



Spray **STRIKER™**



OWNER'S MANUAL

500-3250 GALLON HI-FLOW ELECTRIC DE-ICING SPRAYER

This manual replaces all editions with an earlier date.

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CAUTION - Read this manual before installing or operating the sprayer

Technical specifications

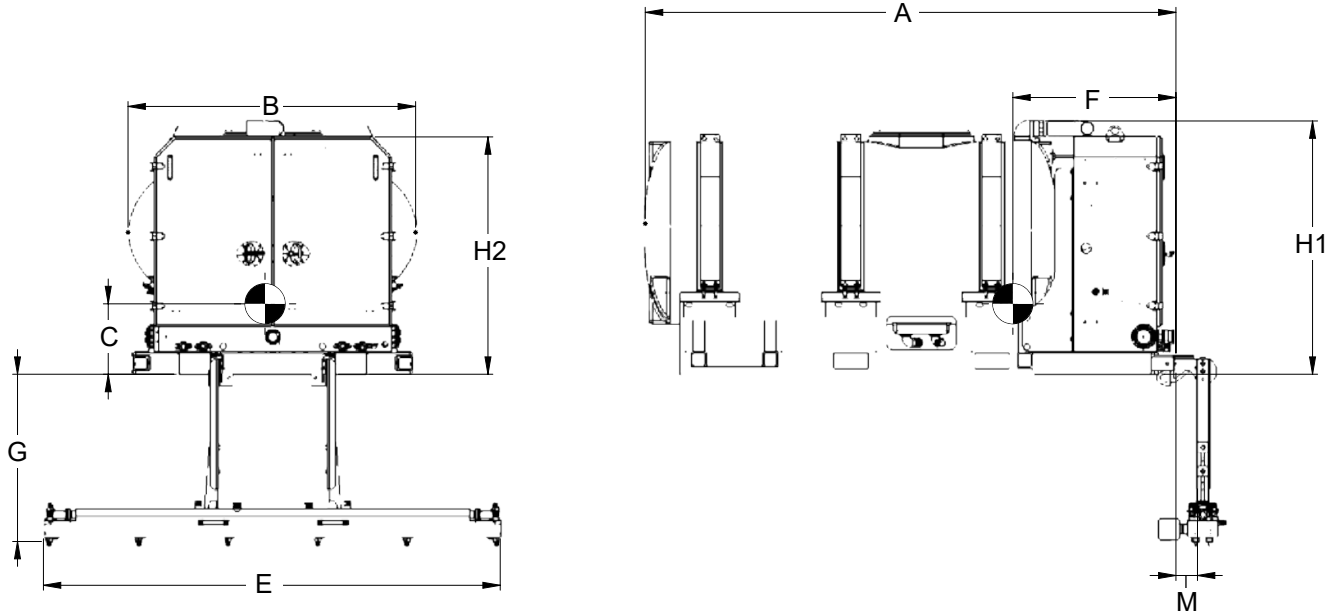


Image shows SprayStriker™ 500

Key	Description	500	750/800	1000	1600	2650	3250
A	Total length	105"	111"	113"	161"	145"	175"
B	Width	57"	69"	78"	78"	88"	88"
C	Height of the centre of gravity from the loading surface of the carrying vehicle (empty liquid tanks)	14"	-	16"	12"	-	-
	Height of the centre of gravity from the loading surface of the carrying vehicle (completely filled liquid tanks)	23"	-	30"	30"	-	-
E	Spray bar width	90" or 100"					
F	Distance from the centre of gravity to the rear part of the sprayer (empty liquid tanks)	32"	-	43"	56"	-	-
	Distance from the centre of gravity to the rear part of the sprayer (completely filled liquid tanks)	52"	-	61"	85"	-	-
G	Distance between spray bar and the loading surface of the carrying vehicle	Adjustable 21-34"					
H1	Total height from the loading surface of the carrying vehicle	50"	56"	63"	63"	94"	94"
H2	Height from the loading surface of the carrying vehicle	47"					
M	Distance between the rear of the sprayer and spray bar	Adjustable 2-14"					

Description	500	750 / 800	1000	1600	2650	3250
Tank volume	500 gal	750 / 800 gal	1000 gal	1600 gal	2650 gal	3250 gal
Spray width (max)	30 ft	30 ft	30 ft	30 ft	30 ft	30 ft
Spray volume (12V/24V)	20 gal/min (12V) / 40 gal/min (24V)					
1 lane, Max speed @20 gal/lane mile	50 mph	50 mph	50 mph	50 mph	50 mph	50 mph
3 lane, Max speed @20 gal/lane mile	20 mph	20 mph	20 mph	20 mph	20 mph	20 mph
Weight (empty tanks)	1150 lbs	1215/1230 lbs	1280 lbs	1720 lbs	2100 lbs	2500 lbs
Weight (completely filled liquid tanks)	5760 lbs	8130 / 8606 lbs	10500 lbs	16472 lbs	26543 lbs	32465 lbs

These numbers are only guidelines, and based on brine liquid with a density of 69 lb/ft³.

Specifications are subject to change without notice. We do not take any responsibility in any direct or indirect damages or warranty cases concerning the values above.

Sprayer parts



Incorrect installation and operation can lead to serious personal injury and/or damage your equipment and property. Note and ensure that you understand this manual before installing, operating or making adjustments to the sprayer.

**WARNING**

Observe these safety precautions before, during and after operating the sprayer. You can prevent injury to persons and damage to the sprayer by following these precautions.

**CAUTION**

Empty and clean the liquid tank after each use. Unused material left in the tank could freeze or solidify, causing the sprayer to not work properly.

Safety guidelines

1. Read this manual before operating the sprayer.
2. Ensure that you have fastened the sprayer to the vehicle according to descriptions in this manual.
3. Before every use, make sure all the equipment is securely mounted into place.
4. Do not exceed your vehicle total weight beyond payload limits.
5. Always empty the sprayer before removing it from the vehicle.
6. A sprayer in need of repairs or maintenance should not be operated.
7. Shut off the vehicle before attaching, detaching or servicing the sprayer.
8. Before removing or replacing any electrical components, always disconnect the battery.
9. Do not keep gasoline or other flammable liquids on the vehicle bed while sprayer is mounted on the truck bed.
10. Do not use flammable or petroleum liquids in the liquid system

Personal safety

- Protect your eyes with safety goggles when filling the sprayer and handling de-icing liquids.
- Wear protecting clothes and avoid touching the de-icing liquids. Liquid brine can irritate skin, eyes and breathing organs.

Noise

The noise caused by the running sprayer does not exceed 70 dB

Control placement

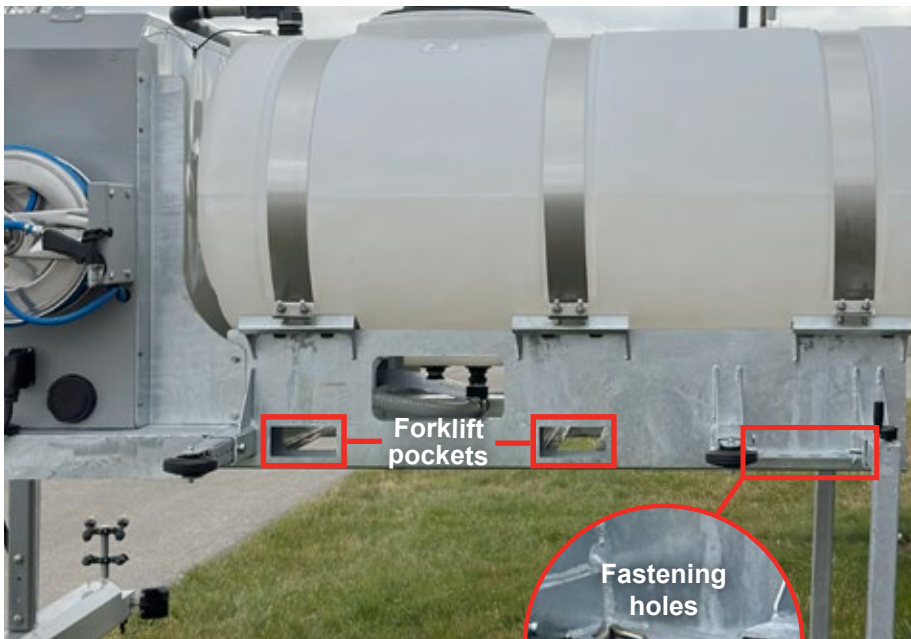
The controller should be mounted in a place where it can easily be reached and doesn't interfere with the access to vehicle controls or other equipment. Make sure that the sprayer control panel doesn't block the vehicle airbag area. Protect the controller from water, dirt and dust.



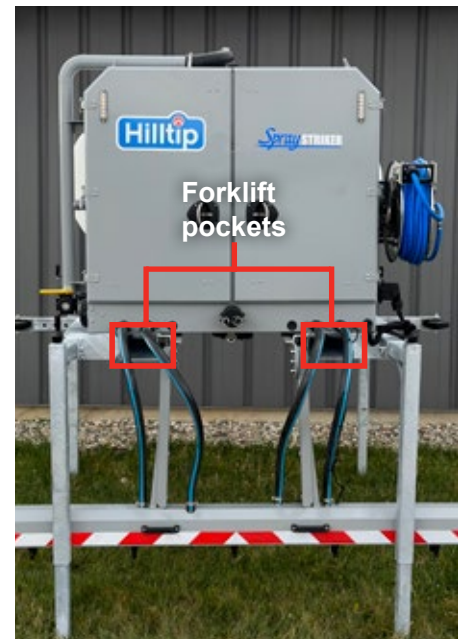
Lifting and fastening the sprayer to vehicle

WARNING
Make sure that the sprayer is securely fastened before every use.

1. Remove tailgate from vehicle.
2. Check the vehicle bed and remove sharp debris or foreign objects to protect the sprayer from damage. Also remove gasoline and other flammable liquids.
3. Lift the sprayer with a forklift onto the vehicle bed. There are forklift pockets in the rear and on the side of the sprayer (see pictures below). **NOTE! Only lift empty tanks, do not lift the spreader when the tanks are full of liquid.**
4. There are fastening points (holes) at each side of the sprayer bottom frame (see picture below). Use these fastening points to fasten the sprayer with turnbuckles or tensioning straps to the vehicle bed to prevent the sprayer from moving sideways.



