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TR-2000

Instruction book

675035-GB-97/6



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 TR 2000 models, please pay attention to the paragraphs dealing with precisely your model.

If any portion of the instruction book remains unclear after reading it, contact your HARDI dealer for further explanation before using the equipment.



Description

The HARDI TR 2000 trailed field sprayers consist of a 1302 or 361 pump, frame with adjustable wheel track gauge and ground clearance, 2000 litre tanks, BK (manual) or EC (Electric Control)operating unit, 18 metre SPB spray boom which are available in four different types.

HY model - Features: Hydraulic lift cylinder for the boom height adjustment and two-fold cylinders for boom wing fold and unfold. HY model can be upgraded to HZ type.

HZ model - Has the same features as the HY but has also two boom wing tilt cylinders that give the ability to obtain individual boom tilt as well as individual wing fold. The hydraulic system is electrically operated.

MX model - Features: Hydraulic lift cylinder and manual folding.

MY model - Features: The MY type are of the same type as the MX but with hydraulic folding. The MX and MY cannot be upgraded to electrical hydraulic system which allows individual tilt of the left and right boom side.

Hydraulics

Hydraulic connection needs one single outlet for the lift function, (same for the MY, HY- and HZ model).

And a double acting outlet for the folding.

Note that the hydraulic system requires an oil capacity of approx. 3 litres and a min. pressure of 130 bar.

BE CAUTIOUS WITH INITIAL USE OF THE HYDRAULIC SYSTEM; IF THERE IS AIR IN THE SYSTEM THIS MAY CAUSE VIOLENT MOVEMENTS OF THE BOOM. THEREFORE TAKE CARE THAT NO PERSONS OR OBJECTS ARE HURT OR DAMAGED IN THE PROCESS OF TESTING.



The boom is connected to the frame by a trapeze suspension which in turn is supported by two heavy duty coil springs. A damper is fitted to reduce either lateral/ horizontal trapeze or vertical boom movement.

Recommended max. spraying speed is 10 km/hour on level ground. The outer sections incorporate a spring loaded breakaway.

This ensures extra boom stability and longer boom life especially when driving on uneven ground or at high spraying speeds.

The design of the pump is simple, with easily accessible diaphragms and valves that ensure spray 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 and efficient agitation.

The BK 180 K operating unit consists of: Pressure agitator, safety valve, on/off function, pressure filter with pressure gauge, distribution valves with pressure equalisation device and HARDI MATIC.

The EC operating unit consists of: On/off control, pressure gauge, pressure regulating valve with built-in HARDI MATIC and distribution valves with pressure equalisation.

HARDI MATIC ensures a constant volume per hectare of the liquid at varying speed in the same gear. The number of revolutions on the PTO must be kept between 300-600 r/min.

Furthermore, there is a ladder on the left-hand boom transport bracket easing tank access for the filling of sprays, cleaning, etc.

The sprayer can either be equipped with single axle or tandem system.



Identification plates

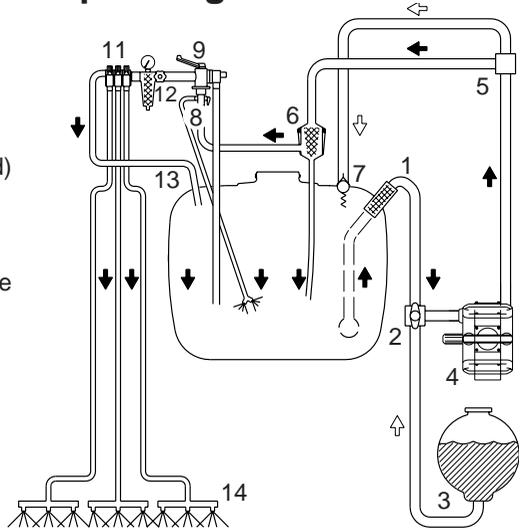
An identification plate fitted on the frame and pump is to indicate model, year of production with serial number and country of origin.

If ordering spare parts, inform your dealer of these so the right model and version are described.



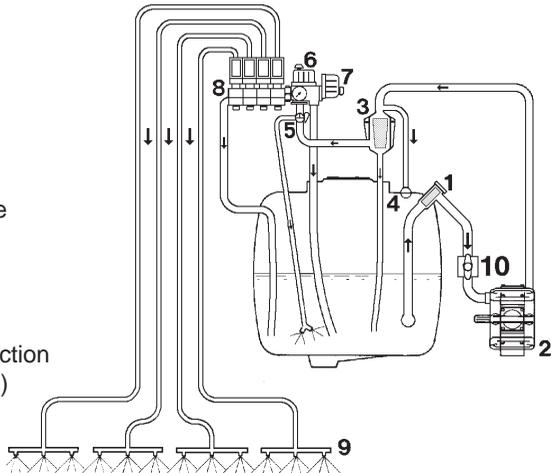
Function diagram BK operating unit

1. Suction filter
2. Suction manifold (if fitted)
3. Rinsing tank (if fitted)
4. Pump
5. Pressure manifold
6. Self-Cleaning Filter (if fitted)
7. Safety valve
8. Pressure agitator valve
9. Main ON/OFF valve
10. Pressure filter with pressure gauge
11. Distribution valves with pressure equalization
12. Pressure control valve with HARDI-MATIC
13. Return to tank
14. Sprayer boom



Function diagram EC operating unit

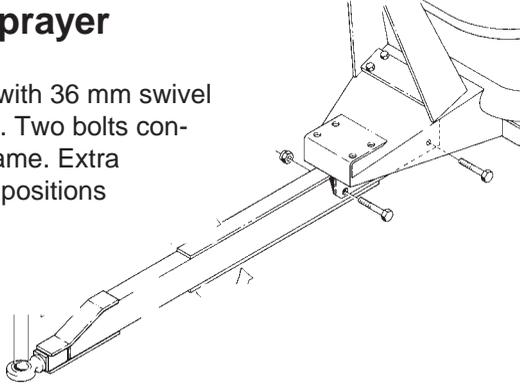
1. Suction Filter
2. Pump
3. Self-cleaning Filter
4. Safety Valve
5. Pressure Agitator
6. Operating Unit with Pressure Gauge
7. Pressure Control Valve with HARDI-MATIC
8. Distribution Valve with Pressure Equalization
9. Sprayer Boom
10. Filling valve, for connection of Filling filter (optional)



Connecting the sprayer

Drawbar

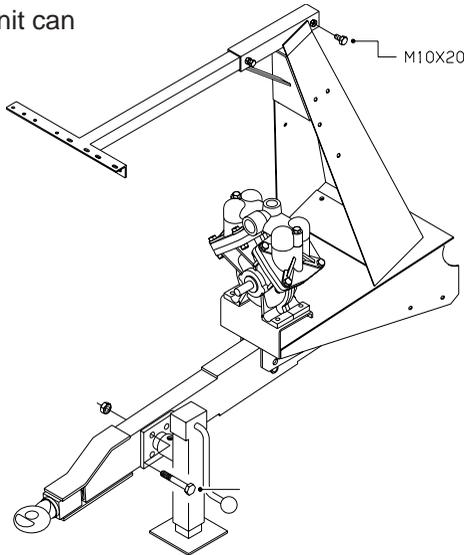
The drawbar is equipped with 36 mm swivel towing ring, or a fork hitch. Two bolts connect the drawbar to the frame. Extra bolt holes permit different positions to suit tractor hitch.

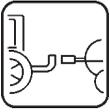


WARNING: Trailer frame must be supported before adjusting drawbar position.
After the drawbar is connected, the jack is folded up or removed.

BK operating unit

The position of the operating unit can be adjusted forward and backward. Position it so it can be operated from the tractor without risk of damage to the sprayer or tractor.





Transmission shaft

Operator safety

To avoid accidents and personal injuries, note the following recommended precautions and safe operation practices.



Always STOP ENGINE before attaching the transmission shaft to tractor P.T.O. - most tractor P.T.O. shafts can be rotated by hand to facilitate spline alignment, when engine is stopped.

When attaching the shaft, make sure that the snap lock is FULLY ENGAGED - push and pull shaft until it locks.



WARNING: ROTATING TRANSMISSION SHAFTS WITHOUT PROTECTION GUARDS ARE FATAL.

Always keep protection guards and chains intact and make sure that they cover all rotating parts, including cross journals at each end of the shaft. Do not use without protection guard.

Do not touch or stand on the transmission shaft when it is rotating - safety distance: 1.5 metres.

Prevent protection guards from rotating by attaching the chains allowing sufficient slack for turns.

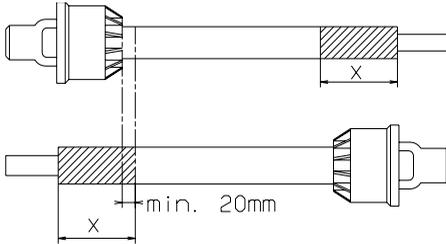
Make sure that protection guards around tractor P.T.O. and implement shaft are intact.

Always STOP ENGINE and remove the ignition key before carrying out maintenance or repairs to the transmission shaft or implement.

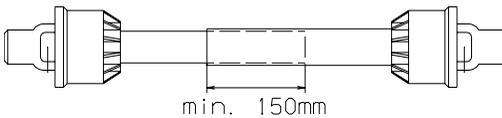
Installation of transmission shaft

Initial installation of the shaft is done as follows:

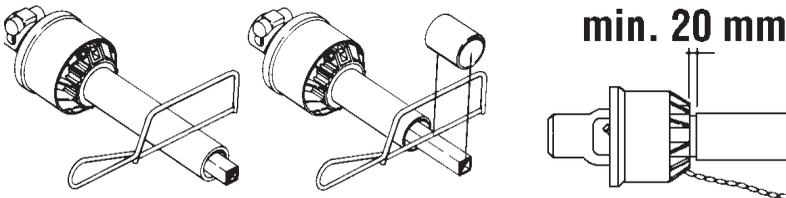
1. Attach sprayer to tractor and set sprayer in the position with **shortest** distance between the tractor and sprayer pump P.T.O. shafts.
2. Stop engine and remove ignition key.
3. If transmission shaft must be shortened, the shaft is pulled apart. Fit the two shaft parts at tractor and sprayer pump and measure how much it is necessary to shorten the shaft. Mark the protection guards.



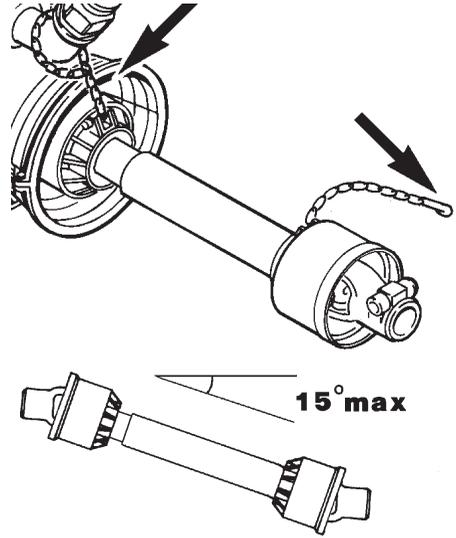
NOTE: The shaft must always have a minimum overlap of 150 mm.



4. The two parts are shortened equally. Use a saw, and file the profiles afterwards to remove burrs.
5. Grease the profiles, and assemble male and female parts again.



