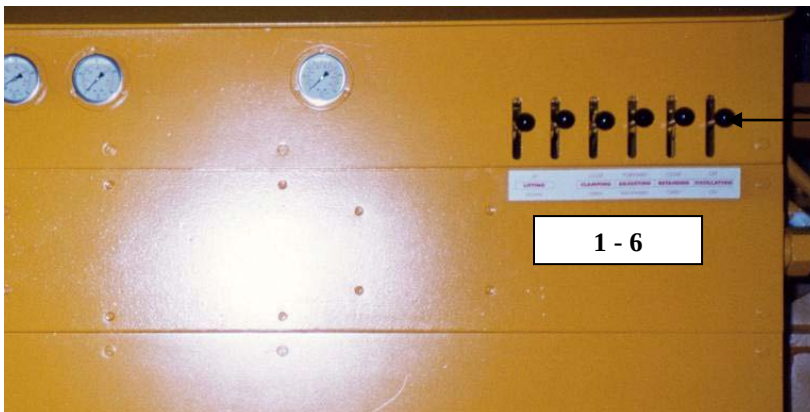
1. main pressure P1

3. hydr. pressure retaining cylinder

2. main pressure P2

4. hydr. pressure clamping cylinder

5. pilot pressure



Manual controls

1 - 6

Function of control levers on valve box (from left to right.)

Lever 1 + 2: lifting cylinder

1 = cylinder left up

2 = cylinder left down

3 = cylinder right up

4 = cylinder right down

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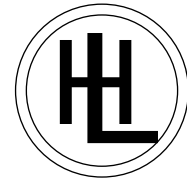
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Lever 3: clamping cylinder
5 = closed
6 = open

Lever 4: adjusting cylinder
7 = forward
8 = backward

Lever 5: retaining cylinder
9 = closed
10 = open

Lever 6: oscillating cylinder

8.2 MAINTENANCE

As it is inevitable during boring work that the oscillator is heavily dirtied, it is very important to clean the oscillator periodically.

Cleaning of the clamping wedges between the wear strips is particularly important. This shall preferably be done with a high-pressure washer.

If it is inevitable that the machine will get in contact with concrete, cement-containing water or mud, protect the whole machine with a suitable separating agent before starting work.

NOTE

Never use sharp-edged tools or scouring agents to clean cylinder rods!

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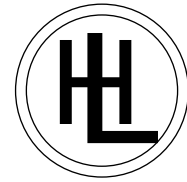
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Each day, before starting work

- check of fuel level at the inspection glass at the diesel tank or at the fuel gage of the power pack.
- check of hydraulic fluid level at the inspection glass at the rear of the hydraulic tank.
- check of lube oil level in the engine.
- check for any leaks.
- check for any damages.
- check all quick couplings; make sure they are tight

Grease the machine at least once a week.

WARNING

If anything seems to be in less than a perfect condition, immediate actions must be taken!

Immediately repair any defects found!

Once a week check

- the contamination indicators of the hydraulic filter.
- the distilled water level of the batteries.
- the cooling water level

WARNING

Smoking and the use of naked flames are prohibited while the conditions of the batteries are checked!

NOTE

If excessive contamination of the filter was found, the reasons shall be found and all the hydraulic fluid be changed!

If required, the whole system shall be flushed with hydraulic oil!

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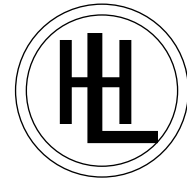
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According to the oscillator load, but every **2500 hours** change all hydraulic fluid and the hydraulic filter element of the power pack.

We recommend changing the oil for the first time after **500 hours**.

NOTE

In addition (if no power pack is used) comply with the carrier manufacturer's care and maintenance instructions!

8.3 SETUP AND OPERATION

8.3.1

For erection of the oscillator, a horizontal level of $\sim 20 \text{ m}^2$ ($\sim 215 \text{ sqft.}$) shall be prepared at the pile drilling site. Horizontal erection of the oscillator facilitates perpendicular drilling of the hole and prevents the moving collar from tilting while closing. With the great forces developing when closing the collar, tilted closing will cause damages and/or constriction of the casings.

