



The Sprayer

# *Operator's Manual*

## **NAVIGATOR 3100/3800/4500/6200**

**Instruction book**

67025603 - Version 1.01

US - 07.2017



# **NAVIGATOR**

## **3100/3800/4500/6200**

### **Instruction book**

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## Welcome letter

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Dear New HARDI® Owner,

Thank you for purchasing your new HARDI® product and welcome to the ever-increasing family of proud HARDI® owners.

HARDI® is the leading sprayer company in offering growers strong, reliable products made for the widest range of applications worldwide. Quality, reliability, and resale value make the HARDI® product line the preferred product line of customers both in North America as well as worldwide. Our guiding principle is to provide the highest level of customer satisfaction and long term value in the marketplace today. We have developed a very high level of customer loyalty in the marketplace which we are very proud of and strive every day to maintain and to continue to grow.

HARDI® is your specialist in spraying and we spend all of our time and keep all of our focus on spraying. We do not share our resources between other types of products or compromise on anything in providing the best quality sprayers to the market today. We can provide the latest in technology with our products if desired, or allow them to operate with the technology that you already use on other products in most cases. You get to decide that, and what best suits your needs. We feel that you, our customer, are the best suited to answer that question for your operation. Either way, you decide, and we will try and help make it happen for you.

Our broad spectrum of product offerings, from the ruggedly simple models we build to our highly sophisticated models, the built-in HARDI® strength and reliability ensures a low cost of ownership. HARDI® sprayers are all based on a functional design concept of being as simple to operate as possible and to meet our customers' requirements for all their application needs.

Please take the time to thoroughly read the Operator's Manual before using your equipment. You will find many helpful hints as well as important safety and operation information.

Some of the features on your HARDI® sprayer were suggested by growers. There is no substitute for "on farm" experience and we invite your comments and suggestions. If any portion of this instruction book remains unclear after reading it, contact your HARDI® dealer or service personnel for further explanation before using the equipment.

**For Product, Service or Warranty Information please contact your local HARDI® dealer.**

- Please use the HARDI® Customer Service number: 1-866-770-7063

- Or send your email to [CUSTSERV@hardi-us.com](mailto:CUSTSERV@hardi-us.com)

**HARDI® NORTH AMERICA INC.**

**Visit us online at: [www.hardi-us.com](http://www.hardi-us.com)**

1500 West 76th St.  
Davenport, Iowa 52806  
Phone: (563) 386-1730  
Fax: (563) 386-1280

Sincerely,

A handwritten signature in black ink, appearing to read "Wayne Buchberger". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Wayne Buchberger

President



### Operator safety

---

#### Symbols

These symbols are used throughout the book to designate where the reader needs to pay extra attention.



This symbol means DANGER. Be very alert as your safety is involved!



This symbol means WARNING. Be alert as your safety can be involved!



This symbol means ATTENTION. This guides you to better, easier and safer operation of your sprayer!



This symbol means NOTE.

---

#### General info

Note the following recommended precautions and safe operating practices before using the sprayer.



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.



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



Local law may demand that the operator is certified to use spray equipment. Adhere to the law.



The driver's seat is the intended working place during operation.



Wear protective clothing. Clothing may differ depending on the chemical being sprayed. Adhere to local law.



Wash and change clothes after spraying. Wash tools if they have become contaminated.



Do not eat, drink or smoke while spraying or working with contaminated equipment. In case of poisoning, immediately seek medical advice. Remember to identify chemicals used.



No persons are allowed in the operation area of the sprayer. Be careful not to hit people or surroundings when maneuvering the sprayer, especially while backing up.



Slow down when driving in uneven terrain as the machine might be in risk of turning over.



Keep children away from the equipment!



Do not attempt to enter the tank.



Do not go under any part of the sprayer unless it is secured. The boom is secure when placed in the transport brackets.



Pressure test with clean water prior to filling with chemicals. Never disconnect the hoses if the machine is in operation.



DANGER! Do not exceed the P.T.O. max. recommended r.p.m.



Rinse and wash equipment after use and before servicing.

---

## 2 - Safety notes

-  Never service or repair the equipment while it is operating. Always replace all safety devices or shields immediately after servicing.
-  Disconnect electrical power before servicing and depressurize equipment after use and before 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.
-  The External Cleaning Device should not be used if essential parts of the equipment have been damaged, including safety devices, high pressure hoses, etc.

### Label explanation

The labels designate potential dangerous places on the machine. Anybody working with or being in close range of the sprayer must respect these labels!

The labels should always be clean and readable! Worn or damaged labels must be replaced with new ones. Contact your local dealer for new labels.

10532403 - Rotating PTO

Rotating driveline contact can cause death. Keep away!



10533003 - Overhead lines

Do not contact electrical lines when moving or operating!



10533403 - Axle adjust

Risk of serious injury or death from crushing. Securely support sprayer.



10616103 - Paralift™

Risk of serious injury or death from crushing. Do not enter between tank and center frame.



10532503 - Hydraulic hazard

Risk of serious injury or death from escaping hydraulic fluid.



10532603 - Not for drinking

This water must never be used for drinking.



10532703 - Crush fingers

Never place fingers in clutch.



10532803 - Fold wings

Keep away when folding, unfolding wings.



10533203 - Chemicals

Carefully read information about chemicals before handling. Observe all safety rules.



10577603 - Do not weld

Disconnect all electronics before welding. Avoid high pressure spray on components.



10532903 - Tank drain

Tank contents will drain when handle is pulled.



10533103 - General label

Read Operator's manual and chemical manufacturer's instructions.



10533303 - Quick fill

Keep valve closed and capped.



10533603 - Open slowly

Contents under pressure. Open cap slowly.



## 2 - Safety notes

97606603 - Pre-Delivery

Remove tie straps before unfolding boom first time.



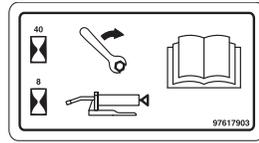
97610103 - Tank return hose

Tank return hose must be connected to a low pressure port.



97617903 - Breakaway

See Boom Operator's manual for maintenance.



97827000 - EasyClean filter

Open and clean filter monthly.



978439 - Lifting point



978440 - Bolt torque

Tighten to torque settings according to operator's manual.



10533803 - Red Reflector



10533903 - Amber Reflector



10601403 - SMV Sign

Slow Moving Vehicle.



## 2 - Safety notes

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### Local poison information center



If you live anywhere in the United States, the following toll free number will connect you to your Local Poison Information Center.

PHONE NO. 1 - 800 - 222 - 1222



If you live outside the United States, find the number for the poison control center in your phone book and write it in the space below:

PHONE NO. \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_



Keep a list, in the space provided below, of all the chemicals that you have in use.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

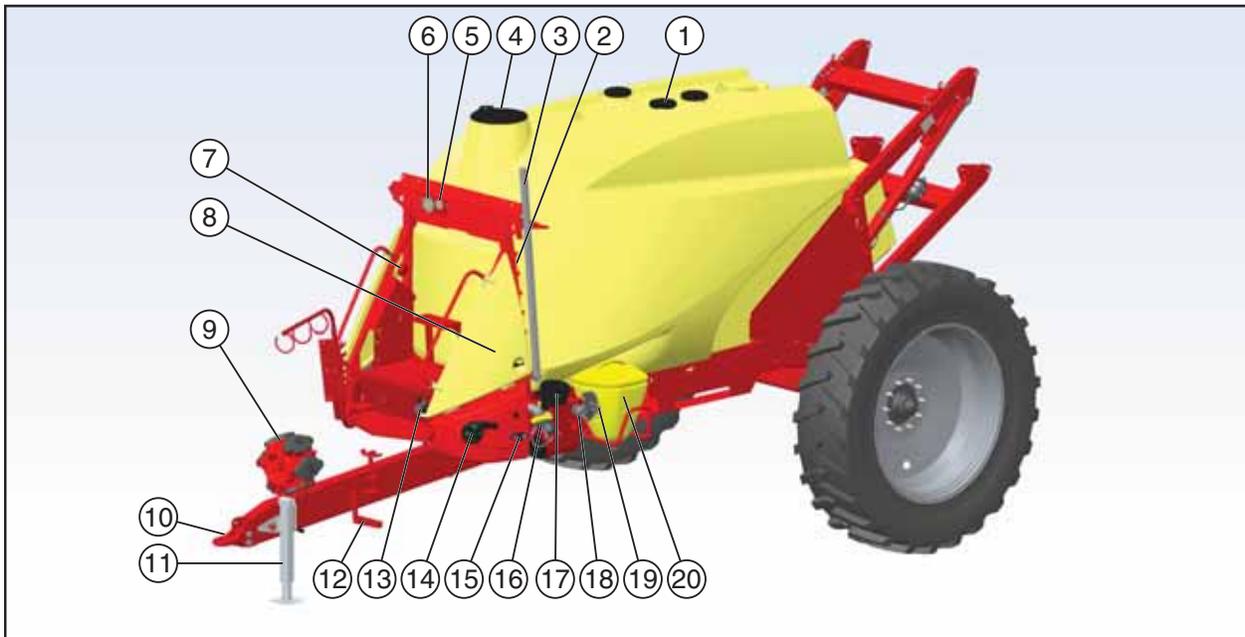
8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

#### General Info

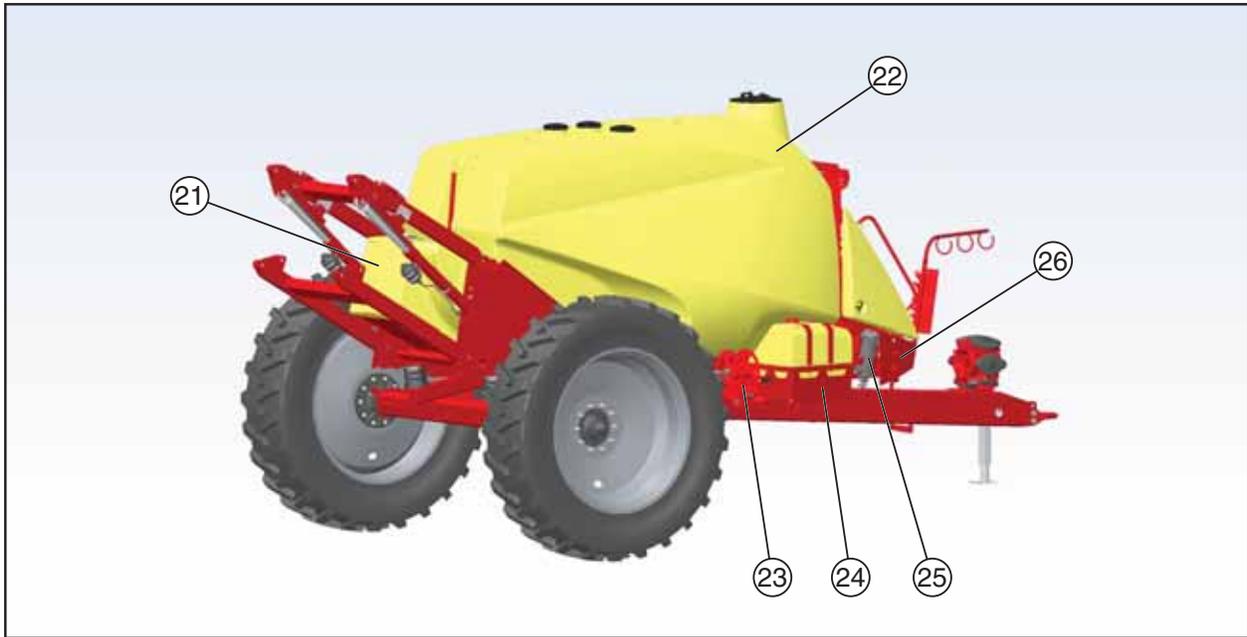
#### View



- |  |                              |
|--|------------------------------|
| 1. Tank Tube Riser/Pipe Lid            | 11. Support Leg              |
| 2. Rinse Tank Level Indicator          | 12. Step to Platform         |
| 3. Main Tank Level Indicator           | 13. Agitation Valve          |
| 4. Main Tank Lid                       | 14. Pressure SmartValve      |
| 5. EasyClean Filter Clogging Indicator | 15. Suction Valve            |
| 6. Spray Pressure Gauge                | 16. External Filling Coupler |
| 7. Clean Water Tank Lid                | 17. EasyClean Filter         |
| 8. SafetyLocker                        | 18. Rinse Tank Coupler       |
| 9. Pump                                | 19. TurboFiller Valves       |
| 10. Drawbar Hitch                      | 20. TurboFiller              |

### 3 - Description

#### View



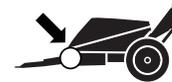
- |  |                                     |
|--|-------------------------------------|
| 21. Rinse Tank                             | 24. ChemLocker with FoamMarker Tank |
| 22. Main Tank                              | 25. CycloneFilter                   |
| 23. Hose Reel for External Cleaning Device | 26. Support Leg Storing Position    |

#### Identification plates

An identification plate fitted on the frame indicates producer name, model and serial number.



Frame, boom center frame and other main steel components have identification plates indicating type and part number. (not illustrated)



#### Roadworthiness

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



ATTENTION! Max. driving speed is 25 mph (40 km/h). Be aware that this may differ due to local law. Contact local authorities for information of max. driving speeds!

#### Sprayer use

The HARDI® sprayer is for the application of crop protection chemicals and liquid fertilizers. The equipment must only be used for this purpose. It is not allowable to use the sprayer for other purposes. If no local law demands that the operator must be certified to use spray equipment, it is strongly recommended to be trained in correct plant protection and in safe handling of plant protection chemicals to avoid unnecessary risk for persons and the environment when doing your spray job.

### **Frame**

Very strong and compact steel frame with a strong chemical and weather resistant electrostatic powder coat paint. Fasteners (screws, bolts, nuts, etc.) have been DELTA-MAGNI treated to be resistant to corrosion.

---

### **Tank**

The main tank (made of impact-proof, UV and chemical resistant polyethylene) has a purposeful design with no sharp corners for easy cleaning. A large, easy to read tank contents indicator is placed beside the platform and is visible from the tractor cabin. The filling hole is placed so it can be accessed from the platform. This ensures easy access for filling, cleaning the tank, etc. The sprayer is also equipped with a rinse tank (optional) and a clean water tank.

Nominal tank contents: 800 gal (3100 model), 1000 gal (3800 model), 1200 gal (4500 model) or 1600 gal (6200 model).

## 3 - Description

### Liquid System

#### Pump

Diaphragm pump with easily accessible valves and diaphragms. Model 364 or 464 with 6 diaphragms.

Standard = 540 r.p.m. (6 splines). Optional = 1000 r.p.m. (20 or 21 splines). The design of the diaphragm pump is simple, with easily accessible diaphragms and valves that ensure liquid does not contact the vital parts of the pump.

Pump model 464 is shown in the picture.



#### Valves and Symbols

The possible functions of valves are indicated by colored discs on the function labels. The modular valve system allows for the addition of optional extras on both the pressure and suction side. A function is activated by turning the handle towards the desired function.



ATTENTION! Only the functions used should be open - always close remaining valves.

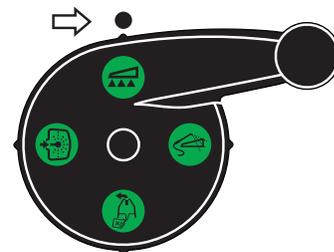


ATTENTION! If a valve is too tight or too loose to operate (= liquid leakage), then the valve needs to be serviced. Please see "Adjustment of 3-Way Valve" on page 80 for further information.

#### Pressure SmartValve (Green Symbols)

This valve selects which function the pressurized liquid from the pump will be routed to.

The active function is indicated by the indicator. The handle is turned so the indicator points to the label for required function. If the handle is turned to a position without label (unused function), the valve is closed.



Spraying



Internal tank rinsing (optional)



TurboFiller (optional)

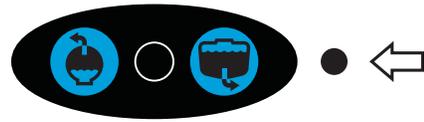


External tank cleaning (optional)

#### Suction Valve (Blue symbols)

This valve selects suction from main tank or from the rinse tank.

The handle is turned so the label for required function is directed to the indicator. If the handle is turned to vertical position (indicator not pointing at a label), the valve is closed.

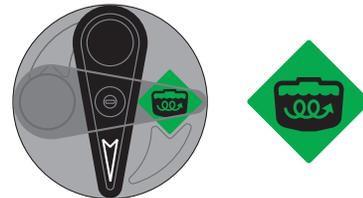


#### Agitation Valve (Green symbol)

With the adjustable agitation valve, it is possible to combine spraying with a high volume rate at high pressure with agitation at the same time.

This is controlled continuously by the valve: The valve is marked with an arrow on the disc that indicates the amount of liquid that passes through the valve.

- If the handle is turned to a position near the tip of the arrow, then only a small amount of liquid is allowed to pass the valve, resulting in less agitation.
- If the handle is turned to a position in the wide end of the arrow, then a large amount of liquid will pass the valve, resulting in more agitation.



### 3 - Description

#### DynamicFluid4 pressure regulation

DynamicFluid4 regulation is a continuous process that continues even if the nozzles are closed. Two ceramic discs regulate the pressure and ensures quick reaction and zero leakages. Sprayer speed, P.T.O. r.p.m. and number of sections activated are parameters used, and the benefit is more precise application rates from the second the sprayer begins spraying.

The DynamicFluid4 uses feed forward technology based on 5 sensors that feed the JobCom computer with data necessary for optimal regulation. It auto-primes at start-up, starts and moves the valve towards the final position immediately after the operator makes changes. E.g. when section valves are opened or closed, the regulation valve is started the same time the section valve motors are started. This avoids overpressure situations e.g. after running empty and refill of main tank.

The 5 sensors are also back-up for each other and ensures the system can continue regulation even if one or more sensor signals fail. Sensors used are:

- Sprayer speed sensor
- Flow sensor
- Pressure sensor
- Pump r.p.m. sensor
- Regulation valve opening angle sensor

The DynamicFluid4 pressure regulation features are:

- Very fast and accurate regulation when all sensors are ok, setup in menus are correct and pump, filters and valves are in good condition.
- Quick reacting valve when sections are turned ON/OFF and at speed changes.
- Optimized AutoSectionControl feature that predicts boom sections will open and nozzle pressure.
- Optimized for different P.T.O. systems.
- Nozzle surveillance. No setup or tuning required for nozzle change.
- Warning in display if failures occur on boom plumbing, such as severe clogging of line or nozzle filters or large leakages on hoses and fittings.
- All functions work, although with degraded performance (Limp home modes), if:
  - Faults occur in fluid system, e.g. pump defects, clogged filters, leaking valves.
  - Sensor failure appear on pressure sensor, flow sensor or R.P.M. sensor.
  - There is wrong setup of sprayer data in menus.
- Emergency mode if angle sensor or speed sensor fails.

#### Screen icons

The sprayer driver selects one of three modes Auto, Manual or Increment steps. The sprayer computer detects one of three regulation modes Drop, Question mark or calibration jug. This makes 9 modes in total.

Auto	Manual	Increment steps	
When Automatic Volume Rate button is pressed on the SetBox.	When one of the Manual pressure control buttons is pressed on the SetBox.	When the Volume Rate is changed in steps with %-up or %-down buttons on the Terminal.	
			<b>Calibration jug</b> There is flow to section valves. Nozzle size (G/min at 45 psi) has been calculated.
			<b>Drop</b> There is no flow to section valves. The pump is not started or the pressure SmartValve is set to other function than spraying.
			<b>Question mark</b> There is flow to section valves but pressure and flow has not yet been stable, therefore the nozzle size (G/min at 45 psi) has not been calculated. The system uses the previously stored nozzle size.

# 3 - Description

## Regulation valve function diagram

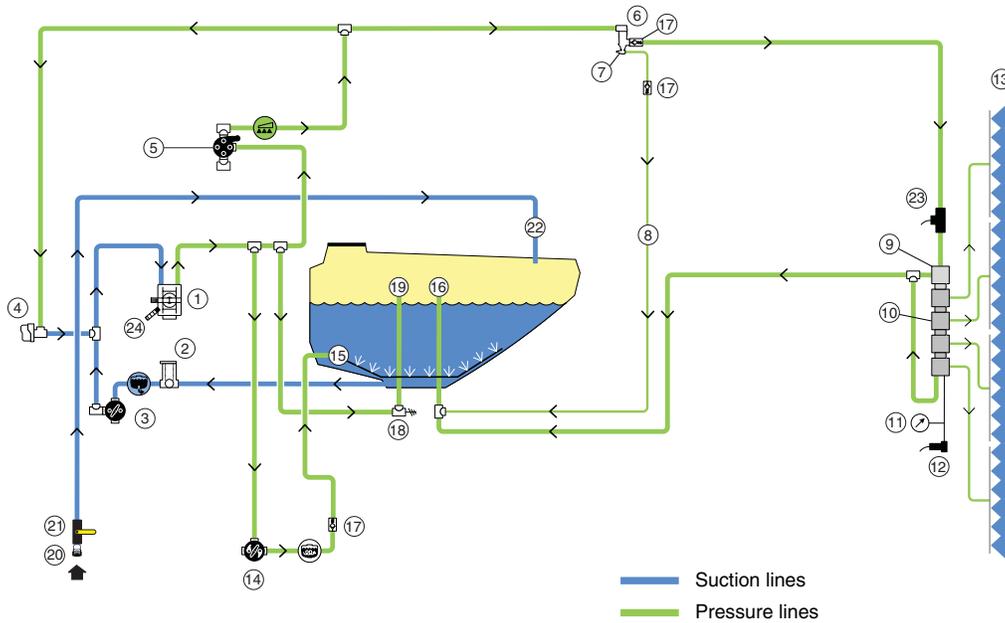


ATTENTION! Auto mode icons shown, but could be Manual or Increment steps icons, depending on driver selection.



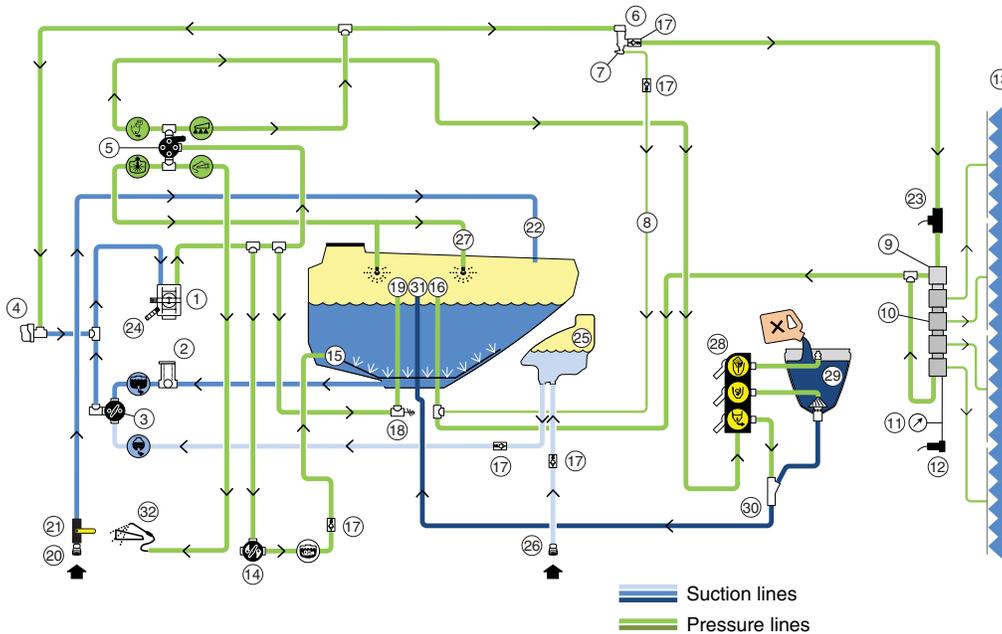
### 3 - Description

#### Diagram - Basic Liquid System



- |                                   |   |
|-----------------------------------|---|
| 1. Pump                           | 13. Spray Boom                              |
| 2. EasyClean filter               | 14. Agitation Valve                         |
| 3. Suction Valve for Tanks        | 15. Agitation Tube                          |
| 4. Pressure Control Valve         | 16. Return Line / Riser Pipe                |
| 5. Pressure SmartValve            | 17. One-Way Valve                           |
| 6. CycloneFilter                  | 18. Safety Valve                            |
| 7. Purge Valve                    | 19. Riser Pipe                              |
| 8. Return Line for Boost Function | 20. Main Tank Quick Fill coupler            |
| 9. Bypass Valve for Boom          | 21. Main Tank Quick Fill valve              |
| 10. Distribution Valves           | 22. Main Tank Quick Fill hose to tank inlet |
| 11. Pressure Gauge                | 23. Flowmeter                               |
| 12. Pressure Sensor               | 24. Speed Sensor for Pump                   |

**Diagram - Liquid System with Options**



- |                                   |   |
|-----------------------------------|---|
| 1. Pump                           | 17. One-Way Valve                           |
| 2. EasyClean Filter               | 18. Safety Valve                            |
| 3. Suction Valve for Tanks        | 19. Riser Pipe                              |
| 4. Pressure Control Valve         | 20. Main Tank Quick Fill Coupler            |
| 5. Pressure SmartValve            | 21. Main Tank Quick Fill Valve              |
| 6. CycloneFilter                  | 22. Main Tank Quick Fill hose to tank inlet |
| 7. Purge Valve                    | 23. Flowmeter                               |
| 8. Return Line for Boost Function | 24. Speed Sensor for Pump                   |
| 9. Bypass Valve for Boom          | 25. Rinse Tank                              |
| 10. Distribution Valves           | 26. Rinse Tank Coupler                      |
| 11. Pressure Gauge                | 27. Rinsing Nozzles                         |
| 12. Pressure Sensor               | 28. Valve Block for TurboFiller             |
| 13. Spray Boom                    | 29. TurboFiller                             |
| 14. Agitation Valve               | 30. Ejector for TurboFiller                 |
| 15. Agitation Tube                | 31. Tank Hose for Turbofiller               |
| 16. Return Line / Riser Pipe      | 32. External Cleaning                       |

## 3 - Description

### Filters

An EasyClean suction filter is fitted in the working zone.

A Cyclone pressure filter is fitted to the sprayer's right side just in front of the ChemLocker. It has a built-in self-cleaning function.

In-line pressure filters can be fitted at each boom section as an option.

All filters should always be in use and their function checked regularly. Pay attention to the correct combination of filter and mesh size (see "Filters and nozzles" on page 93).

