



**MANUAL FOR THE USER**  
**OF**  
**TREE SPADE OPTIMAL 850**  
**TYPE 851F4AE**

**Manufacturer:**

**Optimal-Vertrieb Opitz GmbH**  
**Eysoelden M 41**  
**91177 Thalmaessing**  
**Germany**

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**Serial Number**

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## **WARNING**

**Operator must have read and understood instructions before running the tree spade. Untrained operators can cause injury or death.**



### **Safety Alert Symbol:**

This symbol is used for important safety messages. When you see this symbol, follow the message to avoid personal injury or death.



Never use tree spade without instructions. See machine signs (decals), and Operation & Maintenance Manual of tree spade. The operation instructions for power unit must be followed.



Before starting operations, bolts and hydraulic fittings must be checked to make sure they are free of damage and well tightened. Defective or loose hose pipes might cause serious injuries and therefore must be replaced immediately.



The operator is responsible for ensuring that no person is near the tree spade when in operation.



No one should be underneath the raised tree spade or near shearing and pinching areas, or near any hydraulic components. We are advising the user that due to their functional positions and movements the danger areas cannot be furnished with protective guards.



Keep bystanders well away from work area.



Do not perform any manual work on the tree or shrub when it is inside the tree spade. In particular, do not check the position of the tree or shrub by hand or feet when it is inside the tree spade. Do not tie the tree or shrub when it is near or inside the machine.



When sight is limited, an assistant should direct the operator by hand signals.



When driving, the tree spade should be in the lowest possible position. When moving and working on public roads, the traffic rules and regulations must be adhered to.



Never leave power unit with engine running or with lift arms up.



To park, engage parking brake and put tree spade flat on the ground.



When doing cleaning, maintenance or repair work, lower the tree spade to the ground and stop the engine of the power unit.



Never modify equipment. Use only original spare parts approved by manufacturer for this particular model tree spade.

## **1. Operating Specifications**

**Description of machine** Tree Spade Optimal 850

**type** 851F4AE

**serial number** 850

**capacity** upper root ball diameter 85 cm / 33"  
root ball depth 60 cm / 23"

**dimensions of basic machine** working height 143 cm / 56"  
working width, gate closed 108 cm / 43"  
working width, gate open 155 cm / 61"  
clearance between open gate 70 cm / 28"

**weight** basic machine, empty 490 kg / 1078 lbs.

**rated type of attachment** attachment by means of back plate to wheel loader or excavator

minimum tipping load 2300 kg / 5060 lbs.

the power unit must be equipped with an auxiliary double-acting hydraulic circuit for implements:

working pressure 160-200 bar/ 2286–2857 psi  
oil flow 40 l/min. / 11 gpm

**controls** 4 electro-hydraulic valves, double-acting, actuated by a rotary switch or joystick

**other features** adjustable feet  
4 concave spades

**field of application** tree nurseries; tree farms; gardens; civic greens

## **Assembly**

**IMPORTANT:** When doing assembly work, heed relevant instructions of manufacturer of power unit !

**Never work under raised tree spade !**

**When you get the hydraulics started, heed all safety precautions expounded under section 3. and 4. !**

### **2.1 Back Plate**

The tree spade is attached to the power unit by means of a back plate. The back plate is procured from the manufacturer of the power unit, or it might be fabricated according to the drawings and the instructions of the manufacturer of the power unit.

The back plate is to be furnished with borings as per drawing page 12. At these points the tree spade is bolted tightly to the back plate.

### **2.2 Rear Stabilizers**

If the power unit is to be furnished with rear stabilizers, fasten stabilizers to the loader. Mounting instructions of manufacturers must be adhered to.

If rear stabilizers are to be controlled by Optimal valve bank, the two supply lines must be connected to the free ports of the valve marked (by cast-in) "A" and "B". The lines are to be run to the lines for the rear stabilizers, and connected by push-on couplings.

### **2.3 Installation of Electro-Hydraulic Control**

2.3.1 Install rotary switch at suitable and dry location in the power unit, e.g. on the instrument panel, as shown on drawing page 13.

Run 5-conductor cable from switch to socket, following the path of the auxiliary hydraulic line on the boom.

Install 5-pole socket next to hydraulic dis-connect of hydraulic circuit of the power unit.

Run 2-pole cable from switch and connect it to power supply of power unit, brown wire to ground, blue wire to +12V.

The tree spade is now ready for operation.

### **2.3.A      Installation of Joystick (Optional)**

The joystick is secured to the right control stick of a skid steer by means of the clamp included. The small hole may need to be enlarged to the diameter of the control stick. For other loader types attach the joystick directly to the auxiliary hydraulic control lever.

All other installation instructions follow 2.3.2 – 2.3.4.

## **Putting into Service**

The tree spade with the back plate is attached and secured to the lift arms of the of the power unit.

The hydraulic hoses are connected to the push-on couplings of the auxiliary hydraulic circuit of the power unit. If applicable, the hoses of the rear stabilizer control are also coupled together.

The plug of the electric control cable of the tree spade is plugged into the socket and installed inside the power unit (see section 2.)

When the blades do not move smoothly, it is because of dry guide faces. Grease the guides properly and run the blades often enough up and down until they run smoothly. For greasing, please refer to section 5.2.

**IMPORTANT:** When operating the power unit, follow instructions of operating manual of power unit !

## **Operating Instructions**

**IMPORTANT:** It is the operator's prime duty to ensure that persons stay clear of the danger area, i.e. in particular below the raised machine or near the potential pinching and shearing area of the gates and the spades !

When sight is limited, an assistant should direct the operator by hand signals.

Each day before starting operations, bolts and hydraulic fittings must be checked to make sure they are free of damage and well tightened !

## **The Controls**

The electro-hydraulic controls are arranged as follows:

Selector Switch	Joystick (optional)	Work Movement	Control Valve (actuated by <u>Manual Lever or Pedal</u> )
function 1:	T3	gate Lock	unlock / lock
function 2:	T5	gate	open / close
function 3:	T4	blades	up / down
(function 4:	T6	stabilizers	up / down)

The function required is preset by the rotary switch and then activated by the auxiliary hydraulic control valve.

## **Operation**

The Operator must be a reliable person. Before commencing production work, he or she must study these present operating instructions thoroughly.

The following safety instructions must be observed:

Nobody should be near the shearing and pinching areas when the tree spade is in operation.



Do not bind the tree or shrub when it is near or inside the machine.

Do not perform any manual work at the tree or shrub when it is inside the tree spade. In particular, do not check the position of the tree or shrub by hand or feet when it is inside the tree spade.

- 4.2.1 First lower the tree spade with the lift arms of the power unit until the points of the blades are about 20 cm / 8" above the ground.

Preset function 1 "gate lock" on selector switch and activate "unlock" with auxiliary hydraulic control valve.

Then preset function 2 "gate" on switch and activate "open" with control valve.

Now the gate is open. Drive towards the tree you intend to dig until the tree is positioned in the center of the main frame.

Preset function 2 "gate" and activate "close", then lock the gate by presetting function 1 "gate lock" and activating "lock".

**Locking the gate before starting the digging operation is of utmost importance and must never be omitted !**

**If the gate is not locked properly, the frame may be bent !**

After having locked the gate, lower the machine to the ground. Put the tree spade in level position. Again check if the tree is positioned in the center of the frame. Correct position if necessary.

If the power unit is furnished with rear stabilizers, extend stabilizers prior to digging. Preset function 4 and actuate "down" using the hydraulic lever.

