



The Sprayer

Operator's Manual

SARITOR 4000/5000

Instruction book

67023003 - Version 1.10

US - 10.2016



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Welcome letter



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

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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

Before using the sprayer, read the following recommendations and safety instructions.

- Read this instruction book carefully before using the equipment. It is equally important that other operators of this equipment also read 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 according to the plant protection chemicals used. Comply to any applicable local legislation.
 - After spraying, the operator should wash and change his clothes.
 - Rinse and wash equipment after use and before servicing. Wash tools if they have become contaminated.
 - Do not eat, drink or smoke during the use and maintenance of your sprayer.
 - In case of poisoning, immediately seek medical advice. Remember to identify chemicals used. Follow instructions indicated on the label(s) of the products used.
 - Never service or repair the equipment while it is operating.
 - Replace all safety devices or shields immediately after servicing.
 - Do not go under the machine unless it is secured. The boom is secure when placed in the transport brackets.
 - Do not attempt to enter the tank.
 - Keep children away from the sprayer.
-

Important guidelines

- Comply with all recommendations for installation, carrying out adjustments, maintenance and repair contained in this instruction book.
 - Use only original spare parts and accessories conforming to the manufacturer's recommendations.
 - Do not modify or have your machine and its accessories modified by someone else (mechanical, electrical, hydraulic and pneumatic characteristics) and, more generally, the parts of the machine affecting user safety, without first requesting written agreement from the manufacturer.
 - Failure to respect these rules may make your machine dangerous. In the event of damage or injury, HARDI® shall not be held liable in any way.
-

2 - Safety notes

Operator's skill

The machine should be used and maintained by people who are aware of its special use and safety characteristics. Before using your machine, familiarize yourself with all the commands. When working, it will be too late to do so. Ensure that you have the skills required for protecting crops and the environment, and for handling and spraying plant protection chemicals.

Driving on public roads

When driving on public roads, obey all traffic regulations. Pay particular attention to those regarding mandatory equipment such as lights, indicators, hazard lights, etc.

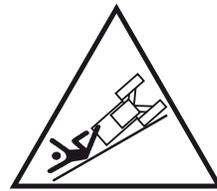
You should be aware of the vehicle's size and weight, particularly the overall width and height.



WARNING! You must in all circumstances adapt your driving on the road, particularly by reducing your speed during turns or when road conditions demand. Also reduce speed when meeting or being passed by another vehicle.

Driving in fields

Be very careful to avoid the risk of overturning when driving at speeds greater than 9 mph (15 km/h) or when driving on a slope.



ATTENTION! As a general rule:

- Adapt your speed and driving to suit the terrain you are driving on. Be aware and take care!
- Slow down when driving on uneven terrain as the sprayer may become unbalanced and overturn.
- No persons are allowed in the operational area of the sprayer. Take care not to harm people or surroundings when maneuvering the sprayer, especially while backing up.
- In all circumstances and particularly on uneven and sloping terrain, drive the machine at a low speed, especially on curves and avoid sudden changes of direction.
- Do not brake or accelerate suddenly when going up or down a slope, bearing in mind the variable volume of liquid in the sprayer tank.



DANGER! Boom maneuvers should be carried out with the sprayer stationary and on flat ground. Ensure that there are no obstacles nearby (electrical lines, people, poles etc.).

Lights, working at night

If there is insufficient light for working at night, the spraying boom should be equipped with boom lights. For more information on this equipment, contact your HARDI® dealer.

Recommendations to users of crop protection chemicals

This sprayer has been designed and manufactured by HARDI® for the application of crop protection chemicals. For your safety and the proper functioning of the sprayer, it is important to read and understand all instruction books delivered with this sprayer.

It is also the sole responsibility of the operator to strictly comply with all recommendations given by the manufacturers of all crop protection chemicals used with this sprayer.

In particular, it is strongly recommended that any operator of this sprayer:

- Carefully read the label(s) of the manufacturer(s) of the treatment products used with this sprayer and follow the instructions given (measuring, personal protective equipment, etc.);
- Mix only products whose compatibility was expressly recognized by the manufacturer(s) of the crop protection chemicals being mixed;
- Avoid introducing air while filling the tank to prevent the formation of foam and cause problems with overflow;
- Follow the manufacturer(s) instructions and warnings for all crop protection chemicals regarding proper storage, processing and keeping chemicals out of the reach of children and animals;
- Observe all precautions relating to the disposal/recycling of packaging, in accordance with the recommendations of the manufacturer(s) of the products used;
- Contact the manufacturer(s) of the plant protection product (or their representative) if any doubt remains after reading the label(s) of their product(s).

Personal safety equipment

Depending on which type of chemical is used, some or all of the following protective clothing and equipment will be required:

1. Ear muffs
2. Safety goggles or face shield
3. Respirator
4. Chemical resistant coveralls
5. Chemical resistant gloves
6. Chemical resistant boots

Contaminated clothing

Contaminated clothing should be removed and safely stored and laundered. Do not contaminate the inside of the cab with soiled clothing.



2 - Safety notes

Explanation of symbols on safety decals

Safety decals

The orange triangle decals on your sprayer will caution you in regards to hazards that may be encountered in various areas of the sprayer.

This manual contains explanations for the decals which are found on your sprayer.

Mandatory

Read manual

- Consult Operator's Manual, located inside the black manual holder or in manual slot in the cab.



Remove key

- Used in conjunction with 'Read Manual' symbol to warn that manual must be read before operating the sprayer.



Personal protective equipment

- Overalls, face screen, mask and gloves must be worn to operate in this area.



Maintenance

- A regular inspection and maintenance schedule is needed to keep this part operating safely.
- Consult Operator's Manual for maintenance schedule.



Tire pressure check

- A regular inspection and maintenance schedule is needed to keep tires operating safely.
- Consult Operator's Manual for recommended pressure levels



Prohibited

Speed limit

- Maximum speed limit while operating the sprayer.
- Extra care must be taken on hills and when cornering.



No passengers on sprayer

- Do not climb onto tank or into it.
- Danger of injury or death.



2 - Safety notes

Do not drink

- Water from clean water tank is for hand washing, cleaning of clogged nozzles, etc. This water must never be used for drinking.



Do not overfill tank

- Risk of contamination.
- Risk of tank damage.



Danger

Overhead wires

- Take care when operating near wires to prevent entanglement or electrocution.



Fluids under pressure

- Wear gloves and face screen.



Chemical hazards

- Read manufacturer's labels.
- Wear personal protective equipment, including face screen and gloves, when handling these.
- Provide adequate ventilation.



Danger overhead

- Do not enter paralift area or stand under booms.
- Take care when opening doors/covers - loose items may be present in them.



Danger, toxic fumes may be present

- Take care when opening lids - fumes may be present.
- Do not inhale tank fumes.



Danger of toppling over on hillside or slope

- Drive with extreme caution.
- Widen axle track width to minimize risk.



2 - Safety notes

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. _____

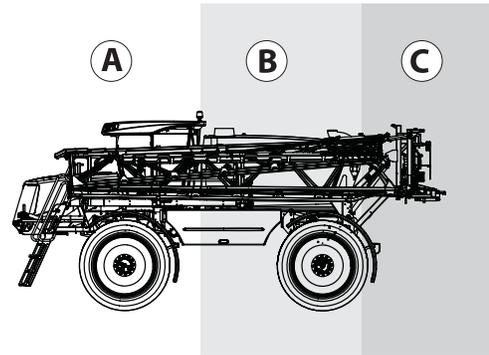
10. _____

General information

General View

The SARITOR is divided into 3 zones: a Clean zone, a Working zone and a Spraying zone, referring to the level of possible chemical contamination. The functions and features are listed by zones below. Please note that some of the features are optional equipment.

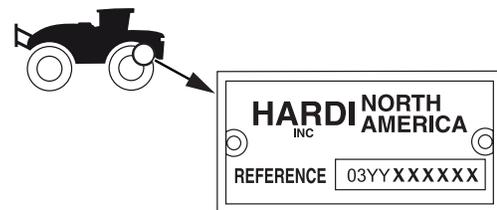
A. Clean Zone	Engine Working platform with ladder Cabin Valve for hand washing
B. Working Zone	Access to Main tank Tank level indicator Multipath Valves FastFiller coupler ChemFiller
C. Spraying Zone	Boom lift, up/down Boom Nozzles Mudguards Suspension



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.

Sprayer identification plates



Frame

Very strong and compact frame which also has a strong chemical and weather resistant electrostatic lacquer coat. The hardware is either stainless steel or treated to be resistant to corrosion. The front and rear suspension is provided by a pneumatic system.

Tanks

The main tank is made of impact-proof, UV-resistant and chemical resistant polyethylene. It has a purposeful design with no sharp corners for easy cleaning. Nominal content: 1100 gallons (4000 liters) or 1300 gallons (5000 liters). A large, easy to read tank level indicator is placed beside the platform and is visible from the cabin. The filling hole is placed so it can be accessed from the platform. The SARITOR is standard equipped with a 150 gallon (575 liter) rinse tank, and a 26 gallon (100 liter) clean water tank (hand washing tank).

3 - Description

Liquid system

General information - valve system

All of the spray functions are operated via centrally located valves with color coded pictorial symbols for easy operation. The fluid system is located on the sprayer's left side under the cover. To access the Fluid Working Zone, open the cover. Most valves can be operated from both the Fluid Working Zone or from the cab.

Pump

The SARITOR uses the HARDI® 650 WetSeal run dry centrifugal pump.

Valves and symbols

The valves are identified by colored symbols according to their function. They correspond to the different possible functions of the valves, thus facilitating their use. A function is activated by turning the handle towards the desired function.

Suction valve

Suction valve = blue symbols

Turn the handle towards the symbol for the desired function



Filling chemicals
via the TurboFiller



Side Banjo Filtered Fast
Filling System



Clean Water Induction



Chemical Induction
(Fast filling)



Quick Fill for Rinse Tank



Quick Fill for Main Tank

Pressure valve

Pressure valve = green symbols

Turn the handle towards the symbol for the desired function.

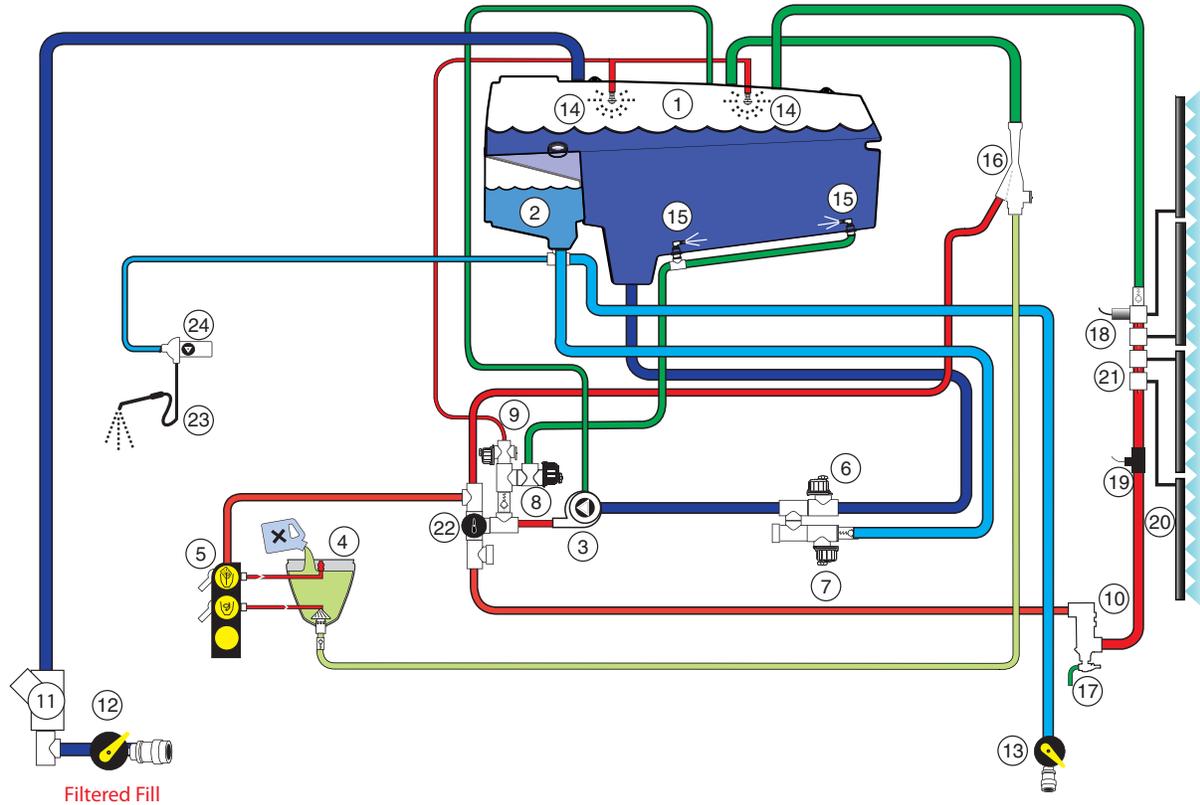


Chemical Filler
Ejector



Boom Nozzles

Diagram - Liquid system with optional extras



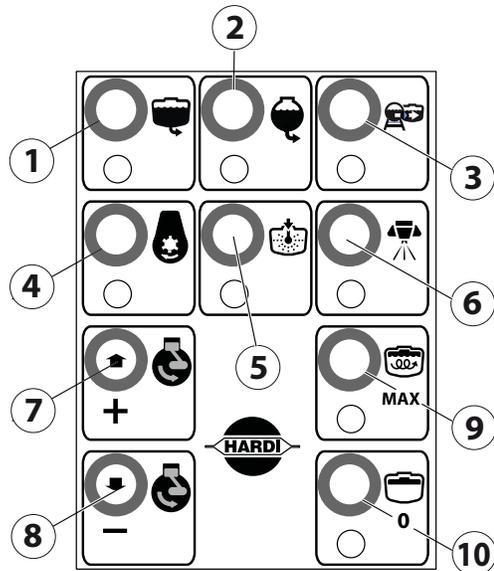
- | | |
|--------------------------|---------------------------|
| 1. Main Tank | 13. Rinse Tank Fill Valve |
| 2. Rinse Tank | 14. Rinse Nozzles |
| 3. Main Fluid Pump | 15. Agitation Nozzles |
| 4. TurboFiller Tank | 16. Ejector |
| 5. TurboFiller controls | 17. Filter Bypass Return |
| 6. Main Tank Valve | 18. Pressure Sensor |
| 7. Rinse Tank Valve | 19. Flow Meter |
| 8. Agitation Valve | 20. Spray Boom |
| 9. Rinse Nozzles Valve | 21. Section Valves |
| 10. Cyclone Filter | 22. Chemfiller Valve |
| 11. Filling Filter | 23. Wash Down Hose |
| 12. Main Tank Fill Valve | 24. Electric Pump |

3 - Description

External controls

A panel equipped with push buttons provides external control of the main functions of spraying and engine speed. The commands are grouped together by color to simplify their use. LEDs indicate function activation.

1. Suction from main tank
2. Suction from rinse tank
3. Not used
4. Spray pump control
5. Tank rinsing nozzles
6. Spray nozzles On/Off
7. Engine throttle increase
8. Engine throttle decrease
9. Start agitation of main tank
10. Stop agitation of main tank



TurboFiller

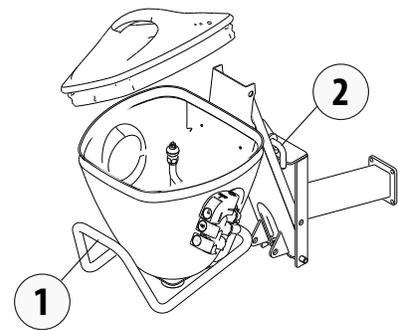
TurboFiller = yellow symbols

The TurboFiller is located in the Fluid Working Zone on the sprayer's left side. When being used, it should be unlocked by pulling out the lock pin (2) (located to the right of the TurboFiller) and pushed down by grabbing the handle (1) on the TurboFiller until it clicks into the locked down-position.

After use, the TurboFiller is retracted by pulling the handle (1) back up until it clicks into the locked storing position.

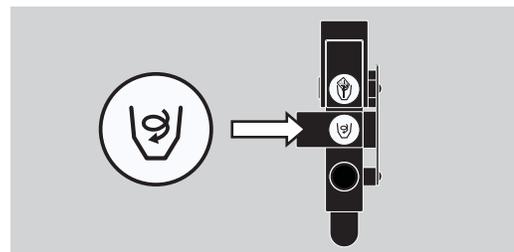


WARNING! Before releasing the lock (2) always keep a hand on the grip to avoid abrupt movement of the TurboFiller!



TurboDeflector valve

This TurboDeflector valve activates the vortex flushing of the TurboFiller. The valve is the bottom valve located to the left side of the TurboFiller and is activated in two ways. Push the valve lever down to get a quick flush in the hopper. Lift the lever to lock it in the open position for continuous liquid rotation in the hopper.

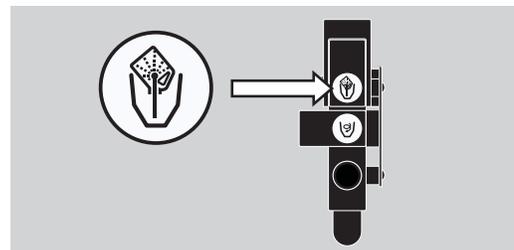


Chemical container cleaning lever

The upper lever located to the left of TurboFiller is used for two purposes:

When TurboFiller lid is open: For cleaning empty containers. Put container over the rotating rinsing nozzle in the middle of the TurboFiller to rinse inside of the container.

When TurboFiller lid is closed: Use the Chemical Container Cleaning lever to rinse the hopper after filling of chemicals has ended.



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

Filters

A Cyclone pressure filter is fitted in the liquid area on the left side of the TurboFiller. It has a built in self-cleaning function.

In-line pressure filters are fitted at each section.

All filters should always be in use and their function checked regularly. Pay attention to the correct combination of filter and mesh size. The mesh size should always be less than the average of the nozzles in use.

CycloneFilter

With the CycloneFilter, any impurities in the spray liquid will by-pass the filter and be recirculated 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:

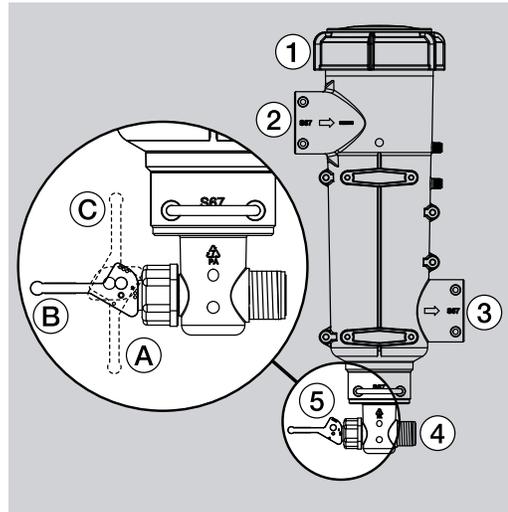
- A. This position (Marked with 1 dot): There is no return flow. Position is used when flushing the boom if there is spray liquid in the main tank. Also used when high spraying volume is required.
- B. This position (Marked with 2 dots): Normal spraying position. With return flow to prevent clogging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



DANGER! The pressure valve must be closed before opening the Cyclone filter! If not, spraying liquid can hit you when opening the filter, and drain from the main tank!



ATTENTION! Use of position (C) is no guarantee for a clean filter. Always regularly do a visual inspection and cleaning of the filter. If needed, see "10 hours service - CycloneFilter" on page 65.



3 - Description

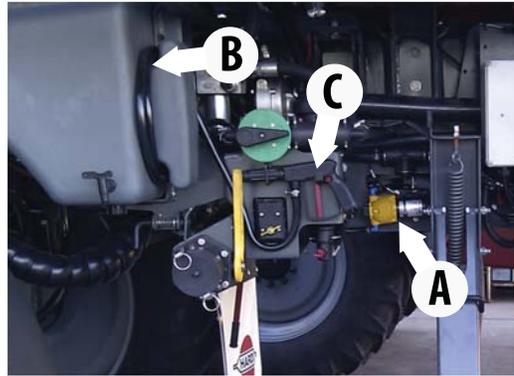
External Cleaning Device

The External Cleaning Device is comprised of a hose (B), spray gun (C) and an electric pump (A).



