

## MANUAL

## ΟΝ

## TREE SPADE OPTIMAL 900



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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.

A 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.

**A** 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.

A 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.



A

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



A

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

When digging, it might happen that a stone gets caught between two blades and the blades get bent. This causes tremendous tension in the steel blade. Do not try to release the stone by means of a crow bar or other tools. Place the digging head again into the planting hole and retract the blades. Thereby the stone will come loose and the blades which got a high degree of bending strength will regain their former shape. After that the root ball can be dug again.



The operator must be sure that the ground he is going to dig is free from any underground installations such as cables, pipes or any other utilities or dangerous matter. Damaging such underground installations or matter is dangerous and might result in serious injury or death.



Safety stickers have been placed on the tree spade to warn the user of possible dangers. In case a safety sticker has been worn or destroyed, it must be replaced immediately. Safety stickers can be ordered with your distributor or the manufacturer. For ordering please use the part numbers listed on page 2A. Fix the stickers on the locations marked on page 2A.





#### 6. Lock Cylinder:



Part N° 7118000019





PERCENT Review Part N° 7118000010

ANDERE METORY

8. Oil - Manifold:



4. Tower:

Part N° 7118000001



AVOID INJURY Stay Clear Of **Elevated Unit** And Tree Spade

Part Nº 7118000009

A AVISO

EVITESE LA HERIDA No se acerque ni la unidad elevada ni la transplantadora

Part N° 7118000016 5. Gate Cylinder:



Part N° 7118000007 3. Tower:



Part N° 7118000001



**MOVING MACHINERY KEEP HANDS AND** FEET CLEAR Part N° 7118000014



MAQUINARIA EN MOVIMIENTO MANTENGA MANOS Y PIES ALEJADOS

#### Part N° 7118000017



Part N° 7118000013



- 2A -

Part N° 7118000005

Part Nº 7118000006

7. Frame:



Part N° 7118000001

DANGER

KEEP AWAY

FROM SWING AREA

WHEN IN OPERATION

A PELIGRO

NO SE ACERQUE A LA

ZONA DE MOVIMIENTO

CUANDO ESTA

EN FUNCIONAMIENTO Part N° 7118000015

Cylinder:

5. Gate

Part N° 7118000007

Part N° 7118000001

WARNIING

AVOID INJURY Stay Clear!

This structure

swings outward

AVISO

**EVITESE LA HERIDA** No se acerque!

Está estructura

mueve hacia afuera

Part N° 7118000020

Part N° 7118000012

44

2. Tower:

Part N° 7118000008

1. Tower:

### 1. Operating Specifications

Description	Tree Spade OPTIMAL 900	
serial number	900	
capacity	upper root ball diameter root ball depth	90 cm (36") 60 cm (24")
dimensions of basic machine	height width, gate closed width, gate open clearance between open gate	150 cm (59") 110 cm (43") 150 cm (59") 70 cm (28")
weight	basic machine, empty	598 kg (1315 lbs.)
rated type of attachment	attachment by means of back plate to loader or excavator	
	minimum lift capacity	1.500 kg (3,300 lbs.)
	the power unit must be equipped with an auxiliary double-acting hydraulic circuit for implements: working pressure 160 - 200 bar (2,300-2,900 lbs/in oil flow 40 l/min. (11 GPM)	
controls	electro-hydraulic valves, double- for three or four functions actuated by rotary switch or joy s	-acting, stick
field of application	tree nurseries; gardens; civic gre	eens

#### 2. Assembly

# IMPORTANT: When doing assembly work, heed relevant instructions of manufacturers of power unit!

#### 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 instructions of the manufacturer of the power unit.

The back plate is to be furnished with borings as per drawing page 18. At these attachment points the tree spade is bolted tightly to the back plate.

#### 2.2 Installation of Electro-Hydraulic Control

- 2.2.1 Install rotary switch or joystick at suitable and dry location in the power unit, e.g. the rotary switch on the instrument panel, or the joy stick at the hydraulic lever.
- 2.2.2 Install 7-pole electric socket next to hydraulic disconnect of auxiliary hydraulic circuit at the power unit.
- 2.2.3 The blue wire should be connected to 12 VDC, the brown wire to the ground.

## Important: Electric power should be flowing only when the ignition of the power unit is activated, otherwise the battery may run down. Maximum power input 5 Ampere !