8.3.2

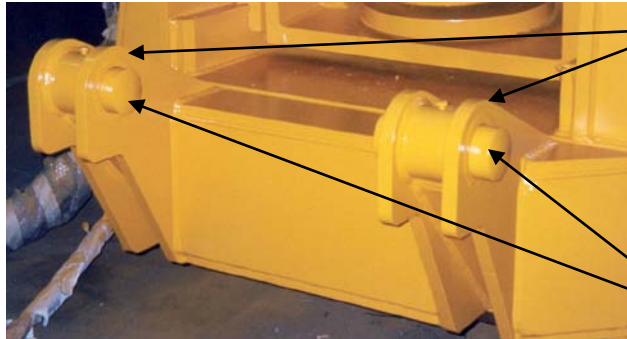
The support formation of the oscillator must have sufficient load-bearing capacities. Uncontrolled caving underneath the machine during drilling or extracting of casings may cause damage to the steelwork and to the hydraulic cylinders.

If the necessary load-bearing capacity appropriate to the lifting forces of the oscillator (max. $5,8 \text{ kg/cm}^2 \sim 11880 \text{ lbs/sqft}$) cannot be achieved, a suitably sized steel mattress shall be used to support the machine on the ground.

8.3.3

NOTE

Make sure that for the following procedure the oscillator and the crane are standing on leveled ground!



Oscillator attachment
points

Pins

Drive the crane slowly towards the oscillator, so that the brackets, mounted on the undercarriage of the crane, are in alignment with the attachment points of the oscillator.

Attach 2 strands of the lifting device to the rear lifting points of the oscillator.

Lift the oscillator, so that the pins of the attachment points are above the brackets.

Move the crane forward until the pins are in alignment with the slots in the brackets.

Lower the machine and let the pins slide into the brackets.

WARNING

Do not run the hydraulic lines coming from the valve box of the oscillator over!

WARNING

To give signals the operator of the carrier, never stand between the carrier and the oscillator!

Stay outside the zone, where the tracks are going to drive!

When checking the position of both machines, always stop the carrier!

Never check the alignment of bores with your fingers!

Connect the hydraulic lines and the electric cable to the respective ports at the crane or the power pack and the remote control.

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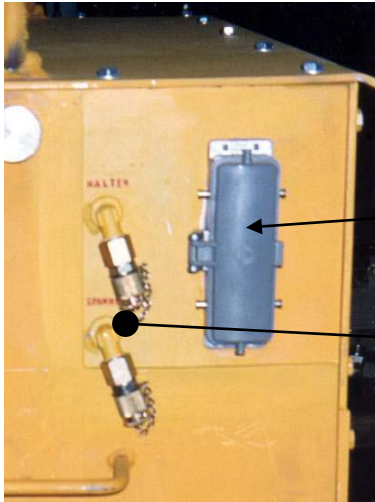
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Remote control cable socket
on the oscillator valve box

Test ports to be connected
to the remote control

WARNING

**Quick dis-connects must be fully seated to allow free hydraulic flow!
Blocked hydraulic flow will stop or slow operations and cause excessive heat or even destroy hydraulic valves which can cause bodily injury or death!
All coupling parts must be free of dirt and water!
Do not use excessive power to tighten the couplings!**

8.3.4

The oscillator shall be erected exactly on the drilling point by means of meticulous measuring.

Adjustment of the casing is effected by the individually controllable lifting cylinders in transversal direction and with the adjusting cylinder/upper casing guide in longitudinal direction.

Before the casing is stabilized in the ground, adjustment work must be completed.

8.3.5

As soon as 150 bar operating pressure for oscillation have been exceeded, the use of the rapid oscillating motion is no longer permitted!

8.3.6

Re-adjustment of a casing already driven in by several meters and which is stabilized in the ground is not permitted.

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WARNING

Under no circumstances, the casing stabilized in the ground shall be re-adjusted by displacing the oscillator by means of the crane!

8.3.7

The oscillator is to be operated from the remote control inside the tripod. The remote control and the tripod must be arranged outside of the slewing range of the crane.

WARNING

Mind the tools coming out of the casing during drilling!

