

## Contents

EC Declaration of Conformity .....	2
Operator safety .....	3
Description .....	4
Operation diagram .....	5
Connecting the sprayer .....	6
Roadworthiness .....	6
Operating instructions .....	7
Operation of the boom .....	7
Boom height .....	7
Pulsation damper .....	7
Adjustment of the operating unit .....	8
Maintenance .....	9
Filters .....	9
Lubrication .....	10
Readjustment of the boom .....	12
Changing of valves and diaphragms .....	13
Nozzle tubes and fittings .....	14
Off-season storage .....	14
Operational problems .....	16
Technical specifications .....	18
Pictorial symbols .....	20
Preassembly information .....	21
Assembly .....	22
Spare parts drawings .....	27

# BL

## Instruction book

673224-GB-04/2002



# EC Declaration of Conformity

## Manufacturer,

HARDI INTERNATIONAL A/S  
Helgeshøj Allé 38  
DK 2630 Taastrup  
DENMARK

## Importer,

declare that the following product;

.....  
.....

Adhere extra shipping package labels to inside cover.

**A.** was manufactured in conformity with the provisions in the COUNCIL DIRECTIVE of 14 June 1989 on mutual approximation of the laws of the Member States on the safety of machines (89/392/EEC as amended by directives 91/368/EEC and 93/368/EEC) with special reference to Annex 1 of the Directive on essential safety and health requirements in relation to the construction and manufacture of machines.

**B.** was manufactured in conformity with the standards current at that time that implements a harmonised standard in accordance with Article 5 (2) and other relevant standards.


Taastrup 03.04.2002

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Lars Bentsen  
Product Development Manager  
HARDI INTERNATIONAL A/S

## Operator safety



Watch for this symbol . It means WARNING, CAUTION, NOTE. Your safety is involved so be alert!

Note the following recommended precautions and safe operating practices.

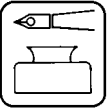
-  Read and understand this instruction book before using the equipment. It is equally important that other operators of this equipment read and understand this book.
-  Local law may demand that the operator be certified to use spray equipment. Adhere to the law.
-  Pressure test with clean water prior to filling with chemicals.
-  Wear protective clothing.
-  Rinse and wash equipment after use and before servicing.
-  Depressurize equipment after use and before servicing.
-  Never service or repair the equipment whilst it is operating.
-  Disconnect electrical power before servicing.
-  Always replace all safety devices or shields immediately after servicing.
-  If an arc welder is used on the equipment or anything connected to the equipment, disconnect power leads before welding. Remove all inflammable or explosive material from the area.
-  Do not eat, drink or smoke whilst spraying or working with contaminated equipment.
-  Wash and change clothes after spraying.
-  Wash tools if they have become contaminated.
-  In case of poisoning, seek doctor or ambulance. Remember to identify chemicals used.
-  Keep children away from the equipment.
-  Do not attempt to enter the tank.
-  If any portion of this instruction book remains unclear after reading it, contact your HARDI dealer for further explanation before using the equipment.



We congratulate you for choosing a HARDI plant protection product. The reliability and efficiency of this product depend on your care. The first step is to carefully **read and pay attention** to this instruction book. It contains essential information for the efficient use and long life of this quality product.

As the instruction book covers all BL models, please pay attention to the paragraphs dealing with precisely your model. This book is to be read in conjunction with the Spray Technique book.

HARDI INTERNATIONAL A/S reserve the right to make changes in design or to add new features without any obligation in relation to implements purchased before or after such changes.



## Description

The Hardi BL models consist of a pump, frame with tank of 200 or 300 litre capacity with basket filter, M-70 operating unit and 6 or 8 metre SB booms.

The design of the diaphragm pump is simple, with easily accessible diaphragms and valves that ensures liquid does not come in contact with the vital parts of the pump.

The tank, made of impact-proof and chemical resistant polyethylene, has a purposeful design with no sharp edges for easy cleaning. A suction filter is located inside the tank at the sump.

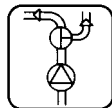
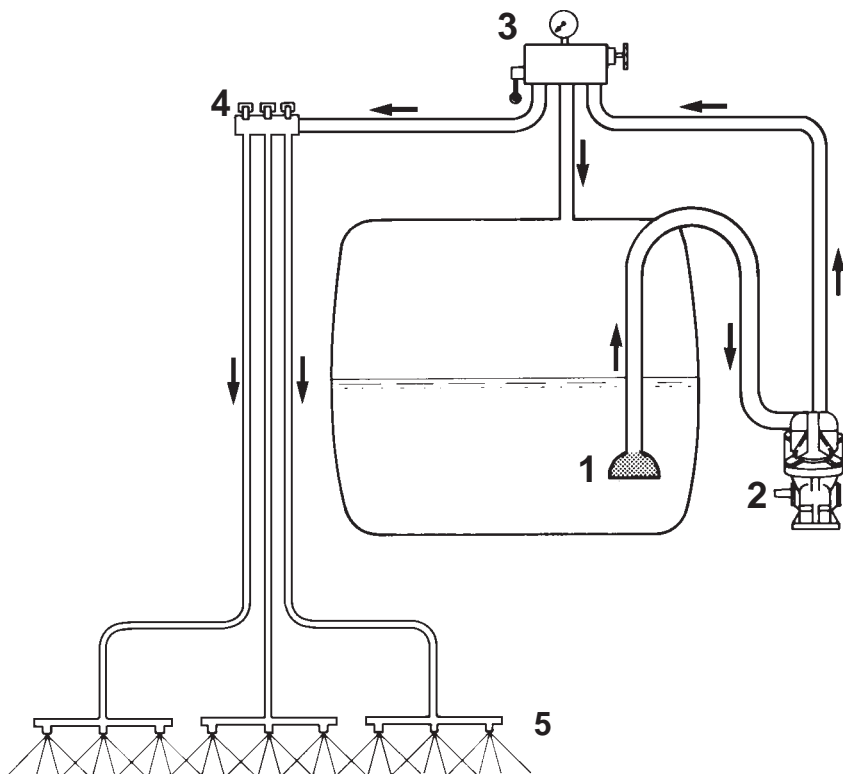
The M-70 operating unit consists of; on/off function, pressure regulation valve with pressure gauge and distribution valves for closing of spray boom sections.

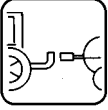
The SB boom is bolted to the tank frame and is fitted with spring loaded breakaways at the pivots.

An identification plate fitted on the frame indicates model, year of production and serial number, and country of origin.

# Operation diagram

1. Suction filter
2. Pump
3. On/off and pressure regulation valve
4. Distribution valve
5. Sprayer boom





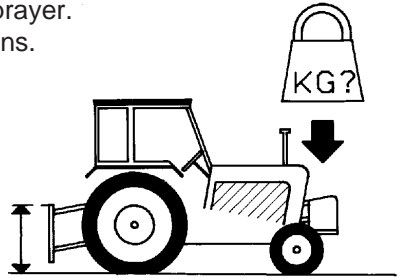
## Connecting the sprayer

The sprayer is designed for three point suspension and is equipped with 22 mm pivots (category I).

**WARNING:** Note the weight of the sprayer. See section on Technical specifications.

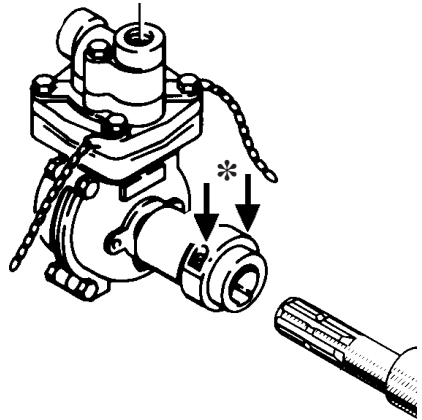
Generally it is recommended to:

1. Add ballast to front of tractor.
2. Increase tyre pressure (see tractor instruction book).
3. Travel at slower speeds when driving with a full tank.  
(The tractor will have decreased braking efficiency.)
4. Be careful when filling/lifting the sprayer the first time.



The pump is mounted directly to the tractor P.T.O.

1. Undo the 2 allen screws \* on coupling and remove key.
2. Slide pump onto P.T.O. shaft.
3. Replace key and tighten allen screws.
4. Secure pump with supplied chains to prevent rotation.



## Roadworthiness

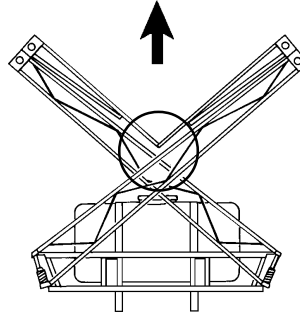
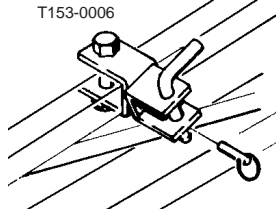
When driving on public roads and other areas where the highway code applies, or areas where there are special rules and regulations for marking and lights on implements, you should observe these and equip implements accordingly.

# Operating instructions

## Operation of the boom

Remove boom transport lock pin (8 metre only). When unfolding (or folding) the initial force to release the spring loaded breakaways will be higher than the actual unfolding/folding.

**CAUTION:** The breakaways must be correctly tensioned and lubricated. (see section on Re-adjustment of the boom)  
Replace boom transport lock pin when driving with folded boom.