DANGER! The External Cleaning Device operates at a very high pressure and could potentially cause serious personal injury. It is therefore essential the following Safety rules be observed and strictly enforced:

1. Never point the water jet at people, animals, electric components, overhead power lines or other sensitive objects.
2. Never try to clean clothing or foot wear.
3. Pressure can penetrate skin and cause severe injury. Never work with unprotected eyes, bare feet or sandals.
4. Never operate without approved chemical safety wear including face mask, gloves, respirator, boots and coveralls.
5. Beware of flying particles being dislodged by the cleaning jet.
6. The spray gun and hose are affected by "recoil" when the handle is released during operation. Therefore, always hold the insulation on top of the gun with one hand and the pistol grip with the other hand to facilitate better control of the device.



Cabin

Access to the cab

The cab is accessed by the front ladder and working platform. Two keys for locking the door of the cab are provided.

Emergency Exit

In case of emergency, there is an emergency exit located to the right of the driver's seat, opposite the door of the cab.

To exit the cab using the emergency exit, proceed in the following way:

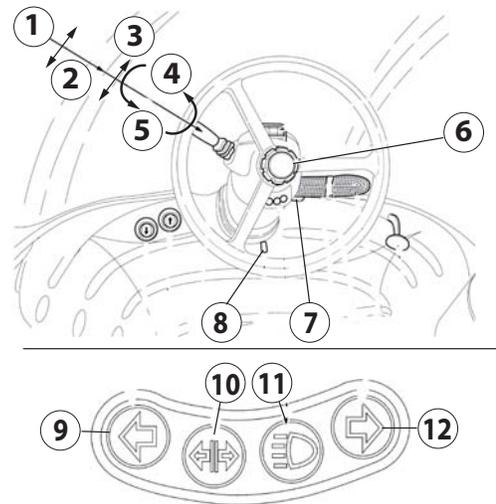
- Unlock the emergency exit:
 - Pull the top of the emergency exit handle down to the horizontal position.
 - Slightly open the emergency door until the metal pin that attaches to the door is lined up with the slot in the bottom of the handle.
 - Lift the handle of the door to release the pin.
- Open the door completely.
- Exit the cab.



DANGER! Always keep the path from the emergency exit free of any obstacles, to allow exit in case of emergency.

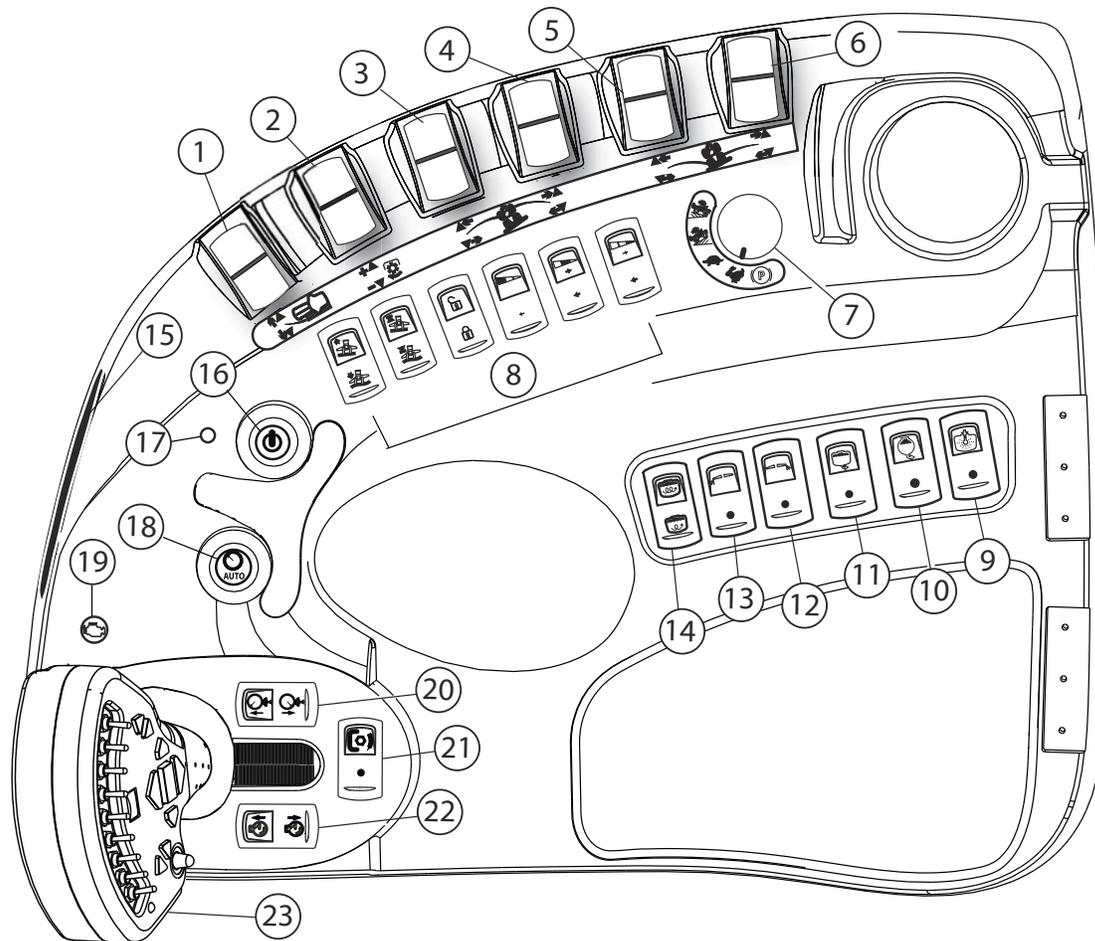
Steering column

1. Direction indicator
2. Horn
3. Selection of lights; road (top) and high-beam headlights (bottom)
4. Position Lights
5. Rotary switch for lights of road
6. Steering wheel height adjustment
 - Unscrew the center hub, then raise or lower the steering wheel to the desired height and re-tighten hub
7. Tilt of the steering wheel
8. Steering column inclination adjustment
9. Direction indicator left
10. Hazard warning lights
11. Road Lights
12. Direction indicator right



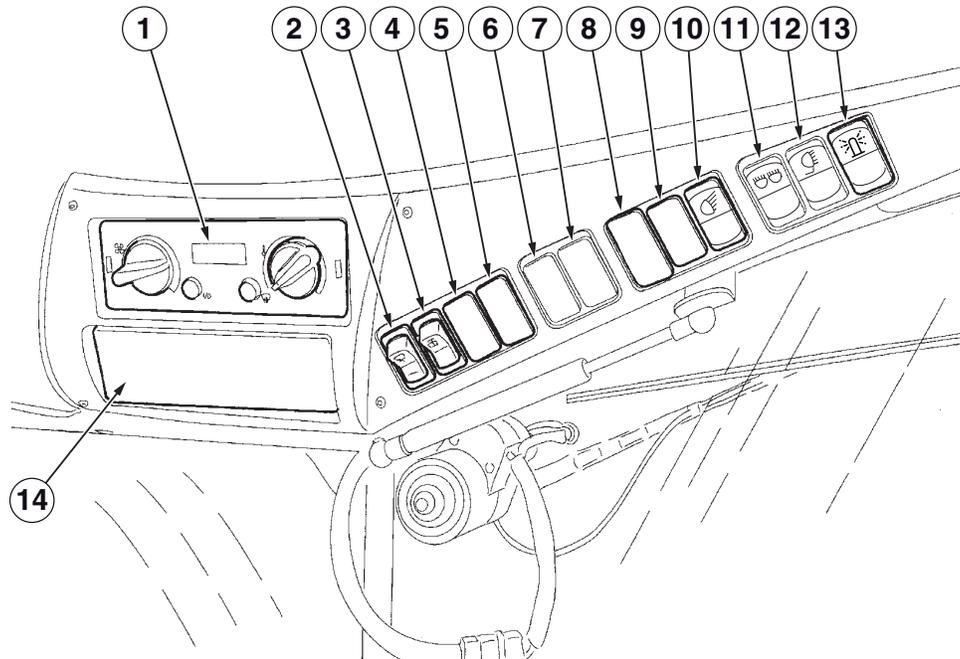
3 - Description

Instrument panel



1. Not used
2. Not used
3. Track adjustment - Left Front Wheel
4. Track adjustment - Right Front Wheel
5. Track adjustment - Left Rear Wheel
6. Track adjustment - Right Rear Wheel
7. Driving mode selector and parking brake
8. Boom hydraulic controls
(See Boom Operator's Manual)
9. Tank rinsing nozzles
10. Suction from Rinse tank
11. Suction from Main tank
12. Right end nozzle control switch
13. Left end nozzle control switch
14. Agitation switch
15. Ashtray
16. On/Off button of the electronic computers
17. Power on LED for computers
18. Auto/Manual Switch for pressure regulation
19. Engine fault indicator
20. Spray pressure
21. Spray pump switch
22. Engine throttle switch
23. Multi-functional Grip handle

Cabin roof instrumentation

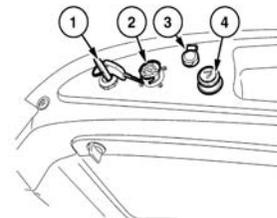


1. Air-conditioning controls	8. Not used
2. Windshield wiper switch	9. Not used
3. Windshield washer switch	10. Side work lights
4. Not used	11. Front work lights
5. Not used	12. Rear lights
6. Not used	13. Beacon light
7. Not used	14. Location of the radio

Start-up and diagnostics of the engine

The start module and diagnostic socket of the engine are placed on the right hand side at the rear of the seat.

1. Ignition key and start (4 positions)
 - Not used
 - OFF
 - Contact
 - Starting the engine



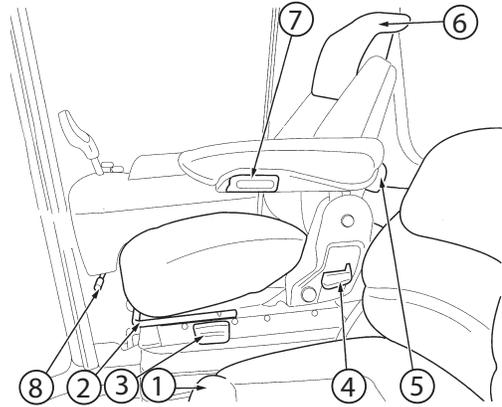
Note: The position 'Contact' engages the power of the electrical circuits and the engine preheat.

2. Diagnostic socket of the engine
3. 12 volt outlet (permanent)
4. Cigarette lighter

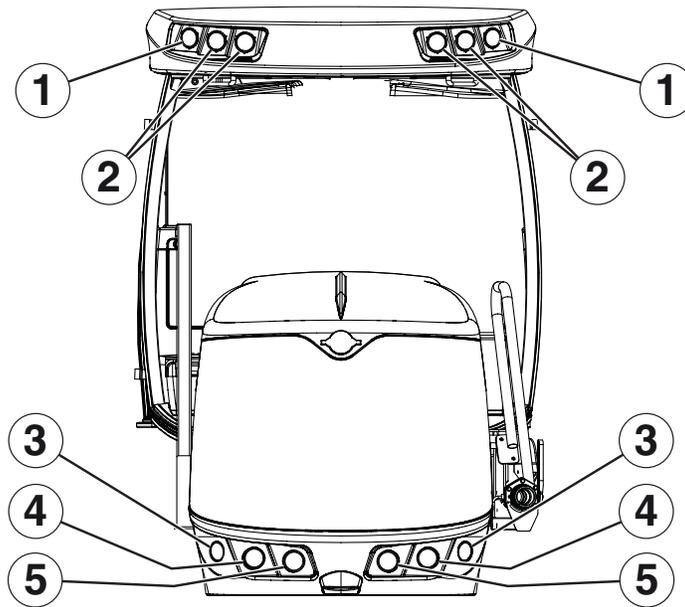
3 - Description

The seat

1. Passenger Seat Cushion
2. Driver's seat front/back position lever
3. Driver's seat weight/height settings lever
4. Adjustment lever for inclination of the backrest
5. Lumbar adjustment
6. Headrest height adjustment
7. Left side armrest adjustment lever
8. Right-hand side module front/back position lever



Lighting and cab lights



1. Side work lights	4. Low headlights
2. Front overhead work lights	5. Road Lights
3. Front side work lights	

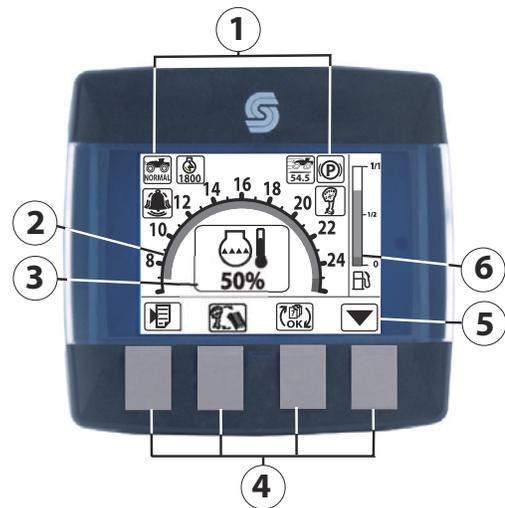


Note: Headlights (1) and (3) will light up simultaneously.

The multifunction display

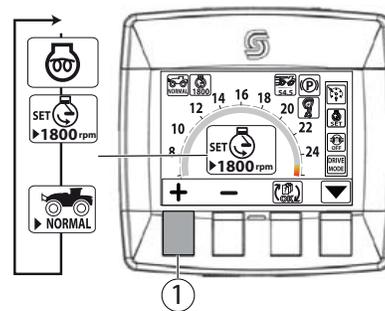
The multifunction display shows information relating to the operation of the engine, (tachometer, temperature, etc.) and the various modes (Road, Field, etc.). The display also shows errors that may occur during the use of the machine (engine temperature, oil pressure, transmission error, etc.).

1. Current mode symbols
2. Tachometer
3. Display of engine and transmission functions
4. Push Buttons of controls and settings
5. Horizontal Menu
6. Vertical Menu



Display of functions

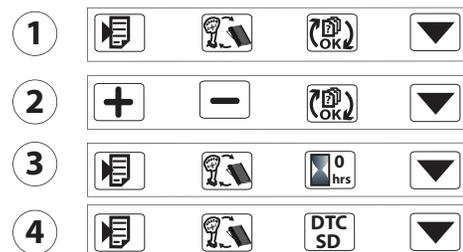
- Press button (1) to scroll through the various functions.



Horizontal Menus

Press button below symbol to select corresponding menu.

1. Normal Mode of Operation
2. Settings
3. Hour meter
4. Management of engine (DTC) and transmission (SD) errors



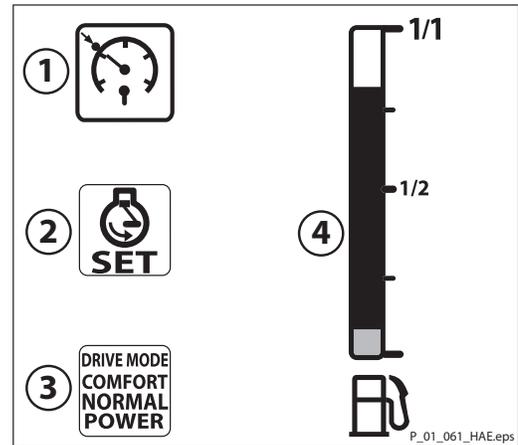
3 - Description

Vertical Menu

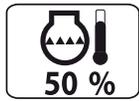
Press button below vertical menu to scroll through available options.

1. Forward speed limitation
2. Engine speed limitation
3. Driving mode behavior switch
4. Fuel gauge

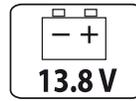
 Note: The fuel gauge (4) is displayed by default, or after 5 seconds of inactivity of the vertical push button.



Messages in normal operating mode



Engine temperature
0 to 100%.



Battery charge voltage



Engine oil pressure



Limitation of the motor speed [Field] mode
See "Limitation of engine speed - hydraulic oil temperature too high" on page 44



Turbocharger pressure



Restricting the travel speed in [Road] mode



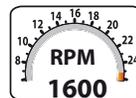
Hydraulic pressure of the transmission



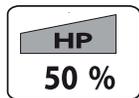
Restricting the travel speed in [Field] mode



Instant fuel consumption



Displays the speed of the engine



Power supplied by the engine



Displays if transmission error occurs
See "Transmission error codes" on page 77



Displays if engine errors occur (level 1)



Preheating of the engine

3 - Description

Messages in selection mode



COMFORT Driving Mode
See "Drive mode behavior" on page 42



Anti-slip disabled
See "Traction Control System" on page 42



NORMAL Driving Mode
See "Drive mode behavior" on page 42



Anti-slip engaged
See "Traction Control System" on page 42



POWER Driving Mode
See "Drive mode behavior" on page 42

Alarm Messages - priority



WARNING! The display of these alerts necessitates the immediate shutdown of the engine.



Alarm engine overheating



Alarm pressure of the turbo-compressor



Alarm engine oil pressure



Alarm engine defect (level 3)

Alert Messages - Operation limited



WARNING! These warning messages are displayed when operating anomalies appear on the self-propelled.



Temperature of the hydraulic transmission too high



Temperature of the hydraulic transmission too low



Alert default engine (Level 2)

Alert Messages - Maintenance

These warning messages are displayed when maintenance work must be performed on the self-propelled.



Maintenance (level 1)



Maintenance (level 2)

3 - Description

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.

General information

Unloading the sprayer from the truck

The machine can only be unloaded if the engine is running. In effect, the braking system is engaged unless the engine is running. To move the self-propelled, you must observe the following points:

Turn the battery cut-off handle to power the electrical circuits.

Place the forward handle in neutral.

Check that the parking brake is engaged.

Turn the ignition key to start the engine.

Press the engine throttle switch to increase engine rpm. To ensure sufficient traction and braking of the self-propelled on an incline, the engine rpm must be a minimum of 1500 rpm.

Push the Grip handle forward very slowly to move forward or back to move backwards.

Ensure that no one is in the unloading area.

Do not attempt to unload the sprayer if you are unfamiliar with the instructions described above.

Access to the engine

To access the engine, you must lift the hood. For more information on periodic maintenance of the engine, see chapter "Service and Maintenance intervals" on page 64.

Opening the hood

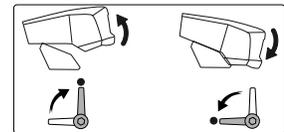
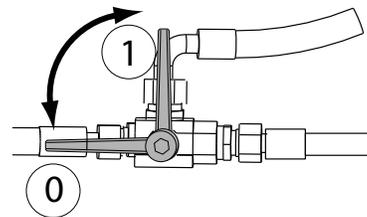
- Turn valve handle to position (1).
- Use the manual pump to lift and hold the hood open to the desired height.

Closing the hood

- Gradually turn valve handle to position (0) to close the hood.



Note: The valve handle should remain in position (0) after the hood is lowered.



Check engine

The main elements must be verified before the first starting of the engine:

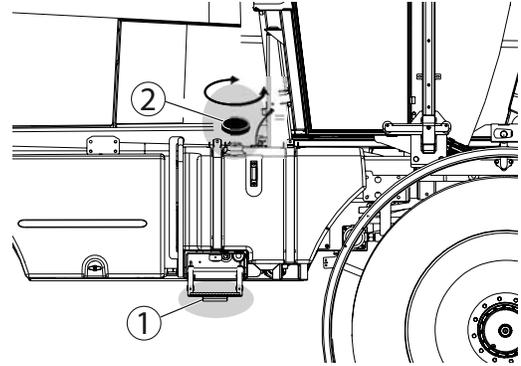
- Coolant Level and Engine Oil Level
- Correct tightness of the oil and fuel filters
- Tension on the belts

4 - Sprayer setup

Filling the fuel tank

The fuel tank has a 145 gallon (550 L) capacity. Before filling, you must:

- Stop the engine
- Pull and lower the access ladder (1) to access the reservoir.
- Thoroughly clean the cap (2) to prevent the introduction of impurities into the tank. Use a funnel and a filter if necessary.
- Do not smoke while filling the tank.



DANGER! Diesel fuel is extremely flammable. Handle with care. Do not smoke or expose fuel to open flame. It is recommended for the operator to install a fire extinguisher in a place that is easily accessible and checked regularly.