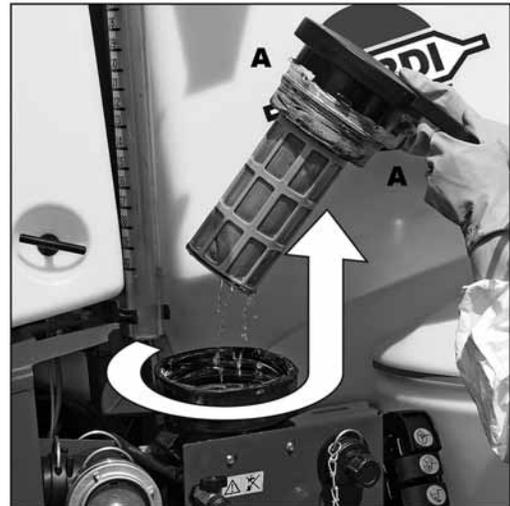
### EasyClean Filter

To ensure proper function of filter and its built-in valve, the filter must be opened at least once every month. A label on the lid also designates this.

- To open filter, turn it counterclockwise and pull it up as shown in picture.
- Pull out the two locks (A) to remove filter element from the lid.

An EasyClean clogging indicator is located beside the spray pressure gauge on the platform:

Clogging indicator color	Filter status
Green indicator.	No cleaning necessary.
Yellow indicator.	It is possible to finish an ongoing spraying job and then clean the filter afterwards.
Red indicator.	Clean the EasyClean Filter immediately, as the filter is clogged.



### CycloneFilter

With the CycloneFilter, any impurities in the spray liquid will by-pass the filter and be re-circulated back to the tank via the return flow.

Function diagram

1. Filter lid
2. From pump
3. To boom
4. Return to tank
5. Return valve

Valve (5) has three positions marked with small dots on the lever:

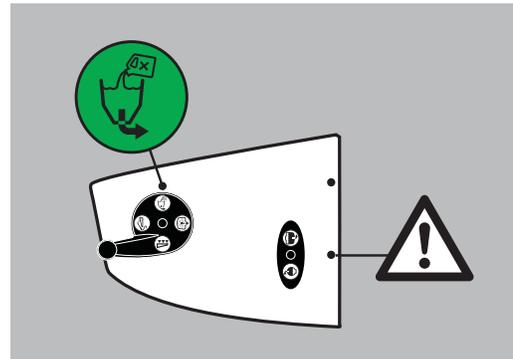
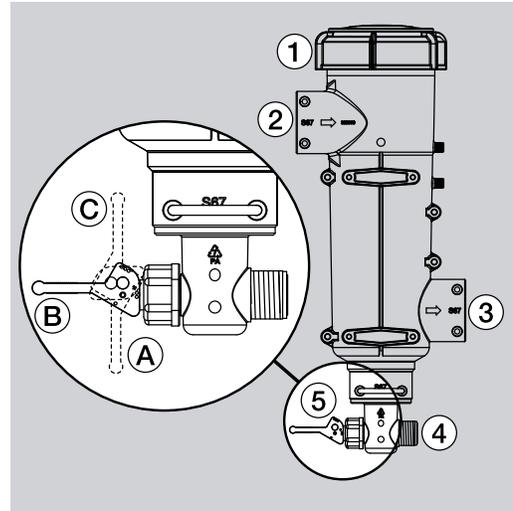
- A. Position marked with 1 dot: There is no return flow. Position is used when rinsing the boom if there is spray liquid in the main tank. Also used when high spraying volume is required.
- B. Position marked with 2 dots: Normal spraying position with return flow to prevent clogging the filter when spraying. Position is used when rinsing the boom if the main tank is empty.
- C. Position marked with 3 dots: Flushing position, which is used if filter is clogged. Lift and hold the lever to use this position which greatly increases return flow and flushes the filter. The pressure SmartValve must be set to "Spraying".



ATTENTION! Use of position C is no guarantee for a clean filter. Always regularly do a visual inspection and cleaning of the filter. If necessary, see "10 Hours Service - CycloneFilter" on page 73.



DANGER! Never open the Cyclone filter unless the pressure SmartValve and suction valve are both closed (turned to an unused position)! If no unused pressure positions are available, then turn the pressure SmartValve to "TurboFiller" (with all valves closed). Otherwise, spraying liquid may hit you when opening the filter, and drain the main tank contents!



### 3 - Description

#### TurboFiller (optional)

##### Before use

- Pull the handle (A) to unlock.
- Grab the handle on the TurboFiller and push down (B) until it clicks into the locked down-position.

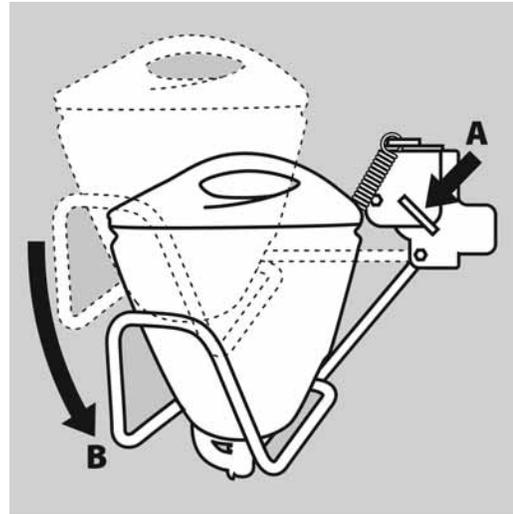
##### After use

Pull the handle (A) to unlock.

- Grab the handle to pull TurboFiller back in storing position until it locks.



**WARNING!** Before releasing the lock (A), always keep a hand on the grip to avoid abrupt movement of the TurboFiller!

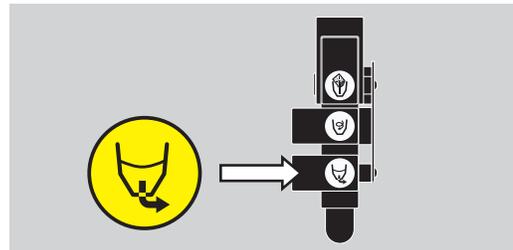


#### TurboFiller Suction Valve

The valve is used simultaneously with the TurboFiller. The valve has 2 settings: Continuously open (lift lever to lock) or spring loaded (push lever down to open, let go to close). Open the valve when chemicals are to be filled into the TurboFiller and transferred to main tank.



Suction from TurboFiller

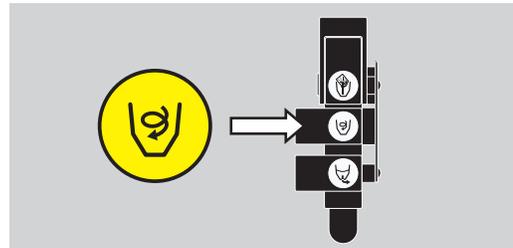


#### TurboDeflector Valve

This TurboDeflector valve activates the vortex flushing of the TurboFiller. Lift the lever to lock it in open position for continuous liquid rotation in the hopper.



Start TurboDeflector



#### Chemical Container Rinsing Lever

The upper lever is used for two purposes.

When the TurboFiller lid is open:

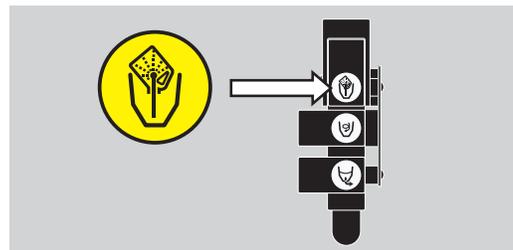
For rinsing empty containers. Place the container over the rotating flushing nozzle in the middle of the TurboFiller to rinse the inside of the container.

When the TurboFiller lid is closed:

Use the Chemical Container Rinsing lever to rinse the hopper, when the filling of chemicals is completed.



Chemical Container Rinsing



**DANGER!** Do not press the lever unless the multi-hole nozzle is covered by a container or the TurboFiller lid is closed to avoid spray liquid hitting the operator.

### Rinse Tank (optional)

A rinse tank can be mounted to the rear of the sprayer. The tank is made of impact-proof and chemical resistant polyethylene.

The rinse tank level indicator is placed at the platform.

Nominal content: approx. 130 gal (500 liters).

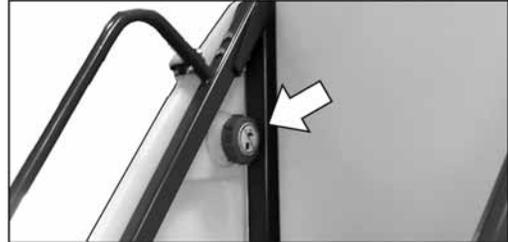
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### Clean Water Tank

A clean water tank is integrated into the right side cover. It is accessed for filling at the sprayer's right side when entering the platform. The ball valve is located on the valve cover below the EasyClean filter on sprayer's left side.

The water in this tank is for hand washing, cleaning of clogged nozzles, etc. Only fill this tank with clean water.

Capacity: approx. 5 gal (20 liters).



**WARNING!** Although the clean water tank is only filled with clean water, this water must NEVER be used for drinking.

## 3 - Description

### Hydraulic Systems

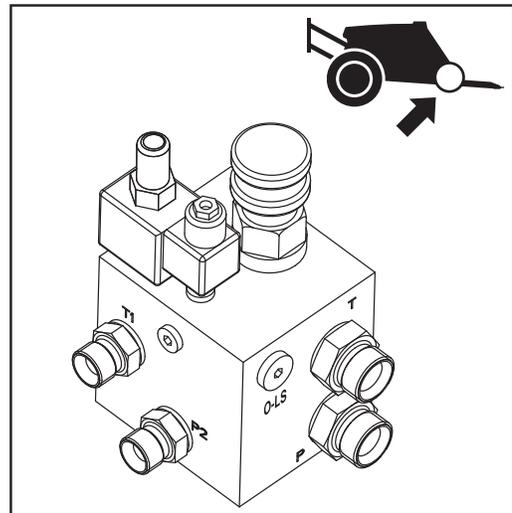
#### PARALIFT™

This hydraulic block manages hydraulic pressure for the PARALIFT™.



#### Open Center Hydraulics

The open center hydraulics block is necessary if the tractor uses open center hydraulics and/or load sensing. For adjustment, see “Open center hydraulics” on page 39.

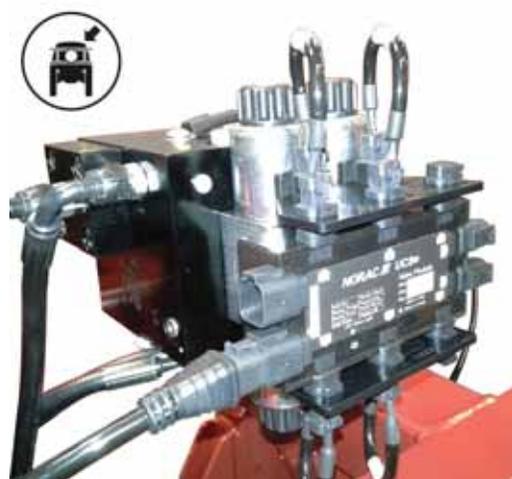


#### Boom Hydraulics

The boom hydraulics vary depending on the boom model. A separate “Boom Operator’s Manual” is supplied with your sprayer and contains detailed information on the hydraulic components required to operate the boom functions.

#### AutoHeight

On sprayers with AutoHeight, a hydraulic block manages hydraulic pressure for the automatic boom height control functions.



### Boom

#### Boom Operator's Manual

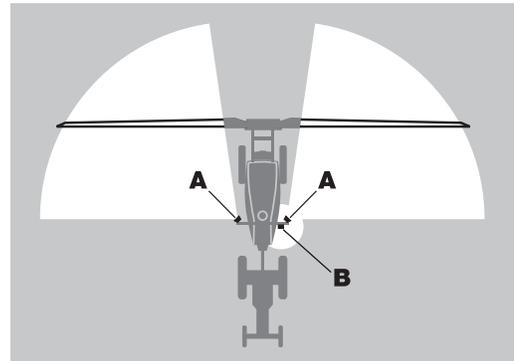
A separate "Boom Operator's Manual" is supplied with your sprayer and contains detailed information on boom safety, set-up, operation and maintenance.



**DANGER!** Important information on Safety, Operation and Maintenance specific to your boom configuration is detailed in the "Boom Operator's Manual" supplied with your sprayer. It must be read and fully understood by anyone intending to operate this equipment. Failure to do so could result in serious personal injury or death.

#### Night Spraying Light (Platform mounted lights)

The 2 boom flood light lamps (A) are mounted to the railing of the platform (one at each side) and are positioned to illuminate both boom wings. The work light lamp (B) is also mounted to the railing of the platform above the valves. This lamp is positioned to light the HARDI® TurboFiller and the valve system. The boom and work lights selector switch is placed just below the SafetyLocker (between valve shield and EasyClean filter).

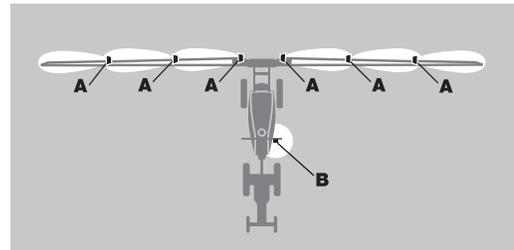


#### Night Spraying Light (Boom mounted lights)

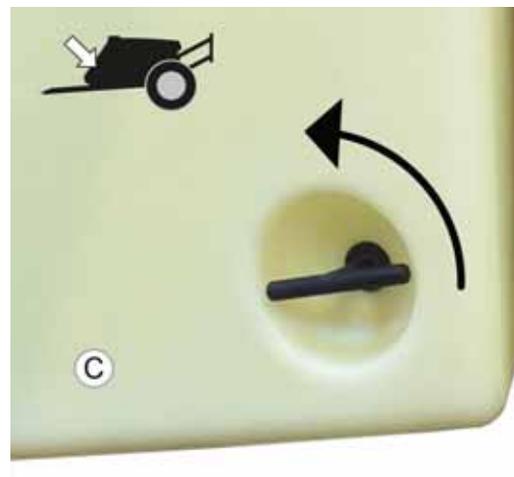
Floodlights (A) are mounted on the spray boom, and they are positioned to illuminate both boom wings for spraying at night.

The work light lamp (B) is also mounted to the railing of the platform above the valves. This lamp is positioned to light up the HARDI® TurboFiller and the valve system.

The boom lights (A) are turned on/off by the controller unit in the tractor.



The work light (B) is turned on/off by activating a switch (D) inside the left side cover (C). Open the cover to turn on the light.



## 3 - Description

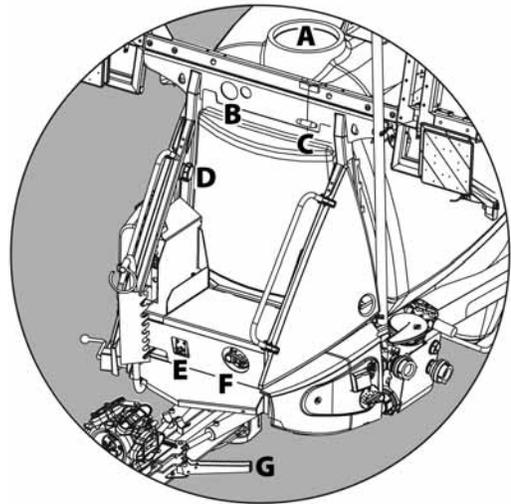
### Equipment

#### Platform

To get access to the platform, lift and swing the step (G) on the drawbar out until it clicks into locked out-position. To retract step, then lift and swing step to retracted locked in-position.

The pressure regulation valve (E) and the Agitation valve (F) are situated in front of the platform floor. The platform gives access to the clean water tank lid (D), the main tank lid (A). Also the main tank drain valve (C) can be operated from the platform. The pressure gauge (B) and EasyClean clogging indicator (B) are visible at the top of the platform.

By removing the platform floor, the valve components are accessible.



#### Nozzle Pressure Gauge

The remote pressure gauge is integrated in the platform. This gauge measures the working pressure at the distribution manifold on the boom center section.

The outputs stated in the nozzle charts are always based on the pressure measured at the nozzle. Both when calibrating and spraying, the pressure must be adjusted according to the readings of this pressure gauge.



#### Tank Level Indicators

The actual fluid level in the main tank can be observed on the tank level indicator. The scale is displayed in US gallons (liters optional).



**ATTENTION!** The level indicator is only intended as a guide for the tank level.

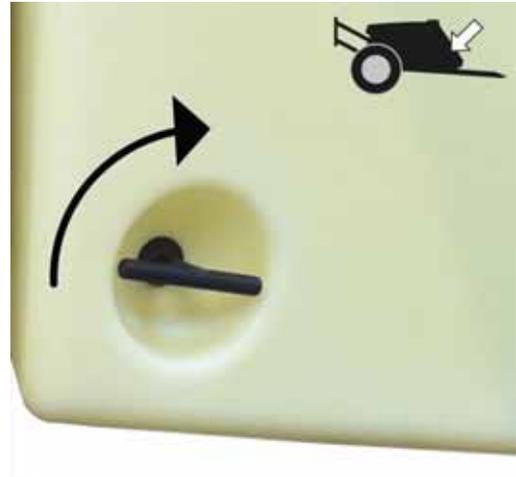
The accuracy for the level is within 5% when the tank is above 20% filled and within 7.5% when the tank is below 20% filled.

Just behind the main tank scale, a level for the rinse tank is attached to the frame. This is intended as a guide to see if the rinse tank is full or empty. If the indicator ball is at the top, then the rinse tank is full.



### Right Side Cover

The right side cover is opened by turning the handle in the lower left corner of the cover and lifting the cover up.



### Main components:

- A. JobCom box
- B. Electric junction box for work lights
- C. Electric junction box for spray boom lights
- D. Clean water tank (integrated in the side cover).

 NOTE! Locations may vary depending on machine components.

 ATTENTION! Only open the right side cover when the clean water tank is empty!



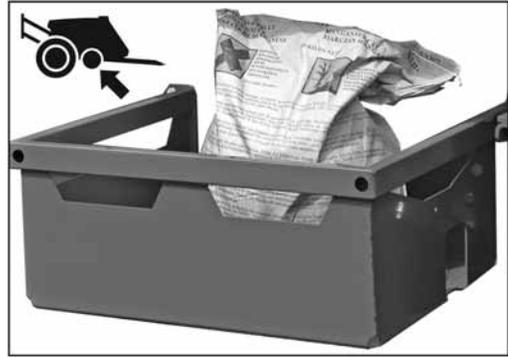
### 3 - Description

#### ChemLocker

A ChemLocker for storage of chemical containers etc. can be mounted on the sprayer's right side.

If the optional FoamMarker is installed, then the FoamMarker tank may be placed inside the ChemLocker.

 ATTENTION! Maximum load 225 lbs./25 gal. (100 kg/100 liters).



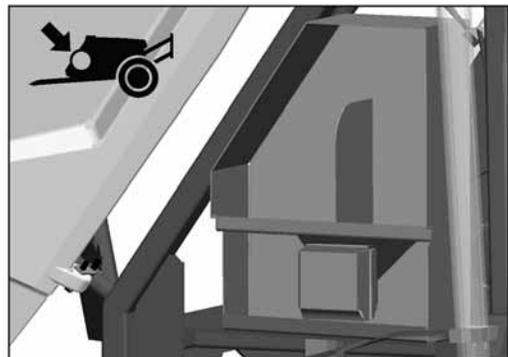
#### SafetyLocker

The locker is integrated in the left side, just above the SmartValves.

It is for the purpose of storing non-contaminated protective gear, soap for hand washing, etc.

The locker is split in two compartments for the separation of clean clothes from gloves with risk of contamination.

 WARNING! Although this locker is meant for storing nontoxic items, it must never be used for storing food, beverage or other things meant for consumption.



#### External Cleaning Device (optional)

This equipment is comprised of a hose reel and a spray gun used to clean the complete sprayer externally in the field with clean water. The External Cleaning Device is located on the sprayer's right side just behind the ChemLocker.

 WARNING! This cleaning device produces a high pressure spray. Incorrect use may result in injuries!

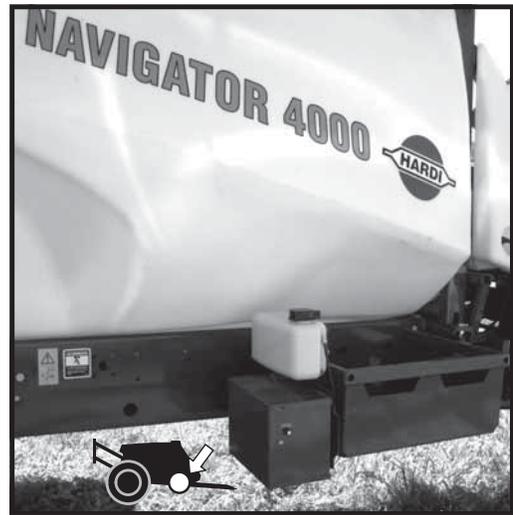
 DANGER! For the safety of yourself and others, the following rules should always be observed:

- Never point the water jet at people, animals, electrical installations or other sensitive objects.
- Never try to clean clothing or footwear while worn by yourself or others.
- Never operate with bare feet or sandals.
- It is recommended to wear goggles.
- Protect yourself and others in the area from particles bouncing up during cleaning.



### **Richway® Direct Inject foam marker (optional)**

The Richway® Direct Inject foam marker system may be installed behind the ChemLocker on the sprayer's right side. Clean water is drawn from either the 130 gal (500 liter) Rinse Tank or the 25 gal. (100 liter) FoamMarker tank (placed inside the ChemLocker).



### 3 - Description

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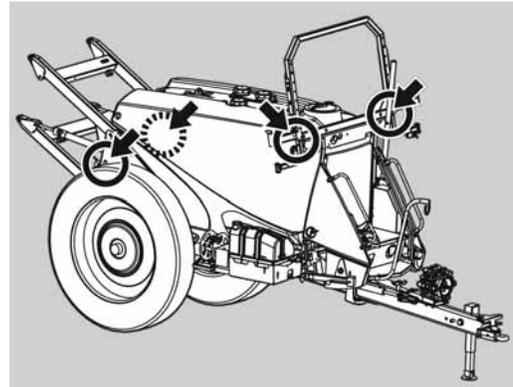
### General info

#### Unloading the Sprayer from the Truck

For the unloading of the sprayer, you may need a crane. When unloading with a crane, please observe the lifting points as shown in the picture, and make sure that the straps or belts used for lifting are strong enough.

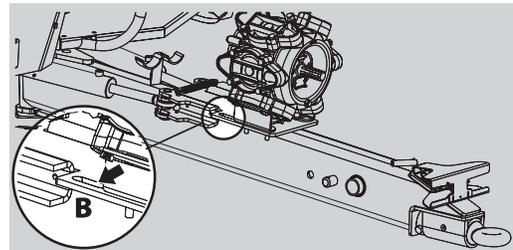
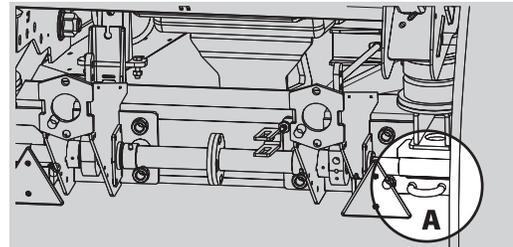


ATTENTION! Only lift the sprayer when the tanks are empty!



#### Pulling the Sprayer at the Tie Down Points

For moving the sprayer or loading it onto e.g. a truck, it can be pulled using the hooks at the rear-end (A), or a hook can be fastened into the hole in the front end of the sprayer (B) as shown.



#### Before Putting the Sprayer into Operation

Although the sprayer has been supplied with a strong and protective surface treatment on steel parts, bolts etc. in the factory, it is recommended to apply a film of anti-corrosion oil (e.g. CASTROL RUSTILO or SHELL ENSIS FLUID) on all metal parts in order to avoid chemicals and fertilizers discoloring the enamel.

If this is done before the sprayer is put into operation for the first time, it will always be easy to clean the sprayer and keep the enamel clean for many years. This treatment should be carried out every time the protection film is washed off.

## 4 - Sprayer setup

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### Support jack

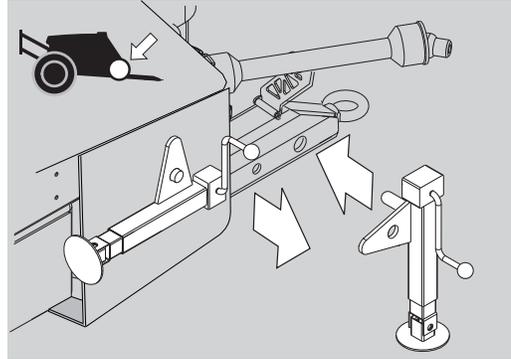
The support jack is stored in the bracket on the sprayer's right side when the sprayer is attached to the tractor.

#### To use the support jack

1. Lift the jack off the storage bracket.
2. The support leg can then be mounted to the drawbar extension on either side as preferred.
3. Secure with the lynch pin.

#### To remove the support jack

1. Lift the jack.
2. Remove the lynch pin and pull out the support jack.
3. Secure the jack at the storage bracket with the lynch pin.



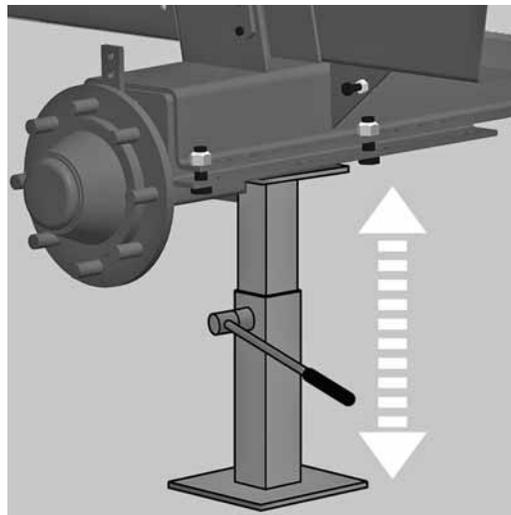
### Jack Up the Sprayer

When the sprayer needs wheel mounting, wheel changing, or wheel bearing changing etc., jack up the sprayer under the axle as shown.



**DANGER!** Be sure to place sprayer on level and firm ground to prevent sprayer from falling off the jack. It is good practice to:

- use stop wedges at the opposite wheel to prevent rolling.
- connect the sprayer's drawbar to a tractor to help balance the sprayer on the jack.



### Transmission Shaft (P.T.O.)

#### Operator Safety

1. Always STOP THE ENGINE before attaching the transmission shaft to the tractor P.T.O. - most tractor P.T.O. shafts can be rotated by hand to facilitate spline alignment, when the engine is stopped.
2. When attaching the shaft, make sure that the snap lock is FULLY ENGAGED - push and pull the shaft until it locks.
3. Always keep protection guards and chains intact and make sure that it covers all rotating parts, including CV-joints at each end of the shaft. Do not use without protection guard.
4. Do not touch or stand on the transmission shaft, when it is rotating - keep your safety distance at 5 ft. (1.5 meter). Also NEVER cross over a rotating P.T.O. shaft to reach the other side of the sprayer.
5. Prevent protection guards from rotating by attaching the chains allowing sufficient slack for turns.
6. Make sure that protection guards around the tractor P.T.O. and the implement shaft are intact.
7. Always STOP THE ENGINE and remove the ignition key, before carrying out maintenance or repairs to the transmission shaft or implement.



