

FEUER- LÖSCHTECHNIK FIRE FIGHTING

BEDIENUNGS- UND WARTUNGSANLEITUNG OPERATION AND MAINTENANCE MANUAL

*ISTRUZIONI PER L'USO E LA MANUTENZIONE
INSTRUCTIONS DE SERVICE ET DE MAINTENANCE
INSTRUCCIONES DE SERVICIO Y MANTENIMIENTO
INSTRUKCJA OBSŁUGI I KONSERWACJI
РУКОВОДСТВО ПО ОБСЛУЖИВАНИЮ И ТЕХУХОДУ*

Feuerlöschtechnik *Fire Fighting*



Portable Fire Fighting Unit

model ZL 500 H

Specifications as per Acknowledgement of Order

Order No.:

Contract No.:

PF Pumpen und Feuerlöschtechnik GmbH
Zeichensteig 225
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1.0 General information

This manual provides information for the safe and correct operation of the portable fire fighting unit ZL 500 H and to assure long life and troublefree working of the unit. The design of fire fighting unit is in conformity with DIN 14410 standards.

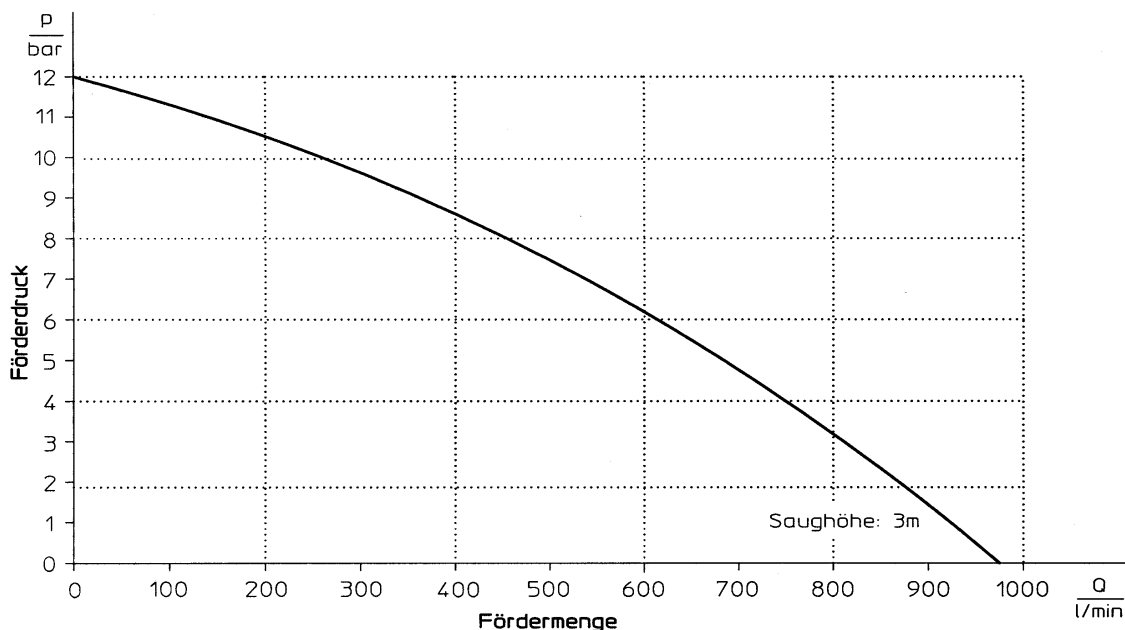
For details concerning the engine consult the manual supplied by the engine manufacturer. A stand-by fire fighting unit has to be in constant state of readiness. Only by scrupulously observing all instructions for its use and maintenance is it possible to meet these requirements and to get the unit into operation with optimum speed.

Apart from fire fighting the unit can also be used to pump polluted liquids.

1.1 Specifications

Flow rate:	500 l/min
rated pressure:	6 bar
rated motor speed:	2925 rpm
geodetic head:	3 m
max. pressure:	11 bar
max. performance:	960 l/min
max. suction lift :	7,5 m

1.2 Performance diagram



2.0 Safety

In this manual, the fundamental rules for installation, operation and maintenance are listed.