Note: Never allow the tank to empty completely to prevent the introduction of any impurities or air into the circuit.



Note: Before a prolonged shutdown, it is recommended to fill the tank to the maximum level in order to avoid any trace of condensation in the tank.



Note: Use low sulfur diesel fuel (ultra-low ULSD diesel ULSD) with a maximum of 15 ppm for the United States and Canada.



Note: The mixture of fuels to low sulfur (ULSD) and biodiesel is accepted up to 20% in order to meet the certification B9000.

Hydraulic Oil Level

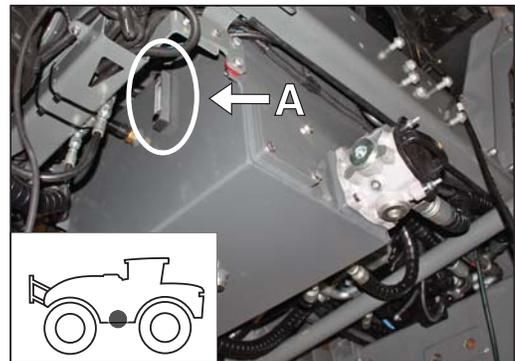
A visual gauge (A) is located on the rear side of the hydraulic reservoir with a capacity of 26 gallons (100 L). A sensor warns the user when the level in the tank is too low. Periodically check the hydraulic oil level.



WARNING! To avoid any risk of damage to the hydraulic components, when the audible alarm sounds, immediately stop the self-propelled and shut off the engine.

The fill hole of the hydraulic reservoir is located in the vicinity of the access platform to the cab. To fill the tank, it is recommended to:

- Thoroughly clean the tank cap to eliminate all traces of dirt and moisture.
- Filter the oil when filling.
- It is essential to use the correct oil. See "Table of recommended lubricants" on page 63.



Oil Level in the wheel gear boxes

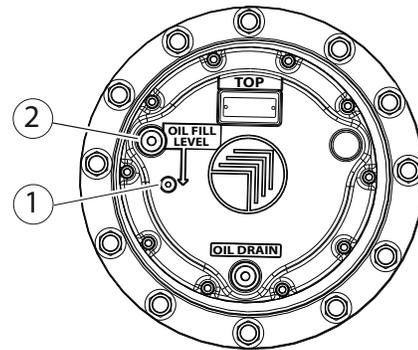


WARNING! Before driving, check the oil level in the wheel gearboxes:

- Move the self-propelled to orient the wheel gearboxes as shown in the illustration.
- Unscrew the oil fill level plug (1).
- Add oil if necessary, through port (2).
- Fill until oil flows through the level port (1).



Note: Only use recommended transmission oil. See "Table of recommended lubricants" on page 63.



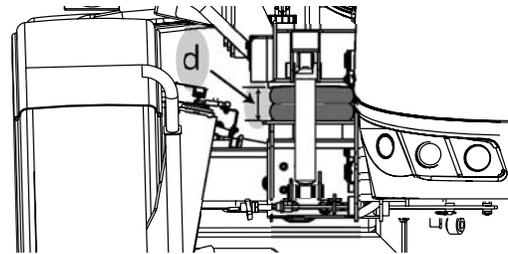
Air Suspension

The height of the suspension air bags (distance d), when service pressure is reached, should be approximately:

Front = 9.5 in. (240 mm)

Rear = 7.5 in. (190 mm).

See "Air suspension adjustment" on page 71 for further details.



Selection of temperature unit

A wire marked X313 is located at the right hand side of the cab. The default temperature unit is set by this wire being grounded or not.

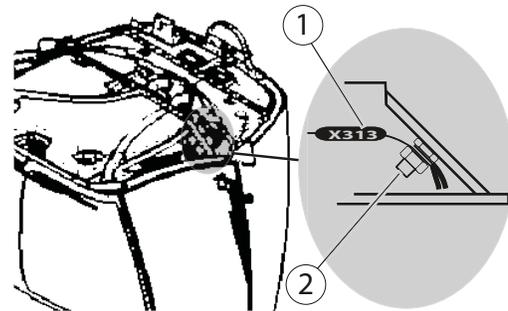
- Open the cab roof.
- Select the temperature unit, Celsius or Fahrenheit:

Celsius (°C) = Wire (1) is connected to the ground nut (2).

Fahrenheit (°F) = Disconnect and isolate wire (1).



Note: Set to Fahrenheit at Factory.



4 - Sprayer setup

Boom

Check boom operator's manual

Before operating your sprayer, check the boom operator's manual for any setup or maintenance required. Failure to do so could result in damage to the boom.

Starting the SARITOR

General information

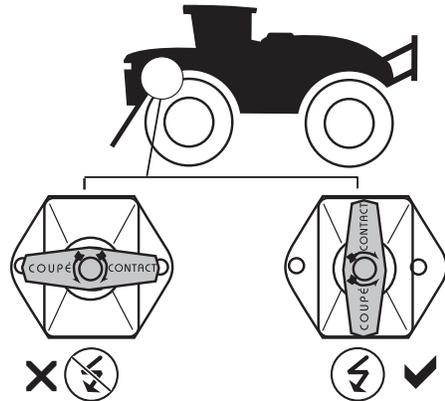


WARNING! Before starting the engine, check the level of the engine oil, coolant and hydraulic oil. Check that the engine radiator and air filter is clean.

Powering the electrical system

The SARITOR is equipped with a battery cut-off switch located near the access ladder to the cab.

- Turn the handle of the battery cut-off switch clockwise (vertical position) to power the electrical circuits of the SARITOR.



Note: Turn the handle of the battery cut-off switch counter-clockwise (horizontal position) to disconnect power to the SARITOR.



WARNING! Never leave a battery charger connected to the SARITOR at high amp (boost) setting. Damage to the electronics may occur. To jump start the SARITOR, only use a charger for as long as necessary to start the engine.



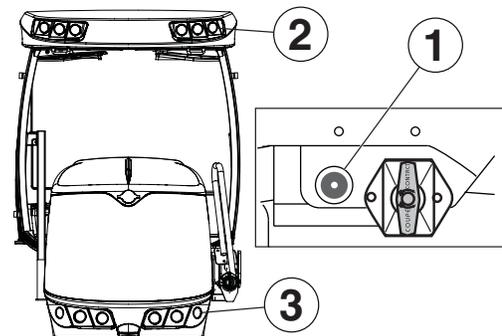
WARNING! Either remove the battery or turn the battery cut-off switch to "OFF" before charging the battery to avoid damaging the SARITOR electronics. See "Charging the Optima AGM battery" on page 72.

Lighting the path to the cab

The self-propelled SARITOR is equipped with lights for the ladder and work platform to assist in climbing up to the cab during low light conditions.

Press button (1) to turn on the headlights (2) and (3).

The headlights will automatically shut off after a few minutes.



ATTENTION! The battery cut-off switch must be in the "ON" (vertical) position in order to power the lights.

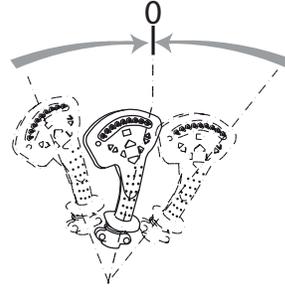


Note: Button (1) will be illuminated with an LED when the power is "ON".

5 - Operation

Starting the engine

Place the Grip handle in neutral to start the engine.

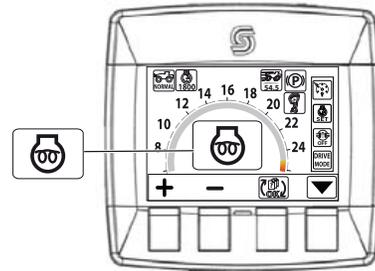


Turn the ignition key to position [1] to initialize the Plus+One system.



If the engine is cold, the engine preheat symbol will appear in the display. Leave the ignition key in position (1) until the symbol disappears before proceeding.

Turn the ignition key to position (2) to start the engine. Release it after start-up and the key will automatically return to position [1].

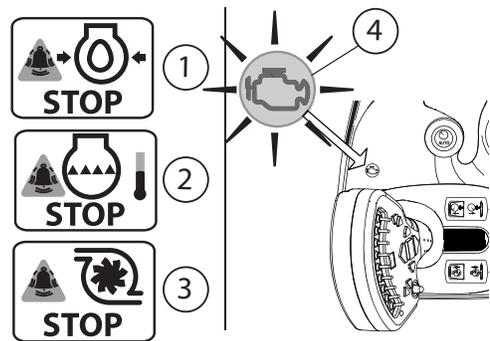


i Note: The symbol only appears if the engine preheat is required to start.

! WARNING! After starting the engine, if the engine fault indicator (4) lights up and one of the 3 priority messages appears on the screen, you must stop the engine immediately to prevent damage to the engine.

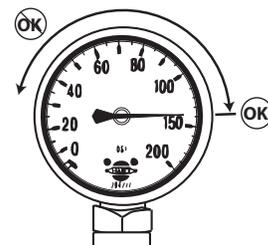
1. Engine oil pressure is too low.
2. Engine overheating.
3. Pressure turbo-compressor too low.

i Note: For more information on the error messages, see "CUMMINS engine error codes" on page 78



Air Suspension

! WARNING! Before driving, wait until the air suspension is operational. A pressure gauge installed on the outside of the cab indicates the pressure in the circuit. The value must be between 130 psi (9 bar) and 145 psi (10 bar). To adjust the air pressure, see "Compressed air pressure adjustment" on page 71

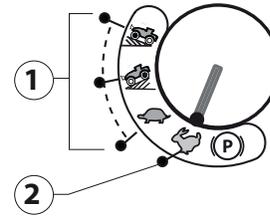


Drive Modes

Driving mode selector

The [Field] and [Road] modes are selected from the 5 positions on the driving mode selector.

1. [FIELD] modes.
2. [ROAD] mode.



The [Field] modes are managed by the Plus+One computer. In these modes, you must manually adjust the engine speed using the "Engine throttle switch" on the console (#22, "Engine throttle switch" on page 22).

In [Road] mode, the computer directly controls the engine speed based on the position of the multi-function Grip handle or foot pedal, depending on which controller is selected.

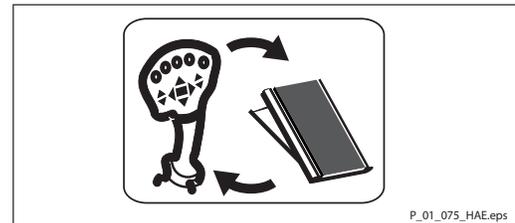
The responsiveness of the acceleration and deceleration of the SARITOR are predefined in the Plus+One computer. To change the driving mode behavior, see "Drive mode behavior" on page 42.



ATTENTION! When any of the [Road] or [Field] modes are selected, the access ladder to the cab raises automatically.

[Road] mode controller

While in [Road] mode, the movement of the SARITOR can be controlled using either the Grip handle or foot pedal (automotive).



P_01_075_HAE.eps

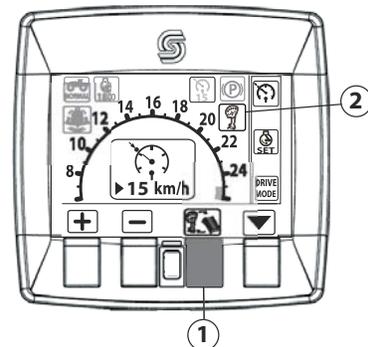
Symbol (2) indicates which controller is selected.

To change the controller:

- Place the Grip handle in the neutral position.
- Press button (1) to change which controller is used.

If the foot pedal is selected, the Grip handle determines the direction of travel.

- Handle forward = Forward travel when foot pedal is pressed.
- Handle back = Reverse travel when foot pedal is pressed.



ATTENTION! Changing the controller is only possible while the Grip handle is in the neutral position.



Note: The foot pedal is not active in [Field] mode.



Note: The default controller option is the Grip handle.

5 - Operation

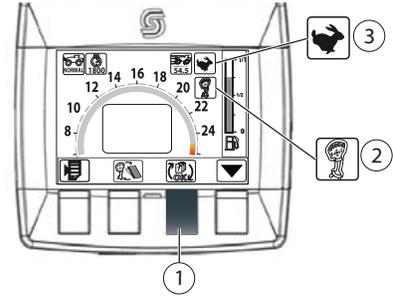
Driving

[Road] mode using the multi-function Grip handle

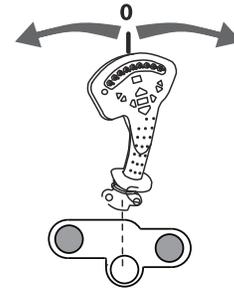
Both speed and direction of travel are controlled using the Grip handle. Push the handle forward to move the sprayer forward. Pull the handle back to move the sprayer in reverse. The engine speed varies according to the position of the handle in [Road] mode. The further the handle is pushed or pulled, the faster the speed of travel.

Hydrostatic braking is achieved by moving the handle to the neutral position. The SARITOR will come to a complete stop when the handle is put into the neutral position. Dynamic braking is achieved by pressing the brake pedal.

- Symbol (3) indicates [Road] mode (rabbit).
- Symbol (2) indicates [handle] controller is selected.
- Press button (1) to select [handle] controller.



- Gradually move the Grip handle in the desired direction of travel to move the SARITOR.



ATTENTION! When the [handle] controller is selected, the foot pedal is inoperative.



Note: In [Road] mode, the maximum speed is 31 mph (50 km/h).



Note: To reduce the maximum travel speed while in [Road] mode, see "Restricting travel speed in [road] mode" on page 43.

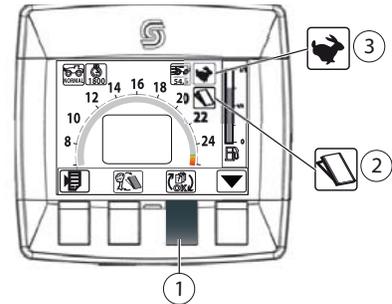
[Road] mode using the foot pedal (automotive)

Using the foot pedal (automotive) simplifies the conduct of the SARITOR self-propelled sprayer. In this mode, the engine speed is related to the speed of travel. The transmission ratio is automatically controlled by the managing of the hydraulic pumps and motors, which reduces fuel consumption.

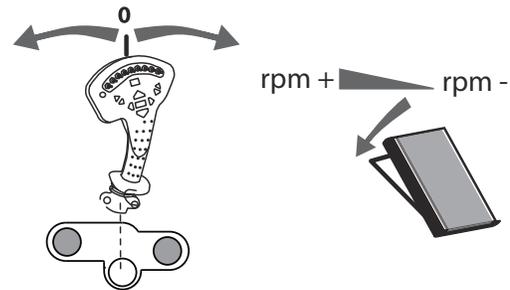
When using the foot pedal (automotive), the speed of travel is controlled by the pedal, while the direction of travel is controlled by moving the Grip handle forward or backward.

Hydrostatic braking is achieved by either releasing the pedal up to a full stop, or by moving the handle to the neutral position. Dynamic braking is achieved by pressing the brake pedal.

- Symbol (3) indicates [Road] mode (rabbit).
- Symbol (2) indicates [pedal] controller is selected.
- Press button (1) to select [pedal] controller.



- Push or pull the Grip handle to select the direction of travel.
- Press the pedal to move the self-propelled, the speed increases as the pedal is pressed further.



i Note: In [Road] mode, the maximum speed is 31 mph (50 km/h).

i Note: To reduce the maximum travel speed while in [Road] mode, see "Restricting travel speed in [road] mode" on page 43.

5 - Operation

[Field] driving modes

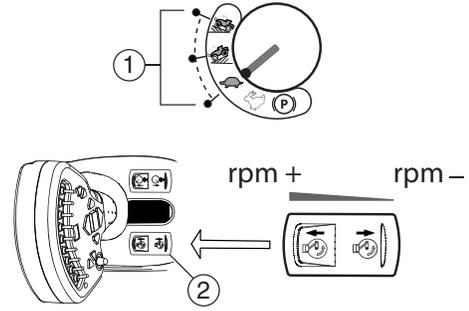
In the [Field] driving modes, the management of the transmission and hydraulic wheel motors depends on which [Field] mode is selected.

The engine speed is manually adjusted using the engine throttle switch on the instrument panel and is not affected by the position of the Grip handle. To preset the engine speed, see “Preset the speed of the engine” on page 43.

The [Field] modes require a minimum engine speed of 1500 rpm for the transmission to provide enough torque for traction and braking. Hydrostatic braking is achieved by moving the handle to the neutral position. The SARITOR will come to a complete stop when the handle is put into the neutral position. Dynamic braking is achieved by pressing the brake pedal.

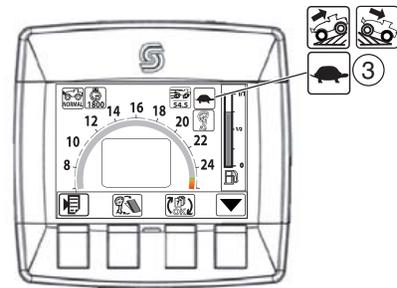
There are 3 [Field] modes of operation; Flat, Uphill & Downhill.

- “FLAT” [Field] mode (turtle): The transmission pump flow is evenly distributed in all the hydraulic motors. The flow is proportional to the position of the Grip handle.
- “UPHILL” [Field] mode: In order to limit slippage of the front wheels while driving uphill, the power of the rear hydraulic motors is greater than that of the front hydraulic motors.
- “DOWNHILL” [Field] mode: In order to limit the slipping of the SARITOR while driving downhill, the power of the front hydraulic motors is greater than that of rear hydraulic motors.

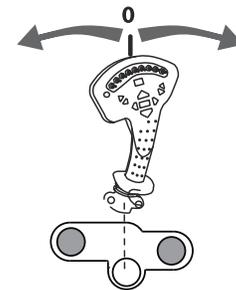


To use one of the [Field] modes:

- Turn the selector switch (1) to one of the modes.
- The display will show the current mode (3).
- Press the “Engine Throttle Switch” (2) to accelerate the engine.



- Gradually move the Grip handle in the desired direction of travel to move the SARITOR.



 ATTENTION! When any of the [Road] or [Field] modes are selected, the access ladder to the cab raises automatically.

 Note: Switching between the 3 [Field] modes may be performed while the SARITOR is in motion.

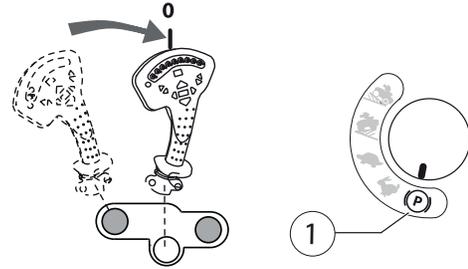
 Note: In [Field] mode, the maximum speed is 18 mph (30 km/h).

 Note: To reduce the maximum travel speed while in [Field] mode, see “Restricting travel speed in [field] mode” on page 5.9.

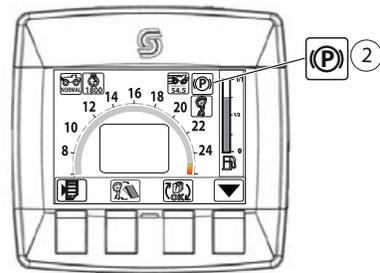
Parking brake

The parking brake uses the mechanical action of the disks inside the wheel gears to keep the machine at a standstill. To engage the parking brake:

- Pull the Grip handle into the neutral position (0) to stop the machine.
- Turn the selector switch to the parking brake position (1).



- The display indicates that the parking brake is engaged (2).
- When the parking brake is on, any action on the Grip handle will not make the machine move.



To release the parking brake:

- Verify that the Grip handle is in the neutral position.
- Turn the selector switch to [Road] or one of the [Field] positions.



WARNING! The parking brake is very effective. Avoid engaging it when the machine is moving, except in an extreme emergency.



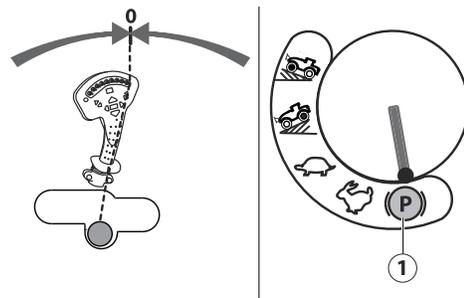
ATTENTION! When the parking brake is engaged, the access ladder to the cab lowers automatically.