## Boom height

Correct boom height is very important in order to achieve the most optimal spray pattern. (See Spray Technique book).

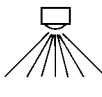

Small adjustments of the boom height can usually be made with the 3-point suspension from the tractor - raising or lowering the sprayer.

In crops where greater adjustments are needed the boom height can be changed manually by removing the 4 bolts holding the boom to the frame.

**Note:** This is best done by 2 persons or with a mechanical hoist.

## Pulsation damper

The air pressure in the pulsation damper is preset at the factory to 2 bar. This covers spray working pressures between 3 and 15 bar. When using spray pressures outside this range, the air pressure should be adjusted as shown in the diagram. The diagram is also embossed on the damper.

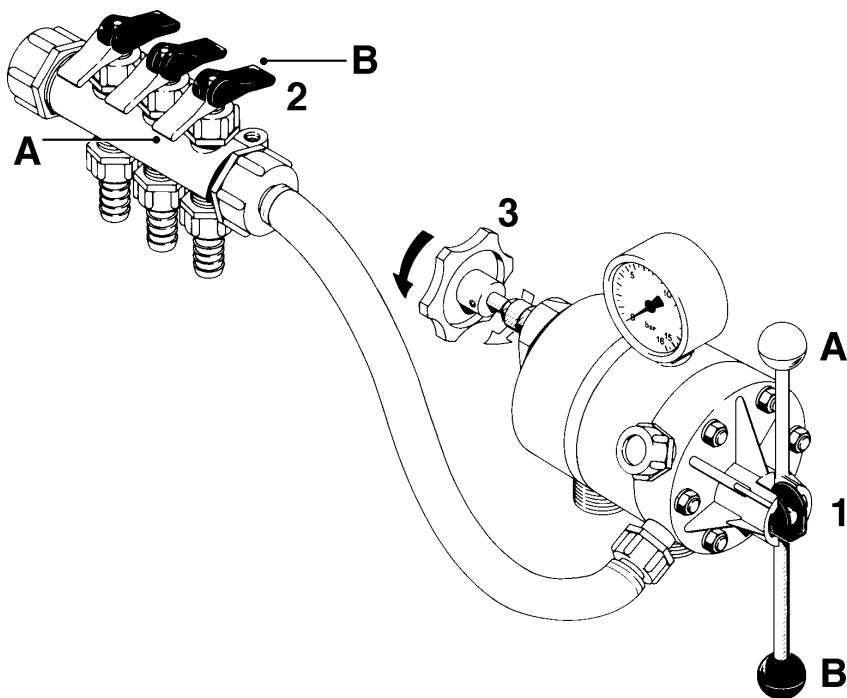
	
<b>bar</b>	<b>bar</b>
<b>15 - 3</b>	<b>0 - 1</b>
<b>3 - 15</b>	<b>1 - 3</b>

T020-0032





## Adjustment of the operating unit



1. Turn main on/off handle **(1)** to off position **A**.
2. Set all hand levers on the distribution valve **(2)** to spraying position **A**.
3. Put the tractor in neutral and set the engine revolutions and thereby the number of revolutions of the pump corresponding to the intended travelling speed. Remember the number of revolutions on the P.T.O. must be kept between 300-600 r/min.
4. Turn main on/off handle **(1)** to spraying position **B**.
5. Now turn the pressure regulating valve **(3)** to until the required pressure is indicated on the pressure gauge.
6. Operating the control unit while driving:  
To close the entire boom, turn the handle **(1)** to position **A**. This takes the pressure off the pump. The liquid will then return to the tank via the return system.



The diaphragm anti-drip valves ensure instantaneous closing of all nozzles. In order to close part of the boom, move lever **(2)** of the distribution valve to position **B** (off position) for the section or sections to be closed. Note that the pressure will rise and readjustment will be necessary.

### **Drain valve operation**

A drain valve cap is located under the tank. Unscrew it to drain tank. Be careful not to lose the seal.

## **Maintenance**

In order to derive full benefit from the sprayer for many years the following few but important rules should be kept:

**Cleaning the Sprayer** - see Spray Technique book.

### **Filters**

Clean filters ensure :

- Sprayer components such as valves, diaphragms and operating unit are not hindered or damaged during operation.
- Nozzle blockages do not occur whilst spraying.
- Long life of pump. A blocked suction filter will result in pump cavitation.

The main filter protecting sprayer components is the suction filter inside the tank at the sump. Check it regularly.  
Also regularly check nozzle filters.





## Lubrication

Recommended lubrication is shown in following tables. Use ball bearing grease (lithium grease No.2)

**NOTE:** If the sprayers are cleaned with a high pressure cleaner or it has been used to spray fertilizer, we recommend lubrication of the entire machine.

**POS.**

 2 Position on sprayer



Page to find more information



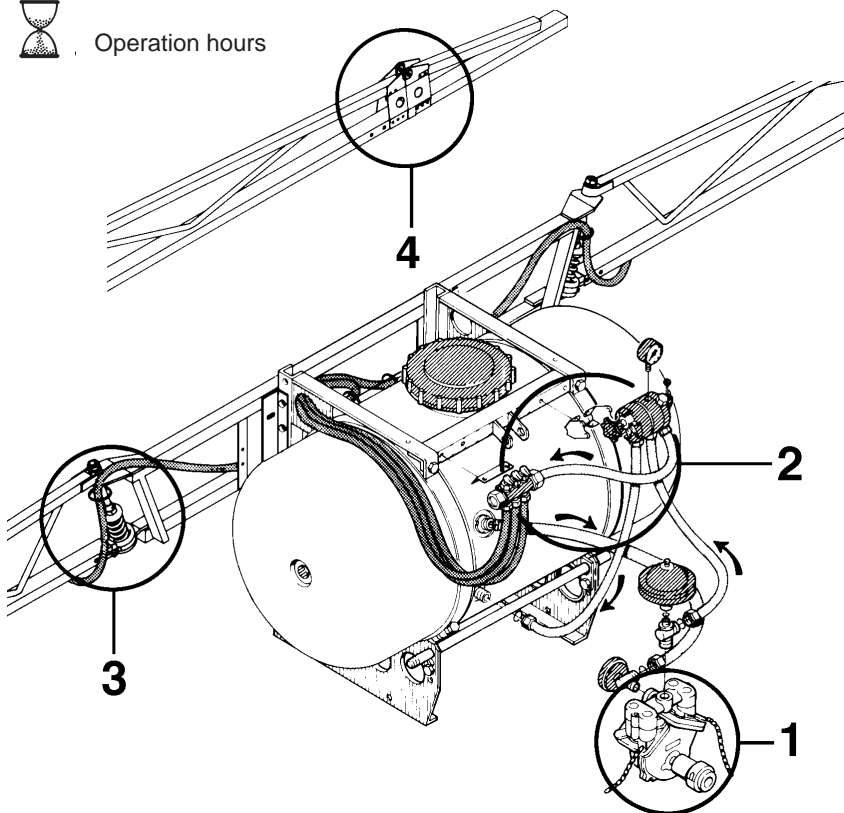
Oil





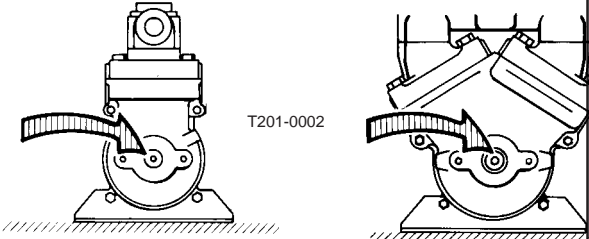
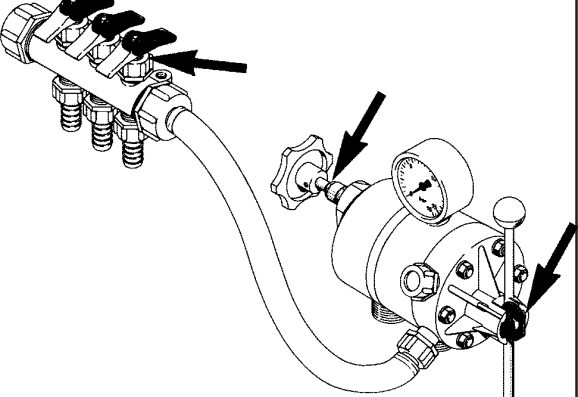
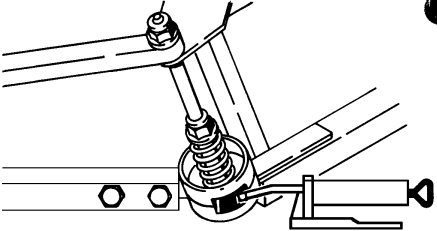
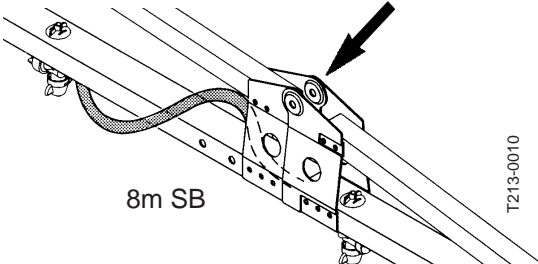


Grease



Operation hours



POS.					
1		X	40	 <p>T201-0002</p>	11
2	X		20		6
3	X		40		10
4	X		40	 <p>8m SB</p> <p>T213-0010</p>	10



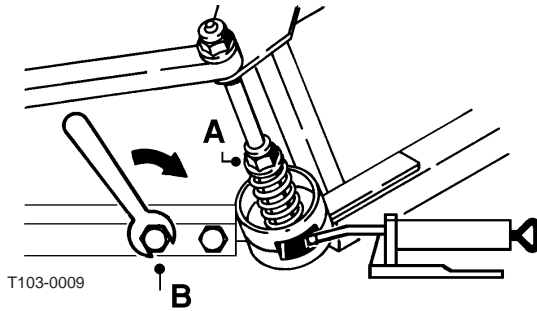
## Re-adjustment of the boom

After having used the sprayer for some days the boom should be adjusted as follows:

When adjusting the sprayer must be on level ground with unfolded boom.