The operators have to be properly instructed to cope with any emergency.



2.1 Safety rules for the operator

To avoid potential hazards to people these rules have to be carefully observed.

1. Wear protective clothing as mandatory for fire fighting.
2. Do not touch rotating or hot parts (e. g. exhaust, cylinder)
3. Do not remove any safety device.
4. Do not run the engine in closed rooms (to avoid inhaling exhaust fumes).
5. Top up the fuel tank only when the engine is stopped and has cooled off, fuel might get spilled onto hot parts.
6. Open the head valve gradually to avoid backlash by the pressure hose.
7. Take care when filling the delivery hose. Vent it (Otherwise the hose might burst and harm the operator).
8. Position the unit so that neither exhaust nor the engine heat can start a fire.
9. Repairs and maintenance work should be carried out by qualified personnel in compliance with the operating instructions for pump and engine.

3.0 Description

3.1 Pump

Single stage centrifugal pump made of sea waterproof aluminium and thus suitable for pumping also brine or polluted water.

The pump is directly flanged to the engine. Shaft sealing is by way of a maintenance-free slip-ring seal.

The suction port has a B-type tight coupling as per DIN 14306 and a strainer basket as per DIN 14423. The head port has a self closing B-type head valve as per DIN 14381 and a B-type tight coupling as per DIN 14308. When draining the delivery hoses over the pump, open the valve completely by pulling the lateral locking pin to avoid backkick of the valve disk.

The pressure meter as per DIN 14421 reads the pressures on the intake and delivery sides.

3.2 Venting

Until the pump draws water, the centrifugal pump and the suction hose are vented by a hand piston pump. The piston pump provides the vacuum for venting. Close the air cock in vent tube, if the pump generates pressure.

3.3 Engine

The pump is driven by an air cooled four-stroke two-cylinder Combustion engine, yielding 18 HP at 3600 rpm.

A flyweight governor maintains a constant engine speed in accordance with the setting of the throttle lever. The tank, located above the engine will hold 8.5 liters of unleaded standard type petrol. The capacity of the oil tank is 1.7 l. (15 W-40 multigrade oil).

3.4 Carrying frame

The carrying frame is made of powder coated sectional steel. Dimensions as per DIN 14410. Four hinged handles facilitate the handling of the unit. On the frame front there is a socket for recharging the battery.

3.5 Meters, signals and controls

- | | |
|------------------------------|---|
| 1. Throttle lever: | „Open“ for high speed
„Closed“ for low speed |
| 2. Choke: | The choke closes the air valve of the carburettor to provide a rich gas mixture (Pull starter for cold start) |
| 3. Hand piston pump: | Actuate for venting the suction hose. |
| 4. Main switch: | In „0“ position ignition is de-activated and engine stops. In „1“ position the ignition is switched on, the oil warning lamp is on. Engine can be started by push button or pull starter. |
| 5. Starter button: | With the main switch on, the engine can be started by push-button. |
| 6. Pressure meter: | Combined pressure/vacuum meter. During the priming cycle the suction head is measured, during operation, the delivery pressure. |
| 7. Oil warning lamp: | When the main switch is turned on the red oil warning lamp goes on. When the engine starts firing the signal will go out. If the light stays on while the engine is running, stop the engine immediately and check the oil level. |
| 8. Fuel stop cock: | To prevent the flooding of the carburettor float chamber close the fuel stop cock in the case of long idle periods. |
| 9. Air cock in venting tube: | Close the air cock if the pump generate pressure. The cock prevent water from entering the piston pump and prevent air from entering the suction hose. |
| 10. Drain cock: | After use, especially if temperatures below zero are to be expected, the pump has to be drained. |
| 11. Pull starter: | For starting with starter cord. |

4.0 Modes of operation

Provided the pump is regularly checked after use it will not be necessary to check fuel and oil tank prior to operation.

4.1 Starting

Start operation in this sequence:

1. Position the pump as near as possible to the water withdrawal point.
2. The pump should not be tilted more than 20°.
3. Remove dummy couplings.
4. Connect the hoses.
5. Close drain cock.
6. Open venting valve.
7. Slightly open head valve.
8. Open fuel cock.
9. Turn on main switch.
10. Cold start: Pull the choke
Hot start: No choke needed
11. Put throttle on part load.
12. Push „Starter“ button until engine fires. Should the engine not start within 15 seconds, interrupt starting process, to avoid overloading the battery and overheating the starter.