Preset function 3 "spades" and activate "down". Now the blades are forced into the ground by means of the spade cylinders. Since all four spade cylinders are activated simultaneously by one valve, the blades which encounter the least resistance at any given time will penetrate into the soil first.

When the frame begins to lift, retract spades fully and then continue digging. Avoid rocking the tree spade while blades are in the ground, it would put extreme stress on the machine and might damage cause damage. Once all

blades are completely pressed into the ground, the tree spade with the planting material is lifted out of the soil by means of the lift arms of the power unit.

**Before travelling, rear stabilizers must be retracted !**

#### **4.2.A Operating with Joystick (optional)**

When your tree spade is equipped with a joystick, the operation is exactly the same as with rotary switch described above. Instead of presetting the work movements by means of the switch, you press the respective thumb buttons as shown under section 4.1 and hold them while moving the auxiliary hydraulic control.

**4.3 IMPORTANT:** Rules and regulations of the Highway Code must be observed when moving on public roads !

#### **Releasing the Tree**

When transplanting or placing the tree in a basket, lower the tree spade by means of the lift arms to the designated location, then retract blades (function 3 "spades", activate "up"), then unlock gate (function 1) and finally open gate (function 2). Lift up the tree spade approximately 20 cm / 8" above the root ball and reverse.

## **Care an Maintenance**

### **5.1 Blade Guides**

Blade guides are to be cleansed at least twice per day, depending on soil conditions and work performed.

When pressing the blades into the ground, most pressure and friction is exerted on the lower part of the guides, and there almost all the wear occurs. Once the guides are worn, they can be turned and used again.

Once both ends of the guides are worn, new guides together with bolts and washers must be installed. For ordering, please refer to the respective drawing and spare parts list.

Maximum wear permitted before turning or replacing: 5 – 6 mm / ¼“.

To find out if guides are worn, lift up empty tree spade and lower all blades completely. When the blades are gapping at the bottom and cannot be adjusted to form a closed digging head, this is a sure sign of worn guides.

#### **IMPORTANT:**

For longer life, make sure tension bolts at bottom of guides are always tight !

Keep the guides well cleaned and lubricated !

### **5.2 Lubrication**

Once per week lubricate all greasing points with lithium-based grease, as per lubrication chart (see page 14).

Proper lubrication is extremely important, as guide faces are subject to rapid wear when operated dry or with accumulated dirt.

## **Hydraulic Hoses**

All hydraulic hoses of the tree spade are to be examined at least once per year and to be replaced, if necessary. After a period of six years all hydraulic hoses are to be replaced for reasons of safety.

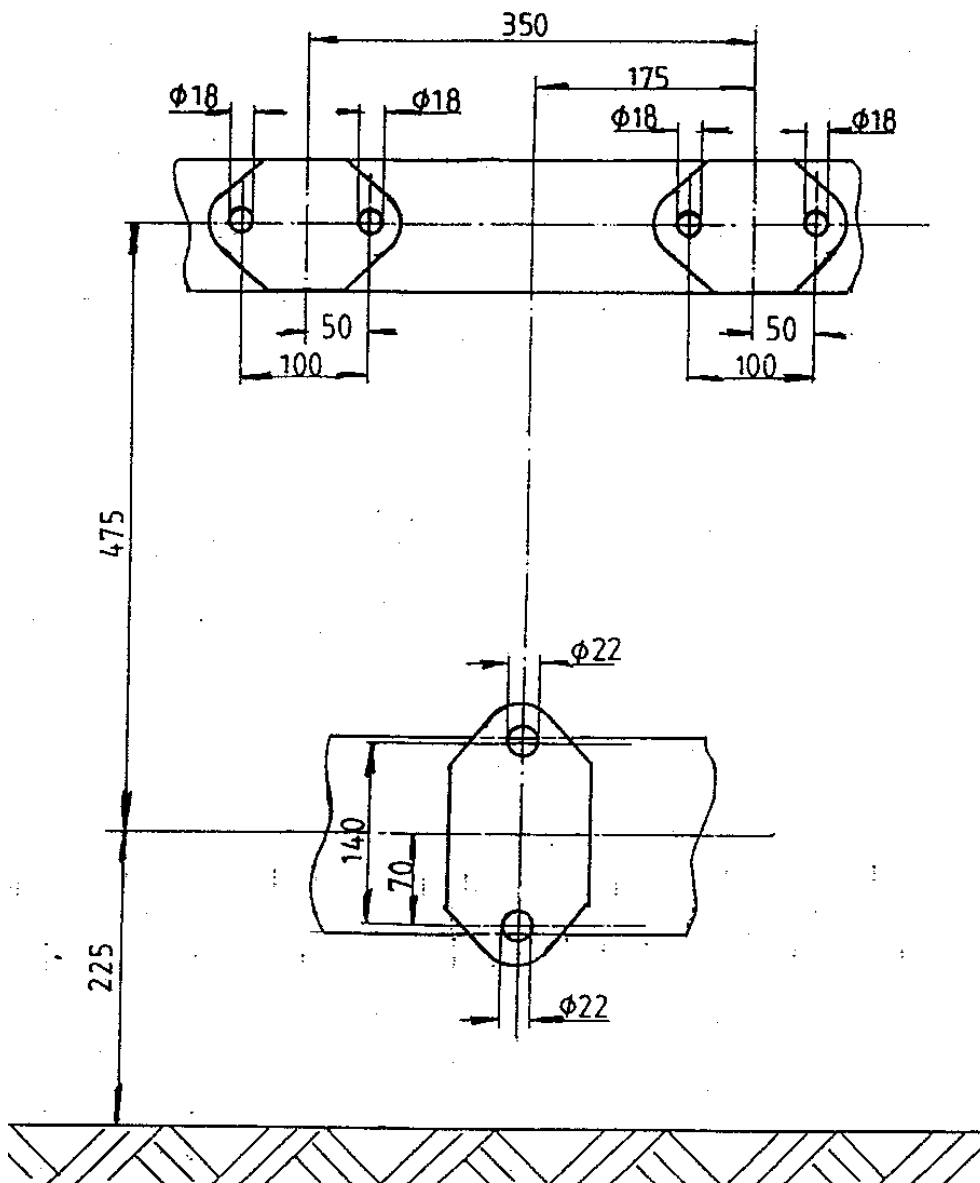
**IMPORTANT:** Machine must be lowered to the ground and switched off during cleaning, maintenance, and repair work !

Use original equipment spare parts only !

The tree spade must be checked by an expert on operational safety once per year !

Do not alter the machine without having consulted the manufacturer.