### Boom breakaway

The function of the breakaway is to prevent or reduce boom damage if it should strike an object or the ground. If it is over-tight, it will not function. If it is too loose, it will yawn (forward and back movement) under spraying.



Lubricate coupling before adjusting spring tension. Slacken screw nut **A** to decrease breakaway resistance. Do not overtighten; better to loose than over-tight. Again minor adjustments in the field may be necessary.

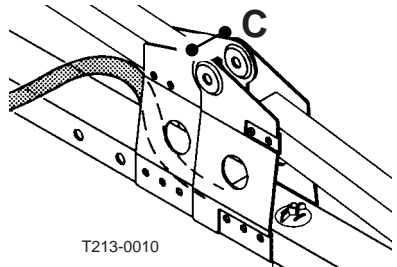
Ensure also channel bolts **B** are tight.

### Outersection (8m SB)

The hinged should be firm.

If overtight it is difficult to fold.

To adjust, tighten or loosen nuts **C**.



T213-0010

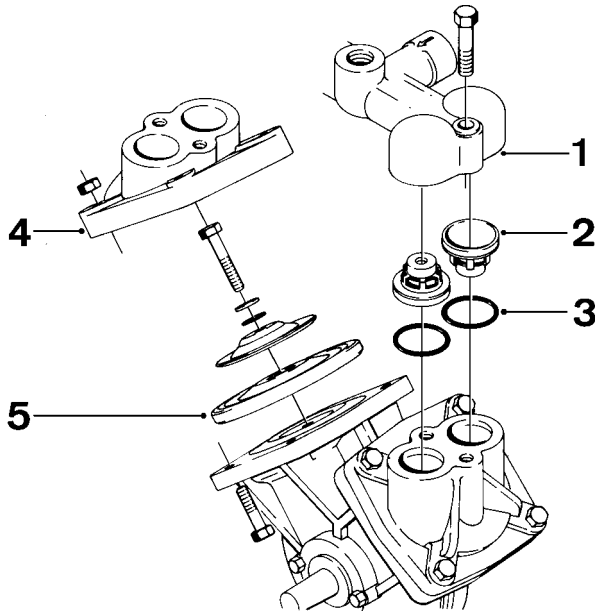
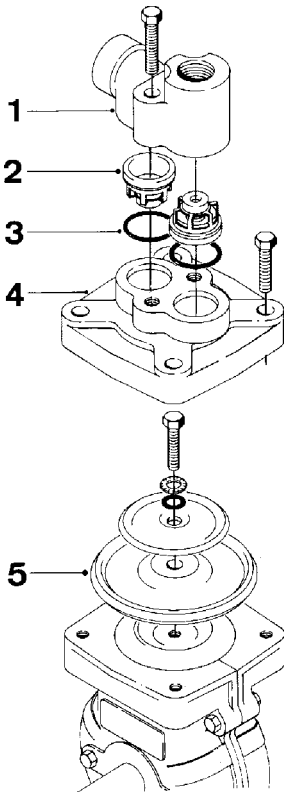
## Changing of valves and diaphragms

### Valves

Dismantle valve compartment **(1)**. Before changing the valves **(2)** note the orientation of the valves so that they may be replaced correctly. It is recommended to use new gaskets **(3)** when changing or checking the valves.

### Diaphragms

Remove the diaphragm cover **(4)** after having dismantled the valve compartment as indicated above. The diaphragm **(5)** may then be changed. If fluids have reached the crankcase, re-grease the pump thoroughly. Check also the drain hole at the bottom of the pump is not blocked.

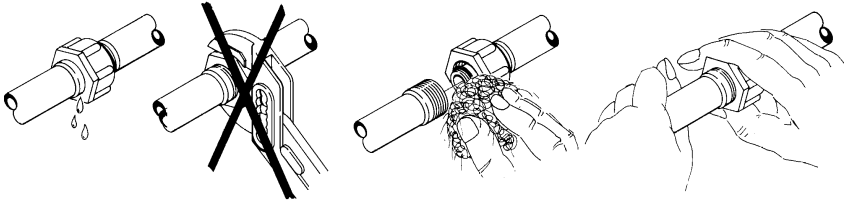
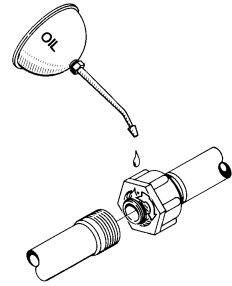




## Nozzle tubes and fittings

Poor seals are usually caused by;

- missing O-rings or gaskets
- damaged or incorrectly seated O-rings
- dry or deformed O-rings or gaskets
- foreign bodies

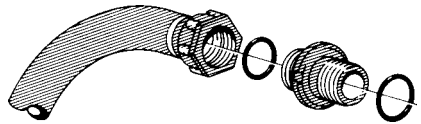


Therefore, in case of leaks: **DO NOT** over-tighten. Disassemble, check condition and position of O-ring or gasket, clean lubricate and reassemble.

For **radial** connections only hand tighten them.

The O-ring must be lubricated **ALL THE WAY ROUND** before refitting.

For **face** connections, a little mechanical leverage may be used.



## Off-season storage

When the spraying season is over you should devote some extra time to the sprayer before it is stored.

### Hoses

Check that none of the hoses are caught or have sharp bends.

A leaky hose can give an annoying delay in the middle of the spraying job. Therefore check all the hoses and change if there is any doubt about the durability.

## Paint

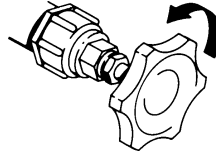
Some chemicals are very hard on paints. It is therefore well advised to remove rust, if any, and then touch up the paint.

## Tank

Check that no chemical residues are left from the last spraying. Chemical residues must not be left in the tank for a long time. It will reduce the life of the tank. See Spray Technique book- Cleaning the sprayer.

## Operating unit

Take care that the pressure regulation valve is completely loosened. The spring is thereby relieved and operation difficulties are avoided at starting-up next season.



## Anti-freeze precaution

If the sprayer is not stored in a frost-proof place you should take the following precautions: Put at least 5 litres of 33% anti-freeze mixture in the tank and let the pump run a few minutes so that the entire system including spray hose are filled. Remove the glycerine filled pressure gauge and store it frost free in vertical position. The anti-freeze solution also hinders the O-rings and gaskets from drying out.





## Operational problems

In cases where breakdowns have occurred the same factors always seem to come into play:

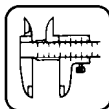
- Minor leaks on the suction side of the pump will reduce the pump capacity or stop the suction completely.
- A clogged suction filter will hinder or prevent suction so that the pump does not operate satisfactorily.
- Clogged up pressure filters will result in increasing pressure at the pressure gauge but lower pressure at the nozzles.
- Foreign bodies stuck in the pump valves with the result that these cannot close tightly against the valve seat. This reduces pump efficiency.
- Poorly reassembled pumps, especially diaphragm covers will allow the pump to suck air resulting in reduced or no capacity.

Therefore **ALWAYS** check:

1. Suction and nozzle filters are clean.
2. Hoses for leaks and cracks, paying particular attention to suction hoses.
3. Gaskets and O-rings are present and in good condition.
4. Pressure gauge is in good working order. Correct dosage depends on it.
5. Operating unit functions properly. Use clean water to check.

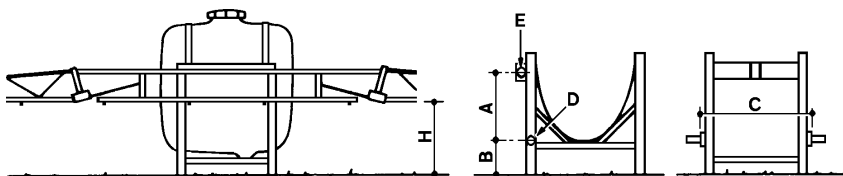


<b>Fault</b>	<b>Probable cause</b>	<b>Control / remedy</b>
No spray from blower when turned on.	Air leak on suction.	Check suction tube and fittings. Check tightness of pump diaphragm and valve covers.
	Air in system.	Fill suction hose with water for initial prime.
	Suction / nozzle filters clogged.	Clean filters.
Lack of pressure.	Incorrect assembly.	Recheck assembly.
	Pump valves blocked or worn.	Check for obstructions and wear.
	Defect pressure gauge.	Check for dirt at inlet of gauge.
Pressure dropping.	Filters clogging.	Clean all filters. Fill with cleaner water.
	Nozzles worn.	Check flow rate and replace nozzles if it exceeds 10%.
	Tank is airtight.	Check vent is clear.
Pressure increasing.	Nozzle filters beginning to clog.	Clean all filters.
Formation of foam.	Air is being sucked into system.	Check tightness / gaskets / O-rings of all fittings on suction side.
	Excessive liquid agitation.	Use foam damping additive.
Liquid leaks from bottom of pump.	Damaged diaphragm.	Replace. See section Changing valves and diaphragms.