DANGER! A ROTATING TRANSMISSION SHAFTS WITHOUT PROTECTION GUARDS ARE FATAL!

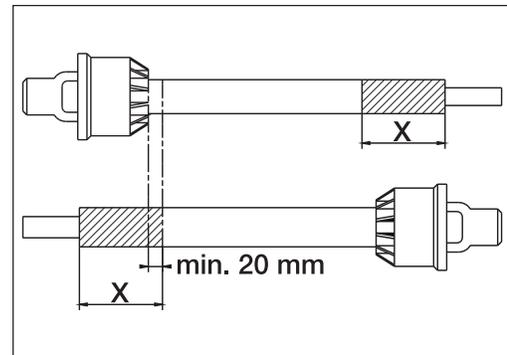
#### P.T.O. Installation



DANGER! As P.T.O. shafts are dangerous in operation, always read the manufacturer's instruction book before applying any changes to the transmission shaft!

First installation of the transmission shaft is done in the following way:

1. Attach the sprayer to the tractor and set the sprayer height in the position with the shortest distance between the tractor and the sprayer pump P.T.O. shafts.
2. Stop the engine and remove the ignition key.
3. If the transmission shaft needs to be shortened, pull the shaft apart. Fit the two shaft parts to the tractor and the sprayer pump and measure how much the shaft needs to be shortened. Also mark the protection guards with the same length to be shortened.



WARNING! Only shorten the shaft if it is absolutely necessary!

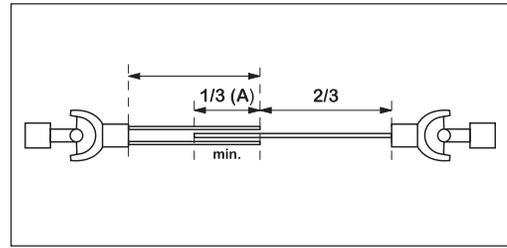


WARNING! The shaft must always have a minimum overlap. The size of this overlap depends on the pump model.

## 4 - Sprayer setup

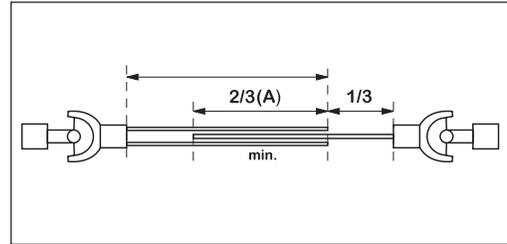
Pump with 6 splines/540 r.p.m.

The shaft must always have an overlap (A) of minimum 1/3 of the length.



Pump with 21 splines/1000 r.p.m.

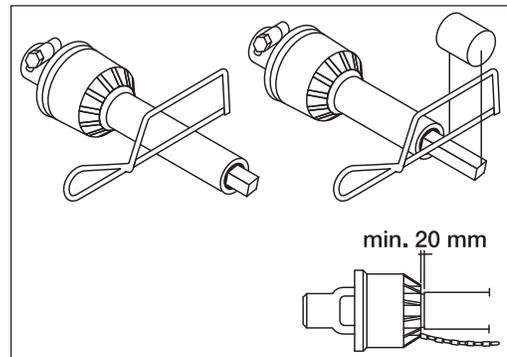
The shaft must always have an overlap (A) of minimum 2/3 of the length.



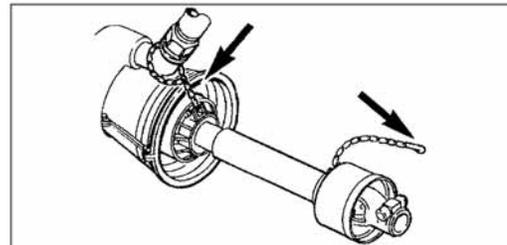
4. The two parts are shortened equally. Use a saw, and file the profiles afterwards to remove burrs.
5. Grease the profiles and assemble male and female parts again.
6. Fit the shaft to tractor P.T.O. and sprayer pump shaft.



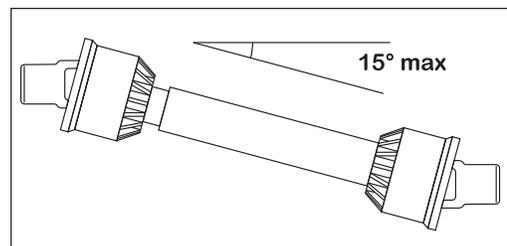
ATTENTION! Female part marked with a tractor towards tractor!



7. Fit the chains to prevent the protection guards from rotating with the shaft.



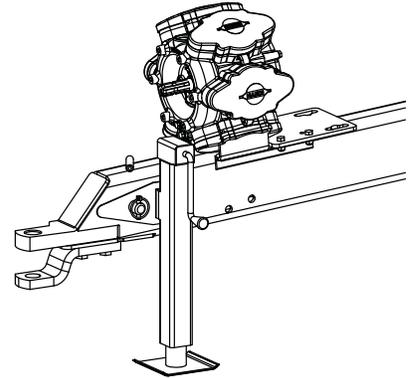
To ensure long life of the transmission shaft, try to avoid working angles greater than 15°.



### Mechanical Connections

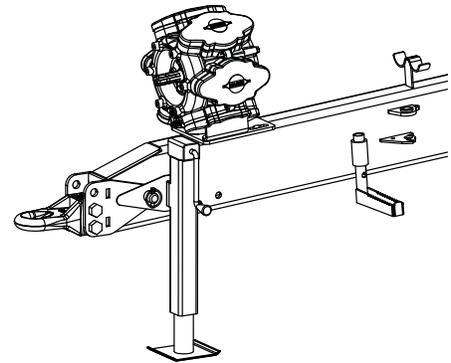
#### Hitch - adjustment (Navigator 3100, 3800, 4500)

The Navigator 3100, 3800 & 4500 models are equipped with a clevis hitch. The lower plate is attached with two bolts and may be removed if needed. No other adjustment is possible.



#### Hitch - adjustment (Navigator 6200)

The Navigator 6200 is equipped with a category 3 hitch. The height of the hitch may be adjusted by removing two bolts and moving the hitch.



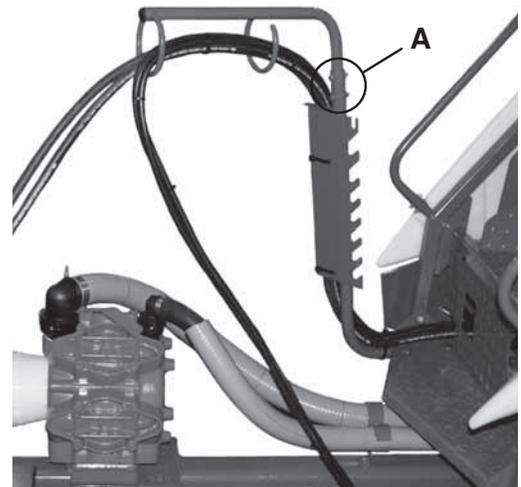
#### Hose Package Support

To prevent hoses and wiring from being damaged by the tractor wheels or the P.T.O. shaft, all hoses, cables and wires are held by the hose bracket fitted to the sprayer platform.

There are two bolts (A) that can be changed to adjust the swivel hose support. By removing the bottom bolt, the hose support is free to swivel as the sprayer turns. The top bolt can be placed in one of three holes to vary the height of the support.



**ATTENTION!** Check that the length of the hoses and cables are sufficient for tight turns.



## 4 - Sprayer setup

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### Hydraulic Systems

---

#### General Info

Ensure that the quick couplers are clean before connection!



ATTENTION! After having operated the boom and the system has been filled with oil, check the tractor's hydraulic oil level and add oil if necessary.



DANGER! Due to the variation in tractor hydraulic systems and capacities, care should be exercised when initially operating the sprayer hydraulic cylinders. There may be air trapped in the system which can cause violent movements of the boom. It is advisable to adjust the hydraulic flow control down to the minimum rate before operating the system. Adjust/increase the flow control after the system is bled of any air, if necessary.



DANGER! Hydraulic leaks: Never use your fingers to locate a leakage in any part of the hydraulic system. Due to high pressure, hydraulic oil may penetrate the skin.

---

#### Requirements - tractor (SPB/SPC HY-model)

The hydraulic system requires:

- One single acting outlet for the lift function of the spray boom.
  - One double acting outlet for the folding function.
  - One double acting outlet for the operation of the hydraulic pump drive (optional). The system has a built-in flow regulator that maintains constant speed on hydraulic movements.
  - Minimum oil pressure of 2,175 psi (150 bar), max. oil pressure of 3,050 psi (210 bar) and an oil capacity of approx. 6.6 gal (25 liters).
- 

#### Requirements - tractor (SPB/SPC HZ-model)

The hydraulic system requires:

- One double acting outlet for the electro-hydraulic operation of the boom functions.
- One double acting outlet for the operation of the hydraulic pump drive (optional). The system has a built-in flow regulator that maintains constant speed on hydraulic movements.
- Oil flow between 3 - 11 gal/min. (10 and 40 l/min) and a min. pressure of 2500 psi (170 bar).

The hydraulic hoses are marked with arrows or colored tie straps to indicate direction of oil flow. Red tie strap = pressure. Green tie strap = Return to tank. The hoses must be hooked up to the correct outlet for the hydraulics to function properly (pressure hose to pressure outlet, return hose to tank outlet).

---

#### Requirements - tractor (DTZ model)

The hydraulic system requires:

- One double acting outlet for the electro-hydraulic operation of the boom functions.
- One double acting outlet for the operation of the hydraulic pump drive (optional). The system has a built-in flow regulator that maintains constant speed on hydraulic movements.
- Oil flow between 4 - 21 gal/min (15 and 80 l/min) at a pressure of 2900 psi (200 bar).
- Minimum oil pressure is 2600 psi (180 bar) to obtain correct operation. Maximum oil pressure is 3050 psi (210 bar).
- Return flow restriction of the connected tractor must be maximum 220 psi (15 bar).
- For Load Sensing systems, an oil flow of approximately 1.3 gal/min (5 l/min) at 360 psi (25 bar) is supplied by the sprayer hydraulics. If a greater flow is required, a different orifice must be installed between the "open center" hydraulic block and the load sensing (LS) hydraulic line - see "Open center hydraulics" on page 39 for more information.

The hydraulic hoses are marked with arrows or colored tie straps to indicate direction of oil flow. Red tie strap = pressure. Green tie strap = Return to tank. The hoses must be hooked up to the correct outlet for the hydraulics to function properly (pressure hose to pressure outlet, return hose to tank outlet).

---

## 4 - Sprayer setup

### Open center hydraulics

The open center hydraulics block is needed if the tractor uses open center hydraulics and/or if load sensing will be used.

The valve (1) on the side of the block is factory set for open center hydraulics, but if closed center hydraulics will be used (also in combination with load sensing) then screw in the valve.

Certain tractor models are able to use Load Sensing without connecting an external sensing line. But if optimal sensing control pressure cannot be obtained, an external sensing line needs to be mounted (3). Please consult your tractor dealer for correct setup and correct connection.

Before operating the hydraulics, the valve should be adjusted according to the specific tractor model. If you have doubt about which type of hydraulic system your tractor is equipped with, please consult your tractor dealer.

List of setting combinations for flow element and circuit value:

Valve no.	1	2	3 (LS port)
Open center	Out	Out	Not connected
Closed center	In	In	Not connected
Load sensing (LS)	In	Out*	Connected

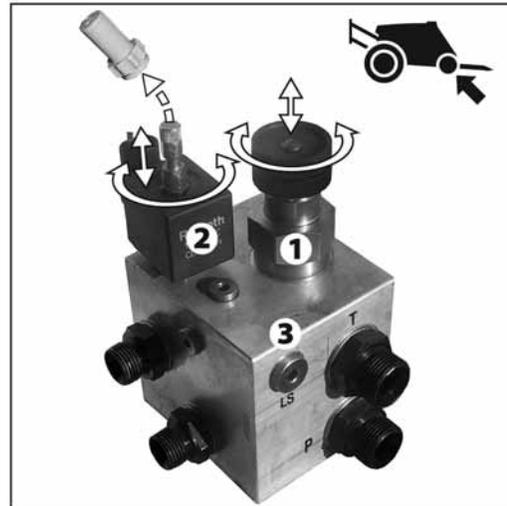
\*If the tractor requires pressure relief, contact your tractor dealer for further advice.



**WARNING!** Always be sure to fully extract or retract the open/closed center selection valve (1). Failure to do so can result in damages to vital pump parts.



**WARNING!** It is of essential importance that connectors on sensing line are kept totally clean. Failure to do so can result in impurities entering the pump and thereby cause damages to vital pump parts.

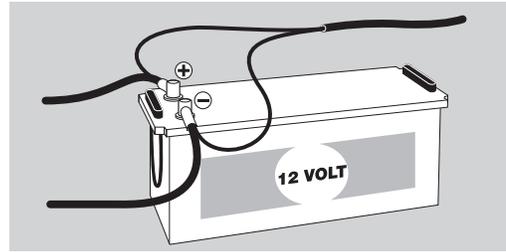


## 4 - Sprayer setup

### Electrical Connections

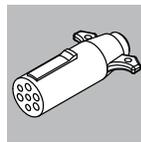
#### Power supply

Power requirement is 12V DC. Always note polarity! For proper function of the electric equipment, the wires must have the following recommended cross sectional areas and correct fuses to ensure a sufficient power supply. The supplied power connectors follow the standard of most newer tractors. If using a tractor with another power connector, it is necessary to disassemble the connector and fit it to the existing tractor connector.

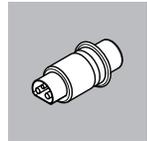


#### LIGHTER CONNECTOR

Spray control unit requires:  
Wire 2.5 mm<sup>2</sup>, Fuse 10 Amp  
Hydraulic control unit requires:  
Wire 4.0 mm<sup>2</sup>, Fuse 16 Amp

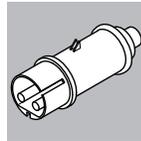


#### 7 POLE TRAFFIC LIGHT CONNECTOR



#### JOB COM CONNECTOR

The unit requires:  
Wire 6.0 mm<sup>2</sup>, Fuse 25 Amp



#### WORKING LIGHT CONNECTOR

The unit requires:  
Wire 10.0 mm<sup>2</sup>, Fuse 30 Amp

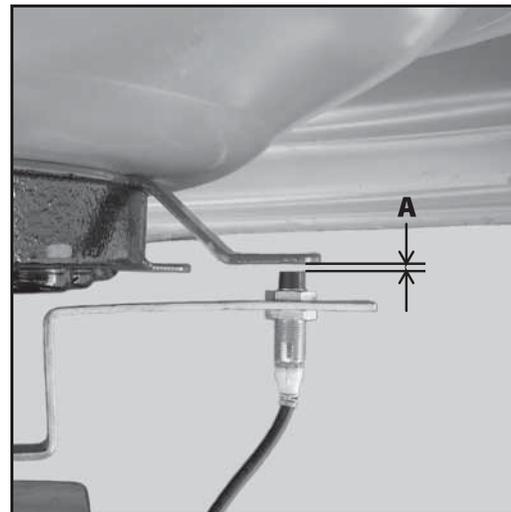


#### ISO POWER CONNECTOR

#### Speed transducer for tractor/sprayer

Note the following if the speed transducer is fitted to the tractor or vehicle.

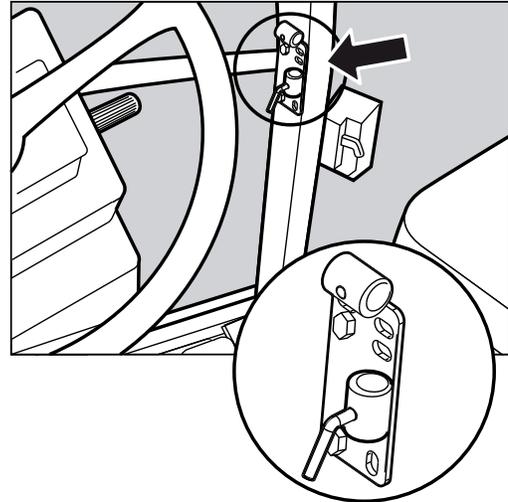
The speed transducer located at the inside of the sprayer's right wheel is an inductive type. It requires a metallic protrusion (e.g. bolt head) to pass by it to trigger a signal. Recommended distance (A) between protrusion and transducer is 1/8" to 3/16" (3 to 5mm).



## 4 - Sprayer setup

### Control units

Find a suitable place in the tractor cabin to mount the control units. Best recommended position is to the right of the driver seat.

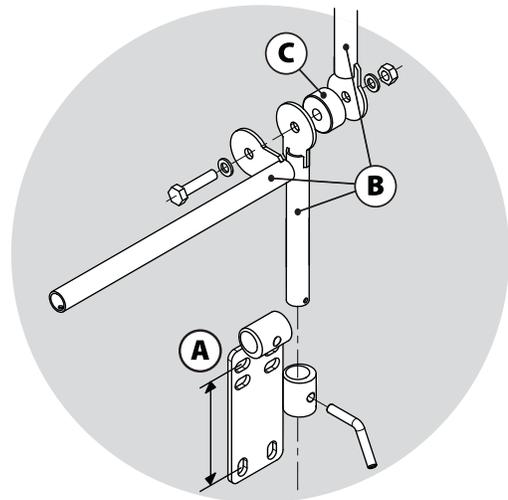


The supplied tractor pillar bracket (A) has a hole spacing of 3.9 in. (100 mm) and 4.7 in. (120 mm), which fits most tractors. Threaded mounting holes may be hidden behind front corner cover. Check the tractor's instruction book for information regarding attachment points.

Three mounting tubes (B) are supplied. One, two or all three may be used. They can be bent and shortened. A spacer (C) is also supplied to allow further attachment possibilities. Find the best solution for your tractor or vehicle.

Tube (B) plate is staggered so that, if correctly orientated, all boxes will line up.

 ATTENTION! See also the controller's instruction book for further details of fitting the controller equipment.



### Road traffic lights

Connect the plug for rear lights to the tractor's 7-pin socket and check the function of rear lights, stop lights, side lights and direction indicators on both sides before driving.

The wiring is in accordance with ANSI/ASAE S279.11. See "Road traffic lights" on page 95.

 ATTENTION! Turn OFF all work lights when driving on public roads!

## 4 - Sprayer setup

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### Liquid System

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#### CycloneFilter

Standard filter size is 80 mesh and can be changed by opening the filter top. Check condition of O-rings and lubricate if necessary or replace if damaged before reassembly.



**DANGER!** Never open the Cyclone filter unless the pressure SmartValve and suction valve are both closed (turned to an unused position)! If no unused pressure positions are available, then turn the pressure SmartValve to "TurboFiller" (with all valves closed). Otherwise, spraying liquid may hit you when opening the filter, and drain the main tank contents!



### Track width, axles and wheels

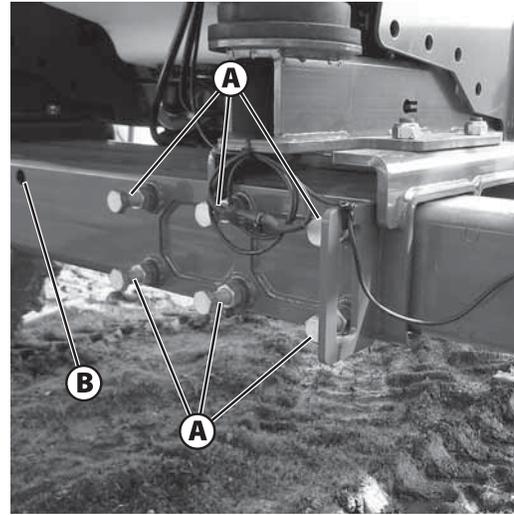
#### Altering the track width (optional adjustable axle)

The adjustable axle track width can be infinitely adjusted from:

60" to 120" (Navigator 3100/3800/4500)

60" to 90" (Navigator 6200 and dual tires)

1. Measure the current track width (center RH tire to center LH tire). Each side must be extended or retracted half the desired alteration.
2. Attach the sprayer to tractor and engage tractor parking brake.
3. Place stop wedges in front of, and behind RH wheel. Jack up LH wheel, support and secure sprayer body.
4. Loosen the jam nuts and bolts (A) for LH wheel axle.
5. Extend or retract the axle. Never extend axle insert too far. On the 60" to 120" axle, some part of the axle insert must always be visible through sight hole (B).
6. Tighten the clamp bolts (A) to a torque of 290 Ft/lb (390 Nm) and lock the bolts with the jam nuts.
7. Repeat the procedure on RH wheel.
8. Check if the distance from center of tire to center of rear frame is equal at RH and LH. On the 60" to 120" axle, make sure both axle inserts are visible through sight hole (B). It may be necessary to change the wheel offset in order to achieve desired distance (see instructions below).
9. Re-tighten bolts and wheel bolts to specified torque after 8 hours of work.



See "50 hours service - Wheel nuts" on page 74 for proper torque and tightening sequence of wheel hubs to rims.



**WARNING!** Securely support the sprayer during axle adjustments. Never attempt to adjust axles with liquid in the tank. Always block wheels on opposite side when adjusting axles.



**WARNING!** Place a jack under the axle and lift the wheel to remove load from the clamps before tightening the clamp bolts to the specified torque.



**WARNING!** On the 60" to 120" axle the front and rear axle inserts must always be visible through the sight hole (B), located in the front and rear of the axle assembly. Otherwise, axle is extended too far to be safe and warranty will be voided.



**ATTENTION!** On the 60" to 120" axle, sight hole (B), located in the front and rear of the axle assembly, may be used as a quick reference for a 120" axle width. When the end of each axle insert is centered in the hole, the axle spacing will be 120" with proper wheel offset.

#### Changing the wheel offset

1. To change the wheel offset, the LH and RH wheels must be swapped in order to turn the rim dish and keep the correct tread direction (tread up in front).
2. Jack up the frame behind both wheels, support and secure sprayer body.
3. Remove both LH and RH wheels and swap sides (keeping the tread direction the same). Tighten wheel bolts to specified torque.

See "50 hours service - Wheel nuts" on page 74 for proper torque and tightening sequence of wheel hubs to rims.



**WARNING!** Securely support the sprayer while swapping wheels. Never attempt to swap wheels with liquid in the tank. Always secure the rear frame when swapping wheels.

## 4 - Sprayer setup

### Dual tire setup (optional)

Two different dual tire kits are available for the Navigator:

22" row spacing (88"/132")

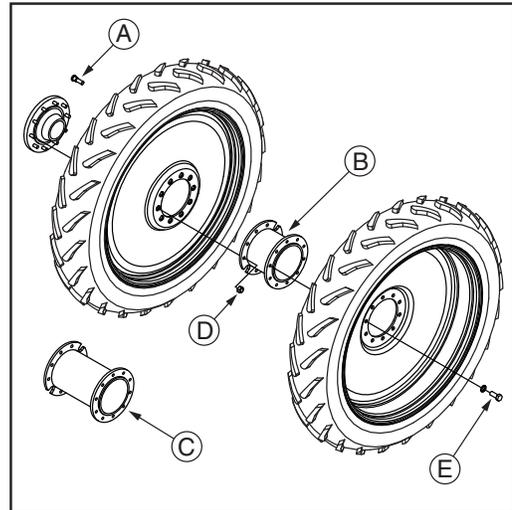
30" row spacing (60"/120")

1. Attach the sprayer to tractor and engage tractor parking brake.
2. Place stop wedges in front of, and behind RH wheel. Jack up LH wheel, support and secure sprayer body.
3. Remove 8 of the 10 wheel nuts, leaving 2 wheel nuts opposite each other to secure the inner wheel.



NOTE! Longer stud bolts (A) are included for earlier model sprayers with shorter stud bolts.

4. Attach dual spacer (B) or (C) to inner rim using the 8 wheel nuts (D) removed in step 3.



NOTE! Inner side of dual spacer has 2 notches to allow space for wheel nuts left on inner wheel. Outer side of dual spacer is threaded for outer wheel bolts.

5. Attach outer LH tire to dual spacer with supplied wheel bolts and lock washers (E). Make sure the distance between the center of inside tire to center of outside tire is 22" or 30". Wheels may need to be reversed and exchanged.
6. See "50 hours service - Wheel nuts" on page 74 for proper torque and tightening sequence.
7. Repeat the procedure for RH wheels.
8. Re-tighten bolts and wheel nuts to specified torque after 8 hours of work.
9. Check the distance between the center of inside LH tire to center of inside RH tire. The distance must be 88" for 22" duals, or 60" for 30" duals. If necessary, adjust the track width. See "Altering the track width (optional adjustable axle)" on page 43.



WARNING! Securely support the sprayer during axle adjustments. Never attempt to adjust axles with liquid in the tank. Always block wheels on opposite side when adjusting axles.

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### Boom

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#### Safety Info

The boom must not be folded/unfolded while driving! Never use the folding/unfolding functions before the sprayer has been stopped! Failure to do so will damage the boom.



**DANGER!** Before unfolding the boom it is important to connect the sprayer to the tractor to prevent overbalancing of the sprayer.



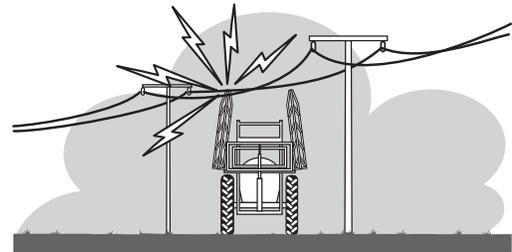
**DANGER!** When folding or unfolding the boom, make sure that no persons or objects are within the operating area of the boom.



**DANGER!** Always follow the guidelines listed below when driving in areas with overhead power lines:

Never use the folding/unfolding functions in areas with overhead power lines.

Unintended boom movements may cause contact with overhead power lines.



**ATTENTION!** A label (ref. no. 105333003) is located on the sprayer's drawbar. This label must be visible to the operator when hooking up the sprayer.



**ATTENTION!** Only unfold and fold the boom on level ground.

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#### Boom Operator's Manual

A separate "Boom Operator's Manual" is supplied with your sprayer and contains detailed information on boom safety, set-up, operation and maintenance.



**DANGER!** Important information on Safety, Operation and Maintenance specific to your boom configuration is detailed in the "Boom Operator's Manual" supplied with your sprayer. It must be read and fully understood by anyone intending to operate this equipment. Failure to do so could result in serious personal injury or death.