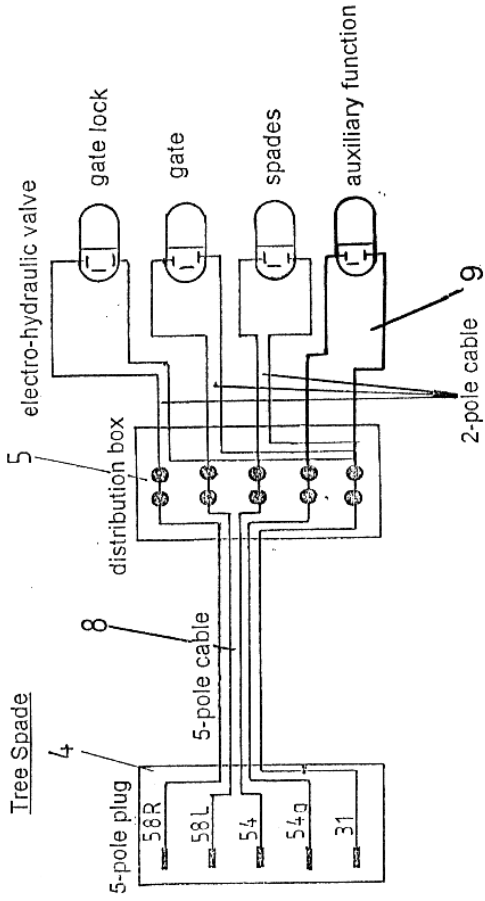
**Never work under the raised tree spade !  
For some unforeseen reason it might drop  
and cause severe injury or death !**



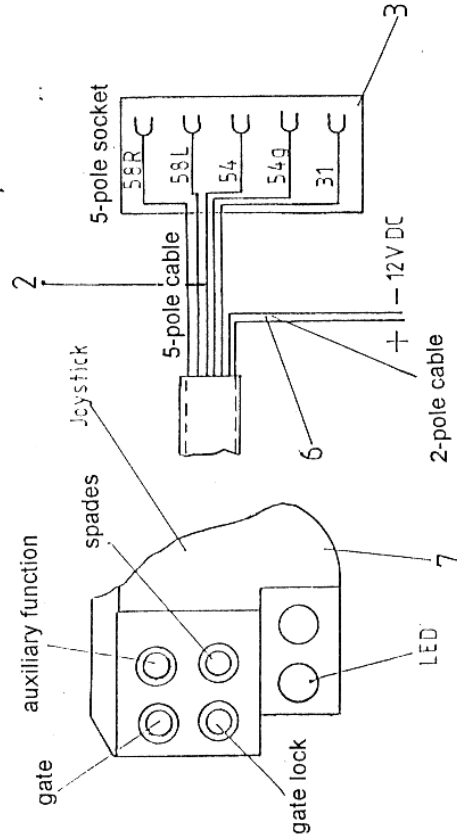
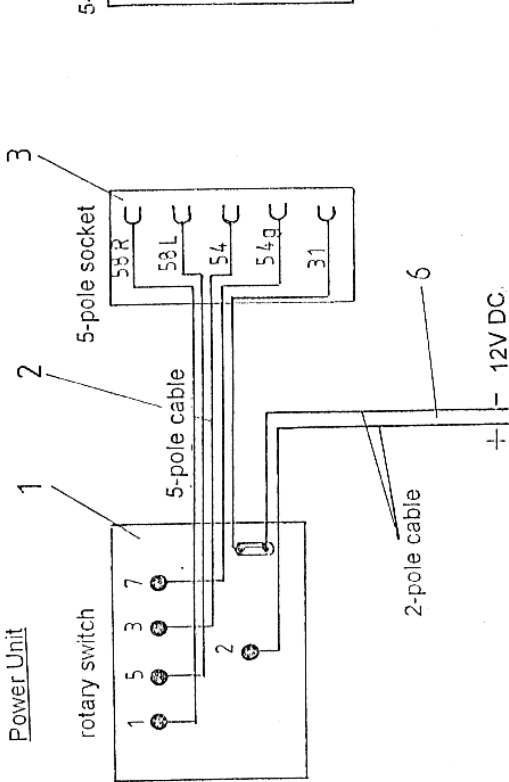
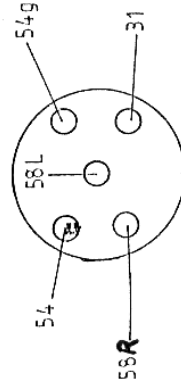
OPTIMAL-Vertrieb Opitz GmbH  
Eysölden M 41  
D-91177 Thalmässing


OPTIMAL 850

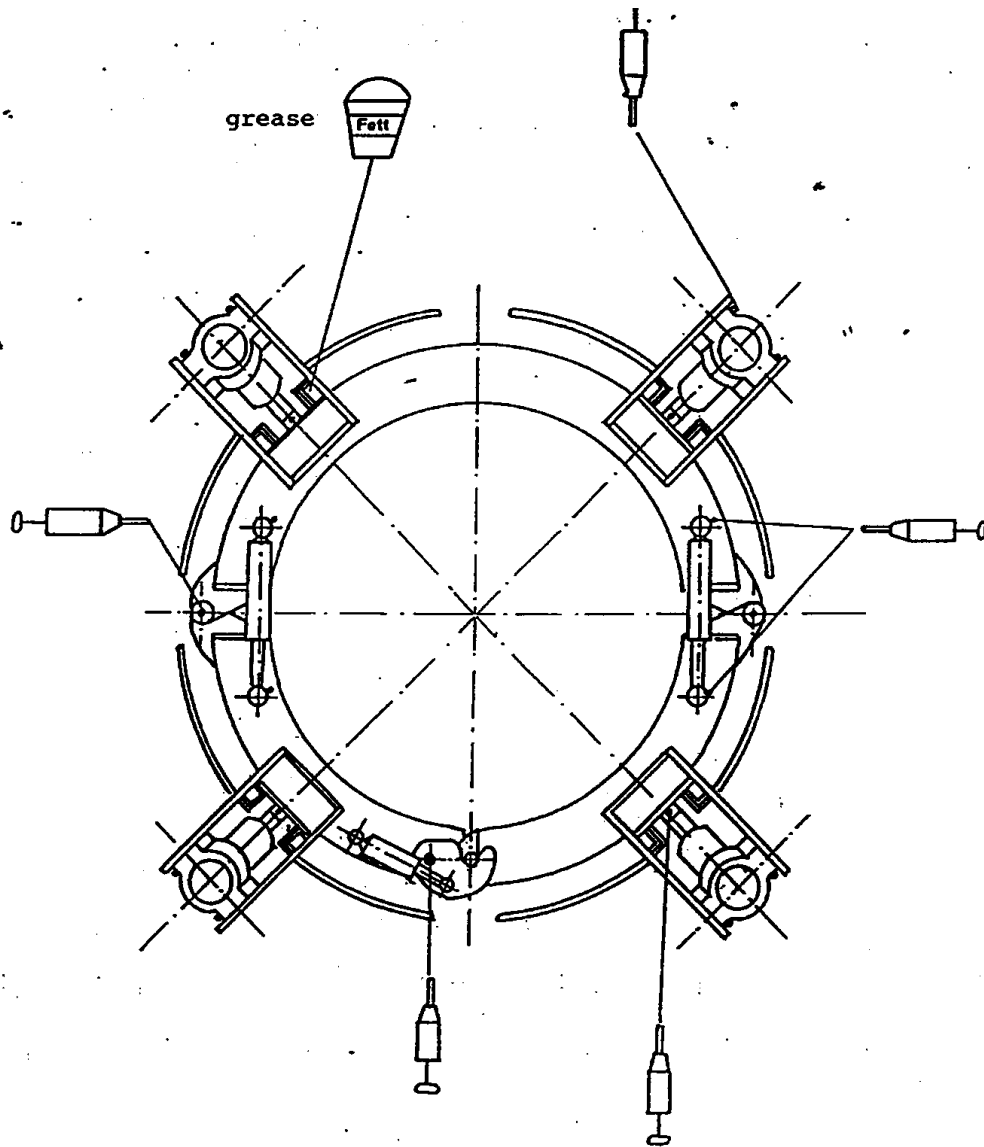
Attachment Points



- 58R – blue
- 58L – yellow/green
- 54 – black (next to brown)
- 54g – black
- 31 – brown