Now the tree spade is ready for operation

#### 3. Putting into Service

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

Both the hydraulic connecting hoses of the tree spade are to be connected to the hydraulic disconnect of the auxiliary hydraulic circuit of the power unit.

The plug of the electric control cable is to be plugged into the socket on the power unit (see section 2.2.2).

Make sure that hydraulic working pressure and oil flow of power unit meets the requirements as laid down in the operating specifications on page 3.

#### IMPORTANT: The hydraulic disconnect of the tree spade and the power unit <u>must</u> match and <u>must</u> be connected properly. Faulty connections are extremely dangerous.

When operating the power unit, follow the instructions of the operating manual of the power unit !

#### 4. Operating Instructions

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

The following safety instructions must be observed:

It is the operator's prime duty to ensure that any persons must stay clear off the danger area. Special care must be taken that no one is ever under the raised tree spade, or near the potential shearing and pinching areas, or near the opened gate, near the spades or near any hydraulic components.

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. Do not bind 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.

Before starting to work with the tree spade, make sure the hydraulic fittings and the bolts are properly tightened and are free from any defects.

#### 4.1 The Controls

The electro-hydraulic controls are to be operated as follows:

4.1.1	Rotary Switch	Control Valve	Work Movement (actuated by Manual Lever or Pedal)
	function 1:	gate lock	unlock / lock
	function 2:	gate	open / close
	function 3:	blades	up / down
	function 4:	stabilizers	up / down



4.1.2	<u>Joystick</u>	Control Valve	Work Movement (actuated by Manual Lever or Pedal)
	T3	gate lock	unlock / lock
	T5	gate	open / close
	T4	blades	up / down
	(T6	stabilizers	up / down)

The function required is preset with the rotary switch and then activated by the manual control valve of the auxiliary hydraulic circuit of the power unit.

With some loaders this valve might be activated by a pedal.

#### 4.2 Operation

First lower the tree spade with the lift arms of the power unit until the blade points are about 20 cm (8") above the ground.

Preset function 1 "gate lock" with rotary switch and activate "unlock" with control valve. Then preset function 2 "gate" and activate "open" with control valve.

With the gate open drive towards the tree. When the tree is positioned in the center of the main frame, preset function 2 "gate" and activate "close". Then preset function 1 "gate lock" and activate "lock".

#### Locking the frame 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 !

In order to prevent the spades from digging with the gate not being properly locked, the gate lock is furnished with a safety switch. If the spades do not move although the operator followed above instructions, this malfunction is probably caused by a branch or some other object obstructing the movement of the gate lock latch. Remove the obstruction and try again.

After having locked the gate, lower the tree spade to the ground and get it into level position. Again check if the tree is positioned in the center of the frame and correct, if necessary.

If the power unit is furnished with rear stabilizers, extend stabilizers prior to digging.

Preset function 3 "blades" and activate "down" with control valve. Now the spade cylinders force the blades into the ground.

Because all 4 spade cylinders are activated by one valve at the same time, the blades which encounter the least resistance at any given time will penetrate into the soil first.

When the frame begins to lift when digging, retract blades and then continue digging. Do not rock the tree spade forward and backward with the tilting cylinder of the power unit when the blades are in the ground!

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

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

## IMPORTANT: When moving and working on public roads, the traffic rules and regulations must be adhered to.

When driving, the tree spade should be in the lowest possible position.

When digging, it might happen that a stone gets caught between two blades and the blades get bent. This causes tremendous tension in the steel blade. Do not try to release the stone by means of a crow bar or other tools.

Place the digging head again into the planting hole and retract the blades. Thereby the stone will come loose and the blades which got a high degree of bending strength will regain their former shape. After that the root ball can be dug again.

#### 4.3 <u>Releasing the Tree</u>

When transplanting, or when placing the tree in a basket, lower the tree spade by means of the lift arms, retract spades (function 3 "blades", control valve "up") then unlock gate (function 1 "gate lock", control valve "unlock") and open gate (function 2 "gate", control valve "open").

When the work has been finished, set the rotary switch in off-position (function 0). If the tree spade is controlled by means of a joy stick, the hydraulics are off when no button is being pressed.