---

#### Maneuvering of the SPB and SPC booms - HY-versions

Both SPB and SPC booms with hydraulic HY-version are operated as follows:

1. Activate the single acting hydraulic outlet to raise the boom to release it from the transport brackets.
2. Activate the double acting hydraulic outlet to unfold the boom. Both wings will now unfold simultaneously.
3. When the boom is completely unfolded, it can be raised or lowered to the desired spray height by activating the single acting hydraulic outlet.
4. Before attempting to fold the boom back into transport position, it should be raised all the way to the top by activating the single acting outlet. This will enable the rear cylinder transport lock.
5. The boom is folded by activating the double acting outlet in the opposite direction that was used to unfold the boom. The boom can now be lowered into the transport brackets.
6. The rear cylinder transport lock will automatically engage when lowering the boom after it has been raised all the way to the top. To disengage the rear transport lock, simply raise the boom back up a few inches and then lower it again.



**ATTENTION!** Only unfold and fold the boom while stationary on level ground.



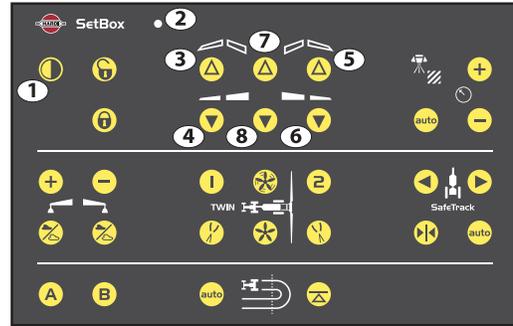
**WARNING!** Ensure that the rear cylinder transport lock is properly engaged before transport.

## 5 - Operation

### Maneuvering of the SPB, 80'-100' SPC booms - (ISOBUS / HC 8600 / HC9600)

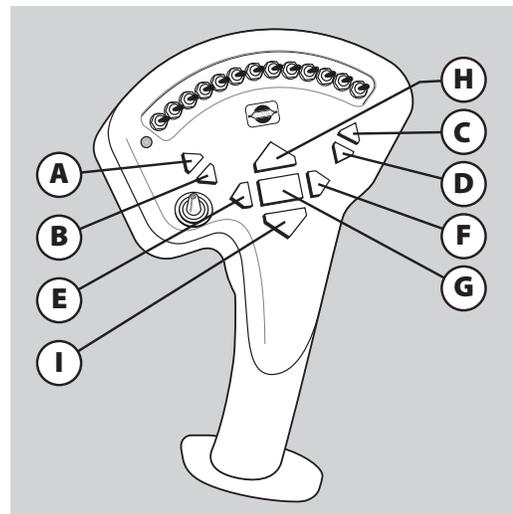
To unfold the boom, do the following:

1. Press switch (H) to raise the boom clear of the transport brackets.
2. Press switches (B) and (D) to lower individual tilt rams.
3. Press switches (4) and (6) to unfold the boom. Rear transport hooks disengage automatically.
4. If only one side of the boom is to be used for spraying, first unfold the boom completely. Then press switch (3) or (5) to fold the desired side back in. Turn off the spray sections for the folded side on the spray control unit.
5. Press switch (I) to lower the boom to correct height above crop or ground level.
6. If equipped with Dual Fold boom, push switch (7) to fold 2nd outer sections in to reduced working width.



To fold the boom, do the following:

1. If equipped with Dual Fold boom, start with boom at maximum working width. If necessary, unfold 2nd outer sections using switch (8).
2. Press switch (H) to raise the boom to highest possible position.
3. Press switches (3) and (5) to fold the boom. Make sure to fold the boom against the vertical slide pads.
4. Press switches (A) and (C) to raise the individual tilt rams.
5. Press switch (I) to lower the boom until the rear transport hooks are firmly engaged.
6. Press switches (B) and (D) to lower the individual tilt rams until they rest on the transport brackets.



 **DANGER!** Be careful to avoid electrical lines when folding/unfolding Dual Fold boom. Outer sections fold/unfold vertically.

 **WARNING!** Ensure that the boom is clear from the transport brackets before unfolding.

 **WARNING!** The folding functions (switches 3 - 8) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

 **ATTENTION!** There are stop switches located in the hydraulic lines of Dual Fold booms to prevent accidental damage by folding/unfolding the 2nd outer sections while in transport position. Switches (7) & (8) (vertical fold) will only function when the inner wings (horizontal fold) are completely unfolded in the operating position.

 **ATTENTION!** The SPB, SPC & Dual Fold SPC HZ booms cannot be operated with the tractor's hydraulic levers.

 **ATTENTION!** It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

## Maneuvering of the 80'-132' DTZ Booms - (ISOBUS / HC 8600 / HC9600)



**WARNING!** The center lock automatically turns ON when pressing one of the boom folding buttons. Boom folding is not possible if the center is unlocked. A manual override of the center lock is possible by activating switches (2) or (3) on the SetBox.



**WARNING!** Only operate the folding functions when the sprayer is stationary! Failure to do so may damage the boom. The center lock automatically opens at speeds exceeding 0.9 mph (1.5 km/h)!



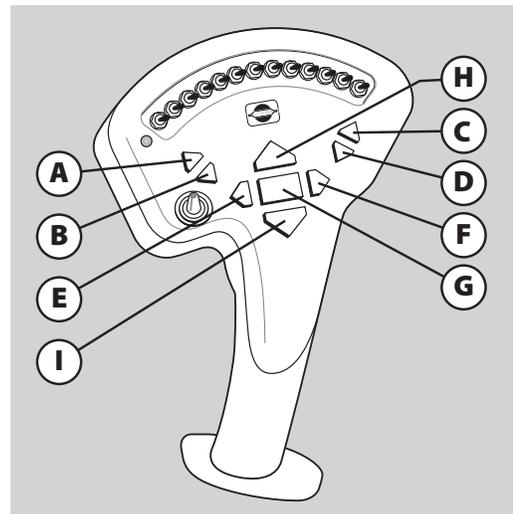
**ATTENTION!** If a folding sequence is not completed, a warning message on the HARDI® display will ask you to complete this sequence before starting the next sequence.



**ATTENTION!** The boom can not be operated with the tractor's hydraulic levers.

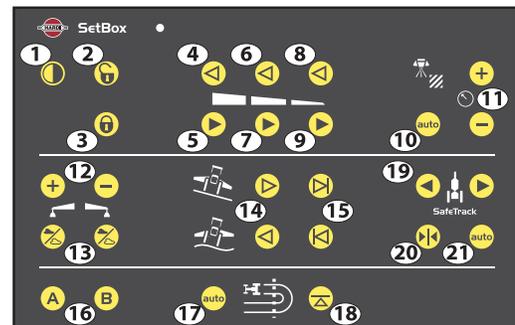
### To unfold the boom

1. Press the boom lift button (H) to lift the boom clear of the transport brackets.
2. If necessary, press and hold (A) and (C) to tilt boom wings up enough to clear the transport brackets.
3. Press and hold button (5) to unfold the inner sections completely (approximately 5 sec. or a warning will appear). Check that the center locked symbol  is visible in the display. If not, press button (3) to engage the center lock.
4. Press and hold (B) and (D) to tilt boom wings down.
5. Press and hold button (7) to unfold the 1st outer sections.
6. Press and hold button (9) to unfold the 2nd outer sections (120'-132' tri-fold booms only).
7. Press and hold the boom down button (I) to lower the boom to the correct working height.
8. If not unlocked, then press button (2) and  symbol appears in display until center is unlocked.



### To fold the boom

1. Press the boom lift button (H) to raise the boom to the highest possible position.
2. Press and hold button (8) to fold the 2nd outer sections (120'-132' tri-fold booms only). The  symbol appears in display until center is locked.
3. Press and hold button (6) to fold the 1st outer sections. Check that the center lock symbol  is visible in the display.
4. Press and hold (A) and (C) to tilt boom wings up until they reach the alignment indicators (For further information, see Operator's manual).
5. Press and hold button (4) to fold the inner sections.
6. Press the boom down button (I) to lower the boom until it rests in the transport locks.



Press and hold (B) and (D) to tilt boom wings down into the transport rests if necessary.

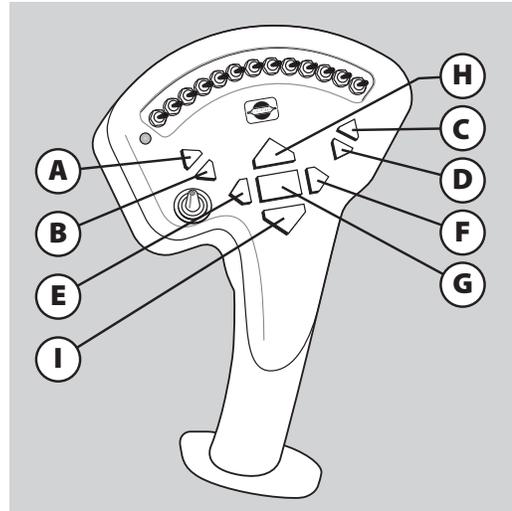
## 5 - Operation

### Boom Tilt Function

The following boom tilt function controls enables you to adjust the boom height individually in the right and left hand side.

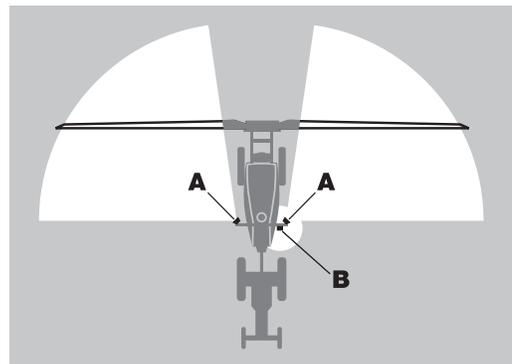
Boom tilt is adjusted by pushing the buttons (A), (B), (C) and (D) on the grip control.

 ATTENTION! Applicable for ISOBUS, HC 8600 and HC 9600.



### Night Spraying Light (Platform mounted lights)

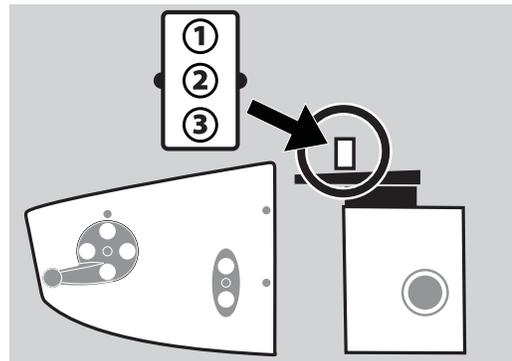
The 2 boom flood light lamps (A) are mounted to the railing of the platform (one at each side) and are positioned to illuminate both boom wings. The work light lamp (B) is also mounted to the railing of the platform above the valves. This lamp is positioned to light the HARDI® TurboFiller and the valve system.



### Work light selector switch

The boom and work lights selector switch is placed just below the SafetyLocker (between valve shield and EasyClean filter) and has three positions:

1. Boom lights ON
2. Lights OFF (neutral position)
3. Work light ON



 ATTENTION! If the lights do not function, check the cable connections and check if the fuses are blown. See "Electrical Schematic for Boom and Work Lights (SPB/SPC Booms)" on page 95.

 ATTENTION! If preferred, the work lights can be controlled from the tractor cabin. Connect from J4 in the work lights junction box to the optional function on the spray control unit.

 ATTENTION! Turn OFF all boom and work lights when driving on public roads!

 ATTENTION! Check frequently that the lights are clean and without damage. Clean with a dry cloth if needed. Replace if broken.

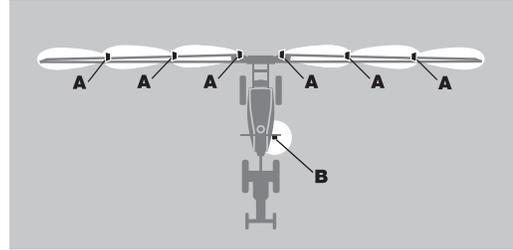
### Night Spraying Light (Boom mounted lights)

Floodlights (A) are mounted on the spray boom, and they are positioned to illuminate both boom wings for spraying at night.

The work light lamp (B) is also mounted to the railing of the platform above the valves. This lamp is positioned to light up the HARDI® TurboFiller and the valve system.

The boom lights (A) are turned on/off with the working lights on the tractor.

The work area light (B) is turned on/off by opening the left side cover (C). Switch (D) inside the left side cover activates the light when the side cover is open.



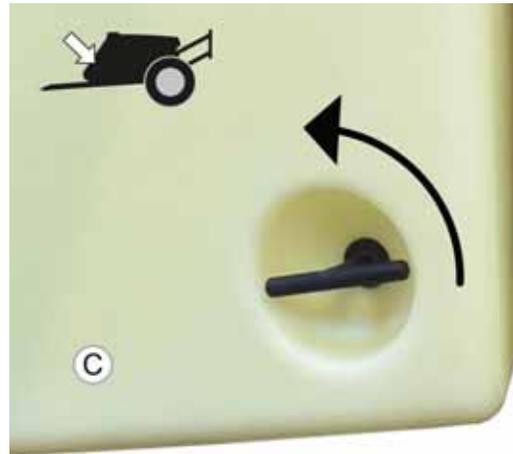
ATTENTION! Turn OFF all boom and work lights when driving on public roads!



ATTENTION! If the lights do not function, check the cable connections and check if the fuses are blown. See “Electrical Schematic for Boom and Work Lights (DTZ Booms)” on page 96.



ATTENTION! Check frequently that the lights are clean and without damage. Clean with a dry cloth if needed. Replace if broken.



## 5 - Operation

### Liquid System

#### Filling/washing location requirements

When filling the sprayer with chemicals and water, it is important to avoid spot contamination by spray chemicals in order to protect the subsoil water resources.

#### At a dedicated filling site

If the sprayer is always filled at the same place, a special filling/washing location should be established. This should have a hard, liquid-impenetrable surface (e.g. concrete) and edges securing against run-off to the surrounding areas. The location should be drained to an adequate receptacle (e.g. slurry tank or similar).

Any spillage or washings should be retained and diluted in order to be distributed on a larger area. This is to ensure minimal environmental impact and avoid build-up of larger chemical concentrations at one spot.

If no other requirements of distances exist, the filling location should be no closer than:

1. 50 yards (meters) from any water supplies for drinking purposes, and
2. 25 yards (meters) from treatment sumps and sewer drainage systems, and
3. 50 yards (meters) from surface water (watercourses, lakes and coastal waters) and from nature reserves.

#### In the field

Alternatively the sprayer can be filled in the field where the spraying is to take place. If so, choose a different location for each refilling.

If no other requirements of distances exist, the filling should not take place closer than:

1. 300 yards (meters) from any water supplies for drinking purposes, and
2. 50 yards (meters) from surface water (watercourses, lakes and coastal waters), treatment sumps, sewer drainage systems and nature reserves.



ATTENTION! Legislation and requirements vary. Always follow local legislation in force at any time.



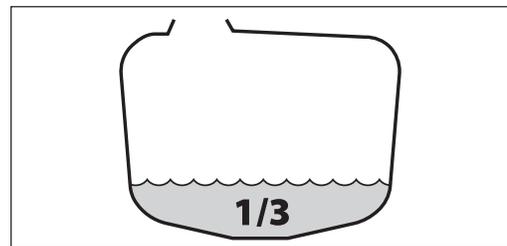
ATTENTION! It is the responsibility of the sprayer owner/operator to comply with all relevant legislation. HARDI® cannot undertake any responsibilities for incorrect operation and use.

#### Filling of water

The tank should normally be filled 1/3 with water before adding chemicals. Always follow the instructions given on the chemical container!



WARNING! If the sprayer is put aside with liquid in the main tank, all MANIFOLD valves must be closed.

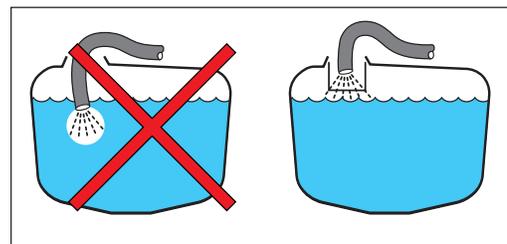


#### Filling through tank lid

Water is filled into the tank by removing the tank lid located at front of the sprayer tank which is accessible from the platform. It is recommended to use water as clean 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.



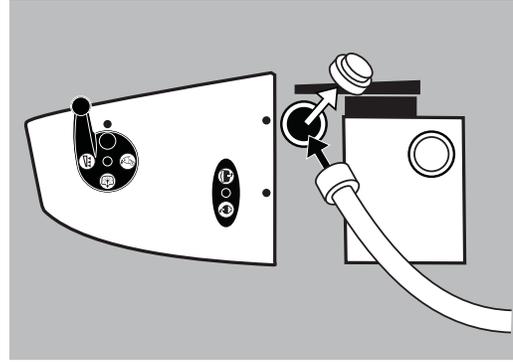
WARNING! Do not let the filling hose enter the tank. Keep it outside the tank, pointing towards the filling hole. If the hose is lowered into the tank and the water pressure drops at the water supply plant, chemicals may be siphoned back and contaminate the water supply lines and source.



### Filling of main tank using Quick fill

The Quick Filling Device is operated as follows:

1. Remove cap from Quick Fill valve and connect filling hose from water supply.
2. Turn handle on Quick Fill valve towards Filling Device.
3. Keep an eye on the main tank level indicator in order not to overflow the tank.
4. Close the Quick Fill valve and remove the filling hose.
5. Replace the cap on the Quick Fill coupler when filling is complete.



**ATTENTION!** Observe local legislation regarding use of filling device. In some areas it is prohibited to fill from open water reservoirs (lakes, rivers etc.). It is recommended only to fill from closed reservoirs (mobile water tanks etc.) to avoid contamination.



**WARNING!** Do not leave the sprayer while filling the tank. Keep an eye on the level indicator in order NOT to overflow the tank.

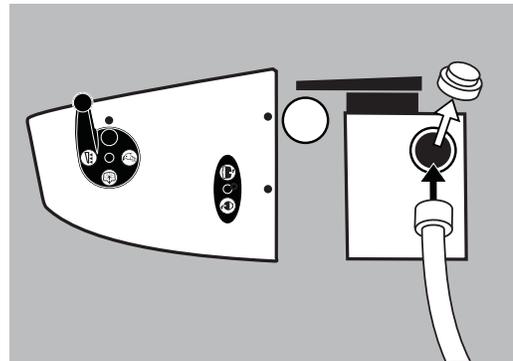


**WARNING!** If filling hose/filter is carried on the sprayer during spraying, it can be contaminated by spray drift which will be transferred to water source when filling!

### Filling of Rinse Tank using Quick fill

A rinse tank is integrated into the rear of the sprayer and is filled via the rinse tank quick coupler located near the EasyClean filter.

1. Remove cap from Quick Fill coupler and connect filling hose from water supply.
2. Fill rinse tank to desired level.
3. Keep an eye on the rinse tank level indicator located on the platform behind the main tank level indicator.
4. Stop filling and remove the filling hose.
5. Replace the cap on the Quick Fill coupler when filling is complete.



**ATTENTION!** Only fill rinse tank with clean water! To avoid algae developing in the rinse tank, always drain this tank if the sprayer is not in use for a long period of time.



**ATTENTION!** For cleaning purposes etc., the rinse tank is also accessible via the tank lid on top of the tank.



**ATTENTION!** Observe local legislation regarding use of filling device. In some areas it is prohibited to fill from open water reservoirs (lakes, rivers etc.). It is recommended only to fill from closed reservoirs (mobile water tanks etc.) to avoid contamination.



**WARNING!** Do not leave the sprayer while filling the tank. Keep an eye on the level indicator in order NOT to overflow the tank.



**WARNING!** If filling hose/filter is carried on the sprayer during spraying, it can be contaminated by spray drift which will be transferred to water source when filling!

## 5 - Operation

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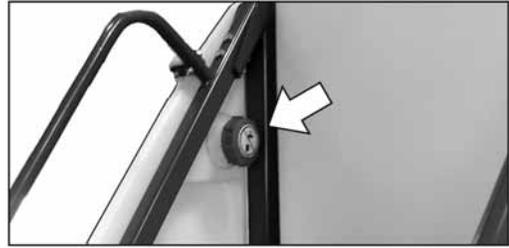
### Filling of Clean Water Tank

To fill the clean water tank:

1. Remove the tank lid.
2. Fill with clean water.
3. Replace the tank lid.

For use of water:

- Turn the ball valve lever to open. The ball valve is located on the valve cover below the EasyClean filter on the sprayer's left side.
- The water from this tank is for hand washing, cleaning of clogged nozzles etc.



**ATTENTION!** Only fill this tank with clean water! To avoid algae developing in the clean water tank, always drain this tank, if the sprayer is not in use for a longer period of time.



**WARNING!** Although the clean water tank is only filled with clean water, this water must NEVER be used for drinking.

### Safety Precautions - Crop Protection Chemicals



WARNING! Always be careful when working with crop protection chemicals!



WARNING! Always wear proper protective clothing before handling chemicals!

### Personal protection

Depending on chemical type, protective gear/equipment should be worn to avoid contact with the chemicals, such as:

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



WARNING! Protective clothing/equipment should be used when preparing the spray liquid, during the spray job and when cleaning the sprayer. Follow the chemical manufacturer's instructions given on the chemical label.



WARNING! It is always advisable to have clean water available, especially when filling the sprayer with chemicals.



WARNING! Always clean the sprayer carefully and immediately after use.



WARNING! Only mix chemicals in the tank according to directions given by the chemical manufacturer.



WARNING! Always clean the sprayer before changing to another chemical.

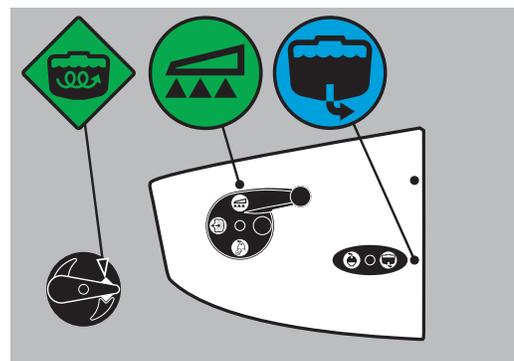
### Filling Chemicals Through Tank Lid

The chemicals are filled through the tank lid - Note instructions on the chemical container!



WARNING! Be careful not to slip or splash chemicals when carrying chemicals up to the tank lid!

1. Make sure the spray control unit is switched off.
2. Set suction valve towards "Suction from main tank", Agitation valve towards "Agitation" and pressure SmartValve towards "Spraying".
3. Engage the pump and set P.T.O. revolutions to recommended pump r.p.m.
4. Add the chemicals through the main tank hole.
5. Keep P.T.O. engaged so the spray liquid is continuously agitated until it has been sprayed on the crop.



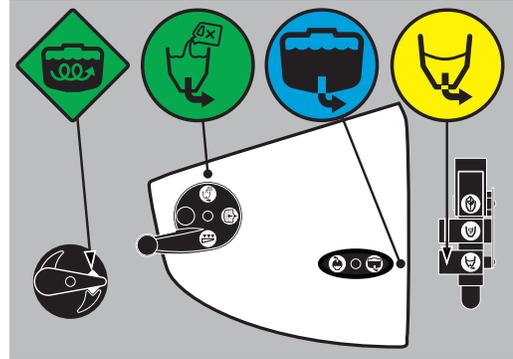
## 5 - Operation

### Filling liquid chemicals by HARDI® TurboFiller (optional)

1. Fill the main tank at least 1/3 with water (unless otherwise stated on the chemical container label).
2. Turn the handle of the suction valve towards "Suction from Main tank". Turn pressure SmartValve towards "TurboFiller". Adjust Agitation valve to desired setting.

 ATTENTION! For increased suction from the TurboFiller, the Agitation valve can be kept closed.

3. Engage the pump and set P.T.O. speed at 540 r.p.m. or 1000 r.p.m. (depending on pump model).
4. Open TurboFiller lid. Measure the correct quantity of chemical and fill it into the hopper.



 DANGER! Always wear face shield and other appropriate personal safety equipment when filling chemicals.

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

5. Engage the hopper transfer device by opening the TurboFiller suction valve to transfer chemicals to the main tank. The TurboFiller suction valve must be open for at least 20 seconds after the chemical is no longer visible in the hopper in order to completely empty the transfer hoses into the main tank.

 DANGER! If the TurboFiller and the transfer hoses are not completely emptied, there is a risk of chemicals being siphoned out of the main tank!

6. If the chemical container is empty, it can be rinsed by the Chemical Container Cleaning device. Place the container over the multi-hole nozzle and push the container cleaning lever.

 DANGER! In order to avoid spray liquid hitting the operator, do not press the lever unless the multi-hole nozzle is covered by a container, as spray liquid may otherwise hit the operator!

 ATTENTION! The rinsing device uses spray liquid to rinse concentrated chemicals from containers. Always rinse the chemical containers with clean water several times until they are clean before disposal.

7. Flush the TurboFiller with clean water from the Rinse tank by turning suction valve towards "Suction from Rinse tank". The TurboFiller suction valve must be open for at least 20 seconds after the rinse water is no longer visible in the hopper in order to empty the transfer hoses completely into the main tank.

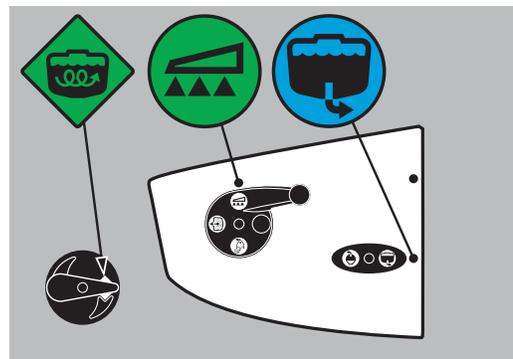
 ATTENTION! If not flushed with clean water, the hopper rinsing device uses spray liquid for rinsing the hopper! Cleaning the TurboFiller must always be done when the spray job is ended, and together with cleaning the entire sprayer. A cleaning after the last filling, and before spraying, does not ensure a clean TurboFiller!

8. Close the TurboFiller suction valve when the hopper has been rinsed and close the lid.

9. If closed, turn the Agitation valve towards "Agitation".

10. When the spray liquid is well agitated, turn handle of the pressure SmartValve towards "Spraying" position. Keep P.T.O. engaged, so that the spray liquid is continuously agitated until it has been sprayed on the crop.

 ATTENTION! If foaming is a problem, turn down the agitation.

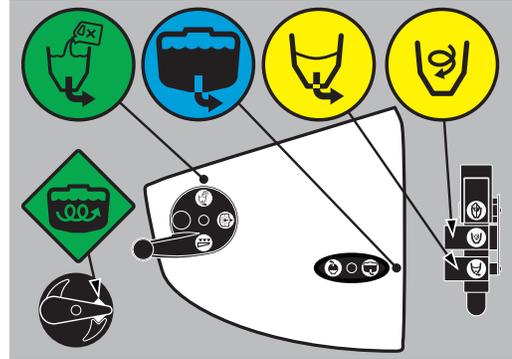


### Filling Powder Chemicals by using HARDI® TurboFiller (optional)

1. Fill the main tank at least 1/2 with water (unless otherwise stated on the chemical container label). See section "Filling of water".
2. Turn the handle of the suction valve towards "Suction from Main tank". Turn pressure SmartValve towards "TurboFiller". Adjust Agitation valve to desired setting.