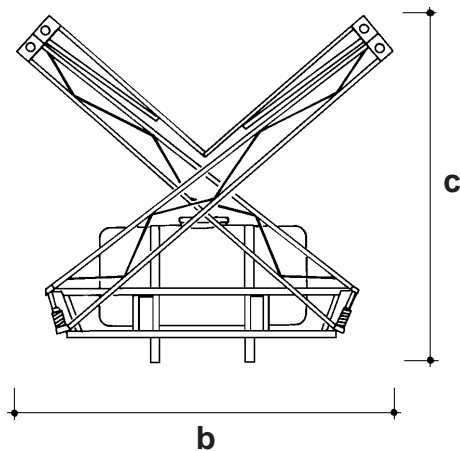
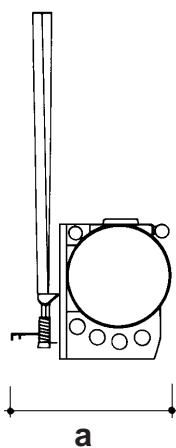
# Technical specifications

## Measure and weights

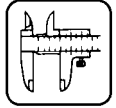


Tank size l	Min. boom height H mm	Max. boom height H mm	A mm	B mm	C mm	D mm	E mm
200/300	20	595	520	210	588	22	26

Tank size l	Spraying width m	Pump model	Measure a x b x c cm	Weight kg
200	6	500	100 × 190 × 160	93
	6	600	100 × 190 × 160	99
	8	600	100 × 190 × 200	105
300	6	500	100 × 190 × 160	99
	6	600	100 × 190 × 160	105
	8	600	100 × 190 × 200	114



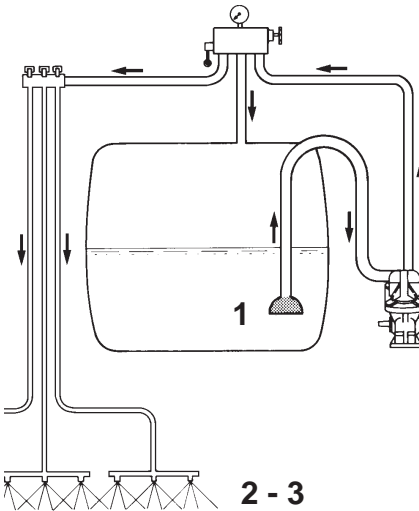
## Power consumption and capacity



500/7.0	r/min										
	300		400		500		540		600		
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW	
0	13	0,15	16	0,15	19	0,22	20	0,29	21	0,29	
5	10	0,22	12	0,29	15	0,37	16	0,45	18	0,52	
10	9	0,29	12	0,45	14	0,52	15	0,59	16	0,67	
15											
Rotation per min.	r/min	Capacity				l/min	Suction height				0,0 m
Power consumption	kW	Max. pressure				15bar	Weight				9,9 kg

600/7.0	r/min										
	300		400		500		540		600		
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW	
0	19	0,15	28	0,22	38	0,29	41	0,30	46	0,37	
5	17	0,29	23	0,45	28	0,52	30	0,59	34	0,67	
10	17	0,45	22	0,59	28	0,82	30	0,89	33	0,97	
15	16		21		27		30		33		
Rotation per min.	r/min	Capacity				l/min	Suction height				0,0 m
Power consumption	kW	Max. pressure				15bar	Weight				15,6 kg

## Filters and nozzles



Pos.	Mesh/ colour	Description/ nozzle
1	23	Suction filter
2	50 blue	Nozzle 4110-16
3	50 blue	Nozzle 4110-20
2	50 blue	Nozzle 4110-14*
3	50 blue	Nozzle 4110-16*

\* 6m SB



## Pictorial symbols



Description



Function



Connection



Warning



Operating



Service/adjustment



Liquid flow



Pressure



Cleaning



Lubrication



Winter storage



Operational problems



Technical specifications

## **Preassembly information**

The sprayer is supplied ex-works in shipping packages (SP). Number of SP's per sprayer varies depending on model.

As this covers all BL models, please note the fittings covering exactly your model.

### **NOTE:**

Removal of the plastic bag covering the tank is easiest done before assembly.

To verify connection of hoses, a function diagram is included on the last page.

## **Packaging information**

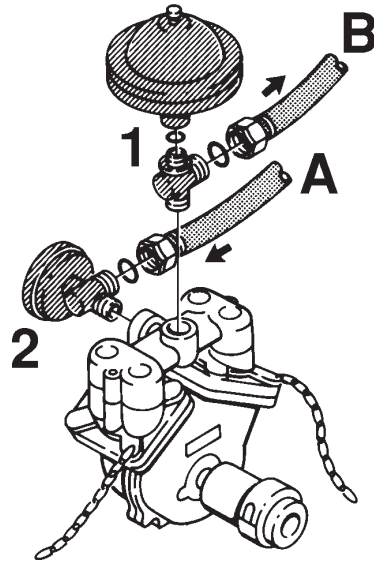
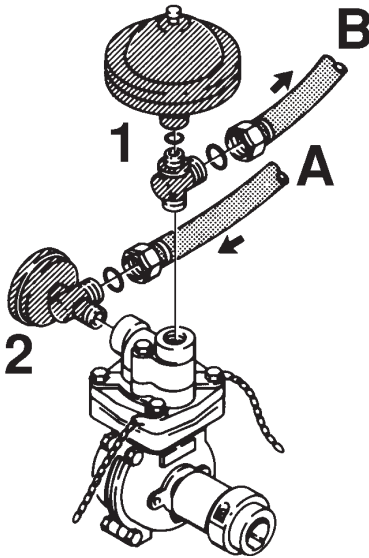
Materials used for packaging are environmentally compatible. They can be safely deposited or they can be burnt in an incinerator.

## **Recycling**

Cardboard: Can recycle up to 99% and therefore should be put into the waste collection system.

Polystyrene foam: Can be recycled. Fluorocarbons (CFC) not used in foam production.

Polyethylene: Can be recycled.



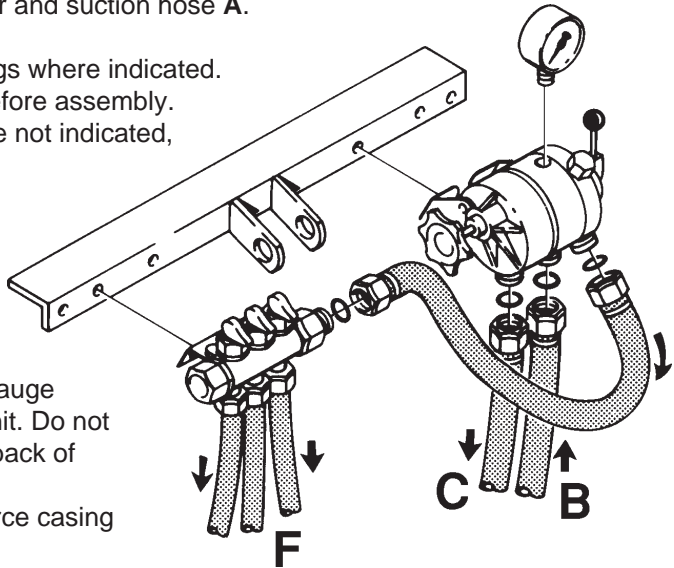
### Assembly

1. Fit pulsation damper and pressure hose **B**.
2. Fit suction damper and suction hose **A**.

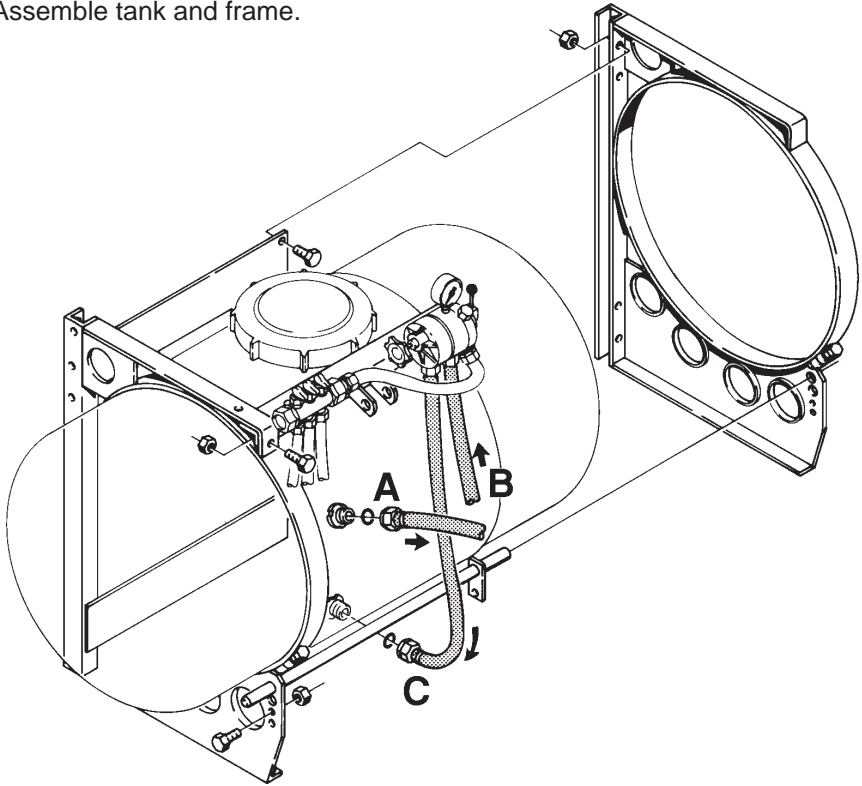
**NOTE:** Use O-rings where indicated. Lubricate them before assembly. Where O-rings are not indicated, use sealing tape.