ATTENTION! The parking brake is activated in the absence of hydraulic pressure in the brake system.

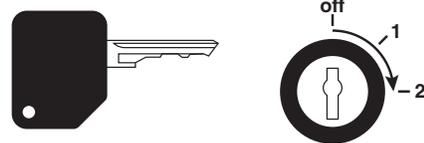
Shutting off the engine

- Place the Grip handle in the neutral position (0) to stop the self-propelled.
- Turn the selector to the parking brake position (1).
- Reduce the engine speed for a few seconds to slow down the turbocharger and stabilize the engine temperature.



ATTENTION! When the parking brake is engaged, the access ladder to the cab lowers automatically.

- Turn the ignition key to the "off" position to shut off the engine.
- Turn the handle of the battery cut-off switch counter-clockwise (horizontal position) to disconnect all electrical power and prevent discharging the battery during prolonged shutdown of the SARITOR.



5 - Operation

Drive Settings

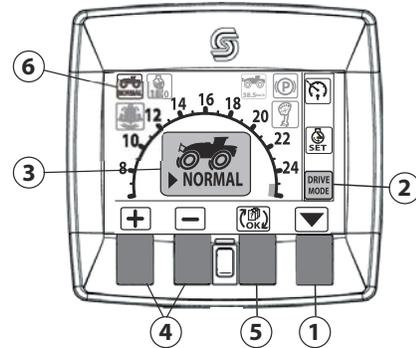
Drive mode behavior

The SARITOR self-propelled sprayer has 3 driving behavior modes available to optimize the overall performance of the transmission (speed/torque, acceleration and progressive braking) depending on variations in the operating conditions

1. [COMFORT] mode: This mode results in a more gradual acceleration of the self-propelled.
2. [NORMAL] mode: This mode incorporates a more aggressive acceleration than the [COMFORT] mode and is typically used with an intermediate throttle.
3. [POWER] mode: This mode allows for the most aggressive acceleration of the self-propelled.

To change the drive mode behavior:

- Press button (1) until [DRIVE MODE] (2) is selected. The current drive mode behavior will be indicated on the screen (3).
- Press the up or down buttons (4) to change the drive mode behavior (3).
- Press button (5) to save the value and return to the previous menu.
- Symbol (6) indicates the drive mode behavior currently in use.



i Note: The driving mode behavior can be changed while driving.

i Note: The default mode is [NORMAL].

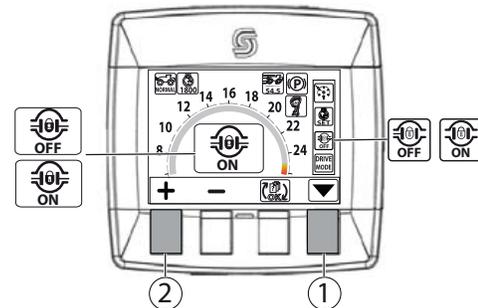
Traction Control System

Sensors built into the hydraulic motors constantly measure the speed of each wheel. A computer compares these speeds and, if necessary, reduces the hydraulic power in a wheel that starts slipping.

To improve the traction control system during turns, sensors placed on the front axle measure the turning angle of the wheels to allow the computer to optimize the traction control system.

The traction control function is only operational while in one of the [Field] modes.

- Press button (1) to select the traction control system symbol.
- Press button (2) To engage or disengage the traction control system.

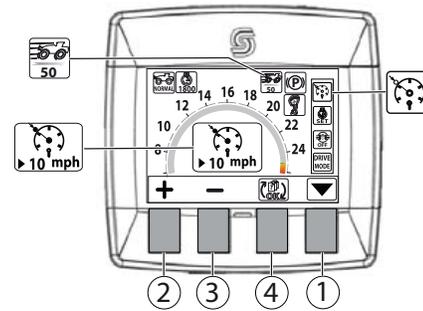


i Note: The traction control system may be engaged or disengaged while driving.

Restricting travel speed in [road] mode

It is possible to limit the travel speed in [road] mode.

- Turn the driving mode selector switch to [road] mode (rabbit).
- Press button (1) to select the “speed limit” symbol.
- Press button (2) or (3) to adjust the value.
- Press button (4) to save the value and return to the previous menu.



i Note: Maximum Value = 31 mph (50 km/h).

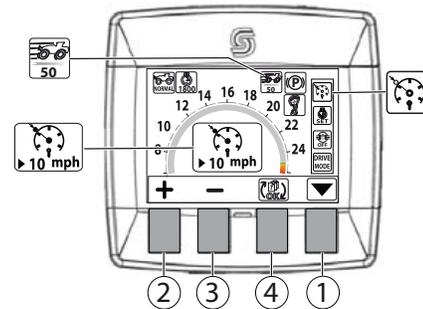
i Note: Minimum Value = 2 mph (3 km/h).

i Note: Default Value = 31 mph (50 km/h).

Restricting travel speed in [field] mode

It is possible to limit the travel speed in [field] mode.

- Turn the driving mode selector switch to one of the 3 [field] modes (flat, uphill, downhill).
- Press button (1) to select the “speed limit” symbol.
- Press button (2) or (3) to adjust the value.
- Press button (4) to save the value and return to the previous menu.



i Note: Maximum Value = 18 mph (30 km/h).

i Note: Minimum Value = 2 mph (3 km/h).

i Note: Default Value = 18 mph (30 km/h).

Preset the speed of the engine

The engine speed can be preset to values between 1200 rpm and 2500 rpm.

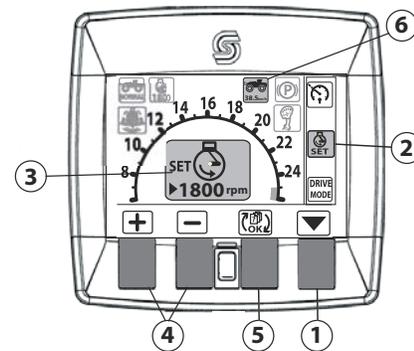
To change the engine speed preset value:

- Press button (1) until the “SET” symbol (2) is selected. Symbol (3) will show the preset function with current preset engine speed.
- Press the up or down buttons (4) to increase or decrease the value in 100 rpm increments.
- Press button (5) to save the value and return to the previous menu.

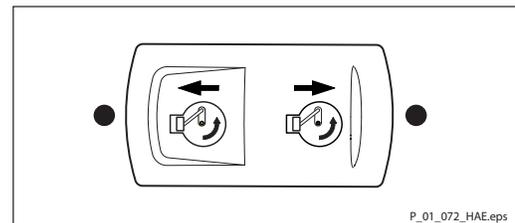
Symbol (6) indicates the value of the pre-adjustment of the engine speed.

The fuel gauge reappears after 5 seconds of inactivity.

To disable the preset speed of the engine, simply press the engine throttle switch on the dashboard.



i Note: The default speed: 2500 rpm.



P_01_072_HAE.eps

5 - Operation

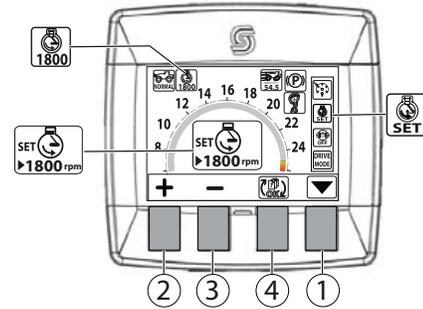
Limitation of engine speed in [Field] mode

It is possible to limit the speed of the engine. This limitation applies only in [Field] mode.

- Press button (1) to select the engine speed limitation.
- Press button (2) or (3) to adjust the value.
- Press button (4) to save the value and return to the previous menu.

 Note: Maximum Value = 2500 rpm.

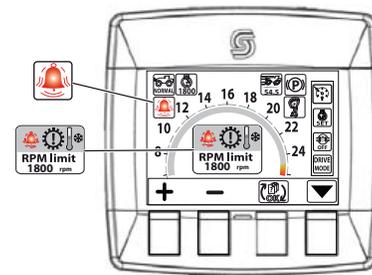
 Note: Minimum Value = 1000 rpm.



Limitation of engine speed - hydraulic oil temperature too low

When the temperature of the hydraulic oil is less than 86° F. (30° C.), the engine speed is limited to 1500 rpm. This restriction protects the components of the hydraulic transmission.

When the hydraulic oil temperature becomes greater than 86° F. (30° C.), the engine accelerates automatically to reach 2500 rpm, but the ground speed remains constant.



To return to normal use of the system:

A. [Field] modes:

Reduce the speed of the engine below 2200 rpm, and then push the Grip handle to return to normal conditions of use.

B. [Road] mode (automotive)

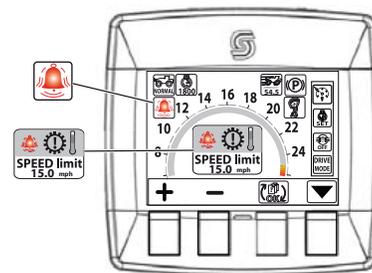
- Pull the Grip handle toward the neutral point to reduce the engine speed below 2200 rpm, and then push the handle back to return to normal conditions of use.

Limitation of engine speed - hydraulic oil temperature too high

When the temperature of the oil in the transmission reaches 194° F. (90° C.), the computer reduces the flow of oil in the hydraulic system, which limits the speed of the self-propelled.



ATTENTION! The self-propelled will stop if the hydraulic oil temperature reaches 203° F. (95° C.).



Engine management

Management of the Anti-stall system

This device avoids engine stalling if the power demanded by the transmission is higher than that supplied by the engine.

To prevent the engine from dropping below the threshold of normal operation, the displacement of the hydraulic motors increases, then the displacement of the pumps is reduced.

When the anti-stall feature is enabled, the ground speed decreases slightly compared with the normal operation of the self-propelled.

Management of the engine overspeed.

This feature prevents the transmission from accelerating the engine beyond a maximum bearable speed during a hydrostatic deceleration.

If the engine speed value exceeds a specified threshold, the displacement of the hydraulic motors decrease, then the displacement of the pumps returns slowly to the neutral point.

When the overspeed function is enabled, the hydrostatic braking is less effective in relation to the normal operation of the self-propelled.



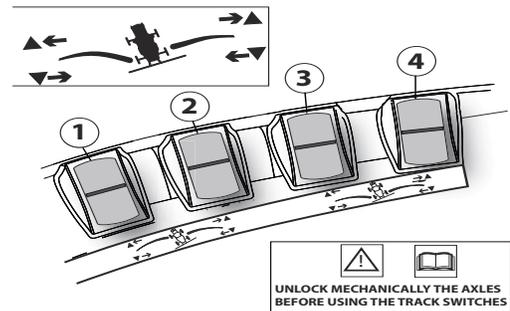
Note: The management of the engine overspeed is not active when the brake pedal is used.

5 - Operation

Track width adjustment

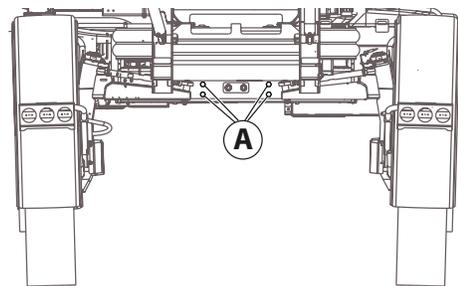
The track width of the front and rear axles of the machine is adjustable. The maximum variation of the track is 40" (1 meter), and each wheel is adjusted independently.

1. Left Front Wheel
2. Right Front Wheel
3. Left Rear Wheel
4. Right Rear Wheel

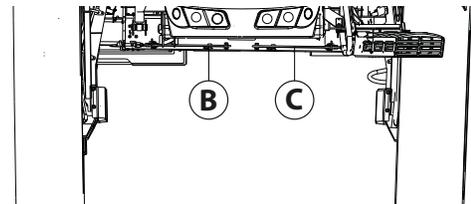


 **ATTENTION!** Before pushing the track variation switches (1-2-3-4), it is important to follow the procedure below.

- Loosen the bolts (A) located on front and rear axles (only if equipped).



- Remove pin (B) from guide (C) and place it to obtain the correct track width.
- Press and hold the switches to move the axles until it stops.
- After adjustment of the track width, tighten the bolts (A).



 **WARNING!** To prevent imbalances of the machine, the left and right wheel spacing must be identical (from center).

 **Note:** The adjustment of the track width should be done in the field in the absence of deep ruts while driving at a slow speed.

 **Note:** 2 types of guides are available; IMPERIAL - P/N 61025901 or (METRIC -P/N 61024501).

Tracks obtained according to the tires

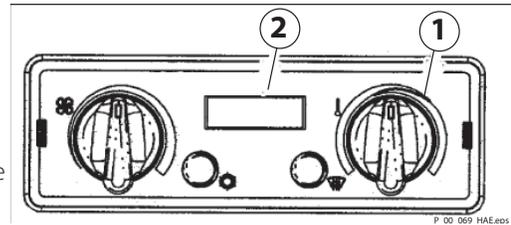
Size Tires	Minimum Track inches (mm)	Maximum Track inches (mm)
380/90R50	118.1 (3000)	157.4 (4000)
480/80R50	118 (2997)	157.3 (3997)
520/85R46	120.3 (3057)	159.7 (4057)

Cabin ceiling controls

Control Module of the ATC air conditioning

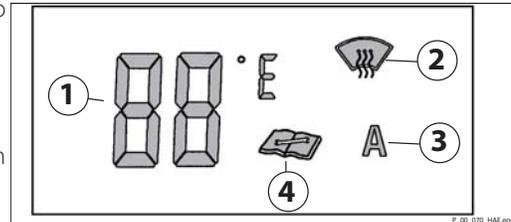
Automatic Temperature Control (ATC)

- A. Temperature control in the cab
 - Turn the temperature control dial (1) clockwise to increase the temperature, or counter-clockwise to lower the temperature in the cab.
- B. ATC Display (2)



The ATC display allows you to view the following information:

- The desired cab temperature (1) in degrees Fahrenheit or Celsius. To change between F. and C., see "Selection of temperature unit" on page 33.
- Symbol (2) is displayed when window de-fogging is in operation.
- The mode of operation. Symbol 'A' (3) indicates that the system is in automatic mode. In this mode, fan speed and heating/cooling are controlled automatically to maintain the desired temperature. When the letter 'A' is not displayed on the screen, the fan speed is controlled manually.
- Symbol (4) is displayed when there is a fault in the operation of the ATC system. A diagnostic code linked to the fault will be shown in the display.
- The ATC operates in the temperature range between 60° F. (16 °C.) and 90° F. (30 °C.).

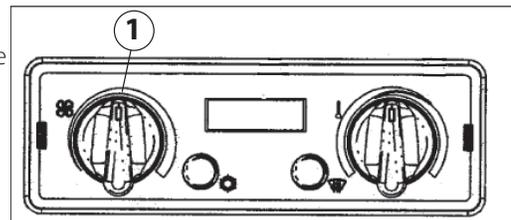


i Note: Symbol (3) is not displayed when the programmed temperature is minimum or maximum.

Fan Speed Control

You can increase or reduce the air flow by turning the fan speed dial (1).

- Turn the fan speed dial (1) clockwise to increase the air flow from the vents placed at the top of the cab.
- Turn the fan speed dial (1) counter-clockwise to decrease the air flow from the vents placed at the top of the cab.



i Note: If necessary, the automatic control of the air conditioning (ATC) will vary the speed of the air flow to maintain the required temperature in the cab.

If you turn the fan speed dial (1) while the ATC mode is engaged, the ATC mode will disengage. The symbol 'A' disappears and the fan speed is manually controlled by the fan speed dial (1).

To reengage the ATC mode, you need to toggle the ATC switch OFF and then back ON to reset the automatic mode. The automatic temperature control works whether the symbol 'A' is displayed or not.

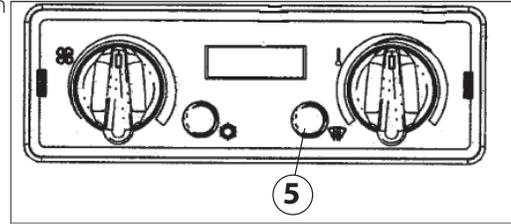
When the automatic air conditioning function or defogging is in operation, the ventilation increases to obtain a temperature difference of 2 °F between the set temperature and that measured in the cab.

When the evaporator sensor reads a temperature below 80°F (26 °C) and the system requests heat, the fan speed does not increase as long as the temperature of the sensor doesn't increase.

5 - Operation

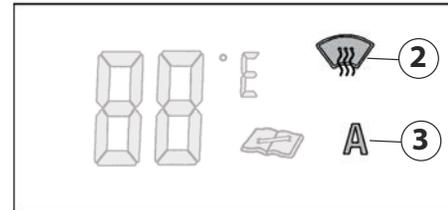
Selecting ATC mode

Once you have activated the ATC mode, you can press switch (5) to switch between the AUTO mode and the defog mode.



In defog mode, the air conditioning compressor operates full-time, and the air is warmed up to promote the defogging of the windows. In this mode, the display indicates symbol (2).

In AUTO mode, the system heats or cools the air to maintain the desired temperature in the cab. In this mode, the display shows the symbol 'A' (3).



Window defogging

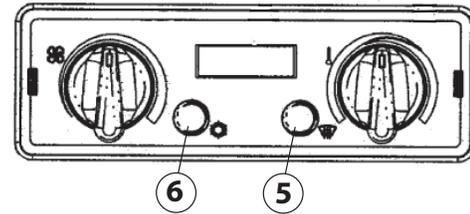
The window defogging mode uses the air conditioning to reduce the moisture in the air for the purpose of drying the windows of the cab.

- Press switch (6) to activate the AUTO mode.
- Toggle switch (5) to display the defog symbol (2).

The temperature control dial can be adjusted to the desired value. If the temperature of the air in the cabin is too cold, the temperature control dial can be rotated in a clockwise direction to increase the temperature.

The temperature in the cab is controlled by a probe measuring the recycled air, while maintaining the temperature requested by means of a heater valve. During the operation of defogging the windows, the a/c compressor is running continuously, unless the evaporator probe detects that it is too cold, which may result in the formation of ice.

The computer of the ATC automatically regulates the speed of the fan to maintain the required temperature in the cab. It is normal that the temperature of the air at startup is colder, caused by the engine being cold. If you reduce the fan speed, during the heating of the engine, the computer of the ATC will disable the automatic mode of the fan speed. To re-engage the automatic mode of the fan speed, the switch of the ATC (6) must be toggled off, then back on to reset the automatic mode.



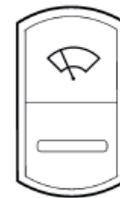
Operational problems

An error code is displayed if a malfunction is shown on the air conditioning system. For more information on the errors, see "Cabin error codes" on page 77.

Windshield Wiper

The switch for the windshield wiper has three positions:

- ON Position (continuous)
- ON Position (intermittent)
- OFF Position



Windshield Washer

The windshield washer switch has two positions:

- ON Position (momentary switch, press and hold)
- OFF Position (returns to OFF after released)



5 - Operation

Boom

Safety info



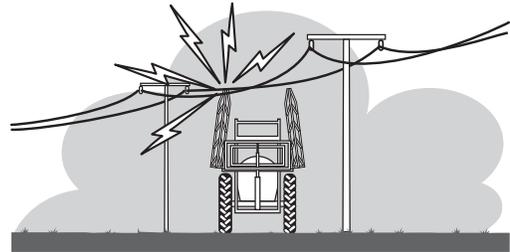
WARNING!

- The boom must not be folded/unfolded while driving!
- Never use the folding/unfolding functions before the sprayer has been stopped! FOLDING THE BOOM WHILE DRIVING WILL DAMAGE THE BOOM.



DANGER!

- When folding or unfolding the boom, make sure that no persons or objects are within the operating area of the boom.
- 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! Decal #97618603 must be placed in the cabin, visible from the operator's seat.



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

Operating the boom

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.

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.

- A. 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 place 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 to ensure minimal environmental impact and avoid build-up of larger chemical concentrations at one spot.

- B. 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,
- 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.



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



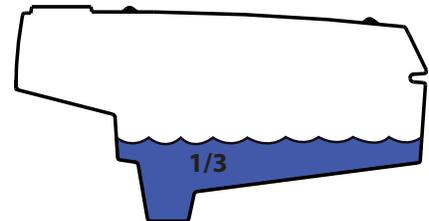
Note: It is the responsibility of the sprayer owner/operator to comply with all relevant legislation. HARDI® cannot undertake any responsibilities for incorrect operation and use.