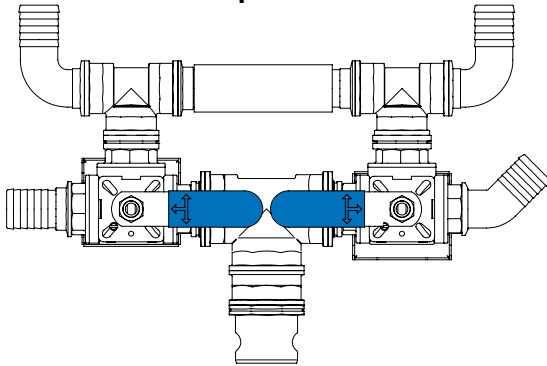
Fastening holes and forlift pockets



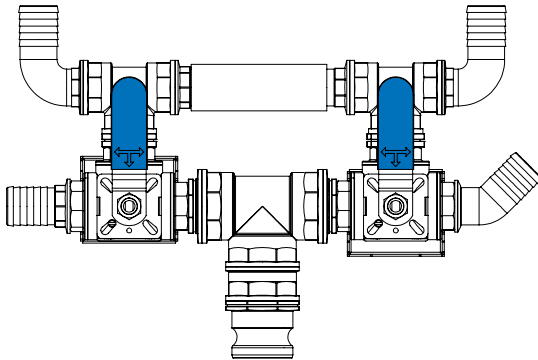
Use the forklift pockets when lifting the sprayer

Main hand valve

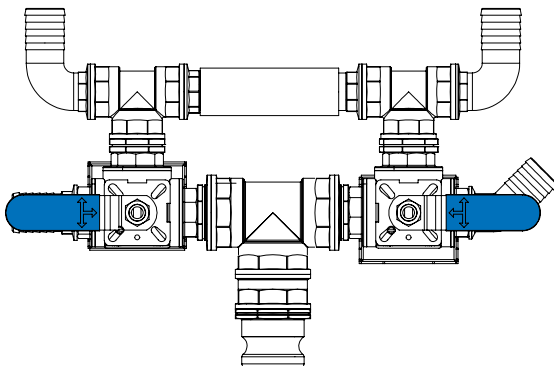
Normal operation mode



Suction mode



Tank drain mode



Main hand valve inside the stainless steel cabinet

Filling the sprayer

- ! WARNING**
Do not use petroleum or flammable liquids for the liquid system
- ! WARNING**
Do not overload your vehicle beyond GVWR or GAWR, overloading could result in accident or damage.
- ! WARNING**
Check that there are no persons within the spray area when starting and operating this sprayer.
- Use water or de-icing liquids for the spray system. Apply your selection to local de-icing recommendations.
 - Use an appropriate anti-freeze liquid for your weather temperatures.



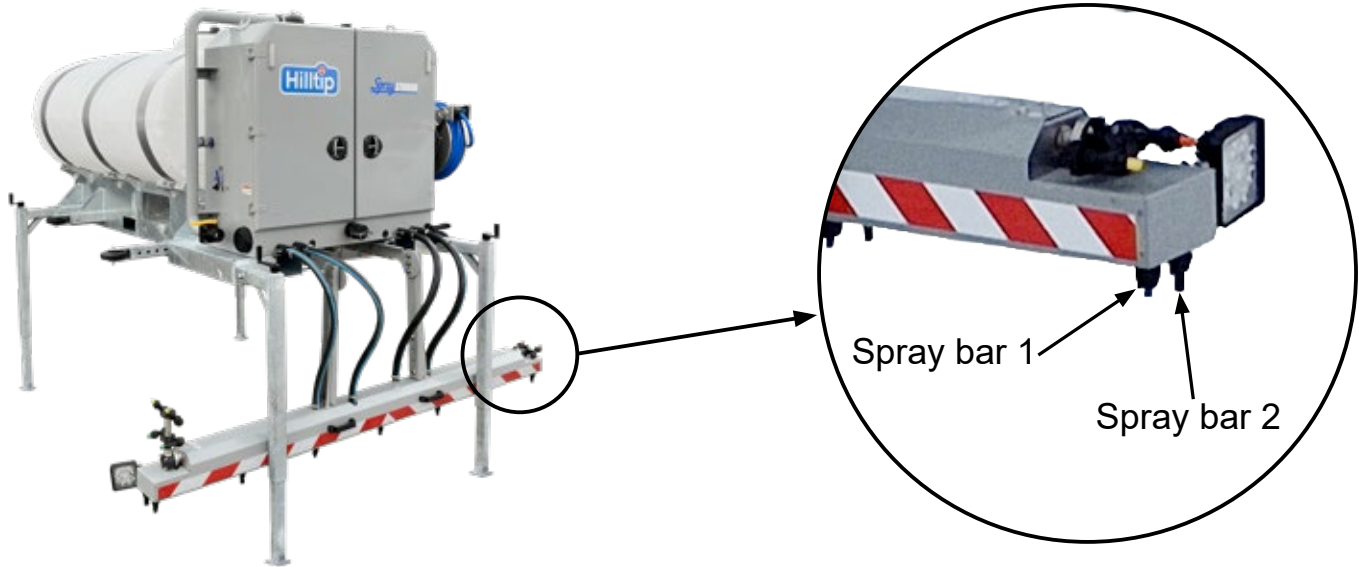
Spray bar installation

Recommended installation height for the spray bar is 20-24" from the ground.



Spray nozzles

- Spray bar 1 is the spray bar furthest from the vehicle, while Spray bar 2 is the one closest to the vehicle.