3. Operating unit and distribution valve are assembled and bolted to rack.

Screw pressure gauge on to operating unit. Do not overtighten. See back of gauge.  
Remember to pierce casing after installation.



4. Assemble tank and frame.



5. Fit hoses. Remember to lubricate O-rings before fitting.

A = Suction hose to pump.

B = From pump.

C = Return to tank.

F = Feed hoses to boom.

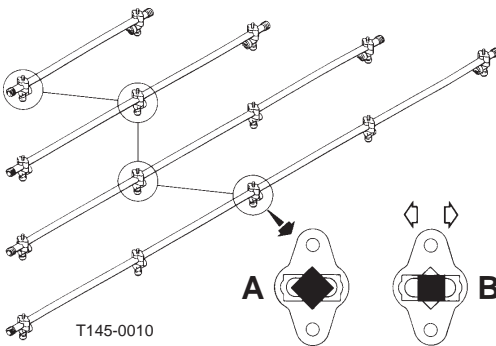
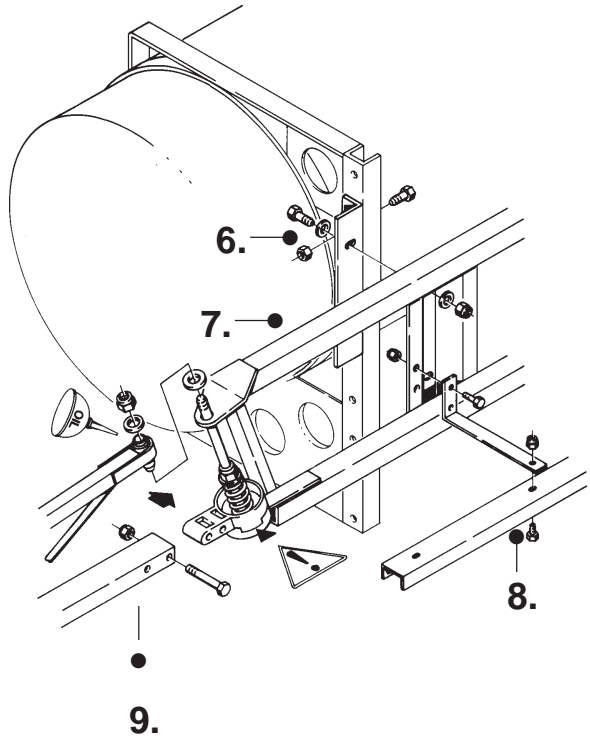
**NOTE:** For sake of good order, it may be necessary to shorten some hoses (for example, suction hose A). This is best done when assembly is completed and before hoses are secured with plastic straps.

6. Bolt angle brackets to frame.

7. Fit boom centre.

8. Fit U-profile.

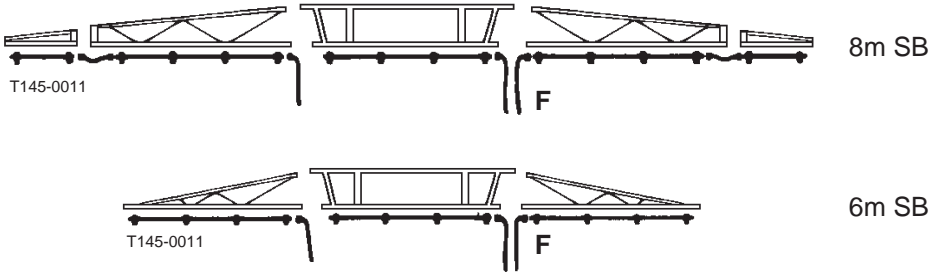
9. Fit boom wings. Be cautious when folding boom for the first time. See section on boom breakaway in instruction book.



10. Nozzle tubes are supplied with one lock nozzle saddle per tube. **A**. The rest can slide lengthwise. **B** allowing for extension and contraction.

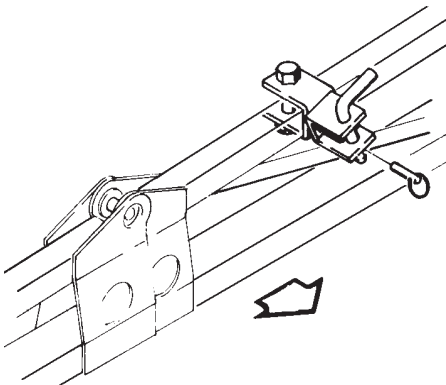
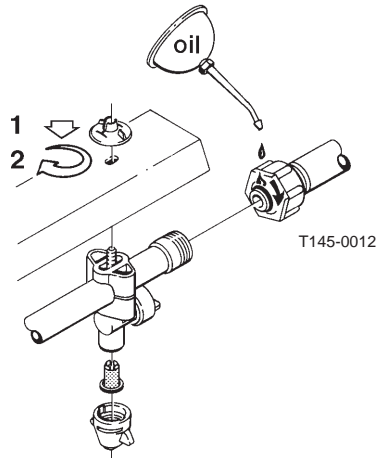


Placement of nozzle tubes, connecting hoses and feed hoses.  
**REMEMBER:** Lubricate O-rings before fitting.