Pull starter: Pull starter cord until you feel a resistance and then yank the starter cord. This way backlash is avoided. Let the starter cord rewind slowly and repeat the process.

13. As soon as engine fires regularly rewind the cord.



14. Do not run pump dry for more than 2 or 3 minutes. Otherwise the slipping seal for the pump shaft might get overheated.

4.2. Priming

1. Use basket and check valve.
2. Secure the suction line with a rope (if necessary also secure the valve).
3. Immerse basket completely in water but take care not to drop it into mud or sand.
4. Make sure the rise of the suction line is continuous.
5. Suction hose must not loop above suction port. (Airlock!).
6. Open air cock in air vent tube.
7. Actuate hand priming pump.
8. Run engine at low speed.
9. Watch vacuum meter (Build-up of vacuum).
10. After some time the pump generate pressure.
11. When the vacuum meter registers a constant vacuum close the air cock in air vent tube.
12. Gradually open head valve.
13. Set throttle to required head pressure.

4.3 Hydrants

When the pump draws the water from the water mains (hydrant) or from another pump no priming is required. Proceed as follows:

1. Close venting air cock.
2. Turn on hydrant.



3. Feed pressure should be more than 1 bar. Otherwise the hose on the suction side might collapse and the water flow be interrupted.



4. The feed pressure must not exceed 12 bar (if necessary install pressure-reducing valve).
5. Start engine (see above).
6. Gradually open head valve.
7. Gradually fill hose lines.
8. Set engine speed to the required head pressure.

4.4 Operating practice

Occasional checking of pressure meter and pump operation is necessary.

1. Oil warning light should not be on.
(Otherwise stop engine and check oil level).
2. Pressure reading should remain constant. (In case of a pressure drop check basket and suction line which might be clogged or leaking).
3. When opening the throttle, pressure should rise. Otherwise there might be cavitation. In case of cavitation the pump runs noisier and might get damaged.
(Cavitation may be caused by a clogged suction line, or in case of draining operation, if suction line is too long and pressure too low).
4. Do not top up fuel tank when engine is running. Fire hazard!
(Cool engine by putting it first in idling mode and then stopping it altogether).
5. Pump should not be working over a longer period with closed delivery end.
Water would get excessively hot. (If a longer interruption of the delivery is unavoidable, open the drain cock in order to provide fresh water to the pump).

5. Ending the operation

1. Throttle down the engine and let engine cool for about two minutes.
2. Put main switch into „OFF“ position (Ignition off).
3. In case the hose lines are still under pressure open the head valve.
(Open valve beyond the position of the locking pin).
4. Drain pump and hoses.
5. Disconnect hoses.
6. Check seals.
7. Fix dummy couplings.
8. Preparation for next operation:

Dry run test.

- Fix dummy coupling on suction port.
- Remove dummy coupling from head port.
- Close drain cock.
- Open venting air cock.
- Close head valve (pressure valve).
- Actuate hand priming pump.
- Vacuum must not drop more than 0.1 bar during 1 minute.

9. Top up fuel.
10. Close fuel cock
11. Check oil level.
12. Check liquid level of battery.
13. Check and clean air filters.
14. Clean engine and pump.
15. Check for damaged or loose parts.
16. Carry out periodic inspections.
17. Store pump in clean and dry place.

6. Antifreeze precautions

If the pump has been properly drained and stored in a frost-proof place no further measures are required.

Otherwise take the following precautions:

1. Pour about 0.5 l antifreeze into the suction port of the pump.
2. Fix dummy couplings.
3. Actuate hand priming pump up to fluid run out.

After the frost period the antifreeze can be drained through the drain valve for re-use.

7. Maintenance

Carry out maintenance as per instructions of the engine manufacturer. If the unit runs for less than 50 hours in twelve months, change the oil on a yearly basis.

7.1 After each operation

Carry out the instruction as per paragraph 5 „Stopping operation“ and, where applicable, Par. 6 „Antifreeze measures“.