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	Electrical System



- lubricate once or twice per day



- lubricate once per week



**Optimal**

OPTIMAL-Vertrieb Opitz GmbH  
Eysölden M 41  
D-91177 Thalmässing

OPTIMAL 850

Lubrication chart



**SPARE PARTS  
ON  
TREE SPADE OPTIMAL 850**

**Manufacturer:**

**Optimal-Vertrieb Opitz GmbH  
Eysoelden M 41  
91177 Thalmaessing  
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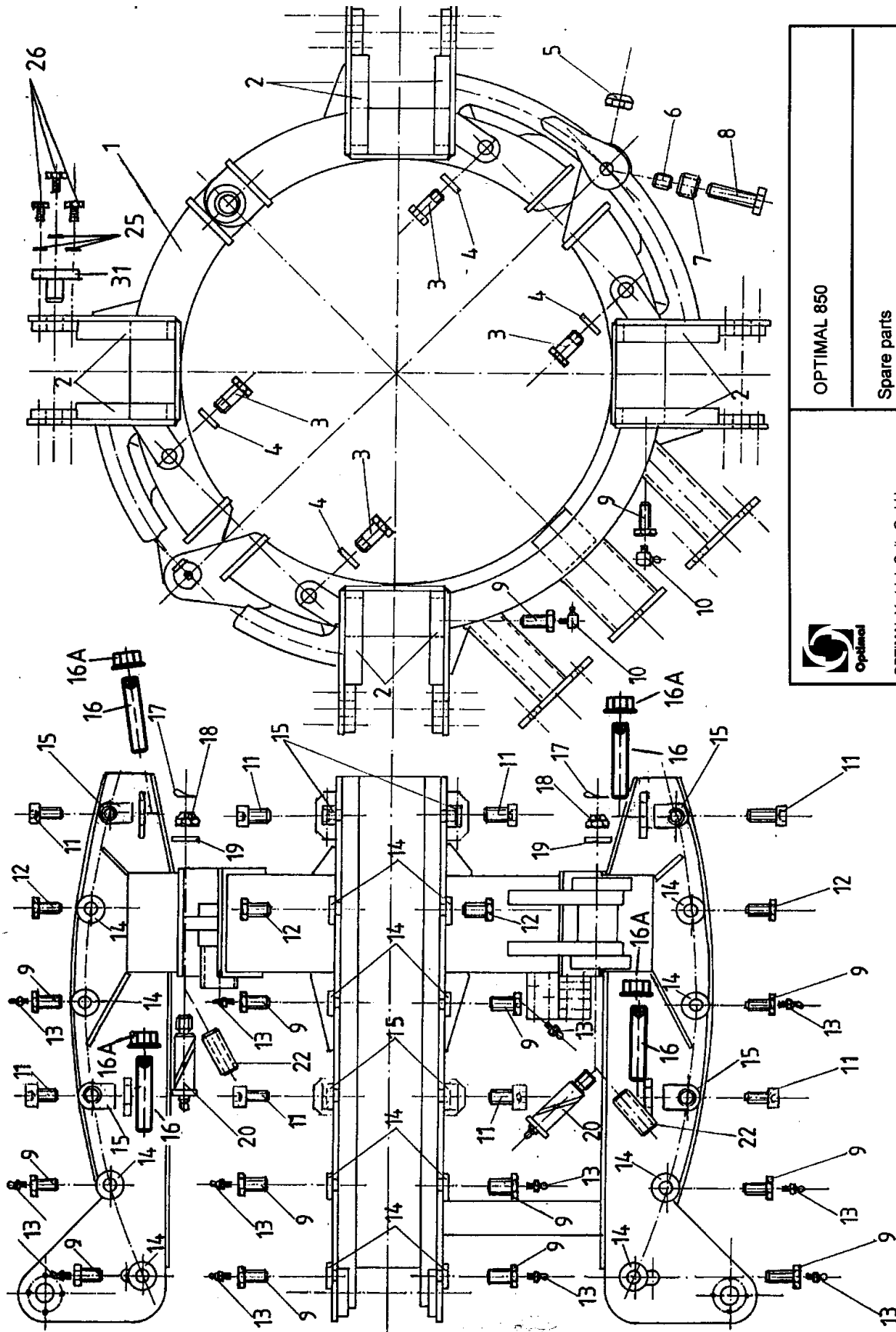
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**Distributor:**

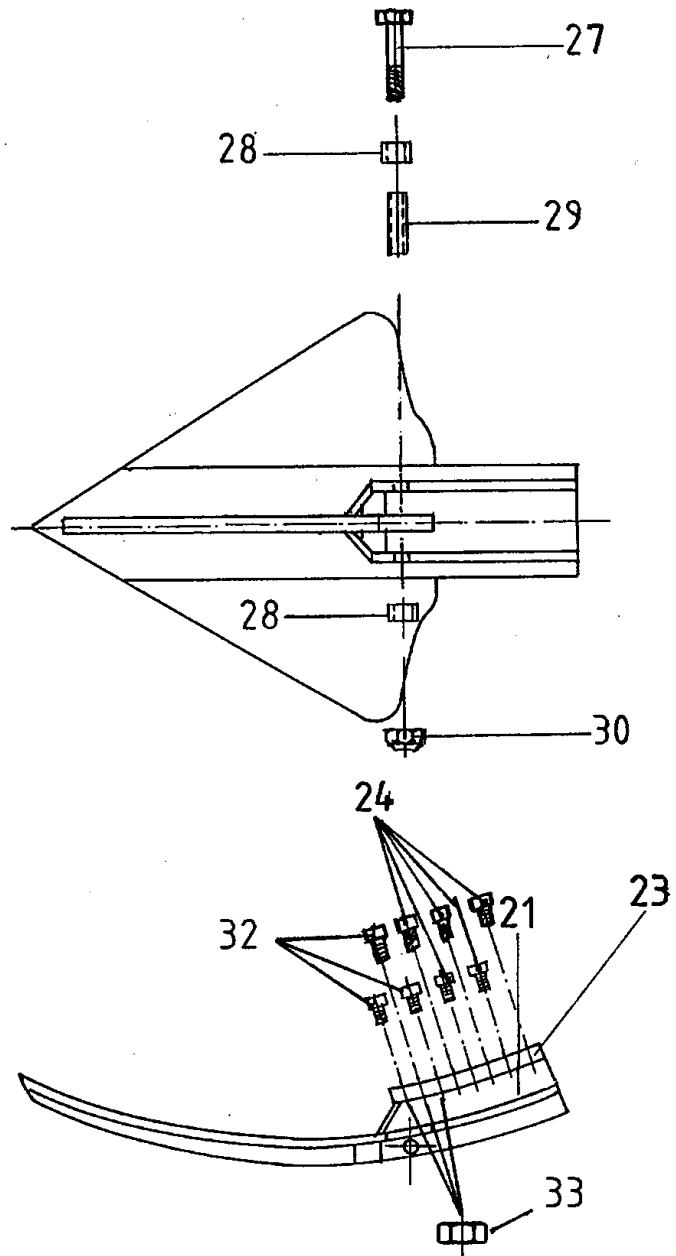
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	OPTIMAL 850
	Spare parts
OPTIMAL-Vertrieb Optiz GmbH Eysolden M 41 D-91177 Thalmassing	



**Optimal**

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Eysölden M 41  
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OPTIMAL 850