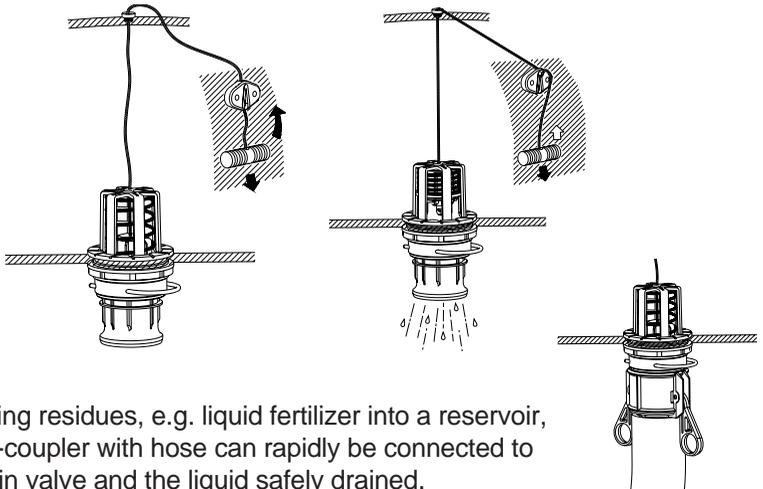
6. Fit the shaft to tractor and sprayer pump.
NOTE: Female part towards tractor.
 Fit the chains to prevent the protection guards to rotate with the shaft.
7. To ensure long life of the transmission shaft, try to avoid working angles larger than 15° .
8. Transmission shafts with cone must be fitted by tightening the Allen screw to a torque of 40 Nm.
 Check again after 2 minutes' use.



Operating Instruction

Operation of the tank drain valve

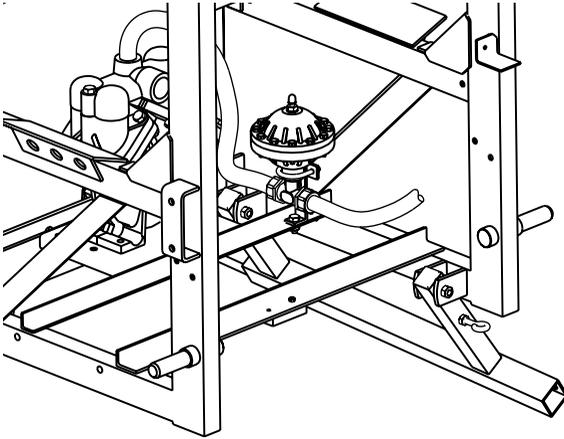
Pull the red handle on the side of the tank to open the drain valve. The valve is spring-loaded, but can be kept open by pulling the string out and upwards in the V-shaped slit. To release, pull the string downward and the valve will close automatically.



If draining residues, e.g. liquid fertilizer into a reservoir, a snap-coupler with hose can rapidly be connected to the drain valve and the liquid safely drained.

Pulsation damper (if fitted)

The air pressure in the pulsation damper is factory preset at 2 bar to cover 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.



bar	bar
1.5 - 3	0 - 1
3 - 15	1 - 3

Roadworthiness

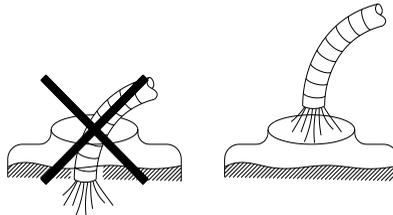
When driving on public roads and other areas where the highway code applies, or areas where there are special rules and regulations for marking and lights on implements, you should observe these and equip implements accordingly.

Filling the main tank

Water is filled into the tank by removing the tank lid located at right hand side of sprayer tank. It is recommended to use as clean water as possible for spraying purposes. Always fill water through the strainer basket to prevent foreign particles from entering the tank. An overhead tank can be used in order to obtain high filling capacity.



WARNING: Do not let the filling hose enter the tank. Keep it outside the tank, pointing towards the filling hole. If the hose is led into the tank and the water pressure drops at the water supply plant, chemicals may be syphoned back and contaminate the water supply lines, plant and well.





Operation of the boom

Always shut tractor off when connecting sprayer, servicing or adjusting boom.

1. MX, MY, HY and HZ. Attach the heavier $\frac{3}{8}$ " hydraulic hose, for the lift cylinder to the tractors single acting outlet.
2. MY and HY. Attach the two smaller $\frac{1}{4}$ " hydraulic hose, for the folding, to the tractors double acting outlet.
3. HZ model only, attach the 12 volt power supply and the two $\frac{1}{4}$ " hoses to the double acting outlet.



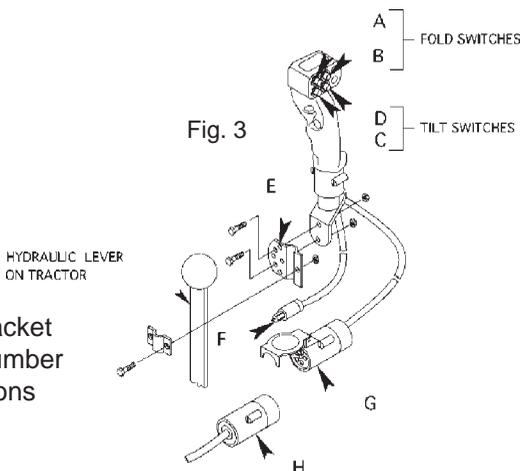
WARNING: WHEN UNFOLDING THE SPRAY BOOM IT IS IMPORTANT THAT THE SPRAYER IS CONNECTED TO THE TRACTOR TO PREVENT OVERBALANCING.

HZ hydraulics

Installation of Handle

The control handle should be attached to the hydraulic lever that operates the double acting outlet you intend to use. Fig. 3 shows an example of how this may be done.

The universal mounting bracket "E" is very flexible and a number of different mounting positions can be used.



Electric hook-up of Handle

1. Connect plug "F" to the tractor's 12 volt power system.

NOTE: Check with your dealer or tractor operators manual for the best location to hook up the 12 volt system.

Try to hook-up the handle as close as possible to the battery for a better power supply.

Brown wire on control handle is positive (+).

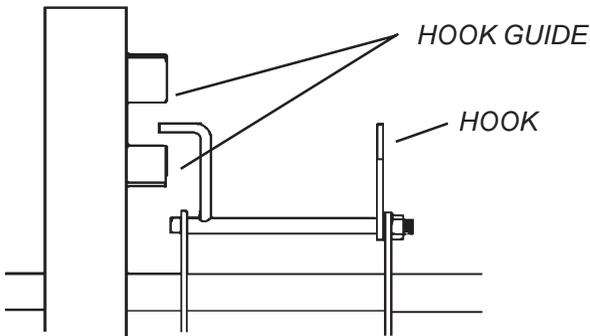
Blue wire on control handle is negative (-).

Releasing the SPB boom from transport supports

Always operate boom on level ground

1. Start tractor and bring engine to operating RPM.
2. Activate the single acting outlet to lift the boom out of the sprayers front transport support.

NOTE: The boom also has a rear transport configured as a hook in the centre of the H-frame. This hook has to be released by lifting the boom with the single acting outlet until the control arm of the hook appears between the two flat bars of the hook guide. Be careful not to bring the control arm past the opening on the hook guide.

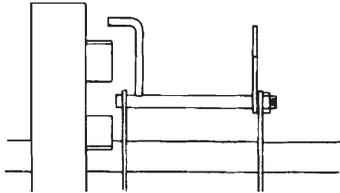




Unfolding and folding the boom (HY and MY-hydraulics)

1. Raise the boom to release it from transport supports.
2. Activate the double acting hydraulics outlet to unfold the boom. Both wings will now unfold simultaneously.
3. When boom is completely unfolded, it can be raised or lowered to desired spray height by activating the single acting hydraulic outlet.
4. Before attempting to fold boom back into transport position, it should be raised all the way to the top by activating the single acting outlet.

NOTE: This time the control arm on the hook should be raised past the opening of the hook guide.



When boom has been raised high enough for the control arm to go past the opening on the hook guide, the wings can be folded into transport position.

The boom is folded in by activating the double acting outlet.

The boom can now be lowered into the transport supports. Ensure that the hook engages on the crossbar on the 'H-frame' (rear transport).

Unfolding HZ boom

1. Raise the boom to release it from transport supports.
(Same procedure as for all boom types see description above).
2. Press switch **A** and **B**.
3. Activate the double acting outlet to unfold the boom. Unfold completely.
4. Leave the **A** and **B** bottom in off pos. and set the double acting hydraulic lever in neutral position.
5. Lower or raise the boom, by activating the single acting outlet
6. To fold the boom: raise to the top and revert unfolding procedure, and then lower it to the transport position.

Folding one side only (HZ boom)

If only one side of the boom is to be used for spraying, do as described above but only press button **A** or **B** as described in point 2 above.

NOTE: It is not advisable to go directly from transport position to spray-
ing position with one side only.

Both wings must first be completely unfolded.

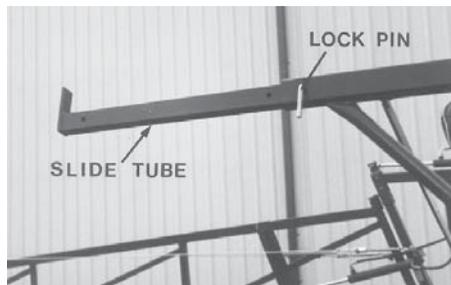
Before attempting to fold one side only, the slide tubes on the front transport support must be moved to their inner position.

Serious damage to your boom may occur, if this is not done.

Single side spraying/folding is only for temporary use with low speed.

Moving transport slide tubes

1. Unfold boom.
2. Remove spring clip from lock pin.
3. Remove lock pin from transport support.
4. Move slide tube toward center until the inner set of holes line up.
5. Replace lockpin.
6. Replace spring clip on lock pin.



To move the slide tube out, reverse the above procedure





Operating the wing tilt - HZ model only

CAUTION

NEVER ATTEMPT TO FOLD BOOM TO TRANSPORT POSITION WHEN WINGS ARE TILTED.

ALWAYS LET WINGS DOWN TO HORIZONTAL POSITION PRIOR TO FOLDING.

NEVER ATTEMPT TO WORK ON OR AROUND WING SECTION WHEN TILTED UP.

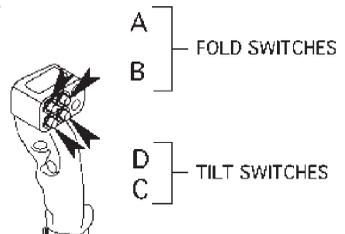
UNEXPECTED BOOM MOVEMENTS MAY OCCUR IF WINGS ARE TILTED WHEN FOLDING.

NEVER USE TILT FUNCTION WHEN BOOM IS FOLDED INTO TRANSPORT POSITION.

ALWAYS HAVE THE SLIDE TUBES ON FRONT TRANSPORT SUPPORTS IN MOST OUTER POSITION WHEN LOWERING BOOM INTO TRANSPORT POSITION.

Operating the wing tilt - HZ model only

1. Press bottom **C** or **D**, depending on which side to be tilted.
2. Activate the double acting outlet to tilt the wing up and down.
3. When wings are in desired position set 1 and 2 back to neutral.