If the oil warning light stays off, the electric starter does not work, or the battery is not re-charged after the main switch is turned on, check the F 1 fuse.

The 16 A fuse is located in the power connector near the starter.

7.2 Monthly maintenance

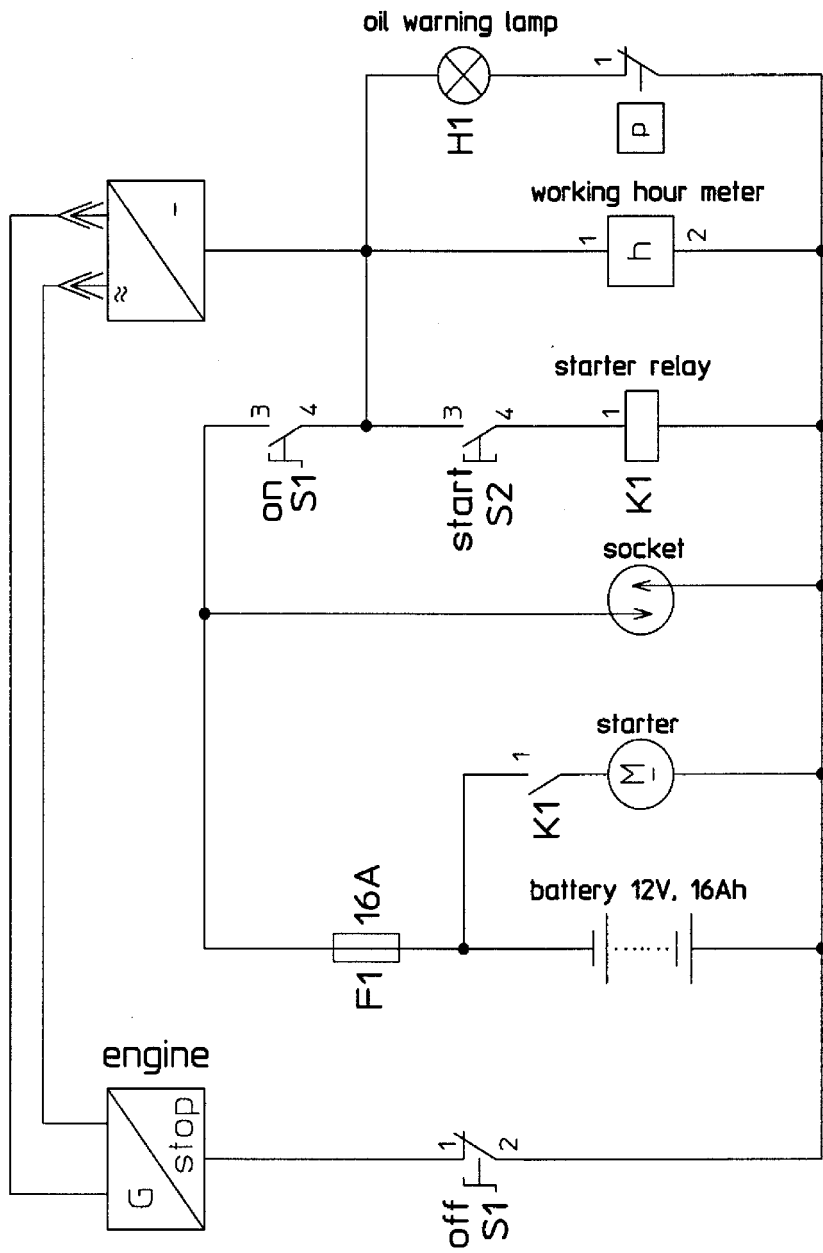
Test run the engine once a month and check:

1. The functioning of the starting process.
2. Keep the pump working at half-throttle for about 15 min.
For that purpose connect the pump to the water supply to avoid dry running.
3. Dry priming test.
4. Check fuel filter for cleanliness.
5. Re-charge starter battery, if necessary.
6. Check if the stop valve in the venting system works freely.
7. Check oil level of engine, and the fuel tank.