Spade

**TREE SPADE OPTIMAL 850 - SPARE PARTS**

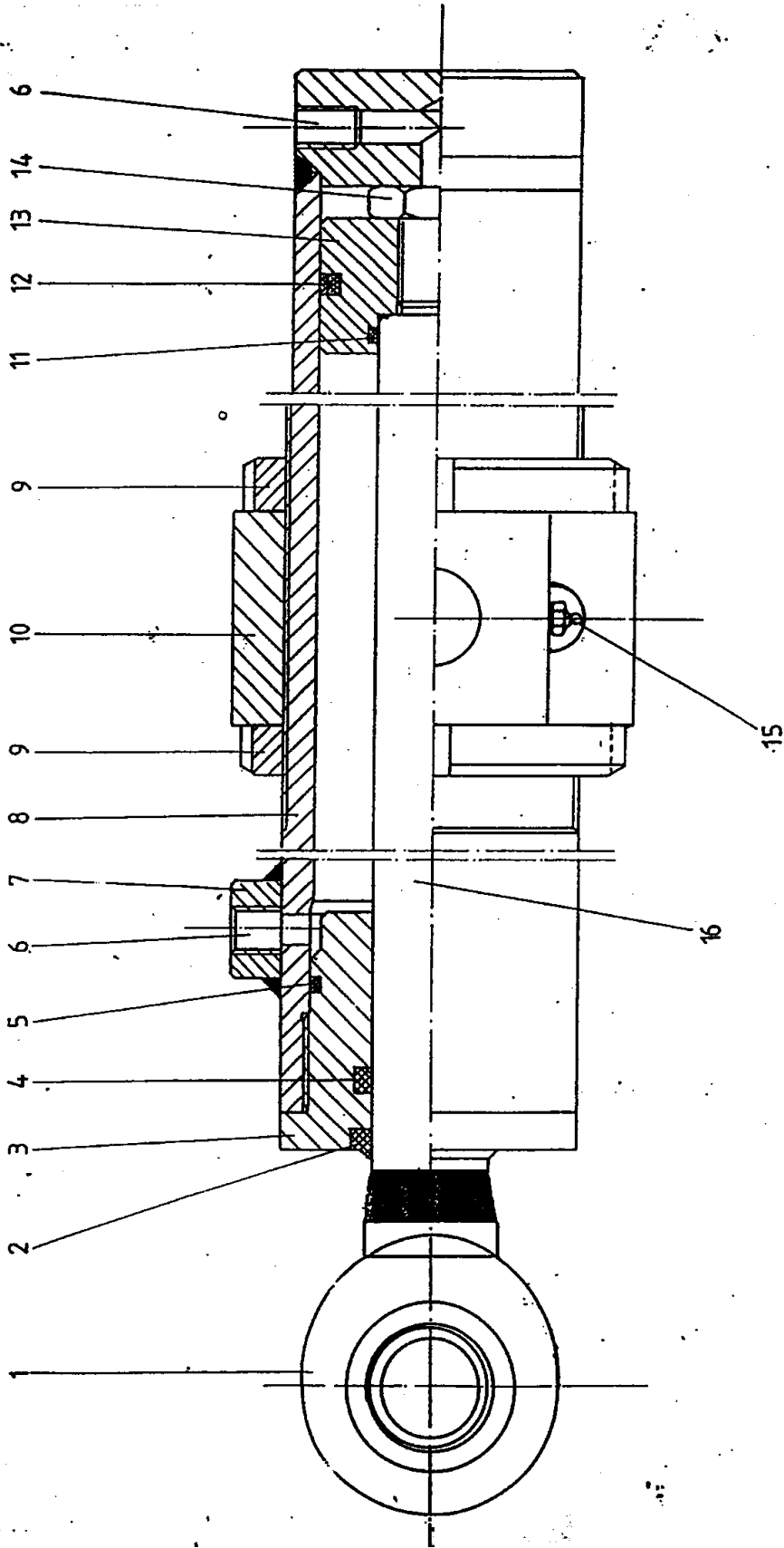
**MAIN FRAME AND SPADES**


<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	1	main frame	850001
2	8	wear guide	30685024
3	4	bolt	30785995
4	4	tapered washer M 20, DIN 6796	504206769
5	2	nut M 20, DIN 985	502200985
6	2	bush 85401	31185401
7	2	bush 85402	31185402
8	2	bolt M 20 x 80, DIN 931	50120080931
9	24	lubrication bolt	39985999
10	2	grease nipple	59908H3M6
11	16	socket head screw M 16 x 40, DIN 912	50116040912
12	8	hex head screw M 16 x 30, DIN 933	50116030933
13	22	grease nipple	59908H1M6
14	32	tapered washer M 16, DIN 6796	504166769
15	16	tension block	309850371
16	16	stud bolt M 16 x 80, DIN 913	50116080913
16a	16	ripping nut, M 16	31185990
17	2	splint pin 3 x 50	59904350
18	2	castellated nut M 24 x 1.5, DIN 937	50224150937

**TREE SPADE OPTIMAL 850 - SPARE PARTS**

**MAIN FRAME AND SPADES**

<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
19	2	washer M 24, DIN 125	506924
20	2	hinge pin 30 x 140	50830140
21	4	blade	31685312
22	8	hinge bush 30 x 36 x 100	5083036100
23	4	cover plate	318853026
24	40	socket head screw M 10 x 20, DIN 912	50110020912
25	32	spring washer M 8, DIN 127	50608
26	32	hex head screw M 8 x 25, DIN 933	50108025933
27	4	bolt M 16 x 120, DIN 931	50116120931
28	8	bush	31185029
29	4	bush	31185030
30	4	nut M 16, DIN 985	502160985
31	8	cylinder suspension pin	30785025
32	24	socket head screw M 10 x 25, DIN 912	50110025912
33	24	nut M 10, DIN 936-04	50210093604

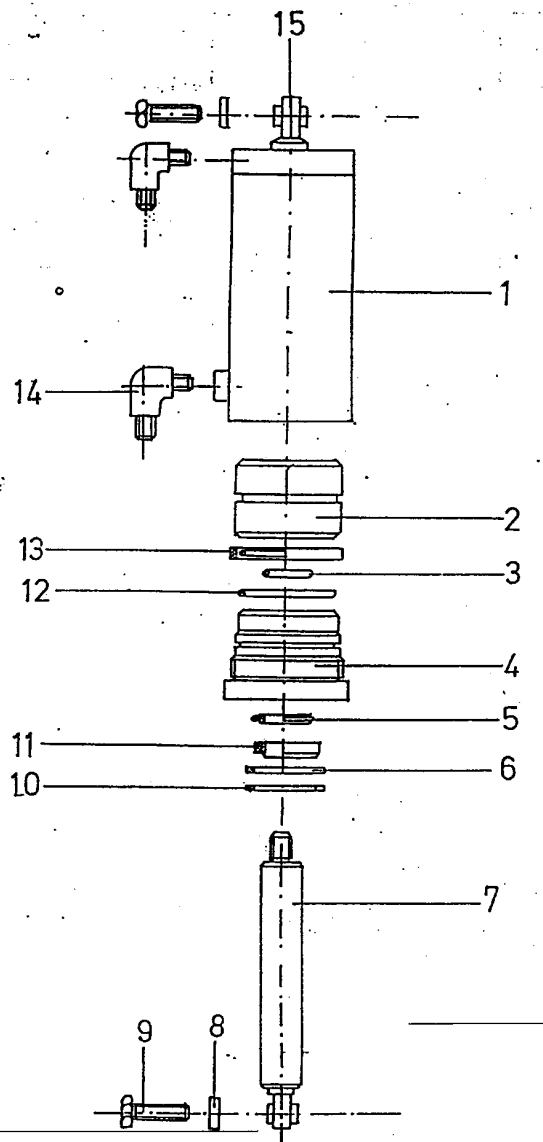


OPTIMAL 850	 OPTIMAL-Vertrieb Optiz GmbH Eysölden M 41 D-91177 Thalmassing
Spade cylinder	
301010851	