Unfolding MY and HY models

1. Raise the boom to the top by activating the single acting lever. (see description of how to release transport lock).
2. Activate the double acting lever and unfold completely.
3. To fold reverse 1 and 2



Unfolding the MX

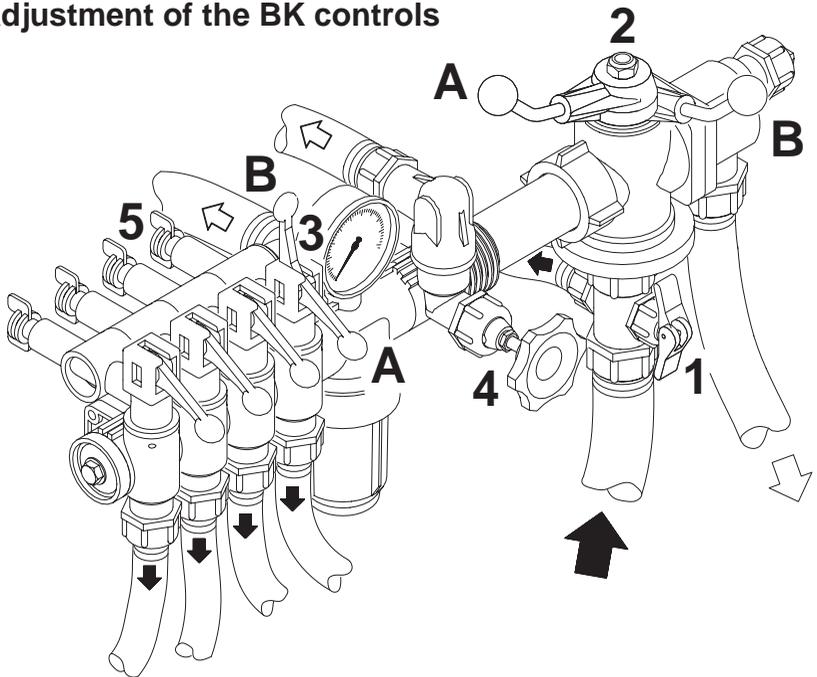
1. Raise the boom to the top by activating the single acting lever. (see description of how to release transport lock).
2. Press down the lever placed on the boom. Position your self between tank and boom. Press the boom gently away from tank. Be careful the boom is spring loaded for making the folding procedure easier.
3. To fold reverse 1 and 2



MX in picture can be upgraded to MY with hydraulic folding.
Ask your local dealer.



Adjustment of the BK controls



1. Choose the correct nozzle. TRIPLET nozzle turrets are turned to the suitable nozzle for the spray purpose. Make sure that all nozzles are of the same type and capacity. See "Spray Technique" book.
2. Open or close lever 1 depending on whether pressure agitation is required. (Remember pressure agitation takes 5% to 10% of pump output).
3. Turn main ON/OFF handle 2 to ON position A.
4. Set all hand levers 3 on the distribution valve to ON position A.
5. Turn the HARDI-MATIC valve 4 anti-clockwise to its extreme position.
6. Put the tractor in neutral and adjust the P.T.O. thereby the number of revolutions of the pump corresponding to the intended travelling speed.
NOTE: The P.T.O. revolutions must be kept between 300-600 r/min.
7. Adjust the HARDI-MATIC valve 4 so that the pressure gauge indicates the recommended pressure.



ADJUSTMENT OF PRESSURE EQUALIZATION:

8. Place the first lever **3** on the distribution valve in OFF position **B**.
9. Turn the adjusting screw **5** until the pressure gauge shows the same pressure again.
10. Adjust the other sections of the distribution valve in the same way. Hereafter adjustment of pressure equalization will only be needed if you change to nozzles of other capacities.

11. OPERATING THE CONTROL UNIT WHILE DRIVING:

To stop the liquid flow to the boom turn the ON/OFF handle **2** to OFF position **B**. This returns the pump output to the tank through the return system. The diaphragm anti-drip valves ensure instantaneous closing of all nozzles.

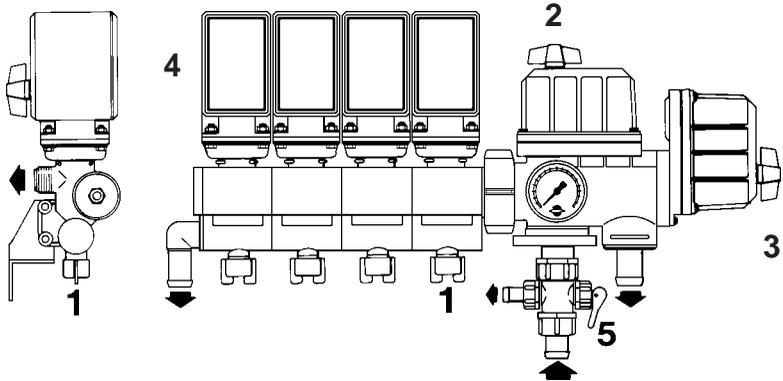
To stop the liquid flow to one or more boom sections, turn lever **3** of the distribution valve to OFF position **B** for the section to be closed. The pressure equalization ensures that the pressure does not rise in the sections which are to remain open.





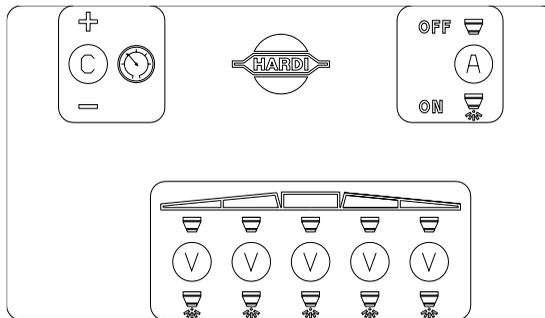
Adjustment of the EC controls

EC operating unit



1. Adjustment screw for pressure equalization
2. Main ON/OFF valve
3. Pressure control valve
4. Distribution valve
5. Pressure agitation valve

EC Remote control box



- A. Operating switch for main ON/OFF valve
- V. Operating switch for distribution valves
- C. Pressure control switch (to lower)
- D. Pressure control switch (to raise)

1. Choose the correct nozzle. TRIPLET nozzle turrets are turned to the suitable nozzle for the spray purpose. Make sure that all nozzles are of the same type and capacity. See "Spray Technique" book.

2. Open or close lever **5** depending on whether pressure agitation is required. (Remember pressure agitation takes 5% to 10% of pump output).
3. Main ON/OFF switch **A** is set towards green.
4. All distribution valves switches **V** are set towards green.
5. Pressure control switch is activated until emergency handle **3**, stops rotating (minimum pressure).
6. Put the tractor in neutral and adjust the P.T.O. and thereby the number of revolutions of the pump corresponding to the intended travelling speed.
NOTE: The P.T.O. revolutions must be kept between 300-600 r/min.
7. Pressure control switch **C** is activated till the recommended pressure is shown on the pressure gauge.



ADJUSTMENT OF PRESSURE EQUALIZATION:

8. Close the first distribution valve switch **V**.
9. Turn the adjusting screw **1** until the pressure gauge shows the same pressure again.
10. Adjust the other sections of the distribution valve in the same way. Hereafter adjustment of pressure equalization will only be needed if you change to nozzles of other capacities.

11. OPERATING THE CONTROL UNIT WHILE DRIVING:

To stop the liquid flow to the boom switch ON/OFF **A** to OFF position. This returns the pump output to the tank through the return system. The diaphragm anti-drip valves ensure instantaneous closing of all nozzles.

To stop the liquid flow to one or more boom sections, switch the relevant distribution valve **V** to OFF position. The pressure equalization ensures that the pressure does not rise in the sections which are to remain open.

In case of power failure it is possible to activate all functions of the operating unit. To operate manually, disconnect the multiplug first.

When the sprayer is put aside, the control box and the multiplug must be protected against moisture and dirt. A plastic bag may be used to protect the multiplug.

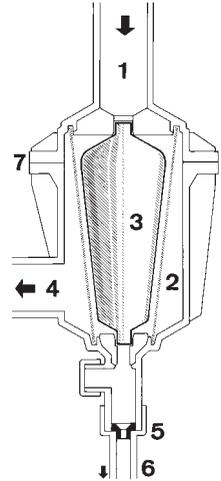




Self-Cleaning Filter

Function diagram

1. From pump
2. Filter screen
3. Guide cone
4. To operating unit
5. 3, 4, 5 or 6 mm restrictor
6. Return to tank
7. Ring nut



Choice of restrictor

It is important to have a large flow through the filter. This is achieved by choosing the restrictor size in relation to the liquid consumption of the spray boom.

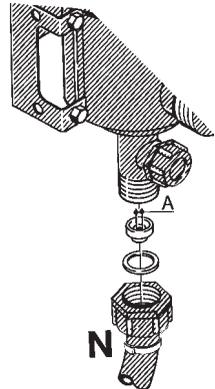
4 restrictors are supplied. Use the green one (largest **A** orifice first).

Hose **N** is unscrewed from the filter. Be careful not to lose the seal. The restrictor is placed in the hose and the hose is mounted again.

If the required working pressure cannot be obtained, the restrictor is too large. Choose a smaller restrictor. Start with a black one, then a white and finally a red one.

When cleaning the filter, remove hose **N** and the hose at the safety valve and check that there are no residues.

Standard filter size is 80 mesh. Filters of 50 and 100 mesh are available. To remove filter mesh undo the large ring nut. Check condition and placement of O-rings before reassembly.

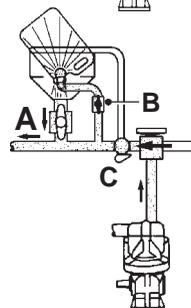
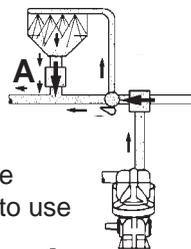
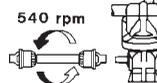
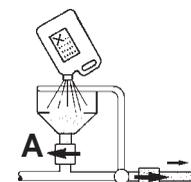
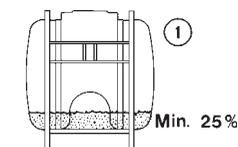


Filling by HARDI FILLER

Chemicals are filled by means of the HARDI FILLER as follows:

Liquid chemicals:

1. Fill the main tank with at least 25% water (unless anything else is stated on the chemical container label). See section "about Filling of water".
2. Turn the handle at the Suction Manifold towards "Main tank" and turn blue Return valve, if fitted, towards "Agitation". Close remaining valves.
3. Turn the handle at the Pressure Manifold towards "HARDI FILLER". Close remaining valves. Check that bottom valve **A** at the FILLER is closed.
4. Engage and set P.T.O. at 540 r.p.m.
5. Open FILLER lid.
6. Measure the correct quantity of chemical and fill it into the hopper.



NOTE! The scale in the hopper can only be used if the sprayer is parked at level ground! It is recommended to use a measuring jug for best accuracy.

7. Open the bottom valve **A** and the chemical is transferred to the main tank.
8. If the chemical container is empty it can be rinsed by the container rinsing device (if fitted).

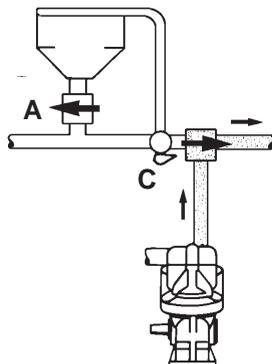
Place the container over the multi-hole nozzle and press the lever.

WARNING! Do not press lever **B** unless the multi-hole nozzle is covered by a container to avoid spray liquid hitting the operator.

IMPORTANT! Rinsing device uses spray liquid for rinsing containers for concentrated chemicals. Always rinse the chemical containers with clean water several times until they are clean before disposal.



9. Engage the hopper rinsing device by opening valve **C**.
10. Close valve **C** again when the hopper is rinsed.



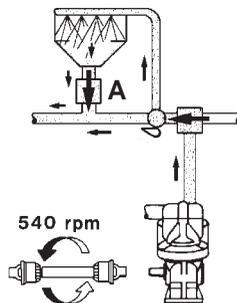
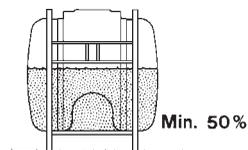
IMPORTANT! The hopper rinsing device is using spray liquid for rinsing the hopper for concentrated chemical! The FILLER must always be cleaned together with the rest of the sprayer when the spray job is done.