Filling of water

Tank should normally be filled 1/3 with water before adding chemicals. Always follow 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.



Main Tank Filling

The Main Tank can be filled using the Filtered Fast Fill System.

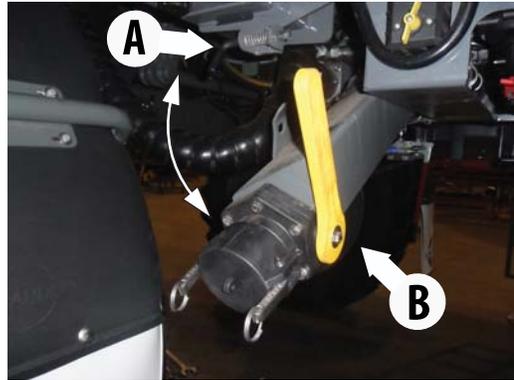
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Filtered Fast Fill System

The fluid is filtered through a filling filter.

The Cam Lock coupling size is 3" and can be located on the side of the sprayer, in the front of the sprayer or both places.

1. For easy filling, the fluid refill arm (B) can be lowered by releasing the locking pin (A) and pulling the arm down.
2. Remove the cap from the Cam Lock and connect the hose.
3. Start the water supply or remote fill pump that will be connected to a clean water supply.
4. Open the valve.
5. Fill Main Tank to required volume.
6. Close the Main Tank Valve.
7. Turn off water supply or remote fill pump.
8. Disconnect filling hose, replace the cam-lock cap and lift the fluid refill arm (B) to transport position.



WARNING! After filling, ensure that the fluid refill arm is in the upper position and the lock is engaged.

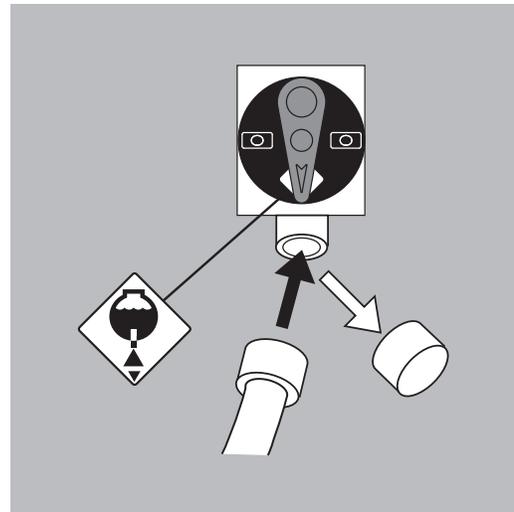
Filling of Rinse tank

The rinse tank is filled via the 2 inch quick coupler. To fill the rinse tank, proceed as follows:

1. Attach the external hose to the rinse tank quick fill coupler on the sprayer.
2. Start water supply or remote fill pump that is connected to a clean water supply.
3. Open the Rinse Tank Fill Valve.
4. When Tank is full, turn off the Rinse Tank Fill Valve.
5. Turn off water supply or remote fill pump.
6. Disconnect hoses.



ATTENTION! Only fill the rinse tank with clean water. To avoid algae developing, always drain the rinse tank if the sprayer is not used for an extended period of time.

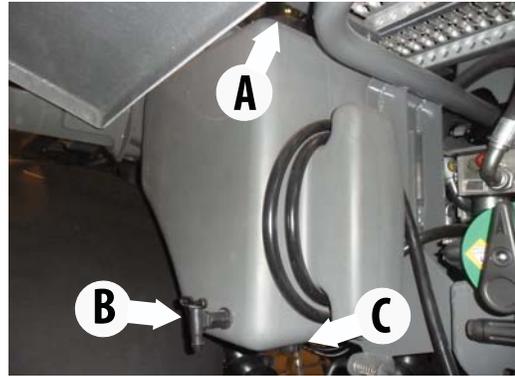


Filling of clean water tank

A clean water tank is fitted below the platform in the fluid working zone on the sprayer's left side. Remove the clean water tank lid (A) for filling (accessible from above the work platform). Fill with clean water and replace tank lid (A). To release water from the clean water tank, use valve (B). The water from this tank is for hand washing, cleaning of clogged nozzles, etc. Only fill the clean water tank with clean water. To drain the clean water tank, remove drain cap (C) and replace after emptying.



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

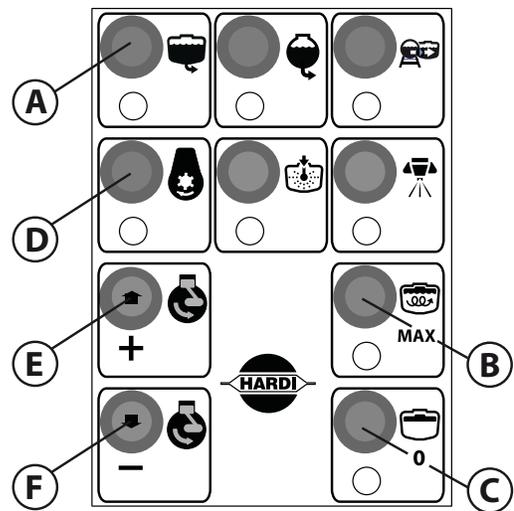


Agitation

The agitation in the Main Tank can be controlled from the work zone beside the Self propelled sprayer on the external control panel. It can also be controlled from the cabin.

For controlling the agitation (on/off) on the external control panel:

1. Press button (B) to turn on the agitation.
2. Press button (C) to turn off the agitation.



For controlling agitation from inside the cab:

1. Press switch (1) to adjust the agitation of the liquid in the main tank.



ATTENTION! Too much agitation may cause foam in the tank. The amount of foam depends on what types of chemicals are being used and how much water it is in the tank. Agitation should be adapted according to the volume of the liquid remaining in the main tank.

Agitation before re-starting spraying

If a spraying job has been interrupted for awhile, severe sedimentation can occur depending on chemicals being used. When re-starting the spray job, it might be necessary to agitate the liquid.

1. Press electric Main Tank Valve (A) on the external control panel to turn it on.
2. Engage the spray pump (D).
3. Adjust the engine rpm to 1500 by pressing the (E) and (F) buttons.
4. To turn on the agitation, press button (B).
5. Agitation should be continued for at least 10 minutes.
6. Press Button (C) to turn off the agitation.

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Parking the sprayer

To avoid spot contamination, the sprayer should always be parked at either the washing/filling 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 or unauthorized persons.

Safety precautions - crop protection chemicals



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



WARNING! Always wear correct protective clothing before handling chemicals!

Personal protection

Depending on chemical type, protective gear/equipment should be worn to avoid contact with the chemicals, e.g.:

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



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.

Chemical Filling

Chemical filling can be done via the TurboFiller.



ATTENTION! The scale in the hopper is only to be used as a reference! It is recommended to use a measuring jug for best accuracy.



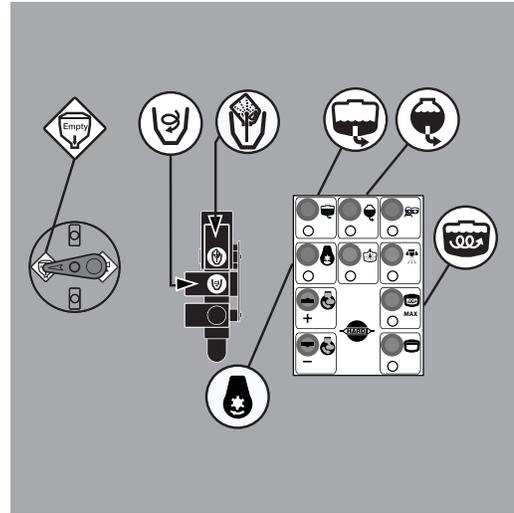
ATTENTION! The Chemical Container Cleaning device uses spray liquid to rinse concentrated chemicals from containers. Always rinse the chemical containers with clean water several times until they are clean before disposal.



ATTENTION! The hopper rinsing device uses spray liquid to rinse concentrated chemicals from the hopper! The FILLER must always be cleaned together with the rest of the sprayer when the spray job is done.

Filling chemicals via the TurboFiller

1. Fill the Main Tank at least 1/3 with water (unless something else is stated on the chemical container label).
2. Press electric Main Tank Valve on the external control panel, to turn it on.
3. Turn on the ChemFiller/Ejector valve to chemFiller. This will activate the TurboFiller.
4. Turn on the Spray Pump from the external control panel.
5. Increase the engine rpm to 1500.
6. Open the TurboFiller lid. Open the TurboDeflector valve.
7. Measure the correct quantity of chemicals and slowly add it into the hopper only as fast as the transfer device can flush it down.
8. If the chemical container is empty, it can be rinsed using the Chemical Container Cleaning device. Place the container over the multi-hole nozzle and push the upper lever to the left of the TurboFiller.
9. Close the TurboFiller lid when finished.



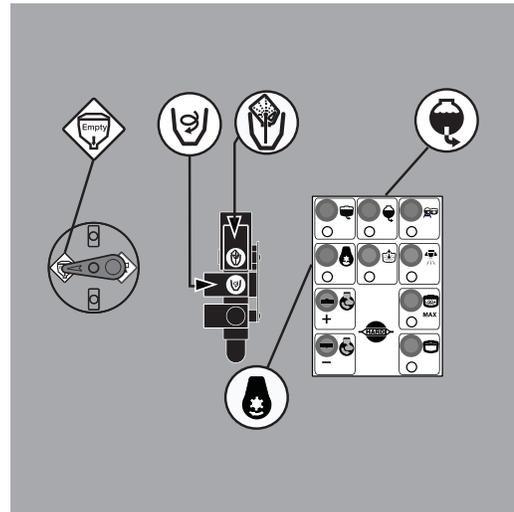
DANGER! Always wear face shield and other appropriate personal safety equipment when filling chemicals.



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

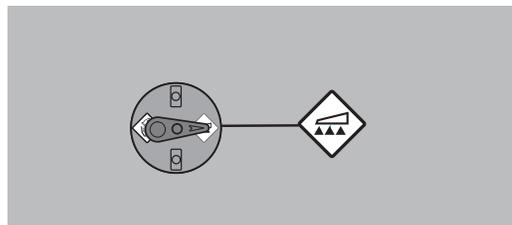
Rinsing TurboFiller

10. Turn off the Main Tank Valve from the external control panel.
11. Turn on the Rinse Tank Valve from the external control panel.
12. Check to make sure the TurboFiller lid is securely closed.
13. Rinse the hopper by using the Control valves on the TurboFiller, then turn them off.
14. Turn off the Rinse Tank Valve from the external control panel.
15. Turn off the Chemical Induction Valve.
16. Continue filling the Main Tank.



Prepare sprayer for Spraying

1. Before entering the cabin, turn the Ejector Spray valve to Spray position. The rest of the functions for spraying can be controlled from the cabin.

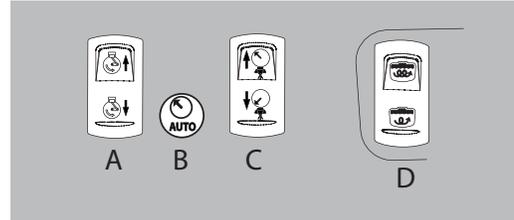


5 - Operation

Spraying controls from the cab

The functions for spraying can be controlled from the control panel of the cab.

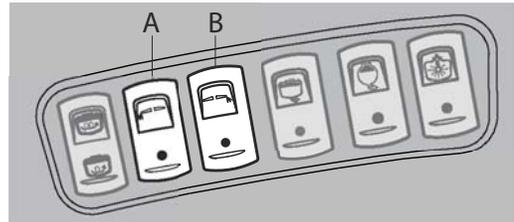
1. Adjust the engine rpm by pressing switch (A).
(22, "Engine throttle switch" on page 22)
2. Press button (B) to engage automatic mode. Pump will start.
(18, "Auto/Manual Switch for pressure regulation" on page 22)
3. Press switch (C) to disengage the Automatic Variable Rate Application (20, "Spray pressure" on page 22)
4. Press button (D) to manually select the level of the agitation.
(14, "Agitation switch" on page 22)



Electrically controlled end nozzle (optional)

The boom can be fitted with end nozzles.

1. Press switch (A) to operate the end nozzle on the left side of the boom.
2. Press switch (B) to operate the end nozzle on the right side of the boom.



Cleaning

General information

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 the job. If any portion remains unclear or requires facilities which are not available, then for safety reasons, please leave the job to your HARDI® dealer's workshop.



ATTENTION!

Clean sprayers are safe sprayers.

Clean sprayers are ready for action.

Clean sprayers cannot be damaged by pesticides and their solvents.

Guidelines

1. 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.
2. Be familiar with local legislation regarding disposal of pesticides washings, mandatory decontamination methods, etc. Contact the appropriate department, e.g. Dept. of Agriculture.
3. Pesticide washings can usually be sprayed out on a soakaway. This is an area of ground that is not used for cropping. You must avoid seepage or runoff of residue into streams, water courses, ditches, wells, springs, etc. The washings from the cleaning area must not enter sewers. Drainage must lead to an approved soakaway.
4. Cleaning starts with calibration, as a well calibrated sprayer will ensure the minimal amount of remaining spray liquid.
5. It is good practice to clean the sprayer immediately after use and thereby render the sprayer safe and ready for the next pesticide application. This also prolongs the life of the components.
6. It is sometimes necessary to leave spray liquid in the tank for short periods, e.g. overnight, or until the weather becomes suitable for spraying again. Unauthorized persons and animals must not have access to the sprayer under these circumstances.
7. 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.

Use of rinse tank and rinsing nozzles

The incorporated rinse tank has four different purposes:

- A. Full internal rinsing (in-field before cleaning or when using same chemicals again soon).
- B. External cleaning (only after completion of "A").
- C. Flushing spray circuit without diluting main tank contents (when spray job is interrupted).
- D. Full internal cleaning (before storage or when switching chemicals).



ATTENTION! The cleaning procedures require the TurboFiller to be cleaned out beforehand (directly after the last chemical filling). If the TurboFiller has not been cleaned, it must be cleaned before performing cleaning procedures A, B, C or D (See "Rinsing TurboFiller" on page 55).



ATTENTION! Do NOT add any cleaning detergents to the rinse tank. If cleaning agents are to be used, they should be added to the main tank.

5 - Operation

A. Full internal rinsing

In-field diluting of remaining spray liquid residues in the spraying circuit for spraying the liquid in the field, before cleaning the sprayer.



Note: This rinsing is adequate/sufficient when the sprayer is going to be used again shortly (e.g. next day) in same or similar crops (no risk of cross contamination and subsequent crop damages).



WARNING! If the next crop to be sprayed is sensitive to the latest chemical used, then a full cleaning should be carried out. See "D: Full internal cleaning (Soak wash)" on page 60.



WARNING! Never clean the sprayer if there are risks of contamination of surface or underground water! Choose a different spot for cleaning every time to avoid spot contamination to build up.



DANGER! Before commencing this rinsing procedure, ensure that the Pressure Empty quick coupler cap is securely fitted and tightened! If this is not fitted and tightened properly, it may burst off during the rinsing process and lead to personal injuries to the operator or persons in proximity of the machine!

This rinsing procedure will rinse the spraying circuit and main tank as follows:

1. Open the spray boom (if it isn't already opened) and lower the boom.
2. Empty the sprayer as much as possible. Close the agitation valve (no agitation). Allow the pump to run until all nozzles stop spraying to ensure that all relevant liquid has been expelled.
3. Turn on the Rinse Tank Valve (This will automatically turn off the Main Tank Valve).
4. Turn on the Agitation valve.
5. Engage the pump.
6. Use 1/6 of the rinse tank contents at this valve setting.
7. Turn the ChemFiller/Ejector valve to off.
8. Turn off the Agitation Valve for 10 seconds.
9. Turn on the Tank Rinse nozzles for 20 seconds.
10. Turn the Chemfiller/Ejector valve to boom "Spraying".



Note: If you want to spray out the diluted liquid while driving in the field, return to the cabin. The rest of the cleaning process can be controlled from there.



Note: If you want to spray out the liquid beside the field with the sprayer parked, the rest of the cleaning process can be controlled from the side of the machine.

11. Open the Boom Spray nozzles with the ON/OFF switch.
12. Open the CycloneFilter valve located at the bottom of the filter fully by pressing it upwards for 10 seconds. This will flush out the sedimentations in the bottom of the filter.
13. Press the Main Tank valve to turn it on. This will automatically close the Rinse Tank valve.
14. If powder has been used, turn on the agitation from the control panel. If the agitation is too strong, you can decrease it gradually from the cabin. Spray out the contents fully. If spraying in the field, choose a different location each time to distribute the spray liquid residues over larger areas. Continue until all fluid is expelled from the boom tubes and nozzles.
15. Turn on the Rinse Tank valve, this will automatically close the Main Tank valve.
16. Turn on the Tank Rinse nozzles and turn off the Boom Spray nozzles and run it for 1 minute.
17. Turn off the Tank Rinse nozzles. Turn on the Main Tank valve. Turn on the Boom Spray nozzles and spray until the Main Tank is empty.
18. Repeat step 15-17 another 3 times using 1/6 off the rinse tank contents in each of the 3 sequences until the Rinse Tank is empty.
19. Shut off nozzles once the rinsing process is completed.

B: External cleaning

This procedure is used to rinse the outside of the sprayer in the field as required.

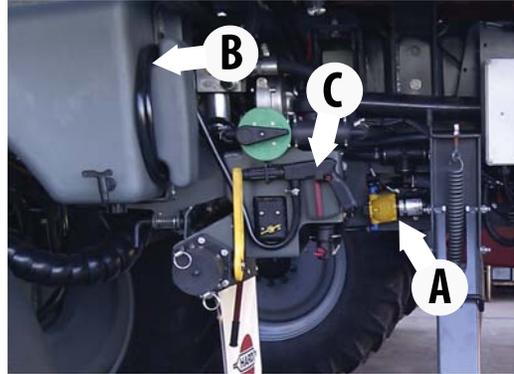


WARNING! Never clean the sprayer if there are risks of contamination of surface or underground water! Choose a different spot for cleaning every time to avoid spot contamination to build up.

Use the External Cleaning Device to wash everything on the outside of the sprayer. This prevents contamination of the storage area and helps the sprayer last longer. When the External Cleaning Device is going to be used, open the cover for the fluid system on sprayer's left side.

The cleaning gun is located on the inner side of the cover.

1. Un-roll the hose from the reel (B) and take the handle (C).
2. Engage clean water pump (A) by pressing the ON/OFF switch at the end of the pump.
3. After cleaning, turn off the clean water pump by pressing the ON/OFF switch.
4. Roll the hose onto the reel again and close cover.



C. Flushing spraying circuit without diluting main tank contents

This procedure is used to flush the pump, operating unit, spray lines, etc. in case of interruption in spraying before main tank is empty (e.g. beginning rain, etc.).

Flushing of the liquid system

1. Turn off the pump.
2. Turn on the Rinse Tank valve.
3. Turn on the Boom nozzles.
4. Turn off the agitation valve (no agitation).
5. Press the CycloneFilter Boost Valve to down position to avoid dilution of main tank contents.
6. Engage the pump and spray water from rinse tank in the field until all nozzle tubes/nozzles are flushed with clean water.
7. Disengage the pump.



WARNING! Don't turn Boom Spray nozzles off until the pump has fully stopped, otherwise diluting of main tank contents will occur.



ATTENTION! It is advisable to increase the forward speed (double if possible) and reduce the 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 cleaner, lubrication of the entire machine is recommended.