 ATTENTION! For increased suction from the TurboFiller, the Agitation valve can be kept closed.

3. Engage the pump and set P.T.O. speed at 540 r.p.m. or 1000 r.p.m. (depending on pump model).
4. Open TurboFiller lid. Open TurboDeflector valve and TurboFiller suction valve.



5. Measure the correct amount of powdered chemical and sprinkle it into the hopper as fast as the transfer device can flush it down. The TurboFiller suction valve must be open for at least 20 seconds after the chemical is no longer visible in the hopper in order to completely empty the transfer hoses into the main tank.

 DANGER! Always wear face shield and other appropriate personal safety equipment when filling chemicals.

 DANGER! If the TurboFiller and the transfer hoses are not completely emptied, there is a risk of chemicals being siphoned out of the main tank!

6. If the chemical container is empty, it can be rinsed by the Chemical Container Cleaning device. Place the container over the multi-hole nozzle and push the container cleaning lever.

 DANGER! In order to avoid spray liquid hitting the operator, do not press the lever unless the multi-hole nozzle is covered by a container, as spray liquid may otherwise hit the operator!

 ATTENTION! The rinsing device uses spray liquid to rinse concentrated chemicals from containers. Always rinse the chemical containers with clean water several times until they are clean before disposal.

7. Flush the TurboFiller with clean water from the Rinse tank by turning suction valve towards "Suction from Rinse tank". The TurboFiller suction valve must be open for at least 20 seconds after the rinse water is no longer visible in the hopper in order to empty the transfer hoses completely into the main tank.

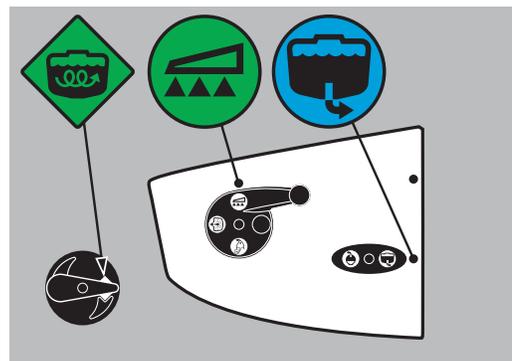
 ATTENTION! If not flushed with clean water, the hopper rinsing device uses spray liquid for rinsing the hopper! Cleaning the TurboFiller must always be done when the spray job is ended, and together with cleaning the entire sprayer. A cleaning after the last filling, and before spraying, does not ensure a clean TurboFiller!

8. Close the TurboFiller suction valve when the hopper has been rinsed and close the lid.

9. If closed, turn the Agitation valve towards "Agitation".

10. When the spray liquid is well agitated, turn handle of the pressure SmartValve towards "Spraying" position. Keep P.T.O. engaged, so that the spray liquid is continuously agitated, until it has been sprayed on the crop.

 ATTENTION! If foaming is a problem, turn down the agitation.

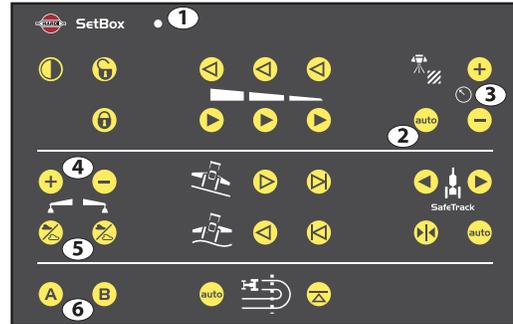


## 5 - Operation

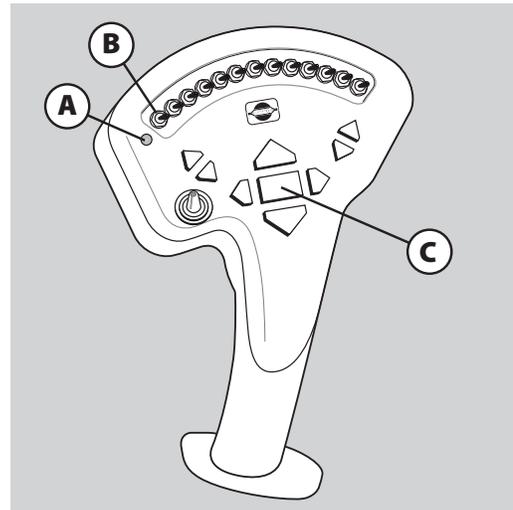
### Operating the Control Units While Spraying

The control units in the tractor control the following functions in the field:

1. Power ON/OFF status LED. The light must be ON.
2. Automatic spray pressure regulation.  
The regulation valve controls the main spray pressure. This is the default selection when the controller is powered ON, and it should remain here during normal spraying.
3. Manual spray pressure regulation.  
During normal spraying, these controls should not be used, as the regulation valve does this automatically.
4. Foam marker blob interval. Regulates the blob interval for the optional foam marker.
5. Foam marker (Left/Right). Turns the optional foam marker ON for each side.
6. Optional function, A or B.  
If extra equipment is added, it can be controlled from here.



- A. Power ON/OFF/status LED. The light must be ON.
- B. Section valves for spray boom. Turns separate sections ON or OFF.
  - Lever up is OFF.
  - Lever down is ON.
- C. Main valve ON/OFF.



**i** NOTE! Check the current volume application rate on the display, or see the instruction book for the spray controller for more information.

### Before Returning to Refill the Sprayer

If the sprayer is to be refilled at a filling location without a dedicated filling site (with hard surface and drain to a closed reservoir), the sprayer should be rinsed in the field before returning to refill.

Dilute the residues of the spraying circuit and spray it on the crop. Then rinse the outside of the sprayer with the External Cleaning Device (optional) before returning to refill.

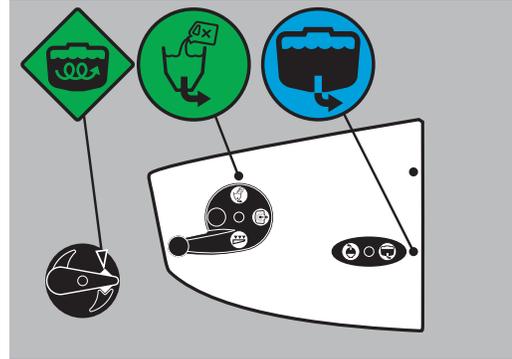


WARNING! Always follow local legislation in force at any time.

### Agitation Before Resuming a Spray Job

If a spray job has been interrupted for a while, severe sedimentation may occur depending on the chemicals being used. Before resuming the spray job, it might be necessary to agitate sedimented material.

1. Turn the handle of the suction valve towards "Suction from main tank". Turn the pressure SmartValve towards "TurboFiller" and turn the agitation valve towards "Agitation".
2. Engage the pump and set P.T.O. speed at 540 r.p.m. or 1000 r.p.m. (depending on pump model).
3. Agitation has started and should be continued for at least 10 minutes.
4. Once the chemicals are mixed, spraying can resume. Turn pressure SmartValve to "Spraying" and start spraying.



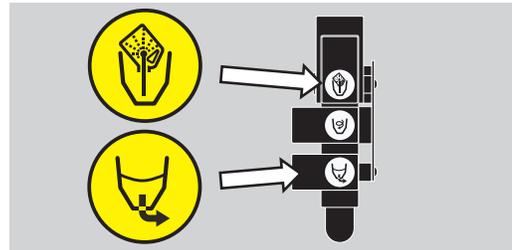
### TurboFiller Rinsing

**i** NOTE! It is important to use clean water from the rinse tank.

Rinse the TurboFiller and chemical containers as follows:

#### Cleaning empty containers - TurboFiller lid is open

1. Put container over the rotating flushing nozzle in the middle of the TurboFiller so that the nozzle is inside the container.
2. Simultaneously press the Chemical Container Cleaning lever and the TurboFiller suction valve. This rinses the chemical container with the flushing nozzle, while the rinsing liquid is emptied out of the TurboFiller.



#### TurboFiller rinsing - TurboFiller lid is closed

1. Close TurboFiller lid.
2. Turn the suction SmartValve to "Rinse tank".
3. Open the Turbo Deflector Valve  for 1 minute to get plenty of clean water through the hoses.
4. Simultaneously press the Chemical Container Cleaning lever and the TurboFiller suction valve. This rinses the hopper with the flushing nozzle, while the rinsing liquid is emptied out of the TurboFiller.
5. Rinse the hopper for 30-40 seconds.
6. Open the lid to inspect if the TurboFiller is empty. If not, close the lid again and press the TurboFiller suction valve until the TurboFiller is empty.
7. After the last flushing, the TurboFiller suction valve must be open for at least 20 seconds after the rinse water is no longer visible in the hopper in order to completely empty the transfer hoses into the main tank.



**ATTENTION!** The TurboFiller needs to be cleaned thoroughly after finishing spraying. This is to ensure that it is clean before spraying other crops that may be sensitive to the chemicals just used. See section "Cleaning" on page 59 for details.

## 5 - Operation

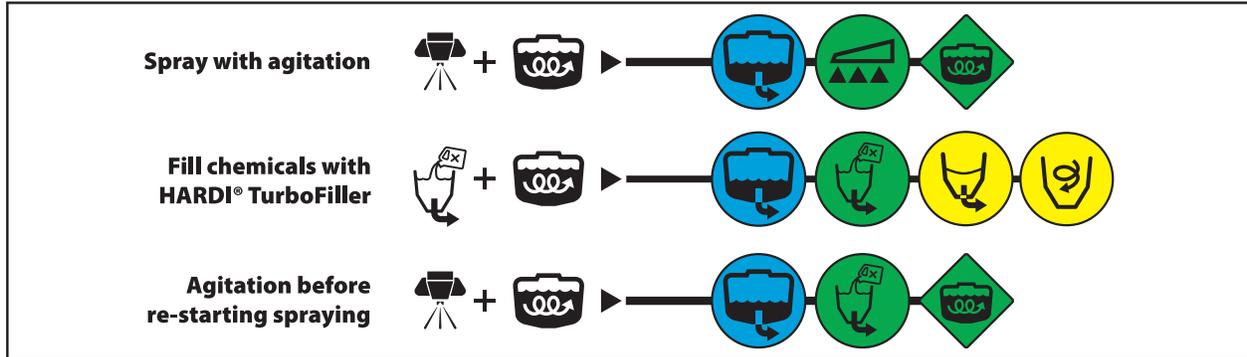
### Parking the Sprayer

To avoid spot contamination, the sprayer must always be parked at either the filling/washing location or under a roof to avoid rainfall washing chemical residues from the sprayer's surfaces.

- Parking at the washing/filling location will retain residues.
- Always park the machine out of reach of children, animals and unauthorized persons.

### Quick reference - Operation

In the following diagram, handle positions for different options are described.



### Cleaning

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#### General Info

In order to derive full benefit from the sprayer for many years, the following service and maintenance program should be followed.



ATTENTION! Always read the individual paragraphs. Read instructions for service/maintenance jobs carefully before starting on the job. If any portion remains unclear, or if it requires facilities which are not available, then please leave the job to your HARDI® dealer's workshop for safety reasons.



ATTENTION!

Clean sprayers are safe sprayers.  
Clean sprayers are ready for action.  
Clean sprayers cannot be damaged by pesticides and their solvents.

#### Guidelines

- Read the whole chemical label. Take note of any particular instructions regarding recommended protective clothing, deactivating agents, etc. Read the detergent and deactivating agent labels. 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 department, e.g. Dept. of Agriculture if you are in doubt.
- Pesticide washings can usually be sprayed out on the field just sprayed or at a suitable cultivated area. Avoid emptying the washings at the same spot every time and keep sufficient distance to the water environment. You must prevent seepage or runoff of residue into streams, watercourses, ditches, wells, springs, etc. The washings from the cleaning area must not enter sewers. Alternatively the washings can be retained in an appropriate receptacle, diluted and distributed over a larger cultivated area - see also "Filling/washing location requirements" on page 50.
- 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, and thereby rendering the sprayer safe and ready for the next pesticide application. This also prolongs the life of the components. It is strongly advised to perform an internal cleaning of the sprayer when high concentrations of acids or chloride are present in the active ingredients, or if the spray liquid is corrosive.
- 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. Children, animals and unauthorized persons 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.
- The sprayer must always be parked under a roof to avoid rainfall washing off chemical residues as well as build-up of spot contamination in the soil. If parked outside, the sprayer should be parked on the filling/washing location in order to retain possible pesticides.

## 5 - Operation

### Standard Cleaning

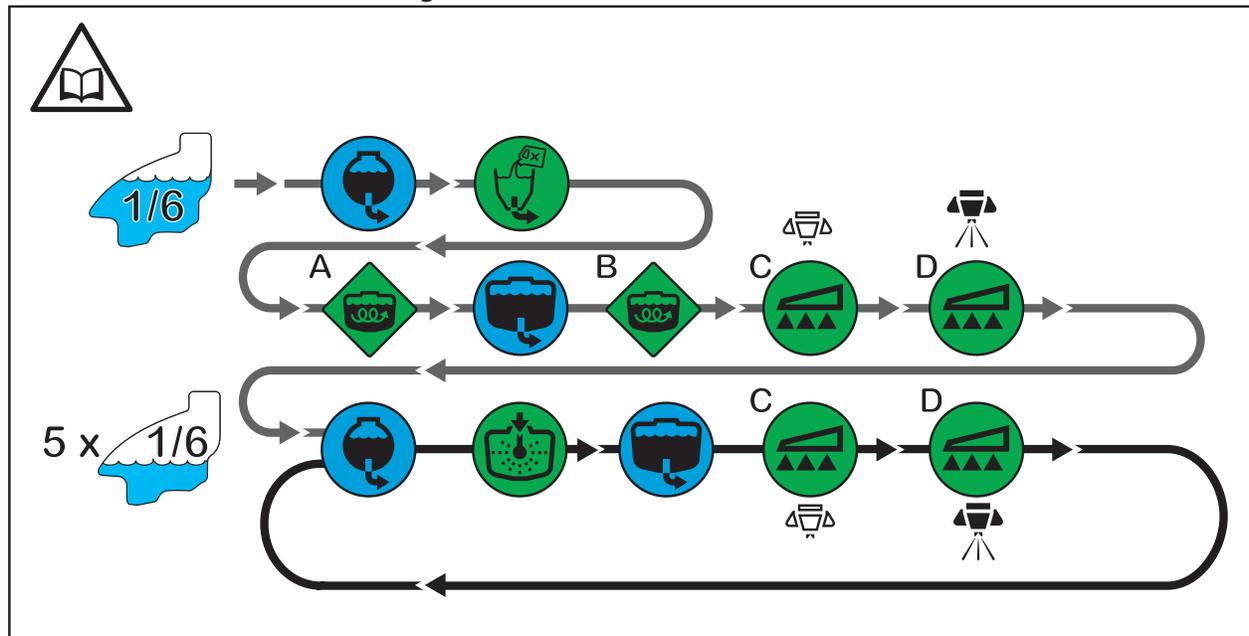
 ATTENTION! For cleaning between spray jobs where crops are not very sensitive towards chemicals just sprayed.

1. Engage pump with tractor in idle, so that pump speed is as low as possible (250/550 r.p.m., depending on pump type).
2. Turn suction valve towards  and the pressure SmartValve towards  until approximately 1/6 of the rinse tank contents are transferred into the main tank. It is important to have full agitation for approximately 20 seconds, and then close agitation valve completely.
3. Turn suction valve towards  and the pressure SmartValve towards  with all sections off for approximately 45 seconds.
4. Turn all sections on. Spray until air comes out of nozzles. When pressure drops, press the  button on the SetBox until yellow LED lights on the regulation valve (closed/max. pressure). When the boom is completely empty, press the  button for a few seconds to avoid a pressure spike when restarting.

#### Repeat the following 3 steps 5 times:

1. Turn suction valve towards  and the pressure SmartValve towards  until approximately 1/6 of the rinse tank contents are transferred into the main tank.
2. Turn suction valve towards  and the pressure SmartValve towards  with all sections off for approximately 45 seconds.
3. Turn all sections on. Spray until air comes out of nozzles. When pressure drops, press the  button on the SetBox until yellow LED lights on the regulation valve (closed/max. pressure). When the boom is completely empty, press the  button for a few seconds to avoid a pressure spike when restarting.

#### Quick Reference - Standard Cleaning



 NOTE! Pump speed 250-280 r.p.m.

- A. Turn On.
- B. Turn Off.
- C. Minimum 45 seconds with nozzle Off.
- D. Spray until air comes out of nozzles. When pressure drops, press the  button on the SetBox until yellow LED lights on the regulation valve (closed/max. pressure). When the boom is completely empty, press the  button for a few seconds to avoid a pressure spike when restarting.

### Cleaning the Tank and Liquid System



ATTENTION! Thorough cleaning of the sprayer is to be carried out when shifting to crops which are very sensitive to chemicals just sprayed, or prior to storage for a longer period of time.



NOTE! Prior to this procedure, a standard cleaning should be carried out (See "Standard Cleaning" on page 60).

- Select and use the appropriate protective clothing. Select detergent suitable for cleaning and suitable deactivating agents if necessary.
  - Rinse and clean sprayer and tractor externally. Use detergent if necessary.
1. Remove tank and suction filters and clean. Be careful not to damage the filter mesh. Replace suction filter top. Replace all filters when the sprayer is completely clean.
  2. With the pump running, rinse the inside of the tank. Do not forget to clean 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 or dedicated filling site.
  3. After spraying the liquid out, stop the pump and fill at least 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. Special detergents for sprayer cleaning are recommended as some also lubricate ball valves, etc.
  4. Start the pump and operate all controls, enabling the liquid to come into contact with all the components. Leave the distribution valves until last. Some detergents and deactivating agents work best if they are left in the tank for a short period. Check the label. Flush the CycloneFilter return line by engaging the lever in the bottom to flush position.
  5. Drain the tank and let the pump run dry. Rinse inside of the tank, again letting the pump run dry.
  6. Stop the pump. If the pesticides used have a tendency to block nozzles and filters, remove and clean them immediately.
  7. Replace all the filters and nozzles and store the sprayer. If it is noted, from previous experiences, that the solvents in the pesticides are particularly aggressive, store the sprayer with the tank lid open.



ATTENTION! It is advisable to increase the forward speed (double, if possible) and reduce the spraying pressure to 20 psi (1.5 bar), when spraying diluted remaining liquid in the field just sprayed.



ATTENTION! If a cleaning procedure is given on the chemical label, follow it closely.



ATTENTION! If the sprayer is cleaned with a high pressure washer, lubrication of the entire machine is recommended.

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### Cleaning and Maintenance of Filters

Clean filters ensure:

- Sprayer components such as valves, diaphragms and operating units are not hindered or damaged during operation.
- Nozzle blockages do not occur while spraying.
- Long life of the pump. A blocked suction filter will result in pump cavitation. The main filter protecting sprayer components is the suction filter. Check it regularly.

## 5 - Operation

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### Use of Rinse Tank and Rinsing Nozzles

The integrated rinse tank can be used for two different purposes:

- A. In-field diluting before cleaning.
- B. Flushing when main tank is not empty.



ATTENTION! If a cleaning procedure is given on the chemical label, follow it closely.

#### A. In-field diluting before cleaning

In-field diluting of remaining spray liquid residue in the spraying circuit should be carried out in the field before cleaning the sprayer.

Rinse the main tank and liquid system:

1. Empty the sprayer as much as possible. Close the Agitation valve (no agitation) and spray until air comes out of all nozzles.
2. Turn suction valve to  and pressure SmartValve to  (or  if not equipped with TurboFiller).
3. Engage and set the pump to approximately 300 or 560 r.p.m. (depending on pump type). Increase the spraying pressure to 85 psi (6 bar).
4. When 1/3 of the contents in the rinse tank are used, turn suction valve to  and operate all valves on the pressure side of the system in the following order, so that all hoses and components are rinsed:
  - a. If equipped with TurboFiller, turn the pressure SmartValve to  and open the TurboFiller suction valve.
  - b. Open the TurboDeflector valve and close it again when clean water comes out of nozzles.
  - c. Close the TurboFiller lid and squeeze the Chemical Container Cleaning lever to clean this device.
  - d. Open the TurboFiller lid again, and make sure that the TurboFiller is empty.
  - e. When empty, close the TurboFiller suction valve.
5. Turn the suction valve to  and the pressure SmartValve to  and spray the liquid in the field just sprayed.

Cleaning of Main Tank:

6. Turn the suction valve to  and the pressure SmartValve to . Remove the filling strainer to avoid any cleaning shadows behind it.
7. When another 1/6 of the contents in the rinse tank are used, turn the suction valve to .
8. Turn pressure SmartValve towards , and spray the liquid in the field just sprayed.
9. Repeat step 6 - 8 one more time.



WARNING! When critical chemicals (like sulphonylurea) have been used, or a cleaning detergent is recommended, do an extra cleaning:

10. Fill the rinse tank again.
11. Fill the main tank with 130 gal. (500 liters) of clean water. See appropriate "Filling of water" section for filling procedure.
12. Add the cleaning detergent to the main tank by using the TurboFiller. Follow instructions on the label of the cleaning agent.
13. Clean the whole system again.
14. To get the best cleaning effect, the filter meshes for the EasyClean and CycloneFilter should be washed with clean water.
15. Rinse the sprayer with clean water afterwards.



ATTENTION! The rinsing nozzles cannot always guarantee a 100% cleaning of the tank. Always clean manually with a brush afterwards, especially if crops sensitive to the chemical just sprayed are going to be sprayed afterwards!

### B. Flushing when main tank is not empty

Flushing the pump, operating unit, spray lines, etc. in case of interruption in spraying before main tank is empty (e.g. because of rain, etc.).

Cleaning of the liquid system:

1. Turn suction valve to . (Keep pressure SmartValve in -position).
2. Close Agitation valve (no agitation) and turn CycloneFilter return valve to position A (marked with 1 dot) to prevent return flow from diluting main tank contents.
3. Engage and set the pump to approximately 300 or 560 r.p.m. (depending on pump type). Increase the spraying pressure to 85 psi (6 bar). Spray the water from the rinse tank into the field until all nozzle tubes/nozzles have been flushed with clean water.
4. Disengage the pump.



ATTENTION! It is advisable to increase the forward speed (double, if possible) and reduce the spraying pressure to 20 psi (1.5 bar), when spraying diluted remaining liquid in the field just sprayed.

### Technical Residue

An amount of spray liquid will inevitably remain in the system. It cannot be sprayed properly on the crop, as the pump takes in air when the tank is just about empty.

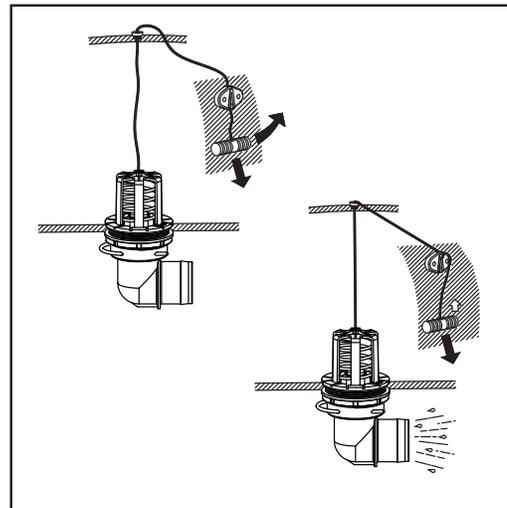
This technical residue is defined as the remaining amount of liquid in the system when the first clear pressure drop appears on the pressure gauge.

The residues in the tank should be diluted immediately in a ratio of 1:10 with clean water and then sprayed on the crop just sprayed with increased driving speed. It is to be noted, however, that the liquid in the spray lines (with original concentration) will be sprayed out first. Therefore, there should be an untreated patch available to spray this onto. In addition, the rinse tank is to be used to separately rinse pump, linkage and armature.

### Using the Drain Valve

The drain valve is operated from the platform just beside the main tank lid.

1. Pull the string to open the drain valve.
2. The valve is spring-loaded, but can be kept open by pulling the string upwards in the V-shaped slit.
3. To release, pull the string downward and the valve will close automatically.



## 5 - Operation

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### Full Internal Cleaning (Soak Wash)



ATTENTION! This cleaning procedure is always used if one or more of these situations occur:

- A. The next crop to be sprayed is at risk of being damaged by the chemical just used, or
- B. The sprayer is not going to be used right away for the same chemical or crop right away, or
- C. Before any repair or maintenance job is going to be carried out on the sprayer.



ATTENTION! Washing the sprayer between jobs with incompatible crops must be done according to instructions from the chemical manufacturer. Use e.g. AllClearExtra, as this is a commonly used cleaning agent. If your chemical prescribes another cleaning agent and/or another cleaning procedure, you must follow that.

Procedure for washing with a cleaning agent such as AllClearExtra:

1. Rinse the sprayer in the field (See "Use of Rinse Tank and Rinsing Nozzles" on page 62).
2. Drive to the filling location. Prepare sprayer for cleaning with cleaning agent. Fill water in the main tank to 10% of its capacity. Fill the rinse tank completely. This water is later used for rinsing.
3. Turn suction valve to  and the pressure SmartValve to  with all sections off. Set agitation valve to "Full agitation".
4. Engage and set the pump speed at approximately 300 r.p.m. or 560 r.p.m. (depending on pump type).
5. Allow the liquid to circulate in the system for 3 minutes.
6. Close Agitation valve (no agitation) and turn the pressure SmartValve to unused function (or "TurboFiller" without activating) for a minimum of 10 seconds in order to burst and flush the safety valve.
7. Open the TurboFiller transfer valve and the deflector valve. Allow the liquid to circulate for 3 minutes.
8. Close the TurboFiller lid and activate the container rinsing valve to clean the hopper inside.
9. Shut off all three valves on the TurboFiller again.
10. Verify that all nozzles are shut at the main ON/OFF button on the grip.
11. Turn the pressure SmartValve to .
12. Allow the liquid in the main tank to circulate for minimum 3 minutes with the nozzles shut. This is done to clean the return lines from boom to tank.
13. Turn the pressure SmartValve to . Allow the liquid to circulate for 3 minutes.
14. Spray out water with cleaning agent and chemical residue. Set the spray pressure at 45-75 psi (3-5 bar). Note that the washing water still contains active chemical and choose an appropriate area to spray this out. Alternatively, the washings can be dumped at the filling/washing location and retained in an appropriate receptacle (e.g. slurry tank or similar) - see "Filling/washing location requirements" on page 50 for more information. Spot contamination and accumulation must be prevented. Continue to spray until all liquid is expelled from the boom tubes and nozzles.
15. Shut off all nozzles by the main ON/OFF switch.
16. Rinse the sprayer again with clean water to rinse out all remains of the cleaning agent - see "Use of Rinse Tank and Rinsing Nozzles" on page 62. This is to remove the cleaning agent from the fluid system, which could contaminate the next spray chemical filled into the main tank.
17. Include rinsing of the TurboFiller in step 16. Operate all 3 valves during this process.
18. Dismantle all filters (suction, pressure, in-line and nozzle filters) and clean the filter screens using clean water and detergent.