#### 5. Care and Maintenance

#### 5.1 Blade Guides

The blades are furnished with plastic linings which slide on steel guides. Once the plastic lining is worn to the point that the heads of the countersunk screws are flush with the surface of the plastic linings, they must be replaced to prevent the screws from damaging the guides.

#### **IMPORTANT:** Keep the guides clean.

#### 5.2 <u>No Lubrication</u>

All sliding surfaces and bearings are made of plastic and do not require any lubrication.

#### 5.3 <u>Hydraulic Oil Supply</u>

Check level of hydraulic oil regularly. For checking, retract all blades "up" and lower the tree spade to the ground. If in that position the oil level is below the mark of the sight glass, oil must be refilled.

#### 5.4 <u>Hydraulic Hoses</u>

All hydraulic hoses must be inspected at least once per year. Damaged hoses must be replaced. At least after 6 years <u>all</u> hoses must be replaced.

#### 5.5 Cylinders

In case the tree spade is not getting used for two weeks, all piston rods of the hydraulic cylinders must be cleaned and covered with a preserving oil film.

**IMPORTANT:** Tree spade must be lowered to the ground and switched off when doing cleaning, maintenance or repair work !

Use original spare parts only !

The tree Spade must be inspected by an expert on operational safety once per year !

Do not alter the design of the tree spade without having consulted the manufacturer !

#### 5.6 Ajusting Blades



Illustration 1





Illustration 2

- 1. General view of spade tower
- 2. A adjustment screw B retention nut
- Slacken retention nut, then readjust tower either way by means of adjustment screw. When spades are in proper position, tighten retention nut.

Illustration 3

## 5.7 Replacing Plastic Bush of Spade Cylinder









Illustration 6



Illustration 8



Illustration 7



Illustration 9

- 12 -



Illustration 10



Illustration 12



Illustration 11



Illustration 13

- 8. General view of gate cylinder with piston rod and eye joint.
- 9. Screw off plastic thread plug.
- 10. Remove dowel pin by means of drift punch.
- 11. Dowel pin has been removed. Note female thread on top of the pin,
- 12. Place extractor on top of pin and fasten screw into female thread.
- 13. When screw has a firm grip, hold it with wrench in position and tighten nut until it is stopped by the extractor. Now hold nut and tighten screw further into pin thread, thereby extracting the pin.
- 14. Pin and plastic bush is removed from eye joint.
- 15. The plastic bush is replaced.



Extractor with screw and nut.

#### 6. Trouble Shooting

- 1. Nothing moves. (none of the hydraulic functions works)
  - Electricity supply to rotary switch is interrupted. Check fuses at power unit.
  - Hydraulic disconnect is not properly attached. Check attachment.
- 2. Two hydraulic functions (e.g. gate lock and spades) work at the same time.
  - On one of the valves the plunger does not move. This defect might be caused by a dirt particle. Disassemble and clean the respective valve.
  - If this does not solve the problem, the valve is damaged and must be replaced.
- 3. After the blades have been retracted and the valve has been relieved, they immediately move down again.
  - If the spades move down a short way only, the oil supply of the pump might be too high.
     Oil flow of power unit must be regulated by service of manufacturer.
  - If the spades move down all the way, the seals in the spade cylinder might be defect und must be replaced.
  - If the spades move down all the way, the spade valve might be defect and must be replaced.
- 4. The gate does not close and / or lock completely.
  - The adjustment screw at the hinge wants readjustment. Adjust adjustment screw.
  - The eye joint is worn, bushes must be replaced.

- 5. Although the gate has been closed and locked properly, the blades do not move down.
  - The safety switch at the lock needs readjustment.
  - The electricity supply is interrupted. Check fuses at power unit.
- 6. The blades do not close properly although the spade cylinders are fully extended.
  - Guides are worn and must be replaced.
  - Blades are bent and have to be adjusted.
  - 7. One function (any) does not work.
    - The electricity supply is interrupted. Check power circuit.
    - The magnet of the respective control valve is defect. Valve must be replaced.
    - The plunger of the control valve is seized, probably due to a dirt particle in the hydraulic oil. Disassemble valve and clean.