5 - Operation

D: Full internal cleaning (Soak wash)



Note: This cleaning procedure is always used when:

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



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

Procedure for wash with a cleaning agent, e.g. AllClearExtra:

1. Rinse the sprayer in the field (See "A. Full internal rinsing" on page 58).
2. Drive to farm fill station.
3. Prepare sprayer for cleaning with cleaning agent, e.g. AllClearExtra. Fill water in the main tank to 10% of capacity (Fill the rinse tank completely. This water is used later for rinsing).
4. Turn on the Main Tank Valve.
5. Turn on the Agitation Valve.
6. Engage the pump.
7. Allow the liquid to circulate for 3 minutes.
8. Turn the Chemfiller/Ejector valve towards the Chemfiller.
9. Open the TurboFiller deflector valve and allow liquid to circulate for 3 minutes.
10. Close the lid and activate the container rinsing valve to clean the inside of the hopper.
11. Shut off container rinsing valve and the deflector valve on the TurboFiller.
12. Verify that all Boom nozzles are shut off.
13. Turn the Chemfiller/Ejector valve towards "Spraying".
14. Allow the liquid in the main tank to circulate for a minimum of 3 minutes with the nozzles off to clean the return lines from the boom to the tank.
15. Spray out water with cleaning agent and chemical residue. Set the spray pressure at 45 - 70 psi (3-5 bar). Note that the washing water still contains active chemical and choose an appropriate area to spray it out. Alternately, the washing water can be dumped at the Filling/washing location and retained in an appropriate receptacle (E.g. slurry tank or similar). Spot contamination and accumulation must be avoided. Continue to spray until all liquid is expelled from the boom tubes and nozzles.
16. Shut off all nozzles with the main ON/OFF switch.
17. Rinse the sprayer again with clean water to rinse out all remains of the cleaning agent (See "A. Full internal rinsing" on page 58). Do this to remove the cleaning agent from the fluid system, which could damage the next spray chemical filled into the main tank.
18. Include rinsing of the TurboFiller. Operate all 3 valves during this process.
19. Remove all filters (suction, pressure, in-line and nozzle filters) and clean the filter screens using clean water and detergent.



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!



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

Use of detergents

It is recommended to use an appropriate cleaning detergent suitable for cleaning agricultural sprayers.

- The cleaning detergents which contain a suitable lube or conditioner is recommended.
- If for some reason this is not available and e.g. triple ammonia water is used, it is important to rinse the circuit immediately after and add some lubricant to the rinsing water to avoid e.g. ball valves seizing up.
- Use of automotive antifreeze/radiator coolant (ethylene glycol) will protect the valves, seals etc. from drying or seizing up.

Technical residue

Inevitably a quantity of spray liquid will remain in the system. It cannot be sprayed properly on the crop, as the pump takes in air when the tank is about to be empty.

This Technical Residue is defined as the remaining liquid quantity in the system as the first clear pressure drop on the pressure gauge is read.

The dilutable residue must be diluted 10 times with clean water and sprayed to the crop just sprayed before cleaning the sprayer.

Cleaning and maintenance of filters

Clean filters ensure:

- Sprayer components such as valves, diaphragms and operating unit are not hindered or damaged during operation.
- Nozzle blockages do not occur while spraying.

Lubrication

General information

Always store lubricants in a clean, dry and cool place - preferably at a constant temperature to avoid contamination from dirt and condensation. Keep oil filling jugs, hoppers and grease guns clean, and clean the lubricating points thoroughly before lubricating. Avoid prolonged skin contact with oil products. Always follow the recommendations concerning quantity. If no quantity is indicated, lubricate until new grease becomes visible.

To open the engine hood, see "Access to the engine" on page 31.

Table of recommended lubricants

Components	Capacity	Capacity (with filter)	Recommended lubricants
Engine Cummins QSB 6.7	19 quarts (18 liters)	19.5 quarts (18.5 liters)	Chevron Delo® 400 LE SAE 15W-40
Hydraulic Transmission and Hydraulic system	26 gallons (100 liters)		Chevron Rando® HDZ ISO 046
Wheel gear boxes	3.2 quarts (3 liters)		Chevron Delo® Syn-Gear HD SAE 75W-90
Coolant	26.4 quarts (25 liters)		Chevron Delo® Extended Life (227811) Prediluted 50/50 Coolant/Antifreeze - B
General lubrication	--		Universal Lithium grease, NLGI No. 2 SHELL RETINAX EP2, CASTROL LMX GREASE

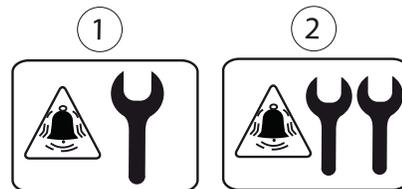


Note: The values in the table above are general capacities. Always use the level indicated by the gauge when filling.

Display of the frequency of maintenance

The following alert symbols appear in the display after 150 hours and 500 hours to indicate that maintenance work needs to be performed on the sprayer:

1. Maintenance after 150 hours of use.
2. Servicing every 500 hours.



Message (1) appears only once after 150 hours to indicate that maintenance work is to be performed on the machine.

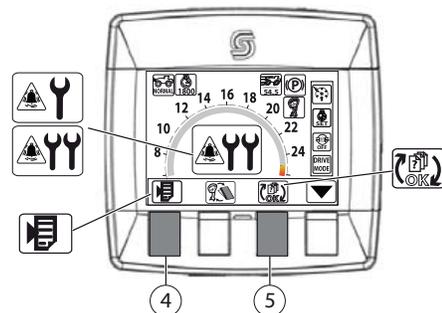
Message (2) appears periodically after 500 hours to indicate that maintenance work is to be performed on the machine.

Reset the time meter

- Simultaneously press buttons (4) and (5) for 5 seconds to reset the maintenance hour meter.



Note: Cancelling the message is to be performed only after the maintenance work has been carried out.



6 - Maintenance

Service and Maintenance intervals

Daily

- Check sprayer filters.
- Check engine oil level.
- Fill the fuel tank.
- Check hydraulic oil level.
- Clean of the engine radiators.
- Check air filter is not clogged.

Maintenance intervals

Maintenance to perform	Interval (hours)							
	10	50	150	250 3 Months	500 6 Months	1000 1 Year	2000 2 Years	5000 4 Years
Tighten wheel bolts	X							
Inspect hoses and hydraulic oil level	X							
Clean CycloneFilter	X							
Boom lubrication		X						
Bleed compressed air tank.		X						
Clean the engine radiators		X						
Drain hydraulic tank			X					
Hydraulic Filters			X					
Coolant Level			X					
Engine air filter				X				
Piping engine air filter				X				
Engine air filter hoses				X				
Compressed air compressor				X			X	
Inspection of engine radiators				X	X			
Drain the coolant					X		X	
Fuel filters					X			
Bleed fuel prefilter				X				
Replace fuel filter					X			
Replace the cabin active carbon filter					X			
Change engine oil and filter					X			
Verification engine vibrations							X	
Check engine fan belt tension						X		
Check spray pressure gauge				X				
Air conditioning						X		
Verification engine								X

10 hours service

Wheel bolts:

- Verify the tightness of all wheel bolts to 250 Ft/lb (340 Nm).

Hydraulic system:

- Verify the tightness of the hydraulic hoses and the oil level in the hydraulic reservoir.

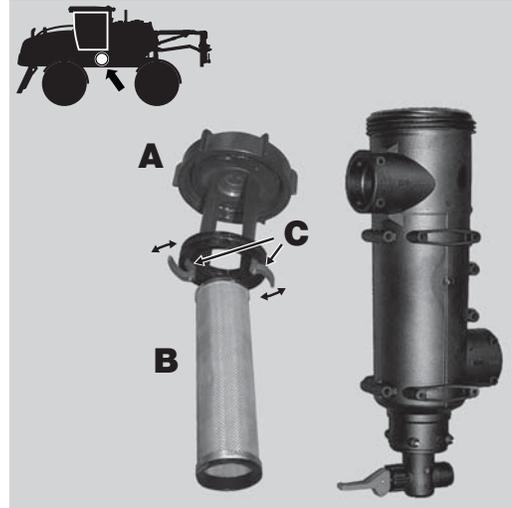
10 hours service - CycloneFilter

To service the CycloneFilter:

1. Close the suction valve and turn the pressure SmartValve to "Main tank" or an unused function.
2. Unscrew filter lid (A).
3. Lift the lid and filter (B) from 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 a brush or similar item to grease with.
2. Mount the filter onto the recess (do not grease) 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 housing and screw the lid until it hits the stop.



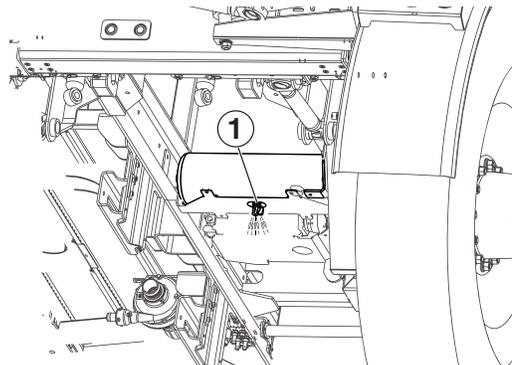
DANGER! Suction valve must always be closed and the pressure SmartValve to "Main tank" before opening the Cyclone filter! If not then spraying liquid can hit you when opening the filter and drain the main tank content!



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

50 hours service - Compressed air tank

Turn the bleed valve (1) to eliminate condensation in the tank.



6 - Maintenance

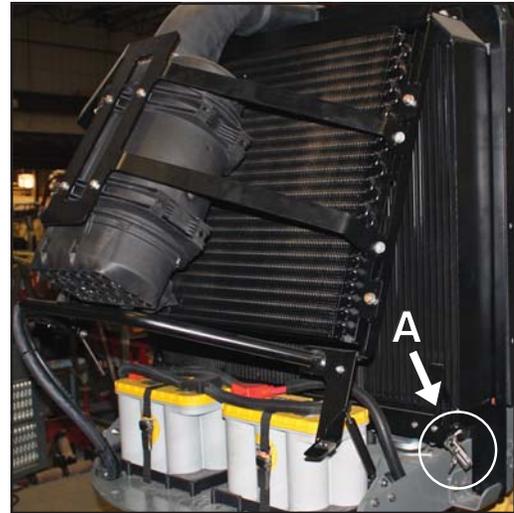
50 hours service - Engine radiators

Lift the motor cover fully.

Release the radiator latch (A).

Tilt the radiator up, as shown in the illustration.

Remove the dust from the filter with compressed air from the inside to the outside.



Note: During cleaning operations, take precautions to not damage the radiator cells.



Note: When the machine is operating in areas with a lot of dust or pollen, the cleaning intervals can be shortened.



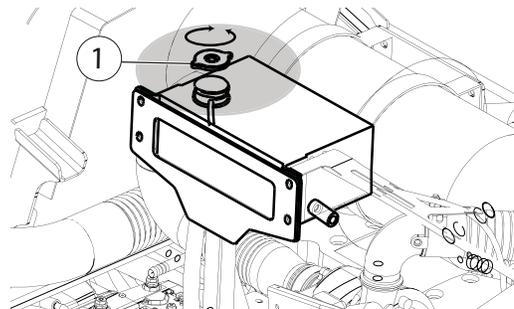
Note: The residue of oil and fuel promotes the clogging of the engine and the radiators. That is why it is advised to carefully check the sealing of the circuits of the engine.

150 hours service - Coolant level



DANGER! In the event of overheating of the engine's cooling system, wait a few minutes before opening the expansion tank plug, in order to avoid any risk of projection that could cause serious burns.

- Regularly check the coolant level.



DANGER! To avoid burns, unscrew the plug (1) when the temperature is below 120 ° F. (50 ° C.).



Note: For further information, see the CUMMINS engine user and maintenance manual.



ATTENTION! Only use the coolant recommended, see "Table of recommended lubricants" on page 63.

250 hours service - Maintenance operations on the engine



Note: For further information, see the CUMMINS engine user and maintenance manual.

500 hours service

This message appears every 500 hours of use to indicate that mandatory maintenance is to be performed on the machine.

1. TOTAL hour meter.
2. Part Time hour meter.
3. MAINTENANCE hour meter.



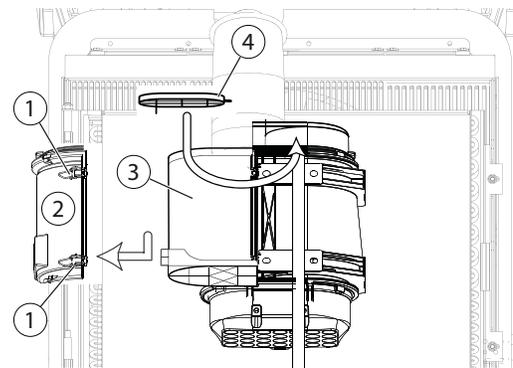
- Change of engine oil and replacement of oil filter cartridge.
- Replacement of fuel filter.
- Bleed the fuel pre-filter.
- Inspection of tightness and tension of engine belts.
- Draining of the hydraulic reservoir and replacement of hydraulic filters.
- Replace the cabin active carbon filter.

500 hours service - Replace engine air filters



WARNING! Wear goggles and a mask for protection to avoid inhaling dust and to protect the eyes.

- Lift the engine hood fully.
- Unhook the 4 latches (1) and remove the lid (2).
- Gently push the main filter (3) down to release it from the housing, then remove.
- Remove filter (4).
- Replace filters (3) and (4).



When reassembling:

- Check the surface of the seals - clean with a slightly damp cloth
- Inspect the air inlet of the engine.
- Check that the fasteners are properly tightened.
- Check that the filter is not damaged.
- Check that the filter is completely in place during reassembly.

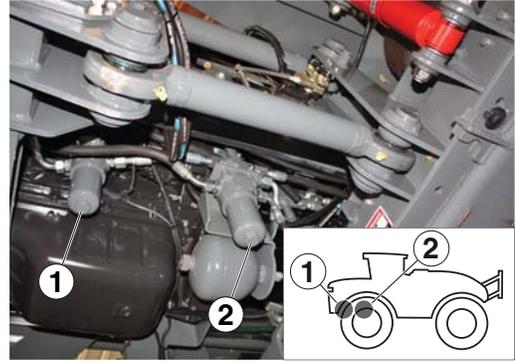


Note: To ensure the best protection, make sure you use original air filters.

6 - Maintenance

500 hours service - Auxiliary hydraulic filter

1. Braking circuit
2. Steering, track width & boom function circuit



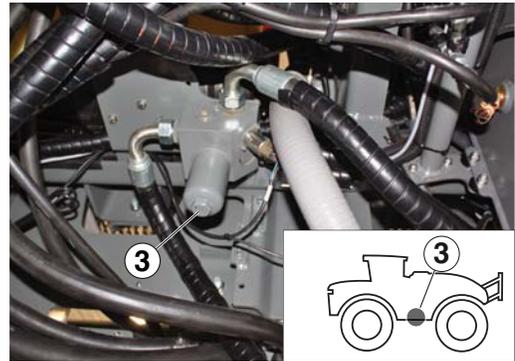
3. Spray pump control circuit

To replace the filter cartridge:

- Unscrew the filter housing.
- Remove the filter cartridge and replace it with a new one.



WARNING! It is essential to use an original filter.



500 hours service - Hydraulic filters in the tank



WARNING! Wear protective gloves while replacing filters to prevent the oil from making any contact with the skin.



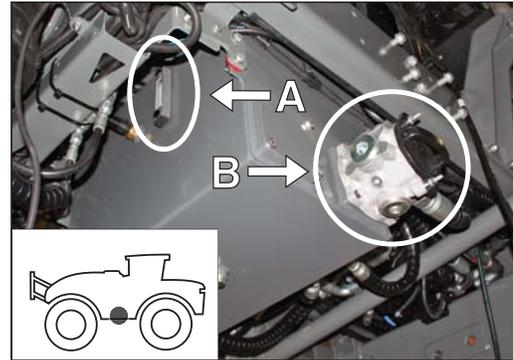
DANGER! Hot oil can cause serious burns.



WARNING! It is essential to use an original filter.

A visual gauge (A) is located on the rear side of the hydraulic reservoir. The filter elements (B) are located on either side of the tank. They should always be replaced at the same time.

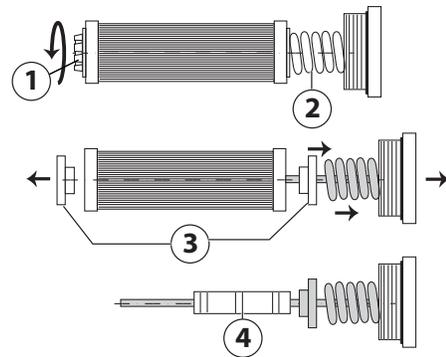
A drip pan should be put in place to collect the used oil contained in the filter housing. A valve at the end of the filter housing retains the oil in the tank.



- Completely unscrew the lid and remove the filter assembly.
- Unscrew the knob (1) to remove the filter. To facilitate this operation, gently press the spring (2).
- Remove the caps from the filter element (3).
- Carefully clean the magnetic core (4) with a cloth.

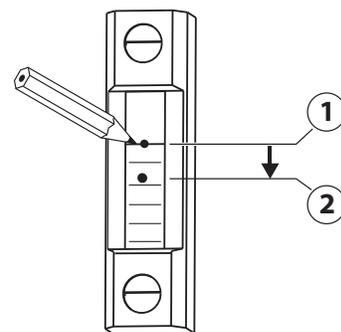


WARNING! It is essential to use original filter elements.



WARNING! Before replacing the filters, note the oil level in the tank (1).

1. Initial level before replacing filters
2. Level after replacing the filters
 - After installing the new filter, the oil level will drop by about 3/8" (10 mm), which means that the filters have been installed correctly.
 - Top up with oil to the maximum level.
 - Start the engine on idle then stop it after a few seconds. This evacuates the air contained in the hydraulic system.
 - Start the engine again on idle and then gradually increase the engine speed.



Note: The oil drained from the filters must never be re-used as it may damage the hydraulic system components.

6 - Maintenance

500 hours service - Replace activated charcoal filter

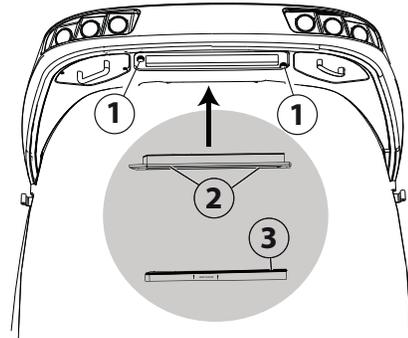
The cabin is fitted with an activated charcoal filter that purifies the air entering the cab interior. It is located outside the cabin in the front.



ATTENTION! Wear goggles and a mask for protection to avoid inhaling dust and to protect the eyes.

To disassemble the activated charcoal filter:

- Remove the thumbscrews (1) and remove the filter assembly.
- Detach the filter from its bracket by removing the screws (2); discard.
- Replace the activated charcoal filter, observing the direction of air movement.
- Reinstall the assembly to the cabin.



WARNING! The frequency of replacement is given for information purposes. However, if bad odors are noticed in the cab, then the filter is no longer completely effective. It must be replaced as soon as possible to avoid any risk of contamination.



WARNING! When the sprayer is not used for prolonged periods, it is advisable to store the activated charcoal filter in a plastic bag.

Every 1000 hours

Cleaning of the hydraulic reservoir.

Check the engine belts.

Drain the engine coolant.

Check the charge of gas from the air conditioning.

Cleaning the condenser of the air conditioning.

Occasional maintenance

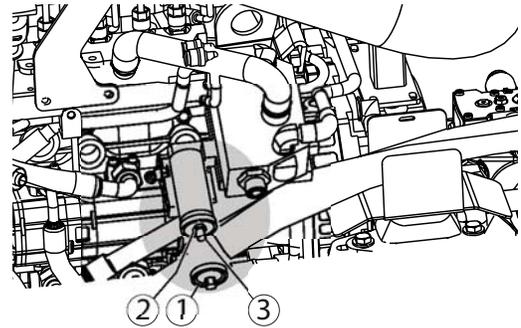
General information

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

Compressed air pressure adjustment

An air compressor is used for the operation of the suspension of the sprayer. The service pressure must be between 130 psi (9 bar) and 145 psi (10 bar).

- Raise the engine hood to access the adjustment of the air compressor, located on the left side of the engine.
- Unscrew the protective cover (1).
- Loosen the lock nut (2) and turn the adjustment screw (3) to adjust the suspension service pressure.