Spray nozzle assembly

Type 1

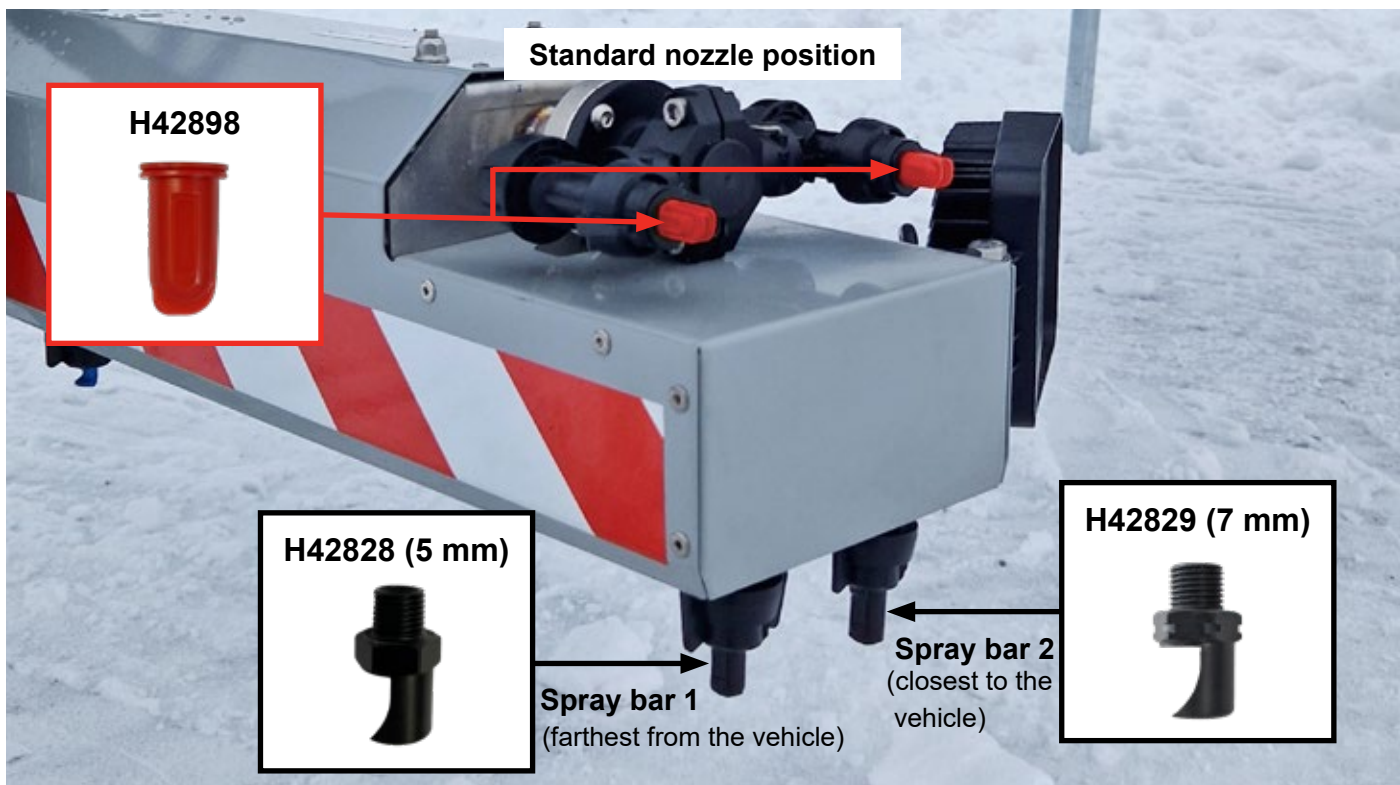


Type 2

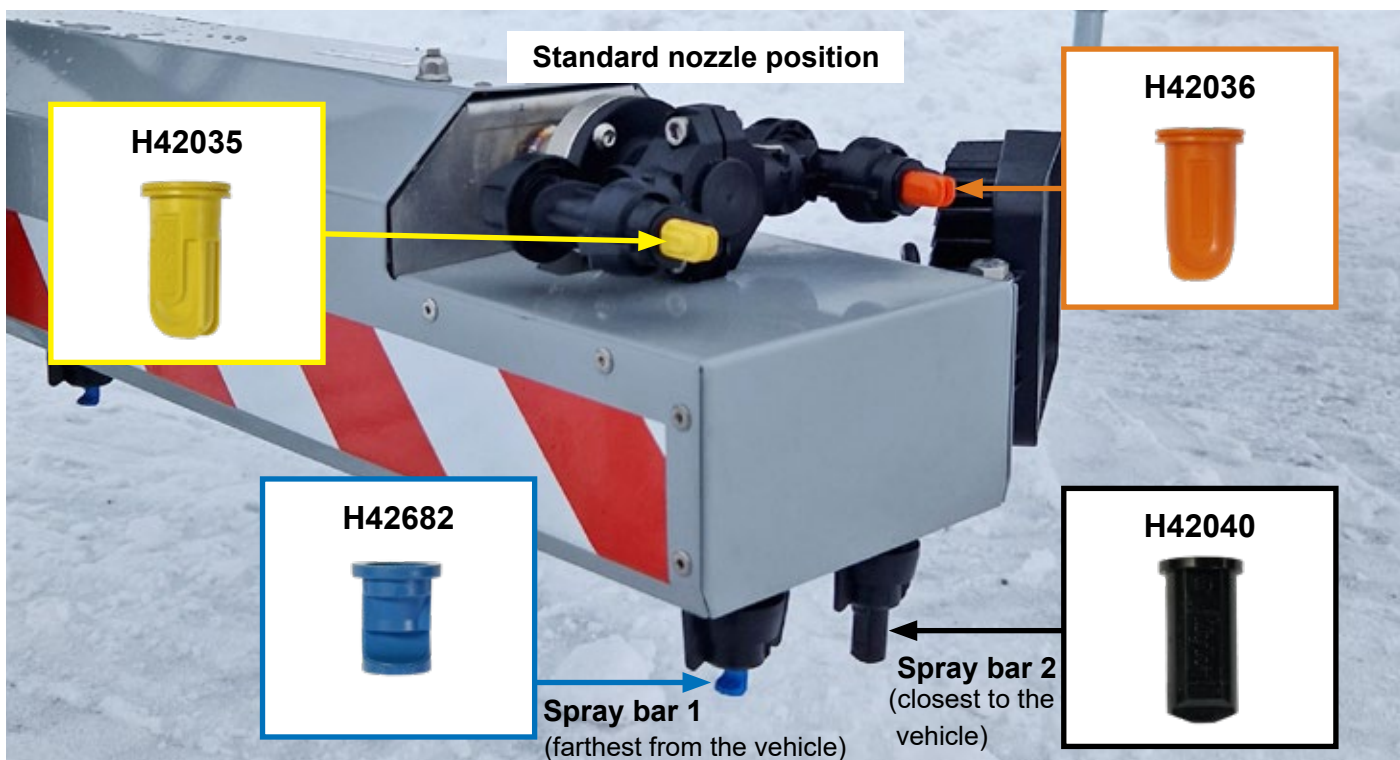


Spray nozzle kits

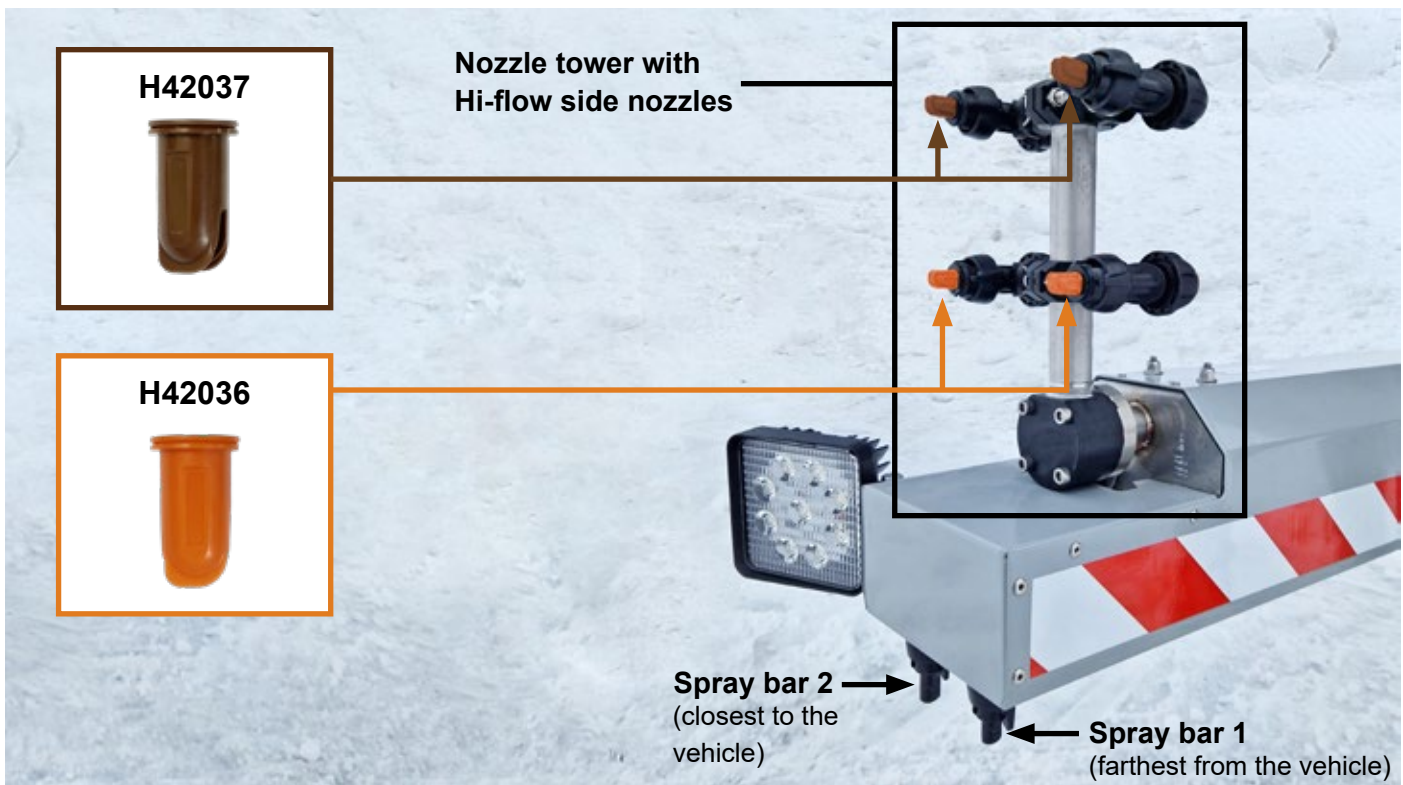
Nozzle kit HFE series 24V (40 gal/min, 150 l/ min) - H42952



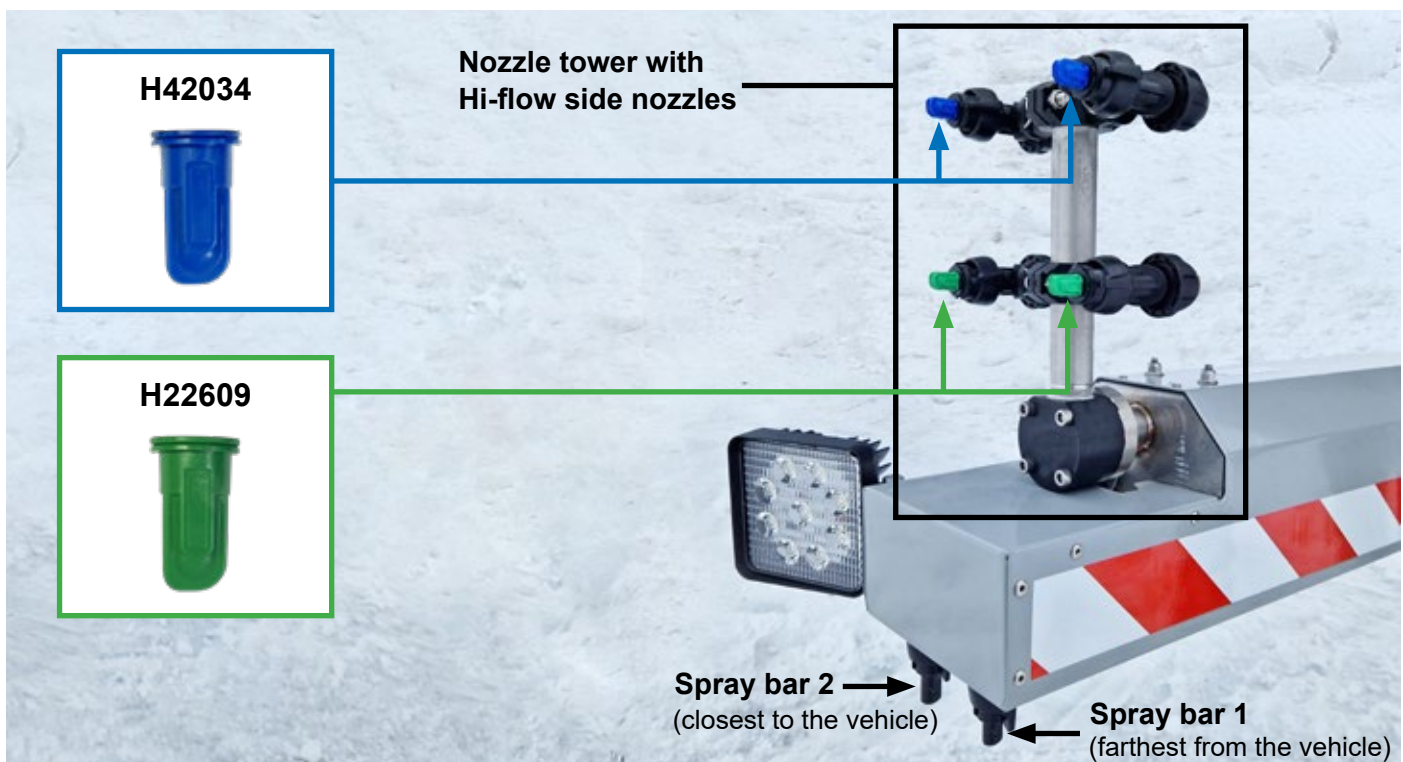
Nozzle kit HFE series 12V (20 gal/min, 75 l/min) - H42953



4x Hi-flow side nozzle for highway, one side (24V) - H42954



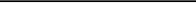
4 x Hi-flow side nozzle for highway, one side (12V) - H42571

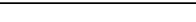


Error codes for DC/DC charger (24V)

Display LED:

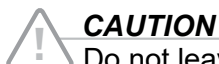
- 1  INPUT
- 2  OUTPUT
- 3  STATUS

Input & Temp. Voltage	LED 1	Status
Red light Quickly		Over Voltage Protection Shutdown
Red light Slowly		Under Voltage Protection Shutdown
Red light Continuously		Charger Over Temperature Protection Shutdown
Orange light Quickly		Over Voltage Alarm
Orange light Slowly		Under Voltage Alarm
Orange light Continuously		Charger Over Temperature Alarm
Green light Continuously		Normal