8.3.8

NOTE

**The oscillator was shipped with the clamping collar in alignment with the base frame by having the clamping collar pressed onto wooden blocks!
Do not start operating without having a casing inserted to the oscillator first!**

- Open the clamping collar by “opening” the clamping cylinder.
- Insert the starter casing.
- Extend both lifting cylinder to the full stroke of 600 mm / 23 ³/₄”.
- Close the clamping collar.
- Switch on the oscillating motion.
- Drive down the casing by retracting the lifting cylinders simultaneously.

NOTE

**To drive down the casing, use only a stroke of 150 mm ~ 6”!
Never retract the lifting cylinders uneven for more than 100 mm ~ 4”!**

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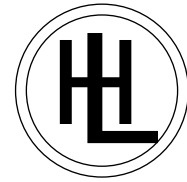
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- Adjust the casing, if necessary, as described before.
- Stop the oscillating motion, once the lifting cylinders are retracted completely.
- Open the clamping collar.
- Extend the lifting cylinders to their full stroke.
- Close the clamping collar and repeat the steps described before.

NOTE

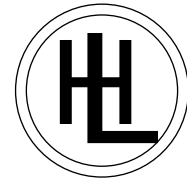
Under no circumstances, the full cylinder stroke of 600 mm $\sim 23 \frac{3}{4}$ " shall be used to push down the casing, because this would bring about constraints and damages to the steelwork and lifting cylinders of the oscillator!

8.3.9 Special action with inclined piles:

Without additional provisions, the hydraulic oscillator is not suitable for the production of inclined piles. Pile inclination of max. 6° to the front and 8° to the rear is feasible, if either the drilling level is prepared or if a suitably wedge-shaped drilling mattress (special oscillator accessories) is used or if the oscillator is equipped with an upper casing guide.

Additionally, a universal joint (special oscillator accessories) has to be used as a linking point of the oscillator to the drilling rig or the crane if the inclination should be achieved sideways.

With inclined piles, the stroke of the oscillating cylinders shall be reduced by approx. 150 mm (~ 6 "). For this purpose, the stop ends of the 4/2-way valve on the left-hand oscillating cylinder shall be re-arranged accordingly.



8.3.10

NOTE

After a pile has been finished and before the last casing (starter casing) is lifted out of the machine, open the clamping collar, with the casing attached to the drilling rig or the crane, place wooden blocks between the clamping collar and the base frame and press the clamping collar into the blocks by retracting the lifting cylinders!

This procedure ensures a perfect alignment of the clamping collar and the base frame!

8.4 BORING PROCEDURE

8.4.1

Drive the bottom casing 2 m – 6' 6" deep into the ground and check the vertically permanently, as required by specification.

8.4.2

Drive bottom casing down by 2 m – 6' 6" more and check verticality.

8.4.3

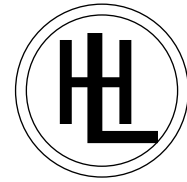
Install the 1st casing and drive it down by approx. 4 m – 13' 1,5" more and check verticality.

Now a total of approx. 8 m – 26' 3" of casing has been driven down and verticality is achieved and stabilized.

8.4.4

Pull the casing column back by approx. 400 mm – 15 ¾" and drive it back in.

Repeat this procedure every 2 m – 6' 6" in order to release cuttings and to reduce the friction on the casing column and to prevent the pile from running out vertically.



8.4.5

Excavation by means of a drilling rig or a hammer grab is effected continually. Depending on the hardness of the soil, excavating should be started, after the casing has been driven down approx. 2 – 3 m – 6' 6" – 10'.

The drive down/pull back movement (pumping action) will loosen the soil, so that the tools used for excavation can easily penetrate.

8.4.6

Install the 2nd casing and continue as described before.

8.4.7

As soon as the cutting shoe of the starter casing hits hard rock, proceed in accordance with drawing no. 4.46690.

8.5 SPECIAL INSTRUCTIONS

8.5.1

Do not try to form a core of more than 200 mm ~ 8" without excavating. This will only cause a high torque, unnecessary wear and tear, high temperatures and fuel consumption without increasing the drilling progress.

8.5.2

During drilling, try to release as much cuttings as possible, accumulated between casing wall and rock wall.