WARNING! It is the responsibility of the sprayer operator or owner, that the sprayer is cleaned sufficiently to prevent contamination of the environment, crop damages and health and safety hazards to the operator and the public. HARDI® cannot be held responsible for any damages or incidents related to insufficient cleaning.

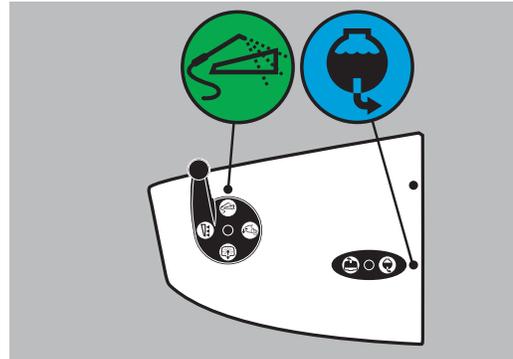


ATTENTION! The rinsing nozzles cannot always guarantee a 100% cleaning of the tank. Always clean manually with a brush afterwards, especially if crops sensitive to the chemical just sprayed are going to be sprayed afterwards!

### Outside Cleaning - Use of External Cleaning Device (optional)

Use the External Cleaning Device to wash everything on the outside of the sprayer.

1. Unroll the hose from the reel.
2. Engage pump speed to approximately 250 r.p.m. or 560 r.p.m., depending on pump model.
3. Turn suction valve to  and pressure SmartValve to  and clean the sprayer.
4. After cleaning, close the pressure SmartValve again.
5. Roll the hose to the reel again.



ATTENTION! If the safety valve is activated, then lower the P.T.O. speed to minimize the amount of rinsing water being lost into the main tank.



ATTENTION! If the sprayer is cleaned with a high pressure washer, lubrication of the entire machine is recommended.



## Lubrication

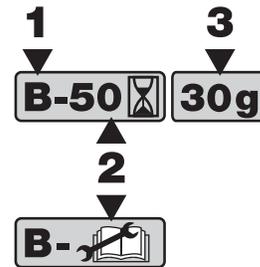
### General Info

Always store lubricants clean, dry and cool - preferably at a constant temperature - to avoid contamination from dirt and condensed water. Keep oil filling jugs, hoppers and grease guns clean, and clean the lubricating points thoroughly before lubricating. Avoid skin contact with oil products for longer periods.

Always follow the quality and quantity recommendations. If no quantity is recommended, feed the lubricator until new grease becomes visible.

### Pictograms in lubrication & oiling plans designate:

1. Lubricant to be used (see "Recommended lubricants" below).
2. Recommended intervals. Shown in hours or with a symbol for occasional maintenance.
3. Amount to be used. Only shown if an amount is specified.



ATTENTION! If the sprayer has been cleaned with a high pressure washer, lubrication of the entire machine is recommended.

### Recommended lubricants



#### BALL BEARINGS:

Universal Lithium grease, NLGI No. 2  
 CHEVRON Multifak EP 2  
 SHELL RETINAX EP2  
 CASTROL LMX GREASE



#### SLIDE BEARINGS:

Lithium grease with Molybdenumdisulphide or graphite  
 SHELL RETINAX HDM2  
 CASTROL MOLYMAX



#### OIL LUB. POINTS:

TOTAL Transmission TM  
 SAE 80W/90  
 Castrol EPX 80W/90  
 SHELL Spirax 80W/90  
 Mobil Mobilube 80W/90



#### PUMPS:

Complex Lithium grease, NLGI No. 1  
 Viscosity @104°F (40° C) > 460 cSt  
 SHELL Gadus S3 V550L 1  
 Mobilgrease XHP 462  
 TOTAL Multis Complex SHD 460

## 6 - Maintenance

### Grease Nipple

When lubricating the sprayer, please use a greasing gun which fits the dimensions of the grease nipple.

Nipple head type: DIN 71412

Nipple head size (A): 6.5 mm



ATTENTION! If grease is leaking from the nipple near its threaded part, when grease is being applied, please tighten the nipple by using a wrench or socket. Replace the nipple if it is damaged or bent out of shape.



ATTENTION! If applying grease into the nipple seems difficult, unscrew the nipple. Check if the nipple is blocked inside, or if the spring-loaded ball is stuck. Clean or repair as needed.



### Grease Gun Calibration

Before lubricating the sprayer, you must calibrate your grease gun to ensure that the correct amount of grease is applied to each lubrication point. The correct amount of grease applied will prolong the lifetime of the sprayer.

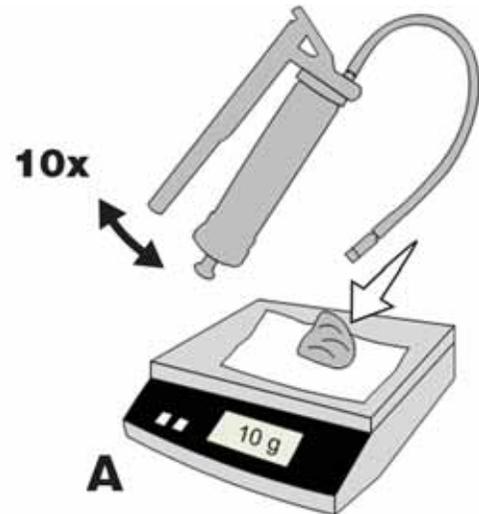
#### Calibration example

1. Insert the correct grease cartridge in your grease gun.
2. Apply grease onto a tissue or a piece of paper. Complete 10 full strokes of the grease gun.
3. Place the paper with grease on a scale (A).
4. If your grease pile weighs for example 10 grams (0.4 oz.), then 1 stroke equals 1 gram (0.04 oz.) of grease.

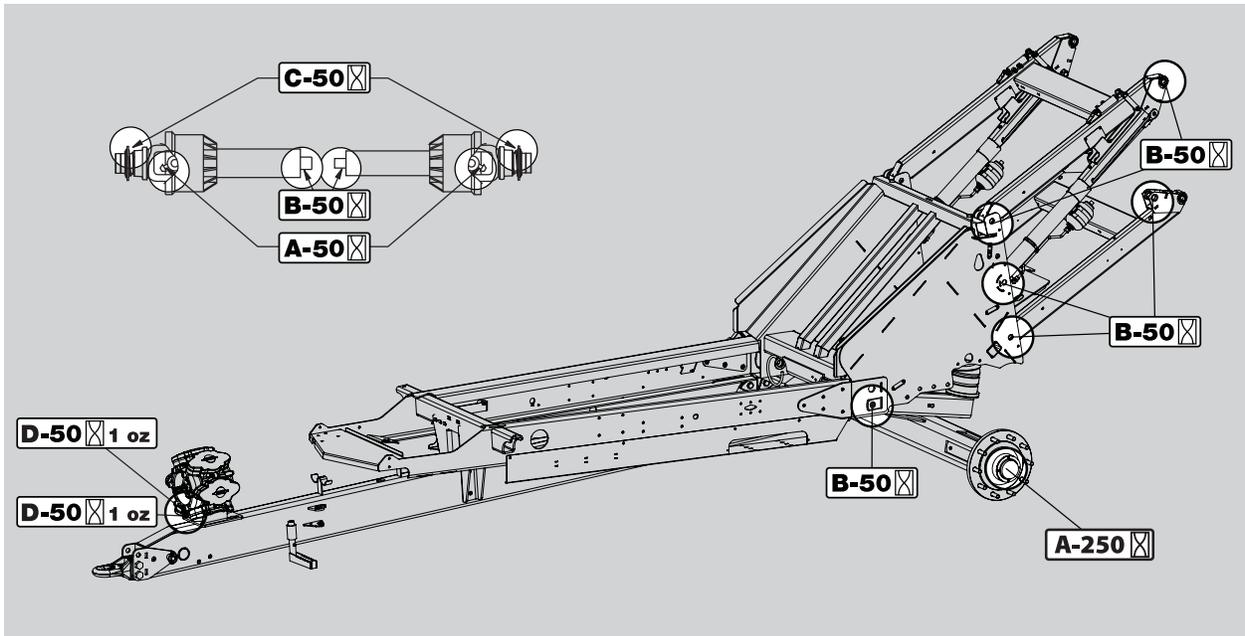
When calibrated, you can count how many strokes to complete when lubricating the different grease points on the sprayer, according to the specifications.

#### Alternative method

1. Count the strokes, until you have 10 grams (0.4 oz.) of grease piled up on the scale (A).
2. Now you can figure out how many strokes to use for applying a certain amount of grease to a lubrication point.



### Lubrication & Oiling Plan - Trailer/ParaLift™



### Greasing the Pump

The pump is greased as follows:

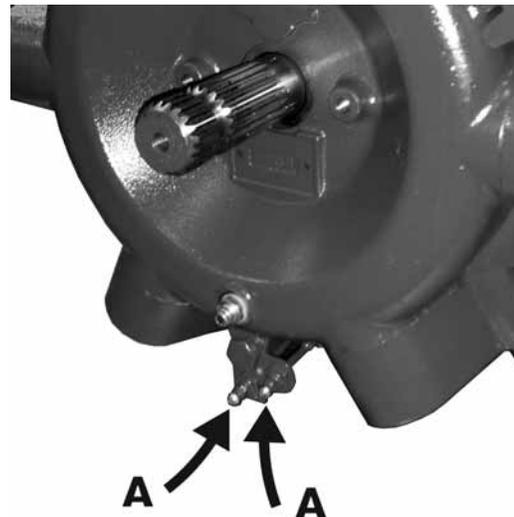
- Factory greased:  
10 oz. (300 grams) grease into each lubrication point (A).
- Normal operation:  
Grease every 50 hours with 1 oz. (30 grams) of grease into each lubrication point (A). See "50 hours service - Greasing the pump" on page 74.
- After disassembling the pump (diaphragm replacement, etc.):  
Grease with 7 oz. (200 grams) of grease into each lubrication point (A).



ATTENTION! In order to prevent excessive wear, it is important to use a recommended lubricant! See "Recommended lubricants" on page 67.



ATTENTION! The pump MUST be stopped during greasing!



## 6 - Maintenance

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### Service and Maintenance Intervals

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#### General Info

National or regional laws may require periodic inspection of the sprayers in use. See the following section for more details.

The subsequent periodic service and maintenance work may be carried out by the user. Contact your HARDI® dealer if in doubt. If this work is completed correctly, the sprayer will run efficiently and its lifetime will be prolonged.

---

#### Tightening Bolts and Nuts

When tightening bolts and nuts as a part of periodic service or due to replacement of spare parts, it is important to apply the correct torque. This will prevent accidents and prolong the lifetime of the parts included in the bolted joints.

If not otherwise stated in this book, please tighten bolts and nuts using the following torques.

Bolt size	Recommended torque (Ft/lb)
M4	2
M5	4
M6	6
M8	15
M10	30
M12	50
M14	85
M16	135
M18	175
M20	260
M22	360
M24	445
M27	720
M30	960



WARNING! Applying too little torque will result in these risks:

- bolted joints will rattle and thus fail under fatigue
- bolts are being worn quickly and thus will not fulfill their design purpose
- bolted joints will come loose
- accidents caused by assembled parts coming apart due to bolts or nuts failing or falling off.



WARNING! Exceeding the maximum torque will result in these risks:

- damaging or stripping the threads and deforming the fastener
- bolt heads will be broken
- bolted joints will come loose
- accidents caused by assembled parts coming apart due to bolts breaking at a later time.

### Tightening Hydraulic Hoses

When tightening hydraulic hoses as a part of periodic service or due to replacement of spare parts, it is important to apply the correct torque. This will prevent accidents and prolong the lifetime of the parts connected with the hoses.

If not otherwise stated in this book, please tighten hydraulic hoses using the following torques:

Hose size (")	Fitting thread size (")	Wrench size (mm)	Recommended torque (Ft/lb)
1/4	9/16	19	21
3/8	11/16	22	32
1/2	13/16	24	46
3/4	13/16	36	96



**DANGER!** A hydraulic hose or joint leaking or coming apart with the oil under pressure can cause severe injuries to persons standing nearby! The oil can be very hot, around 176° F (80 °C), and the oil streaming out can penetrate human skin. Risk of burns on the skin, internal injuries and facial injuries.



**WARNING!** Applying too little torque will result in these risks:

- hydraulic joints will leak due to the high oil pressure
- hydraulic joints will rattle and thus fail under fatigue
- hydraulic joints are being worn quickly and thus will not fulfill their design purpose
- accidents caused by sudden loss of oil pressure due to hydraulic parts coming apart.



**WARNING!** Applying too much torque will result in these risks:

- damaging or stripping the threads and deforming the hydraulic joints
- fittings will be broken
- hydraulic joints will leak
- accidents caused by assembled parts coming apart due to bolts breaking at a later time.



**WARNING!** When assembling a hydraulic joint, this is often being twisted around in different directions to make it fit between other components on the sprayer. Remember to finish by applying the correct torque.



**NOTE!** The sealing system for hoses and fittings is ORFS type (O-Ring Face Seal). This ensures a high level of sealing and good vibration resistance. The fittings use the O-ring compression mechanism to seal.

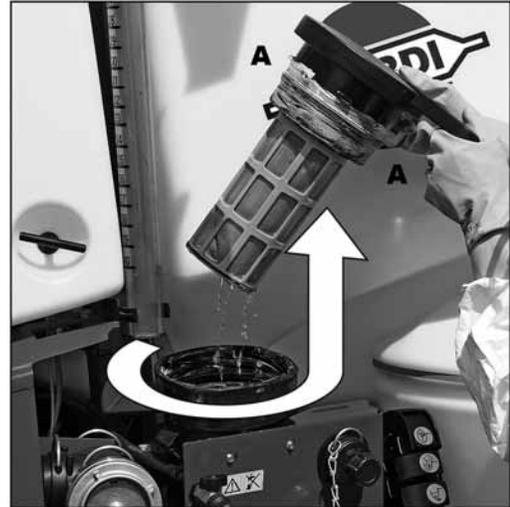
## 6 - Maintenance

### 10 Hours Service - EasyClean Filter

This filter has a clogging indicator as mentioned in the "Description" chapter, but even if this indicator does not show clogging, it should be cleaned every 10 hours.

#### Servicing the filter

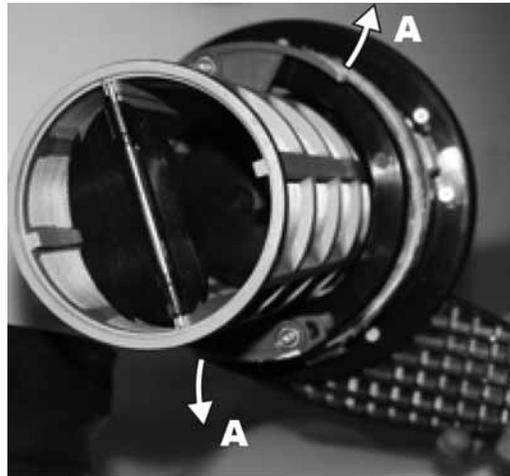
1. Turn the filter lid counterclockwise to open it.
2. Remove lid and filter from the filter housing.



3. Separate filter element from lid/filter guide by turning locks (A) outwards.
4. Clean filter and, if necessary, clean the housing for larger impurities.

#### To reassemble

1. Grease the O-ring on the filter lid.
2. Press the filter onto the filter guide/lid. Make sure that it has caught the guide. Turn locks (A) inwards.
3. Reassemble filter/filter lid into the housing. Make sure that it has caught the guide in the bottom of the housing.
4. Turn the filter lid clockwise to close it.



WARNING! Always wear protective clothing and gloves before servicing the filter!

### 10 Hours Service - CycloneFilter

#### Servicing the filter

1. Turn the pressure SmartValve to an unused function or to tank cleaning nozzles.
2. Unscrew the filter lid (A).
3. Lift lid and filter (B) from the housing.
4. Turn the two locks (C) outwards to unlock the filter from the lid.
5. Separate filter from the integrated filter guide in the lid and clean the filter.

#### To reassemble

1. Grease the two O-rings on the lid/filter guide. Due to small space at lid, use for example a brush to apply the grease.
2. Mount the filter onto the recess (which may not be greased) in the lid/filter guide.
3. Turn the two locks (C) inwards to lock the filter to the lid.
4. Place the filter/filter lid into the housing and tighten the lid until it hits the stop.



WARNING! Always wear protective clothing and gloves, before servicing the filter!



DANGER! The pressure SmartValve must always be turned to an unused function or to tank cleaning nozzles before opening the CycloneFilter! If not, the spraying liquid can hit you when opening the filter, and the main tank content will drain away!

### 10 Hours Service - In-Line Filter

On booms equipped with In-Line Filters, unscrew the filter bowl to inspect and clean the filter. When reassembling, the O-ring should be greased.

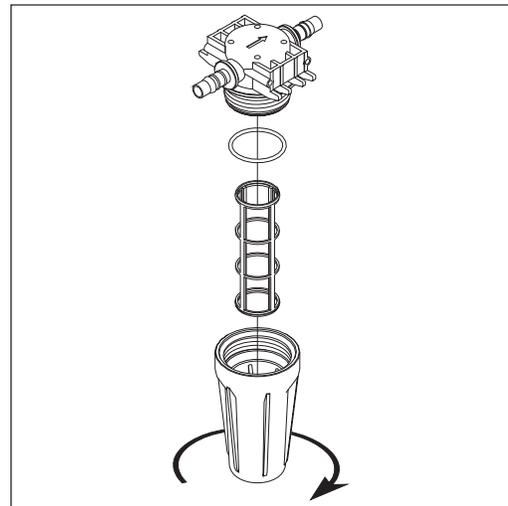
Alternative filter meshes are available. See section "Technical specifications" - Filters and nozzles.



WARNING! Be careful not to splash out liquid when unscrewing the filter bowl.



WARNING! Always wear protective clothing and gloves, before servicing the filter!

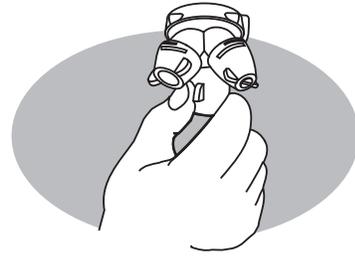


## 6 - Maintenance

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### 10 Hours Service - Nozzle Filters (optional)

The filters are located inside the nozzles. Check and clean.



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### 10 Hours Service - Spraying Circuit

Fill with clean water and operate all functions. Check for leaks using a higher spray pressure than normal. Check nozzle spray patterns visually using clean water.

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### 50 hours service - Greasing the pump

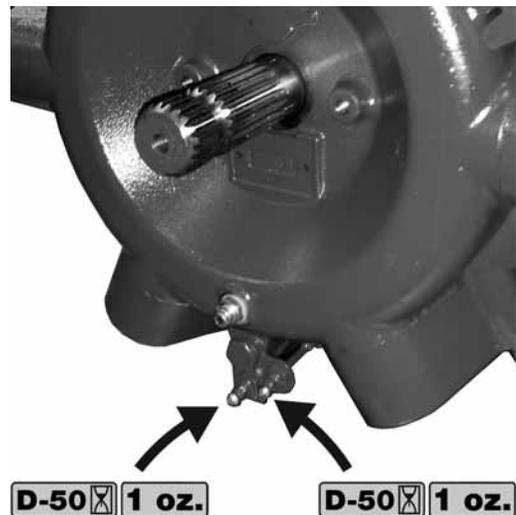
When operating the pump, it MUST be greased every 50 hours with 1 oz. (30 grams) grease into each lubrication point.



ATTENTION! In order to avoid excessive wear, it is important to use a recommended lubricant (i.e. HARDI® part no. 28164600). See "Recommended lubricants" on page 67.



ATTENTION! The pump MUST be stopped during greasing!



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### 50 Hours Service - Transmission Shaft (P.T.O.)

1. Check function and condition of the transmission shaft protection guard. Replace any damaged parts.
2. Lubrication. See "Lubrication & Oiling Plan - Trailer/ParaLift™" on page 69.
3. See the manufacturer's instruction book.

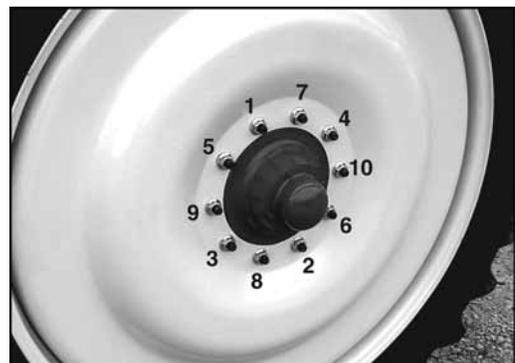
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### 50 hours service - Wheel nuts

Tighten wheel nuts as follows with following torque wrench settings:

Wheel hub to rim plate: 250 Ft/lb (340 Nm)

Tightening sequence: See illustration and tighten in order of numbering.



### 50 Hours Service - Tire Pressure

Check the tire pressure according to the table "Tire Pressure" on page 92.



**DANGER!** Never inflate tires more than to the pressure specified in the table. Over-inflated tires can explode and cause severe personal injuries!



**WARNING!** If replacing tires, always use tires with min. load index as specified.

### 250 Hours Service - Hydraulic Circuit

Check the hydraulic circuit for leaks and repair, if needed.

Refill nitrogen accumulators for:

- ParaLift™



**WARNING!** Hoses for boom lifting device must be changed after every 5 years of use.



**WARNING!** Nitrogen accumulators may contain oil under pressure.

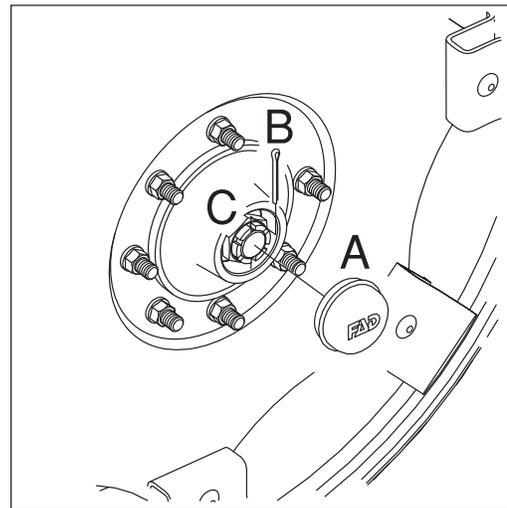
### 250 Hours Service - Hoses and Tubes

Check all hoses and tubes for possible damage and proper attachment. Replace damaged hoses or tubes.

### 250 Hours Service - Wheel Bearings

Check for play in the wheel bearings:

1. Place stop wedges in front of and behind the left wheel and jack up right wheel.
2. Rock the right wheel to discover possible play in the bearings.
3. If any play, support the wheel axle to prevent the trailer from falling down from the jack.
4. Remove hub cap (A) and cotter pin (B). Turn the wheel and tighten the castle nut (C), until a slight resistance is felt in the wheel rotation.
5. Loosen the castellated nut until the first notch - horizontal or vertical - is aligned with the cotter pin hole in the shaft.
6. Fit a new cotter pin and bend it to keep it in place.
7. Fit the hub cap to the hub again.
8. Repeat the procedure for the left wheel.



### 1000 hours service - Transmission shaft (P.T.O.)

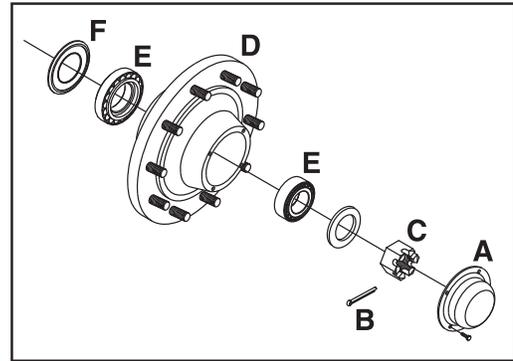
Change the protection tube nylon bearings as described in the manufacturer's instruction book.

## 6 - Maintenance

### 1000 hours service - Wheel bearings

Check the condition of the bearings in the following way:

1. Place stop wedges in front of and behind LH wheel and jack up RH wheel.
2. Support the trailer with axle stands.
3. Remove the wheel.
4. Unscrew the 4 Allen bolts and remove the hub cap (A), cotter pin (B) and castle nut (C).
5. Pull off the wheel hub assembly (D). Use a wheel puller if necessary.
6. Remove roller bearings (E), clean all parts in degreasing detergent and dry them. Inspect bearings (E) and replace if necessary.
7. Pack bearings (E) with fresh wheel bearing grease and re-install using a new seal (F).
8. Turn the wheel and tighten the castle nut (C) until a slight resistance in the wheel rotation is felt.
9. Loosen the castle nut until the first notch (horizontal or vertical) is aligned with the cotter pin hole on the shaft.
10. Fit a new cotter pin and bend it.
11. Fill the hub cap with fresh grease and re-attach it onto the hub.
12. Repeat the procedure on the LH wheel.



**ATTENTION!** The shaft has a vertical and an horizontal cotter pin hole. Use the one first aligned with the notch when loosening the castellated nut.



**WARNING!** If you do not feel totally confident changing wheel bearings, contact your HARDI® dealer's workshop.

### Occasional maintenance

#### General info

The maintenance and replacement intervals for the following will depend very much on the conditions under which the sprayer will be operated and are therefore impossible to specify.

#### Lifting and Removing the Pump

When lifting and removing the pump, use a shackle fitted to the built-in lifting eye located between the heads (A).



**WARNING!** To prevent damages in case of a free-falling pump, use lifting gear with at least 4 tons max. tensile strength.



**NOTE!** Pump weight is approximately 165 lbs. (75 kg).



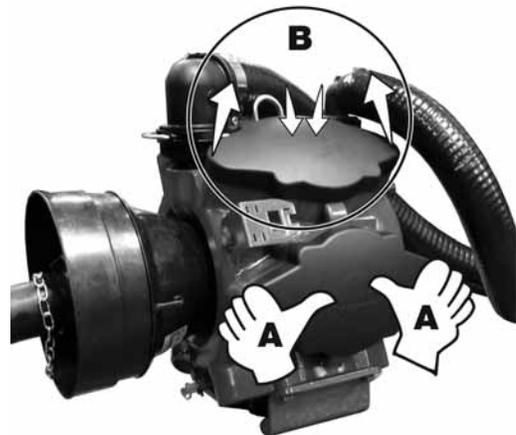
#### Pump valves and diaphragms replacement

Diaphragm pump overhaul kit (valves, seals, diaphragms etc.) can be ordered. Detect the pump model - kit can be ordered using correct HARDI® part No.:

Model 364: part No. 75585900

Model 464: part No. 75586000

1. Lift off the plastic covers (C) with your hands (A) by pulling with the finger tips while pushing with the thumbs in the center, as shown in (B).