Output	LED 2	Status
Red light Quickly		Over Voltage Protection Shutdown
Red light Slowly		Battery Over Temperature Protection Shutdown
Red light Continuously		Short Circuit Protection Shutdown
Orange light Quickly		Over Voltage Alarm
Orange light Slowly		Battery Over Temperature Alarm
Orange light Continuously		Battery Under Voltage Alarm (Pre-Charge)
Green light Continuously		Normal

Output Current	LED 3	Status
Green light Continuously		C.V. & Float
Orange light Quickly		C.V. & De-rating
Orange light Slowly		C.V. & Bulk
Orange light Continuously		C.V. & Absorption

Empty the sprayer



CAUTION

Do not leave liquids in the sprayer tank for an extended period of time

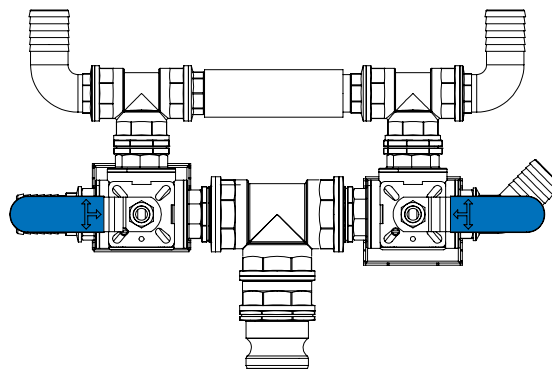


CAUTION

Always empty the sprayer before removing it from the vehicle

To empty the sprayer, the main hand valves should be in tank drain mode and the manual valve located on the bottom of the cabinet (below the main hand valve) should be open.

Tank drain mode



Sprayer maintenance



WARNING

Power should always be shut off before and during service or maintenance of the sprayer



WARNING

Always empty the sprayer before removing it from the vehicle



NOTE

Apply dielectric grease on all electrical connections to prevent corrosion

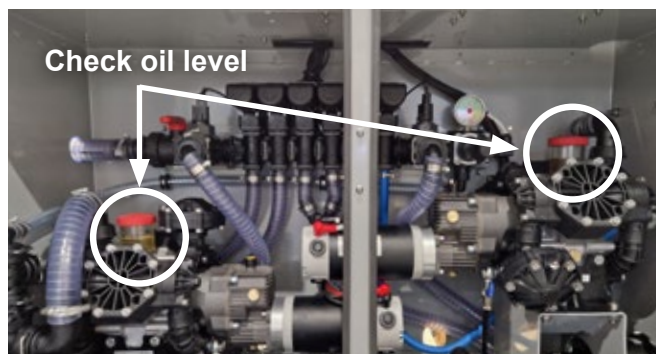


CAUTION

- Do not operate a damaged sprayer or a sprayer in need of maintenance
- Sprayer should be rinsed, emptied and cleaned after each use, to prevent material build-up and corrosion.

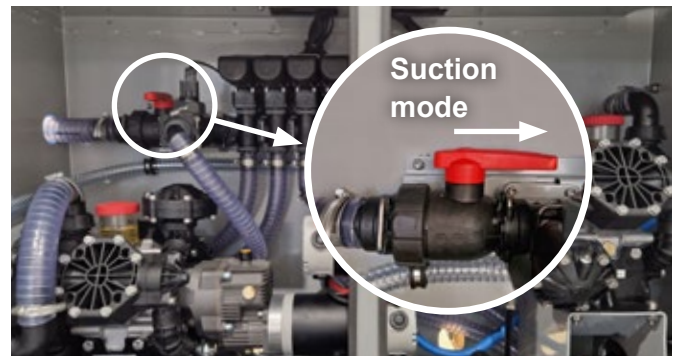
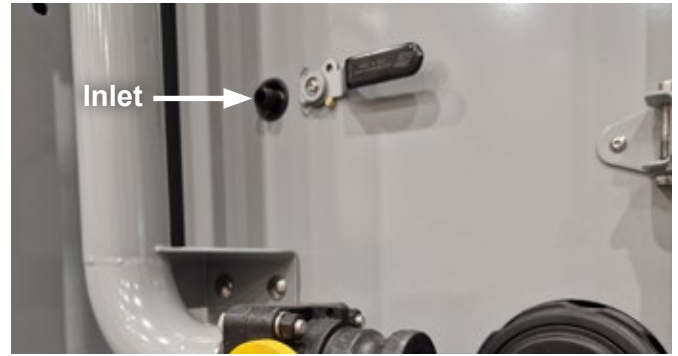
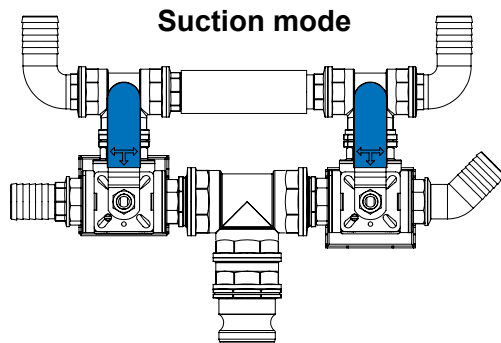
Daily Maintenance

1. Check oil level and add 75W-90 fully synthetic oil if necessary



2. Rinse the pumps after each use

- Connect e.g. a garden hose to the inlet on the drivers side of the cabinet and set the valve to rinse mode
- Set the hand valves in suction mode



- Rinse with washer fluid or glycol. Before long-term storage, always rinse with glycol.

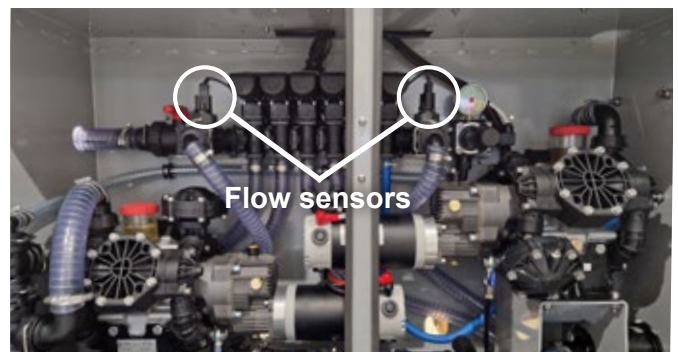
3. Check the filters on both sides of the cabinet and clean them if they are dirty



Unscrew the cap to check the filter

4. Clean the flow sensors

- Unscrew the flow sensors and rinse with water



Brine mixing

How to determine the concentration of salt in your brine liquid with the Hilltip Refractometer:

Thoroughly mix your salt solution. Place a few drops of the brine liquid with pipette on the prism, and close the daylight plate (see image 3). Make sure the sample is evenly distributed and air bubbles are eliminated on prism. Aim front of the refractometer to the direction of light. Take reading when the boundary line of blue and white cross the graduated scale (see image 2). The scale will provide a direct reading of the concentration.

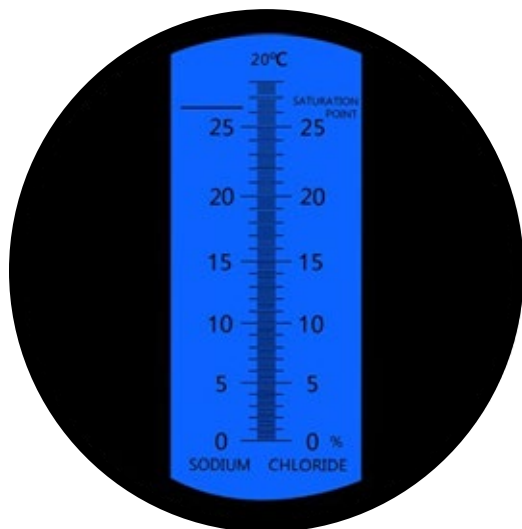


Image 1. As seen when looking in to the instrument. Measure range 0-28%

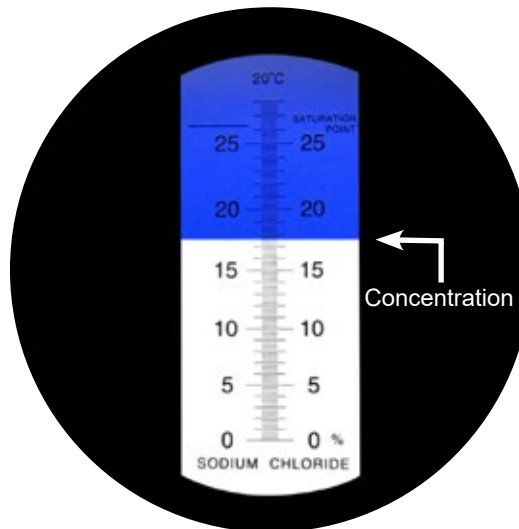


Image 2. Take reading when the boundary line of blue and white cross the graduated scale.