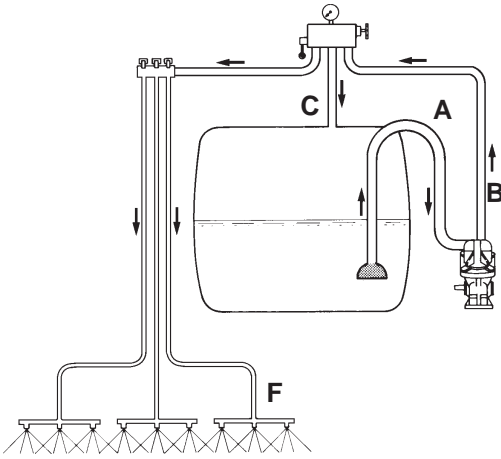


**11.** Fit tubes using synthetic nut.  
Press down 1, turn 2.  
**Do not overtighten.**

**12.** Mount filter and COLOR TIPS.

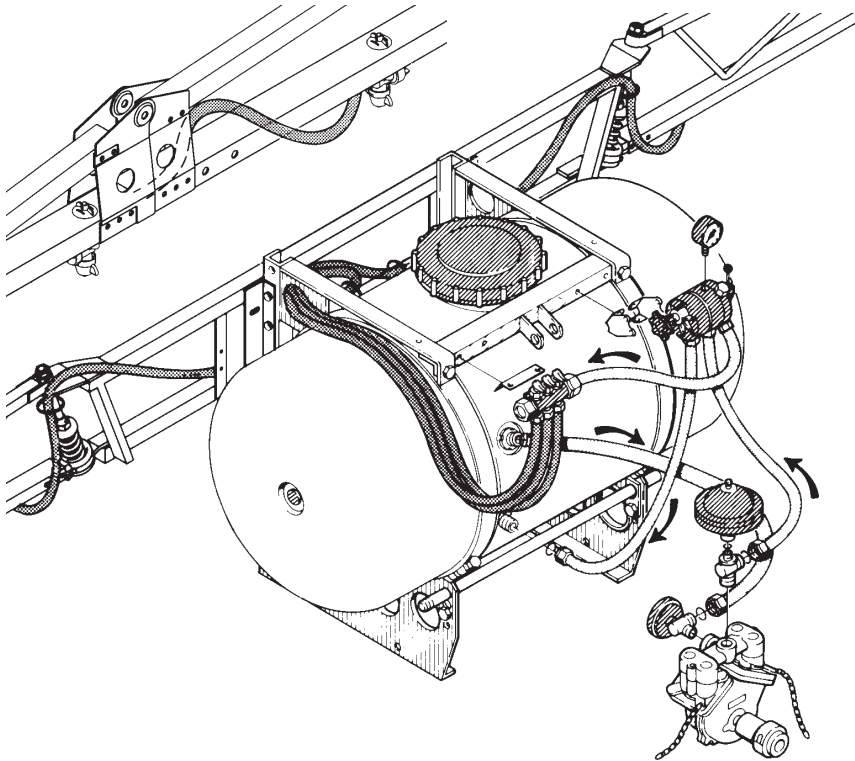


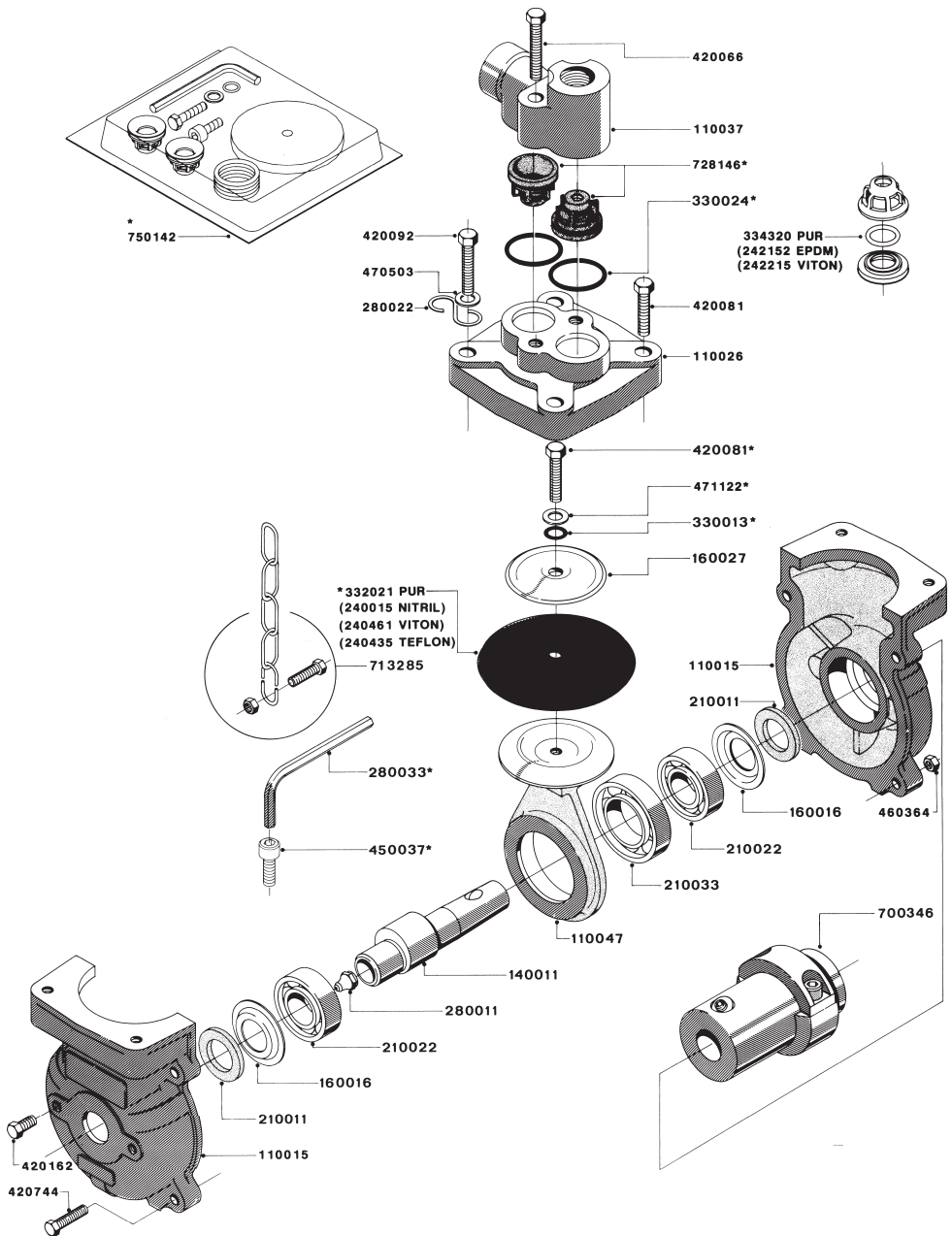
**13.** For 8 metre SB - fit boom transport lock. Arrow indicates forward direction of travel.