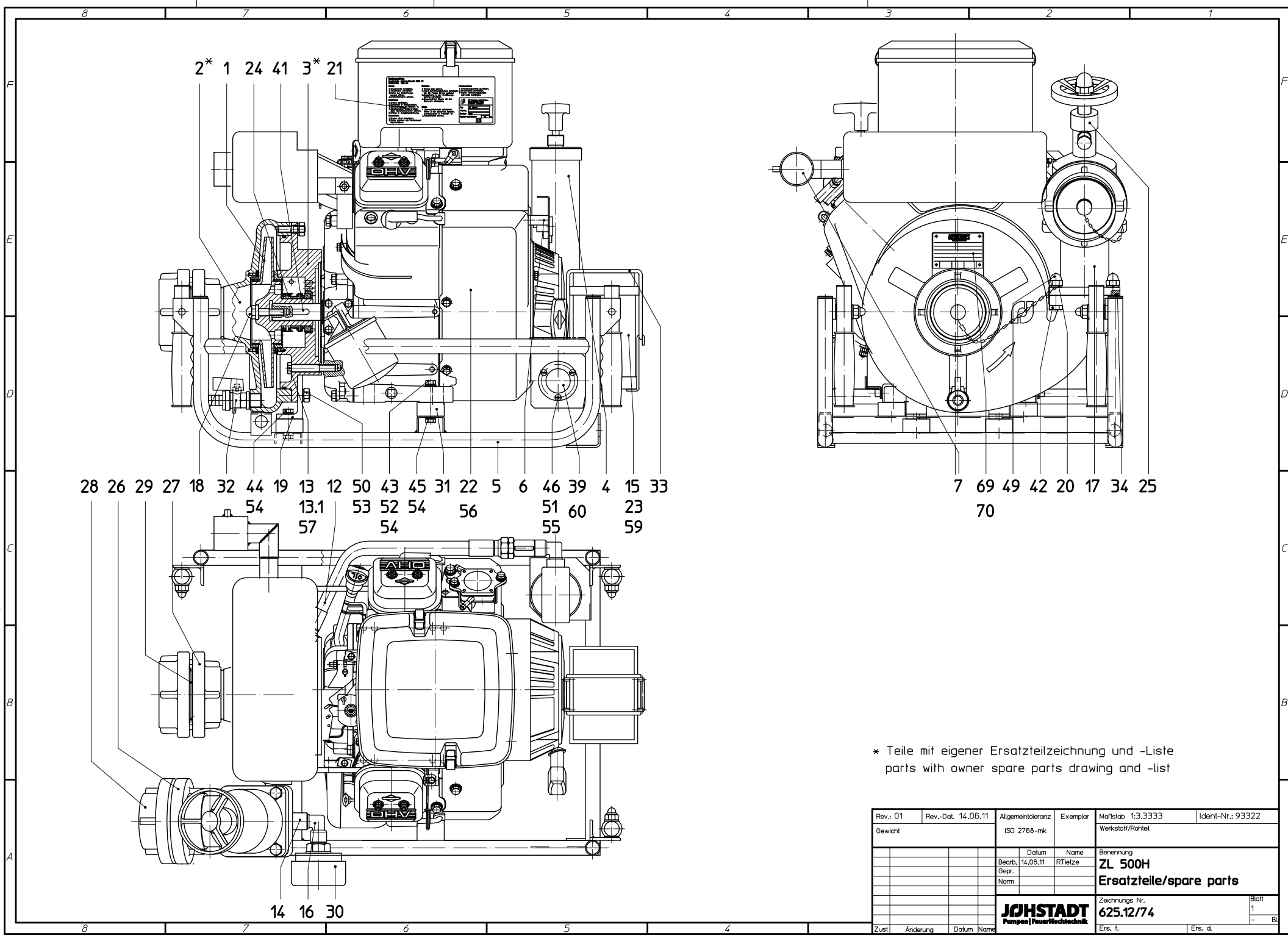
7.3 Yearly maintenance

In addition to the above:

1. Check starter battery. During the starting-up cycle the voltage should not drop below 9 V.
Otherwise exchange battery.
2. Change engine oil.
3. Clean air filter.
4. Clean plugs and check the gap (0.76 mm).
5. For further maintenance measures consult the maintenance instructions of the engine manufacturer.