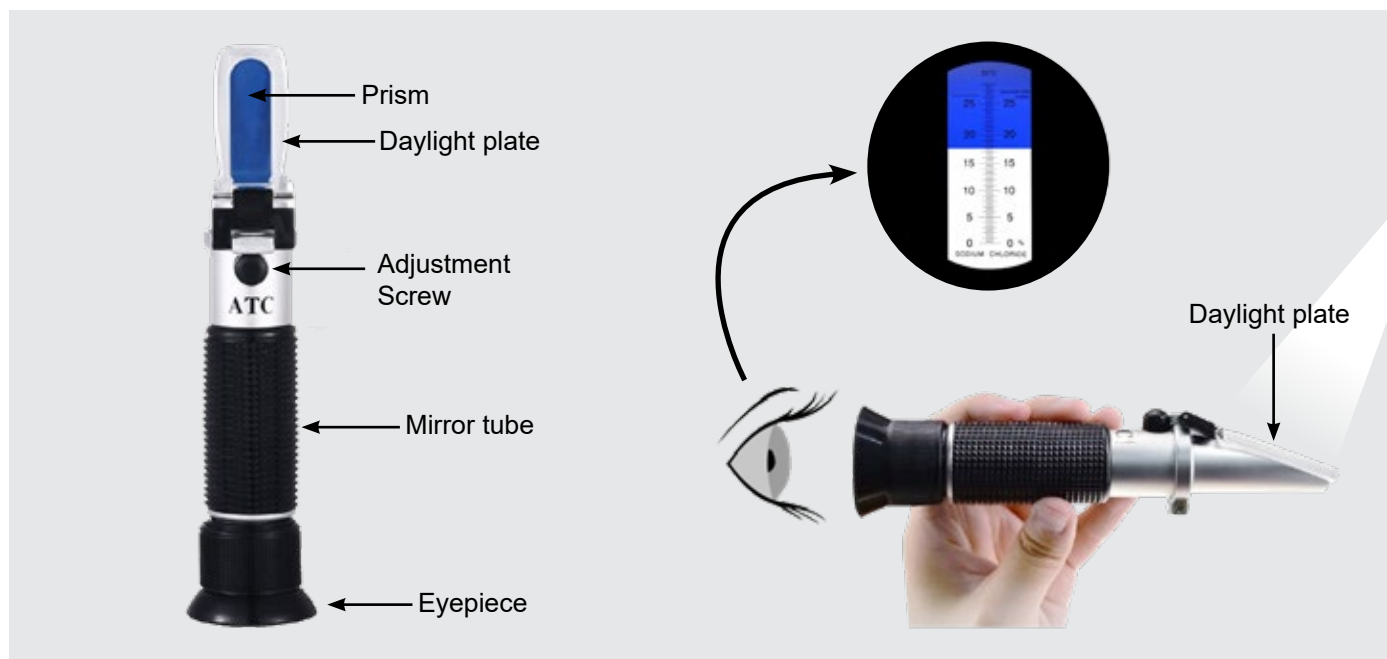


Image 3. Hand held refractometer

% sodium chloride by weight	Pounds of salt per gallon water	Grams salt per L water	Freezing point ° K	Freezing point °C
0	0	0	0	0
5,28	0.464	54,6	+ 26.4	- 3,1
10,56	0.983	113,5	+ 19.4	- 7
15,84	1.567	176,7	+ 10.9	- 11,7
18,48	1.887	210,0	+ 5.7	- 14,6
23,31*	2.288	274,1	- 6.0	- 21
26,13	2.948	313,4	+ 29.8	- 1,2

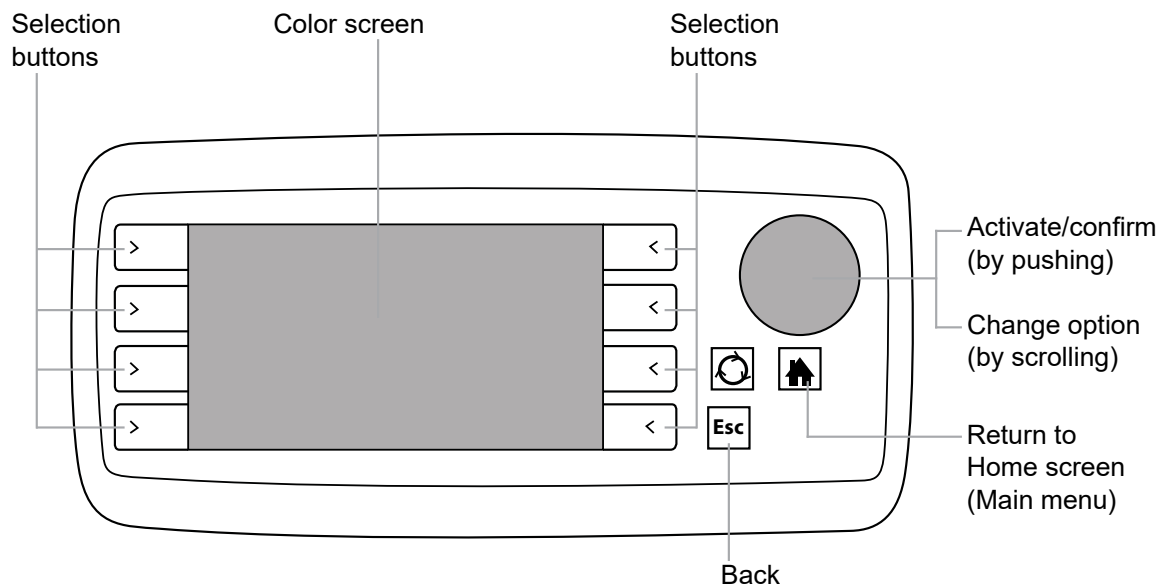


NOTE

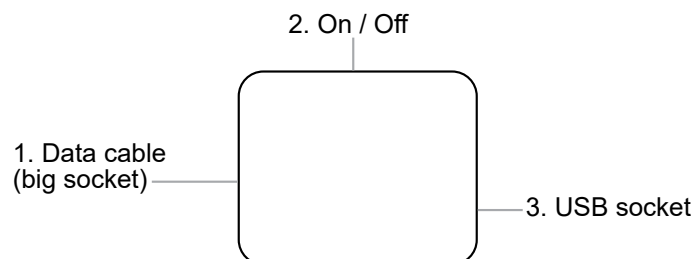
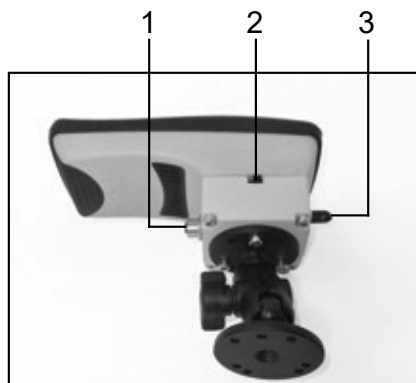
The liquid brine will have the best melting capacity at 23,3% solution.

* Lowest freezing point at this concentration

Controller parts



On the back of the controller:



Main menu

Selecting spraying mode with presets

Start by selecting presets, automatic or manual spreading mode by pushing the selection button next to your choice. Automatic mode will adjust the amount of spreading material (ml/m²) according to your vehicle speed.

When the sprayer is equipped with handspray and this is activated in the machine settings (Main menu → Settings → Machine → Model), you can select handspray directly from the main menu.

>	Main menu		<
>	Presets	HTrack	<
>	Automatic	Settings	<
>	Manual	Info	<

Main menu with Presets and HTrack

>	Handspray		<
>	Presets	HTrack	<
>	Automatic	Settings	<
>	Manual	Info	<

Main menu with the optional features handspray activated.

Info

Error codes: Shows error codes.

GPS: Shows GPS Information

Service: Shows operating hours and service.

Trip log: Shows information about the log.

About: Shows controller and module versions etc.

Users can see if they have the latest software installed or if a new version of SprayStriker software is available. For users with HTrack or Internet access, it is possible to install the latest update from the controller.

See the StrikeSmart™ controller user guide for more information.

>	Information		<
>		Service	<
>	Error Codes	Trip log	<
>	GPS	About	<

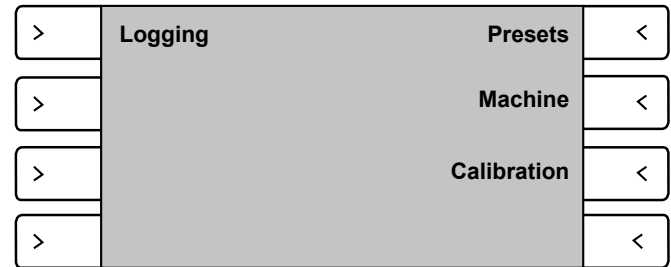
Info menu

Settings menu

Settings menu with presets

Main menu → Settings

Inside the settings-menu, choose a sub-menu by pushing the selection button next to it.

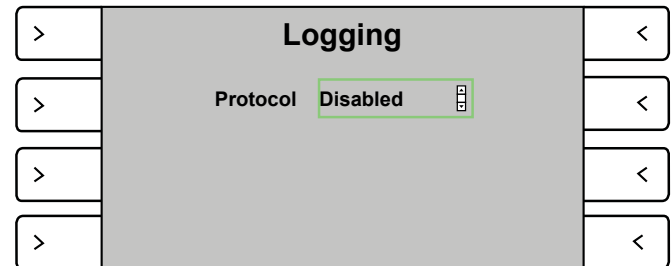


Settings menu

Logging

Go to Logging

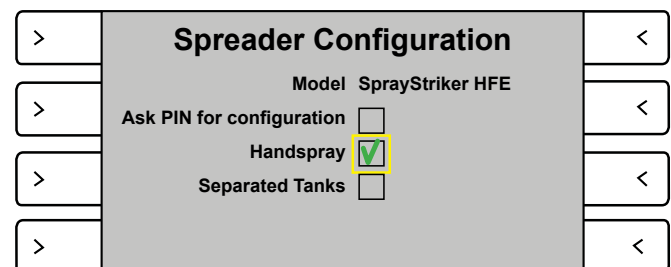
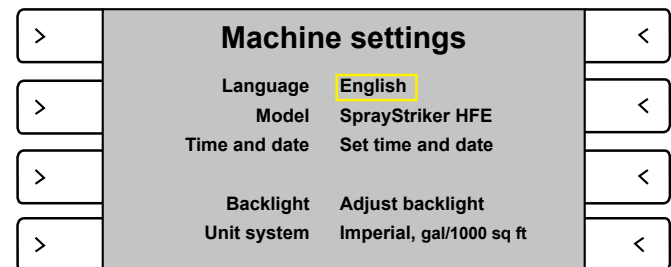
Scroll the round button to browse protocol. Choose Disabled if you use presets, HTrack if you use Hilltip tracking system, DIN EN 15430 if you use an external tracking system. Push the round button once to select protocol. HTrack will be selectable from the main menu.



Machine settings

Go to Machine

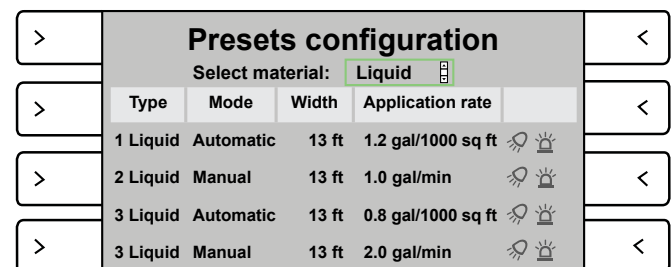
This view lets you set language, model, time and date etc. by pushing and scrolling the round button. Under “model” users will see the spreader configuration and be able to select a specific spreader model. Optional features like handspray can be activated in this menu. When handspray is activated/checked it will be selectable from the main menu. **Note! Check that the correct model is selected.**



Presets configuration

Go to Presets

Push and scroll the round button to select material, fill in the Type, Mode, Width, Application rate and select optional features (work light, beacon). This function will be selectable from the main menu.