10. Close valve **A** and the FILLER lid again.
11. Turn handle at the pressure manifold towards operating unit and close remaining valves. Keep P.T.O. engaged so the spray liquid is continuously agitated until it has been sprayed on the crop.

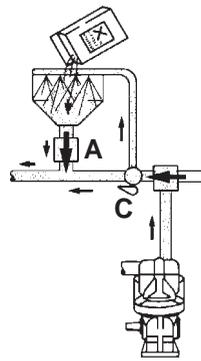
Powder chemicals:

Filling of powder chemicals is done as follows:

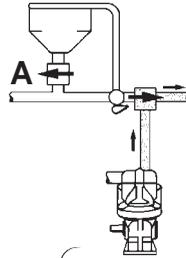
1. Fill the main tank with at least 50% water (unless anything else is stated on the chemical container label). See section “about Filling of water”.
2. Turn the handle at the suction manifold towards “main tank” and turn blue return valve towards “agitation”. Close remaining valves.
3. Turn the handle at the pressure manifold towards “HARDI FILLER”. Close remaining valves.
4. Engage and set P.T.O. at 540 r.p.m.
5. Open the bottom valve **A** at the FILLER. Open FILLER lid.



6. Engage the hopper rinsing device by opening valve **C**.
7. Measure the correct quantity of chemical and sprinkle it into the hopper as fast as the rinsing device can flush it down.

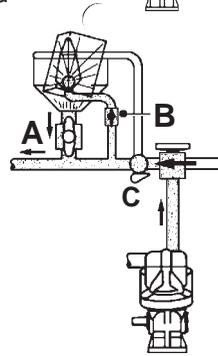


8. If the chemical container is empty it can be rinsed by the container rinsing device (if fitted). Fit the bag bracket and place the powder bag over the multi-hole nozzle and press the lever **B**.



WARNING! Do not press lever **B** unless the multihole nozzle is covered by a container to avoid spray liquid hitting the operator.

IMPORTANT! Rinsing device uses spray liquid for rinsing containers for concentrated chemicals. Always rinse the chemical containers with clean water several times until they are clean before disposal.



9. Close valve **C** again when the hopper is rinsed.

IMPORTANT! The hopper rinsing device is using spray liquid for rinsing the hopper for concentrated chemical. The FILLER must always be cleaned together with the rest of the sprayer when the spray job is done.

10. Close valve **A** and the FILLER lid again.

11. Turn handle at the Pressure Manifold towards operating unit and close remaining valves to mix the spray liquid. Keep P.T.O. engaged so the spray liquid is continuously agitated until it has been sprayed on the crop.





Safety precautions

Always be careful when working with crop protection chemicals!

Personal protection

Dependant on the type of chemical used, the following protective clothing/equipment should be used:

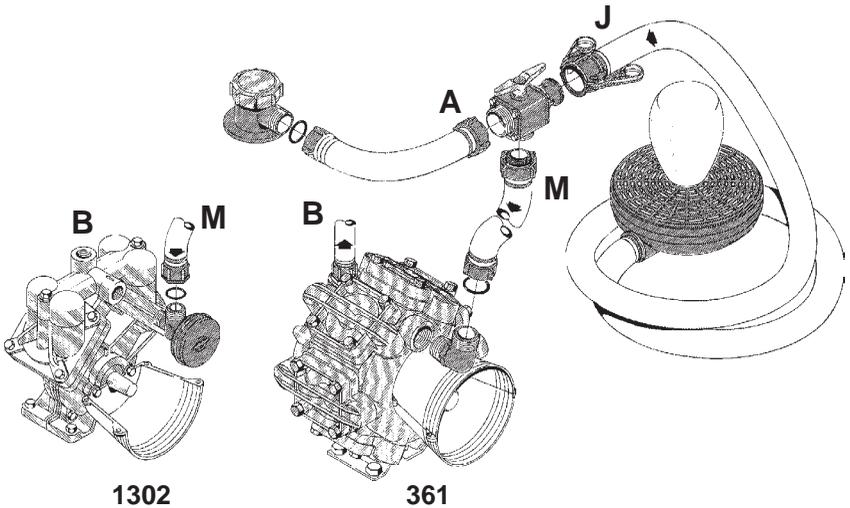
- Gloves
- Waterproof boots
- Headgear
- Respirator
- Safety goggles
- Chemical resistant overall

This equipment should be worn to avoid contact with the chemicals.

Protective clothing/equipment should be used when preparing the spray liquid, during the spraying work and when cleaning the sprayer. Also, follow the recommendations on the chemical label.



Principle of filling devices on TR-2000 (if fitted)



- A = Suction from tank.
B = Pressure to operating unit.
J = Suction towards filling device.
M = Suction from pump.

Adjustments and Maintenance

HARDI CANNOT ASSUME RESPONSIBILITY OR BE HELD LIABLE FOR ANY LOSS OR DAMAGE THAT OCCURS DUE TO LACK OF ADJUSTMENTS OR MAINTENANCE. WE URGE YOU TO FOLLOW THE ADJUSTMENT AND MAINTENANCE RECOMMENDATIONS FOR EVERYONE'S SAFETY.

MAKE IT A DAILY HABIT TO INSPECT YOUR SPRAYER FOR NEED OF ADJUSTMENT OR MAINTENANCE.

IMMEDIATELY REPLACE ANY PARTS ON THE SPRAYER THAT ARE WORN OR BROKEN.

ALWAYS CLEAN YOUR BOOM BEFORE ADJUSTING IT TO AVOID UNNECESSARY CONTACT WITH CHEMICALS.

Your new HARDI SPB boom was hydraulically charged and adjusted at time of assembly. (Applies to booms sold with sprayers as complete units only.)

The SPB Boom will require additional adjustments shortly after being taken into use (after 10 hours) and thereafter at least on an annual basis to perform/work at its optimum level.

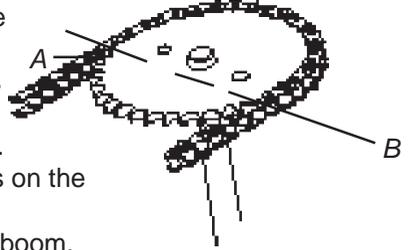
To further ensure proper performance the SPB boom also has to be maintained on a regular basis. Please follow the suggested maintenance intervals. Perform the adjustment procedures in the same sequence as they are written in this manual.





Checking and Adjusting Sprocket Timing

1. With boom unfolded in the spraying position and standing on front side of the boom, check to ensure that the 7th pin connection on the 18 m boom (A) in the timing chains aligned with the center line between the sprocket cap screws (B).
2. Adjust timing, loosen turnbuckles on the front and rear cables until slack.
3. Standing on the front side of the boom, as steep 1.
4. Adjust front and rear cable tension as described in “adjust front and rear cable “



Aligning Wing Assemblies

1. With boom unfolded and in the working position, check alignment of the intermediate section with the center frame.
2. With fold cylinder pressurized, determine if the intermediate section needs to be adjusted to the front or rear to come into alignment with centre frame.
NOTE: Because of adjustments made later, it is better to start with the wing assemblies angled slightly to the rear.
3. Relieve pressure from cylinder by folding boom in a few cm .
NOTE: Cylinder rods have a machined flat which, if visible, can be used for adjustments. If using machined flat for adjustment, leave rod eye pinned to boom and loosen jam
4. Disconnect cylinder rod eye (B) from the intermediate boom section.
5. Loosen jam nut (A) and adjust rod eye (B) IN to move boom for - ward or OUT to move boom rearward.

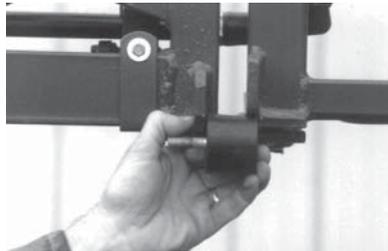
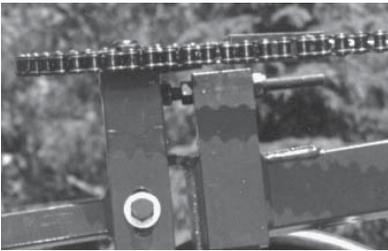
Tighten jam nut (A).

6. Attach cylinder rod to boom and pressurize cylinder to check boom alignment.



Alignment of Intermediate and Outer Wing Sections

1. Remove rubber stop from inner wing.
2. Undo jam nut "A" and adjust set screw "B" by turning nut "C" in or out until outer wing is in line with inner wing.
3. Line up inner and outer wing.
4. Hold the rubber stop close to the tabs.
5. The distance between the tabs should be approx. 2-4 mm less than the length of the rubber stop.
7. The rubber stop may need to be spaced out with 1 or more flat washers.
8. Replace rubber stop and tighten nut to hold it in place.

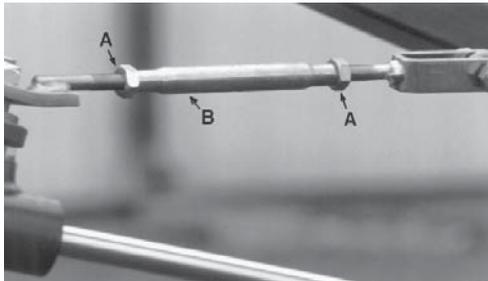


Adjusting Front Fold Cable

CAUTION: REAR CABLE CAN SNAP AND INJURE YOU OR SOMEONE ELSE IF TENSIONED WHEN THE BOOM IS UNFOLDED. ALWAYS ADJUST FRONT CABLE FIRST WITH THE BOOM UNFOLDED AND REAR CABLE LAST WITH THE BOOM FOLDED IN TRANSPORT POSITION.

1. Unfold boom into operating (spraying) position.
2. Shut the tractor off.
3. Slide a straight edge down the underside of intermediate boom section until it just contacts the front cable.
4. Suspend a 4.5 kg (10lb) weight from the straight edge-to-cable contact point and check deflection by measuring the distance from the straight edge to the cable. Cable should deflect 13-20 mm
5. Loosen jam nuts (A) on the turnbuckle assembly and adjust - (picture below) turnbuckle (B) for proper cable deflection.
6. Tighten jam nuts (A) and remove weight.

IMPORTANT: Check boom alignment again. If front cable was tightened, the wing assembly will move forward; or if loosened, wing will move rearward. Adjust fold cylinder if necessary) as described in “Aligning Wing Assemblies”.



Adjusting the Breakaway Clutch

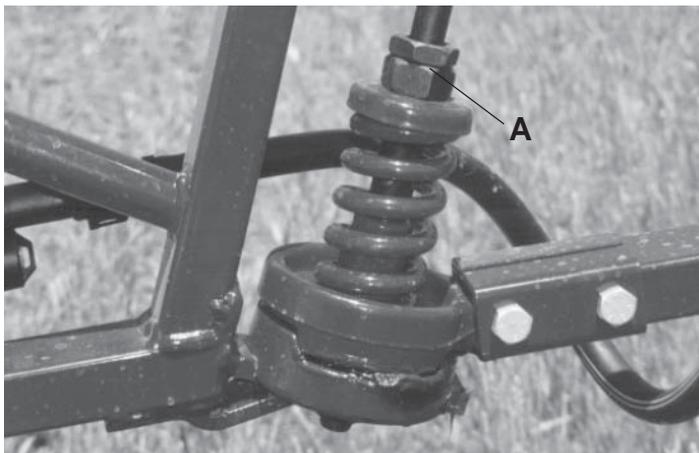
NEVER PLACE FINGERS INTO OPEN BREAKAWAY CLUTCH OTHERWISE YOU MAY BE INJURED SHOULD CLUTCH SNAP CLOSED

The tension on the breakaway for the outer wing can be adjusted by loosening or tightening the adjustment nut “A” .