Stromlaufplan
ZL 500 H



2* 1 24 41 3* 21

28 26 29 27 18 32 44 19 13 12 50 43 45 31 22 5 6 46 39 4 15 33
 54 13.1 53 52 54 56 51 60 23
 57 54 55 59

7 69 49 42 20 17 34 25
 70

14 16 30

* Teile mit eigener Ersatzteilzeichnung und -Liste
 parts with owner spare parts drawing and -list

Rev.: 01	Rev.-Dat. 14.06.11	Allgemeintoleranz	Exemplar	Maßstab 1:3.3333	Ident-Nr.: 93322
Gewicht		ISO 2768-mk		Werkstoff/Rohrl.	
		Bearb. Datum 14.06.11	Name RTietze	Benennung	
		Gepr.		ZL 500H	
		Norm		Ersatzteile/spare parts	
				Zeichnungs Nr.	Blatt
				625.12/74	1
				Ers. f.	- Bl.
Zust.	Änderung	Datum	Name	Ers. d.	

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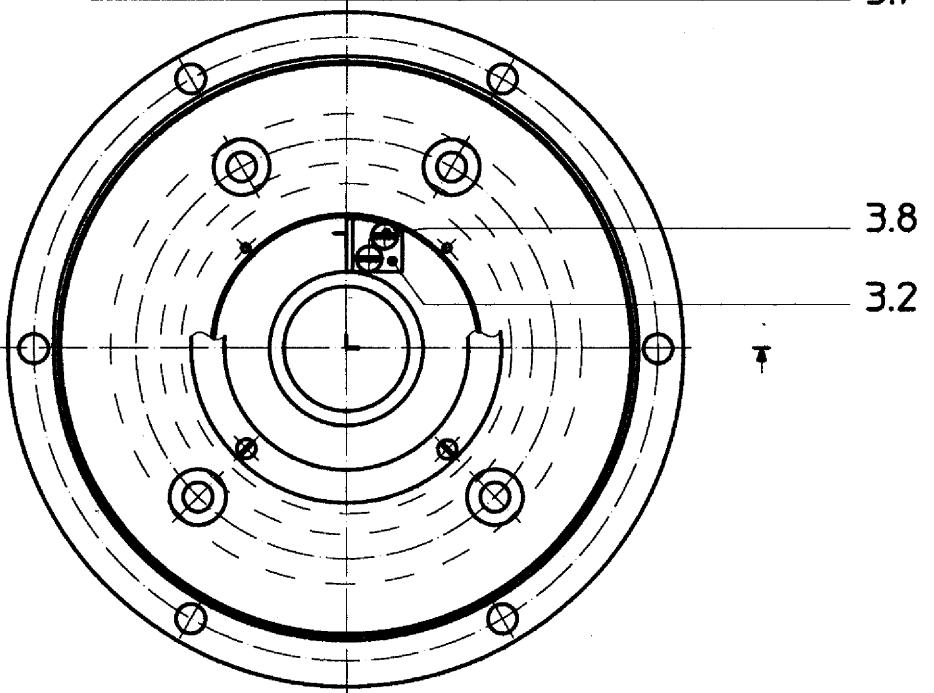
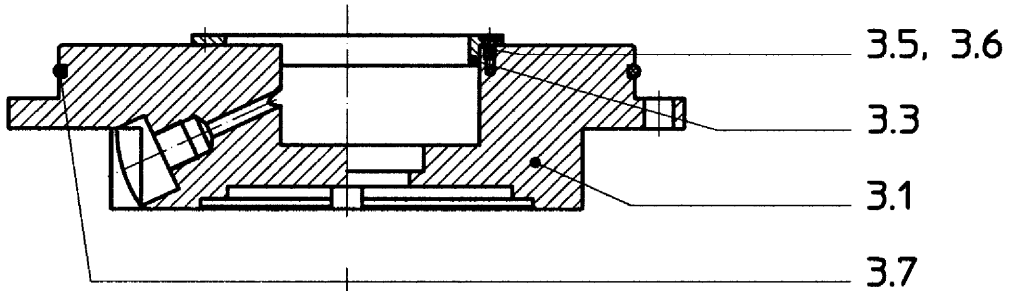
D