Calibration

Go to Calibration → Liquid flow

Choose “Width calibration” or “Max flow calibration” by pushing the selection button next to it.

>	Calibration	<
>		<
>		<
>		Liquid flow

>	Liquid flow settings	<	
>		Flow sensor constant 600	<
>		Width calibration	<
>		Max flow calibration	<

Width calibration

Choose if you want to calibrate “Spraybar width”, “Spraybar width left” or “Spraybar width right” by pushing and scrolling the round button. Press start and follow the instructions.

>	Calibration Spraybar Width	<	
>		Spraybar width (m) 6.5	<
>		Spraybar width left (m) 16.5	<
>		Spraybar width right (m) 16.5	<

>	Calibration Spraybar Width	<	
>		Active valves Spraybar	<
>		Prepare to measure the width of the sprayed area. Select “Start” to start the pump. The pump switches off after 20 seconds. You can also turn it off by selecting “Stop” as soon as you are ready to take the measurement.	<
>		Cancel Start	<

Maximum flow calibration

Choose “Calibrate” by pushing and scrolling the round button. Hand spray is calibrated separately.

>	Maximum flow calibration	<	
>		Spraybar + both end nozzles 120.0 Calibrate	<
>		Spraybar + end nozzle right 100.0	<
>		Spraybar + end nozzle left 110.0	<
>		Primary spraybar 65.0	<
>		Both spraybars 150.0	<
>	End nozzle right 35.0	<	
>	End nozzle left 45.0	<	
>	Both end nozzles 75.0	<	
>	Handspray 12.0 Calibrate	<	

Spraying mode

Basic functions

Example: Activating a basic function in the spraying-control menu. Activate the LED-light by pushing the selection button next to the lamp symbol. The symbol will turn colored and stay that way as long as it's activated. Push the same button again to turn off the lamp.

The area in the bottom of the spraying mode screen shows selected material, vehicle speed and current time.

Adjusting spray volume

Select Automatic or Manual mode in the main menu. In automatic mode the distribution unit is defined by ml/m^2 , and in manual mode by l/min .

Adjust the spray width by activating the end nozzles (left and right) by pushing the button beside the icon. Adjust the spray volume by scrolling the round button.

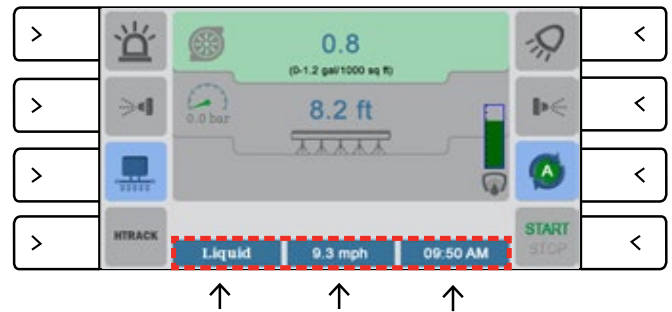
Presets mode

Select Presets mode from the main menu.

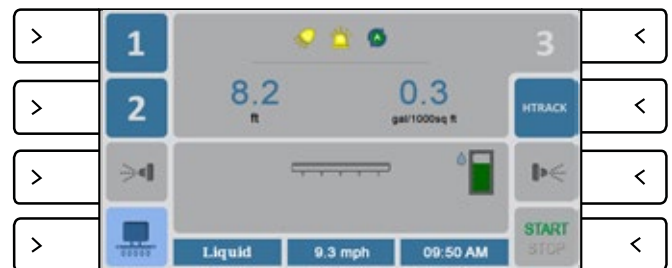
Select one of the four presets by pushing the selection button next to number.



Automatic mode



Manual mode



Presets mode

Symbols

Activate/inactivate a function by pushing the selection button next to it. A grey symbol means that the function is inactive. An activated function is represented by a colored symbol.

START Push this button to **start** your spray
STOP session



When you're spraying in manual mode, push this button to change to automatic mode.



This button will activate the optional LED-work light



Press this button to turn on/off the middle spraybar nozzles.

START When spraying, push this button
STOP to **stop** spraying



When you're spraying in automatic mode, push this button to change to manual mode.



This button will activate the optional beacon light



Push this button to activate the optional electrical end nozzle (right).

Note: Directional control must be activated/ checked under Settings → Machine → Model → Spreader configuration.



Push this button to activate the optional electrical end nozzle (left).

Note: Directional control must be activated/ checked under Settings → Machine → Model → Spreader configuration.

Hilltip HTrack™

The Hilltip HTrack™ system is compatible with all models of IceStriker™, SprayStriker™ and SnowStriker™, via the controller. With the tracking software you can track and manage all of your spreading devices and snowplows online on your computer, tablet or smartphone.

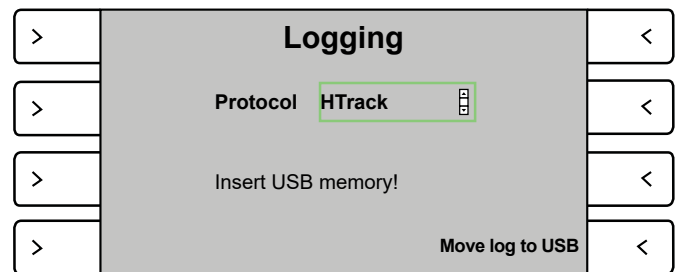
Go to www.htrack.net to read more, and to make a request for an account.

NOTE! More information about HTrack™ setup (settings and tracking) is found in the HTrack™ user guide.

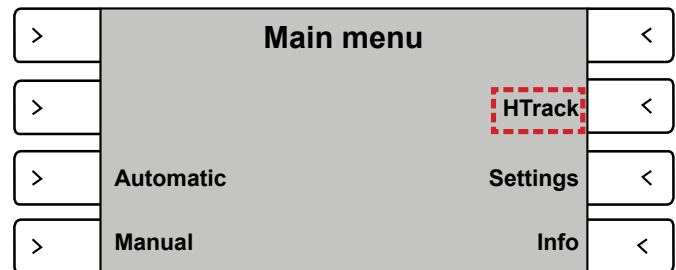
HTrack - Controller setup

Preparations for normal-controller with Hilltip Wi-Fi dongle

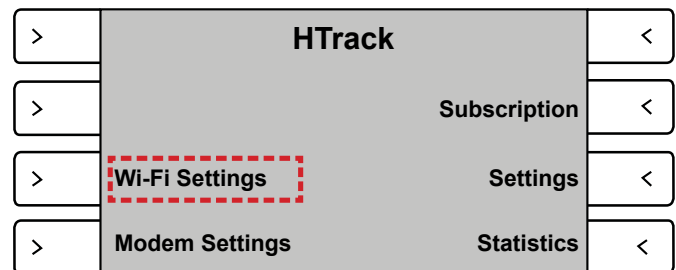
1. Insert the Wi-Fi dongle in the USB port on the back of the controller.
2. Turn on the controller. From the Main menu, go to the Settings menu and select Logging.
3. Select “HTrack” as logging protocol.
4. Go to Main menu and select HTrack.
5. Go to HTrack settings → Wi-fi. Choose “Enabled”. **Note!** Modem settings does not work when Wi-Fi is enabled.
6. Go back to HTrack and select Wi-Fi settings. Select “config” and insert the password in the popup window and press save (see image 6.1 and 6.2 on next page).
7. Log in to the HTrack webpage. Go to “Settings” → “Subscriptions” on the webpage and follow the instructions on page 6.



Select HTrack in Logging menu



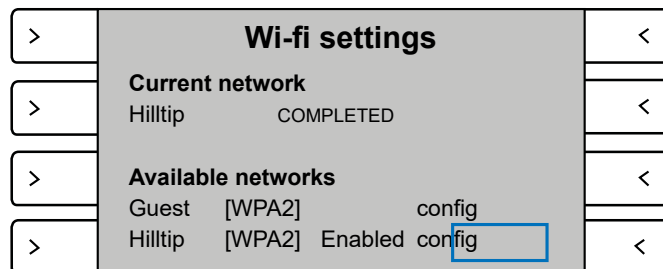
Select HTrack in Main menu



Select Modem Settings in the HTrack menu

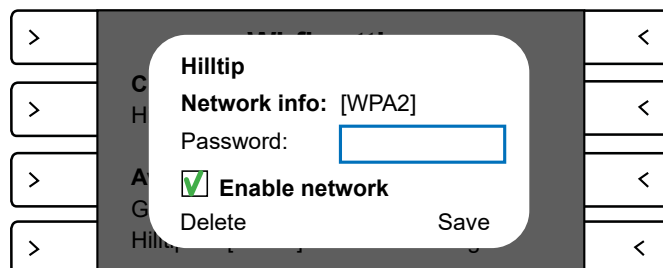
Read more about the setup in the HTrack user guide

Wi-Fi settings: Here users can see the current network and a list of available networks. Scroll down the list to find the correct network. Select “config” at the selected network. A popup window appears on the screen and here users can enter the password and save or delete the network.



The screen displays 'Wi-fi settings'. Under 'Current network', it shows 'Hilltip' with a 'COMPLETED' status. Under 'Available networks', there is a list with 'Guest [WPA2] config' and 'Hilltip [WPA2] Enabled config'. The 'config' button next to 'Hilltip' is highlighted with a blue box.

6.1 Wi-Fi settings



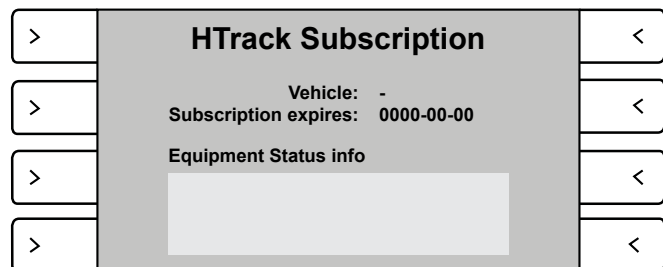
A popup window titled 'Hilltip' is shown over the settings screen. It contains 'Network info: [WPA2]', a 'Password:' field with an input box, a checked checkbox for 'Enable network', and 'Delete' and 'Save' buttons at the bottom.