1. If the breakaway clutch releases too easily, tighten the nut.
2. If the breakaway clutch is too stiff, loosen the nut.

DO NOT TIGHTEN THE BREAKAWAY CLUTCH MORE THAN NECESSARY! OVERTIGHTENING CAN CAUSE DAMAGE TO THE BOOM!

NOTE: Spring pressure from tensioned breakaway clutch only assists in returning outer boom section to alignment.

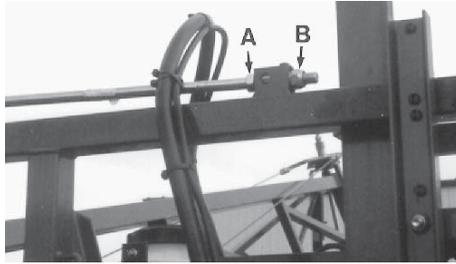


Adjusting Wing Level to Ground

HY-BOOMS

1. Loosen jam nut "A".
2. Adjust nut "B" in or out until wing is level to ground.
3. Secure jam nut "A".

Same procedure applies to both sides.

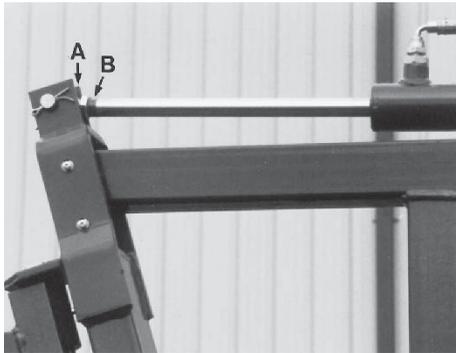


Adjusting Wing Level to Ground

HZ-BOOMS

1. Loosen jam nut "A".
2. Apply an adjustable wrench to the machined surface at "B".
3. Turn the cylinder rod until boom is level to the ground.
4. Secure jam nut "A".

Same procedure applies to both sides.



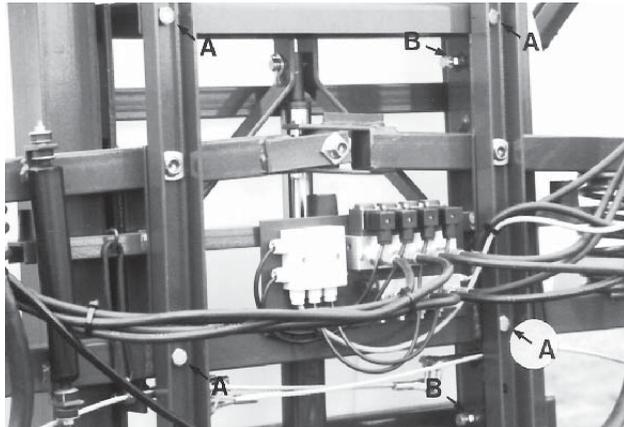
Adjusting the Center to the H-frame

This adjustment will affect the trapeze function and must therefore be made properly.



IMPORTANT: Lubricate pivot linkage (7 places) and grease skid plates prior to adjustment. (picture below)

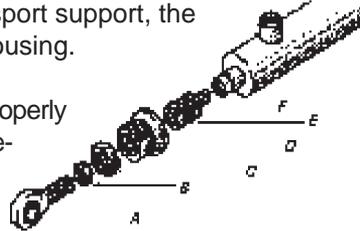
1. Park sprayer on level ground.
2. Tighten the four adjustment bolts (**A**) approx. $\frac{1}{2}$ turn.
3. Grasp the wing by the end and lift it approx. 500 cm. Let the wing go and it should go down to approximately horizontal position.
4. Repeat the above process until the centre is firmly held to the H-frame without affecting the trapeze function.
5. If the trapeze will not let the boom go back to horizontal position, the bolts must be loosened again.
6. Loosen jam nuts and tighten bolts (**B**) in approx. 1 turn.
7. Lift boom all the way to the top, then lower the boom all the way down.
8. Repeat the above procedure until the centre is firmly adjusted in side the H-frame.
9. If the boom will not lower all the way down, the bolts need to be loosened again.



Adjusting Boom Transport Position

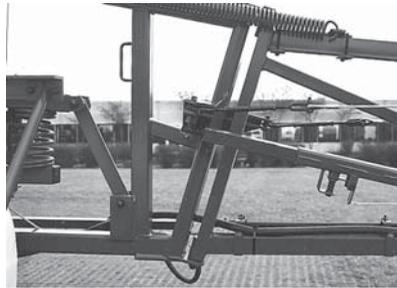
Hydraulic foldable models

1. Lift boom all the way to the top.
2. Fold boom into transport position. With fold cylinder pressurized, determine if boom sections need to be adjusted inwards or outwards.
NOTE: Boom should be approx. 3-5 cm inside front transport support.
3. Relieve pressure from cylinder by unf-5 cm folding boom a few cm.
4. If boom rests too far in on the transport support, loosen the nut (**C**) and adjust collar (**D**) in towards the cylinder housing.
5. If boom rests too far out on the transport support, the (**D**) has to go out from the cylinder housing.
6. Secure jam nut (**C**).
7. Pressurize cylinder to see if boom is properly adjusted. If not, repeat the above procedure until it is correctly adjusted.
Loosened again.



Adjusting Boom Transport Position (manual foldable)

1. Lift boom all the way to the top.
2. Fold the boom into transport position. If the boom needs to be adjusted inwards or outwards do as described below.
3. Loosen jam nut **A** pull out the pin **B** and adjust the road eye **C** in wards for more folding.



Adjusting Rear Cable

CAUTION: REAR CABLE CAN SNAP AND INJURE YOU OR SOMEONE ELSE IF TENSIONED WHEN THE BOOM IS UNFOLDED. ALWAYS ADJUST FRONT CABLE FIRST WITH THE BOOM FOLDED INTO TRANSPORT POSITION.

1. Raise boom to its highest position. Fold boom to transport position with tilt cylinders fully extended. Make sure fold cylinders are pressurized and that boom is folded all the way in.
2. Shut the tractor off.
3. Loosen the jam nuts on the turnbuckle. Adjust (tighten) the turnbuckle so that the outer wing section contacts the boom transport stop bracket. Tighten the turnbuckle another four complete turns and retighten the jam nuts.

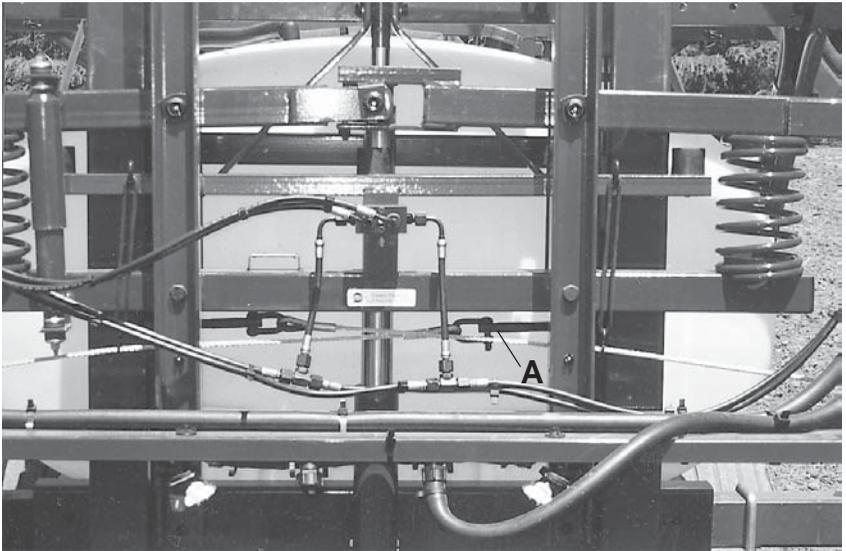


Adjusting Center Section Cables

NEVER ATTEMPT TO ADJUST THE CENTRE CABLES WITHOUT HAVING THE BOOM FOLDED ALL THE WAY INTO THE TRANSPORT POSITION!

Center section cables work together to keep the centre frame square to the H-frame, while folding boom in for transport or when spraying with one side raised and folded.

1. Fold boom into transport position.
2. Shut the tractor off.
3. Check that the tilt cylinders (or turn buckle on the manual model) are COMPLETELY RETRACTED. Adjust, if necessary.
4. Loosen jam nuts **A**.



IMPORTANT: Alternate from side-to-side while making adjustments. Adjust one cable slightly amount, and continue with the next one other, to equalize cable tension and maintain level centre frame.

5. Properly adjusted cables will be very tight and only deflect a small amount (fractions of 2 cm) when pulled on by hand.
6. Tighten jam nuts **A**.
7. Unfold boom to operating (spraying) position.
8. Fold boom and check that centre frame remains square to H-frame.

Lubrication



Oil



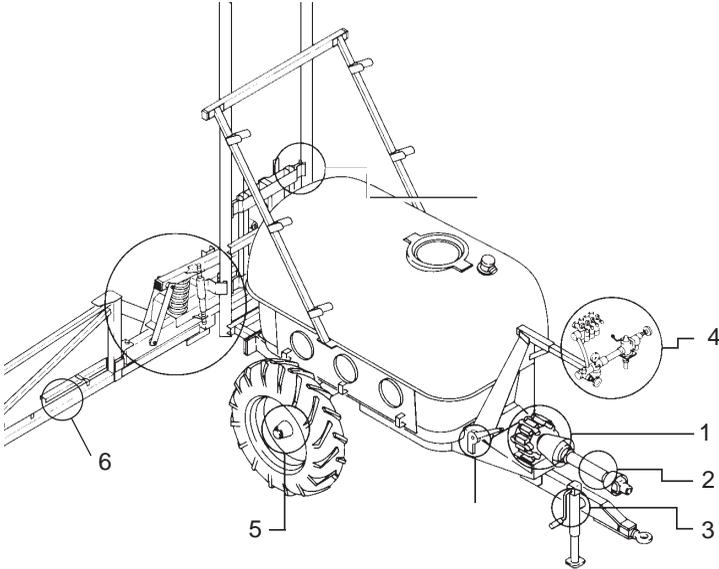
Operation hours

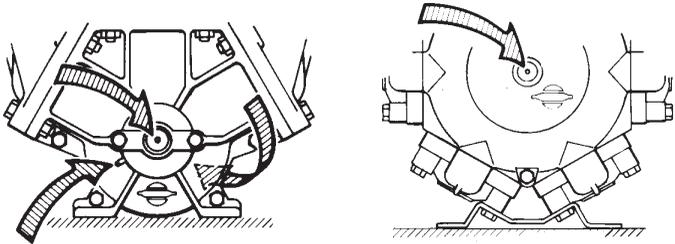
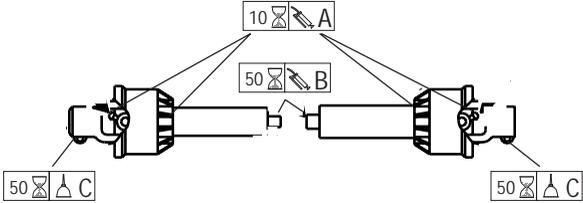
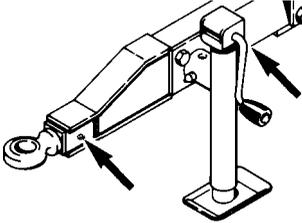
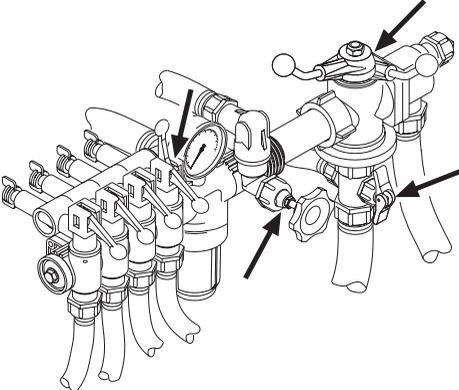


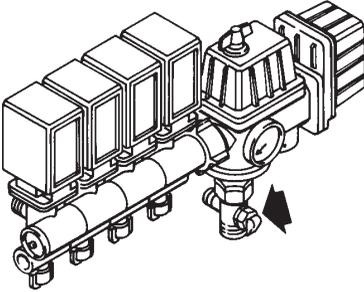
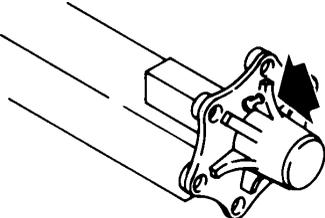
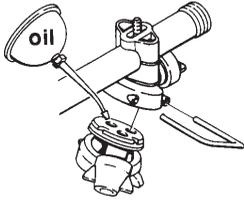
Grease



Winter protection or
off-season storage



POS.					
1		X	40		
2	X X		8 40		
3		X	40		
4	X		20		

POS.					
4	X		20		?
5	X		1000		? ? ?
6	X				?