14. Check hose connections are in accordance with diagram.

15. Organise hoses; it may be necessary to shorten some of them. Secure with straps.

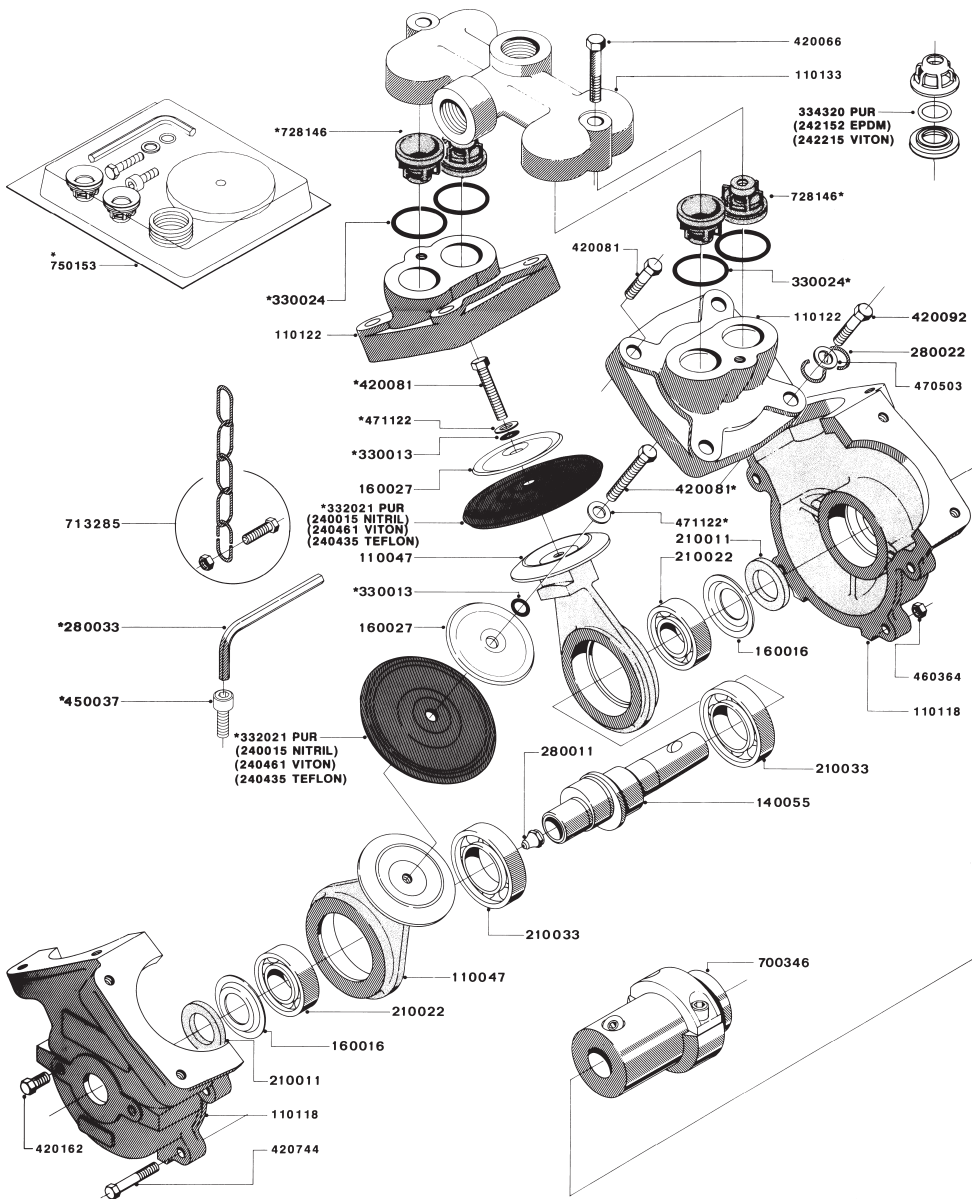




500

4-9.95

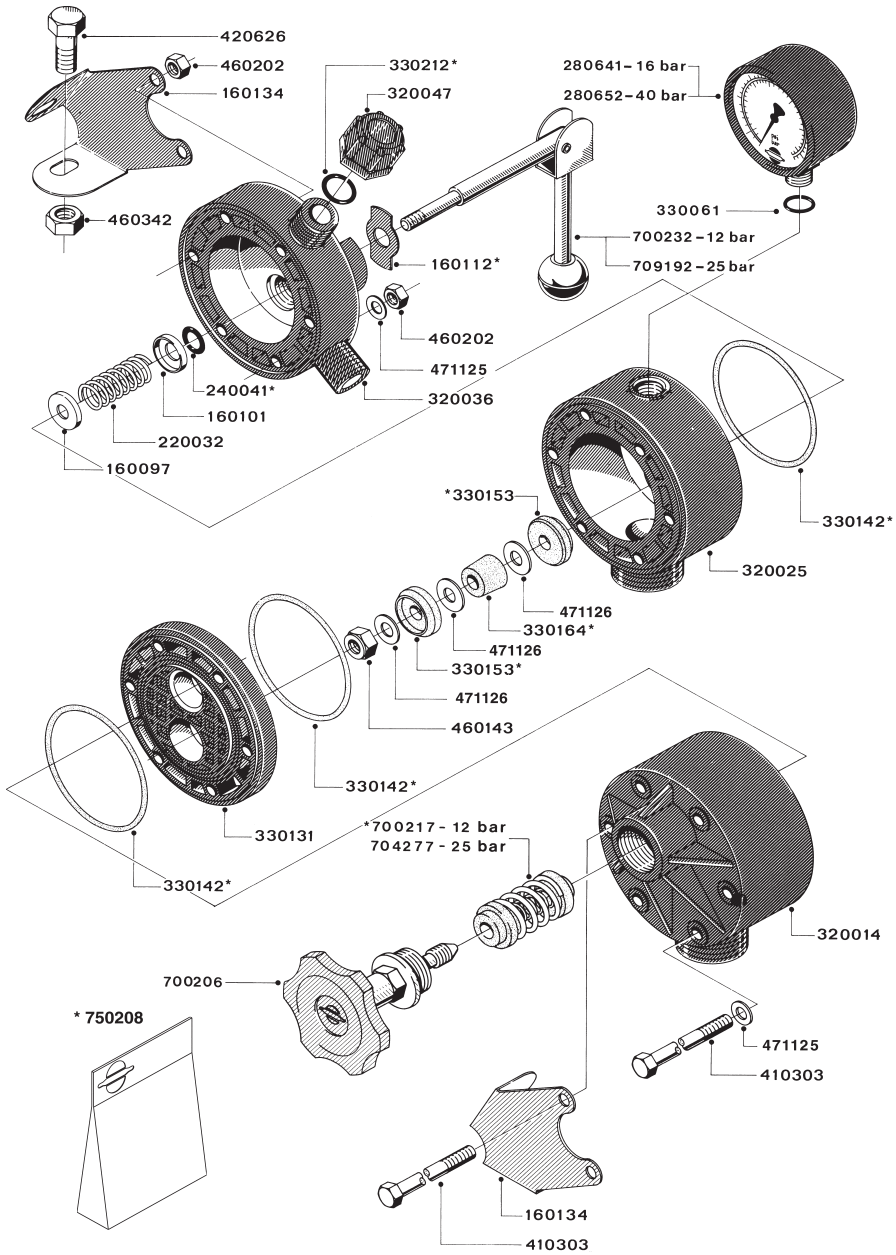
A1



600

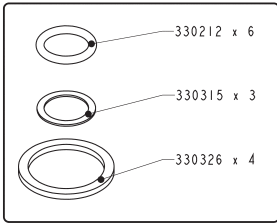
4.9.95

A5

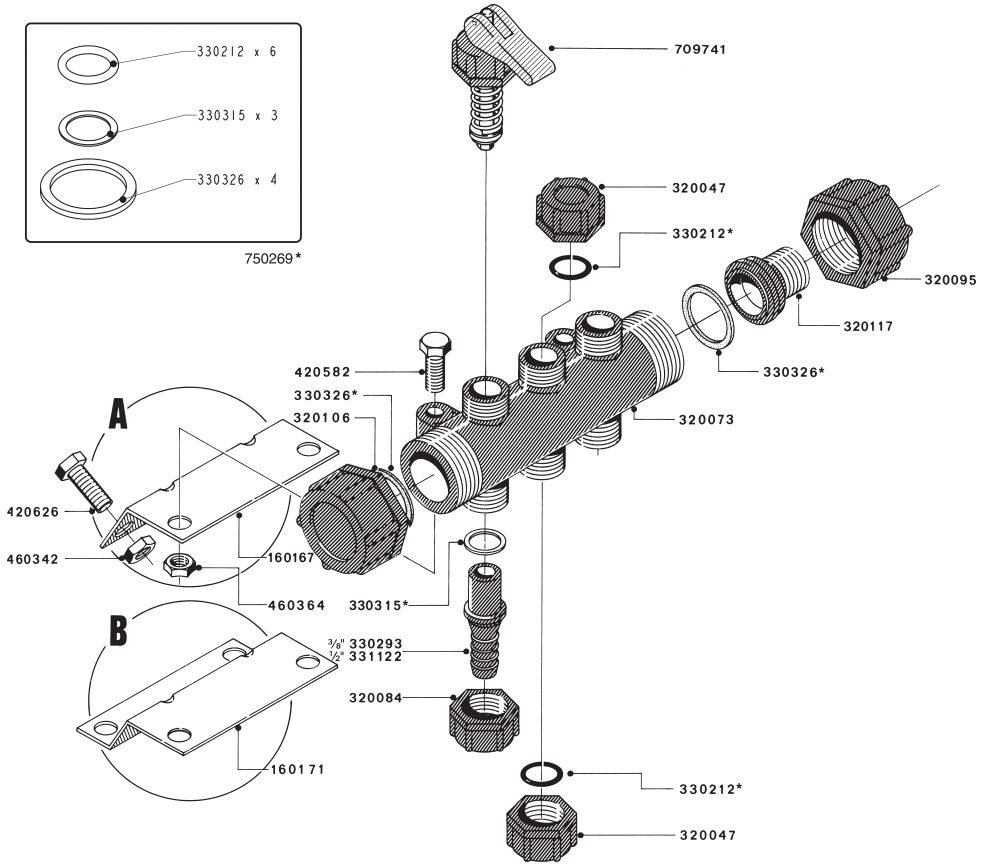


B5

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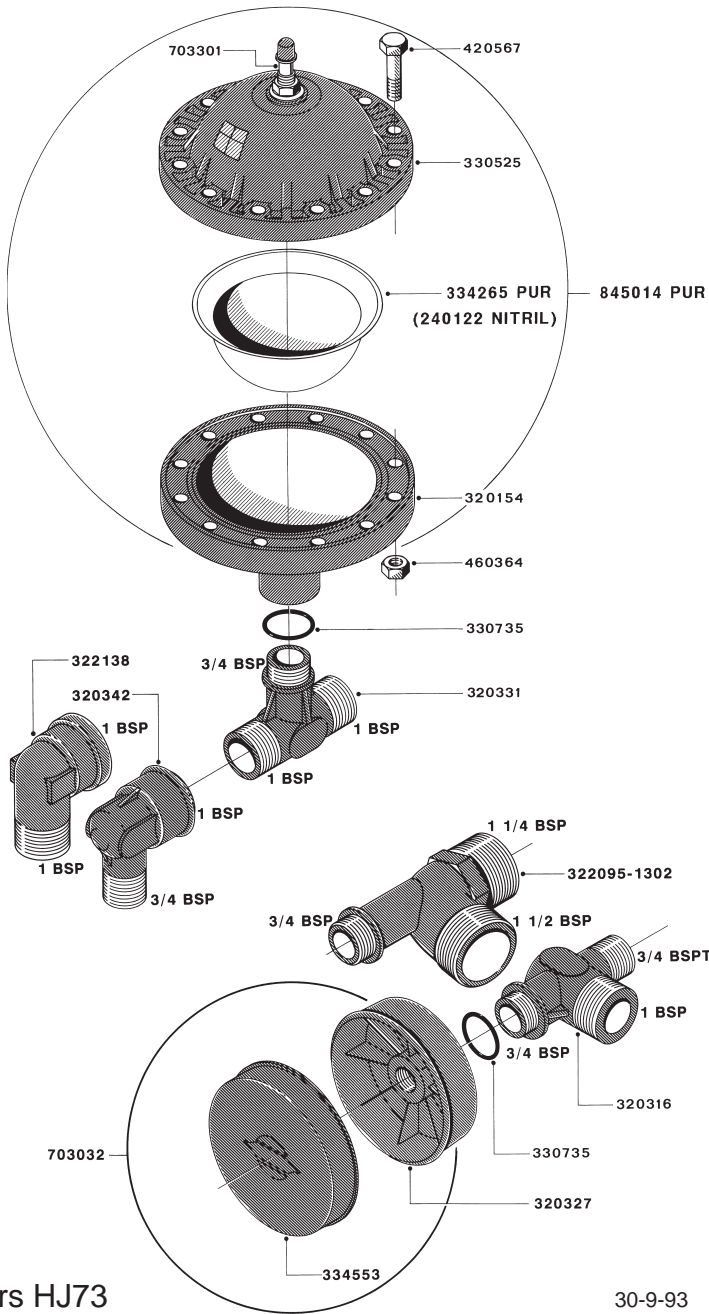