6.2 Popup window: Insert password and press save by scrolling and pushing the round button.

HTrack subscriptions

Go to subscriptions

Shows information about the HTrack subscriptions.

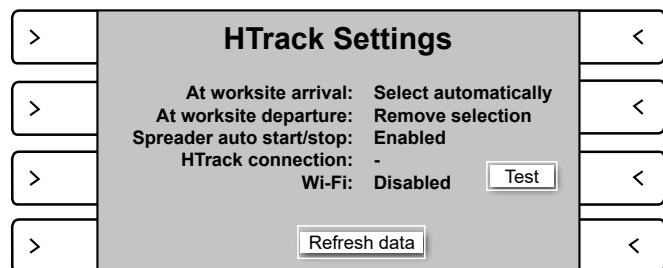


The screen displays 'HTrack Subscription'. It shows 'Vehicle: -', 'Subscription expires: 0000-00-00', and a section for 'Equipment Status info' which is currently blank.

HTrack settings

Go to settings

Choose what will happen when arriving at a worksite. Select “Select Automatically” if you want the machine to select the worksite and preset. When the spreader auto start/stop is enabled, the machine will automatically start spreading upon arrival at the worksite and stop when departing. Change settings and do a test by scrolling and pushing the round button.

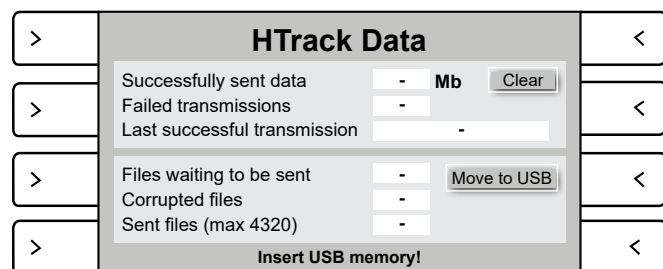


The screen displays 'HTrack Settings'. It includes settings for 'At worksite arrival' (Set to 'Select automatically'), 'At worksite departure' (Set to 'Remove selection'), 'Spreader auto start/stop' (Set to 'Enabled'), and 'HTrack connection' (Set to 'Wi-Fi: Disabled'). There are 'Test' and 'Refresh data' buttons.

HTrack data

Go to statistics

Clear or Move data to USB by scrolling and pushing the round button.



The screen displays 'HTrack Data'. It shows statistics for 'Successfully sent data' (0 Mb), 'Failed transmissions' (0), and 'Last successful transmission'. There is a 'Clear' button. Below, it shows 'Files waiting to be sent' (0), 'Corrupted files' (0), and 'Sent files (max 4320)'. There is a 'Move to USB' button. At the bottom, it says 'Insert USB memory!'.

Tracking

To be completed after you have set up your devices and subscriptions on the webpage:

Auto: The machine selects worksite and starts tracking automatically.

Manual:

Selecting Customer/Contract/Worksite

Press HTrack icon to select one of the customer/contract/worksites that have been configured in the HTrack portal. If worksite is configured with an area, a list of closest worksites is displayed.

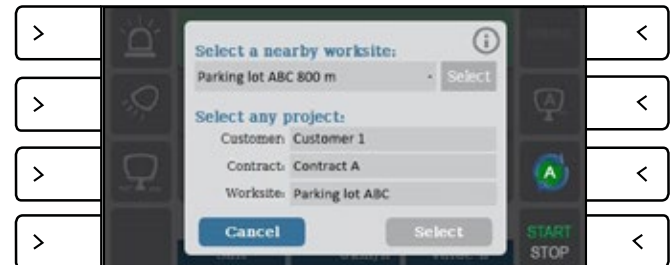
It is possible to select customer, contract or worksite. Select a customer or a contract to filter all worksites belonging to that customer or contract.

If you have many customers and contracts, and want to narrow down the selection list in the controller, we recommend that you link a specific vehicle to your contracts. You can do this by editing a contract at the HTrack-webpage, go to Settings → Contracts.

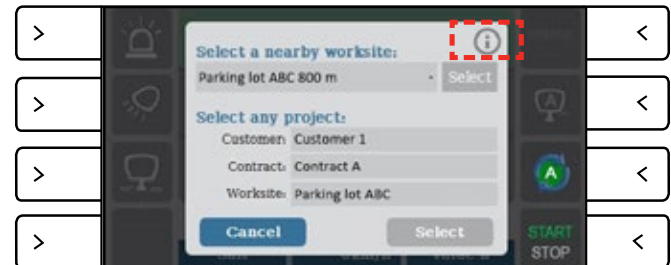
If the info icon (i) in the right corner turns red, there is something wrong with the subscription. For more information, press the info icon by scrolling and pushing the round button.



Select HTrack to in the spreading view to select customer/contract/worksites.



This pop up will show on the controller screen when you press the Htrack icon and manually choose customer/contract/worksites.



Software update

Put the new software files on an USB-memory, and insert it in the USB-slot on the back of the controller. Turn on the controller and wait for about 5 minutes for the system to update. Restart the system after the update is completed.

Please ask your local dealer for the latest version of the software.

For users with HTrack or internet connection via modem or Wi-Fi it is possible to download and install the latest software directly from the controller. This option can be disabled in the HTrack portal (Vehicle settings → Equipment → Controllers). If the update from the controller is blocked users can't see the install button in the controller.

Go to Main Menu → Info → About.

Here users can see if the latest software version is installed and if a new version of SprayStriker software is available. If a new version is available select "Install" by pushing the round button.

The software update is done in three steps:

1. Controller update: If a new software version is available select "Install" by pushing the round button.

2. Spreader module update: When the controller update is ready it is possible to update the spreader module. Select "Install" to update the spreader module.

3. Reboot: When the controller and spreader module update is ready select "Reboot" to complete the update.

>	Versions		<
>	IceStriker (installed) 0.47		<
>	Controller SW	3.0.48 (3.0.55) Change log	<
>	OS	3.0.101-rt130-opus3-2.2.2-2	<
>	IO_Module SW	4.3	<
>	IO_Module HW	0.8	<
>	Serial Nr	1731331CA	<

About view (Software update Not allowed)

>	Versions		<
>	IceStriker (installed) 0.47		<
>	IceStriker (available) 0.48		<
>	Controller SW	3.0.48 (3.0.55) Change log	<
>	OS	3.0.101-rt130-opus3-2.2.2-2 Install	<
>	IO_Module SW	4.3	<
>	IO_Module HW	0.8	<
>	Serial Nr	1731331CA	<

About view (Software update Allowed)

>	1. Controller update Install		<
>	A new software version is available		<
>	Installation version 0.46		<
>	Available version 0.47		<
>	2. Spreader module update		<
>	3. Reboot		<

Step 1. Controller update

>	1. Controller update ✓ Ready		<
>	2. Spreader module update Install		<
>	An update available for the spreader module		<
>	Installation version 0.46		<
>	Available version 0.47		<
>	3. Reboot Reboot		<
>	Reboot to complete update		<

Step 2. Spreader module update

>	1. Controller update ✓ Ready		<
>	2. Spreader module update ✓ Ready		<
>	You have the latest version installed		<
>	3. Reboot		<
>	Reboot to complete update		<

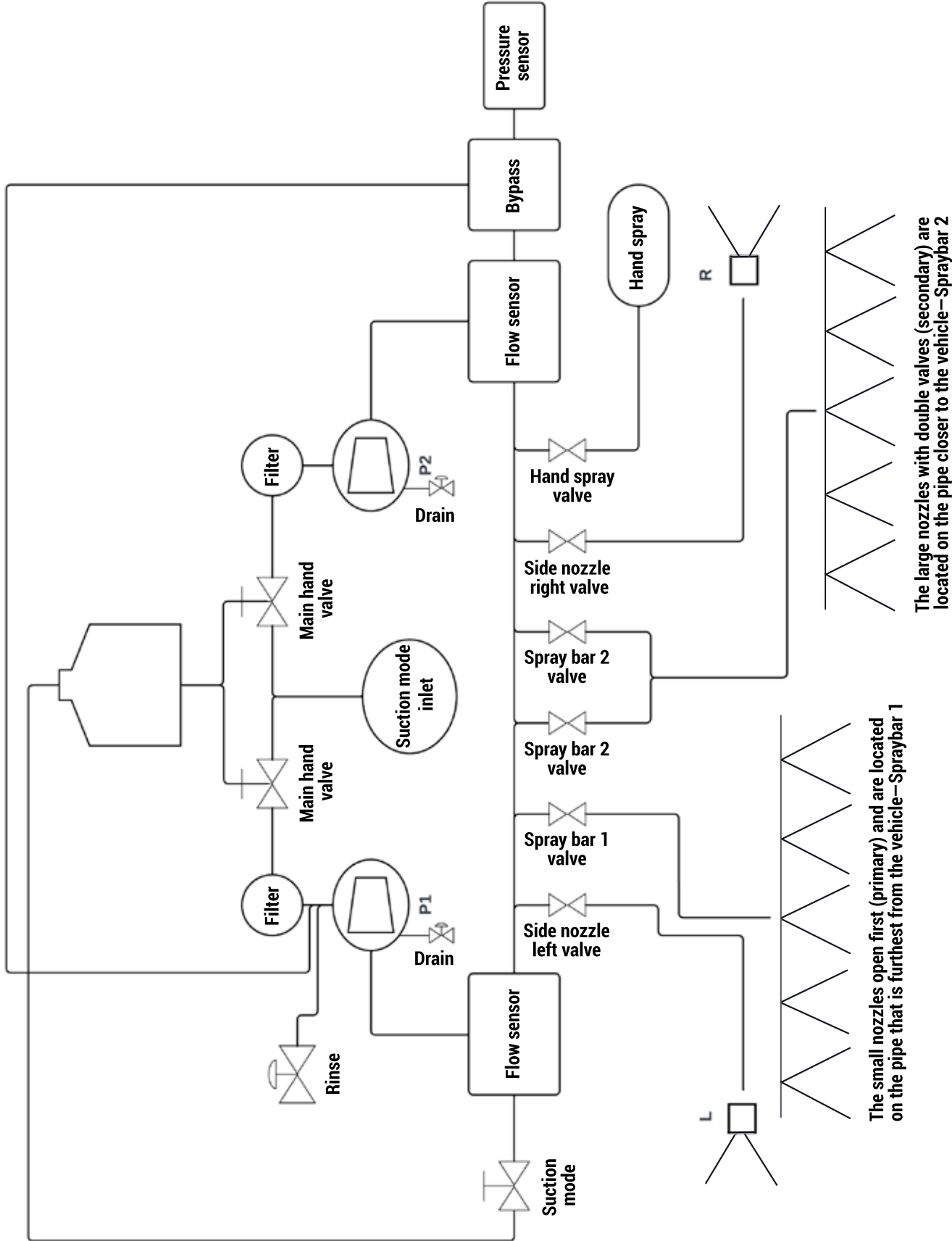
Software update ready

This view is displayed after reboot. In the change log users can see software version updates, new features, bugfixes etc. Push the round button to select the change log and scroll the round button to scroll down and read the log.