C

C

B

A



Rev.: 01	Rev.-Dat. 22.05.06	Allgemeintoleranz	Exemplar	Maßstab	Ident-Nr. 64370
Gewicht		ISO 2788-mk		Werkstoff/Rohrteil	
				Gehäusedeckel-vollst.	
		Datum	Name	Benennung	
		Bearb. 22.05.06	R.Tielze	Housing cover-complete	
		Gepr.		Ersatzteile/spare parts	
		Norm			
				Zeichnungs Nr.	Blatt
				625.12/24 - 3	1
				Ers. f.	Ers. d.
Zust.	Änderung	Datum	Name	 PF Pumpen und Feuerlöschtechnik GmbH Jähstätt	

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PF Pumpen und Feuerlöschtechnik GmbH
www.johstadt.com

Ersatzteilliste / Spare parts list
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ID-No.: 93322 TRAGKRAFTSPRITZE-ZL500H / PORTABLE PUMP ZL 500H
625.12/74 (-) 21102035

Pos	ID-No.	Name	Qty	
1	27207	LAUFRAD-VOLLST. IMPELLER	1	Stück Piece
2	64369	PUMPENGEHAEUSE-VOLLST. PUMP CASING-COMplete	1	Stück Piece
3	64370	GEHAEUSEDECKEL-VOLLST. HOUSING COVER-COMplete	1	Stück Piece
4	75441	ENTLUEFTUNGSPUMPE VACUMAT	1	Stück Piece
5	64702	TRAGGESTELL CARRY FRAME	1	Stück Piece
6	64377	BEDIEN-TAFEL PANEL	1	Stück Piece
7	64376	AUSPUFF-VOLLST. EXHAUST COMPLETE	1	Stück Piece
12	64340	SCHLAUCH FLEXIBLE TUBE	1	Stück Piece
13	64388	SECHSKANTSCHRAUBE HEXAGONAL SCREW	4	Stück Piece
13.1	1878	SCHEIBE WASHER	4	Stück Piece
14	24338	ADAPTER ADAPTER	1	Stück Piece
15	64389	BATTERIEUNTERLAGE BATTERY PAD	1	Stück Piece
16	64395	MANOMETERWINKEL MANOMETER FITTING	1	Stück Piece
17	17082	ZWISCHENSTUECK INTERMEDIATE FLANGE	1	Stück Piece

18	17232	LAUFRADSCHRAUBE IMPELLER SCREW	1	Stück Piece
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19	62405	FUSS BOTTOM	2	Stück Piece
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20	2878	HALTEBLECH RETAINING PLATE	2	Stück Piece
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21	72875	KURZBEDIENANWEISUNG SHORT MANUAL	1	Stück Piece
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22	16828	MOTOR ENGINE	1	Stück Piece
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23	17960	EL-STARTERBATTERIE BATTERY	1	Stück Piece
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24	53700	GLEITRINGDICHTUNG MECHANICAL SEAL	1	Stück Piece
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25	2904	B-DRUCKVENTIL PRESSURE VALVE, TYPE B	1	Stück Piece
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26	1113	FESTKUPPLUNG COUPLING STORZ B	1	Stück Piece
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27	4357	FESTKUPPLUNG COUPLING	1	Stück Piece
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27.1	58095	MUFFENNIPPEL BUSH NIBBLE	1	Stück Piece
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28	1111	BLINDKUPPLUNG-M.KETTE BLIND CAP WITH CHAIN	1	Stück Piece
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28.1	1112	BLINDKUPPLUNG-M.KETTE BLIND CAP WITH CHAIN	1	Stück Piece
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29	17152	SIEB SIEV	1	Stück Piece
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30	1117	DRUCKMESSGERAET PRESSURE GAUGE	1	Stück Piece
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31	16979	GUMMI-METALL-PUFFER DAMPING BUFFER	4	Stück Piece
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32	55477	KUGELHAHN BALL VALVE	1	Stück Piece