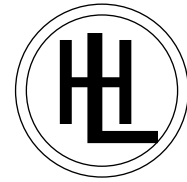
8.5.3

When driving down the casings, do not exceed 200 bar – 2900 psi for oscillating. Otherwise it may become impossible to extract the casings after concreting.

8.5.4

When driving down the casings, using oscillating rapid motion, do not exceed an oscillating pressure of approx. 150 bar – 2175 psi as indicated on the hydraulic pressure gauge.

If a higher oscillating pressure than 150 bar – 2175 psi must be used, switch off the rapid motion!



8.5.5

When using a power pack, make sure, the hydraulic temperature (inside the hydraulic tank) does not exceed 70 °C – 158 °F.

8.6 PRESSURE SETTINGS (For Different Casing Diameter) (Clamping, Oscillating, Lifting - and Retaining)

<u>Casing diameter</u>	<u>Max. pressure setting</u>
1500 mm ~ 4' 11"	270 bar - 3915 psi
1200 mm ~ 3' 11 ¹ / ₄ "	250 bar - 3625 psi
1000 mm ~ 3' 3 ³ / ₈ "	200 bar - 2900 psi
800 mm ~ 2' 7 ¹ / ₂ "	170 bar - 2465 psi

9.0 DESCRIPTION AND FUNCTION OF HYDRAULIC COMPONENTS acc. to dwg.-no. 1.45709

The entire machine is controlled by open hydraulic circuits.

The main control valves (item 1, 2 & 3) are controlled hydraulically over electrical.

This means, that the solenoid valves (item 19, 20) are activated by 24 vdc via remote control. These solenoid valves again control the pilot pressure (~35 bar – 500 psi, inlet P3).

This pilot pressure again is used to switch the main control valves (item 1, 2 & 3) as well as the rapid motion valve (item 27).

To control the oscillating motion, the valve (item 22/23), located at the left hand oscillating cylinder, provides pilot pressure to the oscillating valve (item 3) when activated by the remote control and solenoid valve item 20.

The pilot pressure has to be ~ 35 bar - 500 psi and is controlled by the overload valve (item 7). The pilot pressure can be read out at gage item 8.

The gages, item 9, are indicating the main pressure needed to run the functions lifting, clamping, retaining (upper casing guide), adjusting and oscillating.

To ensure, that the clamping cylinder and the retaining cylinders are kept in their “closed” position, one double check valve (item 12) in each circuit, has been installed in conjunction with a pressure accumulator (item 11), which compensates minor oil losses.

40-010137

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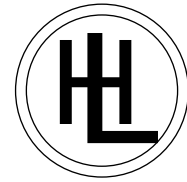
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Bankverbindungen:
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Nr. 5182-001 (BLZ 590 500 00)
Bayerische Hypo- und Vereinsbank AG, Mannheim
Nr. 7 002 580 (BLZ 670 201 90)

Handelsregister Saarbrücken HRB 4398 · Geschäftsführer: Hans G. Leffer, Georg Leffer



To make the two main circuits, lifting, clamping, adjusting, retaining on one side and oscillating on the other side working independently both circuits are independently supplied with hydraulic oil (P1, P2).

In "rapid motion" (valve item 27) the oil-volume of both circuits are added together to get the maximum oscillating frequency.

NOTE

Most problems with the oscillator occur after the machine was reconnected to the crane or the power pack!

In such cases, make sure, that the pilot pressure supply is connected properly and that the control voltage (24 vdc) is indicated by the control lamp at the remote control!

WARNING

Never mix up the hydraulic lines going to the power pack or the crane!

10.0 DRAWINGS

Dwg.- No. 4.46690	Cutting of hard rock procedure
Dwg.- No. 0.48614	Lubrication
Dwg.- No. 0.48613	General layout
Dwg.- No. 4.48925	Hydraulic piping
Dwg.- No. 3.47742	Electric circuit
Dwg.- No. 1.45709	Hydraulic circuit
Dwg - No. 4.44876	Oscillating cylinder
Dwg - No. 4.40443	Clamping cylinder
Dwg - No. 4.40444	Lifting cylinder
Dwg - No. 4.47587	Retaining cylinder
Dwg.- No. 4.40440	Adjusting cylinder

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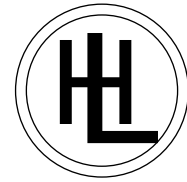
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11.0 WARRANTY

Hans Leffer GmbH guarantees for the period of 12 months or for 2000 working hours (whatever occurs first) from the day of completed commissioning, that the machine is free of defects resulting from design, material and/or manufacturing.