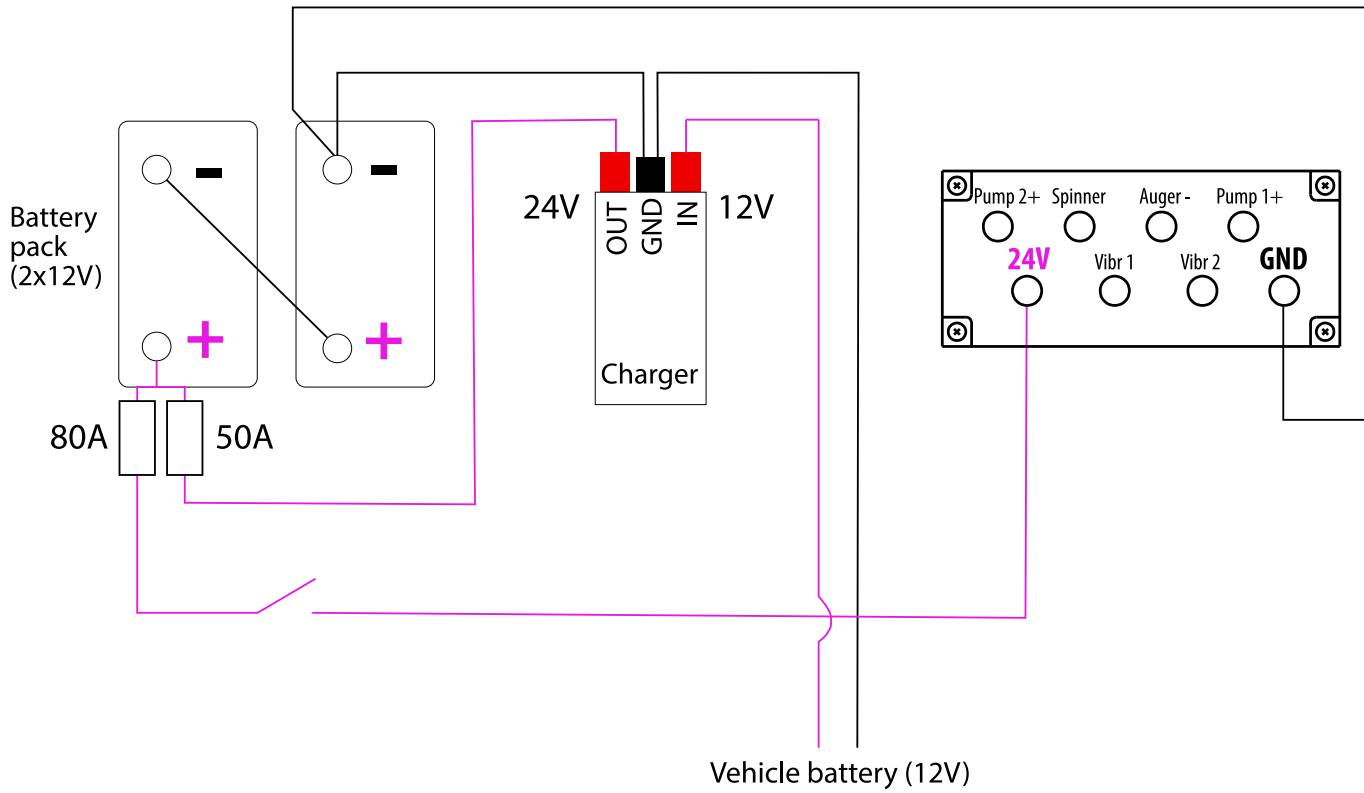
Software update ready		
>	New features	<
>	*Support for 65 TR and 90 UTV	<
>	Buxfix	<
>	*None	<
>	*****Version 0.43*****	<
Ok		

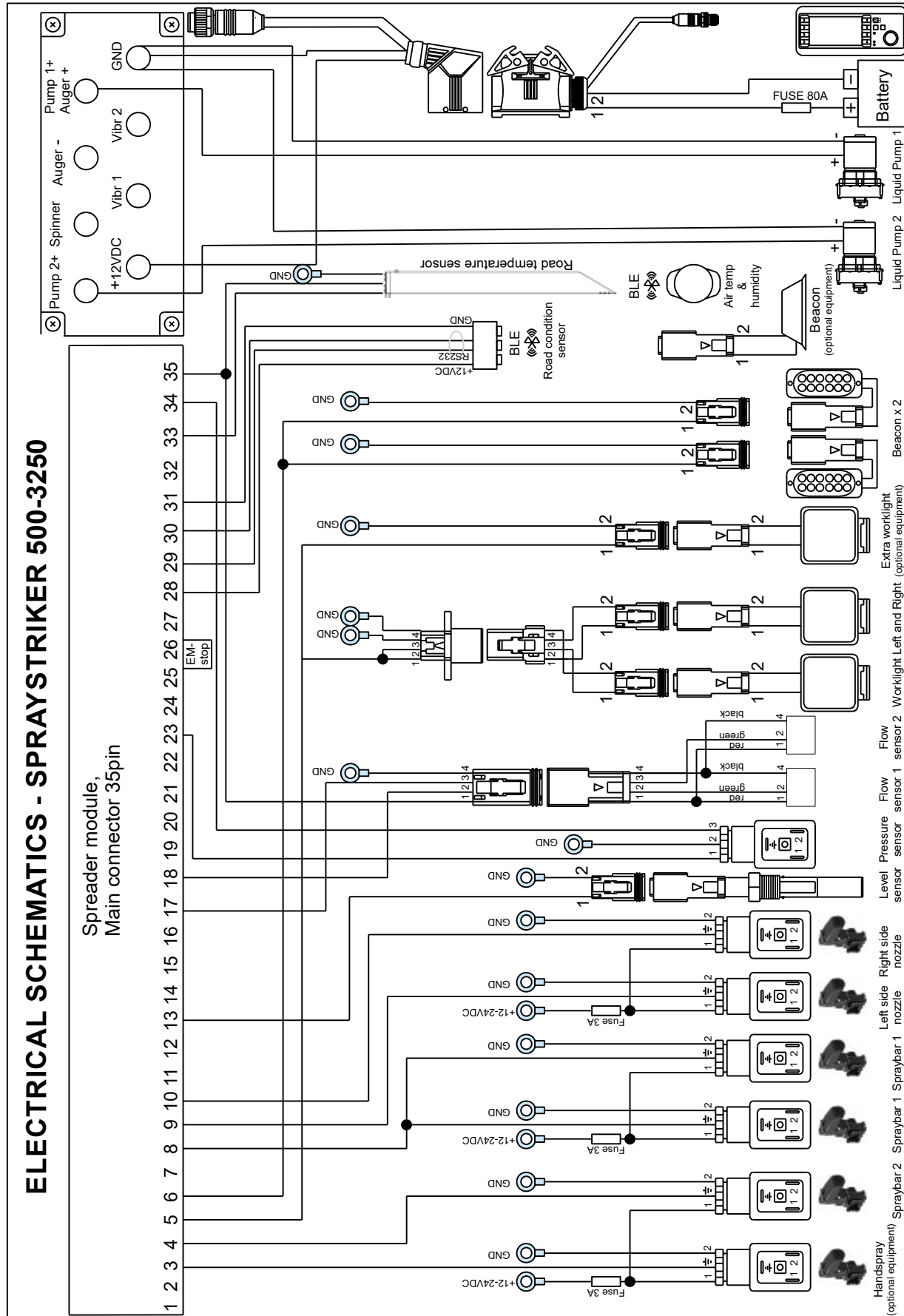
Software update ready

BRINE SYSTEM SCHEMATIC - SPRAYSTRIKER™ 500-3250 HFE SPRAYER



12-24V battery configuration





Warranty information

This warranty replaces all previous warranties

Warranty

This Limited Warranty applies to the SprayStriker™ sprayer, its spare parts and additional equipment (from now on referred to as the "product"), purchased from Hilltip or an authorized dealer.

What does this limited warranty cover?

This Limited Warranty covers any defects in material or workmanship under normal use during the Warranty Period.

During the Warranty Period, Hilltip, or an authorized dealer will repair or replace, at no charge, products or parts of a product that proves defective because of improper material or workmanship, under normal use and maintenance.

How long does the coverage last?

The Warranty Period for the product purchased from Hilltip, or an authorized dealer is two (2) years from the date of purchase. The warranty period for a replacement part is one (1) year from the date of replacement or repair.

How to obtain warranty on your product?

Make sure your dealer has registered your product. In order to obtain service under this warranty the product must be registered with the end user's contact details (name, address, e-mail address and phone number).

What does this limited warranty not cover?

- Improperly installed parts.
- Damage caused by usage that is not in accordance with product instructions.
- Modification of the product, and/or the vehicle, is entirely at the purchaser's risk.
- This warranty does not include compensation for the drive to the service spot.
- Any damage in transit will be the responsibility of the carrier or at the risk of the purchaser.
- Hilltip will not provide replacement equipment or cover rental costs while your equipment is out of service.

This Limited Warranty does not cover any problem that is caused by:

- Misuse, neglect, accident, improper installation, maintenance or storage, or repair or alternation by anyone except Hilltip or an authorized dealer.

What do you have to do?

To obtain warranty service, you must first contact us or your authorized dealer. The purchaser must notify Hilltip or an authorized dealer within ten (10) days after any defect in the product becomes known during the warranty period.

What will we do to correct problems?

Hilltip, or an authorized dealer will repair or replace the part at no charge using either new or refurbished replacement parts.



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