750269\*



**B6**

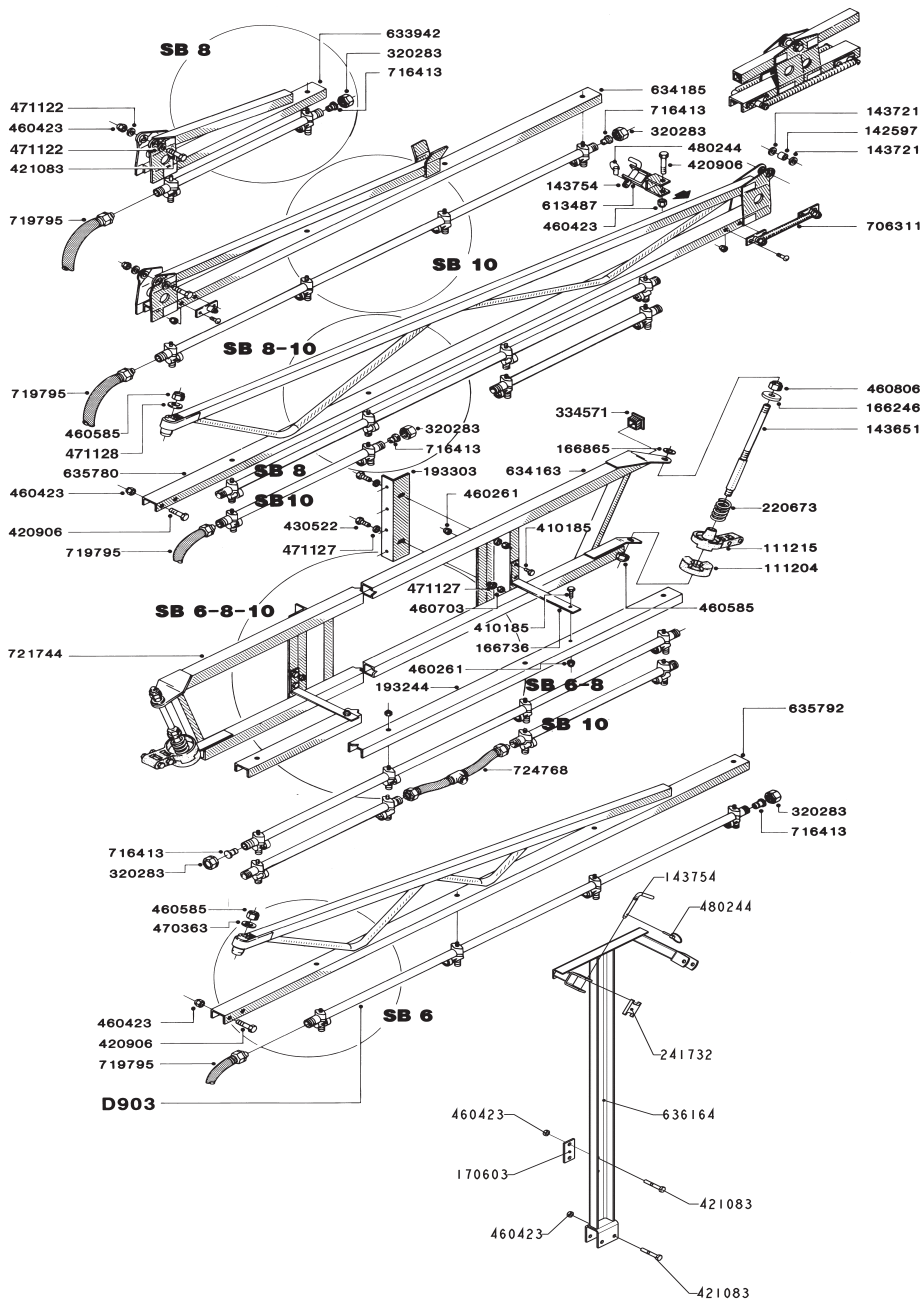
18-2-91



Dampers HJ73

30-9-93

**B300**

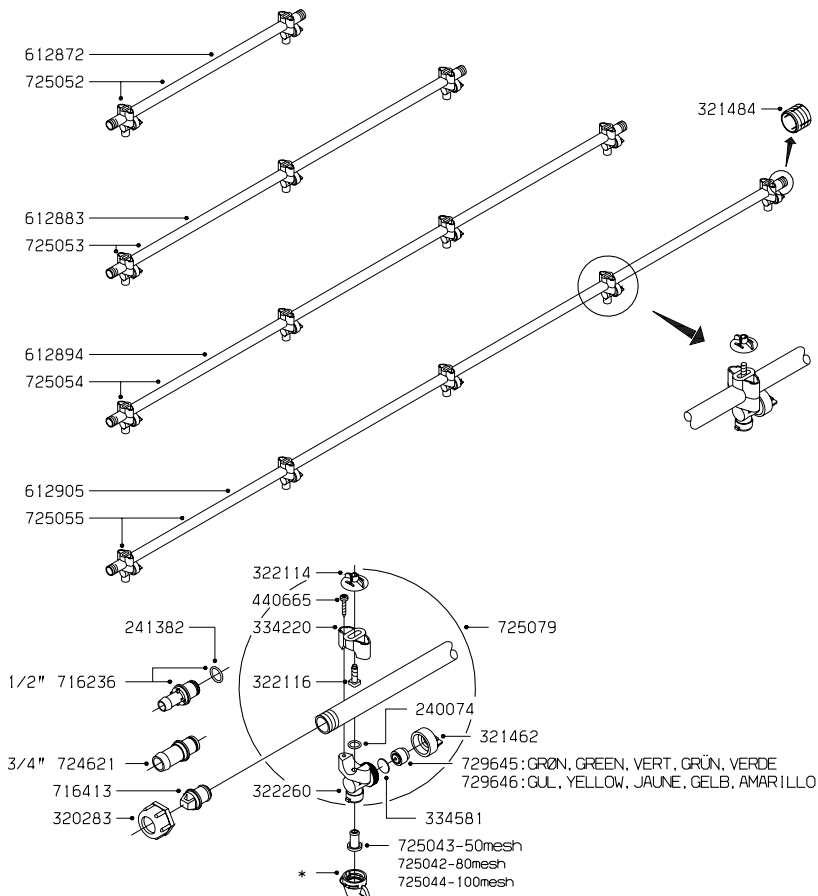


SB 6/8/10m

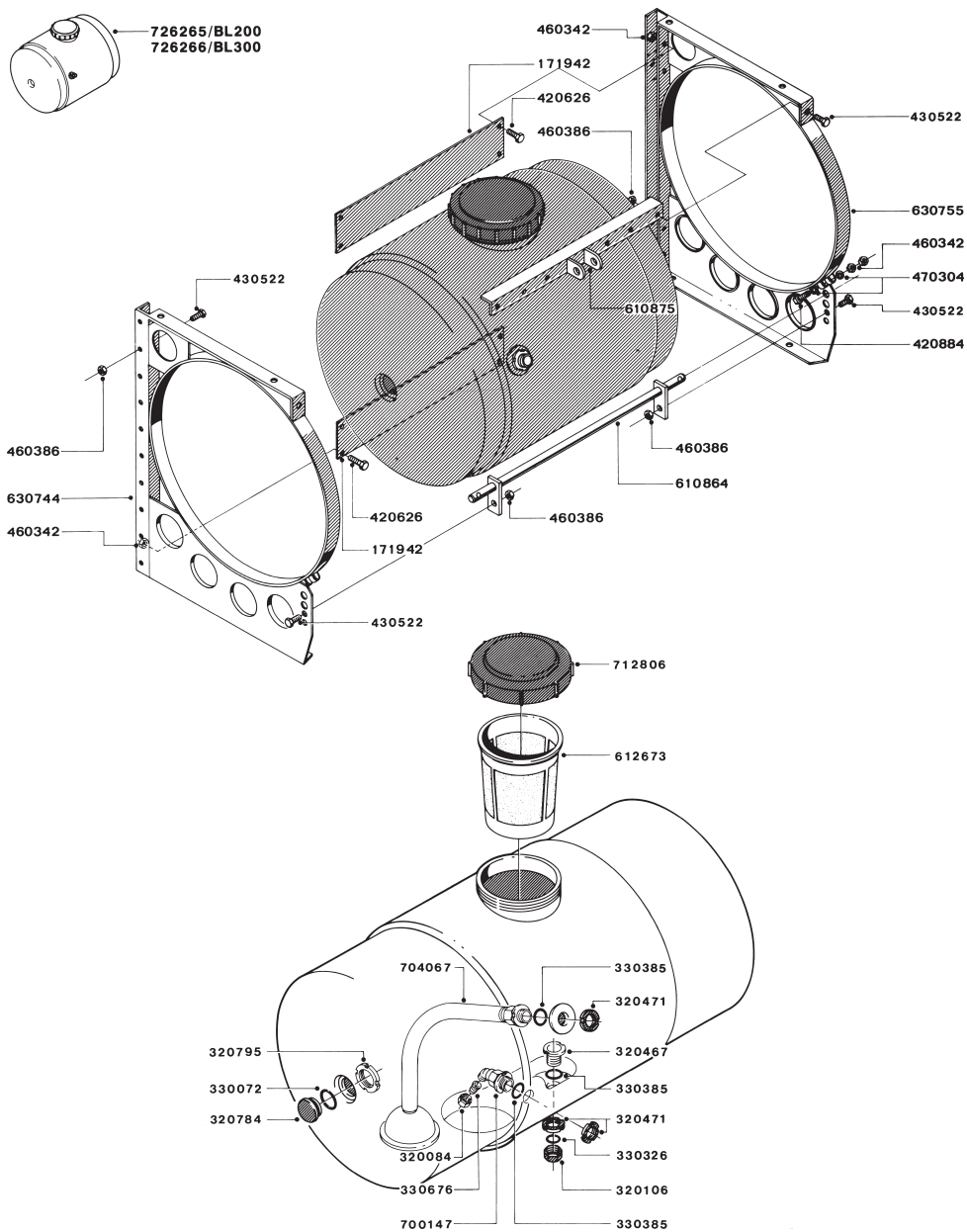
18-2-91

D2





*		FARVE	COLOUR	COULEUR	FARBE	COLOR
371469	S4110-08	VIOLET	VIOLET	VIOLET	VIOLETT	VIOLETA
371470	S4110-10	BRUN	BROWN	BRUN	BRAUN	MARRON
371471	S4110-12	GUL	YELLOW	JAUNE	GELB	AMARILLO
371472	S4110-14	ORANGE	ORANGE	ORANGE	ORANGE	ANARANJADO
371473	S4110-16	RØD	RED	ROUGE	ROT	ROJO
371474	S4110-18	HVID	WHITE	BLANC	WEISS	BLANCO
371475	S4110-20	GRØN	GREEN	VERT	GRÜN	VERDE
371476	S4110-24	TURKIS	TURQUOISE BLUE	BLEU TURQUOISE	TÜRKIS	AZUL TURQUOI
371477	S4110-30	BLÅ	BLUE	BLEU	BLAU	AZUL
371478	S4110-36	GRÅ	GREY	GRIS	GRAU	GRIS
371479	S4110-44	ELFENBEN	IVORY	IVOIRE	ELFENBEIN	MARFIL



BL 200/300

18-2-91

E2