Air suspension adjustment



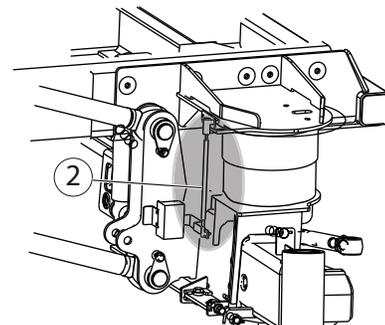
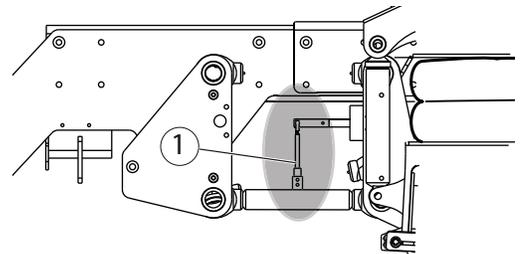
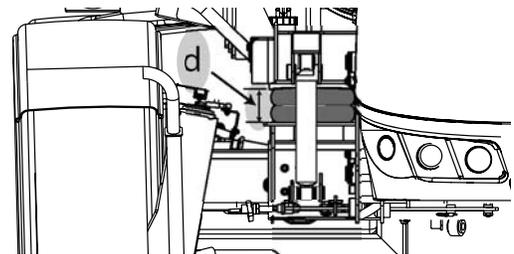
Note: Adjustment of the suspension is performed with an empty tank.

Check beforehand that the compressed air pressure is adjusted correctly.

When service pressure is reached, the front upper arm and rear lower arm should be level.

If the height of the air bag needs adjustment, you can modify it by adjusting the linkage:

- Adjust linkage (1) to change the height of the front air bag.
- Adjust linkage (2) to change the height of the rear air bag.



6 - Maintenance

Charging the Optima AGM battery

The SARITOR is equipped with an Optima AGM battery. Most modern battery chargers have a built-in AGM setting, which should be used to charge the Optima battery. Do not use gel or gel/AGM settings, as this will not fully charge an Optima battery and can damage it over time. Repeatedly charging at high current levels can damage your battery. For best results, use the following recommendations:

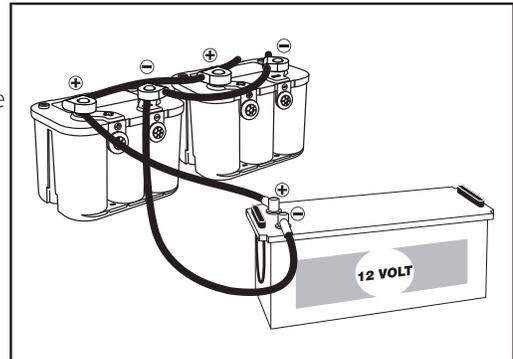
Charger Type	Amps	Target Volts
Regular/Automatic	10	13.8 to 15.0
Float	1	13.2 to 13.8



WARNING! Either remove the battery or turn the battery cut-off switch to "OFF" before charging the battery to avoid damaging the SARITOR electronics.

Deeply Discharged Battery

If an Optima AGM battery is deeply discharged (below 10.5 volts) most basic chargers will not supply a charge. To charge the battery, you can wire a 2nd fully charged automotive battery (12V+) to the discharged AGM battery in parallel (+ to + and - to -). Then hook up the charger to the discharged battery, setting the charger at 10 amps. Leave for 2 hours, monitoring periodically. When the discharged battery reaches 10.5 volts or above, remove the automotive battery and continue charging the AGM battery until fully charged.

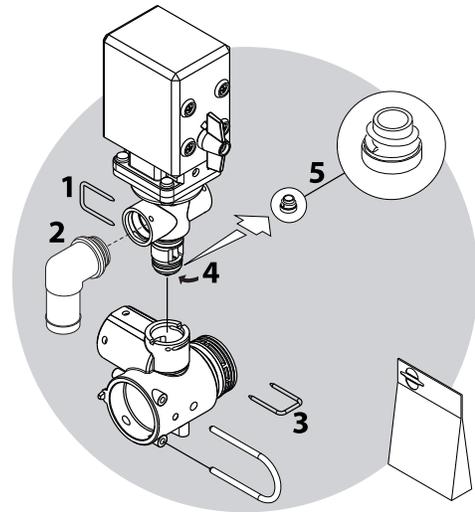


Storage recommendations for the Optima AGM battery

The most important consideration when storing any battery is to make sure the voltage never drops below 12.4 volts. It is recommended to use a "battery maintainer" device that will monitor the battery and keep it at full potential during storage.

Cone check/replacement for EFC distribution valve

Periodically check the distribution valves for proper sealing. Do this by running the sprayer with clean water and open all distribution valves. Cautiously remove the clip (1) and pull out the hose (2) for the return line. When the housing is drained, there should be no liquid flow through the return line. If there is any leakage, the valve cone (5) must be changed. Remove the clip (3) and lift the motor housing off the valve housing. Then unscrew the screw (4) and replace the valve cone (5). Reassemble in reverse order.



Level indicator adjustment

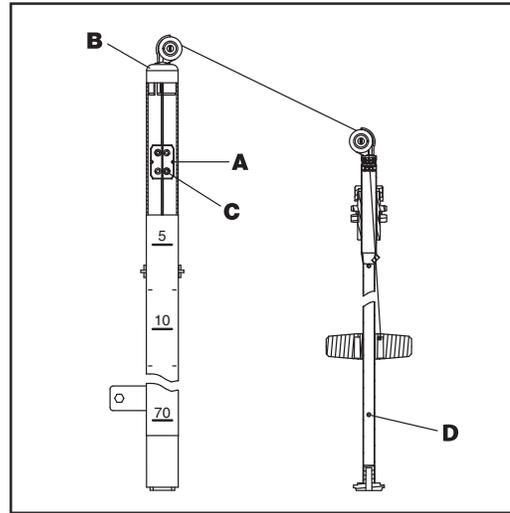
The level indicator reading should be checked regularly. When the tank is empty, the float should lie on the stop pin (D) of the rod, and the O-ring on the indicator should be positioned at the top position line (A).



ATTENTION! The wire guide wheels should be directed so they follow the direction of the wire.

If any deviation is found:

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



Level indicator wire replacement

If the wire 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 73) 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!

Drain valve seal replacement

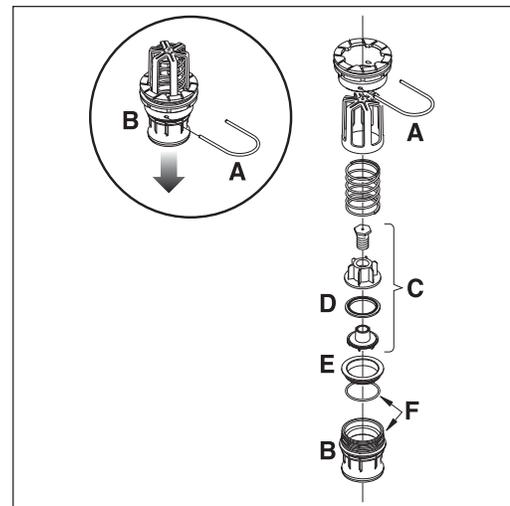
If the main tank drain valve leaks, the seal and seat can be changed the following way.



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.

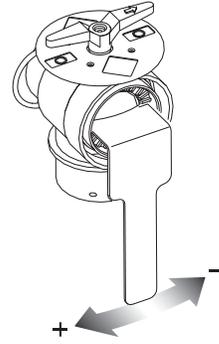


ATTENTION! Check function of valve with clean water before filling chemicals into the tank.

6 - Maintenance

Adjustment of 3-way-valves

If a 3-way valve is difficult to turn or if it turns too easily or there is a risk of leak, the serrated washer can be adjusted as shown in the picture.



 Note: This procedure is also valid for electric valves.

ParaLift Lock

The boom is mechanically held in transport position with paralift lock mechanisms that automatically engage when the first outer section is closing. The folded channel-section locks are fixed to the top paralift arm and engage directly on the top of the paralift cylinders when lowered for transport. This means the boom is not supported by hydraulic oil pressure when in transport.



WARNING! when the sprayer is being transported along rough roads and is bounced over potholes, in extreme cases there is a risk that the lock arms can disengage. Paralift locks should be checked before and after transport to ensure positive lock engagement.

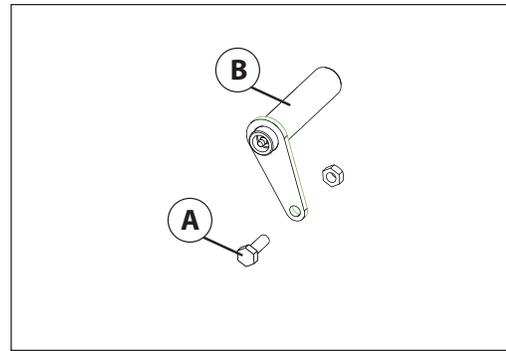
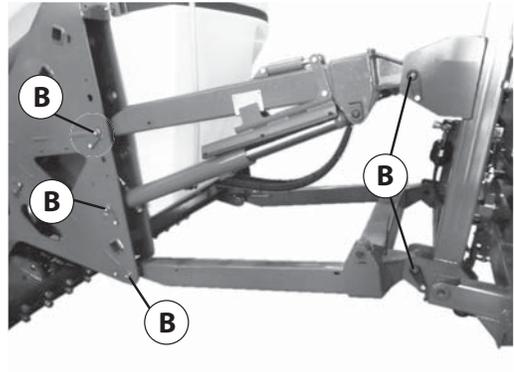


ParaLift wear bushing replacement

The ParaLift is used to raise and lower the boom height to suit the terrain. However, with AutoTerrain, small adjustments are being made continuously. Greasing the ParaLift pivot points on a regular basis will prolong the life of the wear bushings.

Inspect and replace the wear bushings before they are worn through.

1. Unfold the booms 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 bolt (A), pull out pin (B) at one of the upper parallelogram arms and replace the wear bushings.
4. Replace the pin (B) and bolt (A).
5. Repeat this on the other upper arm.
6. The lower arms must be disconnected simultaneously.
7. Grease all grease nipples.
8. Remove the lifting gear.



6 - Maintenance

Off-season storage

Off-season storage program

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

1. Clean the sprayer completely - inside and outside - as described under "D: Full internal cleaning (Soak wash)" on page 60. Make sure that all valves, hoses and auxiliary equipment have been cleaned with detergent and flushed with clean water afterwards, so no chemical residue is left in the sprayer.
2. Replace possible damaged seals and repair possible 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 off the spraying circuit as possible. Let the pump run until all nozzles stop spraying. Remember to drain the flush tank also.
4. Pour appr. 13 gal. (50 liters) anti-freeze mixture consisting of 1/3 automotive 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 anti-freeze is sprayed through the nozzles as well. The anti-freeze will also prevent O-rings, seals, diaphragms etc. from drying out.
6. Lubricate all lubricating points according to the lubricating scheme - regardless of intervals stated.
7. When the sprayer is dry, remove rust from possible scratches or damages in the paint 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 RUSTILLO 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. Bleed any condensation from the air compressor (See "50 hours service - Compressed air tank" on page 65).
12. Drain excess water from the Filling filter hose and filter housing to prevent damage from freezing (See ?????????).
13. All electric plugs and sockets are to be stored in a dry plastic bag to protect them against damp, dirt and corrosion.
14. Remove the control boxes and computer display from the tractor, and store them dry and clean (in-house). A non-condensing environment is recommended.
15. Apply grease on all hydraulic ram piston rods which are not fully retracted in the barrel to protect against corrosion.
16. Chock up the wheels, to prevent moisture damage and deformation of the tires. Tire blacking can be applied to the tire walls to preserve the rubber.
17. To protect against dust, the sprayer can be covered by a tarpaulin. Ensure ventilation to prevent condensation.

Preparing the sprayer for use after storage

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

1. Remove the cover.
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 on the sprayer with clean water.
9. Fill with clean water and check all functions.

Error messages

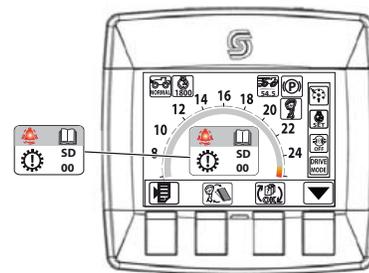
Cabin error codes

The messages below will be displayed when a fault appears on the system of the cab's air conditioning.

List of error codes

ERROR #	Description	Fault operation
01	High pressure switch - Wiring or cycling 2 in 1 minute	Heat mode - compressor clutch disabled
02	Low pressure switch - Wiring or open for 1 minute	Heat mode - compressor clutch disabled only while low pressure switch is open
03	Blower speed select pot open/shorted to power	Auto blower speed
04	Temperature select pot open/shorted to power	72°F Set point
05	Recirc. pot open/shorted to power	Not used on combine
06	Mode select pot open/shorted to power	Not used on combine
07	Cab temp sensor wiring - open, short, ground, power	Manual mode - compressor clutch disabled
08	Evap. temp sensor wiring - open, short, ground, power	Heat mode - compressor clutch disabled
09	Outlet temp sensor wiring - open, short, ground, power	Doesn't limit blower speed on startup
10	Outside temp sensor wiring - open, short, ground, power	Not used on combine
12	Cab pressure sensor wiring	Not currently implemented
14	Clutch output fault (overcurrent, short to ground)	Not currently implemented
15	Defog light output fault (overcurrent, short to ground)	Not currently implemented
15	Defog light output fault (overcurrent, short to ground)	Not currently implemented

Transmission error codes



Error codes	Description	Error codes	Description
001	Low battery voltage	070	Loop error
002	Low battery voltage	071	PWM2 current loop error
003	12V sensor low supply voltage	074	Loop error pump 1
004	12V sensor high supply voltage	080	Brake pressure sensor signal out of range
005	5V sensor low supply voltage	083	CAN bus communication error: signal not received
006	5V sensor high supply voltage	084	High pressure sensor signal out of range
007	Stack overflow	092	Joystick sensor error
008	E2prom memory error	097	Analog mode selector sensor error
009	FLASH memory error	100	Joystick limitation control error
010	RS232 memory error	200	Offroad SD: high battery voltage
011	CAN bus connection error	201	Offroad SD: low battery voltage
012	Current return protection	202	Offroad SD: 12V supply voltage sensor out of range
020 to 045	Internal system error		
051	MAF loading error		
052	Inconsistent key		
053	Inconsistent MAF		
054	Inconsistent input/output		
055	Error in sensitive parameter		
056	SDPHASE code error		
057	Checksum error		
058	Min/Max error in parameter		

7 - Fault finding

CUMMINS engine error codes

SPN	Component / Location	Description (Error location)	FMI
29	Hand throttle	Cable break or short circuit, signal implausible compared to signal or idle sensor	2,3, 4, 11
84	Vehicle speed signal	Speed above target range, signal missing or implausible	0, 8, 12, 14
91	Accelerator pedal	Cable break or short circuit, signal implausible compared to signal of idle sensor (analog pedal)	2, 3, 4, 11
91	Accelerator pedal	Cable break or short circuit, bad PWM signal range or frequency (digital pedal)	2, 8
91	Accelerator pedal	Bad PWM pulse-width repetition rate (digital pedal)	8, 11
94	Fuel low pressure sensor	Cable break or short circuit	3, 4, 11
94	Fuel low pressure	Below target range with system reaction	2, 11
97	Fuel filter water level sensor	Cable break or short circuit	3, 4, 11
97	Water level in fuel filter	Above target range	11, 12
100	Oil pressure sensor	Cable break or short circuit	0, 2, 3, 4
100	Oil pressure sensor	Pressure value implausible low	1, 11
100	Oil pressure	Above target range	0, 11
100	Oil pressure	Below target range	1, 11
102	Charge air pressure sensor	Cable break or short circuit	2, 3, 4
102	Charge air pressure	Outside target range with system reaction	2, 11
105	Charge air temperature sensor	Cable break or short circuit	2, 3, 4, 11
105	Charge air temperature	Outside target range with system reaction	0, 11
107	Air filter condition	Pressure loss above target range with system reaction	0, 11
108	ECU internal error	Ambient pressure sensor defective	2, 3, 4, 11
110	Coolant temperature sensor	Cable break or short circuit	2, 3, 4
110	Coolant temperature	Outside target range with system reaction	0, 11
111	Coolant Level	Outside target range with system reaction	1, 11
157	Rail pressure sensor	Cable break or short circuit	3, 4, 11
157	Rail pressure sensor	Deviation of signal during start or after-run above target range	0, 1, 11
158	Terminal 15	Ignition ON not detected	11, 12
168	Battery	Voltage below target range	0, 1, 11
168	Battery voltage	Above target range with system reaction	2, 11
174	Fuel temperature sensor	Fuel temp. sensor: Cable break or short circuit	3, 4, 11
174	Fuel temperature	Above target range with system reaction	0, 11
175	Oil temperature sensor	Cable break or short circuit	2, 3, 4
175	Oil temperature	Below target range with system reaction	0, 11
190	Engine speed sensor	Engine running with cam-shaft speed signal only	11, 12
190	Engine speed sensor	Speed signal from cam-shaft bad or missing	8, 11, 12
190	Engine speed sensor	Speed signals from crank-shaft bad or missing	8, 11, 12
190	Engine speed sensor	Speed signals of crank-shaft and cam-shaft are phase-shifted	2, 11
190	Overspeed	Engine overspeed with system reaction	0, 11
190	Overrun conditions	Overrun conditions with system reaction	11, 14
520	CAN message	Missing (message "TSC1-TR")	11, 12
563	Main relay	Short circuit to ground or emergency shut-off (relay 3)	7, 11, 12
624	Diagnostic lamp	Cable break or short circuit, disabled by ECU	2, 3, 4, 5
630	ECU internal error	EEPROM memory access	11, 12
639	CAN bus off-state	Cable break or short circuit, off-state (CAN bus A)	11, 14

7 - Fault finding

SPN	Component / Location	Description (Error location)	FMI
651	Single injector	Short circuit (injector 1)	3, 4, 11, 13
651	Single injector	Cable break (injector 1)	5, 13
652	Single injector	Short circuit (injector 2)	3, 4, 11, 13
652	Single injector	Cable break (injector 2)	5, 13
653	Single injector	Short circuit (injector 3)	3, 4, 11, 13
653	Single injector	Cable break (injector 3)	5, 13
654	Single injector	Short circuit (injector 4)	3, 4, 11, 13
654	Single injector	Cable break (injector 4)	5, 13
655	Single injector	Short circuit (injector 5)	3, 4, 11, 13
655	Single injector	Cable break (injector 5)	5, 13
656	Single injector	Short circuit (injector 6)	3, 4, 11, 13
656	Single injector	Cable break (injector 6)	5, 13
657	Single injector	Short circuit (injector 7)	3, 4, 11, 13
657	Single injector	Cable break (injector 7)	5, 13
658	Single injector	Short circuit (injector 8)	3, 4, 11, 13
658	Single injector	Cable break (injector 8)	5, 13
676	Air heater relay	Cable break or wrong connection	4, 11
676	Air heater relay	Inoperable during shut-off	2, 5, 11
677	Start relay	Start relay (high side): Short circuit	3, 4, 11
677	Start relay	Start relay (low side): Cable break or short circuit, disabled by ECU	3, 4, 5, 11
701	Reserve output	Short circuit to Ubatt (output 1)	11
701	Reserve output	Short circuit to ground (output 1)	11
701	Reserve output	Cable break or ECU internal error (output 1)	11
702	Reserve output	Short circuit to Ubatt (output 2)	11
702	Reserve output	Short circuit to ground (output 2)	11
702	Reserve output	Cable break or ECU internal error (output 2)	11
703	Engine operating signal lamp	Cable break or ECU internal error	2, 3, 4, 5
704	Coolant temperature warning lamp	Cable break or short circuit	11
705	Oil pressure warning lamp	Cable break or short circuit	2, 3, 4, 5
729	Air heater relay	Cable break or short circuit	3, 4, 5, 11
730	Air heater magnetic valve	Cable break or short circuit	3, 4, 5, 11
898	CAN message	Missing (message "TSC1-TE")	11, 12
923	Engine power output	Engine power output: Cable break or short circuit	2, 3, 4, 5
975	Fan actuator	Fan actuator: Cable break or short circuit	2, 3, 4, 5
1072	Engine brake (internal)	Internal engine brake: Cable break or short circuit	3, 4, 5, 11
1074	Engine brake flap actuator	Engine brake flap actuator: Cable break or short circuit	3, 4, 5, 11
1079	ECU internal error	Wrong voltage of internal 5V reference source 1	3, 4, 11
1080	ECU internal error	Wrong voltage of internal 5V reference source 2	3, 4, 11
1081	Preheating signal lamp	Cable break or short circuit	2, 3, 4, 5
1109	Shut-off request	Shut-off request ignored by operator	2, 11
1231	CAN bus off-state	Cable break or short circuit, off-state (CAN bus B)	11, 14
1235	CAN bus off-state	Cable break or short circuit, off-state (CAN bus C)	11, 14
1237	Override switch	Switch hangs	2, 11