#### 6. Trouble Shooting - individual spade control

- 8. The spades cannot be operated individually, i.e. all spades move at the same time.
  - Controls were not switched to individual control. (When working in the individual control mode, the red light must show red.)
  - Circuit board is defect and must be replaced.
- 9. One of the blades moves even when not actuated.
  - The electricity between valve and blade has been interrupted.
  - Valve of the respective blade is defect. Replace valve.
- 10. None of the hydraulic functions works.
  - Electricity supply to joy stick is interrupted. Check fuses at power unit.
  - Hydraulic disconnect is not properly attached. Check attachment.
  - Circuit board is defect and must be replaced.

### 7. Appendix

### 7.1 Attachment Points



#### 7.2 Distributor Box



- 1) brown gate lock
- 2) brown frame / rear stabilizer
- 3) blue gate lock
- 4) blue blades
- 5) blue frame
- 6) blue rear stabilizer
- 7) brown blade

- yellow/green Sensor / brown Bridge to 2
- brown Bridge from 1 / brown (31)
- blue (58R)
- black (54) / blue Sensor
- yellow/green (58L)
- grey (54G)
- brown Sensor





#### 7.3 Wiring diagram for Control Box / Control System









## SPARE PARTS

## ΟΝ

## TREE SPADE OPTIMAL 900



#### Manufacturer:

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9 Warranty



## TREE SPADE OPTIMAL 900 - SPARE PARTS

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
1	1	main frame	
2	4	spade tower	3180880011
3	8	guides	30685024
4	16	screw M 16 x 35	5011603500
5	32	screw M 16 x 30	5011603000
6	4	pivot pin 35 mm dia.	3070880080
7	12	flat washer M 24 DIN 125	506924
8	12	elastic stop nut M 24 x 1,5 DIN 985	50224150985
9	4	bolt M 20 x 210 DIN 931	50120210931
10	8	flat washer M 20 DIN 7349	5069201
11	8	elastic stop nut M 20 DIN 985	502200985
12	4	adjustment block	3140880010
13	4	adjustment pin	3070880010
14	4	insert nut	3130880010
15	8	socket head screw M 20 x 55 DIN 912	50120055912
16	4	spacer tube	3110880150
17	4	hex head screw	50120190933
18	4	washer 20	506920
19	2	hinge pin Ø 35	3070880060
20	4	bush 3539-50	544353950

## TREE SPADE OPTIMAL 900 - SPARE PARTS

<u>ltem</u>	<u>Quantity</u>	<u>Description</u>	Part Number
21	4	bush 3539-20	544353920
22	2	screw M 20 x 100 DIN 933	50120100933
23	2	nut M 20 DIN 934	502200934
24	1	gate lock cylinder	3010300140
25	2	socket head screw M 12 x 90 DIN 912	50112090912
26	1	lock pin	3070880110
27	4	tapered sleeve 10 x 32	5067100320
28	1	sensor	5990040754
29	1	socket head screw M 5 x 16 DIN 912	50105016912
30	1	protection for sensor	3180880450
31	4	screw M 6 x 12	501060127985
32	1	relais box PK 102	5990038103
33	1	cable fitting, M16 x 1,5	5997527714
34	1	cable fitting, M12 x 1,5 - 90°	5997499110
35	2	gate cylinder	3010200040
36	4	bush 2023-30	544202330
37	4	pin 20 mm dia.	3070880070
38	4	tapered sleeve 8 x 45	506798451481
39	4	spade cylinder	3010100051
40	8	bush	544303430

## TREE SPADE OPTIMAL 900 - SPARE PARTS

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
41	8	adjustment pin	3070880100
42	8	spacer	3110880120
43	4	bush	31185030
44	4	bolt M 16 x 120 DIN 931	50116120931
45	4	washer 17 mm	506916
46	4	elastic stop nut M 16	502160985
47	1	oil manifold	5470880010
48	4	valve NG 6 - 12 V	547001
49	16	socket head screw	50105050912
50	2	screw M 8 x 20	50108020933
51	2	washer 8.4	506908
52	2	union	515070511017
53	1	oil manifold for optional function	3051110060
54	2	socket head screw M 6 x 80 DIN 912	50106080912
55	2	flat washer 6.4	506906
56	2	nut M 6 DIN 934	502060934
57	2	straight union	3990880010
58	1	electric distributer box	5998KV002142
59	1	protection for control block	3180880460
60	4	bolt M 8 x 12 ISO 7380	501080127980