**TREE SPADE OPTIMAL 850 - SPARE PARTS**

**SPADE CYLINDER, 301010851**

<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	1	eye joint GK 25 DO	5070250
2	1	scraper P7-30	5160330
3	1	guide bush	3116030360
4	1	rod seal S8-30	5160230
5	1	o-ring 55,2 x 3	5170552030
6	2	elbow	515070510813
7	1	socket	3135030501
8	1	cylinder body	3026030047
9	2	slotted nut KM15	31350315
10	1	cylinder suspension	30985024
11	1	o-ring 30 x 2,5	5170300025
12	1	piston seal OMK 60	5160160
13	1	piston	3126030235
14	1	nut M 20 x 1.5, DIN 936	50220150936
15	2	grease nipple	59908H1M6
16	1	piston rod	3036030144
		seal kit, complete	516006030601



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OPTIMAL 850

Gate cylinder

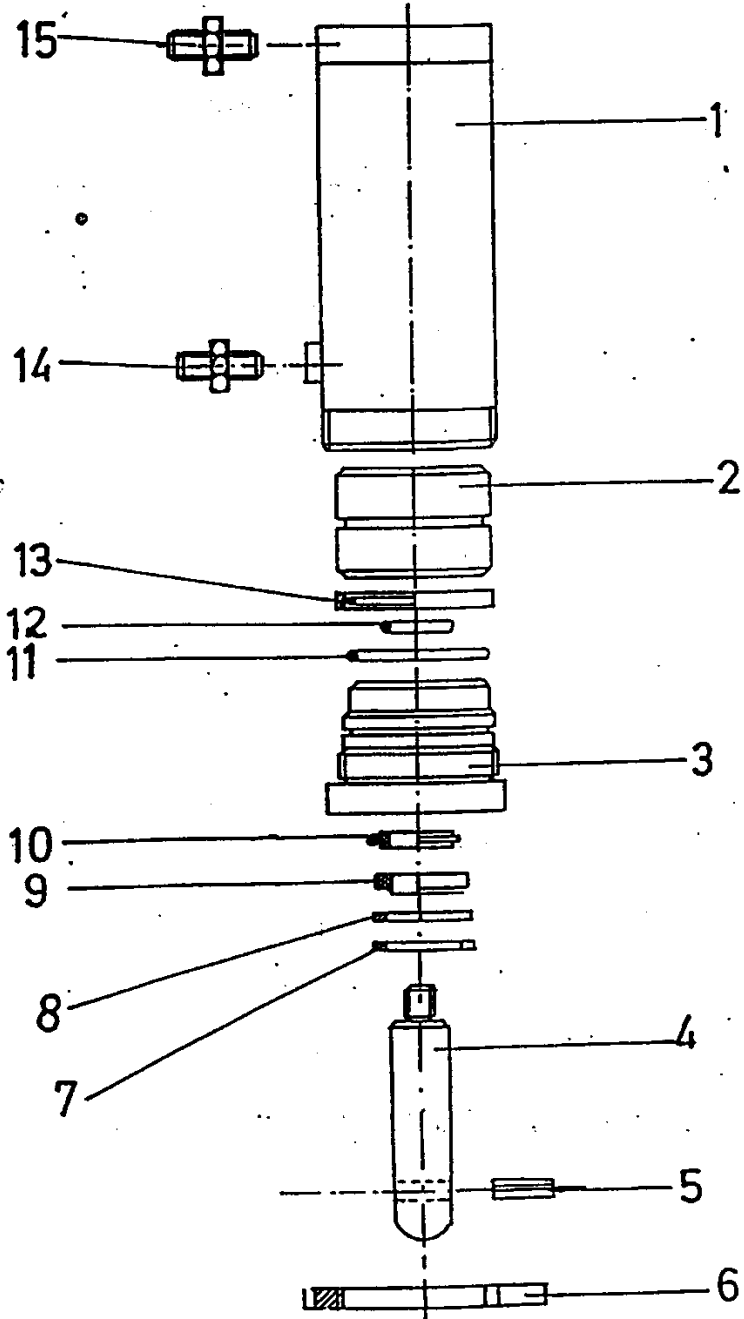
301020850

**TREE SPADE OPTIMAL 850 - SPARE PARTS**

**GATE CYLINDER, 301020850**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	1	cylinder body	3024025090
2	1	piston	3124025230
3	1	o-ring 25 x 2,5	5170250025
4	1	guide bush	3114025347
5	1	rod seal	5160225
6	1	retaining ring 42 x 30 x 2,5	59901423025
7	1	piston rod	3034025190
8	2	tapered washer M 16, DIN 6796	504166769
9	2	hex head screw M 16 x 40, DIN 933	50116040933
10	1	circlip ring JS 42 x 2	599024225
11	1	oil scraper P7-25	5160325
12	1	o-ring 35 x 2,5	5170350025
13	1	piston seal OMK 40	5160140
14	2	elbow	515WE8LR
15	2	eye joint GK 20 DO	5070200
	1	seal kit, complete consisting of items 3, 5, 11, 12, 13	516004025601