ALWAYS CLEAN YOUR BOOM AT THE END OF THE EACH WORKING DAY OR BEFORE PERFORMING SERVICE TO AVOID UNNECESSARY CONTACT WITH CHEMICALS



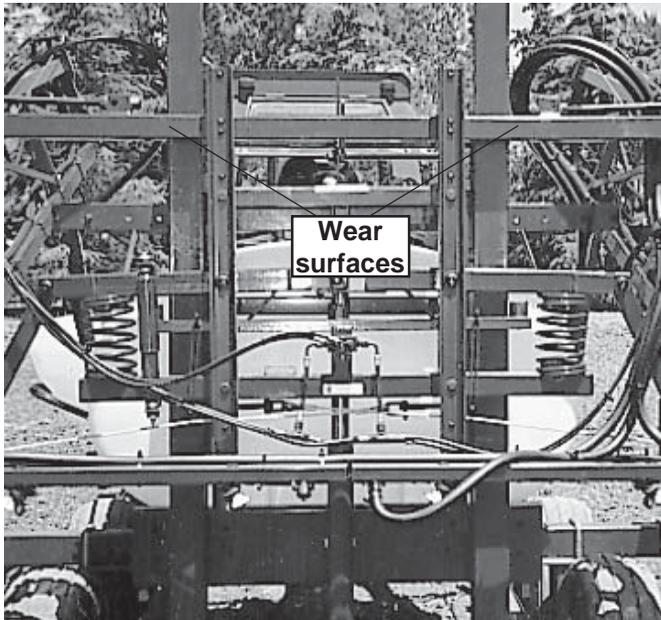
Greasing the H-frame and Centre Frame

Every 8 hours new grease should be applied to the wear surfaces on the H-frame and the centre frame.

1. Apply grease to the lower portion of the H-frame **with the boom hanging in the transport hook.**
2. Apply grease to the upper portion of the H-frame **with the boom unfolded and lowered all the way down.**

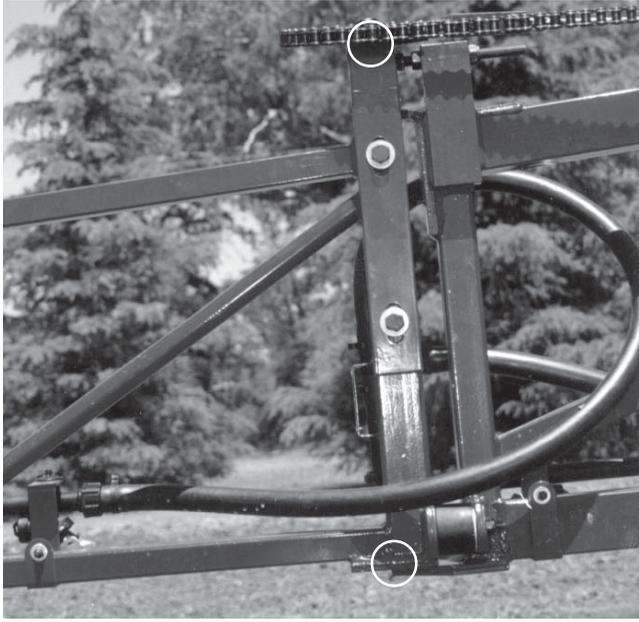
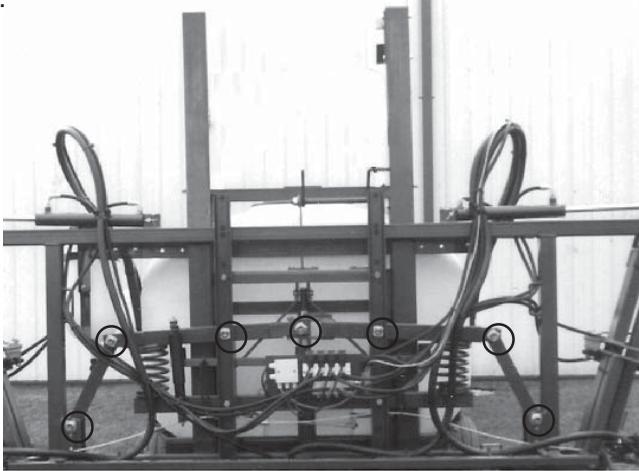
Every 50 hours the grease on the H-frame and centre frame should be completely cleaned off with a degreasing solvent and new grease applied.

Follow the above steps when doing this.



Greasing the Boom

Every 8 hours the places indicated in the following pictures should be greased.





Lubrication of Chain and Sprocket

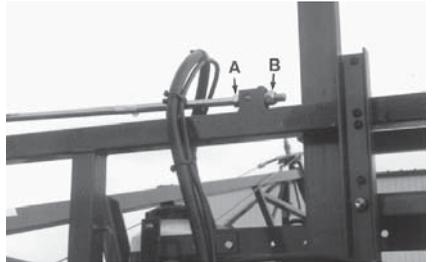
Every 25 hours the chain and sprocket on the boom should be lubricated with a chain lubricant.



Greasing the Breakaway Clutch

NEVER PLACE FINGERS INTO OPEN BREAKAWAY CLUTCH, OTHERWISE YOU MAY BE INJURED SHOULD CLUTCH SNAP CLOSE.

1. Unfold the boom into spraying position.
2. Standing in front of the outer wing, snap the breakaway open by quickly pushing the boom away from you.
3. With the two clutches opened up, stick the nozzle of a grease gun into the clutch and apply a generous amount of grease. This should be done every 8 hours.



Cleaning the sprayer

Guidelines

Read the whole label of the chemical. Take note of any particular instructions regarding recommended protective clothing, deactivating agents, etc. Read the labels regarding the detergent and deactivating agent. If cleaning procedures are given, follow them closely.

Be familiar with local legislation regarding disposal of pesticides washings, mandatory decontamination methods, etc. Contact the appropriate body, e.g. Dept. of Agriculture.

Pesticide washings can usually be sprayed out on a soakaway. This is an area of ground that is not used for cropping. You must avoid seepage or run-off of residues into streams, water courses, ditches, wells, springs, etc. The washings from the cleaning area must not enter sewers. Drainage must lead to a soakaway.

Cleaning starts with the calibration, as a well calibrated sprayer will ensure the minimal amount of remaining spray liquid.

It is good practice to clean the sprayer immediately after use thereby rendering the sprayer safe and ready for the next pesticide application. This also prolongs the life of the components.

It is sometimes necessary to leave spray liquid in the tank for short periods, e.g. overnight, or until the weather becomes suitable for spraying again. Unauthorized persons and animals must not have access to the sprayer under these circumstances.

If the product applied is corrosive, it is recommended to coat all metal parts of the sprayer before and after use with a suitable rust inhibitor.

Remember: Clean sprayers are safe sprayers.
Clean sprayers are ready for action.
Clean sprayers can not be damaged by pesticides and their solvents.

Cleaning

1. Dilute remaining spray liquid in the tank with at least 10 parts water and spray out the liquid in the field you have just sprayed.

NOTE: It is advisable to increase the forward speed (double if possible) and reduce the pressure. For S4110 nozzles, pressure may be reduced to 1.5 bar.

2. Select and use the appropriate protective clothing. Select detergent suitable for cleaning and suitable deactivating agents, if necessary.
3. Rinse and clean sprayer and tractor externally. Use detergent if necessary.
4. Remove tank and suction filters and clean. Be careful not to damage the mesh. Replace suction filter top. Replace filters when the sprayer is completely clean.
5. With the pump running, rinse the inside of the tank. Remember the tank roof. Rinse and operate all components and any equipment that has been in contact with the chemical.

Before opening the distribution valves and spraying the liquid out, decide whether this should be done in the field again or on the soakaway.

6. After spraying out the liquid, stop the pump and fill at least $\frac{1}{5}$ of the tank with clean water. Note that some chemicals require the tank to be completely filled. Add appropriate detergent and /or deactivating agent, e.g. washing soda or triple ammonia.

NOTE: If a cleaning procedure is given on the chemical label, follow it closely.

7. Start the pump and operate all controls enabling the liquid to come in contact with all the components. Leave the distribution valves until last. Some detergents and deactivating agents work best if left in the tank for a short period. Check the label.

The Self-cleaning Filter can be flushed by removing the bypass hose from the bottom of the filter. Stop the pump and remove the hose. Start the pump for a few seconds to flush filter. Be careful not to loose the restrictor nozzle.





8. Drain the tank and let pump run dry. Rinse inside of tank, again letting the pump run dry.
 9. Stop the pump. If the pesticides used have a tendency to block nozzles and filters, remove and clean them now. Check also for sediment on the pressure side of the safety valve for the Self-cleaning Filter.
 10. Replace all the filters and nozzles and store the sprayer. If, from previous experiences, it is noted that the solvents in the pesticide are particularly aggressive, store the sprayer with the tank lid open.
- NOTE:** If the sprayer is cleaned with a high pressure cleaner we recommend lubrication of the entire machine.

Filters

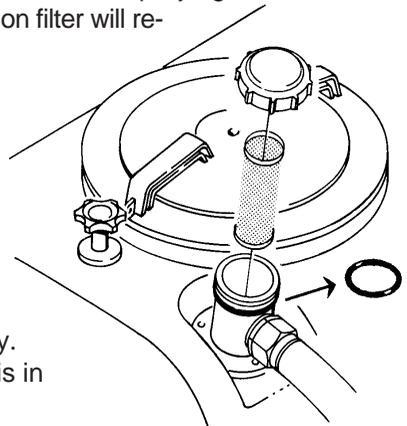
Clean filters ensure:

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

Suction filter

The main filter protecting sprayer components is the suction filter at the top of the tank. Check it regularly.

The main filter protecting sprayer components is the suction filter at the top of the tank. Check it regularly. Ensure that O-ring on filter housing is in good condition and lubricated.