33	7682	RUNDRING O-RING	1	Stück Piece
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34	6433	RUNDRING O-RING	1	Stück Piece
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39	3025	EL-STECKDOSE SOCKET	1	Stück Piece
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41	29726	PASSFEDER FEATHER	1	Stück Piece
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42	1051	SECHSKANTSCHRAUBE HEXAGON SCREW	8	Stück Piece
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43	1103	SECHSKANTSCHRAUBE HEXAGON SCREW	2	Stück Piece
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44	5929	SECHSKANTSCHRAUBE HEXAGONAL HEAD SCREW	2	Stück Piece
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44.1	18098	ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	4	Stück Piece
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45	3586	SECHSKANTSCHRAUBE HEXAGONAL HEAD SCREW	4	Stück Piece
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46	1047	SENKSCHEIBE SLOTTED HEAD SCREW	3	Stück Piece
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49	428	SECHSKANT-HUTMUTTER HEXAGON DOMED CAP NUT	8	Stück Piece
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50	429	SECHSKANTMUTTER HEXAGON NUT	6	Stück Piece
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51	2952	SECHSKANTMUTTER HEXAGON NUT	4	Stück Piece
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52	2293	SCHEIBE WASHER	2	Stück Piece
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53	769	FEDERRING SPRING RING	14	Stück Piece
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54	770	FEDERRING SPRING RING	12	Stück Piece

55	963	FEDERRING SPRING RING	3	Stück Piece
56	2792	OEL ENGINE OIL	1.7	Liter Liter
57	30620	GEWINDEDICHTUNG GASKET	2	ml ml
58	30946	SCHRAUBENSICHERUNG LOCTITE HIGH STRENGTH	3	ml ml
59	64367	EL-SCHUTZKAPPE PROTECTIVE CAP	1	Stück Piece
60	29949	DICHTUNG SEAL	1	Stück Piece
69	72223	TYPENSCHILD DATA PLATE	1	Stück Piece
70	11319	HALBRUNDKERBNAGEL ROUND-HEAD NOTCH NAIL	4	Stück Piece
75	93407	ZUBEHOER PARTS	1	Stück Piece

Ersatzteilliste / Spare parts list

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ID-No.: 64369 PUMPENGEHAEUSE-VOLLST. / PUMP CASING-COMplete
625.12/24-2 (3)

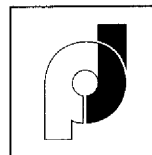
Pos	ID-No.	Name	Qty	
2.1	17068	PUMPENGEHAEUSE PUMP CASING	1	Stück Piece
2.2	17231	SCHLEIFRING SLIP RING	1	Stück Piece
2.4	1192	STIFTSCHRAUBE STUD BOLT	2	Stück Piece
2.5	64368	STIFTSCHRAUBE STUD BOLT	4	Stück Piece

2.5.1	73800	GEWINDESTIFT THREATHED PIN	1	Stück Piece
2.6	3038	ZAHNSCHEIBE TOOTHED LOCK WASHER	4	Stück Piece
2.7	2856	SENKSCHRAUBE HEAD SCREW	4	Stück Piece

Ersatzteilliste / Spare parts list
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ID-No.: 64370 GEHAEUSEDECKEL-VOLLST. / HOUSING COVER-COMLETE
625.12/24-3 (-)

Pos	ID-No.	Name	Qty	
=====				
3.1	17209	GEHAEUSEDECKEL HOUSING COVER	1	Stück Piece
3.2	17418	WINKEL ANGLE	1	Stück Piece
3.3	17231	SCHLEIFRING SLIP RING	1	Stück Piece
3.5	3038	ZAHNSCHEIBE TOOTHED LOCK WASHER	4	Stück Piece
3.6	2856	SENKSCHRAUBE HEAD SCREW	4	Stück Piece
3.7	17151	RUNDRING O-RING	1	Stück Piece
3.8	12172	ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	2	Stück Piece



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Declaration of conformity

as defined by the Directive Machinery 98/37/EG, Annex II A

Herewith we declare that the supplied pump unit model

Portable fire pump ZL 500 H

complies with the following provisions applying to it:

EC-Directive Machinery as amended by 98/37/EG.

Applied harmonized standards, in particular

EN 1028-1, EN 1028-2

EN 953

EN ISO 12100-1, EN ISO 12100-2

EN ISO 9905

EN 294

EN 60204-1

Applied national technical standards and specifications, in particular

DIN 14410

11.07.05