TREE SPADE OPTIMAL 900 - SPARE PARTS

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
61	1	simple pipe clamp	510RAPR-110
62	2	bolt M 6 x 20 DIN 912	50106020912
63	4	double pipe clamp	510112
64	4	cover	5100DP-B1
65	4	bolt M 6 x 35 DIN 931	50106035931
66	1	pin extractor	370880050



## TREE SPADE OPTIMAL 900 - SPARE PARTS

## Adjustment Feet

<u>ltem</u>	<u>Quantity</u>	Description	Part Number
1	1	main frame	
2	2	mounting device	3300880040
3	4	socket head screw M 16 x 40 DIN 912	50116040912
4	2	plastic cover	599035035
5	2	adjusting foot	3300880030
6	2	pin	3301100060
7	2	cotter pin	5990403



TREE SPADE OPTIMAL 900 - SPARE PARTS

## Blades

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
1	4	blade	3160880070
2	8	plastic lining, long	3060880010
3	8	plastic lining, short	3060880020
4	48	countersunk socket head screw	501060207991
5	56	countersunk socket head screw	501060257991
6	104	elastic stop nut M 6 DIN 985	502060985
7	4	bolt M 16 x 120 DIN 931	50116120931
8	8	spacer	3110880120
9	4	bush	31185030
10	4	washer 17 mm	506916
11	4	elastic stop nut M 16	502160985



TREE SPADE OPTIMAL 900 - SPARE PARTS

## Spade Cylinder

<u>ltem</u>	<u>Quantity</u>	Description	Part Number
1	1	cylinder body	3020600090
2	2	slotted nut KM 15	31350315
3	1	cylinder suspension	3090880015
4	1	guide bush 60 30 360	3116030360
5	1	nut M 20 x 1,5 DIN 936	50220150936
6	1	piston 60 30 235	3126030235
7	1	piston rod Ø 30 x 760	3030300070
8	1	eye joint Ø 25	5070880010
9	1	bush 2528-30	544252830
10	1	O-Ring 55,2 x 3 90 Shore	5170552030
11	1	rod seal S 8-30	5160230
12	1	scraper P7-30	5160330
13	1	piston seal OMK 60	5160160
14	1	O-Ring 30 x 2,5 70 Shore	5170300025
15	2	elbow union	515070510813
16	1	kompl. Dichtsatz seal kit jeu de joints	516006030601



TREE SPADE OPTIMAL 900 - SPARE PARTS

## Gate Cylinder

<u>ltem</u>	<u>Quantity</u>	Description	Part Number
1	1	cylinder body	3020320020
2	1	piston rod ø 20 x 171	3030200020
3	1	piston HZ 32/20	3123220010
4	2	union 107051-08-13	515070510813
5	1	guide bush HZ 32/20	3113220010
6	2	bush GSM-2023-30	544202330
7	1	nut M 14 x 1,5	50214120936
8	1	scraper W40 – 20 x 30	5160320
9	1	piston rod seal T7 20 x 26	5160220
10	1	o-Ring 28 x 2,5	5170280025
11	1	o-Ring 16 x 2 90 Shore	5170160020
12	1	piston seal TPM 32 x 24	5160132
13	1	seal kit	516003220601



TREE SPADE OPTIMAL 900 - SPARE PARTS

## Gate Lock Cylinder

<u>ltem</u>	<u>Quantity</u>	Description	Part Number
1	1	cylinder body, HZ 40/25	3020400071
2	1	piston rod ø 25 x 128	3030250090
3	1	guide bush HZ 40/25	3114025010
4	2	union	515070510813
5	6	socket head screw M 6 x 16	50106016912
6	1	scraper P7 - 25 (W4-25)	5160325
7	1	piston rod seal S 8 – 25 (blau)	5160225
8	1	o-Ring 35 x 2,5 90 Shore	5170350025
9	1	piston seal KPD-040-PU	51601402
10	1	seal kit	516004025602