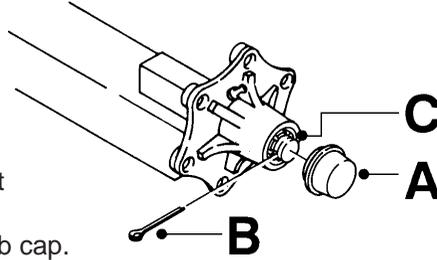
Wheel nuts and bearings

Check wheel nut tension after the first 8 working hours, then every 50 hours.

Check roller bearing slack after the first 8 hours and 50 hours. Then every 100 hours.

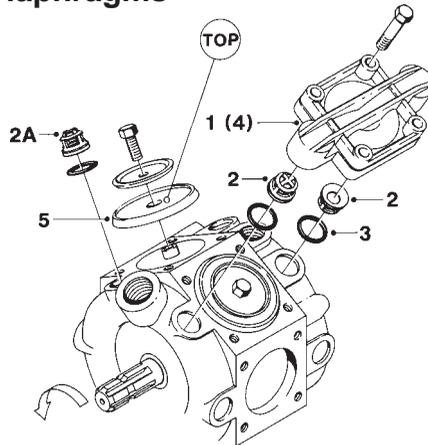
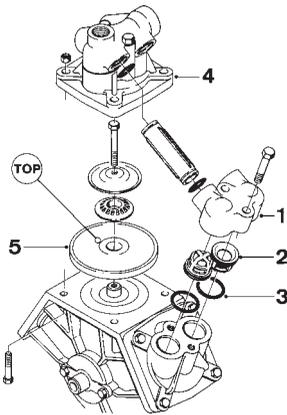
If necessary, adjust as follows:

1. Jack up wheel. It is best to remove the wheel.
2. Remove hub cap **A** and split pin **B**.
3. Shaft nut **C** is tightened until slight rotation resistance.
4. Now loosen shaft nut until first split pin hole is visible.
5. Insert split pin and replace hub cap.



After 1000 hours or once a year, the axle bearings are greased.

Changing of Valves and Diaphragms



Valves

Remove valve cover **1**. Before changing the valves **2** note their orientation so they are replaced correctly.

NOTE: One special valve with white flap **2A** is used on model 361. It has to be placed in the valve opening shown.

It is recommended to use new gaskets **3** when changing or checking the valves.

Diaphragms

Remove the diaphragm cover **4**.

The diaphragm **5** may then be changed.

If fluids have reached the crankcase, re-grease the pump thoroughly.

Check also that the drain hole at the bottom of the pump is not blocked.

Reassemble with the following torque setting.

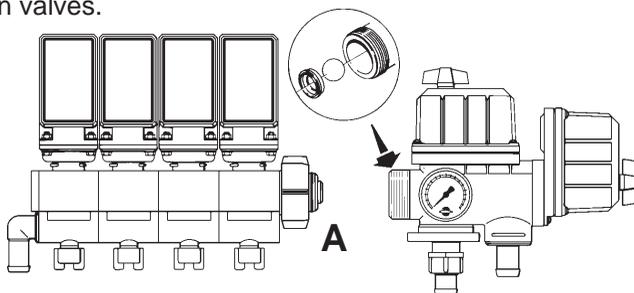
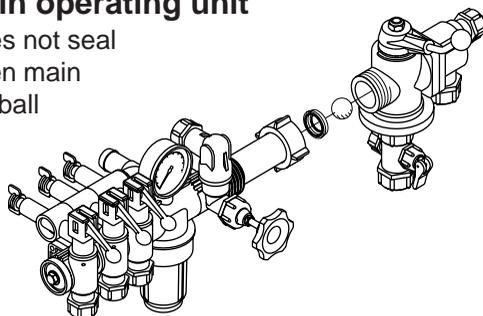
Pump Model	Valve cover Nm	Diaphragm cover Nm	Diaphragm bolt Nm
1202	70	70	60
1302	60	70	60
361	70		60

1 Nm = 0.74 ft-lb

Changing the ball seat in operating unit

If the main ON/OFF valve does not seal properly (dripping nozzles when main ON/OFF valve is closed), the ball and seat should be checked.

Remove the 2 bolts fixing the main ON/OFF-pressure valve unit to the bracket, unscrew the union nut **A** and pull the valve away from the distribution valves.



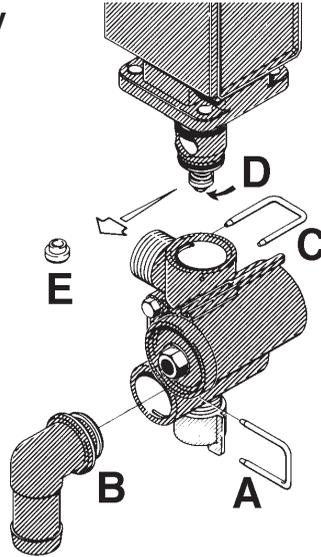
Check the ball for sharp edges and scratches, and check the ball seat for cracks and wear - replace, if necessary.

Checking the valve cone - EC only

Check the distribution valves for proper sealing Periodically. Do this by running the sprayer with clean water and open on/off valve and all distribution valves.

Remove the clip **A** Cautiously and pull out the hose **B** for the pressure equalization device. When the housing is drained, there should be no liquid flow through the pressure equalization device. If there is any leakage, the valve cone **E** must be changed.

Remove the clip **C** and lift the EC-motor housing off the valve housing. Then unscrew the screw **D** and replace the valve cone **E**. Reassemble in opposite sequence.

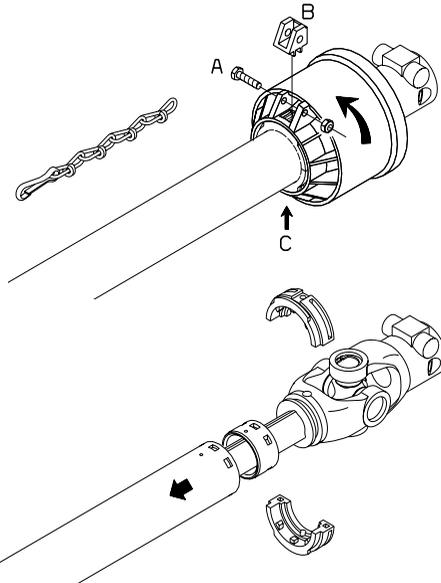


Replacement of transmission shaft protection guards

The replacement of defective protection guards is easy to do.

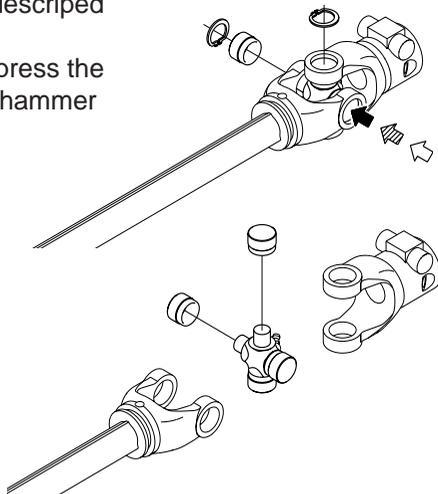
1. Remove bolt **A**, lock **B** and grease nipple **C**. Twist universal cross cover 1/4 turn and pull it backwards.
2. Remove the synthetic bearings and protection tube.
- 2a. Remove inner bush from protection tube.
3. Assemble again in reverse order, using new parts where necessary. Remember to fit chains again.
4. Grease bearings.

Use only genuine HARDI spare parts to service the transmission shaft.



Replacement of transmission shaft cross journals.

1. Remove protection guard as described previously.
2. Remove Seeger circlip rings, press the cross journal sideways - use hammer and mandrel, if necessary.
4. Remove needle bearing cups and cross journal can now be removed.
5. Remove needle bearing cups from new cross journal Carefully and install it in reverse order. Before fitting the needle bearing cups again, check that needles are placed correctly. Avoid dust and dirt in the new bearings.

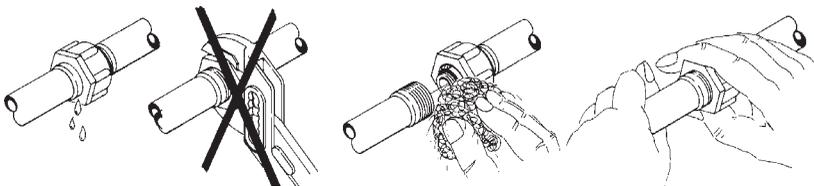
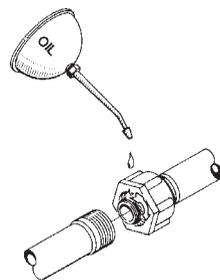


Nozzle tubes and fittings

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

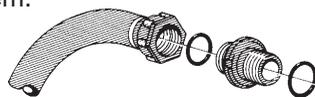
Therefore, in case of leaks: **DO NOT** overtighten. Disassemble, check condition and position of O-ring or gasket, clean, lubricate and reassemble. The O-ring is lubricated **ALL THE WAY ROUND** before fitting on to the nozzle tube.



Use non-mineral lubricant.

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

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



Off-season storage

When the spraying season is over, we recommend that you devote some extra time to the sprayer before storing it.

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 rough 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 section about "Cleaning the sprayer".

EC operating unit

When the sprayer is put away, the control box and the multiplug must be protected against moisture and dirt. A plastic bag may be used.

Transmission shaft

It is important that the push pins are clean and well lubricated, to ensure safe function.

Every 40 hours: Inspection of protection guards, function and condition. Replace damaged parts, if any.

Every 1000 hours: Check condition of protection guards and replace nylon bearings.

Check general condition of cross journals and push-pin/quick release - replace, if necessary.

Anti-freeze precaution

If the sprayer is not stored in a frost free place you should take the following precautions: Put at least 10 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. The anti-freeze solution also hinders the O-rings and gaskets from drying out.

Remove the glycerine filled pressure gauge and store it frost free in vertical position.





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 do 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.
- Electrical and hydraulic components that are contaminated will result in poor connections and rapid wear to the hydraulic system.

Therefore **ALWAYS** check:

1. Suction, Self-Cleaning, pressure 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.
6. Electrical and hydraulic components are maintained clean.

Fault	Probable cause	Control / remedy
Liquid system		
No spray from boom when turned on.	Air leak on suction.	Check if suction filter O-ring is sealed <hr/> Check suction tube and fittings. <hr/> Check tightness of pump diaphragm and valve covers.
	Air in system.	Fill suction hose with water for initial prime.
	Suction/pressure filters clogged.	Clean filters. <hr/> Check that yellow suction pipe is not obstructed or placed too near the tank bottom.
Lack of pressure.	Incorrect assembly.	Agitation nozzles not fitted. <hr/> Too little distance between yellow suction pipe and tank bottom.
	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. <hr/> If using powders, make sure agitation is on.
	Nozzles worn.	Check flow rate and replace nozzles if it exceeds 10%.
	Tank is airtight.	Check vent is clear.
	Sucking air towards end of tank load.	Excessive agitation, turn off. <hr/> Returns inside tank need relocation.





Fault	Probable cause	Control / Remedy
Pressure increasing.	Pressure filters beginning to clog.	Clean all filters.
	Agitation nozzles clogged.	Check by turning agitation off / on.
Formation of foam.	Air is being sucked into system.	Check tightness / gaskets / O-rings of all fittings on suction side.
	Excessive liquid agitation.	Turn agitation off.
		Reduce pump r/min.
	Check safety valve for Self-Cleaning Filter is tight (if fitted).	
Use foam damping additive.		
Liquid leaks from bottom of pump.	Damaged diaphragm.	Replace. See „Changing of valves and diaphragms”.
Hydraulic system Hydraulic movements are fast / slow / erratic.	Air in system.	Loosen cylinder hose connection and activate hydraulics until oil flow has no air bubbles in it (not whitish).
	Insufficient hydraulic pressure.	Check output pressure of tractor hydraulics. Minimum for sprayer is 130 bar.
Cylinder not functioning.	Oil in tractor reservoir low.	Check and top up, if needed.
	Sphere valve closed.	Reset sphere valve to correct position.
	Restrictor blocked.	Place boom in transport bracket. Secure boom from lowering. Remove hydraulic hose nipple and restrictor and clean.