If the machine is going to show defects in design, material and/or manufacturing during the warranty period while used regularly, the defect will be corrected at the manufacturer's discretion.

Regularly use of the machine also means that all service- and maintenance intervals are observed and that the machine is used in accordance with the instructions given in the manual.

If the manufacturer repairs the machine during the warranty period, the warranty for repaired/replaced parts or sections of the machine, will be prolonged for maximum 6 months.

If during the repair of the machine, machine parts are to be replaced and therefore disassembled, all disassembled parts will become the property of Hans Leffer GmbH. Parts like motors, pumps, valves, cylinders and electrical / electronical devices, whether they are apparently defective or not, must not be opened for inspection, alteration or repair.

In these cases Hans Leffer GmbH reserves the right to declare the warranty null and void.

Components may only be opened with prior written authorization from Hans Leffer GmbH and claims will only be accepted if sufficient evidence of the defect in question is sent to

Hans Leffer GmbH.

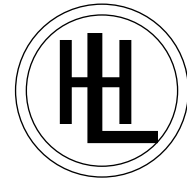
Hans Leffer GmbH reserves final judgment on all such cases.

Above mentioned items shall be returned to Hans Leffer GmbH only with prior acceptance from Hans Leffer GmbH. It is the buyer's responsibility to return the components under warranty freight pre-paid for inspection.

If the component found to be defective, it will be replaced or repaired free of charge.

Components without the original factory seals or which were opened without the agreement of Hans Leffer GmbH, will not be accepted.

The warranty is limited to the replacement or repair of defective products and does not include labor, consumables or other costs incurred in removing, dismantling or re-installing such items.



A. Inspection on site

Parts like motors, pumps, valves, cylinders and electrical / electronical devices, whether they are apparently defective or not, must not be opened for inspection, alteration or repair.

In these cases LEFFER reserves the right to declare the guarantee null and void.

Components may only be opened with prior written authorization from LEFFER and claims will only be accepted if sufficient evidence of the defect in question is sent to H. LEFFER.

H. LEFFER reserves final judgment on all such cases.

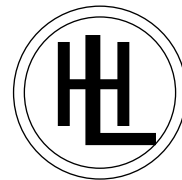
B. Return under warranty

Above mentioned items shall be returned to H. LEFFER only with prior acceptance from H. LEFFER. It is the buyer's responsibility to return the components under guarantee freight pre-paid for inspection.

If the component found to be defective, it will be replaced or repaired free of charge. Components without the original factory seals or which were opened without H. LEFFER's agreement, will not be accepted.

C. Exclusions

The guarantee is limited to the replacement or repair of defective products and does not include labour, consumables or other costs incurred in removing, dismantling or re-installing such items.



12.0

EC-DECLARATION OF CONFORMITY as defined by Machinery Directive 98/37/EG

We herewith declare that the supplied model of Casing Oscillator

Type	:	VRM 1520/900 HD
Date of Construction	:	10/2007
Job no.	:	11-002633
Total Weight	:	17 to

complies with the following provisions applying to it
89/392/EEC amended by directives 91/368/EEC + 93/44 EEC +
93/68 EEC

Applied harmonized standards, in particular

DIN EN ISO 12100-1/2
EN 791
EN 996

Applied national technical standards and specifications, in particular

/

The design of this machine is identical to the casing oscillator of the same type
brought for registered design model examination before the

PRUEF -und ZERTIFIZIERUNGSSTELLE DES FACHAUSSCHUSSES
TIEFBAU

Landsberger Strasse 309, 80867 München

(Examination and Certification Authority of the Committee of Experts for Foundation Work)

STAHL - UND APPARATEBAU
HANS LEFFER GmbH & Co. KG

Ralf-G. Poschke
TB.-Masch.-Bau

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