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D-91177 Thalmassing

OPTIMAL 850

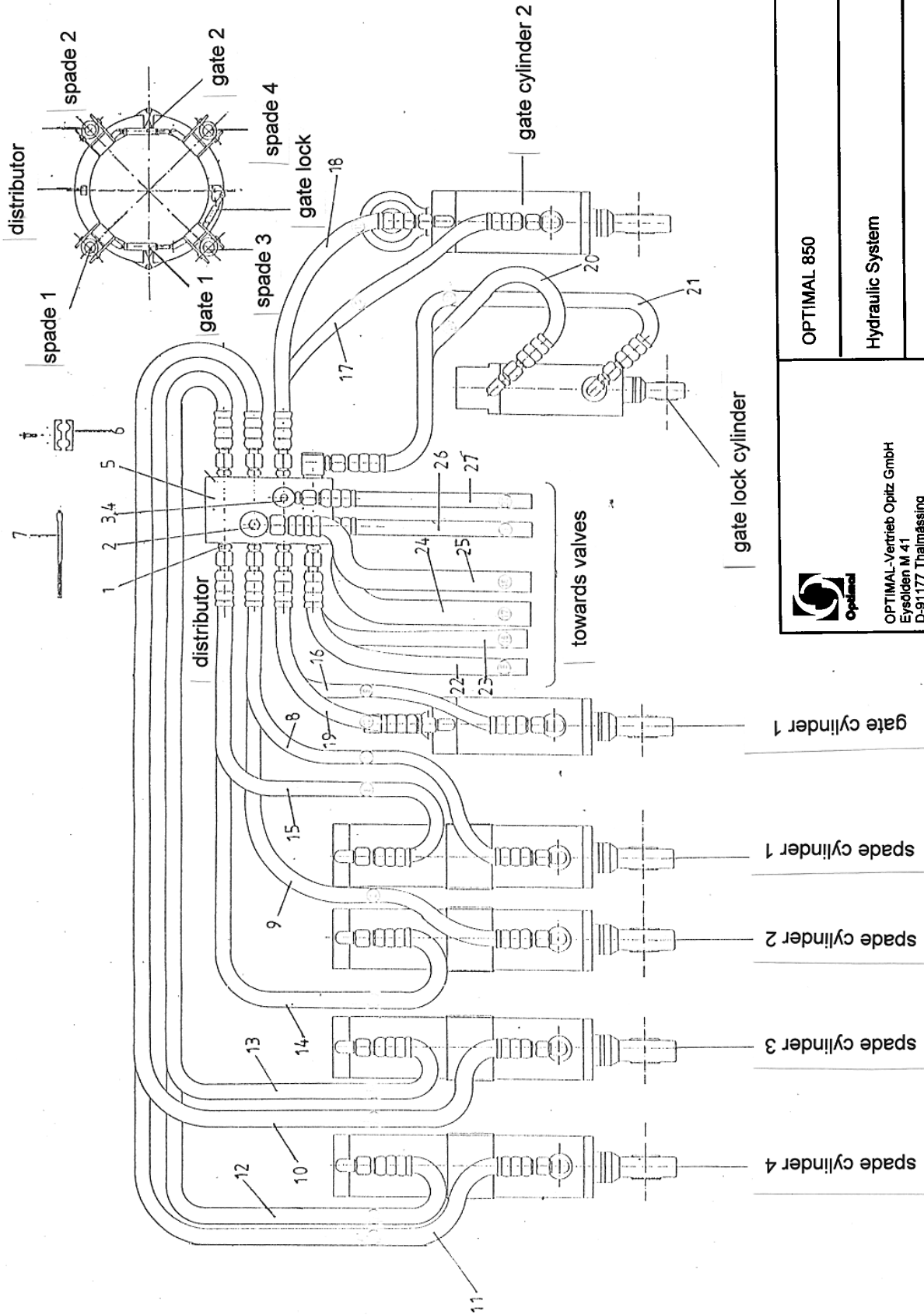
Gate lock cylinder


301030850

**TREE SPADE OPTIMAL 850 - SPARE PARTS**

**GATE LOCK CYLINDER, 301030850**

<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	1	cylinder body	3024025094
2	1	piston	3124025230
3	1	guide bush	3114025347
4	1	piston rod	3034025162
5	1	roll pin 8 x 80, DIN 1481	506708801481
6	1	slotted nut KM 10	50310
7	1	circlip ring JS 42 x 2	599024225
8	1	retaining ring 42 x 30 x 2,5	59901423025
9	1	oil scraper P7-25	5160325
10	1	rod seal S8-25	5160225
11	1	o-ring 35 x 2,5	5170350025
12	1	o-ring 25 x 2,5	5170250025
13	1	piston seal OMK 40	5160140
14	1	union	515GE8LR
15	1	union	515GE8LR
	1	seal kit, complete consisting of items 9, 10, 11, 12, 13	516004025601



OPTIMAL 850	 OPTIMAL-Vertrieb Optitz GmbH Eysolden M 41 D-91177 Thalmassing
Hydraulic System	

**TREE SPADE OPTIMAL 850 - SPARE PARTS**  
**HYDRAULIC SYSTEM**

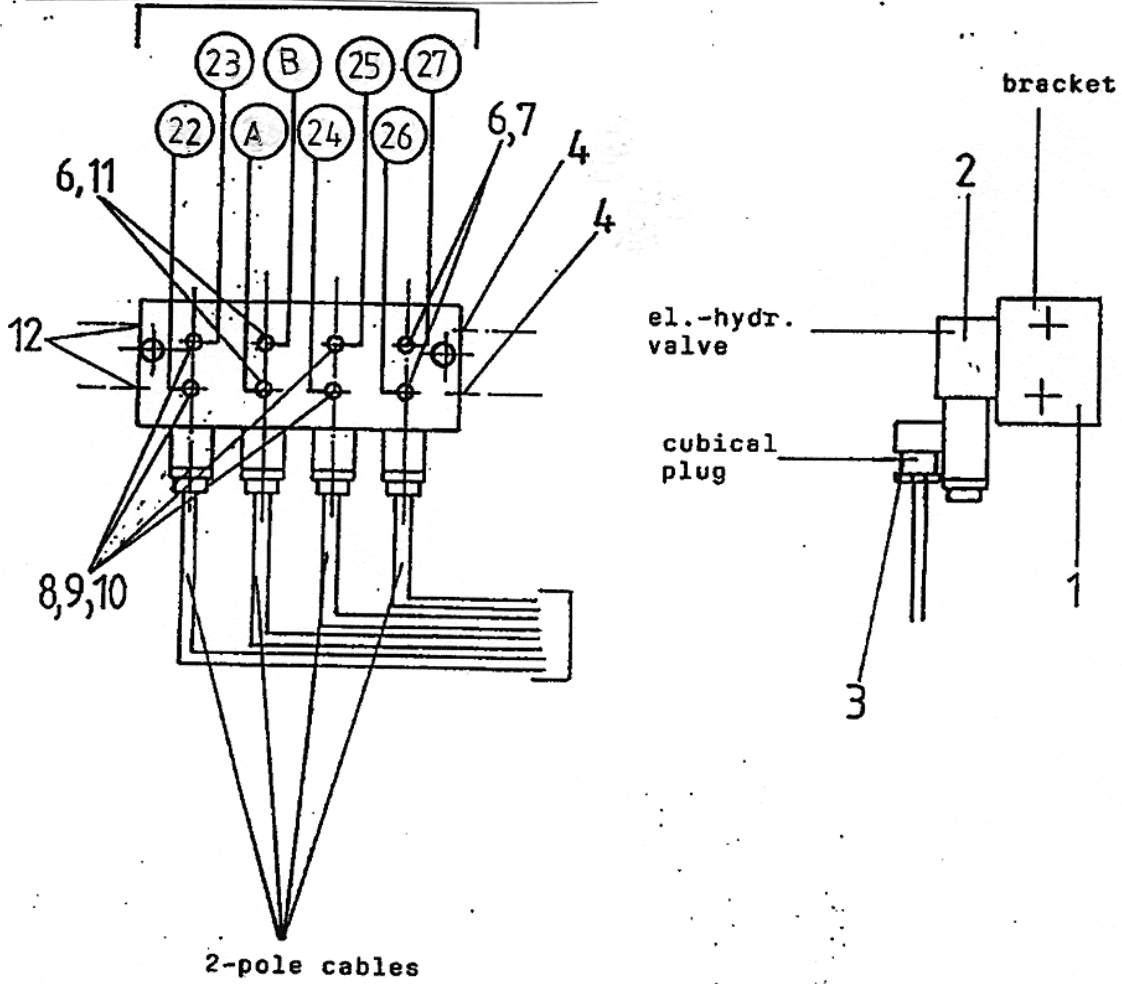
<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	14	straight union	515021000813
2	2	swivel elbow	515070511017
3	1	swivel elbow	515070510813
4	1	oil flow adjuster	515DSSS6 + 39985912
5	1	oil manifold	30511033
6	8	pipe clamp	510RAPR-112
7	9	hose retainer	50960080
8	1	hydraulic hose 1 – 104 cm (41")	513062104011
9	1	hydraulic hose 2 – 104 cm (41")	513062104011
10	1	hydraulic hose 3 – 165 cm (65")	513062165011
11	1	hydraulic hose 4 – 165 cm (65")	513062165011
12	1	hydraulic hose 5 – 192 cm (76")	513062192011
13	1	hydraulic hose 6 – 192 cm (76")	513062192011
14	1	hydraulic hose 7 – 135 cm (54")	513062135011
15	1	hydraulic hose 8 – 135 cm (54")	513062135011
16	1	hydraulic hose 9 – 56 cm (22")	513062056011
17	1	hydraulic hose 10 – 56 cm (22")	513062056011
18	1	hydraulic hose 11 – 42 cm (17")	513062042011