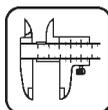
Fault	Probable cause	Control / remedy
Operating unit EC		
Operating unit not functioning.	Blown fuse(s).	Check mechanical function of microswitches. Use cleaning/lubricating agent if the switch does not operate freely.
		Check motor. 450-500 milli-Amperes max. Change motor, if over.
Wrong polarity.		Brown - pos. (+). Blue - neg. (-).
Valves not closing properly.		Check valve seals for obstructions. Check microswitch plate position. Loosen screws holding plate a 1/2 turn.
No power.		Wrong polarity. Check that brown is pos. (+), Blue is neg. (-). Check print plate for dry solders or loose connections. Check fuse holder are tight around fuse.



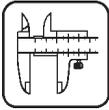
Technical specifications

Pump power consumption and capacity

1302/9.0	r/min									
	300		400		500		540		600	
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	63	0,90	84	1,19	103	1,51	114	1,61	125	1,80
5	58	0,94	79	1,29	96	1,61	105	1,75	116	1,93
10	56	1,30	76	1,80	94	2,30	101	2,48	111	2,72
15	55	1,80	74	2,22	93	2,92	99	3,18	109	3,54
Rotation per min.	r/min	Capacity				l/min	Suction height			0,0 m
Power consumption	kW	Max. pressure				15bar	Weight			35,0 kg



361/9.5	r/min									
	300		400		500		540		600	
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	95	0,92	127	1,33	158	1,56	171	1,69	189	1,85
5	92	1,49	123	1,93	151	2,38	165	2,63	183	2,98
10	91	2,22	120	2,89	148	3,69	163	4,02	180	4,74
15	89	3,03	119	3,92	148	4,90	160	5,40	177	6,15
Rotation per min.	r/min	Capacity				l/min	Suction height			0,0 m
Power consumption	kW	Max. pressure				15bar	Weight			54,0 kg

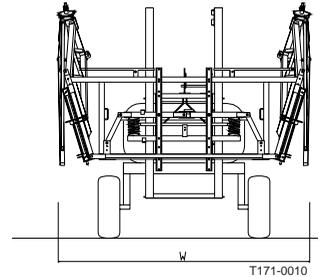
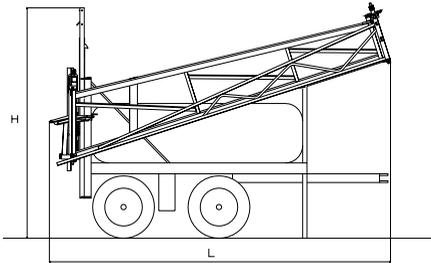


L = 4650 mm

W = 3070 mm

W = With boom dismounted = 2660 mm. for truck transport).

H = 2720 mm



All measurements are with wheels in lowest position (max. clearance)
 If wheels are mounted in the high position then altitude measurement must be minus 150 mm.

Track width = min. 1400 mm. max. 2200 mm. Measurement from centre to centre of wheel.

KG with 18 m SPB, tandem wheels and 1302 pump. If 462 pump are fitted then plus 30 Kg.

Tandem axle

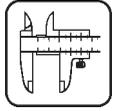
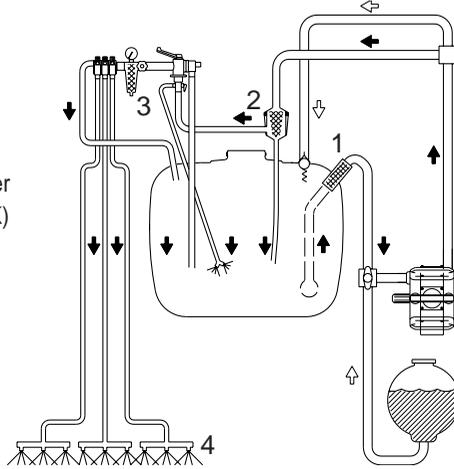
Model	Empty			Full		
	Axle load, kg	Drawbar load, kg	Own weighr, kg	Axle load, kg	Drawbar load, kg	Total weight,kg
TR 2000 HZ	1170	170	1340	2850	490	3340
TR 2000 HY	1150	160	1310	2830	480	3310
TR 2000 MY	1150	160	1310	2830	480	3310
TR 2000 MX	1140	150	1290	2820	470	3290

Single axle

Model	Empty			Full		
	Axle load, kg	Drawbar load, kg	Own weighr, kg	Axle load, kg	Drawbar load, kg	Total weight, kg
TR 2000 HZ	1040	150	1190	2720	470	3190
TR 2000 HY	1020	140	1160	2700	460	3160
TR 2000 MY	1020	140	1160	2700	460	3310
TR 2000 MX	1010	130	1140	2690	450	3140

Filters and nozzles

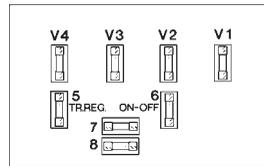
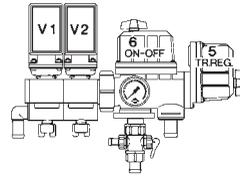
Pos.	Mesh/ colour	Description/ nozzle
1	30 green	Suction filter
2	100 yellow	Self-Cleaning Filter
3	50 blue	Pressure filter (BK)
4	50 blue	Nozzle S4110-18
	80 red	Nozzle S4110-12
	80 red	Nozzle S4110-08



Emergency operation of BK/EC and EC

In case of power failure it is possible to operate all functions of the operating unit manually. First disconnect the multiplug from the control box. Now manually turn the emergency control knobs. The problem may be due to a blown fuse. The fuses are placed in the control box and are marked according to functions. Fuses 7 and 8 are spare fuses.

Fuse type T 500 mA HARDI ref. no. 261125

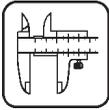


Materials and recycling

Tank: HDPE
Hoses: PVC
Valves: mainly glass-filled PA.
Fittings: PA

Disposal of the sprayer

When the equipment has completed its working life, it must be thoroughly cleaned. The tank, hose and synthetic fittings can be incinerated at an authorized disposal plant. The metallic parts can be scrapped. Always follow local legislation regarding disposal.



Temperature and pressure ranges

Operating temperature range:	2° to 40° C.
Operating pressure for safety valve:	15 bar
Max. oil flow for hydraulics:	48 l/min
Max. pressure for the hydraulics:	180 bar

Recommended tyre pressure

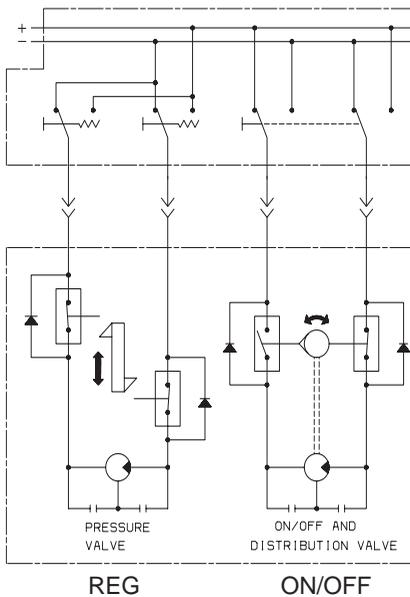
The tyres should not run under-inflated. This only promotes instability and rapid wear.

12,5 X 15 2,5 BAR 36 PSI

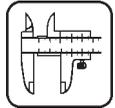
11,0 X 15 2,5 BAR 36 PSI

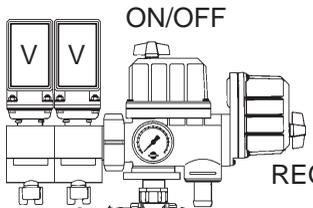
The pressure is specified for a full loaded trailer. When travelling on hard road surfaces with maximum load, do not exceed 10 km/hr. Remember that it is easier to let off a little pressure for a specific use than to re-inflate a tyre in mid field.

BK/EC and EC



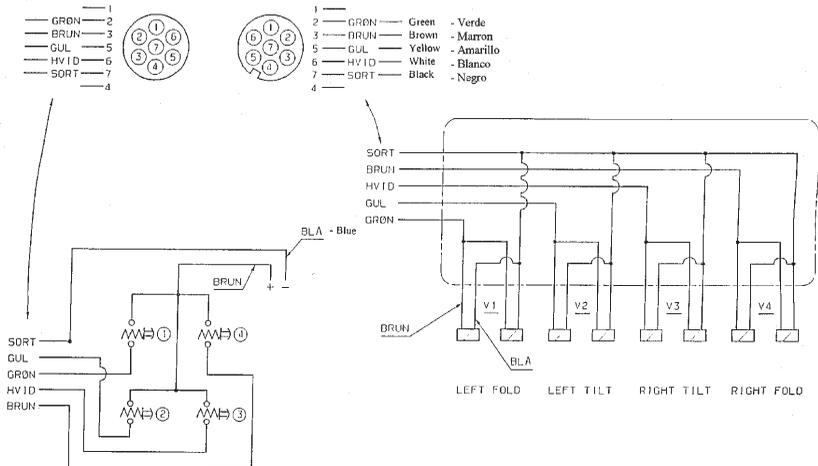
EC

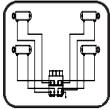


	Number of distribution valves		
	2 / 3 / 4	5 / 6	7
Valve	Wire number or colour code		
V1	1-2	1-2	1-11
V2	3-4	3-4	2-12
V3	5-6	5-6	3-13
V4	7-8	7-8	4-14
V5		9-10	5-15
V6		11-12	6-16
V7			7-17
REG	9-10	13-14	9-10
ON/OFF	11-G/Y	15-G/Y	8-G/Y

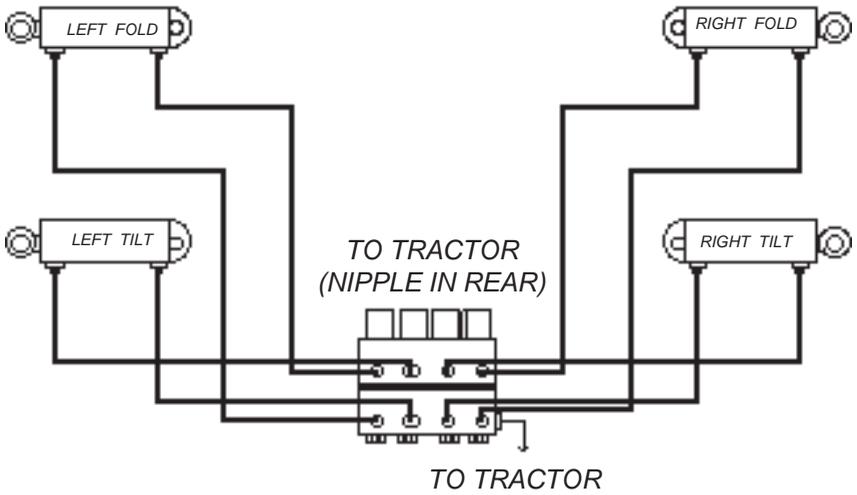
G/Y = green/yellow

Electrical Connections HZ model only





HZ-model



Hydraulic diagrams

MT og HY-model