## 6 - Maintenance

### Valves

2. Loosen the 4 head bolts (1).
3. Remove the head (2).
4. Change the valves (3) - note their orientation so that they are replaced correctly!



ATTENTION! It is recommended to use new gaskets (4) when changing or checking valves.

### Diaphragms

5. Loosen the diaphragm bolt (5).
6. Remove the diaphragm washer (6).
7. The diaphragm (7) may then be changed.
8. Check that the drain hole (8) at the bottom of the pump is not blocked.
9. Apply a small amount of pump grease on the underside of the diaphragms (between diaphragm and connecting rod washer).
10. Reassemble the pump with the following torque setting:
  - Diaphragm head bolts (1): 67 Ft/lb (90 Nm)
  - Diaphragm bolt (5): 67 Ft/lb (90 Nm)
  - Refit the plastic covers (C).



NOTE! The diaphragm bolt on 1000 r.p.m. pumps must be secured with a locking compound such as Loctite® 262 (HARDI® Part No.: 28045503).



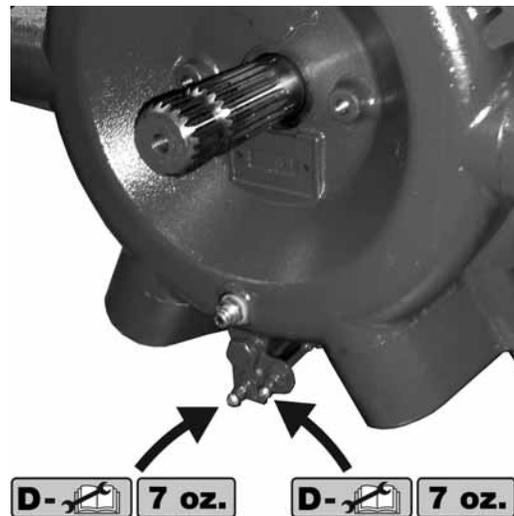
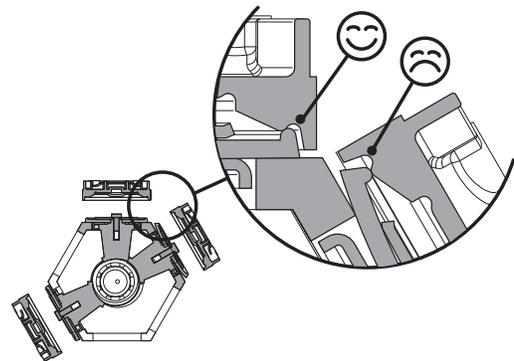
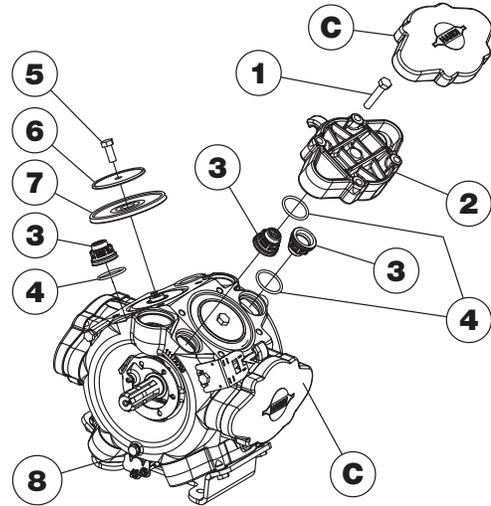
ATTENTION! Before tightening the 4 bolts for the head (2), the diaphragm must be positioned between the center and top to ensure correct sealing between the diaphragm pump housing and diaphragm cover. Turn the crank shaft if necessary.

### Re-lubrication after assembly

After disassembling the pump (diaphragm replacement, etc.), the pump MUST be lubricated with 7 oz. (200 grams) grease into each lubrication point.



ATTENTION! In order to avoid excessive wear, it is important to use a recommended lubricant (i.e. HARDI® part no. 28164600). See "Recommended lubricants" on page 67.

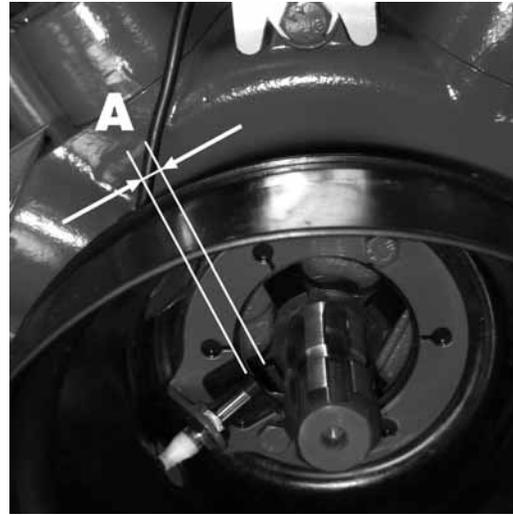


### Speed Transducer for Pump

The speed transducer, measuring rounds per minute (r.p.m.), is located at the inner side of the P.T.O. shield. This sensor is an inductive type, which requires metallic protrusions to pass by it to trigger a signal.

#### Adjustment

1. Adjust air gap (A) to 3/16" (4 mm). Use a feeler gauge or similar tool.
2. After adjustment, turn the pump shaft. Verify air gap variations less than +/-0.02" (+/-0.5 mm). Check this for the entire circumference.
3. Verify transducer function:
  - HC 6500/ISOBUS VT:
    - Monitor the menu [4.5.4.9.6 P.T.O. pump frequency].



### Level Indicator Adjustment

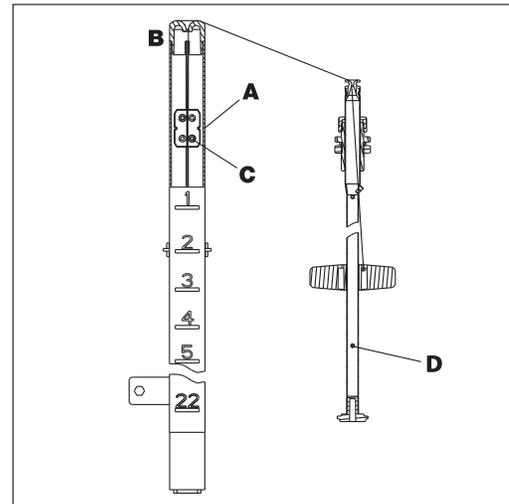
The level indicator reading should be checked regularly. When the tank is empty, the float should lie on the stop pin (D) of the rod, and the O-ring on the indicator should be positioned at the top position line (A).

If any deviation is found, do the following:

1. Pull out the plug (B).
2. Loosen screws (C).
3. Adjust the length of the cord, until it reads correctly.
4. Push the plug (B) back into place.



**NOTE!** To obtain the best accuracy, the adjustment should be done with the sprayer attached to the tractor normally used.



### Level Indicator Cord Replacement

If the cord on the level indicator has to be changed, the float guide pole is removed.

1. Remove the tank drain valve (see "Drain valve seal replacement" on page 80) and loosen the fitting holding the pole in position.
2. Pull the pole down through the drain valve hole, until it is free in the top of the tank.
3. The pole can now be taken out of the tank through the filling hole.



**DANGER!** Do not enter the inside of the tank - the parts can be changed from the outside of the tank!

## 6 - Maintenance

### Drain valve seal replacement

If the main tank drain valve leaks, the seal and seat can be changed the following way.

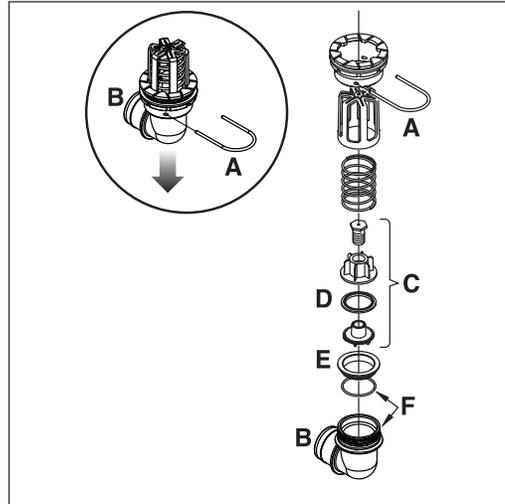


**DANGER!** Do not enter the inside of the tank - the parts can be changed from the outside of the tank!



**WARNING!** Use eye / face protection mask when dismantling the tank drain valve!

1. Make sure the tank is empty and clean.
2. The valve must be closed and the string loose.
3. Pull out the clip (A) and pull down connecting piece (B). The entire valve assembly can now be pulled out.
4. Check cord and valve flap assembly (C) for wear, replace seal (D) and assemble again.
5. Assemble the valve assembly again using a new valve seat (E). Lubricate O-rings (F) before assembly.
6. Fit clip (A) again.



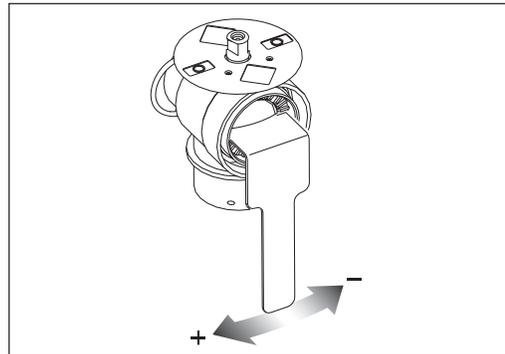
**ATTENTION!** Check function of valve with clean water before filling chemicals into the tank.

### Adjustment of 3-Way Valve

The large ball valve (type S93) can be adjusted, if it is too tight to operate - or if it is too loose (= liquid leakage). Correct setting is when the valve can be operated smoothly by one hand. Use a suitable tool and adjust the toothed ring inside the valve as shown on the drawing.



**ATTENTION!** The small ball valves (type S67) cannot be adjusted.



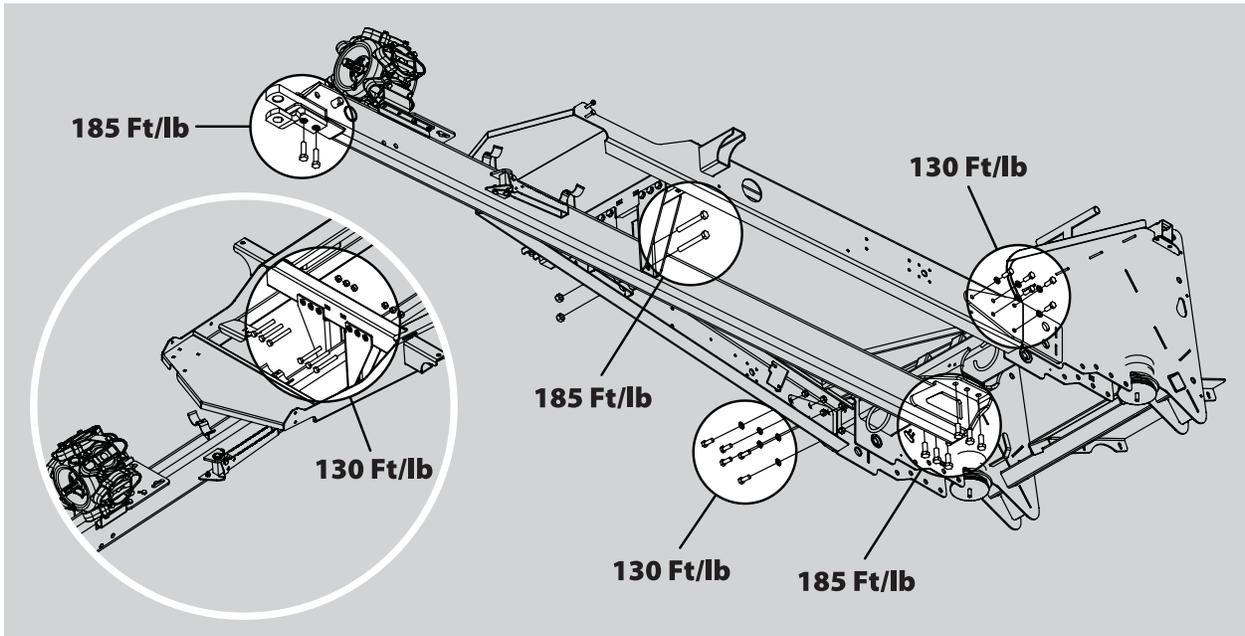
### Safety Valve Activation

To make the fluid system work perfectly over time, it is good practice to regularly provoke opening of the safety valve.

This prevents clogging and ensures proper function of the safety valve. Opening of the valve is done by turning the pressure SmartValve to an unused function (or "TurboFiller" without activating) when the pump is running. This is good practice for all sprayers; particularly for sprayers without optional equipment.

### Re-tighten the Steel Frame

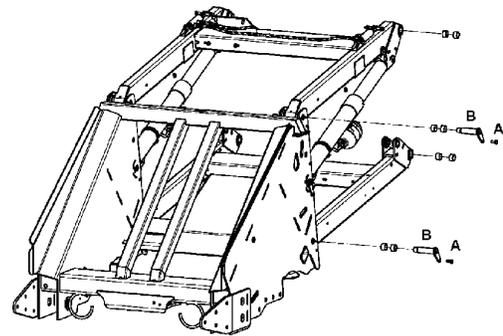
The frame is two sections bolted together. Also the drawbar is bolted to the frame. These bolts need to be tightened correctly. Check regularly if the bolts are tightened according to the specified torques below.



### Wear Bushing Replacement on Boom Lift

The wear bushings are inspected and replaced before they are worn through.

1. Connect the trailer to a tractor and unfold the boom to working position.
2. Lift the boom center frame with a lifting device and support it until the load is taken off the parallelogram arms.
3. Remove the screws (A), and pull out the pins (B) for the upper parallelogram arms and replace the wear bushings.
4. Re-attach the arms.
5. Repeat this procedure with the lower arms.
6. Apply grease into all grease nipples.



### Suspension Rubber Dampers (optional)

If the shock absorbers lose their efficiency, they should be replaced.

1. Connect the sprayer to a tractor to prevent overbalancing.
2. Lift the rear end of the sprayer with e.g. a crane. Use lifting points as described in "Sprayer setup".
3. Loosen the nut below the suspension rubber dampers.
4. Remove the suspension rubber dampers and replace with new ones.
5. Tighten the nut below the suspension rubber dampers.
6. Lower the rear of the sprayer again.

## 6 - Maintenance

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### Shield Replacement on Transmission Shaft (P.T.O.)

- See the manufacturer's instruction book.
- 

### Replacement of Transmission Shaft Cross Journals (P.T.O.)

- See the manufacturer's instruction book.
- 

### Change of Bulbs

1. Switch off the light.
2. Loosen the screws on the lamp and remove the cover or lens.
3. Remove the bulb.
4. Fit a new bulb, refit the cover and tighten the screws.



ATTENTION! If halogen bulbs are used, never touch the bulb with your fingers. Natural moisture in the skin will cause the bulb to burn out when the light is switched on. Always use a clean cloth or tissue when handling halogen bulbs.

---

### Change of Tires



DANGER! If it is necessary to change tires, it is recommended to leave this job to a specialist and follow the rules below. Some mounting instructions are usually printed on the tire itself.

- Always clean and inspect the rim before mounting a new tire.
- Always check that the rim diameter corresponds exactly to the rim diameter molded on the tire.
- Always inspect the tire inside for cuts, penetrating objects or other damages. Repairable damages should be repaired before installing the tube. Tires with non-repairable damages must never be used.
- Also inspect inside the tire for dirt or foreign objects. Remove before installing the tube.
- Always use tubes of recommended size and in good condition. When fitting new tires, always use new tubes.
- Before mounting, always lubricate both tire beads and rim flange with approved lubricating agent or equivalent anti-corrosion lubricant. Never use petroleum based greases and oils because they may damage the tire. Using the appropriate lubricant will prevent the tire from slipping on the rim.
- Always use specialized tools for mounting the tires as recommended by the tire supplier.
- Make sure that the tire is centered, and that the beads are perfectly seated on the rim. Otherwise tearing of the bead wire may occur.
- Inflate the tire to 15-19 psi (1-1.3 bar), then check whether both beads are seated perfectly on the rim. If any of the beads do not seat correctly, deflate the assembly and re-center the beads before starting inflation of the tire. If the beads are seated correctly on the rim at 15-19 psi (1-1.3 bar), inflate the tire to a maximum of 36 psi (2.5 bar) until they seat perfectly on the rim.
- Never exceed the maximum mounting pressure molded on the tire!
- After mounting tires, adjust inflation pressure to operation pressure recommended by the tire manufacturer.
- Do not use tubes in tubeless tires.



DANGER! Not observing mounting instructions will result in a bad seating of the tire on the rim and could cause the tire to burst, leading to serious injury or death!



DANGER! Never mount or use damaged tires or rims! Use of a damaged, ruptured, distorted, welded or brazed rim is not allowed!

### Off-Season Storage

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#### Off-Season Storage Program

When the spraying season is over, you should devote some extra time to the sprayer. If chemical residues are left over in the sprayer for longer periods, it may reduce the life of its individual components. To preserve the sprayer intact and to protect its components, carry out the following off-season storage program.

1. Clean the sprayer completely - inside and outside - as described under "Cleaning" on page 59. Make sure that all valves, hoses and auxiliary equipment have been cleaned with detergent and flushed with clean water afterwards, so that no chemical residues are left in the sprayer.
2. Replace any damaged seals and repair any leaks.
3. Empty the sprayer completely and let the pump work for a few minutes. Operate all valves and handles to drain as much water from the spraying circuit as possible. Let the pump run until air comes out of all nozzles. Remember to drain the rinse tank also.
4. Pour approximately 13 gal. (50 liters) of anti-freeze mixture consisting of 1/3 anti-freeze and 2/3 water into the tank.
5. Engage the pump and operate all valves and functions, operating unit, chemical inductor etc., allowing the anti-freeze mixture to be distributed around the entire circuit. Open the operating unit main ON/OFF valve and distribution valves so the antifreeze is sprayed through the nozzles as well. The anti-freeze will also prevent O-rings, seals, diaphragms etc. from drying out. On sprayers with a FlexCapacity pump, this must also be engaged and flushed.
6. Lubricate all lubricating points according to the lubricating intervals.
7. When the sprayer is dry, remove rust from scratches or damages in the paint, if any, and touch up the paint.
8. Remove the glycerin-filled pressure gauges and store them frost-free in vertical position.
9. Apply a thin layer of anti-corrosion oil (e.g. SHELL ENSIS FLUID, CASTROL RUSTILO or similar) on all metal parts. Avoid oil on rubber parts, hoses and tires.
10. Fold the boom in transport position and relieve pressure from all hydraulic functions.
11. All electric plugs and sockets are to be stored in a dry plastic bag to protect them against moisture, dirt and corrosion.
12. Remove the control boxes and computer display from the tractor. Store them dry and clean (indoors) in a non-condensing environment.
13. Wipe hydraulic quick-couplers clean and fit the dust caps.
14. Apply grease to all hydraulic ram piston rods which are not fully retracted in the barrel to protect against corrosion.
15. Chock the wheels to prevent moisture damage and deformation of the tires. Tire blacking can be applied to the tire walls to preserve the rubber.
16. To protect against dust, the sprayer can be covered by a tarpaulin. Ensure ventilation to prevent condensation.

## 6 - Maintenance

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### **Preparing the sprayer for use after storage**

After a storage period, the sprayer should be prepared for the next season in the following way:

1. Remove the tarpaulin.
2. Remove the support from the wheel axle and adjust the tire pressure.
3. Wipe off the grease from hydraulic ram piston rods.
4. Fit the pressure gauges again. Seal with Teflon tape.
5. Connect the sprayer to the tractor, including hydraulics and electrics.
6. Check all hydraulic and electric functions.
7. Empty the tank of remaining anti-freeze.
8. Rinse the entire liquid circuit of the sprayer with clean water.
9. Fill with clean water and check all functions.

### Operational Problems

---

#### General Info

Operational incidents are often due to the same reasons:

- A suction leakage reduces the pump pressure and may interrupt suction completely.
- A clogged suction filter may hinder or interrupt suction and prevent the pump from running normally.
- A clogged pressure filter increases pressure in the fluid system before the filter, but decreases pressure at the nozzles. This may blow the safety valve.
- Clogged in-line filters or nozzle filters increase pressure in the pressure gauge, but decreases pressure at the nozzles.
- Impurities sucked in by the pump may prevent the valves from closing correctly, thus reducing the pump flow.
- Poor reassembly of the pump, especially the diaphragm covers, allows air intakes or leaks and reduces the pump flow.
- Rusted or dirty hydraulic components cause bad connections and early wear.
- A poorly charged or faulty battery causes failure and misbehavior in the electrical system.

#### Therefore ALWAYS check that

- Suction, pressure and nozzle filters are clean.
- Hoses are free of leaks and cracks, particularly suction hoses.
- Gaskets and O-rings are present and in good condition.
- Pressure gauges are in good working order. Dosage accuracy depends on it.
- Operating unit functions properly. Use clean water to check.
- Hydraulic components are clean.
- The tractor battery and its connectors are in good condition.

## 7 - Fault finding

### Liquid System

FAULT	PROBABLE CAUSE	CONTROL/REMEDY
No spray from boom when turned on.	SmartValve/Pressure valve positions are wrong. Suction/pressure filters are clogged. No suction from tank.	Set correct valve positions for spraying. Clean suction and pressure filters. See if suction fitting in main tank sump is free of sedimentation. Clean if needed.
Lack of pressure.	Incorrect assembly.  Air in system. Too much agitation. Pump valves are blocked or worn. Blocked filters Defective pressure gauge.	Boost valve is open (located at the bottom of the CycloneFilter).  Fill suction hose with water for initial priming. Close the agitation valve. Check for obstructions and wear. Clean all filters. Check for dirt at inlet of pressure gauge.
Pressure dropping.	Filters are clogging.  Nozzles are worn. Sucking air towards end of tank load.	Clean all filters. Fill with cleaner water. If using powders, make sure agitation is on. Check flow rate. Replace nozzles, if it exceeds 10%. Lower pump speed (r.p.m.).
Pressure increasing.	Pressure filters beginning to clog.	Clean all filters.
Formation of foam.	Air is being sucked into system.  Excessive liquid agitation.	Check tightness/gaskets/O-rings of all fittings on suction side.  Lower pump speed (r.p.m.). Check safety valve is tight. Ensure returns inside the tank are present. Use a foam damping additive.
Vibrations in system and unpleasant noise from the pump.	Air is being sucked into system.	Check for leaks, holes in hoses, tightness/gaskets/O-rings of all fittings on the suction side.
Operating unit is not functioning, or it is having a malfunction.	Blown fuse(s).  Wrong polarity. Valves not closing properly.  No power.	Check mechanical function of micro switches. Use cleaning/lubricating agent if the switch does not operate freely. Check motor current, max. 450-500 mA. If over, change the motor. Brown to positive (+). Blue to negative (-). Check valve seals for obstructions. Check micro switch plate position. Loosen the screws holding the plate 1/2 turn. Wrong polarity. Check that brown is positive (+), blue is negative (-). Check print plate for dry solders or loose connections. Check fuse holder is tight around fuse.

### Pump

Liquid leaks from the bottom of the pump.	Damaged diaphragm.	Replace diaphragm. See maintenance section.
Grease leaks from the bottom of the pump.	Grease used has too low viscosity.	Change to recommended grease type.
Grease leaks from the shaft grease seals.	Grease used has too low viscosity. Bearings worn/too high friction.	Change to recommended grease type. Replace pump bearings and grease seals.
Lack of pressure.	Pump valves are blocked or defective Blocked filters	Check for obstructions or, if needed, replace valves. Clean all filters.
Vibrations in system and unpleasant noise from the pump.	Pump valves are blocked or defective Air is being sucked into system.	Check for obstructions or, if needed, replace valves. Check for leaks, pinholes in suction hoses, tightness/gaskets/O-rings of all fittings on the suction side.
Lack of flow/capacity.	Internal wear on connecting rod and ring. Pump valves are blocked or defective	Poor greasing. Replace parts as needed and observe proper grease quality and intervals. Check for obstructions or, if needed, replace valves.
Extreme internal erosion on diaphragm covers and housing.	Too high vacuum caused by clogged suction filter or excessive pump speed (r.p.m.).  Lack of internal cleaning.  Lack of conservation of the fluid system during storage.	Replace affected pump parts. Clean suction filter and observe maximum pump speed (r.p.m.).  Use recommended cleaning procedures and add extra cleaning agents (e.g. AllClearExtra or similar). Always use a proper mixture of anti-freeze during storage.

### Hydraulic System, Z-version

FAULT	PROBABLE CAUSE	CONTROL/REMEDY
No boom movements when activated.	Insufficient hydraulic pressure.	Check oil pressure.
	Insufficient oil supply.	Check tractor hydraulic oil level. Oil flow must be 4-21 gpm (15 - 80 l/min.)* Check tractor hydraulic oil level.
	Blown fuse(s).	Check / replace fuse in junction box.
	Bad / corroded electrical connections.	Check / clean connections, multi plugs etc.
	Insufficient power supply.	Voltage on activated solenoid valve must be more than 8 volts. Use wires of at least 4 mm <sup>2</sup> for power supply.
	Defective relay / diodes in junction box.	Check relays, diodes and soldering at PCB in junction box. LED diodes indicate boom functions.
	Clogged restrictors in bypass block.	Remove and clean restrictors in bypass block (See hydraulic diagram). Change hydraulic oil + filter.
ParaLift™ lock does not lock. Boom lift raises to max. position, when tractor hydraulics are engaged.	Wrong polarity.	Check polarity. Red positive (+), black negative (-).
	Back pressure in return line exceeds 220 psi (15 bar).	Connect the return line with a free flow to hydraulic oil reservoir.  Divide return line in two and lead return oil back to reservoir via two spool valves.
Oil heats up in Closed Center systems.	Bypass valve does not close properly.	Check / close (screw in) by-pass valve.
	Internal leaks in flow regulator.	Replace flow regulator O-rings and backup rings. Replace flow regulator.
Individual hydraulic piston does not move.	Clogged restrictor.	Dismantle and clean restrictor.

\* Depending on scope of supply.



NOTE! Other manuals supplied with your sprayer may contain more information.