**TREE SPADE OPTIMAL 850 - SPARE PARTS**

**HYDRAULIC SYSTEM**

<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
19	1	hydraulic hose 12 – 42 cm (17")	513062042011
20	1	hydraulic hose 13 – 117 cm (46")	513062117011
21	1	hydraulic hose 14 – 121 cm (48")	513062121011
22	1	hydraulic hose 15 – 46 cm (19")	513062046011
23	1	hydraulic hose 16 – 43 cm (17")	513062043011
24	1	hydraulic hose 17 – 51 cm (21")	513102051012
25	1	hydraulic hose 18 – 55 cm (22")	513102055012
26	1	hydraulic hose 19 – 47 cm (19")	513062047011
27	1	hydraulic hose 20 – 55 cm (22")	513062055011

FOR NUMBERS PLEASE REFER  
TO DRAWING "HYDRAULIC SYSTEM"



(A); (B) provision for  
additional functions



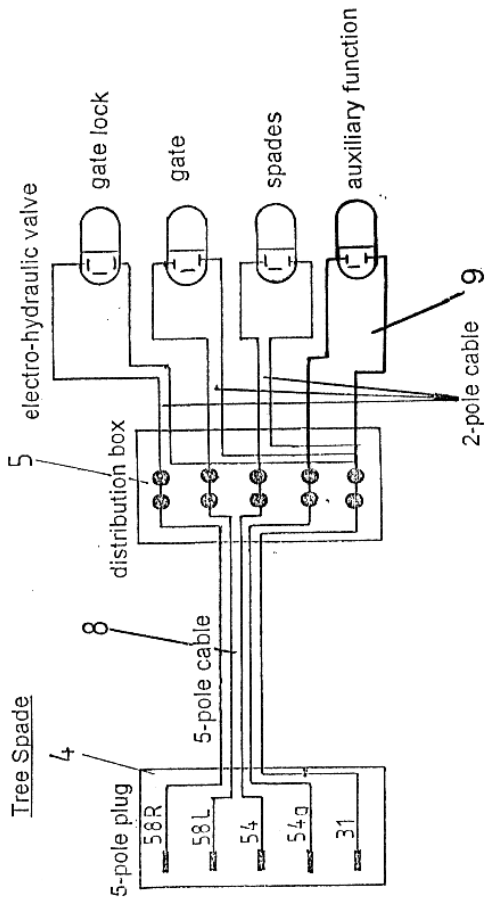
OPTIMAL-Vertrieb Opitz GmbH  
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OPTIMAL 850

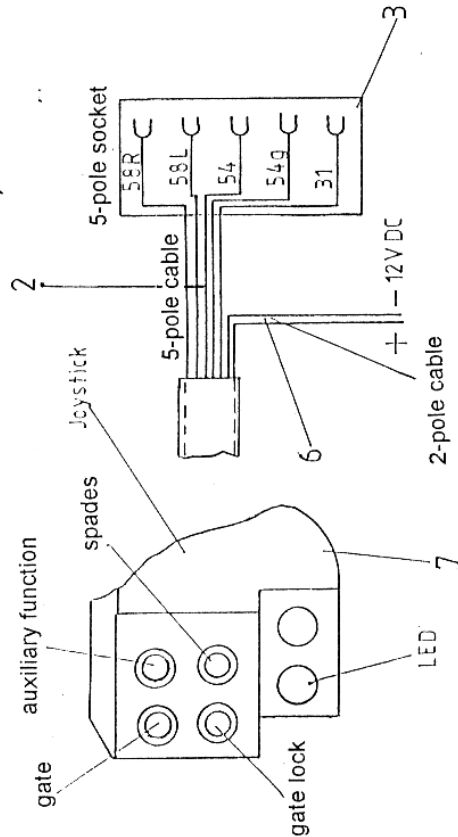
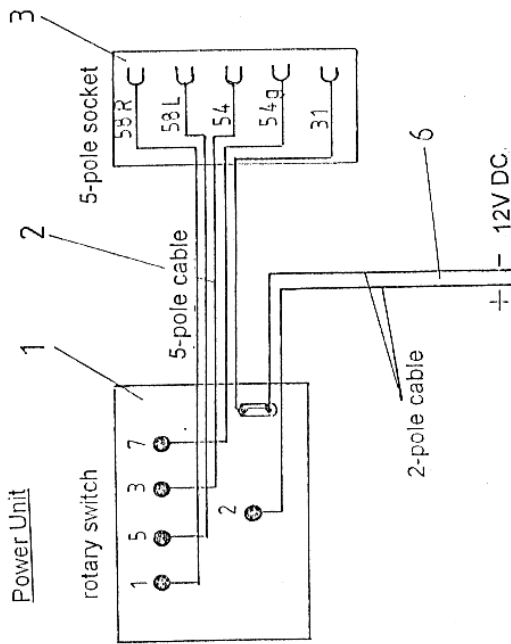
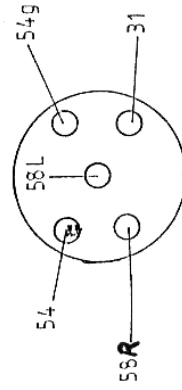
Valve Bank


**TREE SPADE OPTIMAL 850 - SPARE PARTS  
HYDRAULIC SYSTEM - VALVE BANK**

<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	1	valve plate	547005
2	4	electro-hydraulic valve	547001
3	4	plug	547GDM-211
4	2	union	515070391221
6	4	union	515021001017
7	2	union	5150701710
8	4	union	515021000813
9	4	union	515RI3/8x1/4
10	4	union	5150701708
11	2	union	5150103310
12	2	union	515VSTI1/2



- 58R – blue
- 58L – yellow/green
- 54 – black (next to brown)
- 54g – black
- 31 – brown



	<b>OPTIMAL 850</b>
OPTIMAL-Vertrieb Optiz GmbH Eysolden M 41 D-91177 Thalmassing	
Electrical System	



**TREE SPADE OPTIMAL 850 - SPARE PARTS**

**ELECTRIC CONTROLS**

<b><u>Item</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	1	electro-selector switch /4	5470A242-521
2	2	cable 5 x 1.5 – 170 cm (67")	5125015
3	1	7-pole socket	5998JB7-POL
4	1	7-pole plug	5998JA7-POL
5	1	el. distributor box	5998KV002142
6	2	cable 2 x 1,5 - 150 cm (60")	5122015
7	1	Joystick	560001
8	1	cable 5 x 1,5 – 170 cm (67")	5125015
9	1	auxiliary - cable 2 x 1,5 – 40 cm (16")	5122015
	1	spades - cable 2 x 1,5 – 45 cm (18")	5122015
	1	gate - cable 2 x 1,5 – 50 cm (20")	5122015
	1	gate lock - cable 2 x 1,5 – 53 cm (21")	5122015