7 - Fault finding

SPN	Component / Location	Description (Error location)	FMI
1322	Multiple cylinders	Misfire detected	11,12
1323	Single cylinder	Misfire detected (cylinder 1)	11, 12
1324	Single cylinder	Misfire detected (cylinder 2)	11, 12
1325	Single cylinder	Misfire detected (cylinder 3)	11, 12
1326	Single cylinder	Misfire detected (cylinder 4)	11, 12
1327	Single cylinder	Misfire detected (cylinder 5)	11, 12
1328	Single cylinder	Misfire detected (cylinder 6)	11, 12
1346	Misfire	Misfire detected with system reaction	0, 11
1450	Single cylinder	Misfire detected (cylinder 7)	11, 12
1451	Single cylinder	Misfire detected (cylinder 8)	11, 12
1638	Customer-specific sensor	Cable break or short circuit (sensor 2)	3, 4, 11, 12
1638	Customer-specific temperature	Outside target range with system reaction (temperature 2)	2, 11
2634	Main relay	Short circuit to Ubatt (relay 1)	3, 11
2634	Main relay	Short circuit to ground (relay 1)	4, 11
2634	Main relay	Short circuit to ground or emergency shut-off (relay 2)	7, 11, 12
2634	Main relay	Short circuit to ground or emergency shut-off (relay 3)	7, 11, 12
2791	EGR actuator (external)	Short circuit to Ubatt	3, 11
2791	EGR actuator (external)	Short circuit to ground	4, 11
2791	EGR actuator (external)	Cable break or ECU internal error	2, 5, 11
2791	EGR actuator (external)	Cable break or short circuit	2, 3, 4, 5
523212	CAN message	Missing (message "EngPrr" = engine protection)	11, 12
523216	CAN message	Missing (message "PrHtEnCmd" = Preheat and engine command)	11, 12
523218	CAN message	Missing (message "RxCCVS" = cruise control)	11, 12
523222	CAN message	Missing (message "TCO1" = speedo signal)	11, 12
523238	CAN message	Missing (message "SwtOut" = switch outputs)	11, 12
523239	CAN message	Missing or value above target range (message "DecV1" = pseudo pedal)	2, 12
523240	CAN message	Missing (message "FunModCt" = function mode control)	11, 12
523350	Multiple injectors	Short circuit (cylinder bank 1)	3, 4, 11, 13
523351	Multiple injectors	Cable break (cylinder bank 1)	5, 13
523352	Multiple injectors	Short circuit (cylinder bank 2)	3, 4, 11, 13
523353	Multiple injectors	Cable break (cylinder bank 2)	5, 13
523354	ECU internal error	Injector power stage A	2, 3, 12, 14
523355	ECU internal error	Injector power stage B	12
523370	Rail pressure	Compression test active: Rail-pressure monitoring is going to be disabled	11, 14
523420	ECU internal error	Watchdog counter exceeds maximum	11, 14
523450	Multi state switch	Cable break or short circuit, input voltage outside target range (switch 1)	2, 3, 4, 11
523451	Multi state switch	Cable break or short circuit, input voltage outside target range (switch 2)	2, 3, 4, 11
523452	Multi state switch	Cable break or short circuit, input voltage outside target range (switch 3)	2, 3, 4, 11
523470	Rail pressure limiting valve	Opening failure	2, 11, 12, 14
523470	Rail pressure limiting valve	Opening failure with system reaction	11, 12
523490	ECU internal error	Redundant shut-off conditions detected	3, 4, 11, 12
523500	CAN message	Time-out of at least one sent message	11, 12

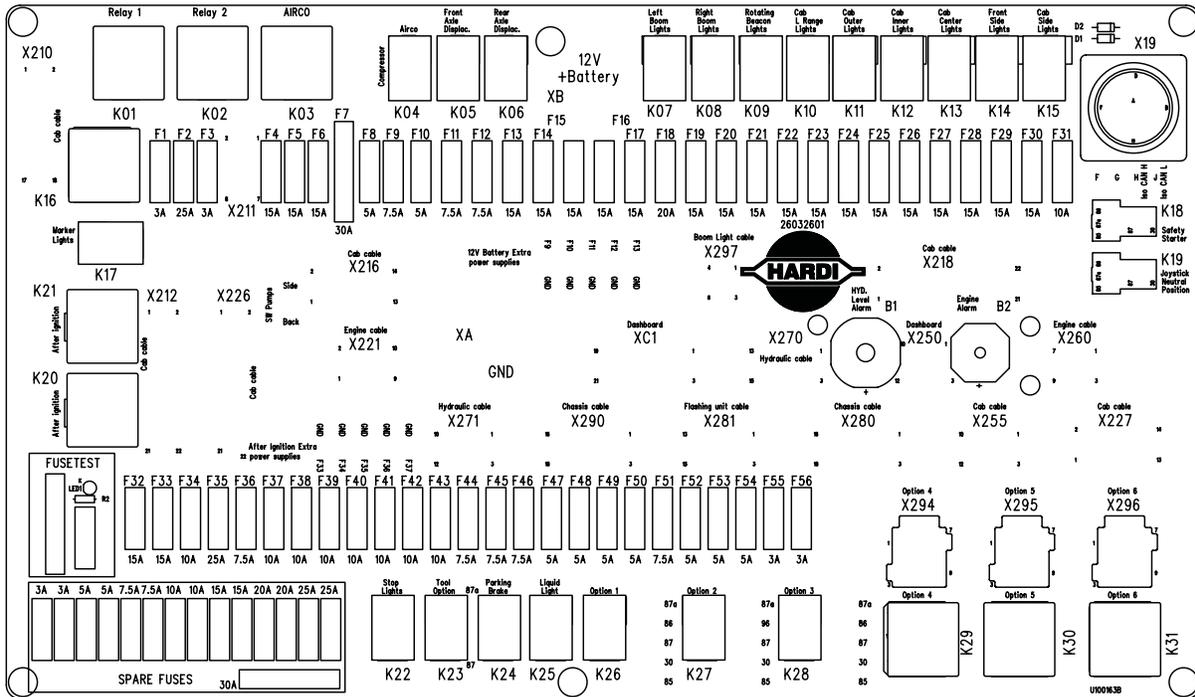
7 - Fault finding

SPN	Component / Location	Description (Error location)	FMI
523550	Terminal 50	Engine start switch hangs	11, 12
523550	ECU internal error	Time processing unit (TPU) defective	2, 11
523561	Begin of injection period	Outside target range or missing (cylinder 1)	2
523562	Begin of injection period	Outside target range or missing (cylinder 2)	2
523563	Begin of injection period	Outside target range or missing (cylinder 3)	2
523564	Begin of injection period	Outside target range or missing (cylinder 4)	2
523565	Begin of injection period	Outside target range or missing (cylinder 5)	2
523566	Begin of injection period	Outside target range or missing (cylinder 6)	2
523567	Begin of injection period	Outside target range or missing (cylinder 7)	2
523568	Begin of injection period	Outside target range or missing (cylinder 8)	2
523600	ECU internal error	Serial communication interface defective	11, 12
523601	ECU internal error	Wrong voltage of internal 5V reference source 3	3, 4, 11
523602	Fan speed	Above target range with system reaction	2, 11
523604	CAN message	Missing (message "RxEngTemp" = engine temperature)	11, 12
523605	CAN message	Missing (message "TSC1-AE")	11, 12
523606	CAN message	Missing (message "TSC1-AR")	11, 12
523607	CAN message	Missing (message "TSC1-DE")	11, 12
523608	CAN message	Missing (message "TSC1-DR")	11, 12
523609	CAN message	Missing (message "TSC1-PE")	11, 12
523610	CAN message	Missing (message "TSC1-VE")	11, 12
523611	CAN message	Missing (message "TSC1-VR")	11, 12
523612	ECU internal hardware monitoring	A recovery occurred which is stored as protected	11, 14
523612	ECU internal hardware monitoring	A recovery occurred which is not stored	11, 14
523612	ECU internal hardware monitoring	A recovery occurred which is visible in the error memory	11, 14
523612	ECU internal hardware monitoring	Overvoltage	3, 11
523612	ECU internal hardware monitoring	Undervoltage	4, 11
523613	Rail pressure	Positive deviation (speed dependent) outside target range	0, 11
523613	Rail pressure	Positive deviation (flow dependent) outside target range (=> Leakage!)	0, 11
523613	Rail pressure	Negative deviation (flow dependent) outside target range	0, 11
523613	Rail pressure	Negative deviation (speed dependent) outside target range	1, 11
523613	Rail pressure	Pressure above target range	0, 11
523613	Rail pressure	Implausible (leakage, injector needle blocked in open position)	2, 11
523615	Metering unit valve	Flow rate outside target range	3, 4, 11
523615	Metering unit valve	Not connected or output disabled	5, 11, 12
523615	Metering unit valve	Short circuit to Ubatt	11, 12
523615	Metering unit valve	Short circuit to ground	11, 12
523617	ECU internal error	Communication with chip CJ940 disturbed	11, 12
-	Customer-specific sensor	Cable break or short circuit (sensor 1)	2, 3, 4, 11
-	Customer-specific temperature	Outside target range with system reaction (temperature 1)	2, 11

7 - Fault finding

Electrical incidents

Main circuit fuses and relays (U100163B)



U100163B

7 - Fault finding

Code		Description	Code	Amp. (A)	Description
F1	3.0	Outdoor cab light timer	F29	15.A	front side cabin lights
F2	25 A	side lights/backlighting	F30	15 A	starter contactor
F3	3 A	12 V BAT - ceiling	F31	10 A	starter solenoid
F4	15 A	flasher unit - control	F32	15 A	dipped beam
F5	15 A	not used	F33	15 A	main beam headlights
F6	15 A	not used	F34	10 A	work area lighting (optional)
F7	30 A	12V BATT - air conditioning	F35	25 A	windscreen washer pump - windscreen wipers
F8	5 A	12V BATT - car radio	F36	7.5 A	acoustic alarm
F9	7.5 A	rear view mirrors	F37	10 A	12 V after ignition - 4-wheel steering
F10	5 A	air conditioning compressor	F38	10 A	12 V after ignition - optional
F11	7.5 A	hydraulic ECU	F39	10 A	12 V after ignition - optional
F12	15 A	hydraulic ECU	F40	10 A	12 V after ignition - adjustable track width VTK only
F13	15 A	12V BATT -Trimble CFX750- optional	F41	10 A	12 V after ignition - OFFROAD controller
F14	15 A	12V BATT - Autoheight control- optional	F42	10 A	road- parking - 4-wheel drive standard mode
F15	15 A	12V BATT - adjustable track width VTK only- optional	F43	5.0 A	brake lights
F16	15 A	12V BATT - adjustable track width controller VTK only	F44	7.5 A	12 V after contact with SD module- input 1
F17	15 A	12V BATT - optional	F45	7.5 A	permanent 12 V battery - HC9500 console
F18	20 A	flasher unit	F46	7.5 A	12 V after contact with SD module- input 2
F19	15 A	boom lights 1 and 2 (HC9500 only)	F47	5 A	hydraulic ECU
F20	15 A	boom lights 3 and 4 (HC9500 only)	F48	5 A	hydraulic oil level alarm
F21	15 A	hazard lights	F49	5 A	brake pressure - hydraulic level - alarms
F22	15 A	cigarette lighter - 12V sockets	F50	5 A	not used
F23	15 A	seat compressor unit	F51	7.5 A	12 V after ignition - engine error
F24	15 A	side cabin lights	F52	5 A	12 V after ignition CANCOCKPIT' console-HC9500
F25	15.0 A	right front cabin lights	F53	5 A	12 V after ignition - right and left direction indicator
F26	15 A	left rear cabin lights	F54	5 A	12 V after ignition - cabin switches
F27	15 A	not used	F55	3 A	12 V after ignition - air conditioning and car radio
F28	15 A	front cabin lights	F56	3 A	12 V after ignition - J1939 diagnostic socket

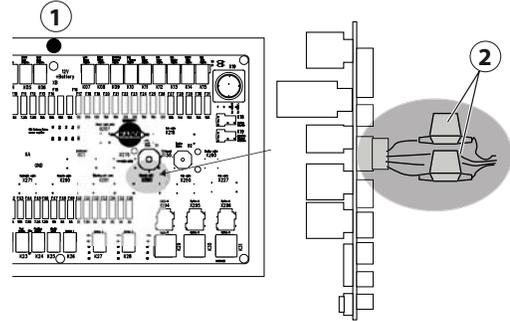
Relays	Description	Relays	Description
K01	not used	K16	not used
K02	not used	K17	backlighting - side lights
K03	air conditioning power	K18	engine starter control
K04	air conditioning compressor	K19	forward handle neutral position
K05	Not used	K20	circuit control after contact
K06	Not used	K21	circuit control after contact
K07	HC9500 only (lights of rail 3 and 4)	K22	BRAKE lights
K08	HC9500 only (lights of ramp 1 and 2)	K23	ROAD mode
K09	hazard lights	K24	parking brake
K10	not used	K25	work area lighting (optional)
K11	right rear cabin lights	K26	not used
K12	left rear cabin lights	K27	not used
K13	not used	K28	not used
K14	front cabin lights		
K15	Front side of the cab lights		

7 - Fault finding

Position Lights Fuse

Two fuses are placed at the rear of the main printed circuit to protect the lighting circuit (position lights).

- Remove screw (1) and rock the main printed circuit to access the fuses.
- Check and replace the defective fuse (7.5 A).



Note: Spare fuses are available on the main printed circuit board.



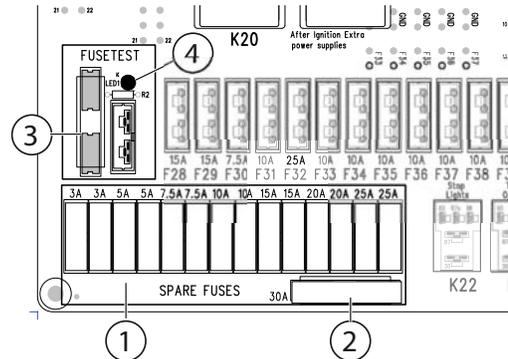
Note: Ensure that the replacement fuse has the same capacity as the original fuse.

Fuse test

The main circuit has "Autofuse" type spare fuses (1) and a "Maxifuse" (2).

To test a fuse.

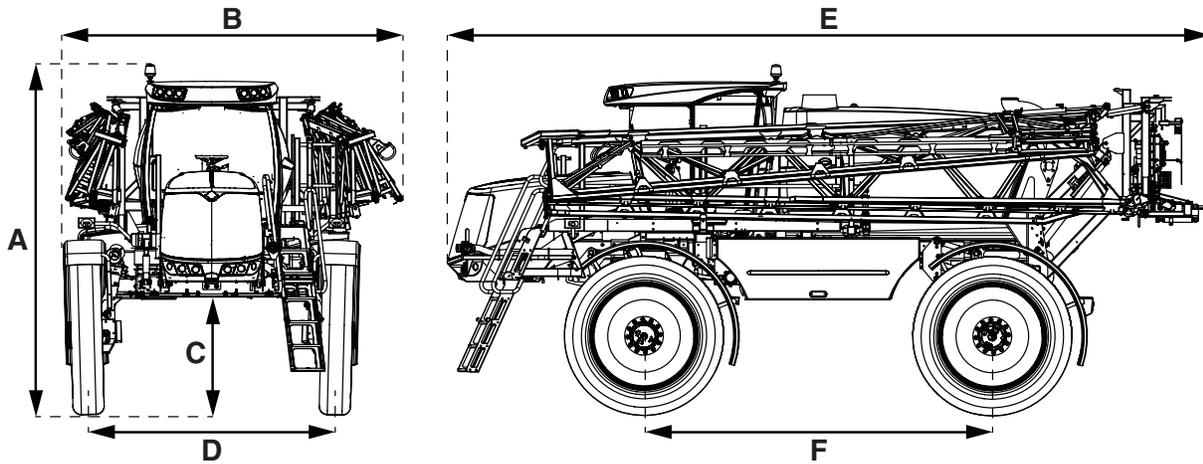
- Remove the fuse to be checked and place it in the fuse holder (3) according to the model.
If the indicator (4) lights up, this means that the fuse is in good working order. If not, use an "Autofuse" (1) or "Maxifuse" f(2) replacement fuse.



Note: Ensure that the replacement fuse has the same capacity as the original fuse.

Specifications

Dimensions



A	B	C	D	E	F
156"	150" (Transport 138")	48" (380/90 R46) / 54" (480/80 R50)	120" to 160"	374"	168"
396 cm	380 cm (Transport 351 cm)	122 cm (380/90 R46) / 137 cm (480/80 R50)	305 cm to 406 cm	950 cm	427 cm

Weight

Weight (empty) 30,250 lbs (5000 & 120' boom).

Tire pressures

Sizes	Load index	Inflation pressure PSI (bar)
380/90R50	169A8	70 (4.8)
480/80R50	169A8	58 (4.0)
520/85R46	169A8	46 (3.2)

8 - Technical Specifications

Identification plates

A. Identification of wheel gear boxes:



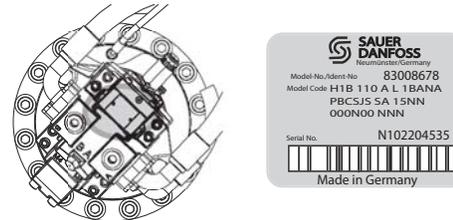
B. Identification of hydraulic pumps:

1. Hydraulic Pump primary transmission, placed behind the engine.
2. Hydraulic Pump of secondary transmission.



C. Identification of hydraulic motors:

The model and serial number are shown on the identification plate, as shown in the illustration.



Warranty policy and conditions

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.

HARDI®'s extended standard 3 year warranty and optional 5 year warranty is underwritten by Ag Guard, 21295 Hollingsworth Road, Tonganoxie, KS 66086, AgGuard.com. All warranty decisions after the first year are at the sole discretion of Ag Guard.

Standard 3 year and optional 5 year self-propelled warranty.

POWER TRAIN covers components that produce, transmit or control engine horsepower for propelling the machine (e.g. engine, engine electronic controls/sensors, turbo, water pump, fuel injection, drive-line couplers/shafts, U-joints, transfer gears, differential, transmission, final drives, axles, hydro, creeper, PTO, etc.).

POWER TRAIN + HYDRAULIC SYSTEMS includes Power train coverage plus hydraulic systems, parts and components associated with steering and implement control (e.g. tanks, pumps, coolers, motors, controls, sensors, valves, cylinders, accumulators, hoses/lines, couplers, swivels, filter bases, etc.).

POWER TRAIN + HYDRAULIC SYSTEMS + PLATFORM includes Power train + Hydraulic Systems coverage plus additional mechanical, electrical and structural components.

Model	Coverage	Terms	Hours	Deductible
Alpha	PT & Hydraulics	3 Years	1,000	\$500.00
Alpha	PT & Hydraulics	5 years	2,000	\$500.00
SARITOR	PT & Hydraulics	3 years	1,000	\$500.00
SARITOR	PT & Hydraulics	5 Years	2,000	\$500.00
PRESIDIO	PT & Hydraulics	3 Years	1,000	\$500.00
PRESIDIO	PT & Hydraulics	5 Years	2,000	\$500.00

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. Tires, Valves and O-rings) 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.

9 - Warranty

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. This warranty is non-transferable.
8. Subject to the following terms, conditions and contributions, HARDI® extends the warranty on polyethylene tanks (excluding fittings, lids and gaskets) to FIVE YEARS. 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. HARDI® reserves the right to incorporate any change in design in its products without obligation to make such changes on units previously manufactured.
10. 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.
11. 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 of HARDI® NORTH AMERICA INC. Approval of warranty is the responsibility of the HARDI® Service Department.
12. 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.
13. ANY pump replacement MUST be approved by the HARDI® Service Department.
14. 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.
15. Parts which are requested for return by the HARDI® Service Department must be returned prepaid within thirty (30) days for warranty settlement.
16. 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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