## 7 - Fault finding

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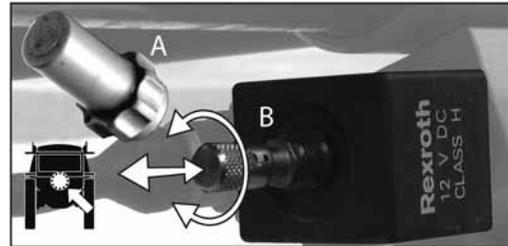
### Mechanical problems

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#### Emergency Operation - Hydraulics

In case of power failure, the damper control can be operated as follows:

1. Remove plastic cover (A) from valve (B).
2. Pivot valve (B) inward.



#### Emergency Operation - Liquid system

In case of power failure, it is possible to operate all functions of the operating unit manually. First disconnect the multi-plug from the control box. Now manually turn the emergency control knobs.

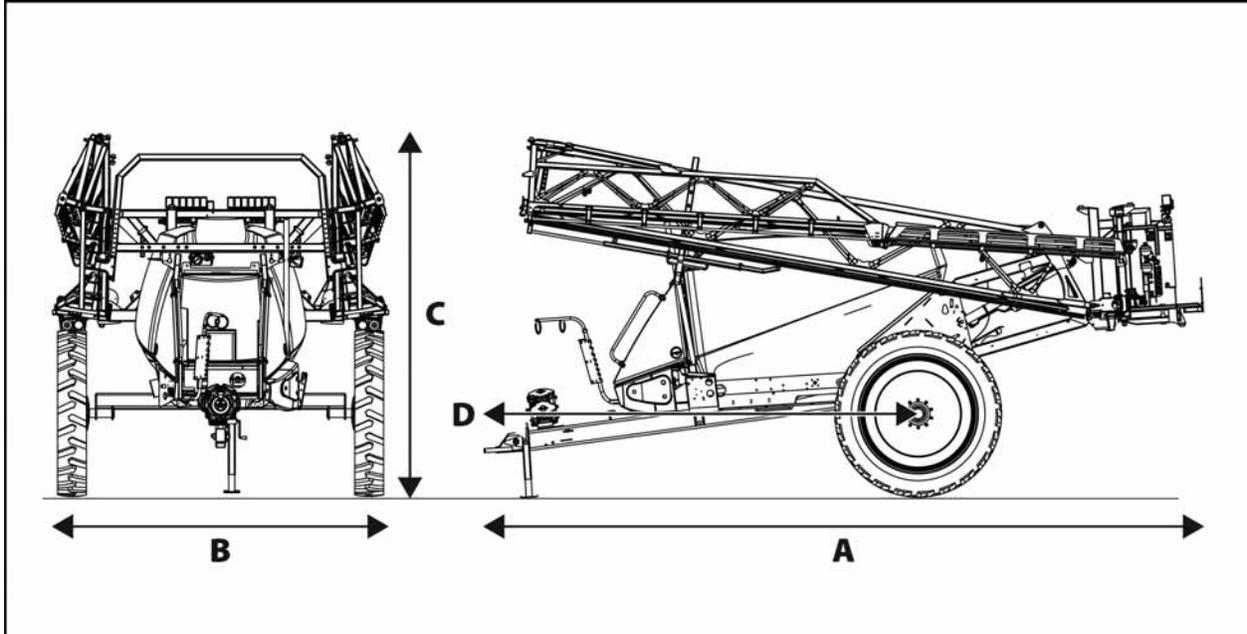
The problem may be due to a blown fuse. A fuse is placed inside the control box. Fuse type: Thermo.

## Dimensions

### General Info

All dimensions, values and weights are depending on mounted options and specific adjustments.

### Overall Dimensions



Eagle™ boom:

Model	Navigator 3100/3800/4500	Navigator 6200
A - Total length	23'2"	24'8"
B - Total width	11'5"	11'5"
C - Total height	12'3"	12'3"
D - Draw to axle	14'9"	16'4"

Delta Force boom:

Model	Navigator 3100/3800/4500	Navigator 6200
A - Total length	24'4"	25'10"
B - Total width	11'4"	11'9"
C - Total height	12'4"	12'6"
D - Draw to axle	15'1"	16'4"

### Tank capacities

Main tank capacity	800, 1000, 1200 or 1600 gallons (3100, 3800, 4500 or 6100 Liters)
Clean water tank capacity	5 gallons (20 Liters)
Rinse tank capacity	130 gallons (500 Liters)
Foam marker tank capacity	25 gallons (100 Liters)

## 8 - Technical specifications

### Weight

#### Navigator 3100 with Eagle™ boom

Boom Width	Empty tank					Full tank*				
	Folded in transport		Unfolded		Total Weight	Folded in transport		Unfolded		Total Weight
	Axle load	Hitch load	Axle load	Hitch load		Axle load	Hitch load	Axle load	Hitch load	
45 ft. SPB	5104	462	5236	330	5566	10853	2387	10985	2255	13240
50 ft. SPB	5148	473	5313	308	5621	10897	2398	11062	2233	13295
60 ft. SPB	5236	484	5456	264	5720	10985	2409	11205	2189	13394
66 ft. SPB	5280	495	5555	220	5775	11029	2420	11304	2145	13449
80 ft. SPC	6886	660	7568	-22	7546	12635	2585	13317	1903	15220
90 ft. SPC	6974	682	7722	-66	7656	12723	2607	13471	1859	15330
100 ft. SPC	7172	704	8030	-154	7876	12921	2629	13779	1771	15550

All weights in pounds (lbs)

\*Main tank capacity: 800 gal (3028 L), Rinse tank capacity: 122 gal (460 L), filled with water

#### Navigator 3800 with Eagle™ boom

Boom Width	Empty tank					Full tank*				
	Folded in transport		Unfolded		Total Weight	Folded in transport		Unfolded		Total Weight
	Axle load	Hitch load	Axle load	Hitch load		Axle load	Hitch load	Axle load	Hitch load	
45 ft. SPB	5148	473	5247	374	5621	12080	2880	12179	2781	14960
50 ft. SPB	5192	484	5324	352	5676	12124	2891	12256	2759	15015
60 ft. SPB	5280	495	5467	308	5775	12212	2902	12399	2715	15114
66 ft. SPB	5324	506	5566	264	5830	12256	2913	12498	2671	15169
80 ft. SPC	6930	671	7579	22	7601	13862	3078	14511	2429	16940
90 ft. SPC	7018	693	7733	-22	7711	13950	3100	14665	2385	17050
100 ft. SPC	7216	715	8041	-110	7931	14148	3122	14973	2297	17270

All weights in pounds (lbs)

\*Main tank capacity: 1000 gal (3785 L), Rinse tank capacity: 122 gal (460 L), filled with water

#### Navigator 4500 with Eagle™ boom

Boom Width	Empty tank					Full tank*				
	Folded in transport		Unfolded		Total Weight	Folded in transport		Unfolded		Total Weight
	Axle load	Hitch load	Axle load	Hitch load		Axle load	Hitch load	Axle load	Hitch load	
45 ft. SPB	5258	484	5324	418	5742	13376	3370	13442	3304	16746
50 ft. SPB	5302	495	5401	396	5797	13420	3381	13519	3282	16801
60 ft. SPB	5390	506	5544	352	5896	13508	3392	13662	3238	16900
66 ft. SPB	5434	517	5643	308	5951	13552	3403	13761	3194	16955
80 ft. SPC	7040	682	7656	66	7722	15158	3568	15774	2952	18726
90 ft. SPC	7128	704	7810	22	7832	15246	3590	15928	2908	18836
100 ft. SPC	7326	726	8118	-66	8052	15444	3612	16236	2820	19056
120 ft. SPC	9266	719	10505	-519	9985	17384	3605	18623	2367	20990

All weights in pounds (lbs)

\*Main tank capacity: 1200 gal (4542 L), Rinse tank capacity: 122 gal (460 L), filled with water

#### Navigator 6200 with Eagle™ boom

Boom Width	Empty tank					Full tank*				
	Folded in transport		Unfolded		Total Weight	Folded in transport		Unfolded		Total Weight
	Axle load	Hitch load	Axle load	Hitch load		Axle load	Hitch load	Axle load	Hitch load	
80 ft. SPC	9064	1001	9680	385	10065	19668	4741	20284	4125	24409
90 ft. SPC	9152	1023	9834	341	10175	19756	4763	20438	4081	24519
100 ft. SPC	9350	1045	10142	253	10395	19954	4785	20746	3993	24739
120 ft. SPC	11290	1038	12529	-200	12328	21894	4778	23133	3540	26673

All weights in pounds (lbs)

\*Main tank capacity: 1600 gal (6056 L), Rinse tank capacity: 122 gal (460 L), filled with water

## 8 - Technical specifications

### Weight (cont.)

#### Navigator 4500 with Delta Force boom

Boom Width	Empty tank					Full tank*				
	Folded in transport		Unfolded		Total Weight	Folded in transport		Unfolded		Total Weight
	Axle load	Hitch load	Axle load	Hitch load		Axle load	Hitch load	Axle load	Hitch load	
<b>90 ft. DTZ</b>	7546	836	8547	-165	8382	15664	3722	16665	2721	19386
<b>100 ft. DTZ</b>	7612	869	8590	-209	8481	15730	3755	16808	2677	19485
<b>120 ft. DTZ</b>	9379	803	10934	-752	10182	17497	3689	19052	2134	21186
<b>132 ft. DTZ</b>	9368	814	10934	-752	10182	17486	3700	19052	2134	21186

All weights in pounds (lbs)

\*Main tank capacity: 1200 gal (4542 L), Rinse tank capacity: 122 gal (460 L), filled with water

#### Navigator 6200 with Delta Force boom

Boom Width	Empty tank					Full tank*				
	Folded in transport		Unfolded		Total Weight	Folded in transport		Unfolded		Total Weight
	Axle load	Hitch load	Axle load	Hitch load		Axle load	Hitch load	Axle load	Hitch load	
<b>90 ft. DTZ</b>	9548	1170	10571	147	10718	20152	4910	21175	3887	25062
<b>100 ft. DTZ</b>	9614	1203	10714	103	10817	20218	4943	21318	3843	25161
<b>120 ft. DTZ</b>	11381	1137	12958	-440	12518	21985	4877	23562	3300	26862
<b>132 ft. DTZ</b>	11370	1148	12958	-440	12518	21974	4888	23562	3300	26862

All weights in pounds (lbs)

\*Main tank capacity: 1600 gal (6056 L), Rinse tank capacity: 122 gal (460 L), filled with water

## 8 - Technical specifications

### Wheel and Axle Dimensions

Sprayer model	Wheel	60" fixed axle	120" fixed axle	60"-120" adj. axle	60"-90" adj. axle	Clearance*
3100/3800/4500	320/90 R46	61"	120"	61"-120"	N/A	31"
3100/3800/4500	380/90 R46	N/A	120"	64"-120"	N/A	31"
3100/3800/4500	320/90 R50	N/A	N/A	N/A	61"-90"	30"
6200	320/90 R50	N/A	120"	N/A	61"-90"	30"
6200	380/90 R46	N/A	120"	N/A	64"-90"	28"
6200	480/80 R46	N/A	120"	N/A	68"-90"	31"

\* below wheel axle  
N/A: Not Applicable

### Tire Pressure

Tire size (")	Load index	Navigator 3100		Navigator 3800		Navigator 4500			Navigator 6200	
		SPB	SPC	SPB	SPC	SPB	SPC	DTZ	SPC	DTZ
320/90 R46	148 A8	36	48	42	52	50	52	52	N/A	N/A
380/90 R46	156 A8	22	35	26	42	35	44	48	N/A	N/A
320/90 R50	169 D	20*	24*	20*	30*	24*	35*	40*	64*	66*
320/90 R50	169 D	10**	10**	10**	12**	10**	15**	18**	22**	24**
380/90 R46	168 A8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	68	72
480/90 R46	168 A8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	50	52

\*Single  
\*\*Dual  
N/A: Not Applicable



NOTE! Be aware of the specific data for your sprayer.



ATTENTION! Legislation and requirements regarding maximum allowable axle load, when driving on public roads, may vary by region. Always follow local legislation in force at any time.



WARNING! If changing tires, always use tires with minimum load index as specified.



DANGER! Never inflate tires to more than the pressure specified in the table. Over-inflated tires can explode causing severe personal injuries! See "Change of Tires" on page 82.

### Specifications

#### Diaphragm pumps

Pump model 364/5.5	PSI	RPM	GPM	HP
	0	1000	51.2	4.2
	220	1000	47.6	7.8

Pump model 364/10.0	PSI	RPM	GPM	HP
	0	540	51.2	2.4
	220	540	47.0	8.3

Pump model 464/6.5	PSI	RPM	GPM	HP
	0	1000	92.2	4.3
	220	1000	78.7	13.8

Pump model 464/12.0	PSI	RPM	GPM	HP
	0	540	88.2	3.0
	220	540	81.9	13.0

#### Filters and nozzles

Filter mesh width

30 mesh: 0.58 mm

50 mesh: 0.30 mm

80 mesh: 0.18 mm

100 mesh: 0.15 mm

#### Temperature and pressure ranges

Spray liquid:

Operating temperature range: 36° F to 104° F (2° to 40° C)

Operating pressure for safety valve: 220 psi (15 bar)

Max. pressure on the pressure manifold: 290 psi (20 bar)

Max. pressure on the suction manifold: 22 psi (1.5 bar)

Hydraulics:

Operating temperature range: 36° F to 176° F (2° to 80° C)

Max. operating pressure:

Tractor: 3046 psi (210 bar)

#### Power consumption

Sprayer	Hp	kW
3100	100	75
3800	110	82
4500	115	86
6200	145	109

## 8 - Technical specifications

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### Materials and Recycling

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#### Disposal of the Sprayer

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

Materials used:

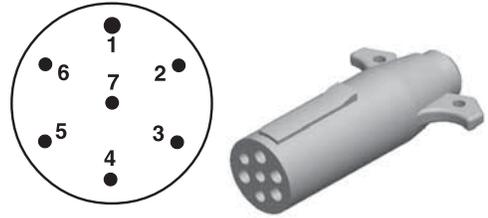
Tanks:	Plastic (HDPE)
Chassis, frame:	Steel (various types)
Boom:	Steel (various types)
Tires:	Rubber
Pump housing:	Grey cast iron (GG200)
Pump diaphragms:	Plastic (PUR)
Hoses (suction):	Plastic (PVC)
Hoses (pressure):	Rubber (EPDM)
Valves:	Glass reinforced plastic (PA)
Hose and pipe fittings:	Glass reinforced plastic (PA)
Filter housings:	Plastic (PP)
Nozzles:	Plastic (POM)

## Electrical Connections

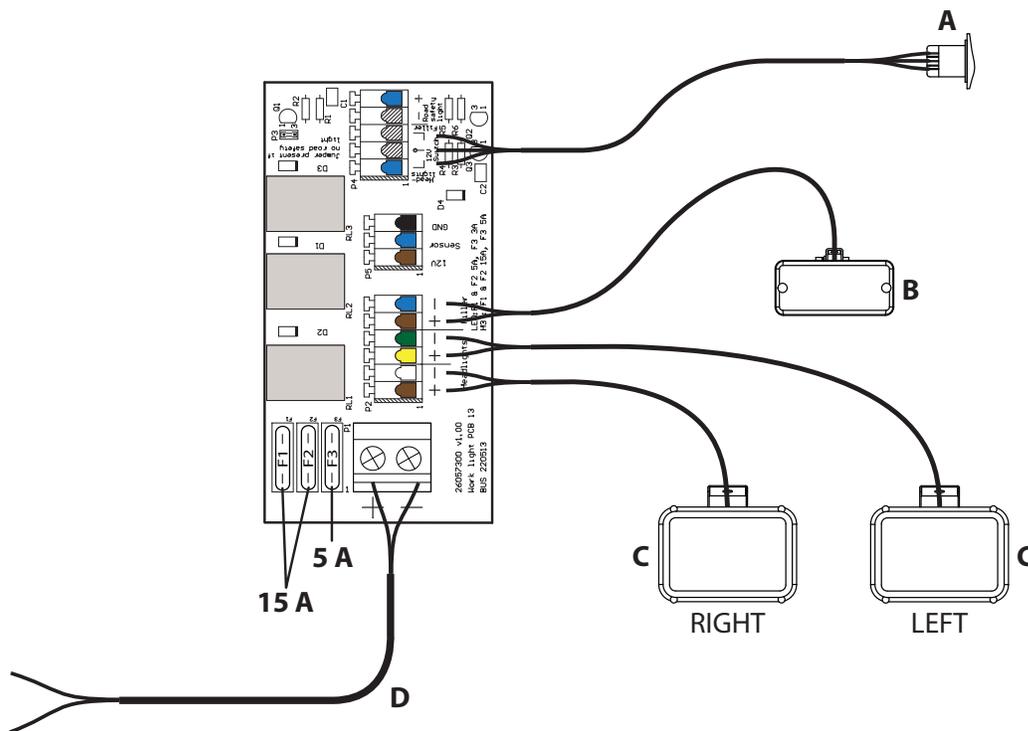
### Road traffic lights

The wiring is in accordance with ANSI/ASAE S279.11.

Position	Wire color
1. Ground	White
2. Work lamps	Black
3. LH flashing & turn indicator	Yellow
4. Free	Red
5. RH flashing & turn indicator	Green
6. Free	Brown
7. Free	Blue



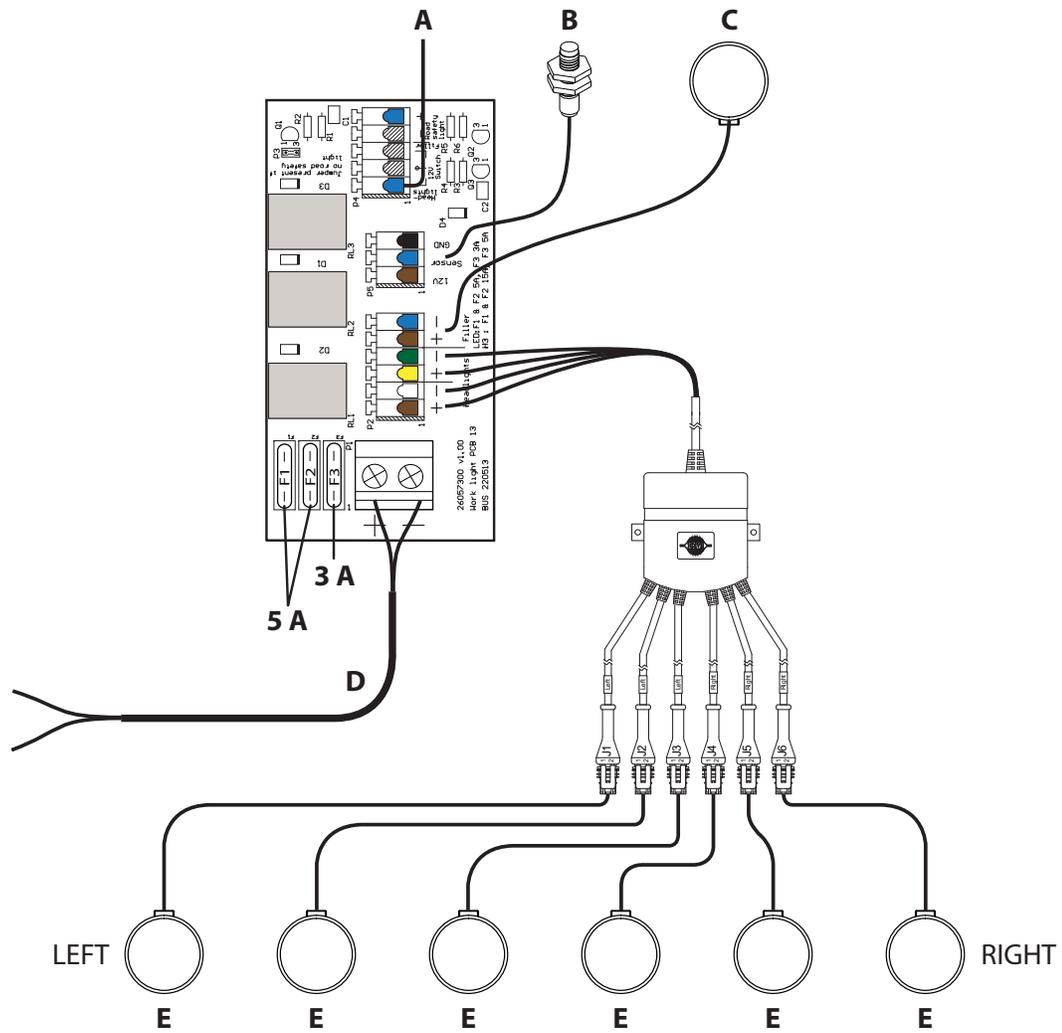
### Electrical Schematic for Boom and Work Lights (SPB/SPC Booms)



- A Switch for work/boom lights
- B Work light
- C Boom lights
- D Cable to JobCom

# 8 - Technical specifications

## Electrical Schematic for Boom and Work Lights (DTZ Booms)



- A Input from tractor to activate
- B Sensor for work light
- C Work light
- D Cable to JobCom
- E Boom lights

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### Warranty policy and conditions

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HARDI® NORTH AMERICA INC. , 1500 West 76th Street, Davenport, Iowa, USA hereinafter called "HARDI®", offers the following limited warranty in accordance with the provisions below to each original retail purchaser of its own manufacturer, from an authorized HARDI® dealer that such equipment is at the time of delivery to such purchaser, free from defects in material and workmanship and that such equipment will be warranted for a period of one year from the time of delivery to the end user, providing the machine is used and serviced in accordance with the recommendations in the Operator's Manual and is operated under normal farm conditions.

1. This limited warranty is subject to the following exceptions:
  - a)Parts of the machine not manufactured by HARDI®, (i.e. engines, tires, tubes, electronic controls and other components or trade accessories, etc.) are not covered by this warranty but are subject to the warranty of the original manufacturer. Any claim falling into this category will be taken up with the manufacturer concerned.
  - b)This warranty will be withdrawn if any equipment has been used for purposes other than for which it was intended or if it has been misused, neglected, or damaged by accident, let out on hire or furnished by a rental agency. Nor can claims be accepted if parts other than those manufactured by HARDI® have been incorporated in any of our equipment. Further, HARDI® shall not be responsible for damage in transit or handling by any common carrier and under no circumstances within or without the warranty period will HARDI® be liable for damages of loss of use, or damages resulting from delay or any consequential damage.
2. We cannot be held responsible for loss of livestock, loss of crops, loss because of delays in harvesting or any other expense or loss incurred for labor, supplies, substitute machinery, rental for any other reason, or for injuries either to the owner or to a third party, nor can we be called upon to be responsible for labor charges, other than originally agreed, incurred in the removal or replacement of components.
3. The customer will be responsible for and bear the costs of:
  - a)Normal maintenance such as greasing, maintenance of oil levels, minor adjustments including the boom.
  - b)Transportation of any HARDI® product to and from where the warranty work is to be performed.
  - c)Dealer travel time to and from the machine or to deliver and return the machine from the service workshop for repair unless otherwise dictated by state law.
  - d)Dealer traveling costs.
4. Parts defined as normal wearing items, (i.e. Pump Diaphragms, Valves, O-rings, Tires and V-belts) are not in any way covered under this warranty.
5. This warranty will not apply to any product which is altered or modified without the express written permission of the HARDI® Service and Engineering Departments and/or repaired by anyone other than an Authorized HARDI® Dealer.
6. Warranty is dependent upon the strict observance by the purchaser of the following provisions:
  - a)That this warranty may not be assigned or transferred to anyone.
  - b)That the Warranty Registration Certificate has been correctly completed by dealer and purchaser with their names and addresses, dated, signed and returned to the appropriate address as given on the Warranty Registration Certificate within 30 days of delivery to the purchaser.
  - c)That all safety instructions in the operator's manual shall be followed and all safety guards regularly inspected and replaced where necessary.
7. No warranty is given on second-hand products and none is implied.
8. Subject to the following terms, conditions and contributions, HARDI® extends the warranty on polyethylene tanks (excluding fittings, lids and gaskets) to FIVE YEARS on field sprayers. To qualify for this extended warranty, the tank must be drained and flushed with fresh water after each day's use. HARDI®'s liability is limited to replacement of defective parts FOB our plant in Davenport, IA at no cost to the purchaser for the first twelve months after date of purchase; at 20% of the then current retail price during the second year; at 40% during the third year; at 60% during the fourth year; and at 80% during the fifth year. This extended warranty is subject, in each instance, to the tank being inspected and approved for replacement or repair by HARDI® personnel before HARDI® will accept any liability hereunder.
9. Subject to the following terms, conditions and contributions, HARDI® extends the warranty on HARDI® diaphragm pumps (excluding wearing parts such as diaphragms, valves and o-rings) to FIVE YEARS. To qualify for this extended

## 9 - Warranty

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warranty, the pump must be drained and flushed with fresh water after each day's use. HARDI®'s liability is limited to replacement of defective parts, FOB our plant in Davenport, IA at no cost to the purchaser during the first twelve months after date of purchase; at 20% of the then current retail price during the second year; at 40% during the third year; at 60% during the fourth year; and at 80% during the fifth year. This five year extended warranty is subject, in each instance, to the pump being inspected and approved for replacement or repair by HARDI® personnel before HARDI® will accept any liability hereunder.

10. HARDI® reserves the right to incorporate any change in design in its products without obligation to make such changes on units previously manufactured.
11. The judgement of the HARDI® Service Department in all cases of claims under this warranty shall be final and conclusive and the purchaser agrees to accept its decisions on all questions as to defect and the repair or exchange of any part or parts.
12. No employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by the CEO in the Davenport office. Approval of warranty is the responsibility of the HARDI® Service Department.
13. Any warranty work performed which will exceed \$1000.00 MUST be approved IN ADVANCE by the Service Department. Warranty claims filed without prior approval will be returned.
14. ANY pump replacement MUST be approved by the HARDI® Service Department.
15. Claims under this policy MUST be filed with the HARDI® Service Department within thirty (30) days of when the work is performed or warranty shall be void unless prior arrangements are made.
16. Parts which are requested for return by the HARDI® Service Department must be returned prepaid within thirty (30) days for warranty settlement.
17. Warranty claims must be COMPLETELY filled out including part numbers and quantities or claims will be returned to the submitting dealer.

### DISCLAIMER OF FURTHER WARRANTY

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, EXCEPT AS SET FORTH ABOVE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE PRODUCT CONTAINED HEREIN. IN NO EVENT SHALL THE COMPANY BE LIABLE FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES (SUCH AS LOSS OF ANTICIPATED PROFITS) IN CONNECTION WITH THE RETAIL PURCHASER'S USE OF THE PRODUCT.

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**HARDI® North America Inc.**

1500 West 76th St - Davenport, IA 52806

Ph: (563) 386-1730

Customer Service Email: [custserv@hardi-us.com](mailto:custserv@hardi-us.com)

Email: [info@hardi-us.com](mailto:info@hardi-us.com)

Website: [www.hardi-us.com](http://www.hardi-us.com)