## TREE SPADE OPTIMAL 900 - SPARE PARTS

## Hydraulic System

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
1	4	spade cylinder	3010100051
2	2	gate cylinder	3010200040
3	1	gate lock cylinder	3010300140
4	1	oil manifold	5470880010
5	1	oil manifold for optional function	3051110060
6	4	control valve NG06	547001
7	4	union	515020231017
8	4	plug	5150103310
10	2	union, long	3990880011
12	2	elbow union	515070391017
13	5	plug VSTI M10x1	515VSTIM10x1
14	14	union	515020230813
15	1	hydraulic hose NW10, length 11"	513102028013
16	1	hydraulic hose NW 10, length 8"	513102020513
17	2	hydraulic hose NW 6, length 49"	513062123011
18	2	hydraulic hose NW 6, length 39"	513062098011
19	2	hydraulic hose NW 6, length 70"	513062176012
20	2	hydraulic hose NW 6, length 60"	513062152012
21	2	hydraulic hose NW 6, length 21"	513062053012
22	2	hydraulic hose NW 6, length 16"	513062040012

## TREE SPADE OPTIMAL 900 - SPARE PARTS

## Hydraulic System

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
23	1	hydraulic hose NW 6, length 50"	513062126012
24	1	hydraulic hose NW 6, length 48"	513062121012
25	1	oil flow adjuster	515179832



TREE SPADE OPTIMAL 900 - SPARE PARTS

## **Eelectric Controls**

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
1	1	electro-selector switch /4	5470A242-521
2	2	cable fitting M20x1,5	5121100000
3	1	7-pole socket	5998JB7-POL
4	1	cable 2x1,5 – 59"	5122015
5	1	cable 5 x 1,5 - 216"	5125015
6	1	electric distributer box	5998KV002142
7	1	7-pole plug	5998JA7-POL
8	1	sensor	5990040754
9	1	cable fitting, M12 x 1,5	5997499110
10	1	cable fitting, M16 x 1,5	5997527714
11	1	relais	5994RD3520
12	1	relais box PK 102	5990038103
13	1	cable 5 x 1,5 - 69"	5125015
14	1	gate lock – cable 2 x 1,5	5122015
15	1	spades - cable 2 x 1,5	5122015
16	1	gate – cable 2 x 1.5	5122015
17	1	auxiliary - cable 2 x 1.5	5122015
18	1	sensor - cable 3 x 1,5	5123015
19	1	protection hose	5997499100
20	4	standard plug	54743650

## TREE SPADE OPTIMAL 900 - SPARE PARTS

## **Eelectric Controls**

<u>ltem</u>	<u>Quantity</u>	<b>Description</b>	Part Number
21	1	switch 4 function, with wiring harness	20133000
22	1	electro-distribution box compl. wired (without sensor)	201408802



#### LIMITED WARRANTY

Optimal-Vertrieb Opitz GmbH ("Opitz") warrants that this product will be free from defects in material and workmanship for a period of 6 months from the date of purchase (the "Warranty Period"). If, during the Warranty Period, this product proves to be defective, Opitz will remedy the defect by either repairing or replacing the product or any of its defective parts, at Opitz's option.

If you need warranty service, you must, prior to the lapse of the Warranty Period, file a claim, together with proof of purchase and your original Warranty Certificate received at the purchase of the product, with Fieldworks Nursery Equipment Grand Bay AL 36541; USA. After a warranty claim is properly filed, Opitz or its designated representative will evaluate the warranty claim. This warranty is conditioned upon your reasonable cooperation with Opitz in the evaluation of your warranty claim and the implementation of any remedy. When supplying replacement product or parts under this warranty, Opitz reserves the right to substitute product or parts of comparable value and design for any discontinued designs. This warranty is not transferable and applies only to the original consumer purchaser.

Opitz does not assume any responsibility for failures, breakage or causes which result from abuse, misuse, negligence, faulty operation, unauthorized repair or alteration, accident, fire, winds, floods, moisture, other unfavorable atmospheric conditions or other causes beyond Opitz's reasonable control or from failure to operate or maintain the product in accordance with the Opitz Operation Manual (a copy of which is provided to you with the product) or from normal wear and tear under normal usage. **OPITZ EXCLUDES AND WILL NOT PAY ANY INCIDENTAL AND CONSEQUENTIAL DAMAGES ARISING OUT OF THE PURCHASE OR USE OF THE PRODUCT**. By this Opitz means any loss, expense or damage other than to the product itself that may result from a defect in the product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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This warranty shall apply only to product that is purchased and used within the United States. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Date of Sale:	Product Sold:
Product Serial Number:	Expiration Date of the Warranty:
Name and Address of Buyer:	
Signature of Buyer:	